

CITY OF MARLBOROUGH, MASSACHUSETTS



BROADMEADOW STREET SEWER PUMP STATION UPGRADES

DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION
135 NEIL STREET, MARLBOROUGH, MA 01752
CONTRACT NO. ED 2023-07



LOCUS MAP
SCALE : 1"=2,500'

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SEPTEMBER 7, 2023



Know what's below.
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Issued For:

**RELEASED FOR
CONSTRUCTION**



09/06/2023

LEGEND		
DESCRIPTION	EXISTING	PROPOSED
SANITARY SEWER		
FORCE MAIN		
WATER MAIN		
TEMPORARY WATER		
STORM DRAIN		
GAS		
ELECTRIC		
TELEPHONE		
HOUSE CONNECTION		
GRINDER PUMP		
SANITARY SEWER MANHOLE		
STORM DRAIN MANHOLE		
ELECTRICAL MANHOLE		
TELEPHONE MANHOLE		
AIR RELEASE VALVE MANHOLE		
FORCE MAIN CLEANOUT MANHOLE		
CLEANOUT		
CATCH BASIN		
CATCH BASIN (CURB INLET)		
HYDRANT		
TEMPORARY HYDRANT		
GATE VALVE		
CHECK VALVE		
CURB STOP		
BUTTERFLY VALVE		
BALL VALVE		
REDUCER		
CAP OR PLUG		
GAS GATE VALVE		
UTILITY POLE		
GUY POLE		
LIGHT POST		
EDGE OF PAVEMENT		
EDGE OF UNPAVED ROAD		
CURB		
SIDEWALK		
RAILROAD		
STONE WALL		
RETAINING WALL		
FENCE		
INDIVIDUAL DECIDUOUS TREE		
INDIVIDUAL EVERGREEN TREE		
TREE LINE		
SURVEY MARKER		
PROPERTY LINE		
EASEMENT LINE		
LIMIT OF WORK		
APPROX. LIMIT OF REFUSE		
SPOT ELEVATIONS		
CONTOUR LINES		
DEPRESSION CONTOUR LINES		
HOUSE NUMBER		
FLOOR ELEVATION		
SILL ELEVATION		

ACCOMP	ASBESTOS CEMENT
ARV	ASPHALT COATED CORRUGATED METAL PIPE
ASTM	AIR RELEASE VALVE
BC	AMERICAN SOCIETY FOR TESTING AND MATERIALS
BIT	BITUMINOUS CONCRETE
BLDG	BITUMINOUS
BM	BUILDING
BO	BENCH MARK
BS	BLOW OFF
BV	BARE STEEL
CATV	BUTTERFLY VALVE
CB	CABLE TELEVISION
CC	CATCH BASIN
CI	CONCRETE CURB
CL	CAST IRON
CMP	CENTERLINE
CONC	CEMENT LINED
CY FT	CORRUGATED METAL PIPE
CY	CONCRETE
D	CUBIC FEET
DIA	CUBIC YARD
DMH	STORM DRAIN, DEPTH FROM RIM TO INVERT
DWG	DROP INLET, DUCTILE IRON
E	DIAMETER
EA	DRAIN MANHOLE
EF	DRAWING
ELEV	EAST, ELECTRIC
EOP	EACH
EW	EACH FACE
EXIST	ELEVATION
FLG	EDGE OF PAVEMENT
FT	EACH WAY
G	EXISTING
GALV	FLANGE
GC	FEET, FOOT
GR	NATURAL GAS
HC	GALVANIZED
HORIZ	GRANITE CURB
HYD	GRANITE
I	HOUSE CONNECTION
IN	HORIZONTAL
INV	FIRE HYDRANT
ID	INVERT
IP	INCH
LB	INVERT
LF	INSIDE DIAMETER
LS	IRON PIPE
MAX	POUND
MB	LINEAR FEET
MDC	LUMP SUM
MDPW	MAXIMUM
MECH	MAIL BOX
MH	METROPOLITAN DISTRICT COMMISSION
MassDOT	MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS
MIN	MECHANICAL
MISC	MANHOLE
MJ	MASSACHUSETTS DEPARTMENT OF TRANSPORTATION
MWRA	MINIMUM
N	MISCELLANEOUS
NE	MECHANICAL JOINT
NW	MASSACHUSETTS WATER RESOURCES AUTHORITY
NF	NORTH
NO OR #	NORTH EAST
NVP	NORTH WEST
OD	NOT FOUND
PCCP	NUMBER
PE	NO VISIBLE PIPE
PL	OUTSIDE DIAMETER
PVC	PRESTRESSED CONCRETE CYLINDER PIPE
PVMT	PLAIN END, POLYETHYLENE
RC	PROPERTY LINE
RD	PLASTIC
ROW	POLYVINYL CHLORIDE
RQD	PAVEMENT
S	REINFORCED CONCRETE
SE	ROAD
SECT	RIGHT-OF-WAY
SF	ROCK QUALITY
SHT	SEWER, SOUTH
SI	SOUTH EAST
SPEC	SECTION
SQ FT	SQUARE FEET
SS	SHEET
STA	SYLVANIA INTERCEPTOR
STL	SPECIFICATIONS
SW	SQUARE FEET
T	SEWER SERVICE, STAINLESS STEEL
TBM	STATION
THK	STEEL
TOP	SIDEWALK, SOUTH WEST
TYP	HYDROSTATIC THRUST, TELEPHONE
UP	TEMPORARY BENCH MARK
VC	THICK (NESS)
VERT	TOP OF PIPE
W	TYPICAL
WS	UTILITY POLE
W/	VITRIFIED CLAY
W/O	VERTICAL
	WATER, WEST
	WEST SIDE
	WITH
	WITHOUT

1. THE CONTRACTOR SHALL CALL DIGSAFE AT 1-888-344-7233 AT LEAST 72 HOURS, SATURDAYS, SUNDAYS, AND HOLIDAYS EXCLUDED, PRIOR TO EXCAVATING AT ANY LOCATION. A COPY OF THE DIGSAFE PROJECT REFERENCE NUMBER(S) SHALL BE GIVEN TO THE OWNER PRIOR TO EXCAVATION.
2. LOCATIONS OF EXISTING PIPES, CONDUITS, UTILITIES, FOUNDATIONS AND OTHER UNDERGROUND OBJECTS ARE NOT WARRANTED TO BE CORRECT AND THE CONTRACTOR SHALL HAVE NO CLAIM ON THAT ACCOUNT SHOULD THEY BE OTHER THAN SHOWN.
3. THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE LOCATION OF SEWER, DRAIN, GAS, AND WATER ALONG WITH ALL OTHER UTILITIES AS NECESSARY TO PERFORM THE WORK.
4. TEST PITS TO LOCATE EXISTING UTILITIES MAY BE ORDERED BY THE ENGINEER AND SHALL BE CONSIDERED INCIDENTAL TO THE PROJECT.
5. PIPE AND STRUCTURE ABANDONMENT SHALL CONFORM TO SPECIFICATION SECTION 02222 - ABANDONMENT OF SEWERS.
6. STONE WALLS, FENCES, MAIL BOXES, SIGNS, CURBS, LIGHT POLES, ETC. SHALL BE REMOVED AND REPLACED AS NECESSARY TO PERFORM THE WORK. UNLESS OTHERWISE INDICATED, ALL SUCH WORK SHALL BE INCIDENTAL TO CONSTRUCTION OF THE PROJECT.
7. ALL PAVEMENT DISTURBED BY THE CONTRACTOR'S OPERATIONS SHALL BE REPLACED IN ACCORDANCE WITH THE SPECIFICATIONS AND AS SHOWN ON THE DRAWINGS.
8. ALL AREAS DISTURBED BY THE CONTRACTOR BEYOND PAYMENT LIMITS SHALL BE RESTORED AT NO ADDITIONAL COST TO THE OWNER.
9. CONCRETE USED FOR PIPE ANCHOR BLOCKS, BACKING, PIPE CRADLES, ARCHES, AND FILL SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI AT 28 DAYS.
10. APPROVED JOINT RESTRAINT METHODS SHALL BE PROVIDED FOR FORCE MAINS WHERE ANY BENDS, TEES, PLUGS, OR WYES ARE INSTALLED.
11. THE CONTRACTOR SHALL NOT STORE ANY APPARATUS, MATERIALS, SUPPLIES, OR EQUIPMENT ON DRAINAGE STRUCTURES OR WITHIN 100 FEET OF WETLANDS OR PRIVATE ROADS.
12. SEWER TRENCHES MAY BE EXCAVATED WIDER THAN THE 'LIMIT OF EXCAVATION AND PAYMENT FOR EARTH EXCAVATION' ABOVE THE 'LINE OF NARROW TRENCH LIMIT.' ANY SUCH ADDITIONAL EXCAVATION SHALL BE AT THE CONTRACTORS EXPENSE AND SHALL NOT BE MEASURED FOR PAYMENT.
13. BELOW THE 'LINE OF NARROW TRENCH LIMIT' THE TRENCH SHOULD NOT BE EXCAVATED BEYOND THE TRENCH WIDTH 'W'. IF MATERIAL IS LOOSENOED OR REMOVED BEYOND THE ABOVE MENTIONED LIMITS, THE CONTRACTOR WILL BE REQUIRED TO PROVIDE CRUSHED STONE FOR THE FULL WIDTH OF THE TRENCH AT NO ADDITIONAL COST TO THE OWNER.
14. OPENINGS FOR PIPE IN PRECAST MANHOLE BASES SHALL BE CAST IN THE REQUIRED LOCATIONS DURING MANHOLE MANUFACTURE. FIELD CUT OPENINGS WILL NOT BE PERMITTED UNLESS APPROVED BY THE ENGINEER.
15. FORM BRICK INVERTS IN MANHOLES WITH BRICK ON EDGE TO A DEPTH OF 0.8 INSIDE DIAMETER OF PIPE AND FORM A 1 INCH SLOPED BENCH WITH BRICK FLAT. INVERT SHALL BE SLOPED UNIFORMLY BETWEEN INLET AND OUTLET PIPE AND SHALL BE FORMED AND FILLED AS REQUIRED TO DIRECT THE FLOW AS INDICATED AND TO PREVENT DEPOSITION OF SOLIDS.
16. IN PAVED AREAS THE TOP OF THE MANHOLE COVER SHALL BE SET FLUSH WITH THE PAVED SURFACE. IN OTHER AREAS THE TOP OF THE COVER SHALL EXTEND 6 INCHES ABOVE FINISHED GRADE, OR AS REQUIRED BY THE ENGINEER.
17. PROTECTION OF WATER SUPPLIES - WHENEVER A SEWER MUST CROSS UNDER A WATER MAIN, THE SEWER SHALL BE LAID AT SUCH AN ELEVATION THAT THE TOP OF THE SEWER IS AT LEAST 18 INCHES BELOW THE BOTTOM OF THE WATER MAIN. WHEN THE ELEVATION OF THE SEWER CANNOT BE VARIED TO MEET THE ABOVE REQUIREMENT, THE WATER MAIN SHALL BE RELOCATED BY THE CONTRACTOR AS REQUIRED BY THE ENGINEER TO PROVIDE THIS SEPARATION.
18. CALCULATION OF PIPE SLOPES IS BASED ON ELEVATION CHANGES DIVIDED BY THE DISTANCE BETWEEN THE OUTSIDE EDGES OF THE MANHOLE WALLS. FOR FOUR FOOT DIAMETER MANHOLES, THIS DISTANCE WAS CALCULATED AS THE CENTERLINE STATIONING MINUS FIVE FEET. FOR FIVE FOOT DIAMETER MANHOLES, THIS DISTANCE WAS CALCULATED AS THE CENTERLINE STATIONING MINUS SIX FEET. 'IN' INDICATES UPSTREAM END OF MANHOLE, 'OUT' INDICATES DOWNSTREAM END OF MANHOLE.
19. ALL STREET EXCAVATIONS SHALL BE COMPLETELY CLOSED AT THE END OF EACH WORKING DAY BY BACKFILLING OR COVERING WITH STEEL PLATES. STEEL PLATES SHALL BE PINNED AND COLD PATCHED. EXCAVATIONS SHALL BE PAVED WITH TEMPORARY PAVEMENT WITHIN ONE (1) WEEK.
20. EXISTING WATER SERVICE CONNECTIONS AND GAS SERVICE CONNECTIONS HAVE NOT BEEN INCLUDED ON THE PLAN VIEWS OR PROFILE VIEWS. THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE LOCATION OF WATER SERVICE CONNECTIONS AND

13. THE CONTRACTOR SHALL MAINTAIN LOCAL TRAFFIC TO ALL STREETS THROUGHOUT THE DURATION OF THE PROJECT.
22. THE CONTRACTOR SHALL COMPLY WITH ALL REQUIREMENTS OF MASSACHUSETTS GENERAL LAW CHAPTER 82A, TRENCH EXCAVATION AND SAFETY REQUIREMENTS, TO PREVENT THE GENERAL PUBLIC FROM UNAUTHORIZED ACCESS TO UNATTENDED TRENCHES.
23. CONTRACTOR SHALL MAINTAIN EXISTING FLOWS IN THE SYSTEM, BYPASSING AS NECESSARY TO PREVENT SURCHARGING, AS APPROVED OR REQUIRED BY THE ENGINEER.
24. CONTRACTOR SHALL NOTIFY RESIDENTS IN PROXIMITY TO EXCAVATIONS PRIOR TO THE START OF WORK AND AT LEAST ONE WEEK IN ADVANCE.
25. CONTRACTOR SHALL BE AVAILABLE 24/7 TO RESPOND PROMPTLY TO BY-PASS REPAIRS AS REQUIRED DURING THE PROJECT.
26. CONTRACTOR SHALL PROVIDE NECESSARY FLOW CONTROL (e.g. PUMPING TRUCKS) AS NECESSARY DURING CONSTRUCTION ACTIVITIES WHEN FLOW CANNOT BE DIRECTED INTO THE TEMPORARY BYPASS SYSTEM.
27. ALL EXPOSED DI PIPE AND FITTINGS SHALL BE ENCASED IN POLYETHYLENE CONFORMING TO AWWA C105.
28. ALL PVC PIPE INSTALLED AS PART OF THIS PROJECT SHALL BE SDR35 PVC PIPE, UNLESS OTHERWISE NOTED.
29. REMOVAL AND DISPOSAL OF ASBESTOS CEMENT (AC) PIPE SHALL BE IN ACCORDANCE WITH SECTION 02111 – ASBESTOS ABATEMENT FOR UNDERGROUND UTILITIES.
30. SEWER AND WET WELL CLEANING AS NECESSARY TO PERFORM WORK SHALL BE CONSIDERED INCIDENTAL TO THIS PROJECT. REMOVAL AND DISPOSAL OF DEBRIS SHALL BE CONSIDERED INCIDENTAL TO THIS PROJECT.
31. SHOULD THE CONTRACTOR CANCEL WORK DUE TO WEATHER OR CONDITIONS BEYOND HIS CONTROL, A MINIMUM 4-HOUR NOTICE SHALL BE PROVIDED TO THE TRAFFIC CONTROL OFFICER. IF THE 4-HOUR CANCELLATION NOTICE IS NOT PROVIDED, THE CONTRACTOR SHALL PAY FOR THE POLICE DETAIL AT THE PREVAILING WAGE RATE ESTABLISHED BY THE MARLBOROUGH POLICE DEPARTMENT.
32. EXISTING UTILITY INFORMATION, TOPOGRAPHIC INFORMATION, EDGE OF PAVEMENT, UTILITY POLE LOCATIONS, AND LOCATIONS OF EXISTING ABOVE GROUND STRUCTURES WERE TAKEN FROM THE FOLLOWING SOURCES:
 - 32.1. EXISTING CONDITIONS SURVEY PERFORMED BY WESTON & SAMPSON ENGINEERS, INC., 2023.
 - 32.2. BROADMEADOW AREA SEWERAGE FACILITIES, ROADWORK, WATER MAIN, AND APPURTENANT WORK RECORD DRAWINGS, METCALF & EDDY, INC. ENGINEERS, 1970.
 - 32.3. HARVARD MEDICAL SCHOOL – BROADMEADOW STREET AND PARMENTER STREET RECORD DRAWINGS, WHITMAN & HOWARD, INC., 1994.
33. ASSESSORS INFORMATION REPRESENTED ON THESE DRAWINGS IS TAKEN FROM THE CITY/TOWN ASSESSOR'S PARCEL MAPS AND IS INCLUDED FOR ILLUSTRATIVE PURPOSES ONLY. ASSESSORS INFORMATION IS NOT INTENDED TO BE AN AUTHORITY RECORD OF PROPERTY OR EASEMENT BOUNDARIES OR A SOURCE OF INFORMATION FOR AN ACTUAL SURVEY OR LEGAL DESCRIPTION OF THE PROPERTY. NO WORK HAS BEEN PERFORMED TO DETERMINE THE DEPICTED PROPERTY AND EASEMENT LINES AND THEREFORE, THESE DRAWINGS ARE NOT INTENDED BE USED TO DELINEATE ANY EXISTING OR PROPOSED STRUCTURES, FEATURES OR BOUNDARIES RELATIVE TO PROPERTY LINES. AUTHORITY RECORDS OF PROPERTY LINES MAY BE LOCATED AT THE STATE OR MUNICIPAL AGENCY RESPONSIBLE FOR MAINTAINING PUBLIC RECORDS IN WHICH THE PARCEL IS LOCATED. LEGALLY AUTHORITY MAPS OF PROPERTY LINES MAY ONLY BE PRODUCED BY A PROFESSIONAL LAND SURVEYOR.
34. CONSTRUCTION WILL NOT BE ALLOWED ON SATURDAYS, SUNDAYS, OR HOLIDAYS WITHOUT WRITTEN AUTHORIZATION FROM THE OWNER AND APPROVAL BY THE ENGINEER.

Consultants:

[illegible]

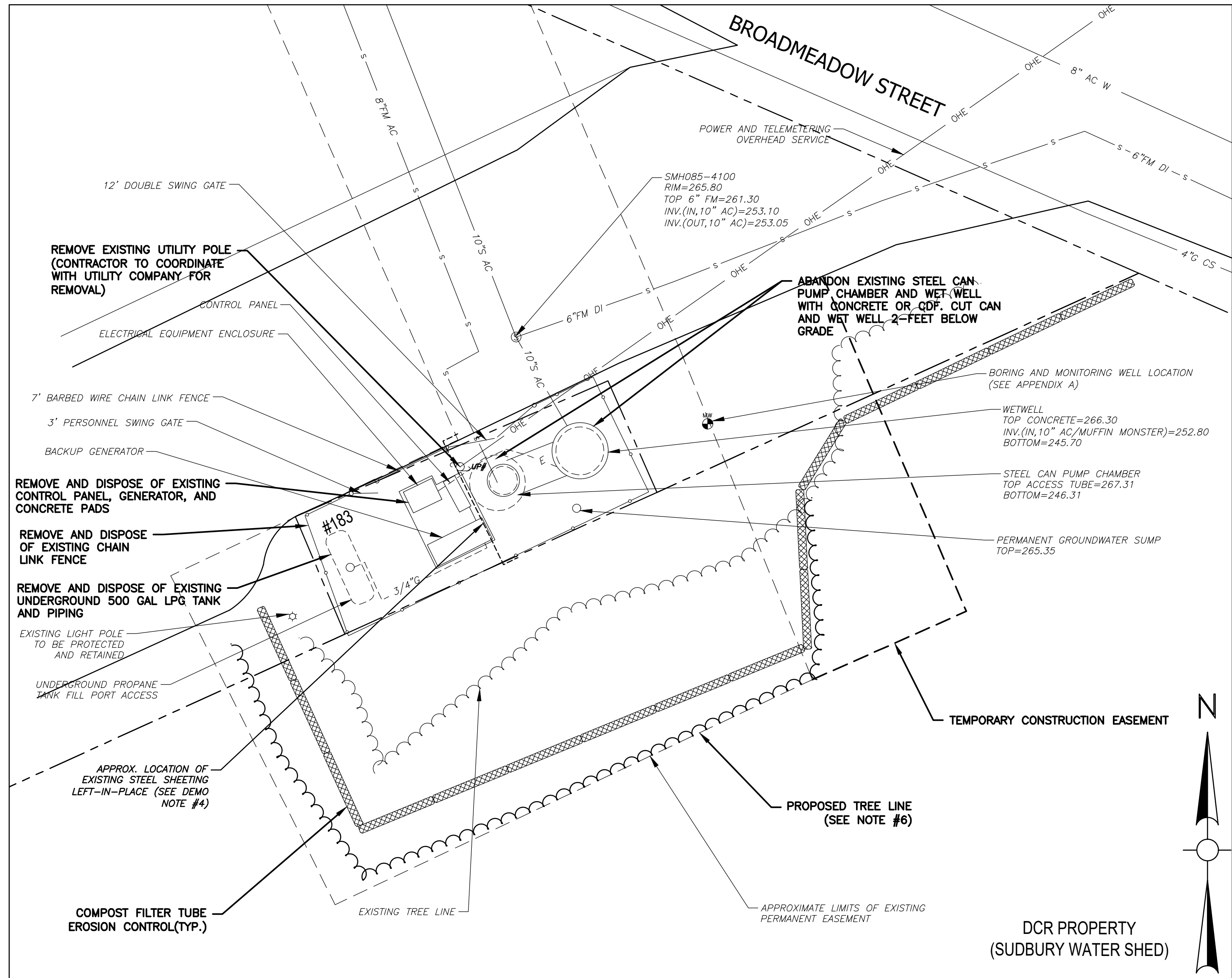
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Scale: NO SCALE

W&S Project No.: ENG23-010
W&S File No.: SEE PATH

Sheet Number:

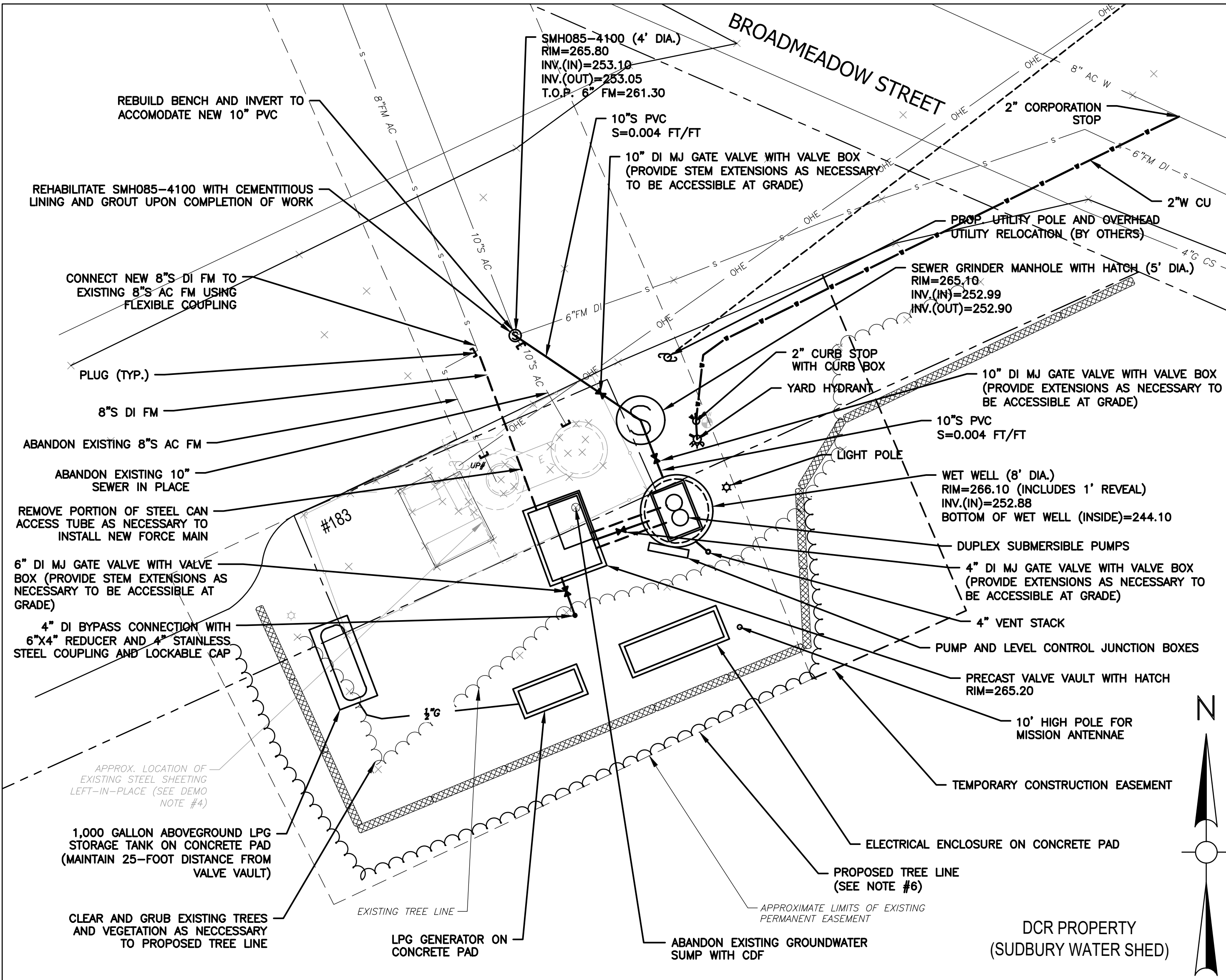
G001



PUMP STATION DEMOLITION PLAN
SCALE: 1" = 10'

DEMOLITION NOTES:

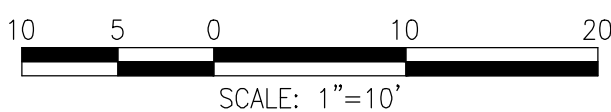
1. THE CONTRACTOR SHALL CLEAN AND DISPOSE OF DEBRIS IN EXISTING WET WELL PRIOR TO ABANDONMENT AT NO ADDITIONAL COST TO THE OWNER.
2. THE CONTRACTOR SHALL COORDINATE WITH THE ENGINEER AND OWNER PRIOR TO DISPOSAL OF ANY ITEMS, PARTS, OR MATERIALS. THE OWNER SHALL DETERMINE AND NOTIFY THE CONTRACTOR WHICH ITEMS, PARTS, OR MATERIALS ARE TO BE SAVED.
3. THE CONTRACTOR SHALL MAINTAIN FLOWS THROUGHOUT THE DURATION OF THE PROJECT.
4. EXISTING SHEETING LEFT-IN-PLACE ENCOUNTERED DURING EXCAVATION SHALL BE REMOVED AND DISPOSED OF BY THE CONTRACTOR AT NO ADDITIONAL COST TO OWNER. THE LOCATION AND EXTENT OF EXISTING SHEETING LEFT-IN-PLACE IS APPROXIMATE.
5. SEE SHEET ED100 FOR ELECTRICAL DEMOLITION PLANS
6. SEE APPENDIX C FOR PHOTOS OF THE EXISTING SITE AND FORESTED AREA.



