BC CANCER CLINIC, VICTORIA - BMS UPGRADE

2410 LEE AVE, VICTORIA, BC V8R 6V5



MECHANICAL ENGINEERING DRAWINGS

SCOPE OF WORKS

THE INTENT OF THIS PROJECT IS TO REPLACE THE FAILED COMPONENTS OF THE EXISTING LEGACY JOHNSON CONTROLS PROPRIETARY BUILDING AUTOMATION SYSTEM ASSOCIATED WITH THE FAILED NCM-1 SUPERVISORY CONTROLLER, AND TO RESTORE CONTROL, MONITORING, ALARMING AND TRENDING FOR THE AFFECTED SYSTEMS AND ZONES THROUGH A NEW BACNET/IP-BASED CONTROL SYSTEM INTEGRATED WITH THE OWNER'S EXISTING BUILDING MANAGEMENT SYSTEM (SIEMENS).

THE WORK IS LIMITED TO THE AFFECTED CONTROLLERS, EQUIPMENT, DEVICES AND POINTS IDENTIFIED IN THE CONTRACT DOCUMENTS. RETAIN FUNCTIONAL LEGACY JOHNSON CONTROLS SYSTEMS, THE CIRCA-2016 JOHNSON CONTROLS BACNET SYSTEM, NC-2, LEVEL 3 CONTROLS AND OTHER UNAFFECTED SYSTEMS, EXCEPT FOR THE INTERFACES EXPRESSLY IDENTIFIED. NCM-1 IS ALSO IDENTIFIED AS NC-1 IN EXISTING RECORDS.

THE FOLLOWING SCOPE OF WORKS IS RECOMMENDED AS A MINIMUM AND IS NOT LIMITED TO:

1. ALL SYSTEMS INCLUDED IN THE WORK SHALL INCLUDE:
   a. FIRST AND SECOND FLOOR HVAC ZONE CONTROLS ASSOCIATED WITH THE LEGACY JOHNSON CONTROLS SYSTEM.
   b. ASSOCIATED TERMINAL UNIT, PLANT AND EQUIPMENT CONTROL AND MONITORING POINTS IDENTIFIED ON THE DRAWINGS.
   c. MEDICAL GAS SYSTEM ALARM AND MONITORING POINTS.
   d. SIX (6) LINAC CABINETS AND ASSOCIATED BAS MONITORING, ALARM AND STATUS POINTS.
   e. OTHER LEGACY JOHNSON CONTROLS PROPRIETARY POINTS IDENTIFIED ON THE DRAWINGS AND POINTS LISTS.
2. PROVIDE ALL LABOUR, MATERIALS, EQUIPMENT, SOFTWARE, PROGRAMMING AND SERVICES REQUIRED FOR THE COMPLETE BAS CUTOVER, INCLUDING:
   a. REMOVAL OF REDUNDANT LEGACY CONTROLLERS, SUPERVISORY CONTROLLERS, PANELS AND ASSOCIATED COMPONENTS WHERE REQUIRED.
   b. INSTALLATION OF NEW BACNET/IP-COMPATIBLE DDC CONTROLLERS, PANELS AND NETWORK COMPONENTS.
   c. MODIFICATION OR EXTENSION OF CONTROL WIRING, COMMUNICATION CABLING AND BAS NETWORK INFRASTRUCTURE AS REQUIRED.
   d. REPLACEMENT OF ROOM TEMPERATURE, DIFFERENTIAL PRESSURE, STATIC PRESSURE AND OTHER FIELD SENSORS WHERE INDICATED.
   e. REUSE AND RECONNECTION OF EXISTING FIELD DEVICES AND WIRING WHERE CONFIRMED FUNCTIONAL AND COMPATIBLE.
   f. PROGRAMMING OF REQUIRED SEQUENCES, GRAPHICS, ALARMS, TRENDS, SCHEDULES AND OPERATOR COMMANDS.
2. PROVIDE BAS INTERFACE FOR THE EXISTING MEDICAL GAS ALARM AND MONITORING POINTS IDENTIFIED ON THE CONTRACT DOCUMENTS. EXISTING MEDICAL GAS SAFETY AND PRIMARY ALARM FUNCTIONS SHALL REMAIN INDEPENDENT OF THE BAS UNLESS SPECIFICALLY NOTED OTHERWISE.
3. PROVIDE BAS INTERFACE FOR THE SIX (6) EXISTING LINAC CABINETS, INCLUDING MONITORING, STATUS, ALARMING AND TRENDING OF THE POINTS IDENTIFIED ON THE CONTRACT DOCUMENTS. EXISTING LINAC SAFETIES AND LOCAL CONTROL FUNCTIONS SHALL REMAIN INDEPENDENT OF THE BAS UNLESS SPECIFICALLY NOTED OTHERWISE.
4. PROVIDE BAS MONITORING AND ALARM ANNUNCIATION FOR THE EXISTING GENERATOR ALARM POINTS ASSOCIATED WITH THE AFFECTED SYSTEM. VERIFY THE EXISTING ALARM CONTACTS, POINT DEFINITIONS, CONTROLLER CONNECTIONS AND NOTIFICATION ROUTING BEFORE CUTOVER. RETAIN INDEPENDENT GENERATOR CONTROLS, SAFETIES AND LOCAL ALARMS.
5. VERIFY EXISTING CONTROLLER LOCATIONS, BAS POINTS, FIELD DEVICES, WIRING, NETWORK CONNECTIONS AND EQUIPMENT INTERFACES PRIOR TO COMMENCING WORK. REPORT DISCREPANCIES TO THE CONSULTANT PRIOR TO PROCEEDING.
6. TEST ALL EXISTING FIELD DEVICES AND WIRING INTENDED FOR REUSE. REPORT FAILED, DAMAGED OR INCOMPATIBLE DEVICES PRIOR TO REPLACEMENT.
7. PRIOR TO CUTOVER, VERIFY THE EXISTING POINTS, SEQUENCES, SETPOINTS, ALARMS AND SYSTEM OPERATION. FOLLOWING CUTOVER, RESTORE EACH AFFECTED SYSTEM TO AUTOMATIC OPERATION IN ACCORDANCE WITH THE DESIGN INTENT.
8. PROVIDE COMPLETE INTEGRATION OF ALL NEW AND MIGRATED POINTS INTO THE OWNER'S EXISTING BMS, INCLUDING APPLICABLE GRAPHICS, STATUS, VALUES, SETPOINTS, COMMANDS, ALARMS, TRENDS AND SCHEDULES.
9. THE BUILDING WILL REMAIN OCCUPIED DURING CONSTRUCTION. COORDINATE ALL SHUTDOWNS AND CUTOVERS WITH THE OWNER. SHUTDOWNS AFFECTING CLINICAL, PHARMACY, MEDICAL GAS, LINAC OR OTHER CRITICAL SYSTEMS SHALL NOT PROCEED WITHOUT OWNER APPROVAL.
10. MAINTAIN EXISTING HVAC AND CRITICAL ENVIRONMENTAL CONTROL DURING CONSTRUCTION TO THE GREATEST EXTENT PRACTICABLE. PROVIDE TEMPORARY CONTROL OR MONITORING WHERE REQUIRED BY THE CONTRACT DOCUMENTS OR APPROVED CUTOVER PLAN.
11. SUBMIT A CUTOVER AND SHUTDOWN PLAN FOR OWNER REVIEW PRIOR TO COMMENCING WORK ON AFFECTED SYSTEMS.
12. PROVIDE COMPLETE POINT-TO-POINT VERIFICATION AND FUNCTIONAL TESTING OF ALL NEW AND MODIFIED BAS POINTS, INCLUDING ASSOCIATED SAFETIES, INTERLOCKS, ALARMS, COMMANDS, SETPOINTS AND CONTROL SEQUENCES. CORRECT ALL DEFICIENCIES PRIOR TO SYSTEM ACCEPTANCE.
13. MAKE GOOD ALL BUILDING FINISHES AND PENETRATIONS DISTURBED BY THE WORK AND PROVIDE FIRESTOPPING AND SMOKE SEALS AT FIRE-RATED ASSEMBLIES AS REQUIRED.
14. PROVIDE FINAL RECORD DOCUMENTATION INCLUDING UPDATED BAS NETWORK ARCHITECTURE, CONTROL SCHEMATICS, CONTROLLER SCHEDULES, POINTS LISTS, SEQUENCES OF OPERATION, AS-BUILT DRAWINGS, SOFTWARE AND DATABASE BACKUPS, O&M INFORMATION AND OWNER TRAINING.
15. PROVIDE A ONE-YEAR COMPREHENSIVE WARRANTY AND A SEPARATE FIVE-YEAR SERVICE AND SUPPORT PERIOD FROM THE SAME ACCEPTANCE DATE. INCLUDE ANNUAL ON-SITE INSPECTIONS AND YEAR-ROUND 24/7 EMERGENCY SERVICE. REFER TO THE WARRANTY AND SERVICE NOTES AND SECTION 25 05 00.

PROJECT NOTES

GENERAL NOTES:

1. THE MECHANICAL SYSTEM SHALL CONSIST OF ALL WORK SHOWN ON DRAWINGS, DIAGRAMS, AND AS DESCRIBED IN SPECIFICATIONS. DRAWINGS ARE GENERALLY DIAGRAMMATIC AND INTENDED TO INDICATE THE SCOPE AND GENERAL ARRANGEMENT OF WORK AND ARE NOT DETAILED INSTALLATION INSTRUCTIONS.
2. ITEMS NOTED "TYPICAL" OR "TYP" ON ANY SHEET APPLY TO THAT PARTICULAR SHEET
3. COORDINATE WITH SPECIFICATIONS. IN CASE OF CONFLICT BETWEEN SPECIFICATIONS AND DRAWINGS THE MORE STRINGENT SHALL APPLY.
4. VERIFY EXISTING CONDITIONS BEFORE COMMENCING ANY WORK ON A PREVIOUSLY INSTALLED EXISTING MECHANICAL SYSTEM.
5. THE MECHANICAL CONTRACTOR SHALL ACT AS THE GENERAL CONTRACTOR AND SHALL INCLUDE ALL SUB TRADES AND WORK TO FACILITATE THE INSTALLATION OF THE SYSTEM INCLUDING BUT NOT LIMITED TO ELECTRICAL CONTRACTOR, PLUMBING CONTRACTOR AND SEISMIC CONTRACTOR. REFER TO RFP FOR DETAILS.
6. NO CORING ON EXISTING STRUCTURES SHALL COMMENCE UNTIL THE AREA IS SCANNED AND THE PROJECT MANAGER HAS APPROVED SCAN REPORT.
7. THE USE OF PLASTIC ANCHORS IS PROHIBITED
8. DO NOT SCALE THE DRAWINGS. OBTAIN ACCURATE MEASUREMENTS FROM SITE.
9. REFER TO THE ACOUSTICAL ENGINEER'S DRAWINGS & SPECIFICATIONS FOR ALL REQUIREMENTS RELATED TO NOISE DAMPENING, SOUND ATTENUATION, & ACOUSTICAL ENCLOSURES. ENSURE ALL MECHANICAL EQUIPMENT & INSTALLATIONS COMPLY WITH THE ACOUSTICAL DESIGN CRITERIA OUTLINED IN BCBC & LOCAL JURISDICTION BYLAWS.
10. THE CONTRACTOR SHALL ALLOW FOR ALL AND ANY PIPING, VENTING OFFSETS REQUIRED TO AVOID THE EXISTING STRUCTURE, MECHANICAL OR ELECTRICAL INSTALLATIONS.
11. VISIT AND INSPECT THE SITE AND REVIEW ALL CORRESPONDING DRAWINGS. NO ALLOWANCE WILL BE MADE FOR FAILURE TO DO SO.
12. REFER TO THE BUILDING ENVELOPE CONSULTANT FOR ALL PENETRATION DETAILS. ENSURE ALL OPENINGS THROUGH THE BUILDING ENVELOPE ARE COORDINATED & SEALED IN ACCORDANCE WITH BCBC & LOCAL JURISDICTION BYLAW REQUIREMENTS.
13. BE RESPONSIBLE FOR CARE OF THE BUILDING. PERFORM ALL CUTTING, PATCHING, PAINTING AND REPAIRING REQUIRED FOR THE WORK OF THIS TRADE. WORKS TO BE PERFORMED BY THE GENERAL CONTRACTOR'S FORCES AT THE MECHANICAL CONTRACTOR'S EXPENSE.
14. CLEAN ALL DEBRIS DAILY AND UPON COMPLETION OF CONTRACT.
15. COORDINATE WORK WITH ALL OTHER TRADES. PATCH AND SEAL ALL FLOOR AND WALL PENETRATIONS WITH FIRE RESISTANT INSULATION AND MASTIC.
16. ONE SET OF OWNER'S APPROVED DRAWINGS AND PERMIT DRAWINGS SHALL BE KEPT ON THE SITE AND AVAILABLE FOR CHECKING AT ALL TIMES DURING CONSTRUCTION.
17. ALL MATERIALS TO MEET FLAME SPREAD RATING REQUIREMENTS OF THE AUTHORITIES HAVING JURISDICTION.
18. OBTAIN ALL PERMITS REQUIRED. ARRANGE FOR INSPECTION OF THE WORK BY THE INSPECTION AUTHORITY AND PAY FULL FEES. PROVIDE FINAL CERTIFICATE TO THE OWNER.
19. MECHANICAL CONTRACTOR SHALL COMPLY WITH ALL THE RULES AND REGULATIONS SET FORTH BY THE OWNER.
20. IDENTIFY ALL EQUIPMENT WITH LAMICOID PLATES.
21. ANY WORK NOT SHOWN ON THE DRAWINGS OR SPECIFICALLY MENTIONED IN THE SPECIFICATIONS AND CONSIDERED NECESSARY FOR THE COMPLETION OF THE WORK IN PROPER MANNER SHALL BE PROVIDED BY THIS CONTRACTOR WITHOUT ADDITIONAL CHARGE.
22. NOTHING CONTAINED HEREIN SHALL BE CONSTRUED TO RELIEVE THIS CONTRACTOR FROM MAKING GOOD AND PERFECT IN ALL USUAL DETAILS OF CONSTRUCTION AND HE WILL BE HELD RESPONSIBLE TO PROVIDE AND FURNISH MATERIAL TO DO ALL THE WORK AND LABOR AND BEAR EXPENSES INCIDENTAL TO THE SATISFACTORY COMPLETION OF THE WORK EMBRACED IN THESE SPECIFICATIONS.
23. MECHANICAL CONTRACTOR SHALL VERIFY AND CONFIRM EXACT LOCATION OF ALL THE EXISTING SERVICES AND EQUIPMENT ON SITE.
24. COMPLETE MECHANICAL INSTALLATION SHALL BE PERFORMED IN ACCORDANCE WITH ALL APPLICABLE CODES, BY-LAWS, AND AUTHORITIES HAVING JURISDICTION.
25. ALL WORK SHALL CONFORM TO ASHRAE 90.1 LATEST EDITION.
26. SEISMIC RESTRAINTS FOR ALL EQUIPMENT AND PIPING COVERED UNDER DIVISION 15. SEISMIC ENGINEER SHALL BE RETAINED UNDER THE CONTRACTOR'S SCOPE OF WORK TO ENSURE SEISMIC INSTALLATIONS ARE APPROVED BY A CERTIFIED SEISMIC ENGINEER.
27. WHERE PIPES PENETRATE HORIZONTAL OR VERTICAL FIRE PARTITIONS, FIRE WALLS, RATED FLOOR ASSEMBLIES OR SMOKE PARTITIONS, INSTALL A ULC LISTED FIRE STOP SYSTEMS MUST PROVIDE AN EFFECTIVE BARRIER AGAINST THE SPREAD OF FIRE, SMOKE AND GASES. THEY MUST BE INSTALLED AS PER MANUFACTURER'S INSTRUCTIONS AND DETAILS.
28. FIRE STOP SYSTEMS ARE TO MEET THE REQUIREMENTS OF THE AUTHORITY HAVING JURISDICTION.
29. SHOP DRAWINGS TO BE SUBMITTED 7 DAYS AFTER AWARD OF CONTRACT.
30. PURCHASE ORDER SHALL BE EXECUTED NO MORE THAN 2 DAYS AFTER RECEIPT OF ENGINEERS APPROVAL.
31. ALTERNATIVE EQUIPMENT MAY BE SUBMITTED IN ACCORDANCE WITH THE RFP DOCUMENTS, A MINIMUM OF 5 BUSINESS DAYS BEFORE SUBMISSION OF ENQUIRES DEADLINE.

MECHANICAL/PLUMBING NOTES:

1. INSTALL ALL MECHANICAL WORK AS HIGH AS POSSIBLE, TIGHT TO STRUCTURE ABOVE, EXCEPT WHERE CONFLICT OCCURS WITH REQUIREMENTS LISTED UNDER SPECIFICATION (VIBRATION ISOLATION).
2. THE MECHANICAL PLANS ARE DIAGRAMMATIC IN NATURE AND DO NOT ATTEMPT TO SHOW ALL REQUIRED OFFSETS.
3. COORDINATE ALL MECHANICAL WORK WITH THAT OF OTHER TRADES TO ENSURE PROPER AND ADEQUATE INTERFACE OF THEIR WORK WITH THE WORK OF THIS CONTRACTOR. PROVIDE COORDINATED SHOP DRAWINGS PRIOR TO FABRICATION AND INSTALLATION.
4. COORDINATE EXACT LOCATIONS OF ALL TEMPERATURE SENSORS WITH CLIENT PRIOR TO INSTALLATION.
5. THE MECHANICAL CONTRACTOR SHALL INCLUDE FOR ALL PERMITS AS REQUIRED BY THE LOCAL AUTHORITY.
6. BEFORE FABRICATION AND INSTALLATION OF DUCTWORK AND PIPING, MAKE CERTAIN THAT SUCH ITEMS CAN BE INSTALLED AS SHOWN ON THE DRAWINGS WITHOUT INTERFERENCE WITH THE STRUCTURE OR THE WORK OF OTHER TRADES. IF ANY MATERIALS ARE FABRICATED OR INSTALLED PRIOR TO THE INVESTIGATION AND REACHING OF A SOLUTION TO POSSIBLE INTERFERENCE PROBLEMS, NECESSARY CHANGES SHALL BE MADE AT THE CONTRACTOR'S EXPENSE.
7. NOTE THE REMOVAL OF MECHANICAL WORK IS NOT SHOWN ON PLANS. CONTRACTOR SHALL VISIT THE SITE AND CONFIRM ALL OF THE EXISTING MECHANICAL ITEMS TO BE REMOVED AND THE REMOVAL WORK SHALL BE INCLUDED IN THE TENDER PRICING. PROTECT FINISHED OR UNFINISHED WORK AND OPERATING WORK AREAS BY TARPAULINS OR OTHER COVERING FROM DAMAGE DUE TO EXECUTION OF WORK. REPAIR DAMAGE TO BUILDING RESULTING FROM MECHANICAL WORK TO THE SATISFACTION OF CONSULTANTS AT NO EXPENSE TO THE OWNER.
8. SHUT-DOWNS OF EXISTING SYSTEMS REQUIRED FOR THIS INSTALLATION SHALL BE FULLY COORDINATE WITH THE BUILDING MANAGEMENT AND THIS WORK PERFORMED AS DIRECTED IN WRITING BY THE BUILDING MANAGEMENT. CONNECTION TO EXISTING SERVICES SHALL BE PERFORMED DURING OFF-WORK HOURS OR ON WEEKEND IN PREMIUM TIME.

ELECTRICAL NOTES:

1. PROVIDE NEC CODE MINIMUM HORIZONTAL AND VERTICAL WORKING CLEARANCE FOR ALL ELECTRICAL PANELS AND EQUIPMENT. OFFSET MECHANICAL WORK AS REQUIRED.
2. VERIFY VOLTAGE ON SITE BEFORE ORDERING EQUIPMENT.

WARRANTY AND SERVICE NOTES

1. PROVIDE A ONE-YEAR COMPREHENSIVE WARRANTY FROM ACCEPTANCE FOR NEW EQUIPMENT, WIRING, SOFTWARE, PROGRAMMING, GRAPHICS, INTEGRATION AND WORK UNDER THIS CONTRACT. INCLUDE PARTS, LABOUR, TRAVEL, TROUBLESHOOTING, DEFECT CORRECTION AND RETESTING. PASS THROUGH LONGER MANUFACTURER WARRANTIES WHERE SUPPLIED.
2. THE WARRANTY APPLIES TO THE DELIVERED WORK AND ITS MODIFICATIONS AND INTERFACES. IT DOES NOT EXTEND TO UNRELATED EXISTING EQUIPMENT. PROVIDE A SEPARATE FIVE-YEAR SERVICE AND SUPPORT PERIOD STARTING ON THE SAME ACCEPTANCE DATE; THIS SERVICE PERIOD DOES NOT EXTEND THE COMPREHENSIVE WARRANTY.
3. INCLUDE AT LEAST ONE SCHEDULED ON-SITE INSPECTION IN EACH SERVICE YEAR, WITH A MINIMUM OF FIVE INSPECTIONS. INCLUDE LABOUR, TRAVEL AND REPORTING. REVIEW CONTROLLER AND NETWORK HEALTH, ALARMS, TRENDS, SCHEDULES, BACKUPS AND SOFTWARE/SUPPORT STATUS AS REQUIRED BY SECTION 25 05 00. REPORT DEFECTS AND RECOMMENDED CORRECTIVE WORK TO THE OWNER.
4. PROVIDE EMERGENCY SERVICE 24 HOURS PER DAY, SEVEN DAYS PER WEEK, YEAR ROUND, INCLUDING WEEKENDS AND STATUTORY HOLIDAYS, THROUGHOUT THE FIVE-YEAR SERVICE PERIOD.
5. A QUALIFIED TECHNICIAN SHALL RESPOND WITHIN 30 MINUTES BY CALLBACK OR PHSA-APPROVED REMOTE BAS/DOC ACCESS. WHEN THE OWNER REQUESTS ON-SITE EMERGENCY TECHNICAL SUPPORT, ATTEND SITE WITHIN 60 MINUTES. MEASURE BOTH PERIODS FROM RECEIPT OF THE REQUEST AT THE DESIGNATED 24/7 CONTACT. REMOTE RESPONSE DOES NOT RESTART THE ATTENDANCE PERIOD. THESE ARE RESPONSE AND ATTENDANCE TIMES, NOT REPAIR-COMPLETION TIMES.
6. INCLUDE THE FIVE-YEAR FIXED SERVICE FEES IN THE CONTRACT PRICE AND ITEMIZE EACH YEAR IN THE TENDER PRICING SUBMISSION, IDENTIFYING OVERLAP WITH THE FIRST-YEAR WARRANTY. INCLUDE INSPECTIONS, 24/7 AVAILABILITY, EMERGENCY CALLBACK/REMOTE RESPONSE, REQUESTED INITIAL EMERGENCY ATTENDANCE, FAULT-DIAGNOSIS LABOUR, ASSOCIATED TRAVEL AND REPORTS. DO NOT CHARGE THESE INCLUDED SERVICES AGAIN AS REPAIR WORK.
7. INCLUDE REQUIRED LICENCE/SUPPORT RENEWALS AND CORRECTIVE SOFTWARE, FIRMWARE AND SECURITY UPDATES FOR THE DELIVERED WORK THROUGHOUT THE FIVE-YEAR SERVICE PERIOD. INCLUDE LABOUR TO APPLY APPROVED CORRECTIVE UPDATES. COORDINATE WITH OWNER IT/FMO, BACK UP CONFIGURATIONS, VERIFY COMPATIBILITY, TEST AFFECTED FUNCTIONS AND UPDATE RECORDS. DISCLOSE EXISTING-PLATFORM SUPPORT OR UPGRADE COSTS REQUIRED SPECIFICALLY FOR THIS WORK.
8. SUBMIT NON-WARRANTY REPAIR RATES FOR EACH SERVICE YEAR, INCLUDING REGULAR/OVERTIME LABOUR, SUBSEQUENT TRAVEL/CALLOUT CHARGES AND PARTS PRICING OR MARKUPS. AFTER THE ONE-YEAR WARRANTY, HARDWARE PARTS AND SUBSEQUENT REPAIR LABOUR ARE PAYABLE ONLY WHEN OUTSIDE ANY CONTINUING MANUFACTURER WARRANTY AND AUTHORIZED BY THE OWNER AT TENDERED RATES. SUBMIT THE DIAGNOSIS AND QUOTATION BEFORE REPAIR.
9. PROVIDE A NAMED SERVICE LEAD AND ALTERNATE, 24/7 CONTACT, ESCALATION ROUTE, INSPECTION SCHEDULE AND SERVICE RECORDS. DISCLOSE OPTIONAL AND POST-SERVICE-TERM COSTS SEPARATELY. OWNER ACCESS, DELIVERED SOURCE FILES, CREDENTIALS AND TOOLS SHALL NOT BE WITHHELD OR REVOKED AT SERVICE EXPIRY. NO OPTIONAL AGREEMENT OR ADDITIONAL ANNUAL FEE MAY BE A CONDITION OF THE INCLUDED OBLIGATIONS.

