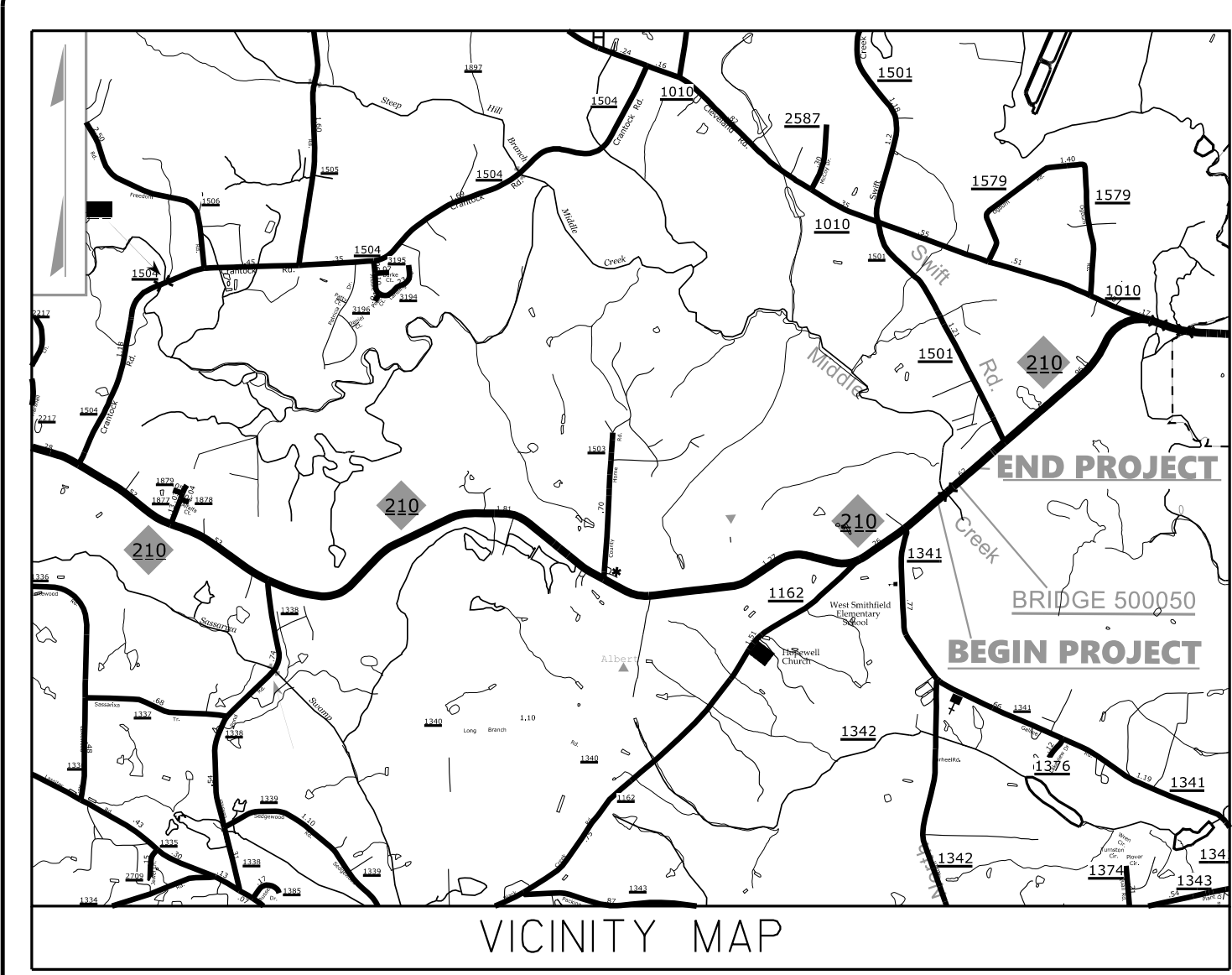


**CONTRACT: \_\_\_\_\_**

**TIP PROJECT: BR-0026**



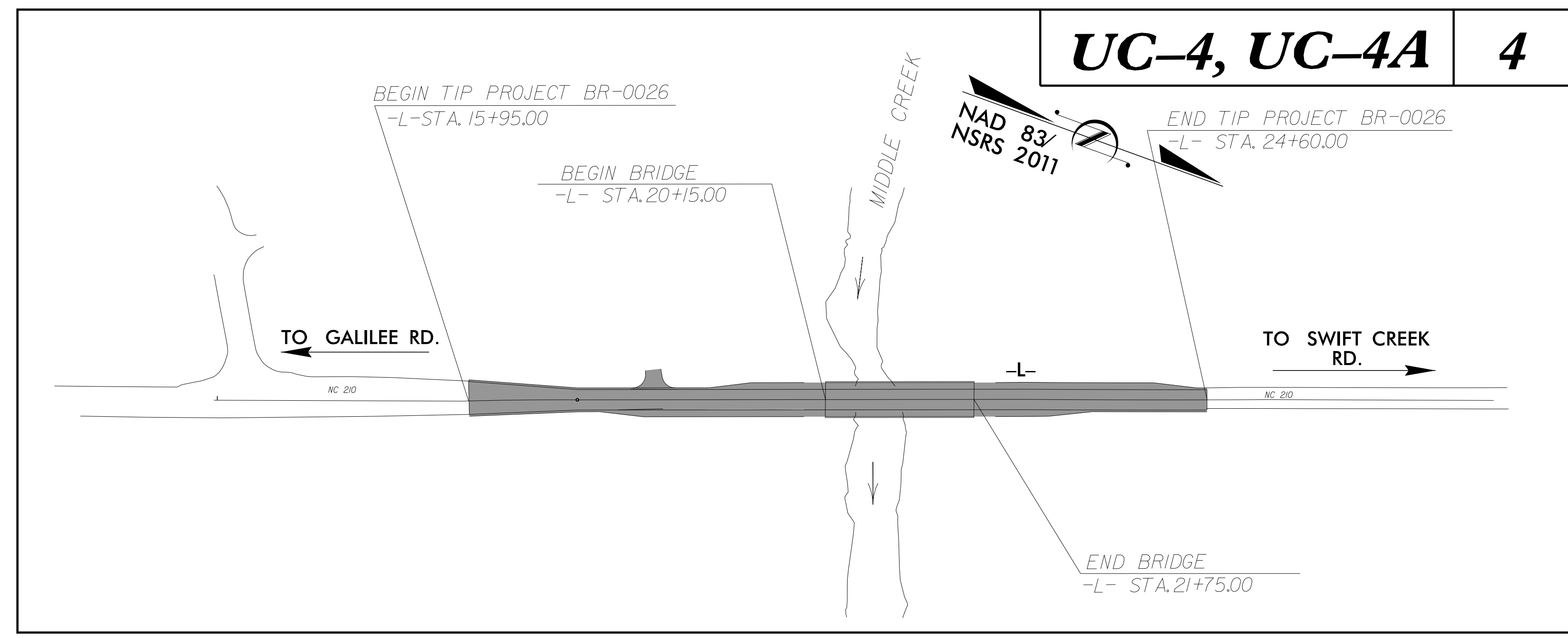
STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**UTILITY CONSTRUCTION PLANS  
JOHNSTON COUNTY**

**LOCATION: BRIDGE NO. 500050 ON NC-210  
OVER MIDDLE CREEK**

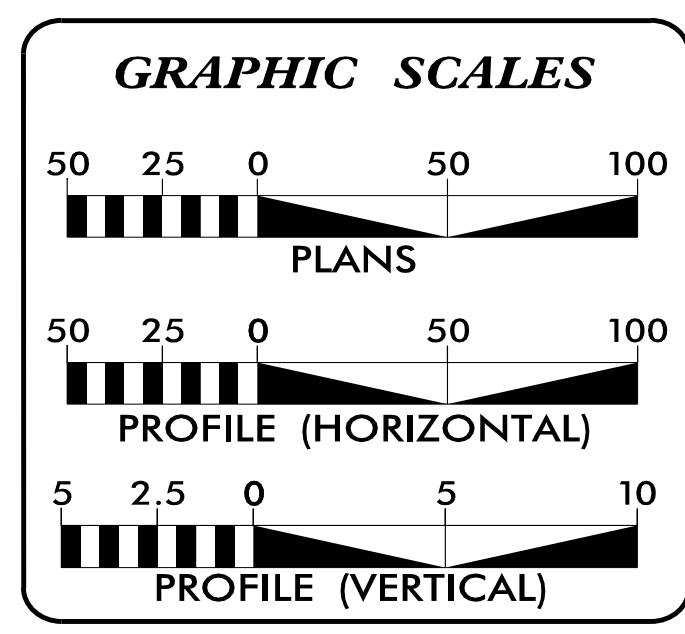
**TYPE OF WORK: RELOCATION OF WATER AND SEWER**

T.I.P. NO.	SHEET NO.
BR-0026	UC-1



**UC-4, UC-4A 4**

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**INDEX OF SHEETS**

SHEET NO.	DESCRIPTION
UC-1	TITLE SHEET
UC-2	UTILITY SYMBOLOGY
UC-3	NOTES
UC-3A thru UC-3I	WATER AND SEWER DETAILS
UC-4 thru UC-4A	UTILITY CONSTRUCTION SHEETS

**WATER UTILITY OWNER ON PROJECT**

(1) WATER - JOHNSTON COUNTY PUBLIC UTILITIES  
(2) SEWER - JOHNSTON COUNTY PUBLIC UTILITIES

PREPARED IN THE OFFICE OF:

ENGINEERING - SURVEYING  
www.JMJT.com  
1909 AILOR AVE  
KNOXVILLE TENNESSEE 37921  
PHONE (865) 546-1800

SEAL:

11/28/2009 11:20:24 PM EST

Matthew Davis, P.E. UTILITY PROJECT ENGINEER  
Shane Waidner PROJECT UTILITY COORDINATOR  
Natalia Dominguez PROJECT UTILITY DESIGNER

PREPARED IN THE OFFICE OF:  
DIVISION OF HIGHWAYS  
UTILITIES UNIT  
UTILITIES ENGINEERING

1555 MAIL SERVICES CENTER  
RALEIGH NC 27699-1555  
PHONE (919) 707-6690  
FAX (919) 250-4151

Nabil Hamdan REGIONAL UTILITIES ENGINEER  
Tanga Sampson REGIONAL UTILITY COORDINATOR  
Kelvin Martin, E.I. SENIOR UTILITIES ENGINEER  
Larry James Jr. SENIOR UTILITY COORDINATOR

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

UTILITIES PLAN SHEET SYMBOLS

PROPOSED WATER SYMBOLS

Water Line (Sized as Shown)	
11¼ Degree Bend	
22½ Degree Bend	
45 Degree Bend	
90 Degree Bend	
Plug	
Tee	
Cross	
Reducer	
Gate Valve	
Butterfly Valve	
Tapping Valve	
Line Stop	
Line Stop with Bypass	
Blow Off	
Fire Hydrant	
Relocate Fire Hydrant	
Remove Fire Hydrant	REM FH
Water Meter	
Relocate Water Meter	
Remove Water Meter	REM WM
Water Pump Station	
RPZ Backflow Preventer	
DCV Backflow Preventer	
Relocate RPZ Backflow Preventer	
Relocate DCV Backflow Preventer	

PROPOSED SEWER SYMBOLS

Gravity Sewer Line (Sized as Shown)	
Force Main Sewer Line (Sized as Shown)	
Manhole (Sized per Note)	
Sewer Pump Station	

PROPOSED MISCELLANOUS UTILITIES SYMBOLS

Power Pole	
Telephone Pole	
Joint Use Pole	
Telephone Pedestal	
Utility Line by Others (Type as Shown)	
Trenchless Installation	
Encasement by Open Cut	
Encasement	

Thrust Block	
Air Release Valve	
Utility Vault	
Concrete Pier	
Steel Pier	
Plan Note	
Pay Item Note	

EXISTING UTILITIES SYMBOLS

Power Pole		*Underground Power Line	
Telephone Pole		*Underground Telephone Cable	
Joint Use Pole		*Underground Telephone Conduit	
Utility Pole		*Underground Fiber Optics Telephone Cable	
Utility Pole with Base		*Underground TV Cable	
H-Frame Pole		*Underground Fiber Optics TV Cable	
Power Transmission Line Tower		*Underground Gas Pipeline	
Water Manhole		Aboveground Gas Pipeline	
Power Manhole		*Underground Water Line	
Telephone Manhole		Aboveground Water Line	
Sanitary Sewer Manhole		*Underground Gravity Sanitary Sewer Line	
Hand Hole for Cable		Aboveground Gravity Sanitary Sewer Line	
Power Transformer		*Underground SS Forced Main Line	
Telephone Pedestal		Underground Unknown Utility Line	
CATV Pedestal		SUE Test Hole	
Gas Valve		Water Meter	
Gas Meter		Water Valve	
Located Miscellaneous Utility Object		Fire Hydrant	
Abandoned According to Utility Records	AATUR	Sanitary Sewer Cleanout	
End of Information	E.O.I.		

\*For Existing Utilities  
 Utility Line Drawn from Record (Type as Shown)   
 Designated Utility Line (Type as Shown)

PROJECT REFERENCE NO.	SHEET NO.
BR-0026	UC-3
DESIGNED BY: MRD	
DRAWN BY: ND	
CHECKED BY: JDN	
APPROVED BY: MRD	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	11/28/2023 11:00:24 PM EST
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	UTILITY CONSTRUCTION PLANS ONLY

# UTILITY CONSTRUCTION

## GENERAL NOTES:

1. THE PROPOSED UTILITY CONSTRUCTION SHALL MEET THE APPLICABLE REQUIREMENTS OF THE NC DEPARTMENT OF TRANSPORTATION'S "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" DATED JANUARY 2024.
2. THE EXISTING UTILITIES BELONG TO JOHNSTON COUNTY PUBLIC UTILITIES. PLEASE CONTACT MIKE KEEN 919-209-8333 OR MIKE.KEEN@JOHNSTONNC.GOV
3. ALL WATER LINES TO BE INSTALLED WITHIN COMPLIANCE OF THE RULES AND REGULATIONS OF THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL AND NATURAL RESOURCES, DIVISION OF WATER RESOURCES, PUBLIC WATER SUPPLY SECTION. ALL SEWER LINES TO BE INSTALLED WITHIN COMPLIANCE OF THE RULES AND REGULATIONS OF THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES, DIVISION OF WATER RESOURCES, WATER QUALITY SECTION. PERFORM ALL WORK IN ACCORDANCE WITH THE APPLICABLE PLUMBING CODES.
4. THE UTILITY OWNER OWNS THE EXISTING UTILITY FACILITIES AND WILL OWN THE NEW UTILITY FACILITIES AFTER ACCEPTANCE BY THE DEPARTMENT. THE DEPARTMENT OWNS THE CONSTRUCTION CONTRACT AND HAS ADMINISTRATIVE AUTHORITY. COMMUNICATIONS AND DECISIONS BETWEEN THE CONTRACTOR AND UTILITY OWNER ARE NOT BINDING UPON THE DEPARTMENT OR THIS CONTRACT UNLESS AUTHORIZED BY THE ENGINEER. AGREEMENTS BETWEEN THE UTILITY OWNER AND CONTRACTOR FOR THE WORK THAT IS NOT PART OF THIS CONTRACT OR IS SECONDARY TO THIS CONTRACT ARE ALLOWED, BUT ARE NOT BINDING UPON THE DEPARTMENT.
5. PROVIDE ACCESS FOR THE DEPARTMENT PERSONNEL AND THE OWNER'S REPRESENTATIVES TO ALL PHASES OF CONSTRUCTION. NOTIFY DEPARTMENT PERSONNEL AND THE UTILITY OWNER TWO WEEKS PRIOR TO COMMENCEMENT OF ANY WORK AND ONE WEEK PRIOR TO SERVICE INTERRUPTION. KEEP UTILITY OWNERS' REPRESENTATIVES INFORMED OF WORK PROGRESS AND PROVIDE OPPORTUNITY FOR INSPECTION OF CONSTRUCTION AND TESTING.

