

CITY OF LUCAS
CONSTRUCTION PLANS FOR
WATER SYSTEM IMPROVEMENTS
McGARITY GROUND STORAGE TANK
AND PUMP STATION

MAYOR
REBECCA MARK

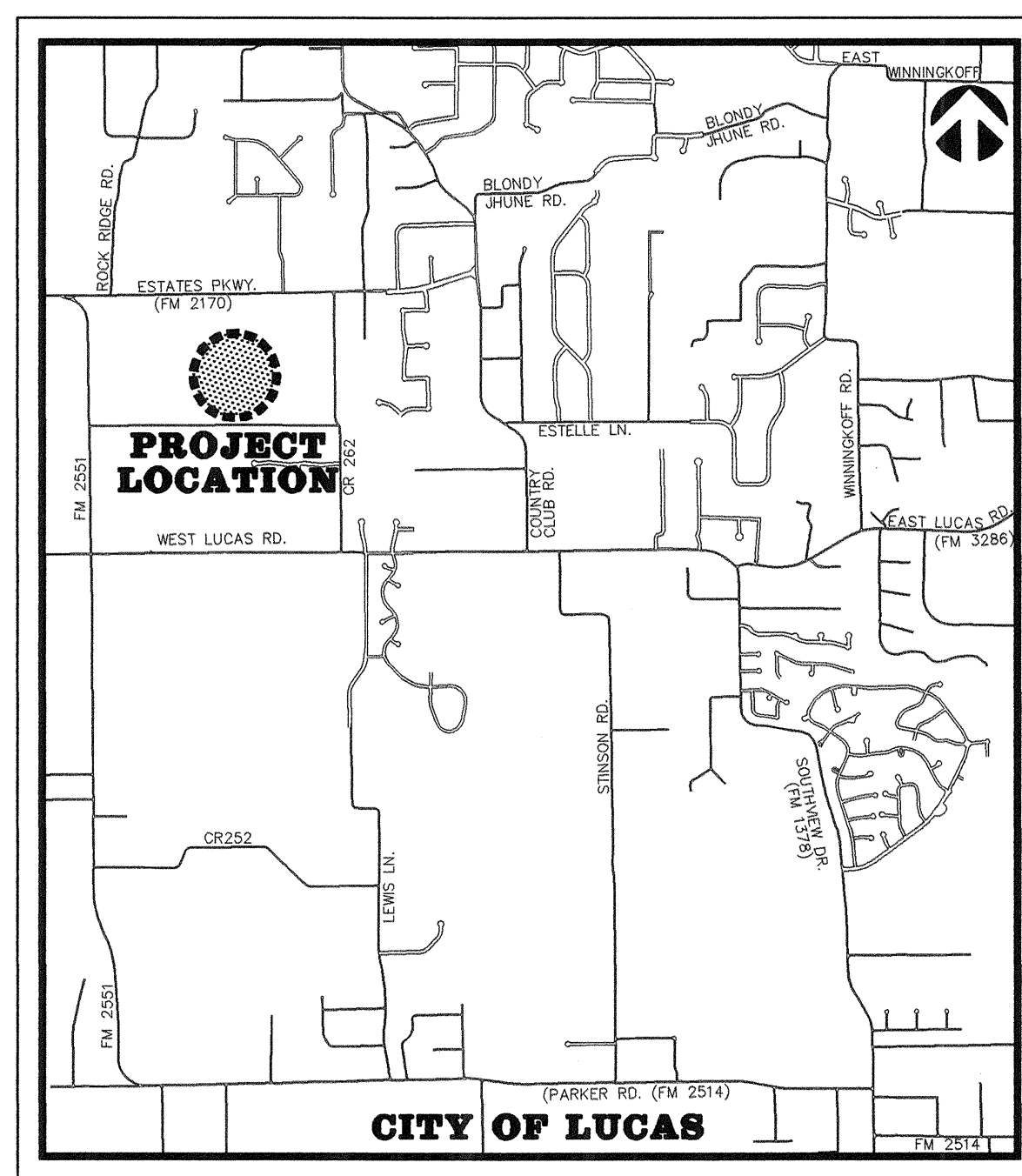
CITY COUNCIL

DEBBIE FISHER	PHILIP LAWRENCE
WAYNE MILLSAP	JIM OLK
KATHLEEN PEELE	DON ZRINY

CITY MANAGER
JEFF JENKINS

DIRECTOR OF PUBLIC WORKS
STACY CAUDELL, P.E.

CONTRACTOR
LAMARC, INC.
COMPLETED JANUARY 2013



VICINITY MAP

BW2 JOB NO. 11-1487
DECEMBER 2011

"REVISED PER ADDENDA"

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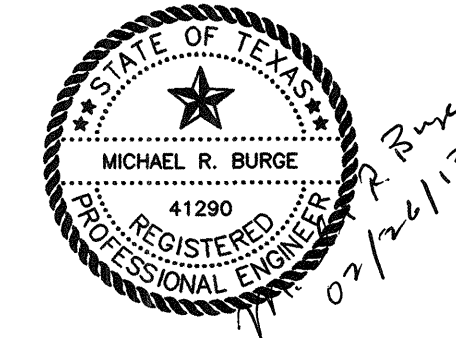
OWNER:
CITY OF LUCAS
665 COUNTRY CLUB ROAD
LUCAS, TEXAS 75002

ENGINEER:



BW2 ENGINEERS, INC.
1919 S. SHILOH ROAD
SUITE 500, L.B. 27
GARLAND, TEXAS 75042
Firm Registration No. F-5290

RECORD DRAWING
BASED ON CONTRACTOR MARKUPS,
NOT FIELD SURVEY.



NO.	DATE	REVISION	REVIEWED
1	2/27/12	ADDED PER ADDENDUM NO. 3	MRB
2	2/27/12	ADDED PER ADDENDUM NO. 2	MRB

GENERAL NOTES:

1.

It is the CONTRACTOR's responsibility to maintain neat and accurate plans of record.
2.

The CONTRACTOR is responsible for maintaining adequate site drainage throughout the duration of this project.
3.

The CONTRACTOR is responsible for obtaining all necessary permits and approvals before construction begins.
4.

The CONTRACTOR shall replace all fence removed during construction in as good or better condition than before construction.
5.

The CONTRACTOR shall take all necessary precautions to ensure that electric power and telephone poles are either moved to a safe location by the affected utility company or not disturbed during construction. All costs incurred for moving electric power and telephone poles shall be included in the price bid for the construction of the project.
6.

The CONTRACTOR shall restore all property including driveways, public streets, sidewalks, public utilities, franchise utilities, private utilities, and all other improvements removed or damaged inside and outside the project limits during construction to as good or better condition than before construction. Restoration shall be made immediately after the property no longer interferes with construction.
7.

The information shown on these drawings concerning type and location of underground and other utilities is not guaranteed to be accurate or all-inclusive. The CONTRACTOR is responsible for making his own determinations as to the type and location of underground utilities and other utilities as may be necessary to avoid damage thereto.
8.

The CONTRACTOR shall not place fill or waste material on any private property without prior written permission from the City of Lucas. No excess excavated material shall be deposited in low areas or along natural drainage ways that will restrict the natural flow of water. If the CONTRACTOR places excavated material in low areas that will cause flood damage, CONTRACTOR will be responsible for all damage resulting from such fill, and he shall remove the fill at CONTRACTOR's expense.
9.

All streets within the scope of the Contract shall be kept accessible to fire trucks, ambulances and other emergency vehicles.
10.

The CONTRACTOR shall be responsible for public safety during the duration of construction. All barricades, warning signs, lights, devices, etc., for the guidance and protection of traffic and pedestrians must conform to the installation shown in 1980 Texas Manual of Uniform Traffic Control Devices, as currently amended by the Texas Department of Transportation. CONTRACTOR shall at all times provide barricades, warning signs and lighting adequate to safeguard the public from any hazards resulting from open trenches during non-work hours.
11.

Filter fabric fence for erosion control shall be provided in accordance with specifications and as shown on the plans and in accordance with the EPA regulations.
12.

The CONTRACTOR shall use the public right-of-ways and existing utility easements for access to the job site.
13.

The CONTRACTOR shall select the subcontractor to be utilized for testing and lab work. The CONTRACTOR shall be responsible for paying for testing and lab work. Selection of subcontractor for this purpose will be subject to approval by the City of Lucas. Testing referred to herein includes compaction and water pressure testing, which shall be required on this project. Testing shall include testing of concrete required to determine and ascertain that concrete strengths in specifications are attained for all concrete members on the project.
14.

The CONTRACTOR shall keep excavated trenches free of groundwater during construction. If necessary, the CONTRACTOR shall utilize dewatering procedures in order to control groundwater during construction such that it does not affect his construction work.
15.

The CONTRACTOR shall provide means for adequately controlling and avoiding soil erosion during construction. The CONTRACTOR shall not store spoil in drainage ways during construction.
16.

All disturbed earth areas are to be finish graded to original or proposed contours, fertilized and hydromulched with bermuda seed according to NCTCOG specifications immediately after construction. Backfill to be select material free of rock and other debris. CONTRACTOR shall thoroughly water the hydromulch immediately after placement. The CONTRACTOR shall also be responsible for continued maintenance and watering of the newly hydromulched areas until the entire project is completed and accepted by the City of Lucas. Watering of the bermuda hydromulch shall be done in a manner and quantity as directed by City of Lucas field representative.
17.

No existing sprinkler/irrigations systems have been shown on the plans; however, they may exist in certain areas. It is the CONTRACTORS responsibility to locate any existing irrigation systems within the project limits and determine if they will be affected by this construction. If CONTRACTOR encounters any sprinkler systems during construction, he shall repair and/or replace in as good or better condition than before construction.
18.

The CONTRACTOR shall maintain adequate sanitary facilities for use by workers throughout construction.
19.

The CONTRACTOR shall conform to the Occupational Safety and Health Administration's (OSHA) standards for trench safety that are in effect during the period of construction.
20.

Ground storage tank shall be constructed in accordance with current AWWA Standards and TCEQ requirements, including requirements for roof vent, manways, drains, sample connections, access ladders, overflows, liquid level indicators, and other appurtenances. All materials and workmanship shall conform to the City of Lucas Standards and Specifications and the North Central Texas Council of Government (NCTCOG) Standards and Specifications, except as noted. In the event of a conflict, the City of Lucas Standards and Specifications shall govern.
21.

No existing trees shall be removed without approval of the City of Lucas.
22.

CONTRACTOR shall provide all necessary construction staking.
23.

CONTRACTOR's working hours shall be in accordance with the provisions of the current City Ordinance governing hours of construction work in the City.

GENERAL NOTES CONT'D.:

24.

All concrete shall have a minimum compressive strength of 4000 psi at 28 days (minimum 6 sacks of cement per cubic yard) unless otherwise noted.
25.

All existing water lines to remain in service during construction. At times when water has to be cut-off, the CONTRACTOR shall coordinate with the City of Lucas.
26.

Buried water lines shall be polyvinyl chloride (PVC) AWWA C900. Above ground water lines shall be ductile iron pipe. Valves and fittings for buried water lines and above ground water lines shall be cast iron. Small water lines such as sampling lines etc., shall be copper pipe with compression type fittings.
27.

CONTRACTOR shall install isolation gate valves and fire hydrants at locations shown on plans unless otherwise directed by City of Lucas. City of Lucas may direct CONTRACTOR to locate valves and fire hydrants at locations other than those shown on plans. Also, City of Lucas may add additional isolation gate valves and fire hydrants as required for operational purposes.
28.

The CONTRACTOR is responsible for keeping streets, parking areas, sidewalks, etc., adjacent to the project free of mud and debris from construction.
29.

The CONTRACTOR shall assume responsibility for protection of public utilities in the construction of this project. All manholes, valve boxes, fire hydrants, etc., must be adjusted to proper line and grade by the CONTRACTOR when construction is completed. The CONTRACTOR shall also be responsible for support of existing utility poles, street signs, etc., when excavating in the vicinity of such poles.
30.

The City of Lucas Public Works Department is to be notified 48 hours (2 working days) prior to any construction.
31.

Arrangements for construction water shall be made through the City of Lucas.
32.

All locations of underground utility lines are approximate. CONTRACTOR shall contact the proper utility companies at least 48 hours prior to construction, shall inform them of beginning of construction and shall make arrangements to have utilities located by flagging. Flagging of utilities shall be completed prior to beginning construction.
33.

PVC pipe shall be manufactured from a low filler PVC component capable of meeting the highest performance standards of the ASTM specifications.
34.

Construction site shall be secure at all times. Safety precautions shall be taken to protect the public from any injury which might result from construction activities.
35.

As part of bid item, "EROSION CONTROL", the CONTRACTOR shall be responsible for implementing any and all erosion control measures as needed to control runoff of siltation from the project site. This shall include, but is not limited to, silt fencing, rock berms, inlet protection, etc. The CONTRACTOR shall maintain these erosion control measures as required until the construction is completed and hydromulch has been placed over disturbed areas.
36.

There is no separate pay resulting from any of the work required as a result of the requirements included in these general notes. All work required shall be included in the price bid for the project.
37.

Two pump control valves shall be provided, one on each of the discharge pipes from the pumps. These valves shall be CLA-VAL 660-11 pump control valves or approved equal.
38.

CONTRACTOR shall provide one-inch holes (up to four holes as determined by City) through the wall in the electrical room for future SCADA connections (to be furnished by others).
39.

All SCADA components and equipment shall be furnished and installed by others.
40.

City building permits will be required. Fees for City permits will be waived by the City.
41.

On Sheet S1.0, remove any reference to optional piers. Piers shall be required.
42.

On Sheet S2.0, remove any reference to optional piers. Piers shall be required.

GENERAL TRAFFIC CONTROL NOTES

Following are General Traffic Control Notes to be utilized on this project as applicable:

1.

All temporary signs, markings, cones, channelizing devices, warning lights and barricades shall be in accordance with the current State of Texas Manual on Uniform Traffic Control Devices (MUTCD).
2.

Type "A" warning lights shall be placed on all advance warning signs. In addition, flags shall be placed on all advance warning signs that detour traffic.
3.

Any existing conflicting markings shall be removed prior to shifting traffic.
4.

All temporary pavement markings required during construction shall be of the removable type. Temporary markings and striping may be required to transition travel lanes between construction phases. All pavement markings and striping shall be reflective.
5.

The spacing of signs and channelization devices may be adjusted to fit the geometric conditions encountered, such as driveways, intersecting roadways, vertical and horizontal alignment, etc., as approved by the City of Lucas.
6.

Advance warning signs shall not be displayed more than forty-eight (48) hours before physical construction begins. Signs may be erected up to one week before needed, if the sign face is fully covered.
7.

Use of barricades, portable barrier rails, vertical panels, and drums shall be limited to the immediate areas of construction where a hazard is present. These devices shall not be stored along the roadway within thirty (30) feet of the edge of the traveled way before or after use unless protected by guardrail, bridge rail, and/or barriers installed for other purposes. These devices shall be removed from the construction work zone when the City of Lucas determines they are no longer needed. Where there is insufficient right-of-way to provide for this thirty (30) foot setback, the City of Lucas shall approve alternate locations.
8.

The posted speed for warning signage is to be determined at the site by the City of Lucas.
9.

Reduced speed warning signage should be placed prior to and at regular intervals within the construction zone.
10.

As part of the bid item, "Construction Barricading/Signing/Traffic Control," the CONTRACTOR is required to submit a traffic control plan for construction a minimum of 3 days prior to changes in traffic handling or movement. These plans are to be reviewed and approved by the City of Lucas prior to construction of that phase.
11.

The CONTRACTOR shall accommodate existing traffic during construction and shall maintain at least one open lane of traffic at all times. Use of flag men, barricades, vertical panels, etc. shall be required and shall be considered subsidiary to "Construction Barricading/Signing/Traffic Control".
12.

CONTRACTOR shall be required to place temporary pavement markings and/or buttons as needed to maintain traffic in a safe and efficient manner after removal of existing markings. These temporary markings shall not be paid for separately but shall be considered subsidiary to "CONSTRUCTION BARRICADING/SIGNING/TRAFFIC CONTROL".

RECORD DRAWING
BASED ON CONTRACTOR MARKUPS,
NOT FIELD SURVEY.

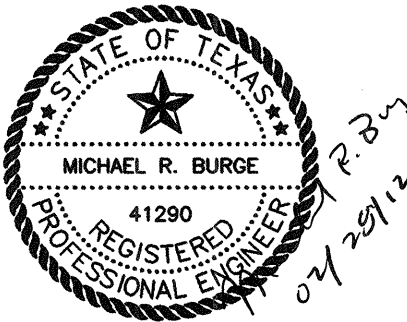
!! CAUTION !!
THERE ARE EXISTING AND/OR PROPOSED UTILITIES IN PROJECT AREA. UTILITY INFORMATION SHOWN ON PLANS REPRESENTS APPROXIMATE LOCATIONS OF EXISTING UTILITIES AND IS NOT NECESSARILY ALL-INCLUSIVE. CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING EXACT LOCATIONS OF ALL EXISTING UTILITIES AND SHALL BE REQUIRED TO PROTECT UTILITIES TO AVOID DAMAGE.
PRIOR TO ANY EXCAVATION, CONTRACTOR SHALL CONTACT DIG-TESS, TEXAS ONE CALL, LONE STAR NOTIFICATION AND OTHERS AS REQUIRED TO LOCATE EXISTING UTILITIES.
CONTRACTOR SHALL ALSO CONTACT APPROPRIATE CITY UTILITY DEPARTMENT FOR FIELD LOCATES OF MUNICIPAL INFRASTRUCTURE 48 HOURS PRIOR TO CONSTRUCTION.

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Δ	2/27/12	REVISED PER ADDENDUM NO. 3	MRB
NO.	DATE	R E V I S I O N	
			REVIEWED

DRAWN: BW2
DESIGN: MRB
REVIEWED: JFW
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DATE: DECEMBER 2011
DWG. NAME: 1487GENNOTE

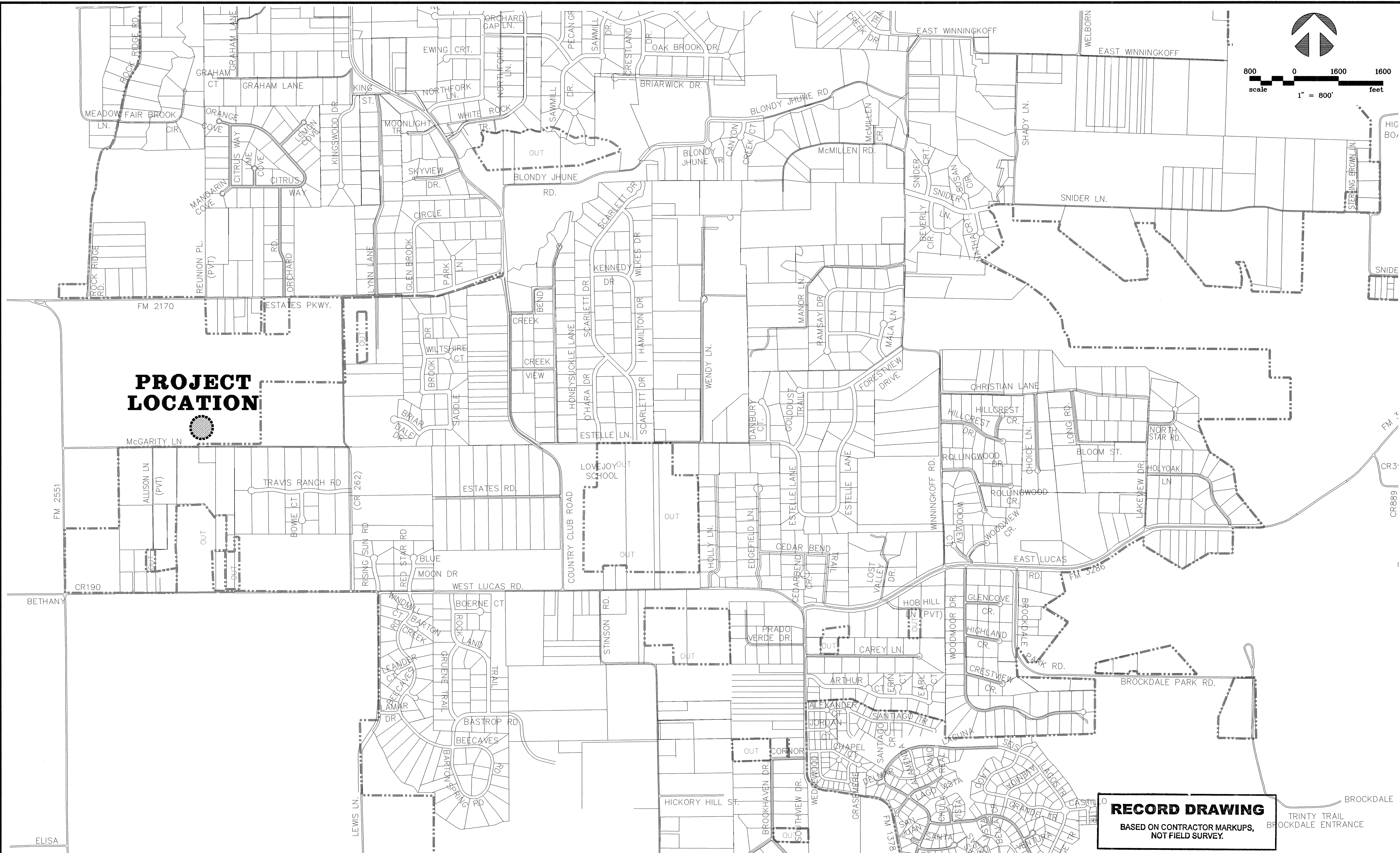


BW2 Engineers, Inc.
1919 S. Shiloh Road
Suite 500, L.B. 27
Garland, Texas 75042
(972) 864-8200 (T) (972) 864-8220 (F)
Firm Registration No. F-5290



WATER SYSTEM IMPROVEMENTS
McGARITY GROUND STORAGE TANK
AND PUMP STATION
PROJECT GENERAL NOTES
CITY OF LUCAS

SHEET NO. C1
OF C11 SHEETS
JOB NO. 11-1487



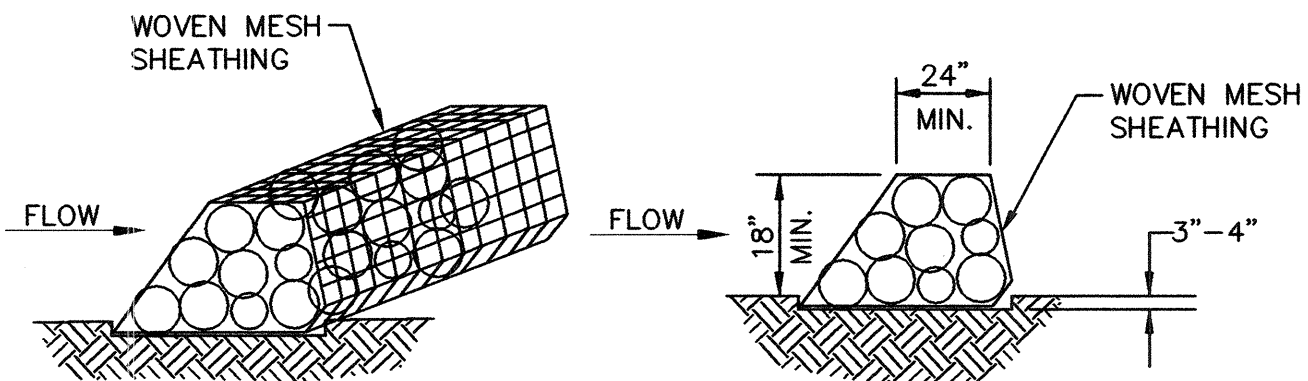
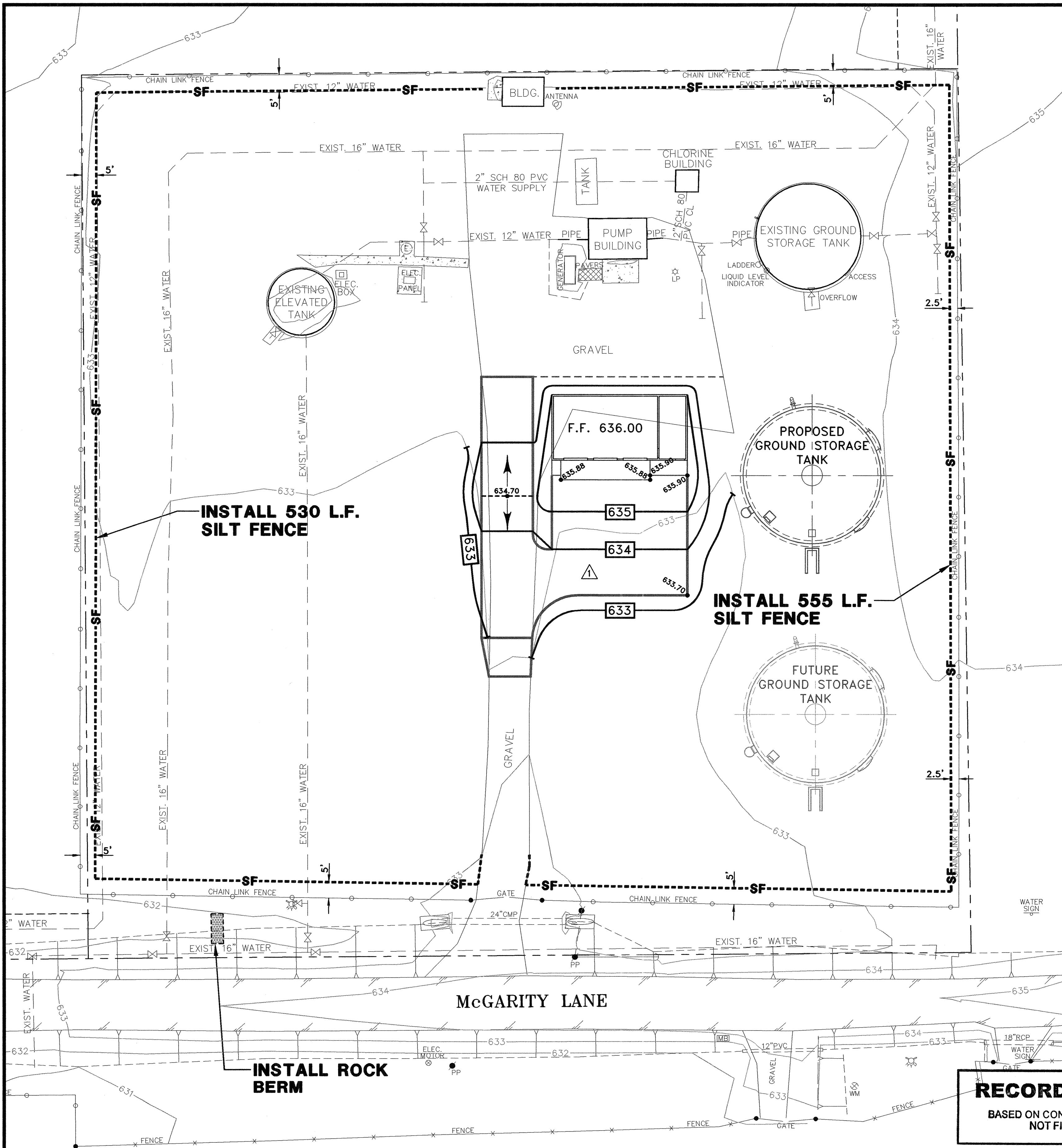
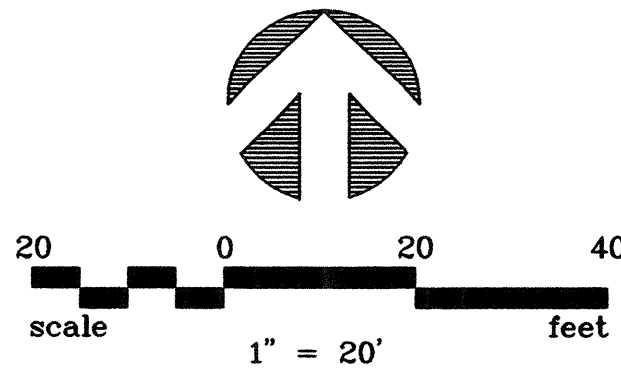
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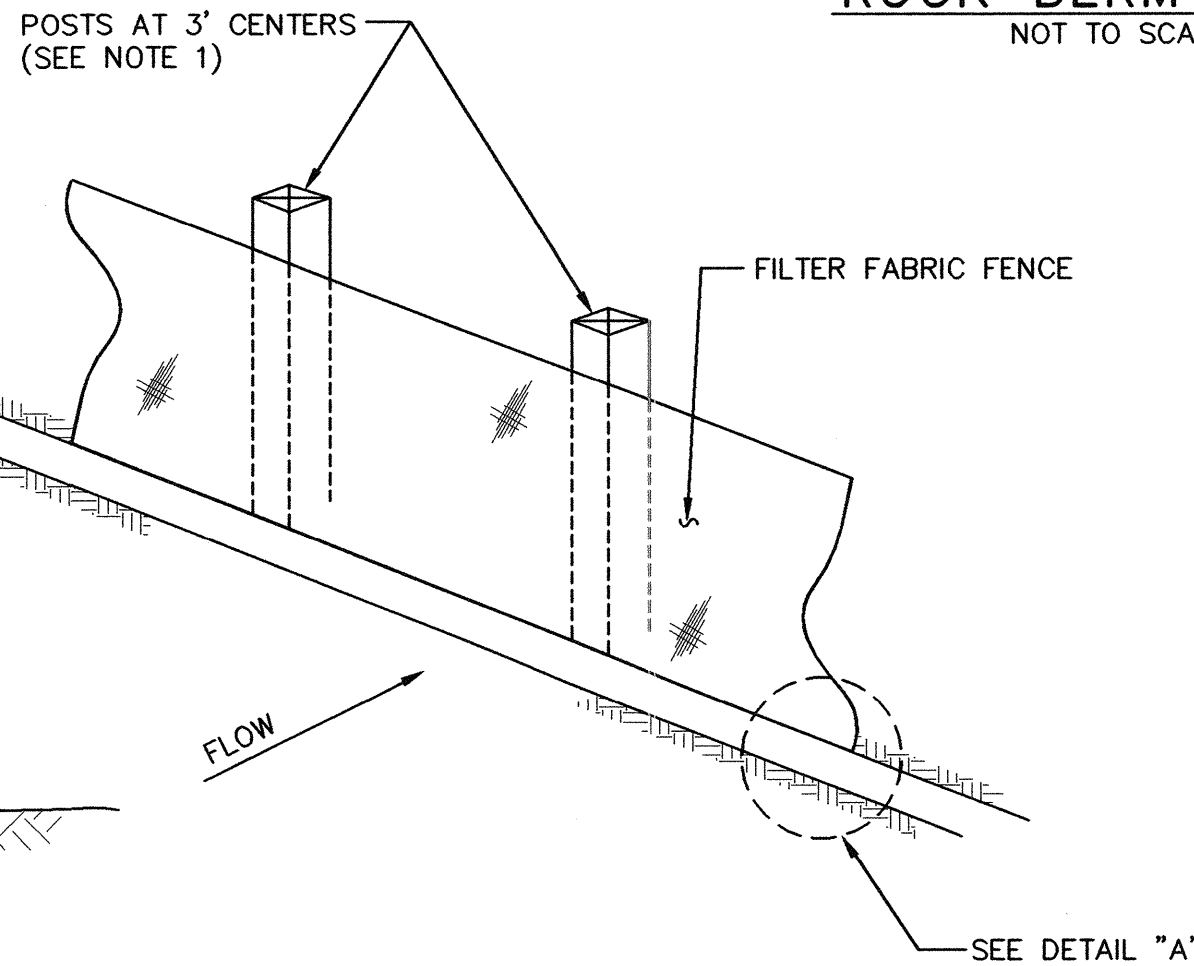
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OF C11 SHEETS
JOB NO. 11-1487

EROSION CONTROL NOTES:

1. EROSION CONTROL DEVICES AS SHOWN ON THE EROSION CONTROL PLAN FOR THE PROJECT SHALL BE INSTALLED PRIOR TO THE START OF LAND DISTURBING ACTIVITIES ON THE PROJECT.
2. ALL EROSION CONTROL DEVICES ARE TO BE INSTALLED IN ACCORDANCE WITH THE APPROVED PLANS AND SPECIFICATIONS FOR THE PROJECT. CHANGES ARE TO BE APPROVED BEFORE CONSTRUCTION BY THE DESIGN ENGINEER AND CITY OF LUCAS.
3. IF THE EROSION CONTROL PLANS AS APPROVED CANNOT CONTROL EROSION AND OFF-SITE SEDIMENTATION FROM THE PROJECT, THE EROSION CONTROL PLAN WILL BE REQUIRED TO BE REVISED AND/OR ADDITIONAL EROSION CONTROL DEVICES WILL BE REQUIRED ON SITE.
4. IF OFF-SITE SOIL BORROW OR SPOIL SITES ARE USED IN CONJUNCTION WITH THIS PROJECT, THIS INFORMATION SHALL BE DISCLOSED AND SHOWN ON THE EROSION CONTROL PLAN. STAGING, BORROW, AND SPOIL AREAS (INCLUDING THOSE LOCATED OFF-SITE) ARE CONSIDERED A PART OF THE PROJECT SITE AND THEREFORE SHALL COMPLY WITH THE CITY OF LUCAS'S EROSION CONTROL REQUIREMENTS. PERIMETER CONTROLS WILL BE PROVIDED BY THE CONTRACTOR FOR THESE AREAS. THEY SHALL BE STABILIZED WITH PERMANENT GROUND COVER PRIOR TO FINAL APPROVAL OF THE PROJECT.
5. ALL EROSION CONTROL DEVICES SHALL BE INSPECTED WEEKLY BY THE CONTRACTOR AND AFTER ALL MAJOR RAIN EVENTS. ANY DEVICES THAT ARE DAMAGED OR DISPLACED WILL BE RESTORED (NO SEPARATE PAY).
6. ALL NON-IMPERVIOUS AREAS AFTER CONSTRUCTION SHALL BE COVERED WITH SOD OR LANDSCAPED IN ACCORDANCE WITH THE LANDSCAPE DRAWINGS. ALL OTHER REMAINING AREAS SHALL BE HYDROMULCHED OR COVERED WITH CURLEX BLANKET (WHERE SHOWN) AND MAINTAINED UNTIL ESTABLISHED.
7. TEMPORARY STONE STABILIZED CONSTRUCTION ENTRANCE SHALL HAVE THE FOLLOWING MINIMUM DIMENSIONS (UNLESS OTHERWISE SHOWN): 25' WIDE X 50' LONG X 8" DEEP. (3"-5" COURSE AGGREGATE). PLACE FILTER FABRIC UNDER STONE PER NCTCOG ITEM 2.23.3.
8. THE STABILIZED CONSTRUCTION ENTRANCE IS TO BE USED AS A VEHICLE WASH DOWN AREA FOR DEBRIS AND SOIL REMOVAL PRIOR TO EXITING THE SITE. THIS STABILIZED ENTRANCE SHALL BE TOP DRESSED WITH ADDITIONAL STONE AS NECESSARY. LOCATION OF STABILIZED ENTRANCE MAY BE MODIFIED IF APPROVED BY CITY OF LUCAS AND THE DESIGN ENGINEER.
9. THE CONTRACTOR SHALL BE RESPONSIBLE, AS THE ENTITY EXERCISING OPERATIONAL CONTROL, FOR ALL PERMITTING AS REQUIRED BY THE EPA/TCEQ. THIS INCLUDES, BUT IS NOT LIMITED TO, MEETING ALL REQUIREMENTS OF TPDES GENERAL PERMIT TXR150000 AND PAYMENT OF ALL ASSOCIATED FEES.
10. IT SHOULD BE NOTED THAT THE AREA OF IMPACT ON THIS PROJECT WILL REQUIRE A SMALL CONSTRUCTION PERMIT THROUGH TCEQ.
11. IT IS VERY IMPORTANT THAT MUD AND OTHER DEBRIS BE KEPT OFF ALL ROADS. CONTRACTOR SHALL IMMEDIATELY REMOVE ANY MUD AND DEBRIS DEPOSITED ON ROADS.
12. CONTRACTOR WILL REPLACE ANY EROSION CONTROL DEVICES THAT ARE DAMAGED AND/OR DISPLACED DURING CONSTRUCTION (NO SEPARATE PAY).



