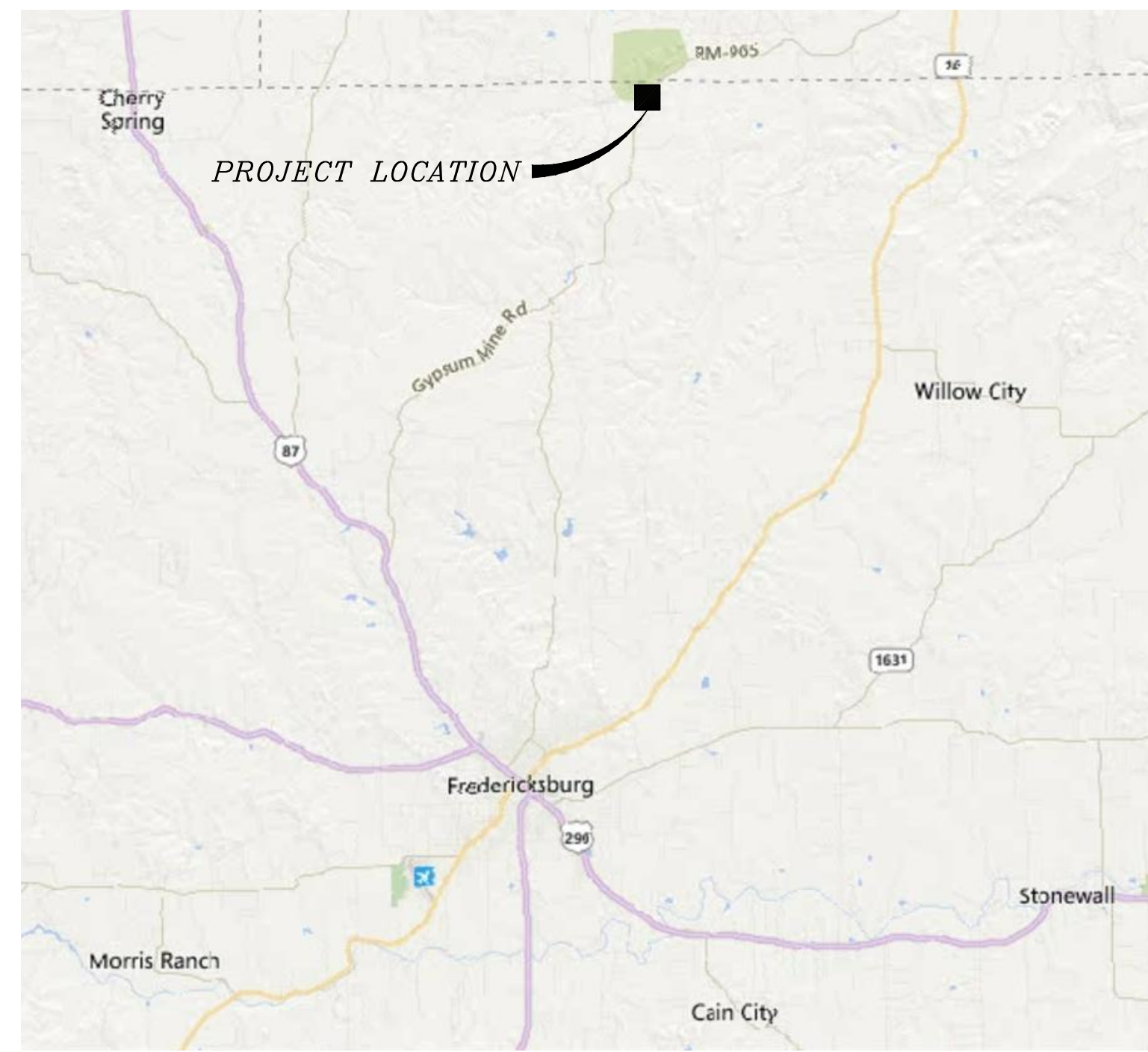


GILLESPIE AND LLANO COUNTY

COUNTY LOCATION MAP
NOT TO SCALE



VICINITY MAP
NOT TO SCALE



SITE LOCATION MAP
NOT TO SCALE

SITE ADDRESS:
Enchanted Rock State Natural Area
16710 Ranch Road 965
Fredericksburg, Texas 78624

DESIGN TEAM

PRIME CONSULTANT
GARVER
3755 S. CAPITAL OF TEXAS HIGHWAY
SUITE 325
AUSTIN, TX 78704
512-485-0009

PROJECT
ENCHANTED ROCK STATE NATURAL AREA
WATER SYSTEM IMPROVEMENTS

TPWD PROJECT NO: 1110212
GARVER PROJECT NO: 20W07000 DATE: MARCH 2021

INDEX OF DRAWINGS

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18	99-CS01	CIVIL DETAILS I
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BUILDING CODE SUMMARY

- A. INTERNATIONAL CODE COUNCIL ADOPTIONS*
 - 1. BUILDING CODE INTERNATIONAL BUILDING CODE 2015
 - 2. STRUCTURAL CODE INTERNATIONAL BUILDING CODE 2015
 - 3. PLUMBING CODE INTERNATIONAL PLUMBING CODE 2015
 - 4. MECHANICAL CODE INTERNATIONAL MECHANICAL CODE 2015
 - 5. GAS CODE INTERNATIONAL FUEL GAS CODE 2015
 - 6. RESIDENTIAL CODE INTERNATIONAL RESIDENTIAL CODE 2015
 - 7. EXISTING BUILDINGS INTERNATIONAL EXISTING BUILDINGS CODE 2015
- * International Fire Code omitted in lieu of TPWD's implementation of National Fire Protection Association codes. International Energy Conservation Code 2015 omitted in lieu of Energy Standard for Buildings, ASHRAE/IESNA Standard 90.1 (2013).
- B. NATIONAL FIRE PROTECTION ASSOCIATION
 - 1. ELECTRICAL CODE NATIONAL ELECTRIC CODE, NFPA-70 2020
 - 2. FIRE CODE NFPA - 1 2015
 - 3. LIFE SAFETY CODE NFPA - 101 2015
- C. STATE ENERGY CONSERVATION OFFICE (SECO)/TEXAS COMPTROLLERS OFFICE
 - 1. ENERGY CODES FOR STATE BUILDINGS - Energy Conservation Design Standards: Texas Administrative Code, Title 34, Part 1, Ch.19, Subchapter C
 - a. COMPLIANCE WITH THE ENERGY CONSERVATION DESIGN STANDARD OF THE AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)/ASHRAE/ILLUMINATING ENGINEERING SOCIETY OF NORTH AMERICA (IESNA), ENERGY STANDARD FOR BUILDINGS, ANSI/ASHRAE/IESNA STANDARD 90.1 (2017)
 - See SECO website for State Funded Buildings, New Construction and Major Renovation Requirements and SECO Compliance Certification Forms
 - 2. WATER CONSERVATION STANDARDS FOR STATE BUILDINGS - Energy Conservation Design Standards: Texas Administrative Code, Title 34, Part 1, Ch.19, Subchapter C
 - a. COMPLIANCE WITH THE WATER CONSERVATION DESIGN STANDARDS FOR STATE BUILDINGS AND INSTITUTIONS OF HIGHER EDUCATION FACILITIES, STATE ENERGY CONSERVATION OFFICE (SECO), 2016
 - See SECO website for Texas Water Conservation Design Standards, Requirements and SECO Compliance Certification / Reporting Form
- D. ACCESSIBILITY CODES
 - 1. US DEPT. OF JUSTICE, 2010 ADA STANDARDS FOR ACCESSIBLE DESIGN
 - 2. ARCHITECTURAL BARRIERS ACT ACCESSIBILITY GUIDELINES; OUTDOOR DEVELOPED AREAS, NOVEMBER 25, 2013
 - 3. 2012 TEXAS ACCESSIBILITY STANDARDS, ELIMINATION OF ARCHITECTURAL BARRIERS, TEXAS GOVERNMENT CODE, CHAPTER 469
- E. PLAYGROUND SAFETY CODE
 - 1. ASTM F1487-17, STANDARD CONSUMER SAFETY PERFORMANCE SPECIFICATIONS FOR PLAYGROUND EQUIPMENT FOR PUBLIC USE
 - 2. ASTM F2223-15, STANDARD GUIDE FOR ASTM STANDARDS ON PLAYGROUND SURFACING

SCOPE OF WORK

CONSTRUCT WATER SYSTEM IMPROVEMENTS INCLUDING BOOSTER PUMP STATION, HYDRO-PNEUMATIC PRESSURE TANKS, ELECTRICAL, CONTROLS, FENCING, YARD PIPING, WATER WELL REHABILITATION, LEAK DETECTION AND APPURTENANCES.



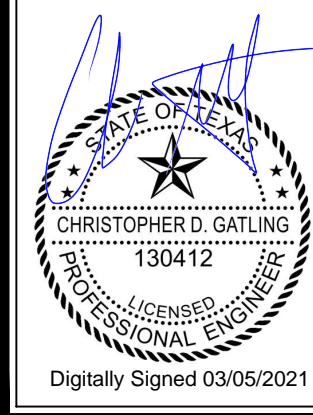
TEXAS PARKS AND WILDLIFE
INFRASTRUCTURE DIVISION

4200 SMITH SCHOOL ROAD - AUSTIN, TEXAS 78744-3292



TPWD USE ONLY:
DESIGN
MANAGER ISSUE
STAMP

Digitally Signed 03/05/2021



ENCHANTED ROCK STATE NATURAL AREA
WATER SYSTEM IMPROVEMENTS
 TPWD PROJECT NO: 1110212 / GARVER PROJECT NUMBER: 20W07000

DATE: MARCH 2021
 DESIGNED BY: CDG
 DRAWN BY: MAW
 REVIEWED BY: TOH
 REVISED:
 REVISED:

SHEET TITLE
 CIVIL NOTES,
 LEGEND AND
 ABBREVIATIONS

SHEET NUMBER
02
 OF 25
 01-G002

GENERAL CIVIL NOTES

- SAFETY SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE ENGINEER SHALL NOT BE RESPONSIBLE FOR SAFETY, MEANS, OR METHODS OF THE CONTRACTOR.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING ALL APPROPRIATE AGENCIES BEFORE WORK COMMENCES TO VERIFY THE TYPE, LOCATION, PROTECTION REQUIREMENTS, DEPTH OF ALL EXISTING UTILITIES, DRAINAGE FACILITIES, AND OTHER OBSTRUCTIONS. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH REPAIRING AND/OR REPLACING ANY SUCH ITEMS DAMAGED DURING CONSTRUCTION.
- CAUTION: UNDERGROUND UTILITIES SHOWN ARE TAKEN FROM EXISTING RECORDS AND ARE SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR ONLY. THE CONTRACTOR SHALL CONTACT ALL UTILITY OWNERS AND CONFIRM LOCATIONS OF UTILITIES AT LEAST 48 HOURS BEFORE BEGINNING CONSTRUCTION. THE CONTRACTOR SHALL ACCURATELY LOCATE AND UNCOVER ALL EXISTING UTILITIES BEFORE BEGINNING CONSTRUCTION. ANY DAMAGE RESULTING FROM THE CONTRACTOR'S OPERATIONS SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE. WHERE CROSSING OF EXISTING UTILITIES OCCUR, PROVIDE 12" MINIMUM CLEARANCE EXCEPT WATER MAINS SHALL BE 24". CROSS UNDER ALL WATER MAINS WHERE NOT POSSIBLE TO PROVIDE 18" CLEARANCE.
- SEWER AND WATER SERVICE SHALL BE MAINTAINED DURING ENTIRE CONSTRUCTION PERIOD OR TEMPORARY FACILITIES PROVIDED.
- CONTRACTOR IS RESPONSIBLE FOR ALL DEWATERING ACTIVITIES AND ASSOCIATED PERMITS REQUIRED FOR ALL EXCAVATIONS REQUIRED TO COMPLETE THE PROJECT.
- APPROXIMATE LOCATIONS OF OVERHEAD POWER LINES MAY OR MAY NOT BE SHOWN ON PLANS. CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR VERIFYING ALL LOCATIONS IN THE FIELD AND PLAN WORK IN THESE AREAS ACCORDINGLY.
- CONTRACTOR SHALL BE RESPONSIBLE FOR SITE DRAINAGE AND COMPLIANCE WITH ALL GOVERNMENTAL STORM WATER REGULATIONS AND PERMITS (SWPPP) AS REQUIRED. CONTRACTOR SHALL OBTAIN NOI FROM APPROPRIATE STATE BODY PRIOR TO ANY CONSTRUCTION. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY PERMITS REQUIRED FOR WORK WITHIN STREAMS.
- IT SHALL BE THE CONTRACTOR'S SOLE RESPONSIBILITY TO PROVIDE TRAFFIC CONTROL AND SIGNAGE FOR THE DURATION OF PROJECT AS REQUIRED BY THE NATIONAL MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES - PART VI, AND/OR ALL OTHER APPLICABLE GUIDELINES OF TXDOT, COUNTY, CITY OR ANY OTHER AUTHORITIES HAVING JURISDICTION OVER THE PROJECT AREAS. ALL ROAD CLOSURE MUST BE APPROVED BY THE COUNTIES OF GILLESPIE AND LLANO TRAFFIC ENGINEER PRIOR TO ANY PUBLIC ROAD CLOSURES.
- CONTRACTOR SHALL MAINTAIN TRAFFIC FLOW TO RESIDENCES AND BUSINESS WITH MINIMUM DISRUPTION OF ACCESS.
- ALL STREETS AND DRIVEWAYS SHALL BE OPEN CUT UNLESS NOTED OTHERWISE.
- ALL EXCAVATION BACKFILL OUTSIDE TRAFFIC WAYS SHALL BE COMPACTED TO MIN 95% STANDARD PROCTOR DENSITY TO PREVENT SETTLEMENT.
- PRIOR TO COMMENCEMENT A PRE-CONSTRUCTION MEETING SHALL OCCUR WITH CONTRACTOR & SUB-CONTRACTORS, ENGINEER, TPWD PROJECT MANAGER, TPWD CONTRACT MANAGER, PARK SUPERINTENDENT, UTILITY PLANT OPERATOR, REGIONAL MAINTENANCE SPECIALIST, TPWD TCEQ LIAISON, AND OTHER STAFF DEEMED NECESSARY.

PAVING AND GRADING NOTES

- ALL PAVING MATERIALS AND CONSTRUCTION SHALL MEET THE TXDOT STANDARD SPECIFICATIONS UNLESS OTHERWISE NOTED.
- ANY PAVEMENT DAMAGED DURING CONSTRUCTION SHALL BE REPAIRED TO EQUAL OR BETTER CONDITION AT THE CONTRACTORS EXPENSE.
- ANY DISTURBED AREAS NOT SPECIFICALLY DESIGNATED TO BE GRADED SHALL BE RESTORED TO EQUAL OR BETTER CONDITION AND SHALL BE GRADED TO DRAIN AS APPROVED BY THE ENGINEER.
- FINAL PAVEMENT SURFACES SHALL NOT BE PLACED UNTIL ALL MAJOR CONSTRUCTION ACTIVITIES HAVE CONCLUDED.
- ANY CHANGES TO FINAL GRADE ELEVATIONS AS SHOWN ON THE PLANS SHALL BE APPROVED BY THE ENGINEER.
- ALL ASPHALT AND CONCRETE PAVING REMOVED AND REPLACED SHALL BE NEAT SAW CUT.
- ALL OPEN CUT TRAFFIC WAYS (ROADS, PARKING LOTS, DRIVES, ETC.) AND ALL AREAS LYING WITHIN PRISM OF TRAFFIC WAYS, SHALL HAVE CRUSHED STONE BACKFILL COMPACTED WITH VIBRATORY COMPACTOR MAXIMUM 6" LIFTS AND COMPACTED TO MINIMUM 100%-98% MODIFIED PROCTOR DENSITY TO PREVENT SETTLEMENT FOR ITS ENTIRE TRENCH HEIGHT AND WIDTH. COMPACTED "PUG-MIX" SHALL BE USED AND MAINTAINED IN TOP 12" OF TRENCH HEIGHT AS REQUIRED TO PREVENT AGGREGATE LOSS DUE TO TRAFFIC.

CIVIL LEGEND NOTES

- GRAY SCALED LINE TYPES AND SYMBOLS INDICATE EXISTING ITEMS. BOLD SCALED LINE TYPES AND SYMBOLS INDICATE PROPOSED ITEMS.
- ADDITIONAL PROCESS LINES MAY BE DENOTED BY A LINE TYPE WITH THE FLOW STREAM IDENTIFIER.

YARD PIPING NOTES

- MINIMUM COVER OVER PIPING SHALL BE 3'-0", MEASURED FROM FINISHED GRADE.
- PROVIDE MINIMUM PIPE COVER, AS SPECIFIED. IN GENERAL LAY PIPE TO UNIFORM GRADES BETWEEN THE ELEVATIONS SHOWN, UNLESS OTHERWISE APPROVED. IN SOME CASES, EXISTING CONDITIONS PROHIBIT UNIFORM GRADES BETWEEN THE ELEVATIONS SHOWN, AND FIELD ADJUSTMENTS TO UNIFORM GRADES ARE REQUIRED AS APPROVED BY ENGINEER.
- SIZE OF FITTINGS SHOWN ON PLANS SHALL CORRESPOND TO ADJACENT STRAIGHT RUN OF PIPE, UNLESS OTHERWISE INDICATED. TYPE OF JOINT AND FITTING MATERIAL SHALL BE AS SPECIFIED FOR ADJACENT STRAIGHT RUN OF PIPE.
- ALL JOINTS SHALL BE WATERTIGHT.
- THRUST AT FITTINGS SHALL BE RESISTED BY RESTRAINED JOINTS AS SPECIFIED AND AS REQUIRED TO RESIST THRUST, UNLESS OTHERWISE APPROVED BY ENGINEER.
- CONTRACTOR SHALL LOCATE AND UNCOVER ALL CONNECTIONS TO EXISTING LINES, AND ANY POSSIBLE CONFLICTS WITH PROPOSED FACILITIES AND VERIFY LOCATION, ELEVATION, PIPE MATERIAL, AND PIPE O.D. PRIOR TO ANY CONSTRUCTION.
- CONTRACTOR SHALL MAINTAIN AND PROTECT ALL EXISTING BURIED PIPING AND UTILITIES. THE CONTRACTOR IS RESPONSIBLE FOR REPAIRING ANY DAMAGED UNDERGROUND FACILITIES.
- ALL SMALL DIAMETER PIPING SHALL BE INSTALLED AS SHOWN ON DRAWINGS WITH ALL FITTINGS AND VALVES AS REQUIRED TO PROVIDE A FUNCTIONAL PIPELINE AS SPECIFIED.
- ALL BURIED VALVES SHALL BE INSTALLED WITH VALVE BOX AS SPECIFIED.
- ALL PIPELINE SHUTDOWNS SHALL BE COORDINATED WITH THE OPERATORS. A WRITTEN WORK PLAN SHALL BE SUBMITTED AT LEAST 72 HOURS PRIOR TO ANY SHUTDOWNS AND APPROVED BY THE ENGINEER AND PARK SUPERINTENDENT.
- ROCK SHALL BE UNDERCUT A MINIMUM OF 4" AND PIPE BEDDED IN STONE. NO SEPARATE PAY ITEM EXISTS FOR ROCK EXCAVATION. ALL EXCAVATION SHALL BE CONSIDERED TO BE UN-CLASSIFIED EXCAVATION AND SUBSIDIARY TO OTHER BID ITEMS.
- CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROPER DISPOSAL OF THE EXISTING PIPE, EXISTING MANHOLES, AND ANY EXCESS MATERIALS RESULTING FROM THE WORK.
- WHERE BYPASS PUMPING IS REQUIRED DURING THE PROJECT, PUMPING SHALL BE HELD TO A MINIMUM. ROUND-THE-CLOCK BYPASS PUMPING IS NOT ALLOWED. AT END OF EACH DAYLIGHT CONSTRUCTION PERIOD, EXISTING WATER WILL BE TEMPORARILY ROUTED TO NEW OR EXISTING PIPES WITH FITTINGS, PIPE, HOSE, OR OTHER APPURTENANCES AS REQUIRED AND DITCH LINES SHALL BE BACKFILLED TO EXISTING GRADE. COST OF THIS WORK SHALL BE INCLUDED IN PIPE INSTALLATION UNLESS LISTED AS A SEPARATE BID ITEM.
- CONTRACTOR SHALL PREVENT STORM WATER AND DEBRIS FROM ENTERING PIPES AND MANHOLES AT ALL TIMES. ALL PIPES AND MANHOLES SHALL BE SECURELY PLUGGED AT THE END OF EACH DAY.

CIVIL LEGEND

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	COMMUNICATION		TOE OF SLOPE
	CABLE TV		TREE LINE
	EASEMENT LINE		UNDERGROUND ELECTRIC
	FENCE		UNDERGROUND TELEPHONE
	FLOODPLAIN		WATER EDGE
	FLOODWAY		WATER LINE
	FLOWLINE		WATER SERVICE LINE
	GAS LINE		POTABLE WATER
	OVERHEAD ELECTRIC		NON-POTABLE WATER
	PROCESS DRAIN		INDICATES ABANDONED LINE
	PROPERTY LINE		12" INDICATES SIZE OF LINE
	RIGHT-OF-WAY		EXISTING PIPE TO BE ABANDONED
	SANITARY SEWER		EXISTING PIPE TO BE REMOVED
	SEWER SERVICE LINE		SHRUB/BUSH
	STORM DRAIN		TREE
	SILT FENCE		
	TOP OF BANK		

SYMBOL	DESCRIPTION
	BENCH MARK
	BOLLARD
	CATCH BASIN/JUNCTION BOX
	CLEANOUT
	CONCRETE HEADWALL
	ELECTRIC BOX
	ELECTRIC DUCT MARKER
	ELECTRIC MANHOLE
	ELECTRIC METER
	FIBER OPTIC BOX
	FIBER OPTIC CABLE RISER/PEDESTAL
	FIBER OPTIC MANHOLE
	FIRE HYDRANT
	FLARED END SECTION (FES)
	GAS METER
	GAS REGULATOR
	GUY WIRE ANCHOR
	IRRIGATION CONTROL VALVE
	LIGHT POLE
	MANHOLE
	MONITORING WELL
	PROCESS DRAIN MANHOLE
	PROPERTY PIN
	RIP RAP
	SANITARY SEWER MANHOLE
	SIGN
	SLOPE DIRECTION INDICATOR
	SPRINKLER HEAD
	STORM DRAIN MANHOLE
	SURVEY CONTROL POINT
	TELEPHONE JUNCTION BOX
	TELEPHONE MANHOLE
	TELEPHONE PEDESTAL
	TELEVISION PEDESTAL
	UTILITY POLE
	VALVE
	WATER METER
	YARD HYDRANT/SPIGOT

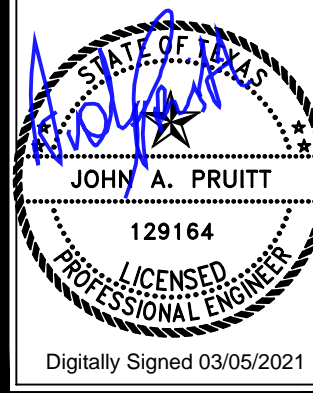
CIVIL LEGEND (CONT'D)

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	DEMOLISH		EXISTING CONCRETE
	EXISTING ASPHALT		PROPOSED CONCRETE
	PROPOSED ASPHALT		GRAVEL ROAD OR DRIVE

ABBREVIATIONS	
ABBREV	DESCRIPTION
ABDN	ABANDON
AFF	ABOVE FINISHED FLOOR
ALUM	ALUMINUM SULFATE
APPROX	APPROXIMATE
ASPH	ASPHALT
ASSY	ASSEMBLY
BC	BACK OF CURB
BLDG	BUILDING
BLK	BLOCK
BM	BENCHMARK
BOT	BOTTOM
C	CONDUIT
CI	CAST IRON
CIP	CAST IRON PIPE
CJ	CONSTRUCTION JOINT
CL	CENTERLINE, CLASS
CMU	CONCRETE MASONRY UNIT
CONC	CONCRETE
CONN	CONNECTION
CONT	CONTINUOUS
CP	CONTROL POINT
DI	DUCTILE IRON
DIA	DIAMETER
DIP	DUCTILE IRON PIPE
EA	EACH
EFF	EFFLUENT
EL, ELEV	ELEVATION
ELEC	ELECTRICAL
EOP	EDGE OF PAVEMENT
EQ	EQUAL
EX	EXISTING
EXP	EXPANSION
FCJ	FLOOR CONSTRUCTION JOINT
FES	FLARED END SECTION
FFE	FINISHED FLOOR ELEVATION
FH	FIRE HYDRANT
FG, FIN GR	FINISH GRADE
FL	FLOWLINE
FLG	FLANGED
FRP	FIBERGLASS REINFORCED PIPE
FT	FEET, FOOT
FTG	FOOTING
G	GUTTER
GL	GAS LINE
GR	GRADE
GV	GATE VALVE
HORIZ	HORIZONTAL
HWY	HIGHWAY
ID	INSIDE DIAMETER
IN	INCHES
INF	INFLUENT
INV	INVERT
JT	JOINT
LEN	LENGTH
LF	LINEAR FEET
LG	LONG
LIN	LINEAL, LINEAR
LOC	LOCATION
LT	LEFT
MANUF	MANUFACTURER
MAX	MAXIMUM
MGD	MILLION GALLONS PER DAY
MH	MANHOLE
MIN	MINIMUM
MISC	MISCELLANEOUS

ABBREV	DESCRIPTION
MJ	MECHANICAL JOINT
N	NORTH
NE	NORTHEAST
NW	NORTHWEST
NIC	NOT IN CONTRACT
NO.#	NUMBER
NTS	NOT TO SCALE
NWSL	NORMAL WATER SURFACE LEVEL
OC	ON CENTER
OD	OUTSIDE DIAMETER
OVF	OVERFLOW
PC	POINT OF CURVE
PD	PROCESS DRAIN
PE	PLAIN END
PI	POINT OF INTERSECTION
PL, PLS	PLATE, PLACES
PO	PUSH ON
PP	POWER POLE
PRC	POINT OF REVERSE CURVE
PSI	POUNDS PER SQUARE INCH
PT	POINT OF TANGENT
PVC	POLYVINYL CHLORIDE
R, RAD	RADIUS
RCP	REINFORCED CONCRETE PIPE
RED	REDUCER
REINF	REINFORCEMENT
REQD	REQUIRED
RJ	RESTRAINED JOINT
ROW, R/W	RIGHT-OF-WAY
RP	RADIUS POINT
RS	RESILIENT SEAT
RT	RIGHT
S	SOUTH, SLUDGE
SCH	SCHEDULE
SD	STORM DRAIN
SDMH	STORM DRAIN MANHOLE
SE	SOUTHEAST
SECT	SECTION
SF	SQUARE FEET
SHT	SHEET
SPEC	SPECIFICATIONS
SQ	SQUARE
SS	SANITARY SEWER
STA	STATION
STD	STANDARD
SW	SIDEWALK, SOUTHWEST
T&B	TOP AND BOTTOM
TBM	TEMPORARY BENCHMARK
TC	TIME CLOCK, TOP OF CURB
TEMP	TEMPORARY, TEMPERED
THK	THICKNESS
TS	TOP OF SIDEWALK
TYP	TYPICAL
UNO	UNLESS NOTED OTHERWISE
V	VOLT, VALVE
VERT	VERTICAL
VT	VENTILATOR
W	WIDTH, WATER
W/	WITH
W/O	WITHOUT
WL	WATER LINE
WS	WATERSTOP
WTM	WATER TRANSMISSION MAIN
WWF	WELDED WIRE FABRIC
X	BY





DATE: MARCH 2021
DESIGNED BY: TBH
DRAWN BY: MAW
REVIEWED BY: TOH
REVISED:
REVISED:

SHEET TITLE
PROCESS MECHANICAL
NOTES, LEGENDS,
AND ABBREVIATIONS

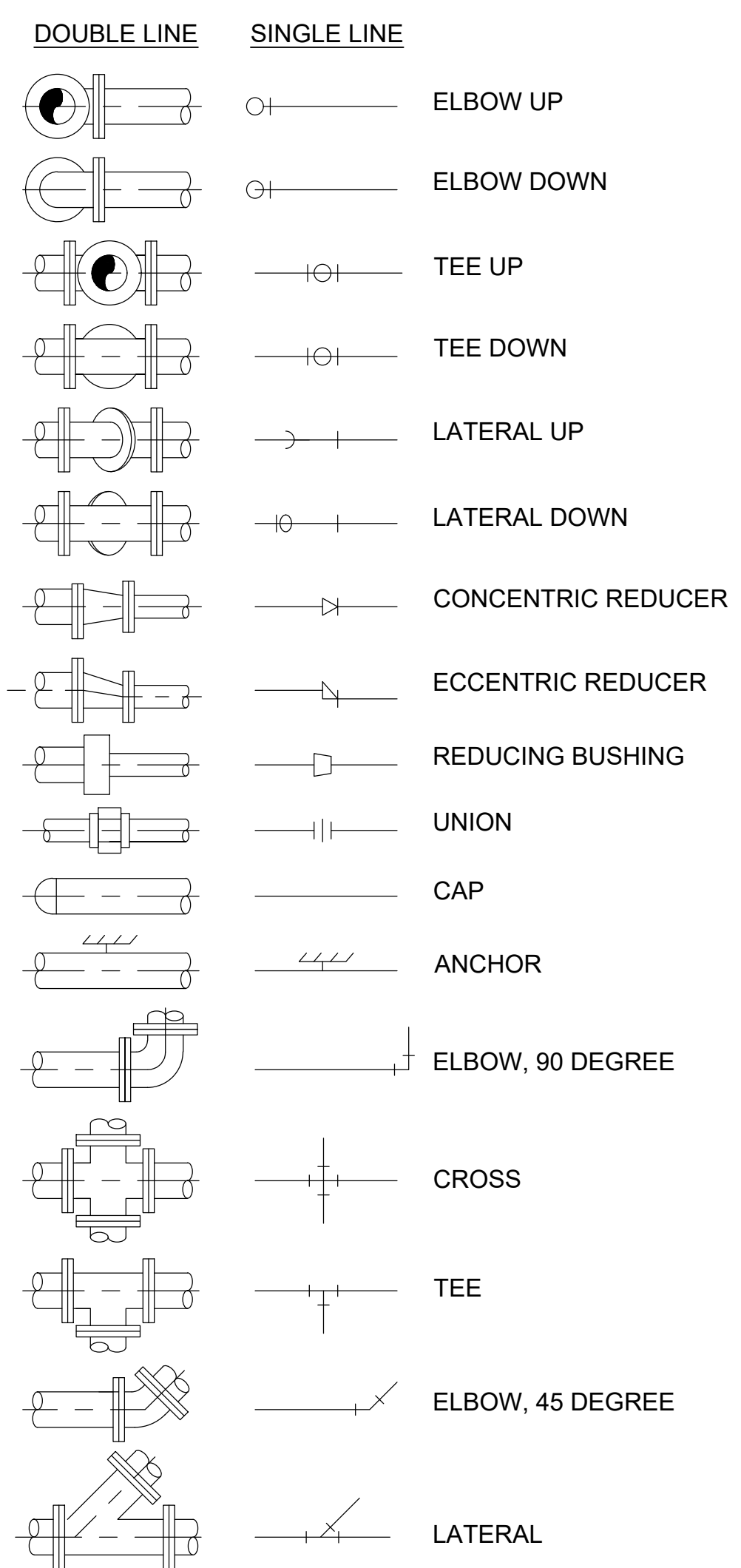
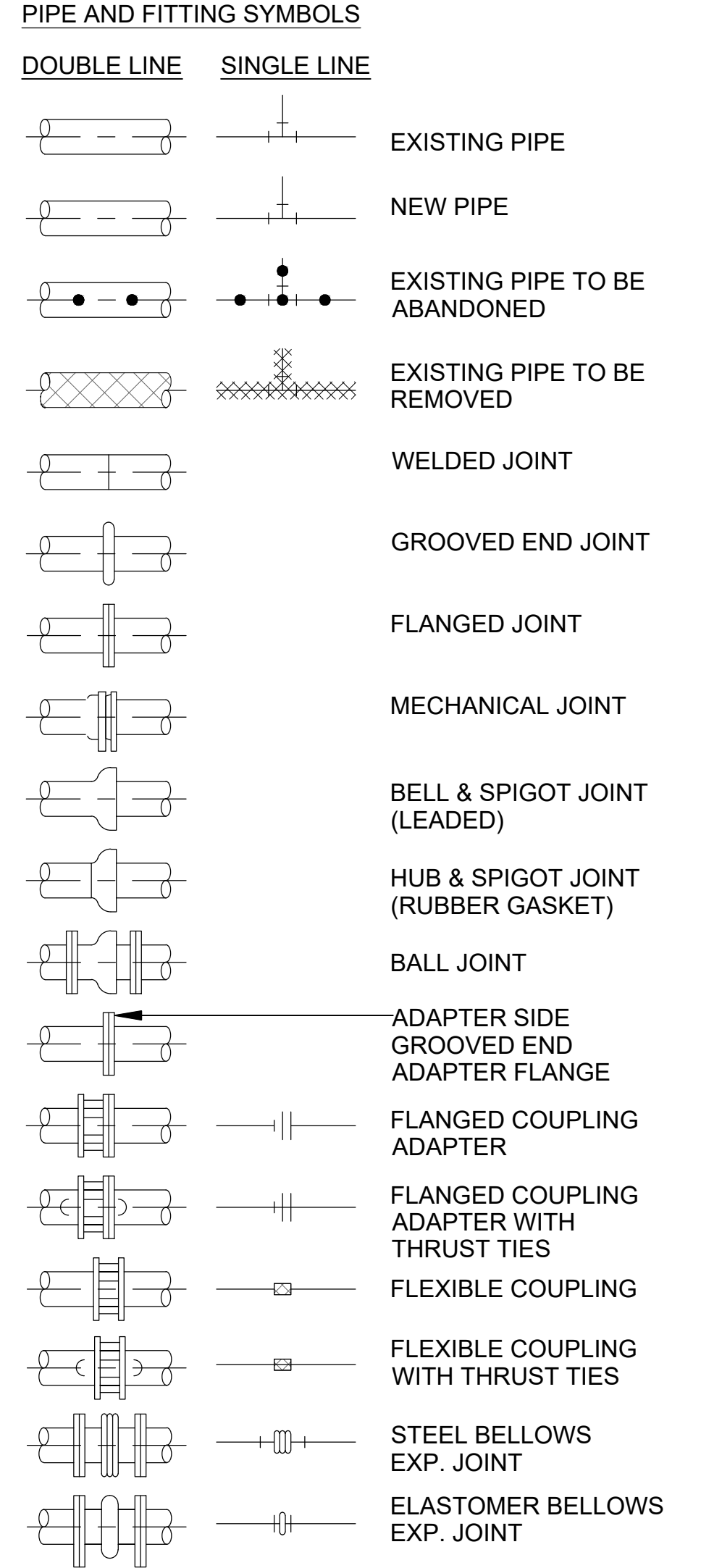
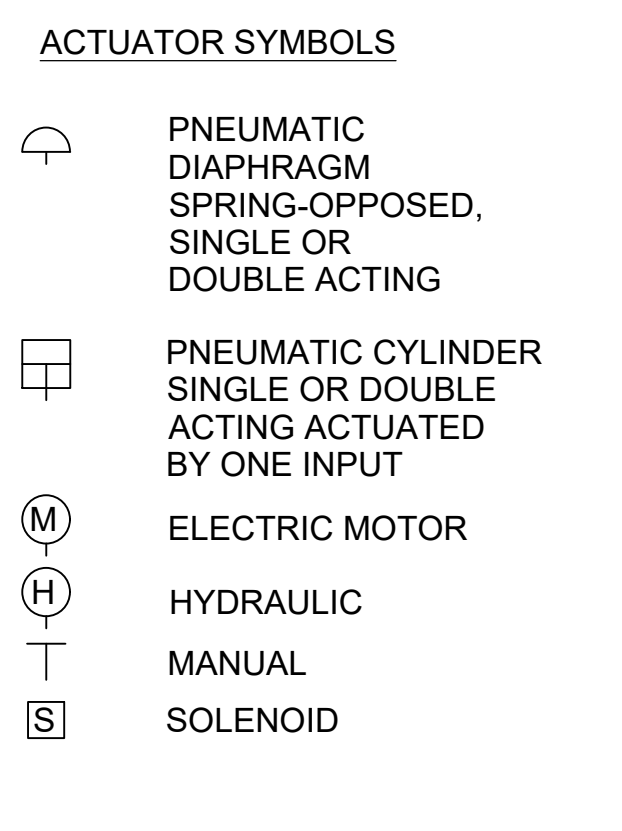
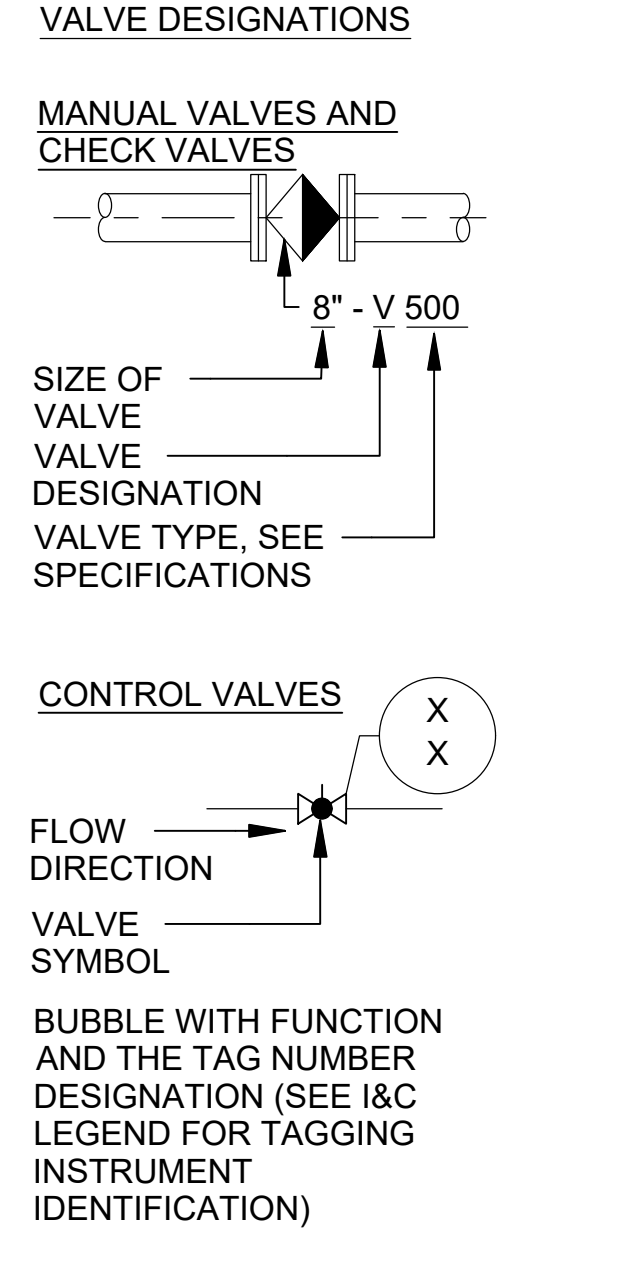
SHEET NUMBER
03
OF 25
01-G003

ABBREVIATIONS		FLOW STREAM IDENTIFICATION	
ABBREVIATION	DESCRIPTION	ABBREVIATION	DESCRIPTION
AWWA	AMERICAN WATER WORKS ASSOCIATION	RW	RAW WATER
CPVC	CHLORINATED POLYVINYL CHLORIDE	W,W1	POTABLE WATER
DX	DIRECT EXPANSION		
ECC	ECCENTRIC EQUIPMENT		
FLEX	FLEXIBLE		
FOB	FLAT ON BOTTOM		
FPM	FEET PER MINUTE		
GAL	GALLON		
GPD	GALLONS PER DAY		
GPH	GALLONS PER HOUR		
GPM	GALLONS PER MINUTE		
IFAS	INTEGRATED FIXED-FILM ACTIVATED SLUDGE		
N.O.	NORMALLY OPEN		
NC	NORMALLY CLOSED		
OS&Y	OUTSIDE STEM AND YOKE		
RPM	REVOLUTIONS PER MINUTE		
SP	STATIC PRESSURE		
VAC	VACUUM		
VTR	VENT THROUGH ROOF		
WC	WATER COLUMN		
WPD	WATER PRESSURE DROP		

- HYDROPNEUMATIC PRESSURE TANK NOTES:**
- THESE HYDROPNEUMATIC PRESSURE FACILITIES MUST BE CONSTRUCTED IN ACCORDANCE WITH THE TEXAS COMMISSION ON ENVIRONMENTAL QUALITY (TCEQ) RULES AND REGULATIONS FOR PUBLIC WATER SYSTEMS 30 TEXAS ADMINISTRATIVE CODE (TAC) CHAPTER 290 SUBCHAPTER D. WHEN CONFLICTS ARE NOTED WITH LOCAL STANDARDS, THE MORE STRINGENT REQUIREMENT SHALL BE APPLIED. AT A MINIMUM, CONSTRUCTION FOR PUBLIC WATER SYSTEMS MUST ALWAYS MEET TCEQ'S "RULES AND REGULATIONS FOR PUBLIC WATER SYSTEMS."
 - ALL HYDROPNEUMATIC TANKS MUST BE LOCATED WHOLLY ABOVE GRADE AND MUST BE OF STEEL CONSTRUCTION WITH WELDED SEAMS EXCEPT AS PROVIDING IN NOTE # 12 OF THESE CONSTRUCTION NOTES.
 - METAL THICKNESS FOR PRESSURE TANKS SHALL BE SUFFICIENT TO WITHSTAND THE HIGHEST EXPECTED WORKING PRESSURES WITH A FOUR TO ONE FACTOR OF SAFETY. TANKS FOR 1000 GALLON CAPACITY OR LARGER MUST MEET THE STANDARDS OF THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME) SECTION VIII, DIVISION 1 CODES AND CONSTRUCTION REGULATIONS AND MUST HAVE AN ACCESS PORT OF PERIODIC INSPECTIONS. AN ASME NAME PLATE MUST BE PERMANENTLY ATTACHED TO THOSE TANKS. TANKS INSTALLED BEFORE JULY 1, 1988, ARE EXEMPT FROM THE ASME CODING REQUIREMENT, BUT ALL NEW INSTALLATIONS MUST MEET THIS REGULATION. EXEMPT TANKS CAN BE RELOCATED WITHIN A SYSTEM, BUT CANNOT BE RELOCATED TO ANOTHER SYSTEM.
 - ALL PRESSURE TANKS SHALL BE PROVIDED WITH A PRESSURE RELEASE DEVICE AND AN EASILY READABLE PRESSURE GAUGE.
 - FACILITIES SHALL BE PROVIDED FOR MAINTAINING THE AIR-WATER-VOLUME AT THE DESIGN WATER LEVEL AND WORKING PRESSURE. AIR INJECTION LINES MUST BE EQUIPPED WITH FILTERS OR OTHER DEVICES TO PREVENT COMPRESSOR LUBRICANT AND OTHER CONTAMINANTS FROM ENTERING THE PRESSURE TANK. A DEVICE TO READILY DETERMINE AIR-WATER-VOLUME MUST BE PROVIDED FOR ALL TANKS GREATER THAN 1000 GALLON CAPACITY. GALVANIZED TANKS WHICH ARE NOT PROVIDED WITH THE NECESSARY FITTINGS AND WERE INSTALLED BEFORE JULY 1, 1988, SHALL BE EXEMPT FROM THIS REQUIREMENT.
 - HYDROPNEUMATIC PRESSURE TANKS SHALL BE PAINTED, DISINFECTED AND MAINTAINED IN STRICT ACCORDANCE WITH CURRENT AMERICAN WATER WORKS ASSOCIATION (AWWA) STANDARDS. PROTECTIVE PAINT OR COATING SHALL BE APPLIED TO THE INSIDE PORTION OF ANY PRESSURE TANK. HOWEVER, NO TEMPORARY COATING, WAX, GREASE COATING OR COATING MATERIALS CONTAINING LEAD WILL BE ALLOWED. NO OTHER COATING WILL BE ALLOWED WHICH ARE NOT APPROVED FOR USE (AS A CONTACT SURFACE WITH POTABLE WATER BY THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY NSF INTERNATIONAL, THE UNITED STATES FOOD AND DRUG ADMINISTRATION (FDA). ALL NEWLY INSTALLED COATINGS MUST CONFORM TO ANS/NSF INTERNATIONAL STANDARD 61 AND MUST BE CERTIFIED BY AN ORGANIZATION ACCREDITED BY ANSI.
 - NO PRESSURE TANK THAT HAS BEEN USED TO STORE ANY MATERIAL OTHER THAN POTABLE WATER MAY BE USED IN A PUBLIC WATER SYSTEM. A LETTER FROM THE PREVIOUS OWNER OR OWNERS MUST BE PROVIDED.
 - PRESSURE TANK INSTALLATIONS SHOULD BE EQUIPPED WITH SLOW CLOSING VALVES AND TIME DELAY PUMP CONTROLS TO ELIMINATE WATER HAMMER TO REDUCE THE CHANCE OF TANK FAILURE. REVISED FEBRUARY 2019 PAGE 2 OF 2
 - ASSOCIATED APPURTENANCES INCLUDING VALVES PIPES AND FITTINGS CONNECTED TO PRESSURE TANKS MUST CONFORM TO ANS/NSF INTERNATIONAL STANDARD 61 AND SHALL BE THOROUGHLY TIGHT AGAINST LEAKAGE. PURSUANT TO 30 TAC §290.44(B)(1), THE MAXIMUM ALLOWABLE LEAD CONTENT OF PIPES, PIPE FITTINGS, PLUMBING FITTINGS, AND FIXTURES IS 0.25 PERCENT.
 - DISINFECTION OF WATER STORAGE FACILITIES SHALL BE IN STRICT ACCORDANCE WITH CURRENT AWWA STANDARD C652-11 OR MOST RECENT.
 - DECHLORINATION OF DISINFECTING WATER SHALL BE IN STRICT ACCORDANCE WITH CURRENT AWWA STANDARD C655-09 OR MOST RECENT.
 - WHERE SEAMLESS FIBERGLASS TANKS ARE UTILIZED, THEY SHALL NOT EXCEED 300 GALLONS IN CAPACITY.
 - NO MORE THAN THREE PRESSURE TANKS SHALL BE INSTALLED AT ANY ONE SITE WITHOUT THE PRIOR APPROVAL OF THE EXECUTIVE DIRECTOR.
 - ALL POTABLE WATER STORAGE TANKS AND PRESSURE MAINTENANCE FACILITIES MUST BE ENCLOSED BY AN INTRUDER RESISTANT FENCE WITH LOCKABLE GATES. PEDESTAL TYPE ELEVATED STORAGE TANKS WITH LOCKABLE DOORS AND WITHOUT EXTERNAL LADDERS ARE EXEMPT FROM THIS REQUIREMENT. THE GATES AND DOORS MUST BE KEPT LOCKED WHENEVER THE FACILITY IS UNATTENDED.

