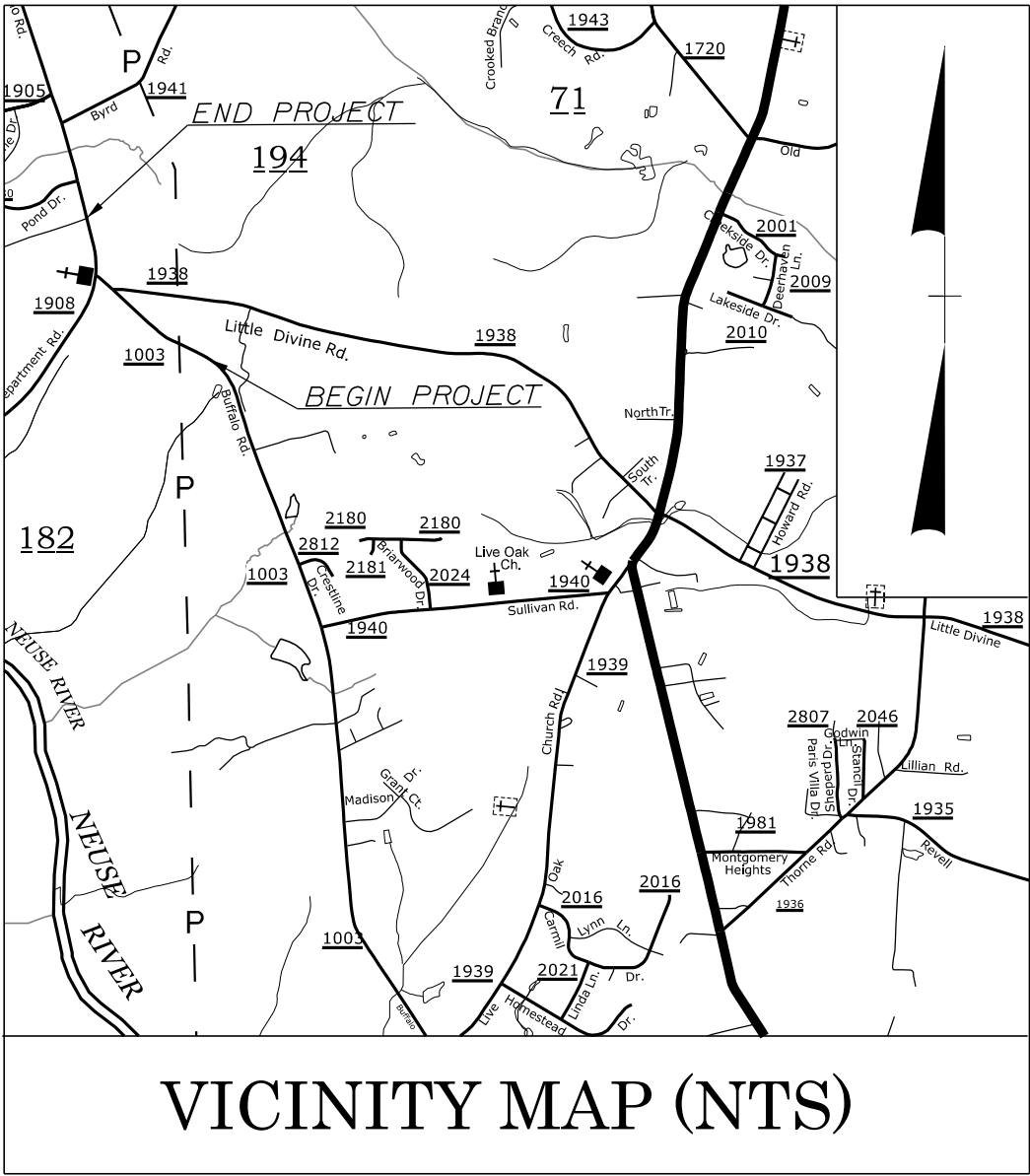


TIP PROJECT: HN-0040



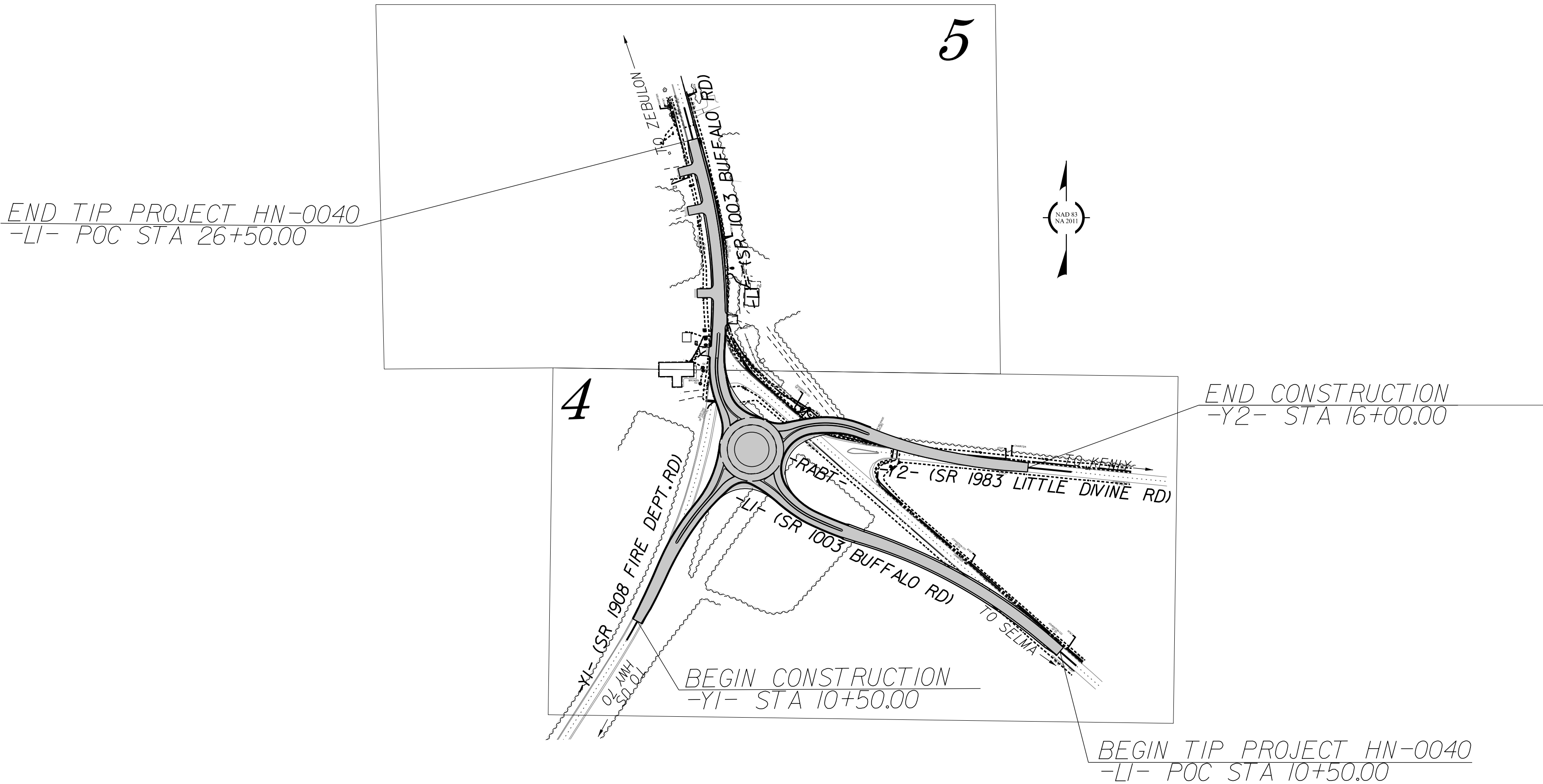
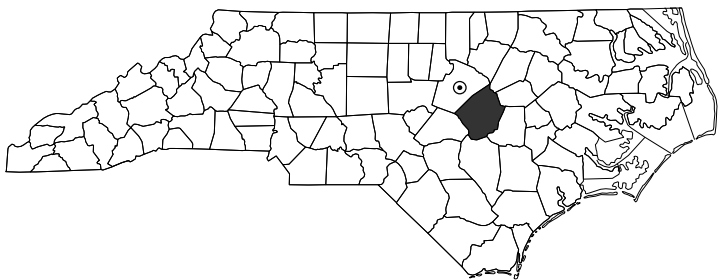
VICINITY MAP (NTS)

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

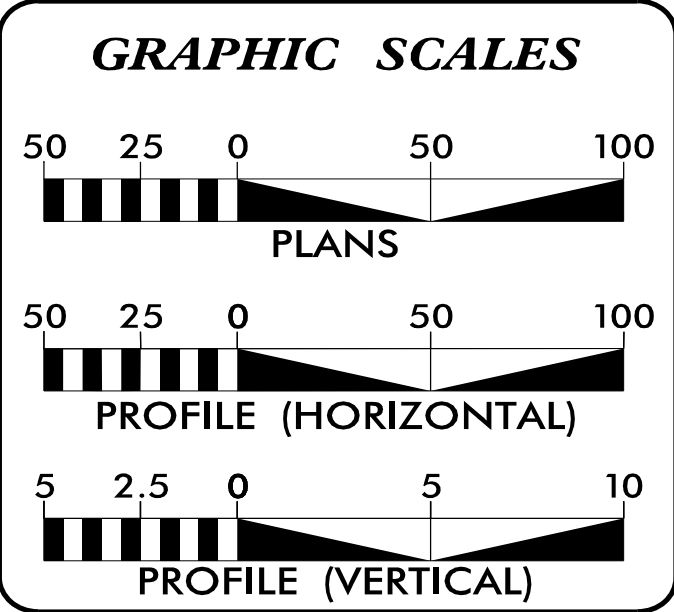
UTILITY CONSTRUCTION PLANS
JOHNSTON COUNTY

LOCATION: SR 1908 (FIRE DEPT. ROAD) AT BUFFALO ROAD INTERSECTION
NORTH OF WILSON'S MILLS. CONSTRUCT ROUNDABOUT

TYPE OF WORK: RELOCATION OF WATER LINES



DOCUMENT NOT CONSIDERED FINAL
UNTIL ALL SIGNATURES ARE COMPLETED

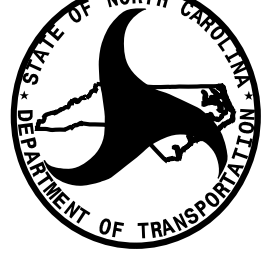


INDEX OF SHEETS	
SHEET NO.:	DESCRIPTION:
UC-1	TITLE SHEET
UC-2	UTILITY SYMBOLOGY
UC-3	NOTES
UC-3A THRU UC-3C	DETAILS
UC-4 THRU UC-5A	PLAN & PROFILE SHEETS

WATER OWNER ON PROJECT	
(A) WATER - JOHNSTON COUNTY PUBLIC WORKS	

PREPARED IN THE OFFICE OF	
	
JOHNSON, MIRMIRAN, & THOMPSON, INC. 3508 TRENT RD. UNIT A NEW BERN, NC 28562 (252) 631-5115	
MARIE PEEDIN, PE	UTILITY PROJECT ENGINEER
EMILY MORRIS, EIT	PROJECT UTILITY DESIGNER

SEAL


	
DIVISION OF HIGHWAYS UTILITIES UNIT 1555 MAIL SERVICES CENTER RALEIGH NC 27699-1555 PHONE (919) 707-6690 FAX (919) 250-4151	
Lonny Sleeper	DIVISION UTILITIES ENGINEER
Jimmy G. Sharpe	SENIOR DIVISION UTILITY COORDINATOR

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
HN-0040	UC-2

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	
Telephone Pole	
Joint Use Pole	
Utility Pole	
Utility Pole with Base	
H-Frame Pole	
Power Transmission Line Tower	
Water Manhole	
Power Manhole	
Telephone Manhole	
Sanitary Sewer Manhole	
Hand Hole for Cable	
Power Transformer	
Telephone Pedestal	
CATV Pedestal	
Gas Valve	
Gas Meter	
Located Miscellaneous Utility Object	
Abandoned According to Utility Records	AATUR
End of Information	E.O.I.

