

WASTEWATER TREATMENT FACILITY IMPROVEMENTS BIG LAKE STATE PARK

CRAIG, MISSOURI

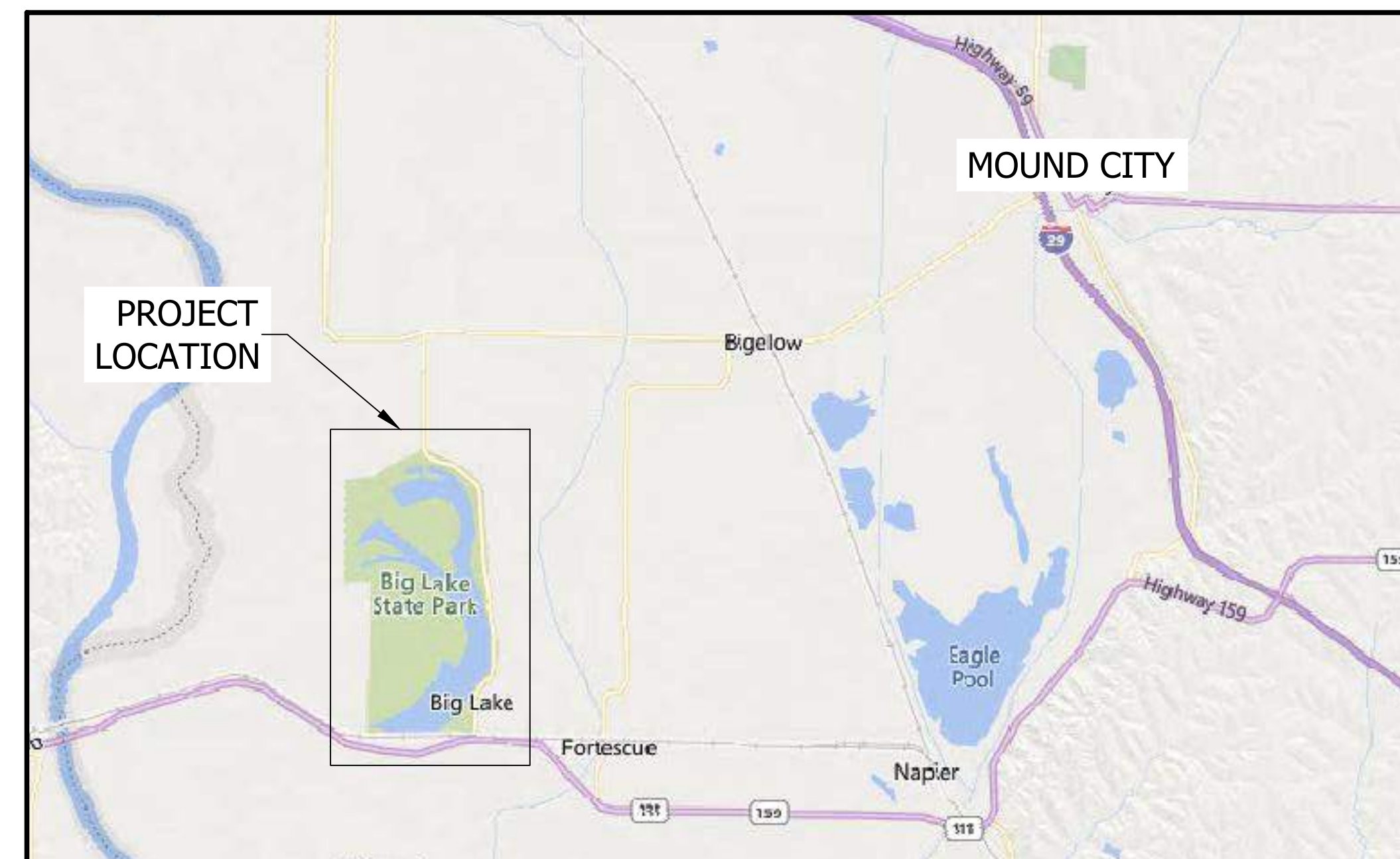
Bartlett & West

1719 SOUTHRIDGE DR., SUITE 100 - JEFFERSON CITY MO 65109.4000
PHONE 573.634.3181
CERTIFICATE OF AUTHORITY NO. 000167 - ENGINEERING
www.bartlettwest.com

OWNER: STATE OF MISSOURI
MICHAEL PARSONS,
GOVERNOR

DEPARTMENT OF
NATURAL RESOURCES,
DIVISION OF STATE PARKS

PROJECT
MANAGEMENT: OFFICE OF ADMINISTRATION
DIVISION OF FACILITIES MANAGEMENT,
DESIGN AND CONSTRUCTION



ENGINEER: BARTLETT & WEST, INC.
(B&W PROJECT NUMBER: 20465.001)

PROJECT NUMBER: X2211-01

SITE NUMBER: 5105
ASSET NUMBER: 7815105016



CONSTRUCTION DOCUMENT
DATE PREPARED: MAY 24, 2023



SHEET NUMBER:

G-001

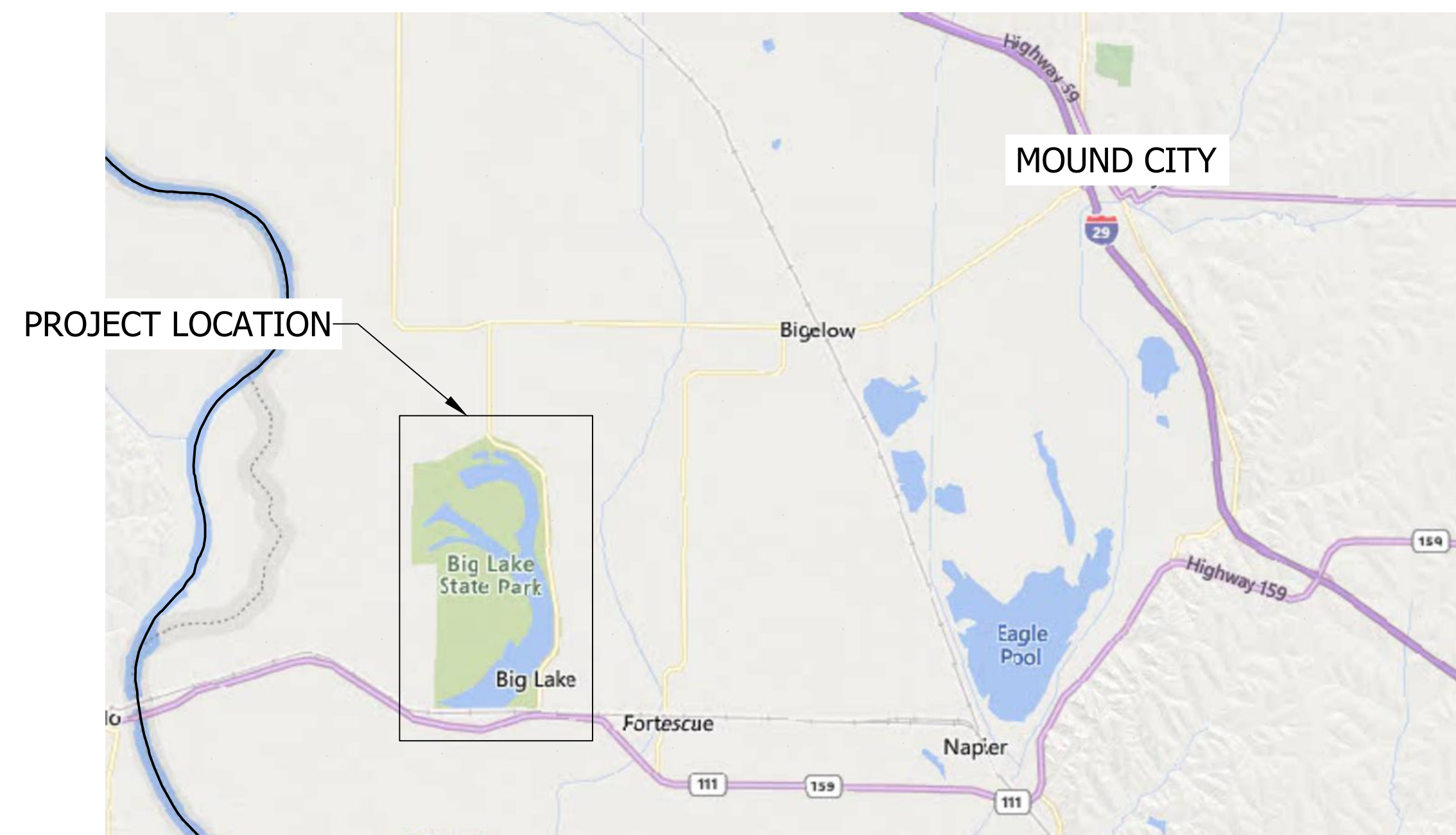
1 OF 31 SHEETS



LOCATION MAP
 SCALE: 1"=1000'
 0 1000' 2000'



MISSOURI COUNTY MAP
 NOT TO SCALE



VICINITY MAP
 NOT TO SCALE



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 1719 SOUTHRIDGE DR., SUITE 100 - JEFFERSON CITY, MO 65109-4000
 VALERIE A. HOLLAND
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 CERTIFICATE OF AUTHORITY NO. 000167 - ENGINEERING
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DEPARTMENT OF
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 DIVISION OF STATE PARKS

BIG LAKE STATE PARK
 WASTEWATER TREATMENT
 FACILITY IMPROVEMENTS

204 LAKE SHORE DRIVE
 CRAIG, MO 64437

PROJECT # X2211-01
 SITE # 5105
 ASSET # 7815105016

REVISION: _____
 DATE: _____
 REVISION: _____
 DATE: _____
 REVISION: _____
 DATE: _____

ISSUE DATE: _____
 CAD DWG FILE:
 G-003.dwg
 DESIGNED BY: BAN
 DRAWN BY: KAK
 APPROVED BY: VAH

SHEET TITLE:
 LOCATION MAP

SHEET NUMBER:

G-003

3 of 31 SHEETS



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ISSUE DATE: _____

CAD DWG FILE:
G-004.dwg

DESIGNED BY: BAN
DRAWN BY: KAK
APPROVED BY: VAH

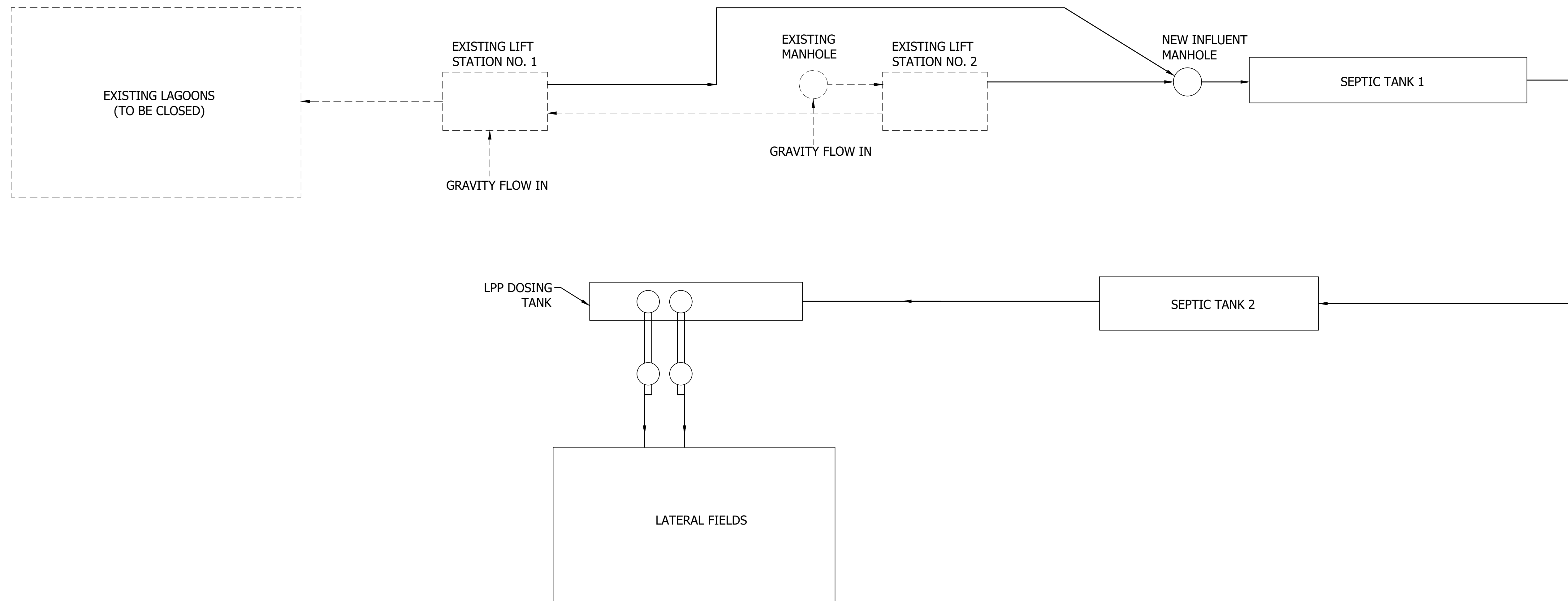
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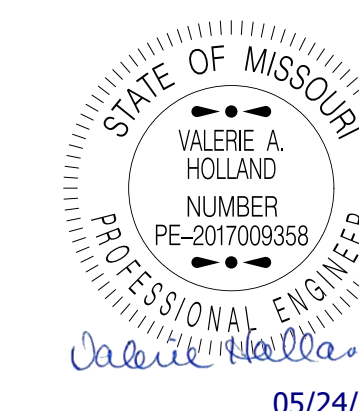
PROCESS FLOW

SHEET NUMBER:

G-004

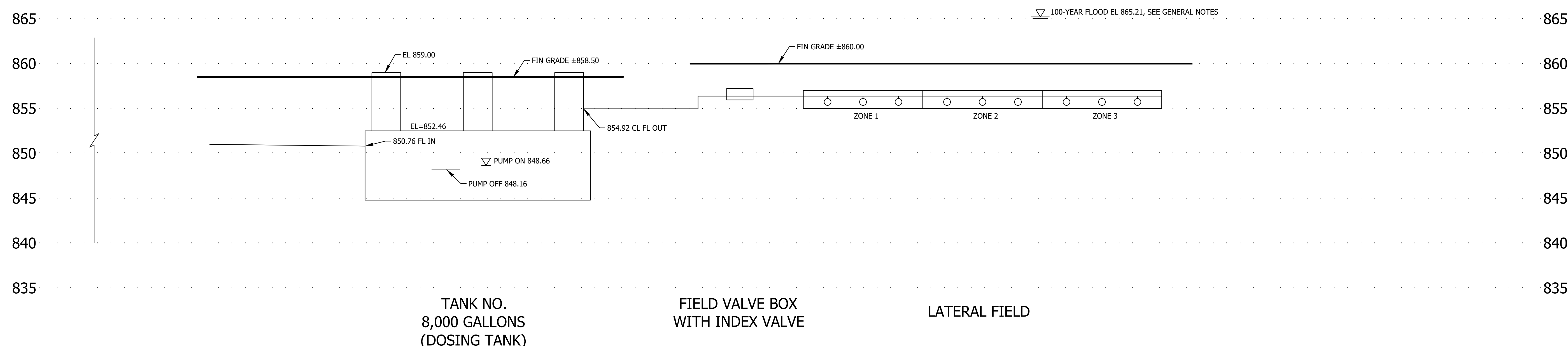
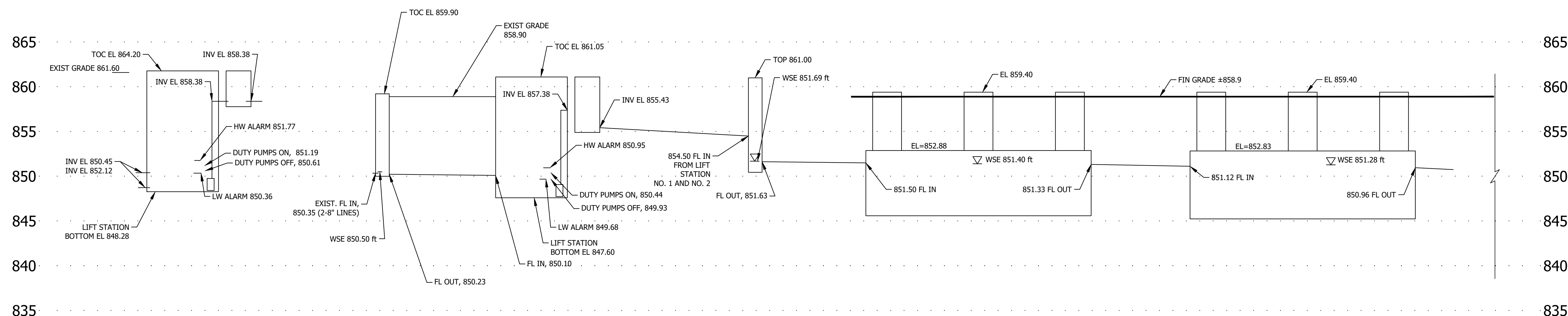
4 of 31 SHEETS





GENERAL NOTES:

1. THE HYDRAULIC PROFILE IS BASED ON ALL UNITS IN SERVICE AT THE PLANT PEAK FLOW RATE OF 15,000 GPD.
2. EXISTING ELEVATIONS SHOWN ARE BASED ON FIELD SURVEY DATA COLLECTED BY BARTLETT & WEST IN JUNE 2022.
3. THE FLOODPLAIN ELEVATION IS ZONE AE WITH A BASE FLOOD ELEVATION 865.00 NAVD 29, BASED ON THE LATEST FEMA FIRM MAP NO. 29087C0085B EFFECTIVE 1/6/1988. CONVERSION FROM NAVD 29 TO NAVD 88 IS 0.21 FEET BASED FROM NGS NCAT TOOL.
4. WATER SURFACE ELEVATION AND OPERATING LEVELS FOR EXISTING LIFT STATIONS ASSUMED BASED ON AS-BUILT INFORMATION AND PUMP MFR MINIMUM RECOMMENDED SUBMERGENCE. PUMP MFR TO CONFIRM OPERATING LEVELS.



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DATE: _____

ISSUE DATE: _____

CAD DWG FILE: _____

G-005.dwg

DESIGNED BY: BAN

DRAWN BY: KAK

APPROVED BY: VAH

SHEET TITLE:

HYDRAULIC
PROFILE

SHEET NUMBER:

G-005

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ABBREVIATIONS

ABBREV.	DESCRIPTION
-A-	
AA	AERATION AIR
AB	AHR BOLT OR AGGREGATE BASE & AERATION
ABAN	ABANDONED IN PLACE
ABC	AGGREGATE BASE COURSE
ABD	AERATION BASIN DRAIN
AC	ASPHALTIC CONCRETE
ACB	AIR CIRCUIT BREAKER
ACP	ASBESTOS CEMENT PIPE OR ACOUSTIC CEILING PANELS
ACU	AIR CONDITIONING UNIT
ADA	AMERICANS WITH DISABILITIES ACT
ADJ	ADJUSTABLE
AFF	ABOVE FINISHED FLOOR
AHR	ANCHOR
AI	ANALOG INPUT
AIC	AIR COMPRESSOR
AID	AIR DRYER
ALM	ALARM
ALTN	ALTERNATE
AL	ALUMINUM
ALP	AIR-LOW PRESSURE
AMSL	ABOVE MEAN SEA LEVEL
AO	ANALOG OUTPUT
APPROX	APPROXIMATE
ARCH	ARCHITECTURAL
ARV	AIR RELEASE VALVE
AS	AIR SCOUR
ATC	ACOUSTICAL TILE CEILING
AWP	ACOUSTIC WALL PANEL
AUTO	AUTOMATIC
AUX	AUXILIARY
AV	ANGLE VALVE
AVG	AVERAGE
@	AT
-B-	
BC	BEGINNING OF CURVE
BCV	BALL CHECK VALVE
BCW	BARE COPPER WIRE
BD	BOARD
BF	BLIND FLANGE, BOTTOM FLAT
BFP	BACK FLOW PREVENTER
BFV	BUTTERFLY VALVE
BL	BLEACH
BLDG	BUILDING
BLK	BLOCK
BLKG	BLOCKING
BLO	BLOWER
BM	BEAM
BOD	BOTTOM OF DUCT
BOP	BOTTOM OF PIPE
BRG	BEARING
BRKR	BREAKER
BS	BOTTOM SLUDGE
BSC	BAR SCREEN
BSCIP	BELL & SPIGOT CAST IRON PIPE
BSP	BLACK STEEL PIPE
BTU	BRITISH THERMAL UNITS
BV	BALL VALVE
BYP	BYPASS
-C-	
C	CONDUIT
C TO C	CENTER TO CENTER
CA	CONCRETE ANCHOR
CB	CATCH BASIN
CFM	CUBIC FOOT PER MINUTE
CHA	CHANNEL AIR
CHAN	CHANNEL
CHS	CHLORINE RESIDUAL SENSOR
CHL	CHLORINE
CHR	CHLORINE RESIDUAL
CIP	CAST IRON PIPE
CIRC	CIRCUMFERENTIAL
CISP	CAST IRON SOIL PIPE
CJ	CONSTRUCTION JOINT
CL OR L	CENTER LINE OR CLOSE (D)
CLD	CHLORINE LEAK DETECTOR
CLG	CHLORINE GAS OR CEILING
CLL	CHLORINE LIQUID
CLO	CLEAN LUBE OIL
CLP	CONTROL PANEL
CLR	CLEAR OR CHLORINE RELIEF
CLV	CHLORINE VACUUM OR CHLORINE VENT
CMSP	CEMENT MORTAR LINED STEEL PIPE
CMP	CORRUGATED METAL PIPE
CMU	CONCRETE MASONRY UNIT
CND	CONDUIT
CO	CLEANOUT OR CONDUIT ONLY
COL	COLUMN
COMP	COMPACTED
COMPA	COMPRESSED AIR
CONC	CONCRETE
CONN	CONNECTION
CONSTR	CONSTRUCTION
CONT	CONTINUE (D) (OUS) OR CONTROL
CPLG	COUPLING
CPT	CONTROL POWER TRANSFORMER
CR	CONDENSATE RETURN
CRN	CRANE
CRPT	CARPET TILE
CS	CHLORINE SOLUTION
CSE	CHLORINATED SECONDARY EFFLUENT
CSP	CARBON STEEL PIPE
CT	CERAMIC TILE
CTD	CENTERED
CTSK	COUNTERSUNK
CU	CUBIC
CUP	COPPER PIPE
CW	COLD WATER

ABBREV.	DESCRIPTION
-D-	
D	DRAIN
D/B	DESIGN/BUILD
DBL	DOUBLE
DCS	DECHLORINATION SOLUTION OR DISTRIBUTED CONTROL SYSTEM OR DILUTED CAUSTIC SOLUTION
DEG	DEGREE
DEMO	DEMOLISH OR DEMOLITION
DET	DETAIL
DG	DIGESTER GAS
DGR	DEGRITTED RETURN
DGS	DIGESTED SLUDGE
DI	DISCRETE INPUT
DIA OR Ø	DIAMETER
DIAG	DIAGONAL
DIG	DIGESTER
DIM	DIMENSION
DIP	DUCTILE IRON PIPE
DIPBS	DUCTILE IRON PIPE, BELL & SPIGOT
DIPMJ	DUCTILE IRON PIPE, MECHANICAL JOINT
DIST	DISTRIBUTION
DJ	DOUBLE JOINT
DMPR	DAMPER
DN	DOWN
DO	ENGINE DIESEL OIL OR DISCRETE OUTPUT
DR	DRAIN OR DRIVE
DS	DOWN SPOUT
DSL	DIGESTED SLUDGE
DV	DIAPHRAGM VALVE
DW	DEWATERING PUMP DISCHARGE
DWG	DRAWING
-E-	
E	EAST OR BURIED ELECTRICAL
EA	EACH
ECC	END OF CURVE
ECC	ECCENTRIC
ED	EQUIPMENT DRAIN
EDB	ELECTRICAL DUCT BANK
EEX	ENGINE EXHAUST
EF	EACH FACE OR EXHAUST FAN
EFL	EFFLUENT
EFU	EXHAUST FAN UNIT
EGR	ENGINE GENERATOR ROOM
EW	ENGINE JACKET WATER
EL	ELEVATION
ELB	ELBOW
ELEC	ELECTRIC (AL)
EMBED	EMBEDMENT
EMH	ELECTRICAL MANHOLE
ENGR	ENGINEER
EO	EMERGENCY OVERFLOW
EOP	EDGE OF PAVEMENT
EP	EXPLOSION PROOF
EQB	EQUALIZATION BASIN
EQL	EQUAL, EQUALIZATION
EQT	EQUIPMENT
ES	EMERGENCY STOP
ESEW	EMERGENCY SHOWER AND EYEWASH
EW	EACH WAY
EWC	ELECTRIC WATER COOLER
EW	ELECTRIC WATER HEATER
EXIST	EXISTING
EXP	EXPANSION
EXPO	EXPOSED
EXT	EXTERIOR
-F-	
F	FAHRENHEIT
FA	FLAME ARRESTOR OR FOUL AIR
FACP	FIRE ALARM CONTROL PANEL
FAE	FOUL AIR EXHAUST
FAN	FAN
FB	FLAT BAR
FC	FLEXIBLE CONNECTION OR FLEXIBLE COUPLING
FCA	FLANGE COUPLING ADAPTER
FCL	FAILS CLOSED OR FERRIC CHLORIDE
FCS	FERRIC CHLORIDE SOLUTION
FCTF	FACTORY FINISH
FCV	FLAPPER CHECK VALVE
FD	FLOOR DRAIN
FDN	FOUNDATION
FE	FINAL EFFLUENT OR FLOW ELEMENT
PEC	FIRE EXTINGUISHER CABINET
FEXT	FIRE EXTINGUISHER
FF	FAR FACE OR FACTORY FINISH
FG	FINISH GRADE
FHY	FIRE HYDRANT
FIG	FIGURE
FILP	FAILS IN LAST POSITION
FIN FL	FINISH FLOOR
FIT	FLOW INDICATOR/TRANSMITTER
FL	FLOOR
FLEX	FLEXIBLE
FLG	FLANGE
FLGA	FLANGE ADAPTER
FLT	FLOW LINE
FLT	FILTERATE
FM	FORCE MAIN
FO	FAILS OPEN OR FUEL OIL
FOR	FUEL OIL RETURN
FOS	FUEL OIL SUPPLY
FPR	FIRE ALARM CABLE PAIR
FR	FORWARD-REVERSE
FRP	FIBERGLASS REINFORCED PLASTIC
FS	FROTH SPRAY
FSH	FLUSH SHELL
FSLOS	FAST-SLOW LOCKOUT STOP
FSP	FABRICATED STEEL PIPE

ABBREV.	DESCRIPTION
-F CONT.-	
FST	FAST OR FORWARD-STOP
FSST	FAST-SLOW-STOP
FT	FOOT
FTC	FAIL TO CLOSE
FTG	FOOTING
FTO	FAIL TO OPEN
FW	FRESH WATER
FX	FIRE EXTINGUISHER
FXE	FIRE EXTINGUISHER (ELEC RM)
-G-	
G	GRIT PIPING
GA	GAGE OR GAUGE
GALV	GALVANIZE (D)
GB	GRAB BAR
GEN	GENERATOR
GFI	GROUND FAULT INTERRUPTER
GL	GLASS
GLB	GLUE LAMINATED BEAM
GLICP	GLASS LINED CAST IRON PIPE
GLV	GLOBE VALVE
GND	GROUND
GR	GRADE
GSP	GALVANIZED STEEL PIPE
GTV	GATE VALVE
GWB	GYPSON WALLBOARD
GYP	GYPSON
-H-	
H1E	HOOK ONE END
H2E	HOOK TWO ENDS
HA	HAND-AUTO
HWD	HARDWARE
HLD	HIGH LEVEL ALARM
HM	HOLLOW METAL
HOA	HAND-OFF-AUTO
HORIZ	HORIZONTAL
"HP"	HIGH POINT OR HORSEPOWER
HPA	HIGH PRESSURE AIR
HPT	HIGH POINT
HPU	HEAT PUMP UNIT
HR	HOSE RACK
HRR	HEAT RECOVERY RETURN
HRS/HRW	HEAT RECOVERY SUPPLY
HTR	HEATER
HW	HEATED DOMESTIC WATER OR HOT WATER
HWL	HIGH WATER LEVEL
HWR	HOT WATER RETURN
HWS	HOT WATER SUPPLY OR HIGH WATER SURFACE
-I-	
IA	INSTRUMENT AIR
IC	INSTRUMENTATION CONDUIT
ID	INTERIOR DIAMETER
IN OR "	INCH
INCLR	INTERCOOLER
INF	INFLUENT
INJ	INJECTOR
INSTR	INSTRUMENT (ATION)
INSUL	INSULATE (D) (ING)(TION)
INTEG	INTEGRAL
INTR	INTERIOR
INVT	INVERT
INWC	INCHES WATER COLUMN
IPB	INSTRUMENTATION PULL BOX
IPD	INFLUENT PUMP DISCHARGE
IPR	INFLUENT PUMP RECYCLE
ISB	INFLUENT SEWER BYPASS
I/O	INPUT/OUTPUT MODULE
-J-	
J	JOIST
JAN	JANITOR
JB	JUNCTION BOX
JT	JOINT
JWR	JACKET WATER RETURN
JWS	JACKET WATER SUPPLY
-K-	
L	ANGLE OR LEFT
LA	LIGHTNING ARRESTER
LAB	LABORATORY
LC	LOCK CLOSE
LCP	LOCAL CONTROL PANEL
LIM SW	LIMIT SWITCH
LL	LIVE LOAD
LLA	LOW LEVEL ALARM
LLCO	LOW LEVEL CUT OFF
LLH	LONG LEG HORIZONTAL
LLV	LONG LEG VERTICAL
LO	LOCK OUT
LOP	LOCK OPEN
LOR	LOCAL-OFF-REMOTE
LOS	LOCKOUT-STOP
LP	LOW POINT OR LIQUID PROPANE
LPA	LOW PRESSURE AIR
LPDG	LOW PRESSURE DIGESTER GAS
LR	LONG RADIUS
LRA	LOCAL-REMOTE-AUTO
LS	LIMIT SWITCH
LSA	LEVEL SENSOR, AIR (BUBBLER)
LTG	LIGHTNING
LUBO	LUBE OIL
LVR	LOUVER