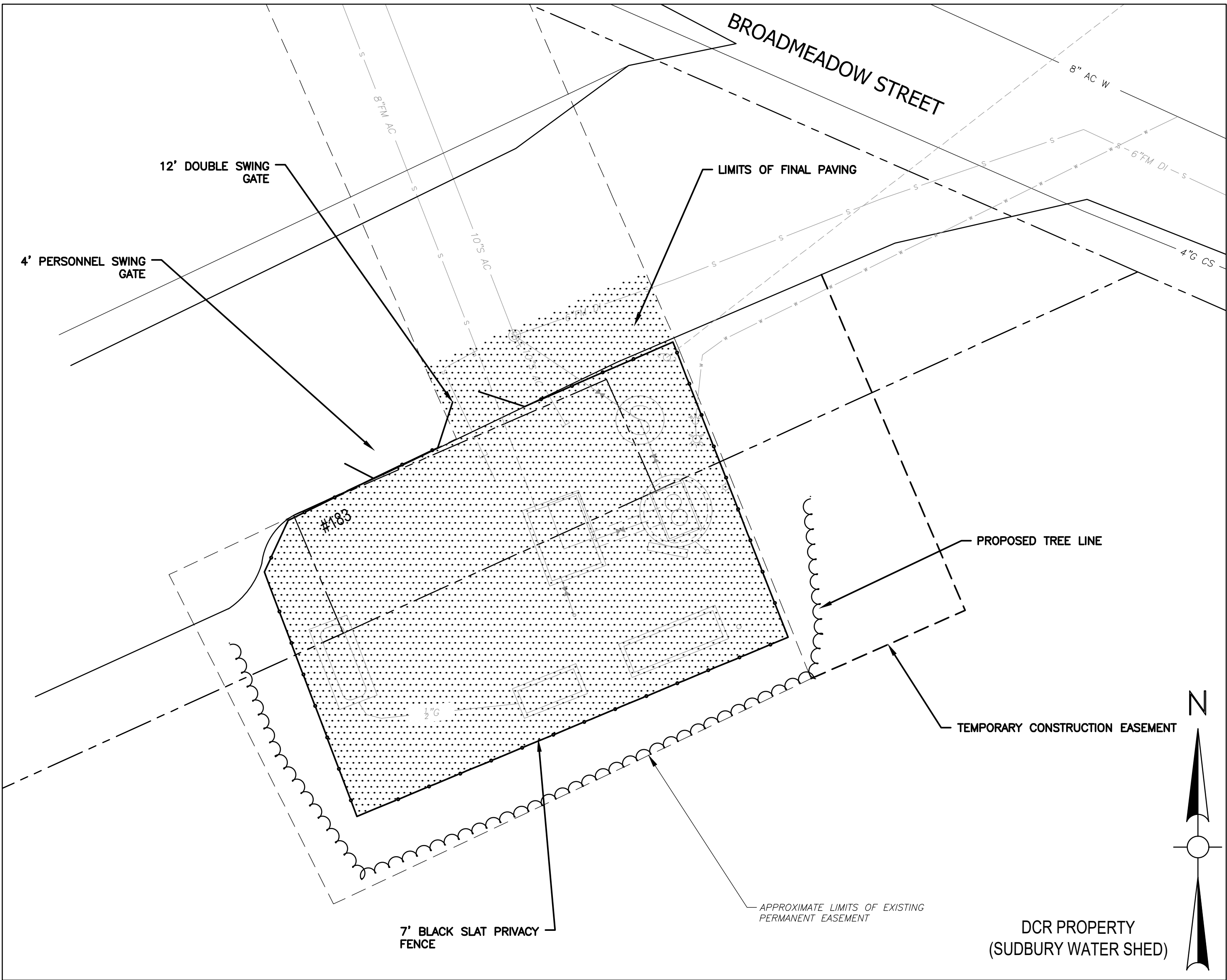
PUMP STATION PROPOSED SITE PLAN
SCALE: 1" = 10'

SITE PLAN NOTES:

1. ALL NON-PAVED AREAS DISTURBED DURING CONSTRUCTION SHALL BE LOAMED AND SEEDED UPON COMPLETION OF WORK.
2. THE CONTRACTOR SHALL MAINTAIN FLOWS THROUGHOUT THE DURATION OF THE PROJECT.
3. EXISTING SHEETING LEFT-IN-PLACE ENCOUNTERED DURING EXCAVATION SHALL BE REMOVED AND DISPOSED OF BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER. THE LOCATION AND EXTENT OF EXISTING SHEETING LEFT-IN-PLACE IS APPROXIMATE.
4. THE CONTRACTOR SHALL COORDINATE WITH UTILITY PROVIDERS REGARDING THE POWER SUPPLY AND TELECOMMUNICATIONS FOR THE PUMP STATION.
5. IF CONTRACTOR'S WORK EXTENDS BEYOND PERMANENT AND/OR TEMPORARY EASEMENTS, SEE WETLAND DELINEATION REPORT IN APPENDIX B TO ENSURE THE WORK ZONE IS STILL OUTSIDE OF THE BUFFER ZONE.
6. CONTRACTOR TO CLEAR AND GRUB TO PROPOSED TREE LINE. SEE APPENDIX C FOR PHOTOS OF THE EXISTING SITE AND FORESTED AREA.
7. ALL SEWER VALVES SHALL OPEN LEFT (COUNTER-CLOCKWISE). ALL WATER VALVES SHALL OPEN RIGHT (CLOCKWISE).



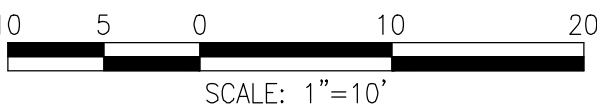
Revisions:		
No.	Date	Description



PUMP STATION FINAL PAVING AND FENCE PLAN
SCALE: 1" = 10'

PAVING AND FENCE NOTES

1. ALL NON-PAVED AREAS DISTURBED DURING CONSTRUCTION SHALL BE LOAMED AND SEEDED UPON COMPLETION OF WORK.
2. IF CONTRACTOR'S WORK EXTENDS BEYOND THE DESIGNATED WORK ZONE, SEE WETLAND DELINEATION REPORT IN APPENDIX B TO ENSURE THE WORK ZONE IS STILL OUTSIDE THE BUFFER ZONE.
3. CONTRACTOR TO CLEAR AND GRUB TO PROPOSED TREE LINE. SEE APPENDIX C FOR PHOTOS OF THE EXISTING SITE AND FORESTED AREA.



Project:
CITY OF MARLBOROUGH,
MASSACHUSETTS
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Drawn By: RWS
Reviewed By: JSL
Approved By: FEO
W&S Project No.: ENG23-0105
W&S File No.: SEE PATH

Drawing Title:
**PUMP STATION
FINAL PAVING AND
FENCE PLANS**

Sheet Number:
C101

TABLE 1

REQUIRED LENGTH OF RESTRAINED JOINTS FROM FITTINGS (FEET)

PIPE SIZE	90° BEND	45° BEND OR WYE BRANCH	22 1/2° BEND	11 1/4° BEND	PLUG, CAP OR IN-LINE VALVE	TEE (BRANCH)
6"	25 (30.5)	10.5 (12.5)	5 (6)	2.5 (3)	43 (64)	34 (51)
8"	33 (40)	13.5 (16.5)	6.5 (8)	3 (4)	55 (82)	47 (70)
10"	40 (48.5)	16.5 (20)	8 (9.5)	4 (5)	67 (100)	58 (87)
12"	47 (56.5)	19.5 (23.5)	9.5 (11.5)	4.5 (5.5)	79 (118)	70 (105)
16"	59.5 (72)	24.5 (30)	12 (14.5)	6 (7)	101 (152)	92 (139)
20"	72 (86.5)	30 (36)	14.5 (17)	7 (8.5)	123 (184)	114 (171)
24"	84 (100)	35 (41)	16.5 (20)	8 (10)	144 (216)	134 (202)
30"	100 (120)	41 (50)	20 (24)	10 (12)	174 (261)	165 (247)

NOTES:

- RESTRAINED LENGTHS LISTED IN PARENTHESES ARE FOR PIPE WRAPPED IN POLYETHYLENE. THE OTHER ASSOCIATED LENGTHS ARE FOR PLAIN UNWRAPPED DUCTILE IRON PIPE.
- THE CONTRACTOR SHALL USE THIS TABLE IN CONJUNCTION WITH THE APPROPRIATE PIPE SPECIFICATION SECTION.

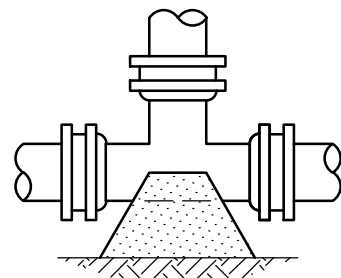
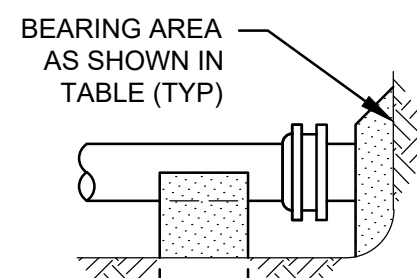
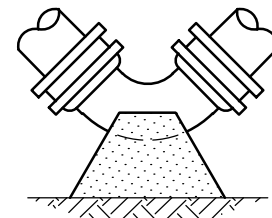
TEE DETAIL
(PLAN VIEW)CAP DETAIL
(PLUG SIMILAR)
(SECTION VIEW)BEND DETAIL
(PLAN VIEW)

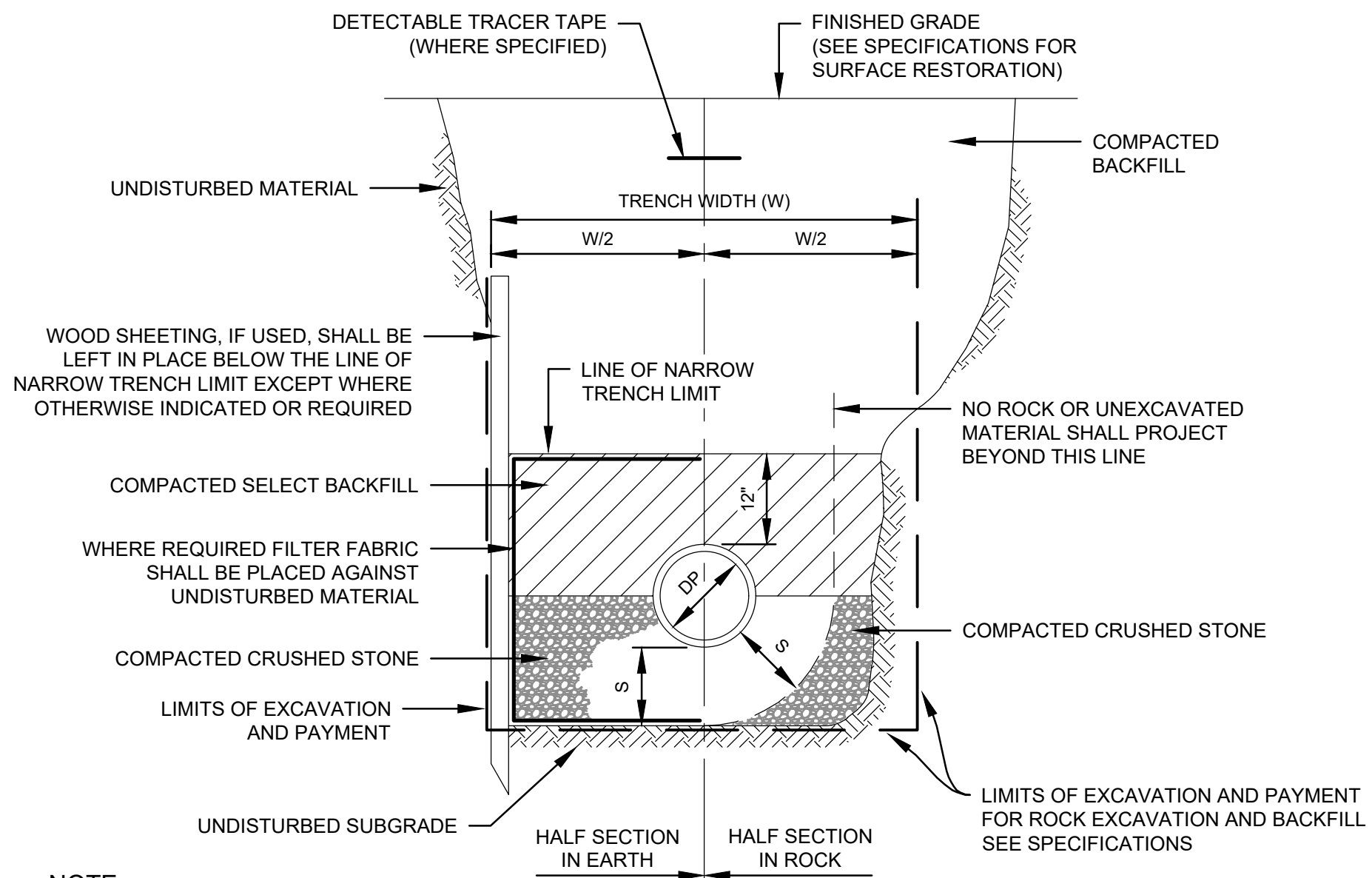
TABLE OF CONCRETE THRUST RESTRAINT MINIMUM BEARING AREAS IN SQUARE FEET AGAINST UNDISTURBED MATERIAL FOR WATER MAIN FITTINGS				
SIZE OF MAIN	90° BENDS, TEES, CAPS AND PLUGS	45° BENDS AND WYES	22-1/2° BENDS	11-1/4° BENDS
6", 8"	5	4	2	2
10", 12"	12	9	5	2

NOTES:

- CONCRETE THRUST RESTRAINT SHALL ONLY BE USED WHERE OTHER MEANS OF RESTRAINT ARE NOT FEASIBLE.
- CONTRACTOR SHALL USE CARE TO AVOID PLACEMENT OF CONCRETE ON THE FITTING JOINTS

CONCRETE THRUST RESTRAINT FOR FITTINGS

N.T.S.



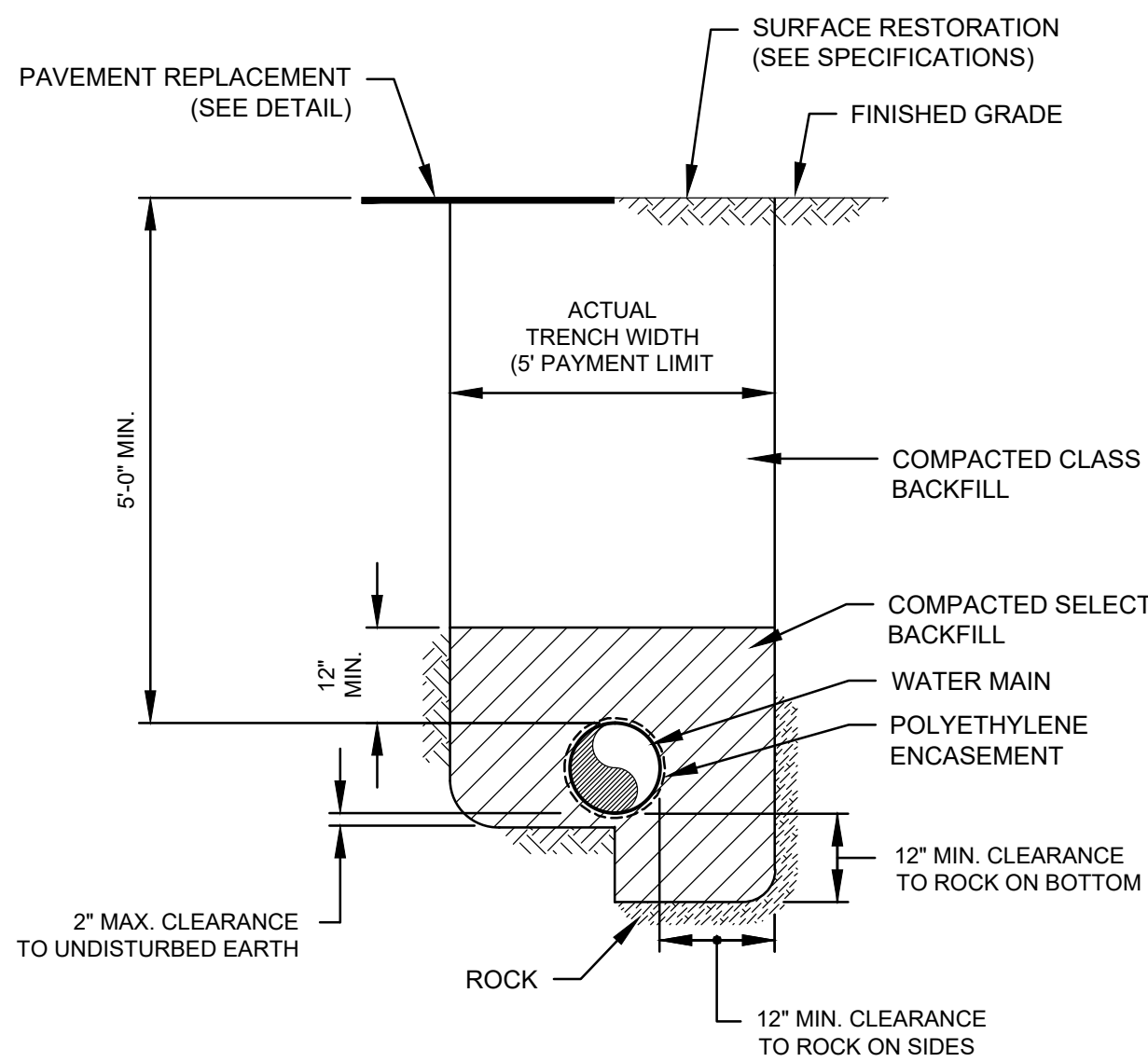
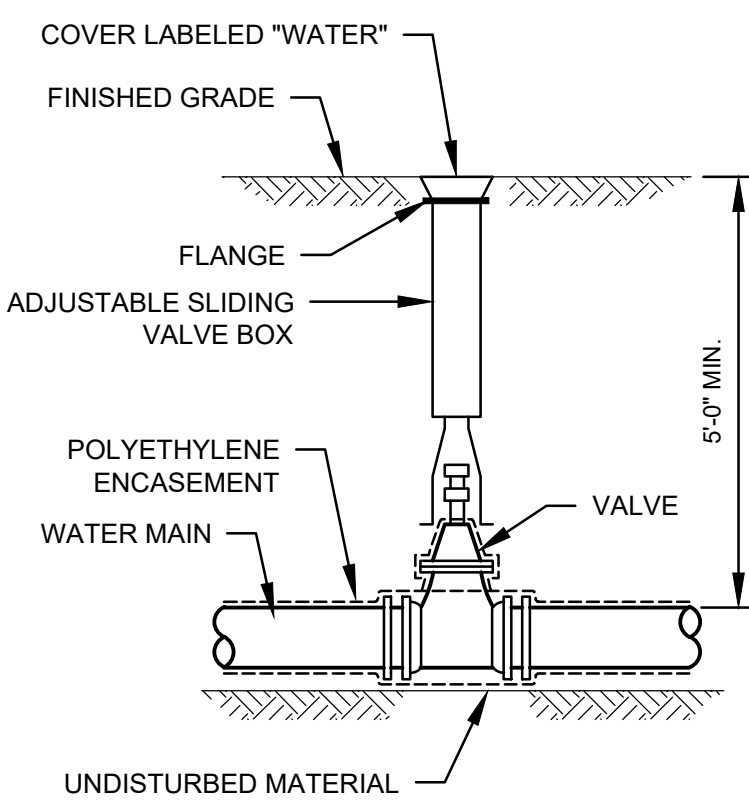
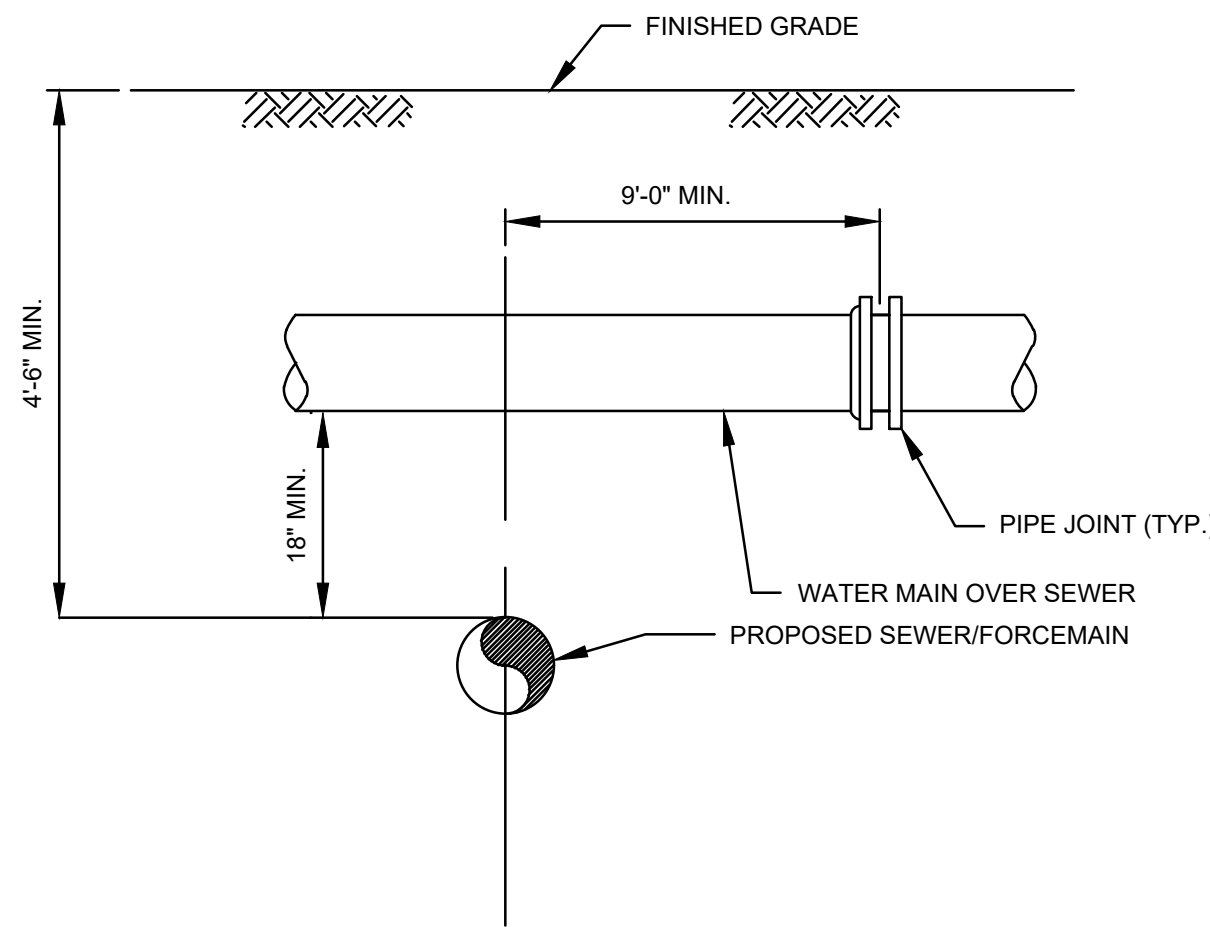
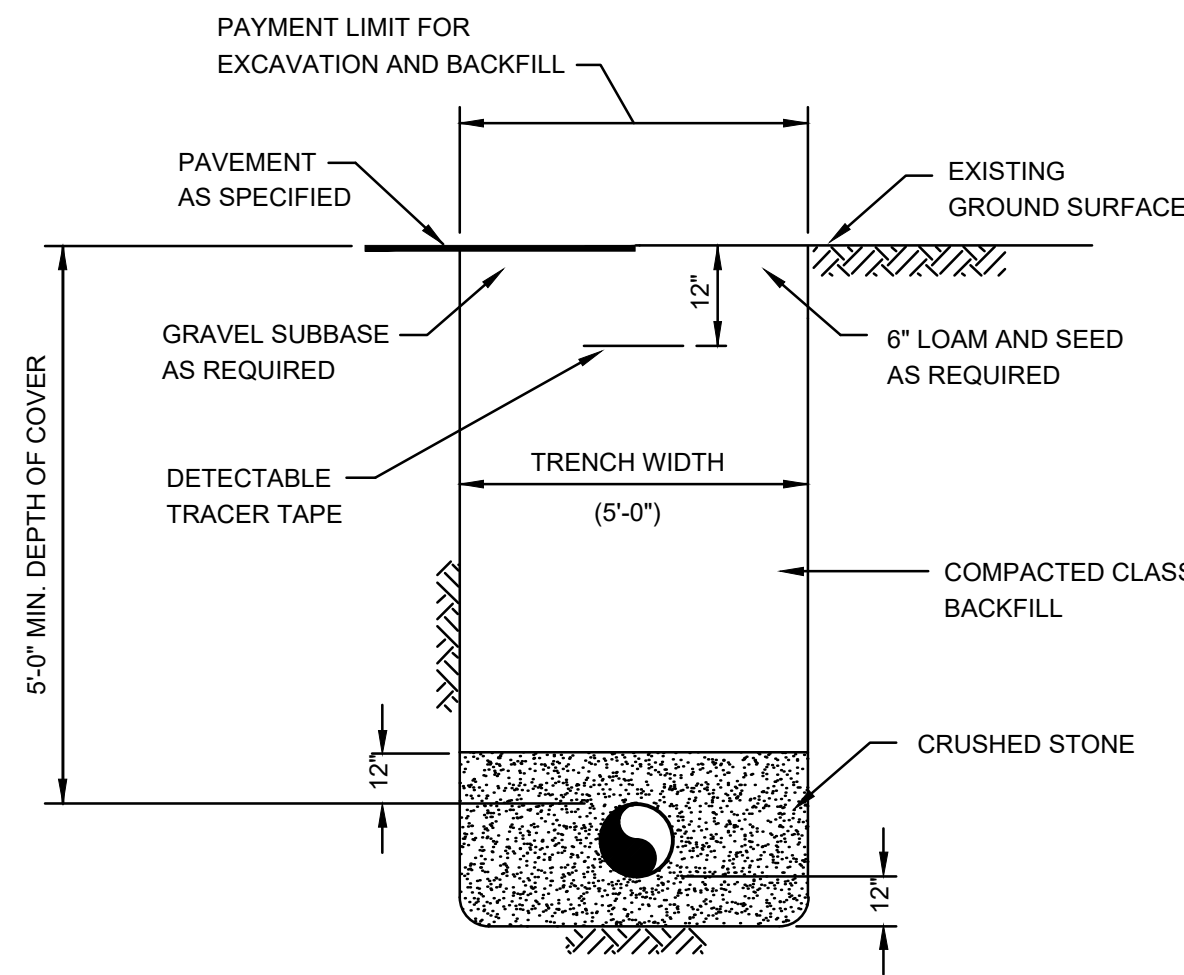
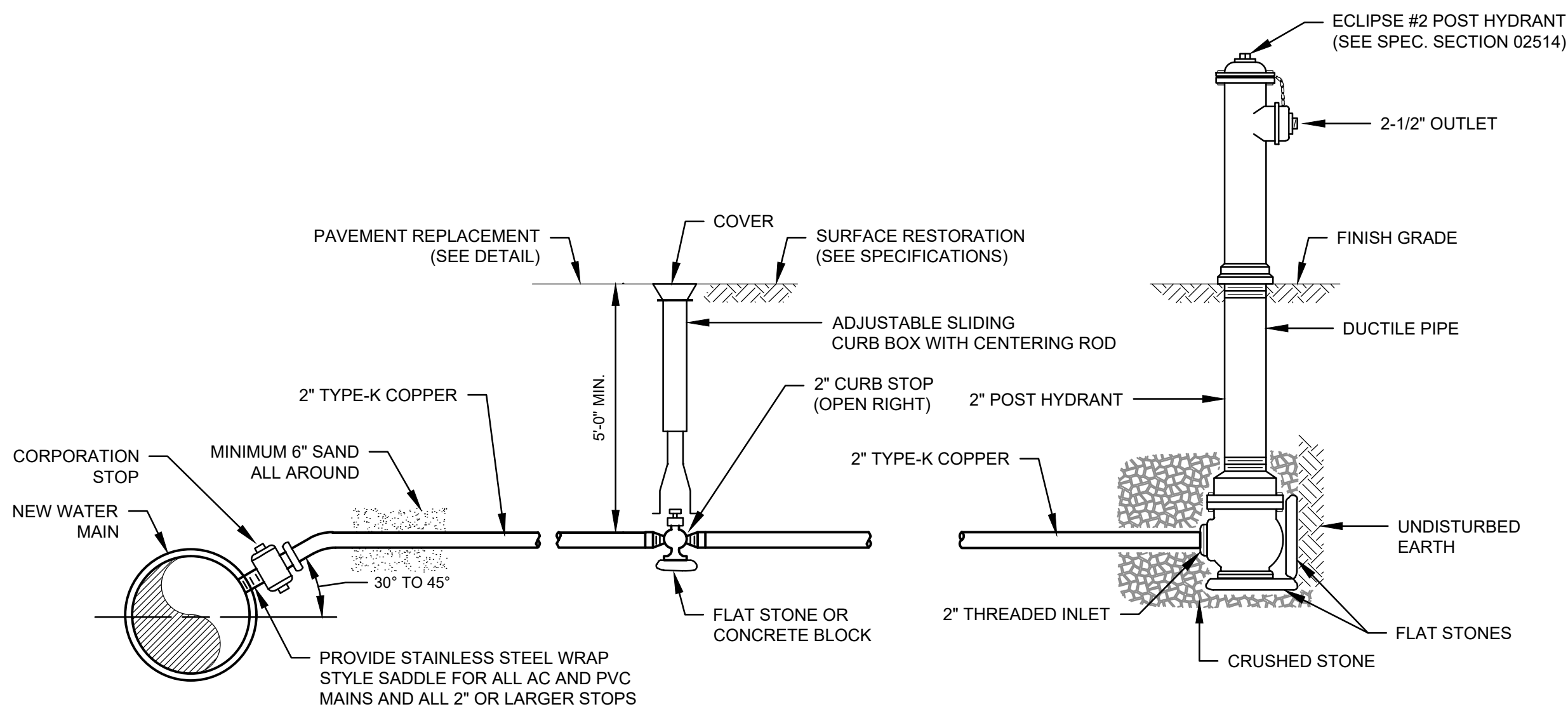
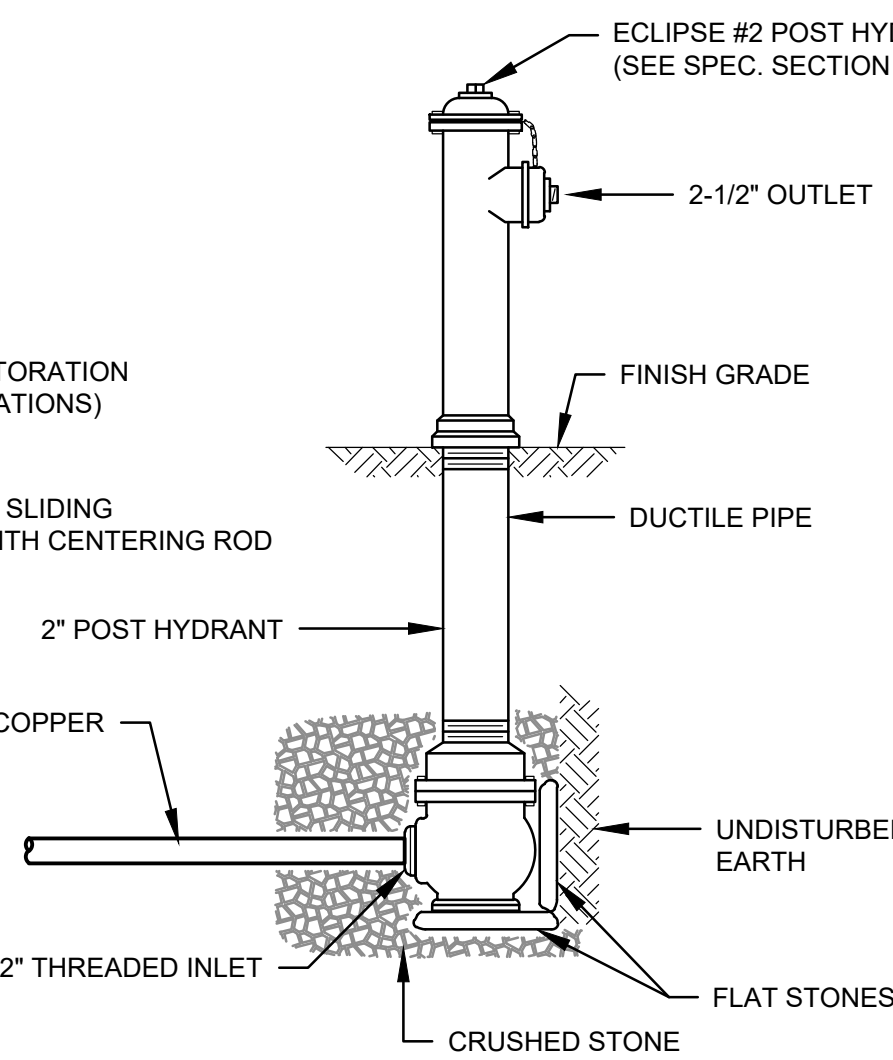
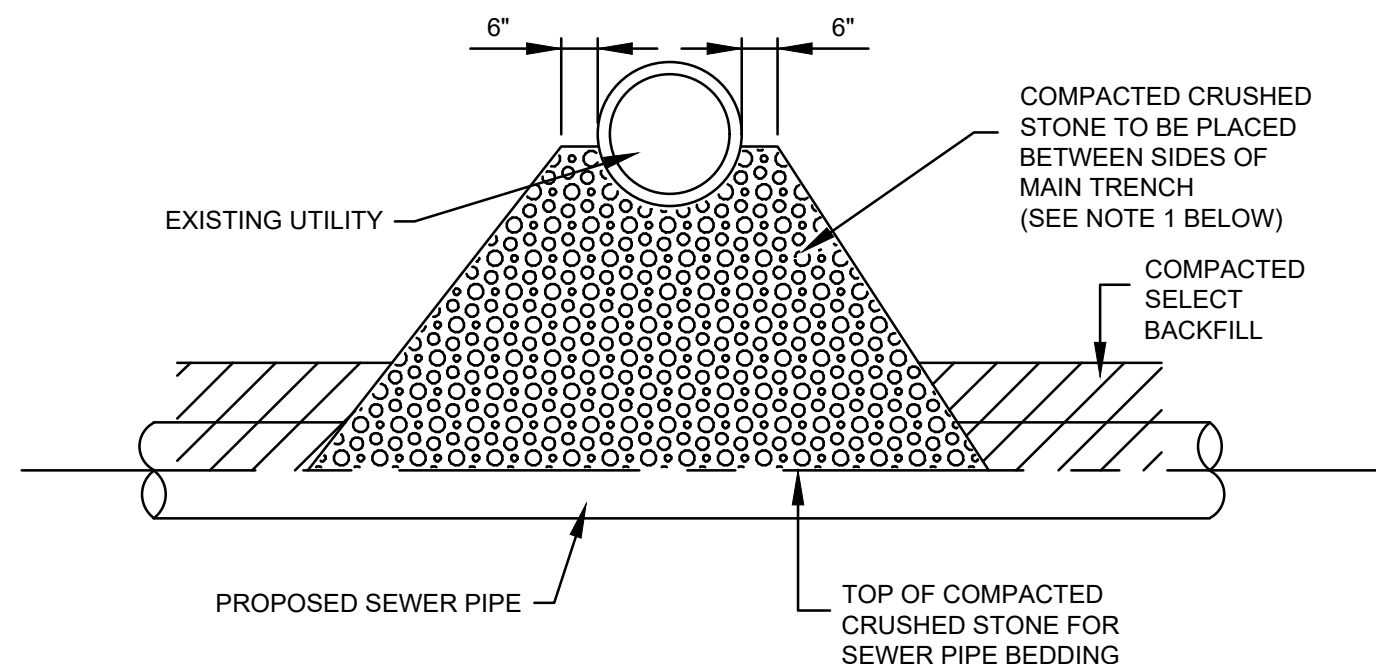
NOTE:

FOR W, DP, AND S, SEE TABLE A.

TRENCH DETAIL
(SEWER, FORCE MAIN, STORM DRAIN)
N.T.S.

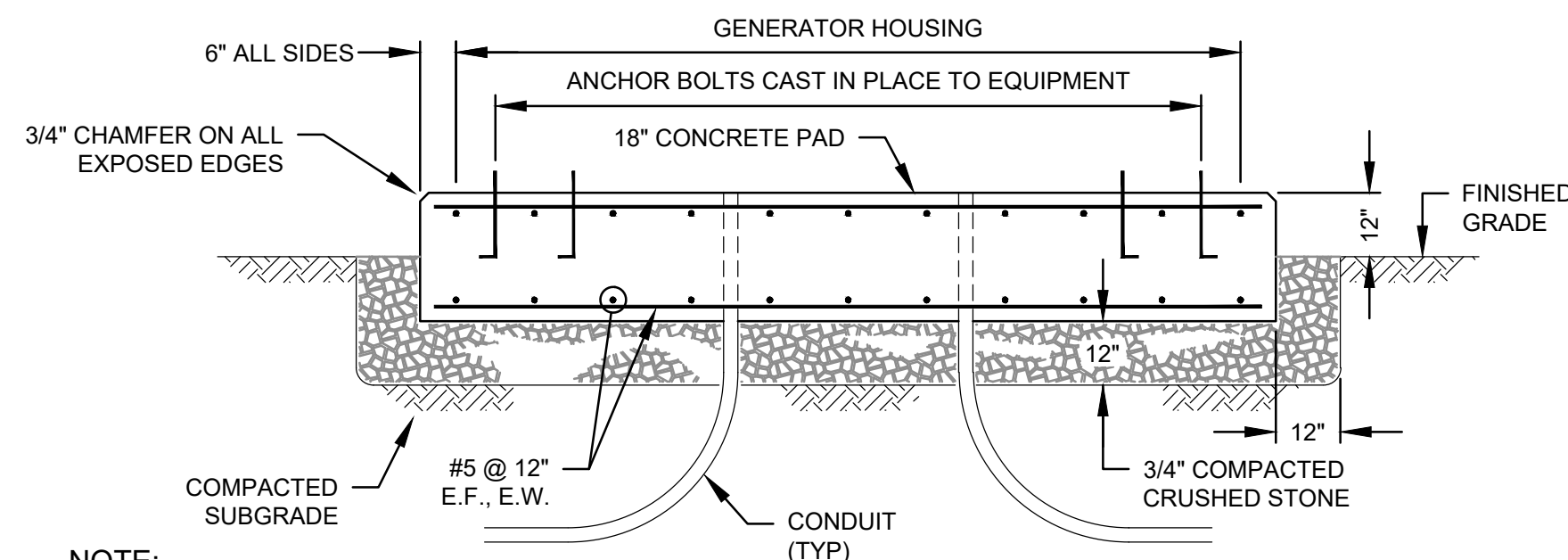
DEPTH TO INVERT	DIAMETER OF PIPE (DP)	MAXIMUM TRENCH WIDTH BELOW LINE OF NARROW TRENCH LIMIT (SHEETED OR UNSHEETED) (W)	MINIMUM CLEARANCE (S)
0 - 12'	TO 18"	5'	6"
0 - 12'	21" - 24"	5'	7-1/2"
OVER 12'	TO 18"	7'	6"
OVER 12'	21" - 24"	7'	7-1/2"

TABLE A

WATER MAIN TRENCH DETAIL
N.T.S.VALVE AND BOX DETAIL
N.T.S.SEWER/FORCEMAIN CROSSING DETAIL
N.T.S.PRESSURE SEWER TRENCH DETAIL
N.T.S.WATER SERVICE DETAIL
N.T.S.YARD HYDRANT
N.T.S.UTILITY CROSSING DETAIL
N.T.S.

NOTE:

- WHERE ASBESTOS CEMENT (A.C.) PIPE IS ENCOUNTERED CONTROLLED DENSITY FILL SHALL BE INSTALLED IN LIEU OF CRUSHED STONE



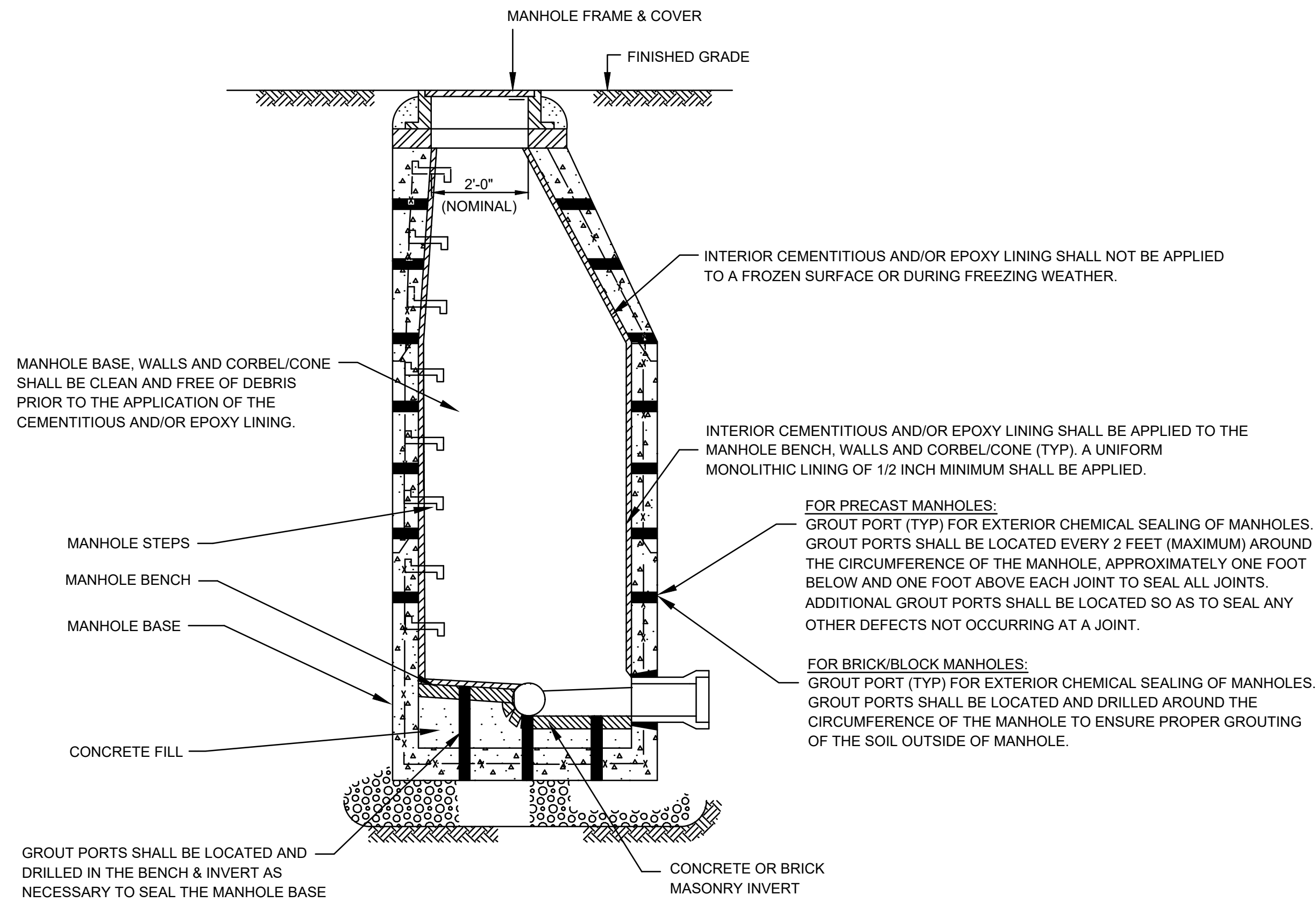
NOTE:

COORDINATE ALL OPENINGS IN CONCRETE PAD WITH EQUIPMENT MANUFACTURER.

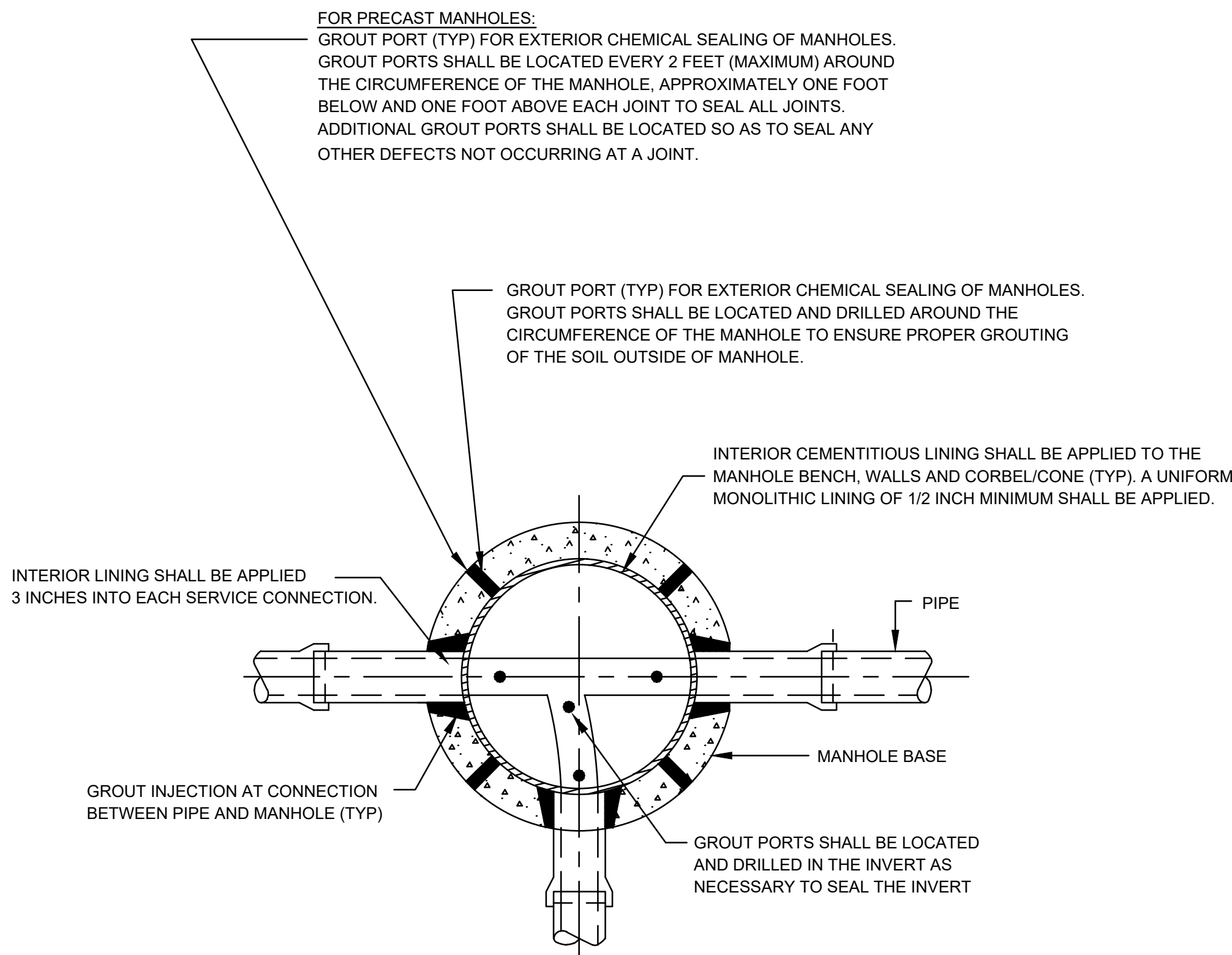
GENERATOR PAD
N.T.S.

Consultants:

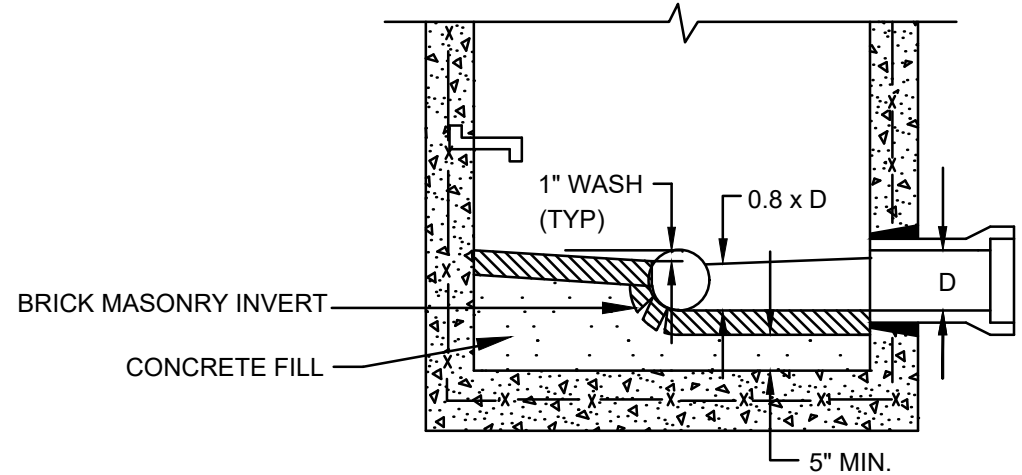
Revisions:		
No.	Date	Description



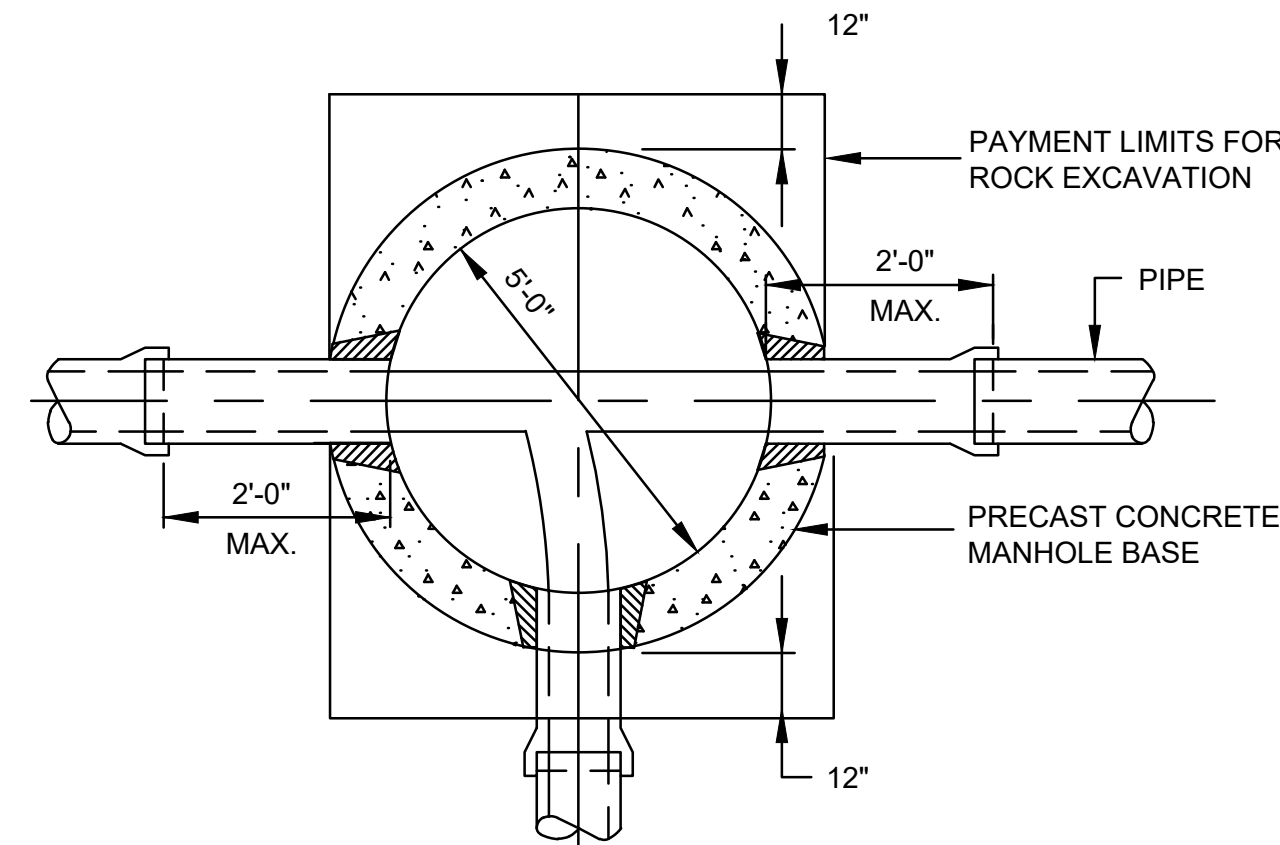
MANHOLE REHABILITATION DETAIL
N.T.S.



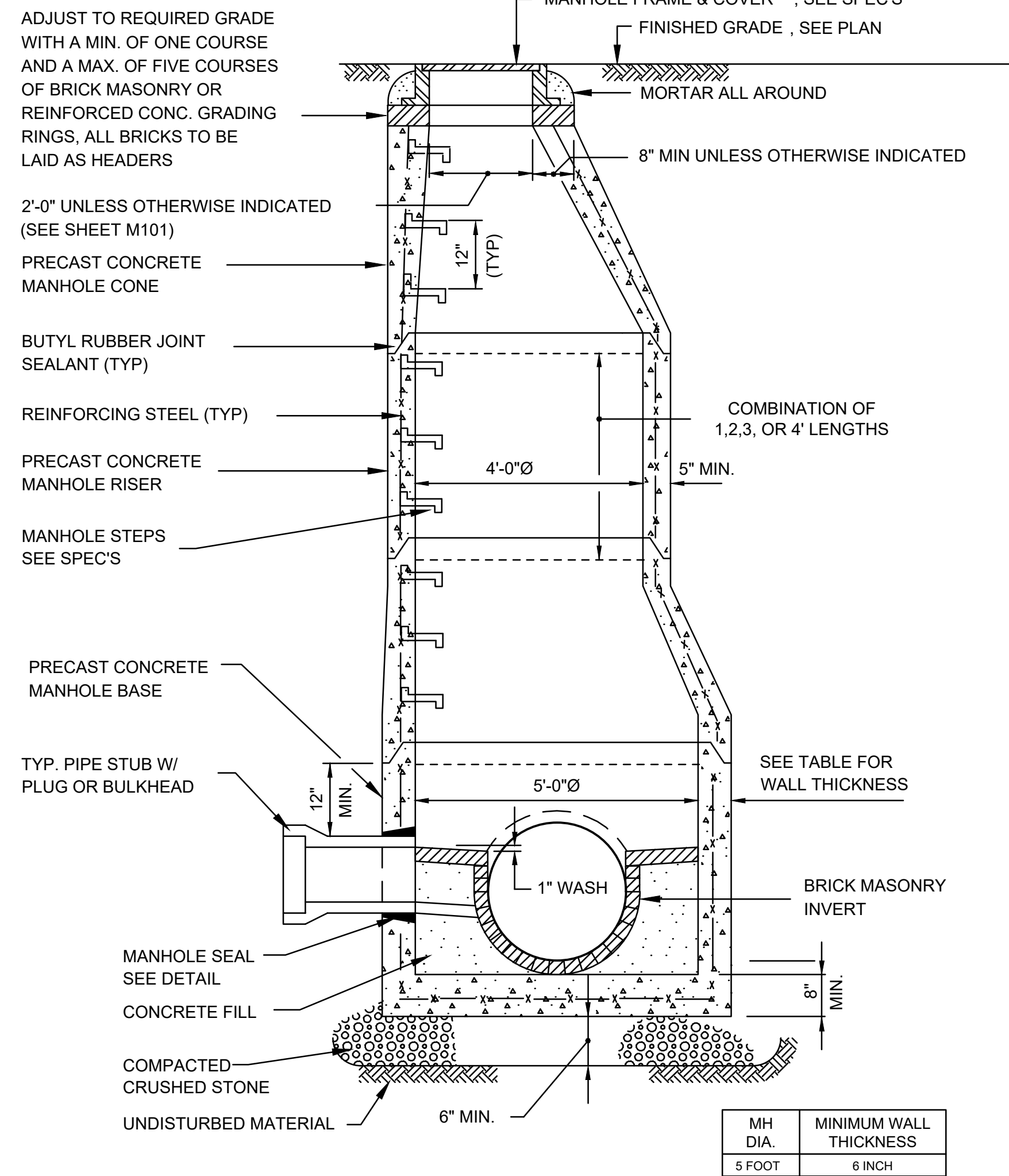
MANHOLE REHABILITATION PLAN
N.T.S.