ROCK BERM DETAIL
NOT TO SCALE



FILTER FABRIC FENCE
NOT TO SCALE

NOTES:

1. IF FACTORY PREASSEMBLED FENCE WITH SUPPORT NETTING IS USED, SPACING OF POSTS MAY INCREASE TO 8' MAXIMUM.
2. FILTER FABRIC SHALL BE AS PER ASTM D4833.
3. WHEN TWO SECTIONS OF FILTER FABRIC ADJOIN EACH OTHER, PROVIDE 6\"/>

LEGEND:

- SF--- SILT FENCE
- [Pattern] ROCK BERM

RECORD DRAWING

BASED ON CONTRACTOR MARKUPS,
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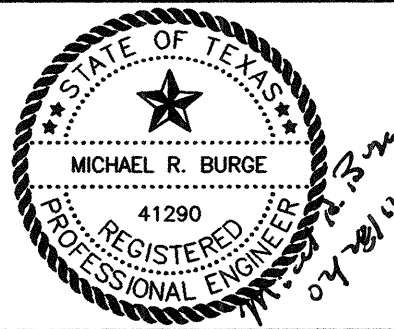
DETAIL "A"
NOT TO SCALE

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NO.	DATE	REVISION	REVIEWED

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DESIGN: MRB
REVIEWED: JFW
SCALE: 1" = 20'
DATE: DECEMBER 2011
DWG. NAME: 1487GRADING

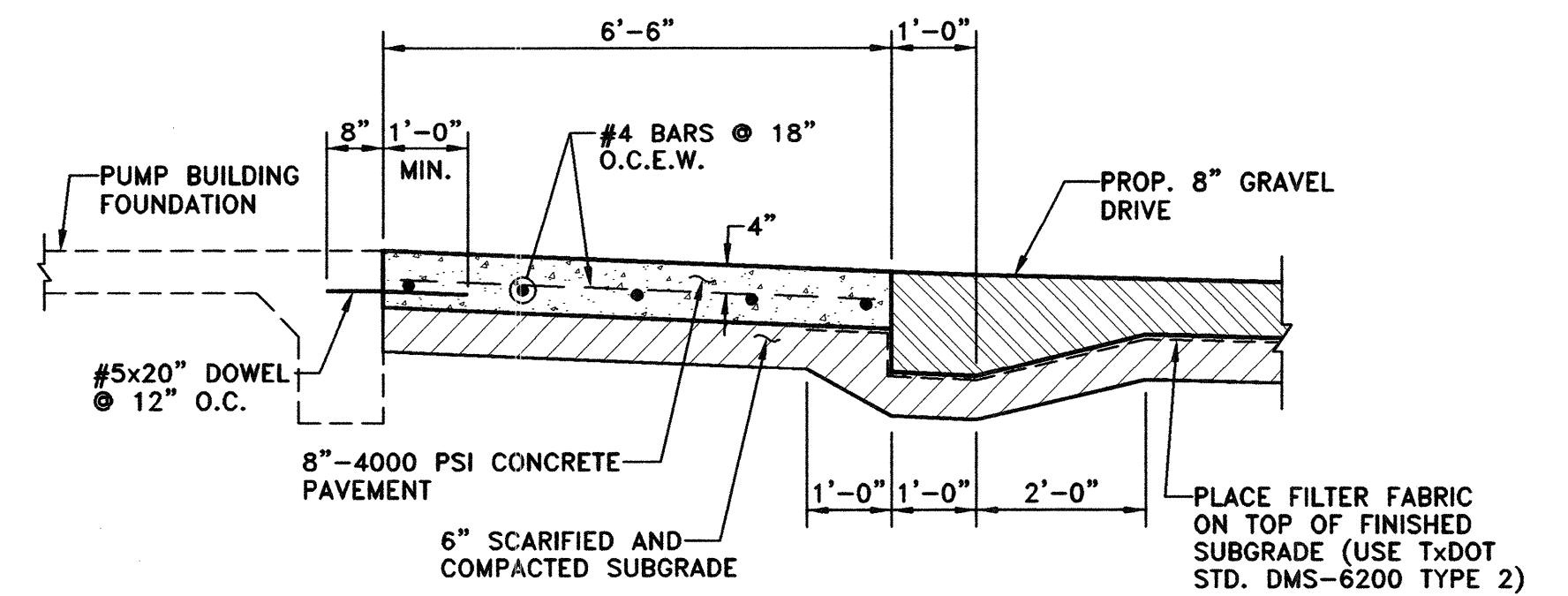
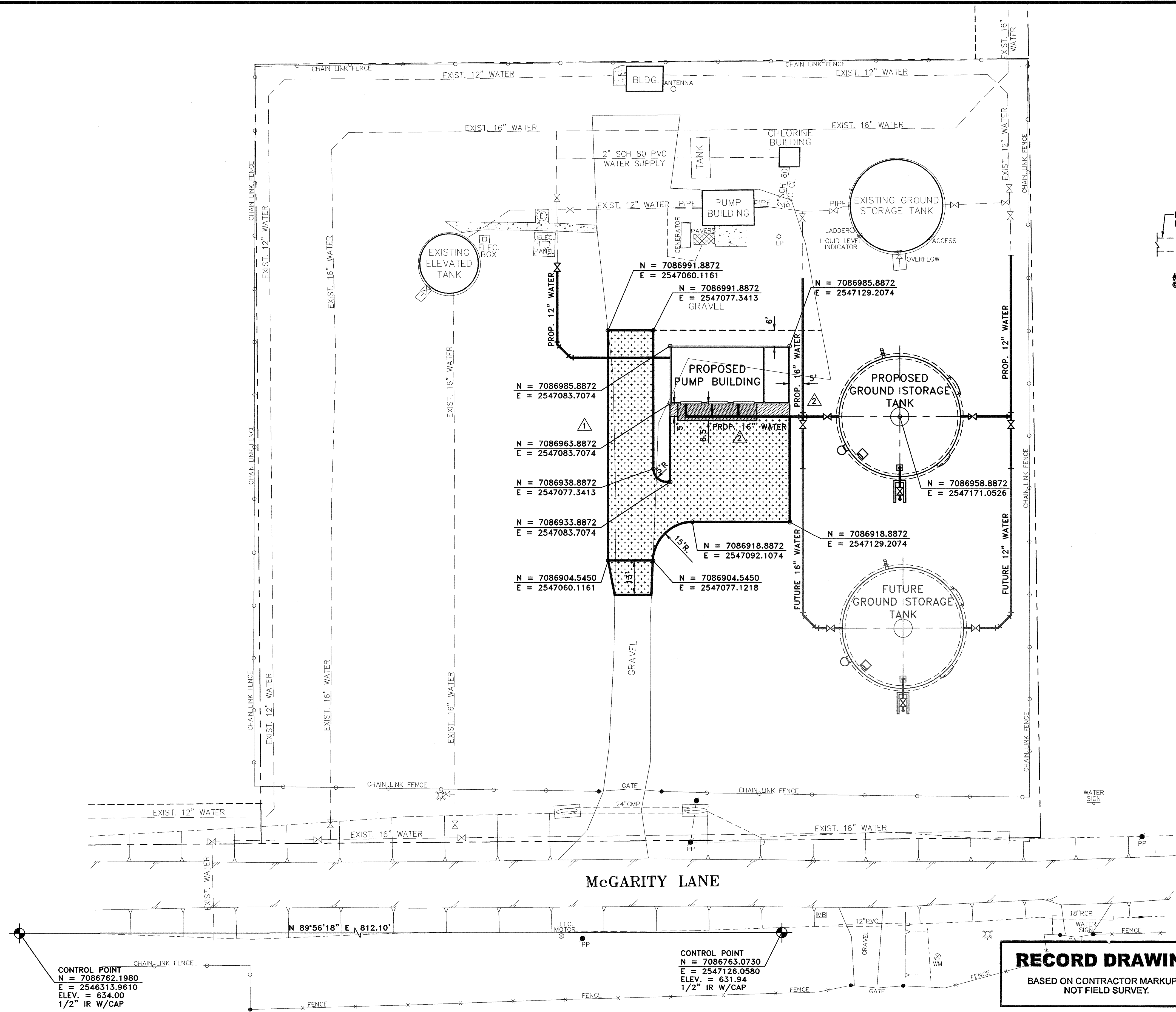
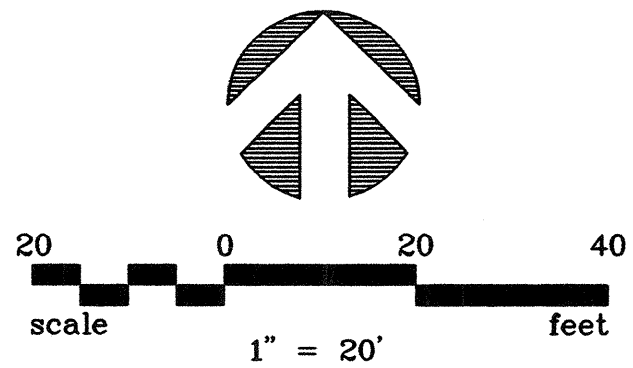


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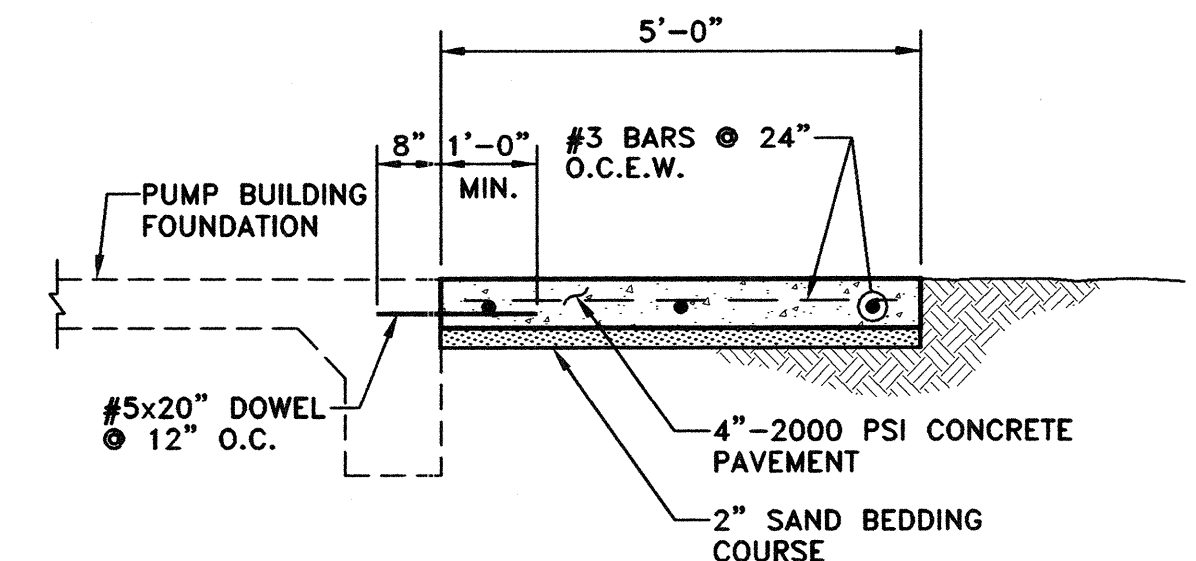


WATER SYSTEM IMPROVEMENTS
McGARITY GROUND STORAGE TANK
AND PUMP STATION
GRADING AND EROSION CONTROL PLAN
CITY OF LUCAS

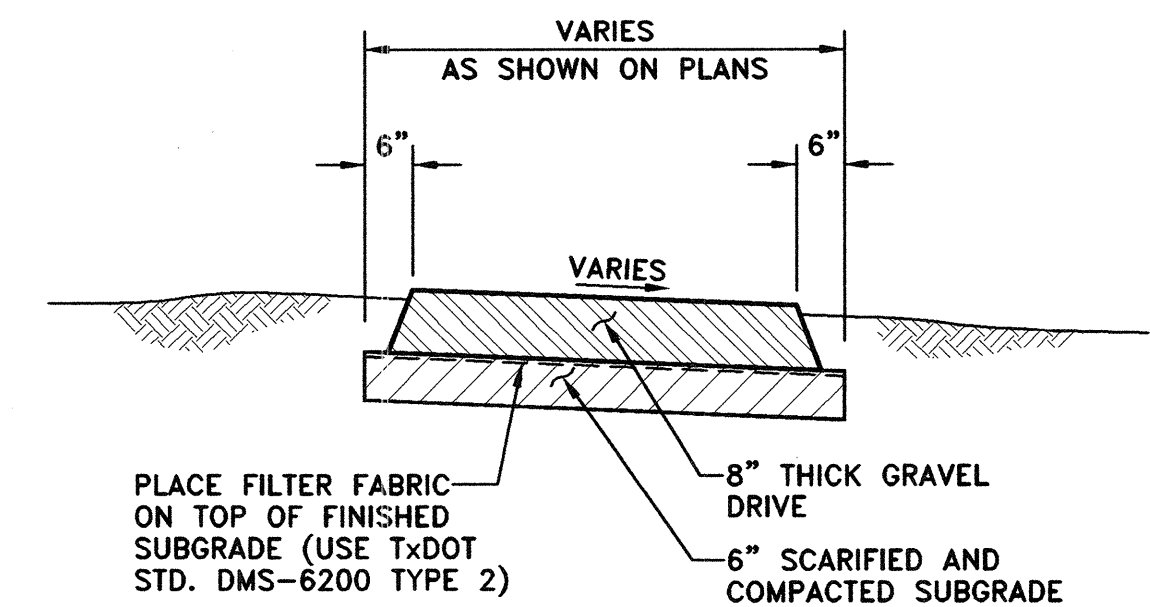
SHEET NO. C3
OF C11 SHEETS
JOB NO. 11-1487



CONCRETE DRIVE SECTION
NOT TO SCALE



CONCRETE SIDEWALK SECTION
NOT TO SCALE



GRAVEL DRIVE SECTION
NOT TO SCALE

NOTES:

1. SLOPE OF PROPOSED GRAVEL DRIVE SHALL MATCH EXISTING GROUND SLOPE UNLESS NOTED OTHERWISE WITH SPOT ELEVATIONS ON PLAN VIEW.
2. AFTER EXCAVATION AND CONSTRUCTION OF PROPOSED GRAVEL DRIVE, BACKFILL REMAINING VOIDS UP TO NEW GRAVEL DRIVE WITH EXISTING EXCAVATED MATERIALS. HOWEVER, THIS MATERIAL MUST BE FREE OF ROCKS AND DEBRIS AND SUITABLE FOR VEGETATIVE GROWTH.

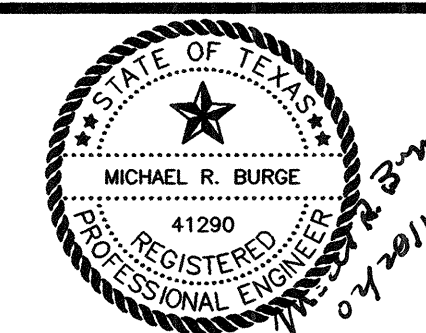
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1	1/18/12	REVISED PER ADDENDUM NO. 3	MRB	
NO.	DATE	REVISION	REVIEWED	

DRAWN: BW2
DESIGN: MRB
REVIEWED: JFW
SCALE: 1" = 20'
DATE: DECEMBER 2011
PROJECT NAME: 1487 SITE

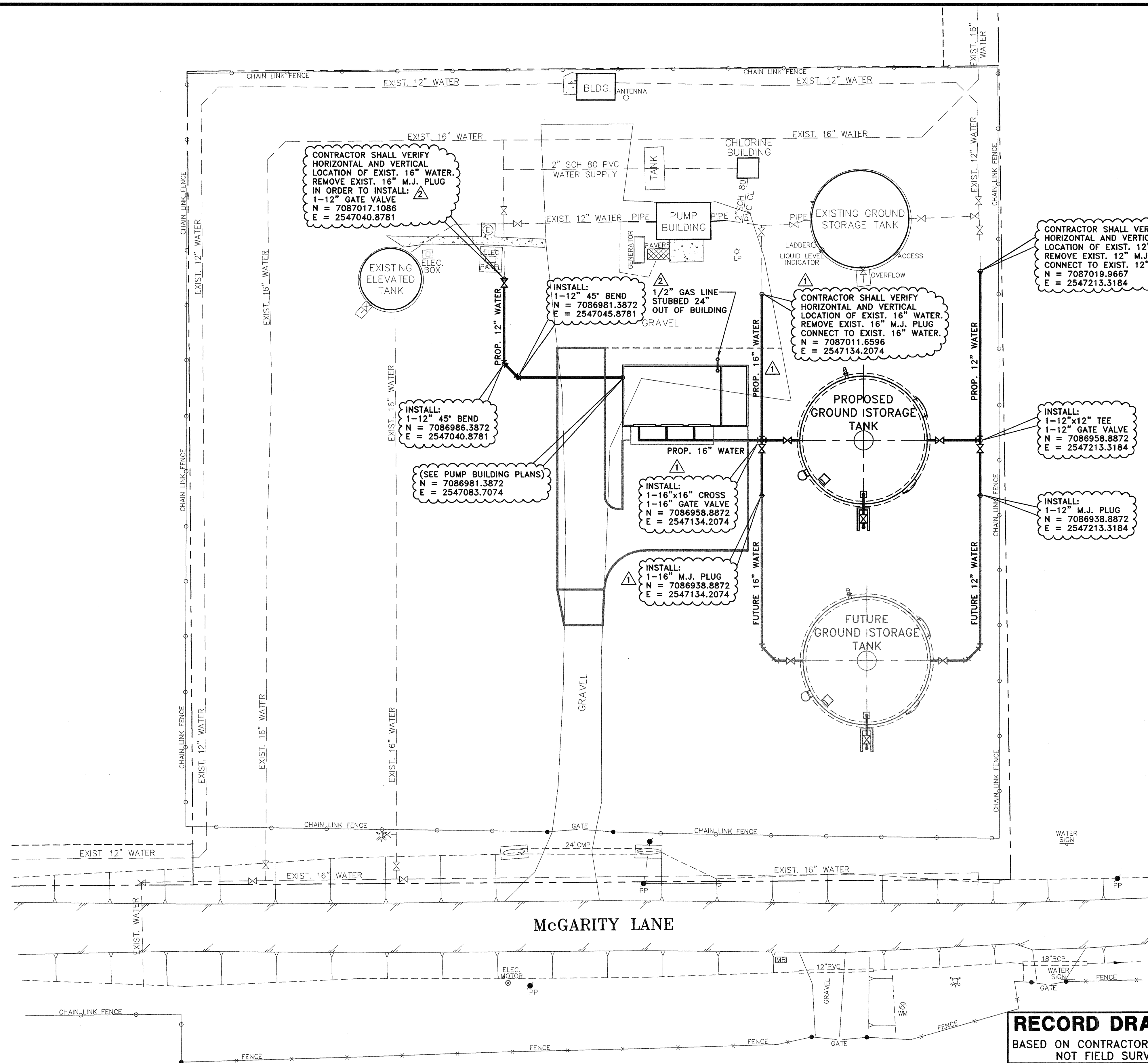
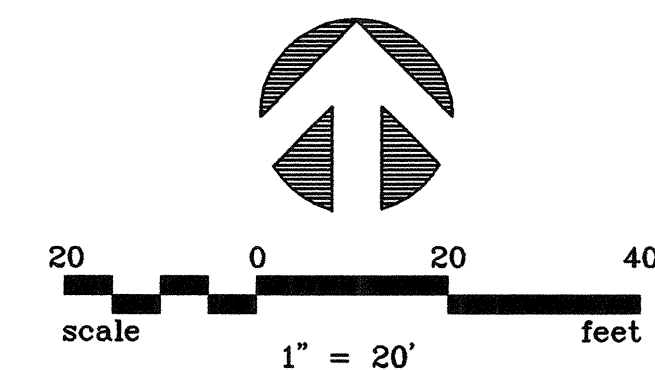


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WATER SYSTEM IMPROVEMENTS
McGARITY GROUND STORAGE TANK
AND PUMP STATION
SITE PLAN
CITY OF LUCAS

SHEET NO. **C4**
OF **C11** SHEETS
JOB NO. **11-1487**



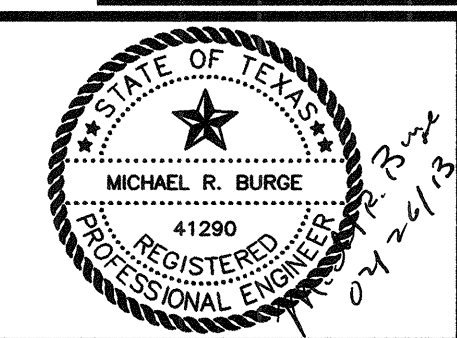
- NOTES:**
1. A 3M LOCATOR COMPATIBLE WITH TYPE 1265 SHALL BE FURNISHED AND INSTALLED NO DEEPER THAN 4 FEET BY THE CONTRACTOR BESIDE ALL VALVES AND ABOVE ALL BENDS ON THE PROPOSED WATER LINE.
 2. EMBEDMENT FOR THE PROPOSED WATER LINES SHALL BE CLASS "B+".
 3. BURIED 12" WATER LINES SHALL BE POLYVINYL CHLORIDE (PVC) AWWA C900, DR-18.
 4. ALL BURIED WATER MAINS SHALL HAVE A MINIMUM 5' COVER.
 5. CONTRACTOR IS RESPONSIBLE FOR LOCATING ALL EXISTING BURIED LINES. LOCATIONS OF PIPELINES SHOWN ON THE PLANS ARE APPROXIMATE AND ARE TO THE BEST KNOWLEDGE OF THE CITY. CONTRACTOR SHALL MAKE ALL REPAIRS TO EXISTING LINES DAMAGED DURING CONSTRUCTION WORK AND SHALL HAVE MATERIALS ON HAND TO MAKE SUCH REPAIRS.
 6. MEGA-LUGS AND THRUST BLOCKING SHALL BE FURNISHED AND INSTALLED ON ALL BENDS, VALVES, AND OTHER FITTINGS THAT ARE REQUIRED FOR THE PROPOSED WATER LINES. MEGA-LUGS SHALL ALSO BE INSTALLED ON ALL PIPE JOINTS. ALL OF THE BURIED FITTINGS SHALL BE OF MECHANICAL JOINT TYPE WITH A MINIMUM WORKING PRESSURE OF 250 PSI.
 7. CONTRACTOR SHALL FURNISH AND INSTALL A TRACER WIRE THAT IS COMPATIBLE WITH AND WILL ALLOW DETECTION BY RADIODETECTION CORPORATION'S DIGITAL PXL-2 PIPE LOCATOR OR EQUAL, PER CITY'S INSTRUCTIONS. THE TRACER WIRE SHALL BE INSTALLED JUST ABOVE THE PROPOSED WATER LINES AND THROUGHOUT THE LENGTH OF THE WATER LINES. THE TRACER WIRE SHALL BE MINIMUM 14 GAUGE WIRE.
 8. FOR PUMP BUILDING AND GROUND STORAGE TANK PIPING, REFER TO THE PUMP BUILDING PIPING PLAN AND GROUND STORAGE TANK - PLAN AND ELEVATION.
 9. CONTRACTOR SHALL INSTALL THE 4" PVC DRAIN LINE DIRECTLY TO THE EAST AT THE SAME SLOPE (1/8" PER FOOT) UNTIL THE DRAIN LINE EMERGES THROUGH THE SIDE OF THE BANK ON THE EAST SIDE OF THE PUMP BUILDING.
 10. BURIED 16" WATER LINES SHALL BE POLYVINYL CHLORIDE (PVC) AWWA C905, DR-18.

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Δ	1/29/13	REVISED PER CONTRACTOR MARKUPS	MRB
Δ	2/27/12	REVISED PER ADDENDUM NO. 4	MRB
NO.	DATE	REVISION	REVIEWED

DRAWN: BW2
 DESIGN: MRB
 REVIEWED: JFW
 SCALE: 1" = 20'
 DATE: DECEMBER 2011
 DWG. NAME: 1487YARDPIPE

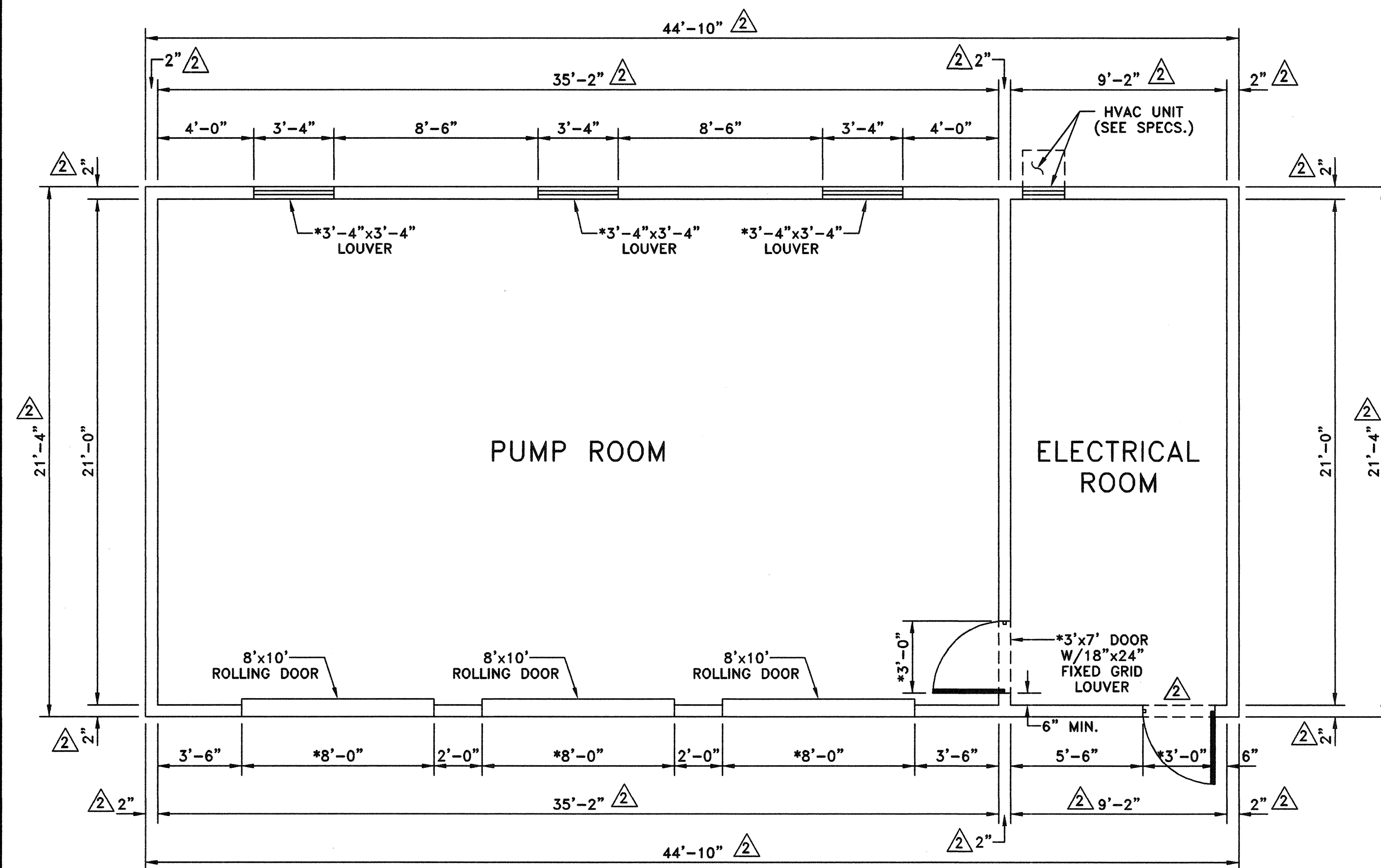


BW2 Engineers, Inc.
 1919 S. Shiloh Road
 Suite 500, L.B. 27
 Garland, Texas 75042
 (972) 864-8200 (T) (972) 864-8220 (F)
 Firm Registration No. F-5290



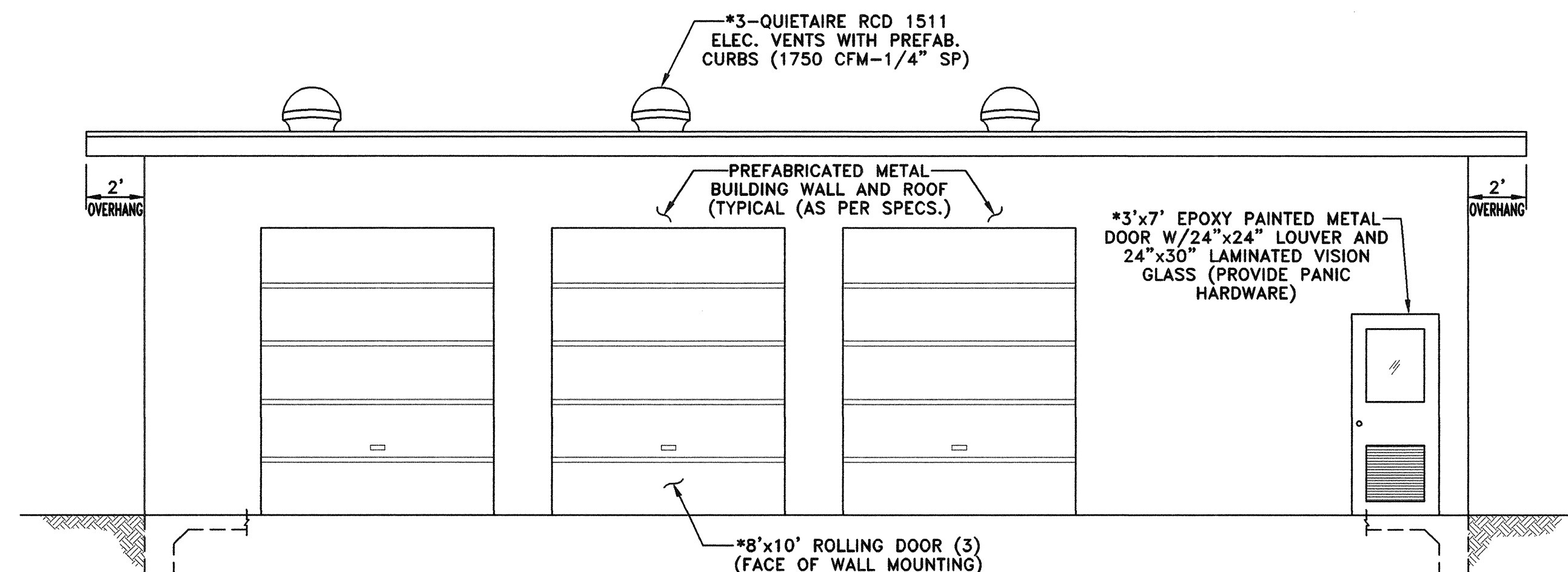
WATER SYSTEM IMPROVEMENTS
McGARITY GROUND STORAGE TANK
AND PUMP STATION
YARD PIPING PLAN
CITY OF LUCAS

SHEET NO. **C5**
 OF **C11** SHEETS
 JOB NO. **11-1487**



*CONTRACTOR TO VERIFY DIMENSION WITH EQUIPMENT MANUFACTURER.

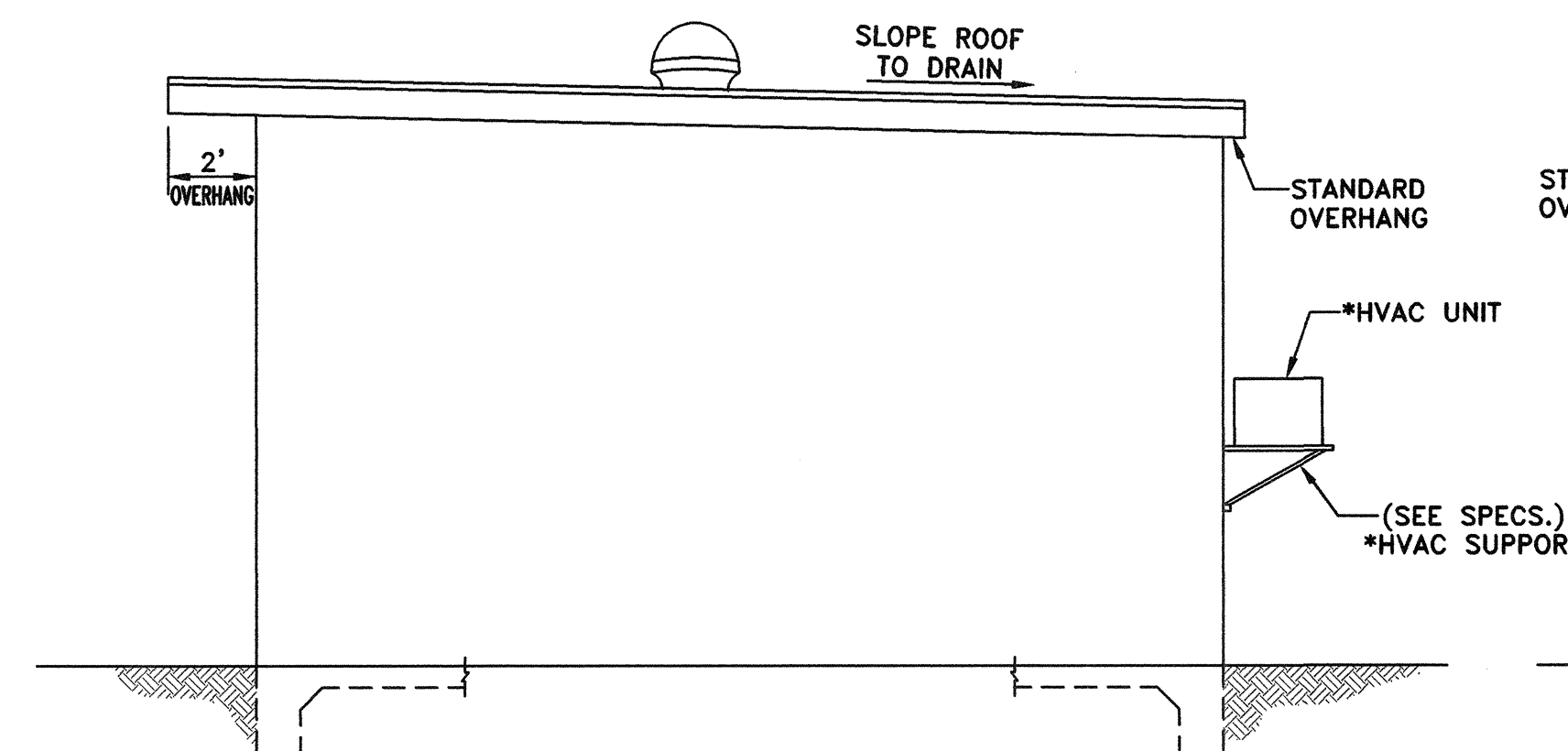
FLOOR PLAN
SCALE: 1/4" = 1'-0"



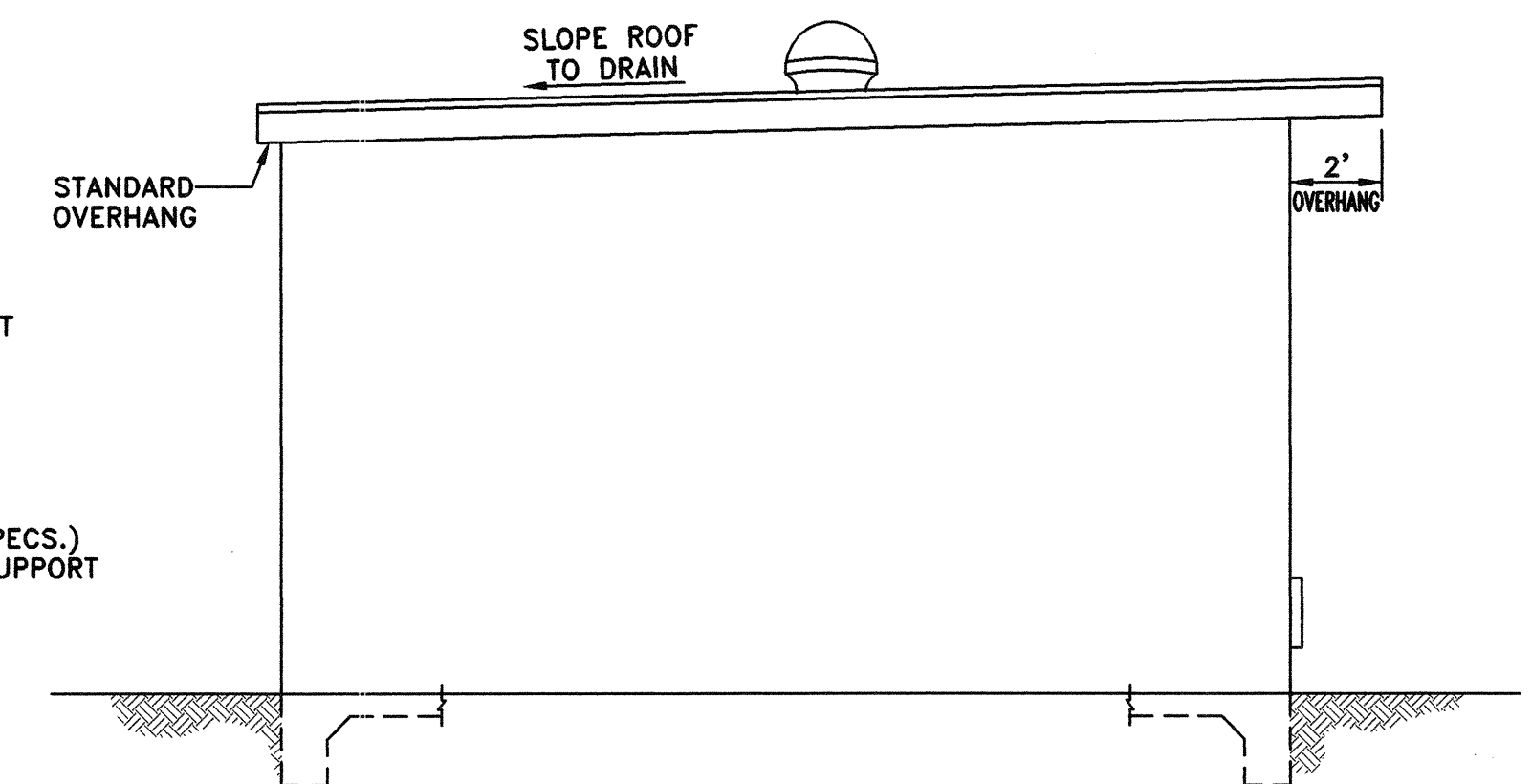
FRONT (SOUTH) ELEVATION
SCALE: 1/4" = 1'-0"

NOTES:

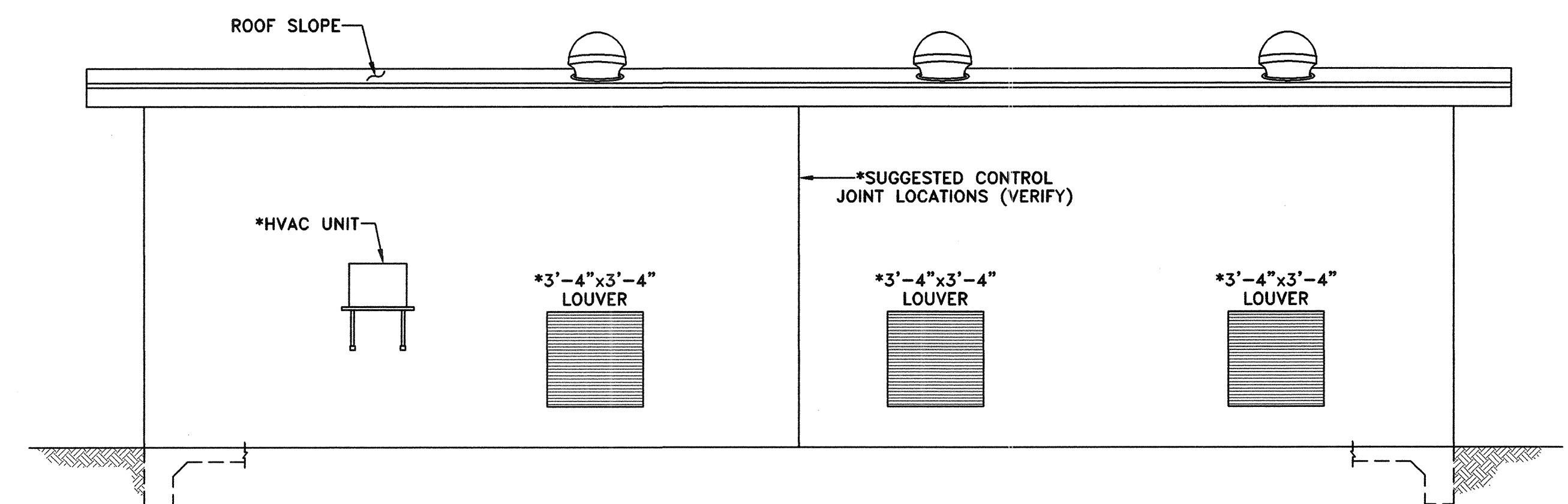
1. ROOF MUST BE DESIGNED TO ACCOMMODATE TEMPERATURE CHANGES, ROOF EXPANSION AND CONTRACTION MOVEMENTS.
2. THERE SHALL BE NO CRACKS, BLISTERS, AND SPITS ON WALLS AND ROOF FOR THE DURATION OF THE WARRANTY TIME.
3. PREFABRICATED METAL BUILDING SHALL BE DESIGNED TO ACCOMMODATE AND CARRY THE MAXIMUM ALLOWABLE WIND UPLIFT FOR THE SITE AREA.
4. THE ROLLING DOORS FOR THE PUMP BUILDING SHALL BE CHAIN HOIST OPERATED.
5. THE SIDEWALLS OF THE BUILDING SHALL BE OF A MINIMUM HEIGHT TO SUPPORT THE 8 FOOT BY 10 FOOT ROLLING DOORS (MINIMUM HEIGHT OF THE SIDEWALLS SHALL BE 12 FEET). SOFFITS AS RECOMMENDED (PER THE MANUFACTURER) AS PART OF THE BUILDING MANUFACTURER STANDARDS SHALL BE PROVIDED ON THE ROOF OVERHANGS.
6. THERE SHALL BE TWO (2) PROPANE HEATERS INSTALLED IN THE PUMP ROOM. SEE SHEET M-1 FOR FURTHER DETAILS. THE CONTRACTOR SHALL INSTALL PIPING FOR PROPANE HEATERS. BURIED PIPING SHALL BE HDPE AND EXPOSED PIPING SHALL BE BLACK IRON PIPE (EXPOSED PIPING SHALL BE THE MINIMUM REQUIRED TO REACH THE SLAB). THE PIPING FOR THE PROPANE HEATERS SHALL BE INSTALLED UNDER THE SLAB TO A POINT APPROXIMATELY TWO (2) FEET NORTH OF THE PUMP BUILDING. THE PIPING SHALL BE PLUGGED AT THIS POINT. THE PROPANE TANK, SUPPORT SLAB, AND ALL OTHER ACCESSORIES RELATED TO THE PROPANE SHALL BE PROVIDED BY OTHERS.
7. A STAINLESS STEEL SINK SHALL BE INSTALLED IN THE PUMP ROOM ON THE INTERNAL WALL. THE INTERNAL WALL SHALL BE OF A SUFFICIENT STRENGTH TO SUPPORT THE SINK. THE SINK SHALL BE MODEL ELKAY MODEL ELV1817 OR APPROVED EQUAL. A COPPER COLD-WATER TAP SHALL BE RUN UNDER THE SLAB FROM THE SUCTION PIPE NEAREST THE SINK TO THE SINK. THE DRAIN FROM THE SINK SHALL BE CONNECTED TO THE 4-INCH DRAIN PIPE UNDER THE PUMP BUILDING.
8. NO FIELD PAINTING WILL BE REQUIRED ON THE PUMP BUILDING.
9. DOOR HARDWARE IN THE BUILDING SHALL BE STANDARD HARDWARE PROVIDED BY THE BUILDING MANUFACTURER.
10. THE ROLLING DOORS SHALL BE GALVANIZED STEEL WITH A GRAY PRIME FINISH AND THE DOOR SHALL BE INSULATED SIMILAR TO WHAT IS PROVIDED IN THE BUILDING.
11. THE INTERNAL WALL BETWEEN THE PUMP ROOM AND THE ELECTRICAL ROOM SHALL BE FURNISHED BY THE BUILDING MANUFACTURER. THIS WALL SHALL BE OF THE SAME MATERIAL AND DESIGN AS THE OUTER WALL OF THE BUILDING.