INFECTION PREVENTION AND CONTROL

1. PERFORM WORK IN ACCORDANCE WITH SECTION 01 35 13, CSA Z317.13:22 AND THE OWNER'S APPLICABLE INFECTION PREVENTION AND CONTROL PROCEDURES.
2. BEFORE ACCESS OR DISTURBANCE, SUBMIT A SITE-SPECIFIC WORK PLAN IDENTIFYING CLINICAL AND SUPPORT AREAS, WORK METHODS, ACCESS ROUTES, DATES, SHUTDOWNS, POTENTIAL IMPACTS, MITIGATION AND COMMUNICATIONS. COMPLETE THE OWNER'S PMA/ICRA PROCESS AND OBTAIN REQUIRED AUTHORIZATIONS.
3. COORDINATE THE PLAN THROUGH THE OWNER'S MULTIDISCIPLINARY REVIEW PROCESS, INCLUDING ISLAND HEALTH FMO, IPAC, CLINICAL OPERATIONS, CENTRE SERVICES AND OTHER AFFECTED STAKEHOLDERS.
4. PROVIDE WORKERS WITH THE INFECTION CONTROL TRAINING REQUIRED BY THE SPECIFICATIONS AND OWNER PROCEDURES. COMPLETE REQUIRED CEILING-ACCESS PERMITS, RISK ASSESSMENTS AND PROTECTIVE MEASURES BEFORE OPENING CEILINGS OR PULLING CABLES.
5. INSTALL AND MAINTAIN THE CONTAINMENT, DUST CONTROL, HVAC PROTECTION, ACCESS AND WASTE-HANDLING MEASURES ESTABLISHED BY THE APPROVED IPAC PLAN. PROTECT OCCUPIED SPACES AND CLEAN TOOLS/EQUIPMENT IN ACCORDANCE WITH THE APPENDED OWNER PROCEDURES.
6. OBTAIN OWNER AUTHORIZATION FOR EACH SHUTDOWN/CUTOVER. IDENTIFY TEMPORARY CONTROL OR MONITORING, NOTIFICATION, RECOVERY AND ROLLBACK ARRANGEMENTS. DO NOT DISABLE CLINICAL OR CRITICAL-SYSTEM PROTECTION TO FACILITATE THE WORK.
7. IF CONDITIONS, WORK METHODS OR AFFECTED AREAS CHANGE, STOP THE AFFECTED WORK, MAKE THE AREA SAFE AND NOTIFY THE OWNER. OBTAIN REVIEW OF THE REVISED RISK ASSESSMENT AND PROTECTIVE MEASURES BEFORE RECOMMENCING.
8. THE CONTRACTOR SHALL PERFORM DAILY AND FINAL CONSTRUCTION CLEANING AND REMOVE DEBRIS. THE OWNER'S TEAM SHALL PERFORM TERMINAL CLEANING. COORDINATE COMPLETION AND ACCESS WITH THE OWNER; CONSTRUCTION CLEANING DOES NOT REPLACE TERMINAL CLEANING.
9. RESTORE AND VERIFY AFFECTED HVAC, ALARMS AND ENVIRONMENTAL CONTROLS BEFORE REQUESTING RETURN TO SERVICE. MAINTAIN PROTECTION UNTIL THE OWNER AUTHORIZES ITS REMOVAL. CLINICAL REOCCUPANCY/RETURN TO SERVICE REQUIRES OWNER AUTHORIZATION UNDER THE APPROVED PLAN.

MECHANICAL LEGEND

X-X	EQUIPMENT / FIXTURE TYPE
X-X X-X	VAV TAG REFERENCE DETAIL

ABBREVIATIONS

T/A	TO ABOVE
T/B	TO BELOW
F/A	FROM ABOVE
F/B	FROM BELOW

CIVIC ADDRESS

2410 LEE AVE
VICTORIA,
BRITISH COLUMBIA
V8R 6V5

DRAWING LIST

DWG. NO	DESCRIPTION	SCALE
M0.1	COVER PAGE, PROJECT NOTES & MECHANICAL LEGEND	NONE
M2.1	EXISTING LEVEL 1 NORTH FLOOR PLAN - MECHANICAL - DEMOLITION	AS NOTED
M2.2	EXISTING LEVEL 1 SOUTH FLOOR PLAN - MECHANICAL - DEMOLITION	AS NOTED
M2.3	EXISTING LEVEL 2 NORTH FLOOR PLAN - MECHANICAL - DEMOLITION	AS NOTED
M2.4	EXISTING LEVEL 2 SOUTH FLOOR PLAN - MECHANICAL - DEMOLITION	AS NOTED
M3.1	MECHANICAL POINTS LIST - 1 OF 4	NONE
M3.2	MECHANICAL POINTS LIST - 2 OF 4	NONE
M3.3	MECHANICAL POINTS LIST - 3 OF 4	NONE
M3.4	MECHANICAL POINTS LIST - 4 OF 4	NONE

COVER PAGE, PROJECT NOTES & MECHANICAL LEGEND

SCALE: NONE

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#	REVISIONS	(YR/M/D)
2	ISSUED FOR TENDER	26/10/30
1	ISSUED FOR REVIEW	26/10/08

ISSUED FOR TENDER

Project

BC CANCER CLINIC, VICTORIA - BMS UPGRADE

2410 LEE AVE, VICTORIA, BC V8R 6V5

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BUILDING ENERGY SOLUTIONS
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Title

COVER PAGE, PROJECT NOTES & MECHANICAL LEGEND

Scale: AS NOTED
Drawn By: BM
Reviewed by: MM
Approved by: SM
Project No. 26-B374

Seal

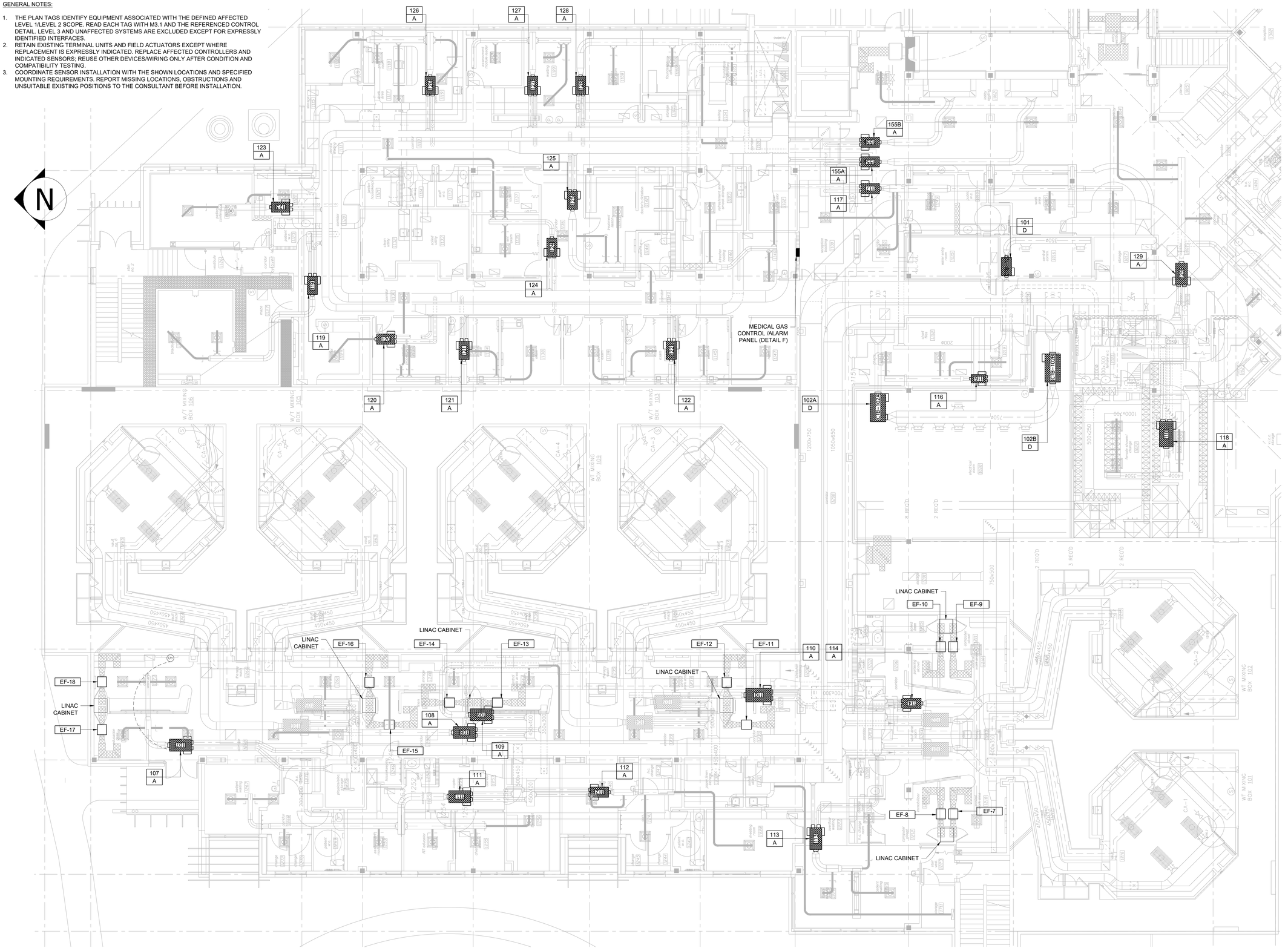
Drawing No.