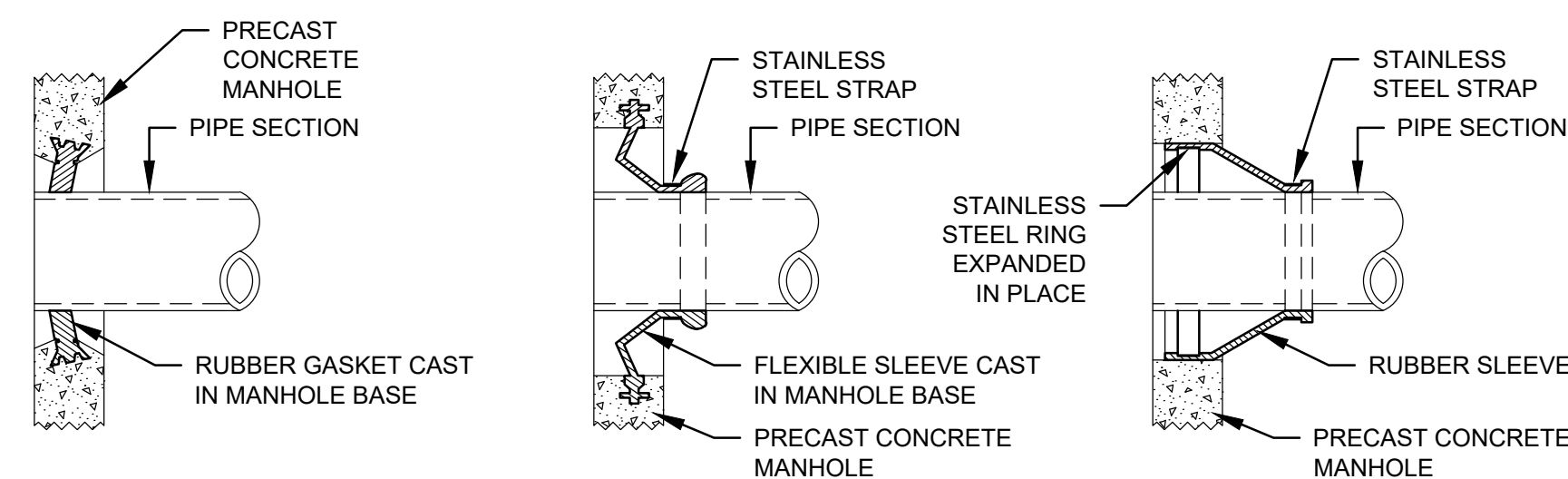
SEWER MANHOLE
BENCH AND INVERT DETAIL
N.T.S.



5'-0" DIA. MANHOLE PLAN
N.T.S.

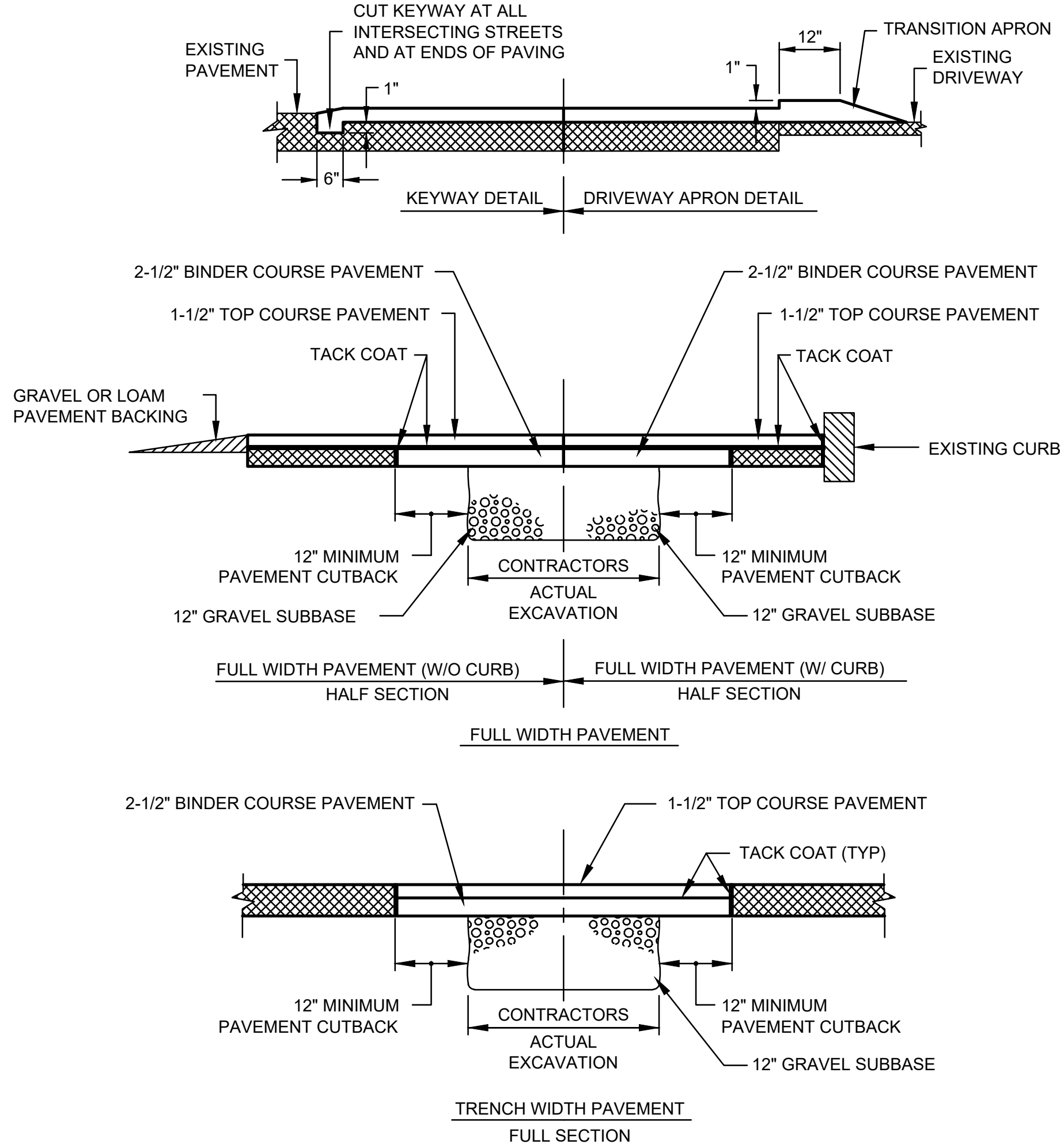


5'-0" DIA.
PRECAST CONCRETE MANHOLE DETAIL
N.T.S.

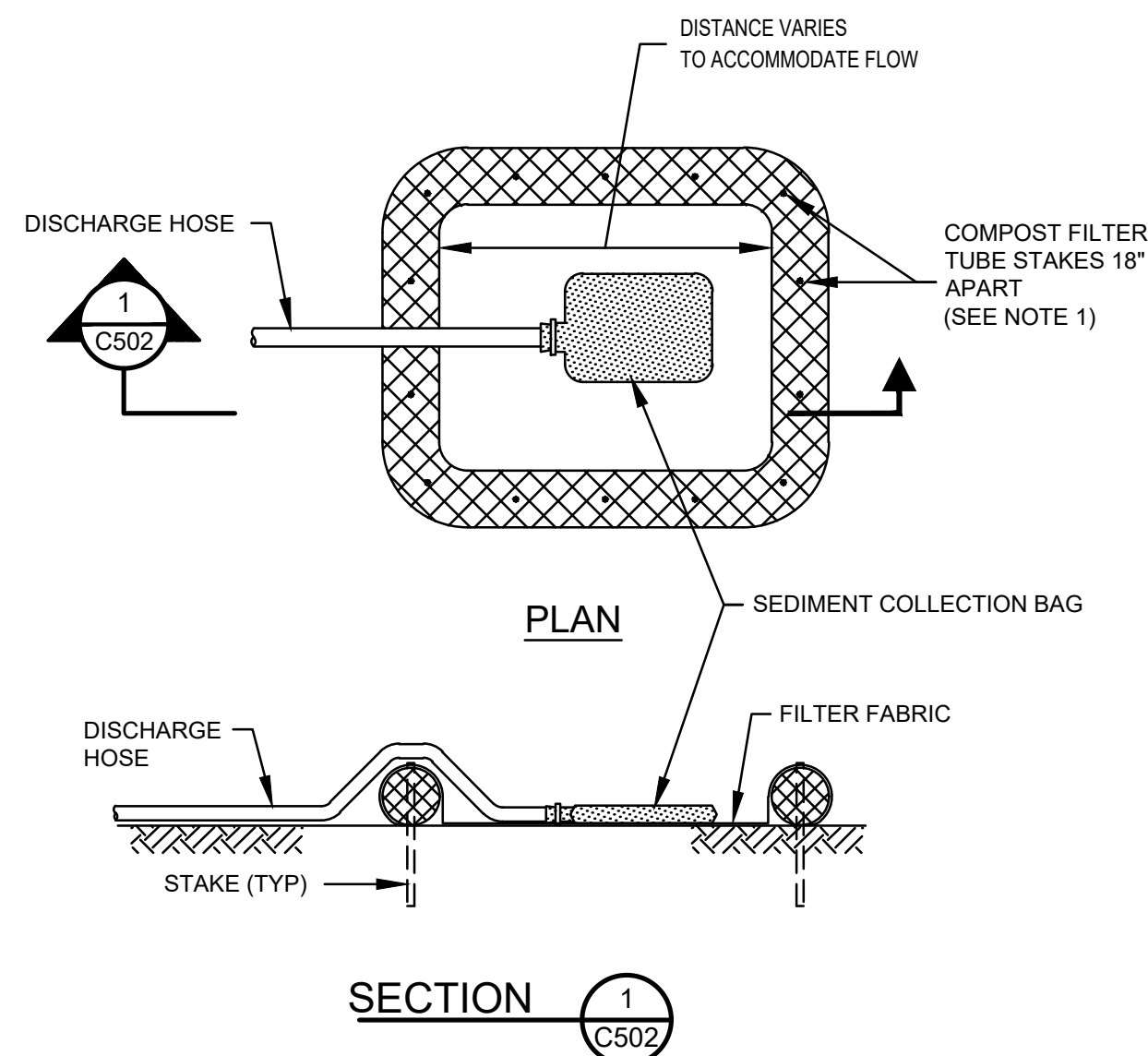


MANHOLE SEAL DETAILS
N.T.S.

Revisions:		
No.	Date	Description

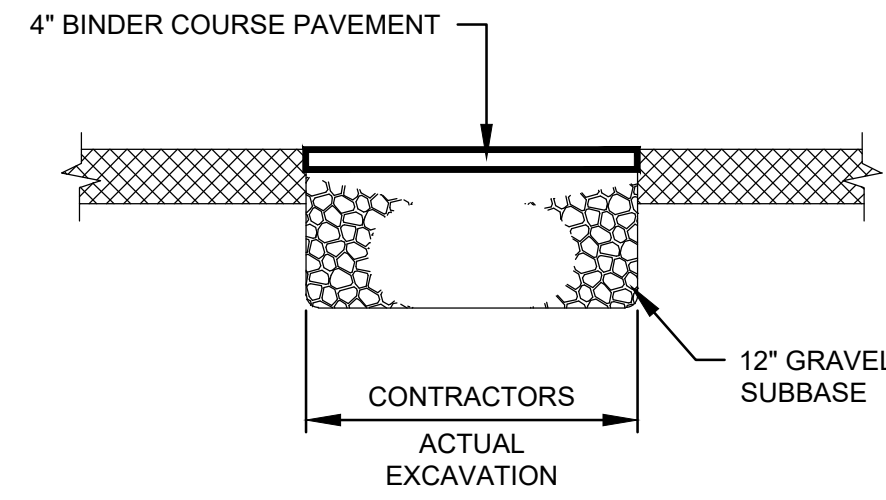


PAVEMENT REPLACEMENT DETAILS
N.T.S.

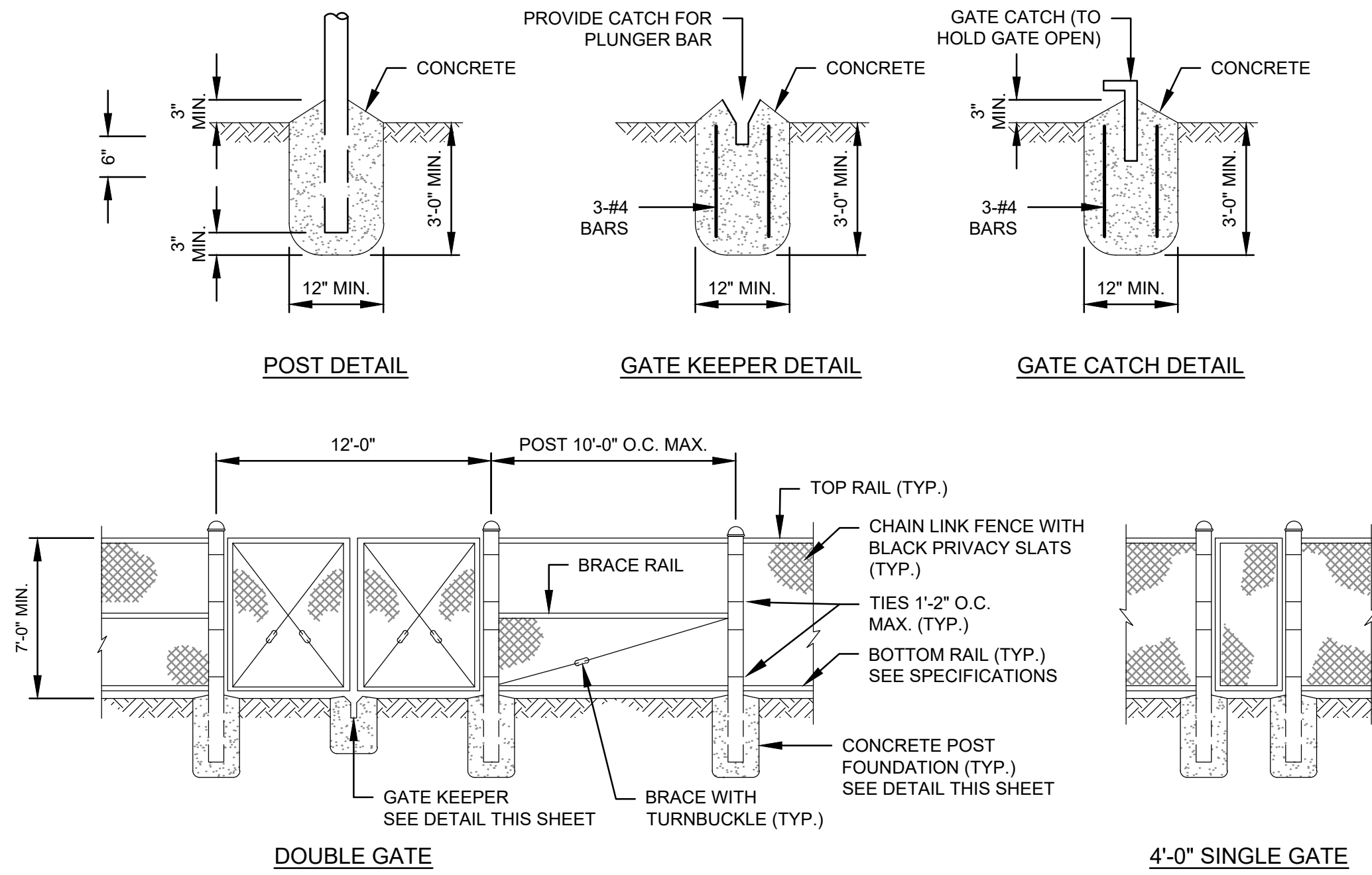


- NOTE:**
1. WHEN STAKING IS NOT POSSIBLE, SUCH AS WHEN TUBES MUST BE PLACED ON PAVEMENT, HEAVY CONCRETE OR CINDER BLOCKS CAN BE USED BEHIND TUBES UP TO 5 FT. APART OR AS REQUIRED TO SECURE TUBES IN PLACE.

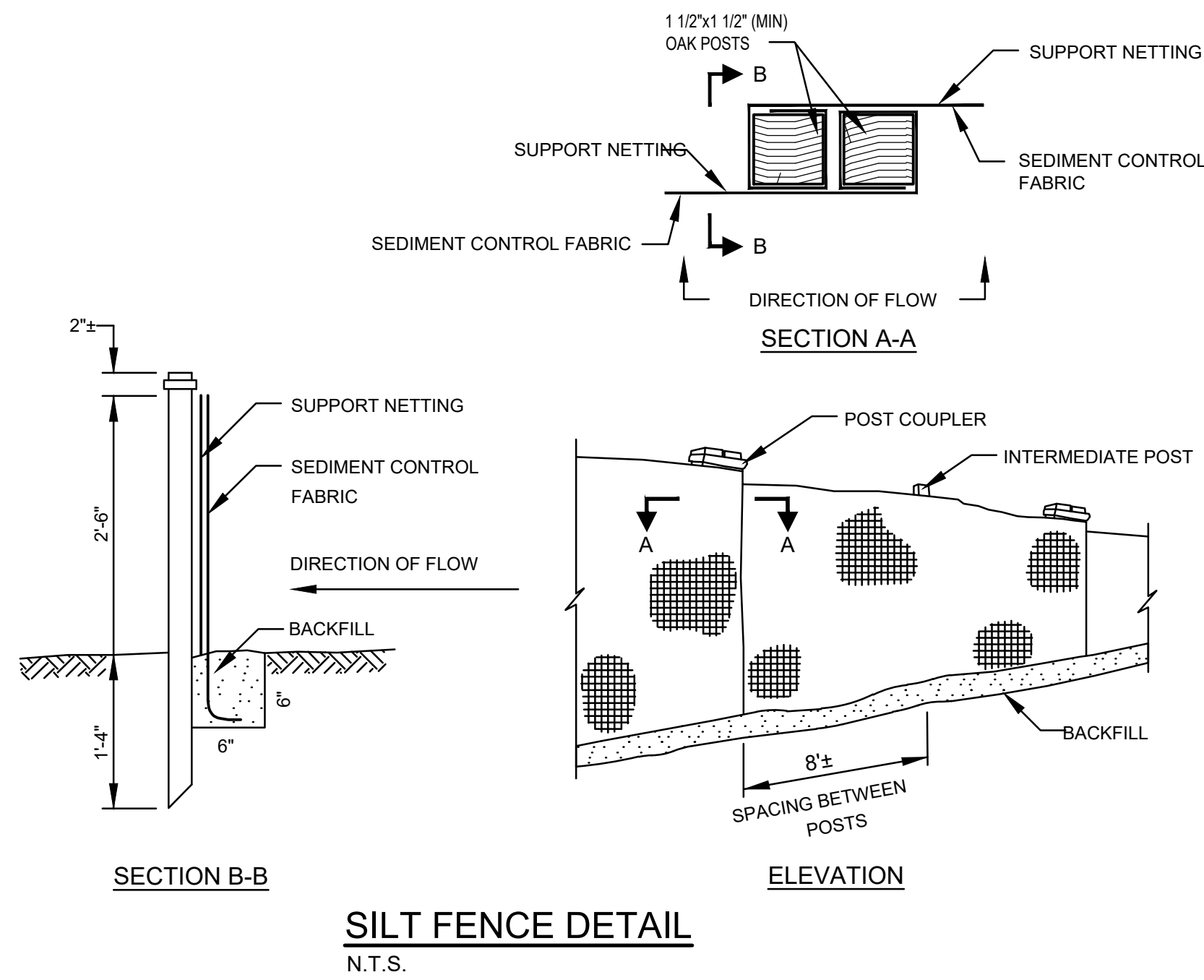
DEWATERING DISCHARGE DISPOSAL DETAIL
N.T.S.



TEMPORARY PAVEMENT DETAIL
N.T.S.



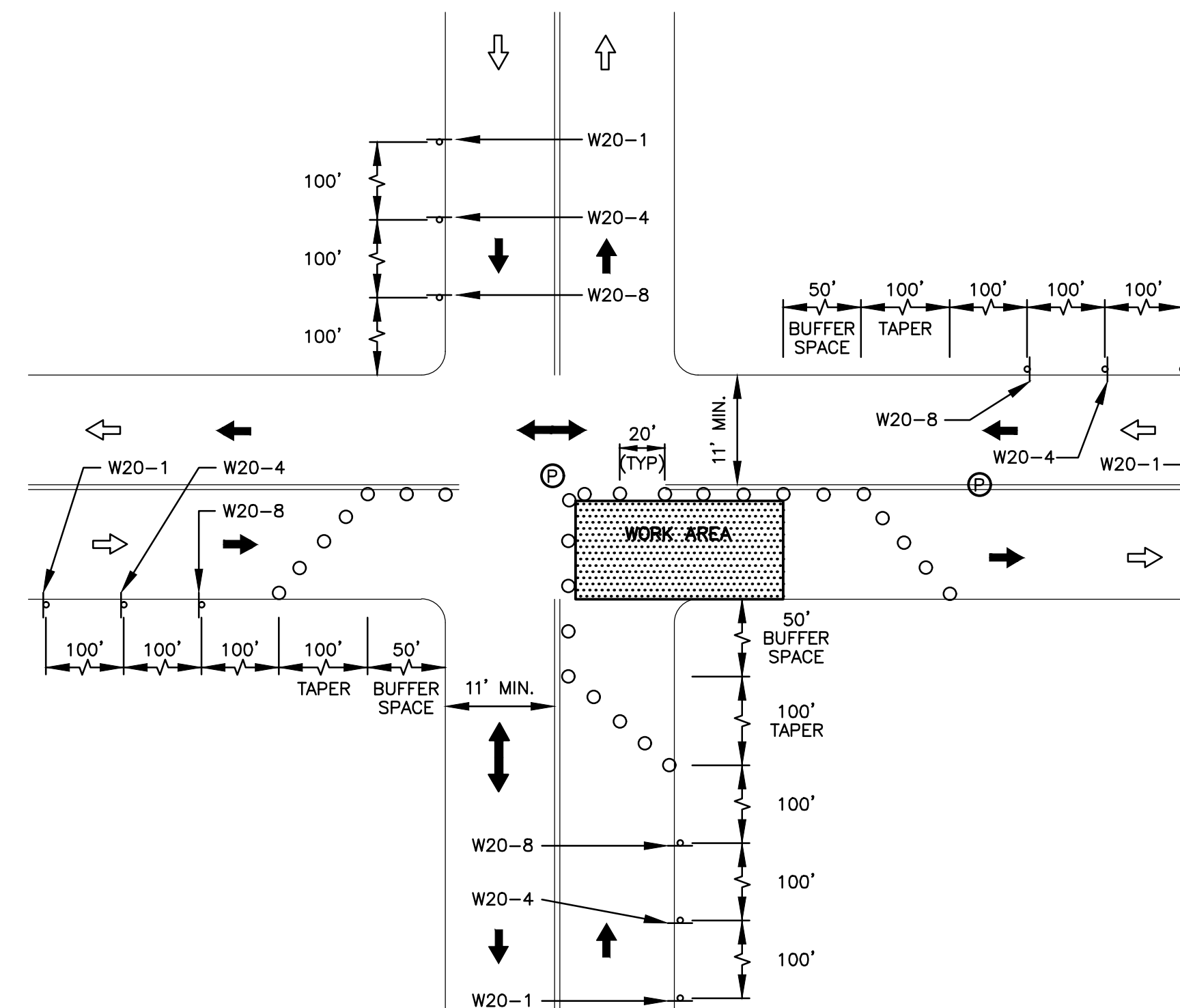
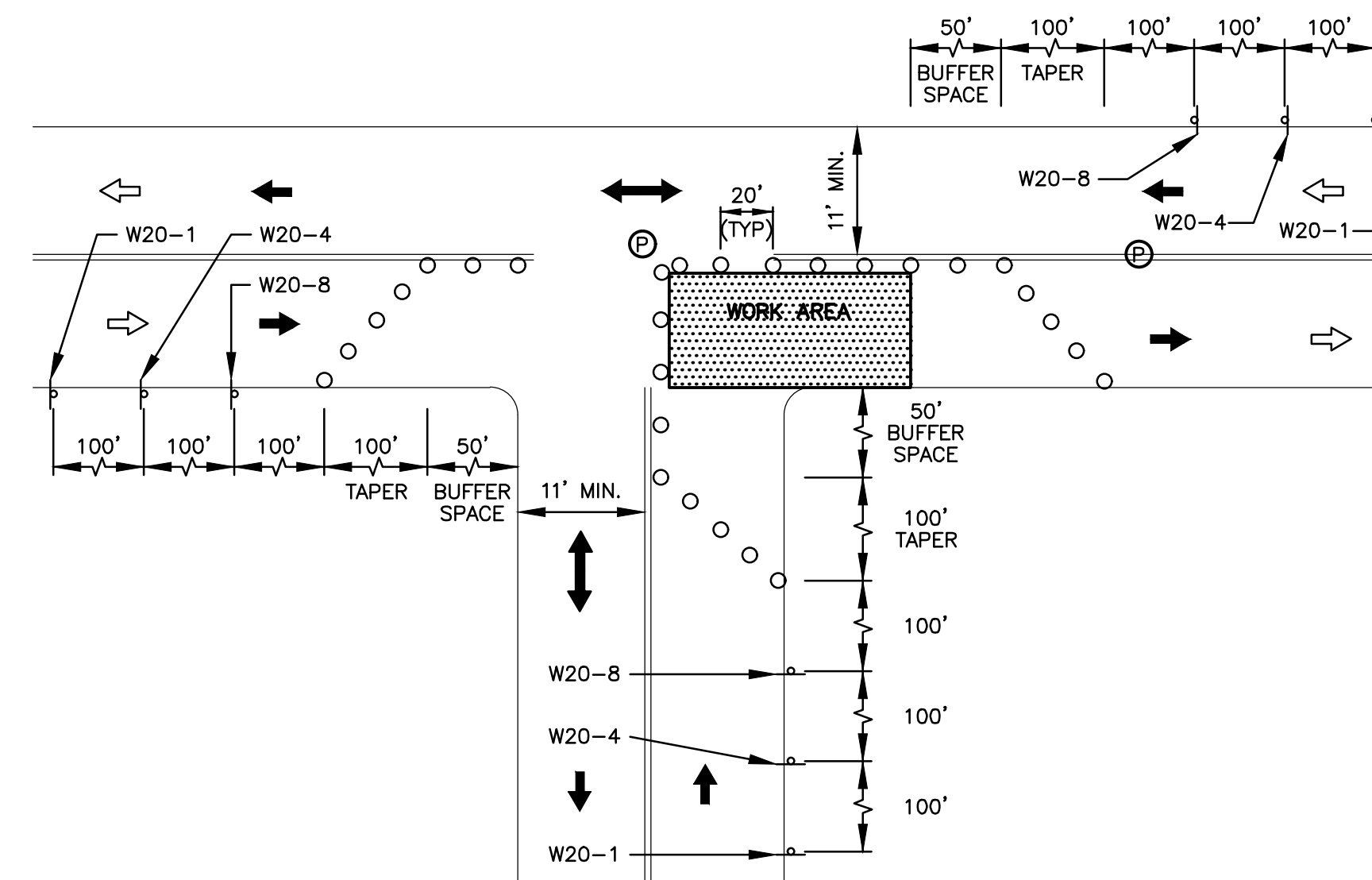
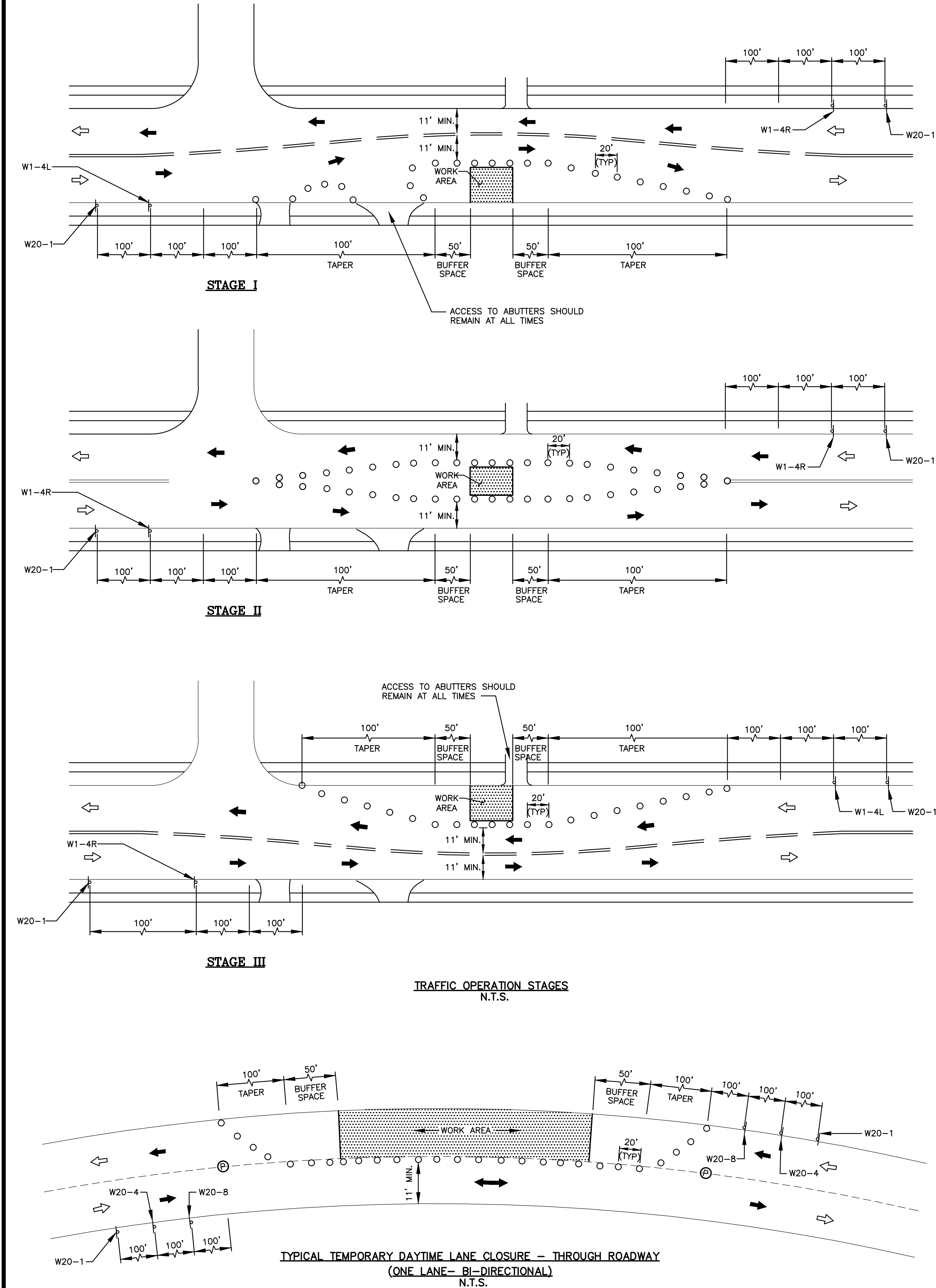
TYPICAL CHAIN LINK FENCE AND GATE DETAILS
N.T.S.