SIDE (EAST) ELEVATION
SCALE: 1/4" = 1'-0"



SIDE (WEST) ELEVATION
SCALE: 1/4" = 1'-0"



RECORD DRAWING
BASED ON CONTRACTOR MARKUPS,
NOT FIELD SURVEY.

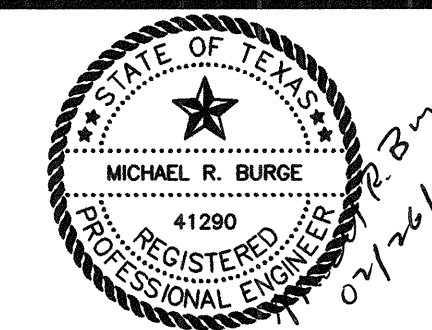
BACK (NORTH) ELEVATION
SCALE: 1/4" = 1'-0"

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2	1/29/13	REVISED PER CONTRACTOR MARKUPS	MRB
1	2/27/12	REVISED PER ADDENDUM NO. 4	MRB
NO.	DATE	REVISION	REVIEWED

DRAWN: BW2
DESIGN: MRB
REVIEWED: JFW
SCALE: 1/4" = 1'-0"
DATE: DECEMBER 2011
DWG. NAME: 1487PLAN-ELEV

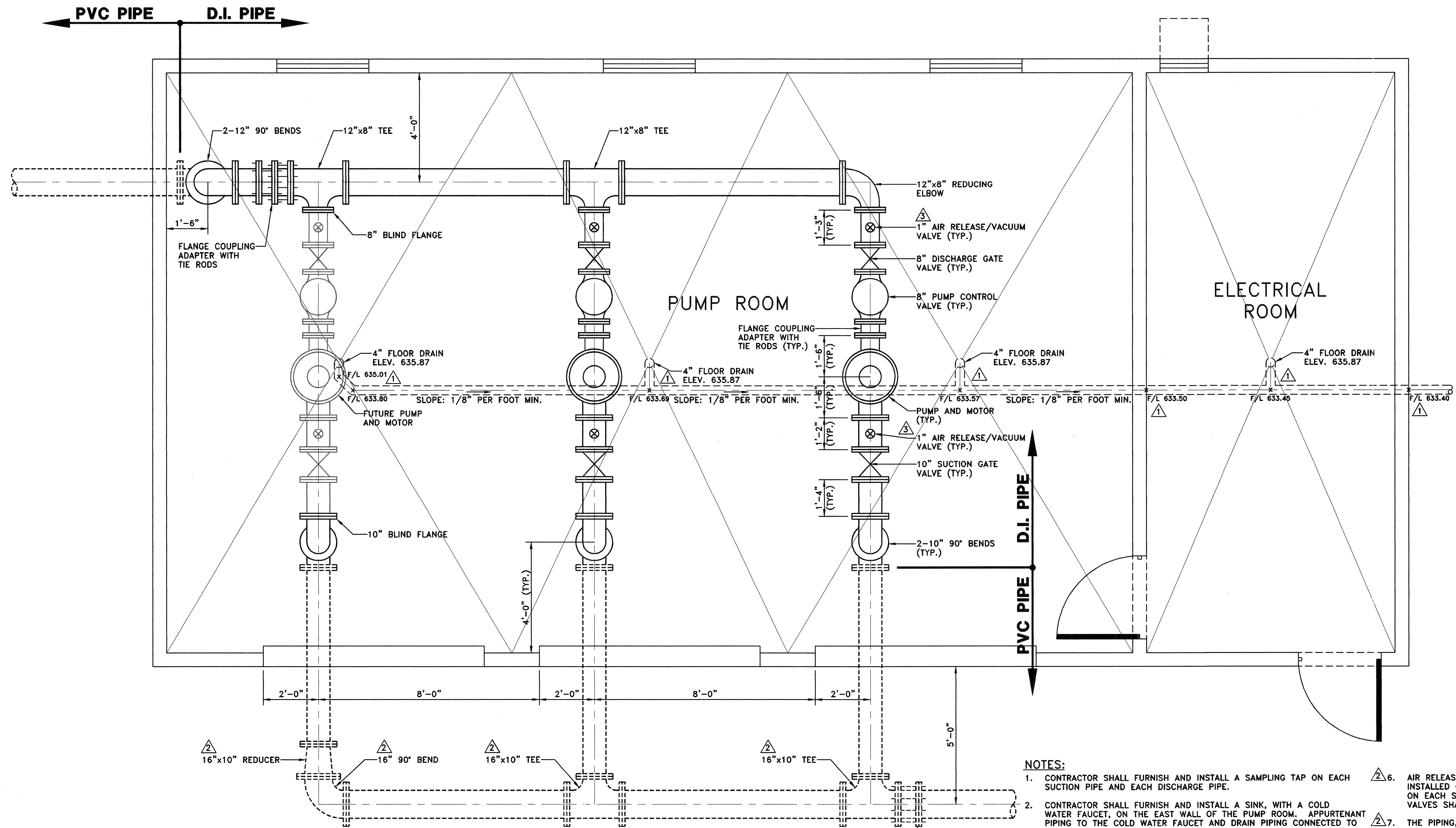


BW2 Engineers, Inc.
1919 S. Shiloh Road
Suite 500, L.B. 27
Garland, Texas 75042
(972) 864-8200 (T) (972) 864-8220 (F)
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WATER SYSTEM IMPROVEMENTS
McGARITY GROUND STORAGE TANK
AND PUMP STATION
PUMP BUILDING PLAN AND ELEVATION
CITY OF LUCAS

SHEET NO. C6
OF C11 SHEETS
JOB NO. 11-1487



PUMP BUILDING PIPING PLAN

SCALE: 1/2" = 1'-0"

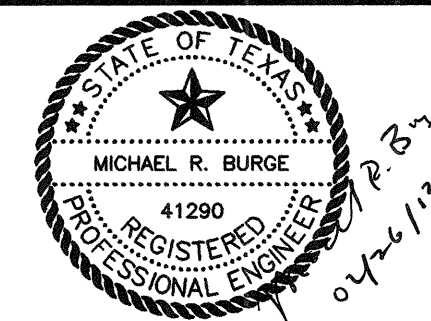
RECORD DRAWING
BASED ON CONTRACTOR MARKUPS,
NOT FIELD SURVEY.

NO.	DATE	REVISION	REVIEWED
6			
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3	1/29/13	REVISED PER CONTRACTOR MARKUPS	MRB
2	2/27/12	REVISED PER ADDENDUM NO. 4	MRB
1	1/18/12	REVISED PER ADDENDUM NO. 3	MRB

DRAWN: BW2
DESIGN: MRB
REVIEWED: JFW
SCALE: 1/2" = 1'-0"
DATE: DECEMBER 2011
DWG. NAME: 1487PUMP-PIPE

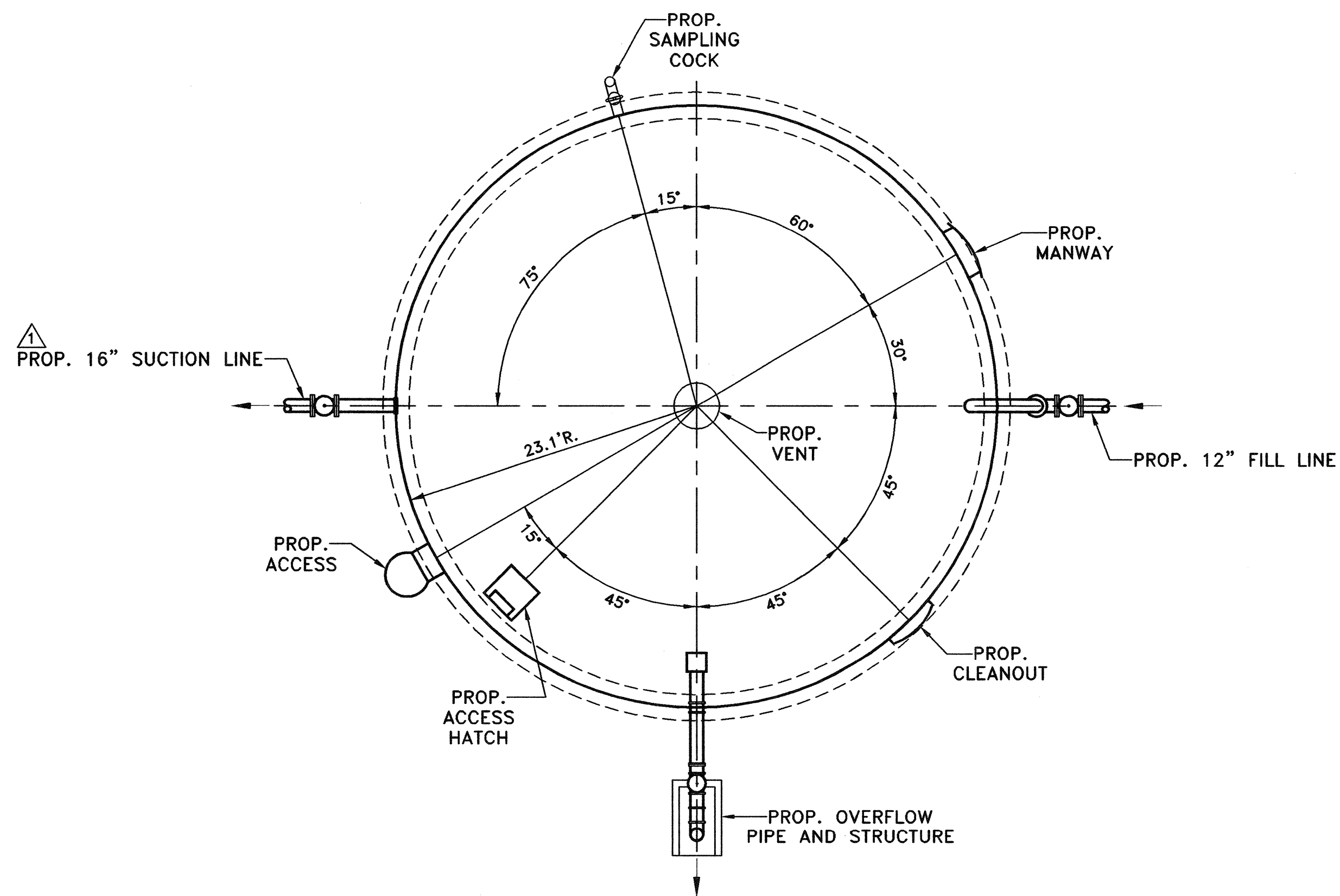


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1919 S. Shiloh Road
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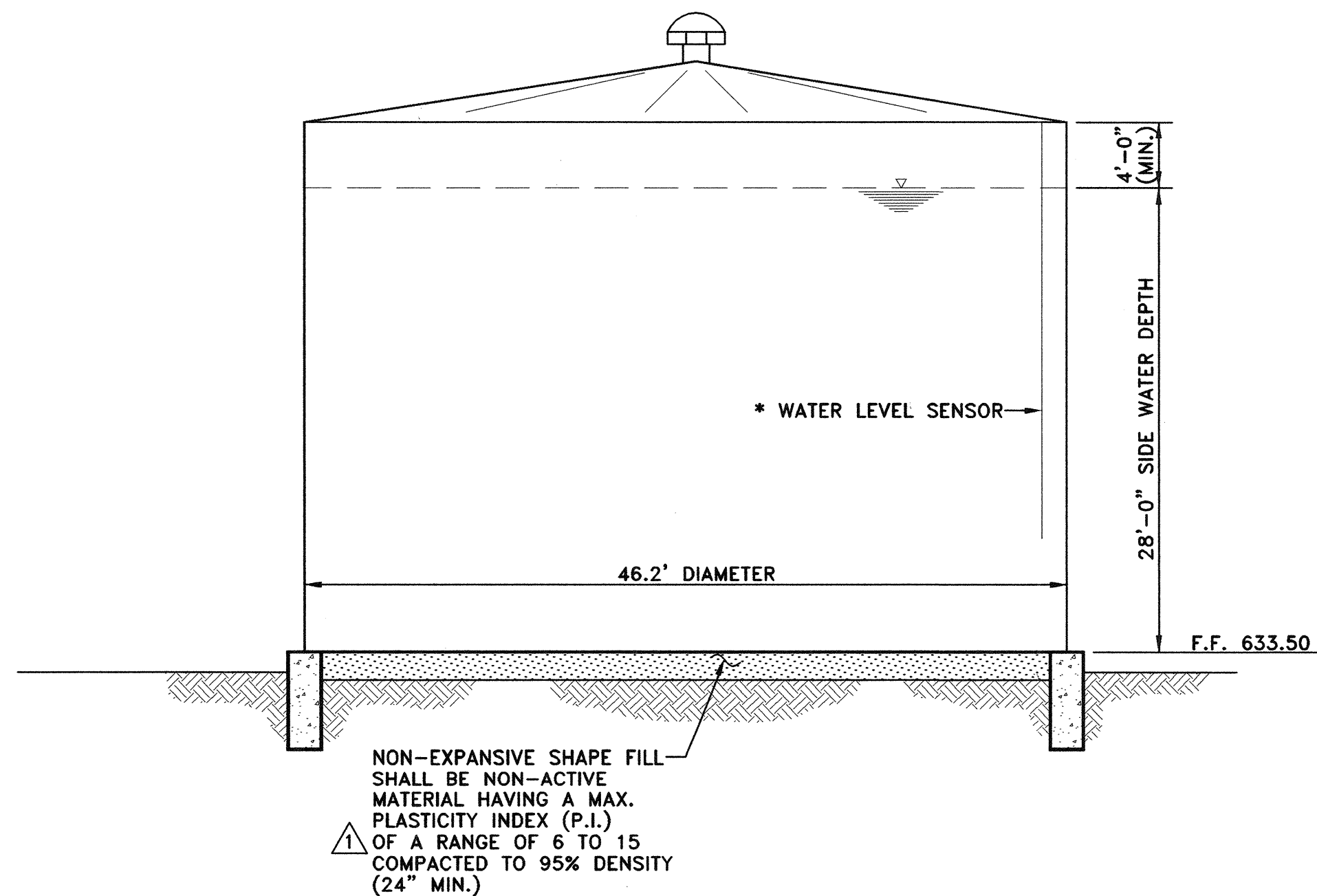


WATER SYSTEM IMPROVEMENTS
McGARITY GROUND STORAGE TANK
AND PUMP STATION
PUMP BUILDING PIPING PLAN
CITY OF LUCAS

SHEET NO. C7
OF C11 SHEETS
JOB NO. 11-1487



PROPOSED GROUND STORAGE TANK - PLAN
N.T.S.



PROPOSED GROUND STORAGE TANK - ELEVATION
N.T.S.

RECORD DRAWING
BASED ON CONTRACTOR MARKUPS,
NOT FIELD SURVEY.

NOTES:

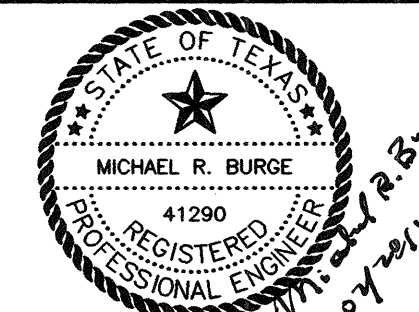
1. PROPOSED TANK SHALL BE CONSTRUCTED AT ELEVATIONS SHOWN ON THIS SHEET.
2. TANK ACCESSORIES SHALL BE LOCATED ON TANK AS SHOWN ON THIS SHEET.
3. GROUND STORAGE TANK SHALL BE STEEL WELDED AS PER AWWA-D-100.
4. STRUCTURAL PER STRUCTURAL SPECS AND DETAILS.
5. ON SHEET S1.0, IN DETAIL 02, CHANGE THE REFERENCE TO THE PLASTICITY INDEX (PI) OF THE NON-EXPANSIVE SHAPED FILL UNDER THE TANK FROM 20 TO A RANGE OF 6 TO 15.
6. ON SHEET S1.0, IN DETAIL 05, CHANGE THE THICKNESS OF THE NON-EXPANSIVE SHAPED FILL FROM 6" MINIMUM TO 24" MINIMUM.

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1	2/27/12	REVISED PER ADDENDUM NO. 4	MRB
NO.	DATE	REVISION	REVIEWED

DRAWN: BW2
DESIGN: MRB
REVIEWED: JFW
SCALE: N.T.S.
DATE: DECEMBER 2011
DWG. NAME: 1487TANKPLAN

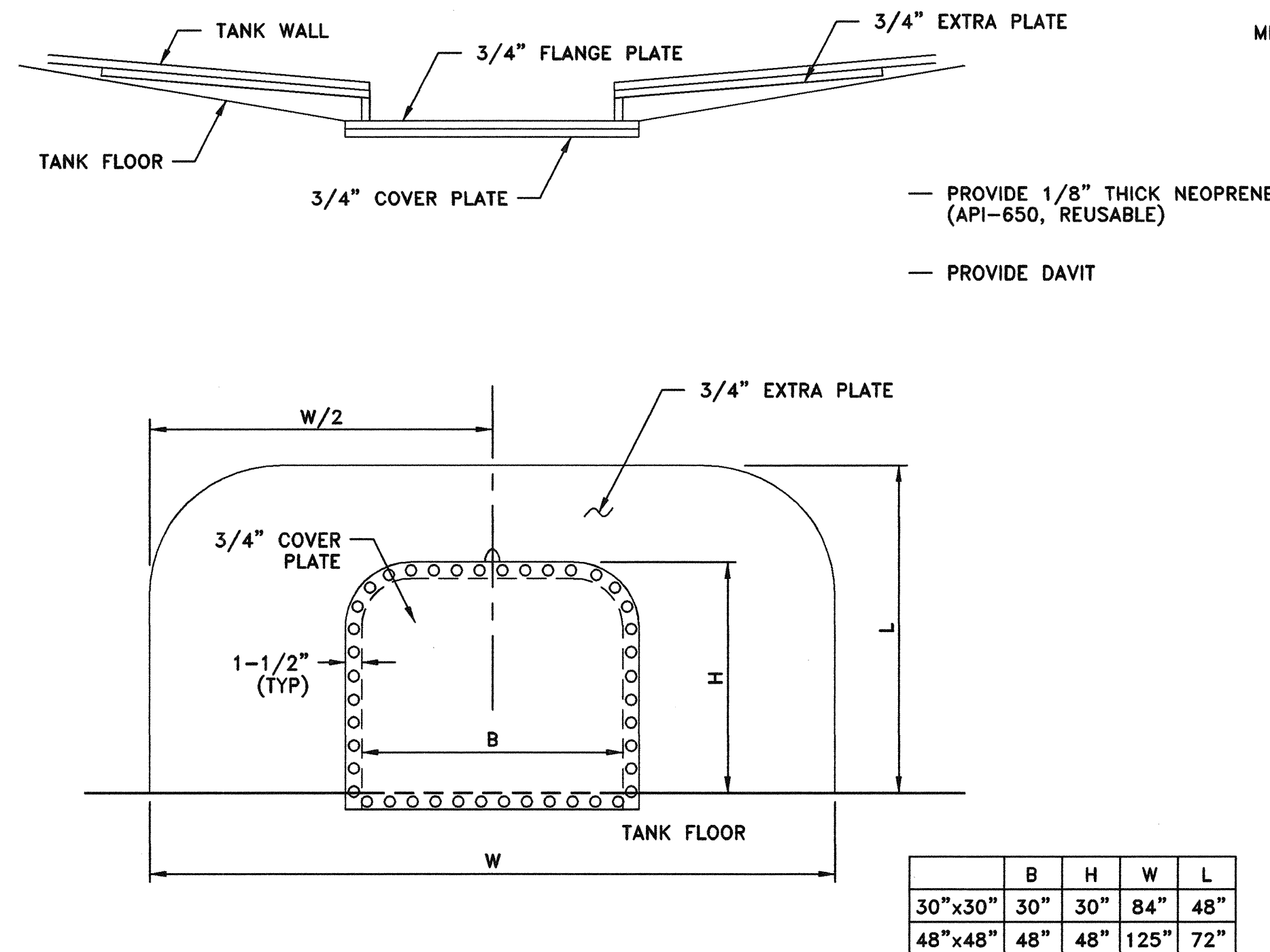


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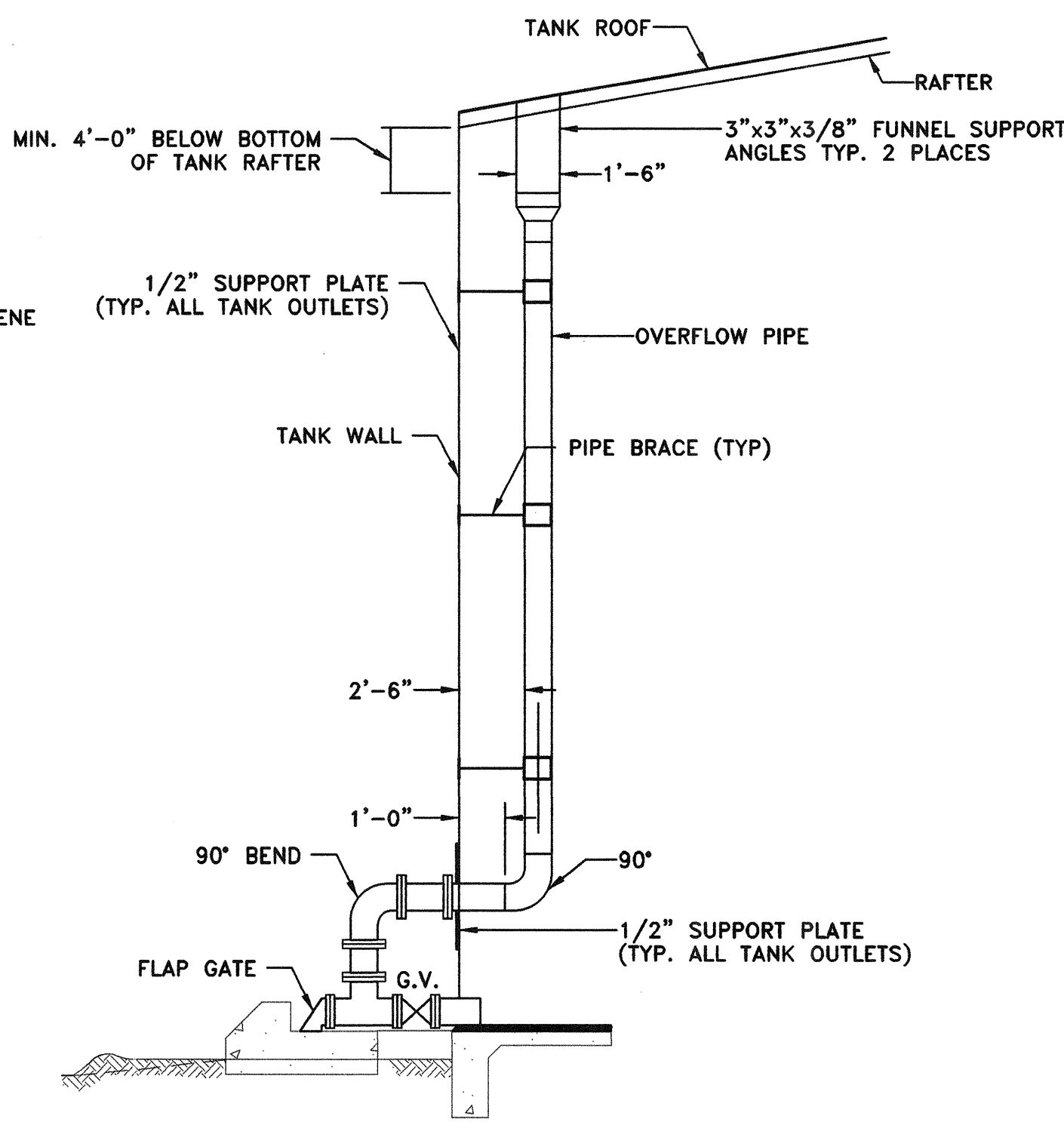


WATER SYSTEM IMPROVEMENTS
McGARITY GROUND STORAGE TANK
AND PUMP STATION
GROUND STORAGE TANK - PLAN AND ELEVATION
CITY OF LUCAS

SHEET NO. **C8**
OF **C11** SHEETS
JOB NO. **11-1487**

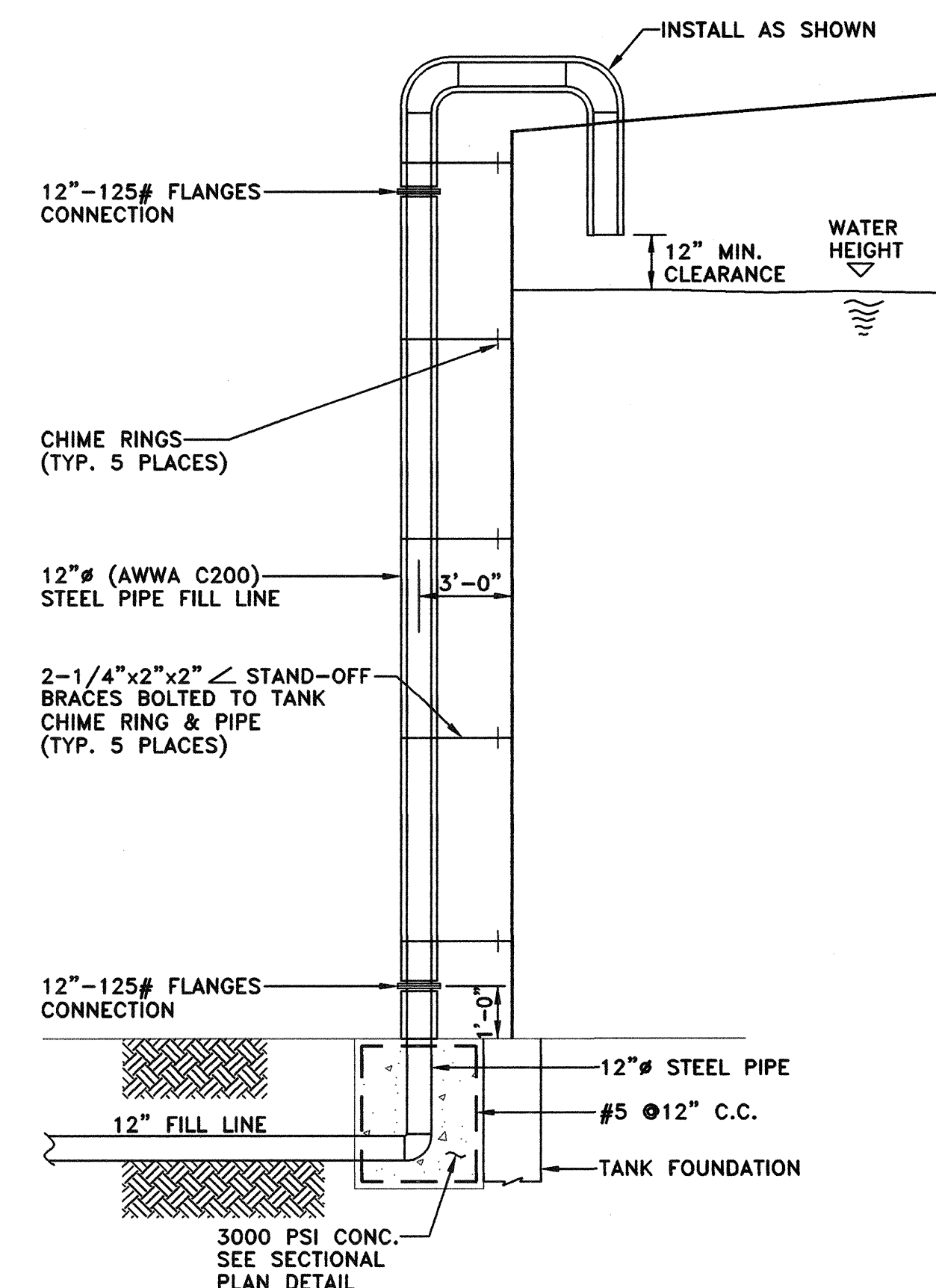


FLUSH TYPE CLEANOUT DOOR DETAIL
(PER API 650)
N.T.S.

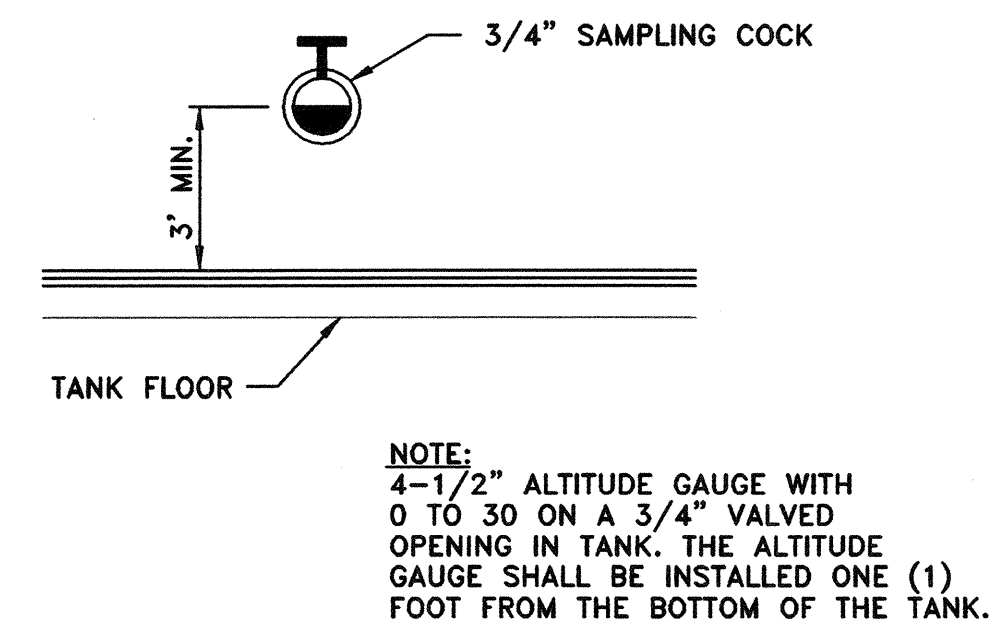


OVERFLOW AND DRAIN DETAIL
N.T.S.

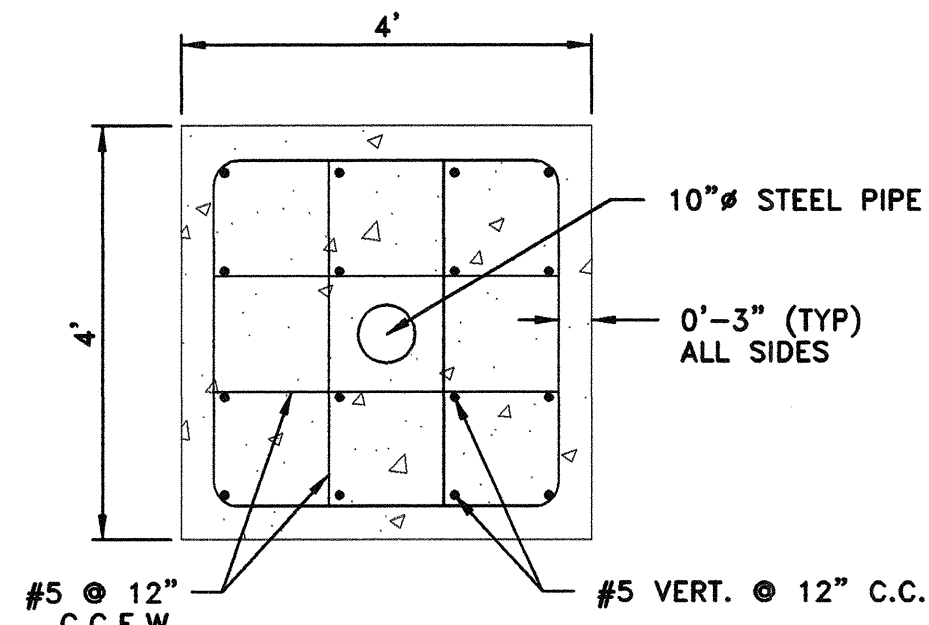
- NOTES:**
- CONTRACTOR SHALL FURNISH AND INSTALL THE VENT, OVERFLOW PIPE, AND OVERFLOW WEIR IN ACCORDANCE WITH AWWA D110 SPECIFICATIONS. THE TANK SUPPLIER SHALL BE RESPONSIBLE FOR SIZING THE VENT, OVERFLOW PIPE, AND OVERFLOW WEIR BASED ON THE AWWA D110 SPECIFICATIONS.
 - THE OVERFLOW PIPE SHALL BE APPROXIMATELY SIZED BY THE TANK SUPPLIER BASED ON A FILL RATE OF APPROXIMATELY 3500 GPM (MINIMUM SIZE OF OVERFLOW PIPE SHALL BE 10" DIAMETER).



