

CITY OF LUCAS

CONSTRUCTION PLANS FOR

WATER SYSTEM IMPROVEMENTS

SINGLE PRESSURE PLANE FACILITIES

NORTH PUMP STATION

BID NO. 019-19

SHEET INDEX

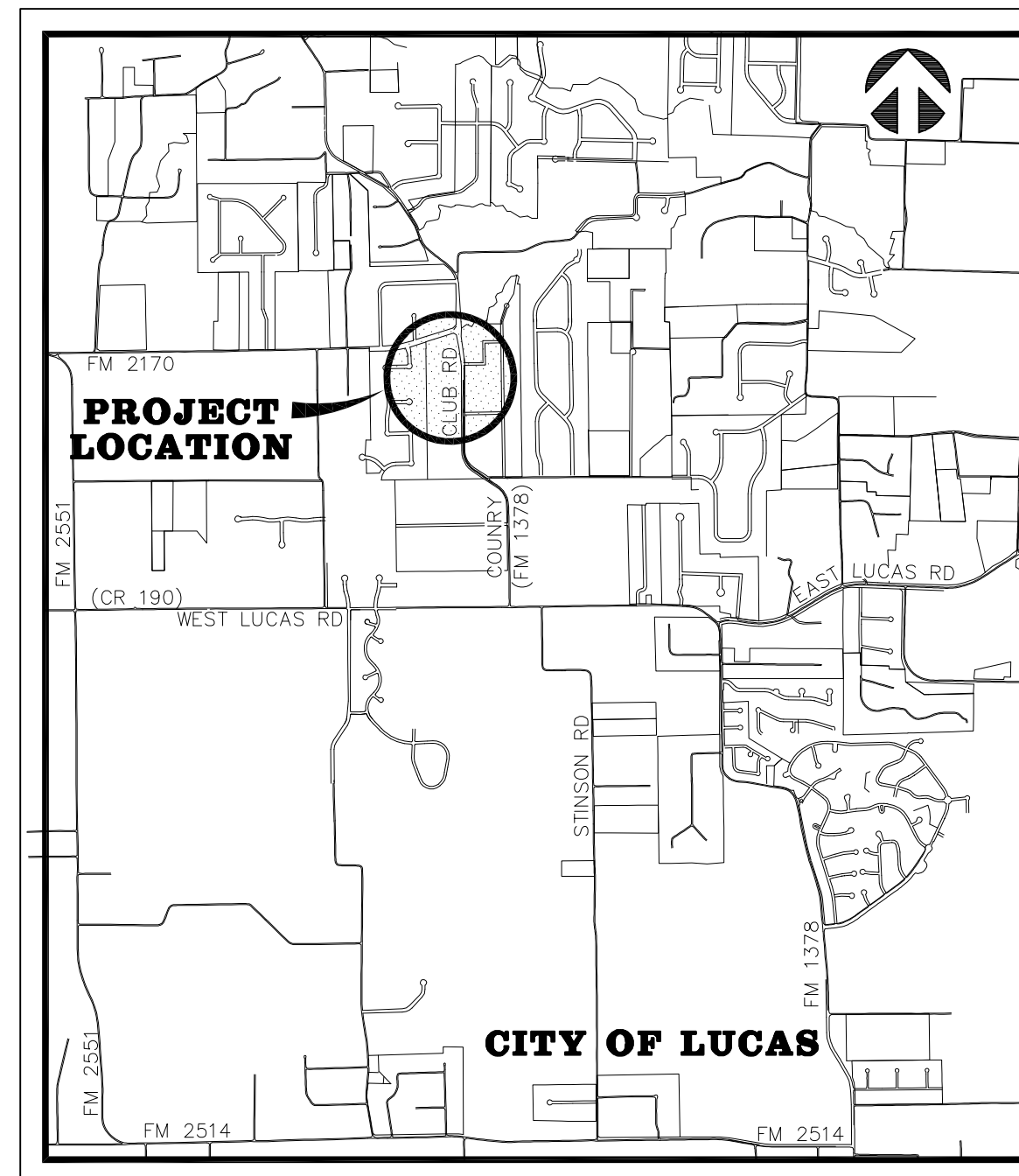
MAYOR
JIM OLK

CITY COUNCIL

TIM BANEY	PHILIP LAWRENCE
STEVE DUKE	WAYNE MILLSAP
DEBBIE FISHER	KATHLEEN PEELE

CITY MANAGER
JONI CLARKE, CPM

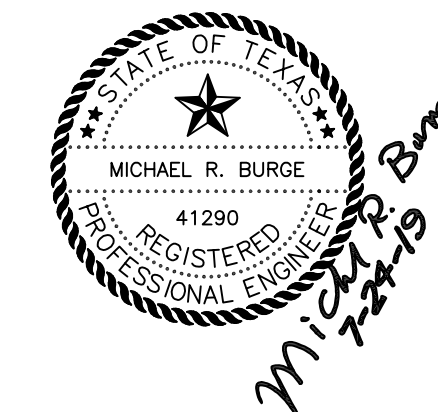
CITY ENGINEER
STANTON FOERSTER, P.E.



VICINITY MAP

BW2 JOB NO. 17-1811

JULY 2019



ENGINEER:



BW2 ENGINEERS, INC.

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

OWNER:

CITY OF LUCAS
151 COUNTRY CLUB ROAD
LUCAS, TEXAS 75002

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GENERAL NOTES:

- It is the CONTRACTOR's responsibility to maintain neat and accurate plans of record.
- The CONTRACTOR is responsible for maintaining adequate site drainage throughout the duration of this project.
- The CONTRACTOR is responsible for obtaining all necessary permits and approvals before construction begins.
- The CONTRACTOR shall replace all fence removed during construction in as good as or better condition than before construction.
- 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. The CONTRACTOR shall be responsible for coordination with franchise utilities, based on approval by the City.
- 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 as or better condition than before construction. Restoration shall be made immediately after the property no longer interferes with construction. All costs incurred for restoring any of the above items shall be included in the price bid for the construction of the project.
- 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.
- 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.
- All streets within the scope of the Contract shall be kept accessible to fire trucks, ambulances and other emergency vehicles.
- 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.
- 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.
- The CONTRACTOR shall use the public right-of-ways and existing utility easements for access to the job site.
- 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 OWNER. Testing referred to herein includes compaction and water pressure testing, which shall be required on this project.
- 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.
- 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.
- All disturbed earth areas are to be finish graded to original or proposed contours, fertilized and either hydromulched with bermuda seed or covered with block sod according to NCTCOG specifications immediately after construction. Backfill to be select material free of rock and other debris. CONTRACTOR shall thoroughly water the hydromulch or block sod immediately after placement. Block sod shall match the existing type of grass on a case by case basis. There shall be no separate pay for matching each type of grass. The CONTRACTOR shall also be responsible for continued maintenance and watering of the newly hydromulched or sodded areas until the entire project is completed and accepted by the City of Lucas. Watering of the bermuda hydromulch or block sod shall be done in a manner and quantity as directed by City of Lucas field representative.
- No existing sprinkler/irrigation systems have been shown on the plans; however, they may exist in certain areas. It is the CONTRACTOR'S 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 as or better condition than before construction. All costs incurred for restoring any sprinkler/irrigation systems shall be included in the price bid for the construction of the project.
- The CONTRACTOR shall maintain adequate sanitary facilities for use by workers throughout construction.
- 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.
- 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.
- No existing trees shall be removed without prior approval of the City of Lucas.
- CONTRACTOR shall provide all necessary construction staking.
- CONTRACTOR'S working hours shall be in accordance with the provisions of the current City Ordinance governing hours of construction work in the City. The CONTRACTOR can work on Saturdays if permission is obtained from the City. The CONTRACTOR will need to submit a written request to the City, on an as-needed basis, to work on Saturdays.

GENERAL NOTES CONT'D.:

- 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 prior to and/or after placing any permanent paving. The CONTRACTOR shall also be responsible for support of existing utility poles, street signs, etc., when excavating in the vicinity of such poles.
- CONTRACTOR shall make provisions to accommodate SCADA equipment and connections. The SCADA system shall be provided by others.
- All existing water lines and service 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 to notify the affected area at least 48 hours prior to water cut-off.
- Electric gate shall have a pad mounted at the entrance such that it is accessible from a vehicle and such that a code can be entered in order to open the gate.
- Proposed water lines shall be polyvinyl chloride (PVC) AWWA C900 for water lines 12 inches in diameter or less and (PVC) AWWA C905 for water lines greater than 12 inches in diameter. New water service line shall be SDR 9 Poly CTS with tracer wire. Main line valves and fittings shall be ductile iron.
- CONTRACTOR shall install isolation gate valves and fire hydrants at locations shown on plans unless otherwise directed by OWNER. OWNER may direct CONTRACTOR to locate valves and fire hydrants at locations other than those shown on plans. Also, OWNER may add additional isolation gate valves and fire hydrants as required for operational purposes.
- The CONTRACTOR is responsible for keeping streets, parking areas, sidewalks, etc., adjacent to the project free of mud and debris from construction.
- The City of Lucas Public Works Department is to be notified 48 hours (2 working days) prior to any construction of paving and utilities in rights-of-way and easements.
- Arrangements for construction water shall be made through the City of Lucas. The City will provide water for the project at no cost to the CONTRACTOR, unless more than two Bac-T tests are required for any component of the project. If more than two Bac-T tests are required, the CONTRACTOR will be responsible for paying for the additional water. All water used on the project will be metered.
- 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.
- PVC pipe shall be manufactured from a low filler PVC component capable of meeting the highest performance standards of the ASTM specifications.
- Construction sites shall be secure at all times. Safety precautions shall be taken to protect the public from any injury which might result from construction activities.
- 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, etc. The CONTRACTOR shall maintain these erosion control measures as required until the construction is completed and sod has been placed over disturbed areas.
- CONTRACTOR shall expose each existing pipeline to which a proposed pipeline will be connected and shall verify the horizontal and vertical location of the existing pipeline prior to the installation of the proposed pipeline.
- Proposed water line shall have a minimum cover of forty two inches (42").
- The fittings for the proposed water line shall be AWWA C153 compact fittings.
- All materials furnished and installed on this project shall be domestic materials and shall be in compliance with the appropriate AWWA Standards for such items.
- Hydromulch or block sodding shall be installed to match surrounding areas where the ground is disturbed in the construction area. City reserves the right to provide direction with regard to areas to be hydromulched or sodded. The CONTRACTOR will receive payment only for the square yards of area actually hydromulched or sodded in the construction area.
- If any conflicts with other utilities occur during the construction activities, the CONTRACTOR shall immediately notify the City's representative and shall make adjustments as necessary with City's concurrence.
- No connections to other City water distribution lines shall be made on Fridays.
- 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 engineer. CONTRACTOR will make all repairs to existing lines damaged during construction work and will have materials on hand to make such repairs.
- CONTRACTOR shall take the existing water lines out of service and abandon in place once all service connections are changed over. CONTRACTOR shall cut and plug existing water lines in a sufficient manner to prevent loss of water.
- Mega-lugs shall be furnished and installed on all bends, valves, joints, and other fittings that are required for the proposed water line.
- A 3M locator type 1266 shall be furnished and installed no deeper than 4 feet by the CONTRACTOR beside all valves, above all bends and above all corporation stops on the proposed water line.
- CONTRACTOR shall furnish and install a tracer wire that is compatible with and will allow detection by radio detection corporation's digital PXL-2 pipe locator. 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.
- If the CONTRACTOR excavates a trench for the proposed water line to a depth requiring a trench safety plan, CONTRACTOR shall provide a trench safety plan prepared and sealed by a licensed engineer, which shall be in conformance with OSHA requirements. CONTRACTOR shall provide trench safety during construction per the trench safety plan when and where it is required as a result of OSHA requirements, job conditions, site conditions, or soil conditions.

GENERAL NOTES CONT'D.:

- The CONTRACTOR shall install a 1" service line, meter, and all appurtenances required to provide water to the pump building. The 1" service line shall be installed across Country Club Road in a 2" PVC sleeve by other than open cut. CONTRACTOR shall furnish and install Ford brass tap and saddle (double saddle) or approved equal.
- The City's Standard Details for the water system can be found on the City's website under Chapter 13 Utilities.
- All new water line furnished and installed on the project shall be DR18 PVC water line.
- The new fencing to be furnished and installed on the project will go around the perimeter of the site along the North side, West side, and South side and shall be installed at the location determined by the City.
- There is no separate pay resulting from any of the work required as a result of the requirements included in these general notes, unless otherwise noted. All work required shall be included in the unit price bid for the project.

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. In addition, flags shall be placed on all advance warning signs that detour traffic.
- Any existing conflicting markings shall be removed prior to shifting traffic.
- 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.
- The spacing of signs and channelizing 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.
- 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.
- 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.
- The posted speed for warning signage is to be determined at the site by the City of Lucas.
- Reduced speed warning signage should be placed prior to and at regular intervals within the construction zone.
- 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.
- 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".
- 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".

CONSTRUCTION SEQUENCE:

- The CONTRACTOR shall perform the construction of the facilities in the following order:
 - The CONTRACTOR shall construct the proposed pump building and complete the installation of the pumps, motors and associated piping.
 - The CONTRACTOR shall place the new pumping facilities into service.
 - The CONTRACTOR shall relocate the existing automatic transfer switch from the existing generator site to the new generator site.
 - The CONTRACTOR shall cut and plug the existing 12" water line (from the existing pump station) on the east side of Country Club Road.
 - The CONTRACTOR shall install Line "W-C".
 - The CONTRACTOR shall complete all the remaining site work as shown in the plans.
 - The CONTRACTOR shall clean up the site.

NTMWD NOTES:

- North Texas Municipal Water District (NTMWD) 42-inch and 20-inch water transmission pipeline are located within limits of construction.
- Operation of heavy earth moving equipment, compaction equipment or heavy construction equipment, such as concrete trucks, shall be restricted to specific crossing points across NTMWD easements, as approved by the NTMWD. The crossings shall be designated and verified to provide a minimum of five feet of cover.
- To assure that placing of significant loads over the NTMWD pipeline does not damage the existing pipeline, no materials shall be stockpiled on the NTMWD easement without authorization from the NTMWD. If the CONTRACTOR desires to use NTMWD's easement for stockpile of materials, contact NTMWD Engineering at (972) 442-5405 so your plans for use of NTMWD's easement can be reviewed.
- Unless otherwise shown or required a minimum of one-foot clearance shall be provided for all utilities crossing the NTMWD pipelines.
- The CONTRACTOR shall contact NTMWD Engineering at (972) 442-5404 at least 48 hours prior to performing any work in the vicinity of the NTMWD facilities.
- For open cut where crossing under the NTMWD pipeline, within ten feet either side of centerline of pipeline, the trench width shall be limited to four-foot with vertical walls, no sloping banks and with the appropriate trench safety. The entire excavation within the limits noted above shall be backfilled with sand to one-foot above top of NTMWD pipeline. One foot minimum vertical clearance is required between NTMWD pipeline and proposed utilities.
- Limits of bore shall be a minimum of the NTMWD easement width.
- The casing pipe shall terminate outside of the NTMWD easement.
- Boring and receiving pits shall be located outside of NTMWD easements.
- A minimum of two-foot horizontal and one-foot vertical clearance is required between proposed water lines and NTMWD pipelines.
- Water lines crossing the NTMWD easement shall be installed in compliance with the Rules and Regulations for Public Water Systems Paragraph 290.44 (e), Location of Water Lines.

!! CAUTION !!

THESE 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.

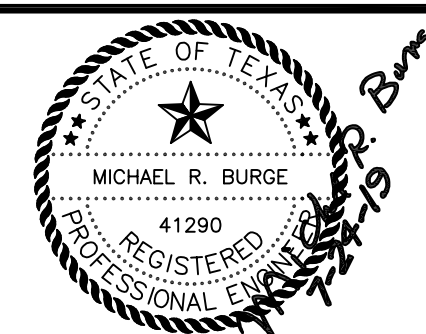
CONTRACTOR SHALL ALSO CONTACT APPROPRIATE CITY UTILITY DEPARTMENT FOR FIELD LOCATES OF MUNICIPAL INFRASTRUCTURE 48 HOURS PRIOR TO CONSTRUCTION.

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NO.	DATE	REVISION	REVIEWED

DRAWN: _____ **BW2**
 DESIGN: _____ **MRB**
 REVIEWED: _____ **JFW**
 SCALE: _____ **NO SCALE**
 DATE: _____ **JULY 2019**
 DWG. NAME: _____ **1811GENNOTE-PS**

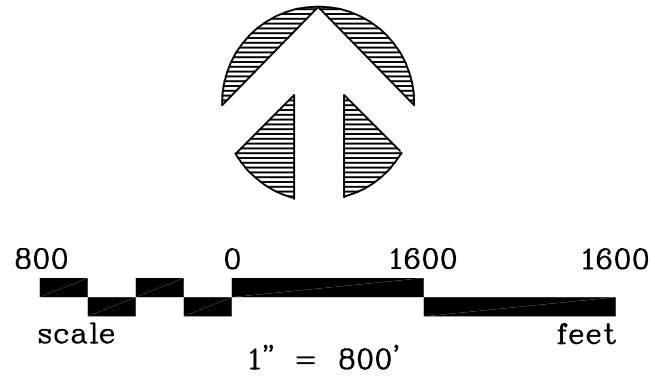
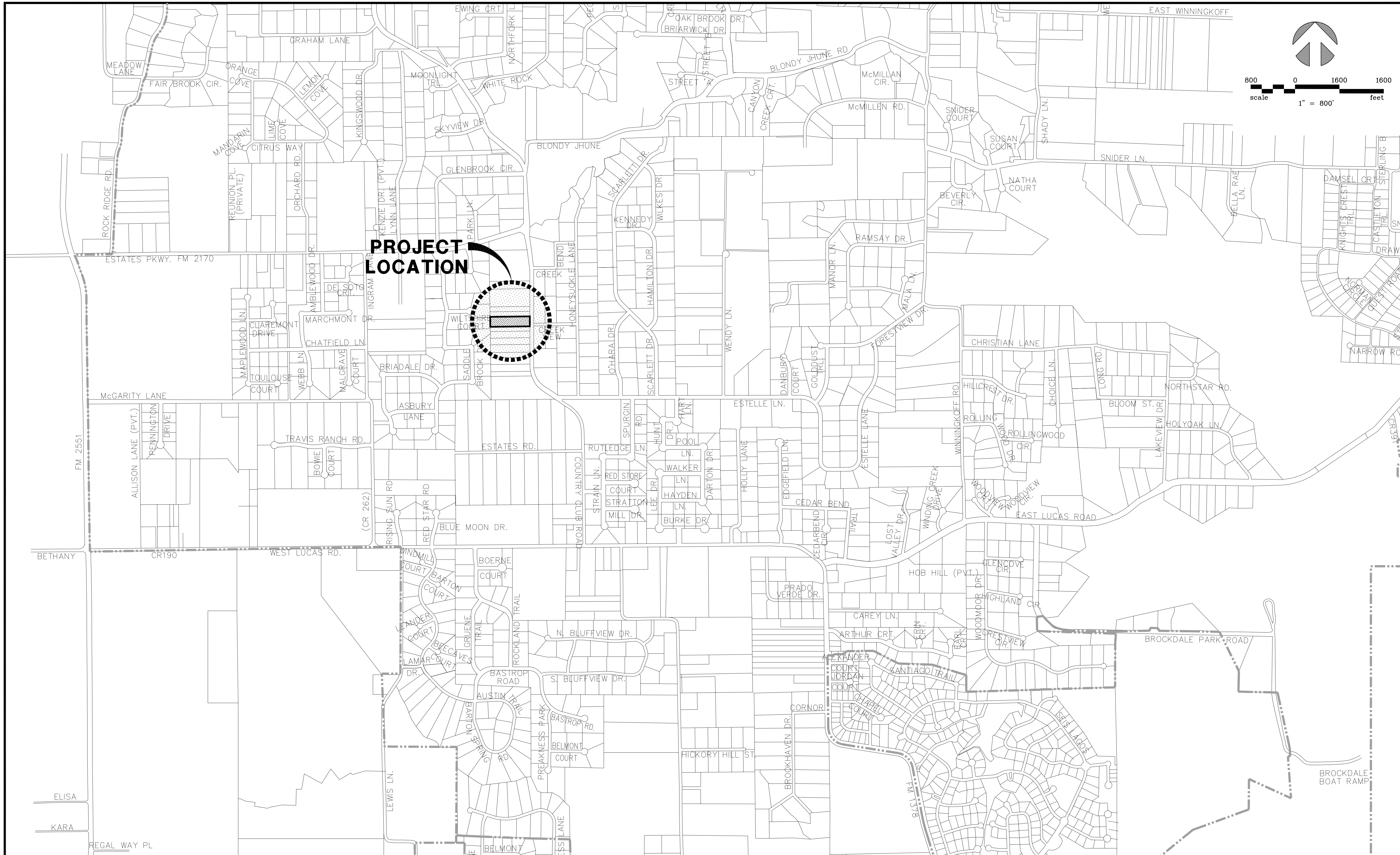


BW2 ENGINEERS, INC.
 1919 S. Shiloh Road
 Suite 500, L.B. 27
 Garland, Texas 75042
 (972) 864-8200 (T) (972) 864-8220 (F)
 Firm Registration No. F-5290



**WATER SYSTEM IMPROVEMENTS
 SINGLE PRESSURE PLANE FACILITIES
 NORTH PUMP STATION
 PROJECT GENERAL NOTES
 CITY OF LUCAS**

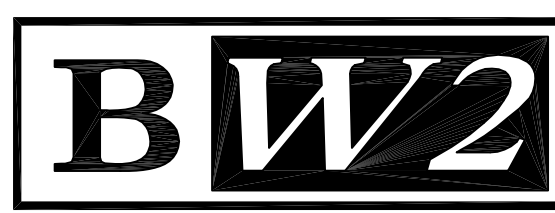
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 OF **C22** SHEETS
 JOB NO. **17-1811**



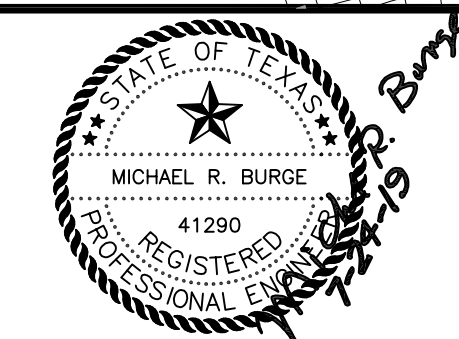
PROJECT LOCATION

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NO.	DATE	REVISION

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 DWG. NAME: 1811LOCMAP-PS

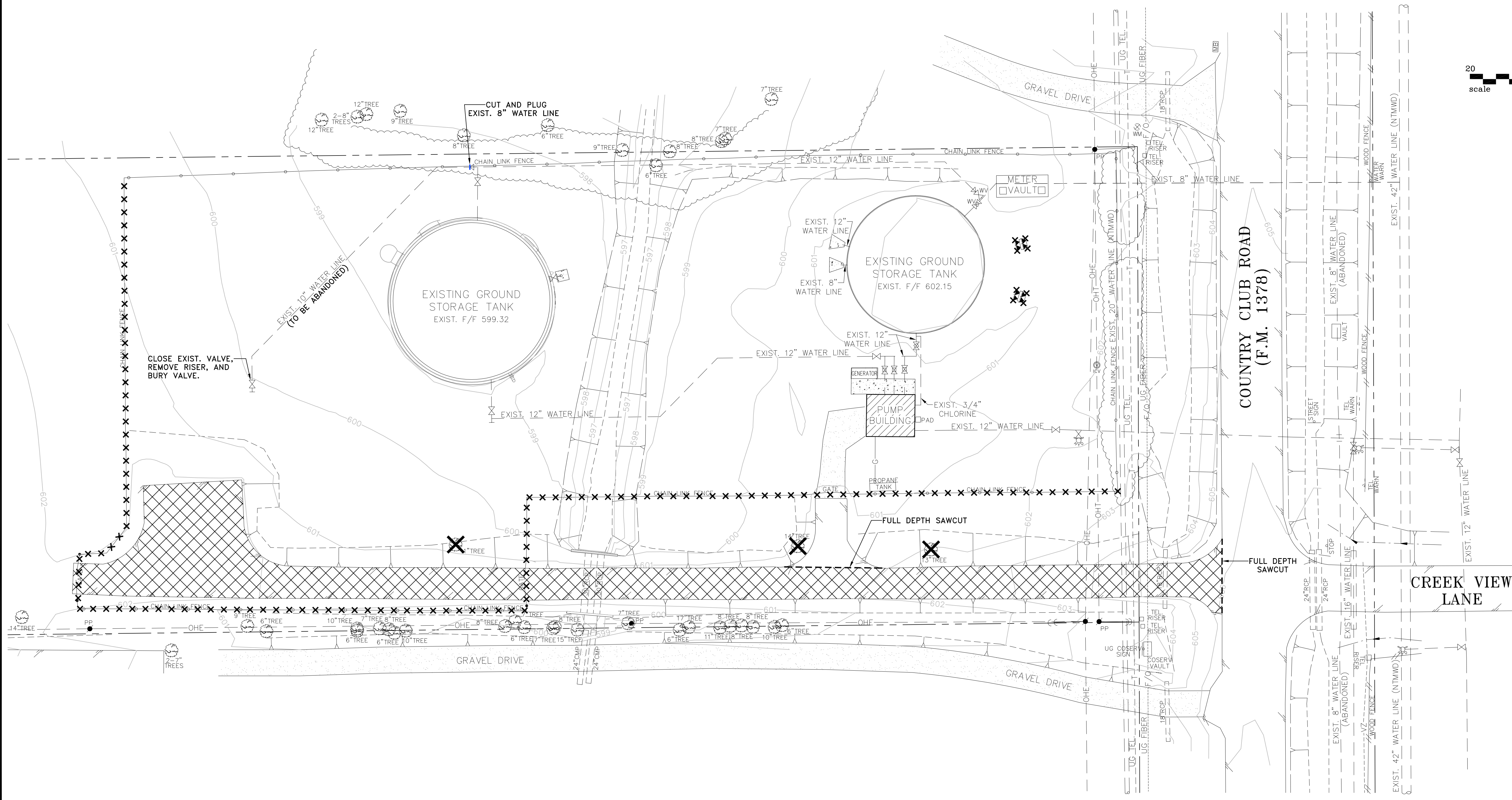
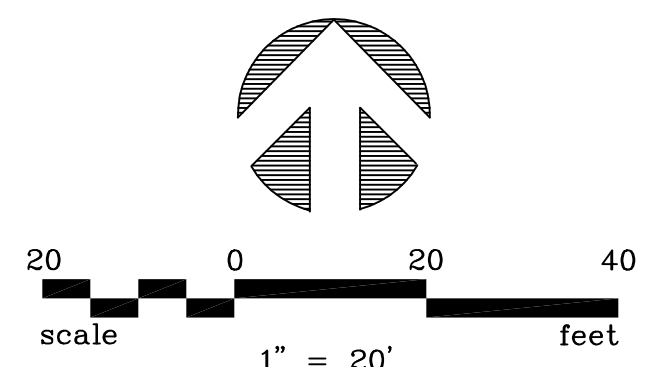


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WATER SYSTEM IMPROVEMENTS
SINGLE PRESSURE PLANE FACILITIES
NORTH PUMP STATION
PROJECT LOCATION MAP
CITY OF LUCAS

SHEET NO. **C3**
 OF **C22** SHEETS
 JOB NO. **17-1811**



DEMOLITION NOTES:

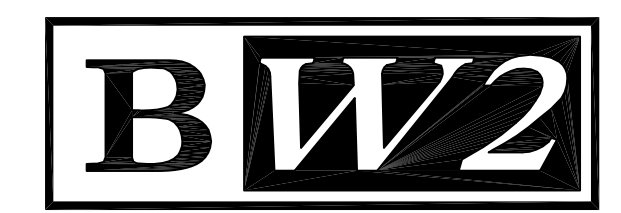
1. ALL ITEMS REMOVED DURING THE DEMOLITION ACTIVITIES, WHICH ARE UNWANTED BY THE CITY, SHALL BE DISPOSED OF BY THE CONTRACTOR OFF-SITE. CONTRACTOR SHALL BE RESPONSIBLE FOR SELECTING THE DISPOSAL SITE, MAKING ARRANGEMENTS FOR DISPOSAL, AND PAYING ANY COSTS ASSOCIATED WITH DISPOSING OF SUCH MATERIALS RESULTING FROM THE DEMOLITION PROCESS.
2. THE EXISTING FENCE SHALL NOT BE REMOVED, UNLESS OTHERWISE SHOWN ON PLANS, SHALL BE PROTECTED BY THE CONTRACTOR DURING THE PROJECT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE TO THE FENCE RESULTING FROM THE DEMOLITION WORK.
3. CONTRACTOR SHALL CONDUCT THE DEMOLITION WORK AND REMOVAL OF DEMOLISHED MATERIALS IN SUCH A MANNER THAT THERE IS NO IMPACT ON THE OTHER FACILITIES AT THE SITE.
4. THE EXISTING ASPHALT PAVEMENT SHALL BE REMOVED ONLY IF IT IS TO BE REPLACED BY FLEX BASE OR CONCRETE PAVEMENT.

LEGEND:

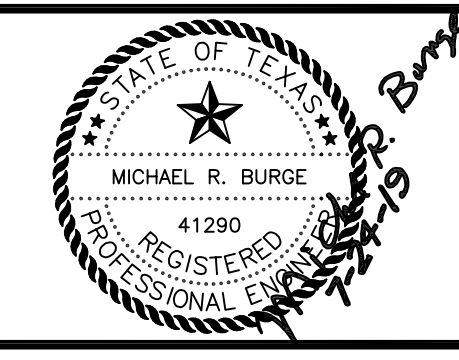
	DENOTES AREAS TO BE DEMOLISHED
	EXISTING TREE TO BE REMOVED
	EXISTING TO BE REMOVED

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NO.	DATE	REVISION	REVIEWED

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 DESIGN: MRB
 REVIEWED: JFW
 SCALE: 1" = 20'
 DATE: JULY 2019
 DWG. NAME: 1811DEMOPAN-PS

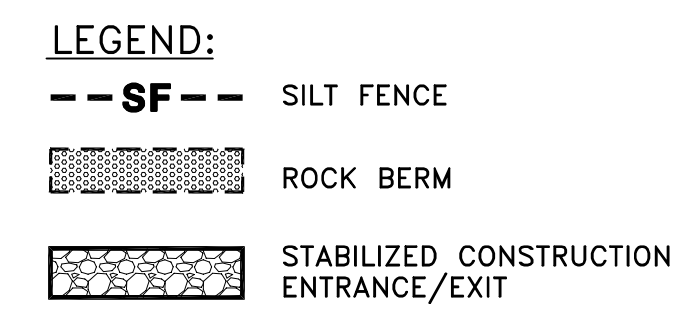
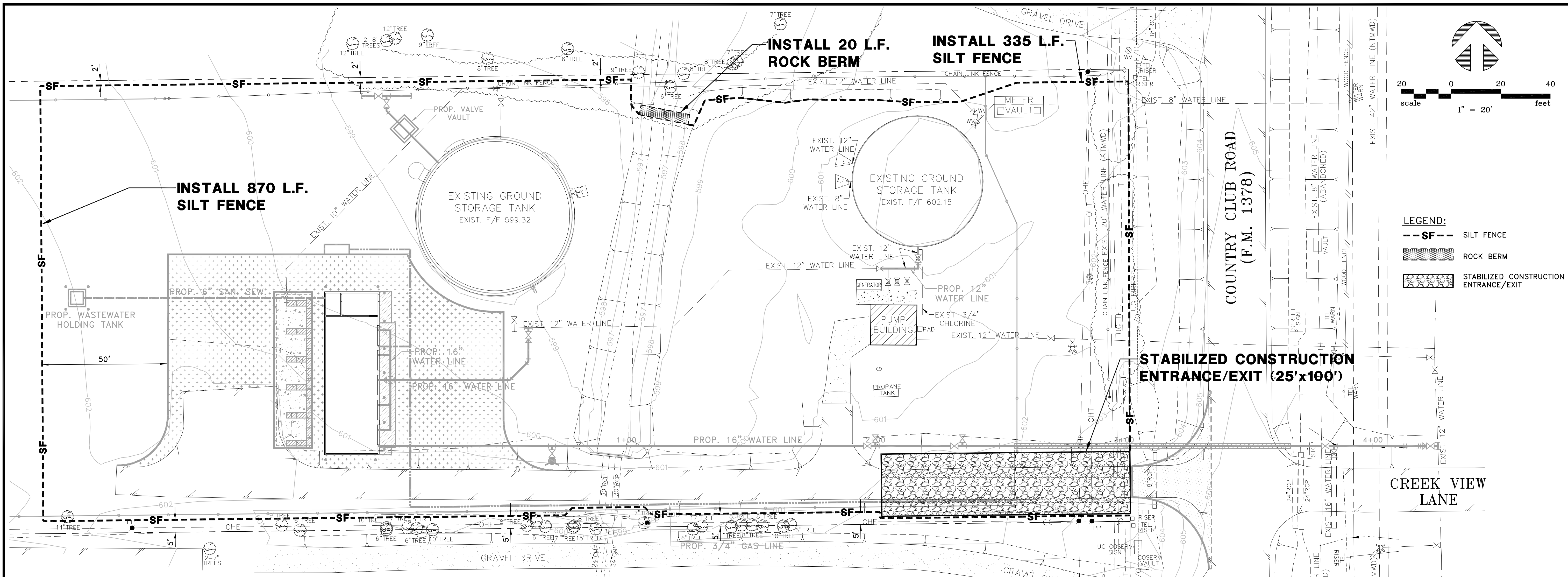


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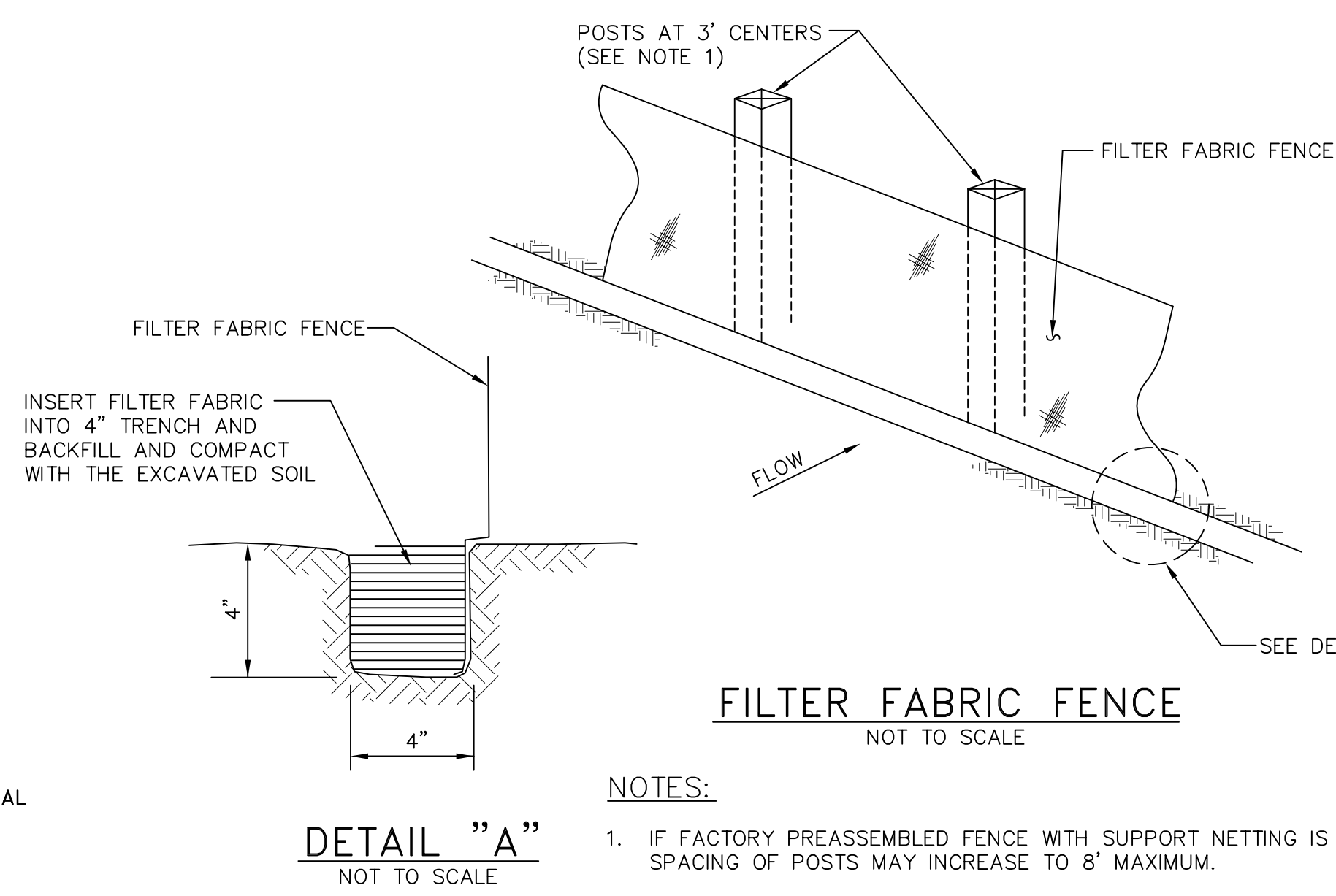
**WATER SYSTEM IMPROVEMENTS
 SINGLE PRESSURE PLANE FACILITIES
 NORTH PUMP STATION
 DEMOLITION PLAN
 CITY OF LUCAS**

SHEET NO. C4
 OF C22 SHEETS
 JOB NO. 17-1811



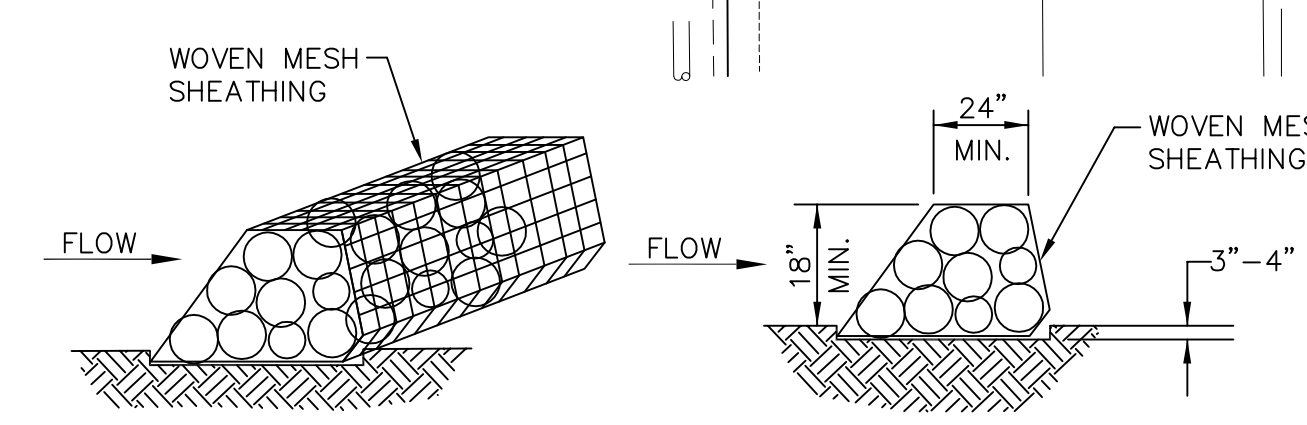
EROSION CONTROL NOTES:

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. OFF-SITE BORROW AND SPOIL AREAS ARE CONSIDERED A PART OF THE PROJECT SITE AND THEREFORE SHALL COMPLY WITH THE CITY OF LUCAS'S EROSION CONTROL REQUIREMENTS. THESE AREAS 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.
6. ALL NON-IMPERVIOUS AREAS AFTER CONSTRUCTION SHALL BE COVERED WITH SOD IN ACCORDANCE WITH GENERAL NOTE 16 AND 36 ON SHEET C2. ALL OTHER DISTURBED AREAS OUTSIDE THE LIMITS SHALL BE THE CONTRACTOR'S RESPONSIBILITY.
7. TEMPORARY STONE STABILIZED CONSTRUCTION ENTRANCE SHALL HAVE THE FOLLOWING MINIMUM DIMENSIONS: 25' WIDE X 100' LONG X 12" DEEP. (6"-8" CRUSHED ROCK). 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.



DETAIL "A"
NOT TO SCALE

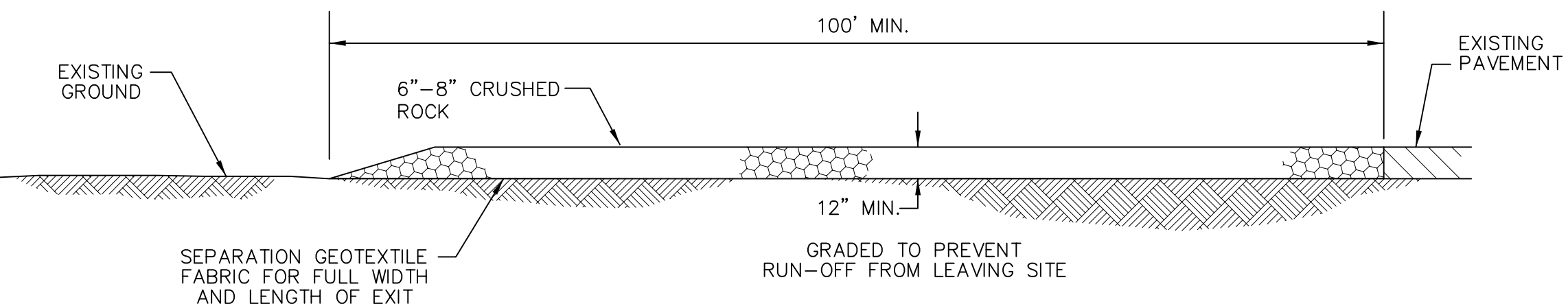
- NOTES:**
1. IF FACTORY PREASSEMBLED FENCE WITH SUPPORT NETTING IS USED, SPACING OF POSTS MAY INCREASE TO 8' MAXIMUM.
 2. FILTER FABRIC SHALL BE AS PER ASTM D4833.
 3. WHEN TWO SECTIONS OF FILTER FABRIC ADJOIN EACH OTHER, PROVIDE 6" OF OVERLAP AT THE POST AND FOLD.



ROCK BERM DETAIL
NOT TO SCALE

CONSTRUCTION ENTRANCE NOTES:

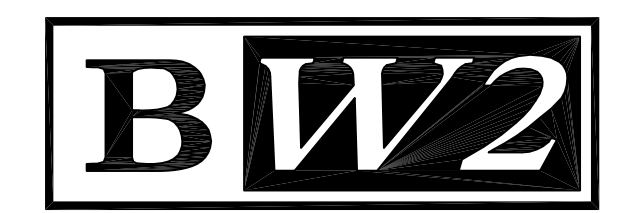
1. LENGTH SHALL BE AS SHOWN ON THE CONSTRUCTION DRAWINGS, BUT NOT LESS THAN 100 FEET.
2. THICKNESS SHALL NOT BE LESS THAN 12 INCHES.
3. WIDTH SHALL NOT BE LESS THAN 25 FEET.
4. STABILIZATION FOR OTHER AREAS SHALL HAVE THE SAME AGGREGATE THICKNESS AND WIDTH REQUIREMENTS AS THE STABILIZED CONSTRUCTION ENTRANCE, UNLESS OTHERWISE SHOWN ON THE CONSTRUCTION DRAWINGS.



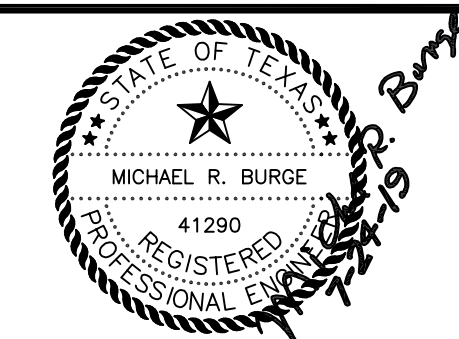
CONSTRUCTION ENTRANCE SECTION
NOT TO SCALE

NO.	DATE	REVISION	REVIEWED
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DRAWN: BW2
 DESIGN: MRB
 REVIEWED: JFW
 SCALE: 1" = 20'
 DATE: JULY 2019
 DWG. NAME: 1811EROSCONT-PS

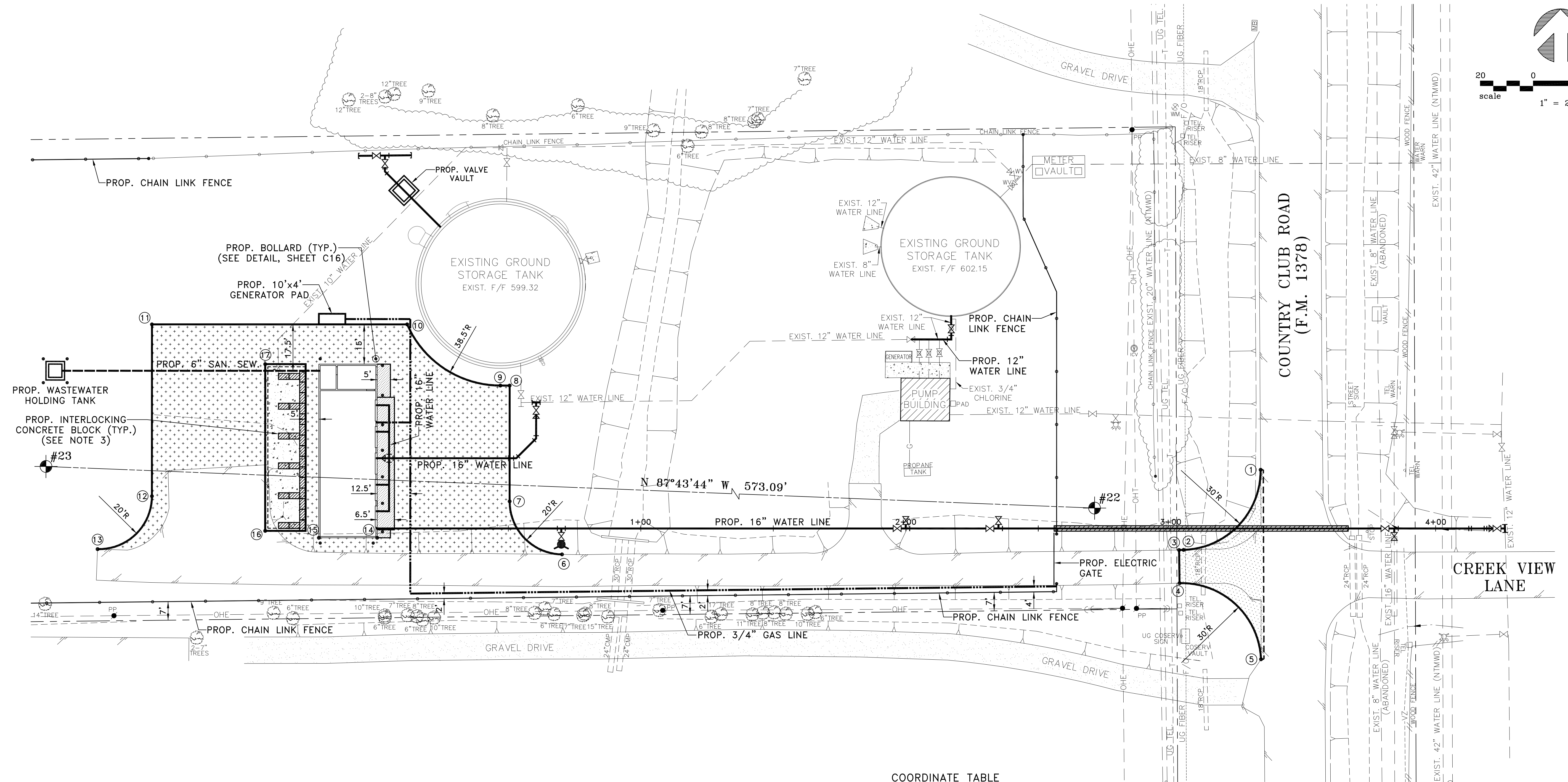
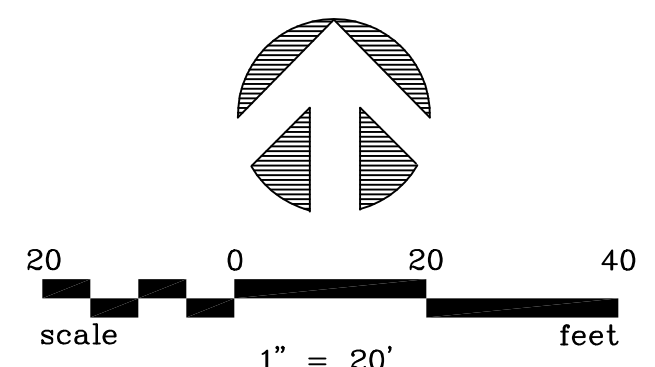


BW2 ENGINEERS, INC.
 1919 S. Shiloh Road
 Suite 500, L.B. 27
 Garland, Texas 75042
 (972) 864-8200 (T) (972) 864-8220 (F)
 Firm Registration No. F-5290



**WATER SYSTEM IMPROVEMENTS
 SINGLE PRESSURE PLANE FACILITIES
 NORTH PUMP STATION
 EROSION CONTROL PLAN
 CITY OF LUCAS**

SHEET NO. C5
 OF C22 SHEETS
 JOB NO. 17-1811



HORIZONTAL & VERTICAL CONTROL POINTS (BM's)

NO.	NORTHING(Y)	EASTING(X)	ELEV.(Z)	DESCRIPTION
22	7088175.2210	2552538.5340	602.37	1/2" I.R. W/CAP
23	7088197.9320	2551965.8940	604.61	1/2" I.R. W/CAP

COORDINATE TABLE

NO.	NORTHING(Y)	EASTING(X)
1	7088189.6755	2552601.2205
2	7088159.4502	2552572.1474
3	7088159.3970	2552570.4250
4	7088146.9077	2552570.6086
5	7088118.1948	2552601.3687
6	7088157.7553	2552337.5386
7	7088177.7539	2552317.7680
8	7088221.4428	2552317.7680
9	7088221.4428	2552314.2680
10	7088244.5273	2552279.0775
11	7088244.5273	2552182.7680
12	7088179.7287	2552182.7680
13	7088159.7357	2552162.2400
14	7088164.0273	2552267.7680
15	7088164.0273	2552245.7680
16	7088166.6333	2552225.5180
17	7088229.5273	2552225.5180

NOTES:

1. PROPOSED 3/4" GAS LINE WILL BE BUILT BY OTHERS TO THE PROPOSED FENCE LINE AND GAS METER WILL BE SET BY OTHERS AT THE FENCE LINE.
2. FENCE SHALL BE FURNISHED AND INSTALLED TO THE BACK SIDE OF CITY'S PROPERTY. EXACT LOCATION TO BE DETERMINED BY THE CITY.
3. THE CONTRACTOR SHALL FURNISH AND INSTALL INTERLOCKING CONCRETE BLOCKS FOR THE STORAGE BINS BEHIND THE NEW PUMP BUILDING. THE CONCRETE BLOCKS SHALL BE 4 FEET LONG, 2 FEET HIGH, AND 2 FEET-3 INCHES THICK. FIVE STORAGE BINS SHALL BE CREATED WITH THE USE OF THE CONCRETE BLOCKS. THE HEIGHT OF THE STORAGE BINS SHALL BE 6 FEET, AND THE DEPTH OF THE STORAGE BINS SHALL BE 8 FEET. ALSO, CONCRETE BLOCKS SHALL BE INSTALLED ALONG THE BACK OF THE STORAGE BINS ON THE EDGE OF THE CONCRETE PAVEMENT A MINIMUM OF 5 FEET FROM THE PUMP BUILDING. THE WALLS ON THE BACK OF THE STORAGE BINS SHALL BE 8 FEET HIGH. FURNISHING AND INSTALLING THE INTERLOCKING CONCRETE BLOCKS SHALL BE INCLUDED IN AN ALTERNATE BID.
4. THE PROPOSED WASTEWATER HOLDING TANK SHALL BE A 300 GALLON, PLASTIC, SEPTIC PUMP TANK BY ACE ROTO-MOLD/DEN-HARTOG (MANUFACTURER'S PART NO. AST-0300-1) OR APPROVED EQUAL.

!! CAUTION !!

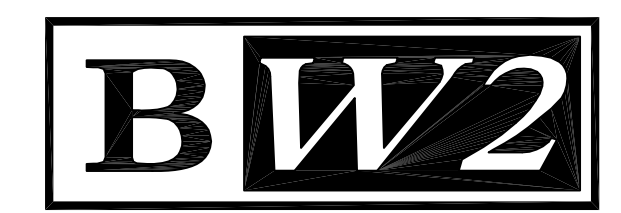
THERE ARE EXISTING AND/OR PROPOSED UTILITIES IN PROJECT AREA. UTILITY INFORMATION SHOWN ON PLANS REPRESENTS APPROXIMATE LOCATIONS OF EXISTING UTILITIES AND IS NOT NECESSARILY ALL-INCLUSIVE. CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING EXACT LOCATIONS OF ALL EXISTING UTILITIES AND SHALL BE REQUIRED TO 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.

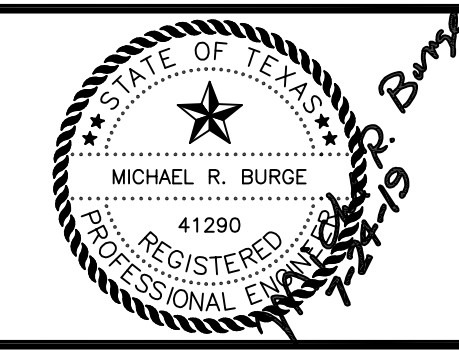
CONTRACTOR SHALL ALSO CONTACT APPROPRIATE CITY UTILITY DEPARTMENT FOR FIELD LOCATES OF MUNICIPAL INFRASTRUCTURE 48 HOURS PRIOR TO CONSTRUCTION.