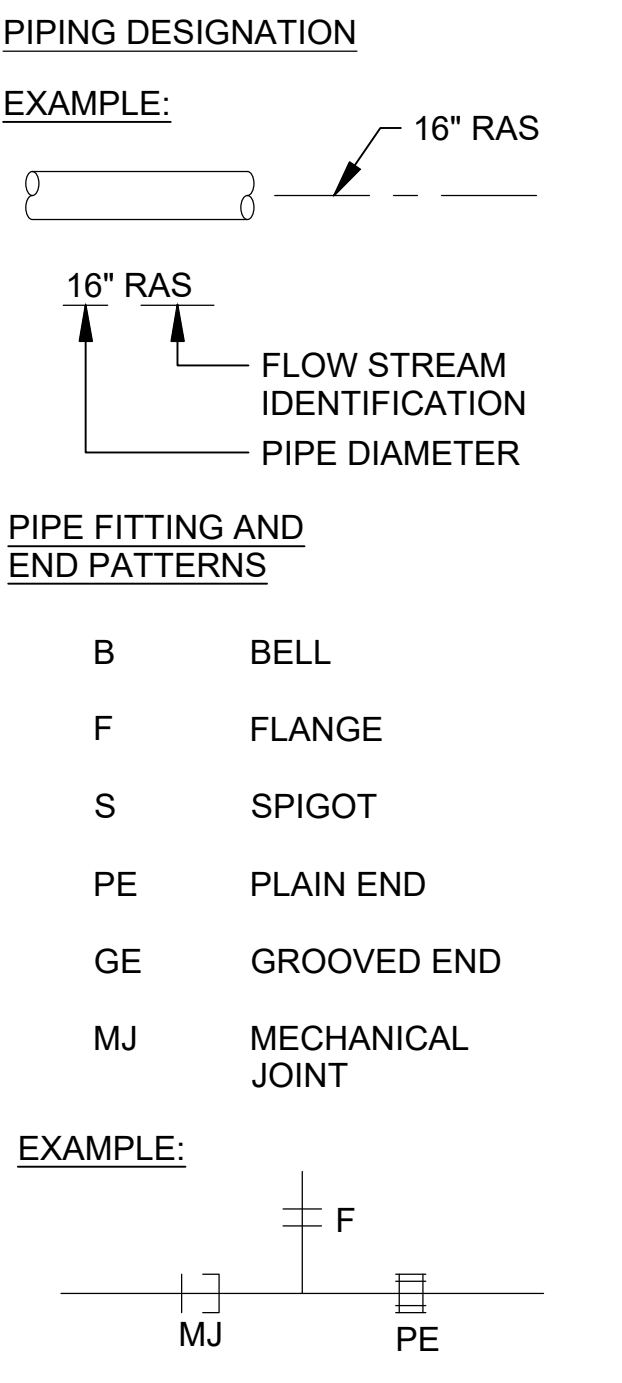
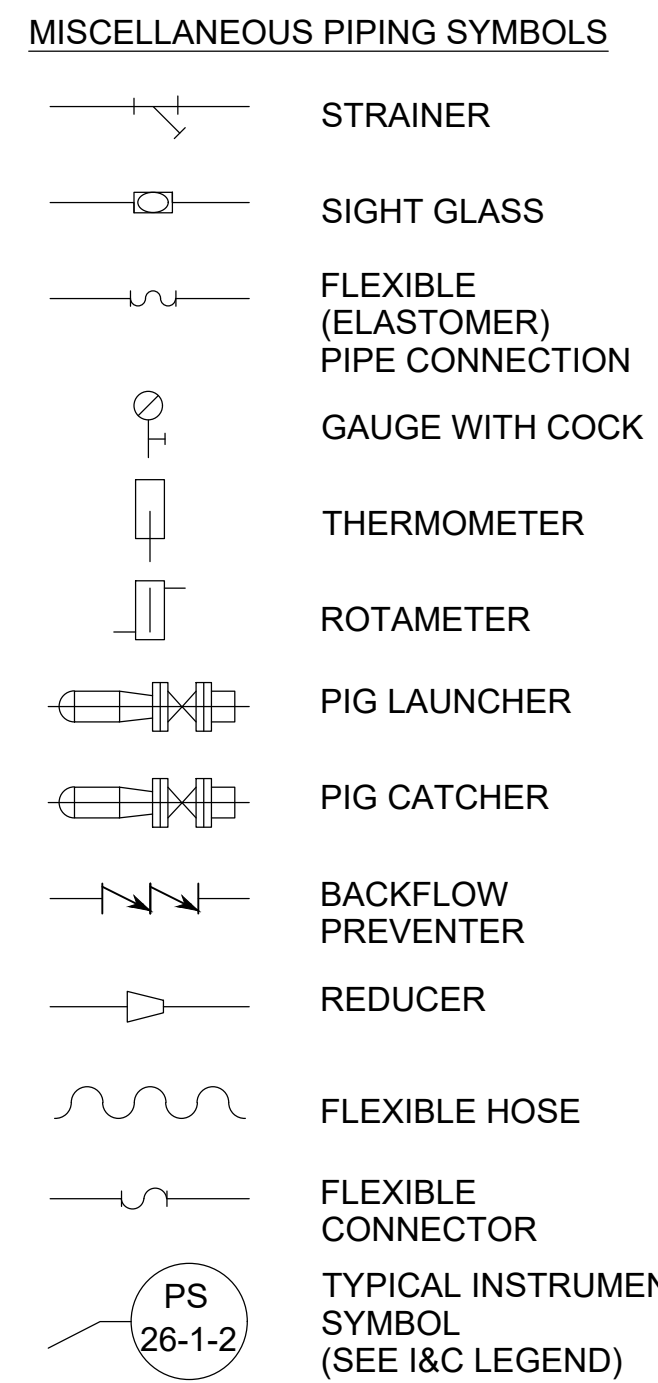
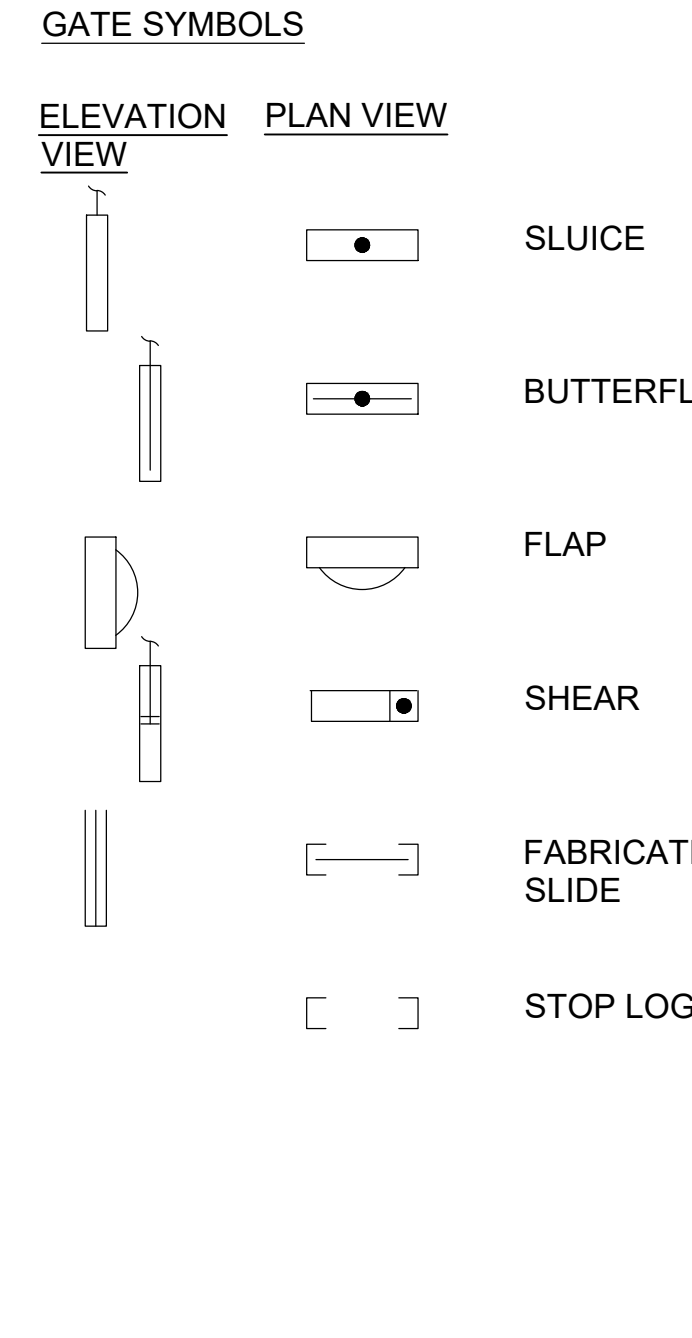
VALVE SYMBOLS

	GATE
	KNIFE GATE
	BUTTERFLY
	GLOBE
	BALL
	VEE-BALL
	PLUG OR COCK
	NEEDLE
	DIAPHRAGM
	PINCH
	SWING CHECK
	BALL CHECK
	ROTARY
	HOSE VALVE (HV-X) OR (V-X) X = NO. IN SPECS
	SAMPLE
	MUD
	PRESSURE RELIEF
	AIR RELEASE
	VACUUM RELIEF
	PRESSURE CONTROL
	TELESCOPING
	SLIDE GATE
	STOP GATE
	THREE-WAY / FOUR-WAY VALVE



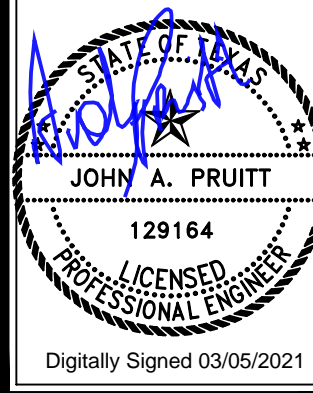
- NOTES:**
- ONLY FLANGED END CONNECTIONS ARE SHOWN HERE FOR DOUBLE LINE FITTINGS; FITTINGS WITH OTHER END PATTERNS ARE SHOWN SIMILARLY ON THE CONSTRUCTION DRAWINGS. ALSO SEE PIPING SPECIFICATIONS.
 - SYMBOLS SHOWN HERE FOR SINGLE LINE FITTINGS ARE GENERIC ONLY. REFER TO PIPING SPECIFICATIONS FOR SPECIFIC END CONNECTIONS FOR SINGLE LINE PIPE AND FITTINGS.
 - EXISTING PIPE AND EQUIPMENT IS SHOWN WITH A DASHED LINE AND/OR SCREENED AND IS NOTED AS EXISTING. NEW PIPING AND EQUIPMENT IS SHOWN WITH A HEAVY LINE.

- GENERAL PIPING NOTES:**
- LAY PIPE TO UNIFORM GRADE BETWEEN INDICATED ELEVATION POINTS.
 - SIZE OF FITTINGS SHOWN ON PLANS SHALL CORRESPOND TO ADJACENT STRAIGHT RUN OF PIPE, UNLESS OTHERWISE INDICATED. TYPE OF JOINT AND FITTING MATERIAL SHALL BE THE SAME AS SHOWN FOR ADJACENT STRAIGHT RUN OF PIPE.
 - LOCATION AND NUMBER OF PIPE HANGERS AND PIPE SUPPORTS SHOWN IS ONLY APPROXIMATE. FINAL SUPPORT REQUIREMENTS SHALL BE DETERMINED IN THE FIELD AND REVIEWED BY THE ENGINEER PRIOR TO INSTALLATION. MAXIMUM SPACING SHALL BE AS SPECIFIED.
 - ALL JOINTS SHALL BE WATERTIGHT. WALL PIPES OR PENETRATION SEALS SHALL BE USED WHEREVER PIPING PASSES FROM A STRUCTURE TO BACKFILL.
 - ALL FLEXIBLE CONNECTORS OR FLANGED COUPLING ADAPTERS SHALL BE PROVIDED WITH THRUST TIES, BLOCKS, OR ANCHORS, UNLESS OTHERWISE NOTED. THRUST PROTECTION SHALL BE ADEQUATE FOR TEST PRESSURES SPECIFIED.
 - SYMBOLS, LEGENDS, AND PIPE USE IDENTIFICATIONS SHOWN SHALL BE FOLLOWED THROUGHOUT THE PLANS, WHEREVER APPLICABLE. NOT ALL OF THE VARIOUS PIPING COMPONENTS ARE NECESSARILY USED IN THE PROJECT.
 - NUMBER AND LOCATION OF UNIONS SHOWN ON PLANS IS ONLY APPROXIMATE. PROVIDE ALL UNIONS NECESSARY TO FACILITATE CONVENIENT REMOVAL OF VALVES AND MECHANICAL EQUIPMENT.
 - WHERE A GROOVED END COUPLING IS SHOWN, IT SHALL BE THE RIGID JOINT TYPE, UNLESS OTHERWISE SPECIFIED. WHERE A FLANGED COUPLING ADAPTER IS SHOWN, A STANDARD FLANGE SHALL BE JOINED TO THE COUPLING ADAPTER.



SPECIAL INSTALLATION NOTE:

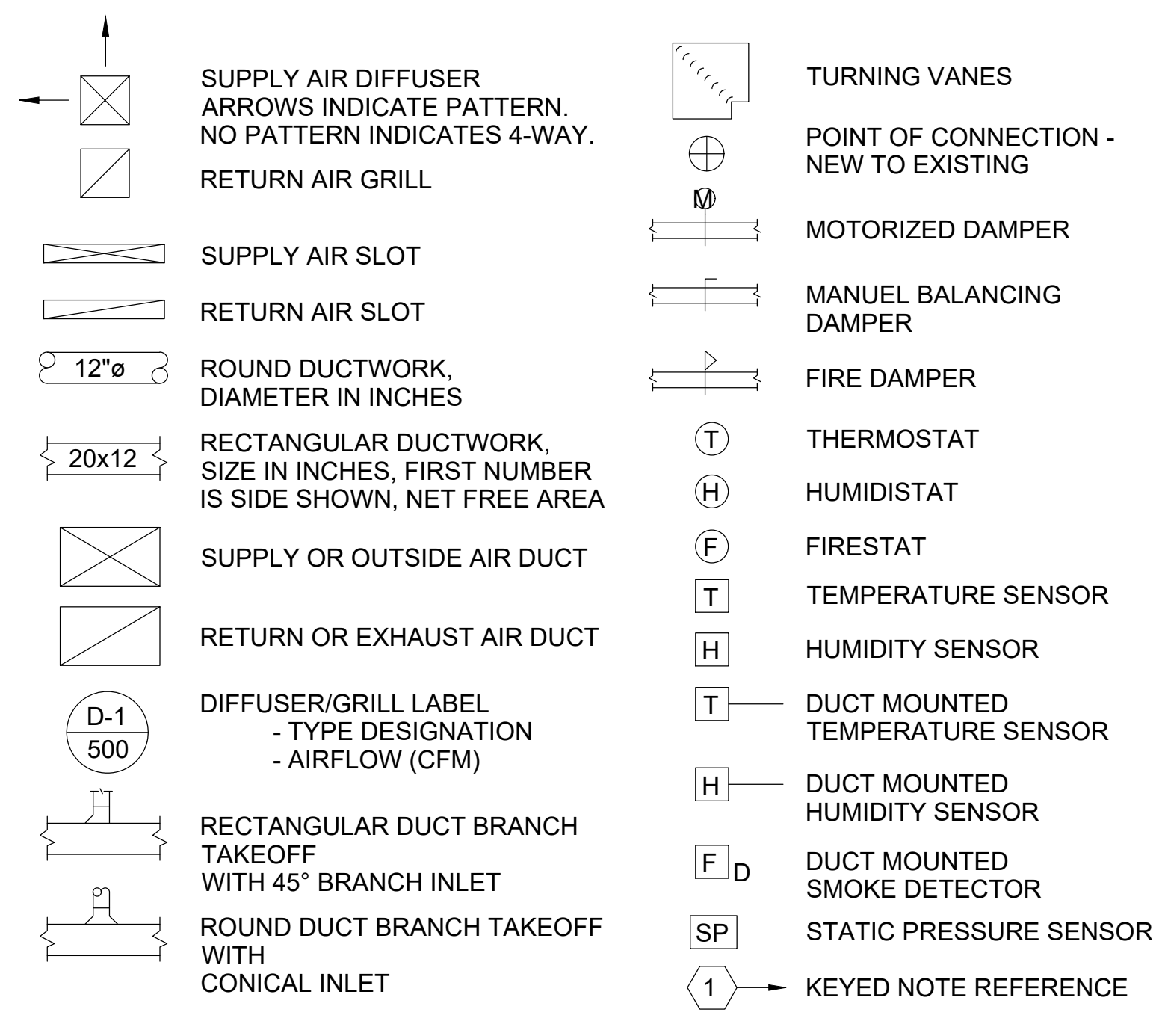
INSTALLATION DETAILS FOR DIVISION 26 ELECTRICAL ARE NOT SHOWN ON MECHANICAL DRAWINGS FOR CLARITY. REFER TO DIVISION 26 INSTRUMENT SPECIFICATIONS, INSTRUMENT LIST, AND DESIGN DETAILS. COORDINATE MATERIAL AND INSTALLATION REQUIREMENTS.



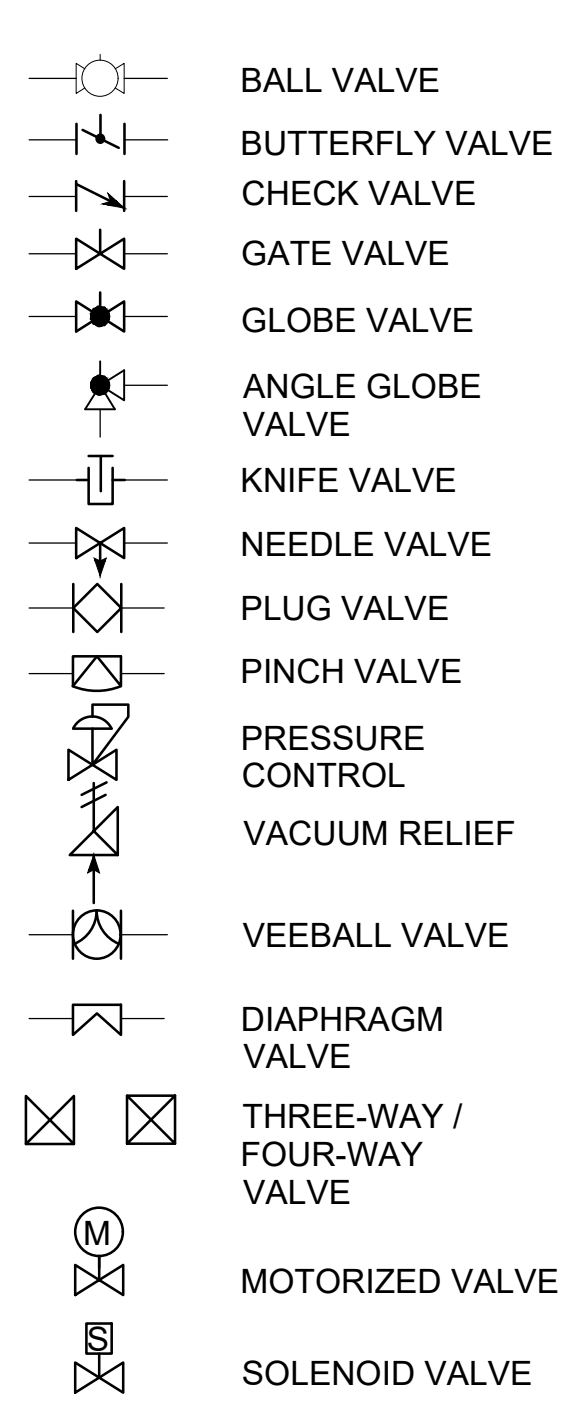
DATE: MARCH 2021
DESIGNED BY: TBH
DRAWN BY: MAW
REVIEWED BY: TOH
REVISED:
REVISED:

SHEET TITLE
BUILDING MECHANICAL
NOTES, LEGENDS,
AND ABBREVIATIONS

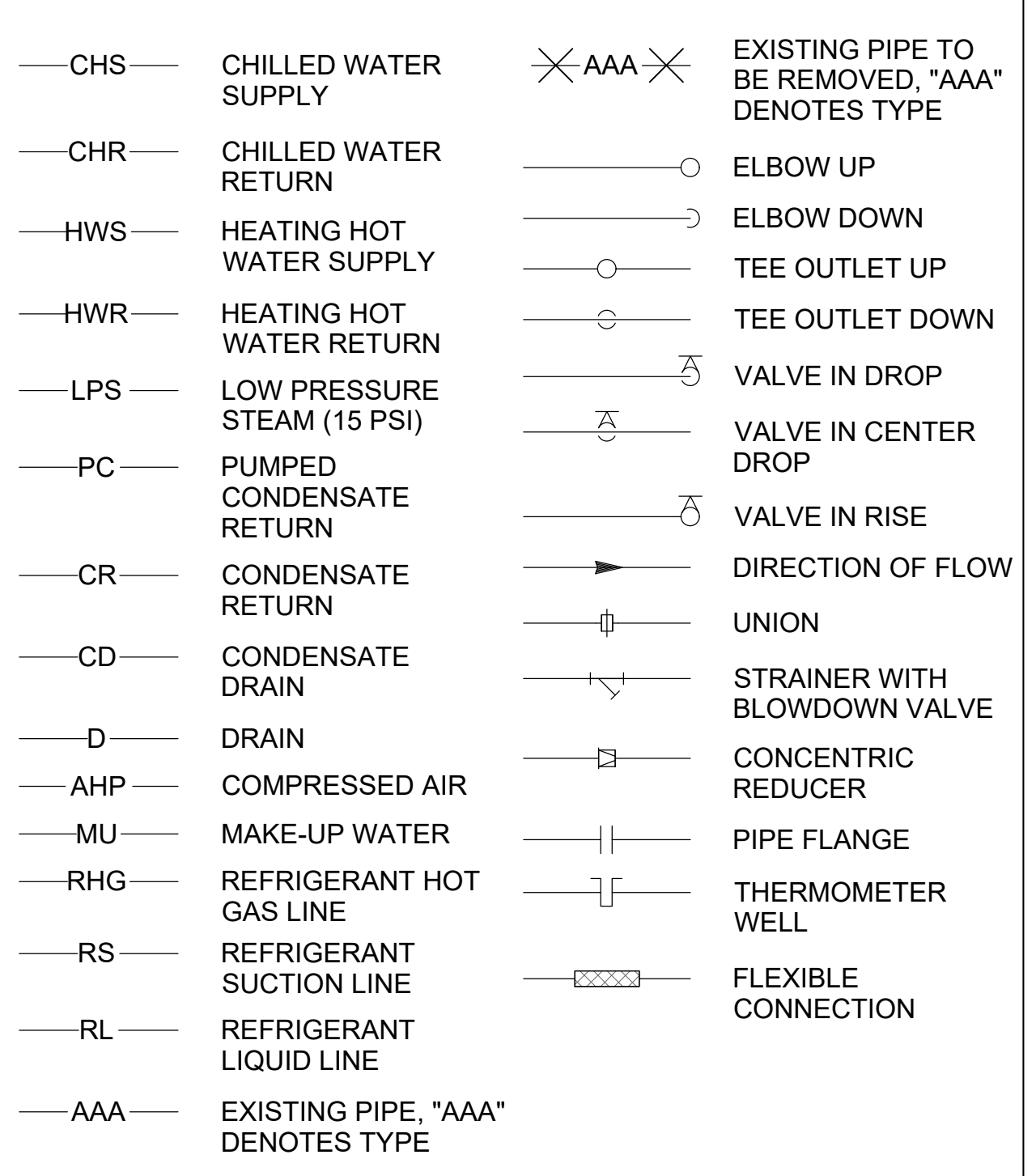
HVAC SYMBOLS:



VALVE SYMBOLS:



PIPING SYMBOLS:



ABBREVIATIONS

ABBREV	DESCRIPTION
A/C	AIR CONDITIONER, AIR CONDITIONING
ABV	ABOVE
ACC	AIR COOLED CHILLER
AMP	AMPERES
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE
APD	AIR PRESSURE DROP
ARI	AIR CONDITIONING & REFRIGERATION INSTITUTE
ASHRAE	AMERICAN SOCIETY OF HEATING, REFRIGERATION & AIR CONDITIONING ENGINEERS
ASME	AMERICAN SOCIETY OF MECHANICAL ENGINEERS
ASTM	AMERICAN SOCIETY OF TESTING AND MATERIALS
AWWA	AMERICAN WATER WORKS ASSOCIATION
BD	BACKDRAFT DAMPER
BFW	BOILER FEED WATER
BOD	BOTTOM OF DUCT
BOP	BOTTOM OF PIPE
BOS	BOTTOM OF STRUCTURE
BTU	BRITISH THERMAL UNIT
CFH	CUBIC FEET PER HOUR
CFM	CUBIC FEET PER MINUTE
CFS	CUBIC FEET PER SECOND
CIRC	CIRCULATING
CLG	CEILING
COL	COLUMN
CPVC	CHLORINATED POLYVINYL CHLORIDE
CU	COPPER
CW	COLD WATER
DB	DRY BULB
dB	DECIBEL
DDC	DIRECT DIGITAL CONTROL(S)
DISC	DISCONNECT
DX	DIRECT EXPANSION
EAT	ENTERING AIR TEMPERATURE
ECC	ECCENTRIC
EDB	ENTERING DRY BULB
ENCL	ENCLOSURE
EQUIP	EQUIPMENT
ESP	EXTERNAL STATIC PRESSURE
EWB	ENTERING WET BULB
EWG	ELECTRIC WATER COOLER
EWT	ENTERING WATER TEMPERATURE
EXH	EXHAUST
FLA	FULL LOAD AMPERES
FLEX	FLEXIBLE
FOB	FLAT ON BOTTOM
FPM	FEET PER MINUTE
GAL	GALLON
GPD	GALLONS PER DAY
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
GRND	GROUND
H, HT	HEIGHT
HD	HEAD, HUB DRAIN
HSTAT	HUMIDISTAT
HTG	HEATING
HTR	HEATER
HW	HOT WATER
HZ	HERTZ
IN WC	INCHES OF WATER COLUMN
KWH	KILOWATT-HOUR
L	LENGTH
LAT	LEAVING AIR TEMPERATURE
LDB	LEAVING DRY BULB
LP	LOW PRESSURE
LRA	LOCKED ROTOR AMPERES
LWB	LEAVING WET BULB
LWT	LEAVING WATER TEMPERATURE
MBTU, MBH	1000 BTU PER HOUR
MCA	MINIMUM CIRCUIT AMPACITY
MCB	MAIN CIRCUIT BREAKER

ABBREVIATIONS

ABBREV	DESCRIPTION
MD	MOTORIZED DAMPER
MOC	MAXIMUM OVER CURRENT PROTECTION
N.O.	NORMALLY OPEN
NC	NOISE CRITERIA, NORMALLY CLOSED
NEC	NATIONAL ELECTRICAL CODE
NEMA	NATIONAL ELECTRICAL MANUFACTURER'S ASSOCIATION
OA	OUTSIDE AIR
OBD	OPPOSED BLADE DAMPER
OS&Y	OUTSIDE STEM AND YOKE
PH, Ø	PHASE
RA	RETURN AIR
RCP	REFLECTED CEILING PLAN
RD	ROOF DRAIN
RECIRC	RECIRCULATE
RH	RELATIVE HUMIDITY
RHG	REFRIGERANT LIQUID
RLA	RUNNING LOAD AMPERES
RPM	REVOLUTIONS PER MINUTE
RS	REFRIGERANT SUCTION
SA	SUPPLY AIR
SD	SMOKE DAMPER, STORM DRAIN
SEC	SECTION
SP	STATIC PRESSURE
ST	SOUND TRAP, STEAM TRAP
SURF	SURFACE
SUSP	SUSPEND, SUSPENDED
THRU	THROUGH
TOD	TOP OF DUCT
TP	TOTAL PRESSURE
TSP	TOTAL STATIC PRESSURE
TSTAT	THERMOSTAT
UF	UNDER FLOOR
U/S	UNDER SLAB
UL	UNDERWRITERS LABORATORIES, INC.
VAC	VACUUM
VAV	VARIABLE AIR VOLUME
VD	VOLUME DAMPER
VTR	VENT THROUGH ROOF
WB	WET BULB
WC	WATER COLUMN
WPD	WATER PRESSURE DROP
WT	WATERTIGHT, WEIGHT
°C	DEGREES CELSIUS
°F	DEGREES FAHRENHEIT

HVAC NOTES:

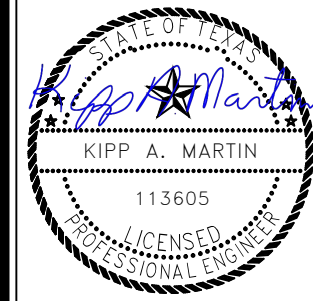
- PROVIDE ACCESS DOORS TO ALL FIRE DAMPERS, SMOKE DAMPERS, EQUIPMENT, COILS, ETC. WHERE NOT DIRECTLY ACCESSIBLE THOROUGH AIR DEVICES OR REMOVABLE CEILING GRID. MINIMUM SIZE SHALL BE 18" X 10" UNLESS NOTED OTHERWISE.
- ALL EQUIPMENT AND MATERIAL SHALL BE SUITABLE FOR ELEVATED TEMPERATURES INDICATED.
- SEE STRUCTURAL PLANS FOR EXACT DIMENSIONS AND DETAILS OF THE BUILDING.
- ALL HVAC WORK TO BE PER SMACNA AND ALL APPLICABLE CODES.
- ALL DUCTS SHALL BE MOUNTED HIGH AS POSSIBLE AGAINST BOTTOM OF BEAMS EXCEPT AS REQUIRED TO AVOID CONFLICTS WITH INTERSECTING DUCTS. DIAGONALLY OFFSET DUCTS IMMEDIATELY BEFORE AND AFTER PASSING UNDER INTERSECTING DUCTS OR LARGE STRUCTURAL MEMBERS TO MAINTAIN DUCT TIGHT TO STRUCTURE.
- PROVIDE TURNING VANES AT ALL ELBOWS GREATER THAN 45°. TURNING VANES SHALL BE SINGLE THICKNESS.
- EXPOSED DUCTWORK, ETC. SHALL BE FURNISHED FREE OF VISUAL DEFECTS, SUITABLE FOR PAINTING AND SHALL BE PAINTED AS REQUIRED BY ARCHITECTURAL SPECIFICATIONS.
- ALL RECTANGULAR SUPPLY AND RETURN DUCTS SHALL BE INTERNALLY LINED WITH 1" INSULATION. SEE SPECIFICATIONS FOR DETAILED INSULATION REQUIREMENTS.
- DUCT SIZES SHOWN ON PLANS INDICATE NET FREE AREA.
- DURING CONSTRUCTION, AFTER START-UP OF HVAC SYSTEMS, CONTRACTOR MUST MAINTAIN AND/OR REPLACE ON A REGULAR SCHEDULE ALL FILTERS IN THE HVAC SYSTEM. ONE (1) WEEK BEFORE THE FACILITY IS OCCUPIED, THE CONTRACTOR MUST REPLACE ALL AIR FILTERS WITH NEW FILTERS. DO NOT OPERATE HVAC SYSTEMS WITHOUT FILTERS IN PLACE.
- BALANCE AIR SYSTEM TO PROVIDE INDICATED AIR FLOWS. SEE SPECIFICATIONS FOR OTHER TEST AND BALANCE REQUIREMENTS. SUBMIT TO ENGINEER FINAL BALANCE OF AIR AND WATER SYSTEMS (FLOW AND TEMPERATURE) FOR REVIEW.
- THE CONTRACTOR SHALL COORDINATE AND VERIFY THE FOLLOWING WITH DIVISIONS 23 AND 26 PRIOR TO BID:

DISCONNECTS:
WHERE NOT FURNISHED WITH EQUIPMENT:
FURNISHED UNDER DIVISION 26, INSTALLED UNDER DIVISION 26. WHERE FURNISHED WITH EQUIPMENT:
FURNISHED UNDER DIVISION 23, INSTALLED UNDER DIVISION 26.

GENERAL MECHANICAL NOTES:

- REFER TO SPECIFICATIONS AND PROJECT MANUAL FOR ADDITIONAL INFORMATION AND REQUIREMENTS.
- REFER TO ALL PROJECT DRAWINGS FOR DETAILS OF CONSTRUCTION AND INSTALLATION REQUIREMENTS.
- REFER TO GENERAL CONDITIONS AND SUPPLEMENTARY GENERAL CONDITIONS FOR THE CONTRACT. THE GENERAL CONTRACTOR IS RESPONSIBLE FOR FULL COORDINATION OF PROJECT INCLUDING THE EQUIPMENT AND INSTALLATION OF THE MECHANICAL WORK.
- CONTRACTOR SHALL BECOME, PRIOR TO BID, THOROUGHLY FAMILIAR WITH THE REQUIREMENTS OF THESE NOTES AS WELL AS OTHER REQUIREMENTS SHOWN ON THE CONTRACT DOCUMENTS.
- ALL DRAWINGS ARE DIAGRAMMATIC AND INDICATE THE GENERAL ARRANGEMENTS OR GEOMETRICAL RELATIONSHIPS OF EQUIPMENT AND SERVICES. THEY ARE NOT INTENDED TO SPECIFY OR SHOW EVERY OFFSET, SEQUENCE, DEVICE, OPTION, FITTING, OR COMPONENT.
- INFORMATION AND COMPONENTS SHOWN ON RISER DIAGRAMS OR DETAILS, BUT NOT SHOWN ON PLANS, AND VICE VERSA, SHALL BE PROVIDED AS IF EXPRESSLY REQUIRED BY BOTH.
- CONTRACTOR SHALL NOT SCALE DRAWINGS. DRAWINGS SPECIFIC TO THIS DISCIPLINE DO NOT LIMIT THE RESPONSIBILITY OF WORK REQUIRED BY THE CONTRACT DOCUMENTS.
- UNLESS NOTED OTHERWISE, THE INDICATION AND/OR DESCRIPTION OF ANY ITEM, IN THE DRAWINGS OR SPECIFICATIONS CARRIES WITH IT THE INSTRUCTION TO FURNISH AND INSTALL THE ITEM.
- EXACT LOCATIONS OF ALL EQUIPMENT, THERMOSTATS, SWITCHES, DUCTS, DIFFUSERS, ETC. SHALL BE COORDINATED WITH OTHER TRADES. CEILING MOUNTED LIGHTING AND ELECTRICAL REQUIREMENTS TAKE PRECEDENCE OVER CEILING MOUNTED MECHANICAL REQUIREMENTS.
- SEE STRUCTURAL DRAWINGS FOR BUILDING DETAILS AND DIMENSIONS. COORDINATE PLACEMENT OF ALL THERMOSTATS, ROOF MOUNTED EQUIPMENT, ETC. WITH STRUCTURAL TRADES.
- CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING ALL WORK WITH THAT OF OTHER TRADES. REFER TO STRUCTURAL, ELECTRICAL, AND OTHER DRAWINGS FOR COMPLETE INFORMATION PRIOR TO BID.
- NO OTHER TRADES, I.E., ELECTRICAL, CEILING, PLUMBING, ETC., SHALL BE SUSPENDED, HUNG, OR SUPPORTED FROM DUCTWORK OR PIPING.
- REPLACE ALL FEATURES REMOVED OR DAMAGED DURING THE COURSE OF THE WORK.
- ALL WORK MUST COMPLY WITH THE REQUIREMENTS OF LOCAL CODES AND ORDINANCES. WHERE INSPECTIONS ARE REQUIRED BY AUTHORITIES HAVING JURISDICTION, WORK MUST NOT BE CONCEALED UNTIL INSPECTIONS AND TESTING ARE COMPLETED AND ACCEPTED.
- HOUSEKEEPING PADS: EXCEPT WHERE STRUCTURAL EQUIPMENT SUPPORT PADS ARE CALLED FOR ON THE PLANS, PROVIDE CONCRETE HOUSEKEEPING PADS FOR ALL GROUND AND/OR FLOOR MOUNTED EQUIPMENT. UNLESS OTHERWISE INDICATED, PADS MUST BE MINIMUM OF 4 INCHES THICK WITH CHAMFERED EDGES. WHERE PADS ARE INSTALLED ON CONCRETE FLOORS, DOWEL RODS PENETRATING INTO BOTH THE PAD AND THE FLOOR (MINIMUM 4 RODS PER PAD) MUST BE USED TO ANCHOR PADS IN POSITION.
- ALL WIRING INSTALLED FOR CONTROLS, POWER, INTERLOCKS, ETC. WHICH ARE TO BE INSTALLED IN OCCUPIED SPACES OR IN RETURN AIR PLENUMS MUST BE PLENUM RATED OR INSTALLED IN CONDUIT UNLESS OTHERWISE INDICATED. ALL SUCH INSTALLATIONS MUST MEET NFPA AND NEC REQUIREMENTS AND LOCAL CODES.
- SEAL ALL ROOF AND WALL PENETRATIONS. FLASH AND COUNTER-FLASH ALL ROOF PENETRATIONS. MINIMUM ACCEPTABLE HEIGHT OF FLASHING IS EIGHT (8) INCHES ABOVE ROOF.
- MAINTAIN A MINIMUM OF 15'-0" BETWEEN ALL FRESH AIR INTAKES AND PLUMBING VENTS EXHAUST FAN DISCHARGE, FLUES, ETC. COORDINATE WITH ALL OTHER CONTRACTORS ON SITE.
- COORDINATE FINAL PLACEMENT OF ALL THERMOSTATS WITH WALL MOUNTED DEVICES AND OWNER'S REPRESENTATIVE. MOUNT THERMOSTATS AT 48" A.F.F. ANY THERMOSTAT THAT IS REQUIRED TO BE MOUNTED ON AN EXTERIOR WALL MUST BE MOUNTED ON AN INSULATED BASE.
- MECHANICAL CONTRACTOR SHALL SUPPLY SMOKE DETECTOR IN RETURN DUCT OF AIR HANDLERS OVER 2000 CFM AND FOR UNITS WHICH SERVE AREAS OF EGRESS FOR INSTALLATION BY ELECTRICAL CONTRACTOR. DETECTORS SHALL BE DUCT MOUNTED, PHOTOELECTRIC TYPE COMPATIBLE WITH EXISTING FIRE ALARM SYSTEM WITH INTEGRAL RELAY FOR SHUTDOWN OF UNIT UPON ACTIVATION OF DETECTOR.
- EXTERIOR DUCTWORK EXPOSED TO WEATHER: CROWN TOP SURFACE FOR WATER RUNOFF AND COMPLETELY SEAL ALL JOINTS WITH UV RESISTANT WEATHERPROOF SEALANT.