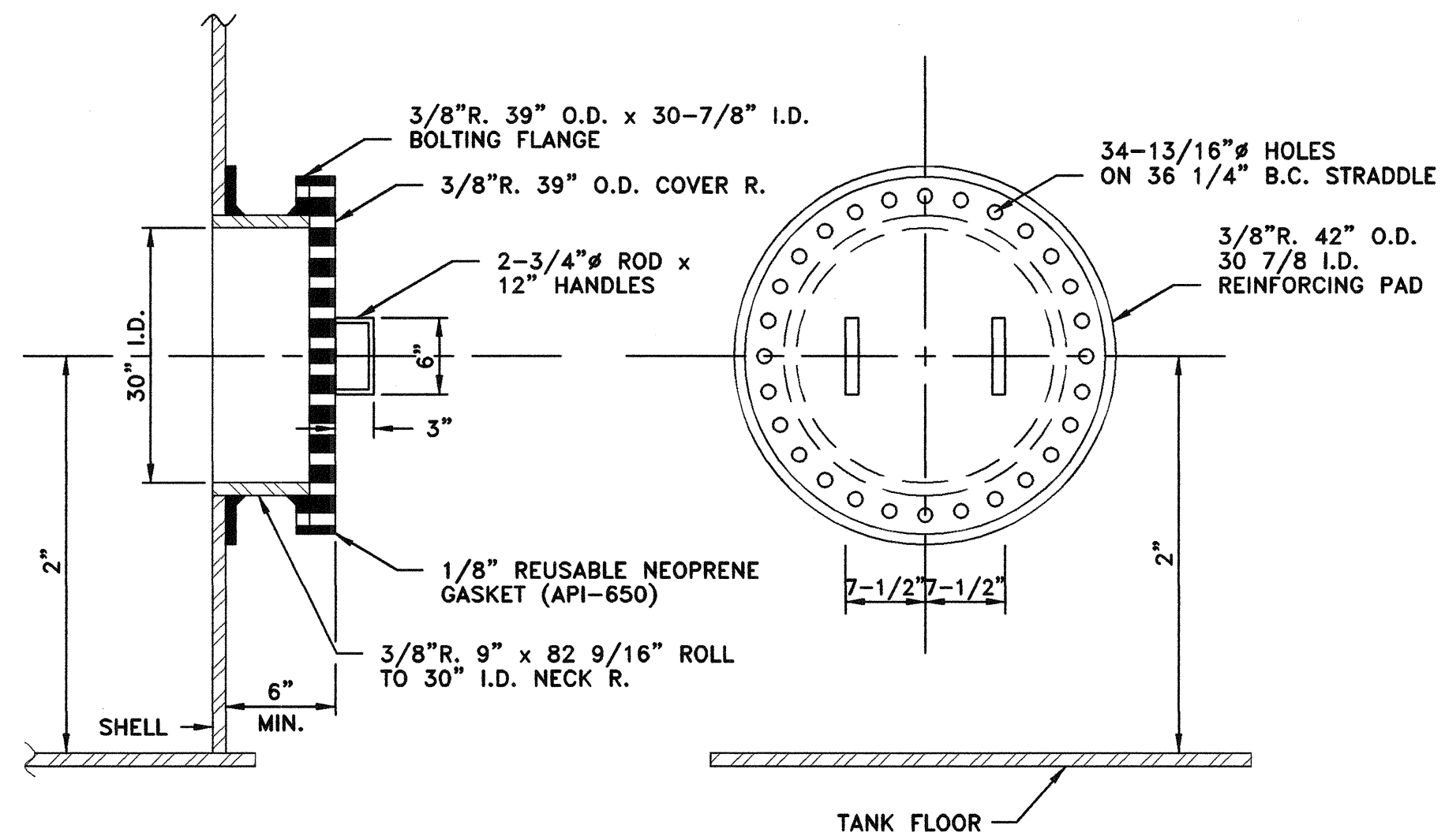
12"Ø FILL LINE CONNECTION SECTION DETAIL
N.T.S.



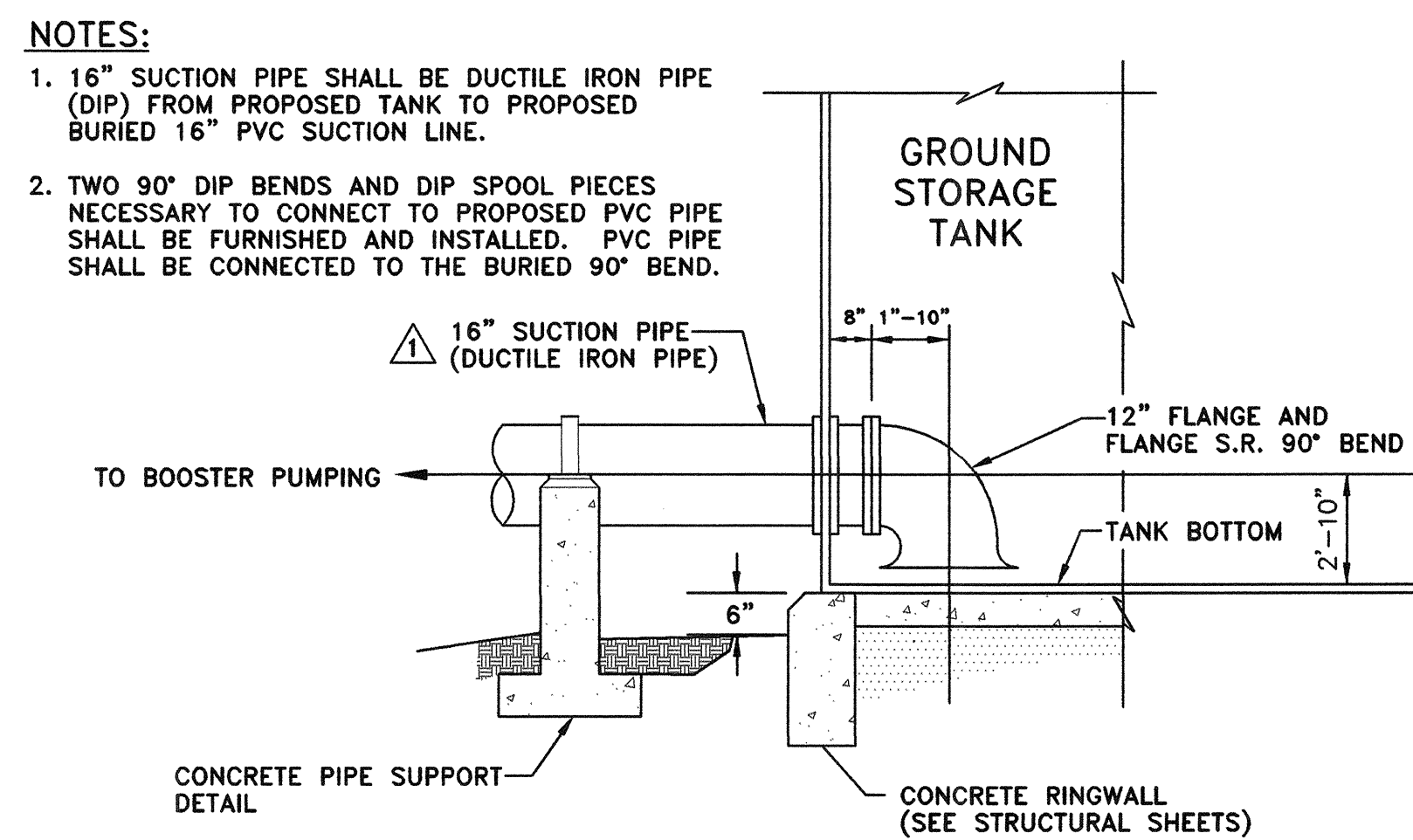
SAMPLING COCK DETAIL
N.T.S.



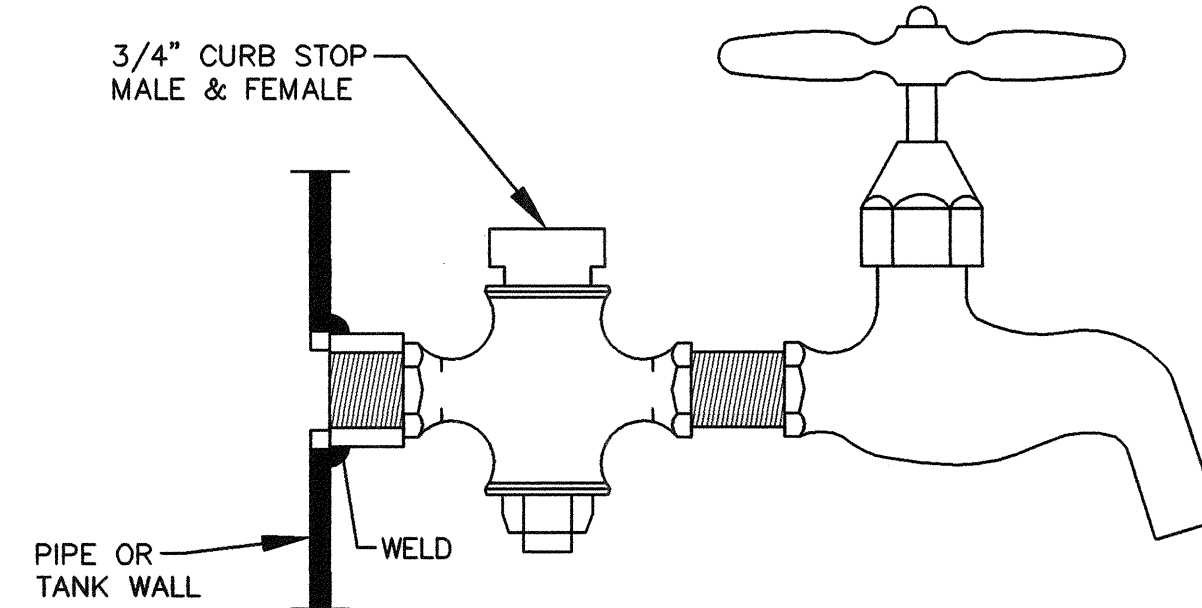
SECTIONAL PLAN
N.T.S.



TANK MANWAY
N.T.S.

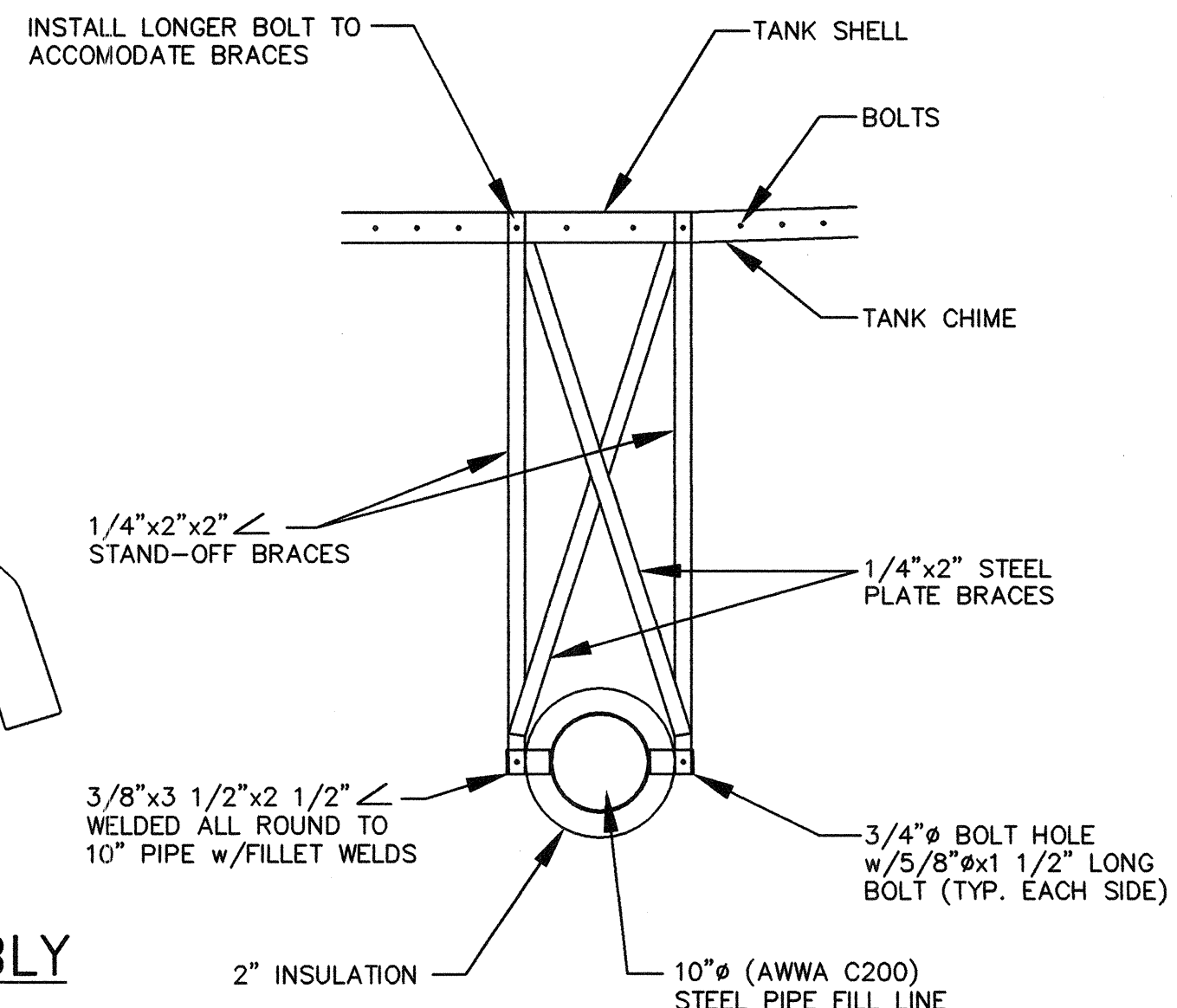


OUTLET CONNECTION (SUCTION PIPE) DETAIL
N.T.S.



3/4" SAMPLING COCK ASSEMBLY
N.T.S.

NOTE:
SAMPLE COCK, CHROME PLATED THREADLESS HOSE BIB BURLINGTON MODEL 2001 O/E, MALE HOSE WITH PLAIN END AND 3/4" IPS THREAD INLET BRASS WITH CROME PLATING.



STAND-OFF BRACE DETAIL SECTION
N.T.S.

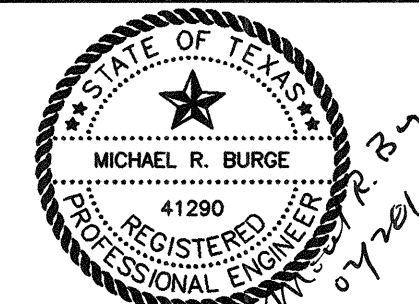
RECORD DRAWING
BASED ON CONTRACTOR MARKUPS,
NOT FIELD SURVEY.

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1	2/27/12	REVISED PER ADDENDUM NO. 4	MRB
NO.	DATE	REVISION	REVIEWED

DRAWN: BW2
DESIGN: MRB
REVIEWED: JFW
SCALE: N.T.S.
DATE: DECEMBER 2011
DWG. NAME: 1487TANKDET1



BW2 Engineers, Inc.
1919 S. Shiloh Road
Suite 500, L.B. 27
Garland, Texas 75042
(972) 864-8200 (T) (972) 864-8220 (F)
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WATER SYSTEM IMPROVEMENTS
McGARITY GROUND STORAGE TANK
AND PUMP STATION
GROUND STORAGE TANK DETAILS - SHEET 1
CITY OF LUCAS

SHEET NO. **C9**
OF **C11** SHEETS
JOB NO. **11-1487**



PLAN
N.T.S.

5"

3'

2'

6" (TYP)

3" (TYP)

3'

TANK WALL

PROP. 3"x18" BLOCKOUT

#4 BARS 12" O.C.E.W. (TYP)

2'x6' SPLASH PAD

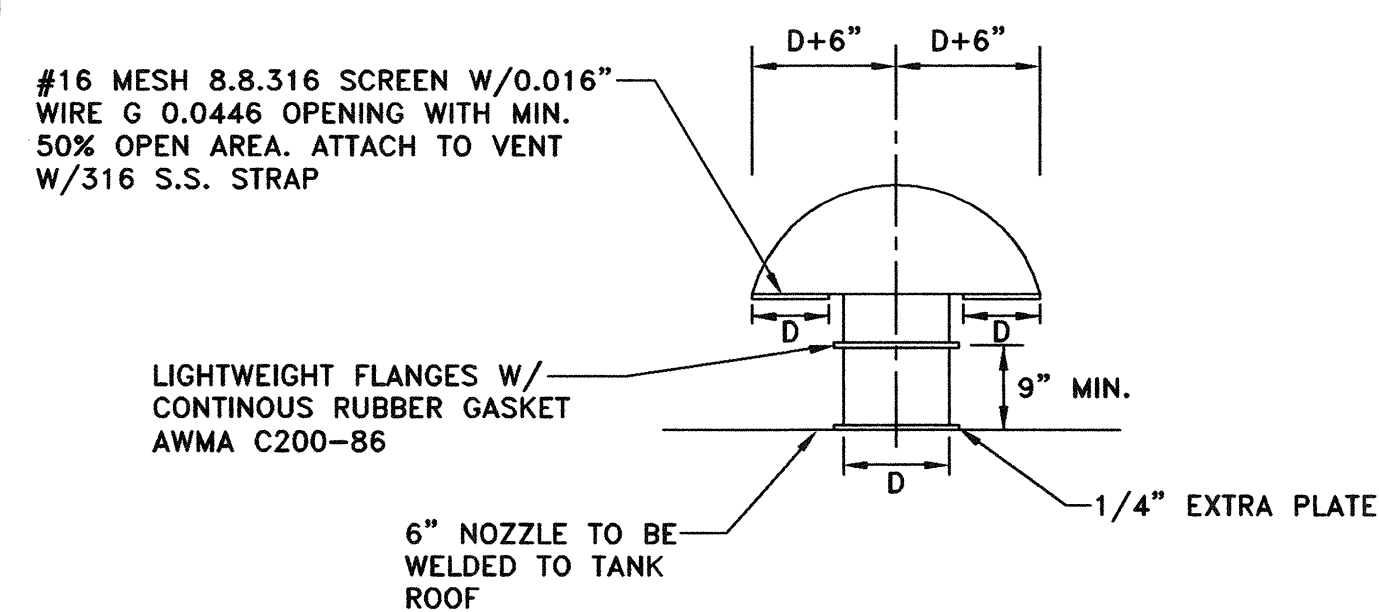
A

A

Diagram illustrating the dimensions and components of a tank hatch assembly:

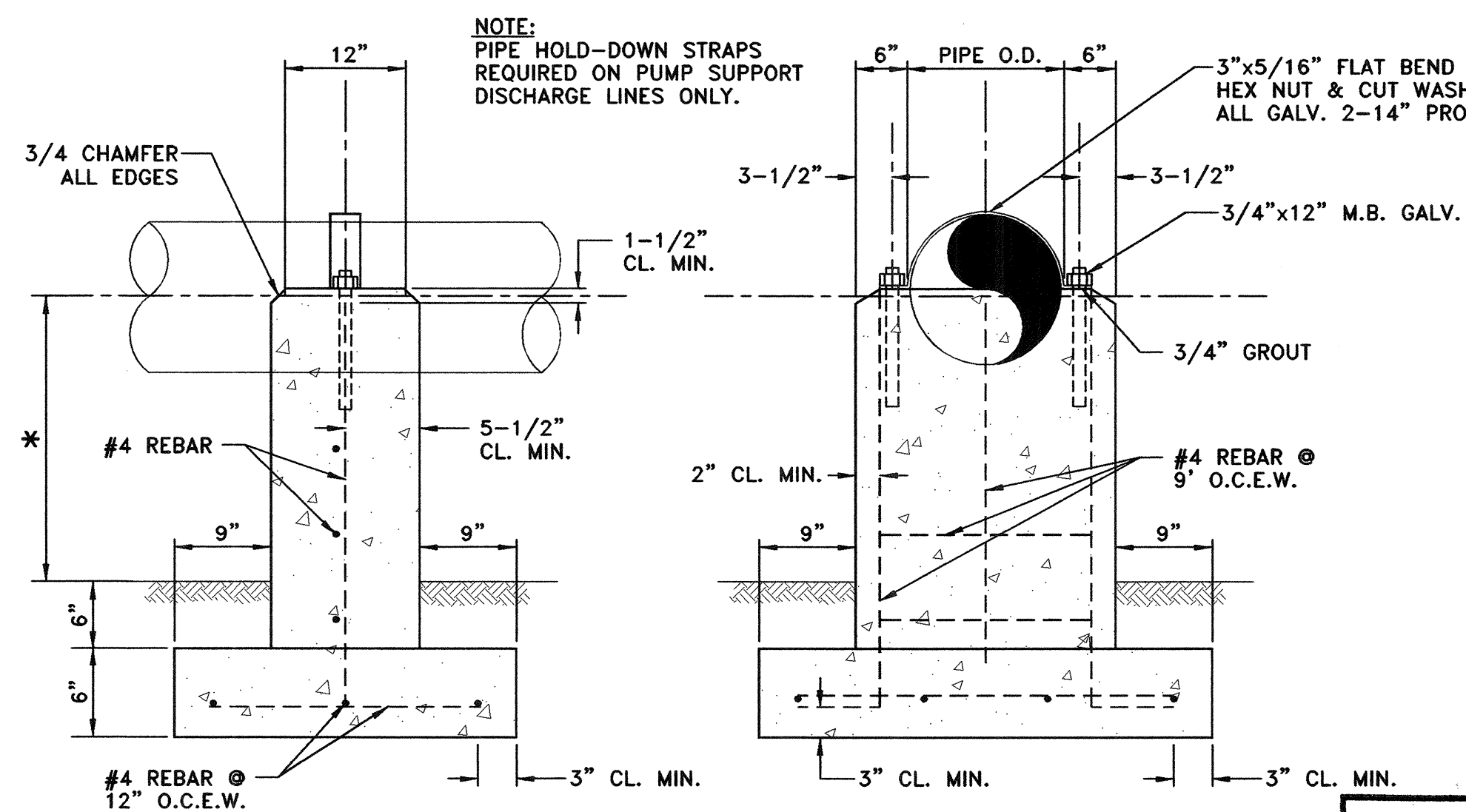
- Dimensions:**
 - Overall height: 6"
 - Top section height: 4"
 - Top section width: 2"
 - Bottom section width: 30" I.S. SQUARE
 - Bottom section height: 1'-4"
- Components and Labels:**
 - INSIDE LIP
 - 3/16" R. : BEND 2" DOWN ALL AROUND
 - 2 EA. 4"x4" BUTT HINGE
 - 1/4"x2"x9" BENT HASP W/LOCK
 - FACE OF TANK
 - 1/4" R. - 10" BEND & WELD TO 30"x30" I.D.

ROOF HATCH DETAIL
N.T.S.



ROOF VENT DETAIL
N.T.S.

1. VENT TO BE FABRICATED FROM THIN WALL SCHEDULE 10 STEEL PIPE.
2. VENT TO BE COATED INSIDE WITH SAME SYSTEM SPECIFIED FOR INSIDE OF TANK.
3. VENT TO BE COATED ON OUTSIDE WITH SAME SYSTEM SPECIFIED FOR TANK EXTERIOR.
4. "D" IS THE DIAMETER IN INCHES AS CALLED OUT ON EACH TANK.
5. CENTER VENT BETWEEN RAFTERS.
OUT ON EACH TANK.



* DIMENSION SHALL BE DETERMINED
BY CONTRACTOR WITH CERTIFIED
SHOP DRAWINGS.

SIDE VIEW FRONT VIEW

CONCRETE PIPE SUPPORT DETAIL

N.T.S.

Diagram illustrating the required safety features and dimensions for a tank hatch:

- SKID PROOF SURFACE PAINTED (4' WIDE & EXTENDED TO LIMIT OF HANDRAIL & GOOSE-NECK VENT) IN CONTRASTING COLOR**
- GUARD RAIL (EXTEND 5' BEYOND BOTH HATCHES)**
- 1/4"x2" FMS BANDS @ 4'-0" O.C.**
- OSHA CAGE WITH GATE & LOCK (A LOCKING GATE FOR CAGED LADDER REQUIRED)**
- HATCH**
- FACE OF TANK**
- GROUND**

Dimensions shown in the diagram:

- 16"
- 13 1/2"
- 8"
- 1'-4"

20" DOMED VENT
(SEE DETAIL THIS SHEET)

STAINLESS STEEL NO. 16 SCREEN

ROOF HATCH

STEEL PLATE SUPPORT TO BE OFFSET BETWEEN RAFTERS

MANHOLE EDGES TO BE RAISED MIN. 4" ABOVE TOP AND COVERED WITH OVERLAPPING BONNET TYPE FABRICATED SOLID COVER WITH METAL BAR ACROSS COVER, HINGED AT ONE END AND LATCHED AT THE OTHER END WITH LOCK. HATCH IS TO HAVE A MIN. OF 4" CURB, OVERLAPPING COVER WITH 2" OVERLAP.

4'x4' CLEANOUT COVER W/DAVIT (SEE DETAIL SHEET)

HANDRAIL W/INTERMEDIATE RAIL
TS 11 1/2x1 1/2"x11 GA
(9" EACH SIDE OF LADDER)

9'

1'-9"

3'-6"

AS REQUIRED

8"

LADDER W/OSHA CAGE
(SEE DETAIL THIS SHEET)

7'

6"

GROUND ELEV.

PROVIDE REMOVABLE BOTTOM LADDER SECTION

STORAGE TANK LADDER DETAIL
N.T.S.

SHEET NO. C10
OF C11 SHEETS
JOB NO. 11-1487

GENERAL TRAFFIC CONTROL NOTES

- ALL TEMPORARY SIGNS, MARKINGS, CONES, CHANNELIZING DEVICES, WARNING LIGHTS AND BARRICADES SHALL BE IN ACCORDANCE WITH THE CURRENT STATE OF TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD).
- TYPE "A" WARNING LIGHTS SHALL BE PLACED ON ALL ADVANCE WARNING SIGNS.
- REDUCED SPEED WARNING SIGNAGE SHOULD BE PLACED PRIOR TO AND AT REGULAR INTERVALS NEAR CONSTRUCTION AREA.

GENERAL STRUCTURAL NOTES:

FOUNDATION:

- THE FOUNDATIONS HAVE BEEN DESIGNED IN ACCORDANCE WITH THE SOILS REPORT PREPARED BY TERRACON CONSULTANTS DATED OCTOBER 6, 2011. PROJECT 94115193.
- THE CONTRACTOR AND ALL SUBCONTRACTORS SHOULD BE TOTALLY FAMILIAR WITH THE CONTENTS OF THE SOILS REPORT.
- ANY CONDITION FOUND, PRIOR TO OR DURING CONSTRUCTION, THAT IS DIFFERENT THAN THAT DESCRIBED IN THE SOILS REPORT AND THAT WOULD AFFECT THE FOUNDATIONS AS DESIGNED, SHALL BE BROUGHT TO THE ATTENTION OF BW2 ENGINEERS AND/OR JOE P. HILL, P. E., INC.
- IN NO CASE SHALL CONSTRUCTION PROCEED IF THE PERFORMANCE OF THE FOUNDATIONS, AS DESIGNED, WILL BE COMPROMISED.
- PRIOR TO ANY NEW CONSTRUCTION, THE SITE SHALL BE CLEARED OF ANY AND ALL OBSTRUCTIONS THAT WOULD HINDER THE PROPER PREPARATION OF THE SITE FOR CONSTRUCTION.
- AREAS TO RECEIVE NEW FILL SHOULD BE STRIPPED AND GRUBBED TO REMOVE ALL VEGETATION AND DELETERIOUS MATERIAL.
- THE EXPOSED SUBGRADE SHOULD THEN BE PROOF ROLLED.
- THE PROOF ROLLING SHOULD BE PERFORMED WITH A FULLY LOADED, TANDEM-AXLE DUMP TRUCK OR OTHER EQUIPMENT PROVIDING AN EQUIVALENT SUBGRADE LOADING.
- A MINIMUM GROSS WEIGHT OF 20 TONS IS RECOMMENDED FOR THE PROOF-ROLLING EQUIPMENT.
- THE PROOF ROLLING SHOULD CONSIST OF SEVERAL OVERLAPPING PASSES IN MUTUALLY PERPENDICULAR DIRECTIONS OVER A GIVEN AREA.
- ANY SOFT OR PUMPING AREAS SHOULD BE EXCAVATED TO FIRM GROUND.
- EXCAVATED AREAS SHOULD BE BACKFILLED WITH PROPERLY PLACED AND COMPACTED FILL AS DISCUSSED IN SECTION 4.2.5 COMPACTION REQUIREMENTS.
- THE ON-SITE SOILS, FREE OF VEGETATION, DEBRIS AND ROCK GREATER THAN 4 INCHES IN MAXIMUM DIMENSIONS, ARE GENERALLY SUITABLE FOR SITE GRADING.
- IF IMPORTED FILL MATERIALS ARE USED, THEY SHOULD BE CLEAN SOIL WITH LIQUID LIMIT LESS THAN 50 AND NO ROCK GREATER THAN 4 INCHES IN MAXIMUM DIMENSIONS.
- THE MATERIAL USED AS SELECT FILL SHOULD BE SANDY CLAY TO CLAYEY SAND WITH A LIQUID LIMIT (LL) OF LESS THAN 35 PERCENT AND A PLASTICITY INDEX (PI) BETWEEN 6 AND 15.
- THE FIRST LIFT OF SELECT FILL SHOULD BE PLACED WET OF OPTIMUM TO PREVENT DRYING THE UNDERLYING SUBGRADE.
- POSITIVE DRAINAGE MUST BE PROVIDED AWAY FROM THE STRUCTURE TO PREVENT THE PONDING OF WATER IN THE SELECT FILL.
- AS AN ALTERNATE TO SELECT FILL, FLEXIBLE BASE CAN BE USED.
- THE BASE SHOULD MEET THE REQUIREMENTS OF TXDOT ITEM 247, TYPE D, GRADE 1 OR 2.
- RECYCLED CONCRETE MEETING THE GRADATION IS ACCEPTABLE.
- THE TANK SHALL HAVE A MINIMUM OF TWO (2) FEET OF SELECT FILL IN ORDER TO RAISE TANK BOTTOM AT LEAST SIX (6) INCHES ABOVE GRADE.
- THE TANK SHALL SET ON A MINIMUM OF SIX (6) INCHES MINIMUM THICK SAND ON THE SELECT FILL.
- THE PUMP BUILDING FOUNDATION SHALL BE PLACED ON A MINIMUM TWO (2) FOOT THICK PAD OF SELECT FILL.
- REFER TO SECTIONS 4.2, 4.4, 4.4.1, 4.4.2, 4.5, 4.5.1, 4.5.2 AND 4.6 FOR OTHER RECOMMENDATIONS.
- SITE GRADING OPERATIONS, WHERE REQUIRED, SHALL BE PERFORMED IN ACCORDANCE WITH THE RECOMMENDATIONS PROVIDED IN THE SOILS REPORT.
- SITE GRADING PLANS AND CONSTRUCTION SHALL STRIVE TO ACHIEVE POSITIVE DRAINAGE AROUND ALL SIDES OF THE PROPOSED STRUCTURE.
- INADEQUATE DRAINAGE AROUND STRUCTURES BUILT ON GRADE CAN CAUSE EXCESSIVE VERTICAL DIFFERENTIAL MOVEMENTS TO OCCUR.
- THE GEOTECHNICAL ENGINEER SHALL MONITOR FOUNDATION CONSTRUCTION TO VERIFY CONDITIONS ARE AS ANTICIPATED.
- FOUNDATION EXCAVATION SHALL BE DRY AND FREE OF LOOSE MATERIAL.
- EXCAVATION FOR FOUNDATIONS SHALL BE FILLED WITH CONCRETE BEFORE THE END OF THE WORKDAY OR SOONER IF NECESSARY TO PREVENT DETERIORATION OF THE BEARING SURFACE.
- ALL EXCAVATIONS SHALL BE SLOPED, SHORED OR SHIELDED IN ACCORDANCE WITH OSHA REQUIREMENTS.

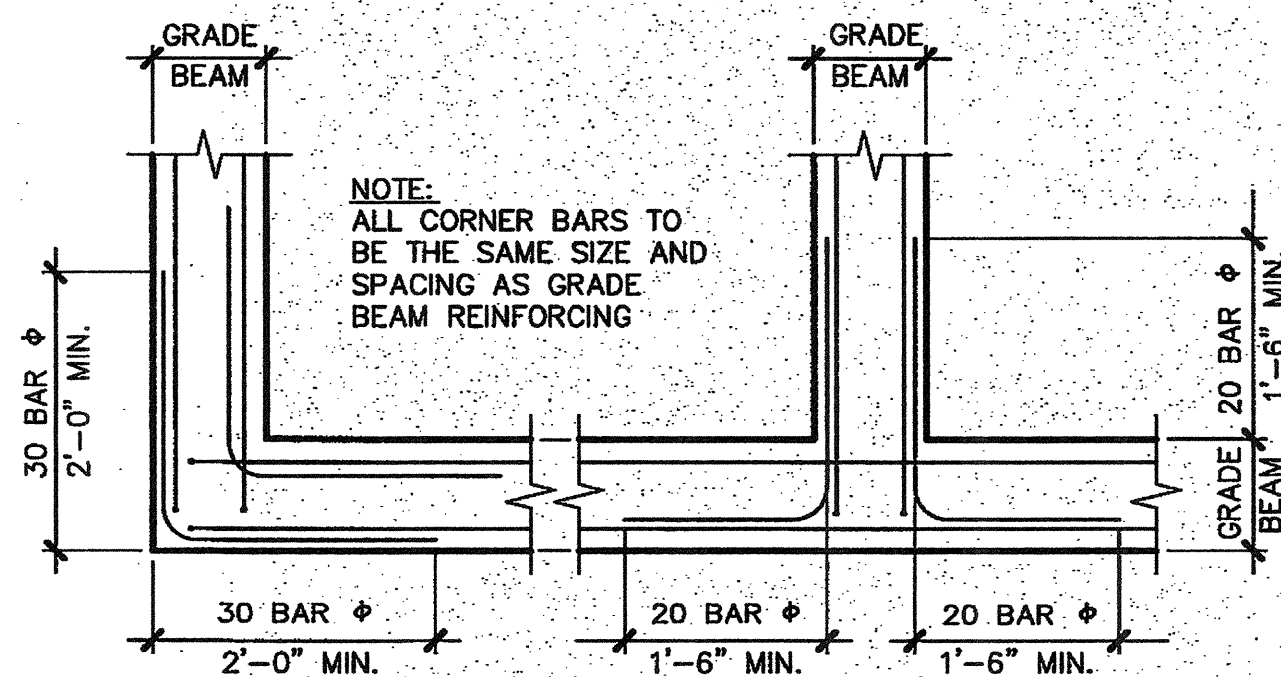
CONCRETE:

- CONCRETE WORK SHALL BE EXECUTED IN STRICT ACCORDANCE WITH THE LATEST EDITION OF THE AMERICAN CONCRETE INSTITUTE BUILDING CODE (ACI 318R-05).
- CONCRETE AND REINFORCING SPECIFICATIONS AS FOLLOWS:

	28 DAY STRENGTH	SACK CONTENT	AGGREGATE	SLUMP
Typical	4,000 PSI	6/C.Y.	H.R.	4" TO 6"
Piers	3,000 PSI	5/C.Y.	H.R.	5" TO 7"
- PORTLAND CEMENT SHALL CONFORM TO ASTM C-33.
- REINFORCING STEEL SHALL CONFORM TO ASTM 615, GRADE 60; GRADE 40 FOR STIRRUPS AND TIES.
- ALL WELDED WIRE FABRIC SHALL CONFORM TO ASTM A82, GRADE 60.
- REINFORCING STEEL SHALL BE DESIGNED, DETAILED, FABRICATED, AND PLACED IN ACCORDANCE WITH THE LATEST ACI "MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES" (ACI 315).
- SLAB REINFORCING SHALL BE LOCATED IN THE SLABS AS NOTED ON THE DRAWINGS.
- ALL GRADE BEAM REINFORCING TO BE AS SHOWN IN SECTIONS ON THE DRAWINGS.
- PROVIDE 2 - #5 BARS EACH SIDE OF ALL OPENINGS. EXTEND BARS TWO (2) FEET PAST OPENINGS EACH DIRECTION.
- CORNER REINFORCING BARS SHALL BE USED AT ALL CORNERS AND INTERSECTIONS.
- REINFORCING SPLICES SHALL OCCUR AT POINTS OF MINIMUM STRESS AND LAP THIRTY (30) BAR DIAMETERS UNLESS OTHERWISE NOTED.
- LAP ALL WELDED WIRE FABRIC EIGHT (8) INCHES MINIMUM.
- THE INTERIOR FLOOR AREAS THAT DO NOT RECEIVE RESILIENT FLOORING OR SURFACE MATERIAL SHALL BE SEALED. THE TIMING OF THE APPLICATION OF THIS MATERIAL MUST BE APPROVED BY THE ENGINEER. THE MATERIAL IS TO BE APPLIED IN ACCORDANCE WITH THE MANUFACTURER'S PUBLISHED INSTRUCTIONS. (TWO COATS MINIMUM).
- ALL INTERIOR CONCRETE FLOOR WORK SHALL BE COATED WITH CURING COMPOUND. APPLICATION SHALL BE IN STRICT ACCORDANCE WITH THE MANUFACTURER'S PUBLISHED INSTRUCTIONS.
- ALL EXTERIOR CONCRETE WALKS AND DRIVES SHALL BE CONSTRUCTED USING AIR-ENTRAINED CONCRETE. SUFFICIENT AIR-ENTRAINING AGENT SHALL BE USED TO REDUCE THE WEIGHT OF THE CONCRETE BY 6% TO 8%.
- SEE ARCHITECTURAL AND MECHANICAL PLANS FOR VERIFICATION OF ALL DEPRESSIONS, OPENINGS, CAST-IN-PLACE ACCESSORIES, ETC.

