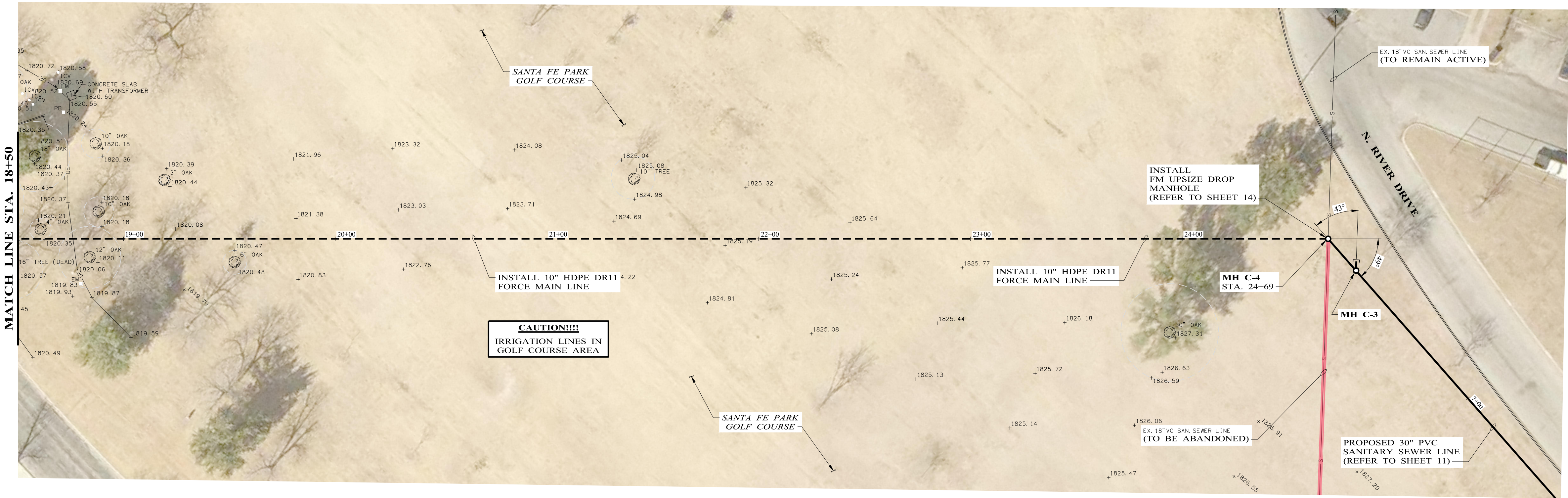


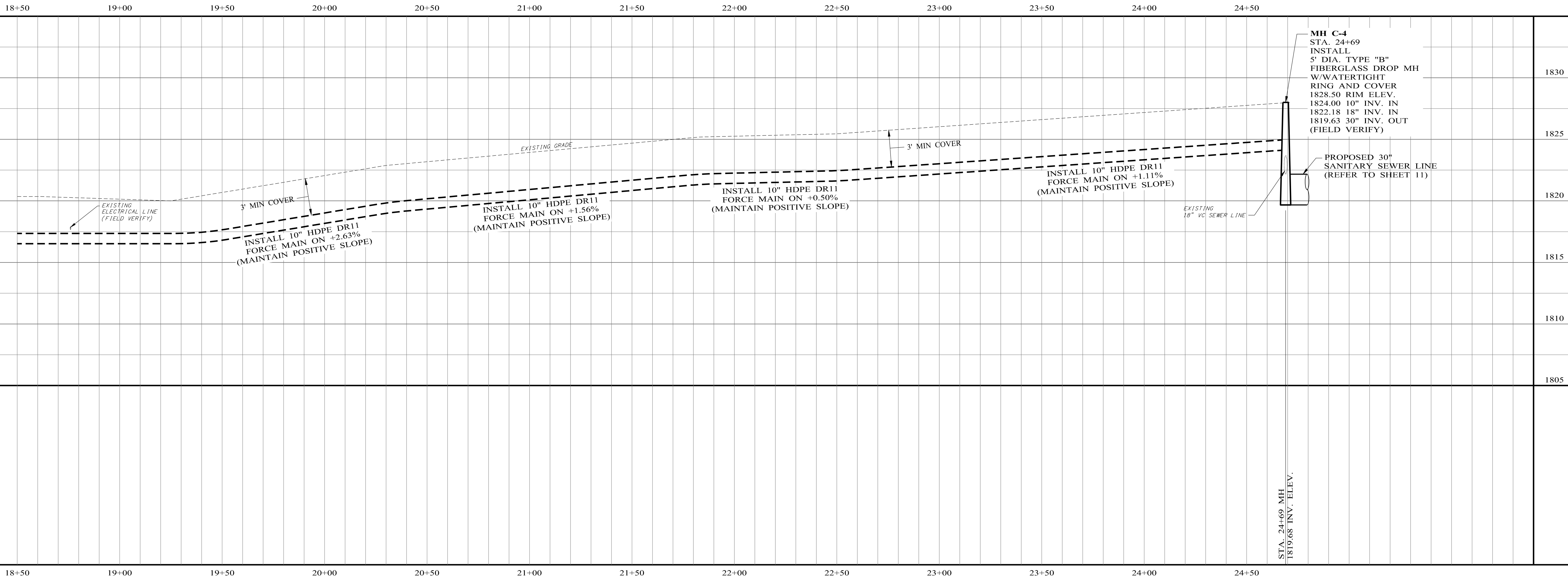
LEGEND

- EXISTING MANHOLE
- EXISTING SEWER LINE
- PROPOSED MANHOLE
- PROPOSED 18" SEWER LINE (UNLESS NOTED OTHERWISE)
- - - PROPOSED 10" FORCE MAIN LINE
- EXISTING SANITARY SEWER TO BE GROUT FILLED AND ABANDONED
- EXISTING SANITARY SEWER LINE AND/OR MANHOLE TO BE REHABILITATED
- CONCRETE PAVEMENT REPLACEMENT
- ASPHALT PAVEMENT REPLACEMENT
- CONCRETE CURB AND GUTTER REPAIR



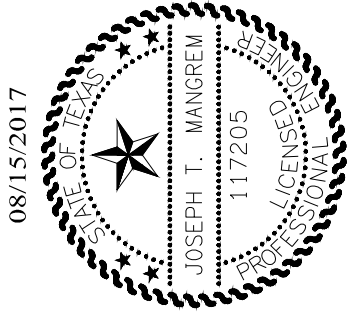
GOLF COURSE RESTORATION NOTES:

1. CONTRACTOR SHALL REPLACE TOPSOIL AND RESEED ALL AREAS DISTURBED BY CONSTRUCTION ACTIVITIES.
2. CONTRACTOR SHALL PROTECT EXISTING IRRIGATION LINES AND REPAIR IF DAMAGED.



CITY OF SAN ANGELO
TEXAS
2017 SULPHUR DRAW
WASTEWATER IMPROVEMENTS PROJECT
LINE "B"
10" FORCE MAIN LINE

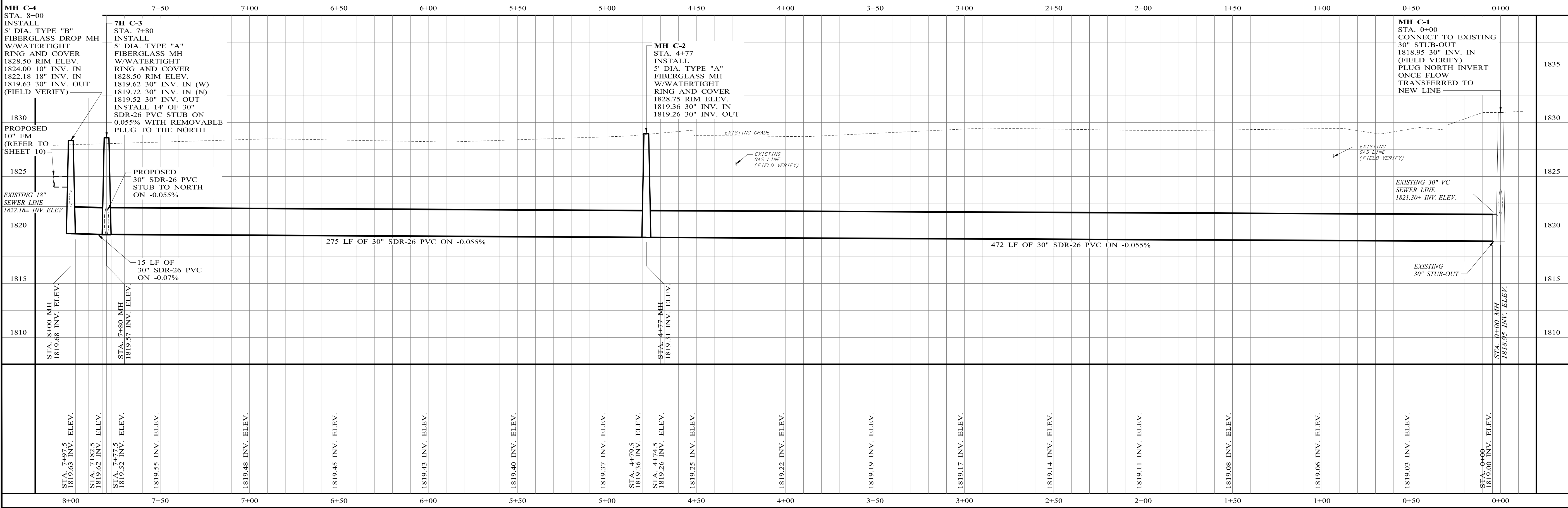
ENPROTEC/HIBBS & TODD, INC.
ENVIRONMENTAL AND CIVIL ENGINEERING
PE Firm Registration No. 1151
PG Firm Registration No. 50103
RPLS Firm Registration Nos. 10017500 & 10067300
325-698-5560



BAR IS ONE
EIGHTH OF
ORIGINAL DRAWING
IF NOT ONE INCH
ON THIS SHEET
ADJUST SCALES
ACCORDINGLY.

DESIGNED BY: J.T.M.
DRAWN BY: 3K
CHECKED BY: S.D.
DATE: 08/15/2017
SCALE: HOR: 1"= 30'
VERT: 1"= 5'

Joseph T. Mangrum



DESIGNED BY: J.T.M.
DRAWN BY: 3K
CHECKED BY: S.D.
DATE: 08/15/2017
SCALE: HOR: 1"= 30'
VERT: 1"= 5'

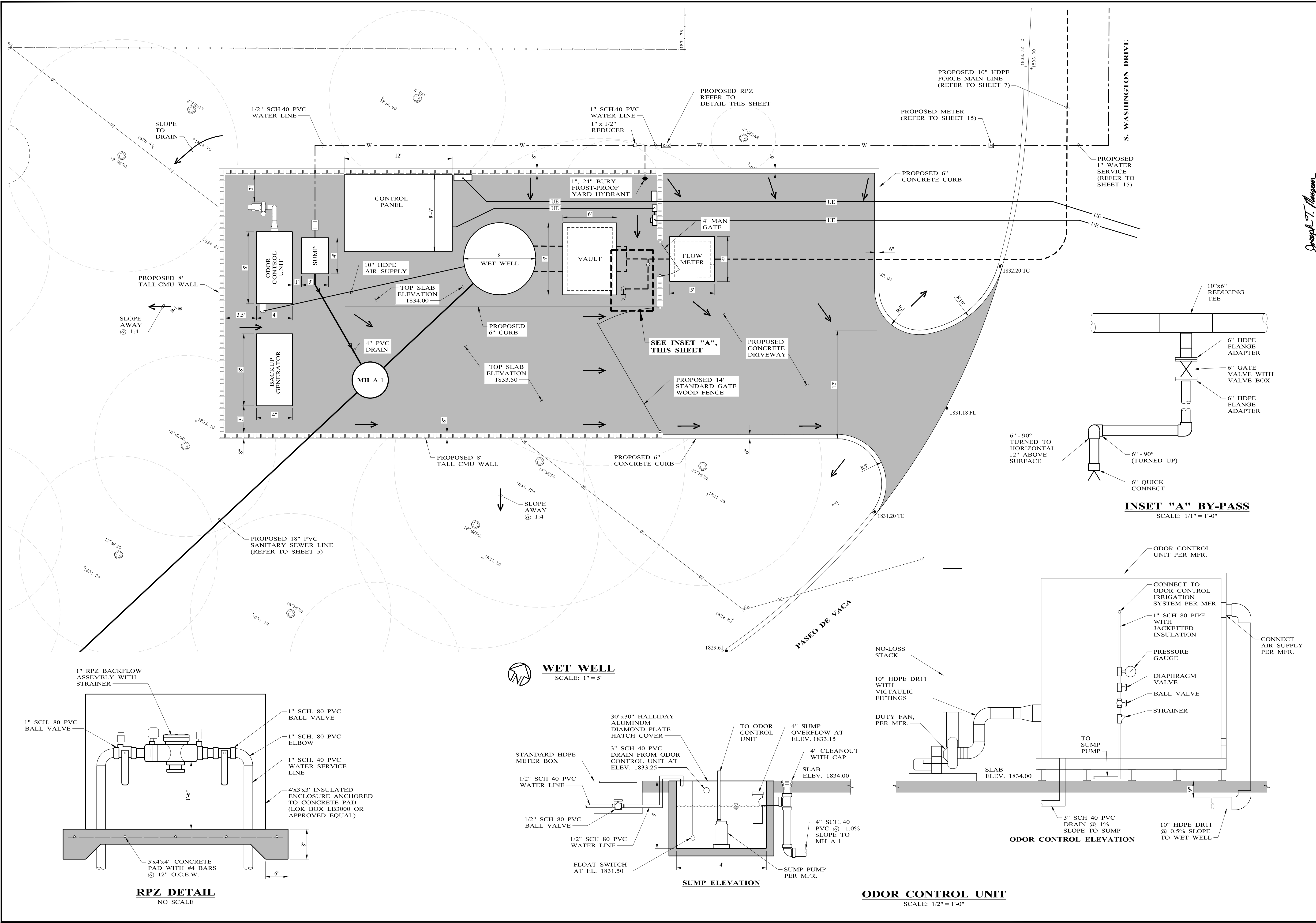
BAR IS ONE
INCH TO
ORIGINAL DRAWING
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08/15/2017
JOSEPH T. MANGREK
117205
PE Firm Registration No. 1151
RPLS Firm Registration Nos. 10017500 & 10007300

ENPROTEC/HIBBS & TODD, INC.
ENVIRONMENTAL AND CIVIL ENGINEERING
325-698-5560

CITY OF SAN ANGELO
TEXAS
2017 SULPHUR DRAW
WASTEWATER IMPROVEMENTS PROJECT
LINE "C"
30" GRAVITY LINE

CONTRACT NO.
16-6683
SHEET NO.
11 OF 20



DESIGNED BY: J.T.M.

DRAWN BY: 3K

CHECKED BY: S.D.

DATE: 08/15/2017

SCALE: 1" = 5'

BAR IS ONE INCH LONG

ORIGINAL DRAWING

0

1

PLAN ONE INCH ON THIS SHEET

ADJUST SCALES ACCORDINGLY

08/15/2017

JOSEPH T. MANGREK

117205

PE Firm Registration No. 1151

RPLS Firm Registration Nos. 10017500 & 10067300

ENPROTEC/HIBBS & TODD, INC.

ENVIRONMENTAL AND CIVIL ENGINEERING

PE Firm Registration No. 1151

RPLS Firm Registration Nos. 10017500 & 10067300

252-698-5560

252-698-5561

CITY OF SAN ANGELO TEXAS

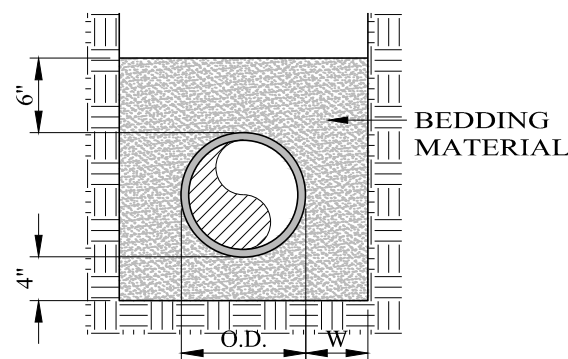
2017 SULPHUR DRAW WASTEWATER IMPROVEMENTS PROJECT

LIFT STATION SITE PLAN AND DETAILS

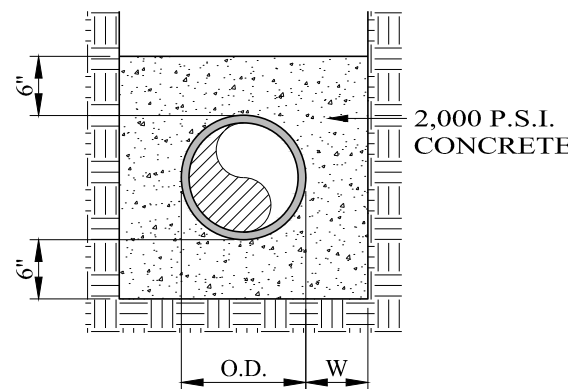
CONTRACT NO. 16-6683

SHEET NO.

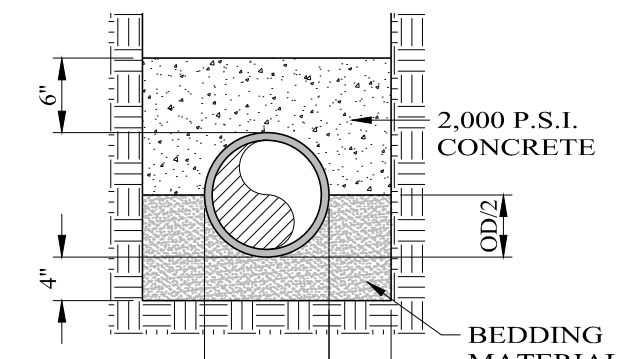
12 OF 20



GRAVEL
EMBEDMENT



CONCRETE
ENCASEMENT



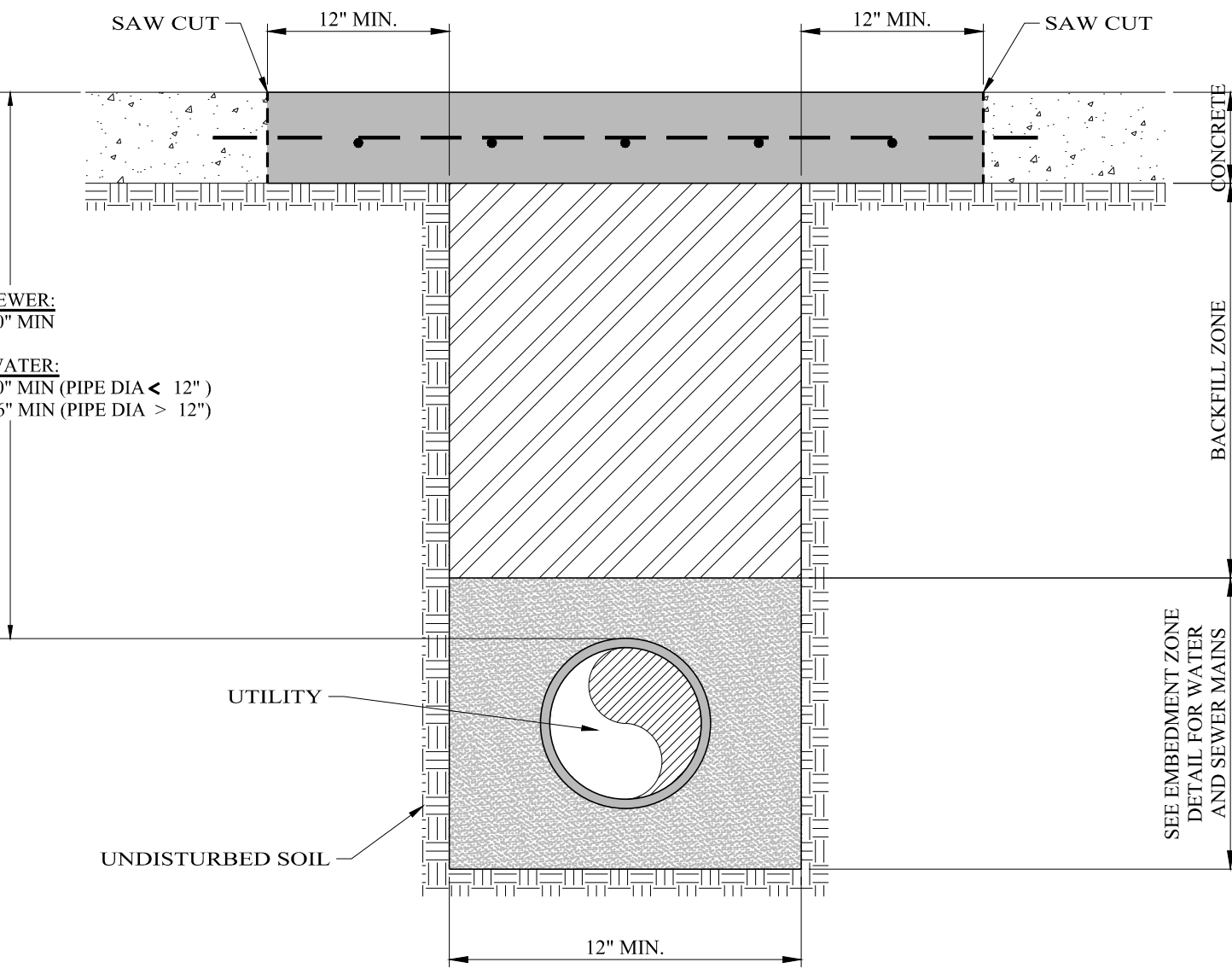
CONCRETE CAP

STANDARD TRENCH WIDTH	
PIPE SIZE	W
16" OR LESS	6"
GREATER THAN 16"	12"