*Underground Power Line	
*Underground Telephone Cable	
*Underground Telephone Conduit	
*Underground Fiber Optics Telephone Cable	
*Underground TV Cable	
*Underground Fiber Optics TV Cable	
*Underground Gas Pipeline	
Aboveground Gas Pipeline	
*Underground Water Line	
Aboveground Water Line	
*Underground Gravity Sanitary Sewer Line	
Aboveground Gravity Sanitary Sewer Line	
*Underground SS Forced Main Line	
Underground Unknown Utility Line	
SUE Test Hole	
Water Meter	
Water Valve	
Fire Hydrant	
Sanitary Sewer Cleanout	

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

UTILITY CONSTRUCTION

GENERAL NOTES:

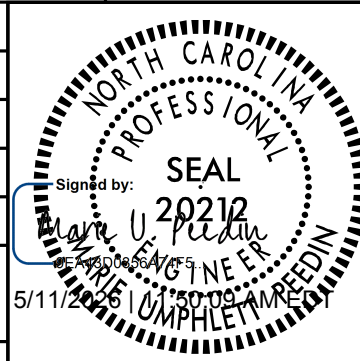
1. THE PROPOSED UTILITY CONSTRUCTION SHALL MEET THE APPLICABLE REQUIREMENTS OF THE NC DEPARTMENT OF TRANSPORTATION'S "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" DATED JANUARY 2024.
2. THE EXISTING UTILITIES BELONG TO JOHNSTON COUNTY PUBLIC WORKS. PLEASE CONTACT MS. CHANDRA COX FARMER, PE, DIRECTOR OF UTILITIES
309 E. MARKET STREET
SMITHFIELD, NC 27577
(919) 989-5075
publicutilities@johnstonnc.gov
3. ALL WATER LINES TO BE INSTALLED WITHIN COMPLIANCE OF THE RULES AND REGULATIONS OF THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL QUALITY, 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 QUALITY, 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:

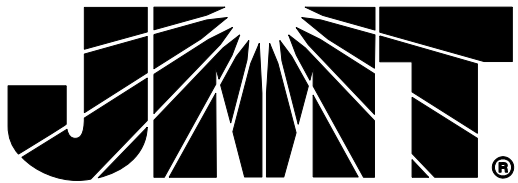
1. DEVIATION FROM THESE PLANS AND NOTES WITHOUT THE PRIOR CONSENT OF THE UTILITY OWNER OR THEIR REPRESENTATIVE OR THE ENGINEER MAY BE CAUSE FOR THE WORK TO BE UNACCEPTABLE.
2. THE LOCATION OF EXISTING UTILITIES SHOWN ON THE PLANS IS FOR THE USE OF THE CONTRACTOR IN PROVIDING PROTECTION FOR THE UTILITIES DURING CONSTRUCTION OPERATIONS. NCDOT, DESIGN CONSULTANT AND/OR AGENT SHALL NOT BE HELD RESPONSIBLE FOR THE ACCURACY OF LOCATION, SIZE, DEPTH, OR COMPLETENESS OF THE INFORMATION. THE CONTRACTOR SHALL VERIFY LOCATION AND DEPTH OF ALL UNDERGROUND UTILITIES PRIOR TO CONSTRUCTION.
3. TAKE NECESSARY PRECAUTIONS TO PREVENT DAMAGE TO POWER POLES DURING WATER LINE INSTALLATION.
DUKE ENERGY CONTACT: ANDREW BRANN
(336) 583-9152
4. CONTRACTOR SHALL COORDINATE ALL WORK WITH UTILITY OWNER AT LEAST 48 HOURS PRIOR TO THE START OF CONSTRUCTION, OR AS OTHERWISE SPECIFIED HEREIN.
5. ALL NCDEQ AND LOCAL TESTING MUST BE COMPLETED AND APPROVED PRIOR TO CONNECTING THE NEW CONSTRUCTION TO THE EXISTING WATER LINES.
6. IF HDPE PIPE IS INSTALLED BY DIRECTIONAL DRILL. IT SHALL BE FILLED WITH WATER AND NOT BE CONNECTED TO ANY OTHER PIPE OR FITTINGS FOR ONE WEEK FROM THE TIME OF INSTALLATION.

JOHNSTON COUNTY

PROJECT REFERENCE NO.		SHEET NO.
HN-0040		UC-3
DESIGNED BY:	ELM	
DRAWN BY:	ELM	
CHECKED BY:	MUP	
APPROVED BY:	MUP	
REVISED:		
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION		
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151		UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION

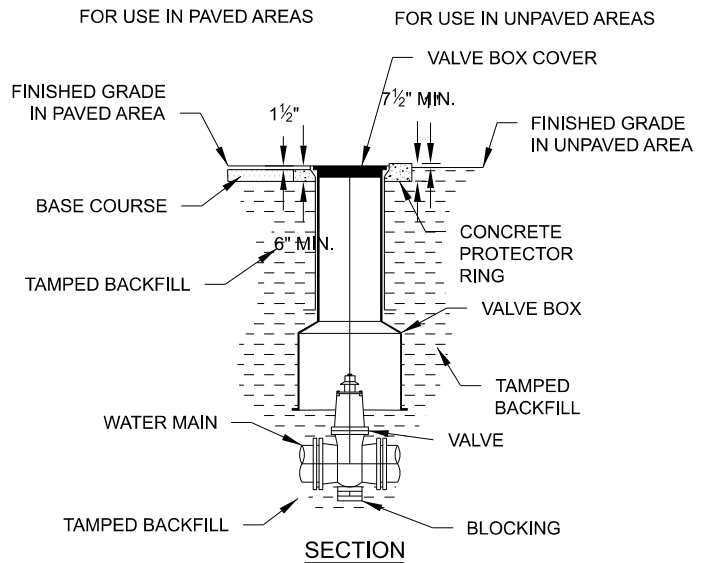
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UNLESS ALL SIGNATURES COMPLETED



PROJECT REFERENCE NO.		SHEET NO.
HN-0040		UC-3A
DESIGNED BY:	ELM	SEAL 20212 NORTH CAROLINA DEPARTMENT OF TRANSPORTATION 5/1/2025 11:42:58 AM J. P. ...
DRAWN BY:	ELM	
CHECKED BY:	MUP	
APPROVED BY:	MUP	
REVISED:		
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION		UTILITY CONSTRUCTION PLANS ONLY
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151		

UTILITY CONSTRUCTION

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UNLESS ALL SIGNATURES COMPLETED



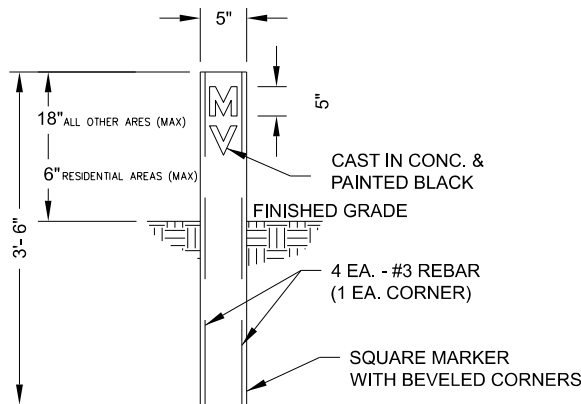
VALVE AND VALVE BOX INSTALLATION
NOT TO SCALE

Name		Date	JOHNSTON COUNTY Department of Public Utilities P.O. Box 2263 Smithfield, NC 27577	WATER STANDARD DETAIL Valve and Valve Box Installation	PAGE 13
Drawn By:					
Checked By:					
Approved By:					
Scale:					
Rev.	Description	Date	Init.		

WATER
STANDARD DETAIL
Valve and Valve
Box Installation

PAGE
13

- NOTES:
1. VALVE MARKERS SHALL BE PLACED AT RW.
 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/ "60" OR "MV" CAST.

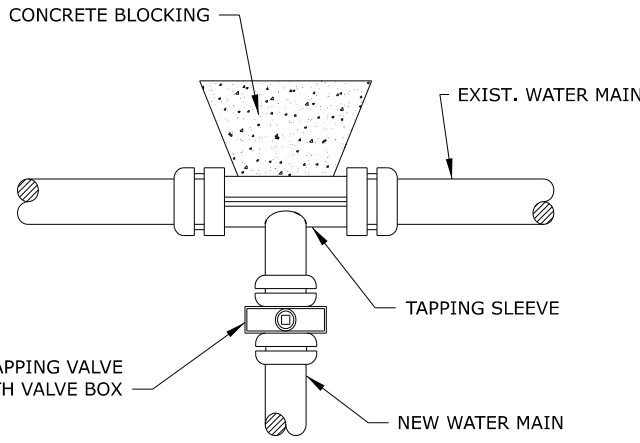


VALVE MARKER DETAIL
NOT TO SCALE

	Name	Date	JOHNSTON COUNTY Department of Public Utilities P.O. Box 2263 Smithfield, NC 27577	WATER STANDARD DETAIL Valve Marker	PAGE
Drawn By:					15
Checked By:					
Approved By:					
Scale:					
Rev.	Description	Date	Init.		