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Digitally Signed 03/05/2021

ENCHANTED ROCK STATE NATURAL AREA
WATER SYSTEM IMPROVEMENTS
TPWD PROJECT NO: 1110212 / GARVER PROJECT NUMBER: 20W07000

DATE: MARCH 2021
DESIGNED BY: SJC
DRAWN BY: MAW
REVIEWED BY: KAM
REVISED:
REVISED:

SHEET TITLE
GENERAL
STRUCTURAL NOTES

SHEET NUMBER
05
OF 25
01-G005

GENERAL NOTES:

- GENERAL NOTES AND STANDARD DETAILS SHALL NOT REPLACE OR OVER RULE ANY STRUCTURE SPECIFIC NOTE, DETAIL, OR SPECIFICATION. STRUCTURE SPECIFIC NOTES AND DETAILS SHALL GOVERN OVER GENERAL NOTES AND STANDARD DETAILS.
- BUILDING RISK CATEGORY----- III
- DESIGN LIVE LOADS - 2015 IBC
ROOF WITHOUT REDUCTION----- 20 PSF
FLOORS:
CORRIDORS----- 100 PSF
ASSEMBLY AREAS----- 100 PSF
BALCONIES----- 100 PSF
RESTROOMS----- 80 PSF
OFFICES----- 50 PSF
STAIRS----- 100 PSF
MOVABLE FILE ROOMS----- 150 PSF
INDUSTRIAL AREAS----- 250 PSF
EQUIPMENT ROOMS----- 250 PSF
AREAS WITH UNRESTRICTED VEHICULAR ACCESS----- AASHTO HS20
- WIND LOAD PARAMETERS - ASCE 7-10
BASIC WIND SPEED----- 120 MPH
EXPOSURE CATEGORY----- C
GCFI +/- 0.18 (ENCLOSED BUILDINGS)
- SEISMIC DESIGN PARAMETERS - 2015 IBC
IMPORTANCE FACTOR, I----- 1.25
SITE CLASS----- D
SEISMIC SPECTRAL ACCELERATIONS
S_s----- 0.056g
S₁----- 0.030g
SEISMIC DESIGN CATEGORY----- A
DESIGN SPECTRAL ACCELERATIONS
S_{DS}----- 0.06g
S_{D1}----- 0.048g
RESPONSE MODIFICATION FACTOR, R----- TO BE DETERMINED BY BUILDING MANUFACTURER
BASIC SEISMIC FORCE RESISTING SYSTEM----- TO BE DETERMINED BY BUILDING MANUFACTURER
SEISMIC RESPONSE COEFFICIENT, C_s----- TO BE DETERMINED BY BUILDING MANUFACTURER
ANALYSIS PROCEDURE----- EQUIVALENT LATERAL FORCE
- SNOW LOADS PARAMETERS - ASCE 7-10
GROUND SNOW LOAD, P_g----- 5 PSF
IMPORTANCE FACTOR, I----- 1.10
EXPOSURE FACTOR, C_e----- 1.0
THERMAL FACTOR, C_t----- 1.2
SLOPED ROOF SNOW LOAD, P_s-----
MINIMUM GROUND SNOW LOAD, P_m----- 5.5 PSF
- THE STRUCTURE SHOULD NOT BE CONSIDERED TO BE STABLE DURING CONSTRUCTION UNTIL ALL ELEMENTS ARE IN PLACE AND CONNECTED. THE CONTRACTOR IS RESPONSIBLE FOR DESIGNING ALL TEMPORARY CONSTRUCTION BRACING, AS REQUIRED.
- CONSTRUCTION METHODS, PROCEDURES, AND SEQUENCES ARE THE CONTRACTOR'S RESPONSIBILITY. THE CONTRACTOR SHALL TAKE THE ALL NECESSARY MEANS TO MAINTAIN AND PROTECT THE STRUCTURAL INTEGRITY OF ALL CONSTRUCTION, NEW AND EXISTING, AT ALL STAGES.
- CONTRACTOR SHALL FIELD VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS PRIOR TO ANY PERTINENT WORK. ALL EXISTING CONDITIONS AND DIMENSIONS SHALL BE NOTED ON THE SHOP DRAWINGS.
- COORDINATE WITH THE ARCHITECTURAL, CIVIL, MECHANICAL, STRUCTURAL, AND ELECTRICAL DRAWINGS, AND VERIFY THE LOCATIONS AND SIZES OF THE CHASES, OPENING, INSERTS, SLEEVES, FINISHES, CONDUITS, DEPRESSIONS AND OTHER PROJECT REQUIREMENTS.
- THE CONTRACTOR IS RESPONSIBLE FOR REVIEWING THE DRAWINGS AND EXISTING CONDITIONS TO DETERMINE WHERE OPENINGS ARE REQUIRED IN WALLS AND SLABS.
- STANDARD DETAILS APPLY UNLESS INDICATED OTHERWISE ON SPECIFIC STRUCTURE DRAWINGS.

STRUCTURAL STEEL NOTES:

- UNLESS OTHERWISE SPECIFIED, HOT-ROLLED STEEL BUILDING MEMBERS USING W-SHAPES SHALL BE ASTM A992; M-, S-, AND C- SHAPES ASTM A36; SQUARE, RECTANGULAR & ROUND HSS SHAPES ASTM A 500 GRADE C; ANGLES AND MISCELLANEOUS STIFFENER PLATES ASTM A 36.
- ALL SHEAR CONNECTIONS NOT DETAILED OR OTHERWISE NOTED SHALL BE STANDARD AISC WELDED OR AISC BOLTED CONNECTIONS AND SHALL HAVE SUFFICIENT CAPACITY TO SUPPORT THE END REACTION EQUAL TO ONE - HALF THE TOTAL UNIFORM CAPACITY SHOWN IN THE ALLOWABLE UNIFORM LOAD TABLES OF THE AISC ALLOWABLE STRESS DESIGN MANUAL - 14TH EDITION.
- WELDING SHALL CONFORM WITH AWS D1.1 STRUCTURAL WELDING CODE.
- ALL BOLTS FOR BEAM CONNECTIONS SHALL BE ASTM A325 WITH A MINIMUM DIAMETER OF 1/2" UNO. ALL BOLTED CONNECTIONS SHALL BE BEARING TYPE CONNECTIONS UNLESS NOTED AS SLIP CRITICAL. WASHERS SHALL BE INSTALLED UNDER NUTS OF FASTENERS WHEN REQUIRED BY THE SPECIFICATION FOR STRUCTURAL JOINTS.
- ALL ANCHOR RODS SHALL BE ASTM F1554, GRADE 36 UNO.

GENERAL CONCRETE NOTES:

- STRUCTURAL CONCRETE FOR FOUNDATION SLABS SHALL HAVE A COMPRESSIVE STRENGTH OF 4,500 PSI AT 28 DAYS.
- CONCRETE FOR SLABS SUBJECTED TO VEHICULAR WHEEL LOADS SHALL HAVE A SPECIFIED COMPRESSIVE STRENGTH OF 3,000 PSI UNO.
- HOLD SLUMP TO 3 INCHES AT POINT OF DELIVERY. IF A HIGH RANGE WATER REDUCER IS ADDED IN THE FIELD THE SLUMP SHALL NOT EXCEED 8 INCHES.
- ALL EXPOSED CONCRETE EDGES SHALL BE CHAMFERED 3/4".
- NON-PRESTRESSED CONCRETE REINFORCEMENT SHALL CONFORM TO ASTM A 615 GRADE 60.
- REINFORCEMENT LAP SPLICES SHALL CONFORM TO D03/3000-100C OR D03/3000-100D.
- CONCRETE COVER OVER REINFORCEMENT SHALL CONFORM TO THE MINIMUM REQUIRED BY DETAIL D03/3000-120, UNO.
- REINFORCEMENT DETAILING AND PLACEMENT SHALL CONFORM TO ACI 318 AND ACI 315.
- NO REINFORCING BAR SHALL BE WELDED OR FIELD BENT IN ANY MANNER, UNLESS SPECIFICALLY SHOWN OR NOTED ON THE DRAWINGS.
- WALKWAYS AND SIDEWALKS SHALL BE POURED WITH SLIGHT SLOPE AND NO LOW SPOTS SO THEY WILL DRAIN FREE. ALL SLOPES SHALL COMPLY WITH ADA REQUIREMENTS.
- ALL CONSTRUCTION JOINTS SHOWN ON THE STRUCTURAL DRAWINGS SHALL BE INCORPORATED INTO THE STRUCTURE. ADDITIONAL CONSTRUCTION JOINTS TO FACILITATE CONSTRUCTION SHALL BE LOCATED AND DETAILED ON THE SHOP DRAWINGS FOR REVIEW. UNLESS INDICATED OTHERWISE, ALL CONSTRUCTION JOINTS TO BE KEYS. HORIZONTAL CONSTRUCTION JOINTS SHALL NOT BE PERMITTED IN WALLS AND BEAMS, UNLESS SHOWN ON THE STRUCTURAL DRAWINGS.
- SUBSTITUTION OF EXPANSION OR DRILLED AND GROUTED-IN ANCHORS FOR EMBEDDED ANCHORS SHOWN ON THE DRAWINGS WILL NOT BE PERMITTED UNLESS APPROVED BY ENGINEER.

FOUNDATION NOTES:

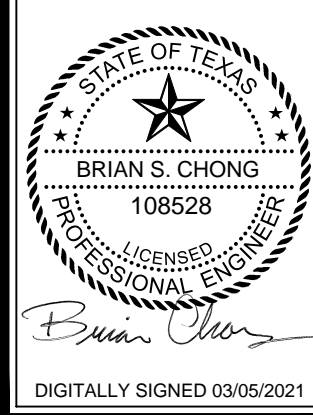
- ASSUMED ALLOWABLE BEARING PRESSURE 2,000 PSF.
- ALL CONCRETE CORNERS SHALL BE CHAMFERED 3/4" ON THE EXTERIOR EXPOSED CORNER.
- COMPACTED GRANULAR FILL OR BASE COURSE ROCK AS INDICATED.

POST-INSTALLED CONCRETE ANCHORS:

- UTILIZE AN ADHESIVE SYSTEM SUCH AS HILTY-HY 200 EPOXY ADHESIVE OR AN APPROVED EQUAL.
- THE EPOXY SYSTEM SHALL BE TESTED IN ACCORDANCE WITH ICC-EES ACCEPTANCE CRITERIA FOR POST-INSTALLED EPOXY ANCHORS IN CONCRETE ELEMENTS (AC308) TABLE 3.8. TECHNICAL DATA SHALL BE PUBLISHED IN AN ICC-ES EVALUATION REPORT SHOWING COMPLIANCE WITH IBC 2015.
- POST-INSTALLED ANCHOR INSTALLATION SHALL BE PERFORMED BY PERSONNEL TRAINED TO INSTALL THE SYSTEM PER THE MANUFACTURERS PRINTED INSTALLATION INSTRUCTIONS (MPII), AS INCLUDED IN THE ANCHORING PACKAGING. THE CONTRACTOR SHALL ARRANGE FOR A MANUFACTURER'S REPRESENTATIVE TO PROVIDE ONSITE INSTALLATION TRAINING FOR POST-INSTALLED ANCHORS. SUBMIT DOCUMENTED CONFIRMATION TO THE ENGINEER PRIOR TO THE START OF ANCHOR INSTALLATION THAT ALL OF THE CONTRACTOR'S PERSONNEL WHO WILL INSTALL POST-INSTALLED ANCHORS HAVE BEEN TRAINED TO INSTALL THE SYSTEM PER MANUFACTURER'S PRINTED INSTRUCTIONS (MPII).
- THE POSITION OF EXISTING REINFORCING BARS IN THE CONCRETE STRUCTURE SHALL BE LOCATED PRIOR TO POST INSTALLING ANCHORS. EXISTING REINFORCEMENT SHALL BE LOCATED USING HILTI FERROSCAN OR GPR. X-RAY. ANCHOR AND EXISTING REINFORCEMENT INTERFERENCE SHALL BE REPORTED TO THE ENGINEER.

LEGEND:

- CENTERLINE
- DEGREES
- FLANGE
- GRIDLINE
- PERCENT
- PLATE
- PLUS / MINUS
- WATERSTOP
- DIRECTION OF DECK SPAN



DIGITALLY SIGNED 03/05/2021

DATE: MARCH 2021
DESIGNED BY: KAD
DRAWN BY: CM
REVIEWED BY: JCW
REVISED:
REVISED:

SHEET TITLE
ELECTRICAL NOTES,
LEGEND, AND
ABBREVIATIONS

SHEET NUMBER
06
OF 25
01-G006

GENERAL NOTES:

- THESE NOTATIONS ARE INTENDED TO BE GENERAL IN NATURE. THEY MAY OR MAY NOT APPLY TO SOME OR ALL OF THE PLAN SHEETS AND SPECIFICATIONS.
- ALL RACEWAYS AND EQUIPMENT SHALL BE INSTALLED AND GROUNDED IN ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE AND APPLICABLE LOCAL CODES.
- CONDUIT RUNS INDICATED ON THE PLAN SHEETS ARE INTENDED TO BE SCHEMATIC ONLY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD ROUTING ALL CONDUIT RUNS AND SHALL COORDINATE ANY DEVIATION FROM ROUTING AS INDICATED HEREIN WITH THE ENGINEER. ALL CONDUIT SHALL BE INSTALLED IN SUCH A MANNER AS TO PREVENT CONFLICTS WITH EQUIPMENT. EXPOSED CONDUIT SHALL BE INSTALLED PARALLEL OR PERPENDICULAR TO BEAMS OR STRUCTURAL CONDITIONS.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD ROUTING ALL CONDUITS NOT INDICATED ON THE PLAN SHEETS. THIS INCLUDES CIRCUITS FOR LIGHTING, RECEPTACLES AND OTHER MISCELLANEOUS EQUIPMENT CIRCUITS.
- ALL CONDUITS SHALL BE ROUTED AND SUPPORTED IN SUCH A MANNER AS TO NOT COMPROMISE THE STRUCTURAL INTEGRITY OF WALLS, FLOORS, CEILINGS, AND ROOFS. WHERE REQUIRED, THE CONTRACTOR SHALL PROVIDE ADDITIONAL STRUCTURAL SUPPORTING MEMBERS FOR THE INSTALLATION AND SHALL COORDINATE SUCH MEMBERS WITH ENGINEER.
- THE CONTRACTOR SHALL VERIFY THE EXACT LOCATION OF CONDUIT ENTRANCES FOR ALL EQUIPMENT WITH SHOP DRAWINGS BEFORE STUBBING UP CONDUITS.
- ALL SURFACE MOUNTED PANELS AND PANELBOARDS ON THE INTERIOR OF EXTERIOR WALLS OR IN OTHER LOCATIONS CONSIDERED DAMP OR WET SHALL BE MOUNTED SO AS TO MAINTAIN A 1/4" MINIMUM AIR SPACE BETWEEN THE ENCLOSURE AND THE WALL.
- PULLBOXES, IF SHOWN ON THE PLANS, ARE SCHEMATIC IN NATURE. THE CONTRACTOR SHALL PROVIDE ADDITIONAL PULLBOXES WHERE REQUIRED TO MAKE A WORKABLE INSTALLATION.
- ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE DETAILS AND SPECIFICATIONS WHETHER OR NOT THEY ARE REFERENCED ON THE DRAWINGS.
- ALL CONDUIT RUNS PASSING THROUGH EXPANSION JOINTS SHALL HAVE EXPANSION OR EXPANSION AND DEFLECTION TYPE FITTINGS. FOR LOCATIONS OF EXPANSION JOINTS, REFER TO THE STRUCTURAL DRAWINGS.
- THE WIRING DIAGRAMS, QUANTITY AND SIZE OF WIRES AND CONDUITS REPRESENT A SUGGESTED ARRANGEMENT BASED UPON SELECTED STANDARD COMPONENTS OF ELECTRICAL EQUIPMENT. IF EQUIPMENT SUPPLIED BY THE MANUFACTURER HAS A LARGER LOAD THAN THE VALUE SHOWN OR INDICATED, THE CABLE, CONDUIT AND ELECTRICAL EQUIPMENT MAY BE ENLARGED AS REQUIRED TO ACCOMMODATE THE HIGHER LOADING. HOWEVER, THE BASIC SEQUENCE AND METHOD OF CONTROL MUST BE MAINTAINED AS INDICATED ON THE DRAWINGS AND/OR SPECIFICATIONS.
- ALL MOTOR STARTER CONTROL POWER TRANSFORMERS SHALL BE SIZED TO PROVIDE SUFFICIENT VOLT-AMPERE CAPACITY FOR OPERATING ALL LOCAL AND REMOTE ELECTRICAL DEVICES ASSOCIATED WITH CONTROL OF THE MOTOR IN ADDITION TO THE STARTER COIL. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING ALL LOADING REQUIREMENTS FOR CONTROL POWER TRANSFORMERS.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR FURNISHING PROPERLY SIZED STARTER OVERLOADS FOR ALL EQUIPMENT INSTALLED.
- MOTOR CONTROL CENTERS AND ALL FREE STANDING PANELS SHALL BE SET ON CONCRETE HOUSEKEEPING PADS WITH LEVELING CHANNELS EMBEDDED IN THE PAD.
- IN GENERAL, SEPARATE POWER, CONTROL AND INSTRUMENTATION WIRING. PROVIDE SEPARATE CONDUIT, PULL AND JUNCTION BOXES. PROVIDE SUITABLE CABLE BARRIER WITHIN PULL OR JUNCTION BOXES WHERE SEPARATION OF WIRING IS NOT SHOWN ON THE DRAWINGS.

- IN AREAS WHERE THERE ARE OVERHEAD BRIDGE CRANES, HOISTS, DOORS OR OTHER SIMILAR ITEMS, NO CONDUITS SHALL BE INSTALLED IN SUCH A MANNER AS TO CONFLICT WITH PROPER OPERATION OF SUCH EQUIPMENT.
- CONTRACTOR SHALL FURNISH AND INSTALL ITEMS AS NECESSARY FOR COMPLETE AND FUNCTIONAL SYSTEMS INCLUDING THE CHEMICAL FEED SYSTEMS, MECHANICAL SYSTEMS, AND PLANT INSTRUMENTATION SYSTEM/DISTRIBUTED CONTROL SYSTEM. THE CONTRACTOR SHALL REFER TO THE SPECIFICATIONS AND OTHER SECTIONS OF THE PLANS FOR ITEMS AS MAY BE REQUIRED AND SHALL PROVIDE CONDUIT, WIRING AND TERMINATIONS FOR ALL ITEMS AS REQUIRED.
- CONTRACTOR SHALL REFER TO OTHER PLAN SHEETS FOR LOCATIONS OF FIREWALLS. ALL CONDUIT PENETRATIONS IN THESE WALLS SHALL BE ACCOMPLISHED IN SUCH A MANNER AS TO NOT REDUCE THE RATING OF THE FIREWALL THROUGH THE USE OF BOXES, SEALANTS AND OTHER ACCESSORIES AS MAY BE REQUIRED.
- CONTRACTOR SHALL REFER TO MECHANICAL PLAN SHEETS AND SPECIFICATIONS FOR ITEMS RELATED TO THE MECHANICAL SYSTEMS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING ALL ITEMS AS NECESSARY FOR COMPLETE AND OPERABLE MECHANICAL HEREIN INCLUDING, BUT NOT LIMITED TO: CONTROL POWER TRANSFORMERS, STARTERS, THERMOSTATS, CONTROL STATIONS, AND OTHER ELECTRICAL ITEMS AS RELATED TO THE INSTALLATION OF THE MECHANICAL SYSTEMS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING DISCONNECTS FOR ALL MECHANICAL MOTORS UNLESS THE EQUIPMENT IS FURNISHED WITH AN INTEGRAL DISCONNECT FROM THE MANUFACTURER. IN ADDITION, THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL PROVIDING CONDUIT, WIRING AND TERMINATIONS FOR ALL COMPONENTS AS MAY BE NECESSARY FOR THE MECHANICAL SYSTEMS.
- ALL RECEPTACLES IN OUTDOOR AND ANTICIPATED WET AREAS SHALL BE GROUND FAULT CIRCUIT INTERRUPTER RECEPTACLES WITH WEATHERPROOF COVERS.
- EQUIPMENT LOCKOUTS SHALL BE IN STRICT ACCORDANCE WITH OWNER'S REQUIREMENTS.
- ALL CONDUITS SHALL HAVE A GROUNDING CONDUCTOR, SIZED PER NEC.
- ALL LIGHTING FIXTURES INSTALLED IN INSULATED LOCATIONS SHALL BE RATED FOR SUCH INSTALLATION IRREGARDLESS OF THE FIXTURE SCHEDULE DESIGNATION.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION OF NEW SERVICE INSTALLATIONS WITH OWNER, ENGINEER AND SERVICING UTILITY. THE CONTRACTOR SHALL FURNISH AND INSTALL ALL ITEMS AS REQUIRED BY SERVICING UTILITY FOR NEW SERVICE CONNECTIONS.
- UNLESS NOTED OTHERWISE, ALL CONTROL PANELS SHALL BE FABRICATED SUCH THAT ALL OPERATORS AND INDICATING DEVICES INDICATED ON THE SCHEMATICS BE LOCATED ON THE FRONT DOOR OR COVER OF THE PANEL. OPERATING AND INDICATING DEVICES SHALL BE VISIBLE AND OPERABLE WITHOUT HAVING TO OPEN THE CONTROL PANEL.
- DUCT BANK INDICATED ARE FOR REFERENCE ONLY; THE CONTRACTOR SHALL REVIEW PLAN SHEETS RELATED TO INDIVIDUAL STRUCTURES AND VERIFY CONDUITS THAT MAY BE REQUIRED. THE CONTRACTOR SHALL VERIFY NUMBER OF CONDUITS AS INDICATED IN THE DUCT BANK PRIOR TO INSTALLATION WITH THE ENGINEER. PROVIDE A SPARE CONDUIT, EQUAL IN SIZE TO THE LARGEST CONDUIT IN USE, FOR EACH SET OF FOUR USED CONDUITS IN EACH DUCT BANK.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING HEAT TRACING FOR ALL EXPOSED WATER LINES TO BE INSTALLED UNDER THIS PROJECT. THE CONTRACTOR SHALL REVIEW OTHER SECTIONS OF THE PLANS AND SPECS AND PROVIDE SUITABLE HEAT TRACING COMPONENTS AS MAY BE REQUIRED, WHETHER INDICATED ON THE ELECTRICAL PLAN SHEETS OR NOT.

CONTROL SCHEMATIC LEGEND

	WIRING WITHIN PANEL		LEVEL SWITCH
	WIRING TO FIELD DEVICE		PRESSURE SWITCH
	PUSHBUTTON SWITCH, NORMALLY OPEN		LIMIT SWITCH CONTACT, NORMALLY OPEN
	PUSHBUTTON SWITCH, NORMALLY CLOSED		LIMIT SWITCH CONTACT, NORMALLY CLOSED
	SELECTOR SWITCH, NUMBER OF POSITIONS AND CONTACTS AS SHOWN		LIMIT SWITCH CONTACT, HELD OPEN
	RELAY CONTACT, NORMALLY OPEN		LIMIT SWITCH CONTACT, HELD CLOSED
	RELAY CONTACT, NORMALLY CLOSED		RELAY COIL, "TR" INDICATES "TIMING RELAY"
	TIME DELAY CONTACT, CLOSE ON ENERGIZATION		PILOT LIGHT; "A" INDICATES "AMBER LENS"
	TIME DELAY CONTACT, OPEN ON ENERGIZATION		"G" INDICATES "GREEN LENS"
	TIME DELAY CONTACT, OPEN ON DE-ENERGIZATION		"R" INDICATES "RED LENS"
	TIME DELAY CONTACT, CLOSE ON DE-ENERGIZATION		SOLENOID
			ELAPSED TIME METER
			TERMINAL BLOCK
			ELECTRICAL CONNECTION
			GROUND CONNECTION TO ENCLOSURE GROUND BAR

LIGHTING, POWER & SYSTEM LEGEND

	1x4 FLUORESCENT LIGHT FIXTURE		HOME RUN TO PANEL IN DEDICATED CONDUIT, RECEPTACLES AND EQUIPMENT SHALL HAVE DEDICATED GREEN GROUND WIRE. NUMBER OF ARROWS INDICATES NUMBER OF PHASE CONDUCTORS. LETTER(S) INDICATE NAME OF PANEL, NUMBER(S) INDICATE CIRCUIT NUMBERS
	FLUORESCENT LIGHT FIXTURE WITH EMERGENCY LIGHT (EL) BATTERY PACK, 1400 LUMENS MINIMUM FOR 2 LAMPS		GROUND
	SWITCH, SINGLE POLE		DATA AND TELEPHONE DUAL OUTLET
	SWITCH, DOUBLE POLE		DUCT BANK, IDENTIFIER SHOWN, REFER TO DUCT BANK SCHEDULE FOR SIZE AND CONFIGURATION
	SWITCH, THREE WAY		GENERATOR, RATINGS AS SHOWN
	SWITCH, FOUR WAY		GROUND ROD AND TEST WELL
	SWITCH, DIMMER		AIRTERMINAL
	NON-FUSED DISCONNECT SWITCH, SIZE AS NOTED		TRANSFORMER, RATINGS AS SHOWN
	COMBINATION DISCONNECT AND MOTOR STARTER, SIZE AS NOTED, FUSED TYPE SHOWN		FUSE, CURRENT LIMITING, AMPERE RATING AS SHOWN OR REQUIRED, "BF" INDICATES "BLOWN FUSE INDICATOR" TYPE
	FUSED DISCONNECT SWITCH, SIZE AS NOTED		ELECTRIC MOTOR, HORSEPOWER AS SHOWN
	HANDHOLE, IDENTIFIER SHOWN, REFER TO HANDHOLE SCHEDULE FOR SIZE		MOTOR STARTER, SIZE AS SHOWN OR REQUIRED, FVNR UNLESS NOTED
	3/4" x 10' COPPER CLAD GROUND ROD		CIRCUIT BREAKER, TRIP RATING SHOWN, 3-POLE UNLESS NOTED OTHERWISE
	20 AMP DUPLEX RECEPTACLE, MTD, 20" AFF TO BOTTOM, WITH #12 GROUND WIRE, "GFCI" INDICATES GROUND FAULT CIRCUIT INTERRUPTER, "WP" INDICATES WEATHERPROOF WHILE-IN-USE ENCLOSURE AND COVER, BOX INDICATES FLOOR OUTLET WITH RECESSED CAST JUNCTION BOX		CAPACITOR, KVAR AS SHOWN
	ELECTRICAL PANEL OR EQUIPMENT CABINET, SURFACE MOUNTED, 5'-6" TO TOP OF ENCLOSURE		REDUCED VOLTAGE SOFT STARTER
	ELECTRICAL PANEL OR EQUIPMENT CABINET, RECESSED MOUNTED, 5'-6" TO TOP OF ENCLOSURE		

EQUIPMENT LINE TYPES

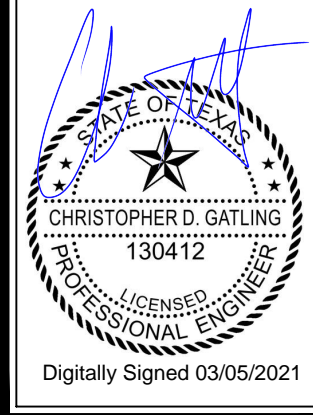
	PROPOSED OR NEW EQUIPMENT
	EXISTING EQUIPMENT
	EQUIPMENT PACKAGE
	GROUND RING OR UNDERGROUND

GENERAL NOTES:

- SOME SYMBOLS OR ABBREVIATIONS MAY APPEAR ON THIS SHEET BUT NOT BE UTILIZED ON THE PROJECT.
- LIGHTING LEGEND SHOWS EXAMPLE IDENTIFIERS, REFER TO LIGHT FIXTURE SCHEDULE FOR SPECIFIC REQUIREMENTS.

ONE-LINE LEGEND

	EXISTING	C.B.	CIRCUIT BREAKER
	NEW	GEC	GROUNDING ELECTRODE CONDUCTOR
	3/4" X 10' GROUND ROD	ATS	AUTOMATIC TRANSFER SWITCH
	CIRCUIT BREAKER	SDBC	SOFT DRAWN BARE COPPER
	EXOTHERMIC WELD (BELOW GRADE) OR MECHANICAL CONNECTION (ABOVE GRADE)	GFP	GROUND FAULT PROTECTION
	GENERATOR	LSI	LONG, SHORT, INSTANTANEOUS

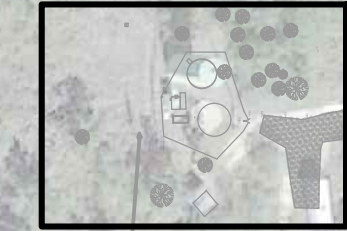


ENCHANTED ROCK STATE NATURAL AREA
WATER SYSTEM IMPROVEMENTS
 TPWD PROJECT NO: 1110212 / GARVER PROJECT NUMBER: 20W07000

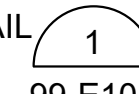
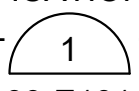
DATE: MARCH 2021
 DESIGNED BY: CDG
 DRAWN BY: MAW
 REVIEWED BY: TOH
 REVISED:
 REVISED:

SHEET TITLE
 SITE PLAN -
 OVERALL

SHEET NUMBER
07
 OF 25
 05-C101



05-C103 (SITE PLAN - ENLARGED)
05-C301 (YARD PIPING - ENLARGED)

- NOTES:
1. WELL NO. 1: REPLACE EXISTING PRESSURE GAUGE. REHABILITATE EXISTING WELL IN ACCORDANCE WITH SECTION 33 11 17 OF THE SPECIFICATIONS. INSTALL NEW DARK SKY COMPLIANT LIGHT WITH SWITCH AT ENTRANCE TO FENCED WELL ENCLOSURE. SEE DETAIL  99-E101
 2. WELL NO. 4: REPLACE EXISTING PRESSURE GAUGE AND ALL ABOVE GROUND INSULATION ON PIPING WITHIN ENCLOSURE. REHABILITATE EXISTING WELL IN ACCORDANCE WITH SECTION 33 11 17 OF THE SPECIFICATIONS. REPLACE EXISTING LIGHT POLE AND FIXTURE. SEE DETAIL  99-E101

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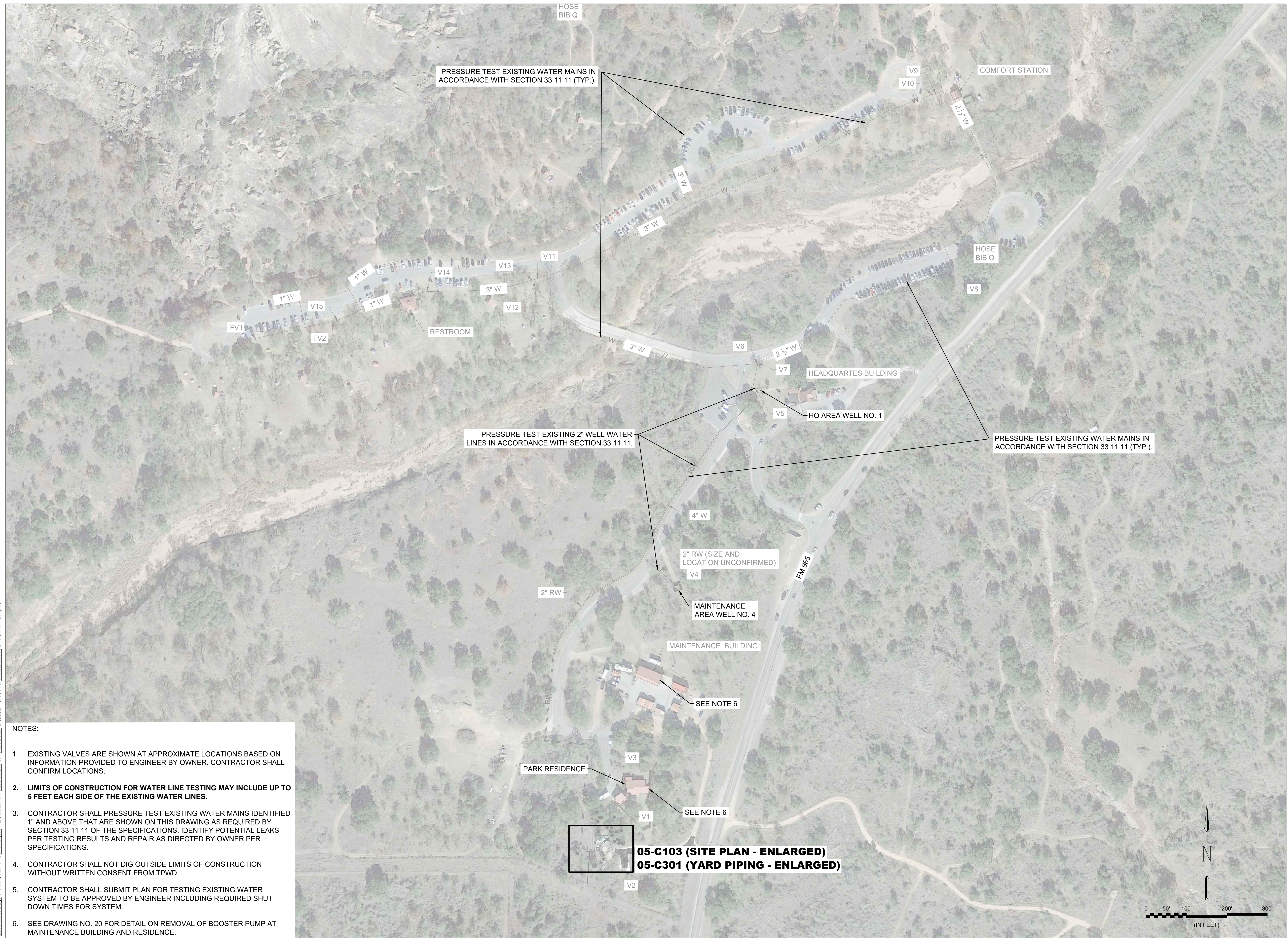
Digitally Signed 03/05/2021

ENCHANTED ROCK STATE NATURAL AREA
WATER SYSTEM IMPROVEMENTS
TPWD PROJECT NO: 1110212 / GARVER PROJECT NUMBER: 20W07000

DATE: MARCH 2021
DESIGNED BY: CDG
DRAWN BY: MAW
REVIEWED BY: TOH
REVISED:
REVISED:

SHEET TITLE
WATER SYSTEM -
OVERVIEW

SHEET NUMBER
08
OF 25
05-C102



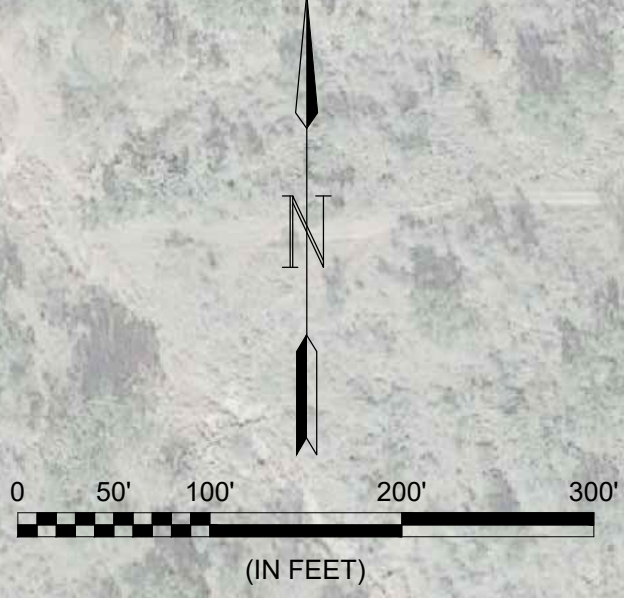
PRESSURE TEST EXISTING WATER MAINS IN ACCORDANCE WITH SECTION 33 11 11 (TYP.).

PRESSURE TEST EXISTING 2" WELL WATER LINES IN ACCORDANCE WITH SECTION 33 11 11.

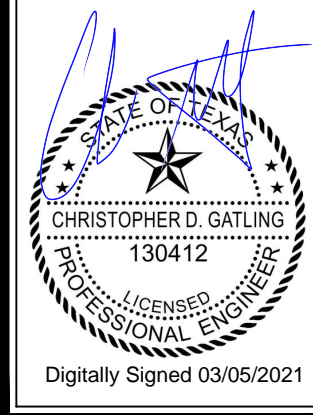
PRESSURE TEST EXISTING WATER MAINS IN ACCORDANCE WITH SECTION 33 11 11 (TYP.).

- NOTES:
- EXISTING VALVES ARE SHOWN AT APPROXIMATE LOCATIONS BASED ON INFORMATION PROVIDED TO ENGINEER BY OWNER. CONTRACTOR SHALL CONFIRM LOCATIONS.
 - LIMITS OF CONSTRUCTION FOR WATER LINE TESTING MAY INCLUDE UP TO 5 FEET EACH SIDE OF THE EXISTING WATER LINES.
 - CONTRACTOR SHALL PRESSURE TEST EXISTING WATER MAINS IDENTIFIED 1" AND ABOVE THAT ARE SHOWN ON THIS DRAWING AS REQUIRED BY SECTION 33 11 11 OF THE SPECIFICATIONS. IDENTIFY POTENTIAL LEAKS PER TESTING RESULTS AND REPAIR AS DIRECTED BY OWNER PER SPECIFICATIONS.
 - CONTRACTOR SHALL NOT DIG OUTSIDE LIMITS OF CONSTRUCTION WITHOUT WRITTEN CONSENT FROM TPWD.
 - CONTRACTOR SHALL SUBMIT PLAN FOR TESTING EXISTING WATER SYSTEM TO BE APPROVED BY ENGINEER INCLUDING REQUIRED SHUT DOWN TIMES FOR SYSTEM.
 - SEE DRAWING NO. 20 FOR DETAIL ON REMOVAL OF BOOSTER PUMP AT MAINTENANCE BUILDING AND RESIDENCE.