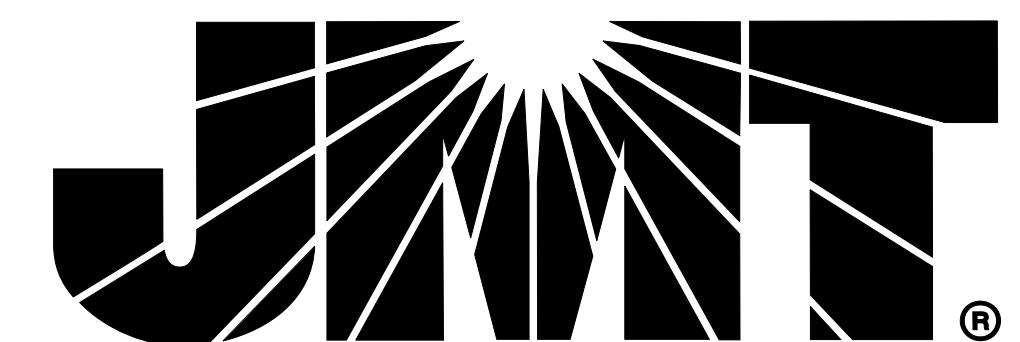
6. THE PLANS DEPICT THE BEST AVAILABLE INFORMATION FOR THE LOCATION, SIZE, AND TYPE OF MATERIAL FOR ALL EXISTING UTILITIES. MAKE INVESTIGATIONS FOR DETERMINING THE EXACT LOCATION, SIZE, AND TYPE MATERIAL OF THE EXISTING FACILITIES AS NECESSARY FOR THE CONSTRUCTION OF THE PROPOSED UTILITIES AND FOR AVOIDING DAMAGE TO EXISTING FACILITIES. REPAIR ANY DAMAGE INCURRED TO EXISTING FACILITIES TO THE ORIGINAL OR BETTER CONDITION AT NO ADDITIONAL COST TO THE DEPARTMENT.
7. MAKE FINAL CONNECTIONS OF THE NEW WORK TO THE EXISTING SYSTEM WHERE INDICATED ON THE PLANS, AS REQUIRED TO FIT THE ACTUAL CONDITIONS, OR AS DIRECTED.
8. MAKE CONNECTIONS BETWEEN EXISTING AND PROPOSED UTILITIES AT TIMES MOST CONVENIENT TO THE PUBLIC, WITHOUT ENDANGERING THE UTILITY SERVICE, AND IN ACCORDANCE WITH THE UTILITY OWNER'S REQUIREMENTS. MAKE CONNECTIONS ON WEEKENDS, AT NIGHT, AND ON HOLIDAYS IF NECESSARY.
9. ALL UTILITY MATERIALS SHALL BE APPROVED PRIOR TO DELIVERY TO THE PROJECT. SEE 1500-7, " SUBMITTALS AND RECORDS" IN SECTION 1500 OF THE STANDARD SPECIFICATIONS.

## PROJECT SPECIFIC NOTES:

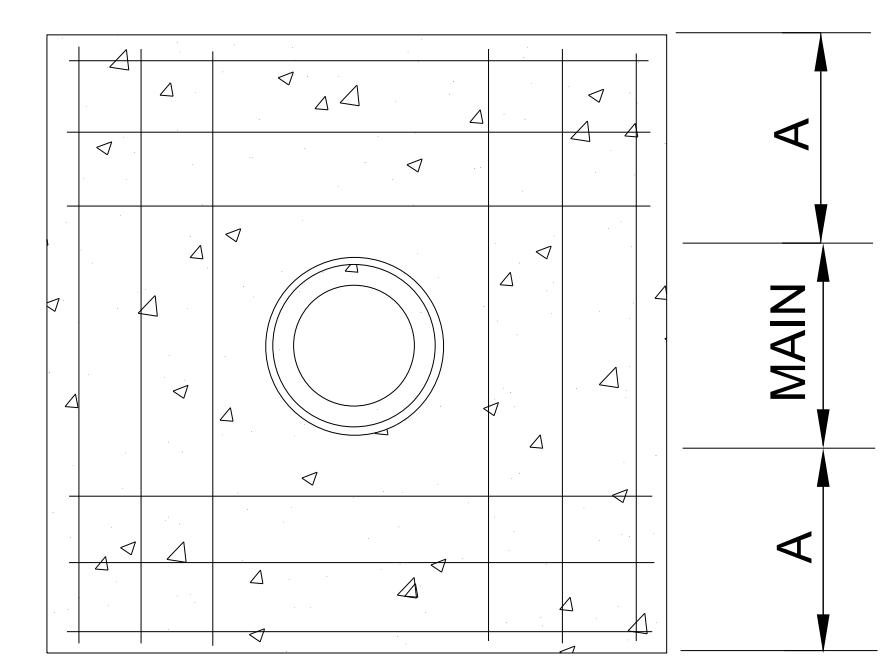
1. THRUST COLLARS ARE REQUIRED AT EACH END OF HDPE PIPE FOR DIRECTIONAL DRILL SECTIONS.
2. ALL FITTINGS SHALL BE DUCTILE IRON MECHANICAL JOINT USING GRIP RINGS. FULL RING OR GRIP RING STYLES ARE ACCEPTABLE. NO GLUE OR PUSH-ON FITTINGS ARE ALLOWED. THRUST BLOCKING IS REQUIRED.
3. CONTRACTOR'S ATTENTION IS DIRECTED TO SECTIONS 102, 107 AND 1550 OF THE STANDARD SPECIFICATIONS CONCERNING TRENCHLESS INSTALLATION. IT IS CONTRACTOR'S RESPONSIBILITY TO HAVE BORE DESIGNED AND SEALED BY A LICENSED NORTH CAROLINA PROFESSIONAL ENGINEER. NO DAMAGE SHALL BE ALLOWED TO RIVER, WETLANDS OR BUFFER ZONES.

4. IF HDPE PIPE IS INSTALLED BY DIRECTIONAL DRILL. IT SHALL BE FILLED WITH WATER AND NOT BE CONNECTED TO ANY OTHER PIPE OR FITTING FOR ONE WEEK FROM THE TIME OF INSTALLATION.
5. NEW WATER LINES MUST BE PRESSURE TESTED AT 200 PSI FOR 3 HOURS. TEST TO OBSERVED BY JOHNSTON COUNTY WATER DEPARTMENT REPRESENTATIVE.
6. SERVICE INTERRUPTIONS SHALL BE SCHEDULED WITH JOHNSTON COUNTY WATER DEPARTMENT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING TEMPORARY POTABLE WATER SUPPLIES TO ANY CUSTOMER UPON REQUEST BY THE COUNTY AND/OR WHEN DURATION OF THE WATER SERVICE LOSS OR DISRUPTION EXCEEDS 4 HOURS.
7. ALL NC DEQ-DWR-PWS AND LOCAL TESTING MUST BE COMPLETED AND APPROVED PRIOR TO CONNECTING THE NEW CONSTRUCTION TO THE EXISTING WATER LINES.
8. HDPE PRESSURE PIPE FOR POTABLE WATER SHALL MEET THE REQUIREMENTS OF NSF 61.
9. ANY NECESSARY CONNECTIONS FOR TESTING AND FILLING THE INSTALLED WATER MAIN WILL BE REQUIRED AND CONSIDERED INCIDENTAL TO THE WATER MAIN.
10. CONTRACTOR SHALL COORDINATE CONNECTION TO EXISTING FORCE MAIN LIFT STATION WITH JOHNSTON COUNTY PUBLIC UTILITIES. CONTRACTOR SHALL MAKE CONNECTION TO ENSURE PUMP STATION SERVICE IS NOT INTERRUPTED.
11. ANY BRIDGE WORK PERFORMED WILL NOT IMPACT EXISTING WATER LINE UNTIL THE NEW LINE HAS BEEN PLACED IN SERVICE. THE EXISTING WATER LINE CAN ONLY BE OUT OF SERVICE FOR A MAXIMUM OF 6 HOURS. CONTRACTOR TO COORDINATE SERVICE OUTAGE WITH JOHNSTON COUNTY PUBLIC UTILITIES.
12. NO DOGHOUSE MANHOLES SHALL BE ALLOWED ON THE PROJECT. ANY GRAVITY SEWER CONNECTIONS ON THE EXISTING LINES SHALL HAVE NEW MANHOLES CUT IN.

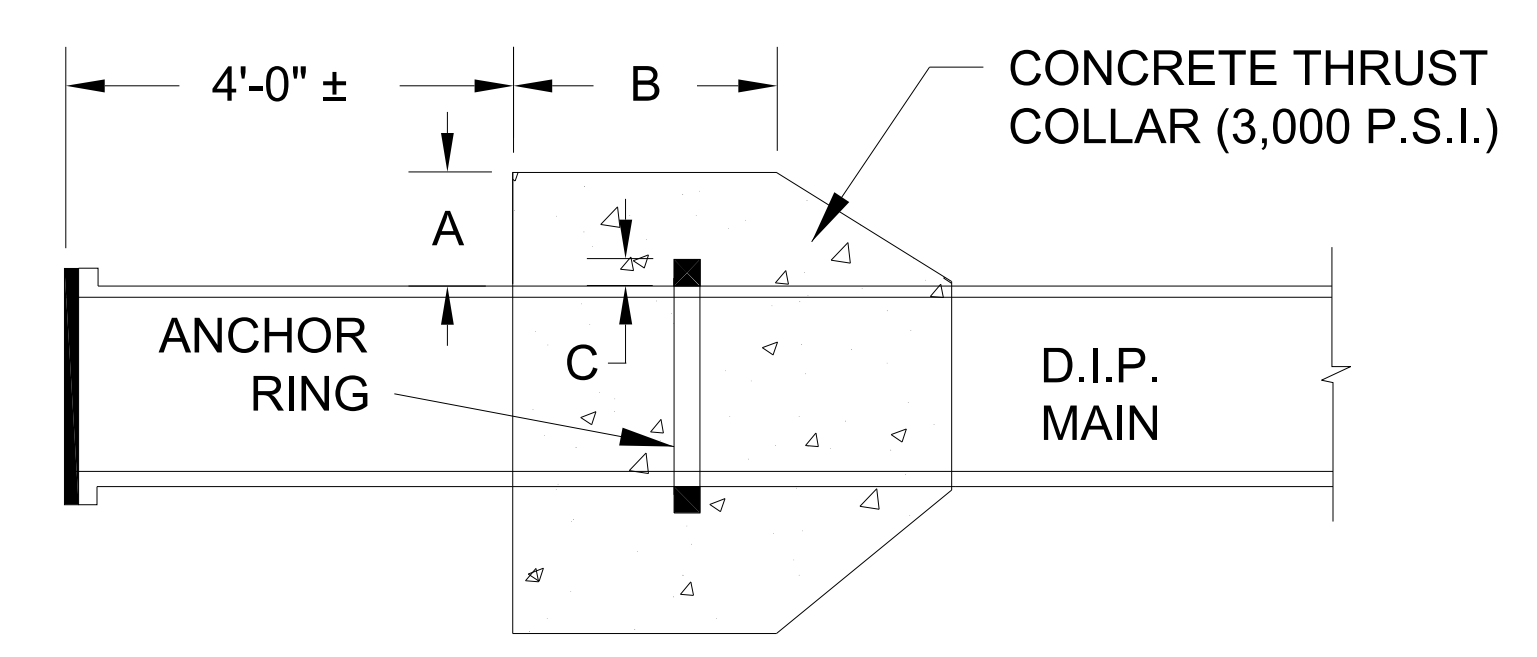
13. CONTRACTOR SHALL COORDINATE WITH THE COUNTY FOR SEWAGE HAULING. COUNTY WILL COORDINATE AND/OR SCHEDULE THE SEPTIC TANK TRUCK. REFER TO THE PROJECT SPECIAL PROVISIONS FOR SEWAGE HAULING INFORMATION.
14. ALL SEWER LINE FITTINGS SHALL BE EPOXY INTERIOR LINED.
15. THE UTILITY CONTRACTOR SHALL INSTALL A 4"X4" CONCRETE VALVE MARKER AT THE EDGE OF THE RIGHT-OF-WAY TO IDENTIFY THE LOCATION OF EACH GATE VALVE INSTALLED IN THE NEW WATER SYSTEM EXCEPT FOR THE FIRE HYDRANT ISOLATION VALVES. THE CONTRACTOR SHALL MEASURE THE DISTANCE FROM THE CENTER OF THE CONCRETE MARKER TO THE CENTER OF OF THE VALVE BOX. THIS DISTANCE (IN LINEAR FEET) SHALL BE STAMPED ON THE BRASS PLATE LOCATED ON THE TOP OF THE CONCRETE VALVE MARKER. IN LIEU OF INSTALLING THE CONCRETE VALVE MARKERS, THE UTILITY CONTRACTOR MAY PROVIDE AT LEAST TWO MEASUREMENTS FROM TWO INDEPENDENT PERMANENT ABOVE GROUND STRUCTURES TO THE PROFESSIONAL ENGINEER (PE) IN RED LINE DRAWINGS TO IDENTIFY THE VALVE LOCATIONS. THE PROFESSIONAL ENGINEER (PE) MUST INCLUDE THESE MEASUREMENTS IN THE AS-BUILT RECORD DRAWINGS SUBMITTED TO JOHNSTON COUNTY PUBIC UTILITIES.
16. HPDE PIPE MUST BE DIPS.