TANK:

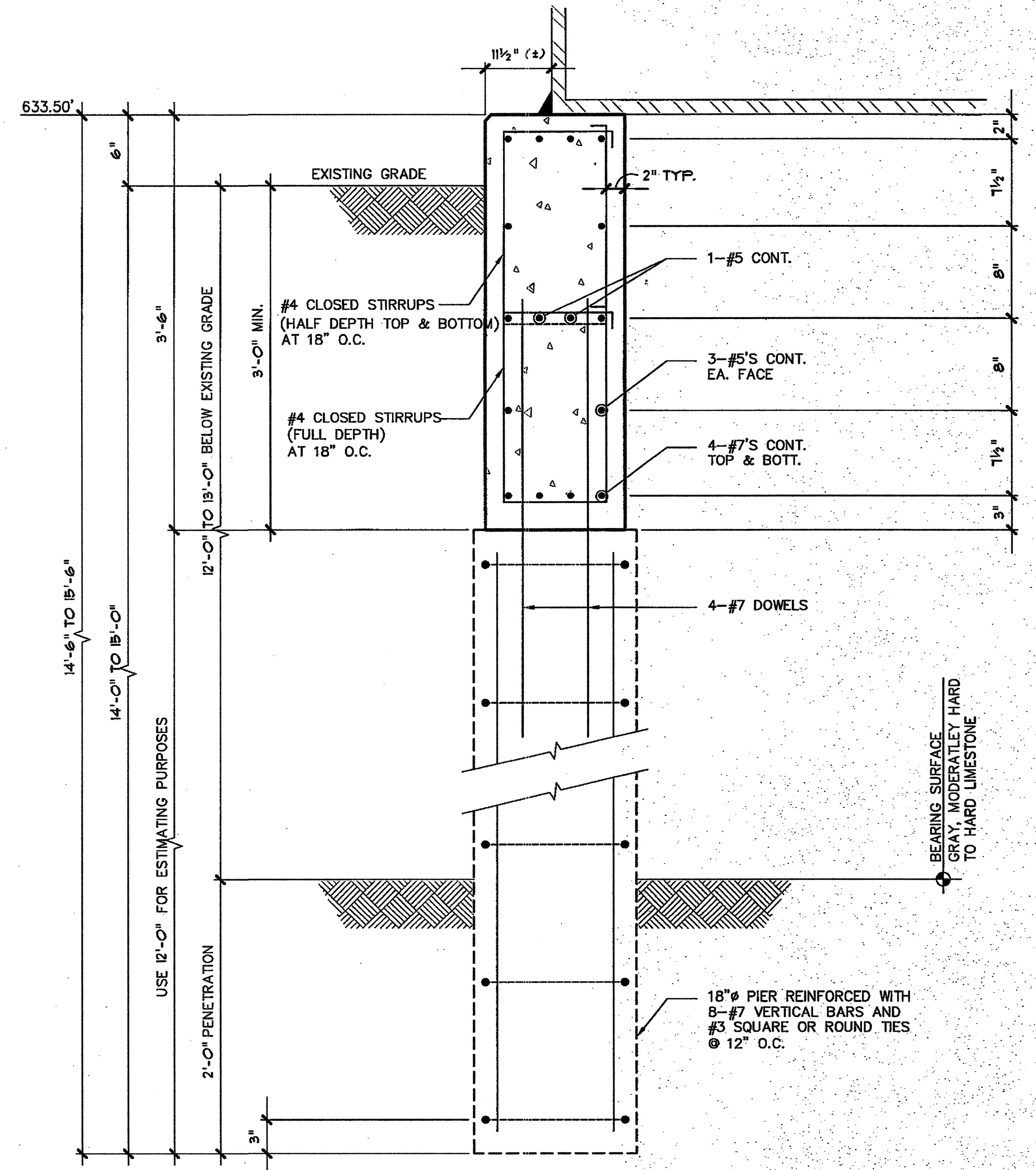
- THE TANK STRUCTURE SHALL BE DESIGNED BY THE TANK VENDOR.
- SHOP DRAWINGS, INCLUDING THE DESIGN CALCULATIONS, SHALL BE SUBMITTED IN ORDER THAT THE ENCLOSED TANK FOUNDATION DESIGN CAN BE VERIFIED.
- THE SUBMITTED CALCULATIONS SHALL CLEARLY AND SPECIFICALLY DESIGNATE THE VERTICAL AND LATERAL LOADS THAT NEED TO BE RESISTED BY THE TANK SUPPORT RING.
- THE CONTRACTOR SHALL ROUGH GRADE THE AREA AS HE DEEMS NECESSARY TO FACILITATE ACCESS AND PROPER CONSTRUCTION OF THE TANK AND ITS FOUNDATION.
- ANY SLOPE SHAPING AND ROUGH GRADING SHALL BE IN ACCORDANCE WITH ALL PREVAILING OSHA STANDARDS AND REQUIREMENTS.



2

TYPICAL CORNER BAR DETAIL

N. T. S.



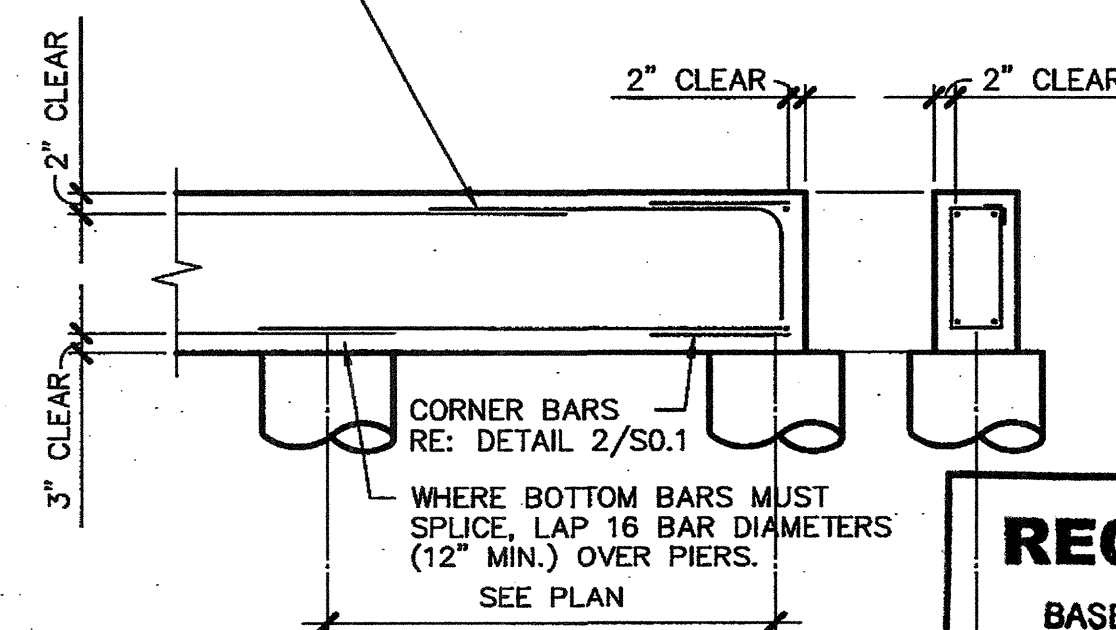
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TANK PIER TYPICAL DETAIL

N. T. S.

OPTIONAL TANK SUPPORT
SPACE PIERS @ 15' AROUND CIRCLE

WHERE TOP BARS MUST SPlice,
LAP 30 BAR DIAMETERS AT MID-SPAN.
AVOID SPlice AT END SPAN.



3

TYPICAL GRADE BEAM REINFORCING

N. T. S.



THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY JOE P. HILL, P.E. 34297 ON JANUARY 13, 2012.

JOE P. HILL P.E.
TEXAS FIRM REG. No. F-2335

Jph

JOE P. HILL, P.E., INC.
CONSULTING STRUCTURAL ENGINEERING
1801 N. Hampton Rd.
Suite 440, Dallas, Texas 75115
(972) 283-5111
FAX (972) 283-5113

Jph, P.E. Job No. 11262

NO.	DATE	REVISION	REVIEWED
6			
5			
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DRAWN: BW2
DESIGN: MRB
REVIEWED: JFW
SCALE: N.T.S.
DATE: DECEMBER 2011
DWG. NAME: 1487TANKPLAN

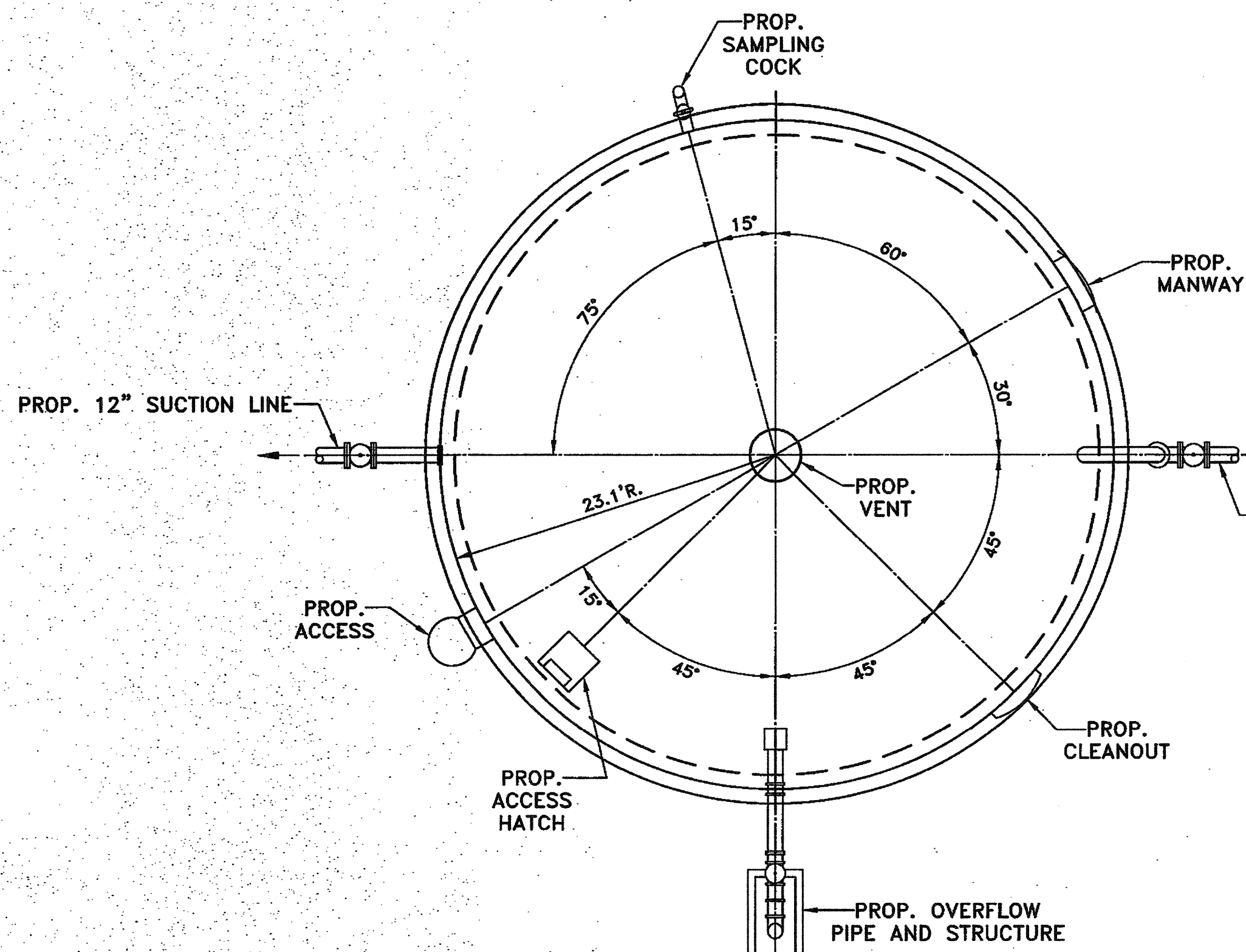


BW2 Engineers, Inc.

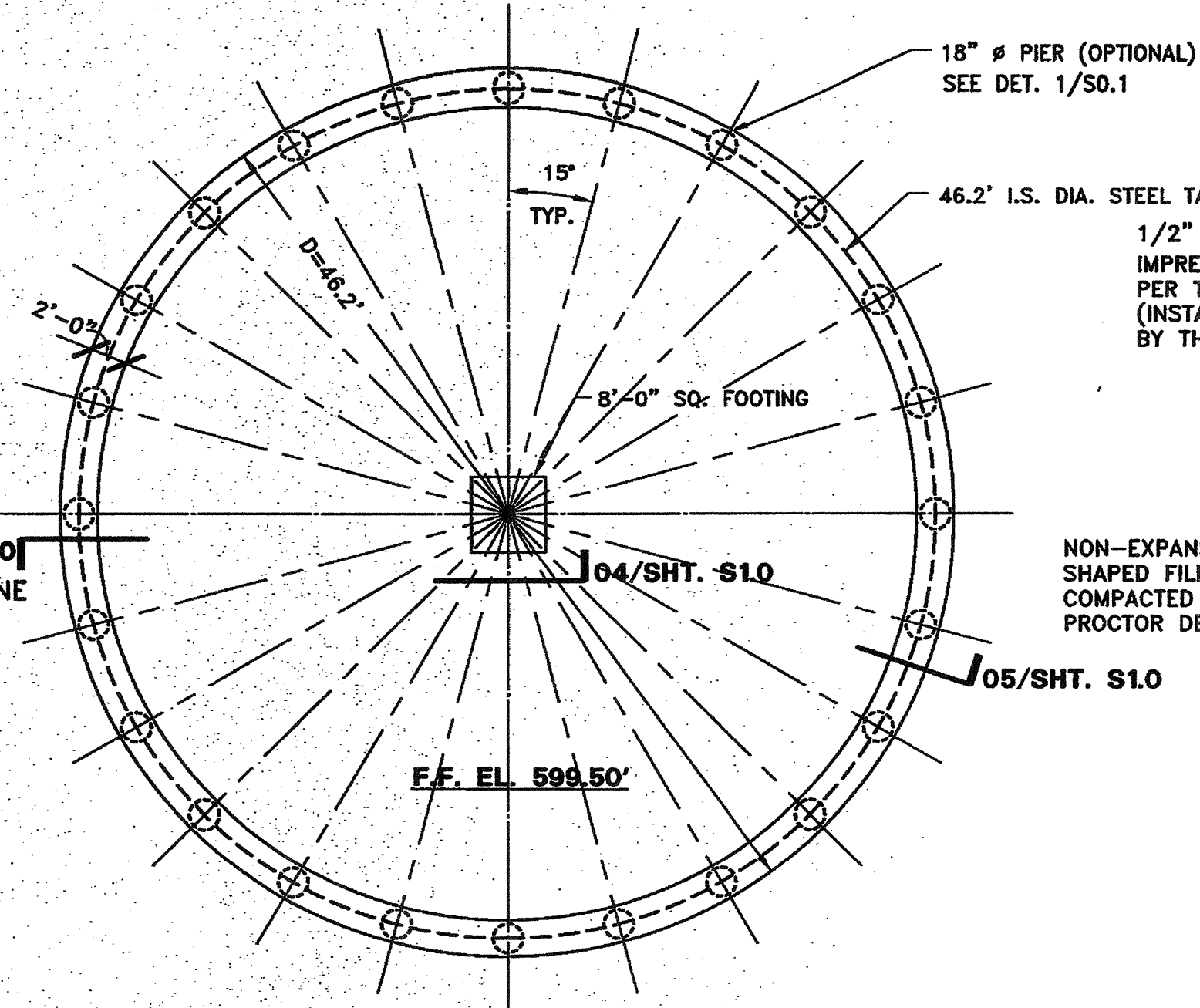
1919 S. Shiloh Road
Suite 500, L.B. 27
Garland, Texas 75042
(972) 864-8200 (T) (972) 864-8220 (F)
Firm Registration No. F-5290

WATER SYSTEM IMPROVEMENTS
McGARITY GROUND STORAGE TANK
AND PUMP STATION
GROUND STORAGE TANK - PLAN AND ELEVATION
CITY OF LUCAS

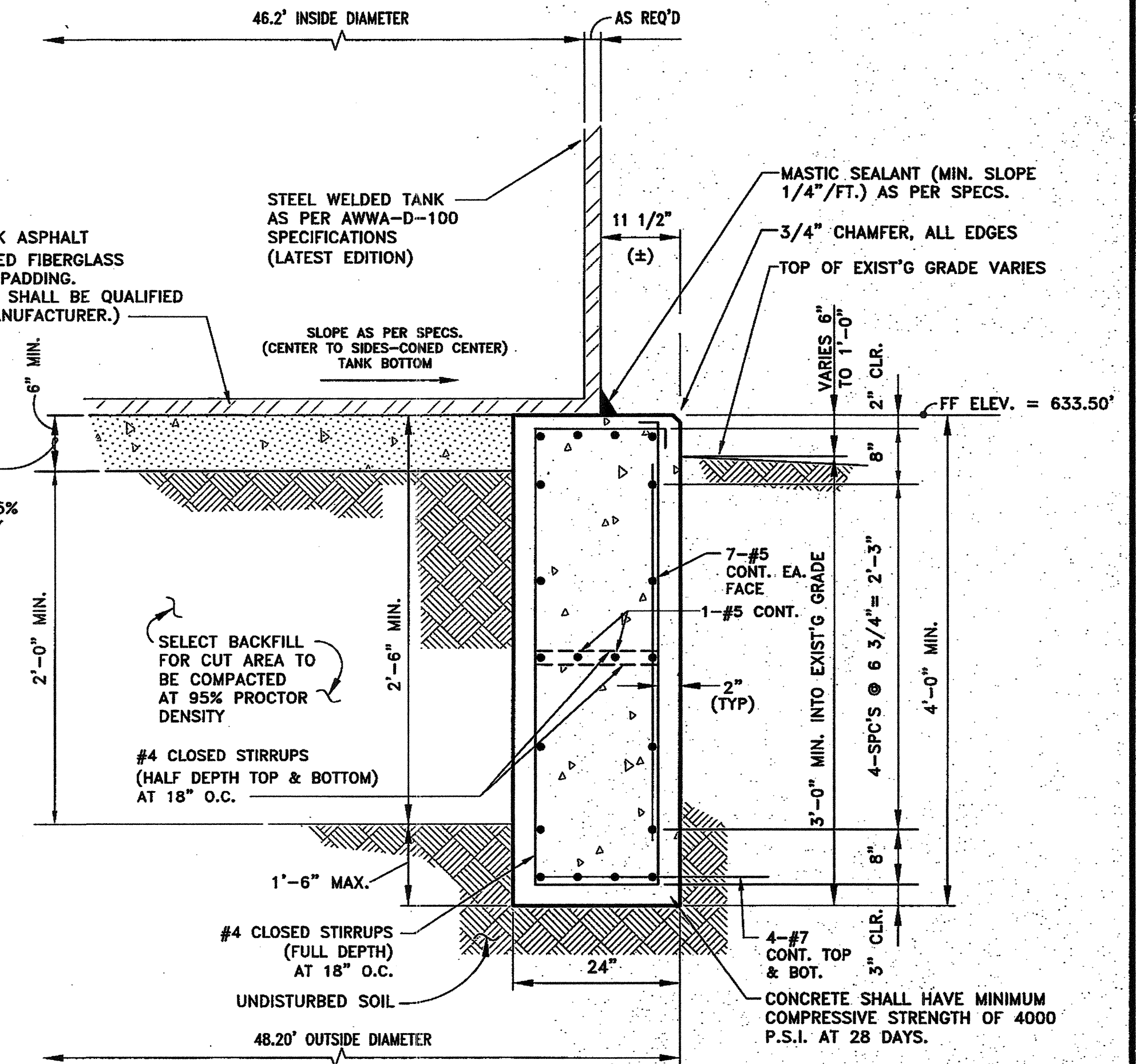
SHEET NO. **SO.1**
OF SHEETS
JOB NO. 11-1487



01 PLAN
NOT TO SCALE



03 TANK FOUNDATION
NOT TO SCALE

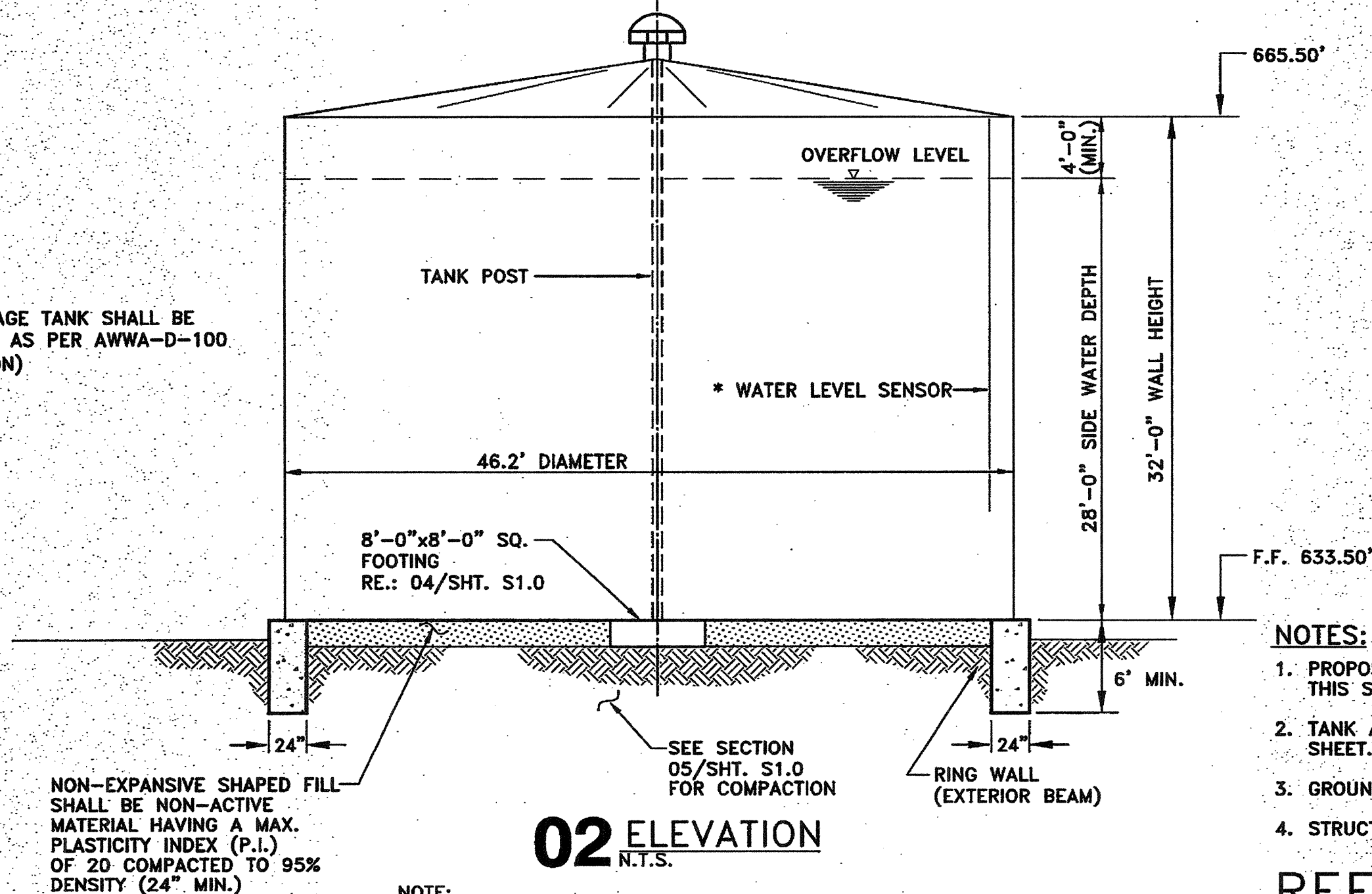


- NOTES:
1. SPLICE LAP LENGTHS SHALL BE 5'-0" FOR #7 BAR AND 3'-0" FOR #5 BAR.
 2. SPLICE LAP SHALL BE STAGGERED AT LEAST A LAP LENGTH.

05 RINGWALL DETAIL
Scale: 3/4"=1'-0"

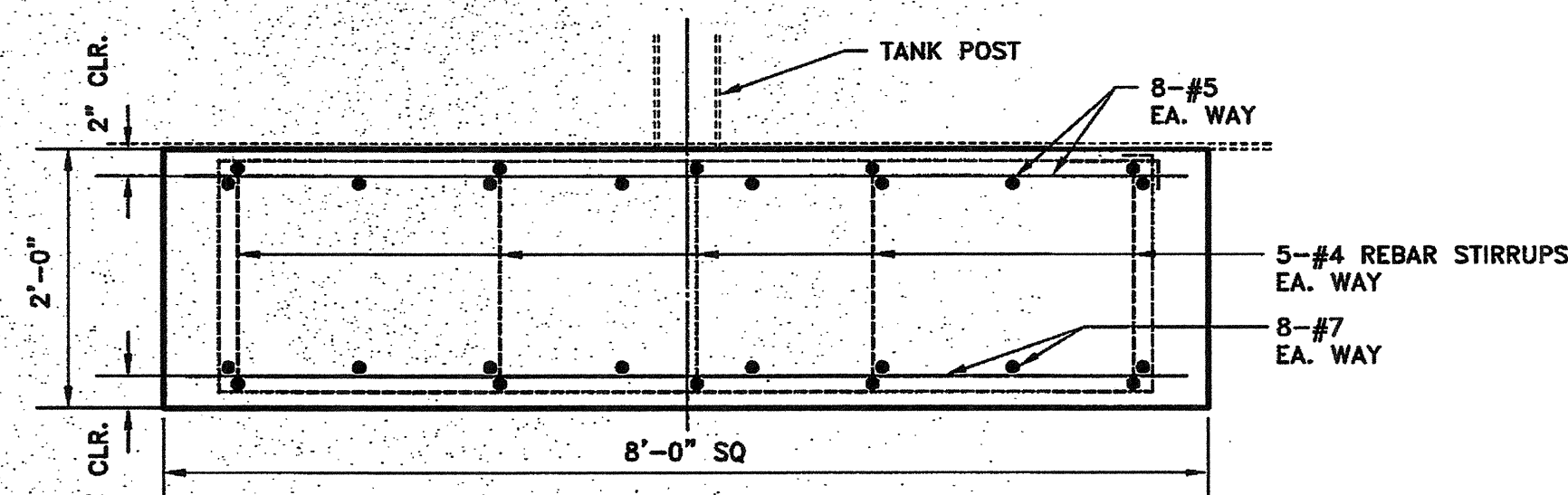
NOTE: SEE OPTIONAL PIER/GR. BM. DETAIL 1/SHT. S0.1

NOTE:
GROUND STORAGE TANK SHALL BE STEEL WELDED AS PER AWWA-D-100 (LATEST EDITION)



02 ELEVATION
N.T.S.

NOTE:
GROUND LINE ELEVATION AROUND THE GROUND STORAGE TANK VARIES. SEE THE GRADING PLAN FOR ADDITIONAL DETAILS.



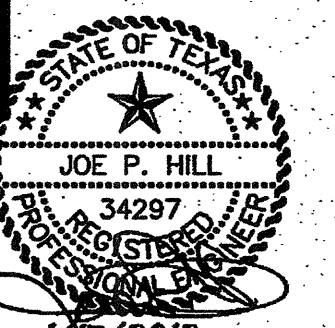
04 SECTION
Scale: 3/4"=1'-0"

- NOTES:
1. PROPOSED TANK SHALL BE CONSTRUCTED AT ELEVATIONS SHOWN ON THIS SHEET.
 2. TANK ACCESSORIES SHALL BE LOCATED ON TANK AS SHOWN ON THIS SHEET.
 3. GROUND STORAGE TANK SHALL BE STEEL WELDED AS PER AWWA-D-100.
 4. STRUCTURAL PER STRUCTURAL SPECS AND DETAILS.

REFER TO SHEET S0.1 FOR "GENERAL STRUCTURAL NOTES"

- NOTES:
1. TANK MANUFACTURER SHALL BE RESPONSIBLE FOR THE DESIGN OF THE TANK PER THE SPECIFICATIONS.
 2. THE DESIGN SHALL INCLUDE THE WALL, FLOOR AND ROOF PLATE THICKNESSES AS REQUIRED.
 3. INCREASE THE PLATE THICKNESS AND PLATE DIMENSIONS WHERE REQUIRED.

RECORD DRAWING
BASED ON CONTRACTOR MARKUPS,
NOT FIELD SURVEY.



THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY JOE P. HILL, P.E. 34297 ON JANUARY 13, 2012.

JOE P. HILL P.E.
TEXAS FIRM REG. NO. F-2335

JOE P. HILL, P.E., INC.
CONSULTING STRUCTURAL ENGINEERING
1801 N. Hampton Rd.
Suite 440, DeSoto, Texas 75115
(972) 283-5111
FAX (972) 283-5113

Jph, P.E. Job No. 11262

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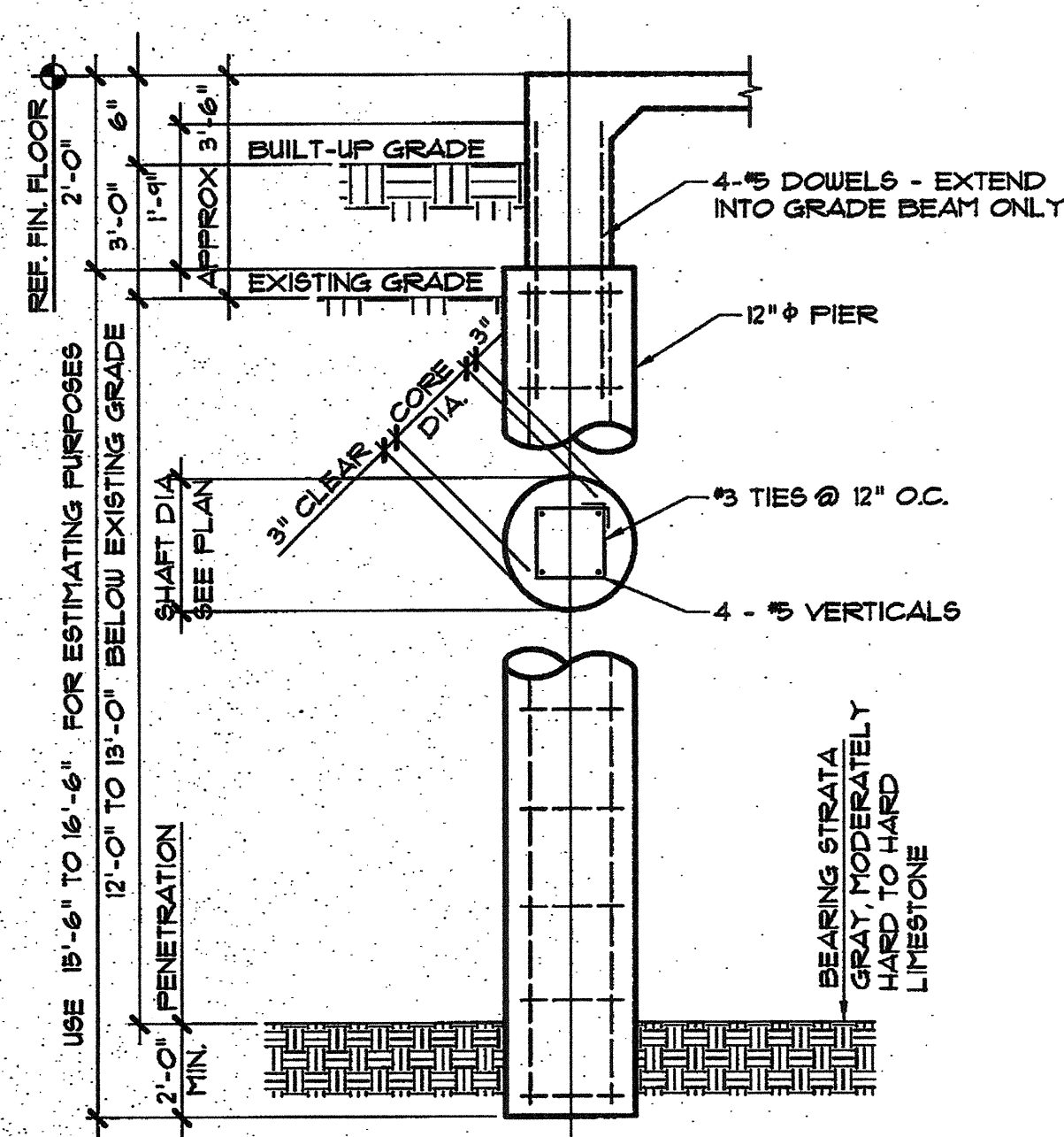
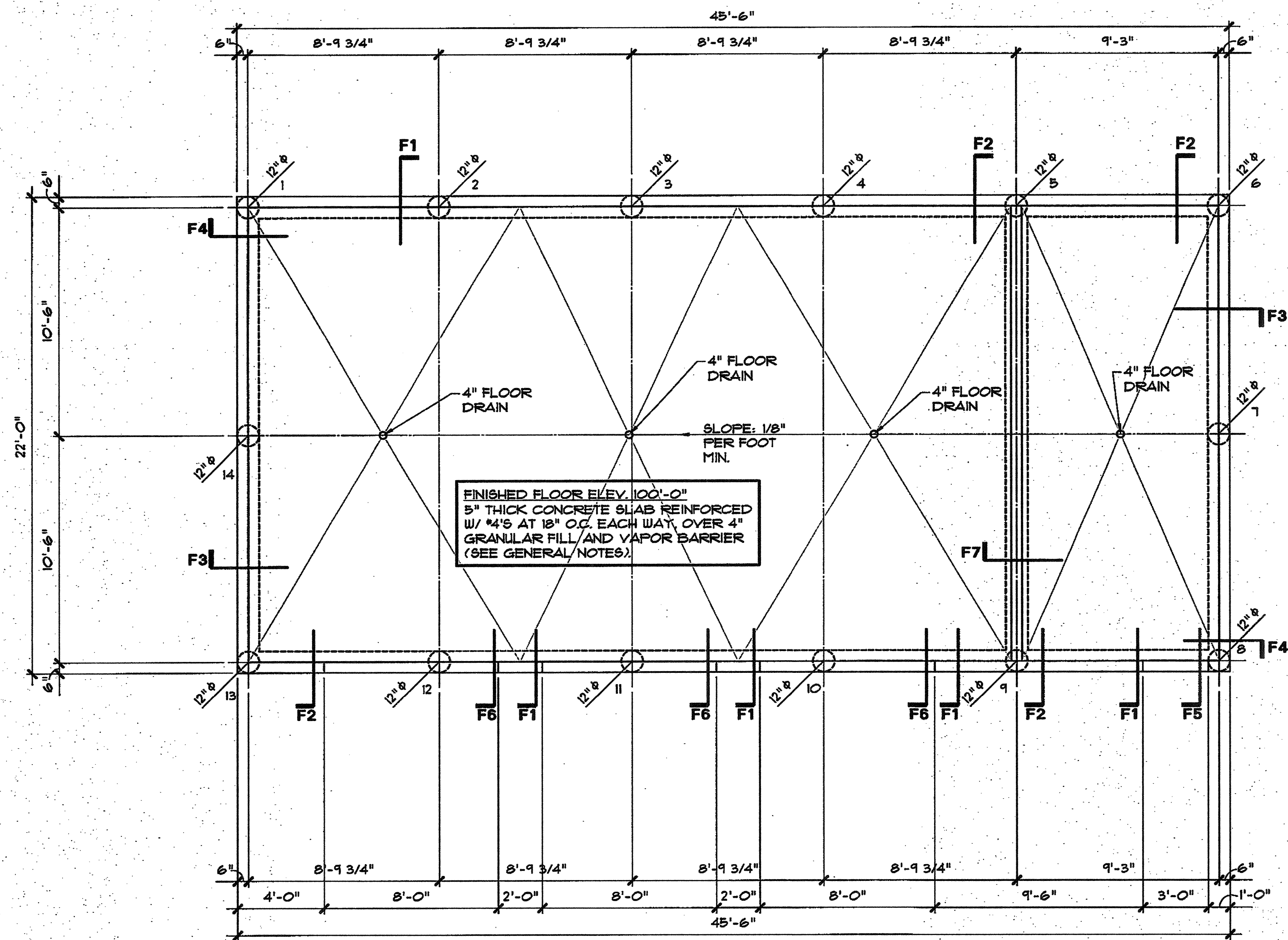
DRAWN: BW2
DESIGN: MRB
REVIEWED: JFW
SCALE: N.T.S.
DATE: DECEMBER 2011
DWG. NAME: 1487TANKPLAN



BW2 Engineers, Inc.
1919 S. Shiloh Road
Suite 500, L.B. 27
Garland, Texas 75042
(972) 864-8200 (T) (972) 864-8220 (F)
Firm Registration No. F-5290

WATER SYSTEM IMPROVEMENTS
McGARITY GROUND STORAGE TANK
AND PUMP STATION
GROUND STORAGE TANK - PLAN AND ELEVATION
CITY OF LUCAS

SHEET NO. **S1.0**
OF SHEETS
JOB NO. 11-1487

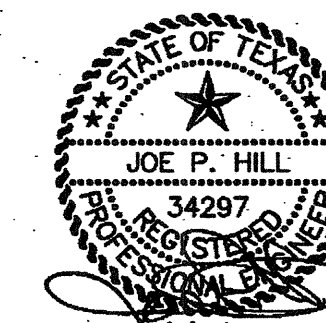
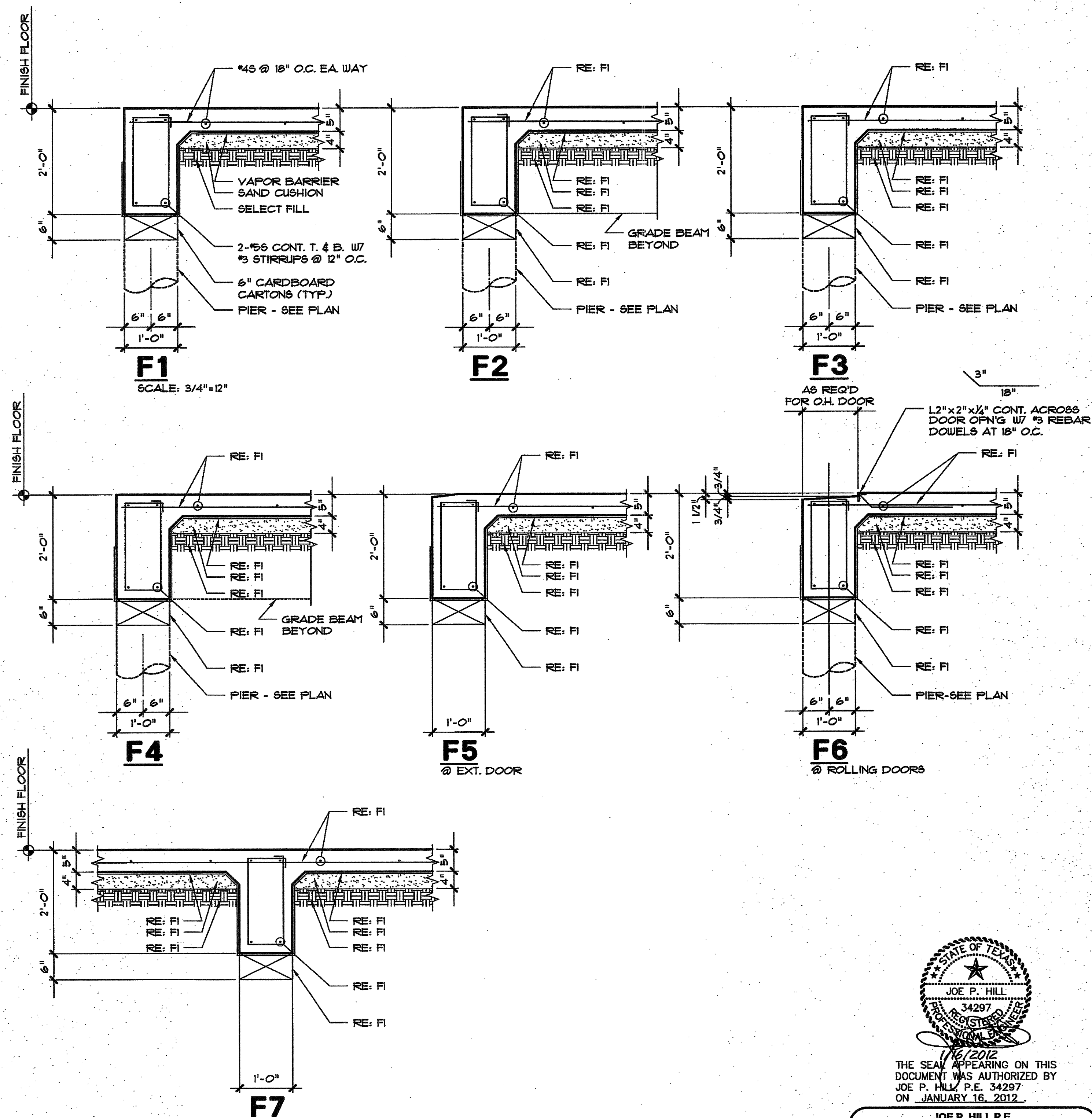


1 TYPICAL PIER DETAIL (OPTIONAL)
N.T.S.
END BEARING:

FOUNDATION/FLOOR PLAN

SCALE: 1/4" = 1'-0"

- NOTES:
1. USE PIERS AND 6" CARD-BOARD CARTONS IF 1" (±) OF VERTICAL MOVEMENT CANNOT BE TOLERATED.
 2. USE 2'-0" OF SELECT FILL TO CONSTRUCT PAD FOR BUILDING PAD. REFER TO SOILS REPORT.
 3. THE PAD FOR THIS BUILDING WILL HAVE TO BE BUILT-UP APPROXIMATELY 3'-0"
 4. USE EITHER SELECT FILL OR IMPROVED SITE MATERIAL AS RECOMMENDED BY THE SOILS REPORT.



THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY JOE P. HILL, P.E. 34297 ON JANUARY 16, 2012.

RECORD DRAWING
BASED ON CONTRACTOR MARKUPS,
NOT FIELD SURVEY.

JOE P. HILL P.E.
TEXAS FIRM REG. No. F-2335

JOE P. HILL, P.E., INC.
CONSULTING STRUCTURAL ENGINEERING
1801 N. Hampton Rd.
Suite 440, DeSoto, Texas 75115
(972) 283-5111
FAX (972) 283-5113

Jph, P.E. Job No. 11262

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6			
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DRAWN: BW2
DESIGN: MRB
REVIEWED: JFW
SCALE: N.T.S.
DATE: DECEMBER 2011
DWG. NAME: 1487TANKPLAN



BW2 Engineers, Inc.
1919 S. Shiloh Road
Suite 500, L.B. 27
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(972) 864-8200 (T) (972) 864-8220 (F)
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WATER SYSTEM IMPROVEMENTS
McGARITY GROUND STORAGE TANK
AND PUMP STATION
GROUND STORAGE TANK - PLAN AND ELEVATION
CITY OF LUCAS

SHEET NO. **S2.0**
OF SHEETS
JOB NO. 11-1487

ELECTRICAL SYMBOLS	
	RECESSED OR SURFACE, TYPE 'A' DOWNLIGHT FIXTURE ON CIRCUIT #3.
	RECESSED OR SURFACE, TYPE 'A' LIGHTING TROFFER FIXTURE ON CIRCUIT #3.
	WALL MOUNTED OR BRACKET MOUNTED LIGHTING FIXTURE.
	RECESSED OR SURFACE, TYPE 'A' WALL WASHER FIXTURE ON CIRCUIT #3.
	HATCHED FIXTURE INDICATING A NIGHT LIGHT OR AN EMERGENCY LIGHTING FIXTURE.
	CEILING MOUNTED EXIT SIGN AND WALL MOUNTED EXIT SIGN.
	UNITARY EMERGENCY LIGHTING FIXTURE
	JUNCTION BOX, SIZED BY E.C. PER NEC.
	GRID SYSTEM JUNCTION BOXES, SIZED BY E.C. PER NEC.
	DUPLEX RECEPTACLE, 20A, 125V, GROUND.
	DUPLEX RECEPTACLE, 20A, 125V, ISOLATED GROUND.
	DUPLEX RECEPTACLE, 20A, 125V, GROUND, HALF SWITCHED.
	SIMPLEX RECEPTACLE, 20A (U.N.O.), 125V, GROUND.
	POWER RECEPTACLE, 2 POLE, 250V SINGLE PHASE. AMPS GREATER THAN 20A TO BE NOTED.
	QUADPLEX RECEPTACLE, 20A, 125V, GROUND.
	3 PHASE RECEPTACLE, AMPS GREATER THAN 20A TO BE NOTED.
	TELEPHONE OUTLET, DATA OUTLET, COMBINATION TELEPHONE/DATA OUTLET.
	TELEVISION OUTLET.
	CEILING MOUNTED SPEAKER, WALL MOUNTED SPEAKER.
	MICROPHONE OUTLETS.
	FLOOR BOX WITH DUPLEX RECEPTACLE.
	FLOOR BOX WITH TELEPHONE OUTLET, FLOOR BOX WITH DATA.
	MULTI-USE FLOOR BOXES.
	MULTI-OUTLET STRIP.
	BUZZER, BELL.
	SINGLE FACE CLOCK, DOUBLE FACE CLOCK.
	FIRE ALARM HORN, FIRE ALARM HORN AND STROBE ASSEMBLY, FIRE ALARM STROBE.
	FIRE ALARM HORN AND STROBE ASSEMBLY WITH MANUAL PULL STATION, MANUAL PULL STATION.
	FIRE ALARM WATER FLOW SWITCH, TAMPER SWITCH.
	FIRE ALARM CEILING MOUNTED SMOKE DETECTOR, DUCT MOUNTED SMOKE DETECTOR.
	UNDER FLOOR SMOKE DETECTOR.
	FIRE ALARM HEAT DETECTOR.
	SINGLE POLE SWITCH.
	THREE WAY SWITCH.
	FOUR WAY SWITCH.
	DIMMER SWITCH.
	KEY OPERATED SWITCH.
	KEY OPERATED THREE WAY SWITCH.
	MOMENTARY CONTACT SWITCH.
	PUSH BUTTON SWITCH.
	START - STOP PUSH BUTTON SWITCH
	H.O.A. PUSH BUTTON SWITCH.
	SINGLE THROW THERMAL SWITCH.
	PUSH BUTTON START / STOP SWITCH.
	MAGNETIC MOTOR STARTER.
	FUSED SWITCH.
	DISCONNECT SWITCH.
	FUSED DISCONNECT SWITCH.
	MOTOR.
	WIRING SYMBOLS: NEUTRAL, HOT, SWITCH, GROUND.
	CONDUIT CONCEALED IN OR BELOW FLOOR.
	PANELBOARD (250 VOLT OR BELOW).
	PANELBOARD (480 VOLT OR 600 VOLT).
	DRY TYPE TRANSFORMER.
	GROUNDING BUS BAR
	TELEPHONE CABINET OR BACKBOARD
	ABOVE COUNTER, GFCI RECEPTACLE, ABOVE COUNTER GFCI RECEPTACLE.
NOTE: NOT ALL SYMBOLS SHOWN ARE NECESSARILY USED.	

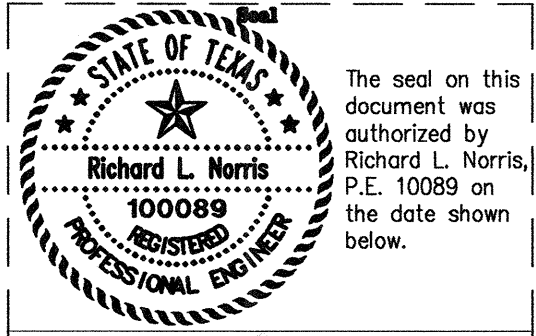
PLUMBING SYMBOL LEGEND	
	SANITARY SEWER (SS)
	SANITARY VENT (V)
	STORM DRAIN (SD)
	STORM OVERFLOW DRAIN (OD)
	GREASE WASTE (GW)
	ACID WASTE (AW)
	ACID VENT (AV)
	DOMESTIC COLD WATER (CW)
	DOMESTIC HOT WATER (100F HW)
	DOMESTIC HOT WATER (140F HW)
	DOMESTIC HOT WATER RETURN (RECIRC)
	DOMESTIC HOT WATER RETURN (140F RECIRC)
	FIRE LINE (F)
	NATURAL GAS (G)
	COMPRESSED AIR (A)
	OXYGEN
	VACUUM
	NITROGEN (N)
	NITROUS OXIDE (NO)
	RISER DOWN (ELBOW)
	RISER UP (ELBOW)
	BRANCH-BOTTOM CONNECTION
	BRANCH-TOP CONNECTION
	TEE CONNECTION
	90° ELBOW
	CAP ON END OF PIPE
	UNION
	FLOOR CLEANOUT
	CLEANOUT PLUG
	BALL VALVE
	PRESSURE REDUCING VALVE
	CHECK VALVE
	FLOW CONTROL VALVE
	GAS COCK
	TEMPERATURE-PRESSURE RELIEF VALVE
	THERMOMETER
	PRESSURE GAUGE WITH GAUGE COCK
	DIRECTION OF SLOPE
	DIRECTION OF FLOW
	OUTLET (SPECIFY TYPE)
	COMPRESSED AIR OUTLET
	NON-FREEZE WALL HYDRANT
	HOSE BIBB
	FLOOR SINK
	FLOOR DRAIN
	HUB DRAIN
	ROOF DRAIN
	OVERFLOW DRAIN
	EXISTING PIPING TO BE REMOVED
	NEW CONNECTION TO EXISTING
NOTE: NOT ALL SYMBOLS SHOWN ARE NECESSARILY USED.	

HVAC & PLUMBING, VALVE & FITTINGS SYMBOLS	
	SOIL OR WASTE
	STORM
	VENT
	COLD WATER
	HOT WATER
	HOT WATER RECIRCULATION
	GAS
	CHILLED WATER SUPPLY/RETURN
	PRODUCTION CHILLED WATER SUPPLY/RETURN
	HOT WATER SUPPLY/RETURN
	CONDENSER WATER SUPPLY/RETURN
	REFRIGERANT SUCTION AND LIQUID LINES
	CONDENSATE DRAIN LINE
	LOW PRESSURE STEAM CONDENSATE
	MEDIUM PRESSURE STEAM CONDENSATE
	HIGH PRESSURE STEAM CONDENSATE
	LOW PRESSURE STEAM SUPPLY (0 TO 15 PSIG)
	MEDIUM PRESSURE STEAM SUPPLY (15 TO 100 PSIG)
	HIGH PRESSURE STEAM (ABOVE 100 PSIG)
	FLOAT AND THERM. TRAP
	BUCKET STEAM TRAP
	GATE VALVE
	BALANCING VALVE
	FLOOR CLEAN OUT
	CLEAN OUT
	FIRE LINE
	BRANCH LINE WITH SPRINKLER HEADS
	FLOOR DRAIN
	HUB DRAIN
	DOWN SPOUT
	FIRE HOSE CABINET
	VENT THRU ROOF
	ROOF DRAIN
	CHECK VALVE
	45° Y VALVE
	GLOBE VALVE
	BUTTERFLY VALVE
	BALL VALVE
	SOLENOID VALVE
	PRESSURE REDUCING VALVE
	PRESSURE RELIEF VALVE
	CONTROL, 2 WAY VALVE
	CONTROL, 3 WAY VALVE
	STRAINER & BLOW OFF VALVE
	PRESSURE GAUGE & COCK
	UNION OR COMPANION FLANGES
	PLUG VALVE
	THERMOMETER
	PRESSURE & TEMPERATURE TAP (PETES PLUG)
	THERMOSTAT
	HUMIDISTAT
	FLOW METER
	ANCHOR (PIPE)
	EXPANSION JOINT
	MANUAL AIR VENT
	AUTOMATIC AIR VENT
	HOSE END DRAIN
	HOSE BIBB
	THERMOMETER & WELL
	TEMPERATURE SENSOR
	FLOW SWITCH
	PRESSURE SENSOR
NOTE: NOT ALL SYMBOLS SHOWN ARE NECESSARILY USED.	

HVAC LEGEND		
SINGLE LINE	DESCRIPTION	DOUBLE LINE
	90° ELBOW DOWN	
	90° ELBOW UP	
	OFFSET TO CHANGE ELEVATION (AT 30% WHEN POSSIBLE ARROW SLOPES DN.)	
	ROUND RADIUS ELBOW	
	45° ELBOW	
	90° STRAIGHT TEE	
	90° CONICAL TEE	
	45° BRANCH	
	45° CONICAL TEE	
	SIZE TRANSITION	
	SHAPE TRANSITION	
	ROUND FLEXIBLE DUCT	
	90° ELBOW DOWN W/ TURNING VANES (U.N.O.)	
	90° ELBOW UP W/ TURNING VANES (U.N.O.)	
	TEE WITH SPLITTER & TURNING VANES IN VERTICAL	
	OFFSET TO CHANGE ELEVATION (AT 30% WHEN POSSIBLE ARROW SLOPES DN.)	
	RECTANGULAR RADIUS ELBOW	
	RECTANGULAR ELBOW WITH TURNING VANES	
	SPLIT BRANCH TAKE-OFF WITH SQUARE ELBOW AND SPLITTER DAMPER.	
	SPLIT BRANCH TAKE-OFF WITH RADIUS ELBOW AND SPLITTER DAMPER.	
	BRANCH TAKE-OFF WITHOUT AIR BALANCING DAMPER.	
	BRANCH TAKE-OFF WITH AIR BALANCING DAMPER. (SCOOP DAMPER)	
	TEE WITH SPLITTER DAMPER	
	SPIN-IN TAP WITH DAMPER	
	SQUARE NECK C.L.S. DIFFUSER 4-WAY DIRECTIONAL THROW UNLESS INDICATED OTHERWISE.	
	SQUARE NECK C.L.S. DIFFUSER 4-WAY DIRECTIONAL THROW UNLESS INDICATED OTHERWISE.	
	SIDEWALL SUPPLY GRILLE OR REGISTER WITH O.D.D.	
	SUPPLY DUCT RISER	
	RETURN, EXHAUST OR OUTSIDE AIR DUCT RISER.	
	CEILING RETURN AIR GRILLE OR REGISTER	
	DOOR GRILLE	
	VOLUME DAMPER	
	FIRE DAMPER	
	MOTORIZED DAMPER	
	GRAVITY BACKDRAFT DAMPER	
	AUTO SMOKE DAMPER	
	DUCT MOUNTED SMOKE DETECTOR	
	SMOKE/FIRE DAMPERS (GLASS 11 MIN.)	
	THERMOSTAT OR TEMPERATURE SENSOR	
	ROOM HUMIDISTAT / CARBON DIOXIDE SENSORS	
NOTE: NOT ALL SYMBOLS SHOWN ARE NECESSARILY USED.		

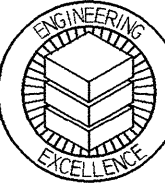
MEP ABBREVIATIONS	
ABV.	ABOVE
AC	ALTERNATING CURRENT
AVC	AIR CONDITIONER
AFD	ABOVE FINISHED CEILING
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AG	ABOVE GRADE AND GFI
AHAP	AS HIGH AS POSSIBLE
AHU	AIR HANDLING UNIT
ALT	ALTERNATE
AMB	AMBIENT TEMPERATURE (°F)
AMP	AMPERE
APPROX.	APPROXIMATELY
ARCH.	ARCHITECTURAL
AVG.	AVERAGE
B	BOILER
B.G.	BELOW GRADE
BMS	BUILDING MANAGEMENT SYSTEM
BRD	BAROMETRIC RELIEF DAMPER
BTU	BRITISH THERMAL UNIT
CD	CONSTRUCTION DOCUMENTS
CFH	CUBIC FEET PER HOUR
CFM	CUBIC FEET PER MINUTE
CH	CHILLER
CHEM.	CHEMICAL
CHP	CHILLED WATER PUMP
CKT.	CIRCUIT
CLG	CEILING
CMFR	COMPRESSOR
CT	COOLING TOWER
CWP	CONDENSER WATER PUMP
CU	CONDENSING UNIT
DB	DRY BULB
DEFL.	DEFLECTION
DEG. F	DEGREES FAHRENHEIT
DET.	DETAIL
DD	DESIGN DEVELOPMENT
DA	DIAHETER
DISC.	DISCONNECT SWITCH
DIM.	DIMENSION
EA	EXHAUST AIR
EDS	ENTERING DRY BULB
EF	EXHAUST FAN
ELEC.	ELECTRICAL
ELEV.	ELEVATION
EMCS	ENERGY MGMT. CONTROL SYSTEM
E.S.P.	EXTERNAL STATIC PRESS. (IN. W.G.)
EMB	ENTERING WET BULB
ENT	ENTERING WATER TEMPERATURE
EXH.	EXHAUST
EXIST.	EXISTING
F/A	FREE AREA OPENING (SQ. FT.)
FCL	FAN COIL UNIT
FHP	FRACTIONAL HORSE POWER
FLR.	FLOOR
GPI	COIL FINS PER INCH.
FFM	FEET PER MINUTE
FPS	FEET PER SECOND
FT	FOOT OR FEET
GFI	GROUND FAULT INTERRUPTER
GPM	GALLONS PER MINUTE
HD	HEAD
HOA	HAND/OFF/AUTO. MOTOR STARTER
HP	HORSE POWER
HPU	HEAT PUMP UNIT
HR.	HOURS
HT	HEIGHT
HTG.	HEATING
HTR.	HEATER
HVAC	HEAT VENT AND AIR CONDITIONING
HWP	HOT WATER PUMP
HX	HEAT EXCHANGER
HZ.	FREQUENCY (HERTZ)
ID	INSIDE DIAMETER OR DIMENSION
IN.	INCHES
KM	KILOMATT
KWH	KILOWATT HOUR
LAT	LEAVING AIR TEMPERATURE
LWT	LEAVING WATER TEMPERATURE
MAX.	MAXIMUM
MIN.	MINIMUM
MCA	MINIMUM CURRENT AMPS.
MOPP	MAX. OVER CURRENT PROTECTION
MWH	1000 BTU PER HOUR
MECH.	MECHANICAL
MFR.	MANUFACTURER
MIN.	MINIMUM
MVD	MANUAL VOLUME DAMPER
N/A	NOT APPLICABLE
NC	NOISE CRITERIA
NIC	NOT IN CONSTRUCTION
NK	NECK DIMENSION
NO	NUMBER
OA	OUTSIDE AIR
OAR	OWNERS AUTHORIZED REPRESENTATIVE
OPD	OPPOSED BLADE DAMPER
OD	OUTSIDE DIAMETER
ORIG.	ORIGINAL
P.D.	PRESSURE DROP (FT)
PH.	PHASE
PMB	POWERED MIXING BOX
PLBG.	PLUMBING
PNL	PANEL
PRESS.	PRESSURE
RA	RETURN AIR
RAG	RETURN AIR GRILLE
RD	RADIUS
RE	REFERENCE
RPM	REVOLUTIONS PER MINUTE
RTU	ROOF TOP UNIT
S/S	SINGLE SPEED MOTOR
S/S/S	START/STOP/STATUS
SA	SUPPLY AIR
SAG	SUPPLY AIR GRILLE
SDC	STAND ALONE DIGITAL CONTROLLER
SEER	SEASON ENERGY EFFICIENCY RATIO
SENS.	SENSIBLE
SP	STATIC PRESSURE
SQ.	SQUARE
STR.	MOTOR STARTER
TEMP.	TEMPERATURE
T.S.P.	TOTAL STATIC PRESSURE (IN. W.G.)
UH	UNIT HEATER
UNO	UNLESS NOTED OTHERWISE
V	VOLT
VAV	VARIABLE AIR VALVE
VEL.	VELOCITY
W	WATT
W	WITH
W/O	WITHOUT
W.G.	WATER GAUGE
WB	WET BULB
WP	WEATHERPROOF
WPD	WATER PRESSURE DROP
WPR	WEATHERPROOF GFI
WTR.	TRANSFORMER

RECORD DRAWING
BASED ON CONTRACTOR MARKUPS,
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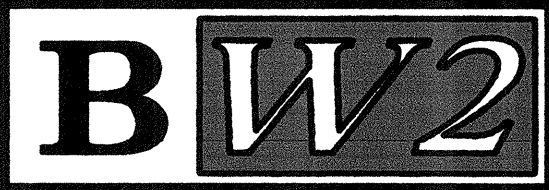
Richard L. Norris
P.E. 100089
12/30/2011

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Consulting Engineer Mechanical / Electrical
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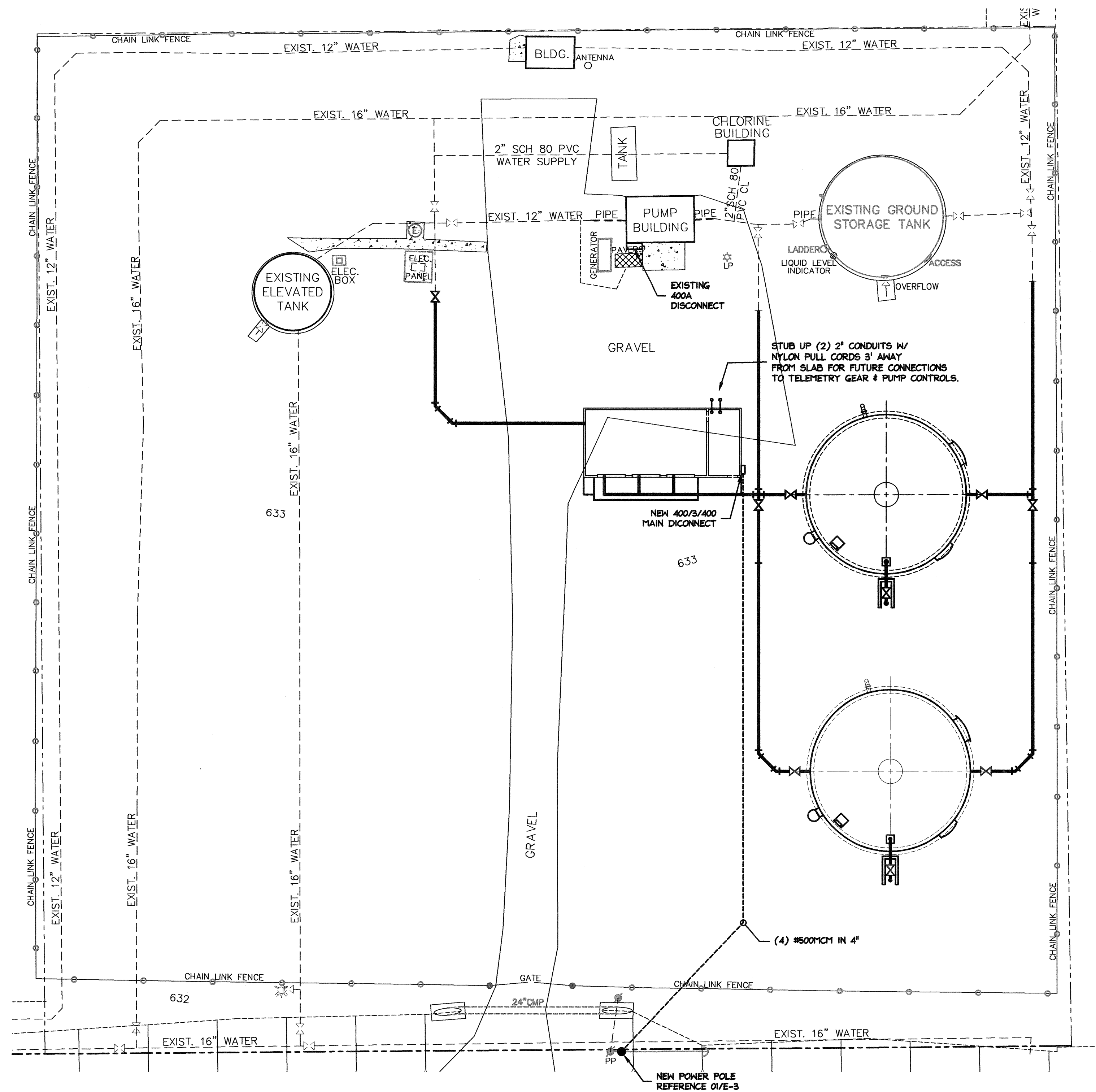
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DESIGN: RLN
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SCALE: NONE
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DWG. NAME: SYMBOLS & ABBREVIATIONS



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SHEET NO. MEP-1
OF SHEETS
JOB NO. 4195



01 MEP SITE PLAN
SCALE: 1"=20'-0"

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STATE OF TEXAS
The seal on this document was authorized by Richard L. Norris, P.E. 100089 on the date shown below.
Richard L. Norris
100089
REGISTERED PROFESSIONAL ENGINEER
c:\richard L. Norris P.E., c-s, Toub & Associates Inc., ou, email=monis@stoubandassociates.com, c=US 2012.01.17 16:57:42 -0600

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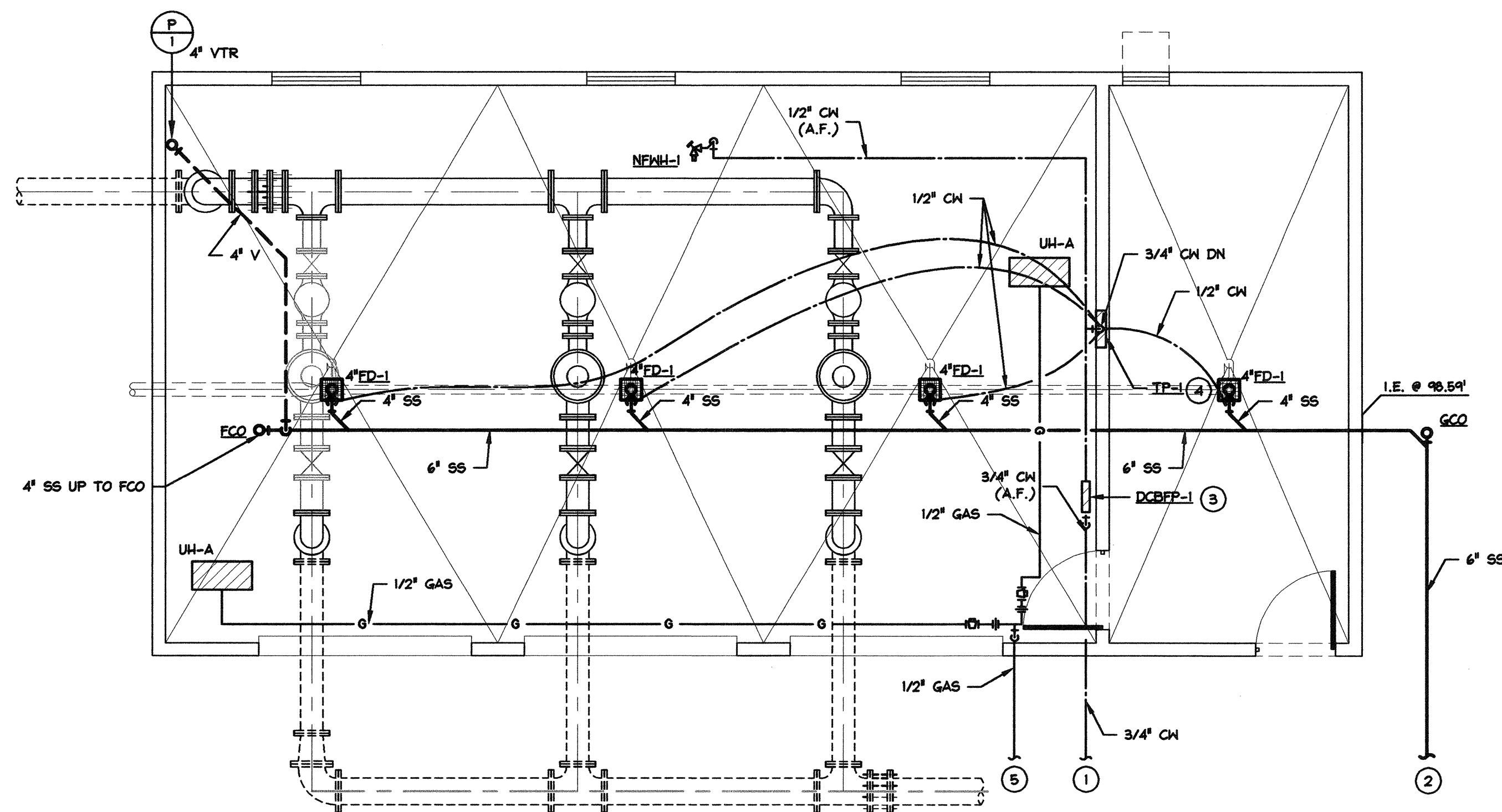
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SCALE: 1"=20'-0"
DATE: 12/30/2011
DWG. NAME: MEP SITE PLAN



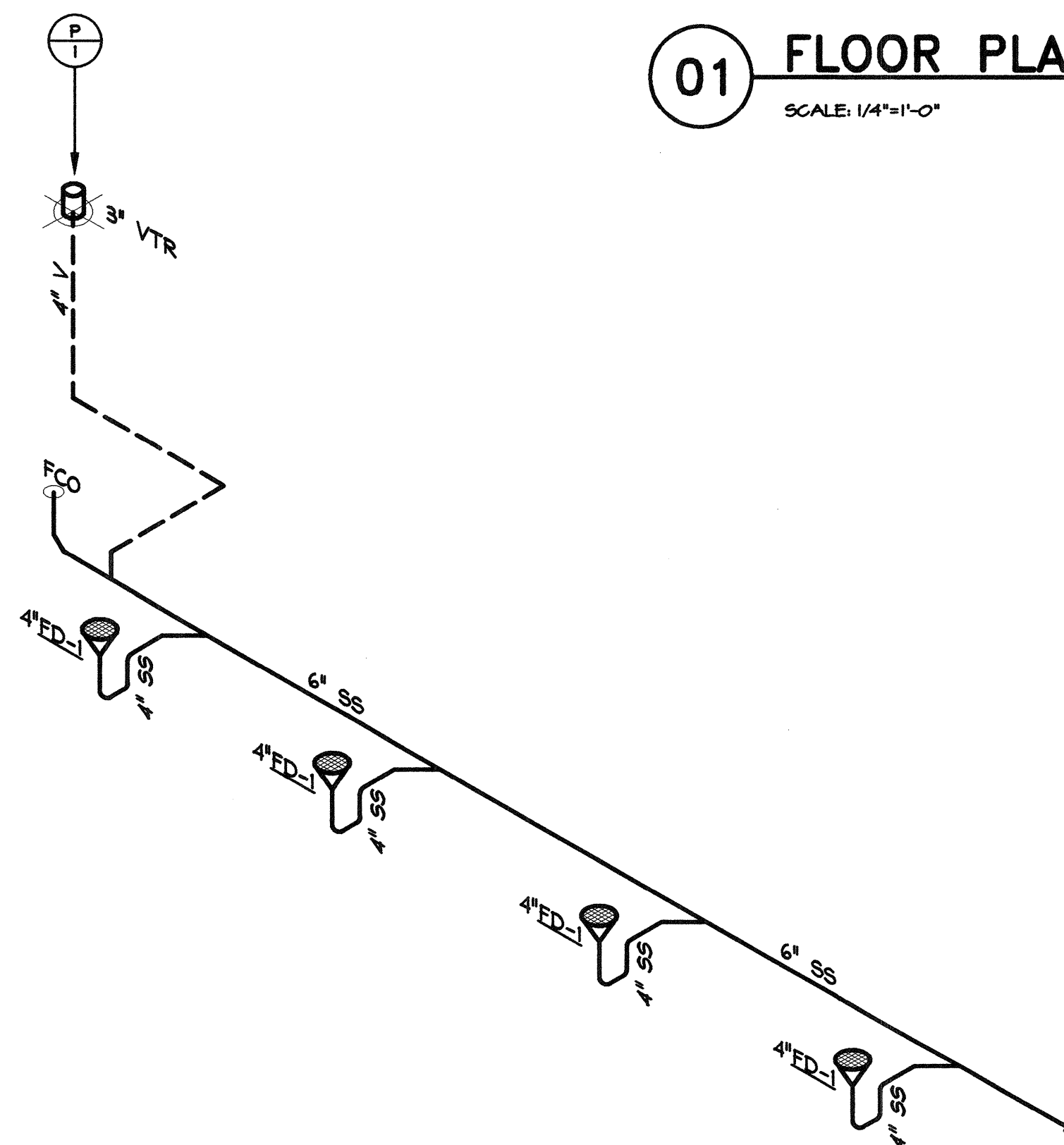
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SHEET NO. MEP-2
OF SHEETS
JOB NO. 4195



01 FLOOR PLAN-PLUMBING
SCALE: 1/4"=1'-0"



02 PLUMBING RISER DIAGRAM
SCALE: 1/4"=1'-0"

GENERAL NOTES:

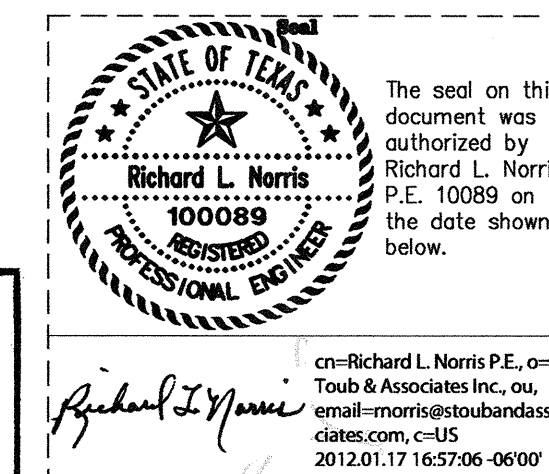
- ALL PLUMBING WORK IS DONE IN ACCORDANCE WITH THE LATEST PLUMBING CODE (IPC 2009).
- CONTRACTOR TO VERIFY ALL EXISTING CONDITIONS BEFORE PROCEEDING WITH FABRICATION OF NEW PLUMBING WORK.
- LOPE OF ALL HORIZONTAL DRAINAGE PIPING (SANITARY, STORM, GREASE WASTE, ACID WASTE, ETC.) AS FOLLOWS UNLESS NOTED OTHERWISE ON PLANS:

SIZE	SLOPE
2 1/2" OR LESS	1/4" IN/FT
3" AND LARGER	1/8" IN/FT
- ALL HORIZONTAL VENT PIPING SHALL BE GRADED AS TO DRAIN BACK TO THE DRAINAGE PIPE BY GRAVITY.
- REFER TO ARCHITECTURAL DRAWINGS FOR EXACT LOCATION AND ELEVATION OF FLOOR DRAINS. CONTRACTOR SHALL COORDINATE LOCATIONS OF FLOOR DRAINS IN MECHANICAL ROOMS WITH HVAC DRAWINGS.
- PROVIDE SHUT-OFF VALVES IN ALL DOMESTIC WATER PIPING SYSTEM BRANCH LINES.
- PROVIDE CLEANOUTS IN HORIZONTAL DRAINAGE PIPING AT ENDS OF RUNS, AT CHANGES IN DIRECTION GREATER THAN 45°, NEAR THE BASE OF STACKS, EVERY 50 FEET IN HORIZONTAL RUNS AND ELSEWHERE AS INDICATED. CLEANOUTS SHALL BE THE SAME NOMINAL SIZE AS THE PIPE THEY SERVE UP TO 4 INCHES. FOR PIPES LARGER THAN 4 INCHES NOMINAL SIZE, THE MINIMUM SIZE OF THE CLEANOUT SHALL BE 4 INCHES.
- UNLESS NOTED ON THE DRAWINGS, ALL PLUMBING PIPING IS UNDERFLOOR.
- INVERT ELEVATION OF PLUMBING SANITARY SEWER LINE IS BASED ON AN ARCHITECTURAL FINISHED FLOOR ELEVATION OF 100'-0".

NOTES BY SYMBOL: *

- FOR CONTINUATION OF SANITARY SEWER LINE, SEE CIVIL DRAWINGS.
- FOR CONTINUATION OF DOMESTIC COLD WATER LINE, SEE CIVIL DRAWINGS.
- DOUBLE CHECK BACK-FLOW PREVENTER (WATTS MODEL NO. 007MBOT-S OR APPROVED EQUAL). VERIFY DESIRED LOCATION PRIOR TO INSTALLATION.
- TRAP PRIMER MANIFOLD (PPP, INC. MODEL NO. PT-4 OR APPROVED EQUAL).
- 1/2" PROPANE GAS LINE TO GAS STORAGE TANKS PROVIDED AND INSTALLED BY THE CONTRACTOR. VERIFY ROUTING AND ALL REQUIREMENTS ON SITE PRIOR TO INSTALLATION.