PIPE EMBEDMENT ZONE
WATER AND SEWER MAINS
NO SCALE

NOTES:

- BEDDING MATERIAL FOR THE INSTALLATION OF WATER AND SEWER MAINS SHALL BE CRUSHED STONE OR PEA GRAVEL THAT WILL REMAIN FIRM AND NOT PERMIT DISPLACEMENT OF THE PIPE EITHER DURING PIPE LAYING OR BACKFILLING OR FOLLOWING THE COMPLETION OF CONSTRUCTION.
- BEDDING MATERIAL SHALL BE FROM AN APPROVED BEDDING MATERIAL SOURCE PER THE LIST OF APPROVED BEDDING SUPPLIERS OR BE APPROVED BY THE CITY ENGINEER.
- TRENCH SPOILS ARE NOT ACCEPTABLE FOR "EMBEDMENT ZONE MATERIAL"

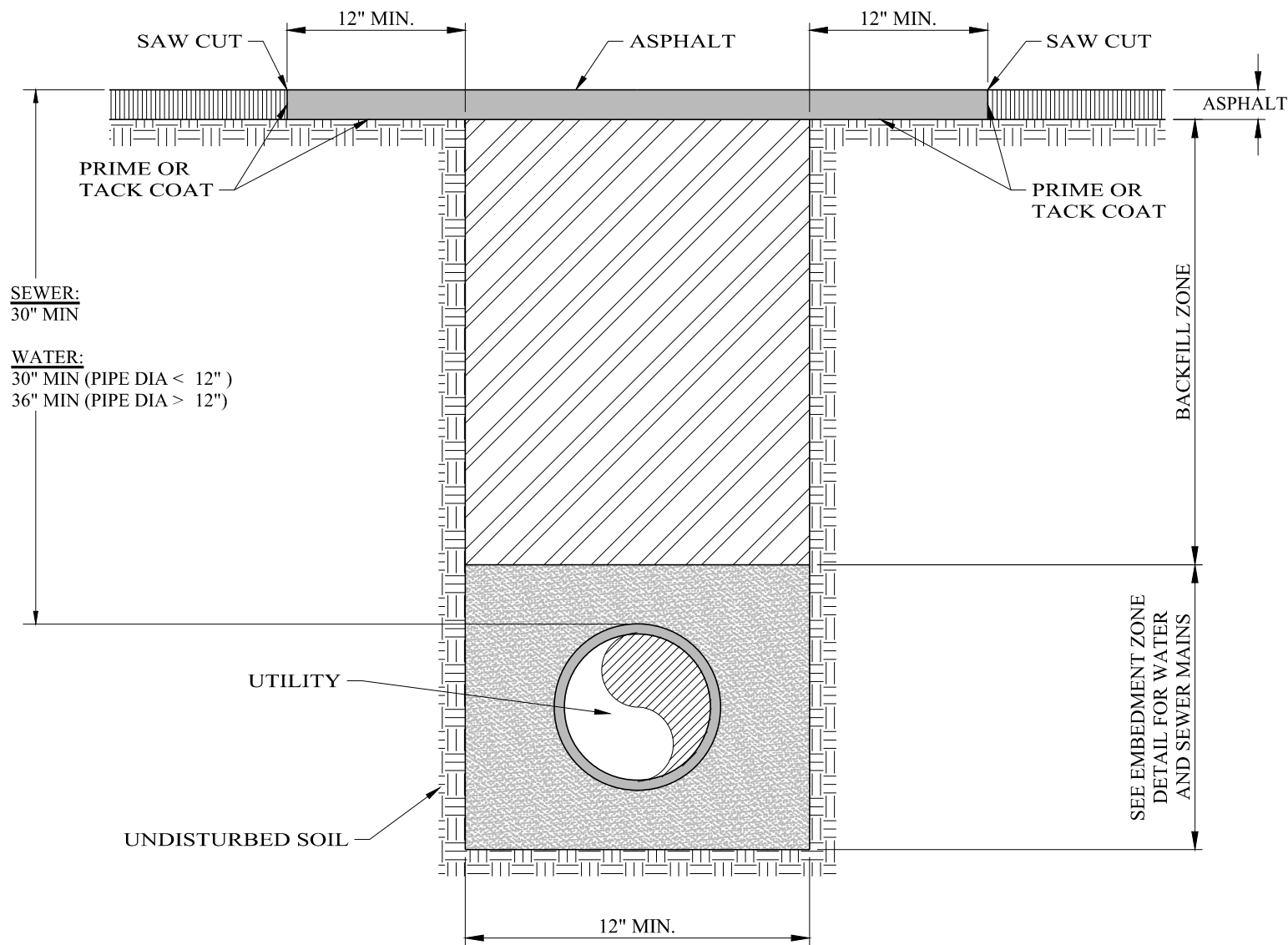


UTILITY TRENCH SECTION
RIGID PAVEMENT

NOTES:

CONCRETE:

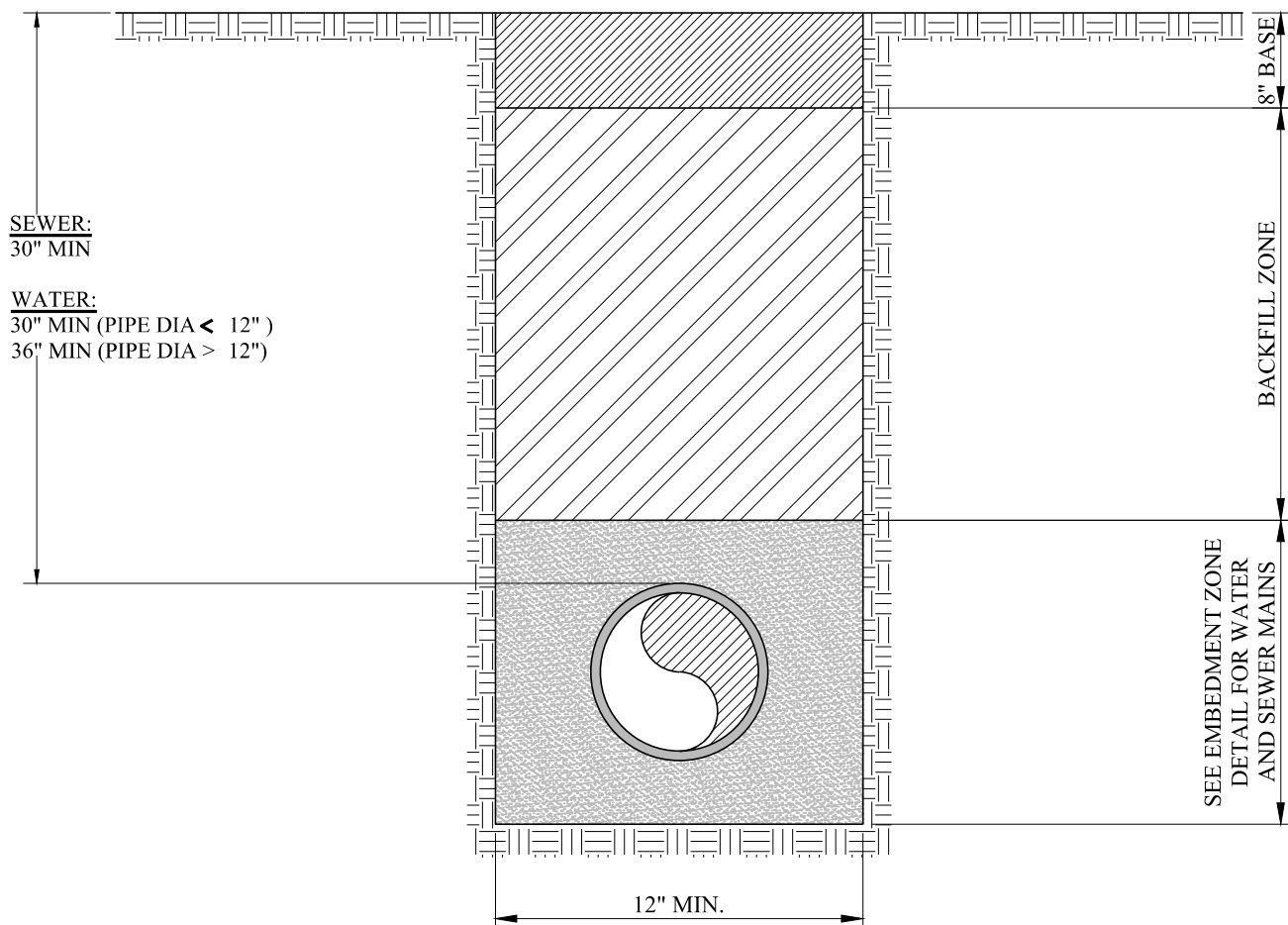
- OPTION #1:
- CLASS P, 4,400 P.S.I. COMPRESSIVE; 680 P.S.I. FLEXURAL AT 28 DAY TEST. BEND EXISTING REBAR INTO CENTER OF NEW CONCRETE. REPLACE AS NECESSARY WITH #4 REBAR ON 12" CENTERS EACH WAY AND DOWEL IN #4 REBAR 9" DEEP WITH 24" LAP SPLICE AND MUST BE ALLOWED TO CURE FOR A PERIOD OF NOT LESS THAN 72 HOURS, OR CLASS P, 4,400 P.S.I. WITH 36 POUNDS OF NOVAMESH 850 PER CUBIC YARD WITH #4 REBAR DOWELS 9" DEEP AND 9" INTO THE TRENCH ON 18" CENTERS AND MUST BE ALLOWED TO CURE FOR A PERIOD OF NOT LESS THAN 72 HOURS.
- OPTION #2:
- CLASS K, 4,400 P.S.I. COMPRESSIVE; 680 P.S.I. FLEXURAL AT 28 DAY TEST. BEND EXISTING REBAR INTO CENTER OF NEW CONCRETE. REPLACE AS NECESSARY WITH #4 REBAR ON 12" CENTERS EACH WAY AND DOWEL IN #4 REBAR 9" DEEP WITH 24" LAP SPLICE AND MUST BE ALLOWED TO CURE FOR A PERIOD OF NOT LESS THAN 24 HOURS, OR CLASS K, 4,400 P.S.I. WITH 36 POUNDS OF NOVAMESH 850 PER CUBIC YARD WITH #4 REBAR DOWELS 9" DEEP AND 9" INTO THE TRENCH ON 18" CENTERS AND MUST BE ALLOWED TO CURE FOR A PERIOD OF NOT LESS THAN 24 HOURS.
- BACKFILL ZONE:
- FLEXIBLE BASE PER CITY OF SAN ANGELO SPECIFICATIONS COMPACTED IN 6" HORIZONTAL LAYERS. MINIMUM DENSITY 95% MODIFIED PROCTOR.



UTILITY TRENCH SECTION
ASPHALT PAVEMENT

NOTES:

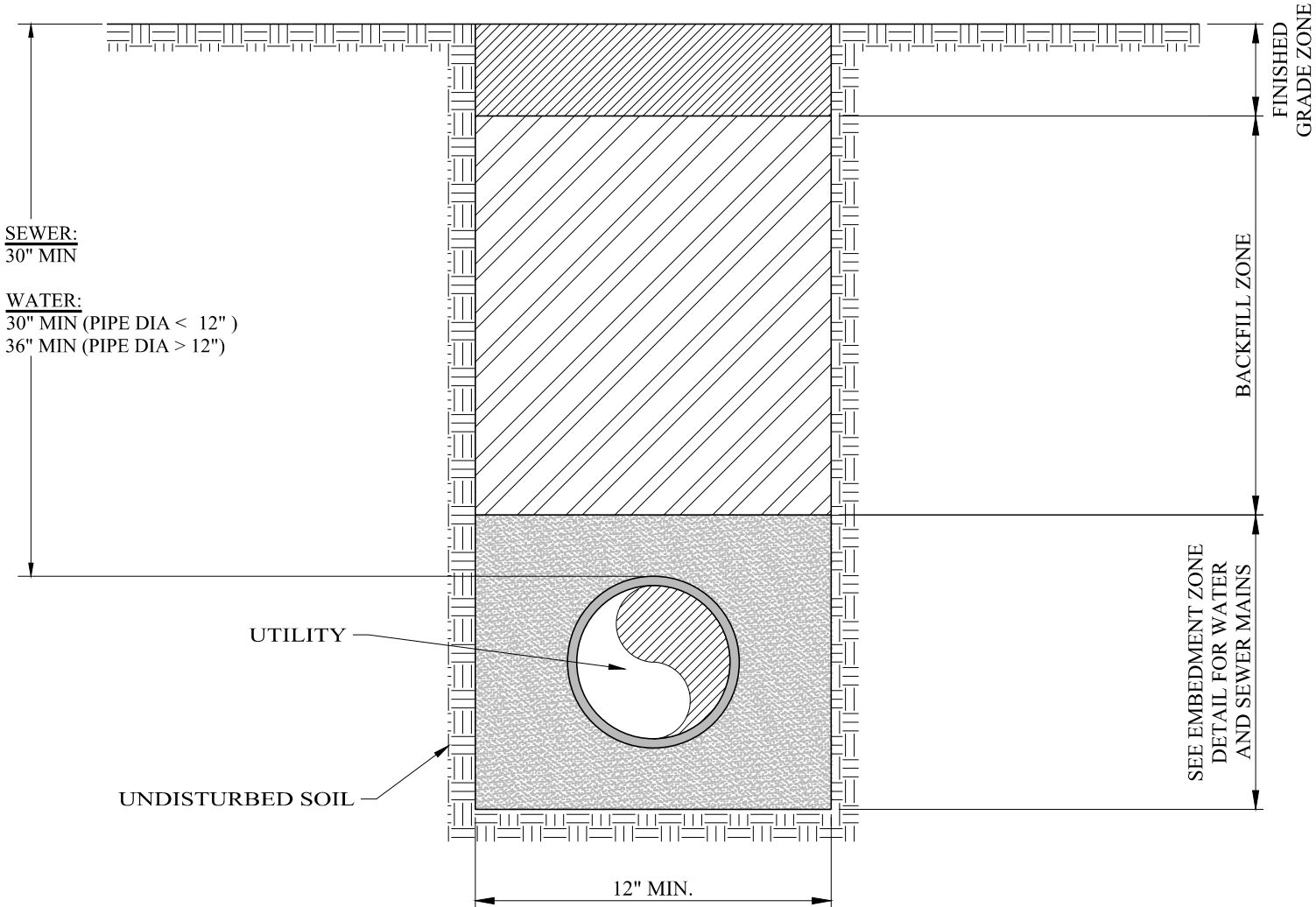
- ASPHALT:
- 2" LAYER
TYPE D, TXDOT HOT MIX OR
TYPE D, TXDOT HOT MIX - COLD LAID
(MUST HAVE PRIOR CITY APPROVAL)
- PRIME COAT:
- TXDOT MC-30 OR AE-P ASPHALT AT THE RATE OF 0.25 TO 0.35 GALLON PER SQUARE YARD OF SURFACE
- TACK COAT:
- SHALL MEET THE REQUIREMENTS OF TXDOT ITEM 300 "ASPHALT, OILS, AND EMULSIONS".
- BACKFILL ZONE:
- FLEXIBLE BASE PER CITY OF SAN ANGELO SPECIFICATIONS
COMPACTED IN 6" HORIZONTAL LAYERS. MINIMUM DENSITY 95% MODIFIED PROCTOR.



UTILITY TRENCH SECTION
UNPAVED STREETS, ALLEYS AND DRIVEWAYS

NOTES:

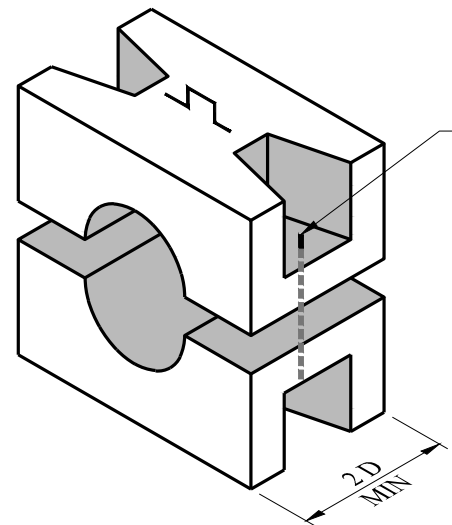
- BASE:
- FLEXIBLE BASE PER CITY OF SAN ANGELO SPECIFICATIONS. COMPACTED IN 6" LAYERS. MINIMUM DENSITY 95% MODIFIED PROCTOR.
- BACKFILL ZONE:
- WHERE PULVERIZED OR GRANULAR MATERIAL IS AVAILABLE FROM EXCAVATION WHICH IS FREE OF SHARP EDGED STONES, OR STONES LARGER THAN 3" IN DIAMETER, CLAY, ORGANIC MATTER, OR OTHER UNSUITABLE SUBSTANCES, HAS A PI<= 20 AND LL<=40, AND MEETS THE APPROVAL OF THE CITY. SUCH MATERIAL MAY BE USED FOR BACKFILL MATERIAL AS INSTRUCTED BY THE OWNER.
- COVER:
- WATER OR SEWER MAINS AND SERVICES WITH LESS THAN 30" COVER AT ANY LOCATION SHALL REQUIRE C.O.S.A. APPROVAL PRIOR TO CONSTRUCTION.



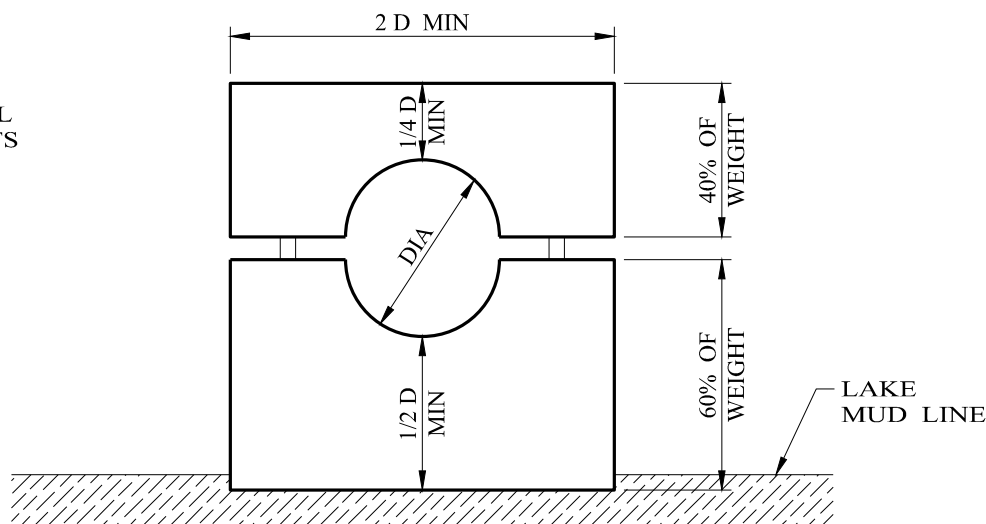
UTILITY TRENCH SECTION
OTHER UNPAVED AREAS

NOTES:

- FINISHED GRADE ZONE:
- BACKFILL SHALL MATCH EXISTING GROUND CONDITIONS (SEE OPTIONS BELOW) OR AS DIRECTED BY THE CITY.
- OPTION #1:
- UTILIZE BACKFILL ZONE MATERIAL FROM OPTION #1
- OPTION #2:
- 6" TOP SOIL.
- OPTION #3:
- 8" FLEXIBLE BASE
- BACKFILL ZONE:
- OPTION #1: WHERE PULVERIZED OR GRANULAR MATERIAL IS AVAILABLE FROM EXCAVATION WHICH IS FREE OF SHARP EDGED STONES, OR STONES LARGER THAN 3" IN DIAMETER, CLAY, ORGANIC MATTER, OR OTHER UNSUITABLE SUBSTANCES, HAS A PI<= 20 AND LL<=40, AND MEETS THE APPROVAL OF THE CITY SUCH MATERIAL MAY BE USED FOR BACKFILL MATERIAL AS INSTRUCTED BY THE OWNER. BACKFILL SHALL BE COMPACTED TO DENSITIES EQUAL TO OR GREATER THAN THAT OF SURROUNDING SOIL, OR A MINIMUM OF 90% MODIFIED PROCTOR.
- OPTION #2: FLEXIBLE BASE PER CITY OF SAN ANGELO SPECIFICATIONS COMPACTED IN 6" HORIZONTAL LAYERS TO MINIMUM DENSITY 95% MODIFIED PROCTOR.