NO.	DATE	REVISION	REVIEWED
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DRAWN: BW2
 DESIGN: MRB
 REVIEWED: JFW
 SCALE: 1" = 20'
 DATE: JULY 2019
 DWG. NAME: 1811SITEPLAN-PS

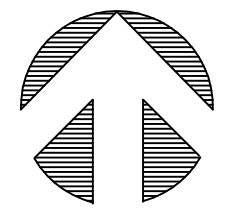


BW2 ENGINEERS, INC.
 1919 S. Shiloh Road
 Suite 500, L.B. 27
 Garland, Texas 75042
 (972) 864-8200 (T) (972) 864-8220 (F)
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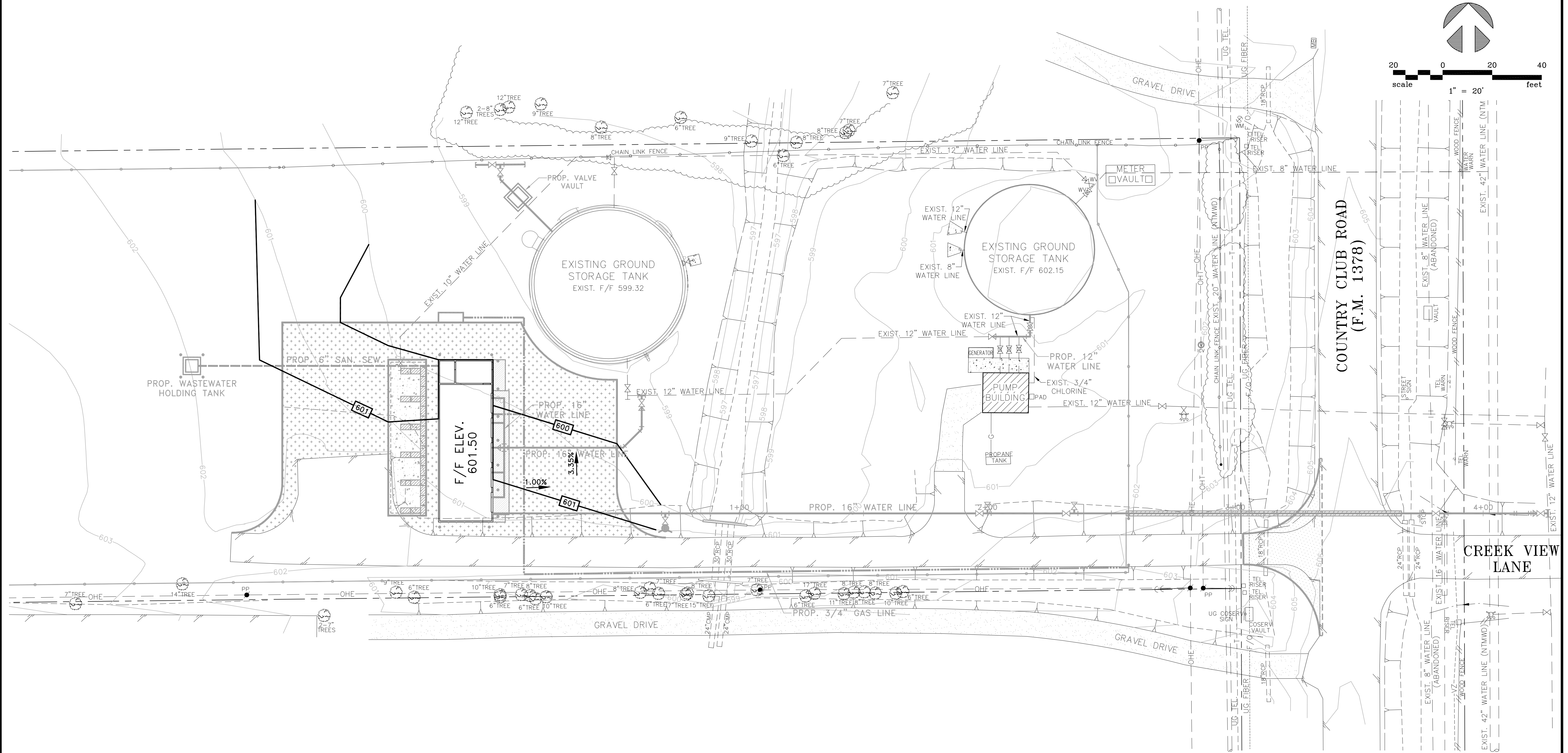


WATER SYSTEM IMPROVEMENTS
 SINGLE PRESSURE PLANE FACILITIES
NORTH PUMP STATION
 SITE PLAN
CITY OF LUCAS

SHEET NO. C6
 OF C22 SHEETS
 JOB NO. 17-1811



20 0 20 40
 scale 1" = 20' feet



LEGEND: (FOR GRADING PLAN)

- 600 — EXISTING CONTOUR
- - - 600 - - - PROPOSED CONTOUR
- F/F FINISHED FLOOR

NOTE:

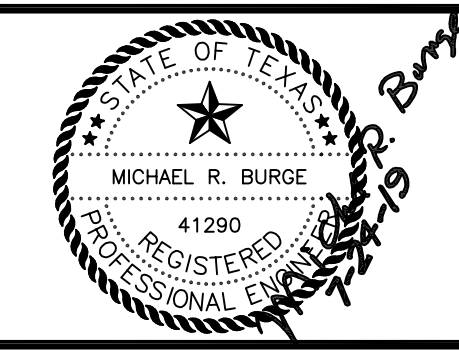
1. AFTER EXCAVATION AND CONSTRUCTION OF PROPOSED FLEX BASE PARKING AREA, BACKFILL REMAINING VOIDS UP TO NEW FLEX BASE PARKING AREA WITH EXISTING EXCAVATED MATERIALS. HOWEVER, THIS MATERIAL MUST BE FREE OF ROCKS AND DEBRIS AND SUITABLE FOR VEGETATIVE GROWTH.

NO.	DATE	REVISION	REVIEWED
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DRAWN: BW2
 DESIGN: MRB
 REVIEWED: JFW
 SCALE: 1" = 20'
 DATE: JULY 2019
 DWG. NAME: 1811GRADEPLAN-PS

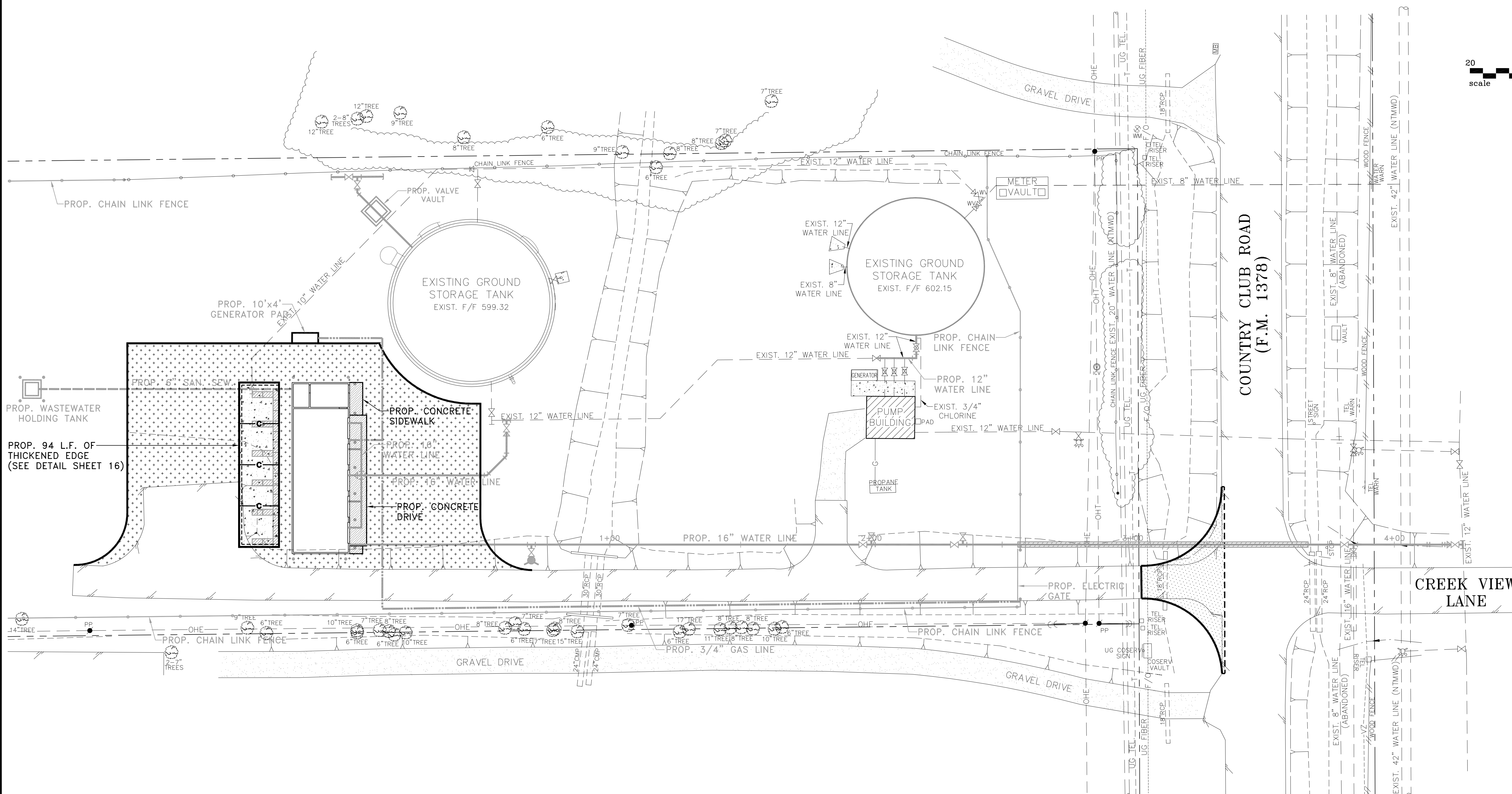
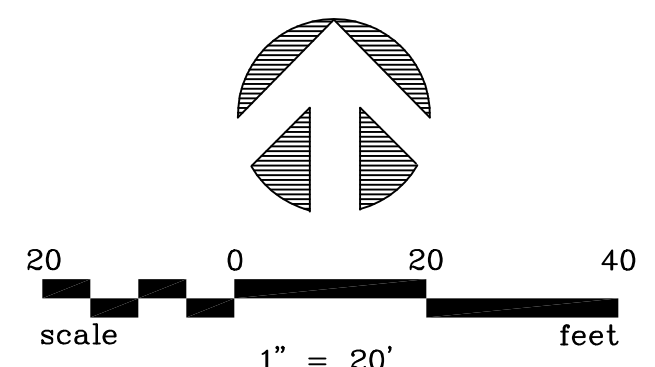


BW2 ENGINEERS, INC.
 1919 S. Shiloh Road
 Suite 500, L.B. 27
 Garland, Texas 75042
 (972) 864-8200 (T) (972) 864-8220 (F)
 Firm Registration No. F-5290



**WATER SYSTEM IMPROVEMENTS
 SINGLE PRESSURE PLANE FACILITIES
 NORTH PUMP STATION
 GRADING PLAN
 CITY OF LUCAS**

SHEET NO. C7
 OF C22 SHEETS
 JOB NO. 17-1811



LEGEND: (PAVING)

- 8" THICK TYPE "A" GRADE 1 FLEXIBLE BASE WITH 6" SCARIFIED AND COMPACTED SUBGRADE (SEE DETAIL, SHEET C16)
- 8" 4,000 PSI REINFORCED CONCRETE PAVEMENT WITH 8" LIME STABILIZED SUBGRADE (SEE DETAIL, SHEET C16)
- 8 1/2" ASPHALT PAVEMENT APPROACH WITH 6" SCARIFIED AND COMPACTED SUBGRADE (SEE DETAIL, SHEET C16)
- 8" 4,000 PSI REINFORCED CONCRETE DRIVE WITH 6" SCARIFIED AND COMPACTED SUBGRADE (SEE DETAIL, SHEET C16)
- SAWED DUMMY JOINT (CONTRACTION JOINT)

!! CAUTION !!

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PRIOR TO ANY EXCAVATION, CONTRACTOR SHALL CONTACT DIG-TESS, TEXAS ONE CALL, LONE STAR NOTIFICATION AND OTHERS AS REQUIRED TO LOCATE EXISTING UTILITIES.

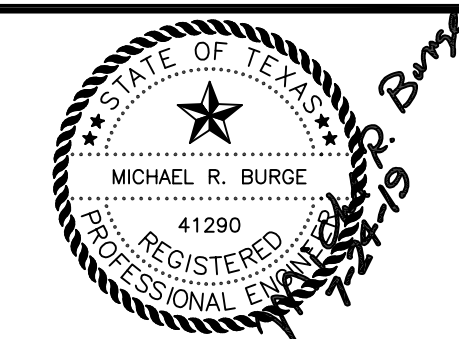
CONTRACTOR SHALL ALSO CONTACT APPROPRIATE CITY UTILITY DEPARTMENT FOR FIELD LOCATES OF MUNICIPAL INFRASTRUCTURE 48 HOURS PRIOR TO CONSTRUCTION.

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NO.	DATE	REVISION	REVIEWED

DRAWN: BW2
 DESIGN: MRB
 REVIEWED: JFW
 SCALE: 1" = 20'
 DATE: JULY 2019
 DWG. NAME: 1811PAVING-PS

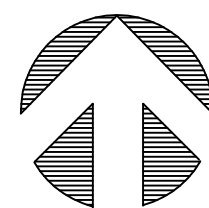


BW2 ENGINEERS, INC.
 1919 S. Shiloh Road
 Suite 500, L.B. 27
 Garland, Texas 75042
 (972) 864-8200 (T) (972) 864-8220 (F)
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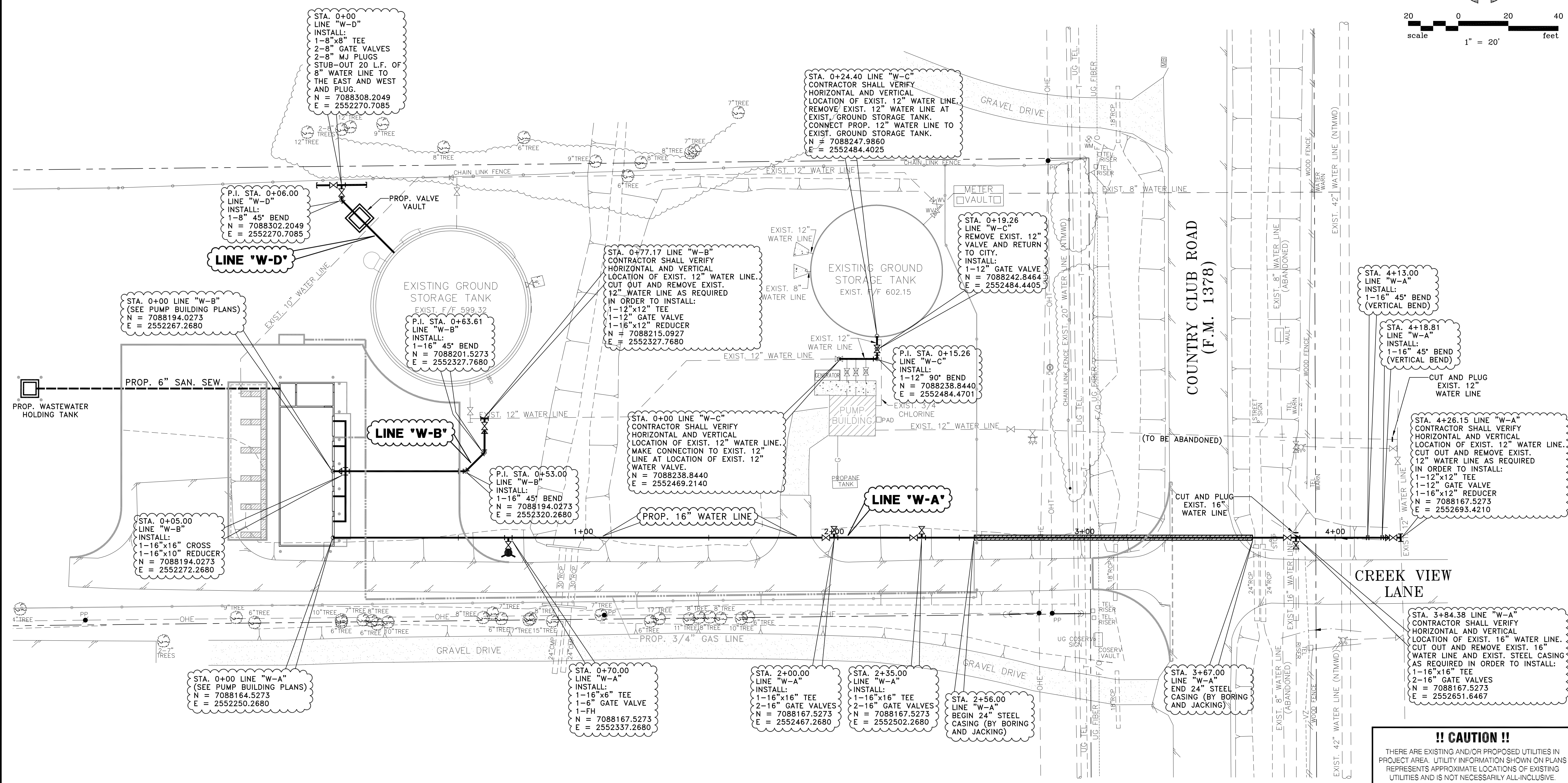


**WATER SYSTEM IMPROVEMENTS
 SINGLE PRESSURE PLANE FACILITIES
 NORTH PUMP STATION
 PAVING PLAN
 CITY OF LUCAS**

SHEET NO. **C8**
 OF C22 SHEETS
 JOB NO. 17-1811



20 0 20 40
 scale 1" = 20' feet



!! CAUTION !!

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PRIOR TO ANY EXCAVATION, CONTRACTOR SHALL CONTACT DIG-TESS, TEXAS ONE CALL, LONE STAR NOTIFICATION AND OTHERS AS REQUIRED TO LOCATE EXISTING UTILITIES.

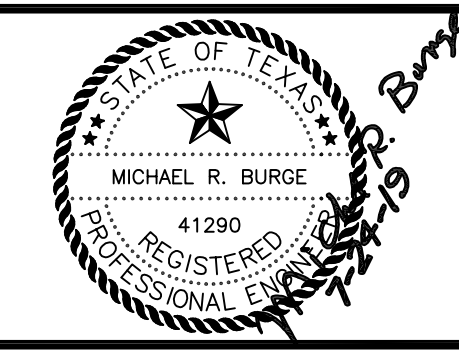
CONTRACTOR SHALL ALSO CONTACT APPROPRIATE CITY UTILITY DEPARTMENT FOR FIELD LOCATES OF MUNICIPAL INFRASTRUCTURE 48 HOURS PRIOR TO CONSTRUCTION.

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NO.	DATE	REVISION	REVIEWED

DRAWN: BW2
 DESIGN: MRB
 REVIEWED: JFW
 SCALE: 1" = 20'
 DATE: JULY 2019
 DWG. NAME: 1811YARDPIPE-PS

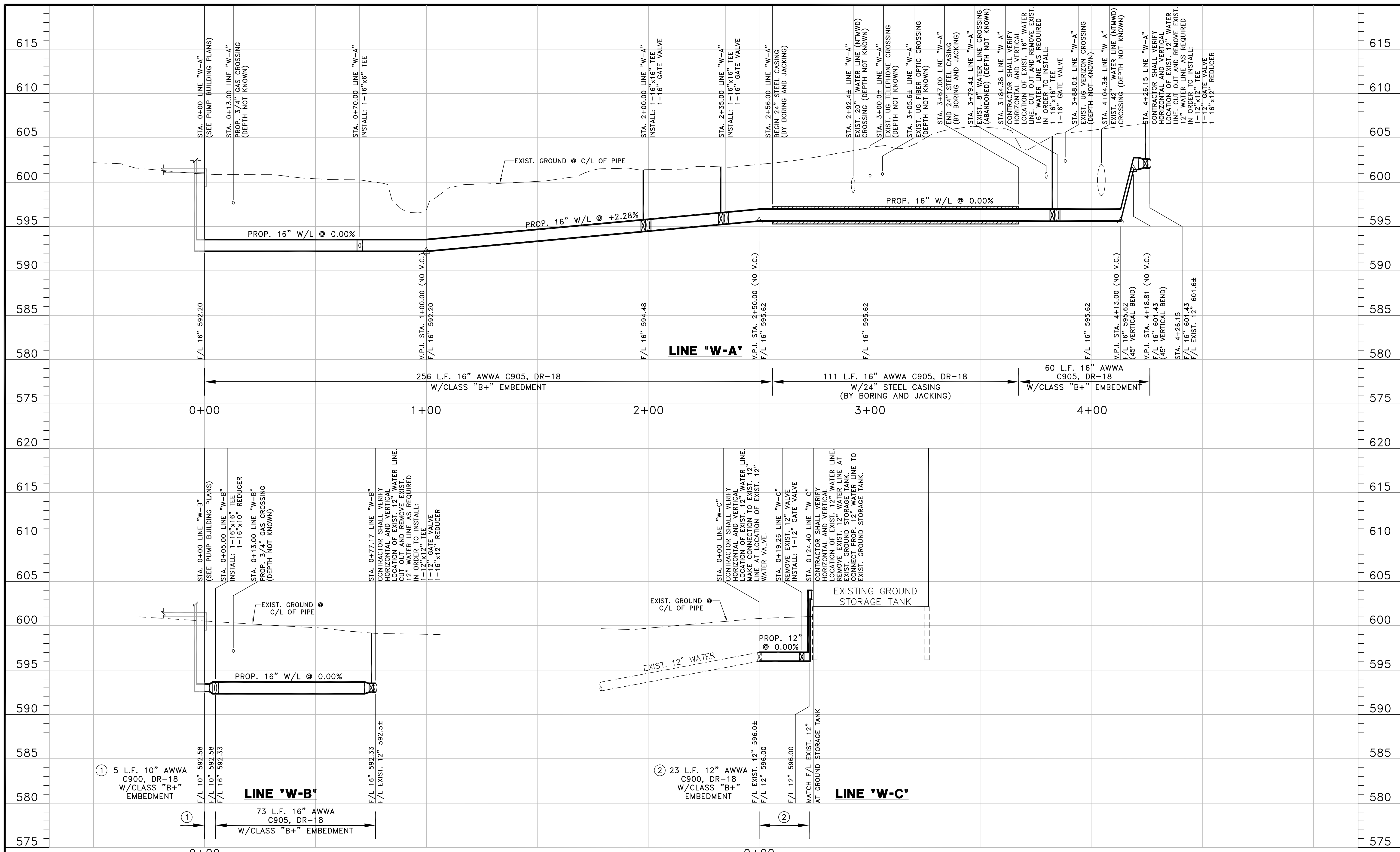


BW2 ENGINEERS, INC.
 1919 S. Shiloh Road
 Suite 500, L.B. 27
 Garland, Texas 75042
 (972) 864-8200 (T) (972) 864-8220 (F)
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**WATER SYSTEM IMPROVEMENTS
 SINGLE PRESSURE PLANE FACILITIES
 NORTH PUMP STATION
 YARD PIPING PLAN
 CITY OF LUCAS**

SHEET NO. C9
 OF C22 SHEETS
 JOB NO. 17-1811

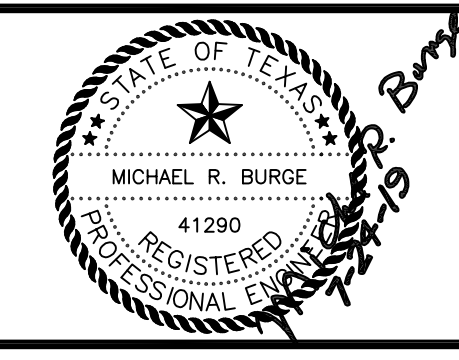


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DRAWN: BW2
 DESIGN: MRB
 REVIEWED: JFW
 SCALE: (H)1"=20', (V)1"=5'
 DATE: JULY 2019
 DWG. NAME: 1811PROFWTR-PS

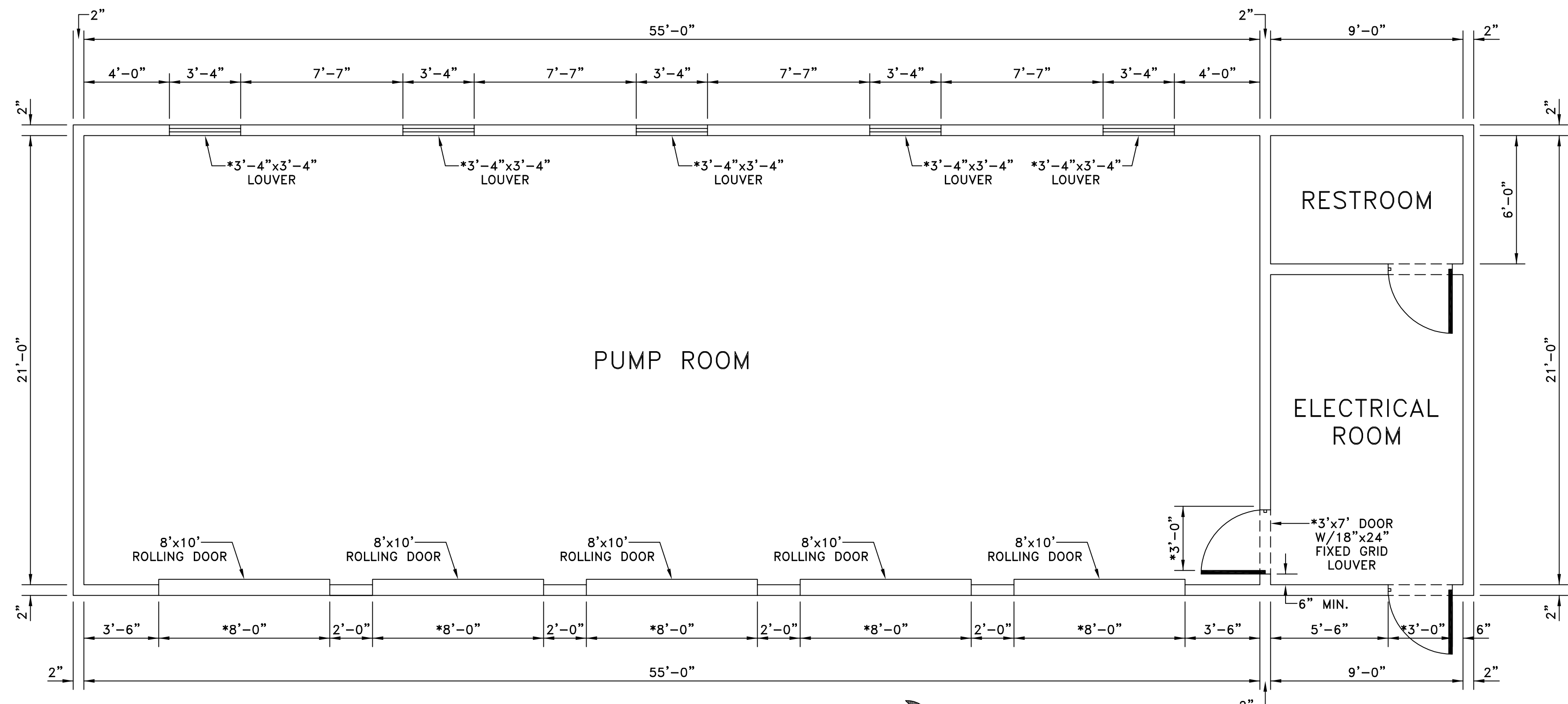


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 1919 S. Shiloh Road
 Suite 500, L.B. 27
 Garland, Texas 75042
 (972) 864-8200 (T) (972) 864-8220 (F)
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WATER SYSTEM IMPROVEMENTS
 SINGLE PRESSURE PLANE FACILITIES
NORTH PUMP STATION
 WATER LINE PROFILES
CITY OF LUCAS

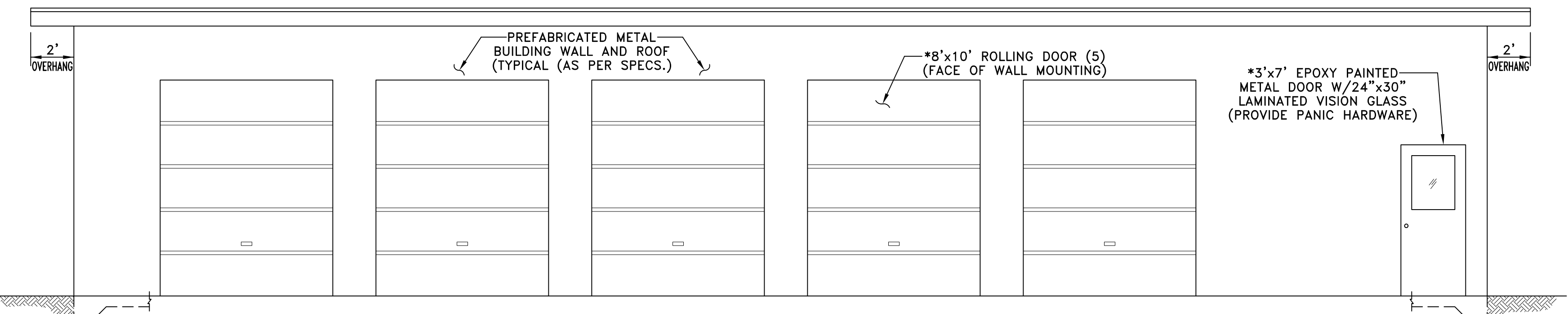
SHEET NO. C10
 OF C22 SHEETS
 JOB NO. 17-1811



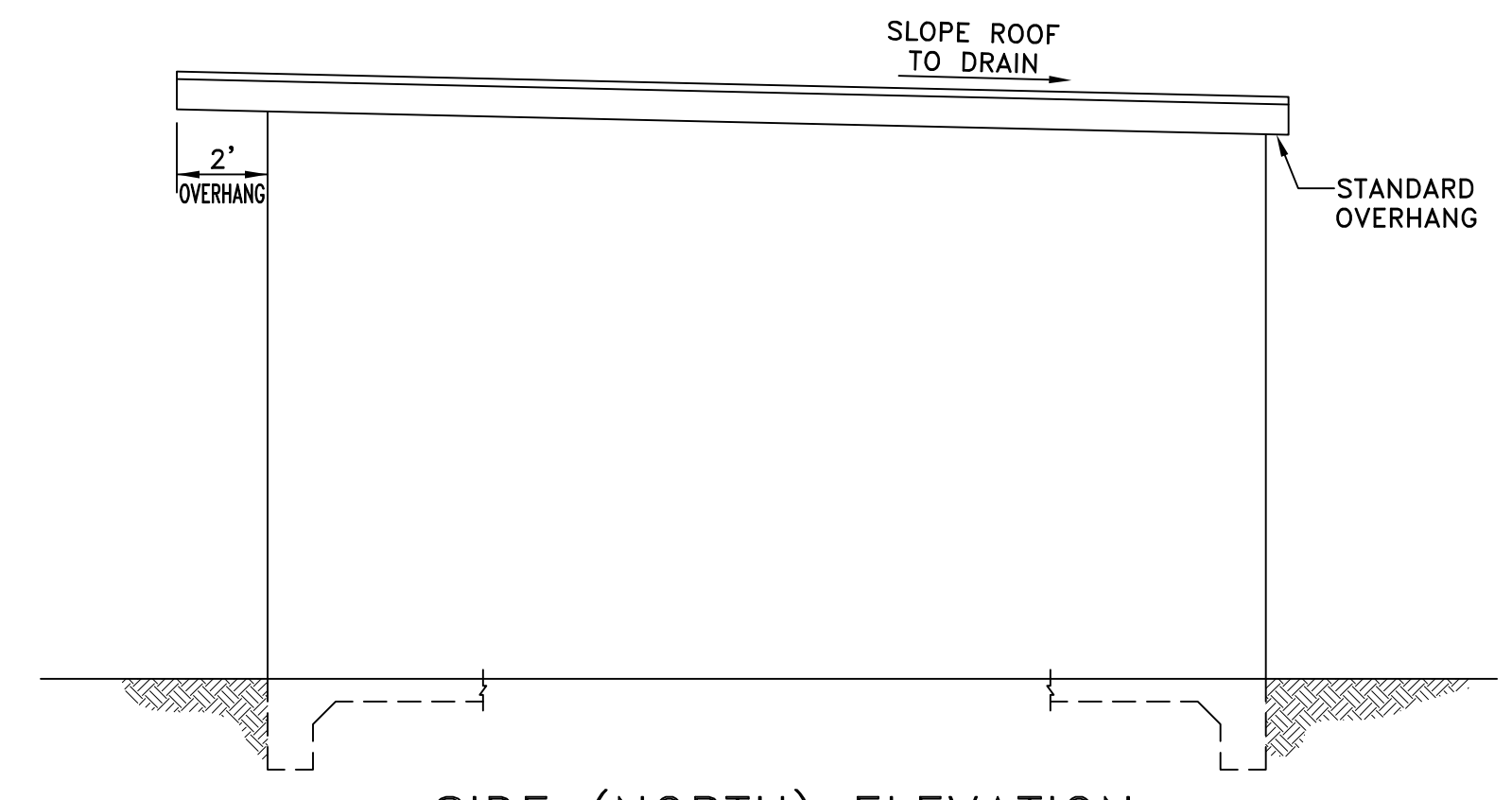
*CONTRACTOR TO VERIFY DIMENSION WITH EQUIPMENT MANUFACTURER.

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

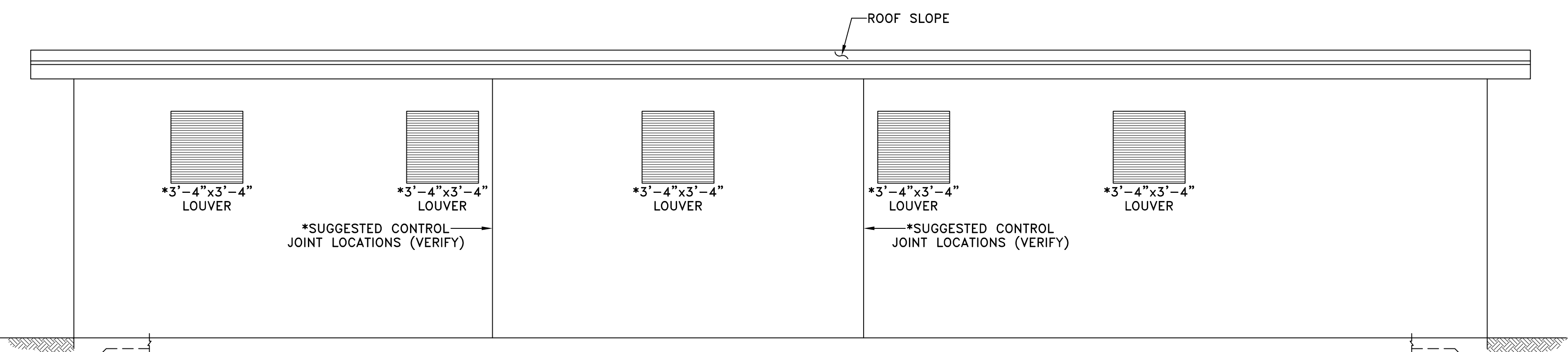
- NOTES:
1. ROOF MUST BE DESIGNED TO ACCOMMODATE TEMPERATURE CHANGES, ROOF EXPANSION AND CONTRACTION MOVEMENTS.
 2. THERE SHALL BE NO CRACKS, BLISTERS, AND SPITS ON WALLS AND ROOF FOR THE DURATION OF THE WARRANTY TIME.
 3. PREFABRICATED METAL BUILDING SHALL BE DESIGNED TO ACCOMMODATE AND CARRY THE MAXIMUM 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. 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.
 7. NO FIELD PAINTING WILL BE REQUIRED ON THE PUMP BUILDING.
 8. DOOR HARDWARE IN THE BUILDING SHALL BE STANDARD HARDWARE PROVIDED BY THE BUILDING MANUFACTURER.
 9. 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.
 10. 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.
 11. THE PUMP BUILDING SHALL BE PAINTED PER THE MANUFACTURE'S RECOMMENDATIONS WITH THE COLORS TO BE SELECTED BY THE CITY.



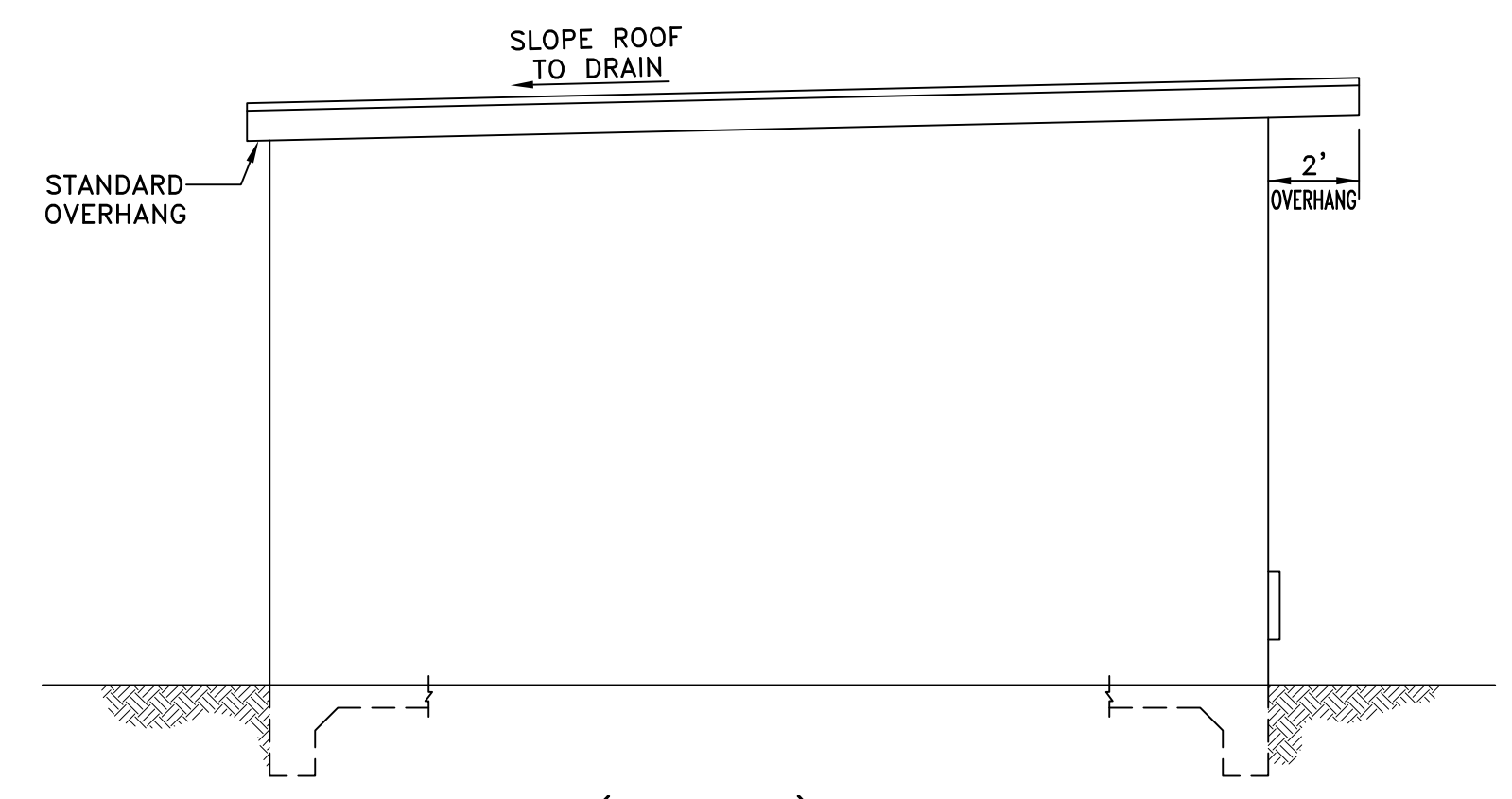
FRONT (EAST) ELEVATION
SCALE: 1/4" = 1'-0"



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



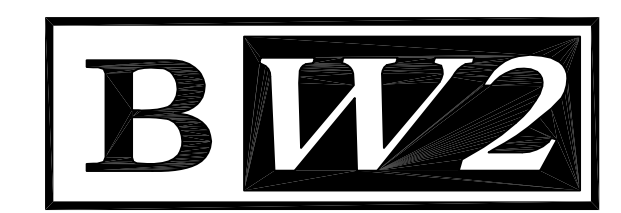
BACK (WEST) ELEVATION
SCALE: 1/4" = 1'-0"



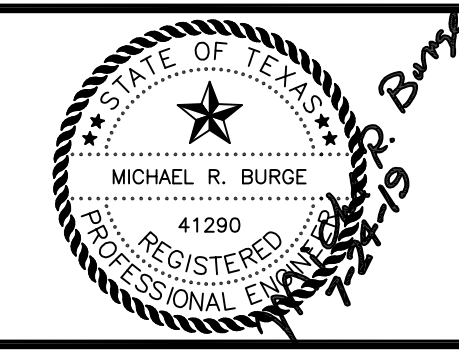
SIDE (SOUTH) ELEVATION
SCALE: 1/4" = 1'-0"

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NO.	DATE	REVISION	REVIEWED

DRAWN: BW2
 DESIGN: MRB
 REVIEWED: JFW
 SCALE: 1/4" = 1'-0"
 DATE: JULY 2019
 DWG. NAME: 1811PLAN-ELEV-PS

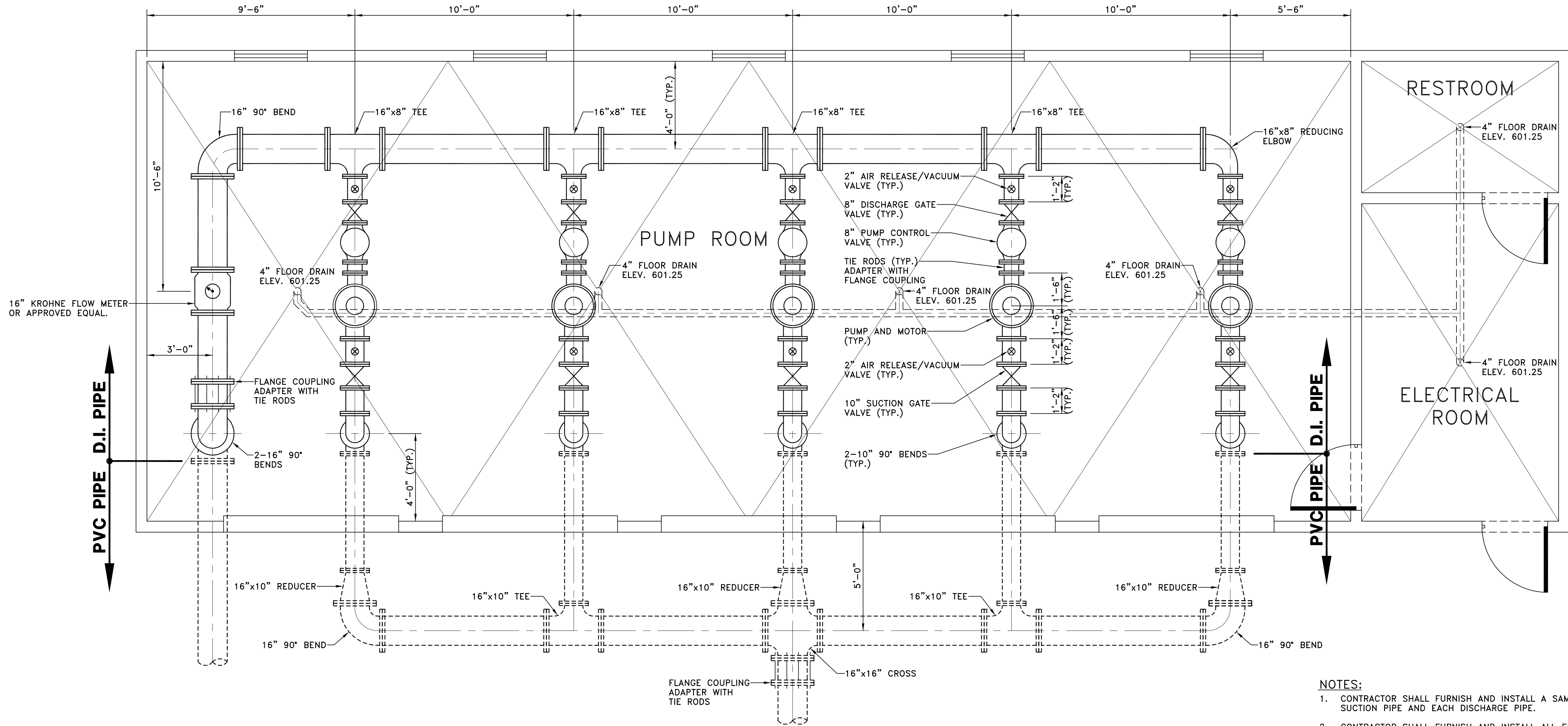


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 1919 S. Shiloh Road
 Suite 500, L.B. 27
 Garland, Texas 75042
 (972) 864-8200 (T) (972) 864-8220 (F)
 Firm Registration No. F-5290



WATER SYSTEM IMPROVEMENTS
 SINGLE PRESSURE PLANE FACILITIES
NORTH PUMP STATION
 PUMP BUILDING FLOOR PLAN
CITY OF LUCAS

SHEET NO. C11
 OF C22 SHEETS
 JOB NO. 17-1811

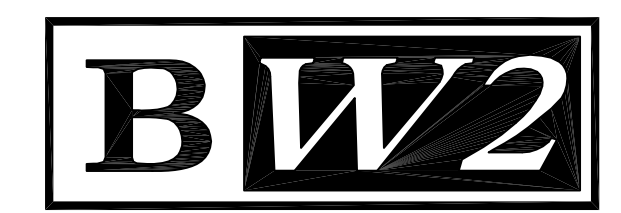


PUMP BUILDING PIPING PLAN
SCALE: 3/8" = 1'-0"

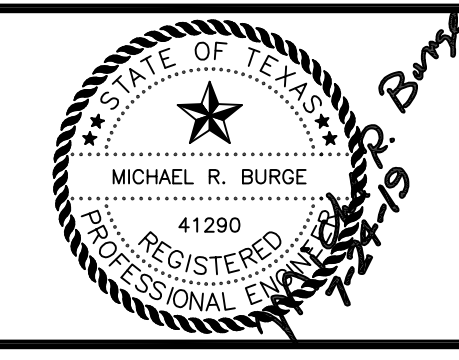
- NOTES:**
- CONTRACTOR SHALL FURNISH AND INSTALL A SAMPLING TAP ON EACH SUCTION PIPE AND EACH DISCHARGE PIPE.
 - CONTRACTOR SHALL FURNISH AND INSTALL ALL ELECTRICAL COMPONENTS AS REQUIRED FOR OPERATION FOR PUMPS, LIGHTING FIXTURES, ETC. PER ELECTRICAL SPECIFICATIONS AND DETAILS.
 - CONTRACTOR SHALL FURNISH AND INSTALL ALL STRUCTURAL COMPONENTS AS REQUIRED FOR OPERATION FOR THE PUMP STATION FOUNDATION PER STRUCTURAL SPECIFICATIONS AND DETAILS.
 - AIR RELEASE/VACUUM VALVES (2" VALVES) SHALL BE FURNISHED AND INSTALLED ON THE SUCTION PIPES AND DISCHARGE PIPES (ONE EACH ON EACH SUCTION PIPE AND DISCHARGE PIPE). AIR RELEASE/VACUUM VALVES SHALL BE APCO ARY CLEAN WATER AIR RELEASE VALVES WITH A DRAIN LINE TO THE FLOOR DRAIN SYSTEM AND SHALL BE AS RECOMMENDED BY THE MANUFACTURER FOR THIS PARTICULAR APPLICATION.
 - ALL PIPING ABOVE THE FLOOR SLAB OF THE PUMP STATION SHALL BE APPROXIMATELY 2- FEET ABOVE THE SLAB, AS MEASURED BETWEEN THE CENTER LINE OF THE PIPE AND THE TOP OF THE SLAB.
 - CONTRACTOR SHALL FURNISH, ASSEMBLE, AND INSTALL EACH OF THE FIVE (5) PUMPING UNITS IN THE LOCATIONS SHOWN ON THIS SHEET.
 - THE FLOW METER SHALL BE AN ELECTROMAGNETIC FLOW METER BY KROHNE, MODEL NO. ENVIROMAG 2000 OR APPROVED EQUAL.
 - THE PUMP CONTROL VALVES SHALL BE 8" PUMP CONTROL VALVES MANUFACTURED BY CLA-VAL (MODEL NO. 60-11) OR APPROVED EQUAL.
 - THE GATE VALVES ON THE SUCTION PIPING AND DISCHARGE PIPING SHALL BE KENNEDY KENSEAL II R/W VALVES OR APPROVED EQUAL.