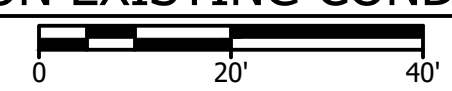
ABBREV.	DESCRIPTION
-L CONT.-	
LWL	LOW WATER LEVEL
LWS	LOW WATER SURFACE
L/L	LEAD/LAG
L/L/LL	LOCAL-REMOTE
L/R	LEAD/LAG/LAG-LAG
-M-	
MATL	MATERIAL
MAX	MAXIMUM
MCC	MOTOR CONTROL CENTER
MCP	MOTOR CIRCUIT PROTECTOR
MECH	MECHANICAL
MFRS	MANUFACTURER'S
MH	MANHOLE, SANITARY
MIN	MINIMUM
MISC	MISCELLANEOUS
MJ	MECHANICAL JOINT
MDDIP	MECHANICAL JOINT DUCTILE IRON PIPE
MARK	MARK
ML	MIXED LIQUOR
MON	MONUMENT
MSL	MEAN SEA LEVEL
MTD	MOUNTED
MV	MOTORIZED VALVE
MWS	MAXIMUM WATER SURFACE
MXR	MIXER
-N-	
N	NORTH
NA	NOT APPLICABLE
NAT GR	NATURAL GRADE
NC	NORMALLY CLOSED
NCHO	NORMALLY CLOSED HEAD OPEN
NDV	NEEDLE VALVE
NF	NEAR FACE
NG	NATURAL GAS
NL	HORIZONTAL
NO	NORMALLY OPEN
NO OR #	NUMBER
NOHC	NORMALLY OPEN HEAD CLOSED
NOM	NOMINAL
NP	NATIONAL PIPE THREAD
NTS	NOT TO SCALE
NV	NEEDLE VALVE
-O-	
OC	ON CENTER
OCL	OPEN-CLOSE
OD	OUTSIDE DIAMETER
OIS	OPERATOR INTERFACE STATION
OP	OPEN
OPNG	OPENING
OPP	OPPOSITE
OPR	OPERATE(OR)
OSC	OPEN-STOP-CLOSE
OTF	OUTFALL
OVFL	OVERFLOW
OVLD	OVERLOAD
-P-	
PA	PLANT AIR
PB	PULL BOX
PBP	PLANT BYPASS
PCV	PLUG CONCENTRIC VALVE
PD	PLANT DRAIN
PE	PLANT EFFLUENT
PEV	PRIMARY EFFLUENT
PERP	PERPENDICULAR
PEV	PLUG ECCENTRIC VALVE
PG	PRESSURE GAUGE
PH	PHASE, pH
PHW	PLANT HOT WATER
PI	POINT OF INTERSECTION OR PRIMARY INFLUENT
PIV	PINCH VALVE
PL	PLATE (STEEL) OR PROPERTY LINE
PLC	PROGRAMMABLE LOGIC CONTROLLER
PLCS	PLACES
PLE	PLAIN END
PPD	POUNDS PER DAY
PPMV	POUNDS PER MILLIONS BY VOLUME
PBBV	POUNDS PER BILLIONS BY VOLUME
PLYWD	PLYWOOD
PMP	PUMP
PNL	PANEL
POL	POLYMER
POLS	POLYMER SOLUTION
PR	PAIR OR INSTRUMENT CABLE PAIR
PRC	PLANT RECYCLE
PREFAB	PREFABRICATED
PR1	PRIMARY
PRPNE	PROPANE GAS
PRV	PRESSURE REDUCING VALVE
PS	PRIMARY SLUDGE, PUMP STATION
PSC	PRIMARY SCUM
PSI	POUND PER SQUARE INCH
PV	PLUG VALVE
PVC	POLYVINYL CHLORIDE
PVCP	RIGID POLYVINYL CHLORIDE PIPE
PVNT	PAVEMENT
PWR	POWER
-T-	
TBG	TUBING
TC	TOP OF CONCRETE
TD	THERMAL DISPERSION
TDR	TOWEL DISPENSER/RECEPTACLE
TE	TERTIARY EFFLUENT
TEL	TELEPHONE SERVICE OR TELEPHONE
TEMP	TEMPERATURE
TF	TOP FLAT
TFR	TRANSFORMER
TH	TOILET PAPER HOLDER
THERMO	THERMOSTAT
THK	THICK/THICKENING
THO	THICKENER OVERFLOW
THRU	THROUGH
TJB	TELEPHONE JUNCTION BOX
TM	TECHNICAL MEMORANDA
TNK	TANK
TOC	TOP OF CONCRETE
TOD	TOP OF DUCT BANK
TOS	TOP OF STEEL
TOW	TOP OF WEIR, TOP OF WALL
TPS	THICKENED PRIMARY SLUDGE
TRF	TRANSFER
TS	THICKENED SLUDGE
TWAS	THICKENED WASTE ACTIVATED SLUDGE
TYP	TYPICAL
T&B	TOP AND BOTTOM
T&G	TONGUE AND GROOVE
TDH	TOTAL DYNAMIC HEAD
TWW	TERTIARY WASHWATER

ABBREV.	DESCRIPTION
-R-	
R	RIGHT OR PLANT RECYCLE FLOW OR RADIUS
RAS	RETURN ACTIVATED SLUDGE
RCP	REINFORCED CONCRETE PIPE
RCPT	RECEPTACLE
RD	ROOF DRAIN
RDCR/RED	REDUCER
RDR	ROLL-UP-DOOR
RDY	READY
REF	REFERENCE
REINF	REINFORCE (D)(ING)(MENT)
REJ	RUBBER EXPANSION JOINT
REQD	REQUIRED
REV	REVISION OR REVERSE ACTING
REW	RECLAIMED WATER
RM	ROOM
RMT	REMOTE
RP	RADIUS POINT
RS	RAW SEWAGE
RTM	RUNNING TIME METER
R/W	RIGHT-OF-WAY
-S-	
S	SOUTH
SA	SAMPLE PIPING OR SERVICE AIR
SC	SUM
SCHED	SCHEDULE
SCF	STANDARD CUBIC FEET
SCFM	STANDARD CUBIC FOOT PER MINUTE
SCS	SCRUBBER CHLORINE SOLUTION
SCV	SWING CHECK VALVE
SD	STORM DRAIN
SE	SECONDARY EFFLUENT
SEC	SECONDARY
SECT	SECTION
SEL	SELECT
SF	SUPPLY FAN, SQUARE FEET
SGL	SINGLE
SH	SHEET





SOUTH LIFT STATION EXISTING CONDITIONS
 SCALE: 1"=20'



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ISSUE DATE: _____
 CAD DWG FILE: C-102.dwg
 DESIGNED BY: BAN
 DRAWN BY: KAK
 APPROVED BY: VAH

SHEET TITLE:
**SOUTH LIFT STATION
 EXISTING CONDITIONS**

SHEET NUMBER:

C-102

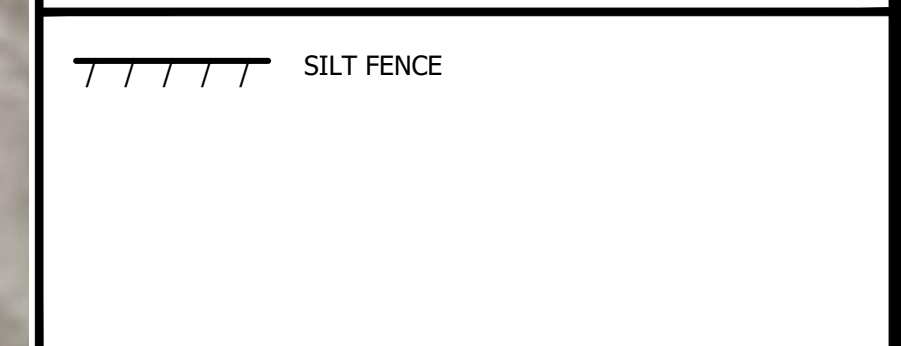
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GENERAL NOTES

- CONTRACTOR SHALL NOT BLOCK ANY ROADWAY WITHOUT APPROVAL FROM THE OWNER.

LEGEND



DEMO AND EROSION PLAN - NORTH
 SCALE: 1"=30'
 0 30' 60'

STATE OF MISSOURI
 MICHAEL PARSONS
 GOVERNOR



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 CAD DWG FILE: C-103 North Demo.dwg
 DESIGNED BY: BAN
 DRAWN BY: KAK
 APPROVED BY: VAH

SHEET TITLE:
**DEMO AND EROSION
 PLAN - NORTH**

SHEET NUMBER:
C-103
 9 of 31 SHEETS



GENERAL NOTES:

- SEE APPLICABLE DETAILS ON SHEET C-503
- ALL GRADING WORK SHALL BE COMPLETED IN STRICT CONFORMANCE WITH ALL PERTAINING STATE CODES, STANDARDS, ORDINANCES & REQUIREMENTS
- ALL AREAS BENEATH PROPOSED STRUCTURES AND WITHIN 2 FEET OUTSIDE OF PROPOSED STRUCTURES SHALL BE PREPARED TO 95% STANDARD PROCTOR WITHIN ± 2% OF OPTIMUM MOISTURE CONTENT
- FINAL GRADES WITHIN GRAVELED AREAS, AND FINAL GRADES IN ALL OTHER AREAS SHALL BE WITHIN 0.1 FEET OF PLAN ELEVATIONS AND VERIFIED BY SURVEYOR
- IF UNSUITABLE MATERIALS IS FOUND DURING ANY EXCAVATION, IT SHALL BE REMOVED AND REPLACED WITH SELECT OR TREATED FILL PER ENGINEER'S RECOMMENDATIONS.

EQUIPMENT LIST

- EXISTING LIFT STATION
- EXISTING VALVE VAULT
- EXISTING MANHOLE
- SILT FENCE
- STRAW BALES

LEGEND

- TREE REMOVAL
- TREE REMOVAL
- REMOVAL
- SILT FENCE
- STRAW BALES

REVISION: _____
 DATE: _____
REVISION: _____
 DATE: _____
REVISION: _____
 DATE: _____
ISSUE DATE: _____

CAD DWG FILE:
 C-104 South Demo.dwg
DESIGNED BY: BAN
DRAWN BY: KAK
APPROVED BY: VAH

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 VALERIE A. HOLLAND
 NUMBER PE-2017009358
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BIG LAKE STATE PARK
 WASTEWATER TREATMENT
 FACILITY IMPROVEMENTS

204 LAKE SHORE DRIVE
 CRAIG, MO 64437
 PROJECT # X2211-01
 SITE # 5105
 ASSET # 7815105016

SHEET TITLE:
**DEMO AND EROSION
 PLAN - SOUTH**

SHEET NUMBER:
C-104
 10 of 31 SHEETS



QUANTITIES:
 CUT - 2658 CUBIC YARDS
 FILL - 4019 CUBIC YARDS

GENERAL NOTES

1. CONTRACTOR SHALL EMPTY LAGOON CELLS OF WATER, LET DRY, REMOVE DRY SOLIDS AT BOTTOM OF LAGOON, REMOVE THE LINER, FILL LAGOON CELLS WITH ACCEPTABLE SOILS. GRADE TO PROVIDE PROPER DRAINAGE, SEED AND MULCH. REFER TO SPECIFICATIONS.
2. CONTRACTOR SHALL REMOVE LAGOON BERMS AND PUSH INTO LAGOON AREA.
3. ALL GRADING WORK SHALL BE COMPLETED IN STRICT CONFORMANCE WITH ALL PERTAINING STATE CODES, STANDARDS, ORDINANCES & REQUIREMENTS.
4. LAGOON AREA MAY BE USED TO MOUND AND STORE EXCAVATED MATERIAL FROM THE TREATMENT AREA.
5. CONTRACTOR SHALL NOT BLOCK ANY ROADWAY WITHOUT APPROVAL FROM THE OWNER.

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PROJECT # X2211-01
 SITE # 5105
 ASSET # 7815105016

REVISION: _____
 DATE: _____
 REVISION: _____
 DATE: _____
 REVISION: _____
 DATE: _____

ISSUE DATE: _____

CAD DWG FILE: _____
 C-105 North Grading.dwg
 DESIGNED BY: BAN
 DRAWN BY: KAK
 APPROVED BY: VAH

SHEET TITLE:

**NORTH GRADING
 PLAN**

SHEET NUMBER:

C-105

11 of 31 SHEETS



SOUTH GRADING PLAN
 SCALE: 1"=30'
 0 30' 60'

GENERAL NOTES:

- SEE APPLICABLE DETAILS ON SHEET C-503
- ALL GRADING WORK SHALL BE COMPLETED IN STRICT CONFORMANCE WITH ALL PERTAINING STATE CODES, STANDARDS, ORDINANCES & REQUIREMENTS
- ALL AREAS BENEATH PROPOSED STRUCTURES AND WITHIN 2 FEET OUTSIDE OF PROPOSED STRUCTURES SHALL BE PREPARED TO 95% STANDARD PROCTOR WITHIN ± 2% OF OPTIMUM MOISTURE CONTENT
- FINAL GRADES WITHIN GRAVELED AREAS, AND FINAL GRADES IN ALL OTHER AREAS SHALL BE WITHIN 0.1 FEET OF PLAN ELEVATIONS AND VERIFIED BY SURVEYOR. IF UNSUITABLE MATERIALS IS FOUND DURING ANY EXCAVATION, IT SHALL BE REMOVED AND REPLACED WITH SELECT OR TREATED FILL PER ENGINEER'S RECOMMENDATIONS.
- INDEXING VALVE VAULT SHALL BE AT ELEV. 860.00

EQUIPMENT LIST

- ① EXISTING LIFT STATION
- ② EXISTING VALVE VAULT
- ③ EXISTING MANHOLE
- ④ INDEXING VALVE AND VAULT



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BIG LAKE STATE PARK
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 FACILITY IMPROVEMENTS

204 LAKE SHORE DRIVE
 CRAIG, MO 64437

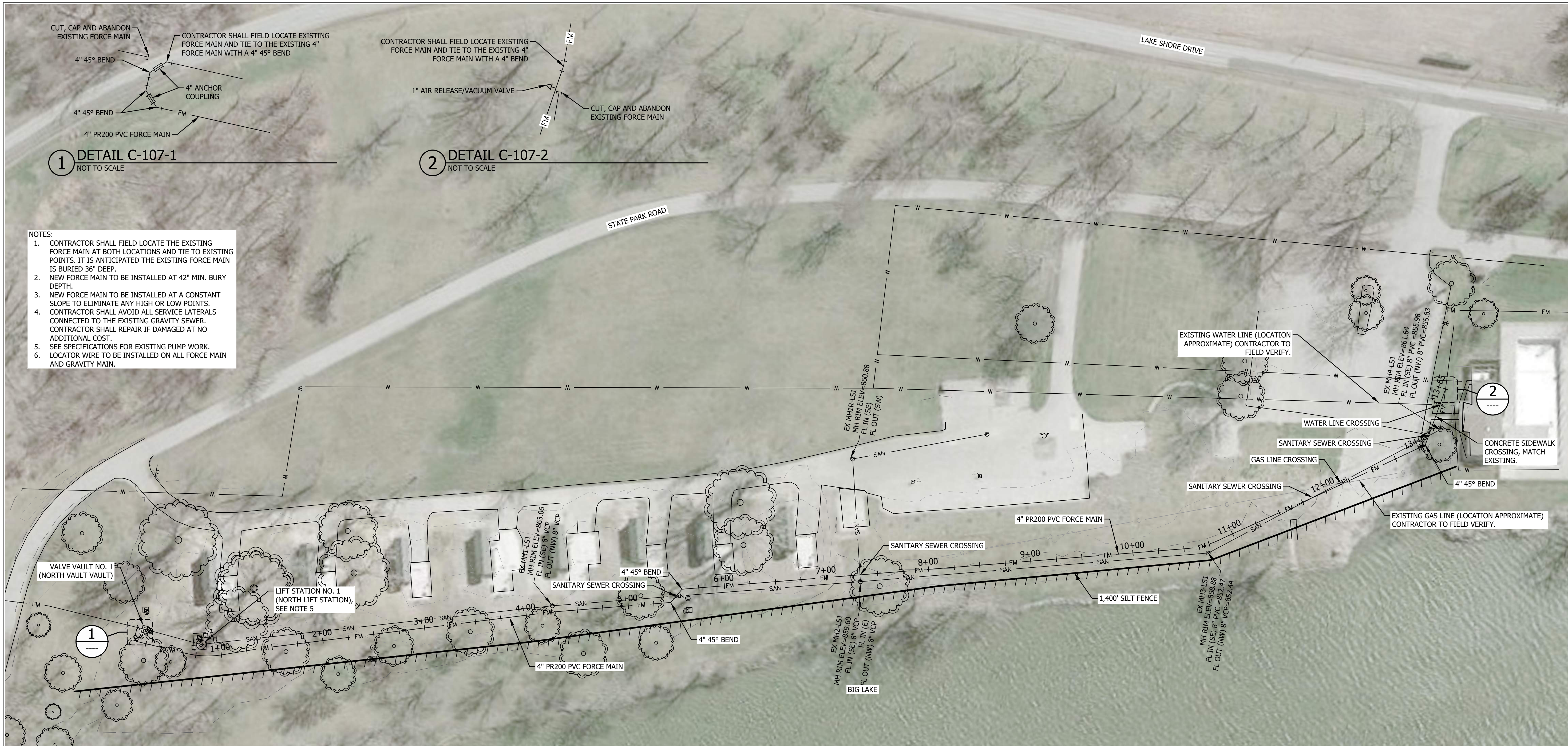
PROJECT # X2211-01
 SITE # 5105
 ASSET # 7815105016

REVISION: _____
 DATE: _____
 REVISION: _____
 DATE: _____
 REVISION: _____
 DATE: _____
 ISSUE DATE: _____

CAD DWG FILE: _____
 C-106 South Grading.dwg
 DESIGNED BY: BAN
 DRAWN BY: KAK
 APPROVED BY: VAH

SHEET TITLE:
**SOUTH GRADING
 PLAN**

SHEET NUMBER:
C-106
 12 of 31 SHEETS

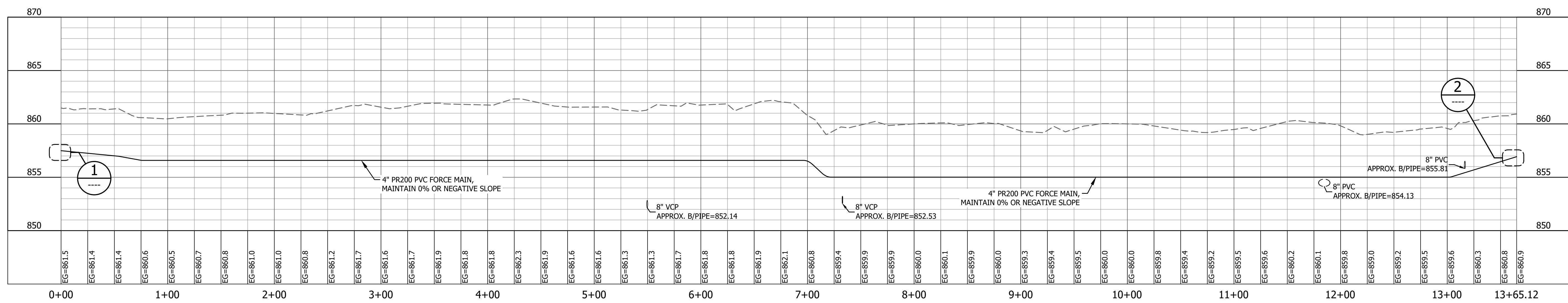


1 DETAIL C-107-1
NOT TO SCALE

2 DETAIL C-107-2
NOT TO SCALE

- NOTES:
- CONTRACTOR SHALL FIELD LOCATE THE EXISTING FORCE MAIN AT BOTH LOCATIONS AND TIE TO EXISTING POINTS. IT IS ANTICIPATED THE EXISTING FORCE MAIN IS BURIED 36" DEEP.
 - NEW FORCE MAIN TO BE INSTALLED AT 42" MIN. BURY DEPTH.
 - NEW FORCE MAIN TO BE INSTALLED AT A CONSTANT SLOPE TO ELIMINATE ANY HIGH OR LOW POINTS. CONTRACTOR SHALL AVOID ALL SERVICE LATERALS CONNECTED TO THE EXISTING GRAVITY SEWER. CONTRACTOR SHALL REPAIR IF DAMAGED AT NO ADDITIONAL COST.
 - SEE SPECIFICATIONS FOR EXISTING PUMP WORK.
 - LOCATOR WIRE TO BE INSTALLED ON ALL FORCE MAIN AND GRAVITY MAIN.

NORTH FORCE MAIN
SCALE: HORZ-1"=50' VERT-1"=5'
0 50 100'





TREATMENT SITE LAYOUT
SCALE: 1"=30'

GENERAL NOTES

- CONTRACTOR TO TAKE SPECIAL CARE TO ENSURE TRENCHES ARE NOT COMPACTED DURING CONSTRUCTION, INCLUDING MINIMIZING FOOT TRAFFIC.
- TRENCHES TO USE CLEAN PEA GRAVEL. CRUSHED LIMESTONE OR DOLOMITE IS SPECIFICALLY NOT ALLOWED. FINES ARE LIMITED TO 1% AND NO MATERIALS PASSING THE NO. 100 SIEVE ARE ACCEPTABLE.
- PIPE TO BE PLACED IN TRENCH WITH A MINIMUM OF 5" OF GRAVEL BELOW LATERAL AND A MINIMUM OF 2" ABOVE THE LATERAL PIPE.
- CONTRACTOR SHALL PROVIDE LINK SEAL OR OTHER ENGINEER APPROVED SEAL FOR FORCE MAIN PENETRATION TO MANHOLE. MANHOLE INTERIOR SHALL HAVE CORROSION BARRIER. SEE SPECIFICATIONS.
- THERE ARE TO BE 2 FIELDS WITH 6 ZONES EACH.
- EACH LATERAL SHALL BE SPACED A MINIMUM OF 5 FT FROM EACH OTHER. THE MANIFOLD PIPE SHALL FEED THE LATERAL AT ITS CENTERLINE. THE MANIFOLD PIPE SHALL HAVE NEGATIVE SLOPE.
- BALANCING OF THE SYSTEM WILL BE PERFORMED BY BALL VALVES LOCATED AT THE ENTRANCE TO EACH LATERAL. EACH LATERAL END SHALL HAVE 5 FT OF RESIDUAL PRESSURE.
- AUTOMATIC INDEXING VALVE (1 INLET, 6 OUTLETS). THE AUTOMATIC DISTRIBUTING VALVE SHALL BE SET AT A HIGH POINT SO THAT ALL PIPES SLOPE AWAY FROM IT.
- FORCE MAIN PIPING SHALL HAVE 42-INCHES COVER. FORCE MAIN SHALL BE ALLOWED TO DRAIN BACK TO LPP TANK IF THE PIPING HAS LESS THAN 42-INCHES OF COVER.
- LATERAL FIELD GEOTEXTILE FABRIC SHALL FULLY ENCOMPASS THE DRAINAGE AGGREGATE AS SHOWN IN THE DETAILS. ALL FABRIC JOINTS SHALL OVERLAP A MINIMUM OF 12-INCHES. PROVIDE ADDITIONAL SHEETS OF GEOTEXTILE FABRIC AND CLAMP FABRIC TO MAINTAIN INTEGRITY.
- DRAINAGE AGGREGATE SHALL MEET MODOT SECTION 1002 WITH THE FOLLOWING GRADATION:

SIEVE SIZE	PERCENT PASSING (BY WEIGHT)
2-1/2-INCH	100
1-1/2-INCH	85-100
3/4 INCH	10-35
1/2 INCH	0
- CONSTRUCT LATERAL TRENCHES WITH 0.00% SLOPE, AND IN NO CASE SHALL THE SLOPE EXCEED 1/2-INCH IN 100 FT.
- THERE SHOULD BE NO SOIL DISTURBANCE TO THE LATERAL FIELD SITE EXCEPT THE MINIMUM REQUIRED FOR INSTALLATION.
- LOCATOR WIRE TO BE INSTALLED ON ALL FORCE MAIN AND GRAVITY MAIN. THIS INCLUDES FORCE MAIN TO THE INDEX VALVE. NO LOCATOR WIRE IS REQUIRED ON THE LATERAL PIPES.

EQUIPMENT AND ITEM LIST

- SEPTIC TANK (10,000 GALLON)
- SEPTIC TANK (8,000 GALLON)
- LPP DOSING TANK (8,000 GALLON)
- INDEXING VALVE (K RAIN 6606 OR APPROVED EQUAL) AND VAULT
- LATERAL PIPE
- 4" DIA JUNCTION MANHOLE
- 6" SCH 40 PVC
- 4" PR200 (SDR21) PVC FORCE MAIN
- 2" PR200 (SDR21) PVC FORCE MAIN
- 1 1/2" PR200 (SDR21) PVC FORCE MAIN
- 10'X10' CEDAR FENCE AROUND CONTROL PANEL, GATE ON EAST SIDE. CONTRACTOR TO COORDINATE WITH FINAL PLACEMENT OF STRUCTURAL PLATFORMS AND SIZE, ADJUST ACCORDINGLY

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BIG LAKE STATE PARK
WASTEWATER TREATMENT
FACILITY IMPROVEMENTS

204 LAKE SHORE DRIVE
CRAIG, MO 64437

PROJECT # X2211-01
SITE # 5105
ASSET # 7815105016

REVISION: _____
DATE: _____
REVISION: _____
DATE: _____
REVISION: _____
DATE: _____

ISSUE DATE: _____
CAD DWG FILE:
C-108 South Layout.dwg
DESIGNED BY: BAN
DRAWN BY: KAK
APPROVED BY: VAH

SHEET TITLE:
TREATMENT SITE
LAYOUT

SHEET NUMBER:
C-108
14 of 31 SHEETS



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ASSET # 7815105016

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DATE: _____
REVISION: _____
DATE: _____
ISSUE DATE: _____

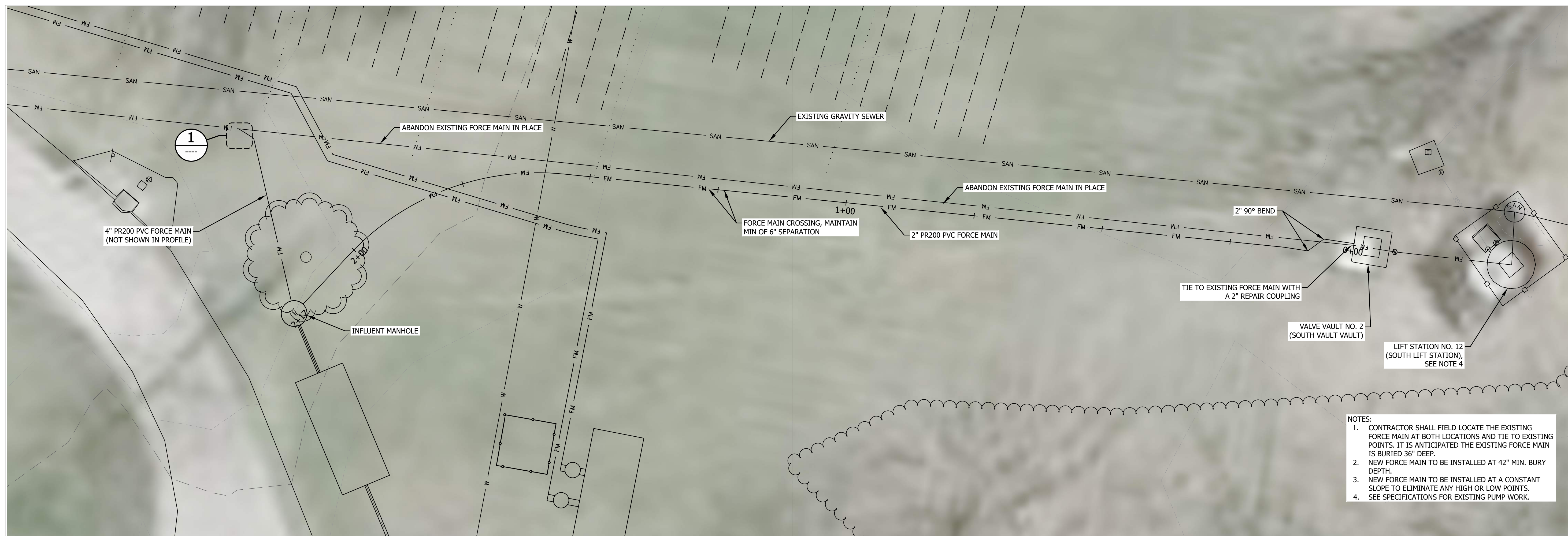
CAD DWG FILE:
C-109 South FM.dwg
DESIGNED BY: BAN
DRAWN BY: KAK
APPROVED BY: VAH

SHEET TITLE:
**SOUTH
FORCE MAIN**

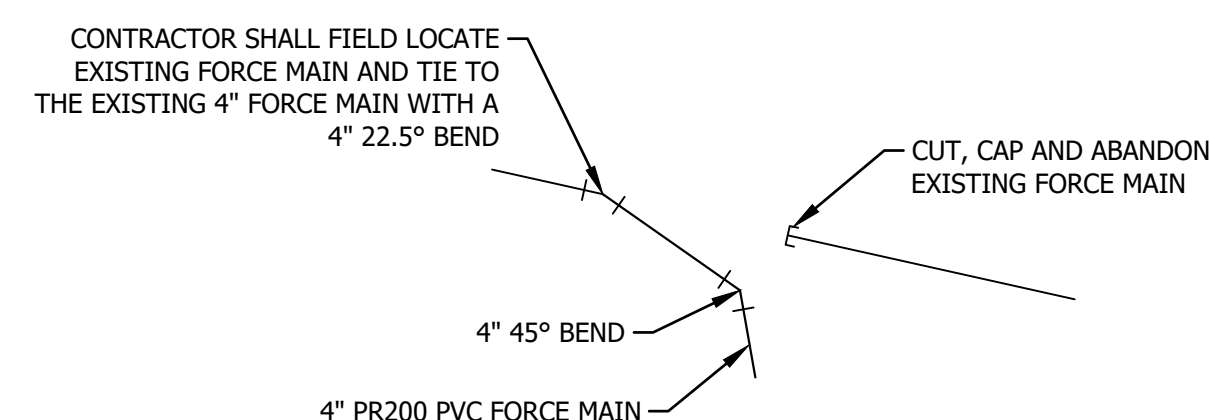
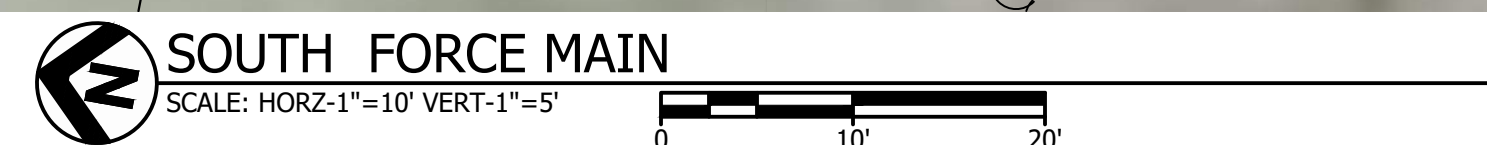
SHEET NUMBER:

C-109

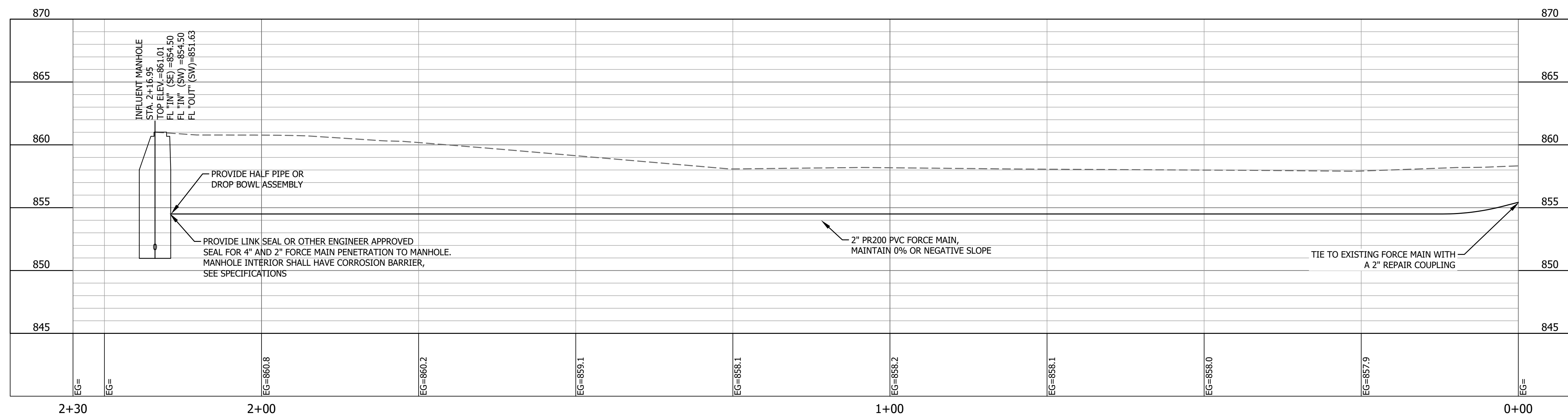
15 of 31 SHEETS



- NOTES:
1. CONTRACTOR SHALL FIELD LOCATE THE EXISTING FORCE MAIN AT BOTH LOCATIONS AND TIE TO EXISTING POINTS. IT IS ANTICIPATED THE EXISTING FORCE MAIN IS BURIED 36" DEEP.
 2. NEW FORCE MAIN TO BE INSTALLED AT 42" MIN. BURY DEPTH.
 3. NEW FORCE MAIN TO BE INSTALLED AT A CONSTANT SLOPE TO ELIMINATE ANY HIGH OR LOW POINTS.
 4. SEE SPECIFICATIONS FOR EXISTING PUMP WORK.