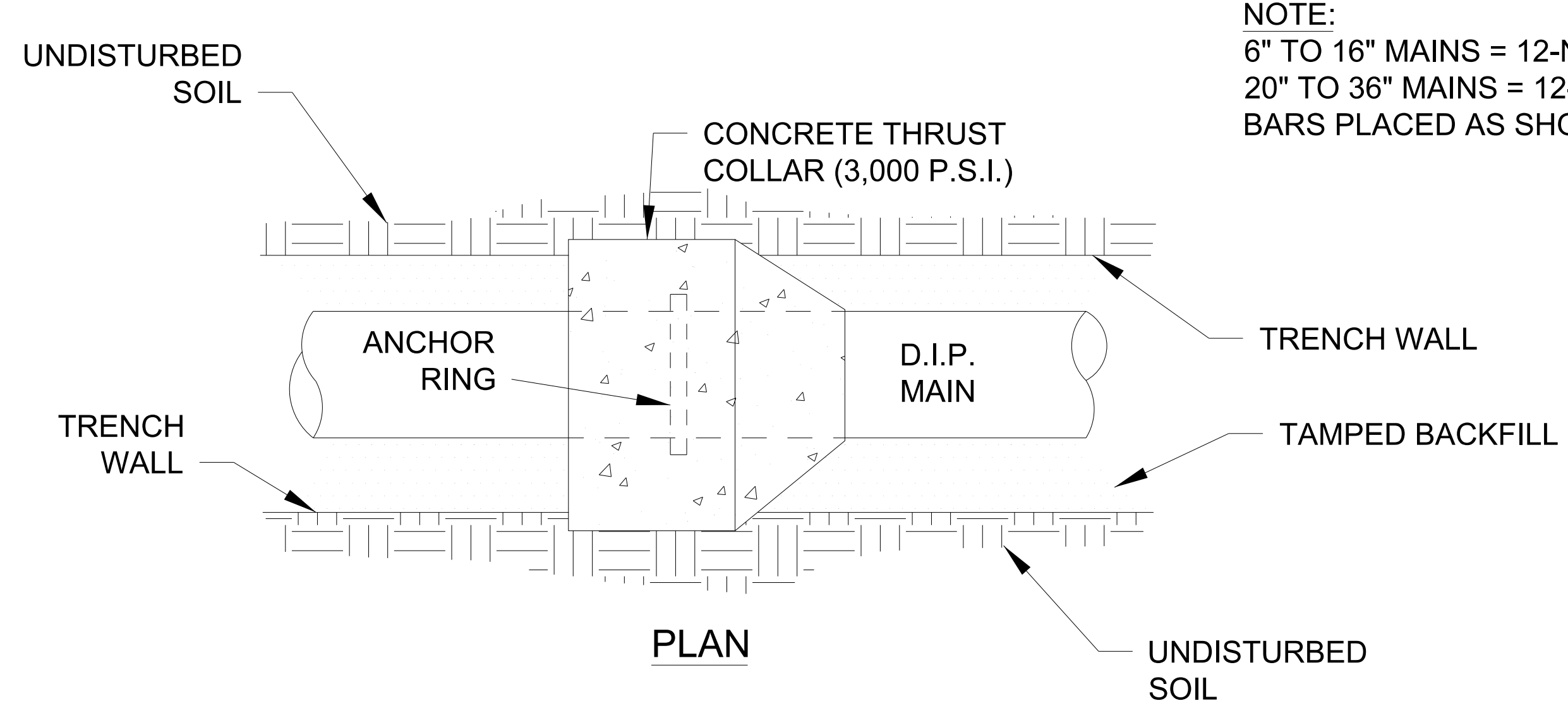
PROJECT REFERENCE NO.	SHEET NO.
BR-0026	UC-3A
DESIGNED BY: MRD	
DRAWN BY: ND	
CHECKED BY: JDN	
APPROVED BY: MRD	
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**REINFORCING**



**SECTION**

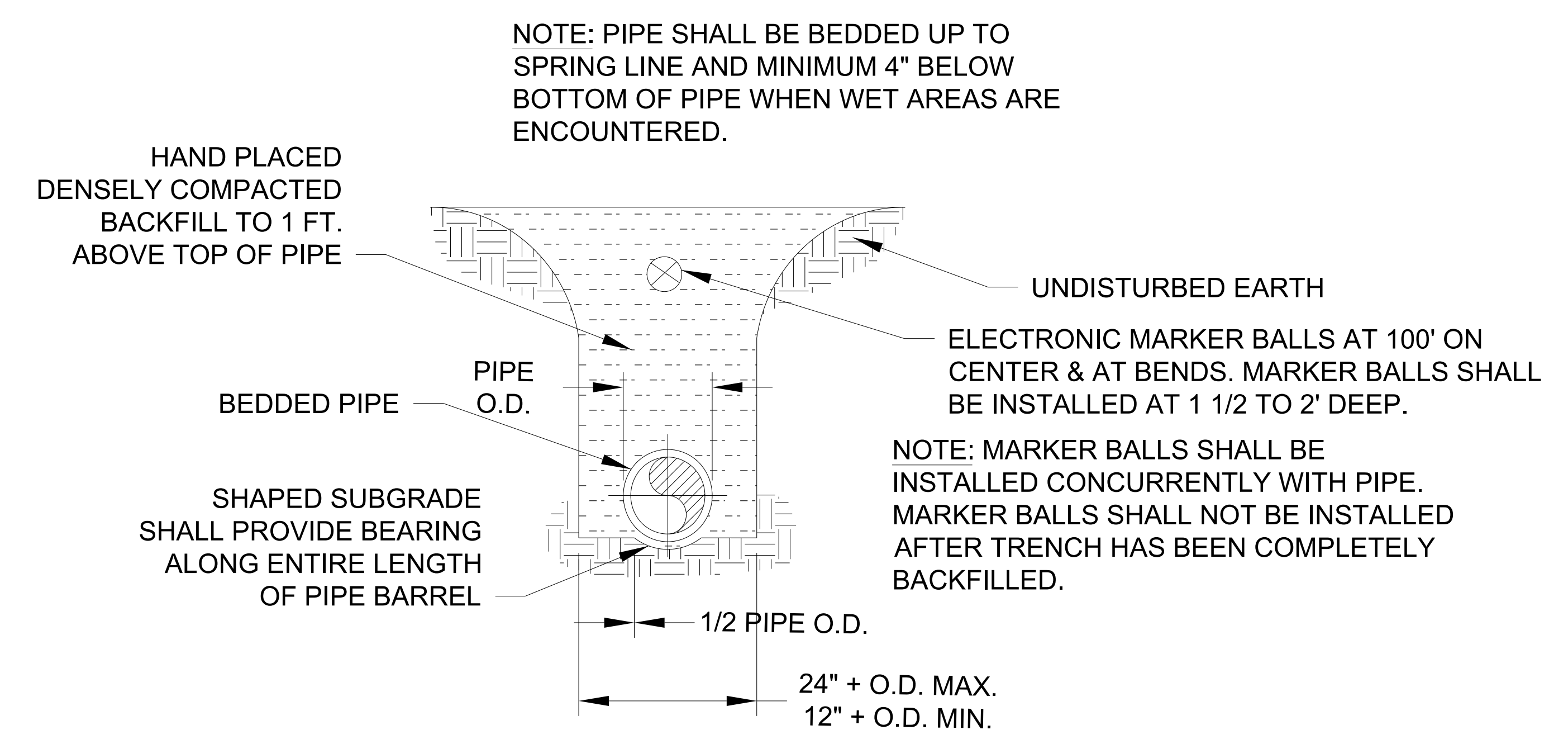


**PLAN**

**NOTE:**  
 6" TO 16" MAINS = 12-NO. 7 BARS  
 20" TO 36" MAINS = 12-NO. 8 BARS  
 BARS PLACED AS SHOWN

SCHEDULE				
PIPE DIAMETER	CONCRETE THRUST COLLAR		ANCHOR COLLAR	RINGS REQUIRED
	A	B	C	
6", 8", 12"	1'-0"	1'-0"	2"	ONE
16"	1'-4"	1'-0"	2"	ONE
20"	1'-4"	1'-0"	3"	ONE
24"	1'-4"	1'-0"	3"	TWO
30"	1'-4"	1'-2"	4"	TWO
36"	1'-4"	1'-4"	4"	TWO

**THRUST COLLAR INSTALLATION**  
NOT TO SCALE

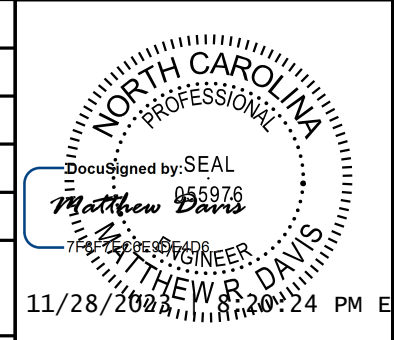


**NOTE:**  
 WATER MAINS 8"Ø AND SMALLER SHALL HAVE MINIMUM OF 3' COVER. WATER MAINS LARGER THAN 8"Ø SHALL HAVE A MINIMUM OF 3'-6" COVER.

**PIPE LAYING CONDITION**  
NOT TO SCALE

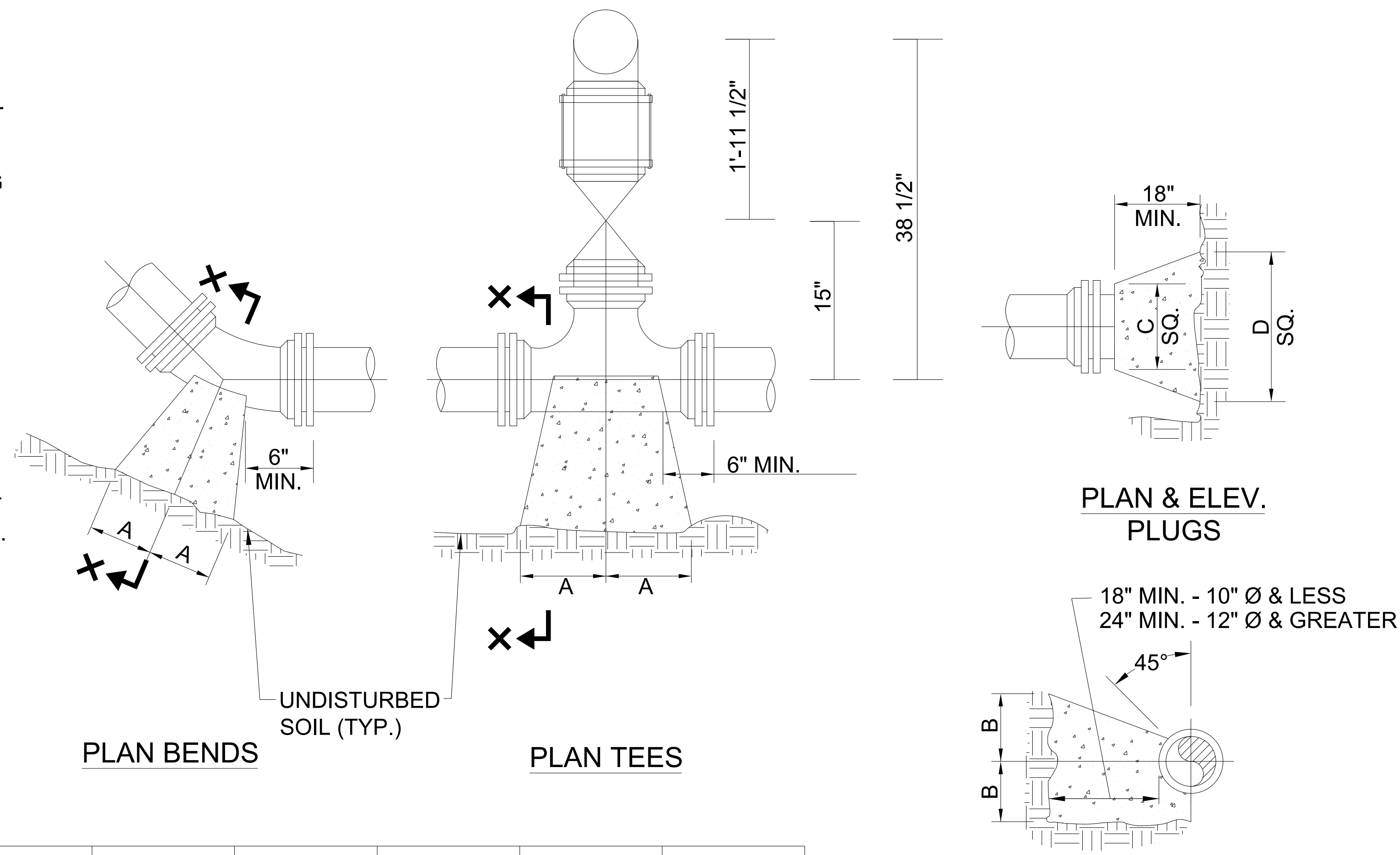
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 V:\shreveville\structures\31748-40 - Johnston\_50 BR-0026\Utilities\BR-0026-UTL uc-3a.dgn

PROJECT REFERENCE NO.	SHEET NO.
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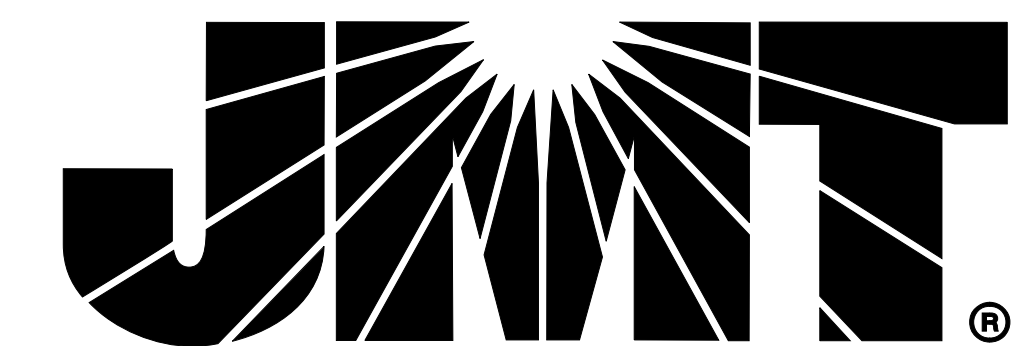
**NOTES:**

1. CONCRETE SHALL BE 3,000 PSI MIN.
2. CONCRETE FOR THRUST BLOCKING SHALL BE KEPT FAIRLY DRY, THUS MAKING THE CONCRETE WEDGE SHAPE MORE EASILY FORMED WITH THE WIDEST PART (BLOCKING AREA) AGAINST UNDISTURBED SOIL.
3. NO CONCRETE SHALL COVER ANY BOLTS OR GLANDS.
4. ALL FITTING AND ACCESSORIES TO BE WRAPPED WITH 10 MIL POLYETHYLENE PRIOR TO POURING BLOCKING.
5. VOLUME OF THRUST BLOCKING SHALL BE AS SHOWN ON THE THRUST BLOCKING SCHEDULE.
6. THRUST BLOCK CALCULATIONS WERE BASED ON SANDY SILT SOIL CONDITIONS WITH A BEARING STRENGTH OF 3000 LB/SQ.FT AND A SAFETY FACTOR OF 1.5.