SILT FENCE DETAIL
N.T.S.

Revisions:		
No.	Date	Description

P:\M&S\Boroughs\W2021\001_Broadmeadow_Pump_Station_Improvements\CD\CD-C503 - Construction Zone Safety Plan.dwg



TEMPORARY TRAFFIC SIGN SUMMARY			
MUTCD CODE	SIZE OF SIGN		SIGN
	WIDTH	HEIGHT	
W1-4L	30"	30"	
W1-4R	30"	30"	
W20-1	36"	36"	
W20-4	36"	36"	
W20-8	36"	36"	
G20-2	36"	18"	

NOTE:

- FOR THE LATEST SPECIFICATION ON TEXT DIMENSIONS AND COLOR, CONTRACTOR SHALL REFER TO THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (CURRENT EDITION).

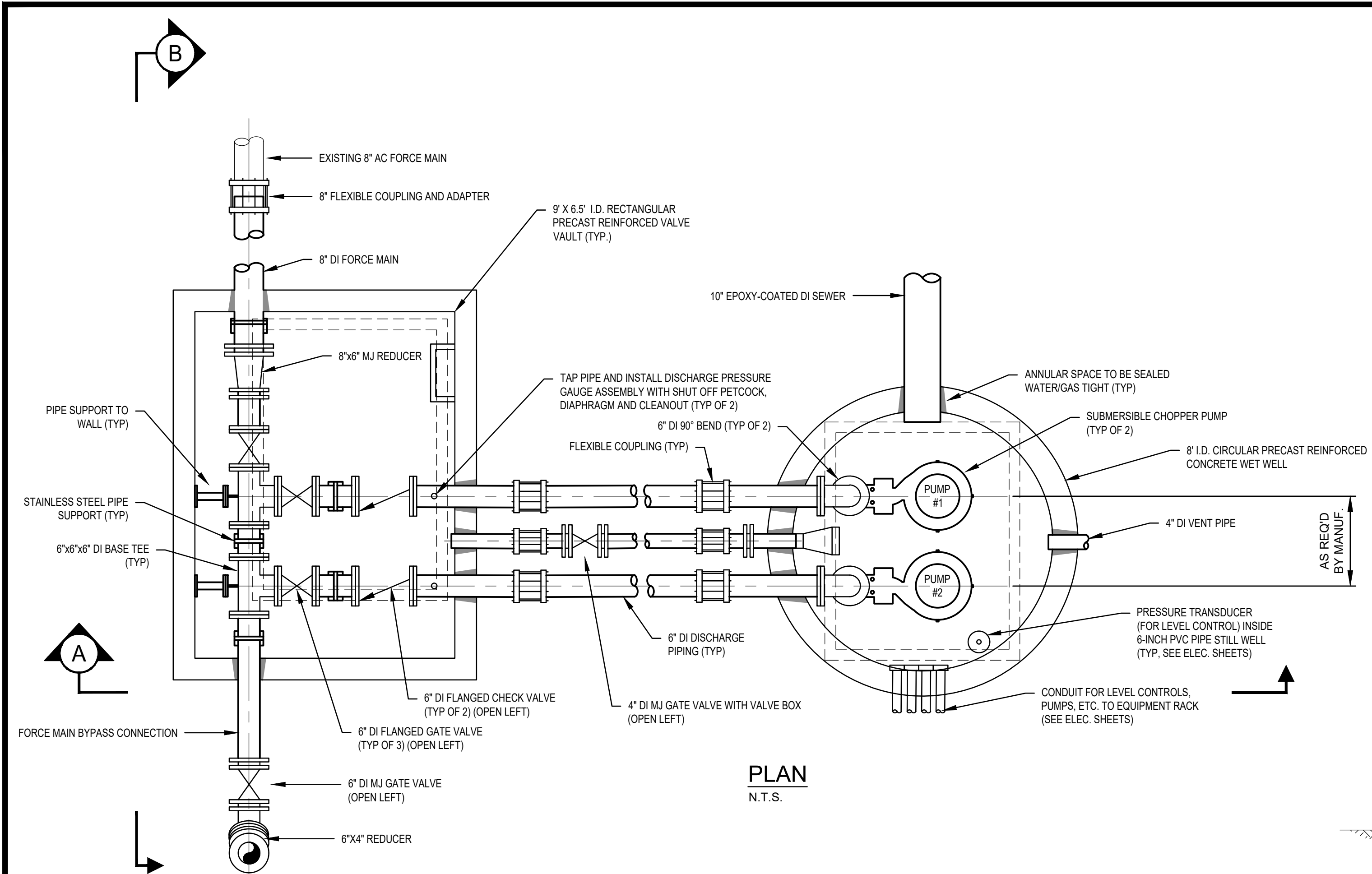
LEGEND:

- REFLECTORIZED DRUM
- TRAFFIC FLOW DURING CONSTRUCTION
- NORMAL TRAFFIC FLOW
- POLICE DETAIL OFFICER
- CONSTRUCTION SIGN
- WORK AREA

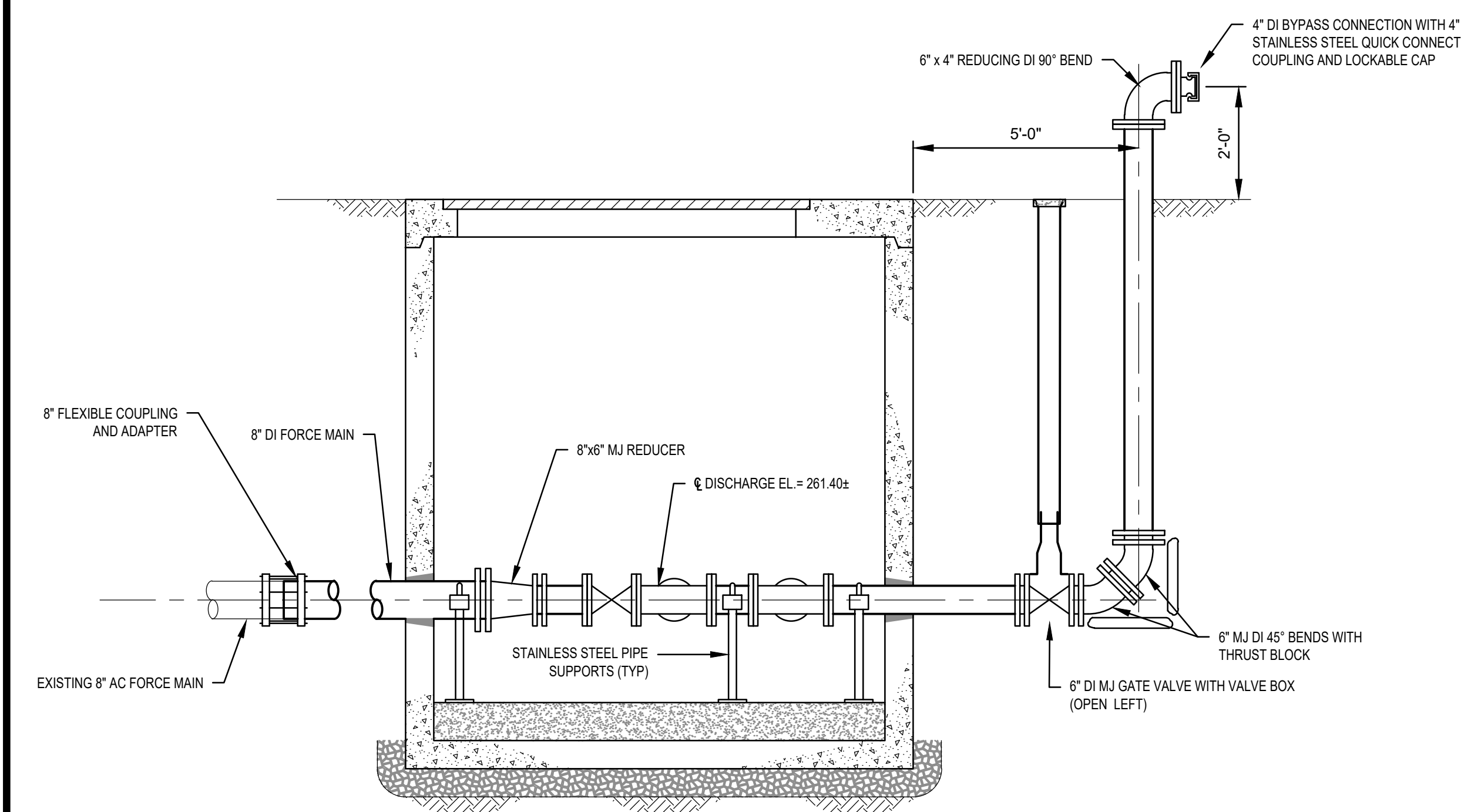
GENERAL NOTES:

- PLACEMENT OF ALL CONSTRUCTION SIGNS, DRUMS, BARRICADES, TRAFFIC DEVICES AND THE SHAPE, SIZE & COLOR OF ALL TEMPORARY TRAFFIC SIGNS SHALL CONFORM WITH THE LATEST EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.
- ADVANCE WARNING SIGN PLACEMENT AND TAPER LENGTH TO BE ADJUSTED ACCORDING TO STREET CONDITIONS AND DRIVEWAY OPENINGS.
- ALL DRUMS SHALL BE APPROXIMATELY PLACED AND MOVED AS NECESSARY TO MAINTAIN ADEQUATE ABUTTER ACCESS AT ALL TIMES.
- THE CONTRACTOR SHALL NOTIFY EACH ABUTTER AT LEAST 24 HOURS IN ADVANCE OF THE START OF ANY WORK THAT WILL REQUIRE THE TEMPORARY CLOSURE OF ACCESS, SUCH AS EXISTING PAVEMENT EXCAVATION, TEMPORARY DRIVEWAY PAVEMENT PLACEMENT AND SIMILAR OPERATIONS.
- NONESSENTIAL TRAFFIC CONTROL DEVICES SHALL BE COVERED OR REMOVED DURING NON-WORKING HOURS.
- PEDESTRIANS SHALL BE PROVIDED WITH ACCESS AND SAFE PASSAGE THROUGH THE TEMPORARY TRAFFIC CONTROL ZONE AT ALL TIMES.
- W20-8 SHALL BE TAKEN DOWN OR COVERED AFTER EACH WORKING DAY OR WHEN OTHERWISE NOT APPLICABLE, OR WHEN POLICE OFFICERS ARE NOT PRESENT TO DIRECT TRAFFIC.
- ADVISORY SPEED PLATES (W13-1 - SEE CURRENT EDITION OF MUTCD) SHALL BE USED IF APPLICABLE AND AS REQUIRED BY THE ENGINEER.
- NO DIFFERENCE IN ROADWAY LANE ELEVATION WILL BE ALLOWED AT THE END OF THE WORK DAY.
- SAMPLE TRAFFIC PLANS INCLUDED ON THIS PLAN SHEET ARE BASED ON AN URBAN (LOW SPEED) ROAD TYPE FROM THE LATEST EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.
- DASHED LINES SHOW LANE DESIGNATIONS TO BE USED DURING CONSTRUCTION.
- THE CONTRACTOR SHALL SUBMIT ANY REVISIONS TO THE CONSTRUCTION ZONE SAFETY PLAN TO THE ENGINEER FOR APPROVAL.
- THIS CONSTRUCTION ZONE SAFETY PLAN SHALL NOT RELIEVE THE CONTRACTOR OF HIS SOLE RESPONSIBILITY FOR CONSTRUCTION SITE SAFETY.

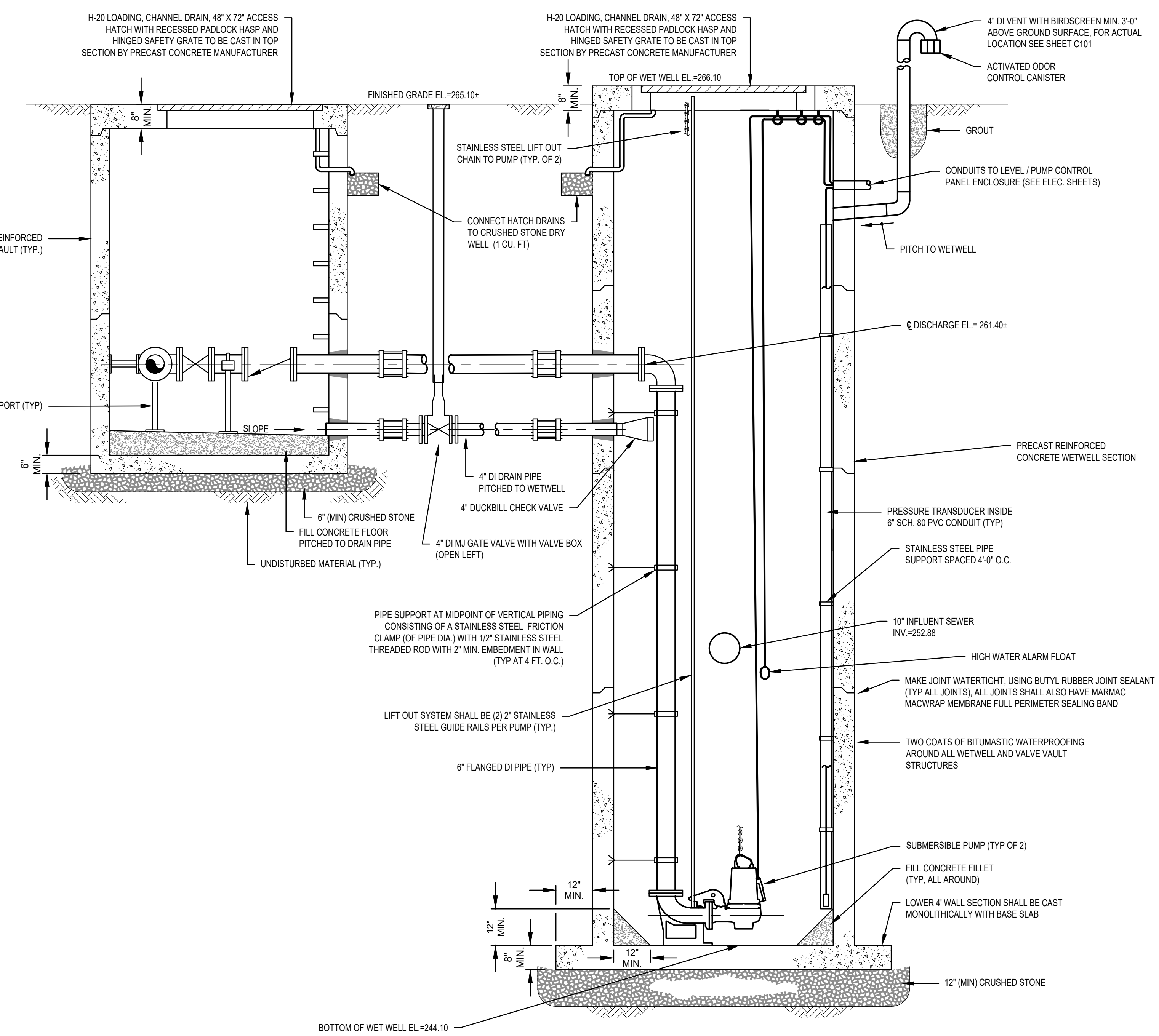
Revisions:		
No.	Date	Description



- NOTES:
1. CONTRACTOR TO VERIFY ALL DIMENSIONS PRIOR TO UPGRADE WORK.
 2. ALL PIPES SHALL BE ADEQUATELY RESTRAINED AND SUPPORTED IN ACCORDANCE WITH THE DRAWINGS, AND PER MANUFACTURERS RECOMMENDATIONS.
 3. ALL CONDUIT, PIPING AND PIPE PENETRATIONS SHALL BE EXPLOSION PROOF AND GAS AND WATER TIGHT.
 4. SEE ELEC. DWGS FOR WIRING/CONDUIT PLANS AND LOCATIONS.
 5. ANY ALUMINUM IN CONTACT WITH MASONRY OR CONCRETE SHALL BE GIVEN A HEAVY BRUSH COAT OF ALKALI-RESISTANT BITUMINOUS PAINT.
 6. ALL PROCESS PIPING (INCLUDING WET WELL VENT AND ABOVE GRADE BYPASS CONNECTION) SHALL BE PAINTED IN ACCORDANCE WITH SECTION 09900.



SECTION B-B
N.T.S.



CONTROL POINT	ELEV.
BACKUP HIGH LEVEL ALARM FLOAT	252.63
LAG PUMP ON/HIGH LEVEL ALARM	252.08
LEAD PUMP ON	251.83
PUMPS OFF	246.83
LOW LEVEL ALARM	246.58

LEVEL SETTINGS

Project:

CITY OF MARLBOROUGH,
MASSACHUSETTS



DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION

BROADMEADOW STREET SEWER
PUMP STATION UPGRADES

135 NEIL STREET,
MARLBOROUGH, MA 01752

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Consultants:

Revisions:

No.	Date	Description

Seal:



FRANK E.
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CIVIL
No. 54761
REGISTERED
PROFESSIONAL ENGINEER

09/06/2023

Issued For:

RELEASED FOR
CONSTRUCTION

Scale:

AS NOTED

Date:

SEPTEMBER 7, 2023

Drawn By:

RWS

Reviewed By:

JSL

Approved By:

FEO

W&S Project No.:

ENG23-0105

W&S File No.:

SEE PATH

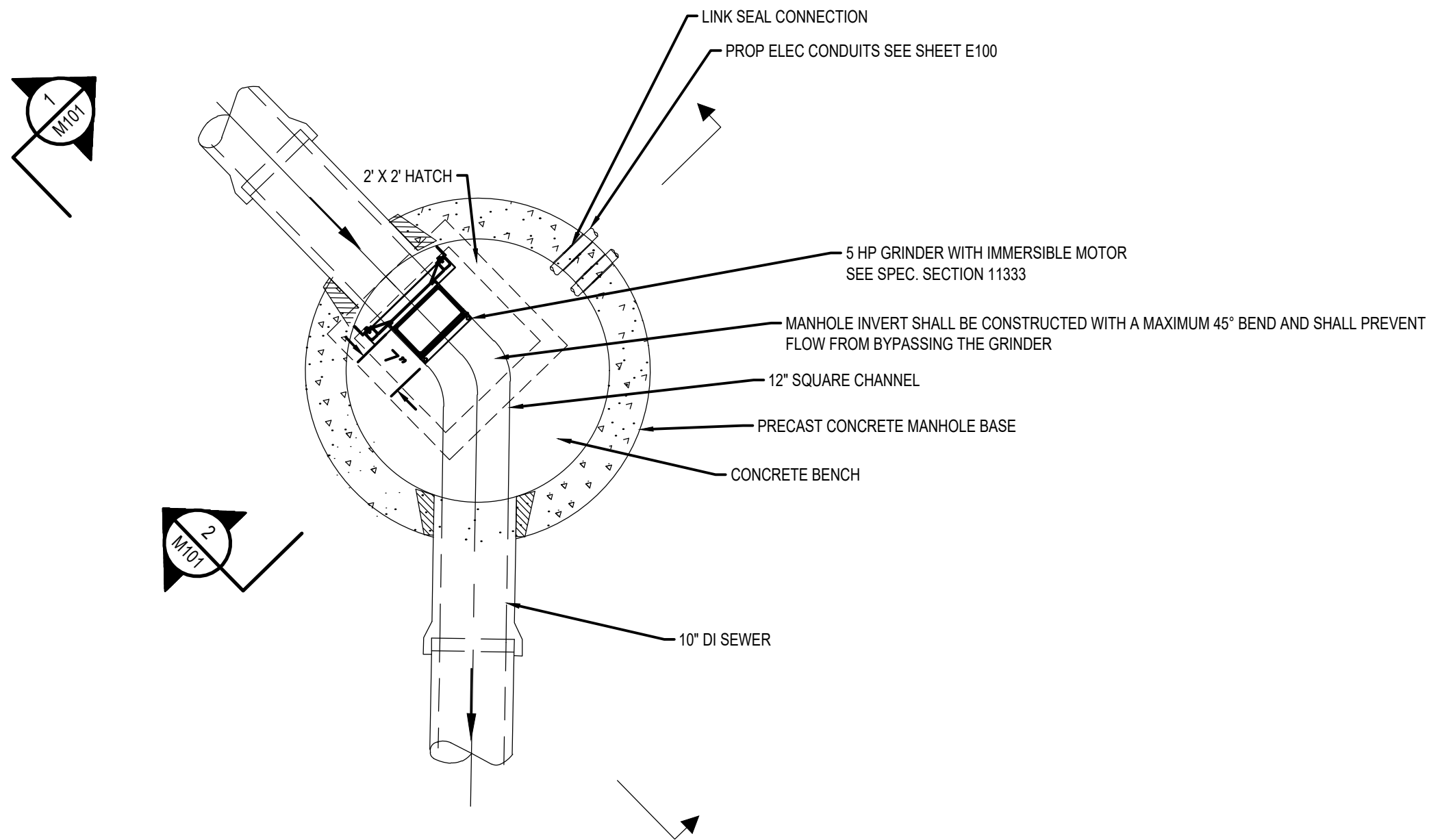
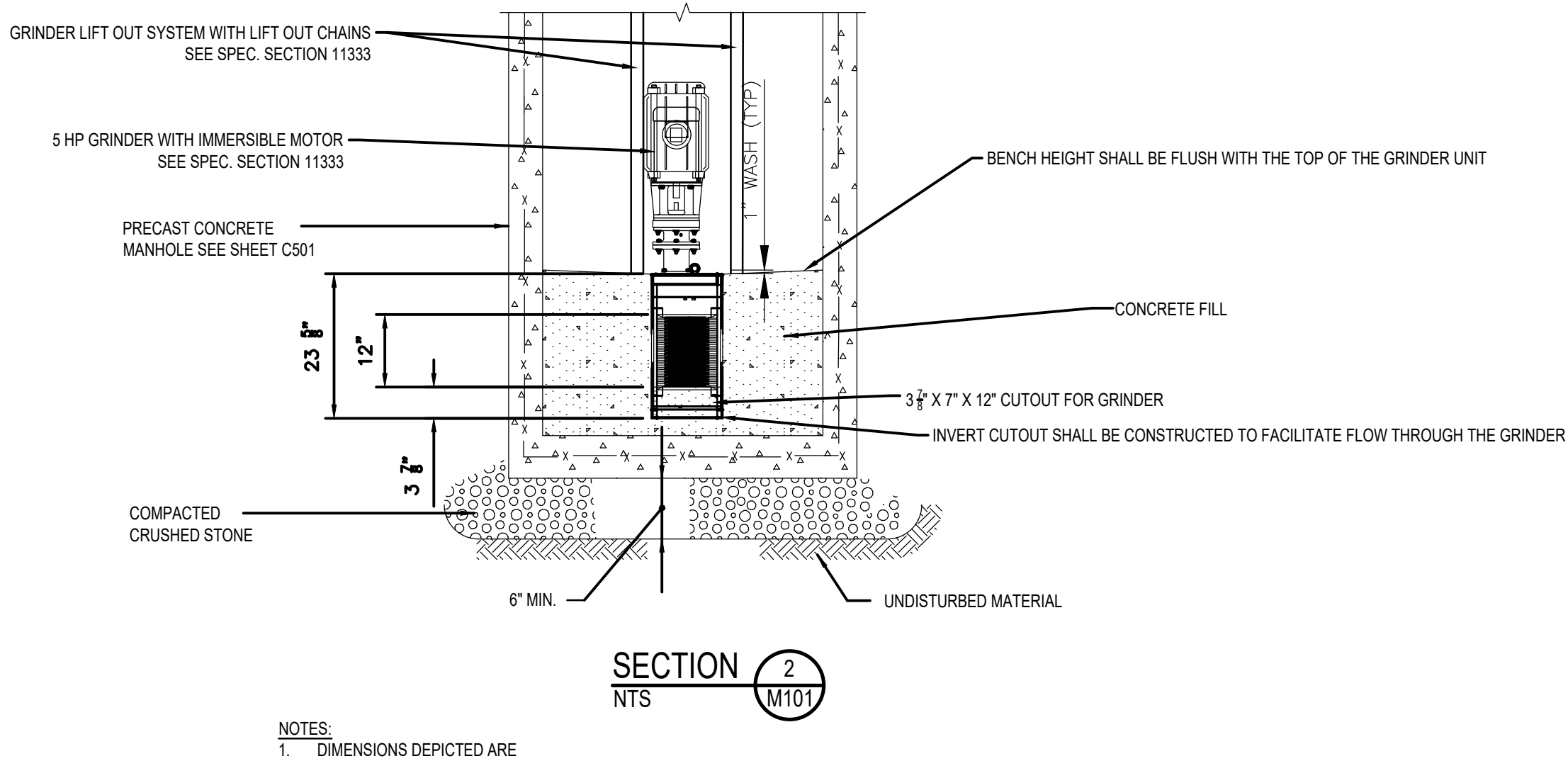
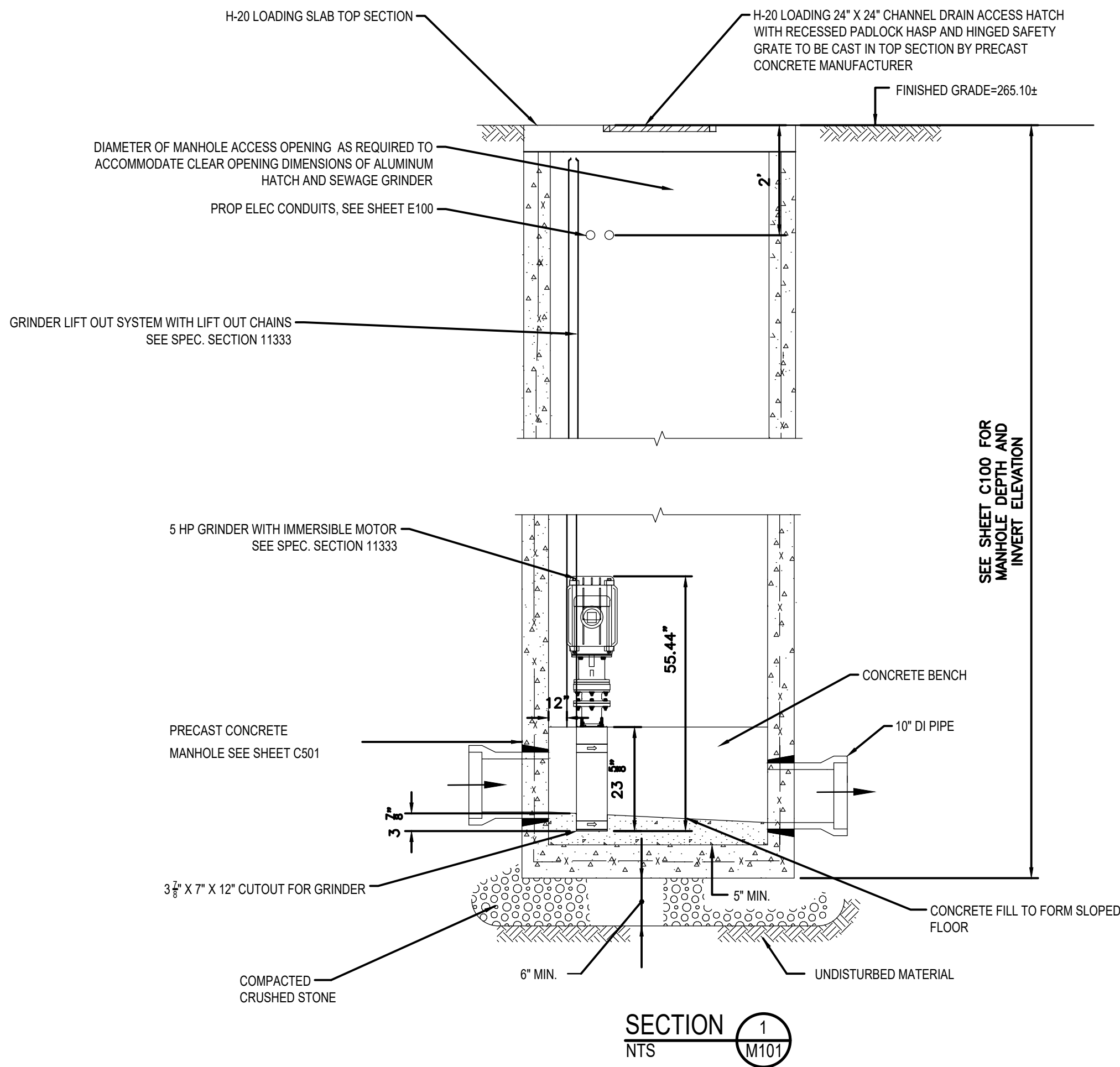
Drawing Title:

PUMP STATION
MECHANICAL PLAN,
SECTIONS, AND
DETAILS

Sheet Number:

M100

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SEWER GRINDER PLAN VIEW

N.T.S.

- NOTES:
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Scale: AS NOTED

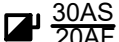
Date: SEPTEMBER 7, 2023
Drawn By: RWS
Reviewed By: JSL
Approved By: FEO
W&S Project No.: ENG23-0105
W&S File No.: SEE PATH

Drawing Title:
**SEWER GRINDER MH
MECHANICAL PLAN,
SECTIONS
AND DETAILS**

Sheet Number:
M101

ELECTRICAL ABBREVIATIONS LIST																										
1P	1 POLE (2P, 3P, 4P, ETC.)	AS	AMP SWITCH	CMPR	COMPRESSOR	DS	SAFETY DISCONNECT SWITCH	FIXT	FIXTURE	HTG	HEATING	LTG	LIGHTING	MSP	MOTOR STARTER PANELBOARD	PA	PUBLIC ADDRESS	RM	ROOM	SYM	SYMMETRICAL	UV	UNIT VENTILATOR OR	∠	ANGLE	
A	AMPERE	ATS	AMP TRIP	CONN	CONNECTION	FLOOR	FLOOR	FLR	FLOOR	HTR	HEATER	LTNG	LIGHTNING	MSBD	MAIN SWITCHBOARD	PE	PULL BOX OR PUSHBUTTON	RSC	RIGID STEEL CONDUIT	SYS	SYSTEM	∅	AT			
AC	ABOVE COUNTER OR AIR	ATS	AUTOMATIC TRANSFER SWITCH	CONST	CONSTRUCTION	DWG	DRAWING	FLR	FLUORESCENT	HV	HIGH VOLTAGE	LV	LOW VOLTAGE	MT	MOUNT	PB	PNEUMATIC ELECTRIC	RTU	ROOF TOP UNIT	TEL	TELEPHONE	V	Δ			
	CONDITIONER	AUTO	AUTOMATIC	CONT	CONTINUATION OR CONTINUOUS	ELEC	ELECTRICAL CONTRACTOR	FUSE	FUSE	HVAC	HEATING, VENTILATING AND AIR	MAX	MAXIMUM	MTC	EMPTY CONDUIT	PED	PEDESTAL	RSC	SURFACE CONDUIT	TEL	TELEPHONE/DATA	VA	FEET			
ACLG	AUTOMATIC CEILING	AUX	AUXILIARY	CONTR	CONTRACTOR	ELEV	ELEVATOR	FUS	FUSED SAFETY DISCONNECT SWITCH	COND	CONDITIONING	MAG S	MAGNETIC STARTER	MTR	MOTOR, TRANSFER SWITCH	PF	POWER FACTOR	SEC	SECONDARY	TERM	TERMINAL	VDT	INCHES			
ADO	AUTOMATIC DOOR OPENER	AV	AUDIO VISUAL	CONV	CONVECTOR	ELEV	ELEVATOR	GAL	GALLON	HWP	HYDRONIC WATER PUMP	MC	MOMENTARY CONTACT	MTR	MOTOR, MOTORIZED	PHASE	PHASE	SHT	SHEET	TEL	TwIST LOCK	VERT	NUMBER			
AF	AMP FRAME	AWG	AMERICAN WIRE GAUGE	CP	CIRCULATING PUMP	EMS	EMERGENCY	GALV	GALVANIZED	IC	INTERRUPTING CAPACITY	MC	MECHANICAL CONTRACTOR	N.C.	NORMALLY CLOSED	PIN	POST INDICATING VALVE	SIM	SIMILAR	TR	TAMPER RESISTANT	VFD	PHASE LINE			
AFF	ABOVE FINISHED FLOOR	BATT	BATTERY	CRT	CATHODE-RAY TUBE	EMS	ENERGY MANAGEMENT SYSTEM	GALV	GALVANIZED	IG	ISOLATED GROUND	MCB	MAIN CIRCUIT BREAKER	N.C.	NATIONAL ELECTRICAL CODE	PVL	PANEL	SIN	SOLID NEUTRAL	TSP	TwISTED SHIELDED PAIR	VOL	CENTER LINE			
AFI	ABOVE FINISHED GRADE	BD	BOARD	CA	CURRENT TRANSFORMER	EMT	ELECTRICAL METALLIC TUBING	GEN	GENERAL CONTRACTOR	IMC	INTERMEDIATE METAL CONDUIT	MCC	MOTOR CONTROL CENTER	NEMA	NATIONAL ELECTRICAL	PP	POWER POLE	SPEC	SPECIFICATION	T-STAT	THERMOSTAT	W	PLATE			
AFG	ABOVE FINISHED GROUND	CE	CERAMIC	CHTR	CHEMICAL TRANSFER	EP	ELECTRIC PNEUMATIC	GEN	GENERAL CONTRACTOR	IMC	INTERMEDIATE METAL CONDUIT	MCC	MOTOR CONTROL CENTER	NEMA	NATIONAL ELECTRICAL	PP	POWER POLE	SPEC	SPECIFICATION	T-STAT	THERMOSTAT	W	PLATE			
	INTERLUPTER	BMS	BUILDING MANAGEMENT SYSTEM	CU	CURR	EQIP	EQUIPMENT	GFI	GROUND FAULT CIRCUIT INTERRUPTER	IMC	INTERMEDIATE METAL CONDUIT	MCC	MOTOR CONTROL CENTER	NEMA	NATIONAL ELECTRICAL	PP	POWER POLE	SPEC	SPECIFICATION	T-STAT	THERMOSTAT	W	PLATE			
AHU	AIR HANDLING UNIT	C	CONDUIT	DCP	DOMESTIC WATER CIRCULATING	EWIC	ELECTRIC WATER COOLER	GFP	GROUND FAULT PROTECTOR	IW	INTERLOCK WITH	MFR	MANUFACTURER	NFDS	NOT-FUSED SAFETY DISCONNECT	PR	PRIMARY	SPP	SPARE	TEV	TELEVISION	WG	WIRE GUARD			
AL	ALUMINUM	CAB	CABINET	DPC	DOMESTIC WATER CIRCULATING	EWIC	ELECTRIC WATER COOLER	GFP	GROUND FAULT PROTECTOR	IW	INTERLOCK WITH	MFR	MANUFACTURER	NFDS	NOT-FUSED SAFETY DISCONNECT	PR	PRIMARY	SPP	SPARE	TEV	TELEVISION	WG	WIRE GUARD			
ALT	ALTERNATE	CAT	CATALOG	DEPT	DEPARTMENT	EXIST	EXISTING	J-BOX	JUNCTION BOX	MFS	MAIN FUSED DISCONNECT SWITCH	NIC	NOT IN CONTRACT	PROJ	PROJECTION	PRV	POWER ROOF VENTILATOR	SS	STAINLESS STEEL	SR	SURFACE RACEWAY	TVTC	WATER HEATER			
ALN	ALTERNATE	CB	CIRCUIT BREAKER	DEPT	DEPARTMENT	EXIST	EXISTING	J-BOX	JUNCTION BOX	MFS	MAIN FUSED DISCONNECT SWITCH	NIC	NOT IN CONTRACT	PROJ	PROJECTION	PRV	POWER ROOF VENTILATOR	SS	STAINLESS STEEL	SR	SURFACE RACEWAY	TVTC	WATER HEATER			
AMPL	AMPLIFIER	CB	CIRCUIT BREAKER	DEPT	DEPARTMENT	EXIST	EXISTING	J-BOX	JUNCTION BOX	MFS	MAIN FUSED DISCONNECT SWITCH	NIC	NOT IN CONTRACT	PROJ	PROJECTION	PRV	POWER ROOF VENTILATOR	SS	STAINLESS STEEL	SR	SURFACE RACEWAY	TVTC	WATER HEATER			
ANNU	ANNUNCIATOR	CCTV	CLOSED CIRCUIT TELEVISION	DISC	DISCONNECT	DIST	DISTRIBUTION	FABP	FIRE ALARM BOOSTER POWER SUPPLY PANEL	HP	HORSEPOWER	MLO	MAIN LUGS ONLY	NTS	NOT TO SCALE	OH	OVERHEAD	RCPT	RECEPTACLE	REQD	REQUIRED	RM	ROOM			
APPROX	APPROXIMATELY	CKT	CIRCUIT	DIA	DIAMETER	FABP	FIRE ALARM BOOSTER POWER SUPPLY PANEL	HP	HORSEPOWER	MLO	MAIN LUGS ONLY	NTS	NOT TO SCALE	OH	OVERHEAD	RCPT	RECEPTACLE	REQD	REQUIRED	RM	ROOM	SW	SWITCH			
AQ-STAT	AQUASTAT	CLG	CEILING	DN	DOWN	FACP	FIRE ALARM CONTROL PANEL	HPF	HIGH POWER FACTOR	LOC	LOCATE OR LOCATION	MMS	MANUAL MOTOR STARTER	OHD	OVERHEAD DOOR	REQD	REQUIRED	RM	ROOM	SW	SWITCH	UTIL	UTILITY			
ARCH	ARCHITECT, ARCHITECTURAL	COMB	COMBINATION	DPR	DAMPER	FACP	FIRE ALARM CONTROL PANEL	HPF	HIGH POWER FACTOR	LOC	LOCATE OR LOCATION	MMS	MANUAL MOTOR STARTER	OHD	OVERHEAD DOOR	REQD	REQUIRED	RM	ROOM	SW	SWITCH	UTIL	UTILITY			

<u>RACEWAY AND WIRING LEGEND</u>	
 1,3 LP1B	HOMERUN TO PANELBOARD WITH 3/4"C. #212 & 1#12GND UNLESS NOTED OTHERWISE, NUMERALS 1 AND 3 INDICATE CIRCUITS IN PANELBOARD. RACEWAYS LARGER THAN 3/4" AND CONDUCTORS LARGER THAN #12 AWG SHALL BE INDICATED ON THE DRAWINGS. PROVIDE AN INSULATED GREEN GROUND WIRE IN ALL RACEWAYS MINIMUM SIZE TO BE #12AWG
	RACEWAY RUN UNDERGROUND OR CONCEALED IN SLAB
	RACEWAY RUN EXPOSED

<u>POWER LEGEND</u>	
	SAFETY SWITCH - RATING AND TYPE AS NOTED
	FUSIBLE SAFETY SWITCH - RATING AND TYPE AS NOTED ON THE DRAWING (30 AMP, 20 AMP FUSE, 3 POLE)
	MOTOR, NUMERAL DENOTES HORSEPOWER
	JUNCTION BOX WITH BLANK COVERPLATE, SIZE AS REQUIRED BY N.E.C.
	EMERGENCY GENERATOR
	WATT HOUR METER
	FLOOD SWITCH
	PRESSURE TRANSDUCER

LIGHTING LEGEND	
OH	WALL MOUNTED LED FIXTURE.
<u>LIGHTING CONTROL SWITCHES</u> (MOUNT 4'-0" AFF UNLESS NOTED OTHERWISE.)	
S	SINGLE POLE SWITCH

ONE-LINE POWER DIAGRAM SYMBOLS	
	CIRCUIT BREAKER
	AUTOMATIC TRANSFER SWITCH

RECEPTACLE LEGEND	
	DUPLEX GROUND FAULT CIRCUIT INTERRUPTER CONVENIENCE OUTLET - 20A, 125V, U-SLOT GROUNDED TYPE MOUNTED 18" ABOVE FINISHED FLOOR TO CENTER LINE. ALL OTHER MOUNTING HEIGHTS SHALL BE AS NOTED ADJACENT TO THE SYMBOL.

GENERAL ELECTRICAL NOTES

1. SYSTEMS WHICH PASS THROUGH THE AREA BEING DEMOLISHED BUT CONTINUE TO AREAS NOT WITHIN THE DEMOLITION SCOPE ARE TO REMAIN. THE ELECTRICAL CONTRACTOR IS TO IDENTIFY (SPRAY PAINT OR EQUIVALENT) AND PROTECT THOSE SYSTEMS WHICH ARE ACTIVE AND ARE TO REMAIN.
2. ALL EXISTING CAST IN PLACE RECEPTACLE, PULL, JUNCTION AND OTHER DEVICE BOXES WHICH CANNOT BE REMOVED OR EFFECTIVELY COVERED ARE TO BE PROVIDED WITH FINISHED PLATES AS APPROVED BY THE ARCHITECT.
3. ALL CONDUIT AND WIRE WHICH IS NO LONGER IN USE IS TO BE REMOVED. CONDUIT AND WIRE IS TO BE REMOVED BACK TO ITS SOURCE OR NEAREST DEVICE WHICH IS SCHEDULED TO REMAIN. COORDINATE THE REMOVAL OF ALL COMMUNICATIONS CONDUIT AND WIRE WITH THE COMMUNICATIONS CONTRACTOR. FIRE ALARM CABLEING IS TO BE RETURNED TO THE NEAREST DEVICE SCHEDULED TO REMAIN. CONTROL PANEL, TERMINAL CABINET, ETC. UNDER NO CIRCUMSTANCES ARE ABANDONED CONDUIT AND WIRE OR SYSTEM COMPONENTS TO REMAIN.
4. MAKE ANY NECESSARY RE-CIRCUITING, EXTENSIONS OF EXISTING CIRCUITS AND RELOCATIONS REQUIRED TO PROPERLY RE-ENERGIZE REMAINING EXISTING SERVICES OR EQUIPMENT THAT MAY BE INTERFERED WITH BY NEW CONSTRUCTION, REMOVALS OR RELOCATIONS. ALL SHUTDOWNS TO RELOCATE ACTIVE FEEDERS OR BRANCH CIRCUITS WILL BE PERFORMED ON OFF HOURS AS MUTUALLY AGREED TO WITH THE OWNER.
5. PRIOR TO REMOVAL OF EQUIPMENT, CONFIRM THAT FEEDER AND BRANCH CIRCUITS ARE NO LONGER ACTIVE. SHOULD IT BE DISCOVERED THE FEEDER OR BRANCH CIRCUITS ARE ACTIVE, NOTIFY THE ARCHITECT IMMEDIATELY FOR DIRECTION.
6. ELECTRICAL CONTRACTOR IS TO REMOVE ALL LAMPS, BALLASTS AND OTHER ELECTRICAL COMPONENTS CLASSIFIED AS HAZARDOUS MATERIALS. ELECTRICAL CONTRACTOR IS TO OBTAIN THE SERVICES OF A LICENSED HAZARDOUS MATERIALS CONTRACTOR TO DISPOSE OF THE MATERIALS. PROVIDE WRITTEN DOCUMENTATION TO THE OWNER'S REPRESENTATIVE FROM THE HAZARDOUS MATERIALS CONTRACTOR.
7. ELECTRICAL DEMOLITION ABBREVIATIONS:
"XM" DENOTES EXISTING EQUIPMENT TO REMAIN
"RE" DENOTES EXISTING EQUIPMENT TO BE DISCONNECTED AND REMOVED ALL EXISTING CONDUIT AND WIRE SHALL BE REMOVED BACK TO ITS SOURCE AND ALL DEVICES ASSOCIATED WITH THE EQUIPMENT SHALL BE REMOVED.

GENERAL ELECTRICAL NOTES	
1. DRAWINGS ARE DIAGRAMMATIC ONLY. THE EXACT LOCATION, MOUNTING HEIGHTS, SIZE OF EQUIPMENT AND ROUTING OF RACEWAYS SHALL BE COORDINATED AND DETERMINED IN THE FIELD.	17. MATERIALS SHALL BE SPECIFICATION GRADE AND UL LISTED.
2. ALL STRAIGHT FEEDER, BRANCH CIRCUIT AND AUXILIARY SYSTEM CONDUIT RUNS SHALL BE PROVIDED WITH SUFFICIENT PULL BOXES TO LIMIT THE MAXIMUM LENGTH OF ANY SINGLE CABLE PULL TO 150 FEET. EXACT SIZES OF PULL BOXES AND LOCATIONS TO BE DETERMINED IN THE FIELD BY THE ELECTRICAL CONTRACTOR.	18. WHERE MATERIAL IS CALLED OUT IN THE LEGEND BY MANUFACTURER, TYPE OR CATALOG NUMBER, SUCH DESIGNATIONS ARE TO ESTABLISH STANDARDS OR DESIRED QUALITY. ACCEPTANCE OR REJECTIONS OF PROPOSED SUBSTITUTIONS SHALL BE SUBJECT TO THE APPROVAL OF THE OWNER.
3. THE ELECTRICAL CONTRACTOR SHALL COORDINATE WITH THE GENERAL CONTRACTOR AS APPLICABLE AS TO THE EXACT LOCATION OF THEIR RESPECTIVE EQUIPMENT, THE POWER WIRING, CONTROL WIRING AND ALL ELECTRICAL CONNECTIONS AND CONDUIT TURN-UPS SHALL BE COORDINATED WITH THE RESPECTIVE CONTRACTORS BEFORE THE START OF CONSTRUCTION IN THE FIELD.	19. WORK SHALL BE COORDINATED WITH THAT OF OTHER TRADES TO ELIMINATE INTERFERENCES.
4. COMBINED HOMERUNS OF TWO (2) OR THREE (3) CIRCUITS MAY BE UTILIZED. HOWEVER, THE NEUTRAL CONDUCTOR IS TO BE INCREASED TO #10AWG. COMBINED HOMERUNS ARE TO BE LIMITED TO 20A, LIGHTING AND POWER CIRCUITS.	20. ELECTRICAL WORK SHALL BE GUARANTEED FOR A PERIOD OF ONE YEAR FROM DATE OF FINAL COMPLETION.
5. WORK SHALL CONFORM TO THE NATIONAL ELECTRICAL CODE WITH MASSACHUSETTS AMENDMENTS, MASSACHUSETTS BUILDING CODE, NFPA AND REQUIREMENTS OF LOCAL AUTHORITIES HAVING JURISDICTION.	21. WORK SHALL BE GROUNDED IN ACCORDANCE WITH CODE REQUIREMENTS. COMPLETE EQUIPMENT (INSULATED GREEN WIRE) GROUNDING SYSTEM SHALL BE INSTALLED.
6. THE WORD "CONTRACTOR" AS USED IN THE "ELECTRICAL WORK" SHALL MEAN THE ELECTRICAL SUBCONTRACTOR.	22. WIRING METHODS: A. EXTERIOR UNDERGROUND FEEDERS SHALL BE PVC SCHEDULE 80 FOR DIRECT BURIED. B. EXTERIOR ABOVE GRADE FEEDERS SHALL BE RGS CONDUIT. C. LIGHTING FIXTURE CONNECTIONS SHALL BE MC CABLE. D. EQUIPMENT CONNECTIONS SHALL BE LIQUID TIGHT FLEXIBLE METAL CONDUIT.
7. CONTRACTOR SHALL PAY FOR ALL PERMITS, INSURANCE AND TESTS, AND SHALL PROVIDE LABOR AND MATERIAL TO COMPLETE THE ELECTRICAL WORK SHOWN.	23. CONDUIT AND TUBING SHALL BE SUPPORTED ON GALVANIZED WALL BRACKETS, TRAPEZE HANGERS OR PIPE STRAPS SECURED BY MEANS OF TOGGLE BOLTS OR INSERTS IN WOOD CONSTRUCTION.
8. OWNER SHALL PAY ELECTRIC UTILITY COMPANY BACKCHARGES.	24. CONDUIT PASSING THROUGH FIRE RATED WALLS AND FLOORS SHALL BE PROVIDED WITH ALL NECESSARY MATERIALS TO ENSURE THAT THE FIRE RATED INTEGRITY IS MAINTAINED.
9. CONTRACTOR SHALL PROVIDE ALL REQUIRE COORDINATION WITH ELECTRIC UTILITY.	25. FEEDER TAPS WILL NOT BE ALLOWED IN PANELBOARD GUTTERS.
10. ELECTRIC UTILITY WORK ORDER NUMBER FOR THIS PROJECT IS #308077479	26. CONTRACTOR SHALL CHECK EXISTING CONDITIONS TO DETERMINE EXACT EXTENT OF WORK TO BE PERFORMED PRIOR TO BIDDING. DIMENSIONS RELEVANT TO EXISTING WORK SHALL BE VERIFIED IN THE FIELD.
11. EXCEPT AS OTHERWISE NOTED, THE ELECTRICAL WORK SHALL INCLUDE DEMOLITION, PANELBOARDS, CIRCUIT BREAKERS, FEEDERS, WIRING, RACEWAYS, LIGHTING FIXTURES, DEVICES, SAFETY SWITCHES, TRANSFORMERS AND CONNECTION NECESSARY TO OPERATE MOTORS AND OTHER EQUIPMENT.	27. IN AREAS NOT AFFECTED BY THIS RENOVATION, THIS SUBCONTRACTOR SHALL MAINTAIN CONTINUITY OF ELECTRIC SERVICE.
12. THE CONTRACTOR SHALL PROVIDE ALL TEMPORARY LIGHTING AND POWER AND THE GENERAL CONTRACTOR SHALL PAY ALL ENERGY CHARGES FOR TEMPORARY POWER AND LIGHTING.	28. ELECTRICAL SHUTDOWN SHALL BE AT A TIME AND DATE APPROVED BY THE OWNER.
13. DURING CONSTRUCTION, THE ELECTRICAL CONTRACTOR SHALL KEEP HIS PORTION OF THE WORK NEAT, CLEAN AND ORDERLY.	29. PROVIDE AS-BUILT "CADD" DRAWINGS AT THE COMPLETION OF THE PROJECT.
14. ALL SYSTEMS SHALL BE TESTED FOR SHORT CIRCUIT AND GROUNDS PRIOR TO ENERGIZING AND ANY DEFECTS SHALL BE CORRECTED.	30. ELECTRICAL CONTRACTOR SHALL LABEL ALL ELECTRICAL DEVICES INCLUDING BUT NOT LIMITED TO RECEPTACLES, DISCONNECT SWITCHES, PANELBOARDS, CONTROL PANELS, JUNCTION BOXES, ETC. A. RECEPTACLES - PANEL NAME AND CIRCUIT DESIGNATION B. DISCONNECTS - PANEL NAME, CIRCUIT DESIGNATION AND EQUIPMENT SERVING. C. PANELBOARDS - PANEL NAME, VOLTAGE, AMPERAGE, PHASE AS WELL AS PANEL AND CIRCUIT IT IS FED FROM. D. CONTROL PANEL - PANEL NAME AND CIRCUIT DESIGNATION E. JUNCTION BOXES - PANEL NAME AND CIRCUIT DESIGNATION
15. ALL CUTTING AND PATCHING REQUIRED FOR ELECTRICAL WORK SHALL BE INCLUDED AS PART OF THIS SECTION.	31. ADDRESS QUESTIONS TO THE ENGINEER IN WRITING BEFORE AWARD OF CONTRACT, OTHERWISE ENGINEER INTERPRETATION OF MEANING AND INTENT OF DRAWINGS SHALL BE FINAL.
16. COMPLETE SHOP DRAWINGS SHALL BE SUBMITTED FOR ELECTRICAL EQUIPMENT. WHERE SPECIFIED ELECTRICAL EQUIPMENT IS SUBSTITUTED, THE ELECTRICAL CONTRACTOR SHALL SUBMIT COMPLETE SPECIFICATIONS ON THE SUBSTITUTE AS WELL AS THE ITEM ORIGINALLY SPECIFIED.	