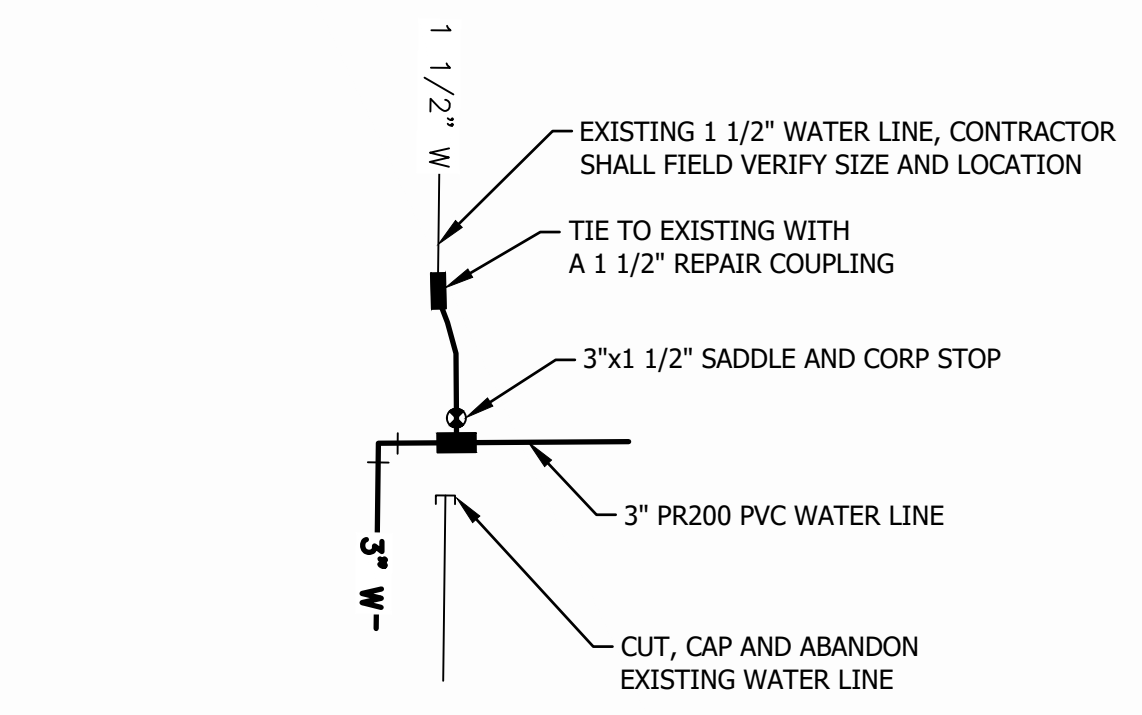


1 DETAIL C-109-1
NOT TO SCALE

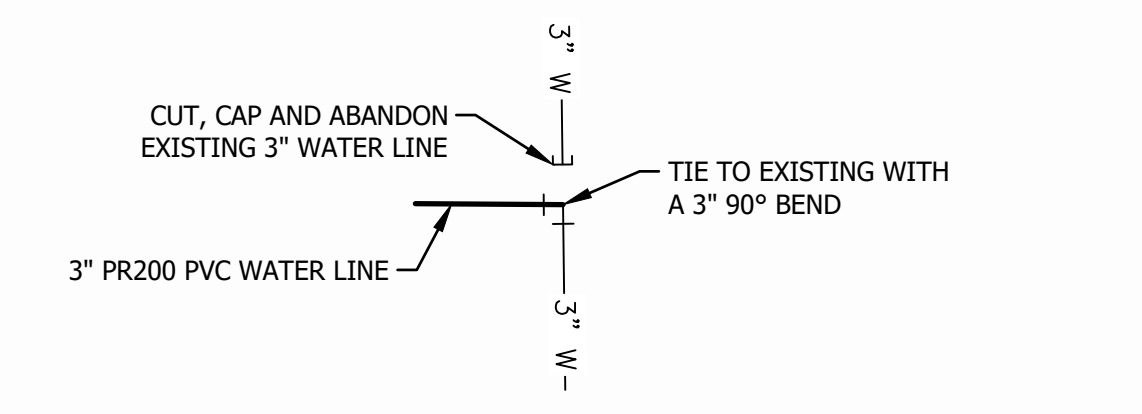




1 DETAIL C-110-1
NOT TO SCALE



2 DETAIL C-110-2
NOT TO SCALE



3 DETAIL C-110-3
NOT TO SCALE

GENERAL NOTES

- CONTRACTOR SHALL COORDINATE WITH OWNER ON ALL SERVICE RECONNECTS.

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FACILITY IMPROVEMENTS

204 LAKE SHORE DRIVE
CRAIG, MO 64437

PROJECT # X2211-01
SITE # 5105
ASSET # 7815105016

REVISION: _____
DATE: _____
REVISION: _____
DATE: _____
REVISION: _____
DATE: _____

ISSUE DATE: _____
CAD DWG FILE:
C-110 WL Relocation.dwg
DESIGNED BY: KAK
DRAWN BY: KAK
APPROVED BY: VAH

SHEET TITLE:
**WATER LINE
RELOCATION**

SHEET NUMBER:
C-110
16 of 31 SHEETS



PLAY GROUND RELOCATION
 SCALE: 1"=50'
 0 50' 100'

GENERAL NOTES

1. THE MODULAR PLAYGROUND EQUIPMENT AND SWINGS SET WORK SHALL BE COMPLETED BY A CERTIFIED PROFESSIONAL PLAYGROUND EQUIPMENT INSTALLER. THE INSTALLER SHALL HAVE A MINIMUM OF 10 YEARS OF EXPERIENCE INSTALLING THE SAME TYPE OF PLAYGROUND EQUIPMENT AND HAVE A CERTIFIED PLAYGROUND SAFETY INSPECTOR. INSTALLER SHALL BE RESPONSIBLE FOR DISASSEMBLY AND REASSEMBLY OF THE EQUIPMENT. IF THE EXISTING EQUIPMENT IS DAMAGED DURING REMOVAL/REINSTALLATION, CONTRACTOR SHALL REPLACE WITH SIMILAR EQUIPMENT WITH NO COST TO THE OWNER. CONTRACTOR SHALL INSTALL NEW SAND, MINIMUM OF 6" THICK.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING SIDEWALK CONFORMS WITH ADA REQUIREMENTS. GENERAL REQUIREMENTS INCLUDE THE FOLLOWING:
 - 1.00-2.00% CROSS SLOPE
 - 5.00% MAX RUNNING SLOPE
 - 4-FOOT MINIMUM WIDTH
3. PARK BENCH SHALL BE EQUIVALENT TO THE EXISTING PARK BENCH AT THE PLAYGROUND.
4. COORDINATE WITH THE PARKS ON SAVING THE SAND FOR REUSE IN STATE PARK.
5. COORDINATE WITH THE PARKS ON SALVAGING THE EXISTING PARK BENCH.

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204 LAKE SHORE DRIVE
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PROJECT # X2211-01
 SITE # 5105
 ASSET # 7815105016

REVISION: _____
 DATE: _____
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 DATE: _____
 REVISION: _____
 DATE: _____
 ISSUE DATE: _____

CAD DWG FILE:
 C-111 PlayGround.dwg
 DESIGNED BY: KAK
 DRAWN BY: KAK
 APPROVED BY: VAH

SHEET TITLE:
**PLAY GROUND
 RELOCATION**

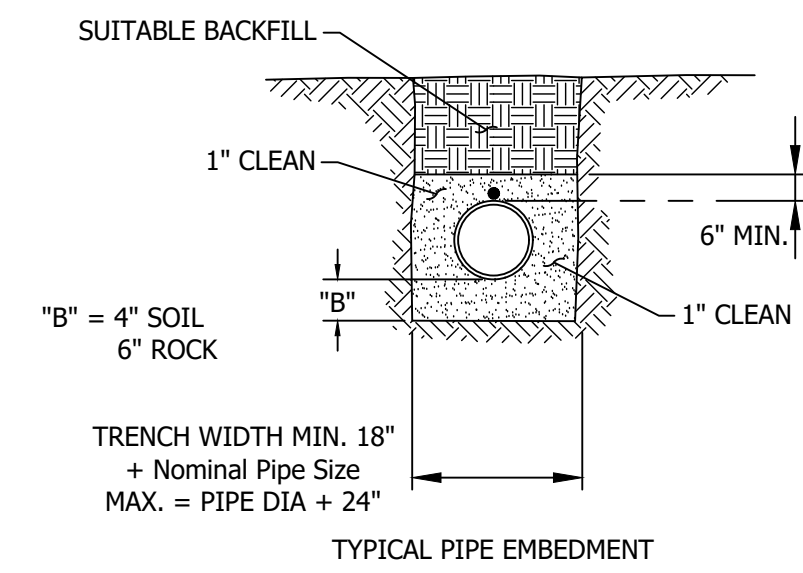
SHEET NUMBER:

C-111

17 of 31 SHEETS

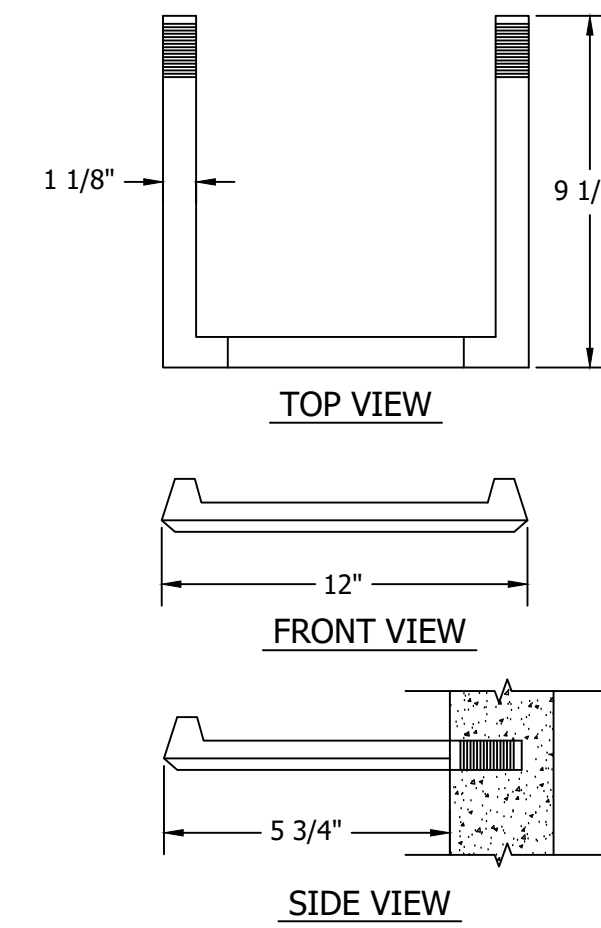
- LOCATOR WIRE NOTES:**
- LOCATOR WIRE TO BE 12 GAUGE, SOLID COPPER WIRE WITH GREEN PE-45 INSULATION.
 - DUCT TAPE LOCATOR WIRE TO TOP OF PIPE ON EACH SIDE OF BELL AND ONE IN THE MIDDLE OF THE PIPE.
 - THE LOCATOR WIRE SHALL BE EXTENDED INTO AND BE ACCESSIBLE AT STRUCTURES; MANHOLES, WET WELL, VALVE VAULT AND AIR RELEASE VALVES. THERE SHALL BE NO MORE THAN ONE SPLICE BETWEEN ACCESS POINTS. DO NOT WRAP WIRE AROUND BOLTS, NUTS, ETC.
 - SPLICE LOCATOR WIRE USING SPLICING KIT 3M DBRY. DUCT TAPE LOCATOR WIRE TO PIPE ON EACH END OF THE SPLICE.
 - UNDERGROUND WARNING TAPE (DIG TAPE) SHALL BE INSTALLED 24" ABOVE ALL FORCE MAIN AND PIPE BETWEEN THE TANKS. TAPE SHALL BE DETECTABLE AND GREEN IN COLOR.
 - CONTRACTOR SHALL CONDUCT TRACER WIRE CONTINUITY TEST WITH OWNERS REPRESENTATIVE PRESENT. LOCATOR WIRE INSTALLATION AND CONTINUITY SHALL BE WARRANTED UNDER THE SAME 1 YEAR PIPE AND WORKMANSHIP WARRANTY.

1 LOCATOR WIRE/WARNING TAPE NOTES
NOT TO SCALE

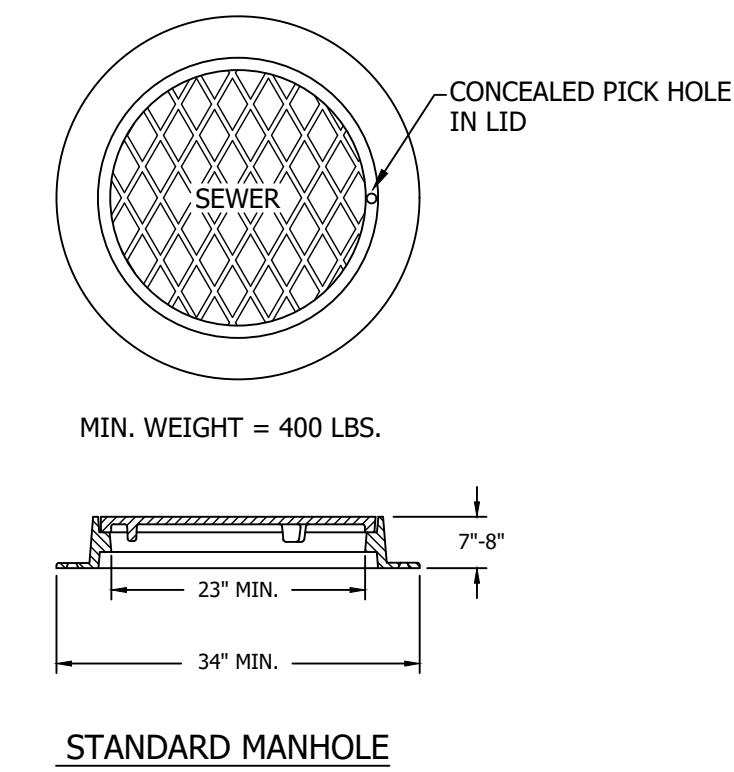


- GENERAL TRENCHING NOTES:**
- SUITABLE BACKFILL MATERIAL SHALL BE FREE OF LARGE ROCK (1" OR LARGER), MUCK AND DEBRIS.
 - SUITABLE MATERIAL MAY HAVE TO BE HAULED TO THE SITE WHEN ENCOUNTERING ROCK EXCAVATION. EXCAVATED ROCK WILL NOT BE ALLOWED BACK IN THE TRENCH WITHIN 3' OF THE TOP OF PIPE.
 - PIPE SHALL BE FULLY SUPPORTED FOR ITS ENTIRE LENGTH WITH APPROPRIATE COMPACTION UNDER THE PIPE HAUNCHES.
 - FINAL GRADING SHALL INCLUDE RAKE AND REMOVE ROCKS, SEED, MULCH AND FERTILIZE ALL DISTURBED AREAS; ALSO HAUL-IN AND SPREAD 2" OF SCREENED AND PULVERIZED TOPSOIL ON ALL DISTURBED AREAS AFTER RAKING AND PRIOR TO SEEDING.

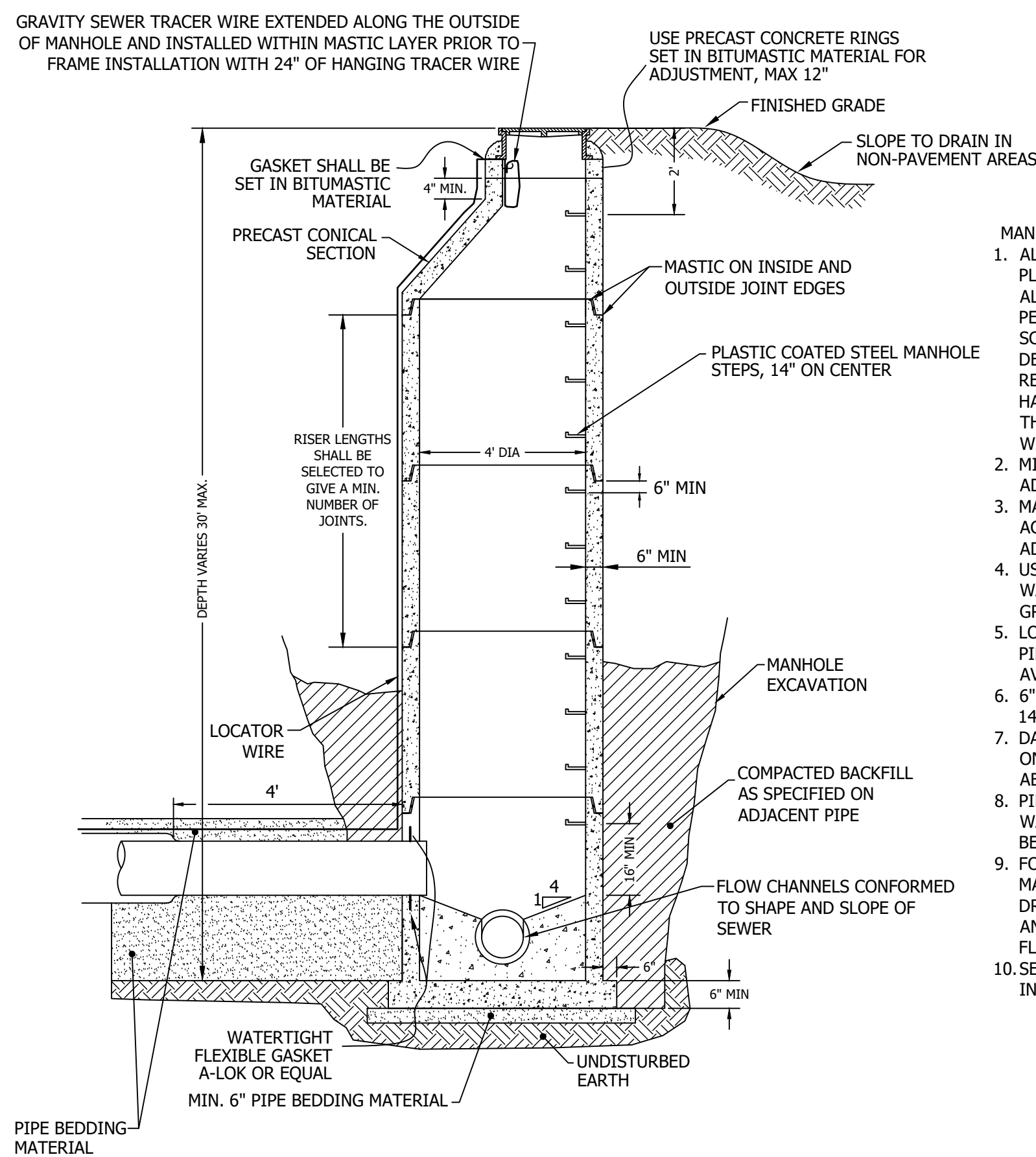
2 GRAVITY SEWER TRENCH DETAILS
NOT TO SCALE



3 MANHOLE STEP DETAIL
NOT TO SCALE

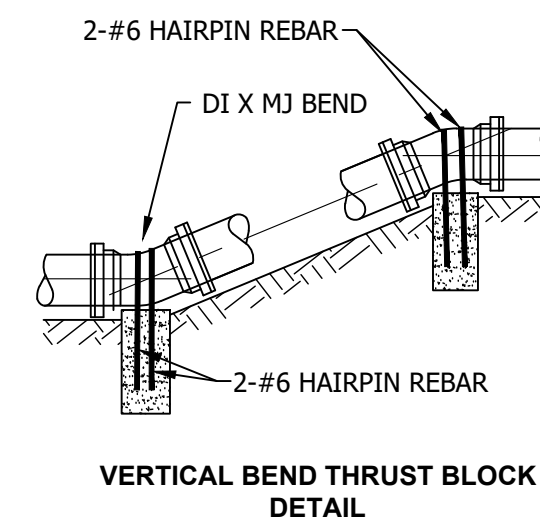


4 FRAME AND LID
NOT TO SCALE

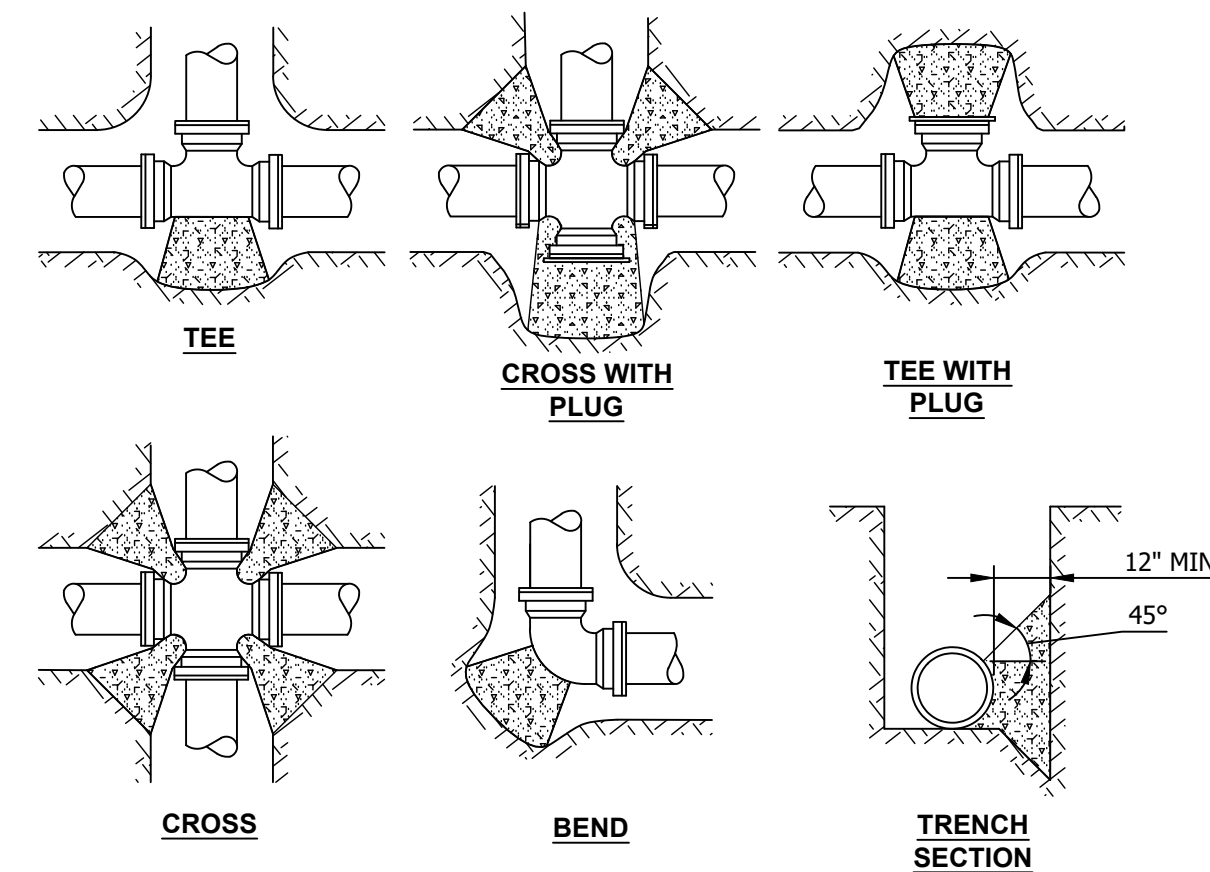


5 STANDARD MANHOLE DETAIL
NOT TO SCALE

- MANHOLE NOTES**
- ALL REQUIRED PIPE OPENINGS SHALL BE PLANT CAST IN M.H. UNITS. FIELD ALTERATIONS OF OPENINGS WILL BE PERMITTED, PROVIDED WALLS ARE SCORED WITH A MASONRY SAW TO A DEPTH SUFFICIENT TO SEVER REINFORCING STEEL. A CHIPPING HAMMER MAY THEN BE USED TO REMOVE THE CONCRETE. GROUT PIPES INTO PLACE WITH EXPANSIVE GROUT.
 - MINIMUM DISTANCE BETWEEN ANY 2 ADJACENT PIPES SHALL BE 4".
 - MANHOLE TOP ADJUSTMENT SHALL BE ACCOMPLISHED BY THE USE OF CONCRETE ADJUSTING RINGS.
 - USE Z-LOK OR EQUAL IN LIEU OF A-LOK WATER TIGHT FLEXIBLE GASKET FOR PIPE GRADES GREATER THAN 15°.
 - LOCATE MANHOLE STEPS FROM EFFLUENT PIPE OR ON LARGEST CLEAR WALL TO AVOID LOCATING STEPS OVER PIPE.
 - 6" BASE UP TO 14" DEPTH, 8" BASE OVER 14" DEPTH.
 - DAMP PROOF COATING (CONSEAL CS-55) ON EXTERIOR OF MANHOLE. NO COATING ABOVE GRADE.
 - PIPE MAY PROJECT 1" MAX PAST INSIDE WALL OF MANHOLE, BUT NO CONTACT BETWEEN PIPE AND INVERT.
 - FOR CONNECTIONS TO EXISTING MANHOLES, CONTRACTOR SHALL CORE DRILL TO MATCH FLOWLINE ELEVATIONS AND INSTALL Z-LOK OR APPROVED FLEXIBLE GASKET.
 - SEE LOCATOR WIRE DETAIL FOR MORE INFORMATION.



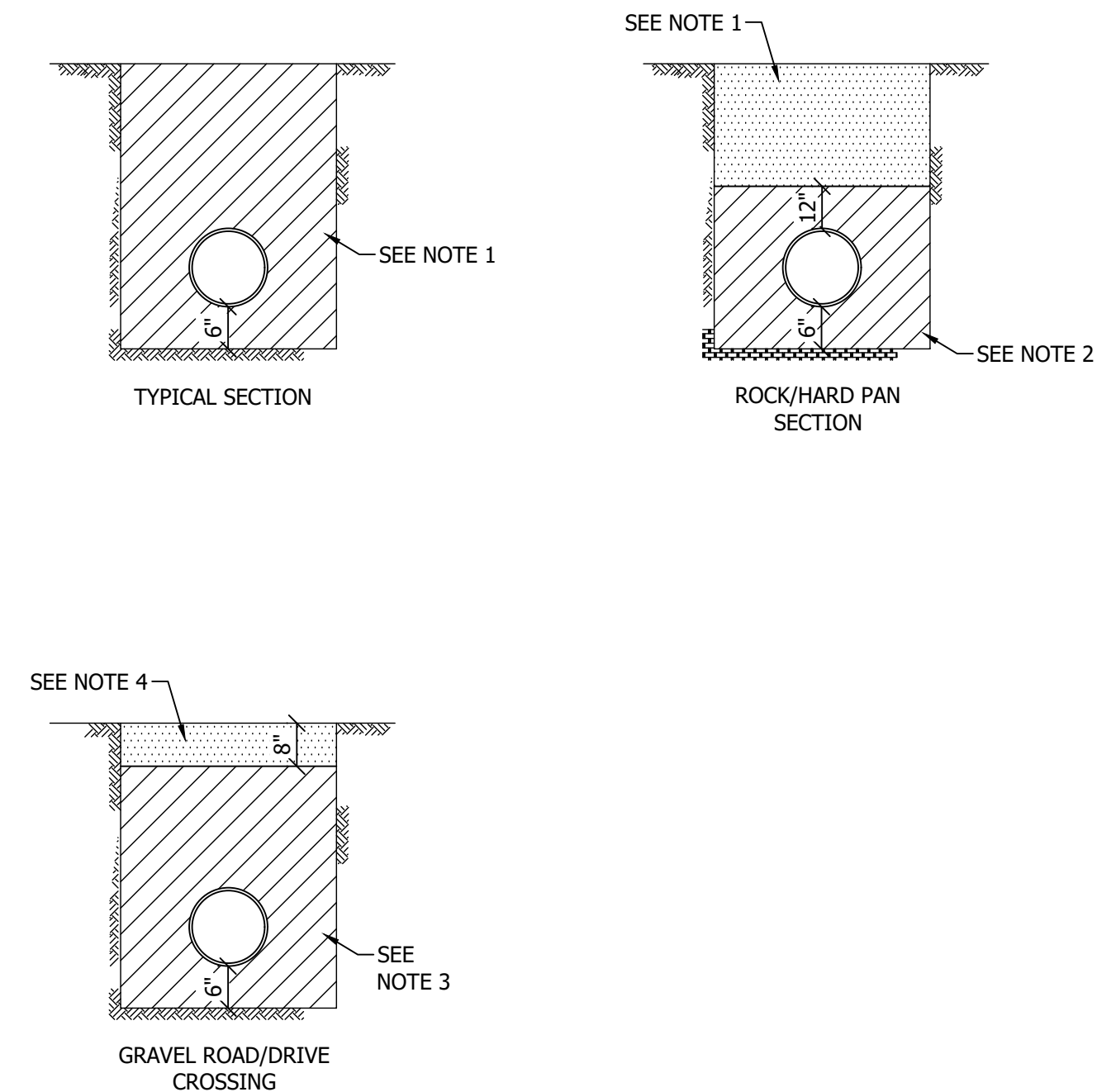
PIPE SIZE	Minimum Volume of Concrete (Cu. Ft.)			
	11k*	22 1/2*	45*	90*
≤4	4.0	8.0	14.5	20.0
6	9.0	17.5	32.0	45.0
8	16.0	31.0	57.0	80.5
10	24.5	48.0	89.0	126.0
12	35.5	69.5	128.0	181.0



PIPE SIZE	Minimum Bearing Area (Sq Ft) by Bend					
	11k*	22 1/2*	45*	90*	Tee / Cap	Cross*
≤4	1.0	1.0	1.2	2.1	1.6	2.1
6	1.0	1.3	2.6	4.8	3.8	4.8
8	1.2	2.4	4.6	8.5	7.0	8.5
10	1.9	3.7	7.2	13.3	10.6	13.3
12	2.7	5.3	10.4	19.2	16.0	19.2
16	4.7	9.4	18.5	34.1	16.0	34.1
20	7.4	14.7	28.9	53.3	16.0	53.3

- NOTES:**
- THRUST BLOCKS SHALL BE FORMED AND POURED AGAINST UNDISTURBED SOIL. KEEP "T" BOLTS CLEAR OF CONCRETE, WRAPPED IN 8 MIL VINYL PLASTIC PROTECTOR.
 - THICKNESS BETWEEN FITTING AND SOIL SHALL BE A MINIMUM OF 12".
 - CONCRETE SHALL HAVE 3000 PSI MINIMUM COMPRESSIVE STRENGTH.
 - PLUGS SHALL BE WRAPPED WITH 8 MIL VISQUEEN AND BOARD PLACED IN FRONT.
 - ALL FITTINGS SHALL HAVE CONCRETE THRUST BLOCKS AND MJ JOINT RESTRAINTS.