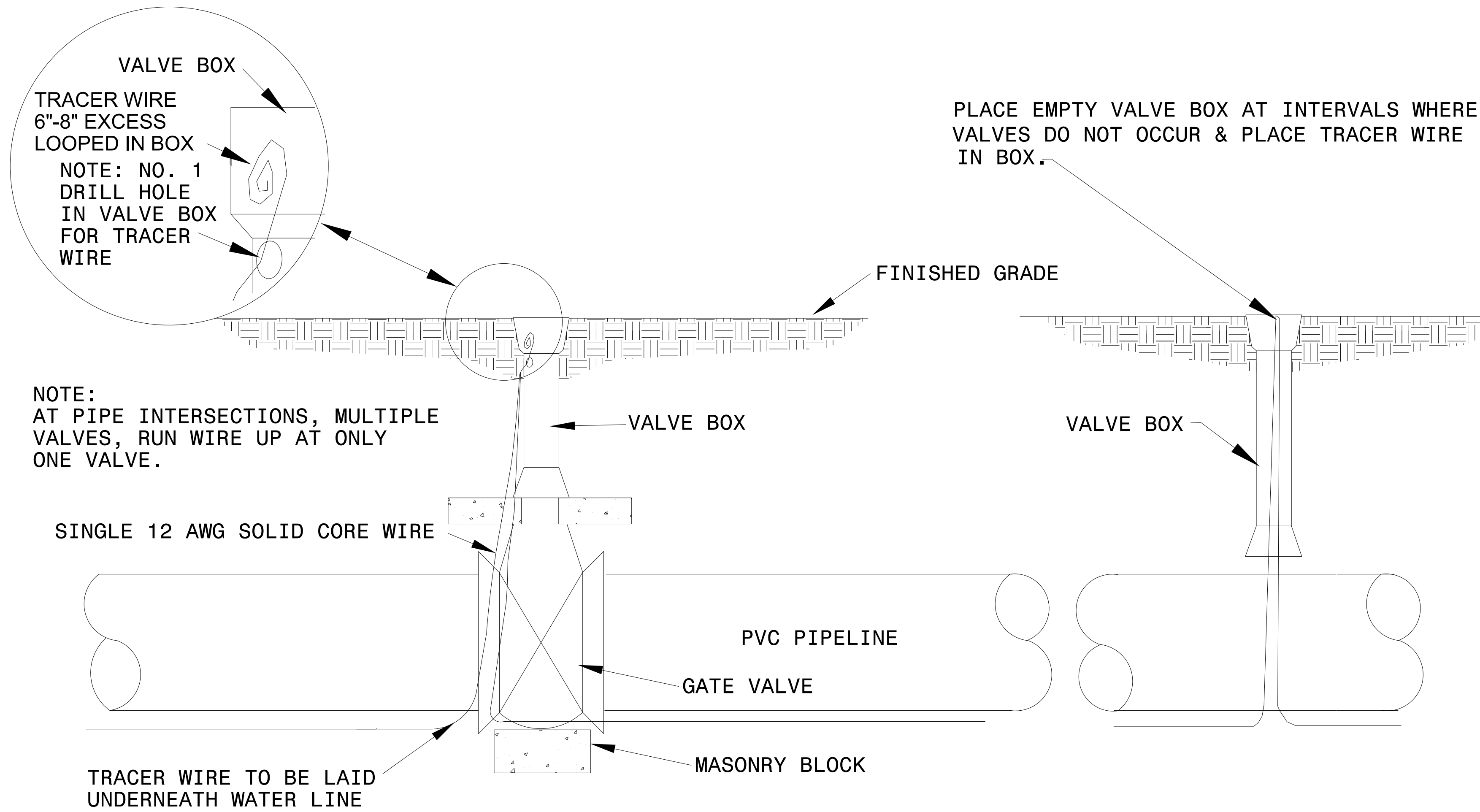
PIPE SIZE	90° BEND		45° BEND		22 1/2° BEND		11 1/4° BEND		TEE		PLUG	
	A	B	A	B	A	B	A	B	A	B	C	D
4"	12"	12"	9"	8"	6"	6"	6"	6"	9"	9"	12"	16"
6"	16"	15"	14"	10"	9"	8"	8"	8"	14"	12"	16"	24"
8"	21"	20"	16"	14"	12"	10"	9"	8"	17"	16"	18"	32"
10"	27"	24"	20"	18"	15"	12"	10"	10"	22"	21"	21"	42"
12"	32"	30"	24"	21"	17"	15"	13"	10"	26"	25"	25"	50"
14"	40"	33"	30"	24"	20"	18"	15"	14"	31"	30"	30"	60"
16"	43"	39"	31"	30"	26"	21"	16"	16"	36"	33"	33"	66"
20"	55"	48"	40"	36"	28"	26"	21"	18"	44"	42"	42"	84"
24"	63"	60"	46"	45"	34"	31"	25"	21"	52"	51"	51"	102"

**THRUST BLOCK DETAIL**  
NOT TO SCALE



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BR-0026	UC-3C
DESIGNED BY: MRD	
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<b>UTILITY CONSTRUCTION</b>	
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NOTE:  
AT PIPE INTERSECTIONS, MULTIPLE  
VALVES, RUN WIRE UP AT ONLY  
ONE VALVE.

SINGLE 12 AWG SOLID CORE WIRE

TRACER WIRE TO BE LAID  
UNDERNEATH WATER LINE

**NOTES:**

1. DRILL HOLE IN VALVE BOX TO INSERT TRACER WIRE, BRING UP TO INSIDE AND ROLL UP AT LEAST 6"-8" EXCESS
2. PLACE TRACER WIRE IN VALVE BOX.
3. DO NOT SPLICE WIRE WHEN BEGINNING A NEW SPOOL. INSTEAD INSTALL A VALVE BOX AND ATTACH EACH WIRE WITH A BRASS SCREW TO THE VALVE BOX.

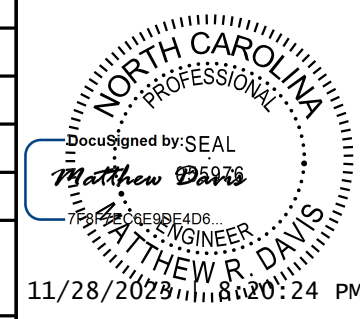
**TYPICAL TRACER WIRE INSTALLATION DETAIL**

NOT TO SCALE



11/20/23  
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### STRUCTURE 500050 JOHNSTON COUNTY

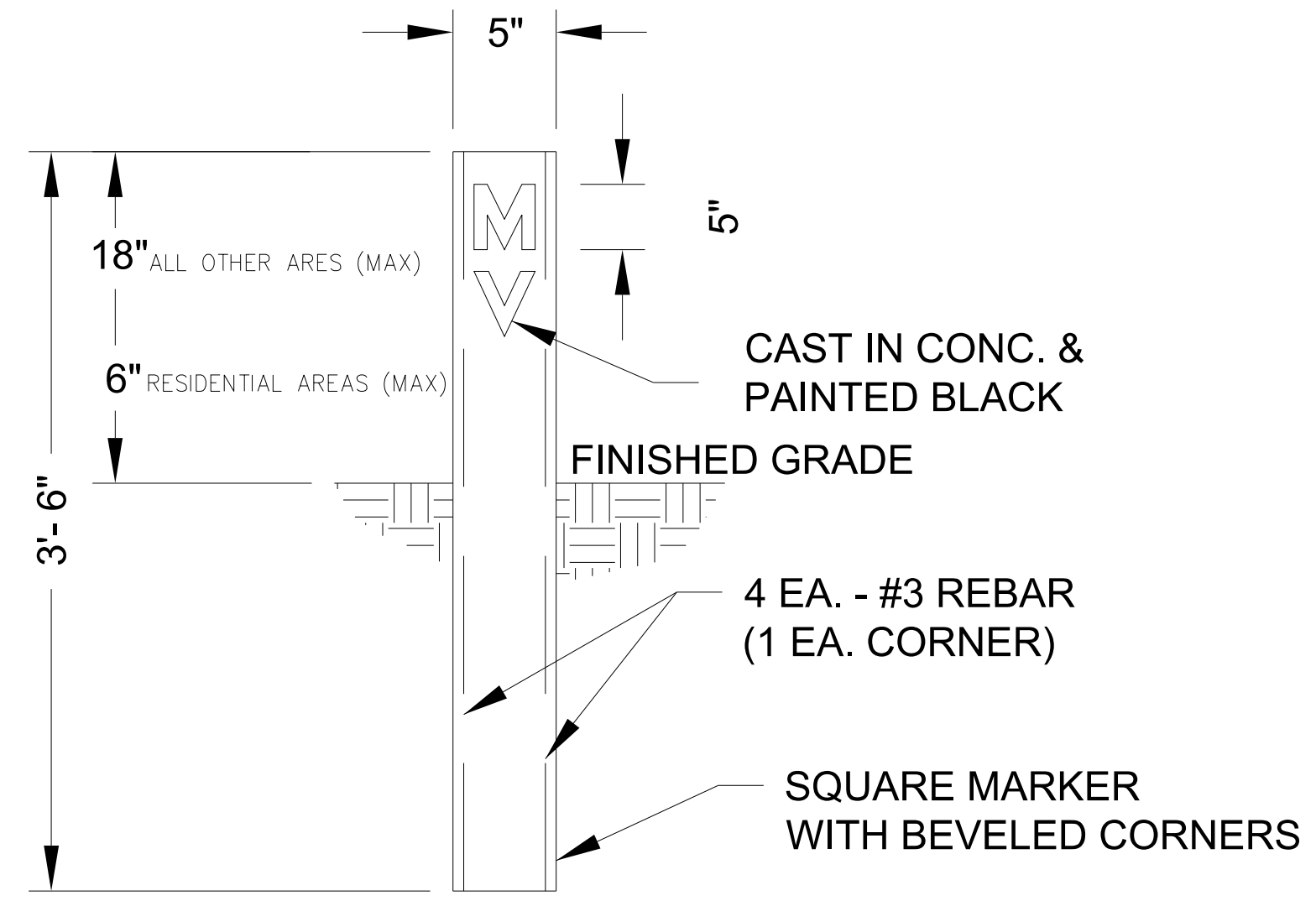
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BR-0026	UC-3D
DESIGNED BY: MRD	
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### UTILITY CONSTRUCTION

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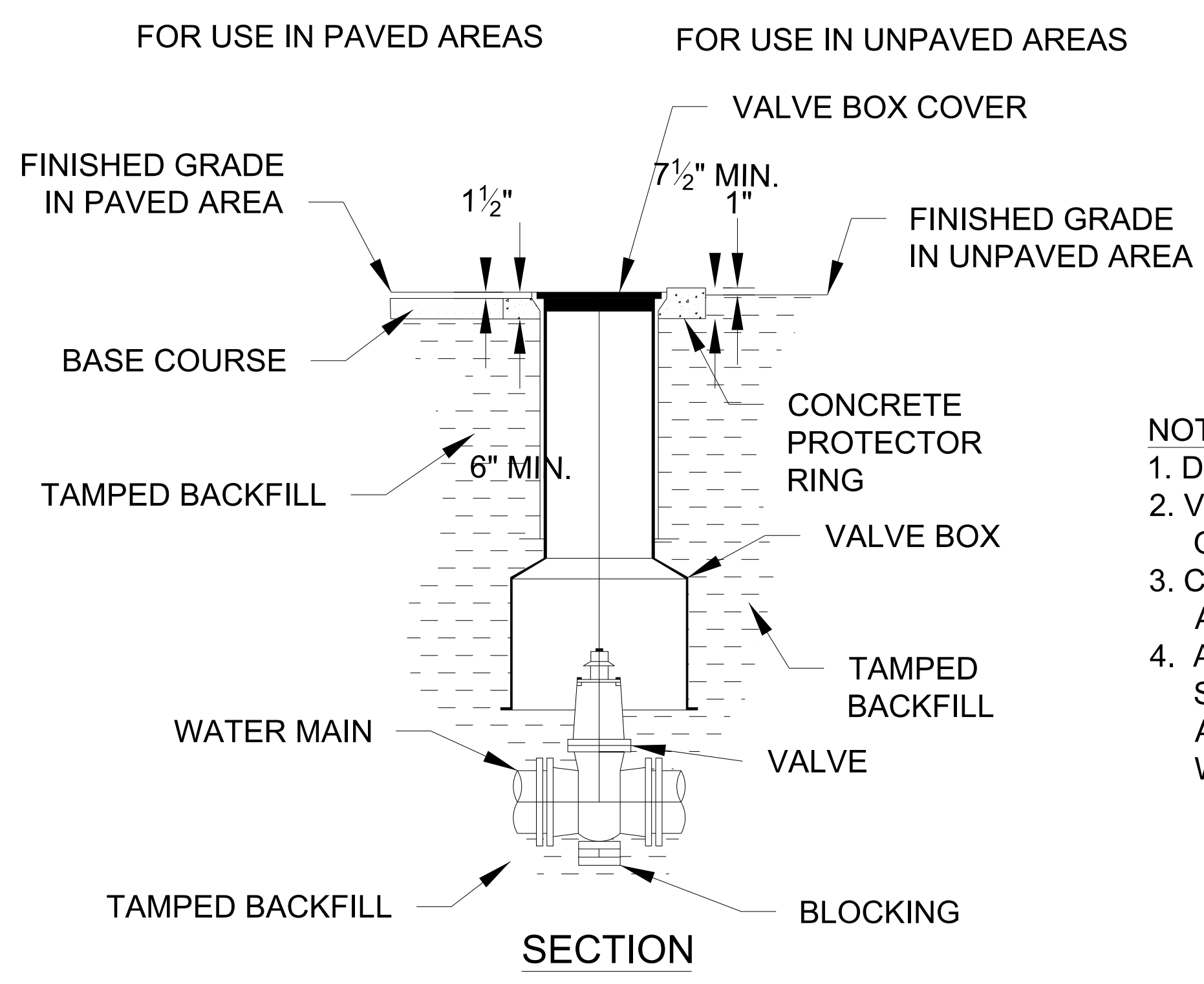
#### NOTES:

1. VALVE MARKERS SHALL BE PLACED AT R/W.
2. LETTERS "MV" SHALL FACE TOWARDS VALVE.
3. MARKER SHALL HAVE BRASS OR BRONZE EMBED ON TOP OR SIDE.
4. CONTRACTOR SHALL STAMP DISTANCE TO CENTER OF VALVE INTO EMBED.
5. BLOW-OFF ASSEMBLY SHALL INCLUDE 1 EA. MARKER W/ "BO" OR "MV" CAST.



## VALVE MARKER DETAIL

NOT TO SCALE

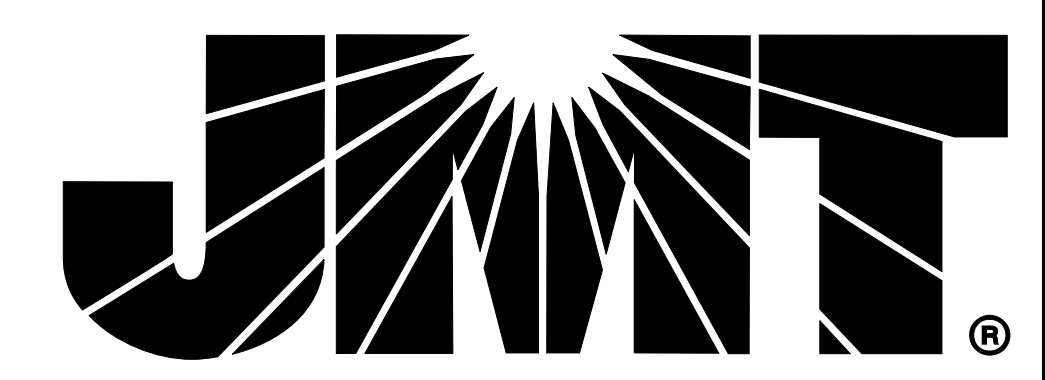


#### NOTES:

1. D.I.P. MAY BE USED FOR VALVE BOX EXTENSIONS.
2. VALVE BOX SHOULD NOT CONTACT WATER MAIN OR VALVE.
3. CONCRETE PROTECTOR RING SHALL BE USED IN ALL UNPAVED AREAS.
4. ALL MATERIALS USED IN THE POTABLE WATER SYSTEM MUST BE NSF61 AND NSF372 CERTIFIED AND MEET THE LATEST FEDERAL SAFE DRINKING WATER ACT REQUIREMENTS.