05-C103 (SITE PLAN - ENLARGED)
05-C301 (YARD PIPING - ENLARGED)



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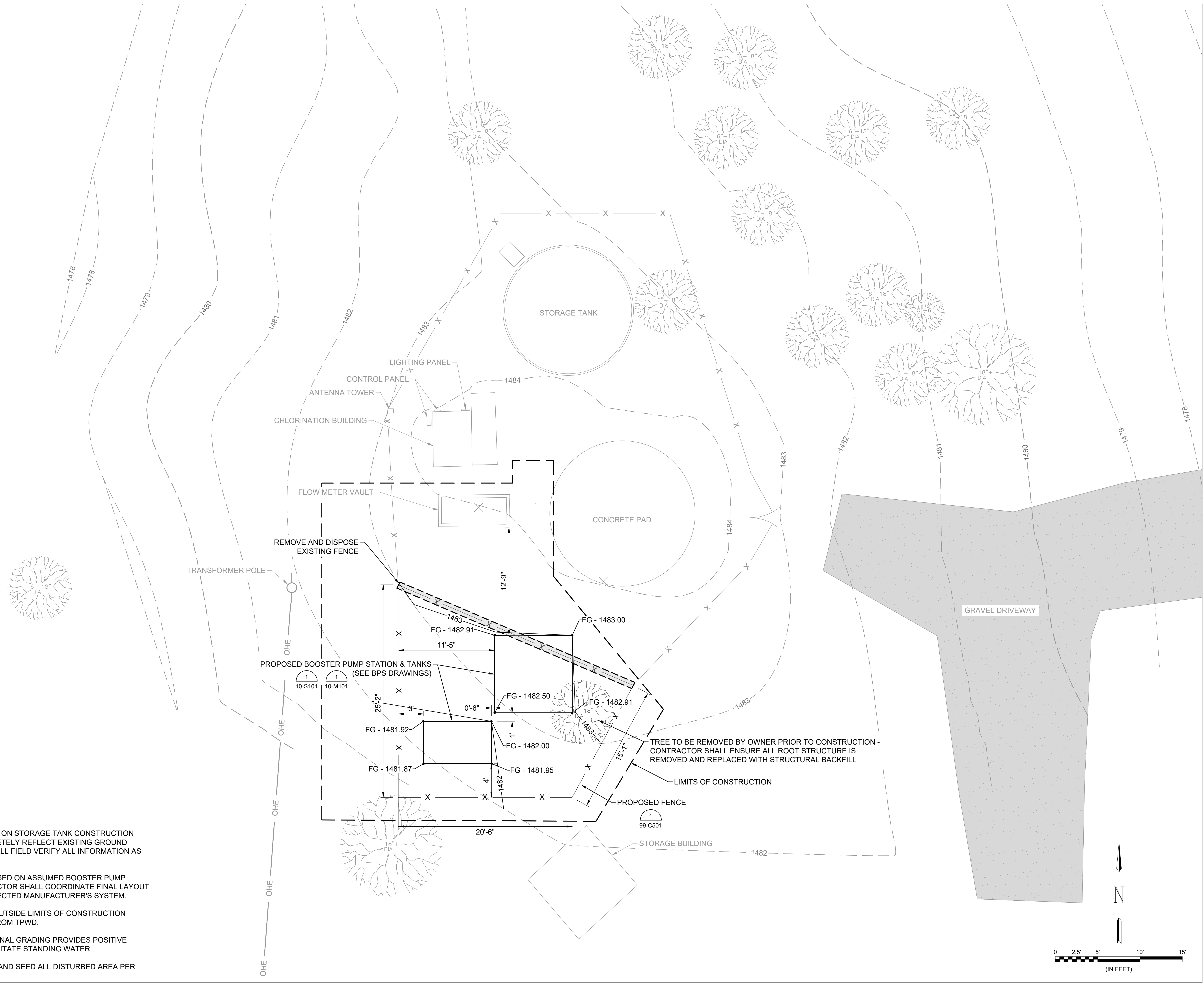


ENCHANTED ROCK STATE NATURAL AREA
WATER SYSTEM IMPROVEMENTS
TPWD PROJECT NO: 1110212 / GARVER PROJECT NUMBER: 20W07000

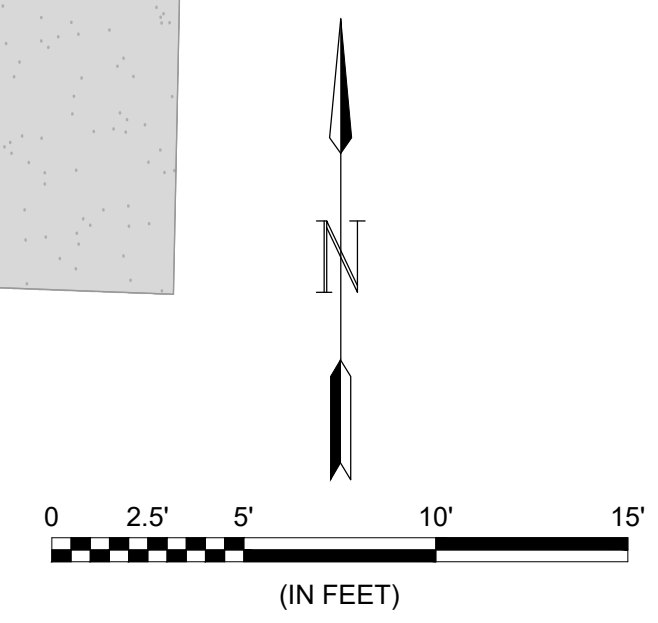
DATE: MARCH 2021
DESIGNED BY: CDG
DRAWN BY: MAW
REVIEWED BY: TOH
REVISED:
REVISED:

SHEET TITLE
SITE PLAN -
ENLARGED

SHEET NUMBER
09
OF 25
05-C103



- NOTES:
1. SURVEY DATA SHOWN IS BASED ON STORAGE TANK CONSTRUCTION PROJECT AND MAY NOT COMPLETELY REFLECT EXISTING GROUND CONDITIONS. CONTRACTOR SHALL FIELD VERIFY ALL INFORMATION AS NECESSARY.
 2. DIMENSIONS ARE PROVIDED BASED ON ASSUMED BOOSTER PUMP STATION DIMENSIONS. CONTRACTOR SHALL COORDINATE FINAL LAYOUT WITH ENGINEER BASED ON SELECTED MANUFACTURER'S SYSTEM.
 3. CONTRACTOR SHALL NOT DIG OUTSIDE LIMITS OF CONSTRUCTION WITHOUT WRITTEN CONSENT FROM TPWD.
 4. CONTRACTOR SHALL ENSURE FINAL GRADING PROVIDES POSITIVE DRAINAGE AND DOES NOT FACILITATE STANDING WATER.
 5. CONTRACTOR SHALL RESTORE AND SEED ALL DISTURBED AREA PER SPECIFICATIONS



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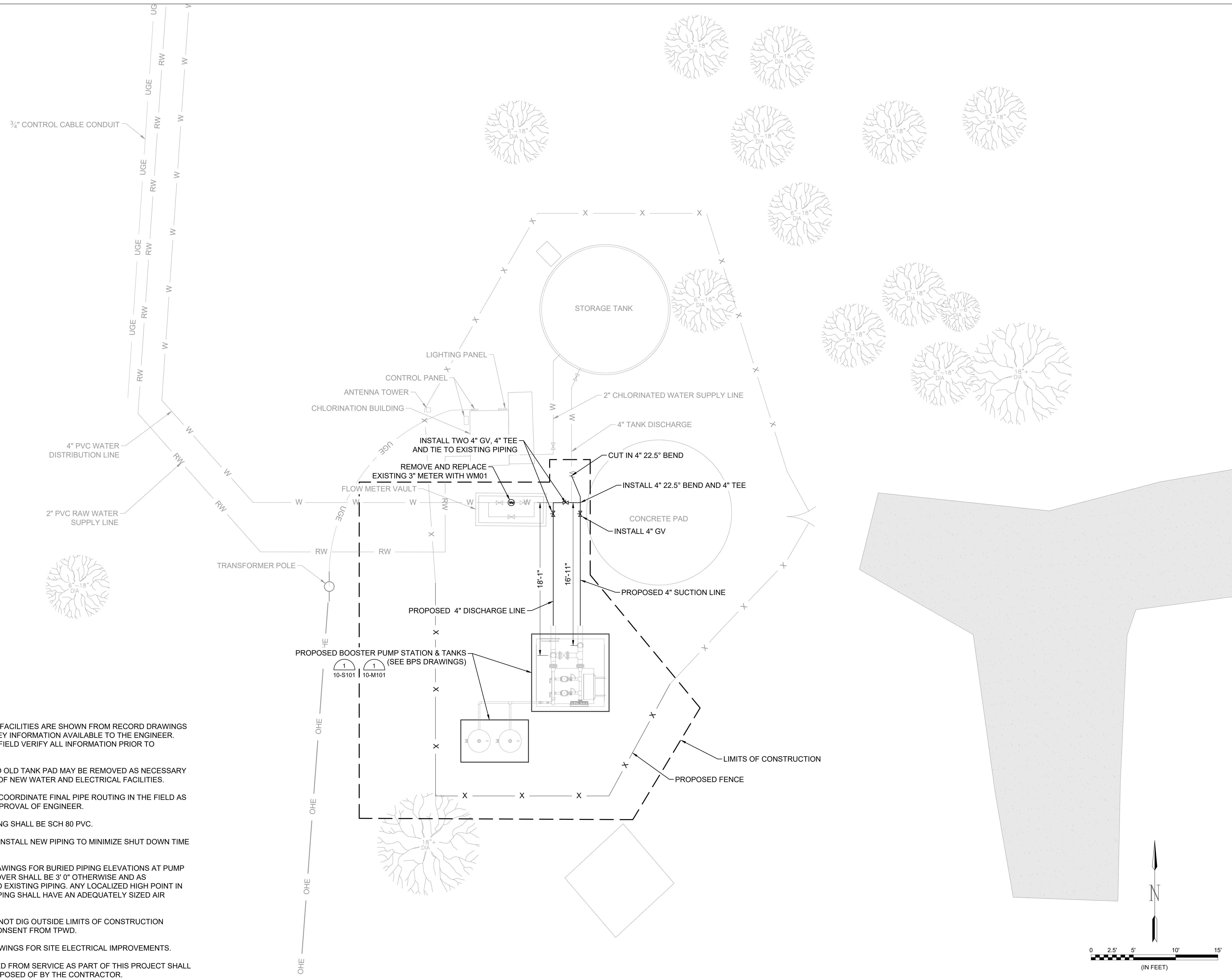


ENCHANTED ROCK STATE NATURAL AREA
WATER SYSTEM IMPROVEMENTS
TPWD PROJECT NO: 1110212 / GARVER PROJECT NUMBER: 20W07000

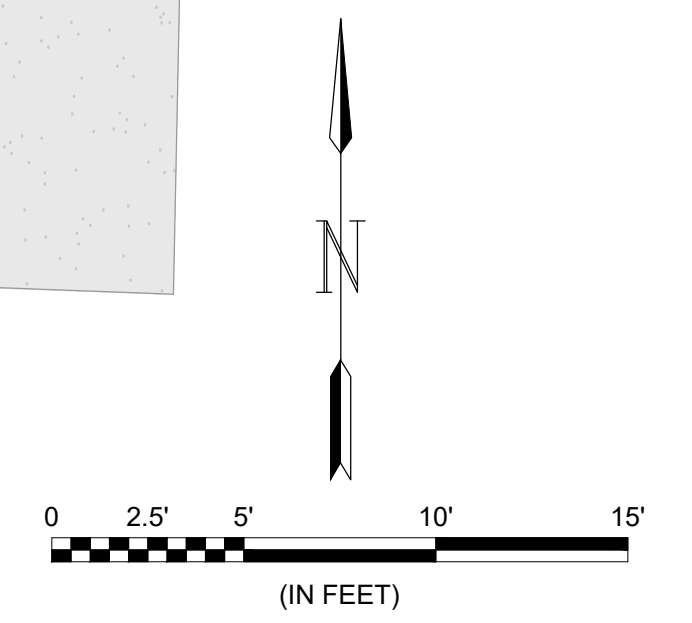
DATE: MARCH 2021
DESIGNED BY: CDG
DRAWN BY: MAW
REVIEWED BY: TOH
REVISED:
REVISED:

SHEET TITLE
YARD PIPING -
ENLARGED

SHEET NUMBER
10
OF 25
05-C301



- NOTES:
- EXISTING PIPING AND FACILITIES ARE SHOWN FROM RECORD DRAWINGS AND PREVIOUS SURVEY INFORMATION AVAILABLE TO THE ENGINEER. CONTRACTOR SHALL FIELD VERIFY ALL INFORMATION PRIOR TO CONSTRUCTION.
 - ABANDONED LINES TO OLD TANK PAD MAY BE REMOVED AS NECESSARY FOR CONSTRUCTION OF NEW WATER AND ELECTRICAL FACILITIES.
 - CONTRACTOR SHALL COORDINATE FINAL PIPE ROUTING IN THE FIELD AS NECESSARY, WITH APPROVAL OF ENGINEER.
 - ALL NEW BURIED PIPING SHALL BE SCH 80 PVC.
 - CONTRACTOR SHALL INSTALL NEW PIPING TO MINIMIZE SHUT DOWN TIME FOR SYSTEM.
 - SEE MECHANICAL DRAWINGS FOR BURIED PIPING ELEVATIONS AT PUMP STATION. MINIMUM COVER SHALL BE 3' 0" OTHERWISE AND AS NECESSARY TO TIE TO EXISTING PIPING. ANY LOCALIZED HIGH POINT IN THE PRESSURIZED PIPING SHALL HAVE AN ADEQUATELY SIZED AIR RELEASE VALVE.
 - CONTRACTOR SHALL NOT DIG OUTSIDE LIMITS OF CONSTRUCTION WITHOUT WRITTEN CONSENT FROM TPWD.
 - SEE ELECTRICAL DRAWINGS FOR SITE ELECTRICAL IMPROVEMENTS.
 - YARD PIPING REMOVED FROM SERVICE AS PART OF THIS PROJECT SHALL BE REMOVED AND DISPOSED OF BY THE CONTRACTOR.



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Last plotted by: Medina, Carlos Plot Style: AECmon.ctb Plot Scale: 1:1 Plot Date: 3/15/2021 11:19 AM Plotter used: DWG To PDF.pc3



EXISTING HEADQUARTER BUILDING
(SEE ENLARGED PLAN ON 05-E103)

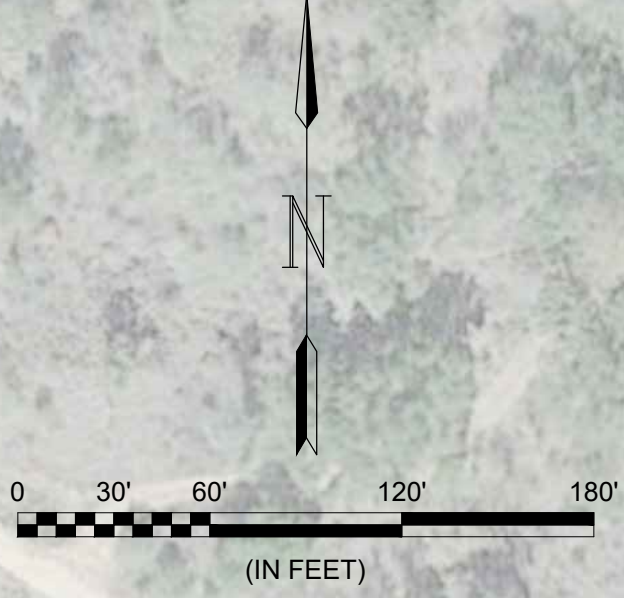
MAINTENANCE AREA WELL NO. 4

ANTENNA SIGNAL PATH

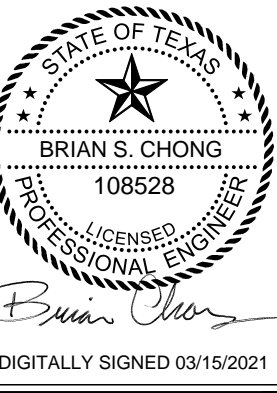
EXISTING MAINTENANCE BUILDING
(SEE ENLARGED PLAN ON 05-E102)

EXISTING PUMP STATION
(SEE ENLARGED PLAN ON 10-E101)

FM 986



TEXAS
PARKS &
WILDLIFE



ENCHANTED ROCK STATE NATURAL AREA
WATER SYSTEM IMPROVEMENTS
TPWD PROJECT NO: 1110212 / GARVER PROJECT NUMBER: 20W07000

DATE: MARCH 2021
DESIGNED BY: KAD
DRAWN BY: CM
REVIEWED BY: JCW
REVISED:
REVISED:

SHEET TITLE
OVERALL
ELECTRICAL
SITE PLAN

SHEET NUMBER
11
OF 25
05-E101

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Last plotted by: Medina, Carlos Plot Style: AECmon.ctb Plot Scale: 1:1 Plot Date: 3/15/2021 11:20 AM Plotter used: DWG To PDF.pc3



NOTES:

1. REMOVE EXISTING WATER PUMP AND CLEANUP AREA FOR NEW MAINTENANCE BLDG. PLC PANEL. PROVIDE AND INSTALL CONDUIT AND CONDUCTOR FOR 120V 20A CIRCUIT FROM EXISTING LIGHTING PANEL TO NEW MAINTENANCE BLDG. PLC PANEL.
2. 1" C. WITH ANTENNA CABLE. FIELD ROUTE CONDUIT AND CABLE FROM ANTENNA TOWER TO RADIO IN MAINTENANCE BLDG. PLC PANEL. PROVIDE ALL REQUIRED CONDUIT SUPPORTS AND HARDWARE.
3. CONTRACTOR SHALL VERIFY ANTENNA LOCATION WITH OWNER.
4. CONTRACTOR SHALL CORE THROUGH MAINTENANCE BUILDING WALL A MINIMUM OF 2 FEET FROM FINISHED GRADE.
5. CONTRACTOR SHALL INSTALL CONDUITS ALONG BUILDING WALLS USING GALVANIZED STEEL CONDUIT STRAPS AND HARDWARE. (TYP)
6. PLC PANEL HMI TO DISPLAY GST LEVEL, GST HIGH AND LOW LEVEL ALARMS, AND BOOSTER PUMP RUNNING AND FAIL STATUS.



ENCHANTED ROCK STATE NATURAL AREA
WATER SYSTEM IMPROVEMENTS
TPWD PROJECT NO: 1110212 / GARVER PROJECT NUMBER: 20W07000

DATE: MARCH 2021
DESIGNED BY: KAD
DRAWN BY: CM
REVIEWED BY: JCW
REVISED:
REVISED:

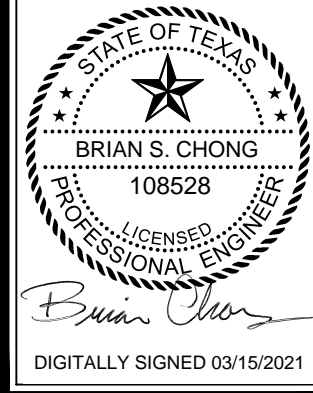
SHEET TITLE
MAINTENANCE
BUILDING ELECTRICAL
SITE PLAN

SHEET NUMBER
12
OF 25
05-E102

File: \\garverinc.local\data\Projects\2020\20W07000 - TPWD Enchanted Rock SP W and WW Upgrades\Drawings\TPWDERSP-05-E-103-SI.dwg Last Save: 3/4/2021 3:46 PM Last saved by: CM Medina
Last plotted by: Medina, Carlos Plot Style: AECOnono.ctb Plot Scale: 1:1 Plot Date: 3/16/2021 11:21 AM Plotter used: DWG To PDF.pc3



- NOTES:
1. PROVIDE AND INSTALL GE MDS RADIO MODEL SD SERIES, RACO VERBATIM 8 CHANNEL AUTODIALER WITH MODBUS INTERFACE MODULE, UPS (30 MINUTE RATED), AND ALL REQUIRED HARDWARE IN A NEMA 1 ENCLOSURE. CONTRACTOR TO COORDINATE WITH OWNER FOR AUTODIALER CONNECTION TO TELEPHONE LINE. PANEL SHALL BE MOUNTED ON WALL USING STEEL UNISTRUT AND HARDWARE.
 2. PROVIDE AND INSTALL 20A 1P CIRCUIT BREAKER TO EXISTING LIGHTING PANEL. CONTRACTOR TO MATCH EXISTING RATING AND TYPE.
 3. CONTRACTOR SHALL INSTALL PROPOSED YAGI ANTENNA TO EXISTING ANTENNA POLE. SEE DETAIL FOR SUGGESTED HEIGHT AND LOCATION. CONTRACTOR TO ADJUST HEIGHT AS REQUIRED FOR A COMPLETE AND FUNCTIONAL SCADA SYSTEM.
 4. 1" C. WITH 2-#12, #12 GND. FIELD ROUTE CONDUIT FROM EXISTING LIGHTING PANEL TO PROPOSED UPS IN THE EXISTING COMMUNICATION ROOM.
 5. 1" C. WITH ANTENNA CABLE. FIELD ROUTE CONDUIT FROM PROPOSED YAGI ANTENNA TO PROPOSED MDS RADIO IN THE EXISTING COMMUNICATION ROOM.
 6. CONTRACTOR SHALL REPLACE EXISTING LIGHT POLE AND FIXTURE.
 7. CONTRACTOR SHALL CORE THROUGH HEADQUARTERS BUILDING WALL A MINIMUM OF 2 FEET FROM FINISHED GRADE.
 8. CONTRACTOR SHALL INSTALL CONDUITS ALONG BUILDING WALLS USING GALVANIZED STEEL CONDUIT STRAPS AND HARDWARE. (TYP)

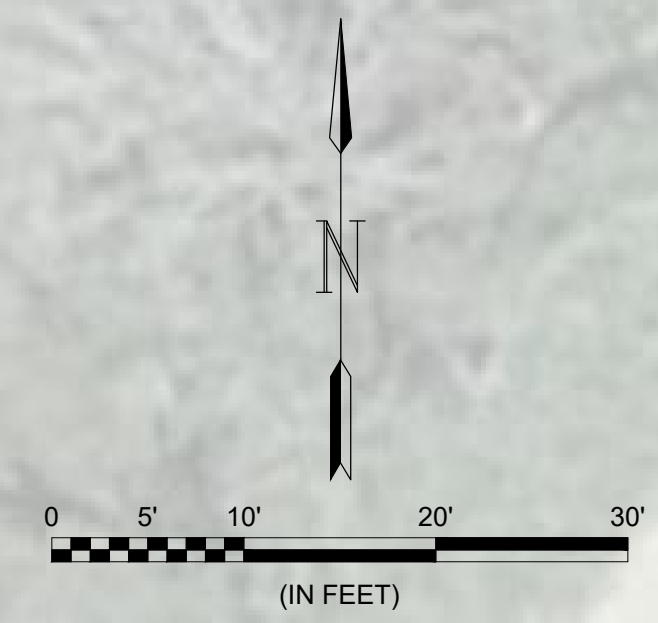


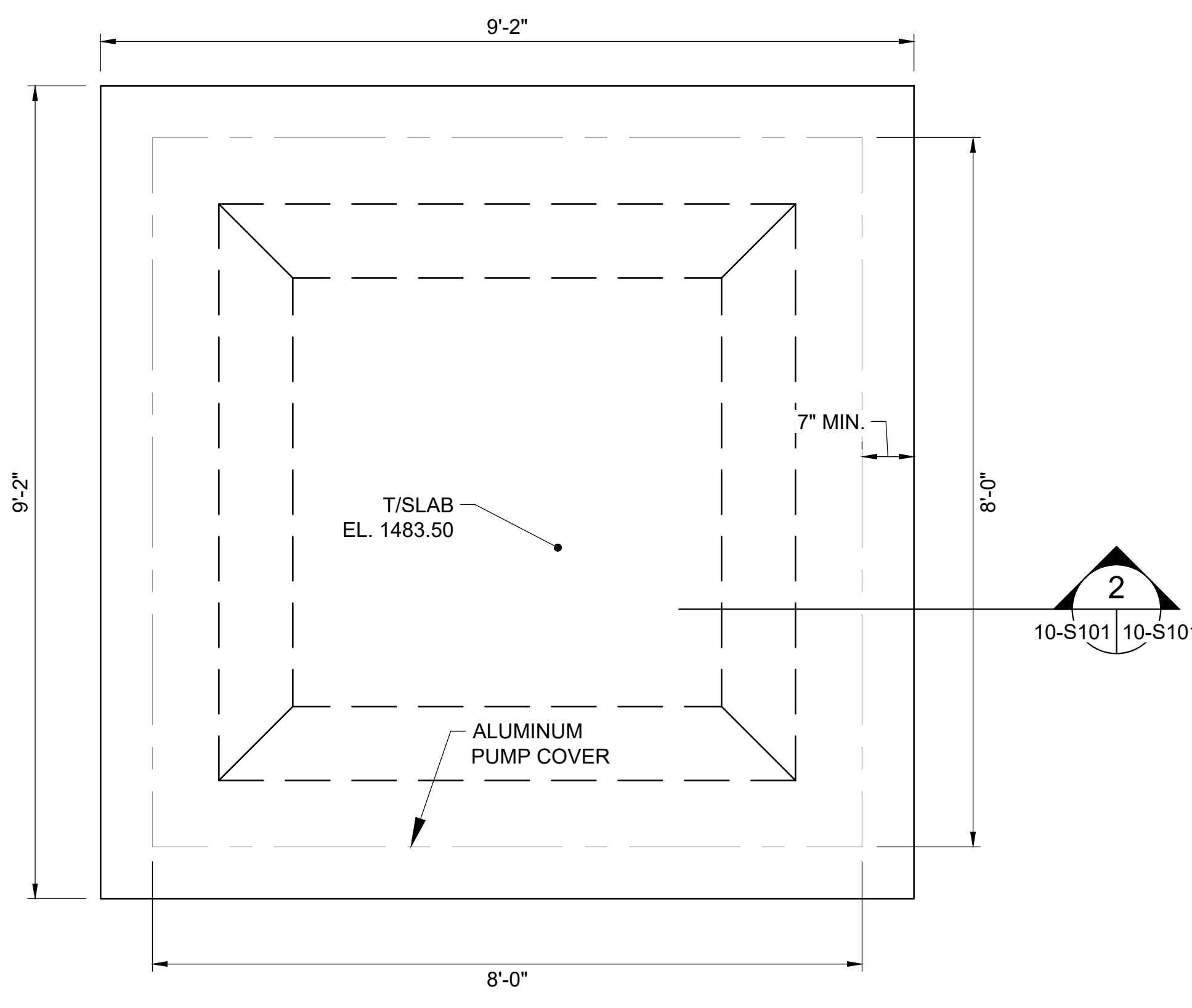
ENCHANTED ROCK STATE NATURAL AREA
WATER SYSTEM IMPROVEMENTS
TPWD PROJECT NO: 1110212 / GARVER PROJECT NUMBER: 20W07000

DATE: MARCH 2021
DESIGNED BY: KAD
DRAWN BY: CM
REVIEWED BY: JCW
REVISED:
REVISED:

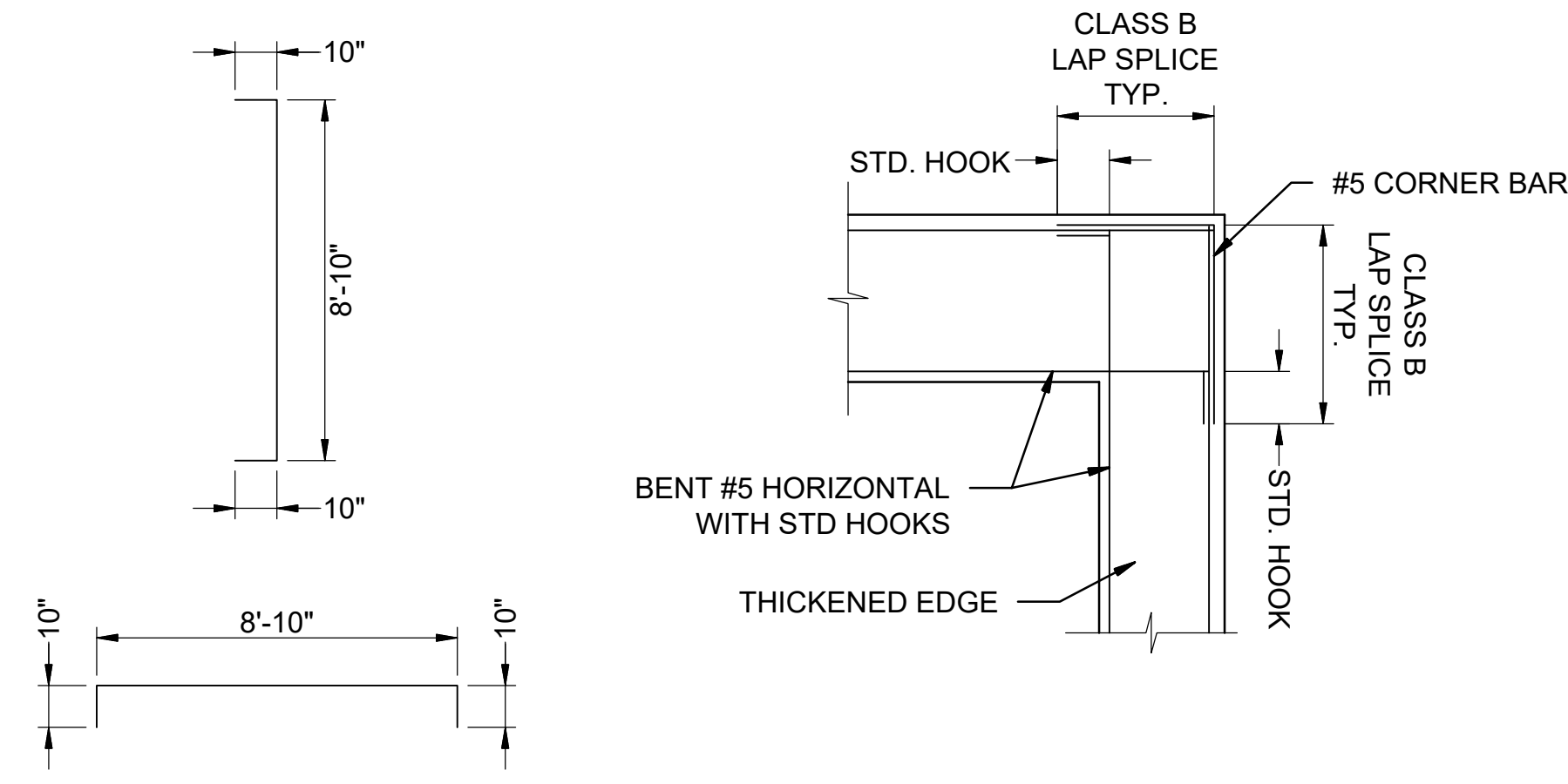
SHEET TITLE
HEADQUARTER
BUILDING ELECTRICAL
SITE PLAN

SHEET NUMBER
13
OF 25
05-E103

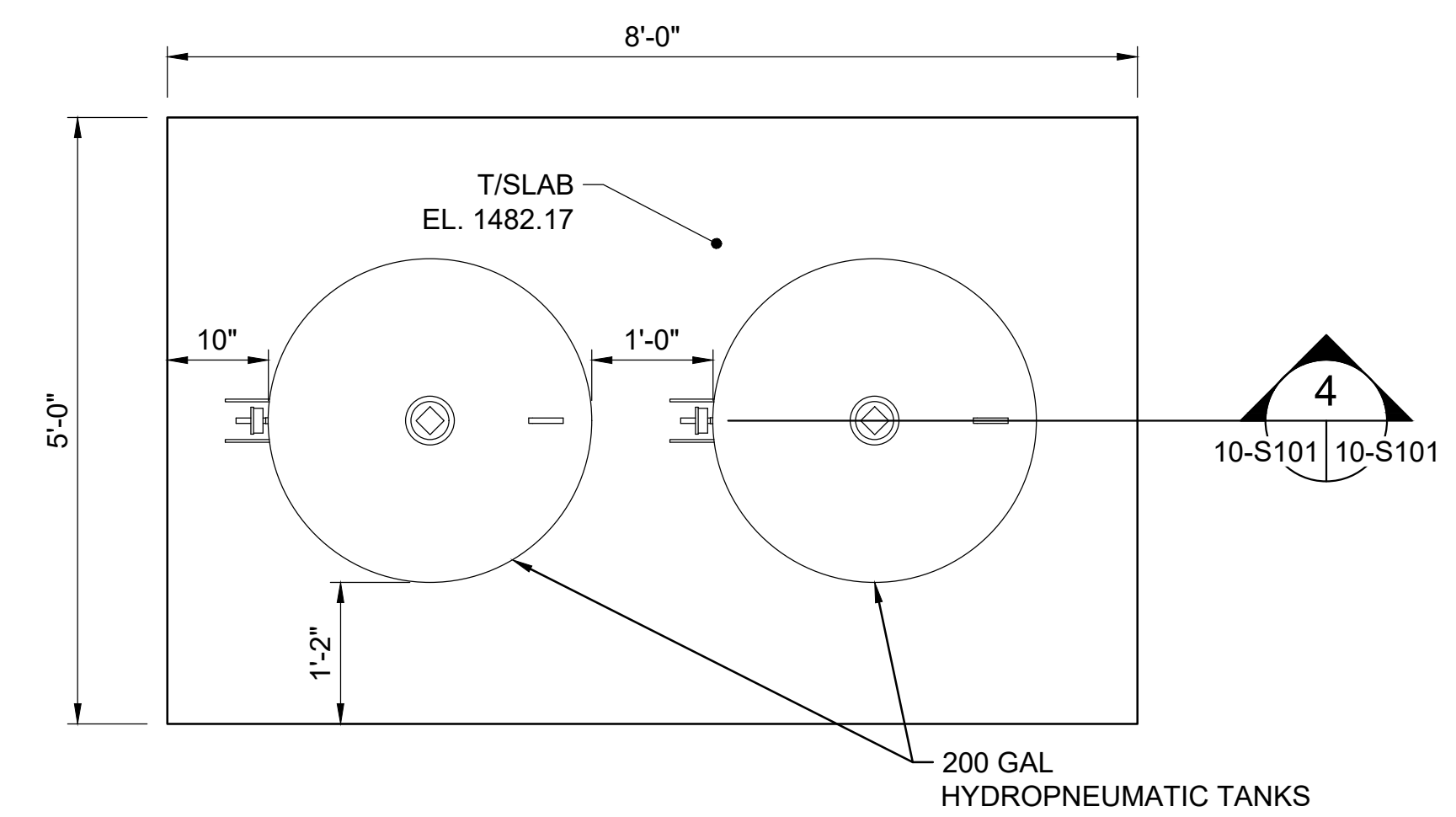




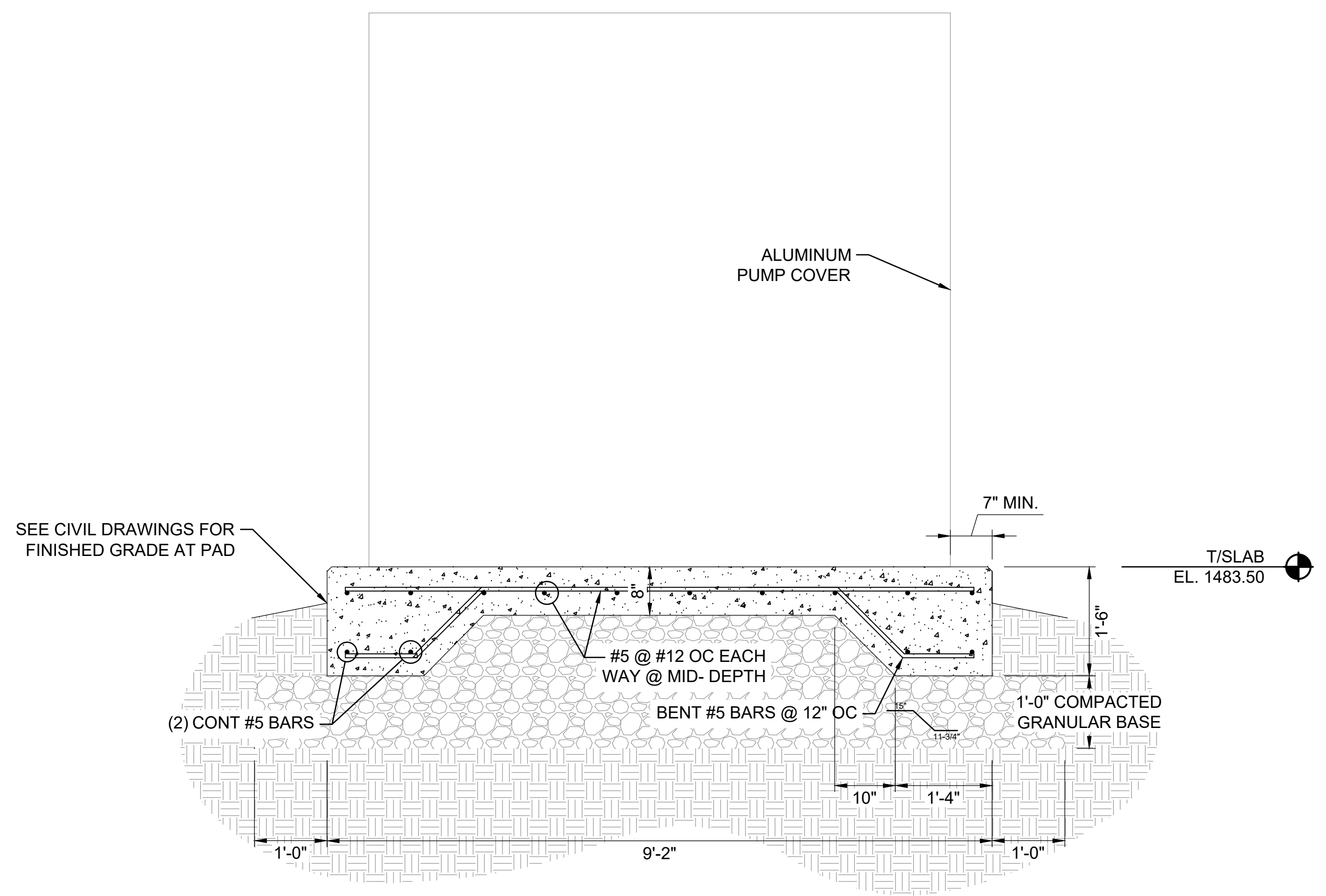
BOOSTER PUMP STATION FOUNDATION PLAN
SCALE: 3/4" = 1'-0"



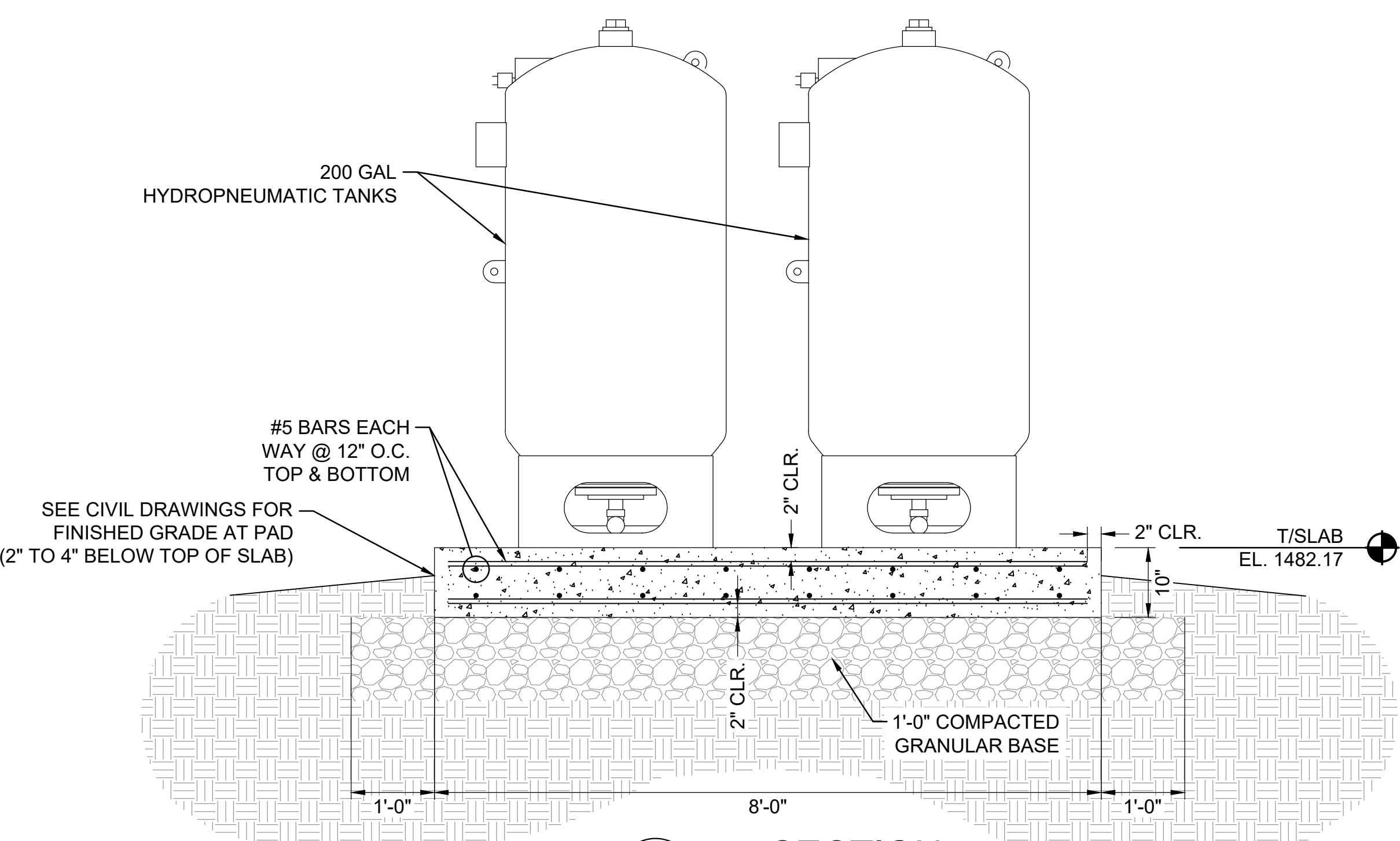
THICKENED EDGE CORNER DETAIL
SCALE: NONE



TANK FOUNDATION PLAN
SCALE: 3/4" = 1'-0"



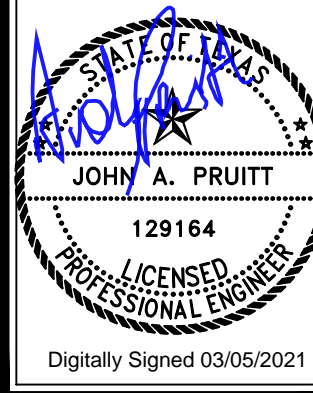
SECTION 2
SCALE: 3/4" = 1'-0"



SECTION 4
SCALE: 3/4" = 1'-0"

- NOTES:
1. VERIFY FINAL DIMENSIONS WITH PUMP STATION STRUCTURE MANUFACTURER.
 2. POWER TROWEL TOP SURFACE OF SLAB.
 3. SEE SPECIFICATIONS (SECTION 13 34 23.14) FOR ALUMINUM PUMP COVER INFORMATION.
 4. SEE SPECIFICATIONS (SECTION 43 42 56.31) FOR PUMP SKID INFORMATION.
 5. ANCHORAGE OF PUMP SKID & ALUMINUM ENCLOSURE TO FOUNDATION TO BE PROVIDED BY PUMP STATION MANUFACTURER.
 6. ANCHORAGE OF TANKS TO FOUNDATION TO BE PROVIDED BY TANK MANUFACTURER.