6 THRUST BLOCK DETAIL
NOT TO SCALE

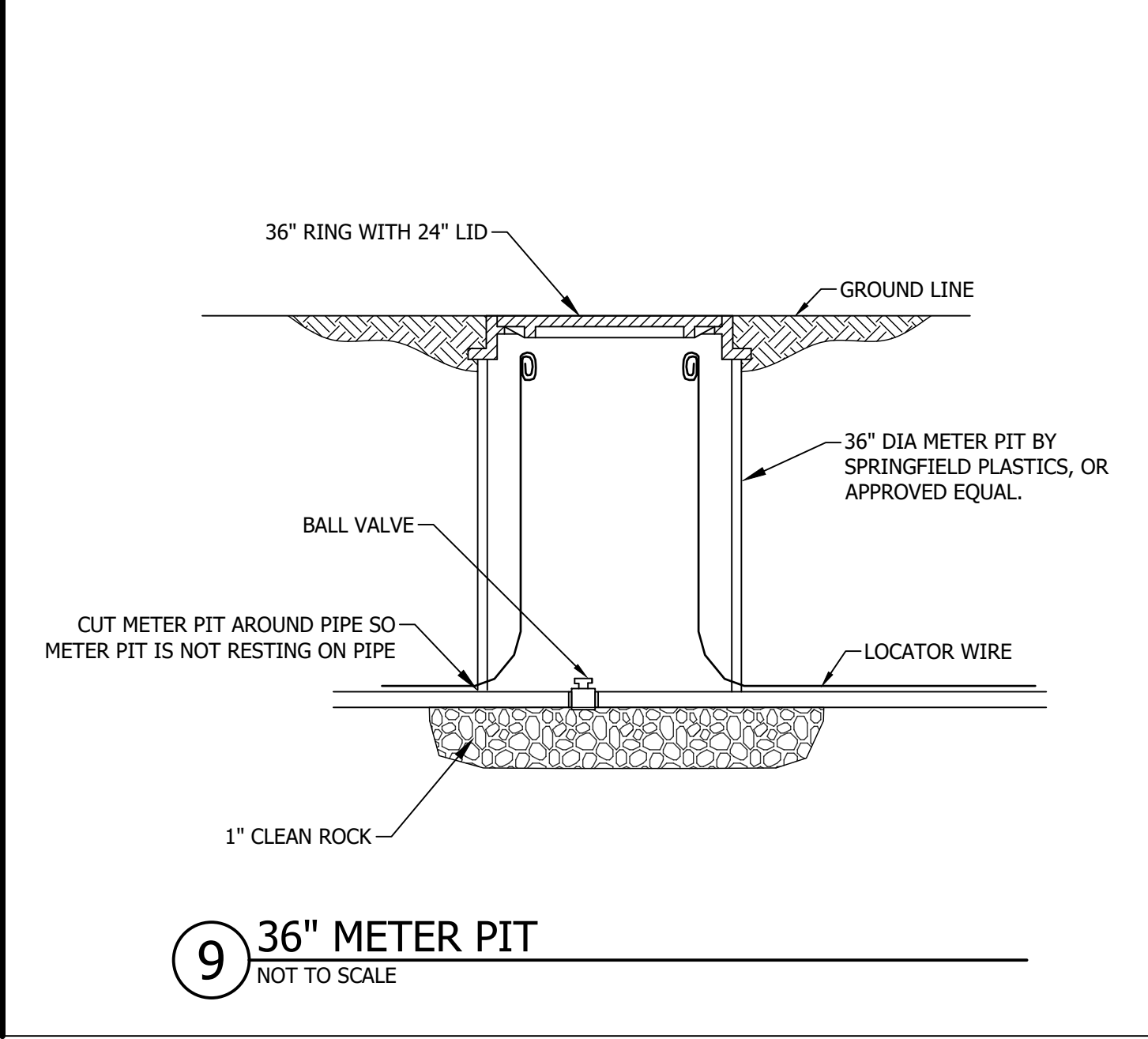
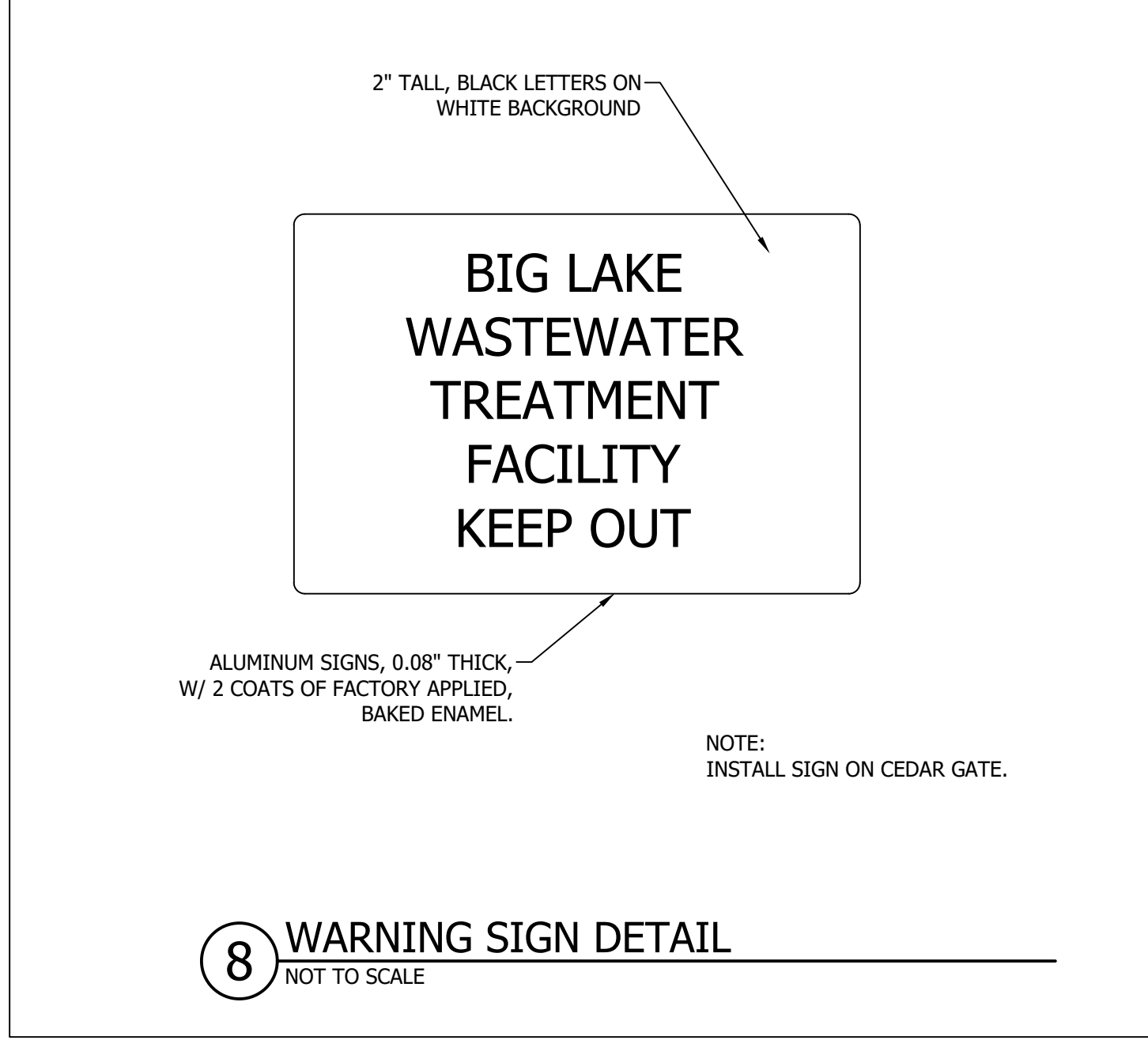
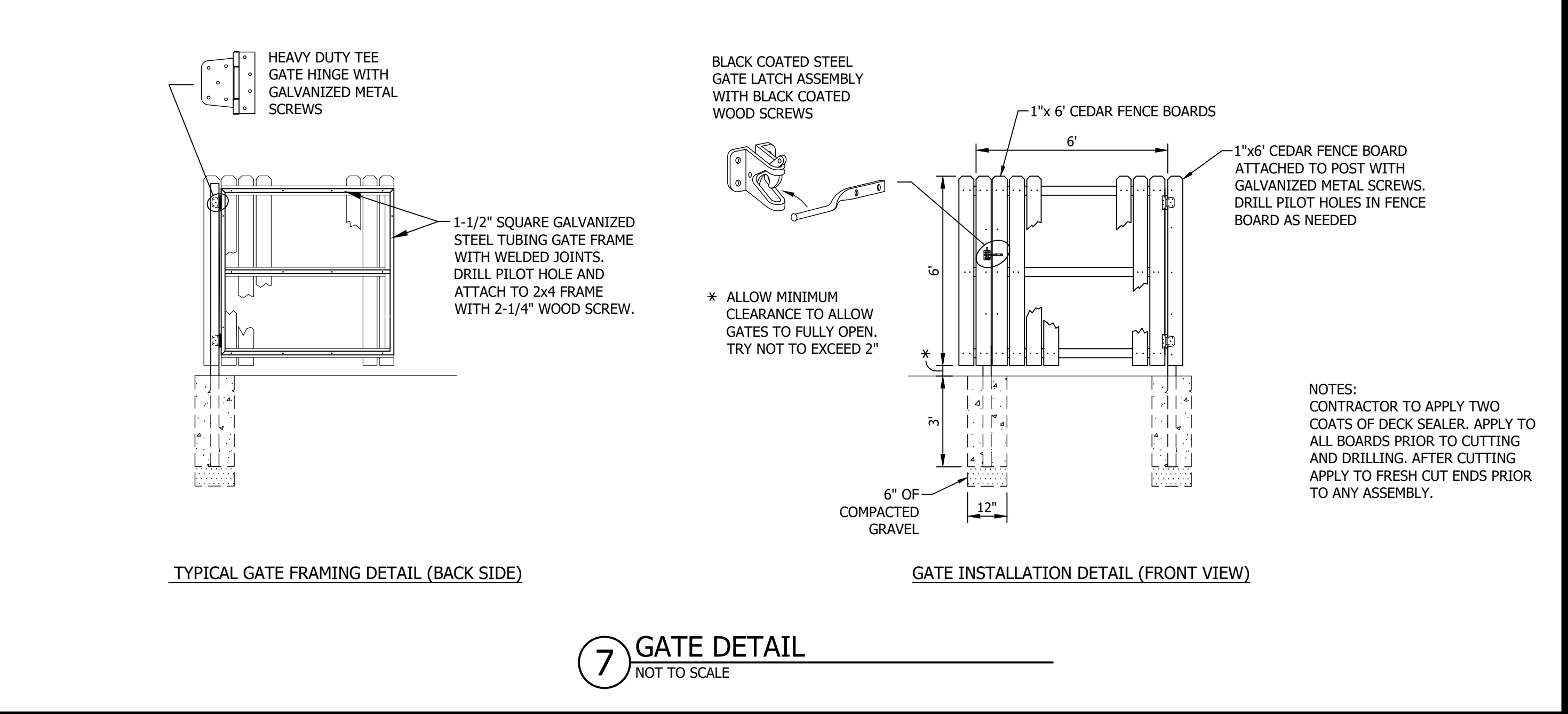
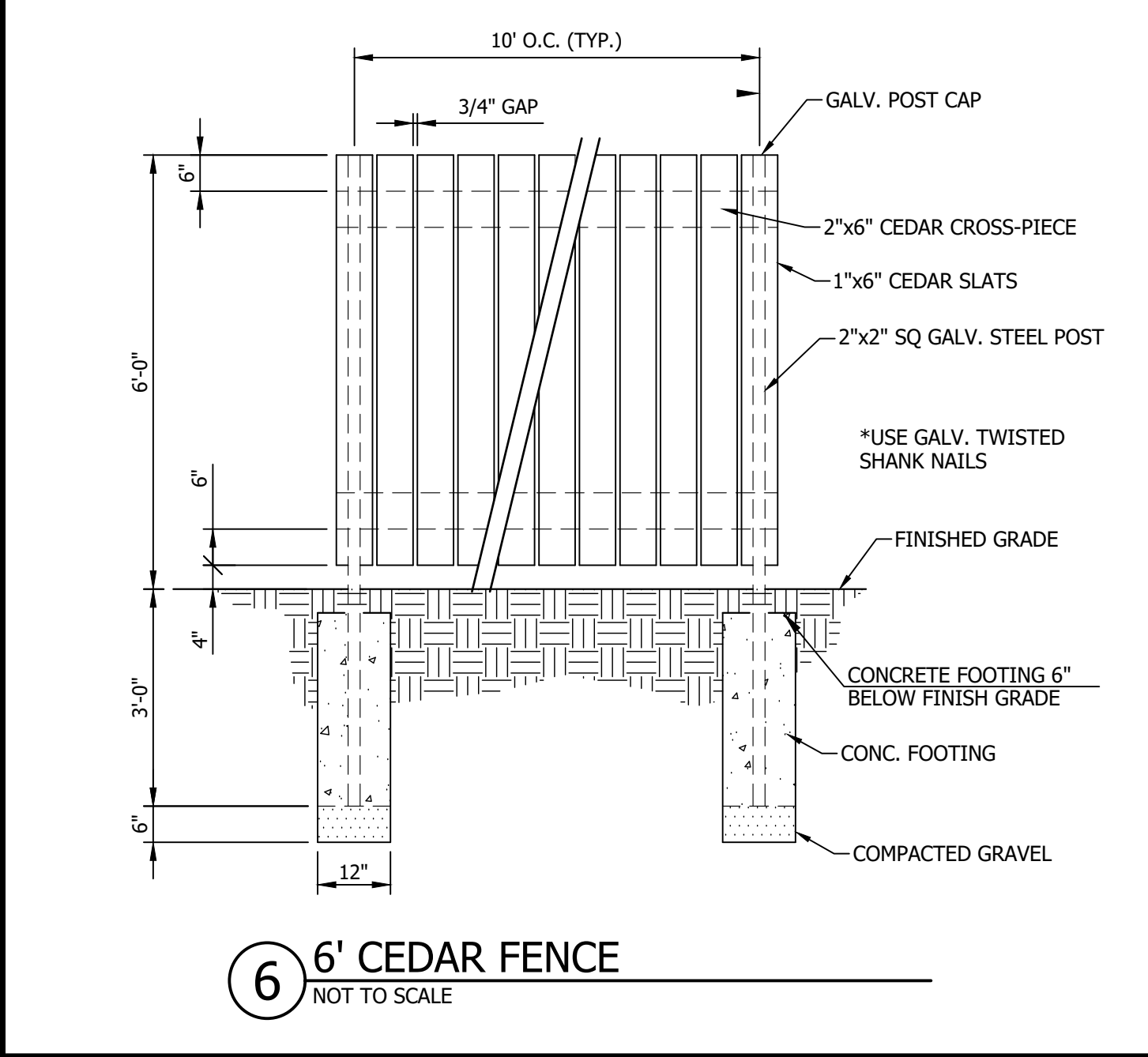
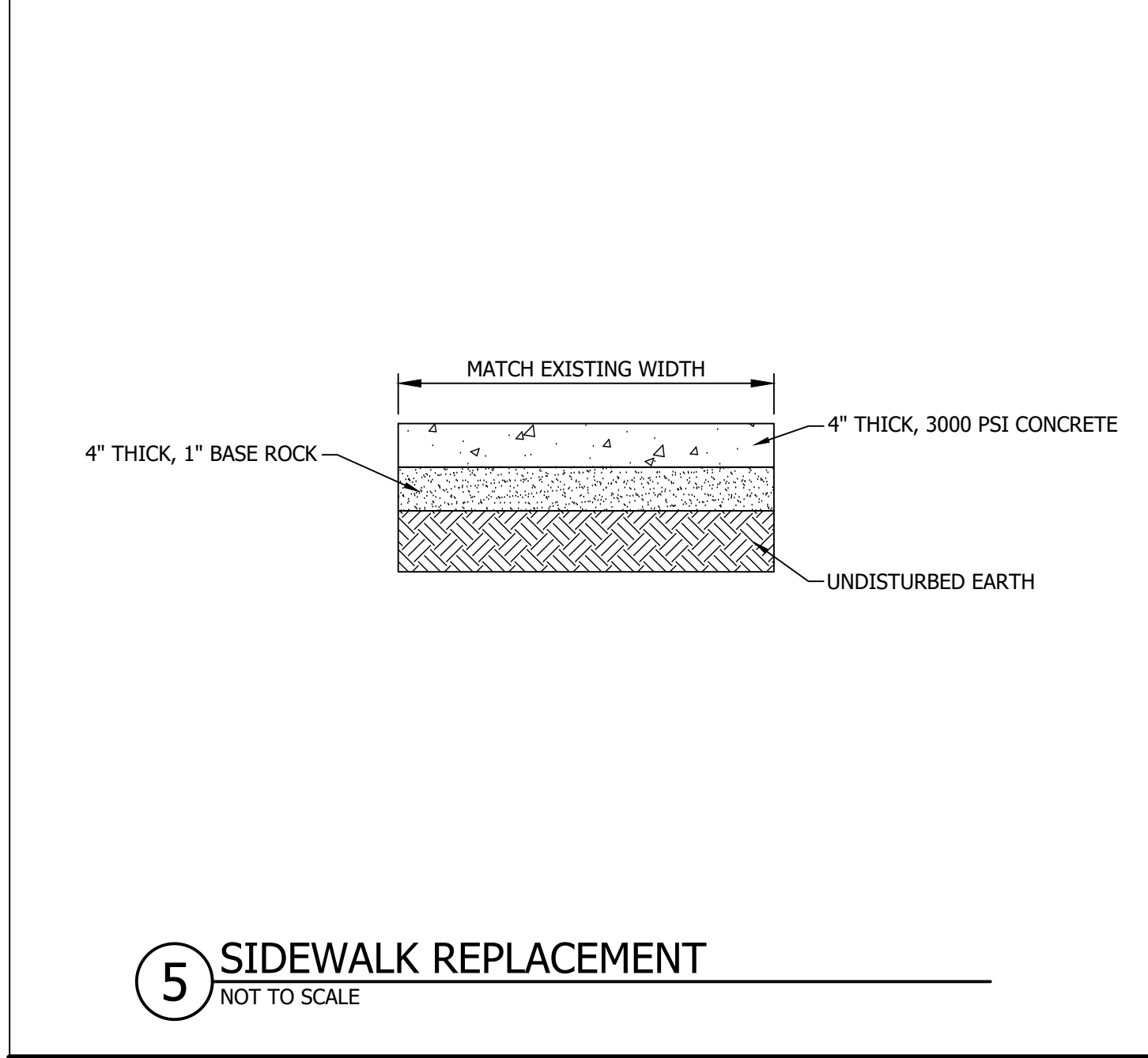
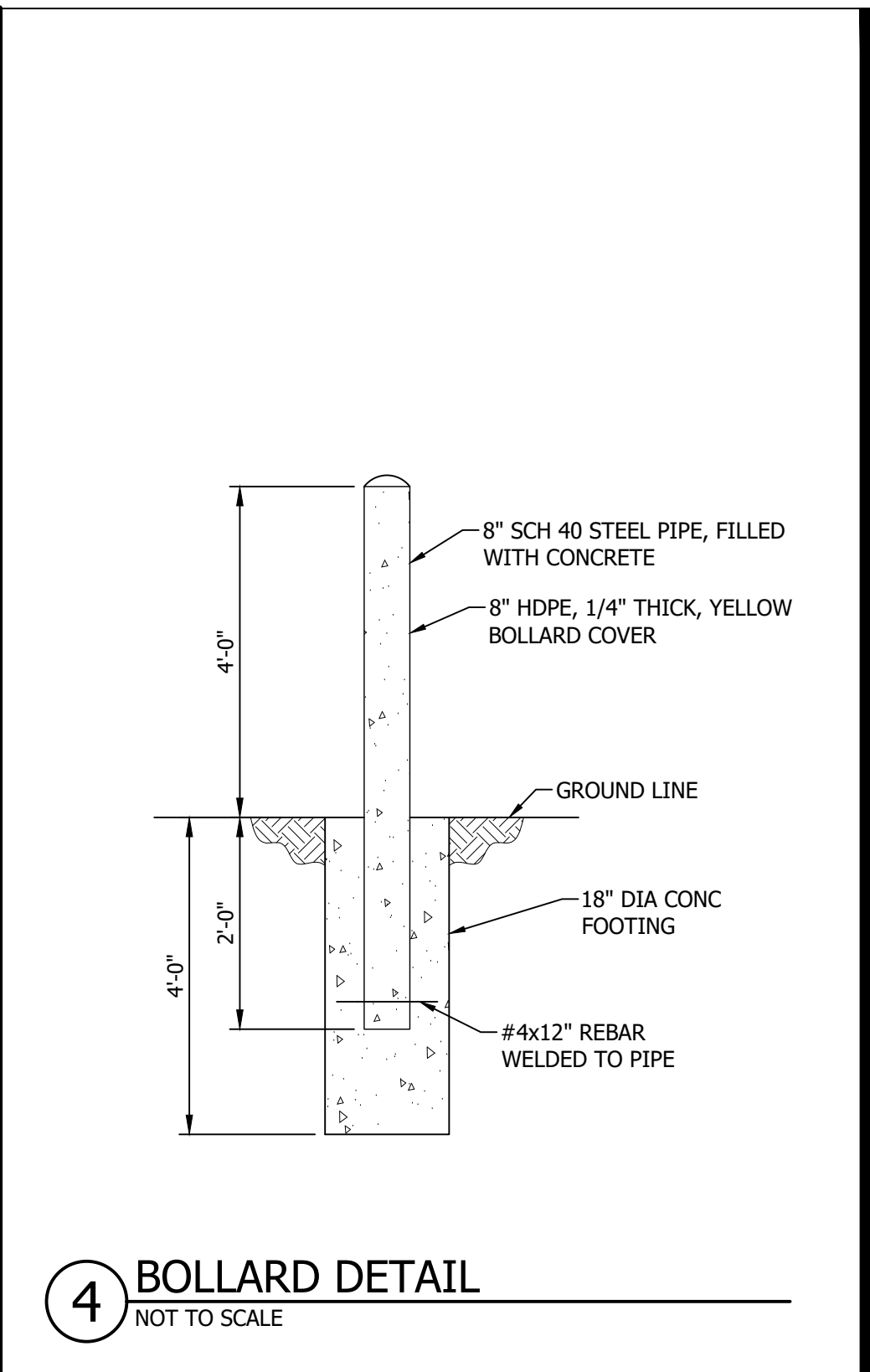
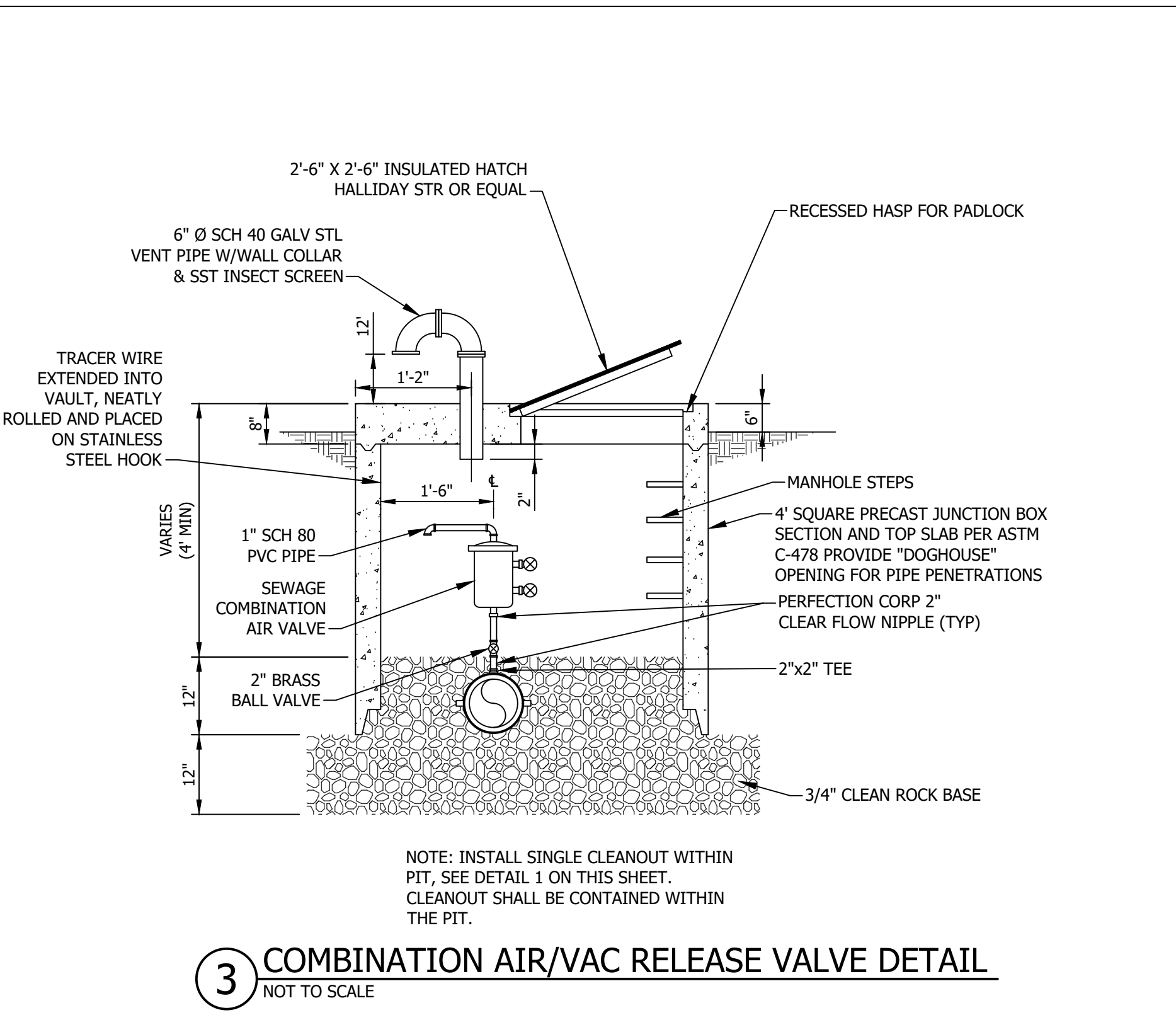
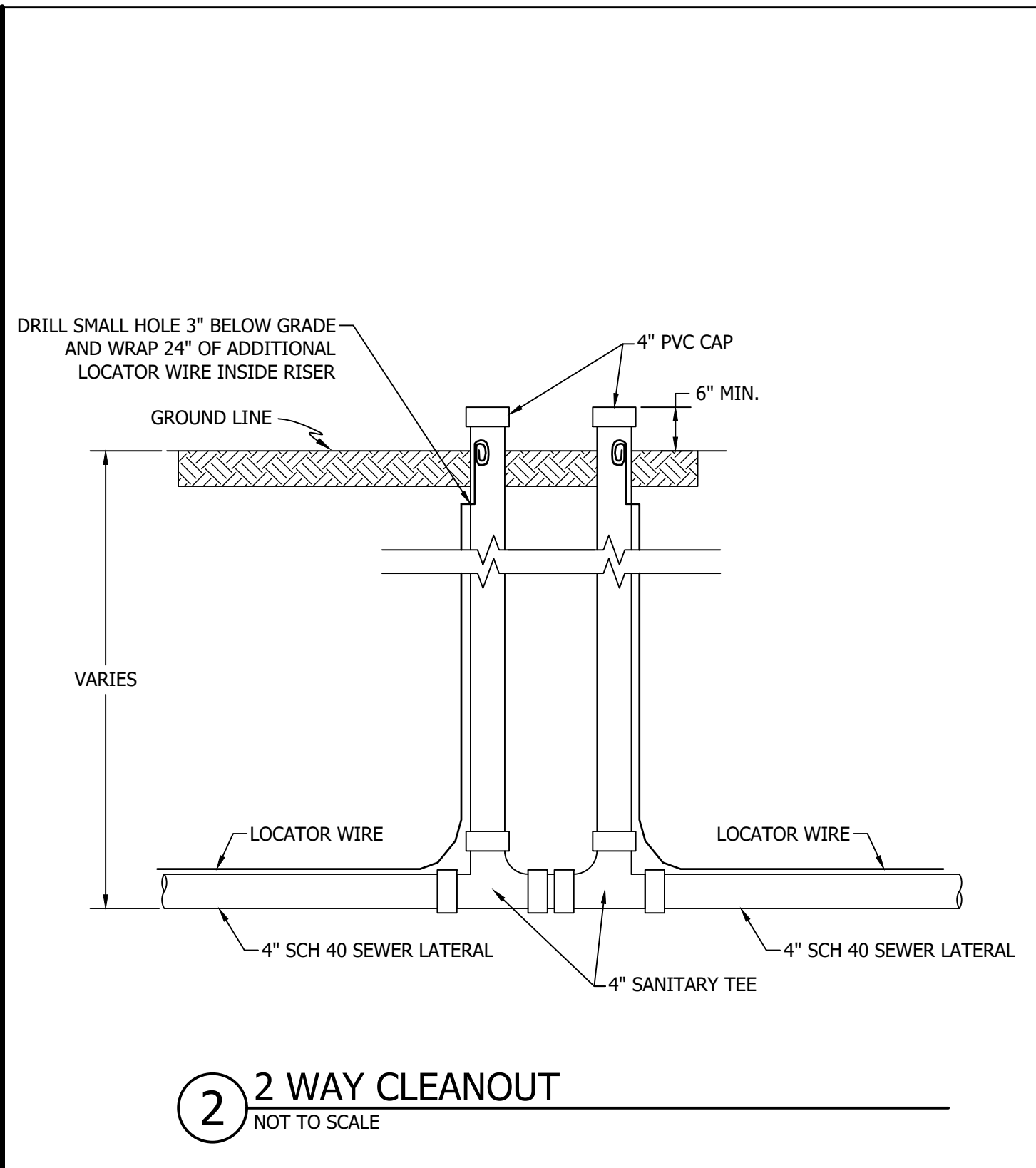
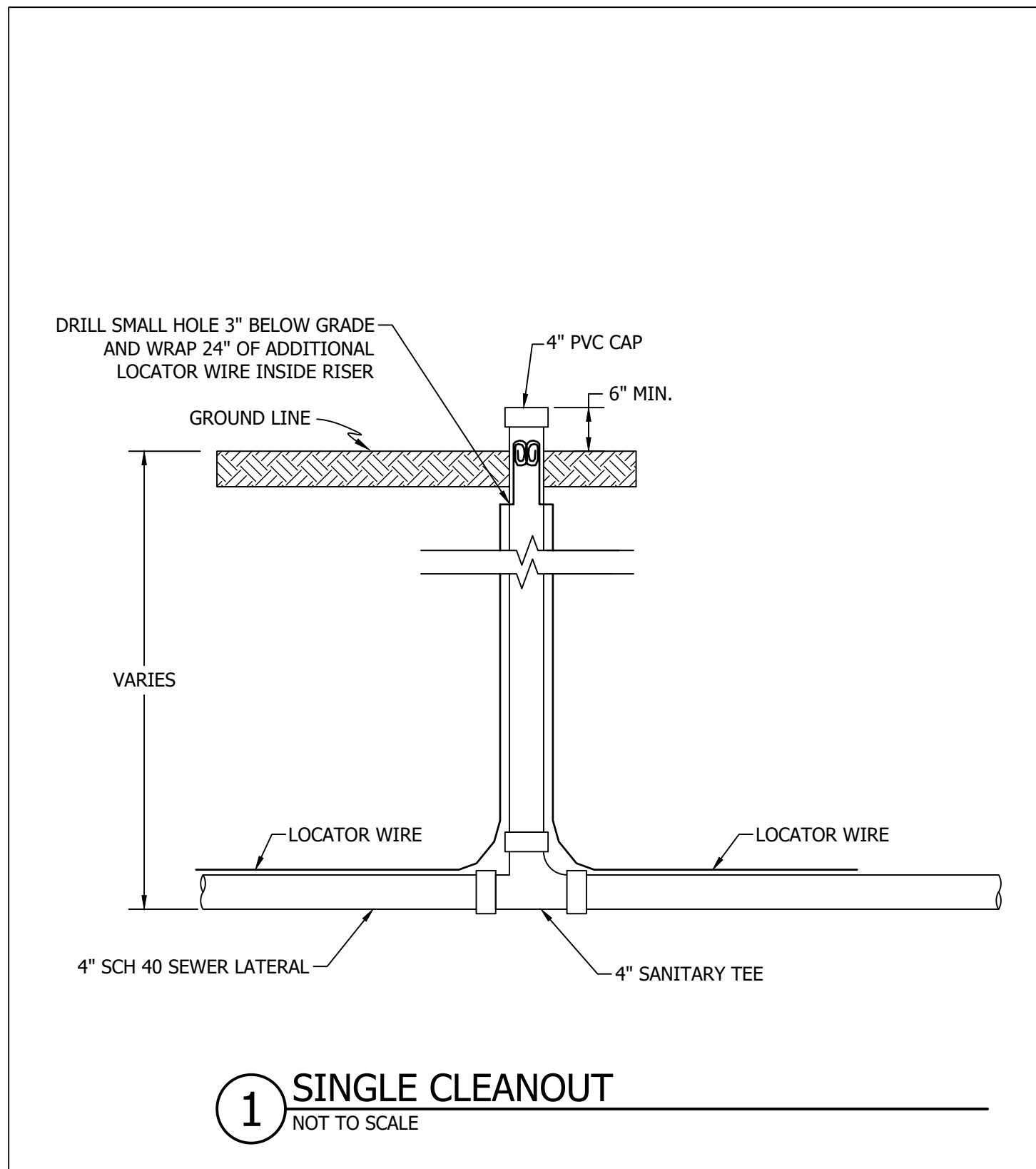


- BEDDING & BACKFILL NOTES:**
- SUITABLE EARTH EXCAVATED MATERIAL FREE FROM DEBRIS, MUCK, MUD BALLS, ROCK, AND HARD OBJECTS LARGER THAN 2" DIA
 - SAND OR LIMESTONE SCREENINGS, MAX 1/4" SIZE
 - 1" MINUS BASE ROCK COMPACTED TO 95% COMPACTION, 6" MAX LIFTS.
 - 1" ROAD ROCK

- GENERAL NOTES:**
- COVER OVER THE PIPE SHALL BE 42" UNLESS OTHERWISE SHOWN ON THE PLANS.
 - LOCATOR WIRE AND UNDERGROUND WARNING TAPE NOT SHOWN FOR CLARITY.
 - BEDDING MATERIAL SHALL BE TAMPED IN LAYERS UNDER THE PIPE HAUNCHES AND AROUND THE PIPE TO TOP OF PIPE TO PROVIDE A UNIFORM BEARING SURFACE.
 - BACKFILL UNDER PERMANENT PAVEMENT SHALL CONFORM TO SPECIFICATIONS.
 - DIRT CHECKS ARE REQUIRED FOR FORCE MAIN INSTALLATION ON SLOPED GROUND. SEE SPECIFICATIONS.
 - FINAL GRADING SHALL INCLUDE RAKE AND REMOVE ROCKS, SEED, MULCH AND FERTILIZE ALL DISTURBED AREAS; ALSO HAUL-IN AND SPREAD 2" OF SCREENED AND PULVERIZED TOPSOIL ON ALL DISTURBED AREAS AFTER RAKING AND PRIOR TO SEEDING.