WATER
STANDARD DETAIL
Valve Marker

PAGE
15



TAPPING SLEEVE & VALVE ASSEMBLY
NOT TO SCALE

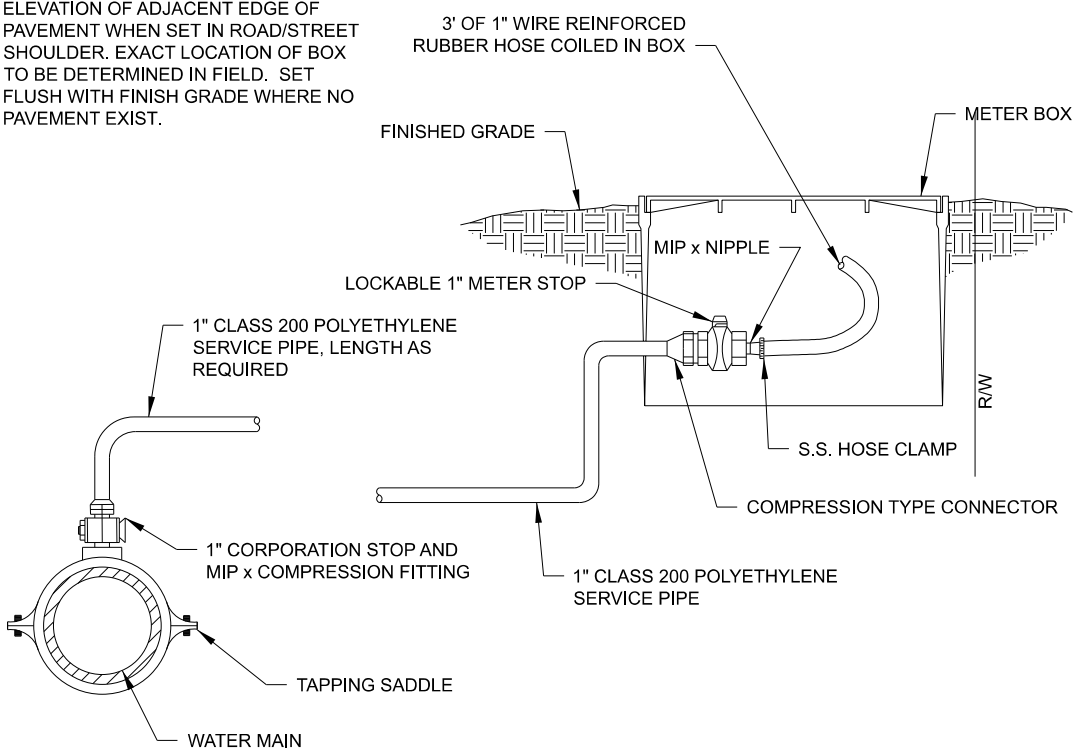
- NOTES:
1. TAPPING SLEEVE SHALL BE FABRICATED OF TYPE 304 OR 316 S.S. AND PROVIDE A 360° SEAL AROUND EXISTING PIPE WITH FULL CIRCUMFERENTIAL GASKET.
 2. TAPPING SLEEVE SHALL BE JCM 432, MUELLER H-304, FORD FTSS, ROMAC ST III OR APPROVED EQUAL.
 3. ALL MATERIALS USED IN THE POTABLE WATER SYSTEM MUST BE NSF61 AND NSF372 CERTIFIED AND MEET THE LATEST FEDERAL SAFE DRINKING WATER ACT REQUIREMENTS.

Name		Date	JOHNSTON COUNTY Department of Public Utilities P.O. Box 2263 Smithfield, NC 27577	WATER STANDARD DETAIL Tapping Sleeve and Valve Assembly	PAGE 5
Drawn By:					
Checked By:					
Approved By:					
Scale:					
Rev.	Description	Date	Init.		

WATER
STANDARD DETAIL
Tapping Sleeve and
Valve Assembly

PAGE
5

- NOTES:
1. TAP ON THE MAIN SHALL BE MADE IN THE POSITION SHOWN.
 2. LOCATE METER BOX AS SHOWN ON PLAN OR AS DIRECTED IN THE FIELD.
 3. PIPE FROM MAIN TO METER STOP TO BE LEVEL OR CONTINUOUS UP GRADE.
 4. TOP OF BOX TO BE AT LEAST 10" BELOW ELEVATION OF ADJACENT EDGE OF PAVEMENT WHEN SET IN ROAD/STREET SHOULDER. EXACT LOCATION OF BOX TO BE DETERMINED IN FIELD. SET FLUSH WITH FINISH GRADE WHERE NO PAVEMENT EXIST.



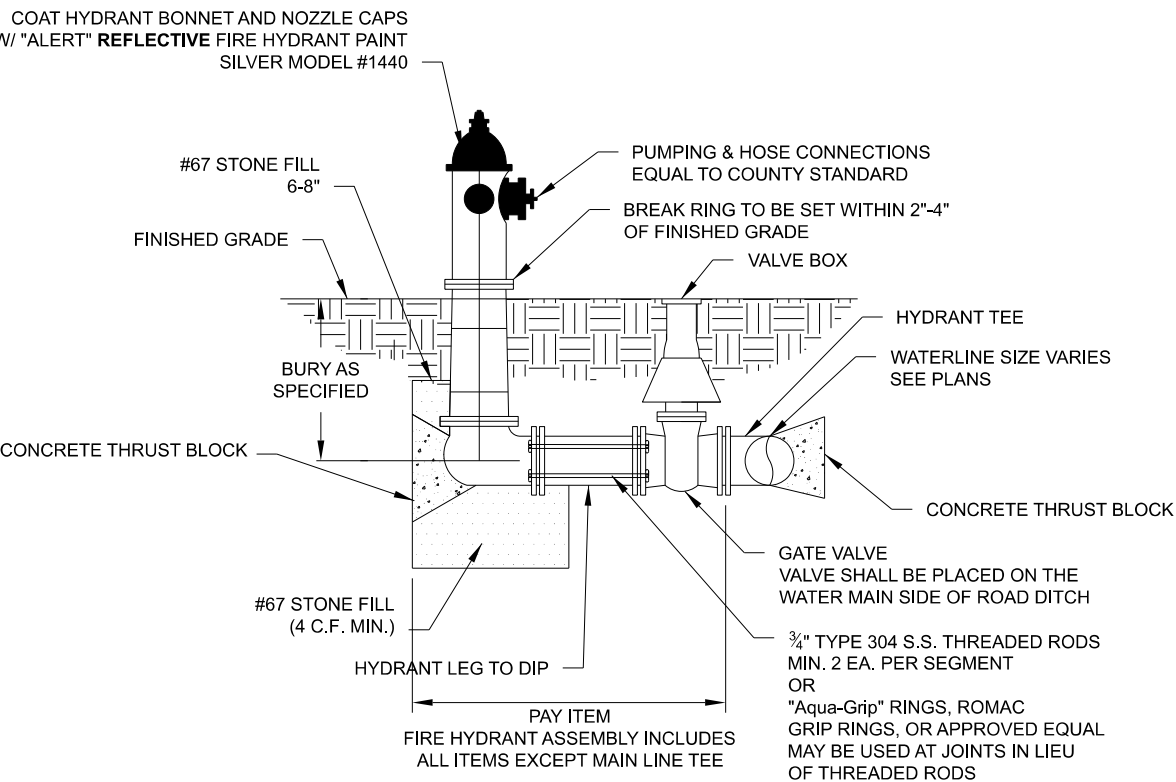
MANUAL AIR RELIEF VALVE ASSEMBLY
NOT TO SCALE

		Name	Date	JOHNSTON COUNTY Department of Public Utilities P.O. Box 2263 Smithfield, NC 27577	WATER STANDARD DETAIL Manual Air Relief Valve Assembly	PAGE
Drawn By:						25
Checked By:						
Approved By:						
Scale:						
Rev.	Description	Date	Init.			

WATER
STANDARD DETAIL
Manual Air Relief
Valve Assembly

PAGE
25

- NOTE:
1. MIN. OF 4 CU. FT. STONE (MORE IF REQ'D).
 2. CONC. THRUST BLOCK TO HAVE MIN. OF 6 SQ. FT. BEARING ON SOLID BANK (MORE IF REQ'D).
 3. DRAIN HOLES AND FLANGES SHALL BE CLEAR OF CONC.
 4. FIRE HYDRANT BARREL SHALL BE PLUMB.
 5. ALL MATERIALS USED IN THE POTABLE WATER SYSTEM MUST BE NSF61 AND NSF372 CERTIFIED AND MEET THE LATEST FEDERAL SAFE DRINKING WATER ACT REQUIREMENTS.



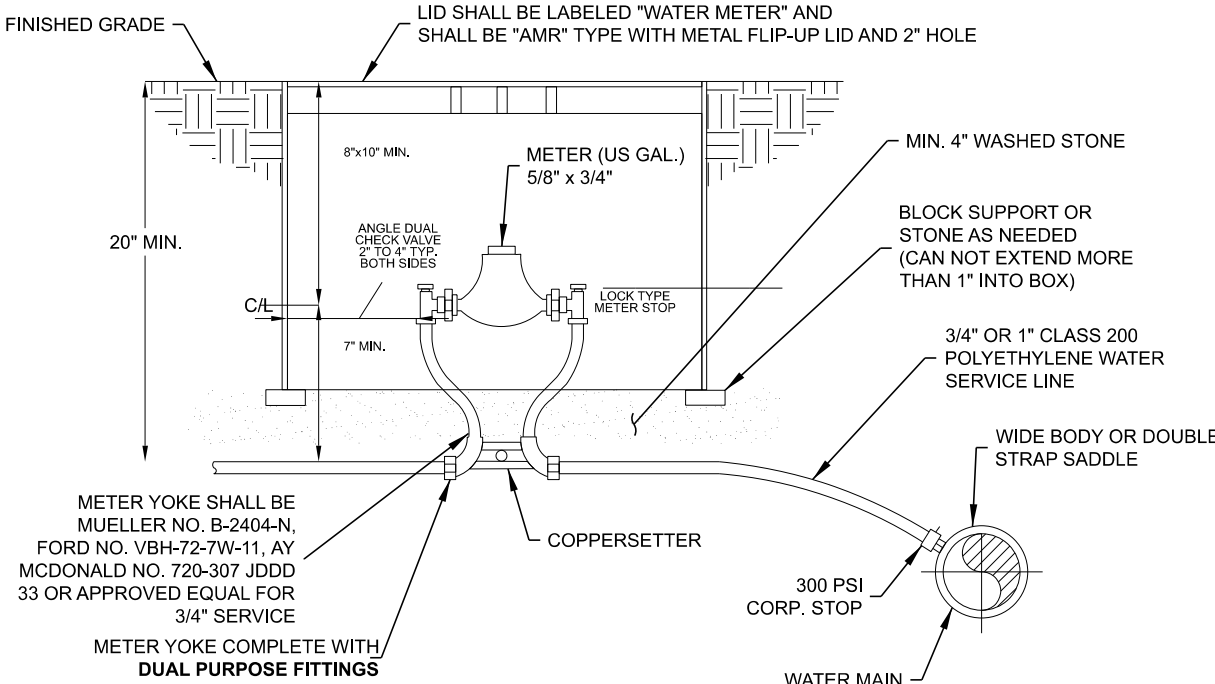
FIRE HYDRANT ASSEMBLY
NOT TO SCALE

"FIRE HYDRANTS INSTALLED ON EXISTING 6" WATER MAINS, MUST BE INSTALLED USING A 6"x6" TEE CUT INTO THE EXISTING WATER MAIN. FIRE HYDRANTS INSTALLED ON EXISTING WATER MAINS LARGER THAN 6" CAN BE INSTALLED USING A TAPPING SLEEVE AND VALVE ON THE EXISTING WATER MAIN.

		Name	Date					PAGE
Drawn By:				JOHNSTON COUNTY Department of Public Utilities P.O. Box 2263 Smithfield, NC 27577		WATER STANDARD DETAIL Fire Hydrant Assembly		4
Checked By:								
Approved By:								
Scale:								
Rev.	Description	Date	Init.					