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DWG. NAME: PLUMBING



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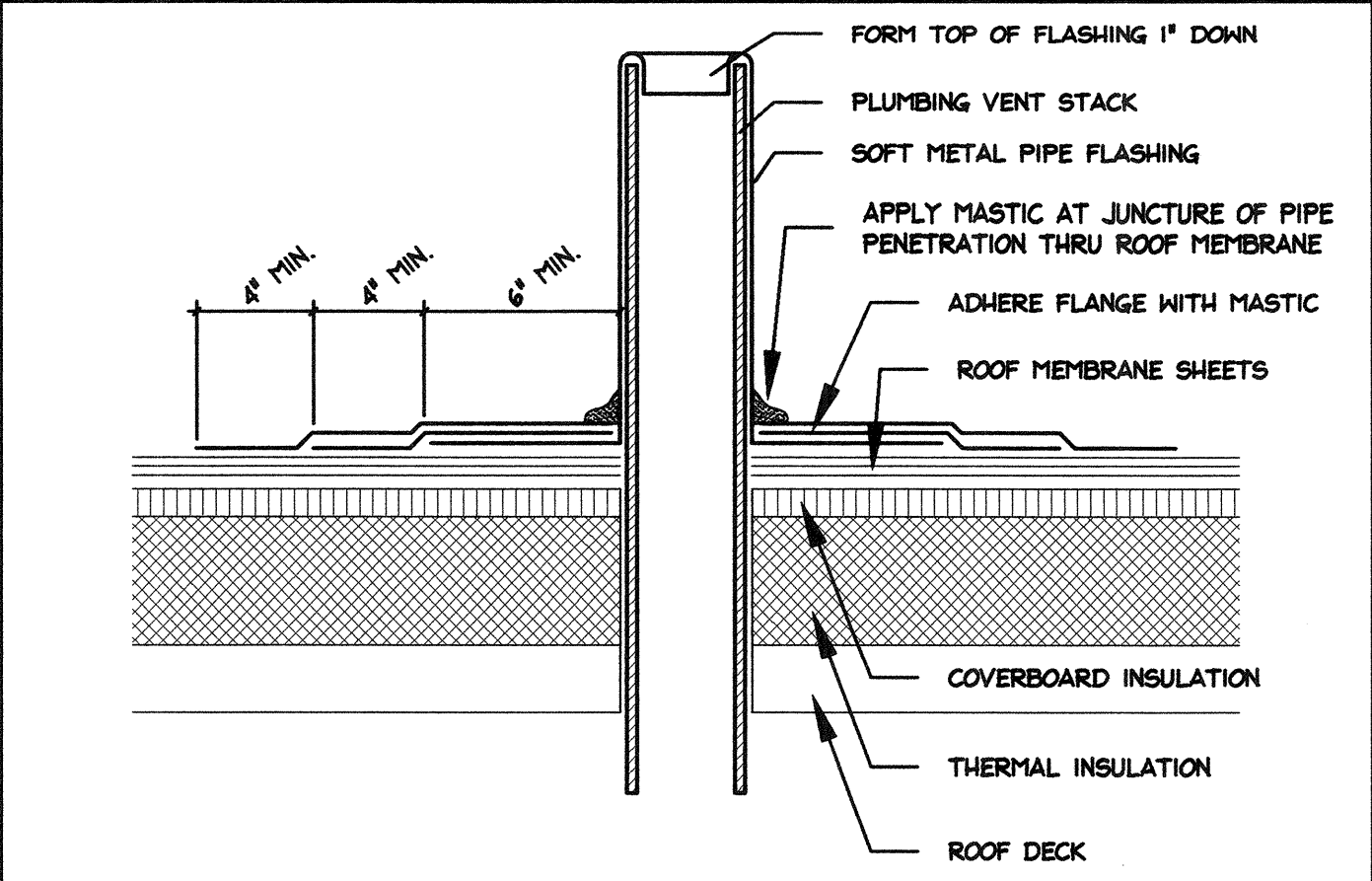
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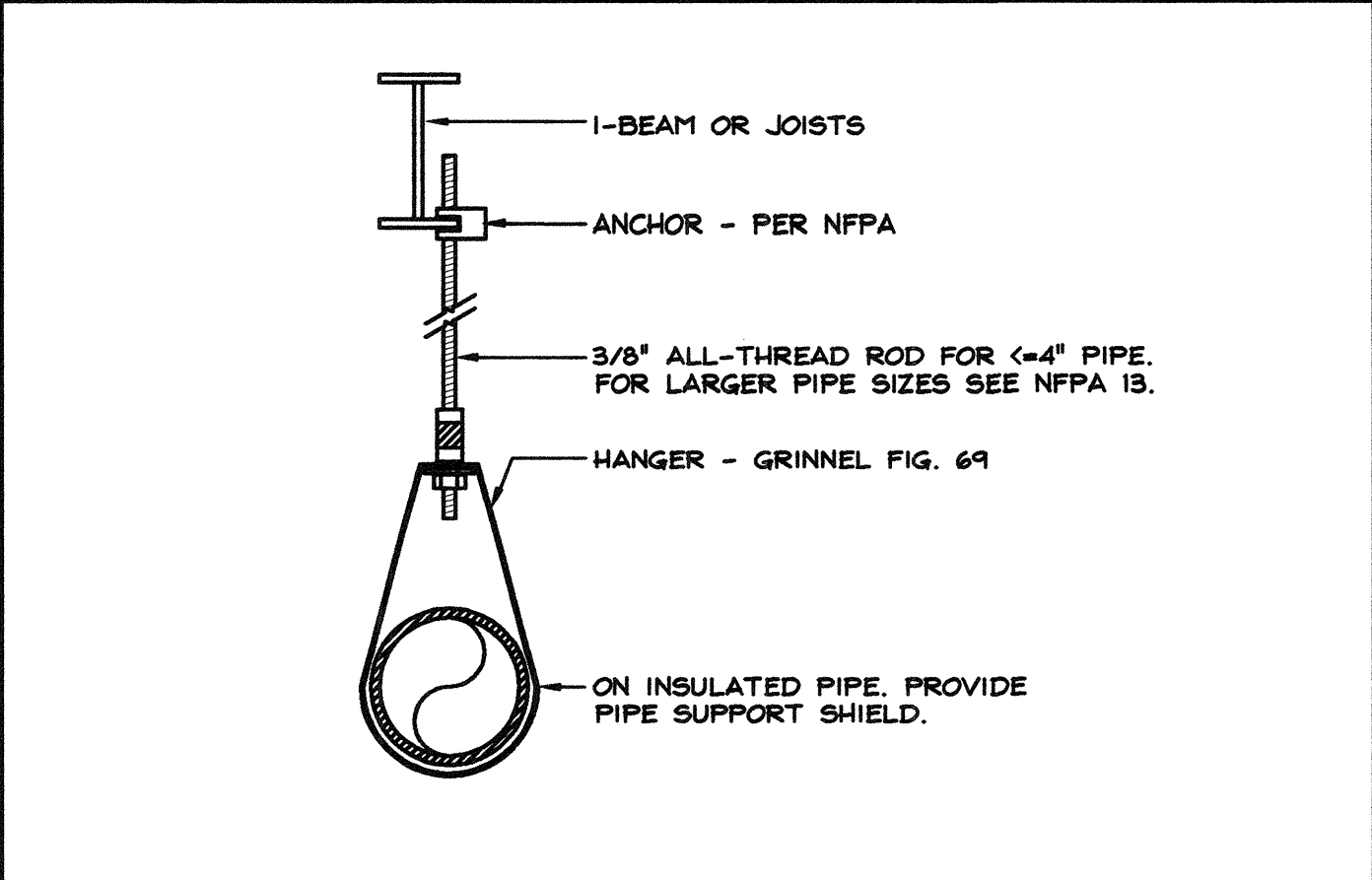
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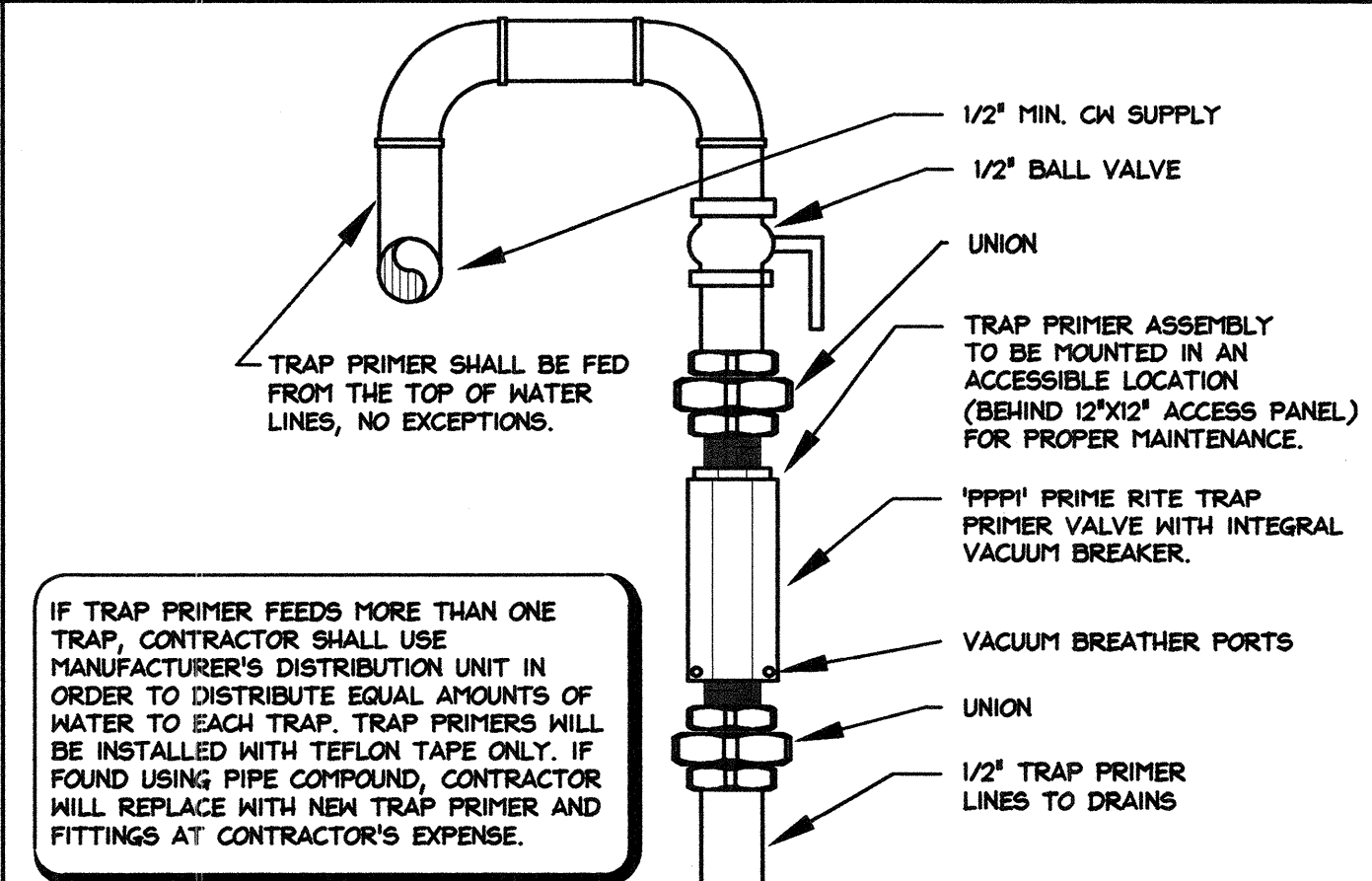
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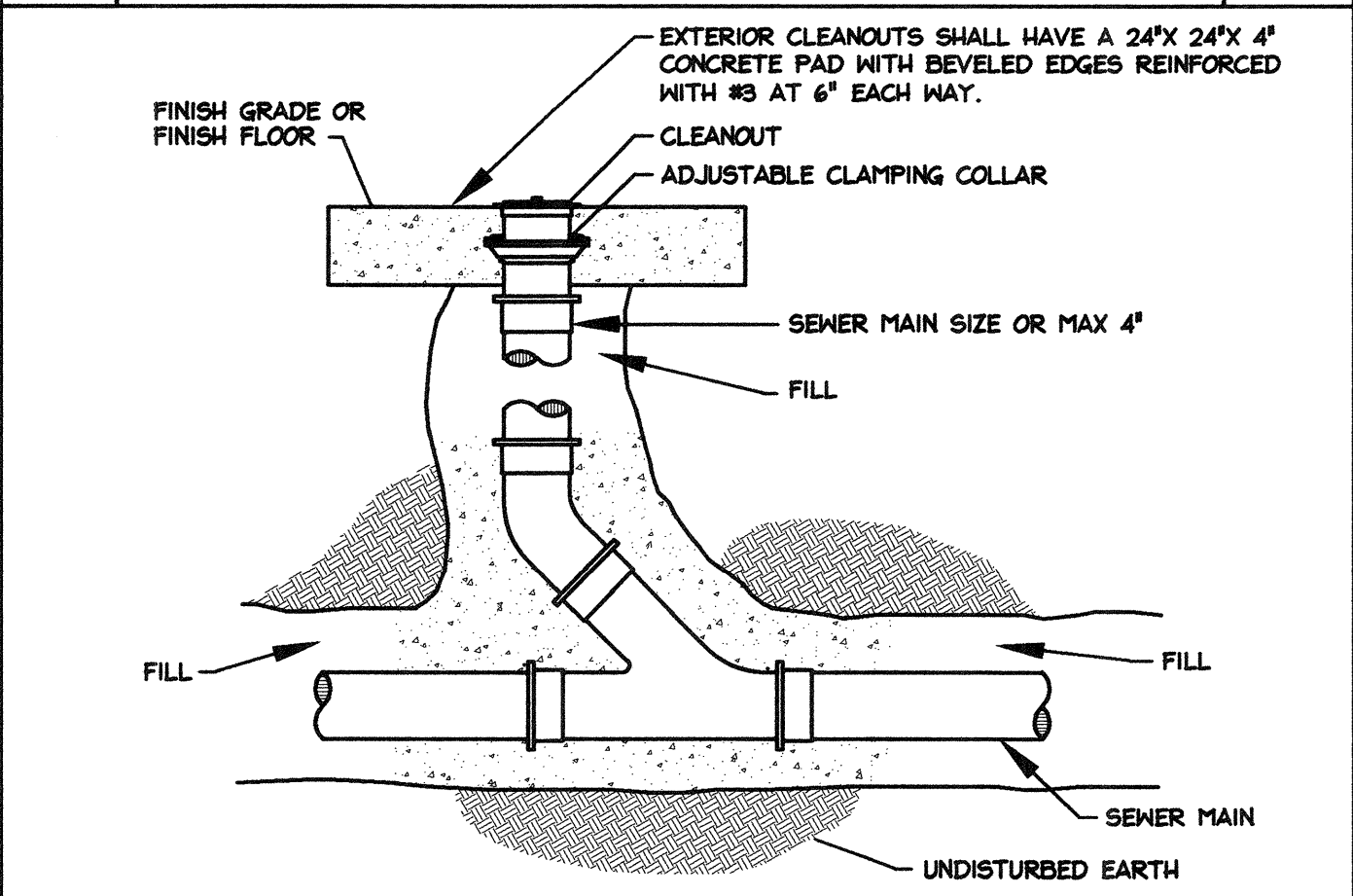
00 VENT THROUGH ROOF DETAIL



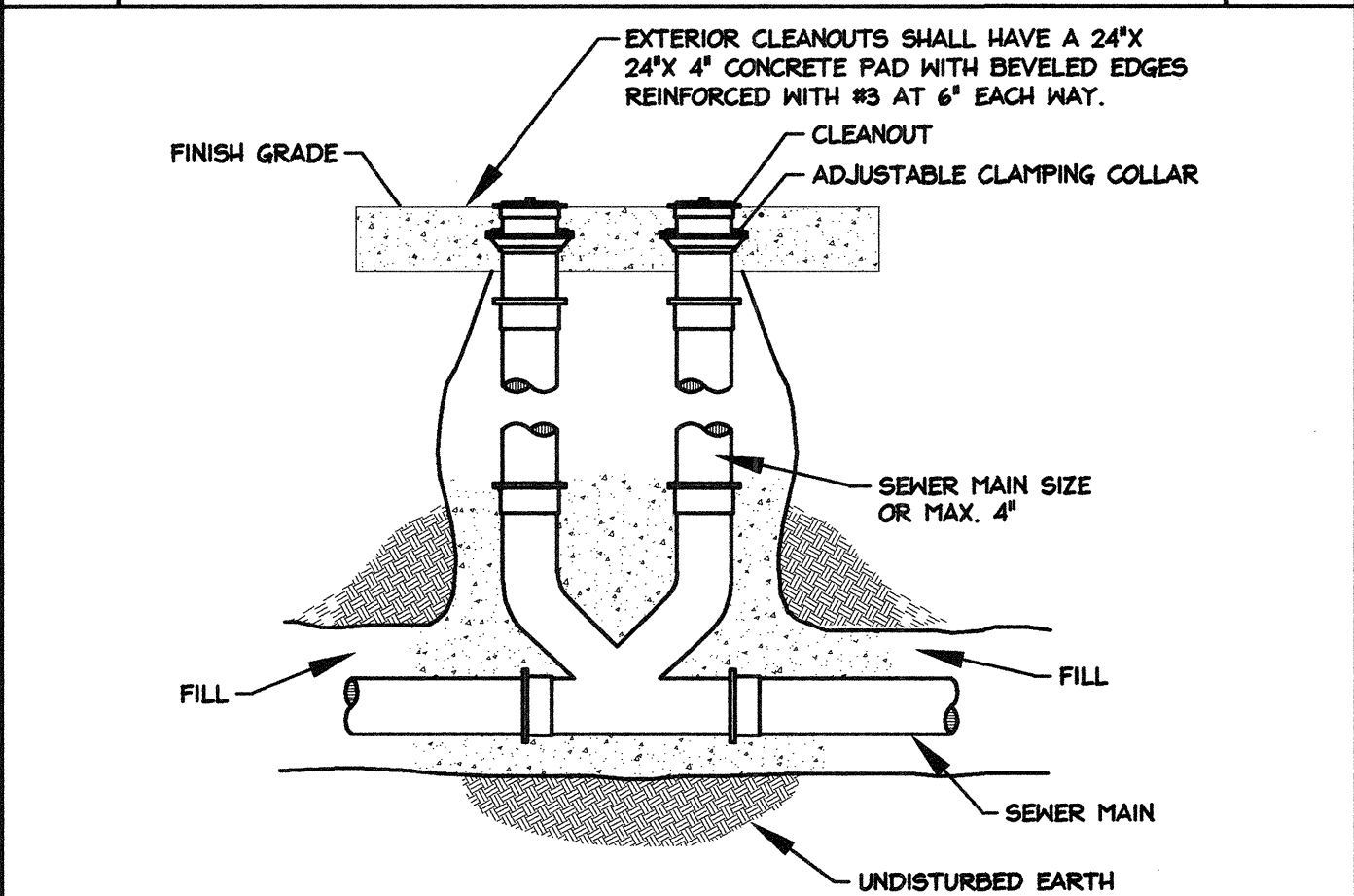
03 PIPE HANGAR DETAIL



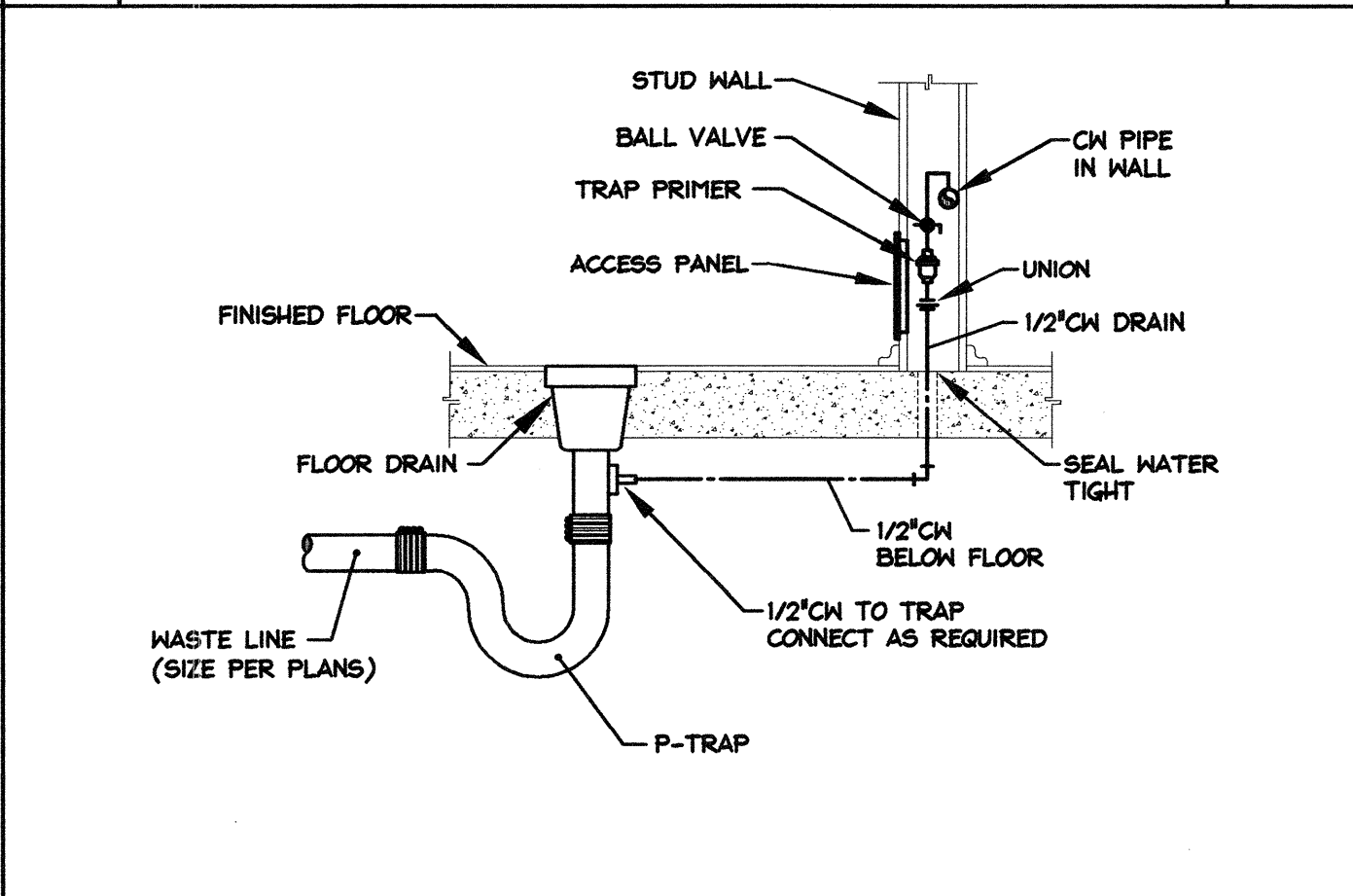
02 TRAP PRIMER DETAIL



07 FLOOR CLEANOUT DETAIL



00 TWO WAY CLEANOUT

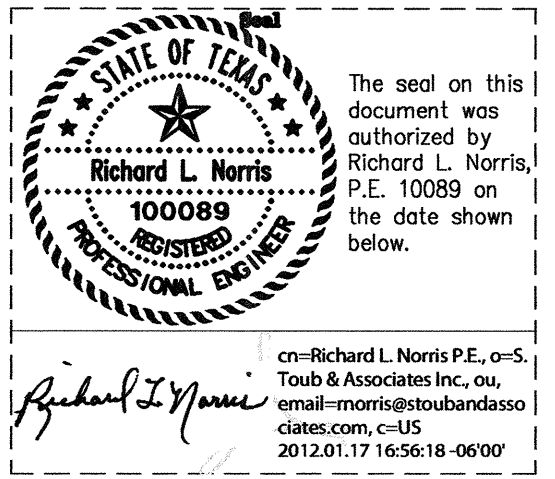


05 TRAP PRIMER TO FD DETAIL

PLUMBING FIXTURE SCHEDULE

DESIG.	DESCRIPTION	MANUFACTURER & MODEL NUMBER	ACCEPTABLE MANUFACTURERS	SAN. SWR SIZE	VENT SIZE	COLD WTR SIZE	HOT WTR SIZE	DESCRIPTION / REMARKS
FD-1	FLOOR DRAIN (MECHANICAL ROOM)	JOSAM #32100-AE-50-BI-VP	J.R. SMITH, WADE, ZURN	-	2"	1/2"	-	CAST IRON FLOOR DRAIN, TWO PIECE BODY W/ DOUBLE DRAINAGE FLANGE, NON-PUNCTURING FLASHING COLLAR, WEEPHOLES, BOTTOM OUTLET, ROUND TOP, ADJUSTABLE COLLAR W/ ROLLED THREAD AND REMOVABLE SEDIMENT BUCKET WHICH SUPPORTS A MEDIUM DUTY, LOOSE SET, ANTI-TILTING CAST IRON GRATE W/ PERIMETER
FCO	INTERIOR FLOOR CLEANOUT	JOSAM #57000-22-VP	J.R. SMITH, WADE, ZURN	-	-	-	-	COATED CAST IRON, LEVEZE FLOOR CLEANOUT, TAPER THREADED BRONZE CLEANOUT PLUG AND ADJUSTABLE ABS HOUSING WITH MEDIUM DUTY SCORIATED SECURED ROUND SATIN NIKALOY TOP WITH VANDAL-PROOF SCREENS. CONTRACTOR SHALL SELECT CLEANOUT COVER FOR FLOOR COVERING USED. REFER TO ARCHITECTURAL DRAWINGS FOR FLOOR COVERINGS.
CO	EXTERIOR FLOOR CLEANOUT	JOSAM #57000-SD-22-VP	J.R. SMITH, WADE, ZURN	-	-	-	-	COATED CAST IRON, LEVEZE FLOOR CLEANOUT, TAPER THREADED BRONZE CLEANOUT PLUG AND ADJUSTABLE ABS HOUSING WITH HEAVY DUTY SCORIATED SECURED ROUND SATIN NIKALOY TOP WITH VANDAL-PROOF SCREENS.
NFWH-1	NON-FREEZE WALL HYDRANT	JOSAM #71000	WOODFORD, MIFAB, J.R. SMITH	-	-	3/4"	-	CAST BRONZE BOX TYPE NON-FREEZE WALL HYDRANT WITH SATIN NIKALOY SCORIATED HINGED LATCHING COVER, 3/4" H.P.T. OUTLET, INTEGRAL VACUUM BREAKER BACKFLOW PREVENTER, PRESSURE RELIEF VALVE, BRONZE CASING, BRONZE OPERATING PARTS CONVERTIBLE INTO SERVICE TOOL, 3/4" FEMALE AND 1" MALE N.P.T. INLET CONNECTION. FURNISH COMPLETE WITH KEY LOCK AND "WATER" CAST ON COVER.

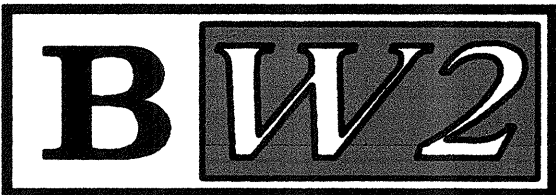
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DATE: 12/30/2011
DWG. NAME: DETAILS & SCHEDULES

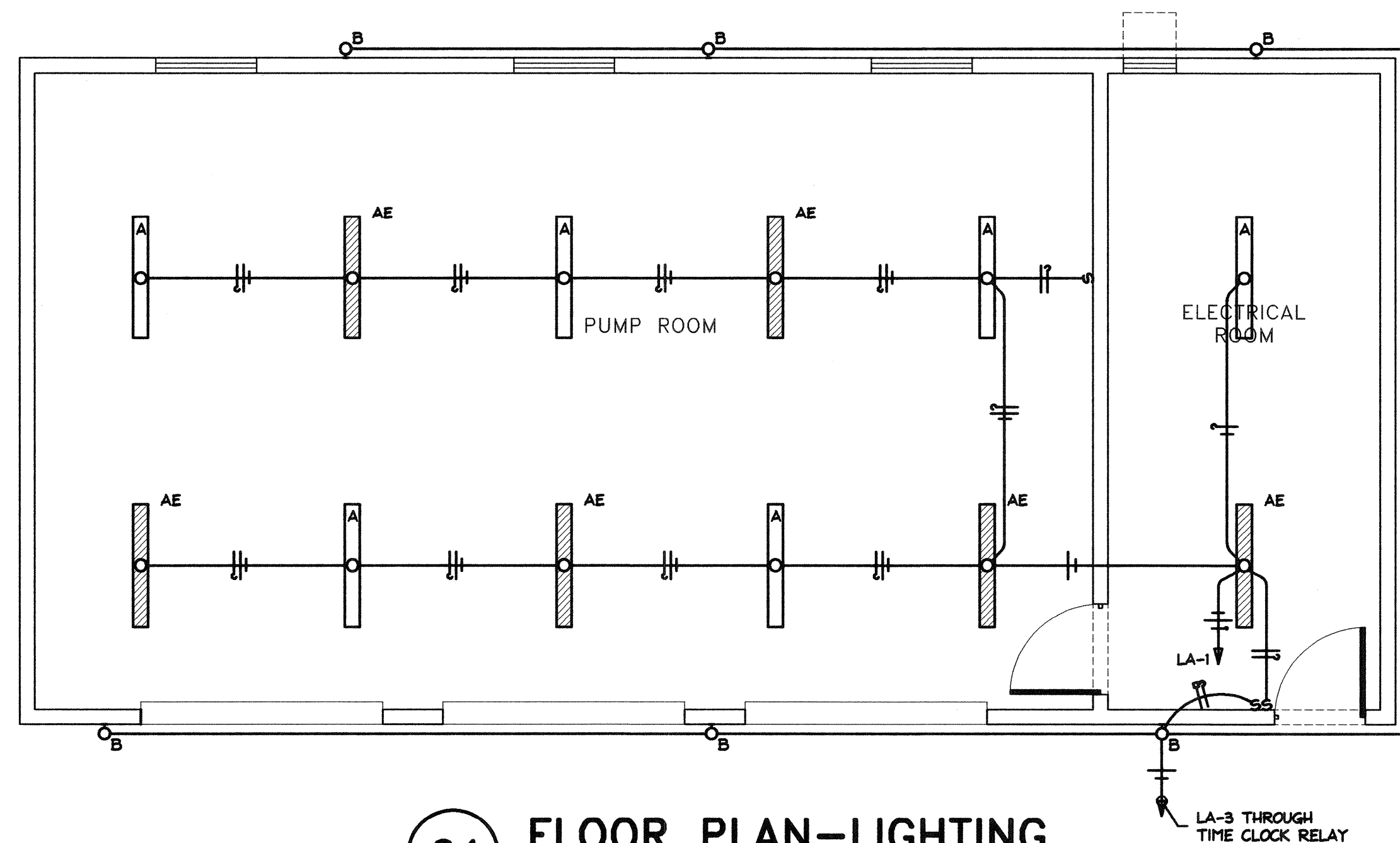


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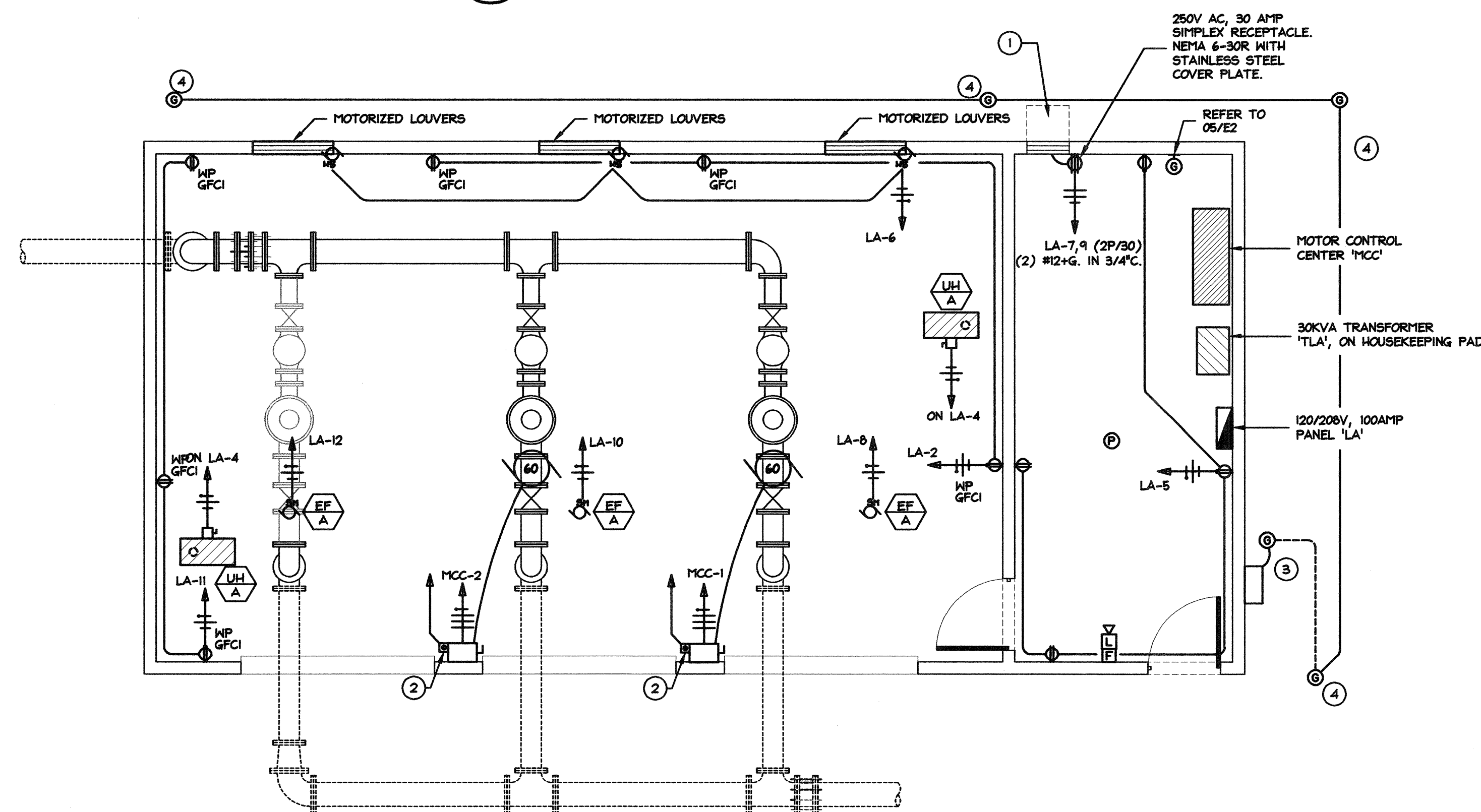


NOTES BY SYMBOL:

- FURNISH AND INSTALL A 208V, 1PH WINDOW MOUNT TYPE HEATING & COOLING UNIT. (CARRIER # GYB 324B, OR EQUAL) WITH EPOXY COATED CONDENSER COILS AND WALL SLEEVE. INSTALL PER MANUFACTURES GUIDELINES
- FURNISH & INSTALL A REMOTE START/STOP MAINTAINED CONTACT PUSH-BUTTON STATION (ALLEN BRADLEY #800H-2HAARS) FOR EACH PUMP. PROVIDE & INSTALL CONDUIT AND CONDUCTORS (3-#12+G) FROM PUSH-BUTTON STATION TO ASSOCIATED MOTOR STARTER SWITCH.
- STUB UP A #3/0 INSULATED COPPER GROUND WIRE INTO A BONDED TO THE METER BASE GROUND LUG, AND CONTINUED ON INTO, AND BONDED TO THE MAIN DISCONNECT GROUNDING LUGS. FIELD VERIFY THE EXACT STUB-UP LOCATION.
- PROVIDE & INSTALL A 3/4" DIA. # 10' COPPER CLAD STEEL GROUND ROD IN GROUND WALL BOX. REFER TO 02/E2

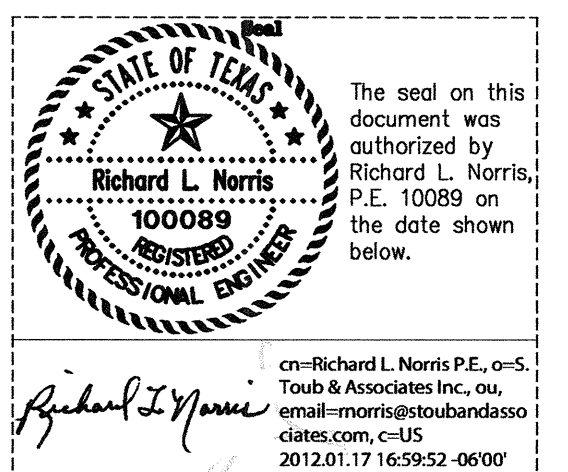
GENERAL NOTES:

- THE ELECTRICAL CONTRACTOR SHALL COORDINATE WITH THE CONTROLS CONTRACTOR AND PROVIDE ALL NECESSARY ELECTRICAL REQUIREMENTS FOR A COMPLETE INSTALLATION.