ISOMETRIC VIEW



GENERAL DESIGN

NOTES

- ANCHOR WEIGHTS SHALL BE PREFABRICATED, REINFORCED CONCRETE AS APPROVED BY THE ENGINEER.
- PROVIDE PROTECTIVE WRAPPING OF 1/8" RUBBER SHEET BETWEEN PIPE AND ANCHOR. EXTEND PROTECTIVE WRAPPING 6" BEYOND WEIGHT LOCATION.
- SPACE ANCHORS AT 10 FEET O.C. FOR PIPE TO BE EXPOSED ON LAKE BOTTOM. ANCHOR WEIGHT TO BE AS RECOMMENDED BY HDPE PIPE MANUFACTURER FOR THE INTENDED INSTALLATION.
- PIPELINE SHALL REMAIN FIRMLY ANCHORED TO RIVER BOTTOM, WITHOUT DISPLACEMENT, EVEN WHEN EMPTY.
- ANCHOR WEIGHTS SHALL PROVIDE FOR A FACTOR ON 2.0 TIMES THE BUOYANCY FORCE OF THE PIPELINE WHEN EMPTY (AIR FILLED).

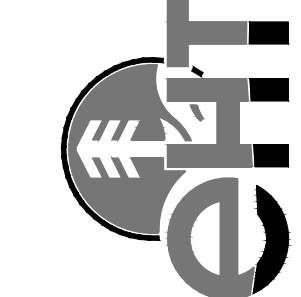
HDPE LAKE ANCHOR WEIGHTS

DESIGNED BY:	J.T.M.
DRAWN BY:	3K
CHECKED BY:	S.D.
DATE:	08/15/2017
SCALE:	NONE

BAR IS ONE FOOT LONG ORIGINAL DRAWING	1 0
DO NOT ENLARGE ON THIS SHEET ADJUST SCALES ACCORDINGLY.	



ENPROTEC/HIBBS & TODD, INC.
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352-698-5560



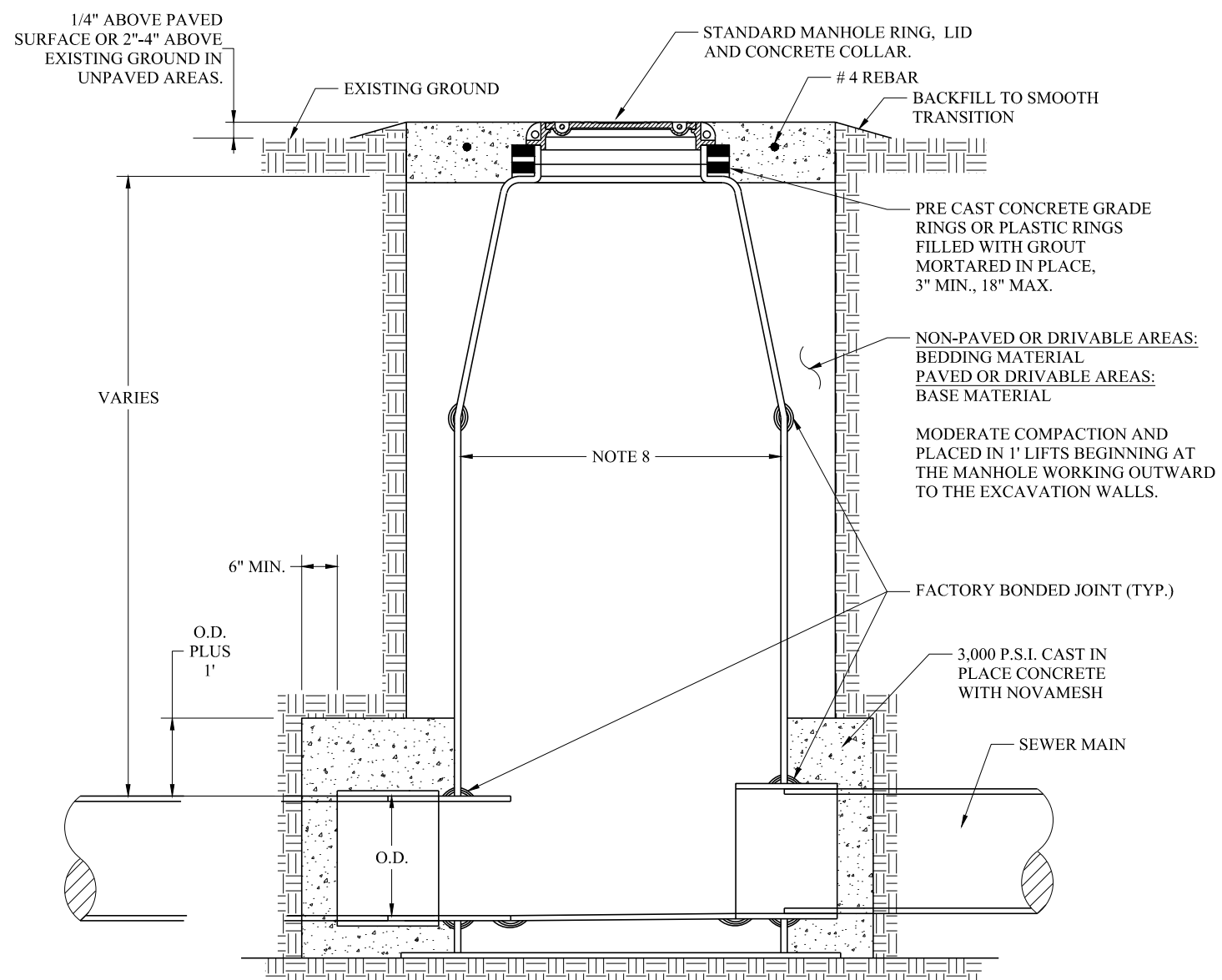
CITY OF SAN ANGELO
TEXAS

2017 SULPHUR DRAW
WASTEWATER IMPROVEMENTS PROJECT

TRENCH ZONE DETAILS

CONTRACT NO.
16-6683

SHEET NO.



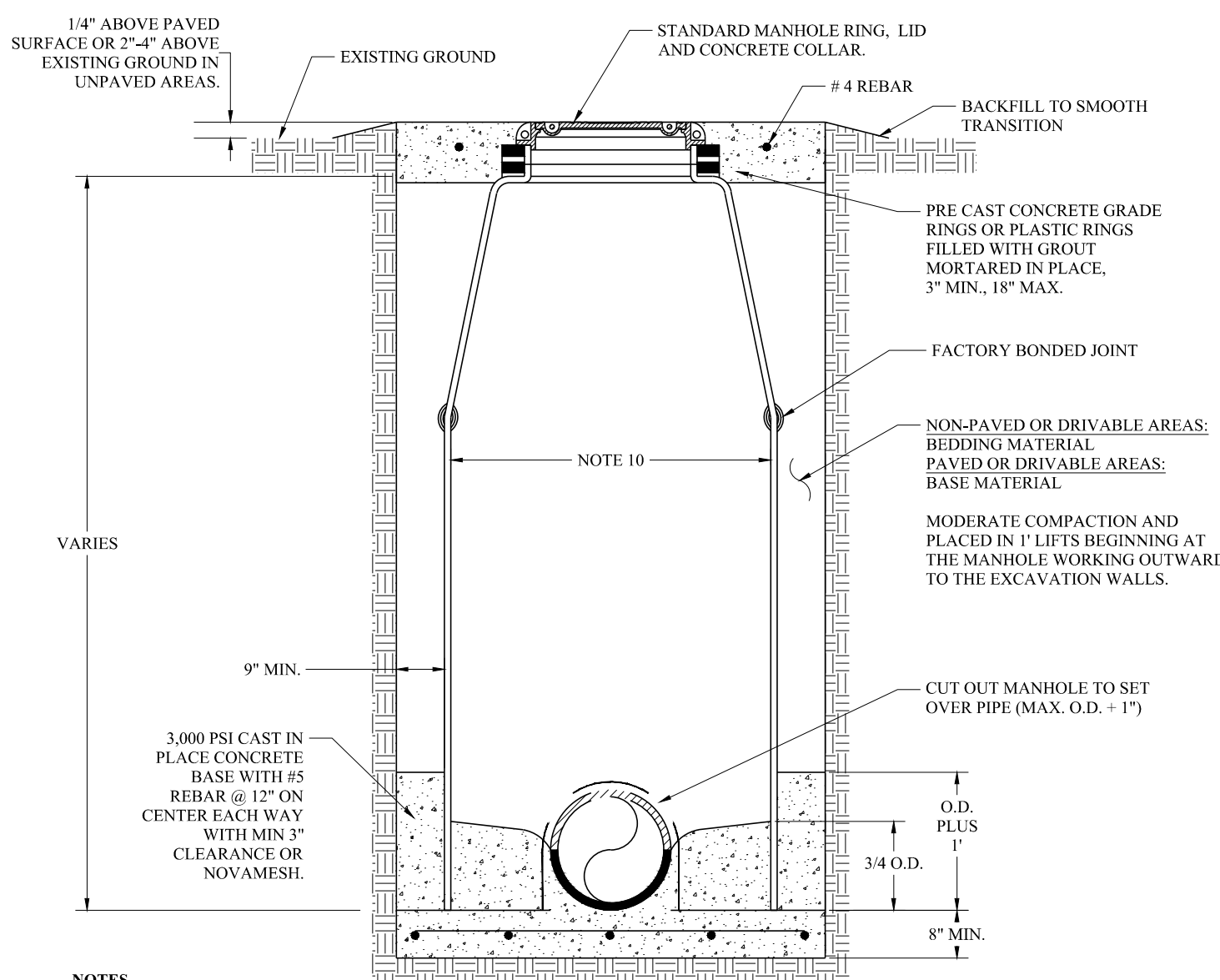
NOTES

- CONTRACTOR SHALL VERIFY MANHOLE DEPTHS, INLET AND OUTLET ELEVATIONS.
- MANHOLE FLOOR SHALL BE FACTORY INSTALLED INTEGRAL FIBERGLASS BENCH AND INVERT AREA. CONCRETE IS NOT ALLOWED.
- ALL INLETS AND OUTLETS SHALL BE BONDED INTO THE MANHOLE RISER BY THE MANUFACTURER.
- CONCRETE SHALL BE PLACED A MINIMUM OF 6" BEYOND AND 1" ABOVE ALL CONNECTIONS.
- MANHOLES SHALL BE STUBBED OUT WITH SUITABLE SIZE PIPE WHEREVER FUTURE EXTENSION OF THE SEWER IS ANTICIPATED.
- STUB-OUTS SHALL EXTEND BEYOND THE EDGE OF EXISTING OR PROPOSED PAVING.
- MANHOLES LOCATED WITHIN A 100-YEAR FLOOD PLAIN OR ANY AREA SUBJECT TO STORMWATER INFILTRATION SHALL INCORPORATE A WATERTIGHT, BOLT-DOWN RING AND LID AND AN INFLOW PREVENTION DEVICES (IPDs).
- MANHOLE SPACING, DIAMETER AND DEPTHS SHALL BE AS FOLLOWS:

PIPE DIAMETER	MANHOLE DEPTH	MANHOLE DIAMETER	MAX. SPACING BETWEEN MANHOLES
15" OR SMALLER	0-16'	48"	500'
15" OR SMALLER	OVER 16'	60"	500'
OVER 15"	ALL DEPTHS	60"	800'

DEFLECTION ANGLE BETWEEN INLET / OUTLET	MIN. ELEVATION DIFFERENCE
LESS THAN 30°	0.10'
GREATER THAN 30°	0.20'

FIBERGLASS MANHOLE - TYPE A



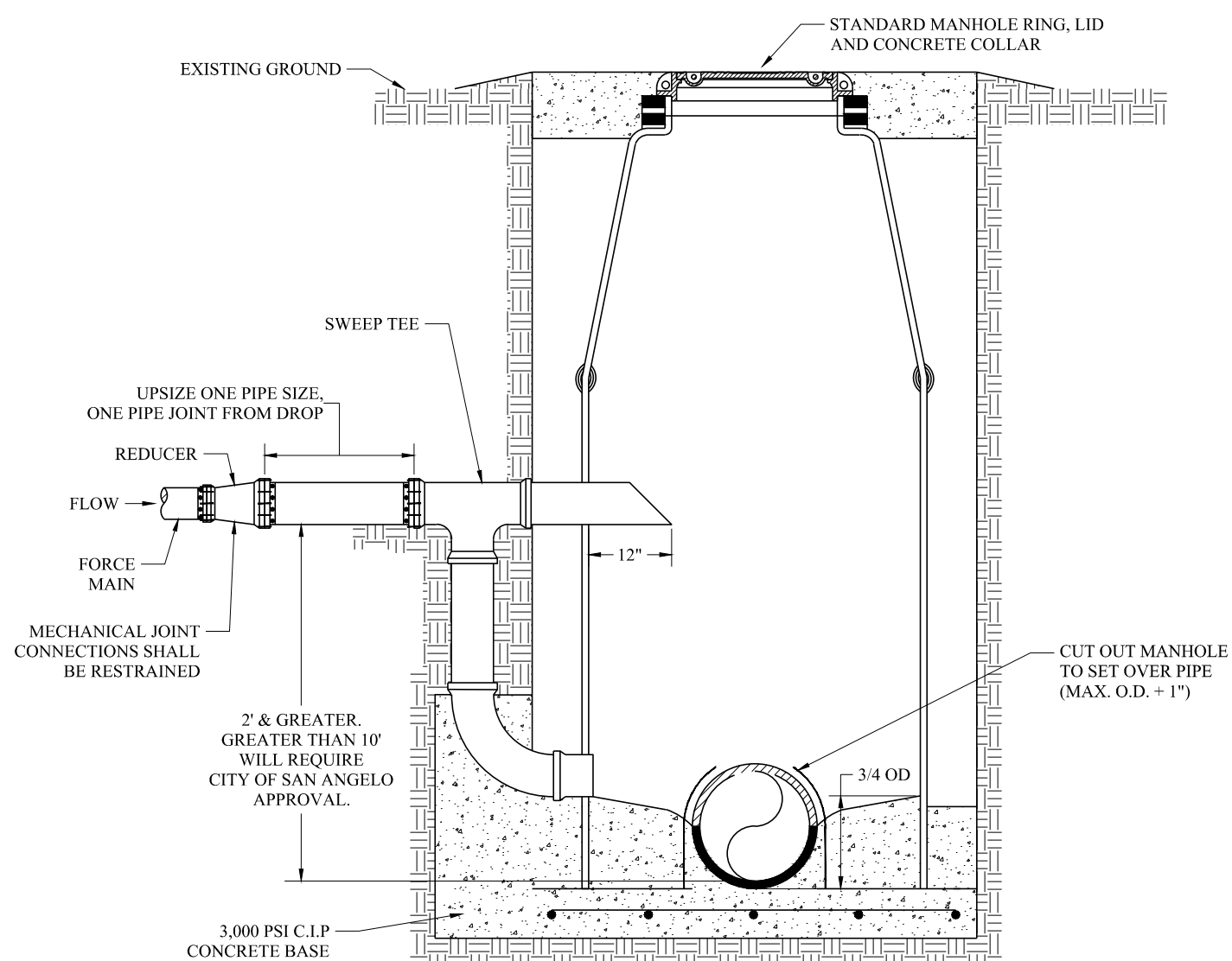
NOTES

- CONTRACTOR SHALL VERIFY MANHOLE DEPTHS, INLET AND OUTLET ELEVATIONS.
- MANHOLE CUTOUT TO BE MADE AT TIME OF INSTALLATION.
- CONCRETE BASE TO BE POURED IN PLACE IN TRENCH AND MANHOLE TO BE INSTALLED BY INSERTING INTO WET CONCRETE BASE.
- FLOW LINE INVERT MAY BE CHANNEL FORMED IN CONCRETE FLOOR OR PIPE SECTION WITH TOP CUT OUT.
- SEAL CONCRETE TO PIPE WITH ELASTOMERIC GASKET SEAL.
- CONCRETE SHALL BE PLACED A MINIMUM OF 6" BEYOND AND 1" ABOVE ALL CONNECTIONS.
- MANHOLES SHALL BE STUBBED OUT WITH SUITABLE SIZE PIPE WHEREVER FUTURE EXTENSION OF THE SEWER IS ANTICIPATED.
- STUB-OUTS SHALL EXTEND BEYOND THE EDGE OF EXISTING OR PROPOSED PAVING.
- MANHOLES LOCATED WITHIN A 100-YEAR FLOOD PLAIN OR ANY AREA SUBJECT TO STORMWATER INFILTRATION SHALL INCORPORATE A WATERTIGHT, BOLT-DOWN RING AND LID AND AN INFLOW PREVENTION DEVICES (IPDs).
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DEFLECTION ANGLE BETWEEN INLET / OUTLET	MIN. ELEVATION DIFFERENCE
LESS THAN 30°	0.10'
GREATER THAN 30°	0.20'

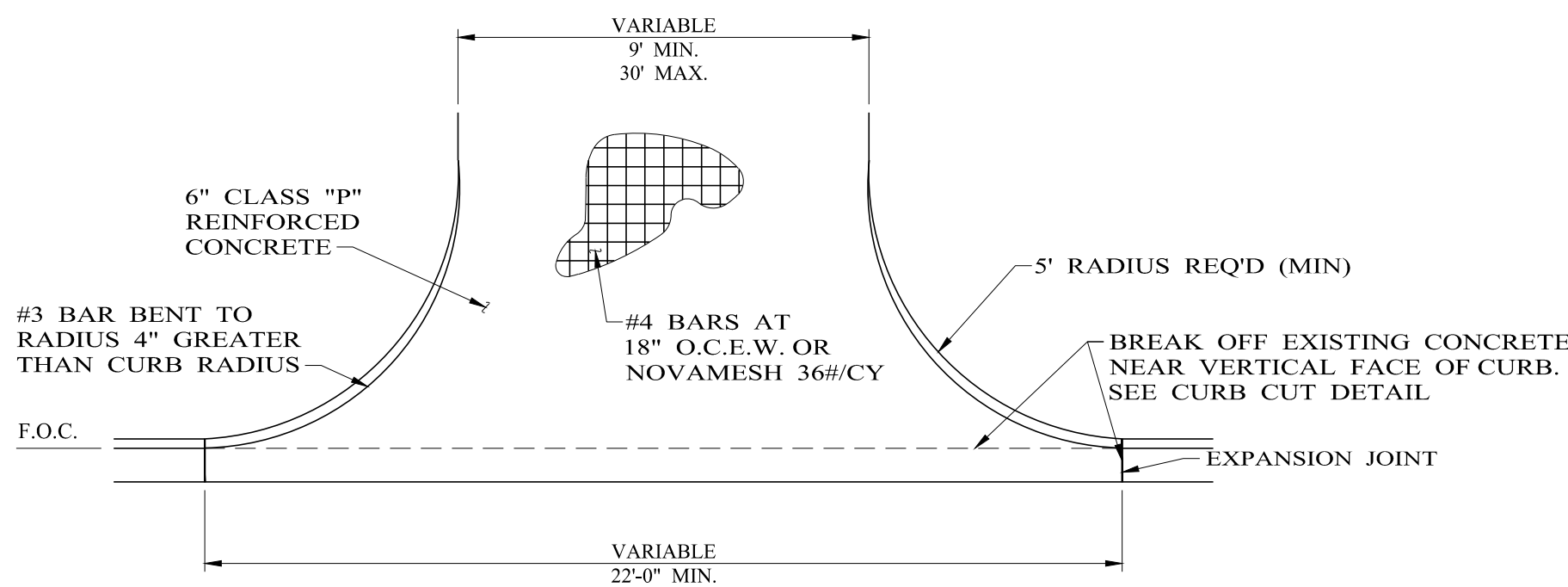
FIBERGLASS MANHOLE - TYPE B



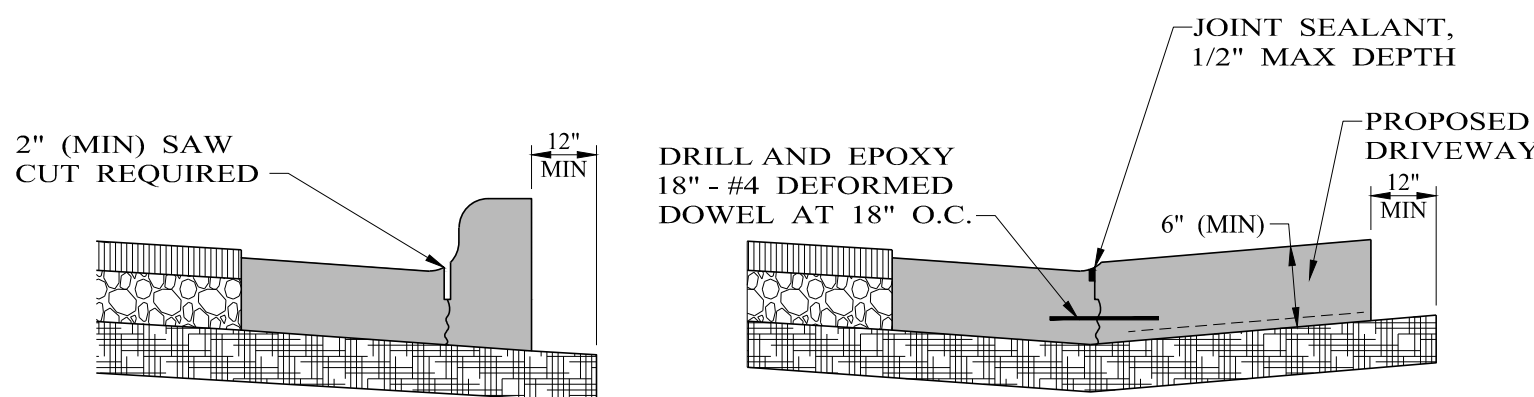
NOTES

- CONSTRUCTION OF THE DROP MANHOLE IS IDENTICAL WITH THE STANDARD MANHOLE A, B AND PRECAST CONCRETE MANHOLE IN EVERY RESPECT EXCEPT THE METHOD OF ENTRANCE OF THE SEWAGE FROM THE LATERALS SHALL BE CONSTRUCTED AS SHOWN ABOVE.
- WHEN ENTERING AN EXISTING MANHOLE WITH A NEW LINE AND THE DIFFERENCE IN ELEVATION OF THE TWO INVERTS EXCEEDS 2' THE METHOD OF ENTRANCE SHALL BE AS ABOVE.
- BACKFILL SHALL BE COMPACTED IN 6" HORIZONTAL LAYERS MINIMUM DENSITY 95% MODIFIED PROCTOR.
- FORCE MAINS SHALL DISCHARGE DIRECTLY INTO A MANHOLE OR WET-WELL WITH CONSIDERATION FOR MINIMIZING SPLASHING AND THE GENERATION OF DAMAGING AND MALODOROUS GASES.
- MANHOLES AND WET-WELLS RECEIVING FORCE MAIN DISCHARGE SHALL BE CONSTRUCTED OF FIBERGLASS OR CONCRETE WITH AN APPROVED PROTECTIVE COATING SYSTEM.