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NO.	DATE	REVISION	REVIEWED

DRAWN: _____ BW2
 DESIGN: _____ MRB
 REVIEWED: _____ JFW
 SCALE: 3/8" = 1'-0"
 DATE: JULY 2019
 DWG. NAME: 1811PUMP-PIPE-PS



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 1919 S. Shiloh Road
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 Garland, Texas 75042
 (972) 864-8200 (T) (972) 864-8220 (F)
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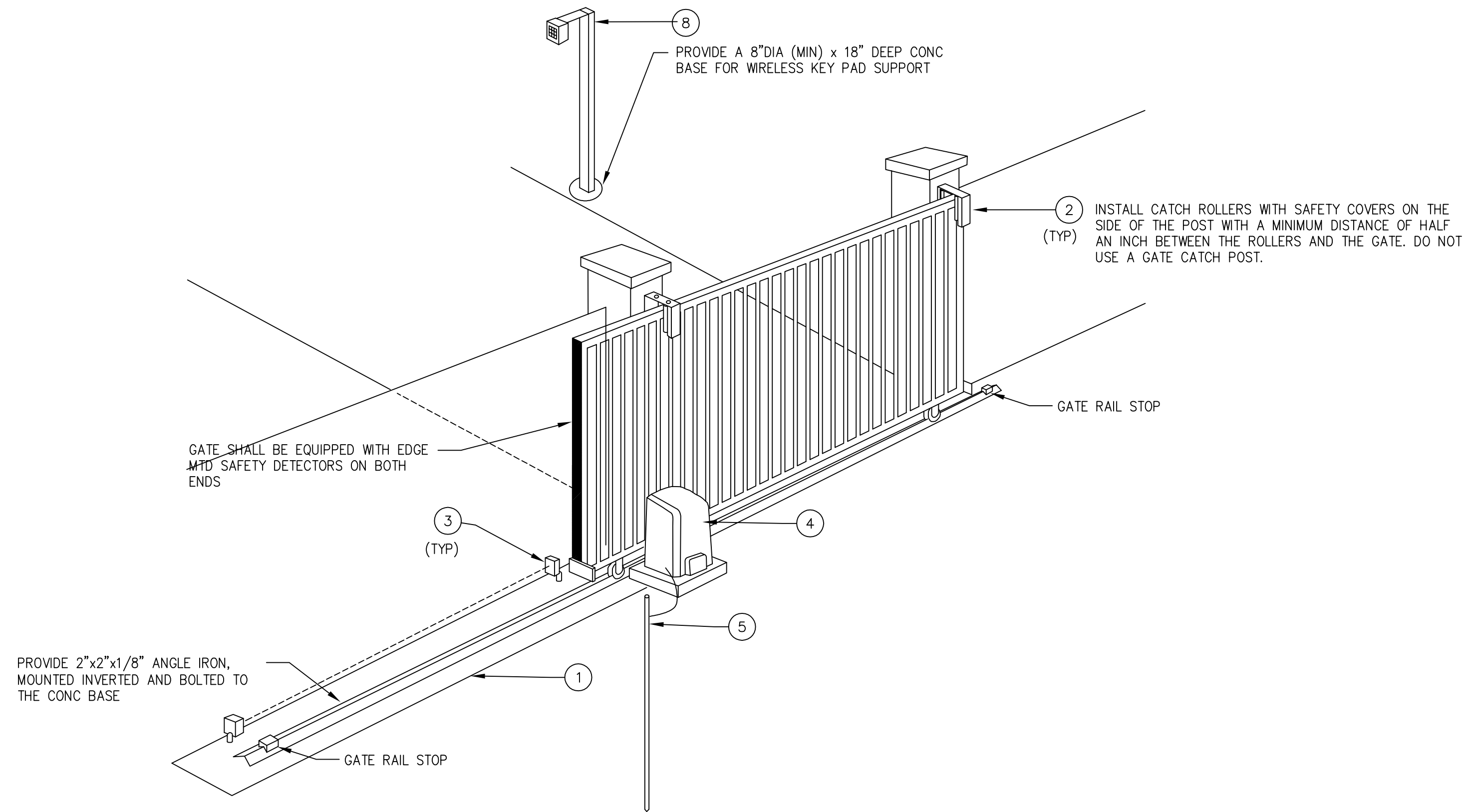


**WATER SYSTEM IMPROVEMENTS
 SINGLE PRESSURE PLANE FACILITIES
 NORTH PUMP STATION
 PUMP BUILDING PIPING PLAN
 CITY OF LUCAS**

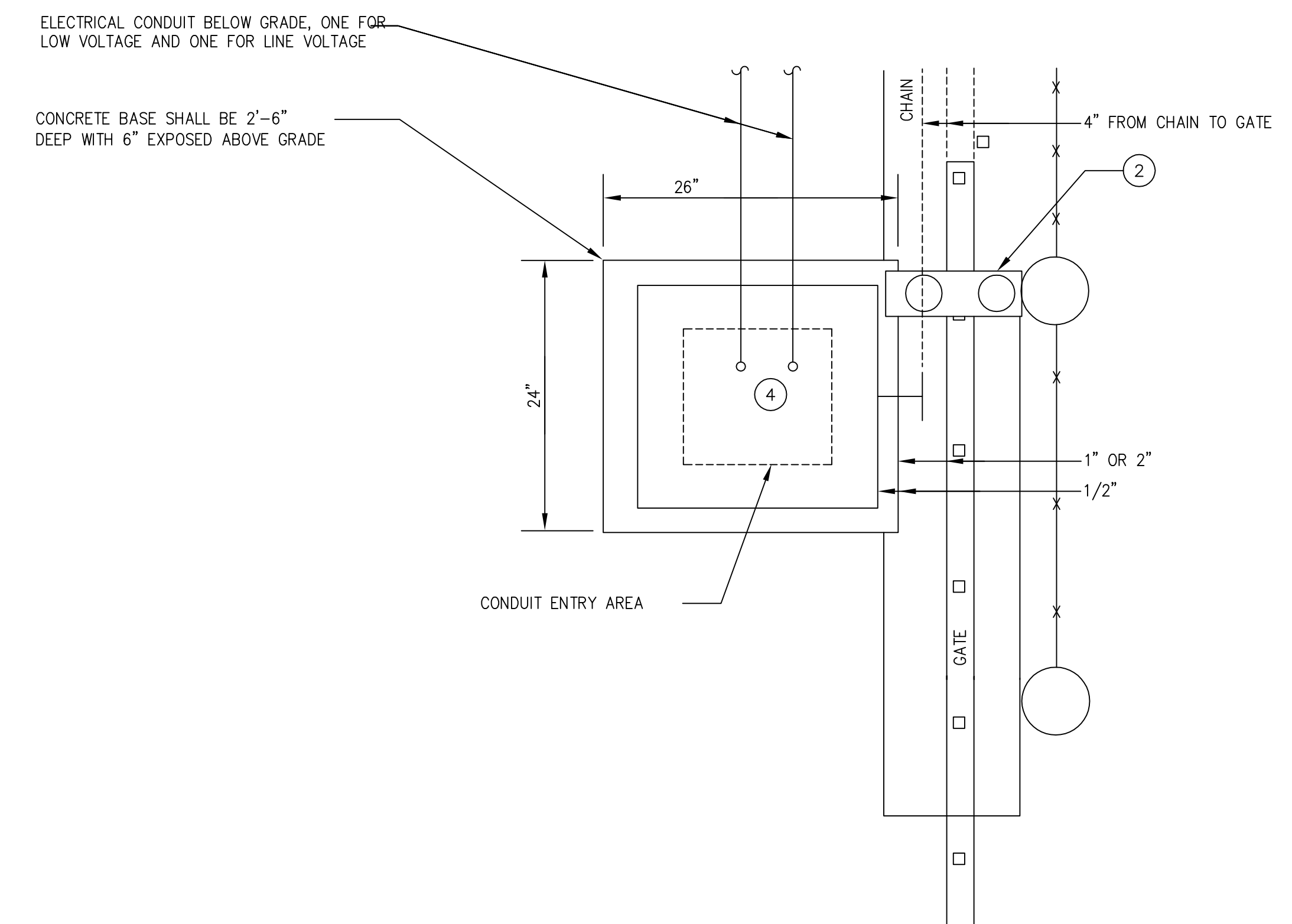
SHEET NO. C12
 OF C22 SHEETS
 JOB NO. 17-1811

NOTES BY SYMBOL: #

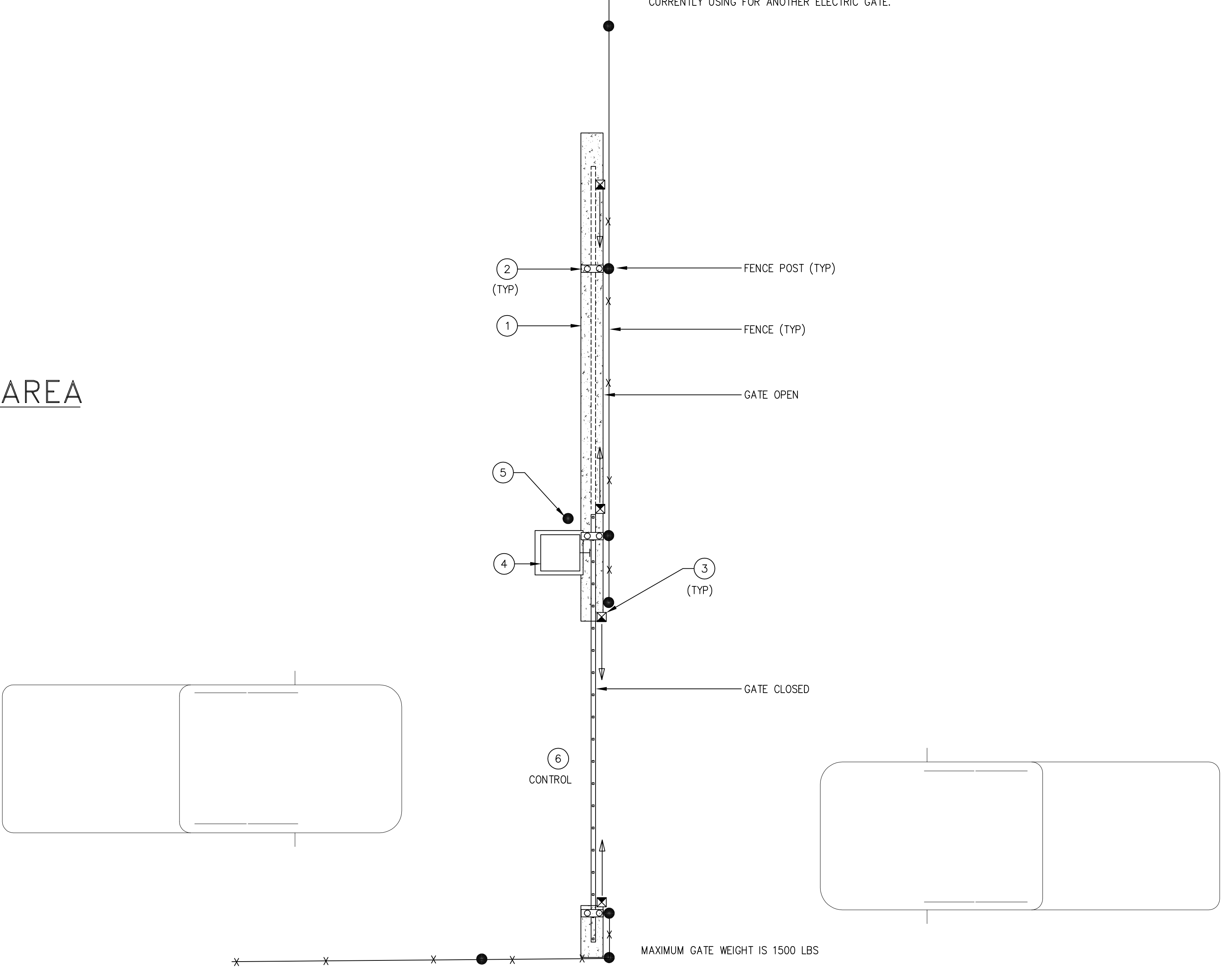
1. CONCRETE PAD FOR GATE TRACK. CONC PAD SHALL BE 12"Wx22"Lx6"D WITH (3) #4 REBAR THE FULL LENGTH OF THE CONCRETE BASE. THE CONCRETE BASE SHALL BE FLUSH WITH THE TOP OF THE CONCRETE DRIVE.
2. FURNISH & INSTALL (3) SAFETY CATCH AND ROLLERS TO GUIDE THE TOP OF THE GATE.
3. PASSIVE INFRARED ENTRAPMENT DEVICE, TWO SETS REQUIRED.
4. GATE OPERATOR, PROVIDE 26"Wx24"Lx30"D CONCRETE BASE - REF TO DETAIL 03 ON THIS SHEET.
5. PROVIDE A 3/4"Dx10' COPPER-CLAD STEEL GROUND ROD. GROUND ROD SHALL GROUND THE GATE OPERATOR, THE FENCE AND THE GUIDE TRACK WITH A #8 BARE COPPER GROUND CONDUCTOR.
6. GATE OPERATION SHALL BE INITIATED BY A WIRELESS PUSHBUTTON CONTROL DEVICE LOCATED IN THE EMPLOYEES VEHICLE. PUSHING THE BUTTON SHALL CAUSE THE GATE TO OPEN; PUSHING THE BUTTON A SECOND TIME SHALL CAUSE THE GATE TO CLOSE. SAFETY DEVICES SUCH AS PASSIVE INFRARED DETECTORS AND END OF GATE PRESSURE SWITCHES SHALL ENSURE THE GATE DOES NOT CLOSE ON A PERSON OR CAR. CONTRACTOR SHALL PROVIDE THE OWNER WITH TEN (10) PREPROGRAMMED WIRELESS CONTROLLERS FOR OPENING AND CLOSING THE MOTORIZED GATE. CONTROLLERS SHALL BE PROGRAMMED TO MATCH GATE CONTROLLERS THE CITY IS CURRENTLY USING FOR ANOTHER ELECTRIC GATE.



02 PERSPECTIVE VIEW - GATE AREA
SCALE: NOT TO SCALE



03 OPERATOR AREA PLAN VIEW
SCALE: NOT TO SCALE



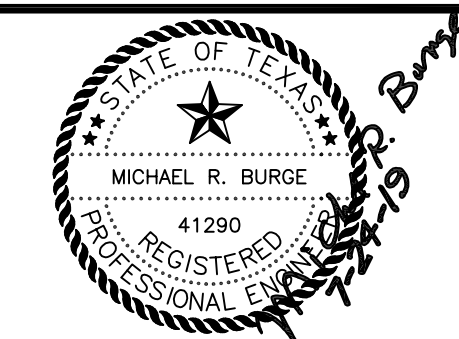
01 PLAN - GATE AREA
SCALE: 1/4"=1'-0"

NO.	DATE	REVISION	REVIEWED
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DRAWN: _____ BW2
 DESIGN: _____ MRB
 REVIEWED: _____ JFW
 SCALE: _____ NOT TO SCALE
 DATE: _____ JULY 2019
 DWG. NAME: _____ 1811GATE-PS

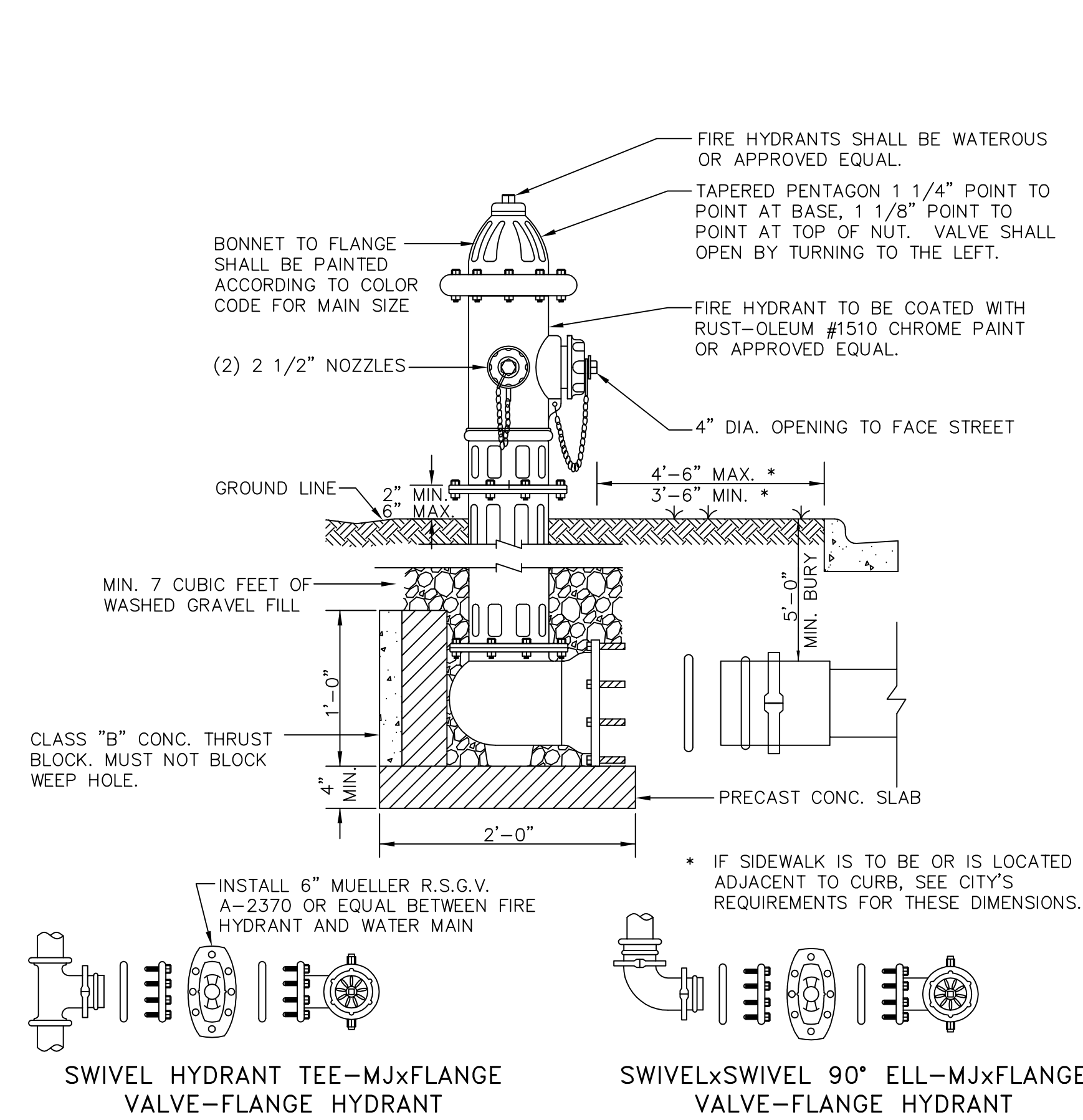


BW2 ENGINEERS, INC.
 1919 S. Shiloh Road
 Suite 500, L.B. 27
 Garland, Texas 75042
 (972) 864-8200 (T) (972) 864-8220 (F)
 Firm Registration No. F-5290

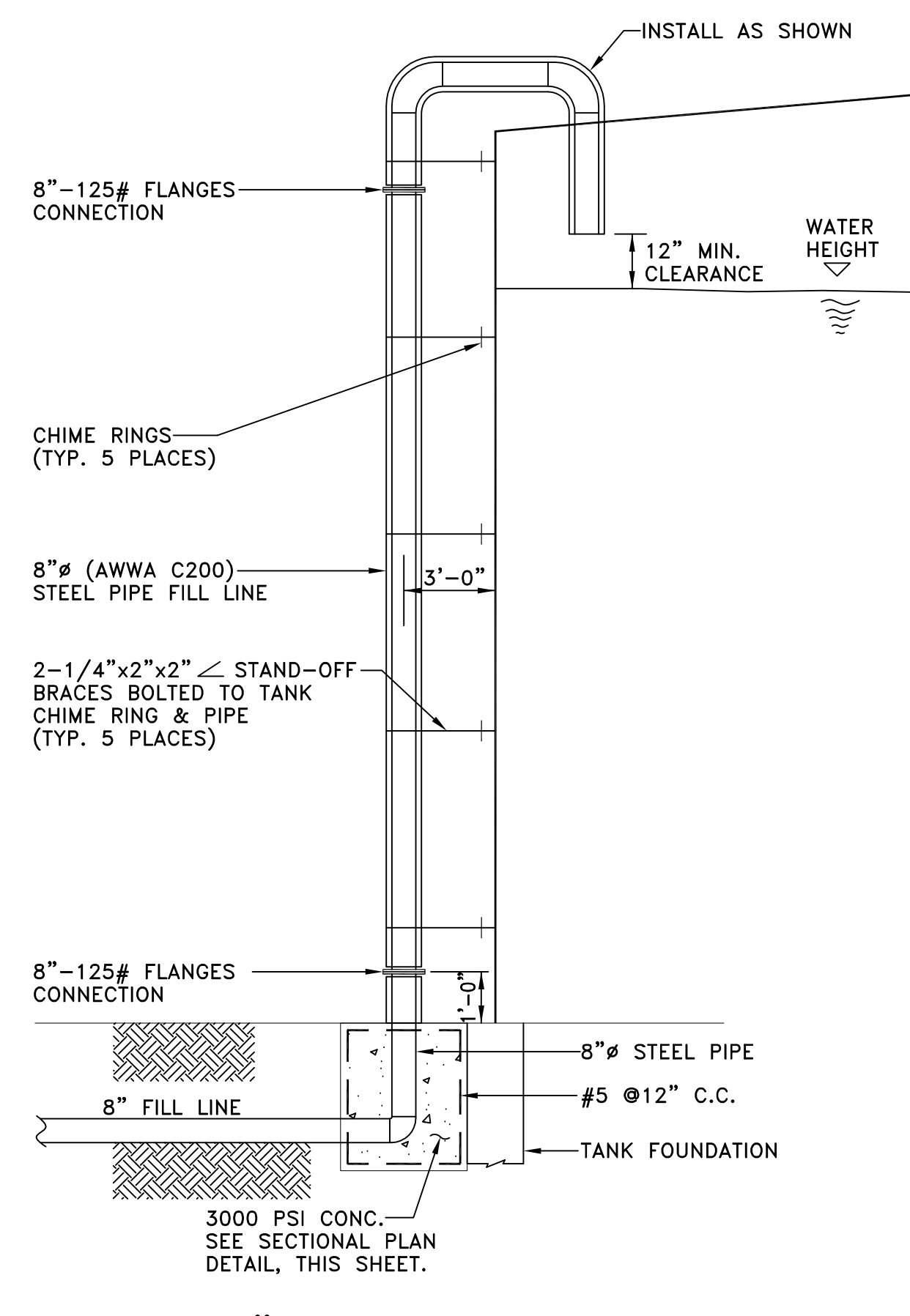


WATER SYSTEM IMPROVEMENTS
 SINGLE PRESSURE PLANE FACILITIES
NORTH PUMP STATION
 MAIN GATE DETAILS
CITY OF LUCAS

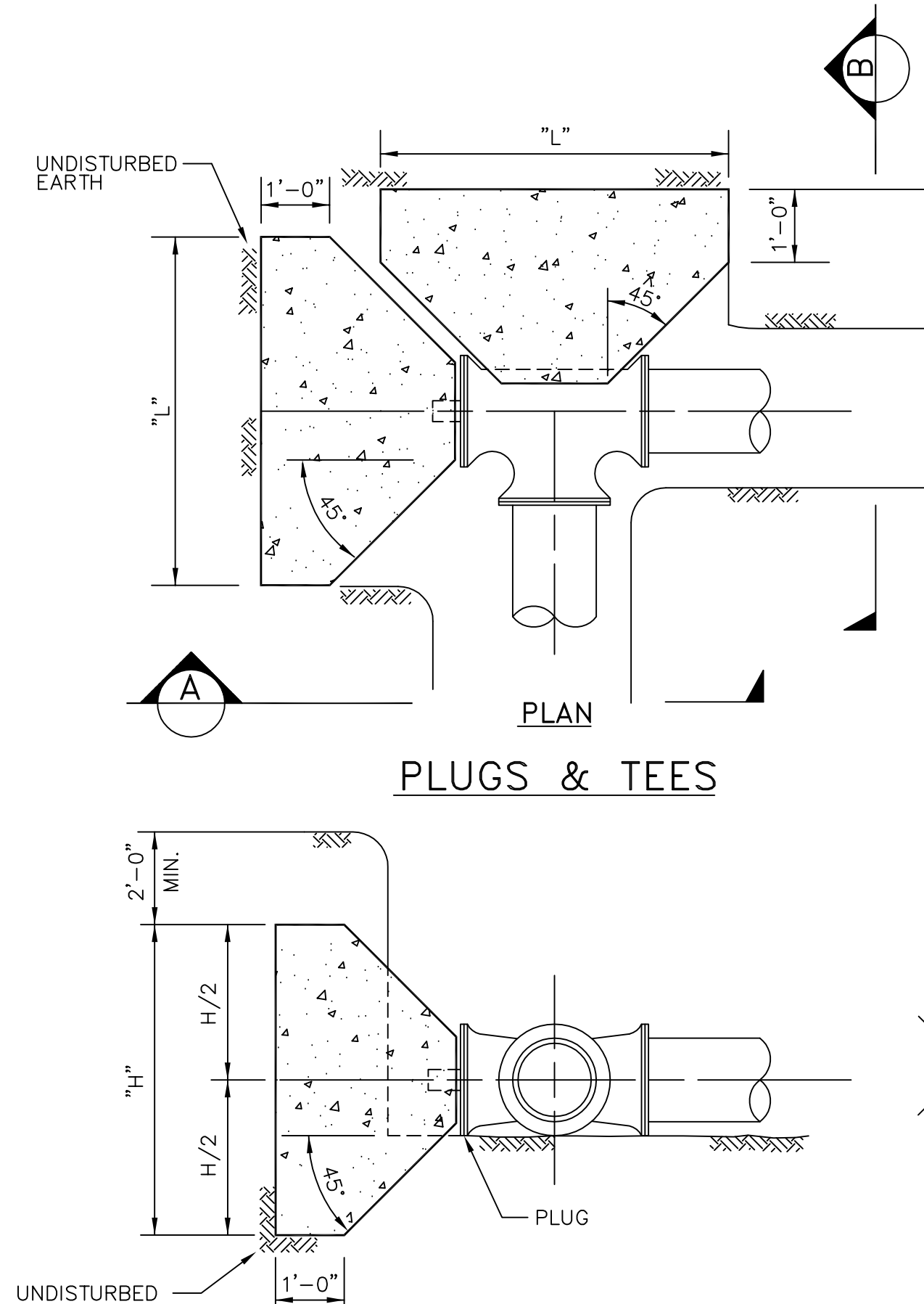
SHEET NO. C13
 OF C22 SHEETS
 JOB NO. 17-1811



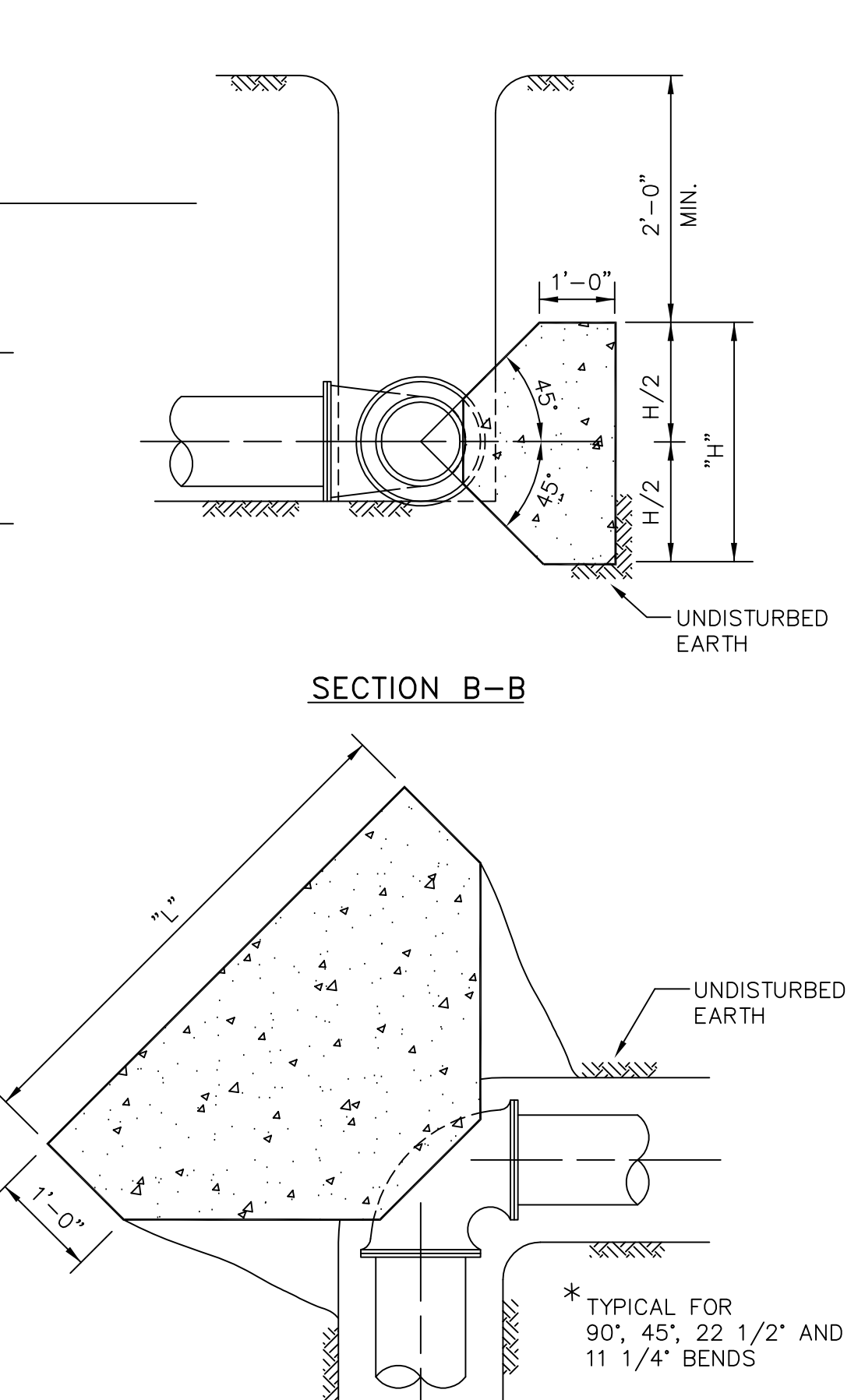
FIRE HYDRANT INSTALLATION
N.T.S.



8" FILL LINE CONNECTION SECTION DETAIL
N.T.S.



PLUGS & TEES



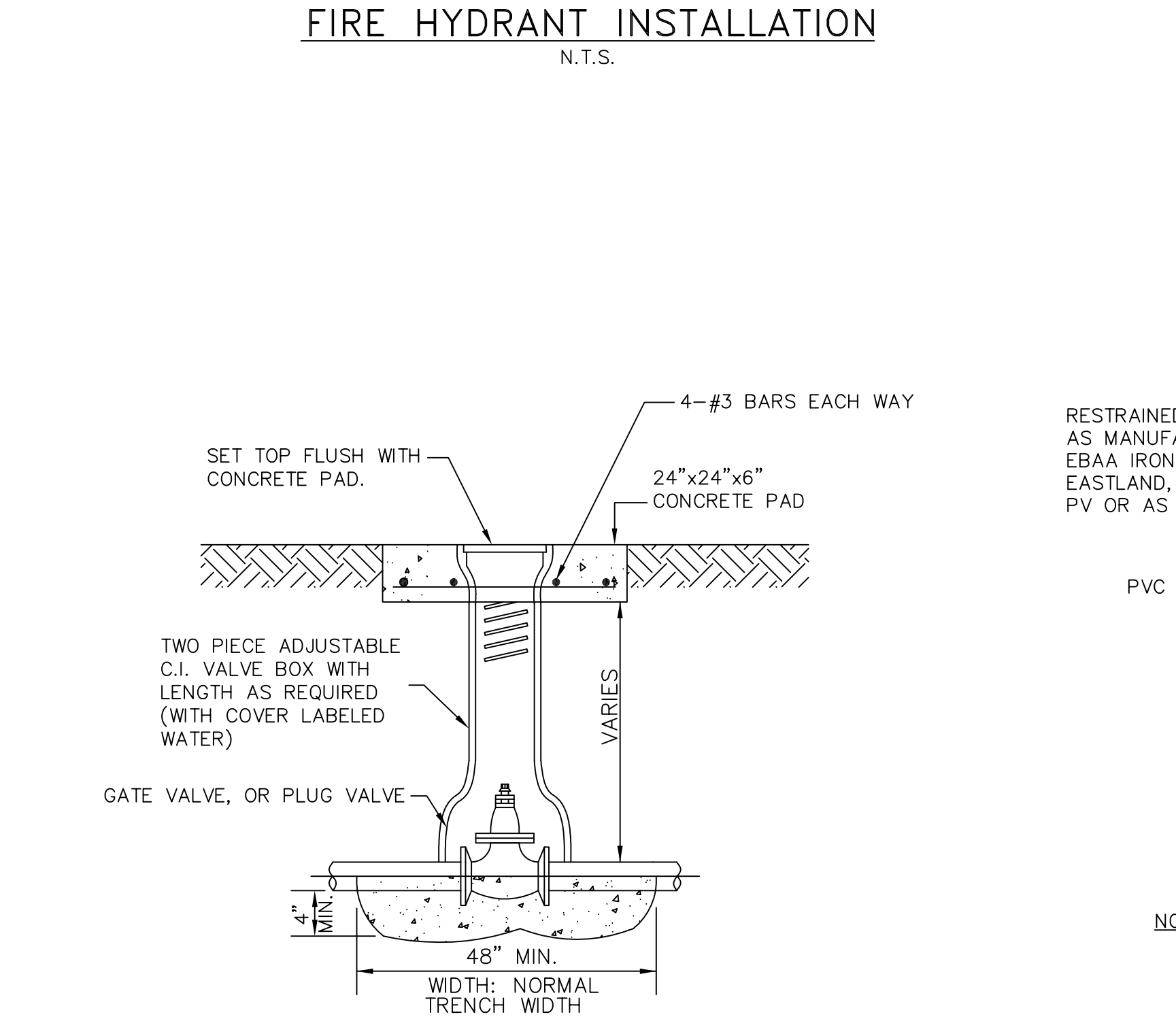
PLAN BENDS

NOTES:

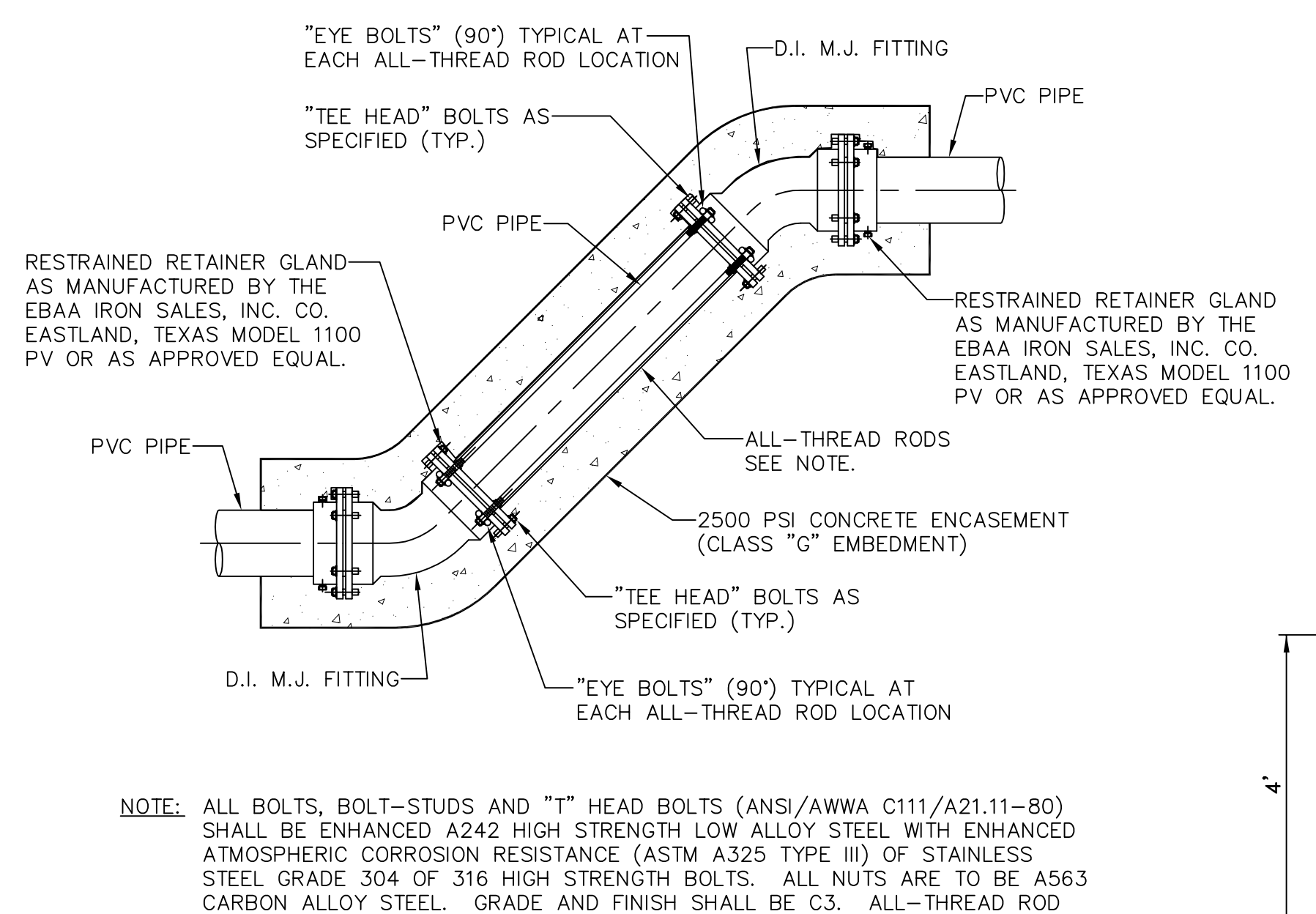
1. THE TABLE IS BASED ON 2000 PSF SOIL BEARING CAPACITY AND FOR A TEST PRESSURE OF 150 P.S.I.
2. CONCRETE FOR THRUST BLOCKING SHALL BE 2000 PSI CONCRETE.
3. VERTICAL BEND THRUST BLOCKING SHALL HAVE REINFORCING BARS NO. 4 AT 12" C-C.
4. ALL BEARING SURFACES OF THRUST BLOCKS SHALL BE POURED AGAINST UNDISTURBED EARTH.
5. ALL THRUST BLOCKING SHALL BE AS INDICATED OR AS PER THE MANUFACTURE'S SPECIFICATIONS.
6. ALL ANCHOR BLOCKS SHALL BE FORMED, POURED IN PLACE, CLASS "B" CONCRETE.

PIPE SIZE (INCHES)	DEGREE OF BEND (DEGREE)	MINIMUM CONCRETE ANCHOR BLOCK			
		EARTH (FEET)		ROCK (FEET)	
		"L"	"H"	"L"	"H"
6, 8	11 1/4	1.0	1.5	1.0	1.0
10, 12*	22 1/2	1.5	1.5	1.0	1.0
16**	45	2.0	2.0	1.5	1.5
	90	5.0	1.5	2.0	2.0

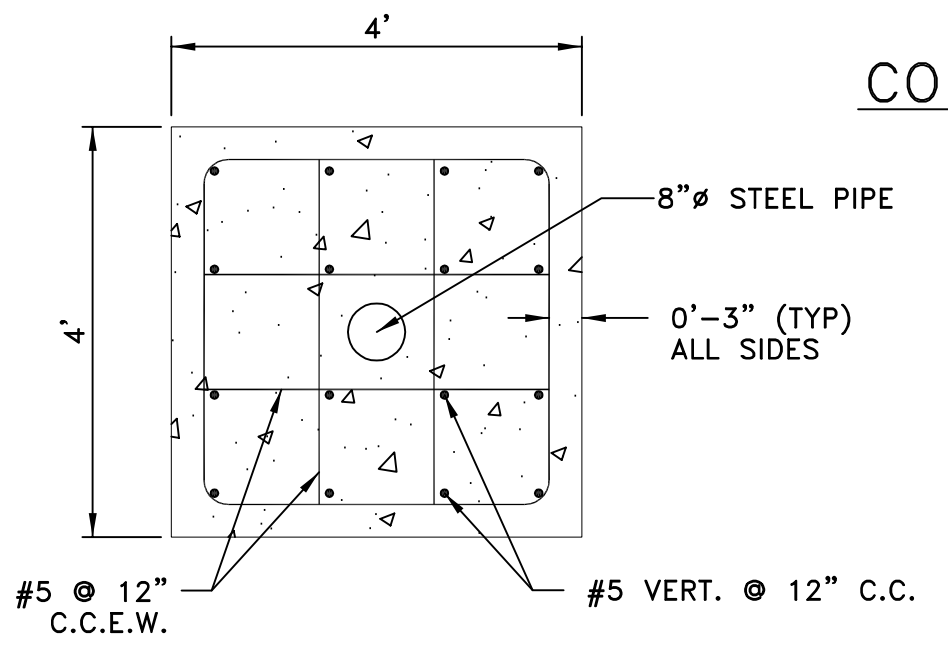
* FOR 12" LINE ADD 1 FOOT TO ALL DIMENSIONS IN THE TABLE.
** FOR 16" LINE ADD 2 FEET TO ALL DIMENSIONS IN THE TABLE.



BURIED VALVE DETAIL
N.T.S.



THRUST HARNESS DETAIL
N.T.S.

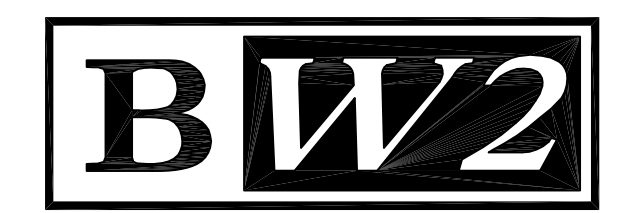


SECTIONAL PLAN DETAIL
N.T.S.

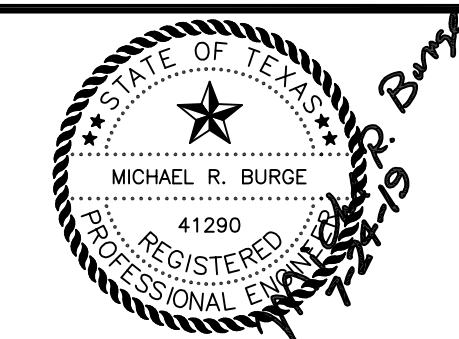
CONCRETE ANCHOR BLOCKS
N.T.S.

NO.	DATE	REVISION	REVIEWED
6			
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DRAWN: BW2
DESIGN: MRB
REVIEWED: JFW
SCALE: N.T.S.
DATE: JULY 2019
DWG. NAME: 1811DET1-PS

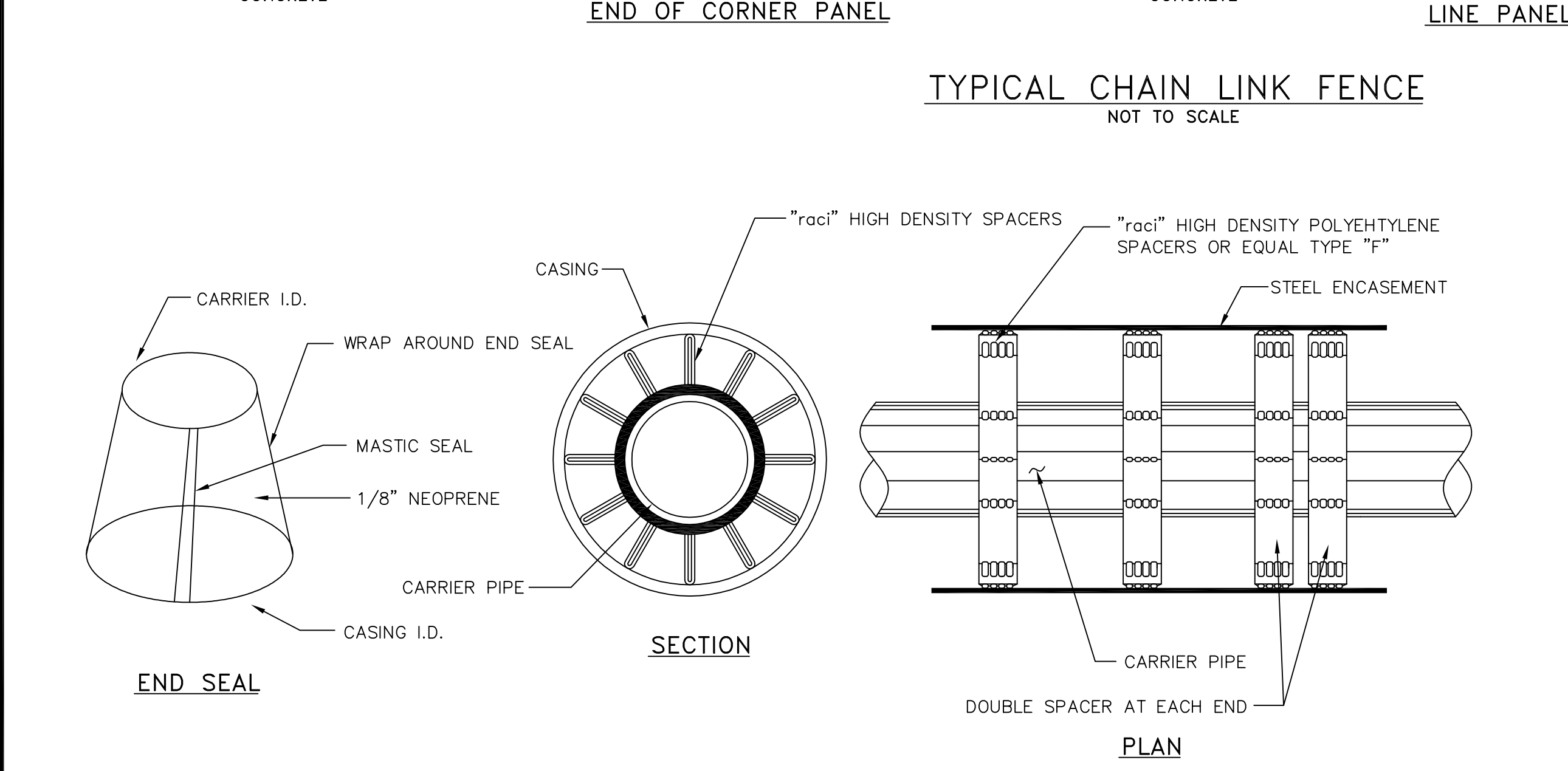
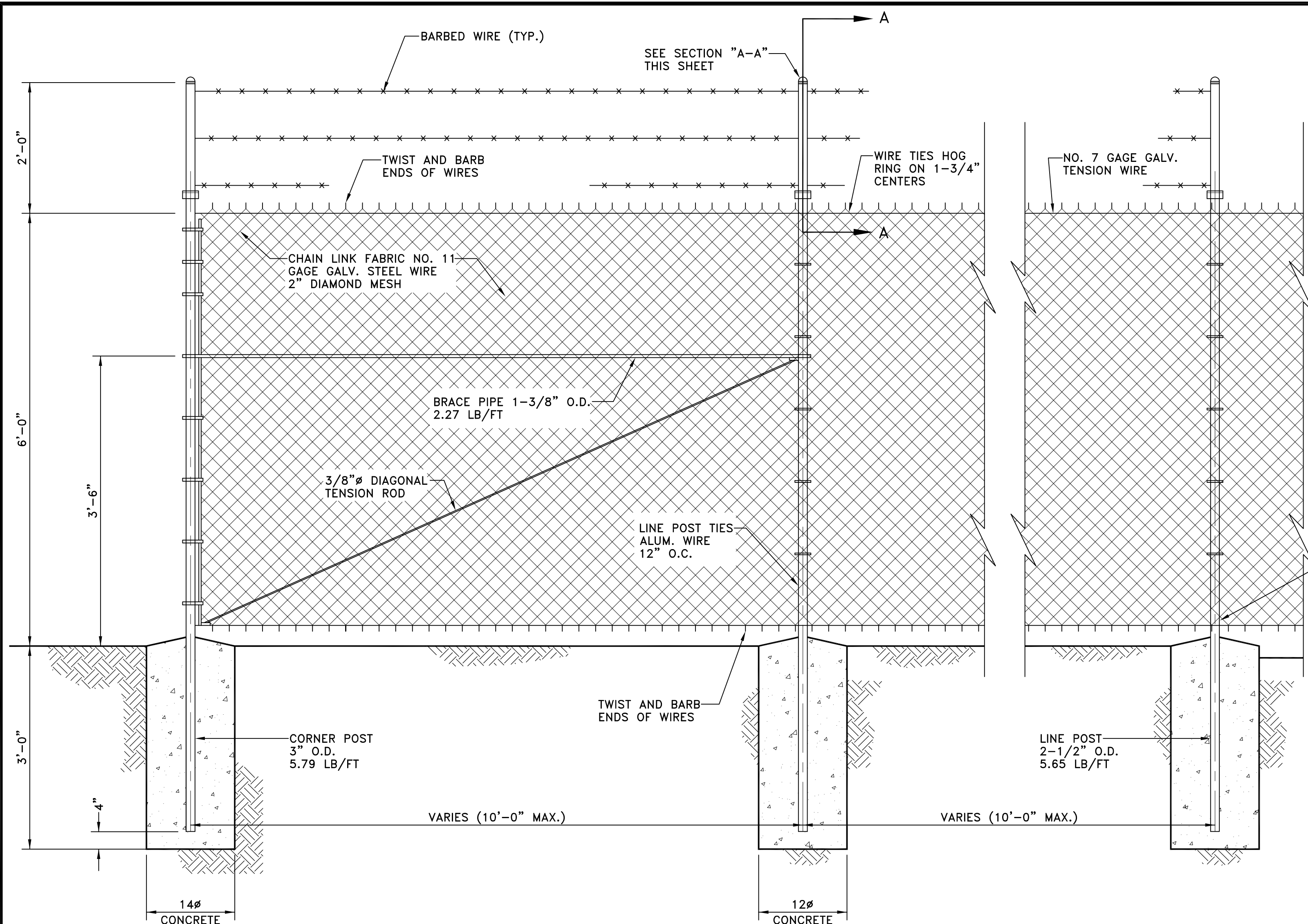


BW2 ENGINEERS, INC.
1919 S. Shiloh Road
Suite 500, L.B. 27
Garland, Texas 75042
(972) 864-8200 (T) (972) 864-8220 (F)
Firm Registration No. F-5290



WATER SYSTEM IMPROVEMENTS
SINGLE PRESSURE PLANE FACILITIES
NORTH PUMP STATION
GENERAL CONSTRUCTION DETAILS - SHEET 1
CITY OF LUCAS

SHEET NO. C14
OF C22 SHEETS
JOB NO. 17-1811



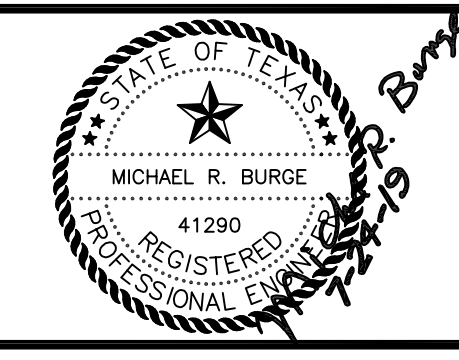
PIPE CASING SPACERS DETAIL
N.T.S.

6			
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NO.	DATE	REVISION	REVIEWED

DRAWN: BW2
 DESIGN: MRB
 REVIEWED: JFW
 SCALE: N.T.S.
 DATE: JULY 2019
 DWG. NAME: 1811DET2-PS



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 1919 S. Shiloh Road
 Suite 500, L.B. 27
 Garland, Texas 75042
 (972) 864-8200 (T) (972) 864-8220 (F)
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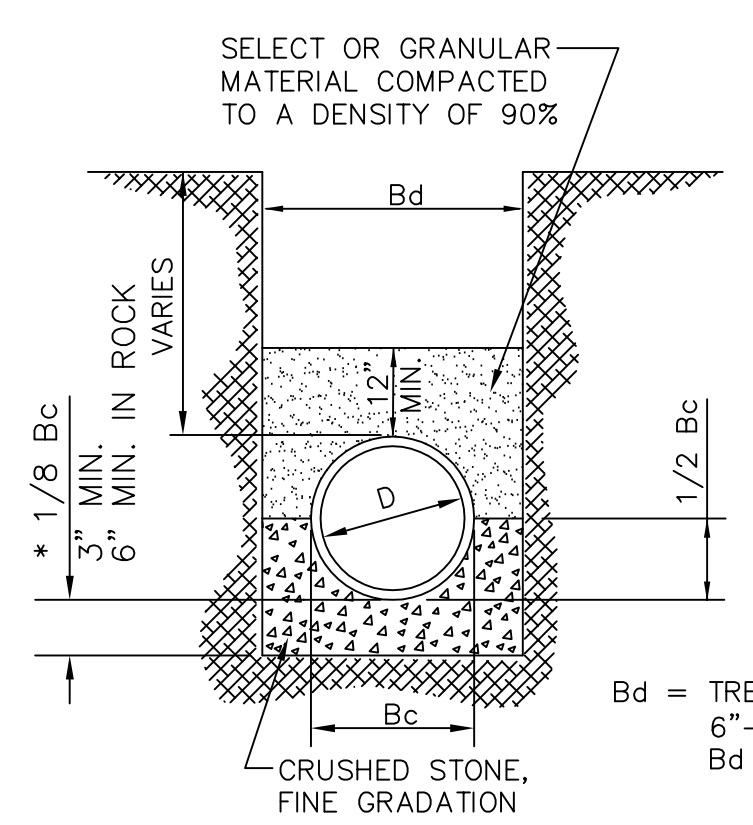
**WATER SYSTEM IMPROVEMENTS
 SINGLE PRESSURE PLANE FACILITIES
 NORTH PUMP STATION
 GENERAL CONSTRUCTION DETAILS - SHEET 2
 CITY OF LUCAS**

SHEET NO. C15
 OF C22 SHEETS
 JOB NO. 17-1811

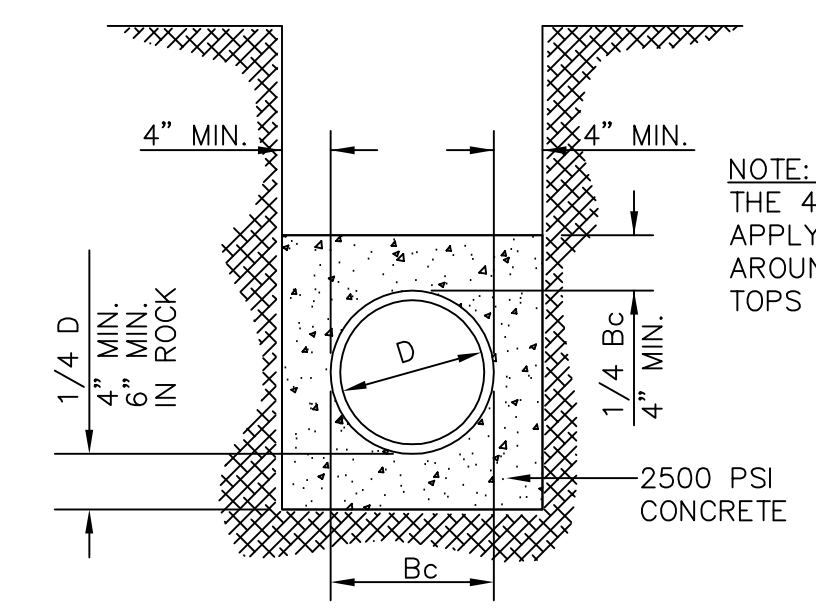
SECTION "A-A"
NOT TO SCALE

NOTE: THE BARBED SECTION AT THE GATE SHALL BE STRAIGHT UP.

CLASS "B+" EMBEDMENT
N.T.S.



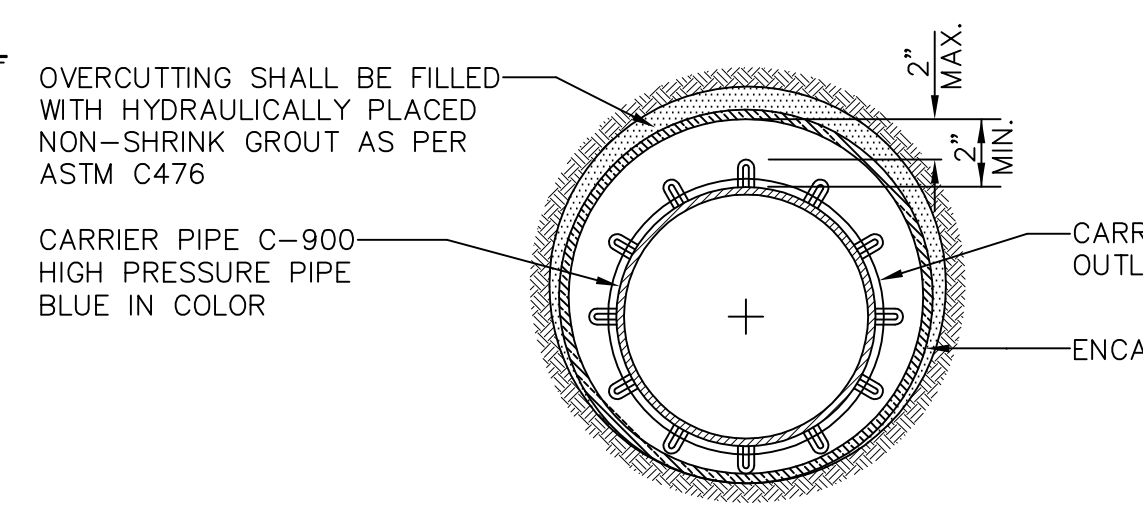
CLASS "G" EMBEDMENT
(CONCRETE ENCASEMENT)
N.T.S.



NOTE: THE 4" MIN. SHALL APPLY TO THICKNESS AROUND PIPE AND OVER TOPS OF BELLS.

TRENCH BACKFILL AND EMBEDMENT NOTES:

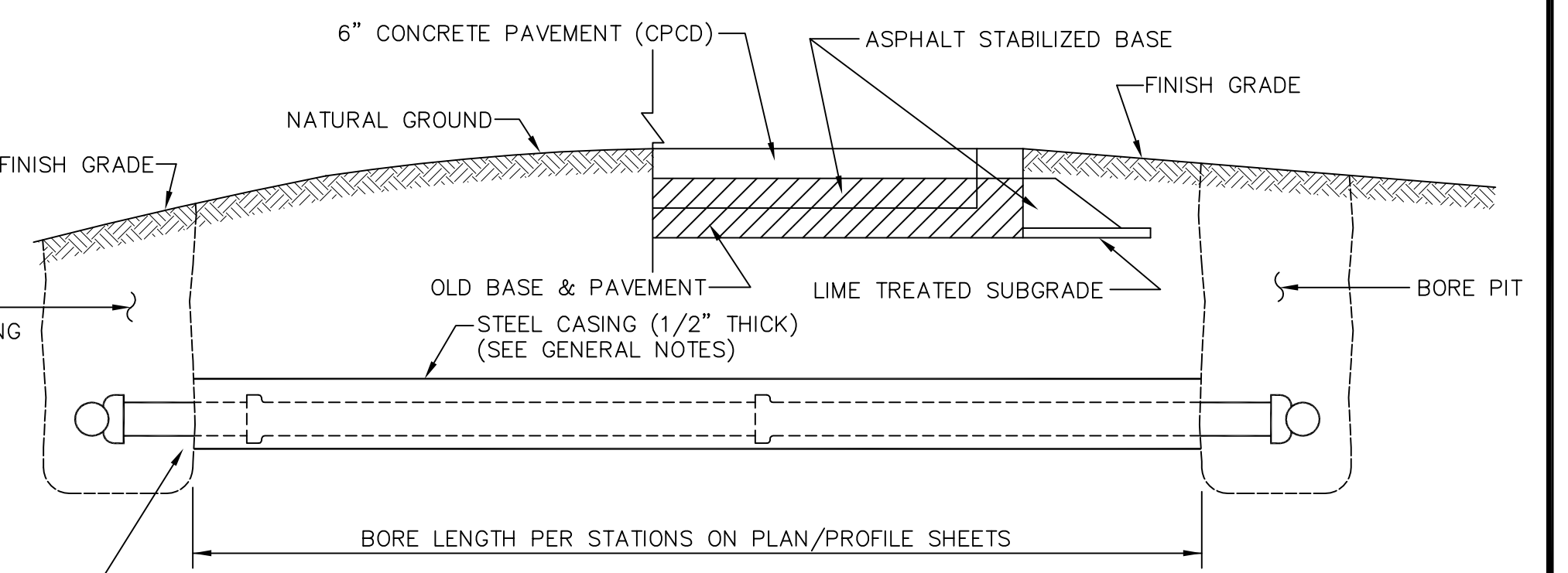
- UNLESS OTHERWISE NOTED, TRENCH BACKFILL AND EMBEDMENT SHALL BE AS SPECIFIED IN NTCOG SPECIFICATION ITEMS 2.1.8, 6.2.9, AND 6.2.10.
- ALL TRENCH BACKFILL SHALL BE COMPACTED TO 95% DENSITY WHEN UNDER PAVEMENT.
- SAND SHALL BE FREE FROM LUMPS, STONES, CLAY AND ORGANIC MATTER. ALL PARTICLES MUST PASS A NO. 8 SIEVE.
- GRANULAR MATERIAL SHALL BE DEFINED AS FREE FLOWING RIVER RUN, SANDY MATERIAL, FREE FROM LARGE STONES, CLAY AND ORGANIC MATERIAL. THE EMBEDMENT MATERIAL WILL NOT BE SUCH THAT WHEN WET, THE FINE MATERIAL FORMS MUD OR MUCK. THE EMBEDMENT MATERIAL SHALL BE COMPOSED OF TOUGH DURABLE PARTICLES, REASONABLY FREE FROM THIN, FLAT AND ELONGATED PIECES, AND OF SUITABLE QUALITY TO INSURE PERMANENCE IN THE TRENCH. THE P.I. OF THE FINES SHALL NOT EXCEED 3. LIGHT WEIGHT AGGREGATE IS NOT ACCEPTABLE FOR GRANULAR EMBEDMENT. STONES LARGER THAN 2" IN DIAMETER ARE NOT ALLOWED.
- STONES LARGER THAN 6" ARE NOT ALLOWED IN THE TRENCH BACKFILL.
- THE TOP 12" (MINIMUM) OF ALL TRENCHES SHALL BE TOPSOIL. STONES LARGER THAN 2" ARE NOT ALLOWED.