7 FORCE MAIN TRENCH DETAILS
NOT TO SCALE

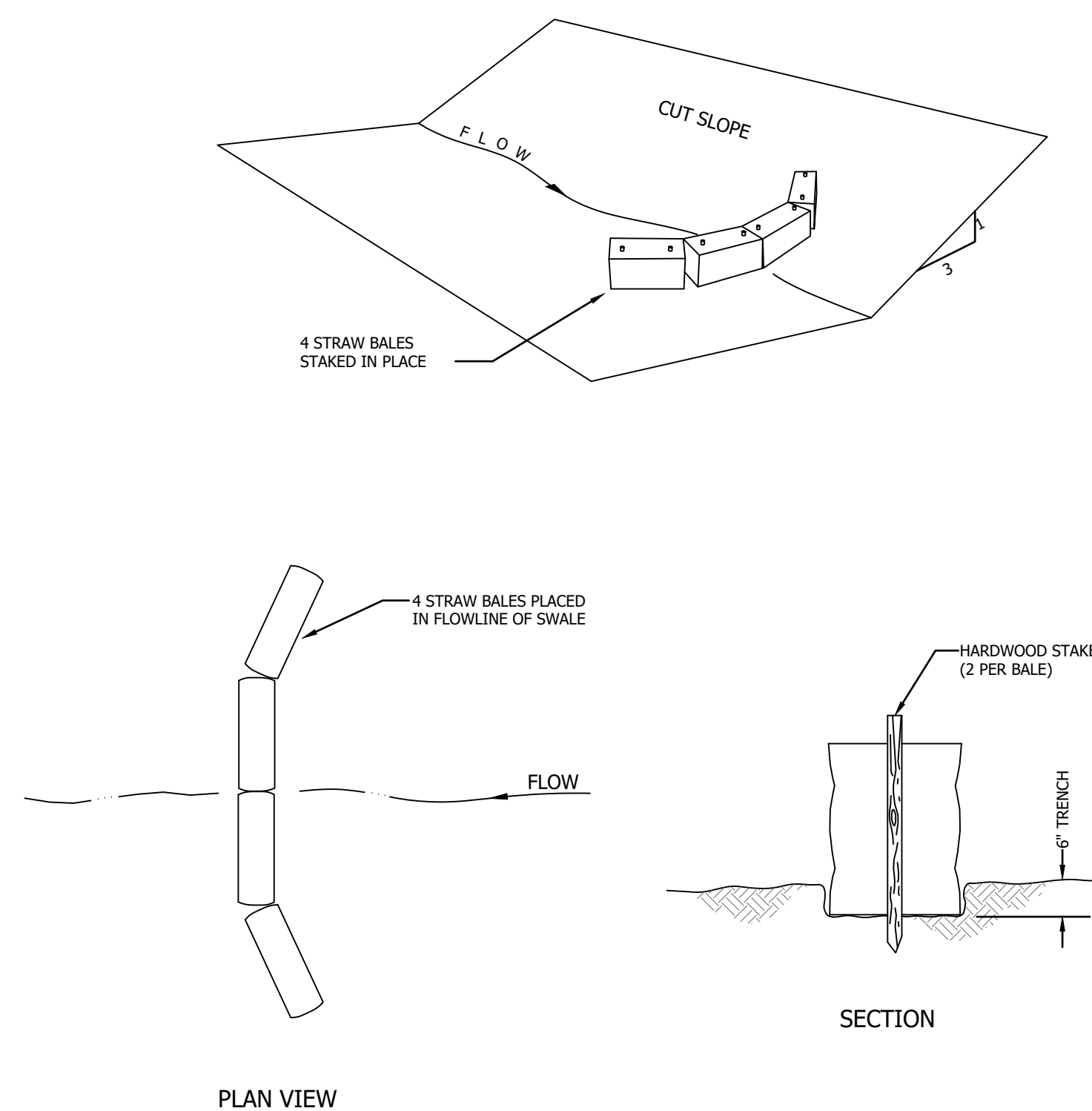




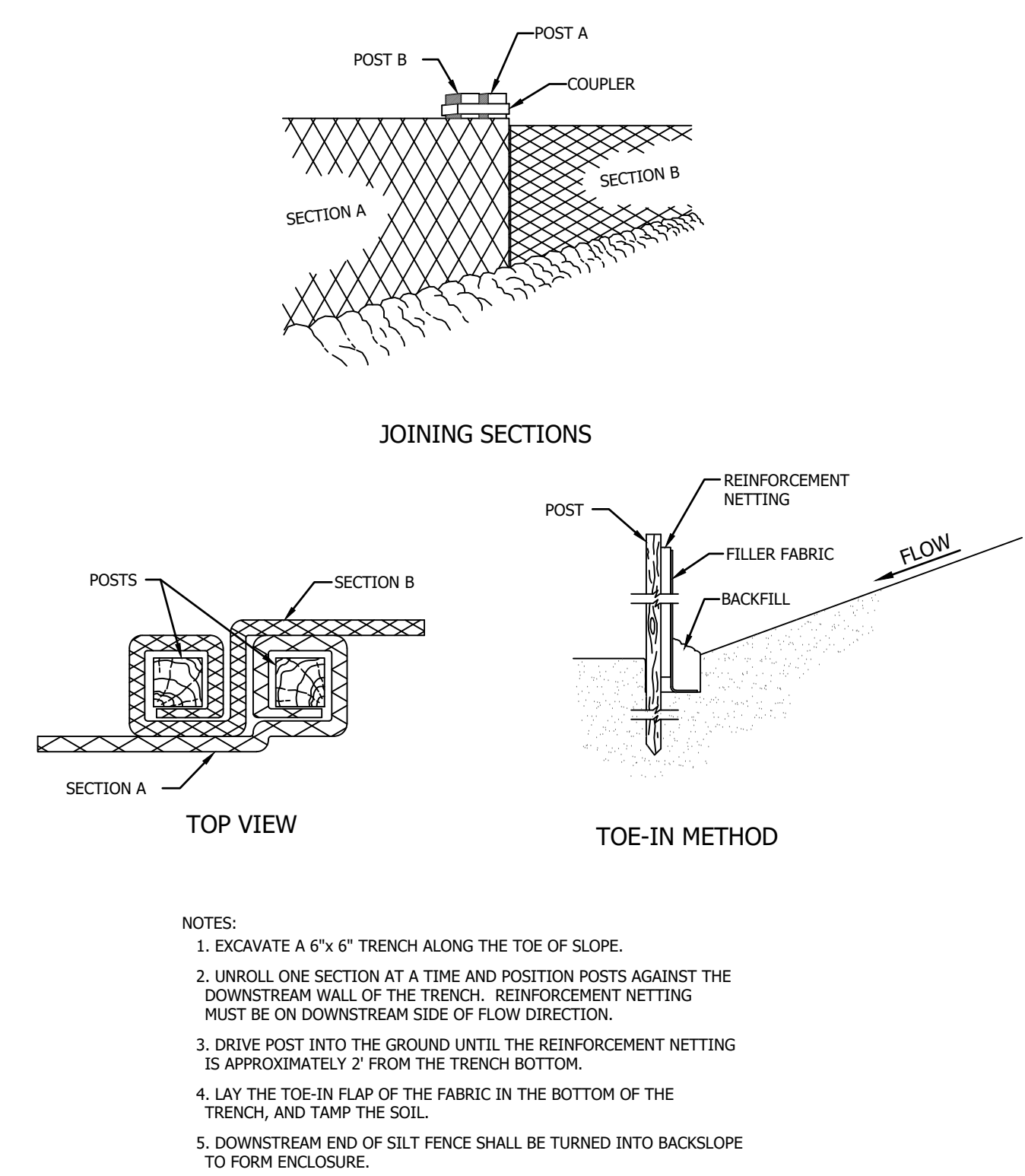
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DESIGNED BY: BAN
DRAWN BY: KAK
APPROVED BY: VAH

SHEET TITLE:
CIVIL DETAILS 2

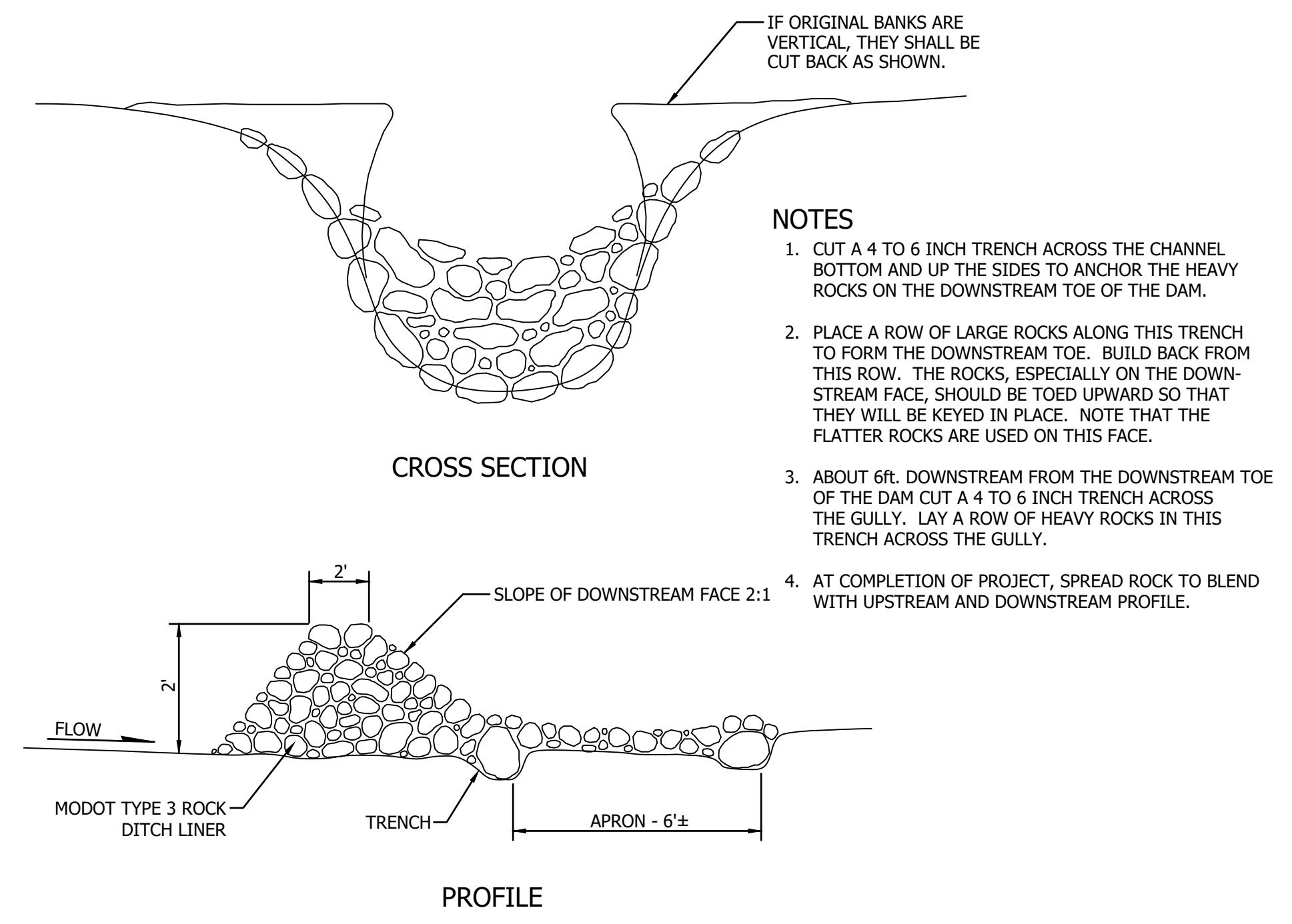


1 STRAW BALE CHECK DAM
NOT TO SCALE



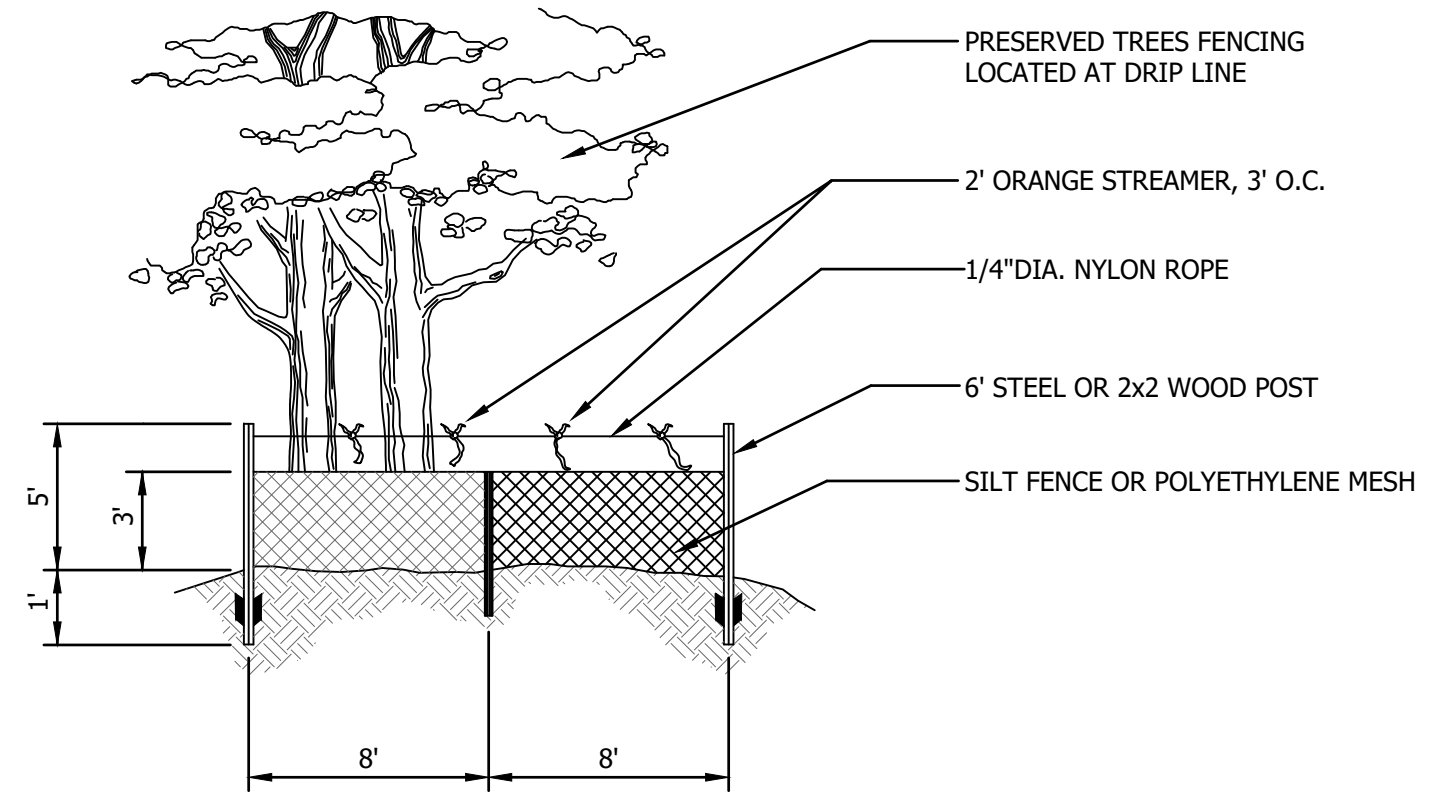
- NOTES:**
1. EXCAVATE A 6" x 6" TRENCH ALONG THE TOE OF SLOPE.
 2. UNROLL ONE SECTION AT A TIME AND POSITION POSTS AGAINST THE DOWNSTREAM WALL OF THE TRENCH. REINFORCEMENT NETTING MUST BE ON DOWNSTREAM SIDE OF FLOW DIRECTION.
 3. DRIVE POST INTO THE GROUND UNTIL THE REINFORCEMENT NETTING IS APPROXIMATELY 2' FROM THE TRENCH BOTTOM.
 4. LAY THE TOE-IN FLAP OF THE FABRIC IN THE BOTTOM OF THE TRENCH, AND TAMP THE SOIL.
 5. DOWNSTREAM END OF SILT FENCE SHALL BE TURNED INTO BACKSLOPE TO FORM ENCLOSURE.

2 SILT FENCE INSTALLATION
NOT TO SCALE



- NOTES**
1. CUT A 4 TO 6 INCH TRENCH ACROSS THE CHANNEL BOTTOM AND UP THE SIDES TO ANCHOR THE HEAVY ROCKS ON THE DOWNSTREAM TOE OF THE DAM.
 2. PLACE A ROW OF LARGE ROCKS ALONG THIS TRENCH TO FORM THE DOWNSTREAM TOE. BUILD BACK FROM THIS ROW. THE ROCKS, ESPECIALLY ON THE DOWNSTREAM FACE, SHOULD BE TOED UPWARD SO THAT THEY WILL BE KEED IN PLACE. NOTE THAT THE FLATTER ROCKS ARE USED ON THIS FACE.
 3. ABOUT 6ft. DOWNSTREAM FROM THE DOWNSTREAM TOE OF THE DAM CUT A 4 TO 6 INCH TRENCH ACROSS THE GULLY. LAY A ROW OF HEAVY ROCKS IN THIS TRENCH ACROSS THE GULLY.
 4. AT COMPLETION OF PROJECT, SPREAD ROCK TO BLEND WITH UPSTREAM AND DOWNSTREAM PROFILE.

3 ROCK CHECK DAM
NOT TO SCALE



4 TREE PROTECTION
NOT TO SCALE

GENERAL NOTES

- MDNR REQUIREMENTS**
1. SUBSTANCES REGULATED BY FEDERAL LAW UNDER THE RESOURCE CONSERVATION AND RECOVERY ACT (RCRA) OR THE COMPREHENSIVE ENVIRONMENTAL RESPONSE COMPENSATION AND LIABILITY ACT (CERCLA) WHICH ARE TRANSPORTED, STORED OR USED FOR MAINTENANCE, CLEANING OR REPAIRS SHALL BE MANAGED ACCORDING TO THE PROVISIONS OF RCRA AND CERCLA.
 2. ALL PAINTS, SOLVENTS, PETROLEUM PRODUCTS AND PETROLEUM WASTE PRODUCTS (EXPECT FUELS) AND STORAGE CONTAINERS (SUCH AS DRUMS, CANS OR CARTONS) SHALL BE STORED SO THAT THESE MATERIALS ARE NOT EXPOSED TO STORM WATER. SUFFICIENT PRACTICES OF SPILL PREVENTION, CONTROL AND/OR MANAGEMENT SHALL BE PROVIDED TO PREVENT ANY SPILLS OF THESE POLLUTANTS FROM ENTERING THE WATERS OF THE STATE. ANY CONTAINMENT SYSTEM USED TO IMPLEMENT THIS REQUIREMENT SHALL BE CONSTRUCTED OF MATERIALS COMPATIBLE WITH THE SUBSTANCES CONTAINED AND SHALL ALSO PREVENT THE CONTAMINATION OF GROUNDWATER.
 3. THE CONTRACTOR SHALL NOTIFY BY TELEPHONE AND IN WRITING THE DEPARTMENT OF NATURAL RESOURCES, WATER POLLUTION CONTROL PROGRAM, POST OFFICE BOX 176, JEFFERSON CITY, MO 65102, 1-800-361-4827, OF ANY OIL SPILLS OR IF HAZARDOUS SUBSTANCES ARE FOUND DURING THE PROSECUTION OF WORK.
- EROSION CONTROL PHASING**
1. CONTRACTOR MAY BEGIN CONSTRUCTION ACTIVITIES AS SOON AS THE EROSION CONTROL MEASURES ARE INSTALLED AND APPROVED BY THE OWNER.
 2. CONTRACTOR SHALL BUILD THE SILT FENCE SHOWN ON THE PLANS AND IN ACCORDANCE TO THE SWPPP AND SHALL TAKE CARE THAT ALL AREAS DISTURBED DURING CONSTRUCTION DRAIN TO THE FENCES INSTALLED.
 3. ALL EROSION CONTROL MEASURES SHALL REMAIN IN PLACE FOR THE DURATION OF THE CONSTRUCTION PROJECT. TEMPORARY EROSION CONTROL MEASURES, SUCH AS SILT FENCE AND STRAW BALES SHALL REMAIN IN PLACE UNTIL THE CONTRACTOR HAS SATISFIED THE PROJECT'S SEEDING BOND REQUIREMENTS.

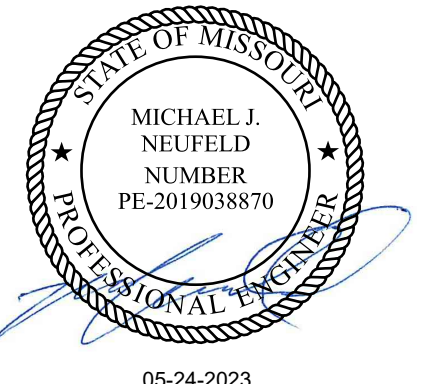


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DESIGNED BY: BAN
DRAWN BY: KAK
APPROVED BY: VAH

SHEET TITLE:
**EROSION
CONTROL DETAILS**

SHEET NUMBER:



OFFICE OF ADMINISTRATION
DIVISION OF FACILITIES
MANAGEMENT,
DESIGN AND CONSTRUCTION

DEPARTMENT OF
NATURAL RESOURCES,
DIVISION OF STATE PARKS

BIG LAKE STATE PARK
WASTEWATER TREATMENT
FACILITY IMPROVEMENTS

204 LAKE SHORE DRIVE
CRAIG, MO 64437

PROJECT # X2211-01
SITE # 5105
ASSET # 7815105016

REVISION: _____
DATE: _____
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DATE: _____
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S-001.dwg
DESIGNED BY: MJN
DRAWN BY: JRW
APPROVED BY: VAH

SHEET TITLE:

STRUCTURAL
GENERAL NOTES

SHEET NUMBER:

S-001

21 of 31 SHEETS

STRUCTURAL GENERAL NOTES

A. CAST-IN-PLACE CONCRETE

- ALL STRUCTURAL CONCRETE HAS BEEN DESIGNED IN ACCORDANCE WITH THE ACI 318 AND THE BUILDING CODE, AND IN CONFORMANCE WITH THE CURRENT "ACI MANUAL OF CONCRETE PRACTICE."
- THE CONCRETE REQUIREMENTS ARE:
 - CEMENT SHALL BE TYPE I OR II CONFORMING TO ASTM C150. FLY ASH CONFORMING TO ASTM C618 TYPE C OR F MAY BE USED TO REPLACE A MAXIMUM OF 20% OF THE CEMENT (BY WEIGHT).
 - FINE AND COARSE AGGREGATES FOR NORMAL WEIGHT CONCRETE SHALL CONFORM TO ASTM C33 AND MEET #67 GRADATION REQUIREMENTS. COARSE AGGREGATES SHALL BE NO LESS THAN 50% OF THE TOTAL AGGREGATE BY WEIGHT, UNLESS APPROVED BY THE ENGINEER PRIOR TO MIX DESIGN SUBMITTAL.
 - MIX REQUIREMENTS ARE:

LOCATION	MIN. 28 DAY FFC	MAX W/CM. RATIO	AIR ENT.
FOUNDATIONS	4500	0.45	6% +/- 1.5%
- SUBMITTALS
 - PRODUCT DATA FOR PROPRIETARY MATERIALS AND ITEMS, INCLUDING REINFORCEMENT AND FORMING ACCESSORIES, ADMIXTURES, PATCHING COMPOUNDS, WATERSTOPS, JOINT SYSTEMS, CURING COMPOUNDS, MISCELLANEOUS MATERIALS, AND OTHERS IF REQUESTED BY ENGINEER.
 - SHOP DRAWINGS FOR REINFORCEMENT DETAILING FABRICATING, BENDING, AND PLACING CONCRETE REINFORCEMENT. COMPLY WITH ACI 315 "MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE "STRUCTURES" SHOWING BAR SCHEDULES, STIRRUP SPACING, BENT BAR DIAGRAMS, AND ARRANGEMENT OF CONCRETE REINFORCEMENT. INCLUDE SPECIAL REINFORCING REQUIRED FOR OPENINGS THROUGH CONCRETE STRUCTURES.
 - THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DESIGN OF ALL FORMING, TEMPORARY BRACING AND SHORING.
 - NO ALUMINUM SHALL BE EMBEDDED IN CONCRETE.

B. STRUCTURAL STEEL

- STRUCTURAL STEEL SHALL MEET THE LATEST "CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES," AND HAS BEEN DESIGNED IN ACCORDANCE WITH THE BUILDING CODE AND AISC "MANUAL OF STEEL CONSTRUCTION, ALLOWABLE STRESS DESIGN, THIRTEENTH EDITION."
- ALL CONNECTIONS NOT DETAILED OR OTHERWISE NOTED SHALL BE DESIGNED BY THE FABRICATOR AND HIGHLIGHTED FOR THE ENGINEER OF RECORD'S REVIEW. CONNECTION DESIGN SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW BEARING THE SEAL AND SIGNATURE OF A PROFESSIONAL ENGINEER LICENSED IN THE STATE WHERE THE PROJECT IS LOCATED.
- STRUCTURAL STEEL SHALL MEET THE FOLLOWING REQUIREMENTS UNLESS NOTED OTHERWISE ON THE DRAWINGS:

TYPE	ASTM	GRADE
W & WT SHAPES	A992	-----
PLATES, CHANNELS & ANGLES	A36	-----
PIPE	A53	B TYPE E OR S
STRUCTURAL TUBING	A500	B
STRUCTURAL BOLTS	A325 OR A490	-----
ERECTION BOLTS	A307	-----
HEADED ANCHOR STUDS	A108	1015/1025
ANCHOR RODS (BOLTS)	A36	-----
- ALL BOLTED CONNECTIONS SHALL BE STANDARD AISC BEARING TYPE FRAMING CONNECTIONS USING 3/4" A325 BOLTS, UNLESS NOTED OTHERWISE, IN CONFORMANCE WITH THE AISC "SPECIFICATIONS FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS". BOLTS SHALL BE SNUG-TIGHTENED, UNLESS NOTED OTHERWISE.
- ALL WELDING SHALL BE IN ACCORDANCE WITH LATEST AWS CODE, SECTION D1.1. ALL WELDS SHALL USE E70XX WELD MATERIAL.
- STEEL FRAMING MEMBERS SHALL ONLY BE SPLICED AT LOCATIONS AS SHOWN ON THE DESIGN DRAWINGS OR AS SHOWN AND APPROVED ON THE SHOP DRAWINGS.
- NO OPENINGS SHALL BE FIELD-CUT IN THE FLANGE OR WEBS OF STEEL MEMBERS WITHOUT THE APPROVAL OF THE ENGINEER, UNLESS NOTED OR DETAILED OTHERWISE.
- GALVANIZED STRUCTURAL STEEL SHALL CONFORM TO ASTM A123 FOR MEMBERS AND ASTM A153 FOR CONNECTION ELEMENTS. REPAIR ANY DAMAGED GALVANIZING COATING IN ACCORDANCE WITH ASTM A780.

C. MISCELLANEOUS

- THE SPECIFICATIONS ARE PART OF THE CONSTRUCTION DOCUMENTS AND MUST BE USED IN CONJUNCTION WITH THE PLANS. WHERE CONFLICTS OCCUR, THE MOST STRINGENT REQUIREMENT SHALL CONTROL.
- DO NOT SCALE PLANS FOR THE PURPOSE OF ESTABLISHING DIMENSIONS.
- DETAILS LABELED "TYPICAL" ARE INTENDED TO REPRESENT A CONDITION THAT OCCURS AT SEVERAL LOCATIONS IN THE PLANS WHETHER OR NOT THE DETAIL WAS REFERENCED.
- THE STRUCTURAL PLANS REPRESENT THE STRUCTURE IN THE COMPLETED CONDITION. IT IS THE CONTRACTOR'S RESPONSIBILITY FOR THE MEANS AND METHODS OF CONSTRUCTING THE STRUCTURE. THE CONTRACTOR SHALL DESIGN AND PROVIDE ALL TEMPORARY SHORING OR BRACING REQUIRED TO SAFELY CONSTRUCT THE STRUCTURE AND PREVENT DAMAGE TO THE STRUCTURE DURING CONSTRUCTION.
- SLABS ON GRADE AND ELEVATED SLABS ARE NOT DESIGNED TO SUPPORT CRANES, FORKLIFTS, MANLIFTS, OR TRUCK TRAFFIC UNLESS NOTED AS SUCH. IT IS THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE IF CONSTRUCTION EQUIPMENT CAN BE SAFELY OPERATED ON SLABS ON GRADE AND ELEVATED SLABS AND TO REPAIR ANY DAMAGE SUCH EQUIPMENT MAY CAUSE.
- THE CONTRACTOR SHALL REVIEW AND APPROVE ALL SHOP DRAWINGS PRIOR TO SUBMITTAL, NOTING ALL CHANGES MADE THAT DO NOT COMPLY WITH THE CONSTRUCTION DOCUMENTS.
- ON EXISTING CONSTRUCTION, THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND ELEVATIONS THAT MAY AFFECT NEW WORK AND REPORT DISCREPANCIES TO THE ENGINEER. EXISTING ABANDONED ELEMENTS THAT INTERFERE WITH NEW CONSTRUCTION SHALL BE REMOVED.