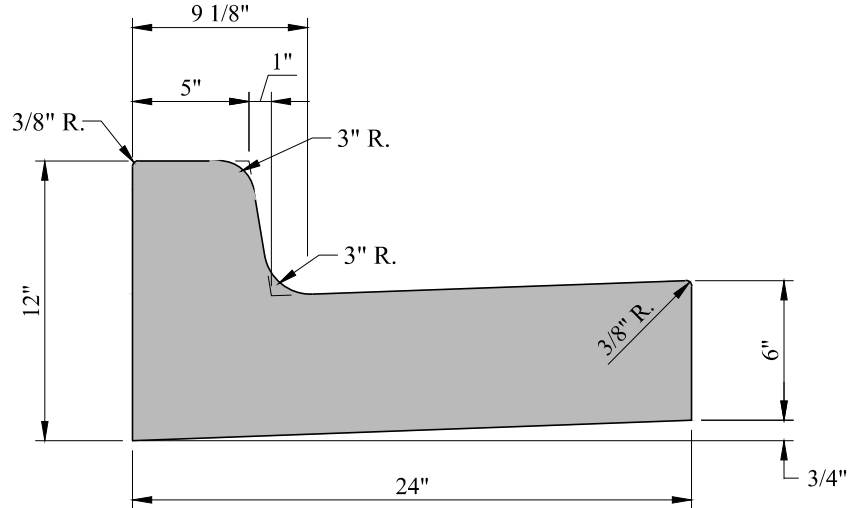
FORCE MAIN UPSIZE INTO DROP MANHOLE



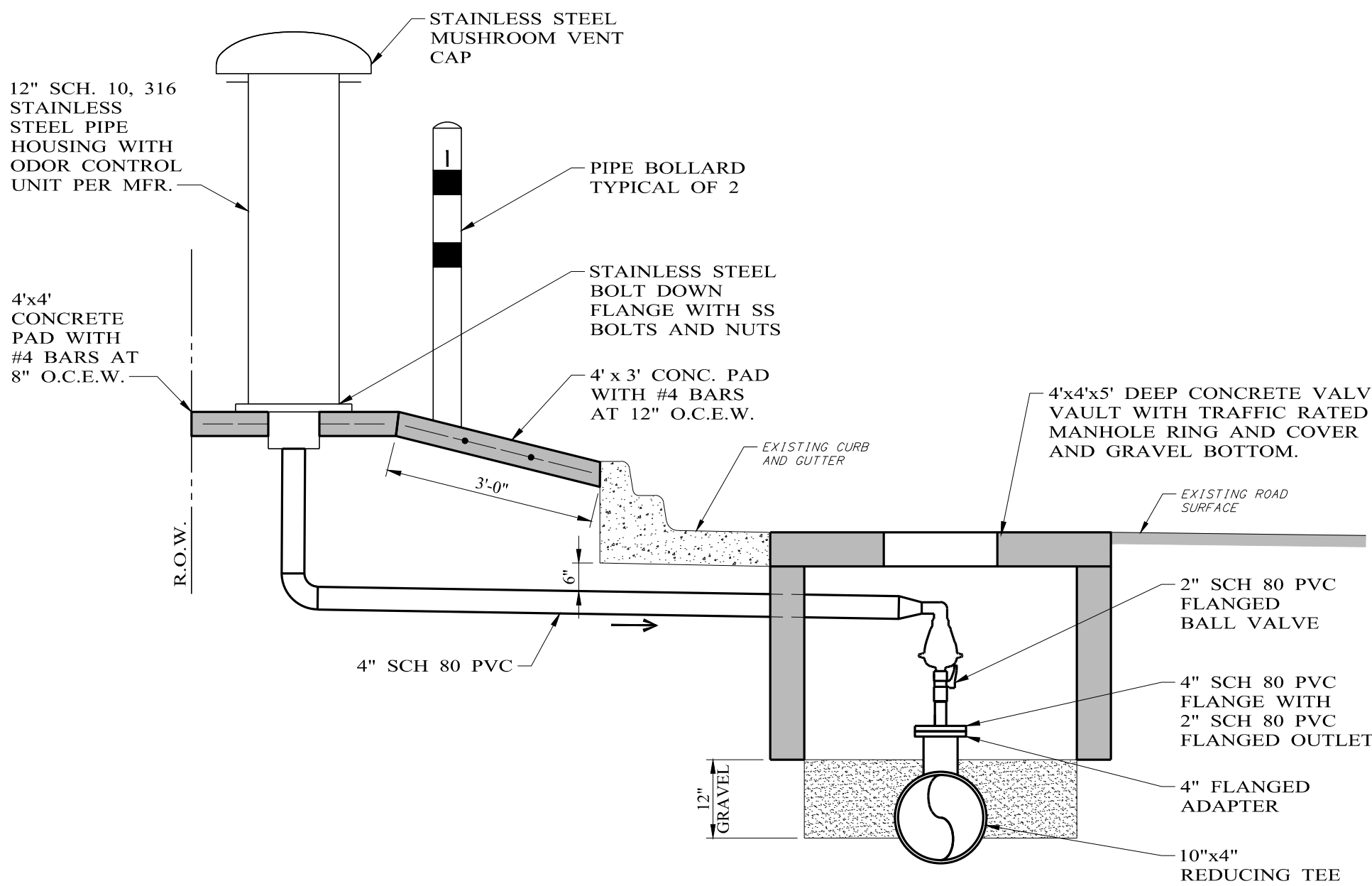
CONCRETE DRIVEWAY APRON



EXISTING CURB CUT DETAIL



STANDARD CURB & GUTTER



AIR RELEASE VALVE WITH ODOR CONTROL ASSEMBLY DETAIL

(REFER TO SHEET 7)
SCALE: 1/2" = 1'-0"

Joseph T. Mayerson

ENPROTEC/HIBBS & TODD, INC.
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PE Firm Registration No. 1151
PG Firm Registration No. 1007950 & 1007960
RPLS Firm Registration Nos. 1007950 & 1007960

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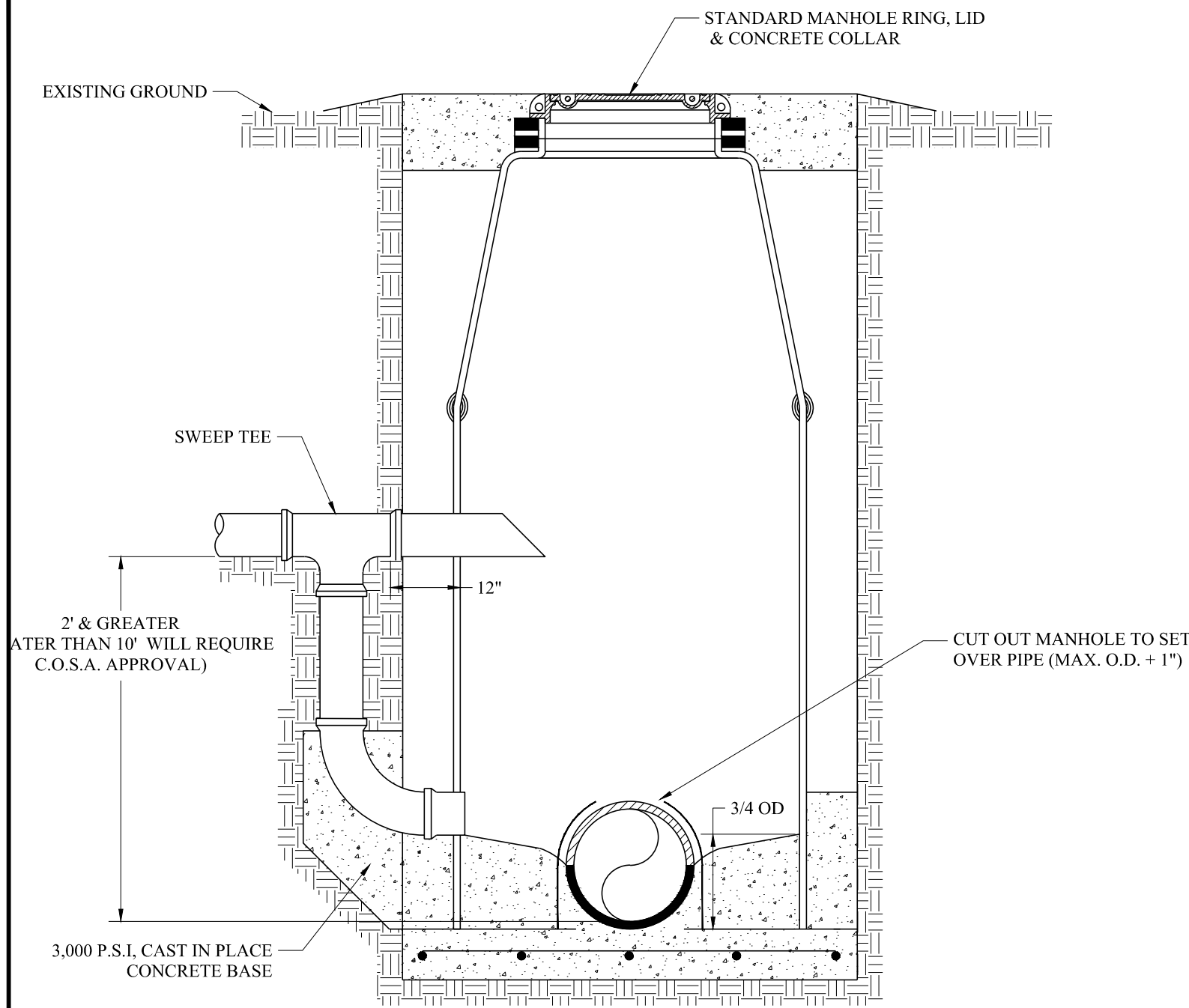
CITY OF SAN ANGELO TEXAS
2017 SULPHUR DRAW
WASTEWATER IMPROVEMENTS PROJECT
MANHOLE DETAILS

CONTRACT NO.
16-6683
SHEET NO.
14 OF 20

DESIGNED BY: J.T.M.
DRAWN BY: 3K
CHECKED BY: S.D.
DATE: 08/15/2017
SCALE: NONE

BAR IS ONE
EIGHTH OF
ORIGINAL DRAWING
IF NOT ONE INCH
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ADJUST SCALES
ACCORDINGLY.

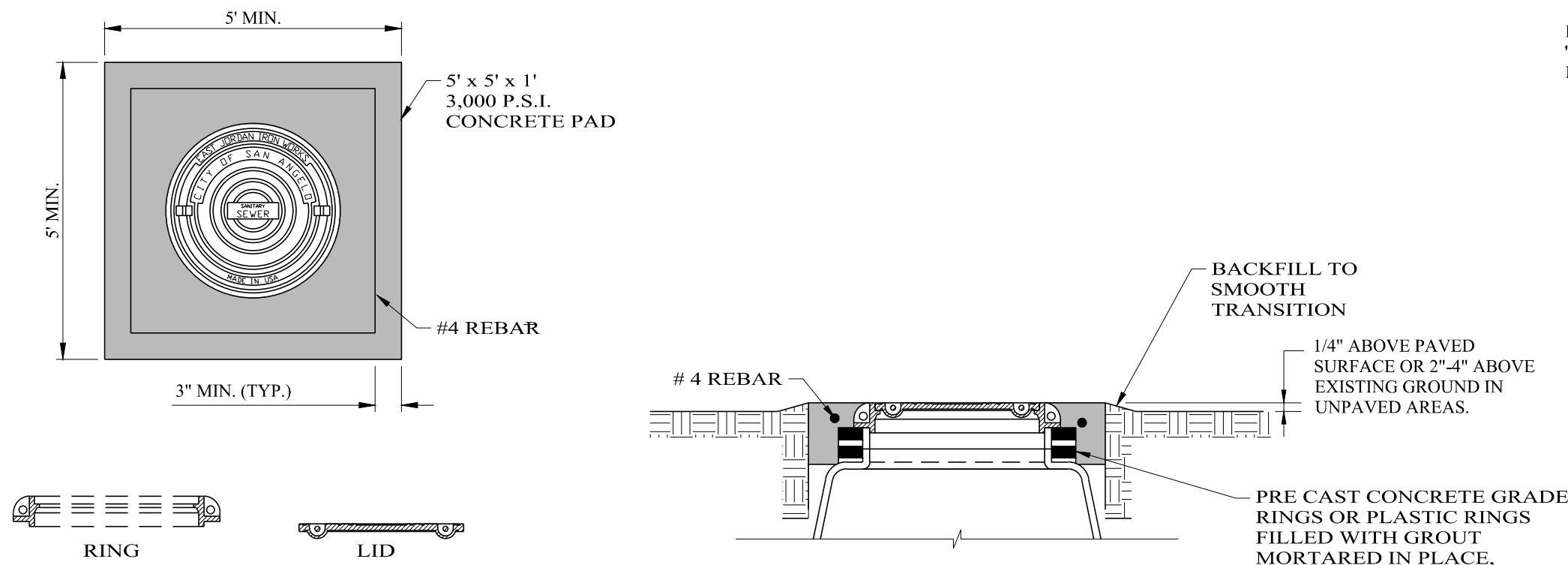
08/15/2017
JOSEPH T. MAYERSON
117205
REGISTERED PROFESSIONAL ENGINEER
CIVIL
STATE OF TEXAS



NOTES

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- WHEN ENTERING AN EXISTING MANHOLE WITH A NEW LINE AND THE DIFFERENCE IN ELEVATION OF THE TWO INVERTS EXCEEDS 2' THE METHOD OF ENTRANCE SHALL BE AS ABOVE.
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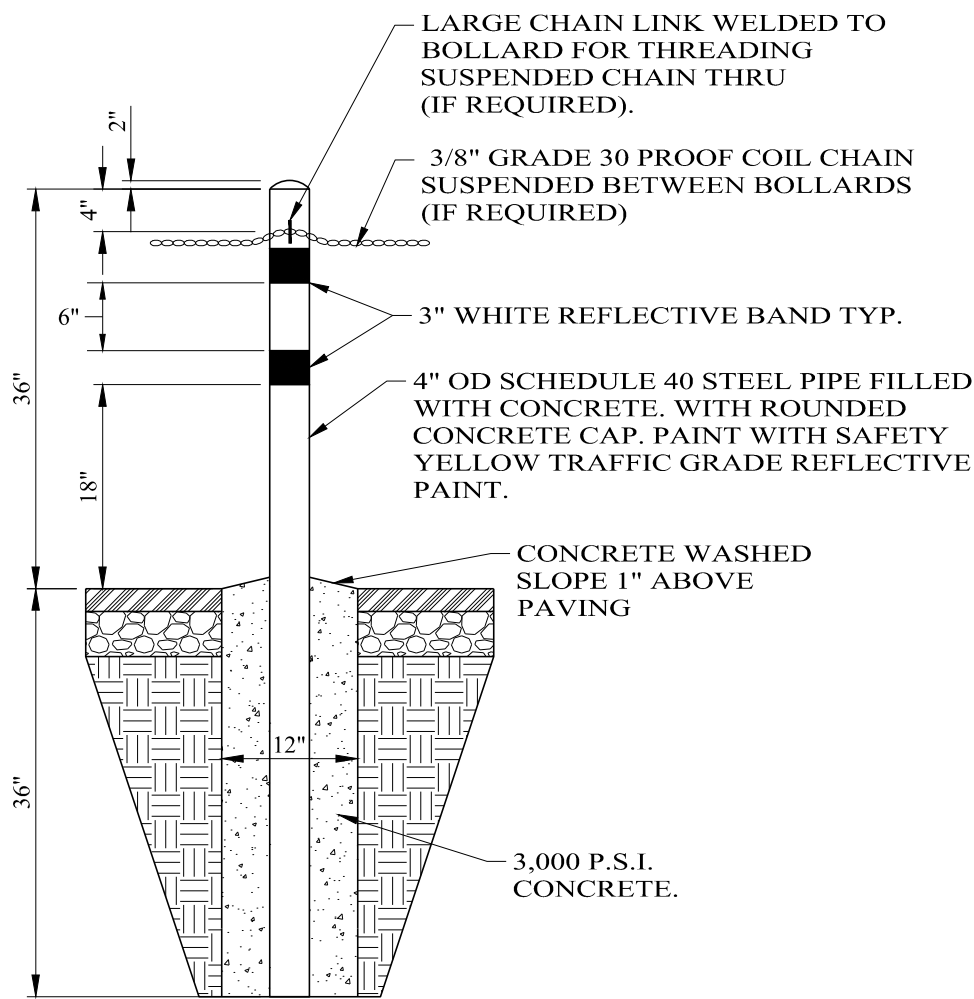
DROP MANHOLE



NOTES:

- MANHOLE RING (V-1420) & LID (V-1430) SHALL BE EAST JORDAN IRON WORKS OR APPROVED EQUAL WITH "CITY OF SAN ANGELO" CUSTOM LETTERING.
- WATER TIGHT, BOLT-DOWN SPECIFIED RING (V-1420) & LID (V-1430) SHALL BE EAST JORDAN IRON WORKS OR APPROVED EQUAL WITH AN INFLOW PREVENTION DEVICE (IPD).
- MANHOLE RING & LID SHALL BE MACHINE FITTED WITH TWO (2) PICK BAR SLOTS.
- MANHOLE RING AND COVER SHALL BE CAST IRON, MEETING THE LATEST REVISION OF ASTM A-48 CLASS 30 WITH A HIGHWAY LOAD RATING OF H-20.
- MANHOLES LOCATED WITHIN A 100-YEAR FLOOD PLAIN OR ANY AREA SUBJECT TO STORMWATER INFILTRATION SHALL INCORPORATE A WATERTIGHT, BOLT-DOWN RING AND LID AND AN INFLOW PREVENTION DEVICES (IPDs).
- MANHOLES LOCATED WITHIN UNDEVELOPED AREAS, AGRICULTURAL FIELDS, OR ANY AREA SUBJECT TO BEING OVERGROWN OR OTHERWISE OBSCURED SHALL INCORPORATE A BOLLARD AT EACH CORNER OF THE CONCRETE COLLAR, FOUR (4) TOTAL.

