BALTIMORE CITY PUBLIC SCHOOLS
PROCUREMENT DEPARTMENT

Contract No. IFB-27051

INVITATION FOR BIDS
Fire Alarm Upgrades at
Mary Ann Winterling Elementary School #150
220 N. Bentalou Street
Baltimore, MD 21223

Bid Due Date:

Thursday, December 17, 2026, 11:00 A.M. Local Time

NOTE:
The attached forms in the response package shall be executed by responding vendors in sufficient detail to demonstrate that the vendor possesses the required qualifications, capacity, ability, and resources necessary to meet the requirements of this solicitation to the satisfaction of Baltimore City Public Schools (City Schools) and for the proper determination of the low responsible and responsive bidder.

In order to be eligible for consideration, bids must be submitted on eMaryland Marketplace Advantage (eMMA) **by 11:00 am local time, Thursday, December 17, 2026**. **Bids submitted in any way other than via eMaryland Marketplace Advantage (eMMA) will not be accepted.**

Bids for this solicitation are being accepted solely via eMaryland Marketplace Advantage (eMMA) online submission through https://emma.maryland.gov. Bids will be opened electronically in eMMA as soon as practicable after the deadline for the receipt of bids in the solicitation. Bid results will not be given by phone.

Bids will not be accepted by email, fax, mail, or by hand delivery.

All Contractors bidding on this solicitation must first be prequalified by the Baltimore City Department of Public Works Contractors Qualification Committee at Room #634, Charles L. Benton Building, 417 E. Fayette Street, Baltimore, Maryland 21202. For additional information please call 410-396-6883.

Note: **Only MBE firms certified by the Maryland Department of Transportation (MDOT) can be utilized to meet the MBE requirements for the contract.**

For additional information and assistance please contact the M/WBE Manager at 667-487-4112 (c) or email to: MWBEOffice@bcps.k12.md.us.

BID INFORMATION SHEET

I.	**Description of Work:**	Fire Alarm Upgrades at Mary Ann Winterling Elementary School #150
II.	**Location of Work:**	Mary Ann Winterling Elementary School #150 220 N. Bentalou Street Baltimore, MD 21223
III.	**Documents Available At:**	In order to participate interested bidders must visit eMaryland Marketplace Advantage website at https://emma.maryland.gov/ and/or http://www.baltimorecityschools.org/Page/25290
IV.	**Pre-Bid Conference:**	Mandatory walk through at the project construction site will be on Monday, November 16, 2026, at 11:00 a.m. For information contact: Project Manager: Seun Joshua Office Telephone: 443-984-1424 Cell Telephone: 443-931-6965 Email: sajoshua@bcps.k12.md.us
V.	**Questions Due:**	November 24, 2026, by 4:00 p.m.
VI.	**Bid Due Date:**	Baltimore City Public Schools 200 East North Avenue, Room #401 Baltimore, MD, 21202 Thursday, December 17, 2026, by 11:00 a.m. local time
VII.	**Bid Opening:**	Baltimore City Public Schools Thursday, December 17, 2026, 12:00 p.m. via MS Teams Call-in Information: Dial in by Phone Number: +1 443-961-1488,,158460953# Phone Conference ID: 158 460 953#
VIII.	**Contact Person:**	Stuart Feldman, Senior Buyer Email: safeldman@bcps.k12.md.us

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INSTRUCTIONS TO BIDDERS

eMaryland Marketplace Advantage (https://emma.maryland.gov/page.aspx/en/usr/login?ReturnUrl=%2fpage.aspx%2fen%2fbuy%2fhomepage) is the website where Baltimore City Public Schools publishes solicitations over $25,000 along with any addenda, associated materials, bidder/offeror questions, City Schools responses, and other solicitation related information.

Prospective bidders may purchase complete sets of contract documents at Gardens Reprographics, 419 St Paul Place, Baltimore, MD 21202, attention John Goodwin, 410-539-2763 or by downloading data from eMaryland Marketplace Advantage website at: https://emma.maryland.gov/page.aspx/en/usr/login?ReturnUrl=%2fpage.aspx%2fen%2fbuy%2fhomepage .

Correspondence between Contractors and City Schools related to this solicitation shall be directed to:

Mr. Stuart Feldman, Senior Buyer
Department of Procurement
200 E. North Avenue, Suite #401
Baltimore, MD 21202
Telephone: 443-984-3389
Fax: (410) 545-6977
Email: safeldman@bcps.k12.md.us

In order to be eligible for consideration, bids must be submitted via eMaryland Marketplace Advantage (eMMA) online portal **by 11:00 am local time, Thursday, December 17, 2026**. **Bids submitted in any way other than via eMaryland Marketplace Advantage (eMMA) will not be accepted.**

Bids for this solicitation are being accepted solely via eMaryland Marketplace Advantage (eMMA) online submission through https://emma.maryland.gov. Bids will be opened electronically in eMMA as soon as practicable after the deadline for the receipt of bids in the solicitation. Bid results will not be given by phone.

Bids will not be accepted by email, fax, mail, or by hand delivery.

Note: Only MBE firms certified by the Maryland Department of Transportation (MDOT) can be utilized to meet the MBE requirements for the contract.

For additional information and assistance please contact the M/WBE Manager at 667487-4112 (c) or email to: MWBEOffice@bcps.k12.md.us.

These Terms and Conditions shall apply unless otherwise stated in the Special Terms and Conditions attached to the individual solicitation.

1. INVITATION TO BID:

A. Baltimore City Public Schools invites all interested and qualified Contractors to submit sealed bids for the procurement of goods and services in accordance with the directions specified in these Instructions to Bidders.

B. DEFINITIONS: For the purpose and clarity of this document only, "City Schools" will mean Baltimore City Public Schools and/or the Baltimore City Board of School Commissioners. "Board" shall mean the Baltimore City Board of School Commissioners, and "Bidder" shall mean any reliable and interested party, Contractor, and/or manufacturer that submits a bid for this solicitation. "Awardee" is defined as the recipient of the contract awarded from this solicitation.

2. LIMITATIONS:

This Invitation for Bid (IFB) does not commit City Schools to award a contract or pay for costs incurred in the preparation of a response to this solicitation or procure or contract for services in connection herewith. City Schools reserves the right to accept or reject any or all responses received as a result of this request, or to cancel this solicitation in part or in its entirety.

3. PRE-BID SITE WALKTHROUGH:

There will be a mandatory pre-bid meeting/site walkthrough on **Monday, November 16, 2026, at 11:00 a.m.**

A. Contractors will be given a walkthrough time based on the order on the sign-in sheet.

B. Each walkthrough will last approximately 45 minutes.

C. Only **two** representatives from each company will be permitted to walk the building.

4. SUBMISSION INSTRUCTIONS:

Bidders shall submit responses in the order and form listed below to expedite accurate evaluation by City Schools. Proposals that do not conform to these instructions may be rejected.

Bids for this solicitation are being accepted **solely via eMaryland Marketplace Advantage (eMMA) website**. The bid due date is **December 17, 2026, by 11:00 am/pm local time**.

Bids will not be accepted by fax, by email, mail, or by hand delivery.

Bidders who may have submitted a hard copy bid/proposal prior to this addendum must submit a timely bid/proposal via eMMA.

Be advised:

- Bid results will not be given by phone.
- A bid tabulation will be sent via email to all vendors submitting bids. Bids will not be publicly opened.

BID SUBMISSION REQUIREMENTS

1.0 ELECTRONIC BID/PROPOSAL SUBMISSION – TWO - PART SUBMISSION

A. Bids/proposals shall be submitted electronically via the eMaryland Marketplace Advantage (eMMA) website. Bid/proposal responses shall be submitted in PDF format. **Bids/Proposals will not be accepted by email, by fax, by mail or by hand delivery.**

B. Bidders/Offerors shall submit the following as **separate** documents:

1. Volume I (Attachment 1) – Bid Submission/Technical Proposal
2. Volume II (Attachment 2) – Minority Business Enterprise and Women's Business Enterprise (MBE/WBE) Commitment Utilization

C. The solicitation number should be included.

Bidders' response shall be submitted in PDF format.

Bids Shall Include:

- Bid Proposal Form
- Non-Collusion Affidavit
- Anti-Bribery Affidavit
- Debarment Affidavit
- Prequalification Certification Affidavit
- Bid Bond
- Certification of Work Capacity and a copy of the Certificate of Pre-Qualification by the Baltimore City Contractor Pre-Qualification Committee
- Copy of the State of Maryland Contractor's License
- Copy of the State of Maryland Certificate of Good Standing or other filing verifying the bidder is in good standing with the Department of Assessments and Taxation of Maryland
- Copies of your firm's Lead-Based Paint Certification, Renovator Certification and worker training records
- W-9 Form
- Insurance Certificate
- Baltimore City's YouthWorks Program forms

5. CONTRACT DOCUMENTS:

All respondents to this solicitation agree to comply with the AIA Standard Form of Agreement and General Conditions as modified by City Schools, as well as all terms and conditions

contained herein, addenda, clarifications, specifications, drawings, other documentation, and requirements of this solicitation. These documents shall form the agreement between City Schools and the successful respondent.

All work performed under this contract and resulting from this solicitation, shall be in accordance with the documents listed herein, any addenda, and other components of the contract documents. The contract resulting from this solicitation is the AIA Agreement that addresses the full spectrum of construction projects. After receipt of a Notice of Intent to Award letter from City Schools, the apparent responsive and responsible low bidder **must** return the following within ten (10) business days:

A. Two (2) original Standard Forms of Agreement between City Schools and the Contractor fully executed, signed, and witnessed.

B. Payment and Performance Bonds in the total amount of award stated in the letter (Payment & Performance Bonds shall be provided as Contractor's overhead expenses without any additional cost to Baltimore City Public Schools). The cost to purchase Payment and Performance Bonds **will not** be reimbursed by City Schools.

If fully executed contract agreements and bonds are not received within 10 days or changes are made to the agreements your bid response will be evaluated as non-responsive, rejected, and City Schools may go against your bid check.

To avoid delays, any respondent who is not prepared to execute the AIA Agreement as reflected in the attached solicitation or not qualified to obtain performance and payment bonds, should not submit a bid response to this solicitation.

By submitting a bid, the respondent acknowledges that if awarded this contract they will accept all provisions contained within this solicitation without exception.

SOLICITATION TERMS & CONDITIONS

1. SUMMARY OF WORK AND SPECIAL PROJECT FEATURES:

IFB-27051 Fire Alarm Upgrades at Mary Ann Winterling Elementary School #150 for Baltimore City Public Schools. A full *project description is shown in the Specifications and Drawings.*

2. TERM OF CONTRACT:

A. All work under this contract shall be completed within **twelve (12) months or 365 days** from the issuance of the Purchase Order. If however, as a result of any act or omission by Baltimore City Public Schools and not by any fault of the respondent, or in the event that City Schools agrees that as a result of force majeure (strikes, acts of God, etc.) certain days are not chargeable as contract work days, the allotted time for work completion shall be increased by the number of days that City Schools determines work progress had been delayed or suspended. No compensation will be awarded for contract duration extensions. All prospective bidders may question the amount of completion time allowed and secure adjustments if circumstances warrant, before bids are submitted.

B. Termination for Convenience: The Baltimore City Board of School Commissioners reserves the right to terminate this contract for convenience upon thirty (30) days written notice to the Contractor. Baltimore City Public Schools may terminate this contract in whole or in part, whenever it determines that such termination is in its best interest, without showing cause, upon giving written notice to the Contractor. City Schools shall pay all reasonable costs incurred by the Contractor up to the day of termination and in no event shall the amount exceed the bid price.

3. DEFINITIONS:

By definition, the Project Manager is a City Schools employee, designated in writing by name to the Contractor. When the term "Project Manager" is used, it parenthetically includes their duly authorized representatives. A duly authorized representative is one or more persons, designated in writing by the Project Manager to the Contractor, to act on their behalf.

The Contractor shall report to and coordinate all project related matters with the City Schools Project Manager:

Seun Joahua
Email: sajoshua@bcps.k12.md.us
Phone: 443-984-1424
Cell: 443-931-6965

4. CONTRACTOR'S RESPONSIBILITIES:

A. The Contractor shall provide labor, materials, equipment, tools, construction machinery, transportation, and all services necessary for the proper execution and completion of this project as described in the contract documents and shall complete the project within the stipulated contract period.

B. The contract resulting from this solicitation shall include projects designed by City Schools. The Contractor must demonstrate the capacity to perform the work indicated in the contract documents.

C. Work under this contract should interfere with the operation of City Schools as little as possible. Buildings will remain occupied during construction; therefore, all work must be coordinated with school authorities to eliminate any interruption to activities, including building heating and ventilation. Work during normal school activities shall be performed during non-school hours, including evenings and weekends. **Noise, dust, and safety barriers in the form of temporary walls will be required to complete this work and should be included in the scope of Contractor's work.**

D. City Schools does not anticipate the addition of any alternative work items which may be listed in the contract specifications and/or drawings. Any additional and/or alternative work required during the life of the project will be performed at the sole discretion of City Schools via change order. If requested by the City Schools Project Manager, the Contractor shall submit a cost proposal for the additional/alternative work which will need written approval prior to the issuance of a change order.

E. All work under this solicitation shall be performed during the following working hours:

- Summer (Last day of school in June to August 15); Normal Working Hours: 7:30 am to 4:00 pm, Monday through Friday
- School Year (August 15 to the last day of school); 4:00 pm to 12:00 am, Monday through Friday. A portion of these hours may require the Contractor to reimburse City Schools for custodial coverage.
- No work that is audible and/or visible to community members within 300 feet of the school will be permitted between the hours of 7:00 pm and 7:00 am (including weekends) per City Code.
- Subject to the prior approval of the City Schools Project Manager, the Contractor may elect to perform work during other hours, weekends, or legal holidays, however, City Schools will not be responsible for any additional cost in excess of the bid price(s).

F. The Contractor shall be required to post State of Maryland construction signs per the sample included in the solicitation at no additional cost to City Schools.

G. The successful Contractor shall use the MD State Prevailing Wage requirements.

H. Removal and relocation of City Schools furniture, equipment, and other materials from a project site shall be completed by the Contractor and coordinated with the City Schools Project Manager. Upon completion of work, the Contractor will also be responsible for returning any furniture, equipment, or other materials back to the renovated area(s) or other areas within the facility as directed by the City Schools Project Manager.

I. All salvaged items shall be stored onsite in a location designated by the City Schools Project Manager, or their designated representative. The intent is to identify the best

components of existing materials for reuse, and non-suitable material will be disposed of upon review the City Schools Project Manager.

J. If roof penetrations are required, they shall be coordinated with the City Schools' Project Manager. The Contractor shall not do any roof penetrations without prior written permission of the City Schools Project Manager.

K. The Contractor shall obtain approval from the City Schools Information Technology (IT) Department to proceed with any work for all methods, materials, and supplies in school buildings related to information technology systems and telecommunications equipment installations, modification and replacement. The Contractor shall first contact the City Schools Project Manager who will provide contact information for the appropriate person(s) in IT. Work shall be governed by the 2010 City Schools Technology Infrastructure Standards. Copies of all documentation and correspondence regarding IT work shall be provided to the Project Manager for approval prior to beginning work. The Contractor shall be responsible for a complete and fully functional system, including all necessary switches, patch panels, or other components, whether included in the specification or not, at no additional cost to BCPS.

L. All IT drops/power locations shall be recessed inside gypsum board walls where no computer workstation or lookup station casework will cover surface mounted raceways (vertical raceways are not to be installed at existing or new gypsum wall areas in any main media center and shall also be recessed at gypsum board walls). Projector IT wiring/power shall be recessed at ceiling locations. Surface mounted raceways are acceptable at CMU walls or locations were concealed underneath permanent workstation casework only. A reasonable shifting in location of outlets and/or surface raceways shall be provided by the Contractor to meet field conditions, at no additional cost to City Schools. The Contractor will reuse and relocate existing patch panels, switches, existing CAT5 cables, etc. to accommodate new work, as required.

M. Contractors shall include the cost for any remediation and abatement oversight, monitoring, onsite PCM analysis, PCM or Transmission Electron Microscopy (TEM) lab test and analysis, final air sampling, and laboratory analysis of any asbestos and/or lead, if required, in their base bid, per the asbestos and lead reports provided in the solicitation, including all addenda. The abatement contractor is not permitted to directly hire the Industrial Hygienist. Unless stated otherwise, all projects are assumed to require some level of abatement or remediation.

5. LEAD BASED PAINT ACTIVITIES AND RENOVATIONS:

On April 22, 2010, the United States Environmental Protection Agency's (EPA) "Renovate Right" legislation (40 CFR 745, Subpart E) went into effect. The purpose of this legislation is to protect building occupants, particularly children under the age of six, against lead exposure risk that occurs during common renovation activities that disturb lead-based paint.

This rule affects renovation and remodeling contractors, maintenance workers, painters, and other specialty trades performing work in areas considered to be "child-occupied facilities" under the statute.

Child occupied facility means a building, or portion of a building, constructed prior to 1978, visited regularly by the same child, under 6 years of age, on at least two different days within any week (Sunday through Saturday period), provided that each day's visit lasts at least 3 hours, the combined weekly visits last at least 6 hours, and the combined annual visits last at least 60 hours. Child-occupied facilities may include, but are not limited to, day care centers, preschools, and kindergarten classrooms. Child-occupied facility encompass only those common areas that are routinely used by children under age 6, such as restrooms and cafeterias. Common areas that children under age 6 only pass through, such as hallways, stairways, and garages are not included. Additionally, with exteriors of public or commercial buildings that contain child-occupied facilities, the child-occupied facility would include the exterior sides of the building that are immediately adjacent to the child-occupied facility or the common areas routinely used by children under age 6.

Rule requirements include, but are not limited to the following:

- Renovation firms must apply to and be certified by, the EPA to perform renovations.
- A certified renovator (a person who has successfully completed training through an EPA accredited course) must be assigned to each renovation and must carry out other duties.
- Workers performing renovations must either be certified renovators or have been trained in the use of lead-safe work practices by a certified renovator.

City Schools contractors should be advised that if your firm has not met the statutory requirements of the EPA's "Renovate Right" rule for compliance with this legislation, your bid will be evaluated and rejected as nonresponsive.

To verify compliance with the "Renovate Right" rule, respondents shall include copies of your firm's certification, renovator certification, and worker training records with your bid response. Additional information related to the "Renovate Right" legislation can be found at www.epa.gov/getleadsafe. For questions and/or concerns related to this requirement please contact:

Manager, Environmental Compliance
Department of Health & Safety, Room 407A
Baltimore City Public Schools
200 E. North Avenue
Baltimore, MD 21202
Office 443-984-3617
Fax 410-659-6937

6. ORDER OF PRECEDENCE:

Any conflicts shall be governed by the following order of precedence:

A. Special Terms & Conditions
B. AIA Contract Agreement
C. Addendum(s)
D. Drawings
E. Specifications
F. City Schools' Bidding Requirements and Conditions
G. AIA General Conditions
H. Other Documents Included in Solicitation
I. Attachments

7. AUTHORITY OF BUILDING SUPERINTENDENT:

A. The Building Superintendent/School Principal is responsible for the public health, safety, and welfare of building occupants and exercises sole authority over City Schools staff and students and may control the conduct of the Contractor's employees by request to the City Schools Project Manager.

B. The Building Superintendent/School Principal has the authority to modify or stop work of the Contractor's employees that may interfere with school programs and/or building operations. Such orders will be relayed through the City Schools Project Manager except in the case of an emergency.

8. BACKGROUND:

Baltimore City Public Schools serves the needs of public education in Baltimore City, covering approximately 77 square miles, with a residential population of more than 646,000. It is the fourth largest public school system in the State of Maryland.

City Schools operates 190 facilities over a ten-mile radius which includes elementary, middle, and high schools, special education centers, alternative schools, and administrative offices. Central Administration for City Schools is located at 200 East North Avenue, Baltimore, Maryland 21202.

The buildings are owned by Baltimore City Government and operated by Baltimore City Public Schools.

Baltimore City Government has the right to approve and inspect the improvements to be made to the buildings.

9. CONTRACTOR'S QUALIFICATIONS:

A. The Contractor shall submit detailed information to demonstrate that they possess the qualifications, ability, capacity, facilities, and resources to accomplish the work described in this solicitation.

B. Information shall be considered confidential other than any steps needed to verify its accuracy. However, City Schools will not assume any responsibility for accidental disclosure of information submitted by the Bidder. The ability of the Contractor to perform the required work will be decided by the Baltimore City Schools Chief Operating Officer and the Director of the Department of Procurement subject to the approval of the Board of School Commissioners. The Board of School Commissioners' decision shall be final.

C. The successful bidder shall be a General Contractor licensed in the State of Maryland in good standing with the Maryland Department of Assessments and Taxation. Bidders shall submit a State of Maryland Certificate of Good Standing or other filing verifying the bidder is in good standing with the Maryland Department of Assessments and Taxation. Certificates of Status may be obtained online at **http://www.dat.state.md.us**. Additionally, Contractors are required to possess all necessary licenses, insurances, and bonding for the work specified in this solicitation. The Contractor's ability to perform the required work will be decided by City Schools.

D. Proposals will only be considered from respondents that have been actively engaged in work of similar size and type for a continuous period not less than the preceding five (5) years, under the same management in effect at the time of bid submission.

E. The Contractor's Qualifications Verification Response shall be included as a part of the solicitation response. Failure to include the Contractor's Qualifications Verification Response could cause your bid to be evaluated as non-responsive.

F. The successful Bidder is required to have all of the necessary pre-qualifications by the Baltimore City Contractors Prequalification Committee for the required scope of work and dollar capacity of this project.

G. The awarded Bidder must self-perform the majority (>51%) of the work for the following trades: HVAC, fire alarms, sprinkler systems, elevators, roof replacement, and window and door projects as shown on the contract drawings with their own employees. This percentage of work may not be subcontracted. If City Schools determines this percentage will not be met at any point during this project, it could be grounds for immediate contract termination.

10. KNOWLEDGE OF TERMS AND CONDITIONS:

Bidders, or their authorized representatives, are expected to familiarize themselves with work site conditions, requirements, drawings, and specifications before submitting bids. Failure to do so will be at the Bidder's own risk. Bidders cannot secure relief on the plea of error. Neither law nor regulations make allowances for errors of omission or commission on the part of Bidders.

11. PARTNERSHIPS:

Bids by partnerships must be signed with the partnership name by one of the members of the partnership or by an authorized representative, followed by the signature and designation of the person signing, who shall also state the names of the individuals composing the partnership.

12. CORPORATIONS:

Bids by corporations must be signed with the name of the corporation, followed by the signature and designation of the officer having authority to sign. When requested, satisfactory evidence of authority of the officer signing on behalf of the corporation shall be furnished. Anyone signing the bid as agent shall file satisfactory evidence of authorization to do so.

13. CERTIFICATES AND AFFIDAVITS:

Respondents are required to complete all the certificates and/or affidavits included in this solicitation. These documents are required by local, state, or federal funding agencies of City Schools as part of the bidding process. These documents may include Anti-Bribery Affidavit, Debarment Certificate, Minority Business Enterprise affidavit, Small Business Enterprise affidavit, and when applicable, and Asbestos Free Certification.

14. ADDENDA:

A. INQUIRIES:

i. No oral interpretation of the meaning of any contract documents will be made. To be given consideration, inquiries must be received in writing at least seven (7) days prior to the date of the bid opening.

B. INTERPRETATION OF DOCUMENTS:

i. During the proposal period, Bidders are to notify City Schools in writing seven (7) days prior to the proposal due date of any issue that could affect the bidding or fulfillment of this contract, including any discrepancies or omissions in the drawings and specifications. If no notification is made, it should be understood that these contract documents are clear as to their intent and shall be interpreted by City Schools as their true intent. The Bidder agrees to abide by the decision of the Director of Procurement on such matters.

ii. In observation of i. above, Bidders shall comply with the true intent of these specifications and not take advantage of any unintentional error or omission and report all errors and omissions once discovered. Bidders should fully complete every part of this solicitation to the true intent and meaning of the contract documents as decided by Baltimore City Public Schools Management. See “Order of Precedence” in regard to any conflicting information between documents.

C. ISSUANCE:

i. Any changes to bid documents will be made through via addendum. Failure of any Bidder to receive such addenda or interpretation shall not relieve them from any

obligations under this solicitation as amended by addendum. All addenda issued shall become part of the contract.

D. SYSTEM TOTALITY:

i. It is the responsibility of the Contractor to confirm the solicitation document's ability to fully meet the intent of the Scope of Work. Questions or issues discovered during the bid process shall be brought to the attention of the City Schools Project Manager.

E. ACCEPTANCE:

i. By submitting a proposal, responding firms acknowledge that if awarded this contract they will accept all of the provisions listed in this solicitation without exception.

15. BID BOND:

Bid Guarantee Deposit (bid proposals when filed, shall be irrevocable). All bids/proposals (unless otherwise noted) shall be accompanied by one of the following:

A. Bid check in amount equal to 2% of the total lump sum bid price, or

B. One-time bid bond equal to the total lump sum of the bid

C. Annual Bid Bond or Continuous Bid Bond which must be on file at the time of bid receipt

D. Bid checks in the amount of $5,000 or less shall be a check of any type drawn upon any solvent clearing house bank of the United States, a registered check or U. S. Postal Money Order

E. Bid check of more than $5,000 shall be made by a certified check, bank cashier's check or bank treasurer's check

F. All bid guarantees (unless otherwise noted) shall be made payable to **Baltimore City Board of School Commissioners**

Payment and/or Performance Bond requirements shall be promptly and properly executed. The requirements of prompt execution will be considered as fulfilled if accomplished within ten (10) working days after award. If the required contract documentation is not executed within the stipulated time, bid checks and/or a bid bond shall be forfeited to City Schools as liquidated damages, as required by Article VI, Section II of the City Charter, for failure to comply with this requirement. Upon execution of the contract agreement, payment, and/or performance bond, City Schools shall refund the amount deposited or release the amount charged against the bond as bid guarantee to the successful Bidder.

Bid guarantees posted by unsuccessful bidders shall be refunded or released by City Schools promptly after an award is made.

16. BID EVALUATION AND AWARD:

A. Contracts shall be awarded to the lowest responsive and responsible bidder, upon review and confirmation of required qualifications indicated in the Instructions to Bidders. Consideration will be given to the competency and responsibility of the Bidder, and the ability of the Bidder to perform satisfactorily. City Schools will consider the Bidder's record and performance of any prior contracts with City Schools, federal departments or agencies, or with other public bodies.

B. The award will be subject to final review and approval by the Baltimore City Board of School Commissioners.

C. Promptly after award by the Board of School Commissioners, the successful Contractor will receive an "Award Notification" letter from City Schools requesting all required paperwork. The awarded Contractor must submit the fully executed contract, performance, and payment guarantee bonds to the buyer within ten (10) working days after receipt of the request from City Schools. If all the required documents are not fully completed and received within the time specified in the solicitation, award will be made to the next low responsive and responsible bidder and any difference in cost will be charged against the first low bidder’s bid bond.

Special Terms and Conditions

1. COMMENCEMENT OF SERVICES:

The City Schools Board of School Commissioners shall have no obligation to pay for services performed before the Board approves the contract and purchase order and notice to proceed have been issued. City Schools shall have no obligation to pay for services in excess of the amount of the award. The Contractor shall not be authorized to proceed with any work until a purchase order is issued by City Schools and received by the Contractor.

2. ANNULMENTS AND RESERVATIONS:

A. RIGHT TO REJECT: The Board reserves the right to reject any or all bids and re-advertise for other bids. The Board reserves the right to approve or disapprove the issuance of a purchase order and/or contract for the work described in this solicitation.

B. WAIVER OF TECHNICAL DEFECTS: The Board reserves the right to waive technical defects, if in its judgment is in the best interest of City Schools.

3. AUTHORITY TO DEBAR OR SUSPEND:

The Director of the City Schools Department of Procurement shall have the authority to debar a person or company for cause from consideration for award of contracts in accordance with the provisions of the City Schools Procurement Policies and Procedures available on the City Schools web site www.bcps.k12.md.us.

4. TERMINATION OF CONTRACT:

A. TERMINATION FOR NON-APPROPRIATION OF FUNDS: City Schools may terminate this contract, in whole or in part, due to insufficient funding or non-appropriation of funds with written notice to the Contractor. City Schools shall pay for all purchases up to the date of the termination notice.

B. TERMINATION FOR DEFAULT: If a Contractor has not performed or has unsatisfactorily performed, payment shall be withheld at the discretion of City Schools. Failure of a Contractor to fulfill their obligations shall be considered just cause for termination of the contract, and the Contractor will not be entitled to any costs incurred up to the date of termination. In the event of default by the Contractor, this contract may be terminated. See also Special Conditions for Construction Contracts.

C. TERMINATION FOR CONVENIENCE: City Schools has the right to withdraw from the terms of the contract, without liability or showing cause, by providing ten (10) calendar days written notice to the Contractor. The Contractor shall be compensated for services rendered prior to the date of termination.

5. GOVERNING LAW:

The bid shall be construed in accordance with and interpreted under any applicable laws, rules, regulations and ordinances of the City of Baltimore (local), State of Maryland, and Federal. Any lawsuits arising from this bid shall be filed in the Circuit Court of Baltimore City, Maryland. During the term of the contract resulting from this solicitation, the awarded Contractor(s) shall pay its employees a State of Maryland, Federal (Davis-Bacon Act) prevailing wage, if applicable, and Living Wage in accordance with all applicable City, State or Federal Living Wage legislation and regulations. The awarded amount of the contract resulting from this bid cannot be increased for the Contractor's failure to factor into its proposal any future increases in the Living Wage rates in effect at the time of this bid.

6. CONTRACT TERMS AND CONDITIONS:

City Schools reserves the right to short pay any line-item invoice that does not agree with the line item price shown on the purchase order. All invoices are to be submitted using the AIA Form showing the purchase order number, project name and school, and the name and address of the Contractor and shall be mailed or delivered to the named Project Manager, Baltimore City Public Schools, Office of Facilities Design and Construction, Room 407A, 200 E. North Avenue, Baltimore, Maryland 21202 (unless otherwise noted).

A. INCORRECT INVOICES:

Invoices will be returned for correction unless they contain the following information: Item numbers, description of item, quantity, unit prices with extensions, and total. Each invoice shall reflect the City Schools purchase order number, and all the items on the invoice shall be listed in the same sequence as listed on the purchase order.

B. PARTIAL PAYMENTS:

Payment in full will only be made upon final acceptance of items as shown on the purchase order. Partial payments may be paid monthly in an amount proportional of progress to date.

C. LATE SUBMISSION OF INVOICES:

The Contractor's invoices are to be submitted in a timely manner, per the terms of the purchase order, after the services and/or the goods and materials have been provided. If invoices are submitted one calendar year after the Contractor's services have been provided, or the last date when goods and materials were accepted by the Board, City Schools shall have no obligation to pay these invoices.

D. CONFIDENTIALITY:

The Contractor acknowledges and agrees to hold all confidential information in the strictest confidence as a fiduciary and will not make any press release or public announcement, or voluntarily sell, transfer, publish, disclose, display, or otherwise make available to any third

persons such confidential information or any portion thereof without the express written consent of City Schools. The Contractor and its employees, agents, volunteers, and subcontractors shall maintain the confidentiality of all medical, psychological, and student records in compliance with federal and state laws. Additionally, the Contractor shall receive written consent from the parent or guardian of each student for the mutual disclosure of such records by and among the Contractor, City Schools and City Schools' employees, agents, volunteers and contractors.

E. INDEMNIFICATION:

The Contractor shall indemnify, defend, and hold harmless the Mayor and City Council of Baltimore (City) and the Baltimore City Public Schools Board of School Commissioners and their respective elected/appointed officials, employees, departments, agencies, agents and volunteers from any and all claims, demands, suits, and actions, including attorneys' fees, litigation expenses and court costs, connected therewith, brought against the City, the Board and their respective elected/appointed officials, employees, departments, agencies, agents, and volunteers, arising as a result of any direct or indirect, willful, or negligent act or omission of the Consultant or its employees**,** agents, or volunteers**.**

F. INSURANCE:

See AIA Document A201 for this information. The selected Contractor shall indemnify and hold harmless the Owner, City Schools, and Mayor and City Council of Baltimore City, and shall be added on any insurance policies and bonding.

G. NON-ASSIGNABILITY:

This contract shall not be assigned, or services subcontracted in whole or in part without the written consent of City Schools. Any attempt to do so without such written consent shall be null and void and of no effect.

H. INDEPENDENT CONTRACTORS:

The Contractor is furnishing its goods and/or services as an independent contractor, and nothing herein shall create any association, partnership or joint venture between the parties or an employer-employee relationship.

I. GENERAL RECORDS CLAUSE:

The Contractor's contracts, files, accounts, records, and other documents related to this contract shall be open to examination and/or audit by City Schools and/or its designated agents and made available at any time upon reasonable prior notice, during the performance of this contract for a period of five (5) years after final payment or longer as required by law, rule, or regulations.

J. SOLE AGREEMENT:

This contract constitutes the sole agreement between the parties and no amendment,

modification or waiver of any of the terms and conditions shall be valid unless in writing and executed by both parties. Any prior verbal agreements or bids shall not be considered a part of this contract.

K. **PROTECTION OF PROPERTY:**

The Contractor will use reasonable care to avoid damaging existing buildings, equipment, and property at jobsites as well as all materials furnished by City Schools. If damage has been caused, the Contractor must replace or repair it at no charge or expense to City Schools as directed by the Contracting Officer. If the Contractor fails or refuses to make such repair or replacement, the Contractor will be liable for the cost, which may be deducted from future payments.

L. PUBLIC STATEMENTS:

The Contractor shall not use or reference the name or emblem of Baltimore City Public Schools in issuing any press releases or making public statement with respect to this contract (unless it is required by applicable law, regulation, or the requirements of any listing agreement with any stock exchange), without prior written consent of City Schools, whose consent will not be unreasonably withheld. Purchase by City Schools of any articles, material, merchandise, or service does not imply adoption or endorsement of the product or service, and the use by any manufacturer, Contractor, merchant or other person of the name or emblem of City Schools in any advertisement is not authorized. The unauthorized use of the name or emblem of City Schools is prohibited by the United States Criminal Code - Section 706.

M. **INSPECTIONS:**

City Schools reserves the right to have inspectors on the manufacturer's premises during the manufacturing process of any products being furnished under this contract for as long as may be considered necessary. All expenses of the inspectors shall be paid by City Schools. The presence of the inspectors shall not relieve the awarded Bidder of responsibility for faulty workmanship of materials that may be discovered at any time after delivery and prior to final acceptance in accordance with these specifications. Access to the manufacturing facility shall be provided for the City Schools representative shall be provided when requested.

N. USE OF BRAND NAMES:

Brand name and model numbers are offered as a reference for Bidders as to the style, size, weight, and other characteristics of the item(s) in the specifications. The use of brand names should not be interpreted to be the exclusive brand desired unless so stated. Acceptability and/or criteria for acceptability of an alternate will be at the sole discretion of City Schools. Additionally, Contractors should use products and materials made in USA whenever possible.

O. PRODUCT OFFERED BY THE BIDDER:

All products offered by the Bidder shall be new and unused, and the latest version. Should a specified product be discontinued and/or upgraded during the course of the contract, the Bidder shall offer a new alternate product that meets and/or exceeds the established specifications, under the same terms, conditions, and prices as the item originally offered. Contractor(s) shall utilize products and materials made in the USA whenever possible. This requirement shall apply to construction projects that are large enough to fall under the requirements of the Buy American Steel Act, Sections 17-301 to 17-306 of the Finance and Procurement Article of the Annotated Code of Maryland. For additional information please visit:

http://mgaleg.maryland.gov/webmga/frmStatutesText.aspx?article=gsf&section=17-301&ext=html&session=2020RS .

P. COMPLIANCE WITH SPECIFICATIONS:

The awarded Bidder shall abide by and comply with the true intent of these specifications and not take advantage of any unintentional error or omission but shall fully complete every part as the true intent and meaning of the contract documents. The successful bidder, after award and before manufacture and/or shipment, may be required to provide detailed descriptive data to enable City Schools to judge the bidder's compliance with the specifications and utilization made in USA products and materials.

Q. PROPOSALS FOR DEVIATIONS TO SPECIFICATIONS:

Any deviation from the specifications must be noted in detail by the Bidder, in writing, seven (7) working days prior to the bid response date. This information will be evaluated by City Schools and shared with the entire list of possible bidders. The absence of a written list of specification deviations attached to the bid response will hold the Bidder strictly accountable to City Schools to the specifications as written. Any deviation from the specifications, without prior documented approval, will be grounds for rejection of the bid.

R. SUBCONTRACTORS:

The awarded Contractor shall give its constant personal attention to the faithful execution of this contract, keep the same under its own control, and not assign work, or any part thereof, without the previous written consent of City Schools. Bidders shall provide the names of all proposed subcontractor(s) they intend employing, the portion of the materials/labor to be furnished by each, their place of business, and any other information as requested in the bid submission instructions. This information may be used in considering the potential performance capabilities of the subcontractor(s).

S. SAFETY REQUIREMENTS:

The awarded Contractor shall insure that any equipment and machinery furnished and

delivered to City Schools complies with all safety regulations as required by the Occupational Safety and Health Administration (OSHA) and the Maryland State Safety Health Act known as MOSHA. The Contractor shall sign the safety section, if attached in the bid proposal, certifying the regulations for the type of equipment furnished shall meet all regulations applying to this type equipment meeting the CFR-1910 MOSHA Standard. The Contractor shall submit Material Safety Data Sheets (MSDS) for all items awarded to that Contractor provided under the terms of this proposal in accordance with OSHA Communication Standard 29 CFR 1910.101, 29 CFR 1910.1200 and 29 CFR 1926.58 or any other applicable state, federal, or local regulation. Prior to delivery of the items awarded, the Contractor must submit MSDS sheets to: Baltimore City Public Schools Director of Facilities, 200 E. North Avenue, Room 407A, Baltimore, Maryland 21202.

7. GUARANTEE AND WARRANTEES:

A. GENERAL: Payment shall be based upon acceptance of goods or services by City Schools. The Contractor expressly warrants that: (a) The merchandise to be furnished and services performed will be free from defects in material and workmanship and will be in full conformity with these specifications, drawings, representation, or sample; that this warranty shall survive acceptance and payment of the merchandise; and that the Contractor will bear the cost of inspection of all goods and services rejected. (b) The Contractor hereby provides a warranty of authorization as to all goods and services. (c) The goods or services furnished must be or have been mined, manufactured, or produced in full compliance with at least the minimum conditions required under the Fair Labor Standards Act of 1938, as amended, and all other applicable local state and federal laws, rules, and regulations to include Department of Transportation (DOT), Food and Drug Administration (FDA) regulations, and the Equal Opportunity Clause contained in Executive Order 11246, as amended. If applicable to the goods or services purchased herein, the Contractor must also be in full compliance with the Workplace Hazardous Materials Information System (WHMIS) legislation and maintain a written Hazard Communication Plan.

B. The awarded Contractor, its employees, agents, volunteers, and contractors who may have contact with students must comply with Title 5, Subtitle 5, Part VI, of the Family Law Article of the Maryland Code. All costs shall be borne by the Contractor.

C. GUARANTEE PERIOD: The Contractor shall unconditionally guarantee all services, materials, and workmanship of all furniture, goods, and equipment furnished for a period of two (2) years from the date of acceptance, i.e., delivery and installation, unless a longer period of warranty is specified.

D. FURNITURE AND EQUIPMENT: If any defects or signs of deterioration are noted within the guarantee period, which in the opinion of City Schools are due to faulty design, installation, workmanship or materials, the Contractor shall repair or adjust the equipment or parts to correct the condition, or it shall replace the part or entire unit to the complete satisfaction of City Schools once notified at their expense. These repairs and/or replacements shall be made at times designated by City Schools.

E. EQUIPMENT: The Contractor agrees to provide onsite service of equipment within eight (8) hours of notification by school system personnel. Loaner equipment shall be supplied free of charge during the warranty period if the equipment cannot be repaired within three (3) working days.

F. OTHER EQUIPMENT: Certain pieces of equipment, machinery, and refrigeration will require guarantees other than detailed above. Refer to the General Conditions for requirements on specific equipment.

G. MANUFACTURER'S AGENT: The Contractor shall act as the manufacturer's agent for all warranty claims.

8. CONTRATOR DISQUALIFICATION – BRIBERY:

A person convicted of bribery, attempted bribery, or conspiracy to bribe shall be disqualified from entering into a contract with any city or other subdivision of the State of Maryland. Every business entity upon submitting a proposal or otherwise applying for a contract shall submit an affidavit stating whether it, its officers, directors, or partners, or its employees have been convicted of bribery, attempted bribery, or conspiracy to bribe under the laws of any State or Federal Government. Please see below State of Maryland Public Ethics Law, Title 15.

The Maryland Public Ethics Law prohibits State employees or officials (and in some cases, former employees) and businesses in which such an individual is employed or holds a financial interest from (i) submitting a proposal or proposal, (ii) negotiating a contract, and (iii) entering into a contract with the governmental unit with which the individual is affiliated per the Maryland Code, State Government Article, SS 15-502.

If the Bidder has any questions concerning application of state ethics laws to their participation in this procurement, it is incumbent upon them to seek advice from the State of Maryland Ethics Commission, 9 State Circle, Suite 200, Annapolis, MD 21401, Telephone (410) 974-2068.

The procurement officer may refer any issue raised by a Bidder to the State of Maryland Ethics Commission and may require the Bidder to obtain advice from the State of Maryland Ethics Commission and may reject a proposal that would result in a violation of ethics law.

The resulting contract is cancelable in the event of a violation of the State of Maryland Public Ethics Law by the vendor or any State of Maryland employee in connection with this procurement.

9. CRIMINAL BACKDROUND CHECK:

A. <u>Criminal Background Check:</u>

Effective July 1, 2015, amendments to § 6-113 of the Education Article of the Maryland Code further require that a Contractor or subcontractor for a local school system may not knowingly assign an employee to work on school premises with direct, unsupervised, and uncontrolled access to children, if the employee has been convicted of, or pled guilty or nolo contendere, to a crime involving a sexual offense, child sexual abuse and crimes of violence. It is the responsibility of the Consultant to make certain that its employees, agents, volunteers, and contractors who have contact with students be fingerprinted and

have a background check in compliance with Title 5, Subtitle 5, Part VI, of the Family Law Article of the Maryland Code.

B. Employees Having Direct Contact with Students:

All current and future employees of the Consultant who may have direct contact with students must have a criminal background check and fingerprinting conducted by the Human Resources Department of City Schools before beginning work. Previous background checks will not be accepted. The fee for the background check shall be paid by the Consultant via check or money order at the time of fingerprinting. No employee can begin work in a city school until results have been received. Violation of this provision may result in Termination for Cause.

C. Employees Do Not Have Direct Contact With Students:

Employees of a Consultant placed in a city school who will not have direct contact with students must have Criminal Justice Information Service (CJIS) and NCIC background checks on record. Copies of the background checks must be forwarded to the contract monitor before services can commence. Every two years the Consultant shall submit copies of background checks to the contract monitor. Should any employee be flagged during the term of this agreement, the Consultant shall contact the contract monitor within 24 hours of notification. Violation of this provision may result in Termination for Cause.

D. Employment of Sex Offenders:

The Consultant shall always be compliant with the Criminal Procedure Article of the Annotated Code of Maryland Section 11-722, which states that a person who enters a contract with a County Board of Education or a nonpublic school may not knowingly employ an individual to work at a school if the individual is a registered sex offender. If a registered sex offender is employed by the Consultant, the Consultant is prohibited from assigning that employee to perform management, delivery, installation, repair, construction or any other type of services on any City Schools property. Violation of this provision may result in Termination for Cause.

10. REQUESTS FOR INFORMATION:

A. During the Construction Phase, the Contractor may submit a written Request for Information (RFI) and is responsible for its prompt delivery to the Project Manager via email. The City Schools Project Manager will provide written responses via email. City Schools will not be responsible for any other explanation or interpretation given prior to the award of contract.

B. The Contractor shall abide by, and comply with, the true intent of these specifications and not take advantage of any unintentional errors or omissions, but shall, upon discovery, immediately report all errors and omissions to the City Schools Project Manager.

11. PERMITS:

The Contractor shall submit applications, obtain, and pay all fees for all permit(s) required by the authorities having jurisdiction. The Contractor's actual permit cost without any markup shall be included in the fixed base bid price submitted with their bid. Copies of all permits and paid receipts shall be to be furnished to the City Schools Project Manager.

12. WORK ARRANGEMENTS:

Work will be scheduled at the convenience of City Schools. Prior to commencing work, the Contractor must provide a work schedule that will not interfere with the facility's daily operations. All scheduling of work shall be coordinated with, and approved by, the City Schools Project Manager and School Principal.

Baltimore City Public Schools may request the Contractor to work at specific times to perform demolition or abatement work, work requiring utilities outages, avoid days that student testing is scheduled, or as required to meet the construction schedule completion. Should after hours work be scheduled City Schools' staff will be required to open and close the school building. The Contractor shall be responsible to compensate the City Schools Office of Planning, Leasing and Permits for all related expenses for City Schools staff. Regular salary, overtime and/or double may be required for City Schools staff in cases where work will be done on Saturday, Sunday and Holidays per City Schools' requirements.

Contractor shall inform City Schools one (1) week in advance of any utility shutdowns in school buildings. Any kind of shut down for inter-connection of piping shall be done on the weekends with prior notice to the City Schools Project Manager. After hours work requests are to be made to the City Schools Project Manager a minimum of 72 hours in advance of the requested date(s) of coverage.

Work should be planned to proceed in an orderly and continuous manner, without undue delay. Submission of samples, shop drawings, schedules, etc. shall be anticipated to avoid delays. City Schools reserves the right to direct the order in which work shall be performed.

13. SITE STORAGE OF MATERIALS:

Permission for the storage of materials and/or tools must be obtained from the City Schools Project Manager in advance and shall be done safely and in such a manner that doesn't interfere with City Schools operations.

It shall be the sole responsibility of the Contractor to protect and safeguard their materials, tools and equipment. City Schools assumes no responsibility for vandalism or theft during the term of the contract. The Contractor shall be responsible for any accidents caused by negligence.
The Contractor shall remove all unused materials, supplies and/or equipment within one (1) day after work is properly completed and accepted by the City Schools Project Manager.

14. PROGRESS MEETINGS AND REPORTS:

Progress meetings shall be held when and if the City Schools Project Manager finds them necessary to expedite completion of work. The Contractor, subcontractors, material suppliers, and other parties concerned with the current and/or future progress of work shall be represented at these meetings by persons familiar with the details of this project and authorized to conclude such matters, including establishment of work schedules, etc. The architect shall record meeting minutes and distribute minutes to the attendees for review and revision, as required.

15. CONTRACTOR'S SUPERVISION:

The Contractor shall always have a responsible and experienced English-speaking supervisor on site for his employees and subcontractors when work is in progress. The Contractor will be responsible for the safety of his workers, the public, building occupants, and any damage to the premises during the duration of the contract.

16. TAXES:

The State Legislature has abolished the sales tax exemption for Contractors who purchase supplies or equipment for construction, repair, or alteration of City Schools' buildings for contracts advertised for bids after July 1, 1968, (Act of 1968, Ch. 452). The Contractor must pay the regular sales tax on any items purchased for use in the execution of such contract. See Business Tax Tip #6 at http://business.marylandtaxes.com/news/taxtips/business/bustip06.asp .

No markups will be permitted on any taxes under this contract.

17. CHANGE ORDERS:

Prior written authorization must be obtained from City Schools before performing any change work. If change work is required during the life of the project, it will be performed at the sole discretion of City Schools. The Contractor shall submit change order requests in compliance with the attached Contract Modification Procedures and related forms.

18. PAYMENTS:

The Contractor shall only be paid for work performed to date, at the time of invoicing. Additional work authorized by Change Order shall be billed separately upon completion, to the approved Change Order value.

Final payment will be made upon receipt and final acceptance of invoice(s) and all supporting documentation as required by City Schools.

19. PROGRESS PHOTOGRAPHS:

For Projects where the Contract Sum is greater than $5,000, the Contractor shall submit two copies of 8" x 10" color photographs of the site condition before construction begins and two copies of 8" x 10" color photographs after Final Completion.

20. LIQUIDATED DAMAGES:

The Baltimore City Public Schools Director of Procurement reserves the right to charge the Contractor **$250.00** per calendar day for each day that materials, equipment and/or services are not delivered in accordance with the delivery schedule mutually developed by the Contractor and City

Schools. Per day charge shall be invoked at the sole discretion of the Baltimore City Schools Director of Procurement. The sum shall be taken as liquidated damages and not as a penalty.

21. SAFETY EQUIPMENT:

All necessary safety equipment, barricades, signs, flashing lights, or other equipment as required for the type of work in accordance with current OSHA, MOSHA and EPA rules and regulations, including those of the using agency governing the work to be done supplied by the Contractor shall be kept and maintained in good condition.

22. GENERAL LEGAL COMPLIANCE:

It shall be the Contractor's sole responsibility to insure they are in compliance with all applicable federal, state, and city laws, rules, ordinances, statutes, all Board Policies and Regulations etc. that may impact this contract. City Schools shall bear no responsibility for monitoring the Contractor's compliance with these legal requirements. If the Contractor fails to maintain legal compliance, City Schools may find the Contractor in default.

23. PREQUALIFICATION OF CONTRACTORS AND SUBCONTRACTORS.

All respondents to the solicitation must meet the qualifications indicated in the Instructions to Bidders.

All bidders are required to be prequalified with Baltimore City Department of Public Works Contractors Prequalification Committee. Only bids of contractors and subcontractors holding a prequalification certificate at the bid opening day and time will be considered. For additional information please call 410-396-6883. If the contract dollar value when added to the Contractor's uncompleted backlog at the time of award exceeds the Contractor's assigned Work Capacity Rating, their bid will be evaluated as non-responsive. Subcontractors intending to perform work in excess of $25,000 on this contract must have established qualification for an adequate Work Capacity Rating and the necessary Work Classification(s) before they are permitted to commence work.

24. EMPLOY BALTIMORE:

On June 9, 2011 the mayor signed an Executive Order titled Employ Baltimore, which applies to this solicitation. The contractor's requirements are summarized below. (See Section B for the applicable forms to be submitted with your bid or proposal.)

A. Bidders shall complete the Employ Baltimore Certification Statement contained in the Bid Document and submit it with their bids. (See section B.)
B. Within two (2) weeks of receiving the award of a City contract, the Contractor shall schedule a meeting with MOED to: (a) assess its employment needs, and (b) discuss other services provided by MOED. If applicable, MOED will then tailor specific hiring and/or training programs to benefit the contractor. The contractor will not receive its first progress payment under this contract, unless and until the meeting has been scheduled.
C. Should the Contractor's workforce plan indicate a need to fill new jobs, the Contractor must agree to post these positions through MOED and its One Stop Career Center Network for

a period of seven (7) days prior to publicly advertising the openings. This will enable MOED to identify and refer qualified City residents to the Contractor as candidates for these job opportunities.

Each contractor shall submit an Employ Baltimore Employment Report to MOED on June 30th and December 31st during each year of its contract, and at the end of the contract, indicating the number of City residents on its payroll. The submission of the Employments Reports as required shall be a condition precedent to the City's release of a final payment or any and all retainage held by the City, pursuant to the contract.

25. BALTIMORE CITY'S YOUTHWORKS PROGRAM:

The City of Baltimore has promulgated an Executive Order regarding the Baltimore City YouthWorks program which is designed to assist youth between the ages of 14 and 21. All contractors, consultants, vendors etc. are encouraged to employ skilled and qualified Baltimore City youth between the ages of 14-21 who meet the job-ready status, as defined by the Baltimore City's Youth Works Program. There is no cost to bidders, but you are required to complete and submit the forms attached to this solicitation along with your bid response package. Failure to submit the information at the time requested may be cause to have your bid rejected.

26. MINORITY BUSINESS PARTICIPATION:

<u>All Contractors shall provide a current copy of the MBE certificate(s) for each subcontractor with their bid response.</u>

Only MBE firms certified by the Maryland Department of Transportation (MDOT) can be utilized to meet the MBE requirements for the contract.

In accordance with §14-303(b)(5) of the State Finance and Procurement Article ("SFP"), the Board of Public Works promulgated regulations requiring all contracts with Minority Business Enterprise (MBE) participation goals to include a liquidated damages provision (COMAR 21.11.03.10(E)). Code of Maryland Regulations 21.01.03.02 provides that "Each regulation adopted under this title that is in effect on the date of award of any procurement contract...is applicable to the contract." *See also* SFP § 11-206(a). Therefore, the MBE liquidated damages requirement became effective for all contracts awarded on or after May 13, 2013.

As per State of Maryland Procurement Regulation 21.11.03, all solicitations issued on or after June 9, 2014, MBE Prime contractors can be counted up to (50%) towards the entire MBE Goal, and up to 100% towards any one of the MBE subgoals.

A. The overall goal for certified minority subcontractor participation in this contract is **30%** with subgoals of **8%** for certified African American-owned businesses and **11%** for certified women-owned businesses.

B. For additional information and assistance related to MBE subcontractor participation please contact the M/WBE Manager at 667-487-4112 or email atMWBEOffice@bcps.k12.md.us.

C. For bids less than $50,000.00, MBE subcontractor participation is not required.

27. MBE PROGRAM LIQUIDATED DAMAGES:

City Schools and the Awardee acknowledge and agree that the program will be damaged (including, but not limited to loss of goodwill, detrimental impact on economic development, and diversion of internal staff resources), if the Awardee does not comply with the requirements of the MBE Program and related contract provisions. Because such damages would be difficult, if not impossible, to ascertain with precision, the Awardee agrees that upon determination by City Schools that the Awardee failed to comply with one or more of the specified requirements of the MBE Program or related contract provisions, the Awardee shall pay liquidated damages to City Schools calculated in accordance with the rates set forth below. The Awardee expressly agrees that City Schools may withhold payment on any invoices to offset liquidated damages owed. Awardee further agrees that for each specified violation, the agreed upon liquidated damages are reasonably proximate to the loss City Schools is anticipated to incur as a result of such violation. City Schools may waive the liquidated damages payable under this section if it determines that the Awardee has made a good faith effort to comply with the specified requirements of the MBE Program or related contract provisions, or that reasons exist for waiving the liquidated damages payable hereunder. Nothing in the foregoing sentence shall be construed as granting City Schools the option to waive liquidated damages in order to seek actual damages instead. City Schools reserves the right to terminate this Agreement and, except as expressly set forth above, exercise all other rights and remedies provided in this Agreement or by law. The rates for calculating liquidated damages shall be:

A. Failure to submit each monthly payment report in full compliance of this Agreement: $120 per day until the monthly report is submitted as required.

B. Failure to include a provision requiring submission of payment reports in its agreements with MBE subcontractors in full compliance of this Agreement: $60 per MBE subcontractor.

C. Failure to comply with terms of this Agreement in terminating, canceling, or changing the scope of work/value of a contract with an MBE subcontractor and/or amendment of the MBE participation schedule set forth in the Awardee MBE Affidavit: the difference between the dollar value of the MBE participation commitment on the MBE participation schedule for that specific MBE firm and the dollar value of the work actually performed by that MBE firm under this Agreement.

D. Failure to meet Awardee total MBE participation goal and sub goal commitments: the difference between the dollar value of the total MBE participation commitment on the MBE participation schedule and the MBE participation actually achieved.

E. Failure to promptly pay all undisputed amounts to a subcontractor in full compliance with the prompt payment provisions of this Agreement: $100 per day until the undisputed amount due to the subcontractor is paid.

28. PREVAILING WAGE REQUIREMENTS (State of Maryland or Davis-Bacon): https:///www.dllr.state.md.us/prevwage

It is mandatory for the successful bidder and their subcontractors to pay the prevailing wage to all workers under their employ as required by the State of Maryland, Department of Labor, Licensing and Regulations, Division of Labor and Industry for projects **in amounts over $250,000.00** in the execution of this contract.

Reference: Annotated Code of Maryland State Finance and Procurement, Section 17-201 through 17-226 and 17-209. The State has enacted a prevailing wage statute for public works contracts. *State Finance & Proc*. § 17-214 requires that a contractor on such a contract pay to employees the wage rate prevailing in the area as found by the State's Commissioner of Labor and Industry. However, it does not apply to contracts for less than $500,000 or contracts for which the federal prevailing wage law applies. § 17-202. The statute only applies to contracts made by "public bodies", defined as the State, its units, or any governmental body with respect to "any public work for which 50% or more of the money used for construction is State money." § 17-201 (i). The prevailing wage statue applies to appropriate construction contracts made by local boards of education. 69 Op. Atty. Gen. Md. 220 (1984); *Demory Brothers v. Board of Public Works*, 20 Md. App. 467, *affirmed,* 273 Md. 320 (1974).

The Contractor shall submit two (2) complete copies of their payroll records and the payroll records of each of their subcontractors; one (1) copy to the Contracting Office (City Schools) and one to the Commissioner of Labor & Industry, Prevailing Wage Unit, 1100 N. Eutaw Street, Room 607, Baltimore, MD 21202. These payroll records must be submitted within fourteen (14) calendar days after the end of each payroll period.

For any questions concerning this matter please contact Ms. Katrina Williams, Wage and Hour Investigator, Division of Labor & Industry, Prevailing Wage Unit at 410-767-2365 or 410-767-2395, email: **kawilliams@dllr.state.md.us**.

29. LIVING WAGE PROGRAM (City of Baltimore):

During the term of the contract resulting from this solicitation the awarded vendor(s) shall pay its employees a living wage (if applicable) in accordance with the Baltimore City Living Wage legislation and regulations. The City's current Living Wage can be obtained by going to http://www.baltimorecity.gov/government/wage/index.html or by contacting the Baltimore Wage Commission at 410-396-4835.

Interagency Commission on School Construction

Construction Signage Instructions

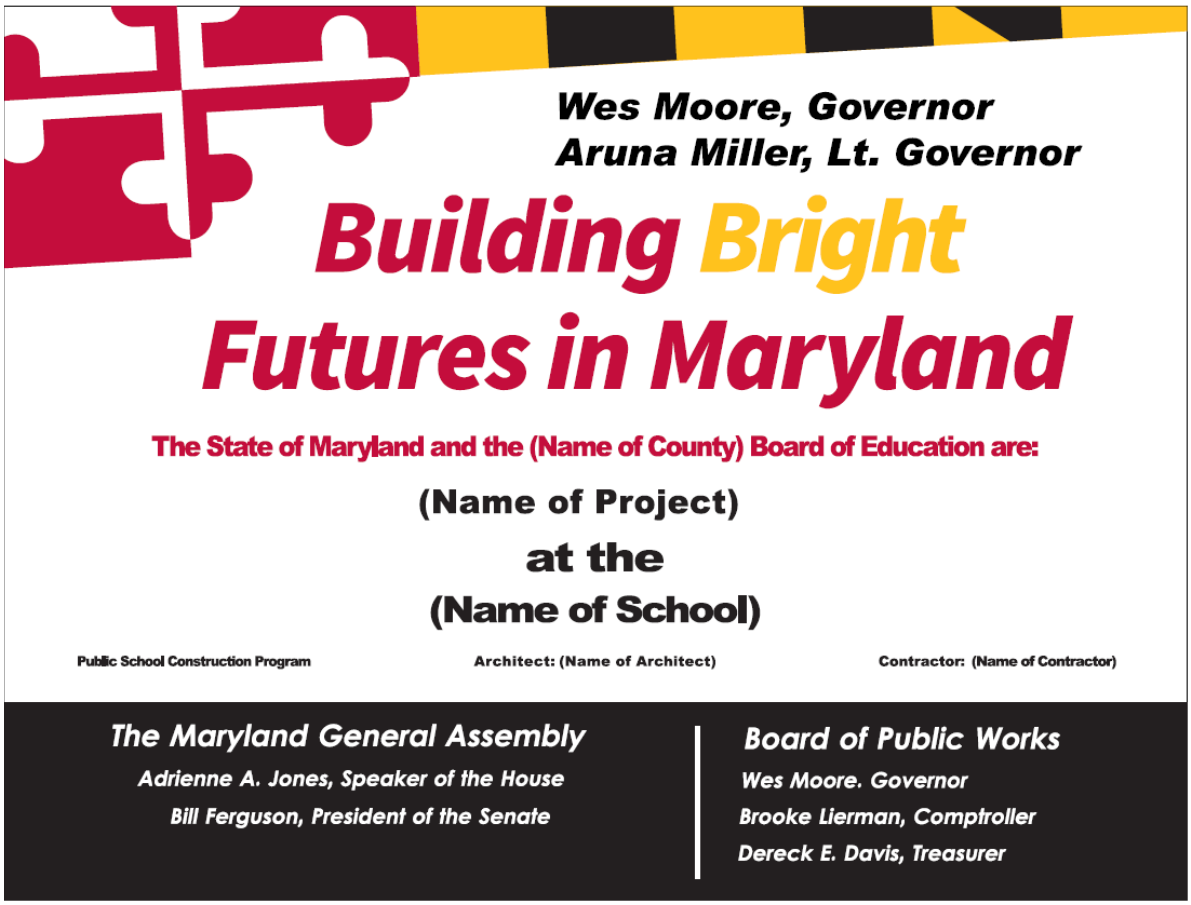
Please refer to the IAC's Administrative Procedures Guide for full details regarding the construction signage required for State funded school construction projects.

In cases where signage is required, signage is available through Maryland Correctional Enterprises (MCE).

MCE can be reached at:

Maryland Correctional Enterprises (MCE) Sign Plant #11
C/O Patuxent Institution
Attention: Christian Mayne, Plant Manager
7555 Waterloo Road Jessup, MD 20794
(410) 799-5102
christiane.mayne@maryland.gov
www.mce.md.gov

Signage Template:



Interagency Commission on School Construction

Plaque Template:

The plaque should be 12” x 18” and include the following text:

STATE FUNDS FOR THE (select appropriate option from list below)
THIS SCHOOL BUILDING WERE PROVIDED THROUGH
THE PUBLIC SCHOOL CONSTRUCTION PROGRAM
(DATE)
BOARD OF PUBLIC WORKS
WES MOORE, GOVERNOR
BROOKE LIERMAN, COMPTROLLER
DERECK E. DAVIS, TREASURER

Options to be selected and inserted:

- “...CONSTRUCTION OF...”
- “...CONSTRUCTION OF AN ADDITION TO...”
- “...RENOVATION OF...”
- “...CONSTRUCTION OF AN ADDITION AND RENOVATIONS TO...”

Vendor's Solicitation Response Package

BALTIMORE CITY PUBLIC SCHOOLS
PROCUREMENT DEPARTMENT

Contract No. IFB-27051

INVITATION FOR BIDS
Fire Alarm Upgrades at
Mary Ann Winterling Elementary School #150
220 N. Bentalou Street
Baltimore, MD 21223

Bid Due Date:

Thursday, December 17, 2026, 11:00 A.M. Local Time

NOTE:
The attached forms in the Response Package shall be executed by all responding vendors in sufficient detail to demonstrate that the vendor possesses the required qualifications, capacity, ability and resources to accomplish the work as set in the solicitation, all to the satisfaction of the Baltimore City Public Schools (City Schools) and for the proper determination of the responsible and responsive vendor.

Bids for this solicitation are being accepted **solely via eMaryland Marketplace Advantage (eMMA)**. The bid due date is **Thursday, December 17, 2026, by 11:00 am local time**. **Bids submitted in any way other than via eMaryland Marketplace Advantage (eMMA) will not be accepted.**

Bids for this solicitation are being accepted solely via eMaryland Marketplace Advantage (eMMA) online submission through https://emma.maryland.gov. Bids will be opened electronically in eMMA as soon as practicable after the deadline for the receipt of bids in the solicitation. Bid results will not be given by phone.

Bids will not be accepted by email, fax, mail, or by hand delivery.

Note: **Only MBE firms certified by the Maryland Department of Transportation (MDOT) can be utilized to meet the MBE requirements for the contract.**

For additional information and assistance please contact the M/WBE Manager at 667-487-4112 (c) or email to: MWBEOffice@bcps.k12.md.us.

BID INFORMATION SHEET

I.	**Description of Work:**	Fire Alarm Upgrades at Mary Ann Winterling Elementary School #150
II.	**Location of Work:**	Mary Ann Winterling Elementary School #150 220 N. Bentalou Street Baltimore, MD 21223
III.	**Documents Available At:**	In order to participate interested bidders need to visit eMaryland Marketplace Advantage website at https://emma.maryland.gov/ and/or http://www.baltimorecityschools.org/Page/25290
IV.	**Pre-Bid Conference:**	Mandatory walkthrough of the project construction site will be on Monday, November 16, 2026, at 11:00 a.m., for information contact: Project Manager: Seun Joshua Office Telephone: 443-984-1424 Cell Telephone: 443-931-6965 Email: sajoshua@bcps.k12.md.us
V.	**Questions Due**	November 24, 2026, by 4:00 p.m.
VI.	**Bid Due Date**	Thursday, December 17, 2026, by 11:00 A.M. local time via eMaryland Marketplace Advantage (eMMA)
VII.	**Bid Opening:**	Thursday, December 17, 2026, 12:00 p.m. via MS Teams Call-in Information: Dial in by Phone Number: +1 443-961-1488,,158460953# Phone conference ID: 158 460 953#
VIII.	**Contact Person**	Stuart Feldman, Senior Buyer Email: safeldman@bcps.k12.md.us

Responding Contractor(s),

The forms included in the response package shall be executed by all responding Bidders in sufficient detail to demonstrate that the Contractor possesses the required qualifications, capacity, ability and resources to accomplish the work as set in the solicitation, all to the satisfaction of Baltimore City Public Schools (City Schools) and for the proper determination of the low, responsible and responsive bidder.

All attached forms shall be submitted on or before the bid due date and time via eMaryland Marketplace Advantage (eMMA) website at: https://emma.maryland.gov/page.aspx/en/usr/login?ReturnUrl=%2fpage.aspx%2fen%2fbpm%2fprocess_browse

BID FORM

(SUBMIT IN DUPLICATE)

BID DUE DATE: December 17, 2026, by 11:00 a.m. Local Time

CONTRACT NO: IFB-27051

PROJECT TITLE: Fire Alarm Upgrades at Mary Ann Winterling Elementary School #150
Baltimore City Public Schools

THIS BID SUBMITTED BY: _____
(Company name)

_____
(Address)

_____

Principal Name, Title, Phone, FAX & E-Mail

_____

REGISTERED MARYLAND CONTRACTOR NO. _____

SUBMITTED TO: The Baltimore City Board of School Commissioners Baltimore, Maryland

The undersigned BIDDER proposes and agrees, if this Bid is accepted, to enter into an agreement with THE BALTIMORE CITY BOARD OF SCHOOL COMMISSIONERS, hereinafter referred to as the OWNER, in the form included in the contract documents to complete all work specified or indicated in the solicitation documents for the bid price and within the time indicated in this solicitation and in accordance with the contract documents.

BIDDER has examined the site and locality where work is to be performed, the legal requirements (federal, state and local laws, ordinances, rules and regulations), and the conditions affecting cost, progress or work performance, and has made such independent investigations, as the BIDDER deems necessary.

The Owner reserves the right to select or reject any, all, or none of the alternates in any order.

ADDENDA

Receipt of the following addenda to the Contract Documents is hereby acknowledged:

Addendum No._____Dated_____Addendum No. _____ Dated _____
Addendum No._____Dated_____Addendum No. _____ Dated _____
Addendum No._____Dated_____Addendum No. _____ Dated _____

BID PROPOSAL

PROPOSAL OF: _____

ADDRESS: _____ ZIP CODE: _____

BID DUE DATE: December 17, 2026

SOLICITATION TITLE: Fire Alarm Upgrades at Mary Ann Winterling Elementary School #150
Baltimore City Public Schools

TO THE BOARD OF SCHOOL COMMISSIONERS OF BALTIMORE CITY:
The undersigned agree to furnish all labor, materials, equipment, services, and training necessary for the fire alarm upgrades at Mary Ann Winterling Elementary School #150 for Baltimore City Public Schools in accordance with the attached specifications, drawings and other related contract documents.
The entire work specified shall be completed for the following price:

ITEM #1: Fire Alarm Upgraded at Mary Ann Winterling Elementary School #402 Base Bid:

_____Dollars and_____Cents ($_____)

ITEM #2: Allowance of $15,000 for any Unforeseen Work including HAZMAT Testing and Remediation:

_____Dollars and_____Cents ($_____)

ITEM #3: Provide Pricing for Emergency Responder Radio Distributed Antenna System (DAS):

_____Dollars and_____Cents ($_____)

ITEM #4: Unit Price #1: Canopy Ceiling Repair:

1. **Description: Replace 1 SF of existing canopy ceiling. Work shall include:**
   - **a. Demolition of damaged existing ceiling board**
   - **b. Temporary removal and reinstallation of existing lights**
   - **c. Replacement of existing perimeter flashings around the demolition area. The contractor has the option to reuse existing flashings – subject to owners' approval on case-by-case basis.**
   - **d. Replacement of the ceiling cementitious board, platers**
2. **Unit of Measurement: square foot.**

$_____Dollars and_____Cents ($_____)

ITEM #5: Unit Price #2: Provide Remove and Replace 1 Damaged Brick:

1. **Description: Replace 1 EA Existing Hollow Metal Door Frame**

$_____Dollars and_____Cents ($_____)

BID TOTAL: Total of Item #'s 1 through 5:

_____Dollars and_____Cents ($_____)

TERMS: NET 30
F.O.B.: DELIVERED

BASIS OF AWARD: This contract shall be awarded to the lowest, qualified, responsive and responsible bidder based on per item or total lump sum cost whatever is in the best interest of Baltimore City Public Schools. Negative references received will affect award of the project.

SCHEDULE:

The undersigned agrees that if awarded a contract, they will expeditiously complete all work in a manner consistent with the approved construction schedule to ensure completion within the prescribed time limits.

REPRESENTATION:

In submitting this Bid, the undersigned Bidder represents that:

a. It has read and understands the contract documents, particularly the General Conditions, and his/her bid is made in accordance therewith.

b. It has visited the site, familiarized itself with the local conditions under which work is to be completed, compared the site with the plans and specifications; satisfied themselves of the conditions of delivery, handling, and storage of materials, and all other matters which may be incidental to the project, before submitting its bid.

c. Its bid is based upon the materials and equipment described within the solicitation documents without exception.

d. It has read the contract and understands all the terms and conditions and will execute it without exception.

ATTACHMENTS

The following items shall be completed, attached to this bid form and shall be submitted to City Schools with the Contractor's bid:

1) Bid Proposal Form
2) Non-Collusion Affidavit
3) Anti-Bribery Affidavit
4) Debarment Affidavit
5) Prequalification Certification Affidavit
6) Bid Bond
7) Copy of the current Baltimore City Contractor and Subcontractors Prequalification Certificates
8) Contractor Qualifications Verification Response.
9) Copy State of Maryland Contractors License
10) Copy State of Maryland Certificate of Good Standing or other filing verifying the bidder is in Good Standing with the Department of Assessments and Taxation of Maryland.
11) Copies of your firm's Lead-Based Paint Certification, Renovator Certification and worker training records.
11) W-9 Form
12) Insurance Certificate
13) City's YouthWorks Program - Baltimore City
14) Minority Business Enterprise documentation as required, forms

NON-COLLUSION CERTIFICATE
(TO BE SUBMITTED WITH BID)

IFB-27051
Fire Alarm Upgrades at
Mary Ann Wintering Elementary School #150

I HEREBY CERTIFY that I am the _____and the duly authorized

representative of _____

whose address is _____ and

THAT NEITHER I nor, to the best of my knowledge, information, and belief, the above firm nor any of its other representatives I here represent:

(a) Have agreed, conspired, connived or colluded to produce a deceptive show of competition in the compilation of the bid or offer being submitted herewith;

(b) Have in any manner, directly or indirectly, entered into any agreement, participated in any collusion to fix the bid price or price proposal of the bidder or offeror herein or any competitor, or otherwise taken any action in restraint of free competitive bidding in connection with the Contract for which the within bid or offer is submitted.

In making this affidavit, I represent that I have personal knowledge of the matters and facts herein stated.

_____ _____
(SIGNATURE) (DATE)

_____
PRINTED OR TYPED NAME)

Subscribed and sworn before me this _____ day of _____, 20___.

x_____ Notary Public

My commission expires: _____

DEBARMENT AFFIDAVIT
(TO BE SUBMITTED WITH BID)
IFB-27051
Fire Alarm Upgrades at
Mary Ann Wintering Elementary School #150

_____ , being first duly sworn deposes and says that he is an officer in the _____ and the party making a certain proposal or bid dated, _____20___, to the Board of School Commissioners for Baltimore City Public Schools:

I further affirm that: Neither I, nor to the best of my knowledge, information, and belief, the above business, or any of its officers, directors, partners, or any of its employees directly involved in obtaining or performing contracts with public bodies, has ever been suspended or debarred (including being issued a limited denial of participation) by any public entity, except as follows (list each debarment or suspension providing the dates of the suspension or debarment, the name of the public entity and the status of the proceedings, the name(s) of the person(s) involved and their current positions and responsibilities with the business, the grounds of the debarment or suspension, and the details of each person's involvement in any activity that formed the grounds of the debarment or suspension):

_____

_____

I further affirm that:
(1) The business was not established, and it does not operate in a manner designed to evade the application of or defeat the purpose of debarment pursuant to Sections 16-101, et seq., of the State Finance and Procurement Article of the Annotated Code of Maryland; and
(2) The business is not a successor, assignee, subsidiary, or affiliate of a suspended or debarred business, except as follows (you must indicate the reasons why the affirmations cannot be given without qualification):

_____

_____

Signature of:

x_____
Bidder, if the bidder is an individual

x_____
Officer, if the bidder is a corporation

x_____
Partner, if the bidder is a partnership

Subscribed and sworn before me this _____ day of _____, 20___.

x_____ Notary Public

My commission expires: _____

ANTI-BRIBERY AFFIDAVIT
(TO BE SUBMITTED WITH BID)

IFB-27051
Fire Alarm Upgrades at
Mary Ann Wintering Elementary School #150

_____, being first duly sworn deposes and says that he is an officer in the organization known as _____and the party making a certain proposal or bid dated, _____20___, to the Board of School Commissioners for Baltimore City Public Schools:

I further confirm that: Neither I, nor to the best of my knowledge, information, and belief, the above business (as in defined in Section 16-101(b) of the State Finance and Procurement Article of the Annotated Code of Maryland), or any of its officers, directors, partners, or any of its employees directly involved in obtaining or performing contracts with public bodies (as is defined in Section 16-101(f) of the State Finance and Procurement Article of the Annotated Code of Maryland), has been convicted of bribery, attempted bribery, or conspiracy to bribe in violation of Maryland Law, or of the law of any other state or federal law, except as follows (indicate the reasons why the affirmation cannot be given and list any conviction, plea, or imposition of probation before judgment with the date, court or administrative body, sentence or disposition, the name(s) of person(s) involved, and their current positions and responsibilities with the business):

_____

_____

_____

Signature of:
x_____
Bidder, if the bidder is an individual
x_____
Partner, if the bidder is a partnership
x_____
Officer, if the bidder is a corporation

Subscribed and sworn before me this _____ day of _____, 20___.

x_____ Notary Public

My commission expires: _____

PREQUALIFICATION CERTIFICATION AFFIDAVIT
(TO BE SUBMITTED WITH BID)

IFB-27051
Fire Alarm Upgrades at
Mary Ann Wintering Elementary School #150

_____ , being first duly sworn deposes and says that he/she is an officer for _____ ("Vendor") and the party making a certain proposal or bid dated _____20___, to the Baltimore City Board of School Commissioners for Baltimore City Public Schools:

I further affirm that: Vendor is prequalified with the Baltimore City Office of Boards and Commissions Review Committee ("Committee") in the amount of $_____and if awarded this contract, the contract dollar value, when added to Vendor's uncompleted backlog of all projects at the time of the bid due date, will not exceed the Committee's assigned work capacity rating, as shown on the accompanying "Calculation of Work Capacity as of Bid Due Date".

I further affirm that: The attached list of Vendor's uncompleted projects is a comprehensive list of uncompleted projects and is accurate as of the bid due date.

Signature of:

x_____
Bidder, if the bidder is an individual

x_____
Officer, if the bidder is a corporation

x_____
Partner, if the bidder is a partnership

Subscribed and sworn before me this _____ day of _____, 20___.

x_____ Notary Public

My commission expires: _____

Calculation of Work Capacity as of Bid Due Date

Project Name	**Total Contract Amount including Change Orders**	**Amount Invoiced Through Bid Due Date**	**Uncompleted Backlog**
Total			

Total Uncompleted Backlog	
IFB-27051 Bid Amount	
Total Uncompleted Backlog plus IFB-27051	
City of Baltimore Work Capacity Rating	
Work Capacity Surplus or Deficit	

BID BOND

KNOW ALL MEN BY THESE PRESENTS, that we, the undersigned _____

_____as Principal, and _____

_____as Surety, are hereby held and firmly bound unto the Baltimore City Board of School Commissioners and the Baltimore City Public Schools, as Owner, Two Percent (2%) of the Total Bid submitted for the payment of which, well and truly to be made, we hereby jointly and severally bind ourselves, our heirs, executors, administrators, personal representatives, successors and assigns. Signed this_____day of _____, 19_____.

The condition of the above obligation is such that WHEREAS the Principal has submitted to the Baltimore City Board of School Commissioners and the Baltimore City Public Schools a certain Bid, attached hereto, and hereby made a part hereof to enter into a Contract, in writing, for the _____

_____

NOW, THEREFORE,

A. If said Bid shall be rejected or in the alternate.

B. If said Bid shall be accepted and the Principal shall execute and deliver a Contract in the form of Contract attached hereto (properly completed in accordance with said Bid), and shall furnish a bond for his faithful performance of said Contract, and for the payment of all persons performing labor or furnishing materials in connection therewith and shall in all other respects perform the Agreement created by the acceptance of said Bid.

Then this obligation shall be void, otherwise the same shall remain in force and effect; it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall in no event, exceed the penal amount of this obligation, as herein stated.

The Surety, for value received, hereby stipulates and agrees that the obligations of said Surety and its bond shall be in no way impaired or affected by an extension of the time within which the Owner may accept such Bid; and said Surety does hereby waive notice of any such extension.

IN WITNESS WHEREOF, the Principal and the Surety have hereunto set their Hand and Seals, and such of them as are Corporation have caused their Corporate Seals to be hereto affixed and these presents to be signed by their proper Officers, the day and year first set forth above.

ATTEST: PRINCIPAL

_____ _____

_____

_____

ATTEST: SURETY

_____

_____

CERTIFICATE OF INSURANCE COVERAGE

Contractor shall submit with their response a Certificate of Insurance that complies with §19-116 of the Insurance Article, Maryland Annotated Code. The Baltimore City Board of School Commissioners should be named as Additional Insured on Contractor Insurance and named as Certificate Holder. Contractor's insurance shall be effective at time of Contractor's response. If the Certificate of Insurance contains a minor irregularity, the Contractor will be allowed five (5) business days to cure the minor irregularity or be determined non-responsive. The Insurance Certificate shall meet the following required insurance coverage:

1. Commercial General Liability Insurance at limits of not less than One Million Dollars ($1,000,000) per occurrence for claims arising out of bodily injuries or death, and property damages, subject to a minimum limit of Three Million Dollars ($3,000,000) aggregate. Such insurance shall include contractual liability insurance.

2. Business Automobile Liability at limits of not less than One Million Dollars ($1,000,000) per occurrence for all claims arising out of bodily injuries or death and property damages. The insurance shall apply to any owned, non-owned, leased, or hired automobiles used in the performance of this Agreement.

3. Workers' Compensation coverage as required by the State of Maryland, as well as any similar coverage required for this work by applicable Federal or "Other States" State Law.

The City, the Board, and their respective elected/appointed officials, employees, departments, agencies, agents and volunteers shall be covered, by endorsement, as additional insureds as respect to liability arising out of activities performed or to be performed by or on behalf of the Contractor in connection with this Agreement.

The Contractor's insurance shall apply separately to each insured against whom a claim is made and/or lawsuit brought.

The Contractor's insurance coverage shall be primary. Any insurance and/or self-insured program maintained by the City or the Board and their respective elected/appointed, officials, employees, departments, agencies, agents and volunteers, shall not contribute with the Contractor's insurance or benefit the Contractor in any way.
The Contractor acknowledges that it is not entitled to any sovereign immunity rights and protections that may be available to the City or the Board pursuant to § 5-518, Cts. & Jud. Proc., Md. Code.

Coverage shall not be suspended, voided, canceled, reduced in coverage or in limits, except by the reduction of the applicable aggregate limit by claims paid, until after forty-five (45) days prior written notice has been given to the City and the

Board. There will be an exception for non- payment of premium, which is ten (10) days' notice of cancellation.

Insurance is to be placed with insurers with a Best's rating of no less than A: VII, or, if not rated with Best's with minimum surpluses the equivalent of Bests' surplus size VII and must be licensed/approved to do business in the State of Maryland.

The Contractor shall furnish the City and the Board's Director of Materials, a "Certificate of Insurance" with a copy of the additional insured endorsement as verification that coverage is in force prior to the commencement of services to be rendered under the terms of this Agreement. Insurance coverage must be maintained throughout the life of the contract. The City and the Board reserve the right to require complete copies of Insurance policies at any time.

Failure to obtain insurance coverage as required or failure to furnish Certificate(s) of Insurance as required may render this Agreement null and void; provided, however, that no act or omission of the City or the Board shall in any way limit modify or affect the obligations of Contractor under any provision of this Agreement.

Current Copy of the Baltimore City Contractor's and Subcontractor's Prequalification Certificates

Contractor Qualifications Verification Response

This Document shall be submitted as a part of the Contractor's Response Package.

Company known as _____
party making a certain proposal or bid dated,___20___, to the Board of School Commissioners for the Baltimore City Public Schools.

I further affirm that: The above business shall self-perform the majority (>51%) of the work, shown on the contract drawings with their own forces; this percentage of the work **may not** be subcontracted. If, at any point during the project it is determined by City Schools that this percentage will not be met, it is grounds for immediate contract termination.

I further affirm that: The information provided in the document below is complete and accurate to the best of my knowledge and that this information will be used by City Schools to determine the responsiveness of the apparent low bidder. Incorrect or incomplete information will be cause for City Schools to deem the apparent low bidder as unresponsive, thereby disqualifying the bidder

Office Address:_____

_____

_____

Additional Location:_____

_____

_____

Signature of:

x_____
Bidder, if the bidder is an individual

x_____
Partner, if the bidder is a partnership

x_____ Maryland Contractor No._____
Officer, if the bidder is a corporation

Subscribed and sworn before me this_____day of_____, 20_____

x_____
Notary Public

My commission expires _____

PROJECT EXPERIENCE

_____, being first duly sworn deposes and says that he is an officer in the building construction organization known as_____ _____and the party making a certain proposal or bid dated, _____20_____, to the Board of School Commissioners for the Baltimore City Public Schools.

I further affirm that:

A. How many years has your organization been in business? _____

B. How many years has your organization been in business under its present _____

C. Under what other or former names has your organization operated?

_____

_____

_____

I further affirm that: The above business has successfully completed, in the role of General Contractor, a minimum of 3 projects of similar size, scope and duration in a public school within the past five years. Respondent shall provide a resume indicating the above-required project experience and at least two references pertaining to this experience.

Examples must be provided below.

1. **Project Name**

_____

Project Address _____ City _____ State _____

Project Owner Contact _____ Phone Number _____

Date of Project Completion _____

Size of Project_____ Dollar Value _____

2. Project Name

_____

Project Address _____ City _____ State _____

Project Owner Contact _____ Phone Number _____

Date of Project Completion _____

Size of Project _____ Dollar Value _____

3. Project Name

_____

Project Address _____ City _____ State _____

Project Owner Contact _____ Phone Number _____

Date of Project Completion _____

Size of Project _____ Dollar Value _____

Warranty Term _____

Signature of:
Bidder, if the bidder is an individual

x_____

Partner, if the bidder is a partnership

x_____ Maryland Contractor No._____

Officer, is the bidder is a corporation

Subscribed and sworn before me this___day of_____, 20___.

x_____Notary Public

My commission expires: _____

Bidders shall submit the following with their bid response:

1. **State of Maryland Contractor's License**

2. **Completed W-9 available at: www.irs.gov/pub/irs-pdf/fw9.pdf**

3. **Copies of your firm's Lead-Based Paint Certification, Renovator Certification and worker training records**

4. **State of Maryland Certificate of Good Standing or other filing verifying the bidder is in Good Standing with the Department of Assessments and Taxation of Maryland (Copy).**

   Bidder shall submit a State of Maryland Certificate of Good Standing or other State of Maryland issued documentation verifying the Contractor is in good standing with the Maryland Department of Assessment and Taxation and/or registered to do business in the State of Maryland.

   The Maryland Certificate of Good Standing should be issued in the calendar year of the proposal release date or sixty (60) days prior to the bid due date.

   If the Certificate of Good Standing contains a minor irregularity, the Contractor will be allowed five (5) business days to cure it or be determined to be non-responsive.

   Certificates of Status may be obtained on line at http://www.dat.state.md.us.

   This requirement applies to both Domestic and Foreign (out of state) Bidders. Foreign entities should contact the State Department of Assessments and Taxation, 301 West Preston Street, Baltimore, Maryland 21201 at 888-246-5941, to determine and apply for the appropriate documentation.

CONTRACT NO.

EXECUTIVE ORDER

WHEREAS, the Mayor and City Council of Baltimore ("City") is committed to promoting the well-being and positive development of the City's youth and providing educational and enrichment opportunities which will lead to academic improvement, safer environments and a reduction in high risk behavior; and

WHEREAS, Baltimore City has an estimated 76,000 citizens between the ages of 14-21, and

WHEREAS, the federal government ceased funding summer job programs for youth in 2000 after 25 years, causing local and state governments to join with businesses, philanthropic, faith-based, community, and educational organizations to obtain grants, tax-deductible donations and job opportunities to help these deserving youth; and

WHEREAS, the City and the Mayor's Office. of Employment Development ("MOED") have established the Baltimore City's YouthWorks program to prepare dependable Baltimore City high school and college students for productive employment that meets the workforce needs of local businesses; and

WHEREAS, 1he City wishes to encourage all local businesses and contractors, service providers, contractors and vendors, etc. doing business with the City to employ skilled and qualified Baltimore City youth between the ages of 14-21, who meet the job-ready status, as defined by 'Baltimore City's Youth Works program, during the summer of 2008; and

WHEREAS, the need to help Baltimore City's youth has never been greater

NOW, THEREFORE, I Sheila Dixon, Mayor of the City of Baltimore, by virtue of the authority vested in me by the Baltimore City Charter. do hereby promulgate the following EXECUTIVE ORDER:

1. Hencefor1h, each and every Solicitation from every City Department, Agency and Office, where the Bid is expected to be $25,000 or more, shall contain the attached form. Each and every Bidder shall provide the City with the (a) name, (b) complete address, (c) telephone number and (d) a contact person to assist MOED with the YouthWorks program.

2. MOED shall contact each and every business identified in §1 above and request that the business, contractor, service provider, contractor and vendor, etc. join with the City in reaching its goal of employing Baltimore City's YonthWorks referrals, or otherwise assist the Baltimore City's YouthWorks program.

3. MOED shall establish and maintain an ongoing relationship with City businesses, contractors, service providers, contractors and vendors, etc. in an effort to address their current and future employment and/or training needs.

4. This Executive Order shall take effect immediately.

IN WITNESS HEREOF, I HAVE PLACED MY HAND AND THE GREAT SEAL OF THE CITY OF BALTIMORE THIS 14th DAY OF JANUARY 2008

{SIGNED} SHEILA DIXON, MAYOR

RESOLUTION OF THE BOARD OF ESTIMATES APPRENTICESHIP

TRAINING PROGRAMS

WHEREAS, the Mayor and City Council of Baltimore, acting by and through the Board of Estimates, pursuant to Article VI, Section 4 of the Charter of Baltimore City, 1964 Revision, as amended, is responsible for awarding contracts and supervising all purchasing by the City; and,

WHEREAS, the Board of Estimates wishes to ensure that all prime contractors performing under any City construction contract conduct apprenticeship training programs as a condition of their contracts;

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF ESTIMATES OF BALTIMORE CITY, that the following policy applies to all prime contractors performing under any construction contract of the City that has a total cost of $1,000,000.00 or more:

1. Prime Contractors shall conduct apprenticeship training programs as a condition of their contracts.
2. Prime Contractors shall submit to the contract administrator for the City agency supervising the contract, within ten days of their receipt of notice of award of each contract, evidence of its participation in a certified apprenticeship program that has been previously approved by the contract administrator, or an apprenticeship training action plan for approval by the contract administrator. Prime Contractors will further submit, from time to time as requested by the contract administrator, evidence of and statistics concerning the apprenticeship training actually performed by the Prime Contractors in connection with each City contract.
3. If the Board of Estimates determines that a Prime Contractor has violated the policy set forth in this Resolution, then the Prime Contractor may be disqualified from bidding on future City contracts or may be found in default of its existing contract.
4. A copy of this Resolution must be included in all City contracts.
5. This Resolution applies to all City Contracts entered into after the date of its approval by the Board of Estimates.
7. This Resolution takes effect immediately.

CONTRACT NO.

C. BALTIMORE APPRENTICESHIP TRAINING PROGRAM

MAYOR AND CITY COUNCIL OF BALTIMORE, MARYLAND

THE BALTIMORE APPRENTICE TRAINEE PROGRAM (BATP)

BID FORM

Contracting Agency _____

Contract (Project Title) _____

Scheduled Bid Due Date _____

APPRENTICE TRAINEE FORM IS DUE WITH THE BID.

FOR MORE INFORMATION ABOUT THIS FORM OR ASSISTANCE, CONTACT:

Minority and Women's Business Opportunity Office (MWBOO)
100 N. Holliday Street, Rm. 101
Baltimore, MD 21202
(410) 396-4355

MWBOO (12/00)

MAYOR AND CITY COUNCIL OF BALTIMORE, MARYLAND
BALTIMORE APPRENTICE TRAINEE PROGRAM (BATP)

PART I.

The City of Baltimore has established an apprentice training program which requires all bidders on City construction projects over $1,000,000.00 to participate in a program certified by the State of Maryland.

Training and upgrading minorities and women toward journeyperson status is the primary objective of this training provision. The purpose for this objective is to insure a pool of qualified minorities and women to replace those who, in the natural course of events, leave the workforce.

The Bidder shall commit to make its best effort to meet the BATP requirements outlined in these contract documents. If awarded this contract, the Bidder shall notify each firm with which they intend to contract of the BATP requirements and make these requirements a material part of the subcontract where appropriate.

The bidder hereby designates:

Name: _____

Title: _____

Phone: _____

as the person who has been designated with the responsibility for carrying out and reporting compliance with this program.

1. Bidders shall make their best effort to comply with the BAT Program requirements outlined in these solicitation documents. Failure to comply with these requirements shall be considered a material breach of this contract and grounds for termination.

2. The Contractor shall submit a plan for apprentice participation with the construction schedule to the contracting agency. The agency engineer shall designate the number of trainees, hours to be utilized, and the area in which the trainees are required.

   A. The draft construction schedule submitted to the contracting agency shall include a copy of the state certified apprentice/OJT program in which the Bidder is participating, required labor resources by trade in order to determine the availability of apprentice opportunities, and a trade breakdown of anticipated participation by apprentices. The construction schedule and any updates shall include apprentice participation by trade.

   B. Apprentice participation shall be distributed throughout each technical discipline or trade designated by the engineer.

   C. The contracting agency will review and approve the apprenticeship participation plan and forward a copy of the approved plan to MWBOO.

   D. Goals for trainees will be based on the Contractor's current utilization (Exhibit I in the contract document) and the availability of minorities and females in specified trade areas as indicated in the publication of the Maryland Department of Labor, Licensing and Regulation, Office of Labor Market Analysis and Information.

   E. The specific efforts proposed by the Contractor or its subcontractors if additional efforts are required to implement the BAT Program.

   F. The Contractor shall submit a BAT Program Report (AA2A) and a written projection for the following month of apprentice hourly participation by trade with each progress payment request.

   G. BAT Program participation plans shall apply to all change orders and extra work orders.

   H. Requests for modifications or amendments of the contractors must be submitted to the contracting agency with copies to MWBOO.

   The Contractor will receive a written response to the request.

CONTRACT NO.

PART II AFFIDAVIT

The undersigned, being first duly sworn on oath states to the City of Baltimore on behalf of the bidder as follows:

1. The Bidder ensures that it will provide opportunities for the training and employment of minorities and women in apprenticeship and other positions with the bidder, subcontractors, or employed on the project.

2. The Bidder agrees that it will make every effort to comply with the BAT Program.

3. Bidders shall maintain records in an easily retrievable and understandable format that documents any and all openings and/or opportunities for apprentice/trainees and where appropriate, make these requirements a part of all subcontract agreements on this project.

4. Bidder acknowledges that any bid which fails to include this duly executed and notarized form with the M/WBE portion of the bid documents may be declared as non-responsive by the Baltimore City Board of Estimates.

5. The bidder agrees to submit all forms as required in Part I& III of this document.

_____ _____

Name of Bidder Name of Project Contract

By _____

Title _____ Date _____

I hereby certify that on this_____day of_____ 20_, before me the subscriber,

a Notary Public of the State of_____in and for _____

_____City or County, personally appeared _____

_____who acknowledged himself-herself to be the (title)

_____of (company) _____

and being duly authorized, executed the foregoing affidavit for the purposes and uses therein contained.

_____
Signature of Notary Public

_____(SEAL)
My Appointment Expires

THE BALTIMORE APPRENTICE TRAINEE PROGRAM (BATP)

INSTRUCTIONS

Part III

I. Advertisement for Construction Bids (Contracting Agency)

All bid advertisements for construction projects with an estimated cost of $1,000,000.00 or more shall include the following language:

"The City of Baltimore has established an apprentice participation program requirement for this contract."

II. Bid Documents

All bid documents where the cost of the bid is estimated to be $1,000,000.00 or more shall include the BATP BID FORM unless otherwise determined by the agency engineer.

The BATP Bid Form must be submitted with the bid.

III. Pre-Bid Conference

If there is a pre-bid conference, an MWBOO Compliance Representative shall be present to discuss the BAT Program.

IV. The following forms must be submitted as indicated:

A. The Plan for Apprenticeship Participation must be completed and submitted for each area of training designated by the agency engineer before the notice to proceed is issued.

B. The Maryland Apprenticeship Agreement forms must be submitted with each progress payment request to the contracting agency or as new trainees are hired.

C. With each progress payment request, the prime contractor must submit the MWBOO AA2 and AA2A to the contracting agency.

D. If an apprentice is terminated, the contracting agency shall be informed within 10 working days. A new Apprentice Agreement Form for the replacement trainee should be attached.

E. MWBOO forms AAl and IA shall be submitted to the contracting agency semi-annually on June 30th and December 31st of each year.

ATTACHMENT

V. Penalties and Sanctions

A. A determination by the Board of Estimates after recommendation by the Minority and Women's Business Opportunity Office (MWBOO) that the Contractor has failed to comply with any portion of the BATP rules described in this solicitation, or its approved apprenticeship plan, shall subject the offending party to any or all of the following:

1. Suspension of Contract
2. Withholding of Funds
3. Rescission of contract based upon a material breach of contract
4. Disqualification of a bidder, contractor for a period of not to exceed two years
5. Payment of Liquidated Damages

B. Violation/Disqualification:

It is a violation of this program to:

1. Willfully falsify, conceal, or cover up by a trick, scheme, or device a material fact, or make any false, fictitious or fraudulent statements or representations or make use of any false, fictitious or fraudulent statement or entry.

2. Willfully obstruct, impede, or attempt to obstruct or impede any authorized official or employee who is investigating the validity of any activity under the BATP.

Mayor's Office of Employment & Development

The Mayor's Office of Employment Development provides businesses with a pipeline of qualified, skilled job candidates and supports businesses in retaining and developing their employees. We offer customized workforce solutions including outreach and recruitment, applicant prescreening, assessment and testing services, tax credit information, human resources support and training funds for new or existing employees. Training funds are available through several programs.

Customized Training is a business-driven program that helps companies train and hire people to fit their job-specific needs. Business Services recruits and pre-screens training applicants. The available positions must be full-time and meet minimum salary requirements. Companies accepting Customized Training grants must agree to hire successful participants. The training can be employer-based, on-the-job, or offered by qualified vendors.

Maryland Business Works enables small businesses and/or companies in high-growth industries to upgrade the skills of their existing employees. Businesses can access up to $25,000 to support their staff development needs. This incumbent worker funding encourages promotion, creates additional job opportunities and improves worker retention by increasing employee skill levels. Funding is limited and is available on a first-come, first-served basis.

MOED works closely with other local, state and federal agencies to promote the link between the city's workforce and economic development initiatives.

For Further Information Contact:
Rosalind Howard or Susan Tagliaferro
Baltimore City Residents First
Mayor's Office of Employment Development
3001 East Madison Street Baltimore, Maryland 21205
Phone 443-984-3014. • Fax 410-361-9648
rhoward@moedworks.com stagliaferro@moedworks.com
-or- BCRF@moedworks.com

BALTIMORE CITY'S YOUTHWORKS
(TO BE SUBMITTED WITH BID)

IFB-27051
Fire Alarm Upgrades at
Mary Ann Wintering Elementary School #150

TO: Mayor's Office of Employment Development ("MOED")

FROM: _____
(Legal name of Bidder)

Pursuant to Executive Order, the aforesaid bidder hereby presents MOED with the following information to assist its outreach for the Baltimore City YouthWorks Program:

Contact Person: _____

Address: _____

_____

Telephone Number: _____

Facsimile Number: _____

E-mail address: _____

Baltimore City's YouthWorks summer jobs program gives Baltimore city teens and young adults between the ages of 14 and 21 real-world work experiences that expose them to career options and pathways, prepare them to success entering the labor market and develop essential skills such as basic workplace etiquette and teamwork. For additional information about the program, call 410-396-5627 or visit the website https://youthworks.oedworks.com/.

IAC/PSCP Form 306.4

CERTIFIED MINORITY BUSINESS ENTERPRISE PARTICIPATION
STANDARD MONTHLY CONTRACTOR'S REQUISITION FOR PAYMENT

LEA: _____ **DATE:** _____

FACILITY NAME: _____ **PSC NO:** _____

SCOPE OF WORK: _____ **REQ NO:** _____

Name of MBE Sub-Contractor	MDOT Certification Number and Classification	TOTAL MBE Contract Amount	Amount to be Paid THIS Requisition	TOTAL Paid to Date	MBE has Received FINAL Payment?	If amount paid is LESS than TOTAL MBE Contract Amount, EXPLAIN VARIANCE
	TOTAL:	**$ -**	**$ -**	**$ -**		

MDOT Certification Number and Classification can be located at http://mbe.state.mdot.state.md.us/directory/

MBE Classification:

African American = AA
Hispanic American = H
Native American = N
Asian American = A
Women = W
African American/Women = AAW
Hispanic American/Women = HW
Native American/Women = NW
Asian American/Women = AW

I certify that the figures and information presented above represent accurate and true statements, that timely payments have been and will be made to suppliers and subcontractors on this project as requisitioned payments are received, and in accordance with our contracts.

_____ _____

Name of Contractor Firm Authorized Contractor Signature/Date

Contractor Federal Tax ID #

Contractor MBE Classification # (if applicable)

Name of LEA MBE Liaison

Signature of LEA MBE Liaison/Date

CERTIFIED MINORITY BUSINESS ENTERPRISE PARTICIPATION STANDARD MONTHLY CONTRACTOR'S REQUISITION FOR PAYMENT

IAC/PSCP Form 306.4

Instructions for Completion of IAC/PSCP Form 306.4

THIS FORM TO BE COMPLETED BY PRIME CONTRACTOR ONLY

1. **LEA** – Enter full name of LEA.
2. **Facility Name** – Enter full name of school/facility.
3. **Scope of Work** – Enter type of work being performed (i.e. New, Renovation, Roof, HVAC, ASP – Flooring, QZAB – Media Center, etc.).
4. **Date** – Date of Requisition.
5. **PSC NO** – Enter full PSC Number as assigned by PSCP.
6. **REQ NO** – Enter the number of the corresponding Requisition for Payment.
7. **Name of MBE Sub-Contractor** – Enter full name of MBE Sub-Contractor.
8. **MDOT Certification Number & Classification** – Enter the 5 digit MDOT Certification number and corresponding MDOT Classification for each MBE Sub-Contractor. MDOT Classifications and the MDOT website are listed at the bottom of this form.
9. **TOTAL MBE Contract Amount** – Enter ORIGINAL Total MBE Contract Amount as stated on MBE Attachments B and D. This amount should NOT be altered with change order amounts, changes to scope of work, etc. which may affect contract amount.
10. **Amount to be Paid This Requisition** – Enter the amount to be paid to the MBE Sub-Contractor for work applicable to this requisition.
11. **TOTAL Paid to Date** – Enter the TOTAL amount paid to date to the MBE Sub-Contractor – this amount should NOT include the amount being paid on this requisition, only the total of prior payments.
12. **MBE has Received FINAL Payment** – Enter "YES" if the MBE Sub-Contractor has been paid in full. Enter "NO" if the MBE Sub-Contractor has NOT been paid in full.
13. **If amount paid is LESS than TOTAL MBE Contract Amount, EXPLAIN VARIANCE** – Enter a brief reason for the MBE Sub-Contractor NOT being paid equal to or greater than the ORIGINAL Total MBE Contract Amount as stated on this form and MBE Attachments B & D. Additional documentation may be required to be submitted for variance explanations.
14. **Name of Contractor Firm** – Enter full name of Prime Contractor.
15. **Authorized Contractor Signature/Date** – The authorized individual employed by the Prime Contractor who filled this form out should date and sign here.
16. **Contractor Federal Tax ID #** – Enter the Federal Tax ID Number of the Prime Contractor.
17. **Contractor MBE Classification #** - Enter the MDOT MBE Classification Number if the Prime Contractor is a MDOT certified MBE Company.
18. **Name of LEA MBE Liaison** – PRINT the name of the LEA MBE Liaison (or other LEA authorized employee) responsible for VERIFYING ALL INFORMATION filled out by the Prime Contractor on this form.
19. **Signature of LEA MBE Liaison/Date** – Signature of the person VERIFYING ALL INFORMATION filled out by the Prime Contractor on this form (signature of person stated in Step #18.)

PERFORMANCE BOND

Principal	Business Address of Principal
Surety a Corporation of the State of _____ and authorized to do business in the State of Maryland	Obligee Baltimore City Board of School Commissioners and The Mayor and City Council of Baltimore
Sum of Bond (Equal to Contract Price SUM OF _____ Dollars ($_____)	
Contract Number and Identification **CONTRACT NO.** **TITLE AND LOCATION**	Date of Contract _____ 20 _____ _____ Date Bond Executed _____ 20 _____

KNOW ALL MEN BY THESE PRESENTS, That we, the PRINCIPAL above named and SURETY above named, are held and firmly bound unto the OBLIGEE above named in the full and just sum of the amount stated above, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, personal representatives, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the PRINCIPAL is entering into a certain Contract with the OBLIGEE described and dated, as shown above and attached hereto, and is required under the Provisions of the Public General Laws of Maryland to give a bond conditioned as hereinafter set forth.

NOW THEREFORE, if the PRINCIPAL shall well and truly perform and fulfill all the undertakings, covenants, terms, conditions and agreements of said Contract during the original term of said Contract and any extensions thereof that may be granted by the OBLIGEE, with or without notice to the SURETY, and during the term or terms of any maintenance, repair, guaranty and warranty required under the Contract, and shall also well and truly perform and fulfill all the undertakings, covenants, terms, conditions and agreements of any and all duly authorized modifications of said Contract that may hereafter be made, notice of which modifications to the SURETY being hereby waived, and shall indemnify and save harmless the Baltimore City Board of School Commissioners, the Baltimore City Public Schools and the Mayor and City Council of Baltimore, their agents and

employees against and from all costs, expenses, damages, injury or loss to which the said Baltimore City Board of School Commissioners and/or the Baltimore City Public Schools, its agents and employees, may be subjected by reason of any wrongdoing, misconduct, want of care or skill, negligence or default on the part of said PRINCIPAL, its agents or employees, or in any manner arising directly or indirectly from any and all causes whatsoever, in or about the execution or performance of the Contract, during the Original term of said Contract and/or any authorized extension or modification thereof and/or during the term or terms of any maintenance, repair, guaranty and warranty required under the Contract, then this obligation shall be null and void; otherwise to remain in full force and effect.

No right of action shall accrue on this bond to or for the use of any person or corporation other than the OBLIGEE, or the successors or assigns of OBLIGEE.

IN WITNESS WHEREOF, the above bounded parties have executed this instrument under their several Seals on the date indicated above, the Name and corporation seal of each corporate party being hereto affixed, and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

ATTEST: as to principal

SIGNATURE	SIGNATURE
PRINT NAME	PRINT NAME AND TITLE (SEAL)

ATTEST: as to surety

SIGNATURE	SIGNATURE
PRINT NAME	PRINT NAME AND TITLE (SEAL)

AGENT (COMPANY): _____

AUTHORIZED BY (NAME AND TITLE): _____

PAYMENT BOND

Principal	Business Address of Principal
Surety a Corporation of the State of _____ and authorized to do business in the State of Maryland	Obligee Baltimore City Board of School Commissioners, the Baltimore City Public Schools and The Mayor and City Council of Baltimore

Sum of Bond (Equal to Contract Price)

SUM OF _____ Dollars
($)_____

Contract Number and Identification	Date of Contract
CONTRACT NO **TITLE AND LOCATION**	_____20 _____ _____ Date Bond Executed _____20 _____

KNOW ALL MEN BY THESE PRESENTS That we, the PRINCIPAL above named and SURETY above named, are held and firmly bound unto the OBLIGEE above named in the full and just sum of the amount stated above, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, personal representatives, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the PRINCIPAL is entering into a certain Contract with the Obligee described and dated, as shown above and attached hereto, and is required under the Provisions of the Public General Laws of Maryland to give bond conditioned as hereinafter set forth.

NOW, THEREFORE, the condition of this obligation is such that if the PRINCIPAL shall promptly make payments to all persons supplying labor and/or material in the prosecution of the work provided for in said Contract and any and all duly authorized extensions and/or modifications of said Contract that may hereafter be made, notice of such extensions and/or modifications to the SURETY being hereby waived, and any maintenance, repair, guaranty and warranty required under the Contract, then this obligation to be null and void: otherwise to remain in full force and effect.

A suit or action commenced hereunder shall comply with applicable Provisions of the Public General Laws of Maryland. No suit or action shall be commenced hereunder against the OBLIGEE, its successors or assigns, nor shall OBLIGEE be liable for any costs or expenses of such suit.

IN WITNESS WHEREOF, the above bounden parties have executed this instrument under their several Seals on the date indicated above, the Name and corporate seal of each corporate party being hereto affixed, and these presents duly signed by its undersigned Representative, pursuant to authority of its governing body.

ATTEST: as to principal

SIGNATURE	SIGNATURE
PRINT NAME	PRINT NAME AND TITLE (SEAL)

ATTEST: as to surety

SIGNATURE	SIGNATURE
PRINT NAME	PRINT NAME AND TITLE (SEAL)

AGENT (COMPANY): _____

AUTHORIZED: _____
NAME AND TITLE

BALTIMORE CITY PUBLIC SCHOOLS

FIRE ALARM UPGRADE

Mary Ann Winterling Elementary School #150
220 North Bentalou Street
Baltimore, MD 21223

PSC #30.225.26SR

Issued for Bid

July 17, 2026

Prepared by
Windward Engineers & Consultants, LLC
777 East Park Drive
Harrisburg, PA 17111

Harris-Kupfer Architects, Inc.
422 N. Howard Street
Baltimore, MD 21201

Johnson Consulting Engineers, Inc.
130 W. 25th Street, Suite 200
Baltimore, MD 21218

Windward Job No. 25.0004591.00

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SECTION 000107

SEALS PAGE

1.1 DESIGN PROFESSIONALS OF RECORD

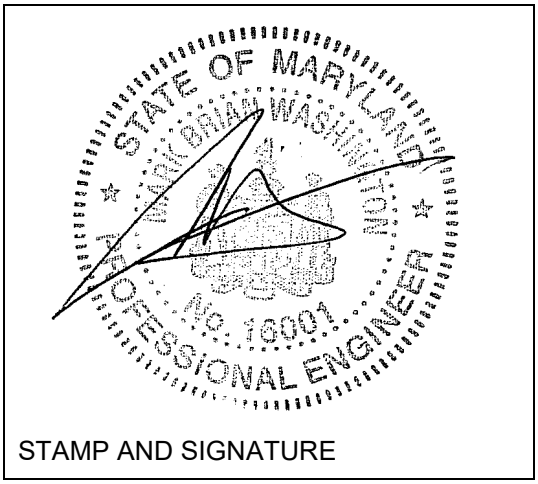
A. Architect:
1. Kenneth Kupfer, RA
2. Maryland State 12901 Architect
3. Responsible for Divisions 01-12.



STAMP AND SIGNATURE

B. Electrical Engineer:

1. Mark Washington, PE
2. Maryland State 16001 Professional Engineer
3. Responsible for Divisions 26-27.



STAMP AND SIGNATURE

C. Fire Protection Engineer:
   1. Matthew Bufton, PE
   2. Maryland State 34852 Professional Engineer.
   3. Responsible for Divisions 28.



STAMP AND SIGNATURE

END OF SECTION 000107

SECTION 000115

LIST OF DRAWING SHEETS

1.1 LIST OF DRAWINGS

A. Drawings: Drawings consist of the Contract Drawings and other drawings listed on the Table of Contents page of the separately bound drawing set titled 95% CD Submission, dated May 08, 2026.

B. List of Drawings: Drawings consist of the following Contract Drawings and other drawings of type indicated:

CS	Cover Sheet

C. Architectural

A000	LEGEND, ABBREVIATIONS & GENERAL NOTES
A100	FIRE RATING PLANS
A200	FIRE-STOPPING DETAILS
A300	SIGNAGE PLAN – GROUND FLOOR
A400	SIGNAGE PLAN – FIRST FLOOR
A500	SIGNAGE PLAN – SECOND FLOOR
A600	SIGNAGE DETAILS

D. Electrical

E000	ELECTRICAL LEGEND AND GENERAL NOTES
ED100	BASEMENT PLAN-EAST WING-LIGHTING-DEMOLITION
ED101	FIRST FLOOR PLAN-EAST WING-LIGHTING-DEMOLITION
ED102	FIRST FLOOR PLAN-WEST WING-LIGHTING-DEMOLITION
ED103	FIRST FLOOR PLAN-EAST WING-LIGHTING-DEMOLITION
ED104	SECOND FLOOR PLAN-WEST WING-LIGHTING-DEMOLITION
ED105	SECOND FLOOR PLAN-EAST WING-LIGHTING-DEMOLITION
E100	BASEMENT PLAN-EAST WING-LIGHTING-NEW WORK
E101	FIRST FLOOR PLAN-WEST WING-LIGHTING-NEW WORK
E102	FIRST FLOOR PLAN-EAST WING-LIGHTING-NEW WORK
E103	SECOND FLOOR PLAN-WEST WING-LIGHTING-DEMOLITION
E104	SECOND FLOOR PLAN-EAST WING-LIGHTING-NEW WORK
E200	EXISTING AND NEW POWER RISER DIAGRAMS

E400	FIRST FLOOR PLAN-WEST WING-DAS-NEW WORK
E401	FIRST FLOOR PLAN-EAST WING-DAS-NEW WORK
E402	SECOND FLOOR PLAN-WEST WING-DAS-NEW WORK
E403	SECOND FLOOR PLAN-WEST WING-DAS-NEW WORK
E404	DAS RISER DIAGRAM AND NOTES

E. Fire Alarm

FA-000	SYMBOLS, LEGENDS, AND ABBREVIATIONS - FIRE ALARM
FA-101	GROUND FLOOR CONSTRUCTION PLAN - FIRE ALARM
FA-102	FIRST FLOOR AREA A CONSTRUCTION PLAN - FIRE ALARM
FA-103	FIRST FLOOR AREA B CONSTRUCTION PLAN - FIRE ALARM
FA-104	SECOND FLOOR AREA A CONSTRUCTION PLAN - FIRE ALARM
FA-105	SECOND FLOOR AREA B CONSTRUCTION PLAN - FIRE ALARM
FA-500	DETAILS - FIRE ALARM

END OF SECTION 000115

SECTION 011000

SUMMARY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Project information.
2. Work covered by Contract Documents.
3. Contractor's use of site and premises.
4. Coordination with occupants.
5. Work restrictions.
6. Specification and Drawing conventions.

1.2 PROJECT INFORMATION

A. Project Identification: BCPSS Mary Ann Winterling Elementary School #150 Fire Alarm Upgrade

B. Project Location: 220 North Bentalou Street, Baltimore, MD 21223.

C. Owner: Baltimore City Public Schools, 200 E. North Avenue, Baltimore, MD 21202.

1. Owner's Representative: Seun Joshua.

D. Fire Protection Engineer: Winward Engineers & Consultants, LLC

E. Engineer’s Consultants: Fire Protection Engineer has retained the following design professionals, who have prepared designated portions of the Contract Documents:

1. Architect: Harris-Kupfer Architects, Inc.
2. Electrical Engineer: Johnson Consulting Engineers, Inc.
3. Cost Estimator: Kumi Construction

1.3 WORK COVERED BY CONTRACT DOCUMENTS

A. The Work of Project is defined by the Contract Documents and consists of the following:

Project consists of replacement of the existing fire alarm system, generator installation and ERRCS/DAS installation.

B. Type of Contract:

1. Project will be constructed under a single prime contract.

1.4 CONTRACTOR'S USE OF SITE AND PREMISES

A. Unrestricted Use of Site: Contractor shall have full use of Project site for construction operations during construction period. Contractor's use of Project site is limited only by Owner's right to perform work or to retain other contractors on portions of Project.

B. Restricted Use of Site: Contractor shall have limited use of Project site for construction operations as indicated on Drawings by the Contract limits and as indicated by requirements of this Section.

C. Limits on Use of Site: Limit use of Project site to areas within the Contract limits indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated.

D. Condition of Existing Building: Maintain portions of existing building affected by construction operations in a weathertight condition throughout construction period. Repair damage caused by construction operations.

E. Condition of Existing Grounds: Maintain portions of existing grounds, landscaping, and hardscaping affected by construction operations throughout construction period. Repair damage caused by construction operations.

1.5 COORDINATION WITH OCCUPANTS

A. Full Owner Occupancy: Owner will occupy site and existing building(s) during entire construction period. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's day-to-day operations. Maintain existing exits unless otherwise indicated.

1.6 WORK RESTRICTIONS

A. Comply with restrictions on construction operations.

1. Comply with limitations on use of public streets, work on public streets, rights of way, and other requirements of authorities having jurisdiction.

B. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after providing temporary utility services according to requirements indicated:

1. Notify Owner not less than two days in advance of proposed utility interruptions.
2. Obtain Owner's written permission before proceeding with utility interruptions.

C. Noise, Vibration, Dust, and Odors: Coordinate operations that may result in high levels of noise and vibration, dust, odors, or other disruption to Owner occupancy with Owner.

1. Notify Owner not less than two days in advance of proposed disruptive operations.
2. Obtain Owner's written permission before proceeding with disruptive operations.

D. Smoking and Controlled Substance Restrictions: Use of tobacco products, alcoholic beverages, and other controlled substances within the existing building, Project site, and on Owner's property is not permitted.

E. Employee Identification: Provide identification tags for Contractor personnel working on Project site. Require personnel to always use identification tags.

F. Employee Screening: Comply with Owner's requirements for drug and background screening of Contractor personnel working on Project site.

1. Maintain list of approved screened personnel with Owner's representative.

1.7 SPECIFICATION AND DRAWING CONVENTIONS

A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:

1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.

2. Text Color: Text used in the Specifications, including units of measure, manufacturer and product names, and other text may appear in multiple colors or underlined as part of a hyperlink; no emphasis is implied by text with these characteristics.

3. Hypertext: Text used in the Specifications may contain hyperlinks. Hyperlinks may allow for access to linked information that is not residing in the Specifications. Unless otherwise indicated, linked information is not part of the Contract Documents.

4. Specification requirements are to be performed by Contractor unless specifically stated otherwise.

B. Division 00 Contracting Requirements: General provisions of the Contract, including General and Supplementary Conditions, apply to all Sections of the Specifications.

C. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 011000

SECTION 012000

PRICE AND PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Procedures for preparation and submittal of applications for progress payments.

B. Documentation of changes in Contract Sum and Contract Time.

C. Change procedures.

D. Correlation of Contractor submittals based on changes.

E. Procedures for preparation and submittal of application for final payment.

1.2 SCHEDULE OF VALUES

A. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit sample to Architect for approval.

B. Forms filled out by hand will not be accepted.

C. Submit a printed schedule on AIA Form G703 - Application and Certificate for Payment Continuation Sheet. Contractor's standard form or electronic media printout will be considered.

D. Submit Schedule of Values in duplicate within 15 days after date of Owner-Contractor Agreement.

1. The Schedule of Values shall not include disproportionate allocation of costs to early phases of the Work. The Architect may reject schedules exhibiting unbalanced distribution.

E. Format: Utilize the Table of Contents of this Project Manual. Identify each line item with number and title of the specification Section. Identify site mobilization and bonds and insurance.

1. Identify site mobilization and bonds and insurance.

2. Include additional line items identified by subsection titles, for Work exceeding $15,000.

F. Revise schedule to list approved Change Orders, with each Application for Payment.

1.3 APPLICATIONS FOR PROGRESS PAYMENTS

A. Payment Period: Submit at intervals stipulated in the Agreement.

B. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit sample to Architect for approval.

C. Forms filled out by hand will not be accepted.

D. Present required information in typewritten form.

E. Form: AIA G702 Application and Certificate for Payment and AIA G703 - Continuation Sheet including continuation sheets when required.

F. Execute certification by signature of authorized officer.

G. Use data from approved Schedule of Values. Provide dollar value in each column for each line item for portion of work performed.

H. List each authorized Change Order as a separate line item, listing Change Order number and dollar amount as for an original item of Work.

I. Submit three copies of each Application for Payment.

J. Include the following with the application:

1. Transmittal letter as specified for Submittals in Section 013000.
2. Construction progress schedule, revised and current as specified in Section 013216.
3. Current construction photographs specified in Section 013000.
4. Partial release of liens from major Subcontractors and vendors.

K. When Architect requires substantiating information, submit data justifying dollar amounts in question. Provide one copy of data with cover letter for each copy of submittal. Show application number and date, and line item by number and description.

L. Clearly indicate on the Application for Payment those line items which include materials or equipment, purchased or fabricated and stored, but not yet installed.

1. Differentiate between items stored on-site and items stored off-site.
2. Payments for material and equipment stored off-site will be at the sole discretion of the owner. If required, Contractor will be responsible for all costs of travel and lodging for Architect, Engineers, and Owner to off-site storage locations to examine these items and the conditions of storage.
3. For items stored off-site, provide a bill of sale from supplier/Trade Contractors and certificates of insurance for the full value of stored materials with the Owner named as the insured.
4. For items stored off-site show a separate line item for the value of delivering and unloading the items at the Project site.
5. For items stored on or off-site, provide in a separate line item for the value of the installation of these items.
6. Stored materials shall be suitably protected from damage, deterioration, and theft and shall be clearly identified as property of the Owner.

M. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:

1. List of subcontractors.
2. Staff names and assignments.
3. Schedule of Values.
4. Contractor's Construction Schedule (preliminary if not final).
5. Products list.
6. Schedule of unit prices.
7. Submittals Schedule (preliminary if not final).
8. Copies of building permits.
9. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
10. Initial progress report.
11. Certificates of insurance and insurance policies.
12. Performance and payment bonds.

13. Data needed to acquire Owner's insurance.

N. Retainage
1. Retainage shall be withheld from each Application for Payment in accordance with the Owner-Contractor Agreement.
2. Reduction of retainage, if permitted, shall be subject to approval by Owner and Architect and contingent upon satisfactory progress of the Work.
3. Release of retainage shall occur only after Final Completion and acceptance of the Work.

O. Application for Payment at Substantial Completion: After issuing the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.

1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.

2. This application shall reflect Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of the Work.

3. Applications for Payment will be reviewed by Architect and Owner for completeness and compliance with Contract Documents.

4. Payment approval is contingent upon verification of Work in place and submitted documentation.

5. Incomplete or noncompliant applications will be returned without processing.

P. Audit

1. Owner reserves the right to audit Contractor’s applications for payment, including supporting documentation, invoices, payroll records, and subcontractor payments, at any time during the Project and for a period after Final Completion as defined in the Contract

1.4 MODIFICATION PROCEDURES

A. For minor changes not involving an adjustment to the Contract Price or Contract Time, Architect will issue instructions directly to Contractor.

B. Architect will advise of minor changes in the Work not involving an adjustment to Contract Sum or Contract Time as authorized by the Conditions of the Contract by issuing supplemental instructions on AIA Form G710.

C. For other required changes, Architect will issue a document signed by Owner instructing Contractor to proceed with the change, for subsequent inclusion in a Change Order.

1. The document will describe the required changes and will designate method of determining any change in Contract Sum or Contract Time.

2. Promptly execute the change.

D. For changes for which advance pricing is desired, Architect will issue a document that includes a detailed description of a proposed change with supplementary or revised drawings and specifications, a change in Contract Time for executing the change with a stipulation of any overtime work required and the period of time during which the requested price will be considered valid. Contractor shall prepare and submit a fixed price quotation within 7 days.

E. Contractor may propose a change by submitting a request for change to Architect, describing the proposed change and its full effect on the Work, with a statement describing the reason for the change, and the effect on the Contract Sum and Contract Time with full documentation.

F. Computation of Change in Contract Amount: As specified in the Agreement and Conditions of the Contract.

1. For change requested by Architect for work falling under a fixed price contract, the amount will be based on Contractor's price quotation.
2. For change requested by Contractor, the amount will be based on the Contractor's request for a Change Order as approved by Architect.
3. For pre-determined unit prices and quantities, the amount will be based on the fixed unit prices.
4. For change ordered by Architect without a quotation from Contractor, the amount will be determined by Architect based on the Contractor's substantiation of costs as specified for Time and Material work.

G. Substantiation of Costs: Provide full information required for evaluation.

1. On request, provide following data:
   a. Quantities of products, labor, and equipment.
   b. Taxes, insurance, and bonds.
   c. Overhead and profit.
   d. Credit for deletions from Contract, similarly documented.
2. Support each claim for additional costs with additional information:
   a. Origin and date of claim.
   b. Dates and times work was performed, and by whom.
   c. Time records and wage rates paid.
   d. Invoices and receipts for products, equipment, and subcontracts, similarly documented.
3. For Time and Material work, submit itemized account and supporting data after completion of change, within time limits indicated in the Conditions of the Contract.

H. Execution of Change Orders: Architect will issue Change Orders for signatures of parties as provided in the Conditions of the Contract.

I. After execution of Change Order, promptly revise Schedule of Values and Application for payment forms to record each authorized Change Order as a separate line item and adjust the Contract Sum.

J. Promptly enter changes in Project Record Documents.

1.5 APPLICATION FOR FINAL PAYMENT

K. Prepare Application for Final Payment as specified for progress payments, identifying total adjusted Contract Sum, previous payments, and sum remaining due.

L. Application for Final Payment will not be considered until the following have been accomplished:

1. All closeout procedures specified in Section 017000, Section 017700 and Section 017800.
2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
3. Updated final statement, accounting for final changes to the Contract Sum.
4. AIA Document G706, "Contractor's Affidavit of Payment of Debts and Claims."
5. AIA Document G706A, "Contractor's Affidavit of Release of Liens."
6. AIA Document G707, "Consent of Surety to Final Payment."
7. Evidence that claims have been settled.

8. Final meter readings for utilities, a measured record of stored fuel, and similar data as of date of Substantial Completion or when Owner took possession of and assumed responsibility for corresponding elements of the Work.

9. Final, liquidated damages settlement statement.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 012000

DOCUMENT 012100

ALLOWANCES

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Quantity allowances.

B. Payment and modification procedures relating to allowances.

1.2 RELATED REQUIREMENTS

A. Section 012000 - Price and Payment Procedures: Additional payment and modification procedures.

B. Section 012200 - Unit Prices

1.3 QUANTITY ALLOWANCES

A. Allowance shall include cost to Contractor of specific products and materials ordered by Owner or as described in the Allowance, in the specified quantity.

B. Costs Included in Quantity Allowances: Cost of components or equipment to Contractor or subcontractor, less applicable trade discounts, including cost of delivery to site and applicable taxes.

C. Where specifically indicated, include in the allowance the labor required to install products, materials, and equipment provided under the allowance. Note: By definition, statements requiring the Contractor to 'provide' a quantity of work includes labor.
   1. Allowances including labor to also include Contractor's costs for receiving and handling at Project site, labor, installation, overhead and profit, uncrating and storage, protection from the elements and damage, and similar costs related to products and materials.
   2. Differences in quantities used will be adjusted by Change Order on an unit cost basis.

D. Where labor is not specifically indicated to be included within the quantity allowance, Contractor's costs for receiving and handling at Project site, labor, installation, overhead and profit, uncrating and storage, protection from the elements and damage, and similar costs related to products and materials ordered by Owner under allowance shall be included as part of the Contract Sum and not part of the allowance.

1.4 ALLOWANCE SCHEDULE

A. Section

END OF SECTION 012100

SECTION 012200

UNIT PRICES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for unit prices.

1.2 DEFINITIONS

A. Unit price is a price per unit of measurement for materials, equipment, or services, or a portion of the Work, added to or deducted from the Contract Sum by appropriate modification, if the scope of Work or estimated quantities of Work required by the Contract Documents are increased or decreased.

1.3 PROCEDURES

A. Unit prices include all necessary material, plus cost for delivery, installation, insurance, applicable taxes, overhead, and profit.

B. Measurement and Payment: See individual Specification Sections for work that requires establishment of unit prices. Methods of measurement and payment for unit prices are specified in those Sections.

C. Owner reserves the right to reject Contractor's measurement of work-in-place that involves use of established unit prices and to have this work measured, at Owner's expense, by an independent surveyor acceptable to Contractor.

D. List of Unit Prices: A schedule of unit prices is included in Part 3. Specification Sections referenced in the schedule contain requirements for materials described under each unit price.

E. Measurement of Quantities

1. Measurement methods delineated in the individual specification sections complement the criteria of this section. In the event of conflict, the requirements of the individual specification section govern.

2. Take all measurements and compute quantities. Measurements and quantities will be verified by Architect.

3. Assist by providing necessary equipment, workers, and survey personnel as required.

4. Payment for Work governed by unit prices will be made on the basis of the actual measurements and quantities of Work that is incorporated in or made necessary by the Work and accepted by the Architect, multiplied by the unit price.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 SCHEDULE OF UNIT PRICES

A. Unit Price No. 1: Canopy Ceiling Repair

1. Description: Replace 1 SF of existing canopy ceiling. Work shall include:

a. Demolition of damaged existing ceiling board

b. Temporary removal and reinstallation of existing lights

c. Replacement of existing perimeter flashings around demolition area. The contractor has the option to reuse existing flashings – subject to owners approval on case-by-case basis.

d. Replacement of the ceiling cementitious board, platers and paint over the entire canopy soffit. Attach new ceiling into existing sub-framing.

2. Unit of Measurement: square foot.

B. Unit Price No. 2: Remove and replace 1 damaged brick

1. Description: Replace 1 EA existing hollow metal door frame

END OF SECTION 012200

SECTION 012300

ALTERNATES

PART 1 - GENERAL

1.1 SECTION INCLUDES

1.1 Administrative and procedural requirements for alternate bids.

1.2 DEFINITIONS

A. Alternate: An amount proposed by bidders and stated on the bid form for certain work defined in the bidding requirements that may be added to or deducted from the base bid amount if owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the contract documents. The cost or credit for each alternate is the net addition to or deduction from the contract sum to incorporate alternate into the work. No other adjustments are made to the contract sum.

B. Include as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not indicated as part of alternate. Include costs of related coordination, modification, or adjustment.

1.3 ACCEPTANCE OF ALTERNATE BIDS

A. Alternate bids quoted on bid forms will be reviewed and accepted or rejected at owner's option. Accepted alternate bids will be identified in the owner-contractor agreement.

B. Coordinate related work and modify surrounding work to integrate the work of each alternate.

1.4 SCHEDULE OF ALTERNATE BIDS

A. Alternate bid no. 1: DAS

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 012300

SECTION 012500

SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for substitutions.

1.2 DEFINITIONS

A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.

1. Substitutions for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.

2. Substitutions for Convenience: Changes proposed by Contractor or Owner that are not required in order to meet other Project requirements but may offer advantage to Contractor or Owner.

1.3 ACTION SUBMITTALS

A. Substitution Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.

1. Documentation: Show compliance with requirements for substitutions and the following, as applicable:

a. Statement indicating why specified product or fabrication or installation method cannot be provided, if applicable.

b. Coordination of information, including a list of changes or revisions needed to other parts of the Work and to construction performed by Owner and separate contractors that will be necessary to accommodate proposed substitution.

c. Detailed comparison of significant qualities of proposed substitutions with those of the Work specified. Include annotated copy of applicable Specification Section. Significant qualities may include attributes, such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.

d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.

e. Samples, where applicable or requested.

f. Certificates and qualification data, where applicable or requested.

g. List of similar installations for completed projects, with project names and addresses as well as names and addresses of architects and owners.

h. Material test reports from a qualified testing agency, indicating and interpreting test results for compliance with requirements indicated.

i. Research reports evidencing compliance with building code in effect for Project, from ICC-ES.

j. Detailed comparison of Contractor's construction schedule using proposed substitutions with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.

k. Cost information, including a proposal of change, if any, in the Contract Sum.

l. Contractor's certification that proposed substitution complies with requirements in the Contract Documents, except as indicated in substitution request, is compatible with related materials and is appropriate for applications indicated.

m. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.

2. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within seven days of receipt of a request for substitution. Architect will notify Contractor through Construction Manager of acceptance or rejection of proposed substitution within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.

a. Forms of Acceptance: Change Order, Construction Change Directive, or Architect's Supplemental Instructions for minor changes in the Work.

b. Use product specified if Architect does not issue a decision on use of a proposed substitution within time allocated.

1.4 QUALITY ASSURANCE

A. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. Engage a qualified testing agency to perform compatibility tests recommended by manufacturers.

1.5 PROCEDURES

A. Coordination: Revise or adjust affected work as necessary to integrate work of the approved substitutions.

1.6 SUBSTITUTIONS

A. Substitutions for Cause: Submit requests for substitution immediately on discovery of need for change, but not later than 15 days prior to time required for preparation and review of related submittals.

1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:

a. Requested substitution is consistent with the Contract Documents and will produce indicated results.

b. Substitution request is fully documented and properly submitted.

c. Requested substitution will not adversely affect Contractor's construction schedule.

d. Requested substitution has received necessary approvals of authorities having jurisdiction.

e. Requested substitution is compatible with other portions of the Work.

f. Requested substitution has been coordinated with other portions of the Work.

g. Requested substitution provides specified warranty.

h. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

B. Substitutions for Convenience: Not allowed unless otherwise indicated.

C. Substitutions for Convenience: Architect will consider requests for substitution if received within 60 days after the Notice of Award. Requests received after that time may be considered or rejected at discretion of Architect.

1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:

a. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Architect for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.

b. Requested substitution does not require extensive revisions to the Contract Documents.

c. Requested substitution is consistent with the Contract Documents and will produce indicated results.

d. Substitution request is fully documented and properly submitted.

e. Requested substitution will not adversely affect Contractor's construction schedule.

f. Requested substitution has received necessary approvals of authorities having jurisdiction.

g. Requested substitution is compatible with other portions of the Work.

h. Requested substitution has been coordinated with other portions of the Work.

i. Requested substitution provides specified warranty.

j. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 012500

SECTION 012600

CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for handling and processing Contract modifications.

1.2 MINOR CHANGES IN THE WORK

A. Architect will issue through Construction Manager supplemental instructions authorizing minor changes in the Work, not involving adjustment to the Contract Sum or the Contract Time, on AIA Document G710.

1. Work Change Proposal Requests issued by Architect or Construction Manager are not instructions either to stop work in progress or to execute the proposed change.

1.3 PROPOSAL REQUESTS

A. Owner-Initiated Proposal Requests: Construction Manager will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.

1. Work Change Proposal Requests issued by Construction Manager are not instructions either to stop work in progress or to execute the proposed change.
2. Within 10 days, when not otherwise specified after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.

a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.

b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.

c. Include costs of labor and supervision directly attributable to the change.

d. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.

B. Contractor-Initiated Proposals: If latent or changed conditions require modifications to the Contract, Contractor may initiate a claim by submitting a request for a change to Architect.

1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.

2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.

3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.

4. Include costs of labor and supervision directly attributable to the change.

5. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.

6. Comply with requirements in Section 012500 "Substitution Procedures" if the proposed change requires substitution of one product or system for product or system specified.

1.4 CHANGE ORDER PROCEDURES

A. On Owner's approval of a Work Change Proposal Request, Architect or Construction Manager will issue a Change Order for signatures of Owner and Contractor on AIA Document G701.

1.5 CONSTRUCTION CHANGE DIRECTIVE

A. Construction Change Directive: Architect may issue a Construction Change Directive on AIA Document G714. Construction Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.

1. Construction Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.

B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.

1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

1.6 WORK CHANGE DIRECTIVE

A. Work Change Directive: Architect may issue a Work Change Directive on EJCDC Document C-940. Work Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.

1. Work Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.

B. Documentation: Maintain detailed records on a time and material basis of work required by the Work Change Directive.

1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 012600

SECTION 013000

ADMINISTRATIVE REQUIREMENTS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Section includes
1. Electronic document submittal service.
2. Project coordination.
3. Requests for interpretation (RFI).
4. Subcontract list.
5. Staff names and assignments.
6. Preconstruction meeting.
7. Progress meetings.
8. Progress photographs.
9. Submittals for review, information, and project closeout.
10. Number of copies of submittals.
11. Submittal procedures.
12. Contractor's use of Architect's CAD files.
13. Delegated design.
14. Contractor's review.
15. Architect's action.
16. Daily construction reports.

B. Related sections
1. Section 013100 - Project Management and Coordination

1.2 PROJECT COORDINATION

A. General: Project management procedures, including use of electronic document service, shall be as directed by Owner. Web Based project management software is only used for specific projects. Emails and hard copies will be permitted otherwise.

B. Project Coordinator: Construction Manager.

C. Cooperate with the Project Coordinator in allocation of mobilization areas of site, for field offices and sheds, for vehicle and truck access, traffic, and parking facilities.

D. During construction, coordinate use of site and facilities through the Project Coordinator.

E. Comply with Project Coordinator's procedures for intra-project communications; submittals, reports and records, schedules, coordination drawings, and recommendations; and resolution of ambiguities and conflicts.

F. Comply with instructions of the Project Coordinator for use of temporary utilities and construction facilities.

G. Coordinate field engineering and layout work under instructions of the Project Coordinator.

H. Make the following types of submittals to Architect through the Project Coordinator:

1. Requests for interpretation.
2. Requests for substitution.
3. Shop drawings, product data, and samples.
4. Test and inspection reports.
5. Design data.
6. Manufacturer's instructions and field reports.
7. Applications for payment and change order request.
8. Progress schedules.
9. Coordination drawings.
10. Closeout submittals.

1.3 REQUEST FOR INTERPRETATION (RFIS)

A. Procedure: Immediately on discovery of the need for interpretation of the Contract Documents, and if not possible to request interpretation at Project meeting, prepare and submit an RFI in the form specified. RFIs shall originate with Contractor. RFIs submitted by entities other than Contractor will be returned with no response. Coordinate and submit RFIs in a prompt manner to avoid delays in Contractor's work or work of subcontractors. Frivolous RFIs: The Contractor will compensate the Owner for the Architect's time and expenses to process RFIs resulting from the Contractor's lack of studying and comparing the Contract Documents, coordinating their own Work, or repeating previous RFIs. Submit RFIs through the Web-based Project Management Software, in PDF format, when project management software is being used. When not, hard copy or email submission is acceptable.

B. Content of the RFI: Include a detailed, legible description of item needing interpretation and the following:

   a. Project name.

   b. Date.

   c. Name of Contractor.

   d. Name of Architect.

   e. RFI number, numbered sequentially.

   f. Specification Section number and title and related paragraphs, as appropriate.

   g. Drawing number and detail references, as appropriate.

   h. Field dimensions and conditions, as appropriate.

   i. Contractor's suggested solution(s). If Contractor's solution(s) impact the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.

   j. Contractor's signature.

   k. Attachments: Include drawings, descriptions, measurements, photos, Product Data, Shop Drawings, and other information necessary to fully describe items needing interpretation.

   l. Supplementary drawings prepared by Contractor shall include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments.

C. Format of RFIs:
   1. Software-Generated RFIs:
      a. Preferred format.
      b. Software-generated form with substantially the same content as indicated above.
      c. Photographs shall be electronic files in JPG format.
      d. Attachments shall be electronic files in Adobe Acrobat PDF format.
   2. Hard-Copy RFIs:
      a. Permitted under conditions where electronic RFI is not feasible.

b. Identify each page of attachments with the RFI number and sequential page number.

D. Architect's Action: Architect will review each RFI, determine action required, and respond through the Web-based Project Management Software. Allow seven working days for Architect's response for each RFI. RFIs received after 1:00 p.m. will be considered as received the following working day.

1. The following RFIs may be returned without action:

a. Requests for approval of submittals.

b. Requests for approval of substitutions.

c. Requests for coordination information already indicated in the Contract Documents.

d. Requests for adjustments in the Contract Time or the Contract Sum.

e. Requests for interpretation of Architect's actions on submittals.

f. Incomplete RFIs or RFIs with numerous errors.

2. Architect's action may include a request for additional information, in which case Architect's time for response will start again.

3. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, submit Change Order Request within 10 days of receipt of the RFI response as provided by General Conditions of the Contract.

E. On receipt of Architect's action, immediately distribute the RFI response to affected parties. Review response and notify Architect within seven days if Contractor disagrees with response.

F. RFI Log: Prepared and maintained by the Architect within the Web-based Project Management Software; or, Contractor to maintain a separate RFI log with subcontractors.

1.4 SUBCONTRACT LIST

A. Prepare a written summary identifying individuals or firms proposed for each portion of the work, including those who are to furnish products or equipment fabricated to a special design. Use form acceptable to City Schools and the Architect. Include the following information in tabular form:

1. Name, address, and telephone number of entities performing subcontract or supplying products.

2. Number and title of related Specification Section(s) covered by subcontract.

3. Drawing number and detail references, as appropriate, covered by subcontract.

4. Number of Copies: Submit four copies of subcontractor list, unless otherwise indicated. Architect will return two copies.

a. Mark up and retain one returned copy as a Project Record Document.

1.5 STAFF NAMES AND ASSIGNMENTS

A. Submit a list of principal staff assignments, including superintendent and other personnel in attendance at Project site, prior to or coinciding with initial Application for Payment.

B. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home and office telephone numbers.

C. Provide names, addresses, and telephone numbers of individuals assigned as standbys in the absence of individuals assigned to Project.

D. Post copies of list in Project meeting room, in temporary field office, and by each temporary phone.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 PRECONSTRUCTION MEETING

A. Construction Manger will schedule a meeting after Notice of Award.

B. Attendance Required:
1. Owner.
2. Architect.
3. Project Coordinator.

C. Agenda:
1. Execution of Owner- Contractor Agreement.
2. Submission of executed bonds and insurance certificates.
3. Distribution of Contract Documents.
4. Submission of list of Subcontractors, list of Products, schedule of values, and progress schedule.
5. Designation of personnel representing the parties to Contract, Construction Manager and Architect.
6. Project dates.
7. Administrative and submittal milestones.
8. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and Contract closeout procedures.
9. Scheduling.
10. Architect’s CAD sharing.
11. Testing and laboratory services; Special Inspections.
12. Temporary facilities and controls.
13. Use of site.

D. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

3.2 PROGRESS MEETINGS

A. Schedule and administer meetings throughout progress of the Work at maximum bi-weekly intervals.

B. Project Coordinator will make arrangements for meetings, prepare agenda with copies for participants, preside over meetings.

C. Attendance Required: Project Coordinator, Contractor's project manager and job superintendent, major Subcontractors and suppliers, Owner, Architect, as appropriate to agenda topics for each meeting.

D. Agenda:
1. Review minutes of previous meetings.
2. Review of Work progress.
3. Field observations, problems, and decisions.
4. Identification of problems that impede, or will impede, planned progress.
5. Review of submittals schedule and status of submittals.
6. Review of off-site fabrication and delivery schedules.
7. Maintenance of progress schedule.
8. Corrective measures to regain projected schedules.
9. Planned progress during succeeding work period.
10. Maintenance of quality and work standards.
11. Effect of proposed changes on progress schedule and coordination.
12. Other business relating to Work.

13. Safety.

E. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

3.3 PREINSTALLATION CONFERENCE

A. General: Refer to Section 013000 – Administrative Requirements. Retain "Preconstruction Conference" Paragraph below if a preconstruction meeting is required. Preinstallation Conferences: Conduct a preinstallation conference at Project site before each construction activity when required by other sections and when required for coordination with other construction.

1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Architect, and Owner's Commissioning Authority of scheduled meeting dates.

2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:

a. Contract Documents.

b. Options.

c. Related RFIs.

d. Related Change Orders.

e. Purchases.

f. Deliveries.

g. Submittals.

h. Review of mockups.

i. Possible conflicts.

j. Compatibility requirements.

k. Time schedules.

l. Weather limitations.

m. Manufacturer's written instructions.

n. Warranty requirements.

o. Compatibility of materials.

p. Acceptability of substrates.

q. Temporary facilities and controls.

r. Space and access limitations.

s. Regulations of authorities having jurisdiction.

t. Testing and inspecting requirements.

u. Installation procedures.

v. Coordination with other work.

w. Required performance results.

x. Protection of adjacent work.

y. Protection of construction and personnel.

3. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.

4. Reporting: Distribute minutes of the meeting to each party present and to other parties requiring information.

5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.

6. Minutes: Entity responsible for conducting the meeting will record and distribute the meeting minutes to each party present and to parties requiring information.

B. Schedule Updating: Revise Contractor's construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

3.4 ELECTRONIC DOCUMENT SERVICE

A. All documents transmitted for purposes of administration of the contract are to be in electronic (PDF) format, and transmitted via an Internet-based submittal service that receives, logs and stores documents, provides electronic stamping and signatures, and notifies addressees via email.
   1. Besides submittals for review, information, and closeout, this procedure applies to Requests for Interpretation (RFIs), progress documentation, contract modification documents (e.g. supplementary instructions, change proposals, change orders), applications for payment, field reports and meeting minutes, Contractor's correction punchlist, and any other document any participant wishes to make part of the project record.
   2. Contractor and Architect are required to use this service.
   3. It is Contractor's responsibility to submit documents in allowable format to the service.
   4. Subcontractors, suppliers, and Architect's consultants are to be permitted to use the service at no extra charge.
   5. Users of the service need an email address, internet access, and PDF review software that includes ability to mark up and apply electronic stamps (such as Adobe Acrobat, www.adobe.com, or Bluebeam PDF Revu, www.bluebeam.com), unless such software capability is provided by the service provider.
   6. Paper document transmittals will not be reviewed; emailed electronic documents will not be reviewed.
   7. All other specified submittal and document transmission procedures apply, except that electronic document requirements do not apply to samples or color selection charts.

B. Cost: The cost of the service is to be paid by Contractor; include the cost of the service in the Contract Sum.

C. Submittal Service - As specified by City Schools.

D. Training: One, one-hour, web-based training session will be arranged for all participants, with representatives of Architect and Contractor participating; further training is the responsibility of the user of the service.

E. Project Closeout: Architect will determine when to terminate the service for the project, Contractor shall obtain an archive copy of the project files from the service for the Architect and Owner.

3.5 PROGRESS PHOTOGRAPHS

A. Photography Type: Digital; electronic files.

B. Provide photographs of site and construction throughout progress of Work produced by an experienced photographer, acceptable to Architect.

C. Specific points in time for specific for specific photos will be indicated.

D. In addition to periodic, recurring views, take photographs of each of the following events:
1. Excavations in progress.
2. Foundations in progress and upon completion.
3. Structural framing in progress and upon completion.
4. Enclosure of building, upon completion.
5. Final completion, minimum of ten (10) photos.
6. Construction at historic building elements.

E. Views:
1. Provide non-aerial photographs from four cardinal views at each specified time, until Date of Substantial Completion.
2. Consult with Architect for instructions on views required.
3. Provide factual presentation.
4. Provide correct exposure and focus, high resolution and sharpness, maximum depth of field, and minimum distortion.

F. Digital Photographs: 24-bit color, minimum resolution of 1600 by 1200 ("2 megapixel"), in JPG format; provide files unaltered by photo editing software.
1. Delivery Medium: Web-based Project Management Software.
2. File Naming: Include project identification, date and time of view, and view identification.
3. Hard Copy: Printed hardcopy (grayscale) of PDF file and point of view sketch.

G. Additional Photographic Requirements: Refer to Section 015721 for photographic documentation requirements for Indoor Air Quality Controls.

3.6 SUBMITTIALS FOR INFORMATION

A. When the following are specified in individual sections, submit them for review:
1. Product data.
2. Shop drawings.
3. Samples for selection.
4. Samples for verification.

B. Package these submittals by specification section, except closeout submittals or Work performed by separate trades, in a single delivery to the Architect; failure of the Contractor to package these submittals in a single delivery may cause the Architect to withhold action on submittal until associated submittals required by the particular specification section are received.

C. Submit to Architect for review for the limited purpose of checking for conformance with information given and the design concept expressed in the contract documents.

D. Product data and shop drawings to be submitted and managed through the Web-based Project Management Software.

E. Samples will be reviewed only for aesthetic, color, or finish selection.

F. After review, provide copies and distribute in accordance with SUBMITTAL PROCEDURES article below and for record documents purposes described in Section 017800 - CLOSEOUT SUBMITTALS.

3.7 SUBMITTALS FOR PROJECT CLOSEOUT

A. When the following are specified in individual sections, submit them at project closeout:
1. Project record documents.
2. Operation and maintenance data.
3. Warranties.
4. Bonds.

5. Other types as indicated.

B. Submit for Owner's benefit during and after project completion.

3.8 NUMBER OF COPIES OF SUBMITTIALS

A. Electronic Documents: Submit one electronic copy in PDF format; an electronically-marked up file will be returned. Create PDFs at native size and right-side up; illegible files will be rejected.

B. Documents for Project Closeout: Make one reproduction of submittal originally reviewed. Submit one extra of submittals for information.

C. Samples: Submit the number specified in individual specification sections; one of which will be retained by Architect.
   1. After review, produce duplicates.
   2. Retained samples will not be returned to Contractor unless specifically so stated.

3.9 SUBMITTAL PROCEDURES

A. Transmit each submittal with a copy of approved submittal form.

B. Submittals not requested will not be recognized or processed.

C. Submittals Schedule: Comply with requirements in Division 01 Section "Construction Progress Documentation" for list of submittals and time requirements for scheduled performance of related construction activities.

D. Processing Time: Allow enough time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
   1. Initial Review: Allow 14 days for initial review of each submittal; duration of time is defined by date received in Architect's office until the day sent from the Architect's office. Allow additional time if coordination with subsequent submittals is required. Architect will advise Contractor when a submittal being processed must be delayed for coordination.
   2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
   3. Resubmittal Review: Allow 15 days for review of each resubmittal; duration of time is defined by date received in Architect's office until the day sent from the Architect's office.
   4. Concurrent Review: Where concurrent review of submittals by Architect's consultants, Owner, or other parties is indicated, allow 21 days for initial review of each submittal; duration of time is defined by date received in consultant's office until the day sent to the Contractor. Submittals required within the following divisions to be sent directly to the Architect's consultants:
      a. All required submittals indicated in Division 3 section.
      b. The following required submittals indicated in Division 4:
         1) Product data, shop drawings, material certificates, mix designs, and cold-weather procedures.
      c. All required submittals indicated in Divisions 26 and 28 sections.
   5. Color Selection: Architect will select colors within 60 days (to allow time for presentation to Owner and for Owner comments) after all color samples have been submitted including but not limited to items listed below. The submittal data shall be complete, including shop drawings, product data, and color samples, and all required submittals and materials shall be in compliance with the specifications and be subsequently approved by the Architect. Color samples shall be actual samples of the material and not photographs. If there is a variation in color, shade, texture, or pattern, submit multiple samples to show full range of variation.

a. Interior Items per specification chapters.

E. Submittal Identification: Place a permanent label or title block on each submittal for identification.

1. Indicate name of firm or entity that prepared each submittal on label or title block.

2. Provide a space approximately 6 by 8 inches on label or beside title block to record Contractor's review and approval markings and action taken by Architect.

3. Include the following information on label for processing and recording action taken:

a. Project name.

b. Date.

c. Name and address of Architect.

d. Name and address of Contractor.

e. Name and address of subcontractor.

f. Name and address of supplier.

g. Name of manufacturer.

h. Submittal number or other unique identifier, including revision identifier.
1) Submittal number shall use Specification Section number followed by a decimal point and then a sequential number (e.g., 06 10 00.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., 06 10 00.01.A).
2) Number and title of appropriate Specification Section.
3) Drawing number and detail references, as appropriate.
4) Location(s) where product is to be installed, as appropriate.
5) Other necessary identification.

F. Deviations: Encircle or otherwise specifically identify deviations from the Contract Documents on submittals.

G. Resubmittals:

1. Resubmit submittals until they are marked "No Exception Taken” or “Note Markings”.

2. Resubmission of items rejected or marked "Revise and Resubmit" will be reviewed one time by the Architect at no cost to the Contractor. Should the re-submittal be rejected or marked "Revise and Resubmit", the Contractor will reimburse the Owner by credit Change Order for all costs to the Owner for additional time spent by the Architect and the Architect's consultants to review the second (and subsequent) resubmission.

H. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.

I. Use for Construction: Use only final submittals with mark indicating “No Exceptions Taken” or “Note Markings” taken by Architect.

3.10 CONTRACTOR’S FAIR USE OF ARCHITECTS CAD FILES

A. At Contractor's written request, copies of Architect's CAD Drawing files will be provided to Contractor for Contractor's use in connection with Project; Contractor must sign and return the release form at the end of this Section. As applicable, the Architect’s consultants may require their own releases to be signed and included with the executed Architect’s form, and the Architect’s consultant may charge a fee for releasing electronic files.

B. Allow one week for processing, shipping and handling after Architect receives the signed form.

C. Only the files indicated on Agreement included at the end of this Section shall be made available for use as backgrounds for preparation of shop drawings and coordination drawings. No other CAD Drawing files, for this Project, will be made available.

D. Contractor does not have the right to release drawing files without first securing a signed Architect's release and, as applicable, the Architect's consultants' forms. Submit executed forms to the Architect by subsequent Application for Payment, with consultant fees as applicable.

E. Any entity receiving the drawing files shall, to the fullest extent permitted by law, indemnify, defend and hold harmless the Architect, and its consultants from all claims, damages, losses, expenses, penalties and liabilities of any kind, including attorney's fees, arising out of or resulting from the use of the drawing files by the Contractor, or by third party recipients of the drawing files from the Contractor.

F. Drawing files must not be considered to be Contract Documents as defined by the General Conditions of Contract.

3.11 DELEGATED DESIGN

A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
   1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Architect.

B. Delegated-Design Submittal: In addition to Shop Drawings, Product Data, and other required submittals, submit three copies of a statement, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional.
   1. Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.

3.12 CONTRACTOR'S REVIEW

A. Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect through the Web-based Project Management Software.

B. Verify:
   1. Field Measurements.
   2. Field Construction Criteria.
   3. Catalog Numbers and Similar Data.
   4. Quantities.

C. Contractor's responsibility regarding errors and omissions in submittals is not relieved by Architect's review of submittals.

D. Contractor's responsibility regarding deviations in submittals from requirements of Contract Documents is not relieved by Architect's review of submittals, unless Architect gives written acceptance of specific deviations as approved by Owner.

E. When work is directly related and involves more than one trade, coordinate submittal with other trades and submit under one cover.

F. After a submittal has been submitted for review, no changes may be made to that Submittal other than changes resulting from review notes made by the Architect unless such changes are clearly identified and circled before being resubmitted. Any failure to comply with this requirement shall nullify and invalidate the Architect's review.

G. Approval Stamp: Stamp each submittal. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and

statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents as indicated below:

THIS IS TO CERTIFY THAT THE SPECIFICATION REQUIREMENTS HAVE BEEN MET AND ALL DIMENSIONS, CONDITIONS, AND QUANTITIES ARE VERIFIED AS SHOWN AND/OR CORRECTED ON THESE DRAWINGS. SIGNED

3.13 ARCHITECT'S/ACTION

A. General: Architect will not review submittals that do not bear Contractor's approval stamp and will return them without action.

B. Action Submittals: Architect will review each submittal, make marks to indicate corrections or modifications required, and return it; except where indicated otherwise. Architect will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action taken, as follows:
   1. NO EXCEPTION TAKEN: The Work covered by the submittal is accepted as specified and the Work may proceed provided it complies with requirements of the Contract Documents.
   2. NOTE MARKINGS: The Work covered by the submittal is accepted as noted and the Work may proceed provided it complies with notations or corrections on the submittal and requirements of the Contract Documents.
   3. REVISE AND RESUBMIT: Do not proceed with the Work covered by the submittal. Revise or prepare a new submittal according to the notations and requirements of the Contract Documents and resubmit without delay. Unmarked items may be fabricated if indicated.
   4. REJECTED: Architect will list reasons for rejection on the submittal or in the transmittal letter accompanying the submittal. Do not proceed with the Work covered by the submittal. Prepare new submittal according to the notations and requirements of the Contract Documents, and resubmit without delay.
   5. ACTION NOT REQUIRED: Either the submittal was not requested, or the submittal was for information only or for record purposes.

C. Informational Submittals: Architect will review each submittal and will not return it or will return it if it does not comply with requirements. Architect will forward each submittal to appropriate party.

D. Partial submittals are not acceptable, will be considered nonresponsive, and will be returned without review.

E. Submittals not required by the Contract Documents may not be reviewed and may be discarded.

3.14 DAILY CONSTRUCTION REPORTS

A. Prepare a daily construction report, recording the following information concerning events at the site.
   1. List of Trade Contractors at the site.
   2. List of major items of equipment on site.
   3. List of construction activities performed (for each trade).
   4. Approximate count of personnel at the site for each trade.
   5. High and low temperatures, general weather conditions.
   6. Accidents and unusual events.
   7. Meetings and significant decisions.
   8. Stoppages, delays, shortages, losses.
   9. Meter readings and similar recordings.
   10. Emergency procedures.
   11. Orders and requests of governing authorities.

12. Change Orders received, implemented.
13. Services connected, disconnected.
14. Equipment or systems tests and start-ups.
15. Partial Completions, occupancies.

B. Duplicate copies of the daily construction reports shall accompany the progress report and be turned over to the Architect at the job conference.

END OF SECTION 013000

SECTION 013100

PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:

1. General coordination procedures.
2. Coordination drawings.
3. RFIs.
4. Digital project management procedures.
5. Project meetings.

B. Related Requirements:

1. Section 013000 – Administrative Requirements
2. Section 013300 - Submittal Procedures

1.3 DEFINITIONS

A. BIM: Building Information Modeling.

B. RFI: Request for Information. Request from Contractor seeking information required by or clarifications of the Contract Documents.

1.4 INFORMATIONAL SUBMITTALS

A. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:

1. Name, address, telephone number, and email address of entity performing subcontract or supplying products.
2. Number and title of related Specification Section(s) covered by subcontract.
3. Drawing number and detail references, as appropriate, covered by subcontract.

1.5 GENERAL COORDINATION PROCEDURES

A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction

operations included in different Sections that depend on each other for proper installation, connection, and operation.

1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
2. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.
3. Make adequate provisions to accommodate items scheduled for later installation.

B. Project Coordinator: Construction Manager. Cooperate with the Project Coordinator in allocation of mobilization areas of site, for field offices and sheds, for vehicle and truck access, traffic, and parking facilities. During construction, coordinate use of site and facilities through the Project Coordinator. Comply with Project Coordinator's procedures for intra-project communications; submittals, reports and records, schedules, coordination drawings, and recommendations; and resolution of ambiguities and conflicts. Comply with instructions of the Project Coordinator for use of temporary utilities and construction facilities. Coordinate field engineering and layout work under instructions of the Project Coordinator.

C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and activities of other contractors to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:

1. Preparation of Contractor's construction schedule.
2. Preparation of the schedule of values.
3. Installation and removal of temporary facilities and controls.
4. Delivery and processing of submittals.
5. Progress meetings.
6. Preinstallation conferences.
7. Project closeout activities.
8. Startup and adjustment of systems.

1.6 DIGITAL PROJECT MANAGEMENT PROCEDURES

A. Use of Architect's Digital Data Files: Digital data files of Architect's BIM model will be provided by Architect for Contractor's use during construction.

1. Digital data files may be used by Contractor in preparing coordination drawings, Shop Drawings, and Project record Drawings.
2. Architect makes no representations as to the accuracy or completeness of digital data files as they relate to Contract Drawings.
3. Digital Drawing Software Program: Contract Drawings are available in most current REVIT version and most current Microsoft operating system.
4. Contractor shall execute a data licensing agreement in the form Agreement form acceptable to Owner and Architect.

a. Subcontractors, and other parties granted access by Contractor to Architect's digital data files shall execute a data licensing agreement in the form of Agreement acceptable to Owner and Architect.

B. Web-Based Project Software: Use Owner's web-based Project software site for purposes of hosting and managing Project communication and documentation until Final Completion.

1. Provide up to 1 web-based Project software user licenses for use of Owner, and Architect.

2. At completion of Project, provide digital archive in format that is readable by common desktop software applications in format acceptable to Architect. Provide data in locked format to prevent further changes.

C. PDF Document Preparation: Where PDFs are required to be submitted to Architect, prepare as follows:

1. Assemble complete submittal package into a single indexed file incorporating submittal requirements of a single Specification Section and transmittal form with links enabling navigation to each item.

2. Name file with submittal number or other unique identifier, including revision identifier.

3. Certifications: Where digitally submitted certificates and certifications are required, provide a digital signature with digital certificate on where indicated.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 013100

SECTION 013114

FACILITY SERVICE COORDINATION

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Coordination documents.

1.2 SUBMITTALS

A. Submit coordination drawings and schedules prior to submitting shop drawings, product data, and samples.

B. Areas of Work requiring Coordination Drawings include (but not limited to) mechanical rooms, electrical rooms, equipment rooms, corridors, horizontal exits from duct shafts, crossovers and any other areas where congestion of Work occurs. Complete the requirements for Coordination Drawings within 75 days of starting construction operations. Prepare Coordination Drawings if limited space availability necessitates maximum utilization of space for efficient installation of different components or if coordination is required for installation of products and materials fabricated by separate entities.

1. Content: Project-specific information, drawn accurately to scale.

2. Do not base Coordination Drawings on reproductions of the Contract Documents or standard printed data. The Construction Documents in their original, copies or electronic file form are the Architect's instrument of service and are protected under copyright laws.

3. Include the following information, as applicable:

a. Follow routing shown on Contract Drawings for pipes, ducts, and conduit, as closely as practicable; place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance and for repairs.

b. Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems.

c. Indicate required installation sequences.

d. Indicate dimensions shown on the Contract Drawings and make specific note of dimensions that appear to conflict with submitted equipment and minimum clearance requirements. Provide alternate sketches to Architect for resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.

4. Number of Copies: Submit digitally via the web-based project management software system as required.

a. Submit five copies where Coordination Drawings are required for operation and maintenance manuals. Architect will retain two copies; remainder will be returned. Mark up and retain one returned copy as a Project Record Drawing.

5. Refer to individual Sections for Coordination Drawing requirements for Work in those Sections.

6. Each trade shall sign and date the Coordination Drawings after the addition of their information.

7. Do not begin fabrication until receipt of completed Coordination Drawings are acknowledged by each contractor in writing to the Architect.
8. No progress payments will be made for any work affected by coordination drawings until coordination drawings governing that work have been accepted.
9. Any work installed prior to approval of coordination drawings shall be modified or replaced, as necessary, to conform to subsequently approved construction drawings, at no additional cost to Owner.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 COORDINATION REQUIRED

A. Coordinate the work listed below:
   1. Electrical: Division 26.
   2. Electronic Safety and Security: Division 28.
   3. Commissioning requirements throughout the Project Manual.

B. Coordinate progress schedules, including dates for submittals and for delivery of products.

C. Conduct meetings among Subcontractors and others concerned, to establish and maintain coordination and schedules, and to resolve coordination matters in dispute.

D. Participate in progress meetings. Report on progress of work to be adjusted under coordination requirements, and any required changes in schedules. Transmit minutes of meetings and reports to concerned parties.

E. Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections, that depend on each other for proper installation, connection, and operation.

F. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.

G. Coordinate installation of different components with other contractors to ensure maximum accessibility for required maintenance, service, and repair.

H. Make adequate provisions to accommodate items scheduled for later installation.

3.2 COORDINATION DOCUMENTS

A. Prepare coordination drawings to organize installation of products for efficient use of available space, for proper sequence of installation, and to identify potential conflicts.
   1. Priority of Construction Space:
      a. Coordinate installation of different components to ensure performance and accessibility for required maintenance, service, and repair of all components, including mechanical and electrical.
      b. Following is the Order of Priority of construction space:

1) First: Ductwork.

2) Second: Fire protection piping.

3) Third: Other piping.

4) Fourth: Conduit.

B. Prepare a master schedule identifying responsibilities for activities that directly relate to this work, including submittals and temporary utilities; organize by specification section.

C. Identify electrical power characteristics and control wiring required for each item of equipment.

D. Maintain maximum headroom at all locations without finished ceilings.

E. Maintain finished ceiling heights as indicated.

F. Coordinate installations with other trades to prevent conflict with Work of other trades and cooperate in making reasonable modifications in layout as needed.

G. Where conflicts occur with placement of mechanical and electrical materials as they relate to placement of other building materials, the Architect shall be consulted for assistance in coordination of the available space to accommodate all trades.

H. Maintain documents for the duration of the work, recording changes due to site instructions, modifications, or adjustments.

I. Any construction delays required to accomplish coordination, approval of submittals or re-submittals, or consequent to coordination work, shall be incurred at no additional cost to Owner; such delays may include, but not be limited to, the following:

1. Time taken for preparation and submission of acceptable coordination drawings, including a reasonable period for Architect's review and approval.
2. Time taken for preparation and approval of acceptable mock-ups.
3. Time taken for modifications and replacements of non-conforming work.

3.3 COORDINATION OF SUBMITTALS

A. Review shop drawings, product data, and samples for compliance with Contract Documents and for coordination with related work. Transmit copies of reviewed documents to Architect.

B. Check field dimensions and clearances and relationship to available space and anchors.

C. Check compatibility with equipment and work of other sections, electrical characteristics, and operational control requirements.

D. Check motor voltages and control characteristics.

E. Coordinate controls, interlocks, wiring of switches, and relays.

F. Coordinate wiring and control diagrams.

G. When changes in the work are made, review their effect on other work.

H. Verify information and coordinate maintenance of record documents.

3.4 COORDINATION OF SUBSTITUTIONS AND MODIFICATIONS

A. Review proposals and requests for substitution prior to submission to Architect.

B. Verify compliance with Contract Documents and for compatibility with work of other sections.

3.5 OBSERVATION OF WORK

A. Observe work for compliance with Contract Documents.

B. Maintain a list of observed deficiencies and defects; promptly submit.

3.6 EQUIPMENT START-UP

A. Verify utilities, connections, and controls are complete and equipment is in operable condition as required by Section 017300.

B. Observe start-up and adjustments, test run, record time and date of start-up, and results.

C. Observe equipment demonstrations made to Owner; record times and additional information required for operation and maintenance manuals.

3.7 INSPECTION AND ACCEPTANCE OF EQUIPMENT

A. Prior to inspection, verify that equipment is tested, operational, clean, and ready for operation.

B. Assist Architect with review. Prepare list of items to be completed and corrected.

END OF SECTION 013114

SECTION 013200

CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:

1. Contractor's Construction Schedule.
2. Construction schedule updating reports.
3. Daily construction reports.
4. Site condition reports.

1.2 DEFINITIONS

A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction Project. Activities included in a construction schedule consume time and resources.

1. Critical Activity: An activity on the critical path that must start and finish on the planned early start and finish times.
2. Predecessor Activity: An activity that precedes another activity in the network.
3. Successor Activity: An activity that follows another activity in the network.

B. CPM: Critical path method, which is a method of planning and scheduling a construction project where activities are arranged based on activity relationships. Network calculations determine when activities can be performed and the critical path of Project.

C. Critical Path: The longest connected chain of interdependent activities through the network schedule that establishes the minimum overall Project duration and contains no float.

D. Event: The starting or ending point of an activity.

E. Float: The measure of leeway in starting and completing an activity.

1. Float time is not for the exclusive use or benefit of either Owner or Contractor, but is a jointly owned, expiring Project resource available to both parties as needed to meet schedule milestones and Contract completion date.
2. Free float is the amount of time an activity can be delayed without adversely affecting the early start of the successor activity.
3. Total float is the measure of leeway in starting or completing an activity without adversely affecting the planned Project completion date.

1.3 INFORMATIONAL SUBMITTALS

A. Format for Submittals: Submit required submittals in the following format:

1. Working electronic copy of schedule file, where indicated.

2. PDF file.

3. Two paper copies, of sufficient size to display entire period or schedule, as required.

B. Startup Network Diagram: Of size required to display entire network for entire construction period. Show logic ties for activities.

C. Contractor's Construction Schedule: Initial schedule, of size required to display entire schedule for entire construction period.

1. Submit a working digital copy of schedule, using software indicated, and labeled to comply with requirements for submittals.

D. CPM Reports: Concurrent with CPM schedule, submit each of the following reports. Format for each activity in reports shall contain activity number, activity description, original duration, remaining duration, early start date, early finish date, late start date, late finish date, and total float in calendar days.

1. Activity Report: List of activities sorted by activity number and then early start date, or actual start date if known.

2. Logic Report: List of preceding and succeeding activities for each activity, sorted in ascending order by activity number and then by early start date, or actual start date if known.

3. Total Float Report: List of activities sorted in ascending order of total float.

E. Construction Schedule Updating Reports: Submit with Applications for Payment.

F. Daily Construction Reports: Submit at weekly intervals.

G. Site Condition Reports: Submit at time of discovery of differing conditions.

1.4 COORDINATION

A. Coordinate Contractor's Construction Schedule with the schedule of values, list of subcontracts, submittal schedule, progress reports, payment requests, and other required schedules and reports.

1. Secure time commitments for performing critical elements of the Work from entities involved.

2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

1.5 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

A. Computer Scheduling Software: Prepare schedules using current version of a program that has been developed specifically to manage construction schedules.

1. Use PlanGrid for current Windows operating system.

B. Time Frame: Extend schedule from date established for commencement of the Work to date of final completion.

1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.

C. Activities: Treat each floor or separate area as a separate numbered activity for each main element of the Work. Comply with the following:

1. Activity Duration: Define activities so no activity is longer than 20 days, unless specifically allowed by Architect.
2. Procurement Activities: Include procurement process activities for the following long lead items and major items, requiring a cycle of more than 60 days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.
3. Submittal Review Time: Include review and resubmittal times indicated in Section 013300 "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's Construction Schedule with submittal schedule.
4. Startup and Testing Time: Include no fewer than 5 days for startup and testing.
5. Commissioning Time: Include no fewer than 30 days for commissioning.
6. Substantial Completion: Indicate completion in advance of date established for Substantial Completion, and allow time for Architect's administrative procedures necessary for certification of Substantial Completion.
7. Punch List and Final Completion: Include not more than 5 days for completion of punch list items and final completion.

D. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule, and show how the sequence of the Work is affected.

1. Phasing: Arrange list of activities on schedule by phase.
2. Owner-Furnished Products: Include a separate activity for each product. Include delivery date indicated in Section 011000 "Summary." Delivery dates indicated stipulate the earliest possible delivery date.
3. Work Restrictions: Show the effect of the following items on the schedule:
    a. Coordination with existing construction.
    b. Limitations of continued occupancies.
    c. Uninterruptible services.
    d. Partial occupancy before Substantial Completion.
    e. Use-of-premises restrictions.
    f. Provisions for future construction.
    g. Seasonal variations.
    h. Environmental control.

E. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, Substantial Completion, and final completion and the following interim milestones:

1. Temporary enclosure and space conditioning.

F. Upcoming Work Summary: Prepare summary report indicating activities scheduled to occur or commence prior to submittal of next schedule update. Summarize the following issues:

1. Unresolved issues.
2. Unanswered Requests for Information.
3. Rejected or unreturned submittals.

4. Notations on returned submittals.

5. Pending modifications affecting the Work and the Contract Time.

G. Contractor's Construction Schedule Updating: At weekly intervals, update schedule to reflect actual construction progress and activities. Issue schedule one week before each regularly scheduled progress meeting.

1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.

2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.

3. As the Work progresses, indicate final completion percentage for each activity.

H. Recovery Schedule: When periodic update indicates the Work is 14 or more calendar days behind the current approved schedule, submit a separate recovery schedule indicating means by which Contractor intends to regain compliance with the schedule. Indicate changes to working hours, working days, crew sizes, equipment required to achieve compliance, and date by which recovery will be accomplished.

I. Distribution: Distribute copies of approved schedule to Architect, Owner, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.

1. Post copies in Project meeting rooms and temporary field offices.

2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

1.6 GANTT-CHART SCHEDULE REQUIREMENTS

A. Gantt-Chart Schedule: Submit a comprehensive, fully developed, horizontal, Gantt-chart-type, Contractor's Construction Schedule within 30 days of date established for the Notice of Award.

B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line.

1. For construction activities that require three months or longer to complete, indicate an estimated completion percentage in 10 percent increments within time bar.

1.7 REPORTS

A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:

1. List of subcontractors at Project site.

2. List of separate contractors at Project site.

3. Approximate count of personnel at Project site.

4. Equipment at Project site.

5. Material deliveries.

6. High and low temperatures and general weather conditions, including presence of rain or snow.
7. Testing and inspection.
8. Accidents.
9. Meetings and significant decisions.
10. Stoppages, delays, shortages, and losses.
11. Meter readings and similar recordings.
12. Emergency procedures.
13. Orders and requests of authorities having jurisdiction.
14. Change Orders received and implemented.
15. Construction Change Directives received and implemented.
16. Services connected and disconnected.
17. Equipment or system tests and startups.
18. Partial completions and occupancies.
19. Substantial Completions authorized.

B. Site Condition Reports: Immediately on discovery of a difference between site conditions and the Contract Documents, prepare and submit a detailed report. Submit with a Request for Information. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 013200

SECTION 013216

CONSTRUCTION PROGRESS SCHEDULE

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Preliminary schedule.

B. Construction progress schedule, with network analysis diagrams and reports.

C. Responsibility for completion of Work per schedule and preparation of recovery schedules.

1.2 SUBMITTALS

A. Within 15 days after date of Agreement, submit preliminary schedule defining planned operations for the first 60 days of Work, with a general outline for remainder of Work.

B. If preliminary schedule requires revision after review, submit revised schedule within 10 days.

C. Within 20 days after review of preliminary schedule, submit draft of proposed complete schedule for review.
   1. Include written certification that major contractors have reviewed and accepted proposed schedule.

D. Within 10 days after joint review, submit complete schedule.

E. Submit updated schedule with each Application for Payment.

F. Submit the number of opaque reproductions that Contractor requires, plus two copies that will be retained by Architect.

G. Submit under transmittal letter form specified in Section 013000.

1.3 QUALITY ASSURANCE

A. Scheduler: Contractor's personnel or specialist Consultant specializing in CPM scheduling with one year’s minimum experience in scheduling construction work of a complexity comparable to this Project, and having use of computer facilities capable of delivering a detailed graphic printout within 48 hours of request.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 PRELIMINARY SCHEDULE

A. Prepare preliminary schedule in the form of a preliminary network diagram.

3.2 CONTENT

A. Show complete sequence of construction by activity, with dates for beginning and completion of each element of construction.

B. Show accumulated percentage of completion of each item, and total percentage of Work completed, as of the first day of each month.

C. Provide separate schedule of submittal dates for shop drawings, product data, and samples, owner-furnished products, Products identified under Allowances, and dates reviewed submittals will be required from Architect, within the Web-based Project Management Software. Indicate decision dates for selection of finishes.
   1. The Architect shall maintain the submittal log between the Architect and Contractor through Web-based Project Management Software.
   2. Contractor to maintain a submittal log with subcontractors.

D. Coordinate content with schedule of values specified in Section 012000.

E. Provide legend for symbols and abbreviations used.

3.3 NETWORK ANALYSIS

A. Prepare network analysis diagrams and supporting mathematical analyses using the Critical Path Method.

B. Illustrate order and interdependence of activities and sequence of work; how start of a given activity depends on completion of preceding activities, and how completion of the activity may restrain start of subsequent activities.

C. Mathematical Analysis: Tabulate each activity of detailed network diagrams, using calendar dates, and identify for each activity:
   1. Preceding and following event numbers.
   2. Activity description.
   3. Estimated duration of activity, in maximum 15-day intervals.
   4. Earliest start date.
   5. Earliest finish date.
   6. Actual start date.
   7. Actual finish date.
   8. Latest start date.
   9. Latest finish date.
   10. Total and free float; float time shall accrue to Owner and to Owner's benefit.
   11. Monetary value of activity, keyed to Schedule of Values.
   12. Percentage of activity completed.
   13. Responsibility.

D. Analysis Program: Capable of compiling monetary value of completed and partially completed activities, accepting revised completion dates, and re-computation of all dates and float.

E. Required Reports: List activities in sorts or groups:
   1. By preceding work item or event number from lowest to highest.
   2. By amount of float, then in order of early start.

3.4 REVIEW AND EVALUATION OF SCHEDULE

A. Participate in joint review and evaluation of schedule with Architect at each submittal.

B. Evaluate project status to determine work behind schedule and work ahead of schedule.

C. After review, revise as necessary as result of review, and resubmit within 10 days.

3.5 FLOAT TIME

A. Float is not for the exclusive benefit of either Contractor or Owner.

B. Manage work according to early start dates, by commencing activities on the early start date (calculated by the latest approved Contract Schedule) or earlier if possible, unless constrained by a bona fide resource limitation.

C. Owner may reserve and apportion float time according to the needs of the Project.

D. Actual or projected Owner-caused delays that do not exceed available float time shall not have any effect upon Contractor's adherence to specified time constraints and shall not be a basis for any time extension.

E. Contractor acknowledges the following:
   1. Activity delays shall not automatically result in adjustment of specified time constraints.
   2. A Change Order or other Owner action or inaction may not affect existing critical activities or cause non-critical activities to become critical.
   3. A Change Order or delay may result in only absorbing a part of the available total float that may exist within an activity chain of the network, thereby not causing any effect on specified time constraints.

F. Pursuant to the above float sharing requirements, float suppression techniques such as preferential sequencing, special lead/lag logic restraints, unreasonably extended activity durations, or imposed dates shall be distributed by Owner to the benefit of Owner and Contractor.

G. In the event of the Contractor wishes to complete the Work earlier than the time specified therefore:
   1. Continue to calculate float based on the Work completion date specified as of Contract execution, by maintaining the specified Work completion date as a "finish-no-later-than" constraint.
   2. The completion time for the Work shall be amended by Owner's acceptance of or acquiescence to Contractor's proposed earlier completion date.
   3. Contractor shall not, under any circumstances, receive additional compensation for indirect, general, administrative or other forms of overhead costs, for the period between the time of earlier completion proposed by Contractor and the completion time for the Work specified as of NTP.

3.6 UPDATING SCHEDULE

A. Maintain schedules to record actual start and finish dates of completed activities.

B. Indicate progress of each activity to date of revision, with projected completion date of each activity.

C. Annotate diagrams to graphically depict current status of Work.

D. Identify activities modified since previous submittal, major changes in Work, and other identifiable changes.

E. Indicate changes required to maintain Date of Substantial Completion.

F. Submit reports required to support recommended changes.

G. Provide narrative report to define problem areas, anticipated delays, and impact on the schedule. Report corrective action taken or proposed and its effect including the effects of changes on schedules of separate contractors.

3.7 RESPONSIBILTY FOR COMPLETION

A. Take a combination of the following actions, at no additional cost to the Owner, when the progress schedule illustrates that the Contract Substantial Completion date cannot be met:
   1. Increase construction manpower in such quantities and trades to substantially eliminate the backlog of Work.
   2. Increase the number of work hours per shift, shifts per working day, working days per week, or the amount of construction equipment, or any combination to substantially eliminate the backlog of Work.
   3. Reschedule activities to achieve maximum practical concurrency of accomplishment of activities.

B. Recovery Schedule: Prepare a recovery schedule from all trades to accelerate progress, if a milestone is missed, a single duration work activity is incomplete for ten workdays, or overall work progress is deemed insufficient by the Owner/Architect.
   1. A recovery schedule must be initiated by the Contractor, reviewed by effected trade contractors and submitted ten working days after one of the above conditions occurs.
   2. Submit recovery schedule in same number of copies as original.
   3. Trades must execute means necessary to bring the Project back on schedule using the recovery schedule; accelerated Work and additional overhead necessary to keep the Project on schedule is included in the Contract.
   4. Recovery schedule to be double the size of the original diagram, as a minimum, illustrating existing and revised activities alongside original data; revised activities must be easily differentiated from original schedule.

C. Failure of the Contractor to comply with requirements of this subsection may be a basis for determination that the Contractor is not prosecuting the Work with such diligence as will ensure completion within the time stipulated; upon such determination, the Owner may take such action deemed appropriate.

3.8 DISTRIBUTION OF SCHEDULE

A. Distribute copies of updated schedules to Contractor's project site file, to Subcontractors, suppliers, Architect, Owner, and other concerned parties.

B. Instruct recipients to promptly report, in writing, problems anticipated by projections shown in schedules.

END OF SECTION 013216

SECTION 013233

PHOTOGRAPHIC DOCUMENTATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for the following:

1. Preconstruction photographs.
2. Periodic construction photographs.
3. Final completion construction photographs.

B. Related Requirements:

1. Section 017700 "Closeout Procedures" for submitting photographic documentation as Project Record Documents at Project closeout.
2. Section 024119 "Selective Demolition" for photographic documentation before selective demolition operations commence.

1.2 INFORMATIONAL SUBMITTALS

A. Key Plan: Submit key plan of Project site and building with notation of vantage points marked for location and direction of each photograph. Indicate elevation or story of construction. Include same information as corresponding photographic documentation.

B. Digital Photographs: Submit image files within two days of taking photographs.

1. Submit photos by uploading to web-based project software site. Include copy of key plan indicating each photograph's location and direction.
2. Identification: Provide the following information with each image description in web-based project software site:

a. Name of Project.
b. Name of Contractor.
c. Date photograph was taken.
d. Description of location, vantage point, and direction.
e. Unique sequential identifier keyed to accompanying key plan.

1.3 QUALITY ASSURANCE

A. Photographer Qualifications: An individual who has been regularly engaged as a professional photographer of construction projects for not less than three years.

1.4 FORMATS AND MEDIA

A. Digital Photographs: Provide color images in JPG format, produced by a digital camera with minimum sensor size of 12 megapixels, and at an image resolution of not less than 3200 by 2400. Use flash in low light levels or backlit conditions.

B. Digital Images: Submit digital media as originally recorded in the digital camera, without alteration, manipulation, editing, or modifications using image-editing software.

C. Metadata: Record accurate date and time from camera.

D. File Names: Name media files with date and sequential numbering suffix.

1.5 CONSTRUCTION PHOTOGRAPHS

A. General: Take photographs with maximum depth of field and in focus.

1. Maintain key plan with each set of construction photographs that identifies each photographic location.

B. Preconstruction Photographs: Before starting construction, take photographs of Project site and surrounding properties, including existing items to remain during construction, from different vantage points, as directed by Architect.

1. Flag construction limits before taking construction photographs.

2. Take 24 photographs to show existing conditions adjacent to property before starting the Work.

3. Take 24 photographs of existing buildings either on or adjoining property to accurately record physical conditions at start of construction.

4. Take additional photographs as required to record settlement or cracking of adjacent structures, pavements, and improvements.

C. Periodic Construction Photographs: Take 24 photographs weekly. Select vantage points to show status of construction and progress since last photographs were taken.

D. Final Completion Construction Photographs: Take 24 photographs after date of Substantial Completion for submission as Project Record Documents. Architect will inform photographer of desired vantage points.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 013233

SECTION 013300

SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Submittal schedule requirements.
2. Administrative and procedural requirements for submittals.

1.2 DEFINITIONS

A. Action Submittals: Written and graphic information and physical samples that require Architect's responsive action. Action submittals are those submittals indicated in individual Specification Sections as "action submittals."

B. Informational Submittals: Written and graphic information and physical samples that do not require Architect's responsive action. Submittals may be rejected for not complying with requirements. Informational submittals are those submittals indicated in individual Specification Sections as "informational submittals."

1.3 SUBMITTAL SCHEDULE

A. Submittal Schedule: Submit, as an action submittal, a list of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or revisions to submittals noted by Architect and additional time for handling and reviewing submittals required by those corrections.

1.4 SUBMITTAL FORMATS

A. Submittal Information: Include the following information in each submittal:

1. Project name.
2. Date.
3. Name of Architect.
4. Name of Contractor.
5. Name of firm or entity that prepared submittal.
6. Names of subcontractor, manufacturer, and supplier.
7. Unique submittal number, including revision identifier. Include Specification Section number with sequential alphanumeric identifier; and alphanumeric suffix for resubmittals.
8. Category and type of submittal.
9. Submittal purpose and description.

10. Number and title of Specification Section, with paragraph number and generic name for each of multiple items.
11. Drawing number and detail references, as appropriate.
12. Indication of full or partial submittal.
13. Location(s) where product is to be installed, as appropriate.
14. Other necessary identification.
15. Remarks.
16. Signature of transmitter.

B. Options: Identify options requiring selection by Architect.

C. Deviations and Additional Information: On each submittal, clearly indicate deviations from requirements in the Contract Documents, including minor variations and limitations; include relevant additional information and revisions, other than those requested by Architect on previous submittals. Indicate by highlighting on each submittal or noting on attached separate sheet.

D. Paper Submittals:

1. Place a permanent label or title block on each submittal item for identification; include name of firm or entity that prepared submittal.
2. Provide a space approximately 6 by 8 inches on label or beside title block to record Contractor's review and approval markings and action taken by Architect.
3. Action Submittals: Submit 2 paper copies of each submittal unless otherwise indicated. Architect will return 1 copies.
4. Informational Submittals: Submit 2 paper copies of each submittal unless otherwise indicated. Architect will not return copies.
5. Transmittal for Submittals: Assemble each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form.

E. PDF Submittals: Prepare submittals as PDF package, incorporating complete information into each PDF file. Name PDF file with submittal number.

F. Submittals for Web-Based Project Software: Prepare submittals as PDF files, or other format indicated by Project software website.

1.5 SUBMITTAL PROCEDURES

A. Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.

1. Web-Based Project Software: Prepare submittals in PDF form, and upload to web-based Project software website. Enter required data in web-based software site to fully identify submittal.
2. Paper: Prepare submittals in paper form, and deliver to Architect.

B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.

1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
2. Submit all submittal items required for each Specification Section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule.

3. Submit action submittals and informational submittals required by the same Specification Section as separate packages under separate transmittals.

C. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.

1. Initial Review: Allow 10 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect will advise Contractor when a submittal being processed must be delayed for coordination.

2. Resubmittal Review: Allow 10 days for review of each resubmittal.

D. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.

E. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.

F. Use for Construction: Retain complete copies of submittals on Project site. Use only final action submittals that are marked with approval notation from Architect's action stamp.

1.6 SUBMITTAL REQUIREMENTS

A. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.

1. If information must be specially prepared for submittal because standard published data are unsuitable for use, submit as Shop Drawings, not as Product Data.

2. Mark each copy of each submittal to show which products and options are applicable.

3. Include the following information, as applicable:

a. Manufacturer's catalog cuts.

b. Manufacturer's product specifications.

c. Standard color charts.

d. Statement of compliance with specified referenced standards.

e. Testing by recognized testing agency.

f. Application of testing agency labels and seals.

g. Notation of coordination requirements.

h. Availability and delivery time information.

4. For equipment, include the following in addition to the above, as applicable:

a. Wiring diagrams that show factory-installed wiring.

b. Printed performance curves.

c. Operational range diagrams.

d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.

5. Submit Product Data before Shop Drawings, and before or concurrent with Samples.

B. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data unless submittal based on Architect's digital data drawing files is otherwise permitted.

1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:

   a. Identification of products.

   b. Schedules.

   c. Compliance with specified standards.

   d. Notation of coordination requirements.

   e. Notation of dimensions established by field measurement.

   f. Relationship and attachment to adjoining construction clearly indicated.

   g. Seal and signature of professional engineer if specified.

2. Paper Sheet Size: Except for templates, patterns, and similar full-size Drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches, but no larger than 30 by 42 inches.

C. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other materials.

1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.

2. Identification: Permanently attach label on unexposed side of Samples that includes the following:

   a. Project name and submittal number.

   b. Generic description of Sample.

   c. Product name and name of manufacturer.

   d. Sample source.

   e. Number and title of applicable Specification Section.

   f. Specification paragraph number and generic name of each item.

3. Email Transmittal: Provide PDF transmittal. Include digital image file illustrating Sample characteristics, and identification information for record.

4. Web-Based Project Software: Prepare submittals in PDF form, and upload to web-based Project software website. Enter required data in web-based software site to fully identify submittal.

5. Paper Transmittal: Include paper transmittal including complete submittal information indicated.

6. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.

   a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.

b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.

7. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.

   a. Number of Samples: Submit 2 full set(s) of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect will return submittal with options selected.

8. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.

   a. Number of Samples: Submit 2 sets of Samples. Architect will retain Sample sets; remainder will be returned.

      1) Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.

      2) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least 2 sets of paired units that show approximate limits of variations.

D. Product Schedule: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:

E. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of architects and owners, and other information specified.

F. Design Data: Prepare and submit written and graphic information indicating compliance with indicated performance and design criteria in individual Specification Sections. Include list of assumptions and summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Number each page of submittal.

G. Certificates:

1. Certificates and Certifications Submittals: Submit a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity. Provide a notarized signature where indicated.

2. Installer Certificates: Submit written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.

3. Manufacturer Certificates: Submit written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.

4. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.

5. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.

6. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification and Procedure Qualification Record on AWS forms. Include names of firms and personnel certified.

H. Test and Research Reports:

1. Compatibility Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.

2. Field Test Reports: Submit written reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.

3. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.

4. Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.

5. Product Test Reports: Submit written reports indicating that current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.

6. Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:

a. Name of evaluation organization.

b. Date of evaluation.

c. Time period when report is in effect.

d. Product and manufacturers' names.

e. Description of product.

f. Test procedures and results.

g. Limitations of use.

1.7 DELEGATED-DESIGN SERVICES

A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.

1. If criteria indicated are insufficient to perform services or certification required, submit a written request for additional information to Architect.

B. Delegated-Design Services Certification: In addition to Shop Drawings, Product Data, and other required submittals, submit digitally signed PDF file and 2 paper copies of certificate, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional.

1. Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.

1.8 CONTRACTOR'S REVIEW

A. Action Submittals and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect.

B. Contractor's Approval: Indicate Contractor's approval for each submittal with indication in web-based Project software. Include name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

1. Architect will not review submittals received from Contractor that do not have Contractor's review and approval.

1.9 ARCHITECT'S REVIEW

A. Action Submittals: Architect will review each submittal, indicate corrections or revisions required, and return it.

1. PDF Submittals: Architect will indicate, via markup on each submittal, the appropriate action.

2. Paper Submittals: Architect will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action.

3. Submittals by Web-Based Project Software: Architect will indicate, on Project software website, the appropriate action.

B. Informational Submittals: Architect will review each submittal and will not return it, or will return it if it does not comply with requirements. Architect will forward each submittal to appropriate party.

C. Partial submittals prepared for a portion of the Work will be reviewed when use of partial submittals has received prior approval from Architect.

D. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.

E. Architect will return without review submittals received from sources other than Contractor.

F. Submittals not required by the Contract Documents will be returned by Architect without action.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 013300

ATTACHMENTS

A. SUBMITTALS SCHDULE

Harris-Kupfer Architects, Inc.

Schedule of Submittals

PROJECT: Mary Ann Winterling Elementary School #150 Fire Alarm Upgrade

DATE RECEIVED	SPEC SECTION # / SHOP DWG. OR SAMPLE #		TITLE	#RECEIVED	REFERRED				ACTION	DATE RETURNED TO CONTRACTOR	COPIES TO			
					TO	DATE SENT	# COPIES	DATE RETURNED TO HKA			CONTRACTOR	OWNER	FIELD	FILE

SECTION 013553

SECURITY PROCEDURES

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Security measures including formal security program, entry control, personnel identification, and miscellaneous restrictions.

1.2 SECURITY PROGRAM

A. Protect Work, existing premises and Owner's operations from theft, vandalism, and unauthorized entry.
B. Initiate program at project mobilization.
C. Maintain program throughout construction period until Owner occupancy.

1.3 ENTRY CONTROL

A. Restrict entrance of persons and vehicles into Project site and existing facilities.
B. Allow entrance only to authorized persons with proper identification.
C. Maintain log of workers and visitors, make available to Owner on request.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 013553

SECTION 014000

QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. References and standards.

B. Quality assurance submittals.

C. Mock-ups.

D. Control of installation.

E. Tolerances.

F. Testing and inspection services.

G. Manufacturer’s field services.

1.2 REFERENCE STANDARDS

A. ASTM D3740 - Standard Practice for Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.

B. ASTM E329 - Standard Specification for Agencies Engaged Construction Inspection and/or Testing.

1.3 SUBMITTALS

A. Testing Agency Qualifications:
   1. Prior to start of Work, submit agency name, address, and telephone number, and names of full-time specialist and responsible officer.
   2. Submit copy of report of laboratory facilities inspection made by NIST Construction Materials Reference Laboratory during most recent inspection, with memorandum of remedies of any deficiencies reported by the inspection.

B. Schedule of Tests and Inspections: Prepare in tabular form, within 30 days following mobilization, and include the following:
   1. Specification section number and title.
   2. Description of test and inspection.
   3. Identification of applicable standards.
   4. Identification of test and inspection methods.
   5. Number of tests and inspections required.
   6. Time schedule or time span for tests and inspections.
   7. Entity responsible for performing tests and inspections.
   8. Requirements for obtaining samples.
   9. Unique characteristics of each quality-control service.

C. Design Data: Submit for Architect's knowledge as contract administrator for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents, or for Owner's information.

D. Test Reports: After each test/inspection, promptly submit two copies of report to Architect and to Construction Manager.
   1. Include:

a. Date issued.
b. Project title and number.
c. Name of inspector.
d. Date and time of sampling or inspection.
e. Identification of product and specifications section.
f. Location of the Project.
g. Type of test/inspection.
h. Date of test/inspection.
i. Results of test/inspection.
j. Conformance with Contract Documents.
k. When requested by Construction Manager or Architect, provide interpretation of results.

2. Test report submittals are for Construction Manager’s and Architect's knowledge as contract administrators for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents, or for Owner's information.

E. Certificates: When specified in individual specification sections, submit certification by the manufacturer and Contractor or installation/application subcontractor to Architect, in quantities specified for Product Data.
1. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
2. Certificates may be recent or previous test results on material or product but must be acceptable to Architect.

F. Manufacturer's Instructions: When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, for the Construction Manager’s and Owner's information. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.

G. Manufacturer's Field Reports: Submit reports for Construction Manager's benefit as contract administrator or for Owner.
1. Submit report in duplicate within 30 days of observation to Construction Manager and Architect for information.
2. Submit for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.

1.4 REFERENCES AND STANDARDS

A. For products and workmanship specified by reference to a document or documents not included in the Project Manual, also referred to as reference standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.

B. Conform to reference standard of date of issue current on date of Contract Documents, except where a specific date is established by applicable code.

C. Obtain copies of standards where required by product specification sections.

D. Maintain copy at project site during submittals, planning, and progress of the specific work, until Substantial Completion.

E. Should specified reference standards conflict with Contract Documents, request clarification from Architect before proceeding.

F. Neither the contractual relationships, duties, nor responsibilities of the parties in Contract nor those of Architect shall be altered from the Contract Documents by mention or inference otherwise in any reference document.

1.5 TESTING AND INSPECTION AGENCIES

A. As indicated in individual specification sections, Owner, Construction Manager or Contractor shall employ and pay for services of an independent testing agency to perform specified testing.
   1. The individual specification section must clearly state that testing is the Owner's or Construction Manager’s responsibility, otherwise the testing to be executed by Contractor.
   2. Construction Manager to submit a mutually acceptable quality control program.

B. Employment of agency in no way relieves Contractor of obligation to perform Work in accordance with requirements of Contract Documents.

C. Contractor Employed Agency:
   1. Testing agency: Comply with requirements of ASTM E 329.
   2. Inspection agency: Comply with requirements of ASTM D3740 and ASTM E329.
   3. Laboratory: Authorized to operate in the State of Maryland.

1.6 CONFLICTING REQUIREMENTS

A. Conflicting Standards and Other Requirements: If compliance with two or more standards or requirements are specified and the standards or requirements establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer conflicting requirements that are different, but apparently equal, to Architect for direction before proceeding.

B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 CONTROL OF INSTALLATION

A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality.

B. Comply with manufacturers' instructions, including each step in the sequence of the work.

C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect before proceeding.

D. Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

E. Have Work performed by persons qualified to produce required and specified quality.

F. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.

G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, and disfigurement.

3.2 MOCK-UPS

A. Tests will be performed under provisions identified in this section and identified in the respective product specification sections.

B. Assemble and erect specified items with specified attachment and anchorage devices, flashings, seals, and finishes.

C. Accepted mock-ups shall be a comparison standard for the remaining Work.

D. Where mock-up has been accepted by Construction Manager and Architect and is specified in product specification sections to be removed, remove mock-up and clear area when directed to do so.

E. In-place mockup: Before proceeding with all windows, doors and curtain walls installation, provide an sample installation of one curtain wall type, including associated louvers. Invite Architect, Owner and manufacturer`s technical representative at following construction stages:

1. At prepared rough opening, before installation of new products
2. At installation of all new products before glazing and perimeter sealants
3. At completed installation

At completion of the sample installation perform ASTM E1105 Procedure B test in the area of min two consecutive floors. Air Pressure Differential:

1. Curtain walls: 12psf.
2. Doors: specified door performance requirements.

In case of failure adjust the installation and repeat the test. Contractor shall note all installation steps and details and follow the exact same procedure for each curtain wall and storefront.

Design requirements in the details are minimal and shall be enhanced as needed for passing the test. After completion of the installation of all units, perform one additional ASTM E1105-B test at a curtain wall selected by the owner.

3.3 TOLERANCES

A. Monitor fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.

B. Comply with manufacturers' tolerances. Should manufacturers' tolerances conflict with Contract Documents, request clarification from Architect before proceeding.

C. Adjust products to appropriate dimensions; position before securing products in place.

3.4 TESTING AND INSPECTION

A. Testing Agency Duties:
1. Provide qualified personnel at site. Cooperate with Construction Manager, Architect and Contractor in performance of services.
2. Perform specified sampling and testing of products in accordance with specified standards.
3. Ascertain compliance of materials and mixes with requirements of Contract Documents.
4. Promptly notify Construction Manager, Architect and Contractor of observed irregularities or non-conformance of Work or products.
5. Perform additional tests and inspections required by Construction Manager and Architect.

6. Submit reports of all tests/inspections specified.

B. Limits on Testing/Inspection Agency Authority:
   1. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.
   2. Agency may not approve or accept any portion of the Work.
   3. Agency may not assume any duties of Contractor.
   4. Agency has no authority to stop the Work.

C. Contractor Responsibilities:
   1. Deliver to agency at designated location, adequate samples of materials proposed to be used that require testing, along with proposed mix designs.
   2. Cooperate with laboratory personnel and provide access to the Work and to manufacturers' facilities.
   3. Provide incidental labor and facilities:
      a. To provide access to Work to be tested/inspected.
      b. To obtain and handle samples at the site or at source of Products to be tested/inspected.
      c. To facilitate tests/inspections.
      d. To provide storage and curing of test samples.
   4. Notify Construction Manager, Architect and laboratory 24 hours prior to expected time for operations requiring testing/inspection services.
   5. Employ services of an independent qualified testing laboratory and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
   6. Arrange with Owner's agency and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.

D. Re-testing required because of non-conformance to specified requirements shall be performed by the same agency on instructions by Architect.

E. Re-testing required because of non-conformance to specified requirements shall be paid for by Contractor.

3.5 MANUFACTURERS' FIELD SERVICES

A. When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, test, adjust and balance of equipment as applicable, and to initiate instructions when necessary.

B. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

3.6 DEFECT ASSESSMENT

A. Replace Work or portions of the Work not conforming to specified requirements.

B. If, in the opinion of Architect, it is not practical to remove and replace the Work, Architect will direct an appropriate remedy or adjust payment.

3.7 REPAIR AND PROTECTION

A. General: On completion of testing, inspection, sample taking, and similar services, repair damaged construction and restore substrates and finishes.

   1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Section 017300 "Execution."

B. Protect construction exposed by or for quality-control service activities.

C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION 014000

SECTION 015000

TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Temporary telecommunications services.

B. Temporary telephone service.

C. Temporary sanitary facilities.

D. Temporary Controls: Barriers, enclosures, and fencing.

E. Security requirements.

1.2 RELATED REQUIREMENTS

A. Section 015500 - Vehicular Access and Parking.

B. Section 013553 - Security Procedures.

C. Section 016116 - Volatile Organic Compound (VOC) Content Restrictions.

1.3 TELECOMMUNICATIONS SERVICES

A. Provide, maintain, and pay for telecommunications services to field office at time of project mobilization.

B. Telecommunications services shall include:
1. Windows-based personal computer dedicated to project telecommunications, with necessary software and laser printer.
2. Telephone Land Lines: One line, minimum; one handset per line.
3. Internet Connections: Minimum of one; 3G(minimum) WiFi access equipment or faster.
4. Email: Account/address reserved for project use.
5. Facsimile Service: Minimum of one dedicated fax machine/printer, with dedicated phone line.

1.4 TEMPORARY SANITARY FACILITIES

A. Provide and maintain required facilities and enclosures. Provide at time of project mobilization.

B. Maintain daily clean and sanitary condition.

1.5 BARRIERS

A. Provide barriers to prevent unauthorized entry to construction areas, to prevent access to areas that could be hazardous to workers or the public, to allow for owner's use of site and to protect existing facilities and adjacent properties from damage from construction operations and demolition.

B. Provide barricades and covered walkways required by governing authorities for public rights-of-way and for public access to existing building.

C. Provide protection for plants designated to remain. Replace damaged plants.

D. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.

1.6 FENCING

A. Provide 8 foot high fence around construction site; equip with vehicular and pedestrian gates with locks.

1.7 EXTERIOR ENCLOSURES

A. Provide temporary insulated weather tight closure of exterior openings to accommodate acceptable working conditions and protection for Products, to allow for temporary heating and maintenance of required ambient temperatures identified in individual specification sections, and to prevent entry of unauthorized persons. Provide access doors with self-closing hardware and locks.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 015000

SECTION 015100

TEMPORARY UTILITIES

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Temporary Utilities: Electricity, lighting, heat, ventilation, and water.

1.2 RELATED REQUIREMENTS

A. Section 015000 - Temporary Facilities and Controls: Telephone service for administrative purposes.

1.3 TEMPORARY ELECTRICITY

A. Cost: By Contractor.

B. Provide power service required from utility source.

C. Provide power outlets for construction operations, with branch wiring and distribution boxes locate at each floor. Provide flexible power cords as required.

D. Provide main service disconnect and over-current protection at convenient location and meter.

E. Permanent convenience receptacles may be utilized during construction.

F. Provide adequate distribution equipment, wiring, and outlets to provide single phase branch circuits for power and lighting.

1.4 TEMPORARY LIGHTING FOR CONSTRUCTION PURPOSES

A. Provide and maintain incandescent lighting for construction operations to achieve a minimum lighting level of 2 watt/sq ft.

B. Provide branch wiring from power source to distribution boxes with lighting conductors, pigtails, and lamps as required.

C. Maintain lighting and provide routine repairs.

1.5 TEMPORARY HEATING

A. Cost of Energy: By Contractor.

B. Provide heating devices and heat as needed to maintain specified conditions for construction operations.

C. Maintain minimum ambient temperature of 50 degrees F in areas where construction is in progress, unless indicated otherwise in specifications.

D. Prior to operation of permanent equipment for temporary heating purposes, verify that installation is approved for operation, equipment is lubricated, and filters are in place. Provide and pay for operation, maintenance, and regular replacement of filters and worn or consumed parts.

E. For all projects including systemic projects, heat must be available from October 15 to April 15. If project construction schedule has building heat off during this time, Contractor must provide temporary heat solution.

1.6 TEMPORARY COOLING

A. Cost of Energy: By Contractor.

B. Provide cooling devices and cooling as needed to maintain specified conditions for construction operations.

C. Maintain maximum ambient temperature of 80 degrees F in areas where construction is in progress, unless indicated otherwise in specifications.

D. Prior to operation of permanent equipment for temporary cooling purposes, verify that installation is approved for operation, equipment is lubricated, and filters are in place. Provide and pay for operation, maintenance, and regular replacement of filters and worn or consumed parts.

E. For all projects including systemic projects, if the building had air conditioning, AC must be available from October 15 to April 15. If project construction schedule has building AC off during this time, Contractor must provide temporary AC solution.

1.7 EMPORARY VENTILATION

1.8 TEMPORARY WATER SERVICE

A. Cost of Water Used: By Contractor.

B. Provide and maintain suitable quality water service for construction operations at time of project mobilization.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 015100

SECTION 015500

VEHICULAR ACCESS AND PARKING

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Driveways, entrance, and traffic routes.

B. Parking.

C. Existing pavements and parking areas.

D. Permanent pavements and parking facilities.

E. Construction parking controls.

F. Traffic signs and signals.

G. Maintenance.

H. Removal, repair.

I. Mud from site vehicles.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 DRIVEWAYS, ENTRANCE AND TRAFFIC ROUTES

A. Keep driveways and entrances serving premises and site surrounding Project clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials. Provide continuous monitoring of site.
   1. Schedule deliveries to minimize use of driveways and entrances.
   2. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.

B. Truck deliveries shall be scheduled so that the streets adjacent to the site do not back up with delivery trucks waiting to deliver materials. Trucks must be scheduled accordingly, or wait to unload inside the fence in the project site or off the Owner's property.

3.2 PARKING

A. Use of existing parking facilities by construction personnel is not permitted.

B. Do not allow heavy vehicles or construction equipment in parking areas.

C. Arrange for temporary parking areas to accommodate use of construction personnel.

D. When site space is not adequate, provide additional off-site parking.

E. Locate as approved by Architect.

3.3 CONSTRUCTION PARKING CONTROL

A. Control vehicular parking to prevent interference with public traffic and parking, access by emergency vehicles, and Owner's operations.

B. Monitor parking of construction personnel's vehicles. Maintain vehicular access to and through parking areas.

C. Prevent parking on or adjacent to access roads or in non-designated areas.

3.4 HAUL ROUTES

A. Consult with authority having jurisdiction, establish public thoroughfares to be used for haul routes and site access.

B. Confine construction traffic to designated haul routes.

C. Provide traffic control at critical areas of haul routes to regulate traffic, to minimize interference with public traffic.

3.5 TRAFFIC SIGNS AND SIGNALS

A. At approaches to site and on site, install at crossroads, detours, parking areas, and elsewhere as needed to direct construction and affected public traffic.

B. Install and operate traffic control signals to direct and maintain orderly flow of traffic in areas under Contractor's control, and areas affected by Contractor's operations.

C. Relocate as Work progresses, to maintain effective traffic control.

3.6 MAINTENANCE

A. Maintain traffic and parking areas in a sound condition free of excavated material, construction equipment, Products, mud, snow, and ice.

B. Maintain existing paved areas used for construction; promptly repair breaks, potholes, low areas, standing water, and other deficiencies, to maintain paving and drainage in original, or specified, condition.

3.7 REMOVAL, REPAIR

A. Repair existing and new permanent facilities damaged by use, to original condition.

B. Remove equipment and devices when no longer required.

C. Repair damage caused by installation.

3.8 MUD FROM SITE VEHICLES

A. Provide means of removing and remove mud from vehicle wheels before entering streets.

END OF SECTION 015500

SECTION 015721

INDOOR AIR QUALITY CONTROLS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Construction procedures to promote adequate indoor air quality during and after construction.

B. Building flush-out after construction and before occupancy.

C. Testing indoor air quality after completion of construction.

1.2 PROJECT GOALS

A. Dust and Airborne Particulates: Prevent deposition of dust and other particulates in HVAC ducts and equipment.
   1. Clean ductwork as indicated in the drawings. Further cleaning of ductwork is not contemplated under this Contract, unless in case of contractor`s failure to properly protect existing HVAC system.
   2. Contractor shall bear the cost of cleaning required due to failure to protect ducts and equipment from construction dust.

B. Airborne Contaminants: Procedures and products have been specified to minimize indoor air pollutants.
   1. Furnish products meeting the specifications.
   2. Avoid construction practices that could result in contamination of installed products leading to indoor air pollution.

C. Ventilation: HVAC system has been designed to achieve the minimum requirements for ventilation specified in ASHRAE 62.1.

1.3 REFERENCE STANDARDS

A. ASHRAE Std 62.1 - Ventilation For Acceptable Indoor Air Quality.

B. SMACNA (OCC) - IAQ Guideline for Occupied Buildings Under Construction.

1.4 DEFINITIONS

A. Adsorptive Materials: Gypsum board, acoustical ceiling tile and panels, carpet and carpet tile, fabrics, fibrous insulation, and other similar products.

B. Contaminants: Gases, vapors, regulated pollutants, airborne mold and mildew, and the like, as specified.

C. Particulates: Dust, dirt, and other airborne solid matter.

D. Wet Work: Concrete, plaster, coatings, and other products that emit water vapor or volatile organic compounds during installation, drying, or curing.

E. Ventilation: The process of supplying and removing air to and from interior spaces by natural or mechanical means.

F. Volatile Organic Compound (VOC): Carbon compounds that participate in atmospheric photochemical reactions, (excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides and carbonates, and ammonium carbonate); the compounds vaporize (become a gas) at normal room temperatures.

1.5 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.

B. Indoor Air Quality Management Plan: Describe in detail measures to be taken to promote adequate indoor air quality upon completion; use SMACNA IAQ Guidelines for Occupied Buildings Under Construction as a guide.
   1. Submit not less than 60 days before enclosure of building.
   2. Identify potential sources of odor and dust.
   3. Identify construction activities likely to produce odor or dust.
   4. Identify areas of project potentially affected, especially occupied areas.
   5. Evaluate potential problems by severity and describe methods of control.
   6. Describe construction ventilation to be provided, including type and duration of ventilation, use of permanent HVAC systems, types of filters and schedule for replacement of filters.
   7. Describe cleaning and dust control procedures.
   8. Describe coordination with commissioning procedures.

C. Duct and Terminal Unit Inspection Report.

D. Air Contaminant Test Plan: Identify:
   1. Testing agency qualifications.
   2. Locations and scheduling of air sampling.
   3. Test procedures, in detail.
   4. Test instruments and apparatus.
   5. Sampling methods.

E. Air Contaminant Test Reports: Show:
   1. Location where each sample was taken, and time.
   2. Test values for each air sample; average the values of each set of 3.
   3. HVAC operating conditions.
   4. Certification of test equipment calibration.
   5. Other conditions or discrepancies that might have influenced results.

1.6 SCHEDULING

A. Coordinate construction activities to minimize or eliminate disruption of operations in occupied portions of building.

B. Schedule for storage, installation, and protection of all components of air distribution systems.

C. Schedule for storage, installation, and protect of absorptive materials (woven, fibrous or porous in nature, such as carpet, ceiling tiles, insulation, and fabrics) from exposure to emissions during and after installation from materials and finishes with potential for short-term release of off-gassing volatile organic compounds.
   1. Highlight critical methods used to protect absorptive materials from airborne pollutants such as: dust, debris, moisture, gaseous and microbial contamination.

2. Sequence installation of absorptive materials after odor-emitting activities have occurred and have been mitigated by ventilation.

D. Do not store absorptive materials on-site if protection measures as described above cannot be ensured.

E. Avoid building occupancy while construction related pollutants are present.

F. Ensure proper and complete curing of concrete before covering.

G. Contractor to include in the Construction Schedule a separate line item for IAQ testing. Timing and duration for this activity should be scheduled as required to satisfy Compliance Path 1 Flush Out, Compliance Path 2 Baseline or as directed by the Owner.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Low VOC Materials: See other sections for specific requirements for materials with low VOC content.

B. Auxiliary Air Filters:
1. MERV of 13, minimum, when tested in accordance with ASHRAE 52.2, during construction.
2. MERV of 13, minimum, when tested in accordance with ASHRAE 52.2, installed prior to occupancy.

PART 3 - EXECUTION

3.1 CONSTRUCTION PROCEDURES

A. Prevent the absorption of moisture and humidity by adsorptive materials by:
1. Sequencing the delivery of such materials so that they are not present in the building until wet work is completed and dry.
2. Delivery and storage of such materials in fully sealed moisture-impermeable packaging.
3. Provide sufficient ventilation for drying within reasonable time frame.

B. Begin construction ventilation when building is substantially enclosed.

C. HVAC system shall be kept clean, free of dust, debris, moisture, gaseous and microbial contamination during storage, handling, installation and punch-out. Inspect all air inlets, air outlets, grilles, diffusers, plenums, and ducts upon completion of Work.
1. Cover and protect (taped plastic or similar method) all exposed air inlet and outlet openings, grilles, ducts, plenums, to prevent water, moisture, dust and other contaminate intrusion.
2. Apply protection immediately after installation of equipment and ducting.
3. Ducting runs that require more than a single day to install shall be protected at end of each day's Work.
4. Leaks in return ducts and air handlers shall be checked and repaired.
5. Inspect filtration monthly and replace as needed with new media throughout the HVAC system; filtration media shall be minimum MERV 13.
6. After final phase of construction, install new filtration media throughout the HVAC system; filtration media shall be minimum MERV 13.
7. Cleaning of ductwork is not part of this contract; however, Contractor shall bear cost of cleaning required by Owner due to failure of Contractor to protect ducts and equipment from construction pollutants as specified.

D. HVAC equipment and ductwork may NOT be used for ventilation during construction:
   1. Provide temporary ventilation equivalent to 1.5 air changes per hour, minimum.
   2. Exhaust directly to outside.
   3. Seal HVAC air inlets and outlets immediately after duct installation.

E. Do not store construction materials or waste in mechanical or electrical rooms.

F. Provide direct exhaust to the exterior during installation of strong emitting materials, including touch-up activities; keep exhaust away from intakes and occupied spaces.

G. Provide adequate ventilation of packaged dry products prior to installations. Remove from package and place in a secure, dry, well-ventilated space, free from contaminant sources and residues. Provide a temperature range of 60 degrees F minimum to 90 degree maximum continuously during ventilations period. Do not ventilate within limits of Work unless otherwise approved by Architect.

H. "Bake-out" or "super-heating" of spaces to accelerate the release of gaseous emissions is not permitted.

I. Prohibit smoking and use of fossil-fueled temporary heating units inside the building and near building entrances, windows and intakes and within 25 feet of building entrances.

J. Prior to use of return air ductwork without intake filters clean up and remove dust and debris generated by construction activities.
   1. Inspect duct intakes, return air grilles, and terminal units for dust.
   2. Clean plenum spaces, including top sides of lay-in ceilings, outsides of ducts, tops of pipes and conduit.
   3. Clean tops of doors and frames.
   4. Clean mechanical and electrical rooms, including tops of pipes, ducts, and conduit, equipment, and supports.
   5. Clean return plenums of air handling units.
   6. Remove intake filters last, after cleaning is complete.

K. Use integrated pest management practices unless otherwise directed.

L. Remove spills or excess application of solvent-containing products as soon as possible. Use low-emitting cleaning agents, giving preference to Green Seal products.

M. Keep work areas as dry as possible; replace any absorptive (dry sink) material that is exposed to moisture.

N. Use other relevant recommendations of SMACNA IAQ Guideline for Occupied Buildings Under Construction for avoiding unnecessary contamination due to construction procedures.

3.2 PATHWAY INTERUPTION

A. Provide negative pressurization of spaces under construction and/or demolition and positive pressurization of occupied or finished spaces while construction work proceeds in adjacent areas.

B. Relocate pollutant sources when project equipment or staging areas coincide with critical air flow pathways and place plastic barriers to contain construction areas.

C. Temporarily seal building, including air intakes and exhaust vents, and any other building openings, when dust-generating or strong-emitting construction products or procedures are used on the exterior of the building.

D. Once spaces within building become occupied, work areas must remain under negative pressure. Exhaust air at a rate at least 10% greater than the rate of supply. Do not exhaust air where it can be drawn back into occupied spaces and place a continuous plastic barrier creating a seal between construction areas and occupied spaces.

3.3 INDOOR AIR QUALITY MANAGEMENT - PRIOR TO OCCUPANCY

A. Provide Air Contaminant Testing, if testing fails, provide Building Flush-Out.

3.4 BUILDING FLUSH-OUT

A. Perform building flush-out before occupancy, with all interior finishes installed and new filtration media in place.

B. Do not start flush-out until:
   1. All construction is complete.
   2. HVAC systems have been tested, adjusted, and balanced for proper operation.
   3. Inspection of inside of return air ducts and terminal units confirms that cleaning is not necessary.
   4. New HVAC filtration media have been installed.

C. Building Flush-Out: Operate all ventilation systems at normal flow rates with 100 percent outside air until a total air volume of 14,000 cubic feet per square foot of floor area has been supplied.
   1. Obtain Owner's concurrence that construction is complete enough before beginning flush-out.
   2. Maintain interior temperature of at least 60 degrees F and interior relative humidity no higher than 60 percent.
   3. If additional construction involving materials that produce particulates or any of the specified contaminants is conducted during flush-out, start flush-out over.
   4. Space may be occupied following delivery of a minimum of 3,500 cubic feet of outside air per square feet of floor area to space, until the total of 14,000 cubic feet per square foot of outside air has been delivered to the space, and:
      a. Begin ventilation at least three hours prior to daily occupancy.
      b. Continue ventilation during all occupied periods.
      c. Provide minimum outside air volume of 0.30 cfm per square foot or design minimum outside air rate, whichever is greater.
   5. Do not start flush-out in any area until:
      a. All construction is complete.
      b. HVAC systems have been tested, adjusted, and balanced for proper operation.
      c. Inspection of inside of return air ducts and terminal units confirms that cleaning is not necessary. New HVAC filtration media have been installed.

D. Install new HVAC filtration media after completion of flush-out and before occupancy or further testing.

3.5 AIR CONTAMINANT TESTING

A. Perform air contaminant testing before occupancy.

B. Do not start air contaminant testing until:
   1. All construction is complete, including interior finishes.
   2. HVAC systems have been tested, adjusted, and balanced for proper operation.
   3. Cleaning of inside of HVAC ductwork, specified elsewhere, has been completed.
   4. New HVAC filtration media have been installed.

C. Use testing protocols consistent with US EPA “Compendium of Methods for the Determination of Air Pollutants in Indoor Air” and as additionally detailed in the LEED-S Reference Guide; provide the services of a qualified Indoor Air Quality Testing Services Firm.
1. Support the Indoor Air Quality Testing Services Firm by coordinating scheduling of required testing and providing services during IAQ remediation if necessary.

D. Indoor Air Samples: Collect from spaces representative of occupied areas:
   1. Collect samples while operable windows and exterior doors are closed, HVAC system is running normally as if occupied, with design minimum outdoor air, but with the building unoccupied.
   2. Collect samples from spaces in each contiguous floor area in each air handler zone, but not less than one sample per 25,000 square feet; take samples from areas having the least ventilation and those having the greatest presumed source strength.
   3. Collect samples from height from 36 inches to 72 inches above floor.
   4. Collect samples from same locations on 3 consecutive days during normal business hours; average the results of each set of 3 samples.
   5. Exception: Areas with normal very high outside air ventilation rates, such as laboratories, do not need to be tested.
   6. For each sampling point where maximum concentration limits are exceeded conduct flush-out with outside air and retest the specific parameter(s) that were exceeded to indicate the requirements are achieved; repeat procedure until all requirements have been met.
   7. When retesting the same building areas, take samples from at least the same locations as in first test.

E. Outdoor Air Samples: Collect samples at outside air intake of each air handler at the same time as indoor samples are taken.

F. Analyze air samples and submit report.

G. Air Contaminant Concentration Determination and Limits:
   1. Carbon Monoxide: Not more than 9 parts per million and not more than 2 parts per million higher than outdoor air.
   2. Airborne Mold and Mildew: Measure in relation to outside air; not higher than outside air.
   3. Formaldehyde: Not more than 50 parts per billion.
   4. Formaldehyde: Measure in micrograms per cubic meter, in relation to outside air; not more than 20 micrograms per cubic meter higher than outside air.
   5. Total Volatile Organic Compounds (TVOC): Not more than 500 micrograms per cubic meter.
   6. Total Volatile Organic Compounds (TVOC): Measure in micrograms per cubic meter, in relation to outside air; not more than 200 micrograms per cubic meter higher than outside air.
   7. Particulates (PM10): Not more than 50 micrograms per cubic meter.
   8. Total Particulates (PM): Measure in micrograms per cubic meter, in relation to outside air; not more than 20 micrograms per cubic meter higher than outside air.

END OF SECTION 015721

SECTION 016000

PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. General product requirements.

B. Re-use of existing products.

C. Transportation, handling, storage and protection.

D. Product option requirements.

E. Substitution limitations and procedures.

F. Procedures for Owner-supplied products.

G. Maintenance materials, including extra materials, spare parts, tools, and software.

1.2 SUBMITTALS

A. Proposed Products List: Submit list of major products proposed for use, with name of manufacturer, trade name, and model number of each product.
   1. Submit within 45 days after date of Agreement.
   2. For products specified only by reference standards, list applicable reference standards.

B. Product Data Submittals: Submit manufacturer's standard published data. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.

C. Shop Drawing Submittals: Prepared specifically for this Project; indicate utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

D. Sample Submittals: Illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
   1. For selection from standard finishes, submit samples of the full range of the manufacturer's standard colors, textures, and patterns.

PART 2 - PRODUCTS

2.1 EXISTING PRODUCTS

A. Do not use materials and equipment removed from existing premises unless specifically required or permitted by the Contract Documents.

B. Unforeseen historic items encountered remain the property of the Owner; notify Construction Manager and Owner promptly upon discovery; protect, remove, handle, and store as directed by Construction Manager and Owner.

C. Existing materials and equipment indicated to be removed, but not to be re-used, relocated, reinstalled, delivered to the Owner, or otherwise indicated as to remain the property of the Owner, become the property of the Contractor.

D. Reused Products: Reused products include materials and equipment previously used in this or other construction, salvaged and refurbished as specified.

2.2 NEW PRODUCTS

A. Provide new products unless specifically required or permitted by the Contract Documents.

B. Where all other criteria are met, Contractor shall give preference to products that:
   1. Are extracted, harvested, and/or manufactured closer to the location of the project.
   2. Have longer documented life span under normal use.
   3. Result in less construction waste.
   4. Are made of vegetable materials that are rapidly renewable.

C. Sustainably Harvested Wood:
   1. Definition: Wood-based materials include but are not limited to structural framing, dimension lumber, flooring, wood doors, finishes, and furnishings that are permanently installed in the project. Wood and wood-based products not permanently installed in the project are not included in the definition.
   2. Overall Project Requirement: Provide a minimum of 50 percent of all wood-based materials made of sustainably harvested wood.
   3. Specific Wood-Based Fabrications: Fabricate of sustainably harvested wood when so specified elsewhere.
   4. Certification: Provide wood certified or labeled by an organization accredited by one of the following:
      a. The Forest Stewardship Council, The Principles for Natural Forest Management; for Canada visit http://www.fsccanada.org, for the USA visit http://www.fscus.org.

D. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.

E. General Product Requirements: Provide products that comply with the Contract Documents, that are undamaged and, unless otherwise indicated, that are new at time of installation.
   1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
   2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
   3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
   4. Where products are accompanied by the term "as selected," Architect will make selection.
   5. Where products are accompanied by the term "match sample," sample to be matched is Architect's.
   6. Descriptive, performance, and reference standard requirements in the Specifications establish "salient characteristics" of products.

F. Basis-of-Design Product Specification: Where a specific manufacturer's product is named and accompanied by the words "basis of design," including make or model number or other designation, to

establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of other named manufacturers.

G. Materials shall be harvested and/or extracted, and products and/or assemblies shall be manufactured, according to the laws and regulations of the country of origin. Wood products in the project, other than recovered or reused wood, shall not contain wood from endangered wood species unless the trade of such wood conforms with the requirements of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

2.3 PRODUCT OPTIONS

A. Products Specified by Reference Standards or by Description Only: Use any product meeting those standards or description.

B. Products of Named Manufacturers: Contractor to provide products from named manufacturers; refer to other provisions regarding substitutions.

C. Or Equal Product: Product that is demonstrated and approved through submittal process, as a product substitution, to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.

D. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.

2.4 MAINTENANCE MATERIALS

A. Furnish extra materials, spare parts, tools, and software of types and in quantities specified in individual specification sections.

B. Deliver to Project site; obtain receipt prior to final payment.

PART 3 - EXECUTION

3.1 SUBSTITUTION PROCEDURES

A. Instructions to Bidders specify time restrictions for submitting requests for substitutions during the bidding period. Comply with requirements specified in this section.

B. Timing: Architect will not consider requests for substitution after defined time period, except for extenuating circumstances described below; requests may be considered or rejected at discretion of Architect.
   1. The specification permits "Or Equal."
   2. The product is no longer manufactured.
   3. The product is not available due to a strike.
   4. The specified product is identified as incompatible or inappropriate for the project.
   5. The specified item fails to comply with building code requirements.
   6. The manufacturer or fabricator declares a specified product to be unsuitable for the use intended and refuses to warrant its installation.
   7. Significant cost savings to the Owner.

C. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents.
   1. Statement indicating why specified material or product cannot be provided.
   2. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by Owner and separate contractors, that will be necessary to accommodate proposed substitution.
   3. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
   4. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
   5. Samples, where applicable or requested.
   6. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.
   7. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
   8. Research/evaluation reports evidencing compliance with building code in effect for Project, from a model code organization acceptable to authorities having jurisdiction.
   9. Detailed comparison of Contractor's Construction Schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating lack of availability or delays in delivery.
   10. Cost information, including a proposal of change, if any, in the Contract Sum.
   11. Contractor's certification that proposed substitution complies with requirements in the Contract Documents and is appropriate for applications indicated.
   12. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.

D. A request for substitution constitutes a representation that the submitter:
   1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product.
   2. Will provide the same warranty for the substitution as for the specified product.
   3. Will coordinate installation and make changes to other Work that may be required for the Work to be complete with no additional cost to Owner.
   4. Waives claims for additional costs or time extension that may subsequently become apparent.
   5. Will reimburse Owner and Architect for review or redesign services associated with re-approvalby authorities.

E. Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals, without separate written request, or when acceptance will require revision to the Contract Documents.

F. Substitution Submittal Procedure:
   1. Substitution Request Form: Use CSI Form 13.1A.
   2. Submit three copies of request for substitution for consideration. Limit each request to one proposed substitution.
   3. Submit shop drawings, product data, and certified test results attesting to the proposed product equivalence. Burden of proof is on proposer.
   4. Architect will consider Contractor's request for substitution when the following conditions are met. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:
      a. Substitution requested must meet or exceed specified material, product or equipment items appearance, function and quality level as determined by the Architect and Owner.

b. Requests for substitution must include clear identification of the material, product or equipment item and complete description including drawings, cuts, performance and test data, along with any other information necessary for a complete evaluation.
c. Requested substitution shall not require extensive revisions to the Contract Documents or changes to any other materials, products or equipment items.
d. Requested substitution is consistent with the Contract Documents and will produce indicated results.
e. Substitution request is fully documented and properly submitted.
f. Requested substitution will not adversely affect Contractor's Construction Schedule.
g. Requested substitution has received necessary approvals of authorities having jurisdiction.
h. Requested substitution is compatible with other portions of the Work.
i. Requested substitution provides specified warranty.
j. Requested substitution will not delay the Work.
k. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

1. The Architect's/Owner's decision to accept or reject the proposed substitution shall be final and will be set forth in writing.

G. Architect's Action: If necessary, Architect will request additional information or documentation For evaluation within 7 days of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within 15 days of receipt of request, or 7 days of receipt of additional information or documentation, whichever is later. Architect's notification will be in one the following forms:
1. Form of Acceptance:
a. After Contract signing: Change Order.
2. Use product specified if Architect cannot decide on use of a proposed substitution within time allocated.

3.2 OWNER-SUPPLIED PRODUCTS

A. Owner's / Construction Manager’s Responsibilities:
1. Arrange for and deliver Owner reviewed shop drawings, product data, and samples, to Contractor.
2. Arrange and pay for product delivery to site.
3. On delivery, inspect products jointly with Contractor.
4. Submit claims for transportation damage and replace damaged, defective, or deficient items.
5. Arrange for manufacturers' warranties, inspections, and service.

B. Contractor's Responsibilities:
1. Review Owner reviewed shop drawings, product data, and samples.
2. Receive and unload products at site; inspect for completeness or damage jointly with Owner.
3. Handle, store, install and finish products.
4. Repair or replace items damaged after receipt.

3.3 TRANSPORTATION AND HANDLING

A. Coordinate schedule of product delivery to designated prepared areas to minimize site storage time and potential damage to stored materials.

B. Transport and handle products in accordance with manufacturer's instructions.

C. Transport materials in covered trucks to prevent contamination of product and littering of surrounding areas.

D. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.

E. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage.

F. Arrange for the return of packing materials, such as wood pallets, where economically feasible.

3.4 STORAGE AND PROTECTION

A. Designate receiving/storage areas for incoming products so that they are delivered according to installation schedule and placed convenient to work area to minimize waste due to excessive materials handling and misapplication.

B. Store and protect products in accordance with manufacturers' instructions.

C. Store with seals and labels intact and legible.

D. Store sensitive products in weather tight, climate controlled, enclosures in an environment favorable to product.

E. For exterior storage of fabricated products, place on sloped supports above ground.

F. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.

G. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.

H. Prevent contact with material that may cause corrosion, discoloration, or staining.

I. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.

J. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

END OF SECTION 016000

SECTION 016116

VOLATILE ORGANIC COMPOUND CONTENT RESTRICTIONS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Low-emitting restrictions for product categories listed below under "DEFINITIONS."

B. VOC-restricted products.

C. All products of each category that are installed in the project must comply; Owner's project goals do not allow for partial compliance.

1.2 DEFINITIONS

A. Low-Emitting Products: All products of each of the following categories when installed or applied on-site in the building interior:
   1. Adhesives, sealants, and sealer coatings.
   2. Paints and coatings.
   3. Insulation.
   4. Gypsum board.
   5. Acoustical ceilings and panels.
   6. Cabinet work.
   7. Wall coverings.
   8. Composite wood and agrifiber products used either alone or as part of another product.

B. Interior of Building: Within the building waterproofing envelope.

C. Adhesives: All gunnable, trowelable, liquid-applied, and aerosol adhesives, whether specified or not; including flooring adhesives, resilient base adhesives, and pipe jointing adhesives.

D. Sealants: All gunnable, trowelable, and liquid-applied joint sealants and sealant primers, whether specified or not; including firestopping sealants and duct joint sealers.

1.3 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.

B. Evidence of Compliance: Submit for each different product in each applicable category.

C. Product Data: For each VOC-restricted product used in the project, submit product data showing compliance, except when another type of evidence of compliance is required.
   1. Adhesives, sealants, paints and coatings: VOC content as measured in grams per Liter (g/L).
   2. Furniture and Furnishings (Classroom furniture including teacher desks, table and seats): Proof of GREENGUARD Children and Schools Certification.
      a. Alternate compliance “Method B”: Proof of procedure compliance based on the U.S. EPA's Environmental Technology Verification (ETV) Large Chamber Test Protocol for Measuring Emissions of VOCs and Aldehydes (September 1999) testing protocol conducted in an independent third party air quality testing laboratory.
      b. Alternate compliance “Method C”: Proof of procedure compliance based on BIFMA M7.1-2005 and X7.1-2005 testing protocol conducted in an independent third-party air quality testing laboratory.

3. Ceiling and Wall Systems (gypsum board, insulation, acoustical ceiling systems and wall coverings): Compliance with the California Department of Health Services Standard Practice for The Testing Of Volatile Organic Emissions From Various Sources Using Small-Scale Environmental Chambers, including 2004 Addenda or SCS or CHPS.

D. Installer Certifications for Accessory Materials: Require each installer of any type of product (not just the products for which VOC restrictions are specified) to certify that either 1) no adhesives, joint sealants, paints, coatings, or composite wood or agrifiber products have been used in the installation of his products, or 2) that such products used comply with these requirements.
   1. Use the form following this section for installer certifications.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Adhesives applied within the building waterproofing envelope shall comply with the current VOC Content limits, as expressed in grams per liter, of South Coast Air Quality Management District (SCAQMD) Rule 1168 "Adhesive and Sealant Applications," amended January 7, 2005, or more stringent levels, as follows:
   1. Indoor Carpet & Pad Adhesives: 50.
   2. Wood Flooring Adhesive: 100.
   3. Rubber Floor Adhesives: 60.
   4. Subfloor Adhesives: 50.
   5. Ceramic Tile Adhesives: 65.
   6. VCT and Asphalt Tile (& Linoleum) Adhesives: 50.
   7. Dry Wall and Panel Adhesives: 50.
   8. Cove Base Adhesives: 50.
   9. Multipurpose Construction Adhesives: 70.
   10. Structural Glazing Adhesives: 100.
   11. PVC Welding: 510.
   12. CPVC Welding: 490.
   13. ABS Welding: 325.
   14. Plastic Cement Welding: 250.
   15. Adhesive Primer for Plastic: 550.
   16. Contact Adhesive: 80.
   17. Special Purpose Contact Adhesive: 250.
   18. Structural Wood Member Adhesive: 140.
   19. Metal to metal substrates: 30.
   20. Plastic foam substrate: 50.
   21. Porous substrate except wood: 50.
   22. Wood substrate: 30.
   23. Fiberglass substrate: 80.
   24. All Other Welding & Installation Adhesives: 250.

B. Aerosol Adhesives applied within building waterproofing envelope shall comply with the VOC Content limits, as expressed in percentage of VOCs by weight, of Green Seal (GS) Standard GS-36 “Commercial Adhesives,” October 19, 2000 as follows:
   1. General Purpose Mist Spray: 65% VOCs by weight.
   2. General Purpose Web Spray: 55% VOCs by weight.
   3. Special Purpose Aerosol Adhesives (all types): 70% VOCs by weight.

C. Sealants applied within building waterproofing envelope shall comply with VOC Content limits, as expressed in grams per liter, less water and exempt compounds, of SCAQMD Rule 1168 “Adhesive and Sealant Applications,” amended January 7, 2005, as follows:
   1. Architectural Sealants: 250.

2. Non-membrane Roof: 300.
3. Single-Ply Roof Membrane: 450.
4. Other: 420.

D. Sealant primers applied within building waterproofing envelope shall comply with VOC Content limits, as expressed in grams per liter, less water and exempt compounds, of SCAQMD Rule 1168 “Adhesive and Sealant Applications,” amended January 7, 2005, as follows:
1. Architectural, Nonporous: 250.
2. Architectural, Porous: 775.
3. Other: 750.

E. Paints and Coatings:
1. Provide coatings that comply with the most stringent requirements specified in the following:
   a. 40 CFR 59, Subpart D--National Volatile Organic Compound Emission Standards for Architectural Coatings.
2. Credit EQ 4.2: VOC limits.
   a. Flat Paints, Coatings, and Primers: VOC not more than 50 g/L.
   b. Non-Flat Paints, Coatings, and Primers: VOC not more than 150 g/L.
   c. Anticorrosive and Antirust Paints Applied to Ferrous Metals: VOC not more than 250 g/L.
   d. Clear Wood Finishes, Varnishes: VOC not more than 350 g/L.
   e. Clear Wood Finishes, Lacquers: VOC not more than 550 g/L.
   f. Floor Coatings: VOC not more than 100 g/L.
   g. Shellacs, Clear: VOC not more than 730 g/L.
   h. Shellacs, Pigmented: VOC not more than 550 g/L.
   i. Stains: VOC not more than 250 g/L.
   j. Flat Interior Topcoat Paints: VOC not more than 50 g/L.
   k. Non-Flat Interior Topcoat Paints: VOC not more than 150 g/L.
   l. Anticorrosive and Antirust Paints Applied to Ferrous Metals: VOC not more than 250 g/L.
   m. Clear Wood Finishes, Varnishes and Sanding Sealers: VOC not more than 350 g/L.
   n. Clear Wood Finishes, Lacquers: VOC not more than 550 g/L.
   o. Primers, Sealers, and Undercoaters: VOC not more than 200 g/L.
   p. Dry-Fog Coatings: VOC not more than 400 g/L.
   q. Zinc-Rich Industrial Maintenance Primers: VOC not more than 340 g/L.
   r. Pretreatment Wash Primers: VOC not more than 420 g/L.
   s. Aromatic Compounds: Paints and coatings shall not contain more than 1.0 percent by weight total aromatic compounds (hydrocarbon compounds containing one or more benzene rings).
   t. Restricted Components: Paints and coatings shall not contain any of the following:
      1) Acrolein.
      2) Acrylonitrile.
      3) Antimony.
      4) Benzene.
      5) Butyl benzyl phthalate.
      6) Cadmium.
      7) Di (2-ethylhexyl) phthalate.
      8) Di-n-butyl phthalate.
      9) Di-n-octyl phthalate.
      10) 1,2-dichlorobenzene.
      11) Diethyl phthalate
      12) Dimethyl phthalate.
      13) Ethylbenzene.
      14) Formaldehyde.

15) Hexavalent chromium.
16) Isophorone.
17) Lead.
18) Mercury.
19) Methyl ethyl ketone.
20) Methyl isobutyl ketone.
21) Methylene chloride.
22) Naphthalene.
23) Toluene (methylbenzene).
24) 1,1,1-trichloroethane.
25) Vinyl chloride.

3. Determination of VOC Content: Testing and calculation in accordance with 40 CFR 59, Subpart D (EPA Method 24), exclusive of colorants added to a tint base and water added at project site; or other method acceptable to authorities having jurisdiction.
4. Evidence of Compliance: Acceptable types of evidence are:
   a. Report of laboratory testing performed in accordance with requirements.

F. Composite Wood and Agrifiber Products and Adhesives Used for Laminating Them: Provide products having no added urea-formaldehyde resins.
   1. Evidence of Compliance: Acceptable types of evidence are:
      a. Published product data showing compliance with requirements.

G. Other Product Categories: Comply with limitations specified elsewhere.

PART 3 - EXECUTION

3.1 FIELD QUALITY CONTROL

A. Owner reserves the right to reject non-compliant products, whether installed or not, and require their removal and replacement with compliant products at no extra cost to Owner.

B. All additional costs to restore indoor air quality due to installation of non-compliant products will be borne by Contractor.

END OF SECTION 016116

SECTION 017300

EXECUTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes general administrative and procedural requirements governing execution of the Work, including, but not limited to, the following:

1. Construction layout.
2. Field engineering and surveying.
3. Installation of the Work.
4. Cutting and patching.
5. Coordination of Owner's portion of the Work.
6. Coordination of Owner-installed products.
7. Progress cleaning.
8. Starting and adjusting.
9. Protection of installed construction.

B. Related Requirements:

1. Section 017700 "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, replacing defective work, and final cleaning.
2. Section 024119 "Selective Demolition" for demolition and removal of selected portions of the building.
3. Section 013000 - Administrative Requirements, for submittal procedures

1.2 DEFINITIONS

A. Retain terms that remain after this Section has been edited for a project.

B. Cutting: Removal of in-place construction necessary to permit installation or performance of subsequent work.

C. Patching: Fitting and repair work required to restore construction to original conditions after installation of subsequent work.

1.3 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.

B. Cutting and Patching: Submit written request in advance of cutting or alteration that affects:

1. Structural integrity of any element of Project.
2. Integrity of weather exposed or moisture resistant element.
3. Efficiency, maintenance, or safety of any operational element.
4. Visual qualities of sight exposed elements.

5. Work of Owner or separate Contractor.
6. Include in request:
    a. Identification of Project.
    b. Location and description of affected work.
    c. Necessity for cutting or alteration.
    d. Description of proposed work and products to be used.
    e. Alternatives to cutting and patching.
    f. Effect on work of Owner or separate Contractor.
    g. Written permission of affected separate Contractor.
    h. Date and time work will be executed.

C. Project Record Documents: Accurately record actual locations of capped and active utilities.

1.4 QUALITY ASSURANCE

A. Cutting and Patching: Comply with requirements for and limitations on cutting and patching of construction elements.
1. Structural Elements: When cutting and patching structural elements, or when encountering the need for cutting and patching of elements whose structural function is not known, notify Architect of locations and details of cutting and await directions from Architect before proceeding. Shore, brace, and support structural elements during cutting and patching. Do not cut and patch structural elements in a manner that could change their load-carrying capacity or increase deflection.
2. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety.
3. Other Construction Elements: Do not cut and patch other construction elements or components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety.
4. Visual Elements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch exposed construction in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

B. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of specified products and equipment.

1.5 PROJECT CONDITIONS

A. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.

B. Dust Control: Execute work by methods to minimize raising dust from construction operations. Provide positive means to prevent air-borne dust from dispersing into atmosphere and over adjacent property.

C. Noise Control: Provide methods, means, and facilities to minimize noise produced by construction operations.

D. Pest and Rodent Control: Provide methods, means, and facilities to prevent pests and insects from damaging the work.

E. Rodent Control: Provide methods, means, and facilities to prevent rodents from accessing or invading premises.

F. Pollution Control: Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances, and pollutants produced by construction operations. Comply with federal, state, and local regulations.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Comply with requirements specified in other Sections.

1. For projects requiring compliance with sustainable design and construction practices and procedures, use products for patching that comply with sustainable design requirements.

B. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.

1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to Architect for the visual and functional performance of in-place materials. Use materials that are not considered hazardous.

C. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

1. Use cleaning products that comply with Green Seal's GS-37, or if GS-37 is not applicable, use products that comply with the California Code of Regulations maximum allowable VOC levels.

2.2 PATCHING MATERIALS

A. New Materials: As specified in product sections; match existing products and work for patching and extending work.

B. Type and Quality of Existing Products: Determine by inspecting and testing products where necessary, referring to existing work as a standard.

C. Product Substitution: For any proposed change in materials, submit request for substitution described in Section 01 60 00.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent work. Start of work means acceptance of existing conditions.

B. Verify that existing substrate is capable of structural support or attachment of new work being applied or attached.

C. Examine and verify specific conditions described in individual specification sections.

D. Take field measurements before confirming product orders or beginning fabrication, to minimize waste due to over-ordering or mis-fabrication.

E. Verify that utility services are available, of the correct characteristics, and in the correct locations.

F. Prior to Cutting: Examine existing conditions prior to commencing work, including elements subject to damage or movement during cutting and patching. After uncovering existing work, assess conditions affecting performance of work. Beginning of cutting or patching means acceptance of existing conditions.

G. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.

1. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.

2. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.

3. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.

H. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:

1. Description of the Work, including Specification Section number and paragraph, and Drawing sheet number and detail, where applicable.

2. List of detrimental conditions, including substrates.

3. List of unacceptable installation tolerances.

4. Recommended corrections.

I. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Clean substrate surfaces prior to applying next material or substance.

B. Seal cracks or openings of substrate prior to applying next material or substance.

C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.

D. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

E. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.

F. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents, submit a request for information to Architect in accordance with requirements in Section 013100 "Project Management and Coordination."

3.3 PREINSTALLATION MEETINGS

A. When required in individual specification sections, convene a preinstallation meeting at the site prior to commencing work of the section.

B. Require attendance of parties directly affecting, or affected by, work of the specific section.

C. Notify Architect four days in advance of meeting date.

D. Prepare agenda and preside at meeting:

E. Review conditions of examination, preparation and installation procedures.

1. Review coordination with related work.
2. Review conflicts and compatibility issues.
3. Review environmental limitations and protection.
4. Examine substrates.
5. Review requirements of the following:
    a. Contract Documents.
    b. Options.
    c. Related Change Orders.
    d. Submittals.
    e. Mockups.
    f. Testing and inspection.

F. Record minutes and distribute copies within two days after meeting to participants, with two copies to Construction Manager, Architect, Owner, participants, and those affected by decisions made.

3.4 LAYING OUT THE WORK

A. Verify locations of survey control points prior to starting work.

B. Promptly notify Construction Manager and Architect of any discrepancies discovered.

C. Protect survey control points prior to starting site work; preserve permanent reference points during construction.

D. Promptly report to Construction Manager and Architect the loss or destruction of any reference point or relocation required because of changes in grades or other reasons.

E. Replace dislocated survey control points based on original survey control. Make no changes without prior written notice to Construction Manager or Architect.

F. Utilize recognized engineering survey practices.

G. Establish elevations, lines and levels. Locate and lay out by instrumentation and similar appropriate means:

H. Site improvements including pavements; stakes for grading, fill and topsoil placement; utility locations, slopes, and invert elevations.

I. Grid or axis for structures.

J. Building foundation, column locations, ground floor elevations.

K. Periodically verify layouts by same means.

L. Maintain a complete and accurate log of control and survey work as it progresses.

3.5 INSTALLATION

A. Install products as specified in individual sections, in accordance with manufacturer's instructions and recommendations, and to avoid waste due to necessity for replacement.

B. Make vertical elements plumb and horizontal elements level, unless otherwise indicated.

C. Install equipment and fittings plumb and level, neatly aligned with adjacent vertical and horizontal lines, unless otherwise indicated.

D. Make consistent texture on surfaces, with seamless transitions, unless otherwise indicated.

E. Make neat transitions between different surfaces, maintaining texture and appearance.

F. Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.

1. Make vertical work plumb and make horizontal work level.

2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.

3. Conceal pipes, ducts, and wiring in finished areas unless otherwise indicated.

4. Maintain minimum headroom clearance of 80 inchesunless otherwise indicated on Drawings.

G. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.

H. Install products at the time and under conditions that will ensure satisfactory results as judged by Architect. Maintain conditions required for product performance until Substantial Completion.

I. Conduct construction operations, so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy of type expected for Project.

J. Sequence the Work and allow adequate clearances to accommodate movement of construction items on-site and placement in permanent locations.

K. Tools and Equipment: Select tools or equipment that minimize production of excessive noise levels.

L. Templates: Obtain and distribute to the parties involved templates for Work specified to be factory prepared and field installed. Check Shop Drawings of other portions of the Work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.

M. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions with manufacturer.

1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.

2. Allow for building movement, including thermal expansion and contraction.

3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

N. Joints: Make joints of uniform width. Where joint locations in exposed Work are not indicated, arrange joints for the best visual effect, as judged by Architect. Fit exposed connections together to form hairline joints.

O. Repair or remove and replace damaged, defective, or nonconforming Work.

1. Comply with Section 017700 "Closeout Procedures" for repairing or removing and replacing defective Work.

3.6 ALTERATIONS

A. Drawings showing existing construction and utilities are based on casual field observation and existing record documents only.

1. Verify that construction and utility arrangements are as shown.

2. Report discrepancies to Architect before disturbing existing installation.

3. Beginning of alterations work constitutes acceptance of existing conditions.

B. Keep areas in which alterations are being conducted separated from other areas that are still occupied.

1. Provide, erect, and maintain temporary dustproof partitions of construction specified in Section 015000 in locations indicated on drawings.

2. Provide sound retardant partitions of construction indicated on drawings in locations indicated on drawings.

C. Maintain weatherproof exterior building enclosure except for interruptions required for replacement or modifications; take care to prevent water and humidity damage.

D. Where openings in exterior enclosure exist, provide construction to make exterior enclosure weatherproof.

1. Insulate existing ducts or pipes that are exposed to outdoor ambient temperatures by alterations work.

E. Remove existing work as indicated and as required to accomplish new work.

1. Remove items indicated on drawings.

2. Relocate items indicated on drawings.

3. Where new surface finishes are to be applied to existing work, perform removals, patch, and prepare existing surfaces as required to receive new finish; remove existing finish if necessary for successful application of new finish.

4. Where new surface finishes are not specified or indicated, patch holes and damaged surfaces to match adjacent finished surfaces as closely as possible.

F. Services (Including but not limited to HVAC, Plumbing, Fire Protection, Electrical, and Telecommunications): Remove, relocate, and extend existing systems to accommodate new construction.

1. Maintain existing active systems that are to remain in operation; maintain access to equipment and operational components; if necessary, modify installation to allow access or provide access panel.

2. Where existing systems or equipment are not active and Contract Documents require reactivation, put back into operational condition; repair supply, distribution, and equipment as required.

3. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.

a. Disable existing systems only to make switchovers and connections; minimize duration of outages.

b. Provide temporary connections as required to maintain existing systems in service.

4. Verify that abandoned services serve only abandoned facilities.

5. Remove abandoned pipe, ducts, conduits, and equipment, including those above accessible ceilings; remove back to source of supply where possible, otherwise cap stub and tag with identification; patch holes left by removal using materials specified for new construction.

G. Protect existing work to remain.

1. Prevent movement of structure; provide shoring and bracing if necessary.
2. Perform cutting to accomplish removals neatly and as specified for cutting new work.
3. Repair adjacent construction and finishes damaged during removal work.
4. Patch as specified for patching new work.

H. Patching: Where the existing surface is not indicated to be refinished, patch to match the surface finish that existed prior to cutting. Where the surface is indicated to be refinished, patch so that the substrate is ready for the new finish.

I. Refinish existing surfaces as indicated:

1. Where rooms or spaces are indicated to be refinished, refinish all visible existing surfaces to remain to the specified condition for each material, with a neat transition to adjacent finishes.
2. If mechanical or electrical work is exposed accidentally during the work, re-cover and refinish to match.
3. Patch as specified for patching new work.

J. Clean existing systems and equipment.

K. Remove demolition debris and abandoned items from alterations areas and dispose of off-site; do not burn or bury.

L. Do not begin new construction in alterations areas before demolition is complete.

M. Comply with all other applicable requirements of this section.

3.7 CUTTING AND PATCHING

A. Whenever possible, execute the work by methods that avoid cutting or patching.

B. See Alterations article above for additional requirements.

C. Perform whatever cutting and patching is necessary to:

1. Complete the work.
2. Fit products together to integrate with other work.
3. Provide openings for penetration of mechanical, electrical, and other services.
4. Match work that has been cut to adjacent work.
5. Repair areas adjacent to cuts to required condition.
6. Repair new work damaged by subsequent work.
7. Remove samples of installed work for testing when requested.
8. Remove and replace defective and non-conforming work.

D. Execute cutting and patching including excavation and fill to complete the work, to uncover work in order to install improperly sequenced work, to remove and replace defective or non-conforming work, to remove samples of installed work for testing when requested, to provide openings in the work for penetration of mechanical and electrical work, to execute patching to complement adjacent work, and to fit products together to integrate with other work.

E. Execute work by methods that avoid damage to other work and that will provide appropriate surfaces to receive patching and finishing. In existing work, minimize damage and restore to original condition.

F. Employ original installer to perform cutting for weather exposed and moisture resistant elements, and sight exposed surfaces.

G. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.

H. Restore work with new products in accordance with requirements of Contract Documents.

I. Fit work airtight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.

J. At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with fire rated material in accordance with Section 078400, to full thickness of the penetrated element.

K. Patching:

1. Finish patched surfaces to match finish that existed prior to patching. On continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.

2. Match color, texture, and appearance.

3. Repair patched surfaces that are damaged, lifted, discolored, or showing other imperfections due to patching work. If defects are due to condition of substrate, repair substrate prior to repairing finish.

L. Refinish surfaces to match adjacent finish. For continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.

M. Make neat transitions. Patch work to match adjacent work in texture and appearance. Where new work abuts or aligns with existing, perform a smooth and even transition.

N. General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.

1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.

O. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.

P. Temporary Support: Provide temporary support of Work to be cut.

Q. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.

R. Adjacent Occupied Areas: Where interference with use of adjoining areas or interruption of free passage to adjoining areas is unavoidable, coordinate cutting and patching in accordance with requirements in Section 011000 "Summary."

S. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to minimize interruption to occupied areas.

T. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.

1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
4. Excavating and Backfilling: Comply with requirements in applicable Sections where required by cutting and patching operations.
5. Revise "Mechanical and Electrical Services" Subparagraph below to suit Project.
6. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
7. Retain subparagraph below if required to prevent multiple cutting and patching in the same area. Insert specific requirements for multiple contracts and special conditions requiring coordination.
8. Proceed with patching after construction operations requiring cutting are complete.

U. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as practicable, as judged by Architect. Provide materials and comply with installation requirements specified in other Sections, where applicable.

1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.
2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.

    a. Clean piping, conduit, and similar features before applying paint or other finishing materials.

    b. Restore damaged pipe covering to its original condition.

3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.

    a. Where patching occurs in a painted surface, prepare substrate and apply primer and intermediate paint coats appropriate for substrate over the patch, and apply final paint coat over entire unbroken surface containing the patch, corner to corner of wall and edge to edge of ceiling. Provide additional coats until patch blends with adjacent surfaces.

4. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition and ensures thermal and moisture integrity of building enclosure.

V. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

3.8 PROGRESS CLEANING

A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.

B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.

C. Broom and vacuum clean interior areas prior to start of surface finishing and continue cleaning to eliminate dust.

D. Collect and remove waste materials, debris, and trash/rubbish from site periodically and dispose off-site; do not burn or bury.

E. Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.

1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.

2. Do not hold waste materials for more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F (27 deg C).

3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.

a. Use containers intended for holding waste materials of type to be stored.

4. Coordinate progress cleaning for joint-use areas where Contractor and other contractors are working concurrently.

F. Site: Maintain Project site free of waste materials and debris.

G. Work Areas: Clean areas where Work is in progress to the level of cleanliness necessary for proper execution of the Work.

1. Remove liquid spills promptly.

2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.

H. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.

I. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.

J. Exposed Surfaces: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

K. Waste Disposal: Section 017419 Construction Waste Management and Disposal.

L. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.

M. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

N. Limiting Exposures: Supervise construction operations to ensure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.9 STARTING AND ADJUSTING

A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.

B. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.

C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

D. Manufacturer's Field Service: Comply with qualification requirements in Section 014000 "Quality Requirements."

3.10 PROTECTION AND REPAIR OF INSTALLED CONSTRUCTION

A. Protect installed work from damage by construction operations.

B. Provide special protection where specified in individual specification sections.

C. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.

D. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.

E. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.

F. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.

G. Prohibit traffic from landscaped areas.

H. Remove protective coverings when no longer needed; reuse or recycle plastic coverings if possible.

I. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.

J. Repair Work previously completed and subsequently damaged during construction period. Repair to like-new condition.

K. Protection of Existing Items: Provide protection and ensure that existing items to remain undisturbed by construction are maintained in condition that existed at commencement of the Work.

L. Comply with manufacturer's written instructions for temperature and relative humidity.

3.11 SYSTEM STARTUP

A. Coordinate schedule for start-up of various equipment and systems.

B. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for conditions that may cause damage.

C. Verify tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.

D. Verify that wiring and support components for equipment are complete and tested.

E. Execute start-up under supervision of applicable Contractor personnel and manufacturer's representative in accordance with manufacturers' instructions.

F. Submit a written report that equipment or system has been properly installed and is functioning correctly.

G. All mechanical equipment to have new filters installed at time of turnover.

3.12 ADJUSTING

A. Adjust operating products and equipment to ensure smooth and unhindered operation.

3.13 FINAL CLEANING

A. Employ experienced workers or professional cleaners for final cleaning; clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program.

B. Use cleaning materials that are nonhazardous.

C. Remove all labels that are not permanent. Do not paint or otherwise cover fire test labels or nameplates on mechanical and electrical equipment.

D. Clean debris from roofs, gutters, downspouts, and drainage systems.

E. Remove waste, surplus materials, trash/rubbish, and construction facilities from the site; dispose of in legal manner; do not burn or bury.

F. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.

G. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.

H. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.

I. Remove tools, construction equipment, machinery, and surplus material from Project site.

J. Remove snow and ice to provide safe access to building.

K. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.

L. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.

M. Sweep concrete floors broom clean in unoccupied spaces.

N. Vacuum carpet and similar soft surfaces, removing debris and excess nap; shampoo if visible soil or stains remain.

O. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Polish mirrors and glass, taking care not to scratch surfaces.

P. Remove labels that are not permanent.

Q. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.

1. Do not paint over "UL" and similar labels, including mechanical and electrical nameplates.

2. Revise seven subparagraphs below to suit Project. Check for conflict or duplication with provisions in other Sections, particularly Divisions 20 through 29.

R. Wipe surfaces of mechanical and electrical equipment, elevator equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.

S. Replace parts subject to unusual operating conditions.

T. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.

U. Clean exposed surfaces of diffusers, registers, and grills.

V. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency. Replace burned-out bulbs, and those noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.

W. Leave Project clean and ready for occupancy.

X. Contractor is responsible for protection and safeguard of the existing landscaping including hardscape, grass, furniture, vegetated areas and other existing vegetation. Contractor shall replace all damaged vegetation to restore pre-construction appearance at a minimum.

Y. Contractor shall provide min 100 digital photos with min 10mpix resolution to cover each area of the work prior to start of construction.

END OF SECTION 017300

SECTION 017419

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 - GENERAL

1.1 WASTE MANAGEMENT REQUIREMENTS

A. Owner requires that this project generate the least amount of trash and waste possible.

B. Employ processes that ensure the generation of as little waste as possible due to error, poor planning, breakage, mishandling, contamination, or other factors.

C. Minimize trash/waste disposal in landfills; reuse, salvage, or recycle as much waste as economically feasible.

D. Required Recycling, Salvage, and Reuse: The following may not be disposed of in landfills or by incineration:
   1. Aluminum and plastic beverage containers.
   2. Corrugated cardboard.
   3. Wood pallets.
   4. Clean dimensional wood: May be used as blocking or furring.
   5. Land clearing debris, including brush, branches, logs, and stumps.
   6. Metals, including packaging banding, metal studs, sheet metal, structural steel, piping, reinforcing bars, door frames, and other items made of steel, iron, galvanized steel, stainless steel, aluminum, copper, zinc, lead, brass, and bronze.

E. Contractor shall submit periodic Waste Disposal Reports; all landfill disposal, recycling, salvage, and reuse must be reported regardless of to whom the cost or savings accrues; use the same units of measure on all reports.

F. Contractor shall develop and follow a Waste Management Plan designed to implement these requirements.

G. The following sources may be useful in developing the Waste Management Plan:
   1. "Maryland Recycles" website: http://www.mdrecycles.org/ for local resources related to construction materials recycling and salvage.
   2. Maryland Commercial Recycling Specialists (410) 333-3066.
   3. "Builders' Guide to Reuse & Recycling: A Directory for Construction and Demolition Materials in the Metropolitan Washington Region": www.mwcog.org/buidersrecyclingguide/
   4. "MACREDO: Mid-Atlantic Consortium of Recycling and Economic Development Officials" provides a recycling markets and sources directory for the Mid-Atlantic States; website: http://macredo.libertynet.org/index.html
   5. Habitat Restore of Northern Virginia, for construction materials reuse, 7770 Richmond
   6. Highway, Alexandria, VA 22306, (703) 360-6700, http://www.restorenova.org.
   7. “Used Building Materials Association (UBMA)” www.ubma.org.
   8. The Loading Dock, Inc., Baltimore, MD.
   9. Second Chance Inc., Baltimore, MD.
   10. RecycleOne, Hyattsville, MD, http://www.recycleone.net.

H. Methods of trash/waste disposal that are not acceptable are:

1. Burning on the project site.
2. Burying on the project site.
3. Dumping or burying on other property, public or private.
4. Other illegal dumping or burying.

I. Regulatory Requirements: Contractor is responsible for knowing and complying with regulatory requirements, including but not limited to Federal, state and local requirements, pertaining to legal disposal of all construction and demolition waste materials.

J. Contractor to provide receptacle for recycling and general waste.

1.2 RELATED REQUIREMENTS

A. Section 013000 - Administrative Requirements: Additional requirements for project meetings, reports, submittal procedures, and project documentation.

B. Section 015000 - Temporary Facilities and Controls: Additional requirements related to trash/waste collection and removal facilities and services.

C. Section 016000 - Product Requirements: Waste prevention requirements related to delivery, storage, and handling.

D. Section 017000 - Execution and Closeout Requirements: Trash/waste prevention procedures related to demolition, cutting and patching, installation, protection, and cleaning.

E. Sections related to demolition of existing on-site buildings or associated site structures.

1.3 DEFINITIONS

A. Clean: Untreated and unpainted; not contaminated with oils, solvents, caulk, or the like.

B. Construction and Demolition Waste: Solid wastes typically including building materials, packaging, trash, debris, and rubble resulting from construction, remodeling, repair and demolition operations.

C. Hazardous: Exhibiting the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity or reactivity.

D. Nonhazardous: Exhibiting none of the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity, or reactivity.

E. Nontoxic: Neither immediately poisonous to humans nor poisonous after a long period of exposure.

F. Recyclable: The ability of a product or material to be recovered at the end of its life cycle and remanufactured into a new product for reuse by others.

G. Recycle: To remove a waste material from the project site to another site for remanufacture into a new product for reuse by others.

H. Recycling: The process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for the purpose of using the altered form. Recycling does not include burning, incinerating, or thermally destroying waste.

I. Return: To give back reusable items or unused products to vendors for credit.

J. Reuse: To reuse a construction waste material in some manner on the project site.

K. Salvage: To remove a waste material from the project site to another site for resale or reuse by others.

L. Sediment: Soil and other debris that has been eroded and transported by storm or well production run-off water.

M. Source Separation: The act of keeping different types of waste materials separate beginning from the first time they become waste.

N. Toxic: Poisonous to humans either immediately or after a long period of exposure.

O. Trash: Any product or material unable to be reused, returned, recycled, or salvaged.

P. Waste: Extra material or material that has reached the end of its useful life in its intended use. Waste includes salvageable, returnable, recyclable, and reusable material.

1.4 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.

B. Provide Waste Management Plan Prior to the start of any construction, demolition, or deconstruction, a construction and demolition. Make it available to the owner and AHJ. The plan shall do the following:
   a. Identify the construction and demolition waste materials expected to be diverted.
   b. Identify materials or building elements to be deconstructed.
   c. Indicate whether construction and demolition waste materials are to be source-separated or comingled.
   d. Identify service providers and designate destination facilities for construction and demolition waste materials generated at the job site.
   e. Identify the average diversion rate for facilities that accept or process comingled construction and demolition materials. Separate average percentages shall be included for those materials collected by construction and demolition materials processing facilities that end up as alternative daily cover and incineration.
   f. Specify a method for tracking.
   g. Specify a reporting mechanism for disposition of waste using items (a) through (f).

C. Waste Management Plan: Include the following information:
   1. Analysis of the trash and waste projected to be generated during the entire project construction cycle, including types and quantities.
   2. Landfill Options: The name, address, and telephone number of the landfill(s) where trash/waste will be disposed of, the applicable landfill tipping fee(s), and the projected cost of disposing of all project trash/waste in the landfill(s).
   3. Landfill Alternatives: List all waste materials that will be diverted from landfills by reuse, salvage, or recycling.
   4. Meetings: Describe regular meetings to be held to address waste prevention, reduction, recycling, salvage, reuse, and disposal.
   5. Materials Handling Procedures: Describe how materials to be diverted from landfills will be protected from contamination and prepared for acceptance by designated facilities; include separation procedures for recyclables, storage, and packaging.
   6. Transportation: Identify the destination and means of transportation of materials to be recycled, i.e. whether materials will be site-separated and self-hauled to designated centers, or whether mixed materials will be collected by a waste hauler.

D. Waste Disposal Reports: Submit at specified intervals, with details of quantities of trash and waste, means of disposal or reuse, and costs; show both totals to date and since last report.
   1. Submit updated Report with each Application for Progress Payment; failure to submit Report will delay payment.
   2. Landfill Disposal: Include the following information:
      a. Identification of material.
      b. Amount, in tons or cubic yards, of trash/waste material from the project disposed of in landfills.
      c. State the identity of landfills, total amount of tipping fees paid to landfill, and total disposal cost.
      d. Include manifests, weight tickets, receipts, and invoices as evidence of quantity and cost.
   3. Recycled and Salvaged Materials: Include the following information for each:
      a. Identification of material, including those retrieved by installer for use on other projects.
      b. Amount, in tons or cubic yards, date removed from the project site, and receiving party.
      c. Transportation cost, amount paid or received for the material, and the net total cost or savings of salvage or recycling each material.
      d. Include manifests, weight tickets, receipts, and invoices as evidence of quantity and cost.
      e. Certification by receiving party that materials will not be disposed of in landfills or by incineration.

   4. Material Reused on Project: Include the following information for each:
   a. Identification of material and how it was used in the project.
   b. Amount, in tons or cubic yards.
   c. Include weight tickets as evidence of quantity.
   5. Other Disposal Methods: Include information similar to that described above, as appropriate to disposal method.

E. Final Waste Management Documentation: Submit at completion of Substantial Completion and prior to contract closeout:
   1. All information required in Monthly Report Submittals.
   2. Legible copies of on-site logs, manifests, weight tickets, and receipts.
      a. Construction and Demolition Waste Management.

PART 2 - PRODUCTS

2.1 PRODUCT SUBSTITUTIONS

A. Waste diversion: A minimum of 50% of nonhazardous construction, demolition, or deconstruction waste material shall be diverted from disposal in landfills and incinerators through reuse, recycling, repurposing, and/or composting. Excavated soil and land-clearing debris shall not be included in the calculation.

B. See Section 016000 - Product Requirements for substitution submission procedures.

C. For each proposed product substitution, submit the following information in addition to requirements specified in Section 016000:
   1. Relative amount of waste produced, compared to specified product.
      a. Cost savings on waste disposal, compared to specified product, to be deducted from the Contract Sum.
   2. Proposed disposal method for waste product.
   3. Markets for recycled waste product.

PART 3 - EXECUTION

3.1 WASTE MANAGEMENT PROCEDURES

A. See Section 013000 for additional requirements for project meetings, reports, submittal procedures, and project documentation.

B. See Section 015000 for additional requirements related to trash/waste collection and removal facilities and services.

C. See Section 016000 for waste prevention requirements related to delivery, storage, and handling.

D. See Section 017300 for trash/waste prevention procedures related to demolition, cutting and patching, installation, protection, and cleaning.

3.2 WASTE MANAGEMENT PLAN IMPLEMENTATION

A. Manager: Designate an on-site person or persons responsible for instructing workers and overseeing and documenting results of the Waste Management Plan.

B. Communication: Distribute copies of the Waste Management Plan to job site foreman, each subcontractor, Owner, and Architect.

C. Instruction: Provide on-site instruction of appropriate separation, handling, and recycling, salvage, reuse, and return methods to be used by all parties at the appropriate stages of the project.

D. Meetings: Discuss trash/waste management goals and issues at project meetings.
   1. Pre-bid meeting.
   2. Pre-construction meeting.
   3. Regular job-site meetings.

E. Records: Maintain onsite logs for each load of materials removed from site:
   1. Landfill Log: Include type of material, load (by weight or volume), recycling/hauling service, date accepted by landfill, and facility fee.
   2. Waste Diversion: Include type of material, load (by weight or volume), recycling/hauling service, date accepted by recycling service, or non-profit receiver and facility fee.
   3. Where comingling occurs prior to collection, track the amount of construction waste diverted from landfill based on the weight or volume of the removed co-mingled waste and provide the documentation of percentages of recycled from the sorting facility.

F. Facilities: Provide specific facilities for separation and storage of materials for recycling, salvage, reuse, return, and trash disposal, for use by all contractors and installers.
   1. Provide containers as required.
   2. Provide temporary enclosures around piles of separated materials to be recycled or salvaged.
   3. Provide materials for barriers and enclosures that are nonhazardous, recyclable, or reusable to the maximum extent possible, reuse project construction waste materials if possible.
   4. Locate enclosures out of the way of construction traffic.
   5. Provide adequate space for pick-up and delivery and convenience to subcontractors.
   6. If an enclosed area is not provided, clearly lay out and label a specific area on-site.
   7. Keep recycling and trash/waste bin areas neat and clean and clearly marked to avoid contamination of materials.
   8. Provide bi-lingual signage.

G. Hazardous Wastes: Separate, store, and dispose of hazardous wastes according to applicable regulations.

H. Recycling: Separate, store, protect, and handle at the site identified recyclable waste products to prevent contamination of materials and to maximize recyclability of identified materials. Arrange for timely pickups from the site or deliveries to recycling facility to prevent contamination of recyclable materials.
   1. Coordinate work of recycling, composting and salvaging waste haulers with other trades.
   2. Revenues, savings, rebates, tax credits, and other incentives received for recycling waste materials shall accrue to the Contractor.

I. Reuse of Materials On-Site: Set aside, sort, and protect separated products in preparation for reuse.

J. Salvage: Set aside, sort, and protect products to be salvaged for reuse off-site.

END OF SECTION 017419

SECTION 017700

CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Administrative and procedural requirements for contract closeout, including, but not limited to, the following:
   1. Inspection procedures.

1.2 RELATED REQUIREMENTS

A. Section 012900 - Payment Procedures.

1.3 SUBSTANTIAL COMPLETION

A. Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion, complete the following. List items below that are incomplete in request.
   1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
   2. Advise Owner of pending insurance changeover requirements.
   3. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
   4. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
   5. Prepare and submit Project Record Documents, operation and maintenance manuals, damage or settlement surveys, property surveys, and similar final record information.
   6. Deliver tools, spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.
   7. Make final changeover of permanent locks and deliver keys to Construction Manager. Advise Construction Manager and Owner's personnel of changeover in security provisions.
   8. Complete startup testing of systems.
   9. Submit test/adjust/balance records.
   10. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
   11. Advise Owner of changeover in heat and other utilities.
   12. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
   13. Complete final cleaning requirements, including touchup painting.
   14. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

B. Inspection: Submit a written request for inspection for Substantial Completion. On receipt of request, Construction Manager will either proceed with inspection process or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Construction Manager of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.
   1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
   2. Results of completed inspection will form the basis of requirements for Final Completion.

1.4 FINAL COMPLETION

A. PRELIMINARY PROCEDURES: Before requesting final inspection for determining date of final completion, complete the following:
   1. Submit a final application for payment according to division 1 section "payment procedures."
   2. Submit certified copy of architect's substantial completion inspection list of items to be completed or corrected (punch list), endorsed and dated by architect. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
   3. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
   4. Submit pest-control final inspection report and warranty.
   5. Instruct owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.

B. Inspection: submit a written request for final inspection for acceptance. On receipt of request, construction manager will either proceed with inspection process or notify contractor of unfulfilled requirements. Architect will prepare a final certificate for payment after inspection or will notify construction manager of construction that must be completed or corrected before certificate will be issued.
   1. Reinspection: request reinspection when the work identified in previous inspections as incomplete is completed or corrected.

C. BUILDING MAINTENANCE PLAN (BMP)

1.5 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

A. Preparation: Submit three copies of list. Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction. Use CSI Form 14.1A.
   1. Organize list of spaces in sequential order, starting with exterior areas first and proceeding from lowest floor to highest floor.
   2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
   3. Include the following information at the top of each page:
      a. Project name.
      b. Date.
      c. Name of Architect.
      d. Name of Contractor.
      e. Page number.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 017700

SECTION 017800

CLOSEOUT SUBMITTALS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Project Record Documents.

B. Operation and Maintenance Data.

C. Warranties and bonds.

D. Building Maintenance Plan (BMP).

E. Attic Stock.

1.2 RELATED REQUIREMENTS

A. Section 013000 - Administrative Requirements: Submittals procedures, shop drawings, product data, and samples.

B. Individual Product Sections: Specific requirements for operation and maintenance data.

C. Individual Product Sections: Warranties required for specific products or Work.

1.3 SUBMITTALS

A. Number of Copies: Submit copies of record Drawings as follows:
   1. Initial Submittal: Submit record digital data files and one set of plots.
   2. Final Submittal: Submit record digital data files and three set(s) of record digital data file plots.

B. Record Specifications: Submit searchable, annotated PDF electronic files of Project's Specifications, including addenda and contract modifications.

C. Record Product Data: Submit searchable, annotated PDF electronic files of each Product Data submittal.
   1. Where Record Product Data is required as part of operation and maintenance manuals, submit marked-up Product Data as an insert in manual instead of submittal as Record Product Data.

D. Miscellaneous Record Submittals: See other Specification Sections for miscellaneous record-keeping requirements and submittals in connection with various construction activities. Submit searchable, annotated PDF electronic files and directories of each submittal.

E. Certification: With each application for payment, provide written certification that Project Record Documents are current at time application is submitted.

F. Reports: Submit written report weekly indicating items incorporated into project record documents concurrent with progress of the Work, including revisions, concealed conditions, field changes, product selections, and other notations incorporated.

G. Operation and Maintenance Data:
   1. Manual Content Submittal: Operations and maintenance manual content is specified in individual Specification Sections to be reviewed at the time of Section submittals. Submit reviewed manual content formatted and organized as required by this Section.
      a. Architect will comment on whether content of operations and maintenance submittals are acceptable.
      b. Where applicable, clarify and update reviewed manual content to correspond to revisions and field conditions.

   2. Manual Format: Submit operations and maintenance manuals in the following format:
      a. PDF electronic file. Assemble each manual into a composite electronically indexed file. Submit through City Schools requested format.
         1) Name each indexed document file in composite electronic index with applicable item name. Include a complete electronically linked operation and maintenance directory.
            (a) Electronic Files: Use electronic files prepared by manufacturer where available. Where scanning of paper documents is required, configure scanned file for minimum readable file size.
            (b) File Names and Bookmarks: Enable bookmarking of individual documents based on file names. Name document files to correspond to system, subsystem, and equipment names used in manual directory and table of contents. Group documents for each system and subsystem into individual composite bookmarked files, then create composite manual, so that resulting bookmarks reflect the system, subsystem, and equipment names in a readily navigated file tree. Configure electronic manual to display bookmark panel on opening file.
         2) Enable inserted reviewer comments on draft submittals.
      b. Three paper copies. Include a complete operation and maintenance directory. Enclose title pages and directories in clear plastic sleeves. Architect will return two copies.
   3. Initial Manual Submittal: Submit draft copy of each manual at least 90 days calendar days before commencing demonstration and training. Architect or Owner will comment on whether general scope and content of manual are acceptable within 60 calendar days before commencing demonstration and training.
   4. Final Draft Manual Submittal: Submit revised draft copy of each manual that was found unacceptable by Architect or Owner at least 30 calendar days before commencing demonstration and training. Architect or Owner will comment or approve within 15 calendar days before commencing demonstration and training.
   5. Number of Copies: Submit the following final O&M:
      a. 3 hard copies
      b. 3 flash drives.

H. Warranties and Bonds:
   1. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within 10 days after acceptance.
   2. Make other submittals within 10 days after Date of Substantial Completion, prior to final Application for Payment.
   3. For items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit within 10 days after acceptance, listing the date of acceptance as the beginning of the warranty period.

I. Prepare and submit a Building Maintenance Plan (BMP).

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 PROJECT RECORD DOCUMENTS

A. Maintain on site one set of the following record documents: record actual revisions to the Work:
   1. Drawings.
   2. Specifications.
   3. Addenda.
   4. Change Orders and other modifications to the Contract.
   5. Reviewed shop drawings, product data, and samples.

B. Ensure entries are complete and accurate, enabling future reference by Owner.

C. Store record documents separate from documents used for construction.

D. Record information concurrent with construction progress.

E. Specifications: Legibly mark and record at each product section description of actual products installed, including the following:
   1. Manufacturer's name and product model and number.
   2. Product substitutions or alternates utilized.
   3. Changes made by Addenda and modifications.

F. Record Drawings and Shop Drawings: Legibly mark each item to record actual construction including:
   1. Record Prints:
      a. Preparation: Mark Record Prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up Record Prints.
         1) Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
         2) Accurately record information in an understandable drawing technique.
         3) Record data as soon as possible after obtaining it. Record and check the markup before enclosing concealed installations.
         4) Cross-reference record prints to corresponding archive photographic documentation.
      b. Content: Types of items requiring marking include, but are not limited to, the following:
         1) Dimensional changes to Drawings.
         2) Revisions to details shown on Drawings.
         3) Depths of foundations below first floor.
         4) Locations and depths of underground utilities referenced to permanent surface improvements.
         5) Revisions to routing of piping and conduits.
         6) Revisions to electrical circuitry.
         7) Actual equipment locations.
         8) Duct size and routing.
         9) Locations of concealed internal utilities referenced to visible and accessible features of the structure.
         10) Changes made by addendum.
         11) Changes made by Change Order or Construction Change Directive.
         12) Changes made following Architect's written orders.
         13) Details not on the original Contract Drawings.

14) Field records for variable and concealed conditions.
15) Record information on the Work that is shown only schematically.

c. Mark the Contract Drawings or Shop Drawings, whichever is most capable of showing actual physical conditions, completely and accurately. If Shop Drawings are marked, show cross-reference on the Contract Drawings. Use personnel proficient at recording graphic information in production of marked-up record prints.
d. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
e. Mark important additional information that was either shown schematically or omitted from original Drawings.
f. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.
g. Record drawings shall be submitted in both PDF and CAD formats. If BIM is used for the project, files shall be submitted in that format also.

2. Record Digital File: Immediately before inspection for Certificate of Substantial Completion, review marked-up Record Prints with Architect. When authorized, prepare a full set of digital data files of the Contract Drawings, as follows:
   a. Format: Same digital data software program, version, and operating system as the original Contract Drawings.
   b. Format: Annotated PDF electronic file annotated text, optical character recognition (OCR) searchable, PDF electronic files with comment function enabled.
   c. Incorporate changes and additional information previously marked on Record Prints. Delete, redraw, and add details and notations where applicable.
   d. Refer instances of uncertainty to Architect for resolution.
3. Newly Prepared Record Drawings: Prepare new Drawings instead of preparing record Drawings where Architect determines that neither the original Contract Drawings nor Shop Drawings are suitable to show actual installation.
   a. New Drawings may be required when a Change Order is issued as a result of accepting an alternate, substitution, or other modification.
   b. Consult Architect for proper scale and scope of detailing and notations required to record the actual physical installation and its relation to other construction. Integrate newly prepared record Drawings into record Drawing sets; comply with procedures for formatting, organizing, copying, binding, and submitting.
4. Format: Identify and date each Record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.
   a. Record Prints: Organize Record Prints and newly prepared record Drawings into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
   b. Record Digital Data Files: Organize digital data information into separate electronic files that correspond to each sheet of the Contract Drawings. Name each file with the sheet identification. Include identification in each digital data file.
   c. Identification: As follows:
      1) Project name.
      2) Date.
      3) Designation "PROJECT RECORD DRAWINGS."
      4) Name of Architect.
      5) Name of Contractor.

G. Product Record Data: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.
   1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
   2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.

3. If possible, a Change Order proposal should include resubmitting updated Product Data. This eliminates the need to mark up the previous submittal.
4. Note related Change Orders, Record Specifications, and Record Drawings where applicable.
5. Format: Submit record Product Data as searchable, annotated PDF electronic file.
   a. Include record Product Data directory organized by Specification Section number and title, electronically linked to each item of record Product Data.

H. Miscellaneous Record Submittals:
1. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.
2. Format: Submit miscellaneous record submittals as PDF electronic file.
   a. Include miscellaneous record submittals directory organized by Specification Section number and title, electronically linked to each item of miscellaneous record submittals.

3.2 OPERATION AND MAINTENANCE DOCUMENTATION DIRECTORY

A. Directory: Prepare a single, comprehensive directory of emergency, operation, and maintenance data and materials, listing items and their location to facilitate ready access to desired information. Include a section in the directory for each of the following:
1. List of documents.
2. List of systems.
3. List of equipment.
4. Table of contents.

B. List of Systems and Subsystems: List systems alphabetically. Include references to operation and maintenance manuals that contain information about each system.

C. List of Equipment: List equipment for each system, organized alphabetically by system. For pieces of equipment not part of system, list alphabetically in separate list.

D. Tables of Contents: Include a table of contents for each emergency, operation, and maintenance manual.

E. Identification: In the documentation directory and in each operation and maintenance manual, identify each system, subsystem, and piece of equipment with same designation used in the Contract Documents. If no designation exists, assign a designation according to ASHRAE Guideline 4, "Preparation of Operating and Maintenance Documentation for Building Systems."

3.3 OPERATION AND MAINTENANCE DATA

A. Source Data: For each product or system, list names, addresses and telephone numbers of Subcontractors and suppliers, including local source of supplies and replacement parts.

B. Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.

C. Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Do not use Project Record Documents as maintenance drawings.

D. Typed Text: As required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.

3.4 OPERATION AND MAINTENANCE DATA FOR MATERIALS AND FINISHES

A. Instructions for Care and Maintenance: Manufacturer's recommendations for cleaning agents and methods, precautions against detrimental cleaning agents and methods, and recommended schedule for cleaning and maintenance.

B. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.

3.5 OPERATION AND MAINTENANCE DATA FOR EQUIPMENT AND SYSTEMS

A. For Each Item of Equipment and Each System:
   1. Description of unit or system, and component parts.
   2. Identify function, normal operating characteristics, and limiting conditions.
   3. Include performance curves, with engineering data and tests.
   4. Complete nomenclature and model number of replaceable parts.

B. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.

C. Panelboard Circuit Directories: Provide electrical service characteristics, controls, and communications; typed.

D. Include color coded wiring diagrams as installed.

E. Operating Procedures: Include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shutdown, and emergency instructions. Include summer, winter, and any special operating instructions.

F. Maintenance Requirements: Include routine procedures and guide for preventative maintenance and troubleshooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
   1. Include HVAC outdoor and exhaust air damper calibration strategy.
      a. Include provisions which ensure that full closure of dampers can be achieved.
   2. Include Carbon Dioxide Monitoring Protocol.
   3. Include Carbon Monoxide Monitoring Protocol.
   4. Include Frost Mitigation Strategy for ventilation heat-recovery system.

G. Provide servicing and lubrication schedule, and list of lubricants required.

H. Include manufacturer's printed operation and maintenance instructions.

I. Include sequence of operation by controls manufacturer.

J. Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.

K. Provide control diagrams by controls manufacturer as installed.

L. Provide Contractor's coordination drawings, with color coded piping diagrams as installed.

M. Lamp Submittal: Include data on all lamps labeled according to fixture type; this data shall include:
1. Manufacturer.
2. Lamp designation (ex. PAR38, M16, T5HO).
3. Manufacturer's catalog number.
4. Wattage.
5. Color temperature.
6. CRI.
7. Beam spread.
8. Initial lumens.
9. Catalog spec sheet for each fixture type.

N. Additional Requirements: As specified in individual product specification sections.

3.6 ASSEMBLY OF OPERTION AND MAINTENANCE MANUALS

A. Assemble operation and maintenance data into durable manuals for Owner's personnel use, with data arranged in the same sequence as, and identified by, the specification sections.

B. Where systems involve more than one specification section, provide separate tabbed divider for each system.

C. Prepare instructions and data by personnel experienced in maintenance and operation of described products.

D. Prepare data in the form of an instructional manual.

E. Binders: Commercial quality, 8-1/2 by 11-inch three D side ring binders with durable plastic covers; 2 inch maximum ring size. When multiple binders are used, correlate data into related consistent groupings.

F. Cover: Identify each binder with typed or printed title OPERATION AND MAINTENANCE INSTRUCTIONS; identify title of Project; identify subject matter of contents.

G. Project Directory: Title and address of Project; names, addresses, and telephone numbers of Construction Manager, Architect, Consultants, Contractor and subcontractors, with names of responsible parties.

H. Tables of Contents: List every item separated by a divider, using the same identification as on the divider tab; where multiple volumes are required, include all volumes Tables of Contents in each volume, with the current volume clearly identified.

I. Dividers: Provide tabbed dividers for each separate product and system; identify the contents on the divider tab; immediately following the divider tab include a description of product and major component parts of equipment.

J. Text: Manufacturer's printed data, or typewritten data on 24-pound paper.

K. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.

L. Arrangement of Contents: Organize each volume in parts as follows:
1. Project Directory.

2. Table of Contents, of all volumes, and of this volume.
3. Operation and Maintenance Data: Arranged by system, then by product category.
   a. Source data.
   b. Product data, shop drawings, and other submittals.
   c. Operation and maintenance data.
   d. Field quality control data.
   e. Photocopies of warranties and bonds.

M. Arrange content by systems under section numbers and sequence of Table of Contents of this Project Manual.

N. Contents: Prepare a Table of Contents for each volume, with each product or system description identified, in three parts as follows:
   1. Part 1: Directory, listing names, addresses, and telephone numbers of Architect, Contractor, Subcontractors, and major equipment suppliers.
   2. Part 2: Operation and maintenance instructions, arranged by system and subdivided by specification section. For each category, identify names, addresses, and telephone numbers of Subcontractors and suppliers. Identify the following:
      a. Significant design criteria.
      b. List of equipment.
      c. Parts list for each component.
      d. Operating instructions.
      e. Maintenance instructions for equipment and systems.
      f. Maintenance instructions for special finishes, including recommended cleaning methods and materials, and special precautions identifying detrimental agents.
   3. Part 3: Project documents and certificates, including the following:
      a. Shop drawings and product data.

O. Provide a listing in Table of Contents for design data, with tabbed dividers and space for insertion of data.

P. Table of Contents: Provide title of Project; names, addresses, and telephone numbers of Architect, Consultants, and Contractor with name of responsible parties; schedule of products and systems, indexed to content of the volume.

3.7 PRODUCT MAINTENANCE MANUAL

A. Content: Organize manual into a separate section for each product, material, and finish. Section format to follow that of the Project Manual(s). Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.

B. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.

C. Product Information: Include the following, as applicable:
   1. Product name and model number.
   2. Manufacturer's name.
   3. Color, pattern, and texture.
   4. Material and chemical composition.
   5. Reordering information for specially manufactured products.

D. Maintenance Procedures: Include manufacturer's written recommendations and the following:
   1. Inspection procedures.
   2. Types of cleaning agents to be used and methods of cleaning.
   3. List of cleaning agents and methods of cleaning detrimental to product.
   4. Schedule for routine cleaning and maintenance.
   5. Repair instructions.

E. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.

F. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
   1. Include procedures to follow and required notifications for warranty claims.

3.8 SYSTEMS AND EQUIPMENT MAINTENANCE MANUAL

A. Use format provided by City Schools, for import into City Schools CMMS system.

B. Provide:
   1. Equipment identification.
   2. Equipment manufacturer, model
   3. Equipment preventative maintenance schedule and requirements.

3.8 BUILDING MAINTENANCE PLAN (BMP)

A. Use format provided by City Schools, for import into City Schools CMMS system.

B. Provide:
   1. Equipment identification
   2. Equipment manufacturer, model number, serial number
   3. Equipment preventative maintenance schedule and requirements

3.9 ATTIC STOCK

A. Provide attic stock per the specification for each item.

B. Provide 1-month cleaning supplies for all new kitchen equipment and flooring materials.

3.10 SYSTEMS AND EQUIPMENT MAINTENANCE MANUAL

A. Use format provided by City Schools, for import into City Schools CMMS system.

B. Provide:
   1. Equipment identification.
   2. Equipment manufacturer, model

C. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranty and bond information, as described below.

D. Source Information: List each system, subsystem, and piece of equipment included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.

E. Manufacturers' Maintenance Documentation: Manufacturers' maintenance documentation including the following information for each component part or piece of equipment:
   1. Standard printed maintenance instructions and bulletins.
   2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
   3. Identification and nomenclature of parts and components.
   4. List of items recommended to be stocked as spare parts.

F. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:
   1. Test and inspection instructions.
   2. Troubleshooting guide.
   3. Precautions against improper maintenance.
   4. Disassembly; component removal, repair, and replacement; and reassembly instructions.
   5. Aligning, adjusting, and checking instructions.
   6. Demonstration and training video recording, if available.

G. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.
   1. Scheduled Maintenance and Service: Tabulate actions for daily, weekly, monthly, quarterly, semiannual, and annual frequencies.
   2. Maintenance and Service Record: Include manufacturers' forms for recording maintenance.

H. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.

I. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.

J. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

K. Include procedures to follow and required notifications for warranty claims.

3.11 WARRANTIES AND BONDS

A. Obtain warranties and bonds, executed in duplicate by responsible Subcontractors, suppliers, and manufacturers, within 10 days after completion of the applicable item of work. Except for items put into use with Owner's permission, leave date of beginning of time of warranty until the Date of Substantial completion is determined.

B. General:
   1. Execute and provide notarized Project Warranty on form furnished by Owner.
   2. Provide special written warranties or guarantees or both for products, equipment, systems, and installations required by other sections of Contract Documents for duration indicated.

3. Provide manufacturer's warranties or guarantees or both for products, equipment, systems, and installations required by other sections of Contract Documents for duration indicated.
4. Where manufacturer's warranties or guarantees, or both expire before duration required by other sections of Contract Documents, obtain and pay for extensions as a part of Contract Price.
5. Provide all warranties or guarantees or both prior to Final Payment.
6. Warranties or guarantees or both required by Contact Documents shall commence on date of Substantial Completion of work, or designated portion thereof, unless otherwise indicated in Certificate of Substantial Completion.

C. Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

D. Include procedures to follow to ensure Warranties are not voided due to maintenance and operational activities,

E. Include procedures required to initiate warranty claims.

F. Provide special written warranties, manufacturer's warranties, and/or guarantees for products, equipment, systems, and installation which are required by other sections of Contract Documents for the duration indicated.

G. Warranties and guarantees shall commence on the date of Substantial Completion of work, or designated portion of work thereof, unless otherwise indicated in Certificate of Substantial Completion.

H. If Contractor cannot warrant and/or guarantee any portion of work using products or construction methods indicated in the Contract Documents, notify Architect and Owner in writing during bid period and before contracts are awarded.
   1. Indicate product or work name(s) and the reasoning to support claim.
   2. Provide names of products, method, and/or data on which substitutions can be warranted and/or guaranteed.
   3. Should Contractor fail to notify Architect, Contractor will be considered as having agreed to warrant and/or guarantee the work indicated.

I. Provide a fully executed and notarized Project Warranty. Owner Standard Document shall be provided.

END OF SECTION 017800

SECTION 017839

PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for project record documents, including the following:

1. Record Drawings.
2. Record Specifications.
3. Record Product Data.

B. Related Requirements:

1. Section 013000 – Administrative Requirements
2. Section 013100 - Project Management and Coordination
3. Section 017700 – Closeout Procedures
4. Section 017800 – Closeout Submittals

1.2 CLOSEOUT SUBMITTALS

A. Record Product Data: Submit one paper copy and annotated PDF electronic files and directories of each submittal.

1. Where record Product Data are required as part of operation and maintenance manuals, submit duplicate marked-up Product Data as a component of manual.

1.3 RECORD DRAWINGS

A. Record Digital Data Files: Immediately before inspection for Certificate of Substantial Completion, produce and review marked-up record prints with Architect. When authorized, prepare a full set of corrected digital data files of the Contract Drawings, as follows:

1. Format: Same digital data software program, version, and operating system as the original Contract Drawings.
2. Format: Annotated PDF electronic file with comment function enabled.
3. Incorporate changes and additional information previously marked on record prints. Delete, redraw, and add details and notations where applicable.
4. Refer instances of uncertainty to Architect for resolution.
5. Architect will furnish Contractor with one set of digital data files of the Contract Drawings for use in recording information.
    a. See Section 013100 "Project Management and Coordination" for requirements related to use of Architect's digital data files.
    b. Architect will provide data file layer information. Record markups in separate layers.

1.4 RECORD SPECIFICATIONS

A. Format: Submit record Specifications as annotated PDF electronic file.

1.5 RECORD PRODUCT DATA

A. Submit record Product Data as annotated PDF electronic file.

1. Include record Product Data directory organized by Specification Section number and title, electronically linked to each item of record Product Data.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 017839

SECTION 017900

DEMONSTRATION AND TRAINING

PART 1 - GENERAL

1.1 SUMMARY

A. Demonstration of newly installed products and systems.

B. Training of Owner personnel in operation and maintenance is required for:
   1. Electrical systems and equipment.
   2. Security and audio-visual systems.
   3. Items specified in individual product Sections.

C. Training of Owner personnel in care, cleaning, maintenance, and repair is required for:
   1. Finishes, including flooring, wall finishes, ceiling finishes.
   2. Fixtures and fittings.
   3. Items specified in individual product Sections.

D. Equipment training should be scheduled during seasonal changeover whenever feasible.

1.2 SUBMITTALS

A. Operations and maintenance manual: Submit operations and maintenance manual/brochure for each product / system.

1.3 QUALITY ASSURANCE

A. Instructor Qualifications: Familiar with design, operation, maintenance and troubleshooting of the relevant products and systems.
   1. Provide as instructors the most qualified trainer of those contractors and/or installers who supplied and installed the systems and equipment.
   2. Where a single person is not familiar with all aspects, provide specialists with necessary qualifications.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 DEMONSTRATION – GENERAL

A. Demonstrations conducted during system start-up do not qualify as demonstrations for the purposes of this section, unless approved in advance by Owner.

B. Demonstrations conducted during Functional Testing need not be repeated unless Owner personnel training is specified.

C. Demonstration may be combined with Owner personnel training if applicable.

D. Operating Equipment and Systems: Demonstrate operation in all modes, including start-up, shut-down, seasonal changeover, emergency conditions, and troubleshooting, and maintenance procedures, including scheduled and preventive maintenance.
   1. Perform demonstrations not less than one weeks prior to Substantial Completion.
   2. For equipment or systems requiring seasonal operation, perform demonstration for other season within six months.

E. Non-Operating Products: Demonstrate cleaning, scheduled and preventive maintenance, and repair procedures.
   1. Perform demonstrations not less than two weeks prior to Substantial Completion.

F. Coordinate demonstration and training requirements with commissioning requirements.

END OF SECTION 017900

SECTION 024119

SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Demolition and removal of selected portions of building or structure.

1.2 MATERIALS OWNERSHIP

A. Unless otherwise indicated, demolition waste becomes property of Contractor.

B. Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, and other items of interest or value to Owner that may be uncovered during demolition remain the property of Owner.

1. Carefully salvage in a manner to prevent damage and promptly return to Owner.

1.3 INFORMATIONAL SUBMITTALS

A. Proposed Protection Measures: Submit report, including Drawings, that indicates the measures proposed for protecting individuals and property, for environmental protection, for dust control and, for noise control. Indicate proposed locations and construction of barriers.

B. Schedule of selective demolition activities with starting and ending dates for each activity.

C. Pre-demolition photographs or video.

D. Statement of Refrigerant Recovery: Signed by refrigerant recovery technician.

1.4 CLOSEOUT SUBMITTALS

A. Inventory of items that have been removed and salvaged.

1.5 QUALITY ASSURANCE

A. Refrigerant Recovery Technician Qualifications: Certified by an EPA-approved certification program.

1.6 FIELD CONDITIONS

A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.

B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.

C. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.

D. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.

1. Hazardous materials will be removed by Owner before start of the Work.
2. If suspected hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Hazardous materials will be removed by Owner under a separate contract.

E. Storage or sale of removed items or materials on-site is not permitted.

F. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.

1. Maintain fire-protection facilities in service during selective demolition operations.

G. Arrange selective demolition schedule so as not to interfere with Owner's operations.

1.7 WARRANTY

A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials and using approved contractors so as not to void existing warranties.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

B. Standards: Comply with ASSE A10.6 and NFPA 241.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that utilities have been disconnected and capped before starting selective demolition operations.

B. Engage a professional engineer to perform an engineering survey of condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during selective building demolition operations.

C. Inventory and record the condition of items to be removed and salvaged.

3.2 PREPARATION

A. Refrigerant: Before starting demolition, remove refrigerant from mechanical equipment according to 40 CFR 82 and regulations of authorities having jurisdiction.

3.3 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage.

B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off utility services and mechanical/electrical systems serving areas to be selectively demolished.

1. Owner will arrange to shut off indicated services/systems when requested by Contractor.
2. Arrange to shut off utilities with utility companies.
3. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.
4. Disconnect, demolish, and remove fire-suppression systems, plumbing, and HVAC systems, equipment, and components indicated on Drawings to be removed.

    a. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.

    b. Piping to Be Abandoned in Place: Drain piping and cap or plug piping with same or compatible piping material and leave in place.

    c. Equipment to Be Removed: Disconnect and cap services and remove equipment.

    d. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.

    e. Equipment to Be Removed and Salvaged: Disconnect and cap services and remove equipment and deliver to Owner.

    f. Ducts to Be Removed: Remove portion of ducts indicated to be removed and plug remaining ducts with same or compatible ductwork material.

    g. Ducts to Be Abandoned in Place: Cap or plug ducts with same or compatible ductwork material and leave in place.

3.4 PROTECTION

A. Temporary Protection: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.

B. Temporary Shoring: Design, provide, and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.

C. Remove temporary barricades and protections where hazards no longer exist.

3.5 SELECTIVE DEMOLITION

A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:

1. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping. Temporarily cover openings to remain.
2. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
3. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before

starting flame-cutting operations. Maintain portable fire-suppression devices during flame-cutting operations.

4. Maintain fire watch during flame-cutting operations.

5. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.

6. Dispose of demolished items and materials promptly.

B. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

C. Removed and Salvaged Items:

1. Clean salvaged items.

2. Pack or crate items after cleaning. Identify contents of containers.

3. Store items in a secure area until delivery to Owner.

4. Transport items to Owner's storage area designated by Owner.

5. Protect items from damage during transport and storage.

D. Removed and Reinstalled Items:

1. Clean and repair items to functional condition adequate for intended reuse.

2. Pack or crate items after cleaning and repairing. Identify contents of containers.

3. Protect items from damage during transport and storage.

4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.

E. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.

3.6 CLEANING

A. Remove demolition waste materials from Project site and dispose of them in an EPA-approved construction and demolition waste landfill acceptable to authorities having jurisdiction.

1. Do not allow demolished materials to accumulate on-site.

2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.

4. Comply with requirements specified in Section 017419 "Construction Waste Management and Disposal."

B. Burning: Do not burn demolished materials.

C. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

END OF SECTION 024119

SECTION 078413

PENETRATION FIRESTOPPING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Penetration firestopping systems for the following applications:

a. Penetrations in fire-resistance-rated walls.

b. Penetrations in horizontal assemblies.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Product Schedule: For each penetration firestopping system. Include location, illustration of firestopping system, and design designation of qualified testing and inspecting agency.

1. Engineering Judgments: Where Project conditions require modification to a qualified testing and inspecting agency's illustration for a particular penetration firestopping system, submit illustration, with modifications marked, approved by penetration firestopping system manufacturer's fire-protection engineer as an engineering judgment or equivalent fire-resistance-rated assembly. Obtain approval of authorities having jurisdiction prior to submittal.

1.3 INFORMATIONAL SUBMITTALS

A. Product test reports.

1.4 CLOSEOUT SUBMITTALS

A. Installer Certificates: From Installer indicating that penetration firestopping systems have been installed in compliance with requirements and manufacturer's written instructions.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: A firm that has been approved by FM Approval according to FM Approval 4991, "Approval of Firestop Contractors," or been evaluated by UL and found to comply with its "Qualified Firestop Contractor Program Requirements."

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Test-Response Characteristics:

1. Perform penetration firestopping system tests by a qualified testing agency acceptable to authorities having jurisdiction.

2. Test per testing standards referenced in "Penetration Firestopping Systems" Article. Provide rated systems complying with the following requirements:

a. Penetration firestopping systems shall bear classification marking of a qualified testing agency.

1) UL in its "Fire Resistance Directory."

2) Intertek Group in its "Directory of Listed Building Products."

3) FM Approval in its "Approval Guide."

2.2 PENETRATION FIRESTOPPING SYSTEMS

A. Penetration Firestopping Systems: Systems that resist spread of fire, passage of smoke and other gases, and maintain original fire-resistance rating of construction penetrated. Penetration firestopping systems shall be compatible with one another, with the substrates forming openings, and with penetrating items if any.

B. Penetrations in Fire-Resistance-Rated Walls: Penetration firestopping systems with ratings determined per ASTM E814 or UL 1479, based on testing at a positive pressure differential of 0.01-inch wg.

1. F-Rating: Not less than the fire-resistance rating of constructions penetrated.

C. Penetrations in Horizontal Assemblies: Penetration firestopping systems with ratings determined per ASTM E814 or UL 1479, based on testing at a positive pressure differential of 0.01-inch wg.

1. F-Rating: At least one hour, but not less than the fire-resistance rating of constructions penetrated.

2. T-Rating: At least one hour, but not less than the fire-resistance rating of constructions penetrated except for floor penetrations within the cavity of a wall.

3. W-Rating: Provide penetration firestopping systems showing no evidence of water leakage when tested according to UL 1479.

D. Exposed Penetration Firestopping Systems: Flame-spread and smoke-developed indexes of less than 25 and 450, respectively, per ASTM E84.

1.

E. Accessories: Provide components for each penetration firestopping system that are needed to install fill materials and to maintain ratings required. Use only those components specified by penetration firestopping system manufacturer and approved by qualified testing and inspecting agency for conditions indicated.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Examine substrates and conditions, with Installer present, for compliance with requirements for opening configurations, penetrating items, substrates, and other conditions affecting performance of the Work.

B. General: Install penetration firestopping systems to comply with manufacturer's written installation instructions and published drawings for products and applications.

C. Install forming materials and other accessories of types required to support fill materials during their application and in the position needed to produce cross-sectional shapes and depths required to achieve fire ratings.

1. After installing fill materials and allowing them to fully cure, remove combustible forming materials and other accessories not forming permanent components of firestopping.

D. Install fill materials by proven techniques to produce the following results:

1. Fill voids and cavities formed by openings, forming materials, accessories and penetrating items to achieve required fire-resistance ratings.
2. Apply materials so they contact and adhere to substrates formed by openings and penetrating items.
3. For fill materials that will remain exposed after completing the Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

3.2 IDENTIFICATION

A. Wall Identification: Permanently label walls containing penetration firestopping systems with the words "FIRE AND/OR SMOKE BARRIER - PROTECT ALL OPENINGS," using lettering not less than 3 incheshigh and with minimum 0.375-inch strokes.

1. Locate in accessible concealed floor, floor-ceiling, or attic space at 15 feetfrom end of wall and at intervals not exceeding 30 feet.

B. Penetration Identification: Identify each penetration firestopping system with legible metal or plastic labels. Attach labels permanently to surfaces adjacent to and within 6 inches of penetration firestopping system edge so labels are visible to anyone seeking to remove penetrating items or firestopping systems. Use mechanical fasteners or self-adhering-type labels with adhesives capable of permanently bonding labels to surfaces on which labels are placed. Include the following information on labels:

1. The words "Warning - Penetration Firestopping - Do Not Disturb. Notify Building Management of Any Damage."
2. Contractor's name, address, and phone number.
3. Designation of applicable testing and inspecting agency.
4. Date of installation.
5. Manufacturer's name.
6. Installer's name.

3.3 FIELD QUALITY CONTROL

A. Owner will engage a qualified testing agency to perform tests and inspections according to ASTM E2174.

B. Where deficiencies are found or penetration firestopping system is damaged or removed because of testing, repair or replace penetration firestopping system to comply with requirements.

C. Proceed with enclosing penetration firestopping systems with other construction only after inspection reports are issued and installations comply with requirements.

END OF SECTION 078413

SECTION 079200

JOINT SEALANTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Latex joint sealants.

1.2 ACTION SUBMITTALS

A. Product Data: For each joint-sealant product.

B. Samples: For each kind and color of joint sealant required.

1.3 INFORMATIONAL SUBMITTALS

A. Product test reports.

B. Preconstruction laboratory test reports.

C. Preconstruction field-adhesion-test reports.

D. Field-adhesion-test reports.

E. Sample warranties.

1.4 QUALITY ASSURANCE

A. Testing Agency Qualifications: Qualified according to ASTM C1021 to conduct the testing indicated.

1.5 WARRANTY

A. Special Installer's Warranty: Installer agrees to repair or replace joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.

1. Warranty Period: Two years from date of Substantial Completion.

B. Special Manufacturer's Warranty: Manufacturer agrees to furnish joint sealants to repair or replace those joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.

1. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 JOINT SEALANTS, GENERAL

A. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

2.2 ACRYLIC LATEX JOINT SEALANTS

A. Acrylic Latex: Acrylic latex or siliconized acrylic latex, ASTM C834, Type OP, Grade NF.

2.3 JOINT-SEALANT BACKING

A. Cylindrical Sealant Backings: ASTM C1330, Type C (closed-cell material with a surface skin), and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.

B. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer.

2.4 MISCELLANEOUS MATERIALS

A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials.

C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:

1. Remove laitance and form-release agents from concrete.

2. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion.

B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience.

C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces.

3.2 INSTALLATION OF JOINT SEALANTS

A. General: Comply with ASTM C1193 and joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.

B. Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.

C. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.

D. Install sealants using proven techniques that comply with the following and at the same time backings are installed:

1. Place sealants so they directly contact and fully wet joint substrates.
2. Completely fill recesses in each joint configuration.
3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

E. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants to form smooth, uniform beads of configuration indicated. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.

1. Provide concave joint profile per Figure 8A in ASTM C1193 unless otherwise indicated.

3.3 FIELD QUALITY CONTROL

A. Sealants not evidencing adhesive failure from testing or noncompliance with other indicated requirements will be considered satisfactory. Remove sealants that fail to adhere to joint substrates during testing or to comply with other requirements. Retest failed applications until test results prove sealants comply with indicated requirements.

END OF SECTION 079200

SECTION 099123

INTERIOR PAINTING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes surface preparation and the application of paint systems on interior substrates.

1. Concrete.
2. Concrete masonry units (CMUs).
3. Steel and iron.

1.2 DEFINITIONS

A. MPI Gloss Level 1: Not more than five units at 60 degrees and 10 units at 85 degrees, according to ASTM D523.

B. MPI Gloss Level 2: Not more than 10 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D523.

C. MPI Gloss Level 3: 10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D523.

D. MPI Gloss Level 4: 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, according to ASTM D523.

E. MPI Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D523.

F. MPI Gloss Level 6: 70 to 85 units at 60 degrees, according to ASTM D523.

G. MPI Gloss Level 7: More than 85 units at 60 degrees, according to ASTM D523.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product. Include preparation requirements and application instructions.

1. Include Printout of current "MPI Approved Products List" for each product category specified, with the proposed product highlighted.

B. Samples: For each type of paint system and in each color and gloss of topcoat.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Products: Subject to compliance with requirements, provide one of the products.

2.2 PAINT, GENERAL

A. MPI Standards: Products shall comply with MPI standards indicated and shall be listed in its "MPI Approved Products Lists."

B. Material Compatibility:

1. Materials for use within each paint system shall be compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.

2. For each coat in a paint system, products shall be recommended in writing by topcoat manufacturers for use in paint system and on substrate indicated.

C. Colors: As indicated in a color schedule.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:

1. Concrete: 12 percent.

2. Fiber-Cement Board: 12 percent.

3. Masonry (Clay and CMUs): 12 percent.

4. Wood: 15 percent.

5. Gypsum Board: 12 percent.

6. Plaster: 12 percent.

C. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.

D. Proceed with coating application only after unsatisfactory conditions have been corrected.

1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates and paint systems indicated.

B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.

1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.

3.3 APPLICATION

A. Apply paints according to manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual."

B. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

C. Concrete Substrates, Nontraffic Surfaces:

1. Institutional Low-Odor/VOC Latex System:

a. Prime Coat: Primer sealer, interior, institutional low odor/VOC[.

b. Intermediate Coat: Latex, interior, institutional low odor/VOC, matching topcoat.

c. Topcoat: Latex, interior, institutional low odor/VOC, flat (MPI Gloss Level 1).

D. Concrete Substrates, Traffic Surfaces:

1. Latex Floor Enamel System :

a. Prime Coat: Floor paint, latex, matching topcoat.

b. Intermediate Coat: Floor paint, latex, matching topcoat.

c. Topcoat: Floor paint, latex, low gloss (maximum MPI Gloss Level 3)

E. CMU Substrates:

1. Institutional Low-Odor/VOC Latex System :

a. Block Filler: Block filler, latex, interior/exterior.

b. Intermediate Coat: Latex, interior, institutional low odor/VOC, matching topcoat.

c. Topcoat: Latex, interior, institutional low odor/VOC, flat (MPI Gloss Level 1).

d. Topcoat: Latex, interior, institutional low odor/VOC (MPI Gloss Level 2)

F. Steel Substrates:

1. Institutional Low-Odor/VOC Latex System:

a. Prime Coat: Primer, rust inhibitive, water based.

b. Intermediate Coat: Latex, interior, institutional low odor/VOC, matching topcoat.

c. Topcoat: Latex, interior, institutional low odor/VOC, flat (MPI Gloss Level 1).

d. Topcoat: Latex, interior, institutional low odor/VOC (MPI Gloss Level 2).

END OF SECTION 099123

SECTION 101423

ROOM-IDENTIFICATION PANEL SIGNAGE

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Room and Door signs.
2. First Responder Exterior Signs.
3. Emergency egress sign package.
4. Dual Language Signage

1.2 DESIGN CONSIDERATIONS

A. Provide educational signage (exterior and interior) either wall or post mounted to enhance and support the school's environmental literacy and curriculum. Signage should include the education aspect or facility features as a facility enhancement.

B. Mount signage at proper ADA height on latch side of door.

C. Where no wall space is provided at the latch side of the door, place on nearest adjacent wall so that person can approach to within 3 inches of signage without protrusions.

D. Regulatory Requirements: Comply with applicable provisions in ADA-ABA accessibility guidelines.

E. Interior Room Signs are to be flat plastic (6" x 6" base size) plaque with raised names/numbers and braille translations.

F. Provide ADA, acrylic panel sign for each interior door. Fixed room number should be included on each sign with fixed room name from the approved room name list. Room numbers on drawings hall match those ultimately used for the building.

G. Meet local Fire Marshal requirements for signage.

H. Emergency egress sign package must include each room or area exiting to outside, with a site plan describing emergency evacuation. Signs must be laminated.

I. See Appendix for list of appropriate room names for signage.

J. All buildings in the district should be considered for dual language signage needs.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Manufacturers:

1. Gemini, Inc.
2. Poblocki & Sons
3. Signs & Wonders, Inc.
4. The Supersine Company.

B. Room Signs:
   1. Type: Unframed
   2. Material: Cast acrylic Sheet
   3. Copy: Raised lettering
   4. First Responder exterior sign

C. Accessories:
   1. Adhesive: Double-sided tape, permanent adhesive
   2. Backing Plate: Matching acrylic blank plate if sign requires glass mounting.
   3. Concealed fasteners (for exterior signage)
      a. Stainless steel screws.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Plaque Mounted: Concealed.

B. Interior signage to be sealed to wall around perimeter with clear pick-resistant silicone sealant.

C. Dual Language Signage:
   1. If a school is determined to require dual language signage the following spaces shall be provide with dual language signage at a minimum:
      a. Health Suite
      b. Gymnasium
      c. Main Office Reception
      d. Cafeteria
      e. Stairs
      f. Media Center
      g. Group Restrooms throughout the building
      h. All spaces within the Community Center area.
         1) Additional sign locations may be considered if needed.
         2) Second language will be determined by City Schools.

D. Provide permanent signage at the following locations:
   1. Main shut off valve for the fire suppression system.
   2. Main electrical room.

E. First Responder Exterior Signs:
   1. Provide each exterior door and each Classroom. Mounted on the building facades.
   2. Exterior-grade solid sheet sign returns and back. Acrylic sheet.
   3. 8”H x 8”W Exterior Door sign size. Black background with 5”white numbers.
   4. 8”H x 16”W Exterior Door sign size. Black background with 5”white numbers.

5. Surface-applied, raised graphics: applied polymer characters. No braille.
6. Sign panel perimeter: finish edges smooth.
7. Edge condition: beveled.
8. Mounting:
    a. On masonry: concealed stainless steel screws and cleat. Caulk sign perimeter with clear sealant.
    b. On FRP doors: use high-bond exterior double-sided tape. Caulk sign perimeter with clear sealant.

END OF SECTION 101423

SECTION 26 0519

LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Building wires and cables rated 600 V and less.
2. Connectors, splices, and terminations rated 600 V and less.

B. Related Sections include the following:

1. Section 26 0513 "Medium-Voltage Cables" for single-conductor and multiconductor cables, cable splices, and terminations for electrical distribution systems with 2001 to 35,000 V.
2. Section 26 0519.13 "Undercarpet Electrical Power Cables" for flat cables for undercarpet installations.
3. Section 27 1500 "Communications Horizontal Cabling" for cabling used for voice and data circuits.

1.3 DEFINITIONS

A. EPDM: Ethylene-propylene-diene terpolymer rubber.

B. NBR: Acrylonitrile-butadiene rubber.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For testing agency.

B. Field quality-control test reports.

1.6 QUALITY ASSURANCE

A. Testing Agency Qualifications: An independent agency, with the experience and capability to conduct the testing indicated, that is a member company of the InterNational Electrical Testing Association or is a nationally recognized testing laboratory (NRTL) as defined by OSHA in 29 CFR 1910.7, and that is acceptable to authorities having jurisdiction.

1. Testing Agency's Field Supervisor: Person currently certified by the InterNational Electrical Testing Association or the National Institute for Certification in Engineering Technologies to supervise on-site testing specified in Part 3.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

C. Comply with NFPA 70.

PART 2 - PRODUCTS

2.1 CONDUCTORS AND CABLES

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Alcan Products Corporation; Alcan Cable Division.
2. American Insulated Wire Corp.; a Leviton Company.
3. General Cable Corporation.
4. Senator Wire & Cable Company.
5. Southwire Company.

C. Copper Conductors: Comply with NEMA WC 70.

D. Conductor Insulation: Comply with NEMA WC 70 for Types THHN-THWN.

E. Multiconductor Cable: Comply with NEMA WC 70 for armored cable, Type AC, metal-clad cable, Type MC with ground wire.

2.2 CONNECTORS AND SPLICES

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. AFC Cable Systems, Inc.
2. Hubbell Power Systems, Inc.
3. O-Z/Gedney; EGS Electrical Group LLC.
4. 3M; Electrical Products Division.
5. Tyco Electronics Corp.

C. Description: Factory-fabricated connectors and splices of size, ampacity rating, material, type, and class for application and service indicated.

PART 3 - EXECUTION

3.1 CONDUCTOR MATERIAL APPLICATIONS

A. Feeders: Copper. Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.

B. Branch Circuits: Copper. Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.

3.2 CONDUCTOR INSULATION AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS

A. Service Entrance: Type THHN-THWN, conductors in raceway.

B. Exposed Feeders: Type THHN-THWN, conductors in raceway.

C. Feeders Concealed in Ceilings, Walls, Partitions, and Crawlspaces: Type THHN-THWN, conductors in raceway.

D. Feeders Concealed in Concrete, below Slabs-on-Grade, and Underground: Type THHN-THWN, single conductors in raceway. Underground feeder cable, Type UF may be used for site lighting.

E. Exposed Branch Circuits, Including in Crawlspaces: Type THHN-THWN, conductors in raceway.

F. Branch Circuits Concealed in Ceilings, Walls, and Partitions: Type THHN-THWN, conductors in raceway.

G. Branch Circuits Concealed in Concrete, below Slabs-on-Grade, and Underground: Type THHN-THWN, conductors in raceway.

H. Cord Drops and Portable Appliance Connections: Type SO, hard service cord with stainless-steel, wire-mesh, strain relief device at terminations to suit application.

I. Class 1 Control Circuits: Type THHN-THWN, in raceway.

J. Class 2 Control Circuits: Type THHN-THWN, in raceway.

3.3 INSTALLATION OF CONDUCTORS AND CABLES

A. Conceal cables in finished walls, ceilings, and floors, unless otherwise indicated.

B. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.

C. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.

D. Install exposed cables parallel and perpendicular to surfaces of exposed structural members, and follow surface contours where possible.

E. Support cables according to Section 260529 "Hangers and Supports for Electrical Systems."

F. Identify and color-code conductors and cables according to Section 260553 "Identification for Electrical Systems."

3.4 CONNECTIONS

A. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

B. Make splices and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.

1. Use oxide inhibitor in each splice and tap conductor for aluminum conductors.

C. Wiring at Outlets: Install conductor at each outlet, with at least 6 inchesof slack.

3.5 SLEEVE AND SLEEVE-SEAL INSTALLATION FOR ELECTRICAL PENETRATIONS

A. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies. Comply with requirements in Section 26 0544 "Sleeves and Sleeve Seals for Electrical Raceways and Cabling."

3.6 FIRESTOPPING

A. Apply firestopping to electrical penetrations of fire-rated floor and wall assemblies to restore original fire-resistance rating of assembly according to Section 07 8413 "Penetration Firestopping."

3.7 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform tests and inspections and prepare test reports.

B. Perform tests and inspections and prepare test reports.

C. Tests and Inspections:

1. After installing conductors and cables and before electrical circuitry has been energized, test service entrance and feeder conductors, and conductors feeding the following critical equipment and services for compliance with requirements.

a. Emergency System Feeders.

b. MEMA System Feeders.

2. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.

3. Infrared Scanning: After Substantial Completion, but not more than 60 days after Final Acceptance, perform an infrared scan of each splice in cables and conductors No. 3 AWG and larger. Remove box and equipment covers so splices are accessible to portable scanner.

a. Follow-up Infrared Scanning: Perform an additional follow-up infrared scan of each splice 11 months after date of Substantial Completion.

b. Instrument: Use an infrared scanning device designed to measure temperature or to detect significant deviations from normal values. Provide calibration record for device.

c. Record of Infrared Scanning: Prepare a certified report that identifies splices checked and that describes scanning results. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.

D. Test Reports: Prepare a written report to record the following:

1. Test procedures used.
2. Test results that comply with requirements.
3. Test results that do not comply with requirements and corrective action taken to achieve compliance with requirements.

E. Remove and replace malfunctioning units and retest as specified above.

END OF SECTION

SECTION 26 0523

CONTROL-VOLTAGE ELECTRICAL POWER CABLES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. UTP cabling.
2. 50/125-micrometer, multimode optical fiber cabling.
3. RS-232 cabling.
4. RS-485 cabling.
5. Low-voltage control cabling.
6. Control-circuit conductors.
7. Identification products.

1.3 DEFINITIONS

A. Basket Cable Tray: A fabricated structure consisting of wire mesh bottom and side rails.

B. Channel Cable Tray: A fabricated structure consisting of a one-piece, ventilated-bottom or solid-bottom channel section.

C. EMI: Electromagnetic interference.

D. IDC: Insulation displacement connector.

E. Ladder Cable Tray: A fabricated structure consisting of two longitudinal side rails connected by individual transverse members (rungs).

F. Low Voltage: As defined in NFPA 70 for circuits and equipment operating at less than 50 V or for remote-control and signaling power-limited circuits.

G. Open Cabling: Passing telecommunications cabling through open space (e.g., between the studs of a wall cavity).

H. RCDD: Registered Communications Distribution Designer.

I. Solid-Bottom or Nonventilated Cable Tray: A fabricated structure consisting of integral or separate longitudinal side rails, and a bottom without ventilation openings.

J. Trough or Ventilated Cable Tray: A fabricated structure consisting of integral or separate longitudinal rails and a bottom having openings sufficient for the passage of air and using 75 percent or less of the plan area of the surface to support cables.

K. UTP: Unshielded twisted pair.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: For cable tray layout, showing cable tray route to scale, with relationship between the tray and adjacent structural, electrical, and mechanical elements. Include the following:

1. Vertical and horizontal offsets and transitions.
2. Clearances for access above and to side of cable trays.
3. Vertical elevation of cable trays above the floor or bottom of ceiling structure.
4. Load calculations to show dead and live loads as not exceeding manufacturer's rating for tray and its support elements.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified layout technician, installation supervisor, and field inspector.

B. Source quality-control reports.

C. Field quality-control reports.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For wire and cable to include in maintenance manuals.

1.7 QUALITY ASSURANCE

A. Testing Agency Qualifications: Member company of an NRTL.

1. Testing Agency's Field Supervisor: Currently certified by BICSI as an RCDD to supervise on-site testing.

B. Surface-Burning Characteristics: As determined by testing identical products according to ASTM E 84 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Flame-Spread Index: 25 or less.
2. Smoke-Developed Index: 50 or less.

C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Test cables upon receipt at Project site.

1. Test optical fiber cable to determine the continuity of the strand end to end. Use optical fiber flashlight.
2. Test optical fiber cable on reels. Use an optical time domain reflectometer to verify the cable length and locate cable defects, splices, and connector; include the loss value of each. Retain test data and include the record in maintenance data.
3. Test each pair of UTP cable for open and short circuits.

1.9 PROJECT CONDITIONS

A. Environmental Limitations: Do not deliver or install UTP and optical fiber cables and connecting materials until wet work in spaces is complete and dry, and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.

PART 2 - PRODUCTS

2.1 PATHWAYS

A. Support of Open Cabling: NRTL labeled for support of Category 6 cabling, designed to prevent degradation of cable performance and pinch points that could damage cable.

1. Support brackets with cable tie slots for fastening cable ties to brackets.
2. Lacing bars, spools, J-hooks, and D-rings.
3. Straps and other devices.

B. Cable Trays:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Cable Management Solutions, Inc.
b. Cablofil Inc.
c. Cooper B-Line, Inc.
d. Cope - Tyco/Allied Tube & Conduit.
e. GS Metals Corp.

2. Cable Tray Materials: Metal, suitable for indoors and protected against corrosion by electroplated zinc galvanizing, complying with ASTM B 633, Type 1, not less than 0.000472 inch thick.

a. Basket Cable Trays: 6 inches wide and 2 inches deep. Wire mesh spacing shall not exceed 2 by 4 inches.
b. Trough or Ventilated Cable Trays: Nominally 6 inches wide.
c. Ladder Cable Trays: Nominally 18 inches wide, and a rung spacing of 12 inches.
d. Channel Cable Trays: One-piece construction, nominally 4 inches wide. Slot spacing shall not exceed 4-1/2 inches o.c.
e. Solid-Bottom or Nonventilated Cable Trays: One-piece construction, nominally 12 inches wide. Provide with solid covers.

C. Conduit and Boxes: Comply with requirements in Section 260533 "Raceways and Boxes for Electrical Systems." Flexible metal conduit shall not be used.

1. Outlet boxes shall be no smaller than 2 inches wide, 3 inches high, and 2-1/2 inches deep.

2.2 BACKBOARDS

A. Description: Plywood, fire-retardant treated, 3/4 by 48 by 96 inches. Comply with requirements for plywood backing panels in Section 061000 "Rough Carpentry."

2.3 UTP CABLE

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Belden CDT Inc.; Electronics Division.
2. Berk-Tek; a Nexans company.
3. CommScope, Inc.
4. Draka USA.
5. Genesis Cable Products; Honeywell International, Inc.
6. KRONE Incorporated.
7. Mohawk; a division of Belden CDT.
8. Nordex/CDT; a subsidiary of Cable Design Technologies.
9. Superior Essex Inc.
10. SYSTIMAX Solutions; a CommScope, Inc. brand.
11. 3M.
12. Tyco Electronics/AMP Netconnect; Tyco International Ltd.

B. Description: 100-ohm, four-pair UTP, formed into 25-pair binder groups covered with a blue thermoplastic jacket.

1. Comply with ICEA S-90-661 for mechanical properties.
2. Comply with TIA/EIA-568-B.1 for performance specifications.
3. Comply with TIA/EIA-568-B.2, Category 6.
4. Listed and labeled by an NRTL acceptable to authorities having jurisdiction as complying with UL 444 and NFPA 70 for the following types:

a. Communications, General Purpose: Type CM or Type CMG; or Type MPP, Type CMP, Type MPR, Type CMR, Type MP, or Type MPG.

b. Communications, Plenum Rated: Type CMP or Type MPP, complying with NFPA 262.

c. Communications, Riser Rated: Type CMR; or Type MPP, Type CMP, or Type MPR; complying with UL 1666.

d. Communications, Limited Purpose: Type CMX; or Type MPP, Type CMP, Type MPR, Type CMR, Type MP, Type MPG, Type CM, or Type CMG.

e. Multipurpose: Type MP or Type MPG; or Type MPP or Type MPR.

f. Multipurpose, Plenum Rated: Type MPP, complying with NFPA 262.

g. Multipurpose, Riser Rated: Type MPR or Type MPP, complying with UL 1666.

2.4 UTP CABLE HARDWARE

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. American Technology Systems Industries, Inc.
2. Dynacom Corporation.
3. Hubbell Premise Wiring.
4. KRONE Incorporated.
5. Leviton Voice & Data Division.
6. Molex Premise Networks; a division of Molex, Inc.
7. Nordex/CDT; a subsidiary of Cable Design Technologies.
8. Panduit Corp.
9. Siemon Co. (The).
10. Tyco Electronics/AMP Netconnect; Tyco International Ltd.

B. UTP Cable Connecting Hardware: IDC type, using modules designed for punch-down caps or tools. Cables shall be terminated with connecting hardware of the same category or higher.

C. Connecting Blocks: 110 style for Category 6. Provide blocks for the number of cables terminated on the block, plus 25 percent spare; integral with connector bodies, including plugs and jacks where indicated.

2.5 OPTICAL FIBER CABLE

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Berk-Tek; a Nexans company.
2. CommScope, Inc.
3. Corning Cable Systems.
4. General Cable Technologies Corporation.
5. Mohawk; a division of Belden CDT.
6. Nordex/CDT; a subsidiary of Cable Design Technologies.
7. Optical Connectivity Solutions Division; Emerson Network Power.
8. Superior Essex Inc.
9. SYSTIMAX Solutions; a CommScope, Inc. brand.
10. 3M.
11. Tyco Electronics/AMP Netconnect; Tyco International Ltd.

B. Description: Multimode, 62.5/125-micrometer, 24 number-fiber, nonconductive, tight buffer, optical fiber cable.

1. Comply with ICEA S-83-596 for mechanical properties.
2. Comply with TIA/EIA-568-B.3 for performance specifications.
3. Comply with TIA/EIA-492AAAA-A for detailed specifications.
4. Listed and labeled by an NRTL acceptable to authorities having jurisdiction as complying with UL 444, UL 1651, and NFPA 70 for the following types:

    a. General Purpose, Nonconductive: Type OFN or OFNG, or Type OFNR or Type OFNP.

b. Plenum Rated, Nonconductive: Type OFNP, complying with NFPA 262.

c. Riser Rated, Nonconductive: Type OFNR or Type OFNP, complying with UL 1666.

d. General Purpose, Conductive: Type OFC or Type OFCG; or Type OFNG, Type OFN, Type OFCR, Type OFNR, Type OFCP, or Type OFNP.

e. Plenum Rated, Conductive: Type OFCP or Type OFNP, complying with NFPA 262.

f. Riser Rated, Conductive: Type OFCR; or Type OFNR, Type OFCP, or Type OFNP; complying with UL 1666.

5. Conductive cable shall be steel-armored type.

6. Maximum Attenuation: 3.5 dB/km at 850 nm; 1.5 dB/km at 1300 nm.

7. Minimum Modal Bandwidth: 160 MHz-km at 850 nm; 500 MHz-km at 1300 nm.

C. Jacket:

1. Jacket Color: Orange for 62.5/125-micrometer cable.

2. Cable cordage jacket, fiber, unit, and group color shall be according to TIA/EIA-598-B.

3. Imprinted with fiber count, fiber type, and aggregate length at regular intervals not to exceed 40 inches.

2.6 OPTICAL FIBER CABLE HARDWARE

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. ADC.

2. American Technology Systems Industries, Inc.

3. Berk-Tek; a Nexans company.

4. Corning Cable Systems.

5. Dynacom Corporation.

6. Hubbell Premise Wiring.

7. Molex Premise Networks; a division of Molex, Inc.

8. Nordex/CDT; a subsidiary of Cable Design Technologies.

9. Optical Connectivity Solutions Division; Emerson Network Power.

10. Siemon Co. (The).

B. Cable Connecting Hardware: Comply with the Fiber Optic Connector Intermateability Standards (FOCIS) specifications of TIA/EIA-604-2, TIA/EIA-604-3-A, and TIA/EIA-604-12. Comply with TIA/EIA-568-B.3.

1. Quick-connect, simplex and duplex, Type SC or Type ST connectors. Insertion loss not more than 0.75 dB.

2. Type SFF connectors may be used in termination racks, panels, and equipment packages.

2.7 RS-232 CABLE

A. Standard Cable: NFPA 70, Type CM.

1. Paired, two pairs, No. 22 AWG, stranded (7x30) tinned-copper conductors.
2. Polypropylene insulation.
3. Individual aluminum foil-polyester tape shielded pairs with 100 percent shield coverage.
4. PVC jacket.
5. Pairs are cabled on common axis with No. 24 AWG, stranded (7x32) tinned-copper drain wire.
6. Flame Resistance: Comply with UL 1581.

B. Plenum-Rated Cable: NFPA 70, Type CMP.

1. Paired, two pairs, No. 22 AWG, stranded (7x30) tinned-copper conductors.
2. Plastic insulation.
3. Individual aluminum foil-polyester tape shielded pairs with 100 percent shield coverage.
4. Plastic jacket.
5. Pairs are cabled on common axis with No. 24 AWG, stranded (7x32) tinned-copper drain wire.
6. Flame Resistance: Comply with NFPA 262.

2.8 RS-485 CABLE

A. Standard Cable: NFPA 70, Type CM or Type CMG.

1. Paired, two pairs, twisted, No. 22 AWG, stranded (7x30) tinned-copper conductors.
2. PVC insulation.
3. Unshielded.
4. PVC jacket.
5. Flame Resistance: Comply with UL 1581.

B. Plenum-Rated Cable: NFPA 70, Type CMP.

1. Paired, two pairs, No. 22 AWG, stranded (7x30) tinned-copper conductors.
2. Fluorinated ethylene propylene insulation.
3. Unshielded.
4. Fluorinated ethylene propylene jacket.
5. Flame Resistance: NFPA 262, Flame Test.

2.9 LOW-VOLTAGE CONTROL CABLE

A. Paired Cable: NFPA 70, Type CMG.

1. One pair, twisted, No. 16 AWG, stranded (19x29) tinned-copper conductors.
2. PVC insulation.
3. Unshielded.
4. PVC jacket.
5. Flame Resistance: Comply with UL 1581.

B. Plenum-Rated, Paired Cable: NFPA 70, Type CMP.

1. One pair, twisted, No. 16 AWG, stranded (19x29) tinned-copper conductors.
2. PVC insulation.
3. Unshielded.
4. PVC jacket.
5. Flame Resistance: Comply with NFPA 262.

C. Paired Cable: NFPA 70, Type CMG.

1. One pair, twisted, No. 18 AWG, stranded (19x30) tinned-copper conductors.
2. PVC insulation.
3. Unshielded.
4. PVC jacket.
5. Flame Resistance: Comply with UL 1581.

D. Plenum-Rated, Paired Cable: NFPA 70, Type CMP.

1. One pair, twisted, No. 18 AWG, stranded (19x30) tinned-copper conductors.
2. Fluorinated ethylene propylene insulation.
3. Unshielded.
4. Plastic jacket.
5. Flame Resistance: NFPA 262, Flame Test.

2.10 CONTROL-CIRCUIT CONDUCTORS

A. Class 1 Control Circuits: Stranded copper, Type THHN-THWN, in raceway, complying with UL 83.

B. Class 2 Control Circuits: Stranded copper, Type THHN-THWN, in raceway or Type XHHN, in raceway or power-limited tray cable, in cable tray, complying with UL 83 & UL 44 where applicable.

C. Class 3 Remote-Control and Signal Circuits: Stranded copper, Type TW or Type TF, complying with UL 83.

2.11 IDENTIFICATION PRODUCTS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Brady Corporation.
2. HellermannTyton.
3. Kroy LLC.
4. Panduit Corp.

B. Comply with UL 969 for a system of labeling materials, including label stocks, laminating adhesives, and inks used by label printers.

C. Comply with requirements in Section 26 0553 "Identification for Electrical Systems."

2.12 SOURCE QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to evaluate cables.

B. Factory test UTP and optical fiber cables on reels according to TIA/EIA-568-B.1.

C. Factory test UTP cables according to TIA/EIA-568-B.2.

D. Factory test multimode optical fiber cables according to TIA/EIA-526-14-A and TIA/EIA-568-B.3.

E. Cable will be considered defective if it does not pass tests and inspections.

F. Prepare test and inspection reports.

PART 3 - EXECUTION

3.1 INSTALLATION OF PATHWAYS

A. Cable Trays: Comply with NEMA VE 2 and TIA/EIA-569-A-7.

B. Comply with TIA/EIA-569-A for pull-box sizing and length of conduit and number of bends between pull points.

C. Comply with requirements in Section 260533 "Raceways and Boxes for Electrical Systems" for installation of conduits and wireways.

D. Install manufactured conduit sweeps and long-radius elbows if possible.

E. Pathway Installation in Equipment Rooms:

1. Position conduit ends adjacent to a corner on backboard if a single piece of plywood is installed or in the corner of room if multiple sheets of plywood are installed around perimeter walls of room.
2. Install cable trays to route cables if conduits cannot be located in these positions.
3. Secure conduits to backboard if entering room from overhead.
4. Extend conduits 3 inches above finished floor.
5. Install metal conduits with grounding bushings and connect with grounding conductor to grounding system.

F. Backboards: Install backboards with 96-inch dimension vertical. Butt adjacent sheets tightly and form smooth gap-free corners and joints.

3.2 INSTALLATION OF CONDUCTORS AND CABLES

A. Comply with NECA 1.

B. General Requirements for Cabling:

1. Comply with TIA/EIA-568-B.1.
2. Comply with BICSI ITSIM, Ch. 6, "Cable Termination Practices."
3. Terminate all conductors; no cable shall contain unterminated elements. Make terminations only at indicated outlets, terminals, and cross-connect and patch panels.
4. Cables may not be spliced. Secure and support cables at intervals not exceeding 30 inches and not more than 6 inches from cabinets, boxes, fittings, outlets, racks, frames, and terminals.

5. Bundle, lace, and train conductors to terminal points without exceeding manufacturer's limitations on bending radii, but not less than radii specified in BICSI ITSIM, "Cabling Termination Practices" Chapter. Install lacing bars and distribution spools.

6. Do not install bruised, kinked, scored, deformed, or abraded cable. Do not splice cable between termination, tap, or junction points. Remove and discard cable if damaged during installation and replace it with new cable.

7. Cold-Weather Installation: Bring cable to room temperature before dereeling. Heat lamps shall not be used for heating.

8. Pulling Cable: Comply with BICSI ITSIM, Ch. 4, "Pulling Cable." Monitor cable pull tensions.

C. UTP Cable Installation:

1. Comply with TIA/EIA-568-B.2.

2. Install 110-style IDC termination hardware unless otherwise indicated.

3. Do not untwist UTP cables more than 1/2 inch from the point of termination to maintain cable geometry.

D. Installation of Control-Circuit Conductors:

1. Install wiring in raceways. Comply with requirements specified in Section 260533 "Raceways and Boxes for Electrical Systems."

E. Optical Fiber Cable Installation:

1. Comply with TIA/EIA-568-B.3.

2. Cable shall be terminated on connecting hardware that is rack or cabinet mounted.

F. Open-Cable Installation:

1. Install cabling with horizontal and vertical cable guides in telecommunications spaces with terminating hardware and interconnection equipment.

2. Suspend copper cable not in a wireway or pathway a minimum of 8 inches above ceilings by cable supports not more than 60 inches apart.

3. Cable shall not be run through structural members or in contact with pipes, ducts, or other potentially damaging items.

G. Installation of Cable Routed Exposed under Raised Floors:

1. Install plenum-rated cable only.

2. Install cabling after the flooring system has been installed in raised floor areas.

3. Coil cable 72 inches long shall be neatly coiled not less than 12 inches in diameter below each feed point.

H. Separation from EMI Sources:

1. Comply with BICSI TDMM and TIA/EIA-569-A recommendations for separating unshielded copper voice and data communication cable from potential EMI sources, including electrical power lines and equipment.

2. Separation between open communications cables or cables in nonmetallic raceways and unshielded power conductors and electrical equipment shall be as follows:

a. Electrical Equipment Rating Less Than 2 kVA: A minimum of 5 inches.

b. Electrical Equipment Rating between 2 and 5 kVA: A minimum of 12 inches.

c. Electrical Equipment Rating More Than 5 kVA: A minimum of 24 inches.

3. Separation between communications cables in grounded metallic raceways and unshielded power lines or electrical equipment shall be as follows:

a. Electrical Equipment Rating Less Than 2 kVA: A minimum of 2-1/2 inches.

b. Electrical Equipment Rating between 2 and 5 kVA: A minimum of 6 inches.

c. Electrical Equipment Rating More Than 5 kVA: A minimum of 12 inches.

4. Separation between communications cables in grounded metallic raceways and power lines and electrical equipment located in grounded metallic conduits or enclosures shall be as follows:

a. Electrical Equipment Rating Less Than 2 kVA: No requirement.

b. Electrical Equipment Rating between 2 and 5 kVA: A minimum of 3 inches.

c. Electrical Equipment Rating More Than 5 kVA: A minimum of 6 inches.

5. Separation between Cables and Electrical Motors and Transformers, 5 kVA or HP and Larger: A minimum of 48 inches.

6. Separation between Cables and Fluorescent Fixtures: A minimum of 5 inches.

3.3 REMOVAL OF CONDUCTORS AND CABLES

A. Remove abandoned conductors and cables.

3.4 CONTROL-CIRCUIT CONDUCTORS

A. Minimum Conductor Sizes:

1. Class 1 remote-control and signal circuits, No 14 AWG.

2. Class 2 low-energy, remote-control, and signal circuits, No. 16 AWG.

3. Class 3 low-energy, remote-control, alarm, and signal circuits, No 12 AWG.

3.5 FIRESTOPPING

A. Comply with requirements in Section 078413 "Penetration Firestopping."

B. Comply with TIA/EIA-569-A, Annex A, "Firestopping."

C. Comply with BICSI TDMM, "Firestopping Systems" Article.

3.6 GROUNDING

A. For data communication wiring, comply with ANSI-J-STD-607-A and with BICSI TDMM, "Grounding, Bonding, and Electrical Protection" Chapter.

B. For low-voltage wiring and cabling, comply with requirements in Section 260526 "Grounding and Bonding for Electrical Systems."

3.7 IDENTIFICATION

A. Identify system components, wiring, and cabling according to TIA/EIA-606-A. Comply with requirements for identification specified in Section 260553 "Identification for Electrical Systems."

3.8 FIELD QUALITY CONTROL

A. Testing Agency: **Engage** a qualified testing agency to perform tests and inspections.

B. Perform tests and inspections.

C. Tests and Inspections:

1. Visually inspect UTP and optical fiber cable jacket materials for UL or third-party certification markings. Inspect cabling terminations to confirm color-coding for pin assignments, and inspect cabling connections to confirm compliance with TIA/EIA-568-B.1.

2. Visually inspect cable placement, cable termination, grounding and bonding, equipment and patch cords, and labeling of all components.

3. Test UTP cabling for DC loop resistance, shorts, opens, intermittent faults, and polarity between conductors. Test operation of shorting bars in connection blocks. Test cables after termination but not after cross connection.

   a. Test instruments shall meet or exceed applicable requirements in TIA/EIA-568-B.2. Perform tests with a tester that complies with performance requirements in "Test Instruments (Normative)" Annex, complying with measurement accuracy specified in "Measurement Accuracy (Informative)" Annex. Use only test cords and adapters that are qualified by test equipment manufacturer for channel or link test configuration.

4. Optical Fiber Cable Tests:

   a. Test instruments shall meet or exceed applicable requirements in TIA/EIA-568-B.1. Use only test cords and adapters that are qualified by test equipment manufacturer for channel or link test configuration.

   b. Link End-to-End Attenuation Tests:

      1) Multimode Link Measurements: Test at 850 or 1300 nm in one direction according to TIA/EIA-526-14-A, Method B, One Reference Jumper.

      2) Attenuation test results for links shall be less than 2.0 dB. Attenuation test results shall be less than that calculated according to equation in TIA/EIA-568-B.1.

D. Document data for each measurement. Print data for submittals in a summary report that is formatted using Table 10.1 in BICSI TDMM as a guide, or transfer the data from the instrument to the computer, save as text files, print, and submit.

E. End-to-end cabling will be considered defective if it does not pass tests and inspections.

F. Prepare test and inspection reports.

END OF SECTION

SECTION 26 0526

GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes: Grounding systems and equipment.

B. Section includes grounding systems and equipment, plus the following special applications:

1. Overhead-line grounding.
2. Underground distribution grounding.
3. Ground bonding common with lightning protection system.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

1.4 INFORMATIONAL SUBMITTALS

A. Informational Submittals: Plans showing dimensioned as-built locations of grounding features specified in "Field Quality Control" Article, including the following:

1. Test wells.
2. Ground rods.
3. Ground rings.
4. Grounding arrangements and connections for separately derived systems.
5. Grounding for sensitive electronic equipment.

B. Qualification Data: For qualified testing agency and testing agency's field supervisor.

C. Field quality-control reports.

1.5 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For grounding to include in emergency, operation, and maintenance manuals. In addition to items specified in Section 017823 "Operation and Maintenance Data," include the following:

1. Instructions for periodic testing and inspection of grounding features at test wells, ground rings, grounding connections for separately derived systems based on NETA MTS & NFPA 70B.

    a. Tests shall determine if ground-resistance or impedance values remain within specified maximums, and instructions shall recommend corrective action if values do not.
    b. Include recommended testing intervals.

1.6 QUALITY ASSURANCE

A. Testing Agency Qualifications: Member company of NETA and/or NRTL.

1. Testing Agency's Field Supervisor: Currently certified by NETA to supervise on-site testing.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

C. Comply with UL 467 for grounding and bonding materials and equipment.

PART 2 - PRODUCTS

2.1 CONDUCTORS

A. Insulated Conductors: Copper or tinned-copper wire or cable insulated for 600 V unless otherwise required by applicable Code or authorities having jurisdiction.

B. Bare Copper Conductors:

1. Solid Conductors: ASTM B 3.
2. Stranded Conductors: ASTM B 8.
3. Tinned Conductors: ASTM B 33.
4. Bonding Cable: 28 kcmil, 14 strands of No. 17 AWG conductor, 1/4 inch (6 mm) in diameter.
5. Bonding Conductor: No. 4 or No. 6 AWG, stranded conductor.
6. Bonding Jumper: Copper tape, braided conductors terminated with copper ferrules; 1-5/8 inches (41 mm) wide and 1/16 inch (1.6 mm) thick.
7. Tinned Bonding Jumper: Tinned-copper tape, braided conductors terminated with copper ferrules; 1-5/8 inches (41 mm) wide and 1/16 inch (1.6 mm) thick.

C. Bare Grounding Conductor and Conductor Protector for Wood Poles:

1. No. 4 AWG minimum, soft-drawn copper.
2. Conductor Protector: Half-round PVC or wood molding; if wood, use pressure-treated fir, cypress, or cedar.

D. Grounding Bus: Predrilled rectangular bars of annealed copper, 1/4 by 4 inches (6.3 by 100 mm) in cross section, with 9/32-inch (7.14-mm) holes spaced 1-1/8 inches (28 mm) apart. Stand-off insulators for mounting shall comply with UL 891 for use in switchboards, 600 V. Lexan or PVC, impulse tested at 5000 V.

2.2 CONNECTORS

A. Listed and labeled by an NRTL acceptable to authorities having jurisdiction for applications in which used and for specific types, sizes, and combinations of conductors and other items connected.

B. Bolted Connectors for Conductors and Pipes: Copper or copper alloy, pressure type with at least two bolts.

1. Pipe Connectors: Clamp type, sized for pipe.

C. Welded Connectors: Exothermic-welding kits of types recommended by kit manufacturer for materials being joined and installation conditions.

D. Bus-bar Connectors: Mechanical type, cast silicon bronze, solderless exothermic-type wire terminals, and long-barrel, two-bolt connection to ground bus bar.

2.3 GROUNDING ELECTRODES

A. Ground Rods: Copper-clad

B. Steel 3/4 inch by 10 feet (19 mm by 3 m) in diameter.

C. Chemical-Enhanced Grounding Electrodes: Copper tube, straight or L-shaped, charged with nonhazardous electrolytic chemical salts.

1. Termination: Factory-attached No. 4/0 AWG bare conductor at least 48 inches (1200 mm) long.
2. Backfill Material: Electrode manufacturer's recommended material.

PART 3 - EXECUTION

3.1 APPLICATIONS

A. Conductors: Install solid conductor for No. 8 AWG and smaller, and stranded conductors for No. 6 AWG and larger unless otherwise indicated.

B. Underground Grounding Conductors: Install bare copper conductor, No. 2/0 AWG minimum.

1. Bury at least 24 inches (600 mm) below grade.
2. Duct-Bank Grounding Conductor: Bury 12 inches (300 mm) above duct bank when indicated as part of duct-bank installation.

C. Isolated Grounding Conductors: Green-colored insulation with continuous yellow stripe. On feeders with isolated ground, identify grounding conductor where visible to normal inspection, with alternating bands of green and yellow tape, with at least three bands of green and two bands of yellow.

D. Grounding Bus: Install in electrical and telephone equipment rooms, in rooms housing service equipment, and elsewhere as indicated.

1. Install bus on insulated spacers 2 inches (50 mm) minimum from wall, 6 inches (150 mm) above finished floor unless otherwise indicated.
2. Where indicated on both sides of doorways, route bus up to top of door frame, across top of doorway, and down to specified height above floor; connect to horizontal bus.

E. Conductor Terminations and Connections:

1. Pipe and Equipment Grounding Conductor Terminations: Bolted connectors.
2. Underground Connections: Welded connectors except at test wells and as otherwise indicated.
3. Connections to Ground Rods at Test Wells: Bolted connectors.
4. Connections to Structural Steel: Welded connectors.

3.2 GROUNDING OVERHEAD LINES

A. Comply with IEEE C2 grounding requirements.

B. Install two parallel ground rods if resistance to ground by a single, ground-rod electrode exceeds 25 ohms.

C. Drive ground rods until tops are 12 inches (300 mm) below finished grade in undisturbed earth.

D. Ground-Rod Connections: Install bolted connectors for underground connections and connections to rods.

E. Lightning Arrester Grounding Conductors: Separate from other grounding conductors.

F. Secondary Neutral and Transformer Enclosure: Interconnect and connect to grounding conductor.

G. Protect grounding conductors running on surface of wood poles with molding extended from grade level up to and through communication service and transformer spaces.

3.3 GROUNDING UNDERGROUND DISTRIBUTION SYSTEM COMPONENTS

A. Comply with IEEE C2 grounding requirements.

B. Grounding Manholes and Handholes: Install a driven ground rod through manhole or handhole floor, close to wall, and set rod depth so 4 inches (100 mm) will extend above finished floor. If necessary, install ground rod before manhole is placed and provide No. 1/0 AWG bare, tinned-copper conductor from ground rod into manhole through a waterproof sleeve in manhole wall. Protect ground rods passing through concrete floor with a double wrapping of pressure-sensitive insulating tape or heat-shrunk insulating sleeve from 2 inches (50 mm) above to 6 inches (150 mm) below concrete. Seal floor opening with waterproof, nonshrink grout.

C. Grounding Connections to Manhole Components: Bond exposed-metal parts such as inserts, cable racks, pulling irons, ladders, and cable shields within each manhole or handhole, to ground rod or grounding conductor. Make connections with No. 4 AWG minimum, stranded, hard-drawn copper bonding conductor. Train conductors level or plumb around corners and fasten to manhole walls. Connect to cable armor and cable shields according to written instructions by manufacturer of splicing and termination kits.

D. Pad-Mounted Transformers and Switches: Install two ground rods and ground ring around the pad. Ground pad-mounted equipment and noncurrent-carrying metal items associated with substations by connecting them to underground cable and grounding electrodes. Install tinned-copper conductor not less than No. 2 AWG for ground ring and for taps to equipment grounding terminals. Bury ground ring not less than 6 inches (150 mm) from the foundation.

3.4 EQUIPMENT GROUNDING

A. Install insulated equipment grounding conductors with all feeders and branch circuits.

B. Install insulated equipment grounding conductors with the following items, in addition to those required by NFPA 70:

1. Feeders and branch circuits.
2. Lighting circuits.
3. Receptacle circuits.
4. Single-phase motor and appliance branch circuits.
5. Three-phase motor and appliance branch circuits.
6. Flexible raceway runs.
7. Armored and metal-clad cable runs.
8. Busway Supply Circuits: Install insulated equipment grounding conductor from grounding bus in the switchgear, switchboard, or distribution panel to equipment grounding bar terminal on busway.
9. Computer and Rack-Mounted Electronic Equipment Circuits: Install insulated equipment grounding conductor in branch-circuit runs from equipment-area power panels and power-distribution units.

C. Air-Duct Equipment Circuits: Install insulated equipment grounding conductor to duct-mounted electrical devices operating at 120 V and more, including air cleaners, heaters, dampers, humidifiers, and other duct electrical equipment. Bond conductor to each unit and to air duct and connected metallic piping.

D. Water Heater, Heat-Tracing, and Antifrost Heating Cables: Install a separate insulated equipment grounding conductor to each electric water heater and heat-tracing cable. Bond conductor to heater units, piping, connected equipment, and components.

E. Isolated Grounding Receptacle Circuits: Install an insulated equipment grounding conductor connected to the receptacle grounding terminal. Isolate conductor from raceway and from panelboard grounding terminals. Terminate at equipment grounding conductor terminal of the applicable derived system or service unless otherwise indicated.

F. Isolated Equipment Enclosure Circuits: For designated equipment supplied by a branch circuit or feeder, isolate equipment enclosure from supply circuit raceway with a nonmetallic raceway fitting listed for the purpose. Install fitting where raceway enters enclosure, and install a separate insulated equipment grounding conductor. Isolate conductor from raceway and from panelboard grounding terminals. Terminate at equipment grounding conductor terminal of the applicable derived system or service unless otherwise indicated.

G. Signal and Communication Equipment: In addition to grounding and bonding required by NFPA 70, provide a separate grounding system complying with requirements in TIA/ATIS J-STD-607-A.

1. For telephone, alarm, voice and data, and other communication equipment, provide No. 4 AWG minimum insulated grounding conductor in raceway from grounding electrode system to each service location, terminal cabinet, wiring closet, and central equipment location.
2. Service and Central Equipment Locations and Wiring Closets: Terminate grounding conductor on a 1/4-by-4-by-12-inch (6.3-by-100-by-300-mm) grounding bus.
3. Terminal Cabinets: Terminate grounding conductor on cabinet grounding terminal.

H. Metal or Wood Poles Supporting Outdoor Lighting Fixtures: Install grounding electrode and a separate insulated equipment grounding conductor in addition to grounding conductor installed with branch-circuit conductors.

3.5 INSTALLATION

A. Grounding Conductors: Route along shortest and straightest paths possible unless otherwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.

B. Ground Bonding Common with Lightning Protection System: Comply with NFPA 780 and UL 96 when interconnecting with lightning protection system. Bond electrical power system ground directly to lightning protection system grounding conductor at closest point to electrical service grounding electrode. Use bonding conductor sized same as system grounding electrode conductor, and install in conduit.

C. Ground Rods: Drive rods until tops are 2 inches (50 mm) below finished floor or final grade unless otherwise indicated.

1. Interconnect ground rods with grounding electrode conductor below grade and as otherwise indicated. Make connections without exposing steel or damaging coating if any.
2. For grounding electrode system, install at least three rods spaced at least one-rod length from each other and located at least the same distance from other grounding electrodes, and connect to the service grounding electrode conductor.

D. Test Wells: Ground rod driven through drilled hole in bottom of handhole. Handholes are specified in Section 260543 "Underground Ducts and Raceways for Electrical Systems," and shall be at least 12 inches (300 mm) deep, with cover.

1. Test Wells: Install at least one test well for each service unless otherwise indicated. Install at the ground rod electrically closest to service entrance. Set top of test well flush with finished grade or floor.

E. Bonding Straps and Jumpers: Install in locations accessible for inspection and maintenance except where routed through short lengths of conduit.

1. Bonding to Structure: Bond straps directly to basic structure, taking care not to penetrate any adjacent parts.
2. Bonding to Equipment Mounted on Vibration Isolation Hangers and Supports: Install bonding so vibration is not transmitted to rigidly mounted equipment.
3. Use exothermic-welded connectors for outdoor locations; if a disconnect-type connection is required, use a bolted clamp.

F. Grounding and Bonding for Piping:

1. Metal Water Service Pipe: Install insulated copper grounding conductors, in conduit, from building's main service equipment, or grounding bus, to main metal water service entrances to building. Connect grounding conductors to main metal water service pipes; use a bolted clamp connector or bolt a lug-type connector to a pipe flange by using one of the lug bolts of the flange. Where a dielectric main water fitting is installed, connect grounding conductor on street side of fitting. Bond metal grounding conductor conduit or sleeve to conductor at each end.
2. Water Meter Piping: Use braided-type bonding jumpers to electrically bypass water meters. Connect to pipe with a bolted connector.
3. Bond each aboveground portion of gas piping system downstream from equipment shutoff valve.

G. Bonding Interior Metal Ducts: Bond metal air ducts to equipment grounding conductors of associated fans, blowers, electric heaters, and air cleaners. Install bonding jumper to bond across flexible duct connections to achieve continuity.

H. Grounding for Steel Building Structure: Install a driven ground rod at base of each corner column and at intermediate exterior columns at distances not more than 60 feet (18 m) apart.

I. Ground Ring: Install a grounding conductor, electrically connected to each building structure ground rod and to each steel column, extending around the perimeter of building.

1. Install tinned-copper conductor not less than No. 2/0 AWG for ground ring and for taps to building steel.
2. Bury ground ring not less than 24 inches (600 mm) from building's foundation.

J. Ufer Ground (Concrete-Encased Grounding Electrode): Fabricate according to NFPA 70; use a minimum of 20 feet (6 m) of bare copper conductor not smaller than No. 4 AWG.

1. If concrete foundation is less than 20 feet (6 m) long, coil excess conductor within base of foundation.
2. Bond grounding conductor to reinforcing steel in at least four locations and to anchor bolts. Extend grounding conductor below grade and connect to building's grounding grid or to grounding electrode external to concrete.

3.6 LABELING

A. Comply with requirements in Section 260553 "Identification for Electrical Systems" for instruction signs. The label or its text shall be green.

B. Install labels at the telecommunications bonding conductor and grounding equalizer and at the grounding electrode conductor where exposed.

1. Label Text: "If this connector or cable is loose or if it must be removed for any reason, notify the facility manager."

3.7 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.

B. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust components, assemblies, and equipment installations, including connections.

C. Perform tests and inspections.

1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.

D. Tests and Inspections:

1. After installing grounding system but before permanent electrical circuits have been energized, test for compliance with requirements.
2. Inspect physical and mechanical condition. Verify tightness of accessible, bolted, electrical connections with a calibrated torque wrench according to manufacturer's written instructions.
3. Test completed grounding system at each location where a maximum ground-resistance level is specified, at service disconnect enclosure grounding terminal**,** at ground test wells and at individual ground rods. Make tests at ground rods before any conductors are connected.

    a. Measure ground resistance no fewer than two full days after last trace of precipitation and without soil being moistened by any means other than natural drainage or seepage and without chemical treatment or other artificial means of reducing natural ground resistance.
    b. Perform tests by fall-of-potential method according to IEEE 81.

4. Prepare dimensioned Drawings locating each test well, ground rod and ground-rod assembly, and other grounding electrodes. Identify each by letter in alphabetical order, and key to the record of tests and observations. Include the number of rods driven and their depth at each location, and include observations of weather and other phenomena that may affect test results. Describe measures taken to improve test results.

E. Grounding system will be considered defective if it does not pass tests and inspections.

F. Prepare test and inspection reports.

G. Report measured ground resistances that exceed the following values:

1. Power and Lighting Equipment or System with Capacity of 500 kVA and Less: 10 ohms.
2. Power and Lighting Equipment or System with Capacity of 500 to 1000 kVA: 5 ohms.
3. Power and Lighting Equipment or System with Capacity More Than 1000 kVA: 3 ohms.
4. Power Distribution Units or Panelboards Serving Electronic Equipment: 1 ohm(s).
5. Substations and Pad-Mounted Equipment: 5 ohms.
6. Manhole Grounds: 10 ohms.

H. Excessive Ground Resistance: If resistance to ground exceeds specified values, notify Architect promptly and include recommendations to reduce ground resistance.

END OF SECTION

SECTION 26 0529

HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Hangers and supports for electrical equipment and systems.
2. Construction requirements for concrete bases.

B. Related Sections include the following:

1. Section 26 0548 "Vibration and Seismic Controls for Electrical Systems" for products and installation requirements necessary for compliance with seismic criteria.

1.3 DEFINITIONS

A. EMT: Electrical metallic tubing.

B. IMC: Intermediate metal conduit.

C. RMC: Rigid metal conduit.

1.4 PERFORMANCE REQUIREMENTS

A. Delegated Design: Design supports for multiple raceways, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

B. Design supports for multiple raceways capable of supporting combined weight of supported systems and its contents.

C. Design equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.

D. Rated Strength: Adequate in tension, shear, and pullout force to resist maximum loads calculated or imposed for this Project, with a minimum structural safety factor of five times the applied force.

1.5 ACTION SUBMITTALS

A. Product Data: For the following:

1. Steel slotted support systems.
2. Nonmetallic slotted support systems.

B. Shop Drawings: Signed and sealed by a qualified professional engineer. Show fabrication and installation details and include calculations for the following:

1. Trapeze hangers. Include Product Data for components.
2. Steel slotted channel systems. Include Product Data for components.
3. Nonmetallic slotted channel systems. Include Product Data for components.
4. Equipment supports.

1.6 INFORMATIONAL SUBMITTALS

A. Welding certificates.

1.7 QUALITY ASSURANCE

A. Welding: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

B. Comply with NFPA 70.

1.8 COORDINATION

A. Coordinate size and location of concrete bases. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and formwork requirements are specified together with concrete Specifications.

B. Coordinate installation of roof curbs, equipment supports, and roof penetrations. These items are specified in Section 07 7200 "Roof Accessories."

PART 2 - PRODUCTS

2.1 SUPPORT, ANCHORAGE, AND ATTACHMENT COMPONENTS

A. Steel Slotted Support Systems: Comply with MFMA-4, factory-fabricated components for field assembly.

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
2. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Allied Tube & Conduit.
b. Cooper B-Line, Inc.; a division of Cooper Industries.

c. ERICO International Corporation.
d. GS Metals Corp.
e. Thomas & Betts Corporation.
f. Unistrut; Tyco International, Ltd.

3. Metallic Coatings: Hot-dip galvanized after fabrication and applied according to MFMA-4.
4. Nonmetallic Coatings: Manufacturer's standard PVC, polyurethane, or polyester coating applied according to MFMA-4.
5. Painted Coatings: Manufacturer's standard painted coating applied according to MFMA-4 requirements.
6. Channel Dimensions: Selected for applicable load criteria.

B. Nonmetallic Slotted Support Systems: Structural-grade, factory-formed, glass-fiber-resin channels and angles with 9/16-inch- (14-mm-) diameter holes at a maximum of 8 inches (200 mm) o.c., in at least 1 surface.

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
2. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Allied Tube & Conduit.
b. Cooper B-Line, Inc.; a division of Cooper Industries.
c. Fabco Plastics Wholesale Limited.

3. Fittings and Accessories: Products of channel and angle manufacturer and designed for use with those items.
4. Fitting and Accessory Materials: Same as channels and angles**,** except metal items may be stainless steel.
5. Rated Strength: Selected to suit applicable load criteria.

C. Raceway and Cable Supports: As described in NECA 1 and NECA 101.

D. Conduit and Cable Support Devices: Steel and malleable-iron hangers, clamps, and associated fittings, designed for types and sizes of raceway or cable to be supported.

E. Support for Conductors in Vertical Conduit: Factory-fabricated assembly consisting of threaded body and insulating wedging plug or plugs for non-armored electrical conductors or cables in riser conduits. Plugs shall have number, size, and shape of conductor gripping pieces as required to suit individual conductors or cables supported. Body shall be malleable iron.

F. Structural Steel for Fabricated Supports and Restraints: ASTM A 36/A 36M, steel plates, shapes, and bars; black and galvanized.

G. Mounting, Anchoring, and Attachment Components: Items for fastening electrical items or their supports to building surfaces include the following:

1. Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened portland cement concrete, steel, or wood, with tension, shear, and pullout capacities appropriate for supported loads and building materials where used.

a. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
b. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1) Hilti Inc.
2) ITW Ramset/Red Head; a division of Illinois Tool Works, Inc.
3) Simpson Strong-Tie Co., Inc.; Masterset Fastening Systems Unit.

2. Mechanical-Expansion Anchors: Insert-wedge-type, [**zinc-coated**] [**stainless**] steel, for use in hardened portland cement concrete with tension, shear, and pullout capacities appropriate for supported loads and building materials in which used.

a. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
b. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1) Cooper B-Line, Inc.; a division of Cooper Industries.
2) Empire Tool and Manufacturing Co., Inc.
3) Hilti Inc.
4) ITW Ramset/Red Head; a division of Illinois Tool Works, Inc.

3. Concrete Inserts: Steel or malleable-iron, slotted support system units similar to MSS Type 18; complying with MFMA-4 or MSS SP-58.
4. Clamps for Attachment to Steel Structural Elements: MSS SP-58, type suitable for attached structural element.
5. Through Bolts: Structural type, hex head, and high strength. Comply with ASTM A 325.
6. Toggle Bolts: All-steel springhead type.
7. Hanger Rods: Threaded steel.

2.2 FABRICATED METAL EQUIPMENT SUPPORT ASSEMBLIES

A. Description: Welded or bolted, structural-steel shapes, shop or field fabricated to fit dimensions of supported equipment.

B. Materials: Comply with requirements in Section 055000 "Metal Fabrications" for steel shapes and plates.

PART 3 - EXECUTION

3.1 APPLICATION

A. Comply with NECA 1 and NECA 101 for application of hangers and supports for electrical equipment and systems except if requirements in this Section are stricter.

B. Maximum Support Spacing and Minimum Hanger Rod Size for Raceway: Space supports for EMT, IMC, and RMC as required by NEC.

C. Multiple Raceways or Cables: Install trapeze-type supports fabricated with steel slotted or other support system, sized so capacity can be increased by at least 25 percent in future without exceeding specified design load limits.

1. Secure raceways and cables to these supports with two-bolt conduit clamps.

D. Spring-steel clamps designed for supporting single conduits without bolts may be used for 1-1/2-inch (38-mm) and smaller raceways serving branch circuits and communication systems above suspended ceilings and for fastening raceways to trapeze supports.

3.2 SUPPORT INSTALLATION

A. Comply with NECA 1 and NECA 101 for installation requirements except as specified in this Article.

B. Raceway Support Methods: In addition to methods described in NECA 1, EMT, IMC, and RMC may be supported by openings through structure members, as permitted in NFPA 70.

C. Strength of Support Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static loads within specified loading limits. Minimum static design load used for strength determination shall be weight of supported components plus 200 lb (90 kg).

D. Mounting and Anchorage of Surface-Mounted Equipment and Components: Anchor and fasten electrical items and their supports to building structural elements by the following methods unless otherwise indicated by code:

1. To Wood: Fasten with lag screws or through bolts.
2. To New Concrete: Bolt to concrete inserts.
3. To Masonry: Approved toggle-type bolts on hollow masonry units and expansion anchor fasteners on solid masonry units.
4. To Existing Concrete: Expansion anchor fasteners.
5. Instead of expansion anchors, powder-actuated driven threaded studs provided with lock washers and nuts may be used in existing standard-weight concrete 4 inches (100 mm) thick or greater. Do not use for anchorage to lightweight-aggregate concrete or for slabs less than 4 inches (100 mm) thick.
6. To Steel: Beam clamps (MSS Type 19, 21, 23, 25, or 27) complying with MSS SP-69
7. To Light Steel: Sheet metal screws.
8. Items Mounted on Hollow Walls and Nonstructural Building Surfaces: Mount cabinets, panelboards, disconnect switches, control enclosures, pull and junction boxes, transformers, and other devices on slotted-channel racks attached to substrate by means that meet seismic-restraint strength and anchorage requirements.

E. Drill holes for expansion anchors in concrete at locations and to depths that avoid reinforcing bars.

3.3 INSTALLATION OF FABRICATED METAL SUPPORTS

A. Comply with installation requirements in Section 05 5000 "Metal Fabrications" for site-fabricated metal supports.

B. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor electrical materials and equipment.

C. Field Welding: Comply with AWS D1.1/D1.1M.

3.4 CONCRETE BASES

A. Construct concrete bases of dimensions indicated but not less than 4 inches (100 mm) larger in both directions than supported unit, and so anchors will be a minimum of 10 bolt diameters from edge of the base.

B. Use 3000-psi (20.7-MPa) 28-day compressive-strength concrete. Concrete materials, reinforcement, and placement requirements are specified in Section 03 3053 "Miscellaneous Cast-in-Place Concrete."

C. Anchor equipment to concrete base.

1. Place and secure anchorage devices. Use supported equipment manufacturer's setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
2. Install anchor bolts to elevations required for proper attachment to supported equipment.
3. Install anchor bolts according to anchor-bolt manufacturer's written instructions.

3.5 PAINTING

A. Touchup: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.

1. Apply paint by brush or spray to provide minimum dry film thickness of 2.0 mils (0.05 mm).

B. Touchup: Comply with requirements in Section 099113 "Exterior Painting", Section 099123 "Interior Painting" and Section 099600 "High Performance Coatings" for cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint on miscellaneous metal.

C. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

END OF SECTION

SECTION 26 0533

RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Metal conduits, tubing, and fittings.
2. Nonmetal conduits, tubing, and fittings.
3. Metal wireways and auxiliary gutters.
4. Nonmetal wireways and auxiliary gutters.
5. Surface raceways.
6. Boxes, enclosures, and cabinets.
7. Handholes and boxes for exterior underground cabling.

B. Related Requirements:

1. Section 26 0543 "Underground Ducts and Raceways for Electrical Systems" for exterior ductbanks, manholes, and underground utility construction.
2. Section 27 0528 "Pathways for Communications Systems" for conduits, wireways, surface pathways, innerduct, boxes, faceplate adapters, enclosures, cabinets, and handholes serving communications systems.
3. Section 28 0528 "Pathways for Electronic Safety and Security" for conduits, surface pathways, innerduct, boxes, and faceplate adapters serving electronic safety and security.

1.3 DEFINITIONS

A. ARC: Aluminum rigid conduit.

B. GRC: Galvanized rigid steel conduit.

C. IMC: Intermediate metal conduit.

1.4 ACTION SUBMITTALS

A. Product Data: For surface raceways, wireways and fittings, floor boxes, hinged-cover enclosures, and cabinets.

B. LEED Submittals:

1. Product Data for Credit IEQ 4.1: For solvent cements and adhesive primers, documentation including printed statement of VOC content.
2. Laboratory Test Reports for Credit IEQ 4: For solvent cements and adhesive primers, documentation indicating that products comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

C. Shop Drawings: For custom enclosures and cabinets. Include plans, elevations, sections, and attachment details.

D. Samples: For wireways, nonmetallic wireways and surface raceways and for each color and texture specified, 12 inches long.

1.5 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Conduit routing plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of items involved:

1. Structural members in paths of conduit groups with common supports.
2. HVAC and plumbing items and architectural features in paths of conduit groups with common supports.

B. Qualification Data: For professional engineer.

C. Seismic Qualification Certificates: For enclosures, cabinets, and conduit racks and their mounting provisions, including those for internal components, from manufacturer.

1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.
4. Detailed description of conduit support devices and interconnections on which the certification is based and their installation requirements.

D. Source quality-control reports.

PART 2 - PRODUCTS

2.1 METAL CONDUITS, TUBING, AND FITTINGS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. AFC Cable Systems, Inc.
2. Allied Tube & Conduit; a Tyco International Ltd. Co.
3. Anamet Electrical, Inc.
4. Electri-Flex Company.
5. O-Z/Gedney; a brand of EGS Electrical Group.

6. Picoma Industries, a subsidiary of Mueller Water Products, Inc.
7. Republic Conduit.
8. Robroy Industries.
9. Southwire Company.
10. Thomas & Betts Corporation.
11. Western Tube and Conduit Corporation.
12. Wheatland Tube Company; a division of John Maneely Company.

B. Listing and Labeling: Metal conduits, tubing, and fittings shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

C. GRC: Comply with ANSI C80.1 and UL 6.

D. ARC: Comply with ANSI C80.5 and UL 6A.

E. IMC: Comply with ANSI C80.6 and UL 1242.

F. PVC-Coated Steel Conduit: PVC-coated rigid steel conduit or IMC.

1. Comply with NEMA RN 1.
2. Coating Thickness: 0.040 inch, minimum.

G. EMT: Comply with ANSI C80.3 and UL 797.

H. FMC: Comply with UL 1; zinc-coated steel or aluminum.

I. LFMC: Flexible steel conduit with PVC jacket and complying with UL 360.

J. Fittings for Metal Conduit: Comply with NEMA FB 1 and UL 514B.

1. Conduit Fittings for Hazardous (Classified) Locations: Comply with UL 886 and NFPA 70.
2. Fittings for EMT:
   a. Material: Steel or die cast.
   b. Type: Setscrew or compression.
3. Expansion Fittings: PVC or steel to match conduit type, complying with UL 651, rated for environmental conditions where installed, and including flexible external bonding jumper.
4. Coating for Fittings for PVC-Coated Conduit: Minimum thickness of 0.040 inch, with overlapping sleeves protecting threaded joints.

K. Joint Compound for IMC, GRC, or ARC: Approved, as defined in NFPA 70, by authorities having jurisdiction for use in conduit assemblies, and compounded for use to lubricate and protect threaded conduit joints from corrosion and to enhance their conductivity.

2.2 NONMETALLIC CONDUITS, TUBING, AND FITTINGS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. AFC Cable Systems, Inc.
2. Anamet Electrical, Inc.

3. Arnco Corporation.
4. CANTEX Inc.
5. CertainTeed Corp.
6. Condux International, Inc.
7. Electri-Flex Company.
8. Kraloy.
9. Lamson & Sessions; Carlon Electrical Products.
10. Niedax-Kleinhuis USA, Inc.
11. RACO; a Hubbell company.
12. Thomas & Betts Corporation.

B. Listing and Labeling: Nonmetallic conduits, tubing, and fittings shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

C. ENT: Comply with NEMA TC 13 and UL 1653.

D. RNC: Type EPC-40-PVC, complying with NEMA TC 2 and UL 651 unless otherwise indicated.

E. LFNC: Comply with UL 1660.

F. Rigid HDPE: Comply with UL 651A.

G. Continuous HDPE: Comply with UL 651B.

H. Coilable HDPE: Preassembled with conductors or cables, and complying with ASTM D 3485.

I. RTRC: Comply with UL 1684A and NEMA TC 14.

J. Fittings for ENT and RNC: Comply with NEMA TC 3; match to conduit or tubing type and material.

K. Fittings for LFNC: Comply with UL 514B.

L. Solvent cements and adhesive primers shall have a VOC content of 510 and 550 g/L or less, respectively, when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

M. Solvent cements and adhesive primers shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

2.3 METAL WIREWAYS AND AUXILIARY GUTTERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Cooper B-Line, Inc.
2. Hoffman; a Pentair company.
3. Mono-Systems, Inc.
4. Square D; a brand of Schneider Electric.

B. Description: Sheet metal, complying with UL 870 and NEMA 250, Type 1, Type 3R or Type 4 unless otherwise indicated, and sized according to NFPA 70.

1. Metal wireways installed outdoors shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

C. Fittings and Accessories: Include covers, couplings, offsets, elbows, expansion joints, adapters, hold-down straps, end caps, and other fittings to match and mate with wireways as required for complete system.

D. Wireway Covers: Hinged type or Screw-cover type unless otherwise indicated.

E. Finish: Manufacturer's standard enamel finish.

2.4 NONMETALLIC WIREWAYS AND AUXILIARY GUTTERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Allied Moulded Products, Inc.
2. Hoffman; a Pentair company.
3. Lamson & Sessions; Carlon Electrical Products.
4. Niedax-Kleinhuis USA, Inc.

B. Listing and Labeling: Nonmetallic wireways and auxiliary gutters shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

C. Description: Fiberglass polyester, extruded and fabricated to required size and shape, without holes or knockouts. Cover shall be gasketed with oil-resistant gasket material and fastened with captive screws treated for corrosion resistance. Connections shall be flanged and have stainless-steel screws and oil-resistant gaskets.

D. Description: PVC, extruded and fabricated to required size and shape, and having snap-on cover, mechanically coupled connections, and plastic fasteners.

E. Fittings and Accessories: Couplings, offsets, elbows, expansion joints, adapters, hold-down straps, end caps, and other fittings shall match and mate with wireways as required for complete system.

F. Solvent cements and adhesive primers shall have a VOC content of 510 and 550 g/L or less, respectively, when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

G. Solvent cements and adhesive primers shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

2.5 SURFACE RACEWAYS

A. Listing and Labeling: Surface raceways and tele-power poles shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Surface Metal Raceways: Galvanized steel with snap-on covers complying with UL 5. Manufacturer's standard enamel finish in color selected by Architect.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Mono-Systems, Inc.

b. Panduit Corp.

c. Wiremold / Legrand.

C. Surface Nonmetallic Raceways: Two- or three-piece construction, complying with UL 5A, and manufactured of rigid PVC with texture and color selected by Architect from [manufacturer's standard] [custom] colors. Product shall comply with UL 94 V-0 requirements for self-extinguishing characteristics.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Hubbell Incorporated; Wiring Device-Kellems Division.

b. Mono-Systems, Inc.

c. Panduit Corp.

d. Wiremold / Legrand.

D. Tele-Power Poles:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Mono-Systems, Inc.

b. Panduit Corp.

c. Wiremold / Legrand.

2. Material: Galvanized steel with ivory baked-enamel finish

3. Fittings and Accessories: Dividers, end caps, covers, cutouts, wiring harnesses, devices, mounting materials, and other fittings shall match and mate with tele-power pole as required for complete system.

2.6 BOXES, ENCLOSURES, AND CABINETS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Adalet.

2. Cooper Technologies Company; Cooper Crouse-Hinds.

3. EGS/Appleton Electric.

4. Erickson Electrical Equipment Company.

5. Hoffman; a Pentair company.

6. Hubbell Incorporated; Killark Division.

7. Milbank Manufacturing Co.

8. Mono-Systems, Inc.

9. O-Z/Gedney; a brand of EGS Electrical Group.

10. RACO; a Hubbell Company.

11. Spring City Electrical Manufacturing Company.

12. Thomas & Betts Corporation.
13. Wiremold / Legrand.

B. General Requirements for Boxes, Enclosures, and Cabinets: Boxes, enclosures, and cabinets installed in wet locations shall be listed for use in wet locations.

C. Sheet Metal Outlet and Device Boxes: Comply with NEMA OS 1 and UL 514A.

D. Cast-Metal Outlet and Device Boxes: Comply with NEMA FB 1 aluminum, Type FD, with gasketed cover.

E. Nonmetallic Outlet and Device Boxes: Comply with NEMA OS 2 and UL 514C.

F. Metal Floor Boxes:

1. Material: Cast metal or sheet metal.
2. Type: Semi-adjustable.
3. Shape: Rectangular.
4. Listing and Labeling: Metal floor boxes shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

G. Nonmetallic Floor Boxes: Nonadjustable, rectangular.

1. Listing and Labeling: Nonmetallic floor boxes shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

H. Luminaire Outlet Boxes: Nonadjustable, designed for attachment of luminaire weighing 50 lb. Outlet boxes designed for attachment of luminaires weighing more than 50 lb shall be listed and marked for the maximum allowable weight.

I. Paddle Fan Outlet Boxes: Nonadjustable, designed for attachment of paddle fan weighing 70 lb.

1. Listing and Labeling: Paddle fan outlet boxes shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

J. Small Sheet Metal Pull and Junction Boxes: NEMA OS 1.

K. Cast-Metal Access, Pull, and Junction Boxes: Comply with NEMA FB 1 and UL 1773, cast aluminum with gasketed cover.

L. Box extensions used to accommodate new building finishes shall be of same material as recessed box.

M. Device Box Dimensions: 4 inches square by 2-1/8 inches deep.

N. Gangable boxes are prohibited.

O. Hinged-Cover Enclosures: Comply with UL 50 and NEMA 250, Type 1, Type 3R or Type 4 with continuous-hinge cover with flush latch unless otherwise indicated.

1. Metal Enclosures: Steel, finished inside and out with manufacturer's standard enamel.
2. Nonmetallic Enclosures: Plastic.
3. Interior Panels: Steel; all sides finished with manufacturer's standard enamel.

P. Cabinets:

1. NEMA 250, Type 1, Type 3R or Type 4 galvanized-steel box with removable interior panel and removable front, finished inside and out with manufacturer's standard enamel.
2. Hinged door in front cover with flush latch and concealed hinge.
3. Key latch to match panelboards.
4. Metal barriers to separate wiring of different systems and voltage.
5. Accessory feet where required for freestanding equipment.
6. Nonmetallic cabinets shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

2.7 HANDHOLES AND BOXES FOR EXTERIOR UNDERGROUND WIRING

A. General Requirements for Handholes and Boxes:

1. Boxes and handholes for use in underground systems shall be designed and identified as defined in NFPA 70, for intended location and application.
2. Boxes installed in wet areas shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Polymer-Concrete Handholes and Boxes with Polymer-Concrete Cover: Molded of sand and aggregate, bound together with polymer resin, and reinforced with steel, fiberglass, or a combination of the two.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
2. Basis-of-Design Product: Subject to compliance with requirements, provide products as indicated on drawings or comparable product by one of the following:
    a. Armorcast Products Company.
    b. Carson Industries LLC.
    c. CDR Systems Corporation; Hubbell Power Systems.
    d. NewBasis.
    e. Oldcastle Precast, Inc.; Christy Concrete Products.
    f. Synertech Moulded Products; a division of Oldcastle Precast, Inc.
3. Standard: Comply with SCTE 77.
4. Configuration: Designed for flush burial with open bottom unless otherwise indicated.
5. Cover: Weatherproof, secured by tamper-resistant locking devices and having structural load rating consistent with enclosure and handhole location.
6. Cover Finish: Nonskid finish shall have a minimum coefficient of friction of 0.50.
7. Cover Legend: Molded lettering, "ELECTRIC.".
8. Conduit Entrance Provisions: Conduit-terminating fittings shall mate with entering ducts for secure, fixed installation in enclosure wall.
9. Handholes 12 Inches Wide by 24 Inches Long and Larger: Have inserts for cable racks and pulling-in irons installed before concrete is poured.

C. Fiberglass Handholes and Boxes: Molded of fiberglass-reinforced polyester resin, with frame and covers of polymer concrete or fiberglass.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
2. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:

a. Armorcast Products Company.
b. Carson Industries LLC.
c. CDR Systems Corporation; Hubbell Power Systems.
d. NewBasis.
e. Nordic Fiberglass, Inc.
f. Oldcastle Precast, Inc.; Christy Concrete Products.
g. Synertech Moulded Products; a division of Oldcastle Precast, Inc.

3. Standard: Comply with SCTE 77.
4. Color of Frame and Cover: Gray.
5. Configuration: Designed for flush burial with open bottom unless otherwise indicated.
6. Cover: Weatherproof, secured by tamper-resistant locking devices and having structural load rating consistent with enclosure and handhole location.
7. Cover Finish: Nonskid finish shall have a minimum coefficient of friction of 0.50.
8. Cover Legend: Molded lettering, "ELECTRIC.".
9. Conduit Entrance Provisions: Conduit-terminating fittings shall mate with entering ducts for secure, fixed installation in enclosure wall.
10. Handholes 12 Inches Wide by 24 Inches Long and Larger: Have inserts for cable racks and pulling-in irons installed before concrete is poured.

2.8 SOURCE QUALITY CONTROL FOR UNDERGROUND ENCLOSURES

A. Handhole and Pull-Box Prototype Test: Test prototypes of handholes and boxes for compliance with SCTE 77. Strength tests shall be for specified tier ratings of products supplied.

1. Tests of materials shall be performed by an independent testing agency.
2. Strength tests of complete boxes and covers shall be by either an independent testing agency or manufacturer. A qualified registered professional engineer shall certify tests by manufacturer.
3. Testing machine pressure gages shall have current calibration certification complying with ISO 9000 and ISO 10012 and traceable to NIST standards.

PART 3 - EXECUTION

3.1 RACEWAY APPLICATION

A. Outdoors: Apply raceway products as specified below unless otherwise indicated:

1. Exposed Conduit: GRC or IMC.
2. Concealed Conduit, Aboveground RNC, Type EPC-40-PVC or EMT.
3. Underground Conduit: RNC, Type EPC-40-PVC, direct buried or concrete encased.
4. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LFMC.
5. Boxes and Enclosures, Aboveground: NEMA 250, Type 3R or Type 4.

B. Indoors: Apply raceway products as specified below unless otherwise indicated:

1. Exposed, Not Subject to Physical Damage: EMT, ENT or RNC.
2. Exposed, Not Subject to Severe Physical Damage: EMT or RNC identified for such use.
3. Exposed and Subject to Severe Physical Damage: GRC or IMC. Raceway locations include the following:
    a. Loading dock.
    b. Corridors used for traffic of mechanized carts, forklifts, and pallet-handling units.
    c. Mechanical rooms.
    d. Gymnasiums.
4. Concealed in Ceilings and Interior Walls and Partitions: ENT.
5. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): FMC, except use LFMC in damp or wet locations.
6. Damp or Wet Locations: GRC or IMC.
7. Boxes and Enclosures: NEMA 250, Type 1, except use NEMA 250, Type 4 stainless steel in institutional and commercial kitchens and damp or wet locations.

C. Minimum Raceway Size: 3/4-inch trade size.

D. Raceway Fittings: Compatible with raceways and suitable for use and location.

1. Rigid and Intermediate Steel Conduit: Use threaded rigid steel conduit fittings unless otherwise indicated. Comply with NEMA FB 2.10.
2. PVC Externally Coated, Rigid Steel Conduits: Use only fittings listed for use with this type of conduit. Patch and seal all joints, nicks, and scrapes in PVC coating after installing conduits and fittings. Use sealant recommended by fitting manufacturer and apply in thickness and number of coats recommended by manufacturer.
3. EMT: Use setscrew or compression, steel fittings. Comply with NEMA FB 2.10.
4. Flexible Conduit: Use only fittings listed for use with flexible conduit. Comply with NEMA FB 2.20.

E. Install nonferrous conduit or tubing for circuits operating above 60 Hz. Where aluminum raceways are installed for such circuits and pass through concrete, install in nonmetallic sleeve.

F. Do not install aluminum conduits, boxes, or fittings in contact with concrete or earth.

G. Install surface raceways only where indicated on Drawings.

H. Do not install nonmetallic conduit where ambient temperature exceeds 120 deg F

3.2 INSTALLATION

A. Comply with NECA 1 and NECA 101 for installation requirements except where requirements on Drawings or in this article are stricter. Comply with NECA 102 for aluminum conduits. Comply with NFPA 70 limitations for types of raceways allowed in specific occupancies and number of floors.

B. Keep raceways at least 6 inches away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.

C. Complete raceway installation before starting conductor installation.

D. Comply with requirements in Section 260529 "Hangers and Supports for Electrical Systems" for hangers and supports.

E. Arrange stub-ups so curved portions of bends are not visible above finished slab.

F. Install no more than the equivalent of three 90-degree bends in any conduit run except for control wiring conduits, for which fewer bends are allowed. Support within 12 inches of changes in direction.

G. Conceal conduit and EMT within finished walls, ceilings, and floors unless otherwise indicated. Install conduits parallel or perpendicular to building lines.

H. Support conduit within 12 inchesof enclosures to which attached.

I. Raceways Embedded in Slabs:

1. Run conduit larger than 1-inch trade size, parallel or at right angles to main reinforcement. Where at right angles to reinforcement, place conduit close to slab support. Secure raceways to reinforcement at maximum 10-footintervals.

2. Arrange raceways to cross building expansion joints at right angles with expansion fittings.

3. Arrange raceways to keep a minimum of 2 inches of concrete cover in all directions.

4. Do not embed threadless fittings in concrete unless specifically approved by Architect for each specific location.

5. Change from ENT to RNC, Type EPC-40-PVC, GRC or IMC before rising above floor.

J. Stub-ups to Above Recessed Ceilings:

1. Use EMT, IMC, or RMC for raceways.

2. Use a conduit bushing or insulated fitting to terminate stub-ups not terminated in hubs or in an enclosure.

K. Threaded Conduit Joints, Exposed to Wet, Damp, Corrosive, or Outdoor Conditions: Apply listed compound to threads of raceway and fittings before making up joints. Follow compound manufacturer's written instructions.

L. Coat field-cut threads on PVC-coated raceway with a corrosion-preventing conductive compound prior to assembly.

M. Raceway Terminations at Locations Subject to Moisture or Vibration: Use insulating bushings to protect conductors including conductors smaller than No. 4 AWG.

N. Terminate threaded conduits into threaded hubs or with locknuts on inside and outside of boxes or cabinets. Install bushings on conduits up to 1-1/4-inch trade size and insulated throat metal bushings on 1-1/2-inch trade size and larger conduits terminated with locknuts. Install insulated throat metal grounding bushings on service conduits.

O. Install raceways square to the enclosure and terminate at enclosures with locknuts. Install locknuts hand tight plus 1/4 turn more.

P. Do not rely on locknuts to penetrate nonconductive coatings on enclosures. Remove coatings in the locknut area prior to assembling conduit to enclosure to assure a continuous ground path.

Q. Cut conduit perpendicular to the length. For conduits 2-inch trade size and larger, use roll cutter or a guide to make cut straight and perpendicular to the length.

R. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 200-lb tensile strength. Leave at least 12 inches of slack at each end of pull wire. Cap underground raceways designated as spare above grade alongside raceways in use.

S. Surface Raceways:

1. Install surface raceway with a minimum 2-inchradius control at bend points.
2. Secure surface raceway with screws or other anchor-type devices at intervals not exceeding 48 inches and with no less than two supports per straight raceway section. Support surface raceway according to manufacturer's written instructions. Tape and glue are not acceptable support methods.

T. Install raceway sealing fittings at accessible locations according to NFPA 70 and fill them with listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces. Install raceway sealing fittings according to NFPA 70.

U. Install devices to seal raceway interiors at accessible locations. Locate seals so no fittings or boxes are between the seal and the following changes of environments. Seal the interior of all raceways at the following points:

1. Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.
2. Where an underground service raceway enters a building or structure.
3. Where otherwise required by NFPA 70.

V. Comply with manufacturer's written instructions for solvent welding RNC and fittings.

W. Expansion-Joint Fittings:

1. Install in each run of aboveground RNC that is located where environmental temperature change may exceed 30 deg F and that has straight-run length that exceeds 25 feet. Install in each run of aboveground RMC and EMT conduit that is located where environmental temperature change may exceed 100 deg F and that has straight-run length that exceeds 100 feet.
2. Install type and quantity of fittings that accommodate temperature change listed for each of the following locations:
    a. Outdoor Locations Not Exposed to Direct Sunlight: 125 deg F temperature change.
    b. Outdoor Locations Exposed to Direct Sunlight: 155 deg F temperature change.
    c. Indoor Spaces Connected with Outdoors without Physical Separation: 125 deg F temperature change.
    d. Attics: 135 deg F temperature change.

3. Install fitting(s) that provide expansion and contraction for at least 0.00041 inch per foot of length of straight run per deg F of temperature change for PVC conduits. Install fitting(s) that provide expansion and contraction for at least 0.000078 inch per foot of length of straight run per deg F of temperature change for metal conduits.

4. Install expansion fittings at all locations where conduits cross building or structure expansion joints.

5. Install each expansion-joint fitting with position, mounting, and piston setting selected according to manufacturer's written instructions for conditions at specific location at time of installation. Install conduit supports to allow for expansion movement.

X. Flexible Conduit Connections: Comply with NEMA RV 3. Use a maximum of 72 inches of flexible conduit for recessed and semirecessed luminaires, equipment subject to vibration, noise transmission, or movement; and for transformers and motors.

1. Use LFMC in damp or wet locations subject to severe physical damage.

2. Use LFMC or LFNC in damp or wet locations not subject to severe physical damage.

Y. Mount boxes at heights indicated on Drawings. If mounting heights of boxes are not individually indicated, give priority to ADA requirements. Install boxes with height measured to bottom of box unless otherwise indicated.

Z. Recessed Boxes in Masonry Walls: Saw-cut opening for box in center of cell of masonry block, and install box flush with surface of wall. Prepare block surfaces to provide a flat surface for a raintight connection between box and cover plate or supported equipment and box.

AA. Horizontally separate boxes mounted on opposite sides of walls so they are not in the same vertical channel.

BB. Locate boxes so that cover or plate will not span different building finishes.

CC. Support boxes of three gangs or more from more than one side by spanning two framing members or mounting on brackets specifically designed for the purpose.

DD. Fasten junction and pull boxes to or support from building structure. Do not support boxes by conduits.

EE. Set metal floor boxes level and flush with finished floor surface.

FF. Set nonmetallic floor boxes level. Trim after installation to fit flush with finished floor surface.

3.3 INSTALLATION OF UNDERGROUND CONDUIT

A. Direct-Buried Conduit:

1. Excavate trench bottom to provide firm and uniform support for conduit. Prepare trench bottom as specified in Section 312000 "Earth Moving" for pipe less than 6 inches in nominal diameter.

2. Install backfill as specified in Section 312000 "Earth Moving."

3. After installing conduit, backfill and compact. Start at tie-in point, and work toward end of conduit run, leaving conduit at end of run free to move with expansion and contraction as temperature changes during this process. Firmly hand tamp backfill around conduit to provide maximum supporting strength. After placing controlled backfill to within 12 inches of finished grade, make final conduit connection at end of run and complete backfilling with normal compaction as specified in Section 312000 "Earth Moving."

4. Install manufactured duct elbows for stub-ups at poles and equipment and at building entrances through floor unless otherwise indicated. Encase elbows for stub-up ducts throughout length of elbow.

5. Install manufactured rigid steel conduit elbows for stub-ups at poles and equipment and at building entrances through floor.

    a. Couple steel conduits to ducts with adapters designed for this purpose, and encase coupling with 3 inches of concrete for a minimum of 12 inches on each side of the coupling.

    b. For stub-ups at equipment mounted on outdoor concrete bases and where conduits penetrate building foundations, extend steel conduit horizontally a minimum of 60 inches from edge of foundation or equipment base. Install insulated grounding bushings on terminations at equipment.

6. Warning Planks: Bury warning planks approximately 12 inches above direct-buried conduits but a minimum of 6 inches below grade. Align planks along centerline of conduit.

7. Underground Warning Tape: Comply with requirements in Section 260553 "Identification for Electrical Systems."

3.4 INSTALLATION OF UNDERGROUND HANDHOLES AND BOXES

A. Install handholes and boxes level and plumb and with orientation and depth coordinated with connecting conduits to minimize bends and deflections required for proper entrances.

B. Unless otherwise indicated, support units on a level bed of crushed stone or gravel, graded from 1/2-inch sieve to No. 4 sieve and compacted to same density as adjacent undisturbed earth.

C. Elevation: In paved areas, set so cover surface will be flush with finished grade. Set covers of other enclosures 1 inch above finished grade.

D. Install handholes with bottom below frost line below grade.

E. Install removable hardware, including pulling eyes, cable stanchions, cable arms, and insulators, as required for installation and support of cables and conductors and as indicated. Select arm lengths to be long enough to provide spare space for future cables but short enough to preserve adequate working clearances in enclosure.

F. Field-cut openings for conduits according to enclosure manufacturer's written instructions. Cut wall of enclosure with a tool designed for material to be cut. Size holes for terminating fittings to be used, and seal around penetrations after fittings are installed.

3.5 SLEEVE AND SLEEVE-SEAL INSTALLATION FOR ELECTRICAL PENETRATIONS

A. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies. Comply with requirements in Section 260544 "Sleeves and Sleeve Seals for Electrical Raceways and Cabling."

3.6 FIRESTOPPING

A. Install firestopping at penetrations of fire-rated floor and wall assemblies. Comply with requirements in Section 078413 "Penetration Firestopping."

3.7 PROTECTION

A. Protect coatings, finishes, and cabinets from damage and deterioration.

1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.

2. Repair damage to PVC coatings or paint finishes with matching touchup coating recommended by manufacturer.

END OF SECTION

SECTION 26 0544

SLEEVES AND SLEEVE SEALS FOR ELECTRICAL RACEWAYS AND CABLING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Sleeves for raceway and cable penetration of non-fire-rated construction walls and floors.
2. Sleeve-seal systems.
3. Sleeve-seal fittings.
4. Grout.
5. Silicone sealants.

B. Related Requirements:

1. Section 07 8413 "Penetration Firestopping" for penetration firestopping installed in fire-resistance-rated walls, horizontal assemblies, and smoke barriers, with and without penetrating items.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. LEED Submittals:

1. Product Data for Credit EQ 4.1: For sealants, documentation including printed statement of VOC content.
2. Laboratory Test Reports for Credit EQ 4: For sealants, documentation indicating that products comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

PART 2 - PRODUCTS

2.1 SLEEVES

A. Wall Sleeves:

1. Steel Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, zinc coated, plain ends.

2. Cast-Iron Pipe Sleeves: Cast or fabricated "wall pipe," equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop unless otherwise indicated.

B. Sleeves for Conduits Penetrating Non-Fire-Rated Gypsum Board Assemblies: Galvanized-steel sheet; 0.0239-inch minimum thickness; round tube closed with welded longitudinal joint, with tabs for screw-fastening the sleeve to the board.

C. PVC-Pipe Sleeves: ASTM D 1785, Schedule 40.

D. Molded-PVC Sleeves: With nailing flange for attaching to wooden forms.

E. Molded-PE or -PP Sleeves: Removable, tapered-cup shaped, and smooth outer surface with nailing flange for attaching to wooden forms.

F. Sleeves for Rectangular Openings:

1. Material: Galvanized sheet steel.

2. Minimum Metal Thickness:

a. For sleeve cross-section rectangle perimeter less than 50 inches and with no side larger than 16 inches, thickness shall be 0.052 inch.

b. For sleeve cross-section rectangle perimeter 50 inches or more and one or more sides larger than 16 inches, thickness shall be 0.138 inch.

2.2 SLEEVE-SEAL SYSTEMS

A. Description: Modular sealing device, designed for field assembly, to fill annular space between sleeve and raceway or cable.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

2. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:

a. Advance Products & Systems, Inc.

b. CALPICO, Inc.

c. Metraflex Company (The).

d. Pipeline Seal and Insulator, Inc.

e. Proco Products, Inc.

3. Sealing Elements: EPDM rubber interlocking links shaped to fit surface of pipe. Include type and number required for pipe material and size of pipe.

4. Pressure Plates: Stainless steel.

5. Connecting Bolts and Nuts: Stainless steel of length required to secure pressure plates to sealing elements.

2.3 SLEEVE-SEAL FITTINGS

A. Description: Manufactured plastic, sleeve-type, waterstop assembly made for embedding in concrete slab or wall. Unit shall have plastic or rubber waterstop collar with center opening to match piping OD.

1. Manufacturers: Subject to compliance with requirements provide products by one of the following:
2. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable.

2.4 GROUT

A. Description: Nonshrink; recommended for interior and exterior sealing openings in non-fire-rated walls or floors.

B. Standard: ASTM C 1107/C 1107M, Grade B, post-hardening and volume-adjusting, dry, hydraulic-cement grout.

C. Design Mix: 5000-psi, 28-day compressive strength.

D. Packaging: Premixed and factory packaged.

2.5 SILICONE SEALANTS

A. Silicone Sealants: Single-component, silicone-based, neutral-curing elastomeric sealants of grade indicated below.

1. Grade: Pourable (self-leveling) formulation for openings in floors and other horizontal surfaces that are not fire rated.
2. Sealant shall have VOC content in according to 40 CFR 59, Subpart D (EPA Method 24).
3. Sealant shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

B. Silicone Foams: Multicomponent, silicone-based liquid elastomers that, when mixed, expand and cure in place to produce a flexible, nonshrinking foam.

PART 3 - EXECUTION

3.1 SLEEVE INSTALLATION FOR NON-FIRE-RATED ELECTRICAL PENETRATIONS

A. Comply with NECA 1.

B. Comply with NEMA VE 2 for cable tray and cable penetrations.

C. Sleeves for Conduits Penetrating Above-Grade Non-Fire-Rated Concrete and Masonry-Unit Floors and Walls:

1. Interior Penetrations of Non-Fire-Rated Walls and Floors:

a. Seal annular space between sleeve and raceway or cable, using joint sealant appropriate for size, depth, and location of joint. Comply with requirements in Section 079200 "Joint Sealants."

b. Seal space outside of sleeves with mortar or grout. Pack sealing material solidly between sleeve and wall so no voids remain. Tool exposed surfaces smooth; protect material while curing.

2. Use pipe sleeves unless penetration arrangement requires rectangular sleeved opening.

3. Size pipe sleeves to provide 1/4-inch annular clear space between sleeve and raceway or cable unless sleeve seal is to be installed or unless seismic criteria require different clearance.

4. Install sleeves for wall penetrations unless core-drilled holes or formed openings are used. Install sleeves during erection of walls. Cut sleeves to length for mounting flush with both surfaces of walls. Deburr after cutting.

5. Install sleeves for floor penetrations. Extend sleeves installed in floors 2 inches above finished floor level. Install sleeves during erection of floors.

D. Sleeves for Conduits Penetrating Non-Fire-Rated Gypsum Board Assemblies:

1. Use circular metal sleeves unless penetration arrangement requires rectangular sleeved opening.

2. Seal space outside of sleeves with approved joint compound for gypsum board assemblies.

E. Roof-Penetration Sleeves: Seal penetration of individual raceways and cables with flexible boot-type flashing units applied in coordination with roofing work.

F. Aboveground, Exterior-Wall Penetrations: Seal penetrations using steel pipe sleeves and mechanical sleeve seals. Select sleeve size to allow for 1-inch annular clear space between pipe and sleeve for installing mechanical sleeve seals.

G. Underground, Exterior-Wall and Floor Penetrations: Install cast-iron pipe sleeves. Size sleeves to allow for 1-inch annular clear space between raceway or cable and sleeve for installing sleeve-seal system.

3.2 SLEEVE-SEAL-SYSTEM INSTALLATION

A. Install sleeve-seal systems in sleeves in exterior concrete walls and slabs-on-grade at raceway entries into building.

B. Install type and number of sealing elements recommended by manufacturer for raceway or cable material and size. Position raceway or cable in center of sleeve. Assemble mechanical sleeve seals and install in annular space between raceway or cable and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

3.3 SLEEVE-SEAL-FITTING INSTALLATION

A. Install sleeve-seal fittings in new walls and slabs as they are constructed.

B. Assemble fitting components of length to be flush with both surfaces of concrete slabs and walls. Position waterstop flange to be centered in concrete slab or wall.

C. Secure nailing flanges to concrete forms.

D. Using grout, seal the space around outside of sleeve-seal fittings.

END OF SECTION

SECTION 26 0553

IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Identification for raceways.
2. Identification of power and control cables.
3. Identification for conductors.
4. Underground-line warning tape.
5. Warning labels and signs.
6. Instruction signs.
7. Equipment identification labels.
8. Miscellaneous identification products.

1.3 ACTION SUBMITTALS

A. Product Data: For each electrical identification product indicated.

B. Samples: For each type of label and sign to illustrate size, colors, lettering style, mounting provisions, and graphic features of identification products.

C. Identification Schedule: An index of nomenclature of electrical equipment and system components used in identification signs and labels.

1.4 QUALITY ASSURANCE

A. Comply with ANSI A13.1 and IEEE C2.

B. Comply with NFPA 70.

C. Comply with 29 CFR 1910.144 and 29 CFR 1910.145.

D. Comply with ANSI Z535.4 for safety signs and labels.

E. Adhesive-attached labeling materials, including label stocks, laminating adhesives, and inks used by label printers, shall comply with UL 969.

1.5 COORDINATION

A. Coordinate identification names, abbreviations, colors, and other features with requirements in other Sections requiring identification applications, Drawings, Shop Drawings, manufacturer's wiring diagrams, and the Operation and Maintenance Manual; and with those required by codes, standards, and 29 CFR 1910.145. Use consistent designations throughout Project.

B. Coordinate installation of identifying devices with completion of covering and painting of surfaces where devices are to be applied.

C. Coordinate installation of identifying devices with location of access panels and doors.

D. Install identifying devices before installing acoustical ceilings and similar concealment.

PART 2 - PRODUCTS

2.1 POWER RACEWAY IDENTIFICATION MATERIALS

A. Comply with ANSI A13.1 for minimum size of letters for legend and for minimum length of color field for each raceway size.

B. Colors for Raceways Carrying Circuits at 600 V or Less:

1. Black letters on an orange field.
2. Legend: Indicate voltage and system or service type.

C. Colors for Raceways Carrying Circuits at More Than 600 V:

1. Black letters on an orange field.
2. Legend: "DANGER CONCEALED HIGH VOLTAGE WIRING" with 3-inch- high letters on 20-inch centers.

D. Self-Adhesive Vinyl Labels for Raceways Carrying Circuits at 600 V or Less: Preprinted, flexible label laminated with a clear, weather- and chemical-resistant coating and matching wraparound adhesive tape for securing ends of legend label.

E. Snap-Around Labels for Raceways Carrying Circuits at 600 V or Less: Slit, pretensioned, flexible, preprinted, color-coded acrylic sleeve, with diameter sized to suit diameter of raceway or cable it identifies and to stay in place by gripping action.

F. Snap-Around, Color-Coding Bands for Raceways Carrying Circuits at 600 V or Less: Slit, pretensioned, flexible, solid-colored acrylic sleeve, 2 inches long, with diameter sized to suit diameter of raceway or cable it identifies and to stay in place by gripping action.

G. Tape and Stencil for Raceways Carrying Circuits More Than 600 V: 4-inch- wide black stripes on 10-inch centers diagonally over orange background that extends full length of raceway or duct and is 12 inches wide. Stop stripes at legends.

H. Metal Tags: Brass or aluminum, 2 by 2 by 0.05 inch, with stamped legend, punched for use with self-locking cable tie fastener.

I. Write-On Tags: Polyester tag, 0.015 inch thick, with corrosion-resistant grommet and cable tie for attachment to conductor or cable.

1. Marker for Tags: Permanent, waterproof, black ink marker recommended by tag manufacturer.
2. Marker for Tags: Machine-printed, permanent, waterproof, black ink marker recommended by printer manufacturer.

2.2 ARMORED AND METAL-CLAD CABLE IDENTIFICATION MATERIALS

A. Comply with ANSI A13.1 for minimum size of letters for legend and for minimum length of color field for each raceway and cable size.

B. Colors for Raceways Carrying Circuits at 600 V and Less:

1. Black letters on an orange field.
2. Legend: Indicate voltage and system or service type.

C. Colors for Raceways Carrying Circuits at More Than 600 V:

1. Black letters on an orange field.
2. Legend: "DANGER CONCEALED HIGH VOLTAGE WIRING" with 3-inch- high letters on 20-inch centers.

D. Self-Adhesive Vinyl Labels: Preprinted, flexible label laminated with a clear, weather- and chemical-resistant coating and matching wraparound adhesive tape for securing ends of legend label.

E. Self-Adhesive Vinyl Tape: Colored, heavy duty, waterproof, fade resistant; 2 inches wide; compounded for outdoor use.

2.3 POWER AND CONTROL CABLE IDENTIFICATION MATERIALS

A. Comply with ANSI A13.1 for minimum size of letters for legend and for minimum length of color field for each raceway and cable size.

B. Self-Adhesive Vinyl Labels: Preprinted, flexible label laminated with a clear, weather- and chemical-resistant coating and matching wraparound adhesive tape for securing ends of legend label.

C. Metal Tags: Brass or aluminum, 2 by 2 by 0.05 inch, with stamped legend, punched for use with self-locking cable tie fastener.

D. Write-On Tags: Polyester tag, 0.015 inch thick, with corrosion-resistant grommet and cable tie for attachment to conductor or cable.

1. Marker for Tags: Permanent, waterproof, black ink marker recommended by tag manufacturer.
2. Marker for Tags: Machine-printed, permanent, waterproof, black ink marker recommended by printer manufacturer.

E. Snap-Around Labels: Slit, pretensioned, flexible, preprinted, color-coded acrylic sleeve, with diameter sized to suit diameter of raceway or cable it identifies and to stay in place by gripping action.

F. Snap-Around, Color-Coding Bands: Slit, pretensioned, flexible, solid-colored acrylic sleeve, 2 inches long, with diameter sized to suit diameter of raceway or cable it identifies and to stay in place by gripping action.

2.4 CONDUCTOR IDENTIFICATION MATERIALS

A. Color-Coding Conductor Tape: Colored, self-adhesive vinyl tape not less than 3 mils thick by 1 to 2 inches wide.

B. Self-Adhesive Vinyl Labels: Preprinted, flexible label laminated with a clear, weather- and chemical-resistant coating and matching wraparound adhesive tape for securing ends of legend label.

C. Snap-Around Labels: Slit, pretensioned, flexible, preprinted, color-coded acrylic sleeve, with diameter sized to suit diameter of raceway or cable it identifies and to stay in place by gripping action.

D. Snap-Around, Color-Coding Bands: Slit, pretensioned, flexible, solid-colored acrylic sleeve, 2 inches long, with diameter sized to suit diameter of raceway or cable it identifies and to stay in place by gripping action.

E. Marker Tapes: Vinyl or vinyl-cloth, self-adhesive wraparound type, with circuit identification legend machine printed by thermal transfer or equivalent process.

F. Write-On Tags: Polyester tag, 0.015 inch thick, with corrosion-resistant grommet and cable tie for attachment to conductor or cable.

1. Marker for Tags: Permanent, waterproof, black ink marker recommended by tag manufacturer.

2. Marker for Tags: Machine-printed, permanent, waterproof, black ink marker recommended by printer manufacturer.

2.5 FLOOR MARKING TAPE

A. 2-inch- wide, 5-mil pressure-sensitive vinyl tape, with black and white stripes and clear vinyl overlay.

2.6 UNDERGROUND-LINE WARNING TAPE

A. Tape:

1. Recommended by manufacturer for the method of installation and suitable to identify and locate underground electrical and communications utility lines.

2. Printing on tape shall be permanent and shall not be damaged by burial operations.

3. Tape material and ink shall be chemically inert, and not subject to degrading when exposed to acids, alkalis, and other destructive substances commonly found in soils.

B. Color and Printing:

1. Comply with ANSI Z535.1 through ANSI Z535.5.

2. Inscriptions for Red-Colored Tapes: ELECTRIC LINE, HIGH VOLTAGE.

3. Inscriptions for Orange-Colored Tapes: TELEPHONE CABLE, CATV CABLE, COMMUNICATIONS CABLE, OPTICAL FIBER CABLE.

C. Tag: Type I:

1. Pigmented polyolefin, bright-colored, continuous-printed on one side with the inscription of the utility, compounded for direct-burial service.

2. Thickness: 4 mils.

3. Weight: 18.5 lb/1000 sq. ft..

4. 3-Inch Tensile According to ASTM D 882: 30 lbf, and 2500 psi.

D. Tag: Type II:

1. Multilayer laminate consisting of high-density polyethylene scrim coated with pigmented polyolefin, bright-colored, continuous-printed on one side with the inscription of the utility, compounded for direct-burial service.

2. Thickness: 12 mils.

3. Weight: 36.1 lb/1000 sq. ft..

4. 3-Inch Tensile According to ASTM D 882: 400 lbf, and 11,500 psi.

E. Tag: Type ID

1. Detectable three-layer laminate, consisting of a printed pigmented polyolefin film, a solid aluminum-foil core, and a clear protective film that allows inspection of the continuity of the conductive core, bright-colored, continuous-printed on one side with the inscription of the utility, compounded for direct-burial service.
2. Overall Thickness: 5 mils.
3. Foil Core Thickness: 0.35 mil.
4. Weight: 28 lb/1000 sq. ft..
5. 3-Inch Tensile According to ASTM D 882: 70 lbf, and 4600 psi.

F. Tag: Type IID:

1. Reinforced, detectable three-layer laminate, consisting of a printed pigmented woven scrim, a solid aluminum-foil core, and a clear protective film that allows inspection of the continuity of the conductive core, bright-colored, continuous-printed on one side with the inscription of the utility, compounded for direct-burial service.
2. Overall Thickness: 8 mils.
3. Foil Core Thickness: 0.35 mil.
4. Weight: 34 lb/1000 sq. ft..
5. 3-InchTensile According to ASTM D 882: 300 lbf, and 12,500 psi.

2.7 WARNING LABELS AND SIGNS

A. Comply with NFPA 70 and 29 CFR 1910.145.

B. Self-Adhesive Warning Labels: Factory-printed, multicolor, pressure-sensitive adhesive labels, configured for display on front cover, door, or other access to equipment unless otherwise indicated.

C. Baked-Enamel Warning Signs:

1. Preprinted aluminum signs, punched or drilled for fasteners, with colors, legend, and size required for application.
2. 1/4-inch grommets in corners for mounting.
3. Nominal size, 7 by 10 inches.

D. Metal-Backed, Butyrate Warning Signs:

1. Weather-resistant, nonfading, preprinted, cellulose-acetate butyrate signs with 0.0396-inch galvanized-steel backing; and with colors, legend, and size required for application.
2. 1/4-inch grommets in corners for mounting.
3. Nominal size, 10 by 14 inches.

E. Warning label and sign shall include, but are not limited to, the following legends:

1. Multiple Power Source Warning: "DANGER - ELECTRICAL SHOCK HAZARD - EQUIPMENT HAS MULTIPLE POWER SOURCES."

2. Workspace Clearance Warning: "WARNING - OSHA REGULATION - AREA IN FRONT OF ELECTRICAL EQUIPMENT MUST BE KEPT CLEAR FOR 36 INCHES."

2.8 INSTRUCTION SIGNS

A. Engraved, laminated acrylic or melamine plastic, minimum 1/16 inch thick for signs up to 20 sq. inches and 1/8 inch thick for larger sizes.

1. Engraved legend with black letters on white face.
2. Punched or drilled for mechanical fasteners.
3. Framed with mitered acrylic molding and arranged for attachment at applicable equipment.

B. Adhesive Film Label: Machine printed, in black, by thermal transfer or equivalent process. Minimum letter height shall be 3/8 inch.

C. Adhesive Film Label with Clear Protective Overlay: Machine printed, in black, by thermal transfer or equivalent process. Minimum letter height shall be 3/8 inch. Overlay shall provide a weatherproof and UV-resistant seal for label.

2.9 EQUIPMENT IDENTIFICATION LABELS

A. Adhesive Film Label: Machine printed, in black, by thermal transfer or equivalent process. Minimum letter height shall be 3/8 inch.

B. Adhesive Film Label with Clear Protective Overlay: Machine printed, in black, by thermal transfer or equivalent process. Minimum letter height shall be 3/8 inch. Overlay shall provide a weatherproof and UV-resistant seal for label.

C. Self-Adhesive, Engraved, Laminated Acrylic or Melamine Label: Adhesive backed, with white letters on a dark-gray background. Minimum letter height shall be 3/8 inch.

D. Engraved, Laminated Acrylic or Melamine Label: Punched or drilled for screw mounting. White letters on a dark-gray background. Minimum letter height shall be 3/8 inch.

E. Stenciled Legend: In nonfading, waterproof, **black** ink or paint. Minimum letter height shall be **1 inch**.

2.10 CABLE TIES

A. General-Purpose Cable Ties: Fungus inert, self extinguishing, one piece, self locking, Type 6/6 nylon.

1. Minimum Width: 3/16 inch.
2. Tensile Strength at 73 deg F, According to ASTM D 638: 12,000 psi.
3. Temperature Range: Minus 40 to plus 185 deg F.
4. Color: Black except where used for color-coding.

B. UV-Stabilized Cable Ties: Fungus inert, designed for continuous exposure to exterior sunlight, self extinguishing, one piece, self locking, Type 6/6 nylon.

1. Minimum Width: 3/16 inch.
2. Tensile Strength at 73 deg F, According to ASTM D 638: 12,000 psi.
3. Temperature Range: Minus 40 to plus 185 deg F.
4. Color: Black.

C. Plenum-Rated Cable Ties: Self extinguishing, UV stabilized, one piece, self locking.

1. Minimum Width: 3/16 inch.
2. Tensile Strength at 73 deg F, According to ASTM D 638: 7000 psi.
3. UL 94 Flame Rating: 94V-0.
4. Temperature Range: Minus 50 to plus 284 deg F.
5. Color: Black.

2.11 MISCELLANEOUS IDENTIFICATION PRODUCTS

A. Paint: Comply with requirements in painting Sections for paint materials and application requirements. Select paint system applicable for surface material and location (exterior or interior).

B. Fasteners for Labels and Signs: Self-tapping, stainless-steel screws or stainless-steel machine screws with nuts and flat and lock washers.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Verify identity of each item before installing identification products.

B. Location: Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment.

C. Apply identification devices to surfaces that require finish after completing finish work.

D. Self-Adhesive Identification Products: Clean surfaces before application, using materials and methods recommended by manufacturer of identification device.

E. Attach signs and plastic labels that are not self-adhesive type with mechanical fasteners appropriate to the location and substrate.

F. System Identification Color-Coding Bands for Raceways and Cables: Each color-coding band shall completely encircle cable or conduit. Place adjacent bands of two-color markings in contact, side by side. Locate bands at changes in direction, at penetrations of walls and floors, at 50-foot maximum intervals in straight runs, and at 25-foot maximum intervals in congested areas.

G. Aluminum Wraparound Marker Labels and Metal Tags: Secure tight to surface of conductor or cable at a location with high visibility and accessibility.

H. Cable Ties: For attaching tags. Use general-purpose type, except as listed below:

1. Outdoors: UV-stabilized nylon.
2. In Spaces Handling Environmental Air: Plenum rated.

I. Underground-Line Warning Tape: During backfilling of trenches install continuous underground-line warning tape directly above line at 6 to 8 inches below finished grade. Use multiple tapes where width of multiple lines installed in a common trench or concrete envelope exceeds 16 inches overall.

J. Painted Identification: Comply with requirements in painting Sections for surface preparation and paint application.

3.2 IDENTIFICATION SCHEDULE

A. Concealed Raceways, Duct Banks, More Than 600 V, within Buildings: Tape and stencil 4-inch-wide black stripes on 10-inch centers over orange background that extends full length of raceway or duct and is 12 inches wide. Stencil legend "DANGER CONCEALED HIGH VOLTAGE WIRING" with 3-inch- high black letters on 20-inch centers. Stop stripes at legends. Apply to the following finished surfaces:

1. Floor surface directly above conduits running beneath and within 12 inches of a floor that is in contact with earth or is framed above unexcavated space.
2. Wall surfaces directly external to raceways concealed within wall.
3. Accessible surfaces of concrete envelope around raceways in vertical shafts, exposed in the building, or concealed above suspended ceilings.

B. Accessible Raceways, Armored and Metal-Clad Cables, More Than 600 V: Self-adhesive vinyl labels. Install labels at 10-foot maximum intervals.

C. Accessible Raceways and Metal-Clad Cables, 600 V or Less, for Service, Feeder, and Branch Circuits More Than 30A, and 120V to ground: Identify with self-adhesive vinyl label labels at 10-foot maximum intervals.

D. Accessible Raceways and Cables within Buildings: Identify the covers of each junction and pull box of the following systems with self-adhesive vinyl labels with the wiring system legend and system voltage. System legends shall be as follows:

1. Emergency Power.
2. Power.

E. Power-Circuit Conductor Identification, 600 V or Less: For conductors in vaults, pull and junction boxes, manholes, and handholes, use color-coding conductor tape to identify the phase.

1. Color-Coding for Phase and Voltage Level Identification, 600 V or Less: Use colors listed below for ungrounded service feeder and branch-circuit conductors.

a. Color shall be factory applied or field applied for sizes larger than No. 8 AWG, if authorities having jurisdiction permit.

b. Colors for 208/120-V Circuits:

1) Phase A: Black.
2) Phase B: Red.
3) Phase C: Blue.

c. Field-Applied, Color-Coding Conductor Tape: Apply in half-lapped turns for a minimum distance of 6 inches from terminal points and in boxes where splices or taps are made. Apply last two turns of tape with no tension to prevent possible unwinding. Locate bands to avoid obscuring factory cable markings.

F. Power-Circuit Conductor Identification, More than 600 V: For conductors in vaults, pull and junction boxes, manholes, and handholes, use nonmetallic plastic tag holder with adhesive-backed phase tags, and a separate tag with the circuit designation.

G. Install instructional sign including the color-code for grounded and ungrounded conductors using adhesive-film-type labels.

H. Conductors to Be Extended in the Future: Attach [**write-on tags**] [**marker tape**] to conductors and list source.

I. Auxiliary Electrical Systems Conductor Identification: Identify field-installed alarm, control, and signal connections.

1. Identify conductors, cables, and terminals in enclosures and at junctions, terminals, and pull points. Identify by system and circuit designation.
2. Use system of marker tape designations that is uniform and consistent with system used by manufacturer for factory-installed connections.
3. Coordinate identification with Project Drawings, manufacturer's wiring diagrams, and the Operation and Maintenance Manual.

J. Locations of Underground Lines: Identify with underground-line warning tape for power, lighting, communication, and control wiring and optical fiber cable.

1. Limit use of underground-line warning tape to direct-buried cables.
2. Install underground-line warning tape for both direct-buried cables and cables in raceway.

K. Workspace Indication: Install floor marking tape to show working clearances in the direction of access to live parts. Workspace shall be as required by NFPA 70 and 29 CFR 1926.403 unless otherwise indicated. Do not install at flush-mounted panelboards and similar equipment in finished spaces.

L. Warning Labels for Indoor Cabinets, Boxes, and Enclosures for Power and Lighting: Self-adhesive warning labels.

1. Comply with 29 CFR 1910.145.
2. Identify system voltage with black letters on an orange background.
3. Apply to exterior of door, cover, or other access.
4. For equipment with multiple power or control sources, apply to door or cover of equipment including, but not limited to, the following:

a. Power transfer switches.

b. Controls with external control power connections.

M. Operating Instruction Signs: Install instruction signs to facilitate proper operation and maintenance of electrical systems and items to which they connect. Install instruction signs with approved legend where instructions are needed for system or equipment operation.

N. Emergency Operating Instruction Signs: Install instruction signs with white legend on a red background with minimum 3/8-inch- high letters for emergency instructions at equipment used for power transfer.

O. Equipment Identification Labels: On each unit of equipment, install unique designation label that is consistent with wiring diagrams, schedules, and the Operation and Maintenance Manual. Apply labels to disconnect switches and protection equipment, central or master units, control panels, control stations, terminal cabinets, and racks of each system. Systems include power, lighting, control, communication, signal, monitoring, and alarm systems unless equipment is provided with its own identification.

1. Labeling Instructions:

a. Indoor Equipment: Self-adhesive, engraved, laminated acrylic or melamine label. Unless otherwise indicated, provide a single line of text with 1/2-inch- high letters on 1-1/2-inch- high label; where two lines of text are required, use labels 2 inches high.

b. Outdoor Equipment: Engraved, laminated acrylic or melamine label.

c. Elevated Components: Increase sizes of labels and letters to those appropriate for viewing from the floor.

d. Unless provided with self-adhesive means of attachment, fasten labels with appropriate mechanical fasteners that do not change the NEMA or NRTL rating of the enclosure.

2. Equipment to Be Labeled:

a. Panelboards: Typewritten directory of circuits in the location provided by panelboard manufacturer. Panelboard identification shall be self-adhesive, engraved, laminated acrylic or melamine label.

b. Enclosures and electrical cabinets.

c. Access doors and panels for concealed electrical items.

d. Switchgear.

e. Switchboards.

f. Transformers: Label that includes tag designation shown on Drawings for the transformer, feeder, and panelboards or equipment supplied by the secondary.

g. Substations.

h. Emergency system boxes and enclosures.

i. Motor-control centers.

j. Enclosed switches.

k. Enclosed circuit breakers.

l. Enclosed controllers.

m. Variable-speed controllers.

n. Push-button stations.

o. Power transfer equipment.

p. Contactors.

q. Remote-controlled switches, dimmer modules, and control devices.

r. Battery-inverter units.

s. Battery racks.

t. Power-generating units.

u. Monitoring and control equipment.

v. UPS equipment.

END OF SECTION

SECTION 26 0573

OVERCURRENT PROTECTIVE DEVICE COORDINATION STUDY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes computer-based, fault-current and overcurrent protective device coordination studies. Protective devices shall be set based on results of the protective device coordination study.

1. Coordination of series-rated devices is permitted where indicated on Drawings.

1.3 ACTION SUBMITTALS

A. Product Data: For computer software program to be used for studies.

B. Other Action Submittals: The following submittals shall be made after the approval process for system protective devices has been completed. Submittals shall be in digital form.

1. Coordination-study input data, including completed computer program input data sheets.
2. Study and Equipment Evaluation Reports.
3. Coordination-Study Report.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For coordination-study specialist.

B. Product Certificates: For coordination-study and fault-current-study computer software programs, certifying compliance with IEEE 399.

1.5 QUALITY ASSURANCE

A. Studies shall use computer programs that are distributed nationally and are in wide use. Software algorithms shall comply with the requirements of standards and guides specified in this Section. Manual calculations are not acceptable.

B. Coordination-Study Specialist Qualifications: An entity experienced in the application of computer software used for studies, having performed successful studies of similar magnitude on electrical distribution systems using similar devices.

1. A professional engineer, licensed in the state where Project is located, shall be responsible for the study. All elements of the study shall be performed under the direct supervision and control of engineers.

C. Comply with IEEE 242 for short-circuit currents and coordination time intervals.

D. Comply with IEEE 399 for general study procedures.

PART 2 - PRODUCTS

2.1 COMPUTER SOFTWARE DEVELOPERS

A. Available Computer Software Developers: Subject to compliance with requirements, companies offering computer software programs that may be used in the Work include, but are not limited to, the following:

B. Computer Software Developers: Subject to compliance with requirements, provide products by one of the following:

C. Basis-of-Design Product: Subject to compliance with requirements, provide the product indicated on Drawings or a comparable product by one of the following:

1. CGI CYME.
2. EDSA Micro Corporation.
3. ESA Inc.
4. Operation Technology, Inc.
5. SKM Systems Analysis, Inc.

2.2 COMPUTER SOFTWARE PROGRAM REQUIREMENTS

A. Comply with IEEE 399.

B. Analytical features of fault-current-study computer software program shall include "mandatory," "very desirable," and "desirable" features as listed in IEEE 399.

C. The computer software program shall be capable of plotting and diagramming time-current-characteristic curves as part of its output. The computer software program shall report device settings and ratings of all overcurrent protective devices and shall demonstrate selective coordination by computer-generated, time-current coordination plots.

1. Optional Features:
    a. Arcing faults.
    b. Simultaneous faults.
    c. Explicit negative sequence.
    d. Mutual coupling in zero sequence.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine Project overcurrent protective device submittals for compliance with electrical distribution system coordination requirements and other conditions affecting performance. Devices to be coordinated are indicated on Drawings.

1. Proceed with coordination study only after relevant equipment submittals have been assembled. Overcurrent protective devices that have not been submitted and approved prior to coordination study may not be used in study.

3.2 POWER SYSTEM DATA

A. Gather and tabulate the following input data to support coordination study:

1. Product Data for overcurrent protective devices specified in other electrical Sections and involved in overcurrent protective device coordination studies. Use equipment designation tags that are consistent with electrical distribution system diagrams, overcurrent protective device submittals, input and output data, and recommended device settings.

2. Impedance of utility service entrance.

3. Electrical Distribution System Diagram: In hard-copy and electronic-copy formats, showing the following:

   a. Circuit-breaker and fuse-current ratings and types.

   b. Relays and associated power and current transformer ratings and ratios.

   c. Transformer kilovolt amperes, primary and secondary voltages, connection type, impedance, and X/R ratios.

   d. Generator kilovolt amperes, size, voltage, and source impedance.

   e. Cables: Indicate conduit material, sizes of conductors, conductor material, insulation, and length.

   f. Busway ampacity and impedance.

   g. Motor horsepower and code letter designation according to NEMA MG 1.

4. Data sheets to supplement electrical distribution system diagram, cross-referenced with tag numbers on diagram, showing the following:

   a. Special load considerations, including starting inrush currents and frequent starting and stopping.

   b. Transformer characteristics, including primary protective device, magnetic inrush current, and overload capability.

   c. Motor full-load current, locked rotor current, service factor, starting time, type of start, and thermal-damage curve.

   d. Generator thermal-damage curve.

   e. Ratings, types, and settings of utility company's overcurrent protective devices.

   f. Special overcurrent protective device settings or types stipulated by utility company.

   g. Time-current-characteristic curves of devices indicated to be coordinated.

   h. Manufacturer, frame size, interrupting rating in amperes rms symmetrical, ampere or current sensor rating, long-time adjustment range, short-time adjustment range, and instantaneous adjustment range for circuit breakers.

   i. Manufacturer and type, ampere-tap adjustment range, time-delay adjustment range, instantaneous attachment adjustment range, and current transformer ratio for overcurrent relays.

   j. Panelboards, switchboards, motor-control center ampacity, and interrupting rating in amperes rms symmetrical.

3.3 FAULT-CURRENT STUDY

A. Calculate the maximum available short-circuit current in amperes rms symmetrical at circuit-breaker positions of the electrical power distribution system. The calculation shall be for a current immediately after initiation and for a three-phase bolted short circuit at each of the following:

1. VFD-controllers.
2. Distribution panelboard.
3. Branch circuit panelboard.

B. Study electrical distribution system from normal and alternate power sources throughout electrical distribution system for Project. Include studies of system-switching configurations and alternate operations that could result in maximum fault conditions.

C. Calculate momentary and interrupting duties based on maximum available fault current.

D. Calculations to verify interrupting ratings of overcurrent protective devices shall comply with IEEE 141 and IEEE 242.

1. Transformers:
   a. ANSI C57.12.10.
   b. ANSI C57.12.22.
   c. ANSI C57.12.40.
   d. IEEE C57.12.00.
   e. IEEE C57.96.
2. Medium-Voltage Circuit Breakers: IEEE C37.010.
3. Low-Voltage Circuit Breakers: IEEE 1015 and IEEE C37.20.1.
4. Low-Voltage Fuses: IEEE C37.46.

E. Study Report:

1. Show calculated X/R ratios and equipment interrupting rating (1/2-cycle) fault currents on electrical distribution system diagram.

F. Equipment Evaluation Report:

1. For devices and equipment rated for asymmetrical fault current, apply multiplication factors listed in the standards to 1/2-cycle symmetrical fault current.
2. Verify adequacy of phase conductors at maximum three-phase bolted fault currents; verify adequacy of equipment grounding conductors and grounding electrode conductors at maximum ground-fault currents. Ensure that short-circuit withstand ratings are equal to or higher than calculated 1/2-cycle symmetrical fault current.

3.4 COORDINATION STUDY

A. Perform coordination study using approved computer software program. Prepare a written report using results of fault-current study. Comply with IEEE 399.

1. Calculate the maximum and minimum 1/2-cycle short-circuit currents.
2. Calculate the maximum and minimum interrupting duty (5 cycles to 2 seconds) short-circuit currents.

3. Calculate the maximum and minimum ground-fault currents.

B. Comply with IEEE 141, IEEE 241 and IEEE 242 recommendations for fault currents and time intervals.

C. Transformer Primary Overcurrent Protective Devices:

1. Device shall not operate in response to the following:

a. Inrush current when first energized.

b. Self-cooled, full-load current or forced-air-cooled, full-load current, whichever is specified for that transformer.

c. Permissible transformer overloads according to IEEE C57.96 if required by unusual loading or emergency conditions.

2. Device settings shall protect transformers according to IEEE C57.12.00, for fault currents.

D. Motors served by voltages more than 600 V shall be protected according to IEEE 620.

E. Conductor Protection: Protect cables against damage from fault currents according to ICEA P-32-382, ICEA P-45-482, and conductor melting curves in IEEE 242. Demonstrate that equipment withstands the maximum short-circuit current for a time equivalent to the tripping time of the primary relay protection or total clearing time of the fuse. To determine temperatures that damage insulation, use curves from cable manufacturers or from listed standards indicating conductor size and short-circuit current.

F. Coordination-Study Report: Prepare a written report indicating the following results of coordination study:

1. Tabular Format of Settings Selected for Overcurrent Protective Devices:

a. Device tag.

b. Relay-current transformer ratios; and tap, time-dial, and instantaneous-pickup values.

c. Circuit-breaker sensor rating; and long-time, short-time, and instantaneous settings.

d. Fuse-current rating and type.

e. Ground-fault relay-pickup and time-delay settings.

2. Coordination Curves: Prepared to determine settings of overcurrent protective devices to achieve selective coordination. Graphically illustrate that adequate time separation exists between devices installed in series, including power utility company's upstream devices. Prepare separate sets of curves for the switching schemes and for emergency periods where the power source is local generation. Show the following information:

a. Device tag.

b. Voltage and current ratio for curves.

c. Three-phase and single-phase damage points for each transformer.

d. No damage, melting, and clearing curves for fuses.

e. Cable damage curves.

f. Transformer inrush points.

g. Maximum fault-current cutoff point.

G. Completed data sheets for setting of overcurrent protective devices.

END OF SECTION

SECTION 262416

PANELBOARDS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Distribution panelboards.
2. Lighting and appliance branch-circuit panelboards.
3. Load centers.
4. Electronic-grade panelboards.

1.3 DEFINITIONS

A. SVR: Suppressed voltage rating.

B. TVSS: Transient voltage surge suppressor.

1.4 PERFORMANCE REQUIREMENTS

A. Seismic Performance: Panelboards shall withstand the effects of earthquake motions determined according to SEI/ASCE 7.

1. The term "withstand" means "the unit will remain in place without separation of any parts from the device when subjected to the seismic forces specified and the unit will be fully operational after the seismic event."

1.5 ACTION SUBMITTALS

A. Product Data: For each type of panelboard, switching and overcurrent protective device, transient voltage suppression device, accessory, and component indicated. Include dimensions and manufacturers' technical data on features, performance, electrical characteristics, ratings, and finishes.

B. Shop Drawings: For each panelboard and related equipment.

1. Include dimensioned plans, elevations, sections, and details. Show tabulations of installed devices, equipment features, and ratings.
2. Detail enclosure types and details for types other than NEMA 250, Type 1.
3. Detail bus configuration, current, and voltage ratings.
4. Short-circuit current rating of panelboards and overcurrent protective devices.
5. Include evidence of NRTL listing for series rating of installed devices.

6. Detail features, characteristics, ratings, and factory settings of individual overcurrent protective devices and auxiliary components.
7. Include wiring diagrams for power, signal, and control wiring.
8. Include time-current coordination curves for each type and rating of overcurrent protective device included in panelboards. Submit on translucent log-log graft paper; include selectable ranges for each type of overcurrent protective device.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified testing agency.

B. Seismic Qualification Certificates: Submit certification that panelboards, overcurrent protective devices, accessories, and components will withstand seismic forces defined in Section 260548 "Vibration and Seismic Controls for Electrical Systems." Include the following:

1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.

C. Field Quality-Control Reports:

1. Test procedures used.
2. Test results that comply with requirements.
3. Results of failed tests and corrective action taken to achieve test results that comply with requirements.

D. Panelboard Schedules: For installation in panelboards. Submit final versions after load balancing.

1.7 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For panelboards and components to include in emergency, operation, and maintenance manuals. In addition to items specified in Section 017823 "Operation and Maintenance Data," include the following:

1. Manufacturer's written instructions for testing and adjusting overcurrent protective devices.
2. Time-current curves, including selectable ranges for each type of overcurrent protective device that allows adjustments.

1.8 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Keys: Two spares for each type of panelboard cabinet lock.
2. Circuit Breakers Including GFCI and Ground Fault Equipment Protection (GFEP) Types: Two spares for each panelboard.

3. Fuses for Fused Switches: Equal to 10 percent of quantity installed for each size and type, but no fewer than three of each size and type.

4. Fuses for Fused Power-Circuit Devices: Equal to 10 percent of quantity installed for each size and type, but no fewer than three of each size and type.

1.9 QUALITY ASSURANCE

A. Testing Agency Qualifications: Member company of NETA or an NRTL.

1. Testing Agency's Field Supervisor: Currently certified by NETA to supervise on-site testing.

B. Source Limitations: Obtain panelboards, overcurrent protective devices, components, and accessories from single source from single manufacturer.

C. Product Selection for Restricted Space: Drawings indicate maximum dimensions for panelboards including clearances between panelboards and adjacent surfaces and other items. Comply with indicated maximum dimensions.

D. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

E. Comply with NEMA PB 1.

F. Comply with NFPA 70.

1.10 DELIVERY, STORAGE, AND HANDLING

A. Remove loose packing and flammable materials from inside panelboards; install temporary electric heating (250 W per panelboard) to prevent condensation.

B. Handle and prepare panelboards for installation according to NECA 407.

1.11 PROJECT CONDITIONS

A. Environmental Limitations:

1. Do not deliver or install panelboards until spaces are enclosed and weathertight, wet work in spaces is complete and dry, work above panelboards is complete, and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.

2. Rate equipment for continuous operation under the following conditions unless otherwise indicated:

.Ambient Temperature: Not exceeding minus 22 deg F to plus 104 deg F.

b. Altitude: Not exceeding 6600 feet.

B. Service Conditions: NEMA PB 1, usual service conditions, as follows:

1. Ambient temperatures within limits specified.

2. Altitude not exceeding 6600 feet.

C. Interruption of Existing Electric Service: Do not interrupt electric service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary electric service according to requirements indicated:

1. Notify Architect and owner no fewer than two weeks in advance of proposed interruption of electric service.
2. Do not proceed with interruption of electric service without Owner's or Construction Manager's written permission.
3. Comply with NFPA 70E.

1.12 COORDINATION

A. Coordinate layout and installation of panelboards and components with other construction that penetrates walls or is supported by them, including electrical and other types of equipment, raceways, piping, encumbrances to workspace clearance requirements, and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.

B. Coordinate sizes and locations of concrete bases with actual equipment provided. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and formwork requirements are specified with concrete.

1.13 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace transient voltage suppression devices that fail in materials or workmanship within specified warranty period.

1. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS FOR PANELBOARDS

A. Fabricate and test panelboards according to IEEE 344 to withstand seismic forces defined in Section 26 0548 "Vibration and Seismic Controls for Electrical Systems."

B. Enclosures: Flush- and surface-mounted cabinets.

1. Rated for environmental conditions at installed location.
    a. Indoor Dry and Clean Locations: NEMA 250, Type 1.
    b. Outdoor Locations: NEMA 250, Type 3R.
    c. Kitchen Areas: NEMA 250, Type 4X, stainless steel.
    d. Other Wet or Damp Indoor Locations: NEMA 250, Type 4.
2. Front: Secured to box with concealed trim clamps. For surface-mounted fronts, match box dimensions; for flush-mounted fronts, overlap box.
3. Hinged Front Cover: Entire front trim hinged to box and with standard door within hinged trim cover.
4. Skirt for Surface-Mounted Panelboards: Same gage and finish as panelboard front with flanges for attachment to panelboard, wall, and ceiling or floor.
5. Gutter Extension and Barrier: Same gage and finish as panelboard enclosure; integral with enclosure body. Arrange to isolate individual panel sections.

6. Finishes:

   a. Panels and Trim: Steel, factory finished immediately after cleaning and pretreating with manufacturer's standard two-coat, baked-on finish consisting of prime coat and thermosetting topcoat.

   b. Back Boxes: Galvanized stee.

   c. Fungus Proofing: Permanent fungicidal treatment for overcurrent protective devices and other components.

7. Directory Card: Inside panelboard door, mounted inmetal frame with transparent protective cover.

C. Incoming Mains Location Top and bottom.

D. Phase, Neutral, and Ground Buses:

1. Material: Hard-drawn copper, 98 percent conductivity.

2. Equipment Ground Bus: Adequate for feeder and branch-circuit equipment grounding conductors; bonded to box.

3. Isolated Ground Bus: Adequate for branch-circuit isolated ground conductors; insulated from box.

4. Extra-Capacity Neutral Bus: Neutral bus rated 200 percent of phase bus and UL listed as suitable for nonlinear loads.

5. Split Bus: Vertical buses divided into individual vertical sections.

E. Conductor Connectors: Suitable for use with conductor material and sizes.

1. Material: Tin-plated aluminum.

2. Main and Neutral Lugs: Mechanical type.

3. Ground Lugs and Bus-Configured Terminators: Mechanical type.

4. Feed-Through Lugs: Mechanical type, suitable for use with conductor material. Locate at opposite end of bus from incoming lugs or main device.

5. Subfeed (Double) Lugs: Mechanical type suitable for use with conductor material. Locate at same end of bus as incoming lugs or main device.

6. Gutter-Tap Lugs: Mechanical type suitable for use with conductor material. Locate at same end of bus as incoming lugs or main device.

7. Extra-Capacity Neutral Lugs: Rated 200 percent of phase lugs mounted on extra-capacity neutral bus.

F. Service Equipment Label: NRTL labeled for use as service equipment for panelboards or load centers with one or more main service disconnecting and overcurrent protective devices.

G. Future Devices: Mounting brackets, bus connections, filler plates, and necessary appurtenances required for future installation of devices.

H. Panelboard Short-Circuit Current Rating: Rated for series-connected system with integral or remote upstream overcurrent protective devices and labeled by an NRTL. Include size and type of allowable upstream and branch devices, listed and labeled for series-connected short-circuit rating by an NRTL.

I. Panelboard Short-Circuit Current Rating: Fully rated to interrupt symmetrical short-circuit current available at terminals.

2.2 DISTRIBUTION PANELBOARDS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

B. Basis-of-Design Product: Subject to compliance with requirements, provide [product indicated on Drawings] <Insert manufacturer's name; product name or designation> or comparable product by one of the following:

1. Eaton Electrical Inc.; Cutler-Hammer Business Unit.
2. General Electric Company; GE Consumer & Industrial - Electrical Distribution.
3. Siemens Energy & Automation, Inc.
4. Square D; a brand of Schneider Electric.

C. Panelboards: NEMA PB 1, power and feeder distribution type.

D. Doors: Secured with vault-type latch with tumbler lock; keyed alike.

1. For doors more than 36 inches high, provide two latches, keyed alike.

E. Mains: Circuit breaker or Lugs only as indicated on the drawings.

F. Branch Overcurrent Protective Devices for Circuit-Breaker Frame Sizes 125 A and Smaller: Bolt-on circuit breakers.

G. Branch Overcurrent Protective Devices for Circuit-Breaker Frame Sizes Larger Than 125 A: Bolt-on circuit breakers; plug-in circuit breakers where individual positive-locking device requires mechanical release for removal.

H. Branch Overcurrent Protective Devices: Fused switches.

I. Contactors in Main Bus: NEMA ICS 2, Class A, electrically held, general-purpose controller, with same short-circuit interrupting rating as panelboard.

1. Internal Control-Power Source: Control-power transformer, with fused primary and secondary terminals, connected to main bus ahead of contactor connection.
2. External Control-Power Source: 24-V control circuit.

2.3 LIGHTING AND APPLIANCE BRANCH-CIRCUIT PANELBOARDS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

B. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:

1. Eaton Electrical Inc.; Cutler-Hammer Business Unit.
2. General Electric Company; GE Consumer & Industrial - Electrical Distribution.
3. Siemens Energy & Automation, Inc.
4. Square D; a brand of Schneider Electric.

C. Panelboards: NEMA PB 1, lighting and appliance branch-circuit type.

D. Mains: Circuit breaker or lugs only as indicated on the drawings.

E. Branch Overcurrent Protective Devices: Bolt-on circuit breakers, replaceable without disturbing adjacent units.

F. Contactors in Main Bus: NEMA ICS 2, Class A, electrically held, general-purpose controller, with same short-circuit interrupting rating as panelboard.

1. Internal Control-Power Source: Control-power transformer, with fused primary and secondary terminals, connected to main bus ahead of contactor connection.
2. External Control-Power Source: 24-V control circuit.

G. Doors: Concealed hinges; secured with flush latch with tumbler lock; keyed alike.

H. Column-Type Panelboards: Narrow gutter extension, with cover, to overhead junction box equipped with ground and neutral terminal buses.

2.4 ELECTRONIC-GRADE PANELBOARDS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

B. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:

1. Current Technology; a subsidiary of Danahar Corporation.
2. Eaton Electrical Inc.; Cutler-Hammer Business Unit.
3. General Electric Company; GE Consumer & Industrial - Electrical Distribution.
4. Siemens Energy & Automation, Inc.
5. Square D; a brand of Schneider Electric.

C. Panelboards: NEMA PB 1; with factory-installed, integral TVSS; labeled by an NRTL for compliance with UL 67 after installing TVSS.

D. Doors: Secured with vault-type latch with tumbler lock; keyed alike.

E. Main Overcurrent Protective Devices: Bolt-on thermal-magnetic circuit breakers.

F. Branch Overcurrent Protective Devices: Bolt-on thermal-magnetic circuit breakers.

G. Buses:

1. Copper phase and neutral buses; 200 percent capacity neutral bus and lugs.
2. Copper equipment and isolated ground buses.

H. Surge Protection Device: IEEE C62.41-compliant, integrally mounted, wired-in or bolt-on, solid-state, parallel-connected, modular (with field-replaceable modules) type, with sine-wave tracking suppression and filtering modules, short-circuit current rating complying with UL 1449, second edition, and matching or exceeding the panelboard short-circuit rating, redundant suppression circuits, with individually fused metal-oxide varistors.

1. Accessories:

a. Fuses rated at 200-kA interrupting capacity.
b. Fabrication using bolted compression lugs for internal wiring.
c. Integral disconnect switch.
d. Redundant suppression circuits.
e. Redundant replaceable modules.

f. Arrangement with wire connections to phase buses, neutral bus, and ground bus.

g. LED indicator lights for power and protection status.

h. Audible alarm, with silencing switch, to indicate when protection has failed.

i. Form-C contacts rated at 5 A and 250-V ac, one normally open and one normally closed, for remote monitoring of system operation. Contacts shall reverse position on failure of any surge diversion module or on opening of any current-limiting device. Coordinate with building power monitoring and control system.

j. Four-digit, transient-event counter set to totalize transient surges.

2. Peak Single-Impulse Surge Current Rating: 160 kA per mode/320 kA per phase.

3. Minimum single-impulse current ratings, using 8-by-20-mic.sec. waveform described in IEEE C62.41.2.

a. Line to Neutral: 70,000A.

b. Line to Ground: 70,000A.

c. Neutral to Ground: 50,000A.

4. Withstand Capabilities: 12,000 IEEE C62.41, Category C3 (10 kA), 8-by-20-mic.sec. surges with less than 5 percent change in clamping voltage.

5. Protection modes and UL 1449 SVR for grounded wye circuits with 480Y/277 -V, three-phase, four-wire circuits shall be as follows:

a. Line to Neutral: 800 V for 480Y/277.

b. Line to Ground: 800 V for 480Y/277.

c. Neutral to Ground: 800 V for 480Y/277.

6. Protection modes and UL 1449 SVR for 240/120-V, three-phase, four-wire circuits with high leg shall be as follows:

a. Line to Neutral: 400 V, 800 V from high leg.

b. Line to Ground: 400 V.

c. Neutral to Ground: 400 V.

7. Protection modes and UL 1449 SVR for 240-, 480-, or 600-V, three-phase, three-wire, delta circuits shall be as follows:

a. Line to Line: 2000 V for 480 V.

b. Line to Ground: 1500 V for 480 V.

2.5 DISCONNECTING AND OVERCURRENT PROTECTIVE DEVICES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

B. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:

1. Eaton Electrical Inc.; Cutler-Hammer Business Unit.

2. General Electric Company; GE Consumer & Industrial - Electrical Distribution.
3. Siemens Energy & Automation, Inc.
4. Square D; a brand of Schneider Electric.

C. Molded-Case Circuit Breaker (MCCB): Comply with UL 489, with interrupting capacity to meet available fault currents.

1. Thermal-Magnetic Circuit Breakers: Inverse time-current element for low-level overloads, and instantaneous magnetic trip element for short circuits. Adjustable magnetic trip setting for circuit-breaker frame sizes 250 A and larger.
2. Adjustable Instantaneous-Trip Circuit Breakers: Magnetic trip element with front-mounted, field-adjustable trip setting.
3. Electronic trip circuit breakers with rms sensing; field-replaceable rating plug or field-replicable electronic trip; and the following field-adjustable settings:
    a. Instantaneous trip.
    b. Long- and short-time pickup levels.
    c. Long- and short-time time adjustments.
    d. Ground-fault pickup level, time delay, and I^2t response.
4. Current-Limiting Circuit Breakers: Frame sizes 400 A and smaller; let-through ratings less than NEMA FU 1, RK-5.
5. GFCI Circuit Breakers: Single- and two-pole configurations with Class A ground-fault protection (6-mA trip).
6. Ground-Fault Equipment Protection (GFEP) Circuit Breakers: Class B ground-fault protection (30-mA trip).
7. Arc-Fault Circuit Interrupter (AFCI) Circuit Breakers: Comply with UL 1699; 120/240-V, single-pole configuration.
8. Molded-Case Circuit-Breaker (MCCB) Features and Accessories:
    a. Standard frame sizes, trip ratings, and number of poles.
    b. Lugs Mechanical style, suitable for number, size, trip ratings, and conductor materials.
    c. Application Listing: Appropriate for application; Type SWD for switching fluorescent lighting loads; Type HID for feeding fluorescent and high-intensity discharge (HID) lighting circuits.
    d. Ground-Fault Protection: Integrally mounted relay and trip unit with adjustable pickup and time-delay settings, push-to-test feature, and ground-fault indicator.
    e. Communication Capability: Universal-mounted communication module with functions and features compatible with power monitoring and control system specified in Section 260913 "Electrical Power Monitoring and Control."
    f. Shunt Trip: 24-V trip coil energized from separate circuit, set to trip at 55 percent of rated voltage.
    g. Undervoltage Trip: Set to operate at 35 to 75 percent of rated voltage without intentional time delay.

h. Auxiliary Contacts: One SPDT switch with "a" and "b" contacts; "a" contacts mimic circuit-breaker contacts and "b" contacts operate in reverse of circuit-breaker contacts.

i. Alarm Switch: Single-pole, normally open contact that actuates only when circuit breaker trips.

j. Key Interlock Kit: Externally mounted to prohibit circuit-breaker operation; key shall be removable only when circuit breaker is in off position.

k. Zone-Selective Interlocking: Integral with electronic trip unit; for interlocking ground-fault protection function with other upstream or downstream devices.

l. Multipole units enclosed in a single housing or factory assembled to operate as a single unit.

m. Handle Padlocking Device: Fixed attachment, for locking circuit-breaker handle in on or off position.

n. Handle Clamp: Loose attachment, for holding circuit-breaker handle in on position.

D. Fused Switch: NEMA KS 1, Type HD; clips to accommodate specified fuses; lockable handle.

1. Fuses, and Spare-Fuse Cabinet: Comply with requirements specified in Section 262813 "Fuses."

2. Fused Switch Features and Accessories: Standard ampere ratings and number of poles.

3. Auxiliary Contacts: One normally open and normally closed contact(s) that operate with switch handle operation.

2.6 PANELBOARD SUPPRESSORS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

B. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:

1. Current Technology; a subsidiary of Danahar Corporation.

2. Eaton Electrical Inc.; Cutler-Hammer Business Unit.

3. General Electric Company; GE Consumer & Industrial - Electrical Distribution.

4. Siemens Energy & Automation, Inc.

5. Square D; a brand of Schneider Electric.

C. Surge Protection Device: IEEE C62.41-compliant, integrally mounted, solid-state, parallel-connected, non-modular type, with sine-wave tracking suppression and filtering modules, UL 1449, second edition, short-circuit current rating matching or exceeding the panelboard short-circuit rating, and with the following features and accessories:

1. Accessories:

a. LED indicator lights for power and protection status.

b. Audible alarm, with silencing switch, to indicate when protection has failed.

c. One set of dry contacts rated at 5 A and 250-V ac, for remote monitoring of protection status.

D. Surge Protection Device: IEEE C62.41-compliant, integrally mounted, wired-in or bolt-on, solid-state, parallel-connected, modular (with field-replaceable modules) type, with sine-wave tracking suppression and filtering modules, UL 1449, second edition, short-circuit current rating matching or exceeding the panelboard short-circuit rating, and with the following features and accessories:

1. Accessories:

   a. Fuses rated at 200-kA interrupting capacity.

   b. Fabrication using bolted compression lugs for internal wiring.

   c. Integral disconnect switch.

   d. Redundant suppression circuits.

   e. Redundant replaceable modules.

   f. Arrangement with wire connections to phase buses, neutral bus, and ground bus.

   g. LED indicator lights for power and protection status.

   h. Audible alarm, with silencing switch, to indicate when protection has failed.

   i. Form-C contacts rated at 5 A and 250-V ac, one normally open and one normally closed, for remote monitoring of system operation. Contacts shall reverse position on failure of any surge diversion module or on opening of any current-limiting device. Coordinate with building power monitoring and control system.

   j. Four-digit, transient-event counter set to totalize transient surges.

2. Peak Single-Impulse Surge Current Rating: 160 kA per mode/320 kA per phase.

3. Minimum single-impulse current ratings, using 8-by-20-mic.sec. waveform described in IEEE C62.41.2.

   a. Line to Neutral: 70,000A.

   b. Line to Ground: 70,000A.

   c. Neutral to Ground: 50,000A.

4. Withstand Capabilities: 12,000 IEEE C62.41, Category C3 (10 kA), 8-by-20-mic.sec. surges with less than 5 percent change in clamping voltage.

5. Protection modes and UL 1449 SVR for grounded wye circuits with 480Y/277-V, three-phase, four-wire circuits shall be as follows:

   a. Line to Neutral: 800 V for 480Y/277.

   b. Line to Ground: 800 V for 480Y/277.

   c. Neutral to Ground: 800 V for 480Y/277.

6. Protection modes and UL 1449 SVR for 240/120-V, single-phase, three-wire circuits shall be as follows:

   a. Line to Neutral: 400 V.

   b. Line to Ground: 400 V.

   c. Neutral to Ground: 400 V.

7. Protection modes and UL 1449 SVR for 240/120-V, three-phase, four-wire circuits with high leg shall be as follows:

    a. Line to Neutral: 400 V, 800 V from high leg.

    b. Line to Ground: 400 V.

    c. Neutral to Ground: 400 V.

8. Protection modes and UL 1449 SVR for 240-, 480-, or 600-V, three-phase, three-wire, delta circuits shall be as follows:

    a. Line to Line: 2000 V for 480 V.

    b. Line to Ground: 1500 V for 480 V.

2.7 ACCESSORY COMPONENTS AND FEATURES

A. Accessory Set: Include tools and miscellaneous items required for overcurrent protective device test, inspection, maintenance, and operation.

B. Portable Test Set: For testing functions of solid-state trip devices without removing from panelboard. Include relay and meter test plugs suitable for testing panelboard meters and switchboard class relays.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Receive, inspect, handle, and store panelboards according to **NECA 407**.

B. Examine panelboards before installation. Reject panelboards that are damaged or rusted or have been subjected to water saturation.

C. Examine elements and surfaces to receive panelboards for compliance with installation tolerances and other conditions affecting performance of the Work.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install panelboards and accessories according to NECA 407.

B. Equipment Mounting: Install panelboards on concrete bases, 4-inch nominal thickness. Comply with requirements for concrete base specified in Section 03 3000 "Cast-in-Place Concrete."

1. Install dowel rods to connect concrete base to concrete floor. Unless otherwise indicated, install dowel rods on 18-inch centers around full perimeter of base.

2. For panelboards, install epoxy-coated anchor bolts that extend through concrete base and anchor into structural concrete floor.

3. Place and secure anchorage devices. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

4. Install anchor bolts to elevations required for proper attachment to panelboards.

5. Attach panelboard to the vertical finished or structural surface behind the panelboard.

C. Temporary Lifting Provisions: Remove temporary lifting eyes, channels, and brackets and temporary blocking of moving parts from panelboards.

D. Comply with mounting and anchoring requirements specified in Section 260548 "Vibration and Seismic Controls for Electrical Systems."

ABOVE FINISHED FLOOR OR GRADE.Mount top of trim 90 inches above finished floor unless otherwise indicated.

F. Mount panelboard cabinet plumb and rigid without distortion of box. Mount recessed panelboards with fronts uniformly flush with wall finish and mating with back box.

G. Install overcurrent protective devices and controllers not already factory installed.

1. Set field-adjustable, circuit-breaker trip ranges.

H. Install filler plates in unused spaces.

I. Stub four 1-inch empty conduits from panelboard into accessible ceiling space or space designated to be ceiling space in the future. Stub four 1-inch empty conduits into raised floor space or below slab not on grade.

J. Arrange conductors in gutters into groups and bundle and wrap with wire ties after completing load balancing.

K. Comply with NECA 1.

3.3 IDENTIFICATION

A. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs complying with Section 260553 "Identification for Electrical Systems."

B. Create a directory to indicate installed circuit loads after balancing panelboard loads; incorporate Owner's final room designations. Obtain approval before installing. Use a computer or typewriter to create directory; handwritten directories are not acceptable.

C. Panelboard Nameplates: Label each panelboard with a nameplate complying with requirements for identification specified in Section 260553 "Identification for Electrical Systems."

D. Device Nameplates: Label each branch circuit device in distribution panelboards with a nameplate complying with requirements for identification specified in Section 26 0553 "Identification for Electrical Systems."

3.4 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

B. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust components, assemblies, and equipment installations, including connections.

C. Perform tests and inspections.

1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.

D. Acceptance Testing Preparation:

1. Test insulation resistance for each panelboard bus, component, connecting supply, feeder, and control circuit.

2. Test continuity of each circuit.

E. Tests and Inspections:

1. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.

2. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.

3. Perform the following infrared scan tests and inspections and prepare reports:

a. Initial Infrared Scanning: After Substantial Completion, but not more than 60 days after Final Acceptance, perform an infrared scan of each panelboard. Remove front panels so joints and connections are accessible to portable scanner.

b. Follow-up Infrared Scanning: Perform an additional follow-up infrared scan of each panelboard 11 months after date of Substantial Completion.

c. Instruments and Equipment:

1) Use an infrared scanning device designed to measure temperature or to detect significant deviations from normal values. Provide calibration record for device.

F. Panelboards will be considered defective if they do not pass tests and inspections.

G. Prepare test and inspection reports, including a certified report that identifies panelboards included and that describes scanning results. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.

3.5 ADJUSTING

A. Adjust moving parts and operable component to function smoothly, and lubricate as recommended by manufacturer.

B. Set field-adjustable circuit-breaker trip ranges as specified in Section 260573 "Overcurrent Protective Device Coordination Study."

C. Load Balancing: After Substantial Completion, but not more than 60 days after Final Acceptance, measure load balancing and make circuit changes.

1. Measure as directed during period of normal system loading.

2. Perform load-balancing circuit changes outside normal occupancy/working schedule of the facility and at time directed. Avoid disrupting critical 24-hour services such as fax machines and on-line data processing, computing, transmitting, and receiving equipment.

3. After circuit changes, recheck loads during normal load period. Record all load readings before and after changes and submit test records.

4. Tolerance: Difference exceeding 20 percent between phase loads, within a panelboard, is not acceptable. Rebalance and recheck as necessary to meet this minimum requirement.

3.6 PROTECTION

A. Temporary Heating: Apply temporary heat to maintain temperature according to manufacturer's written instructions.

END OF SECTION

SECTION 26 2726

WIRING DEVICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Snap switches.

1.3 DEFINITIONS

A. EMI: Electromagnetic interference.

B. Pigtail: Short lead used to connect a device to a branch-circuit conductor.

C. RFI: Radio-frequency interference.

D. UTP: Unshielded twisted pair.

E. Coordination:

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: List of legends and description of materials and process used for premarking wall plates.

C. Samples: One for each type of device and wall plate specified, in each color specified.

1.5 INFORMATIONAL SUBMITTALS

A. Field quality-control reports.

1.6 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For wiring devices to include in all manufacturers' packing-label warnings and instruction manuals that include labeling conditions.

1.7 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers' Names: Shortened versions (shown in parentheses) of the following manufacturers' names are used in other Part 2 articles:

1. Cooper Wiring Devices; Division of Cooper Industries, Inc. (Cooper).
2. Hubbell Incorporated; Wiring Device-Kellems (Hubbell).
3. Leviton Mfg. Company Inc. (Leviton).
4. Pass & Seymour/Legrand (Pass & Seymour).

B. Source Limitations: Obtain each type of wiring device and associated wall plate from single source from single manufacturer.

2.2 GENERAL WIRING-DEVICE REQUIREMENTS

A. Wiring Devices, Components, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Comply with NFPA 70.

C. Devices that are manufactured for use with modular plug-in connectors may be substituted under the following conditions:

1. Connectors shall comply with UL 2459 and shall be made with stranding building wire.
2. Devices shall comply with the requirements in this Section.
3. Match voltage and current ratings and number of conductors to requirements of equipment being connected.

2.3 TOGGLE SWITCHES

A. Comply with NEMA WD 1, UL 20, and FS W-S-896.

B. Switches, 120/277 V, 20 A:

1. Products: Subject to compliance with requirements, provide one of the following:

1) Single Pole:

2) Cooper; AH1221.
3) Hubbell; HBL1221.
4) Leviton; 1221-2.
5) Pass & Seymour; CSB20AC1.

6) Cooper; AH1222.
7) Hubbell; HBL1222.
8) Leviton; 1222-2.

9) Pass & Seymour; CSB20AC2.

2.4 WALL PLATES

A. Single and combination types shall match corresponding wiring devices.

1. Plate-Securing Screws: Metal with head color to match plate finish.
2. Material for Finished Spaces 0.035-inch- thick, satin-finished, Type 302 stainless steel

2.5 FINISHES

A. Device Color:

1. Wiring Devices Connected to Normal Power System White

PART 3 - EXECUTION

3.1 INSTALLATION

A. Comply with NECA 1, including mounting heights listed in that standard, unless otherwise indicated.

B. Coordination with Other Trades:

1. Protect installed devices and their boxes. Do not place wall finish materials over device boxes and do not cut holes for boxes with routers that are guided by riding against outside of boxes.
2. Keep outlet boxes free of plaster, drywall joint compound, mortar, cement, concrete, dust, paint, and other material that may contaminate the raceway system, conductors, and cables.
3. Install device boxes in brick or block walls so that the cover plate does not cross a joint unless the joint is troweled flush with the face of the wall.
4. Install wiring devices after all wall preparation, including painting, is complete.

C. Conductors:

1. Do not strip insulation from conductors until right before they are spliced or terminated on devices.
2. Strip insulation evenly around the conductor using tools designed for the purpose. Avoid scoring or nicking of solid wire or cutting strands from stranded wire.
3. The length of free conductors at outlets for devices shall meet provisions of NFPA 70, Article 300, without pigtails.
4. Existing Conductors:

a. Cut back and pigtail, or replace all damaged conductors.
b. Straighten conductors that remain and remove corrosion and foreign matter.
c. Pigtailing existing conductors is permitted, provided the outlet box is large enough.

D. Device Installation:

1. Replace devices that have been in temporary use during construction and that were installed before building finishing operations were complete.
2. Keep each wiring device in its package or otherwise protected until it is time to connect conductors.
3. Do not remove surface protection, such as plastic film and smudge covers, until the last possible moment.
4. When there is a choice, use side wiring with binding-head screw terminals. Wrap solid conductor tightly clockwise, two-thirds to three-fourths of the way around terminal screw.
5. Use a torque screwdriver when a torque is recommended or required by manufacturer.
6. When conductors larger than No. 12 AWG are installed on 15- or 20-A circuits, splice No. 12 AWG pigtails for device connections.
7. Tighten unused terminal screws on the device.
8. When mounting into metal boxes, remove the fiber or plastic washers used to hold device-mounting screws in yokes, allowing metal-to-metal contact.

3.2 FIELD QUALITY CONTROL

A. Perform the following tests and inspections with the assistance of a factory-authorized service representative:

1. Test Instruments: Use instruments that comply with UL 1436.

B. Wiring device will be considered defective if it does not pass tests and inspections.

C. Prepare test and inspection reports.

END OF SECTION 262726

SECTION 26 2813

FUSES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Cartridge fuses rated 600-V ac and less for use in enclosed switches and enclosed controllers.
2. Plug fuses rated 125-V ac and less for use in plug-fuse-type enclosed switches.
3. Plug-fuse adapters for use in Edison-base, plug-fuse sockets.
4. Spare-fuse cabinets.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product indicated. Include construction details, material, dimensions, descriptions of individual components, and finishes for spare-fuse cabinets. Include the following for each fuse type indicated:

1. Ambient Temperature Adjustment Information: If ratings of fuses have been adjusted to accommodate ambient temperatures, provide list of fuses with adjusted ratings.

    a. For each fuse having adjusted ratings, include location of fuse, original fuse rating, local ambient temperature, and adjusted fuse rating.
    b. Provide manufacturer's technical data on which ambient temperature adjustment calculations are based.

2. Dimensions and manufacturer's technical data on features, performance, electrical characteristics, and ratings.
3. Current-limitation curves for fuses with current-limiting characteristics.
4. Time-current coordination curves (average melt) and current-limitation curves (instantaneous peak let-through current) for each type and rating of fuse.
5. Coordination charts and tables and related data.
6. Fuse sizes for elevator feeders and elevator disconnect switches.

1.4 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For fuses to include in emergency, operation, and maintenance manuals. In addition to items specified in Section 017823 "Operation and Maintenance Data," include the following:

1. Ambient temperature adjustment information.
2. Current-limitation curves for fuses with current-limiting characteristics.
3. Time-current coordination curves (average melt) and current-limitation curves (instantaneous peak let-through current) for each type and rating of fuse
4. Coordination charts and tables and related data.

1.5 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Fuses: Equal to 10 percent of quantity installed for each size and type, but no fewer than two of each size and type.

1.6 QUALITY ASSURANCE

A. Source Limitations: Obtain fuses, for use within a specific product or circuit, from single source from single manufacturer.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

C. Comply with NEMA FU 1 for cartridge fuses.

D. Comply with NFPA 70.

E. Comply with UL 248-11 for plug fuses.

1.7 PROJECT CONDITIONS

A. Where ambient temperature to which fuses are directly exposed is less than 40 deg F (5 deg C) or more than 100 deg F (38 deg C) apply manufacturer's ambient temperature adjustment factors to fuse ratings.

1.8 COORDINATION

A. Coordinate fuse ratings with utilization equipment nameplate limitations of maximum fuse size and with system short-circuit current levels.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Cooper Bussmann, Inc.
2. Edison Fuse, Inc.

3. Ferraz Shawmut, Inc.
4. Littelfuse, Inc.

2.2 CARTRIDGE FUSES

A. Characteristics: NEMA FU 1, nonrenewable cartridge fuses with voltage ratings consistent with circuit voltages.

2.3 PLUG FUSES

A. Characteristics: UL 248-11, nonrenewable plug fuses; 125-V ac.

2.4 PLUG-FUSE ADAPTERS

A. Characteristics: Adapters for using Type S, rejection-base plug fuses in Edison-base fuseholders or sockets; ampere ratings matching fuse ratings; irremovable once installed.

2.5 SPARE-FUSE CABINET

A. Characteristics: Wall-mounted steel unit with full-length, recessed piano-hinged door and key-coded cam lock and pull.

1. Size: Adequate for storage of spare fuses specified with **15** percent spare capacity minimum.
2. Finish: Gray, baked enamel.
3. Identification: "SPARE FUSES" in 1-1/2-inch- (38-mm-) high letters on exterior of door.
4. Fuse Pullers: For each size of fuse, where applicable and available, from fuse manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine fuses before installation. Reject fuses that are moisture damaged or physically damaged.

B. Examine holders to receive fuses for compliance with installation tolerances and other conditions affecting performance, such as rejection features.

C. Examine utilization equipment nameplates and installation instructions. Install fuses of sizes and with characteristics appropriate for each piece of equipment.

D. Evaluate ambient temperatures to determine if fuse rating adjustment factors must be applied to fuse ratings.

E. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 FUSE APPLICATIONS

A. Cartridge Fuses:

1. Motor Branch Circuits: Class RK1, time delay.
2. Other Branch Circuits: Class RK1, time delay.
3. Control Circuits: Class CC, fast acting.

B. Plug Fuses:

1. Motor Branch Circuits: Edison-base type, dual-element time delay.
2. Other Branch Circuits: Edison-base type, single-element fast acting.

3.3 INSTALLATION

A. Install fuses in fusible devices. Arrange fuses so rating information is readable without removing fuse.

B. Install plug-fuse adapters in Edison-base fuseholders and sockets. Ensure that adapters are irremovable once installed.

C. Install spare-fuse cabinet(s).

3.4 IDENTIFICATION

A. Install labels complying with requirements for identification specified in Section 260553 "Identification for Electrical Systems" and indicating fuse replacement information on inside door of each fused switch and adjacent to each fuse block, socket, and holder.

END OF SECTION

SECTION 26 2816

ENCLOSED SWITCHES AND CIRCUIT BREAKERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Fusible switches.
2. Nonfusible switches.
3. Receptacle switches.
4. Shunt trip switches.
5. Molded-case circuit breakers (MCCBs).
6. Molded-case switches.
7. Enclosures.

1.3 DEFINITIONS

A. NC: Normally closed.

B. NO: Normally open.

C. SPDT: Single pole, double throw.

1.4 PERFORMANCE REQUIREMENTS

A. Seismic Performance: Enclosed switches and circuit breakers shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.

1. The term "withstand" means "the unit will remain in place without separation of any parts from the device when subjected to the seismic forces specified and the unit will be fully operational after the seismic event."

1.5 ACTION SUBMITTALS

A. Product Data: For each type of enclosed switch, circuit breaker, accessory, and component indicated. Include dimensioned elevations, sections, weights, and manufacturers' technical data on features, performance, electrical characteristics, ratings, accessories, and finishes.

1. Enclosure types and details for types other than NEMA 250, Type 1.
2. Current and voltage ratings.
3. Short-circuit current ratings (interrupting and withstand, as appropriate).

4. Include evidence of NRTL listing for series rating of installed devices.
5. Detail features, characteristics, ratings, and factory settings of individual overcurrent protective devices, accessories, and auxiliary components.
6. Include time-current coordination curves (average melt) for each type and rating of overcurrent protective device; include selectable ranges for each type of overcurrent protective device.

B. Shop Drawings: For enclosed switches and circuit breakers. Include plans, elevations, sections, details, and attachments to other work.

1. Wiring Diagrams: For power, signal, and control wiring.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified testing agency.

B. Seismic Qualification Certificates: For enclosed switches and circuit breakers, accessories, and components, from manufacturer.

1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.

C. Field quality-control reports.

1. Test procedures used.
2. Test results that comply with requirements.
3. Results of failed tests and corrective action taken to achieve test results that comply with requirements.

D. Manufacturer's field service report.

1.7 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For enclosed switches and circuit breakers to include in emergency, operation, and maintenance manuals. In addition to items specified in Section 01 7823 "Operation and Maintenance Data," include the following:

1. Manufacturer's written instructions for testing and adjusting enclosed switches and circuit breakers.
2. Time-current coordination curves (average melt) for each type and rating of overcurrent protective device; include selectable ranges for each type of overcurrent protective device.

1.8 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Fuses: Equal to 10 percent of quantity installed for each size and type, but no fewer than three of each size and type.
2. Fuse Pullers: Two for each size and type.

1.9 QUALITY ASSURANCE

A. Testing Agency Qualifications: Member company of NETA or an NRTL.

1. Testing Agency's Field Supervisor: Currently certified by NETA to supervise on-site testing.

B. Source Limitations: Obtain enclosed switches and circuit breakers, overcurrent protective devices, components, and accessories, within same product category, from single source from single manufacturer.

C. Product Selection for Restricted Space: Drawings indicate maximum dimensions for enclosed switches and circuit breakers, including clearances between enclosures, and adjacent surfaces and other items. Comply with indicated maximum dimensions.

D. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

E. Comply with NFPA 70.

1.10 PROJECT CONDITIONS

A. Environmental Limitations: Rate equipment for continuous operation under the following conditions unless otherwise indicated:

1. Ambient Temperature: Not less than minus 22 deg F and not exceeding 104 deg F.
2. Altitude: Not exceeding 6600 feet.

B. Interruption of Existing Electric Service: Do not interrupt electric service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary electric service according to requirements indicated:

1. Notify Construction Manager no fewer than seven days in advance of proposed interruption of electric service.
2. Indicate method of providing temporary electric service.
3. Do not proceed with interruption of electric service without Owner’s written permission.
4. Comply with NFPA 70E.

1.11 COORDINATION

A. Coordinate layout and installation of switches, circuit breakers, and components with equipment served and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.

PART 2 - PRODUCTS

2.1 FUSIBLE SWITCHES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

B. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:

1. Eaton Electrical Inc.; Cutler-Hammer Business Unit.
2. General Electric Company; GE Consumer & Industrial - Electrical Distribution.
3. Siemens Energy & Automation, Inc.
4. Square D; a brand of Schneider Electric.

C. Type GD, General Duty, Single Throw, 240-V ac, 800 A and Smaller: UL 98 and NEMA KS 1, horsepower rated, with cartridge or plug fuse interiors to accommodate specified fuses, lockable handle with capability to accept two padlocks, and interlocked with cover in closed position.

D. Type HD, Heavy Duty, Single Throw, 240-V ac, 1200 A and Smaller: UL 98 and NEMA KS 1, horsepower rated, with clips or bolt pads to accommodate specified fuses, lockable handle with capability to accept three padlocks, and interlocked with cover in closed position.

E. Type HD, Heavy Duty, Six Pole, Single Throw, 240-V ac, 200 A and Smaller: UL 98 and NEMA KS 1, horsepower rated, with clips or bolt pads to accommodate specified fuses, lockable handle with capability to accept three padlocks, and interlocked with cover in closed position.

F. Type HD, Heavy Duty, Double Throw, 240-V ac, 1200 A and Smaller: UL 98 and NEMA KS 1, horsepower rated, with clips or bolt pads to accommodate specified fuses, lockable handle with capability to accept three padlocks, and interlocked with cover in closed position.

G. Accessories:

1. Equipment Ground Kit: Internally mounted and labeled for copper and aluminum ground conductors.
2. Neutral Kit: Internally mounted; insulated, capable of being grounded and bonded; labeled for copper and aluminum neutral conductors.
3. Isolated Ground Kit: Internally mounted; insulated, capable of being grounded and bonded; labeled for copper and aluminum neutral conductors.
4. Class R Fuse Kit: Provides rejection of other fuse types when Class R fuses are specified.
5. Auxiliary Contact Kit: One or Two NO/NC (Form "C") auxiliary contact(s), arranged to activate before switch blades open.
6. Hookstick Handle: Allows use of a hookstick to operate the handle.
7. Lugs: Mechanical type, suitable for number, size, and conductor material.
8. Service-Rated Switches: Labeled for use as service equipment.
9. Accessory Control Power Voltage: Remote mounted and powered; 24-V ac, 120-V ac or 208-V ac.

2.2 NONFUSIBLE SWITCHES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

B. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:

1. Eaton Electrical Inc.; Cutler-Hammer Business Unit.

2. General Electric Company; GE Consumer & Industrial - Electrical Distribution.
3. Siemens Energy & Automation, Inc.
4. Square D; a brand of Schneider Electric.

C. Type GD, General Duty, Single Throw, 600 A and Smaller: UL 98 and NEMA KS 1, horsepower rated, lockable handle with capability to accept two padlocks, and interlocked with cover in closed position.

D. Type HD, Heavy Duty, Single Throw, 240-V ac, 1200 A and Smaller: UL 98 and NEMA KS 1, horsepower rated, lockable handle with capability to accept three padlocks, and interlocked with cover in closed position.

E. Type HD, Heavy Duty, Six Pole, Single Throw, 240-V ac, 200 A and Smaller: UL 98 and NEMA KS 1, horsepower rated, lockable handle with capability to accept three padlocks, and interlocked with cover in closed position.

F. Type HD, Heavy Duty, Double Throw, 240-V ac, 1200 A and Smaller: UL 98 and NEMA KS 1, horsepower rated, lockable handle with capability to accept three padlocks, and interlocked with cover in closed position.

G. Accessories:

1. Equipment Ground Kit: Internally mounted and labeled for copper and aluminum ground conductors.
2. Neutral Kit: Internally mounted; insulated, capable of being grounded and bonded; labeled for copper and aluminum neutral conductors.
3. Isolated Ground Kit: Internally mounted; insulated, capable of being grounded and bonded; labeled for copper and aluminum neutral conductors.
4. Auxiliary Contact Kit: One or Two NO/NC (Form "C") auxiliary contact(s), arranged to activate before switch blades open.
5. Hookstick Handle: Allows use of a hookstick to operate the handle.
6. Lugs: Mechanical type, suitable for number, size, and conductor material.
7. Accessory Control Power Voltage: Remote mounted and powered; 24-V ac, 120-V ac or 208-V ac.

2.3 RECEPTACLE SWITCHES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

B. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:

1. Eaton Electrical Inc.; Cutler-Hammer Business Unit.
2. General Electric Company; GE Consumer & Industrial - Electrical Distribution.
3. Siemens Energy & Automation, Inc.
4. Square D; a brand of Schneider Electric.

C. Type HD, Heavy-Duty, Single-Throw Fusible Switch: 240-V ac, 30A; UL 98 and NEMA KS 1; horsepower rated, with clips or bolt pads to accommodate specified indicated fuses; lockable handle with capability to accept three padlocks; interlocked with cover in closed position.

D. Type HD, Heavy-Duty, Single-Throw Nonfusible Switch: 240-V ac, 30A; UL 98 and NEMA KS 1; horsepower rated, lockable handle with capability to accept three padlocks; interlocked with cover in closed position.

E. Interlocking Linkage: Provided between the receptacle and switch mechanism to prevent inserting or removing plug while switch is in the on position, inserting any plug other than specified, and turning switch on if an incorrect plug is inserted or correct plug has not been fully inserted into the receptacle.

2.4 SHUNT TRIP SWITCHES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

B. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:

1. Cooper Bussmann, Inc.
2. Ferraz Shawmut, Inc.
3. Littelfuse, Inc.

C. General Requirements: Comply with ASME A17.1, UL 50, and UL 98, with 200-kA interrupting and short-circuit current rating when fitted with Class J fuses.

D. Switches: Three-pole, horsepower rated, with integral shunt trip mechanism and Class J fuse block; lockable handle with capability to accept three padlocks; interlocked with cover in closed position.

E. Control Circuit: 120-V ac; obtained from integral control power transformer, with primary and secondary fuses, with a control power transformer of enough capacity to operate shunt trip, connected pilot, and indicating and control devices.

F. Accessories:

1. Oiltight key switch for key-to-test function.
2. Oiltight red ON pilot light.
3. Isolated neutral lug; 100 percent rating.
4. Mechanically interlocked auxiliary contacts that change state when switch is opened and closed.
5. Form C alarm contacts that change state when switch is tripped.
6. Three-pole, double-throw, fire-safety and alarm relay; 120-V ac coil voltage.
7. Three-pole, double-throw, fire-alarm voltage monitoring relay complying with NFPA 72.

2.5 MOLDED-CASE CIRCUIT BREAKERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

B. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:

1. Eaton Electrical Inc.; Cutler-Hammer Business Unit.
2. General Electric Company; GE Consumer & Industrial - Electrical Distribution.

3. Siemens Energy & Automation, Inc.
4. Square D; a brand of Schneider Electric.

C. General Requirements: Comply with UL 489, NEMA AB 1, and NEMA AB 3, with interrupting capacity to comply with available fault currents.

D. Thermal-Magnetic Circuit Breakers: Inverse time-current element for low-level overloads and instantaneous magnetic trip element for short circuits. Adjustable magnetic trip setting for circuit-breaker frame sizes 250 A and larger.

E. Adjustable, Instantaneous-Trip Circuit Breakers: Magnetic trip element with front-mounted, field-adjustable trip setting.

F. Electronic Trip Circuit Breakers: Field-replaceable rating plug, rms sensing, with the following field-adjustable settings:

1. Instantaneous trip.
2. Long- and short-time pickup levels.
3. Long- and short-time time adjustments.
4. Ground-fault pickup level, time delay, and I^2t response.

G. Current-Limiting Circuit Breakers: Frame sizes 400 A and smaller, and let-through ratings less than NEMA FU 1, RK-5.

H. Integrally Fused Circuit Breakers: Thermal-magnetic trip element with integral limiter-style fuse listed for use with circuit breaker and trip activation on fuse opening or on opening of fuse compartment door.

I. Ground-Fault, Circuit-Interrupter (GFCI) Circuit Breakers: Single- and two-pole configurations with Class A ground-fault protection (6-mA trip).

J. Ground-Fault, Equipment-Protection (GFEP) Circuit Breakers: With Class B ground-fault protection (30-mA trip).

K. Features and Accessories:

1. Standard frame sizes, trip ratings, and number of poles.
2. Lugs: Mechanical type, suitable for number, size, trip ratings, and conductor material.
3. Application Listing: Appropriate for application; Type SWD for switching fluorescent lighting loads; Type HID for feeding fluorescent and high-intensity discharge lighting circuits.
4. Ground-Fault Protection: Comply with UL 1053; integrally mounted, self-powered type with mechanical ground-fault indicator; relay with adjustable pickup and time-delay settings, push-to-test feature, internal memory, and shunt trip unit; and three-phase, zero-sequence current transformer/sensor.
5. Communication Capability: Circuit-breaker-mounted communication module with functions and features compatible with power monitoring and control system, specified in Section 260913 "Electrical Power Monitoring and Control."
6. Shunt Trip: Trip coil energized from separate circuit, with coil-clearing contact.
7. Undervoltage Trip: Set to operate at 35 to 75 percent of rated voltage without intentional time delay.
8. Auxiliary Contacts: One SPDT switch with "a" and "b" contacts; "a" contacts mimic circuit-breaker contacts, "b" contacts operate in reverse of circuit-breaker contacts.

9. Alarm Switch: One NO] contact that operates only when circuit breaker has tripped.
10. Key Interlock Kit: Externally mounted to prohibit circuit-breaker operation; key shall be removable only when circuit breaker is in off position.
11. Zone-Selective Interlocking: Integral with electronic trip unit; for interlocking ground-fault protection function.
12. Electrical Operator: Provide remote control for on, off, and reset operations.
13. Accessory Control Power Voltage: Integrally mounted, self-powered; 24-V ac or 120-V .

2.6 MOLDED-CASE SWITCHES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

B. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:

1. Eaton Electrical Inc.; Cutler-Hammer Business Unit.
2. General Electric Company; GE Consumer & Industrial - Electrical Distribution.
3. Siemens Energy & Automation, Inc.
4. Square D; a brand of Schneider Electric.

C. General Requirements: MCCB with fixed, high-set instantaneous trip only, and short-circuit withstand rating equal to equivalent breaker frame size interrupting rating.

D. Features and Accessories:

1. Standard frame sizes and number of poles.
2. Lugs: Mechanical type, suitable for number, size, trip ratings, and conductor material.
3. Ground-Fault Protection: Comply with UL 1053; remote-mounted and powered type with mechanical ground-fault indicator; relay with adjustable pickup and time-delay settings, push-to-test feature, internal memory, and shunt trip unit; and three-phase, zero-sequence current transformer/sensor.
4. Shunt Trip: Trip coil energized from separate circuit, with coil-clearing contact.
5. Undervoltage Trip: Set to operate at 35 to 75 percent of rated voltage without intentional time delay.
6. Auxiliary Contacts: One SPDT switch with "a" and "b" contacts; "a" contacts mimic switch contacts, "b" contacts operate in reverse of switch contacts.
7. Alarm Switch: One NO contact that operates only when switch has tripped.
8. Key Interlock Kit: Externally mounted to prohibit switch operation; key shall be removable only when switch is in off position.
9. Zone-Selective Interlocking: Integral with ground-fault shunt trip unit; for interlocking ground-fault protection function.
10. Electrical Operator: Provide remote control for on, off, and reset operations.
11. Accessory Control Power Voltage: Integrally mounted, self-powered; 24-V ac or 120-V ac.

2.7 ENCLOSURES

A. Enclosed Switches and Circuit Breakers: NEMA AB 1, NEMA KS 1, NEMA 250, and UL 50, to comply with environmental conditions at installed location.

1. Indoor, Dry and Clean Locations: NEMA 250, Type 1.
2. Outdoor Locations: NEMA 250, Type 3R
3. Kitchen Areas: NEMA 250, Type 4X, stainless steel.
4. Other Wet or Damp, Indoor Locations: NEMA 250, Type 4.
5. Indoor Locations Subject to Dust, Falling Dirt, and Dripping Noncorrosive Liquids: NEMA 250, Type 12.
6. Hazardous Areas Indicated on Drawings: NEMA 250, Type 7.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine elements and surfaces to receive enclosed switches and circuit breakers for compliance with installation tolerances and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install individual wall-mounted switches and circuit breakers with tops at uniform height unless otherwise indicated.

B. Comply with mounting and anchoring requirements specified in Section 26 0548 "Vibration and Seismic Controls for Electrical Systems."

C. Temporary Lifting Provisions: Remove temporary lifting eyes, channels, and brackets and temporary blocking of moving parts from enclosures and components.

D. Install fuses in fusible devices.

E. Comply with NECA 1.

3.3 IDENTIFICATION

A. Comply with requirements in Section 26 0553 "Identification for Electrical Systems."

1. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs.
2. Label each enclosure with engraved metal or laminated-plastic nameplate.

3.4 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.

B. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust components, assemblies, and equipment installations, including connections.

C. Perform tests and inspections.

1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.

D. Acceptance Testing Preparation:

1. Test insulation resistance for each enclosed switch and circuit breaker, component, connecting supply, feeder, and control circuit.

2. Test continuity of each circuit.

E. Tests and Inspections:

1. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.

2. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.

3. Perform the following infrared scan tests and inspections and prepare reports:

a. Initial Infrared Scanning: After Substantial Completion, but not more than 60 days after Final Acceptance, perform an infrared scan of each enclosed switch and circuit breaker. Remove front panels so joints and connections are accessible to portable scanner.

b. Follow-up Infrared Scanning: Perform an additional follow-up infrared scan of each enclosed switch and circuit breaker 11 months after date of Substantial Completion.

c. Instruments and Equipment: Use an infrared scanning device designed to measure temperature or to detect significant deviations from normal values. Provide calibration record for device.

4. Test and adjust controls, remote monitoring, and safeties. Replace damaged and malfunctioning controls and equipment.

F. Enclosed switches and circuit breakers will be considered defective if they do not pass tests and inspections.

G. Prepare test and inspection reports, including a certified report that identifies enclosed switches and circuit breakers and that describes scanning results. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.

3.5 ADJUSTING

A. Adjust moving parts and operable components to function smoothly, and lubricate as recommended by manufacturer.

B. Set field-adjustable circuit-breaker trip ranges as specified in Section 260573 "Overcurrent Protective Device Coordination Study."

END OF SECTION

SECTION 263213

PACKAGED ENGINE GENERATORS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes packaged engine-generator sets for emergency power supply with the following features:

1. Diesel engine.
2. Unit-mounted cooling system.
3. Unit-mounted control and monitoring.
4. Outdoor enclosure.

B. See Division 16 Section "Transfer Switches" for transfer switches including sensors and relays to initiate automatic-starting and -stopping signals for engine-generator sets.

1.2 SUBMITTALS

A. Product Data: For each type of packaged engine generator and accessory indicated.

B. Shop Drawings: Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.

C. Manufacturer Seismic Qualification Certification: Submit certification that engine-generator set, batteries, battery racks, accessories, and components will withstand seismic forces defined in Division 16 Section "Electrical Supports and Seismic Restraints." Include the following:

1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.

a. The term "withstand" means "the unit will remain in place without separation of any parts from the device when subjected to the seismic forces specified."
b. The term "withstand" means "the unit will remain in place without separation of any parts from the device when subjected to the seismic forces specified and the unit will be fully operational after the seismic event."

2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.

D. Source quality-control test reports.

E. Field quality-control test reports.

F. Operation and maintenance data.

G. Warranty: Special warranty specified in this Section.

1.3 QUALITY ASSURANCE

A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.

B. Manufacturer Qualifications: A qualified manufacturer. Maintain, within 200 miles (321 km) of Project site, a service center capable of providing training, parts, and emergency maintenance repairs.

C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

D. Comply with ASME B15.1.

E. Comply with NFPA 37.

F. Comply with NFPA 70.

G. Comply with NFPA 99.

H. Comply with NFPA 110 requirements for Level 1 emergency power supply system.

I. Comply with UL 2200.

J. Engine Exhaust Emissions: Comply with applicable state and local government requirements.

K. Noise Emission: Comply with applicable state and local government requirements for maximum noise level at adjacent property boundaries due to sound emitted by generator set including engine, engine exhaust, engine cooling-air intake and discharge, and other components of installation.

1.4 PROJECT CONDITIONS

A. Environmental Conditions: Engine-generator system shall withstand the following environmental conditions without mechanical or electrical damage or degradation of performance capability:

1. Ambient Temperature: Minus 15 to plus 40 deg C.
2. Relative Humidity: 0 to 95 percent.
3. Altitude: Sea level to 1000 feet (300 m).

1.5 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of packaged engine generators and associated auxiliary components that fail in materials or workmanship within specified warranty period.

1. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

C. Basis-of-Design Product: Subject to compliance with requirements, provide the product indicated on Drawings or a comparable product by one of the following:

1. Caterpillar; Engine Div.
2. Generac Power Systems, Inc.
3. Kohler Co.; Generator Division.
4. Magnetek, Inc.
5. Onan/Cummins Power Generation; Industrial Business Group.
6. Spectrum Detroit Diesel.

2.2 ENGINE-GENERATOR SET

A. Factory-assembled and -tested, engine-generator set.

B. Mounting Frame: Maintain alignment of mounted components without depending on concrete foundation; and have lifting attachments.

C. Capacities and Characteristics:

1. Power Output Ratings: Nominal ratings as indicated.
2. Output Connections: Three-phase, four wireS.
3. Nameplates: For each major system component to identify manufacturer's name and address, and model and serial number of component.

D. Generator-Set Performance:

1. Steady-State Voltage Operational Bandwidth: 3 percent of rated output voltage from no load to full load.
2. Transient Voltage Performance: Not more than 20 percent variation for 50 percent step-load increase or decrease. Voltage shall recover and remain within the steady-state operating band within three seconds.
3. Steady-State Frequency Operational Bandwidth: 0.5 percent of rated frequency from no load to full load.
4. Steady-State Frequency Stability: When system is operating at any constant load within the rated load, there shall be no random speed variations outside the steady-state operational band and no hunting or surging of speed.
5. Transient Frequency Performance: Less than 5 percent variation for 50 percent step-load increase or decrease. Frequency shall recover and remain within the steady-state operating band within five seconds.

6. Output Waveform: At no load, harmonic content measured line to line or line to neutral shall not exceed 5 percent total and 3 percent for single harmonics. Telephone influence factor, determined according to NEMA MG 1, shall not exceed 50 percent.
7. Sustained Short-Circuit Current: For a 3-phase, bolted short circuit at system output terminals, system shall supply a minimum of 250 percent of rated full-load current for not less than 10 seconds and then clear the fault automatically, without damage to generator system components.
8. Start Time: Comply with NFPA 110, Type 10, system requirements.

2.3 ENGINE

A. Fuel: Fuel oil, Grade DF-2.

B. Rated Engine Speed: 1800 rpm.

C. Maximum Piston Speed for Four-Cycle Engines: 2250 fpm (11.4 m/s).

D. Lubrication System: The following items are mounted on engine or skid:

1. Filter and Strainer: Rated to remove 90 percent of particles 5 micrometers and smaller while passing full flow.
2. Thermostatic Control Valve: Control flow in system to maintain optimum oil temperature. Unit shall be capable of full flow and is designed to be fail-safe.
3. Crankcase Drain: Arranged for complete gravity drainage to an easily removable container with no disassembly and without use of pumps, siphons, special tools, or appliances.

E. Engine Fuel System:

1. Main Fuel Pump: Mounted on engine. Pump ensures adequate primary fuel flow under starting and load conditions.
2. Relief-Bypass Valve: Automatically regulates pressure in fuel line and returns excess fuel to source.
3. Dual Natural Gas with LP-Gas Backup (Vapor-Withdrawal) System:

    a. Carburetor.
    b. Secondary Gas Regulators: One for each fuel type.
    c. Fuel-Shutoff Solenoid Valves: One for each fuel source.
    d. Flexible Fuel Connectors: One for each fuel source.

F. Coolant Jacket Heater: Electric-immersion type, factory installed in coolant jacket system. Comply with NFPA 110 requirements for Level 1 equipment for heater capacity.

G. Governor: Adjustable isochronous, with speed sensing.

H. Cooling System: Closed loop, liquid cooled, with radiator factory mounted on engine-generator-set mounting frame and integral engine-driven coolant pump.

1. Coolant: Solution of 50 percent ethylene-glycol-based antifreeze and 50 percent water, with anticorrosion additives as recommended by engine manufacturer.
2. Temperature Control: Self-contained, thermostatic-control valve modulates coolant flow automatically to maintain optimum constant coolant temperature as recommended by engine manufacturer.

I. Muffler/Silencer: Critical type, sized as recommended by engine manufacturer and selected with exhaust piping system to not exceed engine manufacturer's engine backpressure requirements.

1. Minimum sound attenuation of 25 dB at 500 Hz.
2. Sound level measured at a distance of 10 feet (3 m) from exhaust discharge after installation is complete shall be 85 dBA or less.

J. Muffler/Silencer: Residential type, sized as recommended by engine manufacturer and selected with exhaust piping system to not exceed engine manufacturer's engine backpressure requirements.

1. Minimum sound attenuation of 18 dB at 500 Hz.
2. Sound level measured at a distance of 10 feet (3 m) from exhaust discharge after installation is complete shall be 95 dBA or less.

K. Muffler/Silencer: Industrial type, sized as recommended by engine manufacturer and selected with exhaust piping system to not exceed engine manufacturer's engine backpressure requirements.

1. Minimum sound attenuation of 12 dB at 500 Hz.
2. Sound level measured at a distance of 25 feet (8 m) from exhaust discharge after installation is complete shall be 87 dBA or less.

L. Air-Intake Filter: Heavy-duty, engine-mounted air cleaner with replaceable dry-filter element and "blocked filter" indicator.

M. Starting System: 24-V electric, with negative ground.

1. Components: Sized so they will not be damaged during a full engine-cranking cycle with ambient temperature at maximum specified in Part 1 "Project Conditions" Article.
2. Cranking Motor: Heavy-duty unit that automatically engages and releases from engine flywheel without binding.
3. Cranking Cycle: As required by NFPA 110 for system level specified.
4. Battery: Adequate capacity within ambient temperature range specified in Part 1 "Project Conditions" Article to provide specified cranking cycle at least twice without recharging.
5. Battery-Charging Alternator: Factory mounted on engine with solid-state voltage regulation and 35-A minimum continuous rating.

a. Battery Charger: Current-limiting, automatic-equalizing and float-charging type. Unit shall comply with UL 1236.

2.4 FUEL OIL STORAGE

A. Comply with NFPA 30.

B. Base-Mounted Fuel Oil Tank: Factory installed and piped, complying with UL 142 fuel oil tank. Features include the following:

1. Tank level indicator.
2. Capacity: Fuel for eight hours' continuous operation at 100 percent rated power output.
3. Vandal-resistant fill cap.
4. Containment Provisions: Comply with requirements of authorities having jurisdiction.

2.5 CONTROL AND MONITORING

A. Automatic Starting System Sequence of Operation: When mode-selector switch on the control and monitoring panel is in the automatic position, remote-control contacts in one or more separate automatic transfer switches initiate starting and stopping of generator set. When mode-selector switch is switched to the on position, generator set starts. The off position of same switch initiates generator-set shutdown. When generator set is running, specified system or equipment failures or derangements automatically shut down generator set and initiate alarms.

B. Manual Starting System Sequence of Operation: Switching on-off switch on the generator control panel to the on position starts generator set. The off position of same switch initiates generator-set shutdown. When generator set is running, specified system or equipment failures or derangements automatically shut down generator set and initiate alarms.

C. Configuration: Operating and safety indications, protective devices, basic system controls, and engine gages shall be grouped in a common control and monitoring panel mounted on the generator set. Mounting method shall isolate the control panel from generator-set vibration.

D. Indicating and Protective Devices and Controls: As required by NFPA 110 for Level 1 system, and the following:

1. AC voltmeter.
2. AC ammeter.
3. AC frequency meter.
4. DC voltmeter (alternator battery charging).
5. Engine-coolant temperature gage.
6. Engine lubricating-oil pressure gage.
7. Running-time meter.
8. Ammeter-voltmeter, phase-selector switch(es).
9. Generator-voltage adjusting rheostat.
10. Fuel tank derangement alarm.
11. Fuel tank high-level shutdown of fuel supply alarm.
12. Generator overload.

E. Supporting Items: Include sensors, transducers, terminals, relays, and other devices and include wiring required to support specified items. Locate sensors and other supporting items on engine or generator, unless otherwise indicated.

F. Common Remote Audible Alarm: Comply with NFPA 110 requirements for Level 1 systems. Include necessary contacts and terminals in control and monitoring panel.

1. Overcrank shutdown.
2. Coolant low-temperature alarm.
3. Control switch not in auto position.
4. Battery-charger malfunction alarm.
5. Battery low-voltage alarm.

G. Remote Alarm Annunciator: Comply with NFPA 99. An LED labeled with proper alarm conditions shall identify each alarm event and a common audible signal shall sound for each alarm condition. Silencing switch in face of panel shall silence signal without altering visual indication. Connect so that after an alarm is silenced, clearing of initiating condition will reactivate alarm until silencing switch is reset. Cabinet and faceplate are surface- or flush-mounting type to suit mounting conditions indicated.

2.6 GENERATOR OVERCURRENT AND FAULT PROTECTION

A. Generator Circuit Breaker: Molded-case, thermal-magnetic type; 100 percent rated; complying with NEMA AB 1 and UL 489.

1. Tripping Characteristic: Designed specifically for generator protection.
2. Trip Rating: Matched to generator rating.
3. Shunt Trip: Connected to trip breaker when generator set is shut down by other protective devices.
4. Mounting: Adjacent to or integrated with control and monitoring panel.

B. Ground-Fault Indication: Comply with NFPA 70, "Emergency System" signals for ground-fault. Integrate ground-fault alarm indication with other generator-set alarm indications.

2.7 GENERATOR, EXCITER, AND VOLTAGE REGULATOR

A. Comply with NEMA MG 1.

B. Drive: Generator shaft shall be directly connected to engine shaft. Exciter shall be rotated integrally with generator rotor.

C. Electrical Insulation: Class H or Class F.

D. Stator-Winding Leads: Brought out to terminal box to permit future reconnection for other voltages if required.

E. Construction shall prevent mechanical, electrical, and thermal damage due to vibration, overspeed up to 125 percent of rating, and heat during operation at 110 percent of rated capacity.

F. Enclosure: Dripproof.

G. Instrument Transformers: Mounted within generator enclosure.

H. Voltage Regulator: Solid-state type, separate from exciter, providing performance as specified.

1. Adjusting rheostat on control and monitoring panel shall provide plus or minus 5 percent adjustment of output-voltage operating band.

I. Strip Heater: Thermostatically controlled unit arranged to maintain stator windings above dew point.

J. Windings: Two-thirds pitch stator winding and fully linked amortisseur winding.

K. Subtransient Reactance: 12 percent, maximum.

2.8 OUTDOOR GENERATOR-SET ENCLOSURE

A. Description: Vandal-resistant, weatherproof steel housing, wind resistant up to 100 mph (160 km/h). Multiple panels shall be lockable and provide adequate access to components requiring maintenance. Panels shall be removable by one person without tools. Instruments and control shall be mounted within enclosure.

B. Engine Cooling Airflow through Enclosure: Maintain temperature rise of system components within required limits when unit operates at 110 percent of rated load for 2 hours with ambient temperature at top of range specified in system service conditions.

1. Louvers: Fixed-engine, cooling-air inlet and discharge. Storm-proof and drainable louvers prevent entry of rain and snow.
2. Automatic Dampers: At engine cooling-air inlet and discharge. Dampers shall be closed to reduce enclosure heat loss in cold weather when unit is not operating.

C. Interior Lights with Switch: Factory-wired, vaporproof-type fixtures within housing; arranged to illuminate controls and accessible interior. Arrange for external electrical connection.

1. AC lighting system and connection point for operation when remote source is available.
2. DC lighting system for operation when remote source and generator are both unavailable.

D. Convenience Outlets: Factory wired, GFCI. Arrange for external electrical connection.

2.9 VIBRATION ISOLATION DEVICES

A. Elastomeric Isolator Pads: Oil- and water-resistant elastomer or natural rubber, arranged in single or multiple layers, molded with a nonslip pattern and galvanized-steel baseplates of sufficient stiffness for uniform loading over pad area, and factory cut to sizes that match requirements of supported equipment.

1. Material: Standard neoprene.
2. Durometer Rating: 30.
3. Number of Layers: Four.

B. Restrained Spring Isolators: Freestanding, steel, open-spring isolators with seismic restraint.

1. Housing: Steel with resilient vertical-limit stops to prevent spring extension due to wind loads or if weight is removed; factory-drilled baseplate bonded to 1/4-inch- (6-mm-) thick, elastomeric isolator pad attached to baseplate underside; and adjustable equipment mounting and leveling bolt that acts as blocking during installation.
2. Outside Spring Diameter: Not less than 80 percent of compressed height of the spring at rated load.
3. Minimum Additional Travel: 50 percent of required deflection at rated load.
4. Lateral Stiffness: More than 80 percent of rated vertical stiffness.
5. Overload Capacity: Support 200 percent of rated load, fully compressed, without deformation or failure.

2.10 FINISHES

A. Indoor and Outdoor Enclosures and Components: Manufacturer's standard finish over corrosion-resistant pretreatment and compatible primer.

2.11 SOURCE QUALITY CONTROL

A. Prototype Testing: Factory test engine-generator set using same engine model, constructed of identical or equivalent components and equipped with identical or equivalent accessories.

1. Tests: Comply with NFPA 110, Level 1 Energy Converters and with IEEE 115.
2. Report factory test results within 10 days of completion of test.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Comply with packaged engine-generator manufacturers' written installation and alignment instructions and with NFPA 110.

B. Install packaged engine generator to provide access, without removing connections or accessories, for periodic maintenance.

C. Install packaged engine generator with elastomeric isolator pads and suitable vibration having a minimum deflection of 1 inch (25 mm) on 4-inch- (100-mm-) high concrete base. Secure sets to anchor bolts installed in concrete bases. Concrete base construction is specified in Division 16 Section "Electrical Supports and Seismic Restraints."

D. Install Schedule 40, black steel piping with welded joints and connect to engine muffler. Install thimble at wall. Piping shall be same diameter as muffler outlet. Flexible connectors and steel piping materials and installation requirements are specified in Division 15 Section "Hydronic Piping."

1. Install condensate drain piping to muffler drain outlet full size of drain connection with a shutoff valve, stainless-steel flexible connector, and Schedule 40, black steel pipe with welded joints. Flexible connectors and piping materials and installation requirements are specified in Division 15 Section "Hydronic Piping."

E. Electrical Wiring: Install electrical devices furnished by equipment manufacturers but not specified to be factory mounted.

F. Piping installation requirements are specified in Division 15 Sections. Drawings indicate general arrangement of piping and specialties.

G. Connect fuel, cooling-system, and exhaust-system piping adjacent to packaged engine generator to allow service and maintenance.

H. Connect engine exhaust pipe to engine with flexible connector.

I. Connect fuel piping to engines with a gate valve and union and flexible connector.

1. Natural- and LP-gas piping, valves, and specialties for gas distribution outside the building are specified in Division 2 Section "Natural Gas Distribution."
2. Natural- and LP-gas piping, valves, and specialties for gas piping inside the building are specified in Division 15 Section "Fuel Gas Piping."

J. Ground equipment according to Division 16 Section "Grounding and Bonding."

K. Connect wiring according to Division 16 Section "Conductors and Cables."

L. Identify system components according to Division 15 Section "Mechanical Identification" and Division 16 Section "Electrical Identification."

3.2 FIELD QUALITY CONTROL

A. Perform tests and inspections and prepare test reports.

1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.