- ON NEW CONSTRUCTION, THE CONTRACTOR SHALL VERIFY ALL ARCHITECTURAL, ELECTRICAL, AND MECHANICAL OPENINGS AND EQUIPMENT WEIGHTS PRIOR TO COMMENCING CONSTRUCTION.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR ATTACHING NON-STRUCTURAL ELEMENTS TO THE STRUCTURE TO RESIST ALL LOADS INCLUDING SEISMIC FORCES IN A WAY THAT DOES NOT OVERSTRESS STRUCTURAL MEMBERS. NON-STRUCTURAL ELEMENTS CAN BE FOUND IN THE ARCHITECTURAL, ELECTRICAL, OR MECHANICAL PLANS.
- WHEN THE CONTRACTOR OR HIS SUBCONTRACTOR(S) FAILS TO CONSTRUCT ANY PORTION OF THE STRUCTURE IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS, THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR THE REMEDIATION OF THE DEFECT AND ALL RELATED COSTS INCLUDING ENGINEERING SERVICES. WHEN A DEFECT IS FIRST IDENTIFIED, IT SHALL BE BROUGHT TO THE ENGINEER'S ATTENTION. THE ENGINEER MAY THEN REQUIRE THE CONTRACTOR TO MODIFY/REPLACE THE ELEMENT TO RECTIFY THE SITUATION, OR REQUIRE THE CONTRACTOR TO SUBMIT A RECOMMENDED REPAIR SEALED BY A LICENSED ENGINEER FOR APPROVAL.
- WHEN THE CONTRACTOR, SUB-CONTRACTOR, OR MATERIAL SUPPLIER PROVIDES A PIECE OF EQUIPMENT THAT IS DIFFERENT FROM THE EQUIPMENT THAT THE STRUCTURE IS DESIGNED FOR BY EITHER SIZE, WEIGHT, OR CONFIGURATION, THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH REMEDYING THE SITUATION. THOSE COSTS SHALL INCLUDE THE COSTS TO HIRE A LICENSED ENGINEER TO REDESIGN PORTIONS OF THE STRUCTURE OR THE COSTS OF THE ENGINEER OF RECORD TO REDESIGN PORTIONS OF THE STRUCTURE TO ACCOMMODATE THE SUBSTITUTED PIECE OF EQUIPMENT.

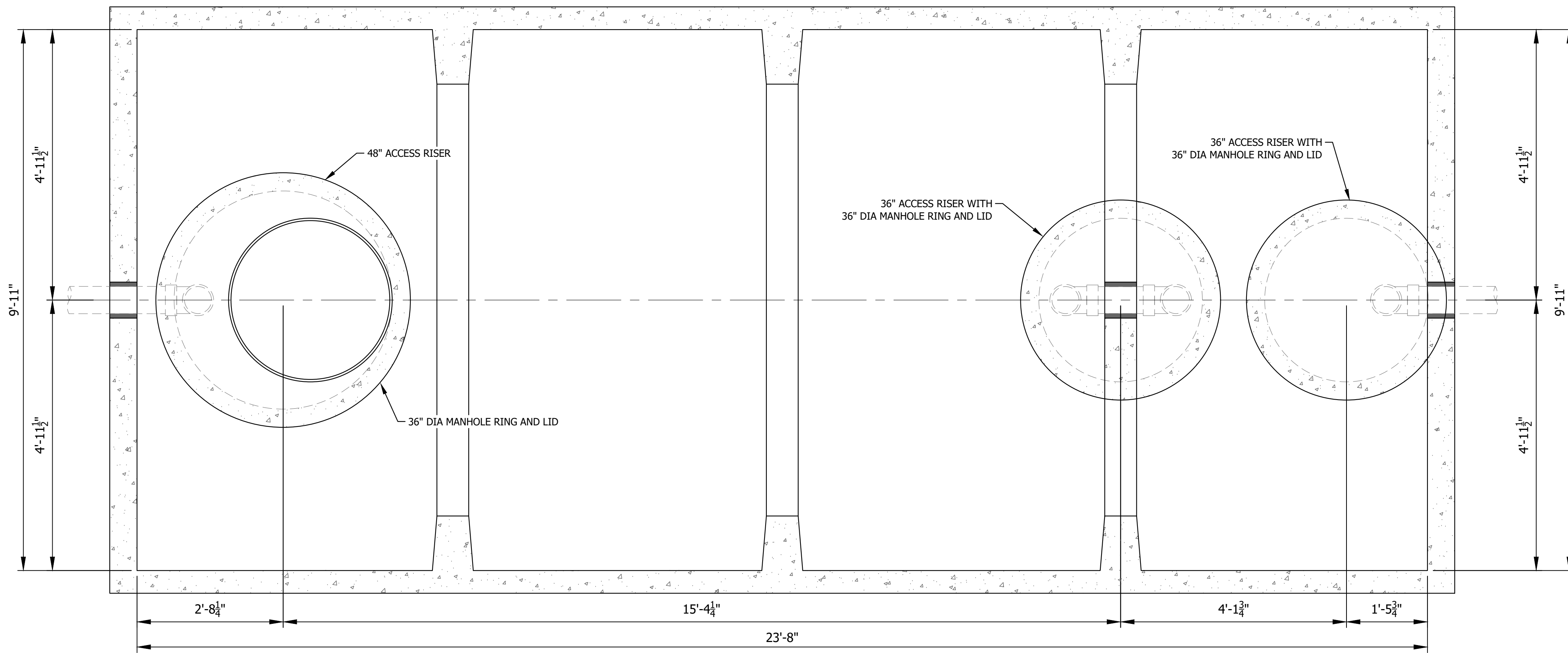
REINFORCEMENT TENSION LAPS, EMBEDMENT, AND HOOK LENGTHS					
BAR SIZE	CLASS "A" LAP (INCHES)		CLASS "B" LAP (INCHES)		HOOKS (INCHES)
	TOP BARS	OTHER BARS	TOP BARS	OTHER BARS	
#3	19	15	24	19	8
#4	25	19	32	25	10
#5	31	24	40	31	12
#6	37	29	48	37	15
#7	54	42	70	54	17
#8	62	48	80	62	19
#9	70	54	90	70	22
#10	77	60	100	77	24
#11	85	66	110	85	26

- NOTES:
- $f'_c = 4,000$ psi, $F_y = 60,000$ psi
 - LENGTHS SHOWN CONFORM TO NON-SEISMIC PROVISIONS OF ACI 318-14 FOR UNCOATED BARS ENCLOSED BY PROPERLY SPACED TIES OR STIRRUPS.
 - CLASS "A" LAPS APPLY WHEN BAR LAPS ARE STAGGERED TO LAP HALF THE BARS AT ONE LOCATION OR WHEN BARS ARE LAPPED AT THE LOCATION OF MINIMUM STRESS IN THE BARS.
 - CLASS "B" LAPS APPLY WHEN ALL BARS ARE LAPPED AT A LOCATION OF MAXIMUM STRESS IN THE BARS.
 - TOP BARS ARE HORIZONTAL BARS PLACED SO THAT MORE THAN 12" OF CONCRETE IS CAST BELOW THE REINFORCEMENT.
 - LAP AND EMBEDMENT LENGTHS HAVE THE SAME VALUES.
 - CLEAR SPACING OF REINFORCEMENT SHALL NOT BE LESS THAN 1" OR 1 BAR DIAMETER. IF THE CLEAR SPACING IS LESS THAN SPECIFIED, MULTIPLY THE ABOVE LENGTHS BY 1.5.
 - CLEAR COVER FOR REINFORCING SHALL NOT BE LESS THAN 1 BAR DIAMETER OR AS SPECIFIED IN SECTION 20.6 OF ACI 318-14. IF THE CLEAR COVER IS LESS THAN SPECIFIED, MULTIPLY THE ABOVE LENGTHS BY 1.5.
 - MULTIPLY THE ABOVE LENGTHS BY 1.3 FOR CONCRETE WITH LIGHTWEIGHT AGGREGATE.
 - MULTIPLY THE ABOVE LENGTHS BY 1.5 FOR EPOXY COATED REINFORCING.
 - FOR CONCRETE STRENGTHS OTHER THAN 4,000 PSI, MULTIPLY THE ABOVE LENGTHS BY $(4,000)^{1/2} / (f'_c)^{1/2}$.

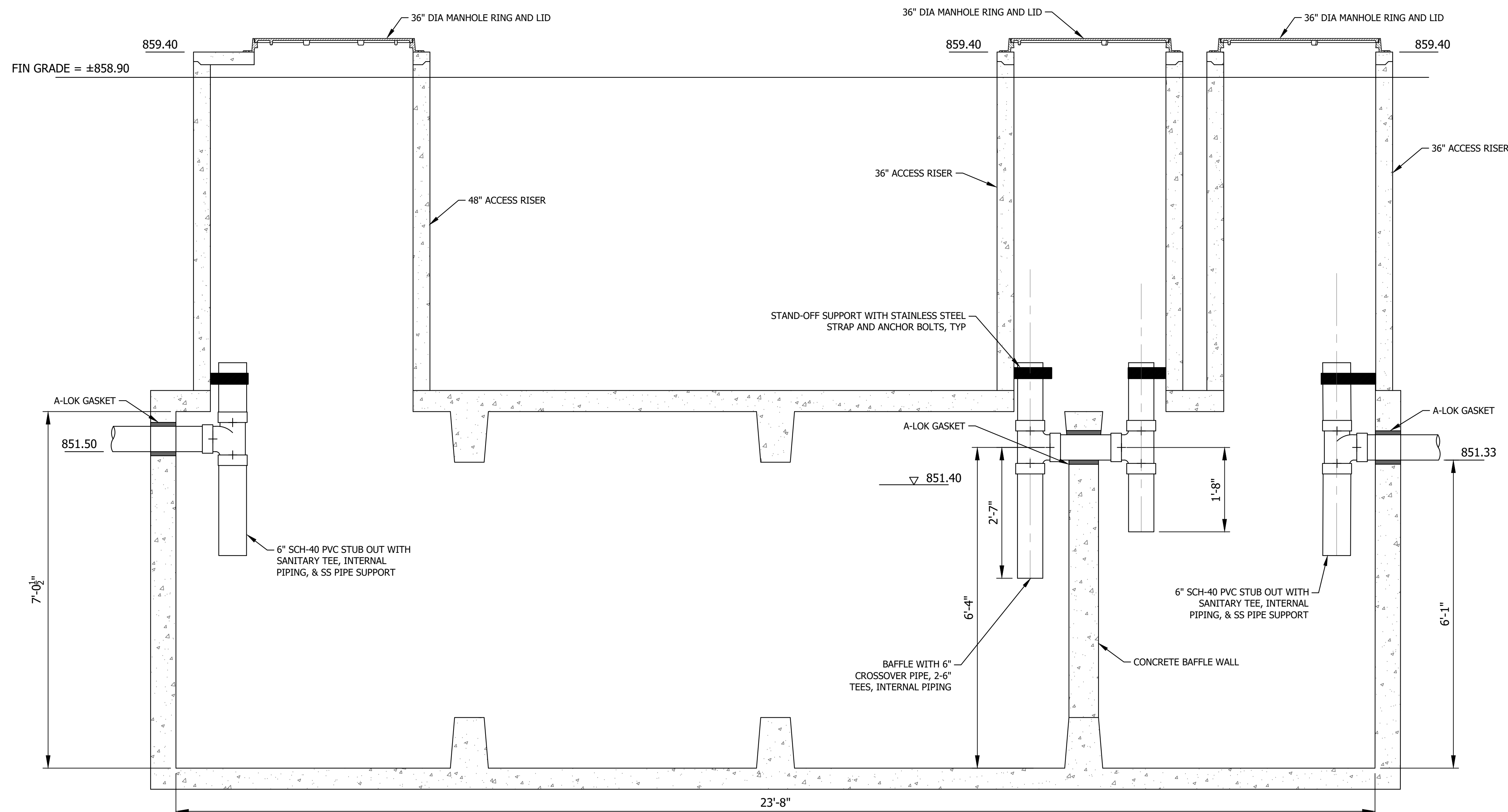
STANDARD HOOK GEOMETRY				
TYPICAL TENSION BARS				
TYPE	BAR SIZE	MIN. BEND DIA.	EXTENSION	
90-DEGREE HOOK	#3 - #8	6d _s	12d _s	
	#9 - #11	8d _s		
	#14, #18	10d _s		
180-DEGREE HOOK	#3 - #8	6d _s	Greater of 4d _s and 2.5"	
	#9 - #11	8d _s		
	#14, #18	10d _s		
STIRRUPS, TIES, AND HOOPS				
TYPE	BAR SIZE	MIN. BEND DIA.	EXTENSION	
90-DEGREE HOOK	#3 - #5	4d _s	Greater of 6d _s and 3"	
	#6 - #8	6d _s	12d _s	
135-DEGREE HOOK	#3 - #5	6d _s	Greater of 6d _s and 3"	
	#6 - #8	8d _s		
180-DEGREE HOOK	#3 - #8	6d _s	Greater of 4d _s and 2.5"	
	#9 - #11	8d _s		

TYPICAL CONCRETE COVER			
EXPOSURE	MEMBER	REINF.	COVER
CAST AGAINST AND PERMANENTLY IN CONTACT WITH SOIL	ALL	ALL	3"
EXPOSED TO WEATHER OR IN CONTACT WITH GROUND	ALL	#6 - #18	2"
		#5 AND SMALLER	1 1/2"
NOT EXPOSED TO WEATHER OR IN CONTACT WITH GROUND	SLABS, JOISTS, AND WALLS	#14, #18	1 1/2"
		#11 AND SMALLER	3/4"
		BEAMS, COLUMNS, PEDESTALS, AND TENSION TIES	PRIMARY REINF. - STIRRUPS, TIES, TIES, HOOPS

¹ MINIMUM CLEAR COVER FOR CONCRETE EXPOSED TO DE-ICING SALTS: WALLS AND SLABS 2", ALL OTHER 2 1/2".



1 SEPTIC TANK 1 - - 10,000 GALLON
SCALE: 3/4"=1'-0"



GENERAL NOTES

1. MANHOLE LIDS SHALL BE BOLT DOWN, WATER TIGHT AND MARKED AS SANITARY SEWER.
2. SEE SPECIFICATIONS FOR CORROSION AND WATER PROOFING.
3. TANK MANUFACTURER TO PROVIDE TANKS, RISERS AND LIDS/HATCHES. CONTRACTOR TO PROVIDE ALL INTERNAL PIPING/EQUIPMENT.
4. TANK MANUFACTURER IS RESPONSIBLE FOR ANTI-BUOYANCY CALCULATIONS.
5. TANK INSTALLATION AND BACKFILL PER MANUFACTURER'S RECOMMENDATIONS ON COMPACTED SUBGRADE CAPABLE OF BEARING WEIGHT OF TANK AND CONTENTS.

STATE OF MISSOURI
MICHAEL PARSONS
GOVERNOR



Bartlett & West
1719 SOUTHRIDGE DR., SUITE 100 - JEFFERSON CITY, MO 65109-4000
CERTIFICATE OF AUTHORITY NO. 000167 - ENGINEERING
www.bartlettwest.com

OFFICE OF ADMINISTRATION
DIVISION OF FACILITIES
MANAGEMENT,
DESIGN AND CONSTRUCTION

DEPARTMENT OF
NATURAL RESOURCES,
DIVISION OF STATE PARKS

BIG LAKE STATE PARK
WASTEWATER TREATMENT
FACILITY IMPROVEMENTS

204 LAKE SHORE DRIVE
CRAIG, MO 64437

PROJECT # X2211-01
SITE # 5105
ASSET # 7815105016

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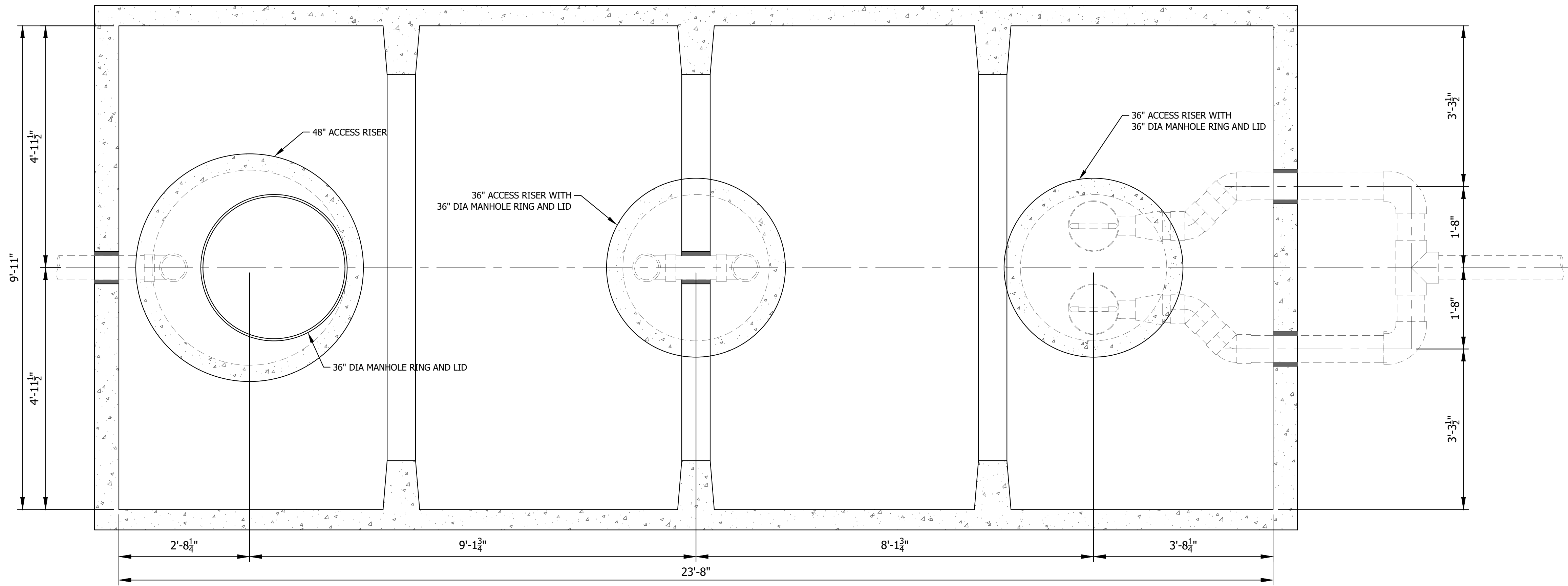
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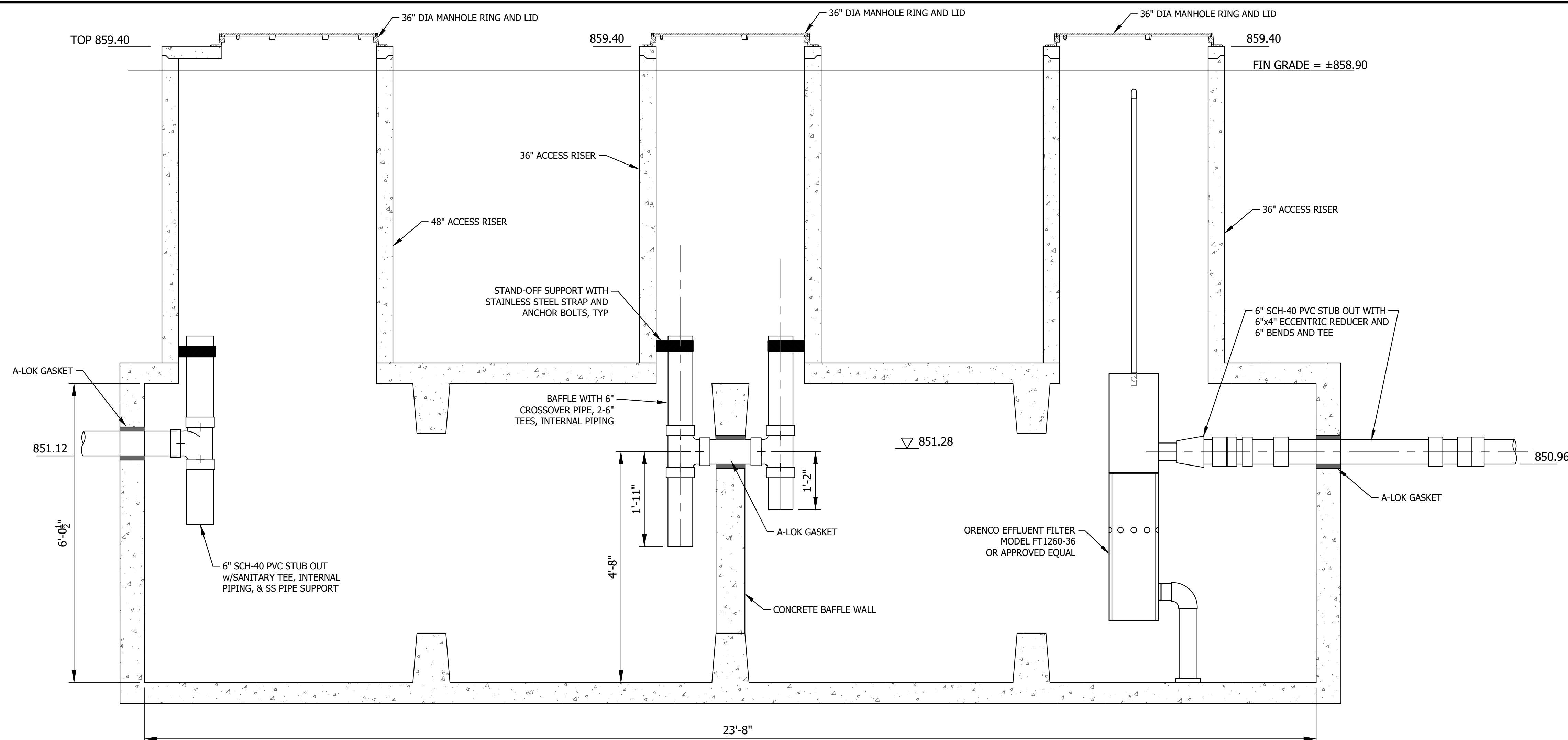
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23 of 31 SHEETS



1 SEPTIC TANK 2 - - 8,000 GALLON
SCALE: 3/4"=1'-0"



GENERAL NOTES

1. MANHOLE LIDS SHALL BE BOLT DOWN, WATER TIGHT AND MARKED AS SANITARY SEWER.
2. SEE SPECIFICATIONS FOR CORROSION AND WATER PROOFING.
3. TANK MANUFACTURER TO PROVIDE TANKS, RISERS AND LIDS/HATCHES. CONTRACTOR TO PROVIDE ALL INTERNAL PIPING/EQUIPMENT.
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STATE OF MISSOURI
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BIG LAKE STATE PARK
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204 LAKE SHORE DRIVE
CRAIG, MO 64437

PROJECT # X2211-01
SITE # 5105
ASSET # 7815105016

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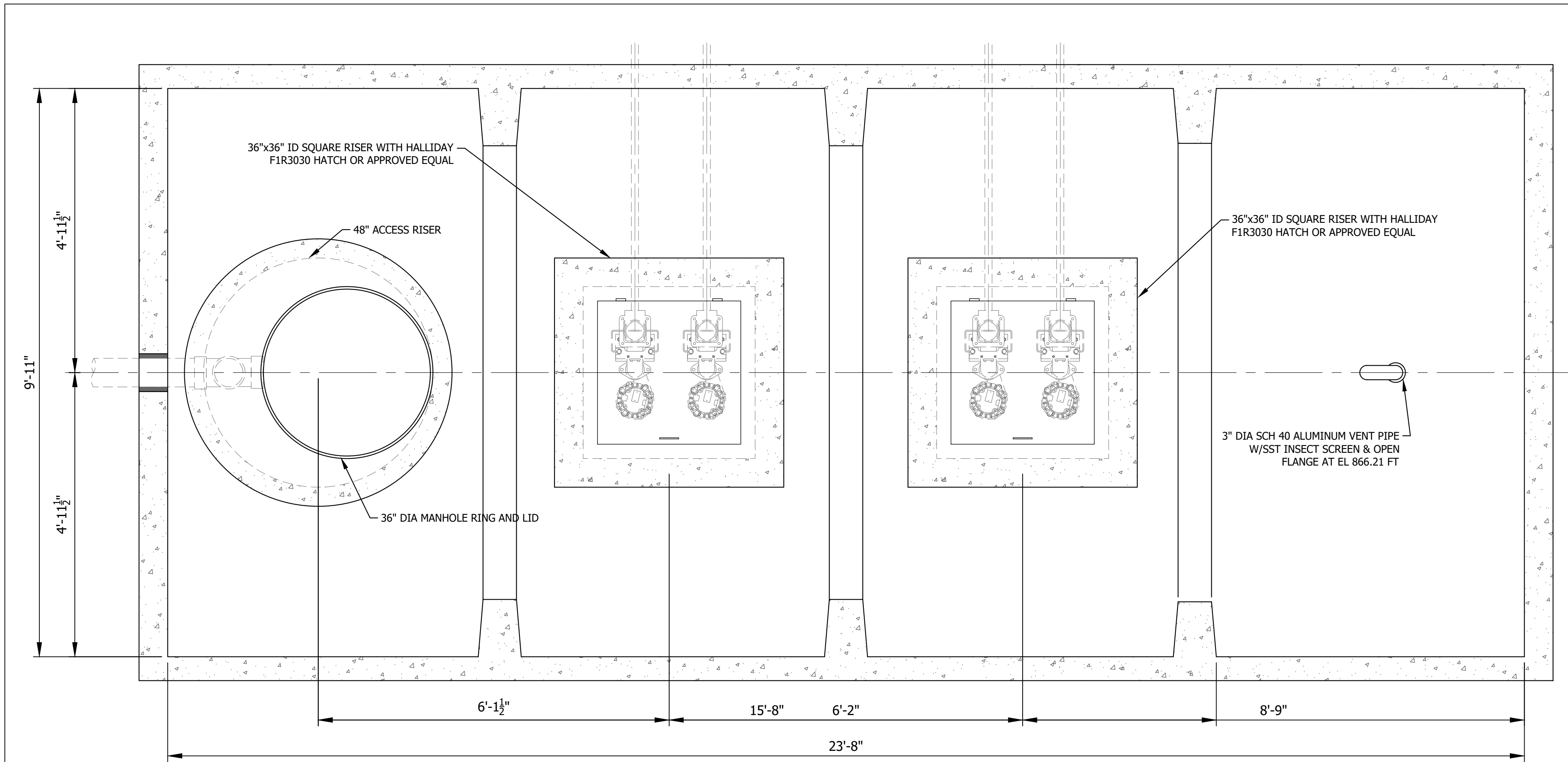
CAD DWG FILE: D-302 Septic2.dwg
DESIGNED BY: BAN
DRAWN BY: KAK
APPROVED BY: VAH

SHEET TITLE:
SEPTIC TANK 2 -
8,000 GALLON

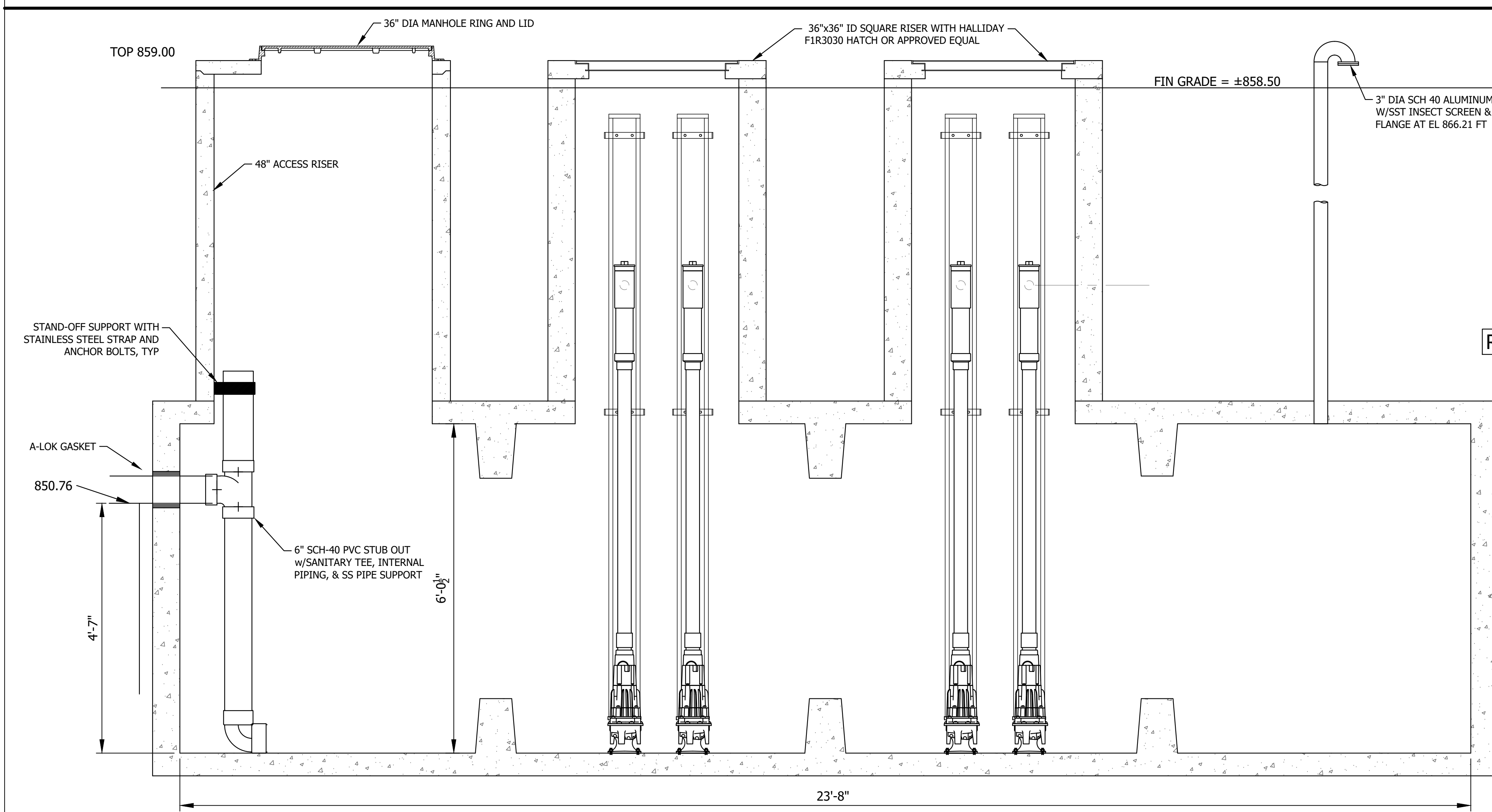
SHEET NUMBER:

D-302

24 of 31 SHEETS



1 DOSING TANK - - 8,000 GALLON
SCALE: 3/4"=1'-0"



REFER TO D-304 FOR PUMP ELEVATIONS

GENERAL NOTES

1. MANHOLE LIDS SHALL BE BOLT DOWN, WATER TIGHT AND MARKED AS SANITARY SEWER.
2. SEE SPECIFICATIONS FOR CORROSION AND WATER PROOFING.
3. TANK MANUFACTURER TO PROVIDE TANKS, RISERS AND LIDS/HATCHES. CONTRACTOR TO PROVIDE ALL INTERNAL PIPING/EQUIPMENT.
4. TANK MANUFACTURER IS RESPONSIBLE FOR ANTI-BUOYANCY CALCULATIONS.
5. TANK INSTALLATION AND BACKFILL PER MANUFACTURER'S RECOMMENDATIONS ON COMPACTED SUBGRADE CAPABLE OF BEARING WEIGHT OF TANK AND CONTENTS.