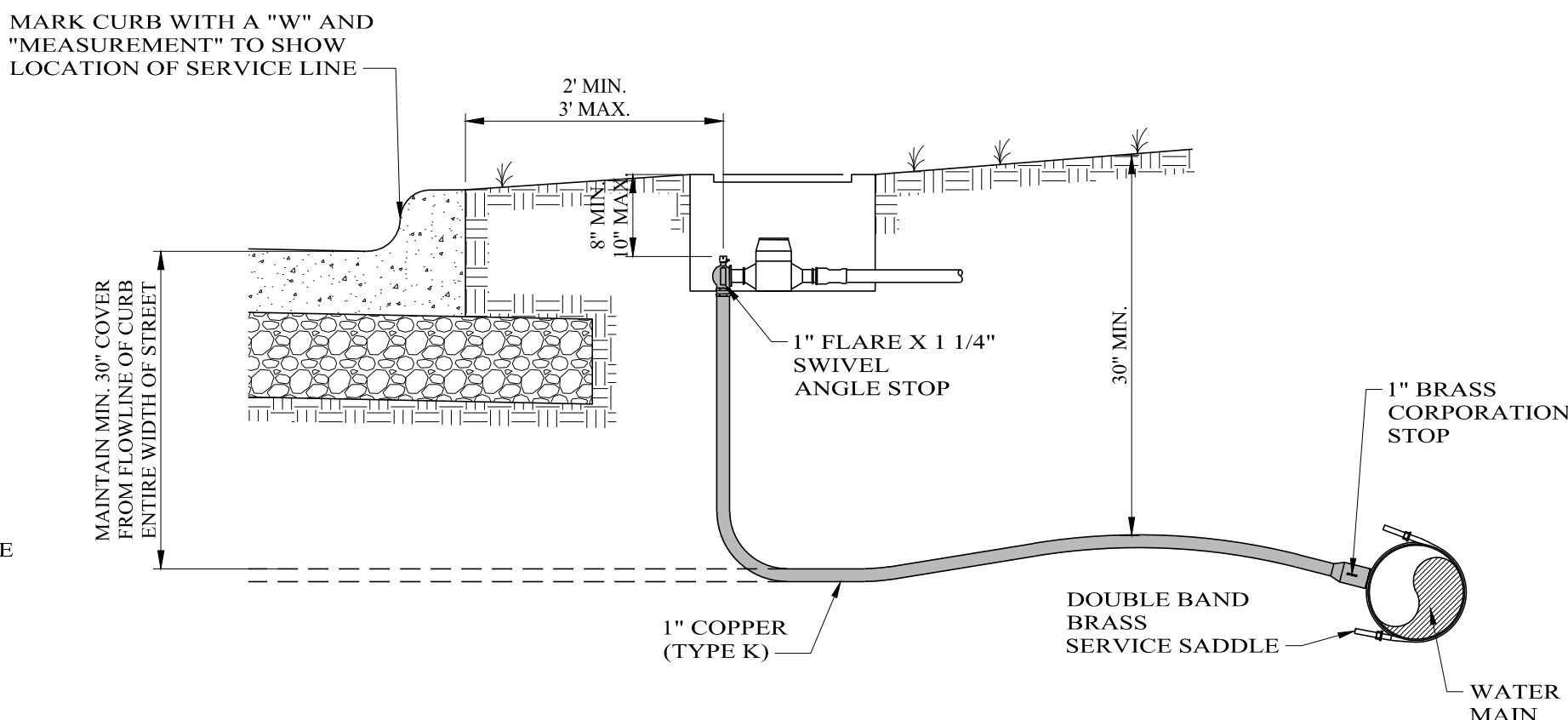
STANDARD MANHOLE RING & LID
WITH CONCRETE COLLAR



NOTES

- VERIFY LOCATIONS OF UNDERGROUND UTILITIES BEFORE DIGGING.
- BOLLARDS SHALL NOT BE PLACED CLOSER THAN 18" TO BACK OF CURB UNLESS OTHERWISE NOTED ON PLANS.
- WHEN BOLLARDS ARE PLACED AS PERIMETER FOR A FACILITY, TYPICAL SPACING SHALL BE 15 FEET.
- SUSPENDED CHAIN SHALL BE PULLED TAUGHT TO PROVIDE MINIMUM 18" CLEARANCE FROM GROUND AT LOWEST POINT.
- TO BEGIN AND END SUSPENDED CHAIN SECURE TO LINK WELDED TO BOLLARD WITH 1/2" SCREW-TYPE QUICK LINK.
- WHERE SUSPENDING CHAIN ACROSS DRIVEWAY FOR A GATE, WELD ONE SIDE SECURE TO BOLLARD WITH SUFFICIENT LENGTH OF CHAIN TO REACH AND LOCK TO A 12" PIECE OF CHAIN WELDED TO BOLLARD ON OTHER SIDE OF DRIVEWAY.

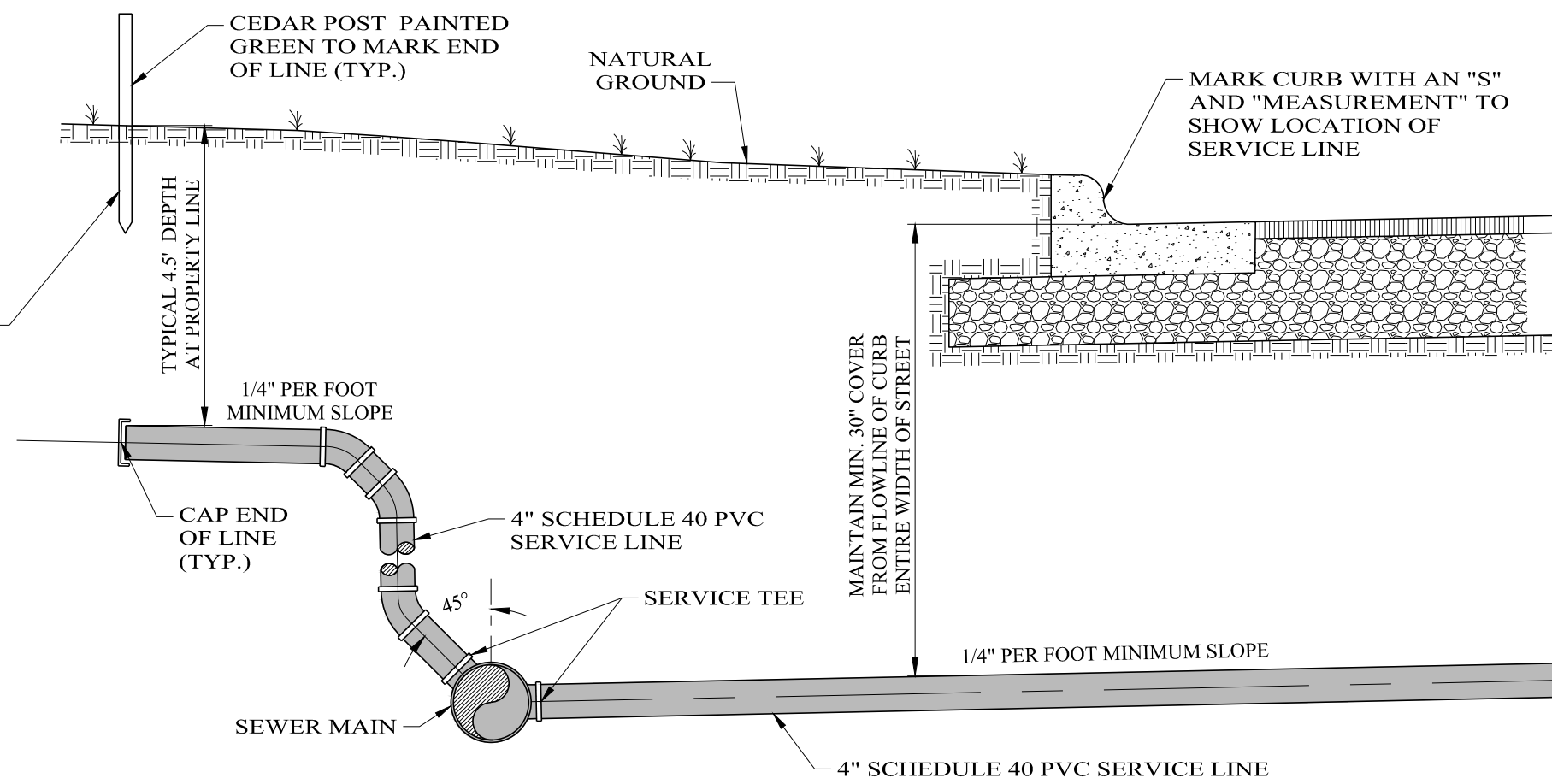
PIPE BOLLARD



NOTES

- ALL CONNECTIONS TO COPPER TUBING SHALL BE FLARED FITTINGS.
- ALL PVC FITTINGS SHALL BE SCHEDULE 80 WITH GLUED JOINTS.
- ANY BUSHINGS REQUIRED SHALL BE BRASS WITH NEOPRENE GASKET.
- ANGLE STOP SHALL BE LOCATED BETWEEN 2' AND 5' FROM BACK OF CURB.
- PEX-A SERVICE LINE WITH COMPRESSION FITTINGS MAY BE USED IN PLACE OF COPPER WITH APPROVAL FROM OWNER.

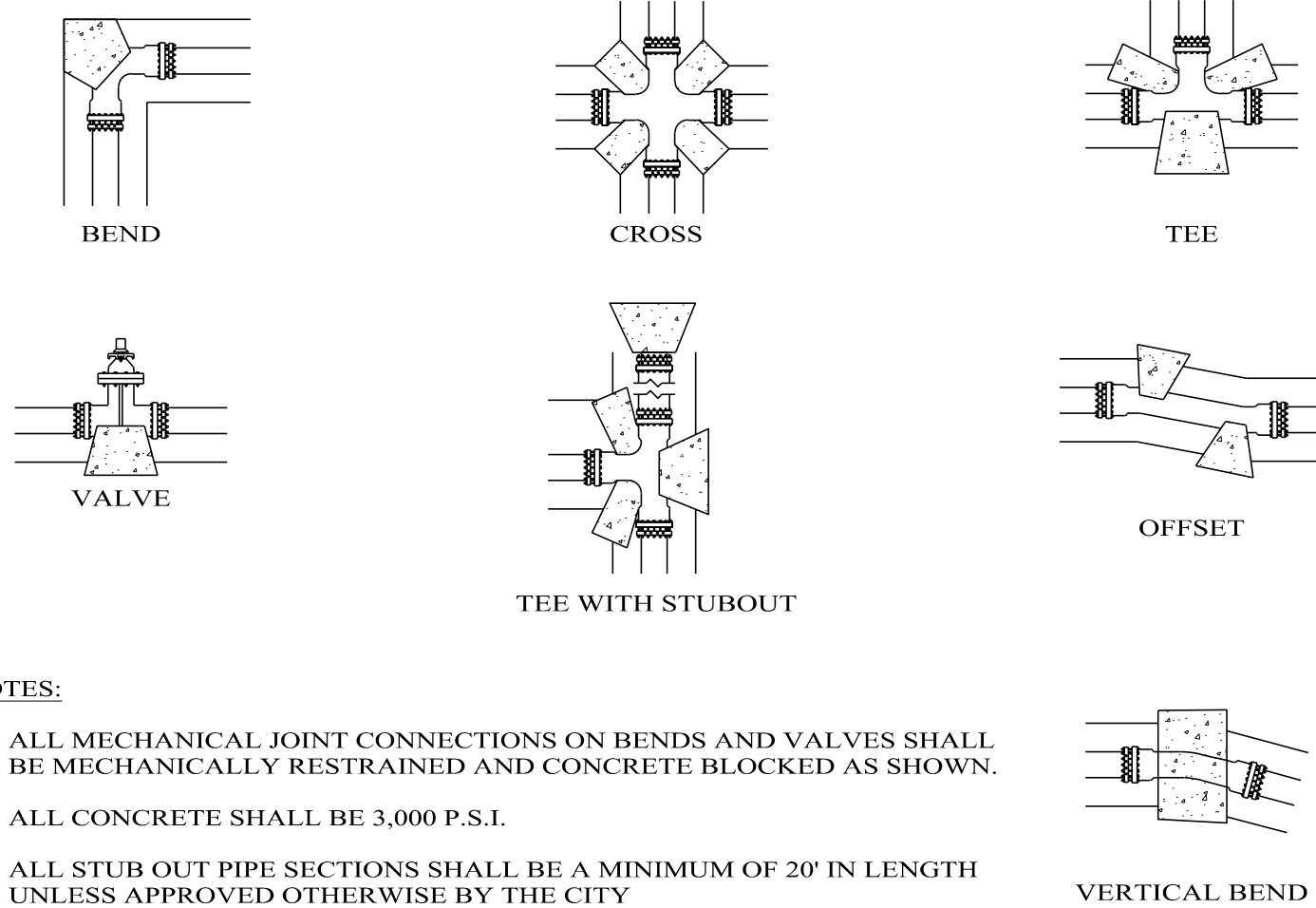
1" SERVICE LINE



NOTES:

- SEWER SERVICE LINES SHALL BE MINIMUM 4" SCHEDULE 40 PVC WITH GLUED JOINTS.
- SERVICE LINE PIPE SHALL BE STANDARD 20' JOINTS, UNLESS TOTAL LENGTH OF SERVICE LINE IS LESS THAN 10', OR UNLESS APPROVED OTHERWISE BY THE CITY OF SAN ANGELO.
- SERVICE LINE BENDS AND WYES SHALL BE SWEEPED. MAXIMUM ALLOWABLE BEND FITTINGS SHALL BE 45°.
- SEWER SERVICES WITH LESS THAN 30" OF COVER FROM THE FLOWLINE OF CURB ON THE SHALLOWER SIDE OF THE STREET SHALL BE INSTALLED WITH A CONCRETE CAP ACROSS THE ENTIRE WIDTH OF STREET.
- SEWER SERVICE WITH LESS THAN 24" OF COVER FROM THE FLOWLINE OF CURB REQUIRE CITY OF SAN ANGELO APPROVAL.

4" SEWER SERVICE LINE

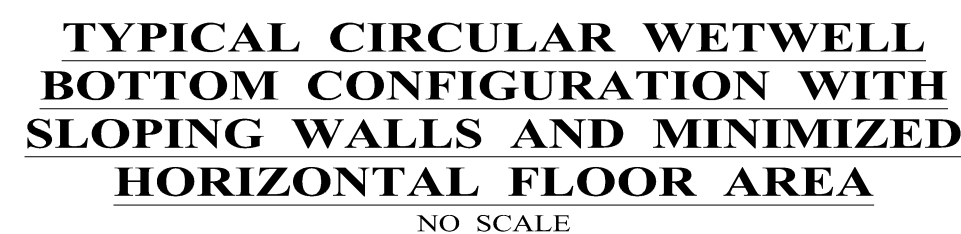
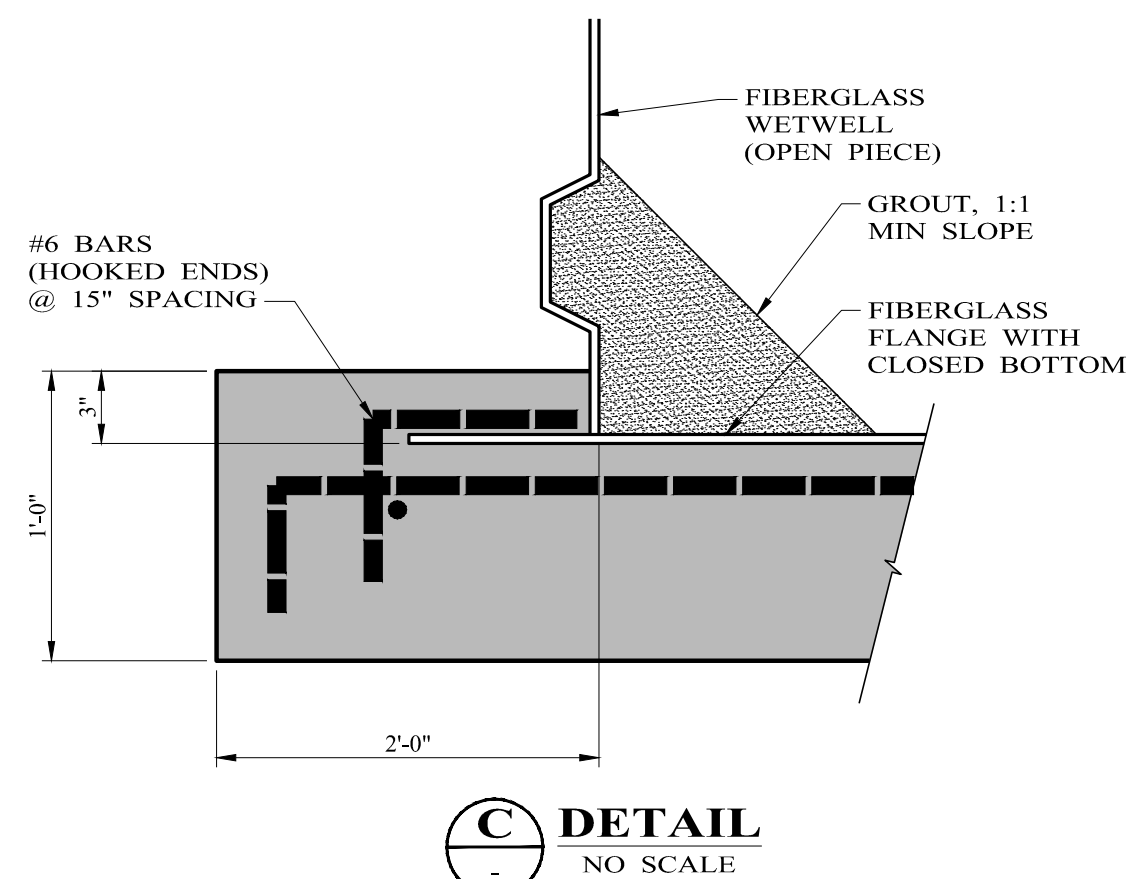
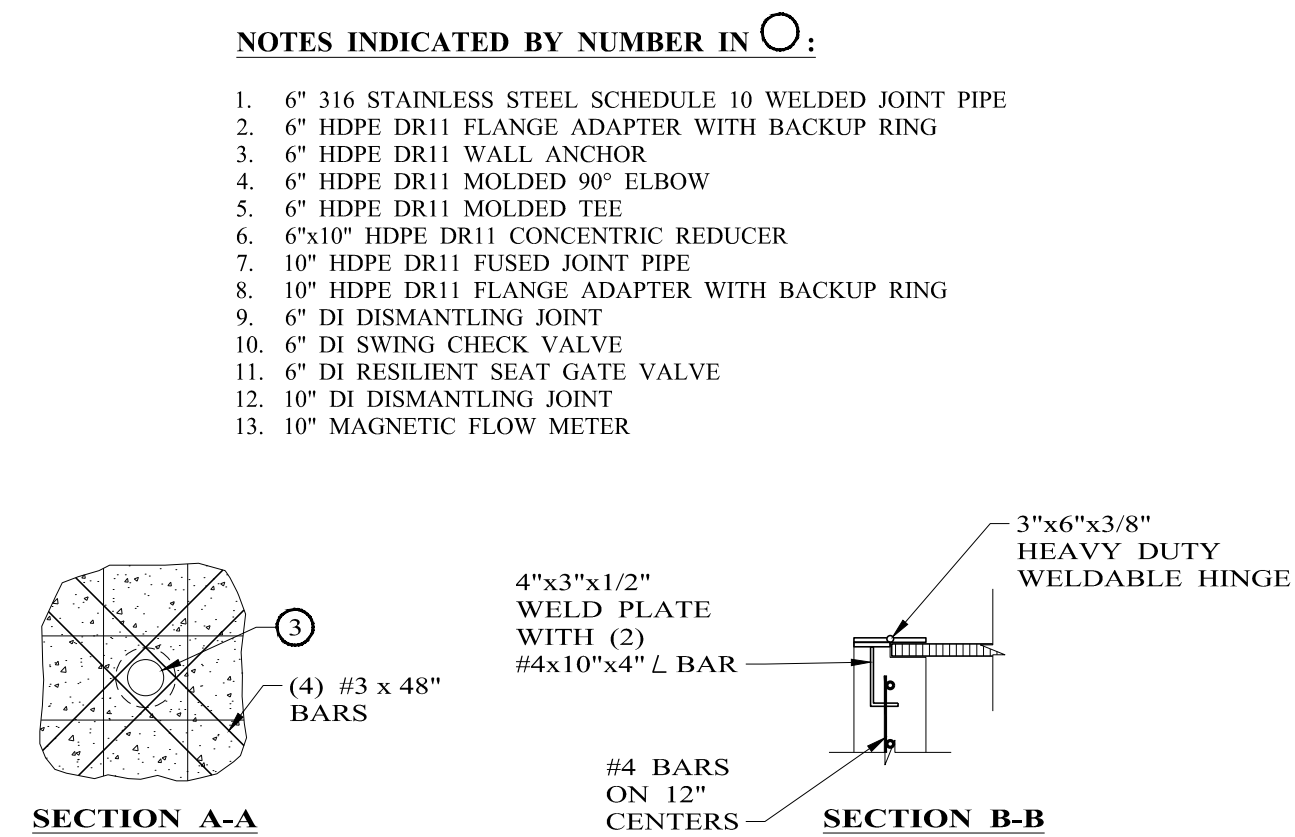