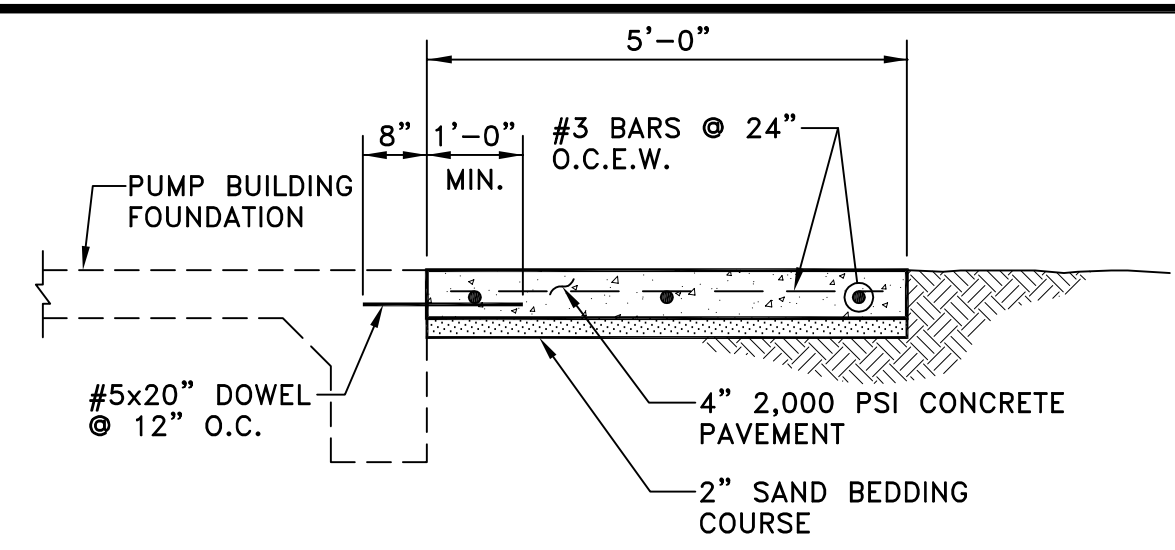
CROSS-SECTION OF BORE WITH STEEL CASING
N.T.S.

GENERAL NOTES:

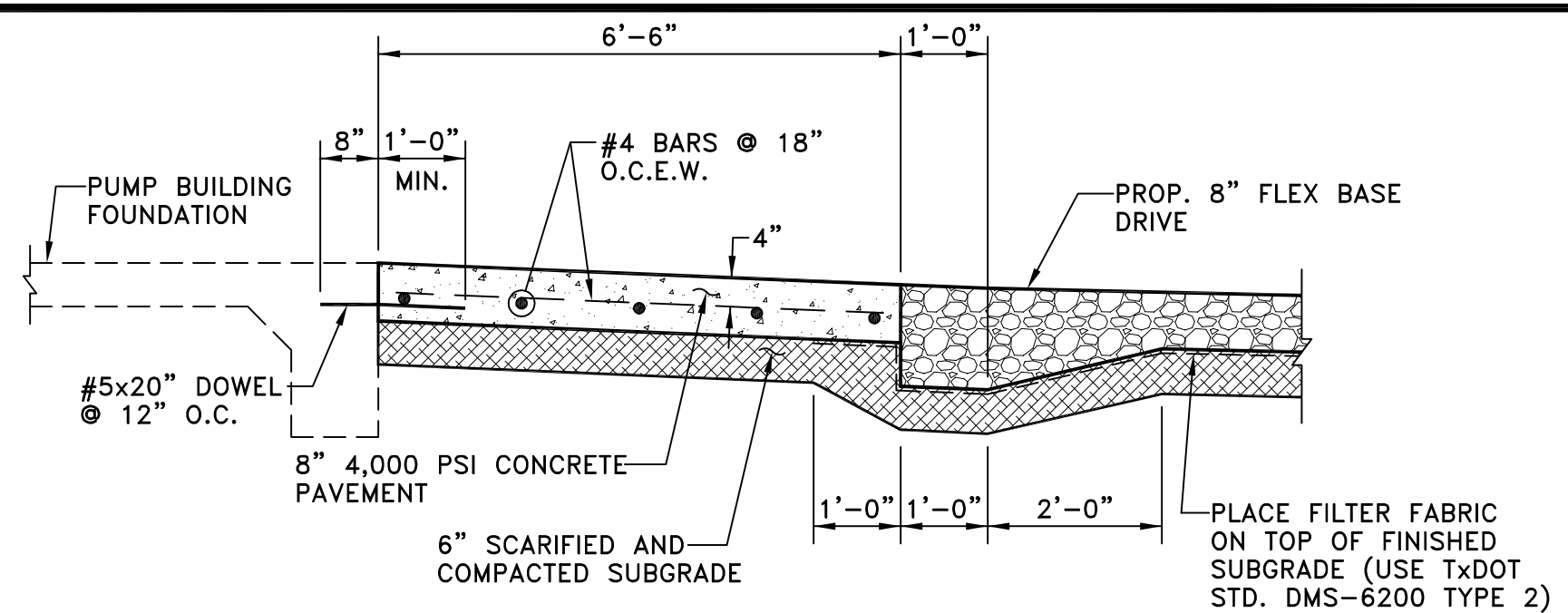
- ALL CONSTRUCTION ACTIVITIES SHALL BE RESTRICTED TO THE EASEMENTS.
- WHERE A BORE/TUNNELING PIT EXCEEDS FIVE (5) FEET IN DEPTH THE CONTRACTOR SHALL INSTALL SHORING OF THE PIT WALLS AS REQUIRED BY TEXAS STATE LAW (HB 662 AND HB 665) REGARDING THE SAFETY SYSTEMS TO BE USED DURING TRENCH EXCAVATION (AS STATED IN THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATIONS STANDARDS).
- ALL BORE/TUNNELING PITS SHALL BE BACKFILLED WITHIN FORTY-EIGHT (48) HOURS OF UTILITY INSTALLATION. NO BORE/TUNNELING PIT SHALL REMAIN OPEN IN EXCESS OF SEVENTY-TWO (72) HOURS WITHOUT SHORING TO PREVENT THE CAVING OF PIT WALLS.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR PHYSICALLY VERIFYING ALL UTILITY CLEARANCES PRIOR TO BEGINNING INSTALLATION.
- CONTRACTOR SHALL REMOVE UNSTABLE MATERIAL FROM THE BOTTOM OF THE BORE PITS ONCE CONSTRUCTION OF THE TUNNEL IS COMPLETE AND CARRIER PIPE HAS BEEN INSTALLED AND SHALL REPLACE THIS UNSTABLE MATERIAL WITH DRY STABLE MATERIAL THAT WILL ADEQUATELY AND SUFFICIENTLY SUPPORT THE PROPOSED PIPELINE.
- CONTRACTOR SHALL INSTALL RACI SPACERS (OR EQUAL) IN ANNULAR SPACE BETWEEN CARRIER PIPE AND CASING PIPE.



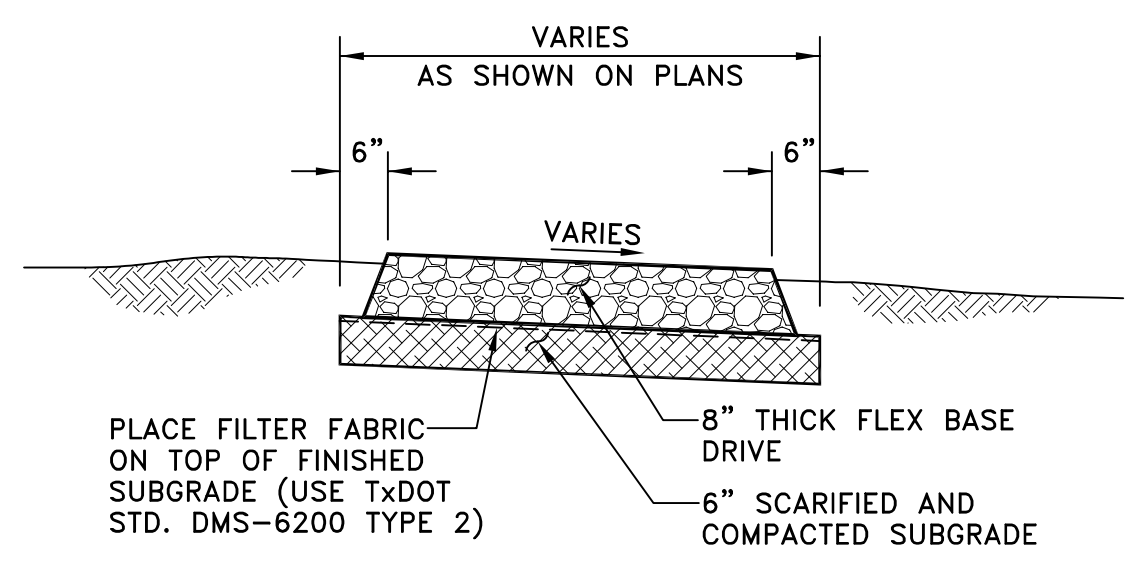
BORING DETAIL
N.T.S.



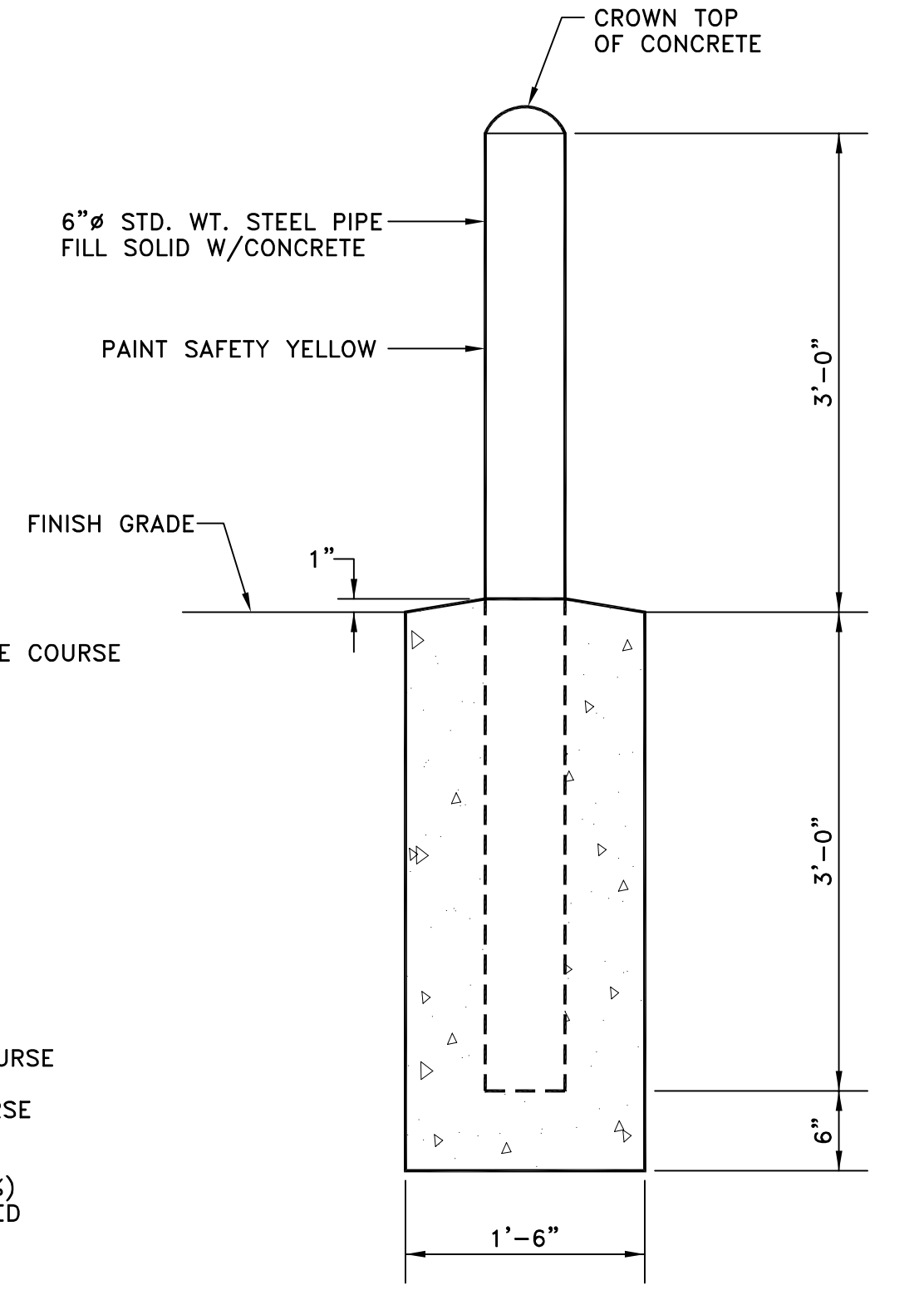
CONCRETE SIDEWALK SECTION
NOT TO SCALE



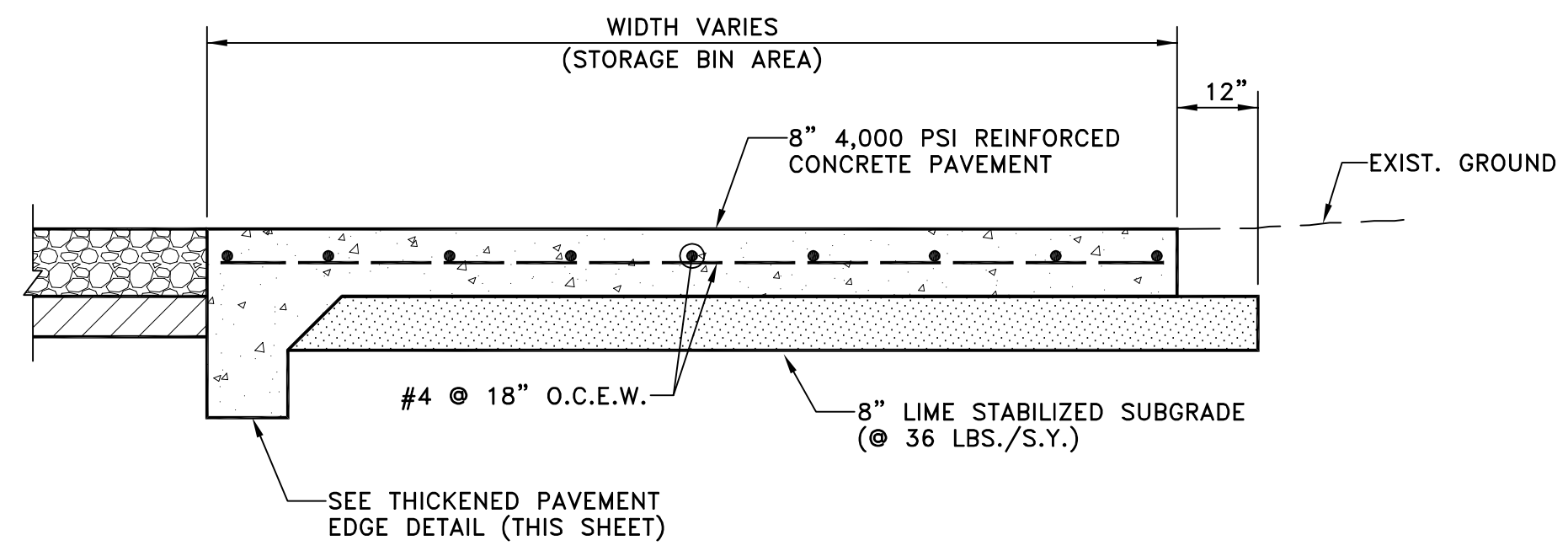
CONCRETE DRIVE SECTION
NOT TO SCALE



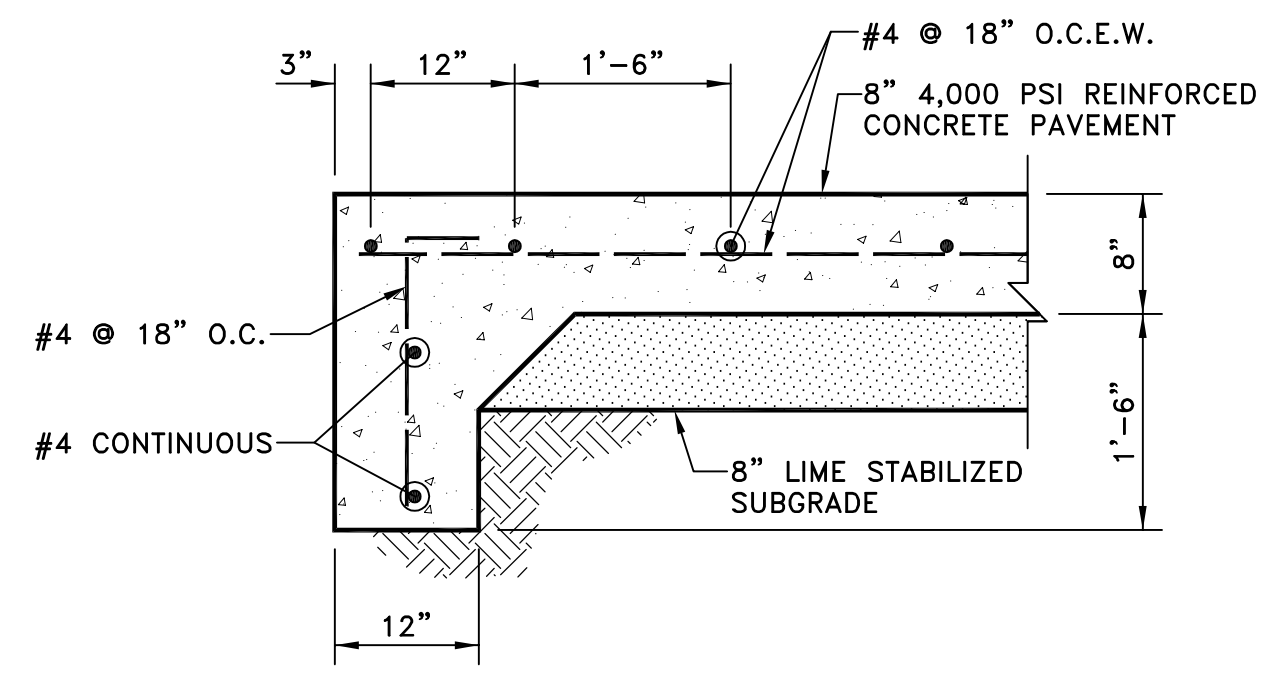
FLEX BASE DRIVE SECTION
NOT TO SCALE



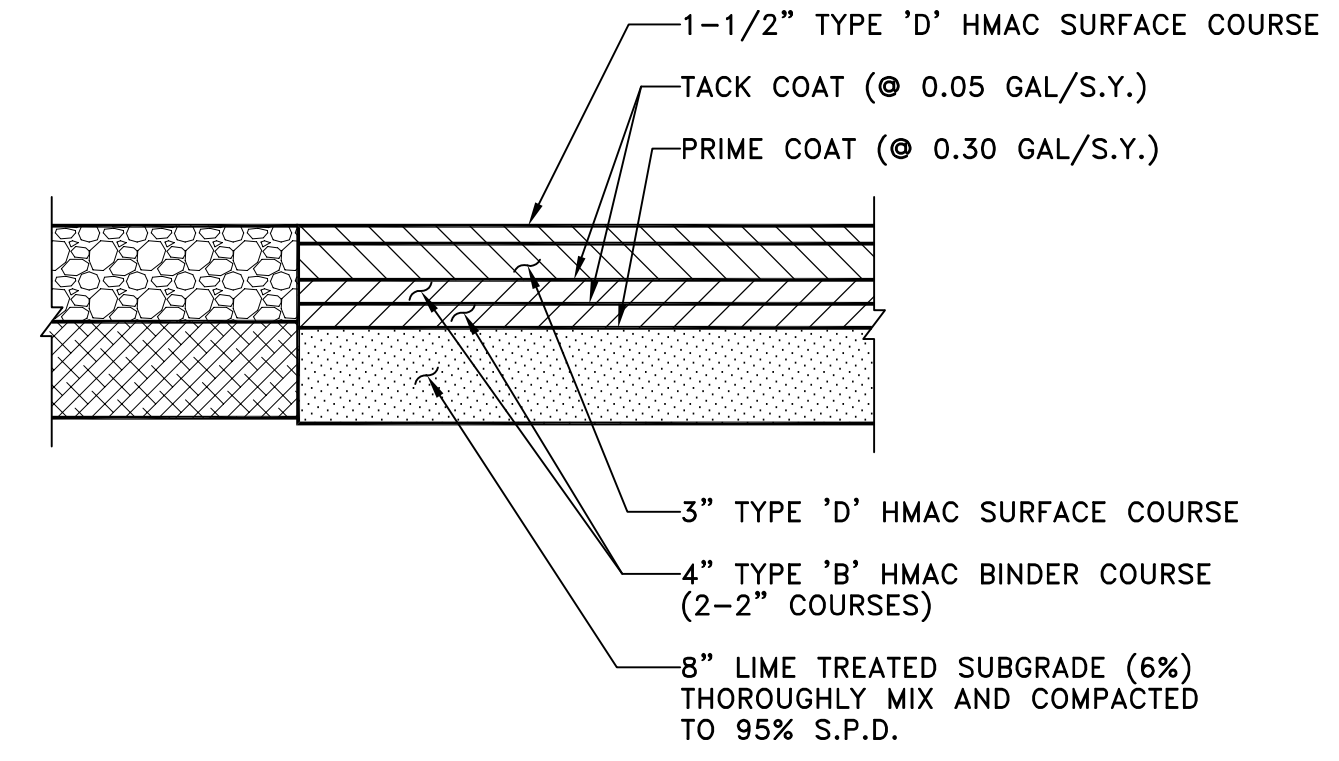
BOLLARD DETAIL
NOT TO SCALE



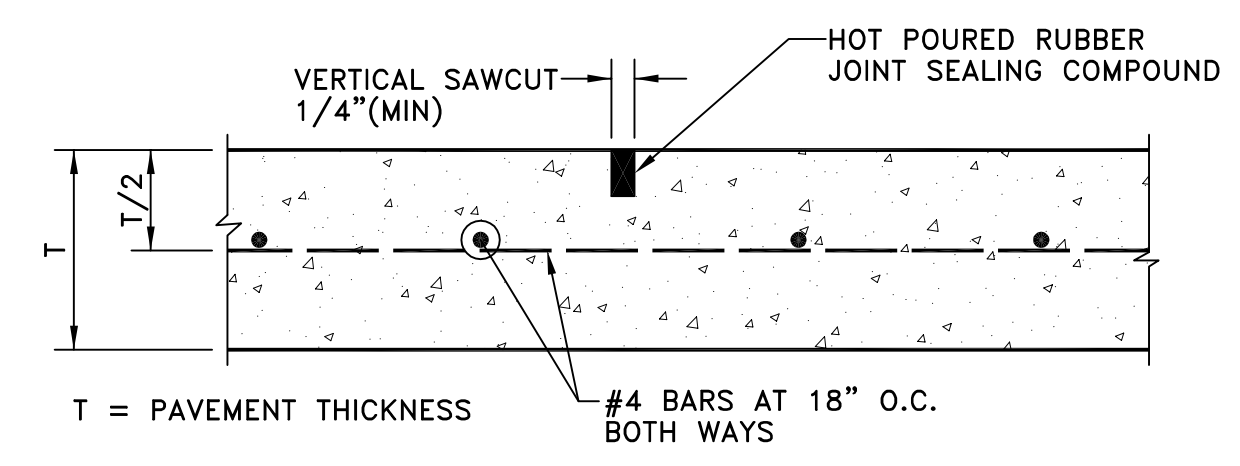
TYPICAL CONCRETE PAVEMENT SECTION
NOT TO SCALE



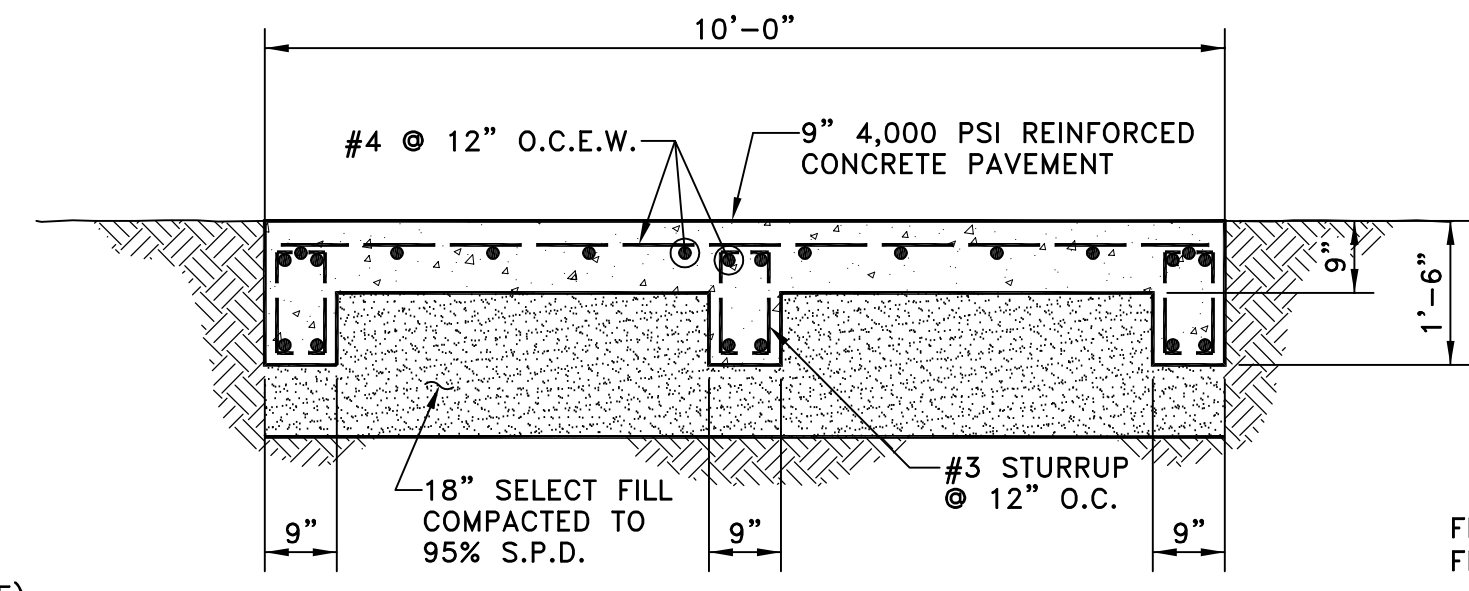
THICKENED PAVEMENT EDGE
NOT TO SCALE



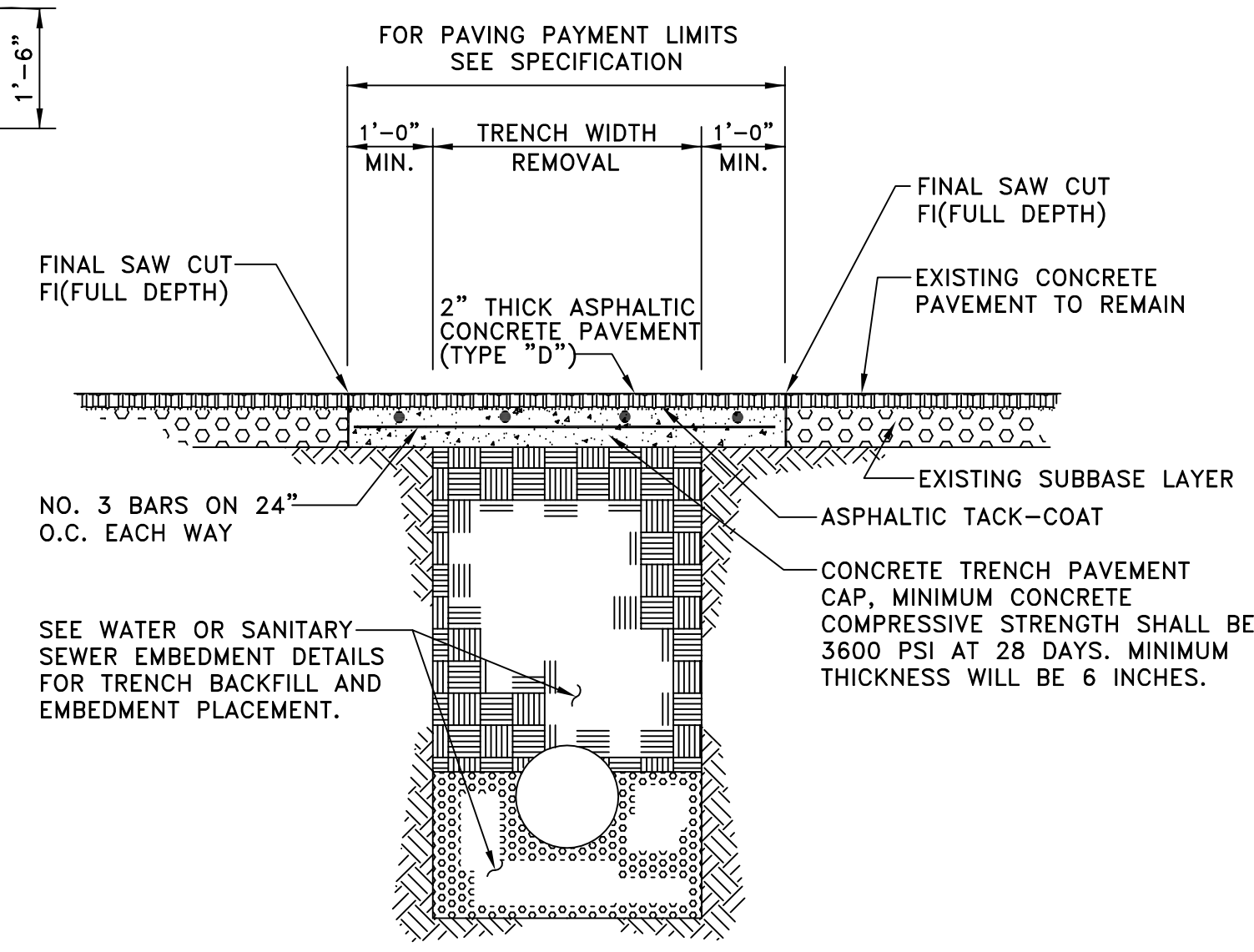
ASPHALT PAVEMENT SECTION
NOT TO SCALE



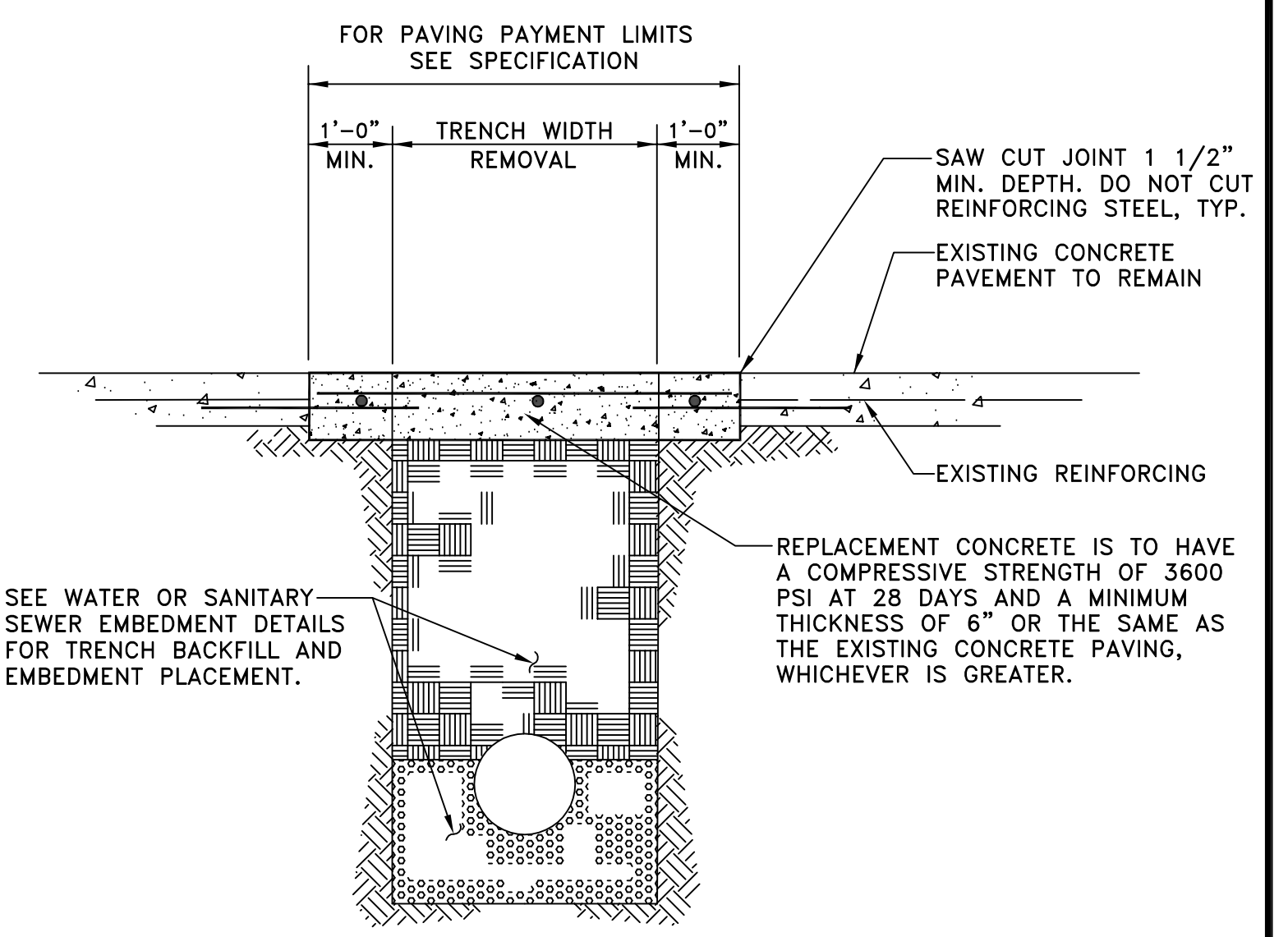
CONTRACTION JOINT
NOT TO SCALE



GENERATOR FOUNDATION
NOT TO SCALE

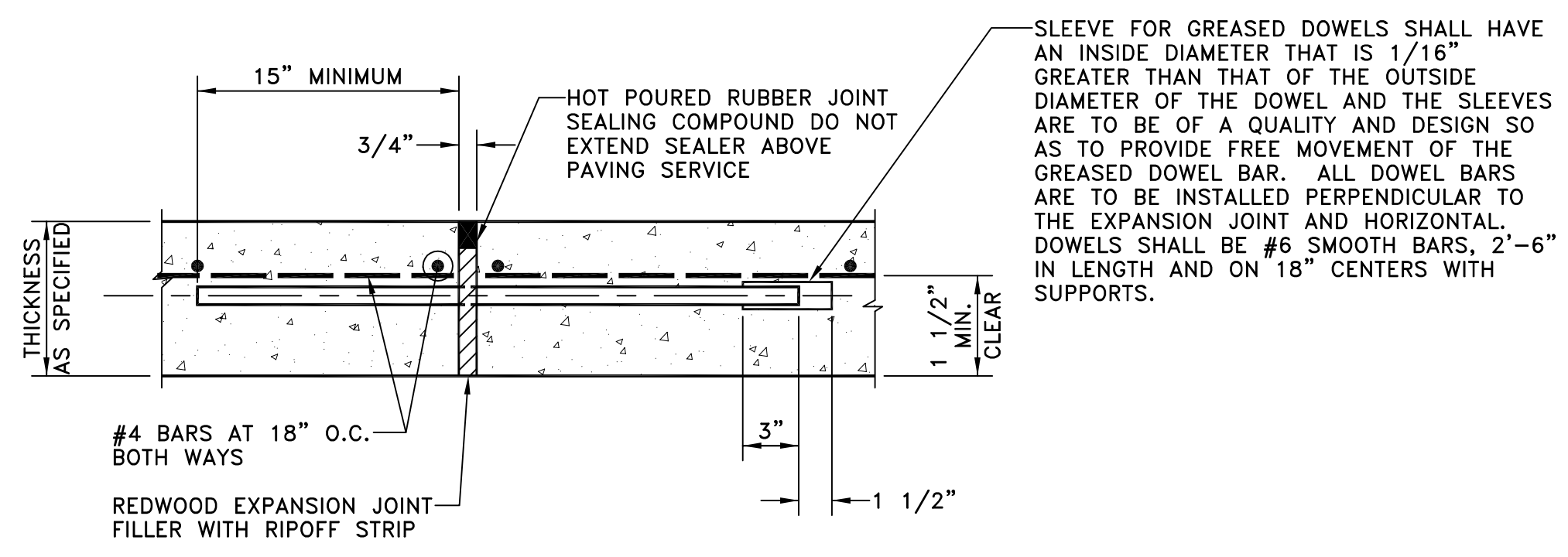


FLEXIBLE BASE AND ASPHALTIC CONCRETE SURFACE



REINFORCED CONCRETE PAVEMENT

- GENERAL NOTES:**
- ALL #4 x 2'-6" BARS ARE TO BE SET IN DRILLED HOLES USING EPOXY GROUT IN THE MANUFACTURER'S RECOMMENDED QUANTITIES.
 - ALL REINFORCING BARS SHALL HAVE WIRE TIES AT EVERY INTERSECTION (100% TIE)
 - WHERE NEW CONCRETE IS TO BE POURED AGAINST OLD CONCRETE, THE OLD CONCRETE SHALL HAVE A COAT OF EPOXY BONDING AGENT APPLIED AT THE MANUFACTURER'S SPECIFIED RATES.
 - MAXIMUM SPACING FOR SAWS TRANSVERSE CONSTRUCTION JOINTS SHALL BE 15'.

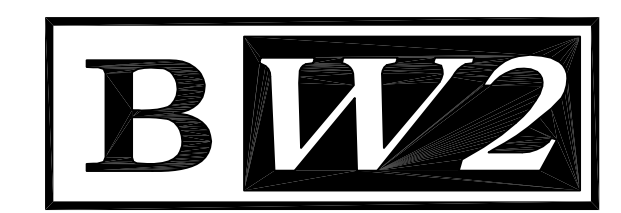


EXPANSION JOINT TYPE "A"
NOT TO SCALE

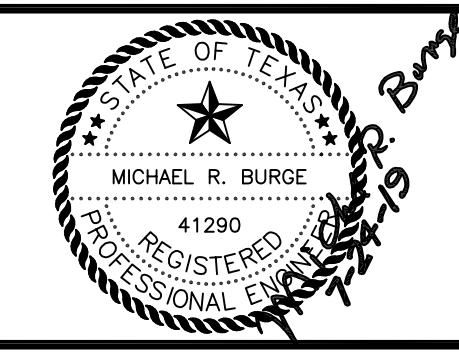
TYPICAL PAVEMENT REPAIR DETAILS
NOT TO SCALE

NO.	DATE	REVISION	REVIEWED
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DRAWN: BW2
 DESIGN: MRB
 REVIEWED: JFW
 SCALE: NOT TO SCALE
 DATE: JULY 2019
 DWG. NAME: 1811DET3-PS

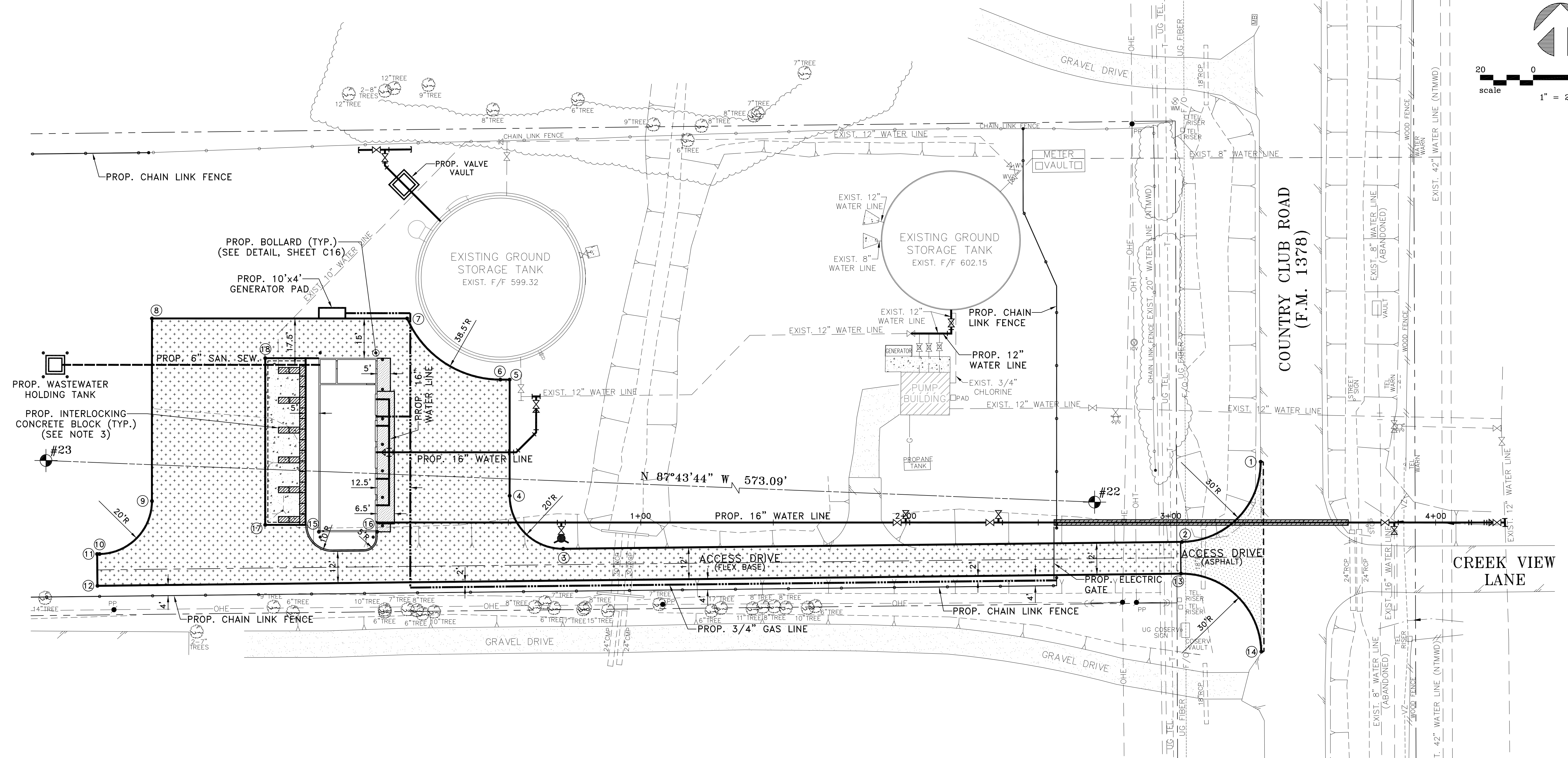
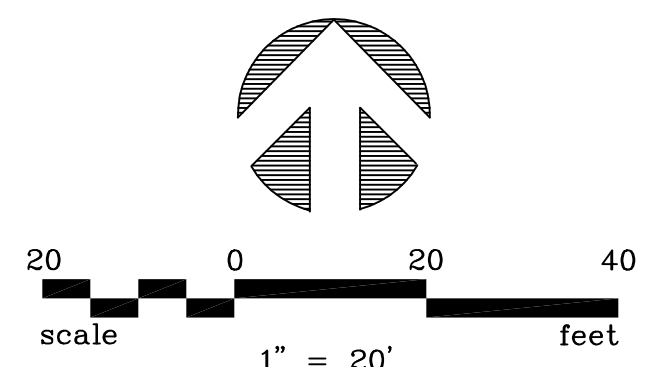


BW2 ENGINEERS, INC.
 1919 S. Shiloh Road
 Suite 500, L.B. 27
 Garland, Texas 75042
 (972) 864-8200 (T) (972) 864-8220 (F)
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WATER SYSTEM IMPROVEMENTS
 SINGLE PRESSURE PLANE FACILITIES
NORTH PUMP STATION
 GENERAL CONSTRUCTION DETAILS - SHEET 3
CITY OF LUCAS

SHEET NO. C16
 OF C22 SHEETS
 JOB NO. 17-1811



HORIZONTAL & VERTICAL CONTROL POINTS (BM's)

NO.	NORTHING(Y)	EASTING(X)	ELEV.(Z)	DESCRIPTION
22	7088175.2210	2552538.5340	602.37	1/2" I.R. W/CAP
23	7088197.9320	2551965.8940	604.61	1/2" I.R. W/CAP

COORDINATE TABLE

NO.	NORTHING(Y)	EASTING(X)
1	7088190.4631	2552601.2143
2	7088160.2253	2552571.5512
3	7088157.6095	2552337.9919
4	7088177.6083	2552317.7680
5	7088221.4428	2552317.7680
6	7088221.4428	2552314.2680
7	7088244.5273	2552279.0775
8	7088244.5273	2552182.7680
9	7088175.6483	2552182.7680
10	7088155.6496	2552162.9919
11	7088155.6393	2552162.0693
12	7088143.6400	2552162.2036
13	7088148.2199	2552571.1299
14	7088118.7861	2552601.4606
15	7088164.0273	2552245.7680
16	7088164.0273	2552267.7680
17	7088166.6533	2552225.5180
18	7088229.5273	2552225.5180

NOTES:

1. PROPOSED 3/4" GAS LINE WILL BE BUILT BY OTHERS TO THE PROPOSED FENCE LINE AND GAS METER WILL BE SET BY OTHERS AT THE FENCE LINE.
2. FENCE SHALL BE FURNISHED AND INSTALLED TO THE BACK SIDE OF CITY'S PROPERTY. EXACT LOCATION TO BE DETERMINED BY THE CITY.
3. THE CONTRACTOR SHALL FURNISH AND INSTALL INTERLOCKING CONCRETE BLOCKS FOR THE STORAGE BINS BEHIND THE NEW PUMP BUILDING. THE CONCRETE BLOCKS SHALL BE 4 FEET LONG, 2 FEET HIGH, AND 2 FEET-3 INCHES THICK. FIVE STORAGE BINS SHALL BE CREATED WITH THE USE OF THE CONCRETE BLOCKS. THE HEIGHT OF THE STORAGE BINS SHALL BE 6 FEET, AND THE DEPTH OF THE STORAGE BINS SHALL BE 8 FEET. ALSO, CONCRETE BLOCKS SHALL BE INSTALLED ALONG THE BACK OF THE STORAGE BINS ON THE EDGE OF THE CONCRETE PAVEMENT A MINIMUM OF 5 FEET FROM THE PUMP BUILDING. THE WALLS ON THE BACK OF THE STORAGE BINS SHALL BE 8 FEET HIGH. FURNISHING AND INSTALLING THE INTERLOCKING CONCRETE BLOCKS SHALL BE INCLUDED IN AN ALTERNATE BID.
4. THE PROPOSED WASTEWATER HOLDING TANK SHALL BE A 300 GALLON, PLASTIC, SEPTIC PUMP TANK BY ACE ROTO-MOLD/DEN-HARTOG (MANUFACTURER'S PART NO. AST-0300-1) OR APPROVED EQUAL.

!! 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.

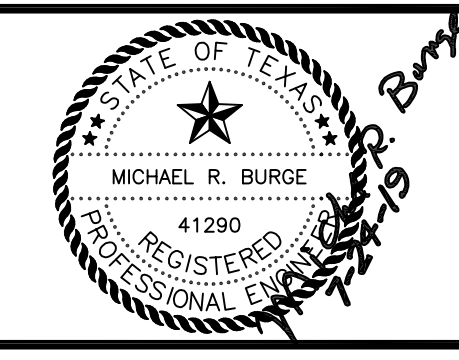
CONTRACTOR SHALL ALSO CONTACT APPROPRIATE CITY UTILITY DEPARTMENT FOR FIELD LOCATES OF MUNICIPAL INFRASTRUCTURE 48 HOURS PRIOR TO CONSTRUCTION.