B. Tests and Inspections:

1. Perform tests recommended by manufacturer and each electrical test and visual and mechanical inspection for "AC Generators and for Emergency Systems" specified in NETA Acceptance Testing Specification. Certify compliance with test parameters.
2. NFPA 110 Acceptance Tests: Perform tests required by NFPA 110 that are additional to those specified here including, but not limited to, single-step full-load pickup test.
3. Battery Tests: Equalize charging of battery cells according to manufacturer's written instructions. Record individual cell voltages.

    a. Measure charging voltage and voltages between available battery terminals for full-charging and float-charging conditions. Check electrolyte level and specific gravity under both conditions.
    b. Test for contact integrity of all connectors. Perform an integrity load test and a capacity load test for the battery.
    c. Verify acceptance of charge for each element of the battery after discharge.
    d. Verify that measurements are within manufacturer's specifications.

4. Battery-Charger Tests: Verify specified rates of charge for both equalizing and float-charging conditions.
5. System Integrity Tests: Methodically verify proper installation, connection, and integrity of each element of engine-generator system before and during system operation. Check for air, exhaust, and fluid leaks.
6. Exhaust-System Back-Pressure Test: Use a manometer with a scale exceeding 40-inch wg (120 kPa). Connect to exhaust line close to engine exhaust manifold. Verify that back pressure at full-rated load is within manufacturer's written allowable limits for the engine.
7. Exhaust Emissions Test: Comply with applicable government test criteria.
8. Voltage and Frequency Transient Stability Tests: Use recording oscilloscope to measure voltage and frequency transients for 50 and 100 percent step-load increases and decreases, and verify that performance is as specified.
9. Harmonic-Content Tests: Measure harmonic content of output voltage under 25 percent and at 100 percent of rated linear load. Verify that harmonic content is within specified limits.
10. Noise Level Tests: Measure A-weighted level of noise emanating from generator-set installation, including engine exhaust and cooling-air intake and discharge, at four locations on the property line, and compare measured levels with required values.

C. Coordinate tests with tests for transfer switches and run them concurrently.

D. Leak Test: After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist.

E. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation.

F. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

G. Remove and replace malfunctioning units and retest as specified above.

H. Retest: Correct deficiencies identified by tests and observations and retest until specified requirements are met.

I. Report results of tests and inspections in writing. Record adjustable relay settings and measured insulation resistances, time delays, and other values and observations. Attach a label or tag to each tested component indicating satisfactory completion of tests.

3.3 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain packaged engine generators. Refer to Division 1 Section "Demonstration and Training."

END OF SECTION

SECTION 263600

TRANSFER SWITCHES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes automatic transfer switches rated 600 V and less.

B. See Division 13 Section "Electric-Drive, Centrifugal Fire Pumps" for automatic transfer switches for fire pumps.

C. See Division 13 Section "Electric-Drive, Vertical-Turbine Fire Pumps" for automatic transfer switches for fire pumps.

1.2 SUBMITTALS

A. Product Data: Include rated capacities, weights, operating characteristics, furnished specialties, and accessories.

B. Shop Drawings: Dimensioned plans, elevations, sections, and details showing minimum clearances, conductor entry provisions, gutter space, installed features and devices, and material lists for each switch specified.

C. Manufacturer Seismic Qualification Certification: Submit certification that transfer switches accessories, and components will withstand seismic forces defined in Division 16 Section "Electrical Supports and Seismic Restraints." Include the following:

1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.

a. The term "withstand" means "the unit will remain in place without separation of any parts from the device when subjected to the seismic forces specified and the unit will be fully operational after the seismic event."

2. Dimensioned Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.

3. Detailed description of equipment anchorage devices on which the certification is based.

D. Field quality-control test reports.

E. Operation and maintenance data.

1.3 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

B. Comply with NEMA ICS 1.

C. Comply with NFPA 70.

D. Comply with NFPA 99.

E. Comply with NFPA 110.

F. Comply with UL 1008 unless requirements of these Specifications are stricter.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Contactor Transfer Switches:

   a. AC Data Systems, Inc.
   b. Caterpillar; Engine Div.
   c. Emerson; ASCO Power Technologies, LP.
   d. Generac Power Systems, Inc.
   e. GE Zenith Controls.
   f. Kohler Power Systems; Generator Division.
   g. Onan/Cummins Power Generation; Industrial Business Group.
   h. Russelectric, Inc.
   i. Spectrum Detroit Diesel.

2. Transfer Switches Using Molded-Case Switches or Circuit Breakers:

   a. AC Data Systems, Inc.
   b. Eaton Electrical Inc.; Cutler-Hammer.
   c. GE Zenith Controls.
   d. Hubbell Industrial Controls, Inc.
   e. Lake Shore Electric Corporation.

2.2 GENERAL TRANSFER-SWITCH PRODUCT REQUIREMENTS

A. Indicated Current Ratings: Apply as defined in UL 1008 for continuous loading and total system transfer, including tungsten filament lamp loads not exceeding 30 percent of switch ampere rating, unless otherwise indicated.

B. Tested Fault-Current Closing and Withstand Ratings: Adequate for duty imposed by protective devices at installation locations in Project under the fault conditions indicated, based on testing according to UL 1008.

1. Where transfer switch includes internal fault-current protection, rating of switch and trip unit combination shall exceed indicated fault-current value at installation location.

C. Solid-State Controls: Repetitive accuracy of all settings shall be plus or minus 2 percent or better over an operating temperature range of minus 20 to plus 70 deg C.

D. Resistance to Damage by Voltage Transients: Components shall meet or exceed voltage-surge withstand capability requirements when tested according to IEEE C62.41. Components shall meet or exceed voltage-impulse withstand test of NEMA ICS 1.

E. Electrical Operation: Accomplish by a nonfused, momentarily energized solenoid or electric-motor-operated mechanism, mechanically and electrically interlocked in both directions.

F. Switch Characteristics: Designed for continuous-duty repetitive transfer of full-rated current between active power sources.

1. Limitation: Switches using molded-case switches or circuit breakers or insulated-case circuit-breaker components are not acceptable.

2. Switch Action: Double throw; mechanically held in both directions.

3. Contacts: Silver composition or silver alloy for load-current switching. Conventional automatic transfer-switch units, rated 225 A and higher, shall have separate arcing contacts.

G. Neutral Switching. Provide four-pole switches where “ATS” indicated, provide neutral pole switched simultaneously with phase poles.

H. Neutral Terminal: Solid and fully rated, unless otherwise indicated.

I. Oversize Neutral: Ampacity and switch rating of neutral path through units indicated for oversize neutral shall be double the nominal rating of circuit in which switch is installed.

J. Battery Charger: For generator starting batteries.

1. Float type rated 2 A.

2. Ammeter to display charging current.

3. Fused ac inputs and dc outputs.

K. Enclosures: General-purpose NEMA 250, Type 1, complying with NEMA ICS 6 and UL 508, unless otherwise indicated.

2.3 AUTOMATIC TRANSFER SWITCHES

A. Comply with Level 1 equipment according to NFPA 110.

B. Switching Arrangement: Double-throw type, incapable of pauses or intermediate position stops during normal functioning, unless otherwise indicated.

C. Signal-Before-Transfer Contacts: A set of normally open/normally closed dry contacts operates in advance of retransfer to normal source. Interval is adjustable from 1 to 30 seconds.

D. Transfer Switches Based on Molded-Case-Switch Components: Comply with NEMA AB 1, UL 489, and UL 869A.

E. In-Phase Monitor: Factory-wired, internal relay controls transfer so it occurs only when the two sources are synchronized in phase.

F. Motor Disconnect and Timing Relay: Controls designate starters so they disconnect motors before transfer and reconnect them selectively at an adjustable time interval after transfer. Time delay for reconnecting individual motor loads is adjustable between 1 and 60 seconds, and settings are as indicated.

G. Programmed Neutral Switch Position: Switch operator has a programmed neutral position arranged to provide a midpoint between the two working switch positions, with an intentional, time-controlled pause at midpoint during transfer.

H. Automatic Transfer-Switch Features:

1. Undervoltage Sensing for Each Phase of Normal Source: Sense low phase-to-ground voltage on each phase. Pickup voltage shall be adjustable from 85 to 100 percent of nominal, and dropout voltage is adjustable from 75 to 98 percent of pickup value. Factory set for pickup at 90 percent and dropout at 85 percent.

2. Adjustable Time Delay: For override of normal-source voltage sensing to delay transfer and engine start signals. Adjustable from zero to six seconds, and factory set for one second.

3. Voltage/Frequency Lockout Relay: Prevent premature transfer to generator. Pickup voltage shall be adjustable from 85 to 100 percent of nominal. Factory set for pickup at 90 percent. Pickup frequency shall be adjustable from 90 to 100 percent of nominal. Factory set for pickup at 95 percent.

4. Time Delay for Retransfer to Normal Source: Adjustable from 0 to 30 minutes, and factory set for 10 minutes to automatically defeat delay on loss of voltage or sustained undervoltage of emergency source, provided normal supply has been restored.

5. Test Switch: Simulate normal-source failure.

6. Switch-Position Pilot Lights: Indicate source to which load is connected.

7. Source-Available Indicating Lights: Supervise sources via transfer-switch normal- and emergency-source sensing circuits.

   a. Normal Power Supervision: Green light with nameplate engraved "Normal Source Available."

   b. Emergency Power Supervision: Red light with nameplate engraved "Emergency Source Available."

8. Unassigned Auxiliary Contacts: Two normally open, single-pole, double-throw contacts for each switch position, rated 10 A at 240-V ac.

9. Transfer Override Switch: Overrides automatic retransfer control so automatic transfer switch will remain connected to emergency power source regardless of condition of normal source. Pilot light indicates override status.

10. Engine Starting Contacts: One isolated and normally closed, and one isolated and normally open; rated 10 A at 32-V dc minimum.

11. Engine Shutdown Contacts: Instantaneous; shall initiate shutdown sequence at remote engine-generator controls after retransfer of load to normal source.

12. Engine Shutdown Contacts: Time delay adjustable from zero to five minutes, and factory set for five minutes. Contacts shall initiate shutdown at remote engine-generator controls after retransfer of load to normal source.

13. Engine-Generator Exerciser: Solid-state, programmable-time switch starts engine generator and transfers load to it from normal source for a preset time, then retransfers and shuts down engine after a preset cool-down period. Initiates exercise cycle at preset intervals adjustable from 7 to 30 days. Running periods are adjustable from 10 to 30 minutes. Factory settings are for 7-day exercise cycle, 20-minute running period, and 5-minute cool-down period. Exerciser features include the following:

a. Exerciser Transfer Selector Switch: Permits selection of exercise with and without load transfer.

b. Push-button programming control with digital display of settings.

c. Integral battery operation of time switch when normal control power is not available.

2.4 SOURCE QUALITY CONTROL

A. Factory test and inspect components, assembled switches, and associated equipment. Ensure proper operation. Check transfer time and voltage, frequency, and time-delay settings for compliance with specified requirements. Perform dielectric strength test complying with NEMA ICS 1.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Design each fastener and support to carry load indicated by seismic requirements and according to seismic-restraint details. See Division 16 Section "Electrical Supports and Seismic Restraints."

B. Floor-Mounting Switch: Anchor to floor by bolting.

1. Concrete Bases: 4 inches high, reinforced, with chamfered edges. Extend base no more than 4 inches in all directions beyond the maximum dimensions of switch, unless otherwise indicated or unless required for seismic support. Construct concrete bases according to Division 16 Section "Electrical Supports and Seismic Restraints."

C. Identify components according to Division 16 Section "Electrical Identification."

D. Set field-adjustable intervals and delays, relays, and engine exerciser clock.

3.2 CONNECTIONS

A. Ground equipment according to Division 16 Section "Grounding and Bonding."

B. Connect wiring according to Division 16 Section "Conductors and Cables."

3.3 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust components, assemblies, and equipment installations, including connections. Report results in writing.

B. Perform tests and inspections and prepare test reports.

1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installation, including connections, and to assist in testing.

2. After installing equipment and after electrical circuitry has been energized, test for compliance with requirements.

3. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.

4. Measure insulation resistance phase-to-phase and phase-to-ground with insulation-resistance tester. Use test voltages and procedure recommended by manufacturer. Comply with manufacturer's specified minimum resistance.

    a. Check for electrical continuity of circuits and for short circuits.

    b. Inspect for physical damage, proper installation and connection, and integrity of barriers, covers, and safety features.

    c. Verify that manual transfer warnings are properly placed.

    d. Perform manual transfer operation.

5. After energizing circuits, demonstrate interlocking sequence and operational function for each switch at least three times.

    a. Simulate power failures of normal source to automatic transfer switches and of emergency source with normal source available.

    b. Simulate loss of phase-to-ground voltage for each phase of normal source.

    c. Verify time-delay settings.

    d. Verify pickup and dropout voltages by data readout or inspection of control settings.

    e. Perform contact-resistance test across main contacts and correct values exceeding 500 microhms and values for 1 pole deviating by more than 50 percent from other poles.

    f. Verify proper sequence and correct timing of automatic engine starting, transfer time delay, retransfer time delay on restoration of normal power, and engine cool-down and shutdown.

6. Ground-Fault Tests: Coordinate with testing of ground-fault protective devices for power delivery from both sources.

    a. Verify grounding connections and locations and ratings of sensors.

C. Coordinate tests with tests of generator and run them concurrently.

D. Report results of tests and inspections in writing. Record adjustable relay settings and measured insulation and contact resistances and time delays. Attach a label or tag to each tested component indicating satisfactory completion of tests.

E. Remove and replace malfunctioning units and retest as specified above.

F. Infrared Scanning: After Substantial Completion, but not more than 60 days after Final Acceptance, perform an infrared scan of each switch. Remove all access panels so joints and connections are accessible to portable scanner.

1. Follow-up Infrared Scanning: Perform an additional follow-up infrared scan of each switch 11 months after date of Substantial Completion.

2. Instrument: Use an infrared scanning device designed to measure temperature or to detect significant deviations from normal values. Provide calibration record for device.

3. Record of Infrared Scanning: Prepare a certified report that identifies switches checked and that describes scanning results. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.

3.4 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain transfer switches and related equipment as specified below. Refer to Division 1 Section "Demonstration and Training."

B. Coordinate this training with that for generator equipment.

END OF SECTION

SECTION 27 0528

PATHWAYS FOR COMMUNICATIONS SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Metal conduits and fittings.
2. Nonmetallic conduits and fittings.
3. Optical-fiber-cable pathways and fittings.
4. Metal wireways and auxiliary gutters.
5. Nonmetallic wireways and auxiliary gutters.
6. Surface pathways.
7. Boxes, enclosures, and cabinets.
8. Handholes and boxes for exterior underground cabling.

B. Related Requirements:

1. Section 260543 "Underground Ducts and Raceways for Electrical Systems" for exterior ductbanks, manholes, and underground utility construction.
2. Section 260533 "Raceways and Boxes for Electrical Systems" for conduits, wireways, surface raceways, boxes, enclosures, cabinets, handholes, and faceplate adapters serving electrical systems.
3. Section 280528 "Pathways for Electronic Safety and Security" for conduits, surface pathways, innerduct, boxes, and faceplate adapters serving electronic safety and security.

1.3 DEFINITIONS

A. ARC: Aluminum rigid conduit.

B. GRC: Galvanized rigid steel conduit.

C. IMC: Intermediate metal conduit.

1.4 ACTION SUBMITTALS

A. Product Data: For surface pathways, wireways and fittings, floor boxes, hinged-cover enclosures, and cabinets.

B. Shop Drawings: For custom enclosures and cabinets. Include plans, elevations, sections, and attachment details.

C. Samples: For wireways and surface pathways and for each color and texture specified, 12 inches long.

1.5 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Pathway routing plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of items involved:

1. Structural members in paths of pathway groups with common supports.
2. HVAC and plumbing items and architectural features in paths of conduit groups with common supports.

B. Qualification Data: For professional engineer.

C. Seismic Qualification Certificates: For pathway racks, enclosures, cabinets, equipment racks and their mounting provisions, including those for internal components, from manufacturer.

1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
3. Detailed description of equipment anchorage devices on which certification is based and their installation requirements.
4. Detailed description of conduit support devices and interconnections on which certification is based and their installation requirements.

D. Source quality-control reports.

PART 2 - PRODUCTS

2.1 METAL CONDUITS AND FITTINGS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. AFC Cable Systems, Inc.
2. Allied Tube & Conduit; a Tyco International Ltd. Co.
3. Alpha Wire Company.
4. Anamet Electrical, Inc.
5. Electri-Flex Company.
6. O-Z/Gedney; a brand of EGS Electrical Group.
7. Picoma Industries; Subsidiary of Mueller Water Products, Inc.
8. Republic Conduit.
9. Robroy Industries.
10. Southwire Company.
11. Thomas & Betts Corporation.
12. Western Tube and Conduit Corporation.

13. Wheatland Tube Company; a division of John Maneely Company.

B. General Requirements for Metal Conduits and Fittings:

1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
2. Comply with TIA-569-B.

C. GRC: Comply with ANSI C80.1 and UL 6.

D. ARC: Comply with ANSI C80.5 and UL 6A.

E. IMC: Comply with ANSI C80.6 and UL 1242.

F. PVC-Coated Steel Conduit: PVC-coated IMC.

1. Comply with NEMA RN 1.
2. Coating Thickness: 0.040 inch, minimum.

G. EMT: Comply with ANSI C80.3 and UL 797.

H. Fittings for Metal Conduit: Comply with NEMA FB 1 and UL 514B.

1. Conduit Fittings for Hazardous (Classified) Locations: Comply with UL 886 and NFPA 70.
2. Fittings for EMT:
   a. Material: Steel.
   b. Type: Setscrew or compression.
3. Expansion Fittings: PVC or steel to match conduit type, complying with UL-467, rated for environmental conditions where installed, and including flexible external bonding jumper.
4. Coating for Fittings for PVC-Coated Conduit: Minimum thickness of 0.040 inch, with overlapping sleeves protecting threaded joints.

I. Joint Compound for IMC, GRC, or ARC: Approved, as defined in NFPA 70, by authorities having jurisdiction for use in conduit assemblies, and compounded for use to lubricate and protect threaded conduit joints from corrosion and to enhance their conductivity.

2.2 NONMETALLIC CONDUITS AND FITTINGS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following

1. AFC Cable Systems, Inc.
2. Allied Tube & Conduit; a Tyco International Ltd. Co.
3. Anamet Electrical, Inc.
4. Arnco Corporation.
5. CANTEX Inc.
6. CertainTeed Corp.
7. Condux International, Inc.
8. Electri-Flex Company.

9. Kraloy.
10. Lamson & Sessions; Carlon Electrical Products.
11. Niedax-Kleinhuis USA, Inc.
12. RACO; a Hubbell company.
13. Thomas & Betts Corporation.

B. General Requirements for Nonmetallic Conduits and Fittings:

1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
2. Comply with TIA-569-B.

C. RNC: Type EPC-40-PVC, complying with NEMA TC 2 and UL 651 unless otherwise indicated.

D. Rigid HDPE: Comply with UL 651A.

E. Continuous HDPE: Comply with UL 651B.

F. RTRC: Comply with UL 1684A and NEMA TC 14.

G. Fittings for RNC: Comply with NEMA TC 3; match to conduit or tubing type and material.

H. Solvent cements and adhesive primers shall have a VOC content of 510 and 550 g/L or less, respectively, when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

I. Solvent cements and adhesive primers shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

2.3 OPTICAL-FIBER-CABLE PATHWAYS AND FITTINGS

A. Manufacturers: Subject to compliance with requirements, provide products by the following one of the following available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Alpha Wire Company.
2. Arnco Corporation.
3. Endot Industries Inc.
4. IPEX.
5. Lamson & Sessions; Carlon Electrical Products.

B. Description: Comply with UL 2024; flexible-type pathway, approved for plenum, riser or general-use installation unless otherwise indicated.

1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
2. Comply with TIA-569-B.

2.4 METAL WIREWAYS AND AUXILIARY GUTTERS

A. Manufacturers: Subject to compliance with requirements, provide products by the following:

1. Cooper B-Line, Inc.

2. Hoffman; a Pentair company.
3. Mono-Systems, Inc.
4. Square D; a brand of Schneider Electric.

B. Description: Sheet metal, complying with UL 870 and NEMA 250 Type or Type 4 unless otherwise indicated, and sized according to NFPA 70.

1. Metal wireways installed outdoors shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
2. Comply with TIA-569-B.

C. Fittings and Accessories: Include covers, couplings, offsets, elbows, expansion joints, adapters, hold-down straps, end caps, and other fittings to match and mate with wireways as required for complete system.

D. Wireway Covers: Hinged type Screw-cover type or Flanged-and-gasketed type unless otherwise indicated.

E. Finish: Manufacturer's standard enamel finish.

2.5 NONMETALLIC WIREWAYS AND AUXILIARY GUTTERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Allied Moulded Products, Inc.
2. Hoffman; a Pentair company.
3. Lamson & Sessions; Carlon Electrical Products.
4. Niedax-Kleinhuis USA, Inc.

B. General Requirements for Nonmetallic Wireways and Auxiliary Gutters:

1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
2. Comply with TIA-569-B.

C. Description: Fiberglass polyester, extruded and fabricated to required size and shape, without holes or knockouts. Cover shall be gasketed with oil-resistant gasket material and fastened with captive screws treated for corrosion resistance. Connections shall be flanged and have stainless-steel screws and oil-resistant gaskets.

D. Description: PVC, extruded and fabricated to required size and shape, and having snap-on cover, mechanically coupled connections, and plastic fasteners.

E. Fittings and Accessories: Couplings, offsets, elbows, expansion joints, adapters, hold-down straps, end caps, and other fittings shall match and mate with wireways as required for complete system.

F. Solvent cements and adhesive primers shall have a VOC content of 510 and 550 g/L or less, respectively, when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

G. Solvent cements and adhesive primers shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

2.6 SURFACE PATHWAYS

A. General Requirements for Surface Pathways:

1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

2. Comply with TIA-569-B.

B. Surface Metal Pathways: Galvanized steel with snap-on covers complying with UL 5. Manufacturer's standard enamel finish in color selected by Architect.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. Mono-Systems, Inc.

b. Niedax-Kleinhuis USA, Inc.

c. Panduit Corp.

d. Wiremold / Legrand.

C. Surface Nonmetallic Pathways: Two- or three-piece construction, complying with UL 5A, and manufactured of rigid PVC with texture and color selected by Architect from manufacturer's standard colors. Product shall comply with UL-94 V-0 requirements for self-extinguishing characteristics.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following

2. :

a. Hubbell Incorporated; Wiring Device-Kellems Division.

b. Lamson & Sessions; Carlon Electrical Products.

c. Mono-Systems, Inc.

d. Panduit Corp.

e. Wiremold / Legrand.

2.7 BOXES, ENCLOSURES, AND CABINETS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Adalet.

2. Cooper Technologies Company; Cooper Crouse-Hinds.

3. EGS/Appleton Electric.

4. Erickson Electrical Equipment Company.

5. Hoffman; a Pentair company.

6. Hubbell Incorporated; Killark Division.
7. Lamson & Sessions; Carlon Electrical Products.
8. Milbank Manufacturing Co.
9. Molex; Woodhead Brand.
10. Mono-Systems, Inc.
11. O-Z/Gedney; a brand of EGS Electrical Group.
12. RACO; a Hubbell company.
13. Robroy Industries.
14. Spring City Electrical Manufacturing Company.
15. Stahlin Non-Metallic Enclosures; a division of Robroy Industries.
16. Thomas & Betts Corporation.
17. Wiremold / Legrand.

B. General Requirements for Boxes, Enclosures, and Cabinets:

1. Comply with TIA-569-B.
2. Boxes, enclosures and cabinets installed in wet locations shall be listed for use in wet locations.

C. Sheet-Metal Outlet and Device Boxes: Comply with NEMA OS 1 and UL 514A.

D. Cast-Metal Outlet and Device Boxes: Comply with NEMA FB 1. aluminum, Type FD, with gasketed cover.

E. Box extensions used to accommodate new building finishes shall be of same material as recessed box.

F. Metal Floor Boxes:

1. Material: Cast metal or sheet metal.
2. Type: Semi-adjustable.
3. Shape: Rectangular.
4. Listing and Labeling: Metal floor boxes shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

G. Nonmetallic Floor Boxes: Nonadjustable rectangular.

1. Listing and Labeling: Nonmetallic floor boxes shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

H. Small Sheet Metal Pull and Junction Boxes: NEMA OS 1.

I. Cast-Metal Access, Pull, and Junction Boxes: Comply with NEMA FB 1 and UL 1773, cast aluminum or galvanized, cast iron with gasketed cover.

J. Device Box Dimensions: 4 inches by 2-1/8 inches by 2-1/8 inches deep.

K. Gangable boxes are prohibited.

L. Nonmetallic Outlet and Device Boxes: Comply with NEMA OS 2 and UL 514C.

M. Hinged-Cover Enclosures: Comply with UL 50 and NEMA 250, Type 12 with continuous-hinge cover with flush latch unless otherwise indicated.

1. Metal Enclosures: Steel, finished inside and out with manufacturer's standard enamel.
2. Nonmetallic Enclosures:
    a. Material: Fiberglass.
    b. Finished inside with radio-frequency-resistant paint.
3. Interior Panels: Steel; all sides finished with manufacturer's standard enamel.

N. Cabinets:

1. NEMA 250, Type 1, galvanized-steel box with removable interior panel and removable front, finished inside and out with manufacturer's standard enamel.
2. Hinged door in front cover with flush latch and concealed hinge.
3. Key latch to match panelboards.
4. Metal barriers to separate wiring of different systems and voltage.
5. Accessory feet where required for freestanding equipment.
6. Nonmetallic cabinets shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

2.8 HANDHOLES AND BOXES FOR EXTERIOR UNDERGROUND CABLING

A. General Requirements for Handholes and Boxes:

1. Boxes and handholes for use in underground systems shall be designed and identified as defined in NFPA 70, for intended location and application.
2. Boxes installed in wet areas shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
3. Comply with TIA-569-B.

B. Polymer-Concrete Handholes and Boxes with Polymer-Concrete Cover: Molded of sand and aggregate, bound together with polymer resin, and reinforced with steel, fiberglass, or a combination of the two.

1. Manufacturers: Subject to compliance with requirements provide products by one of the following available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
2. Basis-of-Design Product: Subject to compliance with requirements, provide
3. product indicated on Drawings or comparable product by one of the following:
    a. Armorcast Products Company.
    b. Carson Industries LLC.
    c. CDR Systems Corporation; Hubbell Power Systems.
    d. NewBasis.
    e. Oldcastle Precast, Inc.; Christy Concrete Products.
    f. Synertech Moulded Products; a division of Oldcastle Precast, Inc.
4. Standard: Comply with SCTE 77.

5. Configuration: Designed for flush burial with integral closed bottom unless otherwise indicated.
6. Cover: Weatherproof, secured by tamper-resistant locking devices and having structural load rating consistent with enclosure and handhole location.
7. Cover Finish: Nonskid finish shall have a minimum coefficient of friction of 0.50.
8. Cover Legend: Molded lettering, "COMMUNICATIONS."
9. Conduit Entrance Provisions: Conduit-terminating fittings shall mate with entering ducts for secure, fixed installation in enclosure wall.
10. Handholes 12 Inches Wide by 24 Inches Long and Larger: Have inserts for cable racks and pulling-in irons installed before concrete is poured.

C. Fiberglass Handholes and Boxes: Molded of fiberglass-reinforced polyester resin, with frame and covers of polymer concrete or fiberglass.

1. Manufacturers: Subject to compliance with requirements, provide products by the following available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
2. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
    a. Armorcast Products Company.
    b. Carson Industries LLC.
    c. CDR Systems Corporation; Hubbell Power Systems.
    d. NewBasis.
    e. Nordic Fiberglass, Inc.
    f. Oldcastle Precast, Inc.; Christy Concrete Products.
    g. Synertech Moulded Products; a division of Oldcastle Precast, Inc.
3. Standard: Comply with SCTE 77.
4. Color of Frame and Cover: Gray.
5. Configuration: Designed for flush burial with integral closed bottom unless otherwise indicated.
6. Cover: Weatherproof, secured by tamper-resistant locking devices and having structural load rating consistent with enclosure and handhole location.
7. Cover Finish: Nonskid finish shall have a minimum coefficient of friction of 0.50.
8. Cover Legend: Molded lettering, "COMMUNICATIONS."
9. Conduit Entrance Provisions: Conduit-terminating fittings shall mate with entering ducts for secure, fixed installation in enclosure wall.
10. Handholes 12 Inches Wide by 24 Inches Long and Larger: Have inserts for cable racks and pulling-in irons installed before concrete is poured.

2.9 SOURCE QUALITY CONTROL FOR UNDERGROUND ENCLOSURES

A. Handhole and Pull-Box Prototype Test: Test prototypes of handholes and boxes for compliance with SCTE 77. Strength tests shall be for specified tier ratings of products supplied.

1. Tests of materials shall be performed by an independent testing agency.
2. Strength tests of complete boxes and covers shall be by either an independent testing agency or manufacturer. A qualified registered professional engineer shall certify tests by manufacturer.
3. Testing machine pressure gages shall have current calibration certification complying with ISO 9000 and ISO 10012, and traceable to NIST standards.

PART 3 - EXECUTION

3.1 PATHWAY APPLICATION

A. Outdoors: Apply pathway products as specified below unless otherwise indicated:

1. Exposed Conduit: PVC.
2. Concealed Conduit, Aboveground: GRC.
3. Underground Conduit: RNC, Type EPC-40-PVC,
4. Boxes and Enclosures, Aboveground: NEMA 250, Type 4.

B. Indoors: Apply pathway products as specified below unless otherwise indicated:

1. Exposed, Not Subject to Physical Damage: EMT or RNC.
2. Exposed, Not Subject to Severe Physical Damage: EMT identified for such use.
3. Exposed and Subject to Severe Physical Damage: IMC. Pathway locations include the following:
    a. Loading dock.
    b. Corridors used for traffic of mechanized carts, forklifts, and pallet-handling units.
    c. Mechanical rooms.
    d. Gymnasiums
4. Concealed in Ceilings and Interior Walls and Partitions: EMT, Type EPC-40-PVC.
5. Damp or Wet Locations: GRC.
6. Pathways for Optical-Fiber or Communications Cable in Spaces Used for Environmental Air: Plenum-type, optical-fiber-cable pathway.
7. Pathways for Optical-Fiber or Communications-Cable Risers in Vertical Shafts: Riser-type, optical-fiber-cable pathway
8. Pathways for Concealed General-Purpose Distribution of Optical-Fiber or Communications Cable: Plenum-type, optical-fiber-cable pathway, General-use, communications-cable pathway or Riser-type, communications-cable pathway.
9. Boxes and Enclosures: NEMA 250 Type 1, except use NEMA 250 Type 4 stainless steel in institutional and commercial kitchens and damp or wet locations.

C. Minimum Pathway Size: 3/4-inch trade size. Minimum size for optical-fiber cables is 1 inch.

D. Pathway Fittings: Compatible with pathways and suitable for use and location.

1. Rigid and Intermediate Steel Conduit: Use threaded rigid steel conduit fittings unless otherwise indicated. Comply with NEMA FB 2.10.

2. PVC Externally Coated, Rigid Steel Conduits: Use only fittings listed for use with this type of conduit. Patch and seal all joints, nicks, and scrapes in PVC coating after installing conduits and fittings. Use sealant recommended by fitting manufacturer and apply in thickness and number of coats recommended by manufacturer.

3. EMT: Use compression, steel fittings. Comply with NEMA FB 2.10.

E. Do not install aluminum conduits, boxes, or fittings in contact with concrete or earth.

F. Install surface pathways only where indicated on Drawings.

G. Do not install nonmetallic conduit where ambient temperature exceeds 120 deg F.

3.2 INSTALLATION

A. Comply with NECA 1, NECA 101, and TIA-569-B for installation requirements except where requirements on Drawings or in this article are stricter. Comply with NECA 102 for aluminum pathways. Comply with NFPA 70 limitations for types of pathways allowed in specific occupancies and number of floors.

B. Keep pathways at least 6 inches away from parallel runs of flues and steam or hot-water pipes. Install horizontal pathway runs above water and steam piping.

C. Complete pathway installation before starting conductor installation.

D. Comply with requirements in Section 260529 "Hangers and Supports for Electrical Systems" for hangers and supports.

E. Arrange stub-ups so curved portions of bends are not visible above finished slab.

F. Install no more than the equivalent of two 90-degree bends in any pathway run. Support within 12 inches of changes in direction. Utilize long radius ells for all optical-fiber cables.

G. Conceal conduit and EMT within finished walls, ceilings, and floors unless otherwise indicated. Install conduits parallel or perpendicular to building lines.

H. Support conduit within 12 inches of enclosures to which attached.

I. Stub-ups to Above Recessed Ceilings:

1. Use EMT, IMC, or RMC for pathways.

2. Use a conduit bushing or insulated fitting to terminate stub-ups not terminated in hubs or in an enclosure.

J. Threaded Conduit Joints, Exposed to Wet, Damp, Corrosive, or Outdoor Conditions: Apply listed compound to threads of pathway and fittings before making up joints. Follow compound manufacturer's written instructions.

K. Coat field-cut threads on PVC-coated pathway with a corrosion-preventing conductive compound prior to assembly.

L. Terminate threaded conduits into threaded hubs or with locknuts on inside and outside of boxes or cabinets. Install insulated bushings on conduits terminated with locknuts.

M. Install pathways square to the enclosure and terminate at enclosures with locknuts. Install locknuts hand tight plus 1/4 turn more.

N. Do not rely on locknuts to penetrate nonconductive coatings on enclosures. Remove coatings in the locknut area prior to assembling conduit to enclosure to assure a continuous ground path.

O. Cut conduit perpendicular to the length. For conduits of 2-inch trade size and larger, use roll cutter or a guide to ensure cut is straight and perpendicular to the length.

P. Install pull wires in empty pathways. Use polypropylene or monofilament plastic line with not less than 200-lbtensile strength. Leave at least 12 inchesof slack at each end of pull wire. Cap underground pathways designated as spare above grade alongside pathways in use.

Q. Surface Pathways:

1. Install surface pathway for surface telecommunications outlet boxes only where indicated on Drawings.
2. Install surface pathway with a minimum 2-inch radius control at bend points.
3. Secure surface pathway with screws or other anchor-type devices at intervals not exceeding 48 inches and with no less than two supports per straight pathway section. Support surface pathway according to manufacturer's written instructions. Tape and glue are not acceptable support methods.

R. Pathways for Optical-Fiber and Communications Cable: Install pathways, metal and nonmetallic, rigid and flexible, as follows:

1. 3/4-Inch Trade Size and Smaller: Install pathways in maximum lengths of 50 feet.
2. 1-Inch Trade Size and Larger: Install pathways in maximum lengths of 75 feet.
3. Install with a maximum of two 90-degree bends or equivalent for each length of pathway unless Drawings show stricter requirements. Separate lengths with pull or junction boxes or terminations at distribution frames or cabinets where necessary to comply with these requirements.

S. Install pathway sealing fittings at accessible locations according to NFPA 70 and fill them with listed sealing compound. For concealed pathways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces. Install pathway sealing fittings according to NFPA 70.

T. Install devices to seal pathway interiors at accessible locations. Locate seals so no fittings or boxes are between the seal and the following changes of environments. Seal the interior of all pathways at the following points:

1. Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.
2. Where an underground service pathway enters a building or structure.
3. Where otherwise required by NFPA 70.

U. Comply with manufacturer's written instructions for solvent welding PVC conduit and fittings.

V. Expansion-Joint Fittings:

1. Install in each run of aboveground RNC that is located where environmental temperature change may exceed 30 deg F, and that has straight-run length that exceeds 25 feet. Install in each run of aboveground RMC and EMT conduit that is located where environmental temperature change may exceed 100 deg F and that has straight-run length that exceeds 100 feet.
2. Install type and quantity of fittings that accommodate temperature change listed for each of the following locations:
    a. Outdoor Locations Not Exposed to Direct Sunlight: 125 deg F temperature change.
    b. Outdoor Locations Exposed to Direct Sunlight: 155 deg F temperature change.

c. Indoor Spaces Connected with Outdoors without Physical Separation: 125 deg F temperature change.

d. Attics: 135 deg F temperature change.

3. Install fitting(s) that provide expansion and contraction for at least 0.00041 inch per foot of length of straight run per deg F of temperature change for PVC conduits. Install fitting(s) that provide expansion and contraction for at least 0.000078 inch per foot of length of straight run per deg F of temperature change for metal conduits.

4. Install expansion fittings at all locations where conduits cross building or structure expansion joints.

5. Install each expansion-joint fitting with position, mounting, and piston setting selected according to manufacturer's written instructions for conditions at specific location at time of installation. Install conduit supports to allow for expansion movement.

W. Mount boxes at heights indicated on Drawings. If mounting heights of boxes are not individually indicated, give priority to ADA requirements. Install boxes with height measured to center of box unless otherwise indicated.

X. Recessed Boxes in Masonry Walls: Saw-cut opening for box in center of cell of masonry block, and install box flush with surface of wall. Prepare block surface to provide a flat surface for a raintight connection between box and cover plate or supported equipment and box.

Y. Horizontally separate boxes mounted on opposite sides of walls so they are not in the same vertical channel.

Z. Support boxes of three gangs or more from more than one side by spanning two framing members or mounting on brackets specifically designed for the purpose.

AA. Fasten junction and pull boxes to or support from building structure. Do not support boxes by conduits.

BB. Set metal floor boxes level and flush with finished floor surface.

CC. Set nonmetallic floor boxes level. Trim after installation to fit flush with finished floor surface.

3.3 SLEEVE AND SLEEVE-SEAL INSTALLATION FOR COMMUNICATIONS PENETRATIONS

A. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies. Comply with requirements in Section 270544 "Sleeves and Sleeve Seals for Communications Pathways and Cabling."

3.4 FIRESTOPPING

A. Install firestopping at penetrations of fire-rated floor and wall assemblies. Comply with requirements in Section 078413 "Penetration Firestopping."

3.5 PROTECTION

A. Protect coatings, finishes, and cabinets from damage or deterioration.

1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.

2. Repair damage to PVC coatings or paint finishes with matching touchup coating recommended by manufacturer.

END OF SECTION

SECTION 27 5319

DISTRIBUTED ANTENNA SYSTEM (DAS)

PART 1 – GENERAL

1.1 SUMMARY

A. This is a delegated design system and the successful contractor shall be responsible for providing full design services as an bid alternate which shall include but is not limited to the following:

1. Survey and evaluation of the existing project site and provide a full report on the problem areas.
2. Testing the site to determine if the building currently has adequate signal strength and coverage for public safety personnel to communicate effectively during emergencies.
3. Preform a comprehensive RF evaluation to determine what is the most appropriate and cost-effective DAS System to install.
4. System designer shall work with school authorities and engineer to develop an optimized DAS design that addresses the specific needs of the building as well as meet the requirements of local authorities and carriers for compliance and a seamless integration.
5. Contractor shall understand the drawings provided are simply diagrammatic in nature and does not include everything needed for a complete and fully functional system. The contractor shall be responsible for providing a full and comprehensive design including shop drawings and submittals for engineer's review and approval.

1.2 SECTION INCLUDES

A. This specification describes technical and performance criteria for deploying a Neutral- Host Distributed Antenna System (DAS) capable of supporting Wireless Service Providers (WSP) and Public Safety Networks (PSN). The DAS components specified in this document include: Donor Antennas, Coverage Antennas, Coax Cable, Coax Connectors, Splitters, Combiners, Couplers, Fiber-Optic Cable, Fiber-Optic Connectors, and Fiber-Optic Jumpers, Bi-Directional Amplifiers (BDA), Fiber-Optic Master Unit and Fiber-Optic Remote Units.

1.3 SYSTEM DESCRIPTION

A. Services: Upon commissioning, the DAS shall provide coverage for the WSPs listed below on all frequencies currently being used by the designated WSPs

1. AT&T Wireless
2. Sprint/Nextel
3. T-Mobile
4. Verizon
5. Public Safety – According local requirements. Example: 800 MHz PSN coverage.

B. The system shall be able to transport and integrate in the DAS solution the PSN frequencies according the local requirements and ordinances.

C. Expansion: Without replacing the Passive DAS Infrastructure, the DAS shall have expansion capabilities to support the following WSP and PSN frequencies deployed in a SISO antenna environment. Any additional Components required for system expansion shall comply with all specifications of this Section.

Notify and provide in your response the operators requirements in the market for MIMO.

Service	Uplink, MHz	Downlink, MHz
Cellular	824 - 849	869 - 894
PCS	1850 - 1915	1930 - 1995
AWS	1710 - 1755	2110 - 2155
Commercial 700 Band	698 – 716,776-787	728 - 746
Narrow Band Public Safety 700 Band	799 - 805	769 - 775
800 Band	806 - 824	851 - 869
900 Band	896 - 902	935 - 941
BRS/EBS	2496-2690	

D. WSP Approval: the Contractor shall propose and deploy a DAS system with equipment that is WSP approved and a RF design and installation that guarantees WSP approval for interconnection to the WSPs' macro networks or BTS equipment. The system will not be turned on without previous WSP acceptance and retransmission agreement. Contractor is responsible to obtain WSP approval. Contractor is responsible to ensure the RF design adapts to the carrier requirements in all stages of the project.

E. Costs associated with each respective RF Source Type and potential costs needs to be included in the response document

F. Situations where the WSP must own the BDA/Repeater needs to be clearly identified and included in the response document

G. The Contractor working with the end user customer is responsible for confirming that the site has the necessary space and power to support the DAS as well as the RF Sources including either BDA/Repeaters and identify the potential power required for Cellular Base Stations.

H. PSN Approval: The Contractor shall propose and deploy a DAS system capable of receiving approval of the PSN Authority Having Jurisdiction (AHJ).

I. Broadband Active Distribution: Single-mode fiber-optic cable will be used for Active distribution. In-line amplifiers are not allowed.

J. Network Management:

1. NMS: The DAS shall have a Network Management System (NMS) capable of alarm, monitor, configuration and control of all Active Components.

2. SNMP Integration: The DAS NMS shall be capable of integration with 3rd party SNMP based NMS products for alarm purposes and provide alarming information.

1.4 ALTERNATIVES

A. No alternative component(s) shall be accepted as equal to the components and manufacturers specified in this document unless the Contractor proves that the alternative component(s) are of equal or superior specifications and quality, and that they have been used in similar projects

of size and complexity for no less than 3-years. The following information shall be required for each alternative component with submittal of the bid response:

1. Passive Components:
    a. Product samples
    b. Detailed product specifications
    c. Independent test results verifying the product specifications
    d. Written documentation from the manufacturer guaranteeing that the alternative component(s) shall remain available for new purchase for a period of 7-years from the date of system acceptance.
2. Active Components:
    a. Hardware and software manuals
    b. Detailed product specifications
    c. Mean Time Between Failure (MTBF) data for each Active Component
    d. Independent test results verifying the product specifications
    e. Written documentation from the manufacturer guaranteeing that the alternative component(s) shall be supported for a period of 7-years from the date of system acceptance.
    f. For Active Components serving the WSPs, written documentation from the WSPs that the alternative component(s) are approved for use within the WSP's network and that interconnection of the DAS to the WSP's network will not be withheld due to the alternative component being used in the DAS.
    g. For Active Components serving the PSN, written documentation from the AHJ that the alternative component(s) are approved for use within the PSN and that system acceptance of the DAS to the PSN will not be withheld due to the alternative component being used in the DAS.

1.5 CODES, STANDARDS AND CERTIFICATIONS

A. All work, including but not limited to: cabling, pathways, support structures, wiring, equipment, installation, workmanship, maintenance and testing shall comply with the latest editions of the National Electrical Code, National Electrical Safety Code, all applicable local rules and regulations, equipment manufacturer's instructions, and the National Electrical Contractor's Association (NECA) Standard of Installation. In case of discrepancy or disagreement between the documents noted above, the contractor shall satisfy the most stringent requirements.

B. Requirements set forth by first-responder code, ordinance, or the PSN AHJ shall supersede the requirements described herein and shall be met in their entirety. It is the Contractor's responsibility to ensure that the DAS complies with local code, ordinances or requirements established by the PSN AHJ.

1.6 ABBREVIATIONS AND ACRONYMS

A. ACG: Automatic Gain Control

B. AHJ: Authority Having Jurisdiction

C. ATP: Acceptance Test Plan

D. AWS: Advanced Wireless Service

E. BDA: Bi-Direction Amplifier
F. BOM: Bill-of-Material
G. BRS: Broadband Radio Service
H. BTS: Base Transceiver Station
I. CDMA: Code Division Multiple Access
J. C/N: Carrier-to-Noise Ratio
K. CWDM: Coarse Wave Division Multiplexing
L. DAS: Distributed Antenna System
M. DWDM: Dense Wave Division Multiplexing
N. EBS: Educational Broadband Service
O. ESMR: Enhanced Specialized Mobile Radio
P. FCC: Federal Communications Commission
Q. GUI: Graphical User Interface
R. iDEN: Integrated Enhanced Digital Network
S. LMR: Land Mobile Radio
T. LTE: Long Term Evolution
U. MTBF: Mean Time Between Failure
V. NFPA: National Fire Protection Association
W. NMS: Network Management System
X. PCS: Personal Communications System
Y. PSN: Public Safety Network
Z. RoF: Radio-over-Fiber
AA. PIM Passive Intermodulation
BB. MIMO Multiple-Input, Multiple-Output
CC. LTE Long Term Evolution
DD. RoHS: Restriction of Hazardous Substances
EE. RSL: Received Signal Level
FF. SISO: Single-Input, Single-Output
GG. SMR: Specialized Mobile Radio
HH. SMS: Short Message Service
II. SNIR: Signal-to-Noise Interference Ratio
JJ. SNMP: Simple Network Management Protocol
KK. SOW: Statement of Work
LL. VSWR: Voltage Standing Wave Ratio MM. WSP: Wireless Service Provider

1.7 DEFINITIONS

A. Acceptance: Expressed approval by the customer

B. Active: DAS components that require AC/DC power for operation

C. Carrier Approval: Expressed written approval to interconnect to the WSP macro network

D. Channel: A path for an RF transmission between two points

E. Component: A main system element of the DAS

F. Contractor: The prime contractor bidding the project

G. Passive: DAS components that do not require AC/DC power for operation

1.8 PERFORMANCE REQUIREMENTS

A. WSP DAS:

1. On a per channel basis, the downlink RSL for each frequency band shall meet or exceed the criteria in Table 1

Table 1. System Parameters

Parameters	Unit	Lower 700 MHz, BRS/EBS	Cellular, PCS, AWS, Commercial 800/900 MHz	Public Safety 380 - 512, 700, 800 MHz
Minimum downlink receive signal level (RSL)	dBm	-77	-85	-95

Contractor in their response shall identify the specific market criteria requested by each respective WSP. Those have to be highlighted and the impact in the project quantified separately from the basic requirements requested in table 1.

Ultimately it is the Contractor's responsibility to confirm that all design requirements for each respective WSP are met with their proposed solution. For example, in certain markets the WSP has a specific requirement for RSSI of -65 dBm at the windows.

2. Contractor shall state the assumed channel loading and frequency bands for the proposed WSP in-building coverage. Prior to installation, contractors shall confirm the channel loading and frequency use in the serving area, and shall guarantee coverage for these channels per the criteria in Table 1.

3. The DAS shall deliver coverage per the criteria in Table 1 throughout 95% of the building. Unless stated separately in the floor plans it is expected coverage including stairwells, elevators, basement and garage. Total Number of Floors: (BLANK), Square Footage: Per Floor: (BLANK), Square Footage Total: (BLANK).

4. The contractor shall explain the method used to avoid downlink and uplink interference.

B. PSN DAS:

1. The PSN DAS shall comply with NFPA-1 2012 Edition

2. Where the in-building coverage requirements include 700 - 800 MHz public safety system and commercial wireless in-building coverage, the two systems shall be able to operate over a unified Passive Cable and Coverage Antenna Infrastructure.

3. Contractors shall state the assumed channel count for the PSN Frequency Bands identified above in Section 1.02 A. with submittal of bid response. Prior to installation, contractors shall confirm the channel count and frequencies with the AHJ, and shall guarantee coverage for these channels per the criteria stated above.
4. The DAS shall be capable of upgrade, without additional hardware or software, to allow for changes to system frequencies within the deployed frequency band in order to maintain radio system coverage as originally designed.
5. The contractor shall explain the method used to avoid downlink and uplink interference.

1.9 ADDITIONAL REQUIREMENETS

A. PSN Approval: When approval of the DAS deployment is required by code or ordinance, the Contractor shall be responsible for facilitating the AHJ approval(s) per the requirements of the code or ordinance.

1.10 SUBMITTALS

A. Submittal Requirements with Bid Response:
   1. Product Data: Submit manufacturer datasheets for the following components:
      a. Donor and Coverage Antennas
      b. Coaxial Cable and Connectors
      c. Splitters, Combiners and Couplers
      d. Bi-Directional Amplifiers (BDA)
      e. Fiber-Optic Master Unit
      f. Fiber-Optic Remote Units
   2. Shop Drawings: Submit the following items:
      a. RF link budget
      b. Overlay of system Components on floor plans
      c. Drawings for Donor Antenna and grounding
      d. Bill-of-Material (BOM)
   3. Statement of Work (SOW): Submit sample SOW
   4. Acceptance Test Plan (ATP): Submit sample ATP
   5. Recommended Spares
   6. Warranty Documents:
      a. Submit for all manufactured Components specified in this Section.
      b. Submit Contractor’s System Warranty.
      c. Submit Manufacturer’s Extended Warranty.

B. Submittal Requirements Prior to Start of Construction
   1. Final RF link budget
   2. Overlay of system Components on floor plans
   3. Drawings for Donor Antenna and grounding
   4. RF propagation modeling

5. Signal to Noise Interference Ratio (SNIR) Map
6. Bill-of-Material (BOM)
7. Maintenance Service Contract
8. Statement of Work (SOW): The contractor shall submit a SOW that has been accepted by the customer or customer's designated representative.
9. Acceptance Test Plan (ATP): The contractor shall submit an ATP that has been accepted by the customer or customer's designated representative.

C. Submittal Requirements at Close Out

1. Drawings: Submit as-built drawings indicating:
   a. Donor antenna, grounding and lighting protection details
   b. Cable routing, splitters, couplers and coverage antenna locations
   c. Active component locations, layout and configuration
2. Test Reports
   a. WSP DAS: Submit accepted ATP reports confirming the requirements of Section 1.07 A have been met.
   b. PSN: Submit Accepted ATP reports confirming the requirements of Section 1.07 B have been met.
3. Field Reports: Submit sweep-testing results for all cable runs.
4. Field Reports: Submit OTDR test results for all fiber runs.
5. Operation and Maintenance Data: Submit hardware and software manuals for all Active Components.
6. Warranty Documents:
   a. Submit for all manufactured components specified in this Section.
   b. Submit Contractor's System Warranty.
   c. Submit Manufacturer's Extended Warranty

1.11 QUALITY ASSURANCE

A. Qualifications: Contractor, and/or Sub-Contractors, shall have a minimum of 5-years full-time experience executing work of similar scope and complexity.

B. Certifications:

1. Passive Components: Contractor or Sub-Contractor shall provide manufacturer certification that their personnel have been trained on the components being installed.
2. Active Components: Contractor or Sub-Contractor shall provide manufacturer certification that their personnel have been trained on the components being installed.

1.12 WARRANTY

A. Manufacturer Warranty:

1. Splitters, Couplers and Coverage Antennas: 5-year limited warranty from date of system acceptance.

2. Coaxial Cable and Connectors: 10-year limited warranty from date of system acceptance.
3. Fiber-Optic Cable: 20-year limited warranty from date of system acceptance.
4. Active Components: The earliest of 1-year limited warranty from date of system installation or 15 months from date of shipment.

B. Contractor Warranty: Contractor shall warrant the system performance as specified in Section 1.07 for 1-year.

1.13 MAINTENANCE

A. The Contractor shall provide an optional maintenance service contract, covering for a period of one-year: preventative maintenance, system monitoring, spares, fault mitigation, equipment repair, and response time.

1.14 CONTRACTOR CREDENTIALS

A. The Contractor shall document their relations with the equipment manufacturer, certifications with the manufacturer and significant success stories.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

A. Specified Manufacturer: CommScope/Andrew

B. Acceptable Manufacturers: As permitted in Section 1.03.

2.2 COMPONENTS

A. Broadband Donor Antennas: Broadband Donor Antennas shall feature a multi-band design, accommodating Cellular, PCS, LMR and AWS frequencies in a single small antenna.

1. Electrical:
   a. Frequency bands, 806 - 960 MHz and 1710 - 2200 MHz
   b. VSWR ≤ 1.8
   c. Gain: 806-960 ≥ 10.5 dBi, 1710 - 2200 ≥ 12 dBi
   d. Maximum input power: 100 watts
   e. Polarization: Vertical
   f. Front-to-back ratio: 806 - 960 ≥ 18 dB, 1710 - 2200 ≥ 20 Db
   g. Impedance: 50 Ω
   h. Azimuth Pattern: As proposed by the manufacturer to meet the performance specifications in this Section.
2. Mechanical:
   a. Radome material: UV-protected ABS
   b. Pigtail cable: RG58, plenum rated
   c. Connector: 50 Ω N Type Female
   d. Mounting: Pole
3. Environmental

a. Temperature: -40 °C to +60 °C
b. Lighting protection: Direct ground
c. Waterproof level: IP 66
d. Wind Speed, maximum: 125 mph

4. Approved Manufacturer: Andrew CELLMAX-EXT-CPU or equivalent, in accordance with Section 1.03.

B. 700 MHz LMR Yagi Donor Antennas:

1. Electrical:
a. Frequency band, 746 - 806 MHz
b. VSWR ≤ 1.5:1
c. Gain: ≥ 1 1.1 dBi
d. Maximum input power: 100 watts
e. Polarization: Vertical
f. Front-to-back ratio: ≥ 15 dB
g. Impedance: 50 Ω
h. Beamwidth, Horizontal, degrees: 60
i. Azimuth Pattern: As proposed by the manufacturer to meet the performance specifications in this Section.

2. Mechanical:
a. Connector: 50 Ω N Type Female
b. Mounting: Pole

3. Environmental:
a. Temperature: -40 °C to +60 °C
b. Lighting protection: Direct ground
c. Waterproof level: IP 66
d. Wind Speed, maximum: 125 mph

4. Approved Manufacturer: Andrew DB498-PS or equivalent in accordance with Section 1.03.

C. Omni-Directional Coverage: Omni-Directional Coverage antennas shall feature a multi-band design, accommodating multiple frequency bands in a single small antenna.

1. Electrical Band 1:
a. Frequency Band: 698 – 800 MHz
b. VSWR: ≤ 1.8:1
c. Gain: ≥ 1.5 dBi
d. Maximum input power:
e. Impedance: 50 Ω
f. Beamwidth, Horizontal: 360° omnidirectional
g. Beamwidth, Vertical: 80° nominal

h. Return Loss: 10.9 dB

2. Electrical Band 2:
   a. Frequency Band: 1710 – 2700 MHz and 800 – 960 MHz
   b. VSWR: ≤ 1.5:1
   c. Gain: ≥ 1.5 dBi @ 800–960 MHz and ≥ 5.0 dBi @ 1710 – 2700 MHz
   d. Maximum input power:
   e. Impedance: 50 Ω
   f. Beamwidth, Horizontal: 360° omnidirectional
   g. Beamwidth, Vertical: 65° nominal
   h. Return Loss: ≤ 13.9 dB
3. Mechanical:
   a. Connector: 50 Ω N Type Female
   b. Mounting: Thru-hole ceiling mount
   c. Radome material: ABS, UV resistant
   d. Pigtail cable: KSR195, plenum rated
4. Environmental:
   a. Application: Indoor
   b. Operating Temperature: 40 °C to +60 °C (40 °F to +140 °F)
   c. Relative Humidity: Up to 100%
5. Regulatory Compliance/Certifications: RoHS 2002/95/EC
6. Approved Manufacturer: Andrew CELLMAX-O-CPUSE or equivalent, in accordance with Section 1.03.

D. Directional Coverage Antennas: Directional coverage antennas shall feature a multi-band design, accommodating multiple frequency bands in a single small antenna.
1. Electrical Band 1:
   a. Frequency Band: 698 – 800 MHz
   b. VSWR: ≤ 1.8:1
   c. Gain: ≥ 5.0 dBi @ 698 – 800 MHz
   d. Maximum input power: 50W
   e. Impedance: 50 Ω
   f. Beamwidth, Horizontal: 110° nominal
   g. Polarization: Vertical
   h. Return Loss: ≤ 10.9 dB
2. Electrical Band 2:
   a. Frequency Band: 1710 – 2700 MHz and 800 – 960 MHz
   b. VSWR: ≤ 1.5:1

c. Gain: ≥ 5.0 dBi @ 800 – 960 MHz and ≥ 6.0 dBi @ 2170 – 2700 MHz and ≥ 8.0 dBi @ 1710 – 2170 MHz

d. Maximum input power:

e. Impedance: 50 Ω

f. Beamwidth, Horizontal: 90° nominal

g. Return Loss: ≤ 13.9 dB

3. Mechanical:

a. Connector: 50 Ω N Type Female

b. Mounting: 4-hole wall mounting plate

c. Radome material: ABS, UV resistant

d. Pigtail cable: RG58, plenum rated

4. Environmental:

a. Application: Indoor

b. Operating Temperature: 40 °C to +60 °C (40 °F to +140 °F)

c. Relative Humidity: Up to 100%

5. Regulatory Compliance/Certifications: RoHS 2002/95/EC

6. Approved Manufacturer: Andrew CELLMAX-D-CPUSE or equivalent, in accordance with Section 1.3

E. Fiber-Optic Cable and Connectors:

1. General Specifications:
   a. Cables shall be six-strand or greater, designed for point-to-point applications as well as mid-span access, and shall provide a high- level of protection for optical fiber installed in interior building environments.
   b. Higher optical fiber count cables shall utilize a sub-unitized design with color-coded subunits for easy identification.
   c. Single-mode optical fibers shall be 8.3 µm and use standard colored tight-buffered construction.
   d. The single-mode optical fiber shall be dispersion-unshifted optical fiber that meets ITU-T G.652c standards.
   e. Cable shall provide optimum performance over entire wavelength range from 1260 to 1625 nanometers.
   f. Cable shall support new and emerging applications that utilize extended E band, 1360 to 1460 nanometers.
   g. Cable shall also support existing and legacy single-mode applications that traditionally operate in 1310 and 1550 nanometer regions.
   h. Cable shall deliver a cost-effective upgrade path by expanding available wavelengths by 50 percent supporting 16 Channels of coarse wave division multiplexing (CWDM) on a single optical fiber and up to 400 Channels of dense wave division multiplexing (DWDM) on a single cable.
   i. Fire ratings: Riser, plenum, and/or LSZH

   j. Approved Manufacture: CommScope Fiber Optic Cable containing TerraSpeed Single Mode Optical Fiber. As an example, P-006-BO- 8W-F25YL, 6-strand breakout cable single-mode Fiber or equal in accordance with Section 1.03.

F. Fiber-Optic Pigtails:

1. General Specifications:
    a. To maintain channel integrity, optical fiber patch cords and pigtails shall be fabricated to meet the performance parameters corresponding to the optical fiber cable approved product type specified below. Patch cord and pigtail plug connectors shall be equipped with boots, and shall have same colors as related optical fiber backbone cables, unless specified or indicated otherwise. Optical fiber patch cords and pigtails shall be available with the following options as specified or indicated:
        1) Termination types: SC-APC
        2) Connector/cable configuration: Simplex and duplex
        3) Fire ratings: Riser, plenum and/or LSZH
        4) Patch cord outside diameters: 1.6 millimeters (0.063 inches) and 3.0 millimeters (0.118 inches)
        5) Pigtails: Ruggedized and tight-buffered optical fiber—0.9 millimeters (0.035 inches) outside diameter
        6) Lengths: As specified or indicated
        7) Approved Manufacturer: CommScope RFT-01RF09-8W-SCA- XX, single reinforced buffered 900 µm, LightScope ZWP single- mode fiber, angled polished connector or equivalent, in accordance with Section 1.03.

G. Air Dielectric, Plenum Rated Cable:
1. Material Characteristics:
    a. Jacket: Halogenated, Fire-Retardant
    b. Outer Conductor Material: Corrugated Aluminum or Corrugated Copper
    c. Inner Conductor Material: Copper-Clad Aluminum Wire
2. Electrical Characteristics:
    a. Impedance: 50 ± 2.0 Ω
    b. Frequency Band: 1 - 8800 MHz
    c. Peak Power Rating: ≥ 40.0 kW
3. Mechanical Characteristics:
    a. Diameter Over Jacket: ≤ .627 in
    b. Minimum Bending Radius: ≤ 5 in
    c. One Time Minimum Bending Radius: ≤ 3 in
4. Attenuation Characteristics shall meet Table2:

Table 2: Attenuation characteristics of Air Dielectric Plenum Rated cable

Frequency (MHz)	Attenuation (dB/100ft)
150	≤ 0.848
450	≤ 1.53
800	≤ 2.105
2000	≤ 3.564

Standard Conditions: VSWR 1.0, ambient temperature 20 °C (68 °F)

5. Approved Manufacturer: Andrew HL4RP-50A, AL4RPV-50A or equivalent, in accordance with Section 1.03.

H. Foam Dielectric Cable:

1. Material Characteristics:

   a. Jacket: Non-halogenated, Fire-Retardant Ployolefin

   b. Outer Conductor Material: Corrugated Copper

   c. Inner Conductor Material: Copper-Clad Aluminum Wire or Copper Tube

2. Electrical Characteristics:

   a. Impedance: 50 ± 1.0 Ω

   b. Frequency Band: 1/2” Nominal: 1 - 8800 MHz, 7/8” Nominal: 1 - 5000 MHz

   c. Peak Power Rating: ≥ 40.0 kW

3. Mechanical Characteristics:
   a. Diameter Over Jacket: 1/2” Nominal: ≤ .630 in, 7/8” Nominal: ≤ 1.1 in
   b. Minimum Bending Radius: 1/2” Nominal: ≤ 5 in, 7/8” Nominal: ≤ 10 in
   c. One Time Minimum Bending Radius: 1/2” Nominal: ≤ 2 in, 7/8” Nominal: ≤ 5 in

4. Attenuation Characteristics: 1/2” Nominal

Table 3: attenuation characteristics, ½” Foam Dielectric cable

Frequency (MHz)	Attenuation (dB/100ft)
150	≤ 0.815
450	≤ 1.447
800	≤ 1.968
2000	≤ 3.251

Standard Conditions: VSWR 1.0, ambient temperature 20 °C (68 °F)

5. Attenuation Characteristics: 7/8” Nominal:

Table 4: attenuation characteristics 7/8” Foam Dielectric Cable

Frequency (MHz)	Attenuation (dB/100ft)
150	≤ 0.417
450	≤ .744
800	≤ 1.014
2000	≤ 1.683

Standard Conditions: VSWR 1.0, ambient temperature 20 °C (68 °F)

6. Approved Manufacturer: Andrew LDF4-50A, FXL-540-NHR, FXL-780-NHR or equivalent, in accordance with Section 1.03.

I. Splitters, Combiners, Couplers, Coax Jumpers and Connectors:

1. Approved Manufacturer: Andrew or equivalent, in accordance with Section 1.03.

J. BDA: When the AHJ and/or WSP dictates a BDA drive the DAS, the BDA shall be of modular design and use digital filtering to mitigate interference and accommodate multiple services for PSNs and WSPs.

1. Characteristics
    a. Operating Temperature Range: -33 °C to +50 °C
    b. Chassis: Shall be of modular design with ≥ 4 frequency bands per 19” chassis. Chassis shall not exceed four Rack Units (RUs) in height.
    c. Filtering: Digital with a minimum 10kHzstep size
    d. Separate Control: Each RF amplifier shall be capable of adjusting and controlling power levels for each WSP when multiple WSPs share a single amplifier.
    e. FCC Part 90.219 Type Classification: Class A narrowband for LMR/SMR/ESMR frequency bands
    f. Alarming: Shall support both SNMP and SMS using wireless modem
    g. Mounting Options: shall support rack, wall and pole mounting
    h. Frequency Bands Supported: 380 - 512 MHz LMR, 769 - 806 MHz LMR, 806 - 869 MHz LMR/SMR/ESMR, 896 - 941MHz LMR/SMR/ESMR, 824 - 894 MHz Cellular, 1710 - 1755 MHz AWS, 1900 - 1950 MHz PCS
2. Compliance:
    a. NFPA: The BDA shall comply with NFPA-1 2012 edition Annex O In- Building Public Safety Radio Enhancement Systems.
    b. FCC: Shall be FCC type certified.
3. Approved Manufacturer: Andrew Node A or equivalent, in accordance with Section 1.03.

K. Fiber-Optic Master Unit: When building size dictates an Active fiber DAS, the Fiber-Optic Master Unit shall convert radio over coax to Radio-Over-Fiber (RoF) for distribution to Fiber-Optic Remote Units.
1. Characteristics
    a. Transmission Media: Single-mode fiber at 1310 nm
    b. Operating Temperature Range: +5 °C to +40 °C
    c. Impendence: 50 Ω
    d. Chassis:
        1) Shall be of modular design capable of supporting ≥ 32 Remote Units per 19”, 4 RU chassis
        2) Shall support redundant power supplies
        3) Shall have the capability to remotely power the Remote Units via composite fiber-optic cable
    e. Point of interface units allowing for separate Uplink and Downlink attenuation.
    f. Automatic Gain Control (AGC): Shall provide AGC for optical loss compensation
    g. Optical Budget: Shall support ≤ 3 dB optical budget (~3 km or 2 miles)
    h. Auxiliary Channel: Shall provide an input to support 400 to 2700 MHz for future expandability
    i. Interlink: Shall support one fiber or two fibers bi-directional optical link for distances up to 20 km with a 10 dB optical budget

j. Remote Supervision:

1) Shall support the TCP/IP protocol, SNMPv2, FTP, HTTP, Telnet, and be fully compatible with general purpose SNMP managers

2) Remote access shall be available via Point-to-Point Protocol (PPP), over circuit-switched/packet data and wired/wireless modems

3) Each Active device shall be manageable via a Web GUI

4) Auto Mapping: Each board position shall be automatically mapped during system turn-up

2. Frequency Bands Supported: 380 - 512 MHz LMR, 769 - 806 MHz LMR, 806 - 869 MHz LMR/SMR/ESMR, 896 - 941MHz LMR/SMR/ESMR, 824 - 894 MHz Cellular, 1710 - 1755 MHz AWS, 1900 - 1950 MHz PCS and 2496 - 2690 MHz BRS/EBS.

3. Approved Manufacturer: Andrew ION-B, ION-M or equivalent, in accordance with Section 1.03.

L. Fiber-Optic Remote Units: The Fiber-Optic Remote Unit converts the RoF signal back to radio over coax, as well as provides filtering so that multiple frequency bands can reside over the same passive cable and antenna infrastructure.

1. Characteristics

a. Operating Temperature Range: +5 °C to +40 °C

b. Impendence: 50 Ω

c. Power Consumption: ≤ 105 watts, maximum

d. Output Power per Carrier at Antenna Port:

Table 5: Frequencies/Technologies/Output Power, Optical Remote Unit

Technology/Band (MHz)	Single carrier (dBm)
Analog 700	27
GSM 700	27
Analog 800 and 850	27
GSM 850 and 850	31
GSM 850 and 850 at band edges	29
iDEN 800 and 850	26
iDEN 800 and 850 at band edges	24
CDMA 800 and 850	29
CDMA 800 and 850 at band edges	27
Analog 900	29
iDEN 900	23
CDMA 1700	30
W-CDMA 1700	28
Analog 1900	31
GSM 1900	31
CDMA 1900	29
W-CDMA 1900	27

e. MTBF (excluding external power supply): ≥ 160,000 hours

f. Physical: The Remote Unit shall consist of the following:

1) Ingress Protection: IP31 or equivalent

2) Frequency Bands supported: 769 - 806 MHz LMR, 806 - 869 MHz LMR/SMR/ESMR, 896 - 941MHz LMR/SMR/ESMR, 824 - 894 MHz Cellular, 1710 - 1755 MHz AWS, 1850 - 1995 MHz PCS

3) Optical Port: 2xSC-APC connector (separated uplink/downlink)

4) Antenna Port: Single 50 Ω N type female connector

5) Auxiliary Ports: Two SMA female for future add-on modules

g. Uplink Noise Figure:

1) LMR 700, LMR 800, Cell850: ≤ 7.5 dB

2) LMR 700, LMR 800, Cell850 at band edges: ≤ 9.5 dB

3) LMR 900: ≤ 8.5 dB

4) AWS: ≤ 7.5 dB

5) PCS 1900 extended: ≤ 7.5 dB

2. Approved Manufacturer: Andrew ION-B, ION-M Series or equivalent in accordance with Section 1.03.

PART 3 – EXECUTION

3.1 INSTALLATION

A. The contractor shall design, install, commission and test the DAS in accordance with the manufacturer's instructions and recommendations.

B. The contractor shall install the DAS in accordance with the accepted SOW.

3.2 ACCEPTANCE TESTING

A. Acceptance testing will be performed confirming the requirements of Section 1.07 have been met.

B. The contractor shall complete the acceptance testing as prescribed in the approved Acceptance Test Plan (ATP) submittal.

END OF SECTION

SECTION 28 3100

FIRE DETECTION AND ALARM

PART 1 - GENERAL

1.1 STIPULATIONS

A. General provisions of the Contract Documents including General and Supplementary Conditions and Division 1 Specifications Sections apply to all work in this section.

1.2 WORK INCLUDED

A. This Section of the specification covers the furnishing and installing of a new complete multiplex/addressable fire alarm system for the Mary Ann Winterling Elementary School as described herein and as shown on the drawings. The work covered by this section of the specifications includes the furnishing of all equipment, labor, materials, and performance of all operations, including field programming of the new system associated with the installation. Disconnecting and removal of the existing fire alarm system, devices, wiring, and exposed conduit is also included.

B. Phasing. Contractor will be required to phase the installation of the new fire alarm system. This will require that either the new and old system components work in unison (e.g., tying the old system in as a part of the new system) or that the new system is completely accepted and operational prior to taking the old system out of service. Temporary relocation of existing devices to facilitate the new work as well as disconnecting and removal of the existing fire alarm system and devices shall be in conjunction with the overall project. The new Fire Alarm Control Panel (FACP) will be installed and fully accepted prior to demolition and replacement work in any portion of the existing building. Install new equipment, perform acceptance test and remove old equipment before proceeding to the next area. Provide a complete system at all times.

C. Provide Fire Alarm Control Panel (FACP), remote Fire Alarm Annunciators (FAA), alarm initiating devices, alarm indicating appliances, and all required connections as shown on the drawings. The FACP shall be UL listed for use as per Control Units (UOJZ). The detection system shall provide smoke and heat detectors, manual pull stations and duct detectors in areas indicated on the drawing. Provide audible/visible notification throughout.

D. Provide necessary equipment, miscellaneous connections, and programming required to interface the new system with the Supervising Station selected by the Owner and as allowed by the Fire Marshal.

E. Provide all interface modules necessary to interconnect the building FACP with the HVAC fan and damper controls, kitchen hood fans and associated suppression systems, and other required initiating or control output devices as applicable. Coordinate all locations of required interconnections with the respective trade contractors.

F. The system shall include all wiring, raceways, pull boxes, terminal cabinets, outlet and mounting boxes, control equipment, alarm and supervisory signal initiating devices, alarm notification appliances, and all other manufacturer proprietary equipment such as Signaling Line Circuit (SLC) modules, notification appliance circuit modules, and other accessories and miscellaneous items required for a complete operating system in the building.

G. The layout on the drawings is diagrammatic. A single fire alarm control panel, a Remote Fire Alarm Annunciator, and several Notification Appliance Circuit (NAC) extender panels (auxiliary power supplies) are indicated. Where additional remote fire alarm control units, NAC extender panels, or similar fire alarm related equipment are needed, they shall be provided at a suitable terminal cabinet location. Each remote fire alarm control unit shall be powered from a wiring riser

specifically for that use or from a local power panel. All fire alarm power circuits shall be dedicated. Where remote fire control units are provided, equipment for notification appliances may be located in the remote fire alarm control units.

H. In lieu of a fire alarm graphic annunciator, the fire marshal has agreed to placing framed floor plans near the point of entry to the building. The Engineer will provide 8 ½ x 11 to 11x 17 floor plans with the appropriate information to the contractor. The contractor shall in turn print these in color, frame, and mount in the location acceptable to the fire marshal. Frames cannot be simply hung. The frames shall be mounted with anchors that firmly affix the frame to the wall, but allow the graphic to be updated in the future.

I. Provide a Knox drawing / document box adjacent to the fire alarm panel. Provide a full size set of as-built drawings, half size set of as-built drawings, and a flash drive containing PDF files of the as-built drawings in the document box. Key the box to match the fire alarm panel key.

1.3 DEFINITIONS

A. Wherever mentioned in this specification or on the drawings, the nomenclature, equipment, devices, appliances, and functions shall be as defined by NFPA 72 or as follows:

1. Authority Having Jurisdiction (AHJ) – For the purpose of these documents the term AHJ is defined as are other commonly used terms for personnel associated with review or approval as follows:

a. AHJ – City of Baltimore

b. Fire Marshal – Baltimore City Fire Department

c. Owner – Baltimore City Public Schools

d. Professional – Windward Engineers & Consultants, LLC

e. Construction Manager (CM) – Agent for the Owner that oversees or coordinates the project daily.

f. Insurance Carrier – Agent for the Owner that provides insurance coverage for the project.

2. Terminal Cabinet – A steel cabinet with locking, hinge-mounted door in which terminal strips are securely mounted. Minimum size is 8-inches by 8-inches (200 mm by 200 mm).

3. Furnish – To supply the stated equipment or materials.

4. Install – To set in position and connect or adjust for use.

5. Provide – To furnish and install the stated equipment or materials.

6. Contractor – Shall refer to the Fire Alarm/Electrical Contractor.

7. Fire Protection/Sprinkler Contractor – Shall refer to the person or groups responsible for providing the sprinkler system.

1.4 APPROVALS

A. The Contractor must comply with all laws, ordinances, and regulations of all Authorities Having Jurisdiction (AHJ), including City, State, Federal, Public Utility, and the Owner’s insurance carrier.

B. Battery calculations, product data sheets, shop drawings and all other associated submittals must bear the stamps of and be reviewed and/or approved by the AHJ and the Owner’s insurance carrier. Any and all comments received from the aforementioned reviews, and resolution thereof, shall be submitted to the Professional for record.

C. The Contractor shall submit full and complete shop drawings to the Professional for review and obtain a stamp of approval from the Professional prior to installation.

1.5 FIRE ALARM DESIGN

A. System shall be a complete, supervised, non-coded, addressable voice fire alarm system conforming to NFPA 72. The system shall operate in accordance with the Matrix of Operations shown on the Contract Drawings. The system shall remain in the alarm mode until all initiating devices are reset and the FACP is manually reset and restored to normal status. The system shall provide the following functions and operating features:

1. All fire alarm system circuits shall be electrically supervised. Provide Class B Signaling Line Circuits (SLC) and Class B Notification Appliance Circuits (NAC). Provide supervision of the primary power supply, presence of the battery, battery voltage, and placement of the modules within the panel.
2. Automatic response functions shall be accomplished by the first device initiated. Alarm functions resulting from initiation by the first devices shall not be altered by subsequent alarms.
3. Alarm, supervisory and trouble signals shall be automatically transmitted to the approved Supervisory Service via a dual-path communicator capable of transmitting signals via internet protocol (IP) and/or cellular signal. Provide all power and data connections needed to produce a functioning system.
4. History log function shall be enabled and shall include all alarms, trouble signals, and reset activities/events. The history log shall not be erased during complete loss of power.
5. The Environmental Compensation function shall be enabled.
6. Adjustable sensitivity for detectors.
7. Block Alarm and Acknowledge shall be provided.
8. The trouble signals shall be non-latching.
9. Alarm Verification shall be available.
10. Device Confirmation shall be enabled.
11. All function keys shall be programmed in accordance with the AHJ and Owner’s specific requirements.
12. Provide program capability via switches in a locked portion of the FACP to bypass the automatic notification appliance circuits, kitchen shunt mechanisms, air handler shutdown, supervising station and other output features. Operation of this programming shall indicate a trouble condition on the FACP and printer output.
13. Alarm functions shall override trouble or supervisory functions. Supervisory functions shall override trouble functions.
14. The system shall be capable of being programmed in the field. All programmed information shall be stored in non-volatile memory.
15. The system shall be capable of operating, supervising, and/or monitoring both addressable and non-addressable alarm and supervisory devices.
16. There shall be no limit, other than maximum system capacity, as to the number of addressable devices which may be in alarm simultaneously.
17. The system shall be configured to permit a single person walk-test to be performed.

18. All fire alarm equipment and devices shall be labeled by location and will display on the FACP and FAA as such. Confirm messages with BCPS prior to programming.

B. Detection Initiation

1. Alarm Verification – Feature shall be field programmable for all smoke detectors in accordance with NFPA 72. Cross-zoning shall not be permitted as a substitute for alarm verification.

2. Detector Sensitivity Check/Adjustment – Individual smoke detector sensitivity checking and adjusting for alarm condition shall be provided at the FACP. Said sensitivity checking and adjusting shall meet and be listed by UL for this function.

3. Detector Maintenance Monitoring – Provide monitoring of smoke detector chambers for gradual buildup of foreign materials in the sensing chamber. When the smoke detector senses a high level of contamination, the control panel shall cause a trouble condition and indicate the specific detector location in need of maintenance.

4. Automatic Drift Compensation – All smoke detectors shall be monitored for changes in sensitivity ranges and automatically adjust the detection range up or down to compensate for environmental changes or degradation of detector components.

1.6 OVERVOLTAGE AND SURGE PROTECTION

A. Signaling Line Circuit Surge Protection. All communications equipment shall be protected against surges induced on any SLC. All cables and conductors, which serve as communications links, shall have surge protection circuits installed in accordance with the Manufacturer's recommendations.

B. Power Supply Circuit Protection. The 120 VAC power supply for the FACP shall be protected against surges in accordance with the Manufacturer's recommendations.

C. Fuses shall not be used for surge protection.

D. Wiring extending outside the building, either underground or overhead, shall meet the requirements of the NEC, NFPA 72, and the manufacturer with respect to lightning and other induced surges. Provide low voltage line protection at the wire entry point to the building.

1.7 QUALITY ASSURANCE

A. Contractor:

1. "Contractor" is defined as the company and authorized representative thereto that installs the fire alarm equipment.

2. Installation shall be accomplished by a Contractor with a minimum of five (5) years experience in the installation of fire alarm systems. Contractor shall show evidence of certification of at least 1 employee directly responsible for the work by the National Institute for Certification in Engineering Technologies (NICET) at Level II, III, or IV in the Fire Alarm Systems subfield of Fire Protection Engineering Technology; or, a Registered Engineer with similar experience in Fire Alarm System installation.

3. If such a certified individual is not employed, adequate documentation shall be provided to show comparable training and experience of an existing employee. At a minimum, comparable training and experience shall consist of 5 years of progressive experience in the installation and design of fire alarm systems of similar size and complexity to that specified herein. Any proposed installer who cannot show evidence of such qualifications may be rejected. The services of a technician certified by the control equipment manufacturer shall be provided to supervise installation adjustments and tests of the system.

B. Distributor:

1. "Distributor" is defined as the company and authorized representative of the Manufacturer that distributes and designs the fire alarm system and associated equipment provided by the Manufacturer and installed by the Contractor.

2. The Distributor shall show evidence of certification by the Manufacturer in the technical support of the system installed under this contract. Documentation of factory Manufacturer training on the system and products being provided is required for an individual directly associated with the project.

3. The Distributor shall show evidence of certification of at least 1 employee by the National Institute for Certification in Engineering Technologies (NICET) at Level III or IV in the Fire Alarm Systems subfield of Fire Protection Engineering Technology; or, a Registered Engineer with similar experience in Fire Alarm System design and installation.

4. If such a certified individual is not employed, adequate documentation shall be provided to show comparable training and experience of an existing employee. At a minimum, comparable training and experience shall consist of 5 years of progressive experience in the installation and design of fire alarm systems of similar size and complexity to that specified herein and demonstrate experience with the design and installation of the system being provided. Additionally, provide documentation for the registered PE or NICET level person that will review and certify the design.

C. Manufacturer and Equipment:

1. "Manufacturer" is defined as the company and authorized representative thereto that produces the fire alarm equipment.

2. Each item of the Fire Alarm System shall be listed as a product of a single fire alarm system manufacturer under the appropriate category by Underwriters Laboratories, Inc. (UL), and shall bear the UL label. All control equipment is to be listed under UL category UOJZ as a single control unit. Partial listing shall NOT be acceptable.

3. All devices shall be listed for use with the UOJZ listed control panel. Any associated third party equipment that is not required to be specifically listed for use with the control panel, shall be certified as being acceptable for use with the specified system by the Manufacturer.

4. Testing Services or Laboratories:

   a. Provide fire alarm and detection system components that are UL listed and FM approved and labeled for their intended use and service. Construct all fire alarm and fire detection equipment in accordance with the latest edition of publications from Underwriters Laboratories (UL) and Factory Mutual Engineering Corporation (FM) such as:

      1) UL 464 – Audible Signal Appliances

      2) UL 864 – Control Units for Fire Protective Signaling Systems

      3) UL 1480 – Speakers for Fire Alarm, Emergency, and Commercial and Professional Use

      4) UL 1971 – Signaling Devices for the Hearing Impaired

D. Codes and Standards:

1. Baltimore City Building, Fire, and related codes – International Codes, 2021 Edition

2. Any local City Codes, Amendments or Ordinances.

3. National Fire Protection Association (NFPA) (IBC/IFC referenced edition if so designated, otherwise latest edition):
    a. NFPA 70, National Electrical Code (NEC)
    b. NFPA 72, National Fire Alarm Code
4. Americans with Disabilities Act (ADA) and the Americans with Disabilities Act Accessibility Guidelines (ADAAG).
5. Underwriters Laboratories (UL), Current Edition or Verified Supplements.
    a. Fire Protection Equipment Directory
    b. Electrical Construction Materials Directory
6. Factory Mutual (FM) Approval Guide, Current Edition or Verified Supplements.
7. The Owner's Insurance Carrier.
8. Maryland Building Performance Standards – Regulations (COMAR 09.12.51.04A and B).

1.8 SUBMITTALS

A. Refer to any front-end general project or electrical specifications for basic information relating to submittal requirements.

B. The Fire Alarm/Electrical Contractor is responsible for all fees and efforts associated with the required approvals.

C. Prior to installation of any materials and/or system components, all fire alarm system shop drawings and equipment must be approved by and bear the stamp of the AHJ and the Owner's Insurance Carrier as applicable. Provide shop drawings as specified in IBC 907.1.2 to the AHJ. Any and all comments received from these reviews shall be submitted to the Professional. After approval by the aforementioned agencies and review by the Design Professional, submit 1 complete record set of documents bearing the aforementioned agencies approval to the Owner and another to the Professional.

D. Submit all shop drawings to the Design Professional for review and approval. Submittals are to be complete. Partial submittals shall not be accepted except as follows. Include in the first submittal a schedule indicating the packaging and estimated delivery date of all required submittals. Example: Submittal 1 (date) will include: Contractor Qualifications, Phasing Plan, and Catalog Data . Submittal 2 (date) will include: AHJ approvals and Drawings and Calculations. Submittal 3 (date) will include: System Messages, Test Plan and Extended Service Agreement.

E. The submittal shall be made as a complete package consisting of fire alarm equipment ONLY. The submittal shall NOT include other electrical equipment or components not directly related to the fire alarm system installation (e.g., security, sound systems, power, etc.) for approval. Where other equipment or components are an integral part of the fire alarm system, they shall be indicated as such but not included with the submittal and only show required interface details. Failure to submit all required materials as a complete, separate, single package shall be cause for rejection of entire package. Copies of the Contract Documents with contractor's notes thereon will be rejected. Simply redlining the Contract Documents is not acceptable. For any resubmittals to the Professional, provide a written response to any previous comments.

F. The fire alarm equipment distributor shall submit documents as specified in the Qualifications portion of this Section. The submittal shall include identification of the following:

1. Name, title, address, and proof of qualifications for each "Contractor" and authorized representative, "Distributor" and authorized representative, and "Manufacturer" and authorized representative.

2. When the distributor intends to utilize the services of a manufactured-affiliated company in the system design, the distributor shall submit a letter of intent to do so, addressed to the Professional, which includes the name of the manufacturer-affiliated company, the names and qualifications of the NICET-certified or registered Engineer employees of the company, and which describes the delegation of fire alarm system design responsibilities.

G. Provide a narrative description of the phasing plan.

1. Outline the sequence of demolition, installation, and acceptance testing.

2. Describe how the systems will be configured to work as a single combined system during the transition.

3. Provide updates to the Professional on a monthly basis including projected dates.

H. System Component Data, Shop Drawings, and Calculations:

1. Drawings shall be to scale. Submit 24x36 or 30x42 inch shop drawings at a scale not smaller than 1/8 inch = 1 foot. All drawings to be in CAD. System component data and calculations shall not be smaller than letter size.

2. Symbols shall be consistent for the entire shop drawing package. Therefore, the symbols used on the floor plan drawings shall be the same symbols used on the riser diagram and details. Submitting a riser diagram with a copy of the Contract Drawings used as the floor plans is unacceptable and will result in rejection of the shop drawings.

3. As a minimum, the fire alarm and fire detection shop drawing submittal shall include the following:

a. Include annotated catalog data showing manufacturer's name, model, voltage, and catalog numbers for all equipment and components. Where multiple configurations of equipment or options are available, indicate specific configuration being submitted.

b. Provide floor plans showing the location of all control units, power extenders, devices, equipment, and appliances and their addresses; including identification of equipment controlled or monitored by the fire alarm system (e.g., fans, dampers, etc.). Show circuiting between all devices. Show locations for all junction boxes used for T-taps. Indicate conduit fill percentages on the plans.

c. Provide complete riser diagrams indicating the wiring sequence of all devices, equipment, and appliances, their addresses, and their connections to the control equipment. Provide a color code schedule for the wiring.

d. Provide point-to-point wiring diagrams showing the points of connection and terminals used for all electrical field connections in the system, including all interconnections within fire alarm cabinets, and between the equipment or systems which are supervised or controlled by the fire alarm system. Diagrams shall show all connections from field devices (interface modules, all fire protection equipment, detectors, manual pull stations, notification appliances, etc.) to the FACP and remote FAA, initiating circuits, switches, relays and terminals, and other ancillary equipment.

e. Provide wiring diagrams and drawings to depict the layout of the power supplies and corresponding audible/visible circuits. Provide circuit numbers for each NAC and SLC circuit.

f. Provide drawings and a description of how the fire alarm system meets the requirements to synchronize all the notification appliances throughout the building.

g. Provide data on each circuit to indicate that there is at least 20 percent spare capacity for notification appliances on the NAC, 20 percent spare capacity on the amplifier circuits, and 20 percent spare capacity for initiating devices on the SLC

(e.g., not more than 80 percent loaded). This portion of the submittal shall include wire sizing calculations to show that the wiring lengths and wire gauge provide adequate voltage to the last device on a circuit. Example - An 8 amp power supply would not be loaded to more than 6.4 amps and if the audible/visible appliance is rated for 16 to 24 volts DC, the wire sizing calculations would show that the last device has a minimum voltage of 17.6 volts. The calculation shall be provided in a tabular format. Simply providing the amperage at the end of the circuit on the riser or plan drawings is not acceptable.

h. Provide complete battery calculations for both the alarm and supervisory power requirements. The calculation shall include: identification, quantity, and ampere-hour requirements for each system component and/or device in both the standby and alarm conditions in a tabular or other easily discernible format. In addition to any manufacturer's recommended derating factor, provide an overall minimum 20 percent Safety Factor.

i. Provide a complete description of the system operation. This shall be a written summary or detailed expansion of the Matrix of Operations shown on the contract drawings.

j. Provide mounting details for all panels. Provide typical mounting details for each type of device for each unique mounting application (e.g., ACT or gypsum ceiling, steel beams or trusses, block or gypsum walls).

k. Include submittal data for all wire, terminal cabinets, and raceways. Provide color samples as required.

l. Provide a complete list of device addresses and their corresponding message to be displayed on the FACP and remote FAA. The wording of the system messages as they appear at the FACP and remote FAA panels shall be submitted for approval to the Owner and the Professional.

I. Provide a complete test plan for system testing at least three weeks prior to the Final acceptance test.

J. Submit a copy of the extended service agreement.

K. Upon receipt of final-approved shop drawing review, the contractor shall issue one set to the local Code Official.

1.9 PROJECT RECORD DOCUMENTS

A. Prepare and submit 5 sets of detailed CAD "As-Built" drawings. The drawings shall show the system as installed, including all deviations from both the project drawings and the approved shop drawings. The drawings shall be prepared on uniform sized sheets the same size as the project drawings.

B. The drawings shall include complete plan view wiring diagrams showing connections between all devices and equipment, including, but not limited to, fire alarm panels, field devices and single line circuit routings between devices. Indicate conduit fill percentages on the plans. All equipment in panels shall be shown in the as-built orientation.

C. Provide drawings detailing all wiring connections within the FACP.

D. Include a riser diagram and drawings showing the as-built location and address or circuit number of all devices and equipment.

E. These drawings shall be submitted with the specified operations and maintenance manuals.

F. Upon completion of the project and after approval by the design Professional, submit one (1) complete, reproducible record set to the Owner. A single CAD (electronic) copy of the "As-Built" drawings shall also be provided.

G. All drawings submitted shall be signed and sealed by the Registered Engineer or the NICET employee of the distributor.

H. Ensure all required record documents are placed in the document storage box at the fire alarm control panel in accordance with NFPA 72.

1.10 OPERATION AND MAINTENANCE DATA

A. Provide 5 bound copies of an operation and maintenance manual. Maintenance manuals shall be furnished complete and consist of fire alarm equipment and data only. Each shall contain sufficient detailed information to enable Owner's technicians to understand, operate and maintain the system equipment and to identify replaceable parts. The manual shall include:

1. An index.
2. Copies of ALL APPROVED SHOP DRAWINGS AND SUBMITTAL MATERIALS UPDATED TO "AS-BUILT".
3. A complete parts list of all components.
4. A copy of the completed and signed Testing and Inspection Form (from NFPA 72 or equivalent).
5. Operating instructions, maintenance and repair procedures, and troubleshooting guidelines.
6. Testing procedures and maintenance frequencies.
7. A list of recommended spare parts. The spare parts list shall include, for each item, the manufacturer's name, serial number of the part, an ordering number, if appropriate, and a physical and electrical description of the part.
8. A printout of the new system program, including all input and output addresses and messages displayed at the FACP and FAA. Failure to include the system program will be cause for withholding final payment.
9. A written copy of all passwords or other access codes for the FACP.

1.11 SERVICE AGREEMENT

A. Included in the bid price shall be a 1 year service contract, effective upon final system acceptance, to provide all service required beyond the warranty and the capability of the facility personnel. Contract shall include all service and repairs required under the warranty as well as quarterly, semi-annual, and annual system testing and inspection in accordance with NFPA 72.

B. The distributor shall make available to the Owner a testing and maintenance contract proposal to maintain the system in accordance with NFPA 72 for years 2 through 5. Breakout pricing on a per year basis. Owner is under no obligation to accept.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Silent Knight

B. Fire Lite

C. Notifier

D. Approved Equal

2.2 FIRE ALARM CONTROL PANEL (FACP)

A. Provide a complete control panel fully enclosed in a lockable steel enclosure as specified herein. All operations required for testing or for normal care and maintenance of the systems shall be performed from the front of the enclosure. If more than a single unit is required at a public accessible location to form a complete control panel, the unit enclosures shall match exactly.

B. Each control unit shall provide power, supervision, control and logic for the entire system, utilizing solid state, modular components, internally mounted and arranged for easy access. Each control unit shall be suitable for operation on a 120 volt, 60 hertz, building power supply. The system devices shall operate at 24 volts DC. Provide each panel with supervisory functions for power failure, internal component placement, and operation. Visual indication of alarm, supervisory or trouble initiation on the fire alarm control panel shall be by liquid crystal display or similar means with a minimum of 80 characters of which at least 32 are field changeable.

C. The FACP shall be listed for Remote Station Service. Provide audible signals to indicate any alarm or trouble condition. The alarm signals shall be different from the trouble signal. Connect all circuit conductors entering or leaving the panel to screw-type terminals with each terminal marked for identification. Locate diodes and relays, if any, on screw terminals in the FACP. Circuits operating at 24 VDC shall not operate at less than 20.8 volts. Circuits operating at any other voltage shall not have a voltage drop exceeding 10 percent of nominal voltage.

D. Operation of the system shall be in accordance with the description under “SYSTEM OPERATION” of this specification section and as indicated in the Matrix of Operations shown on the Contract Drawings.

E. The cabinet enclosure shall be identified by permanent markings on the cabinet or by an engraved laminated phenolic resin nameplate. Lettering on the nameplate shall identify the cabinet and shall not be less than 1-inch high. Provide prominent rigid plastic or metal identification plates for all lamps, circuits, meters, fuses and switches. The cabinet shall be provided in a sturdy steel housing, complete with backbox, hinged steel door with cylinder lock, and surface mounting provisions.

F. Provide an alarm silence switch at the FACP that will silence the audible signal and de-activate the strobes but not affect the visual alarm indicator at the FACP and FAA. Provide trouble and supervisory silencing switch that will silence the audible trouble and supervisory signal, but not extinguish the visual indicator at the FACP and FAA. These switches shall be overridden upon activation of a subsequent alarm.

G. Provide a drill test switch which will activate the alarm indicating devices, but will not put the panel into the alarm mode and will not notify the Supervising Station.

H. Power and supervise each circuit such that a signal from a single device does not prevent the receipt of signals from any other device. All circuits shall be manually resettable by switch from the FACP after the initiating device or devices have been restored to normal.

I. The fire alarm system shall activate general building alarm utilizing the “Temporal Tone”, followed by a voice message.

J. Provide each control unit with non-volatile memory and logic for all functions. The use of long life batteries, capacitors or other age-dependent devices shall not be considered as equal to non-volatile processors, PROMS or EPROMS.

K. Provide control units and control panels that are fully field programmable for control, initiating, supervisory and trouble functions of both input and output. The system program configuration shall be menu-driven. All system changes shall be password protected and shall be

accomplished using personal computer based equipment. All system changes shall be in non-volatile memory.

L. The FACP shall contain features which allow the bypassing of input devices from the system or the modification of system outputs. These control features shall be accessible from a panel mounted keypad. Any bypass or modification to the system shall indicate a trouble condition on the FACP and a printed output of the trouble condition.

M. Provide the necessary controls to prevent the resetting of any alarm, supervisory, or trouble signal while the alarm, supervisory or trouble condition on the system still exists.

N. Provide a typeset printed or typewritten instruction card mounted behind a Lexan plastic or glass cover in a stainless steel or aluminum frame. Install the frame in a conspicuous location observable from the FACP. The card shall show those steps to be taken by an operator when a signal is received as well as the functional operation of the system under all conditions, normal, alarm, supervisory and trouble. The instructions shall be approved by the Owner and the Professional before being posted.

O. The FACP shall have a walk test feature. When using this feature, operation of initiating devices shall result in limited system outputs, so that the notification appliances operate for only a few seconds and the event is indicated on the system printer, but no other outputs occur.

P. Secondary source for emergency power to the FACP:

1. Provide a battery powered secondary power system with sufficient capacity to operate the complete alarm system in normal or supervisory (non-alarm) mode for a period of 24 hours. Following this period of normal operation, the batteries shall have sufficient capacity to operate the system during a fire or other emergency condition for a period of 15 minutes.

2. The battery secondary power source shall be sealed lead-acid or nickel cadmium batteries. Provide an automatic transfer switch to transfer the load to the batteries in the event of the failure of primary power.

3. Provide a solid state, fully automatic, variable charging rate battery charger. The charger shall be capable of providing 150 percent of the connected system load and shall maintain the batteries at full charge. In the event the batteries are fully discharged, the charger shall recharge them back to full charge in twelve hours.

Q. The loss of primary power at the FACP shall result in a trouble signal at both the FACP and the FAA.

2.3 SYSTEM PRINTER

A. Stand Alone Printer Capability: Provide capability and components within the fire alarm panel to connect a stand-alone printer for service and maintenance needs. The printer shall be capable of being utilized for maintenance or system troubleshooting as well as recording alarms.

2.4 COMMUNICATOR

A. Provide a communicator compatible with the Owner’s supervising station to transmit signals as specified in the Matrix of Operations.

B. The stand-alone communicator shall be ul864 listed and shall have the capability of transmitting alarms via ethernet and cellular data. The communicator shall be compatible with the owner’s supervising station to transmit signals as specified in the matrix of operations.

C. Provide back-up battery, size as recommended by the manufacturer, and power transformer in a wall outlet box. Provide low-voltage power-limited cables in conduit from the power transformer to the communicator.

D. Provide data cables, cards and components to communicate with supervising station. A 3/4-inch conduit with the required two (2) cat 6 data cables shall be extended from the FACP communicator to the connection point.

E. Install the communicator in the same room and within 20 feet of the FACP.

F. Provide all power and data connections needed to produce a functioning system.

2.5 AUDIO VOICE PANELS

A. The FACP shall have an associated Voice Alarm or Audio panel that is UL listed for use with the FACP.

1. The Voice Panel shall have a minimum of 3 channels for simultaneous paging and signaling, a paging microphone and be capable of either utilizing 25 or 70.7 Vrms speakers.

2. A full set of switches shall be provided with the panel for functions such as ALL CALL and the ability to selectively call individual areas. Systems that cause signaling devices to go silent while performing signaling functions shall not be acceptable.

3. A microphone mounted in the master control or remote control unit shall allow for the announcement of a message in the building. Any number or all speaker circuits can be selected to receive these voice messages. The master module shall include local speaker and volume control to monitor audio signals. An optional pre-page tone shall be programmable for microphone use.

B. Amplifiers

1. Amplifiers may be distributed throughout the building or centrally banked.

2. A minimum of one common backup amplifier shall be provided for the largest size amplifier used at a location. The transfer to the backup amplifier shall be automatic upon the failure of any one of the primary amplifiers. This transfer to the backup amplifier shall be indicated as a trouble condition on the master control unit.

3. Amplifiers shall have integral power supplies for operating traditional notification appliance circuits.

C. Messaging capability: The panel shall be capable of providing multiple voice messages depending on the event. Custom messages shall be utilized. The capacity of the panel shall provide for the ability to annunciate distinct messages specifying the location of the alarm as well as unique instructions per event per area.

2.6 AUXILIARY POWER SUPPLIES

A. Auxiliary power supplies or notification extender panels of the same Manufacturer as the FACP, or listed for use with the FACP, shall be installed as necessary to provide power to the visible alarms and other required equipment.

2.7 REMOTE FIRE ALARM ANNUNCIATOR (FAA)

A. The Remote FAA panels shall provide the same alpha-numeric display as that of the FACP. FAA panels that provide minimal control functions such as the ability to acknowledge, silence, and reset are acceptable in lieu of those providing full control functions. Size of the panel is a consideration with smaller panels being preferred.

2.8 MONITOR AND CONTROL MODULES

A. Provide supervised addressable monitor and control modules as appropriate to interface with required devices. These devices may also require control relays depending upon the device being interfaced. This includes, but is not limited to HVAC systems and electromagnetic door holders.

B. Modules shall be of the type that mount in a 4 inch square box. The use of addressable relays and mini-modules is acceptable for certain applications with the prior approval of the Professional. Any such use of addressable relays and mini-modules shall be identified in the submittals along with mounting or securing details for each application.

2.9 MANUAL PULL STATIONS

A. Provide addressable double-action type manual pull stations throughout. The stations shall have an impact resistant polycarbonate or cast or extruded metal cover, finished in red with molded raised letter operating instructions of contrasting color. Stations requiring the breaking of a glass panel are not acceptable.

B. All pull stations shall have a clear, tamper proof, plastic cover installed such that the removal or opening of the cover will sound a local alarm, throughout the building. Provide the STI Stopper II Model STI-1130 or equivalent.

C. Furnish stations which require the use of a key or a wrench to reset. All stations shall be master keyed with the fire alarm control panel. Station switches and contacts shall be rated for the voltage and current at which they shall operate. Stations shall be supplied with screw terminals for making connections.

D. Where devices are located in an area subject to high humidity or adverse conditions (e.g., exterior, showers, etc.) indoor/outdoor, weatherproof appliances shall be provided.

E. Provide red surface mounted back boxes provided by the manufacturer of the manual pull station.

2.10 MULTI-CRITERIA (FIRE/SMOKE) DETECTORS

A. Provide addressable multi-criteria open area and duct smoke detectors as follows:

1. Provide smoke detectors utilizing multi-criteria features for operation. Detectors shall be listed for use with the fire alarm control panel.

2. Provide self-restoring type detectors which do not require any readjustment after actuation to restore it to normal operation. Detectors shall be UL listed as Smoke – Automatic Fire Detectors. Install detectors in accordance with the requirements described in the listing.

3. Detectors shall have alarm verification capability and an environmental compensation feature and provided with an insect screen.

4. Provide twist lock bases for the detectors. The detectors shall maintain contact with their bases without the use of springs. Provide companion mounting base with fixed wiring terminals. The detector shall have a visual indicator to show actuation.

5. The detector address shall identify the particular unit, its location within the system, and its sensitivity setting. Detector shall be of the low voltage type rated for use on a 24 VDC system.

6. Detectors shall be equipped with screw terminals for each conductor.

7. Duct smoke detectors shall be furnished and installed by the Fire Alarm Contractor. The Fire Alarm Contractor shall coordinate sampling tube sizes. All duct smoke detectors located 10-feet or higher, located above finished ceilings, or otherwise hidden from view, shall be furnished with remote alarm indicator lamps and test stations located in a readily

accessible location, along with identification nameplates clearly indicating the device and its location.

8. Provide multi-criteria smoke, heat, and carbon monoxide detectors in the Boiler Rooms, Mechanical Rooms, and Kitchen. If a single device is not available, the Contractor shall provide a fixed temperature heat detector, carbon monoxide detector, and monitor module to monitor the carbon monoxide detector.

2.11 HEAT DETECTORS

A. All heat detectors shall be of the type that mount to twist lock bases (similar to the smoke detectors), unless the product line does not support the specified device. In that case, provide an addressable detector from the manufacturer's standard product line or a non-addressable device with the appropriate interface module. These detectors shall be equipped with screw terminals for each conductor. All detectors or twist bases shall be designed for outlet box mounting and supported independently or wiring connections.

B. Heat detectors shall be combination rate-of-rise and fixed temperature type where specified on the drawings. Rate-of-rise operation shall be set a nominal 15 degrees Fahrenheit per minute; fixed temperature shall occur at 135 degrees Fahrenheit (nominal) or as otherwise indicated on the drawings.

C. Provide multi-criteria smoke, heat, and carbon monoxide detectors in the Boiler Rooms, Mechanical Rooms, and Kitchen. If a single device is not available, the Contractor shall provide a fixed temperature heat detector, carbon monoxide detector, and monitor module to monitor the carbon monoxide detector.

2.12 CARBON MONOXIDE DETECTORS

A. Provide carbon monoxide detectors meeting the requirements of UL 2075 and compatible with the installed fire alarm system.

B. Any off-normal condition (i.e. alarm or end-of-life) shall be transmitted to the main fire alarm panel as a TROUBLE alarm.

C. The detector shall be capable of being either flush or surface mounted.

D. The detector shall provide local audible indication of an alarm condition as well as provide LED status indication

2.13 NOTIFICATION APPLIANCES

A. Provide notification appliances in areas as indicated on the Contract Drawings. Combination audible/visible appliances in a single wall or ceiling mounted unit shall be used in all locations where a combination unit can be provided. Separate audible or visible appliances may be used as necessary for coverage of odd shaped areas to form a complete and functional system.

B. Wall Mounted Devices shall be flush mounted throughout the building. Surface mounted devices are permitted in mechanical rooms and like areas. All wall mounted devices shall be white unless otherwise noted.

C. Ceiling Mounted Audible, Visible, and Combination Audible/Visible shall be white unless otherwise noted.

D. Audible/visible devices in areas subject to damage, such as gymnasiums, shall be provided with a wire metal protective cover to protect the device from damage. Plastic covers that reduce light and sound transmission are not acceptable.

E. Audible Appliances:

1. All audible appliances shall be capable of installation on standard 4-inch (100 mm) square electrical boxes. Provide fire alarm horns conforming to UL 464, having separate terminations for each “in” and “out” connection.

2. Audible appliances shall provide a minimum output sound of 15 dBA above ambient throughout the building in accordance with NFPA 72. The appliance shall have a minimum rating of 90 dBA at 10-feet (3 m) as determined by the reverberant room test; data on peak output as determined in an anechoic chamber is not suitable. Audible appliances throughout shall emit a synchronized, temporal signal followed by a voice message.

3. Provide notification appliance mounting plates constructed of cold rolled steel having a minimum thickness of 16 gauge and equipped with mounting holes and other openings as needed for a complete installation. All fabrication marks and holes shall be ground and finished to provide a smooth and neat appearance for each plate. Each plate shall be primed and painted red. Provide terminal blocks for making connections.

4. Speakers shall be of high-efficiency design and life safety rated for both electronic tone signaling and voice applications. Each speaker shall have multiple watt taps to allow for field adjustment.

5. Provide amplifiers as required.

F. Visible Appliances:

1. Visible alarm indicating appliances shall be LED lights meeting the requirements of UL 1971. Strobes shall have a flash rate of between 1 and 3 HZ. Visible appliances throughout each floor shall be synchronized.

2. The strobe lens shall conform to the Americans with Disabilities Act. Strobes shall be designed and listed as required for wall or ceiling mounting as applicable.

3. The Strobe lens housing shall be engraved or stenciled with the word “FIRE”.

4. Ceiling mounted devices shall be specifically approved for ceiling mounting. Wall mounted devices shall not be used for ceiling applications unless approved for such use.

2.14 REMOTE ALARM LAMP AND TEST SWITCH

A. A remote alarm lamp shall be used for identification of an automatic device where alarm devices are mounted such that they are not visible.

B. The alarm lamp shall have an integral keyed test switch to permit testing of the initiating device remotely.

2.15 RECORD DOCUMENT STORAGE BOX

A. Provide a document storage box to hold fire alarm system records and testing information as required by NFPA 72.

B. The document storage box shall be constructed of 18 gauge cold rolled steel with a red factory-applied powder coat finish and white lettering reading “SYSTEM RECORD DOCUMENTS”.

C. The document storage box shall have integral capabilities to store electronic media with a minimum capacity of 8GB.

D. Acceptable manufacturers:

1. Space Age Electronics, Inc.

2. Approved equal.

PART 3 - EXECUTION

3.1 GENERAL

A. The existing Fire Alarm System, equipment, devices, and appliances shall remain in service until completion and acceptance of the new Fire Alarm Control Panel or be integrated with the new panel as follows:

1. As phasing of construction requires completion of a portion of the system, the existing fire alarm system components shall be interconnected with a new fire alarm system in such a way that initiation of either the existing or the new system (e.g., manual pull station, detection, etc.) shall sound a general alarm throughout the building for all existing notification appliances and all new notification appliances in the completed phase portion of the building.

2. Install new equipment, remove old, and perform acceptance test before proceeding to the next area. Provide a complete system at all times. At times this will require both the new and old systems to work in unison (e.g., tying the old system in as a part of the new system).

3. Removal of existing devices and circuits within areas of work is the responsibility of the contractor. The drawings do not show devices to be removed. The contractor shall remove all devices, wiring, and conduit as required as well as making temporary or permanent provisions for circuits to maintain the system as operational.

4. The existing building fire alarm system will require temporary modifications to the circuits throughout different phases of the project in order to keep the system operational. Phasing boundaries and existing fire alarm zone or circuit boundaries do not match. The contractor shall verify all zone and circuit information prior to disconnecting or reconfiguring the circuits.

5. Coordinate covering of inactive pull boxes during construction. This would include existing pull stations that are inactive and yet to be demolished as well as new pull stations that are installed but not yet functional.

B. Provide and install the system in accordance with the plans and specifications, all applicable codes and the manufacturer’s recommendations. All wiring shall be installed in strict accordance with all the provisions of the NEC. Upon completion, the contractor shall so certify in writing to the Owner and the Professional.

C. All associated conduit and wiring for wall-mounted appliances shall be hidden from view. Utilize recessed back boxes to mount the fire alarm device. As an example, this would include manual pull stations and alarm notification devices attached to gypsum or CMU walls. The contractor shall receive approval from the Owner, CM or Professional prior to routing any exposed raceway in finished areas of the building. The contractor shall coordinate the routing of the conduit and placement of boxes to meet this requirement.

D. All junction boxes shall be sprayed red and labeled “Fire Alarm”. Wiring color code shall be maintained throughout the installation.

E. The contractor shall clean all dirt and debris from the inside and the outside of the fire alarm equipment after completion of the installation. Detectors shall not be installed during construction. Installing detectors with a dust cover is not acceptable. Install detectors only after the building is clean and ready for testing and occupancy.

F. The NICET approved Distributor and Contractor supervising employees shall attend all meetings required by the Professional, Owner or CM. This shall include as a minimum a project kickoff meeting, monthly job site visits to supervise the installation, and final system acceptance.

G. Use of wire nuts is prohibited. Installing multiple wires on a single terminal is prohibited.

H. Provide a smoke detector over each Fire Alarm Control Unit. For the purpose of this project, the term Fire Alarm Control Unit shall apply to the FACP, Data Gathering Panels, Amplifier Panels and Notification Extender Panels.

I. Patching and repairing shall comply with Specification for cutting and patching. The removal of the existing fire alarm devices will create several typical patch and repair scenarios. The following is guidance to assist the contractor in understanding the extent of the work required. It is not intended that this portion of the specification be complete with regards to all patching that may be required.

1. Areas that are existing CMU, plaster or gypsum wallboard shall be patched to match the existing finish and painted in accordance with the Specification. This would be typical for notification appliances.

2. Areas that are of other existing material that would be difficult to match, shall have a cover plate slightly larger than the opening installed and painted to match the existing wall.

3.2 SYSTEM FIELD WIRING

A. Wire each signal line circuit and fire alarm indicating appliance circuit in accordance with manufacturer's instructions. Provide fire alarm circuit conductors with color coded insulation, or use color coded tape at each conductor termination and in each junction box and interface panel.

B. Size and quantity of data, communication and control wiring along with related conduit where required shall be in accordance with the General Electrical Division Specifications, except as modified herein and the manufacturer's recommendations and the referenced codes.

C. Signaling Line Circuits, Notification Appliance Circuits, and initiating device circuits shall be supervised in accordance with the requirements of NFPA 72 and the System Operation portion of this specification.

D. Provide wiring within cabinets installed parallel with or at right angles to the sides and back of the enclosure. All conductors which are terminated, spliced, or otherwise interrupted in any enclosure associated with the fire alarm system shall be connected with either crimp-on type connections or with crimp-on spade type connections to terminal blocks. Mark each terminal in accordance with the wiring diagrams of the system.

E. Junction boxes with crimp-on type connections may be utilized where two (2) or fewer wiring connections are made. Provide a labeled terminal cabinet where more than two wiring connections are made.

F. For alarm and supervisory initiating device circuits and alarm indicating circuit wiring for the low voltage portion of the fire alarm system, provide all wiring as recommended by the equipment manufacturer. Provide wiring operating at 120 VAC as minimum No. 12 AWG solid copper having similar insulation.

G. Conduit:

1. Conductors shall be run in conduit in areas with exposed ceilings and unfinished areas throughout, except as otherwise noted. This portion of the system shall be installed in a manner approved by the National Electric Code and the AHJ utilizing approved raceways.

2. All conduit shall be rigid or EMT, sized at 3/4 inch minimum. The color shall be red. Any device wiring that is concealed in a wall or other similar space shall be provided with flexible metallic conduit, conduit or other suitable raceway.

3. The use of Type MC fire alarm cable is permitted in lieu of conduit to the extent permitted by the NEC, except that conductors shall be in conduit or surface raceway as applicable in public or occupied areas with exposed ceilings. All Type MC fire alarm cable shall be red striped or otherwise identified. Type MC cable shall be similar to AFC Cable Systems Fire

Alarm/Control Cable (product indicated to show level of quality and styling). Install, support and terminate as required by the NEC and the Manufacturer's instructions.

H. Surface Raceway:

1. The building shall use exposed surface raceways as described in Section 3.1 above when it is necessary to route exposed cabling in public accessible areas. The extent to which surface raceway is permitted is based on the feasibility of first routing concealed conduit or fishing Type MC fire alarm cable to the device. Where this is not practical, surface raceway is permitted with the approval of the Owner, CM or Professional.

2. For any exposed surface raceways, metallic or non-metallic surface raceway is permissible. Non-metallic surface raceway shall be similar to Panduit LDP models (product indicated to show level of quality). All surface raceway shall be sized as required.

3. Provide new surface mounted back boxes to mount the fire alarm device in areas of the existing building where architectural work will not permit flush mounting and concealed conduit. Route new wiremold from above the ceilings, along architectural elements and down to devices where required.

4. Match or coordinate the surface raceway color with the adjoining surface to provide a uniform appearance. Paint as required and submit color samples to the Professional for approval.

I. Above Ceiling Wiring:

1. It is the intent of this Section to assure plenum rated cable installation is neat, well organized and without conflict with other components located above the ceiling area. The installation shall adhere to all the regulations set forth in the NFPA 72 and the NEC.

2. This section is an allowance for using exposed plenum rated cable and should not be constituted as a prohibition from using conduit or Type MC fire alarm cable at any location.

3. All exposed above ceiling wiring (not in conduit and not Type MC cable) shall be plenum rated cable. The cable shall be power-limited fire protective signaling circuit plenum cable, red in color, and distinctively marked, "FPLP".

4. The cables shall be run through distinct bridle rings or J hooks which are to be properly affixed to the structure, wall and/or partition at maximum 5 foot intervals. Cables shall not rest on top of the suspended ceiling assembly nor shall they be bound to the side of threaded rod or ceiling support cables nor shall they be routed within general purpose or low voltage multi-use cable trays. Cables that run through the ceiling areas may be suspended directly from the structure or deck, but shall not be attached directly to equipment, pipes or ducts.

5. Where 2 or more cables are run parallel to one another and are not within bridle rings, they shall be bound together by nylon tie straps at 5 foot intervals.

6. Plenum rated cable shall be run in conduit at all riser locations. Within areas where physical damage is anticipated, finish ceilings are not provided or when connecting to a wall mounted terminal device, conduit or Type MC fire alarm cable shall be utilized. All drops within walls shall be in a minimum of flexible metal conduit.

7. All drops to ceiling mounted devices shall be from a junction box mounted to the deck or structure. From this box, extend flexible metal conduit to the ceiling mounted device junction box. Wiring and conduit to ceiling mounted devices shall have adequate slack to allow for removal of the device or ceiling tile as necessary. For lay-in type acoustical ceiling tiles, the ceiling mounted junction box shall be attached to via a Caddy acoustical tee bar hanger or equivalent. The box shall not be directly attached to the ceiling tile.

8. All drops to wall mounted devices shall be in flexible metal conduit where the wire is fished or installed within the wall cavity.

9. All interfaces in and out of open ends of junction boxes or conduits shall be fitted with rubber grommets to minimize the potential for damage to the conductor insulation. Specific attention shall be made to hanging methods and the use of brushings or grommets at junction box outlets, stub-ups outlets or transitions to Type MC Cable.
10. Conduit “sleeves” shall be installed where wiring passes through any wall and/or partition.
11. Cables shall be run parallel to walls and/or partitions whenever possible.
12. The contractor shall review the installation techniques with the CM and Owner prior to beginning work and review any completed work after the first day of significant work. The contractor shall remove and replace any non approved installation at his own expense.

J. In accordance with NFPA 72, connections to the light and power service shall be on dedicated branch circuits. The circuits and connections shall be mechanically protected via a handle locking or similar device. Circuit disconnecting means shall have a red marking, shall be accessible only to authorized personnel, and shall be identified as FIRE ALARM CIRCUIT CONTROL. The location of the circuit disconnecting means shall be permanently identified at each fire alarm control unit. This shall apply to all fire alarm control, NAC, amplifier, and similar panels.

K. Distinctively color code all wiring differently from the normal building wiring. Audible alarm indicating appliances shall be color coded differently from alarm initiating circuits. Use different colors for visible alarm indicating appliances.

L. Wiring connections shall be made by the Installing Contractor as shown on drawings furnished by the representative of the Distributor. Power shall not be applied to the system until the Distributor has approved the connections to the control equipment.

3.3 INSTALLATION OF FIRE ALARM INITIATING AND NOTIFICATION EQUIPMENT

A. All initiation and notification equipment shall be installed on back boxes/junction boxes. Field verify exact locations of all panels. All ceiling mounted devices in lay in ceiling areas shall utilize T-Bar hangers or approved equal. Provide a typed label on each manual pull station, detector, and interface module to indicate the loop and address number of the device.

B. Manual Pull Stations: Locate manual pull stations in areas shown on the drawings. Provide recessed back boxes in which the station operating mechanisms shall be mounted. Mount stations with the operating handles 42-inches above the finished floor.

C. Spot Type Smoke and Heat Detectors:

1. Locate detectors in areas shown on the drawings. Detectors located on the ceiling shall be installed not less than 4-inches from a side wall or to the near edge of a ceiling tile. The installation shall comply with the requirements of NFPA 72. Install smoke detectors no closer than 3 feet from HVAC registers.
2. The placement of smoke detectors provided for the closing of electromagnetic door holders shall comply with NFPA 72, except that detectors shall be placed on both sides of the door in all corridor or stairway applications. Area smoke detection may be used in lieu of additional detectors.
3. Verify the quantity and location of duct smoke detectors required with the HVAC schedules and drawings.
4. Devices in areas subject to damage, such as gymnasiums, shall be provided with a wire metal protective cover to protect the device from damage.

D. Audible/Visible Alarm Notification Appliances:

1. Locate alarm notification in areas shown on the drawings.

2. As a minimum, zone each floor separately and synchronize all devices throughout the building.

3. Speaker circuits shall be designed to allow for each speaker to be tapped at 1 watt. Each speaker shall be tapped as required for the space being covered. Speakers shall be tapped at a minimum of ¼ watt.

4. Tap hard wall bathroom and small spaces at 1/8 or ¼ watt tap. Corridors shall be set at ½ watt taps.

5. Speakers shall be tapped to achieve the best balance between audibility and intelligibility in each space. The Contractor is responsible for adjusting wattage taps as required to achieve this balance.

6. System messages shall provide the pre-alert tone at the rated decibel level for the speaker at the specific wattage tap.

7. Devices in areas subject to damage, such as gymnasiums, shall be provided with a wire metal protective cover to protect the device from damage.

E. Visible Alarm Indicating Appliances:

1. Locate visible alarm indicating appliances in areas shown on the drawings. For wall mounted strobes, the strobe shall be installed 80 inches above the finished floor or 6 inches below the ceiling, whichever is lower. Ceiling mounted devices shall be installed with the faceplate flush to the ceiling tile.

2. Provide spare capacity in circuits as described above. Strobe lights shall be wired for synchronized operation throughout.

3. Locate visible alarm indicating appliances in sleeping rooms (e.g., cot area for nurse) in accordance with NFPA 72.

4. Any areas that require alternate mounting locations, wall mounting heights between 80 and 96 inches, or ceiling mounted devices in lieu of wall mounted to properly cover an entire room or area based on obstruction must be coordinated with the Fire Alarm Distributor prior to submitting to the professional for approval. Adjust candela ratings and circuit calculations as required.

F. Fire Alarm Control Panel, Amplifier, and NAC Panels:

1. Locate the FACP where indicated on the drawings. The enclosure shall be surface-mounted with top of the cabinet not more than 6 feet above the finished floor.

2. Locate NAC panels where shown on the drawings. Additional panels, when required, may be located in storage rooms, janitor's closets, or other similar not normally occupied area. The Owner must approve these locations. The enclosures shall be surface mounted with the top of the cabinet not more than 6 feet above the finished floor.

3. Locate amplifiers adjacent to or integral with other fire alarm equipment panels. Bank or distribute amplifier panels throughout the building as required with the required backup capability.

4. Provide a smoke detector over the control panels in accordance with NFPA 72.

5. Provide typed quality labels on all panel identification cards.

6. Extend power from a dedicated spare 20 Amp, 1-Phase breaker in accordance with Part 1 of this Specification and the NEC. Field verify exact locations.

G. Remote FAA:

1. Locate all remote FAA units where indicated on the drawings. The enclosure shall be surface-mounted with top of the cabinet not more than 5 feet above the finished floor.

2. The final location of each FAA unit shall be field verified and located such that it is visible upon entry into the building.

3. Wiring between the FACP and the FAA shall be electrically supervised.

H. Monitor and Control Modules:

1. Modules shall be mounted within 3 feet of the device being monitored or controlled. In public accessible areas, locate in the immediate vicinity of its associated component above the ceiling.

2. Modules shall be labeled with their respective addresses.

3. The Contractor is responsible for coordinating installation with the trade Contractor's providing the other devices.

4. The wiring between modules and their intended interface device, such as sprinkler system device, is solely the responsibility of the Fire Alarm Contractor.

5. Verify the quantity and location of electromagnetic door holders and associated fire alarm interface (smoke detectors and control modules/relays) required with the Architectural Door schedules and drawings. Electromagnetic door holders shall be failsafe (e.g., close on a loss of power to the device) and be powered by the Building Fire Alarm System. They shall be furnished and installed by the fire alarm contractor. The fire alarm contractor shall provide power to the doors and shall connect these devices to the fire alarm system with the appropriate interface modules to release the doors on alarm.

6. Verify the quantity and location of HVAC units requiring unit shutdown and associated fire alarm interface (smoke detectors and control modules/relays) required with the HVAC schedules and drawings.

I. The Contractor shall be responsible for coordination efforts with other construction trades working within the scope of this project.

3.4 MINIMUM SYSTEM TESTS

A. The Contractor and Distributor shall complete preliminary system testing prior to the Final testing to ensure that all systems are working properly.

B. The Contractor and Distributor shall develop a written testing plan and matrix to cover all aspects of system testing. As a minimum, this matrix should include areas for checking all devices and outputs. Output checking shall include representative samples of input devices from circuits or multiple circuits that contribute to multiple alarm outputs.

C. Notify the AHJ, Fire Marshal, Owner's Representative, CM, and the Professional in writing a minimum of 3 weeks prior to the Final acceptance test.

D. The completed fire alarm system shall be fully tested in accordance with the provisions of NFPA 72 by the contractor in the presence of the Professional, AHJ, Fire Marshal and the Owner. The Contractor and Distributor shall perform said tests as required by the Fire Marshal inspection personnel for the final test of equipment and operation of the system. An authorized representative from each supplier of equipment shall be in attendance at the testing to make necessary adjustments. The required tests are as follows:

1. Verify the absence of unwanted voltages between circuit conductors and ground. The tests shall be accomplished at the preliminary test with results available at the final system test.

2. Verify that the control unit is in the normal condition as detailed in the manufacturer's operating and maintenance manual.

3. Test and record each initiating device and indicating appliance and circuit for proper operation and response at the control unit, including those associated with all specified

system interfaces. Testing of all system interfaces shall be conducted in cooperation with the respective system Contractors to verify that the systems function as specified in the Fire Alarm System Matrix of Operations.

4. Test and record the system for all specified functions in accordance with the contract drawings and specifications and the manufacturer's operating and maintenance manual.

5. Test both primary and secondary power. Verify, by test, the secondary power system is capable of operating the system for the time period and in the manner specified.

6. Determine that the system is operable under trouble conditions as specified.

7. Visually inspect all wiring.

8. Test the battery charger and batteries. Mark the date of the test clearly and legibly directly on the batteries themselves.

9. Verify that all software control and data files have been entered or programmed into the FACP. Hard copy records of the software shall be provided to the Owner.

10. Verify that as-built drawings are accurate.

11. Measure and record the current in circuits to ensure there is the specified spare capacity for the circuits.

12. Measure and record the voltage drop at the most remote appliance on each notification appliance circuit to assure that the voltage drop is not excessive.

13. Smoke detectors shall be tested for smoke entry (i.e., go/no-go tests (magnets) are not acceptable). Disconnect the verification feature for smoke detectors during tests to minimize the amount of smoke or test gas needed to activate the detector.

E. Audibility tests shall be performed to verify compliance with the requirements of the Americans with Disabilities Act Accessibility Guidelines (ADAAG). If the system does not meet the intended performance of the ADAAG, this contractor shall provide additional audible appliances and system expansion parts to accommodate them, as required to meet the required audibility levels.

F. The Distributor shall complete a 100 percent system inspection and test of all controls, devices, auxiliary operations and Supervising Station connections. The Distributor shall complete "Record of Completion" forms for the facility as described in NFPA 72, listing any deviations to the applicable codes and having a representative of the Fire Marshal sign the document. Copies of the completed Record of Completion shall be made available to any and all interested parties and be included in the Operation and Maintenance Manual provided to the Owner.

G. After Final testing is complete, provide a letter certifying that the installation is complete and fully operable to the Professional and the Owner. The letter shall include the names and titles of the witnesses to the preliminary tests and final acceptance tests.

H. Upon completion of a successful acceptance test, the contractor shall so certify in writing to the AHJ.

3.5 TRAINING

A. Provide training session, minimum of two (2) at 1 hour each, for all personnel designated by the Owner. All training sessions shall be conducted prior to, or in conjunction with the testing of the system by an authorized representative of the fire alarm equipment distributor.

B. Training sessions shall cover all aspects of system performance, including system architecture, SLC configurations, sensor and other initiating device types, locations, device addresses, fire alarm control panel function key operation, the system Matrix of Operation, and other functions as designated by the Owner.

C. This training shall include training manuals, demonstration equipment and any other items required to assist the Owner in the operation and maintenance of the systems.

D. Comprehensive system troubleshooting training shall be provided for a single individual designated by Owner. This session shall be separate and distinct from the above described session and be a minimum of 2 hours.

3.6 SPARE PARTS AND TOOLS

A. All spare parts furnished shall be directly interchangeable with the corresponding components of the installed system. Spare parts shall be suitably packaged and identified by nameplate, tagging, or stamping. Spare parts shall be delivered to the site in unopened cartons for storage in the building where directed.

B. Provide the following spare parts and accessories:

1. Spot type smoke detector, 1 of each type installed.
2. Heat detector, 1 of each type installed.
3. Interface Module or Addressable Relay, 1 of each type installed.
4. Manual Pull Stations, 1 of each type installed.
5. Audible/visible appliances, 1 of each type installed.

C. Furnish a list, in duplicate, of all other parts and accessories which the manufacturer of the system recommends to be stocked for maintenance.

3.7 KEYS

A. Keys and locks for all equipment shall be identical. Provide not less than 6 keys of each type required. Identify keys by an appropriate number stamped on each key or on a metal tag attached thereto. Provide a key numbering chart in each operation and maintenance manual.

B. Provide a minimum of two (2) reset keys for each manual pull station installed.

C. Provide a minimum of two (2) keys for each key operated test station installed.

3.8 WARRANTY

A. The Contractor shall warrant the fire alarm equipment and wiring to be free from inherent mechanical and electrical defects for a period of 2 years from the date of final installation and acceptance of the system by the Owner’s representatives.

B. Within these warranties, all parts and the associated labor required for response, trouble shooting, repair and/or replacement are to be included.

3.9 SYSTEM SOFTWARE AND FIRMWARE

A. The contractor shall maintain record copies of all versions of system software installed. Changes in software shall be automatically identifiable when different versions of the system program are compared. Differences between the documents shall be distinctly highlighted to make it distinct from the normal program text.

B. The contractor shall maintain a record of all system firmware provided as part of the equipment. In addition, records shall be maintained of all firmware modifications from initial installation until final acceptance.

C. Provide the Owner with a written copy of all passwords or other access codes for the FACP.

D. Lack of documentation of software or firmware changes shall result in complete system re-acceptance testing.

E. Provide 2 programming changes as directed by the A/E, Owner, or Owner's Representative. This does not include programming changes required to make the system operation meet the contract document requirements and approval of the AHJ.

F. Upon completion of this project, the contractor shall turn over to the Owner the most current, virus-free copy of the downloadable, as-built fire alarm software. This information shall be in the following formats: Printed reproducible hard copy and Virus-Free Electronic Media (USB drive or CD). In addition, any revisions created during the warranty period due to warranty related work shall also be issued to the Owner in the formats described at no additional cost.

END OF SECTION

BALTIMORE CITY PUBLIC SCHOOLS

CAPITAL PROJECTS

PSC NUMBER : 30.225.26SR

FIRE ALARM UPGRADE

AT

MARY ANN WINTERLING ELEMENTARY SCHOOL #150

220 NORTH BENTALOU STREET
BALTIMORE, MD 21223

ISSUED FOR BID

JULY 17, 2026

ADD ALTERNATES

THE CONTRACTOR SHALL INCLUDE IN THEIR BID PRICE THE FOLLOWING ITEMS AS ADD ALTERNATES:

- EMERGENCY RESPONDER RADIO DISTRIBUTED ANTENNA SYSTEM
- HAZARDOUS MATERIALS ABATEMENT

LIST OF APPLICABLE CODES:

- BALTIMORE CITY'S BUILDING, FIRE, AND RELATED CODES (CURRENT EDITION)
- INTERNATIONAL BUILDING CODE / 2021
- NATIONAL ELECTRICAL CODE / (AS REFERENCED BY BUILDING, FIRE AND RELATED CODES)
- INTERNATIONAL FIRE CODE / 2021
- INTERNATIONAL ENERGY CONSERVATION CODE / 2021
- INTERNATIONAL GREEN CONSTRUCTION CODE / 2021
- ADA STANDARDS FOR ACCESSIBLE DESIGN
- MARYLAND ACCESSIBILITY CODE COMAR 09.12.53
- NFPA 101 LIFE SAFETY CODE / 2018
- NFPA 13
- NFPA 72

HAZARDOUS MATERIALS NOTE:

REFER TO SPECIFICATIONS FOR HAZARDOUS MATERIALS WORK TO BE INCLUDED IN PROJECT SCOPE

VICINITY/ LOCATION MAP

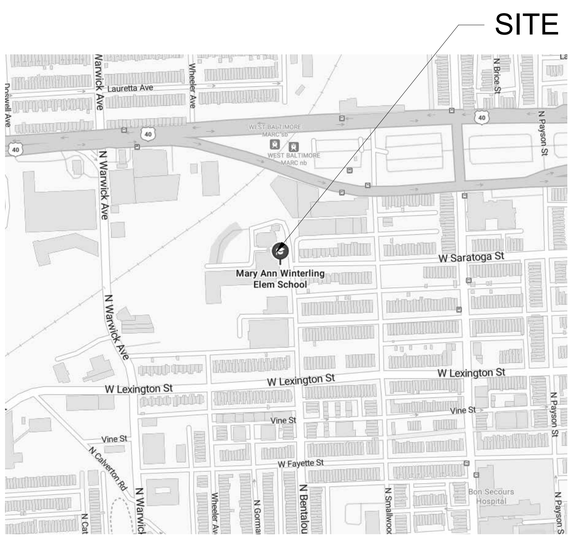


TABLE OF DRAWINGS

SHEET	DRAWING #	DESCRIPTION
1	CS	COVER SHEET
2	A000	LEGEND, ABBREVIATIONS & GENERAL NOTES
3	A100	FIRE RATING PLANS
4	A200	FIRESTOPPING DETAILS
5	A300	SIGNAGE PLAN - GROUND FLOOR
6	A400	SIGNAGE PLAN - FIRST FLOOR
7	A500	SIGNAGE PLAN - SECOND FLOOR
8	A600	SIGNAGE DETAILS
9	E000	ELECTRICAL LEGEND AND GENERAL NOTES
10	ED100	BASEMENT PLAN EAST WING - LIGHTING - DEMOLITION
11	ED101	FIRST FLOOR WEST WING - LIGHTING - DEMOLITION
12	ED102	FIRST FLOOR EAST WING - LIGHTING - DEMOLITION
13	ED103	SECOND FLOOR WEST WING - LIGHTING - DEMOLITION
14	ED104	SECOND FLOOR EAST WING - LIGHTING - DEMOLITION
15	E100	FIRST FLOOR PLAN WEST WING - LIGHTING - NEW WORK
16	E101	FIRST FLOOR PLAN WEST WING - LIGHTING - NEW WORK
17	E102	FIRST FLOOR PLAN EAST WING - LIGHTING - NEW WORK
18	E103	SECOND FLOOR PLAN WEST WING - LIGHTING - NEW WORK
19	E104	SECOND FLOOR PLAN EAST WING - LIGHTING - NEW WORK
20	E200	EXISTING AND NEW POWER RISER DIAGRAMS
21	E401	FIRST FLOOR PLAN WEST - DAS - NEW WORK
22	E402	FIRST FLOOR PLAN EAST WING - DAS - NEW WORK
23	E403	SECOND FLOOR PLAN WEST WING - DAS - NEW WORK
24	E404	SECOND FLOOR PLAN EAST WING - DAS - NEW WORK
25	E405	DAS RISER DIAGRAM AND NOTES
26	FA000	SYMBOLS, LEGENDS, AND ABBREVIATIONS - FIRE ALARM
27	FA101	GROUND FLOOR CONSTRUCTION PLAN - FIRE ALARM
28	FA102	FIRST FLOOR AREA A CONSTRUCTION PLAN - FIRE ALARM
29	FA103	FIRST FLOOR AREA B CONSTRUCTION PLAN - FIRE ALARM
30	FA104	SECOND FLOOR AREA A CONSTRUCTION PLAN - FIRE ALARM
31	FA105	SECOND FLOOR AREA B CONSTRUCTION PLAN - FIRE ALARM
32	FA500	DETAILS - FIRE ALARM

SHEET	DRAWING #	DESCRIPTION

Mayor and City Council of Baltimore City
Board of School Commissioners
Chief Operating Officer, Lynette Boswell Washington. Ph.D.
Executive Director - Facilities Planning, Design, and Construction, Cynthia Smith, P.E.
Director of Design (Operations), Fred D. Mason III, R.A.
Director of Construction (Operations), Maurice Gaskins, MBA CCM
Project Manager, Séun Joshua

7/17/2026 10:04:56 AM

Baltimore City Public Schools

WINDWARD ENGINEERS & CONSULTANTS
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Fax: (410) 235-0946
Email: jcengineers@juno.com

SEAL
STATE OF MARYLAND · MATTHEW BURTON · 34852 · PROFESSIONAL ENGINEER
7/17/2026

PROFESSIONAL CERTIFICATION
I CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.
LICENSE NUMBER: 34852
EXPIRATION DATE: 08/13/2027

REVISIONS		
NO.	REVISION	DATE
1		
2		
3		
4		
5		
6		

HKA PROJECT #:

DESIGNED BY:	SRT
DRAWN BY:	ALT
CHECK BY:	MJB
SCALE:	

FIRE ALARM UPGRADE AT MARY ANN WINTERLING ELEMENTARY SCHOOL #012
PSC NUMBER: 30.225.26SR

220 NORTH BENTALOU STREET
BALTIMORE, MD 21223

COVER SHEET

SCHOOL NUMBER #150

DRAWING NO.
CS

SCOPE OF WORK (BASE BID)

1. PERFORM VISUAL AND DESTRUCTIVE INVESTIGATIONS ON THE EXISTING BUILDING AS INDICATED.
2. INSTALLATION OF A FIRE ALARM SYSTEM.
3. PROVIDE NEW ROOM IDENTIFICATION SIGNAGE AT INTERIOR ROOM DOORS.

ABBREVIATION LEGEND

A.C.T.	ACOUSTICAL CEILING TILE	DWG.	DRAWING	IN.	INCHES	SIM.	SIMILAR
ADA	AMERICANS WITH DISABILITIES ACT	EA.	EACH	JAN. CL.	JANITOR'S CLOSET	S.D.	SOAP DISPENSER
		ELEC.	ELECTRIC(AL)	LF	LINEAR FEET	S.F.	SQUARE FOOT
ADD.	ADDENDUM	ELEV.	ELEVATION	MATL.	MATERIAL	S.Y.	SQUARE YARD
ADJ.	ADJUSTABLE	EMER.	EMERGENCY	MAX.	MAXIMUM	S.S.	STAINLESS STEEL
A.F.F.	ABOVE FINISHED FLOOR	EQ.	EQUAL	MECH.	MECHANICAL	SF	STOREFRONT
AL.	ALUMINUM	EQPMT.	EQUIPMENT	MTL./MET.	METAL	STD.	STANDARD
ALT.	ALTERNATIVE	EXIST.	EXISTING	MIN.	MINIMUM	STL.	STEEL
ANOD.	ANODIZED	E.T.R.	EXISTING TO REMAIN	MISC.	MISCELLANEOUS	STOR.	STORAGE
A.P.	ACCESS PANEL	F.E.	FIRE EXTINGUISHER	MTD.	MOUNTED	TEL.	TELEPHONE
APPROX.	APPROXIMATELY	F.F.	FINISHED FLOOR	N/A	NOT APPLICABLE	TV.	TELEVISION
BLKG.	BLOCKING	F.R.	FIRE RATED	N.I.C.	NOT IN CONTRACT	THK.	THICK(NESS)
C.G.	CORNER GUARD	F.D.	FLOOR DRAIN	O.C.	ON CENTER	THRES.	THRESHOLD
C.J.	CONTROL JOINT	FRP	FIBERGLASS REINFORCED POLYMER	O.D.	OUTSIDE DIAMETER/DIMENSION	T.P.D.	TOILET PAPER DISPENSER
C.L.	CENTER LINE			OH.	OVERHEAD	TYP.	TYPICAL
CLG.	CEILING	FURN.	FURNITURE	PTD.	PAINTED	U.N.O.	UNLESS NOTED OTHERWISE
CLR.	CLEAR(ANCE)	FUR.	FURRING	P.T.D.	PAPER TOWEL DISPENSER	VERT.	VERTICAL
C.M.U.	CONCRETE MASONRY UNIT	GALV.	GALVANIZED	P.LAM/P.L.	PLASTIC LAMINATE	VEST.	VESTIBULE
COL.	COLUMN	G.C.	GENERAL CONTRACTOR	QTY.	QUANTITY	VCT.	VINYL COMPOSTION TILE
CONC.	CONCRETE	GL.	GLASS	RAD.	RADIUS	V.I.F.	VERIFY IN FIELD
CONT.	CONTINUOUS	GLZ.	GLAZE	REF.	REFERNCE, REFRIGERATOR	W/O	WITHOUT
CORR.	CORRIDOR	G.B.	GRAB BAR	R.C.P.	REFLECTED CEILING PLAN	WD.	WOOD
DEMO.	DEMOLITION OR DEMOLISH	HC.	HANDICAP	REQD.	REQUIRED	YD.	YARD
DTL./DETS.	DETAIL(S)	HW.	HARDWARE	REV.	REVISION	GYP	GYPSUM
DIA.	DIAMETER	HT.	HEIGHT	RM.	ROOM	ADD'L	ADDITIONAL
DIM.	DIMENSION	H.M.	HOLLOW METAL	SCHED.	SCHEDULE		
DN.	DOWN	H.W.H.	HOT WATER HEATER	SHT.	SHEET		

DEMOLITION AND CONSTRUCTION NOTES:

1. ALL WORK SHALL BE DONE IN WORKMANLIKE MANNER AND IN CONFORMANCE WITH MANUFACTURER'S REQUIREMENTS.
2. ALL WORK SHALL BE DONE IN ACCORDANCE WITH ALL APPLICABLE LOCAL, STATE, AND FEDERAL AUTHORITIES, RULES AND REGULATIONS.
3. CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PROTECT ALL EXISTING TO REMAIN ITEMS.
4. CONTRACTOR SHALL PATCH ALL OPENINGS IN EXISTING WALLS, FLOORS AND CEILINGS CAUSED BY NEW CONSTRUCTION. PATCHED-IN NEW MATERIAL AND FINISHES SHALL MATCH EXISTING UNLESS OTHERWISE NOTED.
5. CONTRACTOR SHALL REPLACE ALL EXISTING MATERIALS AFFECTED BY NEW CONSTRUCTION. I.E. SUSPENDED ACOUSTICAL CEILING TILE; RUBBER OR WOOD BASE; FLOORING MATERIALS; ETC.
6. IF MORE THAN 10% OF THE EXISTING WALL HAS BEEN AFFECTED BY NEW CONSTRUCTION, THE CONTRACTOR MUST PREP AND PAINT THE ENTIRE WALL.
7. ANY UNFORESEEN OR UNCLEAR CONDITIONS SHALL BE REPORTED TO THE OWNER'S REPRESENTATIVE PRIOR TO PROCEEDING WITH WORK.
8. REMOVE ALL DEMOLITION DEBRIS PROPERLY FROM SITE. ALL DEBRIS SHALL BE CARTED OUT IN COVERED CONTAINERS. DO NOT ACCUMULATE OR PILE DEBRIS ON SITE.
9. CONTRACTOR SHALL COORDINATE ALL WORK WITH THE OWNER'S REPRESENTATIVE.

PROJECT GENERAL NOTES:

1. CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE FEDERAL, STATE AND LOCAL LAWS AND REGULATIONS PERTAINING TO WORK UNDER THIS CONTRACT.
2. CONTRACTOR SHALL PROVIDE ALL MATERIALS OF BEST QUALITY OF THE KIND SHOWN OR SPECIFIED AND SHALL PERFORM THE WORK IN A WORKMANLIKE MANNER ACCORDING TO NORMAL AND REASONABLE PRACTICES OF THE TRADE.
3. CONTRACTOR SHALL VISIT THE SITE TO ACQUAINT THEMSELVES WITH THE EXISTING CONDITIONS AND SHALL INCLUDE ANY AND ALL ITEMS OF WORK AND MATERIALS WHICH ARE EVIDENTLY NECESSARY FOR THE WORK SHOWN, EVEN THOUGH SUCH ITEMS MAY NOT BE EXPRESSLY SHOWN OR SPECIFIED. IN ADDITION, CONTRACTOR SHALL REFER TO FIRE ALARM AND ELECTRICAL DRAWINGS FOR WORK THAT MAY EXTEND BEYOND THE ARCHITECTURAL LIMIT OF WORK.
4. CONTRACTOR IS FULLY RESPONSIBLE FOR THE COORDINATION OF ALL BUILDING TRADES AND NECESSARY INSPECTIONS DURING AND AFTER CONSTRUCTION.
5. ALL DIMENSIONS AND FIELD CONDITIONS SHALL BE FIELD VERIFIED. ANY DISCREPANCIES IN DIMENSIONS, CONDITIONS, OR DOCUMENTS SHALL BE BROUGHT IMMEDIATELY TO THE OWNER'S ATTENTION.
6. AT COMPLETION OF CONSTRUCTION, CONTRACTOR TO CLEAN ALL AREAS OF DEBRIS, DIRT, DUST, ETC., AND PREPARE THE AREA FOR ITS INTENDED USE.
7. ALL PENETRATIONS AND NEW CONSTRUCTION MADE IN FIRE-RATED PARTITIONS, CEILINGS, AND FLOORS MUST BE PATCHED/REPAIRED WITH AN APPROVED FIRE-RATED ASSEMBLY.

GRAPHIC LEGEND

EXISTING WALL/COMPONENT TO REMAIN

ROOM NAME
ROOM #
ROOM TAG

LOCATION OF INTERIOR ROOM SIGN

Baltimore City Public Schools

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LICENSE NUMBER: 12901
EXPIRATION DATE: SEPTEMBER 24, 2027

REVISIONS		
NO.	REVISION	DATE
1		
2		
3		
4		
5		
6		

PROJECT #: 25.0004589.000

DESIGNED BY:	AA
DRAWN BY:	AA
CHECK BY:	KK
SCALE:	

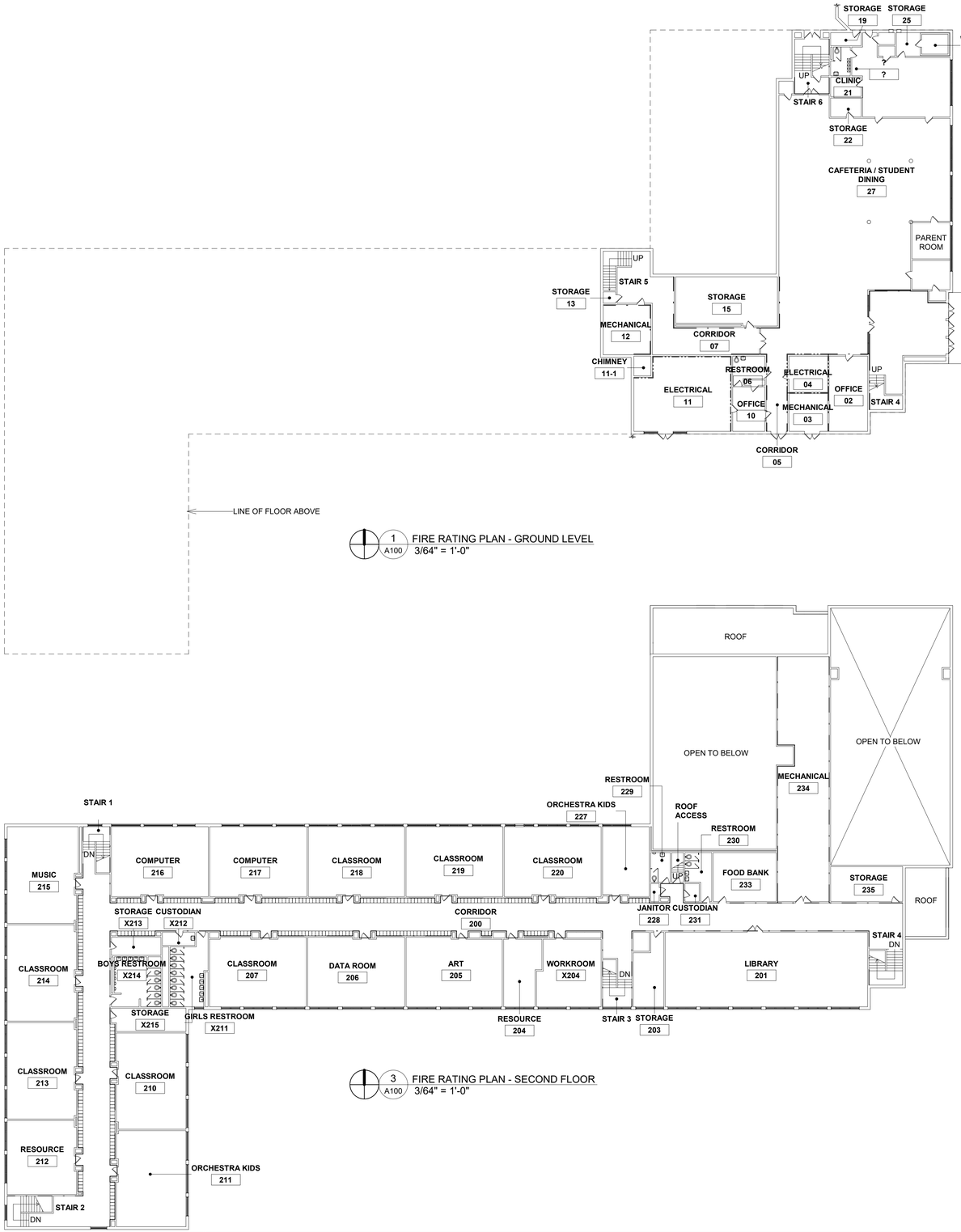
FIRE ALARM DESIGN AT MARY ANN WINTERLING ELEMENTARY SCHOOL #150
PSC NUMBER: 30.225.26SR

220 NORTH BENTALOU STREET
BALTIMORE, MD 21223

LEGEND, ABBREVIATIONS & GENERAL NOTES

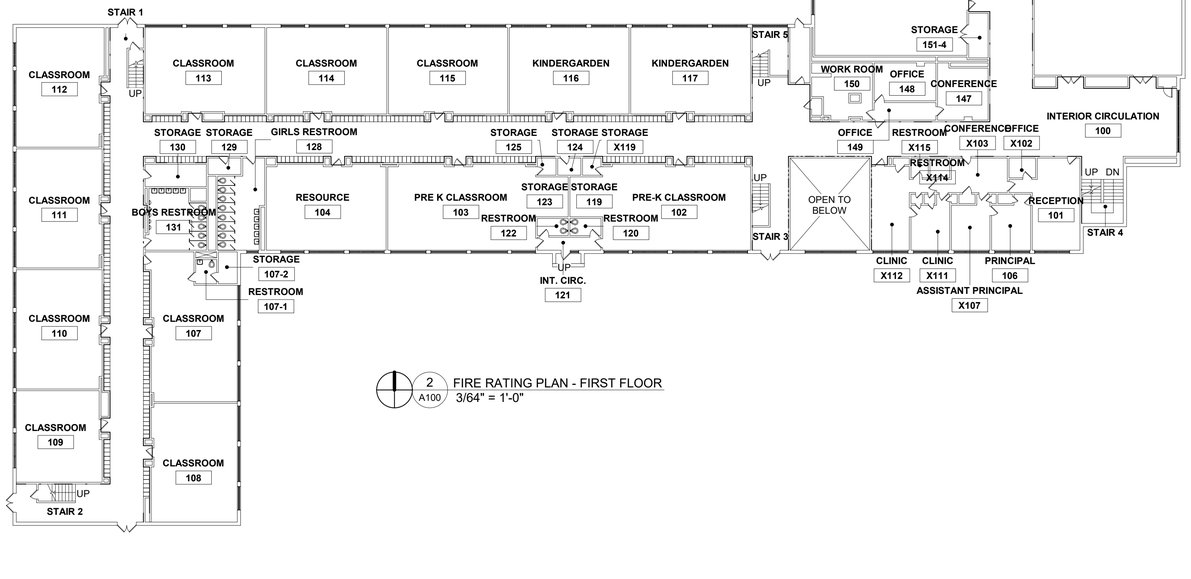
SCHOOL NUMBER #150

DRAWING NO.
A000



1 A100 FIRE RATING PLAN - GROUND LEVEL
3/64" = 1'-0"

3 A100 FIRE RATING PLAN - SECOND FLOOR
3/64" = 1'-0"



2 A100 FIRE RATING PLAN - FIRST FLOOR
3/64" = 1'-0"

FIRE RATING LEGEND

2 HR - FIRE BARRIER

1 HR - FIRE BARRIER

0 16' 32' 64'
0 3"
3/64" = 1'-0"

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FIRE ALARM DESIGN AT MARY ANN WINTERLING ELEMENTARY SCHOOL #150
PSC NUMBER: 30.225.26SR

220 NORTH BENTALOU STREET
BALTIMORE, MD 21223

FIRE RATING PLANS

SCHOOL NUMBER #150

DRAWING NO.
A100

Product iQ®

Design/System/Construction/Assembly Usage Disclaimer

- Authorities Having Jurisdiction should be consulted in all cases as to the particular requirements covering the installation and use of UL Certified products, equipment, system, devices, and materials.
- Authorities Having Jurisdiction should be consulted before construction.
- Fire resistance assemblies and products are developed by the design submitter and have been investigated by UL for compliance with applicable requirements. The published information cannot always address every construction nuance encountered in the field.
- When field issues arise, it is recommended the first contact for assistance be the technical service staff provided by the product manufacturer noted for the design. Users of fire resistance assemblies are advised to consult the general Guide Information for each product category and each group of assemblies. The Guide Information includes specifics concerning alternate materials and alternate methods of construction.
- Only products which bear UL's Mark are considered Certified.

XHEZ - Through-penetration Firestop Systems
XHEZ7 - Through-penetration Firestop Systems Certified for Canada

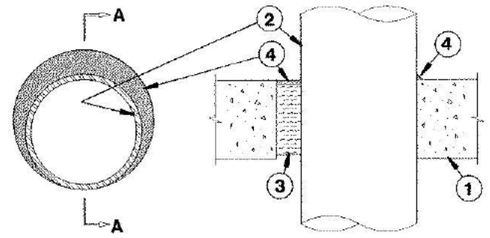
See General Information for Through-penetration Firestop Systems

See General Information for Through-penetration Firestop Systems Certified for Canada

System No. C-AJ-1149

June 23, 2016

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Rating — 2 Hr	F Rating — 2 Hr
T Rating — 0 Hr	FT Rating — 0 Hr
L Rating At Ambient — Less Than 1 CFM/sq ft	FH Rating — 2 Hr
L Rating At 400 F — 4 CFM/sq ft	FTH Rating — 0 Hr
W Rating — Class 1 (See Item 4)	L Rating At Ambient — Less Than 1 CFM/sq ft
	L Rating At 400 F — 4 CFM/sq ft



SECTION A-A

1. **Floor or Wall Assembly** — Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m³) concrete. Wall may also be constructed of any UL Classified **Concrete Blocks** *. Max diam of opening is 12 in. (305 mm).
See **Concrete Blocks** (CAZT) category in the Fire Resistance Directory for names of manufacturers.

2. **Through Penetrants** — One metallic pipe, conduit or tubing to be installed within the firestop system. Pipe, conduit or tubing to be rigidly supported on both sides of floor or wall assembly. The annular space shall be 0 in. (point contact) to max 1-1/4 in. (32 mm). The following types and sizes of metallic pipes, conduits or tubing may be used:

A. **Steel Pipe** — Nom 10 in. (254 mm) diam (or smaller) Schedule 10 (or heavier) steel pipe.

B. **Iron Pipe** — Nom 10 in. (254 mm) diam (or smaller) cast or ductile iron pipe.

C. **Conduit** — Nom 4 in. (102 mm) diam (or smaller) steel electrical metallic tubing or steel conduit.

D. **Copper Tubing** — Nom 4 in. (102 mm) diam (or smaller) Type L (or heavier) copper tubing.

E. **Copper Pipe** — Nom 4 in. (102 in.) diam (or smaller) Regular (or heavier) copper pipe.

3. **Packing Material** — Min 3 in. (76 mm) thickness of min 4 pcf (64 kg/m³) mineral wool batt insulation for nom 4 in. diam (and smaller) pipes, conduits or tubings and a min 4 in. (102 mm) thickness of min 4 pcf (64 kg/m³) mineral wool batt insulation for pipe greater than nom 4 in. diam, firmly packed into opening as a permanent form. Packing material to be recessed from top surface of floor or from both surfaces of wall to accommodate the required thickness of fill material.

4. **Fill, Void or Cavity Material* — Sealant** — Min 1/2 in. (13 mm) thickness of fill material applied within the annulus, flush with the top surface of floor or both surfaces of wall. At the point of contact location between pipe and concrete, a min 1/2 in. (13 mm) diam bead of fill material shall be applied at the concrete/pipe interface on the top surface of floor and on both surfaces of wall. **W Rating applies only when CFS-S SIL GG, CFS-S SIL SL (floors only), CP601S sealant or FS-ONE MAX Intumescent Sealant is used. For W Rating when FS-ONE MAX is used, packing material to be a min 4 in. (102 mm) thickness of min 4 pcf (64 kg/m³) mineral wool batt insulation.**
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP601S, CFS-S SIL GG, CFS-S SIL SL (floors only), CP606 or FS-ONE Sealant or FS-ONE MAX Intumescent Sealant.

*** Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.**

Last Updated on 2016-06-23

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LICENSE NUMBER: 12901
EXPIRATION DATE: SEPTEMBER 24, 2027

REVISIONS		
NO.	REVISION	DATE
1		
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3		
4		
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6		

PROJECT #: 25.0004589.000

DESIGNED BY: AA
DRAWN BY: AA
CHECK BY: KK
SCALE:

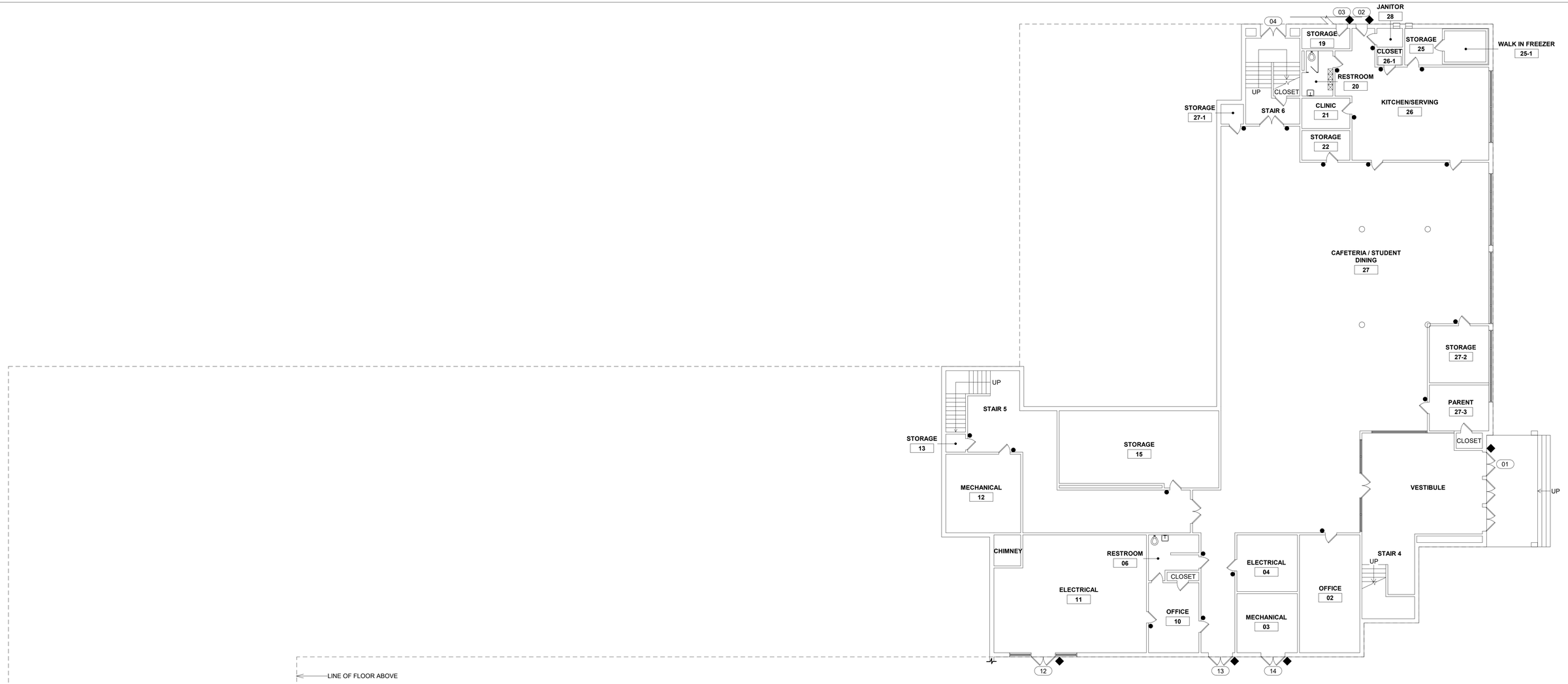
FIRE ALARM DESIGN AT MARY ANN WINTERLING ELEMENTARY SCHOOL #150
PSC NUMBER: 30.225.26SR

220 NORTH BENTALOU STREET
BALTIMORE, MD 21223

FIRESTOPPING DETAILS

SCHOOL NUMBER #150

DRAWING NO.
A200



1 / A300 SIGNAGE PLAN - GROUND LEVEL
NOT TO SCALE

EXTERIOR DOOR NUMBER SCHEDULE

GROUND LEVEL

EXTERIOR DOOR #
01
02
03
04
12
13
14

◆ INDICATES EXTERIOR FIRST RESPONDER SIGNAGE LOCATION

SEE 2/A600 FOR SIGNAGE DETAILS

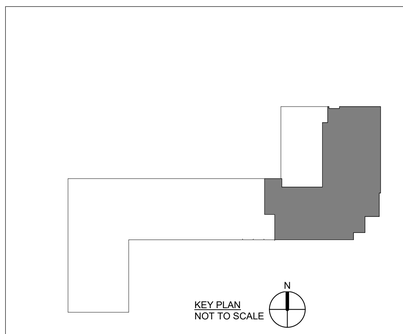
INTERIOR ROOM NAME AND NUMBER SCHEDULE

GROUND LEVEL

INTERIOR ROOM NAME	ROOM #
OFFICE	02
ELECTRICAL	04
RESTROOM	06
OFFICE	10
ELECTRICAL	11
MECHANICAL	12
STORAGE	13
STORAGE	15
LOCKERS	20
CLINIC	21
STORAGE	22
STORAGE	25
WALK-IN FREEZER	25-1
KITCHEN/SERVING	26
KITCHEN/SERVING	26
STORAGE	26-1
STORAGE	27-1
STORAGE	27-2
PARENT	27-3
JANITOR	28
STAIR 6	6

● INDICATES INTERIOR ROOM SIGNAGE LOCATION

SEE 1/A600 FOR SIGNAGE DETAILS



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LICENSE NUMBER: 12901
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REVISIONS		
NO.	REVISION	DATE
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6		

PROJECT #: 25.0004589.000

DESIGNED BY:	AA
DRAWN BY:	AA
CHECK BY:	KK
SCALE:	

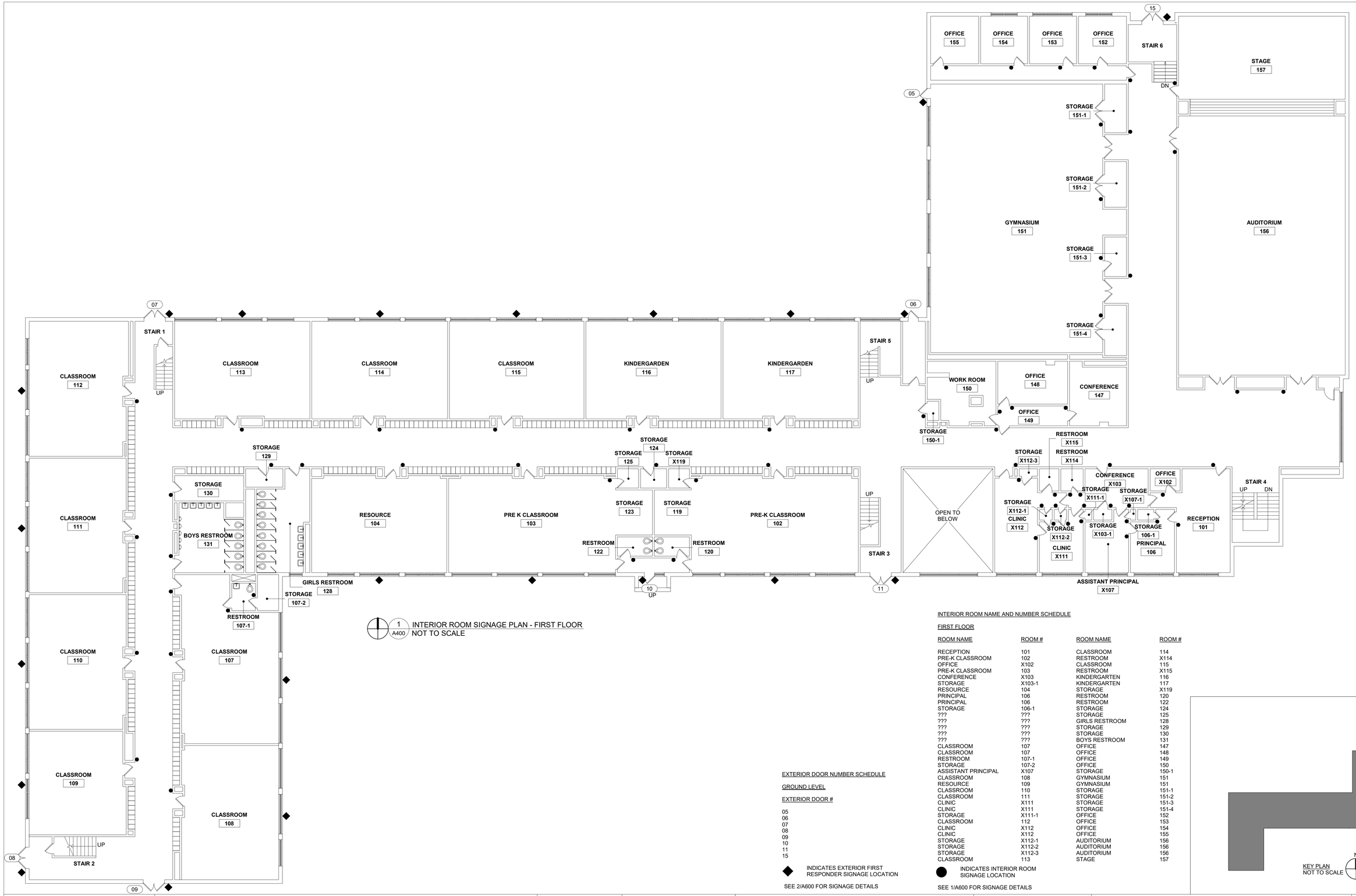
FIRE ALARM DESIGN AT MARY ANN WINTERLING ELEMENTARY SCHOOL #150
PSC NUMBER: 30.225.26SR

220 NORTH BENTALOU STREET
BALTIMORE, MD 21223

SIGNAGE PLAN - GROUND FLOOR

SCHOOL NUMBER #150

DRAWING NO.
A300



1 A400 INTERIOR ROOM SIGNAGE PLAN - FIRST FLOOR
NOT TO SCALE

EXTERIOR DOOR NUMBER SCHEDULE

GROUND LEVEL

EXTERIOR DOOR #

05
06
07
08
09
10
11
15

◆ INDICATES EXTERIOR FIRST RESPONDER SIGNAGE LOCATION

SEE 2/A600 FOR SIGNAGE DETAILS

INTERIOR ROOM NAME AND NUMBER SCHEDULE

FIRST FLOOR

ROOM NAME	ROOM #	ROOM NAME	ROOM #
RECEPTION	101	CLASSROOM	114
PRE-K CLASSROOM	102	RESTROOM	X114
OFFICE	X102	CLASSROOM	115
PRE-K CLASSROOM	103	RESTROOM	X115
CONFERENCE	X103	KINDERGARTEN	116
STORAGE	X103-1	KINDERGARTEN	117
RESOURCE	104	STORAGE	X119
PRINCIPAL	106	RESTROOM	120
PRINCIPAL	106	RESTROOM	122
STORAGE	106-1	STORAGE	124
???	???	STORAGE	125
???	???	GIRLS RESTROOM	128
???	???	STORAGE	129
???	???	STORAGE	130
???	???	BOYS RESTROOM	131
CLASSROOM	107	OFFICE	147
CLASSROOM	107	OFFICE	148
RESTROOM	107-1	OFFICE	149
STORAGE	107-2	OFFICE	150
ASSISTANT PRINCIPAL	X107	STORAGE	150-1
CLASSROOM	108	GYMNASIUM	151
RESOURCE	109	GYMNASIUM	151
CLASSROOM	110	STORAGE	151-1
CLASSROOM	111	STORAGE	151-2
CLINIC	X111	STORAGE	151-3
CLINIC	X111	STORAGE	151-4
STORAGE	X111-1	OFFICE	152
CLASSROOM	112	OFFICE	153
CLINIC	X112	OFFICE	154
CLINIC	X112	OFFICE	155
STORAGE	X112-1	AUDITORIUM	156
STORAGE	X112-2	AUDITORIUM	156
STORAGE	X112-3	AUDITORIUM	156
CLASSROOM	113	STAGE	157

● INDICATES INTERIOR ROOM SIGNAGE LOCATION

SEE 1/A600 FOR SIGNAGE DETAILS

Baltimore City Public Schools

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4				
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6				

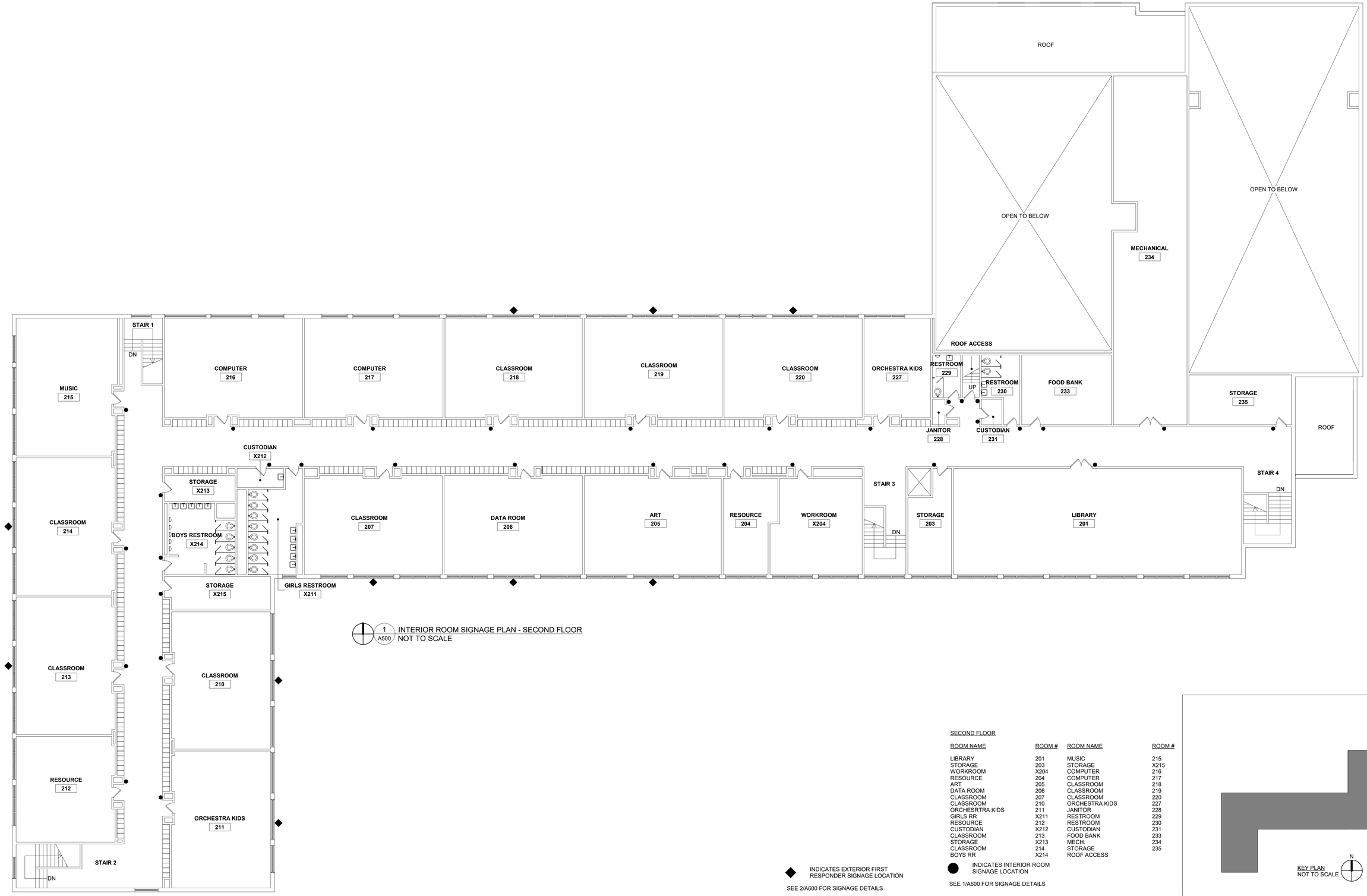
FIRE ALARM DESIGN AT MARY ANN WINTERLING ELEMENTARY SCHOOL #150
PSC NUMBER: 30.225.26SR

220 NORTH BENTALOU STREET
BALTIMORE, MD 21223

SIGNAGE PLAN - FIRST FLOOR

SCHOOL NUMBER #150

DRAWING NO. A400



1 / A500 INTERIOR ROOM SIGNAGE PLAN - SECOND FLOOR
NOT TO SCALE

SECOND FLOOR

ROOM NAME	ROOM #	ROOM NAME	ROOM #
LIBRARY	201	MUSIC	215
STORAGE	203	STORAGE	X215
WORKROOM	X204	COMPUTER	216
RESOURCE	204	COMPUTER	217
ART	205	CLASSROOM	218
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◆ INDICATES EXTERIOR FIRST RESPONDER SIGNAGE LOCATION
SEE 2/A600 FOR SIGNAGE DETAILS

● INDICATES INTERIOR ROOM SIGNAGE LOCATION
SEE 1/A600 FOR SIGNAGE DETAILS

KEY PLAN
NOT TO SCALE

Baltimore City Public Schools

WINDWARD

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SEAL

PROFESSIONAL CERTIFICATION
I CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, KENNETH KUPFER, AND THAT I AM A DULY LICENSED ARCHITECT UNDER THE LAWS OF THE STATE OF MARYLAND.
LICENSE NUMBER: 12901
EXPIRATION DATE: SEPTEMBER 24, 2027

REVISIONS		
NO.	REVISION	DATE
1		
2		
3		
4		
5		
6		

PROJECT #: 25.0004589.000

DESIGNED BY:	AA
DRAWN BY:	AA
CHECK BY:	KK
SCALE:	

FIRE ALARM DESIGN AT MARY ANN WINTERLING
ELEMENTARY SCHOOL #150
PSC NUMBER: 30.225.26SR

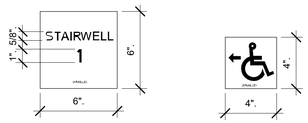
220 NORTH BENTALOU STREET
BALTIMORE, MD 21223

SIGNAGE PLAN - SECOND FLOOR

SCHOOL NUMBER #150

DRAWING NO.
A500

ROOM SIGNAGE



1. CHARACTERS ON SIGNS SHALL BE RAISED 1/32" MINIMUM AND SHALL BE SANS SERIF UPPERCASE CHARACTERS ACCOMPANIES BY CONTRACTED (GRADE 2) BRAILLE.
2. RAISED CHARACTERS SHALL BE A MINIMUM OF 5/8" AND A MAXIMUM OF 2" HIGH.
3. PICTORIAL SYMBOL SIGNS (PICTOGRAMS). PICTORIAL SYMBOL SIGNS (PICTOGRAMS) SHALL BE ACCOMPANIED BY THE VERBAL DESCRIPTION PLACED DIRECTLY BELOW THE PICTOGRAM. THE OUTSIDE DIMENSION OF THE PICTOGRAM FIELD SHALL BE A MINIMUM OF 6 INCHES IN HEIGHT.
4. CHARACTERS AND BRAILLE SHALL BE IN A HORIZONTAL FORMAT. BRAILLE SHALL BE PLACED A MINIMUM OF 3/8 INCH AND A MAXIMUM OF 1/2 INCH DIRECTLY BELOW THE TACTILE CHARACTERS: FLUSH LEFT OR CENTERED. WHEN TACTILE TEXT IS MULTILINED, ALL BRAILLE SHALL BE PLACED TOGETHER BELOW ALL LINES OF TACTILE TEXT.

NOTE: THIS DETAIL IS FOR GENERAL REFERENCE ONLY.
COORDINATE FINAL SIGNAGE WITH SIGNAGE VENDOR.

RESTROOM SIGNAGE

SIGNAGE NOTES:

ALL SIGNAGE TO COMPLY WITH ADA REQUIREMENTS FINAL GRAPHICS TO BE APPROVED BY BCPS PRIOR TO ORDERING.

ACRYLIC BASE WITH RAISED LETTERING AND BRAILLE WHERE REQUIRED.
SIZE: MIN. 1/16" THICK X LENGTH AND HEIGHT AS INDICATED.

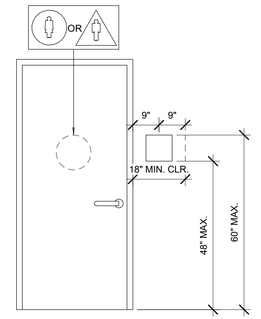
EDGE PROFILE: SQUARE
TEXT AND LETTER STYLE: AS INDICATED
GRAPHIC TO CONFORM TO ADA REQUIREMENTS.

PROVIDE CONCEALED FASTENERS OR ADHESIVES AS RECOMMENDED BY MANUFACTURERS AND AS REQUIRES FOR PERMANENT AND SECURE MOUNTING TO SUBSTRATES INDICATED. SUITABLE FOR CONDITIONS OF APPLICATION AND USE. ALL SIGNAGE TO BE COORDINATED WITH THE CLIENT SIGNAGE VENDOR.

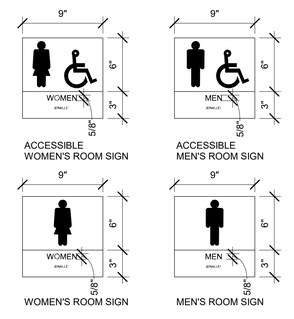


WOMEN'S RESTROOMS SHALL BE IDENTIFIED BY A CIRCLE 1/4" THICK. 12" DIAMETER. THE SYMBOL SHALL BE CENTERED ON THE DOOR AT A HEIGHT OF 60" AND THEIR COLOR AND CONTRAST SHALL BE DISTINCTLY DIFFERENT FROM THE COLOR AND CONTRAST OF THE DOOR. (CBC 111585).

MEN'S RESTROOMS SHALL E 1/4" TICK TRIANGLE, 14" X 14" X 14".



MOUNTING HEIGHT SHALL BE 48" INCHES MIN. ABOVE THE FINISH FLOOR TO THE BOTTOM LINE OF THE SIGN OR 60" INCHES MAX. ABOVE THE FINISHED FLOOR TO THE BOTTOM OF THE TOP LINE. MOUNTING LOCATION SHALL BE DETERMINED SO THAT A PERSON MAY APPROACH WITHIN 3 INCHES OF SIGNAGE WITHOUT ENCOUNTERING PROTRUDING OBJECTS OR STANDING WITHIN THE SWING OF A DOOR.



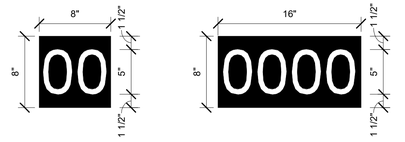
ACCESSIBLE WOMEN'S ROOM SIGN
ACCESSIBLE MEN'S ROOM SIGN
WOMEN'S ROOM SIGN
MEN'S ROOM SIGN

NOTE: THIS DETAIL IS FOR GENERAL REFERENCE ONLY.
COORDINATE FINAL SIGNAGE WITH SIGNAGE VENDOR.

1 A600 INTERIOR SIGNAGE DETAILS
N.T.S.

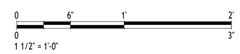
INTERIOR ROOM SIGNAGE NOTES:

- PROVIDE EDUCATIONAL SIGNAGE (INTERIOR) EITHER WALL OR POST MOUNTED TO ENHANCE AND SUPPORT THE SCHOOL'S ENVIRONMENTAL LITERACY AND CURRICULUM. SIGNAGE SHOULD INCLUDE THE EDUCATION ASPECT OR FACILITY FEATURES AS A FACILITY ENHANCEMENT.
- MOUNT SIGNAGE AT PROPER ADA HEIGHT ON LATCH SIDE OF DOOR.
- WHERE NO WALL SPACE IS PROVIDED AT THE LATCH SIDE OF THE DOOR, PLACE ON NEAREST ADJACENT WALL SO THAT PERSON CAN APPROACH TO WITHIN 3 INCHES OF SIGNAGE WITHOUT PROTRUSIONS.
- REGULATORY REQUIREMENTS: COMPLY WITH APPLICABLE PROVISIONS IN ADA-ABA ACCESSIBILITY GUIDELINES.
- SIGNS ARE TO BE FLAT PLASTIC (6" X 6" BASE SIZE) PLAQUE WITH RAISED NAMES/NUMBERS AND BRAILLE TRANSLATIONS.
- PROVIDE ADA, ACRYLIC PANEL SIGN FOR EACH INTERIOR DOOR. FIXED ROOM NUMBER SHOULD BE INCLUDED ON EACH SIGN WITH FIXED ROOM NAME FROM THE APPROVED ROOM NAME LIST. ROOM NUMBERS ON DRAWINGS HALL MATCH THOSE ULTIMATELY USED FOR THE BUILDING.
- MEET LOCAL FIRE MARSHAL REQUIREMENTS FOR SIGNAGE.
- EMERGENCY EGRESS SIGN PACKAGE MUST INCLUDE EACH ROOM OR AREA EXITING TO OUTSIDE, WITH A SITE PLAN DESCRIBING EMERGENCY EVACUATION. SIGNS MUST BE LAMINATED.
- SEE APPENDIX FOR LIST OF APPROPRIATE ROOM NAMES FOR SIGNAGE.
- ALL BUILDINGS IN THE DISTRICT SHOULD BE CONSIDERED FOR DUAL LANGUAGE SIGNAGE NEEDS.
- MANUFACTURERS: GEMINI, INC. , POBLOCKI & SONS, SIGNS & WONDERS, INC., THE SUPERSINE COMPANY.
- ROOM SIGNS:
  - TYPE: UNFRAMED,
  - MATERIAL: CAST ACRYLIC SHEET
  - COPY: RAISED LETTERING
- ACCESSORIES:
  - ADHESIVE: DOUBLE-SIDED TAPE, PERMANENT ADHESIVE
  - BACKING PLATE: MATCHING ACRYLIC BLANK PLATE IF SIGN REQUIRES GLASS MOUNTING.
- PLAQUE MOUNTED: CONCEALED.
  - INTERIOR SIGNAGE TO BE SEALED TO WALL AROUND PERIMETER WITH CLEAR PICK-RESISTANT SILICONE SEALANT.
- DUAL LANGUAGE SIGNAGE:
  - IF A SCHOOL IS DETERMINED TO REQUIRE DUAL LANGUAGE SIGNAGE THE FOLLOWING SPACES SHALL BE PROVIDE WITH DUAL LANGUAGE SIGNAGE AT A MINIMUM:
    - HEALTH SUITE, GYMNASIUM, MAIN OFFICE RECEPTION, CAFETERIA, STAIRS, MEDIA CENTER, GROUP RESTROOMS THROUGHOUT THE BUILDING, ALL SPACES WITHIN THE COMMUNITY CENTER AREA.
- ADDITIONAL SIGN LOCATIONS MAY BE CONSIDERED IF NEEDED.
- SECOND LANGUAGE WILL BE DETERMINED BY CITY SCHOOLS.
- PROVIDE PERMANENT SIGNAGE AT THE FOLLOWING LOCATIONS:
  - MAIN SHUT OFF VALVE FOR THE FIRE SUPPRESSION SYSTEM.
  - MAIN ELECTRICAL ROOM.
- FINAL ROOM NAMES AND NUMBERS TO BE REVIEWED AND APPROVED BY BCPSS PM AND PRINCIPAL.



EXTERIOR DOOR SIGN
EXTERIOR CLASSROOM SIGN

- FIRST RESPONDER EXTERIOR SIGNS:
  - PROVIDE EACH EXTERIOR DOOR AND EACH CLASSROOM. MOUNTED ON THE BUILDING FACADES.
  - EXTERIOR-GRADE SOLID SHEET SIGN RETURNS AND BACK. ACRYLIC SHEET.
  - 8"H X 8"W EXTERIOR DOOR SIGN SIZE. BLACK BACKGROUND WITH 5" WHITE NUMBERS.
  - 8"H X 16"W EXTERIOR CLASSROOM SIGN SIZE. BLACK BACKGROUND WITH 5" WHITE NUMBERS.
  - SURFACE-APPLIED, RAISED GRAPHICS: APPLIED POLYMER CHARACTERS. NO BRAILLE.
  - SIGN PANEL PERIMETER: FINISH EDGES SMOOTH.
  - EDGE CONDITION: BEVELED.
  - MOUNTING:
    - ON MASONRY: CONCEALED STAINLESS STEEL SCREWS AND CLEAT. CAULK SIGN PERIMETER WITH CLEAR SEALANT.
    - ON FRP DOORS: USE HIGH-BOND EXTERIOR DOUBLE-SIDED TAPE. CAULK SIGN PERIMETER WITH CLEAR SEALANT.



2 A600 FIRST RESPONDER EXTERIOR SIGNAGE DETAILS
1 1/2" = 1'-0"

Baltimore City Public Schools

WINDWARD

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SEAL

PROFESSIONAL CERTIFICATION
I CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, KENNETH KUPFER, AND THAT I AM A DULY LICENSED ARCHITECT UNDER THE LAWS OF THE STATE OF MARYLAND.
LICENSE NUMBER: 12901
EXPIRATION DATE: SEPTEMBER 24, 2027

REVISIONS		
NO.	REVISION	DATE
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PROJECT #: 25.0004589.000

DESIGNED BY:	AA
DRAWN BY:	AA
CHECK BY:	KK
SCALE:	

FIRE ALARM DESIGN AT MARY ANN WINTERLING ELEMENTARY SCHOOL #150
PSC NUMBER: 30.225.26SR

220 NORTH BENTALOU STREET
BALTIMORE, MD 21223

SIGNAGE DETAILS

SCHOOL NUMBER #150

DRAWING NO.
A600

ELECTRICAL LEGEND

X-1	HOMERUN TO DESIGNATED PANEL IN MINIMUM 3/4" CONDUIT WITH AN INSULATED GROUND WIRE. U.O.N. "X-1" INDICATES PANELBOARD AND CIRCUIT NO. RESPECTIVELY.
	CIRCUIT (IN MINIMUM 3/4"C. UON) CONCEALED IN WALL OR ABOVE CEILING WITH MINIMUM INSULATED GROUND WIRE (MINIMUM #12 AWG, UON) FOR EACH CONDUIT RUN. #12 AWG WIRE, NO. OF HATCHES INDICATE NO. OF PHASE & NEUTRAL WIRES.
2/40	240 VOLT DISCONNECT SWITCH IN NEMA TYPE-1 OR NEMA 3R ENCLOSURE, NONFUSED, LOCKABLE HANDLE, AMP/POLE AS NOTED ON DRAWING.
	PANELBOARD 120/208V. WALL MOUNTED. TOP CB IN PANEL SHALL BE MAXIMUM 72" AFF.
	20A,120-277V,1P TOGGLE SWITCH, MH = 48"AFF
	20A,1P,3WAY 120-277V TOGGLE SWITCH, MH = 48"AFF
	20A,120-277V,1P KEY OPERATED SWITCH, MH = 48"AFF
	FRACTIONAL HORSE POWER MANUAL STARTER SWITCH MELTING ALLOY TYPE THERMAL OVERLOAD, 2 POLES, 125V WITH RED PILOT LIGHT IN NEMA 3R ENCLOSURE. WALL MOUNTED AT 48"AFF.
	COMBINATION WALL MOUNTED MOTION SENSOR SWITCH WITH MANUAL SWITCHING CAPABILITIES. 20A,120-277V,1P MOUNTING HEIGHT = 48"AFF
	DRAWING NOTE / EQUIPMENT TAG NOTE
A	WALL MOUNTED LIGHTING FIXTURE. LETTER DESIGNATIONS CORRESPOND WITH LIGHTING FIXTURE SCHEDULE.
	UNIVERSAL MOUNTED EMERGENCY EXIT SIGN,AND EMERGENCY LIGHTING UNIT: CEILING MOUNTED, WALL MOUNTED.
	ELECTRICAL MOTOR
A	LED FIXTURE. LETTER DESIGNATIONS CORRESPOND TO LIGHTING FIXTURE SCHEDULE.
B EM	4' LED FIXTURE UPPER CASE LETTER DESIGNATIONS CORRESPOND TO LIGHTING FIXTURE SCHEDULE.
A EM	2X4 RECESSED LIGHT FIXTURE , EMERGENCY
A EM	2X2 RECESSED LIGHT FIXTURE
B	4' LED FIXTURE UPPER CASE LETTER DESIGNATIONS CORRESPOND TO LIGHTING FIXTURE SCHEDULE.
A	2X4 RECESSED LIGHT FIXTURE
A	2X2 RECESSED LIGHT FIXTURE
	CEILING MOUNTED OMNI ANTENNA.
	DIRECTIONAL ANTENNA WALL OR CEILING MOUNTED AS REQUIRED.

ELECTRICAL ABBREVIATIONS

(ETR)	EXISTING TO REMAIN
(N)	NEW
(RX)	REMOVE
(TBR)	EXISTING TO BE RELOCATED
(E)	RELOCATION POINT
A, AMP	AMPERE
AC	ALTERNATING CURRENT
AF	AMP FRAME
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AT	AMP TRIP
AWG	AMERICAN WIRE GAUGE
BKR	BREAKER
BLDG	BUILDING
C, COND	CONDUIT
CB	CIRCUIT BREAKER
CKT	CIRCUIT
CLG	CEILING
DIA	DIAMETER
DISC	DISCONNECT
DN	DOWN
DWG	DRAWING
EC	EMPTY CONDUIT
ECB	ENCLOSED CIRCUIT BREAKER
EG	EQUIPMENT GROUND
ELEC	ELECTRICAL
EMERG	EMERGENCY
EQUIP	EQUIPMENT
ESB	ENERGY SAVING BALLAST
ETR	EXISTING TO REMAIN
EX	EXISTING
EWC	ELECTRIC WATER COOLER
F/A, FA	FIRE ALARM
FAAP	FIRE ALARM ANNUCIATOR PANEL
FACP	FIRE ALARM CONTROL PANEL
FLA	FULL LOAD AMPS
F/N	FULL NEUTRAL
FSS	FUSED SAFETY SWITCH
G, GND	GROUND
GFI	GROUND FAULT INTERRUPTER
HP	HORSEPOWER
HPF	HIGH POWER FACTOR
IG	ISOLATOR GROUND
INCAND	INCANDESCENT
JB	JUNCTION BOX
KAC	THOUSANDS OF AMPS INTERRUPTING CAPACITY
KCMIL, MCM	THOUSANDS CIRCULAR MILS
KV	KILOVOLT
KVA	KILOVOLT AMPS
KW	KILOWATT
LTG	LIGHTING
MAX	MAXIMUM
MCB	MAIN CIRCUIT BREAKER
MCC	MOTOR CONTROL CENTER
MECH	MECHANICAL
MIN	MINIMUM
MLO	MAIN LUGS ONLY
MOCP	MAXIMUM OVERCURRENT PROTECTION
N/A	NOT APPLICABLE
N	NEUTRAL
NC	NORMALLY CLOSED
NEC	NATIONAL ELECTRICAL CODE
NEMA	NATIONAL ELECTRICAL MANUFACTURER'S ASSOCIATION
NIC	NOT IN CONTRACT
NL	NIGHT LIGHT
NF	NON-FUSABLE
NFSS	NON-FUSED SAFETY SWITCH
NO	NORMALLY OPEN
NTS	NOT TO SCALE
#	PHASE
P	POLE
PNL	PANELBOARD
PRI	PRIMARY
QTY	QUANTITY
REC, RECEPT	RECEPTACLE
REQ'D	REQUIRED
RM	ROOM
SCHED	SCHEDULE
SD	SMOKE DETECTOR
SP	SINGLE POLE
SW	SWITCH
T, XFMR, T/F	TRANSFORMER
TEL	TELEPHONE
TYP	TYPICAL
UNF	UNFUSED
UON	UNLESS OTHERWISE NOTED
V	VOLT, VOLTAGE
VA	VOLT AMP
W	WATT, WIRE
WP	WEATHERPROOF
W/	WITH
#	NUMBER

GENERAL ELECTRICAL NOTES

1.) ALL ELECTRICAL MATERIAL AND INSTALLATION SHALL BE IN CONFORMITY WITH THE APPLICABLE CURRENT STANDARDS, RULES, REGULATIONS, AND SPECIFICATIONS OF THE FOLLOWING AUTHORITIES:
- –MARYLAND BUILDING PERFORMANCE STANDARDS/MARCH 2023
- –INTERNATIONAL BUILDING CODE/2021
- –NATIONAL ELECTRICAL CODE /2020
- –INTERNATIONAL FUEL CODE /2021
- –INTERNATIONAL MECHANICAL CODE /2021
- –INTERNATIONAL PLUMBING CODE /2021
- –INTERNATIONAL FIRE CODE /2021
- –INTERNATIONAL ENERGY CONSERVATION CODE /2021
- –INTERNATIONAL GREEN CODE /2021

2.) FURNISH ALL LABOR AND MATERIALS AS REQUIRED TO MEET THE DESIGN INTENT OF THESE DOCUMENTS. COORDINATE WITH FIELD CONDITIONS AT THE JOB SITE AND ALL OTHER TRADES TO DETERMINE ALL ELECTRICAL CONNECTIONS THAT MAY BE REQUIRED. ALL ELECTRICAL MATERIAL AND WORK SHALL HAVE A MINIMUM ONE YEAR GUARANTEE PERIOD TO BEGIN AT THE DATE OF FINAL ACCEPTANCE BY THE OWNER.

3.) SECURE ALL REQUIRED PERMITS AND INSPECTIONS FROM THE AUTHORITY HAVING JURISDICTION.

4.) ALL WIRING INSTALLED WITHIN A RETURN AIR PLENUM SHALL BE RATED FOR SUCH AN APPLICATION.

5.) INSTALL CONDUIT AND JUNCTION BOXES CONCEALED IN FINISHED SPACES.

6.) ALL EQUIPMENT SHALL BE UL LISTED AND LABELED.

7.) ALL CONDUCTORS SHALL BE IDENTIFIED. ALL CONDUCTORS SHALL BE COPPER WITH 600V INSULATION. CONDUCTORS #10 AWG AND SMALLER SHALL BE SOUND COPPER WITH TYPE THHN/THWN, 90ºC INSULATION; ALL CONDUCTORS 8 AWG AND LARGER SHALL BE STRANDED COPPER WITH TYPE THHN/THWN INSULATION RATED AT 90ºC. AMPACITY OF CONDUCTORS SHALL BE AT 75ºC RATING OR RATING OF TERMINATION, WHICHEVER IS LESS.

8.) ELECTRICAL CONTRACTOR MAY UTILIZE TYPE MC CABLE IN LIEU OF CONDUIT AND WIRE IN INTERIOR, DRY, FURRED LOCATIONS WHEN PERMITTED BY THE LOCAL AUTHORITY HAVING JURISDICTION.

9.) PROVIDE "HACR" CIRCUIT BREAKERS FOR HVAC EQUIPMENT.

10.) CIRCUIT NUMBERS ARE FOR GROUPING PURPOSES ONLY. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING FOR CORRECT PHASING WITHIN THE PANELS THEMSELVES. DO NOT INSTALL MORE THAN (3)SINGLE PHASE CIRCUITS WITHIN ANY ONE CONDUIT. AT COMPLETION OF WORK, ALL PANELS SHALL BE LOAD BALANCED UNDER NORMAL OPERATING CONDITIONS; PROVIDE TYPEWRITTEN PANEL DIRECTORY FOR ALL PANELBOARDS. DIRECTORY SHALL INCLUDE TYPE OF LOAD SERVED AND ROOM NUMBERS OF CIRCUIT LOCATION.

11.) THE QUANTITY OF WIRES FOR BRANCH CIRCUITS SHALL BE THE RESPONSIBILITY OF THE CONTRACTORS AS REQUIRED TO INSURE THE PROPER OPERATION OF THE SYSTEM.

12.) WIRING SHALL BE #12 AWG MINIMUM UNLESS OTHERWISE INDICATED; CONDUIT SHALL BE EMT WITH COMPRESSION FITTINGS, 3/4" MINIMUM SIZE UNLESS OTHERWISE INDICATED.

13.) COORDINATE ALL LIGHT FIXTURE TYPES WITH THE ARCHITECTURAL DRAWINGS. SHOULD THERE BE A DISCREPANCY BETWEEN THE TWO, CONTACT THE ARCHITECT PRIOR TO THE PURCHASE OF ANY FIXTURES. VERIFY COMPATIBILITY WITH FINISHES. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ARCHITECTS ATTENTION IMMEDIATELY.

14.) THE ELECTRICAL PLANS ARE DIAGRAMMATIC IN NATURE; DIMENSIONS SHOWN ARE AT A MINIMUM. ALL WRITTEN DIMENSIONS ON THESE PLANS SHALL TAKE PRIORITY OVER SCALED DIMENSIONS. CONTACT ARCHITECT SHOULD THERE BE ANY DISCREPANCIES BETWEEN WHAT IS SHOWN ON THE PLANS AND WHAT EXISTS IN THE FIELD PRIOR TO COMMENCEMENT OF WORK. SHOULD EXACT DIMENSIONS BE REQUIRED,REFER TO THE ARCHITECTURAL PLANS.

15.) MOUNTING HEIGHTS OF DEVICES. UNLESS NOTED OTHERWISE, ARE TO THE CENTERLINE OF THE EQUIPMENT. THE EXCEPTION TO THIS IS LIGHTING FIXTURES; MOUNTING HEIGHTS INDICATED ARE TO THE BOTTOM OF THE FIXTURE. COORDINATE ALL MOUNTING HEIGHTS OF THE VARIOUS DEVICES IN ORDER TO PROVIDE FOR A FINAL INSTALLATION THAT IS CONSISTENT THROUGHOUT THE SPACE.

16.) ANY CUTTING AND PATCHING SHALL BE PERFORMED IN A MANNER THAT IS ACCEPTABLE TO THE ARCHITECT AND SHALL MATCH THE SURROUNDING SURFACES.

17.) VERIFY DOOR SWINGS PRIOR TO LIGHT SWITCH INSTALLATION. GENERALLY, INSTALL SWITCHES ON LATCH SIDE OF DOOR.

18.) GANG MULTIPLE SWITCHES UNDER ONE COVER PLATE.

19.) COORDINATE LOCATION OF ALL WALLSWITCHES AND RECEPTACLES WITH DOORSWINGS AND OPENINGS PRIOR TO ROUGH-IN.

20.) OUTLET BOXES SHALL BE INSTALLED SUCH THAT THEY ARE NOT BACK-TO-BACK; PROVIDE AN 8" MINIMUM OFFSET. ALL ELECTRICAL OUTLETS SHALL HAVE A TAG BEHIND THE COVERPLATE INDICATING THE PANELBOARD AND CIRCUIT NUMBER FROM WHICH THEY ARE FED.

21.) ELECTRICAL CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR ALL EQUIPMENT. IF APPROVED SUBMITTALS ARE FOR EQUIPMENT THAT DIFFERS FROM WHAT WAS SPECIFIED BY THE DESIGN ENGINEER, THE CONTRACTOR SHALL BE ENTIRELY RESPONSIBLE FOR INSURING THAT THIS EQUIPMENT IS EQUIVALENT TO THE ORIGINAL SPECIFIED EQUIPMENT AND ANY ADDITIONAL WORK OR COST AS A RESULT OF USING DIFFERING EQUIPMENT SHALL BE ABSORBED BY THE CONTRACTOR.

22.) THE ELECTRICAL SYSTEM SHALL BE FULLY GROUNDED; PROVIDE GROUND WIRE IN EACH FEEDER AND EACH BRANCH CIRCUIT WHETHER INDICATED OR NOT.

23.) WIRING FOR 20A BRANCH CIRCUITS SHALL BE SIZED AS INDICATED BELOW.

24.) WORK AREA SHALL BE LEFT CLEAN AT THE END OF EACH BUSINESS DAY.

25.) ALL PENETRATIONS OF FIRE RATED WALL ASSEMBLES SHALL BE PROTECTED WITH AN APPROVED FIRE STOP SYSTEM OR IN ACCORDANCE WITH IBC SECTION 712.3.1 WHERE APPLICABLE.

26.) ALL PANELBOARD BUSSES AND GROUND BARS SHALL BE COPPER. BUS BAR SIZE SHALL BE BASED ON CURRENT DENSITY OF 1000A PER SQUARE INCH OF CROSS SECTIONAL AREA. PANELBOARDS SHALL BE FULLY RATED. CIRCUIT BREAKER SHALL BE BOLT ON TYPE. SUB-FEED CIRCUIT BREAKERS ARE NOT ACCEPTABLE.

27.) ALL DISCONNECT SWITCHES CURRENT CARRYING COMPONENTS SHALL BE COPPER.

28.) VERIFY THAT ALL LIGHTING FIXTURES, RECEPTACLES, DEVICES, WIRING, EQUIPMENT AND OTHER INSTALLED COMPLY WITH ALL NEC AND LOCAL CODE REQUIREMENTS FOR THE TYPE OF CONSTRUCTION AND OCCUPANCY REQUIREMENTS FOR THIS PROJECT. PROVIDE HANGERS AS REQUIRED BY CODE.

29.) LOCATE THE LIGHTING FIXTURES AS SHOWN ON THE REFLECTED CEILING PLAN.

30.) THE FINAL LOCATION OF ALL SWITCHES, OUTLETS AND OTHER WALL MOUNTED DEVICES SHALL BE FIELD COORDINATED. ALL LOCATIONS SHALL MEET ALL LOCAL CODE REQUIREMENTS (INCLUDING ALL HANDICAPPED CODE AND ADA REQUIREMENTS).

31.) TEST ALL CIRCUITS, LIGHTING FIXTURES, OUTLETS AND OTHER DEVICES FOR THEIR PROPER OPERATION (INCLUDING ALL GROUNDING).

32.) SCHEDULE AND PERFORM ALL TEST AND INSPECTIONS REQUIRED BY THE LOCAL AUTHORITIES, HAVING JURISDICTION.

33.) REFER TO THE MANUFACTURER'S INSTALLATION INSTRUCTIONS OF ALL LIGHTING FIXTURES, RECEPTACLES, DEVICES AND EQUIPMENT. FURNISH AND INSTALL ALL HARDWARE, PARTS, ACCESSORIES REQUIRED FOR THEIR PROPER INSTALLATION AND OPERATION.

34.) REFER TO DRAWINGS FOR ANY ADDITIONAL REQUIREMENTS, DETAILS AND SPECIFICATIONS RELATED TO THIS PROJECT.

35.) INSTALL ALL WIRING/CONDUIT CONCEALED IN PARTITIONS AND ABOVE THE CEILING, UNLESS OTHERWISE INDICATED.

36.) COORDINATE ALL ELECTRICAL WORK WITH ALL FIELD CONDITIONS AT THE JOB-SITE AND ALL OTHER TRADES INVOLVED.

37.) ALL WIRING, CONDUIT AND JUNCTION BOXES SHALL BE COLOR CODED, IDENTIFIED,/AND LABELED. ALL WORK AND INSTALLATION SHOWN ON THESE DRAWINGS SHALL BE DONE BY A LICENSED CONTRACTOR WITH EXPERIENCE IN THE TYPE OF WORK REQUIRED FOR THIS PROJECT.

38.) RECEPTACLES, OUTLETS AND COVERPLATES SHALL BE ALMOND UNLESS OTHERWISE SPECIFIED BY THE ARCHITECT.

39.) ALL PANELS AND CIRCUIT BREAKER CAPACITY RATINGS AND THEIR CONSTRUCTION SHALL MEET LOCAL CODES. ALL NEW CIRCUIT BREAKERS SHALL HAVE AN A.I.C. RATING COMPATIBLE WITH EXISTING PANEL.

40.) IDENTIFY AND LABEL ALL CIRCUITS.

41.) COORDINATE THE LOCATION AND INSTALLATION OF EXIT SIGNS AS REQUIRED TO INDICATE THE EXIT PATH AS REQUIRED BY CODE.

42.) PROVIDE CAST METAL JUNCTION BOXES AND CONDUIT FOR CIRCUITS BEING INSTALLED IN EXPOSED LOCATIONS.

43.) ALL RECEPTACLES SHOWN IN THE KITCHEN AREAS OR AT SINK AREAS SHALL BE GFCI TYPE WITH STAINLESS STEEL COVER PLATES.

44.) PROVIDE INDEPENDENT SUSPENSION TO THE BUILDING STRUCTURE FOR ALL LAY-IN LIGHT FIXTURES.

120V CIRCUIT LENGTH (FT.)	AWG	277V CIRCUIT LENGTH (FT.)	AWG
0-75	#12	0-150	#12
75-150	#10	151-300	#10
151-200	#8	301-400	#8

LIGHT FIXTURE SCHEDULE

TYPE	DESCRIPTION	LUMENS/WATTS	MANUFACTURER
A	4" RECESSED LED LIGHT FIXTURE WITH ACRYLIC LENS, 0-10V DRIVER AND WHITE FINISH	-/1W 120V	TO MATCH EXISTING LIGHT FIXTURES IN BUILDING
	SURFACE MOUNTED EMERGENCY EXIT SIGN WITH WHITE THERMOPLASTIC HOUSING, GREEN LETTERS, AND LED LAMPS.	LED/120V/1.7W	LITHONIA LIGHTING EXRG M6

NOTE: CONTRACTOR SHALL PROVIDE THE ABOVE MANUFACTURER'S FIXTURE OR AN APPROVED EQUAL SUBSTITUTION.

Baltimore City Public Schools

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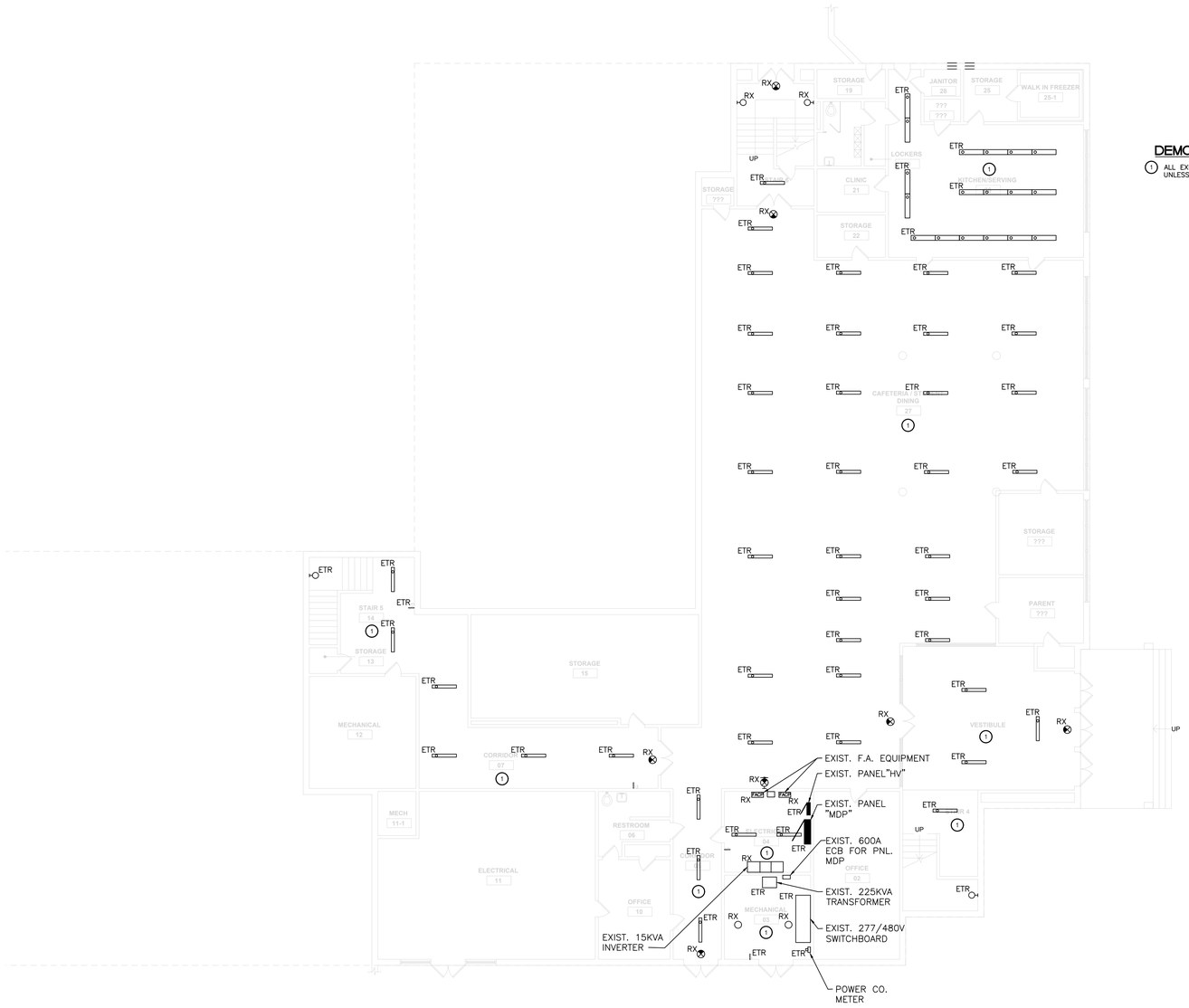
PROJECT #:
DESIGNED BY:
DRAWN BY:
CHECK BY:
SCALE:

FIRE ALARM DESIGN AT MARY ANN WINTERLING ELEMENTARY SCHOOL #012
PSC NUMBER: #30.225.26SR
220 NORTH BENTALOU STREET
BALTIMORE, MD 21223
BID SET JULY 17,2026
ELECTRICAL LEGEND AND GENERAL NOTES

SCHOOL NUMBER #012

DRAWING NO.
E000



DEMOLITION NOTE:

(1) ALL EXISTING LIGHT FIXTURE ARE EXISTING TO REMAIN UNLESS OTHERWISE NOTED.

BASEMENT PLAN EAST WING - LIGHTING - DEMOLITION

SCALE: 3/32"=1'-0"

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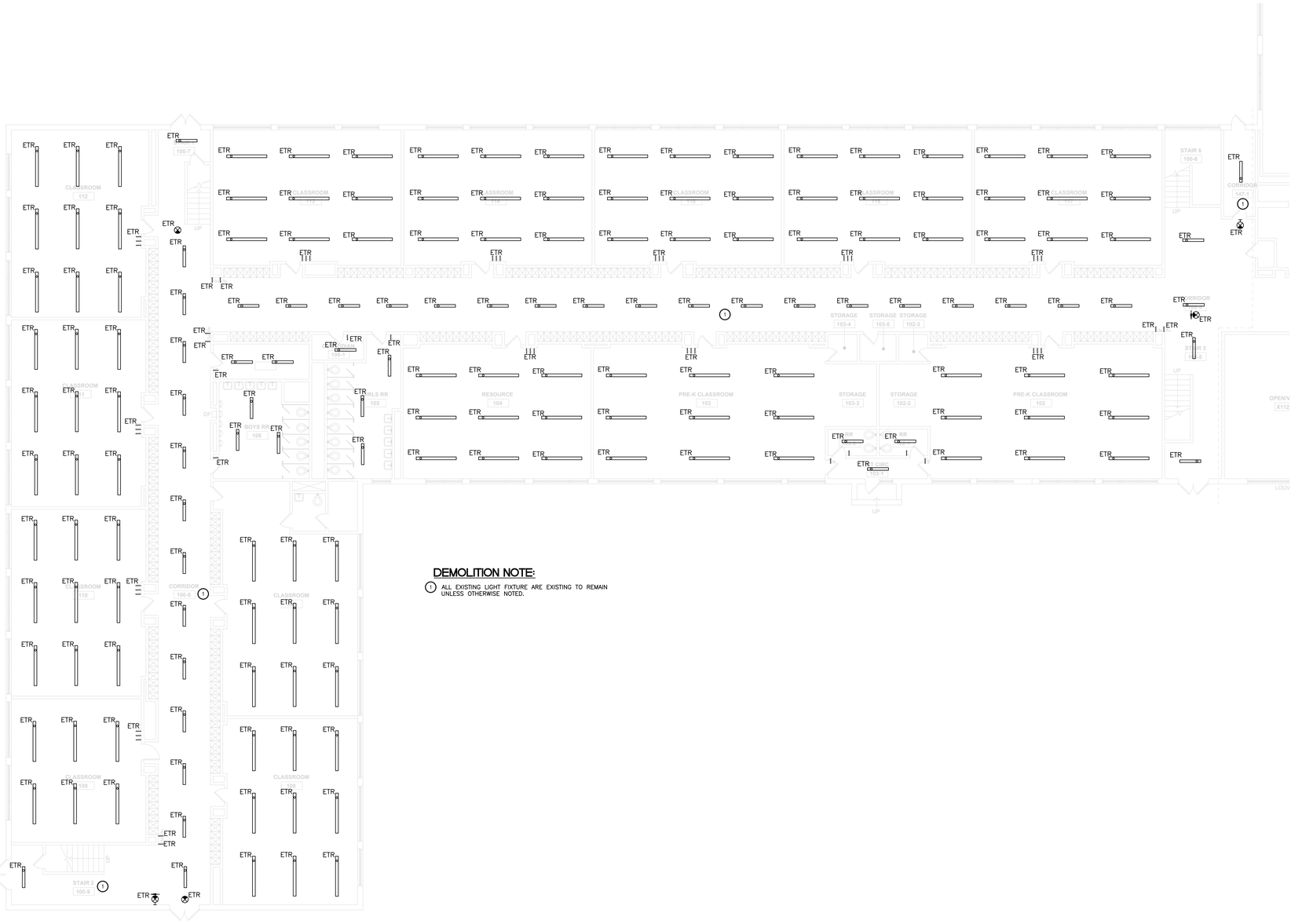
BALTIMORE, MD 21223
BID SET JULY 17,2026
BASEMENT PLAN EAST WING - LIGHTING -DEMOLITION

SCHOOL NUMBER #012

DRAWING NO.
ED-100



DEMOLITION NOTE:

1. ALL EXISTING LIGHT FIXTURE ARE EXISTING TO REMAIN UNLESS OTHERWISE NOTED.

FIRST FLOOR PLAN WEST WING - LIGHTING - DEMOLITION

SCALE: 3/32"=1'-0"

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PSC NUMBER: #30.225.26SR
220 NORTH BENTALOU STREET
BALTIMORE, MD 21223
BID SET JULY 17,2026
FIRST FLOOR PLAN WEST WING LIGHTING - DEMOLITION

SCHOOL NUMBER #012

DRAWING NO.

ED-101



DEMOLITION NOTE:

1. ALL EXISTING LIGHT FIXTURE ARE EXISTING TO REMAIN UNLESS OTHERWISE NOTED.

FIRST FLOOR PLAN EAST WING - LIGHTING - DEMOLITION

SCALE: 3/32"=1'-0"

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PSC NUMBER: #30.225.26SR
220 NORTH BENTALOU STREET
BALTIMORE, MD 21223
BID SET JULY 17,2026
FIRST FLOOR EAST WING LIGHTING - DEMOLITION

SCHOOL NUMBER #012

DRAWING NO.

ED-102



DEMOLITION NOTE:

(1) ALL EXISTING LIGHT FIXTURE ARE EXISTING TO REMAIN UNLESS OTHERWISE NOTED.

SECOND FLOOR PLAN WEST WING - LIGHTING - DEMOLITION

SCALE: 3/32"=1'-0"

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SCALE:

FIRE ALARM DESIGN AT MARY ANN WINTERLING ELEMENTARY SCHOOL #012
PSC NUMBER: #30.225.26SR

220 NORTH BENTALOU STREET
BALTIMORE, MD 21223

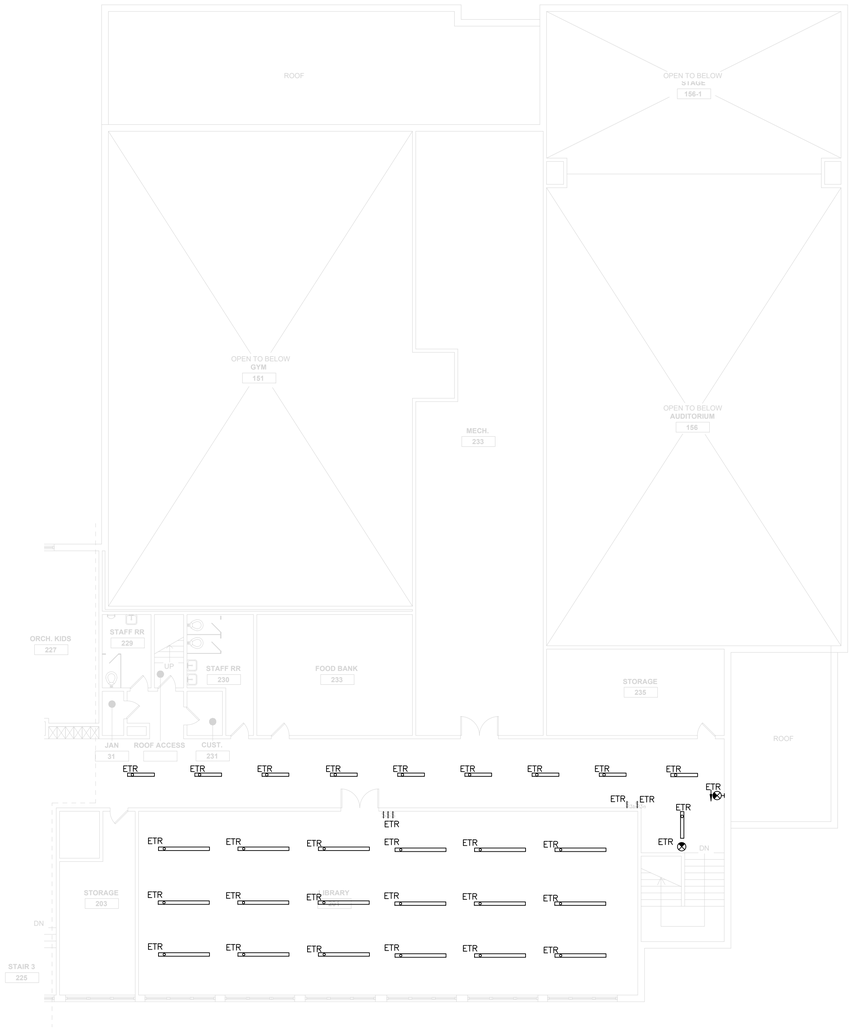
BID SET JULY 17,2026

SECOND FLOOR PLAN WEST WING LIGHTING - DEMOLITION

SCHOOL NUMBER #012

DRAWING NO.

ED-103



SECOND FLOOR PLAN EAST WING - LIGHTING - DEMOLITION

SCALE: 3/32" = 1'-0"

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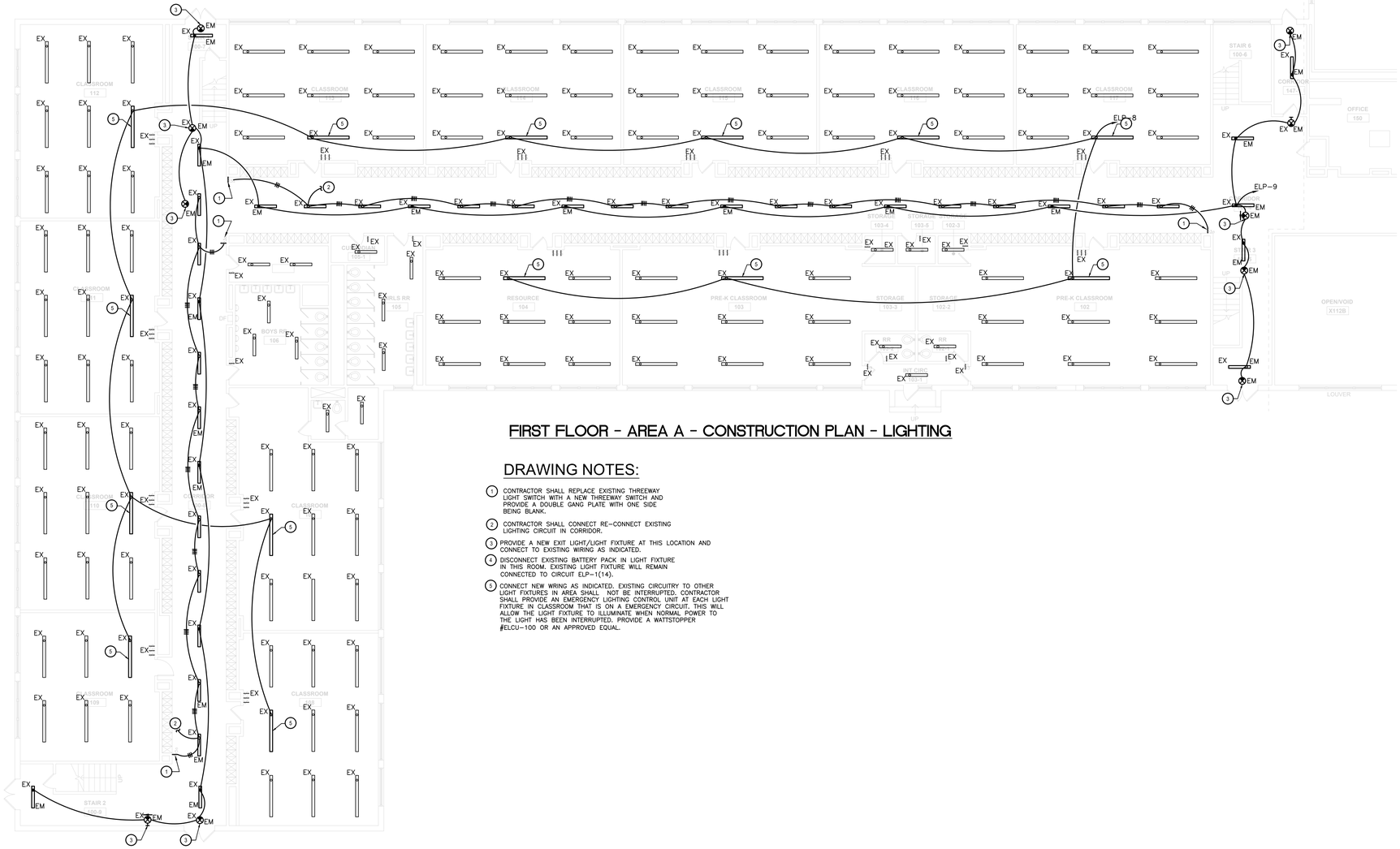
BALTIMORE, MD 21223
BID SET JULY 17,2026
SECOND FLOOR EAST WING LIGHTING - DEMOLITION

SCHOOL NUMBER #012

DRAWING NO.

ED-104



FIRST FLOOR - AREA A - CONSTRUCTION PLAN - LIGHTING

DRAWING NOTES:

1. CONTRACTOR SHALL REPLACE EXISTING THREEWAY LIGHT SWITCH WITH A NEW THREEWAY SWITCH AND PROVIDE A DOUBLE GANG PLATE WITH ONE SIDE BEING BLANK.
2. CONTRACTOR SHALL CONNECT RE-CONNECT EXISTING LIGHTING CIRCUIT IN CORRIDOR.
3. PROVIDE A NEW EXIT LIGHT/LIGHT FIXTURE AT THIS LOCATION AND CONNECT TO EXISTING WIRING AS INDICATED.
4. DISCONNECT EXISTING BATTERY PACK IN LIGHT FIXTURE IN THIS ROOM. EXISTING LIGHT FIXTURE WILL REMAIN CONNECTED TO CIRCUIT ELP-1(14).
5. CONNECT NEW WIRING AS INDICATED. EXISTING CIRCUITRY TO OTHER LIGHT FIXTURES IN AREA SHALL NOT BE INTERRUPTED. CONTRACTOR SHALL PROVIDE AN EMERGENCY LIGHTING CONTROL UNIT AT EACH LIGHT FIXTURE IN CLASSROOM THAT IS ON A EMERGENCY CIRCUIT. THIS WILL ALLOW THE LIGHT FIXTURE TO ILLUMINATE WHEN NORMAL POWER TO THE LIGHT HAS BEEN INTERRUPTED. PROVIDE A WATTSTOPPER #ELCU-100 OR AN APPROVED EQUAL.

FIRST FLOOR PLAN WEST WING - LIGHTING - NEW WORK

SCALE: 3/32"=1'-0"

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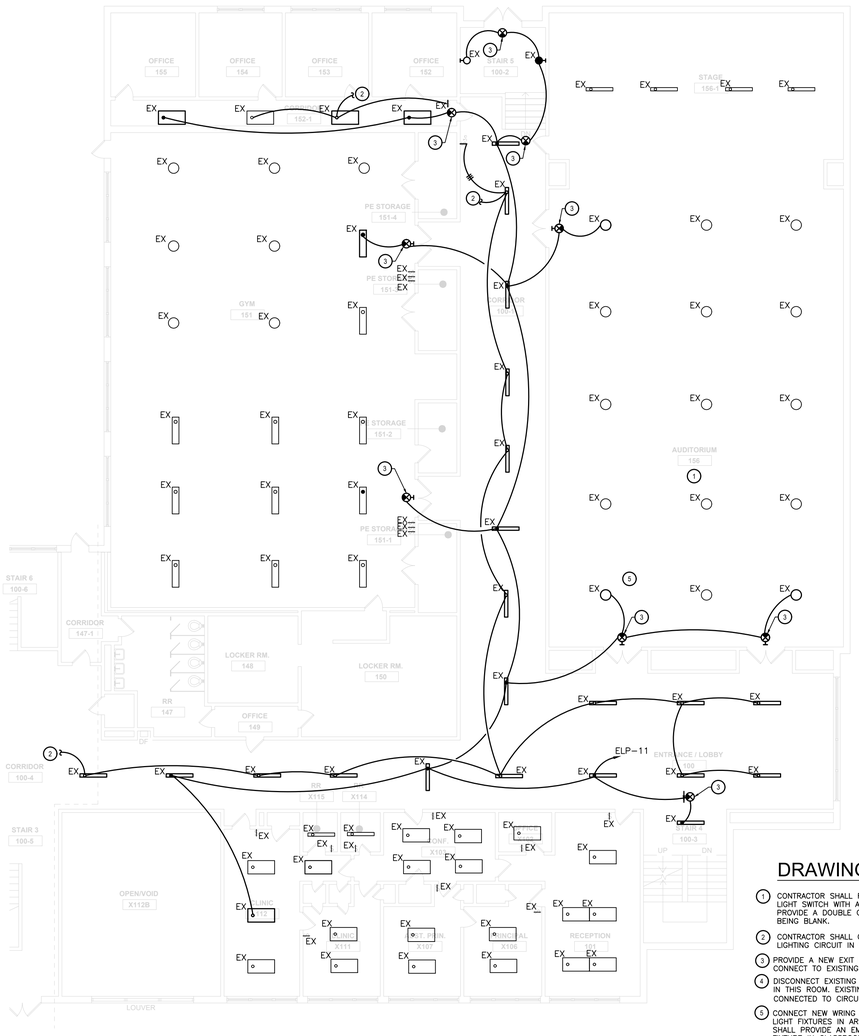
BALTIMORE, MD 21223
BID SET JULY 17,2026
FIRST FLOOR PLAN WEST WING LIGHTING - NEW WORK

SCHOOL NUMBER #012

DRAWING NO.
E-101



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FIRST FLOOR PLAN EAST WING - LIGHTING - NEW WORK

SCALE: 3/32"=1'-0"

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6			SCALE:

FIRE ALARM DESIGN AT MARY ANN WINTERLING ELEMENTARY SCHOOL #012
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220 NORTH BENTALOU STREET
BALTIMORE, MD 21223
BID SET JULY 17,2026
FIRST FLOOR PLAN EAST WING LIGHTING - NEW WORK

SCHOOL NUMBER #012

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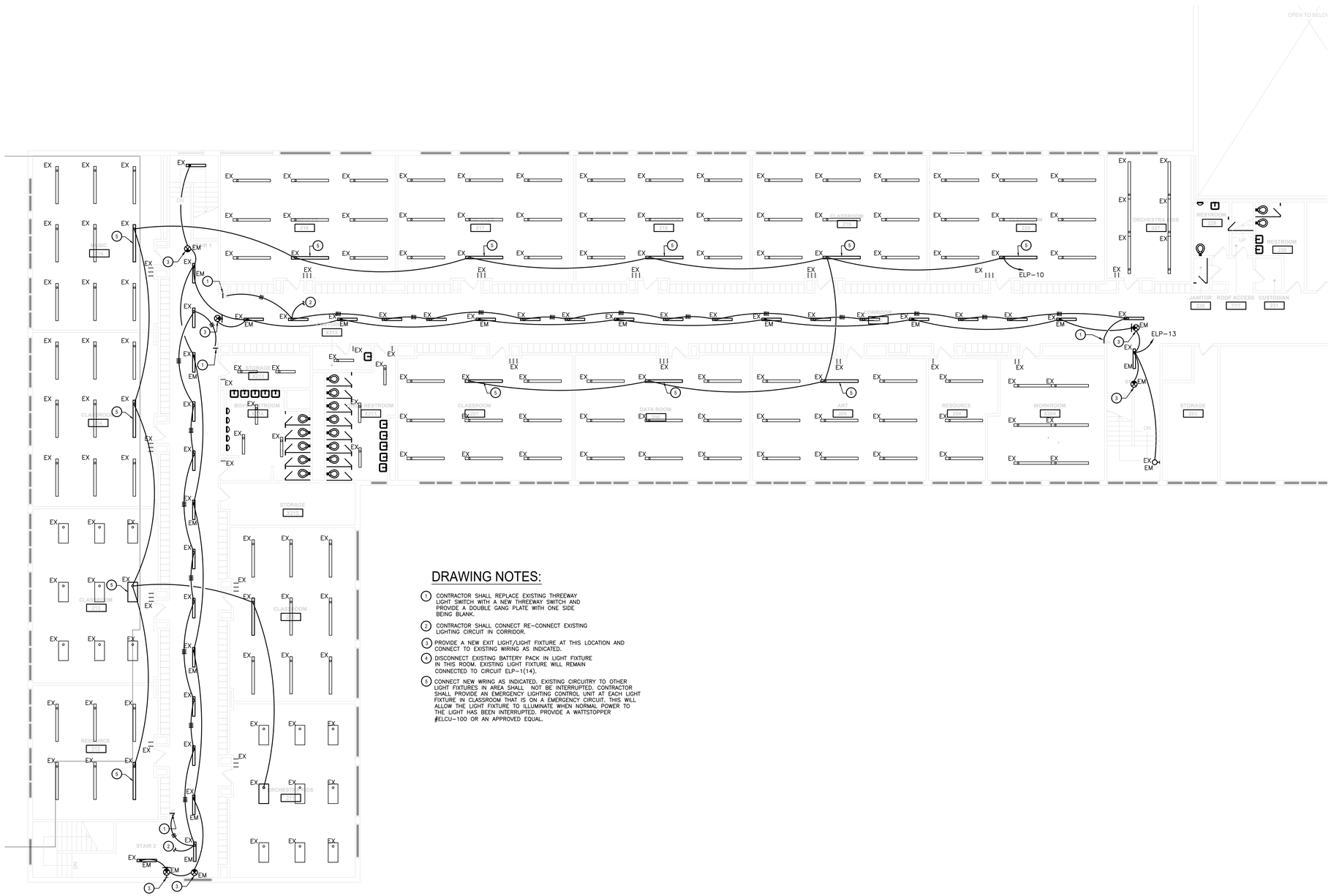
E-102



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SECOND FLOOR PLAN WEST WING - LIGHTING - NEW WORK

SCALE: 3/32"=1'-0"

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SECOND FLOOR PLAN WEST WING LIGHTING - NEW WORK

SCHOOL NUMBER #012

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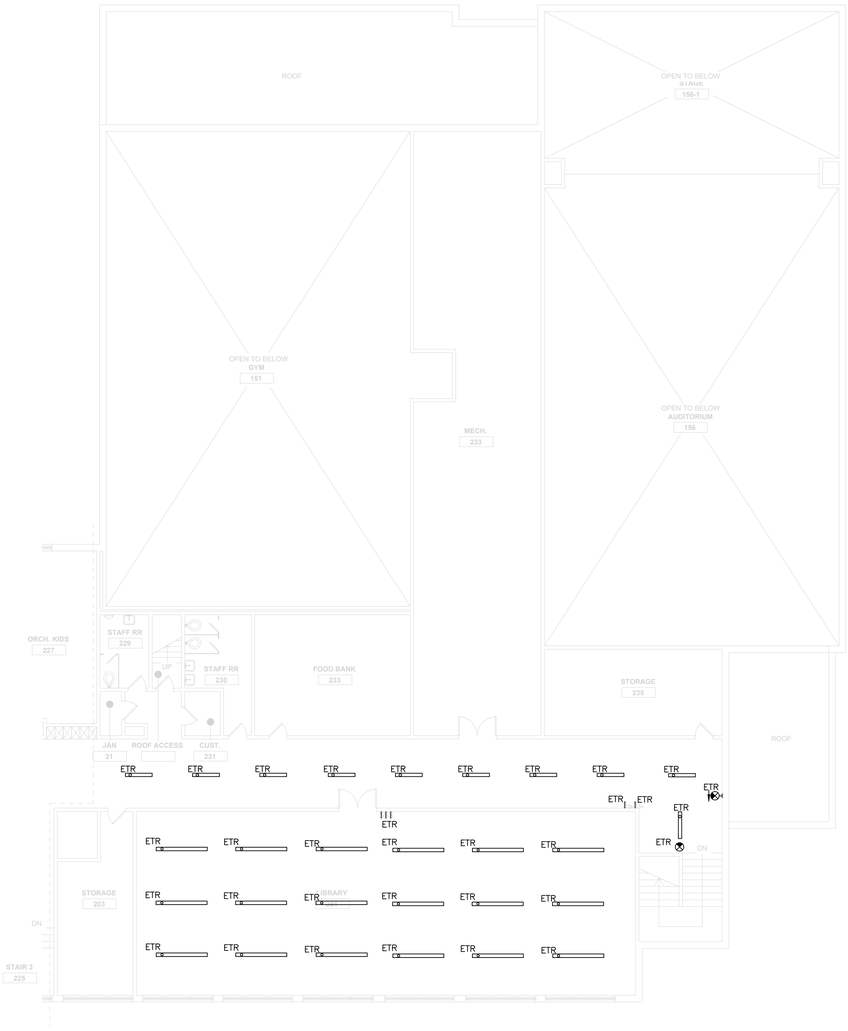

SECOND FLOOR PLAN EAST WING - LIGHTING - NEW WORK

SCALE: 3/32"=1'-0"

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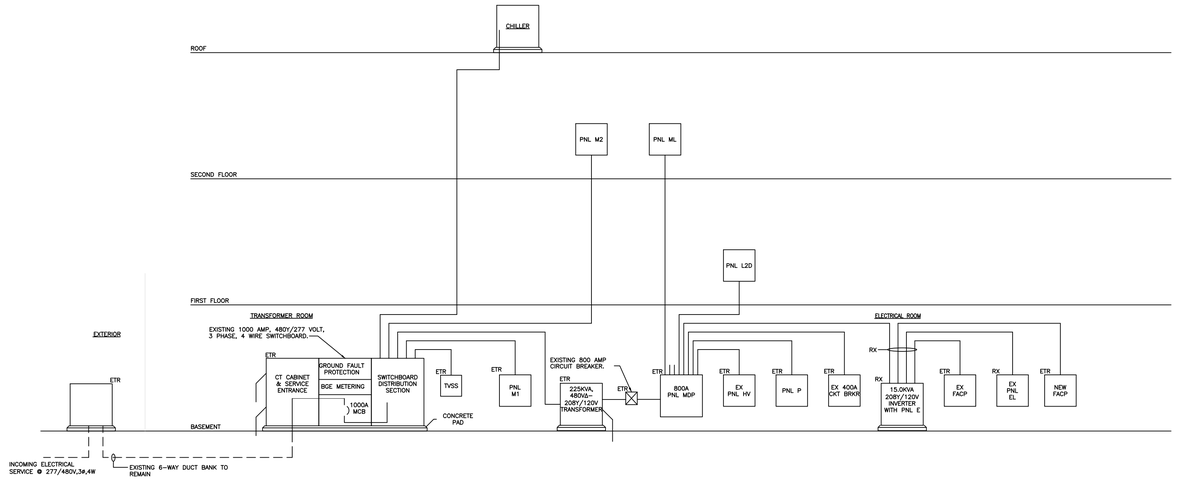
SECOND FLOOR PLAN EAST WING
LIGHTING - NEW WORK

SCHOOL NUMBER #012

DRAWING NO.

E-104



EXISTING POWER RISER DIAGRAM
SCALE: NONE

NEW PANEL ELP

VOLTAGE: 120 / 208
PHASE, WIRE: 3 PH , 4 W
100 AMP MAIN CB
A.I.C.: 10k
MOUNTED: SURFACE
FED FROM: PANEL "MDP"

CKT	SERVING	CB P	CB TRIP	WIRE QTY	WIRE AWG	KVA	PH	KVA	WIRE QTY	WIRE AWG	CB P	CB TRIP	SERVING	CKT
1	NEW FIRE ALARM PANEL	3	20	4	12	0.2	A	0.4	2	12	1	20	NEW SUB FCP PANEL	2
3						0.2	B	0.2	2	12	1	20	ATC PANEL - BOILER RM.	4
5						0.2	C	0.2	2	12	1	20	ATC PANEL - MECH. RM.	6
7	EM. LTG. BASEMENT EAST	1	20	2	12	0.3	A	0.5	2	12	1	20	1ST. FLR. CLASSROOMS	8
9	EM. LTG. FIRST FLR. WEST	1	20	2	12	0.5	B	0.6	2	12	1	20	2ND. FLR. CLASSROOMS	10
11	EM. LTG. FIRST FLR. EAST	1	20	2	12	0.5	C				1	20	SPARE	12
13	EM. LTG. SEC. FLR. WEST	1	20	2	12	0.5	A						BUSSED SPACE	14
15	EM. LTG. SEC. FLR. EAST	1	20	2	12	0.4	B		2	12	1	20	BUSSED SPACE	16
17	BUSSED SPACE	1	20	2	12		C		3	10	1	30	BUSSED SPACE	18
19	BUSSED SPACE	1	20	2	12		A						BUSSED SPACE	20
21	BUSSED SPACE	1	20	2	12		B						BUSSED SPACE	22
23	BUSSED SPACE	1	20	2	12		C						BUSSED SPACE	24

TOTAL DEMAND KVA (PER PHASE): A: 2.1 B: 2.0 C: 0.8 DESIGN KVA: 6 DESIGN AMPS: 17

NOTES:
* PANEL SHALL BE MARKED TO INDICATE POWER SUPPLY DEVICE OR EQUIPMENT, IN ACCORDANCE WITH NEC 408.4(B).

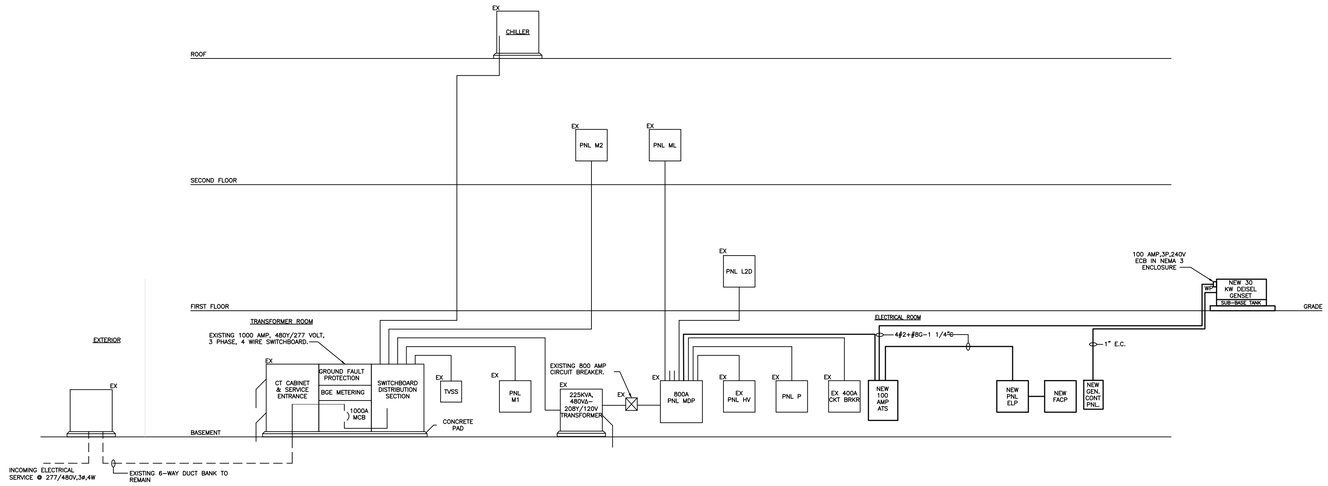
EXIST. PANEL MDP

VOLTAGE: 120 / 208
PHASE, WIRE: 3 PH , 4 W
800 AMP MAIN CB
A.I.C.: 10k
MOUNTED: SURFACE
FED FROM: 800A MCB (XFRM.)

CKT	SERVING	CB P	CB TRIP	WIRE QTY	WIRE AWG	KVA	PH	KVA	WIRE QTY	WIRE AWG	CB P	CB TRIP	SERVING	CKT
1	EXIST. PANEL "DPC"	3	400	4	500 KCM		A		4	2	3	100	EXIST. PANEL "ML"	2
3							B							4
5							C							6
7	EXIST. PANELS "L2B","L3B"	3	200	4	3/0		A		4	2	3	100	EXIST. PANEL "L2D"	8
9							B							10
11							C							12
13	EXIST. PANEL "P"	3	200	4	3/0		A		**4**	**2**	**3**	**100**	**NEW PANEL ELP**	14
15							B							16
17							C							18
19	EXIST. PANEL "HV"	3	60	4	6		A		4	6	3	50	SPARE	20
21							B							22
23							C							24
25	EXIST. PANEL "LB"	3	100	4	2		A		4	2	3	100	EXIST. PANEL "S"	26
27							B							28
29							C							30
31	EXIST. PANEL "L2C"	3	100	4	2		A				3		SPACE	32
33							B							34
35							C							36
37	EXIST. PANEL "K"	3	150	4	1/0		A				3		SPACE	38
39							B							40
41							C							42
43	EXIST. PANEL "L1A","L2A",	3	200	4	3/0		A				3		SPACE	44
45	"L3A"						B							46
47							C							48

TOTAL DEMAND KVA (PER PHASE): A: B: C: DESIGN KVA: DESIGN AMPS:

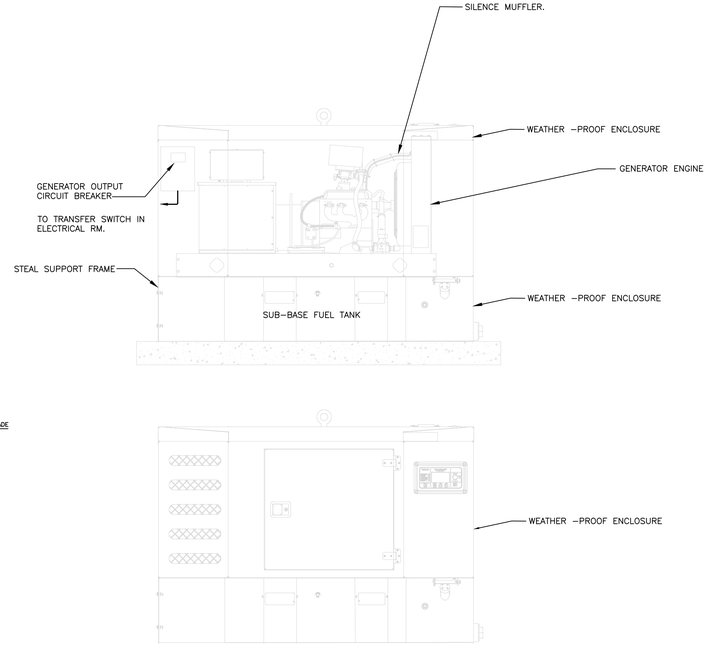
NOTES:
* PANEL SHALL BE MARKED TO INDICATE POWER SUPPLY DEVICE OR EQUIPMENT, IN ACCORDANCE WITH NEC 408.4(B).



NEW POWER RISER DIAGRAM
SCALE: NONE

RISER NOTES

SWITCHBOARD DISTRIBUTION SECTION



EMERGENCY GENERATOR DETAIL
NO SCALE

Baltimore City Public Schools

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422 N. Howard Street
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410.244.8255 phone
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NO.	REVISION	DATE
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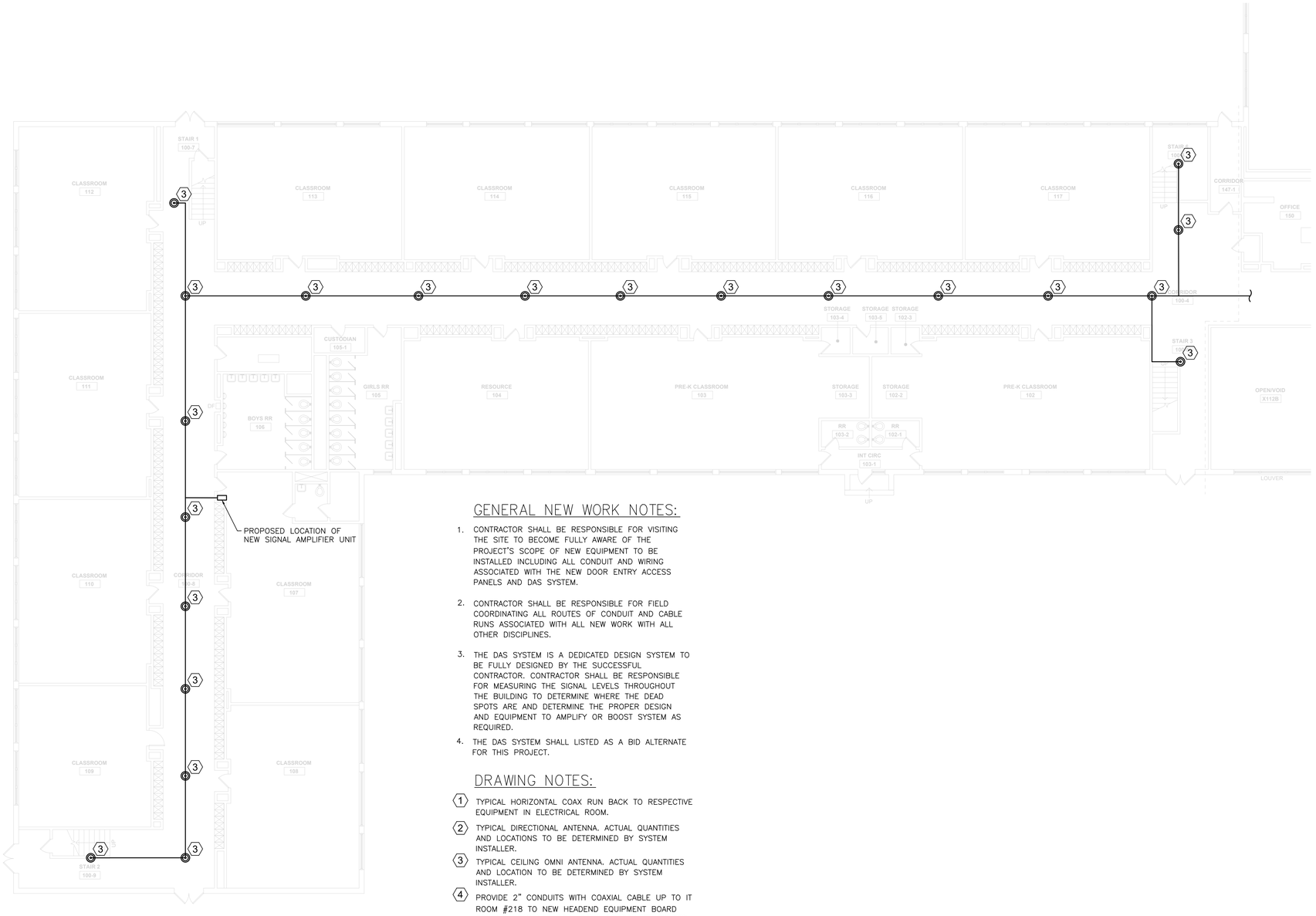
PROJECT #:
DESIGNED BY:
DRAWN BY:
CHECK BY:
SCALE:

FIRE ALARM DESIGN AT MARY ANN WINTERLING ELEMENTARY SCHOOL #012
PSC NUMBER: #30.225.26SR
220 NORTH BENTALOU STREET
BALTIMORE, MD 21223
BID SET JULY 17,2026
EXISTING AND NEW POWER RISER DIAGRAMS

SCHOOL NUMBER #012

DRAWING NO.
E200



FIRST FLOOR PLAN WEST WING - DAS - NEW WORK

SCALE: 3/32"=1'-0"

GENERAL NEW WORK NOTES:

1. CONTRACTOR SHALL BE RESPONSIBLE FOR VISITING THE SITE TO BECOME FULLY AWARE OF THE PROJECT'S SCOPE OF NEW EQUIPMENT TO BE INSTALLED INCLUDING ALL CONDUIT AND WIRING ASSOCIATED WITH THE NEW DOOR ENTRY ACCESS PANELS AND DAS SYSTEM.
2. CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD COORDINATING ALL ROUTES OF CONDUIT AND CABLE RUNS ASSOCIATED WITH ALL NEW WORK WITH ALL OTHER DISCIPLINES.
3. THE DAS SYSTEM IS A DEDICATED DESIGN SYSTEM TO BE FULLY DESIGNED BY THE SUCCESSFUL CONTRACTOR. CONTRACTOR SHALL BE RESPONSIBLE FOR MEASURING THE SIGNAL LEVELS THROUGHOUT THE BUILDING TO DETERMINE WHERE THE DEAD SPOTS ARE AND DETERMINE THE PROPER DESIGN AND EQUIPMENT TO AMPLIFY OR BOOST SYSTEM AS REQUIRED.
4. THE DAS SYSTEM SHALL LISTED AS A BID ALTERNATE FOR THIS PROJECT.