NOTES:

- ALL MECHANICAL JOINT CONNECTIONS ON BENDS AND VALVES SHALL BE MECHANICALLY RESTRAINED AND CONCRETE BLOCKED AS SHOWN.
- ALL CONCRETE SHALL BE 3,000 P.S.I.
- ALL STUB OUT PIPE SECTIONS SHALL BE A MINIMUM OF 20' IN LENGTH UNLESS APPROVED OTHERWISE BY THE CITY
- IF STUBOUT ENCOMPASSES MORE THAN ONE JOINT, BELL JOINT RESTRAINTS SHALL BE USED.
- ALL DUCTILE IRON SHALL BE WRAPPED IN MINIMUM 3 MIL. POLY SHEETING

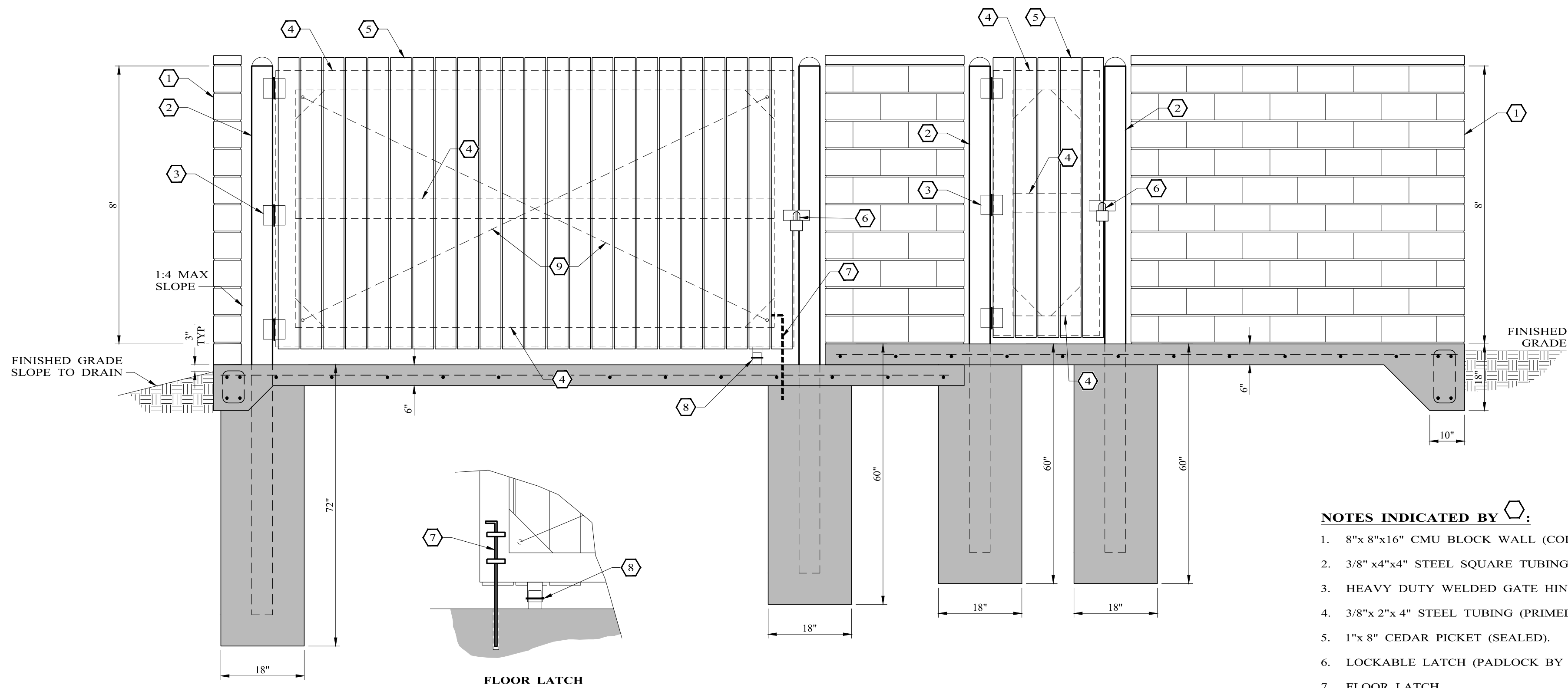
THRUST BLOCKING

DESIGNED BY: J.T.M.	DRAWN BY: 3K	CHECKED BY: S.D.	DATE: 08/15/2017	SCALE: NONE
BAR IS ONE INCH LONG ORIGINAL DRAWING				
IF NOT ONE INCH LONG ON THIS SHEET ADJUST SCALES ACCORDINGLY.				
08/15/2017 JOSEPH T. MANGREK 117205 PE Firm Registration No. 1151 PG Firm Registration No. 10017500 & 10067300 RPLS Firm Registration Nos. 10017500 & 10067300 ENPROTEC/HIBBS & TODD, INC. ENVIRONMENTAL AND CIVIL ENGINEERING 2525-698-5560				
CITY OF SAN ANGELO TEXAS 2017 SULPHUR DRAW WASTEWATER IMPROVEMENTS PROJECT MISCELLANEOUS DETAILS				
CONTRACT NO. 16-6683				
SHEET NO. 15 OF 20				



- NOTES INDICATED BY NUMBER IN  :**
1. HIGH ALARM: ELEV. 1819.84 @ 18" INVERT
 2. LAG PUMP : ELEV. 1819.34 18" INV. - 0.5'
 3. LEAD PUMP: ELEV. 1818.84 18" INV. - 1.0'
 4. PUMP OFF: ELEV. 1812.00
 5. LOW LEVEL LOCK-OUT: ELEV. 1811.00
 6. SUBMERSIBLE LEVEL TRANSDUCER
 7. 316 S.S. ANCHOR BOLTS WITH EPOXY GROUT
 8. TOP RAIL SUPPORT (BOLTS TO COVER FRAME)
 9. STAINLESS STEEL LIFTING CHAIN AND NYLON ROPE.
 10. 316 S.S. GUIDE RAILS, MUST BE PLUMB.
 11. 316 S.S. INTERMEDIATE RAIL SUPPORT @ 5' SPACING (MAX).
 12. 6" 316 S.S. SCH. 10 DISCHARGE PIPING.
 13. SUBMERSIBLE PUMP.
 14. 4"x6" DISCHARGE ELBOW.
 15. TRANSITION FROM 316 S.S. TO HDPE PIPING.
 16. 10" HDPE ODOR CONTROL AIR PIPING.
 17. 316 STAINLESS STEEL PIPE SUPPORT (TYPICAL).
 18. CAST-IN-PLACE VALVE VAULT #4 REBAR @ 9" O.C.E.W. OR PRECAST CONCRETE VAULT WITH APPROVED SUBMITTAL.
 19. 2" SCH. 80 PVC CONDUIT FOR PUMP CABLE (3 EA).

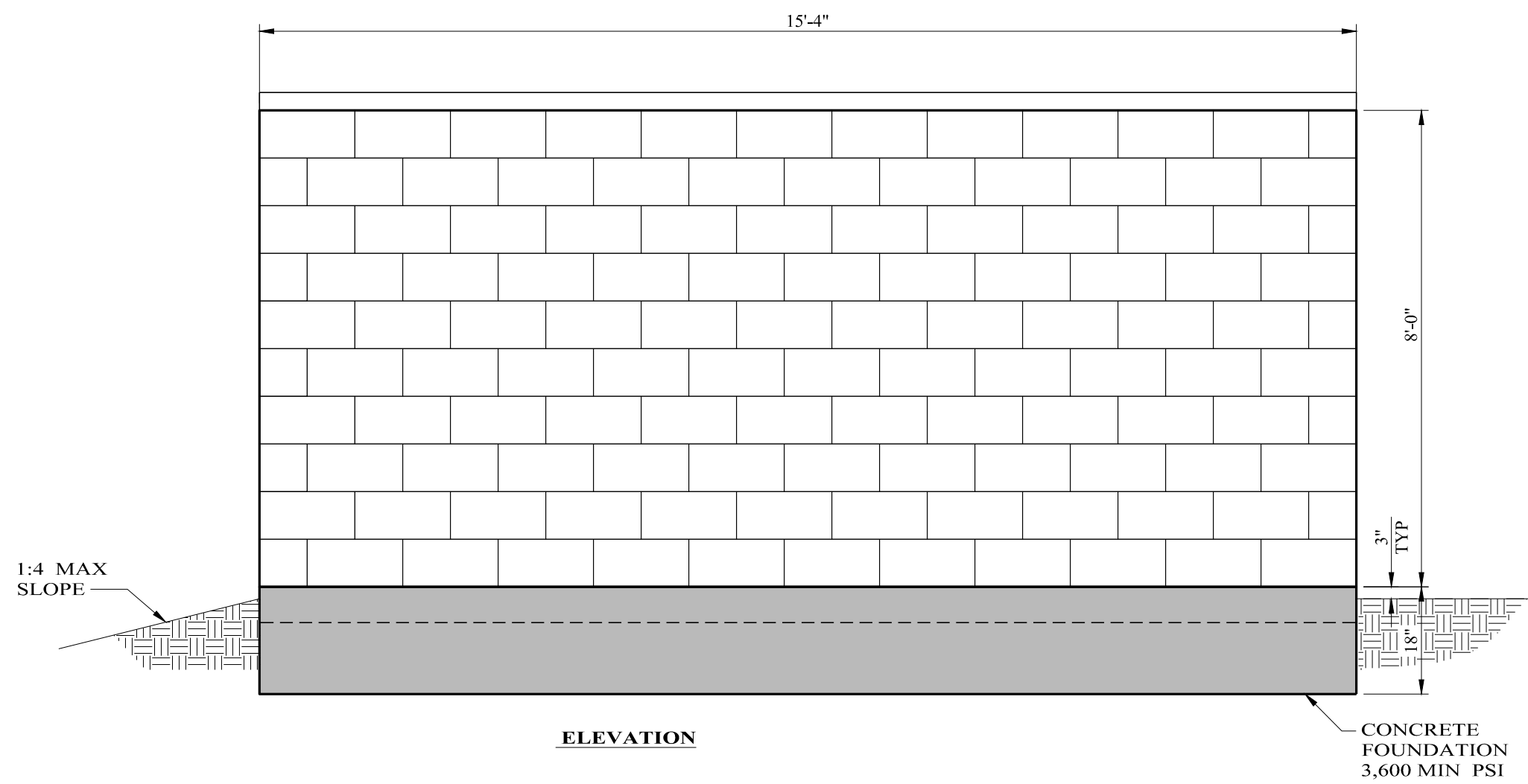
- GENERAL NOTES:**
1. ALL CONCRETE EDGES SHALL BE ROUNDED OR CHAMFERED 1/2".
 2. ALL REBAR SHALL BE GRADE 60 AND TIED AT EACH JUNCTION. REBAR SPLICES, IF REQUIRED, SHALL HAVE A MINIMUM OF 18" OVERLAP OR 40 BAR DIAMETER, WHICHEVER IS GREATER.
 3. DISCHARGE BASE, PUMPS, GUIDERAILS AND DISCHARGE PIPING SHALL BE INSTALLED PRIOR TO PLACING GROUT ON LOWER SLAB TO SLOPE WETWELL FLOOR.
 4. BACKFILL OF THE WETWELL SHALL BE ACCOMPLISHED USING FREE-FLOWING GROUT. HEAVY EQUIPMENT SHALL NOT BE OPERATED CLOSER TO THE WETWELL THAN A DISTANCE EQUAL TO THE HEIGHT OF THE BACKFILL.
 5. ALL BOLTS AND FASTENERS SHALL BE 316 STAINLESS STEEL.
 6. FLANGE ADAPTER BACKUP RINGS SHALL BE LIKE METALS (SS-SS, DI-DI).
 7. DISSIMILAR METALS SHALL INCORPORATE ISOLATION KITS.
 8. WETWELL INLET AND DISCHARGE PIPING SHOWN IN PROFILE FOR CLARITY. ACTUAL ORIENTATION AND PLACEMENT AS PER SITE PLAN.
 9. REFER TO PLAN VIEW FOR PROPER CONFIGURATION OF VALVE VAULT DISCHARGE PIPING.



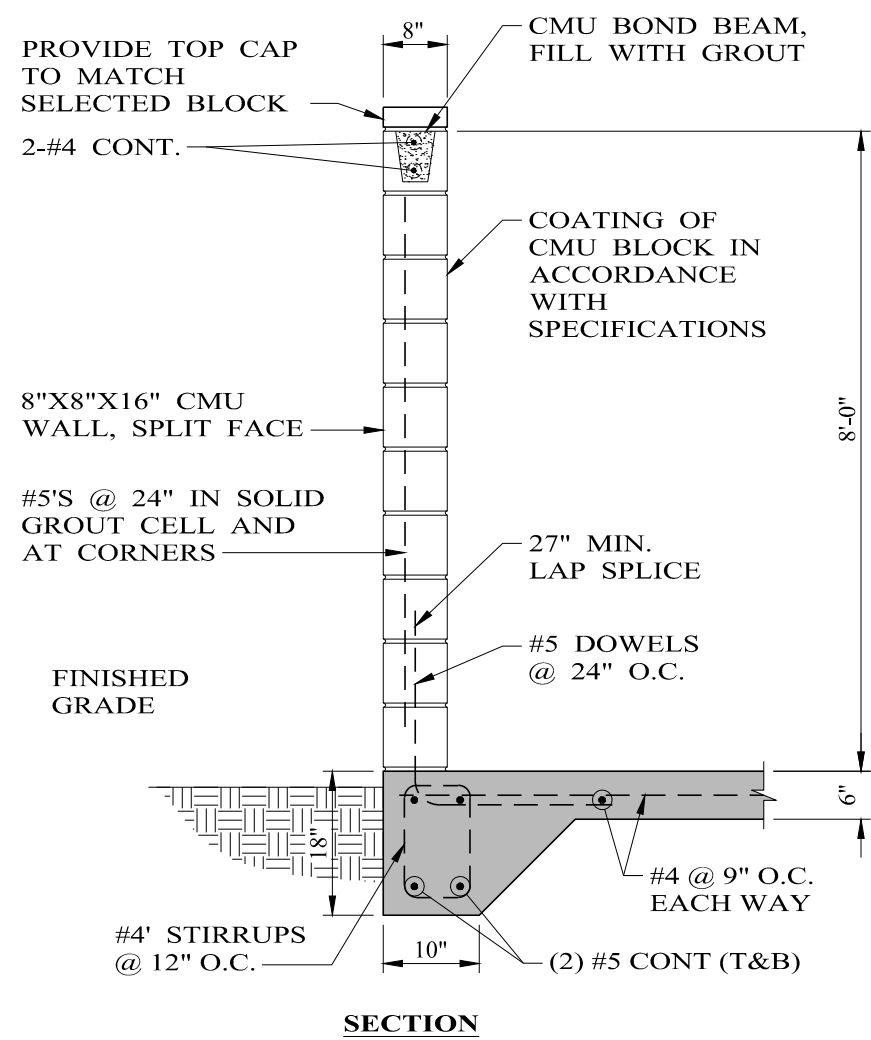
LIFT STATION GATE DETAIL
NO SCALE

NOTES INDICATED BY :