NO.	DATE	REVISION	REVIEWED
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DRAWN: BW2
 DESIGN: MRB
 REVIEWED: JFW
 SCALE: 1" = 20'
 DATE: JULY 2019
 DWG. NAME: 1811SITEPLAN-PSALT1

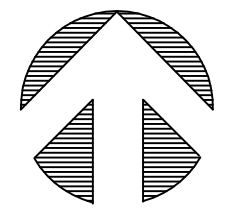


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 Garland, Texas 75042
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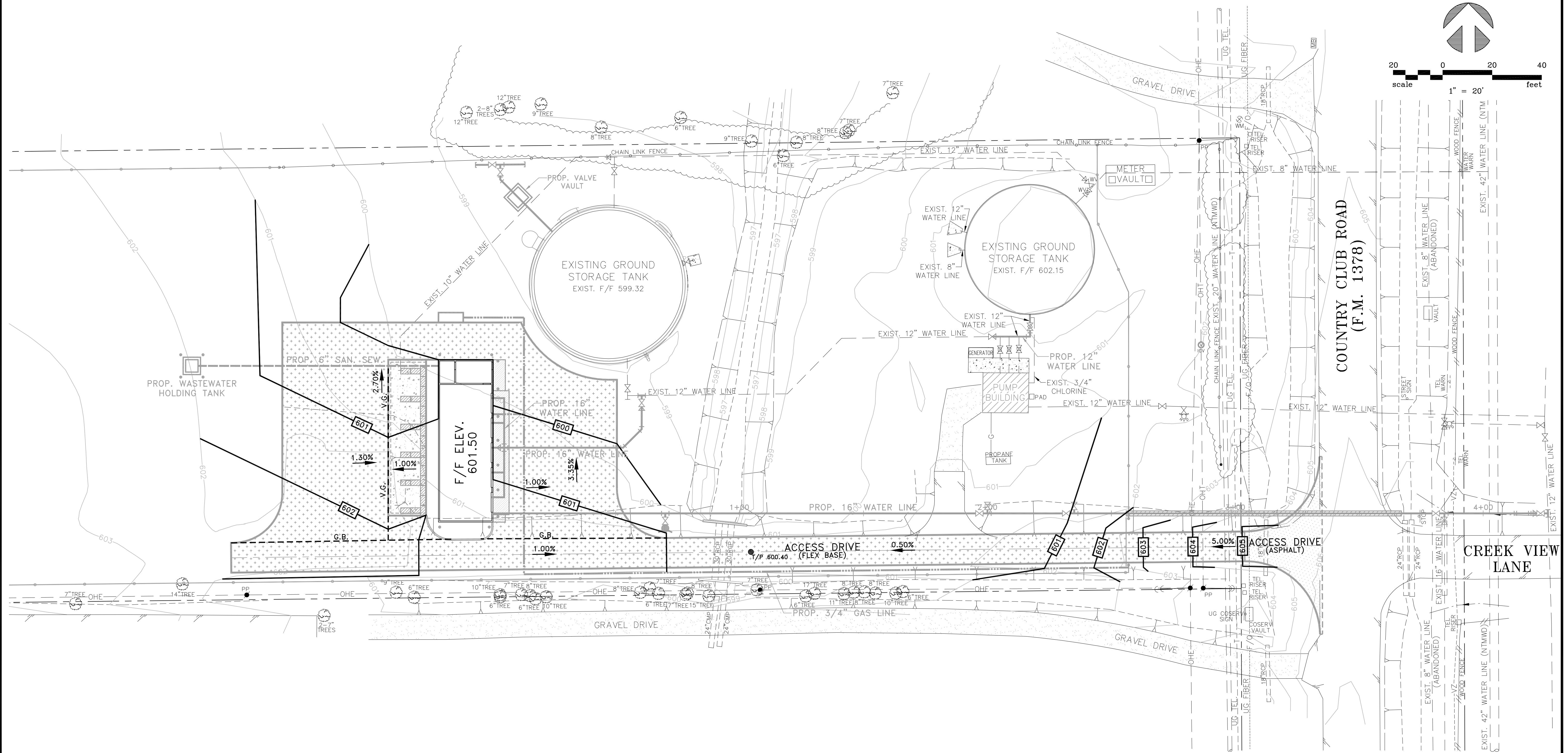


WATER SYSTEM IMPROVEMENTS
 SINGLE PRESSURE PLANE FACILITIES
NORTH PUMP STATION
 SITE PLAN - ALTERNATE BID NO. 1
CITY OF LUCAS

SHEET NO. C17
 OF C22 SHEETS
 JOB NO. 17-1811



20 0 20 40
 scale 1" = 20' feet



LEGEND: (FOR GRADING PLAN)

- 600 — EXISTING CONTOUR
- 600 — PROPOSED CONTOUR
- T/P 600.40 PROPOSED TOP OF PAVEMENT ELEVATION (OR GUTTER ELEVATION)
- G.B. — GRADE BREAK
- V.G. — VALLEY GUTTER
- F/F FINISHED FLOOR

NOTES:

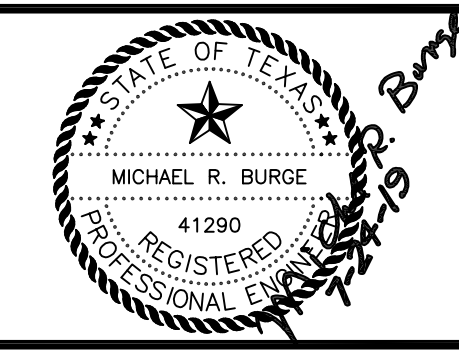
1. SLOPE OF PROPOSED FLEX BASE DRIVE SHALL MATCH EXISTING GROUND SLOPE UNLESS NOTED OTHERWISE WITH SPOT ELEVATIONS ON PLAN VIEW.
2. AFTER EXCAVATION AND CONSTRUCTION OF PROPOSED FLEX BASE DRIVE, BACKFILL REMAINING VOIDS UP TO NEW FLEX BASE DRIVE WITH EXISTING EXCAVATED MATERIALS. HOWEVER, THIS MATERIAL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

NO.	DATE	REVISION	REVIEWED
6			
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DRAWN: BW2
 DESIGN: MRB
 REVIEWED: JFW
 SCALE: 1" = 20'
 DATE: JULY 2019
 DWG. NAME: 1811GRADEPLAN-PSALT1

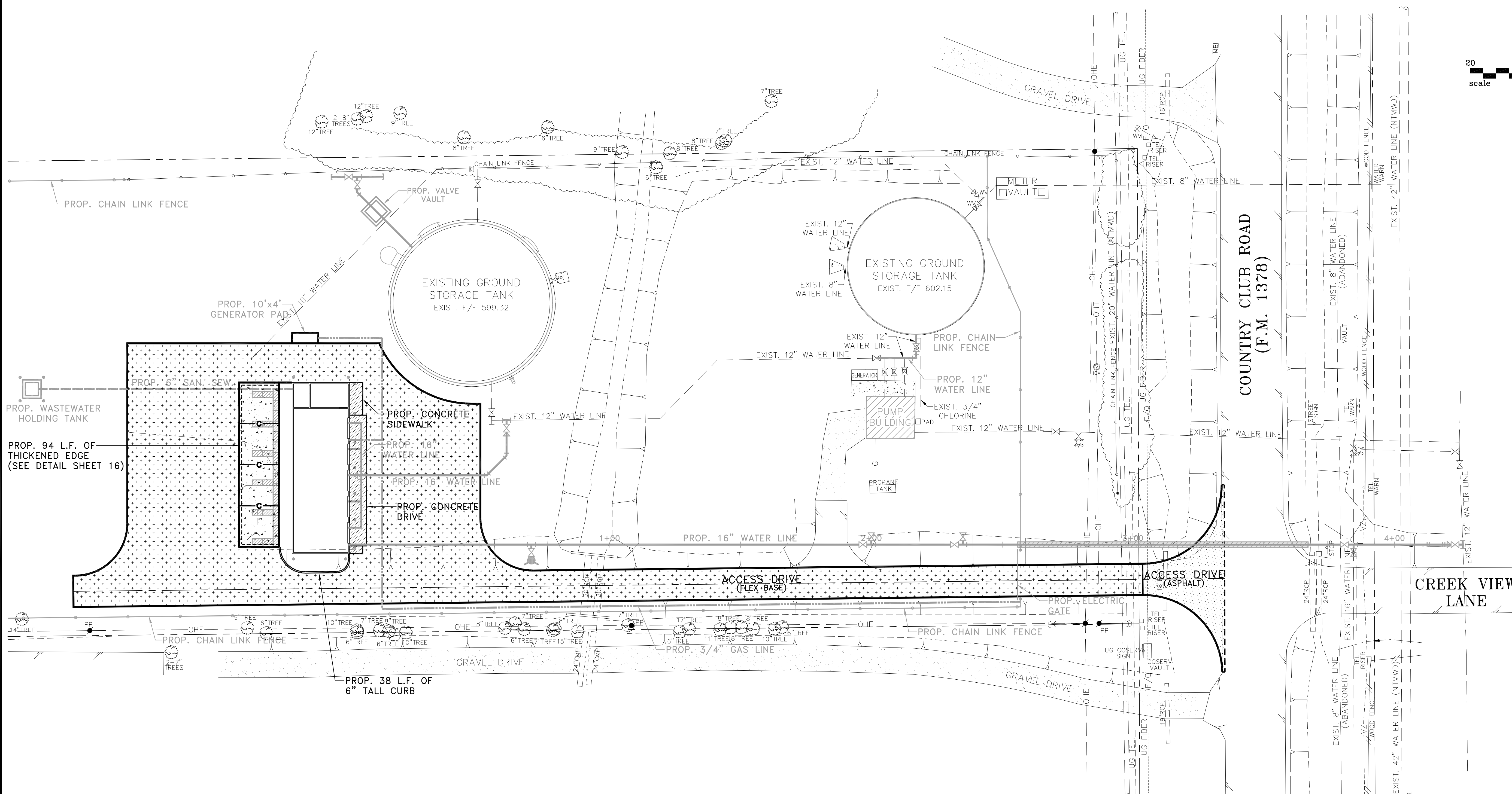
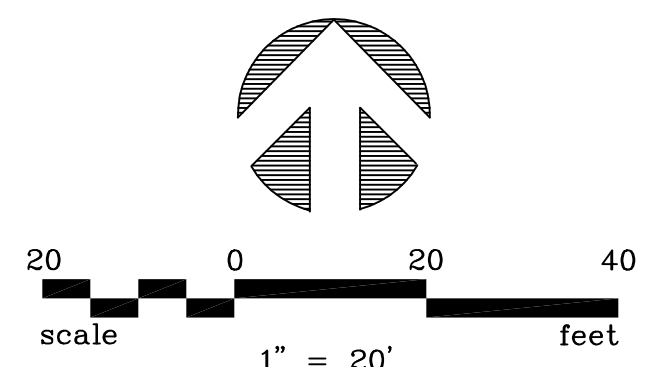


BW2 ENGINEERS, INC.
 1919 S. Shiloh Road
 Suite 500, L.B. 27
 Garland, Texas 75042
 (972) 864-8200 (T) (972) 864-8220 (F)
 Firm Registration No. F-5290



**WATER SYSTEM IMPROVEMENTS
 SINGLE PRESSURE PLANE FACILITIES
 NORTH PUMP STATION
 GRADING PLAN - ALTERNATE BID NO. 1
 CITY OF LUCAS**

SHEET NO. C18
 OF C22 SHEETS
 JOB NO. 17-1811



- LEGEND: (PAVING)**
- 8" THICK TYPE "A" GRADE 1 FLEXIBLE BASE WITH 6" SCARIFIED AND COMPACTED SUBGRADE (SEE DETAIL, SHEET C16)
 - 8" 4,000 PSI REINFORCED CONCRETE PAVEMENT WITH 8" LIME STABILIZED SUBGRADE (SEE DETAIL, SHEET C16)
 - 8 1/2" ASPHALT PAVEMENT APPROACH WITH 6" SCARIFIED AND COMPACTED SUBGRADE (SEE DETAIL, SHEET C16)
 - 8" 4,000 PSI REINFORCED CONCRETE DRIVE WITH 6" SCARIFIED AND COMPACTED SUBGRADE (SEE DETAIL, SHEET C16)
 - SAWED DUMMY JOINT (CONTRACTION JOINT)

NOTE:
 1. ALTERNATE BID NO. 1 INCLUDES REMOVING THE EXISTING ASPHALT DRIVE AND PARKING AREA AND REPLACING IT WITH A NEW ASPHALT APPROACH FROM COUNTRY CLUB ROAD AND A FLEX BASE DRIVE AND PARKING AREA AS SHOWN.

!! 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.

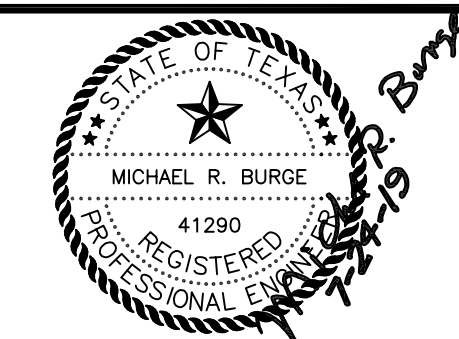
CONTRACTOR SHALL ALSO CONTACT APPROPRIATE CITY UTILITY DEPARTMENT FOR FIELD LOCATES OF MUNICIPAL INFRASTRUCTURE 48 HOURS PRIOR TO CONSTRUCTION.

NO.	DATE	REVISION	REVIEWED
6			
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DRAWN: BW2
 DESIGN: MRB
 REVIEWED: JFW
 SCALE: 1" = 20'
 DATE: JULY 2019
 DWG. NAME: 1811PAVING-PSALT1

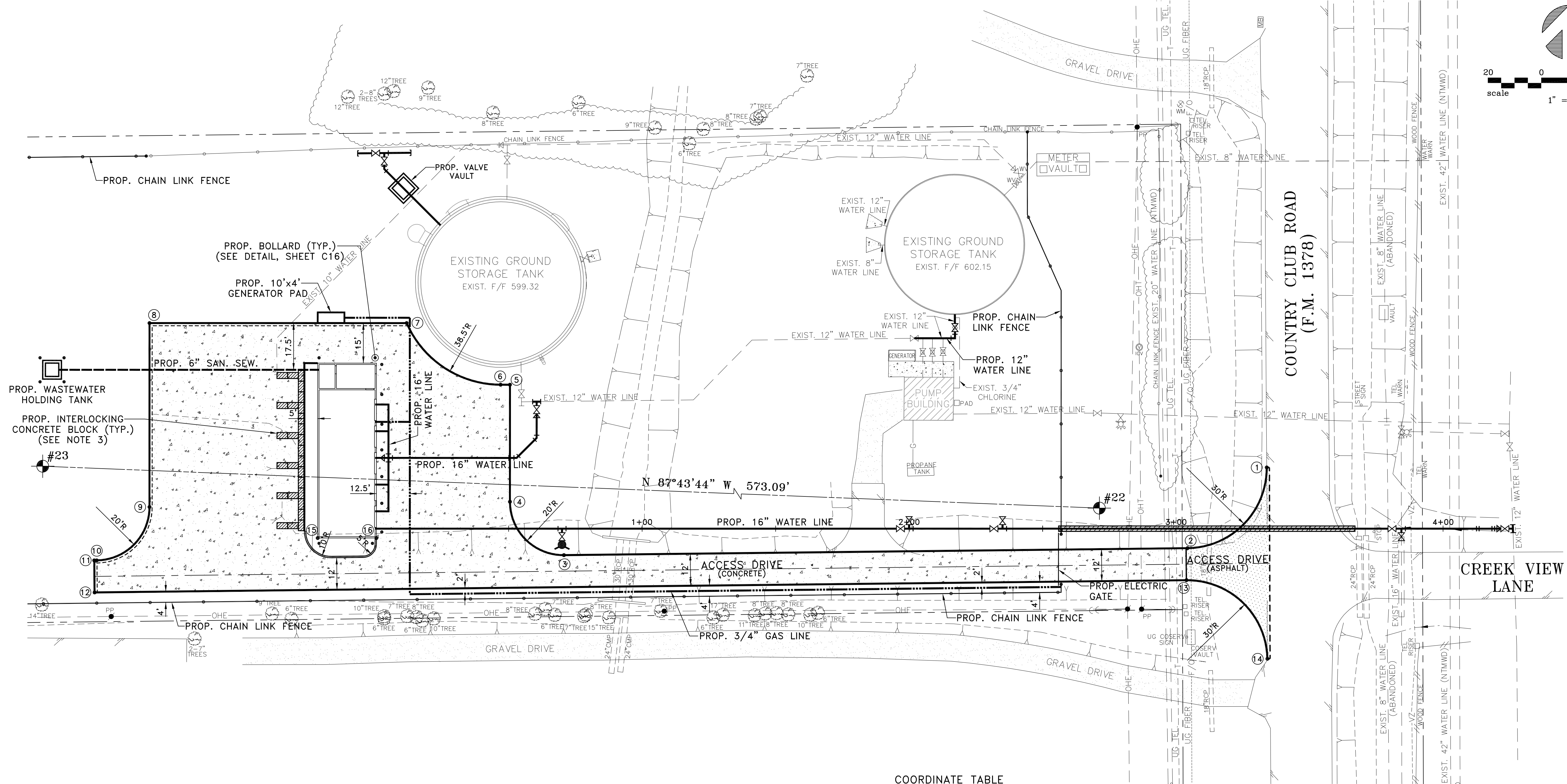
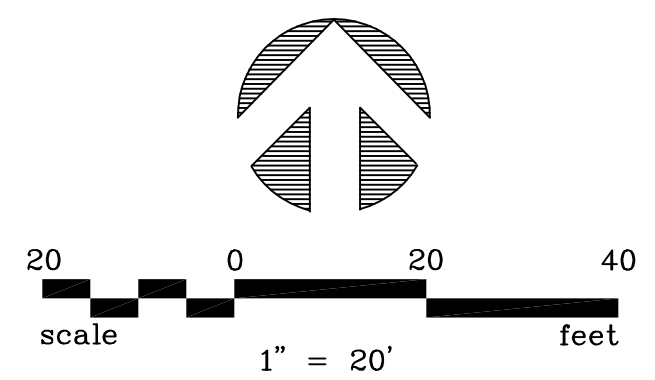


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**WATER SYSTEM IMPROVEMENTS
 SINGLE PRESSURE PLANE FACILITIES
 NORTH PUMP STATION
 PAVING PLAN - ALTERNATE BID NO. 1
 CITY OF LUCAS**

SHEET NO. C19
 OF C22 SHEETS
 JOB NO. 17-1811



COORDINATE TABLE

NO.	NORTHING(Y)	EASTING(X)
1	7088190.4631	2552601.2143
2	7088160.2253	2552571.5512
3	7088157.6095	2552337.9919
4	7088177.6083	2552317.7680
5	7088221.4428	2552317.7680
6	7088221.4428	2552314.2680
7	7088244.5273	2552279.0775
8	7088244.5273	2552182.7680
9	7088175.6483	2552182.7680
10	7088155.6496	2552162.9919
11	7088155.6393	2552162.0693
12	7088143.6400	2552162.2036
13	7088148.2199	2552571.1299
14	7088118.7861	2552601.4606
15	7088164.0273	2552245.7680
16	7088164.0273	2552267.7680

HORIZONTAL & VERTICAL CONTROL POINTS (BM's)

NO.	NORTHING(Y)	EASTING(X)	ELEV.(Z)	DESCRIPTION
22	7088175.2210	2552538.5340	602.37	1/2" I.R. W/CAP
23	7088197.9320	2551965.8940	604.61	1/2" I.R. W/CAP

NOTES:

1. PROPOSED 3/4" GAS LINE WILL BE BUILT BY OTHERS TO THE PROPOSED FENCE LINE AND GAS METER WILL BE SET BY OTHERS AT THE FENCE LINE.
2. FENCE SHALL BE FURNISHED AND INSTALLED TO THE BACK SIDE OF CITY'S PROPERTY. EXACT LOCATION TO BE DETERMINED BY THE CITY.
3. THE CONTRACTOR SHALL FURNISH AND INSTALL INTERLOCKING CONCRETE BLOCKS FOR THE STORAGE BINS BEHIND THE NEW PUMP BUILDING. THE CONCRETE BLOCKS SHALL BE 4 FEET LONG, 2 FEET HIGH, AND 2 FEET-3 INCHES THICK. FIVE STORAGE BINS SHALL BE CREATED WITH THE USE OF THE CONCRETE BLOCKS. THE HEIGHT OF THE STORAGE BINS SHALL BE 6 FEET, AND THE DEPTH OF THE STORAGE BINS SHALL BE 8 FEET. ALSO, CONCRETE BLOCKS SHALL BE INSTALLED ALONG THE BACK OF THE STORAGE BINS ON THE EDGE OF THE CONCRETE PAVEMENT A MINIMUM OF 5 FEET FROM THE PUMP BUILDING. THE WALLS ON THE BACK OF THE STORAGE BINS SHALL BE 8 FEET HIGH. FURNISHING AND INSTALLING THE INTERLOCKING CONCRETE BLOCKS SHALL BE INCLUDED IN AN ALTERNATE BID.
4. THE PROPOSED WASTEWATER HOLDING TANK SHALL BE A 300 GALLON, PLASTIC, SEPTIC PUMP TANK BY ACE ROTO-MOLD/DEN-HARTOG (MANUFACTURER'S PART NO. AST-0300-1) OR APPROVED EQUAL.

!! CAUTION !!

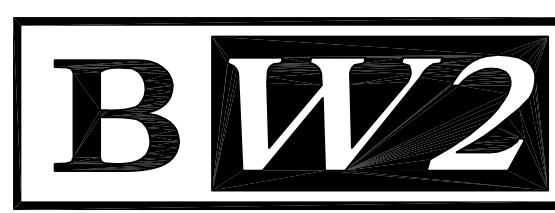
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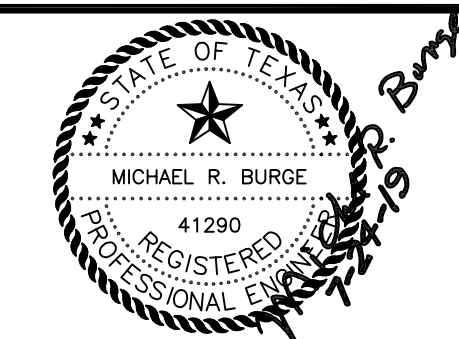
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NO.	DATE	REVISION	REVIEWED
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DRAWN: BW2
 DESIGN: MRB
 REVIEWED: JFW
 SCALE: 1" = 20'
 DATE: JULY 2019
 DWG. NAME: 1811SITEPLAN-PSALT2

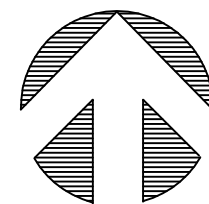


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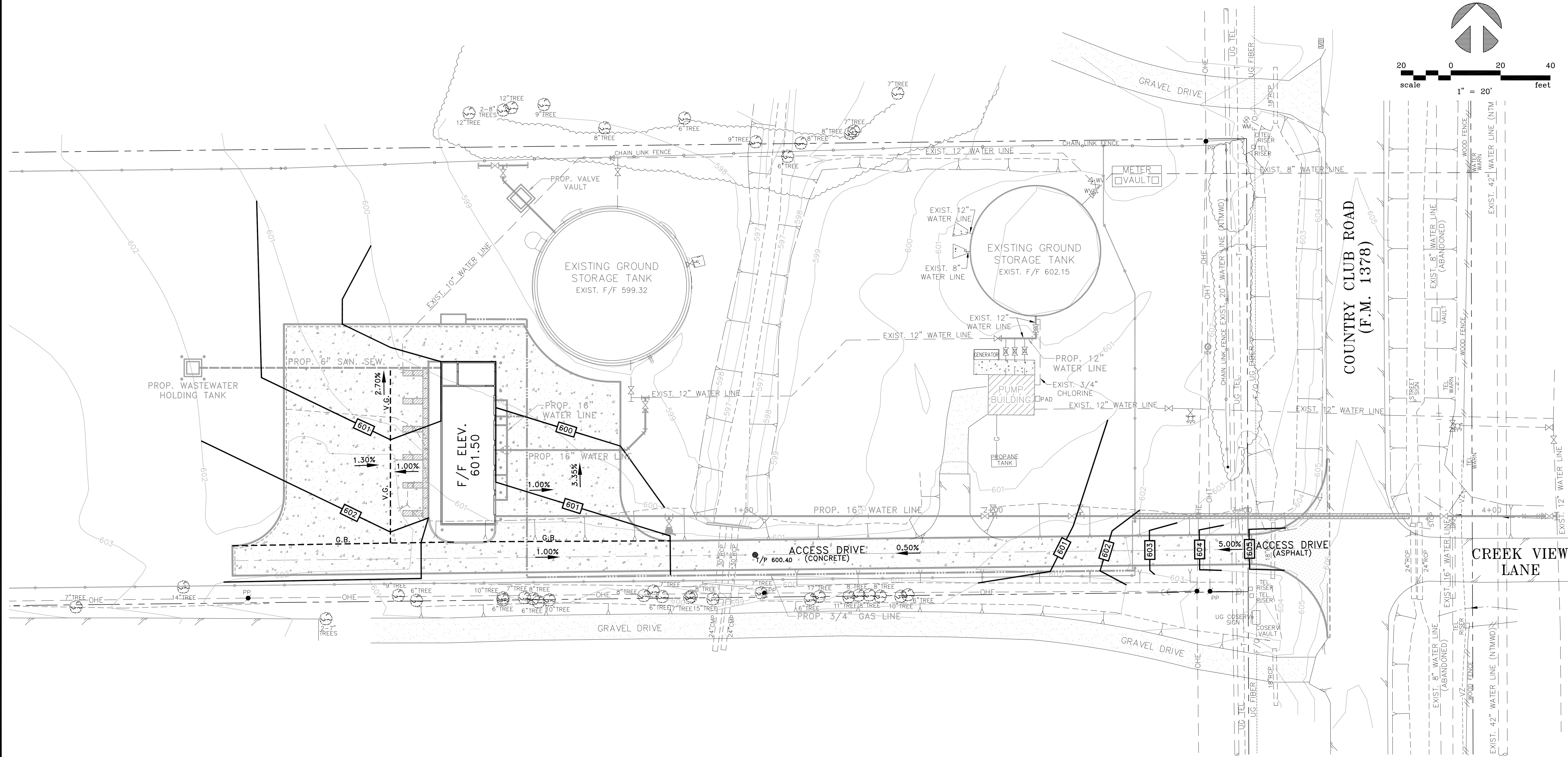


WATER SYSTEM IMPROVEMENTS
 SINGLE PRESSURE PLANE FACILITIES
NORTH PUMP STATION
 SITE PLAN - ALTERNATE BID NO. 2
CITY OF LUCAS

SHEET NO. C20
 OF C22 SHEETS
 JOB NO. 17-1811



20 0 20 40
 scale 1" = 20' feet



LEGEND: (FOR GRADING PLAN)

- 600 --- EXISTING CONTOUR
- 600 — PROPOSED CONTOUR
- T/P 600.40 PROPOSED TOP OF PAVEMENT ELEVATION (OR GUTTER ELEVATION)
- G.B. --- GRADE BREAK
- V.G. --- VALLEY GUTTER
- F/F FINISHED FLOOR

NOTES:

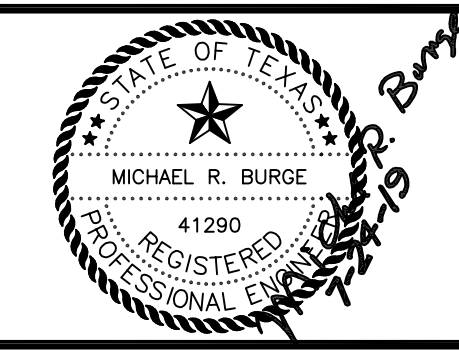
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DRAWN: BW2
 DESIGN: MRB
 REVIEWED: JFW
 SCALE: 1" = 20'
 DATE: JULY 2019
 DWG. NAME: 1811GRADEPLAN-PSALT2

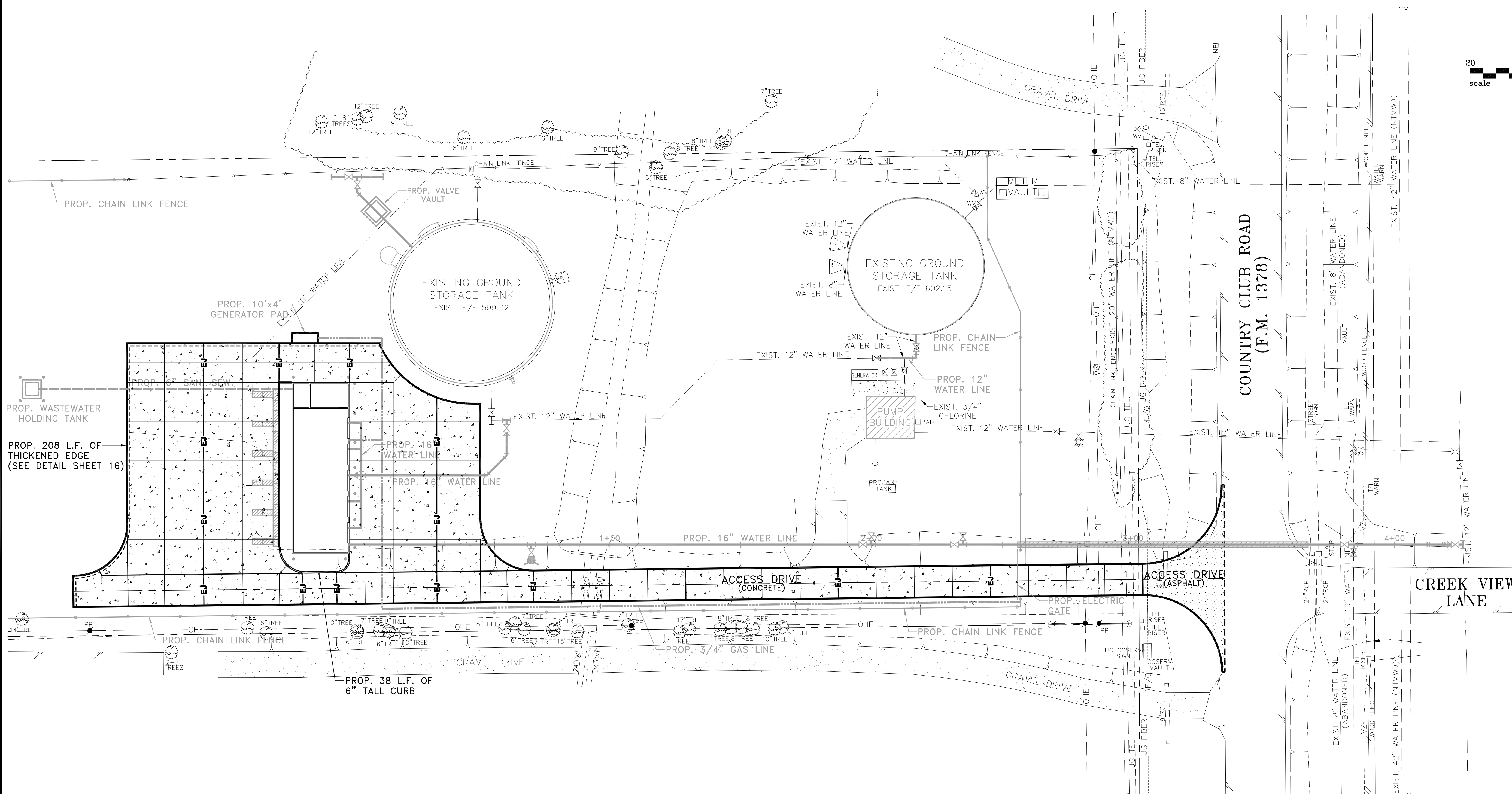
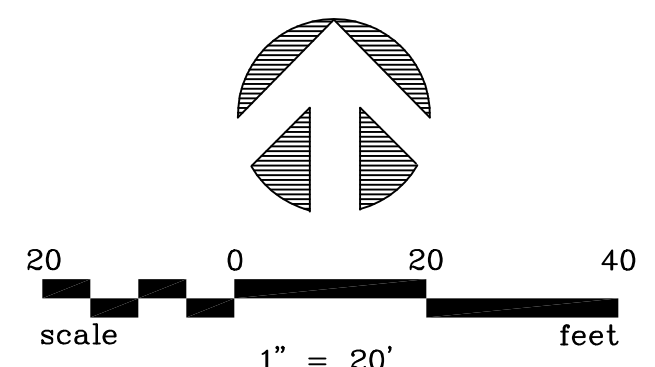


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**WATER SYSTEM IMPROVEMENTS
 SINGLE PRESSURE PLANE FACILITIES
 NORTH PUMP STATION
 GRADING PLAN - ALTERNATE BID NO. 2
 CITY OF LUCAS**

SHEET NO. C21
 OF C22 SHEETS
 JOB NO. 17-1811



LEGEND: (PAVING)

- 8" 4,000 PSI REINFORCED CONCRETE PAVEMENT WITH 8" LIME STABILIZED SUBGRADE (SEE DETAIL, SHEET C16)
- 8 1/2" ASPHALT PAVEMENT APPROACH WITH 6" SCARIFIED AND COMPACTED SUBGRADE (SEE DETAIL, SHEET C16)
- SAWED DUMMY JOINT (CONTRACTION JOINT)
- EXPANSION JOINT

NOTE:
 1. ALTERNATE BID NO. 2 INCLUDES REMOVING THE EXISTING ASPHALT DRIVE AND PARKING AREA AND REPLACING IT WITH A NEW ASPHALT APPROACH FROM COUNTRY CLUB ROAD AND A CONCRETE DRIVE AND PARKING AREA AS SHOWN.

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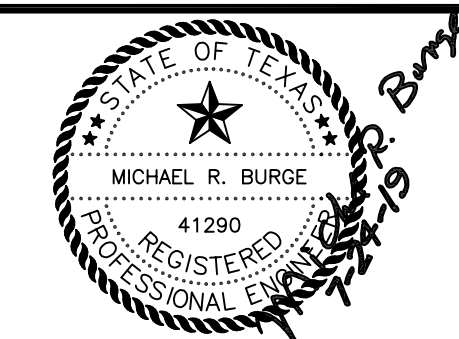
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1			
NO.	DATE	REVISION	REVIEWED

DRAWN: BW2
 DESIGN: MRB
 REVIEWED: JFW
 SCALE: 1" = 20'
 DATE: JULY 2019
 DWG. NAME: 1811PAVING-PSALT2



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**WATER SYSTEM IMPROVEMENTS
 SINGLE PRESSURE PLANE FACILITIES
 NORTH PUMP STATION
 PAVING PLAN - ALTERNATE BID NO. 2
 CITY OF LUCAS**

SHEET NO. C22
 OF C22 SHEETS
 JOB NO. 17-1811

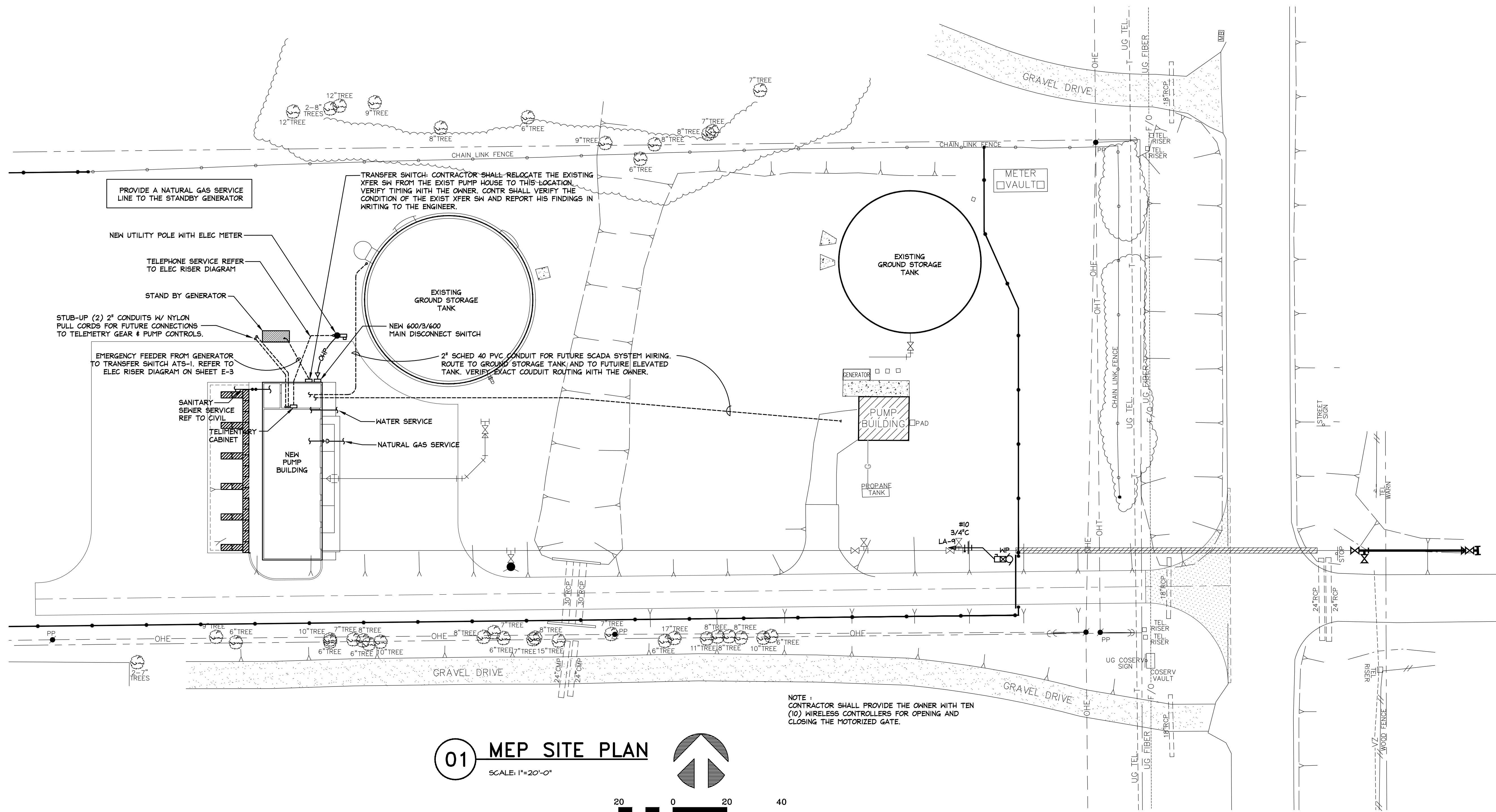
ELECTRICAL SYMBOLS	
	RECESSED OR SURFACE, TYPE 'A' DOWNLIGHT FIXTURE ON CIRCUIT #3.
	RECESSED OR SURFACE, TYPE 'A' LIGHTING TROFFER FIXTURE ON CIRCUIT #3.
	WALL MOUNTED OR BRACKET MOUNTED LIGHTING FIXTURE.
	RECESSED OR SURFACE, TYPE 'A' WALL WASHER FIXTURE ON CIRCUIT #3.
	HATCHED FIXTURE INDICATING A 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, GROUNDED.
	DUPLEX RECEPTACLE, 20A, 125V, ISOLATED GROUND.
	DUPLEX RECEPTACLE, 20A, 125V, GROUND, HALF SWITCHED.
	SIMPLEX RECEPTACLE, 20A (U.N.O.), 125V, GROUNDED.
	POWER RECEPTACLE, 2 POLE, 250V SINGLE PHASE. AMPS GREATER THAN 20A TO BE NOTED.
	QUADPLEX RECEPTACLE, 20A, 125V, GROUNDED.
	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.	

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 4-WAY DIRECTIONAL THRU UNLESS INDICATED OTHERWISE.	
	SQUARE NECK 4-WAY DIRECTIONAL THRU UNLESS INDICATED OTHERWISE.	
	SIDEWALL SUPPLY GRILLE OR REGISTER WITH O.B.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 (CLASS II MIN.)	
	THERMOSTAT OR TEMPERATURE SENSOR	
	ROOM HUMIDISTAT / CARBON DIOXIDE SENSORS	
NOTE: NOT ALL SYMBOLS SHOWN ARE NECESSARILY USED.		

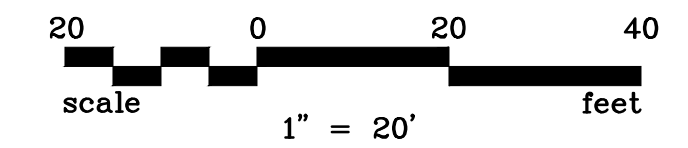
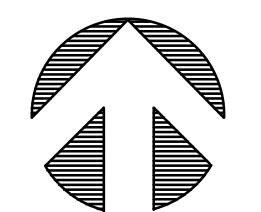
MEP ABBREVIATIONS	
ABV.	ABOVE
AC	ALTERNATING CURRENT
AVC	AIR CONDITIONER
AFG	ABOVE FINISHED CEILING
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AG	ABOVE GRADE AND GFI AS HIGH AS POSSIBLE
AAAP	AIR HANDLING UNIT
AHU	AIR HANDLING UNIT
ALT.	ALTERNATE
AMB.	AMBIENT TEMPERATURE (°F)
AMP.	AMPERE
APPROX.	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
CD	CONSTRUCTION DOCUMENTS
CMFR.	COMPRESSOR
CT	COOLING TOWER
CWP	CONDENSER WATER PUMP
CJ	CONDENSING UNIT
DB	DRY BULB
DEFL.	DEFLECTION
DEG. F	DEGREES FAHRENHEIT
DET.	DETAIL
DD	DESIGN DEVELOPMENT
DIA	DIAMETER
DISC.	DISCONNECT SWITCH
DM.	DIMENSION
EA	EXHAUST AIR
EDB	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 MET BULB
EXT.	ENTERING WATER TEMPERATURE
EXH.	EXHAUST
EXIST.	EXISTING
F/A	FREE AREA OPENING (SQ. FT.)
FCU	FAN COIL UNIT
FHP	FRACTIONAL HORSE POWER
FLR.	FLOOR
GF	COIL FINS PER INCH.
FFM	FEET PER MINUTE
FFS	FEET PER SECOND
FT.	FOOT OR FEET
GFI	GROUND FAULT INTERRUPTER
GPM	GALLONS PER MINUTE
HD.	HEAD
H/A	HANDS/OFF/AUTO. MOTOR STARTER
HP	HORSE POWER
HPU	HEAT PUMP UNIT
HR.	HOUR(S)
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
MCA	MINIMUM CURRENT AMPS.
MOPP	MAX. OVER CURRENT PROTECTION
MHH	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	CHANGERS AUTHORIZED REPRESENTATIVE
OB	OPPOSED BLADE DAMPER
OD	OUTSIDE DIAMETER
ORIG.	ORIGINAL
P.D.	PRESSURE DROP (FT)
PH.	PHASE
PMB	POWERED MIXING BOX
PLUMB.	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
WPG	WEATHERPROOF GFI TRANSFORMER
XFR.	TRANSFORMER

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 (N2)
	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
	CAP ON END OF PIPE
	CHECK VALVE
	OS & 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



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



NOTE :
CONTRACTOR SHALL PROVIDE THE OWNER WITH TEN
(10) WIRELESS CONTROLLERS FOR OPENING AND
CLOSING THE MOTORIZED GATE.

NO.	DATE	REVISION	REVIEWED
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DRAWN: GCH
DESIGN: GCH
REVIEWED: TDT
SCALE: 1"=20'-0"
DATE: JULY 2019
DWG. NAME: MEP SITE PLAN



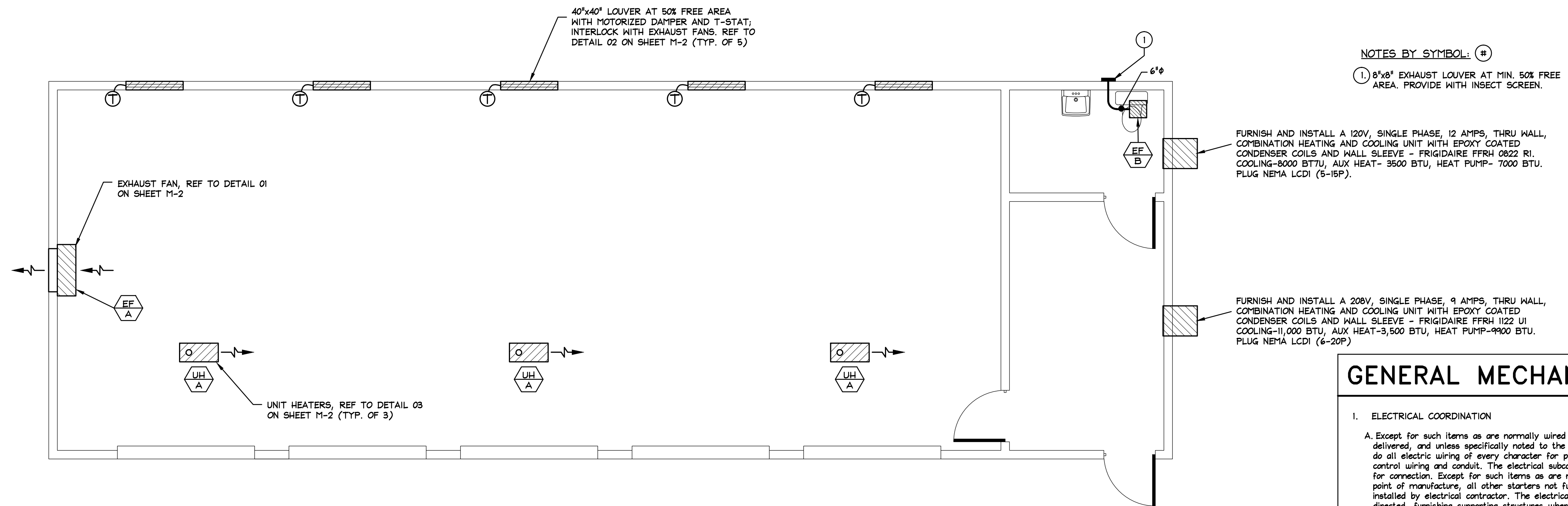
BW2 ENGINEERS, INC.
1919 S. Shiloh Road
Suite 500, L.B. 27
Garland, Texas 75042
(972) 864-8200 (T) (972) 864-8220 (F)
Firm Registration No. F-5290

**WATER SYSTEM IMPROVEMENTS
SINGLE PRESSURE PLANE FACILITIES
NORTH PUMP STATION
MEP SITE PLAN
CITY OF LUCAS**

TTC
FIRM I.D. # 5279
T. TABOR CONSULTING, PLLC
1301 EAST DEBBIE LANE
SUITE 102-152
MANSFIELD, TEXAS 76063
OFFICE: 817-721-2113
TTABOR@TTC-PLLC.COM
18-044-E

Tommy D. Tabor
REGISTERED PROFESSIONAL ENGINEER
57248
2019/07/23

SHEET NO.
MEP-2
OF 11 MEP
JOB NO. 17-1811



NOTES BY SYMBOL: (1)
 (1) 8"x8" EXHAUST LOUVER AT MIN. 50% FREE AREA. PROVIDE WITH INSECT SCREEN.

FURNISH AND INSTALL A 120V, SINGLE PHASE, 12 AMPS, THRU WALL, COMBINATION HEATING AND COOLING UNIT WITH EPOXY COATED CONDENSER COILS AND WALL SLEEVE - FRIGIDAIRE FFRH 0822 RI. COOLING-8000 BTU, AUX HEAT- 3500 BTU, HEAT PUMP- 7000 BTU. PLUG NEMA LCDI (6-15P).

FURNISH AND INSTALL A 208V, SINGLE PHASE, 9 AMPS, THRU WALL, COMBINATION HEATING AND COOLING UNIT WITH EPOXY COATED CONDENSER COILS AND WALL SLEEVE - FRIGIDAIRE FFRH 1122 UI. COOLING-11,000 BTU, AUX HEAT-3,500 BTU, HEAT PUMP-9900 BTU. PLUG NEMA LCDI (6-20P)

GENERAL MECHANICAL NOTES

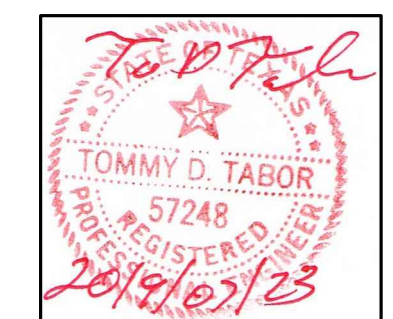
1. ELECTRICAL COORDINATION

A. Except for such items as are normally wired up at their point of manufacture and so delivered, and unless specifically noted to the contrary herein, the electrical subcontractor will do all electric wiring of every character for power supply, line voltage conduit and low voltage control wiring and conduit. The electrical subcontractor shall erect all motors in place ready for connection. Except for such items as are normally supplied with starters installed at their point of manufacture, all other starters not furnished with equipment to be furnished and installed by electrical contractor. The electrical subcontractor will mount all such starters, as directed, furnishing supporting structures where necessary. The owner and other contractors shall furnish with each item requiring electrical connections, the necessary instructions and wiring diagrams to the electrical subcontractor. The electrical subcontractor shall refer to the equipment specifications to determine the scope of work.
2. FINAL INSPECTIONS

A. Upon completion of the contract, there shall be a final inspection of the completed installation. Prior to this inspection, all work under this division shall have been tested, balanced, and adjusted and in final operating condition. A qualified person representing the contractor must be present at this final inspection to demonstrate the system and prove the performance of the equipment.

01 FLOOR PLAN-MECHANICAL

SCALE: 1/4"=1'-0"
 THE CONTRACTOR SHALL PROVIDE A INTERLOCK BETWEEN THE IR HEATERS AND AN EXHAUST FAN TO PROVIDE MAUFACTURES RECOMMENDED EXHAUST VALUES. VERIFY REQMTS WITH MANUFACTURERS INSTALLATION MANUAL.



FIRM I.D # 5279
 T. TABOR CONSULTING, PLLC
 1301 EAST DEBBIE LANE
 SUITE 102-152
 MANSFIELD, TEXAS 76063
 OFFICE 817-721-2113
 TTABOR@TTC-PLLC.COM
 18-044-E

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NO.	DATE	REVISION	REVIEWED

DRAWN: GCH
 DESIGN: GCH
 REVIEWED: TDT
 SCALE: 1/4"=1'-0"
 DATE: JULY 2019
 DWG. NAME: MECHANICAL PLAN



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
 SINGLE PRESSURE PLANE FACILITIES
 NORTH PUMP STATION
 MECAHNICAL PLAN
 CITY OF LUCAS**

SHEET NO. M-1
 OF 11 MEP
 JOB NO. 17-1811

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	WALL	PROP	8750	0.25	--	610	BELT	1	1725	115	1	X-LINE	COOK	36X1W	NOTE: 1,4,8,12	85
EF-B	RESTROOM	CEILING	CENTRIF.	55	0.25		675	DIRECT	45 W	675	115	1	F.H.P.	GREENHECK	SP-B70	NOTES: 1,2,4,5	20

MULTIPLE UNITS HAVE THE SAME DESIGNATION. VERIFY EXACT NUMBER OF UNITS WITH THE FLOOR PLANS.

NOTES:

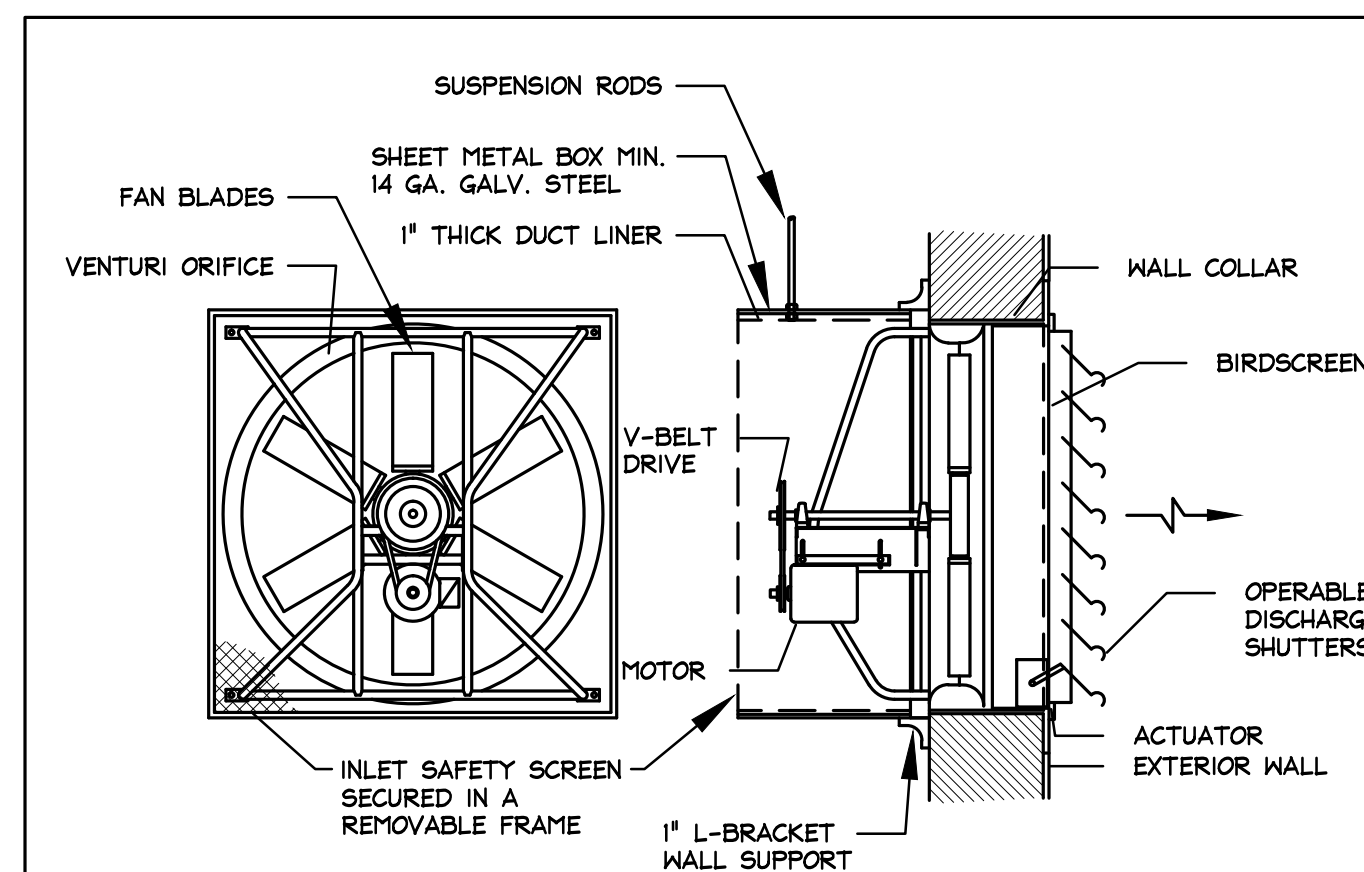
- MINIMUM LEAKAGE GRAVITY BACKDRAFT DAMPER, (2. AUTOMATIC DAMPER WITH ACTUATOR, (3. 2-SPEED MOTOR, (4. BIRDSCREEN (5. MANUFACTURER'S ROOF CURB, (6. INLET SAFETY GUARD, (7. PREMIUM EFFICIENCY ELECTRIC MOTOR, (8. MANUFACTURER'S DISCONNECT SWITCH, (9. SPEED CONTROLLER, (10. THROW AWAY FILTERS, (11. 24" VENTED ROOF CURB, (12. INTERLOCK WITH INTAKE LOUVERS AND MOTORIZED DAMPERS.

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

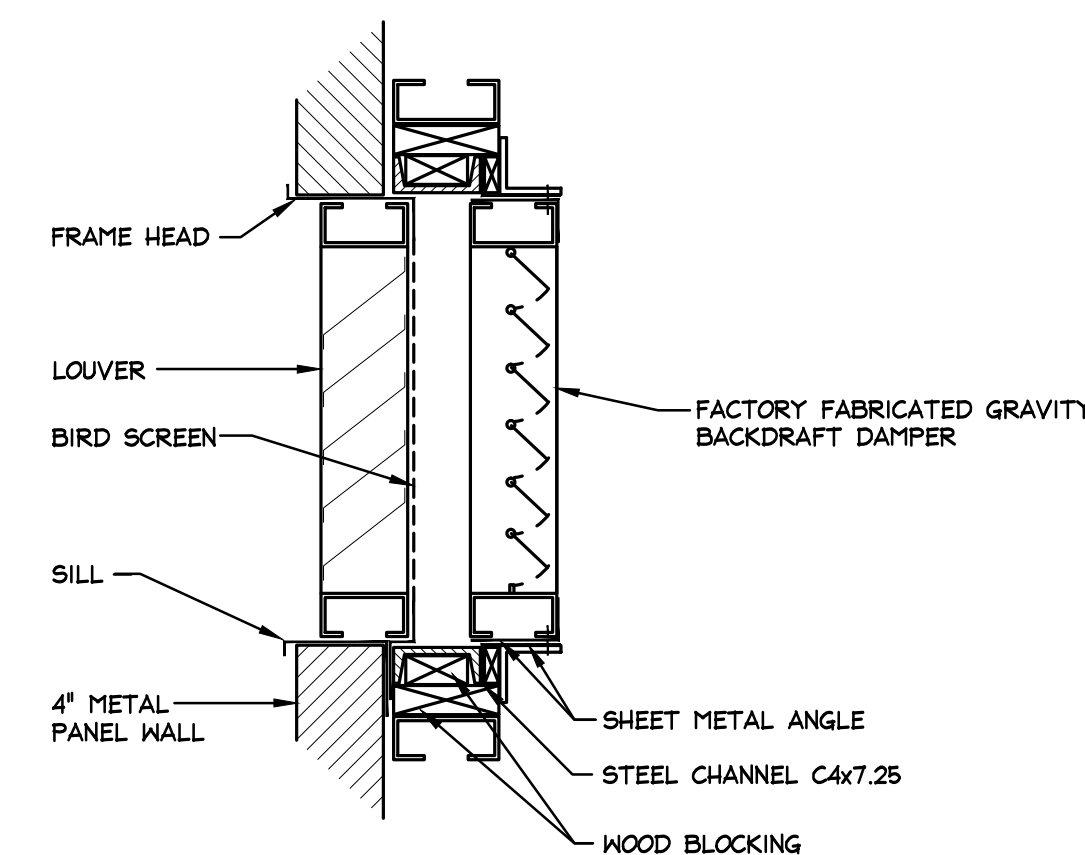
NOTES:

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



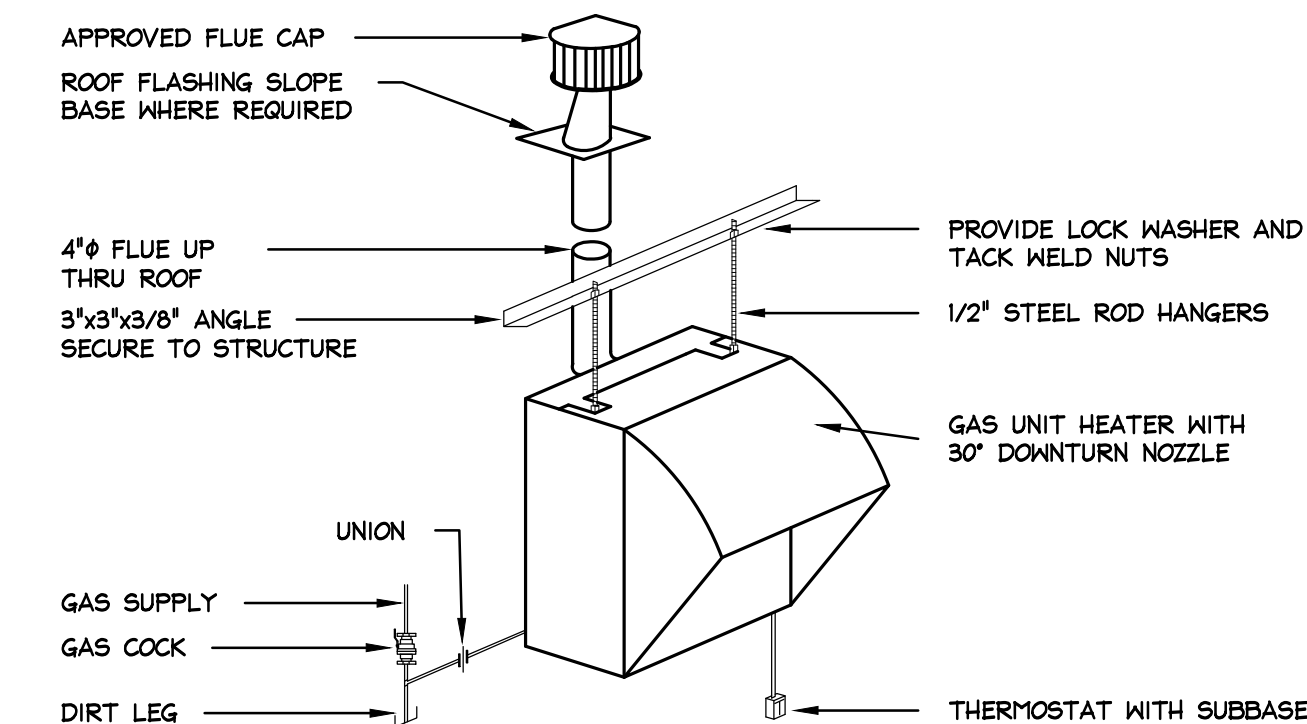
01 WALL EXHAUST FAN

SCALE:
NTS



02 INTAKE WALL LOUVER

SCALE:
NTS



03 UNIT HEATER DETAIL

SCALE:
NTS

NO.	DATE	REVISION	REVIEWED
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DRAWN: GCH
DESIGN: GCH
REVIEWED: TDT
SCALE: 1/4"=1'-0"
DATE: JULY 2019
DWG. NAME: MECH SCHED & DETAILS



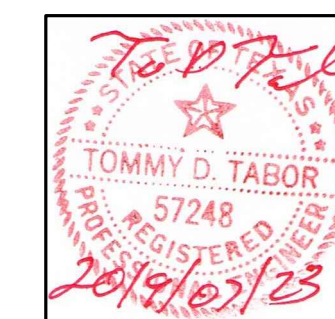
BW2 ENGINEERS, INC.