WATER
STANDARD DETAIL
Fire Hydrant
Assembly

PAGE
4



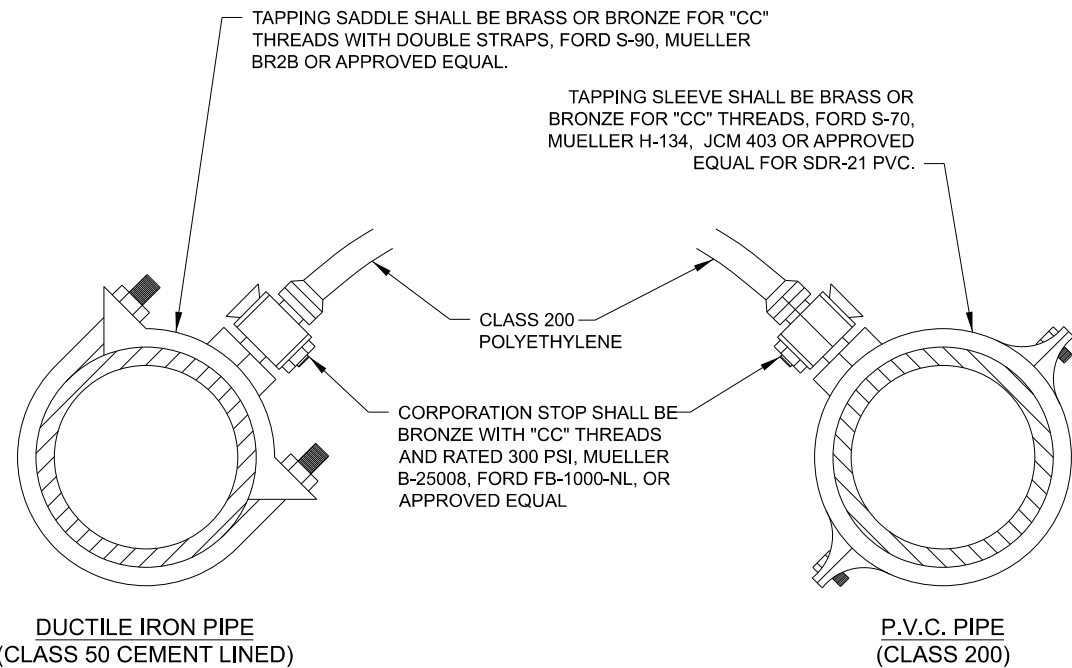
1. CONTRACTOR SHALL PLACE METER BOX IN NON TRAFFIC AREA ONLY, OUTSIDE FENCED AREAS, AND 4 FEET AWAY FROM BUSHES AND TREES THAT COULD COVER THE BOX.
2. PLASTIC METER BOX SHALL BE CENTURY #1015, NDS D1200, OR APPROVED EQUAL.
3. CONTRACTOR SHALL CENTER METER YOKES IN METER BOX.
4. METER YOKES SHALL BE MUELLER NO. B-2404-N, FORD NO. VBH-72-7W-11, AY MCDONALD NO. 720-307 JDDO 33 OR APPROVED EQUAL FOR 3/4" SERVICE.
5. METER TO MEET AWWA C-900 STD. AND SPECS.
6. METER TO BE PROVIDED AND SET BY JOHNSTON COUNTY. METER WILL NOT BE INSTALLED IF THE SETTER IS NOT CENTERED IN THE BOX, THE SETTER HAS BEEN PULLED UP ON ONE END, THE SETTER IS LAYING ON ITS SIDE, THE SETTER IS TO CLOSE TO THE BOX LID, THE BOX IS BELOW GRADE OR BROKEN, THE CUSTOMER'S SERVICE LINE IS NOT HOOKED TO THE UNION NUT, THE 3/4 GATE VALVE HAS NOT BEEN INSTALLED WITHIN 12 INCHES OF THE METER BOX.
7. ALL MATERIALS USED IN THE POTABLE WATER SYSTEM MUST BE NSF61 AND NSF372 CERTIFIED AND MEET THE LATEST FEDERAL SAFE DRINKING WATER ACT REQUIREMENTS.

REVISED ON 9-22-2025

3/4" AND 1" WATER METER SERVICE
NOT TO SCALE

JOHNSTON COUNTY Department of Public Utilities P.O. Box 2263 Smithfield, NC 27577	WATER STANDARD DETAIL 3/4" AND 1" WATER METER SERVICE	PAGE 21
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- NOTE:
1. ALL TAPS 2" AND SMALLER SHALL BE MADE WITH TAPPING SADDLE. ALL TAPS LARGER THAN 2" SHALL BE MADE WITH TAPPING SLEEVE AND VALVE. NO DIRECT TAPS SHALL BE MADE.
 2. ALL MATERIALS USED IN THE POTABLE WATER SYSTEM MUST BE NSF61 AND NSF372 CERTIFIED AND MEET THE LATEST FEDERAL SAFE DRINKING WATER ACT REQUIREMENTS.

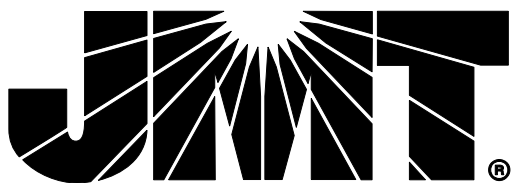


STANDARD WATER TAP DETAIL
NOT TO SCALE

Name		Date	JOHNSTON COUNTY Department of Public Utilities P.O. Box 2263 Smithfield, NC 27577	WATER STANDARD DETAIL Standard Water Tap	PAGE
Drawn By:					20
Checked By:					
Approved By:					
Scale:					
Rev.	Description	Date	Init.		

WATER
STANDARD DETAIL
Standard Water Tap

PAGE
20



PROJECT TYPICAL DETAILS

THRUST COLLAR

CONCRETE THRUST BLOCK AT 45° BEND. SEE THRUST BLOCK DETAIL FOR DIMENSIONS OF BLOCK.

10" MAX.

NOTE: ALL PIPE SEGMENTS LESS THAN 10' SHALL REQUIRE RODDING.

CONCRETE THRUST BLOCK AT 90° BEND. SEE THRUST BLOCK DETAIL FOR DIMENSIONS OF BLOCK.

3/4" S.S. THREADED RODS

ROD REQUIREMENTS

SIZE OF 45° BEND	STATIC THRUST IN POUNDS	NUMBER OF RODS REQUIRED
6"	4,328	2
8"	7,694	2
12"	17,312	4
16"	30,779	6
20"	48,091	8
24"	69,252	10

GENERAL NOTES

1. RODS AND NUTS SHALL BE OF TYPE 304 OR TYPE 316 STAINLESS STEEL.
2. CONCRETE SHALL NOT CONTACT BOLTS OR ENDS OF MECHANICAL JOINT BENDS.

VERTICAL BEND RODDING AND BLOCKING DETAIL

NOT TO SCALE

Name	Date		
Drawn By:			
Checked By:			
Approved By:			
Scale:			
Rev.	Description	Date	Init.

JOHNSTON COUNTY
Department of Public Utilities
P.O. Box 2293
Smithfield, NC 27577

WATER
STANDARD DETAIL
Critical Bend Rodding and Blocking Details

PAGE
7

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.

PLAN BENDS

PLAN TEES

SECTION X-X BENDS & TEES

PLAN & ELEV. PLUGS

THRUST BLOCK DETAIL

NOT TO SCALE

PIPE SIZE	90° BEND	45° BEND	22 1/2° BEND	11 1/4° BEND	TEE	PLUG		
	A	B	A	B	A	B	C	D
4"	8"	12"	8"	8"	8"	8"	8"	10"
6"	10"	12"	8"	10"	8"	8"	10"	10"
8"	12"	12"	10"	10"	8"	8"	10"	12"
10"	14"	14"	10"	12"	8"	10"	11"	14"
12"	16"	16"	12"	14"	8"	12"	14"	16"
14"	18"	18"	14"	16"	10"	14"	16"	18"
16"	20"	20"	16"	18"	12"	16"	18"	20"
18"	22"	22"	18"	20"	14"	18"	20"	22"
20"	24"	24"	20"	22"	16"	20"	22"	24"
24"	28"	28"	24"	26"	20"	24"	26"	28"

THRUST BLOCK DETAIL

NOT TO SCALE

Name	Date		
Drawn By:			
Checked By:			
Approved By:			
Scale:			
Rev.	Description	Date	Init.

JOHNSTON COUNTY
Department of Public Utilities
P.O. Box 2293
Smithfield, NC 27577

WATER
STANDARD DETAIL
Thrust Block

PAGE
8

REINFORCING

SECTION

PLAN

THRUST COLLAR INSTALLATION

NOT TO SCALE

SCHEDULE

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

THRUST COLLAR INSTALLATION

NOT TO SCALE

Name	Date		
Drawn By:			
Checked By:			
Approved By:			
Scale:			
Rev.	Description	Date	Init.

JOHNSTON COUNTY
Department of Public Utilities
P.O. Box 2293
Smithfield, NC 27577

WATER
STANDARD DETAIL
Thrust Collar Installation

PAGE
9

JOHNSTON COUNTY

PROJECT REFERENCE NO. HN-0040

SHEET NO. UC-3B

DESIGNED BY: ELM

DRAWN BY: ELM

CHECKED BY: MUP

APPROVED BY: MUP

REVISED:

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151

UTILITY CONSTRUCTION PLANS ONLY

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

RESTRAINED FLANGE ADAPTER "UNIFLANGE" OR EQUAL

MJ ACCESSORY KIT

"FIELD LOK" GASKET OR EQUAL

DIP (BELL)

DIP (PE)

3/4" THREADED TYPE 304 OR TYPE 316 S.S. RODS MIN. 4 EA.

HARNESS RESTRAINT DETAIL

NOT TO SCALE

Name	Date		
Drawn By:			
Checked By:			
Approved By:			
Scale:			
Rev.	Description	Date	Init.

JOHNSTON COUNTY
Department of Public Utilities
P.O. Box 2293
Smithfield, NC 27577

WATER
STANDARD DETAIL
Restraint Harness

PAGE
10

PIPE RESTRAINT CHARTS

Horizontal & Vertical Up Bends			Vertical Down Bends			Tees, Reducers, Caps		
Pipe Size (inch)	Bend Angle	Pipeline Restraint Req. (feet)	Pipe Size (inch)	Bend Angle	Pipeline Restraint Req. (feet)	Fitting Type	Size (inch)	Pipeline Restraint Req. (feet)
4"	11.25	2	4"	11.25	4	Tee	4	35
	22.5	5		22.5	8		6	52
	30	6		30	11		8	70
	45	10		45	17		10	85
	60	14		60	24		12	101
	90	24		90	41		16	131
6"	11.25	3	6"	11.25	8	Reducer	6x4	30
	22.5	7		22.5	12		8x6	32
	30	9		30	16		10x4	74
	45	14		45	24		10x6	98
	60	19		60	34		12x4	93
	90	33		90	59		12x6	78
8"	11.25	4	8"	11.25	7		12x10	31
	22.5	9		22.5	15		16x4	128
	30	11		30	20		16x6	117
	45	18		45	31		16x8	101
	60	25		60	44		18x10	82
	90	43		90	76		18x12	99
10"	11.25	5	10"	11.25	9	Cap	24x4	187
	22.5	10		22.5	18		24x6	180
	30	14		30	25		24x8	170
	45	21		45	38		24x10	160
	60	30		60	53		24x12	143
	90	52		90	92		24x16	106
12"	11.25	6	12"	11.25	11		4	41
	22.5	12		22.5	21		6	59
	30	16		30	29		8	76
	45	25		45	44		10	92
	60	35		60	62		12	107
	90	60		90	107		16	139
16"	11.25	7	16"	11.25	14		24	194
	22.5	13		22.5	28			
	45	27		45	58			
	90	65		90	139			
	11.25	9		11.25	20			
	22.5	18		22.5	39			
24"	45	37	24"	45	81			
	90	90		90	194			

NOTE: AT PIPE INTERSECTIONS, MULTIPLE VALVES, RUN WIRE UP AT ONLY ONE VALVE.