PANELBOARD SCHEDULE									
DESIGNATION: PPH1			S.C. RATING: 10,000 AMPS A.I.C.				REMARKS: NEMA 4		
LOCATION: ELECTRICAL CABINET			SERVICE: 480/277 VOLT, 3Ø, 4W						
RATING: 100 AMPS			MOUNTING: SURFACE						
MAIN: MLO									
CKT. NO.	LOAD DESIGNATION	CIRCUIT BREAKER	LOAD			CIRCUIT BREAKER	LOAD DESIGNATION	CKT. NO.	
			A	B	C				
1	PUMP CONTROL PANEL	40	11.5			20	GRINDER CONTROL PANEL	2	
3				11.5				4	
5					11.5			6	
7			2.97					8	
9	PANEL PPL1 VIA TRANSFORMER	50		2.97		20	SPARE	10	
11					2.97			12	
13								14	
15	SPARE	20				20	SPARE	16	
17								18	
SUB-TOTAL			14.5	14.5	14.5				
TOTAL			43.5	KVA					
ESTIMATED DEMAND LOAD			39.2	KVA					
TOTAL DEMAND CURRENT			47.2	AMPS					

PANELBOARD SCHEDULE									
DESIGNATION: PPL1			S.C. RATING: 10,000 AMPS A.I.C.				REMARKS: NEMA 4		
LOCATION: ELECTRICAL CABINET			SERVICE: 208/120 VOLT, 3Ø, 4W						
RATING: 100 AMPS			MOUNTING: SURFACE						
MAIN: MLO									
CKT. NO.	LOAD DESIGNATION	CIRCUIT BREAKER	LOAD			CIRCUIT BREAKER	LOAD DESIGNATION	CKT. NO.	
			A	B	C				
1	SPARE	20	0.19			20	CABINET LIGHT AND RECEPTACLE	2	
3	CABINET UNIT HEATER	20		1.25		20	GENERATOR BATTERY CHARGER	4	
5	GENERATOR BLOCK HEATER	30			1.76	20	POLE MOUNTED LIGHT FIXTURE	6	
7	SPACE HEATER RECEPTACLE	20	3.84			20	SPACE HEATER RECEPTACLE	8	
9	VALVE VAULT LIGHT	20		1.56		20	CABINET FANS	10	
11	SPARE	20				20	SPARE	12	
13	SPARE	20				20	SPARE	14	
15	SPARE	20				20	SPARE	16	
17	SPARE	20				20	SPARE	18	
SUB-TOTAL			4.03	2.81	0.88				
TOTAL			8.60	KVA					
ESTIMATED DEMAND LOAD			7.74	KVA					
TOTAL DEMAND CURRENT			21.6	AMPS					

LIGHTING FIXTURE SCHEDULE								
TYPE	DESCRIPTION	MANUFACTURER	CATALOG NUMBER	LAMP	MOUNTING	VOLTAGE	WATTS	REMARKS
S1E	1' X 4' ENCLOSED AND GASKETED, VAPORTIGHT WITH INTEGRAL LED EMERGENCY DRIVER	COOPER LIGHTING	4VT2-LD5-4-DR-UNV-EL10W-L835-CD1-WL-U	4000 LUMEN 3500K LED	SURFACE	120	56	

Project:

CITY OF MARLBOROUGH,
MASSACHUSETTS



DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION

BROADMEADOW STREET SEWER
PUMP STATION UPGRADES

135 NEIL STREET,
MARLBOROUGH, MA 01752

Weston & SampsonSM

Weston & Sampson Engineers, Inc.
427 Main Street, Suite 400
Worcester, MA 01608
978.532.1900 800.SAMPSON

[illegible]

Seal:



The seal is circular with a double-lined border. The outer ring contains the text "COMMONWEALTH OF MASSACHUSETTS" at the top and "PROFESSIONAL ENGINEER" at the bottom, separated by small stars. The center of the seal contains the text "FRANK E. OCHOAINTI" on the first line, "CIVIL" on the second line, "No. 54761" on the third line, and "REGISTERED" on the fourth line.

09/06/2023

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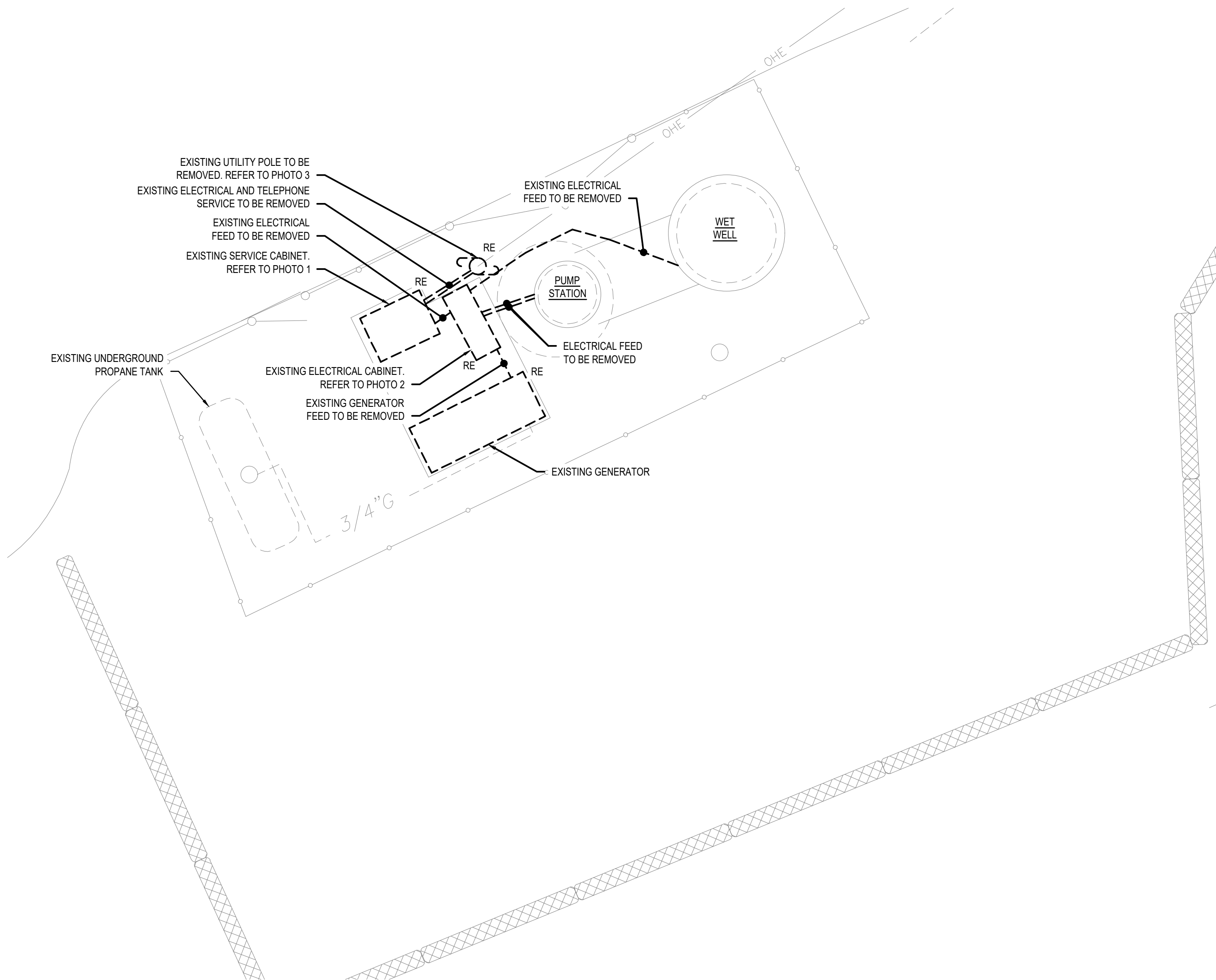
Date:	SEPTEMBER 7, 2023
Drawn By:	DCH
Reviewed By:	DNM
Approved By:	RFM
W&S Project No.:	ENG23-0105
W&S File No.:	SEE PATH

Drawing Title:

ELECTRICAL
LEGENDS,
ABBREVIATIONS, AND
GENERAL NOTES

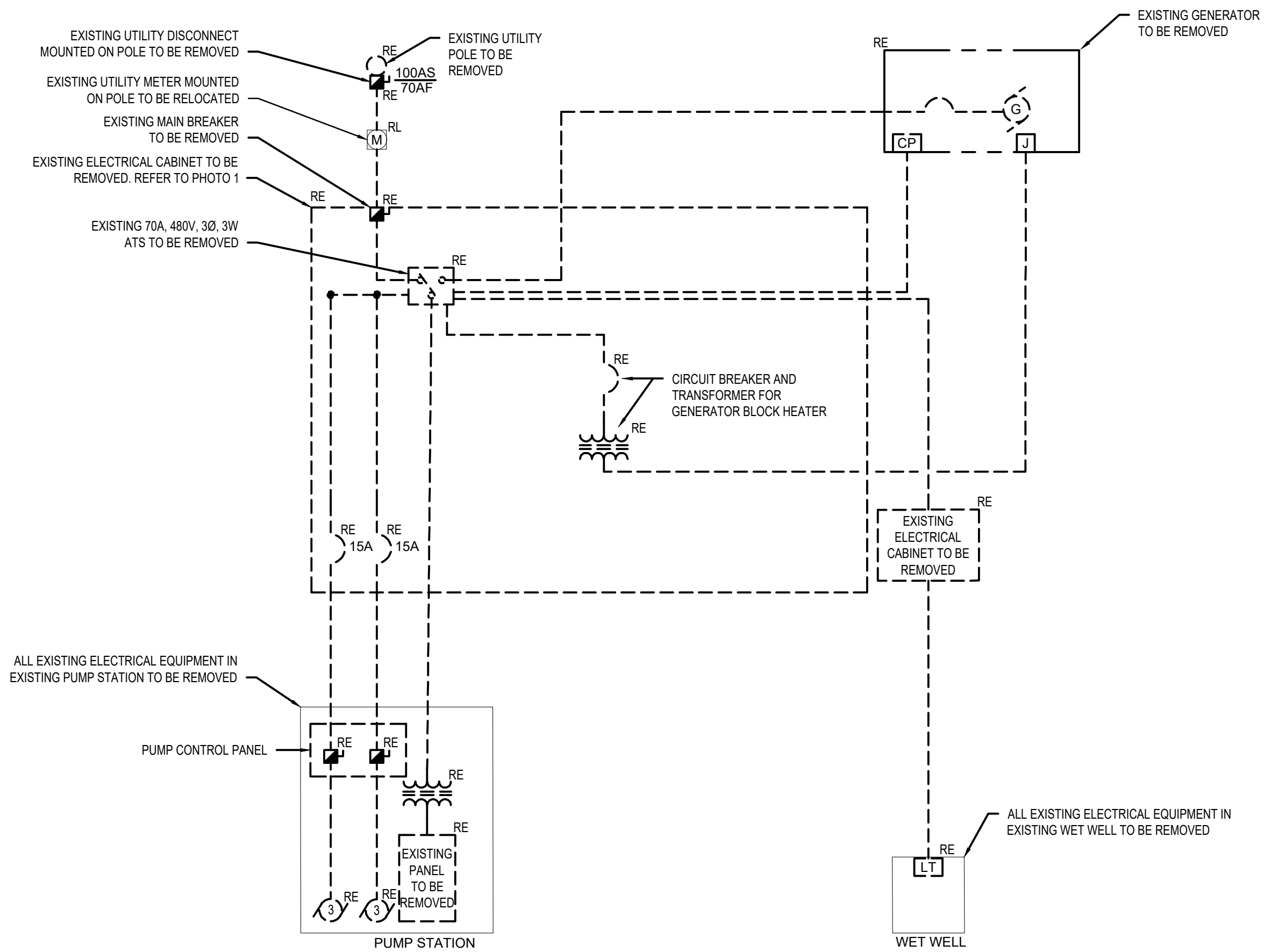
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E001



1 ELECTRICAL SITE DEMOLITION PLAN

SCALE: 1" = 5'-0"



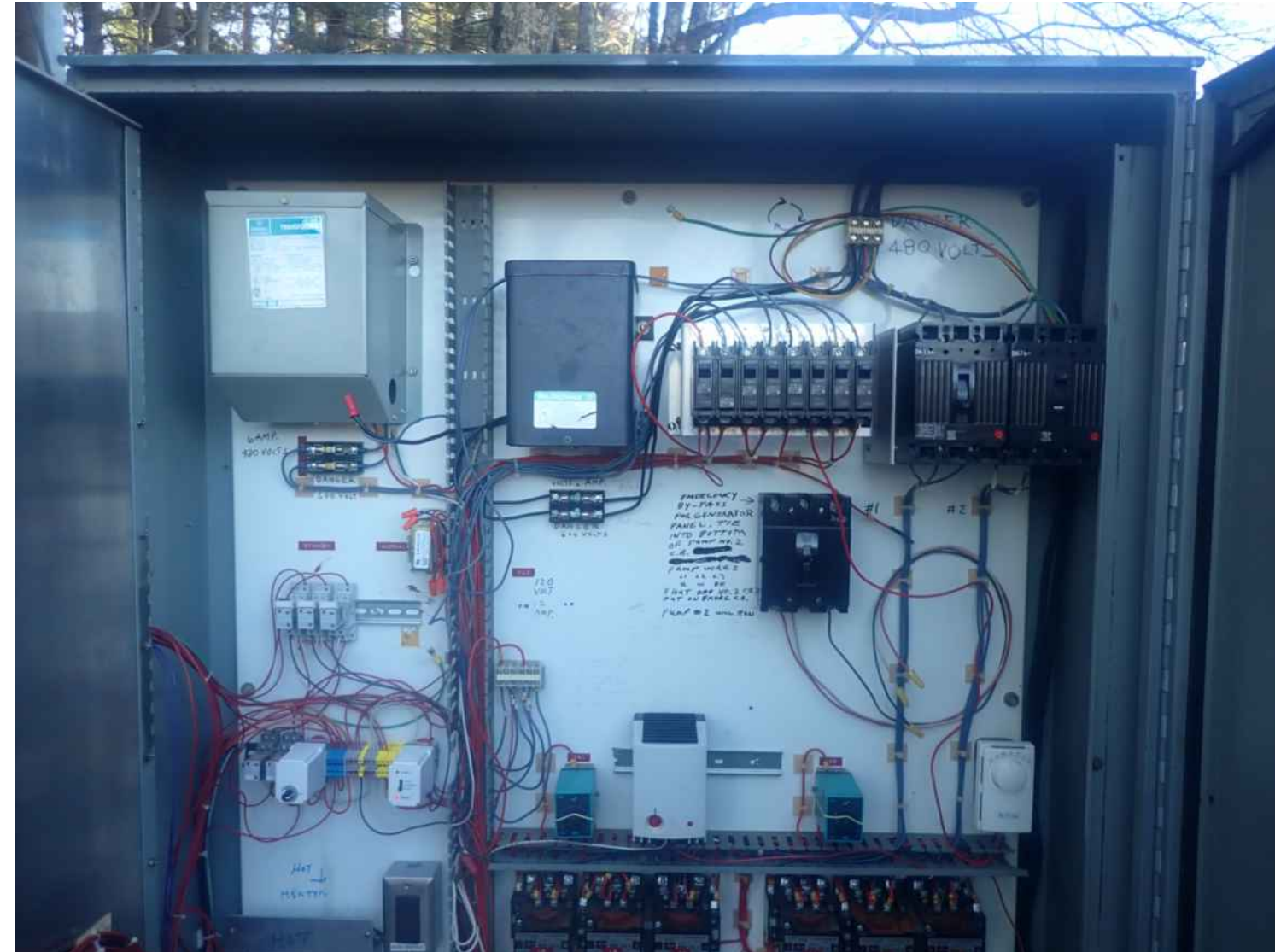
2 ELECTRICAL DEMOLITION ONE LINE DIAGRAM

NOT TO SCALE



3 PHOTO 1: EXISTING SERVICE CABINET

NOT TO SCALE



4 PHOTO 2: EXISTING ELECTRICAL CABINET

NOT TO SCALE



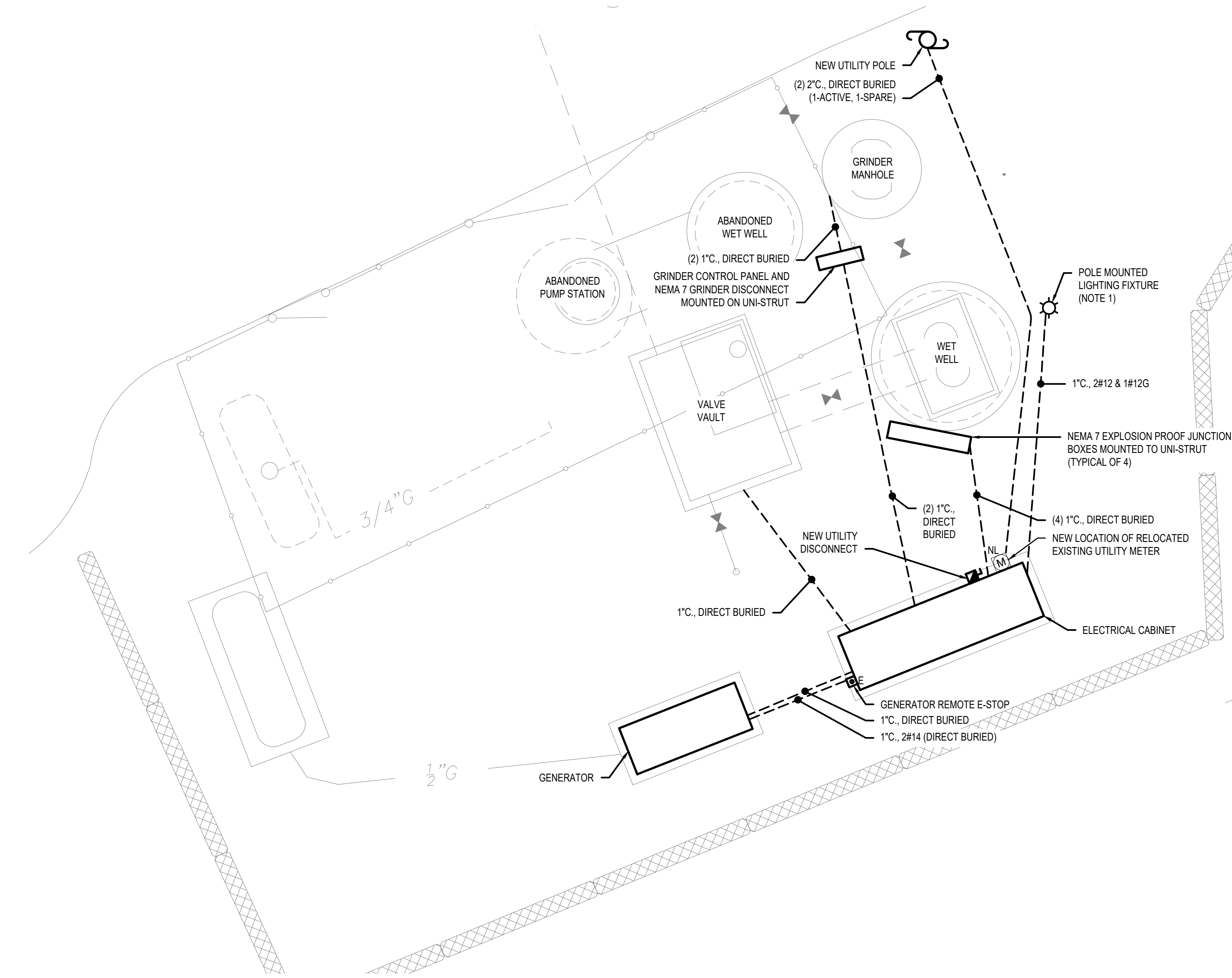
5 PHOTO 3: EXISTING UTILITY POLE

NOT TO SCALE

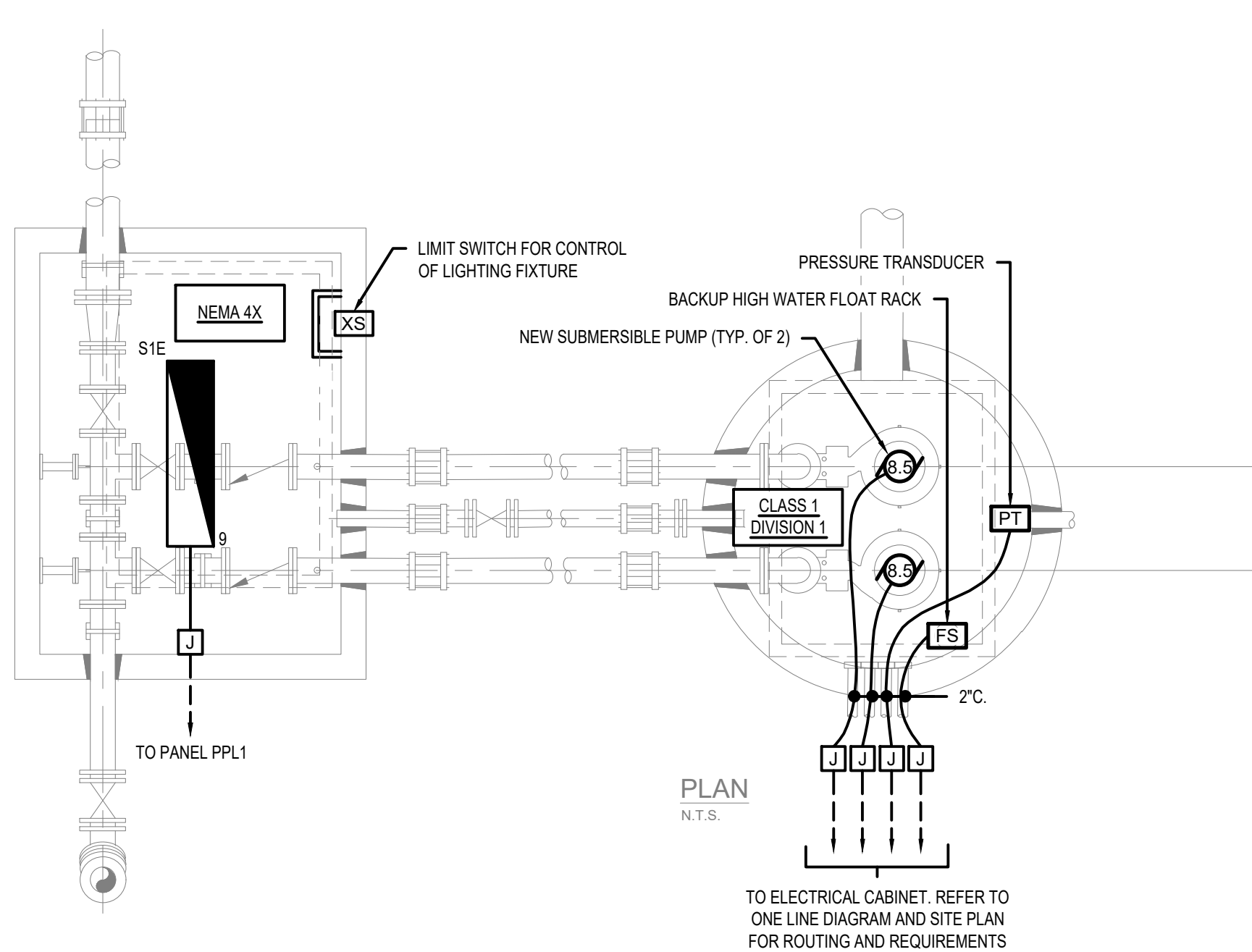
- DRAWING NOTES:**
- REFER TO DRAWING E001 FOR LEGEND, ABBREVIATIONS, AND GENERAL NOTES.
 - ALL EXISTING EQUIPMENT LOCATIONS AND CONDUIT RUNS SHALL BE FIELD VERIFIED FOR EXACT LOCATION AND ROUTING.