M0.1

Latest Revision No. 2

GENERAL NOTES:

1. THE PLAN TAGS IDENTIFY EQUIPMENT ASSOCIATED WITH THE DEFINED AFFECTED LEVEL 1/LEVEL 2 SCOPE. READ EACH TAG WITH M3.1 AND THE REFERENCED CONTROL DETAIL. LEVEL 3 AND UNAFFECTED SYSTEMS ARE EXCLUDED EXCEPT FOR EXPRESSLY IDENTIFIED INTERFACES.
2. RETAIN EXISTING TERMINAL UNITS AND FIELD ACTUATORS EXCEPT WHERE REPLACEMENT IS EXPRESSLY INDICATED. REPLACE AFFECTED CONTROLLERS AND INDICATED SENSORS; REUSE OTHER DEVICES/WIRING ONLY AFTER CONDITION AND COMPATIBILITY TESTING.
3. COORDINATE SENSOR INSTALLATION WITH THE SHOWN LOCATIONS AND SPECIFIED MOUNTING REQUIREMENTS. REPORT MISSING LOCATIONS, OBSTRUCTIONS AND UNSUITABLE EXISTING POSITIONS TO THE CONSULTANT BEFORE INSTALLATION.



EXISTING LEVEL 1 NORTH FLOOR PLAN - MECHANICAL

SCALE: 1/8" = 1'-0"

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EXISTING LEVEL 1 NORTH FLOOR PLAN - MECHANICAL

Scale: AS NOTED
Drawn By: BM
Reviewed by: MM
Approved by: SM
Project No. 26-B374

Seal

Drawing No.

M2.1

Latest Revision No. 2

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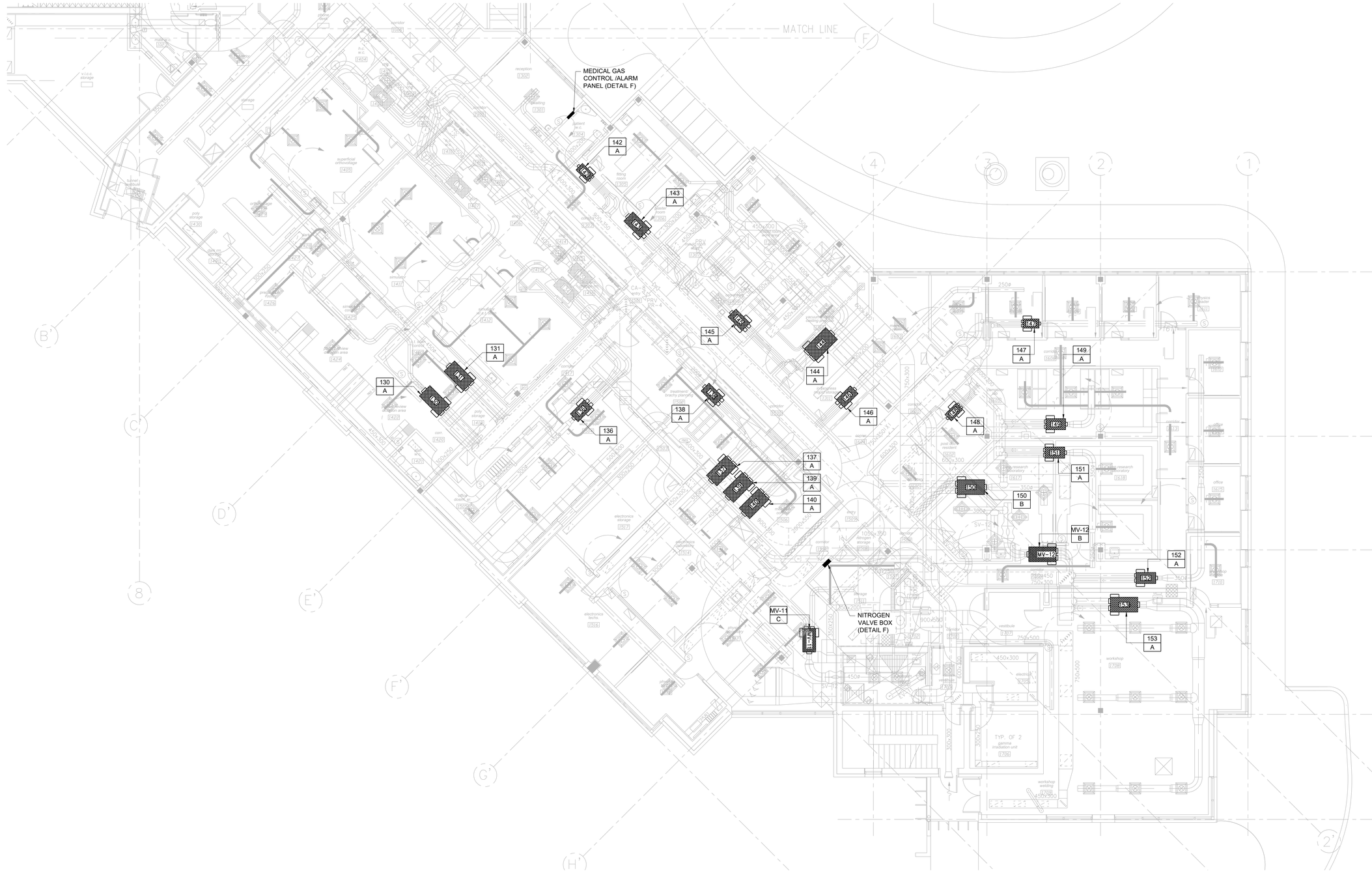
3. COORDINATE SENSOR INSTALLATION WITH THE SHOWN LOCATIONS AND SPECIFIED MOUNTING REQUIREMENTS. REPORT MISSING LOCATIONS, OBSTRUCTIONS AND UNSUITABLE EXISTING POSITIONS TO THE CONSULTANT BEFORE INSTALLATION.



EXISTING LEVEL 1 SOUTH FLOOR PLAN - MECHANICAL

SCALE: 1/8" = 1'-0"

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#	REVISIONS	(YR/M/D)
2	ISSUED FOR TENDER	26/10/30
1	ISSUED FOR REVIEW	26/10/08

ISSUED FOR TENDER

Project

BC CANCER CLINIC, VICTORIA - BMS UPGRADE

2410 LEE AVE, VICTORIA, BC V8R 6V5

BES
MECHANICAL & ELECTRICAL ENGINEERS
BUILDING ENERGY SOLUTIONS
SUITE 206 - 338 WEST 8TH AVENUE
VANCOUVER, BC, CANADA, V5Y 3X2
Tel: 1.604.872.0122

Title

EXISTING LEVEL 1 SOUTH FLOOR PLAN - MECHANICAL

Scale: AS NOTED
Drawn By: BM
Reviewed by: MM
Approved by: SM
Project No. 26-B374

Seal

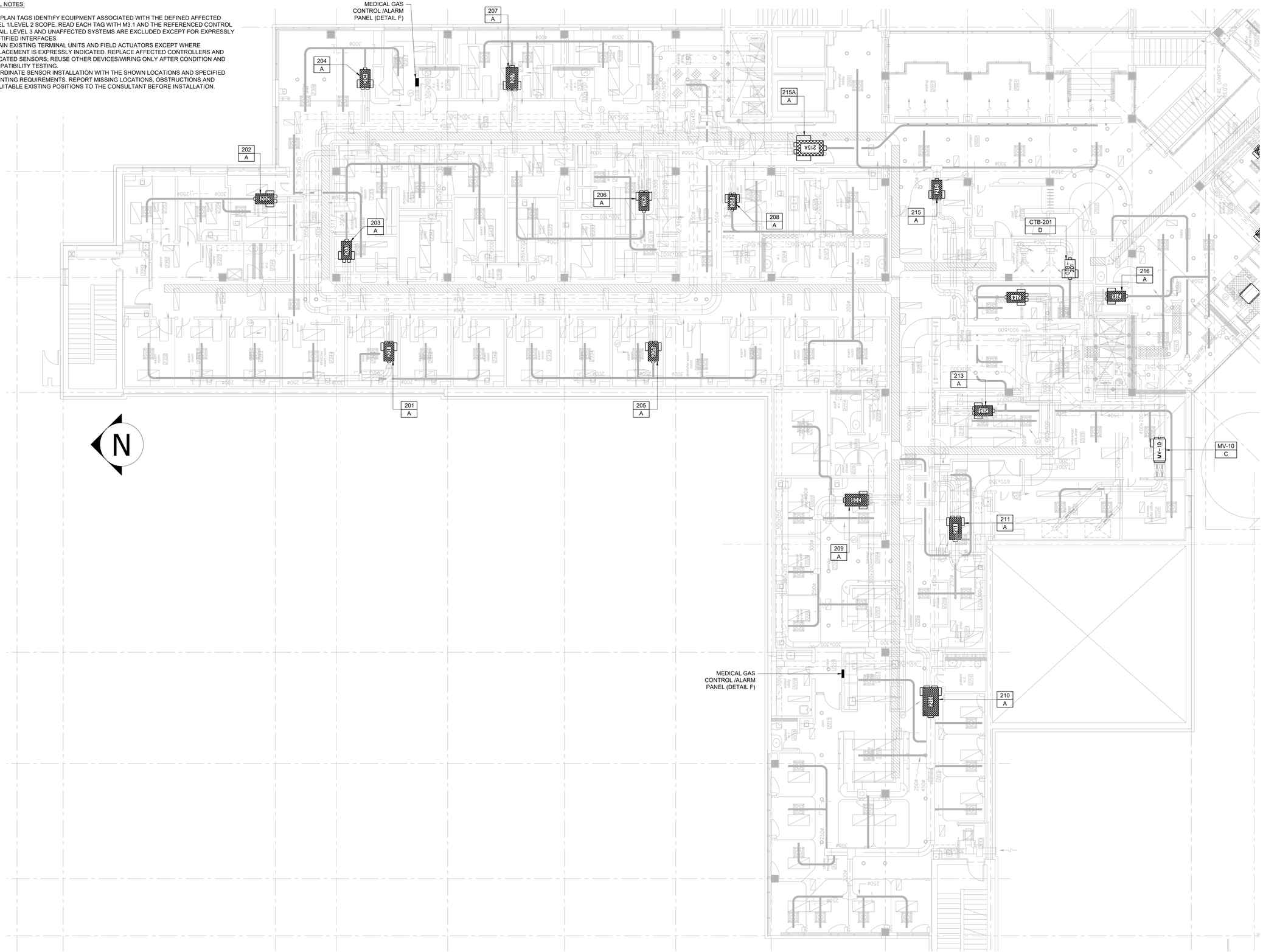
Drawing No.

M2.2

Latest Revision No. 2

GENERAL NOTES:

1. THE PLAN TAGS IDENTIFY EQUIPMENT ASSOCIATED WITH THE DEFINED AFFECTED LEVEL 1/LEVEL 2 SCOPE. READ EACH TAG WITH M3.1 AND THE REFERENCED CONTROL DETAIL. LEVEL 3 AND UNAFFECTED SYSTEMS ARE EXCLUDED EXCEPT FOR EXPRESSLY IDENTIFIED INTERFACES.
2. RETAIN EXISTING TERMINAL UNITS AND FIELD ACTUATORS EXCEPT WHERE REPLACEMENT IS EXPRESSLY INDICATED. REPLACE AFFECTED CONTROLLERS AND INDICATED SENSORS; REUSE OTHER DEVICES/WIRING ONLY AFTER CONDITION AND COMPATIBILITY TESTING.
3. COORDINATE SENSOR INSTALLATION WITH THE SHOWN LOCATIONS AND SPECIFIED MOUNTING REQUIREMENTS. REPORT MISSING LOCATIONS, OBSTRUCTIONS AND UNSUITABLE EXISTING POSITIONS TO THE CONSULTANT BEFORE INSTALLATION.