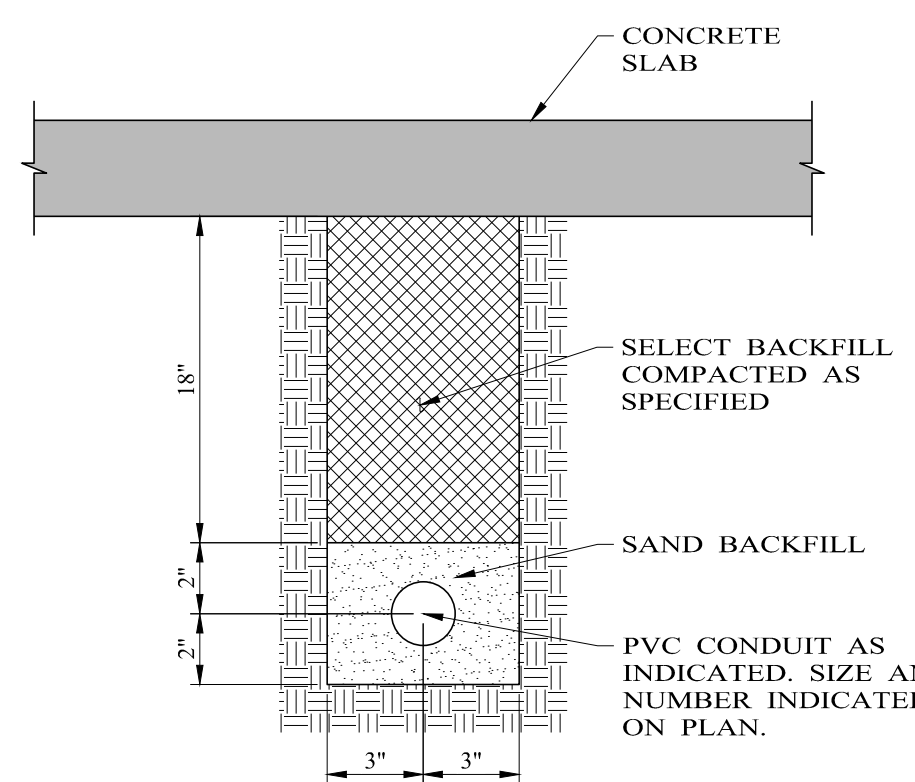
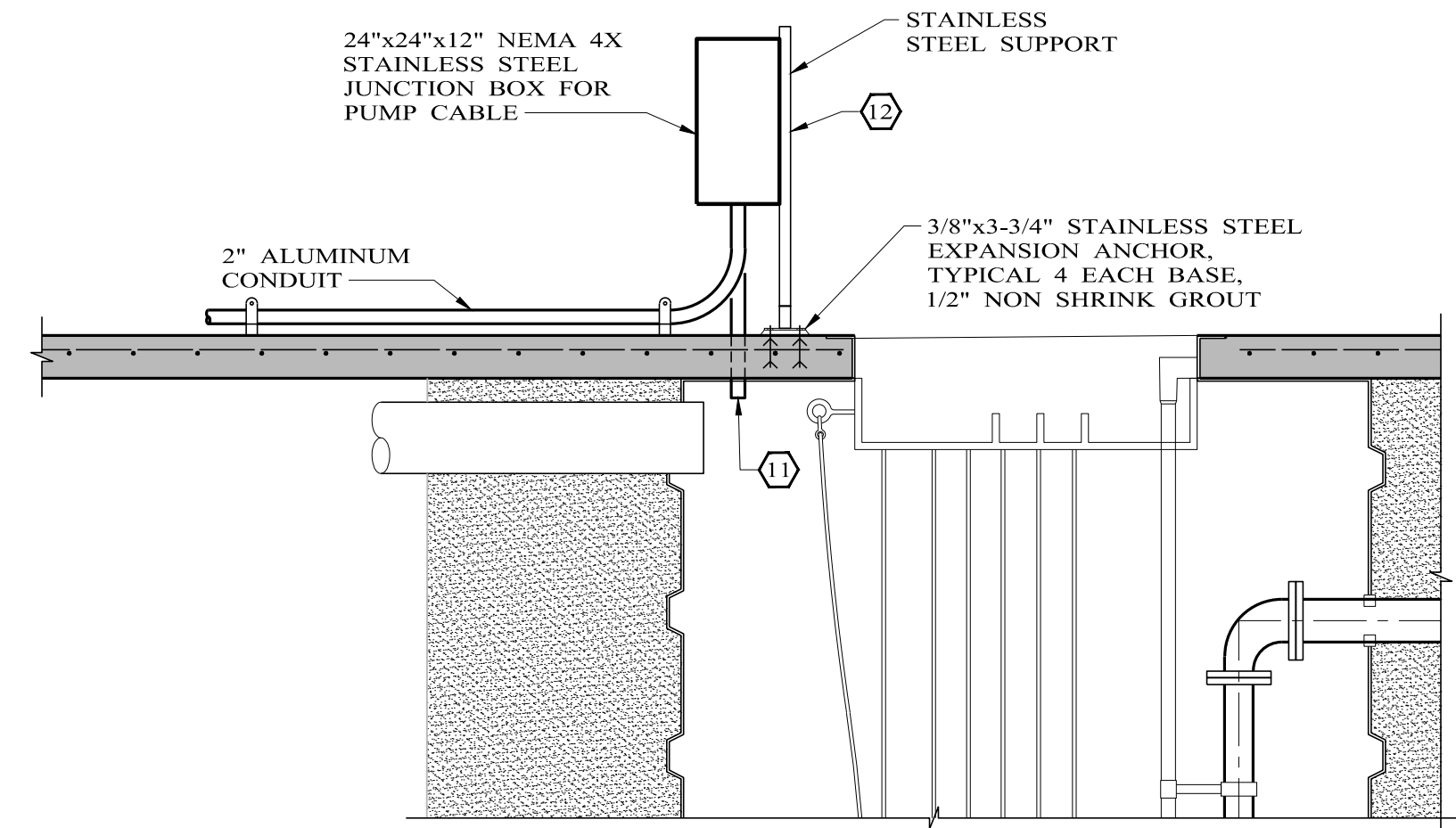
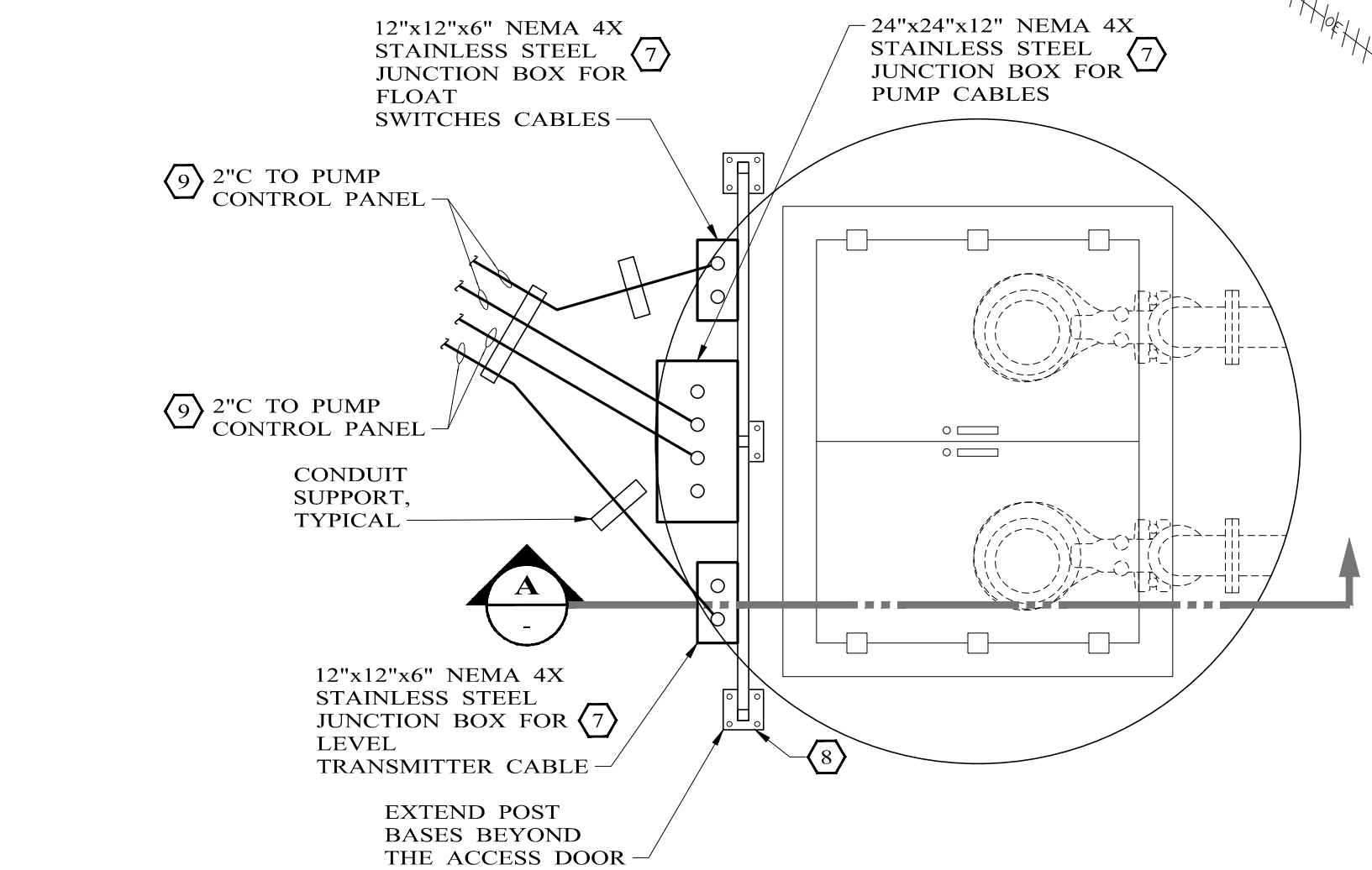
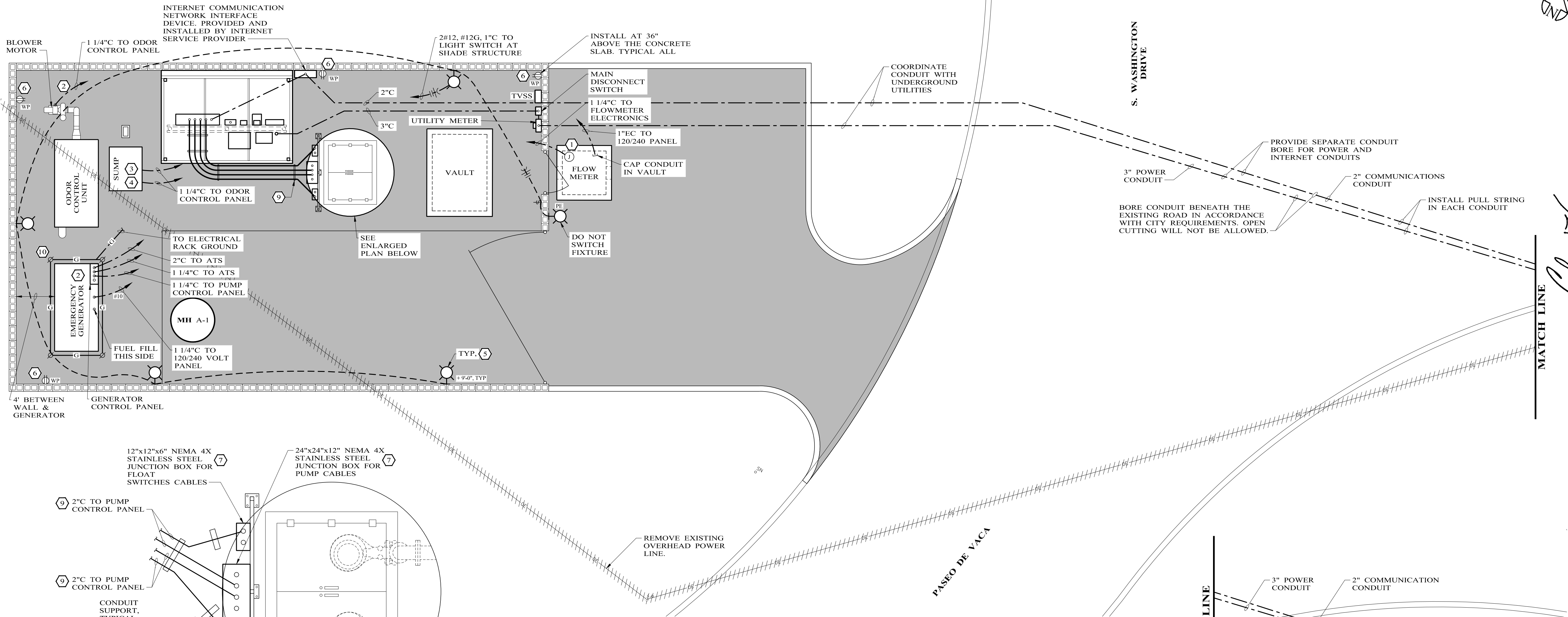
1. 8"x 8"x16" CMU BLOCK WALL (COLOR PER OWNER).
2. 3/8" x4"x4" STEEL SQUARE TUBING (PRIMED AND PAINTED).
3. HEAVY DUTY WELDED GATE HINGE.
4. 3/8"x 2"x 4" STEEL TUBING (PRIMED AND PAINTED).
5. 1"x 8" CEDAR PICKET (SEALED).
6. LOCKABLE LATCH (PADLOCK BY OWNER).
7. FLOOR LATCH.
8. GATE SUPPORT WHEEL.
9. 1/4" STEEL CABLE WITH TURNBUCKLE.



SPLIT - FACED CMU FENCE DETAIL
NO SCALE



Joseph T. Mayson



ELECTRICAL PLAN
SCALE: 1" = 5'

LEGEND	
SYMBOL	DESCRIPTION
ⓐ	JUNCTION BOX
————	CONDUIT - CONCEALED
-----	CONDUIT - EXPOSED
— · — · —	CONDUIT - UNDERGROUND
— G —	DIRECT BURIED GROUND CONDUCTOR
\$	WALL SWITCH: 2 - DOUBLE POLE P - PILOT LIGHT 3 - THREE WAY K - KEY OPERATED 4 - FOUR WAY D - DIMMER WP - WEATHERPROOF CR - CORROSION RESISTANT
ATS	AUTOMATIC TRANSFER SWITCH
EC	EMPTY CONDUIT
WP	WEATHERPROOF
CR	CORROSION RESISTANT
GFI	GROUND FAULT INTERRUPTER
MDP	MAIN DISTRIBUTION PANEL BOARD
TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSOR. SEE SPECIFICATIONS
Ⓢ	RECEPTACLE, NEMA 5-20R UNLESS OTHERWISE INDICATED
Ⓢ T	HOME RUN TO PANEL INDICATED. UNLESS OTHERWISE INDICATED, PROVIDE 2#12 AWG, #12G, 1"C. SHORT DASH INDICATES HOT CONDUCTOR, LONG DASH INDICATES NEUTRAL AND CURVED DASH INDICATES GROUND
Ⓢ	MANUAL MOTOR STARTER WITH THERMAL OVERLOAD, SIZE FOR THE MOTOR
Ⓢ	COMBINATION MOTOR STARTER DISCONNECT, SIZE 1 UNLESS INDICATED OTHERWISE
Ⓢ 30	NON-FUSED DISCONNECT AMPERE RATING AS INDICATED
Ⓢ	ELECTRICAL PULL BOX
Ⓢ	EQUIPMENT ITEM. SEE EQUIPMENT SCHEDULE
Ⓢ	REFER NOTE INDICATED

- GENERAL NOTES:**
- ALL METALLIC CONDUIT PENETRATIONS THROUGH THE LIFT STATION CONCRETE SLAB SHALL BE MADE USING PVC COATED RIGID STEEL CONDUIT UP TO A POINT SIX INCHES ABOVE THE CONCRETE LEVEL. PVC COATING SHALL BE UNDAMAGED.
- NOTES INDICATED ON DRAWING BY:**
- INSTALL NEMA 6 JUNCTION BOX INSIDE MANHOLE. CONDUIT SHALL ENTER THE MANHOLE 18" BELOW GRADE. ROUTE CONDUCTORS TO PROBES AS REQUIRED BY MANUFACTURE. INSTALL WATER PROOF CORD CONNECTIONS AT JUNCTION BOX FOR CONNECTION OF PROBE CONDUCTORS. ROUTE PROBE CONDUCTORS ON THE PIPE AND AROUND THE VAULT SUCH THAT THEY DO NOT INTERFERE WITH ACCESS TO THE FLOWMETER OR CREATE A TRIPPING HAZARD.
 - COORDINATE ACTUAL LOCATION OF CONDUIT STUB-UP WITH EQUIPMENT PROVIDED.
 - COORDINATE CONDUIT WITH SUMP PUMP.
 - COORDINATE CONDUIT AND CABLE WITH FLOAT SWITCH.
 - PROVIDE HOLOPHANE W4GLED-10C-1000-40K-T3-MVOLT. FIXTURE TO BE GRAY. PROVIDE BUTTON TYPE PHOTOCELL, OPTION PE, WHERE INDICATED.
 - CONNECT ALL RECEPTACLES TO COMMON CIRCUIT AS INDICATED ON THE PANEL SCHEDULE. ROUTE CONDUITS AROUND WALL. INSTALL 2#12AWG, #12G, 1" CONDUIT.
 - PROVIDE ENCLOSURE WITH LOCKABLE, HINGED FRONT DOOR. PROVIDE 12 GAUGE BACK PANEL.
 - PROVIDE STAINLESS STEEL B-LINE B281SQ POST BASE ATTACHED TO CONCRETE SLAB WITH STAINLESS STEEL ANCHOR BOLTS. INSTALL B-LINE B22B STAINLESS STEEL DOUBLE STRUT FOR VERTICAL RISER, ONE EACH END AND ONE IN THE MIDDLE. INSTALL STAINLESS STEEL 1-5/8"x1-5/8" HORIZONTAL UNISTRUT FOR BOX SUPPORT, QUANTITY AS REQUIRED.
 - PROVIDE CONDUIT SUPPORT FOR SURFACE MOUNTED CONDUIT AT MAXIMUM FIVE FOOT INTERVALS.
 - INSTALL 5/8"x 8'-0" COPPER CLAD GROUND RODS AT EACH CORNER. TOP OF GROUND ROD SHALL BE AT 30" BELOW GRADE. INSTALL #1/0 AWG BARE COPPER GROUND CONDUCTOR AT 30" DEEP.
 - EXTEND 2" SCHEDULE 80 PVC CONDUITS INTO VAULT. INSTALL END BELL ON CONDUIT.
 - POSITION SUPPORT RACK ABOVE VAULT. DO NOT INTERFERE WITH OPENING OF THE ACCESS HATCH. FINAL LOCATION SHALL BE APPROVED BY THE CITY/ENGINEER.
 - CONDUIT STUB-UP FOR INTERNET SERVICE. INSTALL IN ACCORDANCE WITH PROVIDER REQUIREMENTS.