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BIG LAKE STATE PARK
WASTEWATER TREATMENT
FACILITY IMPROVEMENTS

204 LAKE SHORE DRIVE
CRAIG, MO 64437

PROJECT # X2211-01
SITE # 5105
ASSET # 7815105016

REVISION: _____
DATE: _____
REVISION: _____
DATE: _____
REVISION: _____
DATE: _____

ISSUE DATE: _____
CAD DWG FILE: D-303 Dosing.dwg
DESIGNED BY: BAN
DRAWN BY: KAK
APPROVED BY: VAH

SHEET TITLE:
DOSING TANK -
8,000 GALLON

SHEET NUMBER:
D-303
25 of 31 SHEETS



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CAD DWG FILE: D-303 Dosing.dwg
DESIGNED BY: BAN
DRAWN BY: KAK
APPROVED BY: VAH

SHEET TITLE:
PUMP PLAN
AND SECTION

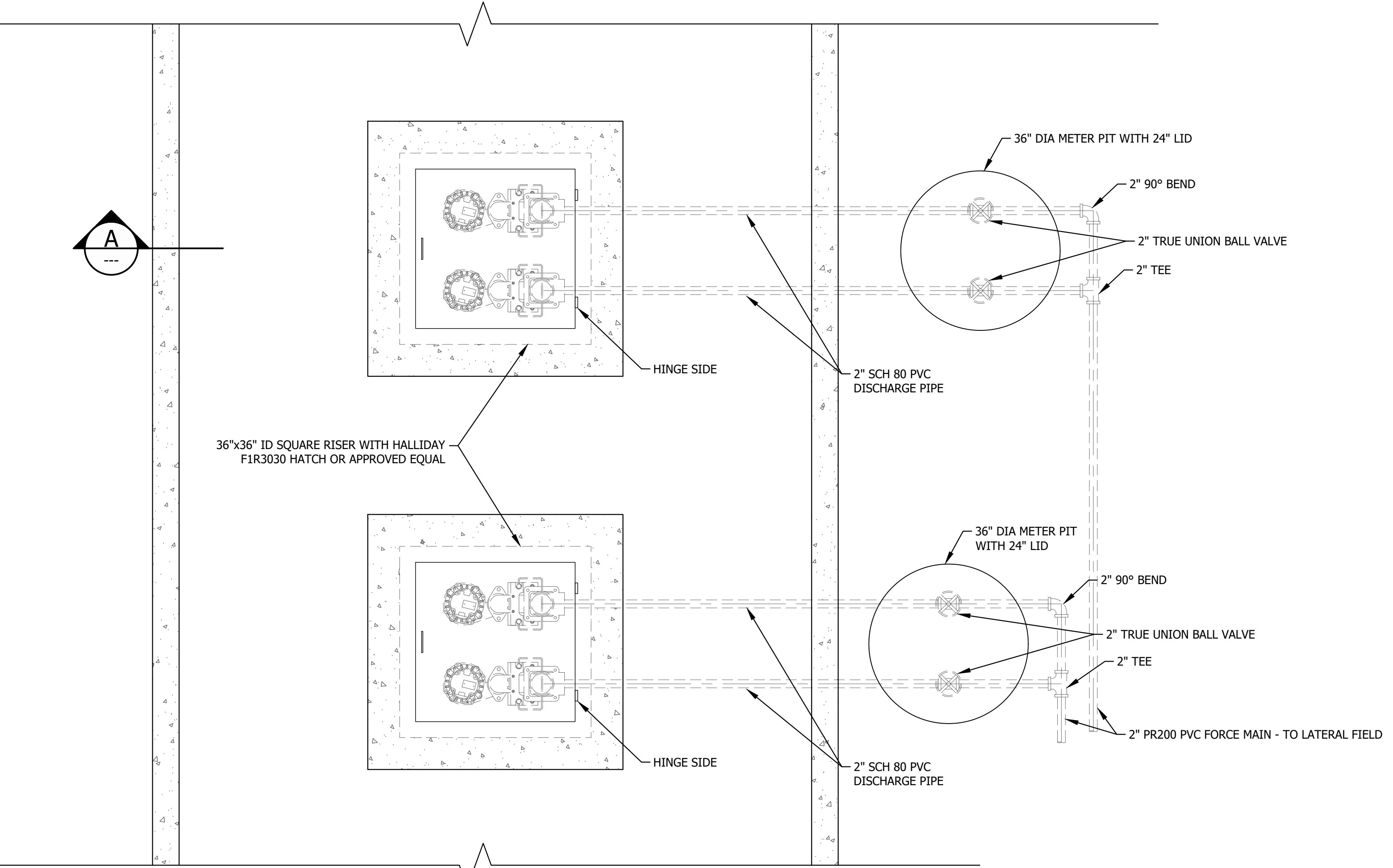
SHEET NUMBER:
D-304
26 of 31 SHEETS

SEWAGE PUMP SPECIFICATIONS	
MANUFACTURER	ZOELLER
TYPE	SUBMERSIBLE VORTEX PUMP
MODEL NO.	E4189
NUMBER REQUIRED	4
HORSEPOWER	2 HP
DESIGN FLOW (GPM)	55.5 GPM (ONE PUMP RUNNING)
DESIGN TDH (FT)	70.8 FT (ONE PUMP RUNNING)
VOLTAGE	230
PHASE	1
HERTZ	60
MOTOR SPEED (RPM)	3,450
LEVEL CONTROL SYSTEM	FLOAT CONTROL
PUMP WEIGHT	97 LBS.
RAIL SYSTEM	SS GUIDE RAILS
DISCHARGE SIZE	2 INCH

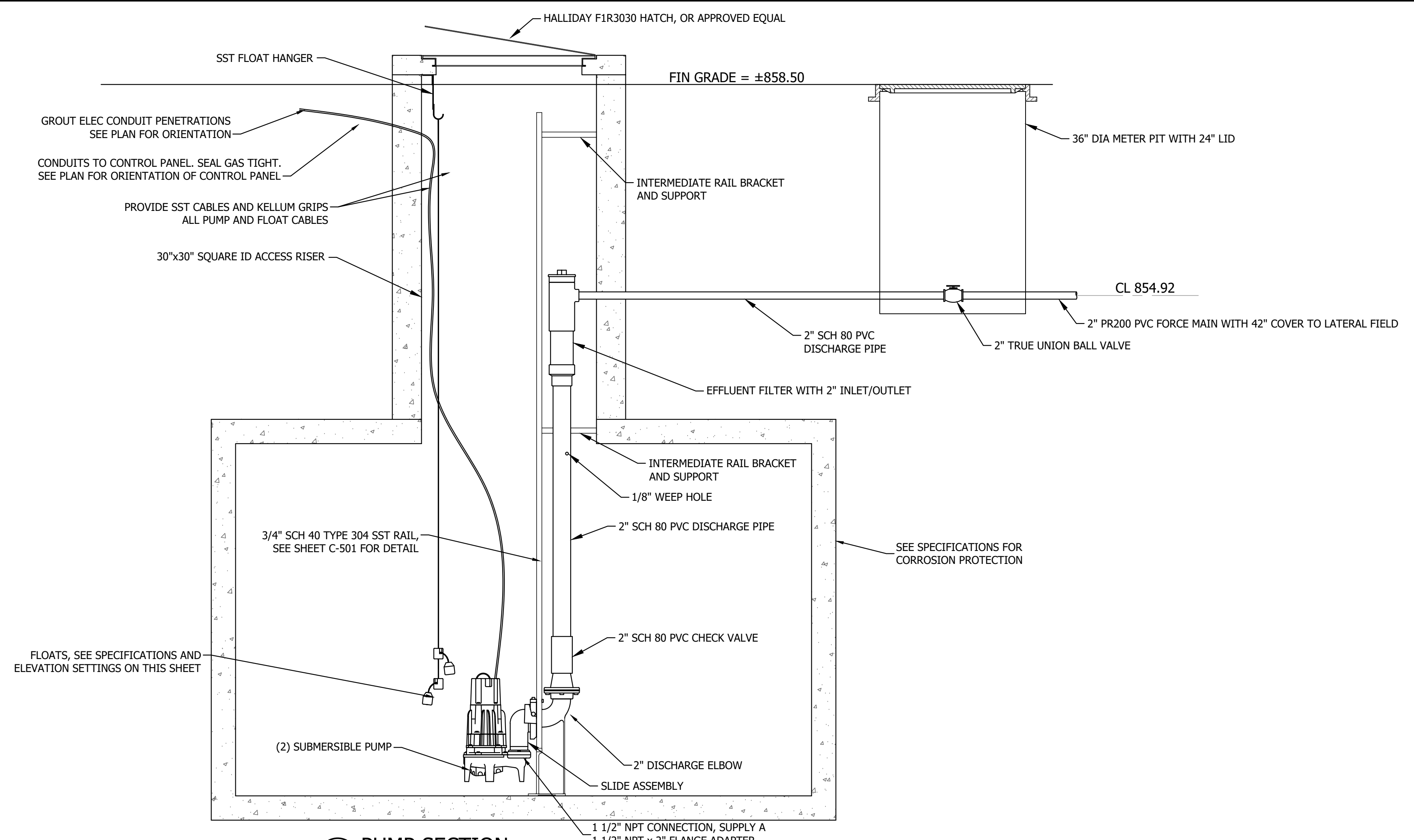
DESIGN LIFT STATION LEVELS	
HIGH FLOAT ALARM:	850.50 FT
LEAD PUMP ON:	848.66 FT
LEAD PUMP OFF:	848.16 FT
LOW FLOAT ALARM:	847.90 FT
LEAD PUMP ON OVERRIDE:	850.00 FT

GENERAL NOTES

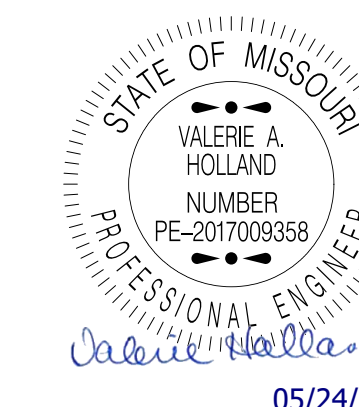
- CONTRACTOR SHALL ADVISE ENGINEER IF UNSTABLE SOIL CONDITIONS ARE FOUND.
- CONTRACTOR IS RESPONSIBLE FOR MEANS, METHODS AND SEQUENCING OF ALL WORK.
- CONTRACTOR IS RESPONSIBLE FOR SAFETY OF ALL PERSONS ON SITE. PROVIDE NECESSARY SHORING, BRACING AND DEWATERING OF EXCAVATIONS. PROVIDE TEMPORARY PROTECTION OF EXCAVATIONS.
- INSTALLATION OF EQUIPMENT IN LIFT STATION AND VALVE VAULT SHALL BE DONE IN ACCORDANCE WITH CONFINED SPACE ENTRY REGULATIONS.
- MOUNTING AND SUPPORT OF ALL EQUIPMENT TO BE DONE PER MANUFACTURER'S REQUIREMENTS. DRAWING SHOW GENERAL ARRANGEMENTS ONLY.
- SUBMIT SHOP DRAWINGS TO ENGINEER FOR APPROVAL BEFORE ORDERING.
- TWO SETS OF OPERATION AND MAINTENANCE MANUALS FOR ALL EQUIPMENT REQUIRED.
- THIS DRAWING MAY NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY. ALL CONSTRUCTION MUST COMPLY WITH OSHA AS EXPANDED AND AMENDED FROM TIME TO TIME, AND ALL RULES AND REGULATIONS THERETO APPLICABLE.
- ALL PIPE, CLEANOUTS, ETC SHALL PREVENT INFILTRATION AND INFLOW FROM ENTERING THE SANITARY SEWER SYSTEM. IF REQUIRED AS A RESULT OF THE PRESSURE TEST, MODIFICATIONS TO THE EXISTING SYSTEM WILL BE MADE PRIOR TO DISCHARGE TO SANITARY SYSTEM.
- ALL PIPING WITHIN WET WELL SHALL BE SCH 80 PVC.
- SCH 80 PVC PIPING SHALL BE SOLVENT WELD.
- PUMPS MUST BE LOCATED FOR EASE OF SERVICE.
- PUMP RATE CAPACITY MUST BE VERIFIED BY FIELD TEST.
- ALL BOLTS, EPOXY ANCHORS, NUTS, THREADED ROD AND ALL HARDWARE IN THE WETWELL SHALL BE 316 STAINLESS STEEL WITHOUT EXCEPTION.
- PRECAST MANUFACTURER SHALL BE SOLELY RESPONSIBLE FOR ALL STRUCTURAL AND ANCHORAGE DESIGN CALCULATIONS IN ACCORDANCE WITH THE SPECIFICATIONS AND USING MINIMUM REQUIRED DIMENSIONS SHOWN IN DRAWINGS.
- LOCATION OF PIPE SUPPORTS SHOWN ARE SCHEMATIC IN NATURE. SEE SPECIFICATIONS FOR PIPE SUPPORT AND PIPE HANGER SPACING REQUIREMENTS.
- CONTRACTOR SHALL COORDINATE WITH PUMP SUPPLIER TO DETERMINE FINAL PLACEMENT, POSITION, AND CONFIGURATION OF PUMPS. COORDINATE PLACEMENT OF ACCESS HATCH, GUIDE RAILS, DISCHARGE PIPING, ETC. AS REQUIRED BY PUMP SUPPLIER. PROVIDE FINAL LAYOUT PLAN FOR OWNER/ENGINEER REVIEW.



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



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



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204 LAKE SHORE DRIVE
CRAIG, MO 64437

PROJECT # X2211-01
SITE # 5105
ASSET # 7815105016

REVISION: _____
DATE: _____
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DATE: _____

ISSUE DATE: _____

CAD DWG FILE:

D-501.dwg

DESIGNED BY: BAN

DRAWN BY: KAK

APPROVED BY: VAH

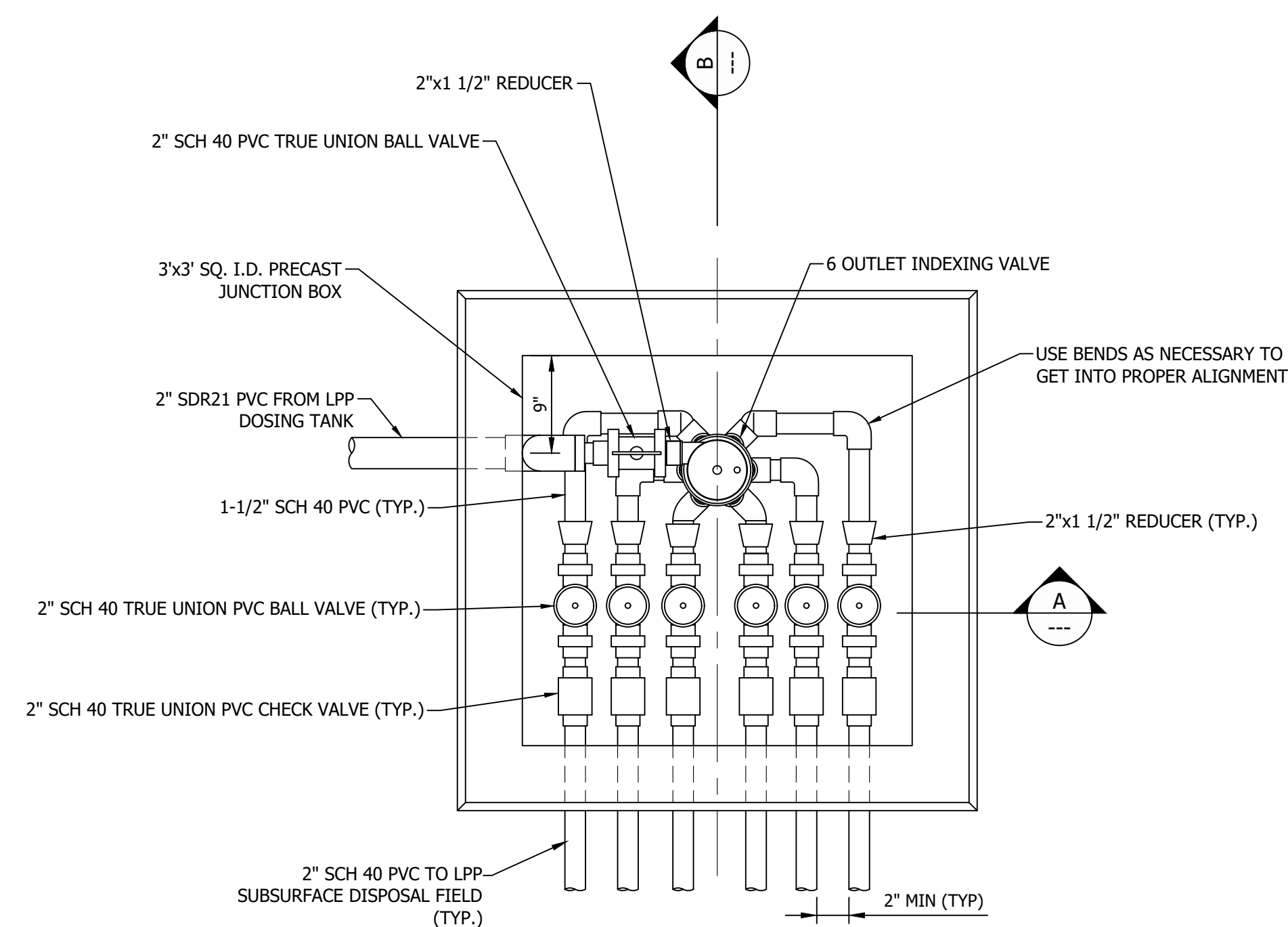
SHEET TITLE:

INDEXING VALVE

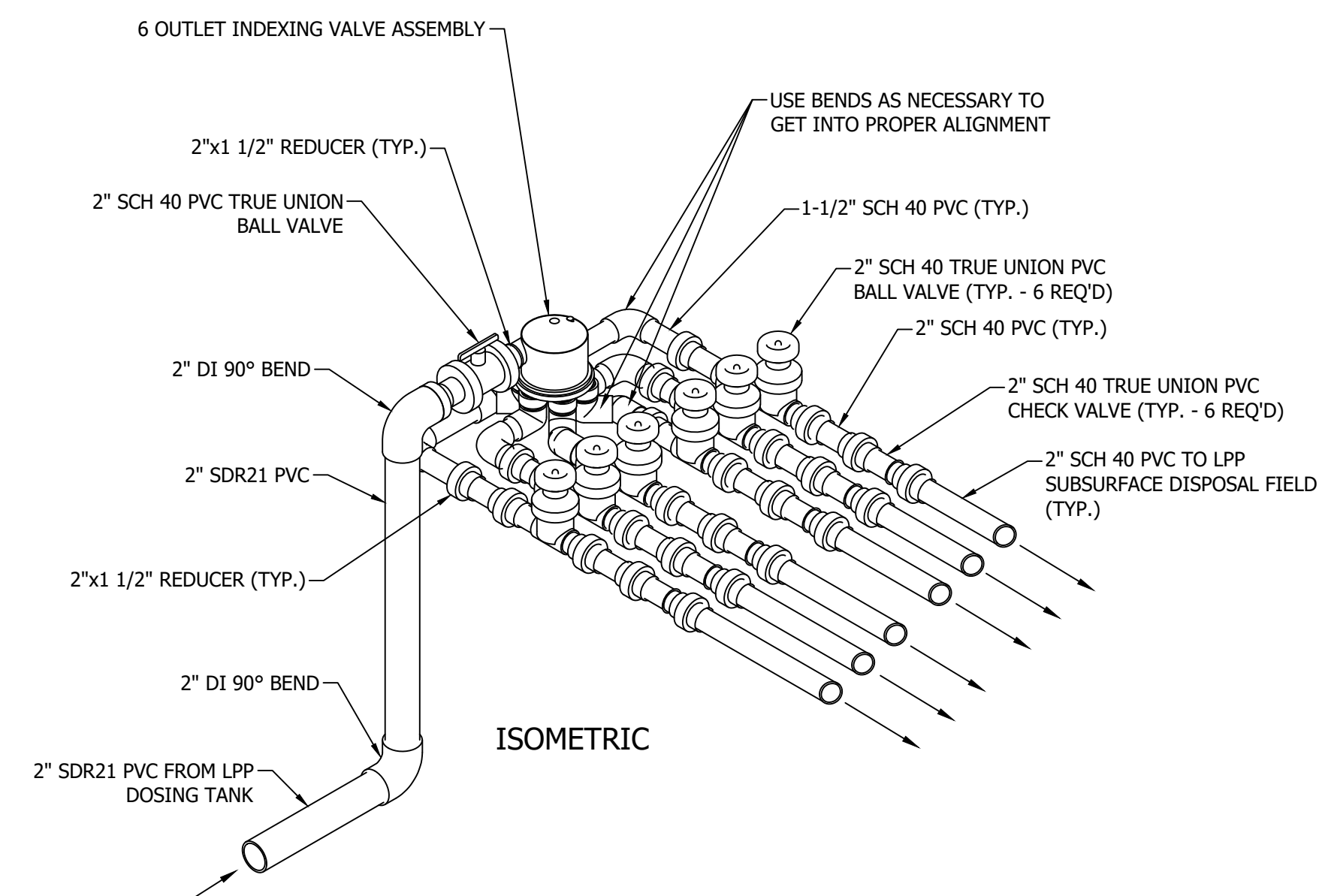
SHEET NUMBER:

D-501

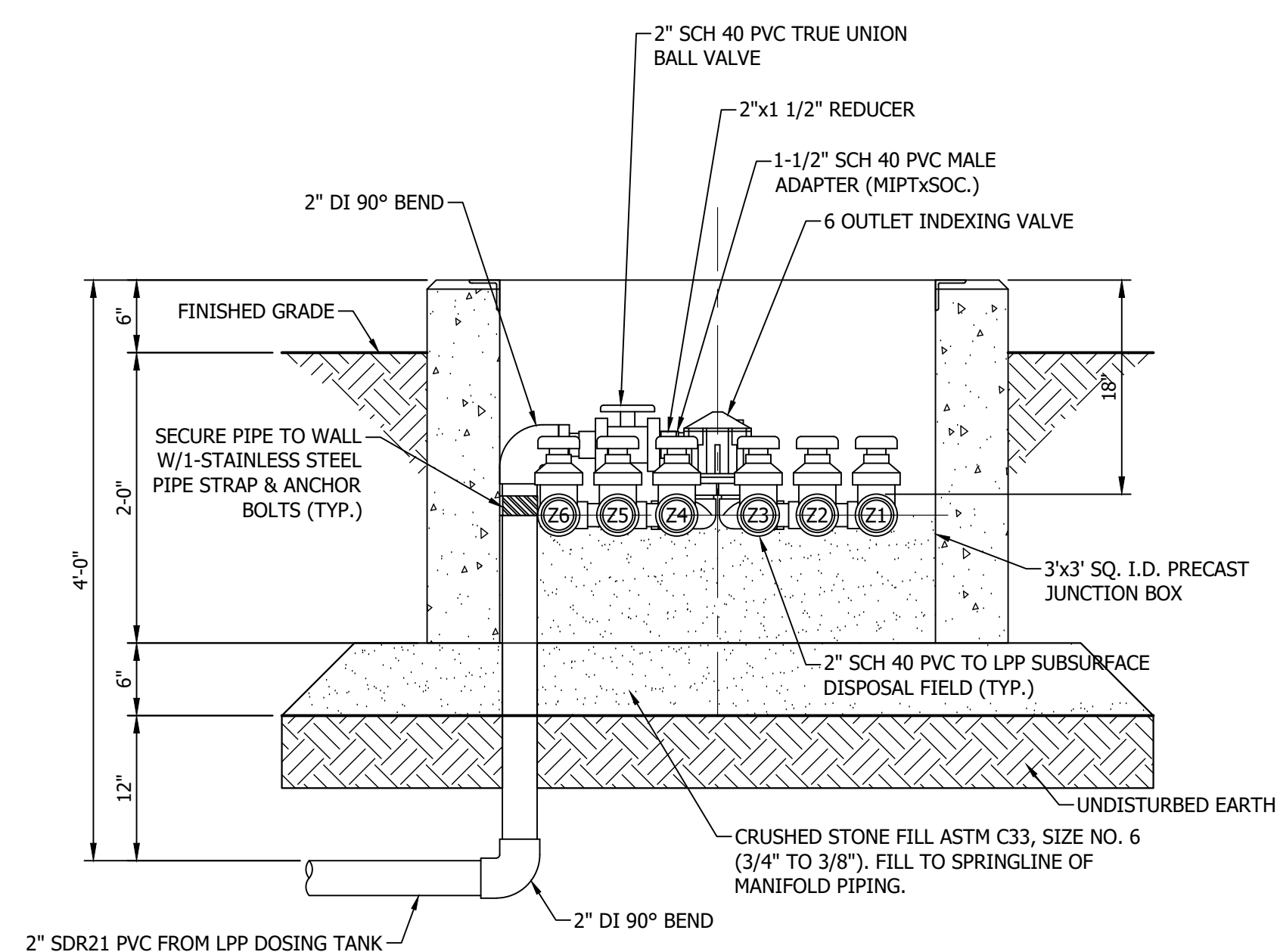
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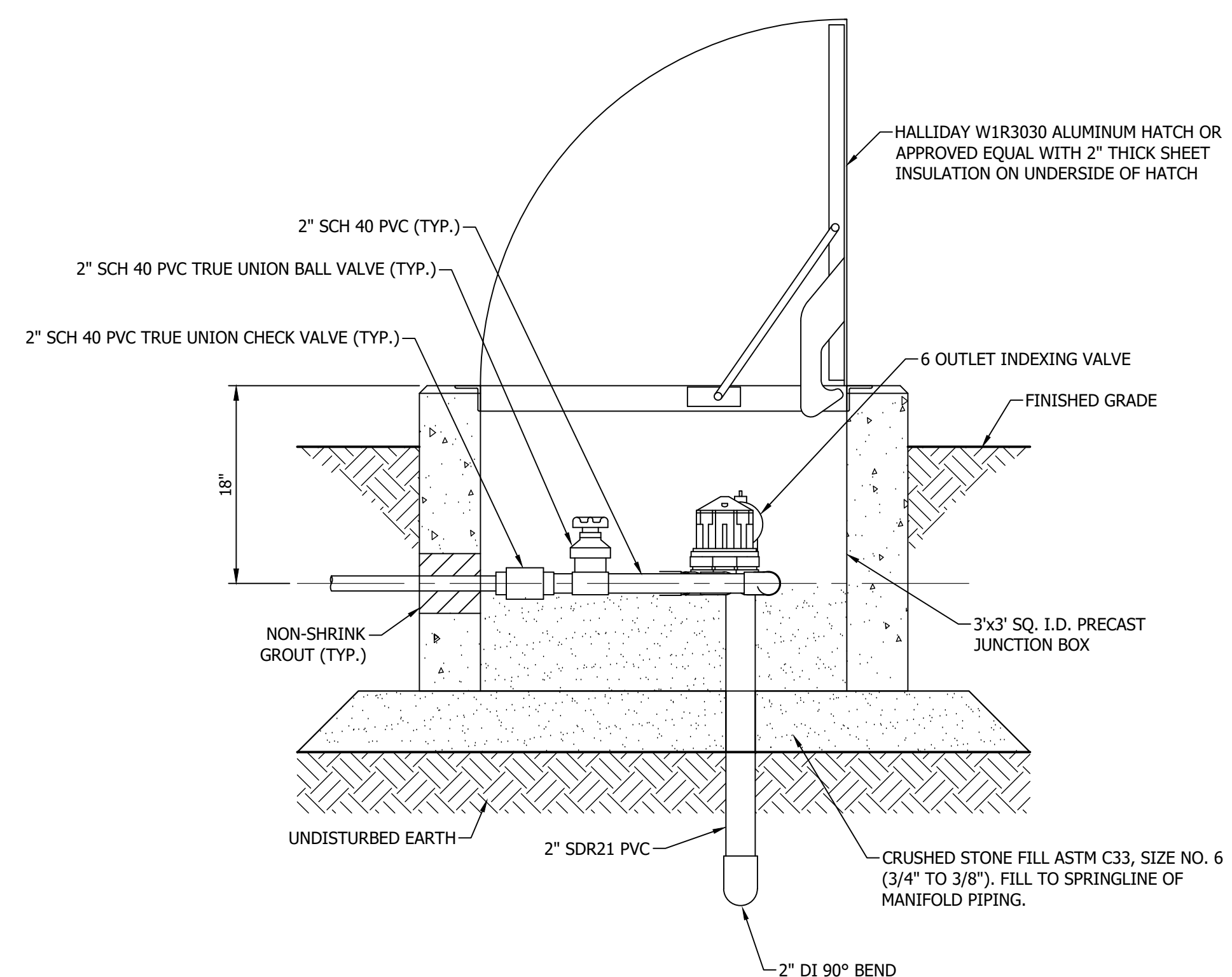
1 INDEXING VALVE
NOT TO SCALE