DRAWING NOTES:

1. TYPICAL HORIZONTAL COAX RUN BACK TO RESPECTIVE EQUIPMENT IN ELECTRICAL ROOM.
2. TYPICAL DIRECTIONAL ANTENNA. ACTUAL QUANTITIES AND LOCATIONS TO BE DETERMINED BY SYSTEM INSTALLER.
3. TYPICAL CEILING OMNI ANTENNA. ACTUAL QUANTITIES AND LOCATION TO BE DETERMINED BY SYSTEM INSTALLER.
4. PROVIDE 2" CONDUITS WITH COAXIAL CABLE UP TO IT ROOM #218 TO NEW HEADEND EQUIPMENT BOARD FOR NEW DAS NETWORK. FIELD COORDINATE ROUTES.
5. LOCATION OF EXISTING 4"C TO SECOND FLOOR I.T. EQUIPMENT IN ROOM 218. FIELD COORDINATE ALL EQUIPMENT LOCATION PRIOR TO BID.
6. PROPOSED ROUTE OF NEW CATEGORY CABLE VERTICAL RISER UP TO 2ND FLOOR. FIELD COORDINATE ROUTE.

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STATE OF MARYLAND
TIMOTHY WASHINGTON
16001
PROFESSIONAL ENGINEER

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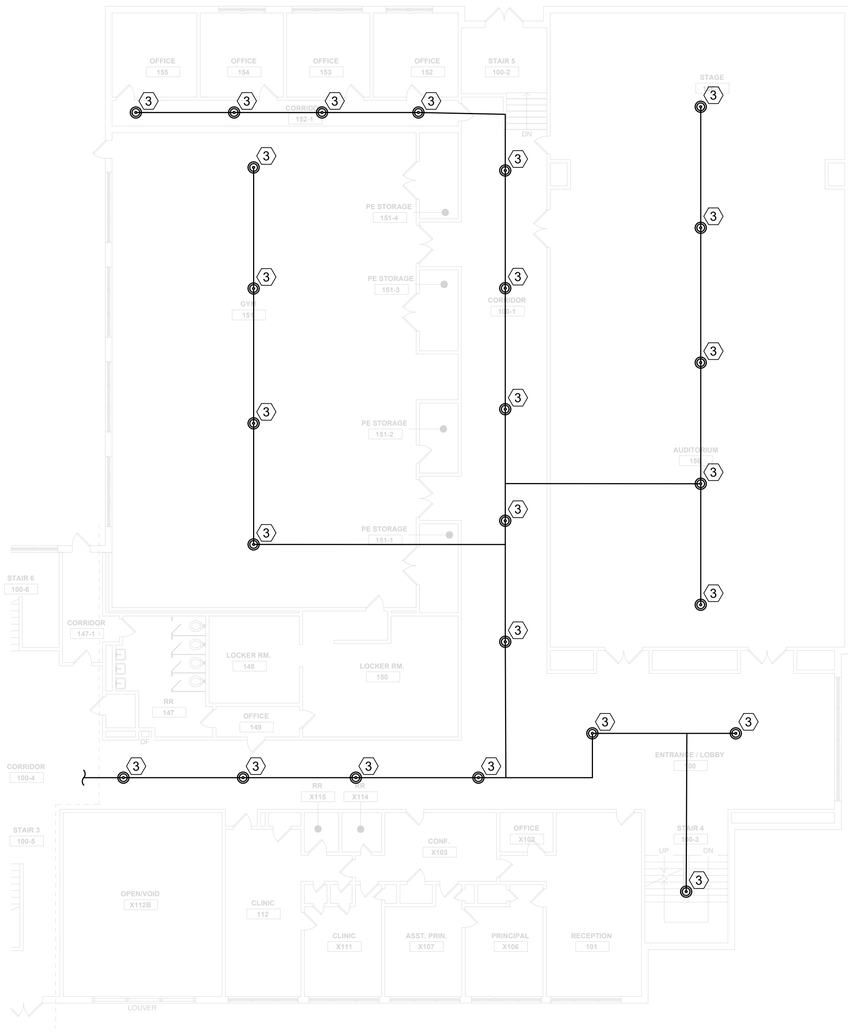
SCALE:

FIRE ALARM DESIGN AT MARY ANN
WINTERLING ELEMENTARY SCHOOL #012
PSC NUMBER: #30.225.26SR
220 NORTH BENTALOU STREET
BALTIMORE, MD 21223
BID SET JULY 17,2026
FIRST FLOOR PLAN WEST- DAS - NEW WORK

SCHOOL NUMBER
#012

DRAWING NO.
E401



FIRST FLOOR PLAN EAST WING - DAS - NEW WORK

SCALE: 3/32"=1'-0"

GENERAL NEW WORK NOTES:

1. CONTRACTOR SHALL BE RESPONSIBLE FOR VISITING THE SITE TO BECOME FULLY AWARE OF THE PROJECT'S SCOPE OF NEW EQUIPMENT TO BE INSTALLED INCLUDING ALL CONDUIT AND WIRING ASSOCIATED WITH THE NEW DOOR ENTRY ACCESS PANELS AND DAS SYSTEM.
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DRAWING NOTES:

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STATE OF MARYLAND
JOSEPH ANTHONY WASHINGTON III
No. 16001
PROFESSIONAL ENGINEER

PROFESSIONAL CERTIFICATION
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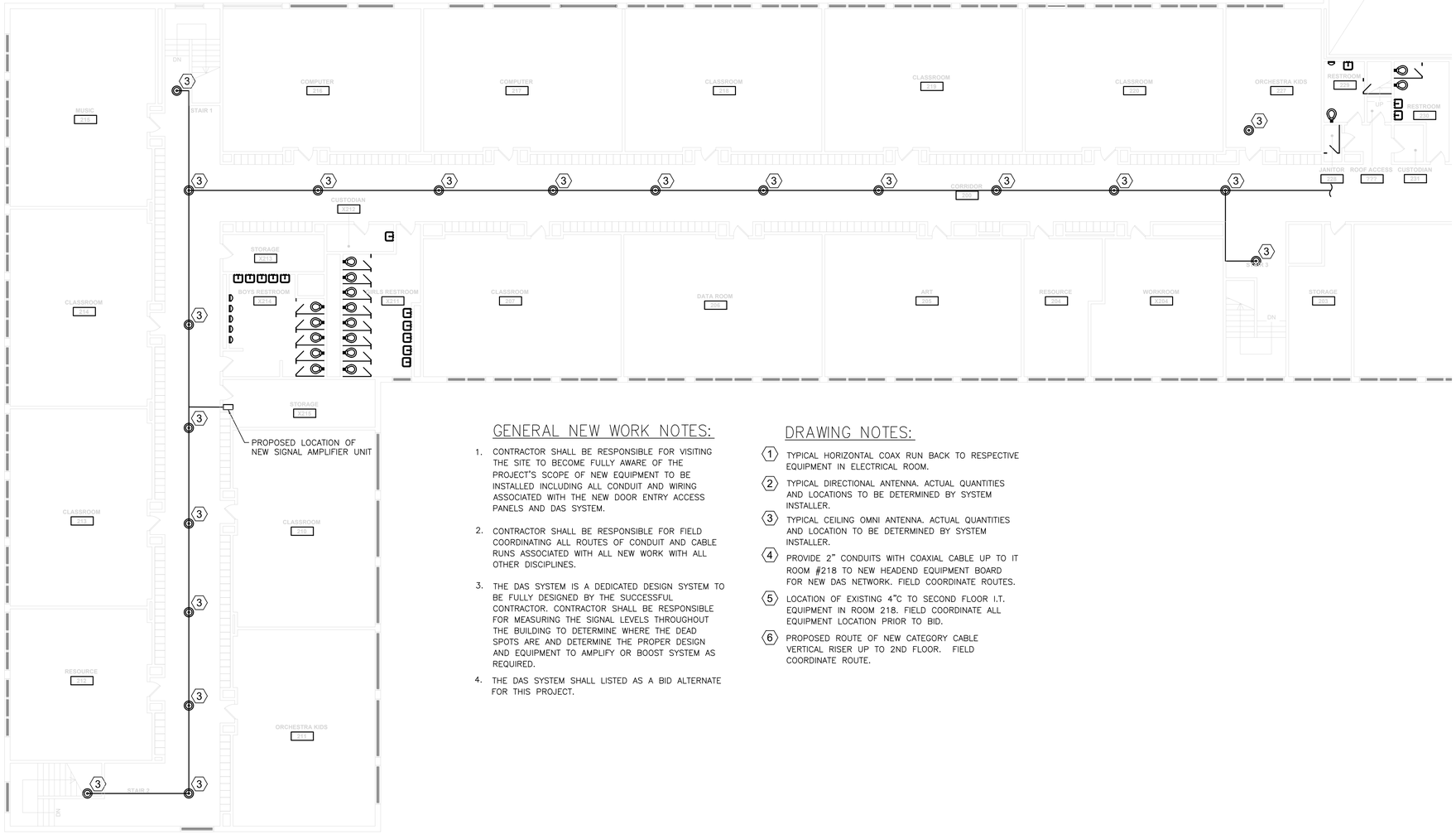
FIRE ALARM DESIGN AT MARY ANN WINTERLING ELEMENTARY SCHOOL #012
PSC NUMBER: #30.225.26SR
220 NORTH BENTALOU STREET
BALTIMORE, MD 21223
BID SET JULY 17,2026
FIRST FLOOR PLAN EAST WING-DAS-NEW WORK

SCHOOL NUMBER #012

DRAWING NO.
E-402



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SECOND FLOOR PLAN WEST WING - DAS - NEW WORK

SCALE: 3/32"=1'-0"

Baltimore City Public Schools

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STATE OF MARYLAND
BENJAMIN WASHINGTON
No. 16001
PROFESSIONAL ENGINEER

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CHECK BY:

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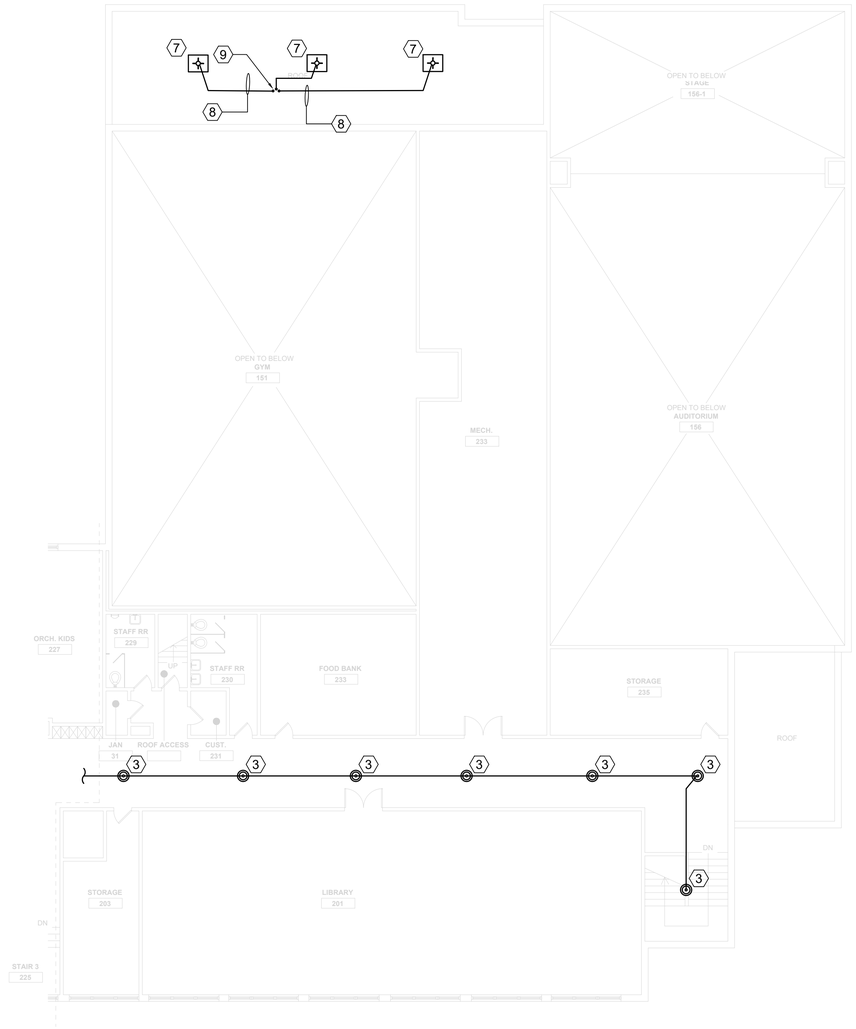
FIRE ALARM DESIGN AT MARY ANN WINTERLING ELEMENTARY SCHOOL #012
PSC NUMBER: #30.225.26SR
220 NORTH BENTALOU STREET
BALTIMORE, MD 21223
BID SET JULY 17,2026
SECOND FLOOR PLAN WEST WING-DAS-NEW WORK

SCHOOL NUMBER #012

DRAWING NO.
E403



SECOND FLOOR PLAN EAST WING - DAS - NEW WORK

SCALE: 3/32"=1'-0"

GENERAL NEW WORK NOTES:

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6. PROPOSED ROUTE OF NEW CATEGORY CABLE VERTICAL RISER UP TO 2ND FLOOR. FIELD COORDINATE ROUTE.
7. TYPICAL DONOR ROOF MOUNTED ANTENNA. SEE DETAIL ON DRAWING E7 & E8.
8. TYPICAL COAX RUN DOWN TO DONOR EQUIPMENT. QUANTITIES AND LOCATIONS TO BE DETERMINED BY SYSTEM INSTALLER.
9. TYPICAL COAX RUN DOWN TO DAS HEADEND UNIT IN ELECTRICAL ROOM ON THE GROUND FLOOR PROVIDE NEW WEATHER HEAD.

Baltimore City Public Schools

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STATE OF MARYLAND · JOHN CHRISTOPHER WASHINGTON · No. 16001 · PROFESSIONAL ENGINEER

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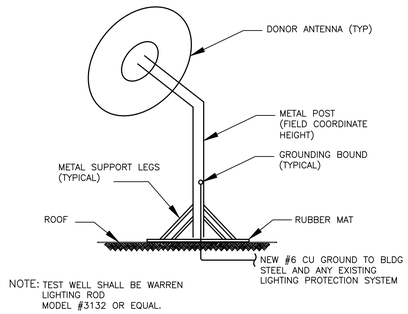
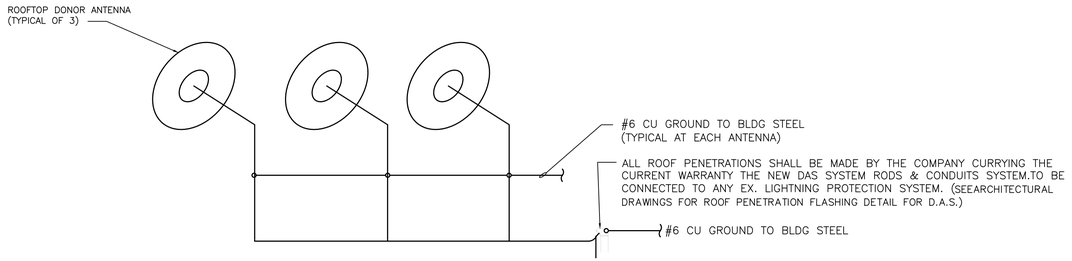
FIRE ALARM DESIGN AT MARY ANN WINTERLING ELEMENTARY SCHOOL #012
PSC NUMBER: #30.225.26SR
220 NORTH BENTALOU STREET
BALTIMORE, MD 21223
BID SET JULY 17,2026
SECOND FLOOR PLAN EAST WING-DAS-NEW WORK

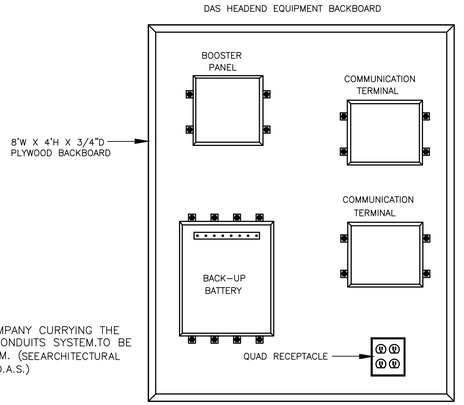
SCHOOL NUMBER #012

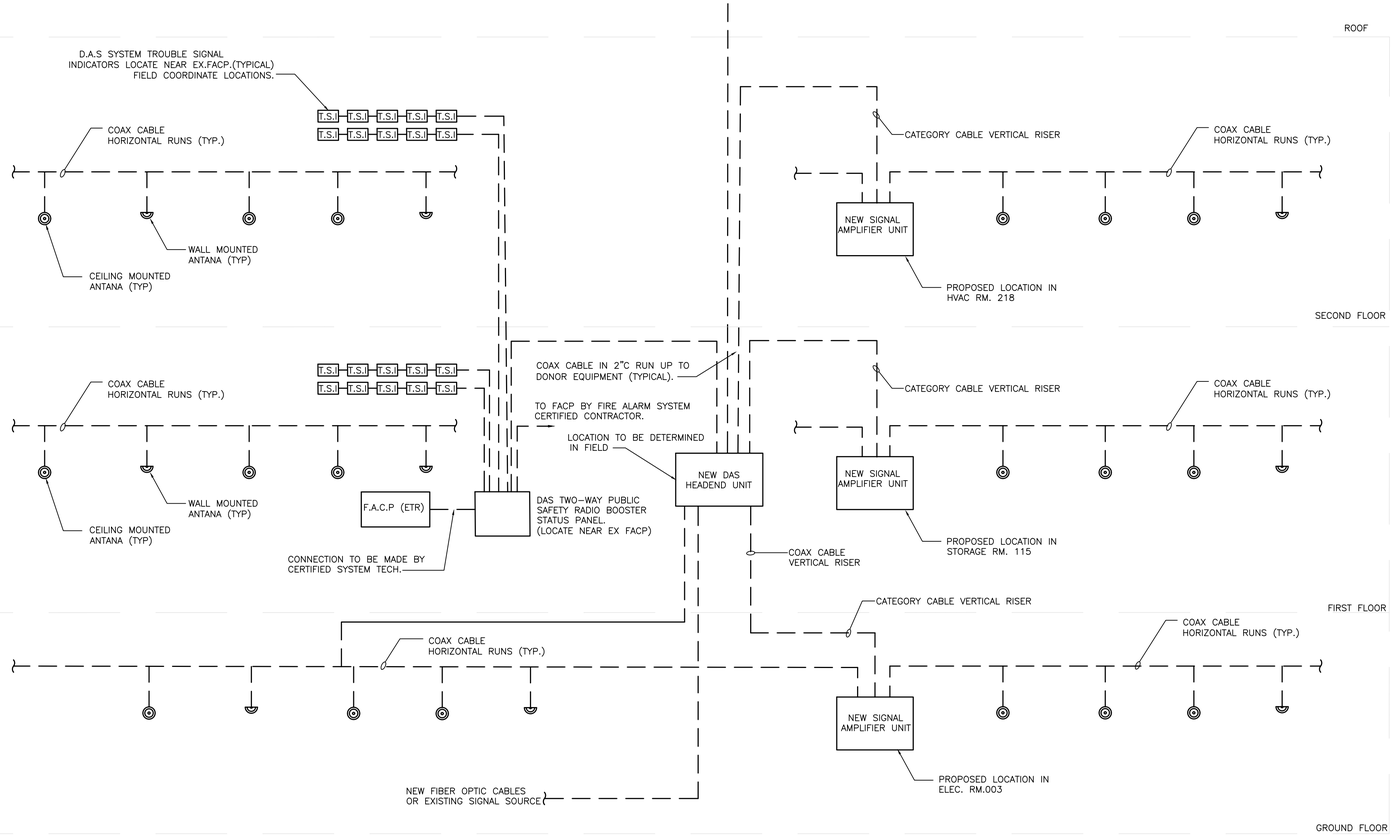
DRAWING NO.
E404



NOTE: TEST WELL SHALL BE WARREN
LIGHTING ROD
MODEL #3132 OR EQUAL.







GENERAL DAS SYSTEM NOTES:

1. SYSTEM WILL BE DESIGNED AND INSTALLED BY A DAS INTEGRATOR, EXPERIENCED WITH DESIGN–BUILD PROJECTS FOR IN–BUILDING, PUBLIC SAFETY, AMPLIFICATION SYSTEMS. QUANTITIES AND LOCATIONS OF ANTENNAS WILL BE AS DETERMINED BY THE DAS INTEGRATOR'S DESIGN.

2. THE DESIGN–BUILD DAS INTEGRATOR WILL HAVE THE QUALIFICATIONS, EXPERIENCE AND EXPERTISE IN THE DESIGN AND INSTALLATION OF PUBLIC SAFETY RADIO DAS.

3. THE INTEGRATOR IS EXPECTED TO PERFORM A RADIO FREQUENCY (RF) SITE SURVEY TO DETERMINE THE SIGNAL STRENGTH AT, OR NEAR, THE PROJECT GROUNDS TO DETERMINE THE LEVEL OF AMPLIFICATION NECESSARY TO PROVIDE CLEAR AND RELIABLE RADIO COMMUNICATIONS OVER 95% OF THE AREA INSIDE THE BUILDING. THE DAS INTEGRATOR WILL ASSUME COMPLETE RESPONSIBILITY FOR A COMPLIANT, RELIABLE AND GOOD WORKING SYSTEM.

4. AREAS REQUIRING COVERAGE INCLUDE STAIRWELLS, CORRIDORS, HALLWAYS, FIRE PUMP ROOM, FIRE COMMAND CENTER AND OTHER AREAS DESIGNATED AS CRITICAL BY THE 2010 NFPA 72, SECTION 24.5.2, AND THE FIRE MARSHAL OR THE AUTHORITY HAVING JURISDICTION (AHJ).

5. THE DAS INTEGRATOR WILL DESIGN AND DEPLOY A DAS SYSTEM CAPABLE OF RECEIVING APPROVAL OF THE AHJ. THE INTEGRATOR WILL COORDINATE WITH THE FIRE MARSHAL'S OR BALTIMORE CITY'S RADIO COMMUNICATIONS OFFICE TO OBTAIN THE CORRECT FREQUENCIES. REPEATER SITE LOCATIONS AND OTHER INFORMATION NECESSARY TO DEPLOY A COMPLETE AND FULLY OPERATIONAL DAS AT PROJECT LOCATION. THE SYSTEM SHALL ALSO INTEGRATE WITH BCPSS CONTROL CENTER IF NEW AND ADDRESSABLE.

6. THE DAS INTEGRATOR'S PROPOSED SYSTEM WILL BE CAPABLE OF EXPANSION WITHOUT REPLACING THE PRIMARY BDA AND DAS INFRASTRUCTURE. EXPANSION CAPABILITIES WILL INCLUDE THE ADDITION OR MODIFICATION OF RADIO FREQUENCIES IN BALTIMORE CITY AND FUTURE SCHOOL BUILDING EXPANSIONS AND RENOVATIONS.

7. THE BDA WILL INCLUDE ALARMS IN ACCORDANCE WITH NFPA 72 WHICH WILL BE CONNECTED TO AN INDICATING LIGHT IN THE FIRE ALARM CONTROL PANEL AND FIRE ALARM ANNUNCIATOR PANEL. THE DAS INTEGRATOR WILL COORDINATE THE INSTALLATION OF THIS ALARM LIGHT WITH THE FIRE ALARM CONTRACTOR.

8. THE DAS INTEGRATOR MAY PROPOSE A PASSIVE OR AN ACTIVE SYSTEM. THE INTEGRATOR WILL BE RESPONSIBLE FOR FURNISHING, INSTALLING, AND TESTING THE FIBER OPTIC CABLE AND COMPONENTS REQUIRED TO MEET THE PERFORMANCE REQUIREMENTS OF THE PROJECT.

9. THE DAS RACK SHOULD BE LOCATED ON THE UPPERMOST FLOOR IN THE TR (OR ER) CLOSEST TO THE LOCATION OF THE ANTENNAS ON THE ROOF.

10. THE DAS INTEGRATOR, AS PART OF HIS DESIGN, WILL RECOMMEND THE PREFERRED LOCATION FOR THE BDA, COVERAGE AND DONOR ANTENNA AS REQUIRED BY THE PROPOSED DESIGN AND EQUIPMENT SELECTED. THE BDA WILL BE MOUNTED IN AN ER OR TR WHICH IS IN CLOSE PROXIMITY TO THE ROOF.

11. ALL ROOF TOP ANTENNA SHALL BE GROUNDED USING AT LEAST #10AWG WIRE PER NEC 250.

Baltimore City
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FIRE ALARM DESIGN AT MARY ANN
WINTERLING ELEMENTARY SCHOOL #012
PSC NUMBER: #30.225.26SR
220 NORTH BENTALOU STREET
BALTIMORE, MD 21223
BID SET JULY 17,2026
DAS RISER DIAGRAM AND NOTES

SCHOOL NUMBER
#012

DRAWING NO.
E405

TYPICAL ANNOTATION LEGEND

- AREA OF REVISION
- REVISION SEQUENCE NUMBER
- KEYNOTE
- POINT OF CONNECTION OF EXISTING SYSTEM
- POINT OF DISCONNECTION OF EXISTING SYSTEM
- DETAIL NUMBER / DRAWING NUMBER
- DETAIL NUMBER / DRAWING NUMBER
- X/X-XXX VIEW REFERENCE

FIRE ALARM SYMBOL LEGEND

Fire Alarm Symbols

- F — MANUAL PULL STATION
- F — SPEAKER, WALL
- F — SPEAKER, CEILING
- STROBE, WALL, CANDELA AS INDICATED
- STROBE, CEILING, CANDELA AS INDICATED
- SPEAKER/STROBE, WALL, CANDELA AS INDICATED
- SPEAKER/STROBE, CEILING, CANDELA AS INDICATED
- RTS — REMOTE LED INDICATOR W/ TEST SWITCH
- SMOKE DETECTOR
- HEAT DETECTOR
- CO — CARBON MONOXIDE DETECTOR
- BEAM DETECTOR (T) — T: TRANSMITTER, R: RECEIVER (R)
- COMBINATION DETECTOR (UP TO THREE)
- DUCT SMOKE DETECTOR
- FIRE/SMOKE DAMPER
- SMOKE DAMPER
- DH — DOOR HOLDER
- DCL — DOOR CLOSER
- FIRE SERVICE PHONE
- FIRE SERVICE PHONE JACK
- XXX — ADDRESSIBLE MODULE
  - AIM: ADDRESSIBLE INPUT MODULE
  - AOM:ADDRESSIBLE OUTPUT CONTROL MODULE
  - AIO: ADDRESSIBLE INPUT/OUTPUT MODULE
- XXXX — FIRE ALARM CONTROL UNIT
  - EVAC: VOICE EVACUATION CONTROL PANEL
  - FAA: FIRE ALARM ANNUNCIATOR
  - FACP: FIRE ALARM CONTROL PANEL
  - FATC: FIRE ALARM TERMINAL CABINET
  - NACP: NOTIFICATION APPLIANCE CIRCUIT PANEL
  - AMP: AMPLIFIER PANEL
  - COMM: FIRE ALARM COMMUNICATOR
  - LOC: VOICE FIRE ALARM LOCAL OPERATING CONSOLE
- XX — SUPERVISORY OR INTERFACE DEVICE
  - PIV: POST INDICATOR VALVE SUPERVISORY
  - PS: PRESSURE SWITCH
  - R: NON-ADDRESSIBLE RELAY
  - VS: VALVE SUPERVISORY SWITCH
  - WF: WATER FLOW SWITCH

GENERAL NOTES FIRE ALARM

1. SOME LEGEND SYMBOLS MAY NOT BE USED. SEE FLOOR PLANS FOR APPLICABLE DEVICES.
2. THESE NOTES ARE GENERAL IN NATURE AND PERTAIN TO THE ENTIRE PROJECT UNLESS OTHERWISE NOTED AS SUCH ON AN INDIVIDUAL DRAWING.
3. PRIOR TO BIDDING, THE CONTRACTOR SHALL EXAMINE ALL PROJECT DRAWINGS AND SPECIFICATIONS TO DEVELOP A COMPLETE UNDERSTANDING OF THE PROJECT SCOPE. THE CONTRACTOR SHALL VISIT THE SITE AND VERIFY EXISTING CONDITIONS BEFORE BIDDING. FAILURE TO DO THIS WILL NOT RELIEVE THE CONTRACTOR OF HIS RESPONSIBILITIES TO PERFORM ALL REQUIRED WORK. THE CONTRACTOR SHALL ADVISE THE PROFESSIONAL OF ANY DISCREPANCIES WHICH WILL AFFECT THE WORK REQUIRED.
4. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH ALL PERTINENT CODES AND REGULATIONS. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT IN ACCORDANCE WITH APPLICABLE CODES, MANUFACTURER'S WRITTEN INSTRUCTIONS, AND RECOGNIZED INDUSTRY PRACTICES. ALL EQUIPMENT, DEVICES, AND MATERIALS SHALL BE UL LISTED AND FM APPROVED.
5. THE CONTRACTOR IS RESPONSIBLE FOR SUBMITTING ALL REQUIRED INFORMATION TO THE AUTHORITY HAVING JURISDICTION TO OBTAIN THE NECESSARY PERMITS AND APPROVALS. ALL FEES ASSOCIATED WITH THIS SUBMISSION ARE THE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR SHALL COORDINATE ALL REQUIRED INSPECTIONS AND BE RESPONSIBLE FOR ALL FEES CHARGED BY THE AUTHORITY HAVING JURISDICTION FOR SUCH INSPECTIONS.
6. REFER TO THE SITE CONDITIONS AND THE EXISTING ARCHITECTURAL PLANS FOR DIMENSIONS, ROOM FINISHES, FIRE WALLS, DOOR HARDWARE SCHEDULES AND LIKE ITEMS. REFER TO THE SITE CONDITIONS AND EXISTING STRUCTURAL DRAWINGS FOR STRUCTURAL MEMBERS. REFER TO OTHER EXISTING TRADES WORK TO UNDERSTAND THE EXTENT OF THEIR WORK AS REQUIRED. EXISTING DRAWINGS WILL BE PROVIDED TO THE SUCCESSFUL BIDDER.
7. DO NOT SCALE DRAWINGS. HOLD INDICATED DIMENSIONS WHERE SHOWN. RESOLVE ANY DISCREPANCIES WITH THE PROFESSIONAL PRIOR TO BEGINNING WORK.
8. PROVIDE A NEW MULTIPLEX/ADDRESSABLE, NON-CODED, SUPERVISED VOICE FIRE ALARM SYSTEM AS DESCRIBED IN THE SPECIFICATIONS AND AS SHOWN ON THE FIRE ALARM DRAWINGS. THE WORK COVERED UNDER THIS CONTRACT INCLUDES THE FURNISHING OF ALL EQUIPMENT, LABOR, AND MATERIALS TO PROVIDE A COMPLETE SYSTEM IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND REFERENCED CODES. THE DRAWINGS DO NOT SHOW ALL REQUIRED CONNECTIONS, INTERCONNECTING DETAILS, TERMINAL BLOCKS, JUNCTION BOXES, ETC. THE CONTRACTOR SHALL PROVIDE ALL APPURTENANCES FOR A COMPLETE AND OPERATIONAL SYSTEM THAT MEETS THE DESIGN INTENT AND CODE REQUIREMENTS.
9. THE LAYOUT ON THE DRAWINGS IS DIAGRAMMATIC. WHERE ADDITIONAL REMOTE FIRE ALARM CONTROL UNITS, NAC EXTENDER PANELS, OR SIMILAR FIRE ALARM RELATED EQUIPMENT ARE NEEDED, THEY SHALL BE PROVIDED. NAC AND AMPLIFIER PANELS SHALL BE FIELD LOCATED IN LOCATIONS APPROVED BY THE SCHOOL DISTRICT.
10. THE CONTRACTOR SHALL COORDINATE WITH OTHER TRADES TO ELIMINATE CONFLICTS BETWEEN STRUCTURAL ELEMENTS AS WELL AS PIPING, DUCTWORK, ARCHITECTURAL, AND OTHER ELECTRICAL WORK. ALL EQUIPMENT SHALL BE COORDINATED WITH OTHER TRADES AND ARCHITECTURAL AND STRUCTURAL FEATURES.
11. THE CONTRACTOR IS ULTIMATELY RESPONSIBLE FOR THE FINAL PLACEMENT OF ALL FIRE ALARM DEVICES IN ACCORDANCE WITH NFPA 72 AND APPLICABLE ADA REQUIREMENTS.
12. PROVIDE A NEW FIRE ALARM CONTROL PANEL (FACP) AND REMOTE ANNUNCIATOR PANEL (FAA).
13. PROVIDE AUDIBLE/VISIBLE NOTIFICATION THROUGHOUT THE BUILDING.
14. PROVIDE DETECTION THROUGHOUT THE BUILDING AS SHOWN IN THE PLANS.
15. PROVIDE DUCT SMOKE DETECTORS. ALLOW FOR AN ADDITIONAL FOUR (4) DUCT DETECTORS IN THE BASE BID ABOVE WHAT IS SHOWN ON THE DRAWINGS. IF THE ADDITIONAL (4) DUCT DETECTORS ARE NOT USED, PROVIDE THEM AS SPARES. FIELD VERIFY EXACT LOCATIONS. INTERFACE THE DUCT SMOKE DETECTORS WITH THE FIRE ALARM SYSTEM TO SHUTDOWN ASSOCIATED AIR HANDLERS UPON ACTIVATION OF THE SMOKE DETECTOR.
16. PROVIDE CONTROL MODULES, RELAYS, AND MONITOR MODULES TO INTERFACE DOOR HOLDERS AND KITCHEN HOOD SUPPRESSION SYSTEMS WITH THE FIRE ALARM SYSTEM.
17. ALL FIRE ALARM WIRING SHALL BE IN CONDUIT WHERE EXPOSED. PLENUM WIRING INSTALLED AS PER THE DETAIL IN THIS DRAWING SET AND SPECIFICATION 283100 MAY BE USED IN AREAS WITH DROP CEILINGS. ALL CONDUIT AND WIRING SHALL BE CONCEALED IN AREAS WITH CEILINGS. CONDUIT SHALL BE UTILIZED IN AREAS WITHOUT CEILINGS. CONTRACTOR SHALL COORDINATE ROUTINGS WITHIN THESE EXPOSED AREAS TO PRODUCE A SYMMETRIC AND AESTHETIC LAYOUT. SEE DIVISION 26 SPECIFICATIONS FOR PAINTING COLOR SELECTION OF CONDUITS AND BOXES.
18. FIRE ALARM CIRCUITS SHALL BE 24-VOLT DC AND POWER WIRING SHALL BE 120-VOLT AC CIRCUITS. SIGNALING LINE CIRCUITS SHALL BE CLASS B AND NOTIFICATION APPLIANCE CIRCUITS SHALL BE CLASS B.
19. CIRCUITS SHALL CONTAIN AT LEAST 20 PERCENT SPARE CAPACITY FOR NOTIFICATION APPLIANCES ON THE NAC AND/OR AMPLIFIER CIRCUITS AND 20 PERCENT SPARE CAPACITY FOR INITIATING DEVICES ON THE SLC (E.G., NOT MORE THAN 80 PERCENT LOADED).
20. CONTRACTOR SHALL REPLACE IN KIND ALL CEILING TILES DAMAGED DURING INSTALLATION AT NO ADDITIONAL COST.
21. CONTRACTOR SHALL REPAINT OR REFINISH ANY AREA IN KIND IF INSTALLATION DEFACES EXISTING WALLS, FLOORS, OR CEILINGS. PROVIDE SURFACE PREPARATION, PRIME AND FINISH COATS TO MATCH EXISTING COLOR, TYPE OF PAINT, TEXTURE AND SHEEN.
22. AFTER ALL EQUIPMENT IS INSTALLED, IT SHALL BE TESTED TO DEMONSTRATE PROPER OPERATION OF PERFORMANCE AND COMPLIANCE WITH THE SPECIFICATIONS. EQUIPMENT NOT OPERATING CORRECTLY SHALL BE FIELD CORRECTED OR REPLACED. SYSTEMS WILL BE TESTED IN ACCORDANCE WITH NFPA REQUIREMENTS. THE OWNER'S REPRESENTATIVE, PROFESSIONAL, AND AUTHORITY HAVING JURISDICTION SHALL BE PRESENT FOR THE TEST.
23. THE CONTRACTOR IS RESPONSIBLE FOR REMOVING ALL EXISTING FIRE ALARM DEVICES AND PATCHING/REPAIRING THE ASSOCIATED LOCATIONS. THE FIRE ALARM DRAWINGS DO NOT SHOW ALL DEVICES TO BE DEMOLISHED. REMOVE AND SALVAGE, IN ACCORDANCE WITH SPECIFICATION 024119, FOR TURN OVER TO THE SCHOOL DISTRICT ANY NEWER GENERATION FIRE ALARM PANELS OR DEVICES THAT ARE REMOVED.
24. PROVIDE CARBON MONOXIDE DETECTION IN THE BOILER ROOM, MECHANICAL ROOMS, KITCHEN, ETC.
25. PROVIDE PULL STATIONS WITH PROTECTIVE COVERS THROUGHOUT THE BUILDING, AS PER SPECIFICATIONS SECTION 283100, PARAGRAPH 2.9.B. SURFACE BOXES SHALL BE FURNISHED BY THE MANUFACTURER.
26. PROVIDE A DRAWING/DOCUMENT BOX ADJACENT TO THE FIRE ALARM PANEL. PROVIDE A FULL SIZE SET OF DRAWINGS, 1/2 SIZE SET, AND A FLASH DRIVE WITH PDF COPIES OF ALL THE AS-BUILT DRAWINGS.
27. THE CONTRACTOR SHALL ENSURE ALL WIRE CONNECTIONS ARE MADE PER NFPA 72, NFPA 70, THE MANUFACTURERS RECOMMENDATIONS AND RECOGNIZED INDUSTRY PRACTICE.
28. UTILIZE BOX EXTENSIONS TO CEILING MOUNT DEVICES IN AREAS WITH EXISTING SPLINE CEILINGS.
29. INCLUDE IN THE BID AN ALLOWANCE TO FURNISH AND INSTALL AN ADDITIONAL 2 DOOR HOLDERS IN THE EVENT ANY OF THE EXISTING DOOR HOLDERS ARE NOT FUNCTIONAL.

FIRE ALARM SHEET LIST

FA000	SYMBOLS, LEGENDS, AND ABBREVIATIONS - FIRE ALARM
FA102	FIRST FLOOR - AREA A - CONSTRUCTION PLAN - FIRE ALARM
FA103	FIRST FLOOR - AREA B - CONSTRUCTION PLAN - FIRE ALARM
FA104	SECOND FLOOR - AREA A - CONSTRUCTION PLAN - FIRE ALARM
FA105	SECOND FLOOR - AREA B - CONSTRUCTION PLAN - FIRE ALARM
FA101	GROUND FLOOR - CONSTRUCTION PLAN - FIRE ALARM
FA500	DETAILS - FIRE ALARM

DEFERRED SUBMISSION

THE FIRE ALARM DRAWINGS AND SPECIFICATIONS ARE PERFORMANCE BASED. THE CONTRACTOR SHALL SUBMIT FOR REVIEW AND APPROVAL AS A DEFERRED SUBMITTAL TO THE AHJ SHOP DRAWINGS AND CALCULATIONS INDICATING THE SYSTEM LAYOUT. THE PROFESSIONAL SHALL REVIEW THE SHOP DRAWINGS AND CALCULATIONS PRIOR TO THE DEFERRED SUBMISSION TO THE AHJ AND PROVIDE NOTATION ON THE DRAWINGS INDICATING THEY WERE REVIEWED BY THE PROFESSIONAL.SUBMIT REVIEWED DRAWINGS PRIOR TO INSTALLATION.

MATRIX OF OPERATIONS

SYSTEM INPUTS / SYSTEM OUTPUTS

	SYSTEM INPUTS	A: ACTUATE FAP TROUBLE LAMP	B: ACTUATE FAP AUDIBLE TROUBLE SIGNAL	C: ACTUATE FAP SUPERVISORY LAMP	D: ACTUATE FAP SUPERVISORY SIGNAL	E: ACTUATE FAP ALARM LAMP	F: ACTUATE FAP AUDIBLE ALARM SIGNAL	G: ACTUATE REMOTE ANNUNCIATOR PANEL	H: ACTUATE ALARM SIGNAL TO ALL BUILDING AREAS	I: TRANSMIT TROUBLE SIGNAL TO SUPERVISING STATION	J: TRANSMIT SUPERVISORY SIGNAL TO SUPERVISING STATION	K: TRANSMIT FIRE ALARM SIGNAL TO SUPERVISING STATION	L: SHUT DOWN ASSOCIATED AIR HANDLER	M: CLOSE ASSOCIATED SMOKE DAMPER	N:	
1	ANY GENERAL BUILDING DETECTOR IN TROUBLE	X	X					X		X	X					1
2	ANY GENERAL BUILDING DETECTOR IN ALARM					X	X	X	X	X		X				2
3	ANY GENERAL BUILDING MANUAL PULL STATION IN ALARM					X	X	X	X	X		X				3
4	ANY DUCT DETECTOR IN ALARM			X	X			X		X		X		X	X	4
5	FIRE ALARM AC POWER FAILURE			X	X			X		X		X				5
6	FIRE ALARM SYSTEM LOW BATTERY	X	X					X		X	X					6
7	OPEN CIRCUIT	X	X					X		X	X					7
8	GROUND FAULT	X	X					X		X	X					8
9	NOTIFICATION APPLIANCE CIRCUIT SHORT	X	X					X		X	X					9
10	ANY TROUBLE ALARM	X	X					X		X	X					10
11	KITCHEN HOOD EXTINGUISHING SYSTEM ACTIVATION					X	X	X	X	X		X				11
12	ANY GENERAL BUILDING CARBON MONOXIDE ALARM			X	X			X		X		X				12
13	ERRCS LOSS OF NORMAL AC POWER SUPPLY			X	X			X		X		X				12
14	ERRCS BATTERY CHARGER FAILURE			X	X			X		X		X				12
15	ERRCS MALFUNCTION OF THE DONOR ANTENNA(S)			X	X			X		X		X				12
16	ERRCS FAILURE OF ACTIVE RF-EMITTING DEVICES(S)			X	X			X		X		X				12
17	ERRCS LOW-BATTERY CAPACITY AT 70-PERCENT REDUCTION OF OPERATING CAPACITY			X	X			X		X		X				12
18	ERRCS FAILURE OF CRITICAL SYSTEM COMPONENTS			X	X			X		X		X				12
19	ERRCS COMMUNICATION WITH FIRE ALARM SYSTEM FAILURE			X	X			X		X		X				12
20	ERRCS ACTIVE RF-EMITTING DEVICES OSCILLATION			X	X			X		X		X				12
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	

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7/17/2026

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CHECK BY: MJB
SCALE:

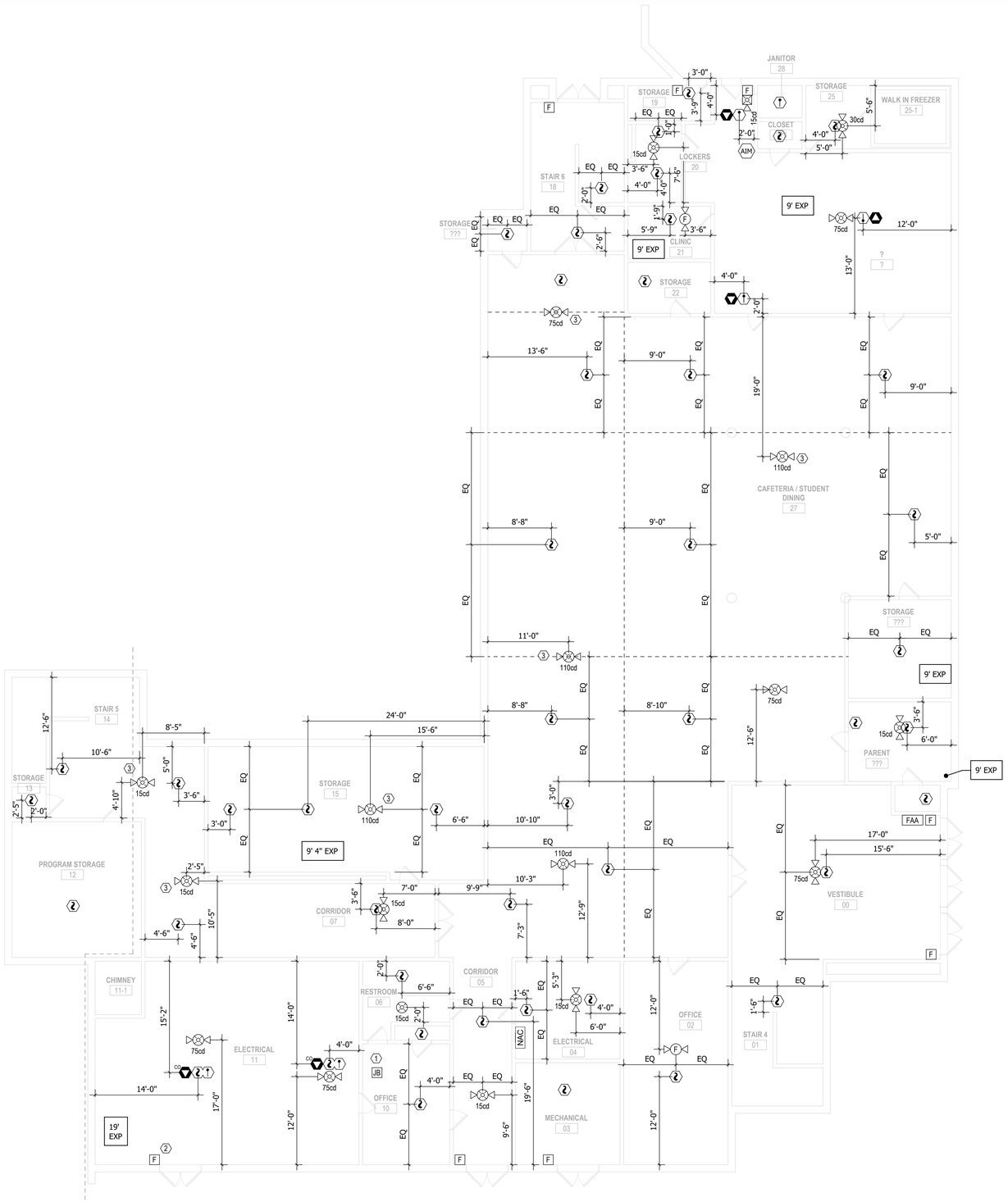
FIRE ALARM UPGRADE AT MARY ANN WINTERLING ELEMENTARY SCHOOL #012
PSC NUMBER: 30.225.26SR

220 NORTH BENTALOU STREET
BALTIMORE, MD 21223

SYMBOLS, LEGENDS, AND ABBREVIATIONS - FIRE ALARM

SCHOOL NUMBER #150

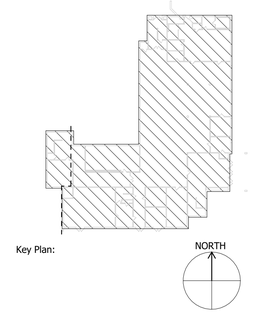
DRAWING NO.
FA000



1 / FA101 GROUND FLOOR CONSTRUCTION PLAN - FIRE ALARM
1/8" = 1'-0"

KEYED NOTES:

1. PROVIDE A JUNCTION BOX WITH A TERMINAL BLOCK TO ALLOW THE NAC/AMP CIRCUIT TO BE EXTENDED IN THE FUTURE SHOULD BE THE ROOM'S USE CHANGE.
2. MOUNT THE DEVICE TO THE DOOR MULLION. ALL WIRING SHALL BE CONCEALED INSIDE THE MULLION.
3. MOUNT THE DEVICE TO THE BOTTOM OF THE BEAM.



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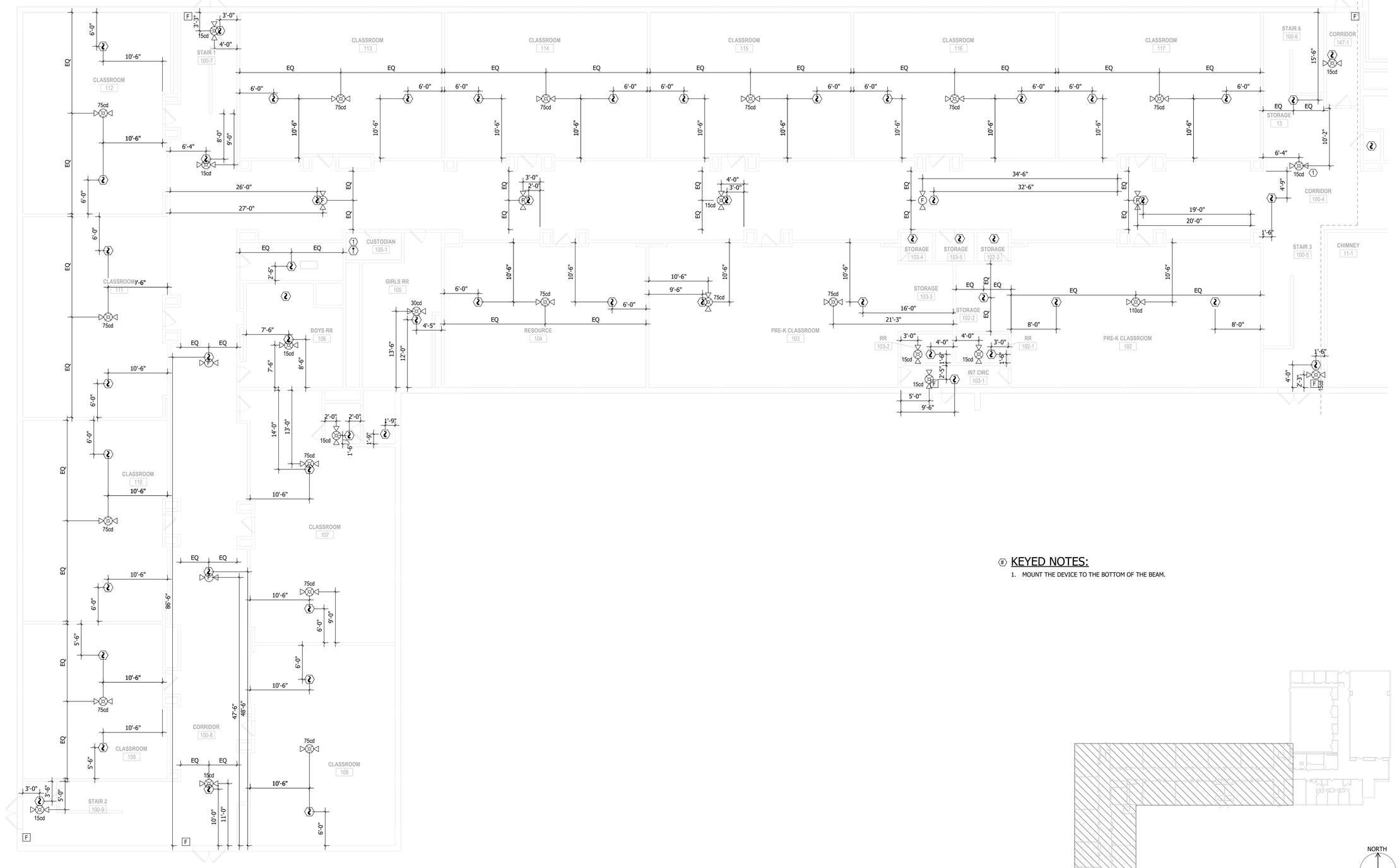
GROUND FLOOR - CONSTRUCTION PLAN - FIRE ALARM

SCHOOL NUMBER #150

DRAWING NO.
FA101



1 FA102 FIRST FLOOR AREA A CONSTRUCTION PLAN - FIRE ALARM
1/8" = 1'-0"

KEYED NOTES:

1. MOUNT THE DEVICE TO THE BOTTOM OF THE BEAM.

Key Plan:

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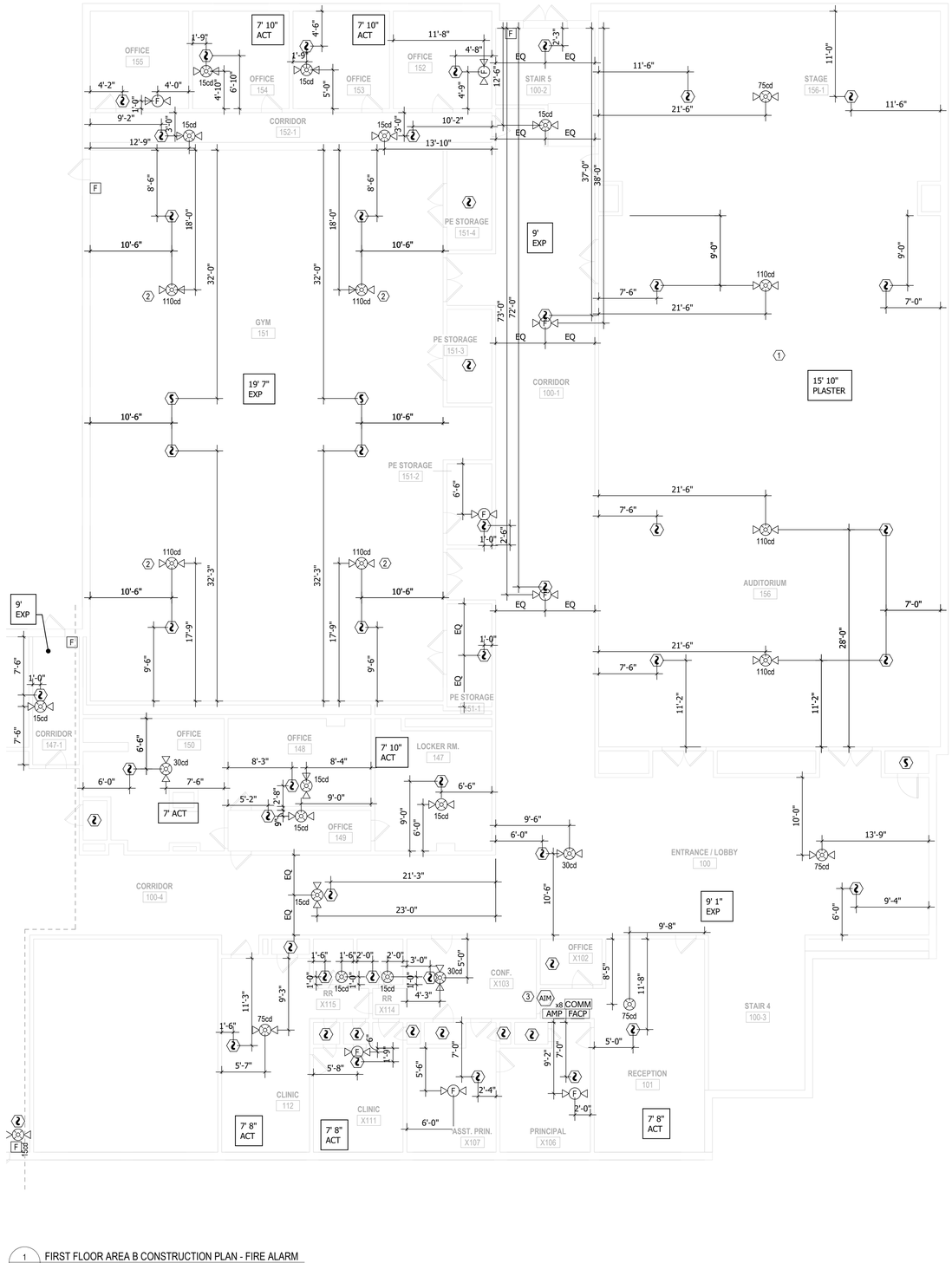
FIRST FLOOR - AREA A - CONSTRUCTION PLAN - FIRE ALARM

SCHOOL NUMBER #150

DRAWING NO.
FA102



1 FA103 FIRST FLOOR AREA B CONSTRUCTION PLAN - FIRE ALARM
1/8" = 1'-0"

GENERAL NOTES:

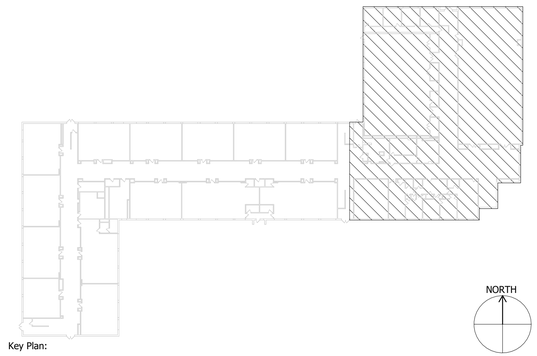
1. PROVIDE PROTECTIVE CAGES ON ALL DEVICES IN THE GYM.

(#) KEYED NOTES:

1. ALIGN THE DEVICES IN THE SPACE WITH THE PENDENT LIGHTS.
2. MOUNT THE DEVICE TO THE BOTTOM CHORD OF THE JOIST.
3. PROVIDE ADDRESSABLE INPUT MODULES TO MONITOR THE EMERGENCY RESPONDER RADIO COMMUNICATION (ERRC) SYSTEM FOR THE FOLLOWING POINTS:
   - LOSS OF NORMAL AC POWER SUPPLY
   - SYSTEM BATTERY CHARGER FAILURE
   - MALFUNCTION OF THE DONOR ANTENNA(S)
   - FAILURE OF ACTIVE RF-EMITTING DEVICES(S)
   - LOW-BATTERY CAPACITY AT 70-PERCENT REDUCTION OF OPERATING CAPACITY.
   - FAILURE OF CRITICAL SYSTEM COMPONENTS
   - COMMUNICATION FAILURE WITH FIRE ALARM SYSTEM.
   - OSCILLATION OF ACTIVE RF-EMITTING DEVICES.

ADD ALTERNATE #1

1. THE EIGHT (8) ADDRESSABLE INPUT MODULES ASSOCIATED WITH MONITORING THE ERRCS.



Key Plan:

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PSC NUMBER: 30.225.26SR

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FIRST FLOOR - AREA B - CONSTRUCTION PLAN - FIRE ALARM

SCHOOL NUMBER #150

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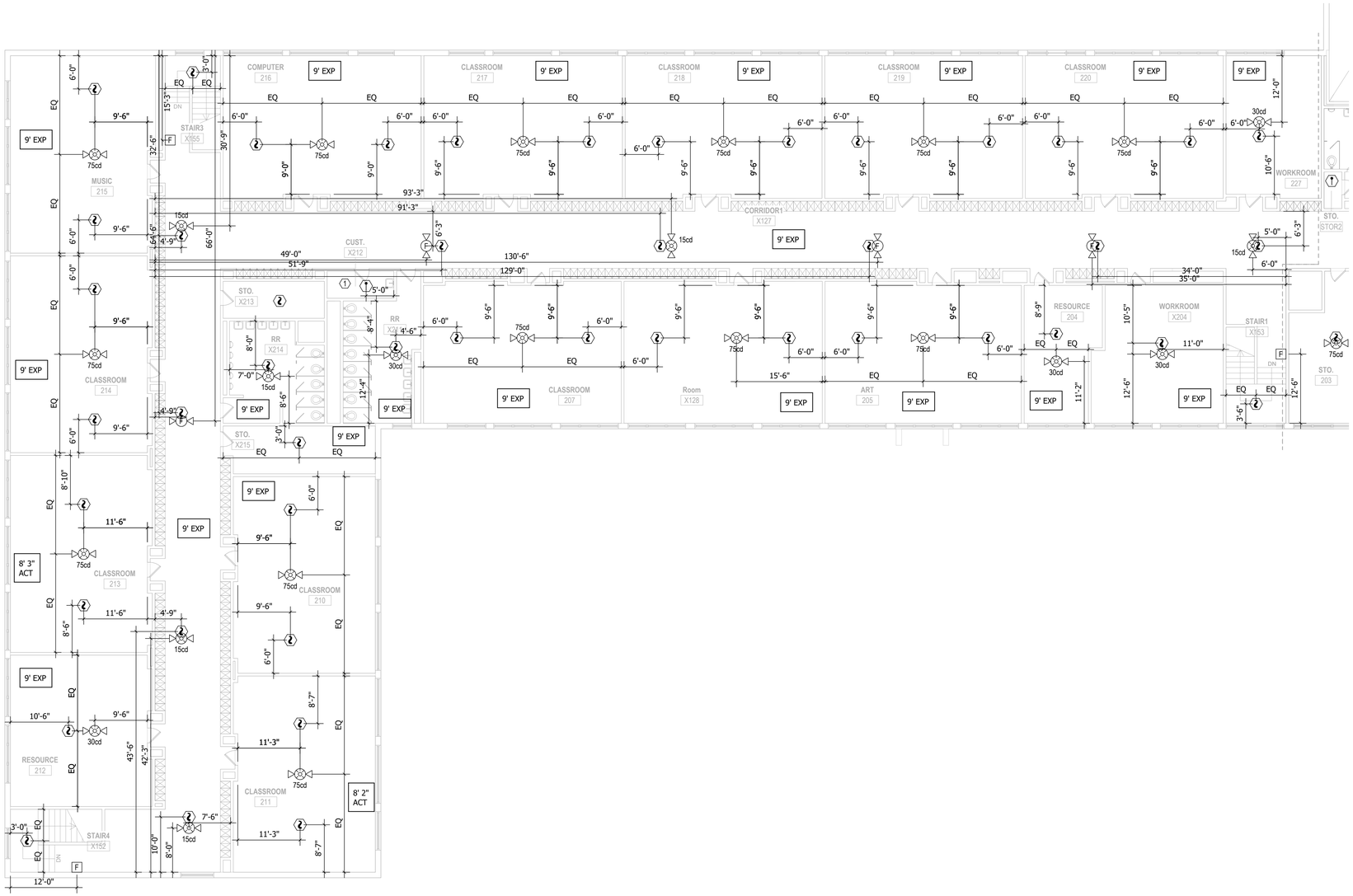
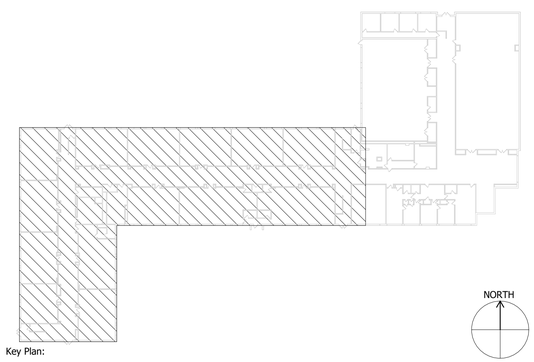
FA103



1 FA104 SECOND FLOOR AREA A CONSTRUCTION PLAN - FIRE ALARM
3/32" = 1'-0"

KEYED NOTES:

1. MOUNT THE DEVICE TO THE BOTTOM OF THE BEAM.



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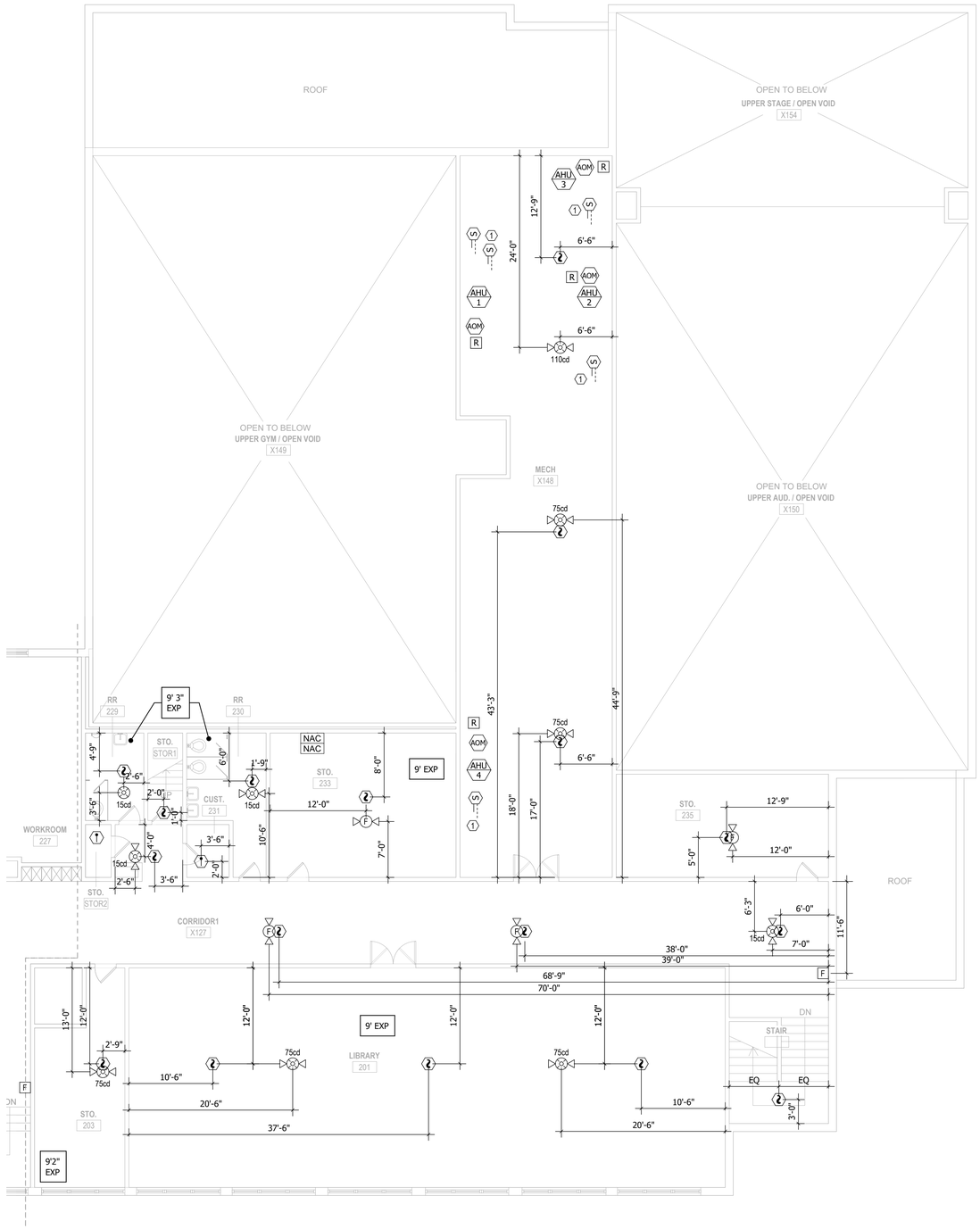
SECOND FLOOR - AREA A - CONSTRUCTION PLAN - FIRE ALARM

SCHOOL NUMBER #150

DRAWING NO. FA104



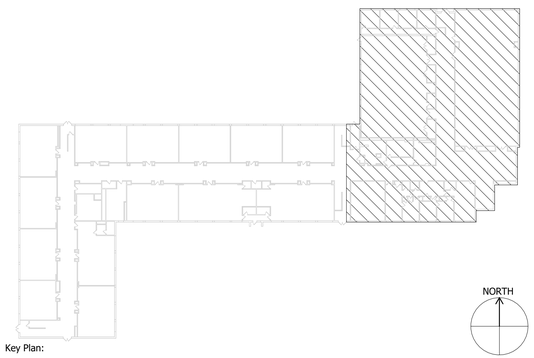
1 FA105 SECOND FLOOR AREA B CONSTRUCTION PLAN - FIRE ALARM
1/8" = 1'-0"

GENERAL NOTES:

1. THE ADDRESSABLE INTERFACE MODULES FOR THE HVAC SYSTEM SHALL BE INSTALLED WITHIN 3-FEET OF THE CONTROLLER FOR THE ASSOCIATED HVAC UNIT.

(#) KEYED NOTES:

1. PROVIDE THE NEW DUCT DETECTOR IN THE SAME LOCATION AS THE EXISTING DUCT DETECTOR.



Key Plan:

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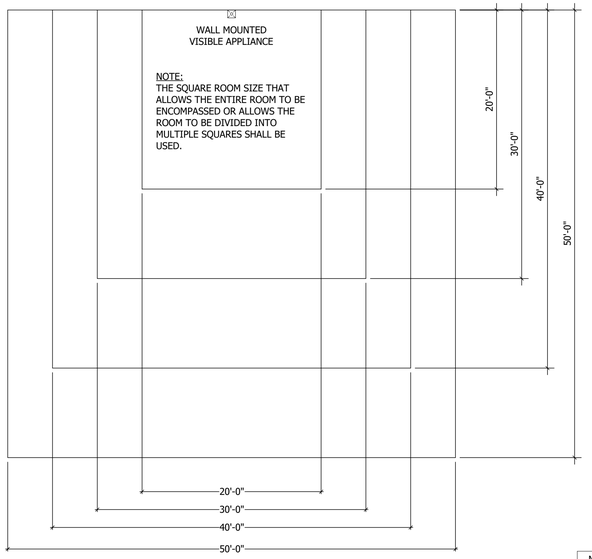
SECOND FLOOR - AREA B - CONSTRUCTION PLAN - FIRE ALARM

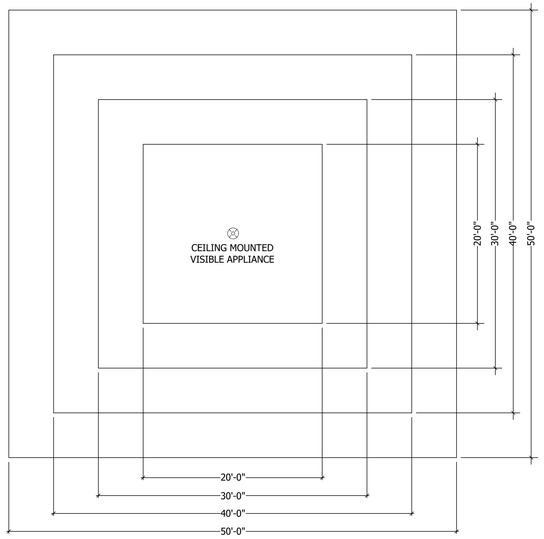
SCHOOL NUMBER #150

DRAWING NO.
FA105



MAXIMUM ROOM SIZE (FT)	MINIMUM REQUIRED LIGHTING OUTPUT (CD) ONE LIGHT PER ROOM
20 X 20	15
28 X 28	30
30 X 30	34
40 X 40	60
45 X 45	75
50 X 50	94
54 X 54	110
55 X 55	115
60 X 60	135
63 X 63	150
68 X 68	177

9 / FA500 FIRE ALARM WALL MOUNTED VISIBLE APPLIANCE SPACING TEMPLATE
NOT TO SCALE

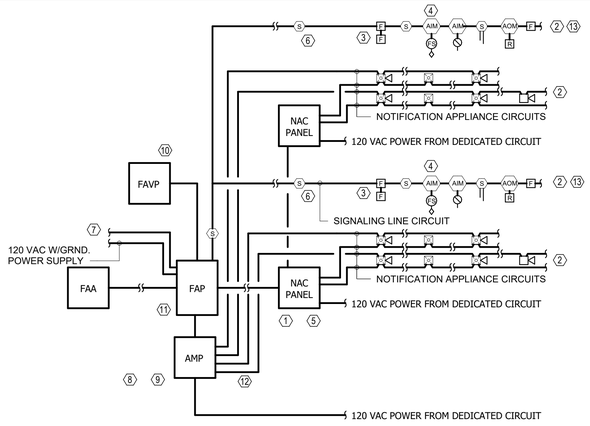


MAXIMUM ROOM SIZE (FT)	MAXIMUM LENS HEIGHT (FT)	MINIMUM REQUIRED LIGHTING OUTPUT (CD)
20 X 20	10	15
30 X 30	10	30
40 X 40	10	60
44 X 44	10	75
50 X 50	10	95
53 X 53	10	110
55 X 55	10	115
59 X 59	10	135
63 X 63	10	150
68 X 68	10	177
70 X 70	10	185

MAXIMUM ROOM SIZE (FT)	MAXIMUM LENS HEIGHT (FT)	MINIMUM REQUIRED LIGHTING OUTPUT (CD)
20 X 20	20	30
30 X 30	20	45
40 X 40	20	75
44 X 44	20	80
50 X 50	20	95
53 X 53	20	110
55 X 55	20	115
59 X 59	20	135
63 X 63	20	150
68 X 68	20	177
70 X 70	20	185

MAXIMUM ROOM SIZE (FT)	MAXIMUM LENS HEIGHT (FT)	MINIMUM REQUIRED LIGHTING OUTPUT (CD)
20 X 20	30	55
30 X 30	30	75
50 X 50	30	95
53 X 53	30	110
55 X 55	30	115
59 X 59	30	135
63 X 63	30	150
68 X 68	30	177
70 X 70	30	185

8 / FA500 FIRE ALARM CEILING MOUNTED VISABLE APPLIANCE SPACING TEMPLATE
NOT TO SCALE



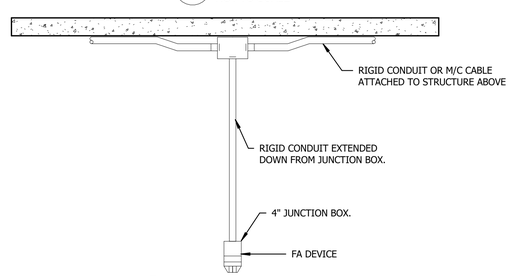
NOTES:

1. THE TYPE OF DEVICE AT THIS LOCATION WILL DEPEND ON THE MANUFACTURER'S EQUIPMENT. NOTHING IN THE DESIGN DOCUMENTS IS INTENDED, NOR SHOULD IT BE CONSTRUED, TO LIMIT THE TYPES OF DEVICES THAT MAY BE USED, PROVIDED THE INTENDED SYSTEM PERFORMANCE IS ACHIEVED AND WITHIN THE UL LISTING.
2. THE DEVICES SHOWN ON THE RISER DIAGRAM ARE REPRESENTATIVE OF THOSE TO BE PROVIDED THROUGHOUT THE BUILDING. THEY ARE NOT INTENDED TO SHOW TOTAL QUANTITIES OF DEVICES. THE CONTRACTOR SHALL REFER TO THE FLOOR PLANS FOR THIS INFORMATION.
3. THE SIGNALING LINE CIRCUIT MAY BE T-TAPPED, PROVIDED THE LOCATION OF THE T-TAP IS CLEARLY SHOWN ON THE SHOP DRAWINGS, IS PERFORMED IN A JUNCTION BOX, AND IS MADE WITH A TERMINAL STRIP. PIGTAILING IS NOT PERMITTED.
4. ADDRESSABLE INTERFACE MODULES ARE REQUIRED FOR NON-ADDRESSABLE INITIATING AND INDICATING DEVIES FOR CONNECTION TO THE FIRE ALARM SYSTEM. SEE THE WIRING SCHEMATICS ON THIS DRAWING FOR ADDITIONAL INFORMATION.
5. PROVIDE REMOTE NOTIFICATION APPLIANCE CIRCUIT POWER BOOSTER PANELS AS REQUIRED.
6. PROVIDE A SMOKE DETECTOR ABOVE ALL CONTROL PANELS (TYPICAL).
7. THE LOCATION AND TYPE OF INTERFACE DEVICE FOR CONNECTION TO THE MONITORING SERVICE MUST BE COORDINATED WITH CONTRACTING SERVICE COMPANY.
8. AMP PANELS ARE PERMITTED TO BE CENTRALLY LOCATED OR DISTRIBUTED IN LOCATIONS ADJACENT TO THE NAC PANELS.
9. PROVIDE AMPLIFIER PANEL CAPACITY AS REQUIRED.
10. THE FIRE ALARM VOICE PANEL SHALL BE LOCATED ADJACENT TO OR INTEGRAL WITH THE MAIN FIRE ALARM PANEL.
11. PROVIDE THE LOCATION OF THE NAC PANELS AT THE MAIN FIRE ALARM PANEL.
12. PAGING ZONES SHALL BE EXIT STAIRWAYS AND EACH FLOOR PER IBC 2021 SECTION 907.5.2.2.
13. UTILIZE A TERMINAL CABINET TO BREAK THE SLC CIRCUIT INTO SMALLER SECTIONS TO ALLOW FOR TESTING OF GROUND FAULTS. LABEL THE LOCATION OF THE TERMINAL CABINET IN THE FIRE ALARM PANEL AND BELOW THE CEILING AT THE ACTUAL LOCATION OF THE TERMINAL STRIP. THE SECTIONS SHALL BE BASED ON THE PHYSICAL LAYOUT OF THE BUILDING (EX. WINGS OR FLOORS).

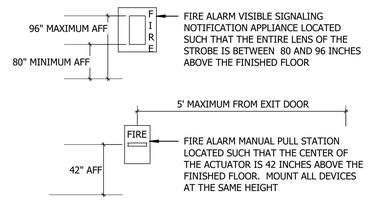
5 / FA500 FIRE ALARM SYSTEM RISER DIAGRAM - MULTIPLE FLOORS VOICE SYSTEM
NOT TO SCALE

NOTES:
PROVIDE 24VDC POWER SUPPLY FROM FACP AS RQUIRED.
PROVIDE RELAY AS REQUIRED.
VERIFY POWER DRAW AND VOLTAGE OF DEVICE WITH THE RESPECTIVE CONTRACTOR.

6 / FA500 FIRE ALARM CONTROL INTERFACE DETAIL
NOT TO SCALE



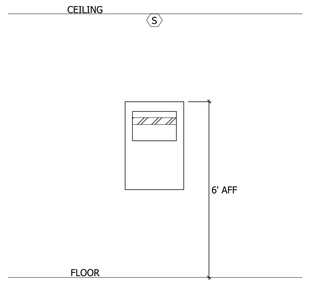
7 / FA500 FIRE ALARM PENDENT MOUNT DEVICE DETAIL
NOT TO SCALE



NOTES:

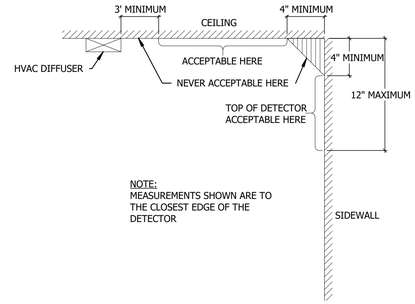
1. WHERE FLOOR PLAN INDICATES THAT NOTIFICATION APPLIANCE AND MANUAL PULL STATION ARE LOCATED IN THE SAME AREA, THEY SHALL BE MOUNTED IN THE SAME VERTICAL LINE.

1 / FA500 FIRE ALARM MANUAL PULL STATION AND STROBE DETAIL
NOT TO SCALE



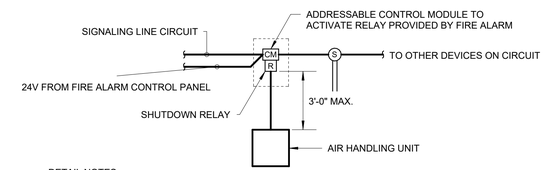
NOTES:
FOR BLOCK WALLS - COORDINATE MOUNTING HEIGHT WITH TOP OF COURSE OF BLOCK NEAREST 6 FEET AFF.

2 / FA500 FIRE ALARM PANEL ANNUNCIATOR MOUNTING DETAIL
NOT TO SCALE



NOTE:
MEASUREMENTS SHOWN ARE TO THE CLOSEST EDGE OF THE DETECTOR

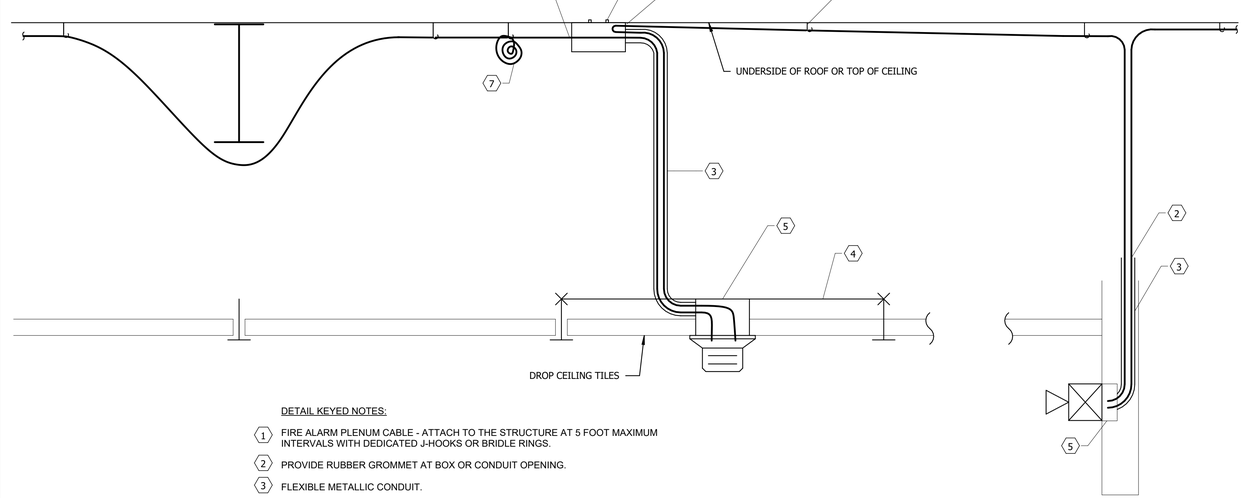
3 / FA500 FIRE ALARM PROPER PLACEMENT FOR DETECTORS DETAIL
NOT TO SCALE



DETAIL NOTES:

1. ACTIVATION OF DUCT DETECTOR SHALL CAUSE SHUT DOWN RELAY TO BE ACTIVATED.
2. DUCT SMOKE DETECTOR PROVIDED BY THE FIRE ALARM CONTRACTOR AND INSTALLED BY OTHERS. ALL CONNECTION, POWER SUPPLY, AND RELAY SHALL BE BY THE FIRE ALARM CONTRACTOR.
3. THE ARRANGEMENT SHOWN DOES NOT PROHIBIT THE USE OF A RELAY BASE DUCT DETECTOR AS LONG AS THE HVAC DEVICE SHUT DOWN IS ACCOMPLISHED WITHIN 3 FEET OF THE RELAY.
4. ALL CONNECTIONS SHALL BE BY THE FIRE ALARM CONTRACTOR.

100 / FA500 FIRE ALARM HVAC SHUT DOWN INTERFACE - ADDRESSABLE PANEL
NOT TO SCALE



DETAIL KEYED NOTES:

1. FIRE ALARM PLENUM CABLE - ATTACH TO THE STRUCTURE AT 5 FOOT MAXIMUM INTERVALS WITH DEDICATED J-HOOKS OR BRIDLE RINGS.
2. PROVIDE RUBBER GROMMET AT BOX OR CONDUIT OPENING.
3. FLEXIBLE METALLIC CONDUIT.
4. CADDY ACOUSTICAL "TEE BAR" ELECTRICAL BOX HANGER OR EQUAL.
5. JUNCTION BOX.
6. SECURELY FASTEN FLEXIBLE METALLIC CONDUIT TO STRUCTURE VIA A JUNCTION BOX OR CONDUIT FITTING AND CLAMP.
7. COIL EXCESS WIRE ON A J-HOOK OR BRIDLE RING ADJACENT TO CONDUIT.

10 / FA500 FIRE ALARM PLENUM WIRING AND DEVICE MOUNTING
NOT TO SCALE

7/17/2026 10:05:10 AM

Baltimore City Public Schools

WINDWARD ENGINEERS & CONSULTANTS
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Harrisburg, PA 17111
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410.244.8255 phone
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Johnson Consulting Engineers, Inc.
130 W. 25th, Suite 200 Street
Baltimore, Maryland 21218
Tel: (410) 235-0057
Fax: (410) 235-0946
Email: jcengineers@juno.com

SEAL
STATE OF MARYLAND · MATTHEW J. RIFFON · 34852 · PROFESSIONAL ENGINEER
7/17/2026

PROFESSIONAL CERTIFICATION
I CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.
LICENSE NUMBER: 34852
EXPIRATION DATE: 08/13/2027

REVISIONS

NO.	REVISION	DATE
1		
2		
3		
4		
5		
6		

HKA PROJECT #:

DESIGNED BY:	SRT
DRAWN BY:	ALT
CHECK BY:	MJB
SCALE:	

FIRE ALARM UPGRADE AT MARY ANN WINTERLING ELEMENTARY SCHOOL #012
PSC NUMBER: 30.225.26SR

220 NORTH BENTALOU STREET
BALTIMORE, MD 21223

DETAILS - FIRE ALARM

SCHOOL NUMBER #150

DRAWING NO.
FA500

Versar INC.

ASBESTOS-CONTAINING MATERIALS MANAGEMENT PLAN AND APPENDICES A AND B

FOR

BENTALOU ELEMENTARY SCHOOL PS150

PREPARED FOR:

THE BOARD OF SCHOOL COMMISSIONERS
FOR THE CITY OF BALTIMORE

PREPARED BY:

VERSAR, INC.
6850 VERSAR CENTER
SPRINGFIELD, VA 22151

MAY 9, 1989

Versar INC.

The Designated LEA Representative, Mr. William A. Gieseking, certifies that the local educational authority (LEA) responsibilities as stipulated by Paragraph 763.84 of the Final Rule for Asbestos-Containing Materials in Schools (see Appendix B) have been met or will be met.

Signature: William A. Gieseking

Date: April 6, 1989

STATE OF MARYLAND TO WIT; CITY OF BALTIMORE.

I HEREBY CERTIFY THAT ON THIS **6th** day of **April** , 19**89**, before me, the Subscriber, a Notary Public of the State of Maryland in and for the City of Baltimore, personally appeared WILLIAM A. GIESEKING, Designated LEA Representative and he acknowledged the afore going certification to be his act.

WITNESS my hand and Notorial Seal,

Phyllis J. Karas

Phyllis J. Karas

Notary Public

My Commission Expires: **July 1, 1990**

ASBESTOS-CONTAINING BUILDING MATERIALS (ACBM) INVENTORY BY BUILDING

BULDING NUMBER *	BUILDING NAME	ADDRESS	FRIABLE ACBM	NON-FRIABLE ACBM	ASSUMED FRIABLE ACBM	ASSUMED NON-FRIABLE ACBM	NO ACBM FOUND	NO SUSPECT MATERIAL
PS004	STEWART HILL	30 S. GILMOR STREET	X	X		X		
PS005	LANGSTON HUGHES	5011 ARBUTUS AVENUE		X		X		
PS007	CECIL	2000 CECIL AVENUE	X	X		X		
PS008	CITY SPRING	100 S. CAROLINE STREET	X	X		X		
PS009	CARROLL PARK	1300 HERKIMER STREET	X			X		
PS010	JAMES McHENRY	31 S. SCHROEDER STREET	X			X		
PS011	EUTAW-MARSHBURN	1624 EUTAW PLACE	X			X		
PS011A	EUTAW-MARSHBURN	1624 EUTAW PLACE	X					
PS012	LAKELAND	2921 STRANDEN ROAD	X	X		X		
PS013	TENCH TILGHMAN	600 N. PATTERSON PARK A		X		X		
PS014	PARK HEIGHTS	4910 PARK HEIGHTS AVENUE		X	X			
PS016	JOHNSON SQUARE	1101 VALLEY STREET	X	X	X			
PS019	LEXINGTON TERRACE	732 W. LEXINGTON STREET	X			X		
PS021	HILTON	3301 CARLISLE AVENUE	X	X	X	X		
PS023	GENERAL WOLFE	245 S. WOLFE STREET		X	X			
PS024	WESTSIDE	2235 NORTH FULTON AVENUE	X	X		X		
PS025	DR. RAYNOR BROWNE	1000 N. MONTFORD AVENUE		X	X	X		
PS026	MADISON SQUARE	1401 E. BIDDLE STREET	X	X		X		
PS027	COMMODORE RODGERS	100 N. CHESTER STREET	X			X		
PS028	WILLIAM PINDERHUGHES	1200 N. FREMONT AVENUE		X		X		
PS029	MATHEW A. HENSON	1600 N. PAYSON STREET	X	X		X		
PS030	GEORGE STREET	601 N. BRUNE STREET	X	X	X	X		
PS031	COLDSTREAM PARK	400 EXETER HALL AVENUE	X	X		X		
PS032	MILDRED MONROE	1634 GUILFORD AVENUE	X	X		X		
PS034	BARRISTER CHARLES CARROLL	1327 WASHINGTON BOULEVARD		X		X		
PS035	HARLEM PARK	1401 W. LAFAYETTE AVENUE	X	X				
PS036	HARFORD HEIGHTS	1919 N. BROADWAY	X	X		X		
PS038	MALCOLM X	2810 SHIRLEY AVENUE	X	X		X		
PS039	DALLAS F. NICHOLAS, SR.	101 E. 21ST STREET		X		X		
PS040	LAKE CLIFTON	2801 SAINT LO DRIVE	X	X	X	X		
PS041	HAMILTON	5609 SEFTON AVENUE	X	X		X		
PS042A	GARRISON	3910 BARRINGTON ROAD	X		X			
PS042B	GARRISON	3910 BARRINGTON ROAD	X			X		
PS043	HAMPSTEAD HILL	101 S. ELLWOOD AVENUE	X	X	X			
PS044	MONTEBELLO	2040 E. 32ND STREET	X	X	X			
PS045	FEDERAL HILL	1040 WILLIAM STREET	X	X		X		
PS046	CHINQUAPIN	900 WOODBROUNE AVENUE	X	X		X		
PS047	HAMPSTEAD HILL	500 S. LINWOOD AVENUE	X	X		X		
PS049	NORTHEAST	5001 MORAVIA ROAD		X		X		
PS050	ADMINISTRATION	1300 GORSUCH AVENUE	X	X		X		
PS051	WAVERLY	3400 ELLERSLIE AVENUE	X	X		X		
PS051A	WAVERLY	3400 ELLERSLIE AVENUE					X	
PS051B	WAVERLY	3400 ELLERSLIE AVENUE					X	
PS051C	WAVERLY	3400 ELLERSLIE AVENUE					X	
PS051D	WAVERLY	3400 ELLERSLIE AVENUE					X	

BALTIMORE CITY SCHOOL MANAGEMENT PLAN LIST

ASBESTOS-CONTAINING BUILDING MATERIALS (ACBM) INVENTORY BY BUILDING

BULDING NUMBER *	BUILDING NAME	ADDRESS	FRIABLE ACBM	NON-FRIABLE ACBM	ASSUMED FRIABLE ACBM	ASSUMED NON-FRIABLE ACBM	NO ACBM FOUND	NO SUSPECT MATERIAL
PS053	MARGARET BRENT	2601 ST. PAUL STREET				X		
PS054	BARCLAY	2900 BARCLAY STREET	X	X		X		
PS055	HAMPDEN	3608 CHESTNUT AVENUE		X		X		
PS056	ROBERT POOLE	1300 W. 36TH STREET	X	X		X		
PS057	LOMBARD	1500 E. LOMBARD STREET	X	X		X		
PS058	ASHBURTON	3935 HILTON ROAD	X	X		X		
PS058A	ASHBURTON	3935 HILTON ROAD					X	
PS058B	ASHBURTON	3935 HILTON ROAD					X	
PS058C	ASHBURTON	3935 HILTON ROAD					X	
PS058D	ASHBURTON	3935 HILTON ROAD					X	
PS060	GWYNNS FALLS	2700 GWYNNS FALLS PARKWAY	X	X		X		
PS060A	GWYNNS FALLS	2700 GWYNNS FALLS PARKWAY		X		X		
PS060B	GWYNNS FALLS	2700 GWYNNS FALLS PARKWAY		X		X		
PS060C	GWYNNS FALLS	2700 GWYNNS FALLS PARKWAY				X		
PS061	JOHN EAGER HOWARD	2011 LINDEN AVENUE	X	X		X		
PS062	EDGECOMBE CIRCLE	2835 VIRGINIA AVENUE	X	X		X		
PS063	ROSEMONT	2777 PRESTMAN STREET	X	X		X		
PS064	LIBERTY	3901 MAINE AVENUE		X		X		
PS066	MOUNT ROYALE	121 MCMECHAN STREET	X	X		X		
PS067	EDGEWOOD	1900 N. EDGEWOOD STREET	X	X	X			
PS070	SOUTHERN	1100 COVINGTON STREET	X	X		X		
PS073	SARAH M. ROACH	3434 OLD FREDERICK ROAD	X	X		X		
PS075	CALVERTON	1100 WHITMORE AVENUE	X	X	X			
PS076N	FRANCIS SCOTT KEY	1425 EAST FORT AVENUE					X	
PS077	HERRING RUN	5001 SINCLAIR LANE	X	X		X		
PS078	HARLEM PARK	1500 HARLEM AVENUE	X	X	X	X		
PS079A	PORTABLE	2801 N. DUKE STREET	X		X			
PS079	WILLIAM H. LEMMEL	2801 N. DUKELAND STREET	X	X		X		
PS080	WEST BALTIMORE	201 N. BEND ROAD	X	X				
PS081	OFFICES (#81)	181 N. BEND STREET	X	X		X		
PS082	GREENSPRING	4701 GREENSPRING AVENUE	X			X		
PS083	WILLIAM PACA	200 N. LAKEWOOD AVENUE	X	X		X		
PS084	THOMAS JOHNSON	100 E. HEATH STREET	X	X		X		
PS085	FORT WORTHINGTON	2701 E. OLIVER STREET	X	X	X	X		
PS086	LAKEWOOD	2625 FEDERAL STREET	X			X		
PS087	WINDSOR HILLS	4001 ALTO ROAD	X	X	X			
PS088	LYNDHURST	621 WILDWOOD PARKWAY	X	X		X		
PS089	ROGNEL HEIGHTS	4300 SIDEHILL ROAD	X	X		X		
PS093	NORTHERN PARKWAY	2500 E. NORTHERN PARKWAY	X	X	X			
PS095	FRANKLIN SQUARE	1400 W. LEXINGTON STREET	X	X	X	X		
PS097	COLLINGTON SQUARE	1409 N. COLLINGTON AVENUE	X			X		
PS098	SAMUEL B.F. MORSE	424-426 S. PULASKI STREET		X	X			
PS101	ELMER A. HENDERSON	1101 N. WOLFE STREET	X	X		X		
PS102	THOMAS G. HAYES	601 CENTRAL AVENUE	X	X	X	X		
PS105	MORAVIA PARK	6201 FRANKFORD AVENUE	X	X		X		

BALTIMORE CITY SCHOOL MANAGEMENT PLAN LIST

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BULDING NUMBER *	BUILDING NAME	ADDRESS	FRIABLE ACBM	NON-FRIABLE ACBM	ASSUMED FRIABLE ACBM	ASSUMED NON-FRIABLE ACBM	NO ACBM FOUND	NO SUSPECT MATERIAL
PS107	GILMOR	1321 N. GILMOR STREET	X	X		X		
PS115	VENABLE	700 E. 34H STREET	X	X		X		
PS117	DUKE ELLINGTON	790 W. NORTH AVENUE		X	X			
PS122	SAMUEL COLERIDGE TAYLOR	507 W. PRESTON STREET	X	X		X		
PS124	BAY BROOK	4301 10TH STREET	X			X		
PS125	FURMAN L. TEMPLETON	1200 PENNSYLVANIA AVENUE		X		X		
PS130	BOOKER T. WASHINGTON	1301 MCCULLOCH STREET	X	X	X			
PS133	DUNBAR	500 N. CAROLINE STREET	X			X		
PS134	WALTER P. CARTER	820 E. 43RD STREET		X	X			
PS135	LUTHER CRAVEN MITCHELL	1731 E. CHASE STREET			X			
PS138	HARRIETT TUBMAN	1807 HARLEM AVENUE		X	X			
PS139	CHARLES CARROLL OF CARROLL	200 N. CENTRAL AVENUE	X	X		X		
PS142	ROBERT COLEMAN	2400 WINDSOR AVENUE		X		X		
PS144	JAMES MOSHER	1000 N. WHELLER AVENUE	X	X		X		
PS145	ALEXANDER HAMILTON	800 POPLAR GROVE STREET		X		X		
PS150	BENTALOU	220 N.BENTALOU STREET	X	X	X			
PS157	GEORGE G. KELSON	701 GOLD STREET	X	X		X		
PS159	CHERRY HILL	801 BRIDGEVIEW ROAD	X	X	X	X		
PS160	CARTER GODWIN WOODSON	2501 SEABURY ROAD	X	X		X		
PS161	GEORGE WASHINGTON	1001 W. SARATOGA	X	X				
PS162	DIGGS-JOHNSON	501-503 W. BARRE STREET	X	X	X			
PS163	PATAPSCO	844 ROUNDVIEW ROAD	X	X		X		
PS164	ARUNDEL	2400 ROUND ROAD	X	X		X		
PS175	GEO. BRAGG NATURE CENTER	6601 BALT. NATIONAL PIKE	X			X		
PS177	GEORGE W. F. McMECHEN	4411 GARRISON BOULEVARD				X		
PS178	FRANCIS M. WOOD	100 N. CALHOUN STREET				X		
PS180	CHERRY HILL	2700 SEAMON ROAD	X	X		X		
PS201	DICKEY HILL	5025 DICKEY HILL ROAD	X	X		X		
PS202	LAFAYETTE	850 BRADDISH AVENUE	X	X		X		
PS203	MARCIE GARNETT FARRING	300 PONTIAC AVENUE		X		X		
PS204	MARY RODMAN	3510 W. MULBERRY STREET	X	X		X		
PS205	WOODHOME	7300 MOYER AVENUE	X	X		X		
PS206	FURLEY	4633 FURLEY AVENUE	X	X	X	X		
PS207	CURTIS BAY	4301 WEST BAY AVENUE	X	X		X		
PS209	WINSTON	1101 WINSTON AVENUE	X	X		X		
PS210	HAZELWOOD	4517 HAZELWOOD AVENUE	X	X	X	X		
PS211	GARDEN VILLE	5300 BELAIR ROAD	X	X		X		
PS212	GARRETT HEIGHTS	2800 AILSA AVENUE	X	X		X		
PS213	GOVANS	5801 YORK ROAD	X	X		X		
PS214	GUILFORD #214	4520 YORK ROAD	X	X		X		
PS215	HIGHLANDTOWN	3223 PRATT STREET		X		X		
PS216	FRANKFORD	6001 FRANKFORD AVENUE	X			X		
PS217	BELMONT	1406 N. ELLAMONT STREET	X	X	X	X		
PS219	YORKWOOD	5931 YORKWOOD ROAD	X	X		X		
PS220	MORRELL PARK	2601 TOLLEY STREET		X		X		

BALTIMORE CITY SCHOOL MANAGEMENT PLAN LIST

ASBESTOS-CONTAINING BUILDING MATERIALS (ACBM) INVENTORY BY BUILDING

BULDING NUMBER *	BUILDING NAME	ADDRESS	FRIABLE ACBM	NON-FRIABLE ACBM	ASSUMED FRIABLE ACBM	ASSUMED NON-FRIABLE ACBM	NO ACBM FOUND	NO SUSPECT MATERIAL
PS221	MOUNT WASHINGTON	1801 SULGRAVE AVENUE	X	X	X			
PS222	PIMLICO	3500 W. NORTHERN PARKWAY	X	X		X		
PS222A	PIMLICO	3500 W. NORTHERN PARKWAY		X				
PS223	PIMLICO	4849 PIMLICO ROAD	X	X	X			
PS224	GROVE PARK	5545 KENNISON AVENUE	X	X		X		
PS225	WESTPORT	2401 NEVADA STREET		X		X		
PS226	VIOLETVILLE	1207 PINE HEIGHTS AVENUE	X	X		X		
PS228	JOHN RUHRAH	701 RAPPOLLA STREET	X	X		X		
PS229	HOLABIRD	1500 IMLA STREET	X	X		X		
PS230	CANTON	801 S. HIGHLAND AVENUE	X			X		
PS231	BREHMS LANE	3536 BREHMS LANE	X	X	X			
PS232	THOMAS JEFFERSON	605 DRYDEN DRIVE	X	X		X		
PS233	ROLAND PARK	5207 ROLAND AVENUE	X	X		X		
PS234	ARLINGTON	3705 W. ROGERS AVENUE	X	X	X	X		
PS235	GLENMOUNT	6211 WALTHER AVENUE	X	X		X		
PS236	HAMILTON	6101 OLD HARFORD ROAD	X	X	X	X		
PS237	HIGHLANDTOWN	231 S. EATON STREET	X	X	X	X		
PS238	VICTORY	1440 CHESAPEAKE AVENUE	X	X		X		
PS239	BENJAMIN FRANKLIN	1201 CAMBRIA STREET	X	X				
PS240	GRACELAND PARK-O'DONNELL	6300 O'DONNELL STREET	X	X	X			
PS241	FALLSTAFF	3801 FALLSTAFF ROAD	X	X		X		
PS241A	FALLSTAFF	3801 FALLSTAFF ROAD		X				
PS242	NORTHWOOD	5201 LOCH RAVEN BOULEVARD	X	X	X			
PS242A	NORTHWOOD	5201 LOCH RAVEN BOULEVARD	X	X		X		
PS243	ARMISTEAD GARDENS	5001 E. EAGER STREET	X	X	X			
PS245	LEITH WALK	1235 SHERWOOD AVENUE	X	X	X			
PS245A	LEITH WALK	1235 SHERWOOD AVENUE	X			X		
PS246	BEECHFIELD	301 BEECHFIELD AVENUE	X	X		X		
PS247	CROSS COUNTRY	6100 CROSS COUNTRY BLVD.	X	X		X		
PS248	SINCLAIR LANE	3880 SINCLAIR LANE	X	X		X		
PS249	MEDFIELD HEIGHTS	4300 BUCHANAN AVENUE	X	X	X	X		
PS250	DR. BERNARD HARRIS, SR.	1400 N. CAROLINE STREET	X			X		
PS251	CALLAWAY	3701 FERNHILL AVENUE	X	X				
PS254	DR. MARTIN LUTHER KING, JR.	3750 GREENSPRING AVENUE	X	X		X		
PS255	SOUTHEAST	6820 FAIT AVENUE	X	X		X		
PS256	CALVIN RODWELL	3501 HILLSDALE ROAD		X		X		
PS260	FREDERICK	2501 FREDERICK AVENUE				X		
PS261	LOCKERMAN-BUNDY	301 N. PULASKI STREET		X		X		
PS301	WILLIAM S. BAER ELEMENTARY	2001 WARWICK AVENUE	X	X		X		
PS303	UPTON	811 W. LANVALE	X	X		X		
PS304	HARBOR VIEW ELEMENTARY	4301 10TH AVENUE	X	X	X			
PS307	CLAREMONT ELEMENTARY	5301 ERDMAN AVENUE	X	X		X		
PS310	FERNHILL ELEMENATRY	3915 FERNHILL AVENUE		X		X		
PS313	LOIS T. MURRAY	1600 E. ARLINGTON AVENUE		X		X		
PS314	SHARP-LEADENHALL	150 W. WEST STREET		X		X		

BALTIMORE CITY SCHOOL MANAGEMENT PLAN LIST

ASBESTOS-CONTAINING BUILDING MATERIALS (ACBM) INVENTORY BY BUILDING

BULDING NUMBER *	BUILDING NAME	ADDRESS	FRIABLE ACBM	NON-FRIABLE ACBM	ASSUMED FRIABLE ACBM	ASSUMED NON-FRIABLE ACBM	NO ACBM FOUND	NO SUSPECT MATERIAL
PS315	DR. LILLIE M. JACKSON	1501 ASBURTON STREET		X		X		
PS353A	WOODBURN CENTER	1301 WOODBURN AVE	X	X				
PS400	EDMONDSON	501 N. ATHOL AVENUE	X	X		X		
PS401	NORTHWESTERN	6900 PARK HEIGHTS AVENUE	X	X		X		
PS402	NORTHERN	2201 PINEWOOD AVENUE	X	X		X		
PS403	COB POLYTECH #403	1400 COLDSPRING LANE	X	X		X		
PS405	PATTERSON	100 KANE STREET	X	X		X		
PS406	FOREST PARK	3401 ELDORADO AVENUE		X		X		
PS407	WESTERN	4600 FALLS ROAD	X	X		X		
PS410	MERGENTHALER	3500 HILLEN ROAD	X	X		X		
PS412	SOUTHWESTERN	200 FONTHILL AVENUE	X			X		
PS413	HARBOR CITY LEARNING CTR.	4801 LIBERTY HEIGHTS AVE.	X	X		X		
PS414	PAUL LAURENCE DUNBAR	1400 ORLEANS STREET	X	X		X		
PS415	SCHOOL FOR THE ARTS	706-712 CATHEDRAL STREET	X	X	X	X		
PS420	WEST SIDE SKILLED CENTER	4501 EDMONDSON AVENUE	X	X	X			
PS450	FREDERICK DOUGLAS	2301 GWYNNS FALLS PARKWAY	X			X		
PS451	JOSEPH C. BRESCOE	5506 W. BIDDLE SREET	X	X		X		
PS453	FAIRMOUNT HILL	100 N. ANN STREET	X	X		X		
PS454	CARVER	2201 PRESSTMAN STREET	X	X		X		
PS456	HARFORD INSTITUTE	2555 HARFORD ROAD	X	X		X		
PS457	LAURENCE G. PAQUIN	2200 SINCLAIR LANE		X		X		
PS480	BALTIMORE CITY COLLEGE	3220 THE ALAMEDA	X	X		X		
PS504	REPAIR SHOP	1230 E. 20th ST.	X	X		X		
PS513	KID'S DINER	SARATOGA & HOLIDAY					X	
PS525	WAREHOUSE	1149 E. GRANBY ST.		X				
PS526	XPORTATION GARAGE & OFFICE	1210 E. 20th ST.	X	X		X		
PS534	ELECTRICAL SHOP	1812 GREENMOUNT AVENUE	X	X				
PS540	SCHOOL HEADQUARTERS	200 E. NORTH AVE.					X	
PS556	GROUNDS SHOP	2614 PENNSYLVANIA AVENUE	X	X				
PS557	OFFICE WAREHOUSE (#557)	2200 ROBB STREET	X	X		X		
PS564	BUS XPORTATION GARAGE&OFF.	1601 BRADDISH AVE.		X		X		
PS564A	BUS XPORTATION GARAGE&OFF.	1601 BRADDISH AVE.		X				
PS701	KIRK AV. STADIUM	KIRK & EXETER HALL AVE.	X					
PS850	PARK HEIGHTS # 1	3941 REISTERTOWN ROAD				X		
PS851	PARK HEIGHTS # 2	2600 KEYWORTH AVENUE	X	X		X		
PS852	PARK HEIGHTS # 3	3901 PARK HEIGHTS AVENUE					X	
WDS001	WALDORF # 1	4901 GREENSPRING AVENUE	X	X		X		
WDS001A	WALDORF # 2	4701 YELLOWWOOD AVENUE	X	X				

* EACH BUILDING NUMBER IN THIS TABLE REPRESENTS A SEPERATE BUILDING FOR WHICH A MANAGEMENT PLAN WAS PRODUCED. BUILDING NUMBERS ENDING IN "A", "B", etc. REPRESENT AUXILIARY BUILDINGS ON THE SITE OF THE MAIN BUILDING.

PREFACE

The purpose of this asbestos-containing materials (ACM) management plan for this school building is to identify the location, extent, and condition of ACM in the school building(s) and to describe and recommend preventive measures and response actions to be taken to protect human health and the environment from these materials. The plan, prepared for the Board of School Commissioners of Baltimore City, is in accordance with and meets the requirements of the Final Rule for Asbestos-Containing Materials in Schools, 40 CFR Part 763. The complete text of 40 CFR Part 763 is maintained on file at the Department of Education, Headquarters Building, 200 East North Avenue, Baltimore, Maryland. Selected excerpts of Part 763 are included in Appendix B of this plan for informational purposes.

The general requirements for the preparation and submittal of management plans are described in Paragraph 763.93 of the EPA Rule (see Appendix B). This plan is organized into ten sections which specifically address the requirements and generally follow the sequence of EPA's description of the plan contents in Paragraph 763.93 (see Appendix B). The first section provides a general description of the school, ACM inspection results, and the assessment of the problem within the school. The ACM inspection results emphasize places or materials that were found to contain asbestos and not places or materials where no ACM or suspect materials were found. Section 2 describes the qualifications and identifies the person designated by the Baltimore City School Board to ensure that the duties of the Board are carried out in accordance with EPA requirements.

Section 3 of the plan summarizes and provides a quick reference to the recommended preventive measures and response actions, and Section 4 provides a detailed description of the actions, including the methods to be used, reasons for selection, and a discussion of the schedule for beginning and completion of the actions.

The credentials and accreditation of the persons who will design or carry out response actions are provided in Section 5. Section 6 contains a description of the ACM which remains in the school once response actions are completed.

Reinspection plans and the plan for operations and maintenance activities are contained in Section 7. The steps that will be used to inform workers and building occupants about provisions of this management plan are contained in Section 8. Section 9 contains an evaluation of the resources required to implement this management plan and Section 10 identifies the consultant and accreditation information of the contributors to this plan.

Appendix A contains copies of the chain-of-custody forms and laboratory data sheets for the bulk sample data. Selected excerpts from the Final Rule for Asbestos-Containing Materials in Schools, 40 CFR Part 763, are included in Appendix B. Appendix C contains information pertaining to all response actions which have taken place at the school since the original inspection. Appendix D contains the ACM abatement schedule. Appendix E contains a description of required operations and maintenance (O&M) activities for the ACM found in this building. Appendix F contains copies of the AHERA accreditation certificates for the Versar inspection, assessment, and management planning personnel and William A. Gieseking, the Designated LEA Representative. Appendix G contains copies of the October 1988 management plan deferral request and approval in accordance with Public Law 100-368, an amendment to AHERA. Appendix G also contains copies of the notification of management plan availability information. Appendix H contains a schematic building floor plan showing most asbestos bulk sampling locations (certain wallboard, plaster, and floor tile mastic samples are not included; see text in Section 1.2 for locations of these samples).

It is to be understood that because this plan recommends various activities over time, the plan must be a dynamic document that changes as

conditions change and scheduled events occur. Provisions are made for an annual update supplement that will have the same format as this plan. Each of the ten sections will be addressed and updated as appropriate in each supplement. The first annual supplement will be issued in May 1990.

GLOSSARY

ACBM:	"Asbestos-containing building material" (ACBM) means surfacing ACM, thermal system insulation ACM, or miscellaneous ACM that is found in or on interior structural members or other parts of a school building.
ACM:	"Asbestos-containing material" (ACM) when referring to school buildings means any material or product which contains more than 1 percent asbestos.
AHERA:	Asbestos Hazard Emergency Response Act
Contractor:	A firm hired by the City of Baltimore to conduct asbestos response action activities. It is understood that any such contractor will be licensed by the State of Maryland to conduct asbestos work and that the work will be performed in accordance with the Baltimore City Technical Specifications (on file at the Physical Plant Office of the Baltimore City Department of Education at 200 E. North Avenue) and applicable State and Federal requirements.
Designated LEA Representative:	Individual appointed by Board of School Commissioners to be responsible for ensuring that the general requirements of the Board related to AHERA are met.
EPA:	U.S. Environmental Protection Agency
Flexible Connector:	A heating/cooling ductwork connector that is flexible so as to minimize the transmission of system vibration; also referred to as a "vibration damper".
Friable	"Friable" when referring to material in a school building means that the material, when dry may be crumbled, pulverized, or reduced to powder by hand pressure, and includes previously nonfriable material after such previously nonfriable material becomes damaged to the extent that when dry it may be crumbled, pulverized, or reduced to powder by hand pressure.

LEA:	Local Education Agency
Responsible Person:	Means the same as Designated LEA Representative (see entry in this Glossary for Designated LEA Representative)
Vibration Damper:	A heating/cooling ductwork connector that is flexible so as to minimize the transmission of system vibration; also referred to as a "flexible connector".

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APPENDICES

Appendix A Asbestos Bulk Sampling Laboratory Data Sheets

Appendix B Excerpts from Final Rule, 40 CFR Part 763

Appendix C Response Action Since Inspection

Appendix D Schedule for Response Actions

Appendix E Operations and Maintenance Procedures

Appendix F AHERA Accreditation/Reaccreditation Certificates

Appendix G Management Plan Deferral Request and Notification of Availability

Appendix H Floor Plan with Sample Locations

1.0 - SCHOOL DESCRIPTION AND INSPECTION AND ASSESSMENT RESULTS

1.1 General Building Description

Bentalou Elementary School (PS150) is located at 220 North Bentalou Street, Baltimore, Maryland 21223. The building's three floors contain approximately 108,310 sq. ft. The building has fire-resistant concrete, steel, and masonry construction throughout. Exterior walls are brick faced with masonry block backup. Interior partitions are masonry block with a structural glazed tile finish in certain areas. Floors are wood, cement, ceramic tile, quarry tile, or resilient tile. Walls are finished with structural glazed tile, ceramic tile or plastic sheet. Ceilings are exposed structural plank, or plaster.

The building was inspected for the presence of asbestos-containing materials (ACM) on April 19, and September 13, 1988, by Lee Sesler.

The building contains 29 classrooms, a library, a gymnasium, an auditorium, offices, work rooms, toilets, locker rooms, storage areas, a boiler room, a kitchen and cafeteria, and a mechanical room. The total building population of 860 consists of 791 students, 65 employees, and 4 maintenance and custodial workers. The transportable building shown on the included floor plan (Figure 1-1) has been removed from the site. The building's heating system consists of 2 oil/gas-fired hot water boilers inter-connected to finned radiators and univents by a hot water supply and return piping system.

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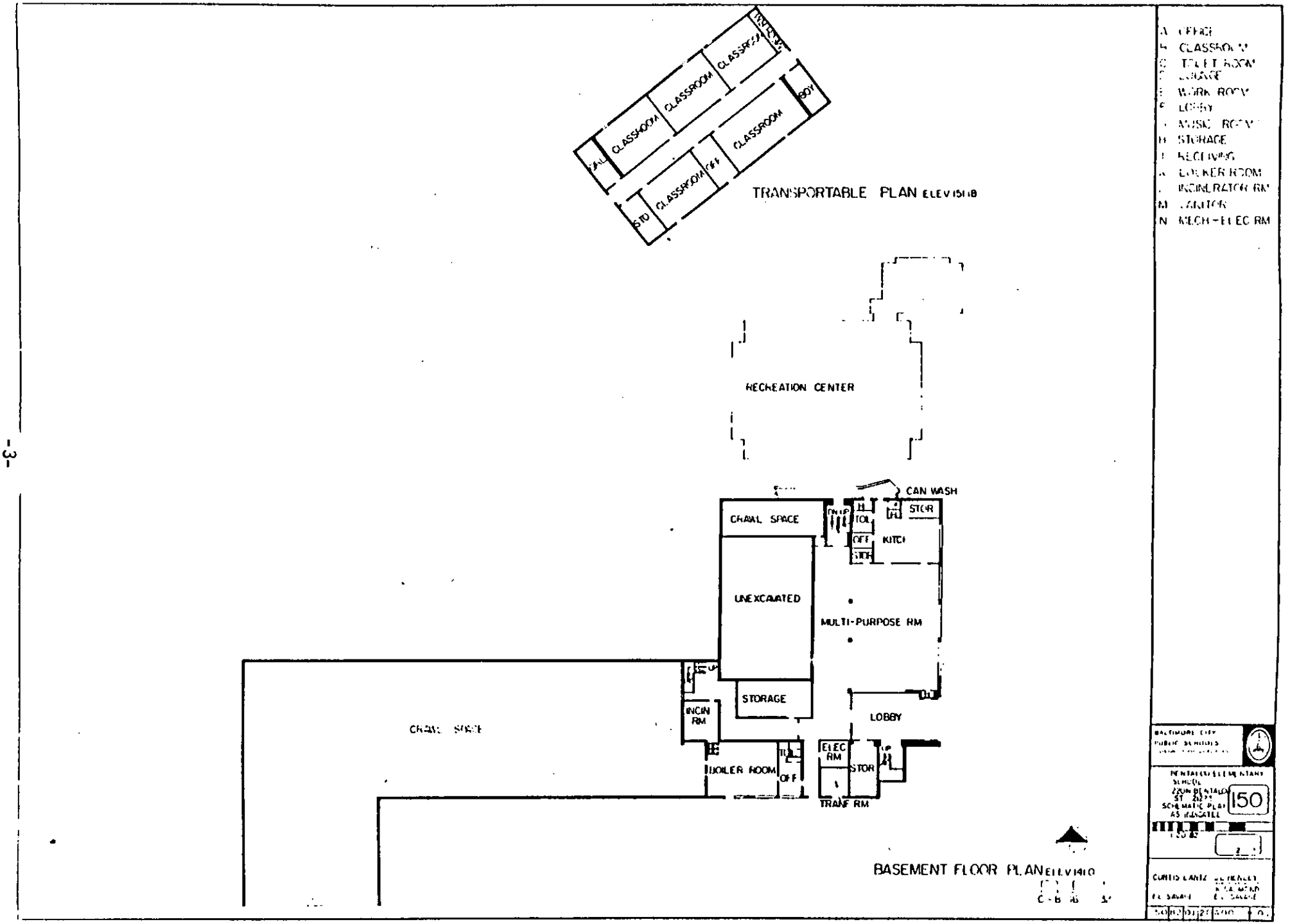
Name	Signature/Date	Accreditation Number
Lee Sesler	Lee Sesler 4-24-89	IMP-R-011

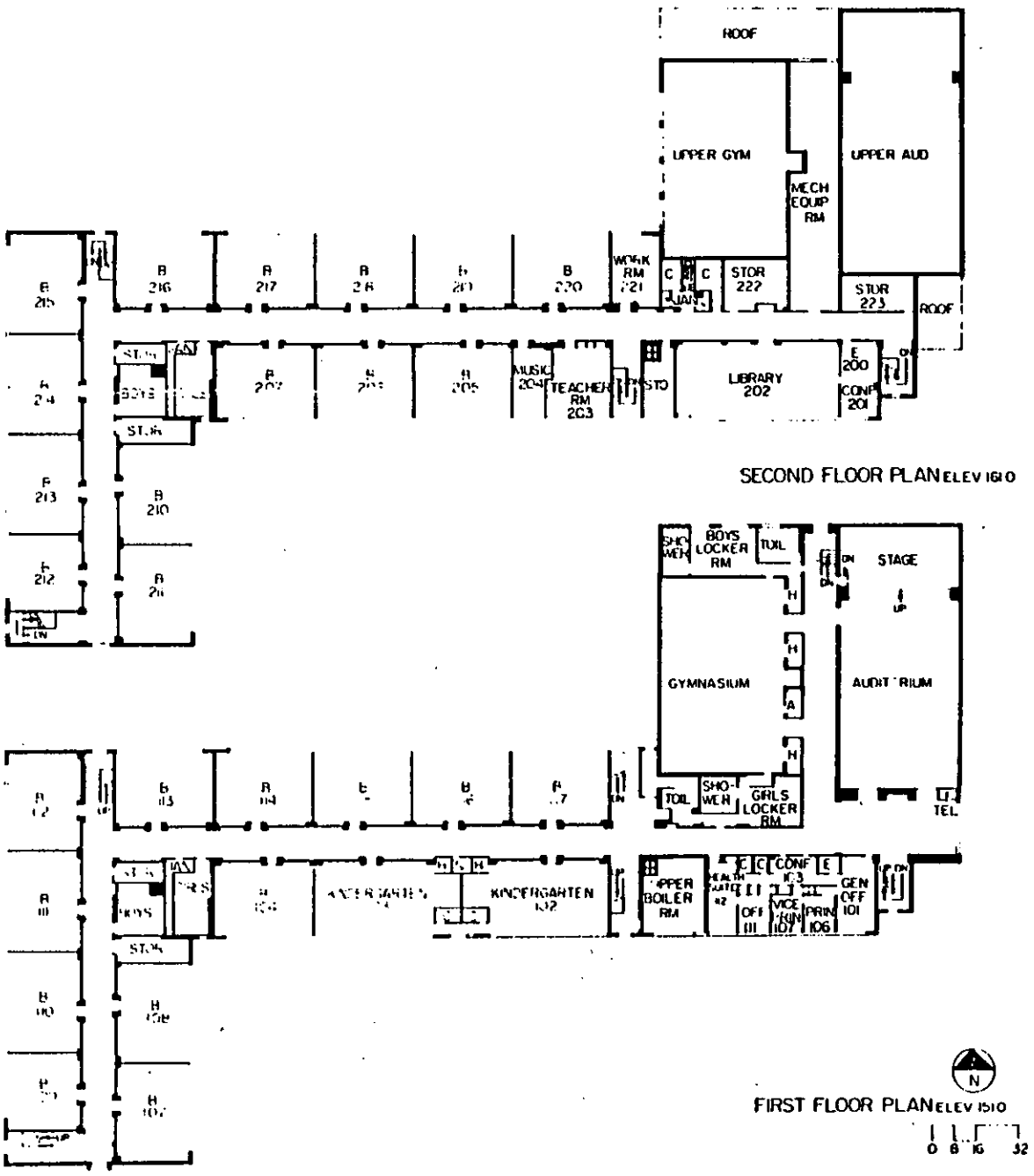
The personnel listed above participated in the inspection of this building and the collection of suspected ACBM samples. Each is accredited by an EPA-approved AHERA inspector's course developed under Section 206(c) of Title II of the Toxic Substances Control Act (TSCA). Copies of the accreditation and/or reaccreditation certificate (provides course name, place, and date; the accreditation number; and the name of the organization providing the course) for each accredited inspector are provided in Appendix F.

The following persons collected ACBM samples prior to promulgation of AHERA and were not accredited at that time. The samples were collected in support of litigation between Baltimore City and the manufacturers and suppliers of asbestos-containing materials. These samples were not collected as a result of any complaints from the building occupants or visitors.



Bentalou Elementary School PS150
(0621k-Rev A)

Figure 1-1



Bentalou Elementary School PS150
(0621k-Rev A)

Figure 1-1 (Cont'd)

1.2 Inspection and Sampling Results

All samples were collected in accordance with EPA sampling protocol (see Appendix B; Paragraph 763.86, Final Rule) by the inspector. According to the rule, only one sample from a suspect material homogeneous area needs to test positive (i.e., 1 percent or greater asbestos fiber) for the entire homogeneous area to be declared an ACM. Therefore, in many instances of suspect materials testing positive, the number of samples taken and/or analyzed is less than the number of samples required by EPA protocol to prove that a material is a non-ACM. In cases where a suspect material is declared a non-ACM, the samples were taken as follows:

a. For surfacing materials, samples were taken in a statistically random manner from the homogeneous area. For areas 1,000 sq. ft., or less, at least three samples were taken. For areas greater than 1,000 sq. ft. but less than or equal to 5,000 sq. ft., at least five samples were taken. For areas greater than 5,000 sq. ft., at least seven samples were taken.

b. For Thermal Systems Insulation, at least three samples were collected in a randomly distributed manner from a homogeneous area.

c. For miscellaneous materials, the samples were taken in a manner sufficient to determine whether the material was ACM or not ACM.

The samples were analyzed by the Versar, Inc., asbestos laboratory at 6850 Versar Center, Springfield, Virginia 22151. The Versar laboratory has been and is accredited by the appropriate EPA accreditation mechanism for the full duration of sampling and analysis activities associated with the development of this management plan. The Versar laboratory is currently accredited for bulk asbestos analysis by polarized light microscopy under the National Voluntary Laboratory Accreditation Program (NVLAP). The laboratory accreditation information and the bulk analysis laboratory data sheets are contained in Appendix A.

The following inspection information includes rough on-site estimates of ACM quantities (contained in the text and summarized in

Table 1-A) which do not have a high degree of accuracy. The estimates provided in subsequent sections may differ from the field estimates for the same material because they were derived (for abatement cost estimates) from actual building drawings and are more accurate.

The floor tile mastic associated with floor tile determined to be an ACM is assumed to also be an ACM, and whatever assessment and response actions apply to the tile apply to the mastic as well. In some cases, the mastic associated with floor tile determined to be non-ACM is assumed to be ACM and in others it was sampled. It is stated in the following text whether the mastic is assumed to be ACM, or whether the mastic was sampled.

Asbestos bulk sampling locations are described in the following text. To augment this information, Appendix H contains a schematic building floor plan showing most sampling locations (certain wallboard, plaster, and floor tile mastic samples are not included; these locations are described in the text).

1.2.1 Ceilings and Walls

Sprayed-on

This material was not observed in the building.

Tile

This material was not observed in the building.

Acoustical Plaster

Acoustical plaster is applied to the ceilings of the auditorium, part of the cafeteria, and the adjacent hallways of the cafeteria and lobby. The material is in good condition overall having only sustained minor, isolated damage. The material on the ceiling in the auditorium, from which samples could not be collected due to its height, is subjected to air erosion due to the radial diffusers installed in the ceiling. This acoustical plaster covers approximately 5,000 sq. ft. Table 1-1 outlines the samples collected from acoustical plaster.

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TABLE 1-1. SAMPLES OF ACOUSTICAL PLASTER IN BUILDING PS150

Sample	Asbestos Content	Location
PS150-001-027-LS	5-10% Chrysotile	Hallway near Cafeteria
PS150-001-028-LS	10-15% Chrysotile	Lobby near Cafeteria
PS150-001-029-LS	10-15% Chrysotile	Doorway near Kitchen

Other Plaster

Sample numbers PS150P-002-003-LS from above the doors to the gym, PS150P-002-004-LS from above the doors to the gym, and PS150P-002-005-LS from above the doors to the auditorium were collected from gypsum plaster in the building and contain <1% asbestos. This material covers approximately 75 sq.ft.

Wallboard

Wallboard was not observed in the building.

1.2.2 Floor Coverings

Table 1-2 outlines the samples collected from floor tile in the building. Samples are grouped by tile type (color).

1.2.3 Mechanical

Pipe

All pipe insulation in the building is fiber glass.

Chases

The crawl space adjacent to the kitchen contained approximately 25 sq. ft. of debris from which sample PS150-001-025-LS was collected; this sample contains <1% asbestos. This material is near the entrance to the crawl space and is scattered across the dirt floor. The crawl space adjacent to the incinerator room was free of debris. Cold water piping and fittings in crawl spaces are not insulated. Sample PS150-001-022-LS was collected from trowelled-on insulation on a hot water elbow in the crawl space and it contains <1% asbestos.

Elbows and Fittings

Approximately 100% of heating supply and return fittings and valves are insulated with a trowelled-on material. Approximately 90% of the hot and recirculating water and 75% of the cold water fittings and valves are insulated with this same trowelled-on material. This material is

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TABLE 1-2. SAMPLES OF TILE IN BUILDING PS150

Sample	Asbestos Content	Description	Approx. Area (sq. ft.)	Sample Location
PS150-001-024-LS	1-5% Chrysotile	Gray w/white	30,000	Hall near Incinerator Rm.
PS150-001-026-LS	1-5% Chrysotile	Gray w/white	30,000	North stairwell
PS150-001-030-LS	1-5% Chrysotile	Gray w/white	30,000	Hall near boiler room
PS150-002-001-LS	1-5% Chrysotile	Tan w/black and red	60,000	Hall near auditorium
PS150-002-002-LS	1-5% Chrysotile	Tan w/black and red	60,000	Hall near Room 112
PS150-003-003-LS	1-5% Chrysotile	Tan w/black and red	60,000	Room 215

generally in good condition but has sustained isolated damage (see Chases). Fittings and valves outside the crawl space are covered with a textile wrapper, while those inside crawl spaces are not. Table 1-3 outlines the eight samples collected from fitting and valve insulation; all eight contained <1% asbestos. This material covers approximately 3,352 sq.ft.

Boilers and Breeching

Both boilers are insulated with a combination of block and trowelled-on insulation. These materials cover an estimated total area of 300 sq. ft. The materials are generally in good condition but have sustained isolated damage from impact. The trowelled-on material has been painted. The boiler breechings are also insulated with a combination of block and trowelled-on insulation. The breechings have sustained more damage than the boilers, and at some areas, the breeching block insulation is exposed. However, the breeching insulation has generally maintained its structural integrity. Breeching insulation covers an estimated 200 sq. ft. Table 1-4 outlines the samples collected from boiler and breeching insulation in the boiler room.

Tanks

The hot water heater in the boiler room has an exposed metal jacket. The expansion tank in the boiler room was uninsulated. The hot water generator in the boiler room has a combination of block and trowelled-on insulation. The trowelled-on layer has been damaged in certain areas, but the insulation has retained its structural integrity. These materials cover approximately 125 sq. ft. Sample PS150-001-015-LS was collected from the trowelled-on insulation, and it contains 55-60% chrysotile. Sample PS150-001-016-LS was collected from the block insulation, and it contains 30-35% amosite.

Ductwork

All duct insulation observed in the building was fiber glass. The ducts in the third floor mechanical room adjacent to the gym have a

TABLE 1-3 SAMPLES OF INSULATION ON ELBOWS AND FITTINGS IN BUILDING PS150

Sample	Asbestos Content	Description	Sample Location
PS150-001-017-LS	<1%	Cold water elbow	Boiler Room
PS150-001-018-LS	<1%	Heating supply elbow	Boiler Room
PS150-001-019-LS	<1%	Heating return elbow	Boiler Room
PS150-001-020-LS	<1%	Hot water valve	Boiler Room
PS150-001-021-LS	<1%	Hot water elbow	Engineer's toilet
PS150-001-022-LS	<1%	Hot water elbow	Crawl Space
PS150-001-023-LS	<1%	Heating elbow	West Hallway
PS150-003-002-LS	<1%	Heating elbow	Mech. Rm above gym

TABLE 1-4 SAMPLES OF BOILER AND BREECHING INSULATION IN BUILDING PS150

Sample	Asbestos Content	Description
PS150-001-001-LS	45-50% Chrysotile 5-10% Amosite	Boiler trowelled-on
PS150-001-002-LS	35-40% Amosite	Boiler block
PS150-001-003-LS	45-50% Chrysotile 5-10% Amosite	Boiler trowelled-on
PS150-001-004-LS	30-35% Amosite	Boiler block
PS150-001-005-LS	50-55% Chrysotile 1-5% Amosite	Boiler trowelled-on
PS150-001-006-LS	35-40% Amosite	Boiler block
PS150-001-007-LS	45-50% Chrysotile 5-10% Amosite	Boiler trowelled-on
PS150-001-008-LS	1-5% Chrysotile 35-40% Amosite	Boiler block
PS150-001-009-LS	55-60% Chrysotile	Boiler trowelled-on
PS150-001-010-LS	<1%	Boiler block
PS150-001-011-LS	55-60% Chrysotile	Boiler trowelled-on
PS150-001-012-LS	<1%	Boiler block
PS150-001-013-LS	50-55% Chrysotile	Breeching trowelled-on
PS150-001-014-LS	35-40% Amosite	Breeching block

mastic applied to the seams of the fiber glass insulation. This material covers about 250 sq. ft. Sample PS150-003-001-LS was collected from this material in the mechanical room and it contains 5-10% chrysotile. Flexible connections in the duct system were made of textile duck or neoprene.

1.2.4 Other

Stage curtains were not suspect in nature. Other suspect materials such as wiring, asbestos cement boards or univent insulation were not observed in the building. Damaged fire doors were not observed in the building and as such, samples were not collected from fire doors. The six fire doors in the building will be assumed to contain asbestos and cover approximately 126 sq.ft.

1.3 Assessment of ACM

1.3.1 Assessment by Functional Space

The ACM in this school building is located in functional spaces.

> A "functional space" means a room, group of rooms, or homogeneous area (including crawl spaces or the space between a dropped ceiling and the floor or roof deck above), such as classroom(s), a cafeteria, gymnasium, hallway(s), designated by a person accredited to prepare management plans, design abatement projects, or conduct response management actions." (40 CFR Part 763.83 Definitions).

For assessment purposes, a functional space shall be defined as any space within a building which is designated and/or utilized by the building occupants for like purposes and which contains ACM. A functional space is not necessarily a space or area which is occupied (i.e., a functional space could be a steam tunnel, enclosed pipe chase, or return air plenum separate and distinct from any adjacent or surrounding functional space(s)). Additionally, a functional space is not necessarily a spatially or functionally contiguous area or space. Generally, however, a functional space shall be limited to areas within a building which are used for a specific function and which contain the same kind(s) of asbestos in the same condition.

The above definition is for guidance only; the management planner is the person finally responsible as designated by AHERA to determine the spatial extent of a particular functional space in the management plan.

1.3.2 Assessment by Damage and Potential Damage Factors

The ACM within a functional space is characterized by both the damage factor and the potential damage factor. The damage factor reflects the current condition of the ACM. There are three damage classifications: (1) significant damage, (2) damage, and (3) little or no damage (i.e., good condition). Likewise, there are three potential damage classifications: (1) potential for significant damage, (2) potential for damage, and (3) little or no potential for damage.

TABLE 1-A
ACM QUANTITIES BY APPLICATION

FOR PS 150

ACM APPLICATION	QUANTITY SQUARE FEET	QUANTITY LINEAR FEET
CEILINGS & WALLS		
SPRAYED-ON		
TILE		
ACOUSTIC PLASTER	5,000	
OTHER PLASTER		
WALLBOARD		
FLOOR COVERINGS	90,000	
MECHANICAL		
PIPE		
ELBOWS & FITTINGS		
BOILERS & BREECHING	500	
TANKS	125	
DUCTWORK	250	
OTHER (GASKETS, FLEXIBLE CONNECTORS, ETC)		
OTHER		
CURTAINS		
FIREDOORS	126	
CEMENT BOARD		

NOTE: FOR LOCATIONS OF ACBM APPLICATIONS, SEE THE PRECEDING TEXT IN THIS SECTION (1.2) AND APPENDIX H.

Significant Damage

Thermal System Insulation (TSI) with "significant damage" is defined as ACM with one or more of the following characteristics:

- The material has no protective covering or the protective covering is damaged or missing over one-half of the surface area.
- The material has sustained extensive overall damage (it is crushed, heavily gouged, and/or punctured) on one-tenth or more of its overall surface.
- The material has sustained extensive damage (it is crushed, heavily gouged, and/or punctured) on one-quarter or more of a localized area of its surface.

Surfacing/Miscellaneous Material with significant damage is defined as ACM with one or more of the following characteristics:

- The material is crumbled, spalled, blistered, or delaminated over one-tenth or more of its overall surface.
- The material is crumbled, spalled, blistered, or delaminated over one-quarter of a localized area of its surface.
- The material has water stains, gouges, or is marred over at least one-tenth of its overall surface.
- The material has water stains, gouges, or is marred over at least one-quarter of a localized area of its surface.

Damage

TSI with "damage" is defined as ACM with one or more of the following characteristics:

- The material's protective covering has been damaged or removed over one-tenth to one-half of its surface.
- The subject ACM is crushed, water-stained, gouged, punctured, or marred over one-tenth or less of its overall surface.
- The subject ACM is water-stained, gouged, punctured, or marred over one-quarter or less of a localized area of its surface.

Surfacing or miscellaneous ACM with "damage" is defined as material with one or more of the following characteristics:

- The ACM is crumbled, blistered, water-stained, gouged, marred, or abraded over less than one-tenth of the overall surface.
- The ACM is crumbled, blistered, water-stained, gouged, marred, or abraded over less than one-quarter of a localized area of its surface.

Little or No Damage

"Little or No Damage" is defined as either TSI or Surfacing/Miscellaneous Material which has no visible damage or deterioration or very limited damage or deterioration.

AHERA requires that all friable ACM and suspect ACM be assessed and placed into one of seven categories. The City of Baltimore Designated LEA Representative has added an eighth category to include "any remaining nonfriable ACM or nonfriable suspected ACM." These eight categories are:

AHERA

1 Damaged or significantly damaged thermal system insulation ACM.

2 Damaged friable surfacing ACM.

3 Significantly damaged friable surfacing ACM.

4 Damaged or significantly damaged friable miscellaneous ACM.

5 ACBM with potential for damage.

6 ACBM with potential for significant damage.

7 Any remaining friable ACBM or friable suspected ACBM.

8 Any remaining nonfriable ACM or nonfriable suspected ACM.

To assist in the assessment of AHERA categories for ACM in each functional space, decision trees, shown in Figures 4-1 and 4-2 in Section 4.2, were used.

1.3.3 Description of Functional Spaces

The 9 functional spaces in PS150 are:

(1) boiler room;
(2) cafeteria and adjacent lobby;

(3) auditorium;
(4) classrooms;
(5) hallways and stairwells;
(6) offices, work rooms and lounges;
(7) old incinerator room;
(8) library; and
(9) mechanical room.

The inspection results of the ACM in the above functional spaces are presented in Section 1.2. The analytical documentation of the samples collected in PS150 is contained in Appendix A.

Functional Space No. 01 - The Boiler Room

The ACM identified in the boiler room consists of a combination of asbestos containing block and trowelled-on insulation applied to the boilers, the boiler breechings and the hot water generator. The fire door in the area will be assumed to contain asbestos for the purposes of the management plan.

Boiler Block and Trowelled-On Insulation

Both boilers are insulated with a combination of asbestos-containing block and trowelled-on insulation. These friable materials have maintained their structural integrity but have sustained minor damage. A 2 sq. ft. section of trowelled-on insulation near the access door on each boiler has delaminated. The boiler insulation has also sustained randomly distributed minor impact damage. The materials cover approximately 239 sq. ft. Overall, these materials have sustained little damage, have little or no potential for damage, and are in AHERA category no. 7.

Boiler Breeching Block and Trowelled-on Insulation

The boiler breechings are insulated with a combination of asbestos-containing block and trowelled-on insulation. These friable materials have maintained their structural integrity but have sustained minor damage. Approximately 2 sq. ft. of block insulation is exposed on the boiler breeching. These materials have also sustained minor cracking. These materials cover approximately 156 sq. ft. Overall, these

materials have sustained little damage, have little or no potential for damage, and are in AHERA category no. 7.

Hot Water Generator Block and Trowelled-On Insulation

The hot water generator is insulated with a combination of asbestos-containing block and trowelled-on insulation. These friable materials have maintained their structural integrity but have sustained minor damage. Approximately 1 sq. ft. of insulation has sustained damage near an intake pipe. These materials have also sustained minor, isolated, randomly distributed impact damage. These materials cover approximately 173 sq. ft. Overall, these materials have sustained little damage, have little or no potential for damage, and are in AHERA category no. 7.

Fire Doors

The fire door in this area will be assumed to contain asbestos for the purposes of the management plan. This material has sustained little or no damage, has a potential for damage, and is in AHERA category no. 8.

Functional Space No. 02 - Cafeteria and Lobby

The ACM identified in the cafeteria and the adjacent lobby consists of acoustical plaster and vinyl asbestos tile. Fire doors in these areas will be assumed to contain asbestos for the purpose of the management plan.

Acoustical Plaster

A portion of the cafeteria ceiling and the ceiling of the adjacent lobby and hallways have asbestos-containing acoustical plaster applied to them. This friable material has sustained minor, randomly distributed impact damage. Minor repairs have been made to the material. Overall, this material has sustained little damage, has a potential for damage, and is in AHERA category no. 5.

Vinyl Asbestos Tile

Floor tile in the cafeteria contains asbestos. This nonfriable material has sustained little or no damage, has little or no potential for damage and is in AHERA category no. 8.

Fire Doors

The two fire doors in these areas will be assumed to contain asbestos for the purposes of the management plan. This material has sustained little or no damage, has a potential for damage, and is in AHERA category no. 8.

Functional Space No. 03 - The Auditorium

The ACM identified in the auditorium consists of acoustical plaster and vinyl asbestos tile. The fire doors in this area will be assumed to contain asbestos for the purposes of the management plan.

Acoustical Plaster

The ceiling of the auditorium has asbestos-containing acoustical plaster applied to it. This friable material has sustained randomly distributed minor impact damage. Air diffusers are installed in the ceiling. Overall, this material has sustained little damage, has a potential for damage, and is in AHERA category no. 5.

Vinyl Asbestos Tile

Floor tile in this area contains asbestos. This nonfriable material has sustained little or no damage, has little or no potential for damage, and is in AHERA category no. 8.

Fire Door

The fire door in this area will be assumed to contain asbestos for the purposes of the management plan. This material has sustained little or no damage, has a potential for damage, and is in AHERA category no. 8.

Functional Space No. 04 - The Classrooms

The ACM identified in the classrooms consists of vinyl asbestos floor tile. This nonfriable material has sustained little or no damage, has little or no potential for damage, and is in AHERA category no. 8.

Functional Space No. 05 - Hallways and Stairwells

The ACM identified in these areas consists of vinyl asbestos floor tile. This nonfriable material has sustained little or no damage, has little or no potential for damage, and is in AHERA category no. 8.

Functional Space No. 06 - Work Rooms and Lounges

The ACM identified in these areas consists of vinyl asbestos floor tile. This nonfriable material has sustained little or no damage, has little or no potential for damage, and is in AHERA category no. 8.

Functional Space No. 07 - Incinerator Room

The fire door in the incinerator room will be assumed to contain asbestos for the purpose of the management plan. This material has sustained little or no damage, has a potential for damage, and is in AHERA category no. 8.

Functional Space No. 08 - Library

The ACM identified in the library consists of vinyl asbestos tile. This nonfriable material has sustained little or no damage, has little or no potential for damage, and is in AHERA category no. 8.

Functional Space No. 09 - Mechanical Room

The ACM identified in this area consists of mastic applied to the seams of the duct work insulation. The fire door in this area will be assumed to contain asbestos for the purpose of the management plan.

Mastic

An asbestos-containing mastic is applied to the seams of the fiber glass insulation covering the ductwork in this area. This material has sustained little or no damage, has little or no potential for damage, and is in AHERA category no. 7.

Fire Doors

The fire door in this area will be assumed to contain asbestos for the purpose of the management plan. This material has sustained little or no damage, has a potential for damage, and is in AHERA category no. 8.

1.3.4 Summary of AHERA Assessment

As previously stated in Section 1.3.2, AHERA categories 1 through 7 pertain to friable ACBM. Category 8 is for nonfriable ACBM, and was created for the convenience of Baltimore City for periodic surveillance purposes. The following Table 1-5 summarizes the ACM in PS150.

TABLE 1-5 ASSESSMENT SUMMARY FOR PS150

FUNCTIONAL SPACE	MATERIAL DESCRIPTION	TYPE	CURRENT DAMAGE	POTENTIAL DAMAGE	AHERA CATEGORY
01- Boiler Room	Boiler Block and Trowelled-on Insulation	TSI	Little or No	Little or No	7
	Boiler Breeching Block and Trowelled-on Insulation	TSI	Little no No	Little or No	7
	Hot Water Generator Block and Trowelled-on Insulation	TSI	Little or No	Little or No	7
	(1) Fire Door	MISC.	Little or No	Damage	8
02- Cafeteria and Lobby	Acoustical Plaster	SURF.	Little or No	Damage	5
	Vinyl Asbestos Tile	MISC.	Little or No	Little or No	8
	(2) Fire Doors	MISC.	Little or No	Damage	8
03- Auditorium	Acoustical Plaster	SURF.	Little or No	Damage	5
	Vinyl Asbestos Tile	MISC.	Little or No	Little or No	8
	(1) Fire Door	MISC.	Little or No	Damage	8
04- Classrooms	Vinyl Asbestos Tile	MISC.	Little or No	Little or No	8
05- Hallways and Stairwells	Vinyl Asbestos Tile	MISC.	Little or No	Little or No	8
06- Offices, Work Rooms, and Lounges	Vinyl Asbestos Tile	MISC.	Little or No	Little or No	8
07- Incinerator Room	(1) Fire Door	MISC.	Little or No	Damage	8

TABLE 1-5 ASSESSMENT SUMMARY FOR PS150

FUNCTIONAL SPACE	MATERIAL DESCRIPTION	TYPE	CURRENT DAMAGE	POTENTIAL DAMAGE	AHERA CATEGORY
08- Library	Vinyl Asbestos Tile	MISC.	Little or No	Little or No	8
09- Mechanical Room	Duct Mastic	MISC.	Little or No	Little or No	7
	(1) Fire Door	MISC.	Little or No	Damage	8

2.0 - DESIGNATED LEA REPRESENTATIVE

The Board of School Commissioners of Baltimore City has designated Mr. William A. Gieseking as the individual responsible for ensuring that the general requirements of the Board are met. Mr. Gieseking's official title is the Designated LEA Representative; his address is:

Mr. William A. Gieseking
Designated LEA Representative
Division of Physical Plant
200 East North Avenue, Room 407
Baltimore, MD 21202
Tele: (301) 396-8672

Mr. Gieseking has attended EPA-approved training courses developed under Section 206(c) of Title II of the Toxic Substances Control Act (TSCA). Copies of his accreditation/reaccreditation certificates are provided in Appendix F. Mr. Gieseking's accreditations related to ACM are: (1) Designing the Abatement Project; (2) Inspection; (3) Management Planning; (4) Abatement Supervisor/Competent Person; (5) Clearance Testing for Asbestos: AHERA Requirements; and (6) Operations and Maintenance Planning.

As the Designated LEA Representative, Mr. Gieseking is responsible for ensuring that the correct procedures are followed for inspection, management plan development and submission, and implementation of response actions. In addition, AHERA requires that the designated representative oversee the following actions:

- Conducting the reinspections and periodic surveillance;
- Informing workers and building occupants, or their legal guardians, at least once each school year about inspection, response actions, and post-response activities;
- Proper training of all maintenance and custodial employees;
- Providing information to short-term workers who may come in contact with asbestos in a school, regarding the locations of ACM;
- Posting warning labels as needed; and
- Ensuring that management plans are available for inspection and proper notification of management plan availability has been given.

3.0 - SYNOPSIS OF APPLICABLE RESPONSE ACTIONS AND/OR PREVENTIVE MEASURES

Table 3-1 summarizes the general response actions and/or preventive measures which must be undertaken to reduce the possibility of a release of asbestos fibers in the school. These general response actions and/or preventive measures are contained in AHERA (40 CFR Part 763) Section 763.90 (see Appendix B). The Baltimore City, Department of Education shall select and implement the response action(s) and/or preventive measure(s) which shall be sufficient to protect the health of the school occupants and overall school environment. The Board may select the least burdensome method to protect health and the environment.

The bases for the specific recommendations regarding each asbestos application are contained in Section 4.0 of the management plan.

The following person developed this management plan, which involved reviewing the inspection information, performing a site visit, preparing the ACM assessment (presented in Section 1.3.3), and recommending preventive measures and response actions. This person is accredited by an EPA-approved AHERA management planner's course developed under Section 206(c) of Title II of the Toxic Substances Control Act (TSCA). Copies of the accreditation/reaccreditation certificate (provides course name, place, and date; accreditation/reaccreditation number; and the name of the organization providing the course) for the management planner are provided in Appendix F.

Name	Signature/Date	Accreditation Number
Lee Seslow	Lee Seslow / 4-24-89	IMP-R-011

TABLE 3-1. ACM RESPONSE ACTIONS

FUNCTIONAL SPACE	MATERIAL DESCRIPTION	AHERA CATEGORY	RESPONSE ACTION SUMMARIES
01- Boiler Room	Boiler Block and Trowelled-on Insulation	7	Repair, encapsulate, and institute a comprehensive O&M program, including measures to eliminate any potential disturbance, until major renovation or demolition require removal or until hazard assessment factors change.
	Boiler Breeching Block and Trowelled-on Insulation	7	Repair, encapsulate, and institute a comprehensive O&M program, including measures to eliminate any potential disturbance, until major renovation or demolition require removal or until hazard assessment factors change.
	Hot Water Generator Block and Trowelled-on Insulation	7	Repair, encapsulate, and institute a comprehensive O&M program, including measures to eliminate any potential disturbance, until major renovation or demolition require removal or until hazard assessment factors change.
	(1) Fire Door	8	Implement an operations and maintenance program until major renovation or demolition require removal or until hazard assessment factors change. An initial cleaning is not necessary.
02- Cafeteria and Lobby	Acoustical Plaster	5	Repair, encapsulate, and institute a comprehensive O&M program, including measures to eliminate any potential disturbance, until major renovation or demolition require removal or until hazard assessment factors change.
	Vinyl Asbestos Tile	8	Implement an operations and maintenance program until major renovation or demolition require removal or until hazard assessment factors change. An initial cleaning is not necessary.
	(2) Fire Doors	8	Implement an operations and maintenance program until major renovation or demolition require removal or until hazard assessment factors change. An initial cleaning is not necessary.

TABLE 3-1. ACM RESPONSE ACTIONS

FUNCTIONAL SPACE	MATERIAL DESCRIPTION	AHERA CATEGORY	RESPONSE ACTION SUMMARIES
03- Auditorium	Acoustical Plaster	5	Repair, encapsulate, and institute a comprehensive O&M program, including measures to eliminate any potential disturbance, until major renovation or demolition require removal or until hazard assessment factors change.
	Vinyl Asbestos Tile	8	Implement an operations and maintenance program until major renovation or demolition require removal or until hazard assessment factors change. An initial cleaning is not necessary.
	(1) Fire Door	8	Implement an operations and maintenance program until major renovation or demolition require removal or until hazard assessment factors change. An initial cleaning is not necessary.
04- Classrooms	Vinyl Asbestos Tile	8	Implement an operations and maintenance program until major renovation or demolition require removal or until hazard assessment factors change. An initial cleaning is not necessary.
05- Hallways and Stairwells	Vinyl Asbestos Tile	8	Implement an operations and maintenance program until major renovation or demolition require removal or until hazard assessment factors change. An initial cleaning is not necessary.
06- Offices, Work Rooms, and Lounges	Vinyl Asbestos Tile	8	Implement an operations and maintenance program until major renovation or demolition require removal or until hazard assessment factors change. An initial cleaning is not necessary.

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TABLE 3-1. ACM RESPONSE ACTIONS

FUNCTIONAL SPACE	MATERIAL DESCRIPTION	AHERA CATEGORY	RESPONSE ACTION SUMMARIES
07- Incinerator	(1) Fire Door	8	Implement an operations and maintenance program until major renovation or demolition require removal or until hazard assessment factors change. An initial cleaning is not necessary.
08- Library	Vinyl Asbestos Tile	8	Implement an operations and maintenance program until major renovation or demolition require removal or until hazard assessment factors change. An initial cleaning is not necessary.
09- Mechanical Room	Duct Mastic	7	Implement a comprehensive O&M program, including measures to reduce or eliminate disturbance, until major renovation or demolition require removal or until hazard assessment factors change.
	(1) Fire Door	8	Implement an operations and maintenance program until major renovation or demolition require removal or until hazard assessment factors change. An initial cleaning is not necessary.

4.0 - DETAILED DESCRIPTION OF PREVENTIVE MEASURES, RESPONSE ACTIONS, AND RESPONSE ACTION PRIORITIZATION SCHEDULE

4.1 Description of Preventive Measures and Response Actions

This section presents recommended response actions and/or preventive methods to abate or contain the ACM identified in PS150. The recommended response actions were selected using the following considerations:

(1) protects human health and the environment.
(2) can be implemented in a timely manner.
(3) least burdensome.
(4) consistent with EPA requirements for assessment category.

General response actions include removal, encapsulation, enclosure, repair, and operations and maintenance program implementation. All response actions, including removal, encapsulation, enclosure, and repair must be performed by contractors accredited to conduct such response actions (see Section 5.0).

As response actions are completed, this section will be updated annually, by means of the annual supplement, to show any change in the AHERA categories and recommended response actions. The annual supplement will reflect any change in the physical condition of any ACM noted during periodic surveillance or reinspections (see Section 7.0).

Functional Space No. 01 - The Boiler Room

The ACM identified in the boiler room consists of a combination of asbestos containing block and trowelled-on insulation applied to the boilers, the boiler breechings and the hot water generator. The fire door in the area will be assumed to contain asbestos for the purposes of the management plan.

Boiler Block and Trowelled-On Insulation

Both boilers are insulated with a combination of asbestos-containing block and trowelled-on insulation. These friable materials have maintained their structural integrity but have sustained minor damage. A 2 sq. ft. section of trowelled-on insulation near the access door on each

boiler has delaminated. The boiler insulation has also sustained randomly distributed minor impact damage. These materials cover approximately 239 sq. ft. Overall, these materials have sustained little damage, have little or no potential for damage, and are in AHERA category no. 7.

Recommended Response Action and Preventive Measure: Repair and encapsulate the boiler insulation in accordance with the Baltimore City Asbestos Specification Document on file at 200 E. North Avenue. The Designated LEA Representative should institute an operations and maintenance plan in this area (see Section 7.0).

Maintenance personnel should use extreme care in this area when performing maintenance activities to prevent damage to this material.

Boiler Breeching Block and Trowelled-on Insulation

The boiler breechings are insulated with a combination of asbestos-containing block and trowelled-on insulation. These friable materials have maintained their structural integrity but have sustained minor damage. Approximately 2 sq. ft. of block insulation is exposed on the boiler breeching. These materials have also sustained minor cracking. These materials cover approximately 156 sq. ft. Overall, these materials have sustained little damage, have little or no potential for damage, and are in AHERA category no. 7.

Recommended Response Action and Preventive Measure: Repair and encapsulate the boiler insulation in accordance with the Baltimore City Asbestos Specification Document on file at 200 E. North Avenue. The Designated LEA Representative should institute an operations and maintenance plan in this area (see Section 7.0).

Maintenance personnel should use extreme care in this area when performing maintenance activities to prevent damage to this material.

Hot Water Generator Block and Trowelled-On Insulation

The hot water generator is insulated with a combination of asbestos-containing block and trowelled-on insulation. These friable

materials have maintained their structural integrity but have sustained minor damage. Approximately 1 sq. ft. of insulation has sustained damage near an intake pipe. These materials have also sustained minor, isolated, randomly distributed impact damage. These materials cover approximately 173 sq. ft. Overall, these materials have sustained little damage, have little or no potential for damage, and are in AHERA category no. 7.

Recommended Response Action and Preventive Measure: Repair and encapsulate the boiler insulation in accordance with the Baltimore City Asbestos Specification Document on file at 200 E. North Avenue. The Designated LEA Representative should institute an operations and maintenance plan in this area (see Section 7.0).

Maintenance personnel should use extreme care in this area when performing maintenance activities to prevent damage to this material.

Fire Door

The fire door in this area will be assumed to contain asbestos for the purposes of the management plan. This material has sustained little or no damage, has a potential for damage, and is in AHERA category no. 8.

Recommended Response Action and Preventive Measures: Institute a comprehensive operations and maintenance plan, including measures to reduce or eliminate disturbance (see section 7.0).

Door stops should be installed to protect this material (if they are not already in place). Kick plates should also be considered to provide further protection to this material. However, the replacement hardware (i.e., locks, hinges, etc.) or the execution of any activity which could damage this material (i.e., drilling, planing, etc.) is prohibited. If such operations are necessary, the Designated LEA Representative should be contacted prior to such activities.

Functional Space No. 02 - Cafeteria and Lobby

The ACM identified in the cafeteria and the adjacent lobby consists of acoustical plaster and vinyl asbestos tile. Fire doors in these areas will be assumed to contain asbestos for the purpose of the management plan.

Acoustical Plaster

A portion of the cafeteria ceiling and the ceiling of the adjacent lobby have asbestos-containing acoustical plaster applied to them. This friable material has sustained minor, randomly distributed impact damage. Minor repairs have been made to the material. Overall, this material has sustained little damage, has a potential for damage, and is in AHERA category no. 5.

Recommended Response Action and Preventive Measure: Repair and encapsulate the acoustical plaster in accordance with the Baltimore City Asbestos Specification Document on file at 200 E. North Avenue. The Designated LEA Representative should institute an operations and maintenance plan in this area (see Section 7.0).

Maintenance personnel should use extreme care in this area when performing maintenance activities to prevent damage to this material.

Vinyl Asbestos Tile

Floor tile in the cafeteria contains asbestos. This nonfriable material has sustained little or no damage, has little or no potential for damage and is in AHERA category no. 8.

Recommended Response Action and Preventive Measure: Implement an operations and maintenance program (see Section 7.0). The cutting, sanding, drilling, or execution of any activity which could damage this material is prohibited. If such operations are required, the Designated LEA Representative should be contacted prior to such activities.

Fire Doors

The two fire doors in these areas will be assumed to contain asbestos for the purposes of the management plan. This material has sustained little or no damage, has a potential for damage, and is in AHERA category no. 8.

Recommended Response Action and Preventive Measure: Institute an operations and maintenance plan, including measures to reduce or eliminate disturbance (see Section 7.0).

Door stops should be installed to protect this material (if they are not already in place). Kick plate should also be considered to provide further protection to this material. However, the replacement hardware (i.e., locks, hinges, etc.) or the execution of any activity which could damage this material (i.e., drilling, planing, etc.) is prohibited. If such operations are necessary, the Designated LEA Representative should be contacted prior to such activities.

Functional Space No. 03 - The Auditorium

The ACM identified in the auditorium consists of acoustical plaster and vinyl asbestos tile. The fire door in this area will be assumed to contain asbestos for the purposes of the management plan.

Acoustical Plaster

The ceiling of the auditorium has asbestos-containing acoustical plaster applied to it. This friable material has sustained randomly distributed minor impact damage. Air diffusers are installed in the ceiling. Overall, this material has sustained little damage, has a potential for damage, and is in AHERA category no. 5.

Recommended Response Action and Preventive Measure: Repair and encapsulate the acoustical plaster in accordance with the Baltimore City Asbestos Specification Document on file at 200 E. North Avenue. The Designated LEA Representative should institute an operations and maintenance plan in this area (see Section 7.0).

Maintenance personnel should use extreme care in this area when performing maintenance activities to prevent damage to this material.

Vinyl Asbestos Tile

Floor tile in this area contains asbestos. This nonfriable material has sustained little or no damage, has little or no potential for damage, and is in AHERA category no. 8.

Recommended Response Action and Preventive Measure: Implement an operations and maintenance program (see Section 7.0). The cutting, sanding, drilling, or execution of any activity which could damage this material is prohibited. If such operations are required, the Designated LEA Representative should be contacted prior to such activities.

Fire Door

The fire door in this area will be assumed to contain asbestos for the purposes of the management plan. This material has sustained little or no damage, has a potential for damage, and is in AHERA category no. 8.

Recommended Response Action and Preventive Measures: Institute a comprehensive operations and maintenance plan, including measures to reduce or eliminate disturbance (see Section 7.0).

Door stops should be installed to protect this material (if they are not already in place). Kick plates should also be considered to provide further protection to this material. However, the replacement hardware (i.e., locks, hinges, etc.) or the execution of any activity which could damage this material (i.e., drilling, planing, etc.) is prohibited. If such operations are necessary, the Designated LEA Representative should be contacted prior to such activities.

Functional Space No. 04 - The Classrooms

The ACM identified in the classrooms consists of vinyl asbestos floor tile. This nonfriable material has sustained little or no damage, has little or no potential for damage and is in AHERA category no. 8.

Recommended Response Action and Preventive Measure: Implement an operations and maintenance program (see Section 7.0). The cutting, sanding, drilling , or execution of any activity which could damage this material is prohibited. If such operations are required, the Designated LEA Representative should be contacted prior to such activities.

Functional Space No. 05 - Hallways and Stairwells

The ACM identified in these areas consists of vinyl asbestos floor tile. This nonfriable material has sustained little or no damage, has

little or no potential for damage, and is in AHERA category no. 8.

Recommended Response Action and Preventive Measure: Implement an operations and maintenance program (see Section 7.0). The cutting, sanding, drilling , or execution of any activity which could damage this material is prohibited. If such operations are required, the Designated LEA Representative should be contacted prior to such activities.

Functional Space No. 06 - Offices, Work Rooms, and Lounges

The ACM identified in these areas consists of vinyl asbestos floor tile. The nonfriable material has sustained little or no damage, has little or no potential for damage and is in AHERA category no. 8.

Recommended Response Action and Preventive Measure: Implement an operations and maintenance program (see Section 7.0). The cutting, sanding, drilling , or execution of any activity which could damage this material is prohibited. If such operations are required, the Designated LEA Representative should be contacted prior to such activities.

Functional Space No. 07 - Incinerator Room

The fire door in the incinerator room will be assumed to contain asbestos for the purposes of the management plan. This material has sustained little or no damage, has a potential for damage and is in AHERA category no. 8.

Recommended Response Action and Preventive Measures: Institute a comprehensive operations and maintenance plan, including measures to reduce or eliminate disturbance (see Section 7.0).

Door stops should be installed to protect this material (if they are not already in place). Kick plates should also be considered to provide further protection to this material. However, the replacement hardware (i.e., locks, hinges, etc.) or the execution of any activity which could damage this material (i.e., drilling, planing, etc.) is prohibited. If such operations are necessary, the Designated LEA Representative should be contacted prior to such activities.

Functional Space No. 08 - Library

The ACM identified in the library consists of vinyl asbestos tile. This nonfriable material has sustained little or no damage, has little or no potential for damage and is in AHERA category no. 8.

Recommended Response Action and Preventive Measure: Implement an operations and maintenance program (see Section 7.0). The cutting, sanding, drilling, or execution of any activity which could damage this material is prohibited. If such operations are required, the Designated LEA Representative should be contacted prior to such activities.

Functional Space No. 09 - Mechanical Room

The ACM identified in this area consists of mastic applied to the seams of the ductwork insulation. The fire door in this area will be assumed to contain asbestos for the purposes of the management plan.

Mastic

An asbestos-containing mastic is applied to the seams of the fiber glass insulation covering the ductwork in this area. This material has sustained little or no damage, has little or no potential for damage, and is in AHERA category no. 7.

Recommended Response Action and Preventive Measure: Implement an operations and maintenance program (see Section 7.0). The cutting, sanding, drilling, or execution of any activity which could damage this material are prohibited. If such operations are required, the Designated LEA Representative should be contacted prior to such activities.

Maintenance personnel should use extreme care in this area when performing maintenance activities to prevent damage to this material.

Fire Door

The fire door in this area will be assumed to contain asbestos for the purposes of the management plan. This material has sustained little or no damage, has a potential for damage, and is in AHERA category no. 8.

Recommended Response Action and Preventive Measures: Implement an operations and maintenance program including measures to reduce or eliminate disturbance (see Section 7.0).

Door stops should be installed to protect this material (if they are not already in place). Kick plate should also be considered to provide further protection to this material. However, the replacement hardware (i.e., locks, hinges, etc.) or the execution of any activity which could damage this material (i.e., drilling, planing, etc.) is prohibited. If such operations are necessary, the Designated LEA Representative should be contacted prior to such activities.

4.2 Response Action Schedule

To assist in the response action scheduling process, a prioritization system has been developed. This system guided the scheduling process by providing a prioritization number based on a hazard potential ranking to each ACM location within the building. It should be noted that the ranking does not necessarily identify the existence or lack of existence of a specific hazard, only a general order, from highest to lowest, of the potential for some hazard. It is also not intended to establish or require a strict order of response actions.

The prioritization system is an extension of the assessment process where each of the ACM applications in each functional space is categorized (see Section 1.3). The process for extending the assessment to assign a hazard potential rank is represented by decision trees for TSI and surfacing/miscellaneous ACM in Figures 4-1 and 4-2, respectively.

The priority position for each ACM location is determined by the hazard potential rank, with number 1 being the highest potential and number 8 being the lowest potential. To provide a priority position for those locations having the same hazard potential rank, each rank is weighted by the estimated person exposure hours per week in the functional space. The ACM application with the highest number of estimated exposure hours has the highest priority of those with the same rank.

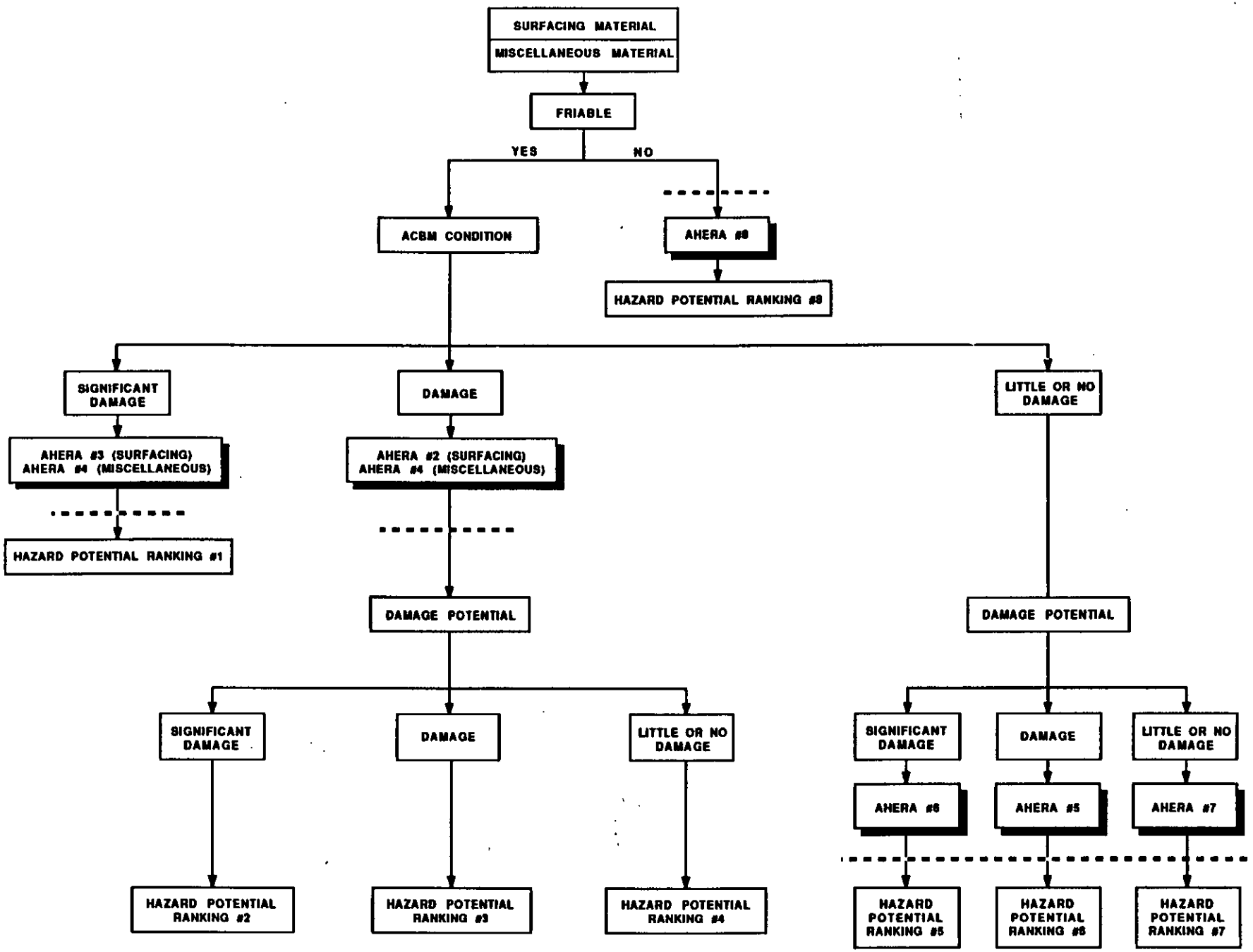
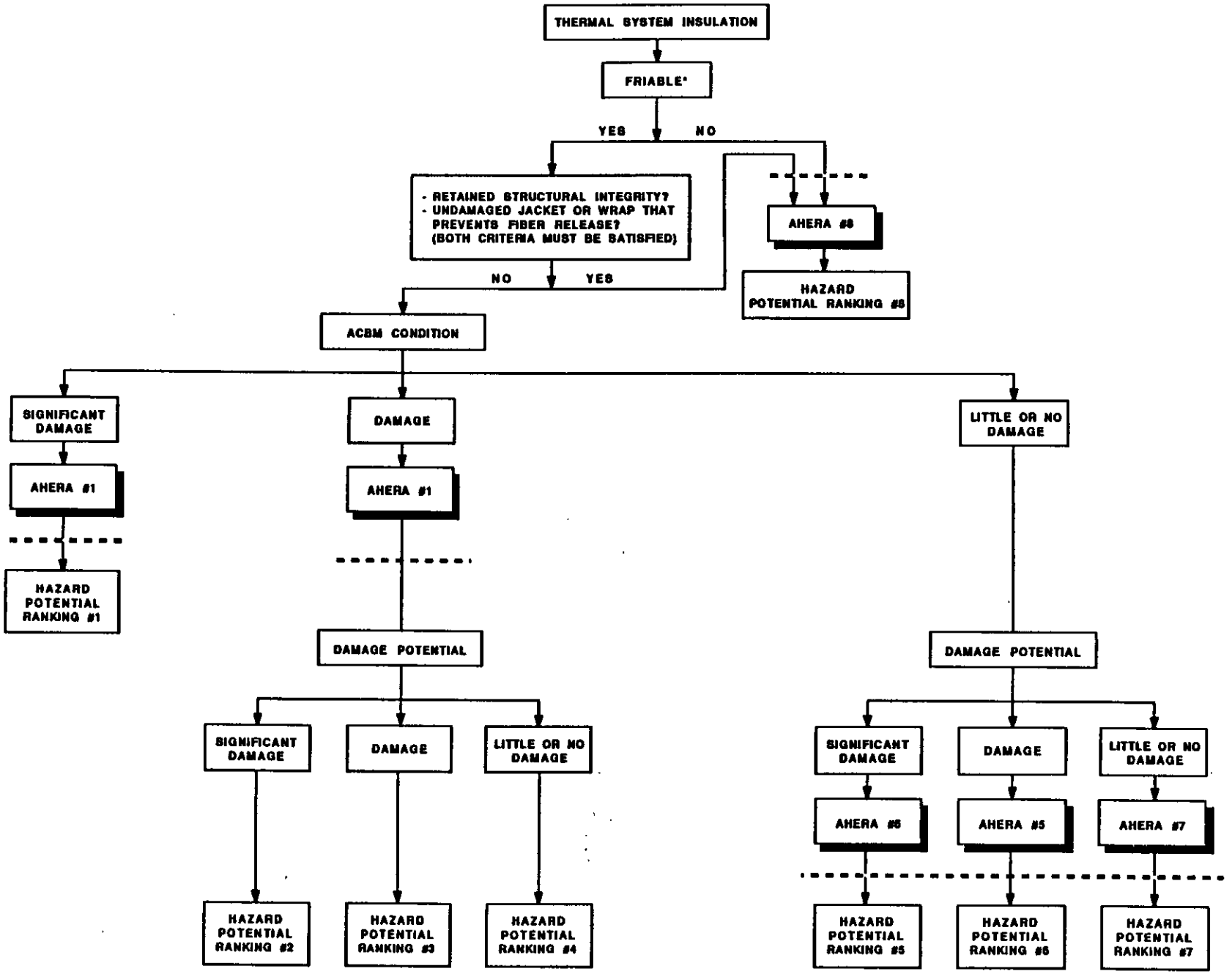


FIGURE 4-2. AHERA CLASSIFICATION "DECISION TREE" SURFACING AND MISCELLANEOUS ACBM



* BY AHERA, SECTION 763.83, "DEFINITIONS"

FIGURE 4-1. AHERA CLASSIFICATION "DECISION TREE" THERMAL SYSTEM INSULATION

Table 4-1 presents the ACM location priority list for this school building. The ACM abatement schedule is provided in Appendix D.

TABLE 4-1 - ACM LOCATION PRIORITY FOR PS150

PRIORITY	FUNCTIONAL SPACE	ESTIMATED CUMULATIVE DESCRIPTION	EXPOSURE HRS	HAZARD POTENTIAL RANK
3	01- Boiler Room	Boiler Block and Trowelled-on Insulation	10	7
3		Boiler Breeching Block and Trowelled-on Insulation	10	7
3		Hot Water Generator Block and Trowelled-on Insulation	10	7
10		(1) Fire Door	10	8
1	02- Cafeteria and Lobby	Acoustical Plaster	4,300	6
6		Vinyl Asbestos Tile	4,300	8
6		(2) Fire Doors	4,300	8
2	03- Auditorium	Acoustical Plaster	1,720	6
7		Vinyl Asbestos Tile	1,720	8
7		(1) Fire Door	1,720	8
5	04- Classrooms	Vinyl Asbestos Tile	21,400	8
6	05- Hallways and Stairwells	Vinyl Asbestos Tile	4,300	8
8	06- Offices, Work Rooms, and Lounges	Vinyl Asbestos Tile	1,625	8

TABLE 4-1 - ACM LOCATION PRIORITY FOR PS150

PRIORITY	FUNCTIONAL SPACE	ESTIMATED CUMULATIVE DESCRIPTION	POTENTIAL EXPOSURE HRS	HAZARD RANK
11	07- Incinerator Room	(1) Fire Door	5	8
9	08- Library	Vinyl Asbestos Tile	300	8
4	09- Mechanical Room	Duct Mastic	5	7
11		(1) Fire Door	5	8

5.0 - CONTRACTOR ACCREDITATION

It is the intention of the Board to use contractors to perform all asbestos operations and maintenance activities and all response actions recommended by this plan.

Currently the Board has contracted with the Marcor Group, Inc., to design and conduct necessary asbestos abatement activities. Marcor is licensed by the State of Maryland as an asbestos abatement contractor, and Marcor's employees have attained the appropriate accreditation by successfully completing all applicable EPA-approved AHERA courses developed under Section 206(c) of Title II of the Toxic Substances Control Act (TSCA).

William A. Gieseking, the Designated LEA Representative, will ensure that any future contractors will be accredited by another state which has adopted a contractor accreditation plan under Section 206(b) of Title II of the Toxic Substances Control Act (TSCA), or are accredited by an EPA-approved course under Section 206(c) of Title II of the Toxic Substances Control Act (TSCA).

6.0 - DESCRIPTION AND LOCATION OF REMAINING ACM

The ACM in this school at the time of the inspection is as described in Table 1-A, Section 1.2, and further defined in the text of Section 1.2. Response actions and conditions and extent of any remaining ACM following a response action are contained in Appendix C. Appendix C will be updated annually and will document all response actions that affect the quantity of ACM remaining at any location in the building. The nature of the response action and the condition and extent of any remaining ACM will be described.

7.0 - OPERATIONS AND MAINTENANCE PLAN, PERIODIC SURVEILLANCE PLAN, AND REINSPECTION PLAN

7.1 Operations and Maintenance Plan

An operations, maintenance, and repair (O&M) program shall be implemented related to all friable ACM present in the school and any nonfriable ACM when the material is about to become friable as a result of activities in the school. The specific O&M procedures and practices related to the actual ACM applications in this building are contained in Appendix E. The program is designed to prevent disturbance of existing ACM, prevent fiber releases, and educate workers. As a matter of Board policy, all activities that disturb or will potentially disturb ACM will be performed by licensed asbestos contractors. The work procedures and health and safety practices that all contractors must follow under this plan are defined in the Baltimore City Technical Specifications for asbestos work. This document is on file at the Physical Plant Office of the Baltimore City Department of Education at 200 E. North Avenue.

7.1.1 Worker Protection

The asbestos fiber cleaning required under this O&M plan and all maintenance, repair, and abatement activities will be performed by contractors. This O&M plan requires that the contractor and his employees strictly follow the health and safety practices described in the Baltimore City Technical Specifications for asbestos work. Although the school workers will not normally be involved in activities involving the disturbance of ACM, they will be instructed during their awareness training (see Section 7.4 Training) to notify the Designated LEA Representative if they notice ACM that has been disturbed or see conditions that may result in a fiber release episode. Since the school workers are not involved in activities related to disturbance of ACM, there are no applicable worker protection requirements.

7.1.2 Cleaning

Areas of the school where friable ACM or damaged or significantly damaged TSI is present will undergo an initial cleaning. The cleaning will be performed by contractors using procedures and health and safety

practices defined in the Baltimore City Technical Specifications for asbestos work. The procedures will meet the minimum requirements of EPA.

After the initial cleaning, additional cleaning (using the same procedures) will be performed by contractor personnel prior to any response action, other than O&M or repair, or at the direction of the Designated LEA Representative. The LEA agrees with this recommendation for additional cleaning.

7.1.3 Other O&M Activities

A warning label shall be placed immediately adjacent to any friable and nonfriable ACBM and suspected ACBM assumed to be ACM located in routine maintenance areas (such as boiler rooms). The warning label shall be readily visible because of bright color or large size and read as follows:

CAUTION: ASBESTOS
HAZARDOUS: DO NOT DISTURB
WITHOUT PROPER TRAINING AND EQUIPMENT

7.1.4 Fiber Release Episode

In the event of a major or minor fiber release, the school principal is to be notified immediately. The principal is to restrict entry to the area and immediately notify the Designated LEA Representative by telephone (No. (301) 396-8672) of the release problem. In the event that the school principal is not on site at the time of the release, the assistant principal or lead maintenance/custodial/operating engineer person should be notified and that person should follow the restriction and notification procedures.

7.2 Periodic Surveillance Plan

Periodic surveillance shall be conducted quarterly from the date of this management plan by a Baltimore City School Operations Area Supervisor. The Operations Area Supervisor must be familiar with the school buildings in order to accurately note any changes in the ACM. The supervisor shall also be responsible for ensuring that the required labeling of areas where ACM is present is intact.

The person performing the quarterly surveillance shall:

- Visually inspect all ACM or assumed ACM locations.
- Record the date of the surveillance, his or her name, and any changes in the condition of the materials (e.g., an increase in the friability of the material and/or an increase in the size of a damaged area by more than 5% in area or length).
- Submit to the Designated LEA Representative a copy of the quarterly surveillance report for inclusion in the annual update of the management plan.

A sample quarterly surveillance reporting form is included as Figure 7-1. The person conducting the surveillance is to indicate any change in ACM condition for each location by indicating a "yes" or "no" as appropriate. Any "yes" requires a written explanation of the observed change in condition. For the initial surveillance, the surveyor must review the Management Plan to establish ACM condition at the time of the inspection. It would be beneficial to have the same individual conduct subsequent surveillance activities, because the same person would be more likely to notice changes in the condition of the ACM. If a person who is unfamiliar with the school conducts periodic surveillance, the person needs to discuss ACM condition with staff operations personnel and review the records of the most recent surveillance and inspection prior to surveillance.

In addition to the quarterly surveillance, daily surveillance shall be performed by the lead maintenance/custodial/operating engineer person on duty at the school. The surveillance will entail visual observation of ACM condition changes during the course of normal maintenance activities. If condition changes are observed, the maintenance person is to contact the school principal immediately.

7.3 Reinspection Plan

Every 3 years from the date of this management plan, the school shall be reinspected by an accredited inspector for all friable and

FIGURE 7-1. QUARTERLY SURVEILLANCE REPORT FORM

DATE: _____ SURVEYOR: _____

SCHOOL NO.: PS150

FUNCTIONAL SPACE	MANAGEMENT AREA DESCRIPTION	CONDITION CHANGE								COMMENTS
		1st Quarter		2nd Quarter		3rd Quarter		4th Quarter		
		Yes	No	Yes	No	Yes	No	Yes	No	
01- Boiler Room	Boiler Block and Trowelled-on Insulation									
	Boiler Breeching Block and Trowelled-on Insulation									
	Hot Water Generator Block and Trowelled-on Insulation									
	(1) Fire Door									
02- Cafeteria and Lobby	Acoustical Plaster									
	Vinyl Asbestos Tile									
	(2) Fire Doors									
03- Auditorium	Acoustical Plaster									
	Vinyl Asbestos Tile									
	(1) Fire Door									

Bentalou Elementary School PS150
(0629k)

FIGURE 7-1. QUARTERLY SURVEILLANCE REPORT FORM

DATE: _____ SURVEYOR: _____

SCHOOL NO.: PS150

FUNCTIONAL SPACE	MANAGEMENT AREA DESCRIPTION	CONDITION CHANGE								COMMENTS
		1st Quarter		2nd Quarter		3rd Quarter		4th Quarter		
		Yes	No	Yes	No	Yes	No	Yes	No	
04- Classrooms	Vinyl Asbestos Tile									
05- Hallways and Stairwells	Vinyl Asbestos Tile									
06- Offices, Work Rooms, and Lounges	Vinyl Asbestos Tile									
07- Incinerator Room	(1) Fire Door									
08- Library	Vinyl Asbestos Tile									
09- Mechanical Room	Duct Mastic									
	(1) Fire Door									

Bentalou Elementary School PS150
(0629k)

nonfriable ACM in the building. For each area of the school building the inspector shall:

- Visually reinspect and reassess the condition of all known friable ACM.
- Visually inspect material that was previously considered nonfriable ACM and determine whether it has become friable since the last inspection or reinspection.
- Identify any homogeneous areas with material that has become friable since the last inspection or reinspection.
- Assess the condition of the newly friable material in areas where samples are collected.
- Reassess the condition of friable ACM previously identified.
- Provide a copy of the reinspection report to the Designated LEA Representative.

Copies of all reinspection reports shall be appended to this management plan.

7.4 Training

Prior to the implementation of the operations, maintenance, and repair provisions of the management plan, the Designated LEA Representative shall ensure that all members of its maintenance and custodial staff (i.e., custodians, electricians, heating/air conditioning engineers, plumbers, repair shop employees, etc.) who work in a building that contains ACM receive awareness training of at least 2 hours. Minimum training shall include, but not be limited to:

- Information regarding asbestos and its various uses and forms;
- Information on health effects associated with asbestos exposure;
- Locations of ACM identified throughout the school buildings in which they work;
- Recognition of damage, deterioration, and delamination of ACM;
- The name and telephone number of the designated person designated by the LEA as the contact point for asbestos related matters and management; and
- The availability and location of the management plan.

In addition, the awareness training shall include information regarding ACM location code marks in public areas, how to recognize and report changes in ACM condition, and emergency procedures for fiber releases. Work practices that minimize any chance for disturbance of ACM will be emphasized.

Participation in the above training program shall be documented in an attendance roster. A certificate of attendance shall be completed for each employee with a copy maintained in his/her personnel file. New custodial and maintenance employees shall be trained within 60 days after commencement of employment. A 2-hour refresher training program shall be provided to all custodial and maintenance employees on an annual basis and be documented with a certificate of attendance.

8.0 - NOTIFICATION AND MANAGEMENT PLAN AVAILABILITY

The Board of School Commissioners of Baltimore City as the LEA is required under Section 763.93 (see Appendix B) of AHERA to maintain and make available for review all management plans prepared for school buildings within the Baltimore City Public School System. Specific requirements include:

- A complete set of management plans for all buildings in the school system shall be maintained at the Board of School Commissioners administrative offices;
- Public notice of plan availability shall be provided annually (i.e., through ads in local newspapers, notices to parent-teacher associations and organizations and letters to parents when there is no parent-teacher organization in-place, newsletters, etc.);
- Provide annual notice to interested parties regarding results of (re-)inspections, response actions, and periodic surveillance programs either planned or in progress;
- Update management plans to reflect changes in conditions of ACM identified through (re-)inspections, periodic surveillance, or brought about through response actions or building renovation; and
- A listing of organizations notified and documentation describing the method of notification shall be included in the annual update to the management plan.

The Baltimore City Public Schools have taken the following steps to notify parents, teachers, and employees of the availability of the Asbestos Management Plans:

- A letter from Dr. Richard C. Hunter, Superintendent of Public Instruction, addressed to parents and personnel of the Baltimore City Public Schools regarding the May 9, 1989, availability of the Asbestos Management Plans will be issued. This letter will be attached to a memorandum of distribution addressed to principals, union leaders, and parent organization leaders.
- A circular regarding availability of Asbestos Management Plans will be issued to deputy superintendents, chief financial officers, associate and assistant superintendents, executive directors, heads of central office units, and principals.

A dated copy of the above items will be included in the Asbestos Management Plans (see Appendix G).

Records must be kept of all relevant events occurring after submission of the management plan. These records become part of the management plan through annual updates to the plan. The relevant events include:

- Response actions and response measures
- Training of personnel
- Periodic surveillance
- Reinspections and assessments
- Cleaning activities
- Maintenance request activities
- Fiber release episodes

9.0 - LEA RESOURCE EVALUATION

The current approximate cost to remove all the ACM from PS150 is $1,021,109. In the event the Baltimore City Board of School Commissioners decide not to completely remove all the ACM within PS150, the following costs are applicable.

The Annual Operation and Maintenance activity cost is approximately $3,800 per year. The Initial Cleaning cost is approximately $1,400. The estimated cost for the ACM encapsulation and/or enclosure at PS150 is $15,546.

Table 9-1 lists the encapsulation and repair costs per material in each functional space in PS150. The encapsulation costs include the costs for minor repairs, patching, etc. The repair costs include removal of damaged ACM and the subsequent replacement cost of non-ACM.

It should be noted that the estimated costs for response actions that require containment and subsequent clearance for reoccupancy (removal, encapsulation, enclosure, and sometimes repair) include costs for clearance air sampling using phase contrast microscopy (PCM). This air sampling technology is being phased-out by EPA in favor of transmission electron microscopy (TEM). By the time many of the response actions for this building are carried out, TEM clearance may be required. The costs associated with TEM clearance are substantial, averaging about $5,000 per response action location, and may amount to a significant addition to the costs estimated herein.

The schedule attached in Appendix D is based on committed finances for fiscal 1990 and annually thereafter and possibly may be accelerated by the availability of additional financial aid. The committed finances include funds for conducting the 2-hour awareness training courses.

TABLE 9-1 RESPONSE ACTION COSTS

FUNCTIONAL SPACE	MATERIAL DESCRIPTION	TYPE	AHERA CATEGORY	PRIORITY	RESPONSE ACTION	COST
01- Boiler Room	Boiler Block and Trowelled-on Insulation	TSI	7	3	Encapsulate	$866
	Boiler Breeching Block and Trowelled-on Insulation	TSI	7	3	Encapsulate	$524
	Hot Water Generator Block and Trowelled-on Insulation	TSI	7	3	Encapsulate	$500
	(1) Fire Door	MISC.	8	10	O&M	*
02- Cafeteria and Lobby	Acoustical Plaster	SURF.	5	1	Encapsulate	$6,376
	Vinyl Asbestos Tile	MISC.	8	6	O&M	*
	(2) Fire Doors	MISC.	8	6	O&M	*
03- Auditorium	Acoustical Plaster	SURF.	5	2	Encapsulate	$7,280
	Vinyl Asbestos Tile	MISC.	8	7	O&M	*
	(1) Fire Door	MISC.	8	7	O&M	*

Bentalou Elementary School PS150
(0629k)

TABLE 9-1 RESPONSE ACTION COSTS

FUNCTIONAL SPACE	MATERIAL DESCRIPTION	TYPE	AHERA CATEGORY	PRIORITY	RESPONSE ACTION	COST
04- Classrooms	Vinyl Asbestos Tile	MISC.	8	5	O&M	*
05- Hallways and Stairwells	Vinyl Asbestos Tile	MISC.	8	6	O&M	*
06- Offices, Work Rooms, and Lounges	Vinyl Asbestos Tile	MISC.	8	8	O&M	*
07- Incinerator Room	(1) Fire Door	MISC.	8	11	O&M	*
08- Library	Vinyl Asbestos Tile	MISC.	8	9	O&M	*
09- Mechanical Room	Duct Mastic	MISC.	7	4	O&M	*
	(1) Fire Door	MISC.	8	11	O&M	*

*The Operations and Maintenance cost and Initial Cleaning (40 CFR 763.91(c)) costs are given as a lump sum per building (see Section 9.0).

Versar INC.

10.0 - CONSULTANT ACCREDITATION INFORMATION

Baltimore City has retained the following consulting firm to prepare Asbestos Management Plans for all schools in the City:

Versar, Inc.
6850 Versar Center
Springfield, Virginia 22151

(703) 750-3000

The identification and accreditation information for the Versar personnel involved in the building inspection and the development of this management plan is provided in Sections 1.1 and 3.0, respectively. These personnel are accredited by an EPA-approved course developed under Section 206(c) of Title II of the Toxic Substances Control Act (TSCA). Copies of the accreditation/reaccreditation certificates are provided in Appendix F.

Versar INC.

APPENDIX A

ASBESTOS BULK SAMPLING LABORATORY DATA SHEETS

UNITED STATES DEPARTMENT OF COMMERCE
National Institute of Standards and Technology
[formerly National Bureau of Standards]
Gaithersburg, Maryland 20899

April 1, 1989

Marcie Wilson
Versar Inc.
6850 Versar Center
Springfield, VA 22151

NVLAP LAB CODE 1122

Dear Ms. Wilson:

I am pleased to inform you that initial accreditation for Bulk Asbestos Analysis by PLM is granted to your organization under the National Voluntary Laboratory Accreditation Program (NVLAP). This accreditation is effective until April 1, 1990, provided that your organization continues to comply with accreditation requirements contained in the NVLAP Procedures.

Your Certificate of Accreditation is enclosed along with a statement of your Scope of Accreditation. You may reproduce these documents in their entirety and announce your organization's accreditation status using the NVLAP logo (enclosed) in business publications, the trade press, and other business oriented literature. Accreditation does not relieve your organization from observing and complying with any applicable existing laws and/or regulations.

We are pleased to have you participate in NVLAP and look forward to your continued association with this program. If you have any questions concerning your NVLAP accreditation, please direct them to: John L. Donaldson, Manager, Laboratory Accreditation, National Institute of Standards and Technology, Admin A527, Gaithersburg, MD 20899; (301) 975-4016.

Sincerely,

Stanley I. Warshaw, Associate Director for
Industry and Standards

Enclosures

National Institute of Standards and Technology

NVLAP

National Voluntary Laboratory Accreditation Program

SCOPE OF ACCREDITATION

ASBESTOS FIBER ANALYSIS

NVLAP LAB CODE 1122

Versar Inc.
6850 Versar Center
Springfield, VA 22151
Marcie Wilson Phone: 703-750-3000

Accreditation Renewal Date: April 1, 1990

NVLAP Test Method Code	Test Method Designation
18/A01	40 Code of Federal Regulations Chapter I (1-1-87 edition) Part 763, Subpart F, Appendix A, pages 293-299 or the current U.S. Environmental Protection Agency method for the analysis of asbestos in building materials by polarized light microscopy.

DEPARTMENT OF COMMERCE • UNITED STATES OF AMERICA •

For the National Institute of Standards and Technology

United States Department of Commerce
National Institute of Standards and Technology

NVLAP

Certificate of Accreditation

VERSAR INC.
SPRINGFIELD, VA

is recognized under the National Voluntary Laboratory Accreditation Program for satisfactory compliance with criteria established in Title 15, Part 7 Code of Federal Regulations. Accreditation is awarded for specific services, listed on the Scope of Accreditation, for:

ASBESTOS FIBER ANALYSIS

April 1, 1990
Effective until

DEPARTMENT OF COMMERCE • UNITED STATES OF AMERICA •

For the National Institute of Standards and Technology

UNITED STATES DEPARTMENT OF COMMERCE
National Institute of Standards and Technology
(formerly National Bureau of Standards)
Gaithersburg, Maryland 20899

March 22, 1989

Marcie Wilson
Versar Inc.
6850 Versar Center
Springfield, VA 22151

NVLAP Lab Code 1122

Dear Ms. Wilson:

Congratulations! You have passed the January round of Proficiency Testing for the National Voluntary Laboratory Accreditation Program for Bulk Asbestos. You will be notified if there are any other requirements you must meet to obtain accreditation under the Program.

We will begin issuing accreditation certificates in April. Yours will be issued when it has been determined that you have satisfied all the requirements for accreditation.

Sincerely,

John L. Donaldson, Manager
Laboratory Accreditation

UNITED STATES DEPARTMENT OF COMMERCE
National Institute of Standards and Technology
(formerly National Bureau of Standards)
Gaithersburg, Maryland 20899

JAN 2 6 1989

Ms. Marcie Wilson
Versar Inc.
6850 Versar Center
Springfield, VA 22151

NVLAP Lab Code 1122

Dear Ms. Wilson:

On December 15, 1988 your laboratory was visited by a Technical Expert representing the National Institute for Standards and Technology (NIST). The purpose of the visit was to assess your laboratory's compliance with National Voluntary Laboratory Accreditation (NVLAP) criteria for accreditation under the Bulk Asbestos Program.

In a report sent to NVLAP (and given to you before leaving the laboratory) the Technical Expert noted certain deficiencies which must be resolved before NIST accreditation can be granted. Your letter of January 12, 1989, described actions you have proposed (or taken) to resolve those deficiencies. A preliminary review of that submittal indicates that all deficiencies have been fully resolved. However, the Assessment Report and your submittal will receive a final review by a panel of Technical Experts, assisting NVLAP, to confirm that all deficiency responses are fully satisfactory. You will be notified if the panel requires any additional information regarding your laboratory in order to make accreditation recommendations to NVLAP.

Your laboratory must also satisfactorily participate in NVLAP proficiency testing before NIST accreditation can be granted.

Please call Harvey Berger or David Alderman, on 301-975-4016, for information on your laboratory's accreditation status or guidance on actions you must take to comply with accreditation requirements.

Sincerely,

John L. Donaldson, Manager
Laboratory Accreditation

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D C. 20460

OFFICE OF
PESTICIDES AND TOXIC SUBSTANCES

3417

Robert Maxfield
Versar Inc.
6850 Versar Center
Springfield, VA 22151

SUBJECT: EPA Interim Laboratory Accreditation for Laboratories Which Offer Analysis of Bulk Samples for Asbestos

Dear Laboratory Director:

The U.S. Environmental Protection Agency (EPA) has completed its review of the results of the second round of analyses in the EPA "Interim Asbestos Bulk Sample Analysis Quality Assurance Program." I am pleased to inform you that your laboratory has successfully classified each of four bulk samples submitted to your facility as either asbestos-containing or nonasbestos-containing. Since each sample was correctly classified, a status of "accredited" has been assigned to your laboratory. As you are aware, each laboratory is also given a numerical score which does not affect your accredited status. The numerical score reflects your laboratory's performance in determining the quantity and type of asbestos in the asbestos-containing samples. Your laboratory's score is 100 %.

As announced in the FEDERAL REGISTER of March 29, 1988 (see enclosed copy), the second round of the EPA Interim Program is the last planned round of EPA accreditation. Laboratories which are accredited in the second round of this program will be considered accredited until January 12, 1989. The National Bureau of Standards (NBS) will begin formal operation of the National Voluntary Laboratory Accreditation Program (NVLAP) for laboratories which conduct analyses of bulk samples for asbestos by polarized light microscopy (PLM) in October 1988. Applications for participation in this program are currently being accepted. You may contact Dr. Larry Gallowin of NBS at (301)975-4022 for enrollment information. An exception to the EPA deadline of January 12, 1989 has been made for laboratories which are accredited in the second EPA round and have enrolled in the NBS program by September 30, 1988. These laboratories will be considered accredited by EPA until NBS has completed its first

evaluation of an individual laboratory's performance. The enclosed copy of the FEDERAL REGISTER notice details the period of transition from EPA accreditation to NBS accreditation. Please note that a laboratory currently accredited by EPA must enter the NBS program and receive accreditation from NBS to continue analysis of bulk samples from school buildings.

Should you have any questions regarding the current EPA round of accreditation, you may contact Bruce Harvey of Research Triangle Institute at (919)541-6369. Thank you for your participation in the program.

Sincerely,

Martin P. Halper, Director
Exposure Evaluation Division (TS-798)

Enclosure

ASBESTOS BULK SAMPLE ANALYSIS INTERIM ACCREDITATION PROGRAM
RESULTS OF ROUND18
JUNE 20, 1988

Robert Maxfield
Versar Inc
6850 Versar Center
Springfield, VA 22151

(703) 642-6.55

LABORATORY
I D NUMBER
3417

QUALITATIVE PERFORMANCE RATING: 4/4
FALSE NEGATIVES: 0
FALSE POSITIVES: 0
IDENTIFICATION RATING: 4/4
QUANTITATIVE RATING: 4/4
RAW SCORE: 400

LABORATORY IS ACCREDITED

LOT & SAMPLE I D NUMBER	A) 9814	B) 2229	C) 8631	D) 8342
RESULTS FROM LABORATORY NUMBER 3417				
ASBESTOS (%)	37 0 CHRY	34 0 AMOS	57.0 CHRY	48.0 CHRY
OTHER FIBROUS MATERIAL (%)	42 0 CELL	50 0 FBGL	38.0 OTHR	1.0 CELL
NONFIBROUS MATERIAL (%)	21 0 NF	16.0 NF	5.0 NF	51.0 NF
RESULTS FROM REFERENCE LABORATORIES				
ASBESTOS (%)	45 3 CHRY	35 3 AMOS	67.0 CHRY	46.8 CHRY
	0 0 NONE	0.1 CROC	0.0 NONE	0.0 NONE
TOTAL ASBESTOS (%)	45 3	35 4	67.0	46.8
DOMINANT ASBESTOS TYPE	CHRY	AMOS	CHRY	CHRY
STANDARD DEVIATION	15 59	10 62	15.32	17.02
ACCEPTANCE RANGE	16 3-100	7 3-63 4	26.6-100	1.8-91.7
OTHER FIBROUS MATERIAL	CELL	FBGL	SYNT	CELL
	FBGL	CELL	CELL	FBGL
NONFIBROUS MATERIAL	BIND	NONE	BIND	CACO
SUMMARY OF QUANTITATIVE RESULTS				
PERCENT ASBESTOS-PERCENTILES				
50% - MEDIAN (N=1E3)	40.0	30.0	74.0	45.0
100% - MAXIMUM	100 0	99.0	100.0	95.0
95%	75.0	60.0	98.8	80.0
75%	50 0	40.0	88 0	60.0
25%	30.0	20.0	58.8	30.9
5%	15.0	7.5	40.0	13.9
0% - MINIMUM	0.0	0.0	0.0	0.0
PERCENT OTHER FIBROUS MATERIAL				
OFM - MEDIAN (N)	40.0(970)	60.0(974)	27.0(896)	5.0(342)
PERCENT NONFIBROUS MATERIAL				
NF - MEDIAN (N)	16.5(804)		5.0(294)	50.0(940)

ASBESTOS ABBREVIATIONS
AMOS=AMOSITE CHRY=CHRYSOTILE CROC=CROCIDOLITE
OTHER FIBROUS MATERIAL ABBREVIATIONS
CELL=CELLULOSE FBGL=FIBROUS GLASS SYNT=SYNTHETIC FIBERS OTHR=OTHER
NONFIBROUS MATERIAL ABBREVIATIONS
BIND=BINDER CACO=CALCIUM CARBONATE

Versar INC.

MEMORANDUM

To: Larry Davies Date: 3/31/89

From: Marcie Wilson

Subject: Asbestos Lab Personnel Who Have Analyzed Samples for Project 5013

NAME	INITIALS	SIGNATURE
Marcie Wilson	MW	MWilson
Michael Lucas		M. Lucas
Ronald Martin	RM	RMartin
Barbara Clements	BC	B Clements
Traci Hartsell	th	T. Hartsell
Timothy Perkins	TAP	Timothy A. Perkins
Donna Southard	ds	dSouthard
Joe Swofford	JS	JSwofford

The field bulk sample numbers consist of four character groups and have the following general format:

PSXXX-00A-00B-INT
Character Group = (1) (2) (3) (4)

1. The first character group represents the school or building number assigned by Baltimore City:

   PS = Public School
   XXX = School or building number; leading zeros are not significant (e.g., PS40 is equivalent to PS040).

2. The second character group represents locations within the building assigned at the discretion of the inspector; leading zeros are not significant (e.g., 004 = 04 = 4).

3. The third character group represents the numbered series of samples within a location assigned at the discretion of the inspector; leading zeros are not significant (e.g., 001 = 01 = 1).

4. The fourth character group represents the inspector's initials; its use is optional.

Therefore, the following sample numbers are equivalent and may represent the same sample:

PS40-01-01-LGD
PS040-1-1-LGD
PS040-001-001

LABORATORY ANALYSIS DATE
FOR PS150

BATCH NO. *	ANALYSIS DATE
66	09/29/88
716	04/27/88
717	04/27/88
718	04/27/88

* BATCH NUMBER IS PROVIDED ON EACH LABORATORY ANAYSIS DATA SHEET IN THE UPPER RIGHT CORNER, THIRD LINE FROM THE TOP.

Versar INC.

SAMPLE #: ASB88 - 08007

LABORATORY REPORT - BULK ASBESTOS ANALYSIS

SITE: PS150

PROJECT NUMBER: 6013 . 8 . 2 BATCH #: 718

CLIENT: BALTIMORE

FIELD SAMPLE #: PS150-001-001-LJ MATRIX: BULK

DATES:

RECEIVED: 4/21/88 COLLECTED: 4/19/88 REPORTED: / /88

LOCATION:

GROSS DESCRIPTION:

FRIABLE [X] FIBROUS [X] HOMOGENOUS [X]

COLOR/APPEARANCE: Gray/Tan

ASBESTOS CONTENT

Chrysotile	45-50 %
Amosite	5-10 %
Crocidolite	%
Tremolite	%
Actinolite	%
Anthophyllite	%

NON-ASBESTOS/FIBROUS CONTENT

[CELLULOSE]	%
[FIBROUS GLASS]	%
[SYNTH. POLYMER]	%
[ ]	%
[ ]	%

NON-ASBESTOS/NON-FIBROUS CONTENT

[BIND. MATERIAL] 35-40 %

TOTAL PERCENT ASBESTOS: 50-60 %

COMMENTS

DESCRIPTION OF ANALYSIS: Bulk Asbestos samples are analyzed by trained microscopists, using Polarized Light Microscopy with dispersion staining. Analysts are trained by EPA McCrone Research Institute utilizing the EPA Interim Method for the Determination of Asbestos in Bulk Insulation Samples, EPA-600/M4-82-020.

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Asbestos Laboratory
Manager

RMartin
Asbestos Analyst

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SAMPLE #: ASB88 - 08008

LABORATORY REPORT - BULK ASBESTOS ANALYSIS

SITE: PS150

PROJECT NUMBER: 6013 . 8 . 2 BATCH #: 718

CLIENT: BALTIMORE

FIELD SAMPLE #: PS150-001-002-LJ MATRIX: BULK

DATES:
RECEIVED: 4/21/88 COLLECTED: 4/19/88 REPORTED: / /88

LOCATION:

GROSS DESCRIPTION:
FRIABLE [X] FIBROUS [X] HOMOGENOUS [X]

COLOR/APPEARANCE: Gray Tan

ASBESTOS CONTENT

Chrysotile	%
Amosite	35-40 %
Crocidolite	%
Tremolite	%
Actinolite	%
Anthophyllite	%

NON-ASBESTOS/FIBROUS CONTENT

[CELLULOSE]	%
[FIBROUS GLASS]	%
[SYNTH. POLYMER]	%
[ ]	%
[ ]	%

NON-ASBESTOS/NON-FIBROUS CONTENT

[BIND. MATERIAL] 55-60 %

TOTAL PERCENT ASBESTOS: 35-40 %

COMMENTS

DESCRIPTION OF ANALYSIS: Bulk Asbestos samples are analyzed by trained microscopists, using Polarized Light Microscopy with dispersion staining. Analysts are trained by EPA McCrone Research Institute utilizing the EPA Interim Method for the Determination of Asbestos in Bulk Insulation Samples, EPA-600/M4-82-020.

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Manager

Asbestos Analyst

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LABORATORY REPORT - BULK A

BATCH #: 718

SITE: PS150

PROJECT NUMBER: 6013 . 8 . 2

CLIENT: BALTIMORE

MATRIX: BULK

FIELD SAMPLE #: PS150-001-003-LJ

DATES: RECEIVED: 4/21/88 COLLECTED: 4/19/88 REPORTED: / /88

LOCATION:

GROSS DESCRIPTION: FRIABLE [X] FIBROUS [X] HOMOGENOUS [X]

COLOR/APPEARANCE: Gray/Tan

ASBESTOS CONTENT

Chrysotile	40-45 %
Amosite	10-15 %
Crocidolite	%
Tremolite	%
Actinolite	%
Anthophyllite	%

NON-ASBESTOS/FIBROUS CONTENT

[CELLULOSE]	%
[FIBROUS GLASS]	%
[SYNTH. POLYMER]	%
[ ]	%
[ ]	%

NON-ASBESTOS/NON-FIBROUS CONTENT

[BIND. MATERIAL] 35-40 %

TOTAL PERCENT ASBESTOS: 50-60 %

COMMENTS

DESCRIPTION OF ANALYSIS: Bulk Asbestos samples are analyzed by trained microscopists, using Polarized Light Microscopy with dispersion staining. Analysts are trained by EPA McCrone Research Institute utilizing the EPA Interim Method for the Determination of Asbestos in Bulk Insulation Samples, EPA-600/M4-82-020.

RM

Asbestos Analyst

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SAMPLE #: ASB88 - 08010

LABORATORY REPORT - BULK ASBESTOS ANALYSIS

SITE: PS150

PROJECT NUMBER: 6013 . 8 . 2 BATCH #: 718

CLIENT: BALTIMORE

FIELD SAMPLE #: PS150-001-004-LS MATRIX: BULK

DATES:
RECEIVED: 4/21/88 COLLECTED: 4/19/88 REPORTED: / /88

LOCATION:

GROSS DESCRIPTION:
FRIABLE [X] FIBROUS [X] HOMOGENOUS [X]

COLOR/APPEARANCE: Gray/Tan

ASBESTOS CONTENT

Chrysotile	%
Amosite	30-35 %
Crocidolite	%
Tremolite	%
Actinolite	%
Anthophyllite	%

NON-ASBESTOS/FIBROUS CONTENT

[CELLULOSE]	%
[FIBROUS GLASS]	%
[SYNTH. POLYMER]	%
[ ]	%
[ ]	%

NON-ASBESTOS/NON-FIBROUS CONTENT

[BIND. MATERIAL] 60-65 %

TOTAL PERCENT ASBESTOS: 30-35 %

COMMENTS

DESCRIPTION OF ANALYSIS: Bulk Asbestos samples are analyzed by trained microscopists, using Polarized Light Microscopy with dispersion staining. Analysts are trained by EPA McCrone Research Institute utilizing the EPA Interim Method for the Determination of Asbestos in Bulk Insulation Samples, EPA-600/M4-82-020.

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SAMPLE #: ASB88 - 08011

LABORATORY REPORT - BULK ASBESTOS ANALYSIS

SITE: PS150

PROJECT NUMBER: 6013 . 8 . 2 BATCH #: 718

CLIENT: BALTIMORE

FIELD SAMPLE #: PS150-001-005-LJ MATRIX: BULK

DATES:

RECEIVED: 4/21/88 COLLECTED: 4/19/88 REPORTED: / /88

LOCATION:

GROSS DESCRIPTION:

FRIABLE [X] FIBROUS [X] HOMOGENOUS [X]

COLOR/APPEARANCE: Gray | Tan

ASBESTOS CONTENT

Chrysotile	50-55 %
Amosite	1-5 %
Crocidolite	%
Tremolite	%
Actinolite	%
Anthophyllite	%

NON-ASBESTOS/FIBROUS CONTENT

[CELLULOSE]	%
[FIBROUS GLASS]	%
[SYNTH. POLYMER]	%
[ ]	%
[ ]	%

NON-ASBESTOS/NON-FIBROUS CONTENT

[BIND. MATERIAL] 35-40 %

TOTAL PERCENT ASBESTOS: 51-60 %

COMMENTS

DESCRIPTION OF ANALYSIS: Bulk Asbestos samples are analyzed by trained microscopists, using Polarized Light Microscopy with dispersion staining. Analysts are trained by EPA McCrone Research Institute utilizing the EPA Interim Method for the Determination of Asbestos in Bulk Insulation Samples, EPA-600/M4-82-020.

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SAMPLE #: ASB88 - 08012

LABORATORY REPORT - BULK ASBESTOS ANALYSIS

SITE: PS150

PROJECT NUMBER: 6013 . 8 . 2 BATCH #: 718

CLIENT: BALTIMORE

FIELD SAMPLE #: PS150-001-006-LJ MATRIX: BULK

DATES:
RECEIVED: 4/21/88 COLLECTED: 4/19/88 REPORTED: / /88

LOCATION:

GROSS DESCRIPTION:
FRIABLE [X] FIBROUS [X] HOMOGENOUS [X]

COLOR/APPEARANCE: Gray Tan

ASBESTOS CONTENT

Chrysotile	%
Amosite	35-40 %
Crocidolite	%
Tremolite	%
Actinolite	%
Anthophyllite	%

NON-ASBESTOS/FIBROUS CONTENT

[CELLULOSE]	%
[FIBROUS GLASS]	%
[SYNTH. POLYMER]	%
[ ]	%
[ ]	%

NON-ASBESTOS/NON-FIBROUS CONTENT

[BIND. MATERIAL] 55-60 %

TOTAL PERCENT ASBESTOS: 35-40 %

COMMENTS

DESCRIPTION OF ANALYSIS: Bulk Asbestos samples are analyzed by trained microscopists, using Polarized Light Microscopy with dispersion staining. Analysts are trained by EPA McCrone Research Institute utilizing the EPA Interim Method for the Determination of Asbestos in Bulk Insulation Samples, EPA-600/M4-82-020.

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SAMPLE #: ASB88 - 08013

LABORATORY REPORT - BULK ASBESTOS ANALYSIS

SITE: PS150

PROJECT NUMBER: 6013 . 8 . 2 BATCH #: 718

CLIENT: BALTIMORE

FIELD SAMPLE #: PS150-001-007-LS MATRIX: BULK

DATES:

RECEIVED: 4/21/88 COLLECTED: 4/19/88 REPORTED: / /88

LOCATION:

GROSS DESCRIPTION:

FRIABLE [X] FIBROUS [X] HOMOGENOUS [X]

COLOR/APPEARANCE: Gray/Tan

ASBESTOS CONTENT

Chrysotile	45-50	%
Amosite	5-10	%
Crocidolite		%
Tremolite		%
Actinolite		%
Anthophyllite		%

NON-ASBESTOS/FIBROUS CONTENT

[CELLULOSE]		%
[FIBROUS GLASS]		%
[SYNTH. POLYMER]		%
[ ]		%
[ ]		%

NON-ASBESTOS/NON-FIBROUS CONTENT

[BIND. MATERIAL] 35-40 %

TOTAL PERCENT ASBESTOS: 50-60 %

COMMENTS

DESCRIPTION OF ANALYSIS: Bulk Asbestos samples are analyzed by trained microscopists, using Polarized Light Microscopy with dispersion staining. Analysts are trained by EPA McCrone Research Institute utilizing the EPA Interim Method for the Determination of Asbestos in Bulk Insulation Samples, EPA-600/M4-82-020.

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SAMPLE #: ASB88 - 08014

LABORATORY REPORT - BULK ASBESTOS ANALYSIS

SITE: PS150

PROJECT NUMBER: 6013 . 8 . 2 BATCH #: 718

CLIENT: BALTIMORE

FIELD SAMPLE #: PS150-001-008-LJ MATRIX: BULK

DATES:
RECEIVED: 4/21/88 COLLECTED: 4/19/88 REPORTED: / /88

LOCATION:

GROSS DESCRIPTION:
FRIABLE [X] FIBROUS [X] HOMOGENOUS [X]

COLOR/APPEARANCE: Gray/Tan

ASBESTOS CONTENT

Chrysotile	1-5 %
Amosite	35-40 %
Crocidolite	____ %
Tremolite	____ %
Actinolite	____ %
Anthophyllite	____ %

NON-ASBESTOS/FIBROUS CONTENT

[CELLULOSE]	____ %
[FIBROUS GLASS]	____ %
[SYNTH. POLYMER]	____ %
[____]	____ %
[____]	____ %

NON-ASBESTOS/NON-FIBROUS CONTENT

[BIND. MATERIAL] 50-55 %

TOTAL PERCENT ASBESTOS: 36-45 %

COMMENTS

DESCRIPTION OF ANALYSIS: Bulk Asbestos samples are analyzed by trained microscopists, using Polarized Light Microscopy with dispersion staining. Analysts are trained by EPA McCrone Research Institute utilizing the EPA Interim Method for the Determination of Asbestos in Bulk Insulation Samples, EPA-600/M4-82-020.

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SAMPLE #: ASB88 - 08015

LABORATORY REPORT - BULK ASBESTOS ANALYSIS

SITE: PS150

PROJECT NUMBER: 6013 . 8 . 2 BATCH #: 718

CLIENT: BALTIMORE

FIELD SAMPLE #: PS150-001-009-LJ MATRIX: BULK

DATES: RECEIVED: 4/21/88 COLLECTED: 4/19/88 REPORTED: / /88

LOCATION:

GROSS DESCRIPTION: FRIABLE [X] FIBROUS [X] HOMOGENOUS [X]

COLOR/APPEARANCE: Gray Tan

ASBESTOS CONTENT

Chrysotile	55-60 %
Amosite	%
Crocidolite	%
Tremolite	%
Actinolite	%
Anthophyllite	%

NON-ASBESTOS/FIBROUS CONTENT

[CELLULOSE]	%
[FIBROUS GLASS]	%
[SYNTH. POLYMER]	%
[ ]	%
[ ]	%

NON-ASBESTOS/NON-FIBROUS CONTENT

[BIND. MATERIAL] 35-40 %

TOTAL PERCENT ASBESTOS: 55-60 %

COMMENTS

DESCRIPTION OF ANALYSIS: Bulk Asbestos samples are analyzed by trained microscopists, using Polarized Light Microscopy with dispersion staining. Analysts are trained by EPA McCrone Research Institute utilizing the EPA Interim Method for the Determination of Asbestos in Bulk Insulation Samples, EPA-600/M4-82-020.

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SAMPLE #: ASB88 - 08016

LABORATORY REPORT - BULK ASBESTOS ANALYSIS

SITE: PS150

PROJECT NUMBER: 6013 . 8 . 2 BATCH #: 718

CLIENT: BALTIMORE

FIELD SAMPLE #: PS150-001-0 10 -LJ MATRIX: BULK

DATES:

RECEIVED: 4/21/88 COLLECTED: 4/19/88 REPORTED: / /88

LOCATION:

GROSS DESCRIPTION:

FRIABLE [X] FIBROUS [X] HOMOGENOUS [X]

COLOR/APPEARANCE: Tan

ASBESTOS CONTENT

Chrysotile	____ %
Amosite	____ %
Crocidolite	____ %
Tremolite	____ %
Actinolite	____ %
Anthophyllite	____ %

NON-ASBESTOS/FIBROUS CONTENT

[CELLULOSE]	1-5 %
[FIBROUS GLASS]	45-50 %
[SYNTH. POLYMER]	____ %
[____]	____ %
[____]	____ %

NON-ASBESTOS/NON-FIBROUS CONTENT

[BIND. MATERIAL]	40-45 %

TOTAL PERCENT ASBESTOS: <1 %

COMMENTS

DESCRIPTION OF ANALYSIS: Bulk Asbestos samples are analyzed by trained microscopists, using Polarized Light Microscopy with dispersion staining. Analysts are trained by EPA McCrone Research Institute utilizing the EPA Interim Method for the Determination of Asbestos in Bulk Insulation Samples, EPA-600/M4-82-020.

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Versar INC.

SAMPLE #: ASB88 - 08017

LABORATORY REPORT - BULK ASBESTOS ANALYSIS

SITE: PS150

PROJECT NUMBER: 6013 . 8 . 2 BATCH #: 718

CLIENT: BALTIMORE

FIELD SAMPLE #: PS150-001-011-LS MATRIX: BULK

DATES:

RECEIVED: 4/21/88 COLLECTED: 4/19/88 REPORTED: / /88

LOCATION:

GROSS DESCRIPTION:

FRIABLE [X] FIBROUS [X] HOMOGENOUS [X]

COLOR/APPEARANCE: Gray Tan

ASBESTOS CONTENT		NON-ASBESTOS/FIBROUS CONTENT	
Chrysotile	55-60 %	[CELLULOSE]	%
Amosite	%	[FIBROUS GLASS]	%
Crocidolite	%	[SYNTH. POLYMER]	%
Tremolite	%	[ ]	%
Actinolite	%	[ ]	%
Anthophyllite	%		

NON-ASBESTOS/NON-FIBROUS CONTENT

[BIND. MATERIAL] 35-40 %

TOTAL PERCENT ASBESTOS: 55-60 %

COMMENTS

DESCRIPTION OF ANALYSIS: Bulk Asbestos samples are analyzed by trained microscopists, using Polarized Light Microscopy with dispersion staining. Analysts are trained by EPA McCrone Research Institute utilizing the EPA Interim Method for the Determination of Asbestos in Bulk Insulation Samples, EPA-600/M4-82-020.

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Versar INC.

SAMPLE #: ASB88 - 08018

LABORATORY REPORT - BULK ASBESTOS ANALYSIS

SITE: PS150

PROJECT NUMBER: 6013 . 8 . 2 BATCH #: 718

CLIENT: BALTIMORE

FIELD SAMPLE #: PS150-001-012-LS MATRIX: BULK

DATES:
RECEIVED: 4/21/88 COLLECTED: 4/19/88 REPORTED: / /88

LOCATION:

GROSS DESCRIPTION:
FRIABLE [X] FIBROUS [X] HOMOGENOUS [X]

COLOR/APPEARANCE: Tan

ASBESTOS CONTENT	
Chrysotile	%
Amosite	%
Crocidolite	%
Tremolite	%
Actinolite	%
Anthophyllite	%

NON-ASBESTOS/FIBROUS CONTENT	
[CELLULOSE]	1-5 %
[FIBROUS GLASS]	45-50 %
[SYNTH. POLYMER]	%
[ ]	%
[ ]	%

NON-ASBESTOS/NON-FIBROUS CONTENT	
[BIND. MATERIAL]	40-45 %

TOTAL PERCENT ASBESTOS: <1 %

COMMENTS

DESCRIPTION OF ANALYSIS: Bulk Asbestos samples are analyzed by trained microscopists, using Polarized Light Microscopy with dispersion staining. Analysts are trained by EPA McCrone Research Institute utilizing the EPA Interim Method for the Determination of Asbestos in Bulk Insulation Samples, EPA-600/M4-82-020.

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Versar INC.

SAMPLE #: ASB88 - 07995

LABORATORY REPORT - BULK ASBESTOS ANALYSIS

SITE: PS150

PROJECT NUMBER: 6013 . 8 . 2 BATCH #: 717

CLIENT: BALTIMORE

FIELD SAMPLE #: PS150-001-013-LS MATRIX: BULK

DATES:

RECEIVED: 4/21/88 COLLECTED: 4/19/88 REPORTED: / /88

LOCATION:

GROSS DESCRIPTION:

FRIABLE [X] FIBROUS [X] HOMOGENOUS [X]

COLOR/APPEARANCE: Tan/Gray

ASBESTOS CONTENT

Chrysotile	50-55 %
Amosite	%
Crocidolite	%
Tremolite	%
Actinolite	%
Anthophyllite	%

NON-ASBESTOS/FIBROUS CONTENT

[CELLULOSE]	%
[FIBROUS GLASS]	%
[SYNTH. POLYMER]	%
[ ]	%
[ ]	%

NON-ASBESTOS/NON-FIBROUS CONTENT

[BIND. MATERIAL] 40-45 %

TOTAL PERCENT ASBESTOS: 50-55 %

COMMENTS

DESCRIPTION OF ANALYSIS: Bulk Asbestos samples are analyzed by trained microscopists, using Polarized Light Microscopy with dispersion staining. Analysts are trained by EPA McCrone Research Institute utilizing the EPA Interim Method for the Determination of Asbestos in Bulk Insulation Samples, EPA-600/M4-82-020.

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Versar INC.

SAMPLE #: ASB88 - 07996

LABORATORY REPORT - BULK ASBESTOS ANALYSIS

SITE: PS150

PROJECT NUMBER: 6013 . 8 . 2 BATCH #: 7/7

CLIENT: BALTIMORE

FIELD SAMPLE #: PS150-001-014-LS MATRIX: BULK

DATES:

RECEIVED: 4/21/88 COLLECTED: 4/19/88 REPORTED: / /88

LOCATION:

GROSS DESCRIPTION:

FRIABLE [X] FIBROUS [X] HOMOGENOUS [X]

COLOR/APPEARANCE: Gray

ASBESTOS CONTENT

Chrysotile	%
Amosite	35-40 %
Crocidolite	%
Tremolite	%
Actinolite	%
Anthophyllite	%

NON-ASBESTOS/FIBROUS CONTENT

[CELLULOSE]	%
[FIBROUS GLASS]	%
[SYNTH. POLYMER]	%
[ ]	%
[ ]	%

NON-ASBESTOS/NON-FIBROUS CONTENT

[BIND. MATERIAL] 55-60 %

TOTAL PERCENT ASBESTOS: 35-40 %

COMMENTS

DESCRIPTION OF ANALYSIS: Bulk Asbestos samples are analyzed by trained microscopists, using Polarized Light Microscopy with dispersion staining. Analysts are trained by EPA McCrone Research Institute utilizing the EPA Interim Method for the Determination of Asbestos in Bulk Insulation Samples, EPA-600/M4-82-020.

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Versar INC.

SAMPLE #: ASB88 - 07997

LABORATORY REPORT - BULK ASBESTOS ANALYSIS

SITE: PS150

PROJECT NUMBER: 6013 . 8 . 2 BATCH #: 717

CLIENT: BALTIMORE

FIELD SAMPLE #: PS150-001-015-LS MATRIX: BULK

DATES:
RECEIVED: 4/21/88 COLLECTED: 4/19/88 REPORTED: / /88

LOCATION:

GROSS DESCRIPTION:
FRIABLE [X] FIBROUS [X] HOMOGENOUS [X]

COLOR/APPEARANCE: Tan/Gray

ASBESTOS CONTENT		NON-ASBESTOS/FIBROUS CONTENT	
Chrysotile	55-60 %	[CELLULOSE]	%
Amosite	%	[FIBROUS GLASS]	%
Crocidolite	%	[SYNTH. POLYMER]	%
Tremolite	%	[ ]	%
Actinolite	%	[ ]	%
Anthophyllite	%		

NON-ASBESTOS/NON-FIBROUS CONTENT

[BIND. MATERIAL] 35-40 %

TOTAL PERCENT ASBESTOS: 55-60 %

COMMENTS

DESCRIPTION OF ANALYSIS: Bulk Asbestos samples are analyzed by trained microscopists, using Polarized Light Microscopy with dispersion staining. Analysts are trained by EPA McCrone Research Institute utilizing the EPA Interim Method for the Determination of Asbestos in Bulk Insulation Samples, EPA-600/M4-82-020.

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Manager

Asbestos Analyst

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Versar INC.

SAMPLE #: ASB88 - 07998

LABORATORY REPORT - BULK ASBESTOS ANALYSIS

SITE: PS150

PROJECT NUMBER: 6013 . 8 . 2 BATCH #: 717

CLIENT: BALTIMORE

FIELD SAMPLE #: PS150-001-016-LS MATRIX: BULK

DATES:
RECEIVED: 4/21/88 COLLECTED: 4/19/88 REPORTED: / /88

LOCATION:

GROSS DESCRIPTION:
FRIABLE [X FIBROUS [X HOMOGENOUS [X

COLOR/APPEARANCE: Gray

ASBESTOS CONTENT

Chrysotile	%
Amosite	30-35 %
Crocidolite	%
Tremolite	%
Actinolite	%
Anthophyllite	%

NON-ASBESTOS/FIBROUS CONTENT

[CELLULOSE]	%
[FIBROUS GLASS]	%
[SYNTH. POLYMER]	%
[ ]	%
[ ]	%

NON-ASBESTOS/NON-FIBROUS CONTENT

[BIND. MATERIAL] 60-65 %

TOTAL PERCENT ASBESTOS: 30-35 %

COMMENTS

DESCRIPTION OF ANALYSIS: Bulk Asbestos samples are analyzed by trained microscopists, using Polarized Light Microscopy with dispersion staining. Analysts are trained by EPA McCrone Research Institute utilizing the EPA Interim Method for the Determination of Asbestos in Bulk Insulation Samples, EPA-600/M4-82-020.

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Versar INC.

SAMPLE #: ASB88 - 07999

LABORATORY REPORT - BULK ASBESTOS ANALYSIS

SITE: PS150

PROJECT NUMBER: 6013 . 8 . 2 BATCH #: 71

CLIENT: BALTIMORE

FIELD SAMPLE #: PS150-001-017-LS MATRIX: BULK

DATES:

RECEIVED: 4/21/88 COLLECTED: 4/19/88 REPORTED: / /88

LOCATION:

GROSS DESCRIPTION:

FRIABLE [X] FIBROUS [X] HOMOGENOUS [X]

COLOR/APPEARANCE: Tan

ASBESTOS CONTENT	
Chrysotile	%
Amosite	%
Crocidolite	%
Tremolite	%
Actinolite	%
Anthophyllite	%

NON-ASBESTOS/FIBROUS CONTENT	
[CELLULOSE]	%
[FIBROUS GLASS]	35-40 %
[SYNTH. POLYMER]	%
[ ]	%
[ ]	%

NON-ASBESTOS/NON-FIBROUS CONTENT	
[BIND. MATERIAL]	55-60 %

TOTAL PERCENT ASBESTOS: <1 %

COMMENTS

DESCRIPTION OF ANALYSIS: Bulk Asbestos samples are analyzed by trained microscopists, using Polarized Light Microscopy with dispersion staining. Analysts are trained by EPA McCrone Research Institute utilizing the EPA Interim Method for the Determination of Asbestos in Bulk Insulation Samples, EPA-600/M4-82-020.

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Versar INC.

SAMPLE #: ASB88 - 08000

LABORATORY REPORT - BULK ASBESTOS ANALYSIS

SITE: PS150

PROJECT NUMBER: 6013 . 8 . 2 BATCH #: 717

CLIENT: BALTIMORE

FIELD SAMPLE #: PS150-001-018-LS MATRIX: BULK

DATES:

RECEIVED: 4/21/88 COLLECTED: 4/19/88 REPORTED: / /88

LOCATION:

GROSS DESCRIPTION:

FRIABLE [X] FIBROUS [X] HOMOGENOUS [X]

COLOR/APPEARANCE: Tan

ASBESTOS CONTENT		NON-ASBESTOS/FIBROUS CONTENT	
Chrysotile	%	[CELLULOSE]	%
Amosite	%	[FIBROUS GLASS]	35-40 %
Crocidolite	%	[SYNTH. POLYMER]	%
Tremolite	%	[ ]	%
Actinolite	%	[ ]	%
Anthophyllite	%		

NON-ASBESTOS/NON-FIBROUS CONTENT

[BIND. MATERIAL] 55-60 %

TOTAL PERCENT ASBESTOS: <1 %

COMMENTS

DESCRIPTION OF ANALYSIS: Bulk Asbestos samples are analyzed by trained microscopists, using Polarized Light Microscopy with dispersion staining. Analysts are trained by EPA McCrone Research Institute utilizing the EPA Interim Method for the Determination of Asbestos in Bulk Insulation Samples, EPA-600/M4-82-020.

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SAMPLE #: ASB88 - 08001

LABORATORY REPORT - BULK ASBESTOS ANALYSIS

SITE: PS150

PROJECT NUMBER: 6013 . 8 . 2 BATCH #: 717

CLIENT: BALTIMORE

FIELD SAMPLE #: PS150-001-019-LS MATRIX: BULK

DATES:
RECEIVED: 4/21/88 COLLECTED: 4/19/88 REPORTED: / /88

LOCATION:

GROSS DESCRIPTION:
FRIABLE [N] FIBROUS [N] HOMOGENOUS [N]

COLOR/APPEARANCE: Tan

ASBESTOS CONTENT	
Chrysotile	____ %
Amosite	____ %
Crocidolite	____ %
Tremolite	____ %
Actinolite	____ %
Anthophyllite	____ %

NON-ASBESTOS/FIBROUS CONTENT	
[CELLULOSE]	____ %
[FIBROUS GLASS]	35-40 %
[SYNTH. POLYMER]	____ %
[____]	____ %
[____]	____ %

NON-ASBESTOS/NON-FIBROUS CONTENT

[BIND. MATERIAL] 55-60 %

TOTAL PERCENT ASBESTOS: <1 %

COMMENTS

DESCRIPTION OF ANALYSIS: Bulk Asbestos samples are analyzed by trained microscopists, using Polarized Light Microscopy with dispersion staining. Analysts are trained by EPA McCrone Research Institute utilizing the EPA Interim Method for the Determination of Asbestos in Bulk Insulation Samples, EPA-600/M4-82-020.

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Versar INC.

SAMPLE #: AS888 - 08002

LABORATORY REPORT - BULK ASBESTOS ANALYSIS

SITE: PS150

PROJECT NUMBER: 6013 . 8 . 2 BATCH #: 717

CLIENT: BALTIMORE

FIELD SAMPLE #: PS150-001-020-LS MATRIX: BULK

DATES:

RECEIVED: 4/21/88 COLLECTED: 4/19/88 REPORTED: / /88

LOCATION:

GROSS DESCRIPTION:

FRIABLE [X] FIBROUS [X] HOMOGENOUS [X]

COLOR/APPEARANCE: Tan

ASBESTOS CONTENT

Chrysotile	____ %
Amosite	____ %
Crocidolite	____ %
Tremolite	____ %
Actinolite	____ %
Anthophyllite	____ %

NON-ASBESTOS/FIBROUS CONTENT

[CELLULOSE]	____ %
[FIBROUS GLASS]	35-40 %
[SYNTH. POLYMER]	____ %
[____]	____ %
[____]	____ %

NON-ASBESTOS/NON-FIBROUS CONTENT

[BIND. MATERIAL]	55-60 %

TOTAL PERCENT ASBESTOS: <1 %

COMMENTS

DESCRIPTION OF ANALYSIS: Bulk Asbestos samples are analyzed by trained microscopists, using Polarized Light Microscopy with dispersion staining. Analysts are trained by EPA McCrone Research Institute utilizing the EPA Interim Method for the Determination of Asbestos in Bulk Insulation Samples, EPA-600/M4-82-020.

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Versar INC.

SAMPLE #: ASB88 - 08003

LABORATORY REPORT - BULK ASBESTOS ANALYSIS

SITE: PS150

PROJECT NUMBER: 6013 . 8 . 2 BATCH #: 717

CLIENT: BALTIMORE

FIELD SAMPLE #: PS150-001-021-LS MATRIX: BULK

DATES:

RECEIVED: 4/21/88 COLLECTED: 4/19/88 REPORTED: / /88

LOCATION:

GROSS DESCRIPTION:

FRIABLE [X] FIBROUS [X] HOMOGENOUS [X]

COLOR/APPEARANCE: Tan

ASBESTOS CONTENT	
Chrysotile	%
Amosite	%
Crocidolite	%
Tremolite	%
Actinolite	%
Anthophyllite	%

NON-ASBESTOS/FIBROUS CONTENT	
[CELLULOSE]	1-5 %
[FIBROUS GLASS]	35-40 %
[SYNTH. POLYMER]	%
[ ]	%
[ ]	%

NON-ASBESTOS/NON-FIBROUS CONTENT	
[BIND. MATERIAL]	50-55 %

TOTAL PERCENT ASBESTOS: <1 %

COMMENTS

DESCRIPTION OF ANALYSIS: Bulk Asbestos samples are analyzed by trained microscopists, using Polarized Light Microscopy with dispersion staining. Analysts are trained by EPA McCrone Research Institute utilizing the EPA Interim Method for the Determination of Asbestos in Bulk Insulation Samples, EPA-600/M4-82-020.

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SAMPLE #: ASB88 - 08004

LABORATORY REPORT - BULK ASBESTOS ANALYSIS

SITE: PS150

PROJECT NUMBER: 6013 . 8 . 2 BATCH #: 717

CLIENT: BALTIMORE

FIELD SAMPLE #: PS150-001-022-LS MATRIX: BULK

DATES:

RECEIVED: 4/21/88 COLLECTED: 4/19/88 REPORTED: / /88

LOCATION:

GROSS DESCRIPTION:

FRIABLE [X] FIBROUS [X] HOMOGENOUS [X]

COLOR/APPEARANCE: Tan

ASBESTOS CONTENT	
Chrysotile	%
Amosite	%
Crocidolite	%
Tremolite	%
Actinolite	%
Anthophyllite	%

NON-ASBESTOS/FIBROUS CONTENT	
[CELLULOSE]	%
[FIBROUS GLASS]	35-40 %
[SYNTH. POLYMER]	%
[ ]	%
[ ]	%

NON-ASBESTOS/NON-FIBROUS CONTENT	
[BIND. MATERIAL]	55-60 %

TOTAL PERCENT ASBESTOS: <1 %

COMMENTS

DESCRIPTION OF ANALYSIS: Bulk Asbestos samples are analyzed by trained microscopists, using Polarized Light Microscopy with dispersion staining. Analysts are trained by EPA McCrone Research Institute utilizing the EPA Interim Method for the Determination of Asbestos in Bulk Insulation Samples, EPA-600/M4-82-020.

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SAMPLE #: ASB88 - 08005

LABORATORY REPORT - BULK ASBESTOS ANALYSIS

SITE: PS150

PROJECT NUMBER: 6013 . 8 . 2 BATCH #: 717

CLIENT: BALTIMORE

FIELD SAMPLE #: PS150-001-023-LS MATRIX: BULK

DATES:

RECEIVED: 4/21/88 COLLECTED: 4/19/88 REPORTED: / /88

LOCATION:

GROSS DESCRIPTION:

FRIABLE [X] FIBROUS [X] HOMOGENOUS [X]

COLOR/APPEARANCE: Tan

ASBESTOS CONTENT	
Chrysotile	%
Amosite	%
Crocidolite	%
Tremolite	%
Actinolite	%
Anthophyllite	%

NON-ASBESTOS/FIBROUS CONTENT	
[CELLULOSE]	1-5 %
[FIBROUS GLASS]	35-40 %
[SYNTH. POLYMER]	%
[ ]	%
[ ]	%

NON-ASBESTOS/NON-FIBROUS CONTENT	
[BIND. MATERIAL]	50-55 %

TOTAL PERCENT ASBESTOS: <1 %

COMMENTS

DESCRIPTION OF ANALYSIS: Bulk Asbestos samples are analyzed by trained microscopists, using Polarized Light Microscopy with dispersion staining. Analysts are trained by EPA McCrone Research Institute utilizing the EPA Interim Method for the Determination of Asbestos in Bulk Insulation Samples, EPA-600/M4-82-020.

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SAMPLE #: ASB88 - 08006

LABORATORY REPORT - BULK ASBESTOS ANALYSI

SITE: PS150

PROJECT NUMBER: 6013 . 8 . 2 BATCH #: 71

CLIENT: BALTIMORE

FIELD SAMPLE #: PS150-001-024-LS MATRIX: BULK

DATES:
RECEIVED: 4/21/88 COLLECTED: 4/19/88 REPORTED: / /8

LOCATION:

GROSS DESCRIPTION:
FRIABLE [No] FIBROUS [No] HOMOGENOUS [X]

COLOR/APPEARANCE: Brown

ASBESTOS CONTENT

Chrysotile	1-5 %
Amosite	%
Crocidolite	%
Tremolite	%
Actinolite	%
Anthophyllite	%

NON-ASBESTOS/FIBROUS CONTENT

[CELLULOSE]	%
[FIBROUS GLASS]	%
[SYNTH. POLYMER]	%
[ ]	%
[ ]	%

NON-ASBESTOS/NON-FIBROUS CONTENT

[BIND. MATERIAL] 90-95 %

TOTAL PERCENT ASBESTOS: 1-5 %

COMMENTS

DESCRIPTION OF ANALYSIS: Bulk Asbestos samples are analyzed by trained microscopists, using Polarized Light Microscopy with dispersion staining. Analysts are trained by EPA McCrone Research Institute utilizing the EPA Interim Method for the Determination of Asbestos in Bulk Insulation Samples, EPA-600/M4-82-020.

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SAMPLE #: ASB88 - 07984

LABORATORY REPORT - BULK ASBESTOS ANALYSIS

SITE: PS150

PROJECT NUMBER: 6013 . 8 . 2 BATCH #: 716

CLIENT: BALTIMORE

FIELD SAMPLE #: PS150-001-025-LS MATRIX: BULK

DATES:

RECEIVED: 4/21/88 COLLECTED: 4/19/88 REPORTED: / /88

LOCATION:

GROSS DESCRIPTION:

FRIABLE [X] FIBROUS [X] HOMOGENOUS [X]

COLOR/APPEARANCE: tan

ASBESTOS CONTENT	
Chrysotile	____ %
Amosite	____ %
Crocidolite	____ %
Tremolite	____ %
Actinolite	____ %
Anthophyllite	____ %

NON-ASBESTOS/FIBROUS CONTENT	
[CELLULOSE]	1-5 %
[FIBROUS GLASS]	40-45 %
[SYNTH. POLYMER]	____ %
[____]	____ %
[____]	____ %

NON-ASBESTOS/NON-FIBROUS CONTENT	
[BIND. MATERIAL]	45-50 %

TOTAL PERCENT ASBESTOS: <1 %

COMMENTS

DESCRIPTION OF ANALYSIS: Bulk Asbestos samples are analyzed by trained microscopists, using Polarized Light Microscopy with dispersion staining. Analysts are trained by EPA McCrone Research Institute utilizing the EPA Interim Method for the Determination of Asbestos in Bulk Insulation Samples, EPA-600/M4-82-020.

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VERSAR INC.

SAMPLE #: ASB88 - 07985

LABORATORY REPORT - BULK ASBESTOS ANALYSIS

SITE: PS150

PROJECT NUMBER: 6013 . 8 . 2 BATCH #: 716

CLIENT: BALTIMORE

FIELD SAMPLE #: PS150-001-026-LS MATRIX: BULK

DATES:
RECEIVED: 4/21/88 COLLECTED: 4/19/88 REPORTED: / /88

LOCATION:

GROSS DESCRIPTION:
FRIABLE [No] FIBROUS [No] HOMOGENOUS [X]

COLOR/APPEARANCE: Tan

ASBESTOS CONTENT		NON-ASBESTOS/FIBROUS CONTENT	
Chrysotile	1-5 %	[CELLULOSE]	1-5 %
Amosite	%	[FIBROUS GLASS]	%
Crocidolite	%	[SYNTH. POLYMER]	%
Tremolite	%	[ ]	%
Actinolite	%	[ ]	%
Anthophyllite	%		

NON-ASBESTOS/NON-FIBROUS CONTENT

[BIND. MATERIAL] 85-90 %

TOTAL PERCENT ASBESTOS: 1-5 %

COMMENTS

DESCRIPTION OF ANALYSIS: Bulk Asbestos samples are analyzed by trained microscopists, using Polarized Light Microscopy with dispersion staining. Analysts are trained by EPA McCrone Research Institute utilizing the EPA Interim Method for the Determination of Asbestos in Bulk Insulation Samples, EPA-600/M4-82-020.

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Versar INC.

SAMPLE #: ASB88 - 07986

LABORATORY REPORT - BULK ASBESTOS ANALYSIS

SITE: PS150

PROJECT NUMBER: 6013 . 8 . 2 BATCH #: 716

CLIENT: BALTIMORE

FIELD SAMPLE #: PS150-001-027-LS MATRIX: BULK

DATES:

RECEIVED: 4/21/88 COLLECTED: 4/19/88 REPORTED: / /88

LOCATION:

GROSS DESCRIPTION:

FRIABLE [X] FIBROUS [X] HOMOGENOUS [X]

COLOR/APPEARANCE: Tan

ASBESTOS CONTENT	
Chrysotile	5-10 %
Amosite	%
Crocidolite	%
Tremolite	%
Actinolite	%
Anthophyllite	%

NON-ASBESTOS/FIBROUS CONTENT	
[CELLULOSE]	5-10 %
[FIBROUS GLASS]	%
[SYNTH. POLYMER]	1-5 %
[ ]	%
[ ]	%

NON-ASBESTOS/NON-FIBROUS CONTENT	
[BIND. MATERIAL]	70-75 %

TOTAL PERCENT ASBESTOS: 5-10 %

COMMENTS

DESCRIPTION OF ANALYSIS: Bulk Asbestos samples are analyzed by trained microscopists, using Polarized Light Microscopy with dispersion staining. Analysts are trained by EPA McCrone Research Institute utilizing the EPA Interim Method for the Determination of Asbestos in Bulk Insulation Samples, EPA-600/M4-82-020.

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Versar INC.

SAMPLE #: ASB88 - 07987

LABORATORY REPORT - BULK ASBESTOS ANALYSIS

SITE: PS150

PROJECT NUMBER: 6013 . 8 . 2 BATCH #: 716

CLIENT: BALTIMORE

FIELD SAMPLE #: PS150-001-028-LS MATRIX: BULK

DATES:
RECEIVED: 4/21/88 COLLECTED: 4/19/88 REPORTED: / /88

LOCATION:

GROSS DESCRIPTION:
FRIABLE [X] FIBROUS [X] HOMOGENOUS [X]

COLOR/APPEARANCE: Tan

ASBESTOS CONTENT

Chrysotile	10-15 %
Amosite	%
Crocidolite	%
Tremolite	%
Actinolite	%
Anthophyllite	%

NON-ASBESTOS/FIBROUS CONTENT

[CELLULOSE]	1-5 %
[FIBROUS GLASS]	%
[SYNTH. POLYMER]	%
[ ]	%
[ ]	%

NON-ASBESTOS/NON-FIBROUS CONTENT

[BIND. MATERIAL] 75-80 %

TOTAL PERCENT ASBESTOS: 10-15 %

COMMENTS

DESCRIPTION OF ANALYSIS: Bulk Asbestos samples are analyzed by trained microscopists, using Polarized Light Microscopy with dispersion staining. Analysts are trained by EPA McCrone Research Institute utilizing the EPA Interim Method for the Determination of Asbestos in Bulk Insulation Samples, EPA-600/M4-82-020.

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SAMPLE #: AS888 - 07988

LABORATORY REPORT - BULK ASBESTOS ANALYSIS

SITE: PS150

PROJECT NUMBER: 6013 . 8 . 2 BATCH #: 716

CLIENT: BALTIMORE

FIELD SAMPLE #: PS150-001-029-LS MATRIX: BULK

DATES:
RECEIVED: 4/21/88 COLLECTED: 4/19/88 REPORTED: / /88

LOCATION:

GROSS DESCRIPTION:
FRIABLE [X] FIBROUS [X] HOMOGENOUS [X]

COLOR/APPEARANCE: Tan

ASBESTOS CONTENT		NON-ASBESTOS/FIBROUS CONTENT	
Chrysotile	10-15 %	[CELLULOSE]	1-5 %
Amosite	%	[FIBROUS GLASS]	%
Crocidolite	%	[SYNTH. POLYMER]	%
Tremolite	%	[ ]	%
Actinolite	%	[ ]	%
Anthophyllite	%		

NON-ASBESTOS/NON-FIBROUS CONTENT

[BIND. MATERIAL] 75-80 %

TOTAL PERCENT ASBESTOS: 10-15 %

COMMENTS

DESCRIPTION OF ANALYSIS: Bulk Asbestos samples are analyzed by trained microscopists, using Polarized Light Microscopy with dispersion staining. Analysts are trained by EPA McCrone Research Institute utilizing the EPA Interim Method for the Determination of Asbestos in Bulk Insulation Samples, EPA-600/M4-82-020.

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Versar INC.

SAMPLE #: ASB88 - 07989

LABORATORY REPORT - BULK ASBESTOS ANALYSIS

SITE: PS150

PROJECT NUMBER: 6013 . 8 . 2 BATCH #: 716

CLIENT: BALTIMORE

FIELD SAMPLE #: PS150-001-030-LS MATRIX: BULK

DATES:

RECEIVED: 4/21/88 COLLECTED: 4/19/88 REPORTED: / /88

LOCATION:

GROSS DESCRIPTION:

FRIABLE [No] FIBROUS [No] HOMOGENOUS [X]

COLOR/APPEARANCE: Tan

ASBESTOS CONTENT

Chrysotile	1-5 %
Amosite	%
Crocidolite	%
Tremolite	%
Actinolite	%
Anthophyllite	%

NON-ASBESTOS/FIBROUS CONTENT

[CELLULOSE]	%
[FIBROUS GLASS]	%
[SYNTH. POLYMER]	%
[ ]	%
[ ]	%

NON-ASBESTOS/NON-FIBROUS CONTENT

[BIND. MATERIAL] 90-95 %

TOTAL PERCENT ASBESTOS: 1-5 %

COMMENTS

DESCRIPTION OF ANALYSIS: Bulk Asbestos samples are analyzed by trained microscopists, using Polarized Light Microscopy with dispersion staining. Analysts are trained by EPA McCrone Research Institute utilizing the EPA Interim Method for the Determination of Asbestos in Bulk Insulation Samples, EPA-600/M4-82-020.

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Versar INC.

SAMPLE #: ASB88 - 07990

LABORATORY REPORT - BULK ASBESTOS ANALYSIS

SITE: PS150

PROJECT NUMBER: 6013 . 8 . 2 BATCH #: 716

CLIENT: BALTIMORE

FIELD SAMPLE #: PS150-002-001-LS MATRIX: BULK

DATES:
RECEIVED: 4/21/88 COLLECTED: 4/19/88 REPORTED: / /88

LOCATION:

GROSS DESCRIPTION: FRIABLE [No] FIBROUS [No] HOMOGENOUS [X]

COLOR/APPEARANCE: Tan

ASBESTOS CONTENT		NON-ASBESTOS/FIBROUS CONTENT	
Chrysotile	1-5 %	[CELLULOSE]	%
Amosite	%	[FIBROUS GLASS]	%
Crocidolite	%	[SYNTH. POLYMER]	%
Tremolite	%	[ ]	%
Actinolite	%	[ ]	%
Anthophyllite	%		

NON-ASBESTOS/NON-FIBROUS CONTENT

[BIND. MATERIAL] 90-95 %

TOTAL PERCENT ASBESTOS: 1-5 %

COMMENTS

DESCRIPTION OF ANALYSIS: Bulk Asbestos samples are analyzed by trained microscopists, using Polarized Light Microscopy with dispersion staining. Analysts are trained by EPA McCrone Research Institute utilizing the EPA Interim Method for the Determination of Asbestos in Bulk Insulation Samples, EPA-600/M4-82-020.

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Versar INC.

SAMPLE #: ASB88 - 07991

LABORATORY REPORT - BULK ASBESTOS ANALYSIS

SITE: PS150

PROJECT NUMBER: 6013 . 8 . 2 BATCH #: 716

CLIENT: BALTIMORE

FIELD SAMPLE #: PS150-002-002-LS MATRIX: BULK

DATES:
RECEIVED: 4/21/88 COLLECTED: 4/19/88 REPORTED: / /88

LOCATION:

GROSS DESCRIPTION:
FRIABLE [NO] FIBROUS [ND] HOMOGENOUS [X]

COLOR/APPEARANCE: Tan

ASBESTOS CONTENT

Chrysotile	1-5 %
Amosite	%
Crocidolite	%
Tremolite	%
Actinolite	%
Anthophyllite	%

NON-ASBESTOS/FIBROUS CONTENT

[CELLULOSE]	%
[FIBROUS GLASS]	%
[SYNTH. POLYMER]	%
[ ]	%
[ ]	%

NON-ASBESTOS/NON-FIBROUS CONTENT

[BIND. MATERIAL] 90-95 %

TOTAL PERCENT ASBESTOS: 1-5 %

COMMENTS

DESCRIPTION OF ANALYSIS: Bulk Asbestos samples are analyzed by trained microscopists, using Polarized Light Microscopy with dispersion staining. Analysts are trained by EPA McCrone Research Institute utilizing the EPA Interim Method for the Determination of Asbestos in Bulk Insulation Samples, EPA-600/M4-82-020.

Marcie L. Wilson
Asbestos Laboratory
Manager

Asbestos Analyst

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Versar INC.

SAMPLE #: ASB88 - 07992

LABORATORY REPORT - BULK ASBESTOS ANALYSIS

SITE: PS150

PROJECT NUMBER: 6013 . 8 . 2 BATCH #: 716

CLIENT: BALTIMORE

FIELD SAMPLE #: PS150-003-001-LS MATRIX: BULK

DATES:

RECEIVED: 4/21/88 COLLECTED: 4/19/88 REPORTED: / /88

LOCATION:

GROSS DESCRIPTION:

FRIABLE [X] FIBROUS [X] HOMOGENOUS [NO]

COLOR/APPEARANCE: Black/Yellow

ASBESTOS CONTENT

Chrysotile	5-10 %
Amosite	%
Crocidolite	%
Tremolite	%
Actinolite	%
Anthophyllite	%

NON-ASBESTOS/FIBROUS CONTENT

[CELLULOSE]	%
[FIBROUS GLASS]	5-10 %
[SYNTH. POLYMER]	%
[ ]	%
[ ]	%

NON-ASBESTOS/NON-FIBROUS CONTENT

[BIND. MATERIAL] 75-80 %

TOTAL PERCENT ASBESTOS: 5-10 %

COMMENTS

DESCRIPTION OF ANALYSIS: Bulk Asbestos samples are analyzed by trained microscopists, using Polarized Light Microscopy with dispersion staining. Analysts are trained by EPA McCrone Research Institute utilizing the EPA Interim Method for the Determination of Asbestos in Bulk Insulation Samples, EPA-600/M4-82-020.

Marcie L. Wilson
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Manager

Asbestos Analyst

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Versar INC.