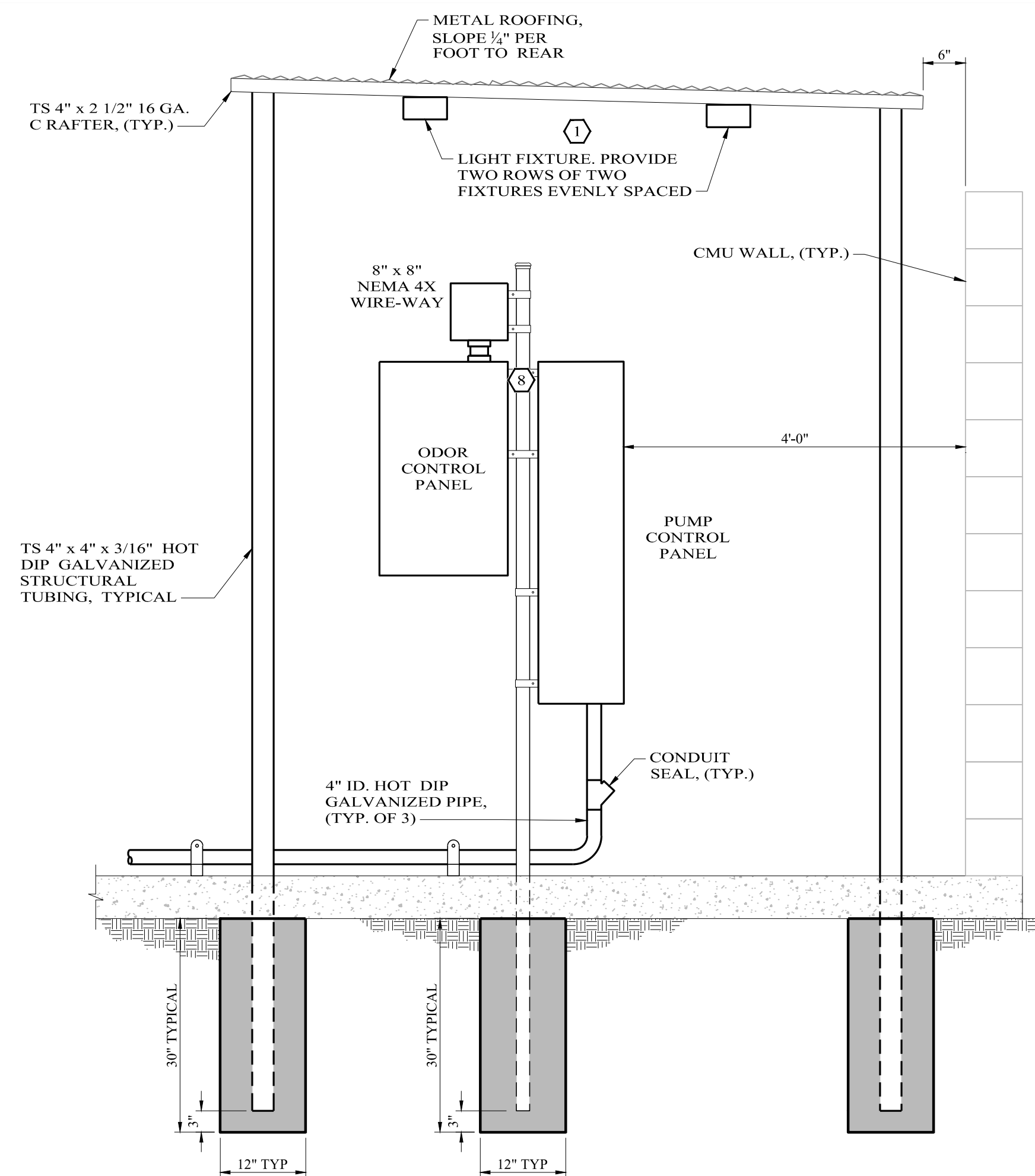
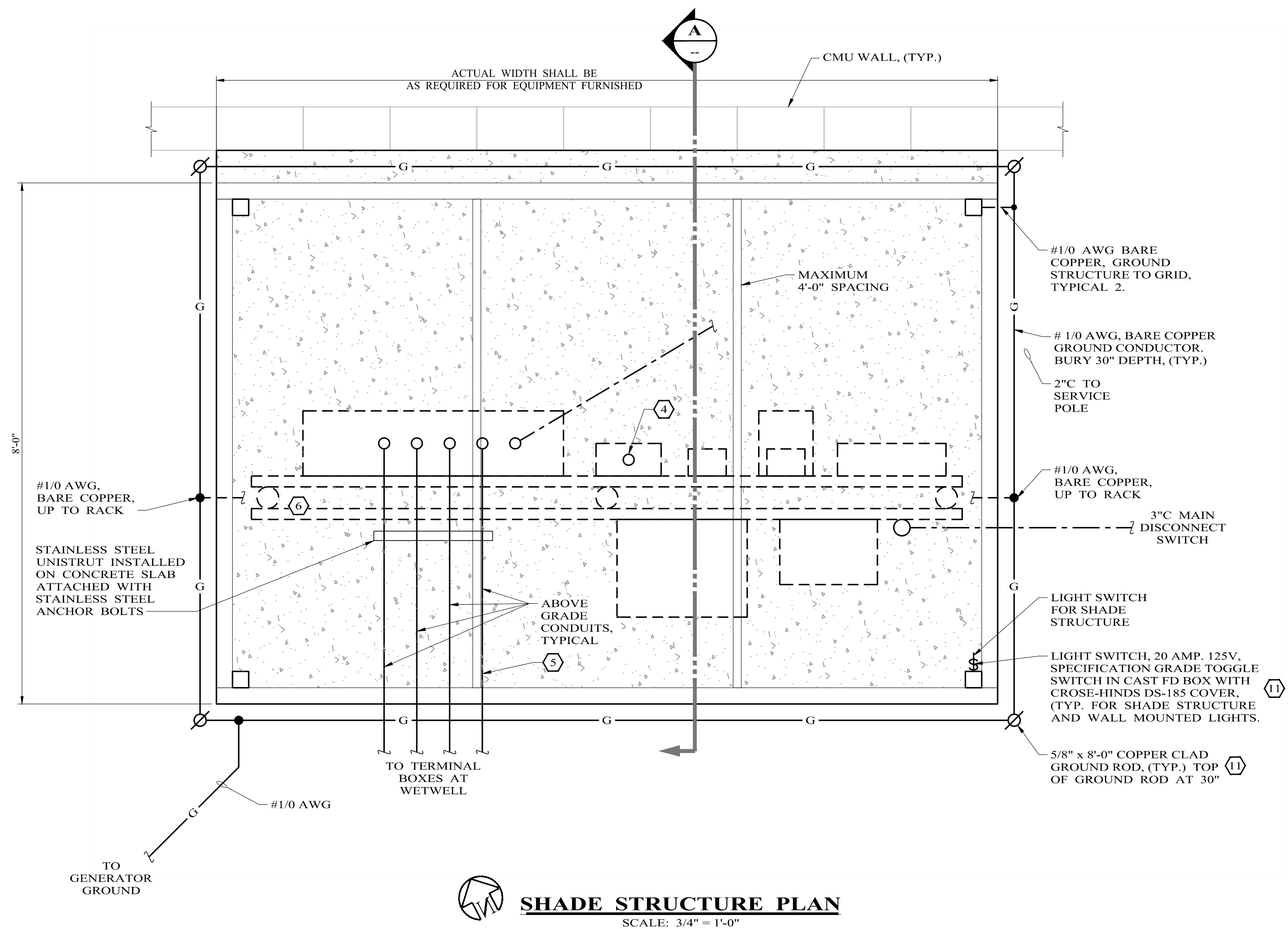
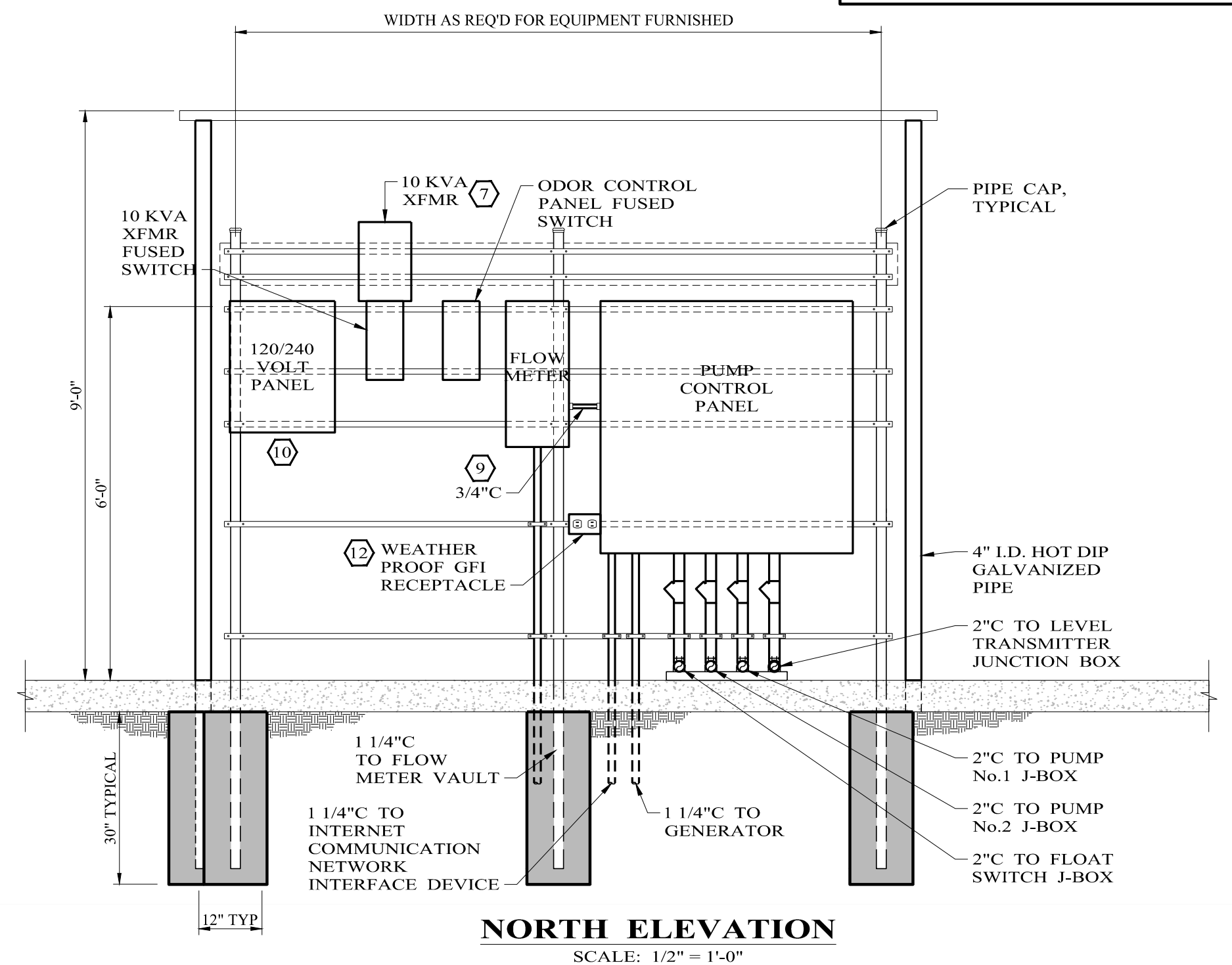
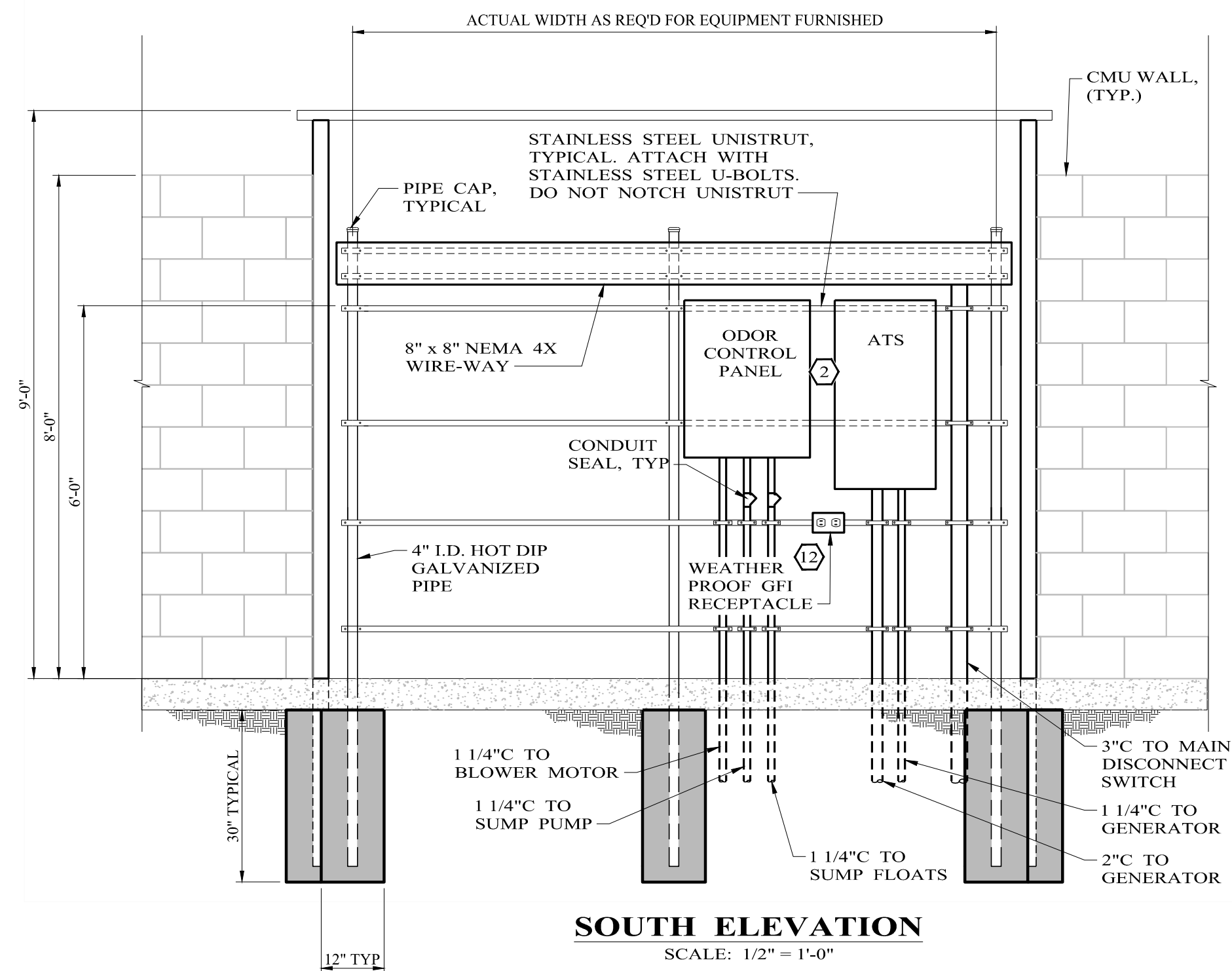
**CITY OF SAN ANGELO
TEXAS**
**2017 SULPHUR DRAW
WASTEWATER IMPROVEMENTS PROJECT**
ELECTRICAL PLAN

ENPROTEC/HIBBS & TODD, INC.
ENVIRONMENTAL AND CIVIL ENGINEERING
PE Firm Registration No. 1151
PG Firm Registration No. 50103
RPLS Firm Registration Nos. 10017500 & 10067300
325-698-5560

DESIGNED BY: C.W.V.
DRAWN BY: 3K
CHECKED BY: C.W.V.
DATE: 08/15/2017
SCALE: 1" = 5'

BAR IS ONE
EIGHTH OF
ORIGINAL DRAWING

PLAN NOT ONE INCH
ON THIS SHEET
ADJUST SCALES
ACCORDINGLY.



- SHADE STRUCTURE NOTES:**
1. SEAL ALL OPEN ENDS OF TUBING VIA BUTT WELDING OR END CAPS.
 2. ALL STRUCTURAL STEEL COMPONENTS SHALL BE SHOP PRIMED.
 3. ALL FIELD WELDS SHALL BE WIRE-BRUSHED AND CLEANED PRIOR TO PRIMING.
 4. FINISH COAT ALL STRUCTURAL STEEL COMPONENTS WITH 12-15 MIL., D.F.T. POLYURETHANE COATING SYSTEM TO MATCH COLOR OF ROOF PANELS.
 5. METAL ROOFING SHALL BE WHITE IN COLOR.
 6. FABRICATION, ERECTION AND FASTENING SHALL BE IN ACCORDANCE WITH AISC SPECIFICATIONS AND STANDARD PROCEDURES FOR TYPICAL METAL BUILDING CONSTRUCTION.

- ## NOTES INDICATED ON DRAWING BY
1. LIGHT FIXTURE SHALL BE CEILING MOUNTED, LITHONIA VAP 12000 LML PCL WD MOULT GZ1040K80CRL. LIGHT SHALL BE SWITCHED FROM THE LOCATION INDICATED ON LEG OF SHADE STRUCTURE.
 2. ALL CONDUIT PENETRATIONS SHALL HAVE WATER PROOF HUBS.
 3. SUPPORT CONDUITS AT UNISTRUT WITH STAINLESS STEEL TWO-HOLE STRAPS. ALL FASTENERS SHALL BE STAINLESS STEEL.
 4. ROUTE 1 1/4" CONDUIT TO FLOWMETER VAULT.
 5. ROUTE CONDUITS SUCH THAT THEY DO NOT INFRINGE ON REQUIRED NEC FRONT ACCESS OF OTHER PANELS.
 6. DO NOT INSTALL ANY EQUIPMENT THIS AREA.
 7. INSTALL TRANSFORMER ABOVE FUSED SWITCH. PROVIDE SUPPORTS AS REQUIRED.
 8. ROUTE CONDUITS TO WIREWAY AS REQUIRED.
 9. DO NOT ROUTE CABLE FROM FLOWMETER ELECTRONICS TO PUMP CONTROL PANEL THROUGH WIREWAY BUT ROUTE SEPARATELY.
 10. CONDUITS TO REMOTE EQUIPMENT NOT SHOWN. SEE PLAN VIEWS PANEL SCHEDULE, AND ONE-LINE DIAGRAM FOR REQUIRED CONDUITS.
 11. CONNECT TO CIRCUIT IN 120/240 VOLT PANEL.
 12. CONNECT TO SAME CIRCUIT IN 120/208 VOLT PANEL.

Chaw Theng

DESIGNED BY:	C.W.V.
DRAWN BY:	3K
CHECKED BY:	C.W.V.
DATE:	08/15/2017
SCALE:	AS NOTED

BAR IS ONE
INCH ON
ORIGINAL DRAWING

1
0

IF NOT ONE INCH
ON THIS SHEET
ADJUST SCALES
ACCORDINGLY.



ENPROTEC/HIBBS & TODD, INC.
ENVIRONMENTAL AND CIVIL ENGINEERING
 1000 West
 325.698-5560
 PE Firm Registration No. 151
 Professional Engineer
 Reg. No. 1001890 & 10007390
 RPLS Firm Registration

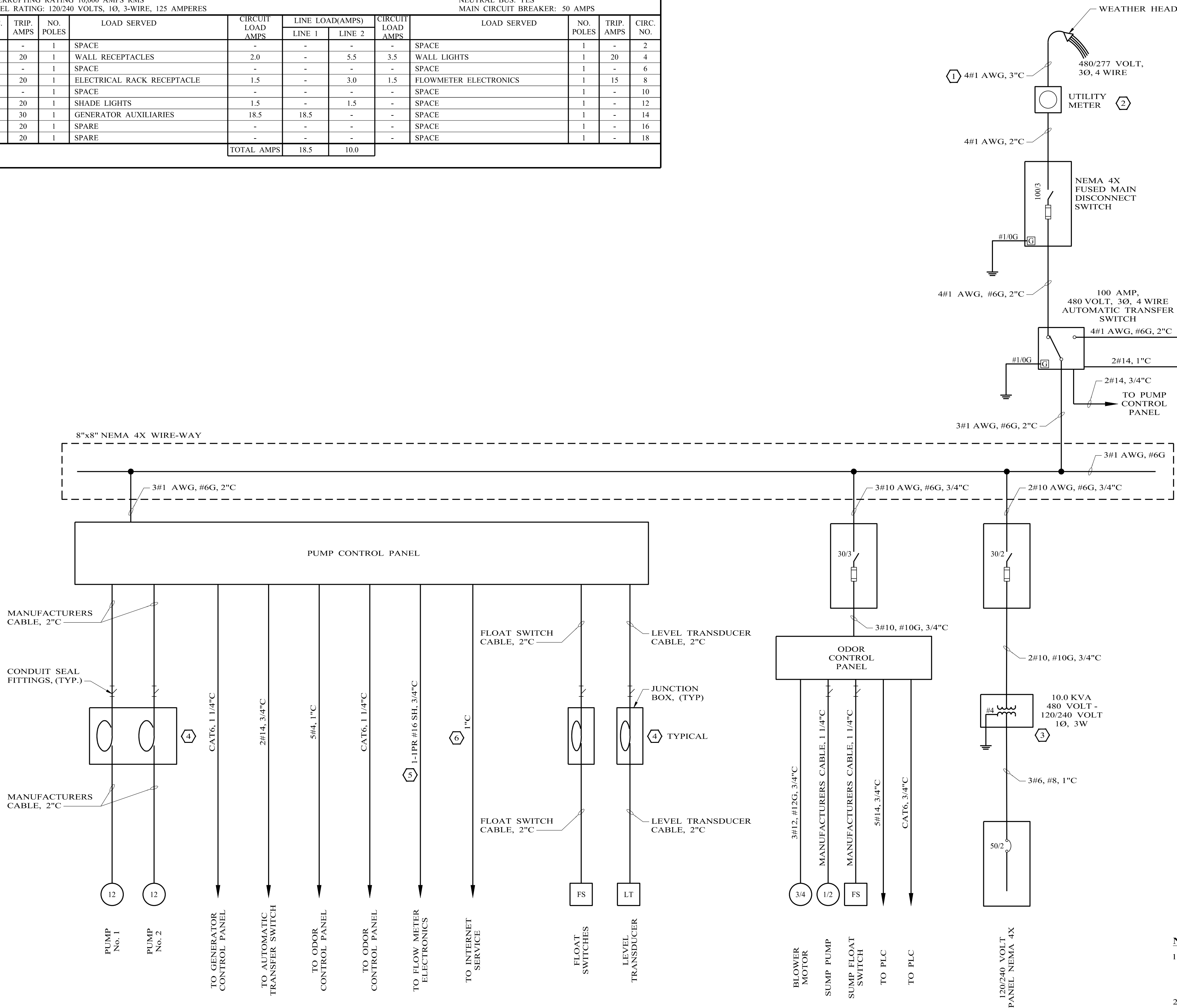
**CITY OF SAN ANGELO
TEXAS
2017 SULPHUR DRAW
WASTEWATER IMPROVEMENTS PROJECT
ELECTRICAL DETAILS**

CONTRACT NO.
16-6683

SHEET NO.

19 OF 20

LOCATION: LIFT STATION ELECTRICAL RACK								PANELBOARD DESIGNATION: 120/240 VOLT			
TYPE ENCLOSURE: NEMA 4X SURFACE MOUNT								GROUND BUS: YES			
INTERRUPTING RATING 10,000 AMPS RMS								NEUTRAL BUS: YES			
PANEL RATING: 120/240 VOLTS, 1Ø, 3-WIRE, 125 AMPERES								MAIN CIRCUIT BREAKER: 50 AMPS			
CIRC. NO.	TRIP. AMPS	NO. POLES	LOAD SERVED	CIRCUIT LOAD AMPS	LINE LOAD(AMPS)		CIRCUIT LOAD AMPS	LOAD SERVED	NO. POLES	TRIP. AMPS	CIRC. NO.
					LINE 1	LINE 2					
1	-	1	SPACE	-	-	-	-	SPACE	1	-	2
3	20	1	WALL RECEPTACLES	2.0	-	5.5	3.5	WALL LIGHTS	1	20	4
5	-	1	SPACE	-	-	-	-	SPACE	1	-	6
7	20	1	ELECTRICAL RACK RECEPTACLE	1.5	-	3.0	1.5	FLOWMETER ELECTRONICS	1	15	8
9	-	1	SPACE	-	-	-	-	SPACE	1	-	10
11	20	1	SHADE LIGHTS	1.5	-	1.5	-	SPACE	1	-	12
13	30	1	GENERATOR AUXILIARIES	18.5	18.5	-	-	SPACE	1	-	14
15	20	1	SPARE	-	-	-	-	SPACE	1	-	16
17	20	1	SPARE	-	-	-	-	SPACE	1	-	18
				TOTAL AMPS	18.5	10.0					



- NOTES INDICATED BY NUMBER IN ⬡:
- CONDUIT SHALL BE UNDERGROUND SERVICE FROM THE LAST UTILITY POLE. BORE CONDUIT BENEATH PASEO DE VACA AS INDICATED. ALL WORK AT THE ELECTRIC UTILITY POLE SHALL BE IN ACCORDANCE WITH THE UTILITY REQUIREMENTS.
 - PROVIDE METERING EQUIPMENT IN ACCORDANCE WITH UTILITY REQUIREMENTS.
 - PROVIDE TRANSFORMER WITH NON-VENTILATED STAINLESS STEEL ENCLOSURE WITH AN EPOXY-RESIN ENCAPSULATED CORE AND COIL ASSEMBLY.
 - PROVIDE ONE FULL LOOP OF CABLE WITHIN THE PULL BOX FOR EACH CABLE.
 - DO NOT ROUTE CABLE FROM FLOWMETER ELECTRONICS TO PLC THROUGH WIREWAY BUT ROUTE SEPARATELY.
 - PROVIDE RJ11 CONNECTION AND CABLE AS REQUIRED BY INTERNET SERVICE PROVIDER.

Chow Terry

DESIGNED BY: C.W.V.

DRAWN BY: 3K

CHECKED BY: C.W.V.

DATE: 08/15/2017

SCALE: NONE

BAR IS ONE INCH LONG
ORIGINAL DRAWING

1
0

PANOT ONE INCH
ON THIS SHEET
ADJUST SCALES
ACCORDINGLY.

08/15/2017
CIVIL ENGINEERING
REGISTERED PROFESSIONAL
CLOIS WAYNE VERTSE
02324
REGISTERED PROFESSIONAL
REGISTERED PROFESSIONAL
FIRM REG. #3286

ENPROTEC/HIBBS & TODD, INC.

ENVIRONMENTAL AND CIVIL ENGINEERING

PE Firm Registration No. 1151
PG Firm Registration Nos. 10017500 & 10067300
RPLS Firm Registration Nos. 10017500 & 10067300

eht

ENVIRONMENTAL AND CIVIL ENGINEERING

252-698-5560

CITY OF SAN ANGELO
TEXAS

2017 SULPHUR DRAW
WASTEWATER IMPROVEMENTS PROJECT

ELECTRICAL ONE-LINE DIAGRAM

CONTRACT NO.
16-6683

SHEET NO.

20 OF 20