## VALVE AND VALVE BOX INSTALLATION

NOT TO SCALE

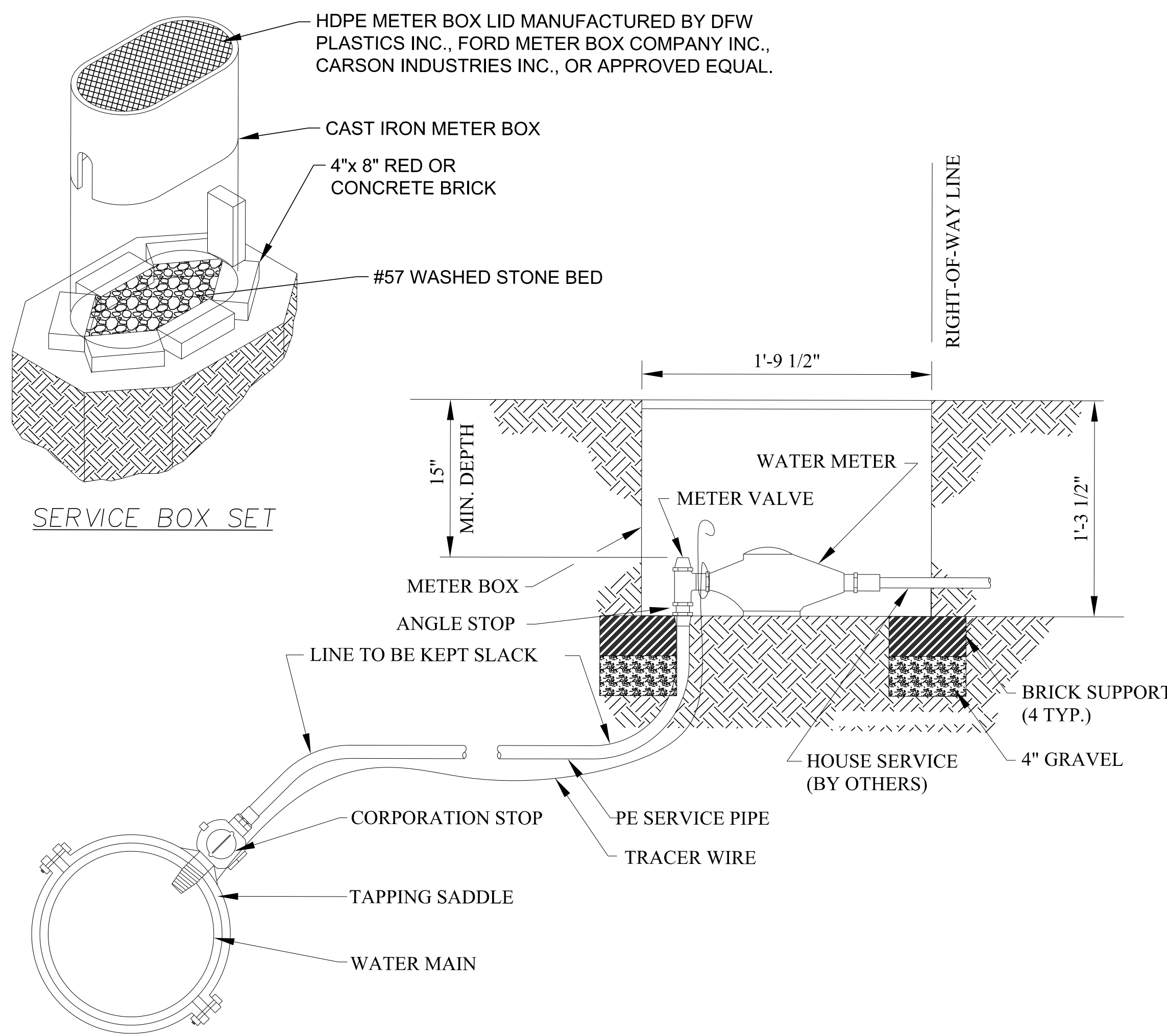


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PROJECT REFERENCE NO.	SHEET NO.
BR-0026	UC-3E
DESIGNED BY: MRD	
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**UTILITY CONSTRUCTION**

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- NOTES:**
- METER BOX SHALL BE A STANDARD MBX-1 BOX AND LID SHALL BE A POLYMER LID THAT IS RADIO FREQUENCY TRANSPARENT AND COMPATIBLE WITH AMR & AMI CONNECTIONS. METER BOX FOR 2" METERS AND LARGER SHALL BE A MBX-5 BOX.
  - TRACER WIRE SHALL BE INSTALLED ON ALL WATER SERVICES EXTENDING CONTINUOUS FROM THE MAIN INTO THE METER BOX. THE WIRE SHALL BE 12 GA. HDPE COATED, SOLID CORE COPPER. 18"-24" OF BLUE TRACER WIRE SHALL BE COILED UP IN THE METER BOX

**Horizontal & Vertical Up Bends**

Pipe Size (inch)	Bend Angle	Pipeline Restraint Req. Each Side of Fitting (feet)
6"	11.25	5
	22.5	10
	45	19
	90	46
8"	11.25	6
	22.5	12
	45	25
10"	11.25	8
	22.5	15
	45	30
12"	11.25	9
	22.5	17
	45	36
16"	11.25	11
	22.5	22
	45	46
	90	110

**PIPE RESTRAINT CHARTS**

**Vertical Down Bends**

Pipe Size (inch)	Bend Angle	Pipeline Restraint Req. Each Side of Fitting (feet)
6"	11.25	9
	22.5	18
	45	37
	90	74
8"	11.25	12
	22.5	24
	45	49
10"	11.25	14
	22.5	29
	45	59
	90	118
12"	11.25	17
	22.5	34
	45	70
	90	140
16"	11.25	38
	22.5	76
	45	158
	90	237

**Tees, Reducers, Caps**

Pipe Size (inch)	Bend Angle	Pipeline Restraint Req. Each Side of Fitting (feet)
Tee	4	38
	6	59
	8	82
	10	101
	12	123
Reducer	16	164
	6x4	37
	8x6	40
	10x4	93
	10x6	70
	10x8	39
	12x4	118
	12x6	99
Cap	12x10	40
	16x8	130
	16x10	105
	16x12	94
	4	51
Cap	6	72
	8	95
	10	115
	12	136
	16	177

**TYPICAL WATER SERVICE CONNECTION TO EXISTING METER**  
NOT TO SCALE

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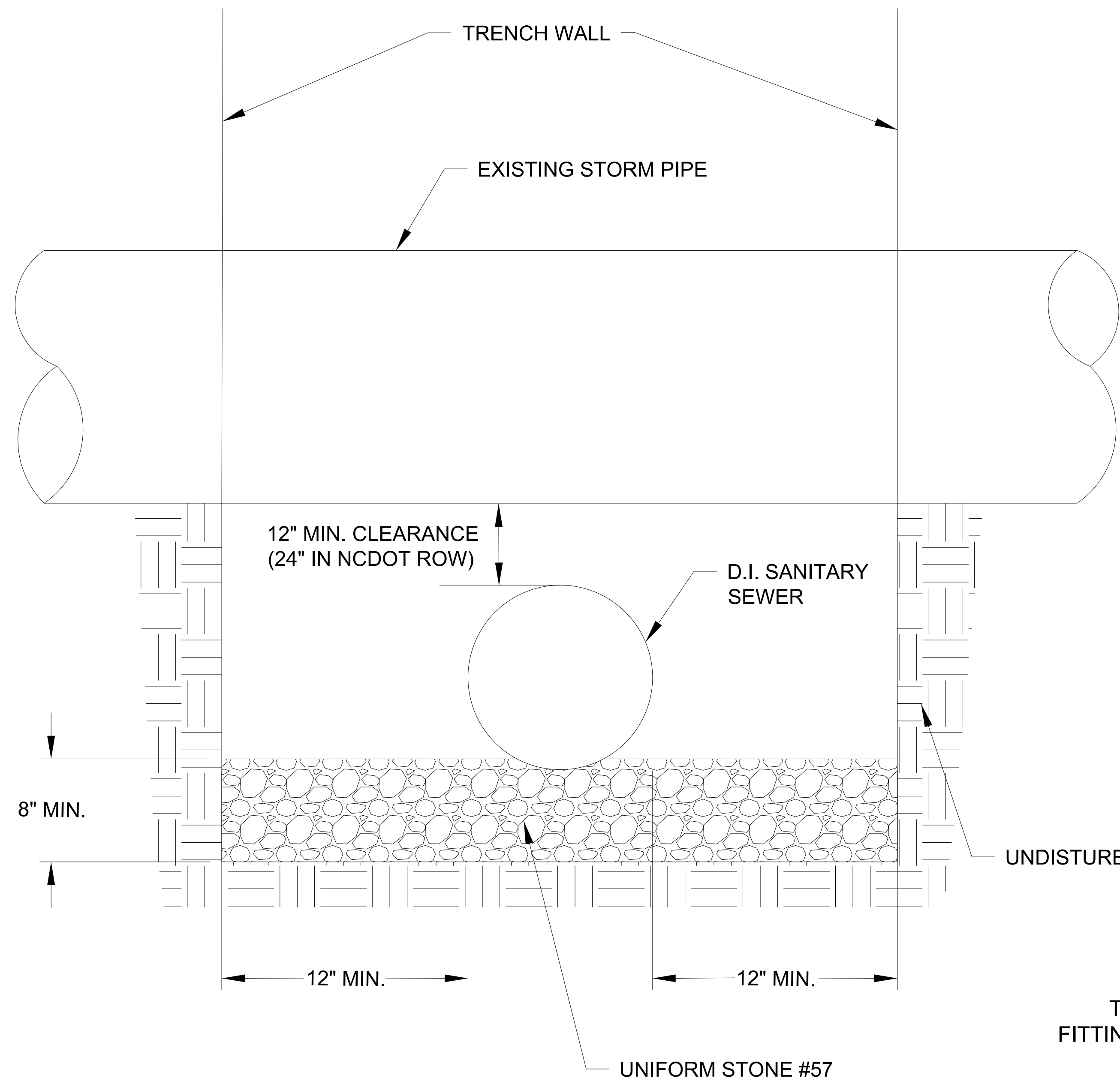
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11/20/23  
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**STRUCTURE 500050**  
**JOHNSTON COUNTY**

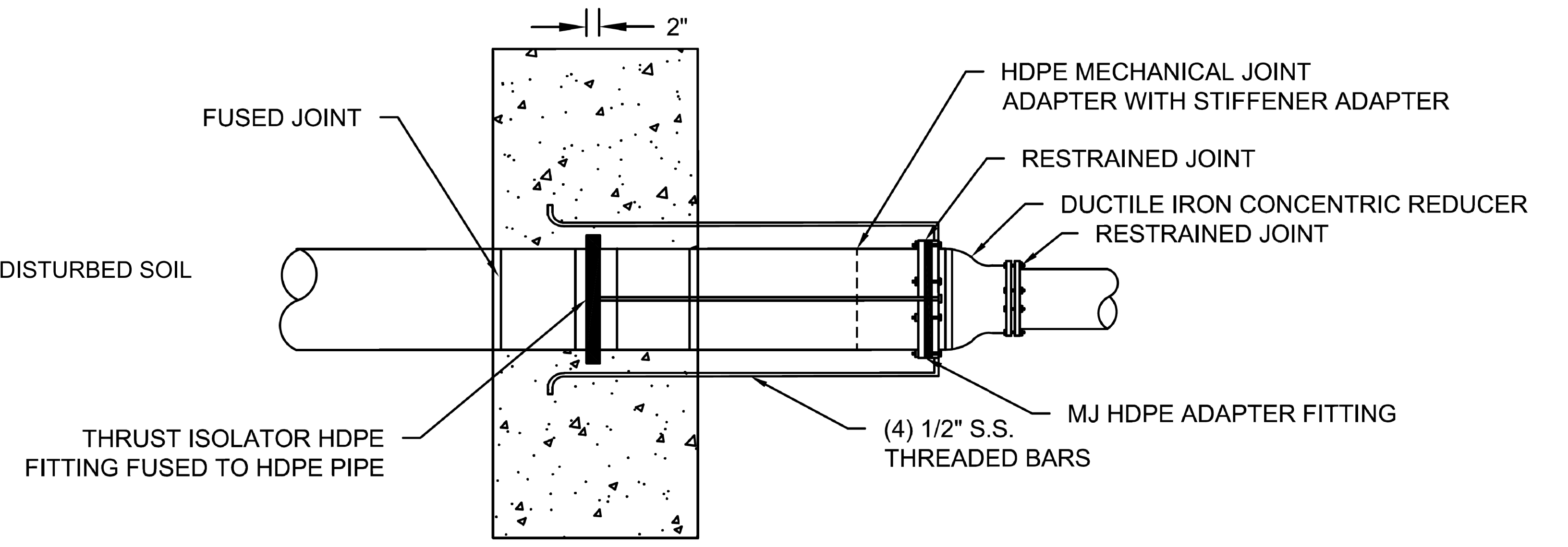
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NOTE:  
DUCTILE IRON SHALL  
EXTEND FOR 10" ON EITHER  
SIDE OF THE STORM PIPE.

## STORM SEWER CROSSING DETAILS

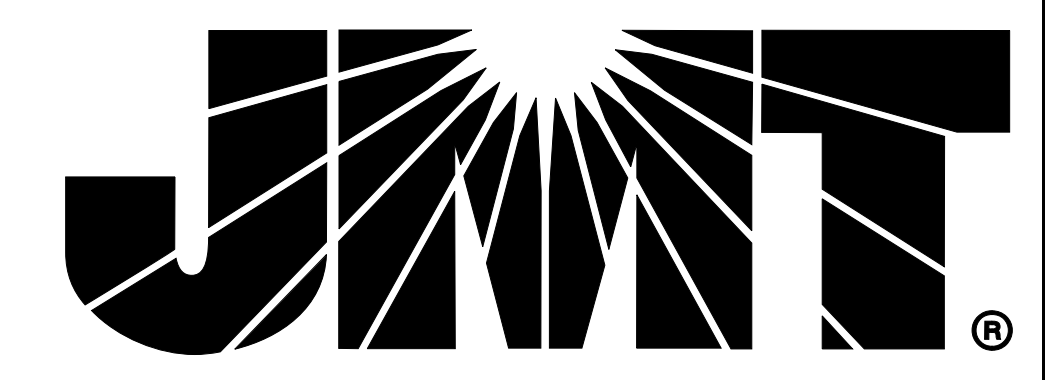
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NOTE:  
SEE SEPARATE DETAIL FOR CONCRETE ANCHOR BLOCK

## HDPE PIPE CONNECTION

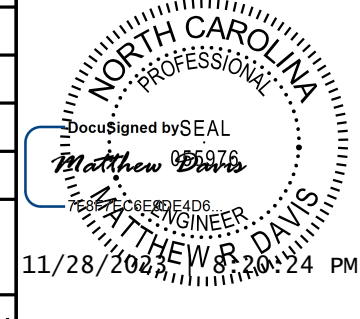
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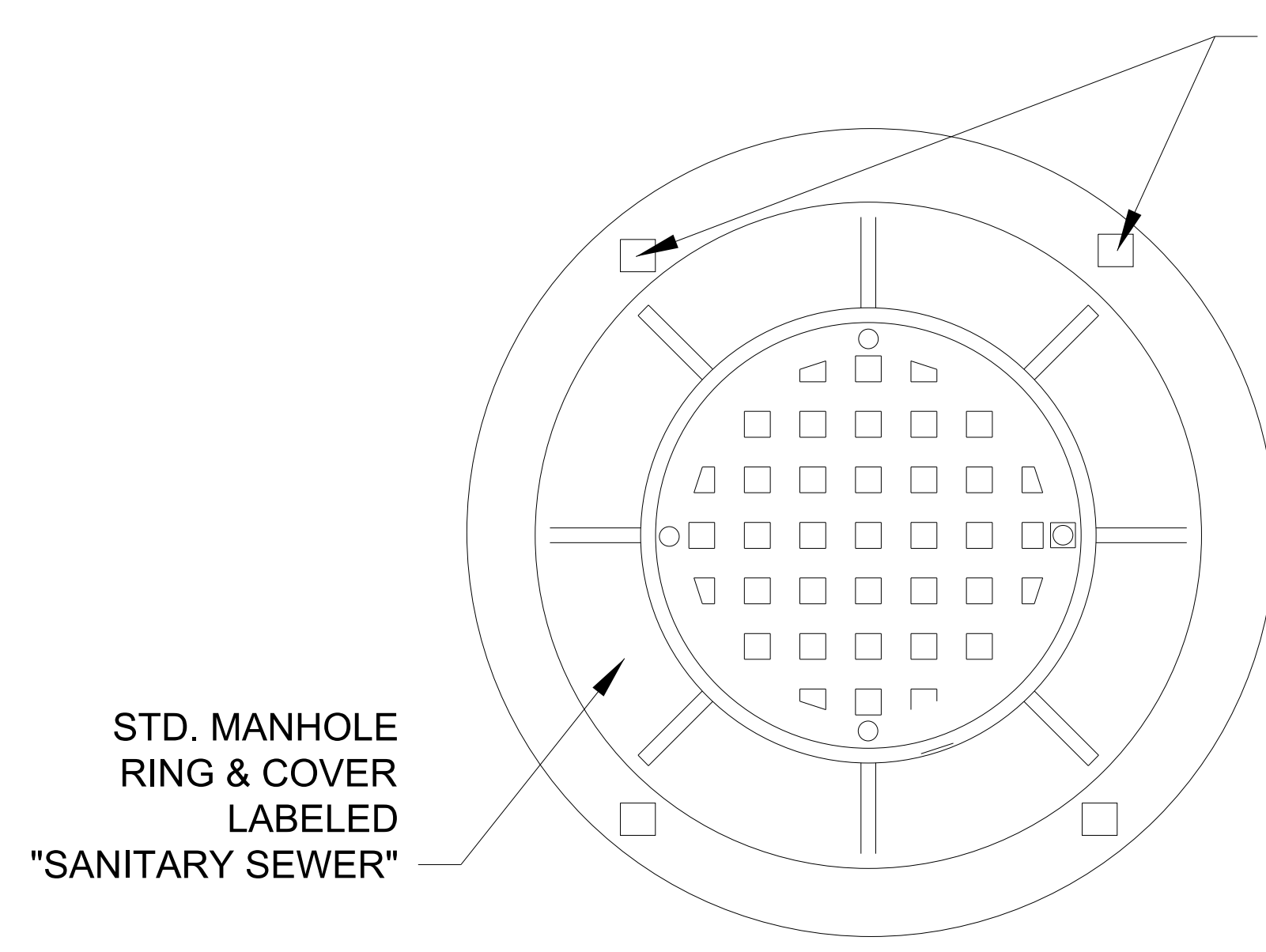