SAMPLE #: ASB88 - 07993

LABORATORY REPORT - BULK ASBESTOS ANALYSIS

SITE: PS150

PROJECT NUMBER: 6013 . 8 . 2 BATCH #: 716

CLIENT: BALTIMORE

FIELD SAMPLE #: PS150-003-002-L5 MATRIX: BULK

DATES:

RECEIVED: 4/21/88 COLLECTED: 4/19/88 REPORTED: / /88

LOCATION:

GROSS DESCRIPTION:

FRIABLE [X] FIBROUS [X] HOMOGENOUS [X]

COLOR/APPEARANCE: Tan

ASBESTOS CONTENT

Chrysotile	%
Amosite	%
Crocidolite	%
Tremolite	%
Actinolite	%
Anthophyllite	%

NON-ASBESTOS/FIBROUS CONTENT

[CELLULOSE]	1-5 %
[FIBROUS GLASS]	40-45 %
[SYNTH. POLYMER]	%
[ ]	%
[ ]	%

NON-ASBESTOS/NON-FIBROUS CONTENT

[BIND. MATERIAL] 45-50 %

TOTAL PERCENT ASBESTOS: <1 %

COMMENTS

DESCRIPTION OF ANALYSIS: Bulk Asbestos samples are analyzed by trained microscopists, using Polarized Light Microscopy with dispersion staining. Analysts are trained by EPA McCrone Research Institute utilizing the EPA Interim Method for the Determination of Asbestos in Bulk Insulation Samples, EPA-600/M4-82-020.

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Manager

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Versar INC.

SAMPLE #: ASB88 - 07994

LABORATORY REPORT - BULK ASBESTOS ANALYSIS

SITE: PS150

PROJECT NUMBER: 6013 . 8 . 2 BATCH #: 716

CLIENT: BALTIMORE

FIELD SAMPLE #: PS150-00 3-003-LS MATRIX: BULK

DATES:

RECEIVED: 4/21 /88 COLLECTED: 4/19/88 REPORTED: / /88

LOCATION:

GROSS DESCRIPTION:

FRIABLE [N] FIBROUS [N] HOMOGENOUS [X]

COLOR/APPEARANCE: Tan

ASBESTOS CONTENT

Chrysotile	1-5 %
Amosite	%
Crocidolite	%
Tremolite	%
Actinolite	%
Anthophyllite	%

NON-ASBESTOS/FIBROUS CONTENT

[CELLULOSE]	%
[FIBROUS GLASS]	%
[SYNTH. POLYMER]	%
[ ]	%
[ ]	%

NON-ASBESTOS/NON-FIBROUS CONTENT

[BIND. MATERIAL] 90-95 %

TOTAL PERCENT ASBESTOS: 1-5 %

COMMENTS

DESCRIPTION OF ANALYSIS: Bulk Asbestos samples are analyzed by trained microscopists, using Polarized Light Microscopy with dispersion staining. Analysts are trained by EPA McCrone Research Institute utilizing the EPA Interim Method for the Determination of Asbestos in Bulk Insulation Samples, EPA-600/M4-82-020.

Marcie L. Wilson
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Versar INC.

SAMPLE #: ASB88 - 20618

LABORATORY REPORT - BULK ASBESTOS ANALYSIS

SITE: PS150

PROJECT NUMBER: 6013 . 10 . 2

BATCH #: 66

CLIENT: BALTIMORE

FIELD SAMPLE #: PS-150P-002 -003 -LS

MATRIX: BULK

DATES: RECEIVED: 9/13/88 COLLECTED: 9/13/88 REPORTED: / /88

LOCATION:

GROSS DESCRIPTION: FRIABLE [X] FIBROUS [ ] HOMOGENOUS [X]

COLOR/APPEARANCE: white

ASBESTOS CONTENT

Chrysotile	%
Amosite	%
Crocidolite	%
Tremolite	%
Actinolite	%
Anthophyllite	%

NON-ASBESTOS/FIBROUS CONTENT

[CELLULOSE]	1-5 %
[FIBROUS GLASS]	%
[SYNTH. POLYMER]	%
[ ]	%
[ ]	%

NON-ASBESTOS/NON-FIBROUS CONTENT

[BIND. MATERIAL]	90-95 %

TOTAL PERCENT ASBESTOS: <1 %

COMMENTS

DESCRIPTION OF ANALYSIS: Bulk Asbestos samples are analyzed by trained microscopists, using Polarized Light Microscopy with dispersion staining. Analysts are trained by EPA McCrone Research Institute utilizing the EPA Interim Method for the Determination of Asbestos in Bulk Insulation Samples, EPA-600/M4-82-020.

Marcie L. Wilson
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Manager

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Versar INC.

SAMPLE #: ASB88 - 20619

LABORATORY REPORT - BULK ASBESTOS ANALYSIS

SITE: PS150

PROJECT NUMBER: 6013 . 10 . 2

BATCH #: 66

CLIENT: BALTIMORE

FIELD SAMPLE #: PS150P-002 -004 -LS

MATRIX: BULK

DATES: RECEIVED: 9/13/88 COLLECTED: 9/13/88 REPORTED: / /88

LOCATION:

GROSS DESCRIPTION: FRIABLE [X] FIBROUS [ ] HOMOGENOUS [X]

COLOR/APPEARANCE: white

ASBESTOS CONTENT

Chrysotile	%
Amosite	%
Crocidolite	%
Tremolite	%
Actinolite	%
Anthophyllite	%

NON-ASBESTOS/FIBROUS CONTENT

[CELLULOSE]	%
[FIBROUS GLASS]	%
[SYNTH. POLYMER]	%
[ ]	%
[ ]	%

NON-ASBESTOS/NON-FIBROUS CONTENT

[BIND. MATERIAL] 95-100 %

TOTAL PERCENT ASBESTOS: <1 %

COMMENTS

DESCRIPTION OF ANALYSIS: Bulk Asbestos samples are analyzed by trained microscopists, using Polarized Light Microscopy with dispersion staining. Analysts are trained by EPA McCrone Research Institute utilizing the EPA Interim Method for the Determination of Asbestos in Bulk Insulation Samples, EPA-600/M4-82-020.

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SAMPLE #: AS888 - 20620

RSAI INC.

LABORATORY REPORT - BULK ASBESTOS ANALYSIS

SITE: PS150 BATCH #: 66

T NUMBER: 6013 . 10 . 2

CLIENT: BALTIMORE

SAMPLE #: PS150P -002 -005 -LS MATRIX: BULK

RECEIVED: 9/13/88 COLLECTED: 9/13/88 REPORTED: / /88

ION:

DESCRIPTION: FRIABLE [X] FIBROUS [ ] HOMOGENOUS [X]

/APPEARANCE: white

ASBESTOS CONTENT

Chrysotile	%
Amosite	%
Crocidolite	%
Tremolite	%
Actinolite	%
Anthophyllite	%

NON-ASBESTOS/FIBROUS CONTENT

[CELLULOSE]	1-3 %
[FIBROUS GLASS]	%
[SYNTH. POLYMER]	%
[ ]	%
[ ]	%

NON-ASBESTOS/NON-FIBROUS CONTENT

[BIND. MATERIAL] 90-95 %

AL PERCENT ASBESTOS: <1 %

COMMENTS

CRIPTION OF ANALYSIS: Bulk Asbestos samples are analyzed by trained roscopists, using Polarized Light Microscopy with dispersion staining. rlysts are trained by EPA McCrone Research Institute utilizing the EPA terim Method for the Determination of Asbestos in Bulk Insulation mples, EPA-600/M4-82-020.

rcie L. Wilson
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Versar INC.

APPENDIX B

FINAL RULE FOR ASBESTOS-CONTAINING MATERIALS IN SCHOOLS: 40 CFR 763

Excerpts

Friday
October 30, 1987

PARTIAL COPY

federal register

Part III

Environmental Protection Agency

40 CFR Part 763

Asbestos-Containing Materials in Schools; Final Rule and Notice

PARTIAL COPY

VI. References

1. USEPA. "Guidance for Controlling Asbestos-Containing Materials in Buildings," EPA 560/5–85–024, June 1985.

2. USEPA. "A Guide to Respiratory Protection for the Asbestos Abatement Industry," EPA 560/OPTS–86–001, September 1986.

3. USEPA. "Asbestos in Buildings: Simplified Sampling Scheme for Friable Surfacing Materials," EPA 560/5–85–030a. October 1985.

4. USEPA. Friable Asbestos-Containing Materials in Schools, 40 CFR Part 763, Subpart F.

5. USEPA. National Emission Standards for Hazardous Air Pollutants, 40 CFR Part 61, Subpart M.

6. USDOL. OSHA. Occupational Exposure to Asbestos, 29 CFR 1926.58.

7. USEPA. Toxic Substances; Asbestos Abatement Projects, 40 CFR Part 763, Subpart G.

VII. Regulatory Assessment Requirements

A. Executive Order 12291

Under Executive Order 12291, EPA has determined that this rule is a "major" rule and has developed a Regulatory Impact Analysis. EPA has prepared an economic impact analysis of the TSCA Title II regulations.

B. Regulatory Flexibility Act

EPA has analyzed the economic impact of this rule on small businesses. EPA's analysis of the economic consequences of this rule appears in Unit IV.

C. Paperwork Reduction Act

The reporting and recordkeeping provisions in this rule have been approved by the Office of Management and Budget (OMB) under the Paperwork Reduction Act, and has been assigned OMB control number 2070–0091.

List of Subjects in 40 CFR Part 763

Asbestos, Environmental protection, Hazardous substances, Incorporation by reference, Occupational health and safety, Recordkeeping, Schools.

Dated: October 17, 1987.

Lee M. Thomas,

Administrator.

Therefore, 40 CFR Part 763 is amended as follows:

PART 763—[AMENDED]

1. The authority citation for Part 763 continues to read as follows:

Authority: 15 U.S.C. 2605 and 2607(c). Subpart E also issued under 15 U.S.C. 2641, 2643, 2646, and 2647.

2. By adding §§ 763.80 through 763.99 and Appendices A, B, and D to Subpart E to read as follows:

Subpart E—Asbestos-Containing Materials in Schools

Sec.

763.80 Scope and purpose.
763.83 Definitions.
763.84 General local education agency responsibilities.
763.85 Inspection and reinspections.
763.86 Sampling.
763.87 Analysis.
763.88 Assessment.
763.90 Response actions.
763.91 Operations and maintenance.
763.92 Training and periodic surveillance.
763.93 Management plans.
763.94 Recordkeeping.
763.95 Warning labels.
763.97 Compliance and enforcement.
763.98 Waiver; delegation to State.
763.99 Exclusions.
Appendix A to Subpart E—Interim Transmission Electron Microscopy Analytical Methods—Mandatory and Nonmandatory—and Mandatory Section to Determine Completion of Response Actions
Appendix B to Subpart E—Work Practices and Engineering Controls for Small-Scale, Short-Duration Operations Maintenance and Repair (O&M) Activities Involving ACM
* * * * *
Appendix D to Subpart E—Transport and Disposal of Asbestos Waste

§ 763.80 Scope and purpose.

(a) This rule requires local education agencies to identify friable and nonfriable asbestos-containing material (ACM) in public and private elementary and secondary schools by visually inspecting school buildings for such materials, sampling such materials if they are not assumed to be ACM, and having samples analyzed by appropriate techniques referred to in this rule. The rule requires local education agencies to submit management plans to the Governor of their State by October 12, 1988, begin to implement the plans by July 9, 1989, and complete implementation of the plans in a timely fashion. In addition, local education agencies are required to use persons who have been accredited to conduct inspections, reinspections, develop management plans, or perform response actions. The rule also includes recordkeeping requirements. Local education agencies may contractually delegate their duties under this rule, but they remain responsible for the proper performance of those duties. Local education agencies are encouraged to consult with EPA Regional Asbestos Coordinators, or if applicable, a State's lead agency designated by the State Governor, for assistance in complying with this rule.

(b) Local education agencies must provide for the transportation and disposal of asbestos in accordance with EPA's "Asbestos Waste Management Guidance." For convenience, applicable sections of this guidance are reprinted as Appendix D of this subpart. There are regulations in place, however, that affect transportation and disposal of asbestos waste generated by this rule. The transportation of asbestos waste is covered by the Department of Transportation (49 CFR Part 173, Subpart J) and disposal is covered by the National Emissions Standards for Hazardous Air Pollutants (NESHAP) (40 CFR Part 61, Subpart M).

§ 763.83 Definitions.

For purposes of this subpart:

"Act" means the Toxic Substances Control Act (TSCA), 15 U.S.C. 2601, *et seq.*

"Accessible" when referring to ACM means that the material is subject to disturbance by school building occupants or custodial or maintenance personnel in the course of their normal activities.

"Accredited" or "accreditation" when referring to a person or laboratory means that such person or laboratory is accredited in accordance with section 206 of Title II of the Act.

"Air erosion" means the passage of air over friable ACBM which may result in the release of asbestos fibers.

"Asbestos" means the asbestiform varieties of: Chrysotile (serpentine); crocidolite (riebeckite); amosite (cummingtonitegrunerite); anthophyllite; tremolite; and actinolite.

"Asbestos-containing material" (ACM) when referring to school buildings means any material or product which contains more than 1 percent asbestos.

"Asbestos-containing building material" (ACBM) means surfacing ACM, thermal system insulation ACM, or miscellaneous ACM that is found in or on interior structural members or other parts of a school building.

"Asbestos debris" means pieces of ACBM that can be identified by color, texture, or composition, or means dust, if the dust is determined by an accredited inspector to be ACM.

"Damaged friable miscellaneous ACM" means friable miscellaneous ACM which has deteriorated or sustained physical injury such that the internal structure (cohesion) of the material is inadequate or, if applicable, which has delaminated such that its bond to the substrate (adhesion) is

inadequate or which for any other reason lacks fiber cohesion or adhesion qualities. Such damage or deterioration may be illustrated by the separation of ACM into layers; separation of ACM from the substrate; flaking, blistering, or crumbling of the ACM surface; water damage; significant or repeated water stains, scrapes, gouges, mars or other signs of physical injury on the ACM. Asbestos debris originating from the ACBM in question may also indicate damage.

"Damaged friable surfacing ACM" means friable surfacing ACM which has deteriorated or sustained physical injury such that the internal structure (cohesion) of the material is inadequate or which has delaminated such that its bond to the substrate (adhesion) is inadequate, or which, for any other reason, lacks fiber cohesion or adhesion qualities. Such damage or deterioration may be illustrated by the separation of ACM into layers; separation of ACM from the substrate; flaking, blistering, or crumbling of the ACM surface; water damage; significant or repeated water stains, scrapes, gouges, mars or other signs of physical injury on the ACM. Asbestos debris originating from the ACBM in question may also indicate damage.

"Damaged or significantly damaged thermal system insulation ACM" means thermal system insulation ACM on pipes, boilers, tanks, ducts, and other thermal system insulation equipment where the insulation has lost its structural integrity, or its covering, in whole or in part, is crushed, water-stained, gouged, punctured, missing, or not intact such that it is not able to contain fibers. Damage may be further illustrated by occasional punctures, gouges or other signs of physical injury to ACM; occasional water damage on the protective coverings/jackets; or exposed ACM ends or joints. Asbestos debris originating from the ACBM in question may also indicate damage.

"Encapsulation" means the treatment of ACBM with a material that surrounds or embeds asbestos fibers in an adhesive matrix to prevent the release of fibers, as the encapsulant creates a membrane over the surface (bridging encapsulant) or penetrates the material and binds its components together (penetrating encapsulant).

"Enclosure" means an airtight, impermeable, permanent barrier around ACBM to prevent the release of asbestos fibers into the air.

"Fiber release episode" means any uncontrolled or unintentional disturbance of ACBM resulting in visible emission.

"Friable" when referring to material in a school building means that the material, when dry, may be crumbled, pulverized, or reduced to powder by hand pressure, and includes previously nonfriable material after such previously nonfriable material becomes damaged to the extent that when dry it may be crumbled, pulverized, or reduced to powder by hand pressure.

"Functional space" means a room, group of rooms, or homogeneous area (including crawl spaces or the space between a dropped ceiling and the floor or roof deck above), such as classroom(s), a cafeteria, gymnasium, hallway(s), designated by a person accredited to prepare management plans, design abatement projects, or conduct response actions.

"High-efficiency particulate air" (HEPA) refers to a filtering system capable of trapping and retaining at least 99.97 percent of all monodispersed particles 0.3 μm in diameter or larger.

"Homogeneous area" means an area of surfacing material, thermal system insulation material, or miscellaneous material that is uniform in color and texture.

"Local education agency" means:

(1) Any local educational agency as defined in section 198 of the Elementary and Secondary Education Act of 1965 (20 U.S.C. 3381).

(2) The owner of any nonpublic, nonprofit elementary, or secondary school building.

(3) The governing authority of any school operated under the defense dependents' education system provided for under the Defense Dependents' Education Act of 1978 (20 U.S.C. 921, et seq.).

"Miscellaneous ACM" means miscellaneous material that is ACM in a school building.

"Miscellaneous material" means interior building material on structural components, structural members or fixtures, such as floor and ceiling tiles, and does not include surfacing material or thermal system insulation.

"Nonfriable" means material in a school building which when dry may not be crumbled, pulverized, or reduced to powder by hand pressure.

"Operations and maintenance program" means a program of work practices to maintain friable ACBM in good condition, ensure clean up of asbestos fibers previously released, and prevent further release by minimizing and controlling friable ACBM disturbance or damage.

"Potential damage" means circumstances in which:

(1) Friable ACBM is in an area regularly used by building occupants, including maintenance personnel, in the course of their normal activities.

(2) There are indications that there is a reasonable likelihood that the material or its covering will become damaged, deteriorated, or delaminated due to factors such as changes in building use, changes in operations and maintenance practices, changes in occupancy, or recurrent damage.

"Potential significant damage" means circumstances in which:

(1) Friable ACBM is in an area regularly used by building occupants, including maintenance personnel, in the course of their normal activities.

(2) There are indications that there is a reasonable likelihood that the material or its covering will become significantly damaged, deteriorated, or delaminated due to factors such as changes in building use, changes in operations and maintenance practices, changes in occupancy, or recurrent damage.

(3) The material is subject to major or continuing disturbance, due to factors including, but not limited to, accessibility or, under certain circumstances, vibration or air erosion.

"Preventive measures" means actions taken to reduce disturbance of ACBM or otherwise eliminate the reasonable likelihood of the material's becoming damaged or significantly damaged.

"Removal" means the taking out or the stripping of substantially all ACBM from a damaged area, a functional space, or a homogeneous area in a school building.

"Repair" means returning damaged ACBM to an undamaged condition or to an intact state so as to prevent fiber release.

"Response action" means a method, including removal, encapsulation, enclosure, repair, operations and maintenance, that protects human health and the environment from friable ACBM.

"Routine maintenance area" means an area, such as a boiler room or mechanical room, that is not normally frequented by students and in which maintenance employees or contract workers regularly conduct maintenance activities.

"School" means any elementary or secondary school as defined in section 198 of the Elementary and Secondary Education Act of 1965 (20 U.S.C. 2854).

"School building" means:

(1) Any structure suitable for use as a classroom, including a school facility such as a laboratory, library, school eating facility, or facility used for the preparation of food.

(2) Any gymnasium or other facility which is specially designed for athletic

or recreational activities for an academic course in physical education.

(3) Any other facility used for the instruction or housing of students or for the administration of educational or research programs.

(4) Any maintenance, storage, or utility facility, including any hallway, essential to the operation of any facility described in this definition of "school building" under paragraphs (1), (2), or (3).

(5) Any portico or covered exterior hallway or walkway.

(6) Any exterior portion of a mechanical system used to condition interior space.

"Significantly damaged friable miscellaneous ACM" means damaged friable miscellaneous ACM where the damage is extensive and severe.

"Significantly damaged friable surfacing ACM" means damaged friable surfacing ACM in a functional space where the damage is extensive and severe.

"State" means a State, the District of Columbia, the Commonwealth of Puerto Rico, Guam, American Samoa, the Northern Marianas, the Trust Territory of the Pacific Islands, and the Virgin Islands.

"Surfacing ACM" means surfacing material that is ACM.

"Surfacing material" means material in a school building that is sprayed-on, troweled-on, or otherwise applied to surfaces, such as acoustical plaster on ceilings and fireproofing materials on structural members, or other materials on surfaces for acoustical, fireproofing, or other purposes.

"Thermal system insulation" means material in a school building applied to pipes, fittings, boilers, breeching, tanks, ducts, or other interior structural components to prevent heat loss or gain, or water condensation, or for other purposes.

"Thermal system insulation ACM" means thermal system insulation that is ACM.

"Vibration" means the periodic motion of friable ACBM which may result in the release of asbestos fibers.

§ 763.84 General local education agency responsibilities.

Each local education agency shall:

(a) Ensure that the activities of any persons who perform inspections, reinspections, and periodic surveillance, develop and update management plans, and develop and implement response actions, including operations and maintenance, are carried out in accordance with Subpart E of this part.

(b) Ensure that all custodial and maintenance employees are properly trained as required by this Subpart E and other applicable Federal and/or State regulations (e.g., the Occupational Safety and Health Administration asbestos standard for construction, the EPA worker protection rule, or applicable State regulations).

(c) Ensure that workers and building occupants, or their legal guardians, are informed at least once each school year about inspections, response actions, and post-response action activities, including periodic reinspection and surveillance activities that are planned or in progress.

(d) Ensure that short-term workers (e.g., telephone repair workers, utility workers, or exterminators) who may come in contact with asbestos in a school are provided information regarding the locations of ACBM and suspected ACBM assumed to be ACM.

(e) Ensure that warning labels are posted in accordance with § 763.95.

(f) Ensure that management plans are available for inspection and notification of such availability has been provided as specified in the management plan under § 763.93(g).

(g)(1) Designate a person to ensure that requirements under this section are properly implemented.

(2) Ensure that the designated person receives adequate training to perform duties assigned under this section. Such training shall provide, as necessary, basic knowledge of:

(i) Health effects of asbestos.

(ii) Detection, identification, and assessment of ACM.

(iii) Options for controlling ACBM.

(iv) Asbestos management programs.

(v) Relevant Federal and State regulations concerning asbestos, including those in this Subpart E and those of the Occupational Safety and Health Administration, U.S. Department of Labor, the U.S. Department of Transportation and the U.S. Environmental Protection Agency.

(h) Consider whether any conflict of interest may arise from the interrelationship among accredited personnel and whether that should influence the selection of accredited personnel to perform activities under this subpart.

§ 763.85 Inspection and reinspections.

(a) *Inspection.* (1) Except as provided in paragraph (a)(2) of this section, before October 12, 1988, local education agencies shall inspect each school building that they lease, own, or otherwise use as a school building to identify all locations of friable and nonfriable ACBM.

(2) Any building leased or acquired on or after October 12, 1988, that is to be used as a school building shall be inspected as described under paragraphs (a) (3) and (4) of this section prior to use as a school building. In the event that emergency use of an uninspected building as a school building is necessitated, such buildings shall be inspected within 30 days after commencement of such use.

(3) Each inspection shall be made by an accredited inspector.

(4) For each area of a school building, except as excluded under § 763.99, each person performing an inspection shall:

(i) Visually inspect the area to identify the locations of all suspected ACBM.

(ii) Touch all suspected ACBM to determine whether they are friable.

(iii) Identify all homogeneous areas of friable suspected ACBM and all homogeneous areas of nonfriable suspected ACBM.

(iv) Assume that some or all of the homogeneous areas are ACM, and, for each homogeneous area that is not assumed to be ACM, collect and submit for analysis bulk samples under §§ 763.86 and 763.87.

(v) Assess, under § 763.88, friable material in areas where samples are collected, friable material in areas that are assumed to be ACBM, and friable ACBM identified during a previous inspection.

(vi) Record the following and submit to the person designated under § 763.84 a copy of such record for inclusion in the management plan within 30 days of the inspection:

(A) An inspection report with the date of the inspection signed by each accredited person making the inspection, State of accreditation, and if applicable, his or her accreditation number.

(B) An inventory of the locations of the homogeneous areas where samples are collected, exact location where each bulk sample is collected, dates that samples are collected, homogeneous areas where friable suspected ACBM is assumed to be ACM, and homogeneous areas where nonfriable suspected ACBM is assumed to be ACM.

(C) A description of the manner used to determine sampling locations, the name and signature of each accredited inspector who collected the samples, State of accreditation, and, if applicable, his or her accreditation number.

(D) A list of whether the homogeneous areas identified under paragraph (a)(4)(vi)(B) of this section are surfacing material, thermal system insulation, or miscellaneous material.

(E) Assessments made of friable material, the name and signature of each accredited inspector making the

assessment, State of accreditation, and if applicable, his or her accreditation number.

(b) *Reinspection.* (1) At least once every 3 years after a management plan is in effect, each local education agency shall conduct a reinspection of all friable and nonfriable known or assumed ACBM in each school building that they lease, own, or otherwise use as a school building.

(2) Each inspection shall be made by an accredited inspector.

(3) For each area of a school building, each person performing a reinspection shall:

(i) Visually reinspect, and reassess, under § 763.88, the condition of all friable known or assumed ACBM.

(ii) Visually inspect material that was previously considered nonfriable ACBM and touch the material to determine whether it has become friable since the last inspection or reinspection.

(iii) Identify any homogeneous areas with material that has become friable since the last inspection or reinspection.

(iv) For each homogeneous area of newly friable material that is already assumed to be ACBM, bulk samples may be collected and submitted for analysis in accordance with §§ 763.86 and 763.87.

(v) Assess, under § 763.88, the condition of the newly friable material in areas where samples are collected, and newly friable materials in areas that are assumed to be ACBM.

(vi) Reassess, under § 763.88, the condition of friable known or assumed ACBM previously identified.

(vii) Record the following and submit to the person designated under § 763.84 a copy of such record for inclusion in the management plan within 30 days of the reinspection:

(A) The date of the reinspection, the name and signature of the person making the reinspection, State of accreditation, and if applicable, his or her accreditation number, and any changes in the condition of known or assumed ACBM.

(B) The exact locations where samples are collected during the reinspection, a description of the manner used to determine sampling locations, the name and signature of each accredited inspector who collected the samples, State of accreditation, and, if applicable, his or her accreditation number.

(C) Any assessments or reassessments made of friable material, the name and signature of the accredited inspector making the assessments, State of accreditation, and if applicable, his or her accreditation number.

(c) *General.* Thermal system insulation that has retained its structural integrity and that has an undamaged protective jacket or wrap that prevents fiber release shall be treated as nonfriable and therefore is subject only to periodic surveillance and preventive measures as necessary.

§ 763.86 Sampling.

(a) *Surfacing material.* An accredited inspector shall collect, in a statistically random manner that is representative of the homogeneous area, bulk samples from each homogeneous area of friable surfacing material that is not assumed to be ACM, and shall collect the samples as follows:

(1) At least three bulk samples shall be collected from each homogeneous area that is 1,000 ft^2 or less, except as provided in § 763.87(c)(2).

(2) At least five bulk samples shall be collected from each homogeneous area that is greater than 1,000 ft^2 but less than or equal to 5,000 ft^2, except as provided in § 763.87(c)(2).

(3) At least seven bulk samples shall be collected from each homogeneous area that is greater than 5,000 ft^2, except as provided in § 763.87(c)(2).

(b) *Thermal system insulation.* (1) Except as provided in paragraphs (b) (2) through (4) of this section and § 763.87(c), an accredited inspector shall collect, in a randomly distributed manner, at least three bulk samples from each homogeneous area of thermal system insulation that is not assumed to be ACM.

(2) Collect at least one bulk sample from each homogeneous area of patched thermal system insulation that is not assumed to be ACM if the patched section is less than 6 linear or square feet.

(3) In a manner sufficient to determine whether the material is ACM or not ACM, collect bulk samples from each insulated mechanical system that is not assumed to be ACM where cement or plaster is used on fittings such as tees, elbows, or valves, except as provided under § 763.87(c)(2).

(4) Bulk samples are not required to be collected from any homogeneous area where the accredited inspector has determined that the thermal system insulation is fiberglass, foam glass, rubber, or other non-ACBM.

(c) *Miscellaneous material.* In a manner sufficient to determine whether material is ACM or not ACM, an accredited inspector shall collect bulk samples from each homogeneous area of friable miscellaneous material that is not assumed to be ACM.

(d) *Nonfriable suspected ACBM.* If any homogeneous area of nonfriable suspected ACBM is not assumed to be ACM, then an accredited inspector shall collect, in a manner sufficient to determine whether the material is ACM or not ACM, bulk samples from the homogeneous area of nonfriable suspected ACBM that is not assumed to be ACM.

§ 763.87 Analysis.

(a) Local education agencies shall have bulk samples, collected under § 763.86 and submitted for analysis, analyzed for asbestos using laboratories accredited by the National Bureau of Standards (NBS). Local education agencies shall use laboratories which have received interim accreditation for polarized light microscopy (PLM) analysis under the EPA Interim Asbestos Bulk Sample Analysis Quality Assurance Program until the NBS PLM laboratory accreditation program for PLM is operational.

(b) Bulk samples shall not be composited for analysis and shall be analyzed for asbestos content by PLM, using the "Interim Method for the Determination of Asbestos in Bulk Insulation Samples" found at Appendix A to Subpart F in 40 CFR Part 763.

(c)(1) A homogeneous area is considered not to contain ACM only if the results of all samples required to be collected from the area show asbestos in amounts of 1 percent or less.

(2) A homogeneous area shall be determined to contain ACM based on a finding that the results of at least one sample collected from that area shows that asbestos is present in an amount greater than 1 percent.

(d) The name and address of each laboratory performing an analysis, the date of analysis, and the name and signature of the person performing the analysis shall be submitted to the person designated under § 763.84 for inclusion into the management plan within 30 days of the analysis.

§ 763.88 Assessment.

(a)(1) For each inspection and reinspection conducted under § 763.85 (a) and (c) and previous inspections specified under § 763.99, the local education agency shall have an accredited inspector provide a written assessment of all friable known or assumed ACBM in the school building.

(2) Each accredited inspector providing a written assessment shall sign and date the assessment, provide his or her State of accreditation, and if applicable, accreditation number, and submit a copy of the assessment to the person designated under § 763.84 for inclusion in the management plan within 30 days of the assessment.

(b) The inspector shall classify and give reasons in the written assessment for classifying the ACBM and suspected ACBM assumed to be ACM in the school building into one of the following categories:

(1) Damaged or significantly damaged thermal system insulation ACM.

(2) Damaged friable surfacing ACM.

(3) Significantly damaged friable surfacing ACM.

(4) Damaged or significantly damaged friable miscellaneous ACM.

(5) ACBM with potential for damage.

(6) ACBM with potential for significant damage.

(7) Any remaining friable ACBM or friable suspected ACBM.

(c) Assessment may include the following considerations:

(1) Location and the amount of the material, both in total quantity and as a percentage of the functional space.

(2) Condition of the material, specifying:

(i) Type of damage or significant damage (e.g., flaking, blistering, water damage, or other signs of physical damage).

(ii) Severity of damage (e.g., major flaking, severely torn jackets, as opposed to occasional flaking, minor tears to jackets).

(iii) Extent or spread of damage over large areas or large percentages of the homogeneous area.

(3) Whether the material is accessible.

(4) The material's potential for disturbance.

(5) Known or suspected causes of damage or significant damage (e.g., air erosion, vandalism, vibration, water).

(6) Preventive measures which might eliminate the reasonable likelihood of undamaged ACM from becoming significantly damaged.

(d) The local education agency shall select a person accredited to develop management plans to review the results of each inspection, reinspection, and assessment for the school building and to conduct any other necessary activities in order to recommend in writing to the local education agency appropriate response actions. The accredited person shall sign and date the recommendation, provide his or her State of accreditation, and, if applicable, provide his or her accreditation number, and submit a copy of the recommendation to the person designated under § 763.84 for inclusion in the management plan.

§ 763.90 Response actions.

(a) The local education agency shall select and implement in a timely manner the appropriate response actions in this section consistent with the assessment conducted in § 763.88. The response actions selected shall be sufficient to protect human health and the environment. The local education agency may then select, from the response actions which protect human health and the environment, that action which is the least burdensome method. Nothing in this section shall be construed to prohibit removal of ACBM from a school building at any time, should removal be the preferred response action of the local education agency.

(b) If damaged or significantly damaged thermal system insulation ACM is present in a building, the local education agency shall:

(1) At least repair the damaged area.

(2) Remove the damaged material if it is not feasible, due to technological factors, to repair the damage.

(3) Maintain all thermal system insulation ACM and its covering in an intact state and undamaged condition.

(c)(1) If damaged friable surfacing ACM or damaged friable miscellaneous ACM is present in a building, the local education agency shall select from among the following response actions: encapsulation, enclosure, removal, or repair of the damaged material.

(2) In selecting the response action from among those which meet the definitional standards in § 763.83, the local education agency shall determine which of these response actions protects human health and the environment. For purposes of determining which of these response actions are the least burdensome, the local education agency may then consider local circumstances, including occupancy and use patterns within the school building, and its economic concerns, including short- and long-term costs.

(d) If significantly damaged friable surfacing ACM or significantly damaged friable miscellaneous ACM is present in a building the local education agency shall:

(1) Immediately isolate the functional space and restrict access, unless isolation is not necessary to protect human health and the environment.

(2) Remove the material in the functional space or, depending upon whether enclosure or encapsulation would be sufficient to protect human health and the environment, enclose or encapsulate.

(e) If any friable surfacing ACM, thermal system insulation ACM, or friable miscellaneous ACM that has potential for damage is present in a building, the local education agency shall at least implement an operations and maintenance (O&M) program, as described under § 763.91.

(f) If any friable surfacing ACM, thermal system insulation ACM, or friable miscellaneous ACM that has potential for significant damage is present in a building, the local education agency shall:

(1) Implement an O&M program, as described under § 763.91.

(2) Institute preventive measures appropriate to eliminate the reasonable likelihood that the ACM or its covering will become significantly damaged, deteriorated, or delaminated.

(3) Remove the material as soon as possible if appropriate preventive measures cannot be effectively implemented, or unless other response actions are determined to protect human health and the environment. Immediately isolate the area and restrict access if necessary to avoid an imminent and substantial endangerment to human health or the environment.

(g) Response actions including removal, encapsulation, enclosure, or repair, other than small-scale, short-duration repairs, shall be designed and conducted by persons accredited to design and conduct response actions.

(h) The requirements of this Subpart E in no way supersede the worker protection and work practice requirements under 29 CFR 1926.58 (Occupational Safety and Health Administration (OSHA) asbestos worker protection standards for construction), 40 CFR Part 763, Subpart G (EPA asbestos worker protection standards for public employees), and 40 CFR Part 61, Subpart M (National Emission Standards for Hazardous Air Pollutants—Asbestos).

(i) Completion of response actions. (1) At the conclusion of any action to remove, encapsulate, or enclose ACBM or material assumed to be ACBM, a person designated by the local education agency shall visually inspect each functional space where such action was conducted to determine whether the action has been properly completed.

(2)(i) A person designated by the local education agency shall collect air samples using aggressive sampling as described in Appendix A to this Subpart E to monitor air for clearance after each removal, encapsulation, and enclosure project involving ACBM, except for projects that are of small-scale, short-duration.

(ii) Local education agencies shall have air samples collected under this section analyzed for asbestos using laboratories accredited by the National Bureau of Standards to conduct such analysis using transmission electron microscopy (TEM) or, under circumstances permitted in this section,

laboratories enrolled in the American Industrial Hygiene Association Proficiency Analytical Testing Program for phase contrast microscopy (PCM).

(iii) Until the National Bureau of Standards TEM laboratory accreditation program is operational, local educational agencies shall use laboratories that use the protocol described in Appendix A to Subpart E of this part.

(3) Except as provided in paragraphs (i) (4), (5), (6), or (7) of this section, an action to remove, encapsulate, or enclose ACBM shall be considered complete when the average concentration of asbestos of five air samples collected within the affected functional space and analyzed by the TEM method in Appendix A of this Subpart E, is not statistically significantly different, as determined by the Z-test calculation found in Appendix A of this Subpart E, from the average asbestos concentration of five air samples collected at the same time outside the affected functional space and analyzed in the same manner, and the average asbestos concentration of the three field blanks described in Appendix A of this Subpart E is below the filter background level, as defined in Appendix A of this Subpart E, of 70 structures per square millimeter (70 s/mm ^{2}).

(4) An action may also be considered complete if the volume of air drawn for each of the five samples collected within the affected functional space is equal to or greater than 1,199 L of air for a 25 mm filter or equal to or greater than 2,799 L of air for a 37 mm filter, and the average concentration of asbestos as analyzed by the TEM method in Appendix A of this Subpart E, for the five air samples does not exceed the filter background level, as defined in Appendix A, of 70 structures per square millimeter (70 s/mm ^{2}). If the average concentration of asbestos of the five air samples within the affected functional space exceeds 70 s/mm ^{2}, or if the volume of air in each of the samples is less than 1,199 L of air for a 25 mm filter or less than 2,799 L of air for a 37 mm filter, the action shall be considered complete only when the requirements of paragraph (i) (3), (5), (6), or (7) of this section are met.

(5) At any time, a local education agency may analyze air monitoring samples collected for clearance purposes by phase contrast microscopy (PCM) to confirm completion of removal, encapsulation, or enclosure of ACBM that is greater than small-scale, short-duration and less than or equal to 160 square feet or 260 linear feet. The action shall be considered complete when the results of samples collected in the affected functional space and analyzed by phase contrast microscopy using the National Institute for Occupational Safety and Health (NIOSH) Method 7400 entitled "Fibers" published in the NIOSH Manual of Analytical Methods, 3rd Edition, Second Supplement, August 1987, show that the concentration of fibers for each of the five samples is less than or equal to a limit of quantitation for PCM (0.01 fibers per cubic centimeter (0.01 f/cm ^{3}) of air). The method is available at the Office of the Federal Register Information Center, 11th and L St., NW., Room 8401, Washington, DC, 20408, and the EPA OPTS Reading Room, Rm. G004 Northeast Mall, 401 M St., SW., Washington, DC 20460. This incorporation by reference was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR Part 51. The method is incorporated as it exists on the effective date of this rule, and a notice of any change to the method will be published in the Federal Register.

(6) Until October 7, 1989, a local education agency may analyze air monitoring samples collected for clearance purposes by PCM to confirm completion of removal, encapsulation, or enclosure of ACBM that is less than or equal to 3,000 square feet or 1,000 linear feet. The action shall be considered complete when the results of samples collected in the affected functional space and analyzed by PCM using the NIOSH Method 7400 entitled "Fibers" published in the NIOSH Manual of Analytical Methods, 3rd Edition, Second Supplement, August 1987, show that the concentration of fibers for each of the five samples is less than or equal to a limit quantitation for PCM (0.01 fibers per cubic centimeter, 0.01 f/cm ^{3}). The method is available at the Office of the Federal Register, 11th and L St., NW., Room 8301, Washington, DC, 20408, and in the EPA OPTS Reading Room, Rm. G004 Northeast Mall, 401 M St., SW., Washington, DC 20460. This incorporation by reference was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR Part 51. The method is incorporated as it exists on the effective date of this rule and a notice of any change to the method will be published in the Federal Register.

(7) From October 8, 1989, to October 7, 1990, a local education agency may analyze air monitoring samples collected for clearance purposes by PCM to confirm completion of removal, encapsulation, or enclosure of ACBM that is less than or equal to 1,500 square feet or 500 linear feet. The action shall be considered complete when the results of samples collected in the affected functional space and analyzed by PCM using the NIOSH Method 7400 entitled "Fibers" published in the NIOSH Manual of Analytical Methods, 3rd Edition, Second Supplement, August 1987, show that the concentration of fibers for each of the five samples is less than or equal to a limit of quantitation for PCM (0.01 fibers per cubic centimeter, 0.01 f/cm ^{3}). The method is available at the Office of the Federal Register, 11th and L St., NW., Room 8301, Washington, DC, 20408, and in the EPA OPTS Reading Room, Rm. G004 Northeast Mall, 401 M St., SW., Washington, DC 20460. This incorporation by reference was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR Part 51. The method is incorporated as it exists on the effective date of this rule and a notice of any change to the method will be published in the Federal Register.

(8) To determine the amount of ACBM affected under paragraphs (i) (5), (6), and (7) of this section, the local education agency shall add the total square or linear footage of ACBM within the containment barriers used to isolate the functional space for the action to remove, encapsulate, or enclose the ACBM. Contiguous portions of material subject to such action conducted concurrently or at approximately the same time within the same school building shall not be separated to qualify under paragraphs (i) (5), (6), or (7) of this section.

§ 763.91 Operations and maintenance.

(a) *Applicability.* The local education agency shall implement an operations, maintenance, and repair (O&M) program under this section whenever any friable ACBM is present or assumed to be present in a building that it leases, owns, or otherwise uses as a school building. Any material identified as nonfriable ACBM or nonfriable assumed ACBM must be treated as friable ACBM for purposes of this section when the material is about to become friable as a result of activities performed in the school building.

(b) *Worker protection.* The protection provided by EPA at 40 CFR 763.121 for worker protection during asbestos abatement projects is extended to employees of local education agencies who perform operations, maintenance, and repair (O&M) activities involving ACM and who are not covered by the OSHA asbestos construction standard at 29 CFR 1926.58 or an asbestos worker approved by OSHA under section 19 of the Occupational Safety and Health Act. Local education agencies may consult

Appendix B of this Subpart if their employees are performing operations, maintenance, and repair activities that are of small-scale, short-duration.

(c) *Cleaning*—(1) *Initial cleaning.* Unless the building has been cleaned using equivalent methods within the previous 6 months, all areas of a school building where friable ACBM, damaged or significantly damaged thermal system insulation ACM, or friable suspected ACBM assumed to be ACM are present shall be cleaned at least once after the completion of the inspection required by § 763.85(a) and before the initiation of any response action, other than O&M activities or repair, according to the following procedures:

(i) HEPA-vacuum or steam-clean all carpets.

(ii) HEPA-vacuum or wet-clean all other floors and all other horizontal surfaces.

(iii) Dispose of all debris, filters, mopheads, and cloths in sealed, leak-tight containers.

(2) *Additional cleaning.* The accredited management planner shall make a written recommendation to the local education agency whether additional cleaning is needed, and if so, the methods and frequency of such cleaning.

(d) *Operations and maintenance activities.* The local education agency shall ensure that the procedures described below to protect building occupants shall be followed for any operations and maintenance activities disturbing friable ACBM:

(1) Restrict entry into the area by persons other than those necessary to perform the maintenance project, either by physically isolating the area or by scheduling.

(2) Post signs to prevent entry by unauthorized persons.

(3) Shut off or temporarily modify the air-handling system and restrict other sources of air movement.

(4) Use work practices or other controls, such as, wet methods, protective clothing, HEPA-vacuums, mini-enclosures, glove bags, as necessary to inhibit the spread of any released fibers.

(5) Clean all fixtures or other components in the immediate work area.

(6) Place the asbestos debris and other cleaning materials in a sealed, leak-tight container.

(e) *Maintenance activities other than small-scale, short-duration.* The response action for any maintenance activities disturbing friable ACBM, other than small-scale, short-duration maintenance activities, shall be designed by persons accredited to design response actions and conducted by persons accredited to conduct response actions.

(f) *Fiber release episodes*—(1) *Minor fiber release episode.* The local education agency shall ensure that the procedures described below are followed in the event of a minor fiber release episode (i.e., the falling or dislodging of 3 square or linear feet or less of friable ACBM):

(i) Thoroughly saturate the debris using wet methods.

(ii) Clean the area, as described in paragraph (e) of this section.

(iii) Place the asbestos debris in a sealed, leak-tight container.

(iv) Repair the area of damaged ACM with materials such as asbestos-free spackling, plaster, cement, or insulation, or seal with latex paint or an encapsulant, or immediately have the appropriate response action implemented as required by § 763.90.

(2) *Major fiber release episode.* The local education agency shall ensure that the procedures described below are followed in the event of a major fiber release episode (i.e., the falling or dislodging of more than 3 square or linear feet of friable ACBM):

(i) Restrict entry into the area and post signs to prevent entry into the area by persons other than those necessary to perform the response action.

(ii) Shut off or temporarily modify the air-handling system to prevent the distribution of fibers to other areas in the building.

(iii) The response action for any major fiber release episode must be designed by persons accredited to design response actions and conducted by persons accredited to conduct response actions.

§ 763.92 Training and periodic surveillance.

(a) *Training.* (1) The local education agency shall ensure, prior to the implementation of the O&M provisions of the management plan, that all members of its maintenance and custodial staff (custodians, electricians, heating/air conditioning engineers, plumbers, etc.) who may work in a building that contains ACBM receive awareness training of at least 2 hours, whether or not they are required to work with ACBM. New custodial and maintenance employees shall be trained within 60 days after commencement of employment. Training shall include, but not be limited to:

(i) Information regarding asbestos and its various uses and forms.

(ii) Information on the health effects associated with asbestos exposure.

(iii) Locations of ACBM identified throughout each school building in which they work.

(iv) Recognition of damage, deterioration, and delamination of ACBM.

(v) Name and telephone number of the person designated to carry out general local education agency responsibilities under § 763.84 and the availability and location of the management plan.

(2) The local education agency shall ensure that all members of its maintenance and custodial staff who conduct any activities that will result in the disturbance of ACBM shall receive training described in paragraph (a)(1) of this section and 14 hours of additional training. Additional training shall include, but not be limited to:

(i) Descriptions of the proper methods of handling ACBM.

(ii) Information on the use of respiratory protection as contained in the EPA/NIOSH *Guide to Respiratory Protection for the Asbestos Abatement Industry*, September 1986 (EPA 560/OPTS-86-001), available from TSCA Assistance Office (TS-799), Office of Toxic Substances, Environmental Protection Agency, Rm. E-543, 401 M St. SW., Washington, DC 20460, and other personal protection measures.

(iii) The provisions of this section and § 763.91, Appendices A, B, C, D of this Subpart E of this part, EPA regulations contained in 40 CFR Part 763, Subpart G, and in 40 CFR Part 61, Subpart M, and OSHA regulations contained in 29 CFR 1926.58.

(iv) Hands-on training in the use of respiratory protection, other personal protection measures, and good work practices.

(3) Local education agency maintenance and custodial staff who have attended EPA-approved asbestos training or received equivalent training for O&M and periodic surveillance activities involving asbestos shall be considered trained for the purposes of this section.

(b) *Periodic surveillance.* (1) At least once every 6 months after a management plan is in effect, each local education agency shall conduct periodic surveillance in each building that it leases, owns, or otherwise uses as a school building that contains ACBM or is assumed to contain ACBM.

(2) Each person performing periodic surveillance shall:

(i) Visually inspect all areas that are identified in the management plan as ACBM or assumed ACBM.

(ii) Record the date of the surveillance, his or her name, and any

changes in the condition of the materials.

(iii) Submit to the person designated to carry out general local education agency responsibilities under § 763.84 a copy of such record for inclusion in the management plan.

§ 763.93 Management plans.

(a)(1) On or before October 12, 1988, each local education agency shall develop an asbestos management plan for each school, including all buildings that they lease, own, or otherwise use as school buildings, and submit the plan to an Agency designated by the Governor of the State in which the local education agency is located. The plan may be submitted in stages that cover a portion of the school buildings under the authority of the local education agency.

(2) If a building to be used as part of a school is leased or otherwise acquired after October 12, 1988, the local education agency shall include the new building in the management plan for the school prior to its use as a school building. The revised portions of the management plan shall be submitted to the Agency designated by the Governor.

(3) If a local education agency begins to use a building as a school after October 12, 1988, the local education agency shall submit a management plan for the school to the Agency designated by the Governor prior to its use as a school.

(b) On or before October 17, 1987, the Governor of each State shall notify local education agencies in the State regarding where to submit their management plans. States may establish administrative procedures for reviewing management plans. If the Governor does not disapprove a management plan within 90 days after receipt of the plan, the local education agency shall implement the plan.

(c) Each local education agency must begin implementation of its management plan on or before July 9, 1989, and complete implementation in a timely fashion.

(d) Each local education agency shall maintain and update its management plan to keep it current with ongoing operations and maintenance, periodic surveillance, inspection, reinspection, and response action activities. All provisions required to be included in the management plan under this section shall be retained as part of the management plan, as well as any information that has been revised to bring the plan up-to-date.

(e) The management plan shall be developed by an accredited management planner and shall include:

(1) A list of the name and address of each school building and whether the school building contains friable ACBM, nonfriable ACBM, and friable and nonfriable suspected ACBM assumed to be ACM.

(2) For each inspection conducted before the December 14, 1987:

(i) The date of the inspection.

(ii) A blueprint, diagram, or written description of each school building that identifies clearly each location and approximate square or linear footage of any homogeneous or sampling area where material was sampled for ACM, and, if possible, the exact locations where bulk samples were collected, and the dates of collection.

(iii) A copy of the analyses of any bulk samples, dates of analyses, and a copy of any other laboratory reports pertaining to the analyses.

(iv) A description of any response actions or preventive measures taken to reduce asbestos exposure, including if possible, the names and addresses of all contractors involved, start and completion dates of the work, and results of any air samples analyzed during and upon completion of the work.

(v) A description of assessments, required to be made under § 763.88, of material that was identified before December 14, 1987, as friable ACBM or friable suspected ACBM assumed to be ACM, and the name and signature, State of accreditation, and if applicable, accreditation number of each accredited person making the assessments.

(3) For each inspection and reinspection conducted under § 763.85:

(i) The date of the inspection or reinspection and the name and signature, State of accreditation and, if applicable, the accreditation number of each accredited inspector performing the inspection or reinspection.

(ii) A blueprint, diagram, or written description of each school building that identifies clearly each location and approximate square or linear footage of homogeneous areas where material was sampled for ACM, the exact location where each bulk sample was collected, date of collection, homogeneous areas where friable suspected ACBM is assumed to be ACM, and where nonfriable suspected ACBM is assumed to be ACM.

(iii) A description of the manner used to determine sampling locations, and the name and signature of each accredited inspector collecting samples, the State of accreditation, and if applicable, his or her accreditation number.

(iv) A copy of the analyses of any bulk samples collected and analyzed, the name and address of any laboratory that analyzed bulk samples, a statement that the laboratory meets the applicable requirements of § 763.87(a) the date of analysis, and the name and signature of the person performing the analysis.

(v) A description of assessments, required to be made under § 763.88, of all ACBM and suspected ACBM assumed to be ACM, and the name, signature, State of accreditation, and if applicable, accreditation number of each accredited person making the assessments.

(4) The name, address, and telephone number of the person designated under § 763.84 to ensure that the duties of the local education agency are carried out, and the course name, and dates and hours of training taken by that person to carry out the duties.

(5) The recommendations made to the local education agency regarding response actions, under § 763.88(d), the name, signature, State of accreditation of each person making the recommendations, and if applicable, his or her accreditation number.

(6) A detailed description of preventive measures and response actions to be taken, including methods to be used, for any friable ACBM, the locations where such measures and action will be taken, reasons for selecting the response action or preventive measure, and a schedule for beginning and completing each preventive measure and response action.

(7) With respect to the person or persons who inspected for ACBM and who will design or carry out response actions, except for operations and maintenance, with respect to the ACBM, one of the following statements:

(i) If the State has adopted a contractor accreditation program under section 206(b) of Title II of the Act, a statement that the person(s) is accredited under such plan.

(ii) A statement that the local education agency used (or will use) persons who have been accredited by another State which has adopted a contractor accreditation plan under section 206(b) of Title II of the Act or is accredited by an EPA-approved course under section 206(c) of Title II of the Act.

(8) A detailed description in the form of a blueprint, diagram, or in writing of any ACBM or suspected ACBM assumed to be ACM which remains in the school once response actions are undertaken pursuant to § 763.90. This description shall be updated as response actions are completed.

(9) A plan for reinspection under § 763.85, a plan for operations and maintenance activities under § 763.91,

and a plan for periodic surveillance under § 763.92, a description of the recommendation made by the management planner regarding additional cleaning under § 763.91(c)(2) as part of an operations and maintenance program, and the response of the local education agency to that recommendation.

(10) A description of steps taken to inform workers and building occupants, or their legal guardians, about inspections, reinspections, response actions, and post-response action activities, including periodic reinspection and surveillance activities that are planned or in progress.

(11) An evaluation of the resources needed to complete response actions successfully and carry out reinspection, operations and maintenance activities, periodic surveillance and training.

(12) With respect to each consultant who contributed to the management plan, the name of the consultant and one of the following statements:

(i) If the State has adopted a contractor accreditation plan under section 206(b) of Title II of the Act, a statement that the consultant is accredited under such plan.

(ii) A statement that the contractor is accredited by another State which has adopted a contractor accreditation plan under section 206(b) of Title II of the Act, or is accredited by an EPA-approved course developed under section 206(c) of Title II of the Act.

(f) A local education agency may require each management plan to contain a statement signed by an accredited management plan developer that such person has prepared or assisted in the preparation of such plan or has reviewed such plan, and that such plan is in compliance with this Subpart E. Such statement may not be signed by a person who, in addition to preparing or assisting in preparing the management plan, also implements (or will implement) the management plan.

(g)(1) Upon submission of a management plan to the Governor for review, a local education agency shall keep a copy of the plan in its administrative office. The management plans shall be available, without cost or restriction, for inspection by representatives of EPA and the State, the public, including teachers, other school personnel and their representatives, and parents. The local education agency may charge a reasonable cost to make copies of management plans.

(2) Each local education agency shall maintain in its administrative office a complete, updated copy of a management plan for each school under its administrative control or direction. The management plans shall be available, during normal business hours, without cost or restriction, for inspection by representatives of EPA and the State, the public, including teachers, other school personnel and their representatives, and parents. The local education agency may charge a reasonable cost to make copies of management plans.

(3) Each school shall maintain in its administrative office a complete, updated copy of the management plan for that school. Management plans shall be available for inspection, without cost or restriction, to workers before work begins in any area of a school building. The school shall make management plans available for inspection to representatives of EPA and the State, the public, including parents, teachers, and other school personnel and their representatives within 5 working days after receiving a request for inspection. The school may charge a reasonable cost to make copies of the management plan.

(4) Upon submission of its management plan to the Governor and at least once each school year, the local education agency shall notify in writing parent, teacher, and employee organizations of the availability of management plans and shall include in the management plan a description of the steps taken to notify such organizations, and a dated copy of the notification. In the absence of any such organizations for parents, teachers, or employees, the local education agency shall provide written notice to that relevant group of the availability of management plans and shall include in the management plan a description of the steps taken to notify such groups, and a dated copy of the notification.

(h) Records required under § 763.84 shall be made by local education agencies and maintained as part of the management plan.

(i) Each management plan must contain a true and correct statement, signed by the individual designated by the local education agency under § 763.84, which certifies that the general local education agency responsibilities, as stipulated by § 763.84, have been met or will be met.

§ 763.94 Recordkeeping.

(a) Records required under this section shall be maintained in a centralized location in the administrative office of both the school and the local education agency as part of the management plan. For each homogeneous area where all ACBM has been removed, the local education agency shall ensure that such records are retained for 3 years after the next reinspection required under § 763.85(b)(1), or for an equivalent period.

(b) For each preventive measure and response action taken for friable and nonfriable ACBM and friable and nonfriable suspected ACBM assumed to be ACM, the local education agency shall provide:

(1) A detailed written description of the measure or action, including methods used, the location where the measure or action was taken, reasons for selecting the measure or action, start and completion dates of the work, names and addresses of all contractors involved, and if applicable, their State of accreditation, and accreditation numbers, and if ACBM is removed, the name and location of storage or disposal site of the ACM.

(2) The name and signature of any person collecting any air sample required to be collected at the completion of certain response actions specified by § 763.90(i), the locations where samples were collected, date of collection, the name and address of the laboratory analyzing the samples, the date of analysis, the results of the analysis, the method of analysis, the name and signature of the person performing the analysis, and a statement that the laboratory meets the applicable requirements of § 763.90(i)(2)(ii).

(c) For each person required to be trained under § 763.92(a) (1) and (2), the local education agency shall provide the person's name and job title, the date that training was completed by that person, the location of the training, and the number of hours completed in such training.

(d) For each time that periodic surveillance under § 763.92(b) is performed, the local education agency shall record the name of each person performing the surveillance, the date of the surveillance, and any changes in the conditions of the materials.

(e) For each time that cleaning under § 763.91(c) is performed, the local education agency shall record the name of each person performing the cleaning, the date of such cleaning, the locations cleaned, and the methods used to perform such cleaning.

(f) For each time that operations and maintenance activities under § 763.91(d) are performed, the local education agency shall record the name of each person performing the activity, the start and completion dates of the activity, the locations where such activity occurred, a description of the activity including preventive measures used, and if ACBM

is removed, the name and location of storage or disposal site of the ACM.

(g) For each time that major asbestos activity under § 763.91(e) is performed, the local education agency shall provide the name and signature, State of accreditation, and if applicable, the accreditation number of each person performing the activity, the start and completion dates of the activity, the locations where such activity occurred, a description of the activity including preventive measures used, and if ACBM is removed, the name and location of storage or disposal site of the ACM.

(h) For each fiber release episode under § 763.91(f), the local education agency shall provide the date and location of the episode, the method of repair, preventive measures or response action taken, the name of each person performing the work, and if ACBM is removed, the name and location of storage or disposal site of the ACM.

(Approved by the Office of Management and Budget under control number 2070-0091)

§ 763.95 Warning labels.

(a) The local education agency shall attach a warning label immediately adjacent to any friable and nonfriable ACBM and suspected ACBM assumed to be ACM located in routine maintenance areas (such as boiler rooms) at each school building. This shall include:

(1) Friable ACBM that was responded to by a means other than removal.

(2) ACBM for which no response action was carried out.

(b) All labels shall be prominently displayed in readily visible locations and shall remain posted until the ACBM that is labeled is removed.

(c) The warning label shall read, in print which is readily visible because of large size or bright color, as follows: CAUTION: ASBESTOS. HAZARDOUS. DO NOT DISTURB WITHOUT PROPER TRAINING AND EQUIPMENT.

§ 763.97 Compliance and enforcement.

(a) *Compliance with Title II of the Act.* (1) Section 207(a) of Title II of the Act (15 U.S.C. 2647) makes it unlawful for any local education agency to:

(i) Fail to conduct inspections pursuant to section 203(b) of Title II of the Act, including failure to follow procedures and failure to use accredited personnel and laboratories.

(ii) Knowingly submit false information to the Governor regarding any inspection pursuant to regulations under section 203(i) of Title II of the Act.

(iii) Fail to develop a management plan pursuant to regulations under section 203(i) of Title II of the Act.

(2) Section 207(a) of Title II of the Act (15 U.S.C. 2647) also provides that any local education agency which violates any provision of section 207 shall be liable for a civil penalty of not more than $5,000 for each day during which the violation continues. For the purposes of this subpart, a "violation" means a failure to comply with respect to a single school building.

(b) *Compliance with Title I of the Act.* (1) Section 15(1)(D) of Title I of the Act (15 U.S.C. 2614) makes it unlawful for any person to fail or refuse to comply with any requirement of Title II or any rule promulgated or order issued under Title II. Therefore, any person who violates any requirement of this Subpart is in violation of section 15 of Title I of the Act.

(2) Section 15(3) of Title I of the Act (15 U.S.C. 2614) makes it unlawful for any person to fail or refuse to establish or maintain records, submit reports, notices or other information, or permit access to or copying of records, as required by this Act or a rule thereunder.

(3) Section 15(4) (15 U.S.C. 2614) of Title I of the Act makes it unlawful for any person to fail or refuse to permit entry or inspection as required by section 11 of Title I of the Act.

(4) Section 16(a) of Title I of the Act (15 U.S.C. 2615) provides that any person who violates any provision of section 15 of Title I of the Act shall be liable to the United States for a civil penalty in an amount not to exceed $25,000 for each such violation. Each day such a violation continues shall, for purposes of this paragraph, constitute a separate violation of section 15. A local education agency is not liable for any civil penalty under Title I of the Act for failing or refusing to comply with any rule promulgated or order issued under Title II of the Act.

(c) *Criminal penalties.* If any violation committed by any person (including a local education agency) is knowing or willful, criminal penalties may be assessed under section 16(b) of Title I of the Act.

(d) *Injunctive relief.* The Agency may obtain injunctive relief under section 208(b) of Title II of the Act to respond to a hazard which poses an imminent and substantial endangerment to human health or the environment or section 17 (15 U.S.C. 2616) of Title I of the Act to restrain any violation of section 15 of Title I of the Act or to compel the taking of any action required by or under Title I of the Act.

(e) *Citizen complaints.* Any citizen who wishes to file a complaint pursuant to section 207(d) of Title II of the Act should direct the complaint to the Governor of the State or the EPA Asbestos Ombudsman, 401 M Street, SW., Washington, DC 20460. The citizen complaint should be in writing and identified as a citizen complaint pursuant to section 207(d) of Title II of TSCA. The EPA Asbestos Ombudsman or the Governor shall investigate and respond to the complaint within a reasonable period of time if the allegations provide a reasonable basis to believe that a violation of the Act has occurred.

(f) *Inspections.* EPA may conduct inspections and review management plans under section 11 of Title I of the Act (15 U.S.C. 2610) to ensure compliance.

§ 763.98 Waiver; delegation to State.

(a) *General.* (1) Upon request from a State Governor and after notice and comment and an opportunity for a public hearing in accordance with paragraphs (b) and (c) of this section, EPA may waive some or all of the requirements of this Subpart E if the State has established and is implementing or intends to implement a program of asbestos inspection and management that contains requirements that are at least as stringent as the requirements of this Subpart E.

(2) A waiver from any requirement of this Subpart E shall apply only to the specific provision for which a waiver has been granted under this section. All requirements of this Subpart E shall apply until a waiver is granted under this section.

(b) *Request.* Each request by a Governor to waive any requirement of this Subpart E shall be sent with three complete copies of the request to the Regional Administrator for the EPA Region in which the State is located and shall include:

(1) A copy of the State provisions or proposed provisions relating to its program of asbestos inspection and management in schools for which the request is made.

(2)(i) The name of the State agency that is or will be responsible for administering and enforcing the requirements for which a waiver is requested, the names and job titles of responsible officials in that agency, and phone numbers where the officials can be contacted.

(ii) In the event that more than one agency is or will be responsible for administering and enforcing the requirements for which a waiver is requested, a description of the functions to be performed by each agency, how the program will be coordinated by the lead agency to ensure consistency and

effective administration in the asbestos inspection and management program within the State, the names and job titles of responsible officials in the agencies, and phone numbers where the officials can be contacted. The lead agency will serve as the central contact point for the EPA.

(3) Detailed reasons, supporting papers, and the rationale for concluding that the State's asbestos inspection and management program provisions for which the request is made are at least as stringent as the requirements of this Subpart E.

(4) A discussion of any special situations, problems, and needs pertaining to the waiver request accompanied by an explanation of how the State intends to handle them.

(5) A statement of the resources that the State intends to devote to the administration and enforcement of the provisions relating to the waiver request.

(6) Copies of any specific or enabling State laws (enacted and pending enactment) and regulations (promulgated and pending promulgation) relating to the request, including provisions for assessing criminal and/or civil penalties.

(7) Assurance from the Governor, the Attorney General, or the legal counsel of the lead agency that the lead agency or other cooperating agencies have the legal authority necessary to carry out the requirements relating to the request.

(c) *General notice—hearing.* (1) Within 30 days after receipt of a request for a waiver, EPA will determine the completeness of the request. If EPA does not request further information within the 30-day period, the request will be deemed complete.

(2) Within 30 days after EPA determines that a request is complete, EPA will issue for publication in the Federal Register a notice that announces receipt of the request, describes the information submitted under paragraph (b) of this section, and solicits written comment from interested members of the public. Comments must be submitted within 60 days.

(3) If, during the comment period, EPA receives a written objection to a Governor's request and a request for a public hearing detailing specific objections to the granting of a waiver, EPA will schedule a public hearing to be held in the affected State after the close of the comment period and will announce the public hearing date in the Federal Register before the date of the hearing. Each comment shall include the name and address of the person submitting the comment.

(d) *Criteria.* EPA may waive some or all of the requirements of Subpart E of this part if:

(1) The State's lead agency and other cooperating agencies have the legal authority necessary to carry out the provisions of asbestos inspection and management in schools relating to the waiver request.

(2) The State's program of asbestos inspection and management in schools relating to the waiver request and implementation of the program are or will be at least as stringent as the requirements of this Subpart E.

(3) The State has an enforcement mechanism to allow it to implement the program described in the waiver request.

(4) The lead agency and any cooperating agencies have or will have qualified personnel to carry out the provisions relating to the waiver request.

(5) The State will devote adequate resources to the administration and enforcement of the asbestos inspection and management provisions relating to the waiver request.

(6) When specified by EPA, the State gives satisfactory assurances that necessary steps, including specific actions it proposes to take and a time schedule for their accomplishment, will be taken within a reasonable time to conform with applicable criteria under paragraph (d) (2) through (4) of this section.

(e) *Decision.* EPA will issue for publication in the Federal Register a notice announcing its decision to grant or deny, in whole or in part, a Governor's request for a waiver from some or all of the requirements of this Subpart E within 30 days after the close of the comment period or within 30 days following a public hearing, whichever is applicable. The notice will include the Agency's reasons and rationale for granting or denying the Governor's request. The 30-day period may be extended if mutually agreed upon by EPA and the State.

(f) *Modifications.* When any substantial change is made in the administration or enforcement of a State program for which a waiver was granted under this section, a responsible official in the lead agency shall submit such changes to EPA.

(g) *Reports.* The lead agency in each State that has been granted a waiver by EPA from any requirement of Subpart E of this part shall submit a report to the Regional Administrator for the Region in which the State is located at least once every 12 months to include the following information:

(1) A summary of the State's implementation and enforcement activities during the last reporting period relating to provisions waived under this section, including enforcement actions taken.

(2) Any changes in the administration or enforcement of the State program implemented during the last reporting period.

(3) Other reports as may be required by EPA to carry out effective oversight of any requirement of this Subpart E that was waived under this section.

(h) *Oversight.* EPA may periodically evaluate the adequacy of a State's implementation and enforcement of and resources devoted to carrying out requirements relating to the waiver. This evaluation may include, but is not limited to, site visits to local education agencies without prior notice to the State.

(i) *Informal conference.* (1) EPA may request that an informal conference be held between appropriate State and EPA officials when EPA has reason to believe that a State has failed to:

(i) Substantially comply with the terms of any provision that was waived under this section.

(ii) Meet the criteria under paragraph (d) of this section, including the failure to carry out enforcement activities or act on violations of the State program.

(2) EPA will:

(i) Specify to the State those aspects of the State's program believed to be inadequate.

(ii) Specify to the State the facts that underlie the belief of inadequacy.

(3) If EPA finds, on the basis of information submitted by the State at the conference, that deficiencies did not exist or were corrected by the State, no further action is required.

(4) Where EPA finds that deficiencies in the State program exist, a plan to correct the deficiencies shall be negotiated between the State and EPA. The plan shall detail the deficiencies found in the State program, specify the steps the State has taken or will take to remedy the deficiencies, and establish a schedule for each remedial action to be initiated.

(j) *Rescission.* (1) If the State fails to meet with EPA or fails to correct deficiencies raised at the informal conference, EPA will deliver to the Governor of the State and a responsible official in the lead agency a written notice of its intent to rescind, in whole or part, the waiver.

(2) EPA will issue for publication in the Federal Register a notice that announces the rescission of the waiver, describes those aspects of the State's

program determined to be inadequate, and specifies the facts that underlie the findings of inadequacy.

§ 763.99 Exclusions.

(a) A local education agency shall not be required to perform an inspection under § 763.85(a) in any sampling area as defined in 40 CFR 763.103 or homogeneous area of a school building where:

(1) An accredited inspector has determined that, based on sampling records, friable ACBM was identified in that homogeneous or sampling area during an inspection conducted before December 14, 1987. The inspector shall sign and date a statement to that effect with his or her State of accreditation and if applicable, accreditation number and, within 30 days after such determination, submit a copy of the statement to the person designated under § 763.84 for inclusion in the management plan. However, an accredited inspector shall assess the friable ACBM under § 763.88.

(2) An accredited inspector has determined that, based on sampling records, nonfriable ACBM was identified in that homogeneous or sampling area during an inspection conducted before December 14, 1987. The inspector shall sign and date a statement to that effect with his or her State of accreditation and if applicable, accreditation number and, within 30 days after such determination, submit a copy of the statement to the person designated under § 763.84 for inclusion in the management plan. However, an accredited inspector shall identify whether material that was nonfriable has become friable since that previous inspection and shall assess the newly-friable ACBM under § 763.88.

(3) Based on sampling records and inspection records, an accredited inspector has determined that no ACBM is present in the homogeneous or sampling area and the records show that the area was sampled, before December 14, 1987 in substantial compliance with § 763.85(a), which for purposes of this section means in a random manner and with a sufficient number of samples to reasonably ensure that the area is not ACBM.

(i) The accredited inspector shall sign and date a statement, with his or her State of accreditation and if applicable, accreditation number that the homogeneous or sampling area determined not to be ACBM was sampled in substantial compliance with § 763.85(a).

(ii) Within 30 days after the inspector's determination, the local education agency shall submit a copy of the inspector's statement to the EPA Regional Office and shall include the statement in the management plan for that school.

(4) The lead agency responsible for asbestos inspection in a State that has been granted a waiver from § 763.85(a) has determined that, based on sampling records and inspection records, no ACBM is present in the homogeneous or sampling area and the records show that the area was sampled before December 14, 1987, in substantial compliance with § 763.85(a). Such determination shall be included in the management plan for that school.

(5) An accredited inspector has determined that, based on records of an inspection conducted before December 14, 1987, suspected ACBM identified in that homogeneous or sampling area is assumed to be ACM. The inspector shall sign and date a statement to that effect, with his or her State of accreditation and if applicable, accreditation number and, within 30 days of such determination, submit a copy of the statement to the person designated under § 763.84 for inclusion in the management plan. However, an accredited inspector shall identify whether material that was nonfriable suspected ACBM assumed to be ACM has become friable since the previous inspection and shall assess the newly friable material and previously identified friable suspected ACBM assumed to be ACM under § 763.88.

(6) Based on inspection records and contractor and clearance records, an accredited inspector has determined that no ACBM is present in the homogeneous or sampling area where asbestos removal operations have been conducted before December 14, 1987, and shall sign and date a statement to that effect and include his or her State of accreditation and, if applicable, accreditation number. The local education agency shall submit a copy of the statement to the EPA Regional Office and shall include the statement in the management plan for that school.

(7) An architect or project engineer responsible for the construction of a new school building built after October 12, 1988, or an accredited inspector signs a statement that no ACBM was specified as a building material in any construction document for the building, or, to the best of his or her knowledge, no ACBM was used as a building material in the building. The local education agency shall submit a copy of the signed statement of the architect, project engineer, or accredited inspector to the EPA Regional Office and shall include the statement in the management plan for that school.

(b) The exclusion, under paragraph (a)(1) through (4) of this section, from conducting the inspection under § 763.85(a) shall apply only to homogeneous or sampling areas of a school building that were inspected and sampled before October 17, 1987. The local education agency shall conduct an inspection under § 763.85(a) of all areas inspected before October 17, 1987, that were not sampled or were not assumed to be ACM.

(c) If ACBM is subsequently found in a homogeneous or sampling area of a local education agency that had been identified as receiving an exclusion by an accredited inspector under paragraphs (a) (3), (4), (5) of this section, or an architect, project engineer or accredited inspector under paragraph (a)(7) of this section, the local education agency shall have 180 days following the date of identification of ACBM to comply with this Subpart E.

Appendix A to Subpart E—Interim Transmission Electron Microscopy Analytical Methods—Mandatory and Nonmandatory—and Mandatory Section to Determine Completion of Response Actions

I. Introduction

The following appendix contains three units. The first unit is the mandatory transmission electron microscopy (TEM) method which all laboratories must follow; it is the minimum requirement for analysis of air samples for asbestos by TEM. The mandatory method contains the essential elements of the TEM method. The second unit contains the complete non-mandatory method. The non-mandatory method supplements the mandatory method by including additional steps to improve the analysis. EPA recommends that the non-mandatory method be employed for analyzing air filters; however, the laboratory may choose to employ the mandatory method. The non-mandatory method contains the same minimum requirements as are outlined in the mandatory method. Hence, laboratories may choose either of the two methods for analyzing air samples by TEM.

The final unit of this Appendix A to Subpart E defines the steps which must be taken to determine completion of response actions. This unit is mandatory.

II. Mandatory Transmission Electron Microscopy Method

A. Definitions of Terms

1. "Analytical sensitivity"—Airborne asbestos concentration represented by each fiber counted under the electron

Versar INC

ASBESTOS-CONTAINING MATERIALS MANAGEMENT PLAN APPENDICES C, D, E, F, G, AND H

FOR

BENTALOU ELEMENTARY SCHOOL
PS150

PREPARED FOR:

THE BOARD OF SCHOOL COMMISSIONERS
FOR THE CITY OF BALTIMORE

PREPARED BY:

VERSAR, INC.
6850 VERSAR CENTER
SPRINGFIELD, VA 22151

MAY 9, 1989

APPENDIX C

RESPONSE ACTION SINCE INSPECTION

NO ACTIVITIES TO DATE

Versar INC.

APPENDIX D

SCHEDULE FOR RESPONSE ACTIONS

RESPONSE ACTION SCHEDULE

SCHOOL NAME: Bentalou Elementary School

NUMBER: PS 150

RESPONSE ACTIONS PER FUNCTIONAL SPACE

FUNCTIONAL SPACE No.	DATE START	DATE OF COMPLETION
01	7/1/96	7/1/97
02	7/1/96	7/1/97
03	7/1/96	7/1/97

Versar INC.

APPENDIX E

OPERATIONS AND MAINTENANCE PROCEDURES

Versar INC.

ACOUSTIC PLASTER

Acoustic plaster typically is found on ceiling and sometimes on wall surfaces. This material is characteristically used for decorative or fire protection purposes. This material is particularly subject to water damage. Any leakage from above can dislodge acoustical plaster from its substrate. In addition, the installation of lighting fixtures, or any component that may compromise the integrity of the material can also create dislodged material, resulting in airborne release of fibers. The following guidelines should be implemented when encountering acoustical plaster materials:

- Do not drill, sand, or otherwise disturb acoustical plaster.
- Discourage students from throwing objects at, writing on, or poking at material.
- Any debris found on horizontal surfaces should be brought to the attention of the Designated LEA Representative. This individual will take the necessary measures to clean up the ACM material.
- If any work is to be conducted that will require the penetration of any plaster, the Designated LEA Representative should be contacted before any activity begins. He will assign the proper individuals to perform the requested work.
- Any water damage should also be reported to the Designated LEA Representative. Water damage may be observed as a large discolored patch on the ceiling surface. Eventually, the plaster will become so heavy with water that it will not support its own weight and will fall to the floor or other horizontal surfaces.
- Any currently abrasive movable objects, such as doors or curtains, should be relocated to avoid contact with the ceiling. Any disturbance of ACM that this activity generates must be reported to the Designated LEA Representative.

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FLOOR TILE/SHEET FLOORING MASTIC

Floor tile, sheet flooring, and mastic often contain asbestos. The mastic found beneath the floor tile and sheet flooring is used to bond the tile and sheet flooring to the substrate. Floor tile, sheet flooring, and mastic are nonfriable in their installed state. However, if any sanding, drilling, or abrading of tile, sheet flooring, or mastic occurs, it can create friable material. When friable, disturbed tile, sheet flooring, and mastic can release fibers into the surrounding air. Several precautions must be followed to reduce potential fiber release and entrainment into the building environment.

The following methods and precautions to be followed for asbestos-containing floor tile, sheet flooring, and mastic are described below:

- Floor tile, sheet flooring, and/or mastic must not be sanded, drilled, or otherwise abraded.
- Floor tile and sheet flooring should maintain a good waxed surface to prevent potential premature wear by pedestrian traffic.
- The use of machines to strip old wax is prohibited; use floor mops or other hand methods. Do not use steel wool pads or other abrasives for polishing.
- Any spilled liquids should be promptly cleaned up to avoid water damage that may cause delamination of tile from its substrate.
- Removal of floor tile, sheet flooring, and mastic should never take place, regardless of quantity, unless the Designated LEA Representative is notified. This individual will assist the school in the proper removal of the tile, sheet flooring, and mastic.

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BOILERS, BREECHING, TANKS

Boilers, breeching, and tanks may have several layers of asbestos-containing insulating material. A block layer sometimes is found beneath a trowelled-on smooth layer. Both layers often contain asbestos. In addition, these components may have a painted canvas covering. Persons working around these components must take precautions to prevent accidental fiber release from the insulation.

The following operations and maintenance procedures are to be followed related to asbestos-containing boiler, breeching, or tank insulation:

- Avoid any drilling, replacement of insulation, cutting, fitting of new components, or sanding. Any needed repairs and/or removal must be cleared with the Designated LEA Representative prior to such activities.
- Report any new damage. Do not attempt to clean up loose or fallen asbestos insulation. The need for any clean-up should be reported to the Designated LEA Representative.
- Avoid storing, stacking, or leaning material against boilers, breeching, or tanks to prevent impact damage.
- Any system leaks or other potential sources of water should be addressed immediately to avoid water or steam damage to the insulation. If damage has already occurred to the insulation, do not attempt repair. Contact the Designated LEA Representative as soon as the leak is discovered. If possible, shut off the water or steam to prevent continued leakage.
- If the insulation is covered with canvas, report any punctures to or abrasions of the canvas or paint deterioration to the Designated LEA Representative.

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DUCT WORK

Asbestos-insulated duct work can be found virtually anywhere in the school. Insulation on ducts can be trowelled-on, preformed, or sprayed-on. Duct insulation is important to protect because of the proximity to building occupants. Ducts in high traffic areas, gyms, locker rooms, or other areas where students could disturb the insulation should be monitored to quickly detect any damage due to impact or abrading of the material. When working near or around duct insulation, contact with the insulation must be avoided. Some ducts may have a continuous air flow over the insulation. If this is the case, any signs of air erosion of the insulation should be immediately reported to the Designated LEA Representative:

The following operations and maintenance procedures are to be followed related to asbestos-containing duct work insulation:

- Do not cut, drill, abrade, or make any alterations to insulated duct work.
- Avoid placing ladders, scaffolding, or any other device against the duct work that may cause damage.
- Report any damage to the Designated LEA Representative. If asbestos material is found that had dislodged from the duct, do not attempt to clean it up. The Designated LEA Representative will assign the appropriate personnel.
- If the insulation is covered with canvas, report any punctures to or abrasions of the canvas or paint deterioration to the Designated LEA Representative.

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FIRE DOORS

Throughout the building, fire doors are most commonly found as barriers between mechanical and boiler rooms, hallways, or to the outside. The door interior (or core) is often friable asbestos material. In its present state between a layer of wood or metal, fiber release is minimal. However, should any drilling, cutting, altering of the doors, or hardware removal take place, it could result in asbestos fibers being released into the ambient air.

The following operations and maintenance procedure are to be followed related to asbestos-containing fire doors:

- Drilling or cutting into the door is prohibited. If this type of work needs to take place, consult the Designated LEA Representative prior to such activities.
- When doors are to be replaced, they should be removed intact as per the Baltimore Specifications.
- Any work done to locks or handles should be avoided since asbestos can be exposed and damaged through this activity. Again, consult the Designated LEA Representative for guidance prior to such activities.

APPENDIX F

AHERA ACCREDITATION/REACCREDITATION CERTIFICATES

Aerosol Monitoring & Analysis, Inc.

This is to certify that

MICHAEL BOND

has successfully completed a
8 hour training course entitled

EPA INSPECTOR/MANAGEMENT PLANNER RECERTIFICATION

Presented by Aerosol Monitoring & Analysis, Inc.

on APRIL 12, 1989

Location HANOVER, MARYLAND

Expires 4/12/90

Corporate Headquarters
P.O. Box 687
Hunt Valley, Md 21030

Certificate # 89-1686

DANIEL R. TWILLEY
Director



INSTITUTE FOR ENVIRONMENTAL EDUCATION

Woburn, Massachusetts

This is to certify that

Michael T. Bond

has successfully completed the course

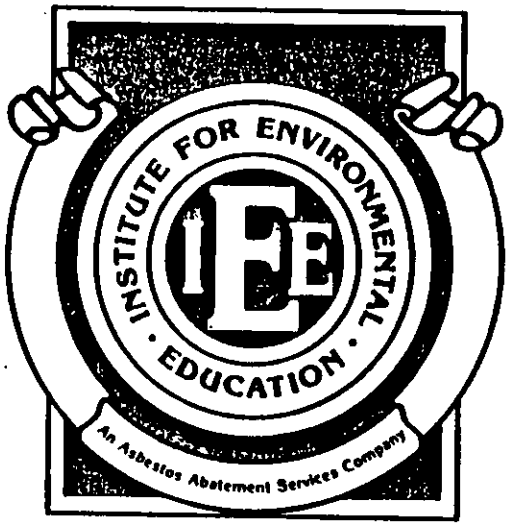
AHERA ASBESTOS INSPECTION TRAINING

March 2, 1988
Date

83202-150
Certificate Number

March 2, 1989
Expiration Date

Mary Beth Carew
Director



INSTITUTE FOR ENVIRONMENTAL EDUCATION

Woburn, Massachusetts

This is to certify that

Michael T. Bond

has successfully completed the course

AHERA ASBESTOS MANAGEMENT PLANNING TRAINING

March 4, 1988
Date

83302-136
Certificate Number

March 4, 1989
Expiration Date

Mary Beth Carnes
Director

The Georgia Institute of Technology

Resat Cakmakci

Has attended and satisfactorily passed an examination
covering the contents of a continuing education course entitled:

"INSPECTING BUILDINGS FOR ASBESTOS-CONTAINING MATERIALS"

012
Certificate Number

October 7, 1987
Date



Course Director

Exam Administrator

The Georgia Institute of Technology

Resat Cakmakci

Has attended and satisfactorily passed an examination
covering the contents of a continuing education course entitled:

"MANAGING ASBESTOS IN BUILDINGS"



284
Certificate Number

January 15, 1988
Date

Course Director

Rachel D. McCain
Exam Administrator

Alice Hamilton Occupational Health Center

This is to Certify that

Lawrence G. Davies

has met the Attendance Requirements

and successfully completed the Course in

Asbestos Inspector/Management Planner Refresher

Brian W. Davies

Course Director

January 20, 1989

Date

Registered Certificate

No: IMP-R-002

Expires on: January 20, 1990

21

The Georgia Institute of Technology

Larry Davies

Has attended and satisfactorily passed an examination
covering the contents of a continuing education course entitled:

"MANAGING ASBESTOS IN BUILDINGS"

020
Certificate Number

October 9, 1987
Date



Course Director

Exam Administrator

The Georgia Institute of Technology

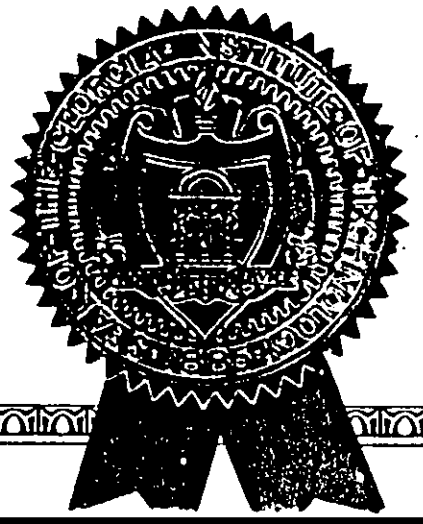
Larry Davies

Has attended and satisfactorily passed an examination
covering the contents of a continuing education course entitled:

"INSPECTING BUILDINGS FOR ASBESTOS-CONTAINING MATERIALS"

024
Certificate Number

October 7, 1981
Date



Course Director

Exam Administrator

TUFTS UNIVERSITY

Center for Environmental Management

April 20, 1989

Mr. Lee Sesler
Versar, Inc.
P.O. Box 1549
6850 Versar Center
Springfield, VA 22151

Dear Mr. Sesler:

May this letter serve to confirm that Mr. Patrick Elmer and Mr. Ken Till participated and successfully completed the Tufts University Center for Environmental Management (formerly Asbestos Information Center) Asbestos Abatement for Inspectors and Management Planners five-day training course. Both gentlemen attended the February 15 - 19, 1988 course and received certificates from our institution.

Elmer - #8802-02-023 and #8802-02-087
Till - #8802-02-060 and #8802-02-124

We have no record of their attending the required Annual Review session at Tufts University.

Respectfully,

Anne Chabot

Anne Chabot
Program Development Coordinator

AC/cc

Curtis Hall
474 Boston Avenue
Medford, Massachusetts 02155
617/381-3486 General Information
617/381-3531 Division of Education and Training
617/381-3194 FAX

Medical College of Virginia
Virginia Commonwealth University

Department of Preventive Medicine
and the
Program in Industrial Hygiene/Occupational and Environmental Health

HEREBY AWARD THIS

Certificate of Completion

TO

DONALD K. FULTON

for successful completion of the course

Managing Asbestos in Buildings

ONE DAY UPDATE

R Leonard Vance — Instructor

March 3, 1989 — Date

Chairman, Department of Preventive Medicine

Medical College of Virginia
Virginia Commonwealth University

Department of Preventive Medicine
and the
Program in Industrial Hygiene/Occupational and Environmental Health

HEREBY AWARD THIS

Certificate of Completion

TO

DONALD K. FULTON

for successful completion of the course

INSPECTING BUILDINGS FOR

ASBESTOS - CONTAINING MATERIALS

ONE DAY UPDATE

R Leonard Vance — March 3, 1989

Instructor — Date

Chairman, Department of Preventive Medicine



INSTITUTE FOR ENVIRONMENTAL EDUCATION

Woburn, Massachusetts

This is to certify that

Donald K. Fulton

has successfully completed the course

AHERA ASBESTOS MANAGEMENT PLANNING TRAINING

March 4, 1988
Date

83302-104
Certificate Number

March 4, 1989
Expiration Date

Mary Beth Carew
Director



INSTITUTE FOR ENVIRONMENTAL EDUCATION

Woburn, Massachusetts

This is to certify that

Donald K. Fulton

has successfully completed the course

AHERA ASBESTOS INSPECTION TRAINING

March 2, 1988
Date

83202-104
Certificate Number

March 2, 1989
Expiration Date

Mary Beth Carnie
Director

COPY

Alice Hamilton Occupational Health Center

This is to Certify that

Tom Hardy

has met the Attendance Requirements

and successfully completed the Course in

Asbestos Inspector/Management Planner Refresher

Brian W. Smith

Course Director

January 20, 1989

Date

Registered Certificate

No: IMP-R-005

Expires on: January 20, 1990

The Georgia Institute of Technology

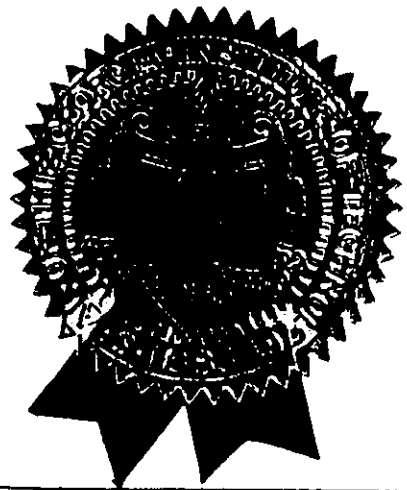
Thomas Hardy

Has attended and satisfactorily passed an examination
covering the contents of a continuing education course entitled:

"MANAGING ASBESTOS IN BUILDINGS"

312
Certificate Number

January 15, 1988
Date



Course Director

Rachel D. McCain
Exam Administrator

The Georgia Institute of Technology

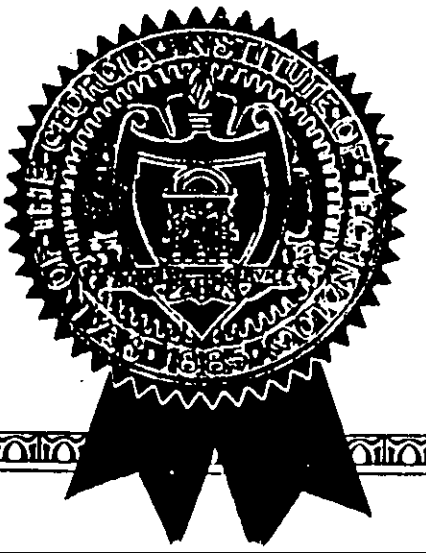
Tom Hardy

Has attended and satisfactorily passed an examination
covering the contents of a continuing education course entitled:

"INSPECTING BUILDINGS FOR ASBESTOS-CONTAINING MATERIALS"

036
Certificate Number

October 7, 1981
Date



Course Director

Rachel L. McCain
Exam Administrator

The University of Illinois at Chicago
School of Public Health

B 1337

MIDWEST ASBESTOS INFORMATION CENTER

Certifies that

GARY G. JOHNSON

Has Attended the Continuing Education Course

BUILDING INSPECTION

and Successfully Passed the Competency Exam

Date of Issuance FEBRUARY 10, 1988

Date of Expiration FEBRUARY 10, 1989

Audrey K. Gordon

Director
Continuing Education

Jacob A Bundy MD

Dean
School of Public Health

The University of Illinois at Chicago
School of Public Health

B 1271

MIDWEST ASBESTOS INFORMATION CENTER

Certifies that

GARY G. JOHNSON

Has Attended the Continuing Education Course

MANAGEMENT PLAINING

and Successfully Passed the Competency Exam

Date of Issuance JANUARY 22, 1988

Date of Expiration JANUARY 22, 1989

Audrey K. Gordon

Director
Continuing Education

Jacob A Bundy MD

Dean
School of Public Health

Certificate

of

Completion

Carl R.C. Kohlmeyer

has successfully completed the course for Asbestos Inspectors at the Abatement Safety Training Institute.

Jay Sall, Director of Training

Date of Completion: November 30, 1988

CERT. NO. A 0109

EXP. DATE 12/31/89

© GOES 910

LITHO IN U.S.A.

Alice Hamilton Occupational Health Center

This is to Certify that

Christopher W. Lear

has met the Attendance Requirements and successfully completed the Exam in the Course entitled

Asbestos Inspector/ Management Planner Refresher

Course Director

February 28, 1989
Date

Approval by:

Environmental Protection Agency (EPA)
Virginia Department of Commerce
Maryland Department of the Environment *

Registered Certificate
No: IMP-R-018

Expires on: February 28, 1990

* Maryland accepts EPA Inspector/Management Planner certification

Tufts University

Christopher Lear

Has attended and satisfactorily passed
an examination covering the contents of the course:

"Asbestos Abatement for Management Planners"

conducted by the

Asbestos Information Center
Center for Environmental Management

8802-02-098
Certificate Number

February 18-19, 1988
Date of Course

February 19, 1989
Expiration Date

SIGILLUM UNIVERSITATIS TUFTENSIS
1852
PAX ET LUX

Brenda Cole
Training and Education Coordinator

Anthony D. Cortese
Director
Center For Environmental Management

Tufts University

Christopher Lear

Has attended and satisfactorily passed
an examination covering the contents of the course:

"Asbestos Abatement for Inspectors"

conducted by the

Asbestos Information Center
Center for Environmental Management

8802-02-035
Certificate Number

February 15-17, 1988
Date of Course

February 17, 1989
Expiration Date

SIGILLUM UNIVERSITATIS TUFTENSIS
1852
PAX ET LUX

Brenda Cole
Training and Education Coordinator

Anthony D. Cortese
Director
Center For Environmental Management

The University of Illinois at Chicago
School of Public Health

B 1345

MIDWEST ASBESTOS INFORMATION CENTER

Certifies that

MICHAEL R. LYNCH

Has Attended the Continuing Education Course

BUILDING INSPECTION

and Successfully Passed the Competency Exam

Date of Issuance FEBRUARY 10, 1988

Date of Expiration FEBRUARY 10, 1989

Audrey K. Gordon

Director
Continuing Education

Jacob A Bundy MD

Dean
School of Public Health

Alice Hamilton Occupational Health Center

This is to Certify that

Michael Lynch

has met the Attendance Requirements

and successfully completed the Course in

Asbestos Management Planning

Course Director

March 30, 1988

Date

Registered Certificate

No: MP - 001

Expires on: March 18, 1989

Temple University

College of Engineering Philadelphia, PA

This certificate is awarded to

STEPHEN MAXWELL

for participation and successfully completing (by examination)

The Building Inspector Course

conducted at the

U.S. Environmental Protection Agency, Region III

Asbestos Abatement Center

TEMPLE UNIVERSITY · INCORPORATED 1888 · Of the Commonwealth System Of Higher Education

Lester Levin

Director, Asbestos Abatement Center

Dean, College of Engineering

Certificate No. BI- 382

Exp. Date 7/8/89

COPY

Temple University

College of Engineering Philadelphia, PA

This certificate is awarded to

STEPHEN MAXWELL

for participation and successfully completing (by examination)

The Management Planners Course

conducted be the

U.S. Environmental Protection Agency, Region III

Asbestos Abatement Center

Lester Levin

Director, Asbestos Abatement Center

Dean, College of Engineering

Certificate No. MP- 276

Exp. Date 7/10/89

Alice Hamilton Occupational Health Center

COPY

This is to Certify that

Michael Miskovsky

has met the Attendance Requirements

and successfully completed the Course in

Asbestos Inspector/Management Planner Refresher

Course Director

January 20, 1989
Date

Registered Certificate

No: IMP-R-006

Expires on: January 20, 1990

The Georgia Institute of Technology

Mike Miskovsky

Has attended and satisfactorily passed an examination
covering the contents of a continuing education course entitled:

"INSPECTING BUILDINGS FOR ASBESTOS-CONTAINING MATERIALS"

056
Certificate Number

October 7, 1987
Date



Course Director

Exam Administrator

The Georgia Institute of Technology

Mike Miskovsky

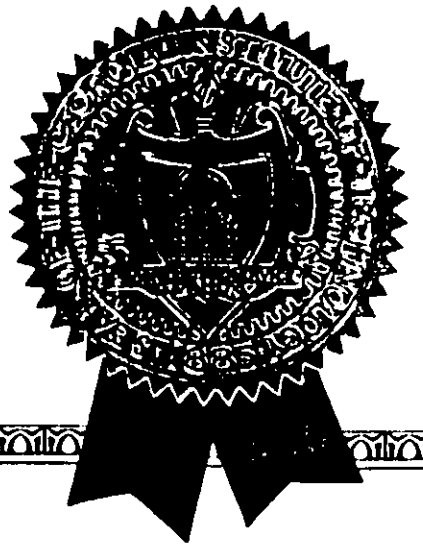
COPY

Has attended and satisfactorily passed an examination
covering the contents of a continuing education course entitled:

"MANAGING ASBESTOS IN BUILDINGS"

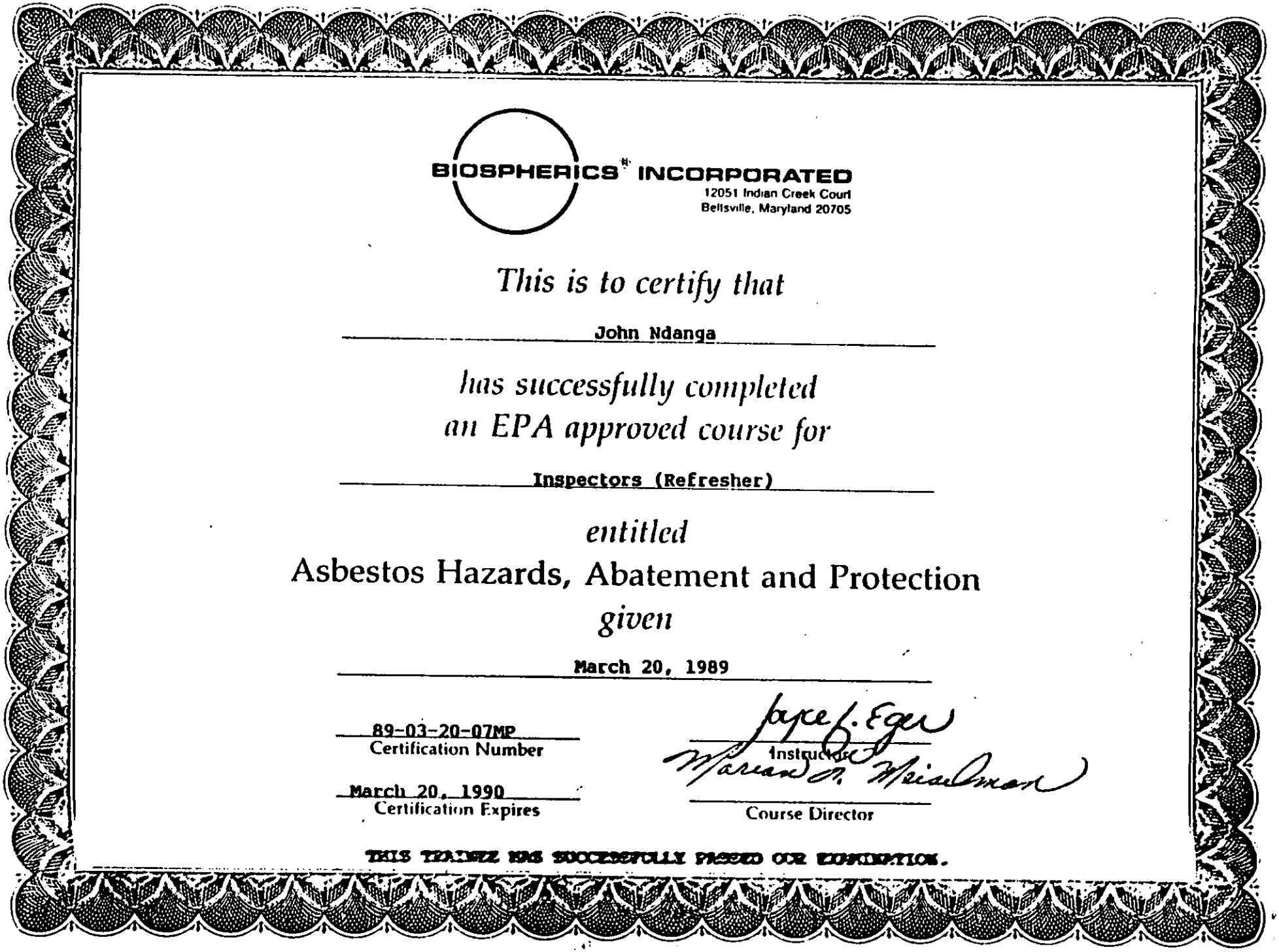
048
Certificate Number

October 9, 1987
Date



Course Director

Exam Administrator



BIOSPHERICS® INCORPORATED
12051 Indian Creek Court
Beltsville, Maryland 20705

This is to certify that

John Ndanga

has successfully completed
an EPA approved course for

Inspectors (Refresher)

entitled
Asbestos Hazards, Abatement and Protection
given

March 20, 1989

89-03-20-07MP
Certification Number

March 20, 1990
Certification Expires

Joyce J. Egan
Instructor

Mariam A. Mirabassi
Course Director

THIS TRAINEE HAS SUCCESSFULLY PASSED ITS EXAMINATION.

BIOSPHERICS® INCORPORATED
12051 Indian Creek Court
Beltsville, Maryland 20705

This is to certify that

John Ndanga

has successfully completed
an EPA approved course for

Management Planners (Refresher)

entitled

Asbestos Hazards, Abatement and Protection

given

March 20, 1989

89-03-20-07MP
Certification Number

March 20, 1990
Certification Expires

Joyce J. Egan
Instructor

Miriam N. Mickelson
Course Director

THIS TRAINEE HAS SUCCESSFULLY PASSED OUR EXAMINATION.



INSTITUTE FOR ENVIRONMENTAL EDUCATION

Woburn, Massachusetts

This is to certify that

J.F. Ndanga

has successfully completed the course

AHERA ASBESTOS INSPECTION TRAINING

March 2, 1988
Date

83202-102
Certificate Number

March 2, 1989
Expiration Date

Mary Beth Carew
Director

INSTITUTE FOR ENVIRONMENTAL EDUCATION

Woburn, Massachusetts

This is to certify that

J.F. Ndanga

has attended
the course

AHERA ASBESTOS MANAGEMENT PLANNING TRAINING

March 4, 1988
Date

83302-201
Certificate Number

March 4, 1989
Expiration Date

Mary Beth Carew
Director

The Georgia Institute of Technology

David A. Nelson

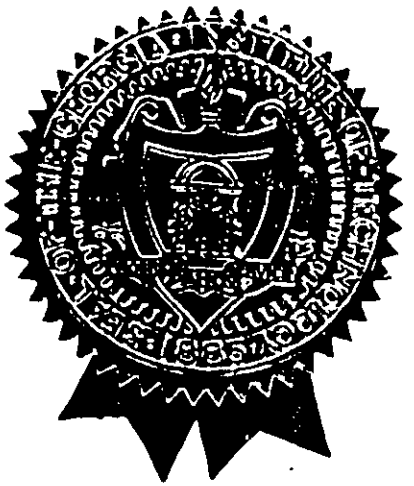
Has attended and satisfactorily passed an examination
covering the contents of a continuing education course entitled:

"INSPECTING BUILDINGS FOR ASBESTOS-CONTAINING MATERIALS"
ANNUAL UPDATE COURSE

055
Certificate Number

November 29, 1988
Date

November 29, 1989
Expiration Date



Course Director

Exam Administrator

The Georgia Institute of Technology

David A. Nelson

Has attended and satisfactorily passed an examination
covering the contents of a continuing education course entitled:

"MANAGING ASBESTOS IN BUILDINGS"
(Management Planning)
ANNUAL UPDATE COURSE

049
Certificate Number

November 29, 1988
Date

November 29, 1989
Expiration Date



Course Director

Exam Administrator

The Georgia Institute of Technology

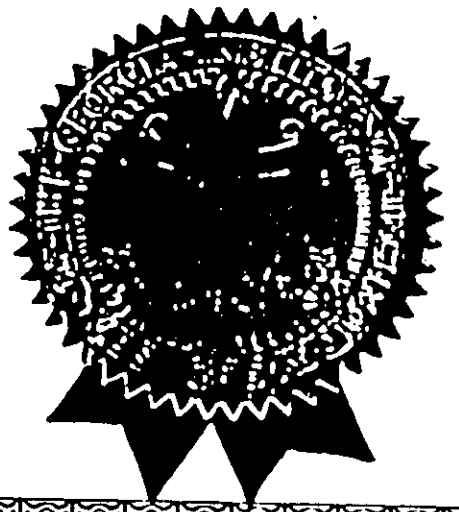
David Andrew Nelson

Has attended and satisfactorily passed an examination
covering the contents of a continuing education course entitled:

"INSPECTING BUILDINGS FOR ASBESTOS-CONTAINING MATERIALS"

292
Certificate Number

December 16, 1987
Date



Course Director

Rachel D. McCain
Exam Administrator

The Georgia Institute of Technology

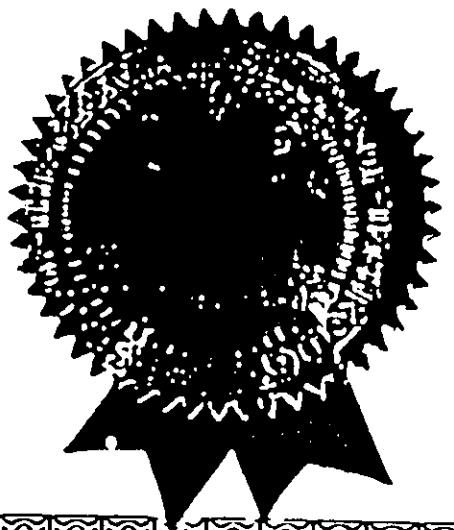
David Andrew Nelson

Has attended and satisfactorily passed an examination
covering the contents of a continuing education course entitled:

"MANAGING ASBESTOS IN BUILDINGS"

245
Certificate Number

December 18, 1987
Date



Course Director

Rachel G. McCain
Exam Administrator

Alice Hamilton Occupational Health Center

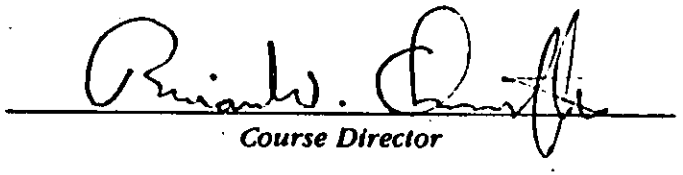
This is to Certify that

Bradley J. Norton

has met the Attendance Requirements

and successfully completed the Course in

Asbestos Inspector/Management Planner Refresher



Course Director

January 20, 1989

Date

Registered Certificate

No: IMP-R-007

Expires on: January 20, 1990

[redacted]

The University of Illinois at Chicago
School of Public Health

B 1351

MIDWEST ASBESTOS INFORMATION CENTER

Certifies that

BRADLEY J. NORTON

Has Attended the Continuing Education Course

BUILDING INSPECTION

and Successfully Passed the Competency Exam

Date of Issuance FEBRUARY 10, 1988

Date of Expiration FEBRUARY 10, 1989

Audrey K. Gordon

Director
Continuing Education

Jacob a Brody MD

Dean
School of Public Health

The University of Illinois at Chicago
School of Public Health

B 1279

MIDWEST ASBESTOS INFORMATION CENTER

Certifies that

BRADLEY J. NORTON

Has Attended the Continuing Education Course

MANAGEMENT PLANNING

and Successfully Passed the Competency Exam

Date of Issuance JANUARY 22, 1988

Date of Expiration JANUARY 22, 1989

Audrey K. Gordon

Director
Continuing Education

Jacob A Brody MD

Dean
School of Public Health

Alice Hamilton Occupational Health Center

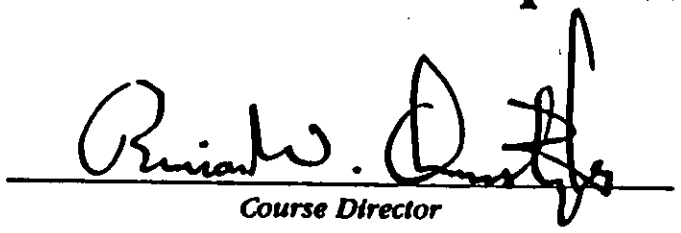
This is to Certify that

Andris Olmetti

has met the Attendance Requirements

and successfully completed the Course in

Asbestos Inspector/Management Planner



Course Director

August 12, 1988

Date

Registered Certificate

No: MPI-086

Expires on: August 12, 1989

Alice Hamilton Occupational Health Center

This is to Certify that

Russell E. Pitzer

has met the Attendance Requirements

and successfully completed the Course in

Asbestos Inspector/Management Planner Refresher

Course Director

January 20, 1989
Date

Registered Certificate

No: IMP-R-009

Expires on: January 20, 1990

B 1119

The University of Illinois at Chicago
School of Public Health

MIDWEST ASBESTOS INFORMATION CENTER

COPY

Certifies that

RUSSELL E. PITZER

Has Attended the Continuing Education Course

BUILDING INSPECTION

and Successfully Passed the Competency Exam

Date of Issuance JANUARY 14, 1988

Date of Expiration JANUARY 14, 1989

Audrey K. Gordon

Director
Continuing Education

Jacob a Bwoly MD

Dean
School of Public Health

The University of Illinois at Chicago
School of Public Health

B1214

MIDWEST ASBESTOS INFORMATION CENTER

Certifies that

RUSSELL E. PITZER

Has Attended the Continuing Education Course

MANAGEMENT PLANNING

and Successfully Passed the Competency Exam



Date of Issuance FEBRUARY 10, 1988

Date of Expiration FEBRUARY 10, 1989

Audrey K. Gordon
Director
Continuing Education

Jacob A Brody MD
Dean
School of Public Health

Alice Hamilton Occupational Health Center

This is to Certify that

Lee F. Sesler

has met the Attendance Requirements

and successfully completed the Course in

Asbestos Inspector/Management Planner Refresher

Brian W. Johnston

Course Director

January 20, 1989

Date

Registered Certificate

No: IMP-R-011

Expires on: January 20, 1990

The Georgia Institute of Technology

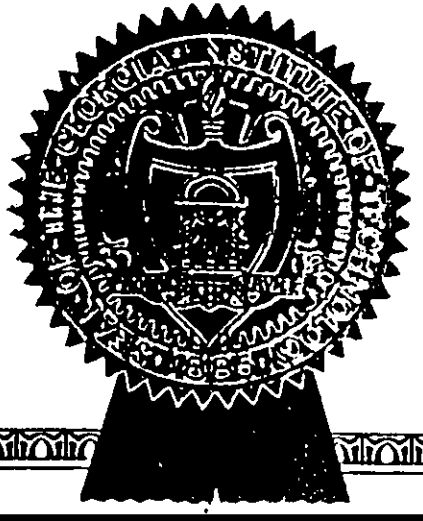
Lee Sesler

Has attended and satisfactorily passed an examination
covering the contents of a continuing education course entitled:

"INSPECTING BUILDINGS FOR ASBESTOS-CONTAINING MATERIALS"

071
Certificate Number

October 7, 1987
Date



Course Director

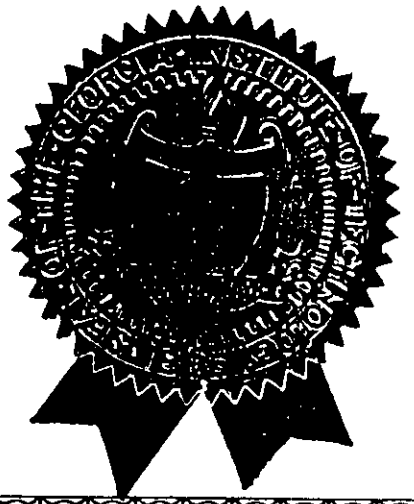
Exam Administrator

The Georgia Institute of Technology

Lee Sesler

Has attended and satisfactorily passed an examination
covering the contents of a continuing education course entitled:

"MANAGING ASBESTOS IN BUILDINGS"



344
Certificate Number

January 15, 1988
Date

Course Director

Rachel D. McCain
Exam Administrator

Temple University

College of Engineering Philadelphia, PA

This certificate is awarded to

ANTHONY L. SHALEESH

for participation and successfully completing (by examination)

The Building Inspector Course

conducted by the

U.S. Environmental Protection Agency, Region III

Asbestos Abatement Center

Linda Lewis

BI-364

exp. date 7-2-89

Temple University

College of Engineering Philadelphia PA

This certificate is awarded to

ANTHONY L. SHALEESH

for participation and successfully completing (by examination)

The Management Planners Course

conducted by the

US Environmental Protection Agency, Region III

Asbestos Abatement Center

[redacted]

Inf- 2.53

exp date 7-3-89

Alice Hamilton Occupational Health Center

This is to Certify that

William J. Shaughnessy

has met the Attendance Requirements

and successfully completed the Course in

Asbestos Inspector/Management Planner Refresher

Course Director

January 20, 1989
Date

Registered Certificate

No: IMP-R-012

Expires on: January 20, 1990

The Georgia Institute of Technology

William J. Shaughnessy

Has attended and satisfactorily passed an examination
covering the contents of a continuing education course entitled:

"INSPECTING BUILDINGS FOR ASBESTOS-CONTAINING MATERIALS"

308
Certificate Number

December 16, 1987
Date

Course Director

Rachel G. McCain
Exam Administrator

The Georgia Institute of Technology

William J. Shaughnessy

Has attended and satisfactorily passed an examination
covering the contents of a continuing education course entitled:

"MANAGING ASBESTOS IN BUILDINGS"

251
Certificate Number

December 18, 1987
Date

Course Director

Rachel S. McCain
Exam Administrator

Temple University

College of Engineering Philadelphia, PA

This certificate is awarded to

for participation and successfully completing (by examination)

The Building Inspector Course

conducted for the

U.S. Environmental Protection Agency, Region III

Asbestos Abatement Center

Hester Levin

Director, Asbestos Abatement Center

Dean, College of Engineering

Certificate No. BI- 396

Exp. Date 7/8/89

Temple University

College of Engineering Philadelphia, PA

This certificate is awarded to

for participation and successfully completing (by examination)

The Management Planners Course

conducted by the

U.S. Environmental Protection Agency, Region III

Asbestos Abatement Center

Lester Levin

Director, Asbestos Abatement Center

Dean, College of Engineering

Certificate No. MP- 287

Exp. Date 7/10/89

Temple University

College of Engineering Philadelphia, PA

This certificate is awarded to

for participation and successfully completing (by examination)

The Building Inspector Course

conducted by the

U.S. Environmental Protection Agency, Region III

Asbestos Abatement Center

Lester Levin

Director, Asbestos Abatement Center

Dean, College of Engineering

Certificate No. BI- 397

Exp. Date 7/8/89

Temple University

College of Engineering Philadelphia, PA

This certificate is awarded to

for participation and successfully completing (by examination)

The Management Planners Course

conducted be the

U.S. Environmental Protection Agency, Region III

Asbestos Abatement Center

Lester Levin

Director, Asbestos Abatement Center

Dean, College of Engineering

Certificate No. MP- 288

Exp. Date 7/10/89

BIOSPHERICS® INCORPORATED
12051 Indian Creek Court
Beltsville, Maryland 20705

This is to certify that

Walter Taylor

has successfully completed
an EPA approved course for

Inspectors (Refresher)

entitled
Asbestos Hazards, Abatement and Protection
given

March 20, 1989

89-03-20-08MP
Certification Number

March 20, 1990
Certification Expires

Joyce J. Egan
Instructor

Marian D. Weissman
Course Director

THIS TRAINEE HAS SUCCESSFULLY PASSED OUR EXAMINATION.

BIOSPHERICS® INCORPORATED
12051 Indian Creek Court
Beltsville, Maryland 20705

This is to certify that

Walter Taylor

has successfully completed
an EPA approved course for

Management Planners (Refresher)

entitled

Asbestos Hazards, Abatement and Protection

given

March 20, 1989

89-03-20-08MP
Certification Number

March 20, 1990
Certification Expires

Joyce J. Egan
Instructor

Marianne M. Meiselman
Course Director

THIS TRAINEE HAS SUCCESSFULLY PASSED OUR EXAMINATION.

The Georgia Institute of Technology

Walter W. Taylor

Has attended and satisfactorily passed an examination
covering the contents of a continuing education course entitled:

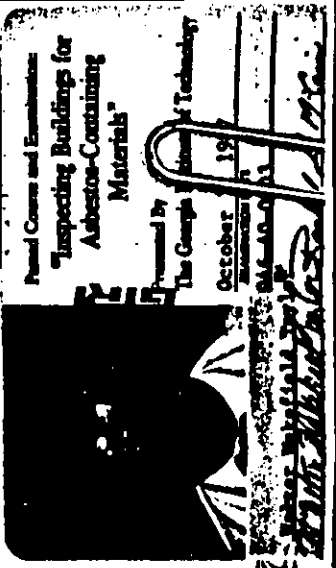
"INSPECTING BUILDINGS FOR ASBESTOS-CONTAINING MATERIALS"

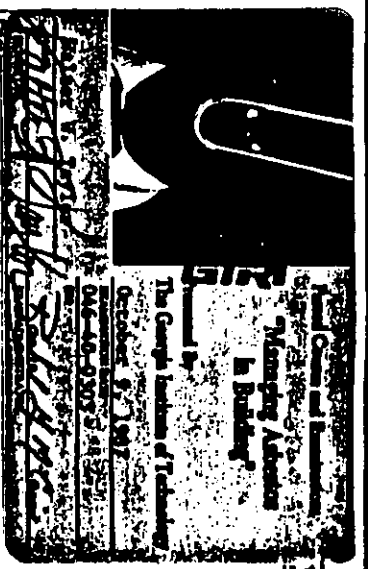
084
Certificate Number

October 7, 1987
Date

Course Director

Exam Administrator





The Georgia Institute of Technology

Walter Taylor

Has attended and satisfactorily passed an examination
covering the contents of a continuing education course entitled:

"MANAGING ASBESTOS IN BUILDINGS"

076
Certificate Number

October 9, 1987
Date

Course Director

Exam Administrator

TUFTS UNIVERSITY

Center for Environmental Management

April 20, 1989

Mr. Lee Sesler
Versar, Inc.
P.O. Box 1549
6850 Versar Center
Springfield, VA 22151

Dear Mr. Sesler:

May this letter serve to confirm that Mr. Patrick Elmer and Mr. Ken Till participated and successfully completed the Tufts University Center for Environmental Management (formerly Asbestos Information Center) Asbestos Abatement for Inspectors and Management Planners five-day training course. Both gentlemen attended the February 15 - 19, 1988 course and received certificates from our institution.

Elmer - #8802-02-023 and #8802-02-087
Till - #8802-02-060 and #8802-02-124

We have no record of their attending the required Annual Review session at Tufts University.

Respectfully,

Anne Chabot

Anne Chabot
Program Development Coordinator

AC/cc

Curtis Hall
474 Boston Avenue
Medford, Massachusetts 02155
617/381-3486 General Information
617/381-3531 Division of Education and Training
617/381-3064 FAX

Alice Hamilton Occupational Health Center

This is to Certify that

Bruce K. Walch

has met the Attendance Requirements

and successfully completed the Course in

Asbestos Inspector/Management Planner

Brian W. Smith

Course Director

December 9, 1988

Date

Registered Certificate

No: MPI-098

Expires on: December 9, 1989

Aerosol Monitoring & Analysis, Inc.

This is to certify that

WILLIAM A. GIESEKING

has successfully completed a
8 hour training course entitled

EPA INSPECTOR/MANAGEMENT PLANNER RECERTIFICATION

Presented by Aerosol Monitoring & Analysis, Inc.

on APRIL 12, 1989

Location HANOVER, MARYLAND

Expires 4/12/90

Corporate Headquarters
P.O. Box 687
Hunt Valley, Md 21030

Certificate # 89-1679

DANIEL R. TWILLEY
Director

The Environmental Institute

William A. Gieseking

Has completed coursework and satisfactorily passed
an examination that meets all criteria required for the
EPA-Model Accreditation Course

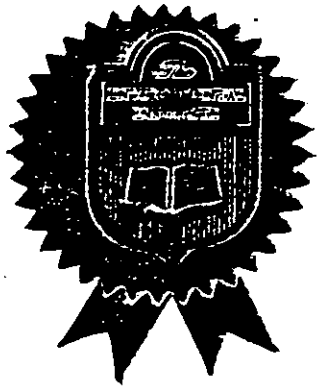
Asbestos in Buildings: Designing the Abatement Project

1158
Certificate Number

November 18, 1988
Date

Eva M Clay
Director, The Environmental Institute

Rachel Y. McCa
Exam Administrator



NATIONAL ASBESTOS TRAINING CENTER

The University of Kansas

WILLIAM A. GIESEKING

has completed a course and passed an examination in

Inspection/Management Planning for Asbestos Control—(AHERA)

DATE: FEBRUARY 8 - 12, 1988

EXAM DATE: FEBRUARY 10, 12, 1988

NUMBER: VIIKU85800-18

EXPIRES: MARCH 1, 1989

SOCIAL SECURITY #: 216-38-4222

Aerosol Monitoring & Analysis, Inc.

An AIHA Accredited Laboratory

This is to certify that

WILLIAM GIESEKING

has attended a

8 hour training course entitled

EPA ABATEMENT SUPERVISORY RECERTIFICATION

Presented by Aerosol Monitoring & Analysis, Inc.

on OCTOBER 18, 1988

Location THE LAKEFRONT, HUNT VALLEY, MARYLAND

Expires OCTOBER, 1989

Corporate Headquarters
P.O. Box 687
Hunt Valley, Md 21030

Certificate # 88-1279

Rebecca Fahey

Course Instructor

REBECCA FAHEY, TRAINING CONSULTANT

Aerosol Monitoring & Analysis, Inc.

An AIHA Accredited Laboratory

This is to certify that

WILLIAM A. GIESEKING

has attended a

32 hour training course entitled

4 DAY ABATEMENT SUPERVISOR/COMPETENT PERSON

Presented by Aerosol Monitoring & Analysis, Inc.

on NOVEMBER 10-13, 1987

Location CORPORATE HEADQUARTERS, HUNT VALLEY, MARYLAND

Expires NOVEMBER, 1988

Corporate Headquarters
P.O. Box 687
Hunt Valley, Md 21030

Certificate # 87-1126

Course Instructor

Daniel R. Twilley, Director of Training

This is to certify that

William Giesking

attended the

4th NATIONAL SERIES ON OPERATIONS & MAINTENANCE PLANNING

in New Brunswick, New Jersey on October 6, 1987

Sponsored by:

Hall-Kimbrell ENVIRONMENTAL SERVICES

W. D. Kimbrell

W. D. Kimbrell, President



© 0085 444

LITHO IN U.S.A.

GEORGIA INSTITUTE OF TECHNOLOGY

This is to certify that

WILLIAM ANDERSEN GIESEKING

has successfully completed

CLEARANCE TESTING FOR ASBESTOS:
AHERA REQUIREMENTS

conducted by
GEORGIA TECH
EDUCATION EXTENSION SERVICES
Atlanta, Georgia
OCTOBER 28-29, 1987

President

Director, Education Extension Services
Associate Vice President for Academic Affairs

Versar INC.

APPENDIX G

MANAGEMENT PLAN DEFERRAL REQUEST
AND
NOTIFICATION OF AVAILABILITY

State of Maryland

DEPARTMENT OF THE ENVIRONMENT

201 WEST PRESTON STREET • BALTIMORE, MARYLAND 21201
AREA CODE 301 • 225XXX 631-3834

William Donald Schaefer
Governor

Martin W. Walsh, Jr.
Secretary

November 16, 1988

Mr. Richard C. Hunter
Superintendent of Public Instruction
Baltimore City Board of Education
200 E. North Avenue
Baltimore, Maryland 21202

NOV 21 RECD

RE: Deferral Request - Approved

Log Number: Not Applicable

Dear Mr. Hunter:

This letter is to inform you that your 10/11/88 request for a deferral to May 9, 1989, for the submission of your asbestos management plan under the Asbestos Hazard Emergency Response Act (AHERA) has been approved.

Be advised, this deferral applies only to the requirement for submission of management plans. No other requirements of the AHERA regulations are affected by this deferral.

Should you have any questions about the submission of your management plans, or other AHERA related questions, please contact Ms. Janie Gordon, Program Manager, Office of School Asbestos Assistance at (301) 225-5755.

Sincerely,

Katherine P. Farrell, M.D., M.P.H.
Administrator
Center for Environmental Health

KPF/egs

HAND DELIVERY OF CORRECTED REQUEST:

Management Plan Deferral Request addressed to:

Dr. Katherine P. Farrell
The Maryland Department of the Environment
Center for Environmental Health

From: Dr. Richard C. Hunter
Baltimore City Public Schools

RECEIVED BY: [illegible]

DATE RECEIVED: 11/15/88 TIME: 10:30

Reviewed + Approved. Approval Letter To Follow.

JG.

CITY OF BALTIMORE

KURT L. SCHMOKE, Mayor

DEPARTMENT OF EDUCATION

RICHARD C. HUNTER

Superintendent of Public Instruction

200 E. North Avenue

Baltimore, Maryland 21202

October 11, 1988

Dr. Katherine P. Farrell, M.D., M.P.H.
Administrator
The Maryland Department of the Environment
Center for Environmental Health
P.O. Box 13387
Baltimore, Maryland 21203

Dear Dr. Farrell:

In accordance with Public Law 100-368, an amendment to AHERA, the Baltimore City Public Schools is requesting a deferral of deadline from October 12, 1988 to May 9, 1989 for the submission of Asbestos Management Plans. This request is made for all school buildings and related facilities, such as the Repair Shop, Electrical Shop, etc., under the authority of the Board of School Commissions of Baltimore City and as identified in **Attachment #1**.

The following assurances are provided as required by the amendment for Category B Deferrals:

Assurance 1 **(Attachment #2)**

A brief explanation why Baltimore City, despite good faith efforts, will not be able to meet the original October 12, 1988 deadline for submittal of its management plans.

Assurance 2 **(Attachment #3)**

Documentation filed at each school showing that an inspection has been completed in at least one other school under Baltimore City's authority.

Assurance 3 **(Attachment #4)**

Documentation that Baltimore City has attempted to notify all affected groups of their intent to request a deferral of submission deadline.

Assurance 4 (Attachment #5)

A proposed schedule outlining all significant activities leading up to the submission of the Management Plans by May 9, 1989.

We await your written response regarding the deferral of the submission deadline for Management Plans for Baltimore City Public Schools.

Very truly yours,

Richard C. Hunter
Superintendent of
Public Instruction

The accuracy of the information contained in this request for a deferral is hereby sworn to

Richard C. Hunter
Superintendent of
Public Instruction

STATE OF MARYLAND TO WIT; CITY OF BALTIMORE

I HEREBY CERTIFY THAT ON THIS 14th day of Novemba, 19 88 before me, the Subscriber, A Notary Public of the State of Maryland in and for the City of Baltimore, personally appeared RICHARD C. HUNTER, Superintendent of Public Instruction and he acknowledged the afore going DEFERRAL REQUEST to be the act and deed of said BALTIMORE CITY PUBLIC SCHOOLS and in my presence signed the same.

WITNESS my hand and Notarial Seal,

NOTARY PUBLIC

My Commission expires: July 1, 1990

BLD NO.	BUILDING NAME	ADDRESS
PS004	STEWART HILL	30 S. GILMOR STREET
PS005	LANGSTON HUGHES	5011 ARBUTUS AVENUE
PS007	CECIL	2000 CECIL AVENUE
PS008	CITY SPRING	100 S. CAROLINE STREET
PS009	CARROLL PARK	1300 HERKIMER STREET
PS010	JAMES MCHENY	31 S. SCHROEDER STREET
PS011	EUTAW-MARSHBURN	1624 EUTAW PLACE
PS012	LAKELAND	2921 STRANDEN ROAD
PS013	TENCH TILGHMAN	600 N. PATTERSON PARK A
PS014	PARK HEIGHTS	4910 PARK HEIGHTS AVENUE
PS016	JOHNSON SQUARE	1101 VALLEY STREET
PS019	LEXINGTON TERRACE	732 W. LEXINGTON STREET
PS021	HILTON	3301 CARLISLE AVENUE
PS022	GEORGE WASHINGTON ELEM	1001 W. SARATOGA
PS023	GENERAL WOLFE	245 S. WOLFE STREET
PS024	WESTSIDE	2235 NORTH FULTON AVENUE
PS025	DR. RAYNOR BROWNE	1000 N. MONTFORD AVENUE
PS026	MADISON SQUARE	1401 E. BIDDLE STREET
PS027	COMMODORE RODGERS	100 N. CHESTER STREET
PS028	WILLIAM PINDERHUGHES	1200 N. FREMONT AVENUE
PS029	MATTHEW A. HENSON	1600 N. PAYSON STREET
PS030	GEORGE STREET	601 N. BRUNE STREET
PS031	COLDSTREAM PARK	400 EXETER HALL AVENUE
PS032	MILDRED MONROE	1634 GUILFORD AVENUE
PS034	BARRISTER CHARLES CARROLL	1327 WASHINGTON BOULEVARD
PS035	HARLEM PARK	1401 W. LAFAYETTE AVENUE
PS036	HARFORD HEIGHTS	1919 N. BROADWAY
PS038	MALCOLM X	2810 SHIRLEY AVENUE
PS039	DALLAS F. NICHOLAS, SR.	101 E. 21ST STREET
PS040	LAKE CLIFTON	2801 SAINT LO DRIVE
PS041	HAMILTON	5609 SEFTON AVENUE
PS042A	GARRISON	3910 BARRINGTON ROAD
PS042B	GARRISON	3910 BARRINGTON ROAD
PS043	HAMPSTEAD HILL	101 S. ELLWOOD AVENUE
PS044	MONTEBELLO	2040 E. 32ND STREET
PS045	FEDERAL HILL	1040 WILLIAM STREET
PS046	CHINQUAPIN	900 WOODBROURE AVENUE
PS047	HAMPSTEAD HILL	500 S. LINWOOD AVENUE
PS049	NORTHEAST	5001 MORAVIA ROAD
PS050	ADMINISTRATION	1300 GORSUCH AVENUE
PS051	WAVERLY	3400 ELLERSLIE AVENUE
PS051A	WAVERLY	3400 ELLERSLIE AVENUE
PS051B	WAVERLY	3400 ELLERSLIE AVENUE
PS051C	WAVERLY	3400 ELLERSLIE AVENUE
PS051D	WAVERLY	3400 ELLERSLIE AVENUE
PS053	MARGARET BRENT	2601 ST. PAUL STREET
PS054	BARCLAY	2900 BARCLAY STREET
PS055	HAMPDEN	3608 CHESTNUT AVENUE
PS056	ROBERT POOLE	1300 W. 36TH STREET
PS057	LOMBARD	1500 E. LOMBARD STREET
PS058	ASHBURTON	3935 HILTON ROAD
PS058A	ASHBURTON	3935 HILTON ROAD

BLD NO.	BUILDING NAME	ADDRESS
PS058B	ASHBURTON	3935 HILTON ROAD
PS058C	ASHBURTON	3935 HILTON ROAD
PS058D	ASHBURTON	3935 HILTON ROAD
PS060	GWYNNS FALLS	2700 GWYNNS FALLS PARKWAY
PS060A	GWYNNS FALLS	2700 GWYNNS FALLS PARKWAY
PS060B	GWYNNS FALLS	2700 GWYNNS FALLS PARKWAY
PS061	JOHN EAGER HOWARD	2011 LINDEN AVENUE
PS062	EDGECOMBE CIRCLE	2835 VIRGINIA AVENUE
PS063	ROSEMONT	2777 PRESTMAN STREET
PS064	LIBERTY	3901 MAINE AVENUE
PS066	MOUNT ROYALE	121 MCMECHAN STREET
PS067	EDGEWOOD	1900 N. EDGEWOOD STREET
PS070	SOUTHERN	1100 COVINGTON STREET
PS073	SARAH M. ROACH	3434 OLD FREDERICK ROAD
PS075	CALVERTON	1100 WHITMORE AVENUE
PS076	FRANCIS SCOTT KEY	1425 E. FORT AVENUE
PS077	HERRING RUN	5001 SINCLAIR LANE
PS078	HARLEM PARK	1800 HARLEM AVENUE
PS079A	PORTABLE	2801 N. DUKE STREET
PS079	WILLIAM H. LEMMEL	2801 N. DUKELAND STREET
PS080	WEST BALTIMORE	201 N. BEND ROAD
PS081	OFFICES (#81)	181 N. BEND STREET
PS082	GREENSPRING	4701 GREENSPRING AVENUE
PS083	WILLIAM PACA	200 N. LAKEWOOD AVENUE
PS084	THOMAS JOHNSON	100 E. HEATH STREET
PS085	FORT WORTHINGTON	2701 E. OLIVER STREET
PS086	LAKEWOOD	2825 FEDERAL STREET
PS087	WINDSOR HILLS	4001 ALTO ROAD
PS088	LYNDHURST	601 WILDWOOD PARKWAY
PS089	ROGNEL HEIGHTS	4300 SIDEHILL ROAD
PS093	NORTHERN PARKWAY	2500 E. NORTHERN PARKWAY
PS095	FRANKLIN SQUARE	1400 W. LEXINGTON STREET
PS097	COLLINGTON SQUARE	1409 N. COLLINGTON AVENUE
PS098	SAMUEL B.F. MORSE	424-426 S. PULASKI STREET
PS101	ELMER A. HENDERSON	1101 N. WOLFE STREET
PS102	THOMAS G. HAYES	601 CENTRAL AVENUE
PS105	MORAVIA PARK	6201 FRANKFORD AVENUE
PS107	GILMOR	1321 N. GILMOR STREET
PS115	VENABLE	700 E. 34E STREET
PS117	DUKE ELLINGTON	790 W. NORTH AVENUE
PS122	SAMUEL COLERIDGE TAYLOR	507 W. PRESTON STREET
PS124	BAY BROOK	4301 10TH STREET
PS125	FURMAN L. TEMPLETON	1200 PENNSYLVANIA AVENUE
PS130	BOOKER T. WASHINGTON	1301 MCCULLOCH STREET
PS133	DUNBAR	500 N. CAROLINE STREET
PS134	WALTER P. CARTER	820 E. 43RD STREET
PS135	LUTHER CRAVEN MITCHELL	1731 E. CHASE STREET
PS138	HARRIETT TUBMAN	1807 HARLEM AVENUE
PS139	CHARLES CARROLL OF CARROLL	200 N. CENTRAL AVENUE
PS142	ROBERT COLEMAN	2400 WINDSOR AVENUE
PS144	JAMES MOSHER	1000 N. WHEELER AVENUE
PS145	ALEXANDER HAMILTON	800 POPLAR GROVE STREET

BLD NO.	BUILDING NAME	ADDRESS
PS150	BENTALOU	220 N.BENTALOU STREET
PS157	GEORGE G. KELSON	701 GOLD STREET
PS159	CHERRY HILL	801 BRIDGEVIEW ROAD
PS160	CARTER GODWIN WOODSON	2501 SEABURY ROAD
PS162	DIGGS-JOHNSON	501-503 W. BARRE STREET
PS163	PATAPSCO	644 ROUNDVIEW ROAD
PS164	ARUNDEL	2400 ROUND ROAD
PS175	GEO. BRAGG NATURE CENTER	6601 BALT. NATIONAL PIKE
PS177	GEORGE W. F. MCMECHEN	4411 GARRISON BOULEVARD
PS178	FRANCIS M. WOOD	100 N. CALHOUN STREET
PS180	CHERRY HILL	2700 SEAMON ROAD
PS201	DICKEY HILL	5025 DICKEY HILL ROAD
PS202	LAFAYETTE	850 BRADDISH AVENUE
PS203	MARCIE GARNETT FARRING	300 PONTIAC AVENUE
PS204	MARY RODMAN	3510 W. MULBERRY STREET
PS205	WOODHOME	7300 MOYER AVENUE
PS206	FURLEY	4033 FURLEY AVENUE
PS207	CURTIS BAY	4301 WEST BAY AVENUE
PS209	WINSTON	1101 WINSTON AVENUE
PS210	HAZELWOOD	4517 HAZELWOOD AVENUE
PS211	GARDEN VILLE	5300 BELAIR ROAD
PS212	GARRETT HEIGHTS	2800 AILSA AVENUE
PS213	GOVANS	5801 YORK ROAD
PS214	GUILFORD #214	4520 YORK ROAD
PS215	HIGHLANDTOWN	3203 PRATT STREET
PS216	FRANKFORD	6001 FRANKFORD AVENUE
PS217	BELMONT	1406 N. ELLAMONT STREET
PS219	YORKWOOD	5931 YORKWOOD ROAD
PS220	MORRELL PARK	2601 TOLLEY STREET
PS221	MOUNT WASHINGTON	1801 SULGRAVE AVENUE
PS222	PIMLICO	3500 W. NORTHERN PARKWAY
PS222A	PIMLICO	3500 W. NORTHERN PARKWAY
PS223	PIMLICO	4849 PIMLICO ROAD
PS224	GROVE PARK	5545 HENNISON AVENUE
PS225	WESTPORT	2401 NEVADA STREET
PS226	VIOLETVILLE	1207 PINE HEIGHTS AVENUE
PS228	JOHN RUHRAH	701 RAPPOLLA STREET
PS229	EDLABIRD	1500 IMLA STREET
PS230	CANTON	801 S. HIGHLAND AVENUE
PS231	BREHMS LANE	3536 BREHMS LANE
PS232	THOMAS JEFFERSON	605 DRYDEN DRIVE
PS233	ROLAND PARK	5207 ROLAND AVENUE
PS234	ARLINGTON	3705 W. ROGERS AVENUE
PS235	GLENMOUNT	6211 WALTHER AVENUE
PS236	HAMILTON	6101 OLD HARFORD ROAD
PS237	HIGHLANDTOWN	231 S. EATON STREET
PS238	VICTORY	1440 CHESAPEAKE AVENUE
PS239	BENJAMIN FRANKLIN	1201 CAMBRIA STREET
PS240	GRACELAND PARK-O'DONNELL	6300 O'DONNELL STREET
PS241	FALLSTAFF	3801 FALLSTAFF ROAD
PS241A	FALLSTAFF	3801 FALLSTAFF ROAD
PS242	NORTHWOOD	5201 LOCH RAVEN BOULEVARD

BLD NO.	BUILDING NAME	ADDRESS
PS242A	NORTHWOOD	5201 LOCH RAVEN BOULEVARD
PS243	ARMISTEAD GARDENS	5001 E. EAGER STREET
PS245	LEITH WALK	1235 SHERWOOD AVENUE
PS245A	LEITH WALK	1235 SHERWOOD AVENUE
PS246	BEECHFIELD	301 BEECHFIELD AVENUE
PS247	CROSS COUNTRY	6100 CROSS COUNTRY BLVD.
PS248	SINCLAIR LANE	3880 SINCLAIR LANE
PS249	MEDFIELD HEIGHTS	4300 BUCHANAN AVENUE
PS250	DR. BERNARD HARRIS. SR.	1400 N. CAROLINE STREET
PS251	CALLAWAY	3701 FERNHILL AVENUE
PS254	DR. MARTIN LUTHER KING, JR.	3750 GREENSPRING AVENUE
PS255	SOUTHEAST	6820 FAIT AVENUE
PS256	CALVIN RODWELL	3501 HILLSDALE ROAD
PS260	FREDERICK	2501 FREDERICK AVENUE
PS261	LOCKERMAN-BUNDY	301 N. PULASKI STREET
PS301	WILLIAM S. BAER ELEMENTARY	2001 WARWICK AVENUE
PS303	UPTON	811 W. LANVALE
PS304	HARBOR VIEW ELEMENTARY	4301 10TH AVENUE
PS307	CLAREMONT ELEMENTARY	5301 ERDMAN AVENUE
PS310	FERNHILL ELEMENATRY	3915 FERNHILL AVENUE
PS313	LOIS T. MURRAY	1600 E. ARLINGTON AVENUE
PS314	SHARP-LEADENHALL	150 W. WEST STREET
PS315	DR. LILLIE M. JACKSON	1501 ASBURTON STREET
PS353A	WOODBURN CENTER	1301 WOODBURN AVE
PS400	EDMONDSON	501 N. ATHOL AVENUE
PS401	NORTHWESTERN	6900 PARK HEIGHTS AVENUE
PS402	NORTHERN	2201 PINEWOOD AVENUE
PS403	CCB POLYTECH #403	1400 COLDSPRING LANE
PS405	PATTERSON	100 LANE STREET
PS406	FOREST PARK	3401 ELDORADO AVENUE
PS407	WESTERN	4600 FALLS ROAD
PS410	MERGENTHALER	3500 HILLEN ROAD
PS411	WALBROOK	2000 EDGEWOOD STREET
PS412	SOUTHWESTERN	200 FONTHILL AVENUE
PS413	HARBOR CITY LEARNING CTR.	4801 LIBERTY HEIGHTS AVE.
PS414	PAUL LAURENCE DUNBAR	1400 ORLEANS STREET
PS415	SCHOOL FOR THE ARTS	708-712 CATHEDRAL STREET
PS420	WEST SIDE SKILLED CENTER	4501 EDMONDSON AVENUE
PS450	FREDERICK DOUGLAS	2301 GWYNNS FALLS PARKWAY
PS451	JOSEPH C. BRESCOE	5506 W. BELLE STREET
PS453	FAIRMOUNT HILL	100 N. ANN STREET
PS454	CARVER	2201 PRESSTMAN STREET
PS456	HARFORD INSTITUTE	2555 HARFORD ROAD
PS457	LAURENCE G. PAQUIN	2200 SINCLAIR LANE
PS480	BALTIMORE CITY COLLEGE	3220 THE ALAMEDA
PS504	REPAIR SHOP	1230 E. 20th ST.
PS513	KID'S DINER	SARATOGA & HOLIDAY
PS525	WAREHOUSE	1149 E. GRANBY ST.
PS528	XPORTATION GARAGE & OFFICE	1210 E. 20th ST.
PS534A	ELECTRICAL SHOP:	1812 GREENMOUNT AVENUE
PS534B	ELECTRICAL SHOP:	1812 GREENMOUNT AVENUE
PS540	SCHOOL HEADQUARTERS	200 E. NORTH AVE.

BLD NO.	BUILDING NAME	ADDRESS
PS556	GROUNDS SHOP	2614 PENNSYLVANIA AVENUE
PS557	OFFICE WAREHOUSE (#557)	2200 ROBB STREET
PS564	BUS XPORTATION GARAGE&OFF.	1604 BRADDISH AVE.
PS701	KIRK AV. STADIUM	KIRK & EXETER HALL AVE.

ATTACHMENT #2

STATEMENT AS TO WHY BALTIMORE CITY CANNOT MEET THE ORIGINAL 10/12/88 DEADLINE.

Baltimore City Public Schools has attempted to meet the October 12 deadline by retaining Versar, Inc. to inspect their buildings and to develop Management Plans for same. Versar must confer with the Baltimore City Public Schools in order to develop the schedules for response actions which, in turn, are dependent upon the aggregate cost of the Management Plans. While Versar has been at work on this project since late Spring, they cannot complete their contract obligations in time to permit the City to assess the budget implications and develop an appropriate schedule and still meet the October 12 deadline.

ATTACHMENT #3

Versar INC.

To School _____

Versar, Inc. has been employed by the City of Baltimore, Department of Education to prepare asbestos-containing materials management plans in accordance with EPA requirements. We are currently in the process of preparing a management plan for this school based on an on-site inspection and the analysis of bulk samples of suspect materials taken during the inspection.

Very truly yours,

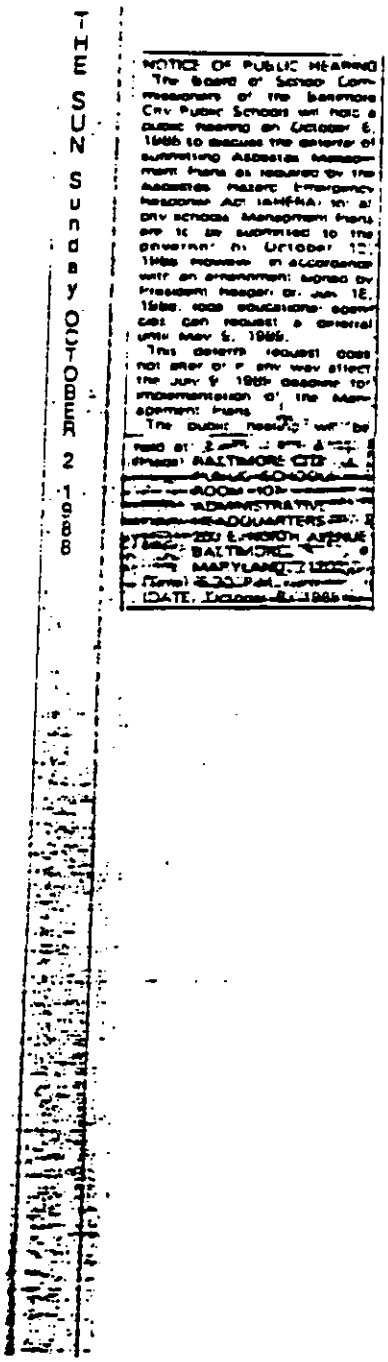
Lawrence G. Davies

Lawrence G. Davies
Program Manager

12445-4

6850 VERSAR CENTER • P.O. BOX 1549 • SPRINGFIELD, VIRGINIA 22151 • TELEPHONE: (703) 750-3000 • TELEX: 901125

ATTACHMENT #4



THE SUN Sunday October 2 1988

NOTICE OF PUBLIC HEARING

The Board of School Commissioners of the Baltimore City Public Schools will hold a public hearing on October 6, 1988 to discuss the content of submitting Asbestos Management Plans as required by the Asbestos Hazard Emergency Response Act (AHERA). All City schools Management Plans are to be submitted to the governor on October 12, 1988 however in accordance with an amendment signed by President Reagan on Jun 1E, 1988, local educational agencies can request a deferral until May 9, 1989.

This deferral request does not alter or in any way affect the July 9 1988 deadline for implementation of the Management Plans.

The public hearing will be held at 7 p.m. at the [illegible] BALTIMORE CITY [illegible] PUBLIC SCHOOLS [illegible] ROOM 101 [illegible] ADMINISTRATIVE [illegible] HEADQUARTERS [illegible] 200 E. NORTH AVENUE [illegible] BALTIMORE [illegible] MARYLAND [illegible]

DATE: October 6, 1988

ATTACHMENT #4

BALTIMORE CITY PUBLIC SCHOOLS
BALTIMORE, MARYLAND 21202
Office of
The Superintendent of Public Instruction

September 27, 1988

To: Principals, Union Leaders, and Parent Organization Leaders

From: Richard C. Hunter, Superintendent of Public Instruction

Subject: Hearing on Deferral of Asbestos Management Plans

The accompanying letter explains an important public hearing to be held by the Board of School Commissioners on October 6. Because the hearing is crucial to our asbestos management program, I am asking that you help us publicize the meeting as widely as you can. Principals, please see that copies of the letter go home with students. Union leaders and parent group leaders, please see that copies are distributed to your members. Thank you for assisting us with this important meeting.

/jd

CITY OF BALTIMORE

KURT L. SCHMOKE, Mayor

DEPARTMENT OF EDUCATION
RICHARD C. HUNTER
Superintendent of Public Instruction
200 E. North Avenue
Baltimore, Maryland 21202

September 26, 1988

Dear Parents, Students, and Personnel of the Baltimore City Public Schools:

The Board of School Commissioners will hold a public hearing on October 6, 1988 at 6:30 p.m. at 200 E. North Avenue, Room 107. The purpose of this hearing is to discuss a deferral of management plans for asbestos-containing materials in our elementary and secondary schools. These plans are required by the Asbestos Hazard Emergency Response Act (AHERA) which was signed into law by President Reagan on October 22, 1986. The plans were to be submitted to the governor by October 12, 1988. However, this date can be extended to May 9, 1989 if local educational agencies can show a good faith effort to comply with the October date.

Management plans include inspection reports, sample analyses, physical assessments, response actions, and time and cost schedules. Once this information is documented, the Baltimore City Public Schools personnel must review the response actions and cost allocations with members of the city's Asbestos Program to ensure affordability. Versar, Inc., the company doing our inspections, analysis, assessments, and development of response actions, has advised that they will not complete their portion of the plans in time for us to develop schedules and still comply with the October 12 deadline. We are, therefore, recommending that the submission of the management plans be deferred until May 9, 1989.

Deferral requests must be discussed at a public hearing in accordance with AHERA requirements. A submission deferral of the management plans will not affect the AHERA requirement that all plans be implemented by July 9, 1989.

Your attendance at the October 6 hearing is invited.

Very truly yours,

Richard C. Hunter
Superintendent of Public Instruction

RCH:jd

ATTACHEMENT #5

PROPOSED SCHEDULE
FOR SUBMISSION OF
MANAGEMENT PLANS
BY
MAY 9, 1989

ACTIVITY	COMPLETION DATE
INSPECTIONS BY VERSAR, INC.	NOVEMBER 30, 1988
*LABORATORY ANALYSIS	JANUARY 15, 1988
DEVELOPMENT OF INDIVIDUAL SCHOOL MANAGEMENT PLANS BY VERSAR INC.	JANUARY 15, 1989
DEVELOPMENT OF NARRATIVE FLOOR PLANS BY BALTIMORE CITY ASBESTOS OFFICE	APRIL 1, 1989
ASSIGNING OF TIME SCHEDULES AND FUNDING ALLOTMENTS BY BALTIMORE CITY PUBLIC SCHOOLS AND BALTIMORE CITY ASBESTOS PROGRAM	April 28, 1989
SUBMISSION OF MANAGEMENT PLANS TO MARYLAND DEPARTMENT OF THE ENVIRONMENT, CENTER FOR ENVIRONMENTAL HEALTH	MAY 9, 1989

*The attached letter from Versar, Inc. (Attachment 5A) clarifying the completion date for the LABORATORY ANALYSIS is to become part of the Proposed Schedule above.

ATTACHMENT 5A

Versar INC.

November 14, 1988

Mr. William A. Gieseking
Baltimore City Public Schools
Physical Plant
Room 407
200 East North Ave.
Baltimore, MD 21202

Dear Mr. Gieseking:

The laboratory analyses of all bulk asbestos samples taken in support of the production of AHERA management plans for Baltimore City Schools will be completed no later than 15 January 1989.

Very truly yours,

Harvey Davies

Lawrence G. Davies
Program Manager

LGD:scr

12445-18

6850 VERSAR CENTER • P.O. BOX 1549 • SPRINGFIELD, VIRGINIA 22151 • TELEPHONE: (703) 750-3000 • TELEX: 901125

State of Maryland

DEPARTMENT OF THE ENVIRONMENT
201 WEST PRESTON STREET • BALTIMORE, MARYLAND 21201
AREA CODE 301 • 225-5755

William Donald Schaefer
Governor

Martin W. Walsh, Jr.
Secretary

November 1, 1988

Mr. Richard C. Hunter
Superintendent of Public Instruction
Balto. City Board of Education
200 E. North Avenue
Baltimore, MD 21202

RE: Deferral Request - Denied

Log Number: Not Applicable

Dear Sir:

This letter is to inform you that your request for a deferral to May 9, 1989, for the submission of your asbestos management plan is not complete.

The Asbestos Hazard Emergency Response Act (AHERA) requires the following information be submitted under Category B Deferrals. The items checked below were determined to be either missing or incomplete.

___ A list of all schools covered by the request.

_X_ A statement, the accuracy of which is sworn to by a responsible official of the agency (by notorization or other means of certification), that includes the following information with respect to each school for which a deferral is sought in the request. Statement must be notarized.

___ Assurance 1: A statement and brief explanation why the LEA, despite good faith efforts, will not be able to meet the original October 12, 1988, deadline for submittal of its management plan.

___ Assurance 2: A statement that the LEA has made at least one of the following documents available for inspection at each school for which a deferral is sought:

a. A solicitation by the LEA to contract with an accredited asbestos contractor for inspection or management plan development.

b. A letter certifying that school district personnel are enrolled in an EPA-approved training course for inspection and management plan development.

c. Documentation showing that suspected asbestos-containing material from the school is being analyzed at an accredited laboratory.

d. Documentation showing that an inspection or management plan has been completed in at least one other school under the LEA's authority.

_____ Assurance 3: A statement giving assurance that the LEA has carried out notification of affected groups and, in the case of a public school, a public meeting. (Again, the new law requires that before filing a deferral request, an LEA shall notify affected parent, teacher, and employee organizations of its intent to file its request. In the case of a public school, the LEA shall discuss the request at a public meeting of the school board, and affected organizations shall be notified in advance of the time and place of the meeting.)

__X__ Assurance 4: A proposed schedule outlining all significant activities leading up to submission of a management plan by May 9, 1989, including the inspection of the school. This schedule must contain a deadline of no later than December 22, 1988, for entering into a contract with an accredited inspector (unless inspections are to be performed by accredited school personnel). Laboratory analysis and management plan development must also be included in the activity schedule. Specific proposed dates would be appropriate. Tentative schedule.

You may correct and refile your request no later than 15 days upon receipt of this letter. Should you have any questions regarding the submission of Deferral Request or other AHERA related questions, contact Ms. Janie Gordon, Program Manager, Office of School Asbestos Assistance at (301) 225-5755.

Sincerely,

Katherine P. Farrell, M.D., M.P.H.
Administrator
Center for Environmental Health

KPF:ae

HAND DELIVERY OF:

Management Plan Deferral Request addressed to:

Dr. Katherine P. Farrell
The Maryland Department of the Environment
Center for Environmental Health

From: Dr. Richard C. Hunter
Baltimore City Public Schools

RECEIVED BY: [signature]

DATE RECEIVED: 10/11/89 TIME: 3 P.M.

CITY OF BALTIMORE

KURT L. SCHMOKE, Mayor

DEPARTMENT OF EDUCATION

RICHARD C. HUNTER
Superintendent of Public Instruction
200 E. North Avenue
Baltimore, Maryland 21202

October 11, 1988

Dr. Katherine P. Farrell, M.D., M.P.H.
Administrator
The Maryland Department of the Environment
Center for Environmental Health
P.O. Box 13387
Baltimore, Maryland 21203

Dear Dr. Farrell:

In accordance with Public Law 100-368, an amendment to AHERA, the Baltimore City Public Schools is requesting a deferral of deadline from October 12, 1988 to May 9, 1989 for the submission of Asbestos Management Plans. This request is made for all school buildings and related facilities, such as the Repair Shop, Electrical Shop, etc., under the authority of the Board of School Commissions of Baltimore City and as identified in **Attachment #1.**

The following assurances are provided as required by the amendment for Category B Deferrals:

Assurance 1 (Attachment #2)

A brief explanation why Baltimore City, despite good faith efforts, will not be able to meet the original October 12, 1988 deadline for submittal of its management plans.

Assurance 2 (Attachment #3)

Documentation filed at each school showing that an inspection has been completed in at least one other school under Baltimore City's authority.

Assurance 3 (Attachment #4)

Documentation that Baltimore City has attempted to notify all affected groups of their intent to request a deferral of submission deadline.

Assurance 4 (Attachment #5)

A proposed schedule outlining all significant activities leading up to the submission of the Management Plans by May 9, 1989.

We await your written response regarding the deferral of the submission deadline for Management Plans for Baltimore City Public Schools.

Very truly yours,

Richard C. Hunter

Richard C. Hunter
Superintendent of
Public Instruction

BALTIMORE CITY SCHOOL MANAGEMENT PLAN LIST 06-Oct-88

BLD NO.	BUILDING NAME	ADDRESS
PS004	STEWART HILL	30 S. GILMOR STREET
PS005	LANGSTON HUGHES	5011 ARBUTUS AVENUE
PS007	CECIL	2000 CECIL AVENUE
PS008	CITY SPRING	100 S. CAROLINE STREET
PS009	CARROLL PARK	1300 HERKIMER STREET
PS010	JAMES MCHENY	31 S. SCHROEDER STREET
PS011	EUTAW-MARSHBURN	1624 EUTAW PLACE
PS012	LAKELAND	2921 STRANDEN ROAD
PS013	TENCH TILGHMAN	600 N. PATTERSON PARK A
PS014	PARK HEIGHTS	4910 PARK HEIGHTS AVENUE
PS016	JOHNSON SQUARE	1101 VALLEY STREET
PS019	LEXINGTON TERRACE	732 W. LEXINGTON STREET
PS021	HILTON	3301 CARLISLE AVENUE
PS022	GEORGE WASHINGTON ELEM	1001 W. SARATOGA
PS023	GENERAL WOLFE	245 S. WOLFE STREET
PS024	WESTSIDE	2235 NORTH FULTON AVENUE
PS025	DR. RAYNOR BROWNE	1000 N. MONTFORD AVENUE
PS026	MADISON SQUARE	1401 E. BIDDLE STREET
PS027	COMMODORE RODGERS	100 N. CHESTER STREET
PS028	WILLIAM PINDERHUGHES	1200 N. FREMONT AVENUE
PS029	MATHEW A. HENSON	1600 N. PAYSON STREET
PS030	GEORGE STREET	601 N. BRUNE STREET
PS031	COLDSTREAM PARK	400 EXETER HALL AVENUE
PS032	MILDRED MONROE	1634 GUILFORD AVENUE
PS034	BARRISTER CHARLES CARROLL	1327 WASHINGTON BOULEVARD
PS035	HARLEM PARK	1401 W. LAFAYETTE AVENUE
PS036	HARFORD HEIGHTS	1919 N. BROADWAY
PS038	MALCOLM X	2810 SHIRLEY AVENUE
PS039	DALLAS F. NICHOLAS, SR.	101 E. 21ST STREET
PS040	LAKE CLIFTON	2801 SAINT LO DRIVE
PS041	HAMILTON	5609 SEFTON AVENUE
PS042A	GARRISON	3910 BARRINGTON ROAD
PS042B	GARRISON	3910 BARRINGTON ROAD
PS043	HAMPSTEAD HILL	101 S. ELLWOOD AVENUE
PS044	MONTEBELLO	2040 E. 32ND STREET
PS045	FEDERAL HILL	1040 WILLIAM STREET
PS046	CHINQUAPIN	900 WOODBROUNE AVENUE
PS047	HAMPSTEAD HILL	500 S. LINWOOD AVENUE
PS049	NORTHEAST	5001 MORAVIA ROAD
PS050	ADMINISTRATION	1300 GORSUCH AVENUE
PS051	WAVERLY	3400 ELLERSLIE AVENUE
PS051A	WAVERLY	3400 ELLERSLIE AVENUE
PS051B	WAVERLY	3400 ELLERSLIE AVENUE
PS051C	WAVERLY	3400 ELLERSLIE AVENUE
PS051D	WAVERLY	3400 ELLERSLIE AVENUE
PS053	MARGARET BRENT	2601 ST. PAUL STREET
PS054	BARCLAY	2900 BARCLAY STREET
PS055	HAMPDEN	3608 CHESTNUT AVENUE
PS056	ROBERT POOLE	1300 W. 36TH STREET
PS057	LOMBARD	1500 E. LOMBARD STREET
PS058	ASHBURTON	3935 HILTON ROAD
PS058A	ASHBURTON	3935 HILTON ROAD

BLD NO.	BUILDING NAME	ADDRESS
PS058B	ASHBURTON	3935 HILTON ROAD
PS058C	ASHBURTON	3935 HILTON ROAD
PS058D	ASHBURTON	3935 HILTON ROAD
PS060	GWYNNS FALLS	2700 GWYNNS FALLS PARKWAY
PS060A	GWYNNS FALLS	2700 GWYNNS FALLS PARKWAY
PS060B	GWYNNS FALLS	2700 GWYNNS FALLS PARKWAY
PS061	JOHN EAGER HOWARD	2011 LINDEN AVENUE
PS062	EDGECOMBE CIRCLE	2835 VIRGINIA AVENUE
PS063	ROSEMONT	2777 PRESTMAN STREET
PS064	LIBERTY	3901 MAINE AVENUE
PS066	MOUNT ROYALE	121 MCMECHAN STREET
PS067	EDGEWOOD	1900 N. EDGEWOOD STREET
PS070	SOUTHERN	1100 COVINGTON STREET
PS073	SARAH M. ROACH	3434 OLD FREDERICK ROAD
PS075	CALVERTON	1100 WHITMORE AVENUE
PS076	FRANCIS SCOTT KEY	1425 E. FORT AVENUE
PS077	HERRING RUN	5001 SINCLAIR LANE
PS078	HARLEM PARK	1500 HARLEM AVENUE
PS079A	PORTABLE	2801 N. DUKE STREET
PS079	WILLIAM H. LEMMEL	2801 N. DUKELAND STREET
PS080	WEST BALTIMORE	201 N. BEND ROAD
PS081	OFFICES (#81)	181 N. BEND STREET
PS082	GREENSPRING	4701 GREENSPRING AVENUE
PS083	WILLIAM PACA	200 N. LAKEWOOD AVENUE
PS084	THOMAS JOHNSON	100 E. HEATH STREET
PS085	FORT WORTHINGTON	2701 E. OLIVER STREET
PS086	LAKEWOOD	2625 FEDERAL STREET
PS087	WINDSOR HILLS	4001 ALTO ROAD
PS088	LYNDHURST	621 WILDWOOD PARKWAY
PS089	ROGNEL HEIGHTS	4300 SIDEHILL ROAD
PS093	NORTHERN PARKWAY	2500 E. NORTHERN PARKWAY
PS095	FRANKLIN SQUARE	1400 W. LEXINGTON STREET
PS097	COLLINGTON SQUARE	1409 N. COLLINGTON AVENUE
PS098	SAMUEL B.F. MORSE	424-426 S. PULASKI STREET
PS101	ELMER A. HENDERSON	1101 N. WOLFE STREET
PS102	THOMAS G. HAYES	601 CENTRAL AVENUE
PS105	MORAVIA PARK	6201 FRANKFORD AVENUE
PS107	GILMOR	1321 N. GILMOR STREET
PS115	VENABLE	700 E. 34H STREET
PS117	DUKE ELLINGTON	790 W. NORTH AVENUE
PS122	SAMUEL COLERIDGE TAYLOR	507 W. PRESTON STREET
PS124	BAY BROOK	4301 10TH STREET
PS125	FURMAN L. TEMPLETON	1200 PENNSYLVANIA AVENUE
PS130	BOOKER T. WASHINGTON	1301 MCCULLOCH STREET
PS133	DUNBAR	500 N. CAROLINE STREET
PS134	WALTER P. CARTER	820 E. 43RD STREET
PS135	LUTHER CRAVEN MITCHELL	1731 E. CHASE STREET
PS138	HARRIETT TUBMAN	1807 HARLEM AVENUE
PS139	CHARLES CARROLL OF CARROLL	200 N. CENTRAL AVENUE
PS142	ROBERT COLEMAN	2400 WINDSOR AVENUE
PS144	JAMES MOSHER	1000 N. WHELLER AVENUE
PS145	ALEXANDER HAMILTON	800 POPLAR GROVE STREET

BALTIMORE CITY SCHOOL MANAGEMENT PLAN LIST 06-Oct-88

BLD NO.	BUILDING NAME	ADDRESS
PS150	BENTALOU	220 N.BENTALOU STREET
PS157	GEORGE G. KELSON	701 GOLD STREET
PS159	CHERRY HILL	801 BRIDGEVIEW ROAD
PS160	CARTER GODWIN WOODSON	2501 SEABURY ROAD
PS162	DIGGS-JOHNSON	501-503 W. BARRE STREET
PS163	PATAPSCO	844 ROUNDVIEW ROAD
PS164	ARUNDEL	2400 ROUND ROAD
PS175	GEO. BRAGG NATURE CENTER	6601 BALT. NATIONAL PIKE
PS177	GEORGE W. F. MCMECHEN	4411 GARRISON BOULEVARD
PS178	FRANCIS M. WOOD	100 N. CALHOUN STREET
PS180	CHERRY HILL	2700 SEAMON ROAD
PS201	DICKEY HILL	5025 DICKEY HILL ROAD
PS202	LAFAYETTE	850 BRADDISH AVENUE
PS203	MARCIE GARNETT FARRING	300 PONTIAC AVENUE
PS204	MARY RODMAN	3510 W. MULBERRY STREET
PS205	WOODHOME	7300 MOYER AVENUE
PS206	FURLEY	4633 FURLEY AVENUE
PS207	CURTIS BAY	4301 WEST BAY AVENUE
PS209	WINSTON	1101 WINSTON AVENUE
PS210	HAZELWOOD	4517 HAZELWOOD AVENUE
PS211	GARDEN VILLE	5300 BELAIR ROAD
PS212	GARRETT HEIGHTS	2800 AILSA AVENUE
PS213	GOVANS	5801 YORK ROAD
PS214	GUILFORD #214	4520 YORK ROAD
PS215	HIGHLANDTOWN	3223 PRATT STREET
PS216	FRANKFORD	6001 FRANKFORD AVENUE
PS217	BELMONT	1406 N. ELLAMONT STREET
PS219	YORKWOOD	5931 YORKWOOD ROAD
PS220	MORRELL PARK	2601 TOLLEY STREET
PS221	MOUNT WASHINGTON	1801 SULGRAVE AVENUE
PS222	PIMLICO	3500 W. NORTEERN PARKWAY
PS222A	PIMLICO	3500 W. NORTHERN PARKWAY
PS223	PIMLICO	4849 PIMLICO ROAD
PS224	GROVE PARK	5545 KENNISON AVENUE
PS225	WESTPORT	2401 NEVADA STREET
PS226	VIOLETVILLE	1207 PINE HEIGHTS AVENUE
PS228	JOHN RUHRAH	701 RAPPOLLA STREET
PS229	HOLABIRD	1500 IMLA STREET
PS230	CANTON	801 S. HIGHLAND AVENUE
PS231	BREHMS LANE	3536 BREHMS LANE
PS232	THOMAS JEFFERSON	605 DRYDEN DRIVE
PS233	ROLAND PARK	5207 ROLAND AVENUE
PS234	ARLINGTON	3705 W. ROGERS AVENUE
PS235	GLENMOUNT	6211 WALTHER AVENUE
PS236	HAMILTON	6101 OLD HARFORD ROAD
PS237	HIGHLANDTOWN	231 S. EATON STREET
PS238	VICTORY	1440 CHESAPEAKE AVENUE
PS239	BENJAMIN FRANKLIN	1201 CAMBRIA STREET
PS240	GRACELAND PARK-O'DONNELL	6300 O'DONNELL STREET
PS241	FALLSTAFF	3801 FALLSTAFF ROAD
PS241A	FALLSTAFF	3801 FALLSTAFF ROAD
PS242	NORTHWOOD	5201 LOCH RAVEN BOULEVARD

BLD NO.	BUILDING NAME	ADDRESS
PS242A	NORTHWOOD	5201 LOCH RAVEN BOULEVARD
PS243	ARMISTEAD GARDENS	5001 E. EAGER STREET
PS245	LEITH WALK	1235 SHERWOOD AVENUE
PS245A	LEITH WALK	1235 SHERWOOD AVENUE
PS246	BEECHFIELD	301 BEECHFIELD AVENUE
PS247	CROSS COUNTRY	6100 CROSS COUNTRY BLVD.
PS248	SINCLAIR LANE	3880 SINCLAIR LANE
PS249	MEDFIELD HEIGHTS	4300 BUCHANAN AVENUE
PS250	DR. BERNARD HARRIS, SR.	1400 N. CAROLINE STREET
PS251	CALLAWAY	3701 FERNHILL AVENUE
PS254	DR. MARTIN LUTHER KING, JR.	3750 GREENSPRING AVENUE
PS255	SOUTHEAST	6820 FAIT AVENUE
PS256	CALVIN RODWELL	3501 HILLSDALE ROAD
PS260	FREDERICK	2501 FREDERICK AVENUE
PS261	LOCKERMAN-BUNDY	301 N. PULASKI STREET
PS301	WILLIAM S. BAER ELEMENTARY	2001 WARWICK AVENUE
PS303	UPTON	811 W. LANVALE
PS304	HARBOR VIEW ELEMENTARY	4301 10TH AVENUE
PS307	CLAREMONT ELEMENTARY	5301 ERDMAN AVENUE
PS310	FERNHILL ELEMENATRY	3915 FERNHILL AVENUE
PS313	LOIS T. MURRAY	1600 E. ARLINGTON AVENUE
PS314	SHARP-LEADENHALL	150 W. WEST STREET
PS315	DR. LILLIE M. JACKSON	1501 ASBURTON STREET
PS353A	WOODBURN CENTER	1301 WOODBURN AVE
PS400	EDMONDSON	501 N. ATHOL AVENUE
PS401	NORTHWESTERN	6900 PARK HEIGHTS AVENUE
PS402	NORTHERN	2201 PINEWOOD AVENUE
PS403	COB POLYTECH #403	1400 COLDSPRING LANE
PS405	PATTERSON	100 KANE STREET
PS406	FOREST PARK	3401 ELDORADO AVENUE
PS407	WESTERN	4600 FALLS ROAD
PS410	MERGENTHALER	3500 HILLEN ROAD.
PS411	WALBROOK	2000 EDGEWOOD STREET
PS412	SOUTHWESTERN	200 FONTHILL AVENUE
PS413	HARBOR CITY LEARNING CTR.	4801 LIBERTY HEIGHTS AVE.
PS414	PAUL LAURENCE DUNBAR	1400 ORLEANS STREET
PS415	SCHOOL FOR THE ARTS	706-712 CATHEDRAL STREET
PS420	WEST SIDE SKILLED CENTER	4501 EDMONDSON AVENUE
PS450	FREDERICK DOUGLAS	2301 GWYNNS FALLS PARKWAY
PS451	JOSEPH C. BRESCOE	5506 W. BIDDLE SREET
PS453	FAIRMOUNT HILL	100 N. ANN STREET
PS454	CARVER	2201 PRESSTMAN STREET
PS456	HARFORD INSTITUTE	2555 HARFORD ROAD
PS457	LAURENCE G. PAQUIN	2200 SINCLAIR LANE
PS480	BALTIMORE CITY COLLEGE	3220 THE ALAMEDA
PS504	REPAIR SHOP	1230 E. 20th ST.
PS513	KID'S DINER	SARATOGA & HOLIDAY
PS525	WAREHOUSE	1149 E. GRANBY ST.
PS526	XPORTATION GARAGE & OFFICE	1210 E. 20th ST.
PS534A	ELECTRICAL SHOP:	1812 GREENMOUNT AVENUE
PS534B	ELECTRICAL SHOP:	1812 GREENMOUNT AVENUE
PS540	SCHOOL HEADQUARTERS	200 E. NORTH AVE.

BALTIMORE CITY SCHOOL MANAGEMENT PLAN LIST 06-Oct-88

BLD NO.	BUILDING NAME	ADDRESS
PS556	GROUNDS SHOP	2614 PENNSYLVANIA AVENUE
PS557	OFFICE WAREHOUSE (#557)	2200 ROBB STREET
PS564	BUS XPORTATION GARAGE&OFF.	1664 BRADDISH AVE.
PS701	KIRK AV. STADIUM	KIRK & EXETER HALL AVE.

ATTACHMENT #2

STATEMENT AS TO WHY BALTIMORE CITY CANNOT MEET THE ORIGINAL 10/12/88 DEADLINE.

Baltimore City Public Schools has attempted to meet the October 12 deadline by retaining Versar, Inc. to inspect their buildings and to develop Management Plans for same. Versar must confer with the Baltimore City Public Schools in order to develop the schedules for response actions which, in turn, are dependent upon the aggregate cost of the Management Plans. While Versar has been at work on this project since late Spring, they cannot complete their contract obligations in time to permit the City to assess the budget implications and develop an appropriate schedule and still meet the October 12 deadline.

ATTACHMENT #3

Versar INC.

To School _____

Versar, Inc. has been employed by the City of Baltimore, Department of Education to prepare asbestos-containing materials management plans in accordance with EPA requirements. We are currently in the process of preparing a management plan for this school based on an on-site inspection and the analysis of bulk samples of suspect materials taken during the inspection.

Very truly yours,

Lawrence G. Davies

Lawrence G. Davies
Program Manager

12448-4

6850 VERSAR CENTER • P.O. BOX 1549 • SPRINGFIELD, VIRGINIA 22151 • TELEPHONE: (703) 750-3000 • TELEX: 901125

ATTACHMENT #4

THE SUN Sunday OCTOBER 2 1988

NOTICE OF PUBLIC HEARING

The Board of School Commissioners of the Baltimore City Public Schools will hold a public hearing on October 6, 1988 to discuss the desirability of submitting Asbestos Management Plans as required by the Asbestos Hazard Emergency Response Act (AHERA) for all city schools. Management Plans are to be submitted to the Governor in October 1988 pursuant to an amendment signed by President Reagan on June 12, 1988. Non-compliance agencies can request a deferral until May 9, 1989.

This deferral request does not alter or in any way affect the July 9, 1988 deadline for implementation of the Management Plans.

The public hearing will be held at: [illegible] BALTIMORE CITY PUBLIC SCHOOLS ROOM 101 ADMINISTRATIVE HEADQUARTERS 200 E. NORTH AVENUE BALTIMORE, MARYLAND 21202 (Time) 5:30 P.M. (DATE) October 6, 1988

ATTACHMENT #4

BALTIMORE CITY PUBLIC SCHOOLS
BALTIMORE, MARYLAND 21202
Office of
The Superintendent of Public Instruction

September 27, 1988

To: Principals, Union Leaders, and Parent Organization Leaders

From: Richard C. Hunter, Superintendent of Public Instruction

Subject: Hearing on Deferral of Asbestos Management Plans

The accompanying letter explains an important public hearing to be held by the Board of School Commissioners on October 6. Because the hearing is crucial to our asbestos management program, I am asking that you help us publicize the meeting as widely as you can. Principals, please see that copies of the letter go home with students. Union leaders and parent group leaders, please see that copies are distributed to your members. Thank you for assisting us with this important meeting.

/jd

CITY OF BALTIMORE

KURT L. SCHMOKE, Mayor

DEPARTMENT OF EDUCATION
RICHARD C. HUNTER
Superintendent of Public Instruction
200 E. North Avenue
Baltimore, Maryland 21202

September 26, 1988

Dear Parents, Students, and Personnel of the Baltimore City Public Schools:

The Board of School Commissioners will hold a public hearing on October 6, 1988 at 6:30 p.m. at 200 E. North Avenue, Room 107. The purpose of this hearing is to discuss a deferral of management plans for asbestos-containing materials in our elementary and secondary schools. These plans are required by the Asbestos Hazard Emergency Response Act (AHERA) which was signed into law by President Reagan on October 22, 1986. The plans were to be submitted to the governor by October 12, 1988. However, this date can be extended to May 9, 1989 if local educational agencies can show a good faith effort to comply with the October date.

Management plans include inspection reports, sample analyses, physical assessments, response actions, and time and cost schedules. Once this information is documented, the Baltimore City Public Schools personnel must review the response actions and cost allocations with members of the city's Asbestos Program to ensure affordability. Versar, Inc., the company doing our inspections, analysis, assessments, and development of response actions, has advised that they will not complete their portion of the plans in time for us to develop schedules and still comply with the October 12 deadline. We are, therefore, recommending that the submission of the management plans be deferred until May 9, 1989.

Deferral requests must be discussed at a public hearing in accordance with AHERA requirements. A submission deferral of the management plans will not affect the AHERA requirement that all plans be implemented by July 9, 1989.

Your attendance at the October 6 hearing is invited.

Very truly yours,

Richard C. Hunter
Superintendent of Public Instruction

RCH:jc

ATTACHEMENT #5

PROPOSED SCHEDULE FOR SUBMISSION OF MANAGEMENT PLANS BY MAY 9, 1989

ACTIVITY	COMPLETION DATE
INSPECTIONS BY VERSAR, INC.	NOVEMBER 30, 1988
DEVELOPMENT OF INDIVIDUAL SCHOOL MANAGEMENT PLANS BY VERSAR INC.	JANUARY 15, 1989
DEVELOPMENT OF NARRATIVE FLOOR PLANS BY BALTIMORE CITY ASBESTOS OFFICE	APRIL 1, 1989
ASSIGNING OF TIME SCHEDULES AND FUNDING ALLOTMENTS BY BALTIMORE CITY PUBLIC SCHOOLS AND BALTIMORE CITY ASBESTOS PROGRAM	April 28, 1989
SUBMISSION OF MANAGEMENT PLANS TO MARYLAND DEPARTMENT OF THE ENVIRONMENT, CENTER FOR ENVIRONMENTAL HEALTH	MAY 9, 1989

Versar INC.

NOTIFICATION OF AVAILABILITY

BALTIMORE CITY PUBLIC SCHOOLS
BALTIMORE, MARYLAND 21202
Office of
The Superintendent of Public Instruction

Circular No. 114
Series 1988-89
April 13, 1989
DIVISION OF PHYSICAL PLANT

Availability of
Asbestos Management Plans

TO: Deputy Superintendent, Chief Financial Officer, Associate and Assistant Superintendents, Executive Directors, Heads of Central Office Units, and Principals

FROM: Richard C. Hunter, Superintendent of Public Instruction
Mr. Judson Porter, Chief Financial Officer
Curtis E. Lantz, Assistant Superintendent, Division of Physical Plant

In October 1986, the U.S. Congress enacted the Asbestos Hazard Emergency Response Act (AHERA). Under this law, comprehensive regulations were developed to address asbestos problems in public and private elementary and secondary schools. These regulations require schools to inspect for friable and nonfriable asbestos, develop asbestos management plans that address asbestos hazards in school buildings and implement response actions in a timely manner.

These regulations assign schools many new responsibilities. Our program for fulfilling these responsibilities is outlined in the asbestos management plan for each school. The plans currently contain the inspection reports and the appropriate response actions. They, also, contain plans for periodic reinspections and post-response activities if any.

Delivery of Asbestos Management Plans to schools will begin May 1, 1989. The receipt of these management plans will require acknowledgement by the Principal or Vice Principal. On May 9, 1989, the Asbestos Management Plans will be delivered to the Governor as required by law.

As of May 9, 1989, the Asbestos Management Plans will be available for review at the following locations:

- at the Main Office of each school during normal school hours

- at the Division of Physical Plant, Room 407, 200 E. North Avenue, Baltimore, Maryland 21202 during normal business hours.

Please advise your staff of the availability of these plans. Principals will be receiving under separate cover letters advising parents, union leaders and parent organization leaders of the availability of these plans. These letters are to be distributed to parents and employees associated with their respective school.

APPROVAL OF CIRCULARS

EGO

TO: DR. RICHARD C. HUNTER, SUPERINTENDENT OF PUBLIC INSTRUCTION

RE: CIRCULARS FOR EXAMINATION AND APPROVAL OR CORRECTION

RCH — (APPROVED) DISAPPROVED
SUPERINTENDENT'S INITIALS

APPROVED DISAPPROVED
DEPUTY SUPERINTENDENT'S INITIALS

APPROVED DISAPPROVED
CHIEF FINANCIAL OFFICER'S INITIALS

APPROVED DISAPPROVED
CABINET MEMBER INITIALS

COMMENTS: April 5, 1989 memo to Principals, Union Leaders, and Parent Organization Leaders ref: Availability of Management Plans

COLOR: _____ DATE SUBMITTED: _____

BY: _____

BALTIMORE CITY PUBLIC SCHOOLS
BALTIMORE, MARYLAND 21202
Office of
The Superintendent of Public Instruction

April 5, 1989

To: Principals, Union Leaders, and Parent Organization Leaders

From: Richard C. Hunter, Superintendent of Public Instruction

Subject: Availability of Management Plans

The accompanying letter briefly explains the Asbestos Hazard Emergency Response Act (AHERA). The Asbestos Management Plans are the Baltimore City Public Schools' response to that act. Because the availability of these plans are crucial to our Asbestos Management Program, I am asking that you help us publicize their availability as widely as you can.

Principals, please see that copies of the letter go home with students and are distributed to all staff within your building. **Union Leaders** and **parent group leaders**, please see that copies of the letter are distributed to your members.

Thank you for assisting us with this important task.

CITY OF BALTIMORE

KURT L. SCHMOKE, Mayor

DEPARTMENT OF EDUCATION

RICHARD C. HUNTER
Superintendent of Public Instruction
200 E. North Avenue
Baltimore, Maryland 21202

April 5, 1989

Dear Parents and Personnel of the Baltimore City Public Schools:

AVAILABILITY OF ASBESTOS MANAGEMENT PLANS

In October 1986, the U.S. Congress enacted the Asbestos Hazard Emergency Response Act (AHERA). Under this law, comprehensive regulations were developed to address asbestos problems in public and private elementary and secondary schools. These regulations require schools to inspect for friable and nonfriable asbestos, develop asbestos management plans that address asbestos hazards in school buildings and implement response actions in a timely manner.

These regulations assign schools many new responsibilities. Our program for fulfilling these responsibilities is outlined in the asbestos management plan for each school. The plans currently contain the inspection reports and the appropriate response actions. They, also, contain plans for periodic reinspections and post-response activities if any.

Delivery of Asbestos Management Plans to schools will begin May 1, 1989. On May 9, 1989, the Asbestos Management Plans will be delivered to the Governor as required by law.

As of May 9, 1989, the Asbestos Management Plans will be available for review at the following locations:

- at the Main Office of each school
- at the Division of Physical Plant, Room 407, 200 E. North Avenue, Baltimore, Maryland 21202 during normal business hours.

Very truly yours,

Richard C. Hunter

Richard C. Hunter
Superintendent of Public Instruction

CITY OF BALTIMORE

KURT L. SCHMOKE, Mayor

DEPARTMENT OF EDUCATION
RICHARD C. HUNTER
Superintendent of Public Instruction
200 E. North Avenue
Baltimore, Maryland 21202

May 1, 1989

Dear Principal and/or Vice Principal:

In accordance with the Asbestos Hazard Response Act (AHERA), each school is required to maintain a copy of its respective Asbestos Management Plan in their administrative office. These plans are to be made available for inspection by the public without cost or restriction.

The bound copy of the Asbestos Management Plan being delivered to your school today includes the following:

- A list of all Baltimore City Public Schools by name and address and including inventory data indicating whether or not there is asbestos within your building.

- Dated Copy of Notification of availability of Asbestos Management Plans.

- Site specific asbestos management data.

- The following Appendices:

  A - Lab Analysis Sheets and Chain of Custody Data
  B - Selected excerpts from Final Rule 40 CFR Part 763 for asbestos containing materials in schools.
  C - Data pertaining to all response actions which have taken place at the school since the original inspection.
  D - Abatement Schedule for Asbestos Containing Materials.
  E - Site specific O&M contractor abatement procedures.
  F - Copies of certification certificates for inspectors, management planners and Designated LEA Representative.
  G - Copy of BCPS submission deferral letters and subsequent approval letters from the State of Maryland.
  H - Floor plans showing bulk sampling locations.

Section 207(a) of Title II of the Act and Section 15(1)(D) of the Act make it unlawful for any LEA or person to fail or refuse to

retain this copy of the Asbestos Management Plan in the administrative office. Failure to do so can result in fines being levied by the Environmental Protection Agency against the Baltimore City Public Schools, as well as, individuals who refuse to comply.

A meeting will be scheduled at a later date to have a representative from the consultant who developed the management plan, Versar, Inc., meet with you to review and discuss your Asbestos Management Plan in depth.

Very truly yours,

Richard C. Hunter
Superintendent of
Public Instruction

Versar INC.

APPENDIX H

FLOOR PLAN WITH SAMPLE LOCATIONS

BALTO. CODE	VERSAR CODE
150-001	PS150-001-027-LS
150-002	PS150-001-028-LS
150-003	PS150-001-029-LS
150-004	PS150-001-025-LS
150-005	PS150-001-022-LS
150-006	PS150-001-024-LS
	PS150-001-026-LS
	PS150-001-030-LS
	PS150-002-001-LS
	PS150-002-002-LS
	PS150-003-003-LS
150-007	PS150-001-017-LS
	PS150-001-018-LS
	PS150-001-019-LS
	PS150-001-020-LS
	PS150-001-021-LS
	PS150-001-022-LS
	PS150-001-023-LS
	PS150-003-001-LS
150-008	PS150-001-015-LS
	PS150-001-016-LS
150-009	PS150-003-001-LS
150-010	PS150-001-001-LS
	PS150-001-002-LS
	PS150-001-003-LS
	PS150-001-004-LS
	PS150-001-005-LS
	PS150-001-006-LS
	PS150-001-007-LS
	PS150-001-008-LS
	PS150-001-009-LS
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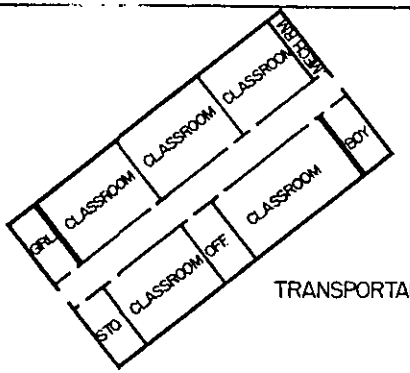
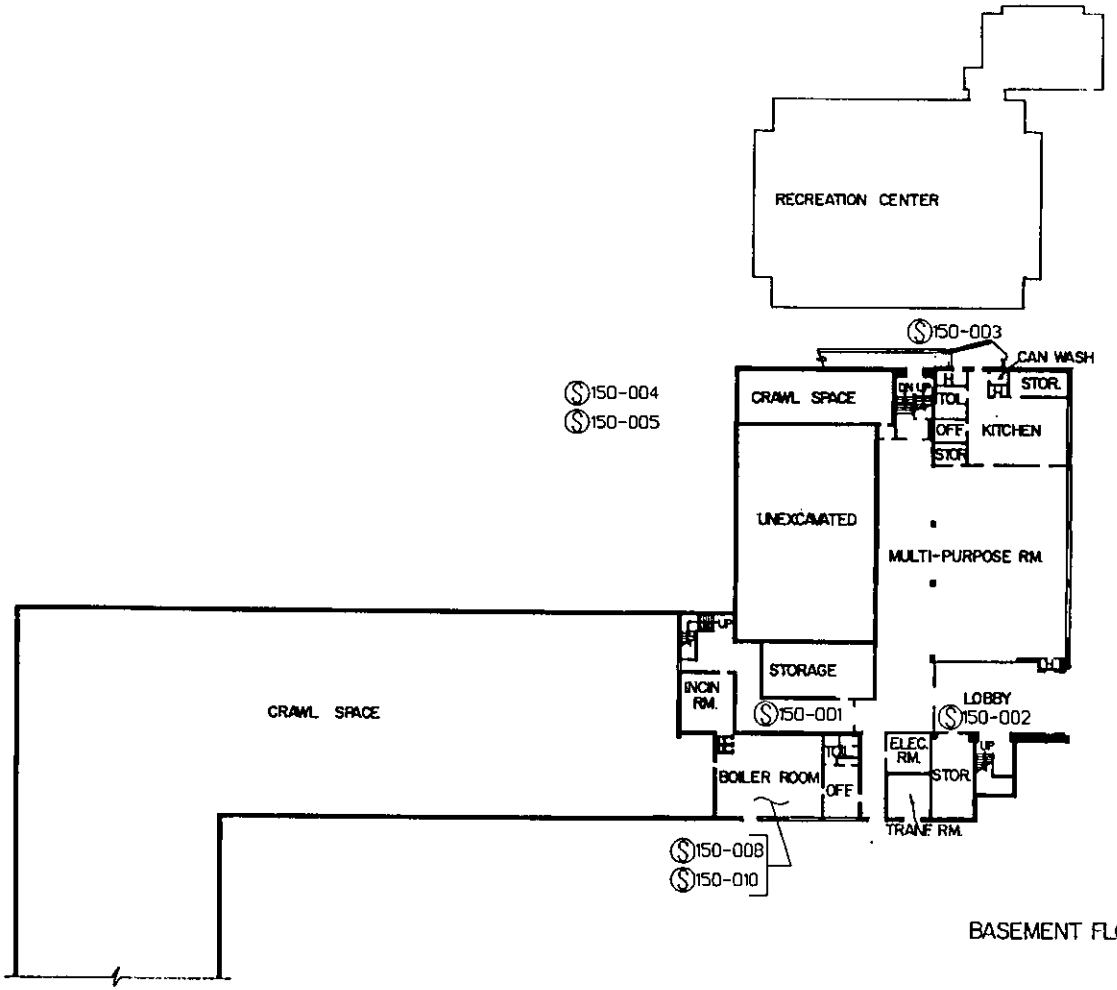
	PS150-001-012-LS
	PS150-001-013-LS
	PS150-001-014-LS



TRANSPORTABLE PLAN ELEV 151.8



BASEMENT FLOOR PLAN ELEV 141.0

0 8 16 32

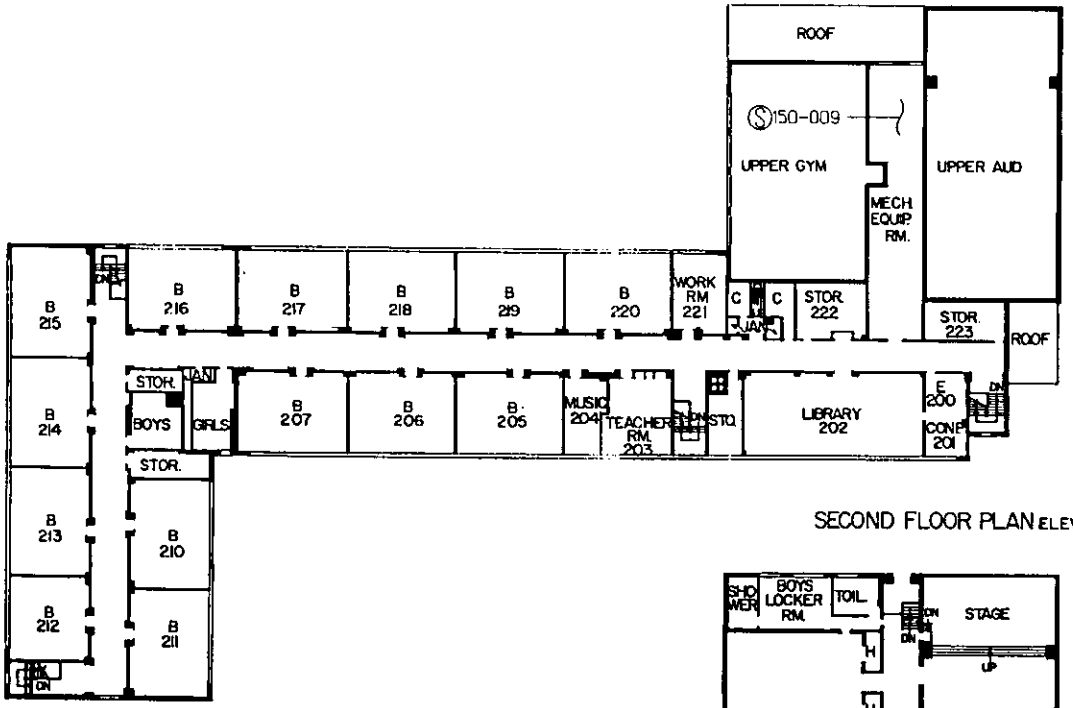
A OFFICE
B CLASSROOM
C TOILET ROOM
D LOUNGE
E WORK ROOM
F LOBBY
G MUSIC ROOM
H STORAGE
J RECEIVING
K LOCKER ROOM
L INCINERATOR RM.
M JANITOR
N MECH.-ELEC. RM.

TYPICAL OF BUILDING
Ⓢ150-006
Ⓢ150-007

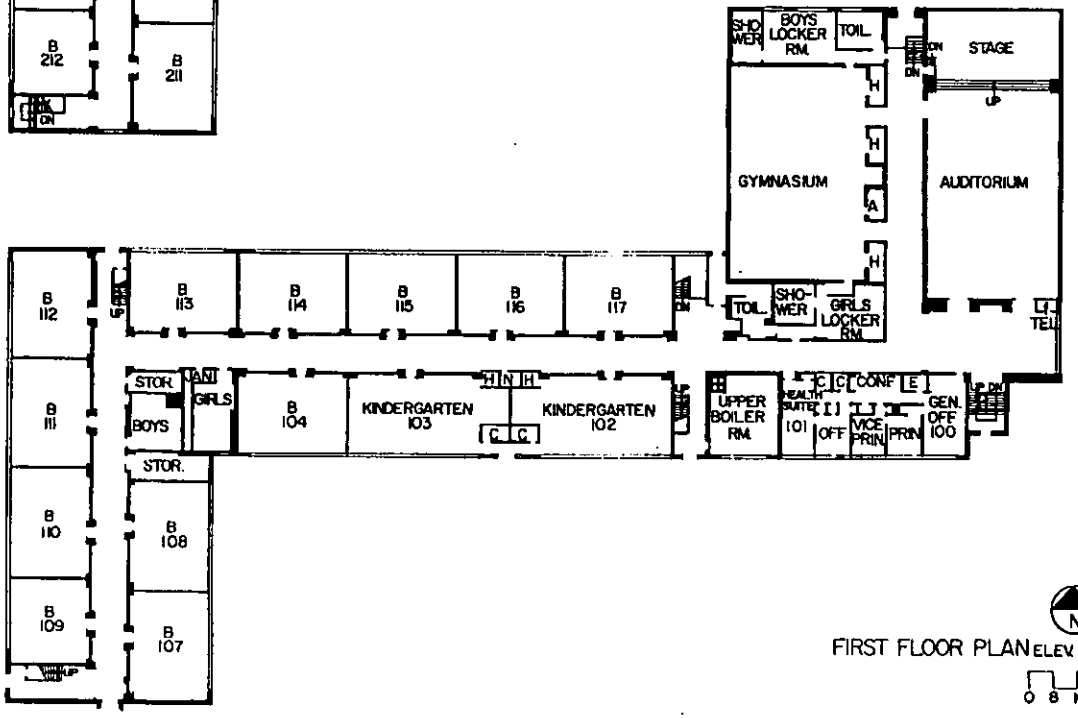
BALTIMORE CITY PUBLIC SCHOOLS
DIVISION OF PHYSICAL PLANT

BENTALOU ELEMENTARY SCHOOL
2200 N. BENTALOU ST.
SCHEMATIC PLAN
AS INDICATED
150

CURTIS LANTZ
J.L. HENLEY
E.J. SAVAGE



SECOND FLOOR PLAN ELEV. 161.0



FIRST FLOOR PLAN ELEV. 151.0

0 8 16 32

TYPICAL OF BUILDING
S150-006
S150-007

BALTIMORE CITY PUBLIC SCHOOLS
DIVISION OF PHYSICAL PLANT
BENTALOU ELEMENTARY SCHOOL
FROM BENTALOU ST. TO 22ND ST.
SCHEMATIC PLAN AS CREATED
SHEET NO. 150
SCALE 1/8" = 1'-0"
DATE 5-2-73
CURTIS LANTZ
J.J. HENLEY
E.L. SAVAGE
E.L. SAVAGE

AMENDMENT NO. 1

DATED SEPTEMBER 20, 1989

TO

ASBESTOS-CONTAINING
MATERIALS MANAGEMENT
PLAN

DATED MAY 9, 1989

FOR

BENTALOU ELEMENTARY SCHOOL

PS 150

ISSUED BY THE

BALTIMORE CITY PUBLIC SCHOOLS

ASBESTOS COORDINATOR AND

DESIGNATED LOCAL EDUCATION

AGENCY REPRESENTATIVE

BALTIMORE CITY PUBLIC SCHOOLS

AMENDMENT NO. 1
DATED: SEPTEMBER 20, 1989

TO THE MANAGEMENT PLAN

A. TO SECTION 3.0 - in the 3rd paragraph the wording "preparing the ACM assessment" means the person signing at the end of this paragraph actually made the ACM assessment and is responsible for it.

B. To SECTION 7 IN 7.1,2 "CLEANING" - Delete the present paragraphs and insert the following. "Additional cleaning is not recommended. The LEA agrees with the recommendation."

C. TO THE ASBESTOS-CONTAINING BUILDING MATERIALS (ACBM) INVENTORY BY BUILDING LIST - pages III, IV, V, VI, and VII are replaced with the attached pages Rev. dated September 20, 1989.

TO THE MANAGEMENT PLAN APPENDICES

D. TO APPENDIX D - SCHEDULE FOR RESPONSE ACTIONS - The attached Response Action Schedule dated September 20, 1989 replaces the original schedule issued with the management plan.

E. TO APPENDIX H - Add the following note to the floor plans and the management plan section 1.2. "Sample locations described within the Management Plans can be located within the building by a red or black spot of spray paint and the corresponding sample number written in permanent ink adjacent to the sample location. Also, a floor plan with sample locations marked upon it is located within Appendix H."

BALTIMORE CITY SCHOOL MANAGEMENT PLAN LIST

ASBESTOS-CONTAINING BUILDING MATERIALS (ACBM) INVENTORY BY BUILDING

BULDING NUMBER *	BUILDING NAME	ADDRESS	FRIABLE ACBM	NON-FRIABLE ACBM	ASSUMED FRIABLE ACBM	ASSUMED NON-FRIABLE ACBM	NO ACBM FOUND	NO SUSPECT MATERIAL

ASBESTOS-CONTAINING BUILDING MATERIALS (ACBM) INVENTORY BY BUILDING

BULDING NUMBER *	BUILDING NAME	ADDRESS	FRIABLE ACBM	NON-FRIABLE ACBM	ASSUMED FRIABLE ACBM	ASSUMED NON-FRIABLE ACBM	NO ACBM FOUND	NO SUSPECT MATERIAL
PS004	STEWART HILL	30 S. GILMOR STREET	X	X		X		
PS005	LANGSTON HUGHES	5011 ARBUTUS AVENUE		X		X		
PS007	CECIL	2000 CECIL AVENUE	X	X		X		
PS008	CITY SPRING	100 S. CAROLINE STREET	X	X		X		
PS009	CARROLL PARK	1300 HERKIMER STREET	X			X		
PS010	JAMES McHENRY	31 S. SCHROEDER STREET	X			X		
PS011	EUTAW-MARSHBURN	1624 EUTAW PLACE	X			X		
PS011A	EUTAW-MARSHBURN	1624 EUTAW PLACE	X					
PS012	LAKELAND	2921 STRANDEN ROAD	X	X		X		
PS013	TENCH TILGHMAN	600 N. PATTERSON PARK A		X		X		
PS014	PARK HEIGHTS	4910 PARK HEIGHTS AVENUE		X		X		
PS016	JOHNSON SQUARE	1101 VALLEY STREET	X	X		X		
PS019	LEXINGTON TERRACE	732 W. LEXINGTON STREET	X			X		
PS021	HILTON	3301 CARLISLE AVENUE	X	X	X	X		
PS022N	GEORGE WASHINGTON	800 SCOTT STREET					X	
PS023	GENERAL WOLFE	245 S. WOLFE STREET		X		X		
PS024	WESTSIDE	2235 NORTH FULTON AVENUE	X	X		X		
PS025	DR. RAYNOR BROWNE	1000 N. MONTFORD AVENUE		X	X	X		
PS026	MADISON SQUARE	1401 E. BIDDLE STREET	X	X		X		
PS027	COMMODORE RODGERS	100 N. CHESTER STREET	X			X		
PS028	WILLIAM PINDERHUGHES	1200 N. FREMONT AVENUE		X		X		
PS029	MATHEW A. HENSON	1600 N. PAYSON STREET	X	X		X		
PS030	GEORGE STREET	601 N. BRUNE STREET	X	X	X	X		
PS031	COLDSTREAM PARK	400 EXETER HALL AVENUE	X	X		X		
PS032	MILDRED MONROE	1634 GUILFORD AVENUE	X	X		X		
PS034	BARRISTER CHARLES CARROLL	1327 WASHINGTON BOULEVARD		X		X		
PS035	HARLEM PARK	1401 W. LAFAYETTE AVENUE	X	X				
PS036	HARFORD HEIGHTS	1919 N. BROADWAY	X	X		X		
PS038	MALCOLM X	2810 SHIRLEY AVENUE	X	X		X		
PS039	DALLAS F. NICHOLAS, SR.	101 E. 21ST STREET		X		X		
PS040	LAKE CLIFTON	2801 SAINT LO DRIVE	X	X	X	X		
PS041	HAMILTON	5609 SEFTON AVENUE	X	X		X		
PS042A	GARRISON	3910 BARRINGTON ROAD	X		X			
PS042B	GARRISON	3910 BARRINGTON ROAD	X			X		
PS043	HAMPSTEAD HILL	101 S. ELLWOOD AVENUE	X	X	X			
PS044	MONTEBELLO	2040 E. 32ND STREET	X	X	X			
PS045	FEDERAL HILL	1040 WILLIAM STREET	X	X		X		

BALTIMORE CITY SCHOOL MANAGEMENT PLAN LIST

ASBESTOS-CONTAINING BUILDING MATERIALS (ACBM) INVENTORY BY BUILDING

BULDING NUMBER *	BUILDING NAME	ADDRESS	FRIABLE ACBM	NON-FRIABLE ACBM	ASSUMED FRIABLE ACBM	ASSUMED NON-FRIABLE ACBM	NO ACBM FOUND	NO SUSPECT MATERIAL
PS046	CHINQUAPIN	900 WOODBROUNE AVENUE	X	X		X		
PS047	HAMPSTEAD HILL	500 S. LINWOOD AVENUE	X	X		X		
PS049	NORTHEAST	5001 MORAVIA ROAD		X		X		
PS050	ADMINISTRATION	1300 GORSUCH AVENUE	X	X		X		
PS051	WAVERLY	3400 ELLERSLIE AVENUE	X	X		X		
PS051A	WAVERLY	3400 ELLERSLIE AVENUE					X	
PS051B	WAVERLY	3400 ELLERSLIE AVENUE					X	
PS051C	WAVERLY	3400 ELLERSLIE AVENUE					X	
PS051D	WAVERLY	3400 ELLERSLIE AVENUE					X	
PS053	MARGARET BRENT	2601 ST. PAUL STREET				X		
PS054	BARCLAY	2900 BARCLAY STREET	X	X		X		
PS055	HAMPDEN	3608 CHESTNUT AVENUE		X		X		
PS056	ROBERT POOLE	1300 W. 36TH STREET	X	X		X		
PS057	LOMBARD	1500 E. LOMBARD STREET	X	X		X		
PS058	ASHBURTON	3935 HILTON ROAD	X	X		X		
PS058A	ASHBURTON	3935 HILTON ROAD					X	
PS058B	ASHBURTON	3935 HILTON ROAD					X	
PS058C	ASHBURTON	3935 HILTON ROAD					X	
PS058D	ASHBURTON	3935 HILTON ROAD					X	
PS060	GWYNNS FALLS	2700 GWYNNS FALLS PARKWAY	X	X		X		
PS060A	GWYNNS FALLS	2700 GWYNNS FALLS PARKWAY		X		X		
PS060B	GWYNNS FALLS	2700 GWYNNS FALLS PARKWAY		X		X		
PS060C	GWYNNS FALLS	2700 GWYNNS FALLS PARKWAY				X		
PS061	JOHN EAGER HOWARD	2011 LINDEN AVENUE	X	X		X		
PS062	EDGECOMBE CIRCLE	2835 VIRGINIA AVENUE	X	X		X		
PS063	ROSEMONT	2777 PRESTMAN STREET	X	X		X		
PS064	LIBERTY	3901 MAINE AVENUE		X		X		
PS066	MOUNT ROYALE	121 MCMECHAN STREET	X	X		X		
PS067	EDGEWOOD	1900 N. EDGEWOOD STREET	X	X	X			
PS070	SOUTHERN	1100 COVINGTON STREET	X	X		X		
PS073	SARAH M. ROACH	3434 OLD FREDERICK ROAD	X	X		X		
PS075	CALVERTON	1100 WHITMORE AVENUE	X	X	X			
PS076N	FRANCIS SCOTT KEY	1425 EAST FORT AVENUE					X	
PS077	HERRING RUN	5001 SINCLAIR LANE	X	X		X		
PS078	HARLEM PARK	1500 HARLEM AVENUE	X	X	X	X		
PS079A	PORTABLE	2801 N. DUKE STREET	X		X			
PS079	WILLIAM H. LEMMEL	2801 N. DUKELAND STREET	X	X		X		
PS080	WEST BALTIMORE	201 N. BEND ROAD (R)	X	X		X		
PS081	OFFICES (#81)	181 N. BEND STREET	X	X		X		
PS082	GREENSPRING	4701 GREENSPRING AVENUE	X			X		
PS083	WILLIAM PACA	200 N. LAKEWOOD AVENUE	X	X		X		
PS084	THOMAS JOHNSON	100 E. HEATH STREET	X	X		X		
PS085	FORT WORTHINGTON	2701 E. OLIVER STREET	X	X	X	X		
PS086	LAKEWOOD	2625 FEDERAL STREET	X			X		
PS087	WINDSOR HILLS	4001 ALTO ROAD	X	X	X			
PS088	LYNDHURST	621 WILDWOOD PARKWAY	X	X		X		
PS089	ROGNEL HEIGHTS	4300 SIDEHILL ROAD	X	X		X		

BALTIMORE CITY SCHOOL MANAGEMENT PLAN LIST

ASBESTOS-CONTAINING BUILDING MATERIALS (ACBM) INVENTORY BY BUILDING

BULDING NUMBER *	BUILDING NAME	ADDRESS	FRIABLE ACBM	NON-FRIABLE ACBM	ASSUMED FRIABLE ACBM	ASSUMED NON-FRIABLE ACBM	NO ACBM FOUND	NO SUSPECT MATERIAL
PS093	NORTHERN PARKWAY	2500 E. NORTHERN PARKWAY	X	X	X			
PS095	FRANKLIN SQUARE	1400 W. LEXINGTON STREET	X	X	X	X		
PS097	COLLINGTON SQUARE	1409 N. COLLINGTON AVENUE	X			X		
PS098	SAMUEL B.F. MORSE	424-426 S. PULASKI STREET (R)		X		X		
PS101	ELMER A. HENDERSON	1101 N. WOLFE STREET	X	X		X		
PS102	THOMAS G. HAYES	601 CENTRAL AVENUE	X	X	X	X		
PS105	MORAVIA PARK	6201 FRANKFORD AVENUE	X	X		X		
PS107	GILMOR	1321 N. GILMOR STREET	X	X		X		
PS115	VENABLE	700 E. 34H STREET	X	X		X		
PS117	DUKE ELLINGTON	790 W. NORTH AVENUE		X	X			
PS122	SAMUEL COLERIDGE TAYLOR	507 W. PRESTON STREET	X	X		X		
PS124	BAY BROOK	4301 10TH STREET	X			X		
PS125	FURMAN L. TEMPLETON	1200 PENNSYLVANIA AVENUE		X		X		
PS130	BOOKER T. WASHINGTON	1301 MCCULLOCH STREET	X	X	X			
PS133	DUNBAR	500 N. CAROLINE STREET	X			X		
PS134	WALTER P. CARTER	820 E. 43RD STREET (R)		X		X		
PS135	LUTHER CRAVEN MITCHELL	1731 E. CHASE STREET			X			
PS138	HARRIETT TUBMAN	1807 HARLEM AVENUE		X	X			
PS139	CHARLES CARROLL OF CARROLL	200 N. CENTRAL AVENUE	X	X		X		
PS142	ROBERT COLEMAN	2400 WINDSOR AVENUE		X		X		
PS144	JAMES MOSHER	1000 N. WHELLER AVENUE	X	X		X		
PS145	ALEXANDER HAMILTON	800 POPLAR GROVE STREET		X		X		
PS150	BENTALOU	220 N.BENTALOU STREET	X	X	X			
PS157	GEORGE G. KELSON	701 GOLD STREET	X	X		X		
PS159	CHERRY HILL	801 BRIDGEVIEW ROAD	X	X	X	X		
PS160	CARTER GODWIN WOODSON	2501 SEABURY ROAD	X	X		X		
PS161	GEORGE WASHINGTON (413)	1001 W. SARATOGA	X	X				
PS163	PATAPSCO	844 ROUNDVIEW ROAD	X	X		X		
PS164	ARUNDEL	2400 ROUND ROAD	X	X		X		
PS175	GEO. BRAGG NATURE CENTER	6601 BALT. NATIONAL PIKE	X			X		
PS177	GEORGE W. F. McMECHEN	4411 GARRISON BOULEVARD				X		
PS178	FRANCIS M. WOOD	100 N. CALHOUN STREET				X		
PS180	CHERRY HILL	2700 SEAMON ROAD	X	X		X		
PS201	DICKEY HILL	5025 DICKEY HILL ROAD	X	X		X		
PS202	LAFAYETTE	850 BRADDISH AVENUE	X	X		X		
PS203	MARCIE GARNETT FARRING	300 PONTIAC AVENUE		X		X		
PS204	MARY RODMAN	3510 W. MULBERRY STREET	X	X		X		
PS205	WOODHOME	7300 MOYER AVENUE	X	X		X		
PS206	FURLEY	4633 FURLEY AVENUE	X	X	X	X		
PS207	CURTIS BAY	4301 WEST BAY AVENUE	X	X		X		
PS209	WINSTON	1101 WINSTON AVENUE	X	X		X		
PS210	HAZELWOOD	4517 HAZELWOOD AVENUE	X	X	X	X		
PS211	GARDEN VILLE	5300 BELAIR ROAD	X	X		X		
PS212	GARRETT HEIGHTS	2800 AILSA AVENUE	X	X		X		
PS213	GOVANS	5801 YORK ROAD	X	X		X		
PS214	GUILFORD #214	4520 YORK ROAD	X	X		X		

BALTIMORE CITY SCHOOL MANAGEMENT PLAN LIST

ASBESTOS-CONTAINING BUILDING MATERIALS (ACBM) INVENTORY BY BUILDING

BULDING NUMBER *	BUILDING NAME	ADDRESS	FRIABLE ACBM	NON-FRIABLE ACBM	ASSUMED FRIABLE ACBM	ASSUMED NON-FRIABLE ACBM	NO ACBM FOUND	NO SUSPECT MATERIAL
PS215	HIGHLANDTOWN	3223 PRATT STREET		X		X		
PS216	FRANKFORD	6001 FRANKFORD AVENUE	X			X		
PS217	BELMONT	1406 N. ELLAMONT STREET	X	X	X	X		
PS219	YORKWOOD	5931 YORKWOOD ROAD	X	X		X		
PS220	MORRELL PARK	2601 TOLLEY STREET		X		X		
PS221	MOUNT WASHINGTON	1801 SULGRAVE AVENUE	X	X	X			
PS222	PIMLICO	3500 W. NORTHERN PARKWAY	X	X		X		
PS222A	PIMLICO	3500 W. NORTHERN PARKWAY		X				
PS223	PIMLICO	4849 PIMLICO ROAD	X	X	X			
PS224	GROVE PARK	5545 KENNISON AVENUE	X	X		X		
PS225	WESTPORT	2401 NEVADA STREET		X		X		
PS226	VIOLETVILLE	1207 PINE HEIGHTS AVENUE	X	X		X		
PS228	JOHN RUHRAH	701 RAPPOLLA STREET	X	X		X		
PS229	HOLABIRD	1500 IMLA STREET	X	X		X		
PS230	CANTON	801 S. HIGHLAND AVENUE	X			X		
PS231	BREHMS LANE	3536 BREHMS LANE	X	X	X			
PS232	THOMAS JEFFERSON	605 DRYDEN DRIVE	X	X		X		
PS233	ROLAND PARK	5207 ROLAND AVENUE	X	X		X		
PS234	ARLINGTON	3705 W. ROGERS AVENUE	X	X	X	X		
PS235	GLENMOUNT	6211 WALTHER AVENUE	X	X		X		
PS236	HAMILTON	6101 OLD HARFORD ROAD	X	X	X	X		
PS237	HIGHLANDTOWN	231 S. EATON STREET	X	X	X	X		
PS238	VICTORY	1440 CHESAPEAKE AVENUE	X	X		X		
PS239	BENJAMIN FRANKLIN	1201 CAMBRIA STREET	X	X				
PS240	GRACELAND PARK-O'DONNELL	6300 O'DONNELL STREET	X	X	X			
PS241	FALLSTAFF	3801 FALLSTAFF ROAD	X	X		X		
PS241A	FALLSTAFF	3801 FALLSTAFF ROAD (R)		X				
PS242	NORTHWOOD	5201 LOCH RAVEN BOULEVARD	X	X	X			
PS242A	NORTHWOOD	5201 LOCH RAVEN BOULEVARD	X	X		X		
PS243	ARMISTEAD GARDENS	5001 E. EAGER STREET	X	X	X			
PS245	LEITH WALK	1235 SHERWOOD AVENUE	X	X	X			
PS245A	LEITH WALK	1235 SHERWOOD AVENUE	X			X		
PS246	BEECHFIELD	301 BEECHFIELD AVENUE	X	X		X		
PS247	CROSS COUNTRY	6100 CROSS COUNTRY BLVD.	X	X		X		
PS248	SINCLAIR LANE	3880 SINCLAIR LANE	X	X		X		
PS249	MEDFIELD HEIGHTS	4300 BUCHANAN AVENUE	X	X	X	X		
PS250	DR. BERNARD HARRIS, SR.	1400 N. CAROLINE STREET	X			X		
PS251	CALLAWAY	3701 FERNHILL AVENUE	X	X				
PS254	DR. MARTIN LUTHER KING, JR.	3750 GREENSPRING AVENUE	X	X		X		
PS255	SOUTHEAST	6820 FAIT AVENUE	X	X		X		
PS256	CALVIN RODWELL	3501 HILLSDALE ROAD		X		X		
PS260	FREDERICK	2501 FREDERICK AVENUE				X		
PS261	LOCKERMAN-BUNDY	301 N. PULASKI STREET		X		X		
PS301	WILLIAM S. BAER ELEMENTARY	2001 WARWICK AVENUE	X	X		X		
PS303	UPTON	811 W. LANVALE	X	X		X		
PS304	HARBOR VIEW ELEMENTARY	4301 10TH AVENUE	X	X	X			
PS307	CLAREMONT ELEMENTARY	5301 ERDMAN AVENUE	X	X		X		

BALTIMORE CITY SCHOOL MANAGEMENT PLAN LIST

ASBESTOS-CONTAINING BUILDING MATERIALS (ACBM) INVENTORY BY BUILDING

BULDING NUMBER *	BUILDING NAME	ADDRESS	FRIABLE ACBM	NON-FRIABLE ACBM	ASSUMED FRIABLE ACBM	ASSUMED NON-FRIABLE ACBM	NO ACBM FOUND	NO SUSPECT MATERIAL
PS310	FERNHILL ELEMENATRY	3915 FERNHILL AVENUE		X		X		
PS313	LOIS T. MURRAY	1600 E. ARLINGTON AVENUE		X		X		
PS314	SHARP-LEADENHALL	150 W. WEST STREET		X		X		
PS315	DR. LILLIE M. JACKSON	1501 ASBURTON STREET		X		X		
PS353A	WOODBURN CENTER	1301 WOODBURN AVE	X	X				
PS400	EDMONDSON	501 N. ATHOL AVENUE	X	X		X		
PS401	NORTHWESTERN	6900 PARK HEIGHTS AVENUE	X	X		X		
PS402	NORTHERN	2201 PINEWOOD AVENUE	X	X		X		
PS403	COB POLYTECH #403	1400 COLDSPRING LANE	X	X		X		
PS405	PATTERSON	100 KANE STREET	X	X		X		
PS406	FOREST PARK	3401 ELDORADO AVENUE		X		X		
PS407	WESTERN	4600 FALLS ROAD	X	X		X		
PS410	MERGENTHALER	3500 HILLEN ROAD	X	X		X		
PS412	SOUTHWESTERN	200 FONTHILL AVENUE	X			X		
PS413	HARBOR CITY LEARNING CTR.	4801 LIBERTY HEIGHTS AVE.	X	X		X		
PS414	PAUL LAURENCE DUNBAR	1400 ORLEANS STREET	X	X		X		
PS415	SCHOOL FOR THE ARTS	706-712 CATHEDRAL STREET	X	X	X	X		
PS420	WEST SIDE SKILLED CENTER	4501 EDMONDSON AVENUE (R)	X	X		X		
PS450	FREDERICK DOUGLAS	2301 GWYNNS FALLS PARKWAY	X			X		
PS451	JOSEPH C. BRESCOE	5506 W. BIDDLE SREET	X	X		X		
PS453	FAIRMOUNT HILL	100 N. ANN STREET	X	X		X		
PS454	CARVER	2201 PRESSTMAN STREET	X	X		X		
PS456	HARFORD INSTITUTE	2555 HARFORD ROAD	X	X		X		
PS457	LAURENCE G. PAQUIN	2200 SINCLAIR LANE		X		X		
PS480	BALTIMORE CITY COLLEGE	3220 THE ALAMEDA	X	X		X		
PS504	REPAIR SHOP	1230 E. 20th ST.	X	X		X		
PS513	KID'S DINER	SARATOGA & HOLIDAY					X	
PS525	WAREHOUSE	1149 E. GRANBY ST.		X				
PS526	XPORTATION GARAGE & OFFICE	1210 E. 20th ST.	X	X		X		
PS534	ELECTRICAL SHOP	1812 GREENMOUNT AVENUE	X	X				
PS540	SCHOOL HEADQUARTERS	200 E. NORTH AVE.					X	
PS556	GROUNDS SHOP	2614 PENNSYLVANIA AVENUE	X	X				
PS557	OFFICE WAREHOUSE (#557)	2200 ROBB STREET	X	X		X		
PS564	BUS XPORTATION GARAGE&OFF.	1601 BRADDISH AVE.		X		X		
PS564A	BUS XPORTATION GARAGE&OFF.	1601 BRADDISH AVE.		X				
PS701	KIRK AV. STADIUM	KIRK & EXETER HALL AVE.	X					

* EACH BUILDING NUMBER IN THIS TABLE REPRESENTS A SEPERATE BUILDING FOR WHICH A MANAGEMENT PLAN WAS PRODUCED. BUILDING NUMBERS ENDING IN "A", "B", etc. REPRESENT AUXILIARY BUILDINGS ON THE SITE OF THE MAIN BUILDING.

REV Sept. 20, 1989

APPENDIX C

RESPONSE ACTION SCHEDULE

SCHOOL NAME: Bentalou Elementary School

NUMBER: PS 150

RESPONSE ACTIONS PER FUNCTIONAL SPACE

FUNCTIONAL SPACE No.	DATE START	DATE OF COMPLETION
01	7/1/96	7/1/97
02	7/1/96	7/1/97
03	7/1/96	7/1/97

All spaces listed above or included in table 9-1 of the management plan.

Start O&M (Operations & Maintenance) activities on July 9, 1989.

O&M activities in each functional space shall be ongoing until the building is renovated or demolished.

AMENDMENT NO. 2

DATED SEPTEMBER 19, 1990

TO

ASBESTOS-CONTAINING
MATERIALS MANAGEMENT
PLAN

DATED MAY 9, 1989

FOR

BENTALOU ELEMENTARY SCHOOL

PS # 150

ISSUED BY THE

BALTIMORE CITY PUBLIC SCHOOLS

ASBESTOS COORDINATOR AND

DESIGNATED LOCAL EDUCATION

AGENCY REPRESENTATIVE

TABLE 1-A
ACM QUANTITIES BY APPLICATION

FOR PS 150

ACM APPLICATION	QUANTITY SQUARE FEET	QUANTITY LINEAR FEET
CEILINGS & WALLS		
SPRAYED-ON		
TILE		
ACOUSTIC PLASTER	5,000	
OTHER PLASTER		
WALLBOARD		
FLOOR COVERINGS	90,000	
MECHANICAL		
PIPE		
ELBOWS & FITTINGS		
BOILERS & BREECHING	500	
TANKS	125	
DUCTWORK	250	
OTHER (GASKETS, FLEXIBLE CONNECTORS, ETC)		
OTHER		
CURTAINS		
FIREDOORS	126	
CEMENT BOARD		

NOTE: FOR LOCATIONS OF ACBM APPLICATIONS, SEE THE PRECEDING TEXT IN THIS SECTION (1.2) AND APPENDIX H.

Marcor of Maryland, Inc.
AHERA Trained Personnel

January, 1989

Name	Date	Cert. #	Hours	Exp. Date
Ronald R. Gaynor	1/30/89	89-0270	08	1/90

February, 1989

Name	Date	Cert. #	Hours	Exp. Date
Mark Jones	2/07/89	89-0304	24	2/90
Robert Quinlan	2/07/89	89-0299	32	2/90
Robert Sparks	2/07/89	89-0305	24	2/90
Shawn Washington	2/15/89	WLA302158808		2/90
Zachary Washington	2/15/89	WLA302158806		2/90

March, 1989

Name	Date	Cert. #	Hours	Exp. Date
O.B. Bounsynhanong	3/23/89	89-0624	24	3/90
Billy Dickerson	3/16/89	89-0552	24	3/90
N. Haneluxay	3/06/89	89-0496	24	3/90
Scott Hartman	3/29/89	89-0665	08	3/90
Yomi Humphrey	3/06/89	89-0503	08	3/90
Jim Kelbaugh	3/29/89	89-0669	08	3/90
Khai Keohanam	3/16/89	89-0571	24	3/90
Phath Keohanam	3/16/89	89-0572	24	3/90
Richard G. Kirvosh	3/06/89	89-0498	08	3/90
Greg Lusk	3/06/89	89-0507	08	3/90
Pairuch Singparu	3/23/89	89-0622	24	3/90
S. Soorinhong	3/06/89	89-0495	08	3/90
Mark Stein	3/16/89	89 0555	24	3/90
Dennis Street	3/06/89	89-0504	08	3/90
Amos Tomlin	3/06/89	89-0499	08	3/90
Vankham Vongsaly	3/23/89	89-0623	24	3/90
Larry Williams	3/06/89	89-0494	08	3/90
F. Zambelli	3/06/89	89-0497	08	3/90
Dolly Wood	3/02/89	89-0446	24	3/90

May, 1989

Name	Date	Cert. #	Hour	Exp. Date
Richard Bennett	5/26/89	89-2275	08	5/90
Brian W. Brown	5/25/89	89-2237	24	5/90
Richard Eikenberg	5/26/89	89-2276	08	5/90

May, 1989

Name	Date	Cert. #	Hours	Exp. Date
L.W. Lucas	5/05/89	89-1885	08	5/90
Reginald Owens	5/01/89	89-1846	24	5/90
Charles O. Pamplin	5/01/89	89-1845	24	5/90
Alan Willis	5/18/89	89-1940	24	5/90

June, 1989

Name	Date	Cert. #	Hours	Exp. Date
Rufus E. Carwell	6/05/89	89-2334	24	6/90
Frederick D. Cobb	6/08/89	89-2337	24	6/90
Harry L. Goode, Sr.	6/06/89	89-2325	24	6/90
Willie C. Guyton	6/15/89	89-2413	24	6/90
Bobby L. Hall	6/22/89	89-2504	24	6/90
Bounthay Homsombath	6/29/89	89-2607	24	6/90
Vilay Homsombath	6/29/89	89-2606	24	6/90
Bobby Jackson	6/01/89	89-2282	24	6/90
Elmer Johnson, Jr.	6/16/89	89-2472	08	6/90
Jack McCargish	6/01/89	89-2285	24	6/90
Gary Nelson	6/05/89	89-2327	24	6/90
Michael Rudensky	6/08/89	89-2338	24	6/90
Lay Sinpraseuth	6/29/89	89-2608	24	6/90
Wendell Smith	6/15/89	89-2398	24	6/90
Roland Summers	6/05/89	89-2332	24	6/90
Clarence Tyson	6/08/89	89-2350	24	6/90
Warren E. Workman	6/05/89	89-2335	24	6/90
Quentin Batts	6/24/89	89-3657	08	6/90
Robert S. Brown	6/29/89	89-3711	08	6/90
Arthur Canada	6/24/89	89-3654	08	6/90
Michael D. Elliott	6/07/89	89-2713	24	6/90
Femi R. Jinadu	6/07/89	89-2706	24	6/90
Paul Jones	6/13/89	89-3582	24	6/90
Terry L. Merchant	6/24/89	89-3642	08	6/90

July, 1990

Name	Date	Cert. #	Hours	Exp. Date
Darryl McCoy	7/29/89	89-3718	08	7/90
Jeffrey McCoy	7/27/89	89-3692	08	7/90
Gardner Parks	7/24/89	89-3653	08	7/90
Willie M. Parson	7/13/89	89-3578	24	7/90
Somphone Pathoumthong	7/29/89	89-3713	08	7/90
Charles Rainey	7/24/89	89-3644	08	7/90
Duane Rainey	7/24/89	89-3645	08	7/90
Frederick J. Scott	7/27/89	89-3689	08	7/90
Yang Song	7/24/89	89-3655	08	7/90

July, 1990

Name	Date	Cert. #	Hours	Exp. Date
Lun Thock	7/29/89	89-3715	08	7/90
William Tyson	7/24/89	89-3647	08	7/90
Sack Vongphakoy	7/27/89	89-3693	08	7/90
Donald T. Wilson	7/19/89	89-3624	08	7/90

August, 1989

Name	Date	Cert. #	Hours	Exp. Date
Joyce Beal	8/17/89	89-4078	24	8/90
Cheri Coffey	8/10/89	89-4002	24	8/90
Thomas Head	8/24/89	89-4119	24	8/90
Donnie Jackson	8/31/89	89-4195	24	8/90
Charles Johnson	8/31/89	89-4191	24	8/90
Keith Jones	8/18/89	89-4097	08	8/90
Gordon Kelly	8/18/89	89-4098	08	8/90
Khamoune Maniphone	8/21/89	89-4108	08	8/90
Deron Maynard	8/21/89	89-4107	08	8/90
Keith Morris	8/17/89	89-4075	24	8/90
Somphone Sirisook	8/21/89	89-4113	08	8/90
Melvin Smith	8/11/89	89-4039	08	8/90
John Stewart	8/17/89	89-4079	24	8/90
George Uzzle, Jr.	8/31/89	89-4194	24	8/90
Keith Williams	8/10/89	89-3993	24	8/90
Edgar Wilson	8/31/89	89-4192	24	8/90
Nathaniel Witherspoon	8/17/89	89-4072	24	8/90
Prince Wobo	8/24/89	89-4115	24	8/90
George Uzzle, Jr.	8/31/89	89-4194	24	8/90

September, 1989

Name	Date	Cert. #	Hours	Exp. Date
Sandford D. Becote	9/14/89	89-4255	24	9/90
Lionel Brown	9/21/89	89-4289	24	9/90
Kevin Davis	9/21/89	89-4288	24	9/90
Edmond Geohagan	9/29/89	89-4359	08	9/90
Kermit Nelson-Bey	9/14/89	89-4266	24	9/90

October, 1989

Name	Date	Cert. #	Hours	Exp. Date
Ocie L. Black, Jr.	10/12/89	89-4404	24	10/90
Allan Daughtry	10/12/89	89-4421	08	10/90
Ronald Harvey	10/20/89	89-4478	08	10/90

October, 1989

Name	Date	Cert. #	Hours	Exp. Date
Joseph H. Jones	10/12/89	89-4407	24	10/90
Obediah U. Nwagbanaoche	10/12/89	89-4409	24	10/90
Sam Boun Phavivong	10/12/89	89-4398	24	10/90
Harry Taylor	10/26/89	89-4484	24	10/90
Eric Tucker	10/26/89	89-4483	24	10/90
Bob Brant				

November, 1989

Name	Date	Cert. #	Hours	Exp. Date
Bounthiem Boutchaleune	11/02/89	89-4580	24	11/90
Bob Brant	11/17/89	89-4716	32	11/90
Bouaphan Inthavong	11/16/89	89-4729	24	11/90
Allen Johnson	11/16/89	89-4732	24	11/90
Jeffrey B. Merson	11/22/89	89-4740	24	11/90
Michael Mote	11/03/89	89-4589	08	11/90
Tim Phavivong	11/02/89	89-4581	24	11/90
Seuy Sayngam	11/16/89	89-4728	24	11/90
Mark C. Smith	11/09/89	89-4891	24	11/90
Bouachan Vilayvong	11/16/89	89-4730	24	11/90
Donald Wilson	11/16/89	89-4731	24	11/90

December, 1989

Name	Date	Cert. #	Hours	Exp. Date
Donald Jackson	12/14/89	89-4879	08	12/90
William G. Jones	12/14/89	89-4818	24	12/90
Thomas A. Kochel	12/14/89	89-4819	24	12/90
B.H. Souvanavong	12/14/89	89-4874	08	12/90
Bill Swaggerty	12/14/89	89-4876	08	12/90

January, 1990

Name	Date	Cert. #	Hours	Exp. Date
Robin Baconis	1/04/90	90-0043	08	1/91
Choi	1/04/90	90-0041	08	1/91
Khamla Khantry	1/04/90	90-0042	08	1/91
Albert Kutz	1/04/90	90-0036	08	1/91
Cha Phimphanh	1/04/90	90-0040	08	1/91
Chanphasouk Thongdygnglat	1/02/90	90-0046	08	1/91

July 1989 TO July 1990

ASBESTOS MANAGEMENT PROGRAM

FIELD INSPECTION LOG OF QUARTERLY SURVEILANCE

FOR SCHOOL P.S. 150

1ST QUARTER INSPECTION

Performed by See Attached Form

Date Performed For October 1989 Inspection

2ND QUARTER INSPECTION

Performed by Richard Somerville

Date Performed 2-14-90

3RD QUARTER INSPECTION

Performed by _____

Date Performed _____

4TH QUARTER INSPECTION

Performed by Richard Somerville

Date Performed 6-26-90

SEE ATTACHED SURVEILANCE REPORT FORMS FOR FINDINGS

FIGURE 7-1. QUARTERLY SURVEILLANCE REPORT FORM

DATE: _____ SURVEYOR: Richard Somerville

SCHOOL NO.: PS150

FUNCTIONAL SPACE	MANAGEMENT AREA DESCRIPTION	CONDITION CHANGE								COMMENTS
		1st Quarter		2nd Quarter		3rd Quarter		4th Quarter		
		Yes	No	Yes	No	Yes	No	Yes	No	
01- Boiler Room	Boiler Block and Trowelled-on Insulation		✓		✓				✓	
	Boiler Breeching Block and Trowelled-on Insulation		✓		✓				✓	
	Hot Water Generator Block and Trowelled-on Insulation		✓		✓				✓	
	(1) Fire Door		✓		✓				✓	
02- Cafeteria and Lobby	Acoustical Plaster		✓		✓				✓	
	Vinyl Asbestos Tile		✓		✓				✓	
	(2) Fire Doors		✓		✓				✓	
03- Auditorium	Acoustical Plaster		✓		✓				✓	
	Vinyl Asbestos Tile		✓		✓				✓	
	(1) Fire Door		✓		✓				✓	

FIGURE 7-1. QUARTERLY SURVEILLANCE REPORT FORM

DATE: _____ SURVEYOR: R Somerville

SCHOOL NO.: PS150

FUNCTIONAL SPACE	MANAGEMENT AREA DESCRIPTION	CONDITION CHANGE								COMMENTS
		1st Quarter		2nd Quarter		3rd Quarter		4th Quarter		
		Yes	No	Yes	No	Yes	No	Yes	No	
04- Classrooms	Vinyl Asbestos Tile		✓		✓				✓	
05- Hallways and Stairwells	Vinyl Asbestos Tile		✓		✓				✓	
			✓		✓				✓	
06- Offices, Work Rooms, and Lounges	Vinyl Asbestos Tile		✓		✓				✓	
			✓		✓				✓	
			✓		✓				✓	
07- Incinerator Room	(1) Fire Door		✓		✓				✓	
			✓		✓				✓	
08- Library	Vinyl Asbestos Tile		✓		✓				✓	
09- Mechanical Room	Duct Mastic		✓		✓				✓	
			✓		✓				✓	
	(1) Fire Door		✓		✓				✓	

INSTRUCTIONS ON ATTACHED AND INCLUDED

TRAINING RECORDS

1. Copies of all training certificates are in the file at the office of the asbestos coordinator. All people on these lists were trained by Aerosol Monitoring and Analysis, Inc. of Hanover, Maryland (1-800-221-1745) (usually referred to AMA).

2. The included and attached lists are personnel of Marcor, Inc. only as they are the primary supplier of services since 1987 thru 1991 of asbestos abatement services.

3. The last list of 17 pages are AHERA trained workers or supervisors that have left Marcor employ. The date of certification is the initial date of training as AHERA workers. The expiration date would be one year after the date of certification. The social security number is used in lieu of the control number to individually track these people since they have left Marcors Employ.

JANUARY, 1990

NAME	DATE	CERT.#	HOURS	EXP. DATE
SHAUN DETER	1/04/90	90-0039	08	1/91
CHA PHIMPHANH	1/04/90	90-0040	08	1/91
C. THONGDYGNGLAT	1/04/90	90-0046	08	1/91

FEBRUARY, 1990

NAME	DATE	CERT.#	HOURS	EXP. DATE
HUMPHREY YOMEL SONGURO	2/02/90	90-0420	08	3/90
EDWIN MERRITT	2/20/90	90-0490	32	2/91
MARK STEIN	2/09/90	90-0448	08	2/90
AMED NIAZ HAZEL	2/01/90	90-0363	24	2/91
KENNETH SCHROEDER	2/24/90	90-0493	24	2/91
ZACHARY WASHINGTON	2/27/90	90-0533	08	2/91

MARCH, 1990

NAME	DATE	CERT.#	HOURS	EXP. DATE
SCOTT HARTMAN	3/27/90	90-0749	08	3/91
FRANK ZAMBELLI	3/13/90	90-0643	08	3/91
YOMI HUMPHREY SOGURO	3/13/90	90-0629	08	3/91
RONALD HARVEY	3/13/90	90-0636	08	3/91
MARK STEIN	3/13/90	90-0644	08	3/91
LARRY WILLIAMS	3/13/90	90-0633	08	3/91
ROBERT GILL	3/29/90	90-0731	24	3/91
JIM KELBAUGH	3/13/90	90-0631	08	3/91
KHAI KEOHANAM	3/13/90	90-0635	08	3/91
PHATH KEOHANAM	3/13.90	90-0634	08	3/91
RICHARD KRIVOSH	3/27/90	90-0745	08	3/91
PAIRUCH SINGPARU	3/27/90	90-0743	08	3/91
ROBERT SPARKS	3/13/90	90-0630	08	3/91
VANKHAM VONGSALY	3/13/90	90-0640	08	3/91
WILLIAM WALRATH	3/01/90	90-0527	24	3/91

APRIL, 1990

NAME	DATE	CERT.#	HOURS	EXP. DATE
ROBERT FRANKLIN	4/19/90	90-0891	24	4/91
DAVID HILTON	4/19/90	90-0869	24	4/91

MAY, 1990

NAME	DATE	CERT.#	HOURS	EXP. DATE
LOU LUCAS	5/08/90	90-1002	08	5/91
RICHARD BENNETT	5/08/90	90-1003	08	5/91
RICK EIKENBERG	5/08/90	90-0999	08	5/91
CHRIS CHRISTIAN	5/08/90	90-1001	08	5/91
JACK MCCARGISH	5/22/90	90-1109	08	5/91
CHARLES PAMPLIN	5/08/90	90-0998	08	5/91
LINDA SCHROEDER	5/03/90	90-0956	24	5/91
EDWARD WLADKOWSKI	5/31/90	90-1210	24	5/91

JUNE, 1990

NAME	DATE	CERT.#	HOURS	EXP. DATE
CHARLES ARMSTRONG	6/26/90	90-1490	24	6/91
RUFUS CARWELL	6/20/90	90-1427	08	6/91
HARRY GOODE, SR.	6/12/90	90-1343	08	6/91
BOUNTHAY HOMSOMBATH	6/12/90	90-1360	08	6/91
VILAY HOMSOMBATH	6/12/90	90-1361	08	6/91
BOBBY JACKSON	6/12/90	90-1354	08	6/91
STEVE LOMBARDI	6/28/90	90-1491	24	6/91
WAYNE OLSON	6/21/90	90-1395	24	6/91
AMPHONE PHIMPHANH	6/26/90	90-1484	08	6/91
MICHAEL RUDENSKY	6/12/90	90-1352	08	6/91
ROLAND SUMMERS	6/12/90	90-1342	08	6/91

JULY, 1990

NAME	DATE	CERT.#	HOURS	EXP. DATE
FREDERICK SCOTT	7/31/90	90-1940-R-S	08	7/91
DANIEL BOND	7/17/90	90-1753-W	24	7/91
KEVIN FOLKENRATH	7/26/90	90-1859-W	24	7/91
BILL GOOD	7/12/90	90-1645-W	24	7/91
FEMI JINADU	7/05/90	90-1605-R-W	08	7/91
PAUL JONES	7/05/90	90-1617-R-W	08	7/91
ADAM KENDALL	7/19/90	90-1768-W	24	7/91
ALAN KLOCK	7/26/90	90-1863-W	24	7/91
WILLIAM NEILL	7/19/90	90-1942-W	24	7/91
SOMPHONE PATHOUMTHONG	7/17/90	90-1821-R-W	08	7/91

JULY, 1990

NAME	DATE	CERT.#	HOURS	EXP. DATE
PHET PHOUKIEO	7/26/90	90-1866-W	24	7/91
DUANE RAINEY	7/17/90	90-1818-R-W	08	7/91
YANG SONG	7/17/90	90-1820-R-W	08	7/91
JOHN TERRY	7/19/90	90-1767-W	24	7/91
DONALD WOLFE	7/05/90	90-1618-R-W	08	7/91
CHARLES RAINEY	7/17/90	90-1819-R-W	08	7/91

AUGUST, 1990

NAME	DATE	CERT.#	HOURS	EXP. DATE
JOYCE BEAL	8/28/90	90-2250-R-W	08	8/91
KEVIN BERG	8/14/90	90-2041-W	24	8/91
CHERI COFFEY	8/14/90	90-2060-R-W	08	8/91
TYRON GILES	8/02/90	90-1951-W	24	8/91
KENNETH HOWARD	8/23/90	90-2149-W	24	8/91
EVERETT HUTCHINS	8/02/90	90-1965-W	24	8/91
DONNIE JACKSON	8/28/90	90-2262-R-W	08	8/91
GEORGE LAZZARO	8/09/90	90-2012-W	24	8/91
KHAMOUNE MANIPHONE	8/14/90	90-2063-R-W	08	8/91
RICHARD MANGUM	8/02/90	90-1972-W	24	8/91
BERNARD MILLER	8/02/90	90-1968-W	24	8/91
KEITH MORRIS	8/14/90	90-2057-R-W	08	8/91
MICHAEL NELSON	8/17/90	90-2044-S	32	8/91
SOMPHONE SIRISOVK	8/14/90	90-2072-R-W	08	8/91
BOUALAY THEPSOUVANH	8/02/90	90-1961-W	24	8/91
SOMBOUN THEPSOUVANH	8/02/90	90-1952-W	24	8/91
RONALD TOLBERT	8/02/90	90-1969-W	24	8/91
GEORGE UZZLE	8/14/90	90-2081-R-W	08	8/91
NATHANIEL WITHERSPOON	8/14/90	90-2068-R-W	08	8/91

SEPTEMBER, 1990

NAME	DATE	CERT.#	HOURS	EXP. DATE
ROBERT GILL	9/21/90	90-2388-S	32	9/91
KENNETH HOWARD	9/14/90	90-2342-V	08	9/91
JOHN MESSLER	9/20/90	90-2387-W	24	9/91

MARCOR OF MARYLAND, INC.
AHERA TRAINED PERSONNEL

JANUARY, 1989

NAME	DATE	CERT.#	HOURS	EXP. DATE
C. THONGDYGENELET	1/30/89	89-0268	08	1/90
CHA PHINPHOMU	1/30/89	89-0263	08	1/90
KHAMLA KHANTRY	1/06/89	89-0117	08	1/90
ROBIN BALONIS	1/13/89	89-0127	08	1/90
CHOI	1/30/89	89-0269	08	1/90

FEBRUARY, 1989

NAME	DATE	CERT.#	HOURS	EXP. DATE
RICK EIKENBERG	2/07/89	89-0303	24	2/90

MARCH,1989

NAME	DATE	CERT.#	HOURS	EXP. DATE
RICHARD BENNETT	3/29/90	89/0670	08	3/90

MAY, 1989

NAME	DATE	CERT.#	HOURS	EXP. DATE
CHRIS CHRISTIAN	5/5/89	89-1860	32	5/90

JUNE, 1989

NAME	DATE	CERT.#	HOURS	EXP. DATE
AMPHON PHIMPHANH	6/29/89	89-2605	24	6/90

JULY, 1989

NAME	DATE	CERT.#	HOURS	EXP. DATE
MICHAEL MOTE	7/29/89	89-3709	08	7/90
FEMI JINADU	7/07/89	89-2706	24	7/90
PAUL JONES	7/13/89	89-3582	24	7/90
DONALD WOLFE	7/12/89	6855-ST	24	7/90

OCTOBER, 1989

NAME	DATE	CERT.#	HOURS	EXP. DATE
RENZO CRUZ	10/26/89	89-10-26-01	32	10/90

MARCOR OF MARYLAND, INC.
AHERA TRAINED PERSONNEL

JANUARY, 1988

NAME	DATE	CERT.#	HOURS	EXP. DATE
GARDNER PARKS	1/19/88	88-063	24	1/89
KHAMLA KHANTRY	1/19/88	88-059	24	1/89
PATH KEOHANAN	1/21/88	88-032	24	1/89
B. H. SOUVANNAVONG	1/14/88	88-038	24	1/89

FEBRUARY, 1988

NAME	DATE	CERT.#	HOURS	EXP. DATE
CHOI	2/18/88	88-061	24	2/89
CHA PHIMPHANH	2/18/88	88-207	24	2/89
C. THONGDYGENELET	2/18/88	88-202	24	2/89

MARCH, 1988

NAME	DATE	CERT.#	HOURS	EXP. DATE
FRANK ZAMBELLI	3/15/88	88-271	32	3/89

APRIL, 1988

NAME	DATE	CERT.#	HOURS	EXP. DATE
LOU LUCAS	4/12/88	88-650	32	4/89
RICHARD BENNETT	4/09/88	88-04-10-02E	24	4/89
HUMPHREY YOMEL	4/09/88	88004-10-01E	24	4/89
LARRY WILLIAMS	4/09/88	88-04-10-17E	32	4/89
RICHARD KRIVOSH	4/16/88	88-04-10-05E	24	4/89

JUNE, 1988

NAME	DATE	CERT.#	HOURS	EXP. DATE
GARDNER PARKS	6/10/88	88-778	08	6/89

JULY, 1988

NAME	DATE	CERT.#	HOURS	EXP. DATE
FRED SCOTT	7/22/88	88-952	32	7/89
SOMPHONE PATHOUMTHONE	7/17/88	88-960	24	7/89
YANG SONG	7/17/88	88-956	24	7/89

AUGUST, 1988

NAME	DATE	CERT.#	HOURS	EXP. DATE
MICHAEL MOTE	8/13/88	88-1018	24	8/89
SYSALEUMSACK VONGSHSKDY	8/08/88	88-08-08-07E	32	8/89
MANIPHONE KHAMOUNE	8/14/88	88-1020	24	8/89
CHARLES RAINEY	8/14/88	88-1033	24	8/89
DUANE RAINEY	8/14/88	88-1034	24	8/89
SOMPHONE SIRISOUK	8/14/88	88-1015	24	8/89

DECEMBER, 1988

NAME	DATE	CERT.#	HOURS	EXP. DATE
ROBIN BALONIS	12/21/88	88-1783	08	12/89
KHAMLA KHANTRY	12/21/88	88-1785	08	12/89
S. VONGPHAKDY	12/21/88	88-1786	08	12/89
PHATH KEOHANAM	12/21/88	88-1789	08	12/89
B. H. SOUVANNAVONG	12/21/88	88-1781	08	12/89

AMENDMENT NO. 3

DATED SEPTEMBER 27, 1991

TO

ASBESTOS-CONTAINING

MATERIALS MANAGEMENT

PLAN

DATED MAY 9, 1989

FOR

SCHOOL NO. 150

SCHOOL NAME: BENTALOU ELEMENTARY

NOTE: NO ASBESTOS RESPONSE ACTIONS

FOR SCHOOL FOR PERIOD

REPORTED UNDER THIS

AMENDMENT

ISSUED BY THE

BALTIMORE CITY PUBLIC SCHOOLS

ASBESTOS COORDINATOR AND

DESIGNATED LOCAL EDUCATION

AGENCY REPRESENTATIVE

ASBESTOS UPDATING

AMENDMENT #3

INTRODUCTION

These amendments are issued annually to update the asbestos management plan for each building under control of the Baltimore City Public Schools.

Contents of each annual amendment will include asbestos response actions for the building if any, a table 1A containing the remaining quantities of asbestos containing material in the building if there was an asbestos response action at the building that removed asbestos, a copy of the surveillance logs for the building done at a minimum of a semi-annual basis and any other pertinent information. An asbestos response action shall include any work to clean up asbestos in response to a major or minor fiber release episode, or any work action to remove, encapsulate, enclose or repair asbestos containing materials.

Persons reading this amendment are encouraged to read the asbestos management plan to thoroughly understand the location and extent of asbestos containing materials in the building.

PLEASE POST PLEASE POST

BALTIMORE CITY PUBLIC SCHOOLS

ASBESTOS PROGRAM

NOTICE TO SCHOOL BUILDING VISITORS AND OCCUPANTS (TEACHERS, STUDENTS, OPERATING ENGINEERS AND CUSTODIAL PERSONS) OF ASBESTOS MANAGEMENT PLAN AMENDMENT NUMBER 3 AND AVAILABILITY OF ASBESTOS MANAGEMENT PLANS FOR INSPECTION.

An amendment to the school Asbestos Management Plan has been appended to the management plans for asbestos to be kept in the building administrative office. This is amendment number three (3) and is dated September 27, 1991. This amendment is available for inspection by making request to the building principal.

EPA Rules for school buildings required:

(1) We maintain records on asbestos in each school,

(2) Inform our building occupants and visitors on asbestos in each school building of locations of and response actions for asbestos in each school,

(3) Give right-of-entry to EPA and State of Maryland Environmental Inspectors.

Failure to fulfill the above may result in serious civil and possible criminal penalties assessed against the City for failing to perform the above including possible criminal penalties against persons who willfully avoid the EPA Rules.

If the Asbestos Management Plan and the Amendments to it are not available in your school from your principal report it to Director of Facilities on 396-8665 immediately.

August 1990 TO August 1991

ASBESTOS MANAGEMENT PROGRAM

FIELD INSPECTION LOG OF QUARTERLY SURVEILANCE

FOR SCHOOL P.S. 150

1ST QUARTER INSPECTION

Performed by 1-9-91

Date Performed Richard Somerville

2ND QUARTER INSPECTION

Performed by Richard Somerville

Date Performed 4-10-91

3RD QUARTER INSPECTION

Performed by Richard Somerville

Date Performed 8-16-91

4TH QUARTER INSPECTION

Performed by _____

Date Performed _____

SEE ATTACHED SURVEILANCE REPORT FORMS FOR FINDINGS

FIGURE 7-1. QUARTERLY SURVEILLANCE REPORT FORM

DATE: 1-9-91

SCHOOL NO.: PS150

SURVEYOR: Richard Somerville

FUNCTIONAL SPACE	MANAGEMENT AREA DESCRIPTION	CONDITION CHANGE								COMMENTS
		1st Quarter		2nd Quarter		3rd Quarter		4th Quarter		
		Yes	No	Yes	No	Yes	No	Yes	No	
01- Boiler Room	Boiler Block and Trowelled-on Insulation	✓			✓		✓			Asbestos removed and recovered
		✓			✓		✓			〃 〃
	Boiler Breeching Block and Trowelled-on Insulation	✓			✓		✓			〃 〃
		✓			✓		✓			〃 〃
	Hot Water Generator Block and Trowelled-on Insulation	✓			✓		✓			〃 〃
		✓			✓		✓			〃 〃
	(1) Fire Door		✓		✓		✓			
02- Cafeteria and Lobby	Acoustical Plaster		✓		✓		✓			
			✓		✓		✓			
	Vinyl Asbestos Tile		✓		✓		✓			
	(2) Fire Doors		✓		✓		✓			
03- Auditorium	Acoustical Plaster		✓		✓		✓			
	Vinyl Asbestos Tile		✓		✓		✓			
	(1) Fire Door		✓		✓		✓			

Bentalou Elementary School PS150
(0629k)

FIGURE 7-1. QUARTERLY SURVEILLANCE REPORT FORM

DATE: 1-9-91

SURVEYOR: Richard Somerville

SCHOOL NO.: PS150

FUNCTIONAL SPACE	MANAGEMENT AREA DESCRIPTION	CONDITION CHANGE								COMMENTS
		1st Quarter		2nd Quarter		3rd Quarter		4th Quarter		
		Yes	No	Yes	No	Yes	No	Yes	No	
04- Classrooms	Vinyl Asbestos Tile		✓		✓		✓			
05- Hallways and Stairwells	Vinyl Asbestos Tile		✓ ✓		✓ ✓		✓ ✓			
06- Offices, Work Rooms, and Lounges	Vinyl Asbestos Tile		✓ ✓ ✓		✓ ✓ ✓		✓ ✓ ✓			
07- Incinerator Room	(1) Fire Door		✓ ✓		✓ ✓		✓ ✓			
08- Library	Vinyl Asbestos Tile		✓		✓		✓			
09- Mechanical Room	Duct Mastic		✓ ✓		✓ ✓		✓ ✓			
	(1) Fire Door		✓		✓		✓			

Bentalou Elementary School PS150
(0629k)

TABLE 1-A
ACM QUANTITIES BY APPLICATION

FOR PS 150

ACM APPLICATION	QUANTITY SQUARE FEET	QUANTITY LINEAR FEET
CEILINGS & WALLS		
SPRAYED-ON		
TILE		
ACOUSTIC PLASTER	5,000	
OTHER PLASTER		
WALLBOARD		
FLOOR COVERINGS	90,000	
MECHANICAL		
PIPE		
ELBOWS & FITTINGS		
BOILERS & BREECHING	500	
TANKS	125	
DUCTWORK	250	
OTHER (GASKETS, FLEXIBLE CONNECTORS, ETC)		
OTHER		
CURTAINS		
FIREDOORS	126	
CEMENT BOARD		

NOTE: FOR LOCATIONS OF ACBM APPLICATIONS, SEE THE PRECEDING TEXT IN THIS SECTION (1.2) AND APPENDIX H.