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DATE: MARCH 2021
DESIGNED BY: JHB
DRAWN BY: MAW
REVIEWED BY: TOH
REVISED:
REVISED:

SHEET TITLE
BPS MECHANICAL PLAN

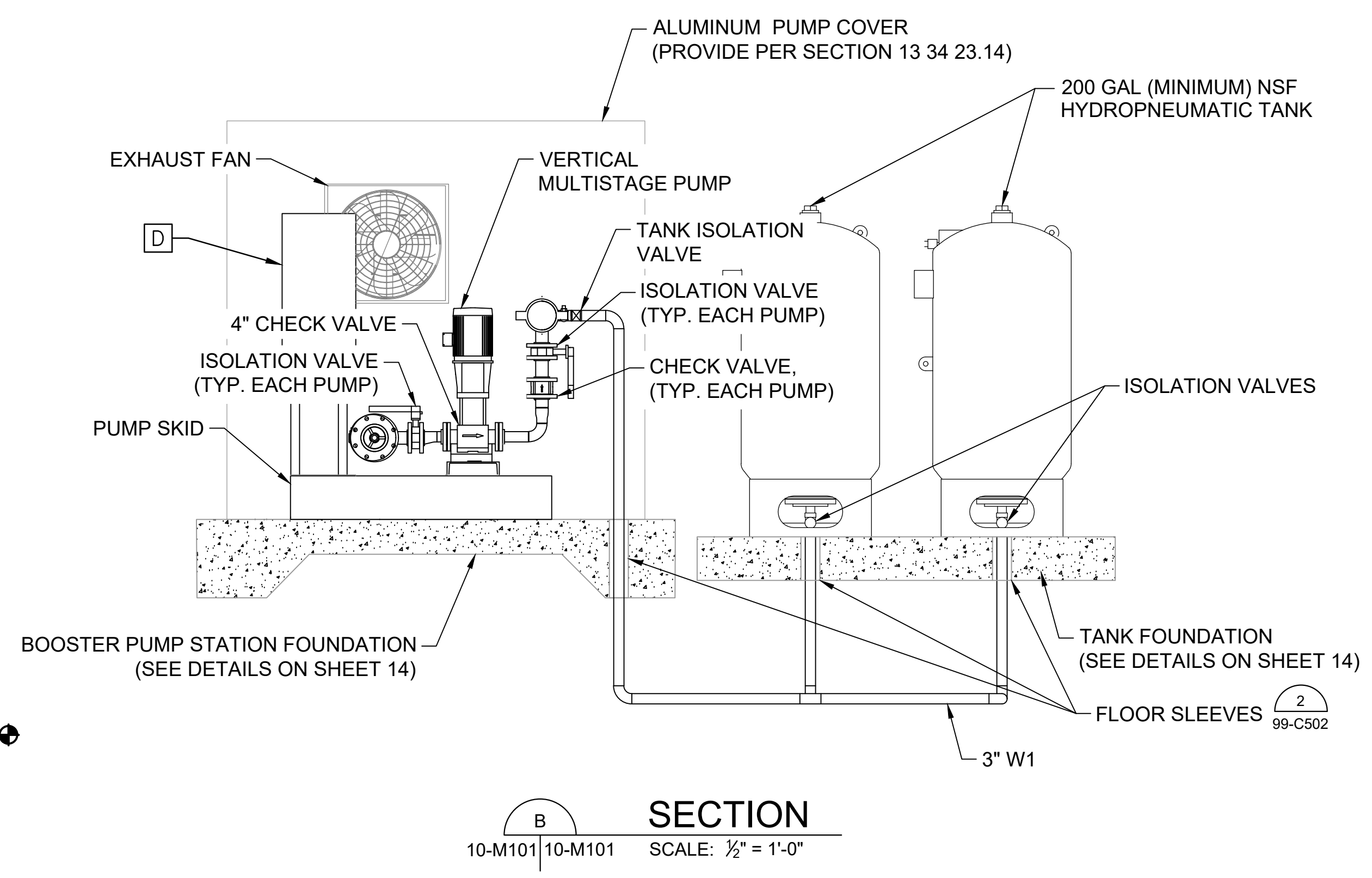
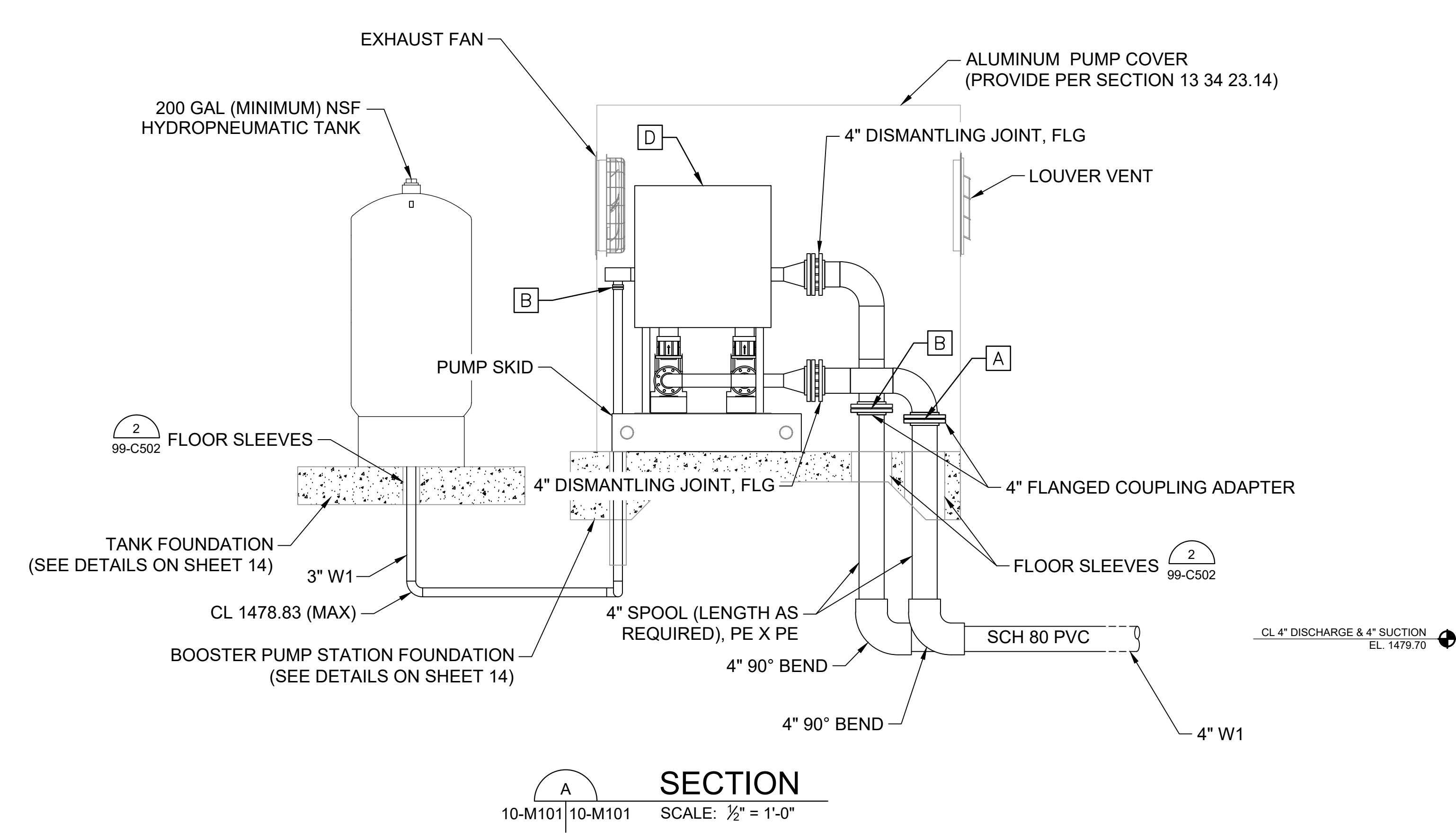
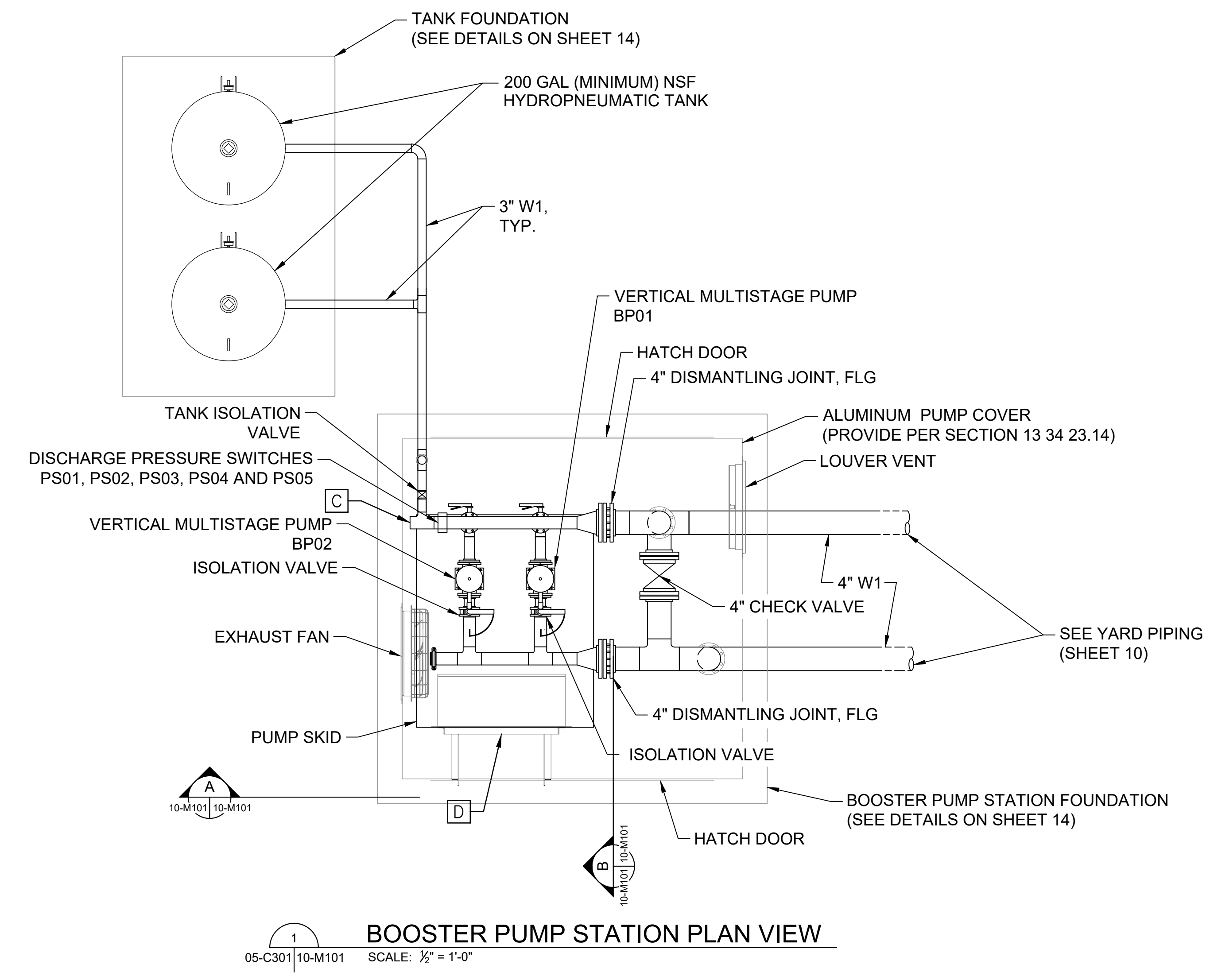
SHEET NUMBER
15
OF 25
10-M101

NOTES:

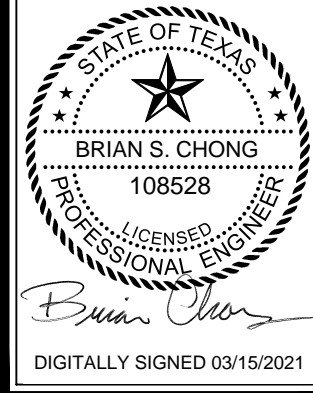
- BOOSTER PUMP STATION BUILDING AND EQUIPMENT SHALL BE PROVIDED BY THE BOOSTER PUMP STATION MANUFACTURER. SEE SECTION 44 42 56.31 POTABLE WATER PACKAGE PUMP STATION SYSTEM FOR EQUIPMENT SPECIFICATIONS.
- BOOSTER PUMP STATION SKID SHALL BE CONNECTED TO THE FOUNDATION PER THE BOOSTER PUMP STATION MANUFACTURER. THE FOUNDATION SHALL BE CONSTRUCTED BY CONTRACTOR. THE CONTRACTOR SHALL COORDINATE THE SLAB PIPE PENETRATION LOCATIONS WITH THE BPS MANUFACTURER.
- SEE 05-C301 FOR PIPING CONTINUATION.
- FULL EXTENT OF THICKENED PUMP STATION SLAB NOT SHOWN FOR CLARITY - SEE STRUCTURAL DRAWING 10-S101
- EQUIPMENT TO BE PROVIDED BY BOOSTER PUMP SKID MANUFACTURER (PER SECTION 43 42 56.13).

A PUMP STATION KEY NOTES:

- PROVIDE A RESTRAINED FLANGED COUPLING ADAPTER FOR CONNECTION TO BOOSTER PUMP STATION SUCTION PIPING.
- PROVIDE A RESTRAINED FLANGED COUPLING ADAPTER FOR CONNECTION TO BOOSTER PUMP STATION DISCHARGE PIPING.
- PRESSURE RELIEF VALVE SET AT 55 PSI, BUSHINGS, NIPPLES AND DISCHARGE PIPE TO EXTERIOR 6" MIN ABOVE GRADE. SEAL PENETRATION THROUGH WALL.
- ELECTRICAL PANELS AND EQUIPMENT



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ENCHANTED ROCK STATE NATURAL AREA
WATER SYSTEM IMPROVEMENTS
TPWD PROJECT NO: 1110212 / GARVER PROJECT NUMBER: 20W07000

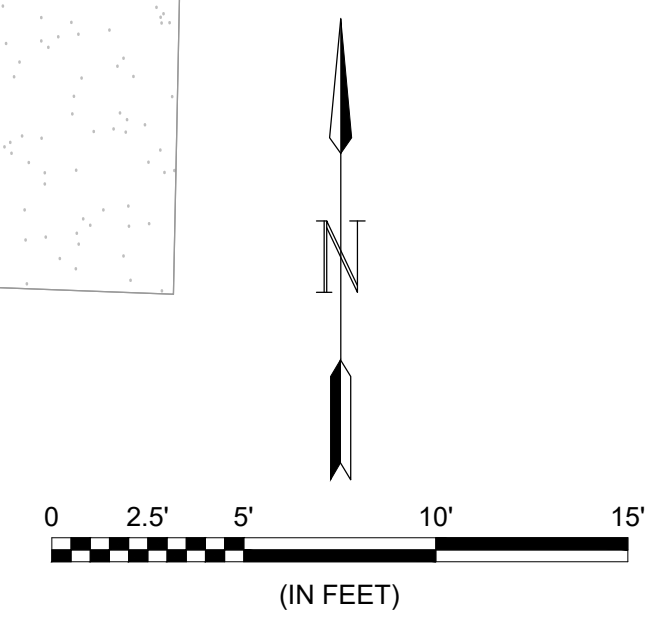
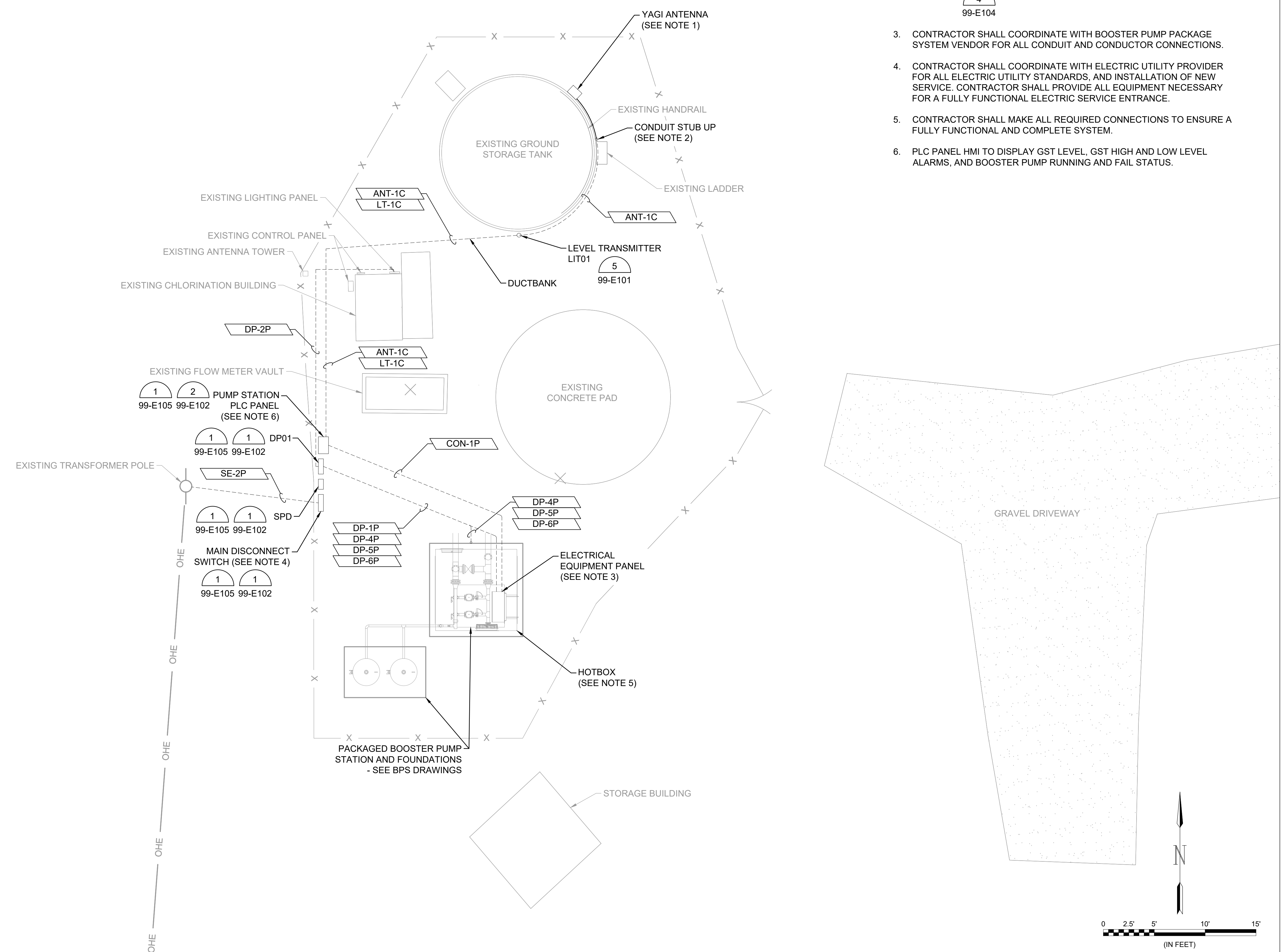
DATE: MARCH 2021
DESIGNED BY: KAD
DRAWN BY: CM
REVIEWED BY: JCW
REVISED:
REVISED:

SHEET TITLE
BPS
ELECTRICAL PLAN

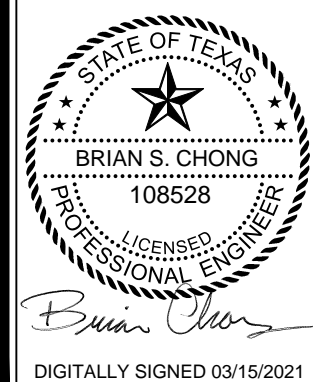
SHEET NUMBER
16
OF 25
10-E101

NOTES:

- CONTRACTOR TO INSTALL NEW YAGI ANTENNA ON EXISTING GST HANDRAIL. SEE DETAIL 3 99-E101
- CONTRACTOR SHALL STUB UP CONDUIT NEXT TO EXISTING GST LADDER AND INSTALL ABOVE GROUND CONDUIT ALONG GST LADDER WITH GALVANIZED STEEL CONDUIT STRAPS AND HARDWARE. SEE DETAIL 4 99-E104
- CONTRACTOR SHALL COORDINATE WITH BOOSTER PUMP PACKAGE SYSTEM VENDOR FOR ALL CONDUIT AND CONDUCTOR CONNECTIONS.
- CONTRACTOR SHALL COORDINATE WITH ELECTRIC UTILITY PROVIDER FOR ALL ELECTRIC UTILITY STANDARDS, AND INSTALLATION OF NEW SERVICE. CONTRACTOR SHALL PROVIDE ALL EQUIPMENT NECESSARY FOR A FULLY FUNCTIONAL ELECTRIC SERVICE ENTRANCE.
- CONTRACTOR SHALL MAKE ALL REQUIRED CONNECTIONS TO ENSURE A FULLY FUNCTIONAL AND COMPLETE SYSTEM.
- PLC PANEL HMI TO DISPLAY GST LEVEL, GST HIGH AND LOW LEVEL ALARMS, AND BOOSTER PUMP RUNNING AND FAIL STATUS.



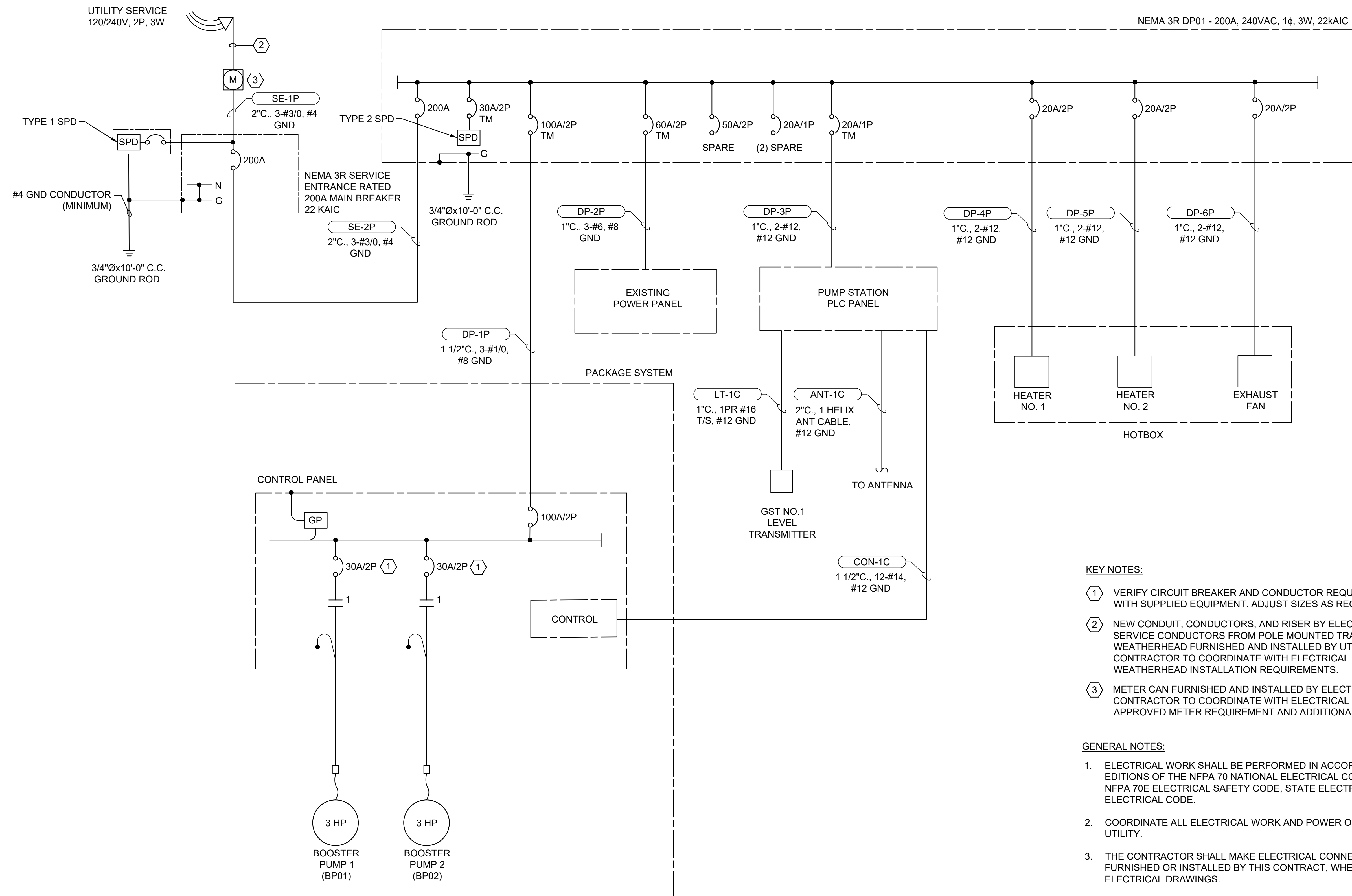
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DATE: MARCH 2021
DESIGNED BY: KAD
DRAWN BY: CM
REVIEWED BY: JCW
REVISED:
REVISED:

SHEET TITLE
BPS
ONE LINE DIAGRAM

SHEET NUMBER
17
OF 25
10-E501

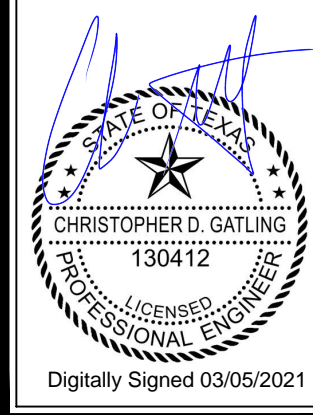


KEY NOTES:

- ① VERIFY CIRCUIT BREAKER AND CONDUCTOR REQUIREMENTS WITH SUPPLIED EQUIPMENT. ADJUST SIZES AS REQUIRED.
- ② NEW CONDUIT, CONDUCTORS, AND RISER BY ELECTRICAL CONTRACTOR. SERVICE CONDUCTORS FROM POLE MOUNTED TRANSFORMERS TO WEATHERHEAD FURNISHED AND INSTALLED BY UTILITY. ELECTRICAL CONTRACTOR TO COORDINATE WITH ELECTRICAL UTILITY FOR RISER AND WEATHERHEAD INSTALLATION REQUIREMENTS.
- ③ METER CAN FURNISHED AND INSTALLED BY ELECTRICAL CONTRACTOR. CONTRACTOR TO COORDINATE WITH ELECTRICAL UTILITY FOR APPROVED METER REQUIREMENT AND ADDITIONAL HARDWARE.

GENERAL NOTES:

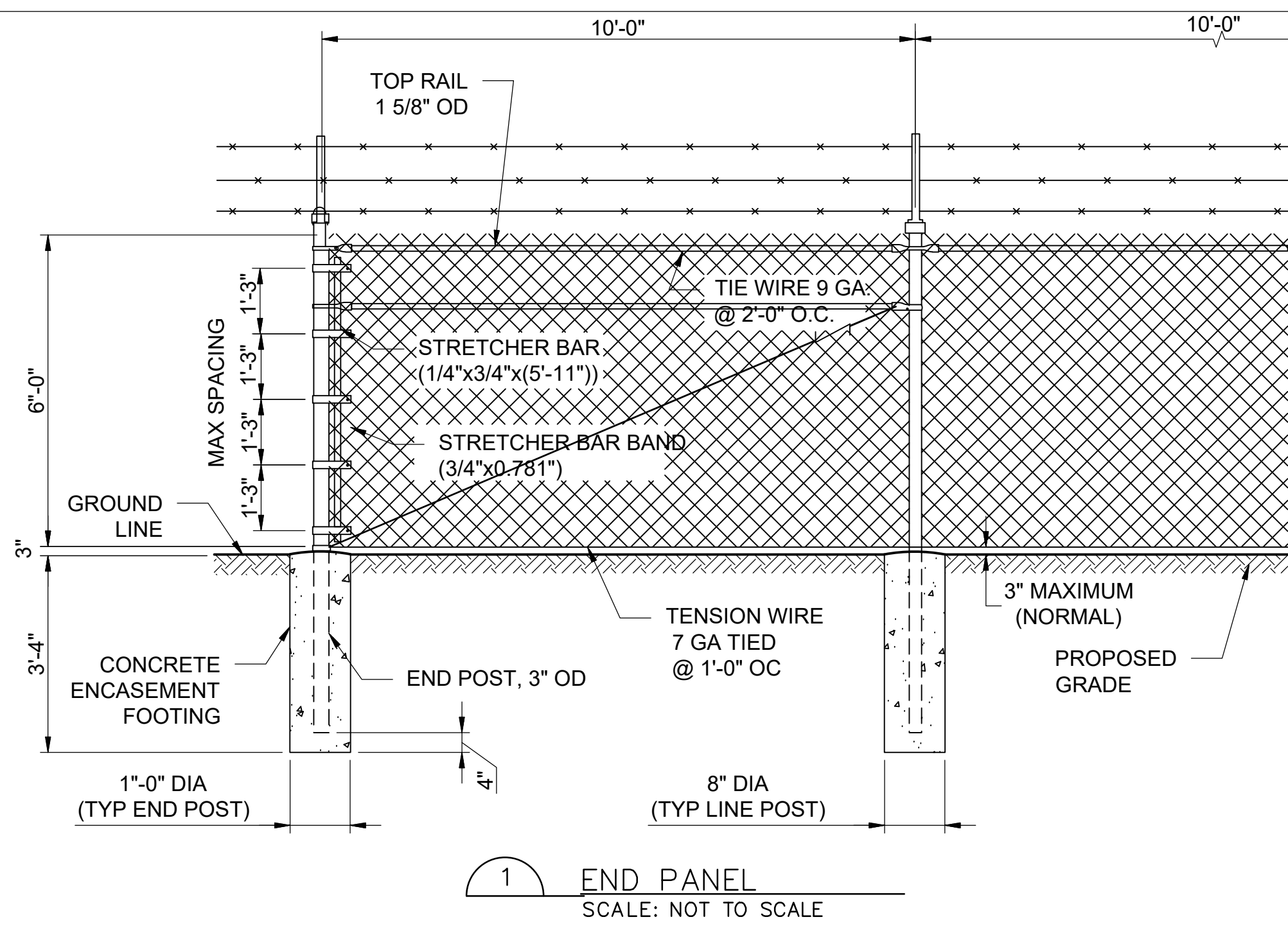
1. ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE NFPA 70 NATIONAL ELECTRICAL CODE, NFPA 101 LIFE SAFETY CODE, NFPA 70E ELECTRICAL SAFETY CODE, STATE ELECTRICAL CODE, AND LOCAL ELECTRICAL CODE.
2. COORDINATE ALL ELECTRICAL WORK AND POWER OUTAGES WITH OWNER AND POWER UTILITY.
3. THE CONTRACTOR SHALL MAKE ELECTRICAL CONNECTIONS TO EVERYTHING FURNISHED OR INSTALLED BY THIS CONTRACT, WHETHER INDICATED OR NOT ON THE ELECTRICAL DRAWINGS.
4. PROVIDE LUGS AS REQUIRED TO FIT WIRING.
5. CONTRACTOR SHALL VERIFY ALL MOTOR SIZES WITH PROVIDED EQUIPMENT AND PROVIDE APPROPRIATELY SIZED OVERCURRENT PROTECTIVE DEVICES.



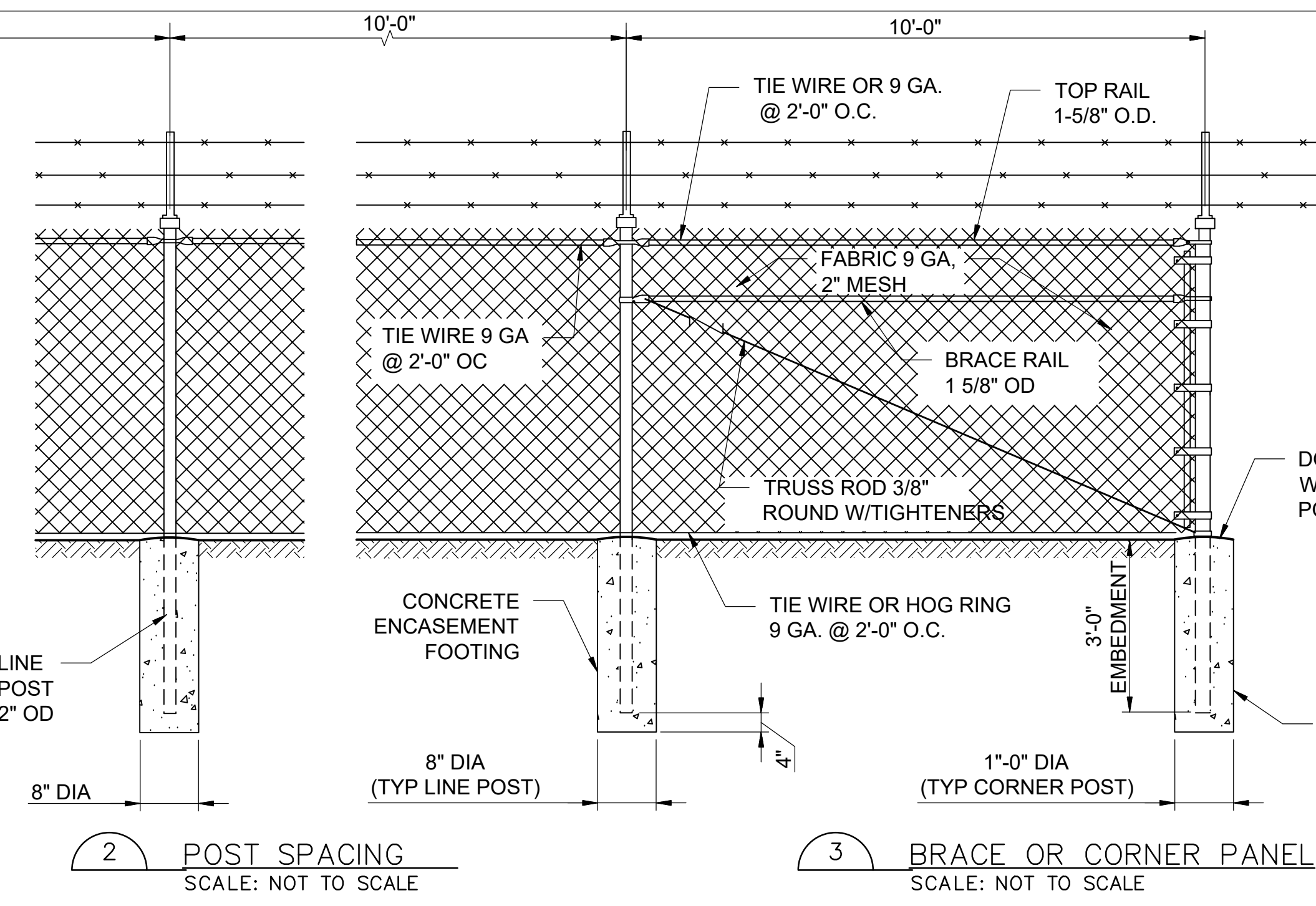
DATE: MARCH 2021
DESIGNED BY: CDG
DRAWN BY: MAW
REVIEWED BY: TOH
REVISED:
REVISED:

SHEET TITLE
CIVIL DETAILS 1

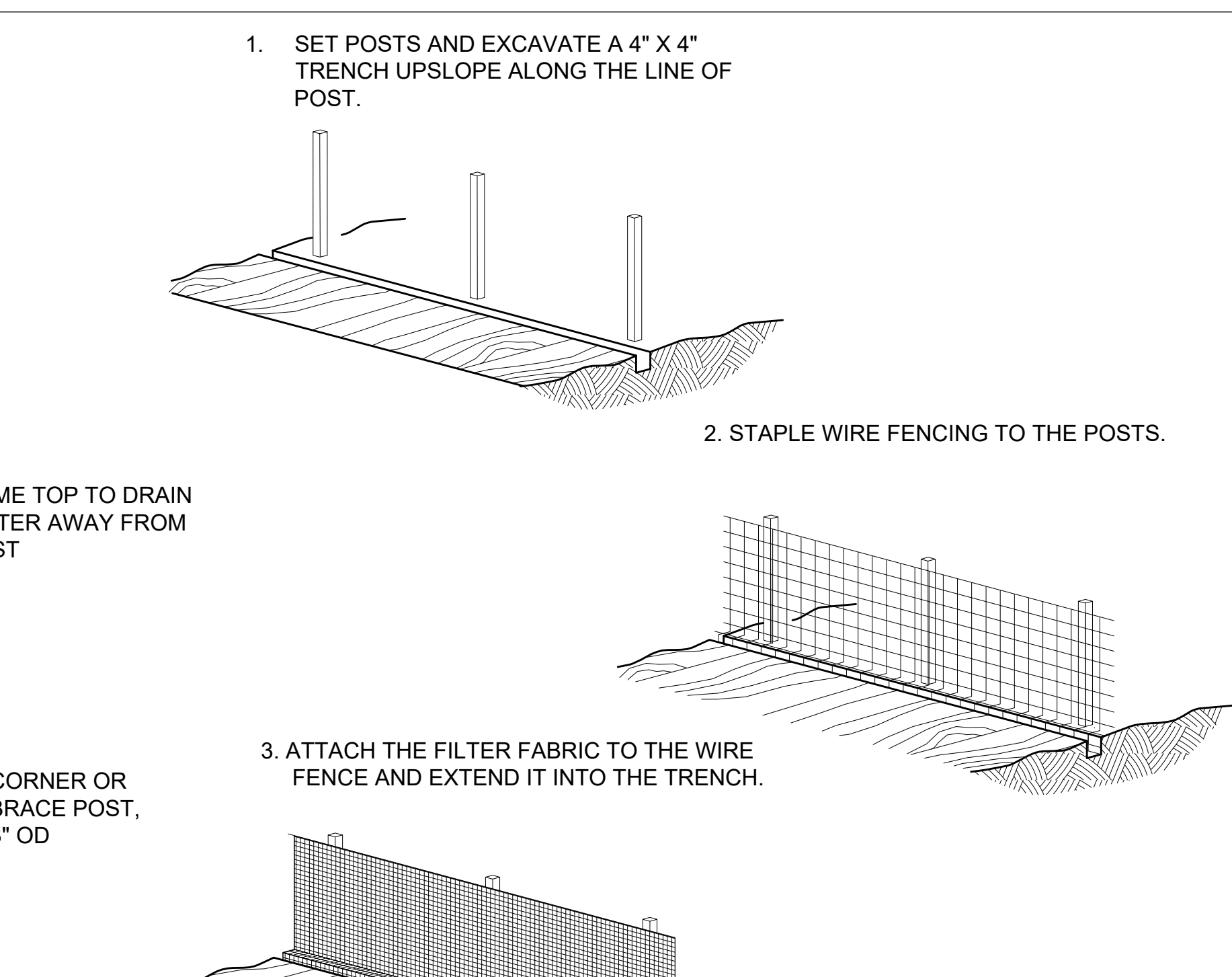
SHEET NUMBER
18
OF 25
99-C501



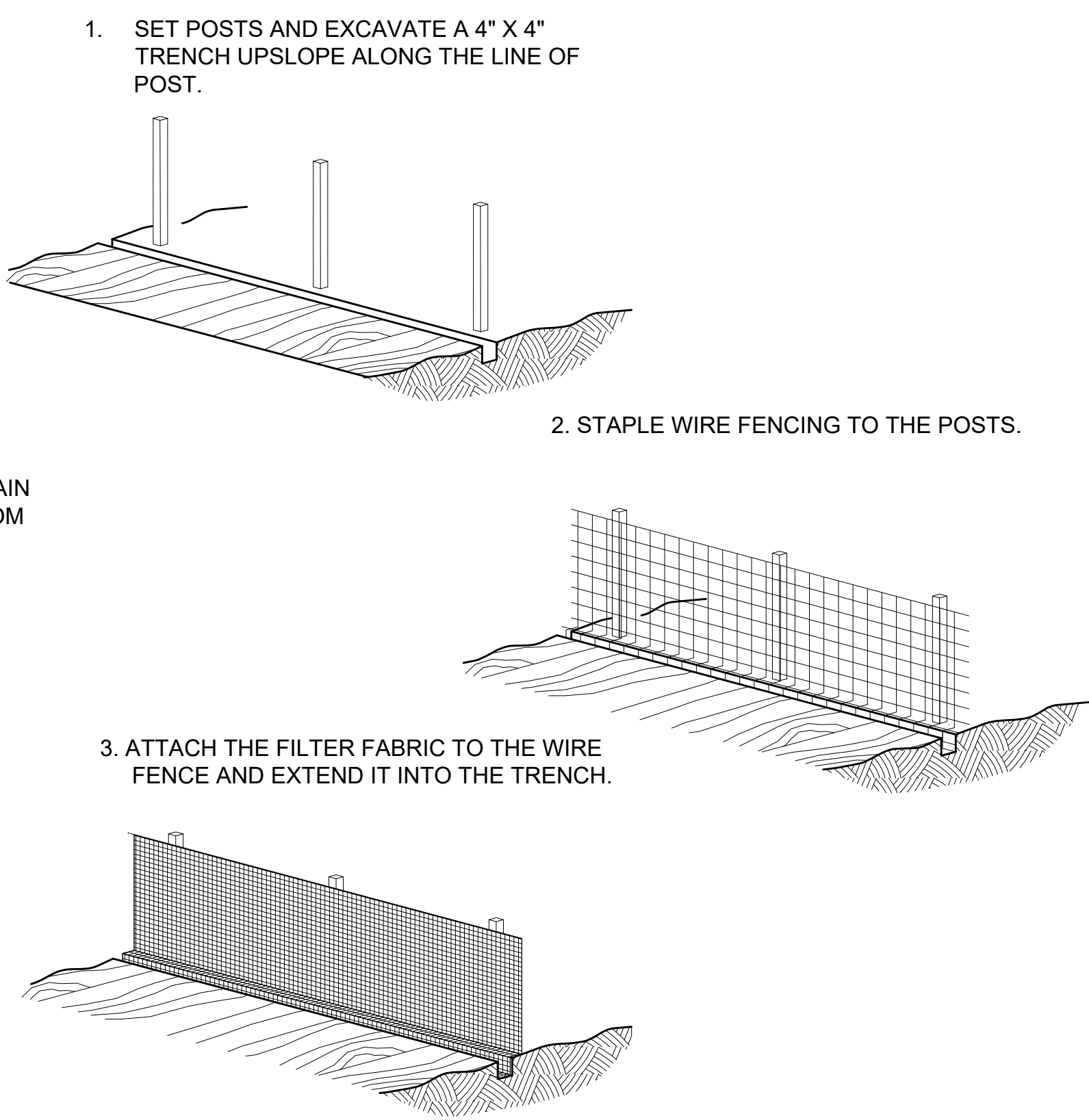
1 END PANEL
SCALE: NOT TO SCALE



2 POST SPACING
SCALE: NOT TO SCALE

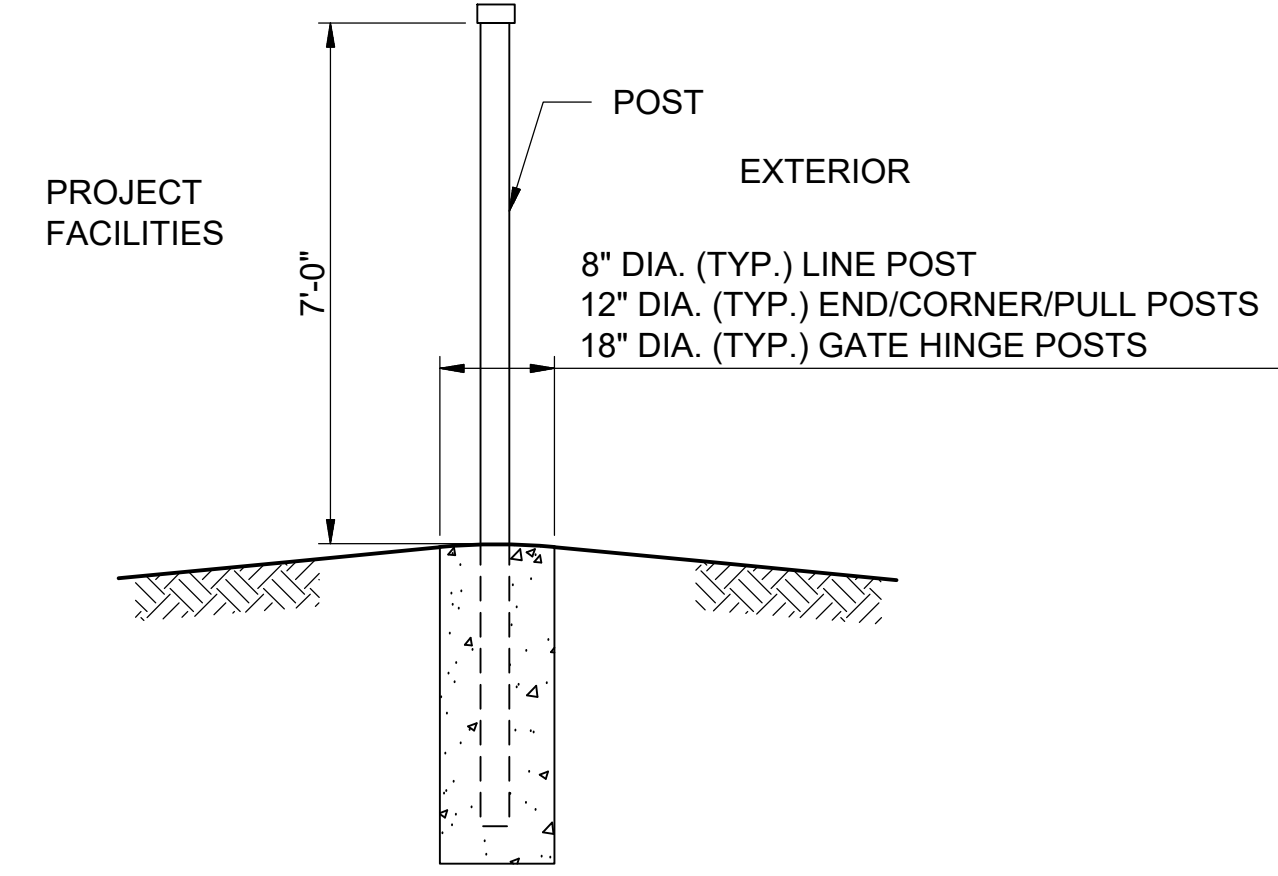


3 BRACE OR CORNER PANEL
SCALE: NOT TO SCALE

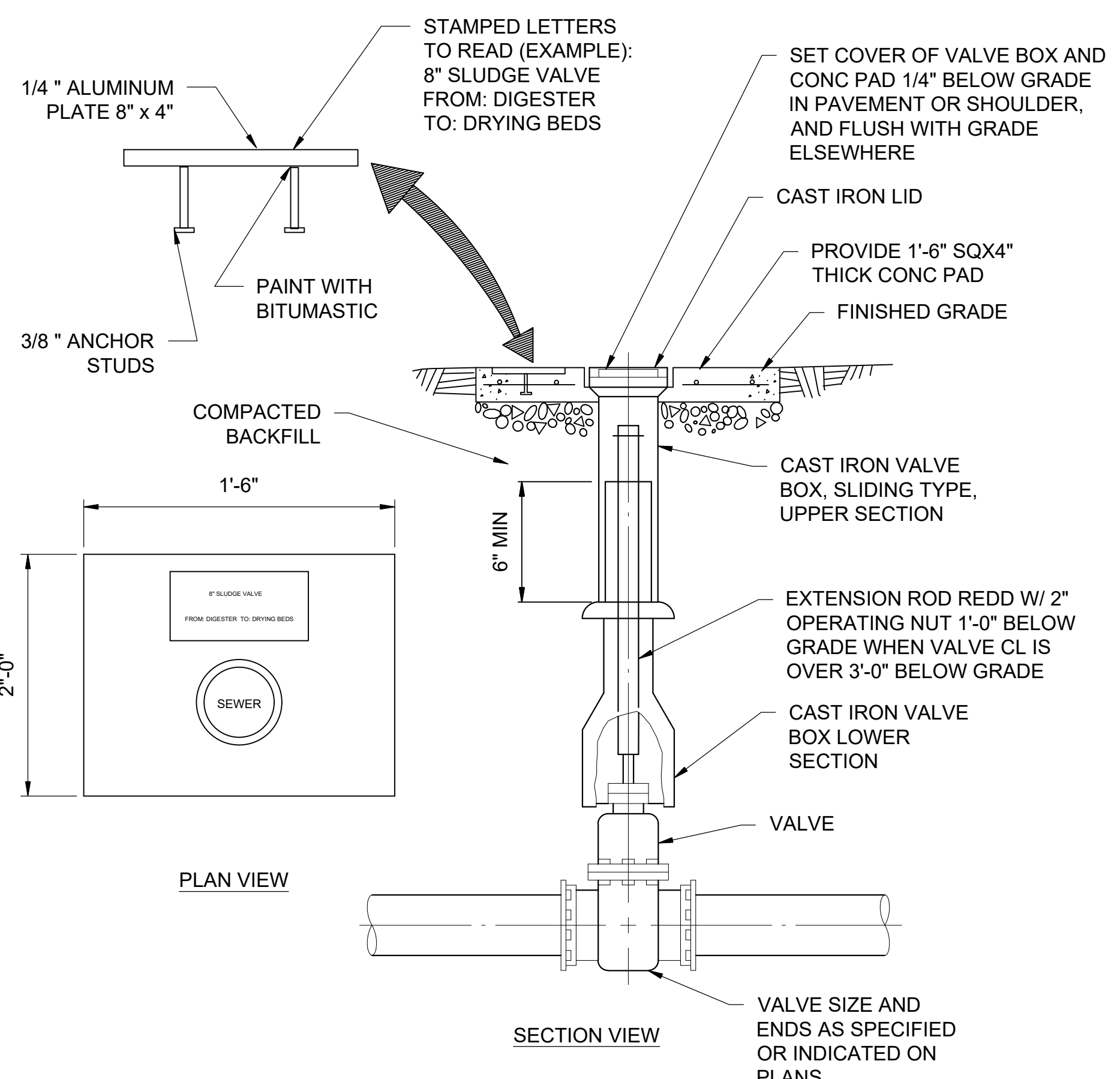


- NOTES:**
- ALL FABRIC, POSTS, NAILS, BRACES, FITTINGS, AND HARDWARE FOR FENCE AND GATES SHALL CONFORM TO THE SPECIFICATIONS.
 - THERMAL EXPANSION COUPLING SHALL BE LOCATED EVERY 100'.

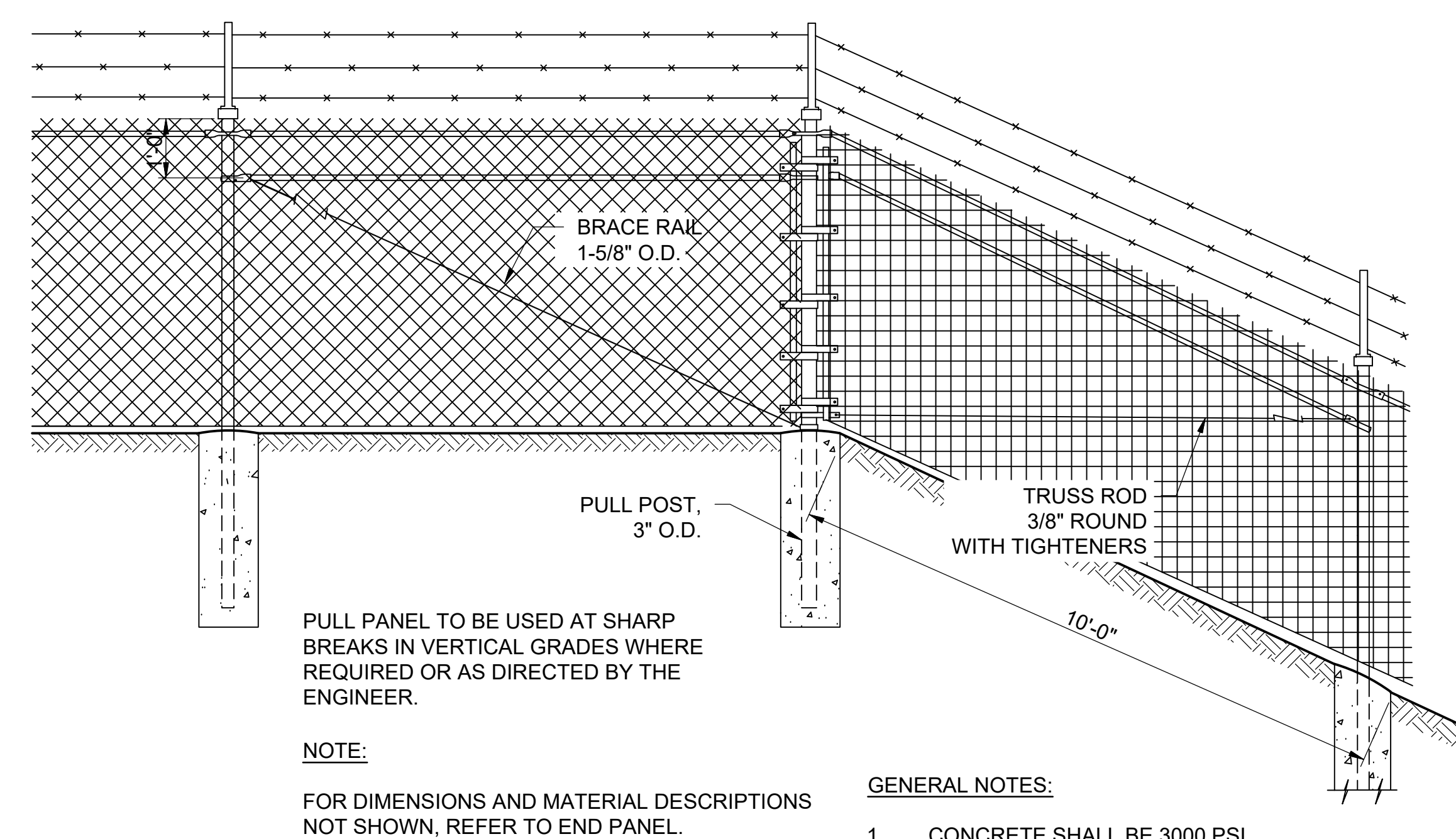
NOTE:
BRACE PANEL SHALL BE PLACED A MAXIMUM OF 400 FEET CENTER TO CENTER FROM END, CORNER, OR BRACE POSTS. ANY BREAKS IN HORIZONTAL ALIGNMENT OF MORE THAN 30 DEGREES SHALL BE CONSIDERED A CORNER.



4 STANDARD POST INSTALLATION
SCALE: NOT TO SCALE



5 BURIED VALVE BOX
SCALE: NONE



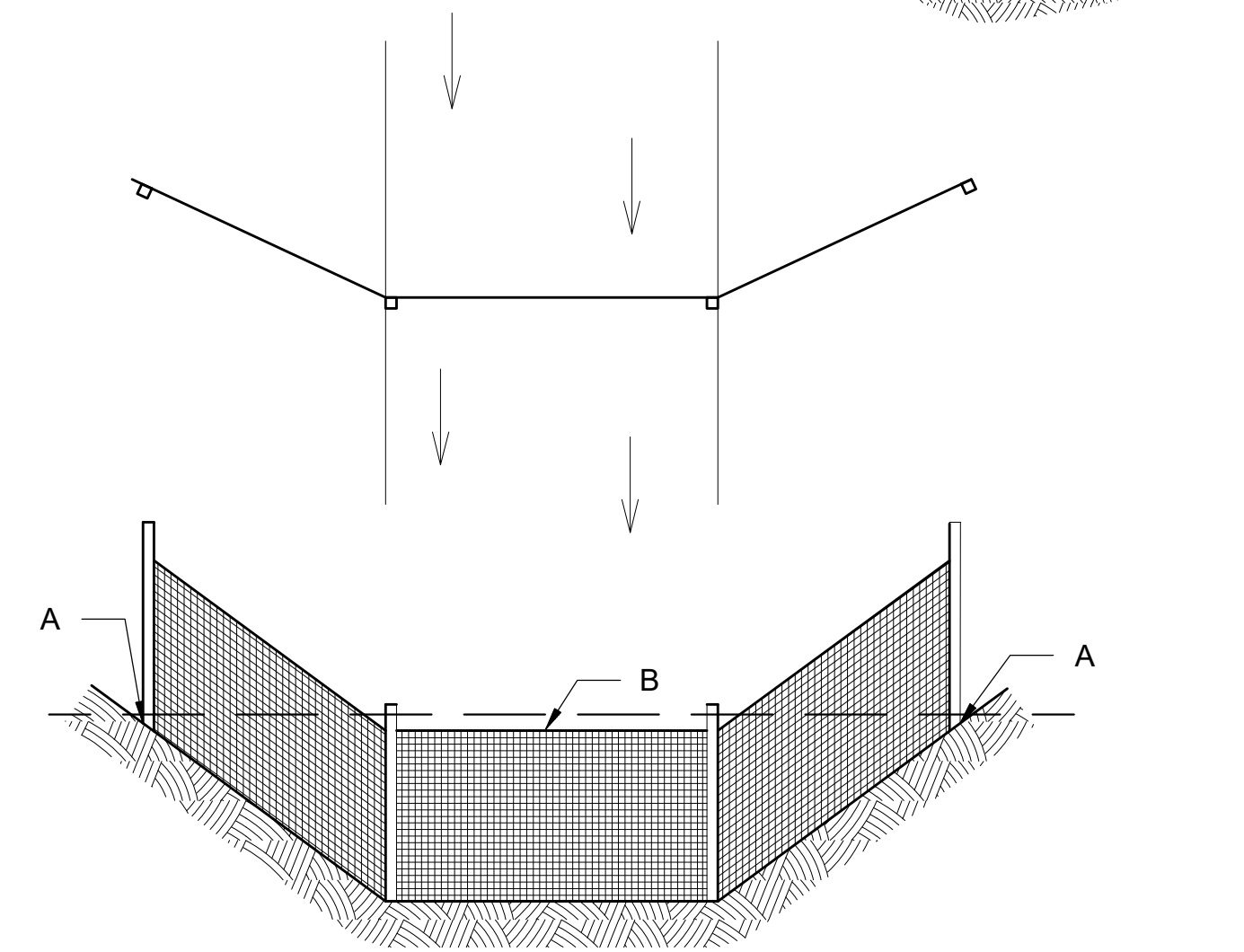
6 PULL PANEL
SCALE: NOT TO SCALE

PULL PANEL TO BE USED AT SHARP BREAKS IN VERTICAL GRADES WHERE REQUIRED OR AS DIRECTED BY THE ENGINEER.

NOTE:
FOR DIMENSIONS AND MATERIAL DESCRIPTIONS NOT SHOWN, REFER TO END PANEL.

GENERAL NOTES:
1. CONCRETE SHALL BE 3000 PSI.

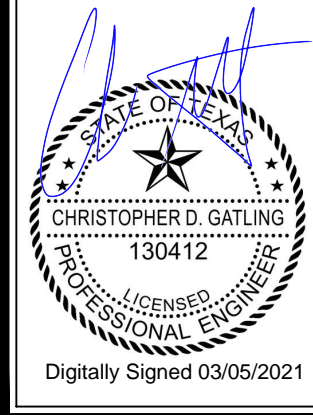
1 TYPICAL FENCE DETAIL
SCALE: NONE



- NOTES:**
- POINTS "A" SHOULD BE HIGHER THAN POINT "B". PROPER PLACEMENT OF A FILTER BARRIER IN A DRAINAGE WAY
 - FENCE POSTS SHALL BE DRIVEN INTO GROUND AT 1' MIN. POST MATERIAL SHALL BE 2" X 2" WOOD, STEEL, OR COMPOSITE MATERIAL.

2 SILT FENCE
SCALE: NONE

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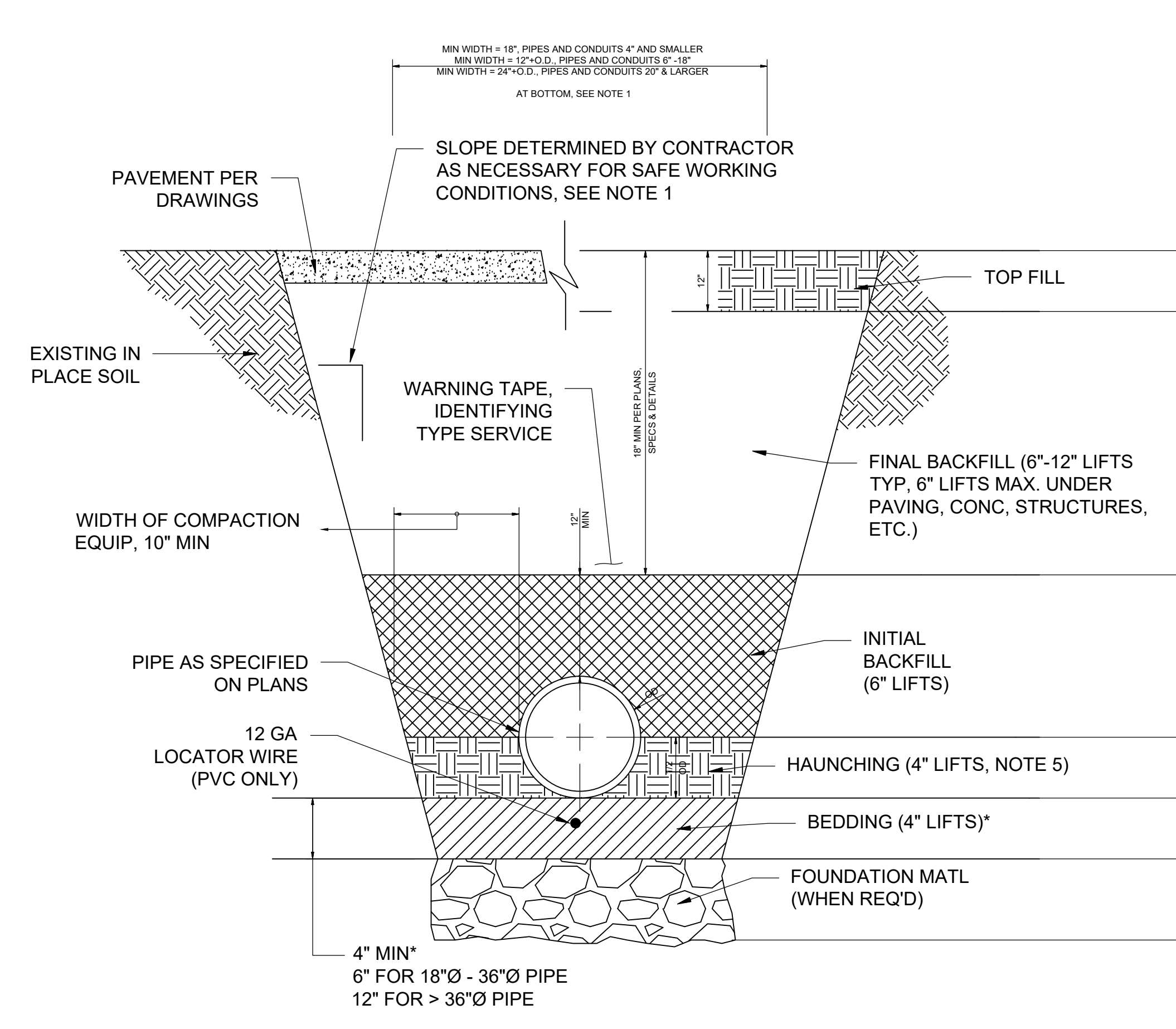
DATE: MARCH 2021
DESIGNED BY: CDG
DRAWN BY: MAW
REVIEWED BY: TOH
REVISED:
REVISED:

SHEET TITLE
CIVIL DETAILS II

SHEET NUMBER
19
OF 25
99-C502

- NOTES:
1. SLOPE, BENCHING, SHORING, ETC. AS DETERMINED AND DESIGNED BY THE CONTRACTOR. CONTRACTOR IS SOLELY RESPONSIBLE FOR COMPLYING WITH ALL APPLICABLE OSHA REGULATIONS FOR "OPEN TRENCH EXCAVATIONS".
 2. BEDDING REQ'D FOR ALL GRAVITY LINES, ALL PVC LINES AND ALL CONCRETE LINES. BEDDING REQUIRED IN ALL AREAS OF ROCK EXCAVATION OR UNSUITABLE SOILS. BELL HOLES REQ'D FOR PIPES > 4" DIA. FOR DUCTILE IRON PRESSURE MAINS, SELECT EARTH MAY BE USED FOR BEDDING IN AREAS OF ROCK EXCAVATION.
 3. ALL MATERIALS SHALL BE COMPACTED TO MINIMUM 95% MODIFIED PROCTOR DENSITY AT 2%± OPTIMUM MOISTURE CONTENT. MATERIALS UNDER PAVING, CONCRETE, STRUCTURES, ETC. SHALL BE COMPACTED TO TO MIN 98%-100% MODIFIED PROCTOR. MECHANICAL COMPACTION SHALL BE BY VIBRATORY SHEEPSFOOT OR OTHER EQUIP. SPECIFICALLY DESIGNED FOR THE COMPACTION OF EARTH. COMPACTION EQUIP. SHALL BE ON-SITE PRIOR TO BEGINNING OF WORK. MECHANICAL COMPACTION SHALL BE COMPLETED IN LOOSE LIFTS AS SHOWN ON THE DETAIL.
 4. TEMPORARY COMPACTED PUG-MIX BACKFILL REQ'D UNTIL PAVEMENT PLACEMENT IS COMPLETE. THE CONTRACTOR SHALL CONTINUOUSLY MAINTAIN THIS PUGMIX TO KEEP IT FLUSH WITH THE ADJACENT PAVING, ETC. UNTIL THE FINAL PAVING IS PLACED. CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING TEMPORARY ASPHALT OR CONCRETE PATCHES WHEN NEEDED FOR PUBLIC SAFETY AND/OR CONVENIENCE.
 5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SELECTING AND UTILIZE APPROPRIATE MEANS AND METHODS OF CONSTRUCTION TO ENSURE THAT THE ENTIRE AREAS UNDER THE HAUNCHES OF THE PIPE ARE FILLED WITH THE REQUIRED MATERIALS AND COMPACTED APPROPRIATELY.
 6. ADDITIONAL AND/OR SPECIAL REQUIREMENTS MAY BE REQ'D BY THE PLANS, SPECIFICATIONS AND/OR CONTRACT DOCUMENTS.
 7. TO THE EXTENT POSSIBLE, AS DETERMINED BY THE CONTRACTOR, TRENCH WALL SHORING METHODS SHALL BE USED IN PAVED AREAS TO MINIMIZE PAVING REPAIR REQUIREMENTS.

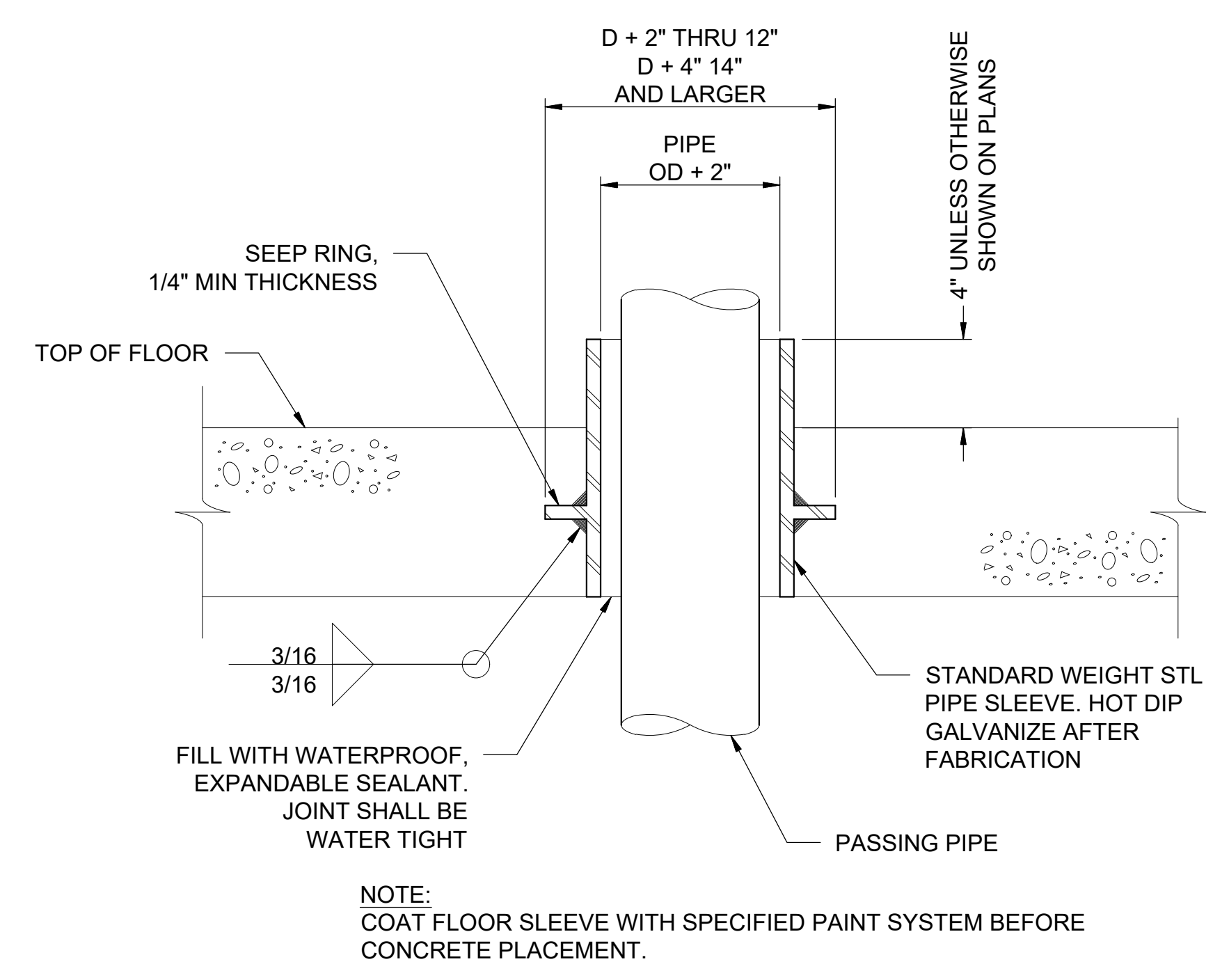
MATERIAL DESIGNATION/DESCRIPTOINS TABLE	
DESIGNATION/MATERIALS	DESCRIPTION
1	CRUSHED STONE, ASTM-448 NO. 57 GRADATION
2	CRUSHED STONE, ASTM-448 NO. 67 GRADATION.
3	SELECT EXCAVATED MAT'L REASONABLY DRY (WITHIN LIMITS REQ'D FOR COMPACTION) NO STONES > 1" DIA.
4	EXCAVATED MAT'L REASONABLY DRY (WITHIN LIMITS REQ'D FOR COMPACTION) NO STONES > 12" DIA.
5	SELECT TOPSOIL MAT'L TO SUPPORT VEGETATION, NO STONES OR ROCK ALLOWED
6	PAVEMENT MATCHING EXISTING PAVEMENT OR AS SPECIFIED ON THE PLANS
7	AGGREGATE BASE COARSE OR CONTROLLED LOW STRENGTH FILL



BEDDING/BACKFILL REQUIREMENTS & MAT'L DESIGNATIONS (SEE MATERIAL DESIGNATION/DESCRIPTOINS TABLE)								
PRESSURE MAINS			GRAVITY LINES			PAVED AREAS		
DI	CONC	HDPE, PVC & FRP	DI	CONC	HDPE, PVC & FRP	DI	CONC	HDPE, PVC & FRP
5	5	5	5	5	5	6**	6**	6**
4	4	4	4	4	4	7	7	7
3	3	*** 1/2	3	3	*** 1/2	1	3	*** 1/2
2	3	*** 1/2	2	3	*** 1/2	2	3	*** 1/2
2	1	2	2	1	2	2	1	2
RIP-RAP OR CRUSHED STONE CLASS 1B (USCS IN ASTM D2487)								

- * SEE NOTE 2
- ** SEE NOTE 4
- *** LINES SMALLER THAN 18" SHALL BE NO.67 BEDDING, LINES 18" AND LARGER NO.67 OR NO.57 BEDDING.

BEDDING AND BACKFILL FOR TRENCHES
SCALE: NONE



FLOOR SLEEVE
SCALE: NONE



DATE: MARCH 2021
DESIGNED BY: CDG
DRAWN BY: MAW
REVIEWED BY: TOH
REVISED:
REVISED:

SHEET TITLE
BOOSTER SYSTEM
REMOVAL DETAILS

SHEET NUMBER
20
OF 25
99-C503



REMOVE AND SALVAGE EXISTING
PRESSURE TANK AND BOOSTER
PUMP STATION TO OWNER.

CONTRACTOR SHALL DISCONNECT
EXISTING PIPING AND REPLUMB
SUCTION AND DISCHARGE SIDE OF
BOOSTER PUMP STATION TOGETHER
MATCHING EXISTING PIPE MATERIAL.

1
99-C503 99-C503 SCALE: NONE
EXISTING MAINTENANCE SHOP BOOSTER PUMP DETAIL



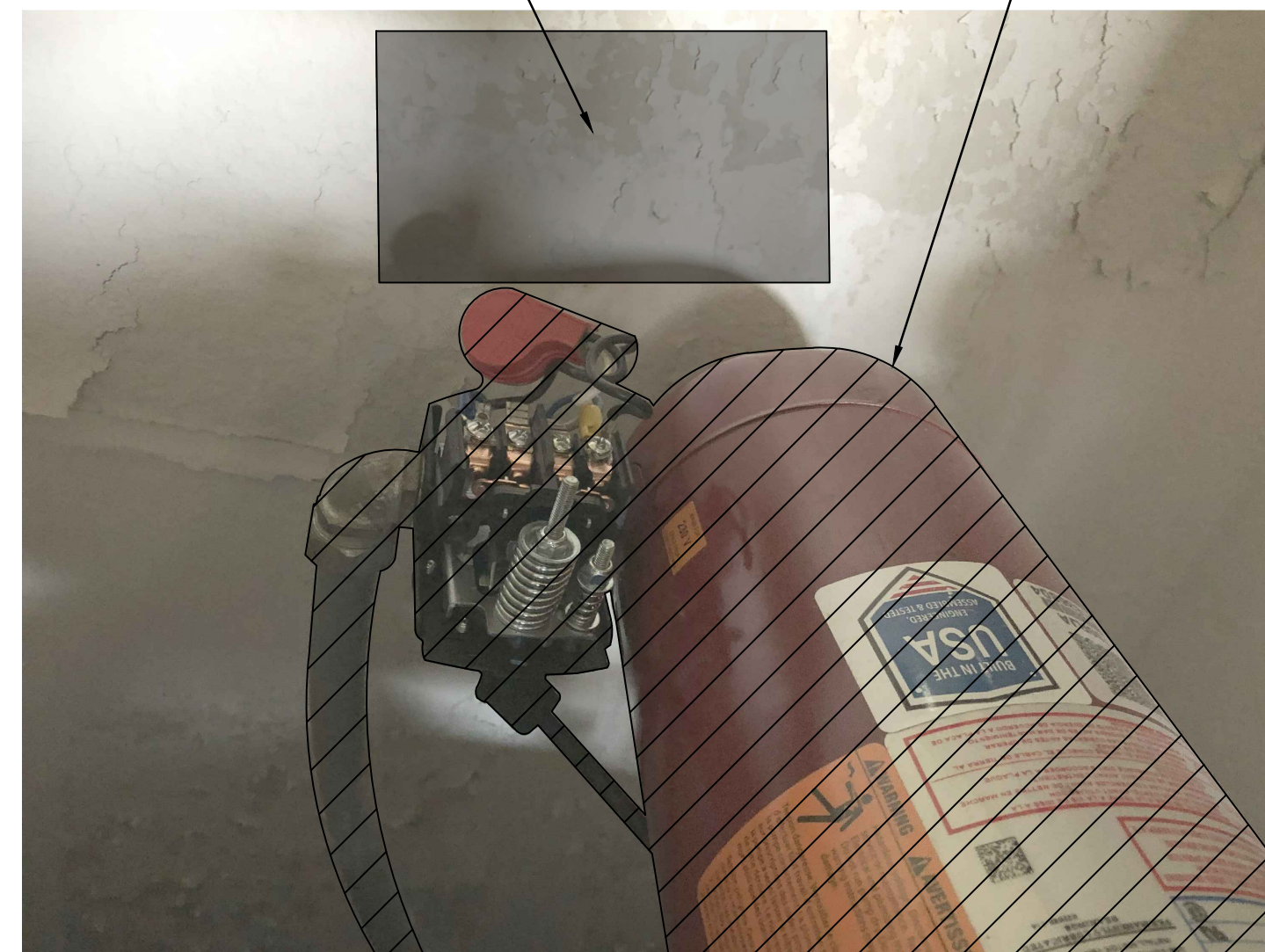
REMOVE AND SALVAGE EXISTING
PRESSURE TANK AND BOOSTER
PUMP STATION TO OWNER.

REMOVE AND DISPOSE
OF ALL EXISTING PIPING.

3
99-C503 99-C503 SCALE: NONE
EXISTING RESIDENCE BOOSTER PUMP DETAIL

INSTALL NEW ELECTRICAL
PANEL ON WALL - SEE
ELECTRICAL DRAWINGS

REMOVE AND SALVAGE EXISTING
PRESSURE TANK AND BOOSTER
PUMP STATION SYSTEM TO OWNER.



2
99-C503 99-C503 SCALE: NONE
EXISTING MAINTENANCE SHOP BOOSTER PUMP DETAIL

REMOVE AND SALVAGE EXISTING
PRESSURE TANK AND BOOSTER
PUMP STATION SYSTEM TO OWNER.

TIE EXISTING SUCTION AND DISCHARGE
PIPING TOGETHER AND INSTALL PIPING
INSULATION TO MATCH EXISTING.

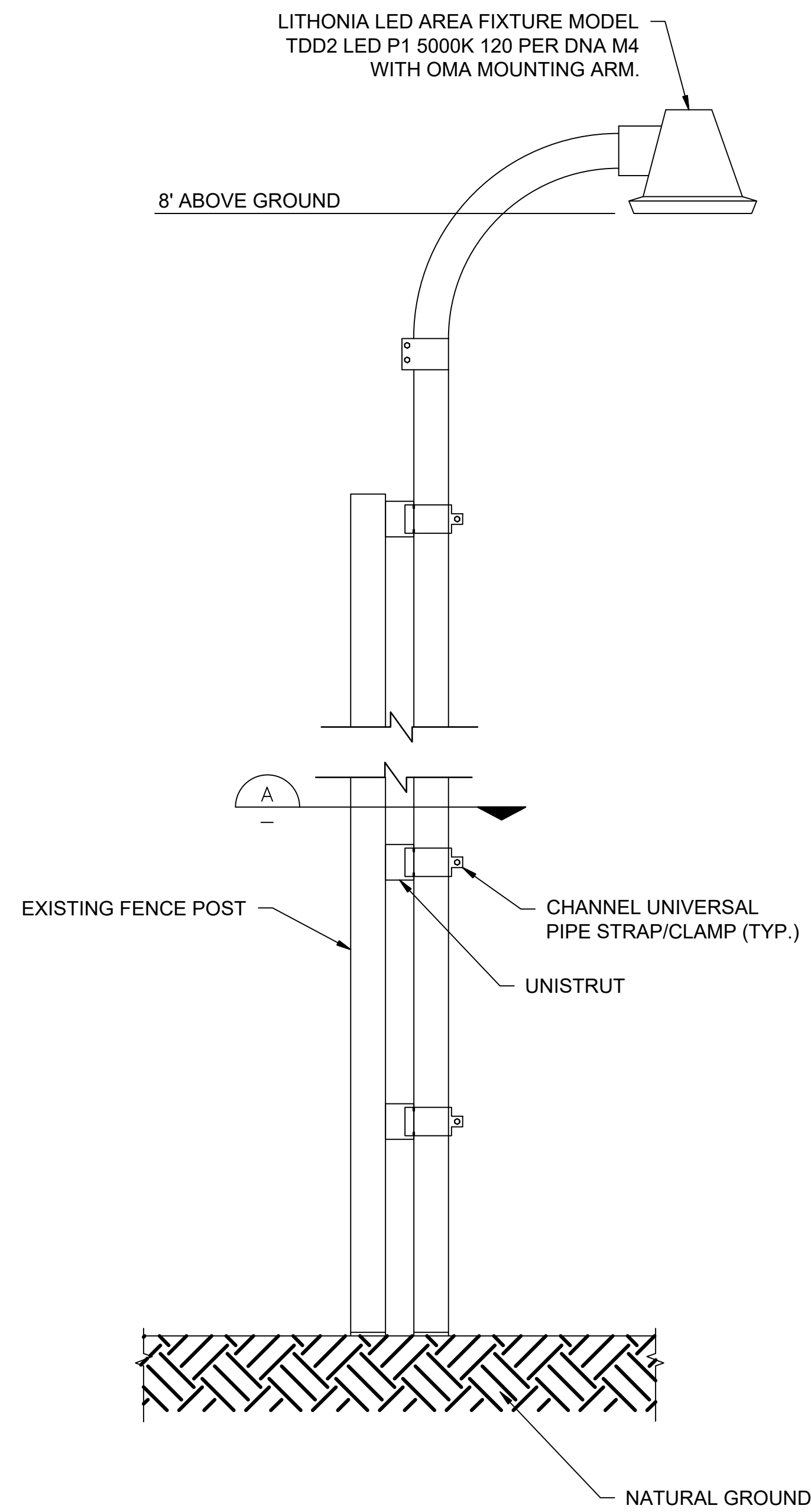
REMOVE AND DISPOSE OF
ALL EXISTING PIPING.

4
99-C503 99-C503 SCALE: NONE
EXISTING RESIDENCE BOOSTER PUMP DETAIL

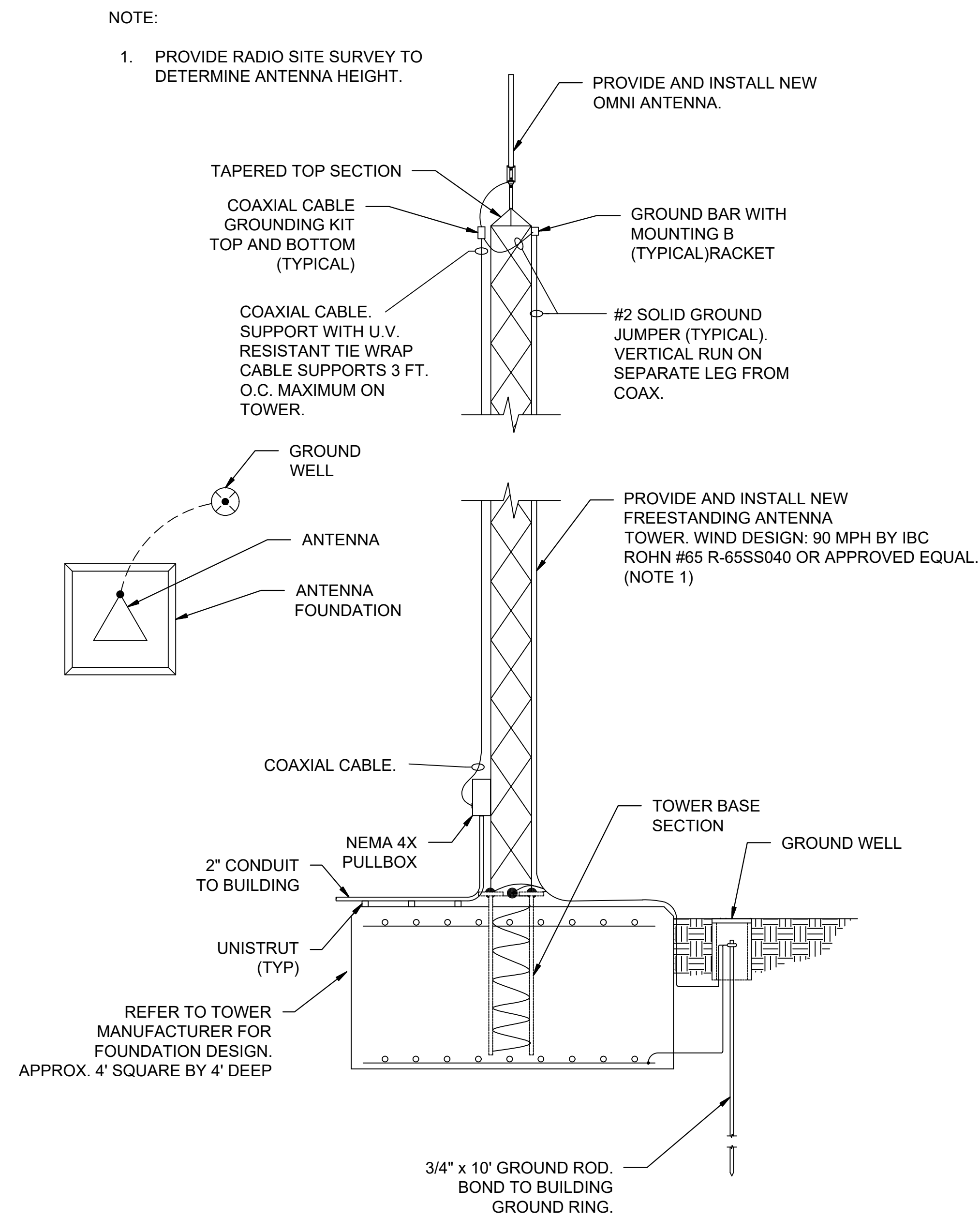
NOTES:

1. CONTRACTOR SHALL PROVIDE PLUMBING PLAN TO BE APPROVED BY ENGINEER.
2. PLACE NEW ELECTRICAL PANEL ON WALL IN EXISTING BOOSTER PUMP LOCATION IN COORDINATION WITH OWNER - SEE ELECTRICAL DRAWINGS.