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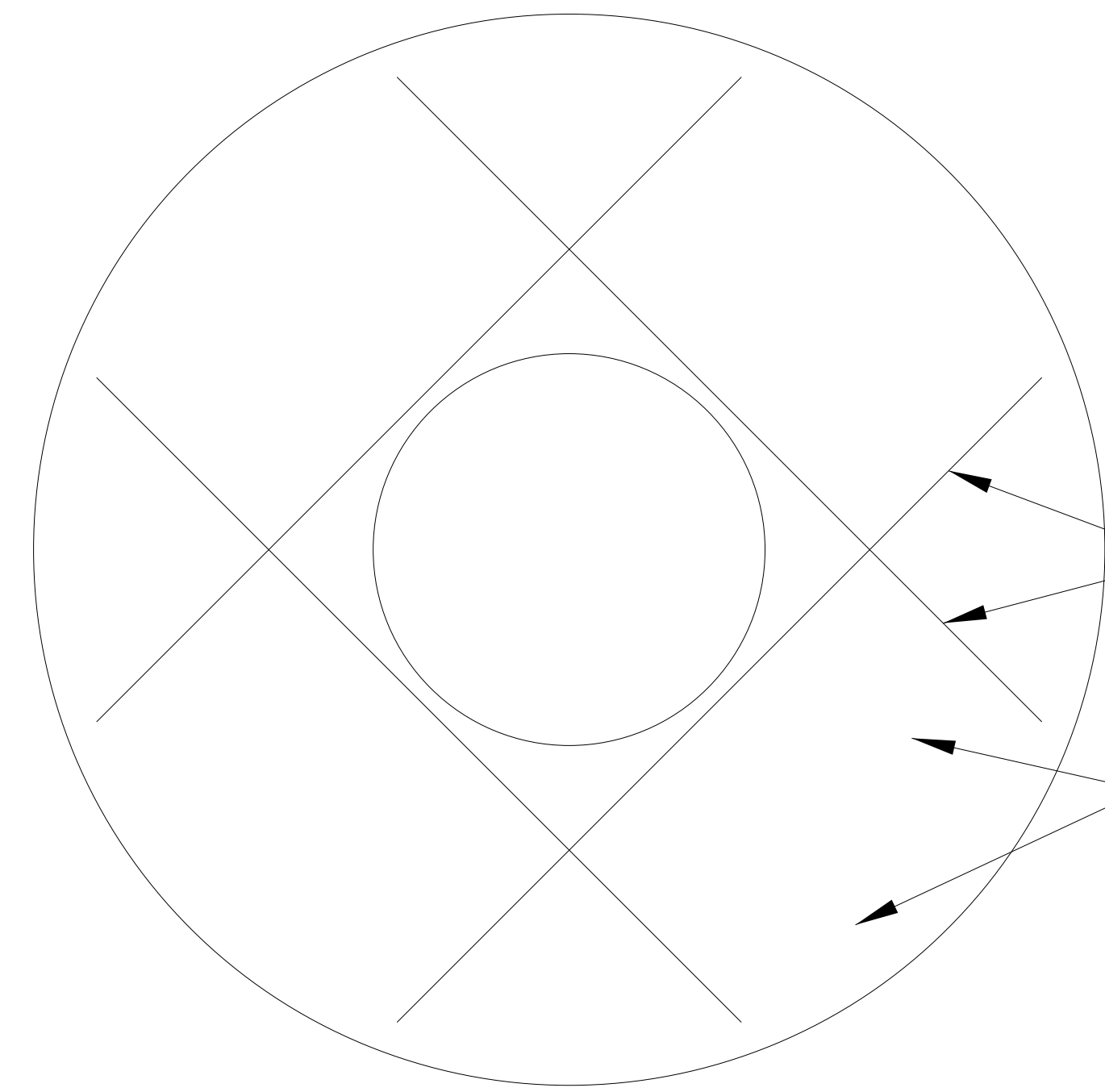
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USE MIN. 4 EA. 1/2" S.S. EXPANSION ANCHOR BOLTS TO SECURE FRAME TO MANHOLE IN NON-TRAFFIC AREAS OR RAISED MANHOLES

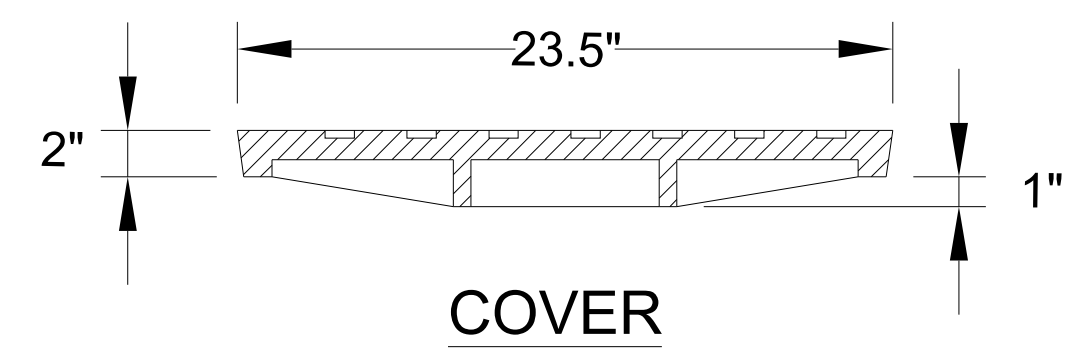
**FRAME & COVER**



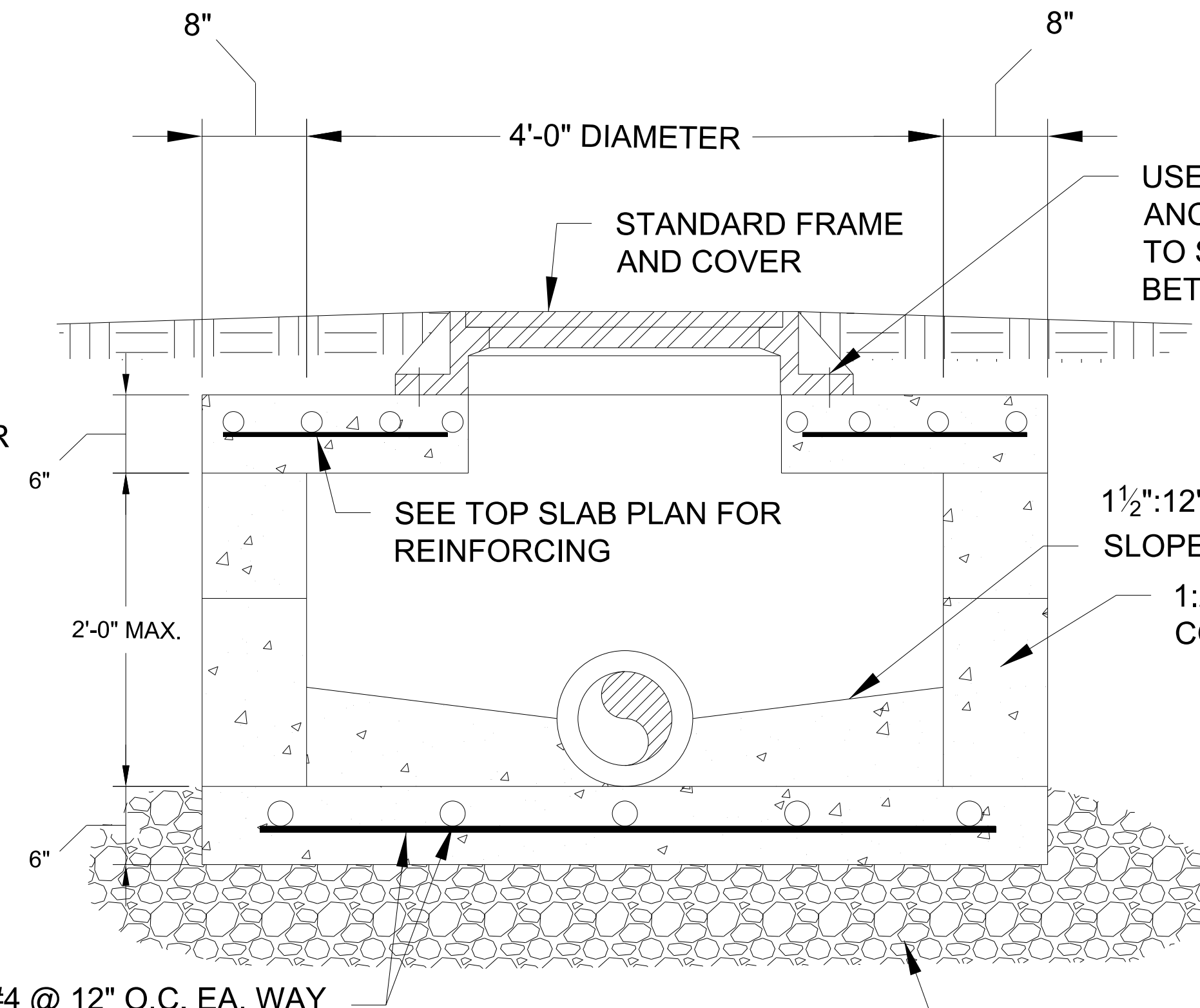
4 EA. #4 BARS  
STAGGER @ 16" O.C.

#4 @ 6" O.C. EA. WAY  
(TOP & BOTTOM FOR  
TRAFFIC LOAD CONDITIONS)

**PLAN - TOP SLAB**



**COVER**



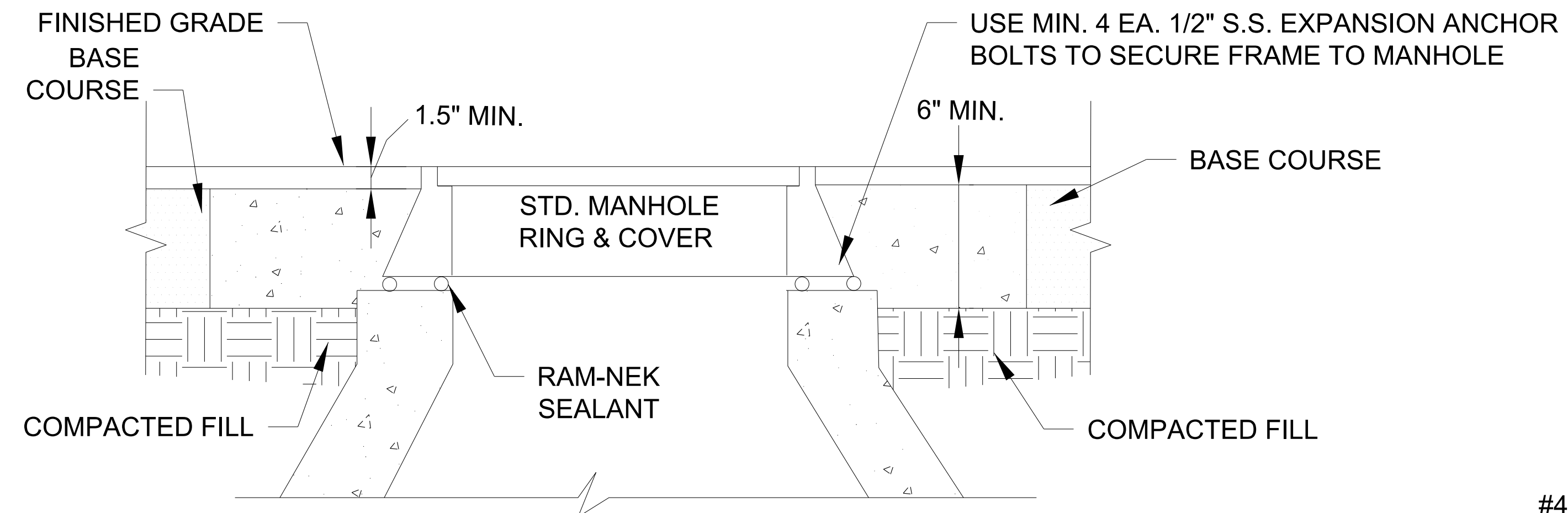
USE 4 EA. 1/2" S.S. EXPANSION ANCHOR BOLTS TO BOLT FRAME TO SPACER. USE ROPE MASTIC SEAL BETWEEN FRAME AND SPACER.

1 1/2":12" SLOPE  
1:2:4 CONCRETE

#4 @ 12" O.C. EA. WAY

MIN. 6" GRAVEL BEDDING

**SECTION**



USE MIN. 4 EA. 1/2" S.S. EXPANSION ANCHOR BOLTS TO SECURE FRAME TO MANHOLE

**FRAME**

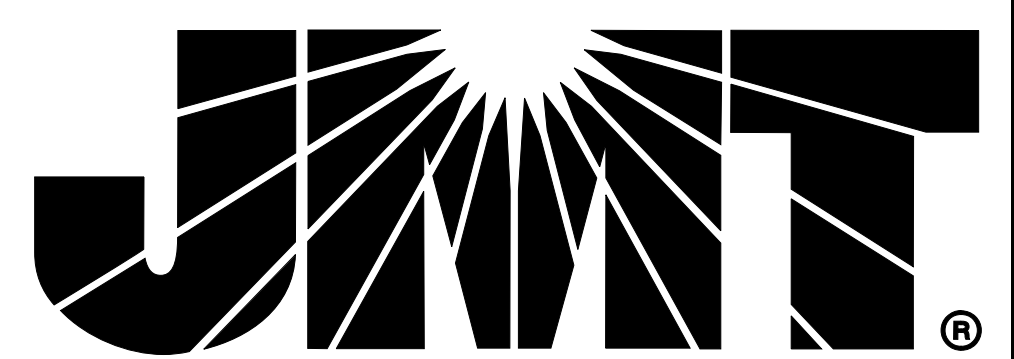
NOTE: CONCRETE ENCASEMENT SHALL ONLY BE USED IN AREAS WHERE COVER IS TO BE FLUSH WITH PAVEMENT OR CONCRETE. CONCRETE ENCASEMENT SHALL NOT BE USED IN NON-TRAFFIC AREAS AND ABOVE GRADE INSTALLATIONS. MANHOLES IN STREETS TO HAVE NO HOLE LIDS.