NAME	CERTIFICATION	PHYSICAL	FIT TEST
Aberneth, Shane	04/12/90	03/27/90	04/12/90
Arendt, Michael	05/17/90	05/09/90	05/17/90
Arendt, Shirley	05/17/90	05/09/90	05/17/90
Armstrong, Charles	06/28/90	06/15/90	06/28/90 01/24/91
Ausherman, Earl	07/26/90	07/27/90	07/26/90
Balonis, Robin	01/22/91	07/30/90 08/02/91	01/22/91 07/18/91
Beal, Joyce	08/28/90	09/07/90	08/28/90
Bennett, Richard	05/08/90 05/21/91	06/01/90 02/22/91	09/17/90 03/14/91
Berg, Kevin	08/16/90	08/03/90	08/16/90
Blankenship, Ronald	05/17/90	05/11/90	05/17/90
Blizzard, Wilson	06/28/90	06/18/90	06/28/90
Bond, Daniel	07/19/90	07/09/90	07/19/90
Bounsynhavong, Outhine	03/27/90	08/18/89	02/15/90
Boutchaleune, Bounthiem	11/02/89	10/24/89	11/02/89
Braxton, Roland	08/09/90	07/30/90	08/09/90
Bryan, Claiborne	07/26/90	07/19/90	07/26/90
Carliss, Donald	03/22/90	02/16/90	03/22/90
Carwell, Rufus	06/20/90	05/30/90	06/20/90 12/21/90
Choi	01/22/91	02/08/91	08/06/90 01/22/91 07/18/91
Cline, Chris	06/20/90	06/20/90	07/25/90
Coffey, Cheri	08/14/90	09/05/90	08/14/90 02/21/91
Conner, Sean	07/26/90	07/16/90	07/26/90
Coombs, Bryon	06/28/90	06/18/90	06/28/90

NAME	CERTIFICATION	PHYSICAL	FIT TEST
DeMinds, Thomas	07/06/90	06/28/90	07/06/90
Deter, Shaun	01/04/90	02/12/90	08/06/90
Dickerson, Billy	03/27/90	03/24/90	03/08/90
Douglas, Charles	07/19/90	07/11/90	07/19/90
Dunlap, Joseph	07/28/90	05/31/91	06/06/91
Eikenberg, Richard	05/08/90	10/31/90	05/08/90 11/29/90 05/09/91
Fisher, Steven	06/13/90 06/04/91	06/13/90	07/25/90 06/06/91
Folkenroth, Kevin	07/24/90 07/16/91	07/18/90 07/30/91	07/26/90 01/10/91 07/18/91
Fordney, Matthew	06/20/90	06/20/90	07/25/90
Franklin, Robert	04/09/91	04/10/91	10/17/90 04/11/91
Gaff, Mark	08/23/90	08/13/90	08/23/90
Giles, Tyron	08/02/90	07/23/90	08/02/90
Gill, Robert	10/21/90	03/19/91	09/17/90
Good, William	07/12/90	07/06/90	07/12/90 01/24/91
Goode, Harry	06/12/90 06/04/91	06/06/90 06/25/91	06/12/90 12/23/90 06/06/91
Guyton, Willie	06/15/89	06/07/89	12/07/89
Hamulack, Michael	07/27/90	07/18/90	07/26/90
Hartman, Scott	03/26/91	04/25/91	09/17/90 03/14/91
Harvey, Ronald	03/12/91	03/20/91	09/17/90 03/14/91
Hawthorne, William	08/02/90	07/12/90	08/02/90
Hazel, Amed	02/26/91	01/22/91	08/06/90 02/28/91

NAME	CERTIFICATION	PHYSICAL	FIT TEST
Hellams, Christopher	07/31/90	07/20/90	08/02/90
Heyn, Kenneth Jr.	07/24/90	07/13/90	07/26/90
Hilton, David	03/09/91	04/11/91	10/24/90 04/11/91
Hogate, William	07/24/90	07/16/90	07/26/90
Homsombath, Bounthay	06/12/90 06/18/91	06/21/90 06/25/91	06/12/90 12/21/90 06/06/91
Homsombath, Vilay	06/12/90 06/18/91	06/21/90 06/25/91	06/12/90 12/21/90 06/06/91
Howard, Kenneth	08/23/90 09/14/90	07/20/90	08/23/90
Howell, Kenneth	11/27/90	11/26/90	11/29/90
Humphrey, Sogunro Yomi	03/12/91	07/31/90 07/22/91	09/19/90 03/14/91
Hutchins, Everett	08/02/90 07/30/91	07/24/90 07/31/91	08/02/90 07/08/91
Jackson, Bobby	06/12/90	06/20/90	06/12/90 12/21/90
Jackson, Donnie	08/28/90	08/23/90	08/28/90
Jinadu, Femi	07/05/90 07/30/91	06/19/90 06/25/91	07/05/90 01/09/91 07/18/91
Johnson, Charles	08/31/89	08/21/89	02/02/90
Johnson, Elmer	06/16/89	10/17/89	08/06/90
Johnson, Willie	07/19/90	07/12/90 05/09/91	07/19/90 05/10/91
Jones, Keith	08/18/89	12/20/89	03/08/90
Jones, Mark	03/13/90	06/07/90	01/03/90
Jones, William E.	06/27/91	06/18/91	06/27/91
Jones, William G.	12/14/89	12/05/89	12/14/89

NAME	CERTIFICATION	PHYSICAL	FIT TEST
Kelbaugh, James	03/12/91	05/18/91	07/19/90 01/10/91 07/18/91
Kendall, Adam	07/19/90	07/11/90	07/19/90
Kenney, William Morgan	07/26/90	07/16/90	07/26/90
Keohanam, Khai	03/12/91	03/14/90	09/17/90 03/14/91
Keohanam, Phath	03/12/91	08/17/90	09/17/90 04/11/91
Khantry, Khamla	01/22/91	03/01/91	09/17/90 01/22/91 07/18/91
Kimbrough, Jessie	12/03/90	07/29/91	08/08/91
Klock, Alan	07/24/90 07/16/91	07/19/90 07/19/91	07/26/90 01/10/91 07/18/91
Knecht, Frank	09/29/90	08/06/90 07/11/91	09/27/90 03/18/91
Kochel, Thomas	12/14/89	11/28/89	12/14/89
Krivosh, Richard	03/12/91	02/28/91	09/17/90 03/14/91
Kutz, Albert	01/04/90	02/26/90	08/09/90
Lang, Robert	05/24/91	05/14/91	06/06/91
Lazzaro, George Jr.	08/09/90	07/31/90	08/09/90
Leigh, Michael	07/26/90	07/18/90	07/26/90
Leuthongchak, Savang	01/11/90	01/08/90	01/11/90
Lombardi, Michael	06/28/90 06/04/91	06/20/90 06/25/91	06/28/90 01/04/91 06/06/91
Lozzi, Christopher	06/20/91	07/03/91	06/20/91
Lucas, L. W.	05/08/90 05/07/91	09/11/90	10/24/90 04/11/91
Mangum, Richard	08/02/90	07/24/90	08/02/90

NAME	CERTIFICATION	PHYSICAL	FIT TEST
Maniphone, Khamoune	08/14/90	03/22/91	08/22/90 02/21/91
Maynard, Deron	08/21/89	04/04/90	01/03/90
McBride, Bill	06/26/90	04/01/90	07/12/90
McBride, Jimmie	05/02/91	06/04/91	07/12/91
McCargish, Jack	05/22/90	06/06/90	05/22/90
	05/10/91	06/25/91	11/29/90 05/09/91
Mejia, Jose	08/02/90	07/18/90	08/02/90
Merritt, Edwin	02/26/91	02/22/91	08/06/90 02/28/91
Merson, Jeffrey	11/20/90	11/30/90	05/10/90 09/20/90 11/20/90
Messler, John	09/20/90	09/17/90	09/20/90 03/20/91
Miller, Bernard	08/02/90	07/26/90	08/02/90
Morris, Keith	08/14/90	08/21/90	08/14/90 02/25/91
Mote, Michael	08/14/90	06/21/90 07/05/91	08/06/90 02/21/91
Neff, Robert	07/12/90	07/06/90	07/12/90
Nelson, Gary	06/12/90	06/21/90	06/12/90
Nelson, Michael	08/17/90	07/24/90 07/18/91	08/16/90 02/21/91
Nwagbaraocha, Obediah	10/09/90	10/26/90	10/26/90 04/11/91
Olson, Wayne	06/21/90 06/04/91	06/18/90 06/25/91	06/21/90 12/21/90 06/06/91
O'Neill, William	07/19/90	07/09/90	07/19/90 01/10/91

NAME	CERTIFICATION	PHYSICAL	FIT TEST
Pamplin, Charles	05/08/90 05/21/91	04/11/91	05/08/90 11/29/90 05/09/91
Parks, Gardner	07/31/90 07/16/91	08/01/90	07/19/90 01/10/91 07/18/91
Parson, Willie	07/13/89	07/10/89	03/29/90
Pathoumthong, Somphone	07/17/90 07/16/91	04/04/90 04/10/91	08/01/90 02/21/91
Patrick, John	07/11/91	06/26/91	07/18/91
Phelps, David	08/02/90	07/24/90	08/02/90
Phengsomphone, Bounthiem	04/09/91	07/09/91	07/18/91
Phimphanh, Amphone	06/26/90 06/04/91	06/28/90 06/27/91	06/26/90 12/21/90 06/06/91
Phimphanh, Cha	01/22/91	02/28/91	08/06/90 01/22/91 07/18/91
Phoukieo, Phet	07/26/90	06/28/90	06/26/90
Phoumy, Pe	11/20/90	08/03/90	08/06/90 11/20/90
Phoutthachone, Paul	12/13/90	07/09/91	08/18/91
Prince, Kenneth Jr.	07/26/90	07/12/90	07/26/90
Raines, Ronnie	07/26/90	07/19/90	07/26/90
Rainey, Charles	07/17/90 07/16/91	07/25/90 07/19/91	08/06/90 02/21/91
Rainey, Ouane	07/17/90 07/16/91	07/25/90 07/19/91	08/06/90 06/06/91
Robinson, Wesley	06/20/91	06/07/91	06/20/91
Rodriguez, Luis	10/25/89	07/08/90	07/19/90
Roland, James	08/02/90	07/17/90	08/02/90
Rudenisky, Michael	06/12/90	06/19/90	08/08/90
Rush, David	07/19/90	07/09/90	07/19/90

NAME	CERTIFICATION	PHYSICAL	FIT TEST
Sayngam, Seuy	11/16/89	08/21/89	11/16/89
Schmidbauer, Ian	03/15/90	03/08/90	03/15/90
Schroeder, Kenneth	02/26/91	02/28/91	08/06/90 02/28/91
Schroeder, Linda	05/03/90	04/30/90	05/03/90 11/29/90
Scott, Frederick	07/31/90	08/05/91	07/31/90 01/10/91
Sharper, Jerry	07/19/90	07/12/90	07/19/90
Sienkielewski, Raymond	05/10/90	04/30/90	05/10/90
Simmons, Steven	07/19/90	07/11/90	07/19/90
Singparu, Pairuch	05/07/91	04/19/91	09/17/90 05/09/91
Sinpraseuth, Lay	06/12/90 06/18/91	10/30/90 06/25/91	06/12/90 12/21/90 06/06/91
Sirisouk, Somphone	08/14/90	08/22/90	07/19/90 01/10/91
Smith Carl	07/06/90	06/27/90	07/06/90
Song, Yang	07/17/90 07/16/91	06/22/90 06/25/91	08/06/90 02/21/91
Sourinhong, Soumphontphakdy	03/13/90	10/17/89	04/19/90
Souvannavong, B. H.	12/11/90	03/22/91	07/19/90 01/10/91 07/18/91
Sparks, Robert	03/13/90	06/08/90	07/25/90
Stanley, Troy	05/31/90 06/04/91	05/30/91	06/06/91
Stein, Mark	03/12/91	03/20/91	09/19/90 03/28/91
Stout, Brian	04/90	09/13/90	09/17/90
Stout, Leonard Jr.	08/02/90	07/26/90	08/02/90

NAME	CERTIFICATION	PHYSICAL	FIT TEST
Street, Dennis	03/01/91	07/26/90 07/31/91	10/26/90 05/01/91
Summers, Roland	06/12/90 06/04/91	05/18/90 05/22/91	06/12/90 12/21/90 06/06/91
Terry, John	07/19/90	07/06/90	07/19/90
Thepsouvanh, Boualay	08/02/90	07/30/90 07/17/91	08/02/90 02/21/91
Thepsouvanh, Somboun	08/02/90	07/30/90 07/19/91	08/02/90 02/21/91
Thongdygnalat, Chanphasouk	01/22/91	07/30/90 07/31/91	08/06/90 01/22/91 07/18/91
Tolbert, Ronald	08/02/90	07/26/90	08/02/90
Tomlin, Amos	03/27/90	08/24/90	03/27/90
Tran, Hung	07/12/90	06/29/90	07/12/90
Tucker, Eric	10/26/89	10/13/89	04/19/90
Tyson, William	07/17/90	04/04/91	09/17/90 03/14/91
Uzzle, George	08/14/90	08/15/90	08/14/90 02/21/91
Vilayvong, Bouachan	11/16/89	08/21/89	11/16/89
Vines, James	07/11/91	07/03/91	07/11/91
Vitkauskas, Richardas	07/26/90	07/19/90	07/26/90
Vongphakdy, Sysaleumsack	07/17/90 07/16/91	02/28/91	08/15/90 02/28/91
Vongsaly, Vankham	03/26/91	08/05/90	10/17/90 04/11/91
Walrath, William	11/30/90	02/27/91	09/17/90 11/29/90 05/09/91
Washington, Zachary	02/26/91	04/05/91	09/17/90 03/14/91
Weiss, George	07/26/90	07/18/90	07/26/90

NAME	CERTIFICATION	PHYSICAL	FIT TEST
Williams, Larry	03/12/91	02/28/91	09/17/90 03/14/91
Williams, Richard	06/19/91	07/19/91	07/17/91
Wilson, Donald	11/20/90	07/27/90 07/18/91	05/24/90 11/20/90 05/13/91
Witherspoon, Nathaniel	08/14/90	08/17/90	08/14/90 02/21/91
Wladkowski, Edward	05/31/90	06/01/90	05/31/90 11/29/90
Wolfe, Donald	07/05/90 07/01/91	06/12/90 07/19/91	07/05/90 07/14/91
Zambelli, Frank	02/26/91	11/20/90	05/17/90 11/20/90 02/28/91
Zaremba, Drew	08/23/90	08/20/90	08/30/90 06/27/91

AHERA ACTIONS

Project Name: Bentalou Elem. #150 BA0381

Project Start: 11-7-90 Project End: 11-9-90

Reason for the Action:

Patch + Repair

Written Description of Action and Methods:

See Daily Job Reports

Name and Address of Contractor:

Matcor of Maryland Licence Number M21-003-005

Hunt Valley, Maryland 21030

State of Accreditation: Maryland

Accreditation Number: Chris Christian (President) 90-1001, 89-1860

Date of Expiration: May 8, 1991, May 5, 1989

List of Employees on job, Accreditation Numbers and Expiration date:

Mike Mote Frank Knecht

Bill Walrath L.W. Lucas

Robert Gill Richard Krivosh

Kevin Berg George Lazzaro

George Uzzie Jr

Location of Disposal site, Waste Manifest Included:

Pulaski Landfill, Somerset, Ky. # 9034

NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.	Manifest Document No.	2. Page 1 of	9034
5 2 1 4 9 5 8 5 2			

3. Generator's Name and Mailing Address
SEE BELOW

P.O. # 4937

4. Generator's Phone ( )

5. Transporter 1 Company Name	6. US EPA ID Number
United Compactors, Inc.	

7. Transporter 2 Company Name	8. US EPA ID Number

9. Designated Facility Name and Site Address
~~Alray Landfill~~ Pulaski Landfill, Inc
~~4910 Sands Road~~ 4145 Hwy 27
~~Lothian, Md. 20711~~ Somerset Ky

10. US EPA ID Number

A. Transporter's Phone
B. Transporter's Phone
C. Facility's Phone

11. Waste Shipping Name and Description	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol
a. BA0 384 School 95	56	Bags		
BA1 402 Poly Western	1	Bag		
~~BA1 401 Fairfield Fire Department~~	~~1~~	~~Bag~~		
b. BA0 343 School 456	259	Bags		
BA0 203 Museum Archives	83	Bags		
~~BA1 EXE 008 GSA~~	~~8~~	~~Bags~~		
c. BA1 008 GSA	112	Bags		
BA1 395 Bath House	2	Bags	1 Bdle	
~~BA0 383 Poly Western~~	~~2~~	~~Bags~~		
d. BA0 381 School 150	24	Bags		
BA0 389 Pimlico Middle School	28	Bags		
~~BA0 380 School 75~~	~~24~~	~~Bags~~		

D. Additional Descriptions for Materials Listed Above
BA1 006 Graham Residence

E. Handling Codes for Wastes Listed Above
33 Bags

15. Special Handling Instructions and Additional Information
TRL # 48174

16. GENERATOR'S CERTIFICATION: I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.

Printed/Typed Name	Signature	Month	Day	Year
Marcor of Maryland	Judy Hilton 11/16/90 Marcor	11	16	90

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year
United Compactors, Inc.		11	16	90

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of waste materials covered by this manifest except as noted in Item 19.

Printed/Typed Name	Signature	Month	Day	Year
	R. Stogsdill	12	17	90

GENERATOR — TRANSPORTER — FACILITY

ORIGINAL — RETURN TO GENERATOR

☑ T & M
☐ CONTRACT
CUSTOMER JOB # _____
CHARGE No.: _____

LOCATION DESCRIPTION: Boiler Room

DAILY JOB REPORT

JOB NUMBER BAO-381 DAY Wednesday DATE 11-7-90

JOB NAME Bentalou Elem. Sch #150 ADDRESS 220 N. Bentalou St. SUPERVISOR Mike Mote

Mike Mote	Sup.	1500	2330	8.0	Michael Mote
Bill Walrath	Sup.	1500	2330	8.0	
Robert Gill	Sup.	1500	2330	8.0	
Kevin Berg	Tech.	1530	2330	7.50	
George Uzzle Jr.	Tech.	1500	2330	8.0	
Frank Knecht	A.D.M.	1500	1630	1½	
L. W. Lucas	A.D.M.	2000	2130	1.50	
CARPENTRY					
Bill Walrath	Tech			2.0	Bill Walrath
Kevin Berg	Tech.			2.0	Kevin Berg
Richard C Knivosk	Driver	3:00	3:30	.5	
AIR TECH NAME: Paul Green Sr.	I.H.	1500	2330	8.0	AIR TECH SIGNATURE:

MATERIAL USED

ITEM	QTY.	ITEM	QTY.	ITEM	QTY.
Bags	200	Glue	24 can	Surfac.	1 Qt.
81 Bags		L. Bulbs	10	Tape	48 roll
82 Bags		Mop Heads	2	32-20	
G. Bags	15	Paint		32-21	
Lrg. Box Filt.	6	Pins		32-22	5 Gal
Sm. Box Filt.	3	Poly	3 roll	32-32	20 Gal
P. Brushes	4	Lrg. Pre. Filt.	12	Towels	1 cs.
W. Brushes	2	Sm. Pre. Filt.	6	Sm. Tubes	
Cassettes		Propane		Varsol	
Drums		Rags	50 Lb	Blk. Poly	1
Ex. Duct	1 roll	Rewet.	1 roll	Nails	5 Lb.
84-18		Ribbon	1 roll	Sock Filters	4
Comfo. Fil.		Scrapers		Soap Tube	1
PAPR. Fil.		Signs	8	Stick Pins	30
Fab. Glass		Stickers		Paint Covers	4
Gloves		Suits	75		

MATERIAL USED

ITEM	QTY.	ITEM	QTY.	ITEM	QTY.
Bags		Glue	7 cans	Surfac.	
81 Bags		L. Bulbs		Tape	14 roll
82 Bags		Mop Heads		32-20	
G. Bags		Paint		32-21	
Lrg. Box Filt.		Pins		32-22	
Sm. Box Filt.		Poly	1½ roll	32-32	
P. Brushes		Lrg. Pre. Filt.	1	Towels	
W. Brushes		Sm. Pre. Filt.		Sm. Tubes	
Cassettes		Propane		Varsol	
Drums		Rags		Blk. Poly	¼ roll
Ex. Duct		Rewet.		Nails	3 Lb.
84-18		Ribbon			
Comfo. Fil.		Scrapers			
PAPR. Fil.		Signs	1		
Fab. Glass		Stickers			
Gloves		Suits			

TIME OF DELIVERY: 3:00 PM DELIVERED BY: Richard C Knivosk MILEAGE: 50

EQUIPMENT USED

ITEM	QTY.	I.D. No.:	ITEM	QTY.	I.D. No.:	ITEM	QTY.	I.D. No.:
Chain			Nozzle	1		Airlss. Sp.		
Drill			Air Pump			Squeegie	1	
Ext. Cord	6		Shwr. Pump			3 Stage	1	Wood
Gang Box	1	#2	Hand Saw	1		Filt Unit	1	
Generator			Cir Saw	1		N.A. Unit	3	#64, 54, mini #18
Hnd. Sprayr.	2		Scrw. Gun			81 Vac		
Hose	5		Shovel	1		82 Vac	1	#14
Ladders	4	2-6', 2-8'	Shower	1	Complete	W/D Vac	3	#12, 36, 24
Str. Lts.	2		MISC.			Owner's or Representative's Signature:		
Locks			"Y" Connector - 1			Supervisor's Signature: Michael Mote		
Mop Set	1		Paint Pans & Rollers - 3					

– OVER –

DESCRIPTION OF WORK AREA: Boiler Room

DESCRIPTION OF WORK PERFORMED: After we unloaded the material and equipment from the truck and took it into the boiler room I had everyone seal up the windows, doors and vents with two layers of poly. After most of the windows were sealed with poly three people started building the three stage airlock out of wood then covering it with two layers of poly sealing it with tape and glue, then setting the shower into place. The other person finished sealing up the last window then hooked up the negative air units exuasting them out the windows. When the setup was complete everyone picked up the trash poly and pieces of tape putting them inside disposal bags then tapping up the bags.

AIR MONITORING COMPANY: I.H. Services

BY WHOM: N/A

GENERAL COMMENTS: The boiler room we are working in is a clean well kept room.

AMOUNT OF DISPOSAL: N/A	ASBESTOS IN WORK AREA NOT PART OF SCOPE: ☐ YES ☒ NO
PRESSURE DIFFERENTIAL READING:	ASBESTOS HANDLED BY OTHERS: ☐ YES ☒ NO
SAMPLING INFORMATION (AIR/BULK)	IF YES, FILL OUT FORM
SAMPLE TYPE QUANT. SAMPLE No. RESULT	VISITORS TO SITE: N/A
PRELIM.	
I.W.A. N/A	
O.W.A.	
PERSONAL	DELAY: ☐ YES ☒ NO BY WHOM:
BULK	MAN HOURS LOST:
FINAL	REASON FOR DELAY:
VERIFICATION BY WHOM:	
☐ VERBAL ☐ WRITTEN	
DATE: TIME:	

DEFINED WORK AREAS: Boiler Room

SPECIFICS WORK PERFORMED: After we unloaded the material and equipment from the truck and took it into the boiler room I had everyone seal up the windows, doors and vents with two layers of poly. After most of the windows were sealed with poly three people started building the three stage airlock out of wood then covering it with two layers of poly sealing it with tape and glue, then setting the shower into place. The other person finished sealing up the last window then hooked up the negative air units exuasting them out the windows. When the setup was complete everyone picked up the trash poly and pieces of tape putting them inside disposal bags then tapping up the bags.

AIR MONITORING COMPANY: I.H. Services

ISSUES: N/A

GENERAL COMMENTS: The boiler room we are working in is a clean well kept room.

SPECIAL NOTES / VISITORS

AMOUNT OF DISPOSAL: N/A	ASBESTOS IN WORK AREA NOT PART OF SCOPE: ☐ YES ☒ NO
PRESSURE DIFFERENTIAL READING:	ASBESTOS HANDLED BY OTHERS: ☐ YES ☒ NO
SAMPLING INFORMATION (AIR/BULK)	IF YES, FILL OUT FORM
SAMPLE TYPE QUANT. SAMPLE No. RESULT	VISITORS TO SITE: N/A
PRELIM.	
I.W.A. N/A	
O.W.A.	
PERSONAL	DELAY: ☐ YES ☒ NO BY WHOM:
BULK	MAN HOURS LOST:
FINAL	REASON FOR DELAY:
VERIFICATION BY WHOM:	
☐ VERBAL ☐ WRITTEN	
DATE: TIME:	

☑ T & M
☐ CONTRACT
CUSTOMER JOB # _____
CHARGE No.: _____

LOCATION DESCRIPTION: Boiler Room

DAILY JOB REPORT

JOB NUMBER BAO-381 DAY Thursday DATE 11-8-90

JOB NAME Bentalou Elem. Sch. #150 ADDRESS 220 N. Bentalou St. SUPERVISOR Mike Mote

Mike Mote	Sup.	16.30	23.30	6.50	Michael Mote
Bill Walrath	Sup.	1500	2330	8.0	Bill Walrath
Kevin Berg	Tech.	1500	2330	8.0	Kevin G. Berg
George Uzzle Jr.	Tech.	1500	2330	8.0	George Uzzle
Frank Knecht	A.O.M.	1900	1945	.75	Frank Knecht
AIR TECH NAME: Paul Green Jr.	E.H.	1500	2330	8.0	AIR TECH SIGNATURE: Paul Green

ITEM	QTY.	ITEM	QTY.	ITEM	QTY.
Bags		Glue		Surfac.	
81 Bags		L. Bulbs		Tape	
82 Bags		Mop Heads		32-20	
G. Bags		Paint		32-21	
Lrg. Box Filt.		Pins		32-22	
Sm. Box Filt.		Poly		32-32	
P. Brushes		Lrg. Pre. Filt.		Towels	
W. Brushes		Sm. Pre. Filt.		Sm. Tubes	
Cassettes		Propane		Varsol	
Drums		Rags			
Ex. Duct		Rewet.			
84-18		Ribbon			
Comfo. Fil.		Scrapers			
PAPR. Fil.		Signs			
Fab. Glass		Stickers			
Gloves		Suits			

ITEM	QTY.	ITEM	QTY.	ITEM	QTY.
Bags		Glue		Surfac.	1/2 pt
81 Bags		L. Bulbs		Tape	10 roll
82 Bags		Mop Heads		32-20	
G. Bags		Paint		32-21	
Lrg. Box Filt.	2	Pins		32-22	
Sm. Box Filt.		Poly		32-32	3 Gal
P. Brushes	2	Lrg. Pre. Filt.	2	Towels	
W. Brushes		Sm. Pre. Filt.		Sm. Tubes	
Cassettes	1	Propane		Varsol	
Drums		Rags	10 lb.	Paint Covers	2
Ex. Duct		Rewet.	1/2 roll		
84-18		Ribbon			
Comfo. Fil.		Scrapers			
PAPR. Fil.		Signs			
Fab. Glass		Stickers			
Gloves		Suits	17		

TIME OF DELIVERY: DELIVERED BY: MILEAGE:

ITEM	QTY.	I.D. No.:	ITEM	QTY.	I.D. No.:	ITEM	QTY.	I.D. No.:
Chain			Nozzle	1		Airlss. Sp.		
Drill			Air Pump			Squeegie	1	
Ext. Cord	10		Shwr. Pump			3 Stage	1	wood
Gang Box	1	#2	Hand Saw	1		Filt Unit	1	
Generator			Cir Saw	1		N.A. Unit	3	#64, 54, mini #18
Hnd. Sprayr.	2		Scrw. Gun			81 Vac		
Hose	5		Shovel	1		82 Vac	1	#14
Ladders	4	2-6', 2-8'	Shower	1	Complete	W/D Vac	3	#12, 36, 24
Str. Lts.	2		MISC.			Owner's or Representative's Signature:		
Locks			"Y" Connector - 1			Supervisor's Signature: Michael Mote		
Mop Set	1		Paint Pans + Rollers - 3					

- OVER -

[redacted] Boiler Room

[redacted] After everyone had suited up and went in the workarea two people started covering the water tank with rewetable and the other person started patching the pipes and damaged spots on the boilers. When all the patch and repair work was done two people started painting the rewet with 32-32 and the other person started wet wiping the floor cleanning up any debris on the floor.

[redacted] I.H. Services

[redacted] N/A

[redacted] We rewrapped the water tank, patched any damaged pipes we found and patched damaged places on the boilers.

[redacted]

AMOUNT OF DISPOSAL: N/A ☒	ASBESTOS IN WORK AREA NOT PART OF SCOPE: ☐ YES ☒ NO
PRESSURE DIFFERENTIAL READING:	ASBESTOS HANDLED BY OTHERS: ☐ YES ☒ NO
SAMPLING INFORMATION (AIR/BULK)	IF YES, FILL OUT FORM
SAMPLE TYPE QUANT. SAMPLE No. RESULT	VISITORS TO SITE: N/A
PRELIM.	
I.W.A. 1 001	
O.W.A.	
PERSONAL G. Uzzle Jr.	DELAY: ☐ YES ☒ NO BY WHOM:
BULK	MAN HOURS LOST:
FINAL	REASON FOR DELAY:
VERIFICATION BY WHOM:	
☐ VERBAL ☐ WRITTEN	
DATE: TIME:	

DEFINED WORK AREAS: Boiler Room

SPECIFIC WORK PERFORMED: After everyone had suited up and went in the workarea two people started covering the water tank with rewetable and the other person started patching the pipes and damaged spots on the boilers. When all the patch and repair work was done two people started painting the rewet with 32-32 and the other person started wet wiping the floor cleanning up any debris on the floor.

EQUIPMENT FURNISHED BY: I.H. Services

OTHER: N/A

REMARKS: We rewrapped the water tank, patched any damaged pipes we found and patched damaged places on the boilers.

N/A

AMOUNT OF DISPOSAL: N/A	ASBESTOS IN WORK AREA NOT PART OF SCOPE: ☐ YES ☒ NO
PRESSURE DIFFERENTIAL READING:	ASBESTOS HANDLED BY OTHERS: ☐ YES ☒ NO
SAMPLING INFORMATION (AIR/BULK)	IF YES, FILL OUT FORM
SAMPLE TYPE QUANT. SAMPLE No. RESULT	VISITORS TO SITE: N/A
PRELIM.	
I.W.A. 1 001	
O.W.A.	
PERSONAL G. Uzzle Jr.	DELAY: ☐ YES ☒ NO BY WHOM:
BULK	MAN HOURS LOST:
FINAL	REASON FOR DELAY:
VERIFICATION BY WHOM:	
☐ VERBAL ☐ WRITTEN	
DATE: TIME:	

☒ T & M
☐ CONTRACT
CUSTOMER JOB # _____
CHARGE NO.: _____

LOCATION DESCRIPTION: Boiler Room

DAILY JOB REPORT

JOB NUMBER BAD-381 DAY Friday DATE 11-9-90

JOB NAME Bentalou Elem. Sch. #150 ADDRESS 220 N. Bentalou St. SUPERVISOR Mike Mote

Mike Mote	Sup.	0800	1630	8.0	Michael Mote
Bill Walrath	Sup.	0800	1630	8.0	Bill Walrath
Kevin Berg	Tech.	0800	1630	8.0	Kevin Berg
George Uzzle Jr.	Tech.	0800	1630	8.0	George Uzzle Jr.
George Lazzaro	Tech.	0800	1630	8.0	George Lazzaro
Ed Wladkowski	T/D	11:45	2:00	2.25	Ed Wladkowski
AIR TECH NAME: Paul Greco Jr.	I.H.	0800	1630	8.0	AIR TECH SIGNATURE: Paul Greco

USED

ITEM	QTY.	ITEM	QTY.	ITEM	QTY.
Bags		Glue		Surfac.	
81 Bags		L. Bulbs		Tape	
82 Bags		Mop Heads		32-20	
G. Bags		Paint		32-21	
Lrg. Box Filt.		Pins		32-22	
Sm. Box Filt.		Poly		32-32	
P. Brushes		Lrg. Pre. Filt.		Towels	
W. Brushes		Sm. Pre. Filt.		Sm. Tubes	
Cassettes		Propane		Varsol	
Drums		Rags			
Ex. Duct		Rewet.			
84-18		Ribbon			
Comfo. Fil.		Scrapers			
PAPR. Fil.		Signs			
Fab. Glass		Stickers			
Gloves		Suits			

USED

ITEM	QTY.	ITEM	QTY.	ITEM	QTY.
Bags	48	Glue		Surfac.	1/2 pt.
81 Bags		L. Bulbs		Tape	
82 Bags		Mop Heads	1	32-20	
G. Bags		Paint		32-21	
Lrg. Box Filt.	2	Pins		32-22	1/2 Gal
Sm. Box Filt.		Poly		32-32	
P. Brushes		Lrg. Pre. Filt.	2	Towels	
W. Brushes		Sm. Pre. Filt.		Sm. Tubes	
Cassettes		Propane		Varsol	
Drums		Rags	15 Lb.		
Ex. Duct		Rewet.			
84-18		Ribbon			
Comfo. Fil.	4	Scrapers			
PAPR. Fil.		Signs			
Fab. Glass		Stickers			
Gloves		Suits	8		

TIME OF DELIVERY: DELIVERED BY: MILEAGE:

EQUIPMENT

ITEM	QTY.	I.D. No.:	ITEM	QTY.	I.D. No.:	ITEM	QTY.	I.D. No.:
Chain			Nozzle	2		Airlss. Sp.		
Drill			Air Pump			Squeegie	1	
Ext. Cord	6		Shwr. Pump			3 Stage	1	wood
Gang Box	1	#2	Hand Saw	1		Filt Unit	1	
Generator			Cir. Saw	1		N.A. Unit	3	#64, 54, mini #18
Hnd. Sprayr.	2		Scrw. Gun			81 Vac		
Hose	5		Shovel	1		82 Vac	1	#14
Ladders	4	2-6', 2-8'	Shower	1	Complete	W/D Vac	3	#12, 36, 24
Str. Lts.	2		MISC.			Owner's or Representative's Signature:		
Locks			"Y" Connector - 1			Supervisor's Signature: Michael Mote		
Mop Set	1		Paint Pans + Rollers - 3					

– OVER –

DEFINED WORK AREA: Boiler Room

SPECIFIC WORK PERFORMED: Everyone suited up went in the work area and started wet wipping everything and cleanning the floor. After we were done and encapsulated the area with 32-22 the hygienist suited up and went in the area to set up his pumps and run finals. After he had run the finals he then took the samples to his office to have them analyzed, then he called and said the area had passed, we started tearing down the area putting the poly in disposal bags. When the truck arrived we loaded our material, equipment and dispasal waste in the truck and then we left the building.

ABATEMENT FIRM COMPANY: I.H. Services

OTHER TRADES: N/A

GENERAL COMMENTS: I walked back threw the boiler room to make sure we have got everything.

AMOUNT OF DISPOSAL: 24 q.y. W	ASBESTOS IN WORK AREA NOT PART OF SCOPE: ☐ YES ☒ NO
PRESSURE DIFFERENTIAL READING:	ASBESTOS HANDLED BY OTHERS: ☐ YES ☒ NO
SAMPLING INFORMATION (AIR/BULK)	IF YES, FILL OUT FORM
SAMPLE TYPE QUANT. SAMPLE No. RESULT	VISITORS TO SITE: N/A
PRELIM.	
I.W.A. N/A	
O.W.A.	
PERSONAL	DELAY: ☐ YES ☒ NO BY WHOM:
BULK	MAN HOURS LOST:
FINAL	REASON FOR DELAY:
VERIFICATION BY WHOM:	
☐ VERBAL ☐ WRITTEN	
DATE: TIME:	

DEFINED WORK AREAS: Boiler Room

SPECIFIC WORK PERFORMED: Everyone suited up went in the workarea and started wet wipping everything and cleanning the floor. After we were done and encapsulated the area with 32-22 the hygienist suited up and went in the area to set up his pumps and run finals. After he had run the finals he then took the samples to his office to have them analyzed, then he called and said the area had passed, we started tearing down the area putting the poly in disposal bags. When the truck arrived we loaded our material, equipment and disposal waste in the truck and then we left the building.

AIR MONITORING COMPANY: I.H. Services

QUALIFIED BY: N/A

GENERAL COMMENTS: I walked back threw the boiler room to make sure we have got everything.

AMOUNT OF DISPOSAL: 24 C.Y. W	ASBESTOS IN WORK AREA NOT PART OF SCOPE: ☐ YES ☒ NO
PRESSURE DIFFERENTIAL READING:	ASBESTOS HANDLED BY OTHERS: ☐ YES ☒ NO
SAMPLING INFORMATION (AIR/BULK)	IF YES, FILL OUT FORM
SAMPLE TYPE QUANT. SAMPLE No. RESULT	VISITORS TO SITE: N/A
PRELIM.	
I.W.A. N/A	
O.W.A.	
PERSONAL	DELAY: ☐ YES ☒ NO BY WHOM:
BULK	MAN HOURS LOST:
FINAL	REASON FOR DELAY:
VERIFICATION BY WHOM:	
☐ VERBAL ☐ WRITTEN	
DATE: TIME:	

AHERA ACTIONS I.H. INFORMATION

Name of person collecting air sample: PAUL GREEN JR

Signature:

Date: 11-7-90 ~ 11-9-90

Location: BONTALOU ES #150 BA0381

Name and address of analyzing lab:

I H Services, Inc., 1521 Edgewood Street, Baltimore, Md., 21224

Date of Analysis: 11-13-90, 11-9-90

Method: NIOSH 7400

Results: SEE DATA SHEETS

Name of Analysis: Anthony Mitchell, Randall Kimmett

Signature:

Statement that Lab. meets applicable requirements:

IH Services, meets the applicable requirementrs of 40 CFR Part 763 Section 763.90 (i)-(2) (ii). The American Idustrial Hygiene Association Proficiency Analytical Tesring Laboratory number is 21224-002. All other laboratories used by IH Services, Inc., for the analysis of samples also meet the applicable requirements of 40 CFR Part 763 Section 763.90 (i) (2) (ii)

I H SERVICES, INC.

1521 Edgewood Street — Suite J • Baltimore, Maryland 21227

PHONE: (301) 644-9400
FAX (301) 644-9402

DAILY OBSERVATIONS

DATE: 11/7/90

INSPECTOR: Paul GREEN Jr.

SITE: Bentalou (ES) #150
220 N. Bentalou St
Balto. Md 21223

TITLE: Industrial Hygienist

PURPOSE OF VISIT: To perform air monitoring in designated work area The boiler room.

GENERAL OBSERVATIONS:

Arrived on site. Marco's personnel put barriers up, over the doors and windows. They built a three stage air lock.

The scope of work is patch and repair approx. 65 SQ.Ft. of tank insulation and 27 LN. Ft. of pipe insulation.

I took a preliminary air sample inside the area.

THIS COPY IS FOR PAGE TWO

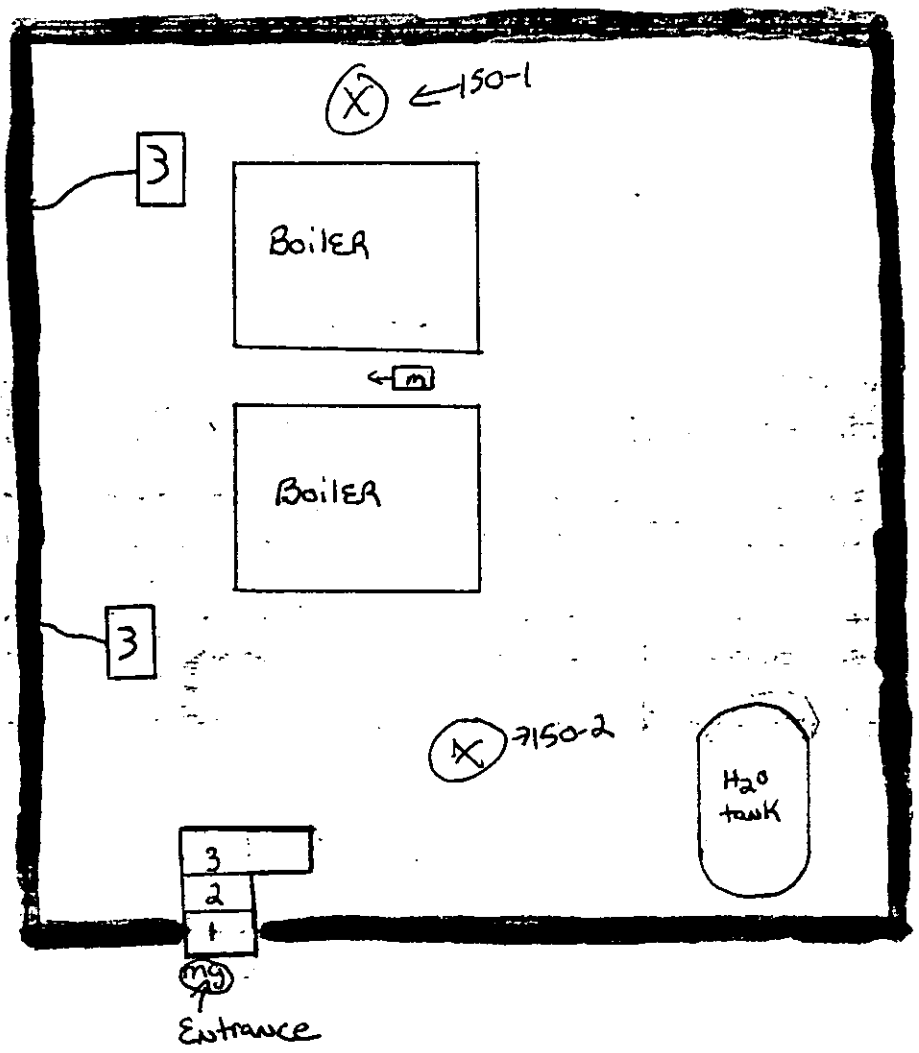
DATE: 11/7/90

GENERAL OBSERVATIONS CONTINUED:

Bentalou (ES) #150
220 Bentalou St.
Balto. Md. 21223

W
S ← → N
E

Boiler Room (Basement level)



Key:

m = Microtrap

m - Minitrap

1 2 3 = Decon

mg = magnahelic gauge

air samples - (X)

150-1 - Preliminary

152-2 Preliminary

I H SERVICES, INC.

1521 Edgewood Street — Suite J • Baltimore, Maryland 21227

PHONE: (301) 644-9400
FAX (301) 644-9402

AIR MONITORING DATA SHEET

Project: Bentalou (ES) #150
Address: 220 N. Bentalou St.
Date: 11/7/90
Activity: Air Monitoring
Job Number: BA-0-381
Work Order Number:

SAMPLED FOR:

	METHOD	CASSETTE	FILTER
☒ Asbestos:	☒ 7400 ☐ TEM	☒ 25mm ☐ 37mm	☒ MCE ☐ PC
☐ Airborne Dust:			
☐ Gas:			
☐ Vapor:			
☐ Other:			

Analytical Method: _____ Ambient Temp.: _____

Protection Worn During Sampling:

	Employee	IH
Full Body Coveralls	☒	☒
Respirator - Air Purifying	☒	☒
Respirator - Power Air Purifying	☐	☐
Respirator - Supplied Air	☐	☐

PERSONAL SAMPLING DATA

Employee Sampled:
Social Security Number:
Smoker: ☐ Yes ☐ No N/A
Job Function:
Description of Activity:

Signature of Employee:

LAB ID	SAMPLE NO.	SAMPLE DATE	RESULTS FIBERS/CC	SAMPLE LOCATION
1617	150-1	11/7/90	<0.005	Preliminary - inside boiler room. (west side of room).
1616	150-2	11/7/90	<0.010 Seeds Abs	PRELIMINARY AIR SAMPLE — INSIDE WORK AREA EAST SIDE OF BOILER ROOM

FIELD SAMPLE NUMBER	TEST PERIOD START	STOP	TOTAL (MIN.)	FLOW RATE SETTING (LITERS/MIN.) START	STOP	VOLUME LITERS	SAMPLE TYPE AMBIENT	AREA	FINAL	PERSONAL	SAMPLE LOCATION IN WORK AREA	OUTSIDE WORK AREA	N/A	INSTRUMENT SERIAL NUMBER
150-1	1610	1810	120	11.8	11.8	1416		✓			✓			G-3
150-2	2000	2100	(60)	11.8	11.8	708		✓			✓			G-3

Comments: See diagram for location of air samples.

Inspector: Robert Green Jr. (PRINT NAME)
Robert Green (SIGNATURE)
Date: 11/7/90

I H SERVICES, INC.

1521 Edgewood Street — Suite J • Baltimore, Maryland 21227

PHONE: (301) 644-9400
FAX (301) 644-9402

CHAIN OF CUSTODY FOR MICROSCOPY SERVICES

No 1714

Submittal Date: 11/7/90 Submitted By: (Print) Paul GREEN JR (Sign) Paul Green Jr

Client Name: Marcor

Address: Hunt Valley, Md 21030

Telephone: (301) 785-2525

Results Required By: 11 / 8 / 90

Number of Samples: 2

Project Name: Bentalou (ES) #150

Address: 220 N. Bentalou St. Balto. Md. 21223

Contact Person: Mike Mertz

Before Noon? ☐ Yes ☑ No

Type of Samples: ☒ Air ☐ Bulk ☐ Wipe ☐ Other:

Release Criteria: ☐ AHERA ☒ 0.010 f/cc ☐ % Asbestos ☐ Other:

LAB ID	SAMPLE NUMBER	DATE	VOLUME (Liters)	METHOD (Check) PCM	PLM	TEM	SEM	OTHER
7677	#150-1	11/7/90	1470	✓				Preliminary
7678	150-2	11/7/90	708	✓				" "

Relinquished By: (Signature)	Date	Relinquished By: (Signature)	Date
Paul Green Jr	11/7/90		
Name: (Printed)	Time	Name: (Printed)	Time
Paul Green Jr			
Received By: (Signature)	Date	Received By: (Signature)	Date
R. Kimmett	11-8-90		
Name: (Printed)	Time	Name: (Printed)	Time
R. KIMMETT	0900		

LABORATORY STAFF ONLY: (CUSTODY)

1. Date/Time Received 11 / 8 / 90 @ 0900 by (Print) Anthony Mitchell R. KIMMETT Sign Anthony Mitchell
2. Date/Time Analyzed 11 / 13 / 90 @ 1230 by (Print) " Sign "
3. Date/Time Reported 11 / 13 / 90 @ 1230 by (Print) " Sign "
4. Results Reported To Randall Kimmett by (Print) " Sign "

I H SERVICES, INC.

1521 Edgewood Street — Suite J • Baltimore, Maryland 21227

PHONE: (301) 644-9400
FAX (301) 644-9402

DAILY OBSERVATIONS

DATE: NOV- 8, 1990

INSPECTOR: Paul GREEN JR

SITE: Bentalou (ES) #150
220 N. Bentalou St.
Balto. Md. 21223

TITLE: Industrial Hygienist

PURPOSE OF VISIT:

To perform air monitoring and pre-abatement visual inspection of boiler room.

GENERAL OBSERVATIONS:

Arrived on site. I performed a pre-abatement visual inspection of the boiler room. After Marcor workers fixed all barriers that I found unsatisfactory, they proceeded with work.

Marcor workers patched and repaired the water tank and the boilers, also all damaged pipe covering.

THIS COPY IS FOR PAGE TWO

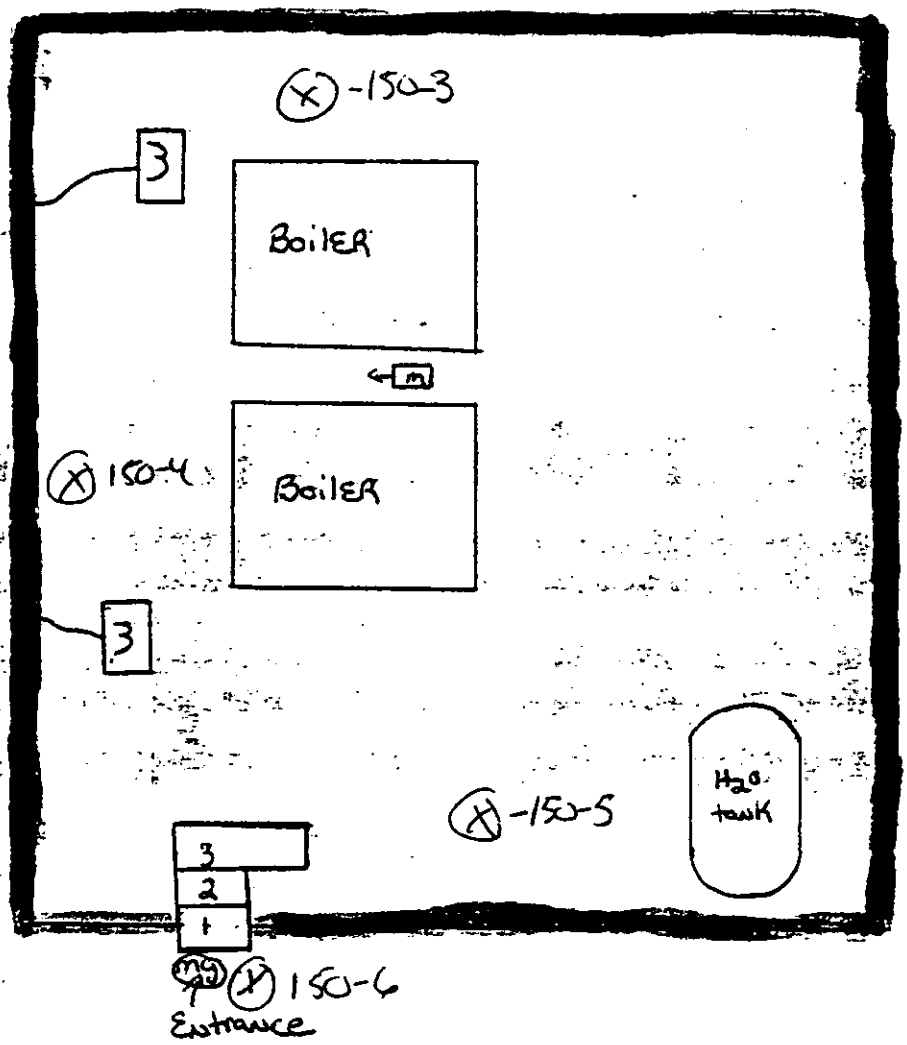
DATE: 11/8/90

GENERAL OBSERVATIONS CONTINUED:

Bentalou (ES) #150
220 Bentalou St.
Balto. Md. 21223

W
S ← → N
E

Boiler Room (Basement level)



Key:

m = Microtrap

m - Minitrap

1 2 3 = Decon

mg = magnahelic gauge

air samples - (X)

150-3
150-4
150-5
150-6
150-7
150-7A (blank QC)

(X) 150-7

I H SERVICES, INC.

1521 Edgewood Street — Suite J • Baltimore, Maryland 21227

PHONE: (301) 644-9400
FAX (301) 644-9402

AIR MONITORING DATA SHEET

Project: Bentalou (ES) #150
Address: 220 N. Bentalou St.
Date: 11/8/90
Activity: Air Monitoring
Job Number: BA-0-381
Work Order Number:

SAMPLED FOR:

- [X] Asbestos: METHOD [X] 7400 [ ] TEM; CASSETTE [X] 25mm [ ] 37mm; FILTER [X] MCE [ ] PC
- [ ] Airborne Dust:
- [ ] Gas:
- [ ] Vapor:
- [ ] Other:

Analytical Method: _____ Ambient Temp.: _____

Protection Worn During Sampling:

	Employee	IH
Full Body Coveralls	[X]	[X]
Respirator - Air Purifying	[X]	[X]
Respirator - Power Air Purifying	[ ]	[ ]
Respirator - Supplied Air	[ ]	[ ]

PERSONAL SAMPLING DATA

Employee Sampled: Bill Walrath
Social Security Number: 215-58-5165
Smoker: [X] Yes [ ] No
Job Function:
Description of Activity: Patch inspect boilers
Signature of Employee: [signature]

LAB ID	SAMPLE NO.	SAMPLE DATE	RESULTS FIBERS/CC	SAMPLE LOCATION
7679	150-3	11/8/90	< .010	area - inside on west side of boiler room
7680	150-4	11/8/90	< .010	area - inside on south side of area
7681	150-5	11/8/90	.10 < 0.10	area sample - inside on southeast corner
7682	150-6	11/8/90	< 0.005	area - outside by air lock
7683	150-7	11/8/90	< 0.005	ambient
7684	150-7A	11	0 fibers in 100 fields	BLANK (Q.C.)

FIELD SAMPLE NUMBER	TEST PERIOD START	TEST PERIOD STOP	TEST PERIOD TOTAL (MIN.)	FLOW RATE SETTING START (LITERS/MIN.)	FLOW RATE SETTING STOP (LITERS/MIN.)	VOLUME LITERS	SAMPLE TYPE AMBIENT	SAMPLE TYPE AREA	SAMPLE TYPE FINAL	SAMPLE TYPE PERSONAL	SAMPLE LOCATION IN WORK AREA	SAMPLE LOCATION OUTSIDE WORK AREA	SAMPLE LOCATION N/A	INSTRUMENT SERIAL NUMBER
150-3	1525	1725	120	5.9	5.9	708		✓			✓			G-3
150-4	1730	1930	120	5.9	5.9	708		✓			✓			G-3
150-5	1745	2230	270	2.4	2.4	648		✓			✓			MSA-3
150-6	2000	2200	120	10.0	10.0	1200		✓				✓		G-5
150-7	2030	2230	120	10.0	10.0	1200	✓					✓		G-3
150-7A	—	—	0	—	—	0		✓					✓	—

Comments: See diagram for location of air samples.

Inspector: Paul Greenstein (PRINT NAME)
Paul Greenstein (SIGNATURE)
Date: 11/8/90

I H SERVICES, INC.

1521 Edgewood Street — Suite J • Baltimore, Maryland 21227

PHONE: (301) 644-9400
FAX (301) 644-9402

CHAIN OF CUSTODY FOR MICROSCOPY SERVICES

No 1706

Submittal Date: 11/8/90 Submitted By: (Print) Paul Green Jr (Sign) Paul Green Jr

Client Name: Mason of Md

Address: Hunt Valley, Md. 21030

Telephone: (301) 785-2525

Project Name: Bentalou #150 (ES)

Address: 220 Bentalou St. Balto. md. 21223

Contact Person: Mike Mote

Results Required By: 11 / 8 / 90

Before Noon? ☐ Yes ☐ No

Number of Samples: 6

Type of Samples: ☒ Air ☐ Bulk ☐ Wipe ☐ Other:

Release Criteria: ☐ AHERA ☒ 0.010 f/cc ☐ % Asbestos ☐ Other:

LAB ID	SAMPLE NUMBER	DATE	VOLUME (Liters)	METHOD (Check) PCM	PLM	TEM	SEM	OTHER
7679	#150-3	11/8/90	708	✓				inside Green
7680	#150-4	↓	708	✓				inside
7681	#150-5		648	✓				inside
7682	#150-6		1200	✓				outside
7683	#150-7		1200	✓				outside
7684	150-7A		0	✓				blank (QC)

Relinquished By: (Signature)	Date	Relinquished By: (Signature)	Date
Paul Green Jr.	11/8/90		
Name: (Printed)	Time	Name: (Printed)	Time
Paul Green, Jr.			
Received By: (Signature)	Date	Received By: (Signature)	Date
R. Kimmett	11-9-90		
Name: (Printed)	Time	Name: (Printed)	Time
R. KIMMETT	0900		

LABORATORY STAFF ONLY: (CUSTODY)

1. Date/Time Received 11 / 9 / 90 @ 0900 by (Print) Anthony Mitchell R. KIMMETT Sign Anthony Mitchell
2. Date/Time Analyzed 11 / 13 / 90 @ 1230 by (Print) " Sign "
3. Date/Time Reported 11 / 13 / 90 @ 1230 by (Print) " Sign "
4. Results Reported To Randall Kimmett by (Print) " Sign "

I H SERVICES, INC.

1521 Edgewood Street — Suite J • Baltimore, Maryland 21227

PHONE: (301) 644-9400
FAX (301) 644-9402

DAILY OBSERVATIONS

DATE: 11/9/90

INSPECTOR: Paul Green J.C.

SITE: Beantalon (ES) #150
220 N. Beantalon St
Balto. Md. 21223

TITLE: Industrial Hygienist

PURPOSE OF VISIT:

To perform air monitoring and inspection in designated work area, The boiler room. Also, perform final inspection of work area.

GENERAL OBSERVATIONS:

Arrived on site. Marco's personnel finished final cleaning the boiler room.

I performed a final visual inspection, then took final air samples.

Notification was given to the supervisor to remove all barriers.

THIS COPY IS FOR PAGE TWO

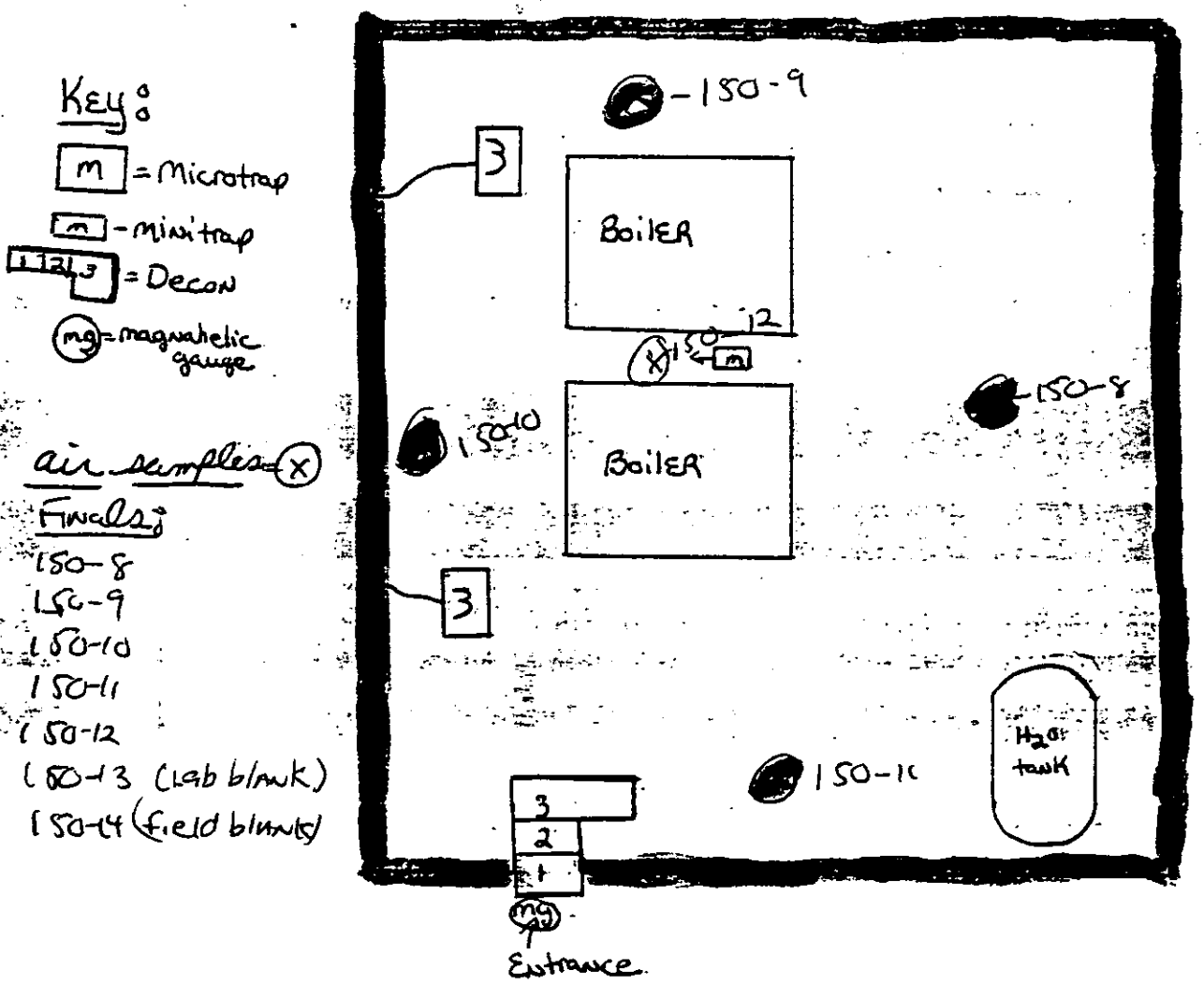
DATE: 11/9/90

GENERAL OBSERVATIONS CONTINUED:

Bentalou (ES) #150
220 Bentalou St
Balto. Md. 21223

W
S ← → N
E

Boiler Room (Basement level)



I H SERVICES, INC.

1521 Edgewood Street — Suite J • Baltimore, Maryland 21227

PHONE: (301) 644-9400
FAX (301) 644-9402

AIR MONITORING DATA SHEET

Project: Bantalon (ES) #150
Address: 220 N. Bantalon St
Date: 11/9/90
Activity: Air monitoring
Job Number: Ba-0-381
Work Order Number:

SAMPLED FOR:

	METHOD	CASSETTE	FILTER
☒ Asbestos:	☒ 7400 ☐ TEM	☒ 25mm ☐ 37mm	☒ MCE ☐ PC
☐ Airborne Dust:			
☐ Gas:			
☐ Vapor:			
☐ Other:			

Analytical Method: _____ Ambient Temp.: _____

Protection Worn During Sampling:

	Employee	IH
Full Body Coveralls	☒	☒
Respirator - Air Purifying	☒	☒
Respirator - Power Air Purifying	☐	☐
Respirator - Supplied Air	☐	☐

PERSONAL SAMPLING DATA

Employee Sampled:
Social Security Number:
Smoker: ☐ Yes ☐ No
Job Function:
Description of Activity:
Signature of Employee:

LAB ID	SAMPLE NO.	SAMPLE DATE	RESULTS FIBERS/CC	SAMPLE LOCATION
76 70	150-8	11/9/90	<0.010	final - inside boiler room north side
76 71	150-9	"	<0.010	final - inside - west side
76 72	150-10	"	<0.010 <0.010	final inside - south side.
76 73	150-11	"	<0.010	final - inside - east side
76 74	150-12	"	<0.010	final - inside - center of the room.
76 75	150-13	"	0 FIBERS PER 100 FIELDS	final (lab blank)
76 76	150-14	"	0 FIBERS PER 100 FIELDS	final (field blank)

FIELD SAMPLE NUMBER	TEST PERIOD START	TEST PERIOD STOP	TOTAL (MIN.)	FLOW RATE SETTING START (LITERS/MIN.)	FLOW RATE SETTING STOP (LITERS/MIN.)	VOLUME LITERS	SAMPLE TYPE AMBIENT	SAMPLE TYPE AREA	SAMPLE TYPE FINAL	SAMPLE TYPE PERSONAL	SAMPLE LOCATION IN WORK AREA	SAMPLE LOCATION OUTSIDE WORK AREA	SAMPLE LOCATION N/A	INSTRUMENT SERIAL NUMBER
150-8	0935	1035	60	12.0	12.0	720			✓		✓			G-1
150-9	0935	1035	60	12.0	12.0	720			✓		✓			G-2
150-10	0935	1035	60	12.0	12.0	720			✓		✓			G-3
150-11	0935	1035	60	12.0	12.0	720			✓		✓			G-5
150-12	0935	1035	60	12.0	12.0	720			✓		✓			G-6
150-13	—	—	0	—	—	0			✓				✓	— Lab blank
150-14	—	—	0	—	—	0			✓				✓	— field blank

Comments: See diagram for location of air samples. Pumps stopped only after about 700 liters because the Note: boilers were running, so the area contains a lot of exhaust in the air.

Inspector: Paul Green Jr. (PRINT NAME)
Paul Green (SIGNATURE)
Date: 11/9/90

I H SERVICES, INC.

1521 Edgewood Street — Suite J • Baltimore, Maryland 21227

PHONE: (301) 644-9400
FAX (301) 644-9402

CHAIN OF CUSTODY FOR MICROSCOPY SERVICES

No 1707

Submittal Date: 11/9/90 Submitted By: (Print) Paul Green Jr. (Sign) Paul Green Jr.

Client Name: Marcon of Md. Project Name: Bentalou (ES) #150

Address: Hunt Valley, Md. 21030 Address: 220 N. Bentalou St. Balto. Md. 21223

Telephone: (301) 785-2525 Contact Person: Mike Mota

Results Required By: 11 / 9 / 90 Before Noon? ☐ Yes ☒ No

Number of Samples: 7

Type of Samples: ☒ Air ☐ Bulk ☐ Wipe ☐ Other:

Release Criteria: ☐ AHERA ☒ 0.010 f/cc ☐ % Asbestos ☐ Other:

LAB ID	SAMPLE NUMBER	DATE	VOLUME (Liters)	METHOD (Check) PCM	PLM	TEM	SEM	OTHER
7670	150-8	11/9/90	720	✓				Final
7671	150-9	"	720	✓				"
7672	150-10	"	720	✓				"
7673	150-11	"	720	✓				"
7674	150-12	"	720	✓				"
7675	150-13	"	0	✓				Lab blank
7676	150-14	"	0	✓				Field blank

Relinquished By: (Signature)	Date	Relinquished By: (Signature)	Date
Paul Green Jr.	11/9/90		
Name: (Printed)	**Time**	**Name: (Printed)**	**Time**
Paul Green Jr.	1100		
Received By: (Signature)	**Date**	**Received By: (Signature)**	**Date**
R. Kimmett	11-9-90		
Name: (Printed)	**Time**	**Name: (Printed)**	**Time**
R. KIMMETT	1100		

LABORATORY STAFF ONLY: (CUSTODY)

1. Date/Time Received 11, 9, 90 @ 1100 by (Print) R. KIMMETT Sign R. Kimmett
2. Date/Time Analyzed 11, 9, 90 @ 1215 by (Print) // Sign //
3. Date/Time Reported 11, 9, 90 @ 1220 by (Print) // Sign //
4. Results Reported To R. Green by (Print) // Sign //

MARYLAND DEPARTMENT OF THE ENVIRONMENT
AIR MANAGEMENT ADMINISTRATION
2500 BROENING HIGHWAY, BALTIMORE, MARYLAND 21224 (301) 631-3200

ASBESTOS REMOVAL/ENCAPSULATION/DEMOLITION PROJECT NOTIFICATION

BA0-381

NAME OF SITE/PROJECT: Bentalou Elementary School (#150)
STREET ADDRESS: 220 N. Bentalou Street; Baltimore, Maryland 21223
CITY COUNTY STATE ZIPCODE

SITE OWNER: CITY OF BALTIMORE
STREET ADDRESS: 2011 LINDEN AVENUE; BALTIMORE, MARYLAND 21217
CITY STATE ZIPCODE

CONTRACTOR NAME: MARCOR OF MARYLAND, INC. LICENCE NO. 21-03-005
CONTACT PERSON: CHRISTOPHER E. CHRISTIAN TELEPHONE NO. (301) 785-2525
DATE OF NOTICE: 10/18/90 PROJECT START DATE: 10/23/90 COMPLETION DATE: 10/26/90
RENOVATION DEMOLITION (ENCAPSULATION) BUILDING TYPE* S

---

*(TYPES: HOSPITAL-H; SCHOOL-S; OFFICE-O; RESIDENCE-R; COMMERICAL-C; INDUSTRIAL-I; PUBLIC-P; CHURCH-W; OTHER-O)

PRIOR USE*	BUILDING AGE	SIZE (SQ.FT.)
School	Approx. 26 yrs. old	225,000 SQ FT

NESHAP (NON-NESHAP)

ASBESTOS INFORMATION

AMOUNT OF FRIABLE ASBESTOS	DESCRIPTION	LOCATION (BLDG., FLOOR, ROOM #)
LINEAR FT.		
SQUARE FT.		
OTHER:		
Patch & Repair:		
65 SQ FT	Tank Insulation	Boiler Room
27 LN FT	Pipe Insulation	Boiler Room

DISPOSAL SITE NAME: AL-RAY LANDFILL

ADDRESS: 4910 SANDS ROAD; LOTHIAN, MD 20711
STREET CITY STATE

REMOVAL PROCEDURES(TO COMPLY WITH EPA,OSHA,COMAR AND ALL LOCAL REGULATIONS)

- Use of 6 mil poly sheeting where required.
- Ues of full body disposable, protective coveralls.
- Use HEPA equipped vacuums and negative air machines.
- Use of respiratory protection as required.
- Use of encapsulant as final stage of cleaning process.

WORK SCHEDULE (PLEASE SPECIFY IF WEEKEND ONLY, NIGHT SHIFT, ETC.)

3:00 p.m. to 11:30 p.m. Tuesday through Friday

IS THIS THE FIRST NOTIFICATION FOR THIS PROJECT? (YES) NO

IF NO, PROVIDE DATE OF FIRST NOTICE AND REASON FOR REVISION

IF THIS IS AN EMERGENCY DEMOLITION OR RENOVATION, GIVE NAME, TITLE, AUTHORITY OF THE STATE OR LOCAL GOVERNMENT REPRESENTATIVE WHO HAS ORDERED THE WORK.

EMPLOYEE INFORMATION:

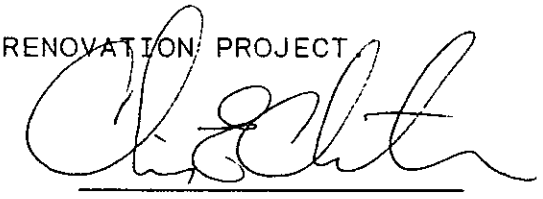
ON A SEPARATE PAGE, PROVIDE THE FOLLOWING INFORMATION FOR EACH EMPLOYEE NOT LISTED ON SCHEDULE 1 OF "APPLICATION FOR LICENSE TO REMOVE/ENCAPSULATE ASBESTOS" WHO WILL HANDLE ASBESTOS ON THIS PROJECT.

A. FULL NAME
B. SOCIAL SECURITY NUMBER
C. NAME OF ORGANIZATION THAT PROVIDED APPROVED TRAINING COURSE
D. DATE OF MOST RECENT APPROVED TRAINING COURSE ATTENDED

GENERAL INSTRUCTIONS:

THIS NOTIFICATION MUST BE RECEIVED BY THE DEPARTMENT:

A. AT LEAST 20 DAYS PRIOR TO START OF DEMOLITION PROJECT IF LESS THAN 260 LINEAR FEET OR 160 SQUARE FEET OF FRIABLE ASBESTOS MATERIALS ARE INVOLVED.
B. AT LEAST 10 DAYS PRIOR TO START OF DEMOLITION PROJECT IF MORE THAN 260 LINEAR FEET OR 160 SQUARE FEET OF FRIABLE ASBESTOS MATERIALS ARE INVOLVED.
C. AS SOON AS POSSIBLE PRIOR TO START OF RENOVATION PROJECT.



SIGNATURE OF CHIEF
Executive Officer
or Designee
CHRIS E. CHRISTIAN

PRESIDENT
Title

cc: Asbestos Coordinator
Region 3
841 Chestnut Building

==========

FOR MDE USE ONLY

VARIANCE GRANTED_____ DENIED_____

DATE NOTIFICATION RECEIVED_____

INSPECTION RECORD: DATE:_____INSPECTOR_____VIOLATION_____

DATE:_____INSPECTOR_____VIOLATION_____

WORK SCHEDULE (PLEASE SPECIFY IF WEEKEND ONLY, NIGHT SHIFT, ETC.)

3:00 p.m. to 11:30 p.m. Tuesday through Friday

IS THIS THE FIRST NOTIFICATION FOR THIS PROJECT? (YES) NO

IF NO, PROVIDE DATE OF FIRST NOTICE AND REASON FOR REVISION

IF THIS IS AN EMERGENCY DEMOLITION OR RENOVATION, GIVE NAME, TITLE, AUTHORITY OF THE STATE OR LOCAL GOVERNMENT REPRESENTATIVE WHO HAS ORDERED THE WORK.

EMPLOYEE INFORMATION:

ON A SEPARATE PAGE, PROVIDE THE FOLLOWING INFORMATION FOR EACH EMPLOYEE NOT LISTED ON SCHEDULE 1 OF "APPLICATION FOR LICENSE TO REMOVE/ENCAPSULATE ASBESTOS" WHO WILL HANDLE ASBESTOS ON THIS PROJECT.

A. FULL NAME
B. SOCIAL SECURITY NUMBER
C. NAME OF ORGANIZATION THAT PROVIDED APPROVED TRAINING COURSE
D. DATE OF MOST RECENT APPROVED TRAINING COURSE ATTENDED

GENERAL INSTRUCTIONS:

THIS NOTIFICATION MUST BE RECEIVED BY THE DEPARTMENT:

A. AT LEAST 20 DAYS PRIOR TO START OF DEMOLITION PROJECT IF LESS THAN 260 LINEAR FEET OR 160 SQUARE FEET OF FRIABLE ASBESTOS MATERIALS ARE INVOLVED.
B. AT LEAST 10 DAYS PRIOR TO START OF DEMOLITION PROJECT IF MORE THAN 260 LINEAR FEET OR 160 SQUARE FEET OF FRIABLE ASBESTOS MATERIALS ARE INVOLVED.
C. AS SOON AS POSSIBLE PRIOR TO START OF RENOVATION PROJECT.



SIGNATURE OF CHIEF Executive Officer or Designee
CHRIS E. CHRISTIAN

PRESIDENT

Title

cc: Asbestos Coordinator
Region 3
841 Chestnut Building

==========

FOR MDE USE ONLY

VARIANCE GRANTED_____ DENIED_____

DATE NOTIFICATION RECEIVED_____

INSPECTION RECORD: DATE:_____INSPECTOR_____VIOLATION_____

DATE:_____INSPECTOR_____VIOLATION_____

AMENDMENT #4

December 4, 1992

(For the period ending June 30, 1992)

AHERA

ASBESTOS CONTAINING MATERIALS MANAGEMENT PLAN

dated May 9, 1989

School No. **PS150**

School Name **Bentalou Elementary**

NOTICE **This amendment includes Asbestos Response Actions for school for period reported under this amendment attached**

Issued

by

Baltimore City **Public Schools**

Asbestos Coordinator

Designated Local Education Agency Representative

City of Baltimore **Public Schools**
AMENDMENT #4
December 4, 1992

INTRODUCTION

These amendments are issued annually to update the **Asbestos Management Plan** for each building under control of the Baltimore City Public Schools.

Contents of each annual amendment will include

- asbestos response actions for the building (if any);
- Table IA containing the remaining quantities of asbestos containing material in the building;
- a copy of the surveillance logs for the building done at a minimum of a semi-annual basis;
- any other pertinent information.

An asbestos response action shall include any work to clean up asbestos in response to a major or minor fiber release episode, or any work action to remove, encapsulate, enclose, or repair asbestos containing materials.

Persons reading this amendment are encouraged to read the **Asbestos Management Plan** to thoroughly understand the location and extent of asbestos containing materials in the building.

David W. Mitchell
Baltimore City Asbestos Coordinator
and Designated LEA Representative

PLEASE POST **PLEASE POST**

City of Baltimore **Public Schools**
ASBESTOS PROGRAM

NOTICE TO SCHOOL BUILDING VISITORS AND OCCUPANTS (TEACHERS, STUDENTS, OPERATING ENGINEERS AND CUSTODIAL PERSONS) OF **ASBESTOS MANAGEMENT PLAN AMENDMENT NUMBER 4** AND AVAILABILITY OF **ASBESTOS MANAGEMENT PLAN** FOR INSPECTION.

An amendment to the Asbestos Management Plan has been appended to the management plans for asbestos to be kept in the building administrative office. This is Amendment #4 and is dated December 4, 1992. This amendment is available for inspection by making request to the building principal.

EPA Rules for school buildings required:

(1) We maintain records on asbestos in each school;

(2) Inform our building occupants and visitors on asbestos in each school building of locations of and response actions for asbestos in each school;

(3) Give right-of-way to EPA and State of Maryland environmental inspectors.

Failure to fulfill the above may result in serious civil and possible criminal penalties assessed against the City for failure to perform the above including possible criminal penalties against persons who willfully avoid the EPA Rules.

If the Asbestos Management Plan and the Amendments to it are not available in your school from the principal report it to **Environmental Services - Asbestos Office at 396-7832** immediately.

David W. Mitchell
Baltimore City Asbestos Coordinator
and Designated LEA Representative

Amendment #4
TABLE 1-A

Baltimore City Schools

ACM in Schools and Removal During the Peroid
March, 1990 - June, 1992

	Ceiling & Walls					Floor Covering	Mechanical						Other			Miscellaneous			
Job No	Spray On SF	Tile SF	Acoustic Plaster SF	Other Plaster SF	Wallboard SF	VAT SF	Pipe LF	Elbows Fittings SF	Boilers Breeching SF	Tanks SF	Ductwork SF	Other TSI LF	Curtains SF	Firedoors Ea/SF	Cement Board SF	Soil SF	Wire LF	Misc LF	Misc SF
PS150																			
Year Beg			5000			90000			500	125	250			126					
BA1532																			
Year End			5000			90000			500	125	250			126					

NOTES:

For locations of ACBM applications, see the AHERA inspection report and management plan for this building located in Section (1.2) and Appendix H.

For job detail see Md. Dept of Environment job notifications, Asbestos Office job notification summary for this building, or invoices related to specific job.

PENTALOW Elementary PS # 150

ACCREDITATION INFORMATION

LEA DESIGNATED PERSON: Telephone No. 396-7832

Typed Name: David W.Mitchell

Training Course: Inspector/Management Planner

Address: Room 300 Abel Wolman Municipal Bldg. Baltimore, Md. 21202

Date: 11/27/91 Total Hrs. 40

Training Provider Aerosol Monitoring & Analysis,Inc.

INSPECTIONS, BULK SAMPLING, AND ASSESSMENTS

Reinspection(s) were conducted by: Don L. Brock Date 5.8.92

Bulk samples were collected by: _____ Date _____

Assessments were made by: Don L. Brock Date 5.8.92

Signature: [signature] Signature: _____

Name: Don L. Brock Name: _____

Accreditation No. VIIKU 95040-03 Accreditation No. _____

State and Date: Md. 12/13/91 State and Date: _____

MANAGEMENT PLANNER:

The reinspection(s) was reviewed by:

Signature: _____

Name: Allen West

Accreditation No. 91-1193

State and Date: Md. 7/19/92

The recommendation(s) for response actions (if any) were made by:

Signature: [signature]

Name: Don L. Brock

Accreditation No. VIIKU 95040-03

State and Date: Md. 12/13/91

HOMOGENEOUS AREA	SAMPLED (1988-89)		FRIABLE (1988-89)		CHANGES (1991-92)		FRIABLE (1991-92)		SAMPLED (1991-92)		CLASS.	RESPONSE ACTION	SCHEDULE (M/D/YR.)
	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO			
S Acoustical Plaster	✓		✓			✓	✓			✓	.6	O+M	
M Floor Tile	✓			✓		✓		✓		✓	5	O+M	
T Boiler + Breeching	✓		✓			✓	✓			✓	6	O+M	
M Mastic	✓		✓			✓	✓			✓	6	O+M	
M Fire Doors		✓		✓		✓		✓		✓	5	O+M	

KEY:

HOMOGENEOUS AREA

T - Thermal Systems
S - Surfacing Material
M - Miscellaneous

CLASSIFICATION

1. Damaged or significantly damaged TSI
2. Damaged friable surfacing material
3. Significantly damaged friable surfacing ACM
4. Damaged or significantly damaged friable miscellaneous ACM
5. ACBM with potential for damage
6. ACBM with potential for significant damage
7. Any remaining friable ACBM or friable suspected ACBM

RESPONSE ACTION

RM - Remove
RP - Repair
ECP - Encapsulate
ENC - Enclose
O&M - Operations and Maintenance
ISL - Isolate

Page_____

BULK SAMPLE DOCUMENTATION

Date: _____ Collected by: _____

Building: _____

Sample No.	Friable		Homogeneous Area	Description of Exact Location
	YES	NO		

Page_____

FRIABLE HOMOGENEOUS AREA-ASSESSMENT

Name of School BONTALOW ELEMENTARY PS # 150 Date 4-14-92

Inspector DON BROCK Sample ID _____

Material Type: ACOUSTICAL PLASTER Location: _____

Area: 5,000 Sq.Ft. _____ Ln.Ft.

COMMENTS (OPTIONAL)

DIFFUSORS IN CEILING, CHECK FOR CONTAINMENTATION IF NOT IN GOOD SHAPE

HAZARD ASSESSMENT FACTORS

DAMAGE FACTORS

Physical	Water	Deterioration
Significant____	Extensive____	Heavy____
Moderate____	Moderate____	Moderate____
None____	Slight____	Light__✓__
MINOR__✓__	None__✓__	None____

DISTURBANCE FACTORS

Proximity to Repair items	Accessible	Texture	Adjacent Rooms
< 1ft.____	Within reach___	Rough____	Gymnasium____
1 to 5ft.___	Barely ____	Pitted____	Music Rm.__✓__
Over 5ft.__✓__	Unreachable__✓__	Moderate___	Mech.Rm.____
		Smooth__✓__	Elevators____

AIR FLOW FACTORS

Barriers	Ventilation	Air Movement	Air Conduits
Permanent____	Yes__✓__	High__✓__	Air plenum___
Enclosed____	No_____	Moderate___	Air shaft____
Encapsulated__	If yes, intake__	Low_____	Elevator_____
None__✓__	exhaust__✓__		Shaft_____
			DIFFUSOR__✓__

STATEMENT OF ACCREDITATION (763.93 (e)(7):

With respect to the person or persons who inspected for ACBM and who will design or carry out response actions, (except for operations and maintenance), with respect to the ACBM:

THE LEA USED OR WILL USE PERSONS WHO HAVE BEEN ACCREDITED BY A STATE ACCREDITATION PLAN OR AN EPA-APPROVED COURSE.

Signature: _____ Typed Name: David W. Mitchell
(Designated Person)

Date: _____

LABORATORY STATEMENT AND CERTIFICATION:

All bulk samples were analyzed by: _____

address: _____

_____

This laboratory meets all requirements of 40 CFR 763.87 and has received accreditation for Polarized Light Microscopy (PLM) analysis under the **NIST/NVLAP Program** (NVLAP # _____) for bulk sample analysis.

_____ . Date(s) of analysis: _____

_____

_____ . Name of analyst(s) : _____

_____

_____ . Signature of analyst(s): _____

_____

1992 FISCAL YEAR

ASBESTOS MANAGEMENT PROGRAM

FIELD INSPECTION LOG OF QUARTERLY SURVEILLANCE

FOR SCHOOL P.S. 150

1st QUARTER INSPECTION

Performed by Richard Somerville

Date Performed October 1991

2nd QUARTER INSPECTION

Performed by Richard Somerville

Date Performed February 1992

3rd QUARTER INSPECTION

Performed by Robert West

Date Performed April 1992

4th QUARTER INSPECTION

Performed by Robert West

Date Performed July 1992

SEE ATTACHED SURVEILLANCE REPORT FORMS FOR FINDINGS

FIGURE 7-1. QUARTERLY SURVEILLANCE REPORT FORM

DATE: _____ SURVEYOR: _____

SCHOOL NO. PS150

FUNCTIONAL SPACE	MANAGEMENT AREA DESCRIPTION	CONDITION CHANGE								COMMENTS
		1st Quarter		2nd Quarter		3rd Quarter		4th Quarter		
		Yes	No	Yes	No	Yes	No	Yes	No	
01- Boiler Room	Boiler Block and Trowelled on Insulation		✓		✓		✓		✓	
	Boiler Breeching Block and Trowelled on Insulation		✓		✓		✓		✓	
	Hot Water Generator Block and Trowelled on Insulation		✓		✓		✓		✓	
	(1) Fire Door		✓		✓		✓		✓	
02- Cafeteria and Lobby	Acoustical Plaster		✓		✓		✓		✓	
	Vinyl Asbestos Tile		✓		✓		✓		✓	
	(2) Fire Doors		✓		✓		✓		✓	
03- Auditorium	Acoustical Plaster		✓		✓		✓		✓	
	Vinyl Asbestos Tile		✓		✓		✓		✓	
	(1) Fire Door		✓		✓		✓		✓	

FIGURE 7-1. QUARTERLY SURVEILLANCE REPORT FORM

DATE: _____ SURVEYOR: _____

SCHOOL NO. PS150

FUNCTIONAL SPACE	MANAGEMENT AREA DESCRIPTION	CONDITION CHANGE								COMMENTS
		1st Quarter		2nd Quarter		3rd Quarter		4th Quarter		
		Yes	No	Yes	No	Yes	No	Yes	No	
04- Classrooms	Vinyl Asbestos Tile		✓		✓		✓		✓	
05- Hallways and Stairwells	Vinyl Asbestos Tile		✓		✓		✓		—	
			✓		✓		✓		✓	
06- Offices, Work Rooms, and Lounges	Vinyl Asbestos Tile		✓		✓		✓		—	
			✓		✓		✓		✓	
			✓		✓		✓		✓	
07- Incinerator Room	(1) Fire Door		✓		✓		✓		✓	
			✓		✓		✓		✓	
08- Library	Vinyl Asbestos Tile		✓		✓		✓		—	
09 Mechanical Room	Duct Mastic		✓		✓		✓		✓	
			✓		✓		✓		✓	
	(1) Fire Door		✓		✓		✓		✓	

City of Baltimore Public Schools

AHERA Actions

Building: **PS150**

Job No BA1532 Start Date 10/28/91 Completion Date 10/28/91

Reason for the Action Remove halloween decorations from 2 asbestos ceiling tiles and decon 8 sf in cafeteria

Written Description of Action and Methods

See Daily Job Reports for the following Invoices (Attached)

11/07/91 Inv# 3208 VDA# 63

Contractor Information

MARCOR Environmental, Inc.
6679 Santa Barbara Road Suite G
Elkridge, Maryland 21227
Tel (410) 796-5991

Maryland State Asbestos License No. M21-003-005 Expiration 6/29/93
AHERA Recertification No. 2510 Expiration 6/30/93 (Supervisor - Chris Christian)

List of Employees on Job, Accreditation Numbers, & Expiration Dates

See Attached Employee List, and Daily Job Reports

Location of Disposal Site, Waste Manifast Included

Pulaski Landfill
Sommerset, KY. 42501
Manifest attached

City of Baltimore Public Schools

AHERA Industrial Hygiene / Air Monitoring Information

Building: **PS150**

Job No BA1532 Start Date 10/28/91 Completion Date 10/28/91

Analyzing Lab

I H Services, Inc.
1521 Edgewood Street
Baltimore, Maryland 21224

Name of person collecting air samples

Method

Results

Name of Analyst

See Attached Analysis Sheets

Statement that Lab meets applicable requirements

IH Services, Inc. meets the applicable requirements of 40 CFR Part 763 Section 763.90 (i) (2) (ii). The American Industrial Hygiene Association Proficiency Analytical Testing Laboratory number is 21224-002. All other laboratories used by IH Services, Inc. for the analysis of samples also meet the applicable requirements of 40 CFR Part 763 Section 763.90 (i) (2) (ii).

MARCOR ENVIRONMENTAL

6679 Santa Barbara Road
Suite G
Elkridge, Maryland 21227
(410) 796-5991
Fax (410) 796-9446
(800) 666-0741

DATE: October 28, 1991

TO: Mr. William A. Gieseking/City of Baltimore

FROM: Chris E. Christian/Project Manager

RE: NOTICE OF ASBESTOS HAZARD ABATEMENT ACTIVITIES

Important Notice: MARCOR and its agents have no knowledge as to the Contractual arrangements with other employers who may be on the premises during abatement procedures. It is incumbent upon you to notify these other employers of the scheduled asbestos abatement activities and the requirements of 29 CFR 1926.58 pertaining to the establishment of "regulated areas." Please direct any questions concerning this notification to me.

In accordance with 29 CFR 1926.58 (OSHA Asbestos Standard for Construction) you are hereby notified that MARCOR of Maryland, Inc. has been contracted to perform certain asbestos abatement procedures on or about the premises of:

Bentalou Elementary School (#150) — BA1-532
(Job Name) — (Job No.)

220 North Bentalou Street — Baltimore, MD 21223
(Address of Job) — (City, State, Zip)

See attached notification
(Areas of Abatement)

Abatement procedures are scheduled to begin on October 28, 1991 and continue through October 28, 1991 .

The nature of abatement will include but not be limited to:
(See attached notification)

MARYLAND DEPARTMENT OF THE ENVIRONMENT, AIR MANAGEMENT ADMINISTRATION
DIVISION OF ASBESTOS AND INDOOR AIR QUALITY CONTROL
2500 BROENING HIGHWAY, BALTIMORE, MARYLAND 21224, (301) 631-3200

ASBESTOS REMOVAL/DEMOLITION/RENOVATION PROJECT NOTIFICATION BA1-532

GENERAL INSTRUCTIONS: (Additional instructions for completing this form are on page 4)

A) ASBESTOS NESHAP (40 CFR PART 61, SUBPART M 61.145) AND COMAR (26.11.21.03) REQUIRE WRITTEN NOTIFIATION OF DEMOLITION OR RENOVATION OPERATIONS. THIS FORM MAY BE USED TO FULFILL BOTH NOTIFICATION REQUIREMENTS.
B) THIS FORM MAY BE REPRODUCED ON COMPUTER AND/OR WORDPROCESSING EQUIPMENT, HOWEVER, THE FORMAT MUST BE SIMILAR TO THAT SHOWN BELOW. FORMATS THAT SIGNIFICANTLY DIFFER FROM THE ONE SHOWN WILL BE RETURNED AS UNACCEPTABLE.
C) FAX TRANSMISSIONS OF THIS FORM WILL NOT BE ACCEPTED. (FOR AN EXCEPTION TO THIS POLICY IN THE CASE OF EMERGENCY PROJECTS ONLY, CONTACT THE AIR MANAGEMENT ADMINISTRATION AT (301) 631-3200).
D) THE NOTIFICATION SHOULD BE TYPED (OR PRINTED CLEARLY) AND POSTMARKED OR DELIVERED NO LATER THAN TEN DAYS PRIOR TO THE BEGINNING OF THE ASBESTOS REMOVAL ACTIVITY OR DEMOLITION (REFER TO 61.145(b) FOR FURTHER DETAILS).

I. FACILITY LOCATION (Include Building Name, Number & Floor or Room Number)

SITE/BUILDING NAME: BENTALOU ELEMENTARY SCHOOL (#150)

Address: 220 NORTH BENTALOU STREET

City:BALTIMORE State: Maryland Zip: 21223

Site Description/Location: CAFETERIA

County: (circle one only) DO NOT WRITE IN THIS

01 Allegheny	05 Caroline	09 Dorchester	13 Howard	17 Queene Anne	21 Washington	
02 Anne Arun	06 Carroll	10 Frederick	14 Kent	18 St. Mary's	22 Wicomico	Region: EPA Region III
03 Baltimore	07 Cecil	11 Garrett	15 Montgomery	19 Somerset	23 Worchester	(DE, DC, MD, PA, VA & WV)
04 Calvert	08 Charles	12 Harford	16 Pr. George	20 Talbot	24 Baltimore City	

II. FACILITY INFORMATION (Identify Owner, Removal Contractor & Other Operator)
OWNER NAME: CITY OF BALTIMORE

Address: 2011 LINDEN AVE.

City: BALTIMORE State: Maryland Zip: 21217

Contact: MR. WILLIAM A. GIESEKING Telephone: 396-7832

MD LICENSE #: 21-03-005 REMOVAL CONTRACTOR: MARCOR of Maryland, Inc.

Address: 6579 SANTA BARBARA ROAD SUITE G

City: ELKRIDGE State: Maryland Zip: 21227

Contact: MR. SCOTT A. HARTMAN Telephone: 796-5991

OTHER OPERATOR:

Address:

City: State: Zip:

Contact: Telephone:

III. FACILITY DESCRIPTION:
Building Size:195,000 SQ. FT. Age in Years: 29

Building Size: SQ. FT. Number of Floors: 3

IV. TYPE OF OPERATION: (Circle one only) S - Demo S - Ordered Demo R - Renovation E - Emergency Renovation

V. IS ASBESTOS PRESENT ? YES NO

VI. TYPE OF NOTIFICATION: (Circle one only) O - Original C - Canceled R - Revised NESHAP NON-NESHAP

If revised, enter re-submit date:

FOR MDE OFFICE USE ONLY

DUPLICATE (YES/NO)	DATE RECEIVED	POSTMARK	NOTIFICATION #

VII. SCHEDULED DATES ASBESTOS REMOVAL: (MM/DD/YY) Start:
Complete:

VIII. SCHEDULED DATES DEMO/RENOVATION: (MM/DD/YY) Start: 10/28/91
Complete:10/28/91
Prep:

IX. DESCRIBE PRIMARY USE OF FACILITY OR ENTER CODES: H - Hospital S - School P - Public Building
O - Office B - Ship I - Industrial C - Commercial
U - University/College or R - Residence

Present Use: S Prior Use: S

X. PROCEDURE, INCLUDING ANALYTICAL METHOD, IF APPROPRIATE, USED TO DETECT THE PRESENCE OF ASBESTOS.
AHERA SURVEY POSTED IN THE BUILDING AND BALTO. CITIES INDUSTRIAL HYGIENE FIRM, BULK ANALYSIS USING PLM.

QUANTITY OF ASBESTOS	RACM TO BE REMOVED	NON-FRIABLE ASBESTOS NOT REMOVED CATEGORY I	NON-FRIABLE ASBESTOS NOT REMOVED CATEGORY II	UNIT OF MEASUREMENT UNIT	
Pipes				LnFt:	Ln M:
Surface Area	DECON 8			SqFt: X	Sq M:
Volume off Facility Component				CuFt:	Cu M:

XI. DESCRIPTION OF PLANNED DEMOLITION OR RENOVATION WORK, AND METHOD(S) TO BE USED: (Use additional sheets, if necessary)
REMOVE HALLOWEEN DECORATIONS FROM 2 ASBESTOS CEILING TILES.

XII. DESCRIPTION OF WORK PRACTICES AND ENGINEERING CONTROLS TO BE USED TO PREVENT EMMISSIONS OF ASBESTOS AT THE DEMOLITION AND RENOVATION SITE. (Use additional sheets, if necessary)

- Use of resiratory protection as required.
- Use of full body disposable coveralls as required.
- Use of HEPA equipped vacuums and negative air filtration units.
- Use of 6 mil polyethylene sheeting as required.
- Use of amended water to properly wet ACM.
- Use of encapsulant as final stage of the cleaning process.

XIII. WASTE TRANSPORTER #1
Name: UNITED COMPACTORS, INC.

Address: 6702 FT. SMALLWOOD ROAD

City: BALTIMORE State: MARYLAND Zip: 21226

Contact: LARRY LOWERY Telephone: 647-9811

WASTE TRANSPORTER #2
Name

Address:

City: State: Zip:

Contact: Telephone:

XIV. WASTE DISPOSAL SITE
Name: PULASKI LANDFILL

Location: 4140 SOUTH HIGHWAY #27

City: SOMERSET State: KENTUCKY Zip: 42501

Contact: RALPH STOGSDILL Telephone: (606) 561-6253

XV. IF DEMOLITION ORDERED BY A GOVERNMENT AGENCY, PLEASE IDENTIFY THE AGENCY BELOW:
NAME: TITLE:

Authority:

Date of Order: (MM/DD/YY) Date Ordered to Begin: (MM/DD/YY)

XVI. FOR EMERGENCY RENOVATIONS:
Date and Hour of Emergency: (MM/DD/YY)

Description of sudden unexpected event: (Use additional sheets, if necessary)

Explanation of how the event caused unsafe conditions or would cause equipment damage or a unreasonable financial burden: (Use additional sheets, if necessary)

XVII. DESCRIPTION OF PROCEDURES TO BE FOLLOWED IN THE EVENT THAT UNEXPECTED ASBESTOS IS FOUND OR PREVIOUSLY NON-FRIABLE ASBESTOS MATERIAL BECOMES CRUMBLED, PULVERIZED, OR REDUCED TO POWDER. (Use additional sheets, if necessary)

SAME AS SECTION XII

XVIII. I certify that I am trained in the provisions of this regulation (40 CFR PART 61, SUBPART M) and will be on-site during the demolition or renovation and evidence that the required training has been accomplished by this person and be available for inspection during normal business hours (required 1 year after promulgation; ie. effective 11/20/91).

Name 10-28-91
Date

XIX. I certify that the above information is correct.

Name 10-28-91
Date

IN ADDITION TO THE INFORMATION REQUIRED BY NESHAP REGULATIONS, MARYLAND REQUIRES THAT THE FOLLOWING INFORMATION BE PROVIDED AT THE TIME OF NOTIFICATION: EMPLOYEE INFORMATION. ON A SEPARATE PAGE, PROVIDE THE FOLLOWING INFORMATION FOR EACH EMPLOYEE NOT LISTED ON SCHEDULE I OF "APPLICATION FOR LICENSE TO REMOVE/ENCAPSULATE ASBESTOS" WHO WILL HANDLE ASBESTOS ON THIS PROJECT.

A) FULL NAME
B) SOCIAL SECURITY NUMBER
C) NAME OF ORGANIZATION THAT PROVIDED APPROVED TRAINING COURSE
D) DATE OF MOST RECENT APPROVED TRAINING COURSE.

WORK SCHEDULE. SPECIFY IF WEEKEND ONLY. NIGHT SHIFT. ETC.

3:00 PM TO 5:00 PM

MARCOR OF MARYLAND, INC.

MARCOR®

THE ENVIRONMENTAL SOLUTION

Remit Payments to:
P.O. Box 1043
Hunt Valley, Maryland 21030-6043

INVOICE NO.
00003208
INVOICE DATE
11/07/91

BILL TO

CUSTOMER :
000083
ASBESTOS COORDINATOR

2011 LINDEN AVE
BALTIMORE, MD 21217

JOB LOCATION

JOB :
BA1532
MD-BENTALOU ELEMENTARY (#150)
220 NORTH BENTALOU STREET
BALTIMORE, MD 21223

ATTN: P.O.

Quantity	Description	Price	Amount
	ATTN: ASBESTOS COORDINATOR P.O. # P670628		
	PARTIAL BILLING		288.14
	THANK YOU FOR ALLOWING MARCOR TO BE PART OF YOUR ENVIRONMENTAL SOLUTION. WITH OUR FULL LINE OF CONSULTING AND ENGINEERING SERVICES, WE LOOK FORWARD TO WORKING WITH YOU AGAIN IN THE NEAR FUTURE.		
	IF YOU HAVE ANY QUESTIONS PLEASE CALL RON GAYNOR AT 410-796-5991.		
	PLEASE MAKE CHECK PAYABLE TO MARCOR OF MARYLAND, INC.		

Subtotals 288.14

Net Amount Due ==> 288.14

TERMS: NET 30 DAYS WITH SERVICE CHARGES OF 1.5% PER MONTH ON UNPAID BALANCE. PERCENTAGE RATE EQUAL TO 18% PER ANNUM. MARCOR RESERVES THE RIGHT TO APPLY PAYMENTS TO SERVICE CHARGES OR OLDEST INVOICES FIRST.

MARCOR TIME & MATERIAL RATES

BALTIMORE CITY
ASBESTOS ABATEMENT SERVICES
CONTRACT # BP-27087
DATE: OCTOBER 31, 1991

Job #: BA1-532
Name: BENTALOU ELEMENTARY (#150)
Address: 220 N. BENTALOU STREET
BALTIMORE, MD 21223

ITEM #	ITEM	UNIT	UNIT PRICE	QTY	EXTENDED PRICE
LABOR:					
1	Superintendent	hrs	$0.00	8	0.00
	Overtime	hrs	0.00		0.00
2	Asbestos Worker	hrs	0.00		0.00
	Overtime	hrs	0.00		0.00
3	Carpenter	hrs	52.40		0.00
	Overtime	hrs	78.60		0.00
3	Laborers	hrs	17.71	8	141.68
	Overtime	hrs	0.00		0.00
TOTAL LABOR					$141.68
EQUIPMENT					
1	HEPA Vacuums	per hour	18.00	8	144.00
2	PAPR's	per hour	0.00		0.00
3	Class "C" Air System	per hour	20.00		0.00
4	Negative Air Unit	per hour	18.00		0.00
5	Shower Assembly	per hour	0.00		0.00
TOTAL EQUIPMENT CHARGES					$144.00
MATERIAL:					
1	Poly Sheeting 6Ml 20'	roll	$24.75		$0.00
2	Poly Sheeting 6Ml 16'	roll	24.75		0.00
3	Millipore Cassettes	each	1.04		0.00
4	Drums w/Caution Label	drum	4.00		0.00
5	Duct Tape	roll	3.25		0.00
6	Encapsulant (Bridging)	gal	17.32		0.00
7	Encapsulant (Penetrating)	gal	6.68		0.00
8	Gloves	pr	0.80		0.00
9	Light Bulbs	each	1.45		0.00
10	Microtrap Filter	each	2.07		0.00
11	Microtrap Prefilter	each	0.48		0.00
12	Microtrap HEPA Filter	ea	98.98		0.00
13	6Ml Asb.Disposal Bag (Labeled)	ea	0.27		0.00
14	Propane	bottle	7.50		0.00
15	Rags	lbs	0.41	5	2.05
16	Respirator Filters "A"	ea	2.43		0.00
17	Respirator Filters PAPR	ea	8.50		0.00
18	Re-wettable Cloth 60"	per ft.	6.75		0.00
19	Asbestos Caution Signs	each	0.27		0.00
20	Spray Adhesive	can	1.88		0.00

MARCOR TIME & MATERIAL RATES

BALTIMORE CITY
ASBESTOS ABATEMENT SERVICES
CONTRACT # BP-27087
DATE: OCTOBER 31, 1991

Job #: BA1-532
Name: BENTALOU ELEMENTARY (#150)
Address: 220 N. BENTALOU STREET
BALTIMORE, MD 21223

ITEM #	ITEM	UNIT	UNIT PRICE	QTY	EXTENDED PRICE
21	Spray Paint	can	4.69		0.00
22	Self Stickpins w/washers	ea	0.08		0.00
23	Disposeable Coveralls (Full)	case (25)	43.00		0.00
24	Vacuum Bags GS81	each	1.99		0.00
25	Vacuum Bags GS82	each	7.60		0.00
26	HEPA Vacuum Filter	each	193.20		0.00
27	Wire Brushes 4 inch	each	0.66		0.00
28	Wire Brushes 6 inch	each	0.97		0.00
29	Wetting Agent	gal	8.30		0.00
30	Glove Bags	ea	2.32		0.00
31	Mop Head	ea	3.75		0.00
32	Paint Brushes	ea	0.87		0.00
33	Shower Towels	ea	0.10		0.00
34	Asbestos waste labels	ea	0.06		0.00
35	Smoke tubes	ea	2.98		0.00
36	Exhaust Duct	100' Roll	14.80		0.00
37	Stapler	each	16.99		0.00
38	Lock (dumpster)	each	12.29		0.00
39	Qwik Scrub	each	0.93		0.00
40	Sawblades	invoice	0.00		0.00
41	Parking	receipts	0.00		0.00
42	Materials	receipts	0.00		0.00
TOTAL MATERIAL					$2.05
MISCELLANEOUS:					
1	BENDIX Pump Calibration	pump mth	$20.00		$0.00
2	Disposal	cu. yd.	80.00		0.00
3	Lab Analysis (normal)	cassette	35.00		0.00
4	Lab Air Analysis (24 hr.Serv)	each	70.00		0.00
5	Industrial Hygienist	hr	50.00		0.00
6	Meal Allowance	man/day	15.00		0.00
7	Subcontract	job	0.00		0.00
8	Rentals	job	0.00		0.00
9	Job site delivery/pick-up	ea.			0.00
10	Mileage	ea mile	0.20		0.00
11	Lodging/Travel + 25%				0.00
12	Gas for job equipment	per ticket			0.00
13.00					
TOTAL MISCELLANEOUS					$0.00

MARCOR TIME & MATERIAL RATES

BALTIMORE CITY
ASBESTOS ABATEMENT SERVICES
CONTRACT # BP-27087
DATE: OCTOBER 31, 1991

Job #: BA1-532
Name: BENTALOU ELEMENTARY (#150)
Address: 220 N. BENTALOU STREET
BALTIMORE, MD 21223

ITEM #	ITEM	UNIT	UNIT PRICE	QTY	EXTENDED PRICE
SUMMARY:					
	LABOR				$141.68
	EQUIPMENT				144.00
	MATERIALS				2.05
	MISCELLANEOUS				0.00
	MARK-UP ON MATERIALS	20.00%			0.41
	MARK-UP ON SUB-CONTRACTS	20.00%			0.00
	MARK-UP ON RENTALS	10.00%			0.00
GRAND TOTAL					$288.14

☑ T & M
☐ CONTRACT
CUSTOMER JOB # _____
CHARGE No.: _____

LOCATION DESCRIPTION: GROUND LEVEL

DAILY JOB REPORT

Page 1 of 1

JOB NUMBER BA1-532 DAY MONDAY DATE 10/28/91

JOB NAME BENTALOU ELEM. SCHOOL ADDRESS 290 N. BENTALOU ST SUPERVISOR MICHAEL NELSON

EMPLOYEE HOURS

MICHAEL NELSON	014507	1500	2330	8	3	5	/	SUP	/	/	Michael Nelson
CHARLES RAINEY	018050	1500	2330	8	3	5	/	TECH	/	/	Charles Rainey
AIR TECH NAME:					AIR TECH SIGNATURE:							

MATERIAL RECEIVED

ITEM	QTY.	ITEM	QTY.	ITEM	QTY.
Bags	0	Glue	0	Surfac.	0
81 Bags		L. Bulbs		Tape	
82 Bags		Mop Heads		32-20	
G. Bags		Paint		32-21	
Lrg. Box Filt.		Pins		32-22	
Sm. Box Filt.		Poly		32-32	
P. Brushes		Lrg. Pre. Filt.		Towels	
W. Brushes		Sm. Pre. Filt.		Sm. Tubes	
Cassettes		Propane		Varsol	
Drums		Rags	10LB		
Ex. Duct		Rewet.	0		
84-18		Ribbon			
Comfo. Fil.		Scrapers			
PAPR. Fil.		Signs			
Fab. Glass		Stickers			
Gloves		Suits			

MATERIAL USED

ITEM	QTY.	ITEM	QTY.	ITEM	QTY.
Bags	0	Glue	0	Surfac.	0
81 Bags		L. Bulbs		Tape	
82 Bags		Mop Heads		32-20	
G. Bags		Paint		32-21	
Lrg. Box Filt.		Pins		32-22	
Sm. Box Filt.		Poly		32-32	
P. Brushes		Lrg. Pre. Filt.		Towels	
W. Brushes		Sm. Pre. Filt.		Sm. Tubes	
Cassettes		Propane		Varsol	
Drums		Rags	5LB		
Ex. Duct		Rewet.	0		
84-18		Ribbon			
Comfo. Fil.		Scrapers			
PAPR. Fil.		Signs			
Fab. Glass		Stickers			
Gloves		Suits			

TIME OF DELIVERY: 1500 DELIVERED BY: MICHAEL NELSON MILEAGE: 25

EQUIPMENT

ITEM	QTY.	QTY. USED	I.D. No.:	ITEM	QTY.	QTY. USED	I.D. No.:	ITEM	QTY.	QTY. USED	I.D. No.:
Chain	0			Nozzle	0			Airlss. Sp.	0		
Drill	↓			Air Pump				Squeegie			
Ext. Cord	1	1		Shwr. Pump				3 Stage			
Gang Box	0			Sawzall				Filt Unit			
Generator				Scaffold				N.A. Unit			
Hnd. Sprayr.				Scrw. Gun				81 Vac			
Hose				Shovel				82 Vac			
Ladders				Shower				W/D Vac	1	1	AU5
Str. Lts.				MISC.				Owner's or Representative's Signature:			
Locks				BUCKETS	2	2		Supervisor's Signature:			
Mop Set	↓										

002-91

-OVER-

[redacted] CAFETERIA

[redacted] UNLOADED SUPERVISORS TRUCK OF MAJOR EQUIPMENT & SUPPLIES. MOVED HANGING ORNAMENTS THAT WERE HUNG BY TAPE FROM ASBESTOS CEILING. ORNAMENTS WERE MOVED & REHUNG ON LIGHT FIXTURES & WALLS. VACUUMED FLOOR & TABLES THAT WERE UNDER ORNAMENTS WITH A W/D HEPA VACUUM. WIPED DOWN TABLES & FLOOR WITH RAGS. LOADED EQUIPMENT & SUPPLIES ONTO SUPERVISORS TRUCK. LEFT WORK AREA NEAT.

[redacted] N/A

[redacted] -0-

[redacted] N/A

[redacted]

AMOUNT OF DISPOSAL: -0-	ASBESTOS IN WORK AREA NOT PART OF SCOPE: ☐ YES ☒ NO
PRESSURE DIFFERENTIAL READING:	ASBESTOS HANDLED BY OTHERS: ☐ YES ☒ NO
SAMPLING INFORMATION (AIR/BULK)	IF YES, FILL OUT FORM
SAMPLE TYPE QUANT. SAMPLE No. RESULT	VISITORS TO SITE: N/A
PRELIM.	
I.W.A.	
O.W.A. N/A	
PERSONAL	DELAY: ☐ YES ☒ NO BY WHOM:
BULK N/A	MAN HOURS LOST:
FINAL	REASON FOR DELAY: N/A
VERIFICATION BY WHOM:	
☐ VERBAL ☐ WRITTEN	
DATE: TIME:	

ATTENTION!!!

PLEASE ATTACH THIS INFORMATION TO

AMENDMENT #4 OF THE

AHERA MANAGEMENT PLAN

(FOR THE PERIOD ENDING JUNE 30, 1992)

SCHOOL # 150

BALTIMORE CITY PUBLIC SCHOOLS

ASBESTOS COORDINATOR

DESIGNATED LOCAL EDUCATION AGENCY REPRESENTATIVE

MARCOR ENVIRONMENTAL, INC.

FIELD EMPLOYEES TRAINED FROM JULY 1, 1991 - JULY 1, 1992

NAME	STATE TRAINED	EXP. DATE	CERT. NUMBER	TITLE	HOURS TRAINED
ABERNETHY,SHANE	MD	06/12/92	312	W	24
ALBEA,NATHANIEL	MD	06/13/92	935	W	24
ANDERSON,FRED	MD	09/24/92	1679	W	24
ANDERSON,JOSE	MD	03/24/93	2020	S	32
AYALA,JESUS	MD	11/13/92	9111157	W	24
BALONIS,ROBIN	MD	01/21/93	113	S	32
BAUBLITZ,HARRY	MD	06/25/93	2465	W	24
BECK,EDWARD	MD	09/23/93	2976	S	32
BENNETT,RICHARD	MD	05/21/92	837	S	32
BLAKE,MICHAEL	MD	01/24/92	77	W	24
BOONE,LOUIS	MD	12/13/91	1973	W	24
BOULAYPHANH,KAYONH	MD	06/04/93	2350	W	24
BOUAPHAANH,KHAMKENG	MD	07/30/92	1263	W	24
BOUNSYNHAVONG,NOPHON	MD	06/25/93	2466	W	24
BOUTJAREUN,SOMPHONE	MD	06/04/93	2317	W	24
BOWMAN,CHARLES	MD	01/09/93	18	W	24
BOYKINS,AVON	MD	09/05/92	1560	W	24
BROCK,CHARLES	MD	01/09/93	23	W	24
BURBANK,ROBERT	MD	08/07/93	2763	W	24
CABRERA,ESVIN	MD	01/18/93	MISTS921020	W	24
CARR,ARTHUR	MD	01/09/93	31	W	24
CHANTHAVONG,BOUNMA	MD	06/25/93	2461	W	24
CHANTIVISACK,SISAVEUY	MD	05/01/93	2163	W	24
CHOI	MD	01/21/93	94	W	24
COFFEEY,CHERI	MD	07/29/93	2726	W	24
COLLINS,OLIVER	MD	06/25/93	2462	W	24
COOPER,GENE	MD	06/25/92	1208	W	24
COTTER,MARK	MD	07/15/93	2588	W	24
CRUZ,RENZO	MD	11/05/93	3170	S	32
CULEBRO,JOSE	MD	05/20/93	2255	W	24
DAVIS,BRUCE	MD	06/29/93	2490	W	24
DODSON,KEVIN	MD	08/01/93	MDIC-91-0047	W	24
DOYLE,JOHN	MD	08/08/92	1338	W	24
DUBOSE,RODNEY	MD	08/22/92	1517	W	24
DUNLAP,JOSEPH	MD	08/06/92	1316	W	24
EICHMAN,GERALD	MD	01/09/93	25	W	24
EIKENBERG,RICHARD	MD	05/04/93	2189	S	32
ELLICK,BRIAN	MD	07/23/93	2653	W	24
EPOUSE-KAMARA,ALUSINE	MD	07/15/93	2595	W	24
ESTADA,PEDRO	MD	08/27/93	2833	W	24
FARR,WALTE	MD	05/28/93	2284	W	24
FLEMING,RONALD	MD	05/07/93	2193	W	24
FLINTALL,DWAYNE	MD	09/08/93	2893	W	24
FOLKENROTH,KEVIN	MD	07/29/93	2688	S	32
			page 1		

MARCOR ENVIRONMENTAL, INC.

FIELD EMPLOYEES TRAINED FROM JULY 1, 1991 - JULY 1, 1992

NAME	STATE TRAINED	EXP. DATE	CERT. NUMBER	TITLE	HOURS TRAINED
FOXWORTH,ERIC	MD	05/20/92	2273	W	24
FRANKLIN,ROBERT	MD	05/08/93	91050801	W	24
GALICIA,OSCAR	MD	01/08/93	MISTS921002	W	24
GAMARRO,BOSBELI	MD	08/05/92	91080521	W	24
GAMARRO,JULIO	MD	01/18/93	MISTS921019	W	24
GILL,ROBERT	MD	09/24/92	1696	S	32
GOODE,HARRY	MD	06/29/93	2484	W	24
GREGOREK,GARY	MD	09/19/92	1626	W	24
GUYTON,WILLIE	MD	01/09/93	17	W	24
HAMMERBACHER,NELSON	MD	12/05/92	2025	W	24
HANELUXAY,NOUNE	MD	09/08/93	2892	W	24
HANVICHID,BILL	MD	11/12/92	1951	W	24
HARNYUENGYONG,PRAKIT	MD	07/14/93	2581	W	24
HARVEY,RONALD	MD	02/25/93	1935	S	32
HASELBACK,JIM	MD	01/09/93	33	W	24
HENRY,DARREN	MD	09/15/92	1558	W	24
HERNANDEZ,JOSE	MD	08/04/93	2704	W	24
HERRERA,ESVIN	MD	10/26/92	MISTS911508	W	24
HERRERA,SERGIO	MD	06/14/93	5063	W	24
HEWLETT,TROY	MD	10/21/91	N/A	W	24
HILTON,DAVID	MD	05/14/93	2062	S	32
HNOANG,DUY	MD	06/03/93	1154	W	24
HOMSOMBATH,BOUNTHAVY	MD	06/18/92	980	W	24
HOMSOMBATH,VILAY	MD	06/18/92	978	W	24
HOPKINS,MICHAEL	MD	05/20/93	92052195	W	24
HOWELL,KENNTH	MD	11/05/93	3171	W	24
HUTCHINS,EVERETT	MD	08/02/91	1965	W	24
HUYNH,HOANG	MD	06/11/93	2375	W	24
INTHAVONG,CHAN	MD	06/25/93	2460	W	24
INTHAVONG,SINGKHAM	MD	01/21/93	79	W	24
JINADU,FEMI	MD	07/14/93	2585	W	24
JOHNSON,WILLIAM	MD	09/22/93	2948	W	24
JONES,MARK	MD	05/28/93	2295	W	24
JONES,RICKIE	MD	06/05/93	2354	S	32
JONES,WILLIAM	MD	06/27/92	1018	W	24
JUDADO,EDGAR	MD	11/15/92	91111505	W	24
KEOMANY,KHAMLA	MD	06/20/93	959	W	24
KHANTRY,KHAMLA	MD	01/28/93	131	W	24
KHOMPHENCHANH,LINTHON	MD	01/21/93	115	W	24
KIMBROUGH,JESSE	MD	12/03/91	1950	W	24
KLOCK,ALAN	MD	07/16/92	1178	W	24
KNECHT,FRANK	MD	09/09/93	2898	S	32
KRIETE,KEVIN	MD	09/17/92	1627	W	24
KRIVOSH,RICHARD	MD	03/13/93	1968	W	24

MARCOR ENVIRONMENTAL, INC.

FIELD EMPLOYEES TRAINED FROM JULY 1, 1991 - JULY 1, 1992

NAME	STATE TRAINED	EXP. DATE	CERT. NUMBER	TITLE	HOURS TRAINED
KUTZ,ALBERT	MD	05/20/93	1110	W	24
LANG,ROBERT	MD	05/24/92	853	W	24
LATHAM,RALPH	MD	06/03/93	1159	W	24
LAZO,MARTIN	MD	01/10/93	92011003	W	24
LEAZER,WILLIAM	MD	06/29/93	2491	W	24
LEE,PAUL	MD	09/19/92	1647	W	24
LEWIS,ARTIS	MD	09/05/92	1564	W	24
LINTON,THOMAS	MD	04/26/92	MISTS911312	W	24
LOMBARDI,MICHAEL	MD	06/04/92	911	W	24
LOZZI,CHRISTOPHER	MD	06/20/92	956	W	24
LUCAS,LOUIS	MD	05/07/92	736	S	32
LYONS,MARK	MD	08/22/92	1464	W	24
MAEKSOMPORN,SINGHAM	MD	07/30/92	2736	S	32
MALLORY,ARTHUR	MD	09/19/92	1633	W	24
MANIPHONE,BILLY	MD	07/29/93	2693	W	24
McBRIDE,JIMMIE	MD	05/02/92	140001	W	24
McCARGISH,JACK	MD	05/04/93	2174	S	32
McKENZIE,MILTON	MD	09/20/92	1648	W	24
McLAMB,COREY	MD	05/07/93	2198	W	24
MEKSOMPHONE,KEN	MD	07/14/93	2585	W	24
MEKSOMPHONE,KEN S.	MD	08/11/93	2718	S	32
MEKSOMPHONE,OWEN	MD	06/12/93	2372	S	32
MEKSOMPHONE,TOM	MD	08/28/93	2852	S	32
MENDEZ,GONZALO	MD	08/15/93	2087	W	24
MERRITT,EDWIN	MD	02/25/93	1939	S	32
MERSON,JEFFREY	MD	05/20/93	92012196	S	32
MESSLER,JOHN	MD	09/08/93	2887	W	24
MORRIS,KEITH	MD	08/27/92	2832	W	24
MOTE,MICHAEL	MD	07/30/93	2741	S	32
MUMMA,RICHARD	MD	07/13/92	MISTS911344	W	24
NANCE,EDDIE	MD	09/05/92	1563	W	24
NELSON,MICHAEL	MD	07/30/93	2747	S	32
NGUYEN,DANG	MD	06/03/93	92060414	W	24
NGUYEN,MINH	MD	06/03/93	1155	W	24
NGUYEN,THANH	MD	06/11/93	2376	W	24
NORWOOD,TIMOTHY	MD	07/22/92	259	W	24
NOUANELADY,PHOUKHONG	MD	11/04/93	3164	W	24
NWAGBARAOCHA,OBEDIAH	MD	10/09/91	2508	W	24
OLSON,WAYNE	MD	06/04/93	2347	W	24
OWENS,ALBERT	MD	09/05/92	1559	W	24
PAMPLIN,CHARLES	MD	05/01/93	2158	S	32
PARKS,GARDNER	MD	07/15/93	2590	S	32
PATHOUMTHONG,SOMPHON	MD	07/16/92	1159	W	24
PATRICK,JOHN	MD	06/11/92	1110	W	24

MARCOR ENVIRONMENTAL, INC.

FIELD EMPLOYEES TRAINED FROM JULY 1, 1991 - JULY 1, 1992

NAME	STATE TRAINED	EXP. DATE	CERT. NUMBER	TITLE	HOURS TRAINED
PHANOUVONG,SISOUPHANH	MD	09/08/93	2891	W	24
PHANOUVONG,SOUVANH	MD	02/24/93	1915	W	24
PHAVIVONG,SOMBOUN	MD	07/14/93	2582	W	24
PHENSOMPHONE,BOUTHIEM	MD	04/09/92	536	W	24
PHIMPHANH,AMPHONE	MD	06/26/93	2464	S	32
PHIMPHANH,CHA	MD	01/23/93	99	W	24
PHIMPHANH,SOMSOUK	MD	04/14/93	2074	S	32
PHIMPHISANE,VIENGKHAM	MD	01/21/93	78	W	24
PHOUTTHACHONE,PAUL	MD	12/13/91	2766	W	24
PION,LAWRENCE	MD	01/21/93	118	S	32
RAGLAND,MICHAEL	MD	01/09/93	32	W	24
RAINEY,CHARLES	MD	07/14/93	2580	S	32
RAINEY,QUANE	MD	07/16/92	1151	W	24
RICHARDSON,JOSEPH	MD	01/09/93	24	W	24
SAENGPET,SOPHON	MD	01/03/92	2831	W	24
SCHROEDER,KENNETH	MD	02/26/92	314	W	24
SCOTT,FREDERICK	MD	07/15/93	2586	S	32
SENGCHANH,JIMMIE	MD	01/21/93	116	W	24
SENGCHANH, SAM	MD	11/04/92	3163	W	24
SHOCKEY, WILLIAM	MD	08/21/92	1479	S	32
SIMMONS, JOHN	MD	9/19/92	1634	W	24
SINGPARU, PIRUCH	MD	05/05/92	731	W	24
SINPRASEUTH, LAY	MD	06/18/92	981	S	32
SIRITHONGDY, KHAMCHANH	MD	06/04/93	2316	W	24
SOGUNRO, ABAYOMI	MD	02/25/93	1931	S	32
SOMBOUN, SCOTT	MD	02/05/93	92-02-05-05	S	32
SONG, YANG	MD	07/16/92	1157	W	24
SOTO, JURADO	MD	11/15/92	91-11-15-02	W	24
SOUKKAOHANH, BOUNTHAV	MD	11/15/93	3174	W	24
SOUTHALA, SITTHIPHANH	MD	06/04/93	2315	W	24
SOURINHADETH, SONE	MD	06/29/93	2684	W	24
SOUVANNAVONG, BOUN-HE	MD	01/28/93	190	W	24
SREEVIENGCHANH, VONE	MD	04/14/93	2069	W	24
STANLEY, TROY	MD	06/04/92	902	W	24
STEIN, MARK	MD	02/25/93	1940	S	32
STREET, DENNIS	MD	02/25/93	1934	S	32
SUMMERS, ROLAND	MD	06/29/93	2485	W	24
SWEENEY, DAVID	MD	09/22/93	2941	S	32
TATE, GORDON	MD	10/21/91	N/A	W	24
THANAVONG, KHAM	MD	01/03/93	10	W	24
THAMAVONG, SOMANH	MD	01/03/93	9	W	24
THEPSOUVANH, BOUALAY	MD	07/29/93	2692	W	24
THEPSOUVANH, SOMBOUN	MD	07/29/93	2691	W	24
THOCK, LUN	MD	08/10/93	2711	W	24

MARCOR ENVIRONMENTAL, INC.

FIELD EMPLOYEES TRAINED FROM JULY 1, 1991 - JULY 1, 1992

NAME	STATE TRAINED	EXP. DATE	CERT. NUMBER	TITLE	HOURS TRAINED
THONGDYGNALAT,CHANPH	MD	01/28/93	92	W	24
TORRES, CARLOS	MD	08/01/93	5175	W	24
TRAN, HUNG	MD	06/03/93	1153	W	24
TYLER, ALEXANDER	MD	09/05/92	1555	W	24
TYSON, WILLIAM	MD	07/16/92	1169	W	24
UZZLE, GEORGE	MD	08/14/91	2081	W	24
VASQUEZ, JOSE	MD	10/05/93	3020	W	24
VASQUEZ, NAPOLEON	MD	01/10/93	92-01-10-04	W	24
VEGA, JUAN	MD	06/04/93	2349	W	24
VINES, JAMES	MD	06/04/93	2321	W	24
VONGPHAKDY, SYSALEUMS	MD	07/30/93	2743	S	32
VONGSALY, VANKHAM	MD	03/26/92	481	W	24
WALLACE, DAVID	MD	07/29/93	2687	W	24
WALRATH, WILLIAM	MD	11/12/92	1957	S	32
WASHINGTON, JAMES	MD	09/08/93	2881	W	24
WASHINGTON, ZACHARY	MD	02/24/93	1917	W	24
WHITE, JESSE	MD	01/03/93	12	W	24
WILLIAMS, BAREASTER	MD	01/21/93	87	W	24
WILLIAMS, LARRY	MD	03/12/92	418	S	32
WILLIAMS, RICHARD	MD	06/20/92	180-50-3925	W	24
WILSON, DONALD	MD	11/04/93	3166	W	24
WITHERSPOON, NATHANIEL	MD	07/29/93	2727	W	24
WOLFE, DONALD	MD	07/02/92	190-56-6855	W	24
YOUNG, SCOTT	MD	09/05/92	1552	W	24
ZAMBELLI, FRANK	MD	02/28/93	1936	S	24

Job's Name:	**Bentalou ES** **220 N. Bentalou St.** **Baltimore, MD 21293**
Job $ Value	$1,250.00
Amount of asbestos removed	Approximately 60 SqFt of Floor Tile Mastic; Approximately 120 SqFt of Chalkboard Mastic
Area/Location of removal	Hallway outside Media Center
Contractor's License	Attached: M21-24-107 (Exp. 5/22/08)
Contractor's Insurance	Attached
MDE Notification	Not Required
Daily Log	Attached: Dated 5/12/08
Workers' Licenses	Attached
Workers' Training Certs	Attached
Workers' Medical Certs	Attached
IH - Monitoring Report	Attached
IH Compliane Cert/Lab Cert	Attached
Waste Manifest	Attached: Copy of Manifest #243454 (Original forthcoming)
Invoice	Attached: 2008- 3332

State of Maryland
Department of the Environment
Shari Wilson, Acting Secretary
Air & Radiation Management Administration

LICENSE FOR ASBESTOS REMOVAL/ENCAPSULATION

License Number: M21-24-107 Expiration Date: May 22, 2008 Control Number: 00003524

This License is issued in accordance with and subject to the provisions of Environment Article, §6-401 et. seq., of the Maryland Code and COMAR 26.11.21 as amended through August 24, 1998.

-- LICENSE HOLDER --

Retro Environmental Inc

Street Address: *5301 Enterprise St Suite D*
Sykesville MD 21784-

Mailing Address: *5301 Enterprise St Suite D*
Sykesville MD 21784-

• Interim Storage Authorization in accordance with COMAR 26.11.21.08C •

If applicable, Authorization Expires: 5/22/2008

Location: *10 Venture Way Space E Sykesville 21784-*

Description: *Fenced-in locked trailer*

George S. Aburn, Jr.

George S. Aburn, Jr., Director

License Issue Date: 5/22/2007

License Effective Date: 5/22/2007

MDE

ACORD CERTIFICATE OF LIABILITY INSURANCE

CSR DG
RETRO-1

DATE (MM/DD/YYYY)
11/05/07

PRODUCER
Russell Ins. Group, Inc. (CDB)
A Subsidiary of ACNB Corp.
P.O. Box 709
Mt. Airy MD 21771
Phone: 410-875-5617 Fax: 410-875-5340

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW.

INSURED

Retro Environmental, Inc.
5301 Enterprise Street Ste D
Sykesville MD 21784

INSURERS AFFORDING COVERAGE		NAIC #
INSURER A:	Hudson Specialty Insurance Co.	
INSURER B:	National Grange Mutual	
INSURER C:	Injured Worker's Ins. Fund	
INSURER D:	Montgomery Insurance Companies	14613
INSURER E:		

COVERAGES

THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. AGGREGATE LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	ADD'L INSRD	TYPE OF INSURANCE	POLICY NUMBER	POLICY EFFECTIVE DATE (MM/DD/YY)	POLICY EXPIRATION DATE (MM/DD/YY)	LIMITS	
A	X	GENERAL LIABILITY X COMMERCIAL GENERAL LIABILITY CLAIMS MADE [X] OCCUR X Lead Abatement X Asbestos Abatemen GEN'L AGGREGATE LIMIT APPLIES PER: POLICY PRO-JECT LOC	FEC6115160	10/17/07	10/17/08	EACH OCCURRENCE DAMAGE TO RENTED PREMISES (Ea occurence) MED EXP (Any one person) PERSONAL & ADV INJURY GENERAL AGGREGATE PRODUCTS - COMP/OP AGG Pollution	$ 5,000,000 $ 50,000 $ 5,000 $ 5,000,000 $ 5,000,000 $ 5,000,000 5,000,000
B		AUTOMOBILE LIABILITY X ANY AUTO ALL OWNED AUTOS SCHEDULED AUTOS X HIRED AUTOS X NON-OWNED AUTOS	B1B59158	06/29/07	06/29/08	COMBINED SINGLE LIMIT (Ea accident) BODILY INJURY (Per person) BODILY INJURY (Per accident) PROPERTY DAMAGE (Per accident)	$ 1,000,000 $ $ $
		GARAGE LIABILITY ANY AUTO				AUTO ONLY - EA ACCIDENT OTHER THAN AUTO ONLY: EA ACC AGG	$ $ $
A		EXCESS/UMBRELLA LIABILITY X OCCUR CLAIMS MADE DEDUCTIBLE RETENTION $	FXS7000173	10/17/07	10/17/08	EACH OCCURRENCE AGGREGATE	$ 4,000,000 $ 4,000,000 $ $ $
C		WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? If yes, describe under SPECIAL PROVISIONS below	3569595ABC	10/17/07	10/17/08	X WC STATU-TORY LIMITS OTH-ER E.L. EACH ACCIDENT E.L. DISEASE - EA EMPLOYEE E.L. DISEASE - POLICY LIMIT	$ 1000000 $ 1000000 $ 1000000
		OTHER					
B		Property - R/C	FRB59158	06/25/07	06/25/08	LBR	50,000
D		Equipment	IM8068992	09/14/07	09/14/08		100,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES / EXCLUSIONS ADDED BY ENDORSEMENT / SPECIAL PROVISIONS

The Baltimore City Public School System and Board of School Commissioners are hereby named as additional insured on the general liability. The policy(s) cannot be reduced or cancelled without at least a forty five (45) days prior written notice to the Baltimore City Public School System.

CERTIFICATE HOLDER

BALTIBA

Baltimore City Public School System
BCPSS Headquarters Building
200 E. North Avenue
Baltimore MD 21202

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, THE ISSUING INSURER WILL ENDEAVOR TO MAIL 45 DAYS WRITTEN NOTICE TO THE CERTIFICATE HOLDER NAMED TO THE LEFT, BUT FAILURE TO DO SO SHALL IMPOSE NO OBLIGATION OR LIABILITY OF ANY KIND UPON THE INSURER, ITS AGENTS OR REPRESENTATIVES.

AUTHORIZED REPRESENTATIVE
Connie O. Bauer

© ACORD CORPORATION 1988

Retro Environmental, Inc.

Date: 05-12-08

WORK PERFORMED TODAY

Specific Work Performed:	Bentalou Elementary

11:00 AM → Supervisor Ricardo + Crew on site Shop Next Drive VAN # 6 to JaB Site

1:30 PM → Chuck Choolmy the 3 Areas Work 1 Area on media Center remove Chalkboard mastic

2 Small areas on hallway Remove floor tile and mastic

2:30 PM → Stor to Set up Critical Barrier and Caution tey on the hallway

3:15 PM → Start to Remove the mastic from Chalkbord

5:00 PM → is Done the Remo the mastic from Chalkboard Next Start on the hallway Remove the floor tile and Mastic 6:30 PM → is Done the allWay Next IH Roons final Sample

8:30 PM → Start theoridow the Critica Next left

ATTACH ALL DUMPSTER TICKECTS TO LOG SHEETS EACH DAY

Amount of Asbestos Loaded Today:		
Bags: 9	Drums:	Other:

☒ Hauled by Retro Truck To: Shop trailer ☐ Disposed of in On-Site Trailer

Supervisor's Signature: RAp

RICARDO A. PORTILLO

Name

Signature

HAS ATTENDED AND PASSED THE EXAM IN AN ASBESTOS TRAINING COURSE ENTITLED:

EPA AHERA ASBESTOS CONTRACTOR / SUPERVISOR REFRESHER COURSE

Course Name

FOR ACCREDITATION UNDER TSCA TITLE II.



(STATE SEAL IS BLUE)

26-Apr-08	26-Apr-09	26-Apr-08
Course Date(s)	Expiration Date	Exam Date

NO. 95754 GES STATE OF MARYLAND

GLOBAL ENVIRONMENTAL SOLUTIONS

This certifies that

RICARDO A. PORTILLO

HAS MET THE ATTENDANCE REQUIREMENTS AND SUCCESSFULLY COMPLETED
THE COURSE ENTITLED

EPA AHERA ASBESTOS CONTRACTOR / SUPERVISOR REFRESHER COURSE

FOR ACCREDITATION UNDER TSCA TITLE II

4/26/2008	4/26/2009	4/26/2008
COURSE DATE	EXPIRATION DATE	EXAM DATE

MICHAEL NORRIS

COURSE DIRECTOR

95754

CERTIFICATE NO.

Virginia Asbestos Training Provider Accreditation No 3323000076

8300 MERRIFIELD AVE UNIT # B FAIRFAX, VA 22031 (703) 205-9188 FAX: (703) 205-9186

Concentra Medical Centers (MD)

4451 G Parliament Place Lanham, MD 20706
Phone: (301) 459-9113 Fax: (301) 459-1214

EMPLOYER AUTHORIZATION AND INFORMATION FOR RESPIRATORY EVALUATION

EMPLOYER TO COMPLETE THE FOLLOWING :

Employee Name: Portillo-Lopez, Ricardo

Address: 8605 leonard dr.

SILVER SPRING MD 20910

Employer: Retro Environmental

Employee SSN: 215-61-5684

Check Type of Respirator(s) To Be Used (Check ✓ALL that apply)

- ☐ Air-purifying (non-powered)
- ☐ Air-purifying (powered)
- ☐ Atmosphere supplying Respirator
- ☐ Combination air-line and SCBA
- ☐ Continous-Flow Respirator
- ☐ Supplied-Air Respirator
- ☐ Open Circuit SCBA
- ☐ Closed Circuit SCBA
- ☐ Dust Mask
- ☐ 1/2 Face with Canisters
- ☐ Full Face with Canisters

Make: _____ Model: _____ Cartridge: _____

Special Work Conditions
(Check ✓ ALL That Apply When Wearing Respirator)

- ☐ High Places
- ☐ Enclosed Places
- ☐ Protective Clothing
- ☐ Temperature Extremes
- ☐ Mostly Cold
- ☐ Mostly Hot
- ☐ Other: _____

Questionare will be: ☐ HAND CARRIED ☐ MAILED ☐ OTHER

Extent of Useage (Check ✓ALL that apply)

- ☐ On a daily basis _____ Total Hours
- ☐ Occasionally - but not more than twice a week _____ Total Hours
- ☐ Rarely - or for Emergency situations only _____ Total Hours

Expected Physical Effort Required (Check ✓ALL that apply)

- ☐ Light
- ☐ Moderate
- ☐ Heavy

Exposure to Hazardous Materials (Check ✓ALL that apply)

- ☐ Arsenic
- ☐ Benzene
- ☐ Coke Oven
- ☐ Cotton Seed / Dust
- ☐ Cadmium
- ☐ Formaldehyde
- ☐ Methylene Chloride
- ☐ Lead
- ☐ Textiles
- ☐ Chromium

Other(s): _____

EVALUATION AUTHORIZATION BY: _____
Signature of Employer Representative

DO NOT WRITE BELOW THIS LINE **DO NOT WRITE BELOW THIS LINE** **DO NOT WRITE BELOW THIS LINE**

PLHCP[1] WRITTEN STATEMENT for RESPIRATORS (EMPLOYER)

PHYSICIAN WILL COMPLETE THE FOLLOWING

This report may contain confidential medical information and is intended for the designated employer contact only. The Americans with Disabilities Act (ADA) imposes very strict limitations on the use of information obtained during physical examination of qualified individuals with disabilities. All information must be collected and maintained on seperate forms, in seperate files, and must be treated as a confidential medical record, with the following exceptions:

- Supervisors and managers may be informed about necessary restrictions on the work or duties of an employee and necessary accommodations.
- First aid and safety personnel may be informed, when appropriate, if the disability might require emergency treatment.

Based upon my findings, I have determined that this individual (Check ✓ALL that apply)

- ☐ Employee must schedule a medical examination with Concentra Medical Centers (MD) prior to respirator approval and usage.
- ☑ Class I - No Restrictions on Respirator Use
- ☐ Class II - Some Specific Use Restrictions
- ☐ To be used for Emergency Response or Escape Only
- ☐ Other: _____
- ☐ Class III - Respirator Use is NOT PERMITTED
- ☐ Further Testing / Evaluation is Required. [2]
- ☐ Fit Test Required
- ☐ Fit Test Performed Satisfactorily
- ☐ Fit Test Performed Unsatisfactorily
- ☐ Fit Test NOT Performed at: Concentra Medical Centers (MI
- ☐ Special prescription eyewear needed to accommodate respirator
- ☐ Special prescription eyewear needed to accommodate respirator
- ☐ Facial hair needs to be shaved to assure tight seal on certain face masks.

[1] Physician or other Licensed Healthcare Professional

[2] Employee must seek further medical evaluation by a private physician who must submit a report to Concentra Medical Centers (MD) of his/her findings to

(Check ✓ ALL that apply)

- ☑ The above individual HAS been examined for respirator fitness in accordance with 29 CFR 1910.134. This limited evaluation is specific to respirator use only. Employees should be instructed to report any difficulties in using respirators or change of any physical status to their supervisor or physician. This evaluation included the Respiratory Questionnaire outlined in 29 CFR 1910.134.
- ☐ The above individual HAS NOT been examined by me for respirator fitness. The employee's medical evaluation consisted of a review of OSHA's Medical Evaluation Questionnaire in Appendix C Part A Section 2. In accordance with 29 CFR 1910.134, this limited evaluation is specific to respirator use only. Employees would be instructed to report any difficulties in using respirators or change of any physical status to their supervisor or physician. This evaluation included the Respiratory Questionnaire outlined in 29 CFR 1910.134.
- ☑ In accordance with specific OSHA requirements, I have informed the above named individual of the results of this evaluation and of any medical conditions resulting from exposures that may require further explanation or treatment. Where applicable, the above named individual has been informed of the increased risk of lung cancer attributable to the combined effect of smoking and asbestos, lead and/or other chemical exposure(s).

Physician's Signature

D17690 MD
Physician's License Number (Optional in Most States)

R Bernay
Physician's Name (Printed)

12/14/07
Date of Exam

12/14/10
Expires On

JOSE LUIS PEREZ-ESCOBAR

Name

Signature

HAS ATTENDED AND AGREED TO THIS EXAM OF AN ASSESSOR TRAINING COURSE ENTITLED:

EPA WPS/ARGRICULTURAL WORKER

PESTICIDE REGULATION LANGUAGE

Course Name:

FOR ACCREDITATION UNDER FIFRA TITLE II



(STATE SEAL IS BLUE)

24-Nov-07	24-Nov-08	24-Nov-07
Course Date(s)	Expiration Date	Exam Date

NO. 93755 G.E.S. STATE OF MARYLAND

GLOBAL ENVIRONMENTAL SOLUTIONS

This certifies that

JOSE LUIS PEREZ-ESCOBAR

HAS MET THE ATTENDANCE REQUIREMENTS AND SUCCESSFULLY COMPLETED THE COURSE ENTITLED

EPA AHERA ASBESTOS WORKER REFRESHER - SPANISH LANGUAGE

FOR ACCREDITATION UNDER TSCA TITLE II

11/24/2007	11/24/2008	11/24/2007
COURSE DATE	EXPIRATION DATE	EXAM DATE
MICHAEL NORRIS	93755	
COURSE DIRECTOR	CERTIFICATE NO.	

Virginia Asbestos Training Provider Accreditation No. 3321000071

8300 MERRIFIELD AVE UNIT # B FAIRFAX, VA 22031 (703) 205-9188 FAX: (703) 205-9186

FROM : GES TRAINING PHONE NO. : 7032059191 Jan. 09 2008 12:52PM P1

CHARLES C. YOUNG, M.D

Diplomate, American Board of Physical Medicine & Rehabilitation
Diplomate, American Board of Electrodiagnostic Medicine
Diplomate, American Board of Neuro-rehabilitation

5055 Seminary Road, #109
Alexandria, VA 22311
(703) 931-5635

FAX:(703) 931-6972

4701 Melbourne Place
College Park, MD 20740
(301) 474-7425

PHYSICIAN'S WRITTEN OPINION-ASBESTOS

Applicant's Name: [illegible]

Social Security #: [illegible] Case #: [illegible]

"The above named individual was seen by me on 6/26/07, and in accordance with all applicable portions of OSHA'S Asbestos Standard for the Construction Industry, 29 CFR 1926:1101 with which I am familiar, I have indicated by my initials, that I have performed the following:"

1. ✓ Reviewed with this individual, his/her completed OSHA Standardized Medical Questionnaire and Work History, directed towards the pulmonary, cardiovascular, and gastrointestinal system; and

2. ✓ Reviewed the employer's description of this individual's duties as they relate to asbestos exposure, the anticipated exposure level, the personal protective and respirator equipment to be utilized by the individual, and any additional medical information resulting from previous examinations; and

3. ✓ Conducted a physical examination of this individual with emphasis on the pulmonary, cardiovascular, and gastrointestinal systems, including a pulmonary function test of forced vital capacity (FVC) and forced expiratory volume at one second (FE.V.1); and

4. ___ Determined that a chest roentgenogram was___ was not✓ required as a part of this examination. (If required, the X-ray was taken and read in accordance with Appendix F of the Asbestos standard): and

5. ___ Determined that this individual may___ may not___ use a respiratory device while performing his/her required employment services: is ✓ is not___ capable of working in hot work environments; and

6. ___ Informed this individual that I have ___ have not✓ detected a medical condition which would place this individual at an increased risk of material health impairment from exposure to asbestos; and

7. ___ Informed this individual of the results of my examination and of any medical condition that may result from this individual's exposure to asbestos; and

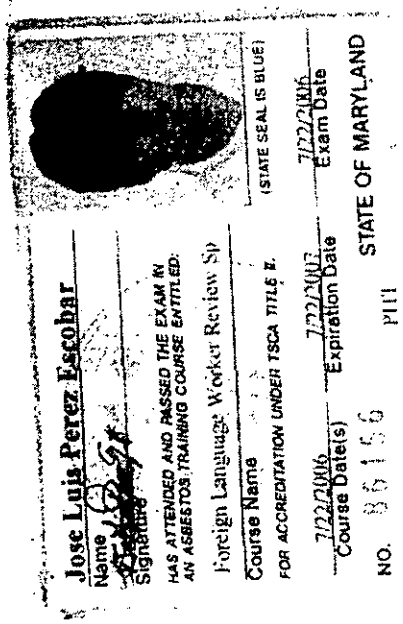
8. ___ Informed this individual of the health risk involved in smoking, of the synergistic relationship between cigarette smoking and asbestos exposure in producing lung cancer, and that cessation of smoking will reduce the risk of lung cancer.

Comments and limitations (If any) _____

CHARLES C. YOUNG, M.D.
5055 Seminary Road, #109
Alexandria, VA 22311
(703) 931-5635

[signature] (Physician's signature)

2007



ALBA SUSANA LEMUS

Name

Signature

HAS ATTENDED AND PASSED THE EXAM IN AN ASBESTOS TRAINING COURSE ENTITLED:

EPA AHERA ASBESTOS WORKER INITIAL - SPANISH LANGUAGE

Course Name

FOR ACCREDITATION UNDER TSCA TITLE II.



(STATE SEAL IS BLUE)

26-Jun-07 to 29-Jun-07	29-Jun-08	29-Jun-07
Course Date(s)	Expiration Date	Exam Date

NO. 91233 GES STATE OF MARYLAND

GLOBAL ENVIRONMENTAL SOLUTIONS

This certifies that

ALBA SUSANA LEMUS

HAS MET THE ATTENDANCE REQUIREMENTS AND SUCCESSFULLY COMPLETED
THE COURSE ENTITLED

EPA AHERA ASBESTOS WORKER INITIAL - SPANISH LANGUAGE

FOR ACCREDITATION UNDER TSCA TITLE II

6/26/2007 to 6/29/2007	6/29/2008	6/29/2007
COURSE DATE	EXPIRATION DATE	EXAM DATE
MICHAEL NORRIS	91233	
COURSE DIRECTOR	CERTIFICATE NO.	

Virginia Asbestos Training Provider Accreditation No 3320000056

8300 MERRIFIELD AVE UNIT # B FAIRFAX, VA 22031 (703) 205-9188 FAX: (703) 205-9186

CHARLES C. YOUNG, M.D

Diplomate, American Board of Physical Medicine & Rehabilitation
Diplomate, American Board of Electrodiagnostic Medicine
Diplomate, American Board of Neuro-rehabilitation

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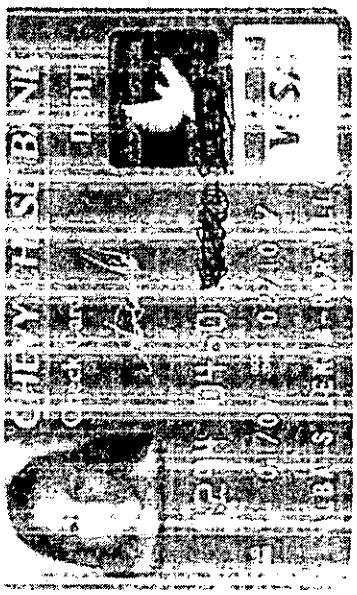
4701 Melbourne Place
College Park, MD 20740
(301) 474-7425



PHYSICIAN'S WRITTEN OPINION-ASBESTOS

Applicant's Name: LEWIS, ALBA

Social Security #: 223-32-3383 Case #: 6766247

"The above named individual was seen by me on 2/22/07, and in accordance with all applicable portions of OSHA'S Asbestos Standard for the Construction Industry, 29 CFR 1926.1101 with which I am familiar, I have indicated by my initials, that I have performed the following."

1. ✓ Reviewed with this individual, his/her completed OSHA Standardized Medical Questionnaire and Work History, directed towards the pulmonary, cardiovascular, and gastrointestinal system; and

2. ✓ Reviewed the employer's description of this individual's duties as they relate to asbestos exposure, the anticipated exposure level, the personal protective and respirator equipment to be utilized by the individual, and any additional medical information resulting from previous examinations; and

3. ✓ Conducted a physical examination of this individual with emphasis on the pulmonary cardiovascular, and gastrointestinal systems, including a pulmonary function test of forced vital capacity (FVC) and forced expiratory volume at one second (FE.V.1): and

4. ___ Determined that a chest roentgenogram was___ was not ✓ required as a part of this examination. (If required, the X-ray was taken and read in accordance with Appendix F of the Asbestos standard): and

5. ___ Determined that this individual may___ may not___ use a respiratory device while performing his/her required employment services: is ✓ is not___ capable of working in hot work environments; and

6. ___ Informed this individual that I have ___ have not ✓ detected a medical condition which would place this individual at an increased risk of material health impairment from exposure to asbestos; and

7. ✓ Informed this individual of the results of my examination and of any medical condition that may result from this individual's exposure to asbestos; and

8. ___ Informed this individual of the health risk involved in smoking, of the synergistic relationship between cigarette smoking and asbestos exposure in producing lung cancer, and that cessation of smoking will reduce the risk of lung cancer.

Comments and limitations (If any) _____

CHARLES C. YOUNG, M.D.
5055 Seminary Road, #109
Alexandria, VA 22311
(703) 931-5635

Charles C. Young M.D.
(Physician's signature)

200

IH SERVICES, INC.

1831 Portal Street – Suite E, Baltimore, Maryland 21224

Main Office: 410-633-4000
Fax: 410-633-4122

AIR MONITORING DATA SHEET

Project: Bentalou ES
Address: 220 N. Bentalou St
Baltimore, MD 21223
Activity: removal floor tiles
Job Number:
Work Order Number:

SAMPLED FOR:

	METHOD	CASSETTE	FILTER
☑ Asbestos:	☑ 7400 ☐ TEM	☐ 25 mm ☐ 37 mm	☑ MCE ☐ PC

☐ Airborne Dust:
☐ Gas:
☐ Vapor:
☐ Other:
Analytical Method: Ambient Temp:

Protection Worn During Sampling:

	EMPLOYEE	IH
Full Body Coveralls	☑	☑
Respirator – Air Purifying	☑	☑
Respirator – Power Air Purifying	☐	☐
Respirator – Supplied Air	☐	☐

PERSONAL SAMPLING DATA

Employee Sampled: N/A
Social Security Number:
Smoker: ☐ Yes ☐ No
Job Function:
Description of Activity:

Signature of Employee

LAB ID	SAMPLE NO.	SAMPLE DATE	RESULTS	SAMPLE LOCATION
V-3669	BES-01	05/12/08	C	Bsmt
V-3670	BES-02		C	Bsmt
V-3671	BES-03		<0.010	Final inside w/ room 201 prior to work
V-3672	BES-04		<0.010	Final inside w/ room 201 prior to work
V-3673	BES-05		<0.010	Final inside w/ room 201 prior to work
V-3674	BES-06		<0.010	Final inside w/ room 201 prior to work
V-3675	BES-07		<0.010	

FIELD SAMPLE NUMBER	TEST PERIOD START	TEST PERIOD STOP	TEST PERIOD TOTAL (MIN.)	FLOW RATE SETTING START (LITERS / MIN.)	FLOW RATE SETTING STOP (LITERS / MIN.)	VOLUME LITERS	SAMPLE TYPE AMBIENT	SAMPLE TYPE AREA	SAMPLE TYPE FINAL	SAMPLE TYPE PERSONAL	SAMPLE LOCATION IN WORK AREA	SAMPLE LOCATION OUTSIDE WORK AREA	SAMPLE LOCATION N/A	INSTRUMENT SERIAL NUMBER
BES-01	—	—	0	—	—	0							✓	Bsmt
02	—	—	0	—	—	0							✓	Bsmt
03	648	748	61	10.0	10.0	610			✓		✓			0431
04	650	750	60	10.0	10.0	600			✓		✓			0538
05	653	753	60	10.0	10.0	600			✓		✓			0355
06	655	755	60	10.0	10.0	600			✓		✓			0532
07	658	758	60	10.0	10.0	600			✓		✓			0585

SAMPLES COLLECTED BY

Hygienist Name: V. Golubitsky
Hygienist Signature:

SAMPLES ANALYZED BY

Analyst: V. Golubitsky (PRINT NAME)
(SIGNATURE)
Date Analyzed: 05/12/08

Rev. 3/08

AIHA

Asbestos Analysts Registry

Laboratory Quality Assurance Programs

AAT Performance Results Report

4/22/2008

Nicole Steinhauer
IH Services, Inc.
1831 Portal Street, Suite E
Holabird Business Park
Baltimore, MD 21224

Organization ID: 100492

REPORT OF PERFORMANCE FOR ROUND # 85, ORGANIZATION # 100492

The following individuals have met all the requirements* for listing in the Asbestos Analysts Registry (AAR) and have been approved by the AIHA Analytical Accreditation Board (AAB):

ID	Name	RESULTS (f/mm2) FOR THE CURRENT ROUND (R85)								Outliers			Performance
										R85	R84	TOT	
7286	Richardson, Scott	A851	229	B851	299	C851	430	D851	438	0	0	0	Acceptable
8305	Golubitskiy, Vladimir	A851	233	B851	358	C851	548	D851	438	0	0	0	Acceptable
8482	Steinhauer, Nicole	A851	252	B851	322	C851	520	D851	421	0	0	0	Acceptable
8866	Oxendine, Derrick B.	A851	240	B851	292	C851	933	D851	398	0	0	0	Acceptable

The following individuals have applied for listing in the AAR and are in the process of gaining AIHA AAB approval status, but have not met all the criteria* or they have lost their board approval status due to non-proficiency or non-participation.:

ID	Name	RESULTS (f/mm2) FOR THE CURRENT ROUND (R85)								Outliers			Performance
										R85	R84	TOT	

The determination of outliers for the above results is based on the following performance limits:

Reference Values for Round #85

Sample ID	Batch	Reference Mean	Lower Limit	Upper Limit	Std Dev	RSD
A851	1	236	118	472	65.56	27.74
B851	1	297	148	595	67.78	22.78
C851	1	467	233	934	117.98	25.26
D851	1	495	247	991	134.41	27.12

*Criteria for AIHA Analytical Accreditation Board Approval of AAR Analysts:

1. The organization's application shall be reviewed and approved by AAR Reviewers and must meet all the requirements of the most current AAR Policies and NIOSH 7400 method.
2. An analyst's application shall be reviewed and approved by AAR Reviewers and must have completed two (2) consecutive AAT rounds with no greater than 2 outliers combined.

SERVICE TRANSPORT GROUP, INC.

58 PYLES LANE, NEW CASTLE, DE 19720
PHONE:(877) 999-9559

Nº 243454 **WASTE SHIPMENT RECORD** **COPY** S.T.G. # _____

GENERATOR

1. Material Origin Site Job # 08-293 Bentalou ES 220 N. Bentalou St. Baltimore, MD 21223	Generator: Name/Address Baltimore City Public Works Asbestos Management/Construction 200 N. Holiday St. ,7th Floor Baltimore, MD 21202	Generator: Phone # 410-396-3791 Attn: Gordon Hubbard
2. Removal Contractor: Name/Address Retro Environmental, Inc. 5301 Enterprise Street, Ste. D Sykesville, MD 21784	Contact: Chuck Ertel	Contractor: Phone # 410-552-9301
3. Responsible Agency: Name/Address U.S. EPA Region III 1650 Arch Street Philadelphia, PA 19103-2029	4. US DOT Class - FRIABLE ASBESTOS ONLY RQ ASBESTOS, 9, NA 2212, PG III	

5. Description of Materials Specify Friable or Non-Friable	Containers No.	Type	Total Quantity
If Friable (enter required information) Non-Friable: Chalkboard Mastic	9	Bags	
If Non-Friable (check one): ☐ Category I ☐ Category II Non-Friable: Floor Tile & Mastic			

6. Special Handling Instructions: 24-hour emergency spill response no. 800-424-9300

7. Generator Certification:
This is to certify that the above named materials are properly classified, described, packaged, marked and labeled and are in proper condition for transport by highway according to the applicable regulations of the Department of Transportation, US E.P.A., and any other state government agency. I certify that the foregoing is true and correct to the best of my knowledge. If the waste shipment is not as I stated, I accept the RETURN of the COMPLETE LOAD to the generator's service location at the generator's expense.

Printed/Typed Name & Title	Signature	Date
Charles J. Ertel, Jr. - General Superintendent	Dave Ertel	5/12/08

TRANSPORTER

8. Transporter 1 (Acknowledgement of Receipt of Materials) *If blank, Transporter 2 serves as sole transporter.

Company Name & Address		
	Signature: _____ Printed Name: _____ Title:	Telephone No. Date:

9. Transporter 2 (Acknowledgement of Receipt of Materials)

Company Name & Address		
Service Transport Group, Inc. 58 Pyles Lane New Castle, DE 19720	Signature: _____ Printed Name: _____ Title:	Telephone No. 877-999-9559 Date:

DISPOSAL SITE

10. Discrepancy Indication Space:

11. Waste Disposal/Recycling Site Owner or Operator's Certification (Receipt of above Waste Except as Noted in 10)

Company Name & Address		
A & L Salvage, Inc. 11225 S. R. 45 P.O. Box 333 Lisbon, OH 44432 Permit No. 139120	Signature: _____ Printed Name: _____ Title: _____	Telephone No. 330-424-3739 Date

WHITE-Disposal Site • GREEN-S.T.G. • YELLOW-Contractor • PINK-Generator • GOLD - Pick Up Receipt

AMENDMENT #5

December 1, 1993
(For the period ending June 30, 1993

AHERA

ASBESTOS CONTAINING MATERIALS MANAGEMENT PLAN

dated May 9, 1989

School No. PS150

School Name Bentalou Elementary

NOTICE

NO Asbestos Response Actions for school
for period reported under this amendment attached.

Issued By
BALTIMORE CITY PUBLIC SCHOOLS

Asbestos Coordinator
Designated Local Education Agency Representative

PLEASE POST PLEASE POST

City of Baltimore Public Schools

ASBESTOS PROGRAM

NOTICE TO SCHOOL BUILDING VISITORS AND OCCUPANTS (TEACHERS, STUDENTS, OPERATING ENGINEERS AND CUSTODIAL PERSONS) OF **ASBESTOS MANAGEMENT PLAN AMENDMENT NO. 5** AND AVAILABILITY OF **ASBESTOS MANAGEMENT PLAN** FOR INSPECTION.

An amendment to the **Asbestos Management Plan** has been appended to the management plans for asbestos to be kept in the building administrative office. This is Amendment #5 and is **dated December 1, 1993**. This amendment is available for inspection by making request to the building principal.

EPA Rules for school buildings require:

(1) We maintain records on asbestos in each school.

(2) Inform our building occupants and visitors on asbestos in each school building of locations of and response actions for asbestos in each school.

(3) Give right-of-way to EPA and State of Maryland environmental inspectors.

Failure to fulfill the above may result in serious civil and possible criminal penalties assessed against the City for failure to perform the above including possible criminal penalties against persons who willfully avoid the EPA Rules.

If the **Asbestos Management Plan and the Amendments** to it are not available in your school from the principal report it to **Environmental Services - Asbestos Office at 396-7832** immediately.,

David W. Mitchell
Baltimore City Asbestos Coordinator
and Designated LEA Representative

City of Baltimore Public Schools

AMENDMENT #5

December 1, 1993

INTRODUCTION

These amendments are issued annually to update the **Asbestos Management Plan** for each building under control of Baltimore City Public Schools.

Contents of each annual amendment will include:

- Asbestos response actions for the building (if any);
- **Table IA** containing the remaining quantities of asbestos containing material in the building;
- A copy of the surveillance logs for the building done at a minimum of a semi-annual basis;
- any other pertinent information.

An asbestos response action shall include any work to clean up asbestos in response to a major or minor fiber release episode, or any work action to remove, encapsulate, enclose, or repair asbestos containing materials.

Persons reading this amendment are encouraged to read the **Asbestos Management Plan** to thoroughly understand the location and extent of asbestos containing materials in the building.

David W. Mitchell
Baltimore City Asbestos Coordinator
and Designated LEA Representative

1992 FISCAL YEAR

ASBESTOS MANAGEMENT PROGRAM

FIELD INSPECTION LOG OF QUARTERLY SURVEILLANCE

FOR SCHOOL P.S. #150

1st QUARTER INSPECTION

Performed by Robert West

Date Performed October 1992

2nd QUARTER INSPECTION

Performed by John Walton

Date Performed 6-25-93

3rd QUARTER INSPECTION

Performed by John Walton

Date Performed 6-25-93

4th QUARTER INSPECTION

Performed by John Walton

Date Performed 6-25-93

SEE ATTACHED SURVEILLANCE REPORT FORMS FOR FINDINGS

FIGURE 7-1. QUARTERLY SURVEILLANCE REPORT FORM

DATE: _____ SURVEYOR: _____

SCHOOL NO.: PS150

FUNCTIONAL SPACE	MANAGEMENT AREA DESCRIPTION	CONDITION CHANGE								COMMENTS
		1st Quarter		2nd Quarter		3rd Quarter		4th Quarter		
		Yes	No	Yes	No	Yes	No	Yes	No	
01- Boiler Room	Boiler Block and Trowelled-on Insulation		✓		✓		✓		✓	
	Boiler Breeching Block and Trowelled-on Insulation		✓		✓		✓		✓	
	Hot Water Generator Block and Trowelled-on Insulation		✓		✓		✓		✓	
	(1) Fire Door		✓		✓		✓		✓	
02- Cafeteria and Lobby	Acoustical Plaster		✓		✓		✓		✓	
	Vinyl Asbestos Tile		✓		✓		✓		✓	
	(2) Fire Doors		✓		✓		✓		✓	
03- Auditorium	Acoustical Plaster		✓		✓		✓		✓	
	Vinyl Asbestos Tile		✓		✓		✓		✓	
	(1) Fire Door		✓		✓		✓		✓	

Bentalou Elementary School PS150
(0629k)

FIGURE 7-1. QUARTERLY SURVEILLANCE REPORT FORM

DATE: _____ SURVEYOR: _____

SCHOOL NO.: PS150

FUNCTIONAL SPACE	MANAGEMENT AREA DESCRIPTION	CONDITION CHANGE								COMMENTS
		1st Quarter		2nd Quarter		3rd Quarter		4th Quarter		
		Yes	No	Yes	No	Yes	No	Yes	No	
04- Classrooms	Vinyl Asbestos Tile		✓		✓		✓		✓	
05- Hallways and Stairwells	Vinyl Asbestos Tile		✓ ✓		✓ ✓		✓ ✓		✓ ✓	
06- Offices, Work Rooms, and Lounges	Vinyl Asbestos Tile		✓ ✓ ✓		✓ ✓ ✓		✓ ✓ ✓		✓ ✓ ✓	
07- Incinerator Room	(1) Fire Door		✓ ✓		✓ ✓		✓ ✓		✓ ✓	
08- Library	Vinyl Asbestos Tile		✓		✓		✓		✓	
09- Mechanical Room	Duct Mastic		✓ ✓		✓ ✓		✓ ✓		✓ ✓	
	(1) Fire Door		✓		✓		✓		✓	

AMENDMENT #5
December 1, 1993

TABLE 1-A

Baltimore City Schools

ACM in Schools and Removal During the Peroid
FISCAL 1993

	CEILING & WALLS					*FLOOR COVER*	*MECHANICAL*						*OTHER*			*MISCELLANEOUS*			
Job No	Spray On SF	Tile SF	Acoustic Plaster SF	Other Plaster SF	Wallboard SF	VAT SF	Pipe LF	Elbows Fittings SF	Boilers Breeching SF	Tanks SF	Ductwork SF	Other TSI LF	Curtains SF	Firedoors Ea/SF	Cement Board SF	Soil SF	Wire LF	Misc LF	Misc SF
PS150																			
Beg Year			5000			90000			500	125	250			126					
Year End			5000			90000			500	125	250			126					

NOTES:
For locations of ACBM applications, see the AHERA Inspection Report and Management Plan for this building located in Section (1.2) and Appendix H.

For Job Detail, see Md. Dept. of Environment Job Notification, Asbestos Office job notification summary for this building, or invoices related to specific jobs.

AMENDMENT #6

December 1, 1994
(For the period ending June 30, 1994

AHERA

ASBESTOS CONTAINING MATERIALS MANAGEMENT PLAN

dated May 9, 1989

School No. PS150

School Name Bentalou Elementary

NOTICE

NO Asbestos Response Actions for school for period reported under this amendment attached.

Issued By
BALTIMORE CITY PUBLIC SCHOOLS

Asbestos Coordinator
Designated Local Education Agency Representative

City of Baltimore Public Schools
AMENDMENT #6
January 1, 1995

INTRODUCTION

These amendments are issued annually to update the **Asbestos Management Plan** for each building under control of Baltimore City Public Schools.

Contents of each annual amendments will include:

- Asbestos response actions for the building (if any):
- **Table 1A** containing the remaining quantities of asbestos containing material in the building:
- A copy of the surveillance logs for the building done at a minimum of a semi-annual basis;
- any other pertinent information.

An asbestos response action shall include any work to clean up asbestos in response to a major or minor fiber release episode, or any work action to remove, encapsulate, enclose or repair asbestos containing materials.

Persons reading this amendment are encouraged to read the ***Asbestos Management Plan*** to thoroughly understand the location and extent of asbestos containing materials in the building .

David W. Mitchell
Baltimore City Asbestos Coordinator
and Designated LEA Representative

PLEASE POST PLEASE POST

CITY OF BALTIMORE PUBLIC SCHOOLS
ASBESTOS PROGRAM

NOTICE TO SCHOOL BUILDING VISITORS AND OCCUPANTS (TEACHERS, STUDENTS, OPERATING ENGINEERS AND CUSTODIAL PERSONS) OF **ASBESTOS MANAGEMENT PLAN AMENDMENT NO. 6** AND AVAILABILITY OF **ASBESTOS MANAGEMENT PLAN** FOR INSPECTION.

An amendment to the **Asbestos Management Plan** has been appended to the management plans for asbestos to be kept in the building administrative office. This is Amendment #6 and is dated January 1, 1995. This amendment is available for inspection by making a request to the building principal.

EPA Rules for school buildings require:

(1) We maintain records on asbestos in each school.

(2) Inform our building occupants and visitors on asbestos in each school building of locations of and response actions for asbestos in each school.

(3) Give right-of -way to EPA and State of Maryland environmental inspectors.

Failure to fulfill the above may result in serious civil and possible criminal penalties assessed against the City for failure to perform the above including possible criminal penalties against persons who willfully avoid the EPA Rules.

If the **Asbestos Management Plan and the Amendments** to it are not available in your school from the principal report it to **Environmental Services - Asbestos Office at 396-7832 immediately.**

David W. Mitchell
Baltimore City Asbestos Coordinator
and Designated LEA Representative

TABLE 1-A

Removal for Fiscal 94 (July 93 to June 94)

Location PS150

Removals

	Beg Yr	Removal 94	End Yr	
Spray On				sf
Tile				sf
Acoustic Plaster	5000		5000	sf
Other Plaster				sf
Wallboard				sf
Pipe				lf
Elbows Fittings				sf
Boilers Breeching	500		500	sf
Tanks	125		125	sf
Ductwork	250		250	lf
Other TSI				lf
Curtains				sf
Firedoors	126		126	sf
Cement Board				sf
VAT	90000		90000	sf
Decon				sf
Soil				sf
Misc Debris CY				cy

NO REMOVALS THIS REPORTING PERIOD

Repairs

Patch LF	
Encapsulate LF	
Encapsulate SF	
Patch SF	
Carpet	
Wire	
MiscLF	
MiscSF	

NO REPAIRS

FIGURE 7-1. QUARTERLY SURVEILLANCE REPORT FORM

DATE: June 1993 SURVEYOR: John Walton

SCHOOL NO.: PS150

FUNCTIONAL SPACE	MANAGEMENT AREA DESCRIPTION	CONDITION CHANGE								COMMENTS
		1st Quarter		2nd Quarter		3rd Quarter		4th Quarter		
		Yes	No	Yes	No	Yes	No	Yes	No	
01- Boiler Room	Boiler Block and Trowelled-on Insulation								✓	
	Boiler Breeching Block and Trowelled-on Insulation								✓	
	Hot Water Generator Block and Trowelled-on Insulation								✓	
	(1) Fire Door								✓	
02- Cafeteria and Lobby	Acoustical Plaster								✓	
	Vinyl Asbestos Tile								✓	
	(2) Fire Doors								✓	
03- Auditorium	Acoustical Plaster								✓	
	Vinyl Asbestos Tile								✓	
	(1) Fire Door								✓	

Bentalou Elementary School PS150
(0629k)

FIGURE 7-1. QUARTERLY SURVEILLANCE REPORT FORM

DATE: _____ SURVEYOR: _____

SCHOOL NO.: PS150

FUNCTIONAL SPACE	MANAGEMENT AREA DESCRIPTION	CONDITION CHANGE								COMMENTS
		1st Quarter		2nd Quarter		3rd Quarter		4th Quarter		
		Yes	No	Yes	No	Yes	No	Yes	No	
04- Classrooms	Vinyl Asbestos Tile								✓	
05- Hallways and Stairwells	Vinyl Asbestos Tile								✓ ✓	
06- Offices, Work Rooms, and Lounges	Vinyl Asbestos Tile								✓ ✓ ✓	
07- Incinerator Room	(1) Fire Door								✓ ✓	
08- Library	Vinyl Asbestos Tile								✓	
09- Mechanical Room	Duct Mastic								✓ ✓	
	(1) Fire Door								✓	

Bentalou Elementary School PS150
(0629k)

FIGURE 7-1. QUARTERLY SURVEILLANCE REPORT FORM

DATE: Dec. 1993 SURVEYOR: John Walton

SCHOOL NO.: PS150

FUNCTIONAL SPACE	MANAGEMENT AREA DESCRIPTION	CONDITION CHANGE								COMMENTS
		1st Quarter		2nd Quarter		3rd Quarter		4th Quarter		
		Yes	No	Yes	No	Yes	No	Yes	No	
01- Boiler Room	Boiler Block and Trowelled-on Insulation				✓					
	Boiler Breeching Block and Trowelled-on Insulation				✓					
	Hot Water Generator Block and Trowelled-on Insulation				✓					
	(1) Fire Door				✓					
02- Cafeteria and Lobby	Acoustical Plaster				✓					
	Vinyl Asbestos Tile				✓					
	(2) Fire Doors				✓					
03- Auditorium	Acoustical Plaster				✓					
	Vinyl Asbestos Tile				✓					
	(1) Fire Door				✓					

Dentalou Elementary School PS150
(0629k)

FIGURE 7-1. QUARTERLY SURVEILLANCE REPORT FORM

DATE: _____ SURVEYOR: _____

SCHOOL NO.: PS150

FUNCTIONAL SPACE	MANAGEMENT AREA DESCRIPTION	CONDITION CHANGE								COMMENTS
		1st Quarter		2nd Quarter		3rd Quarter		4th Quarter		
		Yes	No	Yes	No	Yes	No	Yes	No	
04- Classrooms	Vinyl Asbestos Tile				✓					
05- Hallways and Stairwells	Vinyl Asbestos Tile				✓					
					✓					
06- Offices, Work Rooms, and Lounges	Vinyl Asbestos Tile				✓					
					✓					
					✓					
07- Incinerator Room	(1) Fire Door				✓					
					✓					
08- Library	Vinyl Asbestos Tile				✓					
09- Mechanical Room	Duct Mastic				✓					
					✓					
	(1) Fire Door				✓					

Bentalou Elementary School PS150
(0629k)

RECEIPT OF 1 COPY OF AMENDMENT NUMBER 5 DATED DECEMBER 1, 1993 TO BALTIMORE CITY PUBLIC SCHOOLS ASBESTOS MANAGEMENT PLANS

DELIVERED BY: John Walton
(Print name)

John Walton
(Signature)

Date: 11-23-94
Time: 12:30 pm

DELIVERED TO:

School No.: 150

School Name: Bentalou Elem.

School Address: 220 N. Bentalou St.

RECEIVED BY: Barbara Anderson Phone No: 396-1385
(Print name)

Barbara Anderson
(Signature)

Date Received: 11-23-94 Time: 1:30 P.M.

VISUAL VERIFICATION OF MANAGEMENT PLANS ARE AT SCHOOL WITH AMENDMENTS NUMBERS 1, 2, 3, 4 & 5 BY PERSON DELIVERING PLAN:

YES: ✓ NO: _____

(Deliverer to verify and initial appropriate answer.)

Please return to:

Environmental Services
2011 Linden Avenue, Portable Bldg. #61
Baltimore, MD. 21217

PUBLIC BUILDING MANAGEMENT

ENVIRONMENTAL SERVICES

FIELD INSPECTION LOG FOR SEMI-ANNUAL SURVEILANCE

FOR P.S.# 150

1ST SEMI-ANNUAL INSPECTION

Performed by: John Walton

Date Performed: July 1994

2ND SEMI-ANNUAL INSPECTION

Performed by: John Walton

Date Performed: Dec. 1994

SPECIAL NOTES FOR ANY MAJOR FINDINGS OR CHANGES IN BUILDINGS

Remove all asbestos insulation from boiler room. - 11-21-94
Insulation is damage on supply line at AHU "D" in mechanical room 2nd flr.

SEE ATTACHED SURVEILANCE REPORT FORMS FOR FINDINGS

Please return to:

Environmental Services
2011 Linden Avenue, Portable Bldg. #61
Baltimore, MD. 21217

FIGURE 7-1. QUARTERLY SURVEILLANCE REPORT FORM

DATE: 12/94

SCHOOL NO.: PS150

SURVEYOR: John Walton

FUNCTIONAL SPACE	MANAGEMENT AREA DESCRIPTION	CONDITION CHANGE								COMMENTS
		1st Quarter		2nd Quarter		3rd Quarter 7/94		4th Quarter 12/94		
		Yes	No	Yes	No	Yes	No	Yes	No	
01- Boiler Room	Boiler Block and Trowelled-on Insulation						✓ ✓	✓ ✓		Remove asbestos Insulation from boiler room 11-21-94
	Boiler Breeching Block and Trowelled-on Insulation						✓ ✓	✓ ✓		
	Hot Water Generator Block and Trowelled-on Insulation						✓ ✓	✓ ✓		
	(1) Fire Door						✓		✓	
02- Cafeteria and Lobby	Acoustical Plaster						✓ ✓	✓ ✓		Damaged ceiling in cafeteria
	Vinyl Asbestos Tile						✓			
	(2) Fire Doors						✓			
03- Auditorium	Acoustical Plaster						✓		✓	
	Vinyl Asbestos Tile						✓		✓	
	(1) Fire Door						✓		✓	

FIGURE 7-1. QUARTERLY SURVEILLANCE REPORT FORM

SURVEYOR: John Watts

DATE: Dec. 1994

SCHOOL NO.: PS150

FUNCTIONAL SPACE	MANAGEMENT AREA DESCRIPTION	CONDITION CHANGE								COMMENTS
		1st Quarter		2nd Quarter		3rd Quarter		4th Quarter		
		Yes	No	Yes	No	Yes	No	Yes	No	
04- Classrooms	Vinyl Asbestos Tile						✓			near baseboard damaged + missing.
05- Hallways and Stairwells	Vinyl Asbestos Tile						✓	✓	✓	
06- Offices, Work Rooms, and Lounges	Vinyl Asbestos Tile						✓		✓	
07- Incinerator Room	(1) Fire Door						✓		✓	
08- Library	Vinyl Asbestos Tile						✓		✓	
09- Mechanical Room	Duct Mastic						✓	✓	✓	Insulation damaged Sup line at Attic. 2/
	(1) Fire Door						✓		✓	

AMENDMENT #7

June 1, 1996

AHERA

ASBESTOS CONTAINING MATERIALS
Management Plan

School No: **PS150**

School Name **Bentalou Elementary**

Notice

This Amendment includes Asbestos Response Actions for the School for the period reported under this amendment attached.

Issued by

BALTIMORE CITY PUBLIC SCHOOLS

Asbestos Coordinator

Designated Local Education Agency Representative

City of Baltimore Public Schools
AMENDMENT #7
June 1, 1996

INTRODUCTION

These amendments are issued annually to update the **Asbestos Management Plan** for each building under control of Baltimore City Public Schools.

Contents of each annual amendments will include:

- Asbestos response actions for the building (if any):
- **Table 1A** containing the remaining quantities of asbestos containing material in the building:
- A copy of the surveillance logs for the building done at a minimum of a semi-annual basis;
- any other pertinent information.

An asbestos response action shall include any work to clean up asbestos in response to a major or minor fiber release episode, or any work action to remove, encapsulate, enclose or repair asbestos containing materials.

Persons reading this amendment are encouraged to read the ***Asbestos Management Plan*** to thoroughly understand the location and extent of asbestos containing materials in the building .

David W. Mitchell
Baltimore City Asbestos Coordinator
and Designated LEA Representative

PLEASE POST **PLEASE POST**

CITY OF BALTIMORE PUBLIC SCHOOLS
ASBESTOS PROGRAM

NOTICE TO SCHOOL BUILDING VISITORS AND OCCUPANTS (TEACHERS, STUDENTS, OPERATING ENGINEERS AND CUSTODIAL PERSONS) OF ASBESTOS MANAGEMENT PLAN AMENDMENT NO. 7 AND AVAILABILITY OF ASBESTOS MANAGEMENT PLAN FOR INSPECTION.

An amendment to the Asbestos Management Plan has been appended to the management plans for asbestos to be kept in the building administrative office. This is Amendment #6 and is dated June 1, 1996. This amendment is available for inspection by making a request to the building principal.

EPA Rules for school buildings require:

(1) We maintain records on asbestos in each school.

(2) Inform our building occupants and visitors on asbestos in each school building of locations of and response actions for asbestos in each school.

(3) Give right-of -way to EPA and State of Maryland environmental inspectors.

Failure to fulfill the above may result in serious civil and possible criminal penalties assessed against the City for failure to perform the above including possible criminal penalties against persons who willfully avoid the EPA Rules.

If the Asbestos Management Plan and the Amendments to it are not available in your school from the principal report it to Environmental Services - Asbestos Office at 396-7832 immediately.

David W. Mitchell
Baltimore City Asbestos Coordinator
and Designated LEA Representative

TABLE 1-A

Removal for **Fiscal 95 (July 94 to June 95)**

Location: RS# 150

Removals

	Beg Yr	Removal 94-95	End Yr	Units
Spray On				sf
Tile				sf
Acoustic Plaster	5000		5000	sf
Other Plaster				sf
Wallboard				sf
Pipe		130		lf
Elbows Fittings				sf
Boilers ~~Breaching~~	500	600	0	sf
Tanks	125		125	sf
Ductwork	250		250	lf
Other TSI				lf
Curtains				sf
Firedoors	126		126	sf
Cement Board				sf
VAT	90000		90000	sf
Decon				sf
Soil				sf
Misc Debris CY				cy

Repairs

Patch LF	
Encapsulate LF	
Encapsulate SF	
Patch SF	
Carpet SF	
Wire LF	
MiscLF	
MiscSF	

P.S. # 150 Bonnacou Elementary

Page _____

ACCREDITATION INFORMATION

LEA DESIGNATED PERSON: Telephone No. (410) 396-7832

Typed Name: David Mitchell Training Course: Inspector/ Management Planner

Address: 2011 Linden Avenue Date: Nov. 23, 1994 Total Hrs. 8Hr. Recert.

Baltimore, Maryland 21217 Training Provider Aerosol Monitoring

INSPECTIONS, BULK SAMPLING, AND ASSESSMENTS

Reinspection(s) were conducted by: Don Brock Date 11-20-95

Bulk samples were collected by: _____ Date _____

Assessments were made by: Don Brock Date 11-20-95

Signature: [signature] Signature: _____

Name: Don Brock Name: _____

Accreditation No. 17854 Accreditation No. _____

State and Date: Maryland 12/28/95 State and Date: _____

MANAGEMENT PLANNER:

The reinspection(s) was reviewed by:

Signature: _____

Name: Gordon Hubbard

Accreditation No. 16894

State and Date: Maryland 11/23/95

The recommendation(s) for response actions (if any) were made by:

Signature: [signature]

Name: Don Brock

Accreditation No. 17854

State and Date: Maryland 12/28/95

HOMOGENEOUS AREA	SAMPLED (1988-89)		FRIABLE (1988-89)		CHANGES (1994-95)		FRIABLE (1994-95)		SAMPLED (1994-95)		CLASS.	RESPONSE ACTION	SCHEDULE (M/D/YR.)
	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO			
M PLASTER	✓		✓			✓	✓			✓	6	O&M	
M FLOOR TILE	✓			✓		✓		✓		✓	8	O&M	
T BOILER + BREECHING	✓		✓			✓	✓			✓	5	O&M	
T TANK	✓		✓			✓	✓			✓	5	O&M	
T DUCT SEAM	✓		✓			✓	✓			✓	5	O&M	
M FIRE DOOR		✓		✓		✓		✓		✓	5	O&M	

KEY:

HOMOGENEOUS AREA

T - Thermal Systems
S - Surfacing Material
M - Miscellaneous

CLASSIFICATION

1. Damaged or significantly damaged TSI
2. Damaged friable surfacing material
3. Significantly damaged friable surfacing ACM
4. Damaged or significantly damaged friable miscellaneous ACM
5. ACBM with potential for damage
6. ACBM with potential for significant damage
7. Any remaining friable ACBM or friable suspected ACBM
8. Non-friable

RESPONSE ACTION

RM - Remove
RP - Repair
ECP - Encapsulate
ENC - Enclose
O&M - Operations and Maintenance
ISL - Isolate

Building **PS150**

Job Number *EL1229* *Education* *9916-197-135-00-6*

Job Description *FULL CONTAINMENT FRIABLE. REMOVE AND DISPOSE OF APPROX. 600 SQ FT. OF BOILER INSULATION AND 130 LIN. FT. OF PIPE INSULATION IN THE BOILER ROOM.*

12/13/94	3	101802	$29,127.34	2/7/95
1/20/95	4	101875	$10,152.00	2/7/95
3/13/95	8	102006	$1,712.22	6/7/95

MARCOR ENVIRONMENTAL

DATE: October 20, 1994

TO: Mr. Dave Mitchell / CITY OF BALTIMORE

FROM: Chris E. Christian / Project Manager

RE: NOTICE OF ASBESTOS HAZARD ABATEMENT ACTIVITIES

Important Notice: MARCOR and its agents have no knowledge as to the Contractual arrangements with other employers who may be on the premises during abatement procedures. It is incumbent upon you to notify these other employers of the scheduled asbestos abatement activities and the requirements of 29 CFR 1926.58 pertaining to the establishment of "regulated areas." Please direct any questions concerning this notification to me.

In accordance with 29 CFR 1926.58 (OSHA Asbestos Standard for Construction) you are hereby notified that MARCOR Environmental, Inc. has been contracted to perform certain asbestos abatement procedures on or about the premises of:

BENTALOU ELEMENTARY #150
220 NORTH BENTALOU STREET

BALTIMORE, MD 21223

JOB NUMBER: EL-00001-229

See attached notification:
(Areas of Abatement)

Abatement procedures are scheduled to begin on 11/04/1994 and continue through 11/18/1994.

The nature of abatement will include but not be limited to:
(See attached notification)

MARYLAND DEPARTMENT OF THE ENVIRONMENT, AIR MANAGEMENT ADMINISTRATION
DIVISION OF ASBESTOS AND INDOOR AIR QUALITY CONTROL
2500 BROENING HIGHWAY, BALTIMORE, MARYLAND 21224 (410)631-3200

ASBESTOS REMOVAL/DEMOLITION/RENOVATION PROJECT NOTIFICATION

Contractor Proj #: EL-00001-229

I. FACILITY LOCATION (Include Building Name, Number & Floor or Room Number)

SITE/BUILDING NAME: BENTALOU ELEMENTARY #150
ADDRESS: 220 NORTH BENTALOU STREET

BALTIMORE STATE: MD ZIP: 21223

SITE DESCRIPTION LOCATION: IN THE BOILER ROOM

COUNTY: 24 BALTIMORE CITY

II. FACILITY INFORMATION:

OWNER NAME: CITY OF BALTIMORE
ADDRESS: 2011 LINDEN AVENUE

CITY: BALTIMORE STATE: MD ZIP: 21217
CONTACT: Mr. Dave Mitchell TELEPHONE: (410)396-7832

MD LICENSE #: M21-03-005 REMOVAL CONTRACTOR: MARCOR Environmental, Inc.
ADDRESS: 6679 Santa Barbara Road

CITY: Elkridge STATE: MD ZIP: 21227
CONTACT: Chris E. Christian TELEPHONE: (410)796-5991

OTHER OPERATOR:
ADDRESS:

CITY: STATE: ZIP:
CONTACT: TELEPHONE: ( ) -

III. FACILITY DESCRIPTION:

BUILDING SIZE: Sq.Ft. 208,000 Age in Years: 31

BUILDING SIZE: Ln.Ft. N/A # of Floors: 3

IV. TYPE OF OPERATION: [√] R-RENOVATION

V. IS ASBESTOS PRESENT? YES

VI. TYPE OF NOTIFICATION: [√] O-Original [ ] C-Canceled [ ] R-Revised

If revised, enter Resubmit Date / /

[√] NESHAP [ ] NON-NESHAP

FOR MDE OFFICE USE ONLY

DUPLICATE (Yes / No)	DATE RECEIVED	Postmark	Notification #

ASBESTOS REMOVAL/DEMOLITION/RENOVATION PROJECT NOTIFICATION

VII. SCHEDULED DATES ASBESTOS REMOVAL: (MM/DD/YY)

Start: 11/04/1994

Complete: 11/18/1994

VIII. SCHEDULED DATES DEMO/RENOVATION: (MM/DD/YY)

Start: 11/04/1994

Complete: 11/18/1994

Prep: / /

IX. DESCRIBE PRIMARY USE OF FACILITY OR ENTER CODES:

H-Hospital, S-School, P-Public Building, O-Office, B-Ship
I-Industrial, U-University/Coollege, C-Commercial or R-Residence

PRESENT USE: PUBLIC SCHOOL

PRIOR USE: PUBLIC SCHOOL

X. PROCEDURE, INCLUDING ANALYTICAL METHOD, IF APPROPRIATE, USED TO DETECT THE PRESENCE OF ASBESTOS:

Owner Provided Information.

QUANTITY OF ASBESTOS	RACM to be removed	NONFRIABLE ASBESTOS NOT REMOVED		UNIT OF MEASUREMENT
		Cat I	Cat II	Unit
Pipes	130			LnFt: XXX Ln m:
Surface Area	600			SqFt: XXX Sq m:
Vol RACM Off Facility Component				CuFt: Cu m:

XI. DESCRIPTION OF PLANNED DEMOLITION OR RENOVATION WORK AND METHOD(S) TO BE USED:
Full containment friable. Remove and dispose of approximately 600 square feet of boiler insulation and 130 linear feet of pipe insulation in the boiler room. All work will be done in accordance with all government, state, and local regulations. Set up area containment, establish negative air, wet material using amended water, use approved asbestos removal procedures and disposal, air monitor.

XII. DESCRIPTION OF WORK PRACTICES AND ENGINEERING CONTROL TO BE USED TO PREVENT EMISSIONS OF ASBESTOS AT THE DEMOLITION AND RENOVATION SITE:
Area containment, negative air pressure, wet removal, PAPR respirators, disposable full body suits, double bag waste, 6 mil poly lined and locked trailers for transporting waste, hand load and unload waste.

XIII. WASTE TRANSPORTER #1
NAME: Jones Minority Services, Inc.
ADDRESS: 752 Stinchcomb Road
Severna Park STATE: MD ZIP: 21146
CONTACT: Carol Jones TELEPHONE: (410)789-5700

WASTE TRANSPORTER #2
NAME:
ADDRESS:
STATE: ZIP:
CONTACT: TELEPHONE: ( ) -

XIV. WASTE DISPOSAL SITE
NAME: PST Reclamation, Inc.
ADDRESS: Rubble Landfill
4431 Sands Road
Harwood STATE: MD ZIP: 20776
CONTACT: Torrance Lewis TELEPHONE: (410)741-1776

ASBESTOS REMOVAL/DEMOLITION/RENOVATION PROJECT NOTIFICATION

XV. IF DEMOLITION ORDERED BY A GOVERNMENT AGENCY, PLEASE IDENTIFY THE AGENCY BELOW:

Name: Title:

Authority:

Date of Order (MM/DD/YY): Date Ordered to Begin (MM/DD/YY):

XVI. FOR EMERGENCY RENOVATIONS

Date and Hour of Emergency (MM/DD/YY):

Description of the Sudden, Unexpected Event:

Explanation of how the event caused unsafe conditions or would cause equipment damage or an unreasonable financial burden:

XVII. DESCRIPTION OF PROCEDURES TO BE FOLLOWED IN THE EVENT THAT UNEXPECTED ASBESTOS IS FOUND OR PREVIOUSLY NONFRIABLE ASBESTOS MATERIAL BECOMES CRUMBLED, PULVERIZED, OR REDUCED TO POWDER.
Work area will be immediately contained and access restricted. Asbestos clean up procedures will begin with wet removal using amended water and air monitoring.

XVIII. I CERTIFY THAT AN INDIVIDUAL TRAINED IN THE PROVISIONS OF THIS REGULATION (40 CFR PART 61, SUBPART M) WILL BE ON-SITE DURING THE DEMOLITION OR RENOVATION AND EVIDENCE THAT THE REQUIRED TRAINING HAS BEEN ACCOMPLISHED BY THIS PERSON WILL BE AVAILABLE FOR INSPECTION DURING NORMAL BUSINESS HOURS. (Required 1 year after promulgation; I.E. EFFECTIVE 1/20/91).

(Signature of Owner / Operator) 1/20/94 (Date)

XIX. I CERTIFY THAT THE ABOVE INFORMATION IS CORRECT.

(Signature of Owner / Operator) 1/20/94 (Date)

IN ADDITION TO THE INFORMATION REQUIRED BY NESHAP REGULATIONS, MARYLAND REQUIRES THAT THE FOLLOWING INFORMATION BE PROVIDED AT THE TIME OF NOTIFICATION: EMPLOYEE INFORMATION. ON A SEPARATE PAGE, PROVIDE THE FOLLOWING INFORMATION FOR EACH EMPLOYEE NOT LISTED ON SCHEDULE I OF "APPLICATION FOR LICENSE TO REMOVE/ENCAPSULATE ASBESTOS" WHO WILL HANDLE ASBESTOS ON THIS PROJECT:

A) FULL NAME;
B) SOCIAL SECURITY NUMBER;
C) NAME OF ORGANIZATION THAT PROVIDED APPROVED TRAINING COURSE; AND
D) DATE OF MOST RECENT APPROVED TRAINING COURSE ATTENDED.

WORK SCHEDULE. SPECIFY IF WEEKEND ONLY, NIGHT SHIFT, ETC.

MONDAY THROUGH FRIDAY DURING THE HOURS 1500 TO 2330

City of Baltimore Public Schools

AHERA Industrial Hygiene / Air Monitoring Information

Analyzing Lab

IH Services
1831 Portal Street
Suite E
Baltimore, Maryland 21224

Name of person collecting air samples

Method

Results

Name of Analyst

See Attached Analysis Sheets

Statement that Lab meets applicable requirements

IH Services, Inc. meets the applicable requirements of 40 CFR Part 763 Section 763.90 (i) (2) (ii). The American Industrial Hygiene Association Proficiency Analytical Testing Laboratory number is 21224-002. All other laboratories used by IH Services, Inc. for the analysis of samples also meet the applicable requirements of 40 CFR Part 763 Section 763.90 (i) (2) (ii).

FOR INQUIRES PLEASE CALL	
MARCOR ENVIRONMENTAL, INC.	
PHONE NO.	410-796-5991
FAX NO.	410-796-9446
CONTACT:	AL HORAK

MARCOR ENVIRONMENTAL

CUSTOMER NO.
C00083
INVOICE NO.
101875

Remit Payments to:
P.O. Box 630039,
Baltimore, Maryland 21263

BILL TO

ASBESTOS COORDINATOR
2011 LINDEN AVENUE
BALTIMORE, MD 21217

ATTENTION: DAVE MITCHELL

INVOICE DATE: 01/20/95
MARCOR JOB #: EL-00001-229
CUSTOMER REF. #: BP-17492
STATE WORK PERFORMED: MD
PAGE NUMBER: 1

JOB NAME: BENTALOU ELEMENTARY 150

JOB LOCATION: BENTALOU ELEMENTARY #150
220 NORTH BENTALOU STREET
BALTIMORE, MD 21223

FOR SERVICES RENDERED THROUGH 01/01/95 UNDER THE BASE CONTRACT.
PERIOD OF PERFORMANCE: 12/01/94 TO 01/01/95

	HOURS	AMOUNT
TOTAL LABOR CHARGES	.00	$ .00
TOTAL OTHER DIRECT COSTS		10,152.00
CURRENT BILLINGS		10,152.00
AMOUNT DUE THIS INVOICE		$ 10,152.00

JOB SUMMARY

TOTAL BILLINGS	$ 39,279.34	TOTAL RETENTION	$ .00
TOTAL HOURS	855.50	TOTAL SALES TAX	$ .00
TOTAL COLLECTIONS	$ .00		

TERMS: DUE UPON RECEIPT WITH SERVICE CHARGES OF 1.5% PER MONTH ON UNPAID BALANCE. PERCENTAGE RATE EQUAL TO 18% PER ANNUM. MARCOR RESERVES THE RIGHT TO APPLY PAYMENTS TO SERVICE CHARGES OR OLDEST INVOICES FIRST.

ORIGINAL INVOICE

CONTROL NUMBER 001423

FOR INQUIRES PLEASE CALL	
MARCOR ENVIRONMENTAL, INC.	
PHONE NO:	410-796-5991
FAX NO:	410-796-9446
CONTACT:	AL HORAK

MARCOR ENVIRONMENTAL

CUSTOMER NO.
C00083
INVOICE NO.
101875

Remit Payments to:
P.O. Box 630039,
Baltimore, Maryland 21263

BILL TO

ASBESTOS COORDINATOR
2011 LINDEN AVENUE
BALTIMORE, MD 21217

ATTENTION: DAVE MITCHELL

INVOICE DATE: 01/20/95
MARCOR JOB #: EL-00001-229
CUSTOMER REF. #: BP-17492
STATE WORK PERFORMED: MD
PAGE NUMBER: 2

NVOICE BACKUP

THER DIRECT COSTS:

	COST/QTY	RATE	AMOUNT
CONSULTING AND ANALYTICAL I H SERVICES INC	8,460.00	1.2000	10,152.00
	** TOTAL		10,152.00
			10,152.00
** Total Project EL-00001-229			10,152.00

TERMS: DUE UPON RECEIPT WITH SERVICE CHARGES OF 1.5% PER MONTH ON UNPAID BALANCE. PERCENTAGE RATE EQUAL TO 18% PER ANNUM. MARCOR RESERVES THE RIGHT TO APPLY PAYMENTS TO SERVICE CHARGES OR OLDEST INVOICES FIRST.

CONTROL NUMBER 001424

ORIGINAL INVOICE

I H SERVICES, INC.

Remit Payment To: P.O. Box 9951
Baltimore, MD 21224
ATTN.: Accounts Receivable
PHONE: (410) 633-4000
FAX: (410) 633-4122

Federal I.D. Number
52-1642787

INVOICE NO. 4-412

INVOICE DATE November 30, 1994

P.O. NO. EL00001-229

TO: Marcor Environmental
6679 Santa Barbara Road, Suite G
Baltimore, MD 21227

Re: Bentalou Elem #150

Terms: Net 30 Days
Past Due Invoices Subject to
A Service Charge of 2% per month.

Professional Services

104	Regular IH hours @ $40.00/hour	$4160.00

Analytical Services

90	PCM Air samples @ $20.00/sample	$1800.00
5	Immediate TEM samples @ $500.00/sample	$2500.00

JOB NUMBER	DEPT	ACCOUNT	AMOUNT
EL00001-229	1112	5281	$2460.00
			$
			$
			$
			$
HOLD (CIRCLE)	VOUCHER #	12/6/94	CC.DB
APPROVAL BY	DATE		

$8460.00

TOTAL:

Thank You! — We Appreciate Your Business

1831-E Portal Street
Baltimore, Maryland 21224

Stephen L. Law, Ph.D., CIH
President

Submit to MARCOR in duplicate

FOR INQUIRES PLEASE CALL	
MARCOR ENVIRONMENTAL, INC	
PHONE NO.	410-796-5991
FAX NO.	410-796-9446
CONTACT:	AL HORAK

MARCOR ENVIRONMENTAL

CUSTOMER NO.
C00083
INVOICE NO.
102006

Remit Payments to:
P.O. Box 630039,
Baltimore, Maryland 21263

BILL TO

ASBESTOS COORDINATOR
2011 LINDEN AVENUE
BALTIMORE, MD 21217

ATTENTION: DAVE MITCHELL

INVOICE DATE: 03/13/95
MARCOR JOB #: EL-00001-229
CUSTOMER REF. #: BP-17492
STATE WORK PERFORMED: MD
PAGE NUMBER: 1

JOB NAME: BENTALOU ELEMENTARY 150

JOB LOCATION: BENTALOU ELEMENTARY #150
220 NORTH BENTALOU STREET
BALTIMORE, MD 21223

FOR SERVICES RENDERED THROUGH 02/28/95 UNDER THE BASE CONTRACT.
PERIOD OF PERFORMANCE: 01/30/95 TO 02/28/95

	HOURS	AMOUNT
TOTAL LABOR CHARGES	.00	$ .00
TOTAL OTHER DIRECT COSTS		1,712.22
CURRENT BILLINGS		1,712.22
AMOUNT DUE THIS INVOICE		$ 1,712.22

JOB SUMMARY

TOTAL BILLINGS	$ 40,991.56	TOTAL RETENTION	$ .00
TOTAL HOURS	855.50	TOTAL SALES TAX	$ .00
TOTAL COLLECTIONS	$ 39,279.34		

TERMS: DUE UPON RECEIPT WITH SERVICE CHARGES OF 1.5% PER MONTH ON UNPAID BALANCE. PERCENTAGE RATE EQUAL TO 18% PER ANNUM. MARCOR RESERVES THE RIGHT TO APPLY PAYMENTS TO SERVICE CHARGES OR OLDEST INVOICES FIRST.

ORIGINAL INVOICE

CONTROL NUMBER 001678

FOR INQUIRES PLEASE CALL	
MARCOR ENVIRONMENTAL, INC	
PHONE NO.	410-796-5991
FAX NO.	410-796-9446
CONTACT:	AL HORAK

MARCOR ENVIRONMENTAL

CUSTOMER NO.
C00083
INVOICE NO.
102006

Remit Payments to:
P.O. Box 630039,
Baltimore, Maryland 21263

BILL TO

ASBESTOS COORDINATOR
2011 LINDEN AVENUE
BALTIMORE, MD 21217

ATTENTION: DAVE MITCHELL

INVOICE DATE: 03/13/95
MARCOR JOB #: EL-00001-229
CUSTOMER REF. #: BP-17492
STATE WORK PERFORMED: MD
PAGE NUMBER: 2

INVOICE BACKUP

OTHER DIRECT COSTS:

	COST/QTY		RATE	AMOUNT
SUBCONTRACTORS				
JOSEPH J. HIRSCH, INC.	55.00		1.2000	66.00
		** TOTAL		66.00
HAULING AND DISPOSAL COSTS				
DEAN'S TRUCKING & ROLLOFF I	1,371.85		1.2000	1,646.22
		** TOTAL		1,646.22
				1,712.22
	** Total Project	EL-00001-229		1,712.22

TERMS: DUE UPON RECEIPT WITH SERVICE CHARGES OF 1.5% PER MONTH ON UNPAID BALANCE. PERCENTAGE RATE EQUAL TO 18% PER ANNUM. MARCOR RESERVES THE RIGHT TO APPLY PAYMENTS TO SERVICE CHARGES OR OLDEST INVOICES FIRST.

ORIGINAL INVOICE

CONTROL NUMBER 001679

*** INVOICE ***

PLEASE REMIT TO:

JOSEPH J. HIRSCH, INC.
ELECTRICAL CONTRACTORS
3034 ST. JOHNS AVENUE
BALTIMORE, MD 21214-2645

(410) 426-4221 FAX (410) 426-0508

INVOICE DATE: 12/30/1994

INVOICE NUMBER: 5747

CUSTOMER:
MARCOR Environmental, Inc.
Attn: Accounts Payable
6679-B Santa Barbara Road
Elkridge, MD 21227

LOCATION OF JOB:
School 150

WORK ORDER NUMBER: 6470

DESCRIPTION OF WORK COMPLETED:

Service Call:
Connect power panel...
(purchase order 2941)

JOB NUMBER	DEPT	ACCOUNT	AMOUNT
EL 00001-229	1112	5220-00	$55.00
			$
			$
			$
			$
HOLD (CIRCLE)		VOUCHER #	
APPROVAL BY		DATE 3/3/95	

AMOUNT DUE - $ 55.00

cc: CXI

... THANK YOU FOR YOUR BUSINESS ...

JONES MINORITY

INV DATE:	01/06/94	# OF BAGS	2760
INV #:	3203	INV TOTAL	$6,300
PO#:	3068	@	2.28260869

CUSTOMER NO	CUSTOMER NAME	# BAGS	TOTAL
EL 00001-206	School 219	849	$1,937.93
EL 00001-212	Mitchell Courthouse	157	$358.37
EL 00001-228	School 144	262	$598.04
EL 00001-229	School 150	601	$1,371.85
EL 00001-230	Bragg Center	60	$136.96
EL 00001-232	School 251	61	$139.24
EL 00001-238	School 87	156	$356.09
EL 00001-239	School 58	14	$31.96
EL 00001-240	Boys & Girls Club	391	$892.50
EL 00001-242	Library #2	200	$456.52
EL 00001-243	School 224	9	$20.54
EL			
EL			
EL			
EL			
EL			
	TOTAL:	2760	$6,300.00

2646

NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.: 2 5 1 4 9 5 8 5 2 . . . .
Manifest Document No.: . . . . .
2. Page 1 of

3. Generator's Name and Mailing Address
SEE LIST BELOW

P.O.# 3068

4. Generator's Phone ( )

5. Transporter 1 Company Name
Jones Minority Service

6. US EPA ID Number
. 5 2 1 4 5 4 5 1 4 . . .

7. Transporter 2 Company Name

8. US EPA ID Number
. . . . . .

9. Designated Facility Name and Site Address
PST Reclamation Rubble Landfill
4431 Sands Road
Harwood, Maryland 20776

10. US EPA ID Number
. 9 2 - 0 2 0 0 7 0 1 1 A . .

A. Transporter's Phone
B. Transporter's Phone
C. Facility's Phone

11. Waste Shipping Name and Description	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol
a. EL-00001-206 - School #219, 5931 Yorkwood Road, Baltimore, MD	832	Bags	4 Drums, 1 Door	
EL-00001-212 - Mitchell Courthouse, 111 N. Calvert St., Baltimore, MD	157	Bags		
EL-00001-228 - School #144, 2400 Mosher St., Baltimore, MD	262	Bags		
b. EL-00001-229 - School #150, 220 N. Bentlow St., Baltimore, MD	589	Bags	3 Drums	
EL-00001-230 - Bragg Center, 6603 Baltimore National Pike, Baltimore, MD	60	Bags		
EL-00001-232 - School #251, 3701 Fernhill, Baltimore, MD	61	Bags		
c. EL-00001-238 - School #87, 4001 Alto Rd, Baltimore, MD	136	Bags	5 Drums	
EL-00001-239 - School #58, 3935 Hilton Rd, Baltimore, MD	14	Bags		
EL-00001-240 - Boys & Girls Club, 1300 Herkimer St., Baltimore, MD	391	Bags		
d. EL-00001-242 - Library #2, 31 S. Payson St., Baltimore, MD	200	Bags		
EL-00001-243 - School #224, 5545 Kennison Ave., Baltimore, MD	9	Bags		

GENERATOR

D. Additional Descriptions for Materials Listed Above
FRIABLE ASBESTOS MATERIAL

E. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information
US EPA AGENCY CURTIS BLDG III
Air Waste Management
6th & Walnut Avenue
Philadelphia, PA 19102

2711

16. GENERATOR'S CERTIFICATION: I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.
Printed/Typed Name: Jim Kelbaugh as Agent for Generator
Signature:
Month: 12 Day: 2 Year: 94

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name: Jones Minority Service
Signature:
Month: . Day: . Year: .

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name:
Signature:
Month: . Day: . Year: .

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of waste materials covered by this manifest except as noted in Item 19.
PST Reclamation Rubble Landfill
Printed/Typed Name: TORRENCE LEWIS
Signature:
Month: 12 Day: 6 Year: 94

ORIGINAL — RETURN TO GENERATOR

3344

NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.: 251495852
Manifest Document No.:
2. Page 1 of

3. Generator's Name and Mailing Address
See List Below

P.O.# 2856

4. Generator's Phone ( )

5. Transporter 1 Company Name: Jones Minority Service
6. US EPA ID Number: 521454514

7. Transporter 2 Company Name:
8. US EPA ID Number:

9. Designated Facility Name and Site Address
PST Reclamation Rubble Landfill
4431 Sands Road
Harwood, Maryland 29776
10. US EPA ID Number: 92-0207-11A

A. Transporter's Phone
B. Transporter's Phone
C. Facility's Phone

11. Waste Shipping Name and Description	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol
a. EL-00001-206 -School #219, 5931 Yorkwood, Baltimore, Maryland	~~2896~~ 2131	Bags		
b.				
c.				
d.				

D. Additional Descriptions for Materials Listed Above
Friable Asbestos Material

E. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information
US EPA Agency Curtis Building III
Air Waste Management
6th & Walnut Avenue
Philadelphia, PA 19102

16. GENERATOR'S CERTIFICATION: I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.
Printed/Typed Name: Jim Kelbaugh as Agent for Generator
Signature:
Month: 10 Day: 20 Year: 94

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name: Jones Minority Service
Signature:
Month: Day: Year:

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name:
Signature:
Month: Day: Year:

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of waste materials covered by this manifest except as noted in Item 19.
PST Reclamation Rubble Landfill
Printed/Typed Name: TORRENCE LEWIS
Signature: Torrence Lewis
Month: 10 Day: 21 Year: 94

GENERATOR
TRANSPORTER
FACILITY

ORIGINAL — RETURN TO GENERATOR

189-0843

2648
12/96

JAN 10 1995

DEAN'S TRUCKING & ROLLOFF INC.
6350 STAHL POINT ROAD
BALTIMORE MD 21225

(410)789-5700

TAXPAYER ID 52-1890202

3203

01/06/95

MARCOR ENVIRONMENTAL
6679 SANTA BARBARA ROAD
SUITE G
ELKRIDGE, MD 21227

MARCOR ENVIRONMENTAL
6679 SANTA BARBARA ROAD
SUITE G
ELKRIDGE, MD 21227

Order Date: 01/06/95 Ship Date: 01/06/95
Terms: NET 30 Payment Due: 02/05/95
Comments: FAX (410) 796-9446

12/02/94	1.00	1.00	120 C.Y. WAREHOUSE TRAILER	6,300.00	6,300.00

(See Breakdown Attached)

MARC0300

TOTAL 6,300.00

I H SERVICES, INC.

Industrial Hygiene and Related Services
Baltimore, Maryland 21224

1831 Portal Street
Suite E

Main Office
410-633-4000
FAX
410-633-4122

EXECUTIVE REPORT

Report Number:	4-412
Project:	Bentalou Elementary School #150 202 Bentalou Street Baltimore, MD
Report To:	Marcor Environmental 6679 Santa Barbara Road, Suite G Baltimore, MD 21227

Table of Contents

I Executive Summary

II Methodology

III Documentation

IV Test Results

V References

Submitted by:	Scott H. Garrity, Ernest K. Smith and Anthony Ortiz Industrial Hygienists
Date Submitted:	November 30, 1994

I EXECUTIVE SUMMARY

This executive report encompasses methodology, documentation, results and conclusions concerning all industrial hygiene work and services supplied by IH Services, Inc. This Report documents the work completed as follows:

Project: Bentalou Elementary School

Date: November 22, 1994

IH Services Report No.: 4-412

The methodology in Section II of this Report defines the sampling protocol. Daily air monitoring data sheets, daily asbestos check lists, observation sheets and all accompanying figures used to detail sampling pump locations are in the documentation Section III. Analytical results are found in Section IV. References are found in Section V.

II METHODOLOGY

For all school buildings, and other buildings as requested, the AHERA (Asbestos Hazard Emergency Response Act of 1986) regulations are followed (40 CFR Part 763, Federal Register, Vol. 52, No. 210, Friday, October 30, 1987). The method used for any transmission electron microscopy analysis follows the protocol outlined in this document.

The sample protocol for optical (phase contrast) microscopy is the NIOSH Method 7400, Revision 3: 5/15/89 (NIOSH Manual of Analytical Methods, 5/15/89). NIOSH 7400 requires the use of a 3 piece, 25 mm cassette with a 50 mm extension cowl holding an 0.8 to 1.2 micrometer porosity, mixed cullulose ester filter membrane. Conductive cowls are used to limit problems with static electricity. All flow rates, volumes, positioning of pumps and cassettes, cassette filter media, pump calibration, number of samples, running of ventilation units, limits of detection and analytical methods and techniques for air monitoring are as per the city-wide Asbestos Abatement Requirement Contract BP-27087.

The polarized light microscopy method used for the determination of asbestos in bulk samples is the EPA Interim Bulk Method 600/M4-82-020.

Additional references employed include the "Purple Book" issued by the USEPA detailing guidelines for controlling asbestos-containing materials in buildings (EPA 560/5-85-024, "Guidance for Controlling Asbestos-Containing Materials in Buildings"), and the EPA document entitled "Measuring Airborne Asbestos Following an Abatement Action" (The "Silver Book").

I H SERVICES, INC.

1831-E Portal Street • Baltimore, Maryland 21224

PHONE: (410) 633-4000

FAX: (410) 633-4122

DAILY OBSERVATIONS

DATE: 7 November 1994

INSPECTOR: Scott Garrity

SITE: Bentalou Elementary School #150
220 N. Bentalou Street
Baltimore, Md 21223

TITLE: Industrial Hygienist

PURPOSE OF VISIT:

Air Monitoring and inspection of designated work area.

GENERAL OBSERVATIONS:

Designated work area known as the main boiler room. Scope of work includes removal of approximately 600 square feet of boiler insulation, and approximately 130 linear feet of associated piping. Workers are currently setting up boiler room, and three stage decontamination chamber.

DATE: 11-7-94

Bentalou Elem School #150

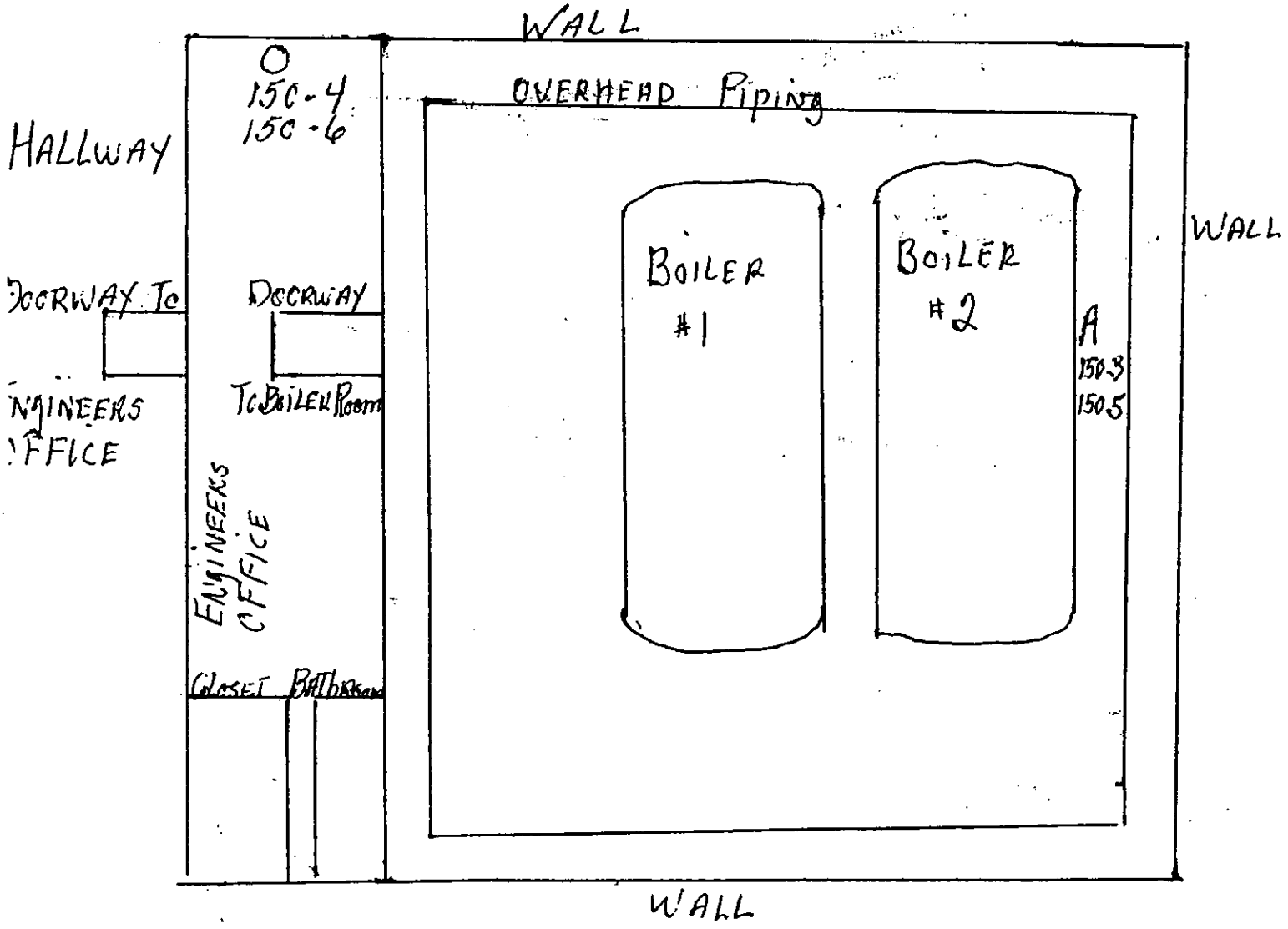
GENERAL OBSERVATIONS CONTINUED:

B. Blank

A - Inside Work Area

O - Outside Work Area

Main Boiler Room



I H SERVICES, INC.

DAILY ASBESTOS ABATEMENT CHECKLIST

Building: Bentalou Elementary School #150 Date: 7 Nov 1994

Location: 220 N. Bentalou Street, Baltimore, Md 21223

Project Description: Removal of approximately 600 square feet of insulation from two boilers, and approximately 130 linear feet of associated piping in boiler room

Company Performing Abatement: Maxon

Supervisor on Job: Khamla Khantony Title: Field Supervisor

Number of Workers at Site: 5

Inspector: Scott GARRITY Signature: Scott Garrity

Title: Industrial Hygienist

WORK SITE INSPECTION

	Acceptable	Not Acceptable	Not Applicable	Problem Encountered / Comments
A. AIRLOCK - DECONTAMINATION AREA				
1. Clean Room - 1st Stage				
a. Floors clean	☐	☐	☑	Setting up containment
b. No asbestos or asbestos-contaminated material present	☑	☐	☐	
c. Street clothes properly stored	☑	☐	☐	
2. Shower Area - 2nd Stage				
a. Shower operating	☐	☐	☑	Setting up containment
b. Shower waste water properly filtered	☐	☐	☑	Setting up containment
3. Equipment Area - 3rd Stage				
a. No excess asbestos debris present	☑	☐	☐	
b. Contaminated suits and material placed in asbestos bag	☑	☐	☐	
4. Airlock perimeter plastic and plastic flaps intact	☑	☐	☐	
5. Proper signage at entrance	☑	☐	☐	
B. PERIMETER BARRIERS				
1. Perimeter plastic intact	☑	☐	☐	
2. Windows and doors sealed	☑	☐	☐	
3. Ducts, ventilator systems, pipes sealed	☑	☐	☐	
4. All other vertical and horizontal openings into area sealed	☑	☐	☐	
C. WORK AREA PRACTICES				
1. Hammers, saws, brooms not in use	☑	☐	☐	
2. Material kept wet	☐	☐	☑	Setting up containment
3. Material bagged promptly	☐	☐	☑	" " "
4. Workers protective equipment	☑	☐	☐	
a. Full body disposable clothing intact	☑	☐	☐	
b. Proper foot protection	☑	☐	☐	
c. Proper NIOSH respirators	☑	☐	☐	
Type: 1/2 face negative pressure				
d. Hard hats	☐	☐	☑	
e. Eye protection	☑	☐	☐	
	☑	☐	☐	

DAILY ASBESTOS ABATEMENT CHECKLIST

Date: 11/7/94

Bentalou Elem School #150

D. WORKER DECONTAMINATION & WORK HABITS

	Acceptable	Not Acceptable	Not Applicable	Problem Encountered / Comments
1. Workers shower upon leaving work area	☐	☐	☑	Setting up containment
2. Contaminated full body suits bagged in dirty room	☐	☐	☑	" " "
3. Disposable suits used once	☐	☐	☑	" " "
4. No smoking in work area or airlock	☑	☐	☐	
5. No eating or drinking in work area or airlock	☑	☐	☐	

E. H.E.P.A. VENTILATION UNITS

1. Number in use 2
2. Pre-filters changed periodically ☑ Yes ☐ No
3. Negative Pressure Inside Work Area:
   a. Measured with:
      ☐ 1. Magnahelic gauge
      ☐ 2. Transducer
   b. Locations(s) and Negative Pressure Reading:

Location	Inches H_2O
#1	
#2	
#3	

4. Is microtrap exhaust properly vented? ☑ Yes ☐ No
5. Is microtrap exhaust hose intact? ☑ Yes ☐ No

F. END OF WORK DAY PROCEDURES

	Acceptable	Not Acceptable	Not Applicable	Problem Encountered / Comments
1. Material on floors bagged before leaving area	☑	☐	☐	
2. Bags of asbestos sealed	☑	☐	☐	
3. If bags are removed:				
a. Properly decontaminated	☑	☐	☐	
b. Tightly sealed	☑	☐	☐	
c. Placed in drums	☑	☐	☐	
4. Are microtraps left running over night	☑	☐	☐	
5. Work area properly sealed off	☑	☐	☐	

G. AIR SAMPLING

	AREA	PERSONAL
1. Number of Air Samples taken	4	0
2. Number of Air Samples taken by Contractor		

H. What is the daily job progress?

Workers are constructing full three stage decontamination chambers, and setting up full containment in designated work area.

I H SERVICES, INC.

1831 Portal Street — Suite E • Baltimore, Maryland 21224

Main Office
410-633-4000
FAX
410-633-4122

AIR MONITORING DATA SHEET

Project: Bentalou Elem. School #150
Address: 220 N. Bentalou St, Balto, Md 21223
Date: 11-7-94
Activity: Setting up wood area
Job Number: EL-00001-229
Work Order Number:

SAMPLED FOR:

- [x] Asbestos: METHOD [x] 7400 [ ] TEM; CASSETTE [x] 25mm [ ] 37mm; FILTER [x] MCE [ ] PC
- [ ] Airborne Dust:
- [ ] Gas:
- [ ] Vapor:
- [ ] Other:

Analytical Method: _____ Ambient Temp.: _____

Protection Worn During Sampling:	Employee	IH
Full Body Coveralls	[x]	[x]
Respirator - Air Purifying	[x]	[x]
Respirator - Power Air Purifying	[ ]	[ ]
Respirator - Supplied Air	[ ]	[ ]

PERSONAL SAMPLING DATA

Employee Sampled:
Social Security Number:
Smoker: [ ] Yes [ ] No
Job Function:
Description of Activity:

Signature of Employee:

LAB ID	SAMPLE NO.	SAMPLE DATE	RESULTS FIBERS/CC	SAMPLE LOCATION
Q0878	150-1	11/7/94	0 fiber per 100 fields	Blank
Q0879	150-2	11/7/94	0 fiber per 100 fields	Blank
Q0900	150-3	11/7/94	L0.01	Inside Work Area
Q0901	150-4	11/7/94	L0.01	Outside Work Area
Q0902	150-5	11/7/94	0.01	Inside Work Area
Q0903	150-6	11/7/94	L0.01	Outside Work Area

FIELD SAMPLE NUMBER	TEST PERIOD START	TEST PERIOD STOP	TEST PERIOD TOTAL (MIN.)	FLOW RATE SETTING START (LITERS/MIN.)	FLOW RATE SETTING STOP (LITERS/MIN.)	VOLUME LITERS	SAMPLE TYPE AMBIENT	SAMPLE TYPE AREA	SAMPLE TYPE FINAL	SAMPLE TYPE PERSONAL	SAMPLE LOCATION IN WORK AREA	SAMPLE LOCATION OUTSIDE WORK AREA	SAMPLE LOCATION N/A	INSTRUMENT SERIAL NUMBER
150-1	Ø	Ø	Ø	Ø	Ø	Ø								Blank
150-2	Ø	Ø	Ø	Ø	Ø	Ø								Blank
150-3	1600	1810	130	9.5	9.5	1235					✓			0160
150-4	1600	1810	130	9.5	9.5	1235						✓		0163
150-5	1830	2040	130	9.5	9.5	1235					✓			0160
150-6	1830	2040	130	9.5	9.5	1235						✓		0163

Comments:

Inspector: Scott GARRITY (PRINT NAME)
Scott Garrity (SIGNATURE)
Date: 7 Nov 1994

I H SERVICES, INC.

1831 Portal Street – Suite E • Baltimore, Maryland 21224

PHONE: (410) 633-4000
FAX (410) 633-4122

CHAIN OF CUSTODY FOR ANALYTICAL SERVICES

№ 3758

Submittal Date: 11-7-94 Submitted By: (Print) Scott GARRITY (Sign) Scott Garrity

Client Name: Marcon

Address:

Telephone:

Results Required by: 11/16/94

Number of Samples: 6

Project Name: Bentalou Elem School #150

Address: 220 N. Bentalou Street
Baltimore, Md 21223

Contact Person:

Before Noon? ☐ Yes ☐ No

Type of Samples: ☑ Air ☐ Bulk ☐ Wipe ☐ Other:

Release Criteria: ☐ AHERA ☐ 0.010 f/cc ☐ % Asbestos ☐ Other:

LAB ID	SAMPLE NUMBER	DATE	VOLUME (Liters)	METHOD (Check)				OTHER
				PCM	PLM	TEM	SEM	
00898	150-1	11/7/94	0	✓				Blank
00899	150-2	11/7/94	0	✓				Blank
00900	150-3	11/7/94	1235	✓				Inside Work Area
00901	150-4	11/7/94	1235	✓				Outside Work Area
00902	150-5	11/7/94	1235	✓				Inside Work Area
00903	150-6	11/7/94	1235	✓				Outside Work Area

Relinquished By: (Signature)	Date	Relinquished By: (Signature)	Date
Name: (Printed)	Time	Name: (Printed)	Time
Received By: (Signature)	Date	Received By: (Signature)	Date
Name: (Printed)	Time	Name: (Printed)	Time

LABORATORY STAFF ONLY: (CUSTODY)

1. Date/Time Received 11/16/94 @ by (Print) Ted Georgelatos Sign
2. Date/Time Analyzed 11/16/94 @ by (Print) Sign
3. Date/Time Reported 11/16/94 @ by (Print) Sign
4. Results Reported To: by (Print) Sign

I H SERVICES, INC.

1831-E Portal Street • Baltimore, Maryland 21224

PHONE: (410) 633-4000

FAX: (410) 633-4122

DAILY OBSERVATIONS

DATE: 8 November 1994

INSPECTOR: Scott Danity

SITE: Bentalou Elem School #150
220 N. Bentalou Street
Baltimore, Md 21223

TITLE: Industrial Hygienist

PURPOSE OF VISIT:

Air Monitoring and inspection of designated work area.

GENERAL OBSERVATIONS:

Designated work area known as the main boiler room. Scope of work includes removal of approximately 600 square feet of boiler insulation and approximately 130 linear feet of associated piping. Workers are currently setting up boiler room and three stage decontamination.

DATE: 11-7-94

Bentalou Elem. School #150

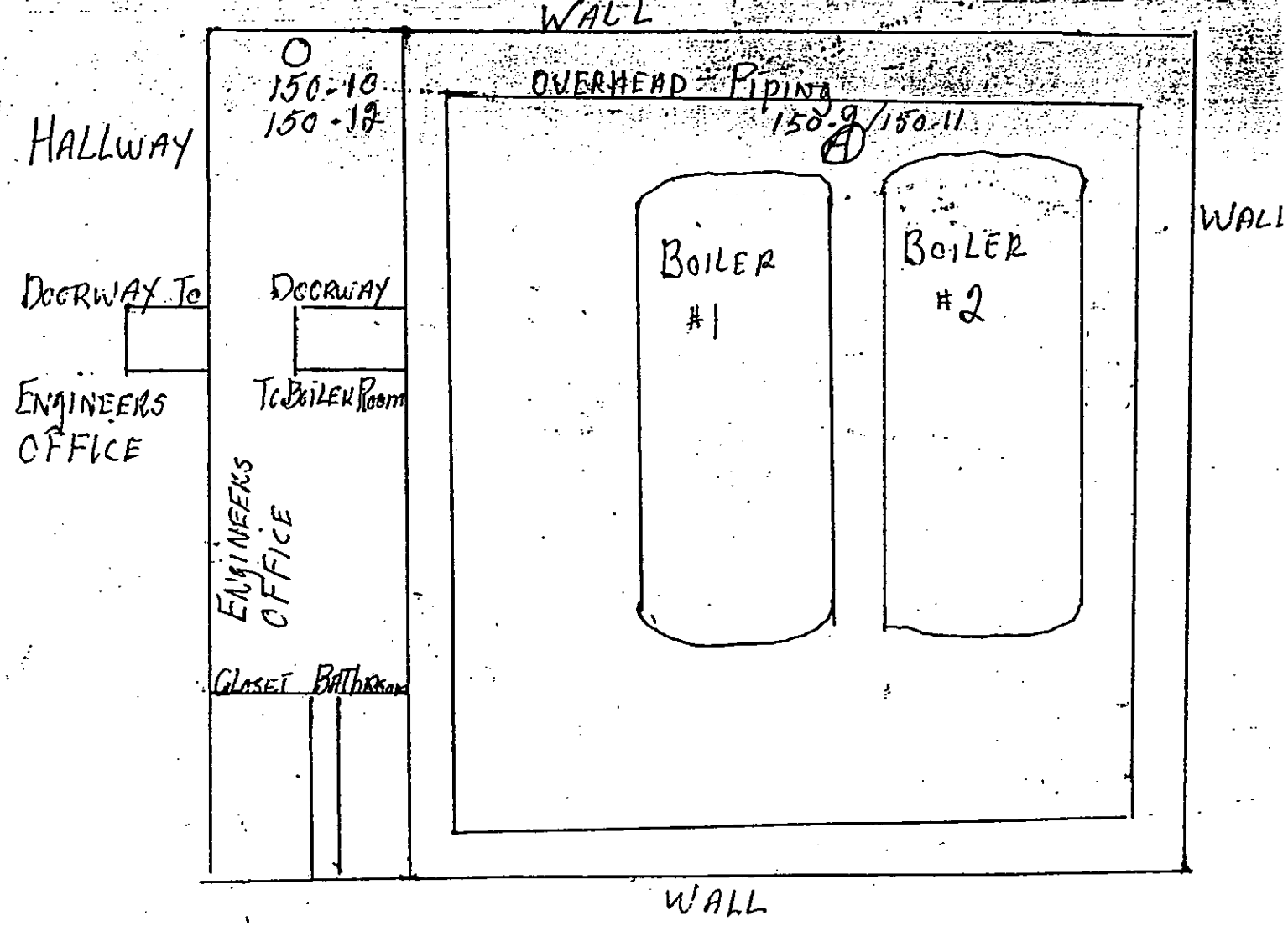
GENERAL OBSERVATIONS CONTINUED:

B. Blank

A - Inside Work Area

O - Outside Work Area

Main Boiler Room



I H SERVICES, INC.

DAILY ASBESTOS ABATEMENT CHECKLIST

Building: Bentalou Elementary School #150 Date: 8 Nov 1994

Location: 220 N. Bentalou Street, Baltimore, Md 21223

Project Description: Removal of approximately 600 square feet of insulation from two boilers and approximately 130 linear feet of associated piping in boiler room

Company Performing Abatement: Marcor

Supervisor on Job: Khamla Khantony Title: Field Supervisor

Number of Workers at Site: 5

Inspector: Scott Garrity Signature: Scott Garrity

Title: Industrial Hygienist

WORK SITE INSPECTION

	Acceptable	Not Acceptable	Not Applicable	Problem Encountered / Comments
A. AIRLOCK - DECONTAMINATION AREA				
1. Clean Room - 1st Stage				
a. Floors clean	☑	☐	☐	
b. No asbestos or asbestos-contaminated material present	☑	☐	☐	
c. Street clothes properly stored	☑	☐	☐	
2. Shower Area - 2nd Stage				
a. Shower operating	☑	☐	☐	
b. Shower waste water properly filtered	☑	☐	☐	
3. Equipment Area - 3rd Stage				
a. No excess asbestos debris present	☑	☐	☐	
b. Contaminated suits and material placed in asbestos bag	☑	☐	☐	
4. Airlock perimeter plastic and plastic flaps intact	☑	☐	☐	
5. Proper signage at entrance	☑	☐	☐	
B. PERIMETER BARRIERS				
1. Perimeter plastic intact	☑	☐	☐	
2. Windows and doors sealed	☑	☐	☐	
3. Ducts, ventilator systems, pipes sealed	☑	☐	☐	
4. All other vertical and horizontal openings into area sealed	☑	☐	☐	
C. WORK AREA PRACTICES				
1. Hammers, saws, brooms not in use	☑	☐	☐	
2. Material kept wet	☑	☐	☐	
3. Material bagged promptly	☑	☐	☐	
4. Workers protective equipment	☑	☐	☐	
a. Full body disposable clothing intact	☑	☐	☐	
b. Proper foot protection	☑	☐	☐	
c. Proper NIOSH respirators Type: ½ face negative pressure	☑	☐	☐	
d. Hard hats	☐	☐	☑	
e. Eye protection	☑	☐	☐	
5. Adequate lighting	☑	☐	☐	

DAILY ASBESTOS ABATEMENT CHECKLIST

Date: 11/8/94

Bentalou Elem School #150

D. WORKER DECONTAMINATION & WORK HABITS

	Acceptable	Not Acceptable	Not Applicable	Problem Encountered / Comments
1. Workers shower upon leaving work area	☐	☐	☑	Setting up
2. Contaminated full body suits bagged in dirty room	☐	☐	☑	" "
3. Disposable suits used once	☑	☐	☐	
4. No smoking in work area or airlock	☑	☐	☐	
5. No eating or drinking in work area or airlock	☑	☐	☐	

E. H.E.P.A. VENTILATION UNITS

1. Number in use 2
2. Pre-filters changed periodically ☑ Yes ☐ No
3. Negative Pressure Inside Work Area:
   a. Measured with:
      ☐ 1. Magnahelic gauge
      ☐ 2. Transducer
   b. Locations(s) and Negative Pressure Reading:

Location	Inches H_2O
#1	
#2	
#3	

4. Is microtrap exhaust properly vented? ☐ Yes ☐ No
5. Is microtrap exhaust hose intact? ☐ Yes ☐ No

F. END OF WORK DAY PROCEDURES

	Acceptable	Not Acceptable	Not Applicable	Problem Encountered / Comments
1. Material on floors bagged before leaving area	☑	☐	☐	
2. Bags of asbestos sealed	☑	☐	☐	
3. If bags are removed:				
a. Properly decontaminated	☑	☐	☐	
b. Tightly sealed	☑	☐	☐	
c. Placed in drums	☑	☐	☐	
4. Are microtraps left running over night	☑	☐	☐	
5. Work area properly sealed off	☑	☐	☐	

G. AIR SAMPLING

	AREA	PERSONAL
1. Number of Air Samples taken	4	0 2 blanks
2. Number of Air Samples taken by Contractor		

H. What is the daily job progress?

Workers are still constructing set up of full containment and three stage decontamination in work area

I H SERVICES, INC.

1831 Portal Street — Suite E • Baltimore, Maryland 21224

Main Office
410-633-4000
FAX
410-633-4122

AIR MONITORING DATA SHEET

Project: Bentalou Elem School #150
Address: 220 N. Bentalou St, Balto, Md 21223
Date: 11-8-94
Activity: Setting up work area
Job Number: EA-00001-229
Work Order Number:

SAMPLED FOR:

- [x] Asbestos: METHOD [x] 7400 [ ] TEM — CASSETTE [x] 25mm [ ] 37mm — FILTER [ ] MCE [ ] PC
- [ ] Airborne Dust:
- [ ] Gas:
- [ ] Vapor:
- [ ] Other:

Analytical Method: _____ Ambient Temp.: _____

Protection Worn During Sampling:

	Employee	IH
Full Body Coveralls	[x]	[x]
Respirator - Air Purifying	[x]	[x]
Respirator - Power Air Purifying	[ ]	[ ]
Respirator - Supplied Air	[ ]	[ ]

PERSONAL SAMPLING DATA

Employee Sampled: W/A
Social Security Number:
Smoker: [ ] Yes [ ] No
Job Function:
Description of Activity:

Signature of Employee: _____

LAB ID	SAMPLE NO.	SAMPLE DATE	RESULTS FIBERS/CC	SAMPLE LOCATION
Q0924	150-7	11/8/94	0 fibers per 100 fields	Blank
Q0925	150-8	11/8/94	0 fibers per 100 fields	Blank
Q0926	150-9	11/8/94	Void overload	Inside
Q0927	150-10	11/8/94	Void overload	Outside
Q0928	150-11	11/8/94	Void overload	Inside
Q0929	150-12	11/8/94	20.01	Outside

FIELD SAMPLE NUMBER	TEST PERIOD START	TEST PERIOD STOP	TEST PERIOD TOTAL (MIN.)	FLOW RATE SETTING START (LITERS/MIN.)	FLOW RATE SETTING STOP (LITERS/MIN.)	VOLUME LITERS	SAMPLE TYPE AMBIENT	SAMPLE TYPE AREA	SAMPLE TYPE FINAL	SAMPLE TYPE PERSONAL	SAMPLE LOCATION IN WORK AREA	SAMPLE LOCATION OUTSIDE WORK AREA	SAMPLE LOCATION N/A	INSTRUMENT SERIAL NUMBER
150-7	∅	∅	∅	∅	∅	∅							/	Blank
150-8	∅	∅	∅	∅	∅	∅								Blank
150-9	0800	1010	130	9.5	9.5	1235					✓			0160
150-10	0800	1010	130	9.5	9.5	1235						✓		0163
150-11	1100	1310	130	9.5	9.5	1235					✓			0160
150-12	1100	1310	130	9.5	9.5	1235						✓		0163

Comments:

Inspector: SCOTT GARRITY (PRINT NAME)
Scott Garrity (SIGNATURE)
Date: 8 Nov 1994

I H SERVICES, INC.

1831 Portal Street – Suite E • Baltimore, Maryland 21224

PHONE: (410) 633-4000
FAX (410) 633-4122

CHAIN OF CUSTODY FOR ANALYTICAL SERVICES

№ 3755

Submittal Date: 11/8/94 Submitted By: (Print) Scott Garrity (Sign) Scott Garrity

Client Name: Mason

Address:

Telephone:

Results Required by: 11 / 17 / 94

Number of Samples: 6

Project Name: Bentalou Elem School #150

Address: 220 N. Bentalou Street
Baltimore, Md 21223

Contact Person:

Before Noon? ☐ Yes ☐ No

Type of Samples: ☑ Air ☐ Bulk ☐ Wipe ☐ Other:

Release Criteria: ☐ AHERA ☐ 0.010 f/cc ☐ % Asbestos ☐ Other:

LAB ID	SAMPLE NUMBER	DATE	VOLUME (Liters)	METHOD (Check)				OTHER
				PCM	PLM	TEM	SEM	
00924	150-7	11/8/94	0	✓				Blank
00925	150-8	11/8/94	0	✓				Blank
00926	150-9	11/8/94	1235	✓				Inside Work Area
00927	150-10	11/8/94	1235	✓				Outside Work Area
00928	150-11	11/8/94	1235	✓				Inside Work Area
00929	150-12	11/8/94	1235	✓				Outside Work Area

Relinquished By: (Signature)	Date	Relinquished By: (Signature)	Date
Name: (Printed)	Time	Name: (Printed)	Time
Received By: (Signature)	Date	Received By: (Signature)	Date
Name: (Printed)	Time	Name: (Printed)	Time

LABORATORY STAFF ONLY: (CUSTODY)

1. Date/Time Received 11 / 16 / 94 @ 1400 by (Print) Ted Koesdatti Sign Ted Koesdatti
2. Date/Time Analyzed 11 / 17 / 94 @ 2100 by (Print) Sign
3. Date/Time Reported 11 / 17 / 94 @ 2130 by (Print) Sign
4. Results Reported To: by (Print) Sign

I H SERVICES, INC.

1831-E Portal Street • Baltimore, Maryland 21224

PHONE: (410) 633-4000

FAX: (410) 633-4122

DAILY OBSERVATIONS

DATE: 9 November 1994

INSPECTOR: Scott Gaunty

SITE: Bentalou Elem School # 150
220 N. Bentalou Street
Baltimore, Md 21223

TITLE: Industrial Hygienist

PURPOSE OF VISIT:

Air Monitoring and inspection of designated work area.

GENERAL OBSERVATIONS:

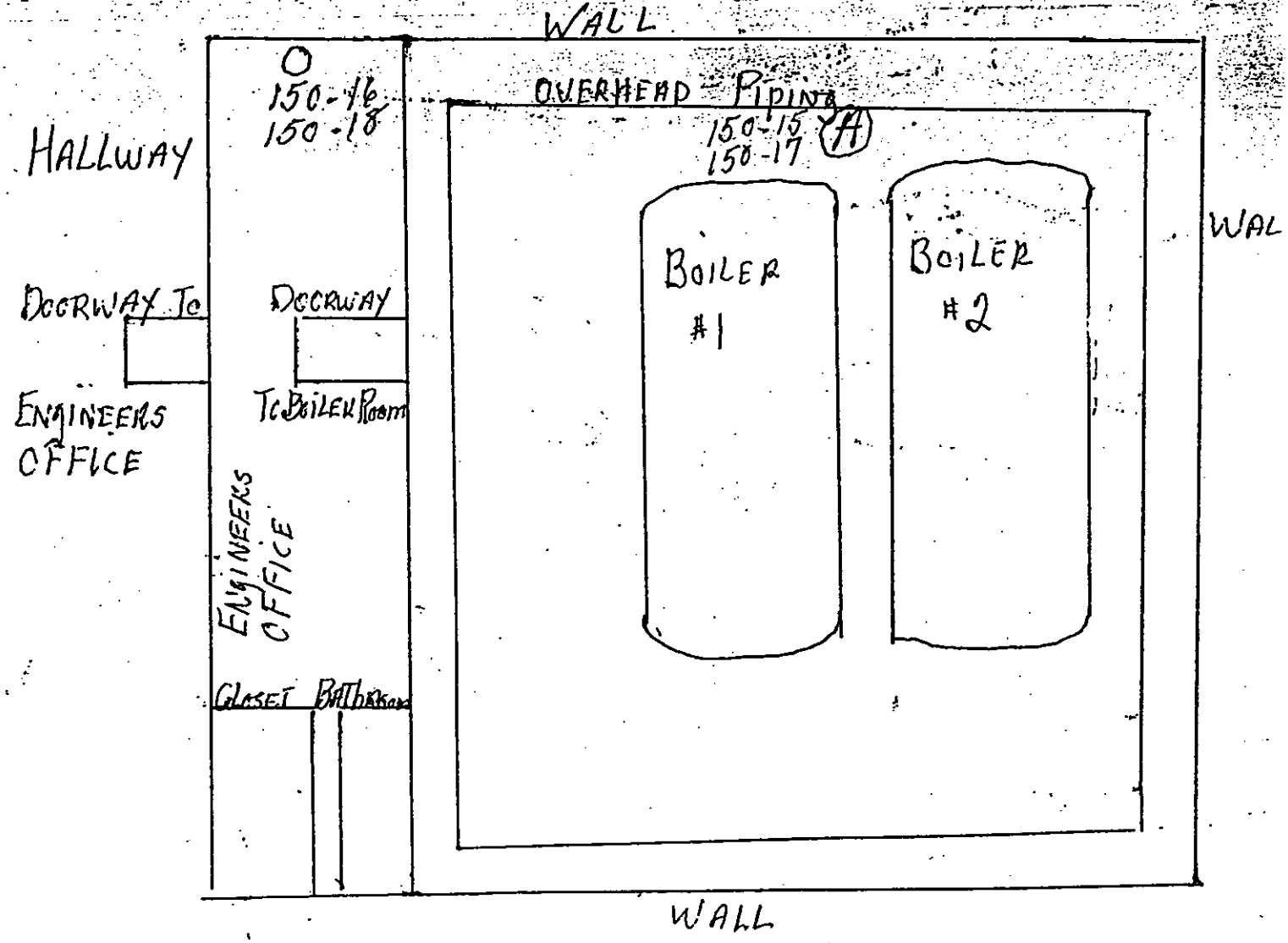
Designated work area known as the main boiler room. Scope of work includes removal of approximately 600 square feet of boiler insulation and approximately 130 linear feet of associated piping. Workers are currently setting up work area and three stage decontamination.

DATE: 11-9-94

Bentalou Elem. School #150
GENERAL OBSERVATIONS CONTINUED:

B - Blank
A - Inside Work Area
O - Outside Work Area

Main Boiler Room



I H SERVICES, INC.

DAILY ASBESTOS ABATEMENT CHECKLIST

Building: Bentalou Elem School #150 Date: 9 Nov 1994

Location: 220 N. Bentalou Street, Baltimore, Md. 21223

Project Description: Removal of approximately 600 square feet of boiler insulation and approximately 130 linear feet of associated piping in boiler room.

Company Performing Abatement: Marcor

Supervisor on Job: Khamla Khantony Title: Field Supervisor

Number of Workers at Site: 11

Inspector: Scott Garrity Signature: Scott Garrity

Title: Industrial Hygienist

WORK SITE INSPECTION

	Acceptable	Not Acceptable	Not Applicable	Problem Encountered / Comments
A. AIRLOCK - DECONTAMINATION AREA				
1. Clean Room - 1st Stage				
a. Floors clean	☑	☐	☐	
b. No asbestos or asbestos-contaminated material present	☑	☐	☐	
c. Street clothes properly stored	☑	☐	☐	
2. Shower Area - 2nd Stage				
a. Shower operating	☑	☐	☐	
b. Shower waste water properly filtered	☑	☐	☐	
3. Equipment Area - 3rd Stage				
a. No excess asbestos debris present	☑	☐	☐	
b. Contaminated suits and material placed in asbestos bag	☑	☐	☐	
4. Airlock perimeter plastic and plastic flaps intact	☑	☐	☐	
5. Proper signage at entrance	☑	☐	☐	
B. PERIMETER BARRIERS				
1. Perimeter plastic intact	☑	☐	☐	
2. Windows and doors sealed	☑	☐	☐	
3. Ducts, ventilator systems, pipes sealed	☑	☐	☐	
4. All other vertical and horizontal openings into area sealed	☑	☐	☐	
C. WORK AREA PRACTICES				
1. Hammers, saws, brooms not in use	☑	☐	☐	
2. Material kept wet	☑	☐	☐	
3. Material bagged promptly	☑	☐	☐	
4. Workers protective equipment	☑	☐	☐	
a. Full body disposable clothing intact	☑	☐	☐	
b. Proper foot protection	☑	☐	☐	
c. Proper NIOSH respirators Type: 1/2 face negative pressure	☑	☐	☐	
d. Hard hats	☐	☐	☑	
e. Eye protection	☑	☐	☐	
5. Adequate lighting	☑	☐	☐	

DAILY ASBESTOS ABATEMENT CHECKLIST

Date: 11/9/94

Bentalou Elem School #150

D. WORKER DECONTAMINATION & WORK HABITS

	Acceptable	Not Acceptable	Not Applicable	Problem Encountered / Comments
1. Workers shower upon leaving work area	☐	☐	☑	Setting up
2. Contaminated full body suits bagged in dirty room	☐	☐	☑	" "
3. Disposable suits used once	☑	☐	☐	
4. No smoking in work area or airlock	☑	☐	☐	
5. No eating or drinking in work area or airlock	☑	☐	☐	

E. H.E.P.A. VENTILATION UNITS

1. Number in use 2
2. Pre-filters changed periodically ☑ Yes ☐ No
3. Negative Pressure Inside Work Area:
   a. Measured with:
      ☐ 1. Magnahelic gauge
      ☐ 2. Transducer
   b. Locations(s) and Negative Pressure Reading:

Location	Inches H_2O
#1	
#2	
#3	

4. Is microtrap exhaust properly vented? ☐ Yes ☐ No
5. Is microtrap exhaust hose intact? ☐ Yes ☐ No

F. END OF WORK DAY PROCEDURES

	Acceptable	Not Acceptable	Not Applicable	Problem Encountered / Comments
1. Material on floors bagged before leaving area	☑	☐	☐	
2. Bags of asbestos sealed	☑	☐	☐	
3. If bags are removed:				
a. Properly decontaminated	☑	☐	☐	
b. Tightly sealed	☑	☐	☐	
c. Placed in drums	☑	☐	☐	
4. Are microtraps left running over night	☑	☐	☐	
5. Work area properly sealed off	☑	☐	☐	

G. AIR SAMPLING

	AREA	PERSONAL
1. Number of Air Samples taken	4	0
2. Number of Air Samples taken by Contractor		

H. What is the daily job progress?

Workers are still in process of setting up containment in work area.

I H SERVICES, INC.

1831 Portal Street — Suite E • Baltimore, Maryland 21224

Main Office
410-633-4000
FAX
410-633-4122

AIR MONITORING DATA SHEET

Project: Bentalou Elem School #150
Address: 220 N. Bentalou St. Balto, Md 21223
Date: 11-9-94
Activity: Setting Up
Job Number: EL000001-229
Work Order Number:

SAMPLED FOR:

- [x] Asbestos: METHOD [x] 7400 [ ] TEM; CASSETTE [x] 25mm [ ] 37mm; FILTER [x] MCE [ ] PC
- [ ] Airborne Dust:
- [ ] Gas:
- [ ] Vapor:
- [ ] Other:

Analytical Method: _____ Ambient Temp.: _____

Protection Worn During Sampling:

	Employee	IH
Full Body Coveralls	[x]	[x]
Respirator - Air Purifying	[x]	[x]
Respirator - Power Air Purifying	[ ]	[ ]
Respirator - Supplied Air	[ ]	[ ]

PERSONAL SAMPLING DATA

Employee Sampled:
Social Security Number:
Smoker: [ ] Yes [ ] No
Job Function:
Description of Activity:

Signature of Employee:

LAB ID	SAMPLE NO.	SAMPLE DATE	RESULTS FIBERS/CC	SAMPLE LOCATION
Q0904	150-13	11/9/94	Above Detection	Blank
Q0905	150-14	11/9/94	Above Detection	Blank
Q0906	150-15	11/9/94	LO.9	Inside Work Area
Q0907	150-16	11/9/94	LO.0	Outside Work Area
Q0908	150-17	11/9/94	LO.011	Inside Work Area
Q0909	150-18	11/9/94	LO.011	Outside Work Area

FIELD SAMPLE NUMBER	TEST PERIOD START	TEST PERIOD STOP	TEST PERIOD TOTAL (MIN.)	FLOW RATE SETTING START (LITERS/MIN.)	FLOW RATE SETTING STOP (LITERS/MIN.)	VOLUME LITERS	SAMPLE TYPE AMBIENT	SAMPLE TYPE AREA	SAMPLE TYPE FINAL	SAMPLE TYPE PERSONAL	SAMPLE LOCATION IN WORK AREA	SAMPLE LOCATION OUTSIDE WORK AREA	SAMPLE LOCATION N/A	INSTRUMENT SERIAL NUMBER
150-13	∅	∅	∅	∅	∅	∅								Blank
150-14	∅	∅	∅	∅	∅	∅								Blank
150-15	1600	1700	60	9.5	9.5	570								C160
150-16	1600	1700	60	9.5	9.5	570								C163
150-17	1900	2200	180	2.0	2.0	450								0257
150-18	1900	2200	180	2.0	2.0	450								0258

Comments:

Inspector: Scott GARRITY (PRINT NAME)
Scott Garrity (SIGNATURE)
Date: 9 Nov 1994

I H SERVICES, INC.

1831 Portal Street – Suite E • Baltimore, Maryland 21224

PHONE: (410) 633-4000
FAX (410) 633-4122

CHAIN OF CUSTODY FOR ANALYTICAL SERVICES

№ 3756

Submittal Date: 11/9/94 Submitted By: (Print) Scott Garrity (Sign) Scott Garrity

Client Name: Marcor

Address:

Project Name: Bentalou Elem. School #150

Address: 220 N. Bentalou Street
Baltimore, Md 21223

Telephone:

Contact Person:

Results Required by: 11 / 16 / 94

Before Noon? ☐ Yes ☐ No

Number of Samples: 6

Type of Samples: ☑ Air ☐ Bulk ☐ Wipe ☐ Other:

Release Criteria: ☐ AHERA ☑ 0.010 f/cc ☐ % Asbestos ☐ Other:

LAB ID	SAMPLE NUMBER	DATE	VOLUME (Liters)	METHOD (Check) PCM	PLM	TEM	SEM	OTHER
Q0904	150-13	11/9/94	0	✓				Blank
Q0905	150-14	11/9/94	0	✓				Blank
Q0906	150-15	11/9/94	570	✓				Inside Work Area
Q0907	150-16	11/9/94	570	✓				Outside Work Area
Q0908	150-17	11/9/94	450	✓				Inside Work Area
Q0909	150-18	11/9/94	450	✓				Outside Work Area

Relinquished By: (Signature)	Date	Relinquished By: (Signature)	Date
Name: (Printed)	Time	Name: (Printed)	Time
Received By: (Signature)	Date	Received By: (Signature)	Date
Name: (Printed)	Time	Name: (Printed)	Time

LABORATORY STAFF ONLY: (CUSTODY)

1. Date/Time Received 11 / 16 / 94 @ 1400 by (Print) Ted Koesenbelter Sign
2. Date/Time Analyzed 11 / 16 / 94 @ 1800 by (Print) Sign
3. Date/Time Reported 11 / 16 / 94 @ 2000 by (Print) Sign
4. Results Reported To: by (Print) Sign

I H SERVICES, INC.