PLACE TRACER WIRE BOX AT INTERVALS WHERE VALVES DO NOT OCCUR & PLACE TRACER WIRE IN BOX.

FINISHED GRADE

TRACER WIRE BOX

VALVE BOX

TRACER WIRE BOX

SINGLE 12 AWG SOLID CORE WIRE

PVC PIPELINE

GATE VALVE

MASONRY BLOCK

TRACER WIRE TO BE LAID UNDERNEATH WATER LINE

NOTES:

1. PLACE TRACER WIRE IN TRACER WIRE BOX AS SHOWN.
2. NO UNDERGROUND SPLICING WILL BE ALLOWED. DO NOT SPLICE WIRE WHEN BEGINNING A NEW SPOOL. INSTEAD INSTALL A TRACER WIRE BOX AND ATTACH EACH WIRE TO THE BOX.
3. TRACER WIRE BOXES SHALL BE PLACED NO FARTHER THAN 400' APART

TYPICAL TRACER WIRE INSTALLATION DETAIL

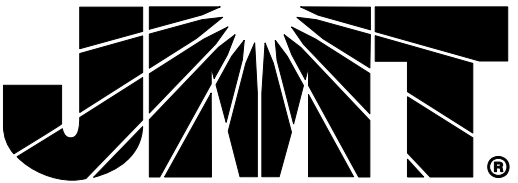
NOT TO SCALE

Name	Date		
Drawn By:			
Checked By:			
Approved By:			
Scale:			
Rev.	Description	Date	Init.

JOHNSTON COUNTY
Department of Public Utilities
P.O. Box 2293
Smithfield, NC 27577

WATER
STANDARD DETAIL
Tracer Wire Installation

PAGE
11



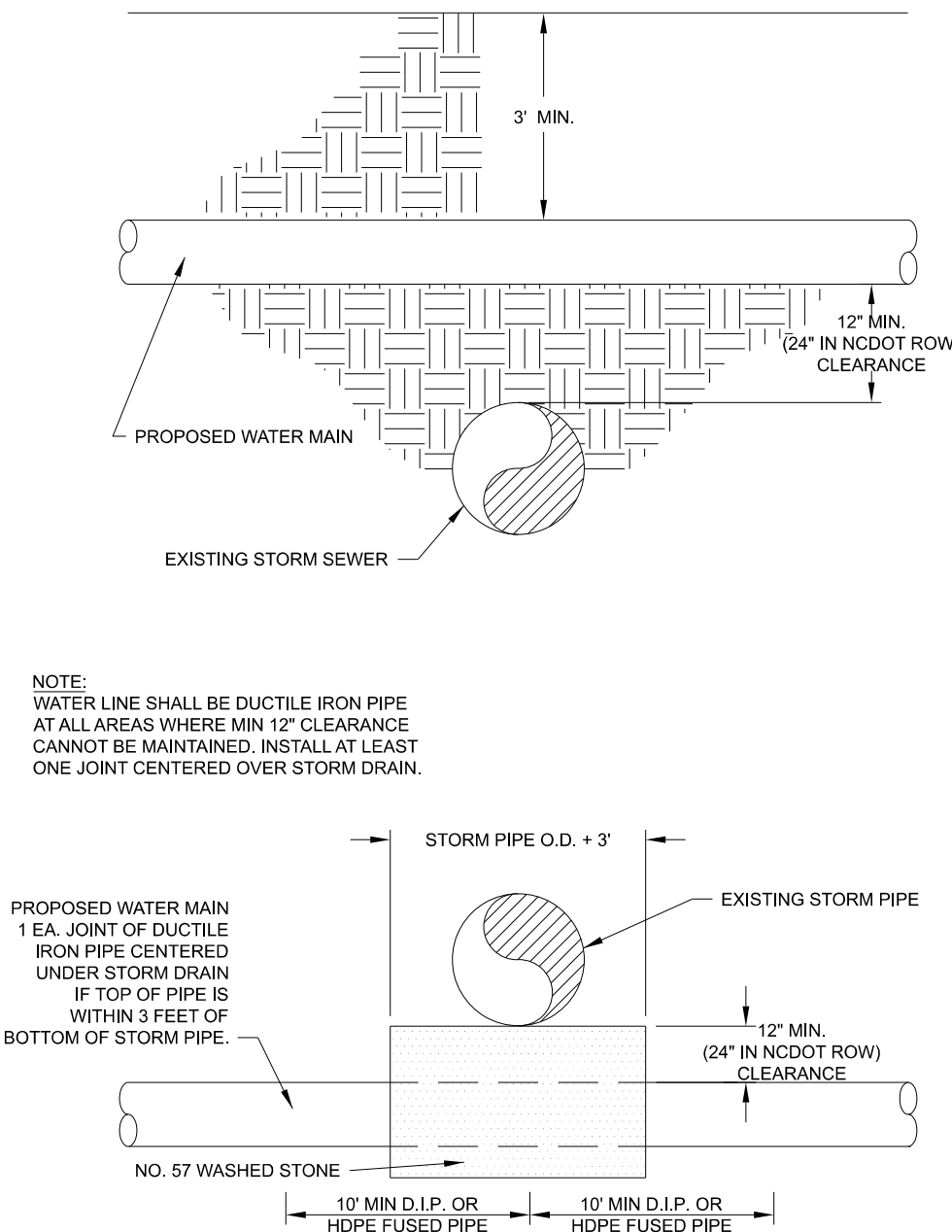
PROJECT TYPICAL DETAILS

JOHNSTON COUNTY

PROJECT REFERENCE NO.		SHEET NO.	
HN-0040		UC-3C	
DESIGNED BY:	ELM		
DRAWN BY:	ELM		
CHECKED BY:	MUP		
APPROVED BY:	MUP		
REVISED:			
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION			
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151		UTILITY CONSTRUCTION PLANS ONLY	

UTILITY CONSTRUCTION

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NOTE:
WATER LINE SHALL BE DUCTILE IRON PIPE
AT ALL AREAS WHERE MIN 12" CLEARANCE
CANNOT BE MAINTAINED. INSTALL AT LEAST
ONE JOINT CENTERED OVER STORM DRAIN.

PROPOSED WATER MAIN
1 EA. JOINT OF DUCTILE
IRON PIPE CENTERED
UNDER STORM DRAIN
IF TOP OF PIPE IS
WITHIN 3 FEET OF
BOTTOM OF STORM PIPE.

STORM PIPE O.D. + 3'

EXISTING STORM PIPE

12" MIN.
(24" IN NCDOT ROW)
CLEARANCE

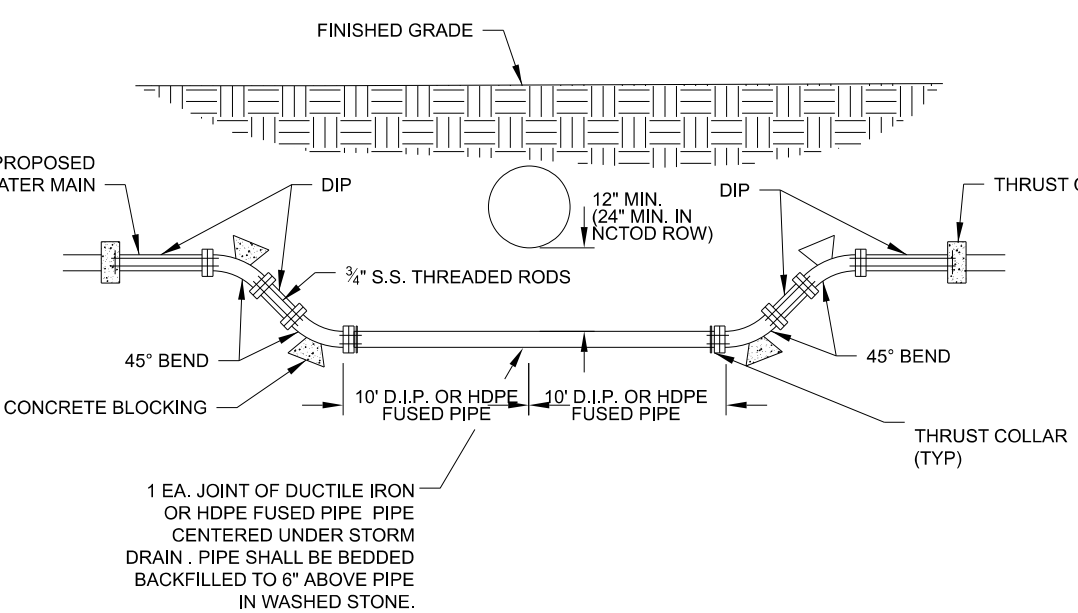
NO. 57 WASHED STONE

10' MIN D.I.P. OR
HDPE FUSED PIPE

10' MIN D.I.P. OR
HDPE FUSED PIPE

STORM SEWER CROSSING DETAILS
NOT TO SCALE

Drawn By:	Name	Date	JOHNSTON COUNTY Department of Public Utilities P.O. Box 2263 Smithfield, NC 27577	STANDARD WATER DETAIL Storm Sewer Crossing	PAGE 12
Checked By:					
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FINISHED GRADE

PROPOSED WATER MAIN

DIP

12" MIN.
(24" MIN. IN
NCDOT ROW)

THRUST COLLAR

45° BEND

10' D.I.P. OR HDPE
FUSED PIPE

10' D.I.P. OR HDPE
FUSED PIPE

45° BEND

THRUST COLLAR
(TYP)

1 EA. JOINT OF DUCTILE IRON
OR HDPE FUSED PIPE. PIPE
CENTERED UNDER STORM
DRAIN. PIPE SHALL BE BEDDED
BACKFILLED TO 6" ABOVE PIPE
IN WASHED STONE.