# STANDARD MANHOLE FRAME & COVER

NOT TO SCALE

# TYPICAL SHALLOW MANHOLE

NOT TO SCALE

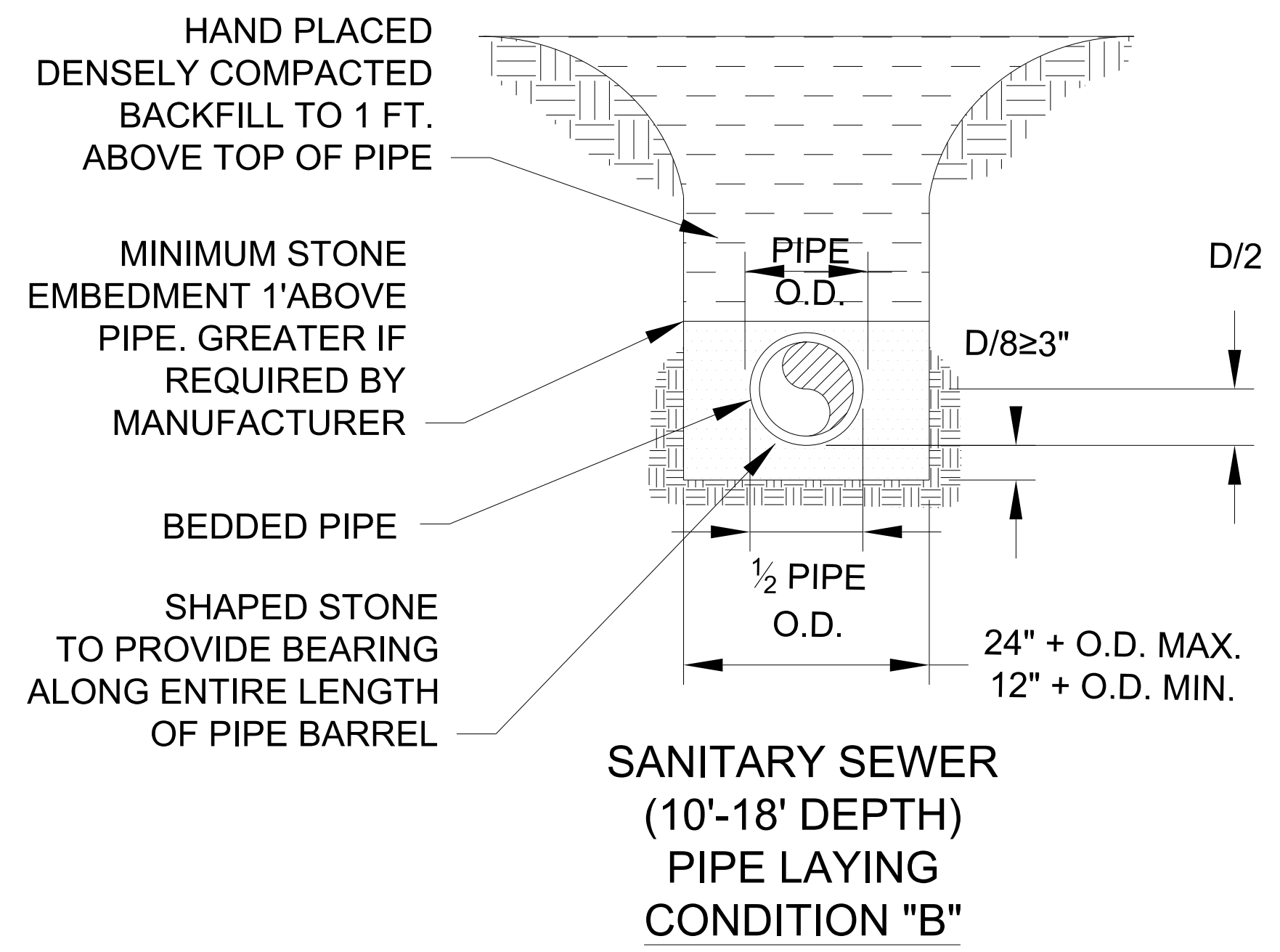
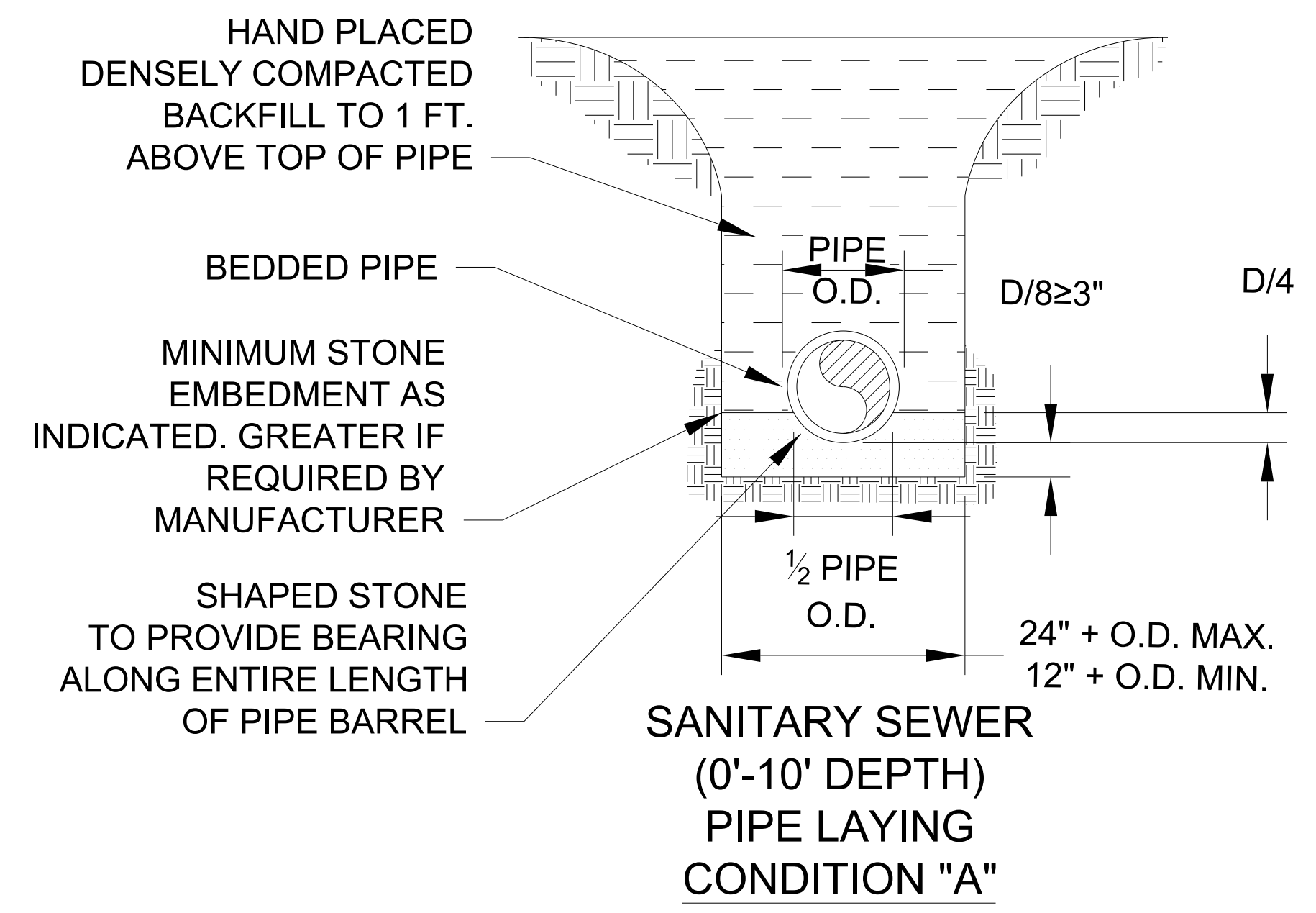


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STRUCTURE 500050  
JOHNSTON COUNTY

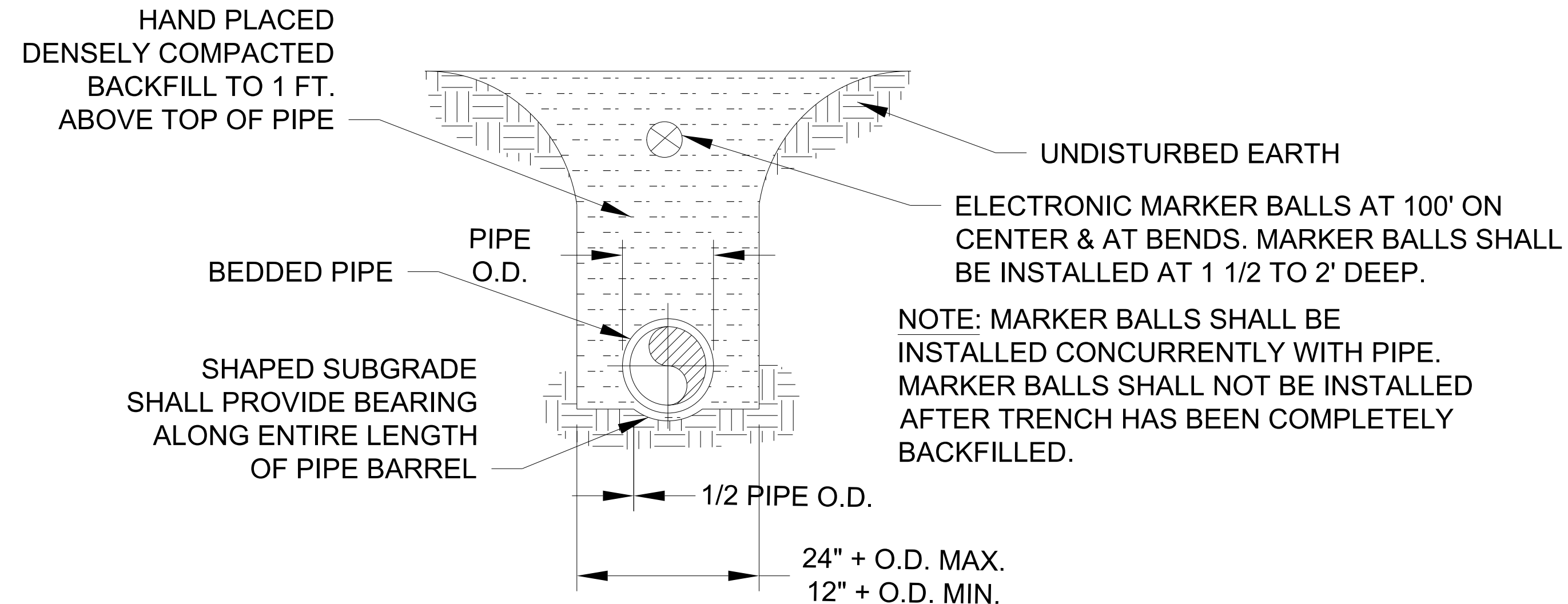
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**NOTE:**  
**C-900 MUST BE USED FOR DEPTHS OF 14 - 18 FEET OR DUCTILE IRON PIPE AT DEPTHS OF 18 FEET AND GREATER.**

## PIPE LAYING CONDITIONS

NOT TO SCALE



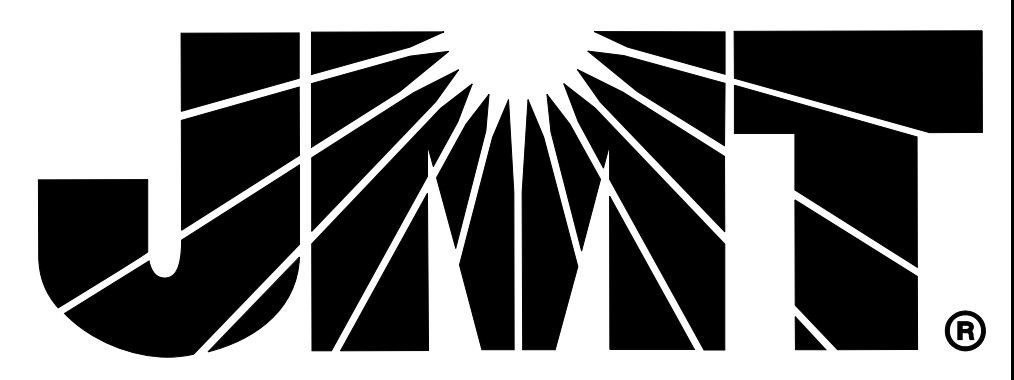
**NOTE:**  
 FORCE MAINS 8"Ø AND SMALLER SHALL HAVE MINIMUM OF 3' COVER. FORCE MAINS LARGER THAN 8"Ø SHALL HAVE A MINIMUM OF 3'-6" COVER.

**NOTE:**  
 PIPE SHALL BE BEDDED UP TO SPRING LINE AND MINIMUM 4" BELOW BOTTOM OF PIPE WHEN WET AREAS ARE ENCOUNTERED.

FORCE MAIN  
 PIPE LAYING  
 CONDITION "E"

## PIPE LAYING CONDITION

NOT TO SCALE

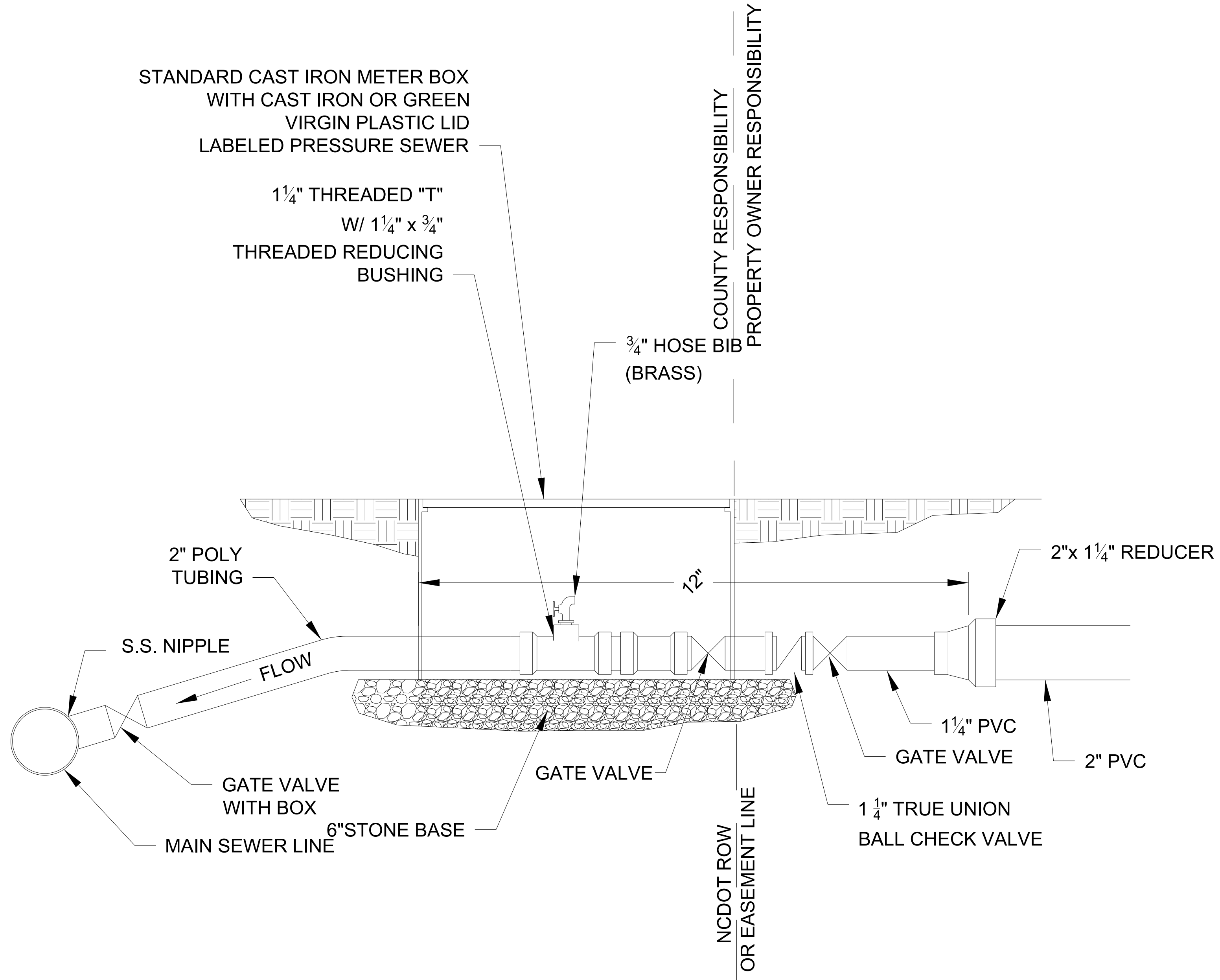


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**STRUCTURE 500050**  
**JOHNSTON COUNTY**

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- NOTES:
1. BALL CHECK VALVES MUST BE RATED FOR A MINIMUM OF 200 PSI. NO SPRING LOADED CHECK VALVES WILL BE USED.
  2. ANY FITTINGS TO BE STAINLESS STEEL.