1831-E Portal Street • Baltimore, Maryland 21224

PHONE: (410) 633-4000

FAX: (410) 633-4122

DAILY OBSERVATIONS

DATE: 10 November 1994

INSPECTOR: Ernest K. Smith

SITE: Bentalou Elementary School #150
220 N. Bentalou Street
Baltimore, MD

TITLE: Industrial Hygienist

PURPOSE OF VISIT:

Perform air monitoring and inspections

GENERAL OBSERVATIONS:

Upon arriving on-site, IH met K. Khantry, Supervisor - Marcor. Supervisor informed IH that crew was performing set-up of Boiler Room Area. Scope of work involved removal of ACM insulation from two (2) Boilers, water tank, breaching and associated pipes/fittings. Supervisor escorted IH to work area. IH set-up equipment and performed air monitoring. Set-up of Boiler Room involved sealing criticals and areas around pipes, enclosing equipment in poly to remove from work area, installation of decon unit shower facility, and HEPA vacuuming of loose debris.

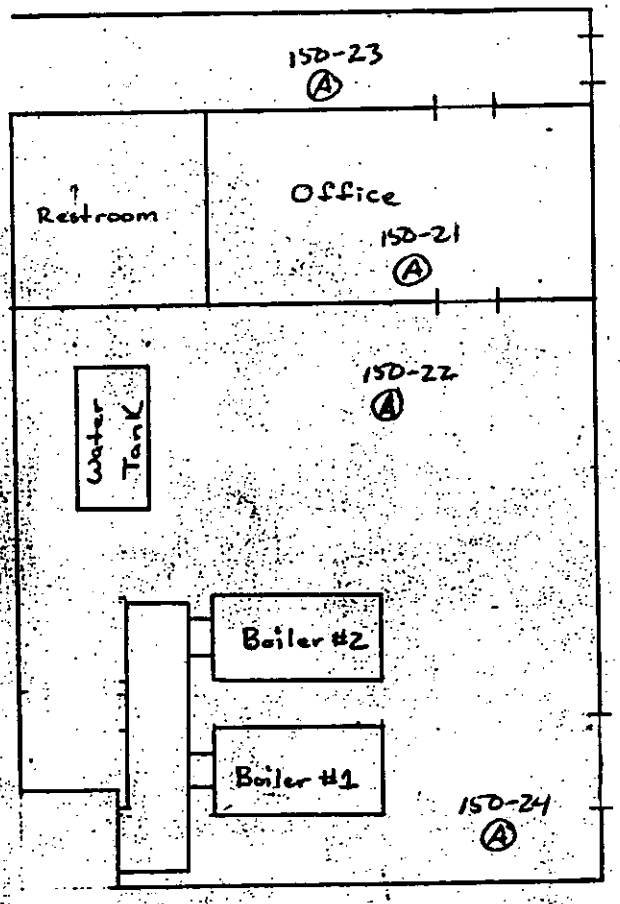
DATE: 10 November 1994

GENERAL OBSERVATIONS CONTINUED:

Bentalou Elementary School #150

220 N. Bentalou Street

Baltimore, MD



BOILER ROOM AREA

150-19 B: Blank

150-20 B: Blank

A: Area

I H SERVICES, INC.

DAILY ASBESTOS ABATEMENT CHECKLIST

Building: Bentalou Elementary School #150 Date: 11/10/94

Location: 220 N. Bentalou Street, Baltimore, MD

Project Description: Removal of ACM insulation from water tank, boilers, breaching and associated pipes/fitting throughout Boiler Room.

Company Performing Abatement: Marcor

Supervisor on Job: Khamla Khantry Title: Supervisor

Number of Workers at Site:

Inspector: Ernest K. Smith Signature: Ernest K. Smith

Title: Industrial Hygienist

WORK SITE INSPECTION A. AIRLOCK - DECONTAMINATION AREA	Acceptable	Not Acceptable	Not Applicable	Problem Encountered / Comments
1. Clean Room - 1st Stage				
a. Floors clean	☐	☐	☑	Performing set-up
b. No asbestos or asbestos-contaminated material present	☐	☐	☑	
c. Street clothes properly stored	☐	☐	☑	
2. Shower Area - 2nd Stage				
a. Shower operating	☐	☐	☑	
b. Shower waste water properly filtered	☐	☐	☑	
3. Equipment Area - 3rd Stage				
a. No excess asbestos debris present	☐	☐	☑	
b. Contaminated suits and material placed in asbestos bag	☐	☐	☑	
4. Airlock perimeter plastic and plastic flaps intact	☐	☐	☑	
5. Proper signage at entrance	☐	☐	☑	
B. PERIMETER BARRIERS				
1. Perimeter plastic intact	☐	☐	☑	Performing set-up
2. Windows and doors sealed	☐	☐	☑	
3. Ducts, ventilator systems, pipes sealed	☐	☐	☑	
4. All other vertical and horizontal openings into area sealed	☐	☐	☑	
C. WORK AREA PRACTICES				
1. Hammers, saws, brooms not in use	☐	☐	☑	Performing set-up
2. Material kept wet	☐	☐	☑	
3. Material bagged promptly	☐	☐	☑	
4. Workers protective equipment	☐	☐	☑	
a. Full body disposable clothing intact	☐	☐	☑	
b. Proper foot protection	☑	☐	☐	
c. Proper NIOSH respirators	☑	☐	☐	
Type: Comfo II & Glendive ½ face neg. press.				
d. Hard hats	☐	☐	☑	
e. Eye protection	☑	☐	☐	
5. Adequate lighting	☑	☐	☐	

DAILY ASBESTOS ABATEMENT CHECKLIST

Date: 11/10/94

D. WORKER DECONTAMINATION & WORK HABITS	Acceptable	Not Acceptable	Not Applicable	Problem Encountered / Comments
1. Workers shower upon leaving work area	☐	☐	☑	
2. Contaminated full body suits bagged in dirty room	☐	☐	☑	
3. Disposable suits used once	☐	☐	☑	
4. No smoking in work area or airlock	☑	☐	☐	
5. No eating or drinking in work area or airlock	☑	☐	☐	

E. H.E.P.A. VENTILATION UNITS

1. Number in use N/A
2. Pre-filters changed periodically ☐ Yes ☐ No
3. Negative Pressure Inside Work Area:
   a. Measured with:
      ☐ 1. Magnahelic gauge
      ☐ 2. Transducer
   b. Locations(s) and Negative Pressure Reading:

Location	Inches H_2O
#1	
#2 N/A	
#3	

4. Is microtrap exhaust properly vented? ☐ Yes ☐ No
5. Is microtrap exhaust hose intact? ☐ Yes ☐ No

F. END OF WORK DAY PROCEDURES	Acceptable	Not Acceptable	Not Applicable	Problem Encountered / Comments
1. Material on floors bagged before leaving area	☑	☐	☐	Performing set-up
2. Bags of asbestos sealed	☐	☐	☑	
3. If bags are removed:				
a. Properly decontaminated	☐	☐	☑	
b. Tightly sealed	☐	☐	☑	
c. Placed in drums	☐	☐	☑	
4. Are microtraps left running over night	☐	☐	☑	
5. Work area properly sealed off	☐	☐	☑	

G. AIR SAMPLING	AREA	PERSONAL
1. Number of Air Samples taken	4	—
2. Number of Air Samples taken by Contractor	—	—

H. What is the daily job progress?

Workers continued set-up of Boiler Room area. Set-up involved sealing criticals & areas around pipes, enclosing equipment not to included in work area, and HEPA vacuuming of loose debris.

I H SERVICES, INC.

1831 Portal Street — Suite E • Baltimore, Maryland 21224

Main Office
410-633-4000
FAX
410-633-4122

AIR MONITORING DATA SHEET

Project: Bentalou Elementary School #150
Address: 220 N. Bentalou St., Balto, MD
Date: 11/10/94
Activity: Air monitoring
Job Number:
Work Order Number:

SAMPLED FOR:

- [x] Asbestos: METHOD [x] 7400 [ ] TEM; CASSETTE [x] 25mm [ ] 37mm; FILTER [x] MCE [ ] PC
- [ ] Airborne Dust:
- [ ] Gas:
- [ ] Vapor:
- [ ] Other:

Analytical Method: PCM Ambient Temp.:

Protection Worn During Sampling:

	Employee	IH
Full Body Coveralls	[ ]	[ ]
Respirator - Air Purifying	[ ]	[ ]
Respirator - Power Air Purifying	[ ]	[ ]
Respirator - Supplied Air	[ ]	[ ]

PERSONAL SAMPLING DATA

Employee Sampled:
Social Security Number:
Smoker: [ ] Yes [ ] No
Job Function:
Description of Activity:

Signature of Employee:

LAB ID	SAMPLE NO.	SAMPLE DATE	RESULTS FIBERS/CC	SAMPLE LOCATION
EK4873	150 -19	11/10/94	ϕ Fibers per 100 fields	Blank
EK4874	150 -20	11/10/94	ϕ Fibers per 100 fields	Blank
EK4875	150 -21	11/10/94	<.005	Area Sample Office Area
EK4876	150 -22	11/10/94	<.005	Area Sample Boiler Room
EK4877	150 -23	11/10/94	<.005	Area Sample Corridor
EK4878	150 -24	11/10/94	<.005	Area Sample Boiler Room

FIELD SAMPLE NUMBER	TEST PERIOD START	TEST PERIOD STOP	TOTAL (MIN.)	FLOW RATE SETTING START (LITERS/MIN.)	FLOW RATE SETTING STOP (LITERS/MIN.)	VOLUME LITERS	SAMPLE TYPE AMBIENT	AREA	FINAL	PERSONAL	SAMPLE LOCATION IN WORK AREA	OUTSIDE WORK AREA	N/A	INSTRUMENT SERIAL NUMBER
150-19	—	—	ϕ	—	—	ϕ							✓	Blank
-20	—	—	ϕ	—	—	ϕ							✓	Blank
-21	1650	1830	100	10.0	10.0	1000		✓				✓		0248
150-22	1650	1830	100	10.0	10.0	1000		✓			✓			0250
-23	1840	2010	90	10.0	10.0	900		✓				✓		0248
-24	1841	2011	90	10.0	10.0	900		✓			✓			0250

Comments:

Inspector: Ernest K. Smith (PRINT NAME)
Ernest K. Smith (SIGNATURE)
Date: 10 November 1994

I H SERVICES, INC.

1831 Portal Street – Suite E • Baltimore, Maryland 21224

PHONE: (410) 633-4000
FAX (410) 633-4122

CHAIN OF CUSTODY FOR ANALYTICAL SERVICES

№ 3800

Submittal Date: 11/10/94 Submitted By: (Print) Ernest K. Smith (Sign) Ernest K. Smith

Client Name: Marcor

Address:

Telephone:

Project Name: Bentalou Elem. Sch. #150

Address: 220 N. Bentalou Street Baltimore, MD

Contact Person: Khamla Khantry

Results Required by: 11 / 11 / 94

Before Noon? ☐ Yes ☑ No

Number of Samples:

Type of Samples: ☑ Air ☐ Bulk ☐ Wipe ☐ Other:

Release Criteria: ☐ AHERA ☑ 0.010 f/cc ☐ % Asbestos ☐ Other:

LAB ID	SAMPLE NUMBER	DATE	VOLUME (Liters)	METHOD (Check)				OTHER
				PCM	PLM	TEM	SEM	
EK4873	150 - 19	11/10/94	∅	✓				Blank
EK4874	-20	"	∅	✓				Blank
EK4875	-21	"	1000	✓				
EK4876	150 -22	11/10/94	1000	✓				
EK4877	-23	"	900	✓				
EK4878	-24	"	900	✓				

Relinquished By: (Signature)	Date	Relinquished By: (Signature)	Date
Name: (Printed)	Time	Name: (Printed)	Time
Received By: (Signature)	Date	Received By: (Signature)	Date
Name: (Printed)	Time	Name: (Printed)	Time

LABORATORY STAFF ONLY: (CUSTODY)

1. Date/Time Received 11 / 10 / 94 @ 2015 by (Print) _____ Sign _____
2. Date/Time Analyzed 11 / 10 / 94 @ 2045 by (Print) _____ Sign _____
3. Date/Time Reported 11 / 10 / 94 @ 2130 by (Print) _____ Sign _____

I H SERVICES, INC.

1831-E Portal Street • Baltimore, Maryland 21224

PHONE: (410) 633-4000

FAX: (410) 633-4122

DAILY OBSERVATIONS

DATE: 11 November 1994

INSPECTOR: Scott Garrity

SITE: Bentalou Elem School #150
220 N. Bentalou Street
Baltimore, Md 21223

TITLE: Industrial Hygienist

PURPOSE OF VISIT:

Perform air monitoring and inspections of designated work area.

GENERAL OBSERVATIONS:

Designated work area known as the main boiler room. Scope of work includes removal of approximately 600 square feet of boiler insulation from two boilers, and approximately 130 linear feet of pipe insulation associated with the boilers. Workers are in process of setting up full containment and three stage decontamination chamber.

DATE: 11-7-94

Page 2 of 2

Bentalou Elem School #150

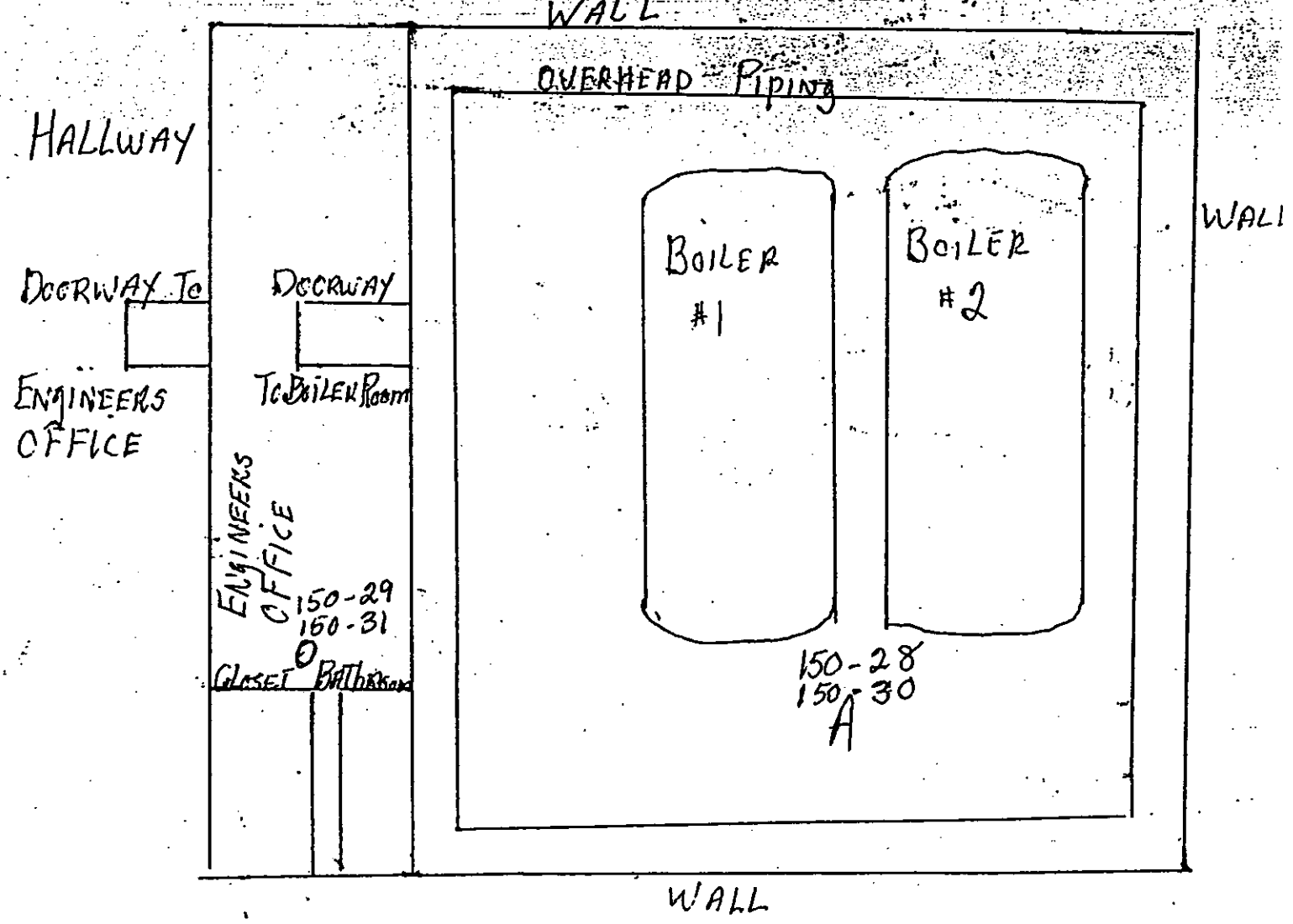
GENERAL OBSERVATIONS CONTINUED:

B- Blank

A- Inside Work Area

O- Outside Work Area

Main Boiler Room



I H SERVICES, INC.

DAILY ASBESTOS ABATEMENT CHECKLIST

Building: Bentalou Elem School #150 Date: 11 Nov 1994

Location: 220 N. Bentalou Street, Baltimore, Md 21223

Project Description: Removal of approximately 600 square feet of boiler insulation from two boilers, and approximately 130 linear feet of pipe insulation associated with boilers.

Company Performing Abatement: Magcon

Supervisor on Job: Khamala Khantony Title: Field Supervisor

Number of Workers at Site: 11

Inspector: Scott GARRITY Signature: Scott Garrity

Title: Industrial Hygienist

WORK SITE INSPECTION

	Acceptable	Not Acceptable	Not Applicable	Problem Encountered / Comments
A. AIRLOCK - DECONTAMINATION AREA				
1. Clean Room - 1st Stage				
a. Floors clean	☑	☐	☐	
b. No asbestos or asbestos-contaminated material present	☑	☐	☐	
c. Street clothes properly stored	☑	☐	☐	
2. Shower Area - 2nd Stage				
a. Shower operating	☑	☐	☐	
b. Shower waste water properly filtered	☑	☐	☐	
3. Equipment Area - 3rd Stage				
a. No excess asbestos debris present	☑	☐	☐	
b. Contaminated suits and material placed in asbestos bag	☑	☐	☐	
4. Airlock perimeter plastic and plastic flaps intact	☑	☐	☐	
5. Proper signage at entrance	☑	☐	☐	
B. PERIMETER BARRIERS				
1. Perimeter plastic intact	☑	☐	☐	
2. Windows and doors sealed	☑	☐	☐	
3. Ducts, ventilator systems, pipes sealed	☑	☐	☐	
4. All other vertical and horizontal openings into area sealed	☑	☐	☐	
C. WORK AREA PRACTICES				
1. Hammers, saws, brooms not in use	☑	☐	☐	
2. Material kept wet	☑	☐	☐	
3. Material bagged promptly	☑	☐	☐	
4. Workers protective equipment	☑	☐	☐	
a. Full body disposable clothing intact	☑	☐	☐	
b. Proper foot protection	☑	☐	☐	
c. Proper NIOSH respirators	☑	☐	☐	
Type: 1/2 face negative pressure				
d. Hard hats	☐	☐	☑	
e. Eye protection	☑	☐	☐	
5. Adequate lighting	☑	☐	☐	

DAILY ASBESTOS ABATEMENT CHECKLIST

Date: 11-11-94
Bintabou Elem School #150

D. WORKER DECONTAMINATION & WORK HABITS	Acceptable	Not Acceptable	Not Applicable	Problem Encountered / Comments
1. Workers shower upon leaving work area	☑	☐	☐	
2. Contaminated full body suits bagged in dirty room	☑	☐	☐	
3. Disposable suits used once	☑	☐	☐	
4. No smoking in work area or airlock	☑	☐	☐	
5. No eating or drinking in work area or airlock	☑	☐	☐	

E. H.E.P.A. VENTILATION UNITS

1. Number in use 2
2. Pre-filters changed periodically ☑ Yes ☐ No
3. Negative Pressure Inside Work Area:
   a. Measured with:
      ☐ 1. Magnahelic gauge
      ☐ 2. Transducer
   b. Locations(s) and Negative Pressure Reading:

Location	Inches H_2O
#1	
#2	
#3	

4. Is microtrap exhaust properly vented? ☑ Yes ☐ No
5. Is microtrap exhaust hose intact? ☑ Yes ☐ No

F. END OF WORK DAY PROCEDURES	Acceptable	Not Acceptable	Not Applicable	Problem Encountered / Comments
1. Material on floors bagged before leaving area	☑	☐	☐	
2. Bags of asbestos sealed	☑	☐	☐	
3. If bags are removed:				
a. Properly decontaminated	☑	☐	☐	
b. Tightly sealed	☑	☐	☐	
c. Placed in drums	☐	☐	☑	Debris bagged
4. Are microtraps left running over night	☑	☐	☐	
5. Work area properly sealed off	☑	☐	☐	

G. AIR SAMPLING	AREA	PERSONAL
1. Number of Air Samples taken	4	0
2. Number of Air Samples taken by Contractor	0	0

H. What is the daily job progress?

Workers are currently setting up full containment in work area, and a three stage decontamination chamber.

I H SERVICES, INC.

1831 Portal Street — Suite E • Baltimore, Maryland 21224

Main Office
410-633-4000
FAX
410-633-4122

AIR MONITORING DATA SHEET

Project: Bentalou Elem. School #150
Address: 220 N Bentalou St. Balto, md 21223
Date: 11-11-94
Activity: Setting up Containment
Job Number: EL-86001-229
Work Order Number:

SAMPLED FOR:

- [x] Asbestos: METHOD [ ] 7400 [ ] TEM; CASSETTE [x] 25mm [ ] 37mm; FILTER [x] MCE [ ] PC
- [ ] Airborne Dust:
- [ ] Gas:
- [ ] Vapor:
- [ ] Other:

Analytical Method: _____ Ambient Temp.: _____

Protection Worn During Sampling:

	Employee	IH
Full Body Coveralls	[x]	[x]
Respirator - Air Purifying	[x]	[x]
Respirator - Power Air Purifying	[ ]	[ ]
Respirator - Supplied Air	[ ]	[ ]

PERSONAL SAMPLING DATA

Employee Sampled: N/A
Social Security Number:
Smoker: [ ] Yes [ ] No
Job Function:
Description of Activity:

Signature of Employee: _____

LAB ID	SAMPLE NO.	SAMPLE DATE	RESULTS FIBERS/CC	SAMPLE LOCATION
QC910	150-26	11/11/94	Above per 100 Field	Blank
QC911	150-27	11/11/94	Above per 100 Field	Blank
QC912	150-28	11/11/94	L0.014	Inside Work Area
QC913	150-29	11/11/94	L0.016	Outside Work Area
QC914	150-30	11/11/94	L0.018	Inside Work Area
QC915	150-31	11/11/94	L0.018	Outside Work Area

FIELD SAMPLE NUMBER	TEST PERIOD START	TEST PERIOD STOP	TEST PERIOD TOTAL (MIN.)	FLOW RATE SETTING START (LITERS/MIN.)	FLOW RATE SETTING STOP (LITERS/MIN.)	VOLUME LITERS	SAMPLE TYPE AMBIENT	SAMPLE TYPE AREA	SAMPLE TYPE FINAL	SAMPLE TYPE PERSONAL	SAMPLE LOCATION IN WORK AREA	SAMPLE LOCATION OUTSIDE WORK AREA	SAMPLE LOCATION N/A	INSTRUMENT SERIAL NUMBER
150-26	Ø	Ø	Ø	Ø	Ø	Ø								Blank
150-27	Ø	Ø	Ø	Ø	Ø	Ø								Blank
150-28	1545	1815	150	2.0	2.0	300					✓			0257
150-29	1545	1815	150	2.0	2.0	300						✓		0258
150-30	1830	2045	135	2.0	2.0	270					✓			0257
150-31	1830	2045	135	2.0	2.0	270						✓		0258

Comments:

Inspector: Scott GARRITY (PRINT NAME)
Scott Garrity (SIGNATURE)
Date: 11 November 1994

I H SERVICES, INC.

1831 Portal Street – Suite E • Baltimore, Maryland 21224

PHONE: (410) 633-4000
FAX (410) 633-4122

CHAIN OF CUSTODY FOR ANALYTICAL SERVICES

№ 3851

Submittal Date: 11-11-94 Submitted By: (Print) Scott Garrity (Sign) Scott Garrity

Client Name: Marcor

Address:

Telephone:

Results Required by: 11 / 17 / 94

Number of Samples: 6

Project Name: Bentalou Elem School #150

Address: 220 N. Bentalou Street
Baltimore, Md 21223

Contact Person:

Before Noon? ☐ Yes ☐ No

Type of Samples: ☑ Air ☐ Bulk ☐ Wipe ☐ Other:

Release Criteria: ☐ AHERA ☐ 0.010 f/cc ☐ % Asbestos ☐ Other:

LAB ID	SAMPLE NUMBER	DATE	VOLUME (Liters)	METHOD (Check)				OTHER
				PCM	PLM	TEM	SEM	
Q0910	150-26	11/11/94	0	✓				Blank
Q0911	150-27	11/11/94	0	✓				Blank
Q0912	150-28	11/11/94	300	✓				Inside Work Area
Q0913	150-29	11/11/94	300	✓				Outside Work Area
Q0914	150-30	11/11/94	270	✓				Inside Work Area
Q0915	150-31	11/11/94	270	✓				Outside Work Area

Relinquished By: (Signature)	Date	Relinquished By: (Signature)	Date
Name: (Printed)	Time	Name: (Printed)	Time
Received By: (Signature)	Date	Received By: (Signature)	Date
Name: (Printed)	Time	Name: (Printed)	Time

LABORATORY STAFF ONLY: (CUSTODY)

1. Date/Time Received 11/16/94 @ 0900 by (Print) Ted Kerschbaum Sign Ted Kerschbaum
2. Date/Time Analyzed 11/17/94 @ 1800 by (Print) Sign
3. Date/Time Reported 11/17/94 @ 2000 by (Print) Sign

I H SERVICES, INC.

1831-E Portal Street • Baltimore, Maryland 21224

PHONE: (410) 633-4000

FAX: (410) 633-4122

DAILY OBSERVATIONS

DATE: 14 November 1994

INSPECTOR: Scott Gannity

SITE: Bentalou Elem School #150
220 N. Bentalou Street
Baltimore, Md 21223

TITLE: Industrial Hygienist

PURPOSE OF VISIT:

Perform air monitoring and inspections of designated work area.

GENERAL OBSERVATIONS:

Designated work area known as the main boiler room. Scope of work includes removal of approximately 600 square feet of boiler insulation from two boilers, and approximately 130 linear feet of pipe insulation associated with the boilers. Scope of work changed to include remainder of pipe in boiler room, and a hot water tank approximately 160 square feet. Workers are currently doing removal.

DATE: 11-14-94

Bentalou Elem. School #150

GENERAL OBSERVATIONS CONTINUED:

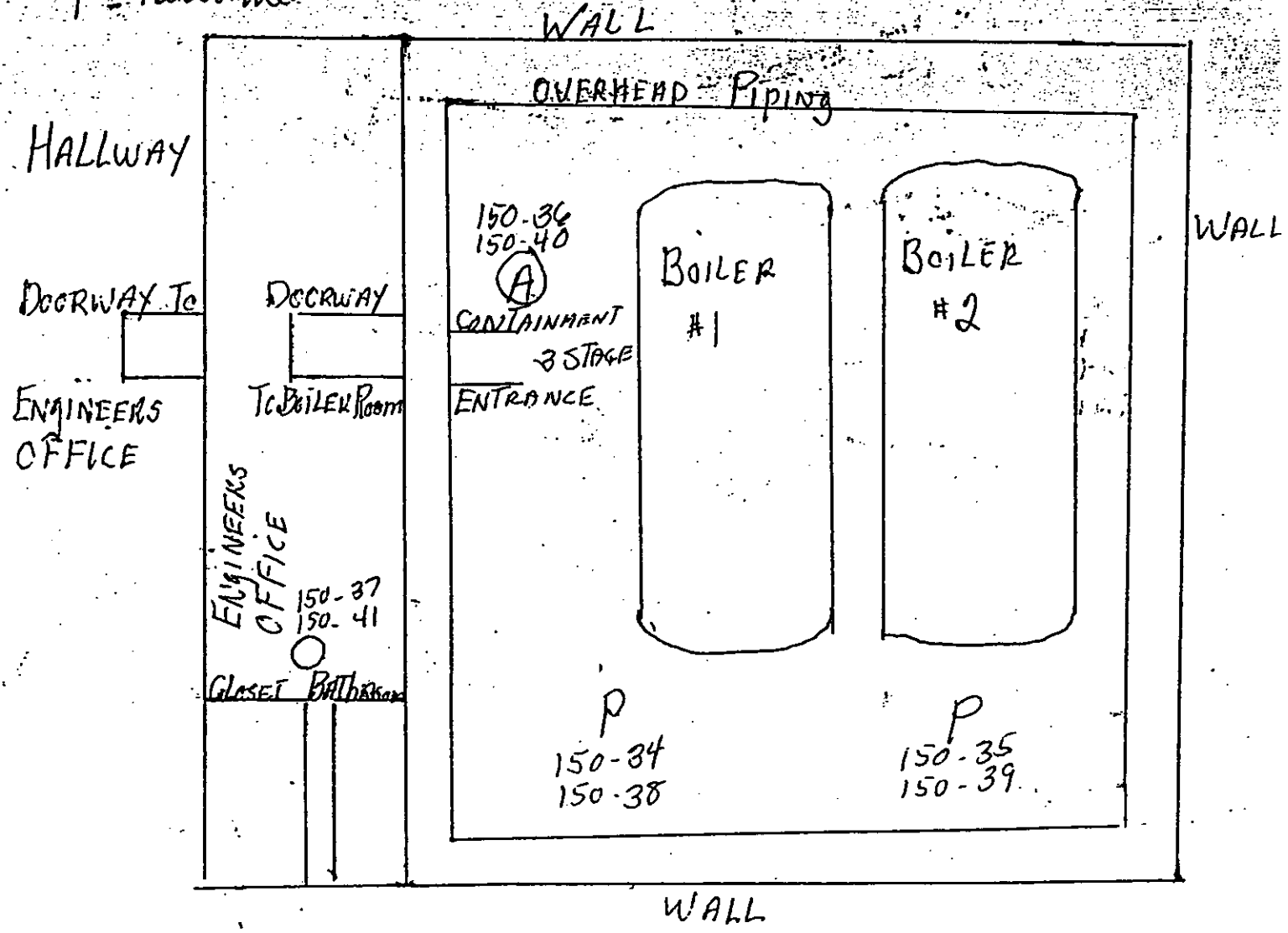
B. Blank

A - Inside Work Area

O - Outside Work Area

P - Personal

Main Boiler Room



I H SERVICES, INC.

1831 Portal Street – Suite E • Baltimore, Maryland 21224

PHONE: (410) 633-4000
FAX (410) 633-4122

PRE-ABATEMENT CHECKLIST

Building: Bentalou Elem School #150 Date: 14 Nov 1994

Location: 220 N. Bentalou Street, Baltimore, Md 21223

Project Description: Removal of approximately 600 square feet of boiler insulation from two boilers and approximately 130 linear feet of associated pipe insulation as well as approx 160 sq ft of tank insulation

Company Performing Abatement: Midcor

Supervisor on Job: Khamala Khantory Title: Field Supervisor

Performance Specification Prepared By: _____

Final Cleanliness Specification: _____ Prepared By: _____

WORK SITE PREPARATION	Acceptable	Not Acceptable	Not Applicable	Problem Encountered / Comments
A. AREA NON-ACCESSIBLE TO GENERAL PUBLIC	☑	☐	☐	
B. SIGNAGE				
1. Proper caution signs at entrances and exits	☑	☐	☐	
2. Dumpster Labeled	☑	☐	☐	
C. AIRLOCK-DECONTAMINATION AREA				
1. Clean Room – 1st Stage				
a. Lockers/clothing storage provided	☑	☐	☐	
b. Double plastic flaps at entrance and exit	☑	☐	☐	
2. Shower Area – 2nd Stage				
a. Shower operating	☑	☐	☐	
b. Shower waste water properly filtered	☑	☐	☐	
c. Double plastic flaps at entrance and exit	☑	☐	☐	
d. Clean towels available	☑	☐	☐	
3. Equipment Room – 3rd Stage				
a. Double plastic flaps at entrance and exit	☑	☐	☐	
b. Labeled bag for disposal of used suits	☑	☐	☐	
D.PERIMETER BARRIER PREPARATION				
1. 6 ml plastic used	☑	☐	☐	
2. Floor plastic (2 layers)	☑	☐	☐	
3. Wall plastic	☑	☐	☐	
4. Proper sealing of:				
a. Doors	☑	☐	☐	
b. Windows	☑	☐	☐	
c. Ventilation Systems	☑	☐	☐	
1. Vents	☑	☐	☐	
2. Ducts	☑	☐	☐	
3. Grills	☑	☐	☐	
4. System turned off	☑	☐	☐	
d. Pipes and conduit	☑	☐	☐	
e. Light Fixtures	☑	☐	☐	
f. Sprinkler Heads	☐	☐	☑	
g. All other openings into work area	☑	☐	☐	
5. Penetrations through ceiling properly sealed	☑	☐	☐	

PRE-ABATEMENT CHECKLIST

Date: 11-14-94
Bentalou Elem School #150

E. ABATEMENT EQUIPMENT

1. H.E.P.A. Filtered Vacuums
   a. Number of units: 1
   b. Type: Wet / Dry
2. H.E.P.A. Ventilation Units
   a. Number of units: 2
   b. Type: _____
   c. Operating: _____ ☑ Yes ☐ No
   d. H.E.P.A. filters present: _____ ☑ Yes ☐ No
   e. Exhausted out of work area: _____ ☑ Yes ☐ No
   f. Negative pressure inside work area:

Measurement	Inches H_2O	Location

3. Water hoses present ☑ Yes ☐ No
4. Amended water sprayers present ☑ Yes ☐ No
5. Surfactant present ☑ Yes ☐ No
6. Type of encapsulant to be used _____
7. Any other equipment to be used _____

F. WORKER PROTECTION

1. Respiratory Protection
   a. Type of respirators to be used: 1/2 face negative pressure
   b. Are respirators NIOSH/MSHA approved? ☑ Yes ☐ No
2. If jurisdiction requires licensing, do all workers have proper identification to perform asbestos removal? ☑ Yes ☐ No
3. Proper Protective Clothing
   ☑ Full body overalls ☐ Hard hats
   ☑ Head covers ☑ Eye protection
   ☑ Foot covers ☐ _____
4. Proper area for changing, eating, resting? ☑ Yes ☐ No

G. VERIFICATION OF WASTE DISPOSAL SITE ☑ Yes ☐ No

Name and Location: P.S.T. Reclamation Landfill, Sands Rd, Harwood, Md.

H. AUTHORIZATION TO PROCEED:

Date: 11-14-94 Time: 1540 HRS
Inspector: Scott GARRITY Signature: Scott Garrity
Title: Industrial Hygienist
Authorization Given To: Khamala Khantery, Field Supervisor
Witness(es): _____

I H SERVICES, INC.

DAILY ASBESTOS ABATEMENT CHECKLIST

Building: Bentalou Elem School #150 Date: 14 Nov 1994

Location: 220 N. Bentalou Street, Baltimore, Md 21223

Project Description: Removal of approximately 600 square feet of boiler insulation from Two boilers, approximately 130 linear feet of associated pipe insulation and approx 40 sq. feet of tank.

Company Performing Abatement: Maco

Supervisor on Job: Khamala Khantoy Title: Field Supervisor

Number of Workers at Site: 6

Inspector: Scott Garrity Signature: Scott Garrity

Title: Industrial Hygienist

WORK SITE INSPECTION

	Acceptable	Not Acceptable	Not Applicable	Problem Encountered / Comments
A. AIRLOCK - DECONTAMINATION AREA				
1. Clean Room - 1st Stage				
a. Floors clean	☑	☐	☐	
b. No asbestos or asbestos-contaminated material present	☑	☐	☐	
c. Street clothes properly stored	☑	☐	☐	
2. Shower Area - 2nd Stage				
a. Shower operating	☑	☐	☐	
b. Shower waste water properly filtered	☑	☐	☐	
3. Equipment Area - 3rd Stage				
a. No excess asbestos debris present	☑	☐	☐	
b. Contaminated suits and material placed in asbestos bag	☑	☐	☐	
4. Airlock perimeter plastic and plastic flaps intact	☑	☐	☐	
5. Proper signage at entrance	☑	☐	☐	
B. PERIMETER BARRIERS				
1. Perimeter plastic intact	☑	☐	☐	
2. Windows and doors sealed	☑	☐	☐	
3. Ducts, ventilator systems, pipes sealed	☑	☐	☐	
4. All other vertical and horizontal openings into area sealed	☑	☐	☐	
C. WORK AREA PRACTICES				
1. Hammers, saws, brooms not in use	☑	☐	☐	
2. Material kept wet	☑	☐	☐	
3. Material bagged promptly	☑	☐	☐	
4. Workers protective equipment	☑	☐	☐	
a. Full body disposable clothing intact	☑	☐	☐	
b. Proper foot protection	☑	☐	☐	
c. Proper NIOSH respirators Type: 1/2 face Negative Pressure	☑	☐	☐	
d. Hard hats	☐	☐	☑	
e. Eye protection	☑	☐	☐	
5. Adequate lighting	☑	☐	☐	

DAILY ASBESTOS ABATEMENT CHECKLIST

Date: 11-14-94

Bentalou Elem School #150

D. WORKER DECONTAMINATION & WORK HABITS	Acceptable	Not Acceptable	Not Applicable	Problem Encountered / Comments
1. Workers shower upon leaving work area	☑	☐	☐	
2. Contaminated full body suits bagged in dirty room	☑	☐	☐	
3. Disposable suits used once	☑	☐	☐	
4. No smoking in work area or airlock	☑	☐	☐	
5. No eating or drinking in work area or airlock	☑	☐	☐	

E. H.E.P.A. VENTILATION UNITS

1. Number in use 2
2. Pre-filters changed periodically ☑ Yes ☐ No
3. Negative Pressure Inside Work Area:
   a. Measured with:
      ☐ 1. Magnahelic gauge
      ☐ 2. Transducer
   b. Locations(s) and Negative Pressure Reading:

Location	Inches H_2O
#1	
#2	
#3	

4. Is microtrap exhaust properly vented? ☑ Yes ☐ No
5. Is microtrap exhaust hose intact? ☑ Yes ☐ No

F. END OF WORK DAY PROCEDURES	Acceptable	Not Acceptable	Not Applicable	Problem Encountered / Comments
1. Material on floors bagged before leaving area	☑	☐	☐	
2. Bags of asbestos sealed	☑	☐	☐	
3. If bags are removed:				
a. Properly decontaminated	☑	☐	☐	
b. Tightly sealed	☑	☐	☐	
c. Placed in drums	☐	☐	☑	Debris bagged
4. Are microtraps left running over night	☑	☐	☐	
5. Work area properly sealed off	☑	☐	☐	

G. AIR SAMPLING	AREA	PERSONAL
1. Number of Air Samples taken	4	4 +2 blanks
2. Number of Air Samples taken by Contractor	—	

H. What is the daily job progress?

Workers are currently doing removal work in the Main Boiler Room.

I H SERVICES, INC.

1831 Portal Street — Suite E • Baltimore, Maryland 21224

Main Office
410-633-4000
FAX
410-633-4122

AIR MONITORING DATA SHEET

Project: Bentalou Elementray School #150
Address: 220 N. Bentalou St. Balto. Md 21223
Date: 11-14-94
Activity: Removal
Job Number: EL-00001-229
Work Order Number:

SAMPLED FOR:

- [x] Asbestos: METHOD [x] 7400 [ ] TEM; CASSETTE [x] 25mm [ ] 37mm; FILTER [x] MCE [ ] PC
- [ ] Airborne Dust:
- [ ] Gas:
- [ ] Vapor:
- [ ] Other:

Analytical Method: _____ Ambient Temp.: _____

Protection Worn During Sampling:

	Employee	IH
Full Body Coveralls	[x]	[x]
Respirator - Air Purifying	[x]	[x]
Respirator - Power Air Purifying	[ ]	[ ]
Respirator - Supplied Air	[ ]	[ ]

PERSONAL SAMPLING DATA

Employee Sampled: Tommy V-Co
Social Security Number: 218-35-7861
Smoker: [x] Yes [ ] No
Job Function: Tech 150-34 and 38
Description of Activity: Removal

Signature of Employee: Carl Fuge

LAB ID	SAMPLE NO.	SAMPLE DATE	RESULTS FIBERS/CC	SAMPLE LOCATION
Q0930	150-32	11/14/94	0 fiber per 100 fields	Blank
Q0931	150-33	11/14/94	0 fiber per 100 fields	Blank
Q0932	150-34	11/14/94	0.625	Personal T. - V-Co.
Q0933	150-35	11/14/94	0.505	Personal C. Morales
Q0934	150-36	11/14/94	Void per count	Outside Work Area
Q0935	150-37	11/14/94	LOD	Outside Work Area
Q0936	150-38	11/14/94	0.929	Personal T. V-Co.

FIELD SAMPLE NUMBER	TEST PERIOD START	TEST PERIOD STOP	TEST PERIOD TOTAL (MIN.)	FLOW RATE SETTING START (LITERS/MIN.)	FLOW RATE SETTING STOP (LITERS/MIN.)	VOLUME LITERS	SAMPLE TYPE AMBIENT	SAMPLE TYPE AREA	SAMPLE TYPE FINAL	SAMPLE TYPE PERSONAL	SAMPLE LOCATION IN WORK AREA	SAMPLE LOCATION OUTSIDE WORK AREA	SAMPLE LOCATION N/A	INSTRUMENT SERIAL NUMBER
150-32	ø	ø	ø	ø	ø	ø								Blank
150-33	ø	ø	ø	ø	ø	ø								Blank
150-34	1600	1900	180	2.0	2.0	360				✓	✓			0257
150-35	1600	1900	180	2.0	2.0	360				✓	✓			0258
150-36	1600	1900	180	9.5	9.5	1710					✓			0160
150-37	1600	1900	180	9.5	9.5	1710						✓		0163
150-38	2000	2200	120	2.0	2.0	240				✓	✓			0257

Comments:

Inspector: Scott Garrity (PRINT NAME)
Scott Garrity (SIGNATURE)
Date: 14 Nov 1994

I H SERVICES, INC.

1831 Portal Street — Suite E • Baltimore, Maryland 21224

Main Office
410-633-4000
FAX
410-633-4122

AIR MONITORING DATA SHEET

Project: Bentalou Elementary School #150
Address: 220 N. Bentalou St, Balto, Md 21223
Date: 11-14-94
Activity: Removal
Job Number: EL-00001-229
Work Order Number:

SAMPLED FOR:

- [x] Asbestos: METHOD [ ] 7400 [ ] TEM; CASSETTE [ ] 25mm [ ] 37mm; FILTER [x] MCE [ ] PC
- [ ] Airborne Dust:
- [ ] Gas:
- [ ] Vapor:
- [ ] Other:

Analytical Method: _____ Ambient Temp.: _____

Protection Worn During Sampling:

	Employee	IH
Full Body Coveralls	[x]	[x]
Respirator - Air Purifying	[x]	[x]
Respirator - Power Air Purifying	[ ]	[ ]
Respirator - Supplied Air	[ ]	[ ]

PERSONAL SAMPLING DATA

Employee Sampled: CESAR MORALES
Social Security Number: 436-71-8408
Smoker: [x] Yes [ ] No
Job Function: Tech 150-35 and 39
Description of Activity: Removal

Signature of Employee: [signature]

LAB ID	SAMPLE NO.	SAMPLE DATE	RESULTS FIBERS/CC	SAMPLE LOCATION
Q0937	150-39	11/14/94	0.99	Personal C. Morales
Q0938	150-40	11/14/94	Void per lab	Inside Work Area
Q0939	150-41	11/14/94	LO.01	Outside Work Area

FIELD SAMPLE NUMBER	TEST PERIOD START	TEST PERIOD STOP	TEST PERIOD TOTAL (MIN.)	FLOW RATE SETTING START (LITERS/MIN.)	FLOW RATE SETTING STOP (LITERS/MIN.)	VOLUME LITERS	SAMPLE TYPE AMBIENT	SAMPLE TYPE AREA	SAMPLE TYPE FINAL	SAMPLE TYPE PERSONAL	SAMPLE LOCATION IN WORK AREA	SAMPLE LOCATION OUTSIDE WORK AREA	SAMPLE LOCATION N/A	INSTRUMENT SERIAL NUMBER
150-39	2000	2200	120	2.0	2.0	240				✓	✓			0258
150-40	2000	2200	120	9.5	9.5	1140					✓			0160
150-41	2000	2200	120	9.5	9.5	1140						✓		0163

Comments:

Inspector: SCOTT GARRITY (PRINT NAME)
Scott Garrity (SIGNATURE)
Date: 14 Nov 1994

I H SERVICES, INC.

1831 Portal Street – Suite E • Baltimore, Maryland 21224

PHONE: (410) 633-4000
FAX (410) 633-4122

CHAIN OF CUSTODY FOR ANALYTICAL SERVICES

№ 3850

Submittal Date: 11/14/94 Submitted By: (Print) Scott Garrity (Sign) Scott Garrity

Client Name: Mason

Address:

Telephone:

Results Required by: 11/17/94

Number of Samples: 10

Project Name: Bentalou Elem. School #150

Address: 220 N. Bentalou Street
Baltimore, Md 21223

Contact Person:

Before Noon? ☐ Yes ☐ No

Type of Samples: ☑ Air ☐ Bulk ☐ Wipe ☐ Other:

Release Criteria: ☐ AHERA ☐ 0.010 f/cc ☐ % Asbestos ☐ Other:

LAB ID	SAMPLE NUMBER	DATE	VOLUME (Liters)	METHOD (Check)				OTHER
				PCM	PLM	TEM	SEM	
Q0930	150-32	11/14/94	0	✓				Blank
Q0931	150-33	11/14/94	0	✓				Blank
Q0932	150-34	11/14/94	360	✓				Personal
Q0933	150-35	11/14/94	360	✓				Personal
Q0934	150-36	11/14/94	1710	✓				Inside Work Area
Q0935	150-37	11/14/94	1710	✓				Outside Work Area
Q0936	150-38	11/14/94	240	✓				Personal
Q0937	150-39	11/14/94	240	✓				Personal
Q0938	150-40	11/14/94	1140	✓				Inside Work Area
Q0939	150-41	11/14/94	1140	✓				Outside Work Area

Relinquished By: (Signature)	Date	Relinquished By: (Signature)	Date
Name: (Printed)	Time	Name: (Printed)	Time
Received By: (Signature)	Date	Received By: (Signature)	Date
Name: (Printed)	Time	Name: (Printed)	Time

LABORATORY STAFF ONLY: (CUSTODY)

1. Date/Time Received 11/16/94 @ 1400 by (Print) [illegible] Sign [illegible]
2. Date/Time Analyzed 11/17/94 @ 2100 by (Print) Sign
3. Date/Time Reported 11/17/94 @ 2130 by (Print) Sign

I H SERVICES, INC.

1831-E Portal Street • Baltimore, Maryland 21224

PHONE: (410) 633-4000

FAX: (410) 633-4122

DAILY OBSERVATIONS

DATE: 15 November 1994

INSPECTOR: Scott Gamaty

SITE: Bentalou Elementary School #150
220 N. Bentalou Street
Baltimore, Md 21223

TITLE: Industrial Hygienist

PURPOSE OF VISIT:

Perform air monitoring and inspections of designated work area.

GENERAL OBSERVATIONS:

Designated work area known as the main boiler room. Scope of work includes removal of approximately 600 square feet of boiler insulation from two boilers, and approximately 130 linear feet of pipe insulation associated with the boilers. Scope of work changed to include remainder of pipe in boiler room, and a hot water tank approximately 160 square feet. Workers are currently performing removal activities.

DATE: 11-15-94

Bentalou Elem. School #150

GENERAL OBSERVATIONS CONTINUED:

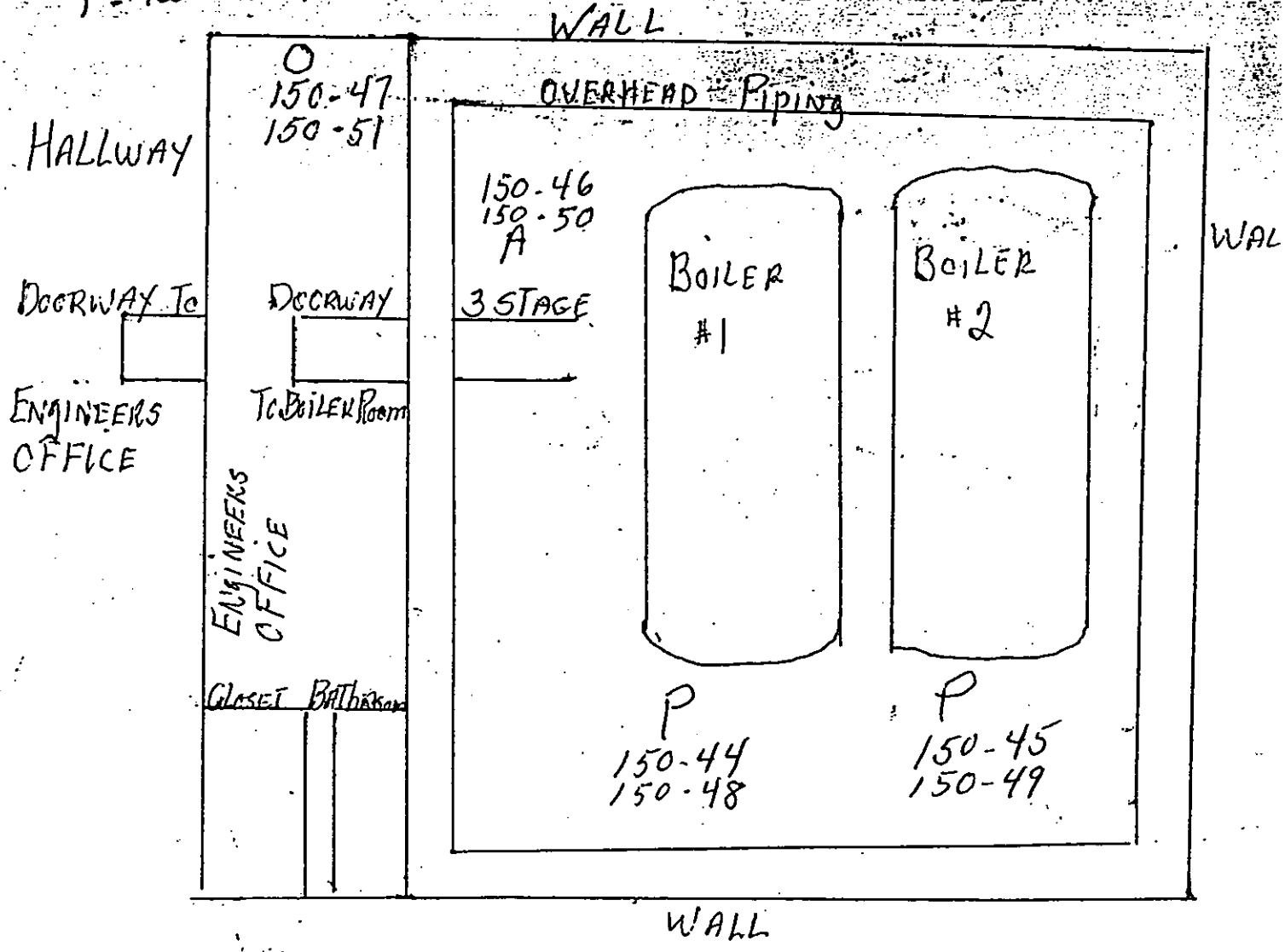
B. Blank

A - Inside Work Area

O - Outside Work Area

P - Personal

Main Boiler Room



I H SERVICES, INC.

DAILY ASBESTOS ABATEMENT CHECKLIST

Building: Bentalou Elementray School #150 Date: 15 Nov 1994

Location: 220 N. Bentalou Street, Baltimore, Md 21223

Project Description: Removal of approximately 600 square feet of boiler insulation from two boilers and approximately 130 linear feet of associated pipe insulation and approx 160 sq ft of tank

Company Performing Abatement: Mascot

Supervisor on Job: Khamala Khantory Title: Field Supervisor

Number of Workers at Site: 7

Inspector: Scott GARRITY Signature: Scott Garrity

Title: Industrial Hygienist

WORK SITE INSPECTION

	Acceptable	Not Acceptable	Not Applicable	Problem Encountered / Comments
A. AIRLOCK - DECONTAMINATION AREA				
1. Clean Room - 1st Stage				
a. Floors clean	☑	☐	☐	
b. No asbestos or asbestos-contaminated material present	☑	☐	☐	
c. Street clothes properly stored	☑	☐	☐	
2. Shower Area - 2nd Stage				
a. Shower operating	☑	☐	☐	
b. Shower waste water properly filtered	☑	☐	☐	
3. Equipment Area - 3rd Stage				
a. No excess asbestos debris present	☑	☐	☐	
b. Contaminated suits and material placed in asbestos bag	☑	☐	☐	
4. Airlock perimeter plastic and plastic flaps intact	☑	☐	☐	
5. Proper signage at entrance	☑	☐	☐	
B. PERIMETER BARRIERS				
1. Perimeter plastic intact	☑	☐	☐	
2. Windows and doors sealed	☑	☐	☐	
3. Ducts, ventilator systems, pipes sealed	☑	☐	☐	
4. All other vertical and horizontal openings into area sealed	☑	☐	☐	
C. WORK AREA PRACTICES				
1. Hammers, saws, brooms not in use	☑	☐	☐	
2. Material kept wet	☑	☐	☐	
3. Material bagged promptly	☑	☐	☐	
4. Workers protective equipment	☑	☐	☐	
a. Full body disposable clothing intact	☑	☐	☐	
b. Proper foot protection	☑	☐	☐	
c. Proper NIOSH respirators	☑	☐	☐	
Type: 1/2 face negative pressure				
d. Hard hats	☐	☐	☑	
e. Eye protection	☑	☐	☐	
5. Adequate lighting	☑	☐	☐	

DAILY ASBESTOS ABATEMENT CHECKLIST

Date: 11-15-94

Bentalou Elem. School #150

D. WORKER DECONTAMINATION & WORK HABITS	Acceptable	Not Acceptable	Not Applicable	Problem Encountered / Comments
1. Workers shower upon leaving work area	☑	☐	☐	
2. Contaminated full body suits bagged in dirty room	☑	☐	☐	
3. Disposable suits used once	☑	☐	☐	
4. No smoking in work area or airlock	☑	☐	☐	
5. No eating or drinking in work area or airlock	☑	☐	☐	

E. H.E.P.A. VENTILATION UNITS

1. Number in use 2
2. Pre-filters changed periodically ☑ Yes ☐ No
3. Negative Pressure Inside Work Area:
   a. Measured with:
      ☐ 1. Magnahelic gauge
      ☐ 2. Transducer
   b. Locations(s) and Negative Pressure Reading:

Location	Inches H_2O
#1	
#2	
#3	

4. Is microtrap exhaust properly vented? ☑ Yes ☐ No
5. Is microtrap exhaust hose intact? ☑ Yes ☐ No

F. END OF WORK DAY PROCEDURES	Acceptable	Not Acceptable	Not Applicable	Problem Encountered / Comments
1. Material on floors bagged before leaving area	☑	☐	☐	
2. Bags of asbestos sealed	☑	☐	☐	
3. If bags are removed:				
a. Properly decontaminated	☑	☐	☐	
b. Tightly sealed	☑	☐	☐	
c. Placed in drums	☐	☐	☑	Debris bagged
4. Are microtraps left running over night	☑	☐	☐	
5. Work area properly sealed off	☑	☐	☐	

G. AIR SAMPLING	AREA	PERSONAL
1. Number of Air Samples taken	4	4
2. Number of Air Samples taken by Contractor		

H. What is the daily job progress?

Workers are currently performing removal work in the Main Boiler Room. Piping insulation, tank insulation and one boiler insulation has been removed.

I H SERVICES, INC.

1831 Portal Street — Suite E • Baltimore, Maryland 21224

Main Office
410-633-400
FAX
410-633-412

AIR MONITORING DATA SHEET

Project: Bentalou Elementary School #150
Address: 220 N. Bentalou St. Balto, Md 21223
Date: 11-15-94
Activity: Removal
Job Number: EL-00001-229
Work Order Number:

SAMPLED FOR:

- [x] Asbestos: METHOD [x] 7400 [ ] TEM; CASSETTE [x] 25mm [ ] 37mm; FILTER [x] MCE [ ] PC
- [ ] Airborne Dust:
- [ ] Gas:
- [ ] Vapor:
- [ ] Other:

Analytical Method: Ambient Temp.:

Protection Worn During Sampling:

	Employee	IH
Full Body Coveralls	[x]	[x]
Respirator - Air Purifying	[x]	[x]
Respirator - Power Air Purifying	[ ]	[ ]
Respirator - Supplied Air	[ ]	[ ]

PERSONAL SAMPLING DATA

Employee Sampled: Billy Madiphone
Social Security Number: 256-35-5999
Smoker: [ ] Yes [x] No
Job Function: Tech 150-44 and 48
Description of Activity: Removal

Signature of Employee: Billy Madiphone

LAB ID	SAMPLE NO.	SAMPLE DATE	RESULTS FIBERS/CC	SAMPLE LOCATION
Q0950	150-42	11/16/94	Abin per 100 fields	Blank
Q0951	150-43	11/15/94	Abin per 100 fields	Blank
Q0952	150-44	11/15/94	0.271	Personal B. Madiphone
Q0953	150-45	11/15/94	Void overload	Personal C. Thongdygnalat
Q0954	150-46	11/16/94	Void overload	Inside Work Area
Q0955	150-47	11/15/94	LO.01	Outside Work Area
Q0956	150-48	11/15/94	LO.02	Personal B. Madiphone

FIELD SAMPLE NUMBER	TEST PERIOD START	TEST PERIOD STOP	TEST PERIOD TOTAL (MIN.)	FLOW RATE SETTING START (LITERS/MIN.)	FLOW RATE SETTING STOP (LITERS/MIN.)	VOLUME LITERS	SAMPLE TYPE AMBIENT	SAMPLE TYPE AREA	SAMPLE TYPE FINAL	SAMPLE TYPE PERSONAL	SAMPLE LOCATION IN WORK AREA	SAMPLE LOCATION OUTSIDE WORK AREA	SAMPLE LOCATION N/A	INSTRUMENT SERIAL NUMBER
150-42	∅	∅	∅	∅	∅	∅								Blank
150-43	∅	∅	∅	∅	∅	∅								Blank
150-44	1530	1830	180	2.0	2.0	360				✓	✓			0257
150-45	1530	1830	180	2.0	2.0	360				✓	✓			0258
150-46	1600	1800	120	9.5	9.5	1140					✓			0160
150-47	1600	1800	120	9.5	9.5	1140						✓		0163
150-48	2000	2800	120	2.0	2.0	240				✓	✓			0257

Comments:

Inspector: Scott Garrity (PRINT NAME)
Scott Garrity (SIGNATURE)
Date: 15 Nov 1994

I H SERVICES, INC.

1831 Portal Street — Suite E • Baltimore, Maryland 21224

Main Office
410-633-4000
FAX
410-633-4122

AIR MONITORING DATA SHEET

Project: Bentalou Elementary School #150
Address: 220 N. Bentalou St, Balto, Md 21223
Date: 11-15-94
Activity: Removal
Job Number: EL-00001-229
Work Order Number:

SAMPLED FOR:

- [x] Asbestos: METHOD [x] 7400 [ ] TEM; CASSETTE [x] 25mm [ ] 37mm; FILTER [x] MCE [ ] PC
- [ ] Airborne Dust:
- [ ] Gas:
- [ ] Vapor:
- [ ] Other:

Analytical Method: _____ Ambient Temp.: _____

Protection Worn During Sampling:	Employee	IH
Full Body Coveralls	[x]	[x]
Respirator - Air Purifying	[x]	[x]
Respirator - Power Air Purifying	[ ]	[ ]
Respirator - Supplied Air	[ ]	[ ]

PERSONAL SAMPLING DATA

Employee Sampled: C. THONGDYNALAT
Social Security Number: 220-90-9319
Smoker: [x] Yes [ ] No
Job Function: Tech 150.45 and 49
Description of Activity: Removal

Signature of Employee: C. Thongdynalat

LAB ID	SAMPLE NO.	SAMPLE DATE	RESULTS FIBERS/CC	SAMPLE LOCATION
Q0957	150-49	11/15/94	void	Personal C. Thongdynalat
Q0958	150-50	11/15/94	void	Inside Work Area
Q0959	150-51	11/15/94	LO.01	Outside Work Area

FIELD SAMPLE NUMBER	TEST PERIOD START	TEST PERIOD STOP	TEST PERIOD TOTAL (MIN.)	FLOW RATE SETTING START (LITERS/MIN.)	FLOW RATE SETTING STOP (LITERS/MIN.)	VOLUME LITERS	SAMPLE TYPE AMBIENT	SAMPLE TYPE AREA	SAMPLE TYPE FINAL	SAMPLE TYPE PERSONAL	SAMPLE LOCATION IN WORK AREA	SAMPLE LOCATION OUTSIDE WORK AREA	SAMPLE LOCATION N/A	INSTRUMENT SERIAL NUMBER
150-49	2000	2200	120	2.0	2.0	240				✓	✓			0258
150-50	2000	2200	120	9.5	9.5	1140					✓			0160
150-51	2000	2200	120	9.5	9.5	1140						✓		0163

Comments:

Inspector: Scott Garrity (PRINT NAME)
Scott Garrity (SIGNATURE)
Date: 15 Nov 1994

I H SERVICES, INC.

1831 Portal Street – Suite E • Baltimore, Maryland 21224

PHONE: (410) 633-4000
FAX (410) 633-4122

CHAIN OF CUSTODY FOR ANALYTICAL SERVICES

№ 3849

Submittal Date: 11-15-94 Submitted By: (Print) Scott Garrity (Sign) Scott Garrity

Client Name: Marcon

Address:

Telephone:

Results Required by: 11 / 21 / 94

Number of Samples: 10

Project Name: Bentalou Elem School #150

Address: 220 N. Bentalou Street
Baltimore, Md 21223

Contact Person:

Before Noon? ☐ Yes ☐ No

Type of Samples: ☑ Air ☐ Bulk ☐ Wipe ☐ Other:

Release Criteria: ☐ AHERA ☐ 0.010 f/cc ☐ % Asbestos ☐ Other:

LAB ID	SAMPLE NUMBER	DATE	VOLUME (Liters)	METHOD (Check)				OTHER
				PCM	PLM	TEM	SEM	
Q0950	150-42	11/15/94	Ø	✓				Blank
Q0951	150-43	11/15/94	Ø	✓				Blank
Q0952	150-44	11/15/94	360	✓				Personal
Q0953	150-45	11/15/94	360	✓				Personal
Q0954	150 46	11/15/94	1140	✓				Inside Work Area
Q0955	150 47	11/15/94	1140	✓				Outside Work Area
Q0956	150 48	11/15/94	240	✓				Personal
Q0957	150 49	11/15/94	240	✓				Personal
Q0958	150-50	11/15/94	1140	✓				Inside Work Area
Q0959	150-51	11/15/94	1140	✓				Outside Work Area

Relinquished By: (Signature)	Date	Relinquished By: (Signature)	Date
Name: (Printed)	Time	Name: (Printed)	Time
Received By: (Signature)	Date	Received By: (Signature)	Date
Name: (Printed)	Time	Name: (Printed)	Time

LABORATORY STAFF ONLY: (CUSTODY)

1. Date/Time Received 11/21/94 @ ____ by (Print) Ted Gerstenhaber Sign Ted Gerstenhaber
2. Date/Time Analyzed 11/21/94 @ ____ by (Print) ____ Sign ____
3. Date/Time Reported 11/21/94 @ ____ by (Print) ____ Sign ____
4. Results Reported To: ____ by (Print) ____ Sign ____

I H SERVICES, INC.

1831-E Portal Street • Baltimore, Maryland 21224

PHONE: (410) 633-4000

FAX: (410) 633-4122

DAILY OBSERVATIONS

DATE: 16 November 1994

INSPECTOR: Ernest K. Smith

SITE: Bentalou Elementary School #150
220 N. Bentalou Street
Baltimore, MD

TITLE: Industrial Hygienist

PURPOSE OF VISIT:

Perform air monitoring and inspections.

GENERAL OBSERVATIONS:

Marcor truck arrived on-site. While truck was on-site, crew loaded 325 bags and 2 drums of waste onto truck. After removing waste bags from work area and loading onto truck, crew continued gross removal of ACM insulation from breaching and Boiling #1. IH set-up equipment and ~~continued~~ performed air monitoring. IH performed inside, outside, and personal air monitoring during removal operations.

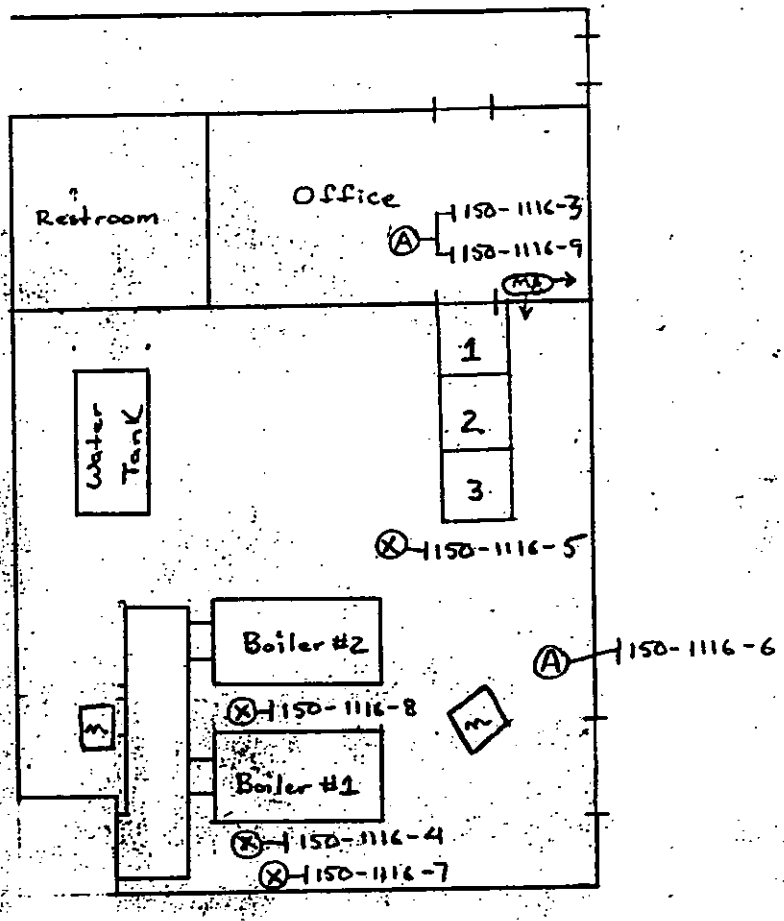
DATE: 16 November 1994

GENERAL OBSERVATIONS CONTINUED:

Bentalou Elementary School #150

220 N. Bentalou Street

Baltimore, MD



BOILER ROOM AREA

150-1116-1 Ⓑ: Blank

150:1116-2 Ⓑ: Blank

Ⓐ: Area

Ⓧ: Personal

Ⓕ: Final

1 2 3 : 3-Stage Decon Unit

m : Negative Air Unit

mg : Pressure Gauge

I H SERVICES, INC.

DAILY ASBESTOS ABATEMENT CHECKLIST

Building: Bentalou Elementary School #150 Date: 11/16/94

Location: 220 N. Bentalou Street, Baltimore, MD

Project Description: Removal of ACM insulation from boilers, breaching, water tank, and associated piping in Boiler Room.

Company Performing Abatement: Marcor

Supervisor on Job: Khamla Khantry Title: Supervisor

Number of Workers at Site: 7

Inspector: Ernest K. Smith Signature: Ernest K. Smith

Title: Industrial Hygienist

WORK SITE INSPECTION

A. AIRLOCK - DECONTAMINATION AREA	Acceptable	Not Acceptable	Not Applicable	Problem Encountered / Comments
1. Clean Room - 1st Stage				
a. Floors clean	☑	☐	☐	
b. No asbestos or asbestos-contaminated material present	☑	☐	☐	
c. Street clothes properly stored	☑	☐	☐	
2. Shower Area - 2nd Stage				
a. Shower operating	☑	☐	☐	
b. Shower waste water properly filtered	☑	☐	☐	
3. Equipment Area - 3rd Stage				
a. No excess asbestos debris present	☑	☐	☐	
b. Contaminated suits and material placed in asbestos bag	☑	☐	☐	
4. Airlock perimeter plastic and plastic flaps intact	☑	☐	☐	
5. Proper signage at entrance	☑	☐	☐	
B. PERIMETER BARRIERS				
1. Perimeter plastic intact	☑	☐	☐	
2. Windows and doors sealed	☑	☐	☐	
3. Ducts, ventilator systems, pipes sealed	☑	☐	☐	
4. All other vertical and horizontal openings into area sealed	☑	☐	☐	
C. WORK AREA PRACTICES				
1. Hammers, saws, brooms not in use	☑	☐	☐	
2. Material kept wet	☑	☐	☐	
3. Material bagged promptly	☑	☐	☐	
4. Workers protective equipment	☑	☐	☐	
a. Full body disposable clothing intact	☑	☐	☐	
b. Proper foot protection	☑	☐	☐	
c. Proper NIOSH respirators	☑	☐	☐	
Type: Comfo II E Glen Arm Ye face neg. press.				
d. Hard hats	☐	☐	☑	
e. Eye protection	☑	☐	☐	
f. Adequate lighting	☑	☐	☐	

DAILY ASBESTOS ABATEMENT CHECKLIST

Date: 11/16/94
Boiler Room

D. WORKER DECONTAMINATION & WORK HABITS	Acceptable	Not Acceptable	Not Applicable	Problem Encountered / Comments
1. Workers shower upon leaving work area	☑	☐	☐	
2. Contaminated full body suits bagged in dirty room	☑	☐	☐	
3. Disposable suits used once	☑	☐	☐	
4. No smoking in work area or airlock	☑	☐	☐	
5. No eating or drinking in work area or airlock	☑	☐	☐	

E. H.E.P.A. VENTILATION UNITS

1. Number in use 2
2. Pre-filters changed periodically ☑ Yes ☐ No
3. Negative Pressure Inside Work Area:
   a. Measured with:
      ☐ 1. Magnahelic gauge
      ☐ 2. Transducer
      * Manometer
   b. Locations(s) and Negative Pressure Reading:

	Location	Inches H_2O
#1	Engineer's office	-0.02
#2		
#3		

4. Is microtrap exhaust properly vented? ☑ Yes ☐ No
5. Is microtrap exhaust hose intact? ☑ Yes ☐ No

F. END OF WORK DAY PROCEDURES	Acceptable	Not Acceptable	Not Applicable	Problem Encountered / Comments
1. Material on floors bagged before leaving area	☑	☐	☐	
2. Bags of asbestos sealed	☑	☐	☐	
3. If bags are removed:				
a. Properly decontaminated	☑	☐	☐	
b. Tightly sealed	☑	☐	☐	
c. Placed in drums	☑	☐	☐	Wire placed in drums.
4. Are microtraps left running over night	☑	☐	☐	
5. Work area properly sealed off	☑	☐	☐	

G. AIR SAMPLING	AREA	PERSONAL
1. Number of Air Samples taken	3	4
2. Number of Air Samples taken by Contractor	—	—

H. What is the daily job progress?

At start of shift, workers removed waste bags and drums from work area and loaded on Marcor truck. Workers continued gross removal of ACM insulation from breaching and Boiler #1.

I H SERVICES, INC.

1831 Portal Street — Suite E • Baltimore, Maryland 21224

Main Office
410-633-4000
FAX
410-633-4122

AIR MONITORING DATA SHEET

Project: Bentalou Elementary School #150
Address: 220 N. Bentalou St., Balto, MD
Date: 11/16/94
Activity: Air Monitoring
Job Number: EL-00001-229
Work Order Number:

SAMPLED FOR:

- [x] Asbestos: METHOD [x] 7400 [ ] TEM; CASSETTE [x] 25mm [ ] 37mm; FILTER [x] MCE [ ] PC
- [ ] Airborne Dust:
- [ ] Gas:
- [ ] Vapor:
- [ ] Other:

Analytical Method: Pcm Ambient Temp.:

Protection Worn During Sampling:

	Employee	IH
Full Body Coveralls	[x]	[ ]
Respirator - Air Purifying	[x]	[ ]
Respirator - Power Air Purifying	[ ]	[ ]
Respirator - Supplied Air	[ ]	[ ]

PERSONAL SAMPLING DATA

Employee Sampled: Norma Hamalauxay
Social Security Number: 583-69-9260
Smoker: [ ] Yes [x] No
Job Function: Tech
Description of Activity: Removal

Signature of Employee: N. Hamalauxay

LAB ID	SAMPLE NO.	SAMPLE DATE	RESULTS FIBERS/CC	SAMPLE LOCATION
EK4943	150-1116-1	11/16/94	# fibers per 100 fields	Blank
EK4944	150-1116-2	11/16/94	# fibers per 100 fields	Blank
EK4945	150-1116-3	11/16/94	<.005	Area Sample Engineer's Office
EK4946	150-1116-4	11/16/94	VOID, Filter Damaged by Water	Personal N. Hamalauxay
EK4947	150-1116-5	11/16/94	.18	Personal C. Phimphanh
EK4948	150-1116-6	11/16/94	.18	Inside Area
EK4949	150-1116-7	11/16/94	.17	Personal N. Hamalauxay

FIELD SAMPLE NUMBER	TEST PERIOD START	TEST PERIOD STOP	TEST PERIOD TOTAL (MIN.)	FLOW RATE SETTING START (LITERS/MIN.)	FLOW RATE SETTING STOP (LITERS/MIN.)	VOLUME LITERS	SAMPLE TYPE AMBIENT	SAMPLE TYPE AREA	SAMPLE TYPE FINAL	SAMPLE TYPE PERSONAL	SAMPLE LOCATION IN WORK AREA	SAMPLE LOCATION OUTSIDE WORK AREA	SAMPLE LOCATION N/A	INSTRUMENT SERIAL NUMBER
150-1116-1	—	—	ø	—	—	ø							✓	Blank
-2	—	—	ø	—	—	ø							✓	Blank
-3	1545	1725	100	10.0	10.0	1000		✓				✓		0248
150-1116-4	1605	1725	80	2.5	2.5	200				✓	✓			23377
-5	1605	1800	115	2.5	2.5	288				✓	✓			0173
-6	1605	2110	305	2.0	2.0	605		✓			✓			0271
150-1116-7	1825	2000	95	2.5	2.5	238				✓	✓			23377

Comments:

Inspector: Ernest IC. Smith (PRINT NAME)
E. Smith (SIGNATURE)
Date: 16 November 1994

I H SERVICES, INC.

1831 Portal Street — Suite E • Baltimore, Maryland 21224

Main Office
410-633-400(
FAX
410-633-412

AIR MONITORING DATA SHEET

Project: Bentalou Elementary School #150
Address: 220 N. Bentalou St., Balto, MD
Date: 11/16/94
Activity: Air Monitoring
Job Number: EL-00001-229
Work Order Number:

SAMPLED FOR:

	METHOD	CASSETTE	FILTER
☑ Asbestos:	☐ 7400 ☐ TEM	☑ 25mm ☐ 37mm	☑ MCE ☐ PC
☐ Airborne Dust:			
☐ Gas:			
☐ Vapor:			
☐ Other:			

Analytical Method: PCM Ambient Temp.:

Protection Worn During Sampling:

	Employee	IH
Full Body Coveralls	☑	☐
Respirator - Air Purifying	☑	☐
Respirator - Power Air Purifying	☐	☐
Respirator - Supplied Air	☐	☐

PERSONAL SAMPLING DATA

Employee Sampled: Cha Phimphanh
Social Security Number: 215-94-4064
Smoker: ☐ Yes ☑ No
Job Function: Tech
Description of Activity: Removal

Signature of Employee: X

LAB ID	SAMPLE NO.	SAMPLE DATE	RESULTS FIBERS/CC	SAMPLE LOCATION
EK4950	150-1116-8	11/16/94	.45	Personal C. Phimphanh
EK4951	150-1116-9	11/16/94	<.005	Area Sample Engineer's Office.

FIELD SAMPLE NUMBER	TEST PERIOD START	TEST PERIOD STOP	TEST PERIOD TOTAL (MIN.)	FLOW RATE SETTING START (LITERS/MIN.)	FLOW RATE SETTING STOP (LITERS/MIN.)	VOLUME LITERS	SAMPLE TYPE AMBIENT	AREA	FINAL	PERSONAL	SAMPLE LOCATION IN WORK AREA	OUTSIDE WORK AREA	N/A	INSTRUMENT SERIAL NUMBER
150-1116-8	1825	1955	90	2.5	2.5	225				✓	✓			0173
-9	1845	2025	100	10.0	10.0	1000		✓				✓		0248

Comments:

Inspector: Ernest K. Smith (PRINT NAME)
Ernest K. Smith (SIGNATURE)
Date: 16 November 1994

I H SERVICES, INC.

1831 Portal Street – Suite E • Baltimore, Maryland 21224

PHONE: (410) 633-4000
FAX (410) 633-4122

№ 4000

CHAIN OF CUSTODY FOR ANALYTICAL SERVICES

Submittal Date: 11/16/94 Submitted By: (Print) Ernest K. Smith (Sign) E K Smith

Client Name: Marcor

Address:

Telephone:

Project Name: Bentelou Elementary School #150

Address: 220 N. Bentelou Street Baltimore, MD

Contact Person: Khamla Khantry

Results Required by: 11 / 17 / 94 Before Noon? ☐ Yes ☑ No

Number of Samples: 9

Type of Samples: ☑ Air ☐ Bulk ☐ Wipe ☐ Other:

Release Criteria: ☐ AHERA ☑ 0.010 f/cc ☐ % Asbestos ☐ Other:

LAB ID	SAMPLE NUMBER	DATE	VOLUME (Liters)	METHOD (Check)				OTHER
				PCM	PLM	TEM	SEM	
EK4943	150-1116-1	11/16/94	ϕ	✓				
EK4944	-2	"	ϕ	✓				
EK4945	-3	"	1000	✓				
EK4946	150-1116-4	11/16/94	200	✓				
EK4947	-5	"	288	✓				
EK4948	-6	"	605	✓				
EK4949	150-1116-7	11/16/94	238	✓				
EK4950	-8	"	225	✓				
EK4951	-9	"	1000	✓				

Relinquished By: (Signature)	Date	Relinquished By: (Signature)	Date
Name: (Printed)	Time	Name: (Printed)	Time
Received By: (Signature)	Date	Received By: (Signature)	Date
Name: (Printed)	Time	Name: (Printed)	Time

LABORATORY STAFF ONLY: (CUSTODY)

1. Date/Time Received 11 / 16 / 94 @ 2115 by (Print) _____ Sign _____
2. Date/Time Analyzed 11 / 16 / 94 @ 2130 by (Print) E K Smith Sign E K Smith
3. Date/Time Reported 11 / 16 / 94 @ 2200 by (Print) _____ Sign _____
4. Results Reported To: K. Khantry by (Print) _____ Sign _____

I H SERVICES, INC.

1831-E Portal Street • Baltimore, Maryland 21224

PHONE: (410) 633-4000

FAX: (410) 633-4122

DAILY OBSERVATIONS

DATE: 11-17-94

INSPECTOR: Anthony Ortiz

SITE: Bentalou Elementary #150
220 Bentalou St.
Balto., Md.

TITLE: Industrial Hygienist

PURPOSE OF VISIT:

Air Monitoring during Removal of ACM from pipes and boilers

GENERAL OBSERVATIONS:

Upon arrival, IH (Tony Ortiz) suited up and entered the area to check the scope of the job. The workers are to begin final cleaning of the area and will continue to do so the rest of this shift.

I H SERVICES, INC.

DAILY ASBESTOS ABATEMENT CHECKLIST

Building: Bentalou Elementary #150 Date: 11-17-94

Location: 220 Bentalou St. Balto, Md.

Project Description: Air Monitoring during removal of Asbestos from pipes and boilers

Company Performing Abatement: Marcor

Supervisor on Job: Rhonda Khantry Title: Supervisor

Number of Workers at Site: 8

Inspector: Anthony Ortiz Signature:

Title: Industrial Hygienest

WORK SITE INSPECTION

	Acceptable	Not Acceptable	Not Applicable	Problem Encountered / Comments
A. AIRLOCK - DECONTAMINATION AREA				
1. Clean Room - 1st Stage				
a. Floors clean	☑	☐	☐	
b. No asbestos or asbestos-contaminated material present	☑	☐	☐	
c. Street clothes properly stored	☑	☐	☐	
2. Shower Area - 2nd Stage				
a. Shower operating	☑	☐	☐	
b. Shower waste water properly filtered	☑	☐	☐	
3. Equipment Area - 3rd Stage				
a. No excess asbestos debris present	☑	☐	☐	
b. Contaminated suits and material placed in asbestos bag	☑	☐	☐	
4. Airlock perimeter plastic and plastic flaps intact	☑	☐	☐	
5. Proper signage at entrance	☑	☐	☐	
B. PERIMETER BARRIERS				
1. Perimeter plastic intact	☑	☐	☐	
2. Windows and doors sealed	☑	☐	☐	
3. Ducts, ventilator systems, pipes sealed	☑	☐	☐	
4. All other vertical and horizontal openings into area sealed	☑	☐	☐	
C. WORK AREA PRACTICES				
1. Hammers, saws, brooms not in use	☑	☐	☐	
2. Material kept wet	☑	☐	☐	
3. Material bagged promptly	☑	☐	☐	
4. Workers protective equipment	☑	☐	☐	
a. Full body disposable clothing intact	☑	☐	☐	
b. Proper foot protection	☑	☐	☐	
c. Proper NIOSH respirators	☑	☐	☐	
Type: Negative Pressure				
d. Hard hats	☐	☐	☑	
e. Eye protection	☑	☐	☐	
5. Adequate lighting	☑	☐	☐	

DAILY ASBESTOS ABATEMENT CHECKLIST

Date: 11-17-94

D. WORKER DECONTAMINATION & WORK HABITS

	Acceptable	Not Acceptable	Not Applicable	Problem Encountered / Comments
1. Workers shower upon leaving work area	☑	☐	☐	
2. Contaminated full body suits bagged in dirty room	☑	☐	☐	
3. Disposable suits used once	☑	☐	☐	
4. No smoking in work area or airlock	☑	☐	☐	
5. No eating or drinking in work area or airlock	☑	☐	☐	

E. H.E.P.A. VENTILATION UNITS

1. Number in use 2
2. Pre-filters changed periodically ☑ Yes ☐ No
3. Negative Pressure Inside Work Area:
   a. Measured with:
      ☐ 1. Magnahelic gauge *manometer
      ☐ 2. Transducer
   b. Locations(s) and Negative Pressure Reading:

	Location	Inches H_2O
#1	Airlock	-.02
#2		
#3		

4. Is microtrap exhaust properly vented? ☑ Yes ☐ No
5. Is microtrap exhaust hose intact? ☑ Yes ☐ No

F. END OF WORK DAY PROCEDURES

	Acceptable	Not Acceptable	Not Applicable	Problem Encountered / Comments
1. Material on floors bagged before leaving area	☑	☐	☐	
2. Bags of asbestos sealed	☑	☐	☐	
3. If bags are removed:				
a. Properly decontaminated	☑	☐	☐	
b. Tightly sealed	☑	☐	☐	
c. Placed in drums	☑	☐	☐	
4. Are microtraps left running over night	☑	☐	☐	
5. Work area properly sealed off	☑	☐	☐	

G. AIR SAMPLING

	AREA	PERSONAL
1. Number of Air Samples taken	9	3
2. Number of Air Samples taken by Contractor		

H. What is the daily job progress?

The scope of todays work is final cleaning

I H SERVICES, INC.

1831 Portal Street — Suite E • Baltimore, Maryland 21224

Main Office
410-633-4000
FAX
410-633-4122

AIR MONITORING DATA SHEET

Project: Bentalou Elementary #150
Address: 220 Bentalou St. Baltimore Md.
Date: November 17, 1994
Activity: Air Monitoring
Job Number: LL00001-227
Work Order Number:

SAMPLED FOR:

- [x] Asbestos: METHOD [x] 7400 [ ] TEM; CASSETTE [x] 25mm [ ] 37mm; FILTER [x] MCE [ ] PC
- [ ] Airborne Dust:
- [ ] Gas:
- [ ] Vapor:
- [ ] Other:

Analytical Method: PCM Ambient Temp.:

Protection Worn During Sampling:

	Employee	IH
Full Body Coveralls	[x]	[x]
Respirator - Air Purifying	[x]	[x]
Respirator - Power Air Purifying	[ ]	[ ]
Respirator - Supplied Air	[ ]	[ ]

PERSONAL SAMPLING DATA

Employee Sampled: Cezar Morales
Social Security Number:
Smoker: [ ] Yes [x] No
Job Function: Technician
Description of Activity: Clean and Remove Asbestos Insulation pipes and ducts
Signature of Employee:

LAB ID	SAMPLE NO.	SAMPLE DATE	RESULTS FIBERS/CC	SAMPLE LOCATION
Q0960	BES 53	11-17-94	0.00 per 100 fields	Blank
Q0961	BES 54	"	0.00 per 100 fields	Blank
Q0962	BES 55	"	0.10	Personal
Q0963	BES 52	"	void overload	inside work area
Q0964	BES 57	"	0.11	inside work area
Q0965	BES 58	"	LO: 0.01	inside work area
Q0966	BES 59	"	LO: 0.01	outside work area

FIELD SAMPLE NUMBER	TEST PERIOD START	TEST PERIOD STOP	TEST PERIOD TOTAL (MIN.)	FLOW RATE SETTING START (LITERS/MIN.)	FLOW RATE SETTING STOP (LITERS/MIN.)	VOLUME LITERS	SAMPLE TYPE AMBIENT	SAMPLE TYPE AREA	SAMPLE TYPE FINAL	SAMPLE TYPE PERSONAL	SAMPLE LOCATION IN WORK AREA	SAMPLE LOCATION OUTSIDE WORK AREA	SAMPLE LOCATION N/A	INSTRUMENT SERIAL NUMBER
BES 53	—	—	Ø	—	—	Ø								
BES 54	—	—	Ø	—	—	Ø								
55	1530	1730	120	2.5	2.5	300		X FD		✓	✓			0204
52	1530	1830	180	2.5	2.5	450		✓			✓			0124
57	1530	1730	120	2.5	2.5	300		✓			✓			0832
58	1600	1900	180	2.5	2.5	450		✓		X FD	X FD	✓		~~3768~~ 0204
59	1800	2000	120	2.5	2.5	300		✓		✓	X FD			0432

Comments:

Inspector: Anthony Ortiz (PRINT NAME)
(SIGNATURE)
Date: 11-17-94

I H SERVICES, INC.

1831 Portal Street — Suite E • Baltimore, Maryland 21224

Main Office
410-633-400(
FAX
410-633-412.

AIR MONITORING DATA SHEET

Project: Bentalou Elementary #150
Address: 220 Bentalou St. Balto, Md.
Date: November 17, 1994
Activity: Air Monitoring
Job Number: EL000001-227
Work Order Number:

SAMPLED FOR:

- [x] Asbestos: METHOD [x] PCM [ ] TEM; CASSETTE [x] 25mm [ ] 37mm; FILTER [x] MCE [ ] PC
- [ ] Airborne Dust:
- [ ] Gas:
- [ ] Vapor:
- [ ] Other:

Analytical Method: PCM Ambient Temp.:

Protection Worn During Sampling:

	Employee	IH
Full Body Coveralls	☑	☐
Respirator - Air Purifying	☐	☐
Respirator - Power Air Purifying	☐	☐
Respirator - Supplied Air	☐	☐

PERSONAL SAMPLING DATA

Employee Sampled: Cezar Morales
Social Security Number:
Smoker: ☐ Yes ☒ No
Job Function: Technician
Description of Activity: Clean and Remove dust from pipes and ducts
Signature of Employee:

LAB ID	SAMPLE NO.	SAMPLE DATE	RESULTS FIBERS/CC	SAMPLE LOCATION
Q0967	BES 60	11-17-94	0.019	inside work area
Q0968	BES 61	"	LO.011	inside work area
Q0969	BES 62	"	LO.065	Personal
Q0970	BES 63	"	LO.065	inside work area
Q0971	BES 64	"	LO.065	inside work area

FIELD SAMPLE NUMBER	TEST PERIOD START	TEST PERIOD STOP	TEST PERIOD TOTAL (MIN.)	FLOW RATE SETTING START (LITERS/MIN.)	FLOW RATE SETTING STOP (LITERS/MIN.)	VOLUME LITERS	SAMPLE TYPE AMBIENT	SAMPLE TYPE AREA	SAMPLE TYPE FINAL	SAMPLE TYPE PERSONAL	SAMPLE LOCATION IN WORK AREA	SAMPLE LOCATION OUTSIDE WORK AREA	SAMPLE LOCATION N/A	INSTRUMENT SERIAL NUMBER
BES60	1830	2000	120	2.5	2.5	300		✓			✓			0124
BES61	1830	2200	180	2.5	2.5	450		✓			✓			0132
BES62	2100	2130	30	2.5	2.5	75				✓	✓			0204
BES63	2100	2130	30	2.5	2.5	75		✓			✓			0132
BES64	2100	2130	30	2.5	2.5	75		✓			✓			0124

Comments:

Inspector: Anthony Ortiz (PRINT NAME)
(SIGNATURE)
Date: 11-17-94

I H SERVICES, INC.

1831 Portal Street – Suite E • Baltimore, Maryland 21224

PHONE: (410) 633-4000
FAX (410) 633-4122

CHAIN OF CUSTODY FOR ANALYTICAL SERVICES

№ 3884

Submittal Date: 11-17-94 Submitted By: (Print) Anthony Otte (Sign) [signature]

Client Name: MarCor Project Name: Bentalou Elementary #1122

Address: Address: 220 Bentalou St

Baltimore, Md

Telephone: Contact Person: Khanka Khantry

Results Required by: 11 / 18 / 94 Before Noon? ☐ Yes ☑ No

Number of Samples: 12

Type of Samples: ☑ Air ☐ Bulk ☐ Wipe ☐ Other:

Release Criteria: ☐ AHERA ☑ 0.010 f/cc ☐ % Asbestos ☐ Other:

LAB ID	SAMPLE NUMBER	DATE	VOLUME (Liters)	METHOD (Check)				OTHER
				PCM	PLM	TEM	SEM	
Q0960	BES 53	11-17-94	Blank					
Q0961	54		Blank					
Q0962	55		300					
Q0963	56		470					
Q0964	57		300					
Q0965	58		450					
Q0966	59		350					
Q0967	60		350					
Q0968	61		470					
Q0969	62		75					
Q0970	63		75					
Q0971	64		75					

Relinquished By: (Signature)	Date	Relinquished By: (Signature)	Date
Name: (Printed)	Time	Name: (Printed)	Time
Received By: (Signature)	Date	Received By: (Signature)	Date
Name: (Printed)	Time	Name: (Printed)	Time

LABORATORY STAFF ONLY: (CUSTODY)

1. Date/Time Received 11 / 21 / 94 @ ____ by (Print) Ted Greenhalgh Sign [signature]
2. Date/Time Analyzed 11 / 21 / 94 @ ____ by (Print) ____ Sign ____
3. Date/Time Reported 11 / 21 / 94 @ ____ by (Print) ____ Sign ____
4. Results Reported To: by (Print) Sign

I H SERVICES, INC.

1831-E Portal Street • Baltimore, Maryland 21224

PHONE: (410) 633-4000

FAX: (410) 633-4122

DAILY OBSERVATIONS

DATE: 11-18-94

INSPECTOR: Anthony Ortiz

SITE: Bentalou Elementary
202 Bentalou St.
Baltimore, Md.

TITLE: Industrial Hygienist

PURPOSE OF VISIT:

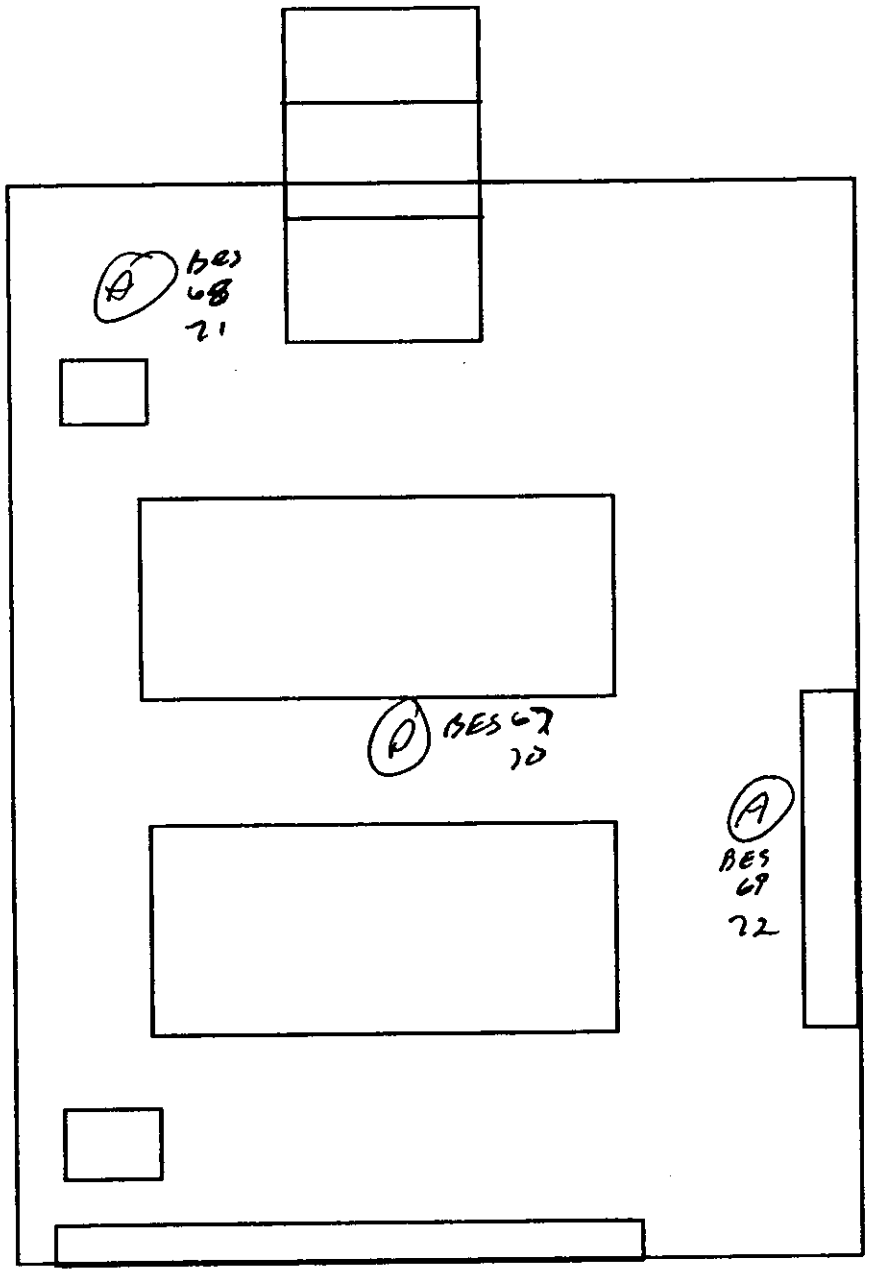
Air Monitoring during removal of ACM from pipes and boilers

GENERAL OBSERVATIONS:

Work is continued on final cleaning of work area. As work is being done other workers perform a bagout (206 bags and one drum) workers exit for break. When they reenter the area they will continue final cleaning.

11-18-54

Bentalou Elementary #150
200 Bentalou St.
Balto., Md.



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P

I H SERVICES, INC.

DAILY ASBESTOS ABATEMENT CHECKLIST

Building: Benta Coe Elementary #1550 Date: 11-18-94

Location: 202 Benta Coe St. Balto., Md.

Project Description: Air Monitoring during removal of ACM from Pipes and Boilers

Company Performing Abatement: Marcor

Supervisor on Job: Khamla Khantry Title: Supervisor

Number of Workers at Site: 12

Inspector: Anthony Orton Signature:

Title: Industrial Hygienist

WORK SITE INSPECTION

	Acceptable	Not Acceptable	Not Applicable	Problem Encountered / Comments
A. AIRLOCK - DECONTAMINATION AREA				
1. Clean Room - 1st Stage				
a. Floors clean	☑	☐	☐	
b. No asbestos or asbestos-contaminated material present	☑	☐	☐	
c. Street clothes properly stored	☑	☐	☐	
2. Shower Area - 2nd Stage				
a. Shower operating	☑	☐	☐	
b. Shower waste water properly filtered	☑	☐	☐	
3. Equipment Area - 3rd Stage				
a. No excess asbestos debris present	☑	☐	☐	
b. Contaminated suits and material placed in asbestos bag	☑	☐	☐	
4. Airlock perimeter plastic and plastic flaps intact	☑	☐	☐	
5. Proper signage at entrance	☑	☐	☐	
B. PERIMETER BARRIERS				
1. Perimeter plastic intact	☑	☐	☐	
2. Windows and doors sealed	☑	☐	☐	
3. Ducts, ventilator systems, pipes sealed	☑	☐	☐	
4. All other vertical and horizontal openings into area sealed	☑	☐	☐	
C. WORK AREA PRACTICES				
1. Hammers, saws, brooms not in use	☑	☐	☐	
2. Material kept wet	☑	☐	☐	
3. Material bagged promptly	☑	☐	☐	
4. Workers protective equipment	☑	☐	☐	
a. Full body disposable clothing intact	☑	☐	☐	
b. Proper foot protection	☑	☐	☐	
c. Proper NIOSH respirators	☑	☐	☐	
Type: Negative Pressure				
d. Hard hats	☐	☐	☑	
e. Eye protection	☑	☐	☐	
5. Adequate lighting	☑	☐	☐	

DAILY ASBESTOS ABATEMENT CHECKLIST

Date: 11-18-94

D. WORKER DECONTAMINATION & WORK HABITS

	Acceptable	Not Acceptable	Not Applicable	Problem Encountered / Comments
1. Workers shower upon leaving work area	☑	☐	☐	
2. Contaminated full body suits bagged in dirty room	☑	☐	☐	
3. Disposable suits used once	☑	☐	☐	
4. No smoking in work area or airlock	☑	☐	☐	
5. No eating or drinking in work area or airlock	☑	☐	☐	

E. H.E.P.A. VENTILATION UNITS

1. Number in use 2
2. Pre-filters changed periodically ☑ Yes ☐ No
3. Negative Pressure Inside Work Area:
   a. Measured with:
      ☐ 1. Magnahelic gauge
      ☐ 2. Transducer
      * Manometer
   b. Locations(s) and Negative Pressure Reading:

	Location	Inches H_2O
#1	-.02 Airlock	-.02
#2		
#3		

4. Is microtrap exhaust properly vented? ☑ Yes ☐ No
5. Is microtrap exhaust hose intact? ☑ Yes ☐ No

F. END OF WORK DAY PROCEDURES

	Acceptable	Not Acceptable	Not Applicable	Problem Encountered / Comments
1. Material on floors bagged before leaving area	☑	☐	☐	
2. Bags of asbestos sealed	☑	☐	☐	
3. If bags are removed:				
a. Properly decontaminated	☑	☐	☐	
b. Tightly sealed	☑	☐	☐	
c. Placed in drums	☑	☐	☐	
4. Are microtraps left running over night	☑	☐	☐	
5. Work area properly sealed off	☑	☐	☐	

G. AIR SAMPLING

	AREA	PERSONAL
1. Number of Air Samples taken	6	2
2. Number of Air Samples taken by Contractor	-	-

H. What is the daily job progress?

Scope of the job is final cleaning of 2 areas

I H SERVICES, INC.

1831 Portal Street — Suite E • Baltimore, Maryland 21224

Main Office
410-633-4000
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410-633-4122

AIR MONITORING DATA SHEET

Project: Bentalou Elementary #150
Address: 202 Bentalou St. Bklta, Md.
Date: November 18, 1994
Activity: Air Monitoring
Job Number: EL00001-229
Work Order Number:

SAMPLED FOR:

☒ Asbestos: METHOD ☐ 7400 ☐ TEM CASSETTE ☒ 25mm ☐ 37mm FILTER ☐ MCE ☐ PC
☐ Airborne Dust:
☐ Gas:
☐ Vapor:
☐ Other:
Analytical Method: PCM Ambient Temp.:

Protection Worn During Sampling:	Employee	IH
Full Body Coveralls	☑	☑
Respirator - Air Purifying	☑	☑
Respirator - Power Air Purifying	☐	☐
Respirator - Supplied Air	☐	☐

PERSONAL SAMPLING DATA

Employee Sampled: CO V Thomas
Social Security Number: 218-38-3861
Smoker: ☐ Yes ☒ No
Job Function: Technician
Description of Activity: Cleaning Removal Asbestos pipes and ducts
Signature of Employee:

LAB ID	SAMPLE NO.	SAMPLE DATE	RESULTS FIBERS/CC	SAMPLE LOCATION
Q0771	BES 65	11-18-94	Other air pump not field	BLANK
Q0773	BES 66	"	Other air pump not field	BLANK
Q0774	BES 67	"	Void overload	Personal
Q0775	BES 68	"	Void Wet	Inside work Area
Q0776	BES 69	"	Void Wet	Inside work Area
Q0777	BES 70	"	0.049	Personal
Q0778	BES 71	"	L0.033	Inside work Area

FIELD SAMPLE NUMBER	TEST PERIOD START	TEST PERIOD STOP	TOTAL (MIN.)	FLOW RATE SETTING START (LITERS/MIN.)	FLOW RATE SETTING STOP (LITERS/MIN.)	VOLUME LITERS	SAMPLE TYPE AMBIENT	SAMPLE TYPE AREA	SAMPLE TYPE FINAL	SAMPLE TYPE PERSONAL	SAMPLE LOCATION IN WORK AREA	SAMPLE LOCATION OUTSIDE WORK AREA	SAMPLE LOCATION N/A	INSTRUMENT SERIAL NUMBER
BES 65	—	—	Ø	—	—	Ø		—					—	Blank
66	—	—	Ø	—	—	Ø		—					—	Blank
67	1530	1730	120	2.5	2.5	300				—	—			0204
68	1530	1830	180	2.5	2.5	450		—			—			0133
69	1530	1830	180	2.5	2.5	450		—			—			0132
70	1830	1930	60	2.5	2.5	150				—	—			0204
71	1830	1930	60	2.5	2.5	150		—			—			0133

Comments:

Inspector: Anthony Oliver (PRINT NAME)
(SIGNATURE)
Date: 11-18-94

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AIR MONITORING DATA SHEET

Project: Berkshire Elementary #150
Address: 202 Berkshire St. Bel Air, Md.
Date: November 18, 1994
Activity: Air Monitoring
Job Number: EL0001-229
Work Order Number:

SAMPLED FOR:

	METHOD	CASSETTE	FILTER
☒ Asbestos:	☒ 7400 ☐ TEM	☐ 25mm ☐ 37mm	☐ MCE ☐ PC
☐ Airborne Dust:			
☐ Gas:			
☐ Vapor:			
☐ Other:			

Analytical Method: PCM Ambient Temp.:

Protection Worn During Sampling:

	Employee	IH
Full Body Coveralls	☑	☑
Respirator - Air Purifying	☑	☑
Respirator - Power Air Purifying	☐	☐
Respirator - Supplied Air	☐	☐

PERSONAL SAMPLING DATA

Employee Sampled: CO UTrone
Social Security Number: 218-35-7864
Smoker: ☐ Yes ☒ No
Job Function: Technician
Description of Activity: Clean and Remove Asbestos from pipes and boiler
Signature of Employee:

LAB ID	SAMPLE NO.	SAMPLE DATE	RESULTS FIBERS/CC	SAMPLE LOCATION
80979	BES 72	11-18-94	L.O. 03	Inside wood area

FIELD SAMPLE NUMBER	TEMP PERIOD START	STOP	TOTAL (MIN.)	FLOW RATE SETTING START (LITERS/MIN.)	STOP	VOLUME LITERS	SAMPLE TYPE AMBIENT	AREA	FINAL	PERSONAL	SAMPLE LOCATION IN WORK AREA	OUTSIDE WORK AREA	N/A	INSTRUMENT SERIAL NUMBER
BES 72	1830	1930	60	2.5	2.5	150		—			—			0132

Comments:

Inspector: Anthony O. Lotz (PRINT NAME)
(SIGNATURE)
Date: 11-18-94

I H SERVICES, INC.

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№ 3885

CHAIN OF CUSTODY FOR ANALYTICAL SERVICES

Submittal Date: 11-18-94 Submitted By: (Print) Anthony Ortez (Sign) Anthony Ortez

Client Name: Marcor

Address:

Telephone:

Project Name: Bentalou Elementary #150

Address: 202 Bentalou St. Balto, Md.

Contact Person: Khamla Khantry

Results Required by: 11 / 21 / 94 Before Noon? ☐ Yes ☑ No

Number of Samples: 8

Type of Samples: ☑ Air ☐ Bulk ☐ Wipe ☐ Other:

Release Criteria: ☐ AHERA ☑ 0.010 f/cc ☐ % Asbestos ☐ Other:

LAB ID	SAMPLE NUMBER	DATE	VOLUME (Liters)	METHOD (Check) PCM	PLM	TEM	SEM	OTHER
Q0972	BES 65	11/18/94	Blank					
Q0973	66		Blank					
Q0974	67		300					
Q0975	68		450					
Q0976	69		450					
Q0977	70		150					
Q0978	71		150					
Q0979	72		150					

Relinquished By: (Signature)	Date	Relinquished By: (Signature)	Date
Name: (Printed)	Time	Name: (Printed)	Time
Received By: (Signature)	Date	Received By: (Signature)	Date
Name: (Printed)	Time	Name: (Printed)	Time

LABORATORY STAFF ONLY: (CUSTODY)

1. Date/Time Received 11/21/94 @ by (Print) Ted Kowalczyk Sign T. Kowalczyk
2. Date/Time Analyzed 11/21/94 @ by (Print) Sign
3. Date/Time Reported 11/21/94 @ by (Print) Sign
4. Results Reported To: by (Print) Sign

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PHONE: (410) 633-4000

FAX: (410) 633-4122

DAILY OBSERVATIONS

DATE: 11-21-94 INSPECTOR: Anthony Ortiz

SITE: Bentalou Elementary #170
202 Bentalou RT.
Balto, Md.

TITLE:

PURPOSE OF VISIT:

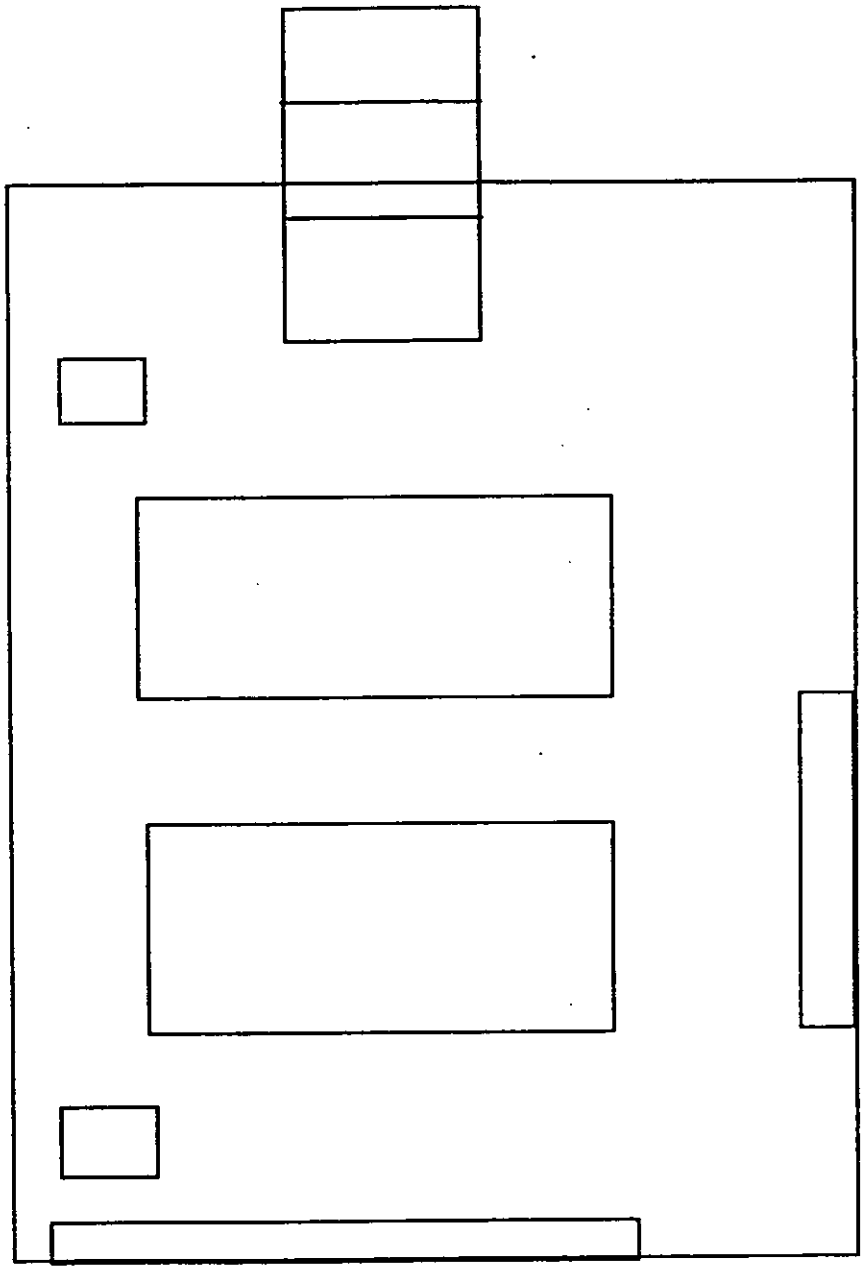
Air Monitoring during removal of ACM from pipes and boilers.

GENERAL OBSERVATIONS:

Workers enter and continue final cleaning of area IH (Tony ORtiz) did not setup pumps do to the aggresive cleaning with water that the cassettes would be saturated with water and they would be damaged. Workers will encapsulate the area after lunch and it will be left to dry for 24 Hrs.

11-21-91

Bentalou Elementary #150
2200 Bentalou St.
Balto, Md.



I H SERVICES, INC.

DAILY ASBESTOS ABATEMENT CHECKLIST

Building: Bentzlow Elementary #150 Date: 11-21-94

Location: 200 Bentzlow St. Baltimore, Md.

Project Description: Air Monitoring during removal of Asbestos from pipes and boilers

Company Performing Abatement: MacCor

Supervisor on Job: Jack Vomgphakly Title: Supervisor

Number of Workers at Site: 17

Inspector: Anthony Ortiz Signature:

Title: Industrial Hygienist

WORK SITE INSPECTION

A. AIRLOCK - DECONTAMINATION AREA	Acceptable	Not Acceptable	Not Applicable	Problem Encountered / Comments
1. Clean Room - 1st Stage				
a. Floors clean	☑	☐	☐	
b. No asbestos or asbestos-contaminated material present	☑	☐	☐	
c. Street clothes properly stored	☑	☐	☐	
2. Shower Area - 2nd Stage				
a. Shower operating	☑	☐	☐	
b. Shower waste water properly filtered	☑	☐	☐	
3. Equipment Area - 3rd Stage				
a. No excess asbestos debris present	☑	☐	☐	
b. Contaminated suits and material placed in asbestos bag	☑	☐	☐	
4. Airlock perimeter plastic and plastic flaps intact	☑	☐	☐	
5. Proper signage at entrance	☑	☐	☐	
B. PERIMETER BARRIERS				
1. Perimeter plastic intact	☑	☐	☐	
2. Windows and doors sealed	☑	☐	☐	
3. Ducts, ventilator systems, pipes sealed	☑	☐	☐	
4. All other vertical and horizontal openings into area sealed	☑	☐	☐	
C. WORK AREA PRACTICES				
1. Hammers, saws, brooms not in use	☑	☐	☐	
2. Material kept wet	☑	☐	☐	
3. Material bagged promptly	☑	☐	☐	
4. Workers protective equipment	☑	☐	☐	
a. Full body disposable clothing intact	☑	☐	☐	
b. Proper foot protection	☑	☐	☐	
c. Proper NIOSH respirators	☑	☐	☐	
Type: Negative Pressure				
d. Hard hats	☐	☐	☑	
e. Eye protection	☑	☐	☐	
5. Adequate lighting	☑	☐	☐	

DAILY ASBESTOS ABATEMENT CHECKLIST

Date: _____

D. WORKER DECONTAMINATION & WORK HABITS	Acceptable	Not Acceptable	Not Applicable	Problem Encountered / Comments
1. Workers shower upon leaving work area	☑	☐	☐	
2. Contaminated full body suits bagged in dirty room	☑	☐	☐	
3. Disposable suits used once	☑	☐	☐	
4. No smoking in work area or airlock	☑	☐	☐	
5. No eating or drinking in work area or airlock	☑	☐	☐	

E. H.E.P.A. VENTILATION UNITS

1. Number in use 2
2. Pre-filters changed periodically ☑ Yes ☐ No
3. Negative Pressure Inside Work Area:
   a. Measured with:
      ☐ 1. Magnahelic gauge * manometer
      ☐ 2. Transducer
   b. Locations(s) and Negative Pressure Reading:

	Location	Inches H_2O
#1	Airlock	.015
#2		
#3		

4. Is microtrap exhaust properly vented? ☑ Yes ☐ No
5. Is microtrap exhaust hose intact? ☑ Yes ☐ No

F. END OF WORK DAY PROCEDURES	Acceptable	Not Acceptable	Not Applicable	Problem Encountered / Comments
1. Material on floors bagged before leaving area	☑	☐	☐	
2. Bags of asbestos sealed	☑	☐	☐	
3. If bags are removed:				
a. Properly decontaminated	☑	☐	☐	
b. Tightly sealed	☑	☐	☐	
c. Placed in drums	☑	☐	☐	
4. Are microtraps left running over night	☑	☐	☐	
5. Work area properly sealed off	☑	☐	☐	

G. AIR SAMPLING	AREA	PERSONAL
1. Number of Air Samples taken	10	0
2. Number of Air Samples taken by Contractor	-	-

H. What is the daily job progress?

Work was continued on time clearing but intended To use large amounts of water and cassettes would be damaged if placed in the work area

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AIR MONITORING DATA SHEET

Project: Bentalou Elementary #152
Address: 202 Bentalou St. Balto, Md.
Date: November 21, 1994
Activity: Air Monitoring
Job Number: EL00001-239
Work Order Number:

SAMPLED FOR:

- ☑ Asbestos: METHOD ☑ 7400 ☐ TEM CASSETTE ☐ 25mm ☐ 37mm FILTER ☐ MCE ☐ PC
- ☐ Airborne Dust:
- ☐ Gas:
- ☐ Vapor:
- ☐ Other:

Analytical Method: PCM Ambient Temp.:

Protection Worn During Sampling:

	Employee	IH
Full Body Coveralls	☐	☑
Respirator - Air Purifying	☑	☑
Respirator - Power Air Purifying	☐	☐
Respirator - Supplied Air	☐	☐

PERSONAL SAMPLING DATA

Employee Sampled:
Social Security Number:
Smoker: ☐ Yes ☐ No
Job Function:
Description of Activity:

Signature of Employee:

LAB ID	SAMPLE NO.	SAMPLE DATE	RESULTS FIBERS/CC	SAMPLE LOCATION
		N/A		Get Daily Observation Sheet

FIELD SAMPLE NUMBER	TEST PERIOD START	TEST PERIOD STOP	TEST PERIOD TOTAL (MIN.)	FLOW RATE SETTING START (L/TERS/MIN.)	FLOW RATE SETTING STOP	VOLUME LITERS	SAMPLE TYPE AMBIENT	SAMPLE TYPE AREA	SAMPLE TYPE FINAL	SAMPLE TYPE PERSONAL	SAMPLE LOCATION IN WORK AREA	SAMPLE LOCATION OUTSIDE WORK AREA	SAMPLE LOCATION N/A	INSTRUMENT SERIAL NUMBER

Comments:

Inspector: Anthony O. Ifidon (PRINT NAME)
(SIGNATURE)
Date: 11-21-94

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FAX (410) 633-4122

CHAIN OF CUSTODY FOR ANALYTICAL SERVICES

№ 3887

Submittal Date: 11-21-94 Submitted By: (Print) Anthony ORton (Sign)

Client Name: Marcor

Address:

Telephone:

Results Required by: 11 / 22 / 94

Number of Samples:

Project Name: Bentalou Elementary #152

Address: 220 Bentalou St. Balto, MD.

Contact Person: Khanla Khantry

Before Noon? ☐ Yes ☒ No

Type of Samples: ☑ Air ☐ Bulk ☐ Wipe ☐ Other:

Release Criteria: ☐ AHERA ☑ 0.010 f/cc ☐ % Asbestos ☐ Other:

LAB ID	SAMPLE NUMBER	DATE	VOLUME (Liters)	METHOD (Check)				OTHER
				PCM	PLM	TEM	SEM	
	N/A							See daily documentation sheet.

Relinquished By: (Signature)	Date	Relinquished By: (Signature)	Date
Name: (Printed)	Time	Name: (Printed)	Time
Received By: (Signature)	Date	Received By: (Signature)	Date
Name: (Printed)	Time	Name: (Printed)	Time

LABORATORY STAFF ONLY: (CUSTODY)

1. Date/Time Received ____/____/____@____ by (Print)____ Sign____
2. Date/Time Analyzed ____/____/____@____ by (Print)____ Sign____
3. Date/Time Reported ____/____/____@____ by (Print)____ Sign____
4. Results Reported To: by (Print) Sign

I H SERVICES, INC.

1831-E Portal Street • Baltimore, Maryland 21224

PHONE: (410) 633-4000

FAX: (410) 633-4122

DAILY OBSERVATIONS

DATE: 11-22-94

INSPECTOR: Anthony Ortiz

SITE: Bentalou Elementary #150
202 Bentalou St.
Balto, Md.

TITLE: Industrial Hygienist I

PURPOSE OF VISIT:

Air Monitoring during removal of ACM from pipes and boilers

GENERAL OBSERVATIONS:

The Scope of todays work is to run TEM Samples. We were forced into an Emergency situation do to inclement weather in the night. I had to run PCM samples to get a entry Clearance for the boiler mechanics to enter the area without respirators, ~~schedule~~

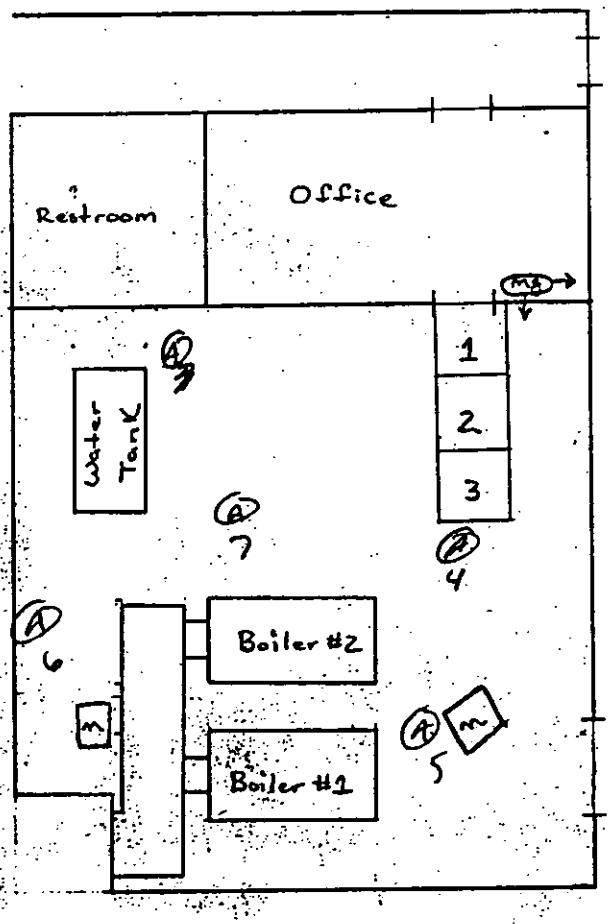
DATE: 11-22-94

GENERAL OBSERVATIONS CONTINUED:

Bentalou Elementary School #150

220 N. Bentalou Street

Baltimore, MD



BOILER ROOM AREA

Ⓑ: Blank

Ⓑ: Blank

Ⓐ: Area

Ⓧ: Personal

Ⓕ: Final

[1][2][3]: 3-Stage Decon Unit

[m]: Negative Air Unit

(mg): Pressure Gauge

I H SERVICES, INC.

DAILY ASBESTOS ABATEMENT CHECKLIST

Building: Bentalou Elementary #150 Date: 11-22-94

Location: 202 Bentalou St. Balto, Md.

Project Description: Air Monitoring during removal of Asbestos from pipes and Boilers

Company Performing Abatement: Marcor

Supervisor on Job: Scott Humphreddy Title: Supervisor

Number of Workers at Site: 1

Inspector: Anthony Okin Signature:

Title: Industrial Hygienist

WORK SITE INSPECTION

	Acceptable	Not Acceptable	Not Applicable	Problem Encountered / Comments
A. AIRLOCK - DECONTAMINATION AREA				
1. Clean Room - 1st Stage				
a. Floors clean	☑	☐	☐	
b. No asbestos or asbestos-contaminated material present	☑	☐	☐	
c. Street clothes properly stored	☑	☐	☐	
2. Shower Area - 2nd Stage				
a. Shower operating	☑	☐	☐	
b. Shower waste water properly filtered	☑	☐	☐	
3. Equipment Area - 3rd Stage				
a. No excess asbestos debris present	☑	☐	☐	
b. Contaminated suits and material placed in asbestos bag	☑	☐	☐	
4. Airlock perimeter plastic and plastic flaps intact	☑	☐	☐	
5. Proper signage at entrance	☑	☐	☐	
B. PERIMETER BARRIERS				
1. Perimeter plastic intact	☑	☐	☐	
2. Windows and doors sealed	☑	☐	☐	
3. Ducts, ventilator systems, pipes sealed	☑	☐	☐	
4. All other vertical and horizontal openings into area sealed	☑	☐	☐	
C. WORK AREA PRACTICES				
1. Hammers, saws, brooms not in use	☑	☐	☐	
2. Material kept wet	☑	☐	☐	
3. Material bagged promptly	☑	☐	☐	
4. Workers protective equipment	☑	☐	☐	
a. Full body disposable clothing intact	☑	☐	☐	
b. Proper foot protection	☑	☐	☐	
c. Proper NIOSH respirators Type: Negative Pressure	☑	☐	☐	
d. Hard hats	☑	☐	☐	
e. Eye protection	☑	☐	☐	
5. Adequate lighting	☑	☐	☐	

DAILY ASBESTOS ABATEMENT CHECKLIST

Date: 11-22-94

D. WORKER DECONTAMINATION & WORK HABITS

	Acceptable	Not Acceptable	Not Applicable	Problem Encountered / Comments
1. Workers shower upon leaving work area	☑	☐	☐	
2. Contaminated full body suits bagged in dirty room	☑	☐	☐	
3. Disposable suits used once	☑	☐	☐	
4. No smoking in work area or airlock	☑	☐	☐	
5. No eating or drinking in work area or airlock	☑	☐	☐	

E. H.E.P.A. VENTILATION UNITS

1. Number in use 2
2. Pre-filters changed periodically ☑ Yes ☐ No
3. Negative Pressure Inside Work Area:
   a. Measured with:
      ☐ 1. Magnahelic gauge * Manometer
      ☐ 2. Transducer
   b. Locations(s) and Negative Pressure Reading:

	Location	Inches H_2O
#1	Airlock	-.015
#2		
#3		

4. Is microtrap exhaust properly vented? ☑ Yes ☐ No
5. Is microtrap exhaust hose intact? ☑ Yes ☐ No

F. END OF WORK DAY PROCEDURES

	Acceptable	Not Acceptable	Not Applicable	Problem Encountered / Comments
1. Material on floors bagged before leaving area	☑	☐	☐	
2. Bags of asbestos sealed	☑	☐	☐	
3. If bags are removed:				
a. Properly decontaminated	☑	☐	☐	
b. Tightly sealed	☑	☐	☐	
c. Placed in drums	☑	☐	☐	
4. Are microtraps left running over night	☑	☐	☐	
5. Work area properly sealed off	☑	☐	☐	

G. AIR SAMPLING

	AREA	PERSONAL
1. Number of Air Samples taken	7	
2. Number of Air Samples taken by Contractor		

H. What is the daily job progress?

Running four samples first and then have them read and passed for Tem samples

I H SERVICES, INC.

1831 Portal Street — Suite E • Baltimore, Maryland 21224

Main Office
410-633-400(
FAX
410-633-412:

AIR MONITORING DATA SHEET

Project: Bentalou Elementary #150
Address: 202 Bentalou St.
Date: November 22, 1994
Activity: Air Monitoring
Job Number: EL 0000 1-239
Work Order Number:

SAMPLED FOR:

- [x] Asbestos: METHOD [x] 7400 [ ] TEM CASSETTE [x] 25mm [ ] 37mm FILTER [x] MCE [ ] PC
- [ ] Airborne Dust:
- [ ] Gas:
- [ ] Vapor:
- [ ] Other:

Analytical Method: PCM Ambient Temp.:

Protection Worn During Sampling:

	Employee	IH
Full Body Coveralls	[ ]	[x]
Respirator - Air Purifying	[x]	[ ]
Respirator - Power Air Purifying	[ ]	[ ]
Respirator - Supplied Air	[ ]	[ ]

PERSONAL SAMPLING DATA

Employee Sampled:
Social Security Number: N/A
Smoker: [ ] Yes [ ] No
Job Function:
Description of Activity:

Signature of Employee:

LAB ID	SAMPLE NO.	SAMPLE DATE	RESULTS FIBERS/CC	SAMPLE LOCATION
EK4984	PCM 1	11-22-94	# fibers per 100 fields	Blank
EK4985	2	"	# fibers per 100 fields	Blank
EK4986	3	"	<.01	inside pcm final
EK4987	4	"	<.01	inside pcm Final
EK4988	5	"	<.01	Inside PCM Final
EK4989	6	"	<.01	inside pcm Final
EK4990	7	"	<.01	inside pcm final

FIELD SAMPLE NUMBER	TEST PERIOD START	TEST PERIOD STOP	TOTAL (MIN.)	FLOW RATE SETTING START (LITERS/MIN.)	FLOW RATE SETTING STOP (LITERS/MIN.)	VOLUME LITERS	SAMPLE TYPE AMBIENT	SAMPLE TYPE AREA	SAMPLE TYPE FINAL	SAMPLE TYPE PERSONAL	SAMPLE LOCATION IN WORK AREA	SAMPLE LOCATION OUTSIDE WORK AREA	SAMPLE LOCATION N/A	INSTRUMENT SERIAL NUMBER
PCM 1	—	—	0	—	—	0		✓	✓				—	Blank
2	—	—	0	—	—	0		✓					—	Blank
3	10.00	1750	60	10.0	10.0	600			✓		✓			0129
4	1600	1700	60	10.0	10.0	600			✓		✓			154
5	1600	1700	60	10.0	10.0	600			✓		✓			0170
6	1600	1700	60	10.0	10.0	600			✓		✓			0133
7	1600	1700	60	10.0	10.0	600			✓		✓			3368

Comments:

Inspector: Anthony E. Petrie (PRINT NAME)
(SIGNATURE)
Date: 11-22-94

I H SERVICES, INC.

1831-E Portal Street • Baltimore, Maryland 21224

PHONE: (410) 633-4000
FAX (410) 633-4122

FINAL ABATEMENT CHECKLIST

Building: Bentalou Elementary #150 Date: 11-21-94

Location: 202 Bentalou St. Balto, Md.

Project Description: _____

Company Performing Abatement: Mercer

Inspector: Anthony Ortiz Signature: [signature]

Title: Industrial Hygienist

Accompanied By: Sack Vangphakdy Title: Supervisor

Time of Inspection: Start: 1615 Stop: 1648

A. VISUAL INSPECTION OF WORK AREA

The following areas have been wet cleaned and/or H.E.P.A. vacuumed and seen to contain no residual dust and debris:

WORK SITE INSPECTION	Acceptable	Not Acceptable	Not Applicable	Problem Encountered / Comments
1. Floors	☑	☐	☐	
2. Walls	☑	☐	☐	
3. Window Ledges	☑	☐	☐	
4. Pipes:				
a. Vertical	☑	☐	☐	
b. Horizontal	☑	☐	☐	
b. Pipe Hangers	☑	☐	☐	
5. Ventilation Equipment	☑	☐	☐	
6. Ducts	☑	☐	☐	
7. Registers	☑	☐	☐	
8. Lights	☑	☐	☐	
9. Conduit and Wires	☑	☐	☐	
10. Sprinkler Heads	☑	☐	☐	
11. Fire Alarms	☐	☐	☑	
12. Electrical Panels and Boxes	☑ TP	☐	☑	
13. All Other Horizontal Surfaces	☑	☐	☐	
14. All Other Vertical Surfaces	☑	☐	☐	
15. Removal Equipment Remaining in Work Areas	☑	☐	☐	
16. Areas Adjacent To Work Site Barrier	☑	☐	☐	

B. ENCAPSULATION

1. Has encapsulant been used? ☑ Yes ☐ No
2. Name of encapsulant used: Foster 32-22

(Complete Page Two)

Date: 11-21-94

C. Have all bags of removal debris been properly labeled and removed from work area? ☑ Yes ☐ No

D. FINAL AIR SAMPLING

1. Sample I.D. Number(s): BES-3 to BES-7
2. Were samples analyzed on site? ☐ Yes ☑ No
3. If yes, person performing analysis: Ernest K. Smith
4. Was a blank submitted? ☑ Yes ☐ No
5. Is electron microscopy required? ☑ Yes ☐ No
6. What is the specified clearance level? ☑ f/cc ☐ s/mm² <0.01 f/cc / Tem
7. Were microtraps run during the taking of final air samples? ☑ Yes ☐ No
8. Were any other aggressive sampling techniques used? ☐ Yes ☑ No

   Describe: _____

E. RESULTS OF VISUAL INSPECTION

The work area was found to be acceptably free of residual dust and debris: ☑ Yes ☐ No

Inspector: Anthony Ortiz Signature: Cathy Ortiz

Date: 11-21-94 Time: 1750

F. RESULTS OF AIR TEST(s)

Sample I.D.	Result	Sample I.D.	Result	Sample I.D.	Result
BES-3	<.01				
BES-4	<.01				
BES-5	<.01				
BES-6	<.01				
BES-	<.01				

Are these results below the final clearance level? ☑ Yes ☐ No

Has the work area been released? ☑ Yes ☐ No

Notification Given To: Sarkis Acoustical Title: Supervisor

Date of Notification: ~~Nov. 21~~ 22 Nov. 1994 Time: ~~2020~~ 1800

Microscopist: Ernest K. Smith Signature: E K Smith

G. Has the contractor been informed to clean all contamination left behind barriers? ☑ Yes ☐ No

H. Final Cleanliness Specification: <0.010 f/cc Prepared by: Baltimore City

Has analysis of final samples met specified level of cleanliness? ☑ Yes ☐ No

I H SERVICES, INC.

1831 Portal Street — Suite E • Baltimore, Maryland 21224

Main Office
410-633-400(
FAX
410-633-412

AIR MONITORING DATA SHEET

Project: Bowlow Elementary #130
Address: 202 Bowlow St. Baltimore, Md.
Date: November 21, 1994
Activity: Air Monitoring
Job Number: EL00001-239
Work Order Number:

SAMPLED FOR:

	Method	Cassette	Filter
☒ Asbestos:	☐ 7400 ☒ TEM	☐ 25mm ☐ 37mm	☐ MCE ☐ PC
☐ Airborne Dust:			
☐ Gas:			
☐ Vapor:			
☐ Other:			

Analytical Method: Fiber Ambient Temp.:

Protection Worn During Sampling:

	Employee	IH
Full Body Coveralls	☐	☐
Respirator - Air Purifying	☐	☐
Respirator - Power Air Purifying	☐	☐
Respirator - Supplied Air	☐	☐

PERSONAL SAMPLING DATA

Employee Sampled:
Social Security Number:
Smoker: ☐ Yes ☐ No
Job Function:
Description of Activity:

Signature of Employee:

LAB ID	SAMPLE NO.	SAMPLE DATE	RESULTS FIBERS/CC	SAMPLE LOCATION
	130			
	80	11-21-94		Blank Lab
	81	11		Blank inside
	82	11		Blank outside
	83	11		inside
	84	11		inside
	85	11		inside
	86	11		inside

FIELD SAMPLE NUMBER	TEST PERIOD START	TEST PERIOD STOP	TEST PERIOD TOTAL (MIN.)	FLOW RATE SETTING START (LITERS/MIN.)	FLOW RATE SETTING STOP (LITERS/MIN.)	VOLUME LITERS	SAMPLE TYPE AMBIENT	SAMPLE TYPE AREA	SAMPLE TYPE FINAL	SAMPLE TYPE PERSONAL	SAMPLE LOCATION IN WORK AREA	SAMPLE LOCATION OUTSIDE WORK AREA	SAMPLE LOCATION N/A	INSTRUMENT SERIAL NUMBER
BES 80	—	—	Ø	—	—	Ø							✓	Blank
81	—	—	Ø	—	—	Ø					✓			Blank
82	—	—	Ø	—	—	Ø						✓		Blank
83	2030	2230	120	10.0	10.0	1200			—		✓			
84	2030	2230	120	10.0	10.0	1200			—		✓			
85	2030	2230	120	10.0	10.0	1200			—		✓			
86	2030	2230	120	10.0	10.0	1200			✓		✓			

Comments:

Inspector: Anthony Okin (PRINT NAME)
(SIGNATURE)
Date: 11-21-94

I H SERVICES, INC.

1831 Portal Street — Suite E • Baltimore, Maryland 21224

Main Office
410-633-4000
FAX
410-633-4122

AIR MONITORING DATA SHEET

Project: Bentzlow Elementary #150
Address: 207 Bentzlow St. Balto., MD.
Date: November 21, 1994
Activity: Air monitoring
Job Number: EC00-01-239
Work Order Number:

SAMPLED FOR:

- [x] Asbestos: METHOD [ ] 7400 [x] TEM CASSETTE [ ] 25mm [ ] 37mm FILTER [ ] MCE [x] PC
- [ ] Airborne Dust:
- [ ] Gas:
- [ ] Vapor:
- [ ] Other:

Analytical Method: TEM Ambient Temp.:

Protection Worn During Sampling:

	Employee	IH
Full Body Coveralls	[ ]	[ ]
Respirator - Air Purifying	[ ]	[ ]
Respirator - Power Air Purifying	[ ]	[ ]
Respirator - Supplied Air	[ ]	[ ]

PERSONAL SAMPLING DATA

Employee Sampled:
Social Security Number:
Smoker: [ ] Yes [ ] No
Job Function:
Description of Activity:

Signature of Employee:

LAB ID	SAMPLE NO.	SAMPLE DATE	RESULTS FIBERS/CC	SAMPLE LOCATION
	BES 87	11-21-94		inside
	88	"		outside
	89	"		outside
	90	"		outside
	91	"		outside
	92	"		outside

FIELD SAMPLE NUMBER	TEST PERIOD START	TEST PERIOD STOP	TEST PERIOD TOTAL (MIN.)	FLOW RATE SETTING START (LITERS/MIN.)	FLOW RATE SETTING STOP (LITERS/MIN.)	VOLUME LITERS	SAMPLE TYPE AMBIENT	SAMPLE TYPE AREA	SAMPLE TYPE FINAL	SAMPLE TYPE PERSONAL	SAMPLE LOCATION IN WORK AREA	SAMPLE LOCATION OUTSIDE WORK AREA	SAMPLE LOCATION N/A	INSTRUMENT SERIAL NUMBER
BES 87	2030	2230	120	10.0	10.0	1200			✓		✓			
88	2030	2230	120	10.0	10.0	1200			✓			✓		
89	2030	2230	120	10.0	10.0	1200			✓			✓		
90	2030	2230	120	10.0	10.0	1200			✓			✓		
91	2030	2230	120	10.0	10.0	1200			✓			✓		
92	2030	2230	120	10.0	10.0	1200			✓			✓		

Comments:

Inspector: Anthony Oliver (PRINT NAME)
(SIGNATURE)
Date: 11-21-94

I H SERVICES, INC.

1831-E Portal Street • Baltimore, Maryland 21224

PHONE: (410) 633-4000
FAX (410) 633-4122

FINAL ABATEMENT CHECKLIST

Building: Bentalou Elementary #152 Date: 11.21.94

Location: 202 Bentalou St. Baltimore, Md.

Project Description: TEM clearance

Company Performing Abatement: Marcor

Inspector: Anthony Oliver Signature: Anthony Oliver

Title: Industrial Hygienist

Accompanied By: Jack Vonepthakdy Title: Supervisor

Time of Inspection: Start: 2000 Stop: 2015

A. VISUAL INSPECTION OF WORK AREA

The following areas have been wet cleaned and/or H.E.P.A. vacuumed and seen to contain no residual dust and debris:

WORK SITE INSPECTION	Acceptable	Not Acceptable	Not Applicable	Problem Encountered / Comments
1. Floors	☑	☐	☐	
2. Walls	☑	☐	☐	
3. Window Ledges	☑	☐	☐	
4. Pipes:				
a. Vertical	☑	☐	☐	
b. Horizontal	☑	☐	☐	
b. Pipe Hangers	☑	☐	☐	
5. Ventilation Equipment	☑	☐	☐	
6. Ducts	☑	☐	☐	
7. Registers	☑	☐	☐	
8. Lights	☑	☐	☐	
9. Conduit and Wires	☑	☐	☐	
10. Sprinkler Heads	☑	☐	☐	
11. Fire Alarms	☑	☐	☐	
12. Electrical Panels and Boxes	☑	☐	☐	
13. All Other Horizontal Surfaces	☑	☐	☐	
14. All Other Vertical Surfaces	☑	☐	☐	
15. Removal Equipment Remaining in Work Areas	☑	☐	☐	
16. Areas Adjacent To Work Site Barrier	☑	☐	☐	

B. ENCAPSULATION

1. Has encapsulant been used? ☑ Yes ☐ No
2. Name of encapsulant used: Foster 32/22

(Complete Page Two)

Date: 11-21-94

C. Have all bags of removal debris been properly labeled and removed from work area? ☑ Yes ☐ No

D. FINAL AIR SAMPLING

1. Sample I.D. Number(s): BES 80 — 92
2. Were samples analyzed on site? ☐ Yes ☑ No
3. If yes, person performing analysis: _____
4. Was a blank submitted? ☑ Yes ☐ No
5. Is electron microscopy required? ☐ Yes ☑ No
6. What is the specified clearance level? ☐ f/cc ☑ s/mm² < 70 s/mm²
7. Were microtraps run during the taking of final air samples? ☑ Yes ☐ No
8. Were any other aggressive sampling techniques used? ☐ Yes ☑ No

Describe: _____

E. RESULTS OF VISUAL INSPECTION

The work area was found to be acceptably free of residual dust and debris: ☑ Yes ☐ No

Inspector: Anthony Ortiz Signature: [signature]

Date: 11-21-94 Time: 2000

F. RESULTS OF AIR TEST(s)

Sample I.D.	Result, S/mm²	Sample I.D.	Result, S/mm²	Sample I.D.	Result
BES-80	NA	BES-85	<62	BES-90	NA
-81	NA	-86	<62	-91	NA
-82	NA	-87	<62	-92	NA
-83	<62	-88	NA		
-84	<62	-89	NA		

Are these results below the final clearance level? ☑ Yes ☐ No

Has the work area been released? ☑ Yes ☐ No

Notification Given To: Scott Vongphakdy Title: Supervisor

Date of Notification: 11-22-94 Time: 1600

Microscopist: AMA Signature: See AMA certificate

G. Has the contractor been informed to clean all contamination left behind barriers? ☑ Yes ☐ No

H. Final Cleanliness Specification: < 70 S/mm² Prepared by: Bldg., City

Has analysis of final samples met specified level of cleanliness? ☑ Yes ☐ No

I H SERVICES, INC.

1831 Portal Street – Suite E • Baltimore, Maryland 21224

PHONE: (410) 633-4000
FAX (410) 633-4122

№ 3886

CHAIN OF CUSTODY FOR ANALYTICAL SERVICES

Submittal Date: 11-22-94 Submitted By: (Print) Anthony Ortiz (Sign) [signature]

Client Name: Mercer Project Name: Benfield Elementary #150

Address: Address: 202 Benfield Rd.
Baltimore, Md.

Telephone: Contact Person: Jack Vonzjhalkdy

Results Required by: 11 / 22 / 94 Before Noon? ☐ Yes ☑ No

Number of Samples: 7

Type of Samples: ☑ Air ☐ Bulk ☐ Wipe ☐ Other:

Release Criteria: ☐ AHERA ☑ 0.010 f/cc ☐ % Asbestos ☐ Other:

LAB ID	SAMPLE NUMBER	DATE	VOLUME (Liters)	METHOD (Check)				OTHER
				PCM	PLM	TEM	SEM	
EK4984	PCM 1	11-22-94	Blank					A
EK4985	BES 2		Blank					
EK4986	3		600					
EK4987	4		600					
EK4988	5		600					
EK4989	6		600					
EK4996	7		600					

Relinquished By: (Signature)	Date	Relinquished By: (Signature)	Date
Name: (Printed)	Time	Name: (Printed)	Time
Received By: (Signature)	Date	Received By: (Signature)	Date
Name: (Printed)	Time	Name: (Printed)	Time

LABORATORY STAFF ONLY: (CUSTODY)

1. Date/Time Received 11 / 22 / 94 @ 1710 by (Print) _____ Sign _____
2. Date/Time Analyzed 11 / 22 / 94 @ 1730 by (Print) [signature] Sign [signature]
3. Date/Time Reported 11 / 22 / 94 @ 1800 by (Print) _____ Sign _____
4. Results Reported To: A. Ortiz by (Print) _____ Sign _____

I H SERVICES, INC.

1831-E Portal Street • Baltimore, Maryland 21224

PHONE: (410) 633-4000

FAX: (410) 633-4122

DAILY OBSERVATIONS

DATE: 11-23-99

INSPECTOR: Anthony Ortiz

SITE: Bentalou Elementary School
202 Bentalou St.
Balto., Md.

TITLE: Industrial Hygienist

PURPOSE OF VISIT:

Air Monitoring during removal of ACM from pipes and boilers

GENERAL OBSERVATIONS:

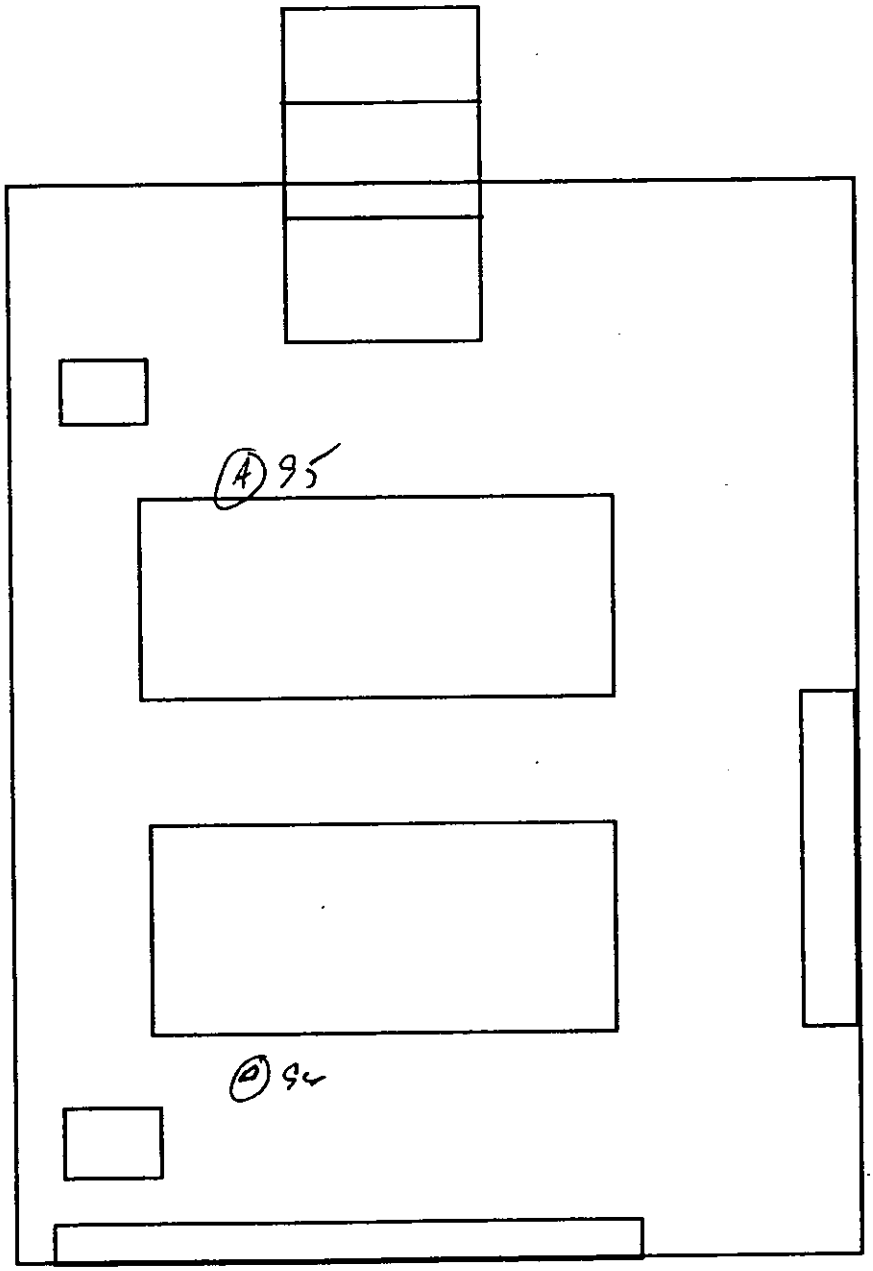
Workers arrive and await word from IH to begin to tear down the work area. IH recieved word that the TEM samples had passed and gave the workers authorization to begin taking down the area. The

1-22-94

Bantalow Elementary #150 — 2 of 2

202 Bantalow St.

Bacto., MD



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I H SERVICES, INC.

DAILY ASBESTOS ABATEMENT CHECKLIST

Building: Bentalou Elementary #150 Date: 11-23-94

Location: 202 Bentalou St. Baltimore, Md.

Project Description: Air Monitoring during removal of ACM from pipes and boilers

Company Performing Abatement: Mercer

Supervisor on Job: Jon Scott Vongphakdy Title: Supervisor

Number of Workers at Site:

Inspector: Anthony Ortiz Signature:

Title: Industrial Hygienist

WORK SITE INSPECTION

A. AIRLOCK - DECONTAMINATION AREA	Acceptable	Not Acceptable	Not Applicable	Problem Encountered / Comments
1. Clean Room - 1st Stage				
a. Floors clean	☐	☐	☑	
b. No asbestos or asbestos-contaminated material present	☐	☐	☑	
c. Street clothes properly stored	☐	☐	☑	
2. Shower Area - 2nd Stage				
a. Shower operating	☐	☐	☑	
b. Shower waste water properly filtered	☐	☐	☑	
3. Equipment Area - 3rd Stage				
a. No excess asbestos debris present	☐	☐	☑	
b. Contaminated suits and material placed in asbestos bag	☐	☐	☑	
4. Airlock perimeter plastic and plastic flaps intact	☐	☐	☑	
5. Proper signage at entrance	☑	☐	☐	
B. PERIMETER BARRIERS				
1. Perimeter plastic intact	☐	☐	☑	
2. Windows and doors sealed	☐	☐	☑	
3. Ducts, ventilator systems, pipes sealed	☐	☐	☑	
4. All other vertical and horizontal openings into area sealed	☐	☐	☑	
C. WORK AREA PRACTICES				
1. Hammers, saws, brooms not in use	☑	☐	☐	
2. Material kept wet	☐	☐	☑	
3. Material bagged promptly	☐	☐	☑	
4. Workers protective equipment	☐	☐	☑	
a. Full body disposable clothing intact	☐	☐	☑	
b. Proper foot protection	☐	☐	☑	
c. Proper NIOSH respirators	☑	☐	☐	
Type: Negative pressure				
d. Hard hats	☐	☐	☑	
e. Eye protection	☑	☐	☐	
5. Adequate lighting	☑	☐	☐	

DAILY ASBESTOS ABATEMENT CHECKLIST

Date: 11-23-84

D. WORKER DECONTAMINATION & WORK HABITS

	Acceptable	Not Acceptable	Not Applicable	Problem Encountered / Comments
1. Workers shower upon leaving work area	☐	☐	☑	
2. Contaminated full body suits bagged in dirty room	☐	☐	☑	
3. Disposable suits used once	☐	☐	☑	
4. No smoking in work area or airlock	☑	☐	☐	
5. No eating or drinking in work area or airlock	☑	☐	☐	

E. H.E.P.A. VENTILATION UNITS

1. Number in use 2
2. Pre-filters changed periodically ☐ Yes ☐ No
3. Negative Pressure Inside Work Area:
   a. Measured with:
      ☐ 1. Magnahelic gauge
      ☐ 2. Transducer
   b. Locations(s) and Negative Pressure Reading:

Location	Inches H_2O
#1 —	
#2	
#3	

4. Is microtrap exhaust properly vented? ☑ Yes ☐ No
5. Is microtrap exhaust hose intact? ☑ Yes ☐ No

F. END OF WORK DAY PROCEDURES

	Acceptable	Not Acceptable	Not Applicable	Problem Encountered / Comments
1. Material on floors bagged before leaving area	☑	☐	☐	
2. Bags of asbestos sealed	☑	☐	☐	
3. If bags are removed:				
a. Properly decontaminated	☑	☐	☐	
b. Tightly sealed	☑	☐	☐	
c. Placed in drums	☑	☐	☐	
4. Are microtraps left running over night	☑	☐	☐	
5. Work area properly sealed off	☑	☐	☐	

G. AIR SAMPLING

	AREA	PERSONAL
1. Number of Air Samples taken	4	
2. Number of Air Samples taken by Contractor		

H. What is the daily job progress?

Workers began taping down the work area after getting OK from IH got the results of the TEM samples which passed

I H SERVICES, INC.

1831 Portal Street — Suite E • Baltimore, Maryland 21224

Main Office
410-633-4000
FAX
410-633-4122

AIR MONITORING DATA SHEET

Project: Bentalou Elementary #150
Address: 202 Bentalou St. Balto, Md.
Date: November 23, 1994
Activity: Air Monitoring
Job Number: EL00001-233
Work Order Number:

SAMPLED FOR:

	METHOD	CASSETTE	FILTER
☒ Asbestos:	☒ 7400 ☐ TEM	☐ 25mm ☐ 37mm	☐ MCE ☐ PC
☐ Airborne Dust:			
☐ Gas:			
☐ Vapor:			
☐ Other:			

Analytical Method: PCM Ambient Temp.:

Protection Worn During Sampling:

	Employee	IH
Full Body Coveralls	☐	☐
Respirator - Air Purifying	☐	☐
Respirator - Power Air Purifying	☐ N/A	☐
Respirator - Supplied Air	☐	☐

PERSONAL SAMPLING DATA

Employee Sampled: N/A
Social Security Number:
Smoker: ☐ Yes ☐ No
Job Function:
Description of Activity:

Signature of Employee:

LAB ID	SAMPLE NO.	SAMPLE DATE	RESULTS FIBERS/CC	SAMPLE LOCATION
Q1008	BES 93	11-23-94	often per 100 field	Blank
Q1009	94	"	often per 100 field	Blank
Q1010	95	"	LO.01	Pre during Tear down
Q1011	96	"	LO.01	Pre during Tear down

FIELD SAMPLE NUMBER	TEST PERIOD START	TEST PERIOD STOP	TEST PERIOD TOTAL (MIN.)	FLOW RATE SETTING START (LITERS/MIN.)	FLOW RATE SETTING STOP (LITERS/MIN.)	VOLUME LITERS	SAMPLE TYPE AMBIENT	SAMPLE TYPE AREA	SAMPLE TYPE FINAL	SAMPLE TYPE PERSONAL	SAMPLE LOCATION IN WORK AREA	SAMPLE LOCATION OUTSIDE WORK AREA	SAMPLE LOCATION N/A	INSTRUMENT SERIAL NUMBER
BES 93	—	—	0	—	—	0		✓			✓		✓	Blank
94	—	—	0	—	—	0		✓			✓		✓	Blank
95	1530	1870	180	2.5	2.5	450		✓			✓			0212
96	1530	1830	180	2.5	2.5	450		✓			✓			0132

Comments:

Inspector: Anthony Ortiz (PRINT NAME)
(SIGNATURE)
Date: 11-23-94

I H SERVICES, INC.

1831 Portal Street – Suite E • Baltimore, Maryland 21224

PHONE: (410) 633-4000
FAX (410) 633-4122

№ 4062

CHAIN OF CUSTODY FOR ANALYTICAL SERVICES

Submittal Date: 11-23-94 Submitted By: (Print) Anthony Ortiz (Sign)

Client Name: Mercor

Address:

Telephone:

Results Required by: 11 / 28 / 94

Number of Samples:

Project Name: Bentlow Elementary #150

Address: 202 Bentlow St. Belcamp, Md.

Contact Person: Scott Vaughn/Anthony Ortiz

Before Noon? ☐ Yes ☒ No

Type of Samples: ☑ Air ☐ Bulk ☐ Wipe ☐ Other:

Release Criteria: ☐ AHERA ☑ 0.010 f/cc ☐ % Asbestos ☐ Other:

LAB ID	SAMPLE NUMBER	DATE	VOLUME (Liters)	METHOD (Check)				OTHER
				PCM	PLM	TEM	SEM	
Q1008	BES 93	11-23-94	Blank	✓				
Q1009	94		Blank					
Q1010	95		480					
Q1011	96		480					

Relinquished By: (Signature)	Date	Relinquished By: (Signature)	Date
Name: (Printed)	Time	Name: (Printed)	Time
Received By: (Signature)	Date	Received By: (Signature)	Date
Name: (Printed)	Time	Name: (Printed)	Time

LABORATORY STAFF ONLY: (CUSTODY)

1. Date/Time Received 11 / 30 / 94 @ 1300 by (Print) Tre Brassell Sign
2. Date/Time Analyzed 11 / 30 / 94 @ 1300 by (Print) Sign
3. Date/Time Reported 11 / 30 / 94 @ 1300 by (Print) Sign
4. Results Reported To: by (Print) Sign

31386

I H SERVICES, INC.

1831 Portal Street – Suite E • Baltimore, Maryland 21224
PHONE: (410) 633-4000
FAX (410) 633-4122

№ 3883

CHAIN OF CUSTODY FOR ANALYTICAL SERVICES

Submittal Date: 11-22-94 Submitted By: (Print) Anthony Ortiz (Sign) [signature]

Client Name: Mirror Project Name: Bentalou Elementary #150

Address: _____ Address: 202 Bentalou St.

_____ Balto., Md.

Telephone: _____ Contact Person: Jack Vongphakdy

Results Required by: 11 / 23 / 94 Before Noon? ☐ Yes ☒ No

Number of Samples: _____

Type of Samples: ☑ Air ☐ Bulk ☐ Wipe ☐ Other: _____

Release Criteria: ☑ AHERA ☐ 0.010 f/cc ☐ % Asbestos ☐ Other: _____

LAB ID	SAMPLE NUMBER	DATE	VOLUME (Liters)	METHOD (Check)				OTHER
				PCM	PLM	TEM	SEM	
	BES 80	11-22-94	Blank					
	81		Blank					
	82		Blank					
	83		1200					
	84		1200					
	85		1200					
	86		1200					
	87		1200					
	88		1200					
	89		1200					
	90		1200					
	91		1200					
	92		1200					

Relinquished By: (Signature)	Date	Relinquished By: (Signature)	Date
Name: (Printed)	Time	Name: (Printed)	Time
Received By: (Signature)	Date	Received By: (Signature)	Date
Name: (Printed)	Time	Name: (Printed)	Time

LABORATORY STAFF ONLY: (CUSTODY)

1. Date/Time Received ____/____/____@____ by (Print)_____ Sign_____
2. Date/Time Analyzed ____/____/____@____ by (Print)_____ Sign_____
3. Date/Time Reported ____/____/____@____ by (Print)_____ Sign_____
4. Results Reported To:_____ by (Print) _____ Sign_____

IV TEST RESULTS

This section contains certificates of analyses for all testing performed.

I H SERVICES, INC.

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REPORT OF ANALYSIS

Report No. 4-412 Report Date: November 18, 1994

Report To: Marcor Environmental Page: 1 of 7

Sample I.D.: Bentalou Elementary School #150

Sample No.	Lab I.D.	Sample Date	Volume (L)	Fibers/cc
150-1	Q-0898	11-07-94	Blank	0 Fiber/ 100 Fields
150-2	Q-0899	11-07-94	Blank	0 Fibers/ 100 Fields
150-3	Q-0900	11-07-94	1235	<0.010
150-4	Q-0901	11-07-94	1235	<0.010
150-5	Q-0902	11-07-94	1235	0.012
150-6	Q-0903	11-07-94	1235	<0.010
150-7	Q-0924	11-08-94	Blank	0 Fiber/ 100 Fields
150-8	Q-0925	11-08-94	Blank	0 Fibers/ 100 Fields
150-9	Q-0926	11-08-94	1235	Void
150-10	Q-0927	11-08-94	1235	Void
150-11	Q-0928	11-08-94	1235	Void
150-12	Q-0929	11-08-94	1235	<0.010

* The limit of Quantitative Detection.

Method of Analysis: Fiber counts were determined by methods described in NIOSH Analytical Method 7400, "Asbestos Fibers in Air."

Stephen L. Law, Ph.D., CIH
President

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REPORT OF ANALYSIS

Report No. 4-412 Report Date: November 18, 1994

Report To: Marcor Environmental Page: 2 of 7

Sample I.D.: Bentalou Elementary School #150

Sample No.	Lab I.D.	Sample Date	Volume (L)	Fibers/cc
150-13	Q-0904	11-09-94	Blank	0 Fiber/ 100 Fields
150-14	Q-0905	11-09-94	Blank	0 Fibers/ 100 Fields
150-15	Q-0906	11-09-94	570	<0.010
150-16	Q-0907	11-09-94	570	<0.010
150-17	Q-0908	11-09-94	450	<0.011
150-18	Q-0909	11-09-94	450	<0.011
150-19	EK4873	11-10-94	Blank	0 Fiber/ 100 Fields
150-20	EK4874	11-10-94	Blank	0 Fibers/ 100 Fields
150-21	EK4875	11-10-94	1000	<0.005*
150-22	EK4876	11-10-94	1000	<0.005*
150-23	EK4877	11-10-94	900	<0.005*
150-24	EK4878	11-10-94	900	<0.005*

* The limit of Quantitative Detection.

Method of Analysis: Fiber counts were determined by methods described in NIOSH Analytical Method 7400, "Asbestos Fibers in Air."

Stephen L. Law, Ph.D., CIH
President

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REPORT OF ANALYSIS

Report No. 4-412 Report Date: November 18, 1994

Report To: Marcor Environmental Page: 3 of 7

Sample I.D.: Bentalou Elementary School #150

Sample No.	Lab I.D.	Sample Date	Volume (L)	Fibers/cc
150-26	Q-0910	11-11-94	Blank	0 Fiber/ 100 Fields
150-27	Q-0911	11-11-94	Blank	0 Fibers/ 100 Fields
150-28	Q-0912	11-11-94	300	<0.016*
150-29	Q-0913	11-11-94	300	<0.016*
150-30	Q-0914	11-11-94	270	<0.018*
150-31	Q-0915	11-11-94	270	<0.018*
150-32	Q-0930	11-14-94	Blank	0 Fiber/ 100 Fields
150-33	Q-0931	11-14-94	Blank	0 Fibers/ 100 Fields
150-34	Q-0932	11-14-94	360	0.625
150-35	Q-0933	11-14-94	360	0.505
150-36	Q-0934	11-14-94	1710	Void
150-37	Q-0935	11-14-94	1710	<0.010
150-38	Q-0936	11-14-94	240	0.929
150-39	Q-0937	11-14-94	240	0.929
150-40	Q-0938	11-14-94	1140	Void
150-41	Q-0939	11-14-94	1140	<0.010

* The limit of Quantitative Detection.

Method of Analysis: Fiber counts were determined by methods described in NIOSH Analytical Method 7400, "Asbestos Fibers in Air."

Stephen L. Law, Ph.D., CIH
President

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REPORT OF ANALYSIS

Report No. 4-412 Report Date: November 18, 1994

Report To: Marcor Environmental Page: 4 of 7

Sample I.D.: Bentalou Elementary School #150

Sample No.	Lab I.D.	Sample Date	Volume (L)	Fibers/cc
150-42	Q-0950	11-15-94	Blank	0 Fiber/ 100 Fields
150-43	Q-0951	11-15-94	Blank	0 Fibers/ 100 Fields
150-44	Q-0952	11-15-94	360	0.271
150-45	Q-0953	11-15-94	360	Void
150-46	Q-0954	11-15-94	1140	Void
150-47	Q-0955	11-15-94	1140	<0.010
150-48	Q-0956	11-15-94	240	<0.020*
150-49	Q-0957	11-15-94	240	Void
150-50	Q-0958	11-15-94	1140	Void
150-51	Q-0959	11-15-94	1140	<0.010
150-1116-1	EK4943	11-16-94	Blank	0 Fibers/ 100 Fields
150-1116-2	EK4944	11-16-94	Blank	0 Fibers/ 100 Fields
150-1116-3	EK4945	11-16-94	1000	<0.005*
150-1116-4	EK4946	11-16-94	200	Void
150-1116-5	EK4947	11-16-94	288	0.180
150-1116-6	EK4948	11-16-94	605	0.180
150-1116-7	EK4949	11-16-94	238	0.170

* The limit of Quantitative Detection.

Method of Analysis: Fiber counts were determined by methods described in NIOSH Analytical Method 7400, "Asbestos Fibers in Air."

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REPORT OF ANALYSIS

Report No. 4-412 Report Date: November 18, 1994

Report To: Marcor Environmental Page: 5 of 7

Sample I.D.: Bentalou Elementary School #150

Sample No.	Lab I.D.	Sample Date	Volume (L)	Fibers/cc
150-1116-8	EK4950	11-16-94	225	0.450
150-1116-9	EK4951	11-16-94	1000	<0.005*
BES-53	Q-0960	11-17-94	Blank	0 Fibers/ 100 Fields
BES-54	Q-0961	11-17-94	Blank	0 Fibers/ 100 Fields
BES-55	Q-0962	11-17-94	300	0.104
BES-56	Q-0963	11-17-94	450	Void
BES-57	Q-0964	11-17-94	300	0.114
BES-58	Q-0965	11-17-94	450	<0.011*
BES-59	Q-0966	11-17-94	300	<0.012*
BES-60	Q-0967	11-17-94	300	0.019
BES-61	Q-0968	11-17-94	450	<0.011*
BES-62	Q-0969	11-17-94	75	<0.065*
BES-63	Q-0970	11-17-94	75	<0.065*
BES-64	Q-0971	11-17-94	75	<0.065*

* The limit of Quantitative Detection.

Method of Analysis: Fiber counts were determined by methods described in NIOSH Analytical Method 7400, "Asbestos Fibers in Air."

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REPORT OF ANALYSIS

Report No. 4-412 Report Date: November 18, 1994

Report To: Marcor Environmental Page: 6 of 7

Sample I.D.: Bentalou Elementary School #150

Sample No.	Lab I.D.	Sample Date	Volume (L)	Fibers/cc
BES-65	Q-0972	11-18-94	Blank	0 Fibers/ 100 Fields
BES-66	Q-0973	11-18-94	Blank	0 Fibers/ 100 Fields
BES-67	Q-0974	11-18-94	300	Void
BES-68	Q-0975	11-18-94	450	Void
BES-69	Q-0976	11-18-94	450	Void
BES-70	Q-0977	11-18-94	150	0.049
BES-71	Q-0978	11-18-94	150	<0.033*
BES-72	Q-0979	11-18-94	150	<0.033*
PCM-1	EK4984	11-22-94	Blank	0 Fibers/ 100 Fields
PCM-2	EK4985	11-22-94	Blank	0 Fibers/ 100 Fields
PCM-3	EK4986	11-22-94	600	<0.010
PCM-4	EK4987	11-22-94	600	<0.010
PCM-5	EK4998	11-22-94	600	<0.010
PCM-6	EK4989	11-22-94	600	<0.010
PCM-7	EK4990	11-22-94	600	<0.010

* The limit of Quantitative Detection.

Method of Analysis: Fiber counts were determined by methods described in NIOSH Analytical Method 7400, "Asbestos Fibers in Air."

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REPORT OF ANALYSIS

Report No. 4-412 Report Date: November 18, 1994

Report To: Marcor Environmental Page: 7 of 7

Sample I.D.: Bentalou Elementary School #150

Sample No.	Lab I.D.	Sample Date	Volume (L)	Fibers/cc
BES-93	Q-1008	11-23-94	Blank	0 Fibers/ 100 Fields
BES-94	Q-1009	11-23-94	Blank	0 Fibers/ 100 Fields
BES-95	Q-1010	11-23-94	450	<0.011*
BES-96	Q-1011	11-23-94	450	<0.011*

* The limit of Quantitative Detection.

Method of Analysis: Fiber counts were determined by methods described in NIOSH Analytical Method 7400, "Asbestos Fibers in Air."

Stephen L. Law, Ph.D., CIH
President

I H SERVICES, INC.

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REPORT OF ANALYSIS

Report No. 4-412 Date: November 30, 1994

Report To: Marcor Environmental Page: 1 of 1
6679 Santa Barbara Road, Suite G
Baltimore, Md 21227

Sample I.D. TEM Analysis submitted for Bentalou Elementary School #150

Sample No.	Lab ID	Sample Date	Volume (L)	S/mm^2	S/cc
BES-80	31386-1	11/22/94	Blank	NA	NA
BES-81	31386-2	11/22/94	Blank	NA	NA
BES-82	31386-3	11/22/94	Blank	NA	NA
BES-83	31386-4	11/22/94	1200	<62	0.0049
BES-84	31386-5	11/22/94	1200	<62	0.0049
BES-85	31386-6	11/22/94	1200	<62	0.0049
BES-86	31386-7	11/22/94	1200	<62	0.0049
BES-87	31386-8	11/22/94	1200	<62	0.0049
BES-88	31386-9	11/22/94	1200	NA	NA
BES-89	31386-10	11/22/94	1200	NA	NA
BES-90	31386-11	11/22/94	1200	NA	NA
BES-91	31386-12	11/22/94	1200	NA	NA
BES-92	31386-13	11/22/94	1200	NA	NA

NA = Not Analyzed

* The limit of quantitative detection.

Method of Analysis: Analytical procedures used meet or exceed the AHERA "Interim Transmission Electron Microscopy Analytical Methods" protocol described in Appendix A to Subpart E of 40 CFR Part 763.

Stephen J. Law, Ph.D., CIH
President

V REFERENCES

1. USEPA 1985. "Guidance for Controlling Asbestos-Containing Materials in Buildings", EPA 560/5-85-024. U.S. Environmental Protection Agency, Exposure Evaluation Division, Office of Pesticides and Toxic Substances, Washington, D.C.

2. USEPA 1984. "Measuring Airborne Asbestos Following an Abatement Action", EPA 600/4-85-049. U.S. Environmental Protection Agency Exposure Evaluation Division, Office of Pesticides and Toxic Substances, Washington, D.C.

3. OSHA 1986. "OSHA Reference Method - Mandatory", Appendix A to 1910.1001, Federal Register, Vol. 51, No. 119, June 20, 1986; Sept. 14, 1988. Final Rules 29 CFR 1926.58 Amended Sept. 14, 1988.

4. USEPA 1987. "Asbestos-Containing Materials in Schools: Final Rule and Notice", 40 CFR Part 763, Federal Register, Vol. 52, No. 210, Friday, October 30, 1987.

AMA Analytical Services, Inc.
Electron & Optical Microscopy Services
NVLAP

November 30, 1994

IH Services, Inc.
1831-E Portal Street
Holabird Industrial Park
Baltimore, MD 21224

RE:	AHERA TEM Analysis
JOB SITE:	Bextslor Elementary School #150
JOB NUMBER:	EL00001-239
AMA CHAIN OF CUSTODY #:	31386

ATTN: Anthony Ortiz

This is the final report for transmission electron microscopy (TEM) analysis performed on the samples from the referenced job site, according to Appendix A to Subpart E of the US EPA's 40 CFR Part 763 (AHERA Final Rules). Air samples were submitted by Anthony Ortiz of IH Services, Inc. to AMA Analytical Services, Inc. on November 23, 1994. Analytical results were reported to Anthony Ortiz and Ted Geisendaffer, by telefax and telephone, on November 23, 1994.

The TEM sample set consisted of five (5) air samples from inside the work area (IWA), five (5) air samples from outside the work area (OWA) and three (3) blank samples. The five (5) inside work area (IWA) air samples were analyzed by AHERA guidelines, using your specified release criteria of 70 structures/square millimeter (s/mm^2).

The grid opening area to be analyzed (per sample) is calculated to ensure that an analytical sensitivity of at least 0.005 structures/cubic centimeter (s/cc) is maintained during TEM analysis. The reported asbestos concentration is expressed at a 95% upper confidence level.

Analytical Results

The samples from inside the work area have an average asbestos concentration of < 70 s/mm^2. Because the volume of all inside the work area samples was $\geq$ 1199L for your 25mm (diameter) cassettes, and since their average concentration was < 70 s/mm^2, neither the outside the work area nor the blank samples were analyzed, in accordance with the AHERA regulations.

Results of TEM analyses are summarized on the Certificate of Analysis found in Appendix A. Individual TEM Fiber Count Sheets are also provided in Appendix B. If asbestos structures were observed during TEM analysis, photographic documentation of characteristic structures and selected area electron diffraction (SAED) patterns may be provided, as well as data acquired by energy dispersive x-ray spectroscopy (EDXA).

A copy of the Chain of Custody/Sample Submittal form and copies of additional support documentation (e.g., field data sheets), if provided, are in Appendix C.

Preparation Of Mixed Cellulose Ester (MCE) Filters

Samples are prepared in a laminar flow (Class 100) fume hood. Sample filters are removed from the cassette and cut into two sections, using surgical grade scissors. One section is used for sample preparation.

Each filter's section is collapsed onto a glass microscope slide using a solution containing dimethylformamide (DMF), acetic acid and water. The collapsed filters are etched to 90% of their original weight in an oxygen plasma, then coated with a supporting layer of carbon.

Three indexed, 200-mesh copper grids are placed into a modified Jaffe wick washer. Sections are excised from the coated filter and placed onto the grids. The filters are then dissolved for approximately one hour in the Jaffe washer using DMF. A final acetone wash, for 10 or more minutes, is then performed.

Analytical Methodology

The TEM air sample preparations are analyzed following the AHERA protocol outlined in Appendix A to Subpart E of the US EPA's 40 CFR Part 763 (Final Rules).

Analysis is conducted using a JEOL 100CXII transmission electron microscope equipped with either a Kevex (Delta Class) or EG&G Ortec energy dispersive x-ray analyzer (EDXA). The sample grids are examined at 100X to determine the quality of the sample preparation. A screen magnification of 15,000X is used for the actual analysis. The number of grid openings analyzed is dependent upon the volume of air collected.

Structures having aspect ratios of ≥ 5:1 and a minimum length of 0.5 micrometers, are examined in detail. Structure morphology, SAED and EDXA are used to differentiate asbestos from non-asbestos structures; each structure is classified as a fiber, bundle, matrix or cluster. Photographic documentation of the morphology and the SAED pattern, as well as EDXA data, are completed for the first five chrysotile and amphibole asbestos structures.

AMA Analytical Services, Inc. appreciates the opportunity to be of service to IH Services, Inc. If you have any questions regarding data, analytical procedures, or analytical results, please do not hesitate to contact us.

Sincerely,
AMA ANALYTICAL SERVICES, INC.

G Edward Carney
Electron Microscopist

W. M. (Chip) Craig
President and Lab Director

GC/kw

APPENDIX A

CERTIFICATE OF ANALYSIS

AMA Analytical Services, Inc.
Electron & Optical Microscopy Services

CERTIFICATE OF ANALYSIS

NVLAP

IH Services, Inc.
1831-E Portal Street
Holabird Industrial Park
Baltimore, MD 21224
ATTENTION: Anthony Ortiz

JOB SITE: Bextalor Elementary # 150
JOB NUMBER: EL00001-239
SUBMITTED BY: IH Services Inc.
FILTER MEDIA: MCE 25mm Dia (385 mm^2) N/P Micron Pore

DATE ANALYZED: 11/23/94
CHAIN OF CUSTODY #: 31386
PERSON SUBMITTING: Anthony Ortiz

SUMMARY OF TRANSMISSION ELECTRON MICROSCOPY

DATE SAMPLED	AMA LAB NUMBER	CLIENT NUMBER	VOLUME SAMPLED (LITERS)	FILTER AREA ANALYZED (mm^2)	ANALYTICAL SENSITIVITY S/mm^2	ANALYTICAL SENSITIVITY S/cc	NO. OF ASBESTOS STRUCTURES AND TYPE	NO. OF NON-ASBESTOS STRUCTURES	ASBESTOS CONCENTRATION S/mm^2	ASBESTOS CONCENTRATION S/cc	SAMPLE TYPE	SAMPLE LOCATION
11/22/94	9502583	BES-80	0	0.000	*******	*******	0	0	<*******	<*******	BLK	BLANK; NOT ANALYZED
11/22/94	9502584	BES-81	0	0.000	*******	*******	0	0	<*******	<*******	BLK	BLANK; NOT ANALYZED
11/22/94	9502585	BES-82	0	0.000	*******	*******	0	0	<*******	<*******	BLK	BLANK; NOT ANALYZED
11/22/94	9502586	BES-83	1200	0.065	15	0.0049	0	0	<62	<0.0197	IWA	INSIDE WORK AREA
11/22/94	9502587	BES-84	1200	0.065	15	0.0049	0	0	<62	<0.0197	IWA	INSIDE WORK AREA

This report applies only to the sample, or samples, investigated and is not necessarily indicative of the quality or condition of apparently identical or similar products. As a mutual protection to clients, the public and these Laboratories, this report is submitted and accepted for the exclusive use of the client to whom it is addressed and upon the condition that it is not to be used, in whole or in part, in any advertising or publicity matter without prior written authorization from us. Sample types, locations and collection protocols are based upon the information provided by the persons submitting them and, unless collected by personnel of these Laboratories, we expressly disclaim any knowledge and liability for the accuracy and completeness of this information. Residual sample material will be discarded in accordance with the appropriate regulatory guidelines, unless otherwise requested by the client. NVLAP Accreditation applies only to polarized light microscopy of bulk samples and transmission electron microscopy of air samples.
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An AIHA (# 8863), NVLAP (# 1143), & New York ELAP (# 10920) Accredited Laboratory
4485 Forbes Blvd., • Lanham MD 20706 • (301) 459-2640 • Toll Free (800) 346-0961 • Fax (301)459-2643

AMA Analytical Services, Inc.
Electron & Optical Microscopy Services

CERTIFICATE OF ANALYSIS

NVLAP

IH Services, Inc.
1831-E Portal Street
Holabird Industrial Park
Baltimore, MD 21224
ATTENTION: Anthony Ortiz

JOB SITE: Bextslor Elementary # 150
JOB NUMBER: EL00001-239
SUBMITTED BY: IH Services, Inc.
FILTER MEDIA: MCE

DATE ANALYZED: 11/23/94
CHAIN OF CUSTODY #: 31386
PERSON SUBMITTING: Anthony Ortiz
25mm Dia (385 mm^2)
N/P Micron Pore

SUMMARY OF TRANSMISSION ELECTRON MICROSCOPY

DATE SAMPLED	AMA LAB NUMBER	CLIENT NUMBER	VOLUME SAMPLED (LITERS)	FILTER AREA ANALYZED (mm^2)	ANALYTICAL SENSITIVITY S/mm^2	ANALYTICAL SENSITIVITY S/cc	NO. OF ASBESTOS STRUCTURES AND TYPE	NO. OF NON-ASBESTOS STRUCTURES	ASBESTOS CONCENTRATION S/mm^2	ASBESTOS CONCENTRATION S/cc	SAMPLE TYPE	SAMPLE LOCATION
11/22/94	9502588	BES-85	1200	0.065	15	0.0049	0	0	<62	<0.0197	IWA	INSIDE WORK AREA
11/22/94	9502589	BES-86	1200	0.065	15	0.0049	0	0	<62	<0.0197	IWA	INSIDE WORK AREA
11/22/94	9502590	BES-87	1200	0.065	15	0.0049	0	0	<62	<0.0197	IWA	INSIDE WORK AREA
11/22/94	9502591	BES-88	1200	0.000	*******	*******	0	0	<*******	<*******	OWA	OUTSIDE WORK AREA; NOT ANALYZED

This report applies only to the sample, or samples, investigated and is not necessarily indicative of the quality or condition of apparently identical or similar products. As a mutual protection to clients, the public and these Laboratories, this report is submitted and accepted for the exclusive use of the client to whom it is addressed and upon the condition that it is not to be used, in whole or in part, in any advertising or publicity matter without prior written authorization from us. Sample types, locations and collection protocols are based upon the information provided by the persons submitting them and, unless collected by personnel of these Laboratories, we expressly disclaim any knowledge and liability for the accuracy and completeness of this information. Residual sample material will be discarded in accordance with the appropriate regulatory guidelines, unless otherwise requested by the client. NVLAP Accreditation applies only to polarized light microscopy of bulk samples and transmission electron microscopy of air samples.

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AMA Analytical Services, Inc.
Electron & Optical Microscopy Services

CERTIFICATE OF ANALYSIS

NVLAP

IH Services, Inc.
1831-E Portal Street
Holabird Industrial Park
Baltimore, MD 21224
ATTENTION: Anthony Ortiz

JOB SITE: Bextslor Elementary # 150
JOB NUMBER: EL00001-239
SUBMITTED BY: IH Services, Inc.
FILTER MEDIA: MCE 25mm Dia (385 mm^2) N/P Micron Pore

DATE ANALYZED: 11/23/94
CHAIN OF CUSTODY #: 31386
PERSON SUBMITTING: Anthony Ortiz

SUMMARY OF TRANSMISSION ELECTRON MICROSCOPY

DATE SAMPLED	AMA LAB NUMBER	CLIENT NUMBER	VOLUME SAMPLED (LITERS)	FILTER AREA ANALYZED (mm^2)	ANALYTICAL SENSITIVITY S/mm^2	S/cc	NO. OF ASBESTOS STRUCTURES AND TYPE	NO. OF NON-ASBESTOS STRUCTURES	ASBESTOS CONCENTRATION S/mm^2	S/cc	SAMPLE TYPE	SAMPLE LOCATION
11/22/94	9502592	BES-89	1200	0.000	*******	*******	0	0	<*******	<*******	OWA	OUTSIDE WORK AREA; NOT ANALYZED
11/22/94	9502593	BES-90	1200	0.000	*******	*******	0	0	<*******	<*******	OWA	OUTSIDE WORK AREA; NOT ANALYZED
11/22/94	9502594	BES-91	1200	0.000	*******	*******	0	0	<*******	<*******	OWA	OUTSIDE WORK AREA; NOT ANALYZED
11/22/94	9502595	BES-92	1200	0.000	*******	*******	0	0	<*******	<*******	OWA	OUTSIDE WORK AREA; NOT ANALYZED

Analytical procedures used meet or exceed the AHERA "Interim Transmission Electron Microscopy Analytical Methods" protocol described in Appendix A to Subpart E of 40 CFR Part 763.

G Edward Carney

This report applies only to the sample, or samples, investigated and is not necessarily indicative of the quality or condition of apparently identical or similar products. As a mutual protection to clients, the public and these Laboratories, this report is submitted and accepted for the exclusive use of the client to whom it is addressed and upon the condition that it is not to be used, in whole or in part, in any advertising or publicity matter without prior written authorization from us. Sample types, locations and collection protocols are based upon the information provided by the persons submitting them and, unless collected by personnel of these Laboratories, we expressly disclaim any knowledge and liability for the accuracy and completeness of this information. Residual sample material will be discarded in accordance with the appropriate regulatory guidelines, unless otherwise requested by the client. NVLAP Accreditation applies only to polarized light microscopy of bulk samples and transmission electron microscopy of air samples.
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APPENDIX B

TEM FIBER COUNT SHEETS

AMA Analytical Services, Inc.

An AIHA/NVLAP Accredited Laboratory

FIBER COUNT SHEET FOR TRANSMISSION ELECTRON MICROSCOPY

Date of Analysis 11/23/94 AMA Lab ID # 195-2586 Filter Type/Size: MCE 25 mm PC ____ mm

Client IH Services Sample Number 83 Starting Time ____ : Filter Porosity NP µm Lot# NP

Chain of Custody # 31386 Stopping Time ____ : Filter Manufacturer N1

Analyst G.F. Carey Grid Storage Box ID # 95028 Working Mag. 15 K L.O.D./Sensitivity 62 s/mm² 0.0197 s/cc

(signed) G.F. Carey Holder # ____ Grid 9 MB Accel. Voltage 100 kV Volume of air Sampled 1200 L

Method/Type (circle): EPA Level II (AHERA) Other: ____ (Air) Water Bulk Wipe Grid Openings to Observe (AHERA) 6

Grid Opening #/Location	Structure Number	Structure Type	Length & Width (in microns)	SAED	Saved Spectrum Identification #	Elements Identified	Fiber Negative Number	SAED Negative Number	Magnification or Camera Length	
1/X-6	NSD		:						K	cm
2/G-5	NSD		:						K	cm
3/O-2	NSD		:						K	cm
4/I-6 ☒	NSD		:						K	cm
5/H-2 ☒	NSD		:						K	cm
6/U-1 ☒	NSD		:						K	cm
			:						K	cm
			:						K	cm
			:						K	cm
			:						K	cm
			:						K	cm
			:						K	cm
			:						K	cm
			:						K	cm
			:						K	cm

LEGEND: NSD = No Structures Detected F = Fiber B = Bundle C = Cluster M = Matrix UTO = Unable to Obtain ☒ = 2nd Grid

Total # of Grid Openings Observed 6 = 0.06 mm² # of Structures Counted: 0

Asbestos Type: ____	____ s < 5µm + ____ s ≥ 5µm	= ____ s/mm²	= ____ s/cc
Asbestos Type: ____	____ s < 5µm + ____ s ≥ 5µm	= ____ s/mm²	= ____ s/cc
Non-Asbestos Type: ____	____ s < 5µm + ____ s ≥ 5µm	= ____ s/mm²	= ____ s/cc
Total Asbestos Structures Counted	= 0 s	= 262 s/mm²	= 0.0197 s/cc

SAED Calibration Date 11/21/94 Mean Grid Opening Area is 0.0101 mm² NOTES: 15/0.049

EDXA Calibration Date ____/____/____ Spectra Disk Identification # ____

Mag. Calibration Date 11/21/94 EM Serial Number is 1561427

4475 Forbes Blvd. • Lanham, MD 20706 • (301) 459-2640 • TOLL FREE (800) 346-0961 • FAX: 301-459-2643

AMA Analytical Services, Inc.

An AIHA/NVLAP Accredited Laboratory

FIBER COUNT SHEET FOR TRANSMISSION ELECTRON MICROSCOPY

Date of Analysis 11/23/94 AMA Lab ID # 195-2587 Filter Type/Size: MCE 25 mm PC ____ mm

Client IH Services Sample Number 84 Starting Time ____ : Filter Porosity NP µm Lot# NP

____ Chain of Custody # 31386 Stopping Time ____ : Filter Manufacturer N1

Analyst GE Carey Grid Storage Box ID # 95028 Working Mag. 15 K L.O.D./Sensitivity 62 s/mm² 0.0197 s/cc

(signed) [signature] Holder # ____ Grid 10 Hex Accel. Voltage 100 kV Volume of air Sampled 1200 L

Method/Type (circle): EPA Level II (AHERA) Other: ____ (Air) Water Bulk Wipe Grid Openings to Observe (AHERA) 6

Grid Opening #/Location	Structure Number	Structure Type	Length & Width (in microns)	SAED	Saved Spectrum Identification #	Elements Identified	Fiber Negative Number	SAED Negative Number	Magnification or Camera Length	
1/K-6	NSD		:						K	cm
2/R-2	NSD		:						K	cm
3/V-2	NSD		:						K	cm
4/O-5 ☒	NSD		:						K	cm
5/J-6 ☒	NSD		:						K	cm
6/X-1 ☒	NSD		:						K	cm
			:						K	cm
			:						K	cm
			:						K	cm
			:						K	cm
			:						K	cm
			:						K	cm
			:						K	cm
			:						K	cm
			:						K	cm

LEGEND: NSD = No Structures Detected F = Fiber B = Bundle C = Cluster M = Matrix UTO = Unable to Obtain ☒ = 2nd Grid

Total # of Grid Openings Observed 6 = 0.063 mm² # of Structures Counted: 0

Asbestos Type: ____ ____ s <5µm + ____ s ≥5µm = ____ s/mm² = ____ s/cc

Asbestos Type: ____ ____ s <5µm + ____ s ≥5µm = ____ s/mm² = ____ s/cc

Non-Asbestos Type: ____ ____ s <5µm + ____ s ≥5µm = ____ s/mm² = ____ s/cc

Total Asbestos Structures Counted = 0 s = <62 s/mm² = <0.0197 s/cc

SAED Calibration Date 11/21/94 Mean Grid Opening Area is 0.0107 mm² NOTES: 15/0.0197

EDXA Calibration Date ____/____/____ Spectra Disk Identification # ____

Mag. Calibration Date 11/21/94 EM Serial Number is 1561427

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AMA Analytical Services, Inc.

An AIHA/NVLAP Accredited Laboratory

FIBER COUNT SHEET FOR TRANSMISSION ELECTRON MICROSCOPY

Date of Analysis 11/23/94 AMA Lab ID # 795-2588 Filter Type/Size: MCE 25 mm PC ____ mm

Client IH Services Sample Number 85 Starting Time ____ : Filter Porosity NP µm Lot# NP

____ Chain of Custody # 31386 Stopping Time ____ : Filter Manufacturer NI

Analyst GE Carney Grid Storage Box ID # 95028 Working Mag. 15 K L.O.D./Sensitivity 62 s/mm² 0.0197 s/cc

(signed) [signature] Holder # ____ Grid 11 Accel. Voltage 100 kV Volume of air Sampled 1200 L

Method/Type (circle): EPA Level II (AHERA) Other: ____ (Air) Water Bulk Wipe Grid Openings to Observe (AHERA) 6

Grid Opening #/Location	Structure Number	Structure Type	Length & Width (in microns)	SAED	Saved Spectrum Identification #	Elements Identified	Fiber Negative Number	SAED Negative Number	Magnification or Camera Length	
1/D-2	NSD		:						K	cm
2/Q-2	NSD		:						K	cm
3/Z1	NSD		:						K	cm
4/U-2 ☒	NSD		:						K	cm
5/X-5 ☒	NSD		:						K	cm
6/R-2 ☒	NSD		:						K	cm
			:						K	cm
			:						K	cm
			:						K	cm
			:						K	cm
			:						K	cm
			:						K	cm
			:						K	cm
			:						K	cm
			:						K	cm

LEGEND: NSD = No Structures Detected F = Fiber B = Bundle C = Cluster M = Matrix UTO = Unable to Obtain ☒ = 2nd Grid

Total # of Grid Openings Observed 6 = 0.021 mm² # of Structures Counted: 0

Asbestos Type: ____ ____ s <5µm + ____ s ≥5µm = ____ s/mm² = ____ s/cc

Asbestos Type: ____ ____ s <5µm + ____ s ≥5µm = ____ s/mm² = ____ s/cc

Non-Asbestos Type: ____ ____ s <5µm + ____ s ≥5µm = ____ s/mm² = ____ s/cc

Total Asbestos Structures Counted = 0 s = 262 s/mm² = 0.0197 s/cc

SAED Calibration Date 11/21/94 Mean Grid Opening Area is 0.0109 mm² NOTES: 15/0349

EDXA Calibration Date ____/____/____ Spectra Disk Identification # ____

Mag. Calibration Date 11/21/94 EM Serial Number is 1561437

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FIBER COUNT SHEET FOR TRANSMISSION ELECTRON MICROSCOPY

Date of Analysis 11/23/94 AMA Lab ID # 195-2589 Filter Type/Size: MCE 25 mm PC ____ mm

Client IH Services Sample Number 86 Starting Time ____ : Filter Porosity NP µm Lot# NP

Chain of Custody # 31386 Stopping Time ____ : Filter Manufacturer M1

Analyst GE Carney Grid Storage Box ID # 95028 Working Mag. 15 K L.O.D./Sensitivity 62 s/mm² 0.0197 s/cc

(signed) [signature] Holder # ____ Grid 12 Mod Accel. Voltage 100 kV Volume of air Sampled 1200 L

Method/Type (circle): EPA Level II (AHERA) Other: ____ (Air) Water Bulk Wipe Grid Openings to Observe (AHERA) 6

Grid Opening #/Location	Structure Number	Structure Type	Length & Width (in microns)	SAED	Saved Spectrum Identification #	Elements Identified	Fiber Negative Number	SAED Negative Number	Magnification or Camera Length	
1/R-2	NSD		:						K	cm
2/D-5	NSD		:						K	cm
3/V-6	NSD		:						K	cm
4/i-1 K	NSD		:						K	cm
5/A-2 K	NSD		:						K	cm
6/w-6 K	NSD		:						K	cm
			:						K	cm
			:						K	cm
			:						K	cm
			:						K	cm
			:						K	cm
			:						K	cm
			:						K	cm
			:						K	cm
			:						K	cm
			:						K	cm

LEGEND: NSD = No Structures Detected F = Fiber B = Bundle C = Cluster M = Matrix UTO = Unable to Obtain ☒ = 2nd Grid

Total # of Grid Openings Observed 6 = 0.365 mm² # of Structures Counted: 0

Asbestos Type: ____ ____ s <5µm + ____ s ≥5µm = ____ s/mm² = ____ s/cc

Asbestos Type: ____ ____ s <5µm + ____ s ≥5µm = ____ s/mm² = ____ s/cc

Non-Asbestos Type: ____ ____ s <5µm + ____ s ≥5µm = ____ s/mm² = ____ s/cc

Total Asbestos Structures Counted = 0 s = <.62 s/mm² = <0.0197 s/cc

SAED Calibration Date 11/21/94 Mean Grid Opening Area is 0.0607 mm² NOTES: 15/0.0197

EDXA Calibration Date ____/____/____ Spectra Disk Identification # ____

Mag. Calibration Date 11/21/94 EM Serial Number is 1501427

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AMA Analytical Services, Inc.

An AIHA/NVLAP Accredited Laboratory

FIBER COUNT SHEET FOR TRANSMISSION ELECTRON MICROSCOPY

Date of Analysis 11/23/94 AMA Lab ID # 795-2590 Filter Type/Size: MCE 25 mm PC ____ mm

Client IH Services Sample Number 87 Starting Time ____ Filter Porosity NP µm Lot# NP

Chain of Custody # 31386 Stopping Time ____ Filter Manufacturer N1

Analyst CE Carney Grid Storage Box ID # 95028 Working Mag. 15 K L.O.D./Sensitivity 62 s/mm² 0.0197 s/cc

(signed) CE Carney Holder # ____ Grid 13 AgB Accel. Voltage 100 kV Volume of air Sampled 1200 L

Method/Type (circle): EPA Level II (AHERA) Other: ____ (Air) Water Bulk Wipe Grid Openings to Observe (AHERA) 6

Grid Opening #/Location	Structure Number	Structure Type	Length & Width (in microns)	SAED	Saved Spectrum Identification #	Elements Identified	Fiber Negative Number	SAED Negative Number	Magnification or Camera Length	
1/W-5	NSD		:						K	cm
2/Y-5	NSD		:						K	cm
3/J-6	NSD		:						K	cm
4/X-2 ☒	NSD		:						K	cm
5/K-5 ☒	NSD		:						K	cm
6/C-6 ☒	NSD		:						K	cm
			:						K	cm
			:						K	cm
			:						K	cm
			:						K	cm
			:						K	cm
			:						K	cm
			:						K	cm
			:						K	cm
			:						K	cm

LEGEND: NSD = No Structures Detected F = Fiber B = Bundle C = Cluster M = Matrix UTO = Unable to Obtain ☒ = 2nd Grid

Total # of Grid Openings Observed 6 = 0.305 mm² # of Structures Counted: 0

Asbestos Type: ____ ____ s < 5µm + ____ s ≥ 5µm = ____ s/mm² = ____ s/cc

Asbestos Type: ____ ____ s < 5µm + ____ s ≥ 5µm = ____ s/mm² = ____ s/cc

Non-Asbestos Type: ____ ____ s < 5µm + ____ s ≥ 5µm = ____ s/mm² = ____ s/cc

Total Asbestos Structures Counted = 0 s = <62 s/mm² = <0.0197 s/cc

SAED Calibration Date 11/21/94 Mean Grid Opening Area is 0.0103 mm² NOTES: 15 / 0349

EDXA Calibration Date ____/____/____ Spectra Disk Identification # ____

Mag. Calibration Date 11/21/94 EM Serial Number is 1561327

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APPENDIX C

CHAIN OF CUSTODY FORMS

AMA Analytical Services, Inc.

AIHA (#8863) NVLAP (#1143) NY ELAP (10920)
4485 Forbes Blvd. • Lanham MD, 20706
(301) 459-2640 • (800) 346-0961• Fax(301) 459-2643

CHAIN OF CUSTODY

(Please Refer To This Number For Inquiries) 31386

MAILING ADDRESS:

1. Submittal Date: 11-22-94
2. Client Name: IH Services Inc.
3. Street/RFD/P.O. Box: 1831 Portal St.
4. City, State, Zip: Balto., Md. 21224
5. Contact Person: Anthony Ortiz

Job Name/location: Bendalow Elementary #150
Job #: EL00001-239 P.O. #:
Bill To: IH Services Inc
Phone #: (410) 633-4000 Fax(410) 6334122
Submitted By: Anthony Ortiz (Print) (Signature)

6. DATE & TIME RESULTS REQUIRED: 11 / 23 / 94, Time: 12:00 PM ☑ IMMED. ☐ 24HR ☐ 48HR ☐ 72HR ☐ 5-DAY OTHER(Specify):

SAMPLE DATA:

1. Analysis Type: ☑ Asbestos ☐ Lead ☐ NOB - Whole (PLM/TEM) ☐ NOB Res. Ash (TEM) ☐ Other(Specify)
2. Total Number Of Samples: TEM 13 PCM ____ PLM ____ LEAD ____ OTHER(Specify)
3. ELECTRON MICROSCOPY SAMPLES:
   A. Filter Type: PC ☐ MCE ☑ B. Porosity: ____ Micron C. Diameter: ☐ 37mm ☑ 25mm
4. Release Critera/Analytical Sensitivity: 0.010 f/cc ☐ 0.005 f/cc ☐ AHERA ☑ % ASBESTOS ☐ S\FT² ☐ OTHER ☐
5. Field Sheet Attached? YES ☐ NO ☑ If No Then Please Complete The Following:

CLIENT ID NUMBER	AMA ID NUMBER	SAMPLE LOCATION	DATE	VOLUME (LITERS)	ANALYSIS: TEM	PCM	PLM	LEAD	OTHER	MATRIX: AIR	BLANK	BULK	WIPE	OTHER
BES80	195·[illegible]	Blank	11-22-94	—	—						—			
81	2584	Blank	11-22-94	—	—						—			
82	2585	Blank	11-22-94	—	—						—			
83	2586	Inside	11-22-94	1200	—					—				
84	2587	Inside	11-22-94	1200	—					—				
85	2588	Inside	11-22-94	1200	—					—				
86	2589	Inside	11-22-94	1200	—					—				
87	2590	Inside	11-22-94	1200	—					—				
88	2591	Outside	11-22-94	1200	—					—				
89	2592	outside	11-22-94	1200	—					—				
90	2593	outside	11-22-94	1200	—					—				
91	2594	outside	11-22-94	1200	—					—				
92	2595	outside	11-22-94	1200	—					—				

REPORTING DATA:

1. Verbal Results To Whom? Name: ____ Phone: ____ Beeper: ____
2. Date Written Results Required 11 / 30 / 94

LABORATORY STAFF ONLY: (CUSTODY)

1. Date/Time RCVD: 11 / 23 / 94 @ 1120 Via: DLO By(Print): Lynn Ewin Sign: Lynn Ewin
2. Date/Time Analyzed: 11 / 23 / 94 @ 1428 By(Print): G.E.Carey Sign: G.E. Carey
3. Results Reported To: Ted G. / A. Ortiz Via: ____ Date: 11 / 23 / 94 Time: 1432 Initials: GC
4. Comments: ____

FOR INQUIRES PLEASE CALL	
MARCOR ENVIRONMENTAL, INC.	
PHONE NO.	410-796-5991
FAX NO.	410-796-9446
CONTACT:	AL HORAK

MARCOR ENVIRONMENTAL

CUSTOMER NO.
C00083
INVOICE NO.
101802

Remit Payments to:
P.O. Box 630039,
Baltimore, Maryland 21263

BILL TO

ASBESTOS COORDINATOR
2011 LINDEN AVENUE
BALTIMORE, MD 21217

ATTENTION: DAVE MITCHELL

INVOICE DATE: 12/13/94
MARCOR JOB #: EL-00001-229
CUSTOMER REF. #: BP-17492
STATE WORK PERFORMED: MD
PAGE NUMBER: 1

JOB NAME: BENTALOU ELEMENTARY 150

JOB LOCATION: BENTALOU ELEMENTARY #150
220 NORTH BENTALOU STREET
BALTIMORE, MD 21223

FOR SERVICES RENDERED THROUGH 11/30/94 UNDER THE BASE CONTRACT.
PERIOD OF PERFORMANCE: 10/31/94 THRU 11/30/94
THIS INVOICE DOES NOT INCLUDE 104 HOURS OF SUPERVISOR TIME
WHICH IS NOT BILLABLE TO THE CITY.

	HOURS	RATE	AMOUNT
SBESTOS LABORER	841.50	29.93	25186.10
ARPENTER	14.00	57.78	808.92
SBESTOS LABORER	.00	.00	.00
ARPENTER	.00	.00	.00
TOTAL LABOR CHARGES	855.50		$ 25,995.02
			.00
URCHASED MATERIALS			376.74
TANDARD MATERIALS USED			2755.58
TOTAL OTHER DIRECT COSTS			3,132.32
CURRENT BILLINGS			29,127.34
AMOUNT DUE THIS INVOICE			$ 29,127.34

JOB SUMMARY

TOTAL BILLINGS	$ 29,127.34	TOTAL RETENTION	$ .00
TOTAL HOURS	855.50	TOTAL SALES TAX	$ .00
TOTAL COLLECTIONS	$ .00		

TERMS: DUE UPON RECEIPT WITH SERVICE CHARGES OF 1.5% PER MONTH ON UNPAID BALANCE. PERCENTAGE RATE EQUAL TO 18% PER ANNUM. MARCOR RESERVES THE RIGHT TO APPLY PAYMENTS TO SERVICE CHARGES OR OLDEST INVOICES FIRST.

ORIGINAL INVOICE

CONTROL NUMBER 001211

FOR INQUIRES PLEASE CALL	
MARCOR ENVIRONMENTAL, INC.	
PHONE NO.	410-796-5991
FAX NO.	410-796-9446
CONTACT:	AL HORAK

MARCOR ENVIRONMENTAL

CUSTOMER NO.
C00083
INVOICE NO.
101802

Remit Payments to:
P.O. Box 630039,
Baltimore, Maryland 21263

BILL TO

ASBESTOS COORDINATOR
2011 LINDEN AVENUE
BALTIMORE, MD 21217

ATTENTION: DAVE MITCHELL

INVOICE DATE: 12/13/94
MARCOR JOB #: EL-00001-229
CUSTOMER REF. #: BP-17492
STATE WORK PERFORMED: MD
PAGE NUMBER: 2

NVOICE BACKUP

IRECT LABOR AT FIXED RATES:

	HOURS	RATE	AMOUNT
ASBESTOS LABORER	841.50	29.93	25,186.10
CARPENTER	14.00	57.78	808.92
	855.50		25,995.02

THER DIRECT COSTS:

	COST/QTY		RATE	AMOUNT
PURCHASED MATERIALS				
NATIONAL LUMBER CO.	313.95		1.2000	376.74
	** TOTAL			376.74
STANDARD MATERIALS USED				
STANDARD MATERIALS				
BAGS-6MIL LABELED ASBESTOS	1,334.00	EACH	.5400	720.36
RESPIRATOR FILTERS "A"	20.00	EACH	3.4800	69.60
SMOKE TUBES	2.00	EACH	5.7400	11.48
DRUMS	3.00	EACH	8.6400	25.92
DUCT TAPE - 2"	81.00	ROLL	5.6900	460.89
DUCT TAPE - 3"	88.00	ROLL	5.6900	500.72
ENCAPSULANT - 3222	10.00	GALLON	9.6200	96.20
NEGATIVE AIR PRE FILTERS	30.00	EACH	.7000	21.00
NEGATIVE AIR BOX FILTERS	23.00	EACH	3.3500	77.05
GLOVES - COTTON	11.00	PAIR	1.4600	16.06
GLOVES - PVC	10.00	PAIR	1.2300	12.30
MOP HEADS	5.00	EACH	4.7400	23.70
POLY SHEETING - 6 MIL	6.00	ROLL	57.8400	347.04
POLY SHEETING - BLACK	.25	ROLL	36.0000	9.00
QUICK SCRUB (SCRUBBER GRILL	12.00	EACH	2.7960	33.55
RAGS	80.00	POUND	.5900	47.20
SHOWER TOWELS	551.00	EACH	.1400	77.14

TERMS: DUE UPON RECEIPT WITH SERVICE CHARGES OF 1.5% PER MONTH ON UNPAID BALANCE. PERCENTAGE RATE EQUAL TO 18% PER ANNUM. MARCOR RESERVES THE RIGHT TO APPLY PAYMENTS TO SERVICE CHARGES OR OLDEST INVOICES FIRST.

ORIGINAL INVOICE

CONTROL NUMBER 001212

FOR INQUIRES PLEASE CALL	
MARCOR ENVIRONMENTAL, INC.	
PHONE NO:	410-796-5991
FAX NO:	410-796-9446
CONTACT:	AL HORAK

MARCOR ENVIRONMENTAL

CUSTOMER NO:
C00083
INVOICE NO:
101802

Remit Payments to:
P.O. Box 630039,
Baltimore, Maryland 21263

BILL TO

ASBESTOS COORDINATOR
2011 LINDEN AVENUE
BALTIMORE, MD 21217

ATTENTION: DAVE MITCHELL

INVOICE DATE: 12/13/94
MARCOR JOB #: EL-00001-229
CUSTOMER REF. #: BP-17492
STATE WORK PERFORMED: MD
PAGE NUMBER: 3

NVOICE BACKUP

	COST/QTY		RATE	AMOUNT
STANDARD MATERIALS USED				
CAUTION SIGNS	8.00	EACH	.3200	2.56
SPRAY ADHESIVE	46.00	CAN	2.4600	113.16
WASTE LABELS	725.00	EACH	.0720	52.20
WETTING AGENT	1.00	GALLON	11.8100	11.81
WIRE BRUSH-4 INCH	12.00	EACH	2.2200	26.64
	** TOTAL			2,755.58
				3,132.32
** Total Project	EL-00001-229			29,127.34

TERMS: DUE UPON RECEIPT WITH SERVICE CHARGES OF 1.5% PER MONTH ON UNPAID BALANCE. PERCENTAGE RATE EQUAL TO 18% PER ANNUM. MARCOR RESERVES THE RIGHT TO APPLY PAYMENTS TO SERVICE CHARGES OR OLDEST INVOICES FIRST.

ORIGINAL INVOICE

CONTROL NUMBER 001213

NATIONAL LUMBER Co.

4901 PULASKI HIGHWAY • BALTIMORE, MD 21224
410-675-4740 FAX 410-675-0119

Fed. I.D. No. 52-0426900

DATE	INVOICE
11/09/94	072905

RECEIVED
** INVOICE **
NOV 14 1994

SOLD TO
MA0480
MARCOR ENVIRONMENTAL
BUILDING B SUITE G
6679 SANTA BARBARARD
BALTIMOE MD 21227

SHIP TO

SCHOOL # 150

ORD BY JIM

(410)796-5991

TAX JURISDICTION NO./DESCRIPTION 0001 MD

DATE ORDERED	DATE SHIPPED	SHIP VIA	JOB NO.	CUST ORDER NO.	SALESPERSON	CLK	TERMS	COPY	PAGE
01 11/07/94	11/07/94	WILL CALL		2926		002	NET 30		0101

ITEM	ORDERED / BACKORDERED	SHIPPED	DESCRIPTION	UNIT PRICE	AMOUNT
248D PC	100.00	100.00	2X4X8/0 K DRY	2.99	299.00

SERVICE ®

JOB NUMBER	DEPT	ACCOUNT	AMOUNT
00001229	111	52010	313.95
			$
			$
			$
			$

HOLD (CIRCLE)
VOUCHER #
APPROVAL BY
DATE 11/15/94

CC: DB

SALES AMOUNT	SALES TAX	SHIPPING CHG.		CODE	DEPOSIT	CASH	CODE	
299.00	14.95							313.95

WINTER SAFETY SALT NOW IN STOCK!

PLEASE PAY THIS AMOUNT

CLAIMS FOR ERROR OR SHORTAGE MUST BE MADE IN 3 DAYS. A CHARGE OF 25% IS MADE FOR HANDLING RETURNED STOCK MATERIAL. NO REFUND ALLOWED ON SPECIAL ORDER MATERIAL. All merchandise returns must be made within two (2) weeks of purchase date, accompanied by sales ticket, and are subject to our inspection. Only items currently in stock will be acceptable for return.

CUSTOMER INVOICE

RECEIVED BY: _____

1. Invoices shall be sent IN TRIPLICATE: 1) a copy marked "Accounting", 2) a copy marked "Operations/File", and 3) a copy marked "Remittance."
2. Order is to be entered in accordance with prices, delivery, and specifications shown above.
3. Notify us immediately if you are unable to ship as specified.

THIS ORDER EXPRESSLY LIMITS ACCEPTANCE TO THE TERMS AND CONDITIONS ON THE FACE AND BACK HEREOF AND ANY ADDITIONAL OR DIFFERENT TERMS PROPOSED BY SELLER ARE OBJECTED TO AND REJECTED UNLESS EXPRESSLY ASSENTED TO IN WRITING BY THE BUYER.

BY _____ AUTHORIZED SIGNATURE

CONFIRMING, DO NOT DUPLICATE

ACCOUNTING

DATE	PAGE	OF
NOV 7 1994	1	1

MARCOR ENVIRONMENTAL

DAILY JOB REPORT — ABATEMENT OPERATIONS

CONTROL NO. 017002

FORM #05405F1

JOB NAME	JOB NUMBER: OFFICE	CONTRACT NUMBER	WORK ORDER #	PREPARED BY
BENTLOU SCHOOL #150	2 2	0 0 0 0 1	2 2 9	KHAMLA KHANTRY

LABOR USED

EMPLOYEE NUMBER	ACT. CODE	EMPLOYEE NAME	START TIME	STOP TIME	LUNCH Y or N	HOURS WORKED	DAY HOURS	NIGHT HOURS	O.T. HOURS	ABSNT/TRDY CODE	TITLE	PROT. LEVEL	MILEAGE REIMB.	EMPLOYEE SIGNATURE
011350		KHAMLA KHANTRY	1500	2330	Y	8	3	5	0		SUP			Khamla Khantry
019760		DENNIS STREET	1500	2330	"	8	3	5	0		FOR			Dennis Street
007850		NOUNE HANELUXAY	1500	2330	"	8	3	5	0		"			N. Haneluxay
011083		PHAIN KEOHANAM	1500	2330	"	8	3	5	0		"			Phain Keohanam
		CO-V. TRUONG	1500	2330	"	8	3	5	0		"			Co-V. Truong
301915		MIGUEL BARBOSA	1500	2330	"	8	3	5	0		"			MIGUEL BARBOSA
		TOTAL MAN-HOURS												
		TOTAL HOURS TO BE PAID (INCLUDING ALL CONTINUATION PAGES)								NO. OF CONTINUATION PAGES ATTACHED:				

STANDARD MATERIALS USED

DESCRIPTION	UNIT	ITEM CODE	UNITS USED	DESCRIPTION	UNIT	ITEM CODE	UNITS USED
ABSORBENT—FORMULA 1M-1216	POUND	0300		GLOVES—COTTON	PAIR		1.24
BAGS—6 MIL ASBESTOS	EACH	0380	40	GLOVES—RUBBER	PAIR		
BAGS—6 MIL CLEAR	EACH	0390		MASKING TAPE	ROLL	2860	
BAGS—10 MIL ASBESTOS	EACH	0385		MASTIC REMOVER	GALLON	2900	
BAGS-GLOVE BAGS—ALL SIZES-ASBESTOS	EACH	0420		PAINT BRUSHES AND ROLLERS	EACH	3140	
BARRIER TAPE-CAUTION/DANGER-1000' ROLL	LIN FT	0460		PLASTIC LINERS—3 MIL—100 PER CARTON	CARTON	3180	
RESPIRATOR CARTRIDGES—HEPA	EACH	0820		PLASTIC LINERS—6 MIL—100 PER CARTON	CARTON	3220	
RESPIRATOR CARTRIDGES—ORGANIC VAPOR/HEPA	EACH	0860		POLY SHEETING—10 MIL	ROLL	3260	
DETECTOR TUBES-SMOKE	EACH	1300	1.	POLY SHEETING—6 MIL	ROLL	3300	1.
DRUMS—FIBER	EACH	1540		POLY SHEETING—4 MIL	ROLL	3320	
DUCT TAPE—1"	ROLL	1570		POLY SHEETING—FIRE RETARDANT ___ MIL	ROLL		
DUCT TAPE—2"	ROLL	1580	12	POLY SHEETING—BLACK ___ MIL	ROLL		
DUCT TAPE—3"	ROLL	1590	10	POLY SHEETING—NYLON REINFORCED ___ MIL	ROLL		
DUCT TAPE—4"	ROLL	1620		PROTECTIVE SUITS—ASBESTOS	EACH	3660	25
DUCT TAPE—BLUE	ROLL	1630		QUICK SCRUB (SCRUBBER GRILL)	EACH	4140	
ENCAPSULANT—3220	GALLON	1710		REWETTABLE CLOTH 60"	LIN FT	4220	
ENCAPSULANT—3222	GALLON	1730		SAFETY FENCE—50 FOOT ROLL	ROLL	4260	
ENCAPSULANT—3232	GALLON	1740		SCRAPERS	EACH	4420	
ENCAPSULANT—3260	GALLON	1750		SHOWER TOWELS—300 PER CASE	EACH	4500	
ENCAPSULANT—8420	GALLON	1760		SIGNS-DANGER Project Signs	EACH	4540	4.
EXHAUST DUCT—10 FEET PER ROLL	LIN FT	1820		SPRAY ADHESIVE	CAN	4820	12
FILTERS—NEGATIVE AIR-PRE	EACH	1850		SPRAY FOAM	CAN	4860	
FILTERS—NEGATIVE AIR-BOX	EACH	1860		SPRAY PAINT	CAN	4900	
FILTERS—NEGATIVE AIR-HEPA	EACH	1870		SPRAY POLY	GALLON	4940	
FILTERS—SOCK FILTER—1 TO 20 MICRONS	EACH	2100		VACUUM BAGS	EACH	4980	
FILTERS-VACUUM—DACRON	EACH	2140		WASTE BOXES/GUZZLER BOXES	EACH	5100	
FILTERS-VACUUM—HEPA	EACH	2180		WASTE LABELS	EACH	5140	

OTHER MATERIALS & EQUIPMENT USED

DESCRIPTION	UNIT	ITEM CODE	UNITS USED
N.A unit 2K	2		
82 VAC	1		
2x6' 5x8' 1x10' LADDERS			
Ext. cords	10		
HAND SPRAYERS	2.		
SHOVEL PL.	2		
SQUEEGIE	1		
TOOL BOX	1.		
MOP SET	1		
CRC-SAW	1		
SHOWERS complet set.	1.		
Fil. unit.	1		

SPECIAL NOTES, VISITORS TO THE SITE AND MISCELLANEOUS COMMENTS

AMOUNT OF DISPOSAL: N/A

AIR SAMPLING INFORMATION

TYPE	QUANTITY	NUMBER	RESULTS
PRELIMINARY	4	[illegible]	
I.W.A.			
O.W.A.			
PERSONAL			
FINAL			

PRESSURE DIFFERENTIAL READING:

AIR MONITORING COMPANY: [illegible]

ASBESTOS IN WORK AREA NOT PART OF SCOPE: ☐ YES ☒ NO

ASBESTOS HANDLED BY OTHERS: ☐ YES ☒ NO IF YES COMPLETE FORM N/A

VISITORS TO THE SITE:

NAME	COMPANY
NAME	COMPANY
NAME	COMPANY

DELAY INFORMATION

DELAYED: ☐ YES ☒ NO IF YES, BY WHOM:

MANHOURS LOST:

REASON FOR DELAY: N/A

USE BALLPOINT PEN
COMPLETE FRONT SIDE FIRST
THEN REMOVE CARBON
THEN COMPLETE BACK OF FORM LAST

DESCRIPTION OF WORK PERFORMED

UNLOAD material and equipment out from warehouse Trucks and Doing Pre-cleaned the Boiler Room and Set-up Two Laying Poly on wall

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MAROR ENVIRONMENTAL

DAILY JOB REPORT — ABATEMENT OPERATIONS

CONTROL NO. 017004

FORM #05405F1

JOB NUMBER														
JOB NAME	OFFICE		CONTRACT NUMBER						WORK ORDER #			PREPARED BY		
BENTLEY STEM #150	S	L	0	0	0	0	1		2	2	9	KHAMLA KHANTRY		

LABOR USED

EMPLOYEE NUMBER	ACT. CODE	EMPLOYEE NAME	START TIME	STOP TIME	LUNCH Y or N	HOURS WORKED	DAY HOURS	NIGHT HOURS	O.T. HOURS	ABSNT/TRDY CODE	TITLE	PROT. LEVEL	MILEAGE REIMB.	EMPLOYEE SIGNATURE
011330		KHAMLA KHANTRY	0730	1600	Y	8	8	0			SUP			
019760		DENNIS STREET	1230	1600	"	3.5	3.5	0			TECH			
301915		MIGUEL BARBOSA	1230	1600	"	3.5	3.5	0			"			
		CO V THUONG	0730	0930	N	2	2	0			"			
007850		MONIKE MANIVONG	0930	1600	Y	6	6	0			"			
011083		PHAM KEOPHOUM	0930	1600	"	6	6	0			"			
016226		CHA PHIM PHAN	0730	1600	Y	8								
		TRAINEE												

TOTAL HOURS TO BE PAID (INCLUDING ALL CONTINUATION PAGES)

NO. OF CONTINUATION PAGES ATTACHED:

STANDARD MATERIALS USED

DESCRIPTION	UNIT	ITEM CODE	UNITS USED	DESCRIPTION	UNIT	ITEM CODE	UNITS USED
ABSORBENT—FORMULA 1M-1216	POUND	0300		GLOVES— PVC	PAIR		2.
BAGS—6 MIL ASBESTOS	EACH	0380	20	GLOVES—	PAIR		
BAGS—6 MIL CLEAR	EACH	0390		MASKING TAPE	ROLL	2860	
BAGS—10 MIL ASBESTOS	EACH	0385		MASTIC REMOVER	GALLON	2900	
BAGS-GLOVE BAGS—ALL SIZES-ASBESTOS	EACH	0420		PAINT BRUSHES AND ROLLERS	EACH	3140	
BARRIER TAPE-CAUTION/DANGER-1000' ROLL	LIN FT	0460		PLASTIC LINERS—3 MIL—100 PER CARTON	CARTON	3180	
RESPIRATOR CARTRIDGES—HEPA	EACH	0820		PLASTIC LINERS—6 MIL—100 PER CARTON	CARTON	3220	
RESPIRATOR CARTRIDGES—ORGANIC VAPOR/HEPA	EACH	0860		POLY SHEETING—10 MIL	ROLL	3260	
DETECTOR TUBES-SMOKE	EACH	1300		POLY SHEETING—6 MIL	ROLL	3300	2.
DRUMS—FIBER	EACH	1540		POLY SHEETING—4 MIL	ROLL	3320	
DUCT TAPE—1"	ROLL	1570		POLY SHEETING—FIRE RETARDANT ___ MIL	ROLL		
DUCT TAPE—2"	ROLL	1580	12	POLY SHEETING—BLACK ___ MIL	ROLL		
DUCT TAPE—3"	ROLL	1590	16	POLY SHEETING—NYLON REINFORCED ___ MIL	ROLL		
DUCT TAPE—4"	ROLL	1620		PROTECTIVE SUITS—ASBESTOS	EACH	3660	
DUCT TAPE—BLUE	ROLL	1630		QUICK SCRUB (SCRUBBER GRILL)	EACH	4140	
ENCAPSULANT—3220	GALLON	1710		REWETTABLE CLOTH 60"	LIN FT	4220	
ENCAPSULANT—3222	GALLON	1730		SAFETY FENCE—50 FOOT ROLL	ROLL	4260	
ENCAPSULANT—3232	GALLON	1740		~~SCRAPERS~~ NAILS	~~EACH~~	4420	2 LBS.
ENCAPSULANT—3260	GALLON	1750		SHOWER TOWELS—300 PER CASE	EACH	4500	
ENCAPSULANT—8420	GALLON	1760		SIGNS-DANGER	EACH	4540	
EXHAUST DUCT—10 FEET PER ROLL	LIN FT	1820		SPRAY ADHESIVE	CAN	4820	
FILTERS—NEGATIVE AIR-PRE	EACH	1850		SPRAY FOAM	CAN	4860	
FILTERS—NEGATIVE AIR-BOX	EACH	1860		SPRAY PAINT	CAN	4900	
FILTERS—NEGATIVE AIR-HEPA	EACH	1870		SPRAY POLY	GALLON	4940	
FILTERS—SOCK FILTER—1 TO 20 MICRONS	EACH	2100		VACUUM BAGS	EACH	4980	
FILTERS-VACUUM—DACRON	EACH	2140		WASTE BOXES/GUZZLER BOXES	EACH	5100	
FILTERS-VACUUM—HEPA	EACH	2180		WASTE LABELS	EACH	5140	

OTHER MATERIALS & EQUIPMENT USED

DESCRIPTION	UNIT	ITEM CODE	UNITS USED
N.A UNIT	2		
82 VAC	1		
2X EXT. 5,8', 2X6' 1X10' LADDERS.			
EXT. CORDS	20.		
HAND SPRAYERS	2		
SHOVEL PL.	2.		
SQUEEGIE	3		
GANG BOX	1.		
MOP SET	1		
CRC. SAW	1.		
SHOWERS SET	1.		
FIL. UNIT	1.		
PENZOL PANEL	1.		

SPECIAL NOTES. VISITORS TO THE SITE AND MISCELLANEOUS COMMENTS

AMOUNT OF DISPOSAL:

AIR SAMPLING INFORMATION

TYPE	QUANTITY	NUMBER	RESULTS
PRELIMINARY		6	
I.W.A.			
O.W.A.			
PERSONAL			
FINAL			

PRESSURE DIFFERENTIAL READING:

AIR MONITORING COMPANY: VH Services Industrial Hygienist Kelli Garrity

ASBESTOS IN WORK AREA NOT PART OF SCOPE: ☐ YES ☐ NO

ASBESTOS HANDLED BY OTHERS: ☐ YES ☐ NO IF YES COMPLETE FORM

VISITORS TO THE SITE:

NAME	COMPANY
NAME	COMPANY
NAME	COMPANY

DELAY INFORMATION

DELAYED: ☐ YES ☐ NO IF YES, BY WHOM:

MANHOURS LOST:

REASON FOR DELAY:

USE BALLPOINT PEN
COMPLETE FRONT SIDE FIRST
THEN REMOVE CARBON
THEN COMPLETE BACK OF FORM LAST

DESCRIPTION OF WORK PERFORMED

Doing PRE-cleaned Boiler AND TAPE up POLY ON WALL AND Floor AND Build-up WOOD BOXES FOR Hot WATER TANK AND; Fort BoilERS

CUSTOMER'S SIGNATURE

JOB SUPERVISOR'S SIGNATURE

OPERATIONS MANAGER APPROVAL

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MARCOR ENVIRONMENTAL

DAILY LOG REPORT — ABATEMENT OPERATIONS

CONTROL NO. 017006

FORM #05405F1

JOB NAME	OFFICE	CONTRACT NUMBER	WORK ORDER #	PREPARED BY
BENNETT ELEM #130	21	00001	229	KAMLA KHANTRY

LABOR USED

EMPLOYEE NUMBER	ACT. CODE	EMPLOYEE NAME	START TIME	STOP TIME	LUNCH Y or N	HOURS WORKED	DAY HOURS	NIGHT HOURS	O.T. HOURS	ABSNT/TRDY CODE	TITLE	PROT. LEVEL	MILEAGE REIMB.	EMPLOYEE SIGNATURE
019780		DENNIS STREET	0730	0930	N	2	2	0			TRADE			DENNIS STREET
301915		MIGUEL BARBOSA	0730	0930	"	2	2	0			"			MIGUEL BARBOSA
007850		NOUNOU PANGLUNG	0730	0930	"	2	2	0			"			N. PANGLUNG
011083		PRATT KEARNEY	0730	0930	"	2	2	0			"			PRATT KEARNEY
		CARPENTERS WORKING.												
		TRAINEE-1												

TOTAL HOURS TO BE PAID: (INCLUDING ALL CONTINUATION PAGES)

NO. OF CONTINUATION PAGES ATTACHED:

STANDARD MATERIALS USED

DESCRIPTION	UNIT	ITEM CODE	UNITS USED	DESCRIPTION	UNIT	ITEM CODE	UNITS USED
ABSORBENT—FORMULA 1M-1216	POUND	0300		GLOVES—	PAIR		
BAGS—6 MIL ASBESTOS	EACH	0380		GLOVES—	PAIR		
BAGS—6 MIL CLEAR	EACH	0390		MASKING TAPE	ROLL	2860	
BAGS—10 MIL ASBESTOS	EACH	0385		MASTIC REMOVER	GALLON	2900	
BAGS-GLOVE BAGS—ALL SIZES-ASBESTOS	EACH	0420		PAINT BRUSHES AND ROLLERS	EACH	3140	
BARRIER TAPE-CAUTION/DANGER-1000' ROLL	LIN FT	0460		PLASTIC LINERS—3 MIL—100 PER CARTON	CARTON	3180	
RESPIRATOR CARTRIDGES—HEPA	EACH	0820		PLASTIC LINERS—6 MIL—100 PER CARTON	CARTON	3220	
RESPIRATOR CARTRIDGES—ORGANIC VAPOR/HEPA	EACH	0860		POLY SHEETING—10 MIL	ROLL	3260	
DETECTOR TUBES-SMOKE	EACH	1300		POLY SHEETING—6 MIL	ROLL	3300	
DRUMS—FIBER	EACH	1540		POLY SHEETING—4 MIL	ROLL	3320	
DUCT TAPE—1"	ROLL	1570		POLY SHEETING—FIRE RETARDANT ___ MIL	ROLL		
DUCT TAPE—2"	ROLL	1580		POLY SHEETING—BLACK ___ MIL	ROLL		
DUCT TAPE—3"	ROLL	1590		POLY SHEETING—NYLON REINFORCED ___ MIL	ROLL		
DUCT TAPE—4"	ROLL	1620		PROTECTIVE SUITS—ASBESTOS	EACH	3660	
DUCT TAPE—BLUE	ROLL	1630		QUICK SCRUB (SCRUBBER GRILL)	EACH	4140	
ENCAPSULANT—3220	GALLON	1710		REWETTABLE CLOTH 60"	LIN FT	4220	
ENCAPSULANT—3222	GALLON	1730		SAFETY FENCE—50 FOOT ROLL	ROLL	4260	
ENCAPSULANT—3232	GALLON	1740		SCRAPERS	EACH	4420	
ENCAPSULANT—3260	GALLON	1750		SHOWER TOWELS—300 PER CASE	EACH	4500	
ENCAPSULANT—8420	GALLON	1760		SIGNS-DANGER	EACH	4540	
EXHAUST DUCT—10 FEET PER ROLL	LIN FT	1820		SPRAY ADHESIVE	CAN	4820	
FILTERS—NEGATIVE AIR-PRE	EACH	1850		SPRAY FOAM	CAN	4860	
FILTERS—NEGATIVE AIR-BOX	EACH	1860		SPRAY PAINT	CAN	4900	
FILTERS—NEGATIVE AIR-HEPA	EACH	1870		SPRAY POLY	GALLON	4940	
FILTERS—SOCK FILTER—1 TO 20 MICRONS	EACH	2100		VACUUM BAGS	EACH	4980	
FILTERS-VACUUM—DACRON	EACH	2140		WASTE BOXES/GUZZLER BOXES	EACH	5100	
FILTERS-VACUUM—HEPA	EACH	2180		WASTE LABELS	EACH	5140	

OTHER MATERIALS & EQUIPMENT USED

DESCRIPTION	UNIT	ITEM CODE	UNITS USED
N/A			

SPECIAL NOTES. VISITORS TO THE SITE AND MISCELLANEOUS COMMENTS

AMOUNT OF DISPOSAL:

AIR SAMPLING INFORMATION

TYPE	QUANTITY	NUMBER	RESULTS
PRELIMINARY			
I.W.A.			
O.W.A.			
PERSONAL			
FINAL			

PRESSURE DIFFERENTIAL READING:

AIR MONITORING COMPANY:

ASBESTOS IN WORK AREA NOT PART OF SCOPE: ☐ YES ☐ NO

ASBESTOS HANDLED BY OTHERS:
☐ YES ☐ NO IF YES COMPLETE FORM

VISITORS TO THE SITE:

NAME	COMPANY
NAME	COMPANY
NAME	COMPANY

DELAY INFORMATION

DELAYED: ☐ YES ☐ NO IF YES, BY WHOM:

MANHOURS LOST:

REASON FOR DELAY:

USE BALLPOINT PEN
COMPLETE FRONT SIDE FIRST
THEN REMOVE CARBON
THEN COMPLETE BACK OF FORM LAST

DESCRIPTION OF WORK PERFORMED

CUSTOMER'S SIGNATURE

JOB SUPERVISOR'S SIGNATURE

OPERATIONS MANAGER APPROVAL

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MARCOR ENVIRONMENTAL

DAILY JOB REPORT — ABATEMENT OPERATIONS

CONTROL NO. 017007

FORM #05405F1

JOB NAME	OFFICE	CONTRACT NUMBER	WORK ORDER #	PREPARED BY
BENTALOR SITE A @ 150	SF	00001	229	KHAMLA KHANTRY

LABOR USED

EMPLOYEE NUMBER	ACT. CODE	EMPLOYEE NAME	START TIME	STOP TIME	LUNCH Y or N	HOURS WORKED	DAY HOURS	NIGHT HOURS	O.T. HOURS	ABSNT/TRDY CODE	TITLE	PROT. LEVEL	MILEAGE REIMB.	EMPLOYEE SIGNATURE
011350		KHAMLA KHANTRY	1500	2330	Y	8	3	5			SUP			
022650		SACK VONGPHAKDY	1500	2330	"	8	3	5			TECH			
020290		C. THONGDYANGLAT	1500	2330	"	8	3	5			"			
301915		MIGUEL BARBOSA	1500	2330	"	8	3	5			"			MIGUEL BARBOSA
		CO V TRUONG	1500	2330	"	8	3	5			"			
007850		WOUNG HANELOXAY	1500	2330	"	8	3	5			"			
011083		PHATH KEOMANIVONG	1500	2330	"	8	3	5			"			
013150		BILLY MANEPHONE	1500	2330	"	8	3	5			"			
016225		CHO PHIMPHONH	1500	2330	"	8	3	5			"			
		TOTAL HOURS TO BE PAID (INCLUDING ALL CONTINUATION PAGES)												

NO. OF CONTINUATION PAGES ATTACHED:

STANDARD MATERIALS USED

DESCRIPTION	UNIT	ITEM CODE	UNITS USED	DESCRIPTION	UNIT	ITEM CODE	UNITS USED
ABSORBENT—FORMULA 1M-1216	POUND	0300		GLOVES—	PAIR		
BAGS—6 MIL ASBESTOS	EACH	0380	20	GLOVES—	PAIR		
BAGS—6 MIL CLEAR	EACH	0390		MASKING TAPE	ROLL	2860	
BAGS—10 MIL ASBESTOS	EACH	0385		MASTIC REMOVER	GALLON	2900	
BAGS-GLOVE BAGS—ALL SIZES-ASBESTOS	EACH	0420		PAINT BRUSHES AND ROLLERS	EACH	3140	
BARRIER TAPE-CAUTION/DANGER-1000' ROLL	LIN FT	0460		PLASTIC LINERS—3 MIL—100 PER CARTON	CARTON	3180	
RESPIRATOR CARTRIDGES—HEPA	EACH	0820		PLASTIC LINERS—6 MIL—100 PER CARTON	CARTON	3220	
RESPIRATOR CARTRIDGES—ORGANIC VAPOR/HEPA	EACH	0860		POLY SHEETING—10 MIL	ROLL	3260	
DETECTOR TUBES-SMOKE	EACH	1300		POLY SHEETING—6 MIL	ROLL	3300	2.
DRUMS—FIBER	EACH	1540		POLY SHEETING—4 MIL	ROLL	3320	
DUCT TAPE—1"	ROLL	1570		POLY SHEETING—FIRE RETARDANT ___ MIL	ROLL		
DUCT TAPE—2"	ROLL	1580	20	POLY SHEETING—BLACK ___ MIL	ROLL		
DUCT TAPE—3"	ROLL	1590	20	POLY SHEETING—NYLON REINFORCED ___ MIL	ROLL		
DUCT TAPE—4"	ROLL	1620		PROTECTIVE SUITS—ASBESTOS	EACH	3660	25
DUCT TAPE—BLUE	ROLL	1630		QUICK SCRUB (SCRUBBER GRILL)	EACH	4140	
ENCAPSULANT—3220	GALLON	1710		REWETTABLE CLOTH 60"	LIN FT	4220	
ENCAPSULANT—3222	GALLON	1730		SAFETY FENCE—50 FOOT ROLL	ROLL	4260	
ENCAPSULANT—3232	GALLON	1740		SCRAPERS	EACH	4420	
ENCAPSULANT—3260	GALLON	1750		SHOWER TOWELS—300 PER CASE	EACH	4500	
ENCAPSULANT—8420	GALLON	1760		SIGNS-DANGER	EACH	4540	
EXHAUST DUCT—10 FEET PER ROLL	LIN FT	1820		SPRAY ADHESIVE	CAN	4820	18.
FILTERS—NEGATIVE AIR-PRE	EACH	1850	2	SPRAY FOAM	CAN	4860	
FILTERS—NEGATIVE AIR-BOX	EACH	1860	2	SPRAY PAINT	CAN	4900	
FILTERS—NEGATIVE AIR-HEPA	EACH	1870		SPRAY POLY	GALLON	4940	
FILTERS—SOCK FILTER—1 TO 20 MICRONS	EACH	2100		VACUUM BAGS	EACH	4980	
FILTERS-VACUUM—DACRON	EACH	2140		WASTE BOXES/GUZZLER BOXES	EACH	5100	
FILTERS-VACUUM—HEPA	EACH	2180		WASTE LABELS	EACH	5140	

OTHER MATERIALS & EQUIPMENT USED

DESCRIPTION	UNIT	ITEM CODE	UNITS USED
N. A UNIT	2		
55 VAC	1		
2X8X1. 2'6", 5X8' 12'0" LADDERS			
EXT. CORD	20		
HAND SPRAYERS	2		
SHOVELS PL	2		
SQUEEGIE	3		
GANG BOX	1		
MOP SET	1		
CRC. SOW	1		
SHOWER SET	1		
FILT. UNIT	1		
POWER PANEL	1		

SPECIAL NOTES, VISITORS TO THE SITE AND MISCELLANEOUS COMMENTS

AMOUNT OF DISPOSAL:

AIR SAMPLING INFORMATION

TYPE	QUANTITY	NUMBER	RESULTS
PRELIMINARY			
I.W.A.			
O.W.A.			
PERSONAL			
FINAL			

PRESSURE DIFFERENTIAL READING:

AIR MONITORING COMPANY: I.H. Services Inc.
Industrial Hygiene Health & Safety

ASBESTOS IN WORK AREA NOT PART OF SCOPE: ☐ YES ☐ NO

ASBESTOS HANDLED BY OTHERS:
☐ YES ☐ NO IF YES COMPLETE FORM

VISITORS TO THE SITE:

NAME	COMPANY
NAME	COMPANY
NAME	COMPANY

DELAY INFORMATION

DELAYED: ☐ YES ☐ NO IF YES, BY WHOM:

MANHOURS LOST:

REASON FOR DELAY:

USE BALLPOINT PEN
COMPLETE FRONT SIDE FIRST
THEN REMOVE CARBON
THEN COMPLETE BACK OF FORM LAST

DESCRIPTION OF WORK PERFORMED

Sealing up poly on wall and floor at the boiler area.
And going pre-cleaned up.

CUSTOMER'S SIGNATURE

JOB SUPERVISOR'S SIGNATURE

OPERATIONS MANAGER APPROVAL

DATE	PAGE	OF
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MARCOR ENVIRONMENTAL

DAILY JOB REPORT — ABATEMENT OPERATIONS

CONTROL NO: 017008

FORM #05405F1

JOB NAME	JOB NUMBER: OFFICE	CONTRACT NUMBER	WORK ORDER #	PREPARED BY
Central Elementary	2 4	0 0 0 0 1	2 2 9	KHAMA KPGNtry

LABOR USED

EMPLOYEE NUMBER	ACT. CODE	EMPLOYEE NAME	START TIME	STOP TIME	LUNCH Y or N	HOURS WORKED	DAY HOURS	NIGHT HOURS	O.T. HOURS	ABSNT/TRDY CODE	TITLE	PROT. LEVEL	MILEAGE REIMB.	EMPLOYEE SIGNATURE
314615		PaFirio Osorio	1500	2330	Y	8	3	5			[illegible]			[signature]
313491		CESAR MORALES	1500	2330	N	8	3	5			N			[signature]

TOTAL HOURS TO BE PAID (INCLUDING ALL CONTINUATION PAGES)

NO. OF CONTINUATION PAGES ATTACHED:

STANDARD MATERIALS USED

DESCRIPTION	UNIT	ITEM CODE	UNITS USED	DESCRIPTION	UNIT	ITEM CODE	UNITS USED
ABSORBENT—FORMULA 1M-1216	POUND	0300		GLOVES—	PAIR		
BAGS—6 MIL ASBESTOS	EACH	0380		GLOVES—	PAIR		
BAGS—6 MIL CLEAR	EACH	0390		MASKING TAPE	ROLL	2860	
BAGS—10 MIL ASBESTOS	EACH	0385		MASTIC REMOVER	GALLON	2900	
BAGS-GLOVE BAGS—ALL SIZES-ASBESTOS	EACH	0420		PAINT BRUSHES AND ROLLERS	EACH	3140	
BARRIER TAPE-CAUTION/DANGER-1000' ROLL	LIN FT	0460		PLASTIC LINERS—3 MIL—100 PER CARTON	CARTON	3180	
RESPIRATOR CARTRIDGES—HEPA	EACH	0820		PLASTIC LINERS—6 MIL—100 PER CARTON	CARTON	3220	
RESPIRATOR CARTRIDGES—ORGANIC VAPOR/HEPA	EACH	0860		POLY SHEETING—10 MIL	ROLL	3260	
DETECTOR TUBES-SMOKE	EACH	1300		POLY SHEETING—6 MIL	ROLL	3300	
DRUMS—FIBER	EACH	1540		POLY SHEETING—4 MIL	ROLL	3320	
DUCT TAPE—1"	ROLL	1570		POLY SHEETING—FIRE RETARDANT ___ MIL	ROLL		
DUCT TAPE—2"	ROLL	1580		POLY SHEETING—BLACK ___ MIL	ROLL		
DUCT TAPE—3"	ROLL	1590		POLY SHEETING—NYLON REINFORCED ___ MIL	ROLL		
DUCT TAPE—4"	ROLL	1620		PROTECTIVE SUITS—ASBESTOS	EACH	3660	
DUCT TAPE—BLUE	ROLL	1630		QUICK SCRUB (SCRUBBER GRILL)	EACH	4140	
ENCAPSULANT—3220	GALLON	1710		REWETTABLE CLOTH 60"	LIN FT	4220	
ENCAPSULANT—3222	GALLON	1730		SAFETY FENCE—50 FOOT ROLL	ROLL	4260	
ENCAPSULANT—3232	GALLON	1740		SCRAPERS	EACH	4420	
ENCAPSULANT—3260	GALLON	1750		SHOWER TOWELS—300 PER CASE	EACH	4500	
ENCAPSULANT—8420	GALLON	1760		SIGNS-DANGER	EACH	4540	
EXHAUST DUCT—10 FEET PER ROLL	LIN FT	1820		SPRAY ADHESIVE	CAN	4820	
FILTERS—NEGATIVE AIR-PRE	EACH	1850		SPRAY FOAM	CAN	4860	
FILTERS—NEGATIVE AIR-BOX	EACH	1860		SPRAY PAINT	CAN	4900	
FILTERS—NEGATIVE AIR-HEPA	EACH	1870		SPRAY POLY	GALLON	4940	
FILTERS—SOCK FILTER—1 TO 20 MICRONS	EACH	2100		VACUUM BAGS	EACH	4980	
FILTERS-VACUUM—DACRON	EACH	2140		WASTE BOXES/GUZZLER BOXES	EACH	5100	
FILTERS-VACUUM—HEPA	EACH	2180		WASTE LABELS	EACH	5140	

OTHER MATERIALS & EQUIPMENT USED

DESCRIPTION	UNIT	ITEM CODE	UNITS USED
N/A			

SPECIAL NOTES. VISITORS TO THE SITE AND MISCELLANEOUS COMMENTS

AMOUNT OF DISPOSAL:

AIR SAMPLING INFORMATION

TYPE	QUANTITY	NUMBER	RESULTS
PRELIMINARY			
I.W.A.			
O.W.A.			
PERSONAL			
FINAL			

PRESSURE DIFFERENTIAL READING:

AIR MONITORING COMPANY: TH Services Corp Industrial Hygienist Scott Bamby

ASBESTOS IN WORK AREA NOT PART OF SCOPE: ☐ YES ☐ NO

ASBESTOS HANDLED BY OTHERS:
☐ YES ☐ NO IF YES COMPLETE FORM

VISITORS TO THE SITE:

NAME	COMPANY
NAME	COMPANY
NAME	COMPANY

DELAY INFORMATION

DELAYED: ☐ YES ☐ NO IF YES, BY WHOM:

MANHOURS LOST:

REASON FOR DELAY:

USE BALLPOINT PEN
COMPLETE FRONT SIDE FIRST
THEN REMOVE CARBON
THEN COMPLETE BACK OF FORM LAST

DESCRIPTION OF WORK PERFORMED

CUSTOMER S SIGNATURE

JOB SUPERVISOR S SIGNATURE

OPERATIONS MANAGER APPROVAL

DATE	PAGE	OF
NOV 10 1994	1	2

MARCOR ENVIRONMENTAL

DAILY JOB REPORT — ABATEMENT OPERATIONS

CONTROL NO. 017009

FORM #05405F1

JOB NAME	JOB NUMBER: OFFICE	CONTRACT NUMBER	WORK ORDER #	PREPARED BY
BERKLEY TERRACE EAST	0	0 0 0 0 0	2 2 9	KHAMLA KHANTY

LABOR USED

EMPLOYEE NUMBER	ACT. CODE	EMPLOYEE NAME	START TIME	STOP TIME	LUNCH Y or N	HOURS WORKED	DAY HOURS	NIGHT HOURS	O.T. HOURS	ABSNT/TRDY CODE	TITLE	PROT. LEVEL	MILEAGE REIMB.	EMPLOYEE SIGNATURE
011350		KHAMLA KHANTY	1500	2330	Y	8	3	5	0	—	SUP			
019760		DENNIS STUART	1500	2330	"	8	3	5	0	—	TECH			
020290		C. THAVILAYSOUK	1700	2330	"	6	1	5	0	—	"			
301915		MIGUEL BARBOSA	1500	2330	"	8	3	5	0	—	"			
		CO V TRUONG	1500	2330	"	8	3	5	0	—	"			
007850		NOUNE KANTEUXAY	1500	2330	"	8	3	5	0	—	"			
011083		PHAYA KEOMANY	1500	2330	"	8	3	5	0	—	"			
013150		BILLY NANCE PHAVONE	1700	2330	"	6	1	5	0	—	"			
016225		OLA PHIMPHANH	1700	2330	"	6	1	5	0	—	"			

TOTAL HOURS TO BE PAID (INCLUDING ALL CONTINUATION PAGES)

NO. OF CONTINUATION PAGES ATTACHED:

STANDARD MATERIALS USED

DESCRIPTION	UNIT	ITEM CODE	UNITS USED
ABSORBENT—FORMULA 1M-1216	POUND	0300	
BAGS—6 MIL ASBESTOS	EACH	0380	20
BAGS—6 MIL CLEAR	EACH	0390	
BAGS—10 MIL ASBESTOS	EACH	0385	
BAGS-GLOVE BAGS—ALL SIZES-ASBESTOS	EACH	0420	
BARRIER TAPE-CAUTION/DANGER-1000' ROLL	LIN FT	0460	
RESPIRATOR CARTRIDGES—HEPA	EACH	0820	
RESPIRATOR CARTRIDGES—ORGANIC VAPOR/HEPA	EACH	0860	
DETECTOR TUBES-SMOKE	EACH	1300	
DRUMS—FIBER	EACH	1540	
DUCT TAPE—1"	ROLL	1570	
DUCT TAPE—2"	ROLL	1580	10
DUCT TAPE—3"	ROLL	1590	16
DUCT TAPE—4"	ROLL	1620	
DUCT TAPE—BLUE	ROLL	1630	
ENCAPSULANT—3220	GALLON	1710	
ENCAPSULANT—3222	GALLON	1730	
ENCAPSULANT—3232	GALLON	1740	
ENCAPSULANT—3260	GALLON	1750	
ENCAPSULANT—8420	GALLON	1760	
EXHAUST DUCT—10 FEET PER ROLL	LIN FT	1820	
FILTERS—NEGATIVE AIR-PRE	EACH	1850	
FILTERS—NEGATIVE AIR-BOX	EACH	1860	
FILTERS—NEGATIVE AIR-HEPA	EACH	1870	
FILTERS—SOCK FILTER—1 TO 20 MICRONS	EACH	2100	
FILTERS-VACUUM—DACRON	EACH	2140	
FILTERS-VACUUM—HEPA	EACH	2180	

DESCRIPTION	UNIT	ITEM CODE	UNITS USED
~~GLOVES—~~ NAILS	~~PAIR~~		3LBS
GLOVES—	PAIR		
MASKING TAPE	ROLL	2860	
MASTIC REMOVER	GALLON	2900	
PAINT BRUSHES AND ROLLERS	EACH	3140	
PLASTIC LINERS—3 MIL—100 PER CARTON	CARTON	3180	
PLASTIC LINERS—6 MIL—100 PER CARTON	CARTON	3220	
POLY SHEETING—10 MIL	ROLL	3260	
POLY SHEETING—6 MIL	ROLL	3300	1.
POLY SHEETING—4 MIL	ROLL	3320	
POLY SHEETING—FIRE RETARDANT ___ MIL	ROLL		
POLY SHEETING—BLACK ___ MIL	ROLL		
POLY SHEETING—NYLON REINFORCED ___ MIL	ROLL		
PROTECTIVE SUITS—ASBESTOS	EACH	3660	10
QUICK SCRUB (SCRUBBER GRILL)	EACH	4140	
REWETTABLE CLOTH 60"	LIN FT	4220	
SAFETY FENCE—50 FOOT ROLL	ROLL	4260	
SCRAPERS	EACH	4420	
SHOWER TOWELS—300 PER CASE	EACH	4500	
SIGNS-DANGER	EACH	4540	
SPRAY ADHESIVE	CAN	4820	6
SPRAY FOAM	CAN	4860	
SPRAY PAINT	CAN	4900	
SPRAY POLY	GALLON	4940	
VACUUM BAGS	EACH	4980	
WASTE BOXES/GUZZLER BOXES	EACH	5100	
WASTE LABELS	EACH	5140	

OTHER MATERIALS & EQUIPMENT USED

DESCRIPTION	UNIT	ITEM CODE	UNITS USED
N A UNIT	2		
82 VAC	1		
EXT. 2X6' 5X8' 1 XTD LADDERS			
EXT. CORD	20		
HAND SPRAYERS	2		
SHOVELS PL	2		
SQUEEGIE	3		
GANG BOX	1		
MOP SET	1		
CRO. SAWS	1		
SHOWER SET	1		
FILT UNIT	1		
POWER PANEL	1		

SPECIAL NOTES, VISITORS TO THE SITE AND MISCELLANEOUS COMMENTS

AMOUNT OF DISPOSAL:

AIR SAMPLING INFORMATION

TYPE	QUANTITY	NUMBER	RESULTS
PRELIMINARY			
I.W.A.			
O.W.A.			
PERSONAL			
FINAL			

PRESSURE DIFFERENTIAL READING:

AIR MONITORING COMPANY: I H Services Ernest K. Smith

ASBESTOS IN WORK AREA NOT PART OF SCOPE: ☐ YES ☐ NO

ASBESTOS HANDLED BY OTHERS:
☐ YES ☐ NO IF YES COMPLETE FORM

VISITORS TO THE SITE:

NAME	COMPANY
NAME Don Brock	COMPANY Co Mgr
NAME	COMPANY

DELAY INFORMATION

DELAYED: ☐ YES ☐ NO IF YES, BY WHOM:

MANHOURS LOST:

REASON FOR DELAY:

USE BALLPOINT PEN
COMPLETE FRONT SIDE FIRST
THEN REMOVE CARBON
THEN COMPLETE BACK OF FORM LAST

DESCRIPTION OF WORK PERFORMED

Continue tape up poly tarp laying on wall and floor and build up three stage airlock with 2x4x8' wood.