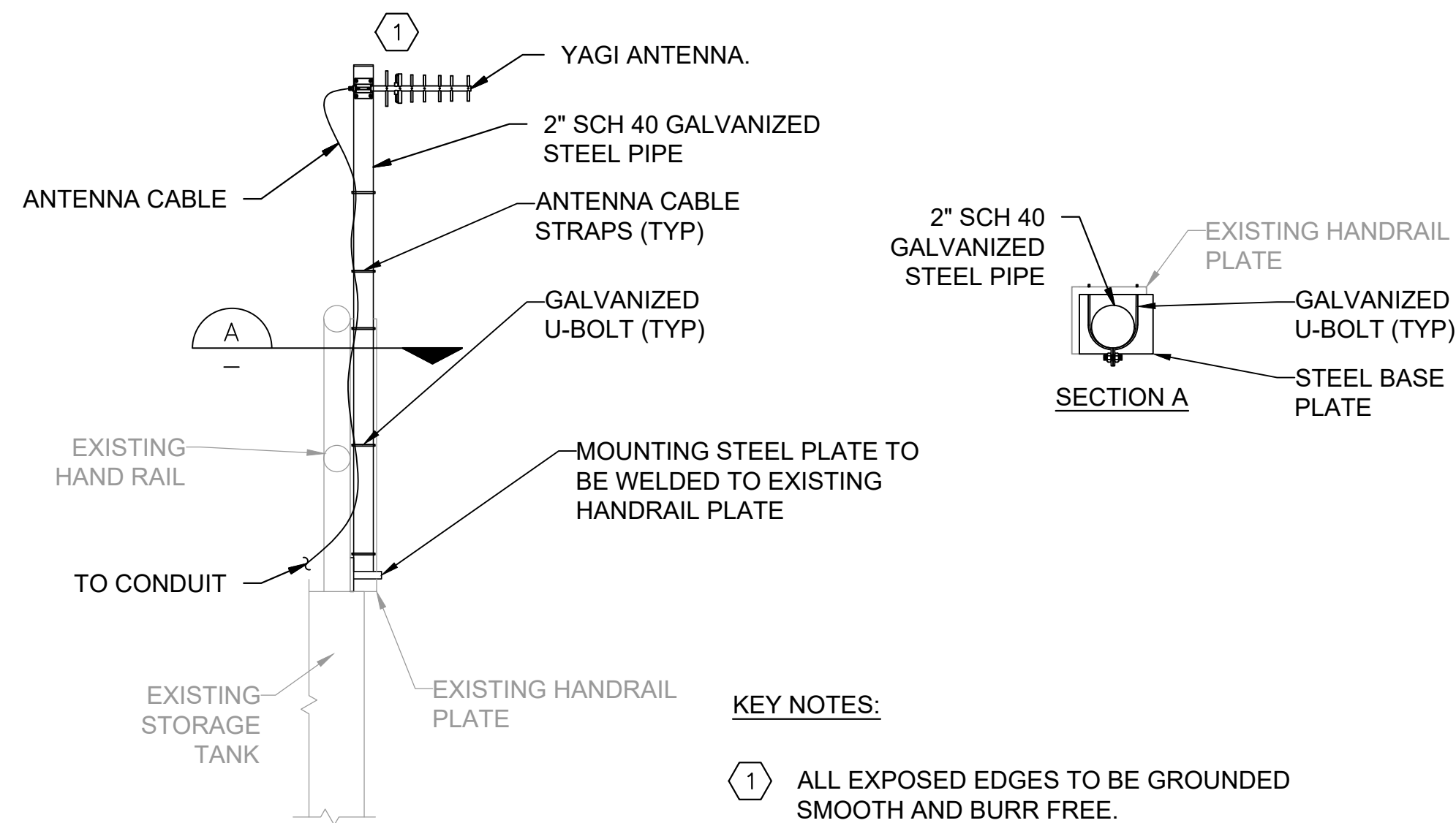
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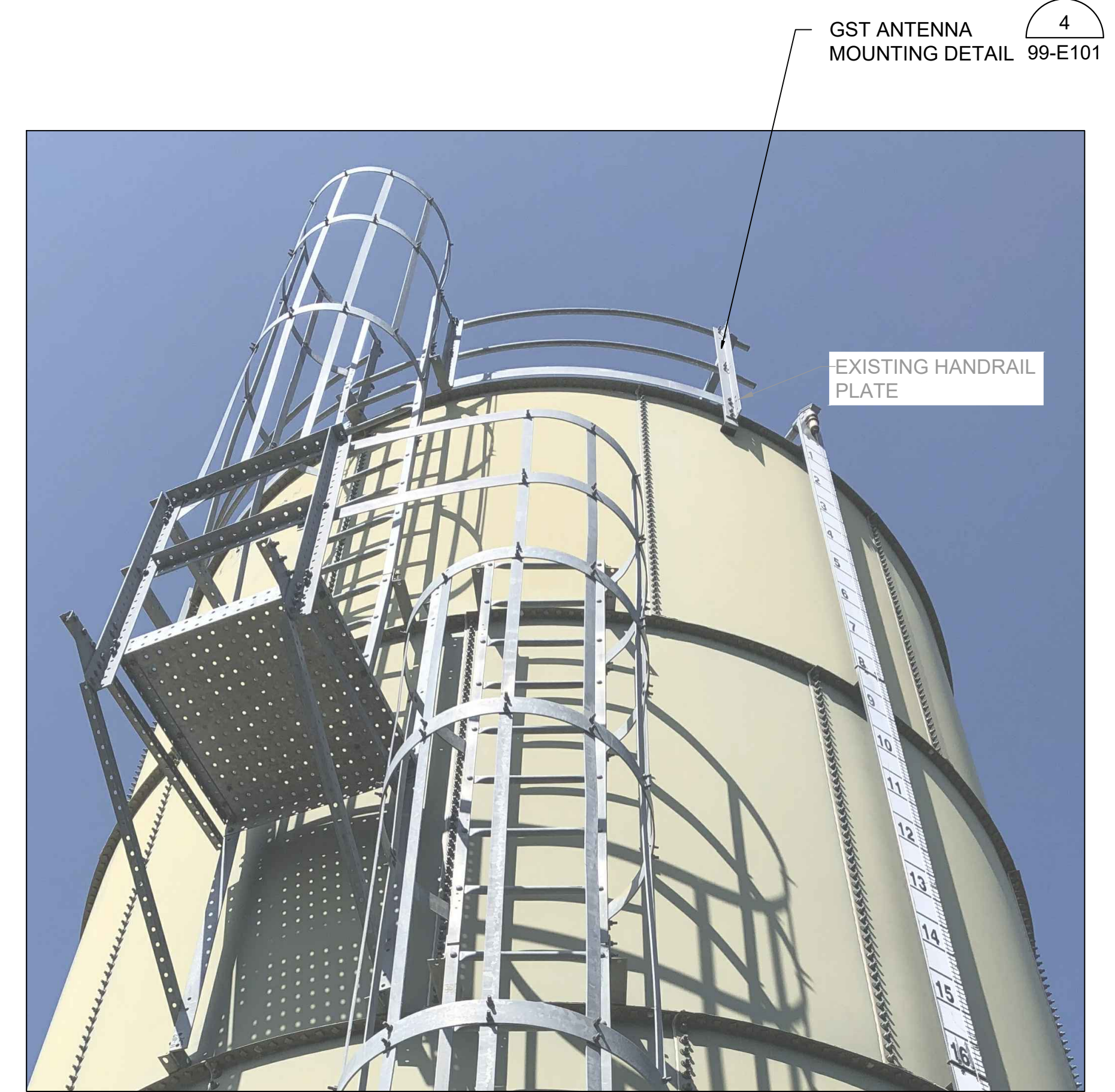
1 SITE LIGHT FIXTURE MOUNTING DETAIL
99-E101 SCALE: NOT TO SCALE



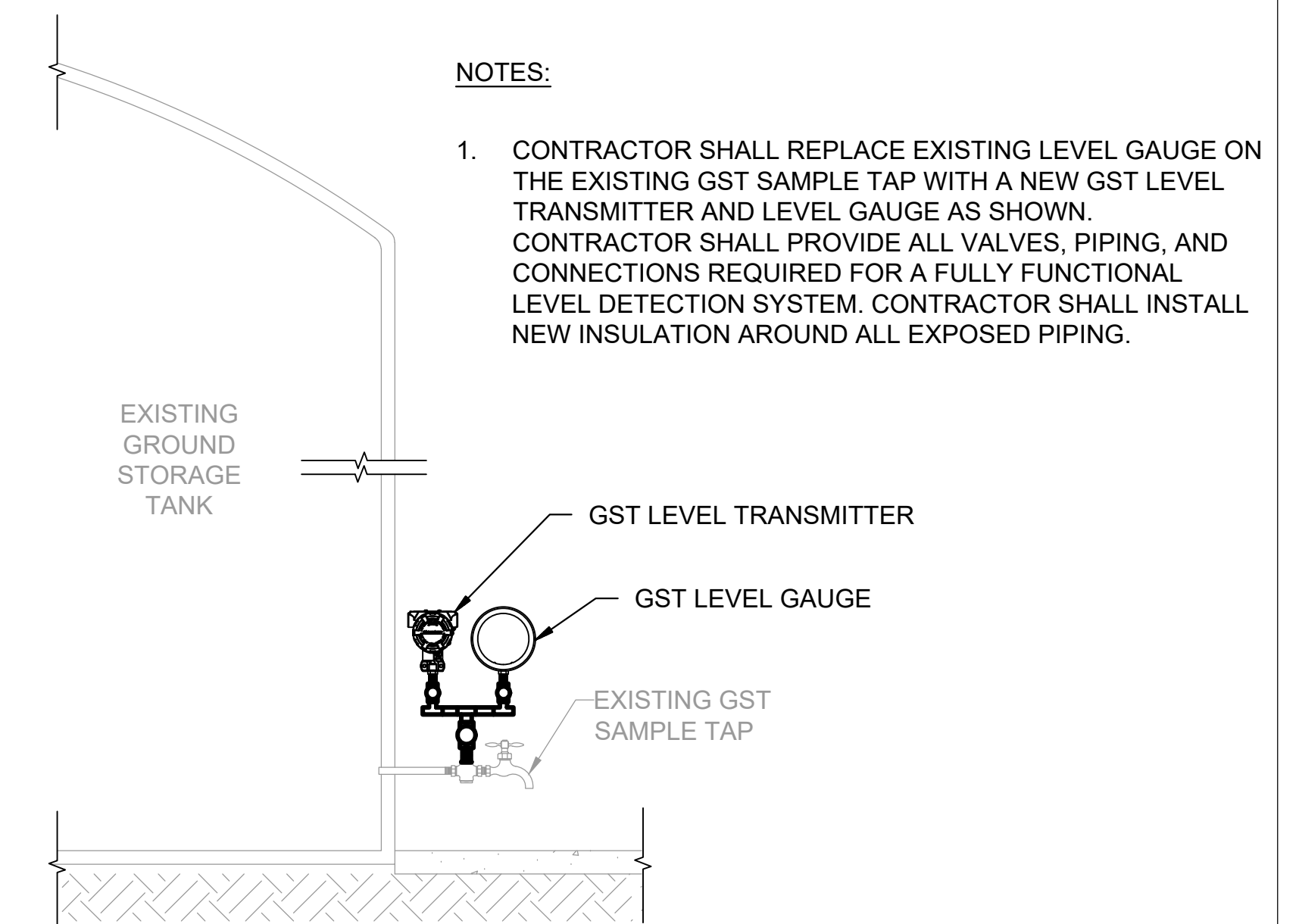
2 ANTENNA TOWER MOUNTING DETAIL
99-E101 SCALE: NOT TO SCALE



3 GROUND STORAGE TANK ANTENNA MOUNTING LOCATION
99-E101 SCALE: NOT TO SCALE

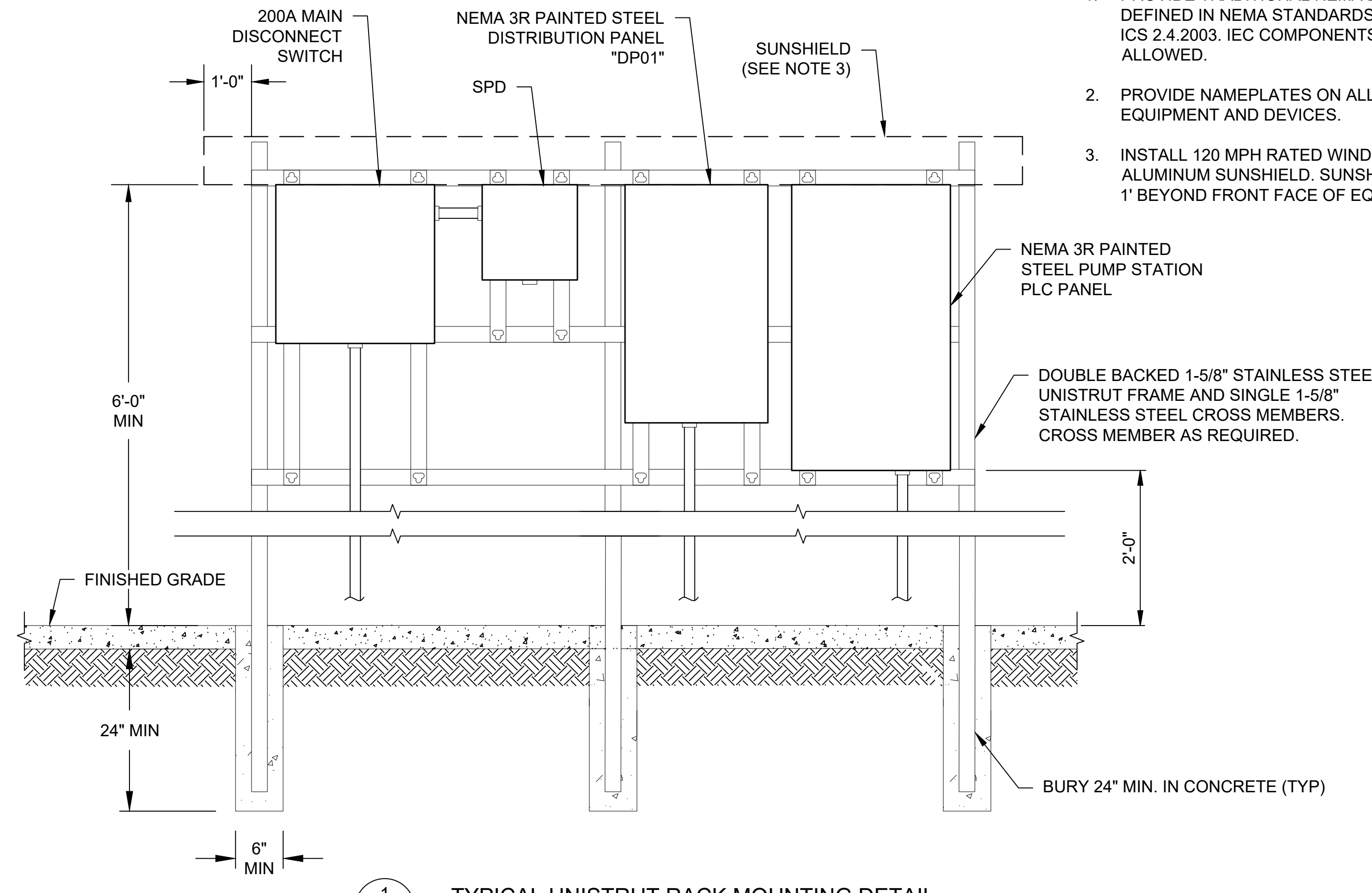


4 GROUND STORAGE TANK ANTENNA MOUNTING DETAIL
99-E101

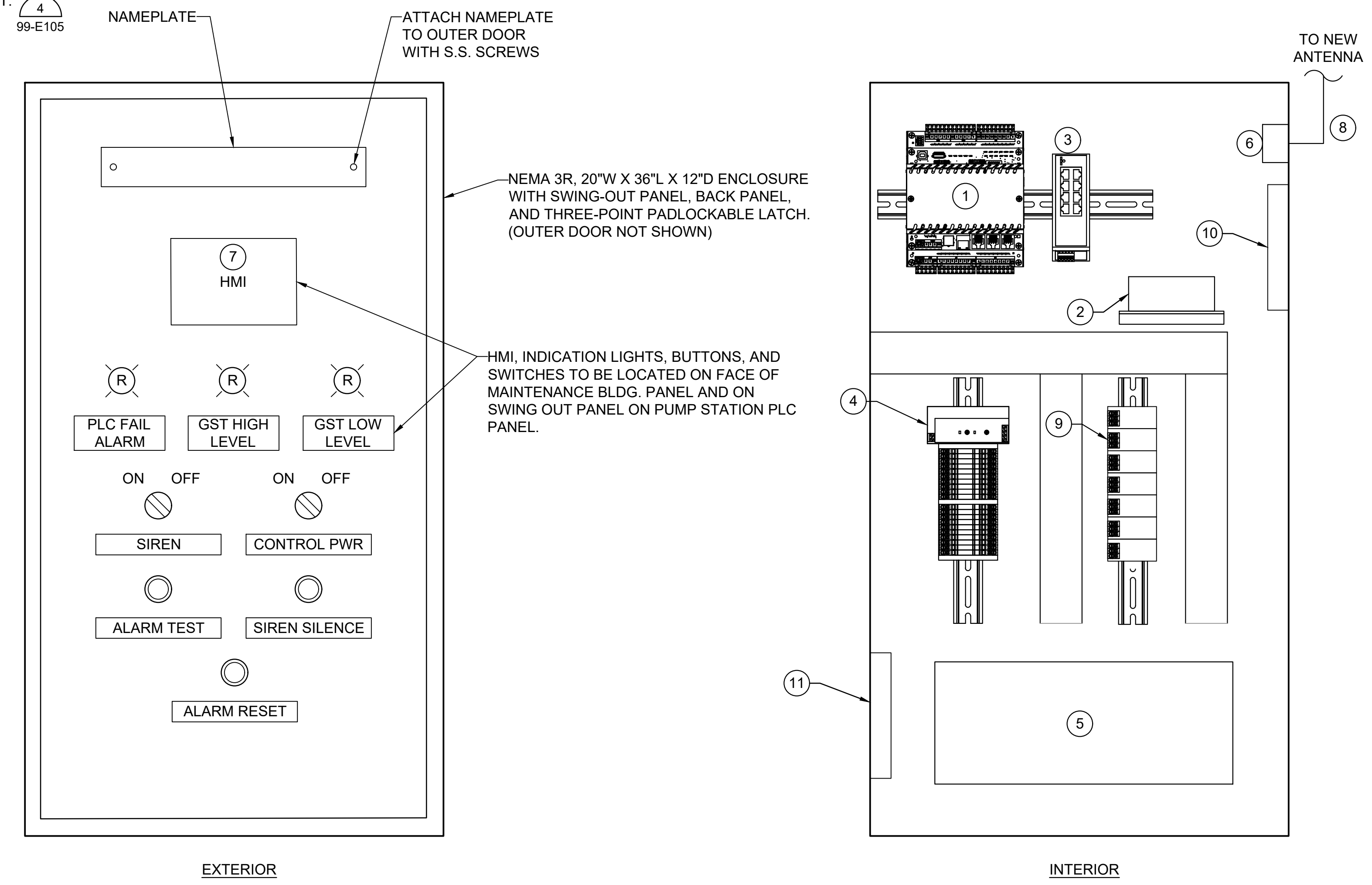


5 GROUND STORAGE TANK LEVEL TRANSDUCER MOUNTING DETAIL
99-E101 SCALE: NOT TO SCALE

- NOTES:
1. PROVIDE TRADITIONAL NEMA DEVICES AS DEFINED IN NEMA STANDARDS PUBLICATION NO. ICS 2.4.2003. IEC COMPONENTS ARE NOT ALLOWED.
 2. PROVIDE NAMEPLATES ON ALL ELECTRICAL EQUIPMENT AND DEVICES.
 3. INSTALL 120 MPH RATED WIND GUSTS ALUMINUM SUNSHIELD. SUNSHIELD TO EXTEND 1' BEYOND FRONT FACE OF EQUIPMENT.



1 TYPICAL UNISTRUT RACK MOUNTING DETAIL
99-E102 SCALE: NOT TO SCALE



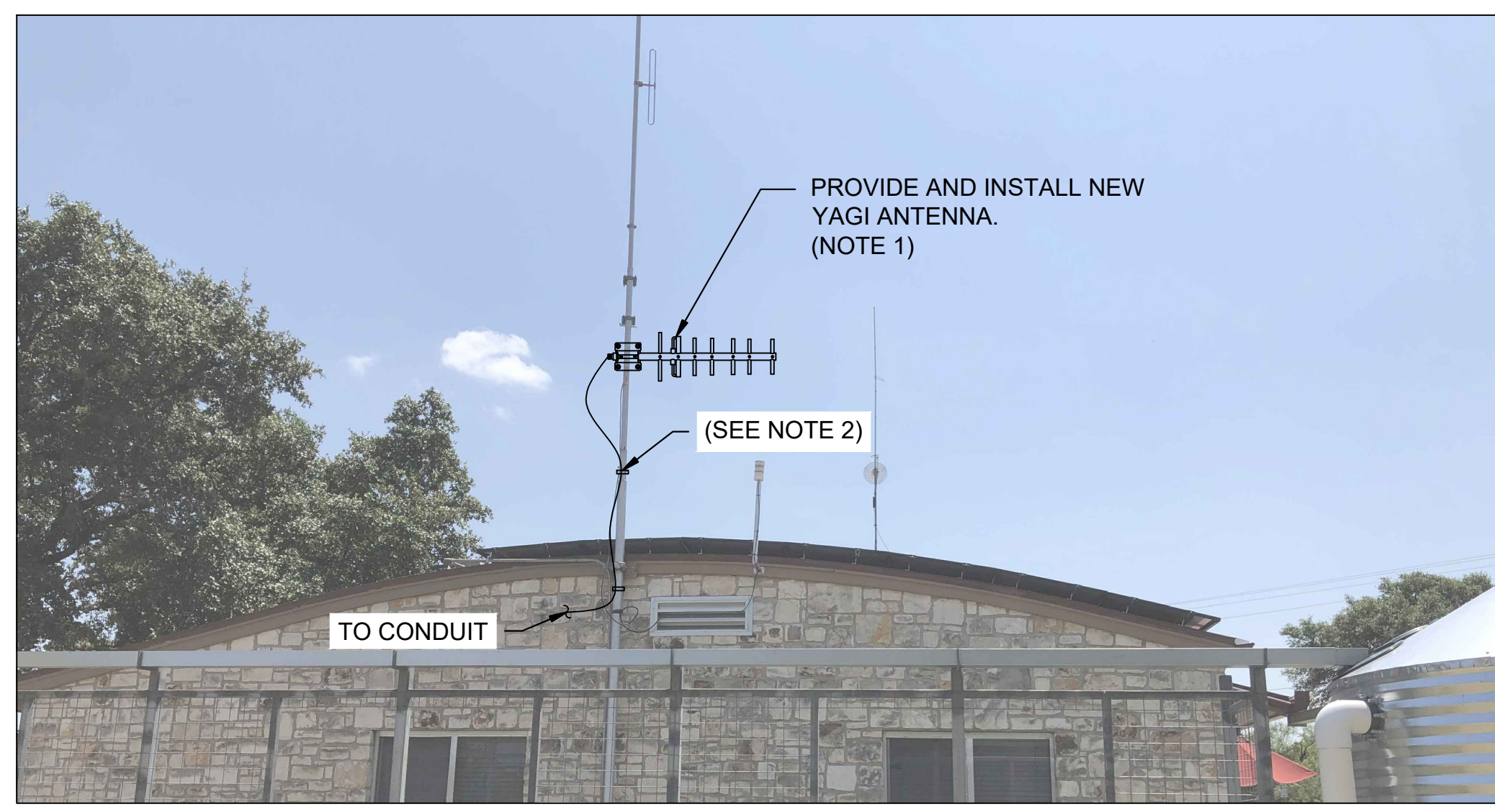
EXTERIOR

INTERIOR

BILL OF MATERIALS			
ITEM	DESCRIPTION	MANUFACTURER	MODEL NO.
1	SCADA PACK PLC	SCHNEIDER ELECTRIC	SEE SPECS.
2	ETHERNET RADIO	FREEWAVE	Z9-PE2
3	8 PORT MANAGED SWITCH	PHOENIX CONTACT	2702324
4	24 VOLT POWER SUPPLY 90W	PHOENIX CONTACT	Z904599
5	UPS 325W DIN Rail	APC	SUA500PDR-S
6	LIGHTNING PROTECTOR 10-1000MHz	POLYPHASER	IS-B50LN-C2
7	6 INCH HMI PANEL	ADVANTECH	WEBOP-3100T
8	ANTENNA CABLE		SEE SPECS.
9	TERMINAL BLOCK RELAY 120V	PHOENIX CONTACT	Z966197
10	ENCLOSURE EXHAUST FAN	HOFFMAN	
11	LOUVER	HOFFMAN	

2 PLC CONTROL PANEL (TYP)
99-E102 SCALE: NOT TO SCALE

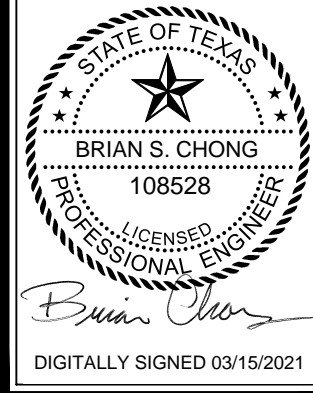
- NOTES:
1. ALL MATERIALS ARE NOT LISTED IN BILL OF MATERIALS TABLE. CONTRACTOR SHALL REFERENCE SPECIFICATIONS AND PROVIDE ALL COMPONENTS NECESSARY FOR A FULLY FUNCTIONAL PLC CONTROL PANEL SYSTEM.



3 HEADQUARTERS BUILDING ANTENNA MOUNTING
99-E102 SCALE: NOT TO SCALE

- NOTES:
1. PROVIDE AND INSTALL NEW YAGI ANTENNA TO EXISTING ANTENNA POLE. VERIFY LOCATION HEIGHT AND ADJUST HEIGHT ACCORDINGLY FOR OPTIMAL SIGNAL. PROVIDE ALL REQUIRED HARDWARE FOR A SECURE MOUNTING.
 2. ANTENNA CABLE TO BE SECURED TO EXISTING ANTENNA POLE WITH GALVANIZED CABLE STRAPS AND HARDWARE.

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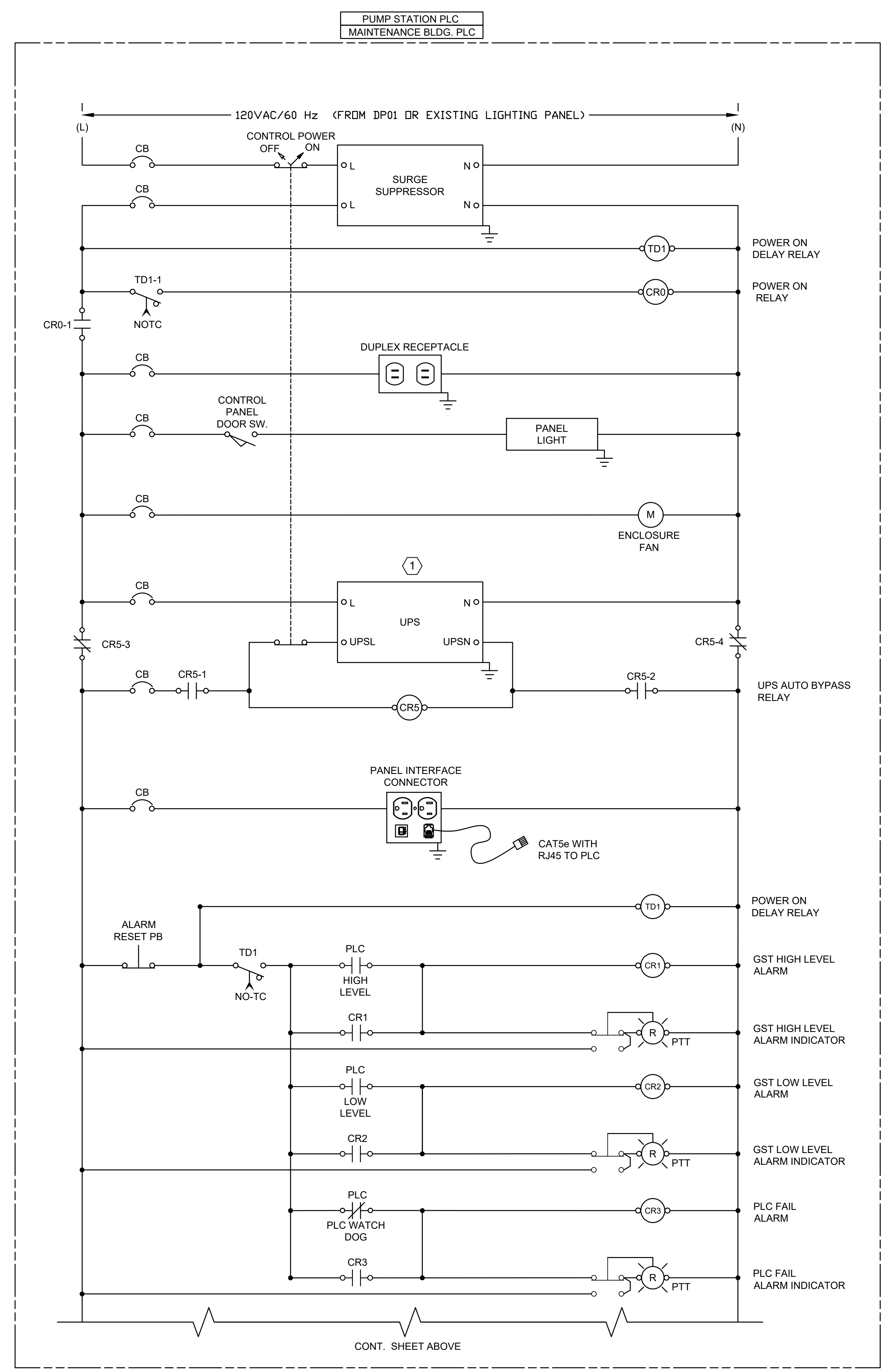


DATE: MARCH 2021
DESIGNED BY: KAD
DRAWN BY: CM
REVIEWED BY: JCW
REVISED:
REVISED:

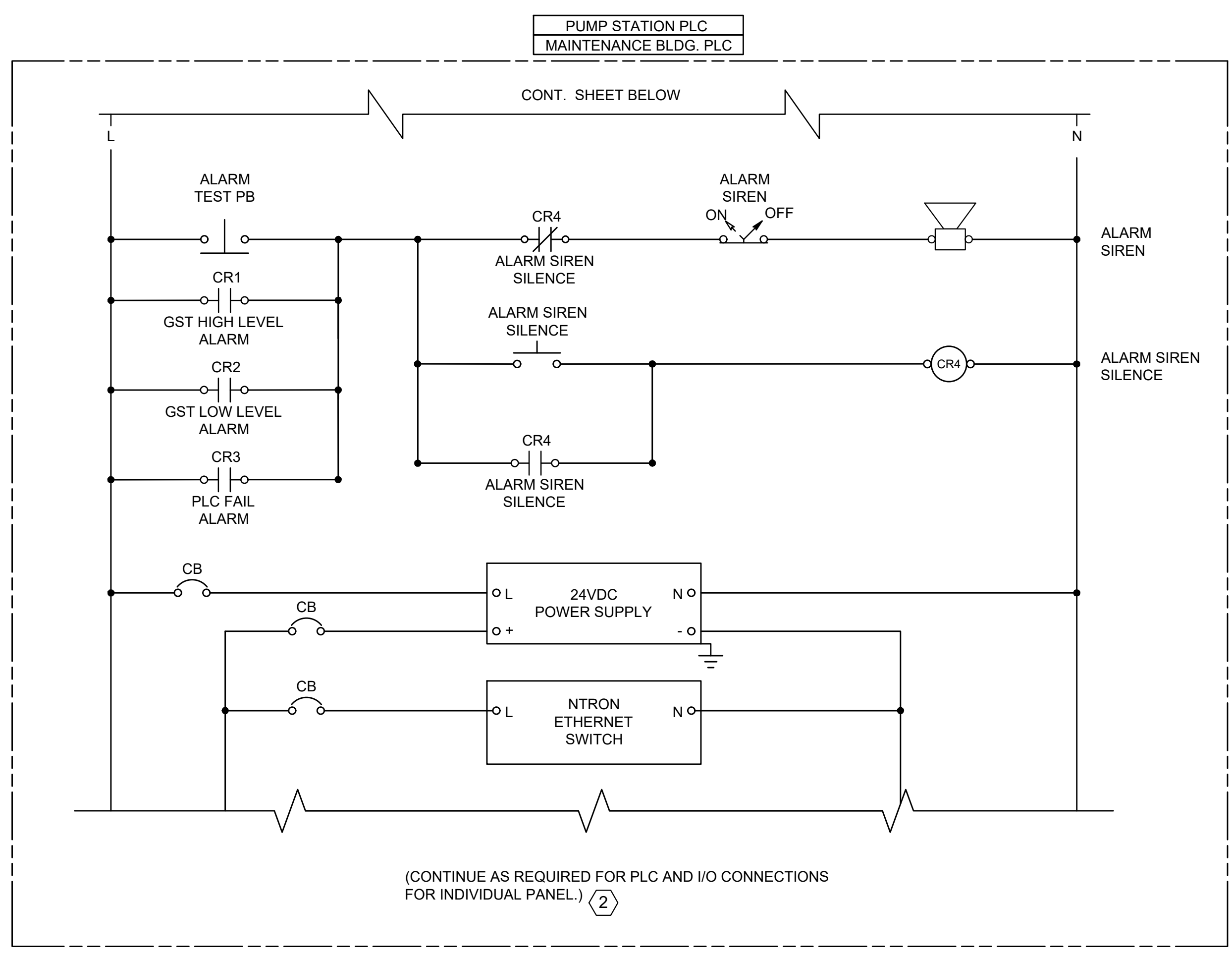
SHEET TITLE
ELECTRICAL
DETAILS III

SHEET NUMBER
23
OF 25
99-E103

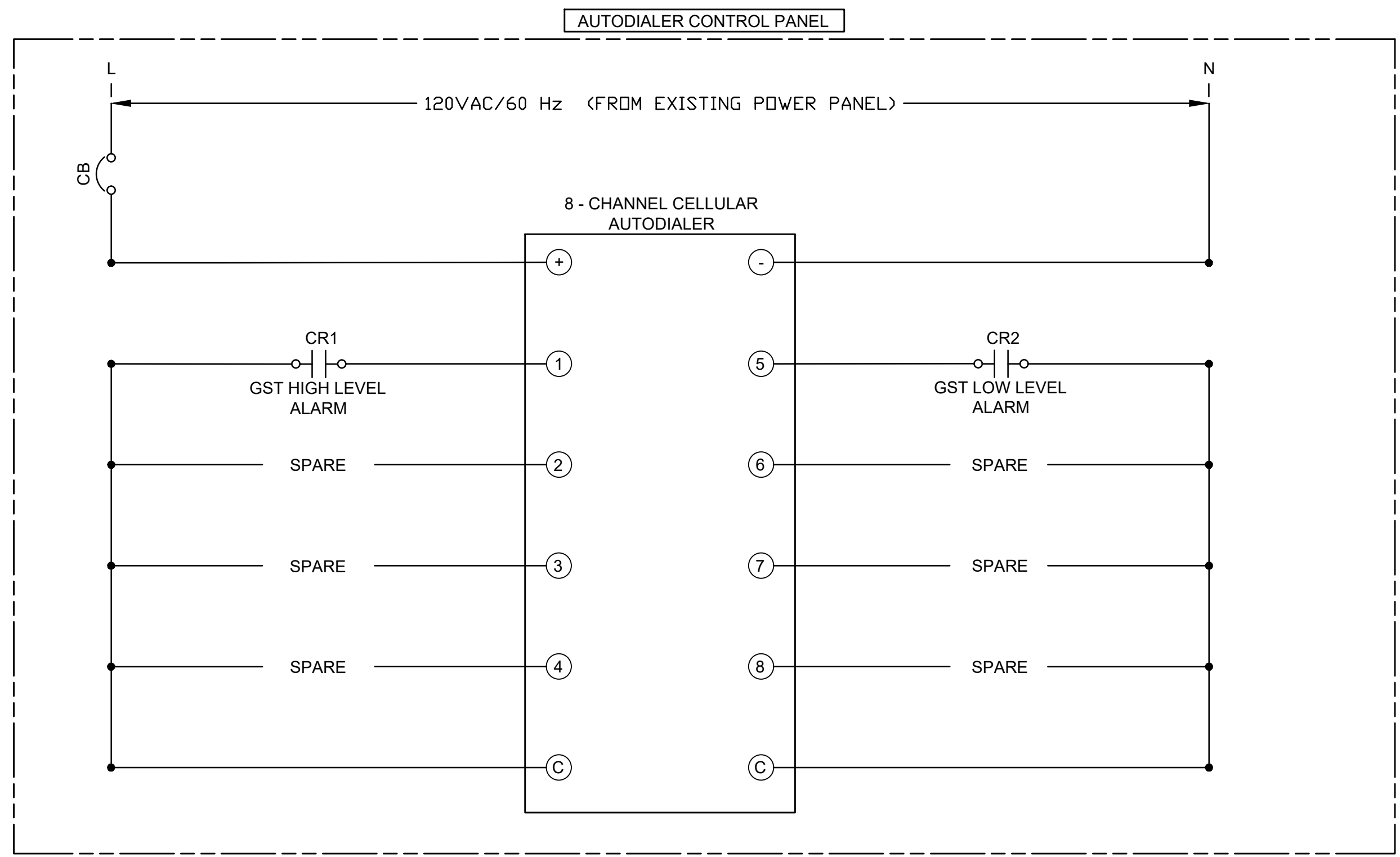
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Last plotted by: Medina, Carlos Plot Style: AEC.ctb Plot Scale: 1:1 Plot Date: 3/15/2021 11:24 AM Plotter used: DWG To PDF.pc3



1
99-E103
SCALE: NONE
PLC PANEL SCHEMATIC (TYP 2)



1
99-E103
SCALE: NONE
PLC PANEL SCHEMATIC CONT. (TYP 2)



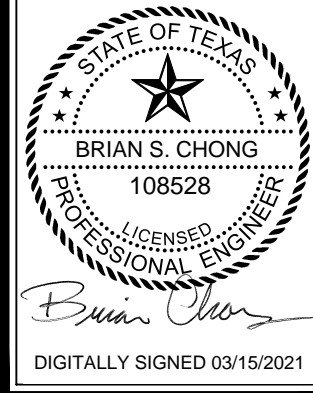
2
99-E103
SCALE: NONE
AUTODIALER

GENERAL NOTES:

- MAKE ALL FINAL CONNECTIONS PER MANUFACTURER'S INSTRUCTIONS.
- NOT ALL DEVICES ARE SHOWN AND INCLUDED. PROVIDE ALL ITEMS AS REQUIRED FOR A COMPLETE INSTALLATION. SEE STRUCTURE ELECTRICAL SHEETS AND SPECIFICATIONS.
- ALL POWER CONNECTIONS TO EXTERNAL DEVICES SHALL BE THROUGH THE USE OF CIRCUIT BREAKERS OR FUSED TERMINAL BLOCKS.