0' 2.5' 5' 10'
SCALE: 1" = 10'

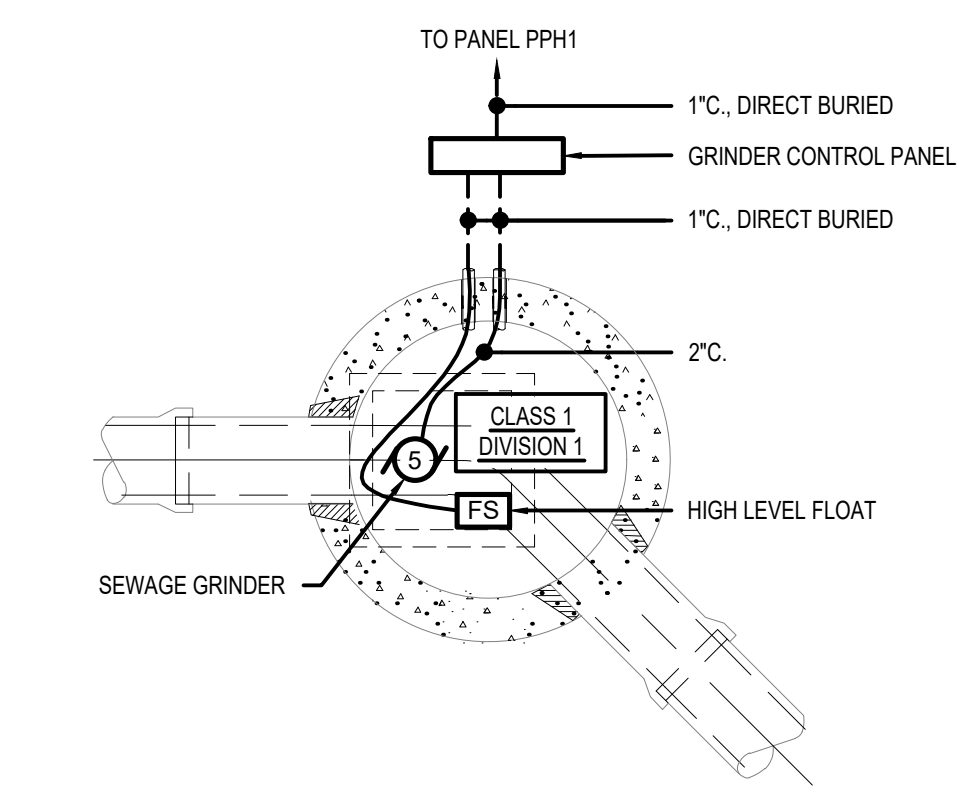
Revisions:		
No.	Date	Description



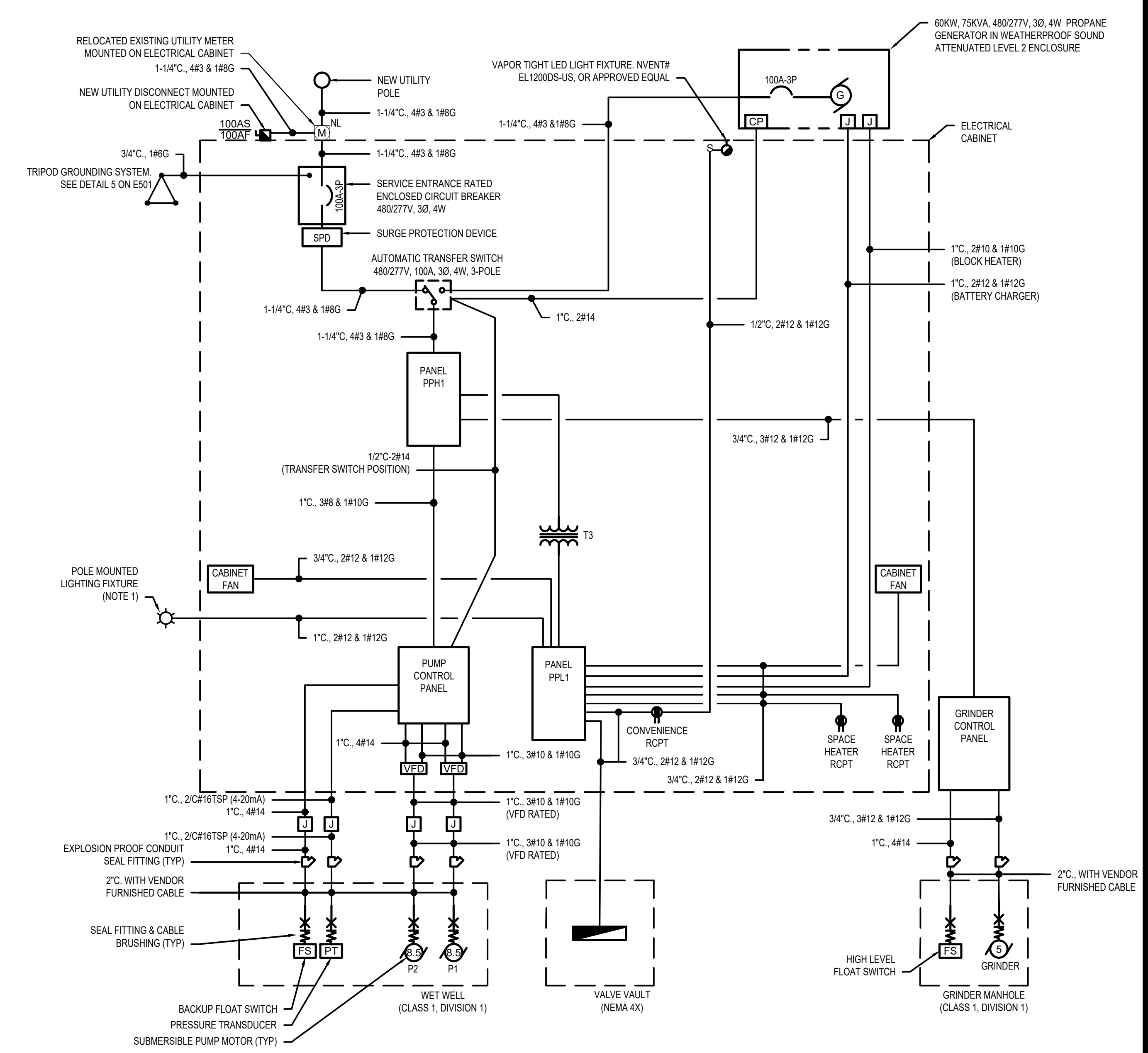
1 ELECTRICAL SITE PLAN
 SCALE: 1" = 5'-0"
 0' 2.5' 5' 10'
 SCALE: 1" = 5'



2 PUMP STATION POWER PLAN
 NOT TO SCALE



3 GRINDER MANHOLE POWER PLAN
 NOT TO SCALE



4 ELECTRICAL ONE LINE DIAGRAM
 NOT TO SCALE

DRY TYPE TRANSFORMER SCHEDULE 480-120/208V							
SIZE	KVA	PRIMARY AMPS	SECONDARY AMPS	480 VOLT OVERCURRENT	208 VOLT OVERCURRENT	480V FEEDER CODE	120/208V FEEDER CODE
T3	30	36	83	50A, 3P	100A, 3P	3/4"C., 3#10 & 1#10GND	1 1/4"C., 4#3 & 1#8GND

DRAWING NOTES:
 1. POLE MOUNTED LIGHTING FIXTURE SHALL BE CREE MODEL NO. OSQ-DA-PB-1A-2ME-B-30K-UL MOUNTED 20'-0" AFF ON VALMONT MODEL NO. DS210-590A200-D1-FP-DB-FBC-A8 STEEL POLE.

Project:

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MASSACHUSETTS

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Consultants:

Revisions:

No.	Date	Description

Seal:

FRANK E. OCCHIPINTI
CIVIL
No. 54761
REGISTERED PROFESSIONAL ENGINEER

09/06/2023

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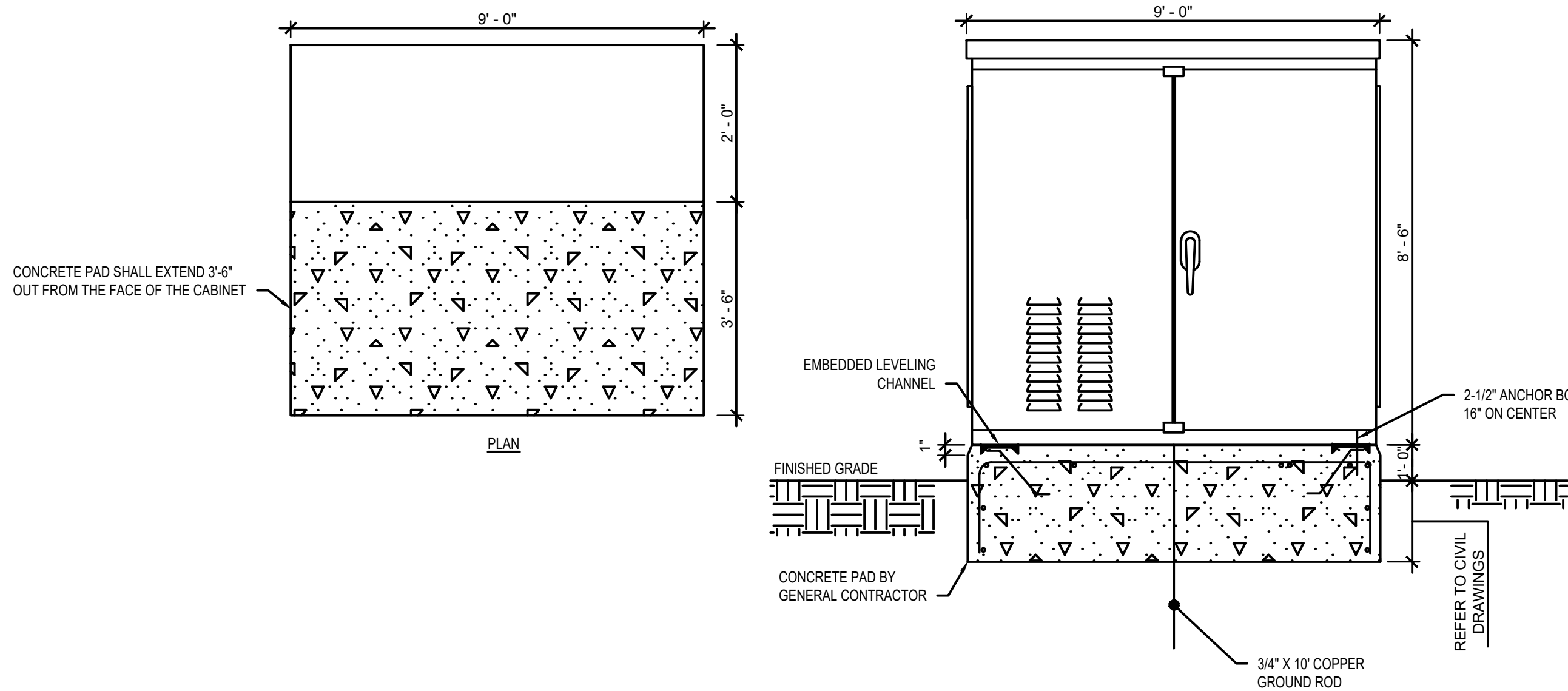
Drawing Title:

**ELECTRICAL
MODIFICATION PLANS**

Sheet Number:

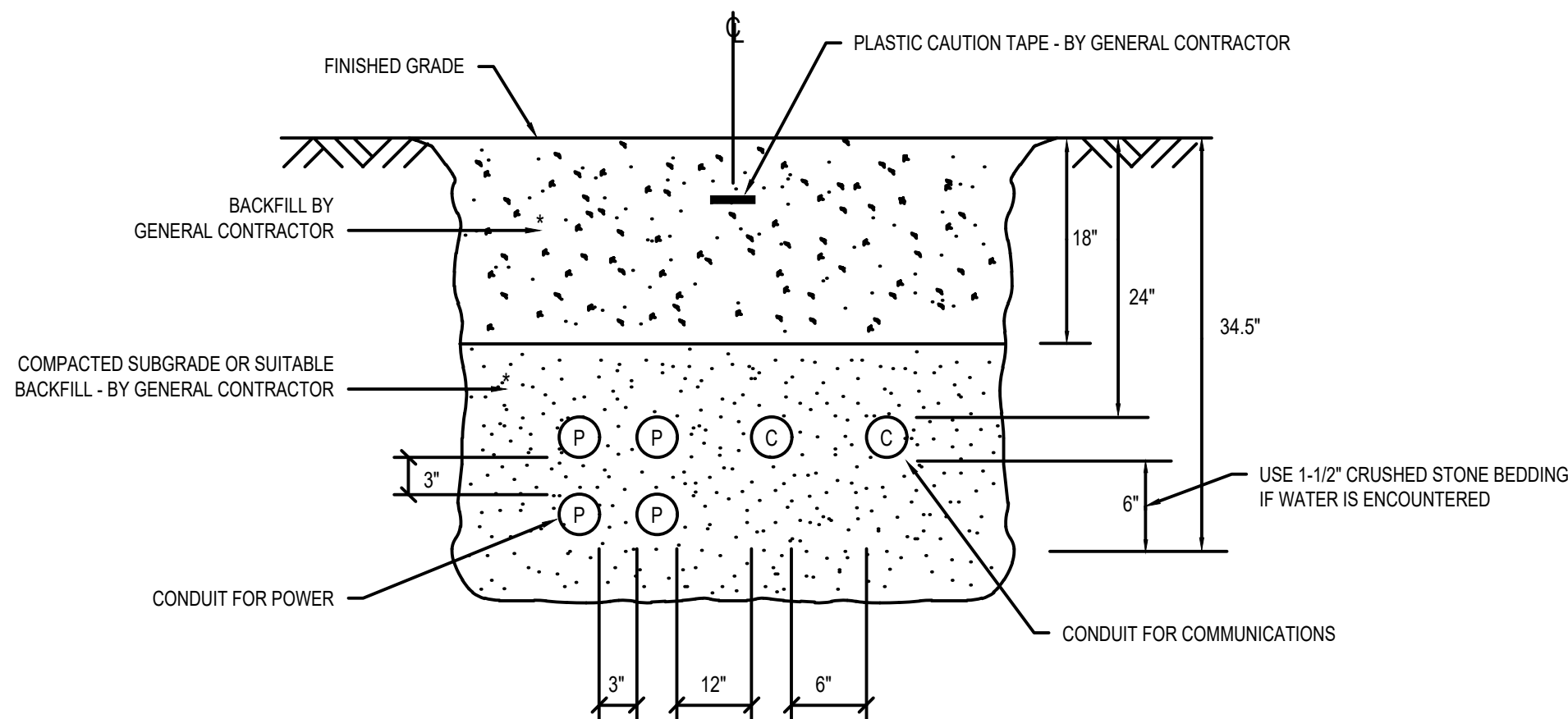
E101

P:\M&S\Drawings\102221001\Broadmeadow Sewer Pump Station Improvements\2023 Electrical\101 - Electrical Modification Plans.dwg



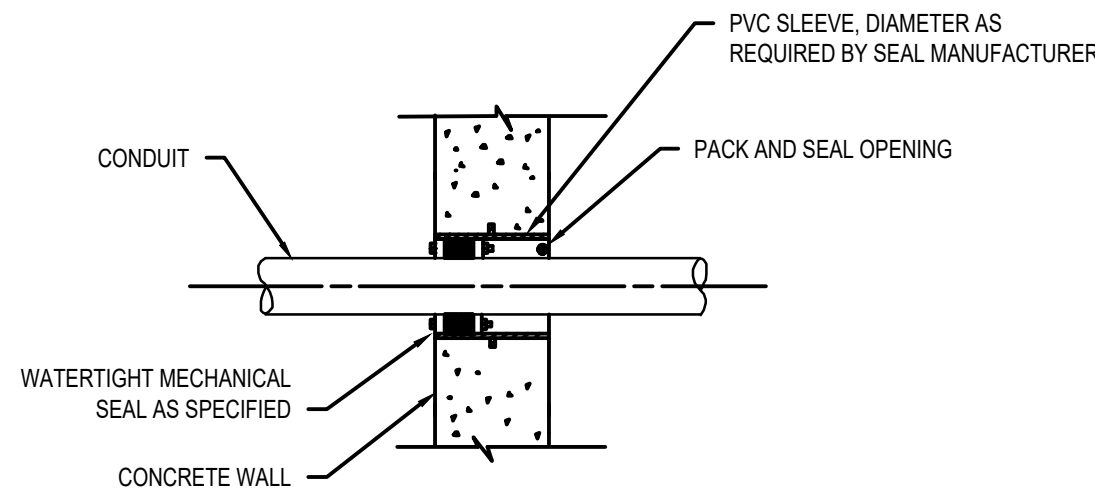
1 TYPICAL ELECTRICAL CABINET DETAIL

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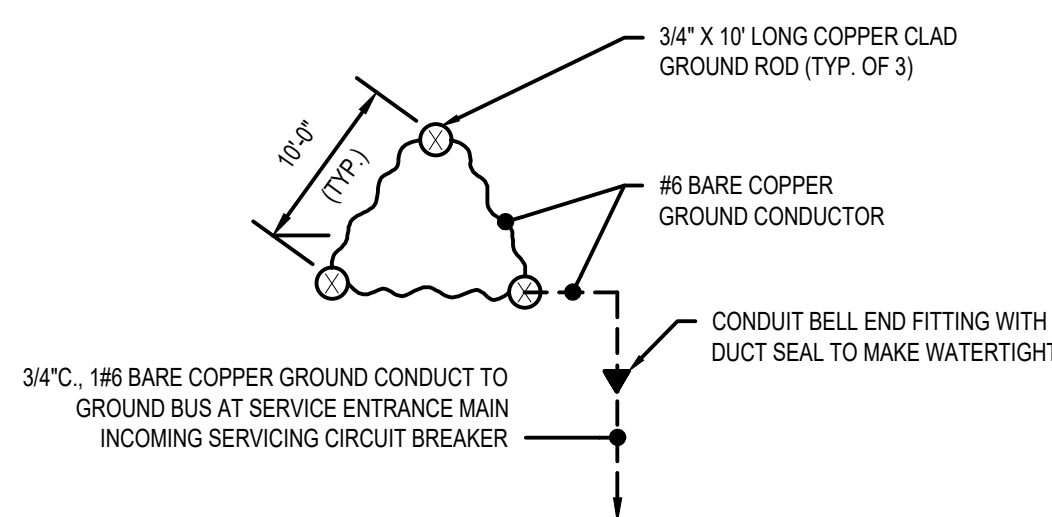
3 TYPICAL DIRECT BURIED CONDUIT DETAIL

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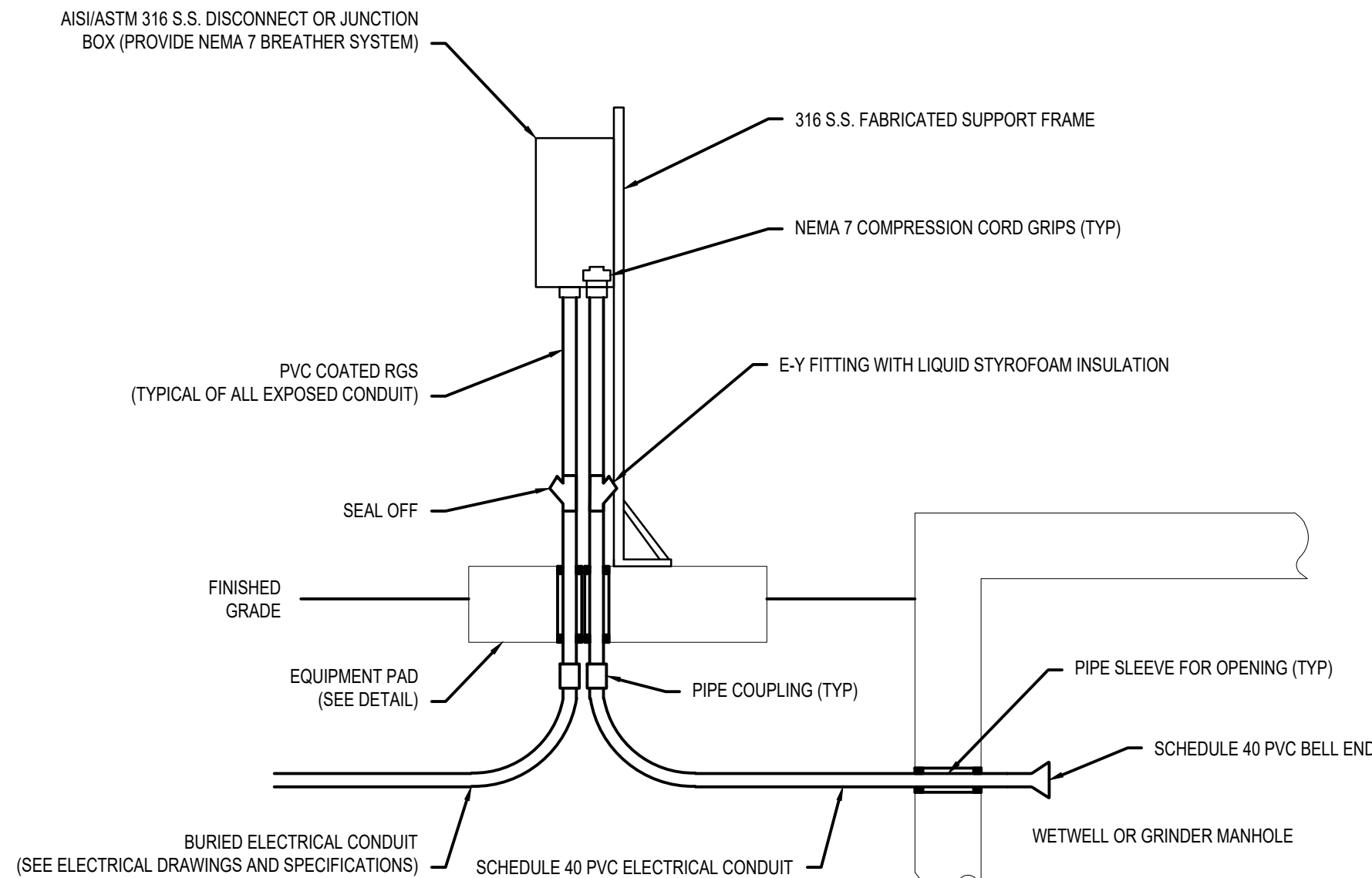
4 WATERTIGHT CONDUIT PENETRATION DETAIL

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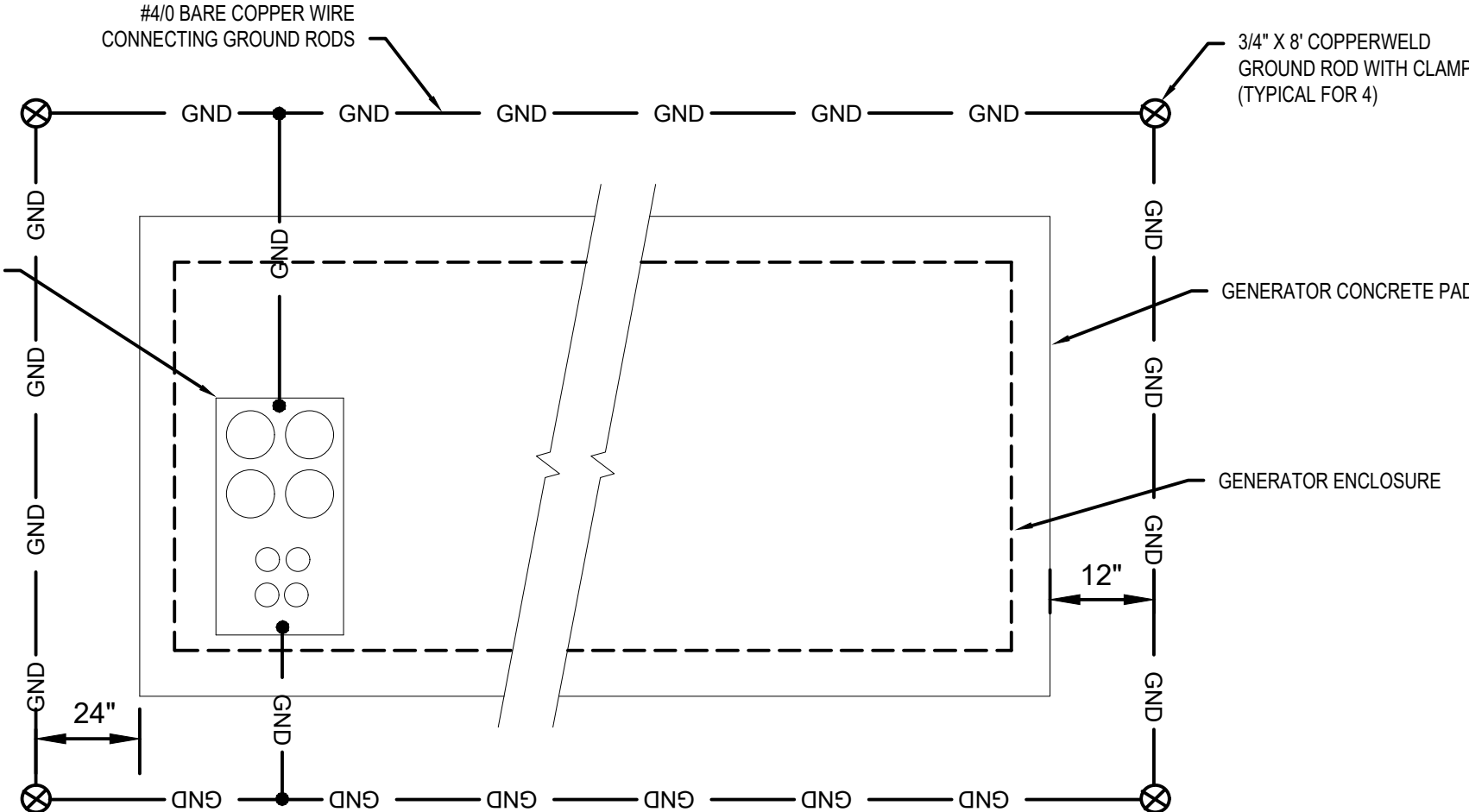
5 TRIPOD GROUNDING SYSTEM DETAIL

SCALE: NOT TO SCALE



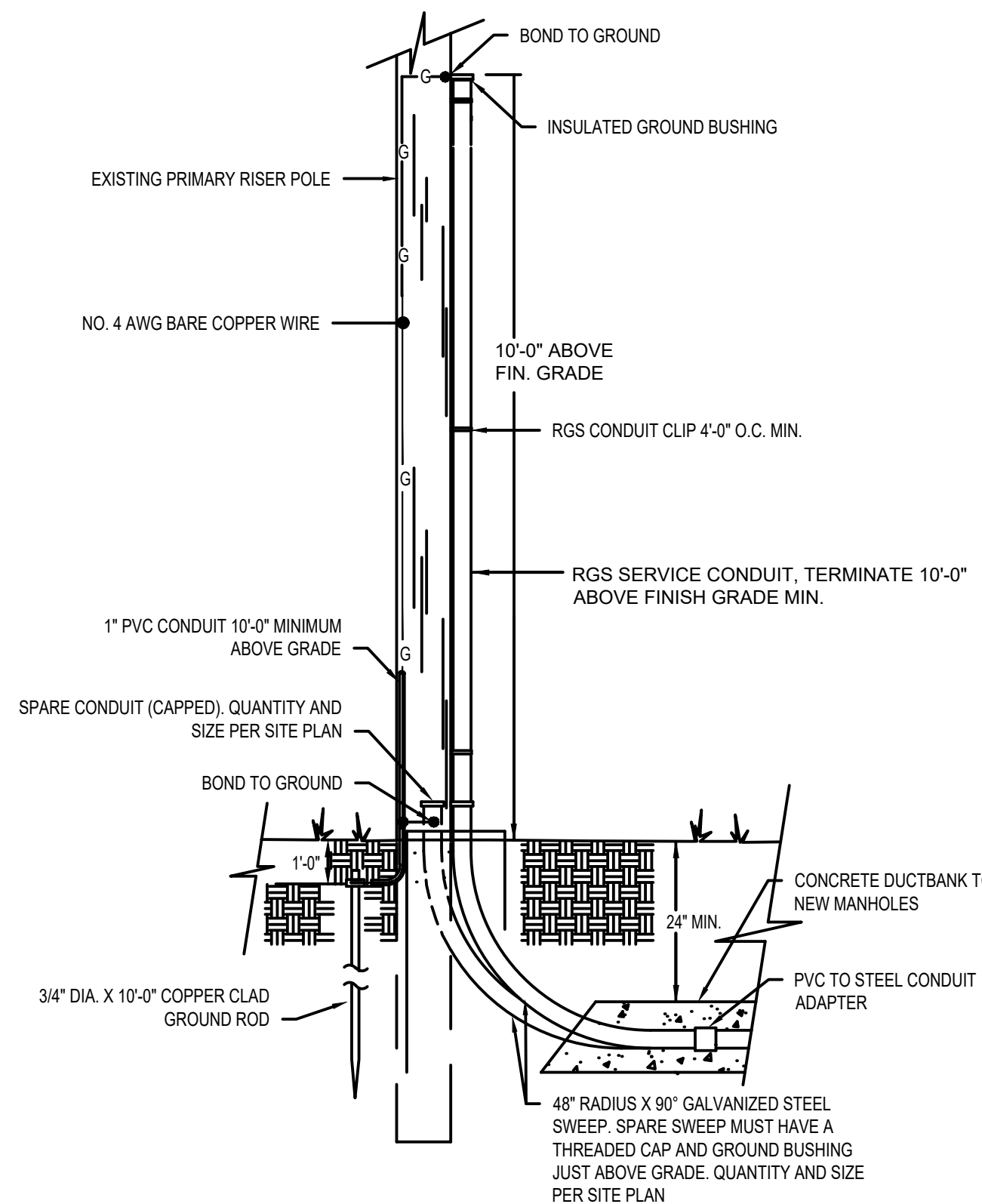
2 TYPICAL JUNCTION BOX OR DISCONNECT MOUNTED DETAIL

SCALE: NOT TO SCALE



6 GENERATOR GROUNDING DETAIL

SCALE: NOT TO SCALE



7 TYPICAL RISER POLE DETAIL

SCALE: NOT TO SCALE

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Revisions:		
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Drawing Title:

ELECTRICAL
DETAILS

Sheet Number:

E501