CUSTOMER'S SIGNATURE

JOB SUPERVISOR'S SIGNATURE

OPERATIONS MANAGER APPROVAL

DATE	PAGE	OF
NOV 10 1994	2	3

MARCOR ENVIRONMENTAL

DAILY JOB REPORT — ABATEMENT OPERATIONS

CONTROL NO. 017010

FORM #05405F1

JOB NAME	JOB NUMBER: OFFICE	CONTRACT NUMBER	WORK ORDER #	PREPARED BY
BENTA 100 ELEM #150	E L	0 0 0 0 1	2 2 9	KHAMLA KHANTY

LABOR USED

EMPLOYEE NUMBER	ACT. CODE	EMPLOYEE NAME	START TIME	STOP TIME	LUNCH Y or N	HOURS WORKED	DAY HOURS	NIGHT HOURS	O.T. HOURS	ABSNT/TRDY CODE	TITLE	PROT. LEVEL	MILEAGE REIMB.	EMPLOYEE SIGNATURE
020290		C. THONGDYCHANH	1500	1700	N	2	2	CARPENTRY	UNDER.	POLL				C. Thongdychanh
016225		CHA PHIMPHANH	1500	1700	"	2	2	CARPENTRY	WORK	"				Cha Phimphanh
013150		BILLY MANEPHONE	1500	1500	"	2	2	CARPENTRY	WORK	"				Billy Manephone
314615		FABIAN OSORIO	1500	2330	Y	8	3	5	0	—	POLL			Fabian Osorio
313491		CESAR MORALES	1500	2330	"	8	3	5	0	—	"			Cesar Morales
							5							

TOTAL HOURS TO BE PAID (INCLUDING ALL CONTINUATION PAGES):

NO. OF CONTINUATION PAGES ATTACHED:

STANDARD MATERIALS USED

DESCRIPTION	UNIT	ITEM CODE	UNITS USED	DESCRIPTION	UNIT	ITEM CODE	UNITS USED
ABSORBENT—FORMULA 1M-1216	POUND	0300		GLOVES—	PAIR		
BAGS—6 MIL ASBESTOS	EACH	0380		GLOVES—	PAIR		
BAGS—6 MIL CLEAR	EACH	0390		MASKING TAPE	ROLL	2860	
BAGS—10 MIL ASBESTOS	EACH	0385		MASTIC REMOVER	GALLON	2900	
BAGS-GLOVE BAGS—ALL SIZES-ASBESTOS	EACH	0420		PAINT BRUSHES AND ROLLERS	EACH	3140	
BARRIER TAPE-CAUTION/DANGER-1000' ROLL	LIN FT	0460		PLASTIC LINERS—3 MIL—100 PER CARTON	CARTON	3180	
RESPIRATOR CARTRIDGES—HEPA	EACH	0820		PLASTIC LINERS—6 MIL—100 PER CARTON	CARTON	3220	
RESPIRATOR CARTRIDGES—ORGANIC VAPOR/HEPA	EACH	0860		POLY SHEETING—10 MIL	ROLL	3260	
DETECTOR TUBES-SMOKE	EACH	1300		POLY SHEETING—6 MIL	ROLL	3300	
DRUMS—FIBER	EACH	1540		POLY SHEETING—4 MIL	ROLL	3320	
DUCT TAPE—1"	ROLL	1570		POLY SHEETING—FIRE RETARDANT ___ MIL	ROLL		
DUCT TAPE—2"	ROLL	1580		POLY SHEETING—BLACK ___ MIL	ROLL		
DUCT TAPE—3"	ROLL	1590		POLY SHEETING—NYLON REINFORCED ___ MIL	ROLL		
DUCT TAPE—4"	ROLL	1620		PROTECTIVE SUITS—ASBESTOS	EACH	3660	
DUCT TAPE—BLUE	ROLL	1630		QUICK SCRUB (SCRUBBER GRILL)	EACH	4140	
ENCAPSULANT—3220	GALLON	1710		REWETTABLE CLOTH 60"	LIN FT	4220	
ENCAPSULANT—3222	GALLON	1730		SAFETY FENCE—50 FOOT ROLL	ROLL	4260	
ENCAPSULANT—3232	GALLON	1740		SCRAPERS	EACH	4420	
ENCAPSULANT—3260	GALLON	1750		SHOWER TOWELS—300 PER CASE	EACH	4500	
ENCAPSULANT—8420	GALLON	1760		SIGNS-DANGER	EACH	4540	
EXHAUST DUCT—10 FEET PER ROLL	LIN FT	1820		SPRAY ADHESIVE	CAN	4820	
FILTERS—NEGATIVE AIR-PRE	EACH	1850		SPRAY FOAM	CAN	4860	
FILTERS—NEGATIVE AIR-BOX	EACH	1860		SPRAY PAINT	CAN	4900	
FILTERS—NEGATIVE AIR-HEPA	EACH	1870		SPRAY POLY	GALLON	4940	
FILTERS—SOCK FILTER—1 TO 20 MICRONS	EACH	2100		VACUUM BAGS	EACH	4980	
FILTERS-VACUUM—DACRON	EACH	2140		WASTE BOXES/GUZZLER BOXES	EACH	5100	
FILTERS-VACUUM—HEPA	EACH	2180		WASTE LABELS	EACH	5140	

OTHER MATERIALS & EQUIPMENT USED

DESCRIPTION	UNIT	ITEM CODE	UNITS USED

SPECIAL NOTES, VISITORS TO THE SITE AND MISCELLANEOUS COMMENTS

AMOUNT OF DISPOSAL:

AIR SAMPLING INFORMATION

TYPE	QUANTITY	NUMBER	RESULTS
PRELIMINARY			
I.W.A.			
O.W.A.			
PERSONAL			
FINAL			

PRESSURE DIFFERENTIAL READING:

AIR MONITORING COMPANY:

ASBESTOS IN WORK AREA NOT PART OF SCOPE: ☐ YES ☐ NO

ASBESTOS HANDLED BY OTHERS:
☐ YES ☐ NO IF YES COMPLETE FORM

VISITORS TO THE SITE:

NAME	COMPANY
NAME	COMPANY
NAME	COMPANY

DELAY INFORMATION

DELAYED: ☐ YES ☐ NO IF YES, BY WHOM:

MANHOURS LOST:

REASON FOR DELAY:

USE BALLPOINT PEN
COMPLETE FRONT SIDE FIRST
THEN REMOVE CARBON
THEN COMPLETE BACK OF FORM LAST

DESCRIPTION OF WORK PERFORMED

SEE PAGE ONE

CUSTOMER'S SIGNATURE

JOB SUPERVISOR'S SIGNATURE

OPERATIONS MANAGER APPROVAL

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MARCOR ENVIRONMENTAL

DAILY JOB REPORT — ABATEMENT OPERATIONS

CONTROL NO. 017012

FORM 805405F1

JOB NAME	OFFICE	JOB NUMBER / CONTRACT NUMBER	WORK ORDER #	PREPARED BY
HEATING SYSTEM 150	2	0 0 0 0 1	2 2 9	KHAMA KHANTRY

LABOR USED

EMPLOYEE NUMBER	ACT. CODE	EMPLOYEE NAME	START TIME	STOP TIME	LUNCH Y or N	HOURS WORKED	DAY HOURS	NIGHT HOURS	O.T. HOURS	ABSNT/TRDY CODE	TITLE	PROT. LEVEL	MILEAGE REIMB.	EMPLOYEE SIGNATURE
011350		KHAMA KHANTRY	1500	2330	Y	8	3	5			SUP			
019760		DENNIS STREET	1500	2330	"	8	3	5			TECH			
020290		O. THONGDYNAM	1500	2330	"	8	3	5			TECH			
301915		MIGUEL BARBOSA	1500	2330	"	8	3	5			"			MIGUEL BARBOSA
		CO V TRUONG	1500	2330	"	8	3	5			"			
007850		NOUNE MANELUXAY	1500	2330	"	8	3	5			"			
011083		PRATH KEOMANY	1500	2330	"	8	3	5			"			
013150		BILLY MANIVONG	1500	2330	"	8	3	5			"			
016225		CHE PHIMPHONE	1500	2330	"	8	3	5			"			

TOTAL HOURS TO BE PAID (INCLUDING ALL CONTINUATION PAGES)

NO. OF CONTINUATION PAGES ATTACHED:

STANDARD MATERIALS USED

DESCRIPTION	UNITS	ITEM CODE	UNITS USED	DESCRIPTION	UNIT	ITEM CODE	UNITS USED
ABSORBENT—FORMULA 1M-1216	POUND	0300		GLOVES—	PAIR		
BAGS—6 MIL ASBESTOS	EACH	0380	10.	GLOVES—	PAIR		
BAGS—6 MIL CLEAR	EACH	0390		MASKING TAPE	ROLL	2860	
BAGS—10 MIL ASBESTOS	EACH	0385		MASTIC REMOVER	GALLON	2900	
BAGS-GLOVE BAGS—ALL SIZES-ASBESTOS	EACH	0420		PAINT BRUSHES AND ROLLERS	EACH	3140	
BARRIER TAPE-CAUTION/DANGER-1000' ROLL	LIN FT	0460		PLASTIC LINERS—3 MIL—100 PER CARTON	CARTON	3180	
RESPIRATOR CARTRIDGES—HEPA	EACH	0820		PLASTIC LINERS—6 MIL—100 PER CARTON	CARTON	3220	
RESPIRATOR CARTRIDGES—ORGANIC VAPOR/HEPA	EACH	0860		POLY SHEETING—10 MIL	ROLL	3260	
DETECTOR TUBES-SMOKE	EACH	1300		POLY SHEETING—6 MIL	ROLL	3300	
DRUMS—FIBER	EACH	1540		POLY SHEETING—4 MIL	ROLL	3320	
DUCT TAPE—1"	ROLL	1570		POLY SHEETING—FIRE RETARDANT ___ MIL	ROLL		
DUCT TAPE—2"	ROLL	1580	6	POLY SHEETING—BLACK ___ MIL	ROLL		
DUCT TAPE—3"	ROLL	1590	10	POLY SHEETING—NYLON REINFORCED ___ MIL	ROLL		
DUCT TAPE—4"	ROLL	1620		PROTECTIVE SUITS—ASBESTOS	EACH	3660	10.
DUCT TAPE—BLUE	ROLL	1630		QUICK SCRUB (SCRUBBER GRILL)	EACH	4140	
ENCAPSULANT—3220	GALLON	1710		REWETTABLE CLOTH 60"	LIN FT	4220	
ENCAPSULANT—3222	GALLON	1730		SAFETY FENCE—50 FOOT ROLL	ROLL	4260	
ENCAPSULANT—3232	GALLON	1740		SCRAPERS	EACH	4420	
ENCAPSULANT—3260	GALLON	1750		SHOWER TOWELS—300 PER CASE	EACH	4500	
ENCAPSULANT—8420	GALLON	1760		SIGNS-DANGER	EACH	4540	2.
EXHAUST DUCT—10 FEET PER ROLL	LIN FT	1820		SPRAY ADHESIVE	CAN	4820	6.
FILTERS—NEGATIVE AIR-PRE	EACH	1850	2	SPRAY FOAM	CAN	4860	
FILTERS—NEGATIVE AIR-BOX	EACH	1860	2	SPRAY PAINT	CAN	4900	
FILTERS—NEGATIVE AIR-HEPA	EACH	1870	4	SPRAY POLY	GALLON	4940	
FILTERS—SOCK FILTER—1 TO 20 MICRONS	EACH	2100		VACUUM BAGS	EACH	4980	
FILTERS-VACUUM—DACRON	EACH	2140		WASTE BOXES/GUZZLER BOXES	EACH	5100	
FILTERS-VACUUM—HEPA	EACH	2180		WASTE LABELS	EACH	5140	

OTHER MATERIALS & EQUIPMENT USED

DESCRIPTION	UNIT	ITEM CODE	UNITS USED
N-A-UNIT	2		
82 GAL W/D VAC	2.		
2'x2'x9. 2x6' 5x8' 1x10' LADDERS			
EXT. CORD	20		
HAND SPRAYERS	2.		
SHOVELS PL.	2.		
SQUEEGIE	2.		
GANG BOX	1.		
MOP SET.	1.		
CRC. SOW	1		
SHOWER SET.	1		
FLT. UNIT.	1		
POWER PANEL	1		

SPECIAL NOTES. VISITORS TO THE SITE AND MISCELLANEOUS COMMENTS

AMOUNT OF DISPOSAL:

AIR SAMPLING INFORMATION

TYPE	QUANTITY	NUMBER	RESULTS
PRELIMINARY			
I.W.A.			
O.W.A.		N/A	
PERSONAL			
FINAL			

PRESSURE DIFFERENTIAL READING:

AIR MONITORING COMPANY: TH Services Corp Industrial Hygienist Scott Bandy

ASBESTOS IN WORK AREA NOT PART OF SCOPE: ☐ YES ☐ NO

ASBESTOS HANDLED BY OTHERS: ☐ YES ☐ NO IF YES COMPLETE FORM

VISITORS TO THE SITE:

NAME	COMPANY
NAME	COMPANY
NAME	COMPANY

DELAY INFORMATION

DELAYED: ☐ YES ☐ NO IF YES, BY WHOM:

MANHOURS LOST:

REASON FOR DELAY:

USE BALLPOINT PEN
COMPLETE FRONT SIDE FIRST
THEN REMOVE CARBON
THEN COMPLETE BACK OF FORM LAST

DESCRIPTION OF WORK PERFORMED

Set up about 100% completed set-up poly on wall and floor and three stage airlock and cleaned off the floor.

CUSTOMER'S SIGNATURE

JOB SUPERVISOR'S SIGNATURE

OPERATIONS MANAGER APPROVAL

DATE	PAGE	OF
NOV. 1 1994	2	3

MARCOR ENVIRONMENTAL

DAILY JOB REPORT — ABATEMENT OPERATIONS

CONTROL NO. 017011

FORM #05405F1

JOB NAME	JOB NUMBER: OFFICE	CONTRACT NUMBER	WORK ORDER #	PREPARED BY
BUILDING SERV #450	E L	0 0 0 0 1	2 2 9	KHAMLA KHALTRY

LABOR USED

EMPLOYEE NUMBER	ACT. CODE	EMPLOYEE NAME	START TIME	STOP TIME	LUNCH Y or N	HOURS WORKED	DAY HOURS	NIGHT HOURS	O.T. HOURS	ABSNT/TRDY CODE	TITLE	PROT. LEVEL	MILEAGE REIMB.	EMPLOYEE SIGNATURE
022650		SAAK VONGPHAKDY	1500	2330	Y	8	3	5			ABAT			
314615		PEDRO OSORIO	1500	2330	"	8	3	5			"			
313491		OSCAR MORALES	1500	2330	"	8	3	5			"			

TOTAL HOURS TO BE PAID (INCLUDING ALL CONTINUATION PAGES): NO. OF CONTINUATION PAGES ATTACHED:

STANDARD MATERIALS USED

DESCRIPTION	UNIT	ITEM CODE	UNITS USED	DESCRIPTION	UNIT	ITEM CODE	UNITS USED
ABSORBENT—FORMULA 1M-1216	POUND	0300		GLOVES—	PAIR		
BAGS—6 MIL ASBESTOS	EACH	0380		GLOVES—	PAIR		
BAGS—6 MIL CLEAR	EACH	0390		MASKING TAPE	ROLL	2860	
BAGS—10 MIL ASBESTOS	EACH	0385		MASTIC REMOVER	GALLON	2900	
BAGS-GLOVE BAGS—ALL SIZES-ASBESTOS	EACH	0420		PAINT BRUSHES AND ROLLERS	EACH	3140	
BARRIER TAPE-CAUTION/DANGER-1000' ROLL	LIN FT	0460		PLASTIC LINERS—3 MIL—100 PER CARTON	CARTON	3180	
RESPIRATOR CARTRIDGES—HEPA	EACH	0820		PLASTIC LINERS—6 MIL—100 PER CARTON	CARTON	3220	
RESPIRATOR CARTRIDGES—ORGANIC VAPOR/HEPA	EACH	0860		POLY SHEETING—10 MIL	ROLL	3260	
DETECTOR TUBES-SMOKE	EACH	1300		POLY SHEETING—6 MIL	ROLL	3300	
DRUMS—FIBER	EACH	1540		POLY SHEETING—4 MIL	ROLL	3320	
DUCT TAPE—1"	ROLL	1570		POLY SHEETING—FIRE RETARDANT ___ MIL	ROLL		
DUCT TAPE—2"	ROLL	1580		POLY SHEETING—BLACK ___ MIL	ROLL		
DUCT TAPE—3"	ROLL	1590		POLY SHEETING—NYLON REINFORCED ___ MIL	ROLL		
DUCT TAPE—4"	ROLL	1620		PROTECTIVE SUITS—ASBESTOS	EACH	3660	
DUCT TAPE—BLUE	ROLL	1630		QUICK SCRUB (SCRUBBER GRILL)	EACH	4140	
ENCAPSULANT—3220	GALLON	1710		REWETTABLE CLOTH 60"	LIN FT	4220	
ENCAPSULANT—3222	GALLON	1730		SAFETY FENCE—50 FOOT ROLL	ROLL	4260	
ENCAPSULANT—3232	GALLON	1740		SCRAPERS	EACH	4420	
ENCAPSULANT—3260	GALLON	1750		SHOWER TOWELS—300 PER CASE	EACH	4500	
ENCAPSULANT—8420	GALLON	1760		SIGNS-DANGER	EACH	4540	
EXHAUST DUCT—10 FEET PER ROLL	LIN FT	1820		SPRAY ADHESIVE	CAN	4820	
FILTERS—NEGATIVE AIR-PRE	EACH	1850		SPRAY FOAM	CAN	4860	
FILTERS—NEGATIVE AIR-BOX	EACH	1860		SPRAY PAINT	CAN	4900	
FILTERS—NEGATIVE AIR-HEPA	EACH	1870		SPRAY POLY	GALLON	4940	
FILTERS—SOCK FILTER—1 TO 20 MICRONS	EACH	2100		VACUUM BAGS	EACH	4980	
FILTERS-VACUUM—DACRON	EACH	2140		WASTE BOXES/GUZZLER BOXES	EACH	5100	
FILTERS-VACUUM—HEPA	EACH	2180		WASTE LABELS	EACH	5140	

OTHER MATERIALS & EQUIPMENT USED

DESCRIPTION	UNIT	ITEM CODE	UNITS USED
N/A			

ACCOUNTING COPY

SPECIAL NOTES, VISITORS TO THE SITE AND MISCELLANEOUS COMMENTS

AMOUNT OF DISPOSAL:

AIR SAMPLING INFORMATION

TYPE	QUANTITY	NUMBER	RESULTS
PRELIMINARY			
I.W.A.			
O.W.A.			
PERSONAL			
FINAL			

PRESSURE DIFFERENTIAL READING:

AIR MONITORING COMPANY: TH Services Industrial Hygiene Staff Barry

ASBESTOS IN WORK AREA NOT PART OF SCOPE: ☐ YES ☐ NO

ASBESTOS HANDLED BY OTHERS:
☐ YES ☐ NO IF YES COMPLETE FORM

VISITORS TO THE SITE:

NAME	COMPANY
NAME	COMPANY
NAME	COMPANY

DELAY INFORMATION

DELAYED: ☐ YES ☐ NO IF YES, BY WHOM:

MANHOURS LOST:

REASON FOR DELAY:

USE BALLPOINT PEN
COMPLETE FRONT SIDE FIRST
THEN REMOVE CARBON
THEN COMPLETE BACK OF FORM LAST

DESCRIPTION OF WORK PERFORMED

CUSTOMER'S SIGNATURE

JOB SUPERVISOR'S SIGNATURE

OPERATIONS MANAGER APPROVAL

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MARKSR ENVIRONMENTAL

DAILY JOB REPORT — ABATEMENT OPERATIONS

CONTROL NO. 017013

FORM #05405F1

JOB NAME	JOB NUMBER: OFFICE	CONTRACT NUMBER	WORK ORDER #	PREPARED BY
BENTLEY ELEMENTARY	D	00001	229	KHAMLA KHANTHY

LABOR USED

EMPLOYEE NUMBER	ACT. CODE	EMPLOYEE NAME	START TIME	STOP TIME	LUNCH Y or N	HOURS WORKED	DAY HOURS	NIGHT HOURS	O.T. HOURS	ABSNT/TRDY CODE	TITLE	PROT. LEVEL	MILEAGE REIMB.	EMPLOYEE SIGNATURE
011350		KHAMLA KHANTHY	1500	2330	Y	8	3	5	0		SUP			
007P30		NOUNG HANELUXAY	1500	2330	"	8	3	5	0		BLD			
013150		BILLY MANIPHONE	1500	2330	"	8	3	5	0		"			
313491		CESAR MORALES	1500	2330	"	8	3	5	0		"			
314615		PORFIRIO OSORIO	1500	2330	"	8	3	5	0		"			
016225		CHA PHIMPHANH	1500	2330	"	8	3	5	0		"			
133770		CO V TRUONG	1500	2330	"	8	3	5	0		"			
008390		THOMAS WOOD	1500	2330	"	8	3	5	0		"			

TOTAL HOURS TO BE PAID (INCLUDING ALL CONTINUATION PAGES)

NO. OF CONTINUATION PAGES ATTACHED:

STANDARD MATERIALS USED

DESCRIPTION	UNIT	ITEM CODE	UNITS USED	DESCRIPTION	UNIT	ITEM CODE	UNITS USED
ABSORBENT—FORMULA 1M-1216	POUND	0300		GLOVES— COTTON	PAIR		6.
BAGS—6 MIL ASBESTOS	EACH	0380	200	GLOVES—	PAIR		
BAGS—6 MIL CLEAR	EACH	0390		MASKING TAPE	ROLL	2860	
BAGS—10 MIL ASBESTOS	EACH	0385		MASTIC REMOVER	GALLON	2900	
BAGS-GLOVE BAGS—ALL SIZES-ASBESTOS	EACH	0420		PAINT BRUSHES AND ROLLERS	EACH	3140	
BARRIER TAPE-CAUTION/DANGER-1000' ROLL	LIN FT	0460		PLASTIC LINERS—3 MIL—100 PER CARTON	CARTON	3180	
RESPIRATOR CARTRIDGES—HEPA	EACH	0820		PLASTIC LINERS—6 MIL—100 PER CARTON	CARTON	3220	
RESPIRATOR CARTRIDGES—ORGANIC VAPOR/HEPA	EACH	0860		POLY SHEETING—10 MIL	ROLL	3260	
DETECTOR TUBES-SMOKE	EACH	1300	1.	POLY SHEETING—6 MIL	ROLL	3300	
DRUMS—FIBER	EACH	1540		POLY SHEETING—4 MIL	ROLL	3320	
DUCT TAPE—1"	ROLL	1570		POLY SHEETING—FIRE RETARDANT ___ MIL	ROLL		
DUCT TAPE—2"	ROLL	1580	2.	POLY SHEETING—BLACK ___ MIL	ROLL		
DUCT TAPE—3"	ROLL	1590	2.	POLY SHEETING—NYLON REINFORCED ___ MIL	ROLL		
DUCT TAPE—4"	ROLL	1620		PROTECTIVE SUITS—ASBESTOS	EACH	3660	25.
DUCT TAPE—BLUE	ROLL	1630		QUICK SCRUB (SCRUBBER GRILL)	EACH	4140	
ENCAPSULANT—3220	GALLON	1710		REWETTABLE CLOTH 60"	LIN FT	4220	
ENCAPSULANT—3222	GALLON	1730		SAFETY FENCE—50 FOOT ROLL	ROLL	4260	
ENCAPSULANT—3232	GALLON	1740		SCRAPERS	EACH	4420	
ENCAPSULANT—3260	GALLON	1750		SHOWER TOWELS—300 PER CASE	EACH	4500	75
ENCAPSULANT—8420	GALLON	1760		SIGNS-DANGER	EACH	4540	
EXHAUST DUCT—10 FEET PER ROLL	LIN FT	1820		SPRAY ADHESIVE	CAN	4820	2-
FILTERS—NEGATIVE AIR-PRE	EACH	1850	4.	~~SPRAY FOAM~~ SURFACTANT	CAN	4860	1CAN.
FILTERS—NEGATIVE AIR-BOX	EACH	1860	2.	SPRAY PAINT	CAN	4900	
FILTERS—NEGATIVE AIR-HEPA	EACH	1870		SPRAY POLY	GALLON	4940	
FILTERS—SOCK FILTER—1 TO 20 MICRONS	EACH	2100		VACUUM BAGS	EACH	4980	
FILTERS-VACUUM—DACRON	EACH	2140		WASTE BOXES/GUZZLER BOXES	EACH	5100	
FILTERS-VACUUM—HEPA	EACH	2180		WASTE LABELS	EACH	5140	

OTHER MATERIALS & EQUIPMENT USED

DESCRIPTION	UNIT	ITEM CODE	UNITS USED
N. A UNIT	2.		
82 # W/D VAC	2.		
2X EXT. 2X6'S 8' 1X10 LADDERS			
EXT. CORD	20		
HAND SPRAYERS	2		
SHOVELS PL.	2		
SQUEEGIE	3		
BAND BOX	1		
MOP SET	1		
CRC SAW	1		
SHOWER SET	1		
F.L. UNIT	1		
POWER PANEL	1		

SPECIAL NOTES. VISITORS TO THE SITE AND MISCELLANEOUS COMMENTS

AMOUNT OF DISPOSAL: N/A

PRESSURE DIFFERENTIAL READING: N/A

AIR MONITORING COMPANY: IH Services Inc Industrial Hygiene Los Angeles County

ASBESTOS IN WORK AREA NOT PART OF SCOPE: ☐ YES ☐ NO

ASBESTOS HANDLED BY OTHERS: ☐ YES ☐ NO IF YES COMPLETE FORM N/A

AIR SAMPLING INFORMATION

TYPE	QUANTITY	NUMBER	RESULTS
PRELIMINARY			
I.W.A.		N/A	
O.W.A.			
PERSONAL			
FINAL			

VISITORS TO THE SITE:

NAME:	COMPANY
NAME	COMPANY
NAME	COMPANY

DELAY INFORMATION

DELAYED: ☐ YES ☒ NO IF YES, BY WHOM:

MANHOURS LOST:

REASON FOR DELAY: N/A

USE BALLPOINT PEN
COMPLETE FRONT SIDE FIRST
THEN REMOVE CARBON
THEN COMPLETE BACK OF FORM LAST

DESCRIPTION OF WORK PERFORMED

60' 100 L. COMPLETED TAPP-UP POLY TWO LAY ON WALL AND FLOOR. AND WE ARE STARTED TO REMOVING ASBESTOS OUT FROM PIPE, AND HOT WATER TANK, AND DOING BAGS UP AND CLEANED OFF THE FLOOR. AND MOVING BAGS NEAR BY THE DECON.

CUSTOMER'S SIGNATURE

JOB SUPERVISOR'S SIGNATURE

OPERATIONS MANAGER APPROVAL

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MARCOR ENVIRONMENTAL

DAILY JOB REPORT — ABATEMENT OPERATIONS

CONTROL NO. 017014

FORM #05405F1

| JOB NUMBER | | |

SPECIAL NOTES. VISITORS TO THE SITE AND MISCELLANEOUS COMMENTS

AMOUNT OF DISPOSAL:

AIR SAMPLING INFORMATION

TYPE	QUANTITY	NUMBER	RESULTS
PRELIMINARY			
I.W.A.			
O.W.A.			
PERSONAL			
FINAL			

PRESSURE DIFFERENTIAL READING:

AIR MONITORING COMPANY: I H Services Inc Industrial Hygienist Scott Bonnick

ASBESTOS IN WORK AREA NOT PART OF SCOPE: ☐ YES ☒ NO

ASBESTOS HANDLED BY OTHERS: ☐ YES ☐ NO IF YES COMPLETE FORM N/A

VISITORS TO THE SITE:

NAME	COMPANY
NAME	COMPANY
NAME	COMPANY

DELAY INFORMATION

DELAYED: ☐ YES ☒ NO IF YES, BY WHOM:

MANHOURS LOST:

REASON FOR DELAY: N/A

USE BALLPOINT PEN
COMPLETE FRONT SIDE FIRST
THEN REMOVE CARBON
THEN COMPLETE BACK OF FORM LAST

DESCRIPTION OF WORK PERFORMED

CONTINUE REMOVING ASBESTOS OUT FROM BOILER # 1 AND HOT WATER TANK AND ABOUT ¾ OF DUCT WORK AND WE ARE BAGING AND CLEANED OFF THE FLOOR AND moving ALL BAGS NEAR BY DUMPSTER

CUSTOMER'S SIGNATURE

JOB SUPERVISOR'S SIGNATURE Ronald L. Smith

OPERATIONS MANAGER APPROVAL

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MARCOR ENVIRONMENTAL

DAILY JOB REPORT — ABATEMENT OPERATIONS

CONTROL NO. 017015

FORM #05405F1

JOB NAME	JOB NUMBER: OFFICE	CONTRACT NUMBER	WORK ORDER #	PREPARED BY
BENTALOW ELEM #150	E L	0 0 0 0 1	2 2 9	KHAMLA KHANTRY

LABOR USED

EMPLOYEE NUMBER	AGT. CODE	EMPLOYEE NAME	START TIME	STOP TIME	LUNCH Y or N	HOURS WORKED	DAY HOURS	NIGHT HOURS	O.T. HOURS	ABSNT/TRDY CODE	TITLE	PROT. LEVEL	MILEAGE REIMB.	EMPLOYEE SIGNATURE
011350		KHAMLA KHANTRY	1500	2330	Y	8	3	5	0		SUP			
020290		A THONGSYSAVAT	1500	2330	"	8	3	5	0		TECH			
007850		NOUNE MANIELUXAY	1500	2330	"	8	3	5	0		"			
013150		BILLY MANIEPHONE	1500	2330	"	8	3	5	0		"			
313491		CESAR MORALES	1500	2330	"	8	3	5	0		"			
314615		PAFIRIO OSORIO	1500	2330	"	8	3	5	0		"			
016225		CHA PHIMPHANH	1500	2330	"	8	3	5	0		"			
183770		CO V TRUONG	1500	2330	"	8	3	5	0		"			
008390		THOMAS HOOD	1500	2330	"	8	3	5	0		"			
		TOTAL HOURS TO BE PAID (INCLUDING ALL CONTINUATION PAGES)												

NO. OF CONTINUATION PAGES ATTACHED: _____

STANDARD MATERIALS USED

DESCRIPTION	UNIT	ITEM CODE	UNITS USED	DESCRIPTION	UNIT	ITEM CODE	UNITS USED
ABSORBENT—FORMULA 1M-1216	POUND	0300		GLOVES— COTTON	PAIR		5
BAGS—6 MIL ASBESTOS	EACH	0380	400	GLOVES— PVC	PAIR		3
BAGS—6 MIL CLEAR	EACH	0390		MASKING TAPE	ROLL	2860	
BAGS—10 MIL ASBESTOS	EACH	0385		MASTIC REMOVER	GALLON	2900	
BAGS-GLOVE BAGS—ALL SIZES-ASBESTOS	EACH	0420		PAINT BRUSHES AND ROLLERS	EACH	3140	
BARRIER TAPE-CAUTION/DANGER-1000' ROLL	LIN FT	0460		PLASTIC LINERS—3 MIL—100 PER CARTON	CARTON	3180	
RESPIRATOR CARTRIDGES—HEPA	EACH	0820		PLASTIC LINERS—6 MIL—100 PER CARTON	CARTON	3220	
RESPIRATOR CARTRIDGES—ORGANIC VAPOR/HEPA	EACH	0860		POLY SHEETING—10 MIL	ROLL	3260	
DETECTOR TUBES-SMOKE	EACH	1300		POLY SHEETING—6 MIL	ROLL	3300	
DRUMS—FIBER	EACH	1540	3	POLY SHEETING—4 MIL	ROLL	3320	
DUCT TAPE—1"	ROLL	1570		POLY SHEETING—FIRE RETARDANT ___ MIL	ROLL		
DUCT TAPE—2"	ROLL	1580	4	POLY SHEETING—BLACK ___ MIL	ROLL		
DUCT TAPE—3"	ROLL	1590	6	POLY SHEETING—NYLON REINFORCED ___ MIL	ROLL		
DUCT TAPE—4"	ROLL	1620		PROTECTIVE SUITS—ASBESTOS	EACH	3660	25
DUCT TAPE—BLUE	ROLL	1630		QUICK SCRUB (SCRUBBER GRILL)	EACH	4140	
ENCAPSULANT—3220	GALLON	1710		REWETTABLE CLOTH 60"	LIN FT	4220	
ENCAPSULANT—3222	GALLON	1730		SAFETY FENCE—50 FOOT ROLL	ROLL	4260	
ENCAPSULANT—3232	GALLON	1740		SCRAPERS	EACH	4420	
ENCAPSULANT—3260	GALLON	1750		SHOWER TOWELS—300 PER CASE	EACH	4500	100
ENCAPSULANT—8420	GALLON	1760		SIGNS-DANGER	EACH	4540	
EXHAUST DUCT—10 FEET PER ROLL	LIN FT	1820		SPRAY ADHESIVE	CAN	4820	
FILTERS—NEGATIVE AIR-PRE	EACH	1850	4	SPRAY FOAM	CAN	4860	
FILTERS—NEGATIVE AIR-BOX	EACH	1860	2	SPRAY PAINT	CAN	4900	
FILTERS—NEGATIVE AIR-HEPA	EACH	1870		SPRAY POLY	GALLON	4940	
FILTERS—SOCK FILTER—1 TO 20 MICRONS	EACH	2100	3	VACUUM BAGS	EACH	4980	
FILTERS-VACUUM—DACRON	EACH	2140		WASTE BOXES/GUZZLER BOXES	EACH	5100	
FILTERS-VACUUM—HEPA	EACH	2180		WASTE LABELS	EACH	5140	100

OTHER MATERIALS & EQUIPMENT USED

DESCRIPTION	UNIT	ITEM CODE	UNITS USED
N. A UNIT	2		2
82 F W/D	2		2
2'x6'x1" 3'x8'x1" 1'x10' LADDERS			
EXT. CORDS	20		20
HAND SPRAYERS	2		2
SHOVELS PL.	2		2
SQUEEGIES	3		3
GANG BOX	1		1
MOP SET	1		1
ORC SOW	1		1
SHOWER SET	1		1
FIL. UNIT SET	1		1
POWER PANEL	1		1

SPECIAL NOTES. VISITORS TO THE SITE AND MISCELLANEOUS COMMENTS

AMOUNT OF DISPOSAL: 325 Bags. 2. Drums

AIR SAMPLING INFORMATION

TYPE	QUANTITY	NUMBER	RESULTS
PRELIMINARY			
I.W.A.			
O.W.A.			
PERSONAL			
FINAL			

PRESSURE DIFFERENTIAL READING:

AIR MONITORING COMPANY: I.H Services

Ernest K. Smith

ASBESTOS IN WORK AREA NOT PART OF SCOPE: ☐ YES ☐ NO

ASBESTOS HANDLED BY OTHERS: ☐ YES ☐ NO IF YES COMPLETE FORM

VISITORS TO THE SITE:

NAME	COMPANY
NAME	COMPANY
NAME	COMPANY

DELAY INFORMATION

DELAYED: ☐ YES ☐ NO IF YES, BY WHOM:

MANHOURS LOST:

REASON FOR DELAY:

USE BALLPOINT PEN
COMPLETE FRONT SIDE FIRST
THEN REMOVE CARBON
THEN COMPLETE BACK OF FORM LAST

DESCRIPTION OF WORK PERFORMED

REMOVING BOILER # 2 AND DUCT WORK AND GOT ABOUT 500 % COMPLETED FOR REMOVED AND WE ARE STARTED TO DO FINAL CLEANED UP THE PIPE HOT WATER TANK, AND BOILERS. AND ALSO WE ARE DO DOUBLE BAGS AND ROVING OUT FROM WORKING AREA TO THE WAREHOUS TRUCK FOR 325 BAGS OF ASBESTOS AND TWO (2) DRUMS.

CUSTOMER'S SIGNATURE

JOB SUPERVISOR'S SIGNATURE

OPERATIONS MANAGER APPROVAL

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MARCOR ENVIRONMENTAL

DAILY JOB REPORT — ABATEMENT OPERATIONS

CONTROL NO. 011424

FORM #05405F1

JOB NAME	OFFICE	CONTRACT NUMBER	WORK ORDER #	PREPARED BY
BERTAGNA ELEM SCHOOL #150	NE	00000	229	KHAMLA KHANTRY

LABOR USED

EMPLOYEE NUMBER	ACT. CODE	EMPLOYEE NAME	START TIME	STOP TIME	LUNCH Y or N	HOURS WORKED	DAY HOURS	NIGHT HOURS	O.T. HOURS	ABSNT/TRDY CODE	TITLE	PROT. LEVEL	MILEAGE REIMB.	EMPLOYEE SIGNATURE
011350		KHAMLA KHANTRY	1500	2330	Y	8	3	5	0		SUP			
019130		FRED SCOTT	1500	1600	N	5	3	0	0		TECH			
016225		CHA PHIMPHAND	1500	2330	Y	8	3	5	0		"			
007850		DOUNG HANELUKAN	1500	2330	"	8	3	5	0		"			
019150		BILLY MAN-PHOTZ	1500	2330	"	8	3	5	0		"			
314615		PAFIRIO OSORIO	1500	2330	"	8	3	5	0		"			
020290		C. THONGDYNALAI	1500	2330	"	8	3	5	0		"			
313491		CESAR MORALES	1500	2330	"	8	3	5	0		"			
133770		CO VINH TRUONG	1500	2330	"	8	3	5	0		"			

TOTAL HOURS TO BE PAID (INCLUDING ALL CONTINUATION PAGES)

NO. OF CONTINUATION PAGES ATTACHED:

STANDARD MATERIALS USED

DESCRIPTION	UNIT	ITEM CODE	UNITS USED	DESCRIPTION	UNIT	ITEM CODE	UNITS USED
ABSORBENT—FORMULA 1M-1216	POUND	0300		GLOVES— PVC	PAIR		2.
BAGS—6 MIL ASBESTOS	EACH	0380	100	GLOVES—	PAIR		
BAGS—6 MIL CLEAR	EACH	0390		MASKING TAPE	ROLL	2860	
BAGS—10 MIL ASBESTOS	EACH	0385		MASTIC REMOVER	GALLON	2900	
BAGS-GLOVE BAGS—ALL SIZES-ASBESTOS	EACH	0420		PAINT BRUSHES AND ROLLERS	EACH	3140	
BARRIER TAPE-CAUTION/DANGER-1000' ROLL	LIN FT	0460		PLASTIC LINERS—3 MIL—100 PER CARTON	CARTON	3180	
RESPIRATOR CARTRIDGES—HEPA	EACH	0820	6.	PLASTIC LINERS—6 MIL—100 PER CARTON	CARTON	3220	
RESPIRATOR CARTRIDGES—ORGANIC VAPOR/HEPA	EACH	0860		POLY SHEETING—10 MIL	ROLL	3260	
DETECTOR TUBES-SMOKE	EACH	1300		POLY SHEETING—6 MIL	ROLL	3300	
DRUMS—FIBER	EACH	1540		POLY SHEETING—4 MIL	ROLL	3320	
DUCT TAPE—1"	ROLL	1570		POLY SHEETING—FIRE RETARDANT ___ MIL	ROLL		
DUCT TAPE—2"	ROLL	1580	6	POLY SHEETING—BLACK ___ MIL	ROLL		
DUCT TAPE—3"	ROLL	1590	2	POLY SHEETING—NYLON REINFORCED ___ MIL	ROLL		
DUCT TAPE—4"	ROLL	1620		PROTECTIVE SUITS—ASBESTOS	EACH	3660	25
DUCT TAPE—BLUE	ROLL	1630		QUICK SCRUB (SCRUBBER GRILL)	EACH	4140	
ENCAPSULANT—3220	GALLON	1710		REWETTABLE CLOTH 60"	LIN FT	4220	
ENCAPSULANT—3222	GALLON	1730		SAFETY FENCE—50 FOOT ROLL	ROLL	4260	
ENCAPSULANT—3232	GALLON	1740		SCRAPERS	EACH	4420	
ENCAPSULANT—3260	GALLON	1750		SHOWER TOWELS—300 PER CASE	EACH	4500	106
ENCAPSULANT—8420	GALLON	1760		SIGNS-DANGER	EACH	4540	
EXHAUST DUCT—10 FEET PER ROLL	LIN FT	1820		SPRAY ADHESIVE	CAN	4820	1.
FILTERS—NEGATIVE AIR-PRE	EACH	1850	4	SPRAY FOAM	CAN	4860	
FILTERS—NEGATIVE AIR-BOX	EACH	1860	4	SPRAY PAINT	CAN	4900	
FILTERS—NEGATIVE AIR-HEPA	EACH	1870		SPRAY POLY	GALLON	4940	
FILTERS—SOCK FILTER—1 TO 20 MICRONS	EACH	2100		VACUUM BAGS	EACH	4980	
FILTERS-VACUUM—DACRON	EACH	2140		WASTE BOXES/GUZZLER BOXES	EACH	5100	
FILTERS-VACUUM—HEPA	EACH	2180		WASTE LABELS	EACH	5140	100

OTHER MATERIALS & EQUIPMENT USED

DESCRIPTION	UNIT	ITEM CODE	UNITS USED
HEPA UNIT	2		2
82 GAL WET VAC	2		2
2X BAR: 2X6' 8FT 7FT LADDERS			
EXT. CORDS	20		20
HAND SPRAYERS	2		2
SHOVELS PL	2		2
SQUEEGEES	3		3
GANG BOX	1		1
MED SET	1		1
CPC — SAW	1		1
SHOWER SET	1		1
FILA UNIT	1		1
POWER PANEL	1		1

SPECIAL NOTES VISITORS TO THE SITE AND MISCELLANEOUS COMMENTS

AMOUNT OF DISPOSAL: N/A

AIR SAMPLING INFORMATION			
TYPE	QUANTITY	NUMBER	RESULTS
PRELIMINARY			
I.W.A.			
O.W.A.			
PERSONAL			
FINAL			

PRESSURE DIFFERENTIAL READING:

AIR MONITORING COMPANY: F4 Services

ASBESTOS IN WORK AREA NOT PART OF SCOPE: ☐ YES ☑ NO

ASBESTOS HANDLED BY OTHERS: ☐ YES ☑ NO IF YES COMPLETE FORM N/A

VISITORS TO THE SITE:

NAME	COMPANY
NAME	COMPANY
NAME	COMPANY

DELAY INFORMATION

DELAYED: ☐ YES ☑ NO IF YES, BY WHOM: N/A

MANHOURS LOST: N/A

REASON FOR DELAY: N/A

USE BALLPOINT PEN
COMPLETE FRONT SIDE FIRST
THEN REMOVE CARBON
THEN COMPLETE BACK OF FORM LAST

DESCRIPTION OF WORK PERFORMED

We are doing Final cleaned wire brushing and wipe down the duct work and pipe, and Boilers. and Hot water Tank and cleaned up the Floor. and also wash down ceiling and poly on wall and Floor

CUSTOMER'S SIGNATURE S Baker

JOB SUPERVISOR'S SIGNATURE Ernesto Fuentes

OPERATIONS MANAGER APPROVAL

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MARCOR ENVIRONMENTAL

DAILY JOB REPORT — ABATEMENT OPERATIONS

CONTROL NO. 017019

FORM #05405F1

JOB NUMBER				
JOB NAME	OFFICE	CONTRACT NUMBER	WORK ORDER #	PREPARED BY
SANTA LOS DIOMEDES	SL	0 0 0 0 1	2 2 9	KHAMLA KHANTRI

LABOR USED

EMPLOYEE NUMBER	ACT. CODE	EMPLOYEE NAME	START TIME	STOP TIME	LUNCH Y or N	HOURS WORKED	DAY HOURS	NIGHT HOURS	O.T. HOURS	ABSNT/TRDY CODE	TITLE	PROT. LEVEL	MILEAGE REIMB.	EMPLOYEE SIGNATURE
008590		THOMAS HOOD	1500	2330	Y	8	3	5	0		TECH			THOMAS HOOD

TOTAL HOURS TO BE PAID (INCLUDING ALL CONTINUATION PAGES)

NO. OF CONTINUATION PAGES ATTACHED:

STANDARD MATERIALS USED

DESCRIPTION	UNIT	ITEM CODE	UNITS USED	DESCRIPTION	UNIT	ITEM CODE	UNITS USED
ABSORBENT—FORMULA 1M-1216	POUND	0300		GLOVES—	PAIR		
BAGS—6 MIL ASBESTOS	EACH	0380		GLOVES—	PAIR		
BAGS—6 MIL CLEAR	EACH	0390		MASKING TAPE	ROLL	2860	
BAGS—10 MIL ASBESTOS	EACH	0385		MASTIC REMOVER	GALLON	2900	
BAGS-GLOVE BAGS—ALL SIZES-ASBESTOS	EACH	0420		PAINT BRUSHES AND ROLLERS	EACH	3140	
BARRIER TAPE-CAUTION/DANGER-1000' ROLL	LIN FT	0460		PLASTIC LINERS—3 MIL—100 PER CARTON	CARTON	3180	
RESPIRATOR CARTRIDGES—HEPA	EACH	0820		PLASTIC LINERS—6 MIL—100 PER CARTON	CARTON	3220	
RESPIRATOR CARTRIDGES—ORGANIC VAPOR/HEPA	EACH	0860		POLY SHEETING—10 MIL	ROLL	3260	
DETECTOR TUBES-SMOKE	EACH	1300		POLY SHEETING—6 MIL	ROLL	3300	
DRUMS—FIBER	EACH	1540		POLY SHEETING—4 MIL	ROLL	3320	
DUCT TAPE—1"	ROLL	1570		POLY SHEETING—FIRE RETARDANT ___ MIL	ROLL		
DUCT TAPE—2"	ROLL	1580		POLY SHEETING—BLACK ___ MIL	ROLL		
DUCT TAPE—3"	ROLL	1590		POLY SHEETING—NYLON REINFORCED ___ MIL	ROLL		
DUCT TAPE—4"	ROLL	1620		PROTECTIVE SUITS—ASBESTOS	EACH	3660	
DUCT TAPE—BLUE	ROLL	1630		QUICK SCRUB (SCRUBBER GRILL)	EACH	4140	
ENCAPSULANT—3220	GALLON	1710		REWETTABLE CLOTH 60"	LIN FT	4220	
ENCAPSULANT—3222	GALLON	1730		SAFETY FENCE—50 FOOT ROLL	ROLL	4260	
ENCAPSULANT—3232	GALLON	1740		SCRAPERS	EACH	4420	
ENCAPSULANT—3260	GALLON	1750		SHOWER TOWELS—300 PER CASE	EACH	4500	
ENCAPSULANT—8420	GALLON	1760		SIGNS-DANGER	EACH	4540	
EXHAUST DUCT—10 FEET PER ROLL	LIN FT	1820		SPRAY ADHESIVE	CAN	4820	
FILTERS—NEGATIVE AIR-PRE	EACH	1850		SPRAY FOAM	CAN	4860	
FILTERS—NEGATIVE AIR-BOX	EACH	1860		SPRAY PAINT	CAN	4900	
FILTERS—NEGATIVE AIR-HEPA	EACH	1870		SPRAY POLY	GALLON	4940	
FILTERS—SOCK FILTER—1 TO 20 MICRONS	EACH	2100		VACUUM BAGS	EACH	4980	
FILTERS-VACUUM—DACRON	EACH	2140		WASTE BOXES/GUZZLER BOXES	EACH	5100	
FILTERS-VACUUM—HEPA	EACH	2180		WASTE LABELS	EACH	5140	

OTHER MATERIALS & EQUIPMENT USED

DESCRIPTION	UNIT	ITEM CODE	UNITS USED

ACCOUNTING COPY

SPECIAL NOTES, VISITORS TO THE SITE AND MISCELLANEOUS COMMENTS

AMOUNT OF DISPOSAL:

AIR SAMPLING INFORMATION

TYPE	QUANTITY	NUMBER	RESULTS
PRELIMINARY			
I.W.A.			
O.W.A.			
PERSONAL			
FINAL			

PRESSURE DIFFERENTIAL READING:

AIR MONITORING COMPANY:

ASBESTOS IN WORK AREA NOT PART OF SCOPE: ☐ YES ☐ NO

ASBESTOS HANDLED BY OTHERS:
☐ YES ☐ NO IF YES COMPLETE FORM

VISITORS TO THE SITE:

NAME	COMPANY
NAME	COMPANY
NAME	COMPANY

DELAY INFORMATION

DELAYED: ☐ YES ☐ NO IF YES, BY WHOM:

MANHOURS LOST:

REASON FOR DELAY:

USE BALLPOINT PEN
COMPLETE FRONT SIDE FIRST
THEN REMOVE CARBON
THEN COMPLETE BACK OF FORM LAST

DESCRIPTION OF WORK PERFORMED

CUSTOMER'S SIGNATURE

JOB SUPERVISOR'S SIGNATURE

OPERATIONS MANAGER APPROVAL

DATE	PAGE	OF
NOV 18 2004	1	2

MARCOR ENVIRONMENTAL

DAILY JOB REPORT — ABATEMENT OPERATIONS

CONTROL NO. 017016

FORM #05405F1

JOB NAME	OFFICE	CONTRACT NUMBER	WORK ORDER #	PREPARED BY
BENTALOU ELEM #150	E L	0 0 0 0 1	2 2 9	KHAMLA KHANTRY

LABOR USED

EMPLOYEE NUMBER	ACT. CODE	EMPLOYEE NAME	START TIME	STOP TIME	LUNCH Y or N	HOURS WORKED	DAY HOURS	NIGHT HOURS	O.T. HOURS	ABSNT/TRDY CODE	TITLE	PROT. LEVEL	MILEAGE REIMB.	EMPLOYEE SIGNATURE
011350		KHAMLA KHANTRY	1500	2330	Y	8	3	5	0		SUP			
016100		MARCUS PAMPLIN	1500	2330	"	8	3	5	0		TECH			
016225		CHA PHIMPHAH	1500	2330	"	8	3	5	0		"			
007850		NOUNE HANELURAY	1500	2330	"	8	3	5	0		"			
013150		BILLY MANEEPHONE	1500	2330	"	8	3	5	0		"			
313491		CESAR CHARLES	1500	2330	"	8	3	5	0		"			
314615		PEDRO OSORIO	1500	2330	"	8	3	5	0		"			
016225		CHA PHIMPHAH T&M NO									"			
											"			

TOTAL HOURS TO BE PAID (INCLUDING ALL CONTINUATION PAGES)

NO. OF CONTINUATION PAGES ATTACHED:

STANDARD MATERIALS USED

DESCRIPTION	UNIT	ITEM CODE	UNITS USED	DESCRIPTION	UNIT	ITEM CODE	UNITS USED
ABSORBENT—FORMULA 1M-1216	POUND	0300		GLOVES—	PAIR		
BAGS—6 MIL ASBESTOS	EACH	0380	300	GLOVES—	PAIR		
BAGS—6 MIL CLEAR	EACH	0390		MASKING TAPE	ROLL	2860	
BAGS—10 MIL ASBESTOS	EACH	0385		MASTIC REMOVER	GALLON	2900	
BAGS-GLOVE BAGS—ALL SIZES-ASBESTOS	EACH	0420		PAINT BRUSHES AND ROLLERS	EACH	3140	
BARRIER TAPE-CAUTION/DANGER-1000' ROLL	LIN FT	0460		PLASTIC LINERS—3 MIL—100 PER CARTON	CARTON	3180	
RESPIRATOR CARTRIDGES—HEPA	EACH	0820		PLASTIC LINERS—6 MIL—100 PER CARTON	CARTON	3220	
RESPIRATOR CARTRIDGES—ORGANIC VAPOR/HEPA	EACH	0860		POLY SHEETING—10 MIL	ROLL	3260	
DETECTOR TUBES-SMOKE	EACH	1300		POLY SHEETING—6 MIL	ROLL	3300	
DRUMS—FIBER	EACH	1540		POLY SHEETING—4 MIL	ROLL	3320	
DUCT TAPE—1"	ROLL	1570		POLY SHEETING—FIRE RETARDANT ___ MIL	ROLL		
DUCT TAPE—2"	ROLL	1580	4	POLY SHEETING—BLACK ___ MIL	ROLL		
DUCT TAPE—3"	ROLL	1590	4	POLY SHEETING—NYLON REINFORCED ___ MIL	ROLL		
DUCT TAPE—4"	ROLL	1620		PROTECTIVE SUITS—ASBESTOS	EACH	3660	50
DUCT TAPE—BLUE	ROLL	1630		QUICK SCRUB (SCRUBBER GRILL)	EACH	4140	12
ENCAPSULANT—3220	GALLON	1710		REWETTABLE CLOTH 60"	LIN FT	4220	
ENCAPSULANT—3222	GALLON	1730		SAFETY FENCE—50 FOOT ROLL	ROLL	4260	
ENCAPSULANT—3232	GALLON	1740		SCRAPERS	EACH	4420	
ENCAPSULANT—3260	GALLON	1750		SHOWER TOWELS—300 PER CASE	EACH	4500	
ENCAPSULANT—8420	GALLON	1760		SIGNS-DANGER	EACH	4540	
EXHAUST DUCT—10 FEET PER ROLL	LIN FT	1820		SPRAY ADHESIVE	CAN	4820	
FILTERS—NEGATIVE AIR-PRE	EACH	1850	2	SPRAY FOAM WIRE BRUSHES	CAN	4860	12
FILTERS—NEGATIVE AIR-BOX	EACH	1860	2	SPRAY PAINT	CAN	4900	
FILTERS—NEGATIVE AIR-HEPA	EACH	1870		SPRAY POLY Rags	CAN	4940	300
FILTERS—SOCK FILTER—1 TO 20 MICRONS	EACH	2100		VACUUM BAGS	EACH	4980	
FILTERS-VACUUM—DACRON	EACH	2140		WASTE BOXES/GUZZLER BOXES	EACH	5100	
FILTERS-VACUUM—HEPA	EACH	2180		WASTE LABELS	EACH	5140	200

OTHER MATERIALS & EQUIPMENT USED

DESCRIPTION	UNIT	ITEM CODE	UNITS USED
N-A UNIT	2		2
"22" 4 W/D VAC	2		2.
2x ext. 2x6' 3x8' 1x10 LADDERS.			
EXT. CORD	20		20
HAND SPRAYERS	2		2
SQUEEGIES	3		3
GANG BOX	1		1
MOP SET	1		1
CORE-SAW	1		1
SHOWER SET	1		1
FILT. UNIT	1		1
SHOVELS PL	1		1
POWER PANEL	1		1

SPECIAL NOTES, VISITORS TO THE SITE AND MISCELLANEOUS COMMENTS

AMOUNT OF DISPOSAL: 206 Bags & 1- Drum. Pick-up.

PRESSURE DIFFERENTIAL READING:

AIR MONITORING COMPANY: TH Services

ASBESTOS IN WORK AREA NOT PART OF SCOPE: ☐ YES ☐ NO

ASBESTOS HANDLED BY OTHERS: ☐ YES ☐ NO IF YES COMPLETE FORM

AIR SAMPLING INFORMATION

TYPE	QUANTITY	NUMBER	RESULTS
PRELIMINARY			
I.W.A.			
O.W.A.			
PERSONAL			
FINAL			

VISITORS TO THE SITE:

NAME	COMPANY
NAME	COMPANY
NAME	COMPANY

DELAY INFORMATION

DELAYED: ☐ YES ☐ NO IF YES, BY WHOM:

MANHOURS LOST:

REASON FOR DELAY:

USE BALLPOINT PEN
COMPLETE FRONT SIDE FIRST
THEN REMOVE CARBON
THEN COMPLETE BACK OF FORM LAST

DESCRIPTION OF WORK PERFORMED

Doing double bags and moving out from working area for 206 bags of asbestos and 1. drum. and we are still final cleaned up the pipe fitting and pipe hanger and duct and hot water tank and boilers and wipe down poly on wall and floor

CUSTOMER S SIGNATURE

JOB SUPERVISOR S SIGNATURE

OPERATIONS MANAGER APPROVAL

DATE	PAGE	OF
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MARCOR ENVIRONMENTAL

DAILY JOB REPORT — ABATEMENT OPERATIONS

CONTROL NO. 017017

FORM #05405F1

JOB NAME	OFFICE	CONTRACT NUMBER	WORK ORDER #	PREPARED BY
BENTALOR BLDG #157	8 4	0 0 0 0 1	2 2 9	KHAMLA KHANTRY

LABOR USED

EMPLOYEE NUMBER	ACT. CODE	EMPLOYEE NAME	START TIME	STOP TIME	LUNCH Y or N	HOURS WORKED	DAY HOURS	NIGHT HOURS	O.T. HOURS	ABSNT/TRDY CODE	TITLE	PROT. LEVEL	MILEAGE REIMB.	EMPLOYEE SIGNATURE
020290		C. THOMASSEN	1500	2330	Y	8	3	5	0		TECH.			C. Thomassen
133770		EDWARD TRUONG	1500	2330	"	8	3	5	0		"			Edward Truong
019750		CHRIS STEWART	1500	2330	"	8	3	5	0		"			Chris Stewart
018020		MICHAEL RAGLAND	1500	2330	"	8	3	5	0		"			Michael Ragland
013842		KEITH MORRIS	1500	2330	"	8	3	5	0		"			Keith Morris
008490		THOMAS HOOD	1500	2330	"	8	3	5	0		"			Thomas Hood

TOTAL HOURS TO BE PAID (INCLUDING ALL CONTINUATION PAGES)

NO. OF CONTINUATION PAGES ATTACHED?

STANDARD MATERIALS USED

DESCRIPTION	UNIT	ITEM CODE	UNITS USED	DESCRIPTION	UNIT	ITEM CODE	UNITS USED
ABSORBENT—FORMULA 1M-1216	POUND	0300		GLOVES—	PAIR		
BAGS—6 MIL ASBESTOS	EACH	0380		GLOVES—	PAIR		
BAGS—6 MIL CLEAR	EACH	0390		MASKING TAPE	ROLL	2860	
BAGS—10 MIL ASBESTOS	EACH	0385		MASTIC REMOVER	GALLON	2900	
BAGS-GLOVE BAGS—ALL SIZES-ASBESTOS	EACH	0420		PAINT BRUSHES AND ROLLERS	EACH	3140	
BARRIER TAPE-CAUTION/DANGER-1000' ROLL	LIN FT	0460		PLASTIC LINERS—3 MIL—100 PER CARTON	CARTON	3180	
RESPIRATOR CARTRIDGES—HEPA	EACH	0820		PLASTIC LINERS—6 MIL—100 PER CARTON	CARTON	3220	
RESPIRATOR CARTRIDGES—ORGANIC VAPOR/HEPA	EACH	0860		POLY SHEETING—10 MIL	ROLL	3260	
DETECTOR TUBES-SMOKE	EACH	1300		POLY SHEETING—6 MIL	ROLL	3300	
DRUMS—FIBER	EACH	1540		POLY SHEETING—4 MIL	ROLL	3320	
DUCT TAPE—1"	ROLL	1570		POLY SHEETING—FIRE RETARDANT ___ MIL	ROLL		
DUCT TAPE—2"	ROLL	1580		POLY SHEETING—BLACK ___ MIL	ROLL		
DUCT TAPE—3"	ROLL	1590		POLY SHEETING—NYLON REINFORCED ___ MIL	ROLL		
DUCT TAPE—4"	ROLL	1620		PROTECTIVE SUITS—ASBESTOS	EACH	3660	
DUCT TAPE—BLUE	ROLL	1630		QUICK SCRUB (SCRUBBER GRILL)	EACH	4140	
ENCAPSULANT—3220	GALLON	1710		REWETTABLE CLOTH 60"	LIN FT	4220	
ENCAPSULANT—3222	GALLON	1730		SAFETY FENCE—50 FOOT ROLL	ROLL	4260	
ENCAPSULANT—3232	GALLON	1740		SCRAPERS	EACH	4420	
ENCAPSULANT—3260	GALLON	1750		SHOWER TOWELS—300 PER CASE	EACH	4500	
ENCAPSULANT—8420	GALLON	1760		SIGNS-DANGER	EACH	4540	
EXHAUST DUCT—10 FEET PER ROLL	LIN FT	1820		SPRAY ADHESIVE	CAN	4820	
FILTERS—NEGATIVE AIR-PRE	EACH	1850		SPRAY FOAM	CAN	4860	
FILTERS—NEGATIVE AIR-BOX	EACH	1860		SPRAY PAINT	CAN	4900	
FILTERS—NEGATIVE AIR-HEPA	EACH	1870		SPRAY POLY	GALLON	4940	
FILTERS—SOCK FILTER—1 TO 20 MICRONS	EACH	2100		VACUUM BAGS	EACH	4980	
FILTERS-VACUUM—DACRON	EACH	2140		WASTE BOXES/GUZZLER BOXES	EACH	5100	
FILTERS-VACUUM—HEPA	EACH	2180		WASTE LABELS	EACH	5140	

OTHER MATERIALS & EQUIPMENT USED

DESCRIPTION	UNIT	ITEM CODE	UNITS USED

SPECIAL NOTES, VISITORS TO THE SITE AND MISCELLANEOUS COMMENTS

AMOUNT OF DISPOSAL:

AIR SAMPLING INFORMATION

TYPE	QUANTITY	NUMBER	RESULTS
PRELIMINARY			
I.W.A.			
O.W.A.			
PERSONAL			
FINAL			

PRESSURE DIFFERENTIAL READING:

AIR MONITORING COMPANY:

ASBESTOS IN WORK AREA NOT PART OF SCOPE: ☐ YES ☐ NO

ASBESTOS HANDLED BY OTHERS:
☐ YES ☐ NO IF YES COMPLETE FORM

VISITORS TO THE SITE:

NAME	COMPANY
NAME	COMPANY
NAME	COMPANY

DELAY INFORMATION

DELAYED: ☐ YES ☐ NO IF YES, BY WHOM:

MANHOURS LOST:

REASON FOR DELAY:

USE BALLPOINT PEN
COMPLETE FRONT SIDE FIRST
THEN REMOVE CARBON
THEN COMPLETE BACK OF FORM LAST

DESCRIPTION OF WORK PERFORMED

CUSTOMER S SIGNATURE

JOB SUPERVISOR S SIGNATURE

OPERATIONS MANAGER APPROVAL

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MARCOR ENVIRONMENTAL

DAILY JOB REPORT — ABATEMENT OPERATIONS

CONTROL NO. 016911

FORM 805405F1

JOB NAME	OFFICE	JOB NUMBER: CONTRACT NUMBER	WORK ORDER #	PREPARED BY
Bethlehem Hospital # 150	E	0 0 0 0 1	2 2 9	Sack Vongphakdy

LABOR USED

EMPLOYEE NUMBER	ACT. CODE	EMPLOYEE NAME	START TIME	STOP TIME	LUNCH Y or N	HOURS WORKED	DAY HOURS	NIGHT HOURS	O.T. HOURS	ABSNT/TRDY CODE	TITLE	PROT. LEVEL	MILEAGE REIMB.	EMPLOYEE SIGNATURE
028650		Sack Vongphakdy	1500	2330	Y	8	3	5			SP			
000750		Norne Honeluway	1500	2330	Y	8	3	5			Tech			
013150		Billy Maniphone	1500	2330	Y	8	3	5			Tech			
313491		Morales Cesar	1500	2330	Y	8	3	5			Tech			
018842		Morri Keith	1500	2330	Y	8	3	5			Tech			
312615		Osorio Porfirio	1500	2330	Y	8	3	5			Tech			
018020		Michael Ragland	1500	2330	Y	8	3	5			Tech			
019700		B.H. Souvanhavong	1500	2330	Y	8	3	5			Tech			
019750		Stewart Christopher	1500	2330	Y	8	3	5			Tech			
		TOTAL HOURS TO BE PAID (INCLUDING ALL CONTINUATION PAGES)												

NO. OF CONTINUATION PAGES ATTACHED: ____

STANDARD MATERIALS USED

DESCRIPTION	UNIT	ITEM CODE	UNITS USED	DESCRIPTION	UNIT	ITEM CODE	UNITS USED
ABSORBENT—FORMULA 1M-1216	POUND	0300		GLOVES—	PAIR		
BAGS—6 MIL ASBESTOS	EACH	0380		GLOVES—	PAIR		
BAGS—6 MIL CLEAR	EACH	0390		MASKING TAPE	ROLL	2860	
BAGS—10 MIL ASBESTOS	EACH	0385		MASTIC REMOVER	GALLON	2900	
BAGS-GLOVE BAGS—ALL SIZES-ASBESTOS	EACH	0420		PAINT BRUSHES AND ROLLERS	EACH	3140	
BARRIER TAPE-CAUTION/DANGER-1000' ROLL	LIN FT	0460		PLASTIC LINERS—3 MIL—100 PER CARTON	CARTON	3180	
RESPIRATOR CARTRIDGES—HEPA	EACH	0820	4	PLASTIC LINERS—6 MIL—100 PER CARTON	CARTON	3220	
RESPIRATOR CARTRIDGES—ORGANIC VAPOR/HEPA	EACH	0860		POLY SHEETING—10 MIL	ROLL	3260	
DETECTOR TUBES-SMOKE	EACH	1300		POLY SHEETING—6 MIL	ROLL	3300	
DRUMS—FIBER	EACH	1540		POLY SHEETING—4 MIL	ROLL	3320	
DUCT TAPE—1"	ROLL	1570		POLY SHEETING—FIRE RETARDANT ___ MIL	ROLL		
DUCT TAPE—2"	ROLL	1580		POLY SHEETING—BLACK ___ MIL	ROLL		
DUCT TAPE—3"	ROLL	1590		POLY SHEETING—NYLON REINFORCED ___ MIL	ROLL		
DUCT TAPE—4"	ROLL	1620		PROTECTIVE SUITS—ASBESTOS	EACH	3660	20
DUCT TAPE—BLUE	ROLL	1630		QUICK SCRUB (SCRUBBER GRILL)	EACH	4140	
ENCAPSULANT—3220	GALLON	1710		REWETTABLE CLOTH 60"	LIN FT	4220	
ENCAPSULANT—3222	GALLON	1730	10	SAFETY FENCE—50 FOOT ROLL	ROLL	4260	
ENCAPSULANT—3232	GALLON	1740		SCRAPERS	EACH	4420	
ENCAPSULANT—3260	GALLON	1750		SHOWER TOWELS—300 PER CASE	EACH	4500	150
ENCAPSULANT—8420	GALLON	1760		SIGNS-DANGER	EACH	4540	
EXHAUST DUCT—10 FEET PER ROLL	LIN FT	1820		SPRAY ADHESIVE	CAN	4820	
FILTERS—NEGATIVE AIR-PRE	EACH	1850	6	SPRAY FOAM	CAN	4860	
FILTERS—NEGATIVE AIR-BOX	EACH	1860	3	SPRAY PAINT	CAN	4900	
FILTERS—NEGATIVE AIR-HEPA	EACH	1870		SPRAY POLY	GALLON	4940	
FILTERS—SOCK FILTER—1 TO 20 MICRONS	EACH	2100		VACUUM BAGS	EACH	4980	
FILTERS-VACUUM—DACRON	EACH	2140		WASTE BOXES/GUZZLER BOXES	EACH	5100	
FILTERS-VACUUM—HEPA	EACH	2180		WASTE LABELS	EACH	5140	

OTHER MATERIALS & EQUIPMENT USED

DESCRIPTION	UNIT	ITEM CODE	UNITS USED
Ladder	each		6
Shower set	each		1
Negative air machine	each		3
Vacuum	each		3
power plant, Mop set	each		1
Handle sprayer	each		2
Water Hoses	Ft.		200
Rag	Pound		15

SPECIAL NOTES, VISITORS TO THE SITE AND MISCELLANEOUS COMMENTS

AMOUNT OF DISPOSAL:

AIR SAMPLING INFORMATION

TYPE	QUANTITY	NUMBER	RESULTS
PRELIMINARY			
I.W.A.			
O.W.A.			
PERSONAL			
FINAL			

PRESSURE DIFFERENTIAL READING: 0.026 P/GC

AIR MONITORING COMPANY: I H Services

ASBESTOS IN WORK AREA NOT PART OF SCOPE: ☐ YES ☑ NO

ASBESTOS HANDLED BY OTHERS: ☐ YES ☑ NO IF YES COMPLETE FORM

VISITORS TO THE SITE:

NAME	COMPANY
NAME	COMPANY
NAME	COMPANY

DELAY INFORMATION

DELAYED: ☐ YES ☑ NO IF YES, BY WHOM:

MANHOURS LOST:

REASON FOR DELAY:

USE BALLPOINT PEN
COMPLETE FRONT SIDE FIRST
THEN REMOVE CARBON
THEN COMPLETE BACK OF FORM LAST

DESCRIPTION OF WORK PERFORMED

Continue FINAL clean at- boilers, pipes and Hot Water Tank.
FINISH FINAL clean- WASHING the WALLS boiler. and Anything
Wrapping the Boilers, Tank, Beache poly at the WALLS clean.
All-Equipment. and- Sent Out. clean the Floor.
After-Lunch- I AND I.H- service going For inspection
All AND Rech all WORKING area.
Completed Finish- For Final clean. We are endcap
with 32-22. after FINISH end- clean And sid work
area. Lock anything and Luring.

CUSTOMER'S SIGNATURE

JOB SUPERVISOR'S SIGNATURE

OPERATIONS MANAGER APPROVAL

DATE	PAGE	OF
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MARCOR ENVIRONMENTAL

DAILY JOB REPORT — ABATEMENT OPERATIONS

CONTROL NO. 016912

FORM 805405F1

JOB NAME	JOB NUMBER: OFFICE	CONTRACT NUMBER	WORK ORDER #	PREPARED BY
Bamboo Elementary	E L	0 0 0 0 1	2 2 9	Sack Vongphakdy

LABOR USED

EMPLOYEE NUMBER	ACT. CODE	EMPLOYEE NAME	START TIME	STOP TIME	LUNCH Y or N	HOURS WORKED	DAY HOURS	NIGHT HOURS	O.T. HOURS	ABSNT/HDY CODE	TITLE	PROT. LEVEL	MILEAGE REIMB.	EMPLOYEE SIGNATURE
020290		C. Thongdygnalat	1500	2330	Y	8	3	5			Tech			C. Thongdygnalat
023400		N. Stheksposan	1500	2330	Y	8	3	5			Tech			Nathaniel Stheksposan
		Co Vinh Truong	1500	2330	Y	8	3	5			Tech			Co Truong
		TOTAL HOURS TO BE PAID (INCLUDING ALL CONTINUATION PAGES)												NO. OF CONTINUATION PAGES ATTACHED

STANDARD MATERIALS USED

DESCRIPTION	UNIT	ITEM CODE	UNITS USED	DESCRIPTION	UNIT	ITEM CODE	UNITS USED
ABSORBENT—FORMULA 1M-1216	POUND	0300		GLOVES—	PAIR		
BAGS—6 MIL ASBESTOS	EACH	0380		GLOVES—	PAIR		
BAGS—6 MIL CLEAR	EACH	0390		MASKING TAPE	ROLL	2860	
BAGS—10 MIL ASBESTOS	EACH	0385		MASTIC REMOVER	GALLON	2900	
BAGS-GLOVE BAGS—ALL SIZES-ASBESTOS	EACH	0420		PAINT BRUSHES AND ROLLERS	EACH	3140	
BARRIER TAPE-CAUTION/DANGER-1000' ROLL	LIN FT	0460		PLASTIC LINERS—3 MIL—100 PER CARTON	CARTON	3180	
RESPIRATOR CARTRIDGES—HEPA	EACH	0820		PLASTIC LINERS—6 MIL—100 PER CARTON	CARTON	3220	
RESPIRATOR CARTRIDGES—ORGANIC VAPOR/HEPA	EACH	0860		POLY SHEETING—10 MIL	ROLL	3260	
DETECTOR TUBES-SMOKE	EACH	1300		POLY SHEETING—6 MIL	ROLL	3300	
DRUMS—FIBER	EACH	1540		POLY SHEETING—4 MIL	ROLL	3320	
DUCT TAPE—1"	ROLL	1570		POLY SHEETING—FIRE RETARDANT ___ MIL	ROLL		
DUCT TAPE—2"	ROLL	1580		POLY SHEETING—BLACK ___ MIL	ROLL		
DUCT TAPE—3"	ROLL	1590		POLY SHEETING—NYLON REINFORCED 4 MIL	ROLL		
DUCT TAPE—4"	ROLL	1620		PROTECTIVE SUITS—ASBESTOS	EACH	3660	
DUCT TAPE—BLUE	ROLL	1630		QUICK SCRUB (SCRUBBER GRILL)	EACH	4140	
ENCAPSULANT—3220	GALLON	1710		REWETTABLE CLOTH 60"	LIN FT	4220	
ENCAPSULANT—3222	GALLON	1730		SAFETY FENCE—50 FOOT ROLL	ROLL	4260	
ENCAPSULANT—3232	GALLON	1740		SCRAPERS	EACH	4420	
ENCAPSULANT—3260	GALLON	1750		SHOWER TOWELS—300 PER CASE	EACH	4500	
ENCAPSULANT—8420	GALLON	1760		SIGNS-DANGER	EACH	4540	
EXHAUST DUCT—10 FEET PER ROLL	LIN FT	1820		SPRAY ADHESIVE	CAN	4820	
FILTERS—NEGATIVE AIR-PRE	EACH	1850		SPRAY FOAM	CAN	4860	
FILTERS—NEGATIVE AIR-BOX	EACH	1860		SPRAY PAINT	CAN	4900	
FILTERS—NEGATIVE AIR-HEPA	EACH	1870		SPRAY POLY	GALLON	4940	
FILTERS—SOCK FILTER—1 TO 20 MICRONS	EACH	2100		VACUUM BAGS	EACH	4980	
FILTERS-VACUUM—DACRON	EACH	2140		WASTE BOXES/GUZZLER BOXES	EACH	5100	
FILTERS-VACUUM—HEPA	EACH	2180		WASTE LABELS	EACH	5140	

OTHER MATERIALS & EQUIPMENT USED

DESCRIPTION	UNIT	ITEM CODE	UNITS USED

SPECIAL NOTES, VISITORS TO THE SITE AND MISCELLANEOUS COMMENTS

AMOUNT OF DISPOSAL:

AIR SAMPLING INFORMATION

TYPE	QUANTITY	NUMBER	RESULTS
PRELIMINARY			
I.W.A.			
O.W.A.			
PERSONAL			
FINAL			

PRESSURE DIFFERENTIAL READING: -0.025 Pa

AIR MONITORING COMPANY: I.H. Services Inc.

ASBESTOS IN WORK AREA NOT PART OF SCOPE: ☐ YES ☑ NO

ASBESTOS HANDLED BY OTHERS: ☐ YES ☑ NO IF YES COMPLETE FORM

VISITORS TO THE SITE:

NAME	COMPANY
NAME	COMPANY
NAME	COMPANY

DELAY INFORMATION

DELAYED: ☐ YES ☑ NO – IF YES, BY WHOM:

MANHOURS LOST:

REASON FOR DELAY:

USE BALLPOINT PEN
COMPLETE FRONT SIDE FIRST
THEN REMOVE CARBON
THEN COMPLETE BACK OF FORM LAST

DESCRIPTION OF WORK PERFORMED

Send first page

CUSTOMER'S SIGNATURE

JOB SUPERVISOR'S SIGNATURE

OPERATIONS MANAGER APPROVAL

DATE	PAGE	OF
11-22-99	1	1

MARCOR ENVIRONMENTAL

DAILY JOB REPORT — ABATEMENT OPERATIONS

CONTROL NO. 016906

FORM #05405F1

JOB NAME	JOB NUMBER: OFFICE	CONTRACT NUMBER	WORK ORDER #	PREPARED BY
Bentalou Elem #150	E L	0 0 0 0 1	2 2 9	Sack Vongplakdy

LABOR USED

EMPLOYEE NUMBER	ACT. CODE	EMPLOYEE NAME	START TIME	STOP TIME	LUNCH Y or N	HOURS WORKED	DAY HOURS	NIGHT HOURS	O.T. HOURS	ABSNT/TRDY CODE	TITLE	PROT. LEVEL	MILEAGE REIMB.	EMPLOYEE SIGNATURE
022650		Sack Vongplakdy	1500	2380	Y	8	3	5			SP			S Vongplakdy
019130		Ford Scott	1500	2380	Y	8	3	5			T			Ford Scott

TOTAL HOURS TO BE PAID (INCLUDING ALL CONTINUATION PAGES)

NO. OF CONTINUATION PAGES ATTACHED:

STANDARD MATERIALS USED

DESCRIPTION	UNIT	ITEM CODE	UNITS USED
ABSORBENT—FORMULA 1M-1216	POUND	0300	
BAGS—6 MIL ASBESTOS	EACH	0380	4
BAGS—6 MIL CLEAR	EACH	0390	
BAGS—10 MIL ASBESTOS	EACH	0385	
BAGS-GLOVE BAGS—ALL SIZES-ASBESTOS	EACH	0420	
BARRIER TAPE-CAUTION/DANGER-1000' ROLL	LIN FT	0460	
RESPIRATOR CARTRIDGES—HEPA	EACH	0820	
RESPIRATOR CARTRIDGES—ORGANIC VAPOR/HEPA	EACH	0860	
DETECTOR TUBES-SMOKE	EACH	1300	
DRUMS—FIBER	EACH	1540	
DUCT TAPE—1"	ROLL	1570	
DUCT TAPE—2"	ROLL	1580	
DUCT TAPE—3"	ROLL	1590	
DUCT TAPE—4"	ROLL	1620	
DUCT TAPE—BLUE	ROLL	1630	
ENCAPSULANT—3220	GALLON	1710	
ENCAPSULANT—3222	GALLON	1730	
ENCAPSULANT—3232	GALLON	1740	
ENCAPSULANT—3260	GALLON	1750	
ENCAPSULANT—8420	GALLON	1760	
EXHAUST DUCT—10 FEET PER ROLL	LIN FT	1820	
FILTERS—NEGATIVE AIR-PRE	EACH	1850	2
FILTERS—NEGATIVE AIR-BOX	EACH	1860	2
FILTERS—NEGATIVE AIR-HEPA	EACH	1870	
FILTERS—SOCK FILTER—1 TO 20 MICRONS	EACH	2100	
FILTERS-VACUUM—DACRON	EACH	2140	
FILTERS-VACUUM—HEPA	EACH	2180	

DESCRIPTION	UNIT	ITEM CODE	UNITS USED
GLOVES—	PAIR		
GLOVES—	PAIR		
MASKING TAPE	ROLL	2860	
MASTIC REMOVER	GALLON	2900	
PAINT BRUSHES AND ROLLERS	EACH	3140	
PLASTIC LINERS—3 MIL—100 PER CARTON	CARTON	3180	
PLASTIC LINERS—6 MIL—100 PER CARTON	CARTON	3220	
POLY SHEETING—10 MIL	ROLL	3260	
POLY SHEETING—6 MIL	ROLL	3300	
POLY SHEETING—4 MIL	ROLL	3320	
POLY SHEETING—FIRE RETARDANT ___ MIL	ROLL		
POLY SHEETING—BLACK ___ MIL	ROLL		
POLY SHEETING—NYLON REINFORCED ___ MIL	ROLL		
PROTECTIVE SUITS—ASBESTOS	EACH	3660	
QUICK SCRUB (SCRUBBER GRILL)	EACH	4140	
REWETTABLE CLOTH 60"	LIN FT	4220	
SAFETY FENCE—50 FOOT ROLL	ROLL	4260	
SCRAPERS	EACH	4420	
SHOWER TOWELS—300 PER CASE	EACH	4500	
SIGNS-DANGER	EACH	4540	
SPRAY ADHESIVE	CAN	4820	
SPRAY FOAM	CAN	4860	
SPRAY PAINT	CAN	4900	
SPRAY POLY	GALLON	4940	
VACUUM BAGS	EACH	4980	
WASTE BOXES/GUZZLER BOXES	EACH	5100	
WASTE LABELS	EACH	5140	

OTHER MATERIALS & EQUIPMENT USED

DESCRIPTION	UNIT	ITEM CODE	UNITS USED
Rag	Pound		5

SPECIAL NOTES. VISITORS TO THE SITE AND MISCELLANEOUS COMMENTS

AMOUNT OF DISPOSAL:

AIR SAMPLING INFORMATION

TYPE	QUANTITY	NUMBER	RESULTS
PRELIMINARY			
I.W.A.			
O.W.A.			
PERSONAL			
FINAL	18	80-98	Tenflex 200

PRESSURE DIFFERENTIAL READING: 0.25 Hg

AIR MONITORING COMPANY: J Mc Service Inc

ASBESTOS IN WORK AREA NOT PART OF SCOPE: ☐ YES ☑ NO

ASBESTOS HANDLED BY OTHERS: ☐ YES ☐ NO IF YES COMPLETE FORM

VISITORS TO THE SITE:

NAME	COMPANY
NAME	COMPANY
NAME	COMPANY

DELAY INFORMATION

DELAYED: ☐ YES ☑ NO IF YES, BY WHOM:

MANHOURS LOST:

REASON FOR DELAY:

USE BALLPOINT PEN
COMPLETE FRONT SIDE FIRST
THEN REMOVE CARBON
THEN COMPLETE BACK OF FORM LAST

DESCRIPTION OF WORK PERFORMED

After J.M. Service Runing the PCM. We are Taking the poly out From Cover the Motor Pum at boiler AND Gas Pump. The engineia going in for Repaire the boiler. After they are finish Repaire. We are Run the T.E.M.

CUSTOMER'S SIGNATURE

JOB SUPERVISOR'S SIGNATURE

OPERATIONS MANAGER APPROVAL

DATE 11-28-94 | PAGE 1 OF 2

MARCOR ENVIRONMENTAL — DAILY JOB REPORT — ABATEMENT OPERATIONS

CONTROL NO. 016909

FORM #05405F1

JOB NAME	OFFICE	CONTRACT NUMBER	WORK ORDER #	PREPARED BY
Bentalou Elementary #152	LA	0 0 0 0 1	2 2 9	Sack Vongphakdy

LABOR USED

EMPLOYEE NUMBER	ACT. CODE	EMPLOYEE NAME	START TIME	STOP TIME	LUNCH Y or N	HOURS WORKED	DAY HOURS	NIGHT HOURS	O.T. HOURS	ABSNT/TRDY CODE	TITLE	PROT. LEVEL	MILEAGE REIMB.	EMPLOYEE SIGNATURE
022650		Sack Vongphakdy	1500	2330	Y	8	3	5			SP			S. Vongphakdy
000750		Dawne Hambleton	1500	2330	Y	8	3	5			Tech			D. Hambleton
013150		Billy Manipholt	1500	2330	Y	8	3	5			Tech			Billy Manipholt
313491		Morales Cesar	1500	2330	Y	8	3	5			Tech			Cesar
314615		Osorio Pofirio	1500	2330	Y	8	3	5			Tech			
019750		Stewart Christopher	1500	2330	Y	8	3	5			Tech			Christopher Stewart
020290		C. Thongdy galat	1500	2330	Y	8	3	5			Tech			C. Thongdy galat
023400		N. Witherspoon	1500	2330	Y	8	3	5			Tech			Nathaniel Witherspoon
		Co. Vinh Truong	1500	2330	Y	8	3	5			Tech			Co Truong
		TOTAL HOURS TO BE PAID (INCLUDING ALL CONTINUATION PAGES)												

NO. OF CONTINUATION PAGES ATTACHED: _____

STANDARD MATERIALS USED

DESCRIPTION	UNIT	ITEM CODE	UNITS USED	DESCRIPTION	UNIT	ITEM CODE	UNITS USED
ABSORBENT—FORMULA 1M-1216	POUND	0300		GLOVES—	PAIR		
BAGS—6 MIL ASBESTOS	EACH	0380	50	GLOVES—	PAIR		
BAGS—6 MIL CLEAR	EACH	0390		MASKING TAPE	ROLL	2860	
BAGS—10 MIL ASBESTOS	EACH	0385		MASTIC REMOVER	GALLON	2900	
BAGS-GLOVE BAGS—ALL SIZES-ASBESTOS	EACH	0420		PAINT BRUSHES AND ROLLERS	EACH	3140	
BARRIER TAPE-CAUTION/DANGER-1000' ROLL	LIN FT	0460		PLASTIC LINERS—3 MIL—100 PER CARTON	CARTON	3180	
RESPIRATOR CARTRIDGES—HEPA	EACH	0820		PLASTIC LINERS—6 MIL—100 PER CARTON	CARTON	3220	
RESPIRATOR CARTRIDGES—ORGANIC-VAPOR/HEPA	EACH	0860		POLY SHEETING—10 MIL	ROLL	3260	
DETECTOR TUBES-SMOKE	EACH	1300		POLY SHEETING—6 MIL	ROLL	3300	
DRUMS—FIBER	EACH	1540		POLY SHEETING—4 MIL	ROLL	3320	
DUCT TAPE—1"	ROLL	1570		POLY SHEETING—FIRE RETARDANT ___ MIL	ROLL		
DUCT TAPE—2"	ROLL	1580	1	POLY SHEETING—BLACK 6 MIL	ROLL		1/4
DUCT TAPE—3"	ROLL	1590		POLY SHEETING—NYLON REINFORCED ___ MIL	ROLL		
DUCT TAPE—4"	ROLL	1620		PROTECTIVE SUITS—ASBESTOS	EACH	3660	
DUCT TAPE—BLUE	ROLL	1630		QUICK SCRUB (SCRUBBER GRILL)	EACH	4140	
ENCAPSULANT—3220	GALLON	1710		REWETTABLE CLOTH 60"	LIN FT	4220	
ENCAPSULANT—3222	GALLON	1730		SAFETY FENCE—50 FOOT ROLL	ROLL	4260	
ENCAPSULANT—3232	GALLON	1740		SCRAPERS	EACH	4420	
ENCAPSULANT—3260	GALLON	1750		SHOWER TOWELS—300 PER CASE	EACH	4500	20
ENCAPSULANT—8420	GALLON	1760		SIGNS-DANGER	EACH	4540	2
EXHAUST DUCT—10 FEET PER ROLL	LIN FT	1820		SPRAY ADHESIVE	CAN	4820	
FILTERS—NEGATIVE AIR-PRE	EACH	1850	2	SPRAY FOAM	CAN	4860	
FILTERS—NEGATIVE AIR-BOX	EACH	1860	2	SPRAY PAINT	CAN	4900	
FILTERS—NEGATIVE AIR-HEPA	EACH	1870		SPRAY POLY	GALLON	4940	
FILTERS—SOCK FILTER—1 TO 20 MICRONS	EACH	2100	6	VACUUM BAGS	EACH	4980	
FILTERS-VACUUM—DACRON	EACH	2140		WASTE BOXES/GUZZLER BOXES	EACH	5100	
FILTERS-VACUUM—HEPA	EACH	2180		WASTE LABELS	EACH	5140	35

OTHER MATERIALS & EQUIPMENT USED

DESCRIPTION	UNIT	ITEM CODE	UNITS USED
Rag	Pound		10
Vacuum	each		1

SPECIAL NOTES, VISITORS TO THE SITE AND MISCELLANEOUS COMMENTS

AMOUNT OF DISPOSAL:

AIR SAMPLING INFORMATION

TYPE	QUANTITY	NUMBER	RESULTS
PRELIMINARY			
I.W.A.			
O.W.A.			
PERSONAL			
FINAL			

PRESSURE DIFFERENTIAL READING:

AIR MONITORING COMPANY: T.H. Service

ASBESTOS IN WORK AREA NOT PART OF SCOPE: ☐ YES ☑ NO

ASBESTOS HANDLED BY OTHERS: ☐ YES ☑ NO IF YES COMPLETE FORM

VISITORS TO THE SITE:

NAME	COMPANY
NAME	COMPANY
NAME	COMPANY

DELAY INFORMATION

DELAYED: ☐ YES ☑ NO IF YES, BY WHOM:

MANHOURS LOST:

REASON FOR DELAY:

USE BALLPOINT PEN
COMPLETE FRONT SIDE FIRST
THEN REMOVE CARBON
THEN COMPLETE BACK OF FORM LAST

DESCRIPTION OF WORK PERFORMED

We are clean Out side. and Store Room. Store all Equipment and Materal. After 5 pm. Have. Results From T.H. Service. Start. Teadown. the poly at walls, windows, Cover. Equipment and. air Lock, bags all poly. Double bags out, Vacuum. the Floor, washing Floor, clean. all. Equipment and Store all. Equipment. with. Materal, Re Check all. inside. and. Outside. working area. Completed. Finish. we are Lock up Anything.

CUSTOMER'S SIGNATURE

JOB SUPERVISOR'S SIGNATURE R. Thompson

OPERATIONS MANAGER APPROVAL

DATE	PAGE	OF
11/28/99	1	2

MARCOR ENVIRONMENTAL

DAILY JOB REPORT — ABATEMENT OPERATIONS

CONTROL NO. 016903

FORM #05405F1

JOB NAME	JOB NUMBER: OFFICE	CONTRACT NUMBER	WORK ORDER #	PREPARED BY
Bentalou - Van #150	E L	0 0 0 0 1	2 2 9	Jack Vongphakdy.

LABOR USED

EMPLOYEE NUMBER	ACT. CODE	EMPLOYEE NAME	START TIME	STOP TIME	LUNCH Y or N	HOURS WORKED	DAY HOURS	NIGHT HOURS	O.T. HOURS	ABSNT/TRDY CODE	TITLE	PROT. LEVEL	MILEAGE REIMB.	EMPLOYEE SIGNATURE
002030		Robin Bolonis	1500	2320	Y	8	3	5			Tech			Robin Bolonis
016147		Gardner Park	1500	1800	N	7	1				Gen.			Gardner Park

TOTAL HOURS TO BE PAID (INCLUDING ALL CONTINUATION PAGES)

NO. OF CONTINUATION PAGES ATTACHED:

STANDARD MATERIALS USED

DESCRIPTION	UNIT	ITEM CODE	UNITS USED	DESCRIPTION	UNIT	ITEM CODE	UNITS USED
ABSORBENT—FORMULA 1M-1216	POUND	0300		GLOVES—	PAIR		
BAGS—6 MIL ASBESTOS	EACH	0380		GLOVES—	PAIR		
BAGS—6 MIL CLEAR	EACH	0390		MASKING TAPE	ROLL	2860	
BAGS—10 MIL ASBESTOS	EACH	0385		MASTIC REMOVER	GALLON	2900	
BAGS-GLOVE BAGS—ALL SIZES-ASBESTOS	EACH	0420		PAINT BRUSHES AND ROLLERS	EACH	3140	
BARRIER TAPE-CAUTION/DANGER-1000' ROLL	LIN FT	0460		PLASTIC LINERS—3 MIL—100 PER CARTON	CARTON	3180	
RESPIRATOR CARTRIDGES—HEPA	EACH	0820		PLASTIC LINERS—6 MIL—100 PER CARTON	CARTON	3220	
RESPIRATOR CARTRIDGES—ORGANIC VAPOR/HEPA	EACH	0860		POLY SHEETING—10 MIL	ROLL	3260	
DETECTOR TUBES-SMOKE	EACH	1300		POLY SHEETING—6 MIL	ROLL	3300	
DRUMS—FIBER	EACH	1540		POLY SHEETING—4 MIL	ROLL	3320	
DUCT TAPE—1"	ROLL	1570		POLY SHEETING—FIRE RETARDANT ___ MIL	ROLL		
DUCT TAPE—2"	ROLL	1580		POLY SHEETING—BLACK ___ MIL	ROLL		
DUCT TAPE—3"	ROLL	1590		POLY SHEETING—NYLON REINFORCED ___ MIL	ROLL		
DUCT TAPE—4"	ROLL	1620		PROTECTIVE SUITS—ASBESTOS	EACH	3660	
DUCT TAPE—BLUE	ROLL	1630		QUICK SCRUB (SCRUBBER GRILL)	EACH	4140	
ENCAPSULANT—3220	GALLON	1710		REWETTABLE CLOTH 60"	LIN FT	4220	
ENCAPSULANT—3222	GALLON	1730		SAFETY FENCE—50 FOOT ROLL	ROLL	4260	
ENCAPSULANT—3232	GALLON	1740		SCRAPERS	EACH	4420	
ENCAPSULANT—3260	GALLON	1750		SHOWER TOWELS—300 PER CASE	EACH	4500	
ENCAPSULANT—8420	GALLON	1760		SIGNS-DANGER	EACH	4540	
EXHAUST DUCT—10 FEET PER ROLL	LIN FT	1820		SPRAY ADHESIVE	CAN	4820	
FILTERS—NEGATIVE AIR-PRE	EACH	1850		SPRAY FOAM	CAN	4860	
FILTERS—NEGATIVE AIR-BOX	EACH	1860		SPRAY PAINT	CAN	4900	
FILTERS—NEGATIVE AIR-HEPA	EACH	1870		SPRAY POLY	GALLON	4940	
FILTERS—SOCK FILTER—1 TO 20 MICRONS	EACH	2100		VACUUM BAGS	EACH	4980	
FILTERS-VACUUM—DACRON	EACH	2140		WASTE BOXES/GUZZLER BOXES	EACH	5100	
FILTERS-VACUUM—HEPA	EACH	2180		WASTE LABELS	EACH	5140	

OTHER MATERIALS & EQUIPMENT USED

DESCRIPTION	UNIT	ITEM CODE	UNITS USED

SPECIAL NOTES. VISITORS TO THE SITE AND MISCELLANEOUS COMMENTS

*AMOUNT OF DISPOSAL:

AIR SAMPLING INFORMATION

TYPE	QUANTITY	NUMBER	RESULTS
PRELIMINARY			
I.W.A.			
O.W.A.			
PERSONAL			
FINAL			

PRESSURE DIFFERENTIAL READING:

AIR MONITORING COMPANY:

ASBESTOS IN WORK AREA NOT PART OF SCOPE: ☐ YES ☑ NO

ASBESTOS HANDLED BY OTHERS:
☐ YES ☑ NO IF YES COMPLETE FORM

VISITORS TO THE SITE:

NAME	COMPANY
NAME	COMPANY
NAME	COMPANY

DELAY INFORMATION

DELAYED: ☐ YES ☑ NO IF YES, BY WHOM:

MANHOURS LOST:

REASON FOR DELAY:

USE BALLPOINT PEN
COMPLETE FRONT SIDE FIRST
THEN REMOVE CARBON
THEN COMPLETE BACK OF FORM LAST

DESCRIPTION OF WORK PERFORMED

Same - first pages -

CUSTOMER'S SIGNATURE

JOB SUPERVISOR'S SIGNATURE

OPERATIONS MANAGER APPROVAL

DATE	PAGE	OF
1/8/97		

MARCOR ENVIRONMENTAL

DAILY JOB REPORT — ABATEMENT OPERATIONS

CONTROL NO. 011423

FORM #05405F1

JOB NAME	JOB NUMBER: OFFICE	CONTRACT NUMBER	WORK ORDER #	PREPARED BY
BENJAMIN FRANKLIN SCHOOL-130	E C	0 0 0 0 1	2 2 3	[illegible]

LABOR USED

EMPLOYEE NUMBER	ACT. CODE	EMPLOYEE NAME	START TIME	STOP TIME	LUNCH Y or N	HOURS WORKED	DAY HOURS	NIGHT HOURS	O.T. HOURS	ABSNT/TRDY CODE	TITLE	PROT. LEVEL	MILEAGE REIMB.	EMPLOYEE SIGNATURE
019130		FRED SCOTT	0600	1100	N	5	5	-	-		SUP			[signature]
			TRAINEE											
				MORNING										
			TRAINEE											
01647		GARDNER PARKS	0715	0815	N	1	1				ASM			

TOTAL HOURS TO BE PAID (INCLUDING ALL CONTINUATION PAGES)

NO. OF CONTINUATION PAGES ATTACHED:

STANDARD MATERIALS USED

DESCRIPTION	UNIT	ITEM CODE	UNITS USED	DESCRIPTION	UNIT	ITEM CODE	UNITS USED
ABSORBENT—FORMULA 1M-1218	POUND	0300		GLOVES—	PAIR		
BAGS—6 MIL ASBESTOS	EACH	0380		GLOVES—	PAIR		
BAGS—6 MIL CLEAR	EACH	0390		MASKING TAPE	ROLL	2860	
BAGS—10 MIL ASBESTOS	EACH	0385		MASTIC REMOVER	GALLON	2900	
BAGS-GLOVE BAGS—ALL SIZES-ASBESTOS	EACH	0420		PAINT BRUSHES AND ROLLERS	EACH	3140	
BARRIER TAPE-CAUTION/DANGER-1000' ROLL	LIN FT	0460		PLASTIC LINERS—3 MIL—100 PER CARTON	CARTON	3180	
RESPIRATOR CARTRIDGES—HEPA	EACH	0820		PLASTIC LINERS—6 MIL—100 PER CARTON	CARTON	3220	
RESPIRATOR CARTRIDGES—ORGANIC VAPOR/HEPA	EACH	0860		POLY SHEETING—10 MIL	ROLL	3260	
DETECTOR TUBES-SMOKE	EACH	1300		POLY SHEETING—6 MIL	ROLL	3300	
DRUMS—FIBER	EACH	1540		POLY SHEETING—4 MIL	ROLL	3320	
DUCT TAPE—1"	ROLL	1570		POLY SHEETING—FIRE RETARDANT ___ MIL	ROLL		
DUCT TAPE—2"	ROLL	1580		POLY SHEETING—BLACK ___ MIL	ROLL		
DUCT TAPE—3"	ROLL	1590		POLY SHEETING—NYLON REINFORCED ___ MIL	ROLL		
DUCT TAPE—4"	ROLL	1620		PROTECTIVE SUITS—ASBESTOS	EACH	3660	
DUCT TAPE—BLUE	ROLL	1630		QUICK SCRUB (SCRUBBER GRILL)	EACH	4140	
ENCAPSULANT—3220	GALLON	1710		REWETTABLE CLOTH 60"	LIN FT	4220	
ENCAPSULANT—3222	GALLON	1730		SAFETY FENCE—50 FOOT ROLL	ROLL	4260	
ENCAPSULANT—3232	GALLON	1740		SCRAPERS	EACH	4420	
ENCAPSULANT—3260	GALLON	1750		SHOWER TOWELS—300 PER CASE	EACH	4500	
ENCAPSULANT—8420	GALLON	1760		SIGNS-DANGER	EACH	4540	
EXHAUST DUCT—10 FEET PER ROLL	LIN FT	1820		SPRAY ADHESIVE	CAN	4820	
FILTERS—NEGATIVE AIR-PRE	EACH	1850		SPRAY FOAM	CAN	4860	
FILTERS—NEGATIVE AIR-BOX	EACH	1860		SPRAY PAINT	CAN	4900	
FILTERS—NEGATIVE AIR-HEPA	EACH	1870		SPRAY POLY	GALLON	4940	
FILTERS—SOCK FILTER—1 TO 20 MICRONS	EACH	2100		VACUUM BAGS	EACH	4980	
FILTERS-VACUUM—DACRON	EACH	2140		WASTE BOXES/GUZZLER BOXES	EACH	5100	
FILTERS-VACUUM—HEPA	EACH	2180		WASTE LABELS	EACH	5140	

OTHER MATERIALS & EQUIPMENT USED

DESCRIPTION	UNIT	ITEM CODE	UNITS USED

ACCOUNTING COPY

SPECIAL NOTES. VISITORS TO THE SITE AND MISCELLANEOUS COMMENTS

AMOUNT OF DISPOSAL:

AIR SAMPLING INFORMATION

TYPE	QUANTITY	NUMBER	RESULTS
PRELIMINARY			
I.W.A.			
O.W.A.			
PERSONAL			
FINAL			

PRESSURE DIFFERENTIAL READING:

AIR MONITORING COMPANY:

ASBESTOS IN WORK AREA NOT PART OF SCOPE: ☐ YES ☐ NO

ASBESTOS HANDLED BY OTHERS: ☐ YES ☐ NO IF YES COMPLETE FORM:

VISITORS TO THE SITE:

NAME	COMPANY
NAME	COMPANY
NAME	COMPANY

DELAY INFORMATION

DELAYED: ☐ YES ☐ NO IF YES, BY WHOM:

MANHOURS LOST:

REASON FOR DELAY:

USE BALLPOINT PEN
COMPLETE FRONT SIDE FIRST
THEN REMOVE CARBON
THEN COMPLETE BACK OF FORM LAST

DESCRIPTION OF WORK PERFORMED

Came and Turned the boilers on and kept a eye on the work area with the plastic sheets and furnace. Turned the boilers off at 11 A.m. Gardener Pablo stopped by to check on the boilers and told me to come back on Monday to turn the boilers on and off again

CUSTOMER'S SIGNATURE

JOB SUPERVISOR'S SIGNATURE

OPERATIONS MANAGER APPROVAL

DATE	PAGE	OF

MARCOR ENVIRONMENTAL

DAILY JOB REPORT — ABATEMENT OPERATIONS

CONTROL NO. 017166

FORM #05405F1

JOB NAME	OFFICE	CONTRACT NUMBER	WORK ORDER #	PREPARED BY
		0 0 0 0 1	2 2 1	

LABOR USED

EMPLOYEE NUMBER	ACT. CODE	EMPLOYEE NAME	START TIME	STOP TIME	LUNCH Y or N	HOURS WORKED	DAY HOURS	NIGHT HOURS	O.T. HOURS	ABSNT/TRDY CODE	TITLE	PROT. LEVEL	MILEAGE REIMB.	EMPLOYEE SIGNATURE
019130		Fred Scott	0600	1430	Y	8	8				SUP			
016477		Spencer Parks	0600	1000	N	2	2				LAB			
		TOTAL HOURS TO BE PAID (INCLUDING ALL CONTINUATION PAGES)									NO. OF CONTINUATION PAGES ATTACHED			

STANDARD MATERIALS USED

DESCRIPTION	UNIT	ITEM CODE	UNITS USED	DESCRIPTION	UNIT	ITEM CODE	UNITS USED
ABSORBENT—FORMULA 1M-1216	POUND	0300		GLOVES—	PAIR		
BAGS—6 MIL ASBESTOS	EACH	0380		GLOVES—	PAIR		
BAGS—6 MIL CLEAR	EACH	0390		MASKING TAPE	ROLL	2860	
BAGS—10 MIL ASBESTOS	EACH	0385		MASTIC REMOVER	GALLON	2900	
BAGS-GLOVE BAGS—ALL SIZES-ASBESTOS	EACH	0420		PAINT BRUSHES AND ROLLERS	EACH	3140	
BARRIER TAPE-CAUTION/DANGER-1000' ROLL	LIN FT	0460		PLASTIC LINERS—3 MIL—100 PER CARTON	CARTON	3180	
RESPIRATOR CARTRIDGES—HEPA	EACH	0820		PLASTIC LINERS—6 MIL—100 PER CARTON	CARTON	3220	
RESPIRATOR CARTRIDGES—ORGANIC VAPOR/HEPA	EACH	0860		POLY SHEETING—10 MIL	ROLL	3260	
DETECTOR TUBES-SMOKE	EACH	1300		POLY SHEETING—6 MIL	ROLL	3300	
DRUMS—FIBER	EACH	1540		POLY SHEETING—4 MIL	ROLL	3320	
DUCT TAPE—1"	ROLL	1570		POLY SHEETING—FIRE RETARDANT ___ MIL	ROLL		
DUCT TAPE—2"	ROLL	1580		POLY SHEETING—BLACK ___ MIL	ROLL		
DUCT TAPE—3"	ROLL	1590		POLY SHEETING—NYLON REINFORCED ___ MIL	ROLL		
DUCT TAPE—4"	ROLL	1620		PROTECTIVE SUITS—ASBESTOS	EACH	3660	
DUCT TAPE—BLUE	ROLL	1630		QUICK SCRUB (SCRUBBER GRILL)	EACH	4140	
ENCAPSULANT—3220	GALLON	1710		REWETTABLE CLOTH 60"	LIN FT	4220	
ENCAPSULANT—3222	GALLON	1730		SAFETY FENCE—50 FOOT ROLL	ROLL	4260	
ENCAPSULANT—3232	GALLON	1740		SCRAPERS	EACH	4420	
ENCAPSULANT—3260	GALLON	1750		SHOWER TOWELS—300 PER CASE	EACH	4500	
ENCAPSULANT—8420	GALLON	1760		SIGNS-DANGER	EACH	4540	
EXHAUST DUCT—10 FEET PER ROLL	LIN FT	1820		SPRAY ADHESIVE	CAN	4820	
FILTERS—NEGATIVE AIR-PRE	EACH	1850		SPRAY FOAM	CAN	4860	
FILTERS—NEGATIVE AIR-BOX	EACH	1860		SPRAY PAINT	CAN	4900	
FILTERS—NEGATIVE AIR-HEPA	EACH	1870		SPRAY POLY	GALLON	4940	
FILTERS—SOCK FILTER—1 TO 20 MICRONS	EACH	2100		VACUUM BAGS	EACH	4980	
FILTERS-VACUUM—DACRON	EACH	2140		WASTE BOXES/GUZZLER BOXES	EACH	5100	
FILTERS-VACUUM—HEPA	EACH	2180		WASTE LABELS	EACH	5140	

OTHER MATERIALS & EQUIPMENT USED

DESCRIPTION	UNIT	ITEM CODE	UNITS USED

SPECIAL NOTES. VISITORS TO THE SITE AND MISCELLANEOUS COMMENTS

"AMOUNT OF DISPOSAL:

AIR SAMPLING INFORMATION

TYPE	QUANTITY	NUMBER	RESULTS
PRELIMINARY			
I.W.A.			
O.W.A.			
PERSONAL			
FINAL			

PRESSURE DIFFERENTIAL READING:

AIR MONITORING COMPANY:

ASBESTOS IN WORK AREA NOT PART OF SCOPE: ☐ YES ☐ NO

ASBESTOS HANDLED BY OTHERS:
☐ YES ☐ NO IF YES COMPLETE FORM

VISITORS TO THE SITE:

NAME	COMPANY
NAME	COMPANY
NAME	COMPANY

DELAY INFORMATION

DELAYED: ☐ YES ☐ NO IF YES, BY WHOM:

MANHOURS LOST:

REASON FOR DELAY:

USE BALLPOINT PEN
COMPLETE FRONT SIDE FIRST
THEN REMOVE CARBON
THEN COMPLETE BACK OF FORM LAST

DESCRIPTION OF WORK PERFORMED

Took out trunk on the boilers and did what ever was needed for the city engineer working on the boiler. Gordon stopped by to check on the boilers and the work I am. Took out trunk on the boiler at 12 PM so they could cool down for the people coming into work at 3 P.M.

CUSTOMER'S SIGNATURE

JOB SUPERVISOR'S SIGNATURE

OPERATIONS MANAGER APPROVAL

DATE	PAGE	OF
21 NOV 94	1	1

MARCOR ENVIRONMENTAL

DAILY JOB REPORT — ABATEMENT OPERATIONS

CONTROL NO. 017163

FORM 805405F1

JOB NUMBER				
JOB NAME	OFFICE	CONTRACT NUMBER	WORK ORDER #	PREPARED BY
BENTALOU ELEM SCHOOL #50	E C	0 0 0 0 1	2 2 9	Fred Scott

LABOR USED

EMPLOYEE NUMBER	ACT. CODE	EMPLOYEE NAME	START TIME	STOP TIME	LUNCH Y or N	HOURS WORKED	DAY HOURS	NIGHT HOURS	O.T. HOURS	ABSNT/TRDY CODE	TITLE	PROT. LEVEL	MILEAGE REIMB.	EMPLOYEE SIGNATURE
01930		Fred Scott	0600	1100	N	5	5				S:LP			Fred Scott
01647		GARDNER PARKS	0800	0900	N	1	1				APP			Gardner Parks

TOTAL HOURS TO BE PAID (INCLUDING ALL CONTINUATION PAGES)

NO. OF CONTINUATION PAGES ATTACHED: _____

STANDARD MATERIALS USED

DESCRIPTION	UNIT	ITEM CODE	UNITS USED	DESCRIPTION	UNIT	ITEM CODE	UNITS USED
ABSORBENT—FORMULA 1M-1216	POUND	0300		GLOVES—	PAIR		
BAGS—6 MIL ASBESTOS	EACH	0380		GLOVES—	PAIR		
BAGS—6 MIL CLEAR	EACH	0390		MASKING TAPE	ROLL	2860	
BAGS—10 MIL ASBESTOS	EACH	0385		MASTIC REMOVER	GALLON	2900	
BAGS-GLOVE BAGS—ALL SIZES-ASBESTOS	EACH	0420		PAINT BRUSHES AND ROLLERS	EACH	3140	
BARRIER TAPE-CAUTION/DANGER-1000' ROLL	LIN FT	0460		PLASTIC LINERS—3 MIL—100 PER CARTON	CARTON	3180	
RESPIRATOR CARTRIDGES—HEPA	EACH	0820		PLASTIC LINERS—6 MIL—100 PER CARTON	CARTON	3220	
RESPIRATOR CARTRIDGES—ORGANIC VAPOR/HEPA	EACH	0860		POLY SHEETING—10 MIL	ROLL	3260	
DETECTOR TUBES-SMOKE	EACH	1300		POLY SHEETING—6 MIL	ROLL	3300	
DRUMS—FIBER	EACH	1540		POLY SHEETING—4 MIL	ROLL	3320	
DUCT TAPE—1"	ROLL	1570		POLY SHEETING—FIRE RETARDANT ___ MIL	ROLL		
DUCT TAPE—2"	ROLL	1580		POLY SHEETING—BLACK ___ MIL	ROLL		
DUCT TAPE—3"	ROLL	1590		POLY SHEETING—NYLON REINFORCED ___ MIL	ROLL		
DUCT TAPE—4"	ROLL	1620		PROTECTIVE SUITS—ASBESTOS	EACH	3660	
DUCT TAPE—BLUE	ROLL	1630		QUICK SCRUB (SCRUBBER GRILL)	EACH	4140	
ENCAPSULANT—3220	GALLON	1710		REWETTABLE CLOTH 60"	LIN FT	4220	
ENCAPSULANT—3222	GALLON	1730		SAFETY FENCE—50 FOOT ROLL	ROLL	4260	
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ENCAPSULANT—8420	GALLON	1760		SIGNS-DANGER	EACH	4540	
EXHAUST DUCT—10 FEET PER ROLL	LIN FT	1820		SPRAY ADHESIVE	CAN	4820	
FILTERS—NEGATIVE AIR-PRE	EACH	1850		SPRAY FOAM	CAN	4860	
FILTERS—NEGATIVE AIR-BOX	EACH	1860		SPRAY PAINT	CAN	4900	
FILTERS—NEGATIVE AIR-HEPA	EACH	1870		SPRAY POLY	GALLON	4940	
FILTERS—SOCK FILTER—1 TO 20 MICRONS	EACH	2100		VACUUM BAGS	EACH	4980	
FILTERS-VACUUM—DACRON	EACH	2140		WASTE BOXES/GUZZLER BOXES	EACH	5100	
FILTERS-VACUUM—HEPA	EACH	2180		WASTE LABELS	EACH	5140	

OTHER MATERIALS & EQUIPMENT USED

DESCRIPTION	UNIT	ITEM CODE	UNITS USED

SPECIAL NOTES. VISITORS TO THE SITE AND MISCELLANEOUS COMMENTS

AMOUNT OF DISPOSAL:

AIR SAMPLING INFORMATION

TYPE	QUANTITY	NUMBER	RESULTS
PRELIMINARY			
I.W.A.			
O.W.A.			
PERSONAL			
FINAL			

PRESSURE DIFFERENTIAL READING:

AIR MONITORING COMPANY:

ASBESTOS IN WORK AREA NOT PART OF SCOPE: ☐ YES ☐ NO

ASBESTOS HANDLED BY OTHERS:
☐ YES ☐ NO IF YES COMPLETE FORM

VISITORS TO THE SITE:

NAME	COMPANY
NAME	COMPANY
NAME	COMPANY

DELAY INFORMATION

DELAYED: ☐ YES ☐ NO IF YES, BY WHOM:

MANHOURS LOST:

REASON FOR DELAY:

USE BALLPOINT PEN
COMPLETE FRONT SIDE FIRST
THEN REMOVE CARBON
THEN COMPLETE BACK OF FORM LAST

DESCRIPTION OF WORK PERFORMED

Came and turned the heat on the boilers on. Kept watch on the work area with the boilers on the boilers kept going off and bad fumes. Hardner stopped by to check on the boilers and the work area.

CUSTOMER'S SIGNATURE

JOB SUPERVISOR'S SIGNATURE

OPERATIONS MANAGER APPROVAL

AMENDMENT #8

June 1, 1997

AHERA

ASBESTOS CONTAINING MATERIALS

Management Plan

School No: PS150

School Name Bentalou Elementary

Notice

No Asbestos Response Actions for the School for the period reported under this amendment attached.

Issued by

BALTIMORE CITY PUBLIC SCHOOLS

Asbestos Coordinator

Designated Local Education Agency Representative

City of Baltimore Public Schools
AMENDMENT #8
JUNE, 1997

INTRODUCTION

These amendments are issued annually to update the ASBESTOS MANAGEMENT PLAN for each building under the control of Baltimore City Public Schools.

Contents of each annual amendment will include:
Asbestos response actions for the (if any);

Table 1A containing the remaining quanities of asbestos containing material in the buillding;

Acopy of the survelliance logs for the building done at a minimum of a semi-annual basis;

any pertinent information.

An asbestos response action shall include any work to clean up asbestos in response to a major or minor fiber release episode, or any work action to remove, encapsulate, enclose, or repair asbestos containing materials.

Persons reading this amendment are encouraged to read the Asbestos Management Plan to thoroughly understand the location and extent of asbestos containing materials in the building.



David Mitchell
Baltimore City Asbestos Coordinator
and Designated LEA Representative

PLEASE POST PLEASE POST

City of Baltimore Public Schools
ASBESTOS PROGRAM

NOTICE TO SCHOOL BUILDING VISITORS AND OCCUPANTS (TEACHERS, STUDENTS, OPERATING ENGINEERS AND CUSTODIAL PERSONS) OF ASBESTOS MANAGEMENT PLAN AMENDMENT NUMBER 8 AND AVAILABILITY OF ASBESTOS MANAGEMENT PLAN FOR INSPECTION.

An amendment to the Asbestos Management Plan has been appended to the management plans for asbestos to be kept in the building administrative office. This amendment is available for inspection by making request to the building principal.

EPA Rules for school buildings required:

(1) We maintain records on asbestos in each school;

(2) Inform our building occupants and visitors on asbestos in each school building of locations of and response actions for asbestos in each school;

(3) Give right-of-way to EPA and State of Maryland environmental inspectors.

Failure to fulfill the above may result in serious civil and possible criminal penalties assessed against the City for failure to perform the above including possible criminal penalties against persons who willfully avoid the EPA Rules.

If the Asbestos Management Plan and the Amendments to it are not available in your school from the principal report it to **Environmental Services - Asbestos Office at 396-7832** immediately.

David W. Mitchell
Baltimore City Asbestos Coordinator
and Designated LEA Representative

TABLE 1-A

Location: PS 150

Removals

	Beg Yr 7/95	Removal	End Yr 6/96	Units
Spray On				sf
Tile				sf
Acoustic Plaster	5000		5000	sf
Other Plaster				sf
Wallboard				sf
Pipe				lf
Elbows Fittings				sf
Boilers Breeching				sf
Tanks	125		125	sf
Ductwork	250		250	lf
Other TSI				lf
Curtains				sf
Firedoors	126		126	sf
Cement Board				sf
VAT	90,000		90,000	sf
Decon				sf
Soil				sf
Misc Debris CY				cy

Repairs

Patch LF	
Encapsulate LF	
Encapsulate SF	
Patch SF	
Carpet SF	
Wire LF	
MiscLF	
MiscSF	

PUBLIC BUILDING MANAGEMENT

ENVIRONMENTAL SERVICES

FIELD INSPECTION LOG FOR SEMI-ANNUAL SURVEILANCE

FOR P.S.# 150

1ST SEMI-ANNUAL INSPECTION

Performed by: John Walls

Date Performed: 4/7/97

2ND SEMI-ANNUAL INSPECTION

Performed by: _____

Date Performed: _____

SPECIAL NOTES FOR ANY MAJOR FINDINGS OR CHANGES IN BUILDINGS

Hole in ceiling - Cafeteria

SEE ATTACHED SURVEILANCE REPORT FORMS FOR FINDINGS

Please return to:

Environmental Services
2011 Linden Avenue, Portable Bldg. #61
Baltimore, MD. 21217

FIGURE 7-1. QUARTERLY SURVEILLANCE REPORT FORM

DATE: 4/7/87

SCHOOL NO.: PS150

SURVEYOR: John Walsh

FUNCTIONAL SPACE	MANAGEMENT AREA DESCRIPTION	CONDITION CHANGE								COMMENTS
		1st Quarter		2nd Quarter		3rd Quarter		4th Quarter		
		Yes	No	Yes	No	Yes	No	Yes	No	
01- Boiler Room	Boiler Block and Trowelled-on Insulation						✓ ✓			
	Boiler Breeching Block and Trowelled-on Insulation						✓ ✓			
	Hot Water Generator Block and Trowelled-on Insulation						✓ ✓			
	(1) Fire Door						✓			
02- Cafeteria and Lobby	Acoustical Plaster					✓				Need repair in ceiling [hole]
	Vinyl Asbestos Tile									
	(2) Fire Doors									
03- Auditorium	Acoustical Plaster						✓			
	Vinyl Asbestos Tile						✓			
	(1) Fire Door						✓			

FIGURE 7-1. QUARTERLY SURVEILLANCE REPORT FORM

DATE: _____ SURVEYOR: _____

SCHOOL NO.: PS150

FUNCTIONAL SPACE	MANAGEMENT AREA DESCRIPTION	CONDITION CHANGE								COMMENTS
		1st Quarter		2nd Quarter		3rd Quarter		4th Quarter		
		Yes	No	Yes	No	Yes	No	Yes	No	
04- Classrooms	Vinyl Asbestos Tile						✓			Floor tile need replacing [illegible] Room 108 & Cafeteria Also.
05- Hallways and Stairwells	Vinyl Asbestos Tile						✓			
							✓			
06- Offices, Work Rooms, and Lounges	Vinyl Asbestos Tile						✓			
							✓			
							✓			
07- Incinerator Room	(1) Fire Door						✓			
							✓			
08- Library	Vinyl Asbestos Tile						✓			
09- Mechanical Room	Duct Mastic						✓			
							✓			
	(1) Fire Door						✓			

1310-26-56

WORK ORDER

No invoices will be paid unless the work is performed in strict accordance with the provisions of this order.

ORIGINAL 1
To be returned to the Department with invoice in triplicate within 30 days after completion of work.

CITY OF BALTIMORE

DEPARTMENT OF PUBLIC WORKS

BUREAU OF GENERAL SERVICES

46321
WORK ORDER

REQ. NO: _____

RETRO ENVIRONMENTAL, INC.
5301 ENTERPRISE STREET, SUITE D
SYKESVILLE, MD. 21784

APRIL 27, 2005

BUDGET ACCOUNT. CS 5/6/05
9916-197-135-00-663

This work order is subject to all of the provisions stated hereon, including the reverse side hereof, and the contractor by the acceptance of this work order, agrees to comply with said provisions.

The work described below is to be performed on the basis indicated:

☐ COST PLUS ☐ INFORMAL BID ☐ FIXED DATE SERVICE

Work performed on a cost plus basis is subject to the provisions on the reverse side of this form.

No subcontracting shall be permitted except on special authorization which when granted must be with the subcontractor's acceptance of all the provisions of this order.

All work is subject to inspection and approval

DESCRIPTION OF WORK:

FURNISH, LABOR, MATERIALS, SERVICES, AND EQUIPMENT TO REPAIR DAMAGED ASBESTOS ACOUSTIC CEILING LOCATED IN A LOBBY AND A CAFETERIA. AIR MONITORING PROVIDED. ALL FOR THE ACTUAL COST OF $1,150.00.

BENTALOU ELEM. SCHOOL, PS #150, 561 LIGHT STREET

INVOICE #2005-1679 DATE: 4/22/05

Before starting work contractor is to notify DON L. BROCK Don Brock 4/27/05 5-4-05
Authorized Bureau Representative

Workmen are to report in and out to EMPLOYEE IN CHARGE
Name of employee on location

ORDER ISSUED BY Gerald P. Weeks
DC GERALD P. WEEKS, CHIEF

I hereby certify that the work has been performed in accordance with the provisions of this order, and the invoice as rendered is correct.

DATE OF COMPLETION 4-22-05 SIGNED Dave Ginocchi
Contractor

I hereby certify that the service specified above has been found to have been completed in a satisfactory manner; that I have carefully examined the invoice and in my opinion the charge is just and correct.

DATE 4/27/05 SIGNED _____
Authorized Bureau Representative

REMEDIATION ENVIRONMENTAL INC.

Asbestos & Lead Abatement • Mold Remediation • Demolition

Invoice

2005-1679

Invoice Date:
Apr 22, 2005

Page:
1

Sold To:
City of Baltimore Public Works
Asbestos Management
200 N. Holiday St., 7th Floor
Baltimore, MD 21202

Ship to:
Job #05-150
Bentalou ES - PS #150
Attn: Don Brock

Customer ID	Customer PO	Payment Terms	
BALTOCITY		Net 30 Days	
Sales Rep ID	**Shipping Method**	**Ship Date**	**Due Date**
GUR.D.		4/18/05	5/22/05

Quantity	Item	Description	Unit Price	Extension
		Repaired damaged asbestos acoustic ceiling located in a lobby and a cafeteria. Air monitoring provided.		1,150.00

2005 APR 25 P 12:01

BLDG. ENG. DIV.

Subtotal	1,150.00
Sales Tax	
Total Invoice Amount	1,150.00
Payment Received	
TOTAL	1,150.00

Check No:

5301 ENTERPRISE STREET, SUITE D • SYKESVILLE, MD 21784 • 410-552-9301 • FAX 410-552-9305

WORK ORDER

4

INSPECTION COPY

No invoices will be paid unless the work is performed in strict accordance with the provisions of this order.

CITY OF BALTIMORE

DEPARTMENT OF PUBLIC WORKS

BUREAU OF GENERAL SERVICES

RETRO ENVIRONMENTAL, INC.
5301 ENTERPRISE STREET, SUITE D
SYKESVILLE, MD. 21784

APRIL 27, 2005 20

46321
WORK ORDER

REQ. NO.

BUDGET ACCOUNT GS 5/6/05
9916-197-135-00-663

This work order is subject to all of the provisions stated hereon, including the reverse side hereof, and the contractor by the acceptance of this work order, agrees to comply with said provisions.

The work described below is to be performed on the basis indicated:

☐ COST PLUS ☐ INFORMAL BID ☐ FIXED DATE SERVICE

Work performed on a cost plus basis is subject to the provisions on the reverse side of this form.

No subcontracting shall be permitted except on special authorization which when granted must be with the subcontractor's acceptance of all the provisions of this order.

All work is subject to inspection and approval

DESCRIPTION OF WORK:

FURNISH LABOR, MATERIALS, SERVICES AND EQUIPMENT TO REPAIR DAMAGED ASBESTOS ACOUSTIC CEILING LOCATED IN A LOBBY AND A CAFETERIA. AIR MONITORING PROVIDED. ALL FOR THE ACTUAL COST OF $1,150.00.

BENTALOU ELEM. SCHOOL, PS #150, 561 LIGHT STREET

INVOICE #2005-1679 DATE: 4/22/05

Before starting work contractor is to notify DON L. BROCK Don Brock 4/27/05 5-4-05
Authorized Bureau Representative

Workmen are to report in and out to EMPLOYEE IN CHARGE DC
Name of employee on location

ORDER ISSUED BY Gerald P. Weeks
GERALD P. WEEKS, CHIEF

ESTIMATED COST 4-22-05

Dave Gnacki

4/27/05

Terms and Conditions for the execution of Cost-Plus contracts.

1. The wage charge on your bill for work done on this order must not in any case exceed that ACTUALLY PAID the labor employed. Certified payrolls must be made available upon request to support such charges.

2. All material must be billed at actual cost.

3. You will be allowed 20% upon Wages and Material Costs as set forth above, totaling in excess of $500.00 and 25% on Wages and Material Cost totaling $500.00 or less. This you agree to accept as your SOLE OVERHEAD AND PROFIT upon work covered by this order. Overhead shall be deemed to include but shall not be limited to the following; use of small tools, job supervision, clerks and watchman, office maintenance and expenses, use of small trucks for transportation, insurance other than labor, and other incidental expenses.

4. The Contractor may bill for moneys actually expended by him (with no overhead or profit thereon) for Workmen's Compensation Insurance, Social Security, Unemployment Taxes and union fringe benefits (if paid) on the wages of workmen employed by him on this job. All such charges shall be documented.

5. Charges for equipment rental used in job performance shall be made at current Associated Equipment Distributors rates, and charges for truck usage shall be at current published rates. Said rates are deemed to include overhead and profit.

6. No sub-contracting shall be permitted except on special authorization which when granted must be with the subcontractor's acceptance of all the provisions of this order and with the understanding that the general contractor shall be allowed 8% of the sub-contractor's basic charge for labor, material and equipment. No such subcontracting shall create any contractual relationship between the City and the sub-contractor.

7. All bills must be itemized, and prescribed Time Sheets and Material Invoices submitted and signed by a Principal of the Contracting firm.

8. You are not authorized to do any work not called for by this order. If additional work seems necessary, or if the work to be done threatens to exceed the $2,000 Charter Limit, return this order at once for cancellation or amendment.

9. Charges for travel time shall not exceed one hour per man per job.

10. Any mutually agreed upon deviations from the above must be in writing, attached hereto, and signed by the Principals of both parties prior to the work being done.

11. Since time is of the essence, any unreasonable delay in performance of the work through the fault of the contractor could place him in default and subject to any additional costs incurred by the City.

RAMERO ENVIRONMENTAL INC.

Asbestos & Lead Abatement • Mold Remediation • Demolition

Invoice

2005-1679

Invoice Date:
Apr 22, 2005

Page:
1

Sold To:
City of Baltimore Public Works
Asbestos Management
200 N. Holiday St., 7th Floor
Baltimore, MD 21202

Ship to:
Job #05-150
Bentalou ES - PS #150
Attn: Don Brock

Customer ID	Customer PO	Payment Terms	
BALTOCITY		Net 30 Days	
Sales Rep ID	**Shipping Method**	**Ship Date**	**Due Date**
GUR.D.		4/18/05	5/22/05

Quantity	Item	Description	Unit Price	Extension
		Repaired damaged asbestos acoustic ceiling located in a lobby and a cafeteria. Air monitoring provided.		1,150.00

2005 APR 25 P 12:01

BLDG. ENG. DIV

Copy

Check No:

Subtotal	1,150.00
Sales Tax	
Total Invoice Amount	1,150.00
Payment Received	
TOTAL	1,150.00

5301 ENTERPRISE STREET, SUITE D • SYKESVILLE, MD 21784 • 410-552-9301 • FAX 410-552-9305

1310-26-56

WORK ORDER

ORIGINAL 1

No invoices will be paid unless the work is performed in strict accordance with the provisions of this order.

To be returned to the Department with invoice in triplicate within 30 days after completion of work.

CITY OF BALTIMORE

DEPARTMENT OF PUBLIC WORKS

BUREAU OF GENERAL SERVICES

46321

WORK ORDER

REQ. NO.

RETRO ENVIRONMENTAL, INC.
5301 ENTERPRISE STREET, SUITE D
SYKESVILLE, MD. 21784

APRIL 27, 2005

BUDGET ACCOUNT:

9916-197-135-00-663

This work order is subject to all of the provisions stated hereon; including the reverse side hereof, and the contractor by the acceptance of this work order, agrees to comply with said provisions.

The work described below is to be performed on the basis indicated:

☐ COST PLUS ☐ INFORMAL BID ☐ FIXED DATE SERVICE

Work performed on a cost plus basis is subject to the provisions on the reverse side of this form.

No subcontracting shall be permitted except on special authorization which when granted must be with the subcontractor's acceptance of all the provisions of this order.

All work is subject to inspection and approval

DESCRIPTION OF WORK:

FURNISH LABOR, MATERIALS, SERVICES AND EQUIPMENT TO REPAIR DAMAGED ASBESTOS ACOUSTIC CEILING LOCATED IN A LOBBY AND A CAFETERIA. AIR MONITORING PROVIDED. ALL FOR THE ACTUAL COST OF $1,150.00.

BENTALOU ELEM. SCHOOL; PS #150, 561 LIGHT STREET

INVOICE #2005-1679 DATE: 4/22/05

Before starting work contractor is to notify DON L. BROCK
Authorized Bureau Representative

Workmen are to report in and out to EMPLOYEE IN CHARGE
Name of employee on location

ORDER ISSUED BY DC GERALD P. WEEKS, CHIEF

I hereby certify that the work has been performed in accordance with the provisions of this order, and the invoice as rendered is correct.

DATE OF COMPLETION SIGNED
Contractor

I hereby certify that the service specified above has been found to have been completed in a satisfactory manner; that I have carefully examined the invoice and in my opinion the charge is just and correct.

DATE SIGNED
Authorized Bureau Representative

Job's Name:	**Bentalou ES** PS150 **220 N. Bentalou St.** **Baltimore, MD 21293**
Job $ Value	$1,250.00
Amount of asbestos removed	Approximately 60 SqFt of Floor Tile Mastic; Approximately 120 SqFt of Chalkboard Mastic
Area/Location of removal	Hallway outside Media Center
Contractor's License	Previously submitted
Contractor's Insurance	Previously submitted
MDE Notification	Previously submitted
Daily Log	Previously submitted
Workers' Licenses	Previously submitted
Workers' Training Certs	Previously submitted
Workers' Medical Certs	Previously submitted
IH - Monitoring Report	Previously submitted
IH Compliane Cert/Lab Cert	Previously submitted
Waste Manifest	Attached: Manifest #243454
Invoice	Previously submitted

SERVICE TRANSPORT GROUP, INC.

58 PYLES LANE, NEW CASTLE, DE 19720 PHONE:(877) 999-9559

No. 243454

WASTE SHIPMENT RECORD

S.T.G. # 23447

GENERATOR

1. Material Origin Site Job # 08-293 Bentalou ES 220 N. Bentalou St. Baltimore, MD 21223	Generator: Name/Address Baltimore City Public Works Asbestos Management/Construction 200 N. Holiday St. ,7th Floor Baltimore, MD 21202	Generator: Phone # 410-396-3791 Attn: Gordon Hubbard
2. Removal Contractor: Name/Address Retro Environmental, Inc. 5301 Enterprise Street, Ste. D Sykesville, MD 21784	Contact: Chuck Ertel	Contractor: Phone # 410-552-9301
3. Responsible Agency: Name/Address U.S. EPA Region III 1650 Arch Street Philadelphia, PA 19103-2029	4. US DOT Class - FRIABLE ASBESTOS ONLY RQ ASBESTOS, 9, NA 2212, PG III	

5. Description of Materials Specify Friable or Non-Friable	Containers No.	Type	Total Quantity
If Friable (enter required information) Non-Friable: Chalkboard Mastic	9	Bags	
If Non-Friable (check one): ☐ Category I ☐ Category II Non-Friable: Floor Tile & Mastic			

6. Special Handling Instructions: 24-hour emergency spill response no. 800-424-9300

7. Generator Certification:

This is to certify that the above named materials are properly classified, described, packaged, marked and labeled and are in proper condition for transport by highway according to the applicable regulations of the Department of Transportation, US E.P.A., and any other state government agency. I certify that the foregoing is true and correct to the best of my knowledge. If the waste shipment is not as I stated, I accept the RETURN of the COMPLETE LOAD to the generator's service location at the generator's expense.

Printed/Typed Name & Title	Signature	Date
Charles J. Ertel, Jr. - General Superintendent		2/16/00

TRANSPORTER

8. Transporter 1 (Acknowledgement of Receipt of Materials) *If blank, Transporter 2 serves as sole transporter.

Company Name & Address		
	Signature: _____ Printed Name: _____ Title:	Telephone No. Date:

9. Transporter 2 (Acknowledgement of Receipt of Materials)

Company Name & Address		
Service Transport Group, Inc. 58 Pyles Lane New Castle, DE 19720	Signature: _____ Printed Name: _____ Title:	Telephone No. 877-999-9559 Date:

DISPOSAL SITE

10. Discrepancy Indication Space:

11. Waste Disposal/Recycling Site Owner or Operator's Certification (Receipt of above Waste Except as Noted in 10)

Minerva Landfill 9000 Minerva Rd. Waynesburg, OH 44688 330-866-3435 Permit # 15-1292	Signature: _____ Printed Name: _____ Title:	Telephone No. 330-424-3739 Date

WHITE-Disposal Site • GREEN-S.T.G. • YELLOW-Contractor • PINK-Generator • GOLD - Pick Up Receipt

AHERA Three (3) Year (Winter 2025) Re-Inspection Data Summary

Facility Name and Number: Mary Ann Winterling Elementary School PS150

1	**Baltimore City Public Schools**		
	LEA Point of Contact:	**Sheila R. Howard, Environmental Compliance**	
	Facility Name and Number:	**Mary Ann Winterling Elementary School PS150**	
2	**Facility Address:**	**220 North Bentalou Street**	
		Baltimore, MD 21223	
3	**Date of Inspection:**	**Friday, March 7, 2025**	
4	**EPA Accredited Inspector(s):**	**Name: Dylan Gomez-Starnes**	**Number: EHSBIR-250131-00003**
	Management Planner(s):	**Name: Sharon Thompson**	**Number: VAIMPR01302025-04**
5	**5A** **Information provided by BCPS to BATTA for Review:**	• **Management Plan by VERSAR, Inc., 1989**	
		• **Reinspection Report by KAYCO Environmental, 2004**	
		• **Reinspection Report by KAYCO Environmental, 2007**	
		• **Reinspection Report by KAYCO Environmental, 2010**	
		• **Reinspection Report by KAYCO Environmental, 2013**	
		• **Reinspection Report by KCI Environmental, 2016**	
		• **Reinspection Report by BATTA Environmental, 2019**	
		• **Reinspection Report by BATTA Environmental, 2021**	
		• **The presence of the 3-year re-inspection is confirmed.**	
	5B **Comments and Issues:**	• **Cove base, cove base adhesive, ceramic tile, ceramic tile grout, terrazzo tile, terrazzo tile grout throughout the school are assumed ACBM.**	
		• **The presence of the 6 month surveillance is confirmed.**	

AHERA Three (3) Year (Winter 2025) Re-Inspection Data Summary

Facility Name and Number: Mary Ann Winterling Elementary School PS150

6	**New suspect ACBM identified during Winter 2025 Re-Inspection – N/A no new suspect ACBM identified**				
	Homogeneous Material Description	Location(s)	Sampling Information		
			ACM?	Samples Collected for HA	

AHERA Three (3) Year (Winter 2025) Re-Inspection Data Summary

Facility Name and Number: Mary Ann Winterling Elementary School PS150

7 Assessment of Friable and Non-friable Assumed Positive or Tested Positive Materials

Homogeneous Material Description	Location(s)	ACM	Friable?	Assessment and Response Action- Winter 2024 Periodic Surveillance				Winter 2025 3-year Re-Inspection	
				AHERA Assessment Category		Management Planner's recommended Response Action		Change in Condition (Y/N)	If "Y", Describe Change in Condition
				Prior	Current	Action	Notes/Comments		
HA ID: **S001** Type: Surf. Detail: Acoustical Plaster	Auditorium Hallway by Cafeteria Lobby by Cafeteria	Y	F	5	5	O&M		N	
HA ID: **M002** Type: Misc. Detail: 9"x9" Gray w/ White Streaked Floor Tile	Hallway near Incinerator Room, North Stairwell Hall near Boiler Room, Auditorium, Stairwell by Kitchen/Cafeteria	Y	NF	5	5	O&M	Stairwell by Kitchen/Cafeteria (1sf damaged) **Maintain Wax Sealant**	N	
HA ID: **M003** Type: Misc. Detail: 9"x9" Tan w/ Black/Red Streaked Floor Tile	Hall near Auditorium, 1st Floor Hallways, Storage Closets, Rooms 111, 115, 116, 206, 207, 211, 215, 216, 217, 218 220	Y	NF	5	5	O&M	Hallway near Gym/Auditorium (1sf damaged) Storage Closet by 112 (1sf damaged) **Maintain Wax Sealant**	N	
HA ID: **M004** Type: Misc. Detail: Mastic on Ductwork	On ductwork in Mechanical Room	Y	NF	5	5	O&M		N	

Key to Abbreviations:

Type:	TSI= Thermal Systems Insulation, Surf. = Surfacing Material, Misc.= Miscellaneous Material
ACM:	A= Assumed, Y= Determined to be asbestos through sampling.
Friable	F= Friable, NF= Non-friable.
AHERA Assessment Category:	**1)**= Damaged or significantly damaged TSI ACBM, **2)** = Damaged friable surfacing ACBM, **3)** = Significantly damaged friable surfacing ACBM **4)** = Damaged or significantly damaged friable miscellaneous ACBM, **5)** = ACBM with potential for damage, **6)** = ACBM with potential for significant damage **7)** = Any remaining friable ACBM or friable suspected ACBM. (**8**) = Not applicable (non-friable surfacing or miscellaneous material).
Response Action:	O&M= Continue surveillance and Operations and Maintenance, AR= Abatement Required as soon as possible.

AHERA Three (3) Year (Winter 2025) Re-Inspection Data Summary

Facility Name and Number: Mary Ann Winterling Elementary School PS150

Homogeneous Material Description	Location(s)	ACM	Friable?	Assessment and Response Action- Winter 2024 Periodic Surveillance				Winter 2025 3-year Re-Inspection	
				AHERA Assessment Category		Management Planner's recommended Response Action		Change in Condition (Y/N)	If "Y", Describe Change in Condition
				Prior	Current	Action	Notes/Comments		
HA ID: M005 Type: Misc. Detail: Fire Doors	Throughout Building	A	NF	5	5	O&M		N	
HA ID: **M006** Type: Misc. Detail: Floor Tile Mastic	Throughout Building	A	NF	5	5	O&M		N	
HA ID: **M007** Type: Misc. Detail: Window Glazing	Throughout Building	A	NF	5	5	O&M		N	
HA ID: **M008** Type: Misc. Detail: Cove Base	Throughout Building	A	NF	5	5	O&M		N	

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AHERA Three (3) Year (Winter 2025) Re-Inspection Data Summary

Facility Name and Number: Mary Ann Winterling Elementary School PS150

Homogeneous Material Description	Location(s)	ACM	Friable?	Assessment and Response Action- Winter 2024 Periodic Surveillance				Winter 2025 3-year Re-Inspection	
				AHERA Assessment Category		Management Planner's recommended Response Action		Change in Condition (Y/N)	If "Y", Describe Change in Condition
				Prior	Current	Action	Notes/Comments		
HA ID: M009 Type: Misc. Detail: Cove Base Adhesive	Throughout Building	A	NF	5	5	O&M		N	
HA ID: **M010** Type: Misc. Detail: Ceramic Tile Grout	Throughout Building	A	NF	5	5	O&M		N	
HA ID: **M011** Type: Misc. Detail: Ceramic Tile	Throughout Building	A	NF	5	5	O&M		N	
HA ID: **M012** Type: Misc. Detail: Terrazzo Tile	Throughout Building	A	NF	5	5	O&M		N	

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AHERA Three (3) Year (Winter 2025) Re-Inspection Data Summary

Facility Name and Number: Mary Ann Winterling Elementary School PS150

Homogeneous Material Description	Location(s)	ACM	Friable?	Assessment and Response Action- Winter 2024 Periodic Surveillance				Winter 2025 3-year Re-Inspection	
				AHERA Assessment Category		Management Planner's recommended Response Action		Change in Condition (Y/N)	If "Y", Describe Change in Condition
				Prior	Current	Action	Notes/Comments		
HA ID: M013 Type: Misc. Detail: Terrazzo Tile Grout	Throughout Building	A	NF	5	5	O&M		N	
HA ID: M014 Type: Misc. Detail: 9"x9" Black w/ White Streaked Floor Tile	Outside Auditorium	A	NF	5	5	O&M		N	
HA ID: M015 Type: Misc. Detail: 9"x9" Tan w/ Brown Streaked Floor Tile	Room 108	A	NF	5	5	O&M		N	
HA ID: M016 Type: Misc. Detail: 9"x9" Light Gray w/ White Streaked Floor Tile	Main Office 100, Conference Room 103, Health Suite 112, Rooms 117, 104, 114, 113	A	NF	5	5	O&M		N	

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AHERA Three (3) Year (Winter 2025) Re-Inspection Data Summary

Facility Name and Number: Mary Ann Winterling Elementary School PS150

Homogeneous Material Description	Location(s)	ACM	Friable?	Assessment and Response Action- Winter 2024 Periodic Surveillance				Winter 2025 3-year Re-Inspection	
				AHERA Assessment Category		Management Planner's recommended Response Action		Change in Condition (Y/N)	If "Y", Describe Change in Condition
				Prior	Current	Action	Notes/Comments		
HA ID: M017 Type: Misc. Detail: 9"x9" Tan w/ Brown/White Streaked Floor Tile	2nd Floor Hallways, Rooms 212, 205, 203, Food Bank 233, Outside Library 201, Outside Room 214, and Room 218	A	NF	5	5	O&M	Food Bank (2sf damaged), Outside Library (1sf damaged), Outside Room 214 (2sf damaged), and Room 218 (2sf damaged) **Maintain Wax Sealant**	N	
HA ID: M018 Type: Misc. Detail: 9"x9" Gray w/ Yellow/Pink/White/ Gray Streaked Floor Tile	Rooms 210, 214, and 215	A	NF	5	5	O&M		N	
HA ID: M019 Type: Misc. Detail: 12"x12" White and Light Blue Floor Tile	Cafeteria and Library	A	NF	5	3	AR	Cafeteria (20sf damaged)	N	

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ACM:	A= Assumed, Y= Determined to be asbestos through sampling.
Friable	F= Friable, NF= Non-friable.
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STATE OF MARYLAND

DEPARTMENT OF LABOR
DIVISION OF LABOR AND INDUSTRY
PREVAILING WAGE SECTION
10946 Golden West Drive, Suite 160
Hunt Valley, MD 21031
(410) 767-2342

The wage rates to be paid laborers and mechanics for the locality described below is announced by order of Commissioner of Labor and Industry.

It is mandatory upon the successful bidder and any subcontractor under him, to pay not less than the specific rates to all workers employed by them in executing contracts in this locality. Reference: Annotated Code of Maryland State Finance and Procurement, Section 17-201 thru 17-226.

These wage rates were taken from the locality survey of 2025 for Baltimore City, issued pursuant to the Commissioner's authority under State Finance and Procurement Article Section 17-209, Annotated Code of Maryland or subsequent modification.

**Note: If additional Prevailing Wage Rates are needed for this project beyond those listed below, contact the Prevailing Wage Unit. Phone: (410) 767-2342, email: prevailingwage@dllr.state.md.us.

Name and Title of Requesting Officer: Carrie Wiskman - Procurement Officer

Department, Agency or Bureau: Baltimore City Public Schools
200 E. North Avenue, Room 407A1 Baltimore, MD 21202

Project Number
30.225.26 SR

Location and Description of work:
Baltimore City: Roof Replacement

Determination Number
66905

Date of Issue: Jul 30, 2026

BUILDING CONSTRUCTION

CLASSIFICATION	MODIFICATION REASON	BASIC HOURLY RATE	BORROWED FROM	FRINGE BENEFIT PAYMENT
BALANCING TECHNICIAN	AD	$25.95		$7.07
BOILERMAKER	CR	$48.36	003	$17.29
BRICKLAYER	AD	$38.80		$15.57
CARPENTER	AD	$35.89		$14.60
CARPENTER - SHORING SCAFFOLD BUILDER	AD	$35.89		$14.60
CARPET LAYER	AD	$35.10		$15.33
CEMENT MASON	CR	$27.76	003	$11.09
COMMUNICATION INSTALLER TECHNICIAN	AD	$32.83		$16.79
DRYWALL - SPACKLING, TAPING, & FINISHING	AD	$35.89		$14.60
ELECTRICIAN	AD	$48.95		$20.56

ELEVATOR MECHANIC	AD	$58.81		$46.61
FIREPROOFER - BY HAND	AD	$17.00		$2.24
FIREPROOFER - SPRAYER	AD	$27.00		$5.22
FIRESTOPPER	AD	$30.21		$10.68
GLAZIER	AD	$36.65		$14.61
INSULATION WORKER	AD	$40.77		$20.42
IRONWORKER - FENCE ERECTOR	CR	$48.25	003	$21.11
IRONWORKER - ORNAMENTAL	AD	$27.99		$4.58
IRONWORKER - REINFORCING	CR	$30.18		$24.09
IRONWORKER - STRUCTURAL	AD	$37.86		$26.22
MARINE - DECKHAND	CR	$37.40	005	$9.22
MARINE - DIVER	CR	$42.21	005	$9.39
MARINE - DIVER TENDER	CR	$39.70	005	$9.39
MARINE - LEVERMAN	CR	$48.48	003	$15.34
MARINE - WELDER	CR	$37.38		$11.85
MILLWRIGHT	AD	$39.50		$17.52
PAINTER	AD	$29.16		$12.01
PAINTER-INDUSTRIAL	AD	$36.37		$16.21
PILEDRIVER	AD	$37.74		$17.64
PLASTERER - MIXER	AD	$20.00		$2.24
PLUMBER	AD	$47.78		$25.93
POWER EQUIPMENT OPERATOR - BACKHOE	AD	$35.18		$15.12
POWER EQUIPMENT OPERATOR - BELT PRESS	CR	$32.92	003	$14.85
POWER EQUIPMENT OPERATOR - BROOM / SWEEPER	AD	$33.23		$15.12
POWER EQUIPMENT OPERATOR - BULLDOZER	CR	$35.18	005	$15.12
POWER EQUIPMENT OPERATOR - CONCRETE PUMP	AD	$35.18		$15.12
POWER EQUIPMENT OPERATOR - CRANE	AD	$42.00		$19.10
POWER EQUIPMENT OPERATOR - CRANE - TOWER	AD	$42.00		$19.10
POWER EQUIPMENT OPERATOR - DRILL - RIG	AD	$35.18		$0.00
POWER EQUIPMENT OPERATOR - EXCAVATOR	AD	$35.18		$15.12
POWER EQUIPMENT OPERATOR - FORKLIFT	AD	$35.18		$15.12
POWER EQUIPMENT OPERATOR - GRADALL	CR	$35.18		$15.12
POWER EQUIPMENT OPERATOR - GRADER	CR	$34.15	005	$14.15
POWER EQUIPMENT OPERATOR - HOIST	CR	$35.15		$15.12
POWER EQUIPMENT OPERATOR - LOADER	AD	$35.18		$15.12
POWER EQUIPMENT OPERATOR - MECHANIC	AD	$37.24		$15.12
POWER EQUIPMENT OPERATOR - MILLING MACHINE	CR	$35.00		$14.05
POWER EQUIPMENT OPERATOR - PAVER	CR	$33.10		$14.05
POWER EQUIPMENT OPERATOR - ROLLER - ASPHALT	CR	$33.10		$14.05
POWER EQUIPMENT OPERATOR - ROLLER - EARTH	AD	$29.60		$15.12
POWER EQUIPMENT OPERATOR - SCREED	CR	$35.37	003	$9.96
POWER EQUIPMENT OPERATOR - SKID STEER (BOBCAT)	AD	$33.23		$15.12
POWER EQUIPMENT OPERATOR-VACUUM TRUCK	AD	$38.60		$15.75
RESILIENT FLOOR	AD	$35.10		$15.33

ROOFER/WATERPROOFER	AD	$34.76		$14.91
SHEETMETAL WORKER (INCLUDING METAL ROOFING)	AD	$50.92		$24.61
SPRINKLERFITTER	AD	$46.50		$26.29
STEAMFITTER/PIPEFITTER	AD	$47.78		$25.93
STONE MASON	AD	$45.65		$21.51
TILE & TERRAZZO FINISHER	AD	$28.85		$12.85
TILE & TERRAZZO MECHANIC	AD	$34.34		$14.50
TRUCK DRIVER - DUMP	CR	$26.73	005	$7.65
TRUCK DRIVER - DUMP - ARTICULATING	CR	$30.97	027	$5.76
TRUCK DRIVER - FLATBED	CR	$26.25	025	$7.60
TRUCK DRIVER - LOWBOY	CR	$31.50	027	$9.19
TRUCK DRIVER - TACK/TAR TRUCK	CR	$29.06		$10.44
TRUCK DRIVER - TANDEM	CR	$27.33	005	$12.07
TRUCK DRIVER - TRACTOR TRAILER	CR	$26.95	005	$11.15
TRUCK DRIVER - WATER	CR	$29.19	005	$4.93
LABORER GROUP II				
LABORER - ASPHALT RAKER	AD	$24.46		$5.92
LABORER - COMMON	AD	$24.46		$5.92
LABORER - CONCRETE PUDDLER	AD	$24.46		$5.92
LABORER - CONCRETE TENDER	AD	$24.46		$5.92
LABORER - CONCRETE VIBRATOR	AD	$24.46		$5.92
LABORER - DENSITY GAUGE	AD	$24.46		$5.92
LABORER - FIREPROOFER - MIXER	AD	$24.46		$5.92
LABORER - FLAGGER	AD	$24.46		$5.92
LABORER - GRADE CHECKER	AD	$24.46		$5.92
LABORER - HAND ROLLER	AD	$24.46		$5.92
LABORER - JACKHAMMER	AD	$24.46		$5.92
LABORER - LANDSCAPING	AD	$24.46		$5.92
LABORER - LAYOUT	AD	$24.46		$5.92
LABORER - LUTEMAN	AD	$24.46		$5.92
LABORER - MORTAR MIXER	AD	$24.46		$5.92
LABORER - PLASTERER - HANDLER	AD	$24.46		$5.92
LABORER - TAMPER	AD	$24.46		$5.92
LABORERS GROUP I				
LABORER - AIR TOOL OPERATOR	AD	$24.46		$10.48
LABORER - ASPHALT PAVER	AD	$24.46		$10.48
LABORER - BLASTER - DYNAMITE	AD	$24.46		$10.48
LABORER - BURNER	AD	$24.46		$10.48
LABORER - CONCRETE SURFACER	AD	$24.46		$10.48
LABORER - HAZARDOUS MATERIAL HANDLER	AD	$24.46		$10.48
LABORER - MASON TENDER	AD	$24.46		$10.48
LABORER - PIPELAYER	AD	$24.46		$10.48
LABORER - SCAFFOLD BUILDER	AD	$24.46		$10.48

Incidental Craft Data: Caulker, Man Lift Operator, Rigger, Scaffold Builder, and Welder receive the wage and fringe rates prescribed for the craft performing the operation to which welding, scaffold building, rigging, operating a Man Lift, or caulking is incidental.

These **Informational Prevailing Wage Rates** may not be substituted for the requirements of pre-advertisement or onsite job posting for a public work contract that exceeds $250,000 in value and either of the following criteria are met: (1) the contracting body is a unit of State government or an instrumentality of the State and there is any State funding for the project; or (2) the contracting body is a political subdivision, agency, person or entity (such as a county) and the State funds 25% or more of the project.

Modification Codes:

(AD) 17-209 Annual Determination from Survey Wage Data Received
(CH) 17-211 Commissioners' Hearing
(CR) 17-208 Commissioners' Review
(SR) 17-208 Survey Review by Staff

Each "Borrowed From" county is identified with the FIPS 3-digit county code unique for the specific jurisdiction in Maryland.

For additional information on the FIPS (Federal Information Processing Standard) code, see http://www.census.gov/datamap/fipslist/AllSt.txt

The Prevailing Wage rates appearing on this form were originally derived from Maryland's annual Wage Survey. The Commissioner of Labor & Industry encourages all contractors and interested groups to participate in the voluntary Wage Survey, detailing wage rates paid to workers on various types of construction throughout Maryland.

A mail list of both street and email addresses is maintained by the Prevailing Wage Unit to enable up-to-date prevailing wage information, including Wage Survey notices to be sent to contractors and other interested parties. If you would like to be included in the mailing list, please forward (1) your Name, (2) the name of your company (if applicable), (3) your complete postal mailing address, (4) your email address and (5) your telephone number to PWMAILINGLIST@dllr.state.md.us. Requests for inclusion can also be mailed to: Prevailing Wage, 1100 N. Eutaw Street - Room 607, Baltimore MD 21201-2201.

MINORITY BUSINESS ENTERPRISE PROCEDURES FOR STATE FUNDED PUBLIC SCHOOL CONSTRUCTION PROJECTS

Revised MARCH 2014

Approved by the Baltimore City Board of Education on _____

These procedures supersede the latest procedures which were previously approved on _____

DATE OF ORIGINAL APPROVAL: _____

DATE OF APPROVAL OF REVISION: _____

These procedures were approved by the Interagency Committee on School Construction on _____ and _____shall be utilized by each public school system in Maryland as a condition for the receipt of State funds through the Public School Construction Program.

The effective date for implementation for projects in Baltimore City is _____.

MINORITY BUSINESS ENTERPRISE PROCEDURES FOR STATE FUNDED PUBLIC SCHOOL CONSTRUCTION PROJECTS

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MINORITY BUSINESS ENTERPRISE PROCEDURES FOR STATE FUNDED PUBLIC SCHOOL CONSTRUCTION PROJECTS

BACKGROUND

In 1978, the Maryland General Assembly passed legislation, which was signed into law to establish the State's Minority Business Enterprise Program. This new law set as a goal that at least 10 percent of each unit of State government's total dollar value of procurement contracts for purchases and/or contracts be awarded to minority business enterprises. This law was subsequently modified and the goal was increased to 14 percent. In 2001 the General Assembly significantly changed the program, setting the overall goal to 25 percent with subcontracting sub-goals of 7 percent for certified African American-owned businesses and 10 percent for certified women-owned businesses. In 2012, the General Assembly passed legislation authorizing the Governor's Office of Minority Affairs (GOMA), in consultation with the Maryland Department of Transportation (MDOT) and the Office of the Attorney General, to set the overall aspirational MBE goal every two years. GOMA proposed the increase to 29% after considering several factors prescribed by law, including the relative availability of minority- and women-owned businesses as demonstrated by the State's most recent Disparity Study, as well as the past participation of MBEs in state procurement. The 29% goal will be in place for fiscal years 2014 and 2015 on State-funded contracts.

In 1979, the Rules, Regulations, and Procedures for the Administration of the School Construction Program were revised by the Board of Public Works to require each local board of education to adopt procedures to attempt to include minority business enterprises in State funded school construction projects. The State law was revised and now states: "The Interagency Committee on School Construction (IAC) shall require each local board of education to adopt procedures consistent with this chapter before obtaining funds for public school construction projects".

In May 2007, the Rules, Regulations, and Procedures were replaced by regulations. The regulations concerning project procurement (COMAR 23.03.03) indicate that the State's minority business enterprise goals and procedures apply to all State funded projects, irrespective of procurement method.

In July 2011, a Sub-Goal Directive was issued by the Governor's Office of Minority Affairs (GOMA). This Directive established the process for setting contract-by-contract sub-goals. Sub-goals consistent with demonstrated underrepresentation were pre-established within the Directive.

The 2012 MBE Program statute directs the Board of Public Works (BPW) to issue regulations that:

- Requiring bidders or offerors to complete a bid document that specifies the overall percentage of the contract they agree to achieve through MBEs clarifies that the documents the bidder or offeror submits for its MBE participation commitments must be made part of the executed contract with the State; and
- Requires that every contract that includes MBE participation goals contain a liquidated damages provision in the event that the prime contractor does not comply in good faith with its MBE participation commitments.

OVERVIEW

This Minority Business Enterprise (MBE) procedure document was originally developed in response to a requirement set forth in the Rules, Regulations, and Procedures for the Administration of the School Construction Program. The MBE requirement was initially established under HB 64, which was passed in the 1978 session of the Maryland General Assembly and signed into law as Chapter 575 of the Acts of 1978.

Since the Board adopted its original Minority Business Enterprise Procedures, there have been changes in State statutes, regulations adopted by the Board of Public Works, procedural requirements, project eligibility requirements and the sub-goals to be set for school construction projects. This revised procedure is consistent with current legislation and the changes to the Code of Maryland Regulations (COMAR) requirements, effective November 7, 2005, May 21, 2007, and November 14, 2011.

The revised procedures issued by GOMA in July 2011 provide guidance for establishing overall goals that are contract-specific and reasonable, and for setting subgoals only on contracts that actually have subcontracting opportunities. The procedures for setting overall MBE goals have not changed, however once the overall goal is decided by the Procurement Review Group (PRG), the subgoal analysis must be completed for contracts that have a total potential MBE participation over a minimum threshold amount, as defined for specific Major Industry Categories.

All activities funded through the Public School Construction Program fall within Construction in the Major Industry Categories. In place of the original goals of 7 percent for African American-owned businesses and 10 percent for certified women-owned businesses, the subgoals for construction are now 7 percent for African American-owned businesses and 4 percent for Asian American-owned businesses. Subgoals are not to be set for other minority groups, which may however be represented in the overall contract goal.

1.0 PURPOSE

The purpose of the Procedures is to fulfill the intent of the law and the guidelines issued by GOMA by setting appropriate goals for minority business enterprise participation in every contract that includes State funding through the Public School Construction Program (PSCP). Local Educational Agencies (LEAs) shall attempt to achieve the result that a minimum of 29 percent of the total dollar value of all construction contracts is made directly or indirectly with certified minority business enterprises when State PSCP funds are utilized, with a minimum of 7 percent from certified African American-owned businesses, a minimum of 4 percent from certified Asian American-owned businesses, and the balance from any certified minority business enterprises. All general contractors, including certified MBE firms, when bidding as general or prime contractors are required to attempt to achieve the MBE subcontracting goals from certified MBE firms.

2.0 EFFECTIVE DATE

These procedures have been adopted for use in Baltimore City and supersede previously utilized MBE procedures, and will take effect on _____ or after _____, in accordance with Title 14, §3, State Finance and Procurement Article, effective July 1, 2011.

3.0 DEFINITIONS

1. **Certification** means the determination that a legal entity is a minority business enterprise consistent with the intent of Subtitle 3 of the State Finance and Procurement Article.
2. **Certified Minority Business Enterprise** means a minority business that holds a certification issued by the Maryland State Department of Transportation (MDOT).
3. **Corporation**, as defined by MDOT, is an artificial person or legal entity created by or under the authority of the laws of any state of the United States, the District of Columbia or a territory or commonwealth of the United States and formed for the purpose of transacting business in the widest sense of that term, including not only trade and commerce, but also manufacturing, mining, banking, insurance, transportation and other forms of commercial or industry activity where the purpose of the organization is profit. For eligibility for certification, disadvantaged and/or minority individuals must own at least 51 percent of the voting stock and at least 51 percent of the aggregate of all classes of stock that have been issued by the corporation. (Note: stock held in trust is not considered as stock held by the disadvantaged businesspersons when computing the business person(s) ownership.)
4. **Managerial Control**, as defined by MDOT, means that a disadvantaged or minority owner(s) has the demonstrable ability to make independent and unilateral business decisions needed to guide the future and destiny of a business. Control may be demonstrated in many ways. For a minority owner to demonstrate control, the following examples are put forth, but are not intended to be all inclusive:
   a. Articles of Incorporation, Corporate Bylaws, Partnership Agreements and other agreements shall be free of restrictive language which would dilute the minority owner's control thereby preventing the minority owner from making those decisions which affect the destiny of a business;
   b. The minority owner shall be able to show clearly through production of documents the areas of the disadvantaged business owner's control, such as, but not limited to:
      1) Authority to sign payroll checks and letters of credit;
      2) Authority to negotiate and sign for insurance and/or bonds;
      3) Authority to negotiate for banking services, such as establishing lines of credit; and
      4) Authority to negotiate and sign for contracts.
   c. Agreements for support services that do not lessen the minority owner's control of the company are permitted as long as the disadvantaged or minority business owner's authority to manage the company is not restricted or impaired.
5. **Minority Business Enterprise (MBE)** means any legal entity, except a joint venture, that is (a) organized to engage in commercial transactions, and (b) at least 51 percent owned and controlled by one or more individuals who are socially and economically disadvantaged including: African Americans; American Indian/Native Americans; Asians; Hispanics; Physically or mentally disabled individuals; Women; or A non-profit entity organized to promote the interests of physically or mentally disabled individuals.
6. **Minority Business Enterprise Liaison** means the employee of the school system designated to administer the Minority Business Enterprise Procedures for State funded public school construction projects.
7. **Operational Control**, as defined by MDOT, means that the disadvantaged or minority owner(s) must possess knowledge necessary to evaluate technical aspects of the business entity. The primary consideration in determining operational control and the extent to which the disadvantaged or minority owner(s) actually operates a business will rest upon the specialties of the industry of which the business is a part. The minority owner should have a working knowledge of the technical requirements needed to operate in his/her industry. Specifically, in the construction industry and especially among small (one to five person firms) contractors, it is reasonable to expect the disadvantaged or minority owner(s) to be knowledgeable of all aspects of the business. Accordingly, in order to clarify the level of operational involvement which a minority owner must have in a business for it to be considered eligible, the following examples are put forth, but are not intended to be all inclusive:
   a. The minority owner should have experience in the industry for which certification is being sought; and
   b. The minority owner should demonstrate that basic decisions pertaining to the daily operations of the business are independently made. This does not necessarily preclude the disadvantaged or minority owner(s) from seeking paid or unpaid advice and assistance. It does mean that the minority owner currently must possess the knowledge to weigh all advice given and to make an independent determination.
8. **Ownership**, as defined by MDOT, means that:
   a. The minority owner(s) of the firm shall not be subject to any formal or informal restrictions, which limit the customary discretion of the owner(s). There shall be no restrictions through, for example, charter requirements, by-law provisions, partnership agreements, franchise or distributor agreements or any other agreements that prevent the minority owner(s), without the cooperation or vote of any non-minority, from making a business decision of the firm.
   b. This means that the disadvantaged or minority persons, in order to acquire their ownership interests in the firm, have made real and substantial contributions of capital, expertise or other tangible personal assets derived from independently owned holdings without benefit of a transfer of assets, gift or inheritance from non-minority persons. Examples of insufficient contributions include a promise to contribute capital, a note payable to the firm or its owners who are not minority persons or the mere participation as an employee rather than as a manager. If the ownership interest held by a disadvantaged or minority person is subject to formal or informal restrictions, such as options, security interests, agreements, etc., held by a non-minority person or business entity, the options, security interests, agreements, etc., held by the non-minority person or business entity must not significantly impair the disadvantaged or minority person's ownership interest.
9. **Partnership** means an unincorporated association of two or more persons to carry on as co- owners of a business for profit. For a partnership to be deemed eligible for certification under the MDOT Program, the disadvantaged or minority person's interest must be at least 51 percent of the partnership capital.
10. **Socially and Economically Disadvantaged** means a citizen or lawfully admitted permanent resident of the United States who is socially disadvantaged and economically disadvantaged. The law establishes the level of personal net worth at $1,500,000, increased

by the Consumer Price Index (CPI); above this net personal worth figure, an individual may not be found to be socially and economically disadvantaged. The current personal net worth figure can be found on the MDOT website at: http://www.mdot.maryland.gov/Office%20of%20Minority%20Business%20Enterprise/Resources%20Information.

11. **Sole Proprietorship**, as defined by MDOT, is a for-profit business owned and operated by a disadvantaged or minority person in his or her individual capacity. For a sole proprietorship to be deemed eligible for certification under the DBE/MBE Program, the disadvantaged or minority person must be the sole proprietor.
12. **Days** means business days unless otherwise specified. Business days are defined as Monday through and including Friday, with the exception of Nationally or State recognized holidays.

4.0 MBE GOAL SETTING PROCEDURES

1. General
   a. The overall MBE goal and the subgoals, if appropriate, are established on a per-contract basis for the purposes of solicitation.
      1) Where a project consists of more than one contract, the individual contract goals and subgoals, if appropriate, should reflect the overall project goal and subgoals, if appropriate.
      2) The words "if appropriate" and "if applicable" throughout this document reflect the understanding that for some solicitations, no African American or Asian American subgoals should be established.
   b. The MBE program requires that all race-neutral measures be considered before making use of race-based measures. Using a combination of race-neutral and race-based measures for each specific school construction project will help ensure that certified MBE firms are afforded the opportunity to submit bids and be utilized to the greatest extent possible.
      1) *Race-neutral measures* include any action taken by the LEA to make it easier for all contractors, including MBEs, to compete successfully for public school construction project contracts. These might include widespread advertising of bidding opportunities, job fairs, and similar publicity events.
      2) *Race-based measures* include setting an overall MBE goal and MBE subgoals, if appropriate, based upon race, gender, ethnicity, etc., for a specific contract.
2. General Considerations for Setting MBE Goal and Subgoal. The overall MBE goal and the subgoals, if appropriate, should be set for each specific project contract, considering but not limited to, the following factors:
   a. The extent to which the work to be performed can reasonably be segmented to allow for MBEs to participate in the project contract;
   b. A determination of the number of certified MBEs that potentially could perform the identified work;
   c. The geographic location of the project in relationship to the identified certified MBEs;
   d. Information obtained from other State and local departments/agencies related to establishing a MBE goal and/or subgoals for similar construction projects or work in the jurisdiction;
   e. Information obtained from other State and local departments/agencies related to MBE participation in similar construction projects or work in the jurisdiction; and
   f. Any other activities or information that may be identified as useful and productive.
3. MBE Subgoal Setting Procedure
   a. Once an overall MBE participation goal is set for a project contract, each unit shall determine the appropriate contract subgoals.
   b. If the expected value of the procurement is not equal to or in excess of $200,000, the Subgoal process is discretionary.
   c. All State funded public school construction is classified as Construction in the Major Industry Category schedule established by regulation.
      1) Accordingly, subgoals for school construction projects receiving State funding participation apply to the following Subgroups:
         - African American: 7%
         - Asian American: 4%
      2) Dually certified firms are to be counted as being owned by a member of the relevant ethnic Subgroup, not as a woman-owned business.
   d. Subgoals shall only be set when the overall goal is greater than or equal to the sum of the subgoals listed in subsection 3. of this section, plus two (2), i.e., the overall goal must be at least 13%; otherwise, no subgoals may be established for the contract.
   e. A subgoal may not be set if the number of certified firms in the Subgroup is less than three (3).
   f. If the Subgroup has three (3) or more certified firms available to perform the work, the Recommended Subgoal should be set at the number specified above, unless a basis is provided in the Procurement Review Group documentation for not applying the specified subgoal.
   g. For each procurement that has an overall goal, the MBE Program Subgoal Worksheet (Appendix I) shall be completed and signed by the LEA Procurement Officer and MBE Liaison
5. The Superintendent or designee shall establish one or more procurement review groups (PRG). The PRG must include at a minimum the MBE liaison and the Procurement Officer (PO) or a representative from the procurement office. The PRG could also include a capital improvement project manager, the project architect, the cost estimator, the Construction Manager, and/or other individuals selected by the Superintendent or designee.
   a. The PRG should communicate and/or meet as needed to consider the subcontracting goal and subgoals, if applicable, for individual projects or groups of projects.
   b. The PRG should consider the factors cited in 4 above when establishing the MBE goal and subgoals, if applicable, for each project or segmented piece of a project that are reasonable and attainable.
   c. The PRG must complete and submit a written analysis for each state funded school construction project with an estimated cost that is expected to exceed $200,000.
      1) For state-funded projects that required review of construction documents (CD), the written analysis and the MBE

Program Worksheet (appendix I) shall be submitted with the CD documents to the Department of General Services, and will be reviewed by the DGS for submission, appropriate signatures and correspondence between the goal and subgoals, if applicable, indicated in the analysis and those of the procurement documents.

2) For state-funded projects that do not require review of construction documents, the written analysis and the MBE Program Worksheet shall be submitted to the PSCP, and will be reviewed for submission and appropriate signatures.

3) For locally funded projects that are anticipating to be requested for state approval of planning and funding, the written analysis and the MBE Program Worksheet shall be submitted with CD documents to the MSDE, and will be reviewed for submission, appropriate signatures, and correspondence between the goal and subgoals, if applicable, indicated in the analysis and those of the procurement documents. Submission of the documents is a pre-condition for recommendation for state approval of planning and funding when submitted in an annual CIP.

d. For projects estimated to cost between $50,000 and $200,000 the same analysis form is to be completed and submitted. This could be a responsibility of the PRG, but could be performed by others as well.

1) For state-funded projects that require review of construction documents (CD), the written analysis and the MBE Program Worksheet shall be submitted with the CD documents to the DGS, and will be reviewed for submission, appropriate signatures, and correspondence between the goal and subgoals, if applicable, indicated in the analysis and those of the procurement documents.

2) For state-funded projects that do not require review of construction documents, the written analysis and the MBE Program Worksheet shall be submitted to the PSCP and will be reviewed for submission and appropriate signatures.

e. If the project cost is estimated to exceed $200,000 then a copy of the written analysis shall also be sent to GOMA at the same time that the written analysis is submitted to the DGS or the PSCP.

f. The PRG should consult with local counsel for the Board of Education as needed.

6. It is recognized that by utilizing the factors cited in 4 above, the MBE goal and/or subgoals, if applicable, for a specific project or portion thereof may be significantly higher than the overall goals of the program (25% overall, with 7% from African American-owned businesses and 4% from Asian American-owned businesses). It is also recognized and possible that there will be MBE goals set that are lower than those stated above or even that no MBE goal and/or subgoals will be set for a specific project or the segmented piece of the project.

7. Assistance in reviewing the factors cited above and setting a goal and/or subgoals, if applicable, for specific projects or a segmented piece of a project can be obtained by contacting the PSCP and/or GOMA.

5.0 IMPLEMENTING PROCEDURES - $50,000 OR LESS

For construction projects estimated to cost $50,000 or less, the following procedures will be utilized

1. A MBE goal and/or MBE subgoals are not required to be set for contracts that are anticipated to be for $50,000 or less.
2. All advertisements, solicitations, and solicitation documents shall include the following statement:
   a. "Certified Minority Business Enterprises are encouraged to respond to this solicitation."
3. To encourage greater MBE participation the staff of the school system should send out notices of potential projects and a specific project to MBEs to solicit bids or proposals directly from minority business enterprise contractors that are certified.
4. A copy of the solicitation notice, preferably electronically, shall be sent to GOMA at the same time the advertisement for the solicitation is released.
5. When a pre-bid or pre-proposal conference or meeting is held, the MBE liaison or designated representative shall explain that all bidders or offerors are encouraged to utilize certified MBEs for this project or segments of the project.
6. Upon request for a specific project, the school system shall provide one set of drawings and specifications (and addenda when issued) to minority business enterprise associations recognized by GOMA. They will be available free of charge to be picked up at a location designated by the LEA. A review of the bid or proposal activity submitted by an association's members may be initiated to justify continuation of this service.
7. Minority Business Enterprise forms identified in Section 6.0 of this procedure for projects over $50,000, are not required to be submitted for these projects ($50,000 or less).
8. The names of prime contractors obtaining drawings and specifications will be shared with certified MBEs and MBE associations, upon request.
9. At the time of the contract award, the MBE Liaison or a designated person will record any anticipated certified minority business enterprise participation data made available from the successful contractor.
10. A business that presents itself as a minority business may participate in a project but may not be counted toward MBE participation until it is a certified minority business enterprise. If the MBE is not certified at the time of contract award, it may not be counted at that time. Only the funds paid after MDOT certification can be counted as MBE participation in the project. If a certified MBE fails to meet the standards specified in State Finance and Procurement Article14-301 (G) and (I), Annotated Code of Maryland, the payments made to the MBE can be recorded and counted under a contract entered into when the MBE was eligible and certified. Ineligibility of an MBE to participate in the MBE program may not be the sole cause of the termination of the MBE contractual relationship for the remainder of the term of the contract.
11. The contractor will complete the Standard Monthly Contractor's Requisition for Payment (IAC/PSCP Form 306.4), specifically page 3 of 16, Minority Business Enterprise Participation, with each requisition submitted for payment. If certified MBE firms are known at the time of contract award their names and other appropriate information should be entered on page 3 of the first and all subsequent requisitions for payment. Any MBEs identified during the life of the project should be added as soon as the contractor engages them after approval by the LEA.
12. Upon completion of the project the contractor will provide a summary of the total of all funds paid to certified MBE firms. This should be within the contractor's final requisition for payment. The summary shall be forwarded to the PSCP with the close-out paperwork.

6.0 IMPLEMENTING PROCEDURES - Over $50,000

For construction projects estimated to cost in excess of $50,000, the following procedures will be utilized:

1. All advertisements, solicitations, and solicitation documents shall include the following statements:
   a. "Certified Minority Business Enterprises are encouraged to respond to this solicitation notice."
   b. "The contractor or supplier who provides materials, supplies, equipment and/or services for this construction project shall attempt to achieve the specific overall MBE goal of __ percent established for this project. All prime contractors, including certified MBE firms, when submitting bids or proposals as general or prime contractors, are required to attempt to achieve this goal from certified MBE firms."
   c. If subgoals have been established for this project then one of the following should be included:
      1) "The subgoals established for this project are __ percent from African American-owned businesses and __ percent from Asian American-owned businesses."
      2) "The subgoal established for this project is __ percent from African American-owned businesses."
      3) "The subgoal established for this project is __ percent from Asian American-owned businesses."
   d. "Notwithstanding any subgoals established above, the Contractor is encouraged to use a diverse group of subcontractors and suppliers from any/all of the various MBE classifications to meet the remainder of the overall MBE participation goal."
   e. "The bidder or offeror is required to submit with its bid or proposal a completed Attachment A – MDOT Certified MBE Utilization and Fair Solicitation Affidavit and Attachment B, MBE Participation Schedule, as described in the solicitation documents.
   f. If there is no overall MBE goal or MBE subgoals established for the project, then only 1.A. above is to be included.
   g. The Bidder/Offeror is advised that liquidated damages will apply in the event the Contractor fails to comply in good faith with the provisions of the MBE program and pertinent Contract provisions.
2. Other Advertisement and Outreach Requirements
   a. To encourage greater MBE participation the staff of the school system should send out notices of potential projects to MBEs or solicit bids or proposals directly from minority business enterprise contractors that are certified.
   b. A copy of the solicitation notice, preferably electronically, shall be sent to GOMA at the same time the advertisement for the solicitation is released.
   c. Upon request for a specific project, the school system shall provide one set of drawings and specifications (and addenda when issued) to minority business enterprise associations recognized by GOMA. They will be available free of charge to be picked up at a location designated by the LEA. A review of the bid or proposal activity by an association's members may be initiated to justify continuation of this service.
   d. When a pre-bid or pre-proposal conference is held, the MBE Liaison or designated representative shall explain the MBE goal and subgoals, if applicable; the MBE provisions of the solicitation; the documentation required at the time of submission; its relationship to the responsiveness of the bidder or offeror; how to complete the required schedules, and additional information and supporting documentation that may be required after the bid or proposal opening. All contractors who attend the pre-bid or pre-proposal conference should receive a list or information explaining how to obtain a listing of certified MBE firms who could perform the work or have expressed an interest in performing the school construction work required for the specific project in the jurisdiction.
   e. The names of prime contractors obtaining drawings and specifications will be shared with certified MBEs and MBE associations, upon request.
   f. The MBE liaison, in conjunction with the procurement officer or project staff, should respond to all applicable questions and concerns relating to the project's MBE requirements completely and in a timely fashion to ensure that all potential contractors and subcontractors can compete effectively.
3. All Solicitation Documents Shall Include the Following:
   a. "Certified Minority Business Enterprises are encouraged to respond to this solicitation notice". "All contractors, including certified MBE firms, when submitting bids or proposals as prime contractors are required to attempt to achieve the MBE goal and subgoals, if applicable, established for the project from certified MBEs".
   b. "The contractor or supplier who provides materials, supplies, equipment and/or services for this construction project shall attempt to achieve the result that a minimum of __ percent of the total contract value is with certified Minority Business Enterprises, with a minimum of __ percent from certified African American-owned businesses, a minimum of __ percent from certified Asian American-owned businesses, and the balance from any certified Minority Business Enterprises. All contractors, including certified MBE firms, when submitting bids or proposals as prime contractors, are required to attempt to achieve the MBE goal and subgoals, if applicable, from certified MBEs". Note: see 6.1.C. above for variations that may be required.
   f. The Bidder/Offeror is advised that liquidated damages will apply in the event the Contractor fails to comply in good faith with the provisions of the MBE program and pertinent Contract provisions.
   c. Each bid or offer submitted, including a submittal from a certified MBE in response to this solicitation, shall be accompanied by a completed Attachment A – MDOT Certified MBE Utilization and Fair Solicitation Affidavit and Attachment B - MBE Participation Schedule,.
      1) Attachment A shall be submitted with the sealed bid price or proposal at a place, date, and time specified in the solicitation document.
      2) As an alternative, and at the discretion of the school system, Attachments B could be submitted within a maximum of 30 minutes after the due time of the bid or proposal documents. Within that time (30 minutes) each bidder or offeror must submit Attachment B, in a separate sealed envelope. The sealed price envelopes from each bidder or offeror who submits both the sealed bid or proposal and the envelope with Attachment B will then be opened and reviewed and recorded as a viable submission. Any contractor that fails to submit the second envelope, with Attachment B, prior to the specified time allowed (30 minutes) after the submittal of the sealed bid or proposal will be deemed non-responsive and the sealed bid or proposal will not be opened or considered.

d. The submittal of a completed and signed Attachment A – MDOT Certified MBE Utilization and Fair Solicitation Affidavit indicates the bidder's or offeror's recognition and commitment to attempt to achieve the MBE goal and/or MBE subgoals, if applicable, for the specific project.
   1) The bidder or offeror recognizes that their efforts made to initiate contact, to solicit, and to include MBE firms in this project will be reviewed carefully and evaluated based upon the actions taken by them prior to and up to 10 business days before the bid or proposal opening. Follow-up actions taken by the bidder or offeror within the 10 business days prior to the bid opening will also be considered.
   2) Based upon this review and evaluation it will be determined, by the MBE liaison, procurement officer, or a designated person, if a good faith effort was made by the apparent low bidder or apparent successful offeror.

e. The bidder or offeror must check one of the two boxes on Attachment A, which relates to the level of MBE participation achieved for the project. The bidder's or offeror's signature indicates that in the event that they did not meet the MBE goal or subgoals, if applicable, that:
   1) They are therefore requesting a waiver, and
   2) Documentation of their good faith efforts will be provided to the school system staff within 10 business days of being notified that they are the apparent low bidder or apparent successful offeror.

f. The bidder or offeror must submit Attachment B (as and when described above), which lists and provides information related to each certified MBE firm that the bidder or offeror will utilize on this project. A completed and accurate Attachment B is required. All of the work specified to be performed by each MBE firm, MDOT certification number, minority type, and percentages must be correct.

g. Attachment B should be completed and submitted with all calculations utilizing the base bid or offer only. A revised Attachment B should be submitted by the successful bidder or offeror once a determination is made as to the acceptance and/or rejection of any alternates.

h. If a request for a waiver has been made, the appropriate box on Attachment A has been checked and the attachment signed, then the LEA should obtain and review the apparent low bidder's or successful offeror's supporting documentation of the good faith efforts to justify the granting of the waiver, prior to submitting the contract award for approval to the board of education.

i. The following documentation shall be considered as part of the contract, and shall be furnished by the apparent low bidder or successful offeror to the MBE Liaison or designated person, within ten (10) business days from notification that the firm is the apparent low bidder or successful offeror:
   1) A completed and signed Attachment B (Revised) – MBE Participation Schedule and Attachment C – Outreach Efforts Compliance Statement and Attachment D - Subcontractor Project Participation Statement . One Attachment D MBE– Subcontractor Project Participation Statement shall be completed and signed by the prime contractor and each MBE firm listed on Attachment B (Revised) – MBE Participation Schedule.
   2) Notification for purposes of this procedure means the earliest of the following methods of communication: orally in person, orally by telephone, orally by a telephone message, a faxed communication, a letter by date received or an electronic communication.
   3) The ten (10) business days do not include the day the notification is received, weekends or holidays (State or Federal), but the material submitted must be received by the close of business on the tenth day.
   4) The requirement to submit the above-listed documentation within the time frame specified will be considered by the IAC in its review of the request for contract award for the project. Failure to submit the required documentation within the time frame specified may result in a delay of the approval of the award of the contract, or the materials being returned without the approval of the award of the contract.

4. Waiver Procedures

a. If the apparent low bidder or successful offeror has determined that they are unable to meet the overall MBE goal or subgoals, if applicable, for the project at the time of submission of a bid or offer, they must check the box on Attachment A indicating the request for a waiver. The signature recognizes and acknowledges that a request for a waiver is being made. The apparent low bidder or successful offeror will therefore be required to submit information and substantiating documentation that will be reviewed to justify the granting of a waiver.

b. If the apparent low bidder or successful offeror is unable to achieve the overall MBE contract goal and/or the MBE subgoals, if applicable, from certified African American-owned businesses and/or from certified Asian American-owned businesses, the apparent low bidder or successful offeror shall submit, within 10 business days from notification that the firm is the apparent low bidder or successful offeror, a completed Attachment C - Outreach Efforts Compliance Statement, Attachment D – Subcontractor Project Participation Statement (if applicable), Attachment E - Minority Subcontractor Unavailability Certificate, and Attachment F - MBE Waiver Documentation which shall include the following:
   1) A detailed statement of the efforts made by the bidder or offeror to identify and select portions of the work proposed to be performed by subcontractors in order to increase the likelihood of achieving the stated goal;
   2) A detailed statement of the efforts made by the bidder or offeror prior to and up to at least ten (10) business days before the bid or proposal opening to solicit minority business enterprises through written notices that describe the categories of work for which subcontracting is being solicited, the type of work to be performed and specific instructions on how to submit a bid or proposal;
   3) Follow-up actions taken by the bidder or offeror within the 10 business days prior to the bid or proposal opening will also be considered.
   4) A detailed statement of the bidder's or offeror's efforts to make personal contact with MBE firms identified for item (2) above;
   5) A record of the name, address, telephone number and dates contacted for each MBE identified under items (2) and (3) above;
   6) A description of the information provided to MBEs regarding the drawings, specifications and the anticipated time schedule for portions of the work to be performed;

7) Information on activities to assist minority business enterprises to fulfill bonding requirements or to obtain a waiver of these requirements;

8) Information on activities to publicize contracting opportunities to minority business enterprises, attendance at pre-bid or pre-proposal meetings or other meetings scheduled by the MBE Liaison or designated representative; and

9) As to each MBE that placed a subcontract quotation or offer which the apparent low bidder or successful offeror considers not to be acceptable, a detailed statement of reasons for this conclusion.

c. In addition to any waiver documentation the apparent low bidder or successful offeror shall submit one completed Attachment D - Subcontractor Project Participation Statement for each MBE firm that will participate in the project consistent with the information previously provided at the time of the submission of Attachment B (Original) or the revised Attachment B (Revised), if alternates were accepted.

d. A waiver of an MBE contract goal or subgoal, if applicable, may be granted by the school system only upon receipt of Attachment C - Outreach Efforts Compliance Statement, Attachment D - Minority Subcontractors Unavailability Statement, and Attachment F -MBE Waiver Documentation as described above in items 1) through 9)

1) The MBE Liaison will review and accept or reject the minority business enterprise material that is submitted, and may obtain legal advice or assistance from their attorney.

2) The MBE waiver request may not be considered unless all of the documentation specified above has been submitted in a timely fashion by the apparent low bidder or successful offeror.

3) Assistance in the review of a request for a waiver (the documentation and justifications) may be requested from the PSCP and/or GOMA.

4) If a determination is made that the apparent low bidder or successful offeror did make a good faith effort, based upon a review of the documentation submitted, then the waiver must be granted. The award of contract shall then be made. The material and information submitted, including the LEA's review and analysis notes and conclusion, shall be retained in the project file.

5) If a determination is made that the apparent low bidder or successful offeror did not make a good faith effort, based upon a review of the documentation submitted, then the waiver should not be granted. The material and information submitted, including the LEA's review and analysis notes and conclusion, shall be retained in the project file. The award of contract shall then be made to the next lowest bidder or offeror, who meets the contractual requirements, including the MBE requirements.

6) When a waiver is requested, a copy of Attachment F - MBE Waiver Documentation, accepted and signed by a school system representative and with the reasons for the determination, shall be forwarded to GOMA and the PSCP within ten (10) business days after approval of the contract award by the board of education. Failure to submit the required documentation within the time frame specified may result in delayed approval of the award of contract by the IAC.

5. All Contracts Shall Include The Following:

a. "The contractor shall perform the contract in accordance with the representations made in Attachment A – MDOT Certified Minority Business Enterprise Utilization and Fair Solicitation Affidavit and Attachment B – MBE Participation Schedule submitted as part of the bid or proposal".

b. "Failure to perform the contract as specified and presented in the bid or proposal submission without prior written consent of the owner shall constitute a violation of a material term of the contract".

1) The contractor shall structure his/her operations for the performance of the contract to attempt to achieve the MBE goals as stated in the solicitation document.

2) The contractor agrees to use his/her best efforts to carry out these requirements consistent with the efficient and effective performance of the contract.

3) The contractor must ensure that all certified MBEs shall have the maximum practical opportunity to compete for additional subcontract work under the contract, even after the award of the contract.

4) The contractor shall submit monthly to the MBE Liaison or the school system's designated representative a report listing any unpaid invoices, over 30 days old, received from any certified MBE subcontractor, the amount of each invoice and the reason payment has not been made.

5) The contractor shall include in its agreements with its certified MBE subcontractors, a requirement that those subcontractors submit monthly to the MBE Liaison or appropriate representative a report that identifies the prime contract and lists all payments received from the contractor in the preceding 30 days, as well as any outstanding invoices, and the amount of those invoices.

6) The contractor shall cooperate in any reviews of the contractor's procedures and practices with respect to minority business enterprises, which the MBE Liaison, the PSCP, and/or GOMA may, from time to time, conduct.

7) The contractor shall maintain such records as are necessary to confirm compliance with its MBE participation obligations. These records must indicate the identity of certified minority and non-minority subcontractors employed on the contract, the type of work performed by each, and the actual dollar value of work performed. Subcontract agreements documenting the work performed by all MBE participants must be retained by the contractor and furnished to the MBE Liaison and or appropriate representative on request.

8) All records concerning MBE participation must be retained by the contractor for a period of five years after final completion of the contract, and will be available for inspection by the MBE Liaison, representatives from the PSCP and/or other designated official entities.

9) At the option of the MBE Liaison, or appropriate agency representative, upon completion of the contract and before final payment and/or release of retainage, the contractor shall submit a final report in affidavit form and under penalty of perjury, of all payments made to, or withheld from MBE subcontractors.

10) If at any time after submission of a bid or proposal and before execution of a contract, the apparent successful bidder or offeror determines that a certified MBE listed on Attachment B – MBE Participation Schedule has become or will become unavailable, then the apparent successful bidder or offeror shall immediately notify the

procurement officer and provide such officer with a reason(s) why the change is requested. Any desired change in Attachment B – MBE Participation Schedule shall be approved in advance by the procurement officer and shall indicate the contractor's efforts to substitute another certified MBE subcontractor to perform the work. Desired changes may occur only upon written approval by the LEA.

11) A business that presents itself as a minority business may participate in a project but the contract value may not be counted toward the MBE goal or subgoals, if applicable, until the business is certified by MDOT. If it is not certified at the time of contract award it may not be counted toward the goal or subgoals, if applicable, at that time. Only the funds paid after MDOT certification can be counted toward meeting the MBE goal or subgoals, if applicable. If a certified MBE fails to meet the standards specified in State Finance and Procurement Article.14-301.1, Annotated Code of Maryland, the payments made to the MBE can be recorded and counted under a contract entered into when the MBE was eligible and certified. Ineligibility of an MBE to participate in the MBE program may not be the sole cause of the termination of the MBE contractual relationship for the remainder of the term of the contract.

12) Contractors are encouraged to seek additional MBE participation in their contracts during the life of the project. Any additional MBE participation from certified MBEs should be reported to the MBE liaison prior to initiation and should be included in subsequent monthly requisitions for payment.

13) The contractor shall complete the Standard Monthly Contractor's Requisition for Payment (IAC/PSCP Form 306.4), specifically page 3 of 16, *Minority Business Enterprise Participation*, with each requisition submitted for payment. This submittal should accurately reflect the payments to be made that month to MBEs, and the cumulative total for the period specified. Any and all MBE firms that are identified on Attachment B should be included on page 3 of the first and all subsequent requisitions for payment. Any MBEs identified during the life of the project should be added as soon as the contractor engages them.

14) At the completion of the project the contractor shall prepare a written summary of the final certified MBE participation in the contract as compared to the proposed participation at the time of contract award. This should include the name of each certified MBE, the percentage and amount that was anticipated to be paid at the time of contract award, the percentage and amount actually paid, and an explanation of any differences that have occurred. Special attention should be given to any situations where the final payments to any MBE were below the level of commitment at the time of contract award. The summary shall be forwarded to the LEA with the final requisition. The LEA shall include this documentation with the submittal of the close-out paperwork to the PSCP.

c. Liquidated Damages – "All Contracts containing certified MBE participation goals shall contain a liquidated damages provision that applies if the contractor fails to comply with good faith with the provisions of State MBE laws or the pertinent terms of the procurement contract".

6. Projects Utilizing a Construction Manager Delivery Method

This section of the procedure has been prepared based upon the utilization of Construction Manager Agency method of delivery. If another alternative method of project delivery is being considered, then these procedures would need to be adapted in consultation with the PSCP before proceeding.

a. For projects that are being designed and solicited utilizing a Construction Manager Agency delivery method with multiple prime contracts, the school system can structure its procedures to attain the overall MBE goal and subgoals, if applicable, for the project as presented below:

b. The MBE liaison and other school system staff should work with the project's construction manager, cost estimator, and architect, along with any other individuals who could provide assistance, to determine the overall MBE utilization strategy for the work required, appropriate bid packages, and an appropriate overall MBE goal and subgoals, if applicable, for each specific bid or proposal package.

c. The overall MBE goal and subgoals, if applicable, for the project shall represent the aggregate of the individual goals and subgoals, if applicable, set for each bid or proposal package.

d. In setting the specific goals and subgoals, if applicable, for each solicitation package consideration should be given to the potential for MBE participation to the maximum extent possible. The information and procedures provided in section 4.0 MBE Goal Setting Procedures should be consulted and followed for these types of projects.

e. Prior to submitting the construction documents for State review and authorization to solicit bids or proposals, the school system's representative will prepare a complete list of the individual solicitation packages and indicate the MBE goal and subgoals, if applicable, for each solicitation package. This would include the overall MBE goal and subgoals, if applicable, established in the solicitation documents, the estimated cost for each solicitation package, and the estimated MBE dollar amounts for each solicitation package. A copy of this list should be submitted with the construction documents. The list should be retained as a record by the school system for comparison to the actual contracts awarded with MBE participation, and the final actual MBE participation at the completion of the project.

f. Contractors submitting bids or proposals for solicitation packages that do not include a MBE goal and subgoals, if applicable, would not be required to submit any of the MBE schedules that are otherwise required nor would they be required to indicate that they are requesting a waiver. The school system representative would, however, request information from the contractor at the completion of the project to determine if any certified MBE firms had participated in the contract.

g. All other submittals of MBE materials and reporting requirements are applicable for the project, including the submittal of Attachments A and B as described in section 6.0. This includes the documentation for a request for a waiver, if applicable and appropriate.

7. Projects Utilizing an Indefinite Delivery/Indefinite Quantity (IDIQ) or Job Order Contracting (JOC) Method of Delivery

a. The solicitation should be prepared and the overall MBE goal and subgoals, if applicable, established based upon the type of work that is anticipated to be specified or performed under the contract and the availability of certified MBEs. This could include an analysis of the percentages of the different types of work, the estimated dollar value in the entire contract, and the availability of MBEs.

b. If an overall goal and subgoals, if applicable, are set the bidders or offerors would be required to submit Attachment A – MDOT Certified Minority Business Enterprise Utilization and Fair Solicitation Affidavit in which they could indicate their anticipated MBE participation based upon the entire contract amount and the types of work specified. The award of contract can be made based upon their estimate of MBE participation since there is no specific task order or description of work to be performed and subcontractors have not been identified or engaged through any type of commitment or subcontract.

c. Since MBE participation is only anticipated in a general sense as an objective and specific contracts to MBEs have not been signed, then the contract award would not be included in any reporting to the PSCP or subsequent reporting to GOMA.

d. However, as the contract proceeds and individual task orders and/or purchase orders are issued, the contractor should submit Attachment B – MBE Participation Schedule for any and all projects or work where MBE subcontractors and/or suppliers might reasonably be utilized. Discussions between the contractor or offeror and the LEA as the task orders and/or purchase orders are being developed should address this aspect of the contract requirements.

e. Any MBE participation should be recorded by the MBE liaison and reported to the PSCP as the task orders and/or purchase orders are approved.

f. The contractor shall complete the Standard Monthly Contractor's Requisition for Payment (IAC/PSCP FORM 306.4), specifically page 3 of 16, *Minority Business Enterprise Participation*, with each requisition submitted for payment. This submittal should accurately reflect the payments to be made that month to MBE S, and the cumulative total for the period specified. Any and all MBE firms that are identified on Attachment B – MBE Participation Schedule should be included on page 3 of the first and all subsequent requisitions for payment. Any MBEs identified during the life of the project should be added as soon as the contractor engages them.

g. At the completion of the contract period or the full utilization of the contract's value a report should be prepared by the LEA MBE Liaison and submitted to the PSCP summarizing the MBE participation in each and all of the task orders or purchase orders issued under the contract. This should include the anticipated MBE participation prior to the issuance of the solicitation, the MBE participation anticipated at the time of contract award and the actual MBE participation at the completion of the contract. The summary shall be forwarded to the LEA with the final requisition. The LEA shall include this documentation with the submittal of the close-out paperwork to the PSCP.

8. Projects Utilizing the Design/Build Delivery Method

a. The solicitation is for both A/E services and the actual construction of a public school project. The solicitation should be prepared and the MBE goal and subgoals, if applicable, established for the construction work that is anticipated for the project. The goal setting procedures described in Section 4.0 above should be utilized for these types of projects.

b. The bidders or offerors should be required to submit Attachment A – MDOT Certified Minority Business Enterprise Utilization and Fair Solicitation Affidavit on which they would indicate their anticipated MBE participation based upon the construction work anticipated and their understanding of the MBE goal and subgoals, if applicable, the types of work involved, and the availability of certified MBEs for the project. Since there are no detailed plans or designs for the project and there are no contracts or subcontracts for the actual construction work there is no need to submit any other MBE schedules, at this time.

c. If the bidder, or offeror, who is to be awarded this contract has indicated that they do not anticipate achieving the overall MBE participation goal and subgoals, if applicable, for this project on Attachment A, then they are in effect requesting a waiver. They will be required to submit documentation at a later date to justify this request.

d. As the project proceeds through the design phase and the project is nearing the completion of the construction documents for submission to the State to review, the Design/Build Team (team) in consultation with LEA representatives should discuss the opportunities and potential for certified MBEs to participate in the project.

e. The team should begin to identify potential contractors and subcontractors, opportunities to segment the project, and MBEs that could participate in the project.

f. At a point in time that is approximately 30 days prior to the anticipated CD submission to the State; the team should complete and submit a revised Attachment B – MBE Participation Schedule to the LEA for their review and approval.

g. If the team had indicated on the Attachment A – MDOT Certified Minority Business Enterprise Utilization and Fair Solicitation Affidavit that they would meet the goals and the information on the revised Attachment B indicates that they did meet the goals then the team should proceed with the construction of the project.

h. If the team had indicated on the Attachment A that they did not anticipate meeting the overall MBE goal and subgoals, if applicable, or only a portion of the goal and subgoals, if applicable, then Attachment B – MBE Participation Schedule, Attachment C - Outreach Efforts Compliance Statement, Attachment E - Minority Subcontractors Unavailability Certificate, and Attachment F -MBE Waiver Documentation should be requested by the LEA. The team should, at this time, submit their documentation in support of the waiver requested.

i. The proposed MBE participation should be reviewed and a determination made as to whether the team has made a good faith effort to meet the MBE goals and subgoals, if applicable, established for the project and as stated on the Attachment A.

j. If a request for a waiver is made and approved, Attachment F - MBE Waiver Documentation should be signed by a school system representative and submitted to the PSCP and GOMA.

k. Since there was no MBE participation reported at the time of the award of the Design/Build contract, the LEA would submit the entire package of information, including all of the MBE related attachments to the PSCP within ten (10) days of the team being directed to proceed with the actual construction work.

l. All other submittals of MBE materials and reporting requirements are applicable for the project, as described above in Section 5.0.

7.0 RECORDS AND REPORTS

1. The MBE Liaison shall maintain such records as are necessary to confirm compliance with its Minority Business Enterprise Procedures

and activities. The records shall be maintained until the project is audited by the PSCP. These records shall include by project:

a. The contractor report submitted at the completion of the project;
b. The identity of the minority contractors employed on the project;
c. The type of work performed;
d. The actual dollar value of the work, services, supplies or equipment; and
e. The MBE percentage of the total contract.

2. The MBE Liaison will maintain a record of all waivers approved for each project or solicitation package where the prime contractor was unable to achieve the established overall goal or subgoals, if applicable. The MBE Liaison will, however, report to the PSCP all MBE participation by MDOT certified firms who are prime contractors, subcontractors, suppliers, or otherwise making an economically viable contribution to each project. This information shall be reported to PSCP within ten (10) days after approval of the award of the contract by the board of education.
3. The LEA shall submit the "Certified Minority Business Enterprise Participation Standard Monthly Contractor's Requisition for Payment" (IAC/PSCP Form 306.4 page 3 of 16, located in the Administrative Procedures Guide), to the PSCP Director of Fiscal Services as part of the regular monthly request for payment for the project.
4. The LEA shall submit the "Close-Out Cost Summary" (IAC/PSCP Form 306.6 located in the Administrative Procedures Guide),, along with the "Certified Minority Business Enterprise Participation Standard Monthly Contractor's Requisition for Payment" (IAC/PSCP Form 306.4) to the PSCP Director of Fiscal Services within 180 days of completion of the project.
   a. All final MBE payments should be verified by the LEA MBE Liaison before submission to the PSCP.
5. Each quarter and at the end of each fiscal year end, the LEA will submit to the, PSCP Fiscal Services the monthly cumulative "Minority Business Enterprises Monthly Procurement Report GOMA MBE Forms 1 & 2" and maintain such records as are necessary to confirm compliance with its minority business enterprise procedures and activities.
6. Each fiscal year end, PSCP Fiscal Services will create an annual report "Minority Business Enterprises Monthly Procurement Report GOMA MBE Forms 1 & 2"and Reporting Form #3 – Annual MBE Procurement Report Database – providing an accounting of payments made to MBE prime and MBE subcontractors. The LEA shall maintain such records as are necessary to confirm compliance with its Minority Business Enterprise Procedures and activities. These reports will compare the overall MBE goal and subgoals, if applicable, for each specific project with the MBE participation anticipated at the time of contract award and the actual MBE participation at the completion of the project.

8.0 MONITORING

1. The LEA's procurement personnel or project staff shall verify that the certified MBE's listed in the MBE participation schedule are actually performing the work.
2. The LEA's procurement personnel or project staff shall ensure that MBE subcontractors are receiving compensation as set forth in MBE participation schedule by ensuring that the contractor submits monthly reports, listing any unpaid invoices over 30 days old received from any certified MBE subcontractor, the amount of each invoice, and the reason payment has not been made.
3. PSCP Fiscal Services will:
   a. Compile data on projects completed during the fiscal year;
   b. Confirm that all MBE subcontractors listed in Attachment B have received payment; and
   c. Maintain such records as are necessary to confirm compliance with its Minority Business Enterprise Procedures and activities.
3. The MBE Liaison and/or the PSCP will conduct reviews as deemed necessary to confirm compliance with the minority business enterprise participation requirements.
4. The MBE Liaison will maintain appropriate records, and shall assist the PSCP in on-site or post-audit reviews upon request.
5. Auditors from the PSCP will have access to and the ability to audit MBE participation for specific projects, information retained by the LEA, and/or submitted to the IAC in reports/forms filed by the LEA as referenced above.

9.0 MINORITY BUSINESS ENTERPRISE LIAISON

1. The Superintendent shall designate an individual to be identified as the MBE Liaison for the school system.
2. The MBE Liaison will be the contact person who will work with the PSCP and GOMA to implement the Minority Business Enterprise Program for the school system and the State of Maryland.
3. The Superintendent will immediately notify the PSCP if there is a change in the MBE Liaison for the school system.

Attachment D. Minority Business Enterprise (MBE) Forms

D-1A
MBE UTILIZATION AND FAIR SOLICITATION AFFIDAVIT
& MBE PARTICIPATION SCHEDULE

PART 1 - INSTRUCTIONS

PLEASE READ BEFORE COMPLETING THIS DOCUMENT

This form includes Instructions and the MBE Utilization and Fair Solicitation Affidavit & MBE Participation Schedule which must be submitted with the bid/proposal. If the bidder/offeror fails to accurately complete and submit this Affidavit and Schedule with the bid or proposal, the Procurement Officer shall deem the bid non-responsive or shall determine that the proposal is not reasonably susceptible of being selected for award.

1. Contractor shall structure its procedures for the performance of the work required in this Contract to attempt to achieve the minority business enterprise (MBE) subcontractor participation goal stated in the Invitation for Bids or Request for Proposals. Contractor agrees to exercise good faith efforts to carry out the requirements set forth in these Instructions, as authorized by the Code of Maryland Regulations (COMAR) 21.11.03.

2. MBE Goals and Subgoals: Please review the solicitation for information regarding the Contract's MBE overall participation goals and subgoals. After satisfying the requirements for any established subgoals, the Contractor is encouraged to use a diverse group of subcontractors and suppliers from the various MBE classifications to meet the remainder of the overall MBE participation goal.

3. MBE means a minority business enterprise that is certified by the Maryland Department of Transportation ("MDOT"). Only MBEs certified by MDOT may be counted for purposes of achieving the MBE participation goals. In order to be counted for purposes of achieving the MBE participation goals, the MBE firm, including a MBE prime, must be MDOT-certified for the services, materials or supplies that it is committed to perform on the MBE Participation Schedule. A firm whose MBE certification application is pending may not be counted.

4. Please refer to the MDOT MBE Directory at https://mbe.mdot.maryland.gov/directory/ to determine if a firm is certified with the appropriate North American Industry Classification System ("NAICS") Code **and** the product/services description (specific product that a firm is certified to provide or specific areas of work that a firm is certified to perform). For more general information about NAICS codes, please visit https://www.census.gov/eos/www/naics/. Only those specific products and/or services for which a firm is certified in the MDOT Directory can be used for purposes of achieving the MBE participation goals. **CAUTION:** If the firm's NAICS Code is in graduated status, such services/products may not be counted for purposes of achieving the MBE participation goals. A NAICS Code is in the graduated status if the term "Graduated" follows the Code in the MDOT MBE Directory.

5. **Guidelines Regarding MBE Prime Self-Performance.** Please note that when a certified MBE firm participates as a prime contractor on a Contract, a procurement agency may count the distinct, clearly defined portion of the work of the Contract that the certified MBE firm performs with its own workforce toward fulfilling up to, but no more than, fifty-percent (50%) of the overall MBE participation goal, including up to one hundred percent (100%) of not more than one of the MBE participation subgoals, if any, established for the Contract.

- ✓ In order to receive credit for self-performance, an MBE prime must be certified in the appropriate NAICS code to do the work and must list its firm in the MBE Participation Schedule, including the certification category under which the MBE prime is self-performing and include information regarding the work it will self-perform.
- ✓ For the remaining portion of the overall goal and the remaining subgoals, the MBE prime must also identify on the MBE Participation Schedule the other certified MBE subcontractors used to meet those goals or request a waiver.
- ✓ These guidelines apply to the work performed by the MBE Prime that can be counted for purposes of meeting the MBE participation goals. These requirements do not affect the MBE Prime's ability to self-perform a greater portion of the work in excess of what is counted for purposes of meeting the MBE participation goals.
- ✓ Please note that the requirements to meet the MBE participation overall goal and subgoals are distinct and separate. If the contract has subgoals, regardless of MBE Prime's ability to self-perform up to 50% of the overall goal (including up to 100% of any subgoal), the MBE Prime must either commit to use other MBEs for each of any remaining subgoals or request a waiver. As set forth in Attachment 1-B Waiver Guidance, the MBE Prime's ability to self-perform certain portions of the work of the Contract will not be deemed a substitute for the good faith efforts to meet any remaining subgoal or the balance of the overall goal.
- ✓ In certain instances where the percentages allocated to MBE participation subgoals add up to more than 50% of the overall goal, the portion of self-performed work that an MBE Prime may count toward the overall goal may be limited to less than 50%. Please refer to the Governor's Office of Small Minority & Women Business Affairs' website for the MBE Prime Regulations Q&A for illustrative examples. http://www.goMDsmallbiz.maryland.gov/Documents/MBE_Toolkit/MBEPrimeRegulation_QA.pdf

6. Subject to items 1 through 5 above, when a certified MBE performs as a participant in a joint venture, a procurement agency may count a portion of the total dollar value of the Contract equal to the distinct, clearly-defined portion of the work of the Contract that the certified MBE performs with its own forces toward fulfilling the Contract goal, and not more than one of the Contract subgoals, if any.

7. The work performed by a certified MBE firm, including an MBE prime, can only be counted towards the MBE participation goal(s) if the MBE firm is performing a commercially useful function on the Contract. Please refer to COMAR 21.11.03.12-1 for more information regarding these requirements.

8. **Materials and Supplies: New Guidelines Regarding MBE Participation.**

   - ✓ Regular Dealer (generally identified as a wholesaler or supplier in the MDOT Directory): Up to 60% of the costs of materials and supplies provided by a certified MBE may be counted towards the MBE participation goal(s) if such MBE is a Regular Dealer of such materials and supplies. Regular Dealer is defined as a firm that owns, operates, or maintains a store, a warehouse, or any other establishment in which the materials, supplies, articles, or equipment are of the general character described by the specifications required under the contract and are bought, kept in stock, or regularly sold or leased to the public in the usual course of business; and does not include a packager, a broker, a manufacturer's representative, or any other person that arranges or expedites transactions.

Example for illustrative purposes of applying the 60% rule:

Overall contract value: $2,000,000
Total value of supplies: $100,000

Calculate Percentage of Supplies to overall contract value: $100,000 divided by $2,000,000 = 5%

Apply 60% Rule - Total percentage of Supplies/Products 5% x 60% = 3%

***3%** would be counted towards achieving the MBE Participation Goal and Subgoal, if any, for the MBE supplier in this example.*

- ✓ Manufacturer: A certified MBE firm's participation may be counted in full if the MBE is certified in the appropriate NAICS code(s) to provide products and services as a manufacturer.

- ✓ Broker: With respect to materials or supplies purchased from a certified MBE that is neither a manufacturer nor a regular dealer, a unit may apply the entire amount of fees or commissions charged for assistance in the procurement of the materials and supplies, fees, or transportation charges for the delivery of materials and supplies required on a procurement toward the MBE contract goals, provided a unit determines the fees to be reasonable and not excessive as compared with fees customarily allowed for similar services. A unit may not apply any portion of the costs of the materials and supplies toward MBE goals.

- ✓ Furnish and Install and other Services: The participation of a certified MBE supplier, wholesaler, and/or regular dealer certified in the proper NAICS code(s) to furnish and install materials necessary for successful contract completion may be counted in full. Includes the participation of other MBE service providers in the proper NAICS code(s) may be counted in full.

9. **Dually certified firms**. An MBE that is certified in more than one subgroup category may only be counted toward goal fulfillment of ONE of those categories with regard to a particular contract.

   Example: A woman-owned Hispanic American (dually certified) firm may be used to fulfill the women-owned OR Hispanic American subgoal, but not both on the same contract.

10. CAUTION: The percentage of MBE participation, computed using the percentage amounts determined for all of the MBE firms listed in PART 3, MUST meet or exceed the MBE participation goal and subgoals (if applicable) as set forth in PART 2- for this solicitation. If a bidder/offeror is unable to meet the MBE participation goal or any subgoals (if applicable), then the bidder/offeror must request a waiver in PART 2 or the bid will be deemed not responsive, or the proposal not reasonably susceptible of being selected for award. You may wish to use the attached Goal/Subgoal Worksheet to assist in calculating the percentages and confirming that your commitment meets or exceeds the applicable MBE participation goal and subgoals (if any).

11. If you have any questions as to whether a firm is certified to perform the specific services or provide specific products, please contact MDOT's Office of Minority Business Enterprise at 1-800-544-6056 or via email to mbe@mdot.state.md.us sufficiently prior to the submission due date.

Subgoals (if applicable)

Total African American MBE Participation:	**8**%
Total Asian American MBE Participation:	%
Total Hispanic American MBE Participation:	%
Total Women-Owned MBE Participation:	**11**%

Overall Goal

Total MBE Participation (include all categories):	**30**%

PART 2 - MBE UTILIZATION AND FAIR SOLICITATION AFFIDAVIT & MBE PARTICIPATION SCHEDULE

This MBE Utilization and Fair Solicitation Affidavit and MBE Participation Schedule must be completed in its entirety and included with the bid/proposal. If the bidder/offeror fails to accurately complete and submit this Affidavit and Schedule with the bid or proposal as required, the Procurement Officer shall deem the bid non-responsive or shall determine that the proposal is not reasonably susceptible of being selected for award.

In connection with the bid/proposal submitted in response to Solicitation No. _____, I affirm the following:

1. **MBE Participation (PLEASE CHECK ONLY ONE)**

☐ I acknowledge and intend to meet IN FULL both the overall certified Minority Business Enterprise (MBE) participation goal of _____ percent and all of the following subgoals:

_____ percent for African American-owned MBE firms
_____ percent for Hispanic American-owned MBE firms
_____ percent for Asian American-owned MBE firms
_____ percent for Women-owned MBE firms

Therefore, I am not seeking a waiver pursuant to COMAR 21.11.03.11. I acknowledge that by checking the above box and agreeing to meet the stated goal and subgoal(s), if any, I **must** complete PART 3 - MBE Participation Schedule and Part 4 Signature Page in order to be considered for award.

OR

☐ After making good faith outreach efforts prior to making this submission, I conclude that I am unable to achieve the MBE participation goal and/or subgoals. I hereby request a waiver, in whole or in part, of the overall goal and/or subgoals I acknowledge that by checking this box and requesting a partial waiver of the stated goal and/or one or more of the stated subgoal(s) if any, I must complete Part 3, the MBE Participation Schedule and Part 4 Signature Page for the portion of the goal and/or subgoal(s) if any, for which I am not seeking a waiver, in order to be considered for award. I acknowledge that by checking this box and requesting a full waiver of the stated goal and the stated subgoal(s) if any, I must complete Part 4 Signature Page in order to be considered for award.

Additional MBE Documentation

I understand that if I am notified that I am the apparent awardee or as requested by the Procurement Officer, I must submit the following documentation within 10 working days of receiving notice of the potential award or from the date of conditional award (per COMAR 21.11.03.10), whichever is earlier:

(a) Good Faith Efforts Documentation to Support Waiver Request (Attachment D-1C)

(b) Outreach Efforts Compliance Statement (Attachment D-2);

(c) MBE Subcontractor/MBE Prime Project Participation Statement (Attachments D-3A and 3B);

(d) Any other documentation, including additional waiver documentation if applicable, required by the Procurement Officer to ascertain bidder or offeror responsibility in connection with the certified MBE participation goal and subgoals, if any.

I understand that if I fail to return each completed document within the required time, the Procurement Officer may determine that I am not responsible and therefore not eligible for contract award. If the contract has already been awarded, the award is voidable.

Information Provided to MBE firms

In the solicitation of subcontract quotations or offers, MBE firms were provided not less than the same information and amount of time to respond as were non-MBE firms.

PART 3 - MBE PARTICIPATION SCHEDULE

SET FORTH BELOW ARE THE (I) CERTIFIED MBES I INTEND TO USE, (II) THE PERCENTAGE OF THE TOTAL CONTRACT VALUE ALLOCATED TO EACH MBE FOR THIS PROJECT AND, (III) THE ITEMS OF WORK EACH MBE WILL PROVIDE UNDER THE CONTRACT. I HAVE CONFIRMED WITH THE MDOT DATABASE THAT THE MBE FIRMS IDENTIFIED BELOW (INCLUDING ANY SELF-PERFORMING MBE PRIME FIRMS) ARE PERFORMING WORK ACTIVITIES FOR WHICH THEY ARE MDOT-CERTIFIED.

Prime Contractor	Project Description	Project/Contract Number

LIST INFORMATION FOR EACH CERTIFIED MBE FIRM YOU AGREE TO USE TO ACHIEVE THE MBE PARTICIPATION GOAL AND SUBGOALS, IF ANY. MBE PRIMES: PLEASE COMPLETE BOTH SECTIONS A AND B BELOW.

SECTION A: For MBE Prime Contractors ONLY (including MBE Primes in a Joint Venture)

MBE Prime Firm Name:_____

MBE Certification Number: _____

(If dually certified, check only one box.)

☐ African American-Owned
☐ Hispanic American- Owned
☐ Asian American-Owned
☐ Women-Owned
☐ Other MBE Classification

NAICS code: _____

Percentage of total Contract Value to be performed with own forces and counted towards the MBE **overall participation goal** (up to 50% of the overall goal): _____% **Please refer to Item #8 in Part 1- Instructions of this document for new MBE participation guidelines regarding materials and supplies.**

Percentage of total Contract Value to be performed with own forces and counted towards the **subgoal**, if any, for my MBE classification (up to 100% of not more than one subgoal): _____%

☐ Supplier, wholesaler and/or regular dealer (count 60%)
☐ Manufacturer (count 100%)
☐ Broker (count reasonable fee/commission only)
☐ Furnish and Install and other Services (count 100%)

Complete the applicable prompt (select only one) from prompts A-C below that applies to the type of work your firm is self-performing to calculate amount to be counted towards achieving the MBE Participation Goal and Subgoal, if any.

A. Percentage amount of subcontract where the MBE Prime firm is being used for manufacturer, furnish and install, and/or services (excluding products / services from suppliers, wholesalers, regular dealers and brokers) **___%**

B. Percentage amount for items of work where the MBE Prime firm is being used as supplier, wholesaler, and/or regular dealer (60% Rule).
Total percentage of Supplies/Products **___**% x 60% = **___%**

C. Percentage amount of fee where the MBE Prime firm is being used as broker (count reasonable fee/commission only) **___ %**

Description of the work to be performed with MBE prime's own forces:
_____
_____

SECTION B: For all Contractors (including MBE Primes and MBE Primes in a Joint Venture)

MBE Firm Name:_____ MBE Certification Number: _____ (If dually certified, check only one box.) ☐ African American-Owned ☐ Hispanic American- Owned ☐ Asian American-Owned ☐ Women-Owned ☐ Other MBE Classification NAICS code: _____	**Please refer to Item #8 in Part 1- Instructions of this document for new MBE participation guidelines regarding materials and supplies.** ☐ Supplier, wholesaler and/or regular dealer (count 60%) ☐ Manufacturer (count 100%) ☐ Broker (count reasonable fee/commission only) ☐ Furnish and Install and other Services (count 100%) **Complete the applicable prompt (select only one) from prompts A-C below that applies to the type of work that the MBE firm named to the left will be performing to calculate the amount to be counted towards achieving the MBE Participation Goal and Subgoal, if any.** **A. Percentage of total contract amount where the MBE firm is being used for manufacturer, furnish and install, and/or services** (excluding products/services from suppliers, wholesalers, regular dealers and brokers) **___%** **B. Percentage of total contract amount for items of work where the MBE firm is being used as supplier, wholesaler, and/or regular dealer** (60% Rule)**)**. Total percentage of Supplies/Products ___% X 60% = **___%** **C. Percentage amount of fee where the MBE firm is being used as broker** (count reasonable fee/commission only) **___ %** Description of the work to be performed: _____ _____
MBE Firm Name:_____ MBE Certification Number: _____ (If dually certified, check only one box.) ☐ African American-Owned ☐ Hispanic American- Owned ☐ Asian American-Owned ☐ Women-Owned ☐ Other MBE Classification NAICS code: _____	**Please refer to Item #8 in Part 1- Instructions of this document for new MBE participation guidelines regarding materials and supplies.** ☐ Supplier, wholesaler and/or regular dealer (count 60%) ☐ Manufacturer (count 100%) ☐ Broker (count reasonable fee/commission only) ☐ Furnish and Install and other Services (count 100%) **Complete the applicable prompt (select only one) from prompts A-C below that applies to the type of work that the MBE Firm named to the left will be performing to calculate the amount to be counted towards achieving the MBE Participation Goal and Subgoal, if any.** **A. Percentage of total contract amount where the MBE firm is being used for manufacturer, furnish and install, and/or services** (excluding products/services from suppliers, wholesalers, regular dealers and brokers) **___%** **B. Percentage of total contract amount for items of work where the MBE firm is being used as supplier, wholesaler, and/or regular dealer** (60% Rule)**)**. Total percentage of Supplies/Products ___% X 60% = **___%** **C. Percentage amount of fee where the MBE firm is being used as broker** (count reasonable fee/commission only) **___ %** Description of the work to be performed: _____ _____

MBE Firm Name:_____ MBE Certification Number: _____ (If dually certified, check only one box.) ☐ African American-Owned ☐ Hispanic American- Owned ☐ Asian American-Owned ☐ Women-Owned ☐ Other MBE Classification NAICS code: _____	**Please refer to Item #8 in Part 1- Instructions of this document for new MBE participation guidelines regarding materials and supplies.** ☐ Supplier, wholesaler and/or regular dealer (count 60%) ☐ Manufacturer (count 100%) ☐ Broker (count reasonable fee/commission only) ☐ Furnish and Install and other Services (count 100%) **Complete the applicable prompt (select only one) from prompts A-C below that applies to the type of work that for the MBE firm named to the left will be performing to calculate the amount to be counted towards achieving the MBE Participation Goal and Subgoal, if any.** **A. Percentage of total contract amount where the MBE firm is being used for manufacturer, furnish and install, and/or services** (excluding products/services from suppliers, wholesalers, regular dealers and brokers) **___%** **B. Percentage of the total contract amount for items of work where the MBE firm is being used as supplier, wholesaler, and/or regular dealer** (60% Rule). Total percentage of Supplies/Products ___% X 60% = **___%** **C. Percentage amount of fee where the MBE firm is being used as broker** (count reasonable fee/commission only) **___ %** Description of the work to be performed: _____ _____
MBE Firm Name:_____ MBE Certification Number: _____ (If dually certified, check only one box.) ☐ African American-Owned ☐ Hispanic American- Owned ☐ Asian American-Owned ☐ Women-Owned ☐ Other MBE Classification NAICS code: _____	**Please refer to Item #8 in Part 1- Instructions of this document for new MBE participation guidelines regarding materials and supplies.** ☐ Supplier, wholesaler and/or regular dealer (count 60%) ☐ Manufacturer (count 100%) ☐ Broker (count reasonable fee/commission only) ☐ Furnish and Install and other Services (count 100%) **Complete the applicable prompt (select only one) from prompts A-C below that applies to the type of work that the MBE firm named to the left will be performing to calculate the amount to be counted towards achieving the MBE Participation Goal and Subgoal, if any.** **A. Percentage of total contract amount where the MBE firm is being used for manufacturer, furnish and install, and/or services** (excluding products/services from suppliers, wholesalers, regular dealers and brokers) **___%** **B. Percentage of total contract amount for items of work where the MBE firm is being used as supplier, wholesaler, and/or regular dealer** (60% Rule)**)**. Total percentage of Supplies/Products ___% X 60% = **___%** **C. Percentage amount of fee where the MBE firm is being used as broker___ %** Description of the work to be performed: _____ _____

CONTINUE ON SEPARATE PAGE IF NEEDED

PART 4 – SIGNATURE PAGE

To complete Affidavit committing to MBE(s) or requesting waiver, Bidder/Offeror must sign below:

I solemnly affirm under the penalties of perjury that: (i) I have reviewed the instructions for the MBE Utilization & Fair Solicitation Affidavit and MBE Schedule, and (ii) the information contained in the MBE Utilization & Fair Solicitation Affidavit and MBE Schedule is true to the best of my knowledge, information and belief.

_____	_____
Bidder/Offeror Name *(PLEASE PRINT OR TYPE)*	Signature of Authorized Representative
_____	_____
Address	Printed Name and Title
_____	_____
City, State and Zip Code	Date

SUBMIT THIS AFFIDAVIT WITH BID/PROPOSAL

D-1B WAIVER GUIDANCE

GUIDANCE FOR DOCUMENTING GOOD FAITH EFFORTS TO MEET MBE PARTICIPATION GOALS

In order to show that it has made good faith efforts to meet the Minority Business Enterprise (MBE) participation goal (including any MBE subgoals) on a contract, the Offeror must either (1) meet the MBE Goal(s) and document its commitments for participation of MBE Firms, or (2) when it does not meet the MBE Goal(s), document its Good Faith Efforts to meet the goal(s).

I. Definitions

MBE Goal(s) – "MBE Goal(s)" refers to the MBE participation goal and MBE participation subgoal(s).

Good Faith Efforts - The "Good Faith Efforts" requirement means that when requesting a waiver, the Offeror must demonstrate that it took all necessary and reasonable steps to achieve the MBE Goal(s), which, by their scope, intensity, and appropriateness to the objective, could reasonably be expected to obtain sufficient MBE participation, even if those steps were not fully successful. Whether the Offeror that requests a waiver made adequate good faith efforts will be determined by considering the quality, quantity, and intensity of the different kinds of efforts that the Offeror has made. The efforts employed by the Offeror should be those that one could reasonably expect the Offeror to take if the Offeror were actively and aggressively trying to obtain MBE participation sufficient to meet the MBE contract goal and subgoals. Mere *pro forma* efforts are not good faith efforts to meet the MBE contract requirements. The determination concerning the sufficiency of the Offeror's good faith efforts is a judgment call; meeting quantitative formulas is not required.

Identified Firms – "Identified Firms" means a list of the MBEs identified by the procuring agency during the goal setting process and listed in the procurement as available to perform the Identified Items of Work. It also may include additional MBEs identified by the Offeror as available to perform the Identified Items of Work, such as MBEs certified or granted an expansion of services after the procurement was issued. If the procurement does not include a list of Identified Firms, this term refers to all of the MBE Firms (if State-funded) the Offeror identified as available to perform the Identified Items of Work and should include all appropriately certified firms that are reasonably identifiable.

Identified Items of Work – "Identified Items of Work" means the Proposal items identified by the procuring agency during the goal setting process and listed in the procurement as possible items of work for performance by MBE Firms. It also may include additional portions of items of work the Offeror identified for performance by MBE Firms to increase the likelihood that the MBE Goal(s) will be achieved. If the procurement does not include a list of Identified Items of Work, this term refers to all of the items of work the Offeror identified as possible items of work for performance by MBE Firms and should include all reasonably identifiable work opportunities.

MBE Firms – "MBE Firms" refers to firms certified by the Maryland Department of Transportation ("MDOT") under COMAR 21.11.03. Only MDOT-certified MBE Firms can participate in the State's MBE Program.

II. Types of Actions Agency will Consider

The Offeror is responsible for making relevant portions of the work available to MBE subcontractors and suppliers and select those portions of the work or material needs consistent with the available MBE subcontractors and suppliers, so as to facilitate MBE participation. The following is a list of types of actions the procuring agency will consider as part of the Offeror's Good Faith Efforts when the Offeror fails to meet the MBE Goal(s). This list is not intended to be a mandatory checklist, nor is it intended to be exclusive or exhaustive. Other factors or types of efforts may be relevant in appropriate cases.

A. Identify Proposal Items as Work for MBE Firms

1. Identified Items of Work in Procurements

   (a) Certain procurements will include a list of Proposal items identified during the goal setting process as possible work for performance by MBE Firms. If the procurement provides a list of Identified Items of Work, the Offeror shall make all reasonable efforts to solicit quotes from MBE Firms to perform that work.

   (b) Offerors may, and are encouraged to, select additional items of work to be performed by MBE Firms to increase the likelihood that the MBE Goal(s) will be achieved.

2. Identified Items of Work by Offerors

   (a) When the procurement does not include a list of Identified Items of Work or for additional Identified Items of Work, Offerors should reasonably identify sufficient items of work to be performed by MBE Firms.

(b) Where appropriate, Offerors should break out contract work items into economically feasible units to facilitate MBE participation, rather than perform these work items with their own forces. The ability or desire of a prime contractor to perform the work of a contract with its own organization does not relieve the Offeror of the responsibility to make Good Faith Efforts.

B. Identify MBE Firms to Solicit

1. MBE Firms Identified in Procurements

(a) Certain procurements will include a list of the MBE Firms identified during the goal setting process as available to perform the items of work. If the procurement provides a list of Identified MBE Firms, the Offeror shall make all reasonable efforts to solicit those MBE firms.

(b) Offerors may, and are encouraged to, search the MBE Directory to identify additional MBEs who may be available to perform the items of work, such as MBEs certified or granted an expansion of services after the solicitation was issued.

2. MBE Firms Identified by Offerors

(a) When the procurement does not include a list of Identified MBE Firms, Offerors should reasonably identify the MBE Firms that are available to perform the Identified Items of Work.

(b) Any MBE Firms identified as available by the Offeror should be certified to perform the Identified Items of Work.

C. Solicit MBEs

1. Solicit <u>all</u> Identified Firms for all Identified Items of Work by providing written notice. The Offeror should:

(a) provide the written solicitation at least 10 days prior to Proposal opening to allow sufficient time for the MBE Firms to respond;

(b) send the written solicitation by first-class mail, facsimile, or e-mail using contact information in the MBE Directory, unless the Offeror has a valid basis for using different contact information; and

(c) provide adequate information about the plans, specifications, anticipated time schedule for portions of the work to be performed by the MBE, and other requirements of the contract to assist MBE Firms in responding. (This information may be provided by including hard copies in the written solicitation or by <u>electronic means</u> as described in C.3 below.)

2. "<u>All</u>" Identified Firms includes the MBEs listed in the procurement and any MBE Firms you identify as potentially available to perform the Identified Items of Work, but it does not include MBE Firms who are no longer certified to perform the work as of the date the Offeror provides written solicitations.

3. "<u>Electronic Means</u>" includes, for example, information provided *via* a website or file transfer protocol (FTP) site containing the plans, specifications, and other requirements of the contract. If an interested MBE cannot access the information provided by electronic means, the Offeror must make the information available in a manner that is accessible to the interested MBE.

4. Follow up on initial written solicitations by contacting MBEs to determine if they are interested. The follow up contact may be made:

(a) by telephone using the contact information in the MBE Directory, unless the Offeror has a valid basis for using different contact information; or

(b) in writing *via* a method that differs from the method used for the initial written solicitation.

5. In addition to the written solicitation set forth in C.1 and the follow up required in C.4, use all other reasonable and available means to solicit the interest of MBE Firms certified to perform the work of the contract. Examples of other means include:

(a) attending any pre-Proposal meetings at which MBE Firms could be informed of contracting and subcontracting opportunities; and

(b) if recommended by the procurement, advertising with or effectively using the services of at least two minority focused entities or media, including trade associations, minority/women community organizations, minority/women contractors' groups, and local, state, and federal minority/women business assistance offices listed on the MDOT Office of Minority Business Enterprise website.

D. Negotiate with Interested MBE Firms

Offerors must negotiate in good faith with interested MBE Firms.

1. Evidence of negotiation includes, without limitation, the following:
   (a) the names, addresses, and telephone numbers of MBE Firms that were considered;
   (b) a description of the information provided regarding the plans and specifications for the work selected for subcontracting and the means used to provide that information; and
   (c) evidence as to why additional agreements could not be reached for MBE Firms to perform the work.
2. The Offeror using good business judgment would consider a number of factors in negotiating with subcontractors, including MBE subcontractors, and would take a firm's price and capabilities as well as contract goals into consideration.
3. The fact that there may be some additional costs involved in finding and using MBE Firms is not in itself sufficient reason for the Offeror's failure to meet the contract MBE goal(s), as long as such costs are reasonable. Factors to take into consideration when determining whether an MBE Firm's quote is excessive or unreasonable include, without limitation, the following:
   (a) dollar difference between the MBE subcontractor's quote and the average of the other subcontractors' quotes received by the Offeror;
   (b) percentage difference between the MBE subcontractor's quote and the average of the other subcontractors' quotes received by the Offeror;
   (c) percentage that the MBE subcontractor's quote represents of the overall contract amount;
   (d) number of MBE firms that the Offeror solicited for that portion of the work;
   (e) whether the work described in the MBE and Non-MBE subcontractor quotes (or portions thereof) submitted for review is the same or comparable; and
   (f) number of quotes received by the Offeror for that portion of the work.
4. The above factors are not intended to be mandatory, exclusive, or exhaustive, and other evidence of an excessive or unreasonable price may be relevant.
5. The Offeror may not use its price for self-performing work as a basis for rejecting an MBE Firm's quote as excessive or unreasonable.
6. The "average of the other subcontractors' quotes received" by the Offeror refers to the average of the quotes received from all subcontractors. Offeror should attempt to receive quotes from at least three subcontractors, including one quote from an MBE and one quote from a Non-MBE.
7. The Offeror shall not reject an MBE Firm as unqualified without sound reasons based on a thorough investigation of the firm's capabilities. For each certified MBE that is rejected as unqualified or that placed a subcontract quotation or offer that the Offeror concludes is not acceptable, the Offeror must provide a written detailed statement listing the reasons for this conclusion. The Offeror also must document the steps taken to verify the capabilities of the MBE and Non-MBE Firms quoting similar work.
   (a) The factors to take into consideration when assessing the capabilities of an MBE Firm, include, but are not limited to the following: financial capability, physical capacity to perform, available personnel and equipment, existing workload, experience performing the type of work, conduct and performance in previous contracts, and ability to meet reasonable contract requirements.
   (b) The MBE Firm's standing within its industry, membership in specific groups, organizations, or associations and political or social affiliations (for example union vs. non-union employee status) are not legitimate causes for the rejection or non-solicitation of Proposals in the efforts to meet the project goal.

E. Assisting Interested MBE Firms

When appropriate under the circumstances, the decision-maker will consider whether the Offeror Offeror made reasonable efforts to assist interested MBR Firms in obtaining:

1. The bonding, lines of credit, or insurance required by the procuring agency or the Offeror; and
2. Necessary equipment, supplies, materials, or related assistance or services.

III. Other Considerations

In making a determination of Good Faith Efforts the decision-maker may consider engineering estimates, catalogue prices, general market availability and availability of certified MBE Firms in the area in which the work is to be performed, other Proposals or offers and subcontract Proposals or offers substantiating significant variances between certified MBE and Non-MBE costs of participation, and their impact on the overall cost of the contract to the State and any other relevant factors.

The decision-maker may take into account whether the Offeror decided to self-perform subcontract work with its own forces, especially where the self-performed work is Identified Items of Work in the procurement. The decision-maker also may take into account the performance of other Offerors in meeting the contract. For example, when the apparent successful Offeror fails to meet the contract goal, but others meet it, this reasonably raises the question of whether, with additional reasonable efforts, the apparent successful Offeror could have met the goal. If the apparent successful Offeror fails to meet the goal, but meets or exceeds the average MBE participation obtained by other Offerors, this, when viewed in conjunction with other factors, could be evidence of the apparent successful Offeror having made Good Faith Efforts.

IV. Documenting Good Faith Efforts

At a minimum, the Offeror seeking a waiver of the MBE Goal(s) or a portion thereof must provide written documentation of its Good Faith Efforts, in accordance with COMAR 21.11.03.11, within 10 Business Days after receiving notice that it is the apparent awardee. The written documentation shall include the following:

A. Items of Work (Complete Good Faith Efforts Documentation Attachment D-1C, Part 1)

A detailed statement of the efforts made to select portions of the work proposed to be performed by certified MBE Firms in order to increase the likelihood of achieving the stated MBE Goal(s).

B. Outreach/Solicitation/Negotiation

1. The record of the Offeror's compliance with the outreach efforts prescribed by COMAR 21.11.03.09C(2)(a). **(Complete Outreach Efforts Compliance Statement - D-2)**.
2. A detailed statement of the efforts made to contact and negotiate with MBE Firms including:
   (a) the names, addresses, and telephone numbers of the MBE Firms who were contacted, with the dates and manner of contacts (letter, fax, e-mail, telephone, etc.) (**Complete Good Faith Efforts Attachment D-1C- Part 2, and submit letters, fax cover sheets, e-mails, etc. documenting solicitations**); and
   (b) a description of the information provided to MBE Firms regarding the plans, specifications, and anticipated time schedule for portions of the work to be performed and the means used to provide that information.

C. Rejected MBE Firms (Complete Good Faith Efforts Attachment D-1C, Part 3)

1. For each MBE Firm that the Offeror concludes is not acceptable or qualified, a detailed statement of the reasons for the Offeror's conclusion, including the steps taken to verify the capabilities of the MBE and Non-MBE Firms quoting similar work.
2. For each certified MBE Firm that the Offeror concludes has provided an excessive or unreasonable price, a detailed statement of the reasons for the Offeror's conclusion, including the quotes received from all MBE and Non-MBE firms proposing on the same or comparable work. **(Include copies of all quotes received.)**
3. A list of MBE Firms contacted but found to be unavailable. This list should be accompanied by an MBE Unavailability Certificate (see **D-1B - Exhibit A** to this Part 1) signed by the MBE contractor or a statement from the Offeror that the MBE contractor refused to sign the MBE Unavailability Certificate.

D. Other Documentation

1. Submit any other documentation requested by the Procurement Officer to ascertain the Offeror's Good Faith Efforts.
2. Submit any other documentation the Offeror believes will help the Procurement Officer ascertain its Good Faith Efforts.

D-1B - Exhibit A
MBE Subcontractor Unavailability Certificate

1. It is hereby certified that the firm of _____
(Name of Minority firm)

located at _____
(Number) (Street)

_____
(City) (State) (Zip)

was offered an opportunity to bid on Solicitation No. _____

in _____ County by _____
(Name of Prime Contractor's Firm)

****

2. _____ (Minority Firm), is either unavailable for the work/service or unable to prepare a Proposal for this project for the following reason(s):

_____

_____

_____

_____

****

_____

(Signature of Minority Firm's MBE Representative) (Title) (Date)

_____

(MDOT Certification #) (Telephone #)

****

3. To be completed by the prime contractor if Section 2 of this form is not completed by the minority firm.

To the best of my knowledge and belief, said Certified Minority Business Enterprise is either unavailable for the work/service for this project, is unable to prepare a Proposal, or did not respond to a request for a price Proposal and has not completed the above portion of this submittal.

_____

(Signature of Prime Contractor) (Title) (Date)

D-1C
GOOD FAITH EFFORTS DOCUMENTATION TO SUPPORT WAIVER REQUEST

PAGE __ OF ___

Prime Contractor:	**Project Description:**	**PROJECT/CONTRACT**
Offeror Company Name, Street Address, Phone		**Solicitation #:**

Parts 1, 2, and 3 must be included with this certificate along with all documents supporting your waiver request.

I affirm that I have reviewed **Attachment D-1B**, Waiver Guidance. I further affirm under penalties of perjury that the contents of Parts 1, 2, and 3 of this **Attachment D-1C** Good Faith Efforts Documentation Form are true to the best of my knowledge, information, and belief.

Company:

Company Name (please print or type)

By:

Signature of Authorized Representative

Printed Name:

Printed Name

Title:

Title

Date:

Date

Address:

Company Address

GOOD FAITH EFFORTS DOCUMENTATION TO SUPPORT WAIVER REQUEST

PART 1 – IDENTIFIED ITEMS OF WORK OFFEROR MADE AVAILABLE TO MBE FIRMS

PAGE __ OF ___

Prime Contractor:	**Project Description:**	**PROJECT/CONTRACT**
Offeror Company Name, Street Address, Phone		**Solicitation #:**

Identify those items of work that the Offeror made available to MBE Firms. This includes, where appropriate, those items the Offeror identified and determined to subdivide into economically feasible units to facilitate the MBE participation. For each item listed, show the anticipated percentage of the total contract amount. It is the Offeror's responsibility to demonstrate that sufficient work to meet the goal was made available to MBE Firms, and the total percentage of the items of work identified for MBE participation equals or exceeds the percentage MBE goal set for the procurement. Note: If the procurement includes a list of Proposal items identified during the goal setting process as possible items of work for performance by MBE Firms, the Offeror should make all of those items of work available to MBE Firms or explain why that item was not made available. If the Offeror selects additional items of work to make available to MBE Firms, those additional items should also be included below.

Identified Items of Work	**Was this work listed in the procurement?**	**Does Offeror normally self-perform this work?**	**Was this work made available to MBE Firms? If no, explain why not.**
	□ Yes □ No	□ Yes □ No	□ Yes □ No
	□ Yes □ No	□ Yes □ No	□ Yes □ No
	□ Yes □ No	□ Yes □ No	□ Yes □ No
	□ Yes □ No	□ Yes □ No	□ Yes □ No
	□ Yes □ No	□ Yes □ No	□ Yes □ No
	□ Yes □ No	□ Yes □ No	□ Yes □ No
	□ Yes □ No	□ Yes □ No	□ Yes □ No

☐ Please check if Additional Sheets are attached.

GOOD FAITH EFFORTS DOCUMENTATION TO SUPPORT WAIVER REQUEST

PART 2 – IDENTIFIED MBE FIRMS AND RECORD OF SOLICITATIONS

PAGE __ OF ___

Prime Contractor:	**Project Description:**	**PROJECT/CONTRACT**
Offeror Company Name, Street Address, Phone		**Solicitation #:**

Identify the MBE Firms solicited to provide quotes for the Identified Items of Work made available for MBE participation. Include the name of the MBE Firm solicited, items of work for which quotes were solicited, date and manner of initial and follow-up solicitations, whether the MBE provided a quote, and whether the MBE is being used to meet the MBE participation goal. MBE Firms used to meet the participation goal must be included on the MBE Participation Schedule. Note: If the procurement includes a list of the MBE Firms identified during the goal setting process as potentially available to perform the items of work, the Offeror should solicit all of those MBE Firms or explain why a specific MBE was not solicited. If the Offeror identifies additional MBE Firms who may be available to perform Identified Items of Work, those additional MBE Firms should also be included below. Copies of all written solicitations and documentation of follow-up calls to MBE Firms must be attached to this form. This list should be accompanied by a Minority Contractor Unavailability Certificate signed by the MBE contractor or a statement from the Offeror that the MBE contractor refused to sign the Minority Contractor Unavailability Certificate (**Attachment D-1B - Exhibit A**). If the Offeror used a Non-MBE or is self-performing the identified items of work, Part 4 must be completed.

Name of Identified MBE Firm & MBE Classification	**Describe Item of Work Solicited**	**Initial Solicitation Date & Method**	**Follow-up Solicitation Date & Method**	**Details for Follow-up Calls**	**Quote Rec'd**	**Quote Used**	**Reason Quote Rejected**
Firm Name: MBE Classification (Check only if requesting waiver of MBE subgoal.) ☐ African American-Owned ☐ Hispanic American- Owned ☐ Asian American-Owned ☐ Women-Owned ☐ Other MBE Classification _____		Date: □ Mail □ Facsimile □ E-mail	Date: □ Phone □ Mail □ Facsimile □ E-mail	Time of Call: Spoke with: _____ □ Left Message	□ Yes □ No	□ Yes □ No	□ Used Other MBE □ Used Non-MBE □ Self-performing
Firm Name: MBE Classification (Check only if requesting waiver of MBE subgoal.) ☐ African American-Owned ☐ Hispanic American- Owned ☐ Asian American-Owned ☐ Women-Owned ☐ Other MBE Classification _____		Date: □ Mail □ Facsimile □ E-mail	Date: □ Phone □ Mail □ Facsimile □ E-mail	Time of Call: Spoke with: _____ □ Left Message	□ Yes □ No	□ Yes □ No	□ Used Other MBE □ Used Non-MBE □ Self-performing

☐ Please check if Additional Sheets are attached.

GOOD FAITH EFFORTS DOCUMENTATION TO SUPPORT WAIVER REQUEST

PART 3 – ADDITIONAL INFORMATION REGARDING REJECTED MBE QUOTES

PAGE __ OF ___

Prime Contractor:	**Project Description:**	**PROJECT/CONTRACT NUMBER:**
Offeror Company Name, Street Address, Phone		**Solicitation #:**

This form must be completed if Part 1 indicates that an MBE quote was rejected because the Offeror is using a Non-MBE or is self-performing the Identified Items of Work. Provide the Identified Items Work, indicate whether the work will be self-performed or performed by a Non-MBE, and if applicable, state the name of the Non-MBE. Also include the names of all MBE and Non-MBE Firms that provided a quote and the amount of each quote.

Describe Identified Items of Work Not Being Performed by MBE (Include spec/ section number from Proposal)	**Self-performing or Using Non-MBE (Provide name)**	**Amount of Non-MBE Quote**	**Name of Other Firms who Provided Quotes & Whether MBE or Non-MBE**	**Amount Quoted**	**Indicate Reason Why MBE Quote Rejected & Briefly Explain**
	□ Self-performing □ Using Non-MBE _____	$_____	_____ □ MBE □ Non-MBE	$_____	□ Price □ Capabilities □ Other
	□ Self-performing □ Using Non-MBE _____	$_____	_____ □ MBE □ Non-MBE	$_____	□ Price □ Capabilities □ Other
	□ Self-performing □ Using Non-MBE _____	$_____	_____ □ MBE □ Non-MBE	$_____	□ Price □ Capabilities □ Other
	□ Self-performing □ Using Non-MBE _____	$_____	_____ □ MBE □ Non-MBE	$_____	□ Price □ Capabilities □ Other
	□ Self-performing □ Using Non-MBE _____	$_____	_____ □ MBE □ Non-MBE	$_____	□ Price □ Capabilities □ Other
	□ Self-performing □ Using Non-MBE _____	$_____	_____ □ MBE □ Non-MBE	$_____	□ Price □ Capabilities □ Other

☐ Please check if Additional Sheets are attached.

D- 2
OUTREACH EFFORTS COMPLIANCE STATEMENT

Complete and submit this form within 10 Business Days of notification of apparent award or actual award, whichever is earlier.

In conjunction with the Proposal submitted in response to Solicitation No. _____, I state the following:

1. Offeror identified subcontracting opportunities in these specific work categories:

_____

_____

_____

2. Attached to this form are copies of written solicitations (with Proposal instructions) used to solicit certified MBE firms for these subcontract opportunities.

3. Offeror made the following attempts to personally contact the solicited MDOT-certified MBE firms:

_____

_____

_____

4. **Please Check One:**

□ This project does not involve bonding requirements.

□ Offeror assisted MDOT-certified MBE firms to fulfill or seek waiver of bonding requirements. (DESCRIBE EFFORTS):

_____

_____

_____

5. **Please Check One:**

_____ Offeror did attend the pre-Proposal conference.

_____ No pre -Proposal meeting/conference was held.

_____ Offeror did not attend the pre-Proposal conference.

PLEASE PRINT OR TYPE

Company:

Company Name (please print or type)

By:

Signature of Authorized Representative

Printed Name:

Printed Name

Title:

Title

Date:

Date

Address:

Company Address

D-3A
CERTIFED MBE SUBCONTRACTOR PARTICIPATION CERTIFICATION

INSTRUCTIONS:

PRIME CONTRACTOR: After completing SECTIONS A, B, and D, provide this form to ***each*** certified Minority Business Enterprise subcontractor (MBE) listed on the MBE Participation Schedule (Attachment D-1A) allowing sufficient time for the MBE to respond within the required timeframe.

CERTIFIED MBE SUBCONTRACTOR: Complete SECTION C to acknowledge and certify the information in SECTION A. Return the completed form directly to the Procurement Officer identified in SECTION D within 10 days after notice from the Prime Contractor of the State's intent to award the Contract. Provide a copy to the Prime Contractor.

IF THIS FORM IS NOT RETURNED WITHIN THE REQUIRED TIME, THE PROCUREMENT OFFICER MAY DETERMINE THAT THE PRIME CONTRACTOR IS NOT RESPONSIBLE AND THEREFORE NOT ELIGIBLE FOR CONTRACT AWARD.

SECTION A

Provided that (Prime Contractor) _____ is awarded the State contract in conjunction with Solicitation Number _____, (Prime Contractor) _____ intends to enter into a subcontract with (Certified MBE Subcontractor) _____ with MDOT Certification Number _____ committing to participation by (Certified MBE Subcontractor) _____ of at least $_____ which equals _____% of the Total Contract Value for the following products/services:

NAICS CODE	WORK ITEM, SPECIFICATION NUMBER, LINE ITEMS OR WORK CATEGORIES (IF APPLICABLE)	DESCRIPTION OF SPECIFIC PRODUCTS AND/OR SERVICES

The Contractor and certified MBE each acknowledge that, for purposes of determining the accuracy of the information provided herein, the Procurement Officer may request additional information, including, without limitation, copies of the subcontract agreements and quotes. The Contractor and certified MBE each solemnly affirms under the penalties of perjury that: (i) the information provided in this Certified MBE Subcontractor Participation Certification is true to the best of its knowledge, information and belief, and (ii) it has fully complied with the State Minority Business Enterprise law, State Finance and Procurement Article §14-308(a)(2), Annotated Code of Maryland which provides that, except as otherwise provided by law, a Contractor may not identify a certified MBE in a Bid/Proposal and:

(1) fail to request, receive, or otherwise obtain authorization from the MBE to identify the MBE in its Bid/Proposal;

(2) fail to notify the MBE before execution of the Contract of its inclusion of the Bid/Proposal;

(3) fail to use the MBE in the performance of the Contract; or

(4) pay the MBE solely for the use of its name in the Bid/Proposal.

SECTION B – Prime Contractor

Signature of Representative:

_____

Printed Name and Title:

_____

Prime Firm's Name: _____

Federal Identification Number: _____

Street Address, City, State, Zip Code:

_____

_____

Phone: _____

Date: _____

SECTION C – Certified MBE Subcontractor

Signature of Representative:

_____

Printed Name and Title:

_____

MBE Firm's Name: _____

Federal Identification Number: _____

Street Address, City, State, Zip Code:

_____

_____

Phone: _____

Date: _____

SECTION D

This completed form is due to the Procurement Officer on or before: _____

Solicitation #: _____ Solicitation Title: _____

Agency/Dept.: _____ Procurement Officer: _____

Phone: _____ Email: _____

Street Address, City, State, Zip Code:

_____

_____

D-3B
MBE PRIME PROJECT PARTICIPATION CERTIFICATION

Please complete and submit this form to attest to each specific item of work that your MBE firm has listed on the MBE Participation Schedule (Attachment D-1A) for purposes of meeting the MBE participation goals. This form must be submitted within 10 Business Days of notification of apparent award. If the Offeror fails to return this affidavit within the required time, the Procurement Officer may determine that Proposal is not susceptible of being selected for Contract award.

Provided that _____ (Prime Contractor's Name) with Certification Number _____ is awarded the State contract in conjunction with Solicitation No. _____, such MBE Prime Contractor intends to perform with its own forces at least $_____ which equals to___% of the Total Contract Amount for performing the following goods and services for the Contract:

NAICS CODE	WORK ITEM, SPECIFICATION NUMBER, LINE ITEMS OR WORK CATEGORIES (IF APPLICABLE) For Construction Projects, General Conditions must be listed separately	DESCRIPTION OF SPECIFIC PRODUCTS AND/OR SERVICES	VALUE OF THE WORK

MBE Prime Contractor

Company:

Company Name (please print or type)

FEIN:

Federal Identification Number

Company Address: _____

Phone:

Printed Name:

Title:

By:

Signature of Authorized Representative

Date:

D-4A
Minority Business Enterprise Participation
Prime Contractor Paid/Unpaid Invoice Report

Report #:	Contract #:
Reporting Period (Month/Year):	Contracting Unit:
Prime Contractor: Report is due to the MBE Liaison by the 10th of the month following the month the services were provided. **Note: Please number reports in sequence**	Contract Amount: MBE Subcontract Amt: Project Begin Date: Project End Date: Services Provided:

Prime Contractor:		Contact Person:	
Address:			
City:		State:	ZIP:
Phone:	FAX:	E-mail:	
MBE Subcontractor Name:		Contact Person:	
Phone:	FAX:	E-mail:	
Subcontractor Services Provided:			

List all payments made to MBE subcontractor named above during this reporting period:			**List dates and amounts of any outstanding invoices:**		
	Invoice #	**Amount**		**Invoice #**	**Amount**
1.			1.		
2.			2.		
3.			3.		
4.			4.		
Total Dollars Paid: $			**Total Dollars Unpaid: $**		

- If more than one MBE subcontractor is used for this contract, you must use separate **Attachment D-4A** forms. Information regarding payments that the MBE prime will use for purposes of meeting the MBE participation goals must be reported separately in **Attachment D-4B**.
- **Return one copy (hard or electronic) of this form to the following addresses (electronic copy with signature and date is preferred):**

Contract Monitor Name	Contracting Unit
Address	City, State Zip
Email	Phone Number
Signature (Required)	Date

D-4B
Minority Business Enterprise Participation
MBE Prime Contractor Report

MBE Prime Contractor:	Contract #:
Certification Number:	Contracting Unit:
Report #:	Contract Amount:
Reporting Period (Month/Year):	Total Value of the Work to the Self-Performed for purposes of Meeting the MBE participation goal/subgoals:
MBE Prime Contractor: Report is due to the MBE Liaison by the 10th of the month following the month the services were provided. **Note: Please number reports in sequence**	Project Begin Date:
	Project End Date:

Contact Person:			
Address:			
City:		State:	ZIP:
Phone:	FAX:	E-mail:	

Invoice Number	**Value of the Work**	**NAICS Code**	**Description of Specific Products and/or Services**

Return one copy (hard or electronic) of this form to the following addresses (electronic copy with signature and date is preferred):

Contract Monitor Name	Contracting Unit
Address	City, State Zip
Email	Phone Number
Signature (Required)	Date

D-5
Minority Business Enterprise Participation
MBE Subcontractor Paid/Unpaid Invoice Report

Report #:	Contract #:
Reporting Period (Month/Year):	Contracting Unit:
Report is due by the 10th of the month following the month the services were performed.	MBE Subcontract Amt:
	Project Begin Date:
	Project End Date:
	Services Provided:

MBE Subcontractor Name:					
MDOT Certification #:					
Contact Person:					
Address:					
City:			State:		ZIP:
Phone:	FAX:		E-mail:		
Subcontractor Services Provided:					
List all payments received from Prime Contractor during reporting period indicated above.			**List dates and amounts of any unpaid invoices over 30 days old.**		
	Invoice Amount	**Date**		**Invoice Amount**	**Date**
1.			1.		
2.			2.		
3.			3.		
4.			4.		
Total Dollars Paid: $			**Total Dollars Unpaid: $**		
Prime Contractor:			Contract Person:		

Return one copy of this form to the following addresses (electronic copy with signature and date is preferred):

Contract Monitor Name	Contracting Unit
Address	City, State Zip
Email	Phone Number
Signature (Required)	Date