KEYED NOTES:

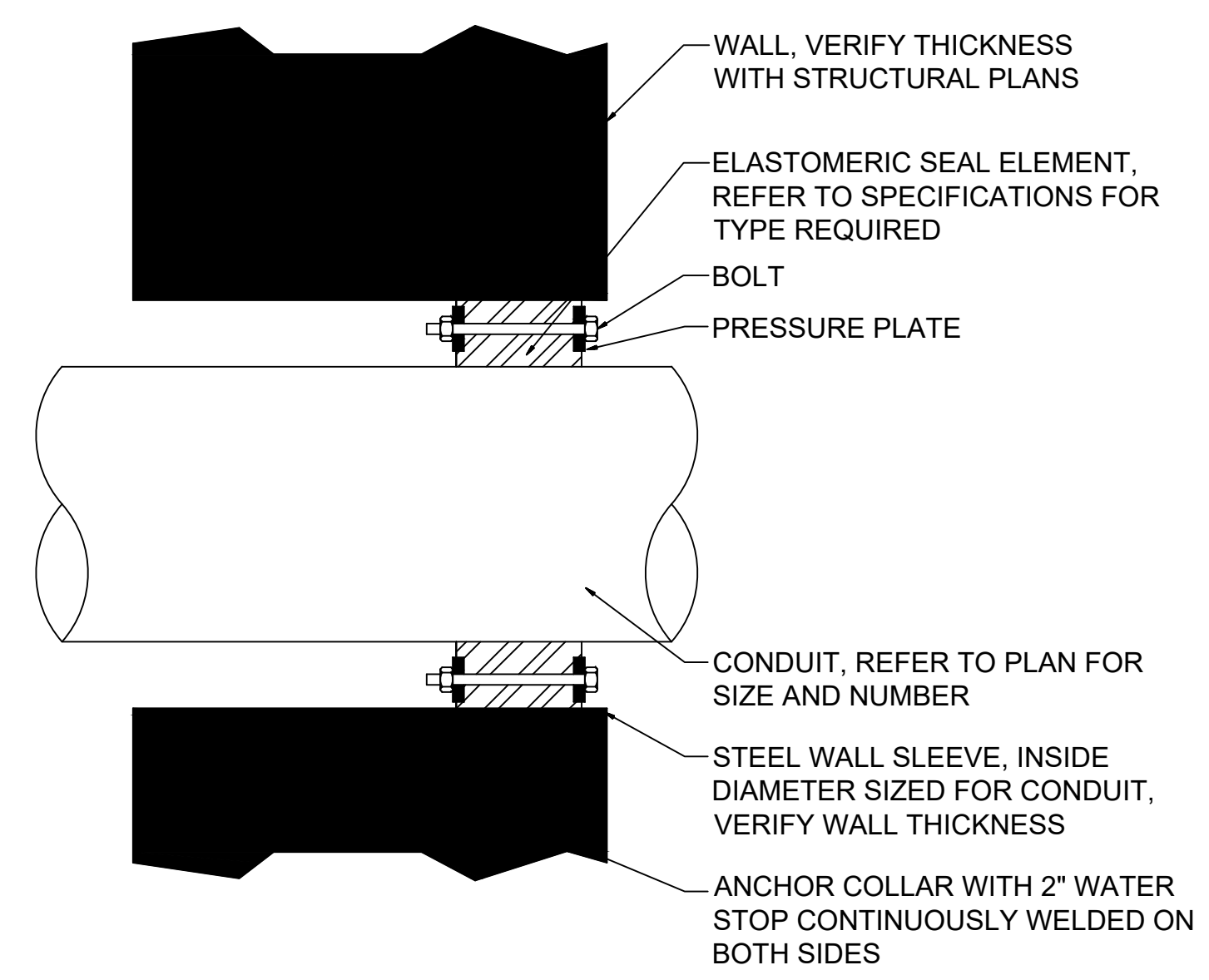
- COORDINATE WITH UPS MANUFACTURER REQUIREMENTS TO PROVIDE REQUIRED LINE AND LOAD POWER CONNECTIONS.
- REFER TO TYPICAL I/Os MODULE INTERCONNECTION DIAGRAMS.



DATE: MARCH 2021
DESIGNED BY: KAD
DRAWN BY: CM
REVIEWED BY: JCW
REVISED:
REVISED:

SHEET TITLE
ELECTRICAL
DETAILS IIII

SHEET NUMBER
24
OF 25
99-E104



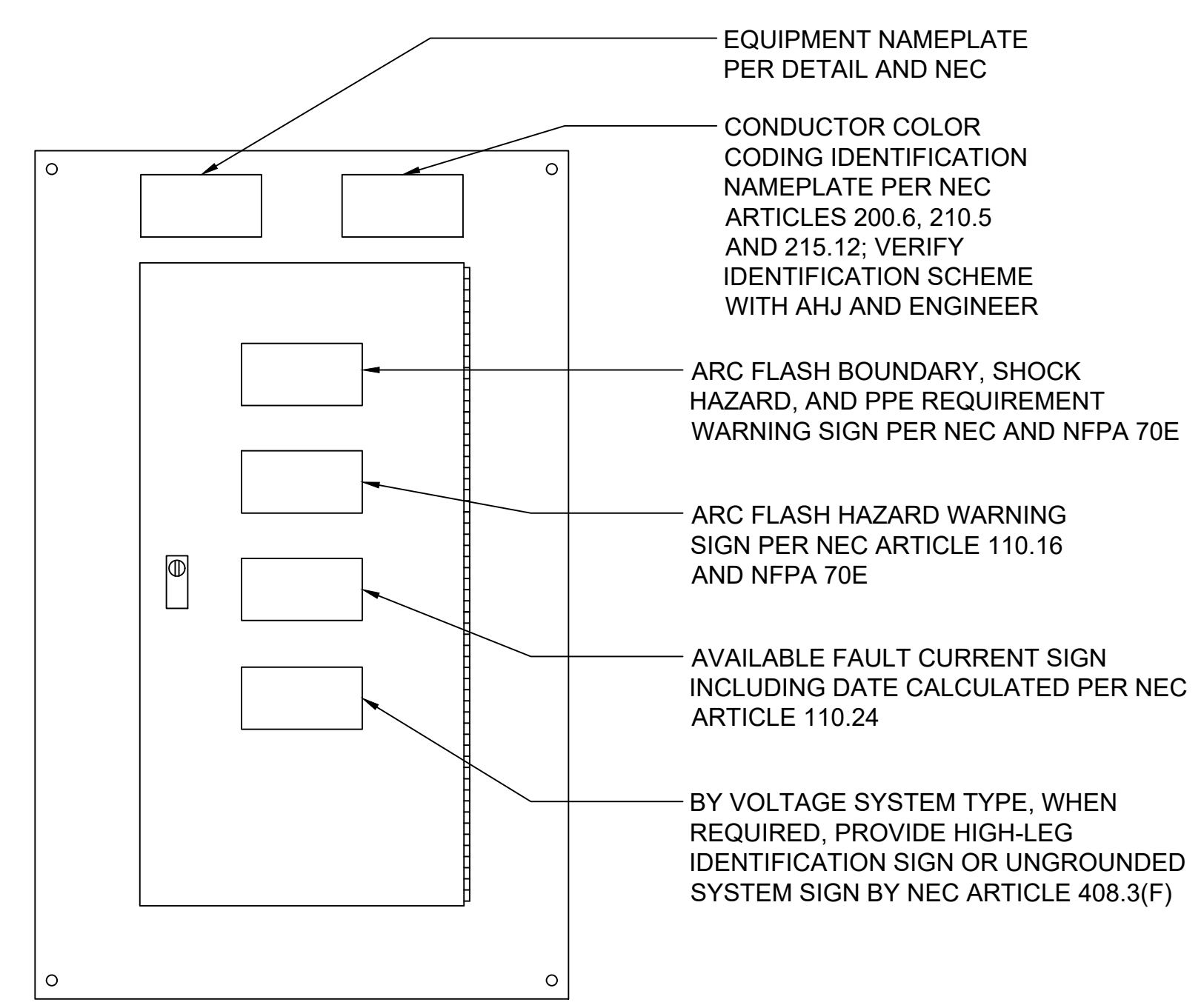
"LINK-SEAL" MODULAR SEAL WITH MODEL 'WS' STEEL WALL SLEEVES

1 TYPICAL WATERSTOP SEALING DETAIL
99-E104 SCALE: NOT TO SCALE



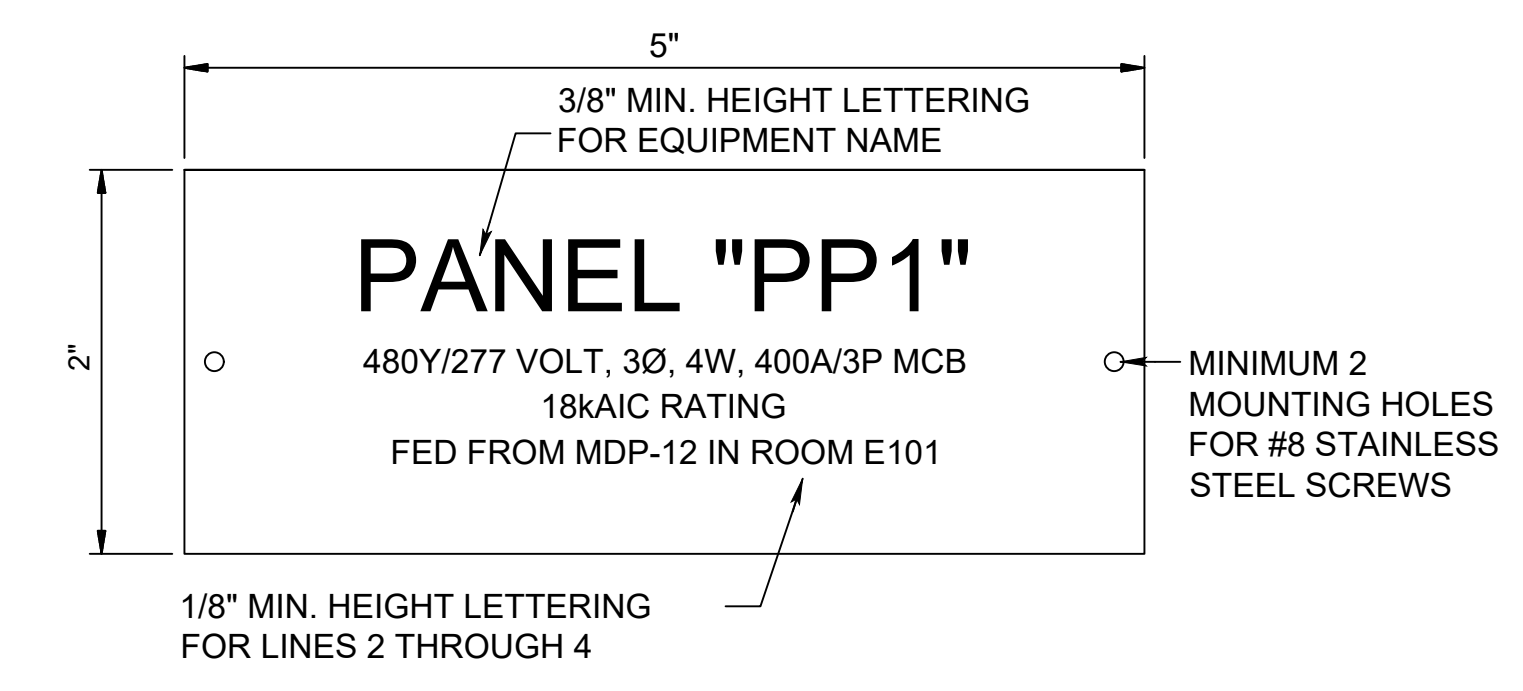
- NOTES:
1. POWER MARKING TAPES SHALL BE DETECTABLE TYPE CONSTRUCTION WITH RED BACKGROUND AND BLACK LETTERING.
 2. COMMUNICATION MARKING TAPES SHALL BE DETECTABLE TYPE CONSTRUCTION WITH ORANGE BACKGROUND AND BLACK LETTERING, "TELEPHONE LINE" OR "FIBER OPTIC LINE" RESPECTIVELY.
 3. TAPE SHALL BE DETECTABLE, DURABLE, HIGHLY VISIBLE, RESISTANT TO ELEMENTS, MEETING AND/OR EXCEEDING ALL INDUSTRY STANDARDS.

2 UNDERGROUND DETECTABLE WARNING TAPE DETAIL
99-E104 SCALE: NOT TO SCALE



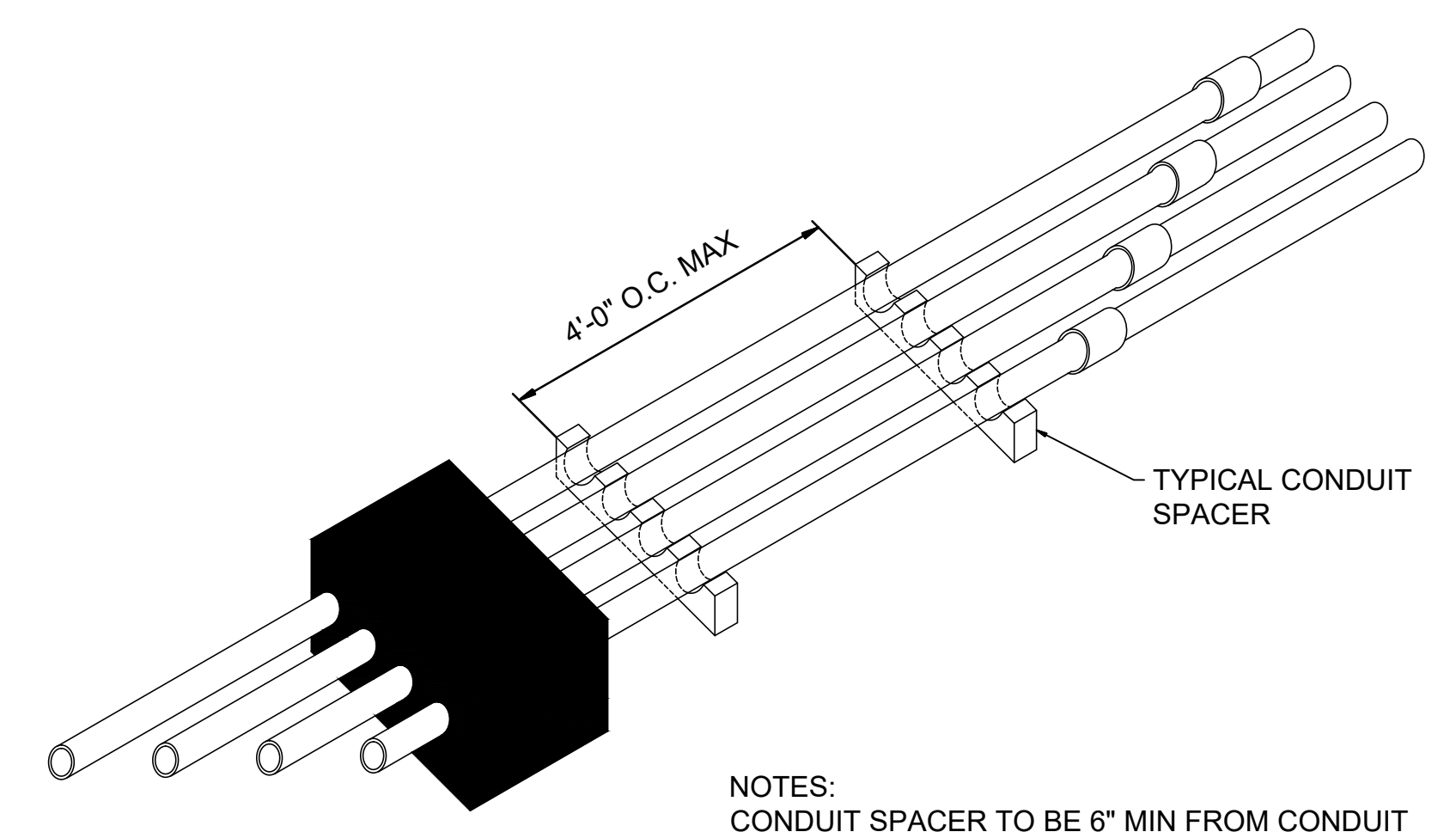
PANEL FRONT VIEW
SCALE: NOT TO SCALE

- NOTES:
1. INSTALL ALL NAMEPLATES AND WARNING SIGNS IN ACCORDANCE WITH NEC AND NFPA 70E REQUIREMENTS.
 2. INSTALL NAMEPLATES AND WARNING SIGNS ON ALL ELECTRICAL EQUIPMENT, INCLUDING BUT NOT LIMITED TO, SWITCHBOARDS, PANELBOARDS, TRANSFORMERS, SWITCHES, CONTROL PANELS AND MOTOR CONTROL CENTERS.
 3. EXTERIOR EQUIPMENT SHALL HAVE WEATHER-RESISTANT, NON-FADING NAMEPLATES AND SIGNAGE.
 4. INSTALL CIRCUIT DIRECTORY AND/OR CIRCUIT IDENTIFICATION FOR PROPER FIELD IDENTIFICATION.
 5. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.



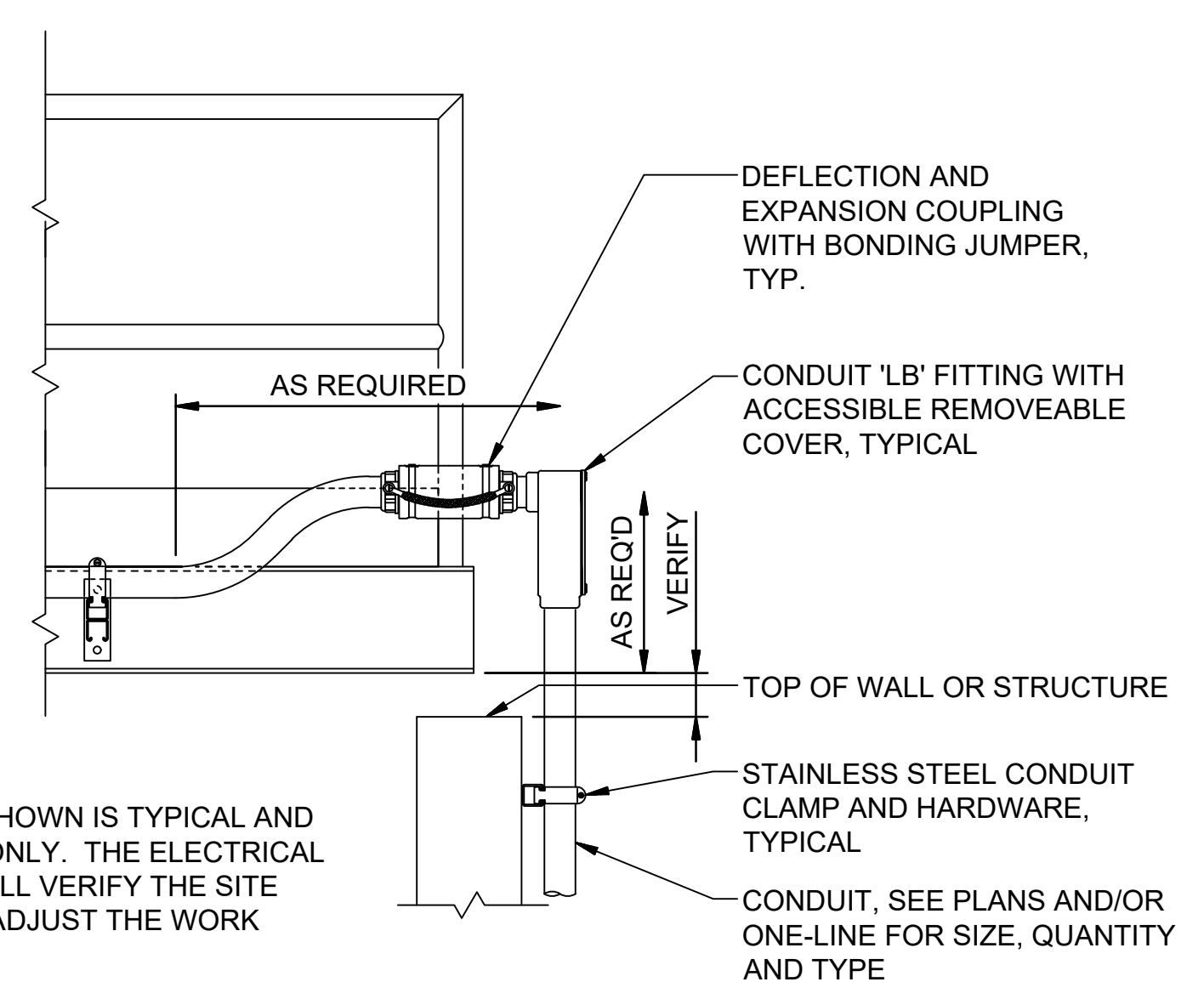
- EQUIPMENT NAMEPLATE NOTES:
1. INSTALL 2-PLEX ACRYLIC, WHITE ON BLACK CORE, 5"x2" TILE, TEXT LINES AS INDICATED, CUSTOM ENGRAVED NAME PLATES.
 2. MOUNT WITH STAINLESS STEEL SCREWS.
 3. SEAL SCREW HOLES WITH SILICONE RUBBER.
 4. NAMEPLATE INFORMATION SHALL INCLUDE:
 - A. IDENTIFICATION NAME.
 - B. VOLTAGE SYSTEM, AND AMPACITY RATING AND TYPE.
 - C. EQUIPMENT AIC RATING.
 - D. FEEDER SOURCE OF SUPPLY DESCRIPTION.

5 TYPICAL ENGRAVED NAMEPLATE DETAIL
99-E104 SCALE: NOT TO SCALE



- NOTES:
CONDUIT SPACER TO BE 6" MIN FROM CONDUIT COUPLINGS.
TYPICAL DUCTBANK COUPLINGS SHALL BE SPACED AT 6" MIN. INTERVALS.

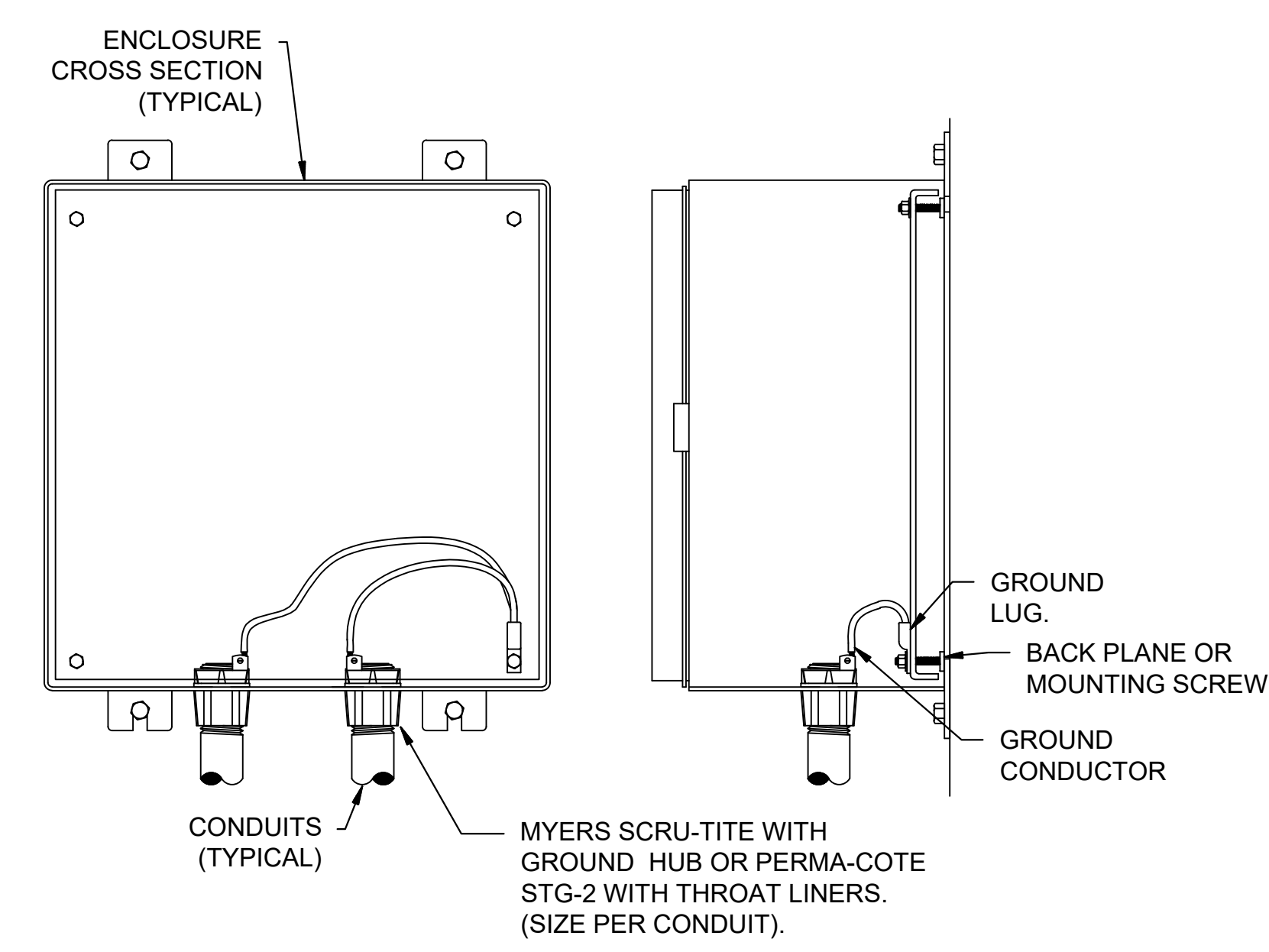
3 TYPICAL DUCTBANK SPACING AND COUPLING DETAIL
99-E104 SCALE: NOT TO SCALE



NOTE:
THE EQUIPMENT SHOWN IS TYPICAL AND FOR REFERENCE ONLY. THE ELECTRICAL CONTRACTOR SHALL VERIFY THE SITE CONDITIONS AND ADJUST THE WORK ACCORDINGLY.

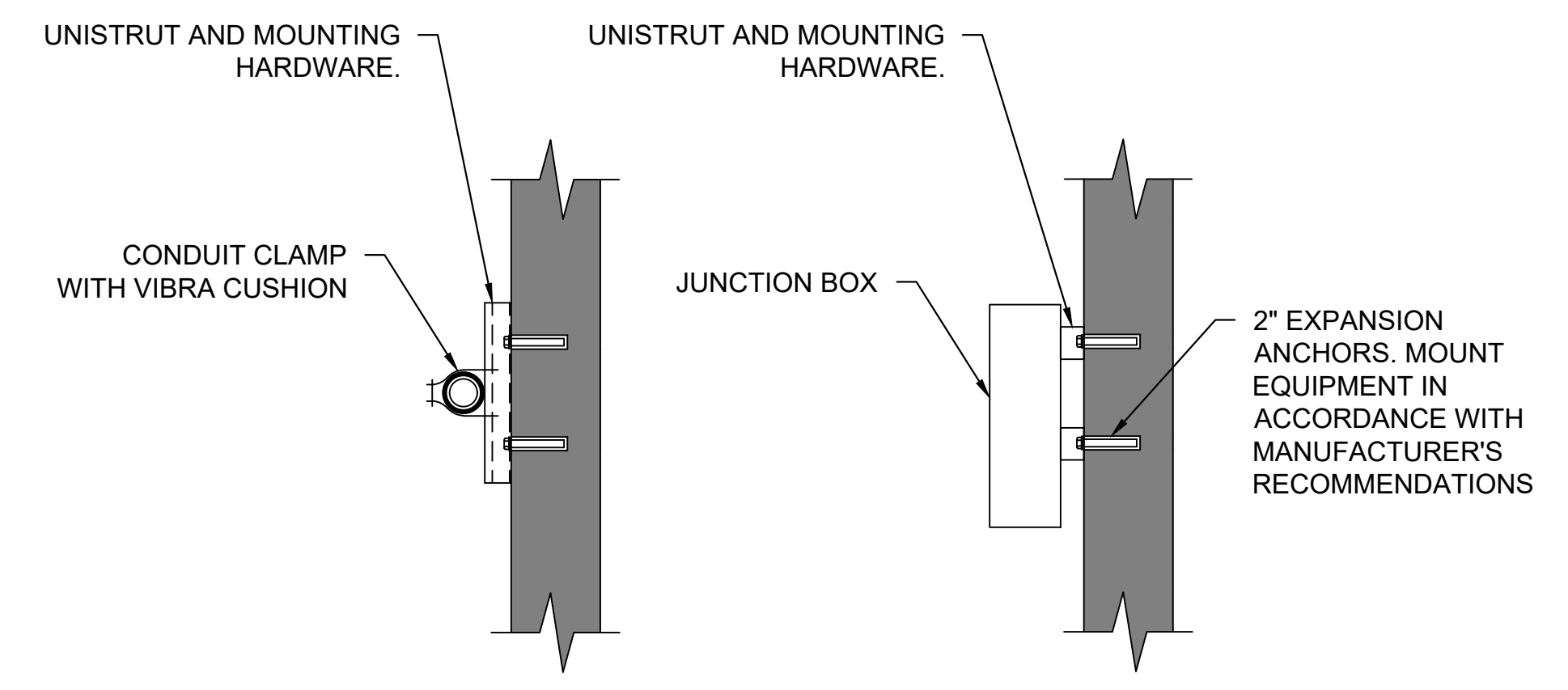
4 TYPICAL DEFLECTION COUPLING DETAIL
99-E104 SCALE: NOT TO SCALE

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Last plotted by: Medina, Carlos Plot Style: AECmon.ctb Plot Scale: 1:1 Plot Date: 3/15/2021 11:25 AM Plotter used: DWG To PDF.pc3



- NOTES:
1. ALL SERVICE, FEEDER AND CONTROL CONDUITS SHALL BE GROUNDED ON BOTH ENDS.

1 CONDUIT GROUNDING DETAIL
99-E105 SCALE: NOT TO SCALE

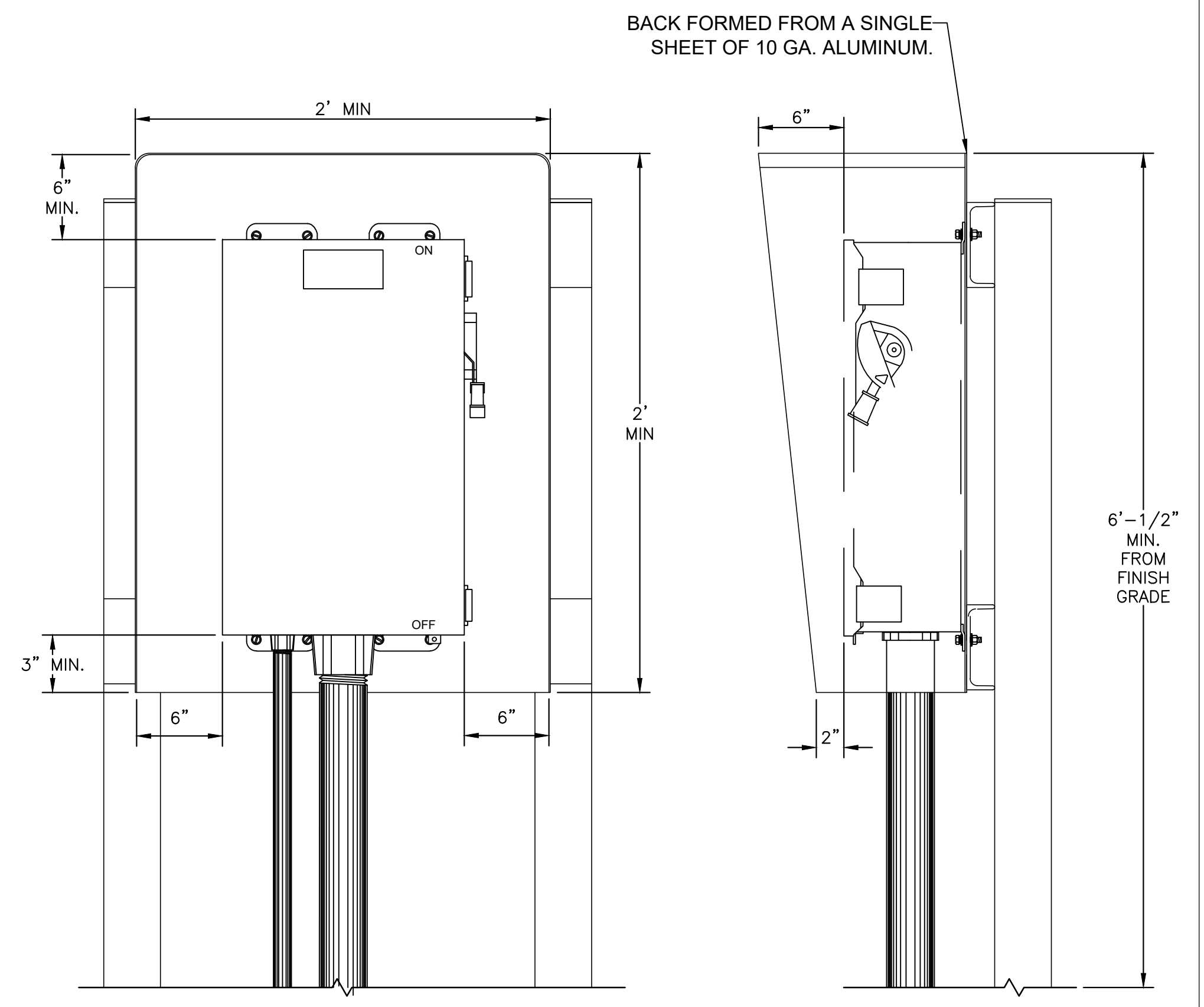
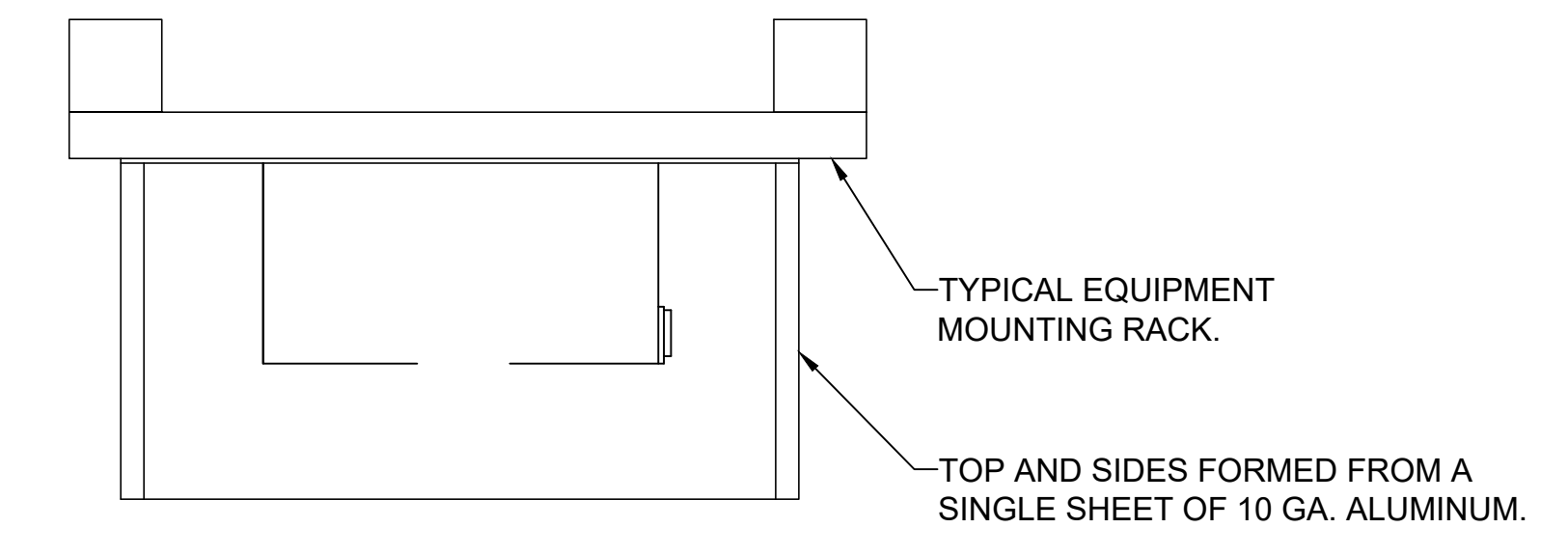


- NOTES:
1. UNISTRUT AND MOUNTING HARDWARE MATERIAL AS CALLED OUT IN ELECTRICAL PLAN SHEETS AND SPECIFICATIONS.
 2. SINGLE CONDUIT SHOWN. SIMILAR FOR MULTIPLE CONDUITS.
 3. SIMILAR FOR ALL ELECTRICAL ENCLOSURES AND PANELS.
 4. VIBRA CUSHION ONLY REQUIRED WHERE NEEDED TO PREVENT METAL TO METAL CONTACT OF DISSIMILAR METAL TYPES OR WHERE EXCESSIVE VIBRATION MAY OCCUR.

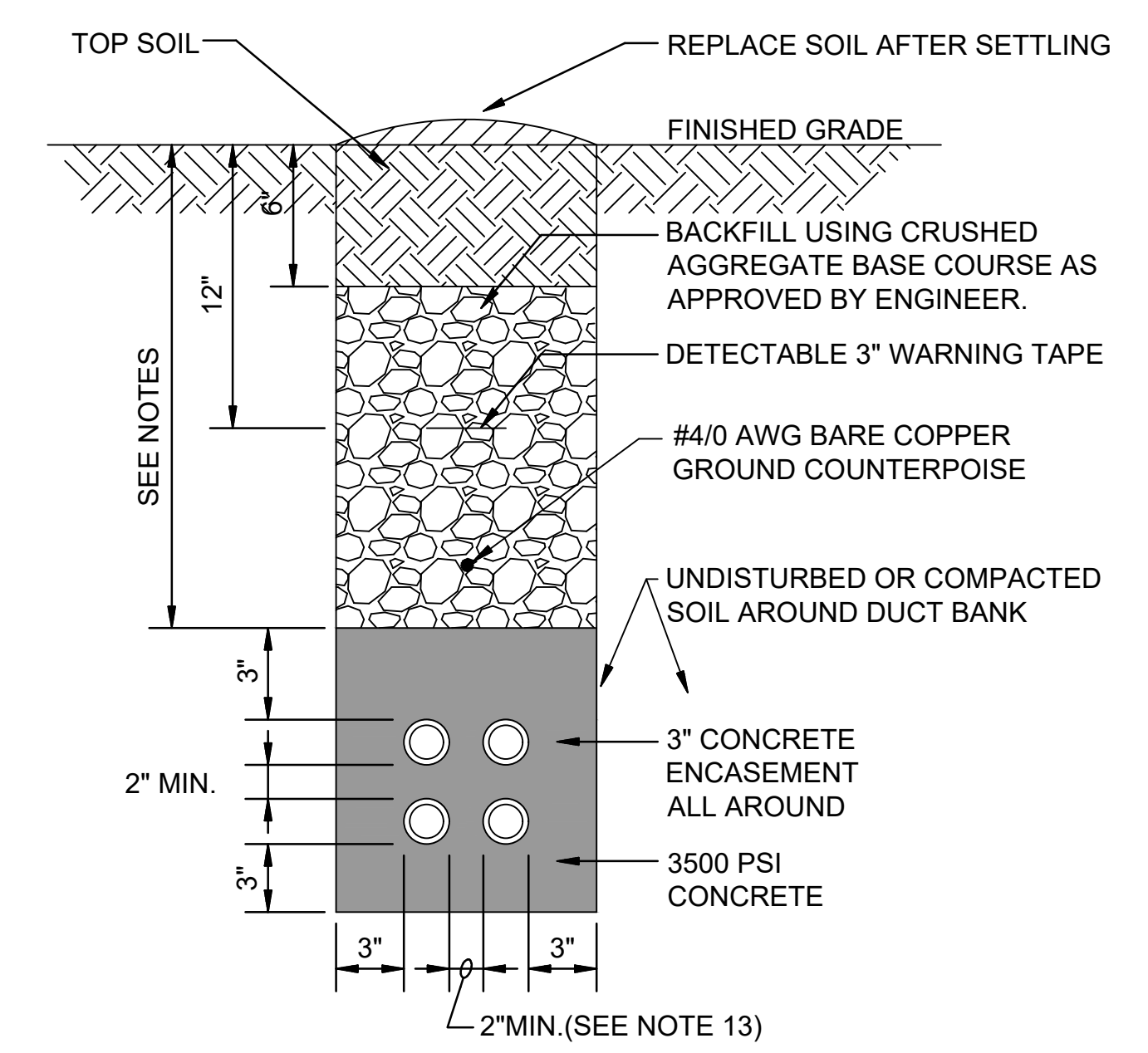
2 CONDUIT AND JUNCTION BOX SUPPORT DETAIL
99-E105 SCALE: NOT TO SCALE

NOTES:

1. ALL EXPOSED EDGES TO BE GROUND SMOOTH AND BURR FREE.
2. MOUNT HOOD BETWEEN INSTRUMENT AND MOUNTING BRACKET. DRILL HOLES IN HOOD AS PER MOUNTING HOLES FOR INSTRUMENTS.



4 TYPICAL SUN SHIELD FOR CONTROL PANEL AND INSTRUMENTS
99-E105 SCALE: NOT TO SCALE



3 CONCRETE ENCASED ELECTRICAL DUCT DETAIL
99-E105 SCALE: NOT TO SCALE

NOTES:

1. CONTRACTOR SHALL STAKE THE DUCT INSTALLATION IN PLAN AND ELEVATION FOR NEW ELECTRICAL DUCTS TO AVOID EXISTING UTILITIES. STAKING PLAN SHALL BE APPROVED BY OWNER AND ENGINEER PRIOR TO WORK.
2. CONTRACTOR SHALL ADJUST THE DEPTH OF THE ELECTRICAL DUCTS AS REQUIRED TO MAINTAIN THE MINIMUM COVER REQUIREMENT INDICATED AND AVOID EXISTING UTILITIES.
3. SIMILAR CONSTRUCTION FOR OTHER DUCT SIZES. SEE ELECTRICAL PLAN SHEETS FOR QUANTITY AND SIZES.
4. INSTALL DUCT CONDUIT SUPPORTS AT 5'-0" O.C. MAXIMUM SPACING. UTILIZE LOCKING COLLARS OR HOLD DOWN BARS WITH ANCHORS TO PREVENT DUCT FLOTATION. (TYPICAL ALL DUCTS).
5. OFFSETS AND BENDS OVER 10 DEGREES AND ELBOWS IN PVC CONDUIT RUNS SHALL BE GRSC.
6. NO PVC SHALL EMERGE FROM THE GROUND OR CONCRETE SLAB OR ENCASMENT, PVC SHALL CONVERT TO PVC COATED GALVANIZED RIGID STEEL CONDUIT PRIOR TO ITS EMERGENCE UNLESS NOTED OTHERWISE.
7. SPARE PVC COATED GALVANIZED RIGID STEEL CONDUITS SHALL STUB UP 6" ABOVE FINISHED GRADE OR CONCRETE PAD SURFACE AND BE CAPPED WATERTIGHT.
8. INSTALL GROUND RODS AT ENDS OF ELECTRICAL DUCT AND CONNECT TO GROUND RING.
9. INSTALL CONDUCTORS AND CABLES AS NOTED ON DRAWINGS. INSTALL FULL ROPE IN ALL SPARE DUCTS.
10. MINIMUM COVER REQUIREMENT FOR DUCT BANKS UNDER ROADS, DRIVEWAYS AND PARKING LOTS SHALL BE 24".
11. MINIMUM COVER REQUIREMENTS FOR ELECTRICAL SECONDARY SERVICE DUCT BANKS SHALL BE 30".
12. MINIMUM COVER REQUIREMENTS FOR ELECTRICAL PRIMARY SERVICE DUCT BANKS SHALL BE 36".
13. VERTICAL AND HORIZONTAL DISTANCES BETWEEN CONDUITS SHALL BE 3" MINIMUM FOR DUCTS CONTAINING CIRCUITS OVER 600 VOLTS.
14. DUCT BANKS TO EXTEND BELOW FLOOR SLABS.

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