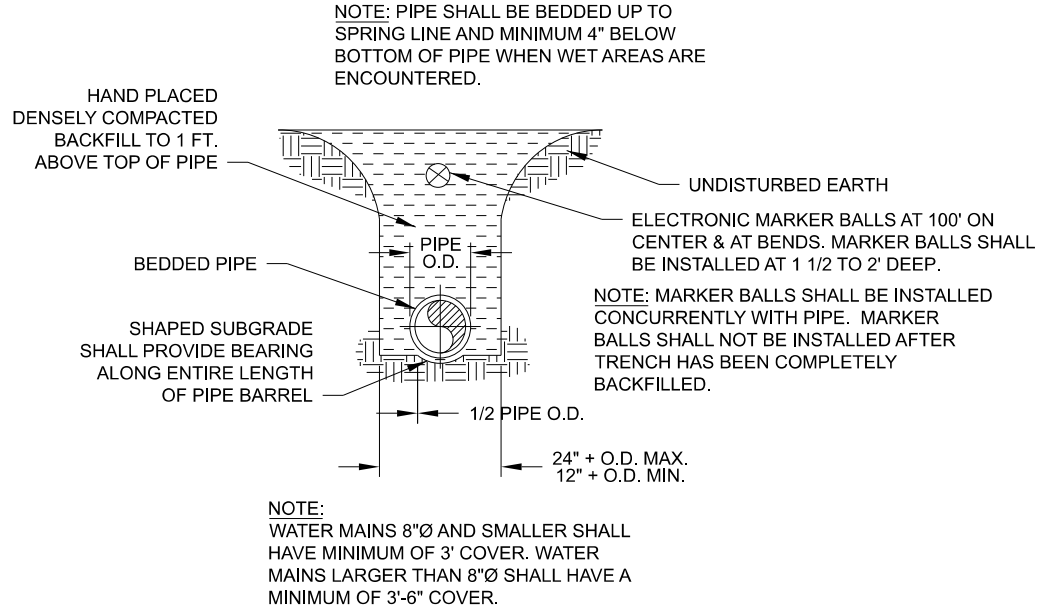
**STORM DRAIN
PIPE CROSSING DETAIL**
NOT TO SCALE

NOTES:

1. CULVERT CROSSINGS IN EXISTING NCDOT RIGHT-OF-WAY
REQUIRE 24" MIN. SEPARATION FROM BOTTOM OF CULVERT
TO TOP OF WATER MAIN.

2. IN LIEU OF RESTRAINT (TIE) RODS, APPROVED RESTRAINT
JOINT PIPE MAY BE USED.

Drawn By:	Name	Date	JOHNSTON COUNTY Department of Public Utilities P.O. Box 2263 Smithfield, NC 27577	WATER STANDARD DETAIL Storm Pipe Crossing	PAGE 11
Checked By:					
Approved By:					
Scale:					
Rev.	Description	Date	Init.		



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

HAND PLACED
DENSELY COMPACTED
BACKFILL TO 1 FT.
ABOVE TOP OF PIPE

BEDDED PIPE

SHAPED SUBGRADE
SHALL PROVIDE BEARING
ALONG ENTIRE LENGTH
OF PIPE BARREL

PIPE O.D.

1/2 PIPE O.D.

24" ± O.D. MAX.
12" ± O.D. MIN.

UNDISTURBED EARTH

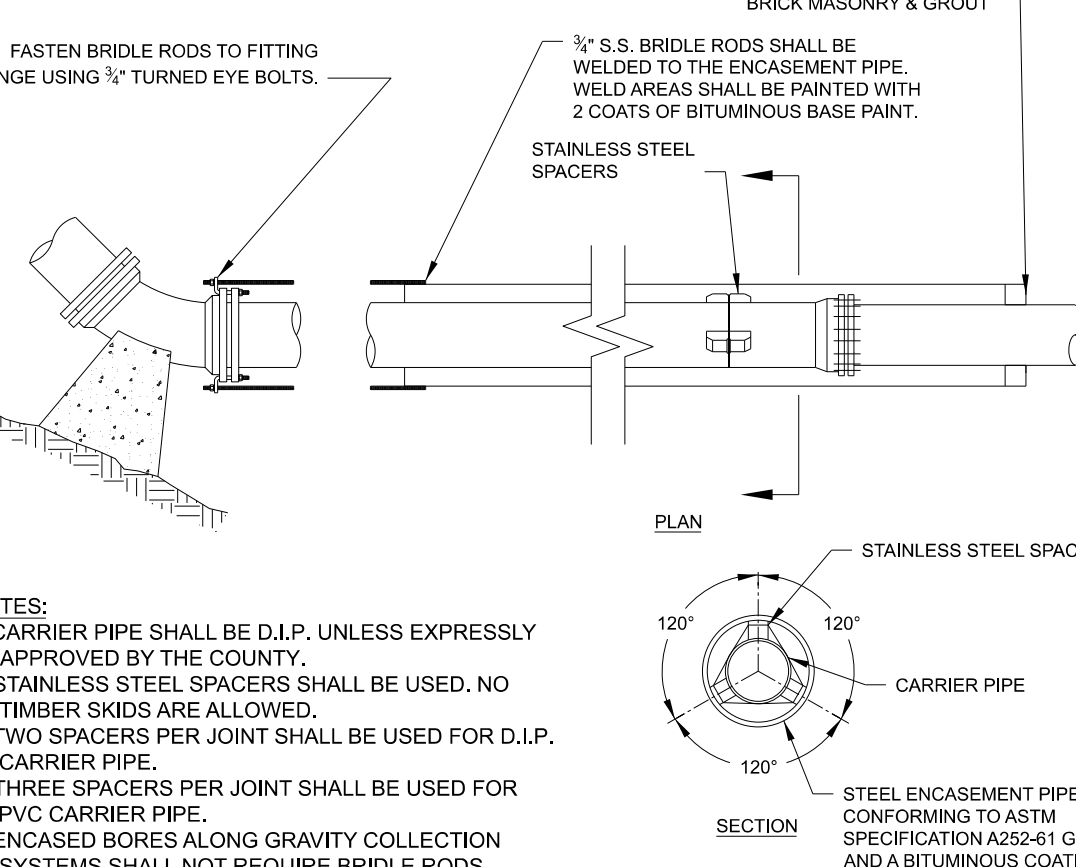
ELECTRONIC MARKER BALLS AT 100' ON
CENTER & AT BENDS. MARKER BALLS SHALL
BE INSTALLED AT 1 1/2 TO 2' DEEP.

NOTE: MARKER BALLS SHALL BE INSTALLED
CONCURRENTLY WITH PIPE. MARKER
BALLS SHALL NOT BE INSTALLED AFTER
TRENCH HAS BEEN COMPLETELY
BACKFILLED.

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

Drawn By:	Name	Date	JOHNSTON COUNTY Department of Public Utilities P.O. Box 2263 Smithfield, NC 27577	WATER STANDARD DETAIL Pipe Laying Condition	PAGE 17
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FASTEN BRIDLE RODS TO FITTING
FLANGE USING 3/4" TURNED EYE BOLTS.

3/4" S.S. BRIDLE RODS SHALL BE
WELDED TO THE ENCASEMENT PIPE.
WELD AREAS SHALL BE PAINTED WITH
2 COATS OF BITUMINOUS BASE PAINT.

STAINLESS STEEL
SPACERS

ENCLOSE ENDS WITH
BRICK MASONRY & GROUT

PLAN

120°

120°

120°

STAINLESS STEEL SPACERS

CARRIER PIPE

SECTION

STEEL ENCASEMENT PIPE
CONFORMING TO ASTM
SPECIFICATION A252-81 GRADE 2
AND A BITUMINOUS COATING ON
THE OUTSIDE.

NOTES:

1. CARRIER PIPE SHALL BE D.I.P. UNLESS EXPRESSLY
APPROVED BY THE COUNTY.

2. STAINLESS STEEL SPACERS SHALL BE USED. NO
TIMBER SKIDS ARE ALLOWED.

3. TWO SPACERS PER JOINT SHALL BE USED FOR D.I.P.
CARRIER PIPE.

4. THREE SPACERS PER JOINT SHALL BE USED FOR
PVC CARRIER PIPE.

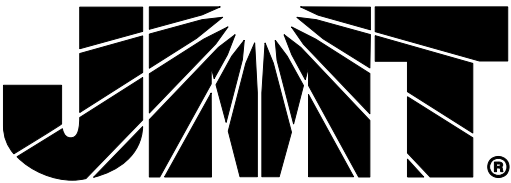
5. ENCASED BORES ALONG GRAVITY COLLECTION
SYSTEMS SHALL NOT REQUIRE BRIDLE RODS.

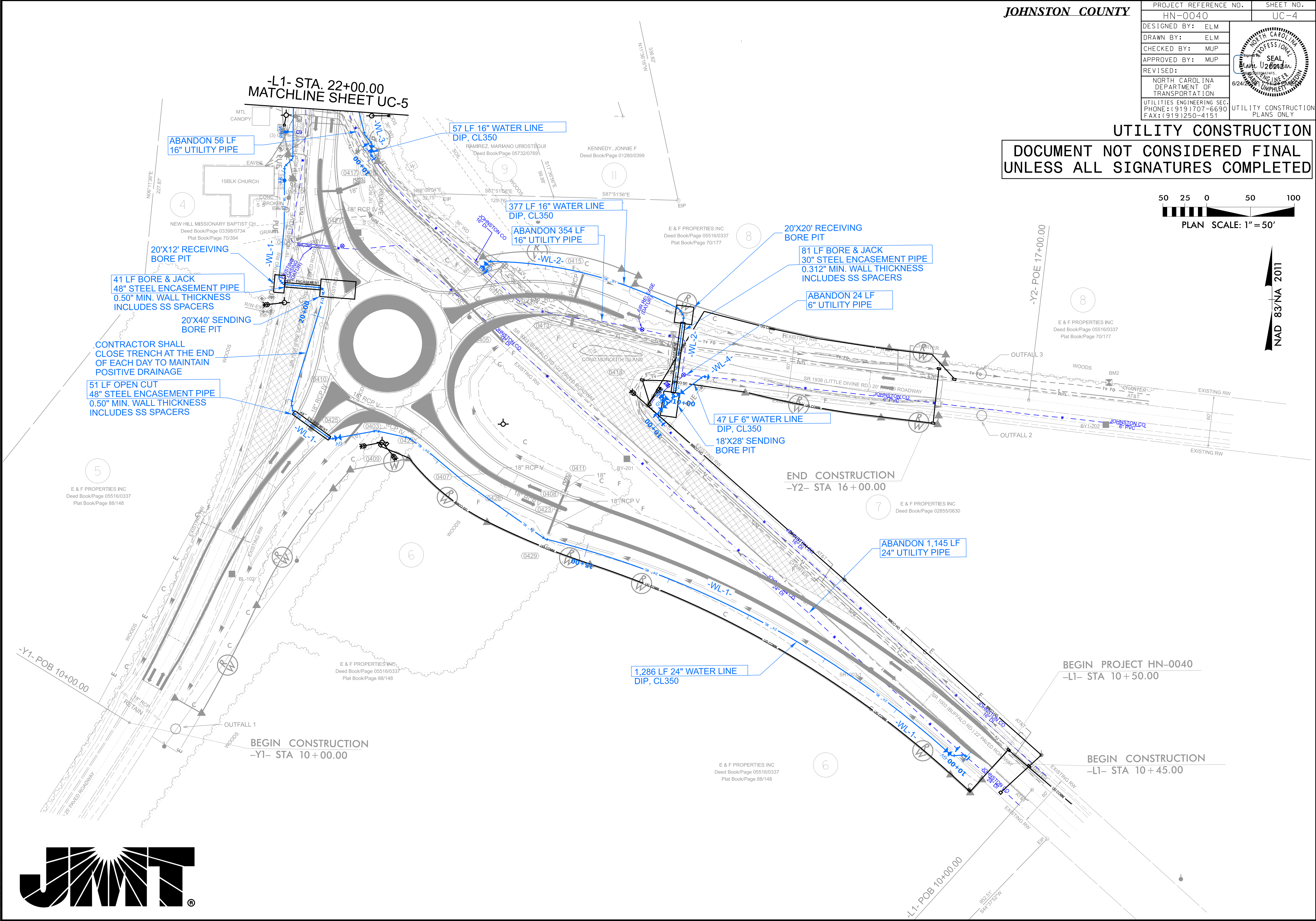
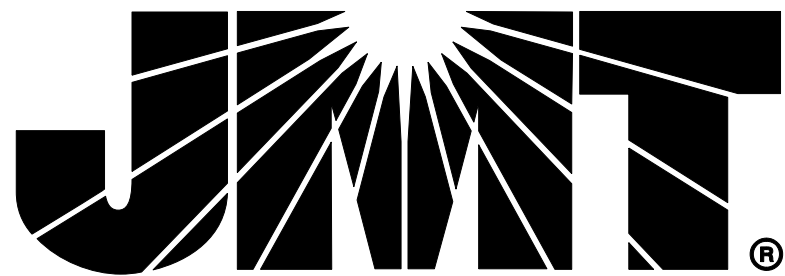
6. 2 EA. 3/4" S.S. BRIDLE RODS SHALL BE REQUIRED ON
ALL LINES 8"Ø AND SMALLER. 4 EA. 3/4" S.S. BRIDLE
RODS SHALL BE REQUIRED ON ALL LINES 10"Ø AND
LARGER.