# STANDARD PRESSURE SEWER CONNECTION

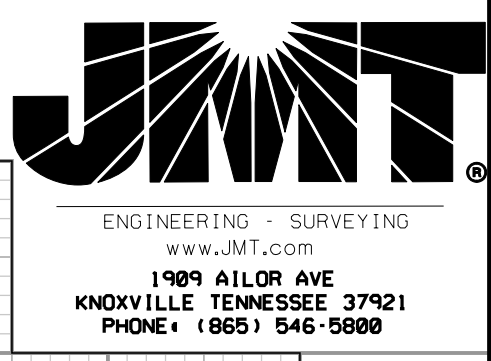
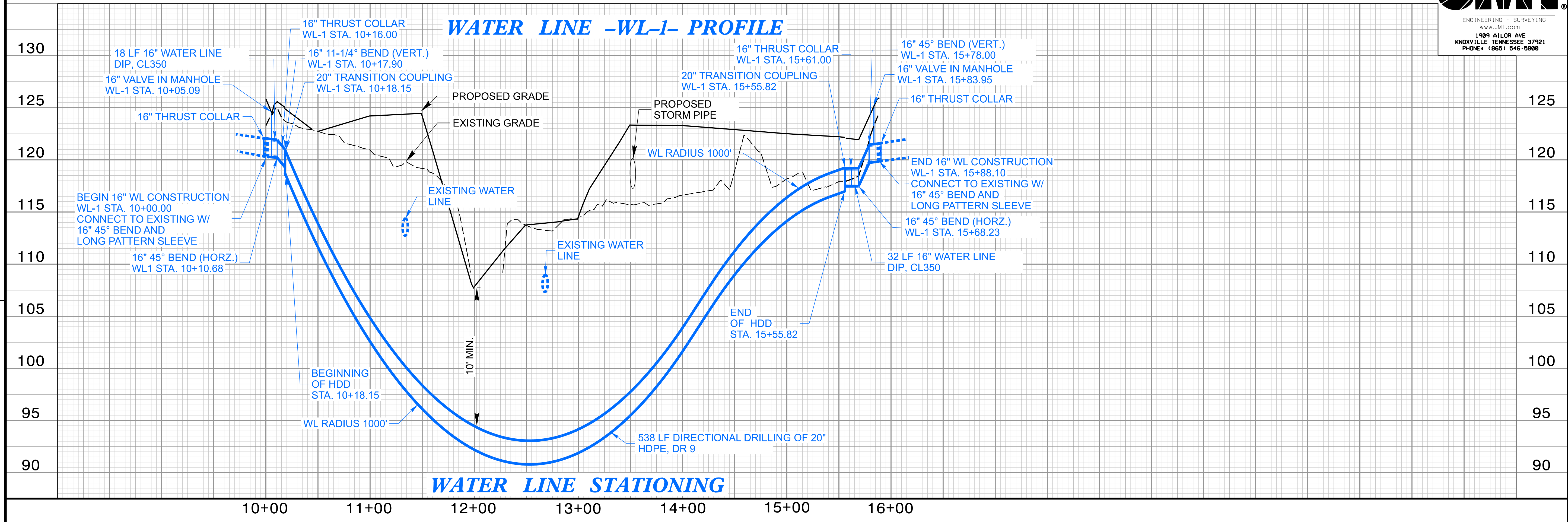
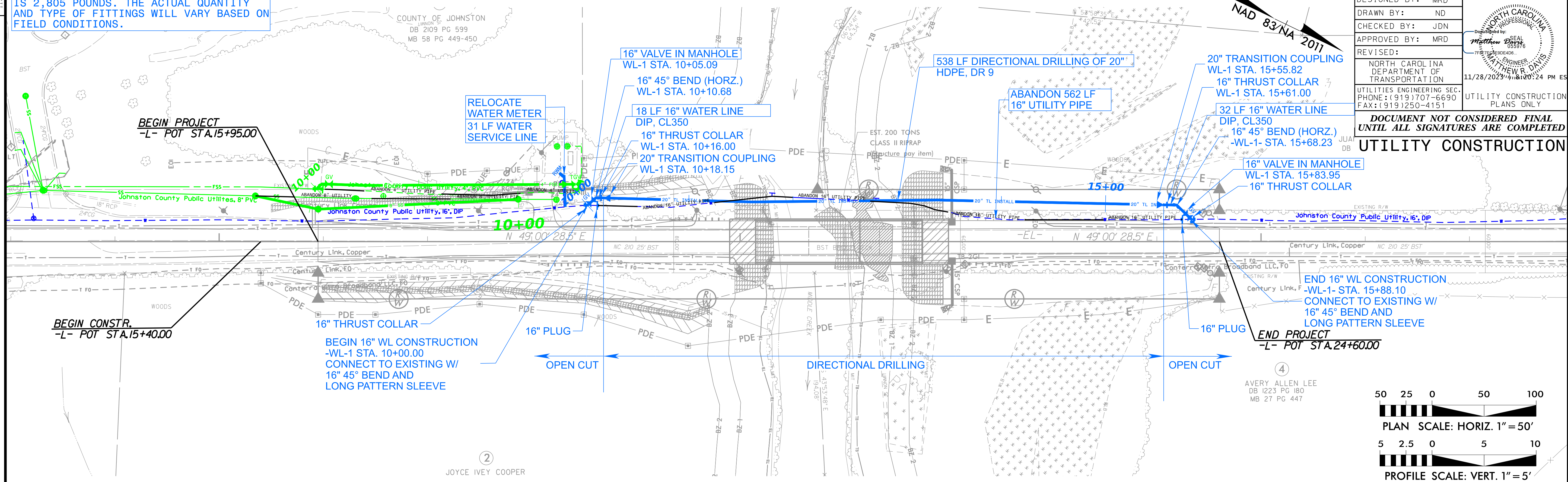
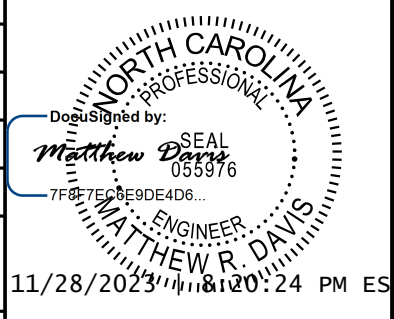
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THE ESTIMATED QUANTITY OF DUCTILE IRON WATER PIPE FITTINGS ON THIS PLAN SHEET IS 2,805 POUNDS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.

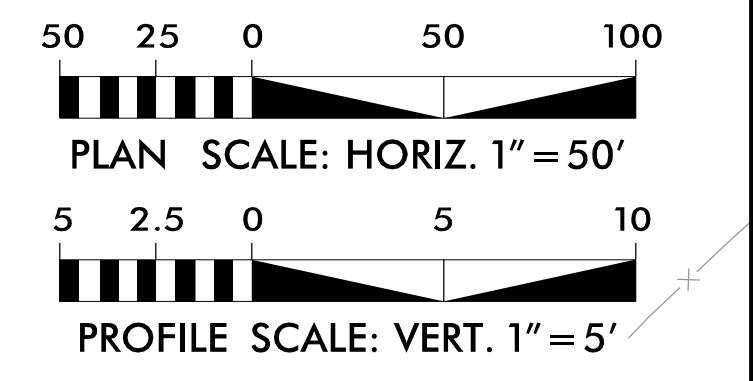
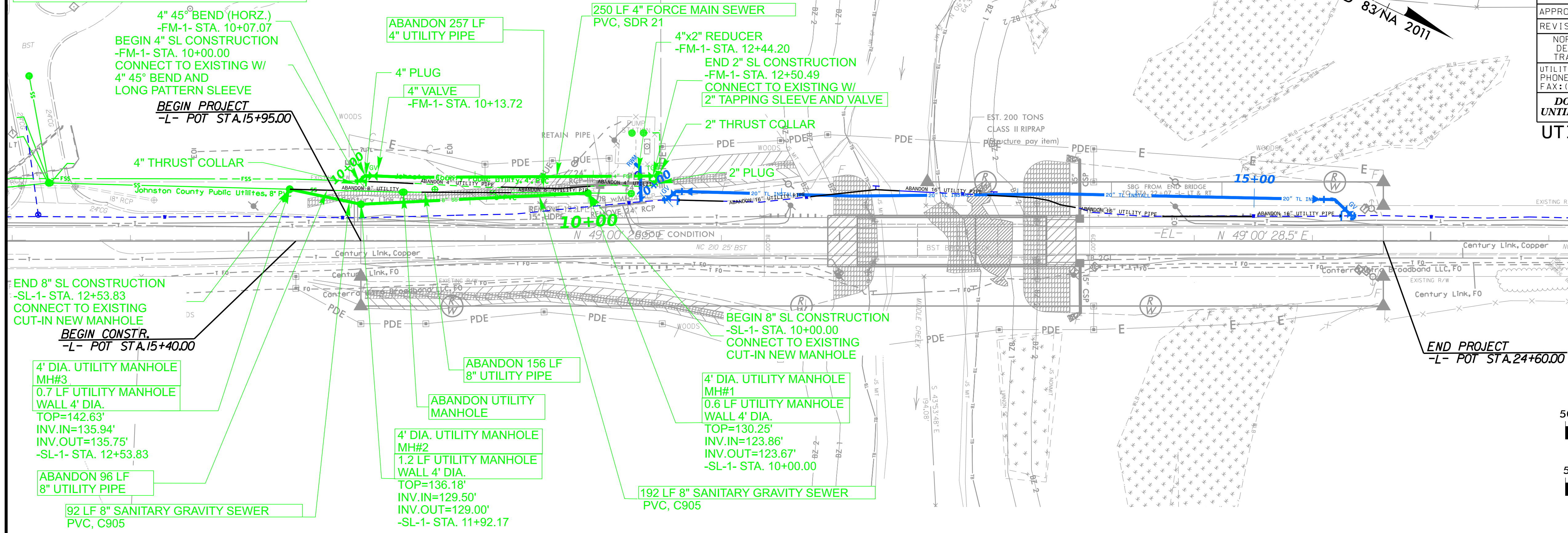
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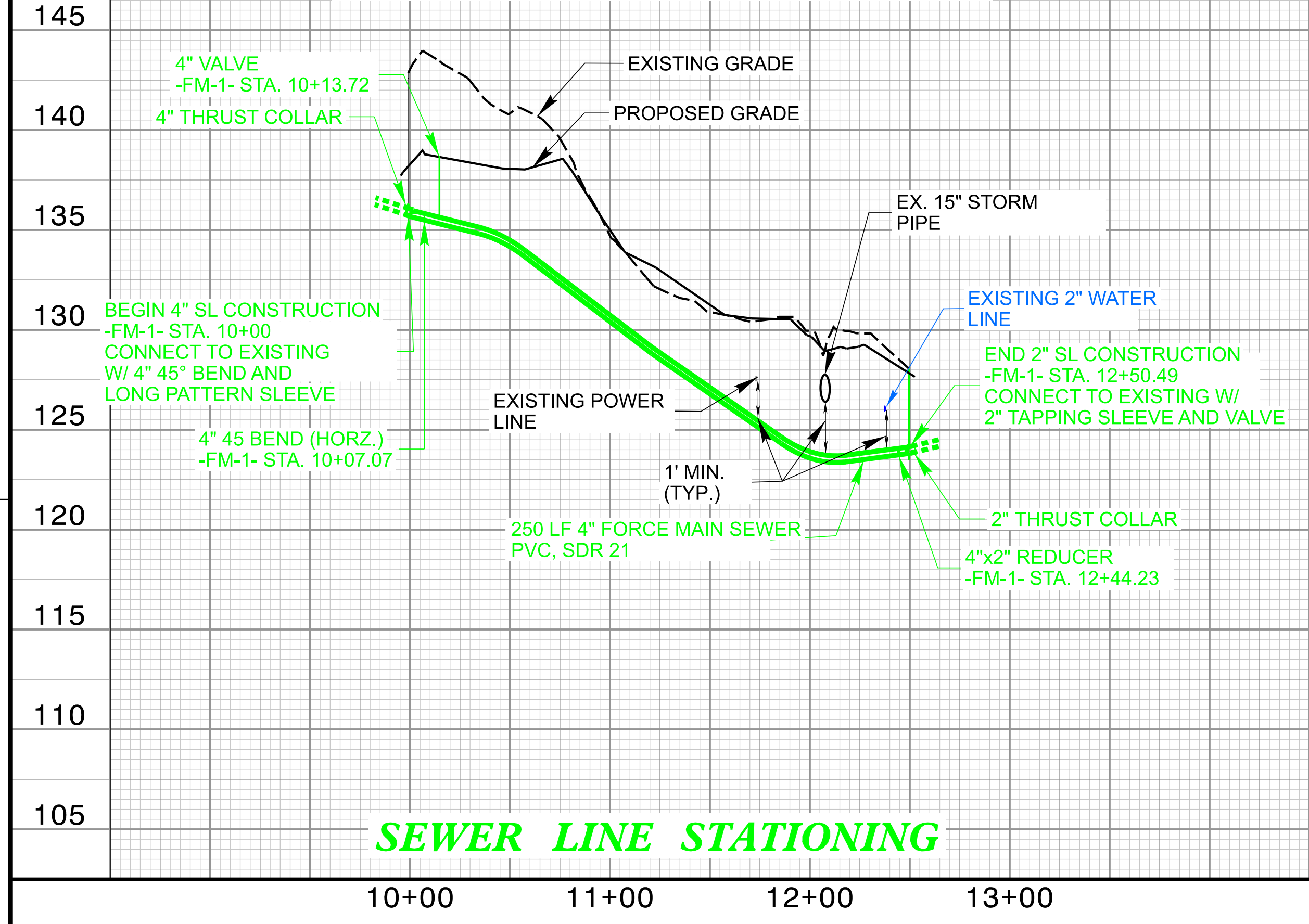
REVISIONS

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THE ESTIMATED QUANTITY OF DUCTILE IRON SEWER PIPE FITTINGS ON THIS PLAN SHEET IS 205 POUNDS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.



**SEWER LINE -FM-1- PROFILE**



**SEWER LINE -SL-1- PROFILE**