EXISTING LEVEL 2 NORTH FLOOR PLAN - MECHANICAL

SCALE: 1/8" = 1'-0"

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EXISTING LEVEL 2 NORTH FLOOR PLAN - MECHANICAL

Scale: AS NOTED
Drawn By: BM
Reviewed by: MM
Approved by: SM
Project No. 26-B374

Seal

Drawing No.

M2.3

Latest Revision No. 2

GENERAL NOTES:

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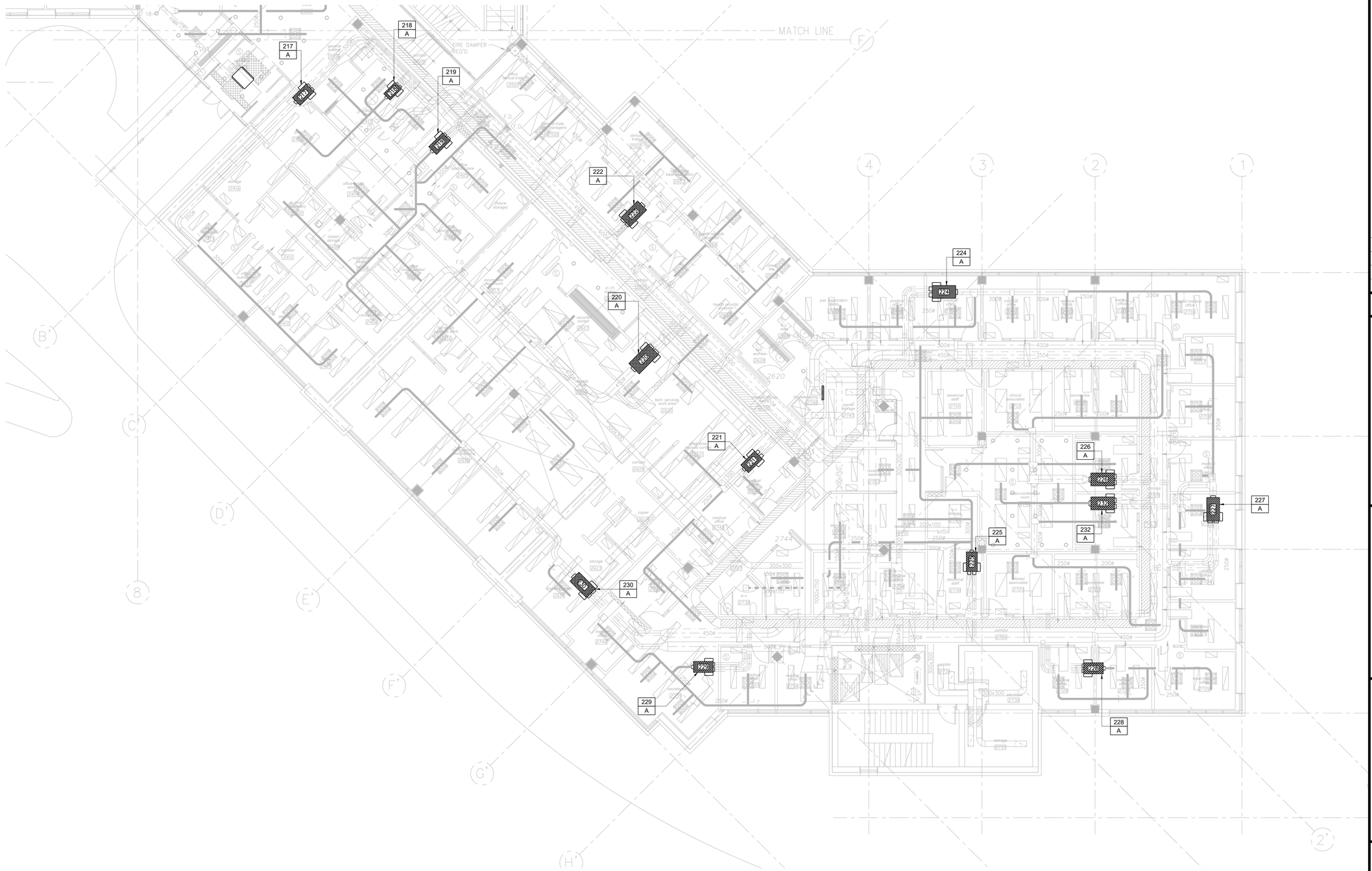

EXISTING LEVEL 2 SOUTH FLOOR PLAN - MECHANICAL

SCALE: 1/8" = 1'-0"

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EXISTING LEVEL 2 SOUTH FLOOR PLAN - MECHANICAL

Scale: AS NOTED
Drawn By: BM
Reviewed by: MM
Approved by: SM
Project No.: 26-B374

Seal

Drawing No.

M2.4

Latest Revision No. 2

VAV Schedule - Points List Summary

Floor	No.	Box ID	Name	Control Detail	Point Summary											Comments
1 North					AI	AO	BI	BO	AV	BV	Loop	Sched	Trend	Alarm	Graphic	
1	1273	DD-107	Control Work Area	A	4	0	0	4	8	7	4	2	12	5	23	
1	1261	DD-108	Control Work Area	A	4	0	0	4	8	7	4	2	12	5	23	
1	1247	DD-109	Control Work Area	A	4	0	0	4	8	7	4	2	12	5	23	
1	1234	DD-110	Control Work Area	A	4	0	0	4	8	7	4	2	12	5	23	
1	1256	DD-111	Senior Terapist	A	4	0	0	4	8	7	4	2	12	5	23	
1	1228	DD-112	Meeting Room	A	5	0	0	4	8	7	4	2	12	5	23	cold deck static press sensor #1
1	1226	DD-113	Family Waiting	A	5	0	0	4	8	7	4	2	12	5	23	hot deck static press sensor #1
1	1210	DD-114	Control Work Area	A	4	0	0	4	8	7	4	2	12	5	23	
1	1251	DD-116	Corridor	A	4	0	0	4	8	7	4	2	12	5	23	
1	1100	DD-117	Reception Booking	A	4	0	0	4	8	7	4	2	12	5	23	
1	1022	DD-118	Female Shower / Change	A	4	0	0	4	8	7	4	2	12	5	23	medical gas panel 1 alarms
1	1127	DD-119	Maze	A	4	0	0	4	8	7	4	2	12	5	23	
1	1129	DD-120	Control Room	A	4	0	0	4	8	7	4	2	12	5	23	Critical Zone
1	1134	DD-121	Exam	A	4	0	0	4	8	7	4	2	12	5	23	
1	1143	DD-122	Exam	A	4	0	0	4	8	7	4	2	12	5	23	
1	1125	DD-123	Patient Conference	A	4	0	0	4	8	7	4	2	12	5	23	
1	1135	DD-124	Ent Exam	A	4	0	0	4	8	7	4	2	12	5	23	
1	1141	DD-125	Treatment	A	4	0	0	4	8	7	4	2	12	5	23	
1	1116	DD-126	Office	A	4	0	0	4	8	7	4	2	12	5	23	
1	1112	DD-127	Assessment Module	A	4	0	0	4	8	7	4	2	12	5	23	
1	1108	DD-128	Project Work Room	A	5	0	0	4	8	7	4	2	12	5	23	cold deck static press sensor #2
1	1027	DD-129	Phone Desk	A	5	0	0	4	8	7	4	2	12	5	23	hot deck static press sensor #2
1	1002	DD-155a	Lobby Seating	A	4	0	0	4	8	7	4	2	12	5	23	
1	1002	DD-155b	Lobby Seating	A	4	0	0	4	8	7	4	2	12	5	23	
1	1016	CTB-101	Communications Room	D	2	0	0	2	3	5	2	0	5	5	12	Critical Zone
1	1020	CTB-102a	Electrical Room	D	2	0	0	2	3	5	2	0	5	5	12	fire alarm input / Critical Zone
1	1020	CTB-102b	Electrical Room	D	2	0	0	2	3	5	2	0	5	5	12	Critical Zone
1 South																
1	1422	DD-130	Patient review dictation area	A	4	0	0	4	8	7	4	2	12	5	23	
1	1423	DD-131	C.T. Scan Control	A	4	0	0	4	8	7	4	2	12	5	23	
1	1505	DD-136	Dosim work area	A	4	0	0	4	8	7	4	2	12	5	23	
1	1516	DD-137	Electronics Storage	A	4	0	0	4	8	7	4	2	12	5	23	
1	1502	DD-138	Treatment Brachy Planning	A	4	0	0	4	8	7	4	2	12	5	23	
1	1514	DD-139	Electronics Laboratory	A	4	0	0	4	8	7	4	2	12	5	23	
1	1514	EV-7	Electronics Laboratory	Phoenix	4	0	0	4	8	7	4	2	12	5	23	see Phoenix Fume Hood Shop Drawings
1	1512	DD-140	Physics Laboratory	A	4	0	0	4	8	7	4	2	12	5	23	
1	1304	DD-142	Patient W.C.	A	4	0	0	4	8	7	4	2	12	5	23	medical gas panel 2 alarms
1	1306	DD-143	Plaster room	A	5	0	0	4	8	7	4	2	12	5	23	cold deck static press sensor #3
1	1308	DD-144	Mould / Vac. Form Room	A	4	0	0	4	8	7	4	2	12	5	23	exhaust extractor alarm EXT-1
1	〃	EV-8A	〃	Phoenix	4	0	0	4	8	7	4	2	12	5	23	see Phoenix Fume Hood Shop Drawings
1	〃	EV-8B	〃	Phoenix	4	0	0	4	8	7	4	2	12	5	23	see Phoenix Fume Hood Shop Drawings
1	1309	DD-145	Cerrobend	A	5	0	0	4	8	7	4	2	12	5	23	hot deck static press sensor #3
1	〃	EV-9	〃	Phoenix	4	0	0	4	8	7	4	2	12	5	23	
1	1607	DD-146	Office	A	4	0	0	4	8	7	4	2	12	5	23	
1	1611	DD-147	Physics Leader	A	4	0	0	4	8	7	4	2	12	5	23	
1	1602	DD-148	Post doc resident	A	4	0	0	4	8	7	4	2	12	5	23	
1	1665	DD-149	Computer Laboratory	A	4	0	0	4	8	7	4	2	12	5	23	
1	1617	DD-150	Physics Laboratory	B	4	1	0	4	8	7	5	2	13	5	24	
1	〃	MV-12	〃	B, Phoenix												
1	〃	EV-12	〃	Phoenix												
1	〃	SV-12	〃	Phoenix												
1	1618	DD-151	Prep Research Laboratory	A	4	0	0	4	8	7	4	2	12	5	23	
1	1615	DD-152	Office	A	4	0	0	4	8	7	4	2	12	5	23	combined per adden #4
1	1708	DD-153	Workshop	A	4	0	0	4	8	7	4	2	12	5	23	
1	1704	MV-11	Hot Room	C	1	1	0	0	1	4	2	0	3	4	7	
1	〃	SV-11	〃	Phoenix												see Phoenix Fume Hood Shop Drawings
1	〃	EV-11	〃	Phoenix												see Phoenix Fume Hood Shop Drawings
2 North																
2	2347	DD-201	Exam Room	A	4	0	0	4	8	7	4	2	12	5	23	
2	2353	DD-202	Exam Room	A	4	0	0	4	8	7	4	2	12	5	23	
2	2313	DD-203	Dictation Alcove	A	4	0	0	4	8	7	4	2	12	5	23	
2	2307	DD-204	Nurse's Desk	A	4	0	0	4	8	7	4	2	12	5	23	
2	2334	DD-205	Exam Room	A	4	0	0	4	8	7	4	2	12	5	23	medical gas panel 3 alarms
2	2316	DD-206	Treatment Liason	A	4	0	0	4	8	7	4	2	12	5	23	
2	2305	DD-207	Nurse's Desk	A	4	0	0	4	8	7	4	2	12	5	23	
2	2326	DD-208	E.N.T. Exam	A	5	0	0	4	8	7	4	2	12	5	23	cold deck static press sensor #5
2	2225	DD-209	Corridor	A	5	0	0	4	8	7	4	2	12	5	23	hot deck static press sensor #5
2	2211	DD-210	Chemo Treatment	A	5	0	0	4	8	7	4	2	12	5	23	cold deck static press sensor #4
2	2208	DD-211	Linen Alcove	A	4	0	0	4	8	7	4	2	12	5	23	medical gas panel 4 alarms
2	2108	DD-213	Pharmaceutical Storage	A	5	0	0	4	8	7	4	2	12	5	23	hot deck static press sensor #4
2	2201	DD-214	Chemo Reception	A	4	0	0	4	8	7	4	2	12	5	23	
2	2002	DD-215	Corridor	A	4	0	0	4	8	7	4	2	12	5	23	
2	2003	DD-215A	Waiting	A	4	0	0	4	8	7	4	2	12	5	23	
2	2009	DD-216	Waiting	A	4	0	0	4	8	7	4	2	12	5	23	
2	2106	MV-10	Pharmacy	C	1	1	0	0	1	4	2	0	3	4	7	
2	〃	SV-10	〃	Phoenix												
2	〃	EV-10A	〃	Phoenix												
2	〃	EV-10B	〃	Phoenix												
2	2014	CTB-201	Communications Room	D	2	0	0	2	3	5	2	0	5	5	12	Critical Zone
2 South																
2	2413	DD-217	Office nutritionist	A	4	0	0	4	8	7	4	2	12	5	23	
2	2400	DD-218	PFS Secretary	A	4	0	0	4	8	7	4	2	12	5	23	
2	2405	DD-219	Office Spiritual Care	A	5	0	0	4	8	7	4	2	12	5	23	cold deck static press sensor #6
2	2607	DD-220	Records Control	A	4	0	0	4	8	7	4	2	12	5	23	
2	2743	DD-221	Medical Office	A	4	0	0	4	8	7	4	2	12	5	23	
2	2604	DD-222	Health Records Analysts	A	5	0	0	4	8	7	4	2	12	5	23	hot deck static press sensor #6
2	2716	DD-224	Head Medical Office	A	4	0	0	4	8	7	4	2	12	5	23	
2	2734	DD-225	Medical Office	A	4	0	0	4	8	7	4	2	12	5	23	
2	2712	DD-226	Copier	A	4	0	0	4	8	7	4	2	12	5	23	
2	2720	DD-227	Head Medical Office	A	5	0	0	4	8	7	4	2	12	5	23	cold deck static press sensor #7
2	2726	DD-228	Head Medical Office	A	5	0	0	4	8	7	4	2	12	5	23	hot deck static press sensor #7
2	2739	DD-229	Secretaries	A	4	0	0	4	8	7	4	2	12	5	23	
2	2615	DD-230	HRT / Transcripts workstation	A	4	0	0	4	8	7	4	2	12	5	23	
2	2746	DD-232	Video-Conference Room	A	4	0	0	4	8	7	4	2	12	5	23	