7. CARRIER PIPE SHALL BE INSTALLED USING 'FIELD
LOK' GASKETS OR APPROVED EQUAL.

STANDARD BORE ENCASEMENT
NOT TO SCALE

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Checked By:					
Approved By:					
Scale:					
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JOHNSTON COUNTY

PROJECT REFERENCE NO.		SHEET NO.
HN-0040		UC-4
DESIGNED BY:	ELM	NOAH CAROLINA PROFESSIONAL SEAL 6/24/2026 JMM 6/24/2026 UTILITY CONSTRUCTION PLANS ONLY
DRAWN BY:	ELM	
CHECKED BY:	MUP	
APPROVED BY:	MUP	
REVISED:		
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION		
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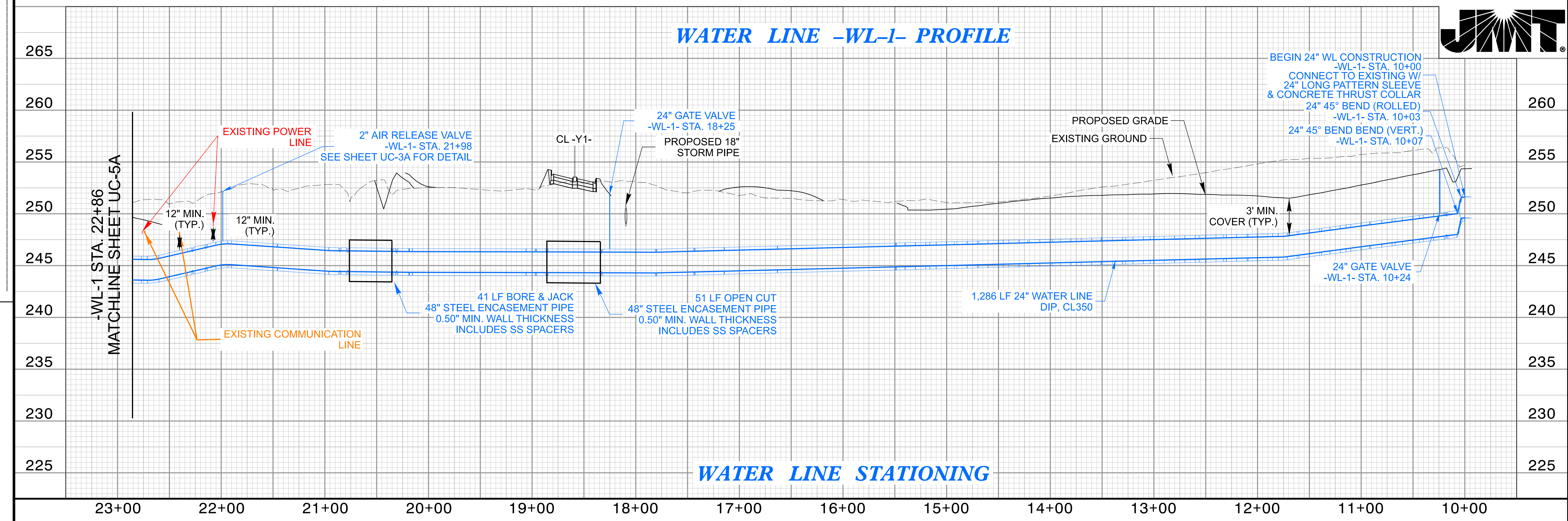
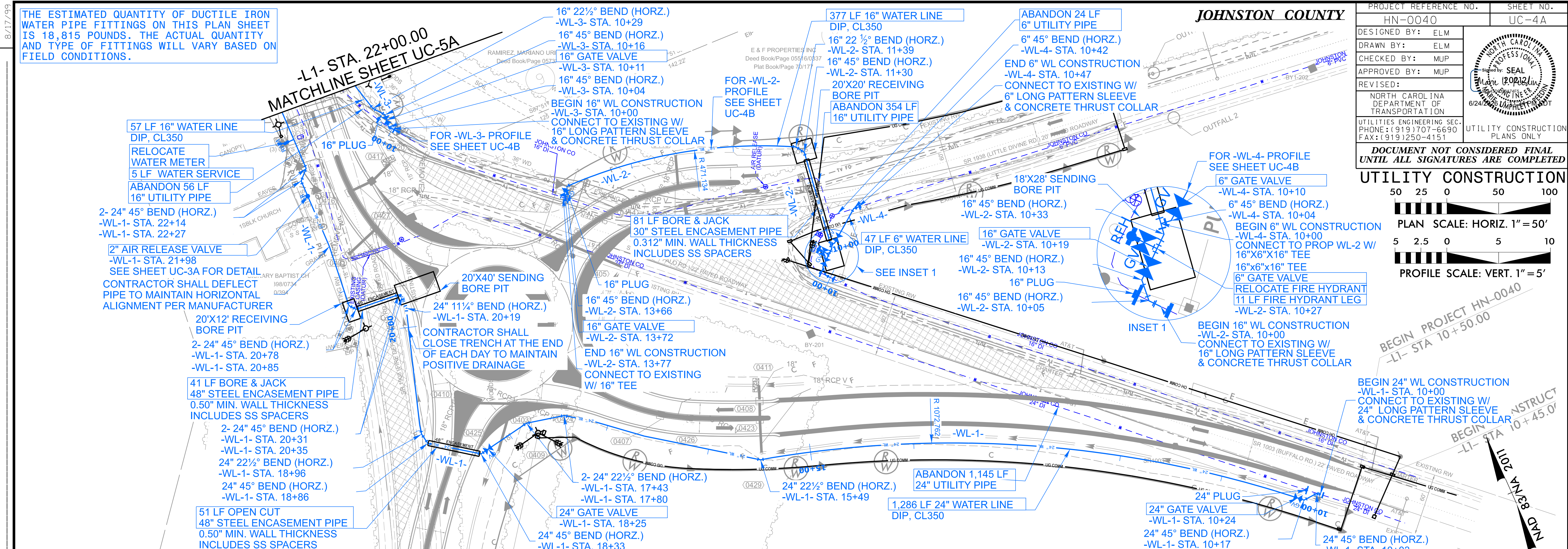
UTILITY CONSTRUCTION

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8/17/99

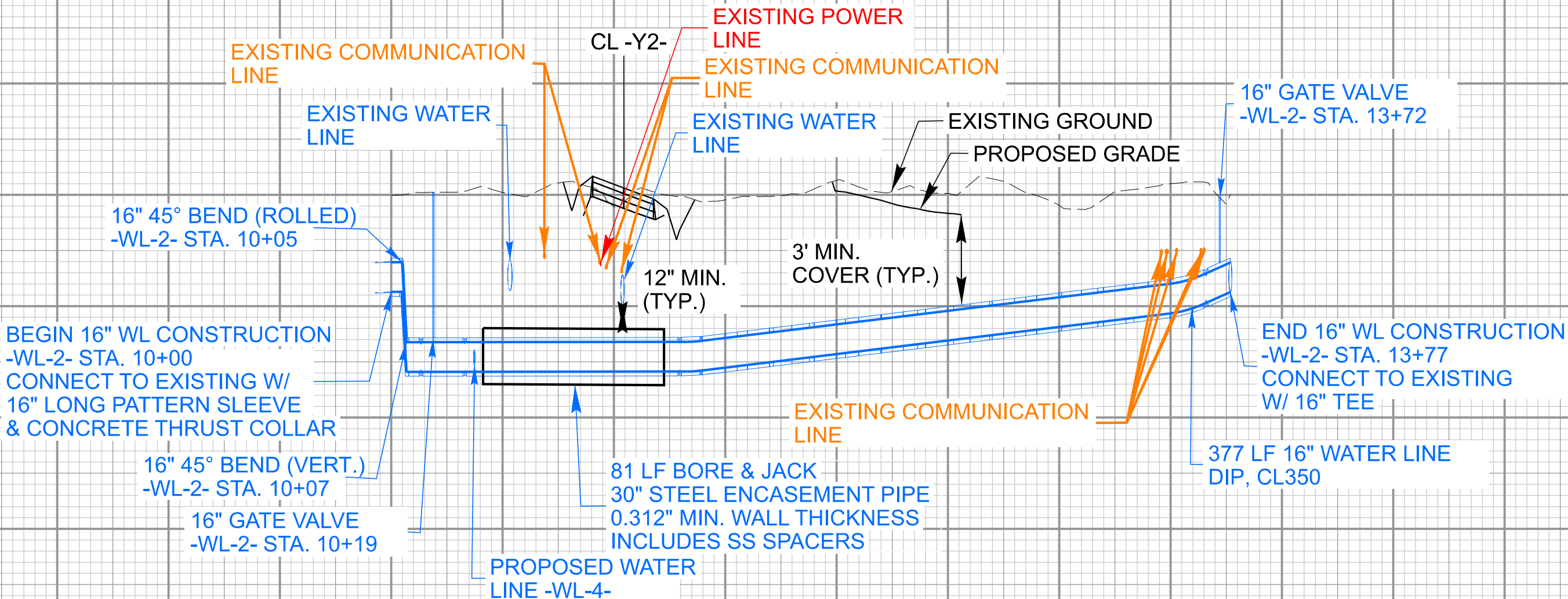


5/28/2026

4/21/2026 14:47:32 PM
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User: jmt

THE ESTIMATED QUANTITY OF DUCTILE IRON WATER PIPE FITTINGS ON THIS PLAN SHEET IS 755 POUNDS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.