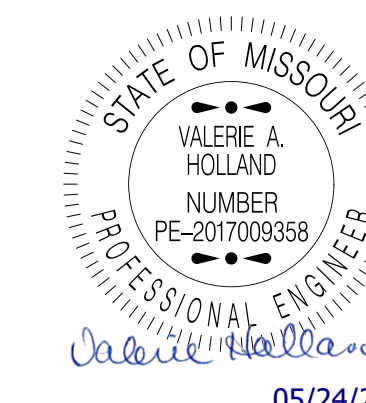
ISOMETRIC



A SECTION
NOT TO SCALE



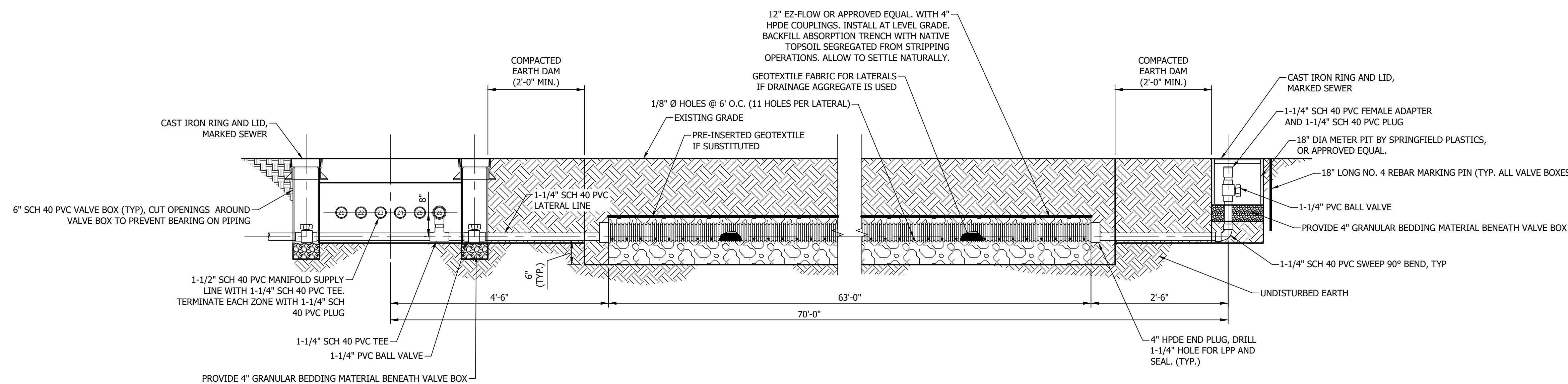
B SECTION
NOT TO SCALE



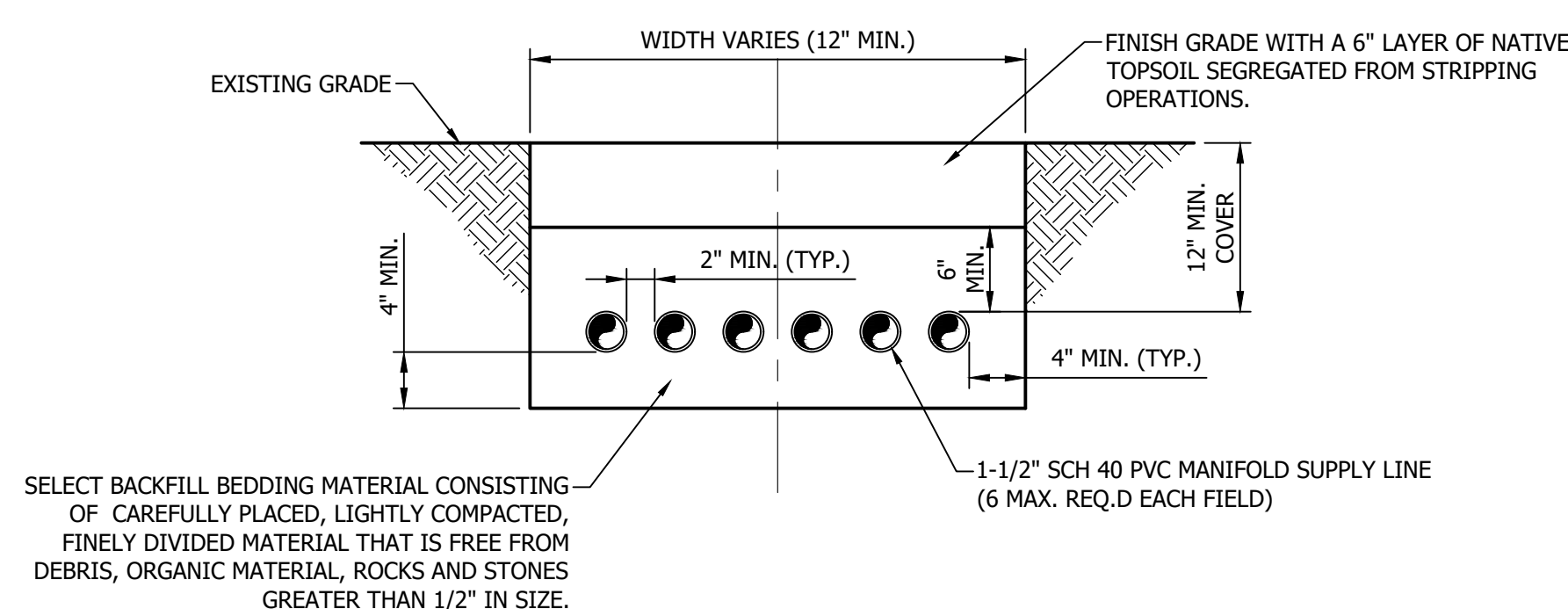
GENERAL NOTES

- THE EZ FLOW EXPANDED POLYSTYRENE AGGREGATE BUNDLES WOULD BE AN ACCEPTABLE SUBSTITUTION FOR THE CASING PIPE, LATERAL PIPE AND AGGREGATE.
- CONTRACTOR SHALL INSTALL PER MANUFACTURER'S REQUIRED INSTALLATION REQUIREMENTS.
- MECHANICALLY COMPACT SOIL BACKFILL TO 95% STANDARD PROCTOR IN 6-INCH LIFTS AS SHOWN IN THE DETAILS.
- BOTTOM AND SIDES OF TRENCH TO BE CLEAR OF ANY ROOTS, ROCKS OR LARGE DEBRIS.
- PROVIDE 1-1/4" SCH 40 PVC MALE ADAPTER & 5 L.F. OF 1-1/4" SCH 40 PVC FOR EACH LATERAL (12 TOTAL REQ'D).
- EACH FIELD SHALL HAVE ONE INSPECTION PORT.
- GEOTEXTILE FABRIC SHALL BE INSTALLED THE FULL LENGTH OF THE LATERAL TO CONTAIN DRAINAGE AGGREGATE. GEOTEXTILE FABRIC WIDTH SHALL BE 24-INCHES AND DEPTH EXTEND 2-INCHES ABOVE AND 4-INCHES BELOW CASING PIPE. PROVIDE A MINIMUM OF 12" OVERLAP AT ALL ADJACENT FABRIC PIECES. MECHANICALLY BIND (CLAMP) FABRIC AT PIPE PENETRATIONS TO MAINTAIN INTEGRITY.
- LATERALS SHALL SLOPE 0% +/- 1/4 INCH IN 10 FT.
- LATERALS SHALL BE SHOP DRILLED PRIOR TO DELIVERY.
- DRAINAGE AGGREGATE SHALL BE WASHED, DURABLE MEETING MODOT SECTION 1002 AND SHALL MEET THE FOLLOWING GRADATION:

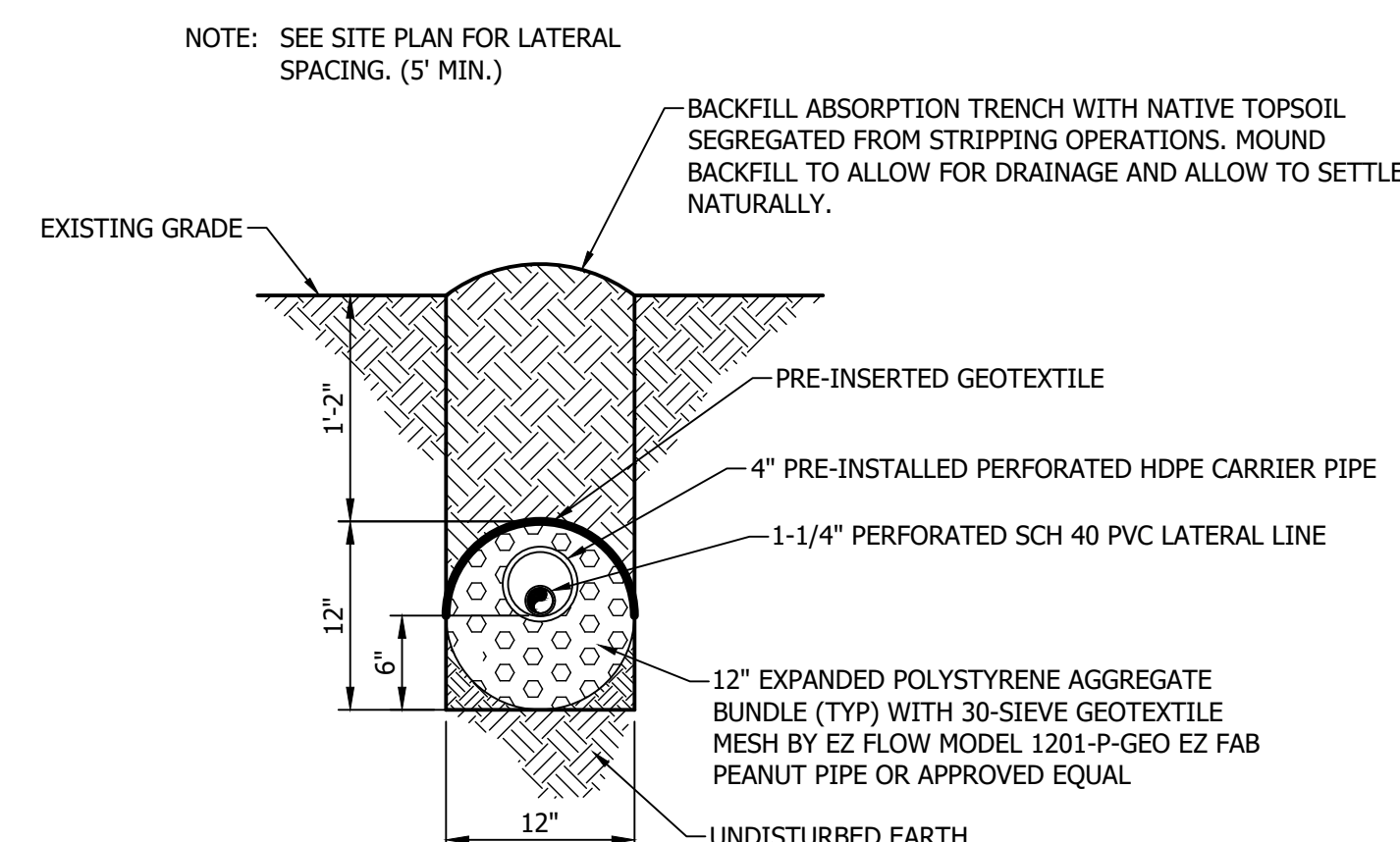
SIEVE SIZE	PERCENT PASSING (BY WEIGHT)
2-1/2 INCH	100
1-1/2 INCH	85-100
3/4 INCH	10-35
1/2 INCH	0



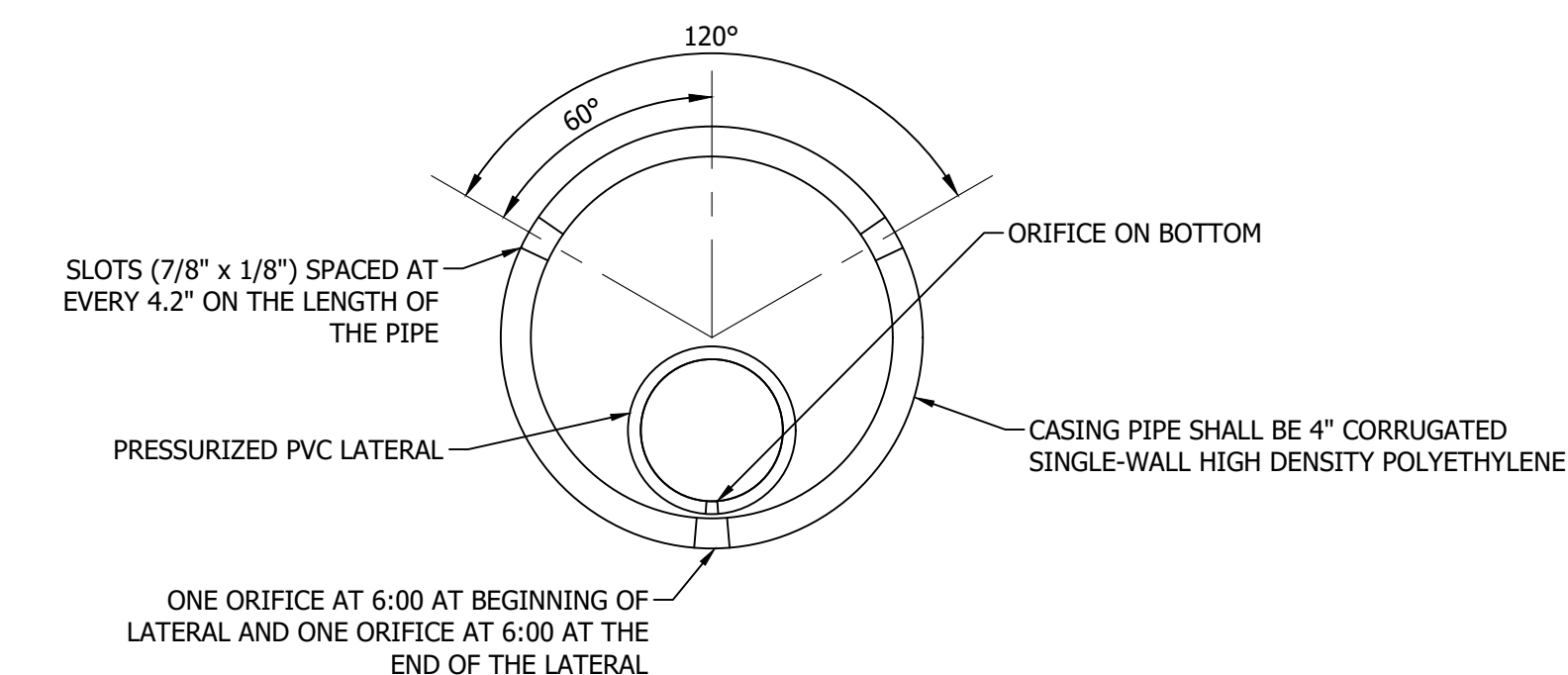
1 TYPICAL LATERAL SECTION
NOT TO SCALE



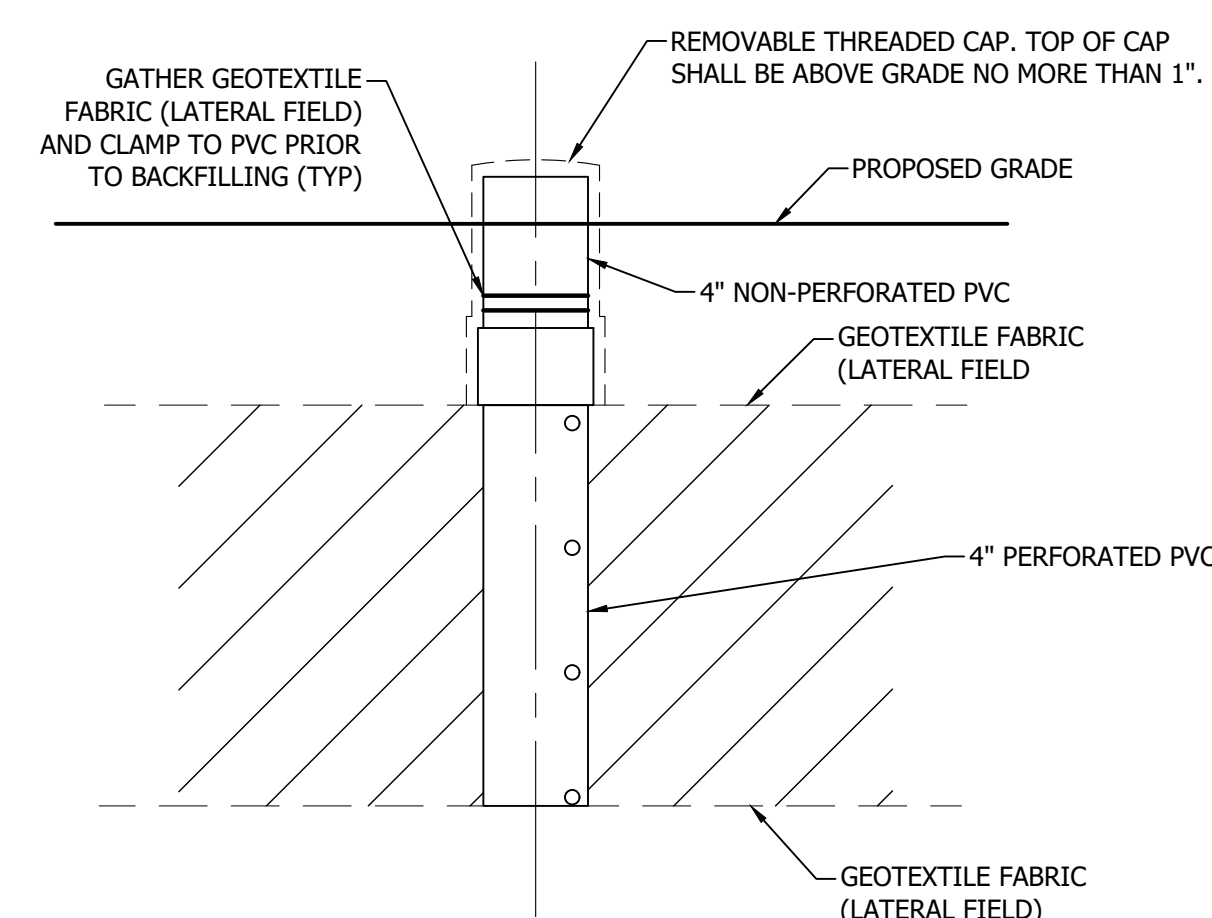
2 SUPPLY & MANIFOLD TRENCH DETAIL
NOT TO SCALE



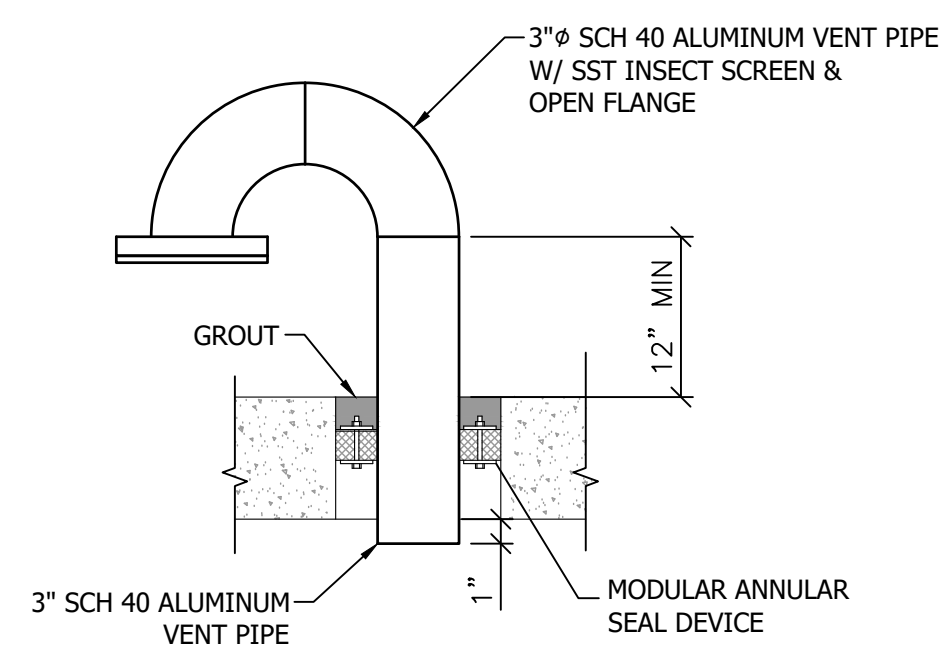
3 LATERAL TRENCH DETAIL
NOT TO SCALE



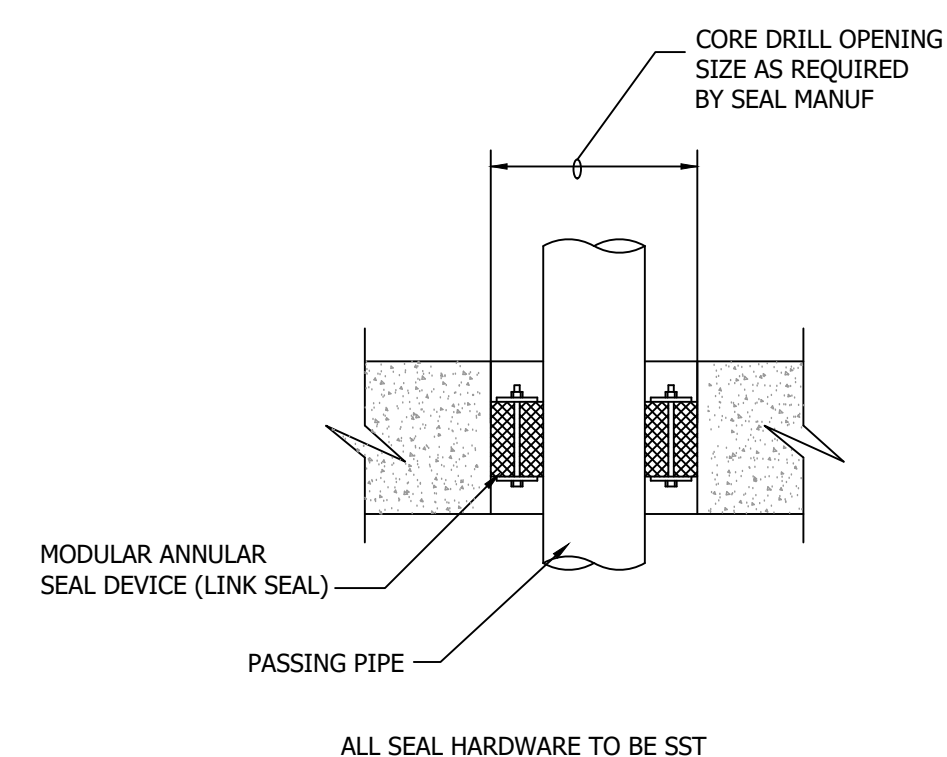
4 LATERAL PIPE SECTION
NOT TO SCALE



5 INSPECTION PORT DETAIL
NOT TO SCALE



1 3" AIR VENT
NOT TO SCALE



2 WALL PENETRATION DETAIL
NOT TO SCALE

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PROJECT # X2211-01
SITE # 5105
ASSET # 7815105016

REVISION: _____
DATE: _____
REVISION: _____
DATE: _____
REVISION: _____
DATE: _____

ISSUE DATE: _____

CAD DWG FILE:
D-503.dwg

DESIGNED BY: BAN
DRAWN BY: KAK
APPROVED BY: VAH

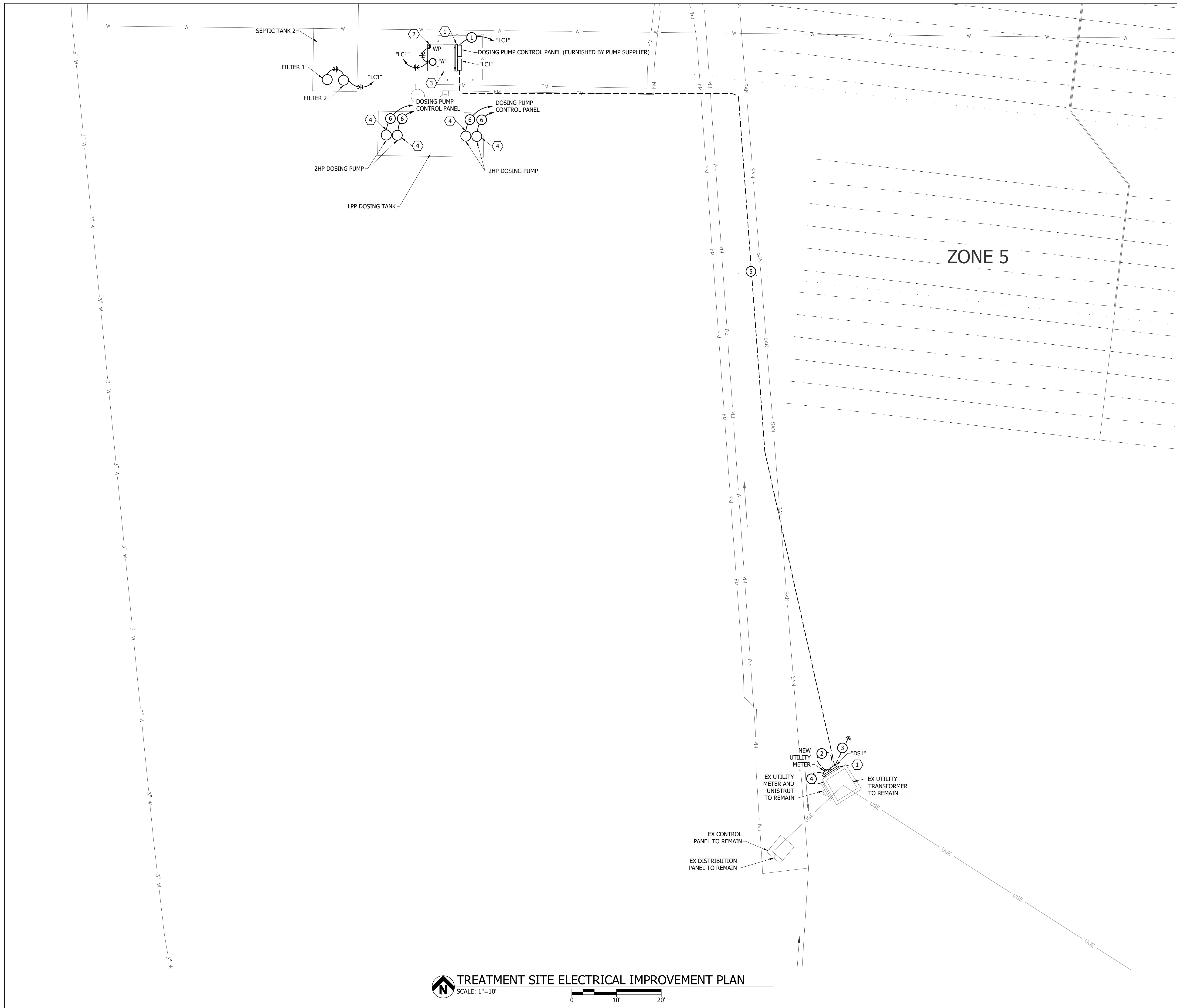
SHEET TITLE:

PROCESS DETAILS

SHEET NUMBER:

D-503

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REFERENCE NOTES:

- 1 E/C TO PROVIDE UNISTRUT ABOVE THE 100 YEAR FLOOD PLAIN, 865.21'. REFER TO DETAIL 1/E-501. FIELD COORDINATE EXACT LOCATION WITH STRUCTURAL PLATFORM.
- 2 E/C TO LOCATE LIGHT SWITCH ADJACENT TO PLATFORM ACCESS LOCATION. FIELD VERIFY EXACT LOCATION.
- 3 E/C TO REFER TO STRUCTURAL PLATFORM DETAIL 1/S-101.
- 4 EXTEND AND CONNECT TO MOTOR STARTER IN MOTOR HEAD. MAKE ALL FINAL CONNECTIONS.
- 5 E/C TO PROVIDE UNISTRUT FOR ELECTRICAL EQUIPMENT MOUNTING. REFER TO DETAIL 1/E-501. FIELD COORDINATE EXACT LOCATION.

GENERAL NOTES:

1. E/C TO COORDINATE UTILITY CONNECTION REQUIREMENTS WITH ATCHISON-HOLT ELECTRIC CO-OP, PHONE (660) 744-5344.
2. E/C TO DISCONNECT EX POWER CONNECTION FOR BOTH 3 HP PUMPS FOR PUMP REFURBISHING AS REQUIRED BY PUMP MANUFACTURER AND RECONNECT EX POWER CONNECTION AFTER PUMP REINSTALLATION. E/C TO MAKE ALL FINAL CONNECTIONS FOR BOTH 3 HP PUMPS AT LIFT STATION. REFER TO SHEETS C-107 AND C-109 FOR EXACT REQUIREMENTS. FIELD COORDINATE WITH G/C.

FEEDER SCHEDULE:

- 1 3-6 & 1-10G IN 1" C.
- 2 3-1 IN 1 1/2" C.
- 3 1-6G IN 3/4" C.
- 4 UTILITY SERVICE FEEDERS TO BE PROVIDED BY UTILITY.
- 5 3-1 & 1-3G IN 1 1/2" C.
- 6 3-10 & 1-10G IN 3/4" C

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ASSET # 7815105016

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REVISION: _____
DATE: _____
ISSUE DATE: _____

CAD DWG FILE: E-101.dwg
DESIGNED BY: ARM
DRAWN BY: KAK
APPROVED BY: VAH

SHEET TITLE:
TREATMENT SITE
ELECTRICAL
IMPROVEMENT PLAN

SHEET NUMBER:

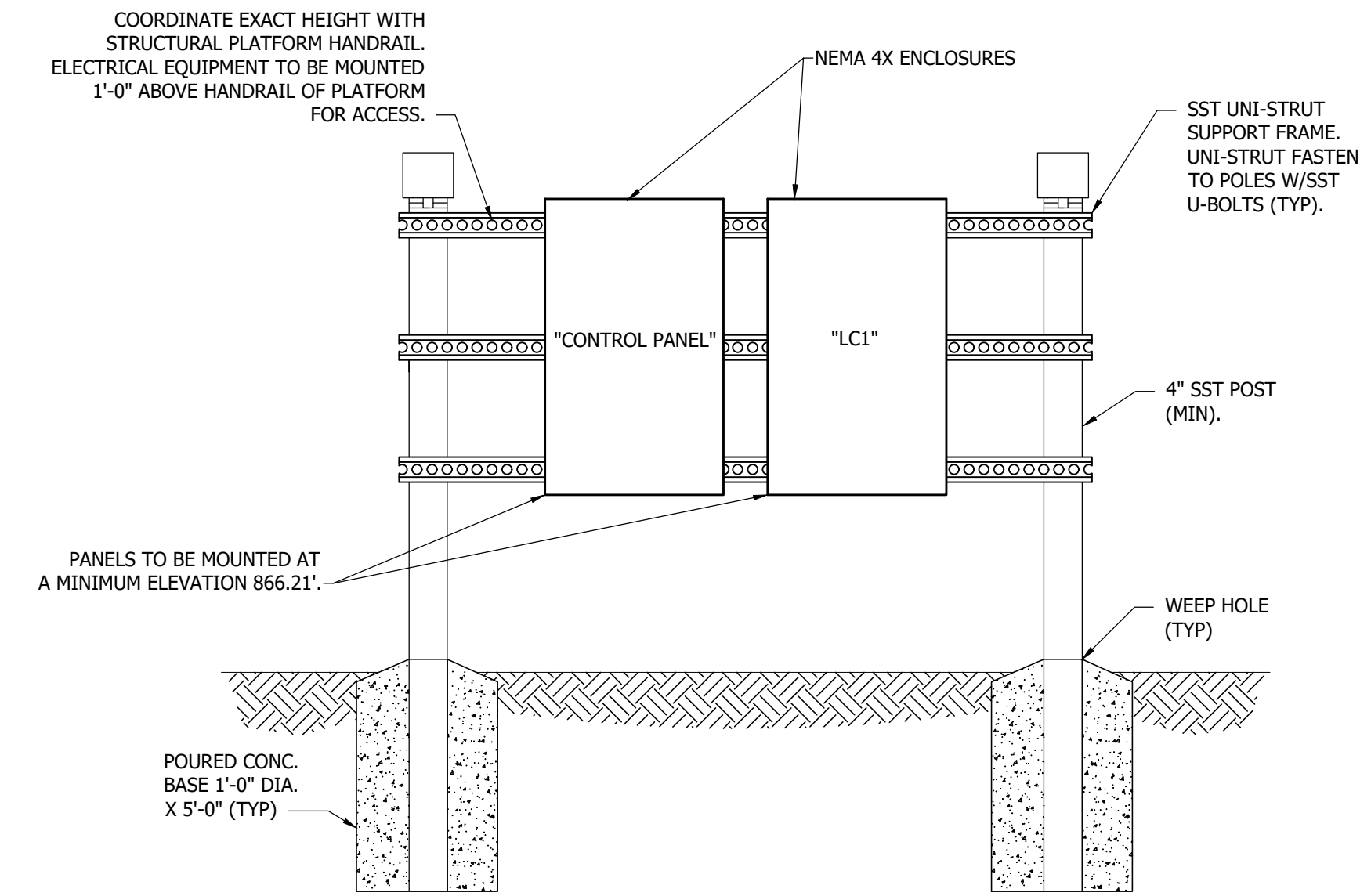
E-101

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CIRCUIT BREAKER PANELBOARD SCHEDULE											
MARK:	"LC1"			MOUNTING:		SURFACE		18k AIC RATING (MINIMUM)			
VOLTAGE:	120/240	PHASE:	1	WIRE:	3	POLES:	6	MAIN BUSS:	100 AMP	MAIN C/B:	100 AMP
CIRC. NO.	LOAD DESCRIPTION	CIRC. BRKR	LOAD (VA)	PHASE LOAD IN VA		LOAD (VA)	CIRC. BRKR	LOAD DESCRIPTION	CIRC. NO.		
				A	B						
1	DOSING PUMP CONTROL PANEL	50A2P	4128	4147		19	20A1P	LIGHT	2		
3	-	-	4128		4328	200	20A1P	SEPTIC TANK FILTERS	4		
5	SPARE	20A1P		0			20A1P	SPARE	6		
TOTALS:				4147	4328						
MAX. PHASE VA:		4328		MAX. PHASE AMPS:		36		MAX. PHASE DIVERSIFIED VA:		4328	
				MAX. PHASE DIVERSIFIED AMPS:						36	

LIGHTING FIXTURE SCHEDULE										
MARK	MANUFACTURER	CATALOG NUMBER	MOUNTING				LAMP		NOTES	
			REC	SURF	WALL	SUSP	TYPE	WATTS		
A	HE WILLIAMS	VF1-L20-730-MF-SR-DBZ-120		X				LED	19	1
NOTES: 1. MOUNT LIGHTING FIXTURE TO TOP OF STRUCTURAL RAIL.										

DISCONNECT SWITCH SCHEDULE									
MARK	EQUIPMENT SERVED	SWITCH VOLTAGE	AMP	POLE	FUSE AMP	TYPE	ENCLOSURE NEMA TYPE	NOTES	
"DS1"	"LC1"	240	100	2	-	-	NEMA 4X		
NOTES:									



1 ELECTRICAL EQUIPMENT MOUNTING DETAIL
NOT TO SCALE