ADDITIONAL DUCT STATIC SENSORS

Additional Deck Static Pressure Sensors

Point Name	AI	AO	BI	BO	AV	BV	Loop	Sched	Trend	Alarm	Graphic
DC1-012 — Cold Deck Static Pressure #1	x								x		x
DC1-013 — Hot Deck Static Pressure #1	x								x		x
DC1-027 — Cold Deck Static Pressure #2	x								x		x
DC1-028 — Hot Deck Static Pressure #2	x								x		x
DC1-046 — Cold Deck Static Pressure #3	x								x		x
DC1-048 — Hot Deck Static Pressure #3	x								x		x
DC1-065 — Cold Deck Static Pressure #5	x								x		x
DC1-066 — Hot Deck Static Pressure #5	x								x		x
DC1-067 — Cold Deck Static Pressure #4	x								x		x
DC1-069 — Hot Deck Static Pressure #4	x								x		x
DC1-078 — Cold Deck Static Pressure #6	x								x		x
DC1-081 — Hot Deck Static Pressure #6	x								x		x
DC1-086 — Cold Deck Static Pressure #7	x								x		x
DC1-087 — Hot Deck Static Pressure #7	x								x		x
Totals shown (14 sensors)	**14**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**14**	**0**	**14**
Hardware I/O (14)					**Software Values (AV + BV: 0)**						

GENERAL NOTES:

1. READ HARDWARE I/O TOTALS SEPARATELY FROM SOFTWARE VALUES, LOOPS, SCHEDULES, TRENDS, ALARMS AND GRAPHICS. A SOFTWARE FUNCTION DOES NOT BY ITSELF REPRESENT AN ADDITIONAL PHYSICAL INPUT OR OUTPUT.
2. ADDITIONAL DECK STATIC PRESSURE INPUTS APPLY ONLY AT THE FOURTEEN LOCATIONS LISTED IN THE ADDITIONAL DECK STATIC PRESSURE SENSOR SCHEDULE. WHERE THE CORRESPONDING TERMINAL ROW ALREADY INCLUDES THE ADDITIONAL AI, COUNT THAT SENSOR ONCE. THESE ARE DECK STATIC SENSORS, NOT TERMINAL VELOCITY-PRESSURE SENSORS.
3. MV-12 IS THE ANCILLARY MAKE-UP AIR COMPONENT ASSOCIATED WITH THE DETAIL B TERMINAL ASSEMBLY. COUNT ITS MV-D OUTPUT WITH THAT ASSEMBLY; DO NOT DUPLICATE THE COMPLETE DETAIL B POINT TOTAL.
4. PHOENIX EV/SV VALVE ROWS DO NOT REPRESENT DETAIL A TERMINAL CONTROLLERS. COUNT PHOENIX INTERFACE POINTS PER CONNECTED HOOD IDENTIFIED IN THE FINAL HOOD/INTERFACE SCHEDULE. DO NOT INFER HOOD QUANTITY FROM THE NUMBER OF EV/SV VALVE ROWS.
5. MEDICAL GAS PANEL LOCATION IDENTIFIES THE PHYSICAL ALARM PANEL. HOST CONTROLLER LOCATION IDENTIFIES THE BAS INPUT TERMINATION. THESE ARE SEPARATE FIELDS; A TERMINAL UNIT ROOM NUMBER SHALL NOT BE USED AS THE ALARM PANEL LOCATION UNLESS THE PANEL IS LOCATED THERE.
6. APPLY THE MEDICAL GAS DETAIL F TOTALS ONCE TO THE COMPLETE INTERFACE. APPLY DETAIL G ONCE TO EACH OF SIX LINAC CABINETS/FAN PAIRS. DO NOT DUPLICATE A SHARED CONTROLLER COMMUNICATION-FAILURE ALARM.
7. VERIFY POINT IDENTIFIERS AND DEVICE CONNECTIONS AGAINST THE CONTRACT SCHEDULE BEFORE CUTOVER. REPORT UNLISTED OR CONFLICTING POINTS TO THE CONSULTANT; DO NOT ADD UNSCHEDULED SAFETY INTERFACES OR OMIT SCHEDULED WORK WITHOUT DIRECTION.

MECHANICAL POINTS LIST - 1 OF 4

SCALE: NONE

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MECHANICAL POINTS LIST - 1 OF 4

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Approved by: SM
Project No. 26-B374

Seal

Drawing No.

M3.1

Latest Revision No. 2

DUAL DUCT VAV - DETAIL A

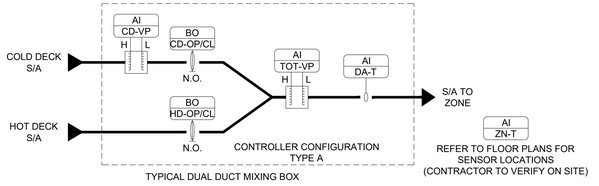
Dual Duct Terminal Box

Point Name	AI	AO	BI	BO	AV	BV	Loop	Sched	Trend	Alarm	Graphic
Zone Temperature (ZN-T)	x								x		x
Cold Deck Velocity Pressure (CD-VP)	x								x		x
Total Supply Velocity Pressure (TOT-VP)	x								x		x
Discharge Air Temperature (DA-T)	x								x		x
Cold Deck Damper Open (CD-OP)				x							x
Cold Deck Damper Close (CD-CL)				x							x
Hot Deck Damper Open (HD-OP)				x							x
Hot Deck Damper Close (HD-CL)				x							x
Zone Temperature Setpoint					x		x		x		x
Discharge Air Temperature Setpoint					x		x		x		x
Cold Deck Airflow					x				x		x
Total Supply Airflow					x				x		x
Hot Deck Airflow (Calculated)					x				x		x
Cold Deck Airflow Setpoint					x		x		x		x
Total Supply Airflow Setpoint					x		x		x		x
Occupied Mode						x		x	x		x
Temporary Occupancy Override						x		x			x
Occupancy Override Duration					x						x
High Zone Temperature Alarm						x				x	x
Low Zone Temperature Alarm						x				x	x
Low Total Supply Airflow Alarm						x				x	x
Sensor Failure Alarm						x				x	x
Controller Communication Failure						x				x	x
Totals per unit	**4**	**0**	**0**	**4**	**8**	**7**	**4**	**2**	**12**	**5**	**23**
Hardware I/O (8)					**Software Values (AV + BV: 15)**						

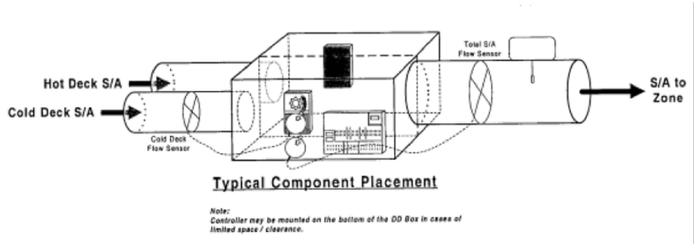
Replace ZN-T and both differential pressure sensors (CD-VP and TOT-VP). Retain and reconnect DA-T and damper actuators, subject to condition and compatibility.

Damper actuators use open/close floating control: two BOs per actuator. Hot deck airflow is calculated from total supply airflow minus cold deck airflow.

Additional deck static pressure sensors and special interfaces apply only to the controllers identified in Additional Points.



TYPICAL DUAL DUCT MIXING BOX



Typical Component Placement

Note:
Controller may be mounted on the bottom of the DD Box in cases of limited space / clearance.

SEQUENCE OF OPERATION:

MODE CONTROL:
THE DUAL DUCT TERMINAL BOX (DD BOX) WILL OPERATE BASED ON A TIME SCHEDULE OR COMMANDED BY THE OPERATOR. THE TEMPORARY OCCUPANCY OVERRIDE WILL PUT THE DD BOX INTO OCCUPIED MODE FOR A PRESET AMOUNT OF TIME (ADJUSTABLE, INITIALLY SET FOR 1 HOUR).