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
SINGLE PRESSURE PLANE FACILITIES
NORTH PUMP STATION
MECHANICAL SCHEDULES & DETAILS
CITY OF LUCAS



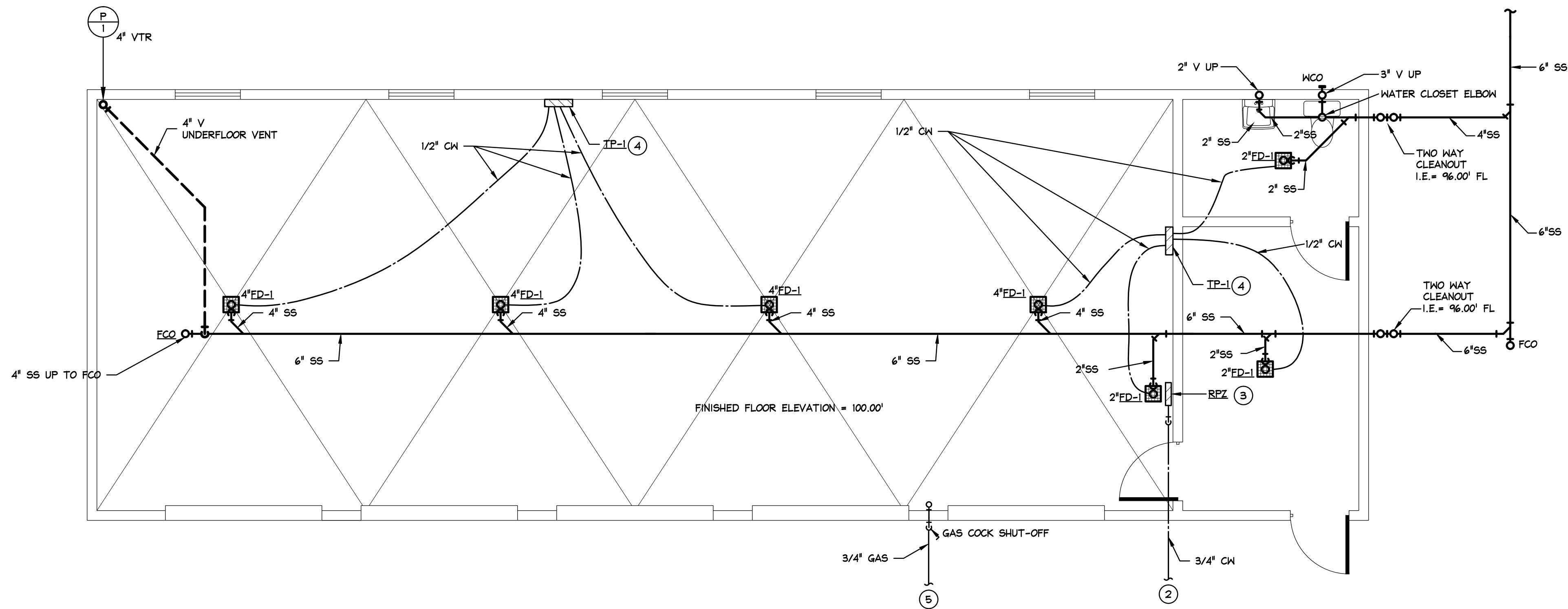
FIRM I.D.# 5279
T. TABOR CONSULTING, PLLC
1301 EAST DEBBIE LANE
SUITE 102-152
MANSFIELD, TEXAS 76063
OFFICE: 817-721-2113
TTABOR@TTC-PLLC.COM
18-044-E



SHEET NO. M-2

OF 11 MEP

JOB NO. 17-1811

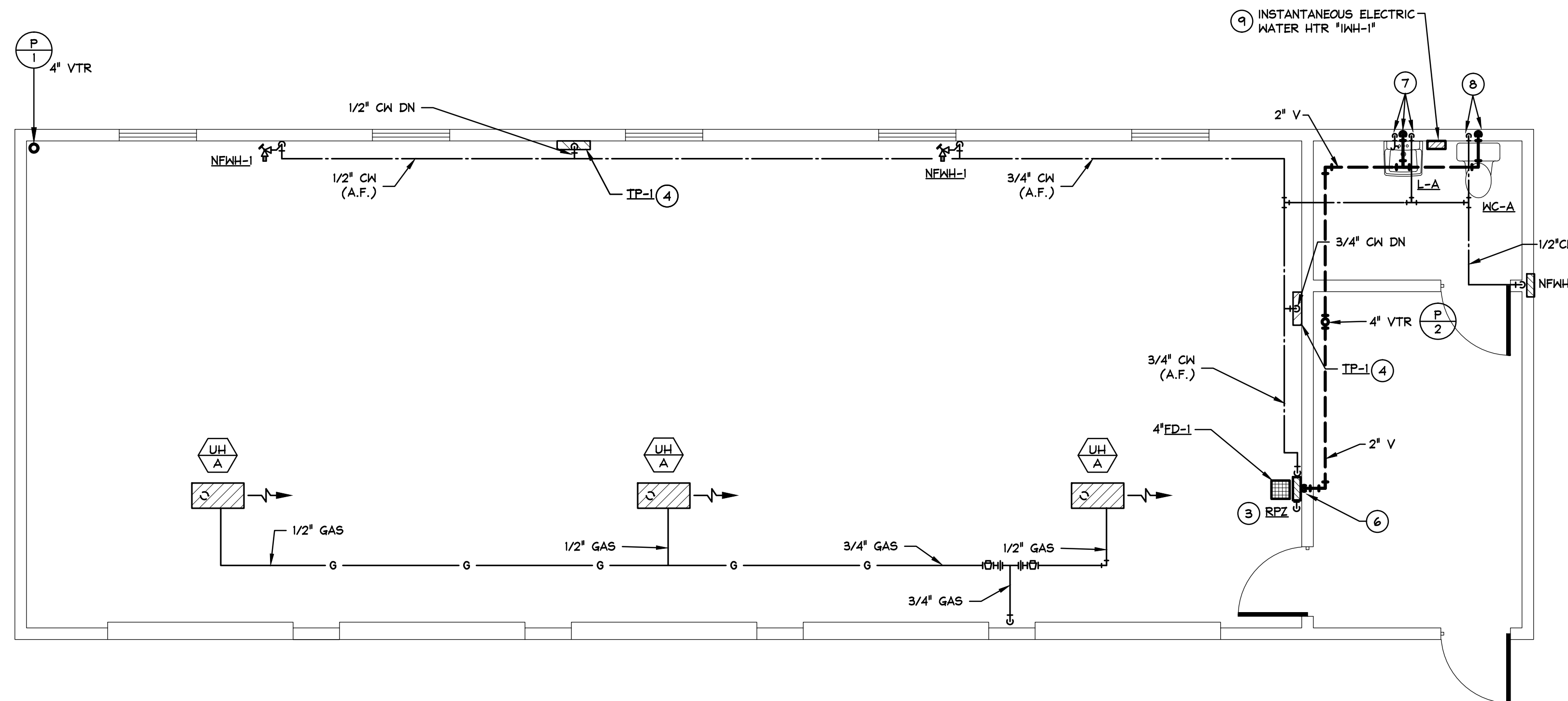


01 FLOOR PLAN - PLBG BELOW FLOOR
SCALE: 1/4"=1'-0"

GENERAL NOTES:

1. PROVIDE ALL MATERIALS, LABOR AND EQUIPMENT AS REQUIRED TO INSTALL COMPLETE AND OPERABLE PIPING SYSTEMS AS INDICATED ON THE DRAWINGS, AS SPECIFIED, AS REQUIRED BY ALL APPLICABLE CODES AND PER MANUFACTURER'S RECOMMENDATIONS.
2. SLOPE OF ALL HORIZONTAL DRAINAGE PIPING (SANITARY, VENTS, 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
3. ALL HORIZONTAL VENT PIPING SHALL BE GRADED AS TO DRAIN BACK TO THE DRAINAGE PIPE BY GRAVITY.
4. REFER TO ENGINEER'S DRAWINGS FOR EXACT LOCATION AND ELEVATION OF FLOOR DRAINS. CONTRACTOR SHALL COORDINATE LOCATIONS OF FLOOR DRAINS.
5. PROVIDE SHUT-OFF VALVES IN ALL DOMESTIC WATER PIPING SYSTEM BRANCH LINES.
6. 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.
7. ALL LAVATORIES AND SINKS SHALL BE PROVIDED WITH A THERMOSTATIC MIXING VALVE (TMV) AS SPECIFIED IN THE PLUMBING FIXTURE SCHEDULE.



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

NOTES BY SYMBOL: (#)

1. FOR CONTINUATION OF SANITARY SEWER LINE, SEE CIVIL DRAWINGS.
2. FOR CONTINUATION OF DOMESTIC COLD WATER LINE, SEE CIVIL DRAWINGS.
3. RPZ - WATTS SERIES 009 OR APPROVED EQUAL FOR 3/4" WATER SERVICE.
4. TRAP PRIMER MANIFOLD (PPP INC. MODEL NO. PT-4 OR APPROVED EQUAL).
5. 3/4" NATURAL GAS LINE TO GAS METER - VERIFY REQUIREMENTS WITH GAS COMPANY. REFER TO CIVIL PLANS FOR ADDITIONAL INFORMATION.
6. 2" V DN IN WALL TO SERVE FLOOR DRAIN.
7. 1/2" CW, 1/2" HW # 2" V DN IN WALL TO SERVE LAV-A
8. 1/2" CW # 3" V DN IN WALL TO SERVE WATER CLOSET.
9. 1/2" CW DN. TO ELECTRIC INSTANTANEOUS WATER HEATER SERVING LAVATORY, MOUNTED ON WALL UNDER LAVATORY. ROUTE 1/2" HW TO LAVATORY FAUCET. REFER TO DETAIL 07 ON SHEET P-3.

PROVIDE A NATURAL GAS SERVICE LINE TO THE STANDBY GENERATOR

NO.	DATE	REVISION	REVIEWED
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DRAWN: GCH
DESIGN: GCH
REVIEWED: TDT
SCALE: 1/4"=1'-0"
DATE: JULY 2019
DWG. NAME: PLBG FLOOR PLANS



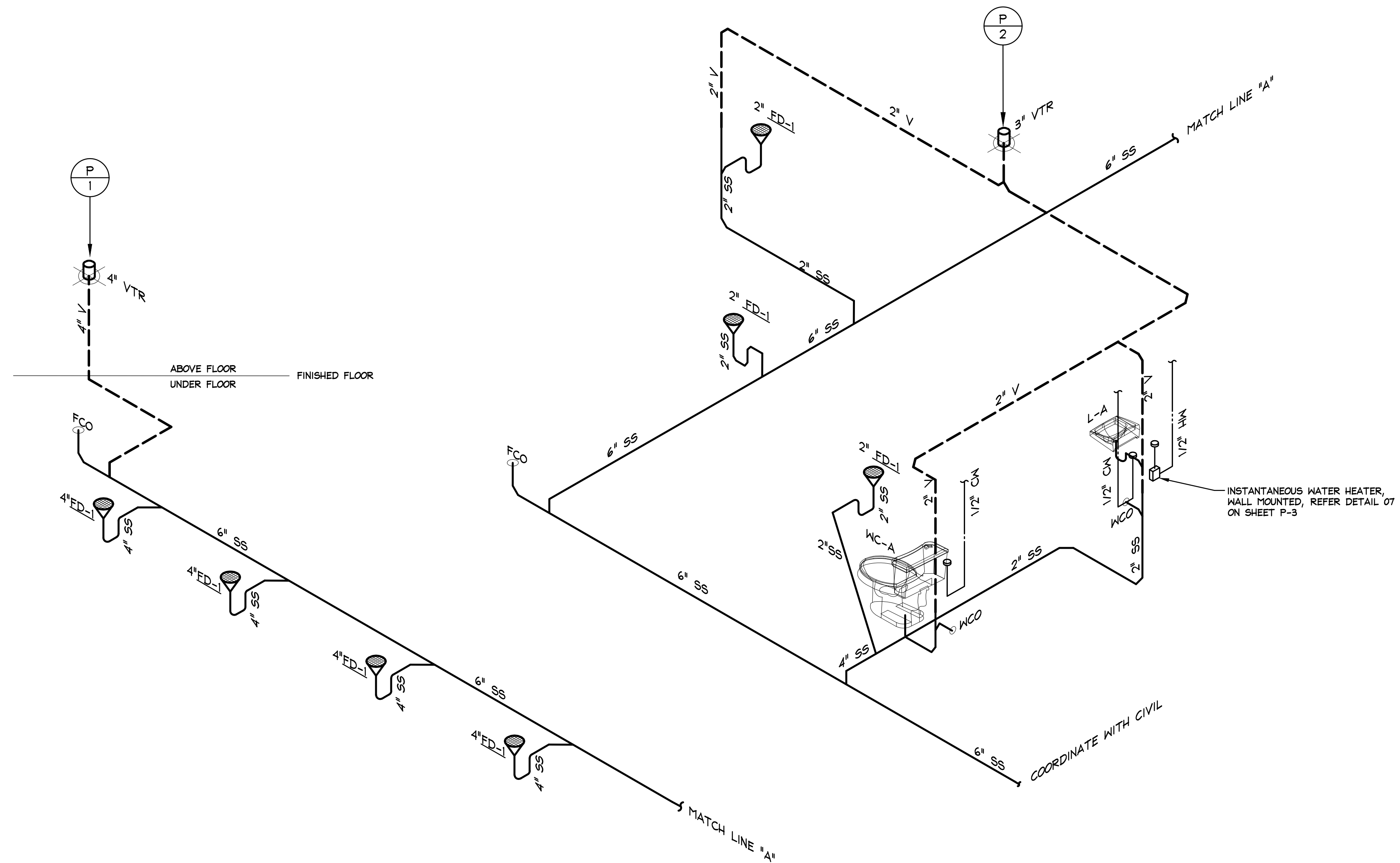
BW2 ENGINEERS, INC.
1919 S. Shiloh Road
Suite 500, L.B. 27
Garland, Texas 75042
(972) 864-8200 (T) (972) 864-8220 (F)
Firm Registration No. F-5290

WATER SYSTEM IMPROVEMENTS
SINGLE PRESSURE PLANE FACILITIES
NORTH PUMP STATION
PLUMBING FLOOR PLANS
CITY OF LUCAS

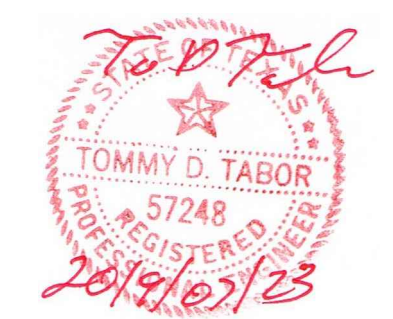


FIRM I.D. # 5279
T. TABOR CONSULTING, PLLC
1301 EAST DEBBIE LANE
SUITE 102-152
MANSFIELD, TEXAS 76063
OFFICE: 817-721-2113
TTABOR@TTC-PLLC.COM
18-044-E

SHEET NO. P-1
OF 11 MEP
JOB NO. 17-1811



01 PLUMBING RISER DIAGRAMS
SCALE: 1/4"=1'-0"



FIRM I.D. # 5279
T. TABOR CONSULTING, PLLC
1301 EAST DEBBIE LANE
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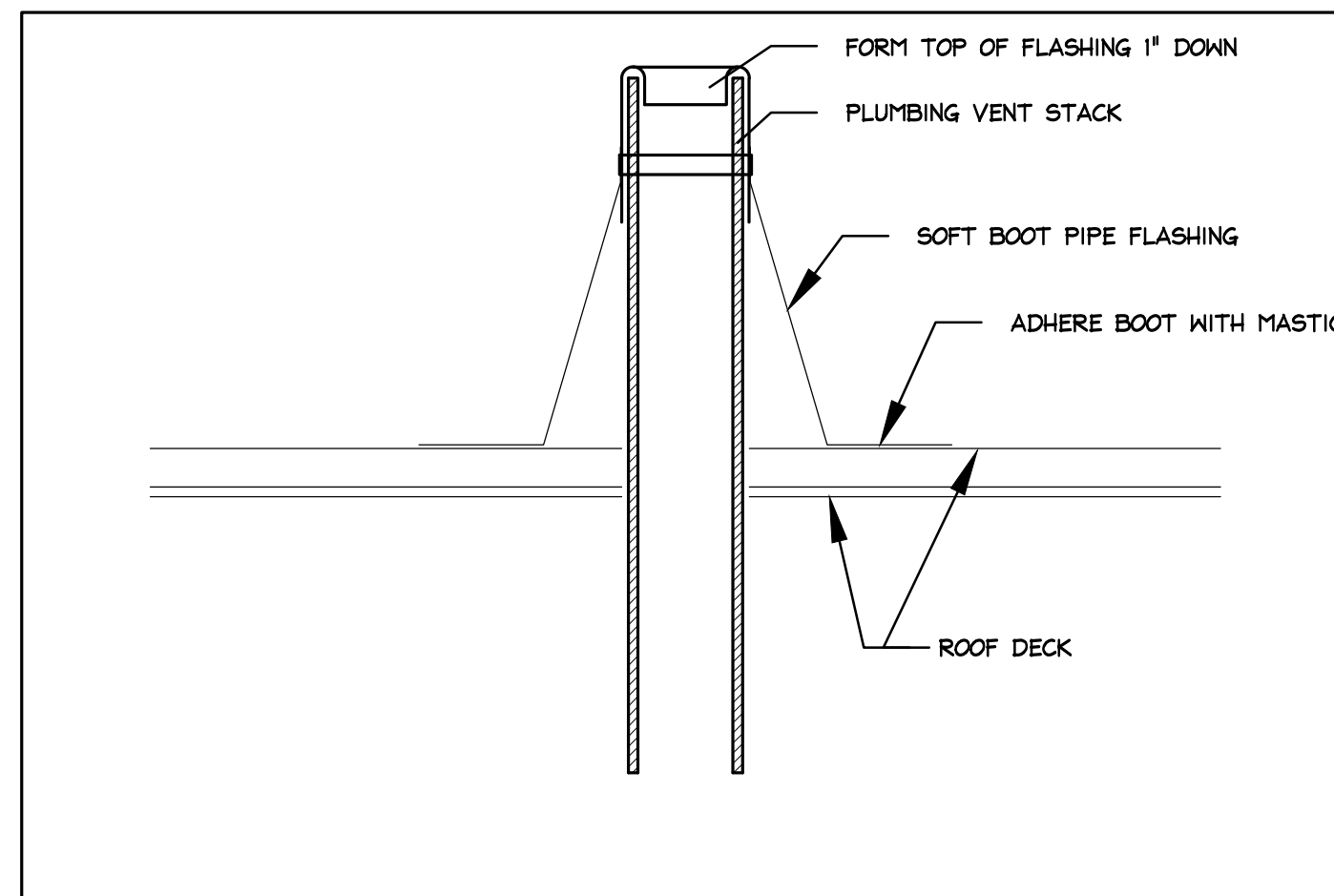
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DESIGN: GCH
REVIEWED: TDT
SCALE: 1/4"=1'-0"
DATE: JULY 2019
DWG. NAME: PLBG RISER DIAGRAM



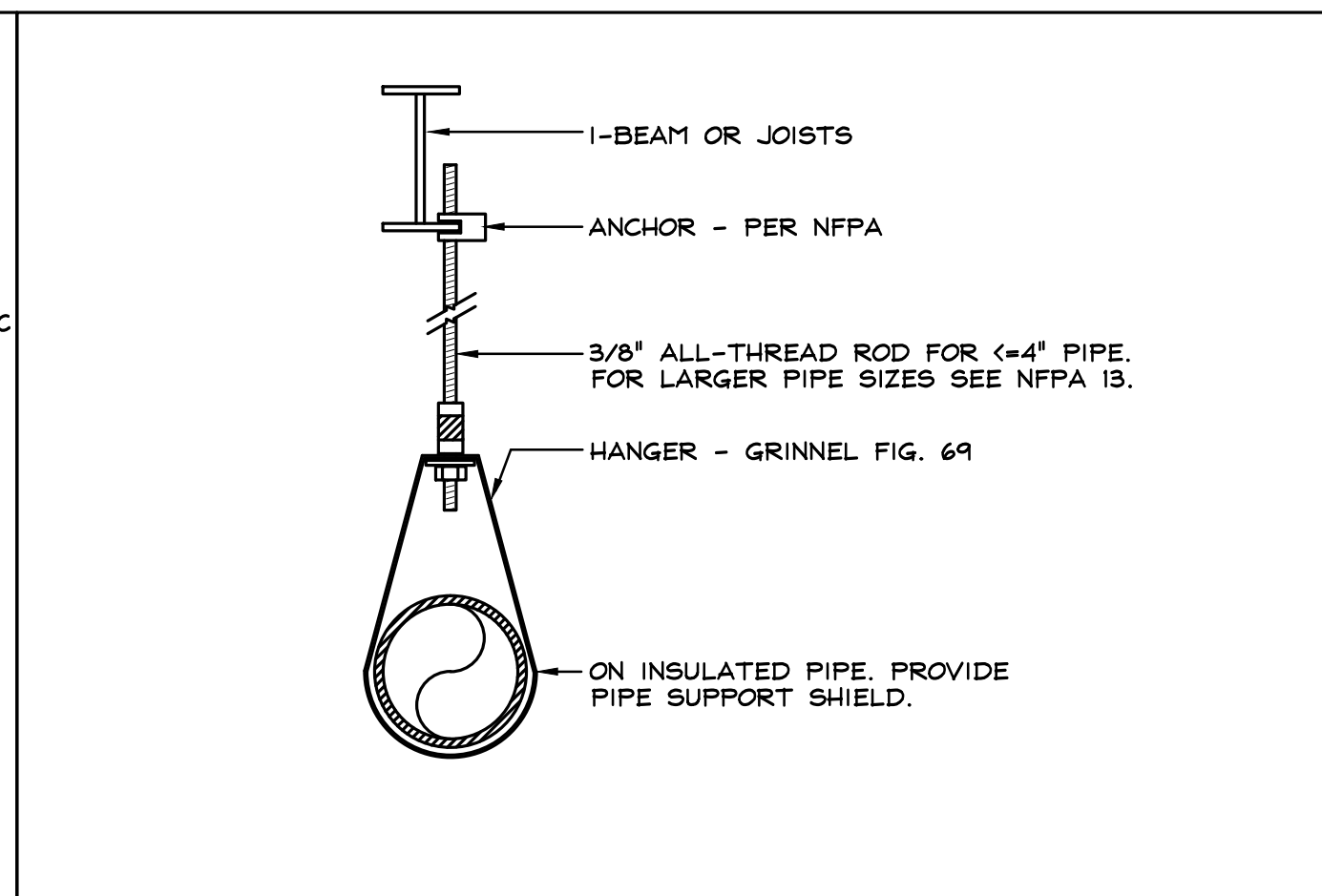
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WATER SYSTEM IMPROVEMENTS
SINGLE PRESSURE PLANE FACILITIES
NORTH PUMP STATION
PLUMBING RISER DIAGRAMS
CITY OF LUCAS

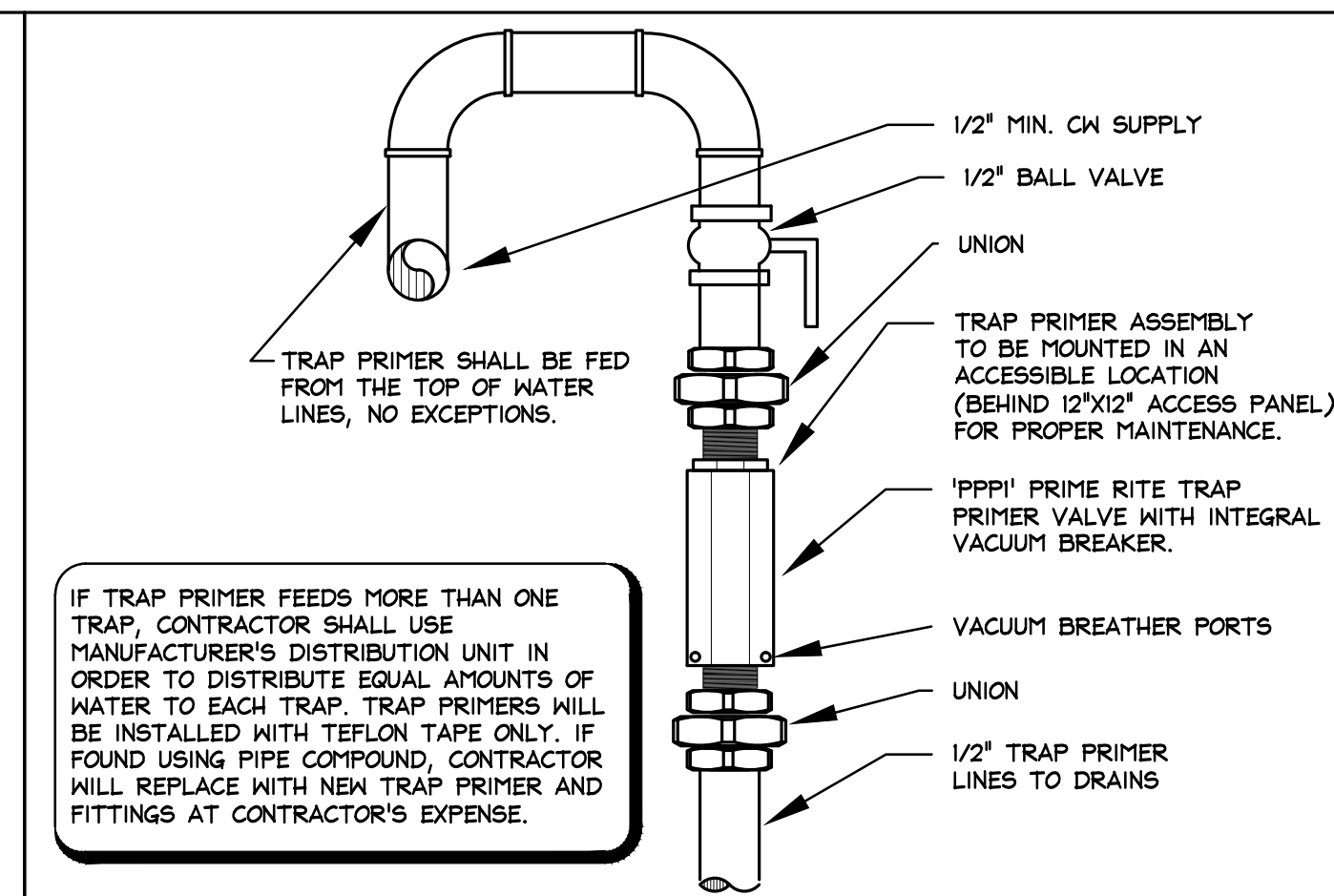
SHEET NO. P-2
OF 11 MEP
JOB NO. 17-1811



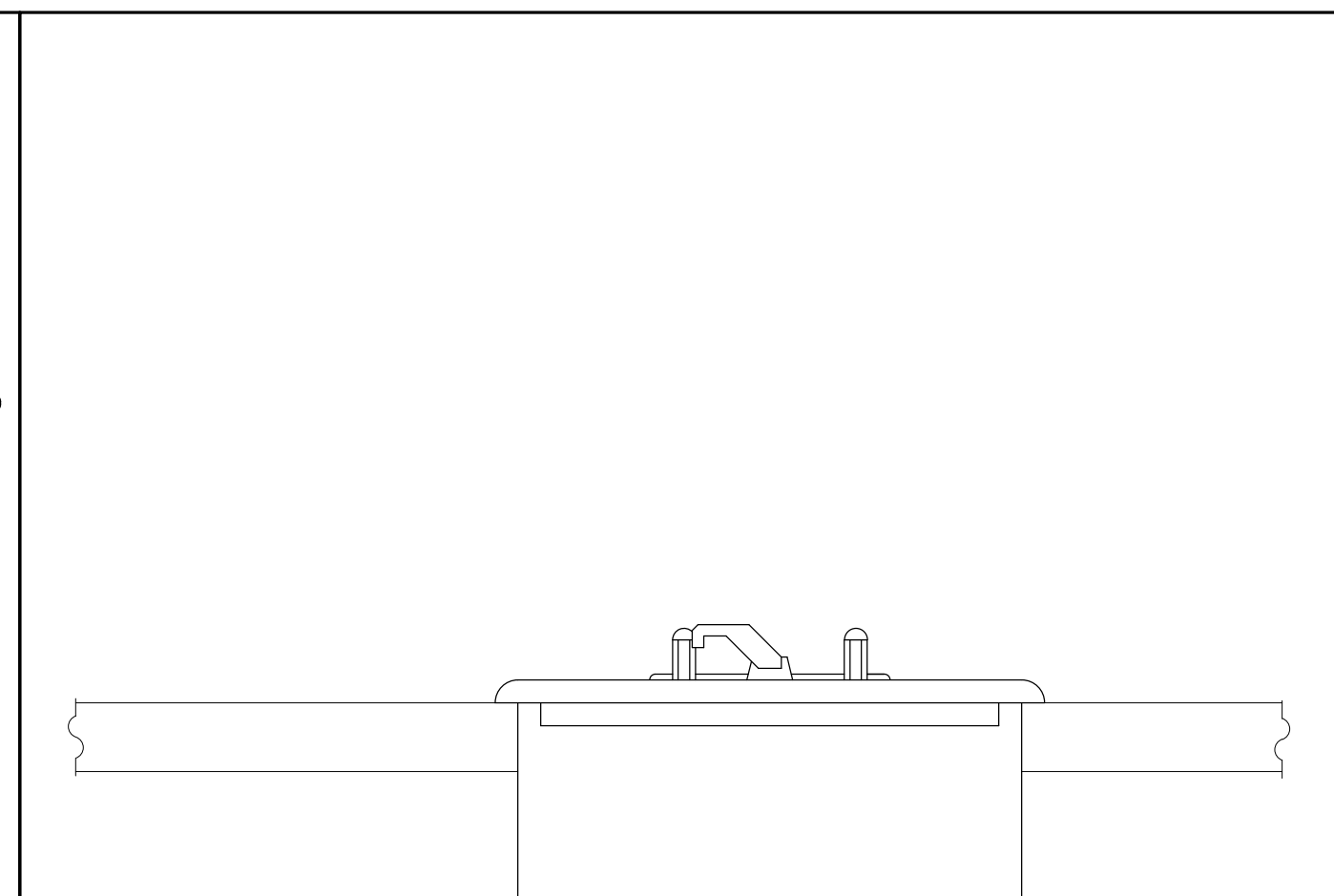
01 VENT THROUGH ROOF DETAIL SCALE: NTS



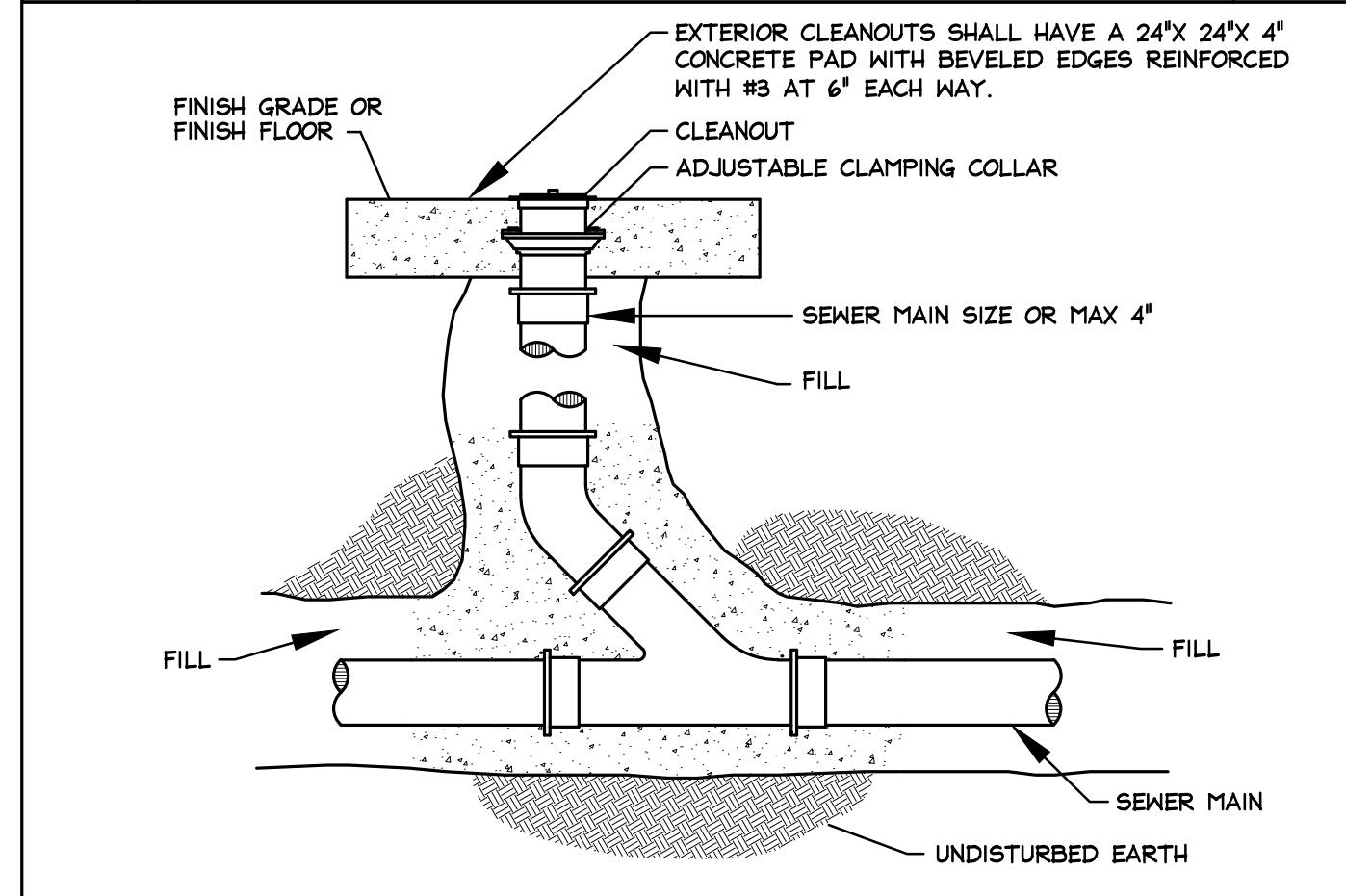
02 PIPE HANGAR DETAIL SCALE: NTS



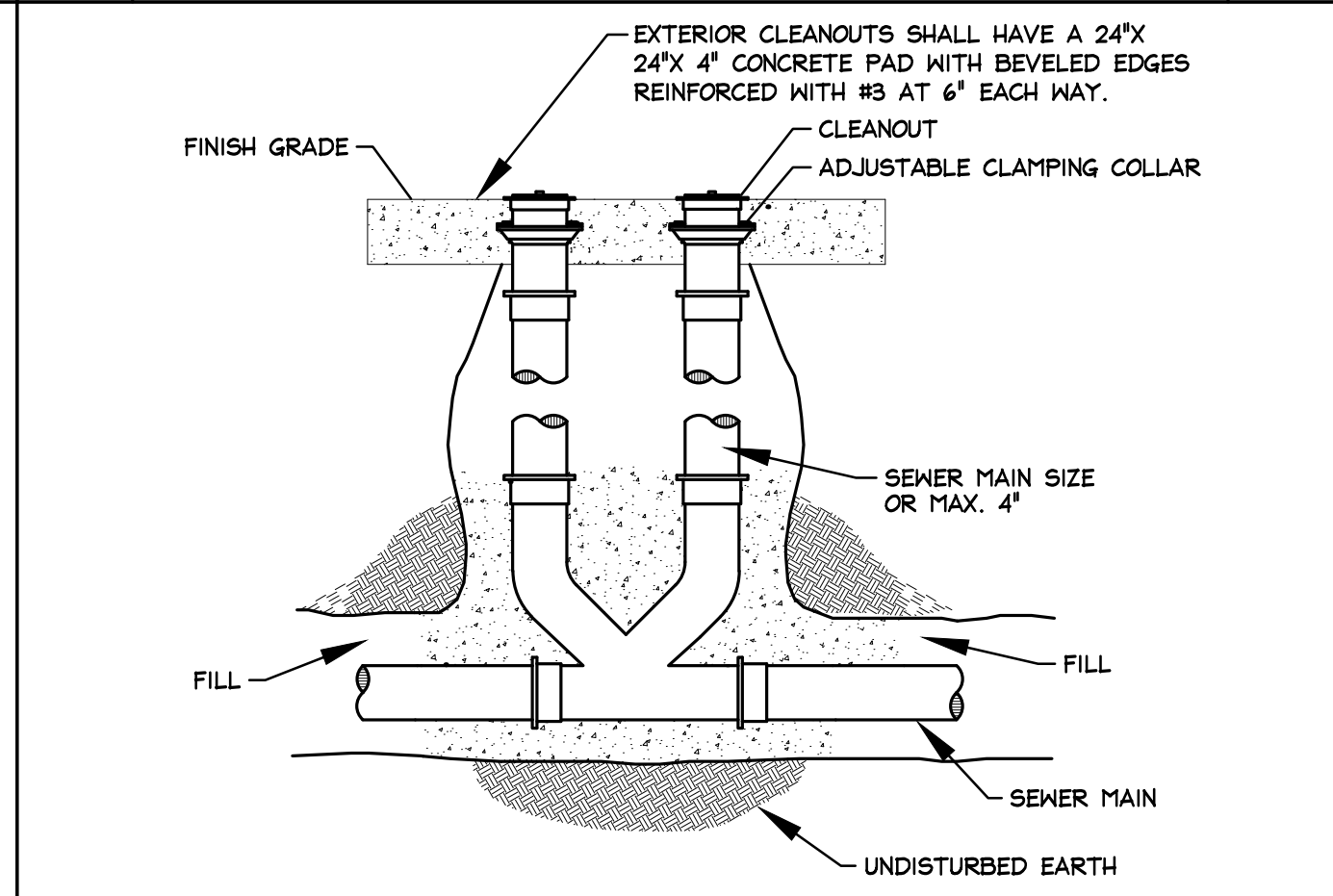
03 TRAP PRIMER DETAIL SCALE: NTS



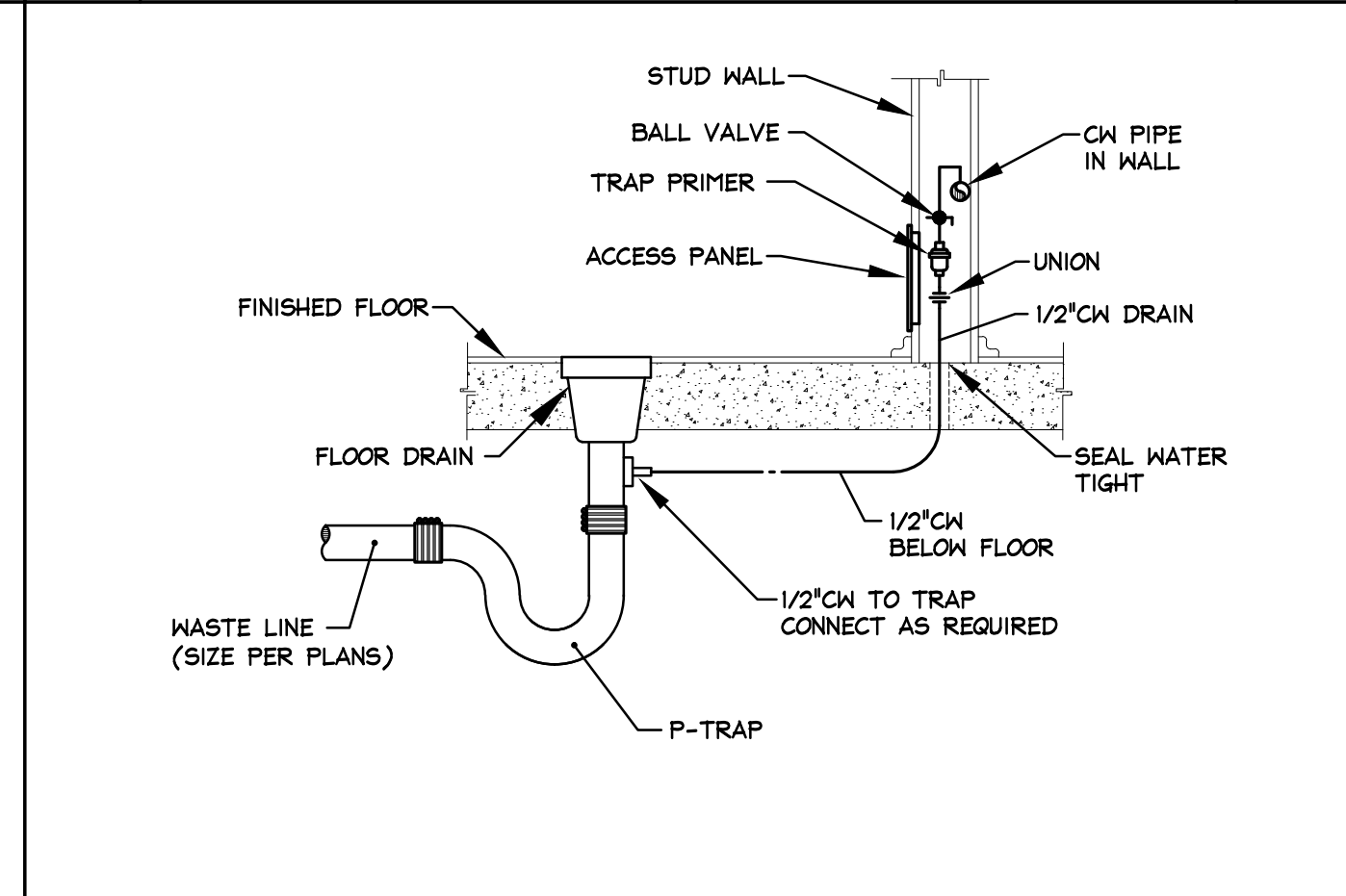
07 INSTANTANEOUS WATER HEATER SCALE: NTS



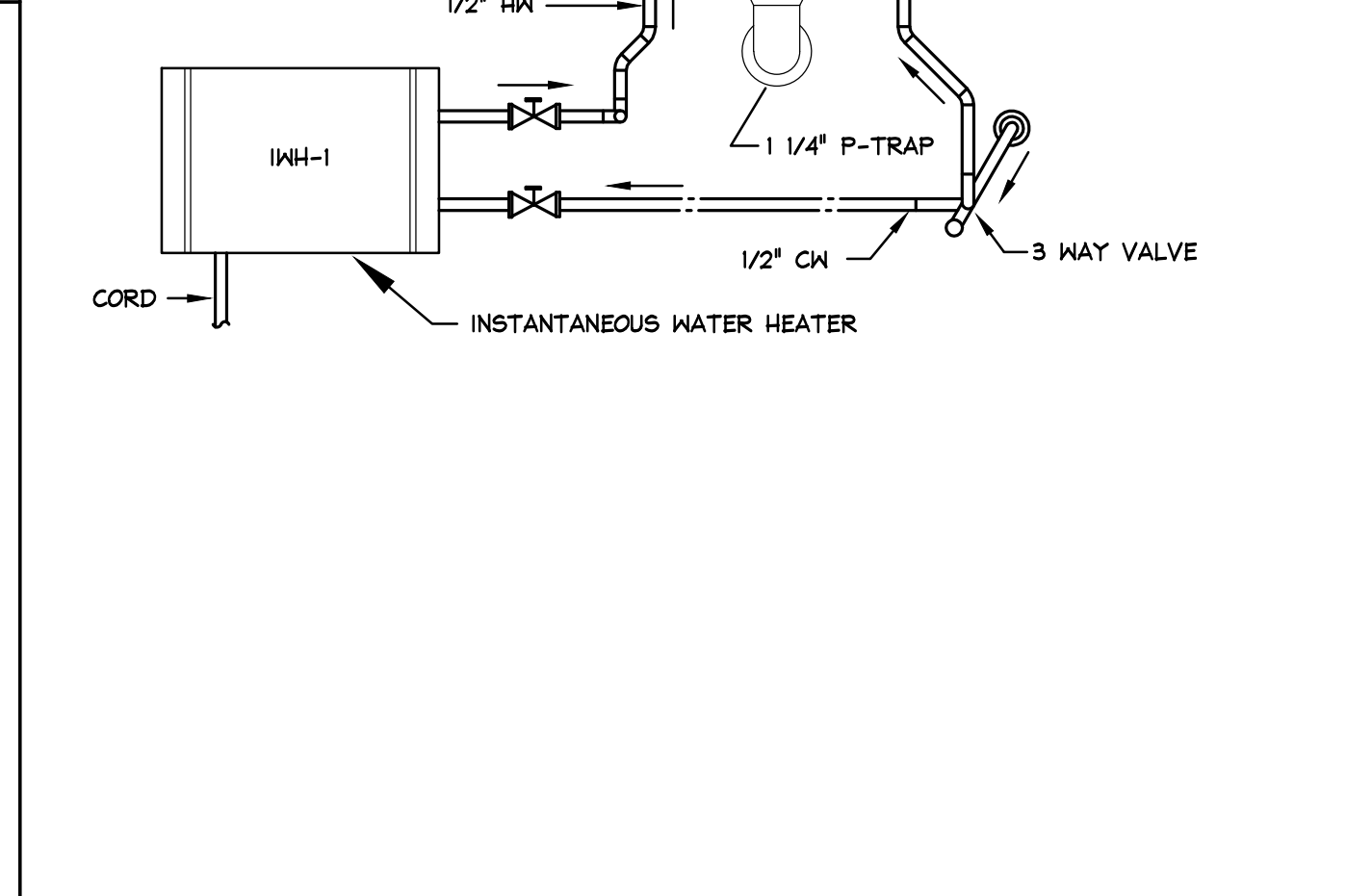
04 FLOOR CLEANOUT DETAIL SCALE: NTS



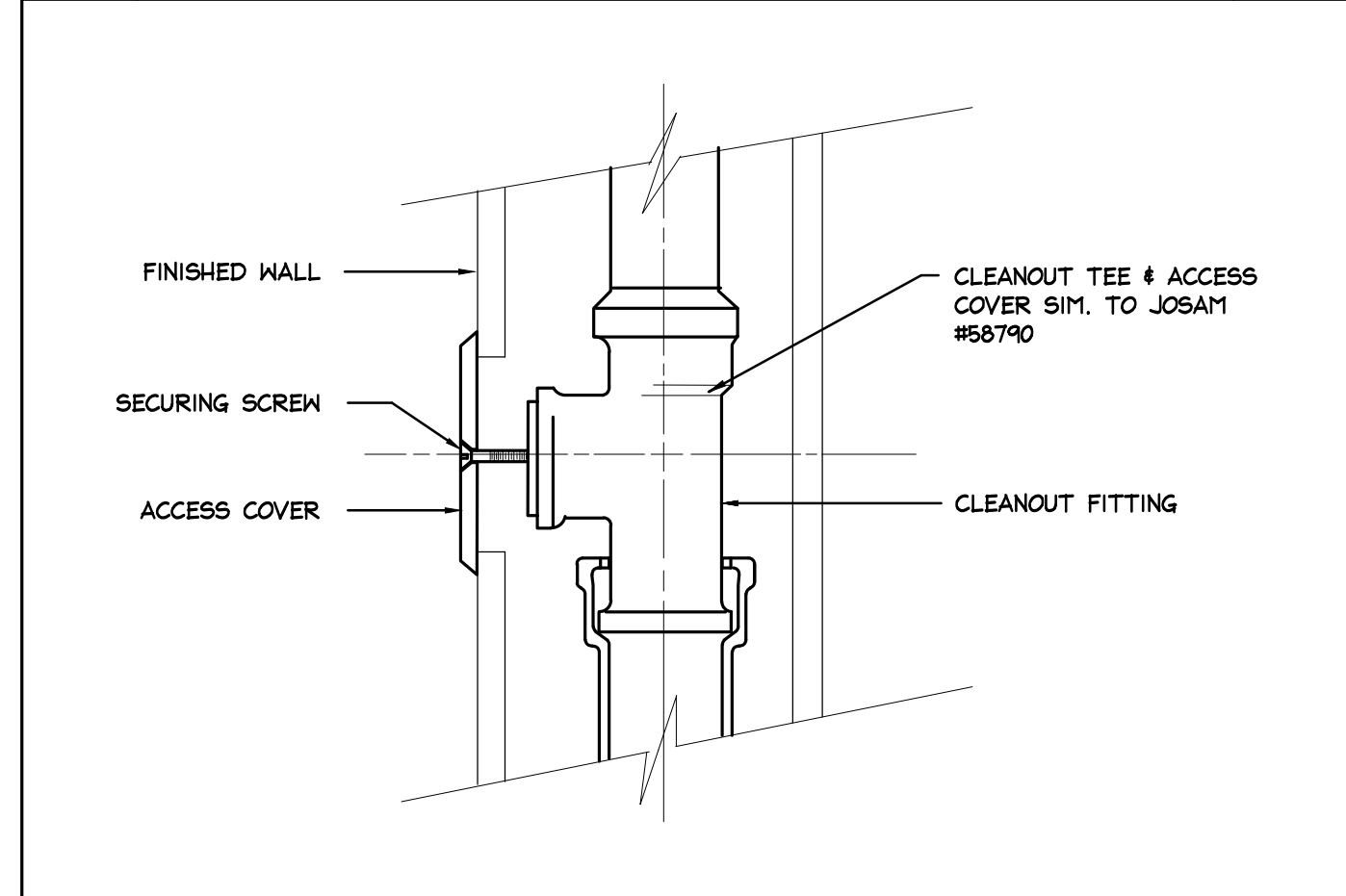
05 TWO WAY CLEANOUT SCALE: NTS



06 TRAP PRIMER TO FD DETAIL SCALE: NTS



07 INSTANTANEOUS WATER HEATER SCALE: NTS



08 WALL CLEANOUT SCALE: NTS

NO.	DATE	REVISION	REVIEWED
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DRAWN: GCH
 DESIGN: GCH
 REVIEWED: TDT
 SCALE: NOT TO SCALE
 DATE: JULY 2019
 DWG. NAME: PLUMBING DETAILS

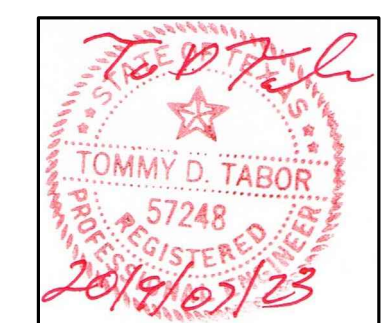


BW2 ENGINEERS, INC.
 1919 S. Shiloh Road
 Suite 500, L.B. 27
 Garland, Texas 75042
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**WATER SYSTEM IMPROVEMENTS
 SINGLE PRESSURE PLANE FACILITIES
 NORTH PUMP STATION
 PLUMBING DETAILS
 CITY OF LUCAS**



FIRM I.D. # 5279
 T. TABOR CONSULTING, PLLC
 1301 EAST DEBBIE LANE
 SUITE 102-152
 MANSFIELD, TEXAS 76063
 OFFICE: 817-721-2113
 TTABOR@TTC-PLLC.COM
 18-044-E



SHEET NO. P-3
 OF 11 MEP
 JOB NO. 17-1811

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 #82100-AE-50-81-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, LEVELIZE FLOOR CLEANOUT, TAPER THREADED BRONZE CLEANOUT PLUG AND ADJUSTABLE ABS HOUSING WITH MEDIUM DUTY SCORIATED SECURED ROUND SATIN NIKALOY TOP WITH VANDAL-PROOF SCREWS. 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, LEVELIZE FLOOR CLEANOUT, TAPER THREADED BRONZE CLEANOUT PLUG AND ADJUSTABLE ABS HOUSING WITH HEAVY DUTY SCORIATED SECURED ROUND SATIN NIKALOY TOP WITH VANDAL-PROOF SCREWS.
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.
WC-A	FLOOR MOUNTED WATER CLOSET TANK TYPE (ADA)	AMERICAN STANDARD CHAMPION PRO LEFT HAND, ELONGATED 211CA.004	KOHLER, MANSFIELD	4"	2"	3/4"	-	FLOOR MOUNTED, TANK TYPE, 1.6 GPF, ELONGATED SIPHON JET ACTION, VITREOUS CHINA WATER CLOSET WITH OLSONITE #95 SOLID PLASTIC OPEN FRONT SEAT WITH CHECK HINGE.
L-A	WALL HUNG LAVATORY DECK MOUNTED FAUCET WITH WRIST BLADE HANDLES (ADA)	AMERICAN STANDARD LUCERNE #0356.015 CHICAGO FAUCET #404-V317CP	KOHLER, MANSFIELD	2"	2"	1/2"	1/2"	VITREOUS CHINA, FAUCET LEDGE, FRONT OVERFLOW, D-SHAPED BOWL, WALL HUNG LAVATORY WITH FAUCET HOLES ON 8" CENTERS. FURNISH COMPLETE WITH CHROME PLATED 1/2 INCH P-TRAP, KEYLESS ANGLE STOPS AND FLEXIBLE METAL SUPPLIES. FAUCET SHALL BE HEAVY DUTY CAST BRASS, POLISHED CHROME PLATED FINISH, 5" SPOUT, INDEXED WRIST BLADE HANDLES WITH VANDAL RESISTANT SCREENS AND VANDAL RESISTANT AERATOR (0.5 GPM).
WCO	WALL CLEANOUT	JOSAM #58600-PLG-COT-VP	J.R. SMITH, WADE, ZURN	-	-	-	-	ROUND STAINLESS STEEL WALL ACCESS COVER WITH VANDAL PROOF CENTER SCREW, CAST IRON NO-HUB CLEANOUT TEE WITH RECESSED BRONZE TAPPED PLUG.