WATER LINE -WL-2- PROFILE

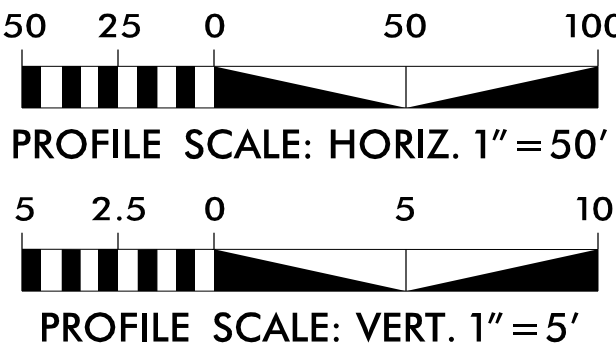


WATER LINE STATIONING

10+00 11+00 12+00 13+00 14+00

JOHNSTON COUNTY

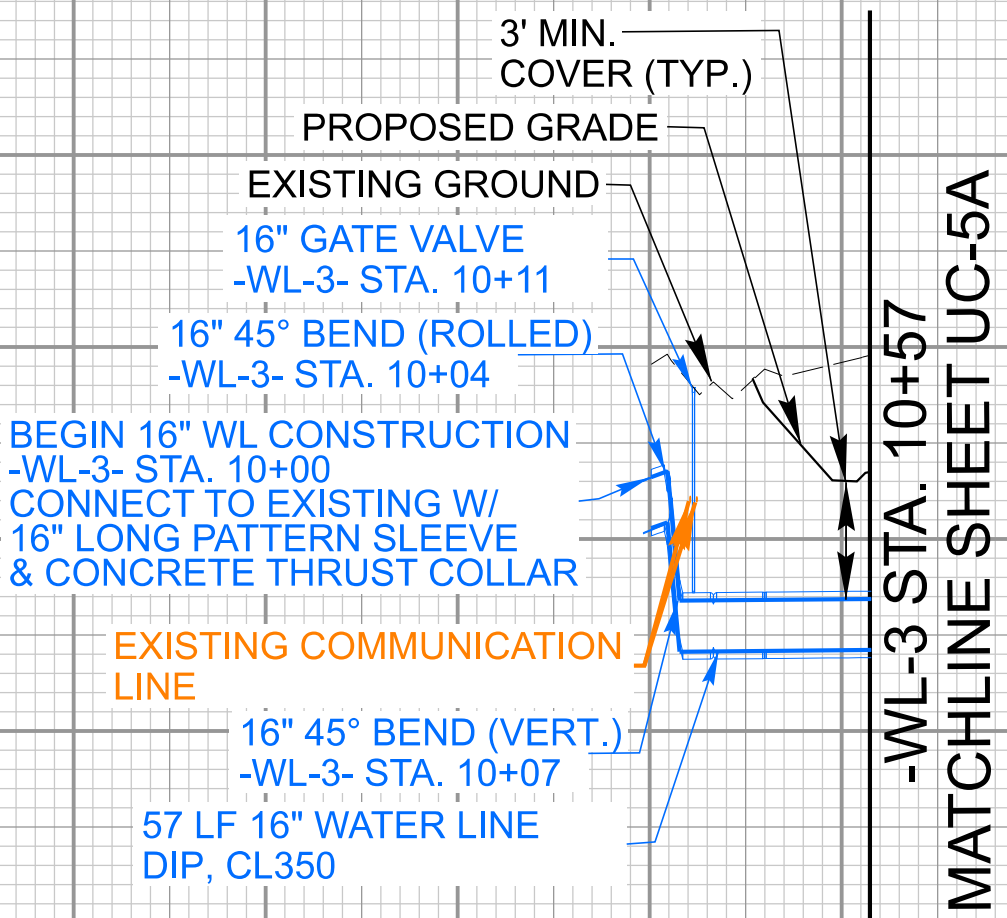
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HN-0040		UC-4B
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WATER LINE -WL-3- PROFILE

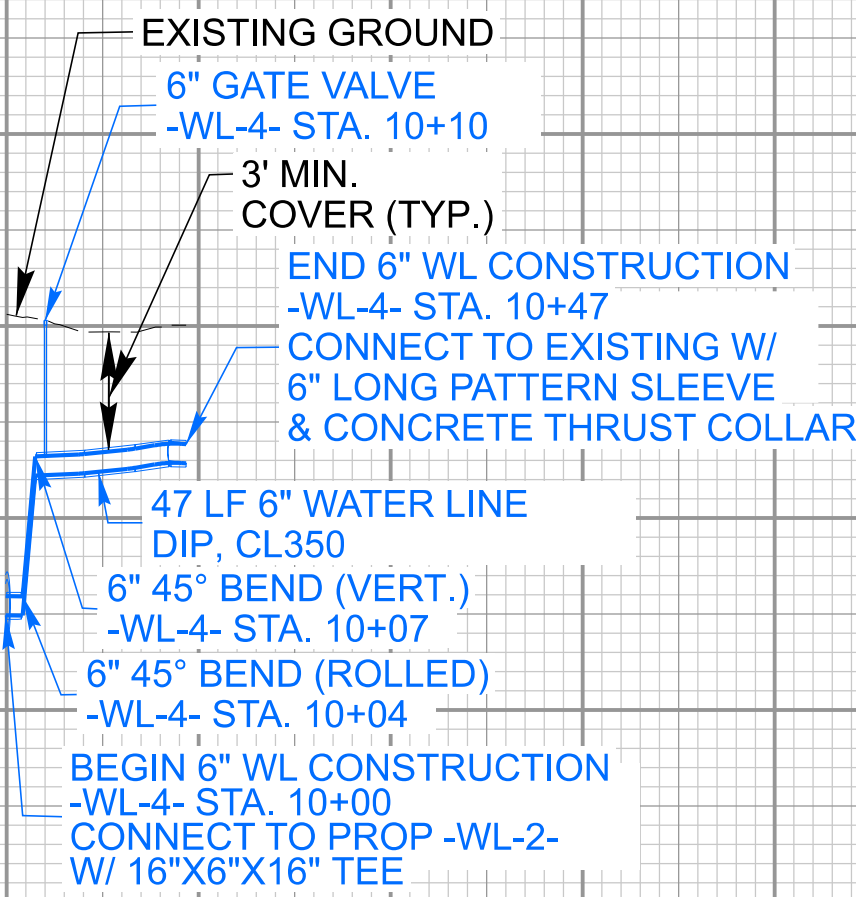


-WL-3 STA. 10+57
MATCHLINE SHEET UC-5A

WATER LINE STATIONING

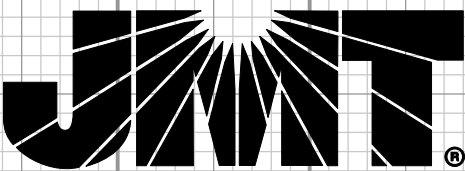
10+00 11+00

WATER LINE -WL-4- PROFILE



WATER LINE STATIONING

10+00 11+00



5/14/99

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HN-0040-UC Plan Sheets.dgn
JMT

JOHNSTON COUNTY

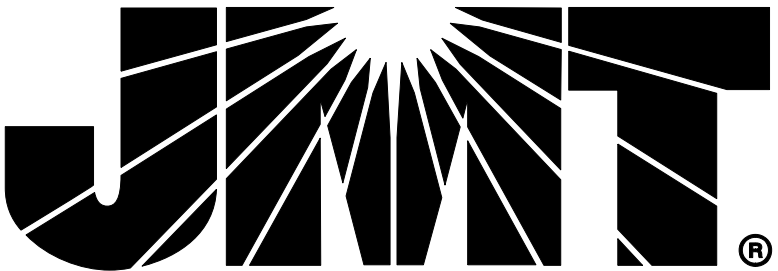
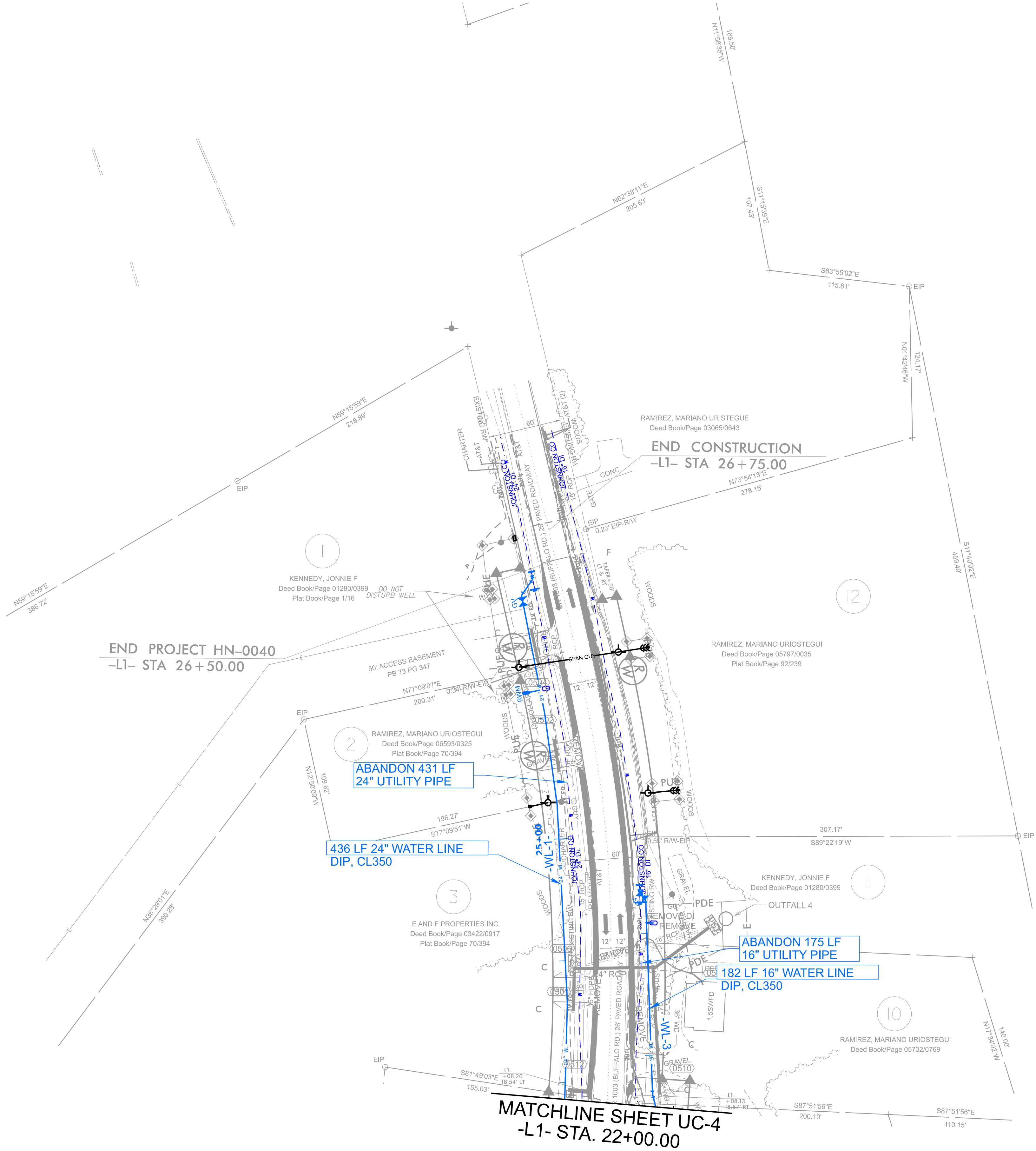
PROJECT REFERENCE NO.		SHEET NO.
HN-0040		UC-5
DESIGNED BY:	ELM	
DRAWN BY:	ELM	
CHECKED BY:	MUP	
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NORTH CAROLINA DEPARTMENT OF TRANSPORTATION		5/11/2026 JMT
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ONLINE SHEET UC-4A
-L1- STA. 22+00.00

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UTILITY CONSTRUCTION

PLAN SCALE: HORIZ. 1" = 50'

PROFILE SCALE: VERT. 1" = 5'