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 DWG. NAME: 4195_E-1.DWG



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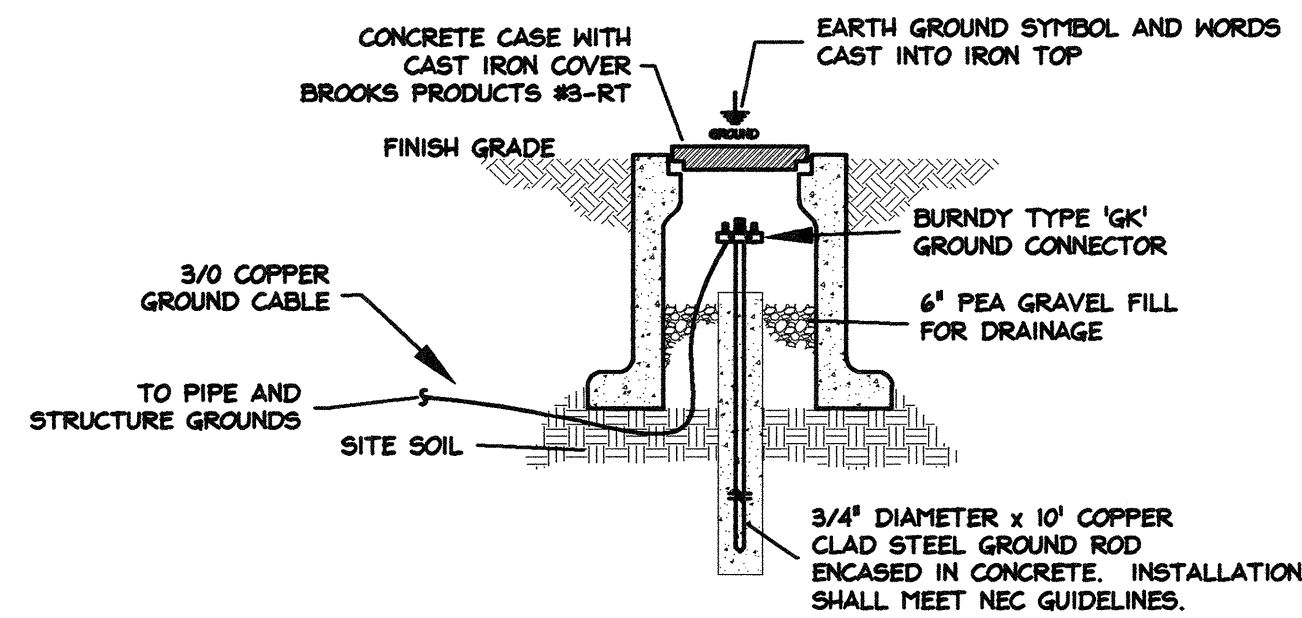
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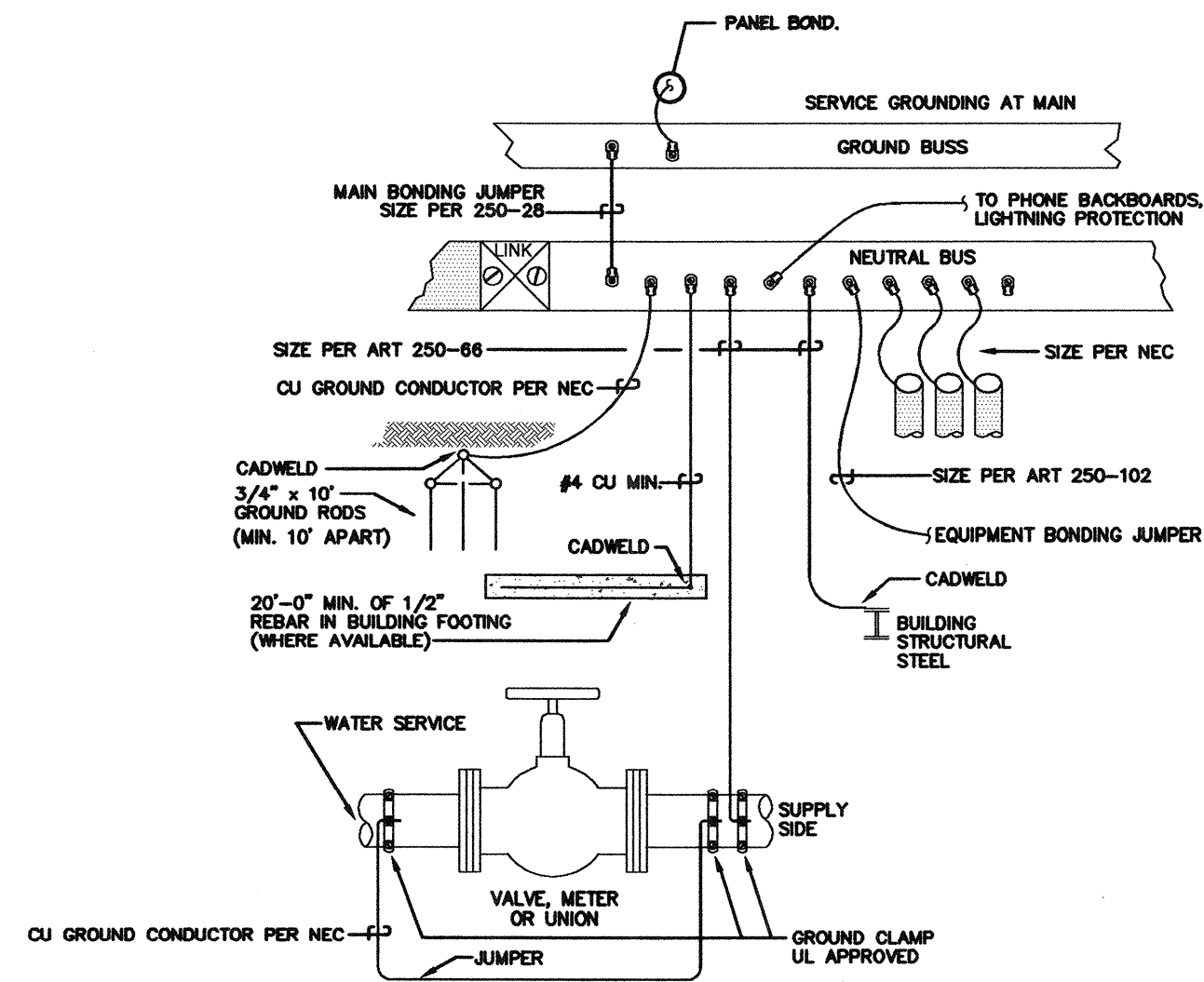
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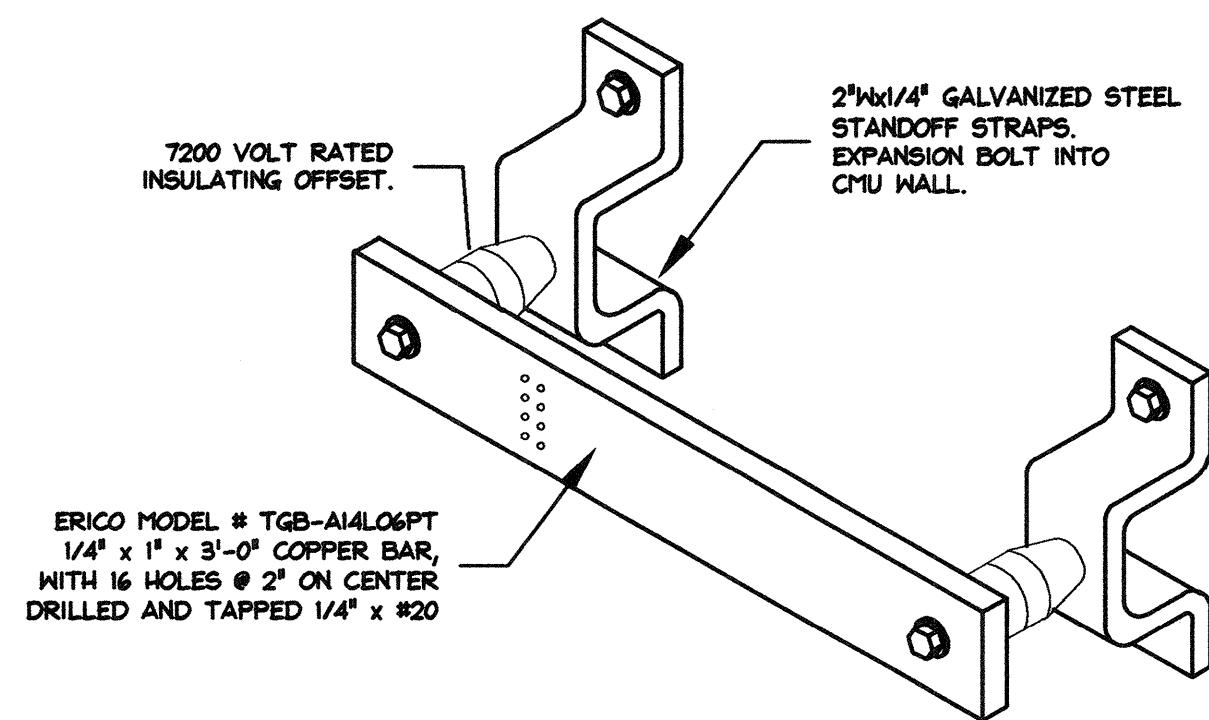
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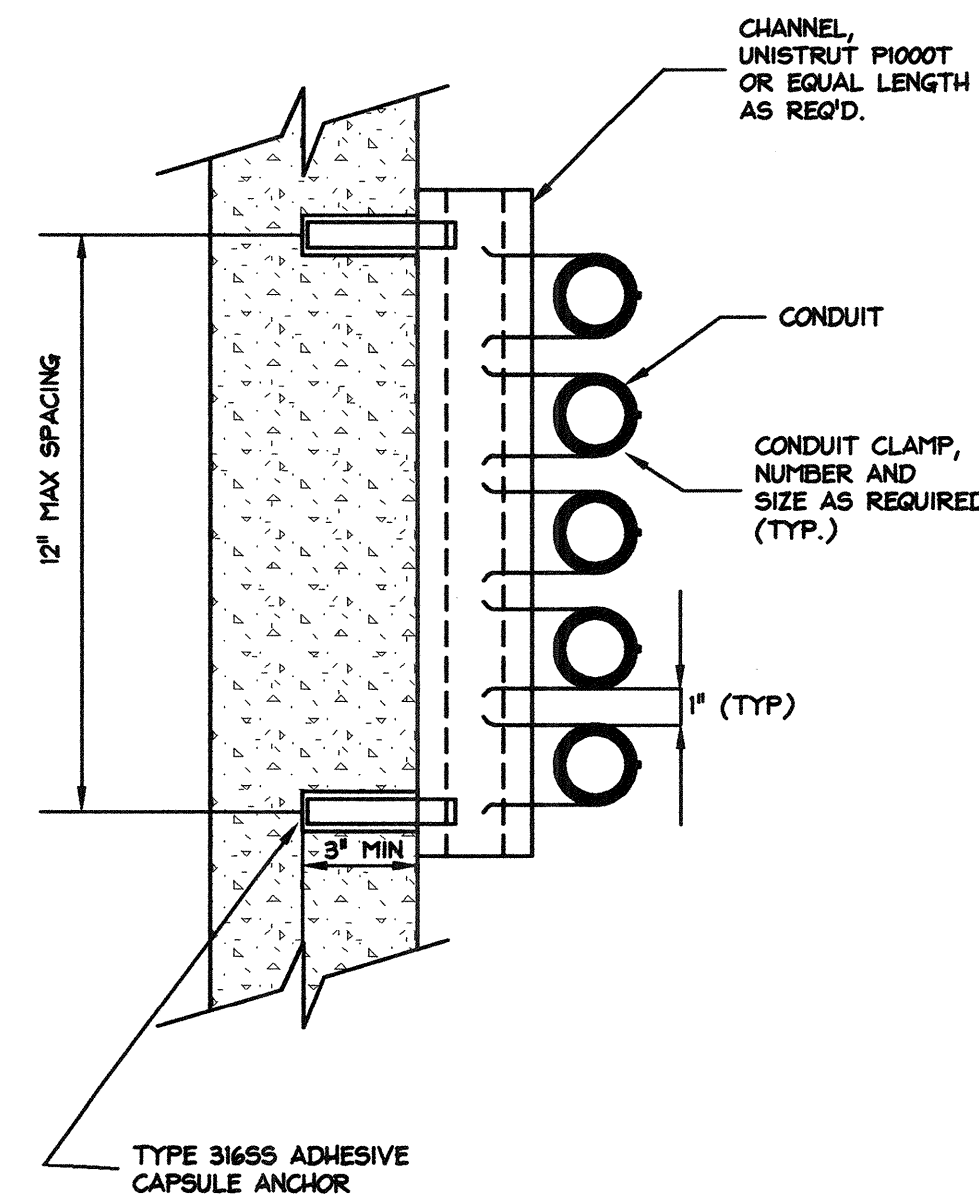
02 ELECTRICAL MAIN GROUNDING DETAIL
SCALE: NONE



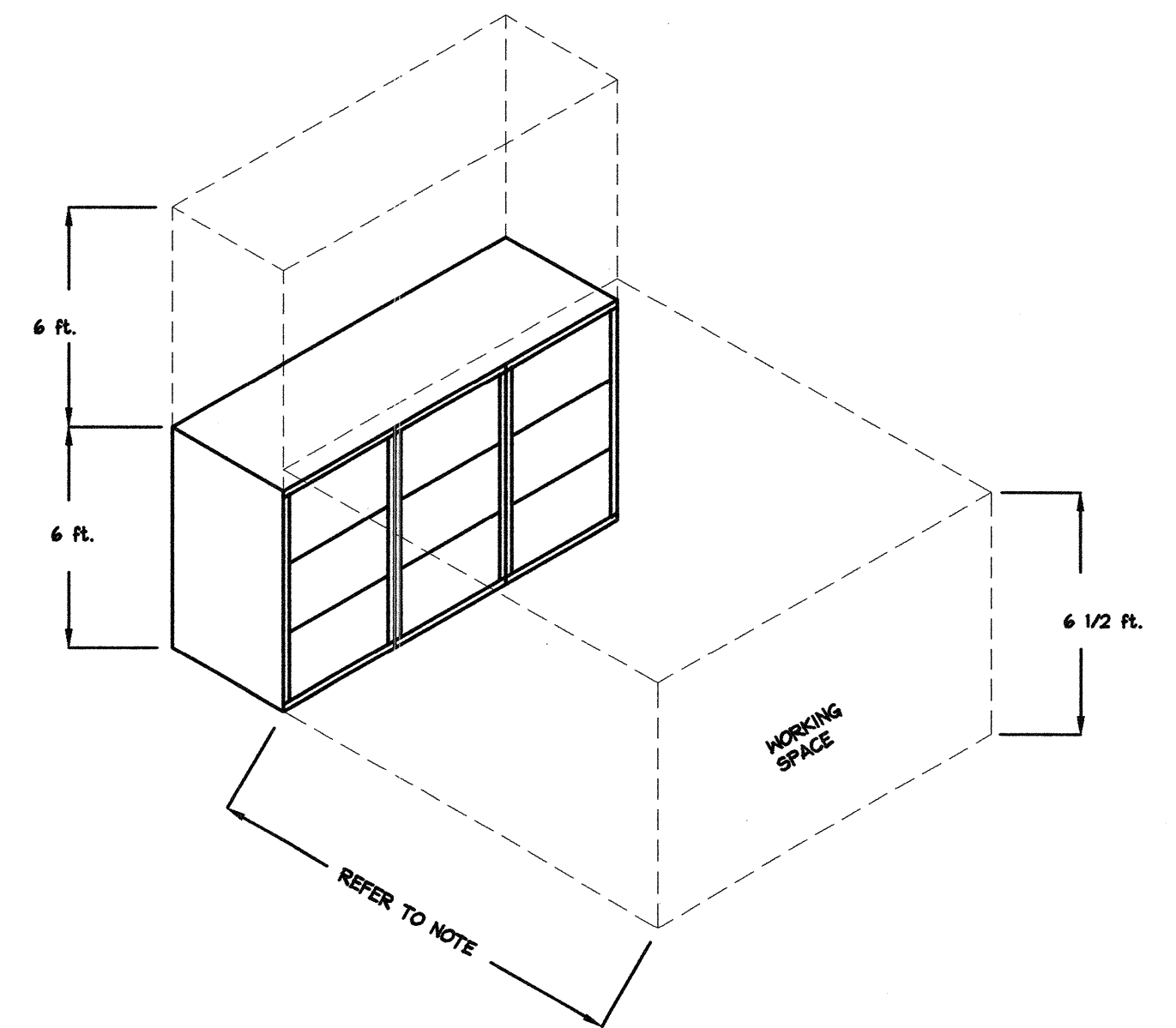
02 NEUTRAL GROUNDING DETAIL
SCALE: NONE



05 GROUNDING BUS DETAIL
SCALE: NONE



04 CONDUIT RACK DETAIL
SCALE: NONE



NOMINAL VOLTAGE	MINIMAL CLEAR DISTANCE		
	CONDITION 1	CONDITION 2	CONDITION 3
0 - 150	900 mm (3 FT)	900 mm (3 FT)	900 mm (3 FT)
151 - 600	900 mm (3 FT)	1 mm (3 1/2 FT.)	1.2 m (4 FT.)

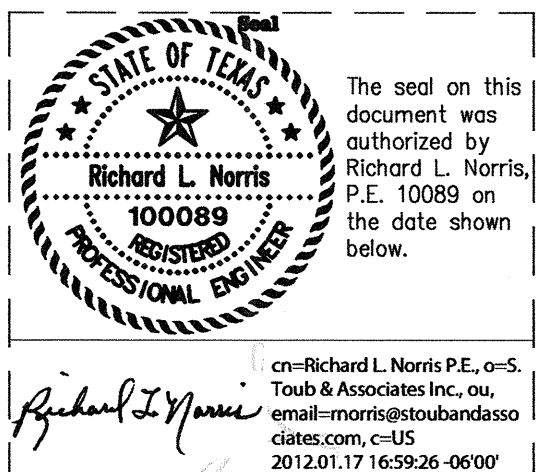
NOTE: WHERE THE CONDITIONS ARE AS FOLLOWS:

CONDITION 1 - EXPOSED LIVE PARTS ON ONE SIDE AND NO LIVE GROUNDED PARTS ON THE OTHER SIDE OF THE WORKING SPACE, OR EXPOSED LIVE PARTS ON BOTH SIDES EFFECTIVELY GUARDED BY SUITABLE WOOD OR OTHER INSULATING MATERIALS. INSULATED WIRE OR INSULATED BUSBARS OPERATING AT NOT OVER 300 VOLTS TO GROUND SHALL NOT BE CONSIDERED LIVE PARTS.

CONDITION 2 - EXPOSED LIVE PARTS ON ONE SIDE AND GROUNDED PARTS ON THE OTHER SIDE. CONCRETE, BRICK, OR TILE WALLS SHALL BE CONSIDERED AS GROUNDED.

CONDITION 3 - EXPOSED LIVE PARTS ON BOTH SIDES OF THE WORK SPACE (NOT GROUNDED AS PROVIDED IN CONDITION 1) WITH THE OPERATOR BETWEEN.

01 ELECTRICAL PANEL WORK SPACE
SCALE: NONE



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PANEL 'LA'

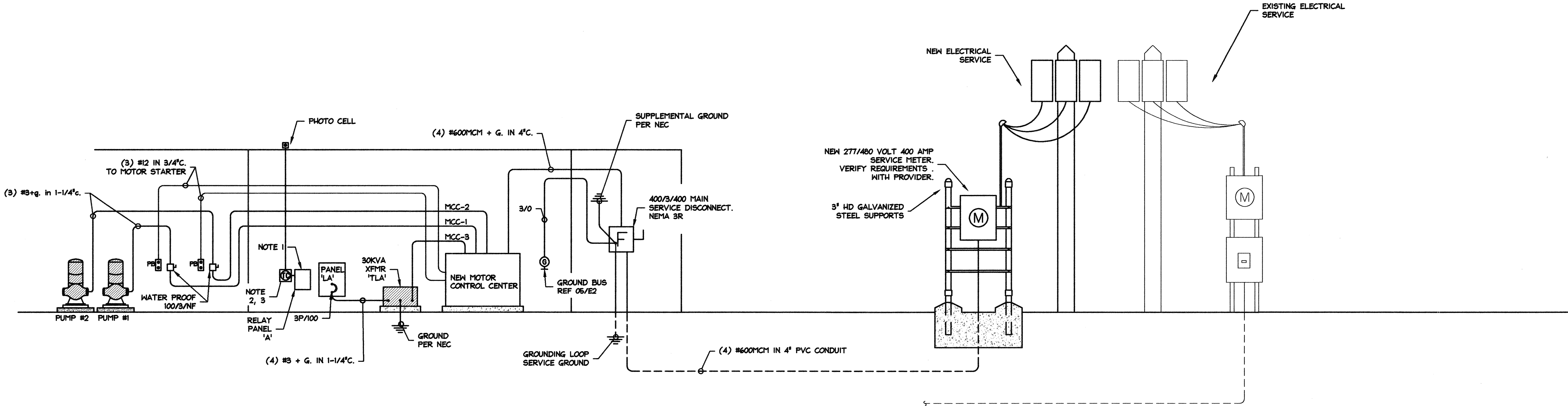
DESCRIPTION	POLES	TRIP	CIRCUIT	LIGHTING	POWER	POWER	LIGHTING	CIRCUIT	TRIP	POLES	DESCRIPTION
INTERIOR LIGHTING	1P	20	1	715		540		2	20	1P	MISC. RECEPTACLES
EXTERIOR LIGHTING	1P	20	3	900		300		4	20	1P	UNIT HEATER, UH-1, UH-2
MISC. RECEPTACLES	1P	20	5		720	200		6	20	1P	LOUVERS
AC UNIT	2P		7		3120	667		8	20	1P	EXHAUST FAN EF-A
MISC. RECEPTACLES	1P	20	11		3120	667		10	20	1P	EXHAUST FAN EF-A
SPARE	1P	20	13		540	667		12	20	1P	EXHAUST FAN EF-A
SPARE	1P	20	15					14	20	1P	SPARE
SPARE	1P	20	17					16	20	1P	SPARE
SPARE	1P	20	19					18	20	1P	SPARE
SPARE	1P	20	21					20	20	1P	SPARE
SPARE	1P	20	23					22	20	1P	SPARE
GROUND BUS	1P	20						24	20	1P	SPARE
22K AIC RATED											
CONNECTED LIGHTING				1615	X 1.25		2019	DESIGNATION			
CONNECTED POWER								MOUNTING			
TOTAL DESIGN LOAD								SURFACE			
TOTAL CONNECTED AMPS								VOLTAGE-PHASE-WIRE			
								120/208 3 PH 4 WIRE			
								MCS			
								MANS AMPS			
								100			

MOTOR CONTROL CENTER

65K AIC RATED										277/480V, 3 PH, 3 WIRE, 400 AMP MAIN BUSSING
NO	SERVES	CIRCUIT BREAKER			STARTER SIZE	STARTER TYPE	HP	WIRE & CONDUIT	REMARKS	
		FRAME SIZE	POLES	TRIP SIZE						
1	PUMP #1	100	3	100	4	XL	60	(3) #3 + G. IN 1-1/4"C.		
2	PUMP #2	100	3	100	4	XL	60	(3) #3 + G. IN 1-1/4"C.		
3	FUTURE PUMP #3	100	3	100	4	XL	60			
4	TRANSFORMER 'TLA'	50	3	50				(3) #8 + G. IN 3/4"C.		
5	SPACE	100	3							

LIGHT FIXTURE SCHEDULE

MARK	DESCRIPTION	LENS LAMPS	REMARKS
A	FLUORESCENT LIGHTING FIXTURE, IMPACT-RESISTANCE, FIBER-GLASS-REINFORCED POLYESTER HOUSING, BAKED WHITE FINISH, 120 VOLT ELECTRONIC BALLAST.	ACRYLIC DIFFUSER W/ FULLY GASKETED HOUSING	LIGHT FIXTURE TYPE 'AE' IS THE SAME AS TYPE 'A' EXCEPT W/ BATTERY BACKUP BALLAST.
	LITHONIA: #VRI-2-48-MVOLT-GE810IS	(2) 32W T8	
B	METAL HALIDE, W/ RUGGED, DIE-CAST ALUMINUM BACK HOUSING AND HINGED DOOR FRAME, BRONZE POLYESTER POWDER PAINT STANDARD FINISH.	TEMPERED GLASS ANODIZED ALUMINUM REFLECTOR	
	LITHONIA: #TWR1C-100M-120	1-100W	



01 ELECTRICAL RISER DIAGRAM
SCALE: NONE

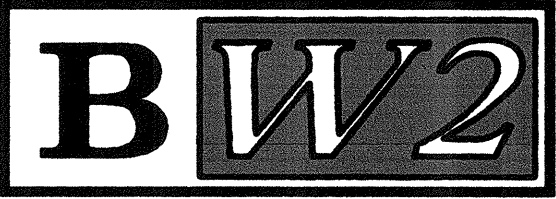
- NOTES:
- RELAY PANEL SHALL CONSIST OF A NEMA 1, HOFFMAN STYLE LOCKABLE ENCLOSURE.
 - CONTACTORS SHALL BE MULTI-POLE, ELECTRICALLY OPERATED, MECHANICALLY HELD, 30 AMP, PHOTOCELL 'ON' AND TIME CLOCK 'OFF' CONTACTORS. ASCO #117 SERIES WITH ACCESSORY #47.
 - TIME CLOCK SHALL TORK CONTACT TIME CONTROL #1800 OR EQUAL. TC SHALL BE A PROGRAMMABLE A 24 HOUR WITH SKIP A DAY FOR 'OFF' SIGNAL TO RELAY.

RECORD DRAWING
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Professional Engineer Seal for Richard L. Norris, State of Texas, No. 100089. Project # 4195, S. Toub & Associates Inc., Consulting Engineer Mechanical / Electrical, Firm Registration No. F-1584, 13641 Omega Road, Dallas, Texas 75244, 972/386-5659, © COPYRIGHT 2009.

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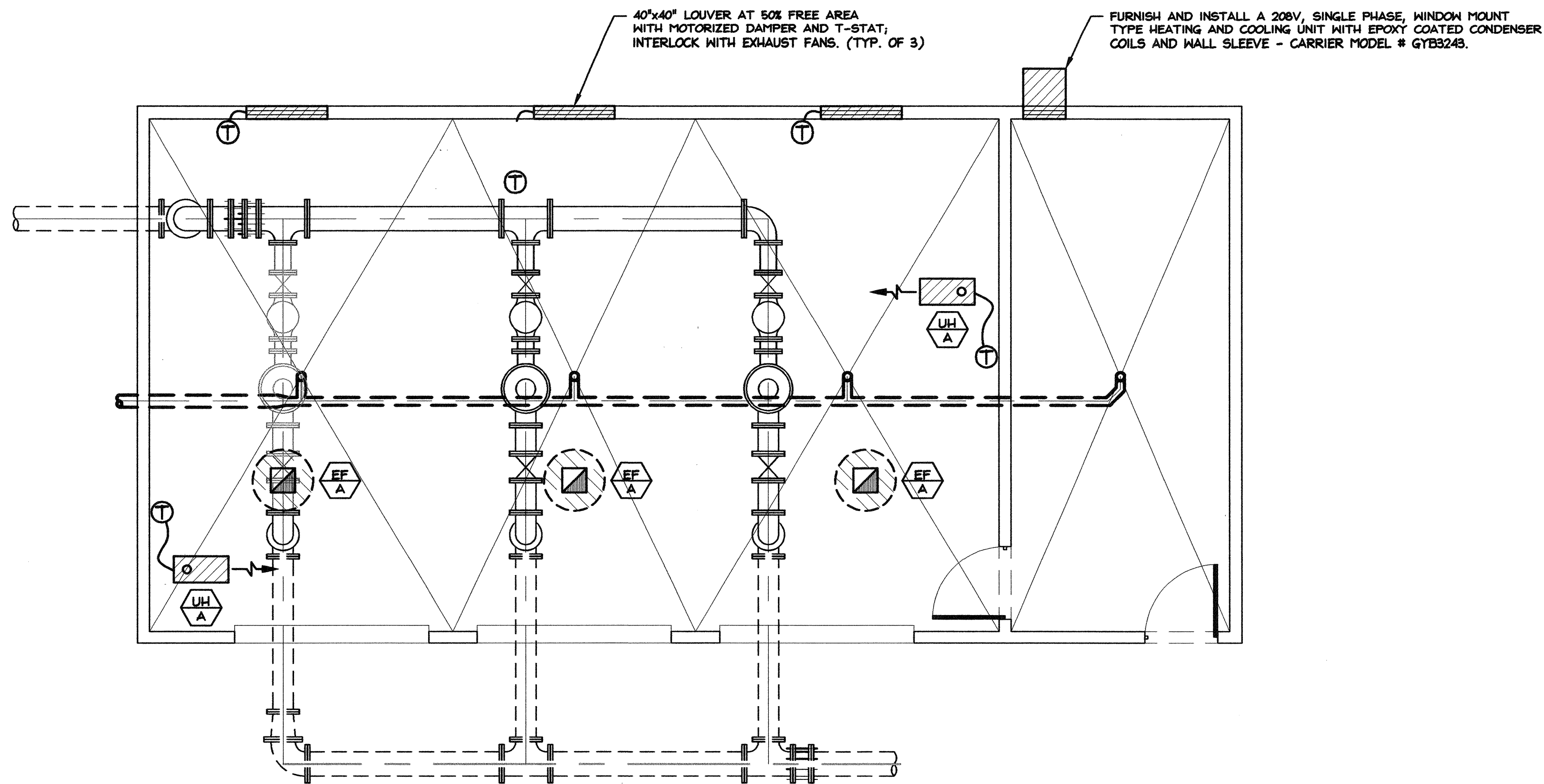
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DWG. NAME: ELECTRICAL SCHEDULES



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Garland, Texas 75042
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RLN 12/11
RICHARD L. NORRIS TEXAS P.E. NO. 100089

SHEET NO. E-3
OF SHEETS
JOB NO. 4195



01 FLOOR PLAN-MECHANICAL
SCALE: 1/4"=1'-0"

UNIT HEATER (GAS FIRED) SCHEDULE

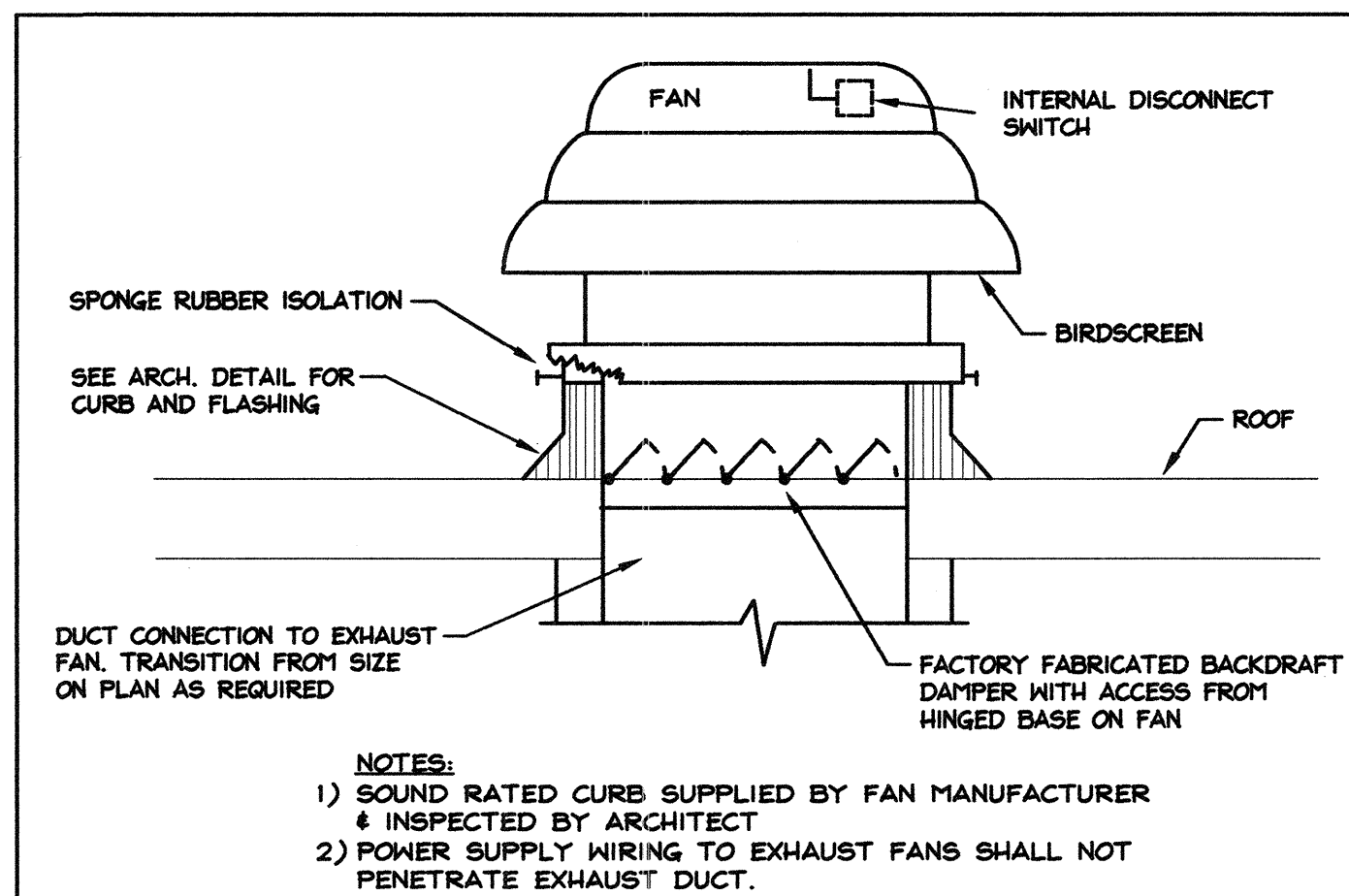
MARK	CFM	INPUT (MBH)	OUTPUT (MBH)	FUEL	H.P.	ELECTRICAL DATA			MANUFACTURER	MODEL NO.	REMARKS	OPERATING WEIGHT (LBS.)
						VOLTS	PHASE	STARTER				
UH-A	380	25	20	PROPANE	1/50	115	1	F.H.P.	REZNOR	F-25	NOTE: 1,2,3,4,5	72

- NOTES:**
1. MULTIPLE UNITS HAVE THE SAME DESIGNATION. VERIFY EXACT NUMBER OF UNITS WITH THE FLOOR PLANS.
 2. PROVIDE ALL SAFETIES.
 3. PROVIDE ALL PROPANE ASSEMBLY EQUIPMENT.
 4. PROVIDE MANUFACTURER'S INTEGRAL THERMOSTAT AND MOUNTING BRACKET.
 5. PROVIDE 30" DOWNTURN AIR NOZZLE.

FAN SCHEDULE

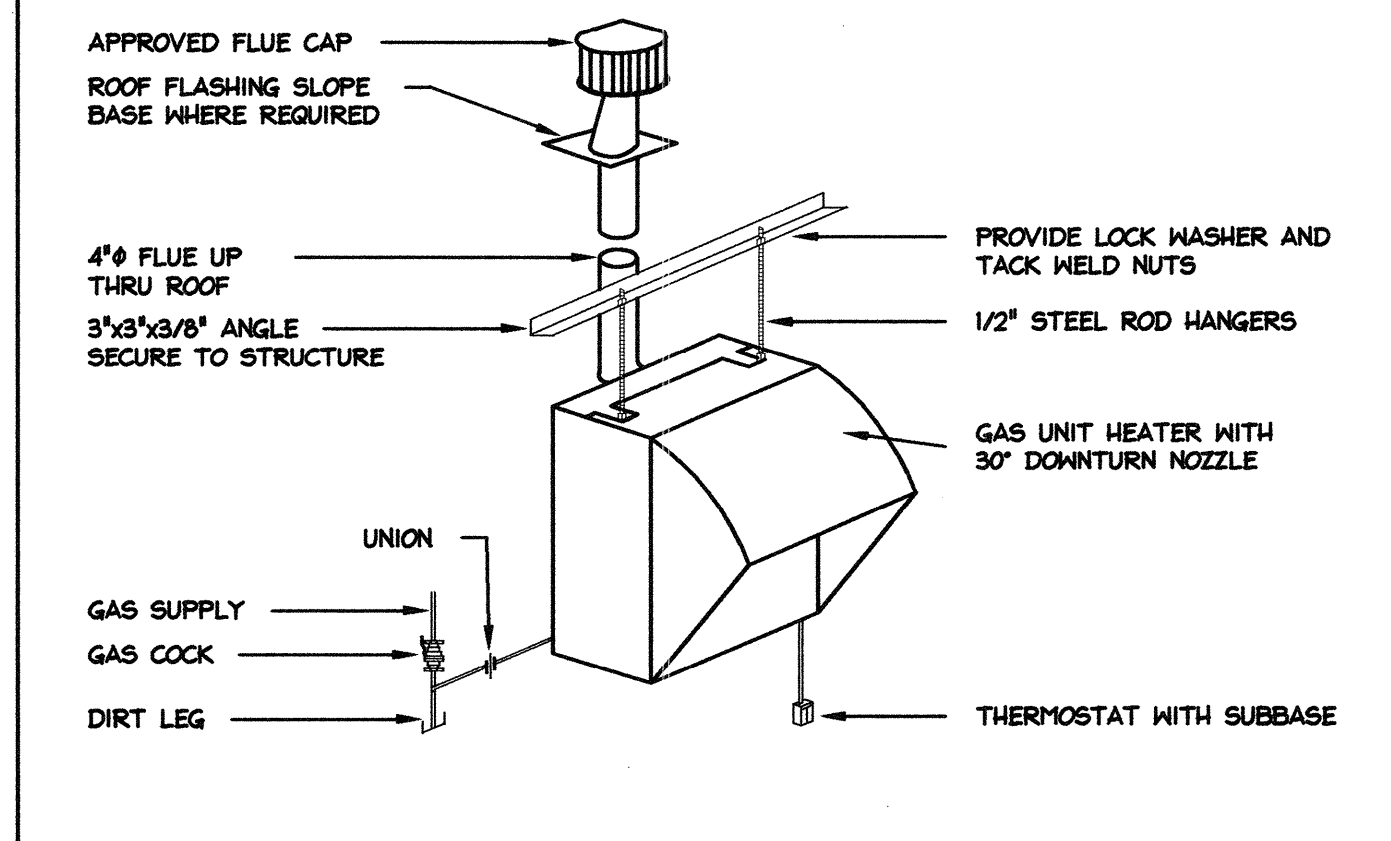
MARK	SERVES	LOCATION	TYPE	CFM	S.P. ("W.G.)	MIN. WHEEL DIA. (IN.)	MAX FAN RPM	TYPE DRIVE	MOTOR DATA					MANUFACTURER	MODEL NO.	REMARKS	OPERATING WEIGHT (LBS.)
									H.P.	RPM	VOLTS	PHASE	STARTER				
EF-A	PUMP ROOM	ROOF	CENTRIF.	1750	0.25	--	588	BELT	1/4	1725	115	1	F.H.P.	GREENHECK	GB-180-4	NOTE: 1,4,5,8,12	85

- NOTES:**
- MULTIPLE UNITS HAVE THE SAME DESIGNATION. VERIFY EXACT NUMBER OF UNITS WITH THE FLOOR PLANS.
1. MINIMUM LEAKAGE GRAVITY BACKDRAFT DAMPER, (2. AUTOMATIC DAMPER WITH ACTUATOR, (3. 2-SPEED MOTOR, (4. BIRDSCREEN (5. MANUFACTURER'S ROOF CURB, (6. INLET SAFETY GUARD, (7. PREMIUM EFFICIENCY ELECTRIC MOTOR, (8. MANUFACTURER'S DISCONNECT SWITCH, (9. SPEED CONTROLLER, (10. THROW AWAY FILTERS, (11. 24" VENTED ROOF CURB, (12. INTERLOCK WITH INTAKE LOUVERS AND MOTORIZED DAMPERS.



01 ROOF EXHAUST FAN

SCALE:
NTS



02 UNIT HEATER

SCALE:
NTS

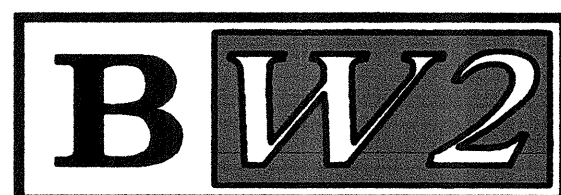
RECORD DRAWING

BASED ON CONTRACTOR MARKUPS,
NOT FIELD SURVEY.

STATE OF TEXAS
Professional Engineer
Richard L. Norris
100089
REGISTERED
The seal on this document was authorized by Richard L. Norris, P.E. 100089 on the date shown below.
Richard L. Norris
S. Toub & Associates Inc.
Consulting Engineer Mechanical / Electrical
Firm Registration No. F-1584
13641 Omega Road, Dallas, Texas 75244
972/386-5629
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NO.	DATE	REVISION	REVIEWED
6			
5			
4			
3			
2			
1			

DRAWN: BER
DESIGN: BER
REVIEWED: RLN
SCALE: 1/4"=1'-0"
DATE: 12/30/2011
DWG. NAME: MECHANICAL



BW2 Engineers, Inc.
1919 S. Shiloh Road
Suite 500, L.B. 27
Garland, Texas 75042
(972) 864-8200 (T) (972) 864-8220 (F)
Firm Registration No. F-5290

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TO BE USED FOR CONSTRUCTION
OR PERMITTING.
RLN 12/11
RICHARD L. NORRIS TEXAS P.E. NO. 100089

SHEET NO. M-1
OF SHEETS
JOB NO. 4195