NOTES:

- WALL HUNG PLUMBING FIXTURES SHALL BE SUPPORTED USING ADJUSTABLE CONCEALED ARM FLOOR MOUNTED SUPPORTS WITH RECTANGULAR STRUCTURAL STEEL UPRIGHTS UTILIZING HEAVY-DUTY CAST-IRON FEET BOLTED TO THE FLOOR AND CAST IRON SUPPORT HEADERS.
- CONTRACTOR SHALL REFER TO PLUMBING CODE(S) FOR MOUNTING HEIGHTS AND LOCATIONS OF ALL PLUMBING FIXTURES INCLUDING HANDICAPPED (ADA) FIXTURES. CONTRACTOR SHALL COORDINATE ADA REQUIREMENTS WITH TEXAS ACCESSABILITY STANDARDS (*TAS - TDLR) PRIOR TO INSTALLATION OF PLUMBING FIXTURES.
- FLUSH VALVE FOR THE HANDICAPPED PLUMBING FIXTURES SHALL BE INSTALLED WHERE THE HANDLE FACES INTO THE OPEN AREA WITHIN THE ROOM.
- CONTRACTOR SHALL PROVIDE FLEXIBLE MOLDED INSULATION SIMILAR TO TRUEBRO 'LAV GUARD' ON P-TRAPS, WATER SUPPLIES AND VALVES SERVING ADA PLUMBING FIXTURES. CONTRACTOR SHALL PROVIDE OFFSET P-TRAPS ON ADA FIXTURES.
- CONTRACTOR SHALL INSTALL ALL PLUMBING FIXTURES SHOWN ON THE PLUMBING DRAWINGS.
- CONTRACTOR SHALL FURNISH AND INSTALL ON EACH PLUMBING FIXTURE CHROME PLATED BRASS P-TRAP, NIPPLES WITH ESCUTCHEON, CHROME PLATED BRASS ANGLE SUPPLIES WITH ALL METAL CONSTRUCTION CHROME PLATED FLEXIBLE BRASS RISERS WITH NIPPLES AND CHROME PLATED BRASS ESCUTCHEONS WITH CAST SET SCREW.
- CONTRACTOR SHALL PROVIDE ALL NECESSARY FITTINGS, PIPING, SUPPORTS, ETC. TO INSTALL EACH PLUMBING FIXTURE PER MANUFACTURER'S INSTALLATION INSTRUCTIONS AND TO COMPLY WITH CITY, STATE, ADA AND TAS CODES AND STANDARDS.

ELECTRIC WATER HEATER SCHEDULE

DESIG.	MANUFACTURER	MODEL NUMBER	TEMP. RISE	LEAVING WATER TEMP.	KW	VOLTAGE	PHASE	DESCRIPTION/REMARKS
IWH-1	CHRONOMITE	SR-30L	49°F	105°	3.6	120	1Ø	SEE NOTES

NOTES:

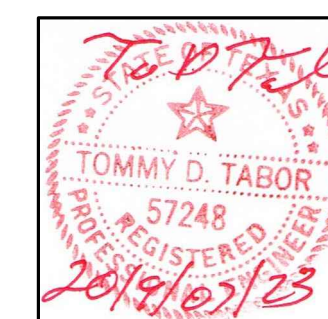
- INSTALL WATER HEATER PER MANUFACTURER'S INSTRUCTIONS.

THERMOSTATIC MIXING VALVE SCHEDULE

DESIG.	MANUFACTURER	MODEL NUMBER	PRESSURE DROP	INLET HOT WATER		INLET COLD WATER		OUTLET TEMPERED WATER		DESCRIPTION / REMARKS
				TEMP.	FLOW	TEMP.	FLOW	TEMP.	FLOW	
TMV	ARMSTRONG RADA	110	30 PSI	110°F	.5 GPM	60°F	.5 GPM	105°F	1.0	SEE NOTE #1

NOTES:

- BRONZE BODY THERMOSTATIC MIXING VALVE WITH INTEGRAL FILTER WASHERS AND CHECK VALVES AND AN ADJUSTMENT CAP WITH LOCKING FEATURE. VALVE SHALL BE ASSE 1016, 1017 AND 1070 LISTED. IF VALVE SERVES WALL HUNG LAVATORY OR HAND SINK, LOCATE VALVE IN WALL DIRECTLY BEHIND A 12"x12" ACCESS PANEL WITH LOCKING COVER. COORDINATE LOCATION WITH ARCHITECT. IF VALVE SERVES A COUNTERTOP LAVATORY, LOCATE VALVE BELOW LAVATORY WITHIN CABINET. IF VALVE SERVES MULTIPLE LAVATORIES OR HAND SINKS, VALVE SIZE SHALL BE AS FOLLOWS: 1-2 LAVATORIES (1/2"), 3-4 LAVATORIES (3/4") AND 5-6 LAVATORIES (1").



FIRM I.D. # 5279
 T. TABOR CONSULTING, PLLC
 1301 EAST DEBBIE LANE
 SUITE 102-152
 MANSFIELD, TEXAS 76063
 OFFICE: 817-721-2113
 TTABOR@TTC-PLLC.COM
 18-044-E

NO.	DATE	REVISION	REVIEWED
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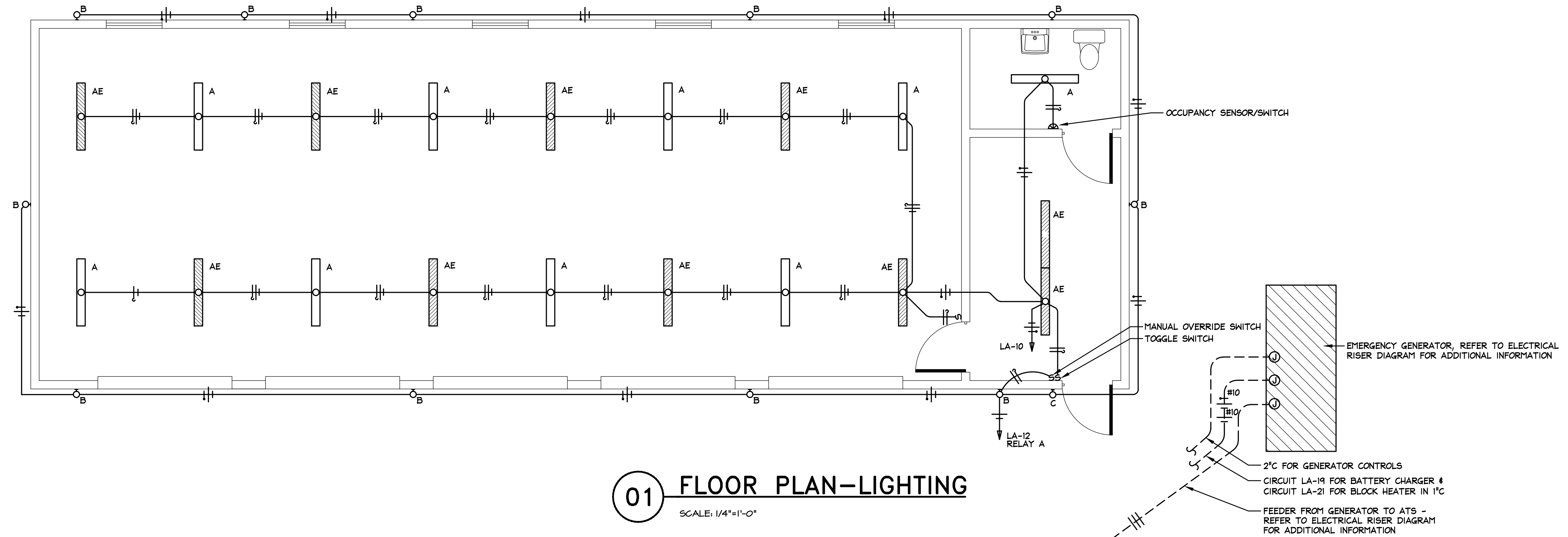
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 DESIGN: GCH
 REVIEWED: TDT
 SCALE: NOT TO SCALE
 DATE: JULY 2019
 DWG. NAME: PLUMBING SCHEDULES



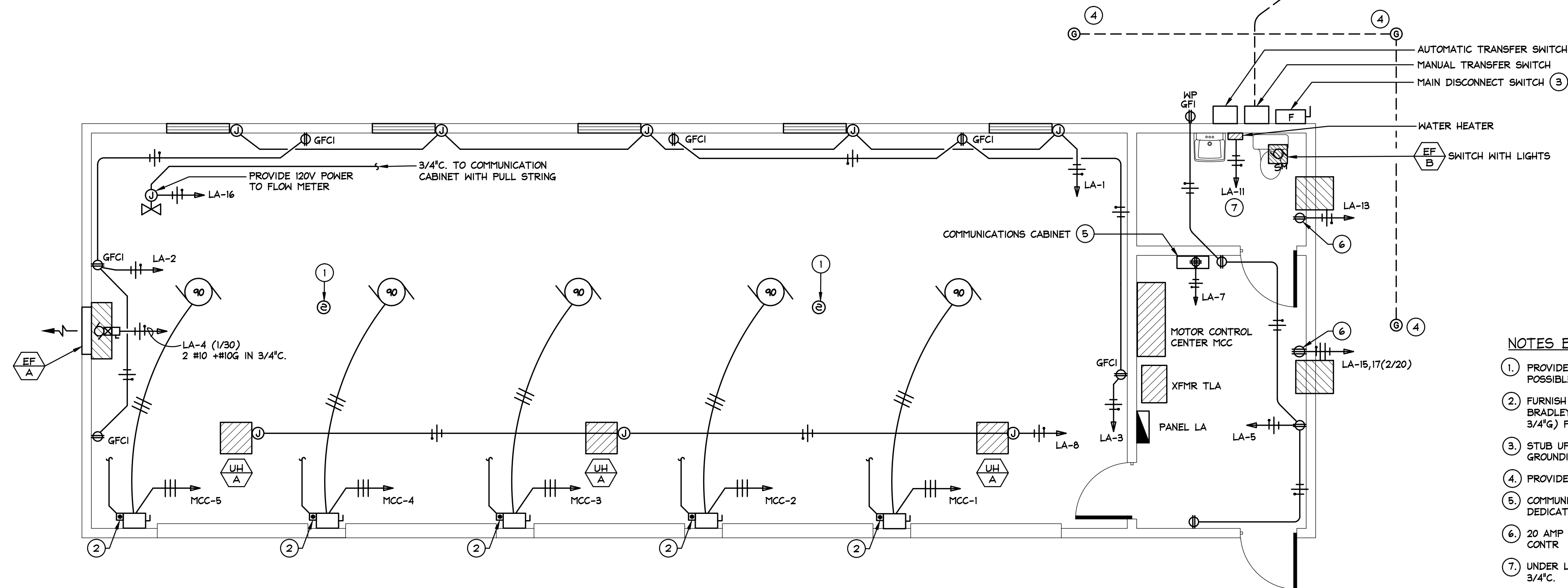
BW2 ENGINEERS, INC.
 1919 S. Shiloh Road
 Suite 500, L.B. 27
 Garland, Texas 75042
 (972) 864-8200 (T) (972) 864-8220 (F)
 Firm Registration No. F-5290

**WATER SYSTEM IMPROVEMENTS
 SINGLE PRESSURE PLANE FACILITIES
 NORTH PUMP STATION
 PLUMBING SCHEDULES
 CITY OF LUCAS**

SHEET NO. P-4
 OF 11 MEP
 JOB NO. 17-1811



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



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

- NOTES BY SYMBOL: (#)**
1. PROVIDE "FIRST ALERT" (OR EQUAL) CARBON MONOXIDE/SMOKE DETECTOR MOUNTED AS HIGH AS POSSIBLE. 120 VOLT OPERATION WITH BATTERY BACKUP.
 2. FURNISH & INSTALL A REMOTE START/STOP MAINTAINED CONTACT PUSH-BUTTON STATION (ALLEN BRADLEY #800H-2HA4RS) FOR EACH PUMP. PROVIDE & INSTALL CONDUIT AND CONDUCTORS (3-#12, 3/4"G) FROM PUSH-BUTTON STATION TO ASSOCIATED MOTOR STARTER SWITCH.
 3. STUB UP A #2/0 INSULATED COPPER WIRE INTO AND BONDED TO THE MAIN DISCONNECT GROUNDING LUGS. FIELD VERIFY THE EXACT STUB-UP LOCATION.
 4. PROVIDE A 3/4" DIAx10' COPPER-CLAD STEEL GROUND ROD IN GROUND WALL BOX. REFER TO 3/E-2.
 5. COMMUNICATIONS CABINET FURNISHED AND INSTALLED BY OTHERS. ELEC CONTR SHALL PROVIDE A DEDICATED BRANCH CIRCUIT (LA-7). TERMINATE TELE CONDUIT TO COMMUNICATIONS CABINET.
 6. 20 AMP RECEPTACLE FOR THRU WALL A/C UNIT - VERIFY REQMTS AND MOUNTING LOCATION WITH MECH CONTR.
 7. UNDER LAV, WALL MOUNTED WATER HEATER, 120 V., 40 AMP, 3600 WATT. PROVIDE (2)#8 #10G IN 3/4"C.

NO.	DATE	REVISION	REVIEWED
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4			
3			
2			
1			

DRAWN: GCH
DESIGN: GCH
REVIEWED: TDT
SCALE: 1/4"=1'-0"
DATE: JULY 2019
DWG. NAME: ELECTRICAL PLANS

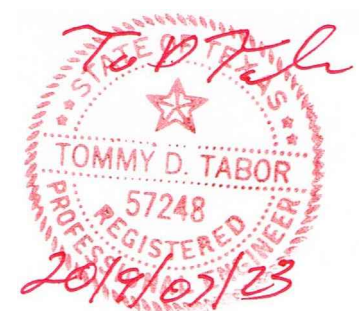


BW2 ENGINEERS, INC.
1919 S. Shiloh Road
Suite 500, L.B. 27
Garland, Texas 75042
(972) 864-8200 (T) (972) 864-8220 (F)
Firm Registration No. F-5290

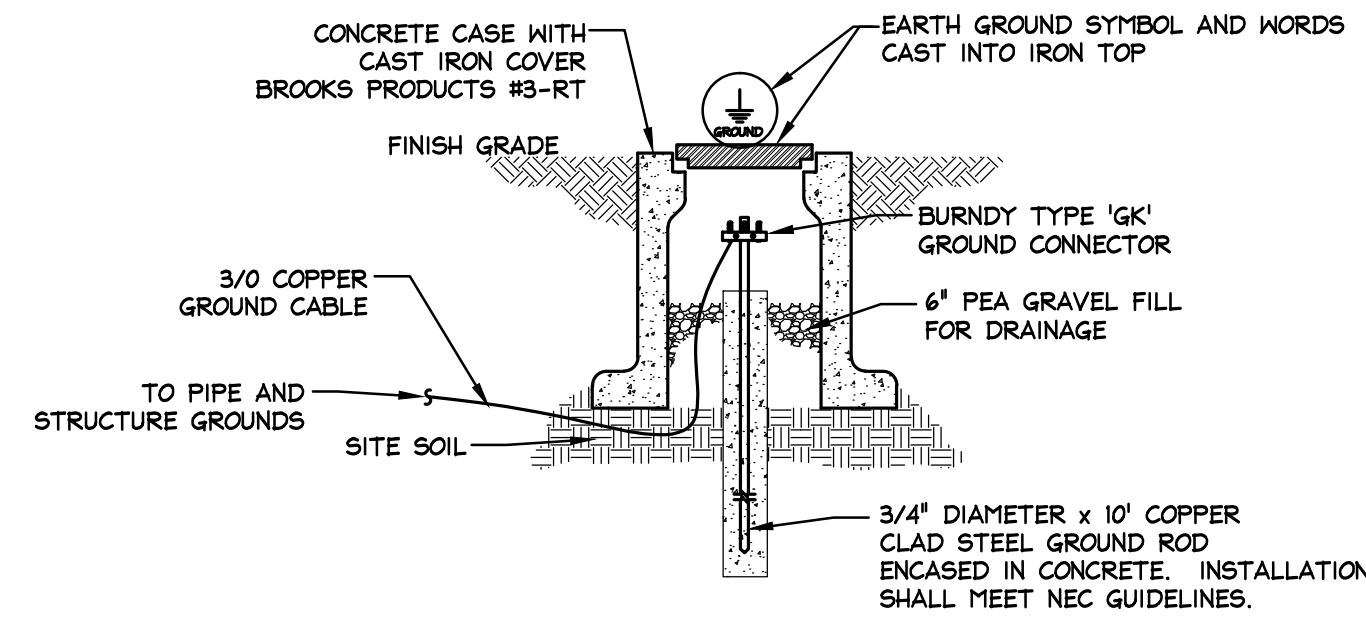
**WATER SYSTEM IMPROVEMENTS
SINGLE PRESSURE PLANE FACILITIES
NORTH PUMP STATION
ELECTRICAL PLANS
CITY OF LUCAS**



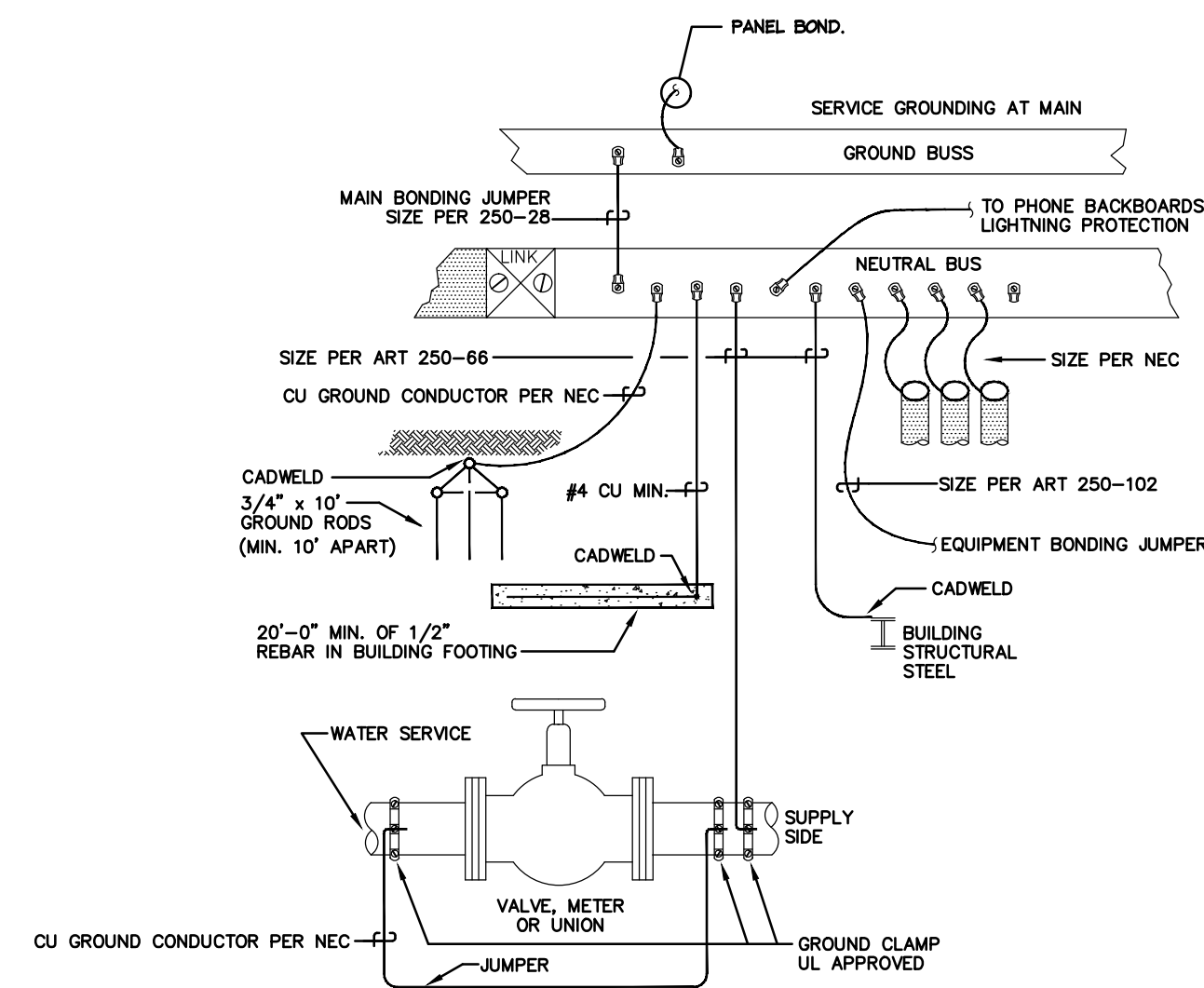
FIRM I.D. # 5279
T. TABOR CONSULTING, PLLC
1301 EAST DEBBIE LANE
SUITE 102-152
MANSFIELD, TEXAS 76063
OFFICE: 817-721-2113
TTABOR@TTC-PLLC.COM
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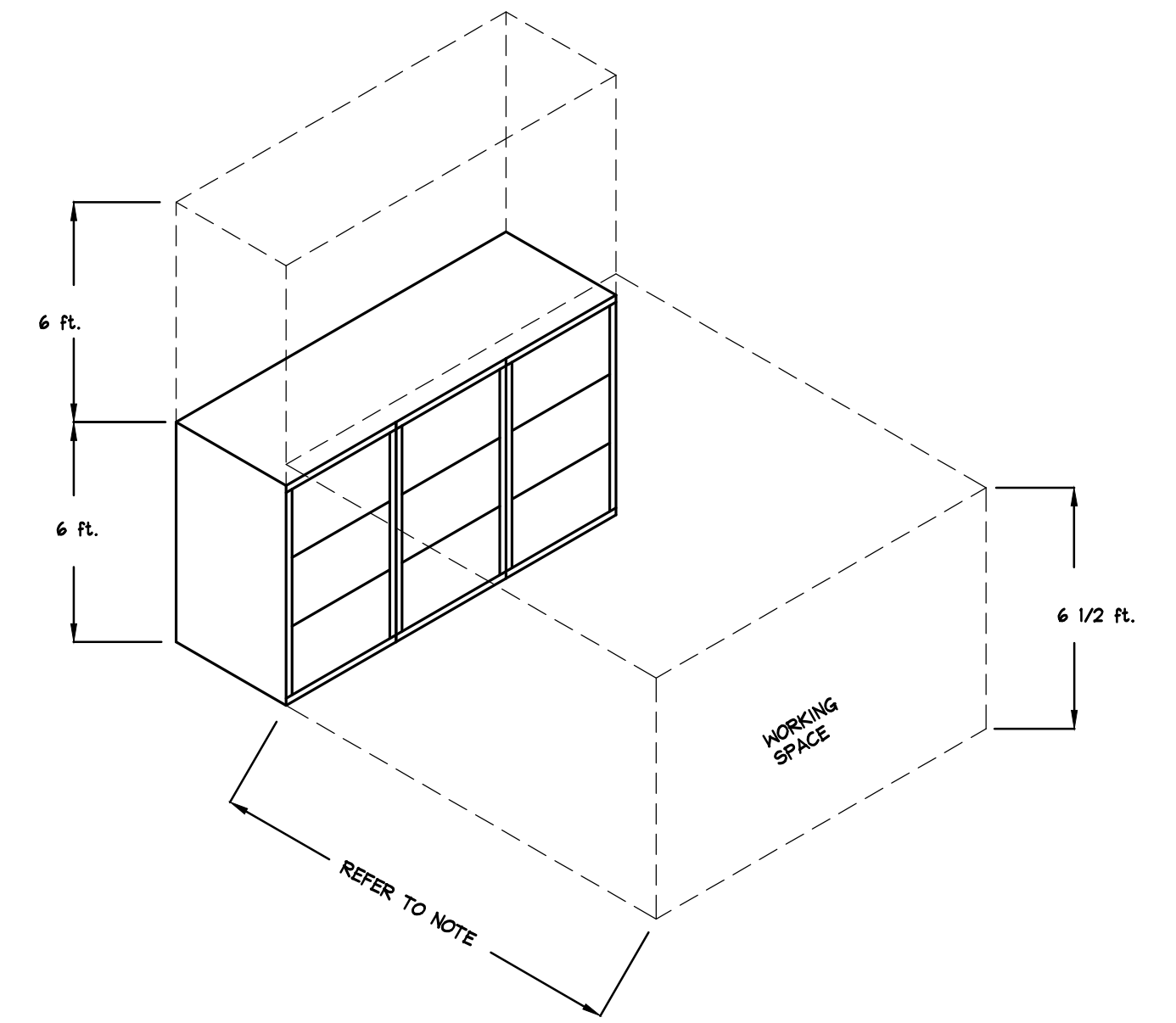
SHEET NO. E-1
OF 11 MEP
JOB NO. 17-1811



03 ELECTRICAL MAIN GROUNDING DETAIL
SCALE: NONE



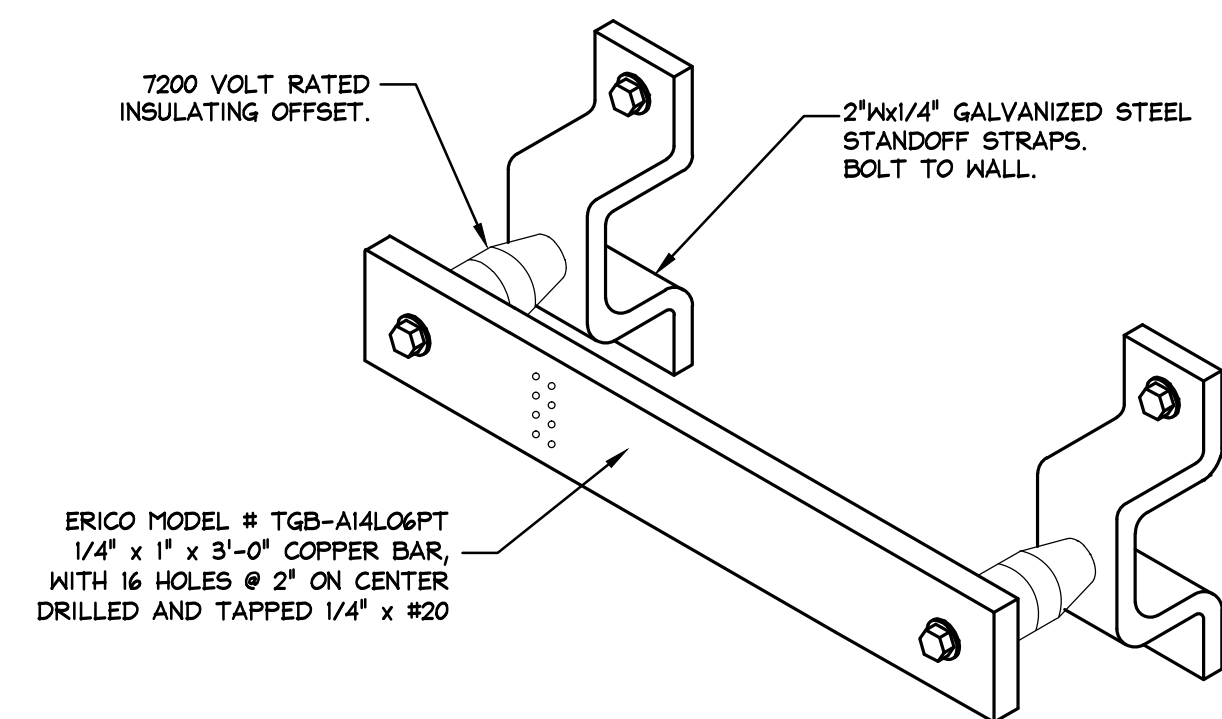
02 GROUNDING DETAIL
SCALE: NONE



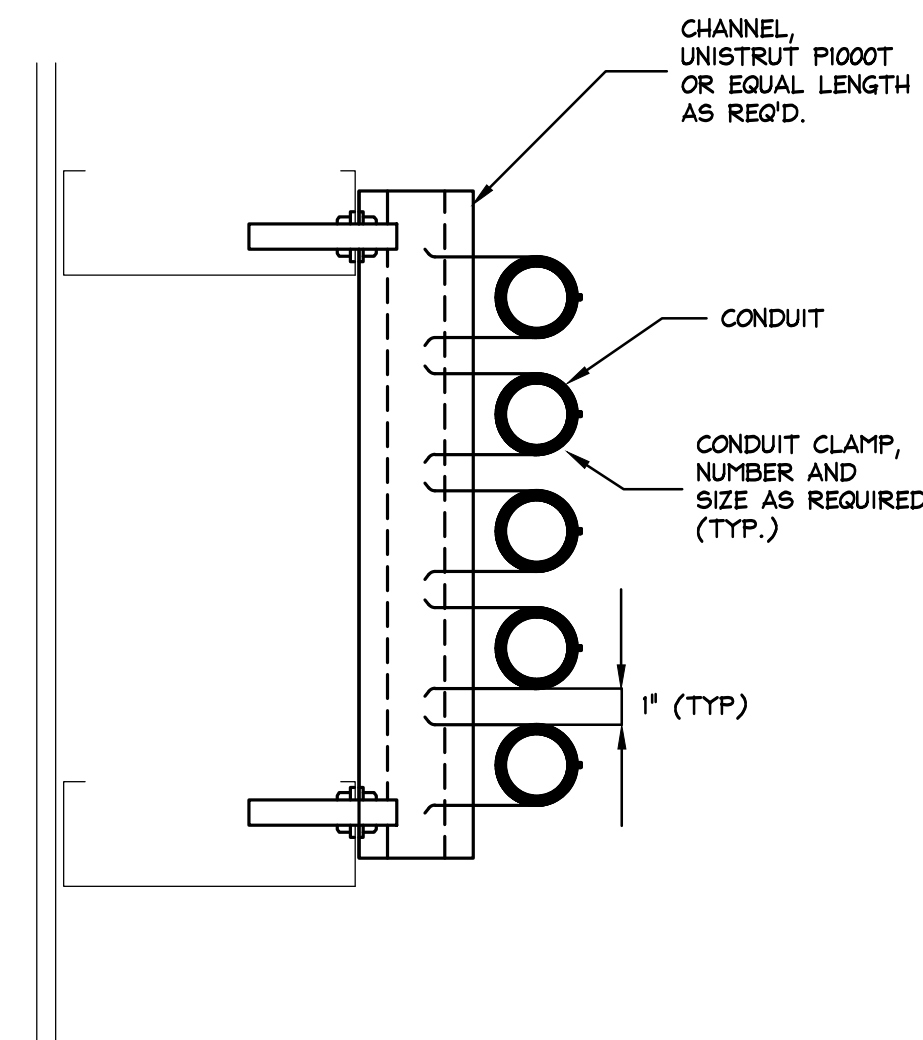
NOMINAL VOLTAGE	MINIMAL CLEAR DISTANCE		
	CONDITION 1	CONDITION 2	CONDITION 3
0 - 150	900 mm (3 FT.)	900 mm (3 FT.)	900 mm (3 FT.)
151 - 600	900 mm (3 FT.)	1 m (3 1/2 FT.)	1.2 m (4 FT.)

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 WORKING SPACE DETAIL
SCALE: NONE



05 GROUNDING BUS DETAIL
SCALE: NONE



04 CONDUIT RACK DETAIL
SCALE: NONE

NO.	DATE	REVISION	REVIEWED
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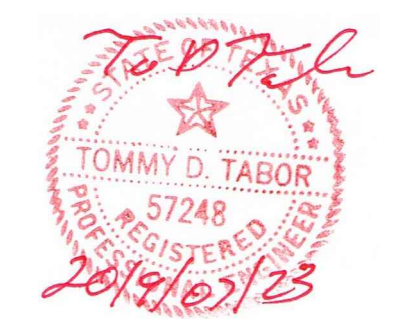
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 REVIEWED: TDT
 SCALE: NONE
 DATE: OCTOBER 12, 2019
 DWG. NAME: ELECTRICAL DETAILS



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
 SINGLE PRESSURE PLANE FACILITIES
 NORTH PUMP STATION
 ELECTRICAL DETAILS
 CITY OF LUCAS**

TTC
 FIRM I.D. # 5279
 T. TABOR CONSULTING, PLLC
 1301 EAST DEBBIE LANE
 SUITE 102-152
 MANSFIELD, TEXAS 76063
 OFFICE: 817-721-2113
 TTABOR@TTC-PLLC.COM
 18-044-E



SHEET NO. E-2
 OF 11 MEP
 JOB NO. 177+811

44,000 AMPS WITHSTAND RATING

MOTOR CONTROL CENTER

277/480V, 3 PH, 4 WIRE,
800 AMP MAIN BUSSING

NO	SERVES	CIRCUIT BREAKER				STARTER TYPE	HP	WIRE & CONDUIT	REMARKS
		FRAME SIZE	POLES	TRIP SIZE	STARTER SIZE				
1	PUMP 1	225	3	200	4	X-LINE	90	(3) #2/0 AND #6 GROUND IN 1-1/2" C.	
2	PUMP 2	225	3	200	4	X-LINE	90	(3) #2/0 AND #6 GROUND IN 1-1/2" C.	
3	PUMP 3	225	3	200	4	X-LINE	90	(3) #2/0 AND #6 GROUND IN 1-1/2" C.	
4	PUMP 4	225	3	200	4	X-LINE	90	(3) #2/0 AND #6 GROUND IN 1-1/2" C.	
5	PUMP 5	225	3	200	4	X-LINE	90	(3) #2/0 AND #6 GROUND IN 1-1/2" C.	
6	XFMR TLA* (30 KVA)	50	3	50	XX	XX	XX	(3) #6 AND #10 GROUND IN 1" C.	
7	FOR SRUGE PROTECTION DEVICE	100	3	60	XX	XX	XX	#6 CU - LEADS SHALL NOT EXCEED 18" IN LENGTH	
8	SPARE	50	3	30	2	X-LINE			
9	SPARE	100	3	100	XX	XX			
10	SPACE	50	3	XX	XX	XX			
11	SPACE	100	3	XX	XX	XX			
12	SPACE	100	3	XX	XX	XX			
13			3						
14			3						

10,000 AMPS WITHSTAND RATING

PANEL - LA		PANELBOARD SCHEDULE CONNECTED LOAD (VA)										
LOAD SERVED	CKT No.	CKT BKR	WIRE	LOAD	PHASE A	PHASE B	PHASE C	LOAD	WIRE	CKT No.	CKT BKR	LOAD SERVED
WALL LOUVERS	1	20	5	500				540	2	20	2	RECEPTACLES
RECEPTACLES	3	20	2	540				1920	3	30	4	EXHAUST FAN
RECEPTACLES	5	20	2	720						20	6	SPARE
COMMUNICATIONS CAB	7	20	5	500				300	5	20	8	(3) IR HEATERS
GATE OPERATOR	9	20	5	800				798	1	20	10	INTERIOR LIGHTING
WATER HEATER	11	40	5	3600				260	1	20	12	EXTERIOR LIGHTING
WALL A/C UNIT	13	20	3	1290				940	1	20	14	SITE LIGHTS
WALL A/C UNIT	15	20	3	700				100	5	20	16	FLOW METER
WALL A/C UNIT	17	20	3	700						20	18	
GEN BAT. CHARGER	19	20	5	500						20	20	
GEN BLOCK HTR	21	20	5	1500						20	22	
										20	24	
										20	26	
										20	28	
										20	30	
										20	32	
										20	34	
										20	36	
										20	38	
										20	40	
										20	42	

VOLTAGE: 208 MAIN TYPE: MCB
PHASE: 3 OCP = 100
WIRE: 4 FEED-THRU LUGS: NO

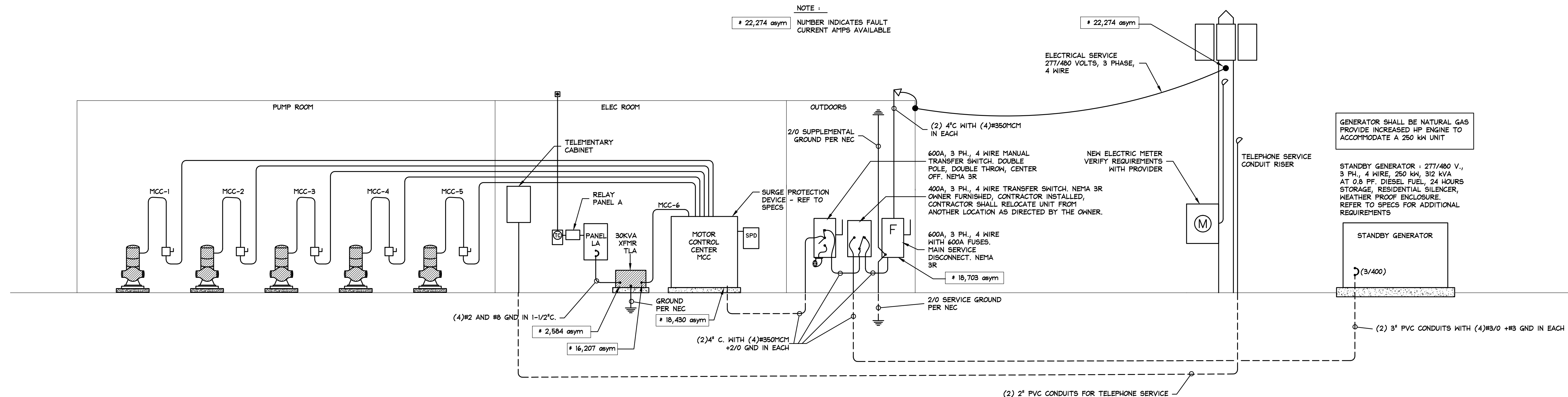
NEC LOAD ANALYSIS		TYPE	VA	PERCENT	VA	VA	VA
CONTINUOUS	1	1998	125%	2498	TOTAL PHASE A	4570	
RECEPTACLE	2	1800	TABLE 220.44	1800	TOTAL PHASE B	6358	
HVAC EQUIPMENT	3	4610	100%	4610	TOTAL PHASE C	5280	
NONCOINCIDENT	4	0	0%	0			
MISC EQUIPMENT	5	7800	100%	7800	CONNECTED LOAD (VA)	16208	
KITCHEN EQUIPMENT	6	0	65%	0	CONNECTED LOAD (A)	45	
MOTOR	7	0	100%	0			
LARGEST MOTOR	8	0	25%	0	DEMAND LOAD (VA)	16708	
DWELLING UNIT	9	0		0	DEMAND LOAD (A)	46	
PANEL FEEDER	9						

* SEE THAT PANEL SCHEDULE FOR ITS SUMMARY

LUMINAIRE SCHEDULE

TAG	MANUFACTURER	MODEL NUMBER	VOLTS	LAMPS	INPUT WATTS	MOUNTING	DESCRIPTION
A	LITHONIA	VAP4000-FST-MD-MVOLT-GZ10-35K80CRI-STSL-CMB-DL	120	4420 LUM 35K	42	CHAIN SUSPENSION	6"x54" GASKETED WATER TIGHT UTILITY LIGHT FIXTURE WITH IMPACT RESISTANT FIBERGLASS REINFORCED POLYESTER HOUSING, WHITE FINISH, ACRYLIC WRAP-AROUND LENS
AE	LITHONIA	VAP4000-FST-MD-MVOLT-GZ10-35K80CRI-STSL-CMB-DL-BSL520	120	4420 LUM 35K	42	CHAIN SUSPENSION	SAME AS TYPE "A" EXCEPT WITH EMERGENCY BATTERY PACK
B	LITHONIA	OLFL-14BZ	120	1900 LUM 40K	25.4	WALL MOUNTED	WALL MOUNTED SECURITY FLOOD LIGHT, AIMABLE AND ADJUSTABLE, DARK BRONZE FINISH
C	LITHONIA	OLWP OLED-P1-40K-120-BZ	120	1414 LUM 40K	22.8	WALL MOUNTED	WALL MOUNTED ENTRY LIGHT, MOUNT AT 8'-0" AFF. DARK BRONZE FINISH

ALL FIXTURES MAY NOT APPLY
EC SHALL CONFIRM MOUNTING HEIGHTS OF ALL FIXTURES WITH ARCHITECT PRIOR TO ROUGH-IN.
EC SHALL COORDINATE DIMENSIONED LOCATIONS OF ALL FIXTURES WITH ARCHITECTS DRAWINGS PRIOR TO ROUGH-IN.
EC SHALL PROVIDE ALL NECESSARY HARDWARE/INSTALLATION TO MAINTAIN THE INTEGRITY OF FIRE RATED ASSEMBLIES IN WHICH FIXTURES ARE INSTALLED.
B.O.F. = BOTTOM OF FIXTURE



01 ELECTRICAL RISER DIAGRAM
SCALE: NONE

NO.	DATE	REVISION	REVIEWED
6			
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DRAWN: GCH
DESIGN: GCH
REVIEWED: TDT
SCALE: NONE
DATE: JULY 2019
DWG. NAME: ELEC RISER & SCHEDULES



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
SINGLE PRESSURE PLANE FACILITIES
NORTH PUMP STATION
ELECTRICAL RISER & SCHEDULES
CITY OF LUCAS

TTC
FIRM I.D. # 5279
T. TABOR CONSULTING, PLLC
1301 EAST DEBBIE LANE
SUITE 102-152
MANSFIELD, TEXAS 76063
OFFICE: 817-721-2113
TTABOR@TTC-PLLC.COM
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SHEET NO. E-3
OF 11 MEP
JOB NO. 17-1811

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:

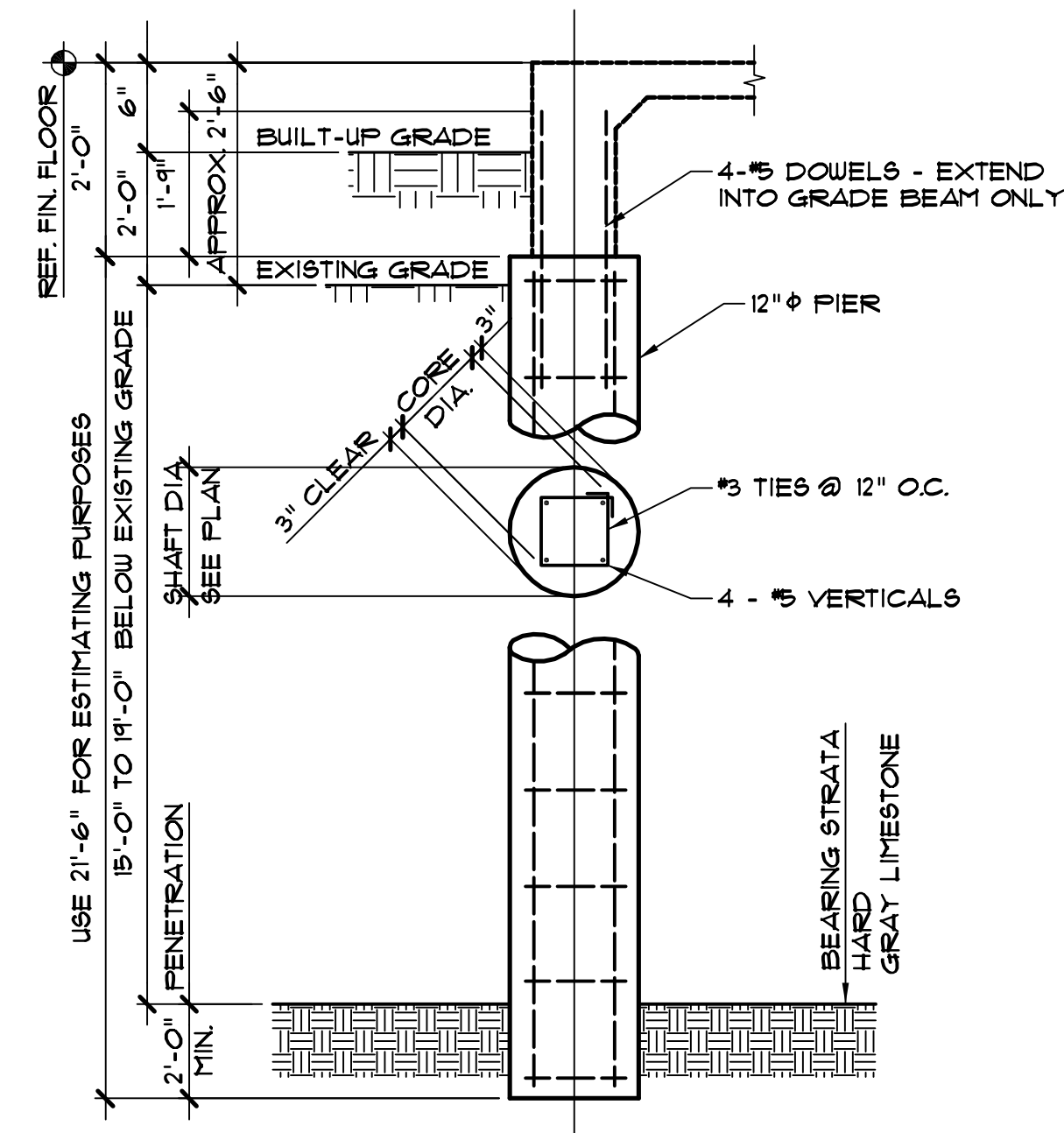
- THE FOUNDATION HAS BEEN DESIGNED IN ACCORDANCE WITH THE SOILS ANALYSIS REPORT PREPARED BY ALLIANCE GEOTECHNICAL GROUP, DATED MARCH 13, 2019 (AGG. NO. DE18-165).
- THE CONTRACTOR SHOULD BE FULLY KNOWLEDGEABLE OF THE CONTENTS OF THE SOILS REPORTS.
- ANY CONDITION FOUND, PRIOR TO OR DURING CONSTRUCTION, 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 AND EXISTING PAVEMENTS.
- THE ENTIRE SUBGRADE SHOULD BE PROOFROLLED.
- PROOFROLLING CAN GENERALLY BE ACCOMPLISHED USING A HEAVY (25 TON OR GREATER TOTAL WEIGHT) PNEUMATIC TIRED ROLLER MAKING SEVERAL PASSES OVER THE AREAS.
- NOT USED.
- THE PROOF ROLLING SHOULD CONSIST OF SEVERAL OVERLAPPING PASSES IN MUTUALLY PERPENDICULAR DIRECTIONS OVER A GIVEN AREA.
- WHERE SOFT, LOOSE OR COMPRESSIBLE ZONES ARE ENCOUNTERED, THESE AREAS SHOULD BE REMOVED TO A FIRM SUBGRADE.
- WET OR VERY MOIST SURFICIAL MATERIALS MAY NEED TO BE UNDERCUT AND EITHER DRIED OR REPLACED WITH PROPER COMPACTION OR REPLACED WITH A MATERIAL WHICH CAN BE PROPERLY COMPACTED.
- ANY RESULTING VOID AREAS SHOULD BE BACKFILLED TO FINISHED SUBGRADE IN 8 INCH COMPACTED LIFTS COMPACTED TO 95% ASTM D 698 AT OPTIMUM TO +3% ABOVE OPTIMUM MOISTURE CONTENT.
- THE UPPER EIGHT (8) INCHES OF SUBGRADE SOIL SHOULD BE COMPACTED AT -1% TO +2% OF OPTIMUM MOISTURE TO A MINIMUM OF 98% STANDARD PROCTOR DENSITY (ASTM D 698).
- AFTER PROOFROLLING IS PERFORMED AND ANY SOFT, LOOSE OR COMPRESSIBLE ZONES ARE REMOVED AND REPLACED, COMPACT UPPER 8 INCHES OF SUBGRADE TO 95% ASTM D 698 AS SPECIFIED ABOVE.
- THEN FILL TO PAVEMENT SUBGRADE USING ON-SITE CLAY SOILS.
- COMPACT THE FILL IN 8 INCH COMPACTED LIFTS COMPACTED AT OPTIMUM TO +3% ABOVE OPTIMUM TO 95% ASTM D 698.
- THE UPPER EIGHT (8) INCHES OF SUBGRADE SOIL SHOULD BE COMPACTED AT -1% TO +2% OF OPTIMUM MOISTURE TO A MINIMUM OF 98% STANDARD PROCTOR DENSITY (ASTM D 698).
- IF IMPORTED FILL MATERIALS ARE USED, THEY SHOULD BE CLEAN SOIL WITH LIQUID LIMIT (LL) OF LESS THAN 35 PERCENT 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 OF THE UNDERLYING SUBGRADE.
- POSITIVE DRAINAGE MUST BE PROVIDED AWAY FROM THE STRUCTURE TO PREVENT THE PONDING OF WATER IN THE SELECT FILL.
- THE PUMP BUILDING FOUNDATION SHALL BE PLACED ON A MINIMUM TWO (2) FOOT THICK PAD OF SELECT FILL.
- SITE GRADING OPERATIONS, WHERE REQUIRED, SHALL BE PERFORMED IN ACCORDANCE WITH GENERALLY ACCEPTABLE STANDARDS.
- 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.
- A 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.

NOTE:
REFER TO THE SOILS REPORT FOR ALL PAD AND PAVEMENT SOIL PREPERATION AND COMPACTION.

CONCRETE:

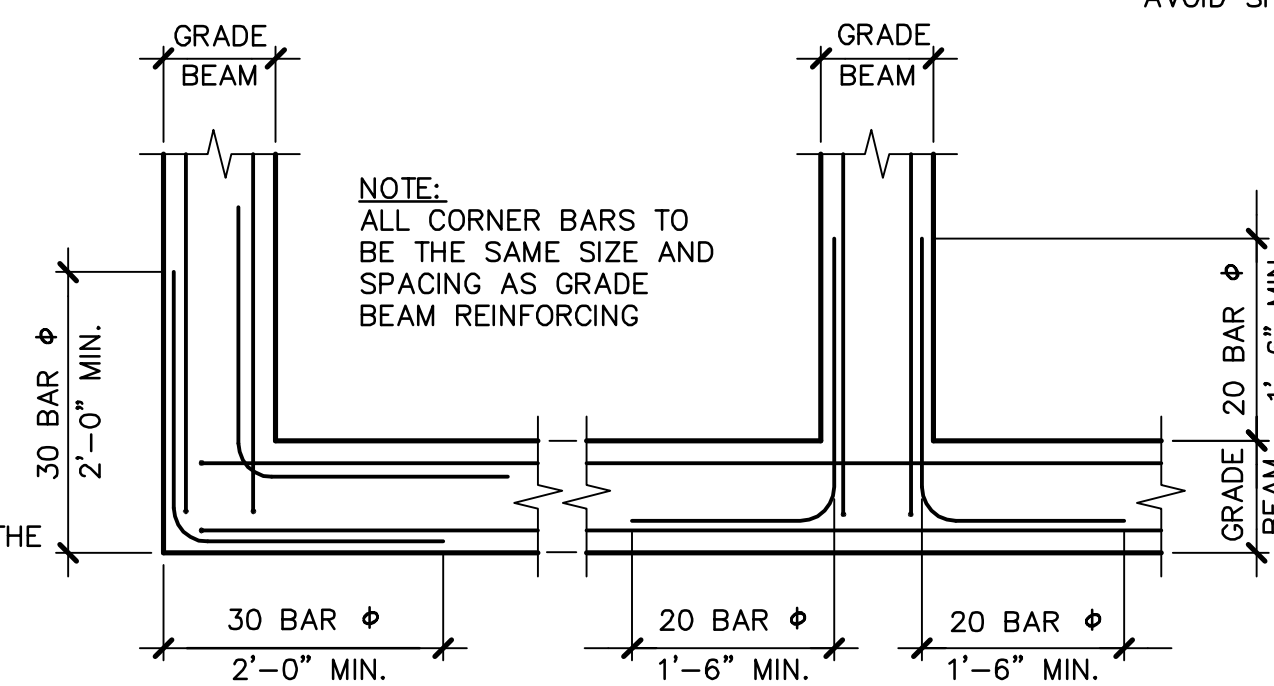
- CONCRETE WORK SHALL BE EXECUTED IN STRICT ACCORDANCE WITH THE LATEST EDITION OF THE AMERICAN CONCRETE INSTITUTE BUILDING CODE (ACI 318-11).
- CONCRETE AND REINFORCING SPECIFICATIONS AS FOLLOWS:

	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, CIVIL AND MECHANICAL PLANS FOR VERIFICATION OF ALL DEPRESSIONS, OPENINGS, CAST-IN-PLACE ACCESSORIES, ETC.
- PIERS:**
 - ALL PIERS SHALL BE STRAIGHT DRILLED, REINFORCED CONCRETE SHAFTS SITUATED IN THE HARD GRAY LIMESTONE AT DEPTHS OF FIFTEEN (15) TO NINETEEN (19) FEET BELOW EXISTING GRADE.
 - THE SHAFTS SHOULD PENETRATE THE STRATUM A MINIMUM OF TWO (2) FEET.
 - EXTENSIONS OF THE PIERS SHOULD BE THE SAME DIAMETER AS THE PIERS, AND THE CROSS SECTION OF THE PIER SHAFT SHOULD NOT BE ALLOWED TO ENLARGE AT THE GROUND LEVEL.
 - COMPLETE INSTALLATION OF THE INDIVIDUAL SHAFTS SHOULD BE ACCOMPLISHED WITHIN EIGHT (8) HOURS AFTER DRILLING.
 - PIER HOLES LEFT OPEN LONGER THAN EIGHT (8) HOURS SHOULD BE RE-EVALUATED PRIOR TO FILLING WITH CONCRETE.
 - GROUNDWATER SEEPAGE WILL LIKELY BE ENCOUNTERED DURING INSTALLATION, IN WHICH CASE ANY EXCESSIVE WATER SHALL BE REMOVED BEFORE CONCRETE IS PLACED.
 - IN MOST CASES, RAPID PLACEMENT OF CONCRETE AND STEEL WILL PERMIT SHAFT INSTALLATION TO PROCEED; HOWEVER, THE SEEPAGE RATES COULD BE SUFFICIENT TO REQUIRE THE USE OF TEMPORARY CASING.
 - IN THOSE INSTANCES WHERE CASING IS REQUIRED, IT SHOULD BE SEATED IN THE PRIMARY FORMATION (HARD GRAY LIMESTONE) AND ALL WATER AND MOST LOOSE MATERIAL REMOVED PRIOR TO EXTENDING THE SHAFT.
 - CARE SHOULD THEN BE TAKEN TO INSURE THAT A SUFFICIENT HEAD OF PLASTIC CONCRETE IS MAINTAINED WITHIN THE CASING DURING EXTRACTION.
 - TEMPORARY CASING WILL NOT BE REQUIRED IF THE DRILLING OPERATIONS CAN BE HANDLED IN SUCH A WAY THAT NO MORE THAN ONE INCH OF WATER IS IN THE HOLE AT THE TIME OF CONCRETING.
 - PENETRATION INTO THE BEARING STRATUM SHOULD ONLY BE COUNTED BELOW THE BOTTOM OF THE CASING.
 - A COLLECTION HOPPER SHOULD BE USED TO ASSURE THAT THE CONCRETE DROPS VERTICALLY INTO THE PIER HOLE WITHOUT SEGREGATING.
 - INSPECTION OF THE PIER DRILLING OPERATIONS BY A REPRESENTATIVE OF ALLIANCE GEOTECHNICAL GROUP IS REQUIRED.
 - THE INSPECTOR CAN ASSURE THAT THE PIERS ARE FULL SIZE, CLEAN AND DRY AT THE TIME OF CONCRETING AND THAT PROPER CONCRETING PROCEDURES ARE USED IN CONSTRUCTING THE PIERS.
 - A "MUSHROOM" AT THE TOP OF THE PIER WOULD ALLOW VERY LARGE UPLIFT PRESSURES TO DEVELOP, AND THE ENLARGEMENT SHOULD NOT BE ALLOWED TO OCCUR.
 - PIER CAPS SHOULD HAVE VOID BOX PROTECTION.
 - ALL PIER HOLES SHOULD BE INSPECTED, ON A CONTINUOUS BASIS, BY ALLIANCE GEOTECHNICAL GROUP PERSONNEL TO HELP VERIFY THE CORRECT BEARING STRUM.
 - THE DESIGN PENETRATION OF INDIVIDUAL SHAFTS SHOULD BE EXCAVATED IN A CONTINUOUS OPERATION AND CONCRETE PLACED AS SOON AS PRACTICAL AFTER COMPLETION OF THE DRILLING.
- SEE CIVIL PLANS FOR VERIFICATION OF ALL DEPRESSIONS, OPENINGS, CAST-IN-PLACE ACCESSORIES, ETC.