OCCUPIED MODE:
THE COLD DECK AND HOT DECK DAMPERS WILL BE MODULATED AS REQUIRED TO MAINTAIN DISCHARGE AIR TEMPERATURE WHILE MAINTAINING CONSTANT TOTAL SUPPLY AIR VOLUME. THE SUPPLY AIR TEMPERATURE SETPOINT WILL BE RESET BY THE ZONE TEMPERATURE SENSOR.

ON A CALL FOR COOLING, THE COLD DECK DAMPER WILL BE ADJUSTED TO INCREASE THE COLD DECK AIRFLOW TO SATISFY THE ZONE COOLING REQUIREMENT, AND THE HOT DECK DAMPER WILL BE ADJUSTED TO PROVIDE THE ADDITIONAL AIR VOLUME NECESSARY TO SATISFY THE ZONE TOTAL SUPPLY AIR VOLUME REQUIREMENT.

ON A CALL FOR HEATING, THE HOT DECK DAMPER WILL BE ADJUSTED TO INCREASE THE HOT DECK AIRFLOW TO SATISFY THE ZONE HEATING REQUIREMENT, AND THE COLD DECK DAMPER WILL BE ADJUSTED TO PROVIDE THE ADDITIONAL AIR VOLUME NECESSARY TO SATISFY THE ZONE TOTAL SUPPLY AIR VOLUME REQUIREMENT.

UNOCCUPIED MODE:
WHERE UNOCCUPIED OPERATION IS PERMITTED BY THE ISSUED TERMINAL SCHEDULE AND CLINICAL REQUIREMENTS, OPERATE AS IN OCCUPIED MODE EXCEPT MAINTAIN THE SCHEDULED CONSTANT MINIMUM TOTAL SUPPLY AIRFLOW AND APPLICABLE UNOCCUPIED TEMPERATURE SETPOINTS. DO NOT APPLY A GENERIC PERCENTAGE REDUCTION. RETAIN REQUIRED CONTINUOUS VENTILATION AND PRESSURE RELATIONSHIPS.

DUAL DUCT VAV - DETAIL B

Dual Duct Lab Terminal Box

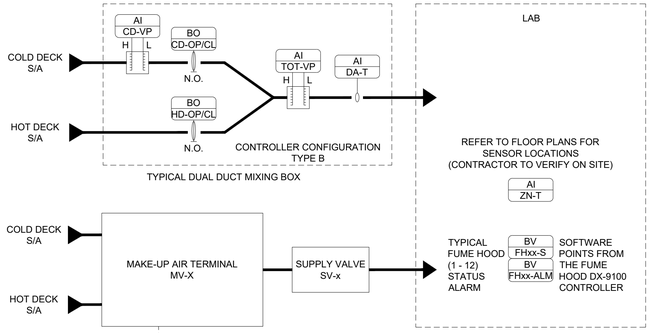
Point Name	AI	AO	BI	BO	AV	BV	Loop	Sched	Trend	Alarm	Graphic
Zone Temperature (ZN-T)	x								x		x
Cold Deck Velocity Pressure (CD-VP)	x								x		x
Total Supply Velocity Pressure (TOT-VP)	x								x		x
Discharge Air Temperature (DA-T)	x								x		x
Cold Deck Damper Open (CD-OP)				x							x
Cold Deck Damper Close (CD-CL)				x							x
Hot Deck Damper Open (HD-OP)				x							x
Hot Deck Damper Close (HD-CL)				x							x
Make-up Air Mixing Damper (MV-D)		x					x		x		x
Zone Temperature Setpoint					x		x		x		x
Discharge Air Temperature Setpoint					x		x		x		x
Cold Deck Airflow					x				x		x
Total Supply Airflow					x				x		x
Hot Deck Airflow (Calculated)					x				x		x
Cold Deck Airflow Setpoint					x		x		x		x
Total Supply Airflow Setpoint					x		x		x		x
Occupied Mode						x		x	x		x
Temporary Occupancy Override						x		x			x
Occupancy Override Duration					x						x
High Zone Temperature Alarm						x				x	x
Low Zone Temperature Alarm						x				x	x
Low Total Supply Airflow Alarm						x				x	x
Sensor Failure Alarm						x				x	x
Controller Communication Failure						x				x	x
Totals per unit	**4**	**1**	**0**	**4**	**8**	**7**	**5**	**2**	**13**	**5**	**24**
Hardware I/O (9)					**Software Values (AV + BV: 15)**						

Replace ZN-T and both differential pressure sensors. Retain DA-T, floating damper actuators, and the 0–10 V make-up air electro-pneumatic interface.

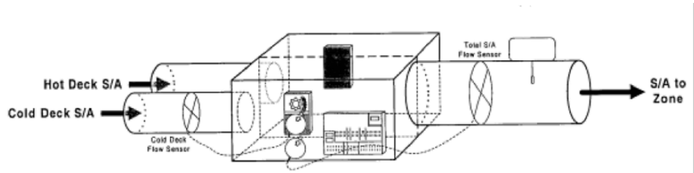
Phoenix Interface — Points per Connected Fume Hood

Point Name	AI	AO	BI	BO	AV	BV	Loop	Sched	Trend	Alarm	Graphic
Fume Hood Status (FHxx-S)						x			x		x
Fume Hood Alarm (FHxx-ALM)						x				x	x
Totals per hood	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**1**	**1**	**2**
Hardware I/O (0)						**Software Values (AV + BV: 2)**					

Phoenix points are a separate interface allowance per connected hood, not per DD terminal. Confirm quantity, available status definitions, and gateway mapping with the controls contractor.



TYPICAL DUAL DUCT MIXING BOX



Typical Component Placement

Note:
Controller may be mounted on the bottom of the DD Box in cases of limited space / clearance.

SEQUENCE OF OPERATION:

MODE CONTROL:
THE DUAL DUCT TERMINAL BOX (DD BOX) WILL OPERATE BASED ON A TIME SCHEDULE OR COMMANDED BY THE OPERATOR. THE TEMPORARY OCCUPANCY OVERRIDE WILL PUT THE DD BOX INTO OCCUPIED MODE FOR A PRESET AMOUNT OF TIME (ADJUSTABLE, INITIALLY SET FOR 1 HOUR).

OCCUPIED MODE:
THE COLD DECK AND HOT DECK DAMPERS WILL BE MODULATED AS REQUIRED TO MAINTAIN DISCHARGE AIR TEMPERATURE WHILE MAINTAINING CONSTANT TOTAL SUPPLY AIR VOLUME. THE SUPPLY AIR TEMPERATURE SETPOINT WILL BE RESET BY THE ZONE TEMPERATURE SENSOR.

ON A CALL FOR COOLING, THE COLD DECK DAMPER WILL BE ADJUSTED TO INCREASE THE COLD DECK AIR VOLE TO SATISFY THE ZONE COOLING REQUIREMENT, AND THE HOT DECK DAMPER WILL BE ADJUSTED TO PROVIDE THE ADDITIONAL AIR VOLUME NECESSARY TO SATISFY THE ZONE TOTAL SUPPLY AIR VOLUME REQUIREMENT.

ON A CALL FOR HEATING, THE HOT DECK DAMPER WILL BE ADJUSTED TO INCREASE THE HOT DECK AIR VOLE TO SATISFY THE ZONE HEATING REQUIREMENT, AND THE COLD DECK DAMPER WILL BE ADJUSTED TO PROVIDE THE ADDITIONAL AIR VOLUME NECESSARY TO SATISFY THE ZONE TOTAL SUPPLY AIR VOLUME REQUIREMENT.

THE MAKE-UP AIR BOX (MV) MIXING DAMPER WILL BE MODULATED AS REQUIRED TO MAINTAIN THE ZONE TEMPERATURE. IT WILL OPERATE IN CONJUNCTION WITH THE DD BOX.

UNOCCUPIED MODE:
WHERE UNOCCUPIED OPERATION IS PERMITTED BY THE ISSUED TERMINAL SCHEDULE AND CLINICAL REQUIREMENTS, OPERATE AS IN OCCUPIED MODE EXCEPT MAINTAIN THE SCHEDULED CONSTANT MINIMUM TOTAL SUPPLY AIRFLOW AND APPLICABLE UNOCCUPIED TEMPERATURE SETPOINTS. DO NOT APPLY A GENERIC PERCENTAGE REDUCTION. RETAIN REQUIRED CONTINUOUS VENTILATION AND PRESSURE RELATIONSHIPS.

LABORATORY FUME HOOD CONTROL:
REFER TO PHOENIX FUME HOOD SHOP DRAWINGS.

MECHANICAL POINTS LIST - 2 OF 4

SCALE: NONE

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Project

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Title

MECHANICAL
POINTS LIST -
2 OF 4

Scale: AS NOTED
Drawn By: BM
Reviewed by: MM
Approved by: SM
Project No.: 26-B374

Seal

Drawing No.

M3.2

Latest Revision No. 2

DUAL DUCT VAV - DETAIL C

Dual Duct Make-up Air

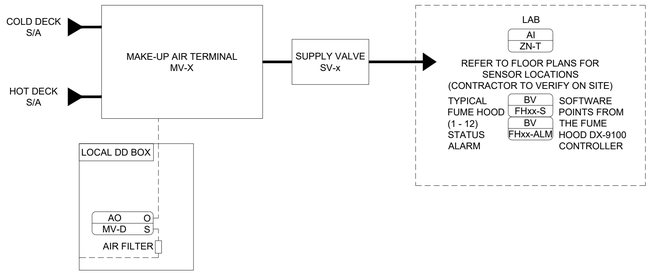
Point Name	AI	AO	BI	BO	AV	BV	Loop	Sched	Trend	Alarm	Graphic
Zone Temperature (ZN-T)	x								x		x
Make-up Air Mixing Damper (MV-D)		x					x		x		x
Zone Temperature Setpoint					x		x		x		x
High Zone Temperature Alarm						x				x	x
Low Zone Temperature Alarm						x				x	x
Sensor Failure Alarm						x				x	x
Controller Communication Failure						x				x	x
Totals per unit	**1**	**1**	**0**	**0**	**1**	**4**	**2**	**0**	**3**	**4**	**7**
Hardware I/O (2)					**Software Values (AV + BV: 5)**						

Replace ZN-T. Retain the 0–10 V electro-pneumatic damper interface. This detail shows no terminal differential pressure, airflow, or discharge temperature sensor.

Phoenix Interface — Points per Connected Fume Hood

Point Name	AI	AO	BI	BO	AV	BV	Loop	Sched	Trend	Alarm	Graphic
Fume Hood Status (FHxx-S)						x			x		x
Fume Hood Alarm (FHxx-ALM)						x				x	x
Totals per hood	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**1**	**1**	**2**
Hardware I/O (0)						**Software Values (AV + BV: 2)**					

Phoenix points are separate from the make-up air controller. Confirm installed hood quantity and interface availability. Level 3 units shown on the source detail are excluded.



SEQUENCE OF OPERATION:

MODE CONTROL:
THE MAKE-UP AIR BOX (MV) MIXING DAMPER WILL BE MODULATED AS REQUIRED TO MAINTAIN THE ZONE TEMPERATURE.

LABORATORY FUME HOOD CONTROL:
REFER TO PHOENIX FUME HOOD SHOP DRAWINGS.

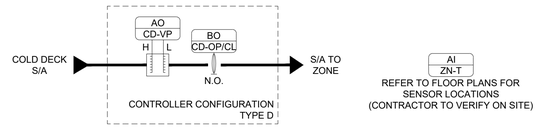
SINGLE DUCT VAV - DETAIL D

Single Duct Terminal Box

Point Name	AI	AO	BI	BO	AV	BV	Loop	Sched	Trend	Alarm	Graphic
Zone Temperature (ZN-T)	x								x		x
Supply Velocity Pressure (S-VP)	x								x		x
Supply Damper Open (DPR-OP)				x							x
Supply Damper Close (DPR-CL)				x							x
Zone Temperature Setpoint					x		x		x		x
Supply Airflow					x				x		x
Supply Airflow Setpoint					x		x		x		x
High Zone Temperature Alarm						x				x	x
Low Zone Temperature Alarm						x				x	x
Low Supply Airflow Alarm						x				x	x
Sensor Failure Alarm						x				x	x
Controller Communication Failure						x				x	x
Totals per unit	**2**	**0**	**0**	**2**	**3**	**5**	**2**	**0**	**5**	**5**	**12**
Hardware I/O (4)					**Software Values (AV + BV: 8)**						

Replace ZN-T and the supply differential pressure sensor (S-VP). Retain and reconnect the floating damper actuator. No discharge temperature sensor is shown.

The source detail does not specify an occupancy schedule. Supply airflow control follows zone temperature demand and scheduled minimum/maximum airflow settings.



SEQUENCE OF OPERATION:

THE AIR VALVE DAMPER WILL BE MODULATED AS REQUIRED TO MAINTAIN THE DESIRED SUPPLY AIR VOLUME. ON AN INCREASED CALL FOR COOLING, THE SUPPLY AIR VOLUME WILL BE INCREASED ABOVE THE PRESET MINIMUM AIR VOLUME AS REQUIRED TO SATISFY THE ZONE TEMPERATURE REQUIREMENT. ON A REDUCED CALL FOR COOLING, THE SUPPLY AIR VOLUME WILL BE REDUCED TO THE PRESET MINIMUM AIR VOLUME.

MECHANICAL POINTS LIST - 3 OF 4

SCALE: NONE

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Drawn By: BM
Reviewed by: MM
Approved by: SM
Project No. 26-B374

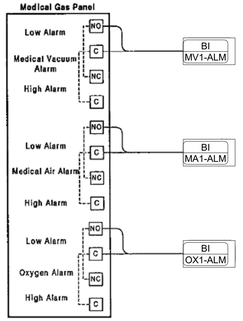
Seal

Drawing No.

M3.3

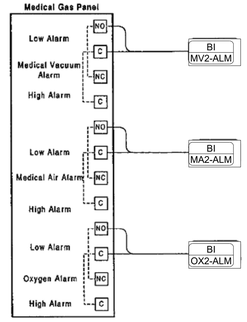
Latest Revision No. 2

MEDICAL GAS MONITORING - DETAIL F



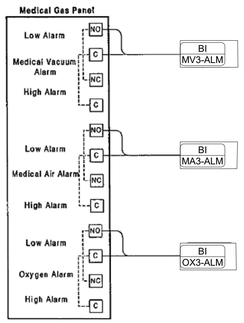
NOTE:
Refer to Manufacturer's Literature for specific wiring requirements

Reception Booking Rm 1100



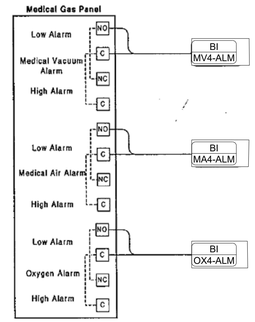
NOTE:
Refer to Manufacturer's Literature for specific wiring requirements

Nurse's Deck Rm 2307



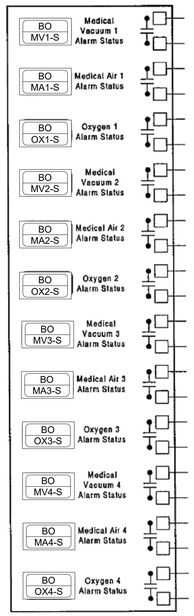
NOTE:
Refer to Manufacturer's Literature for specific wiring requirements

Waiting Rm 1301

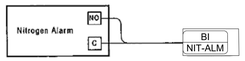


NOTE:
Refer to Manufacturer's Literature for specific wiring requirements

Corridor 2219



RJH Power House
Medical Gas DDC Output Panel EN-6



NOTE:
Refer to Manufacturer's Literature for specific wiring requirements

Room 1512

SEQUENCE OF OPERATION:

MONITOR THE EXISTING MEDAL VACUUM, MEDICAL AIR AND OXYGEN ALARM CONTACTS FROM EACH OF FOUR MEDICAL GAS PANELS. ANNUNCIATE EACH ALARM AT THE BMS OPERATOR WORKSTATION.

MAP EACH ALARM TO THE CORRESPONDING -S RELAY OUTPUT AT PANEL EN-6, RJH POWER HOUSE. RETAIN THE EXISTING RELAY INTERFACE ARRANGEMENT, SUBJECT TO COMPATIBILITY.

MONITOR THE SEPARATE NITROGEN ALARM IN ROOM 1512. NO NITROGEN RELY OUTPUT IS SHOWN.

CONFIRM EACH POLARITY, RELAY NORMAL/ALARM STATE AND RESPONSE TO COMMUNICATION OR POWER LOSS BEFORE PROGRAMMING. COORDINATE AND TEST EVERY INPUT-TO-OUTPUT PATH WITH THE OWNER AND CONTROLS CONTRACTOR.

ALARM INPUTS - ENTIRE MEDICAL GAS INTERFACE

MEDICAL GAS ALARM MONITORING

POINT NAME	AI	AO	BI	BO	AV	BV	LOOP	SCHED	TREND	ALARM	GRAPHIC
MEDICAL VACUUM 1 ALARM (MV1-ALM)			X						X	X	X
MEDICAL AIR 1 ALARM (MA1-ALM)			X						X	X	X
OXYGEN 1 ALARM (OX1-ALM)			X						X	X	X
MEDICAL VACUUM 2 ALARM (MV2-ALM)			X						X	X	X
MEDICAL AIR 2 ALARM (MA2-ALM)			X						X	X	X
OXYGEN 2 ALARM (OX2-ALM)			X						X	X	X
MEDICAL VACUUM 3 ALARM (MV3-ALM)			X						X	X	X
MEDICAL AIR 3 ALARM (MA3-ALM)			X						X	X	X
OXYGEN 3 ALARM (OX3-ALM)			X						X	X	X
MEDICAL VACUUM 4 ALARM (MV4-ALM)			X						X	X	X
MEDICAL AIR 4 ALARM (MA4-ALM)			X						X	X	X
OXYGEN 4 ALARM (OX4-ALM)			X						X	X	X
NITROGEN ALARM (N-ALM / NIT-ALM)			X						X	X	X
TOTALS SHOWN	**0**	**0**	**13**	**0**	**0**	**0**	**0**	**0**	**13**	**13**	**13**

EN-6 ALARM RELAY OUTPUTS - ENTIRE INTERFACE

MEDICAL GAS ALARM RELAY INTERFACE

POINT NAME	AI	AO	BI	BO	AV	BV	LOOP	SCHED	TREND	ALARM	GRAPHIC
MEDICAL VACUUM 1 ALARM RELAY (MV1-S)				X					X		X
MEDICAL AIR 1 ALARM RELAY (MA1-S)				X					X		X
OXYGEN 1 ALARM RELAY (OX1-S)				X					X		X
MEDICAL VACUUM 2 ALARM RELAY (MV2-S)				X					X		X
MEDICAL AIR 2 ALARM RELAY (MA2-S)				X					X		X
OXYGEN 2 ALARM RELAY (OX2-S)				X					X		X
MEDICAL VACUUM 3 ALARM RELAY (MV3-S)				X					X		X
MEDICAL AIR 3 ALARM RELAY (MA3-S)				X					X		X
OXYGEN 3 ALARM RELAY (OX3-S)				X					X		X
MEDICAL VACUUM 4 ALARM RELAY (MV4-S)				X					X		X
MEDICAL AIR 4 ALARM RELAY (MA4-S)				X					X		X
OXYGEN 4 ALARM RELAY (OX4-S)				X					X		X
DC1-216 COMMUNICATION FAILURE						X				X	X
DC1-217 COMMUNICATION FAILURE						X				X	X
TOTALS SHOWN	**0**	**0**	**0**	**12**	**0**	**2**	**0**	**0**	**12**	**2**	**14**

LINAC CABINET EXHAUST AND PIT WATER MONITORING - DETAIL G

POINTS PER LINAC CABINET / FAN PAIR

POINT NAME	AI	AO	BI	BO	AV	BV	LOOP	SCHED	TREND	ALARM	GRAPHIC
CABINET TEMPERATURE (LINCCx-T)	X								X		X
FAN A STATUS (EFxx-S)			X						X		X
FAN B STATUS (EFxx-S)			X						X		X
PIT WATER ALARM (PITx-ALM)			X						X	X	X
FAN A START/STOP (EFxx-c)				X					X		X
FAN B START/STOP (EFxx-c)				X					X		X
CABINET TEMPERATURE SETPOINT					X		X		X		X
LAG FAN TEMPERATURE SETPOINT					X		X		X		X
LEAD FAN SELECTION					X				X		X
FAN A RUN HOURS					X				X		X
FAN B RUN HOURS					X				X		X
LEAD CHANGEOVER INTERVAL					X						X
HIGH CABINET TEMPERATURE ALARM						X				X	X
FAN A FAILURE ALARM						X				X	X
FAN B FAILURE ALARM						X				X	X
CONTROLLER COMMUNICATION FAILURE						X				X	X
TOTALS SHOWN	**1**	**0**	**3**	**2**	**6**	**4**	**2**	**0**	**11**	**5**	**16**

APPLY ONCE PER CABINET: 1 AI + 3 BI + 2 BO.

SIX CABINETS: 6 AI + 18 BI + 12 BO

SOFTWARE ROWS ARE PROPOSED DESIGN REQUIREMENTS. REUSE THE CONTROLLER COMMUNICATION ALARM WHERE SHARED WITH THE TERMINAL DETAIL.

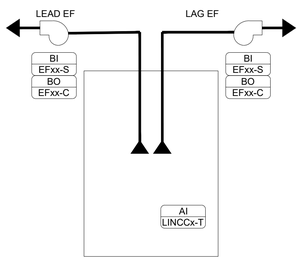
SEQUENCE OF OPERATION:

ENABLE MONITORING AND CABINET EXHAUST CONTROL CONTINUOUSLY, 24 HOURS PER DAY. OPERATE THE TWO EXHAUST FANS AS A LEAD/LAG PAIR AND AND ALTERNATE LEAD DUTY AFTER 200 OPERATING HOURS (ADJUSTABLE).

CYCLE THE LEAD FAN TO MAINTAIN CABINET TEMPERATURE, INITIALLY 23°C (ADJUSTABLE). START THE LAG FAN ABOVE 26°C AND INITIATE A HIGH CABINET TEMPERATURE ALARM.

ON FAILURE OF THE COMMANDED LEAD FAN, START THE LAG FAN AND ANNUNCIATE AN ALARM. ON PIT WATER DETECTION, INITIATE AN ALARM AT THE OPERATOR WORKSTATION.

CONFIRM OPERATING SETPOINTS, CYCLING DEADBAND, PROVING DELAY, ROTATING LOGIC AND EQUIPMENT INTERLOCKS BEFORE CUTOVER.



(1) LINAC COMPUTER CABINET DETAIL

SCALE: NONE



(2) LINAC PIT WATER DETECTOR DETAIL

SCALE: NONE

MECHANICAL POINTS LIST - 4 OF 4

SCALE: NONE

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Project No. 26-B374

Seal

Drawing No.

M3.4

Latest Revision No. 2