1 TYPICAL PIER DETAIL (OPTIONAL)

N. T. S.
END BEARING:



2 TYPICAL CORNER BAR DETAIL

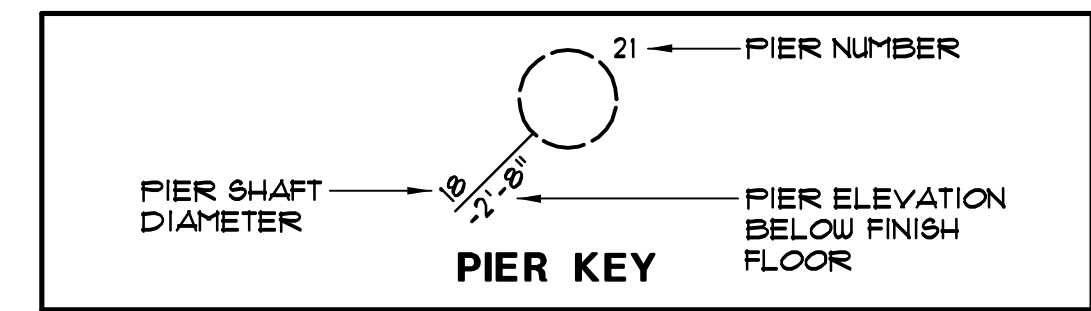
N. T. S.

VOID BOXES:

- GRADE BEAMS SHOULD BE SUPPORTED BY PIERS AND A MINIMUM VOID SPACE OF SIX (6) INCHES PROVIDED BETWEEN THE BOTTOM OF THE GRADE BEAMS AND THE SOIL SUBGRADE.
- A VOID BOX IS NOT REQUIRED FOR GRADE BEAMS UNDERLAIN BY TAN LIMESTONE OR SELECT FILL THAT EXTENDS TO THE TOP OF THE TAN OR GREY LIMESTONE.
- STRUCTURAL CARDBOARD FORMS ARE ONE ACCEPTABLE MEANS OF PROVIDING THIS VOID BENEATH CAST-IN-PLACE BEAMS.
- A SOIL RETAINER SHOULD BE PROVIDED TO HELP PREVENT IN-FILLING OF THE VOID.
- CARE IS REQUIRED IN THE USE OF THE CARDBOARD FORMS TO AVOID COLLAPSING THE VOIDS DURING CONCRETE PLACEMENT.

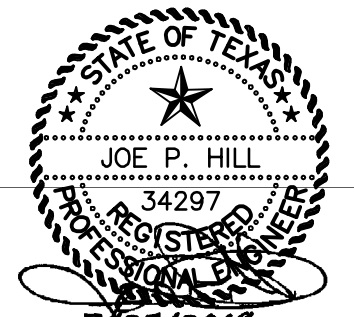
TYPICAL PIER REINFORCING				
PIER MARK	SHAFT DIAMETER	CORE DIAMETER	VERTICAL BARS	SQUARE TIES AND SPACING
A	12"	6"	4-#5's	(*) AT 12" o.c.
B	14"	8"	4-#6's	(*) AT 12" o.c.
C	16"	10"	4-#7's	#3'S AT 12" o.c.
D	18"	12"	8-#6's	#3'S AT 12" o.c.
E	20"	14"	8-#6's	#3'S AT 12" o.c.
F	24"	18"	8-#7's	#3'S AT 12" o.c.
G	26"	20"	12-#6's	#3'S AT 12" o.c.
H	30"	24"	12-#7's	#3'S AT 12" o.c.
I	36"	30"	12-#9's	#3'S AT 12" o.c.
J	42"	36"	12-#10's	#3'S AT 12" o.c.
K	48"	42"	16-#10's	#3'S AT 12" o.c.
L	54"	48"	16-#11's	#3'S AT 12" o.c.
M	60"	54"	16-#14's	#3'S AT 12" o.c.
N	66"	60"	16-#14's	#3'S AT 12" o.c.

(*) INDICATES 1/4" ROUNDO STOCK



3 TYPICAL GRADE BEAM REINFORCING

N. T. S.



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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

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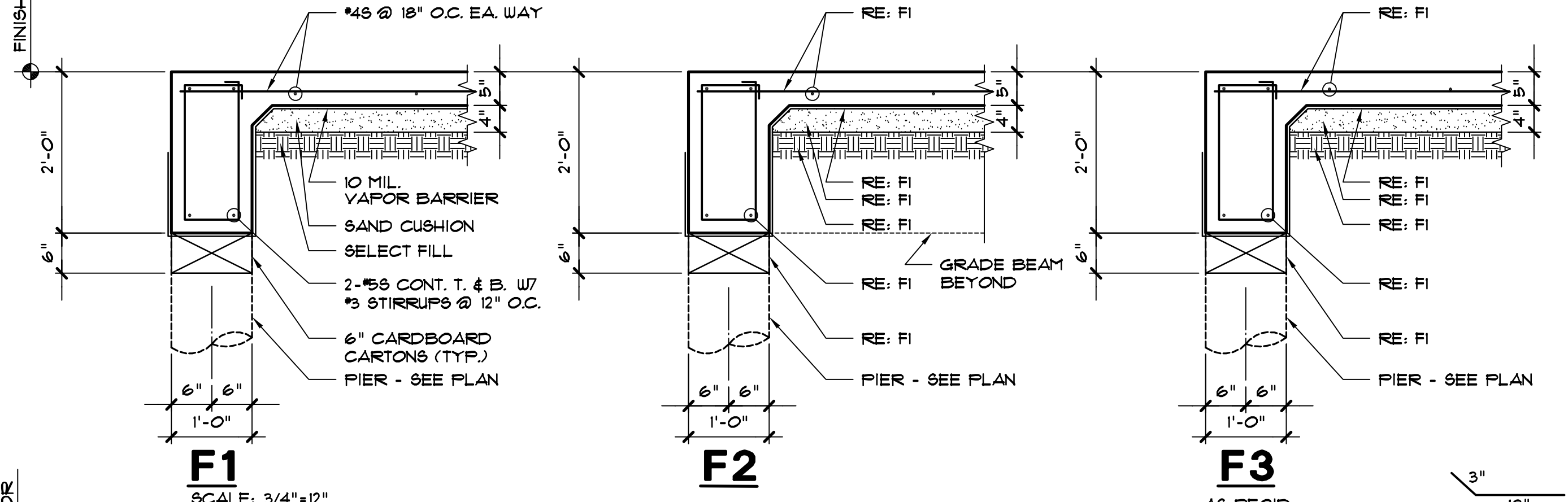
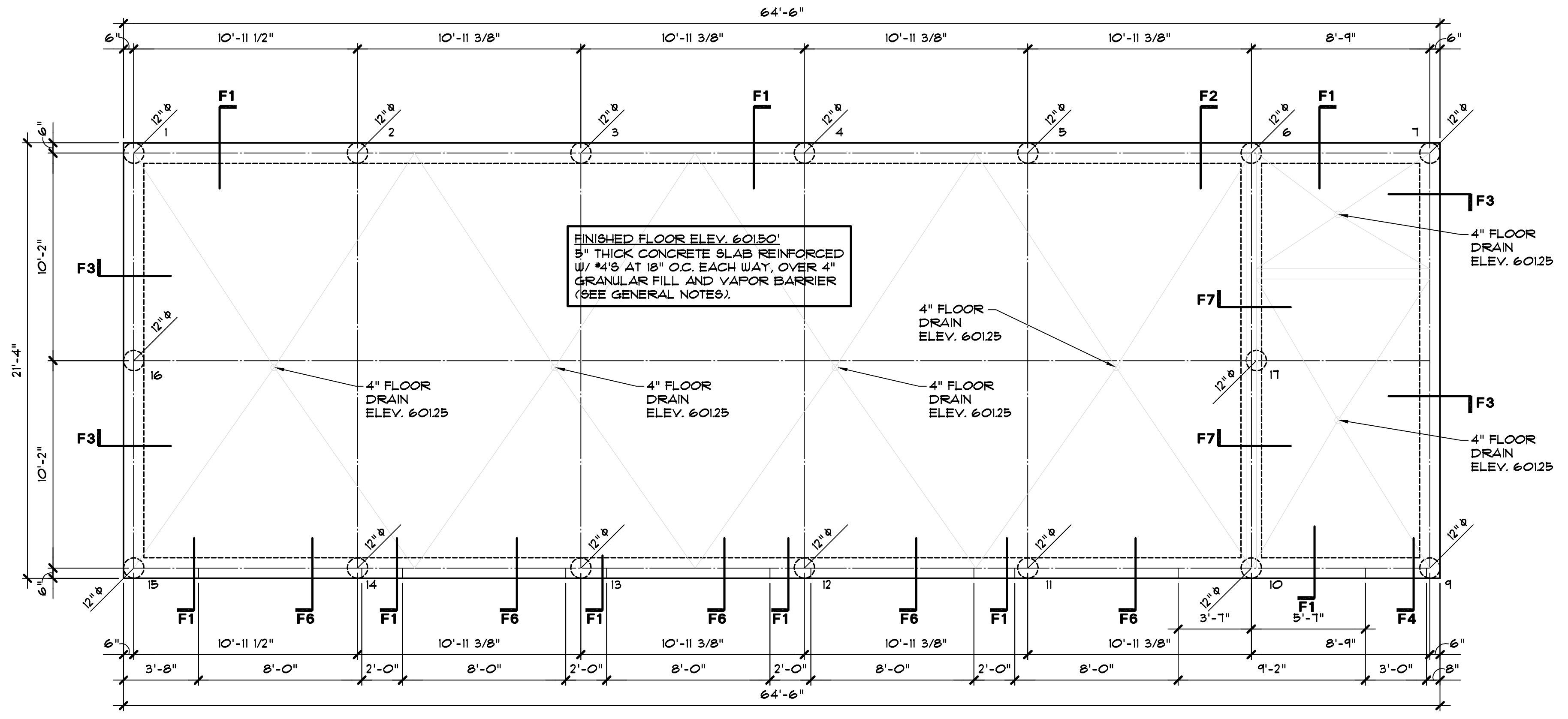
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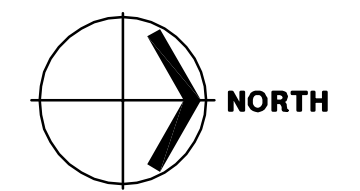
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1919 S. Shiloh Road
Suite 500, L.B. 27
Garland, Texas 75042
(972) 864-8200 (T) (972) 864-8220 (F)
Firm Registration No. F-5290

**WATER SYSTEM IMPROVEMENTS
SINGLE PRESSURE PLANE FACILITIES
NORTH PUMP STATION
STRUCTURAL GENERAL NOTES
CITY OF LUCAS**

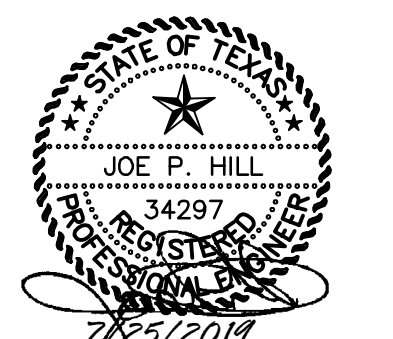
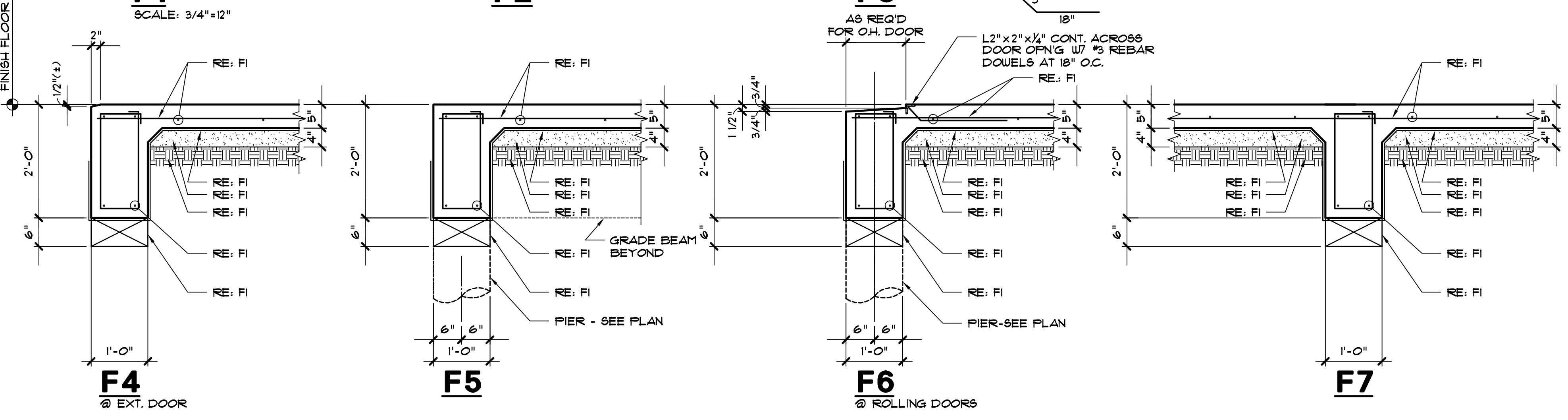
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OF SHEETS
JOB NO. 17-1811



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



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



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

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

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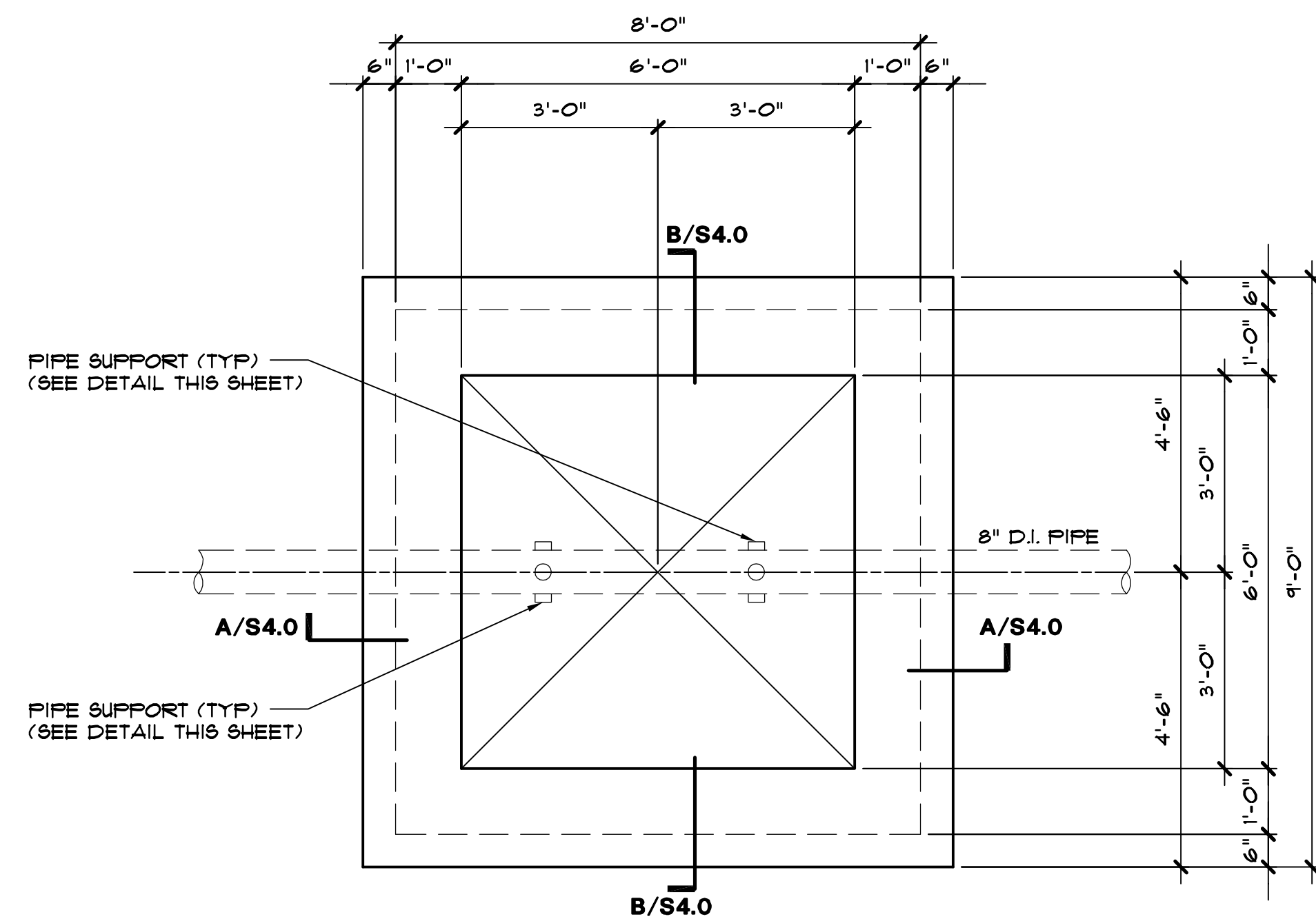


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Suite 500, L.B. 27
Garland, Texas 75042
(972) 864-8200 (T) (972) 864-8220 (F)
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WATER SYSTEM IMPROVEMENTS
SINGLE PRESSURE PLANE FACILITIES
NORTH PUMP STATION
FOUNDATION/FLOOR PLAN
CITY OF LUCAS

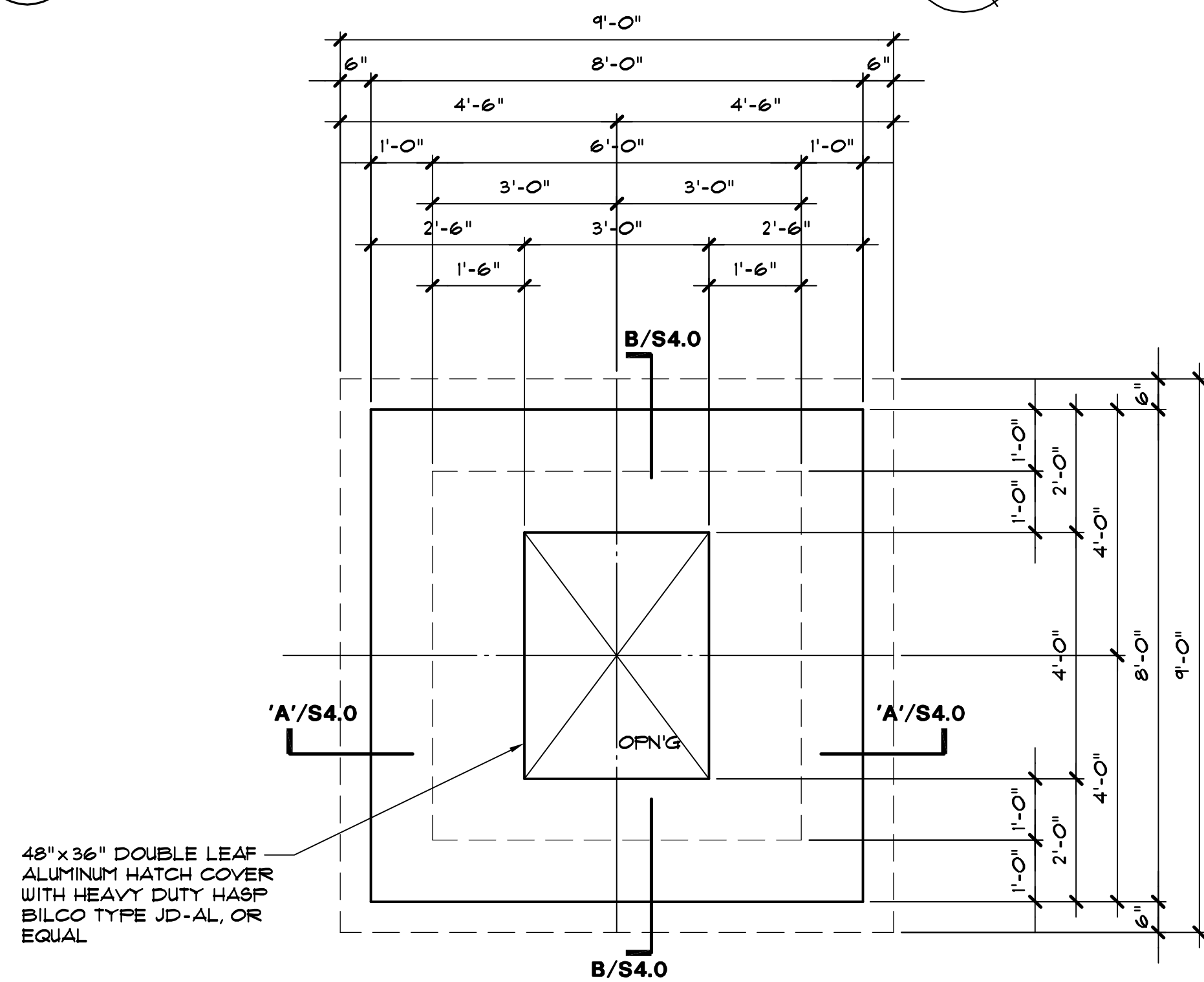
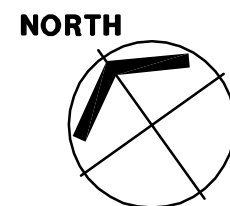
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JOB NO. 17-1811

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01 VALVE VAULT PLAN (BOTTOM)

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



02 VALVE VAULT PLAN (TOP)

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

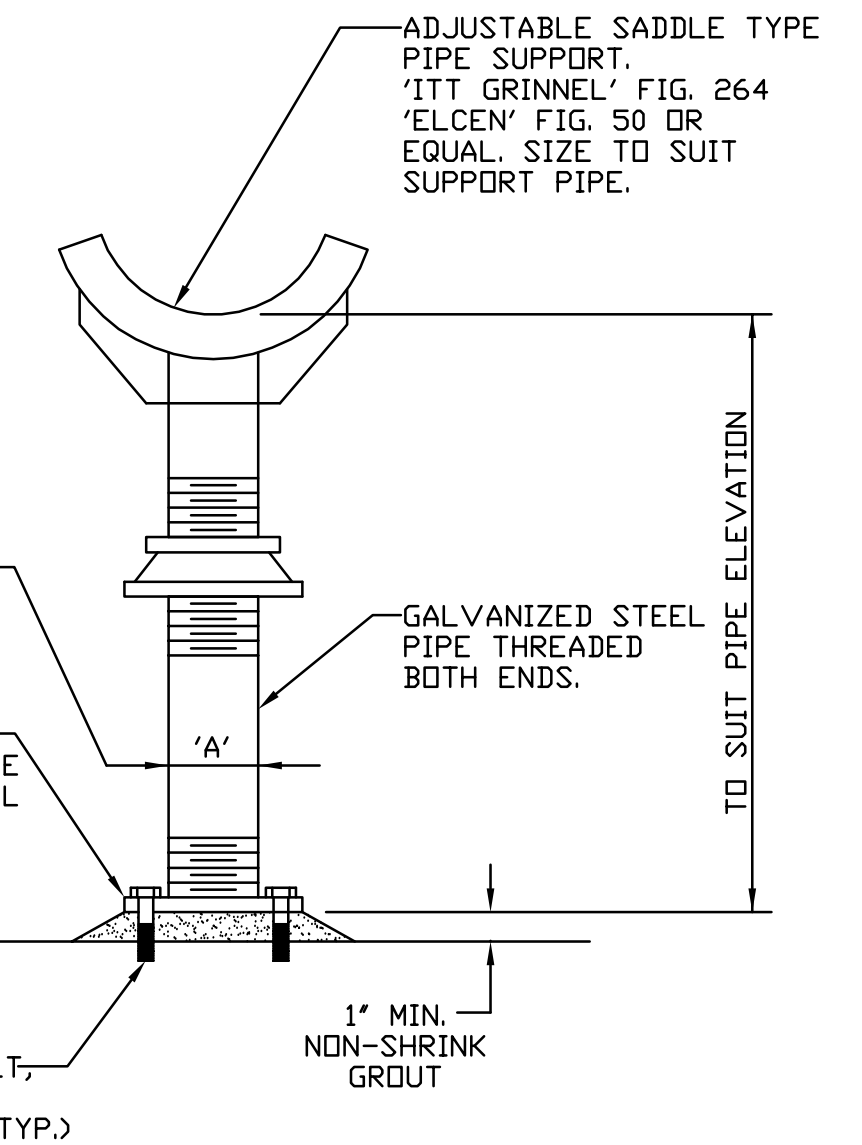


TABLE 1	
SUPPORTED PIPE SIZE	'A'
LESS THAN 3-1/2'	2'
4' THRU 12'	3'
14' THRU 16'	4'
16' AND OVER	6'

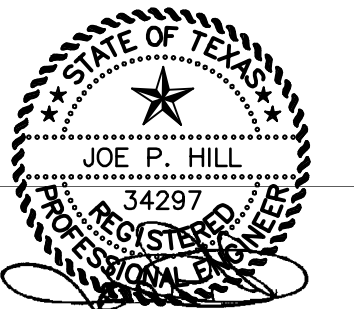
NOMINAL DIA. SEE TABLE 1, 'A' DIMENSION

C.L. FLANGED "CLOW" REGULAR REDUCING FLANGE (3x9) OR F-1900 OR EQUAL SIZE TO SUIT 'A'.

3/4" 0x6" EXPANSION BOLT, 4-REQUIRED PER FLANGED SYMMETRICALLY PLACED (TYP.)



ADJUSTABLE PIPE SUPPORT
NOT TO SCALE



7/25/2019
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TEXAS FIRM REG. No. F-2335



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CONSULTING STRUCTURAL ENGINEERING
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Suite 440, DeSoto, Texas 75115
(972) 283-5111
FAX (972) 283-5113

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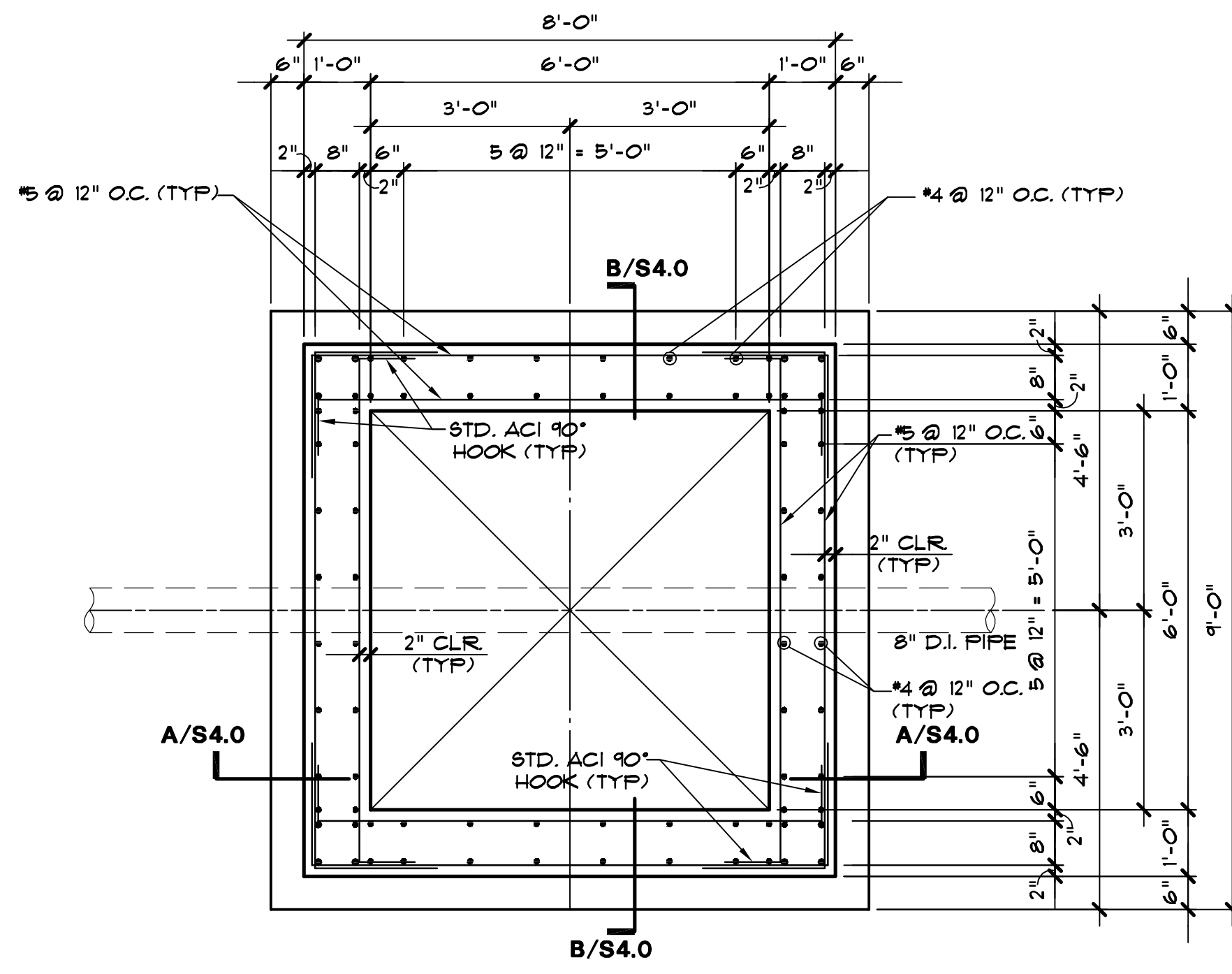
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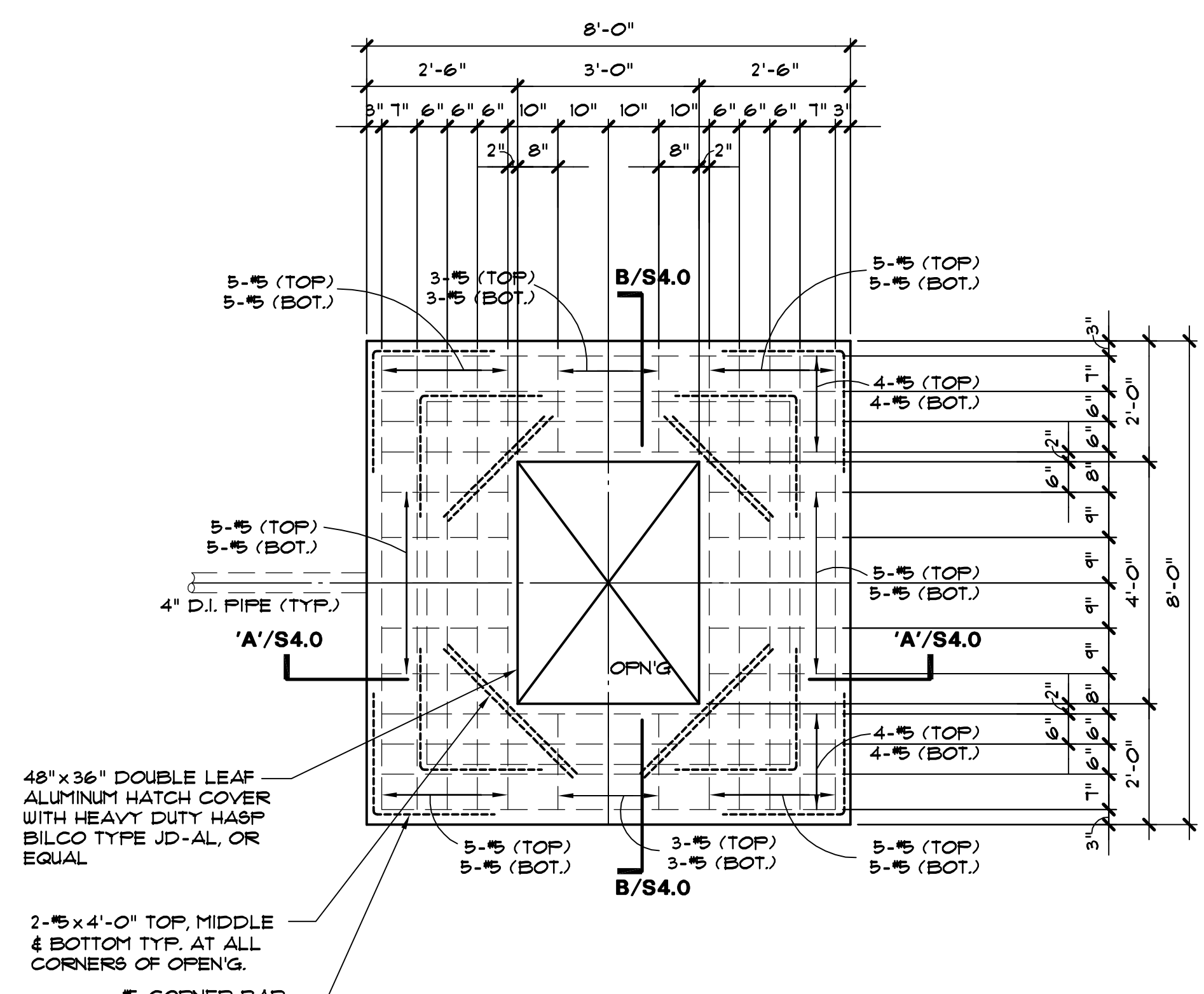
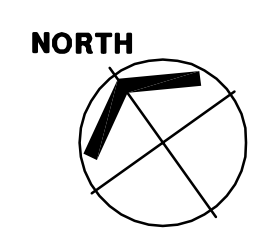
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1919 S. Shiloh Road
Suite 500, L.B. 27
Garland, Texas 75042
(972) 864-8200 (T) (972) 864-8220 (F)
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**WATER SYSTEM IMPROVEMENTS
SINGLE PRESSURE PLANE FACILITIES
NORTH PUMP STATION
VALVE VAULT PLAN
CITY OF LUCAS**

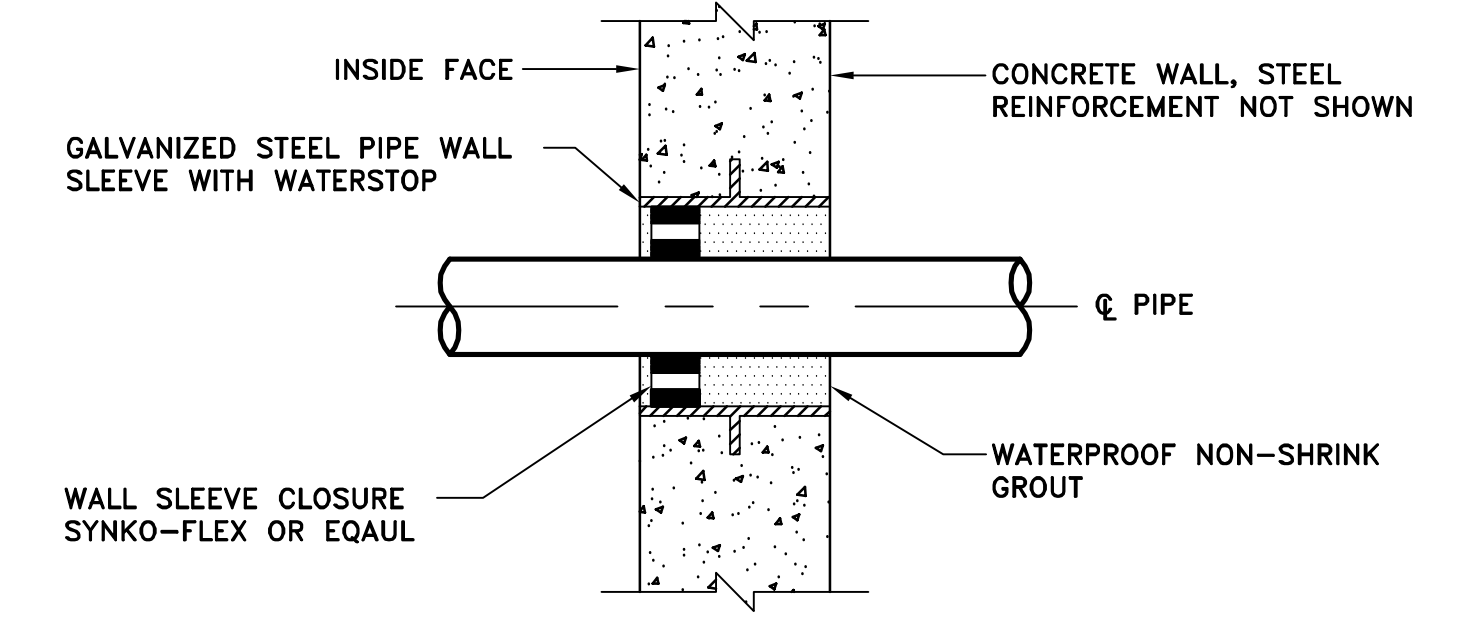
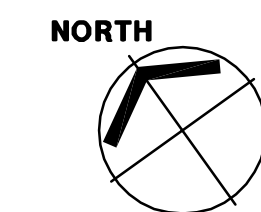
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OF SHEETS
JOB NO. 17-1811



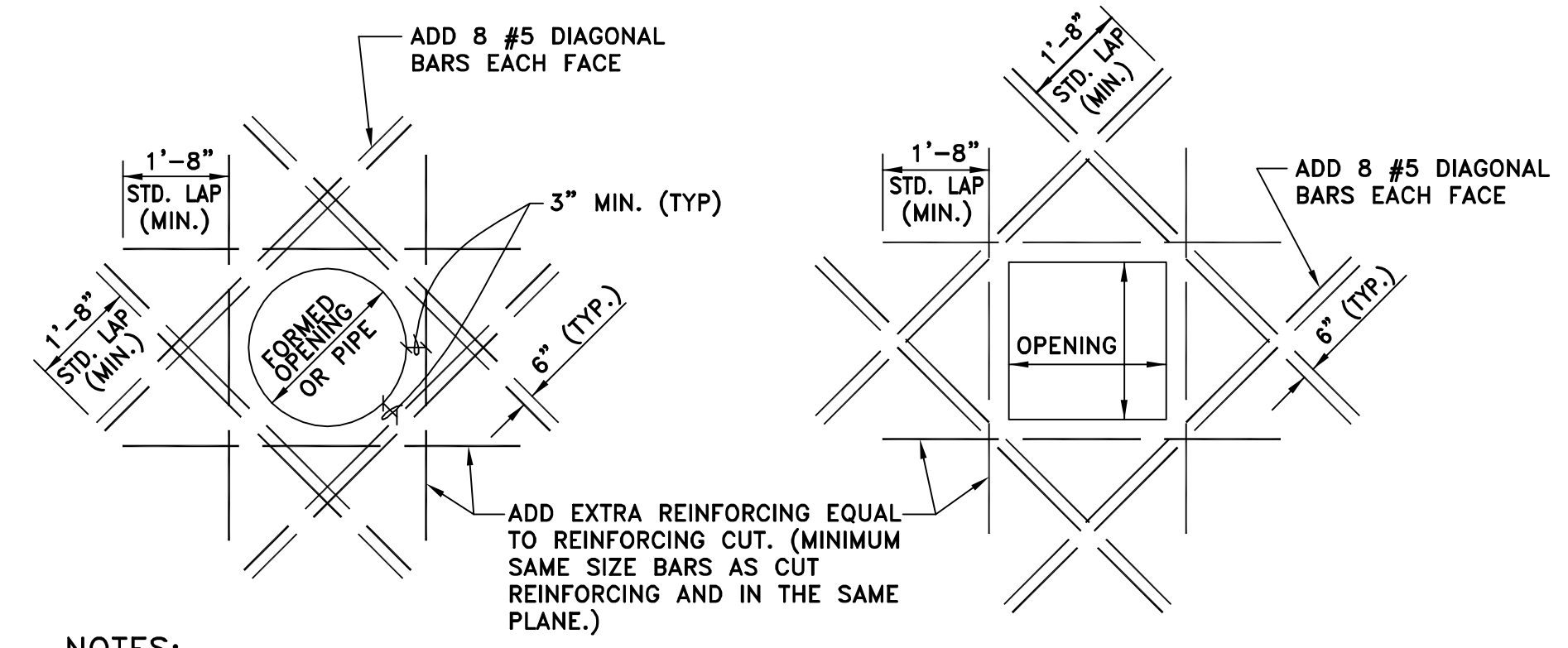
01 VALVE VAULT WALL REINFORCING PLAN
SCALE: 1/2" = 1'-0"



02 VALVE VAULT TOP REINFORCING PLAN
SCALE: 1/2" = 1'-0"

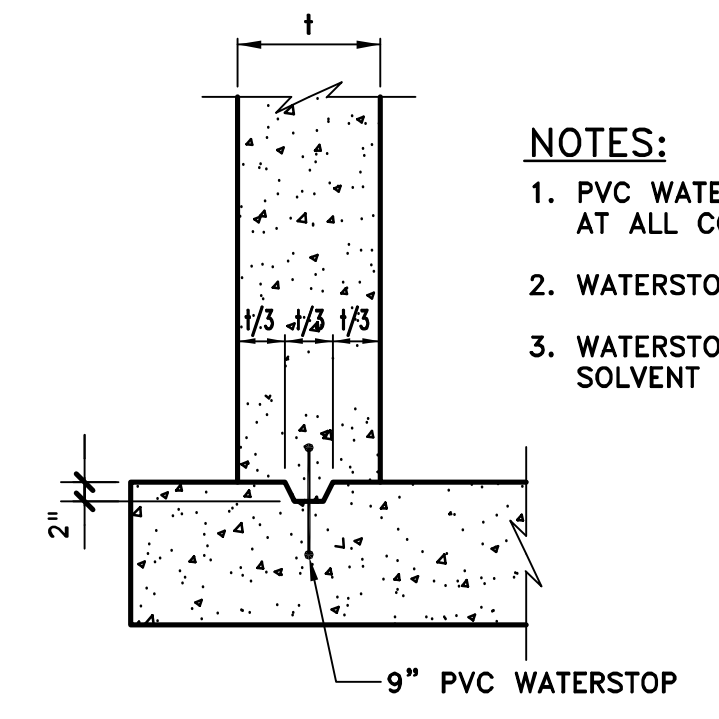


WALL SLEEVE CLOSURE DETAIL
NOT TO SCALE



- NOTES:**
1. SPREAD AND/OR CUT REINFORCING AT OPENINGS. SPREAD BARS NO MORE THAN ONE HALF TYPICAL BAR SPACE.
 2. TWO ADDITIONAL #5 VERTICAL BARS SHALL BE LOCATED TO EITHER SIDE OF THE OPENING, EACH FACE.

REINFORCING AT WALL AND SLAB PENETRATION
SCALE: 1/2" = 1'-0"



- NOTES:**
1. PVC WATERSTOP SHALL BE INSTALLED AT ALL CONSTRUCTION JOINTS.
 2. WATERSTOP SHALL BE CONTINUOUS.
 3. WATERSTOP SPLICES SHALL BE SOLVENT WELDED.

WATERSTOP DETAIL
NOT TO SCALE



STD. ACI 90° HOOK
NOT TO SCALE



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TEXAS FIRM REG. No. F-2335

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

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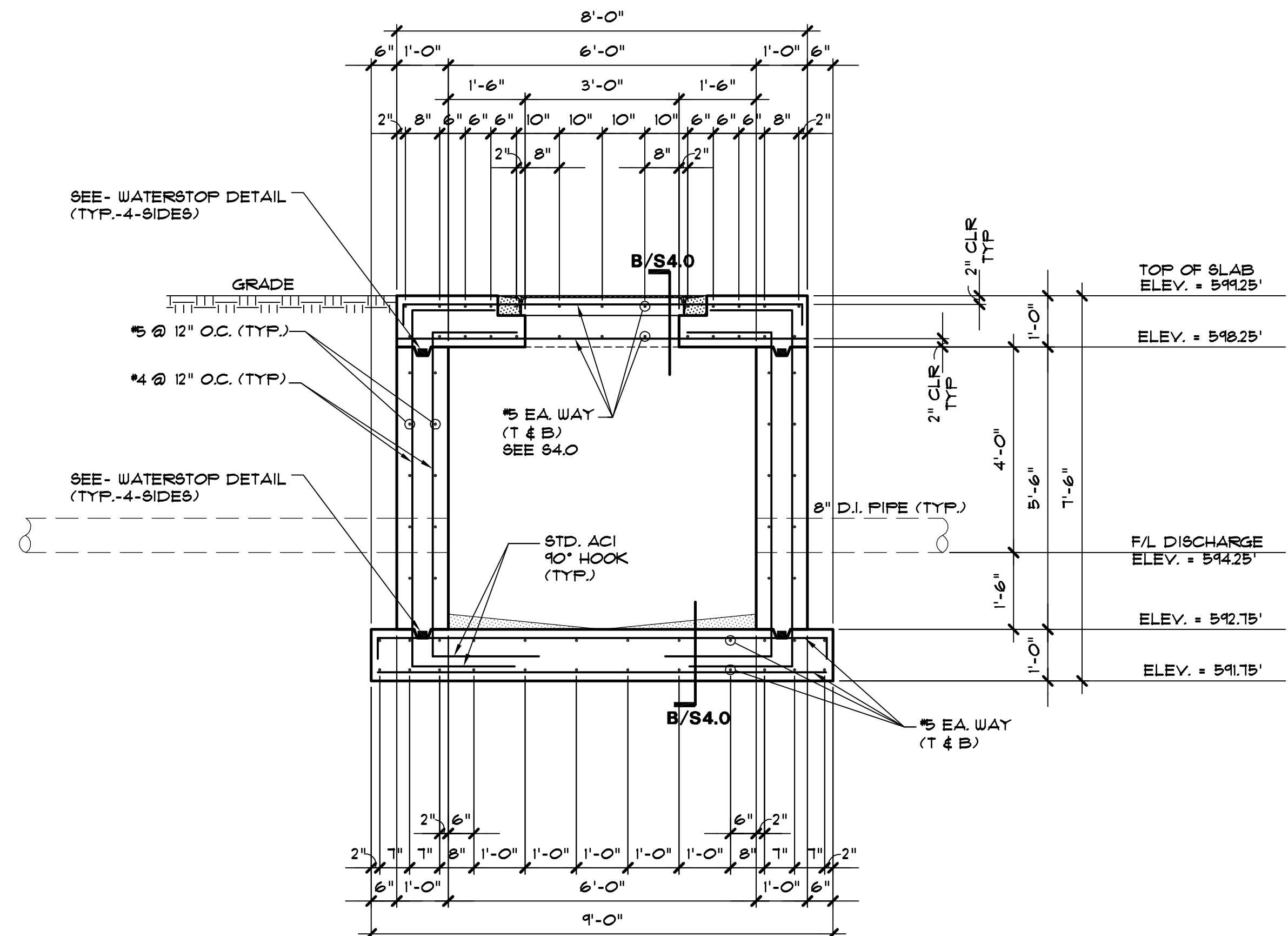


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Garland, Texas 75042
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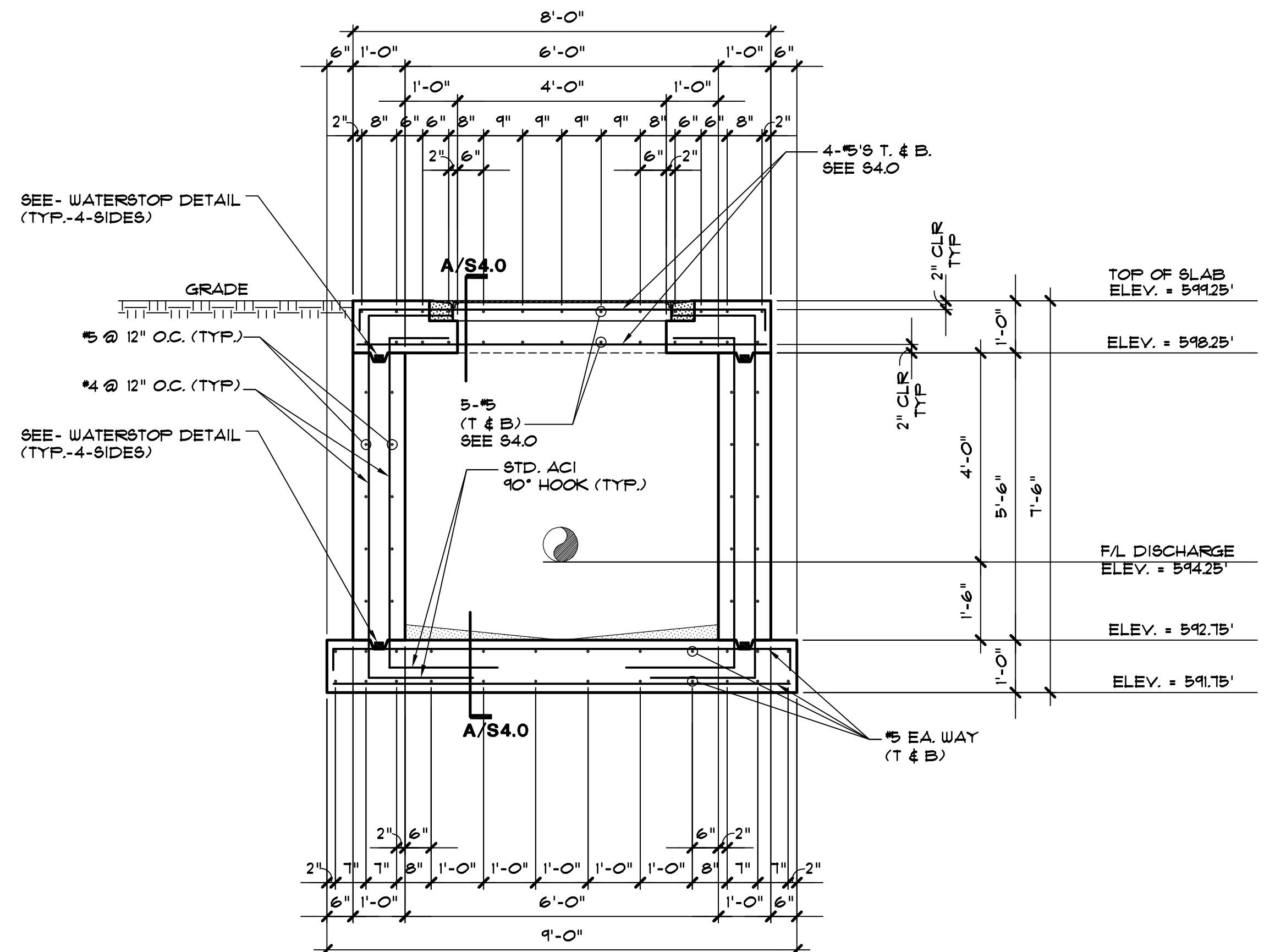
**WATER SYSTEM IMPROVEMENTS
SINGLE PRESSURE PLANE FACILITIES
NORTH PUMP STATION
VALVE VAULT REINFORCING PLAN
CITY OF LUCAS**

SHEET NO. **S3.0**
OF SHEETS
JOB NO. 17-1811

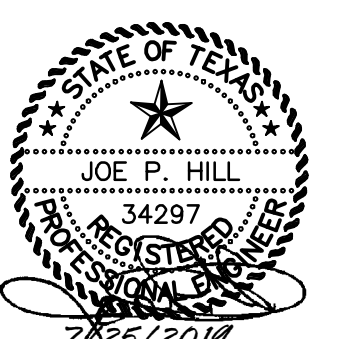
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A VALVE VAULT SECTIONS / REINFORCING
SCALE: 1/2" = 1'-0"



B VALVE VAULT SECTION / REINFORCING
SCALE: 1/2" = 1'-0"



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CONSULTING STRUCTURAL ENGINEERING
1801 N. Hampton Rd.
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Suite 500, L.B. 27
Garland, Texas 75042
(972) 864-8200 (T) (972) 864-8220 (F)
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**WATER SYSTEM IMPROVEMENTS
SINGLE PRESSURE PLANE FACILITIES
NORTH PUMP STATION
VALVE VAULT SECTIONS/REINFORCING
CITY OF LUCAS**

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OF SHEETS
JOB NO. 17-1811

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