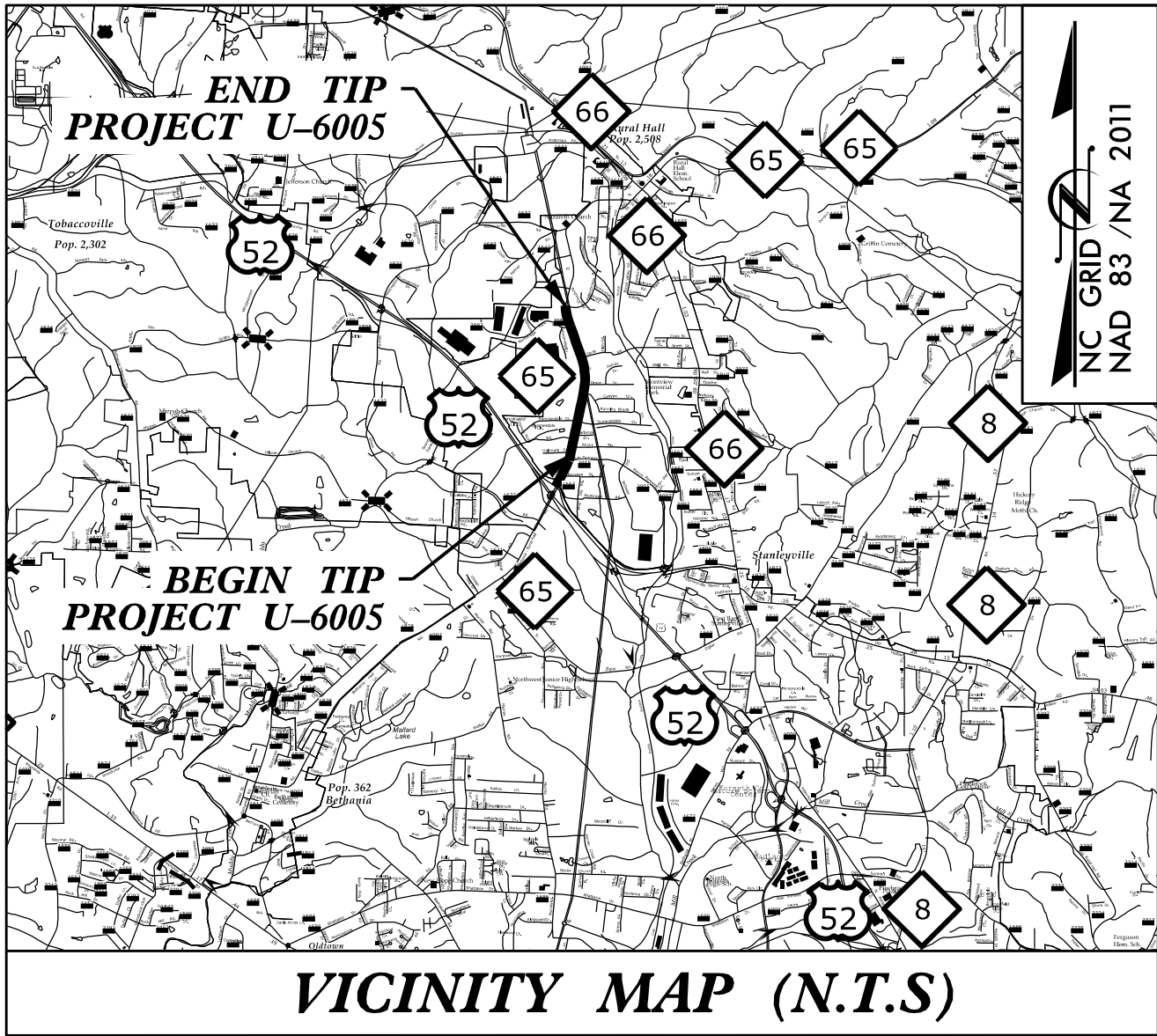


TIP PROJECT: U-6005



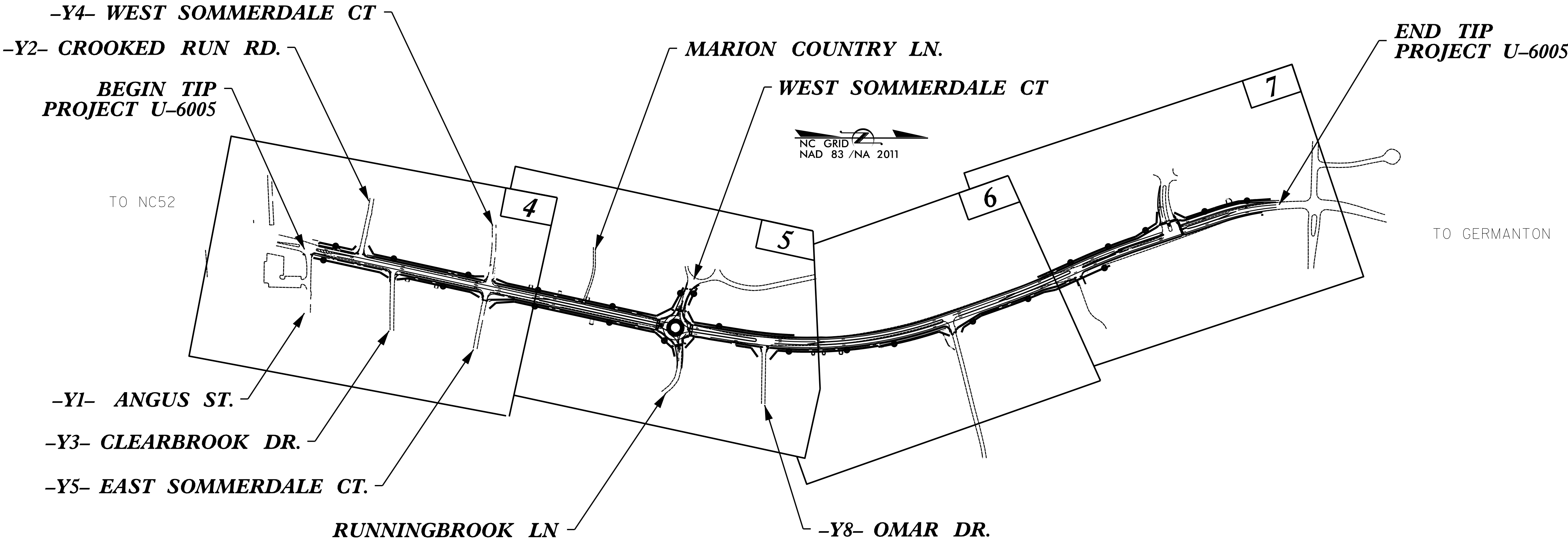
VICINITY MAP (N.T.S)

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

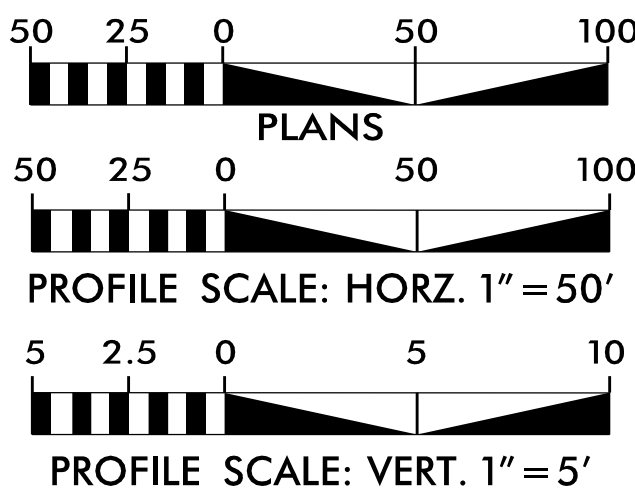
UTILITIES CONSTRUCTION PLANS
FORSYTH COUNTY

LOCATION: NC 65 FROM ANGUS STREET TO
NORTHBRIDGE PARK DRIVE
TYPE OF WORK: WATER AND SEWER
RELOCATION PLANS

T.I.P. NO.	SHEET NO.
U-6005	UC-1



GRAPHIC SCALES



INDEX OF SHEETS

SHEET NO.:	DESCRIPTION:
UC-1	TITLE SHEET
UC-2	UTILITY SYMBOLOGY
UC-3 THRU UC-3M	NOTES & DETAILS
UC-4 THRU UC-7A	UTILITY PLANS & PROFILES

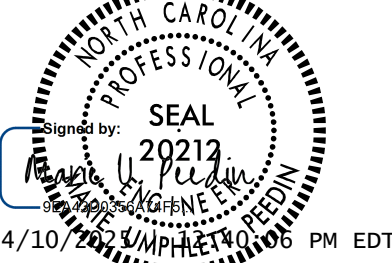
UTILITY OWNERS

(A) WATER & SEWER - WINSTON-SALEM /
FORSYTH COUNTY

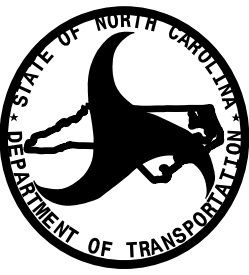
PREPARED IN THE OFFICE OF:



SEAL:



Marie Peedin, P.E.	UTILITY PROJECT ENGINEER
Nick Asaro	PROJECT UTILITY COORDINATOR
Emily Morris, E.I.	PROJECT UTILITY DESIGNER



DIVISION OF HIGHWAYS
UTILITIES UNIT
1555 MAIL SERVICES CENTER
RALEIGH, NC 27699-1555
PHONE (919) 707-6690
FAX (919) 250-4151

Ryan Newcomb	DIVISION PROJECT ENGINEER
Low Porter	DIVISION UTILITIES COORDINATOR
Josh McMahan	SR. DIVISION UTILITIES COORDINATOR

STATE OF NORTH CAROLINA

DIVISION OF HIGHWAYS

FORSYTH COUNTY

PROJECT REFERENCE NO.	SHEET NO.
U-6005	UC-2

UTILITIES PLAN SHEET SYMBOLS

PROPOSED WATER SYMBOLS

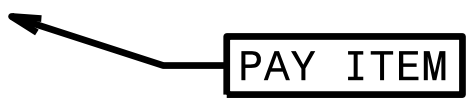
Water Line (Sized as Shown)	
11¼ Degree Bend	
22½ Degree Bend	
45 Degree Bend	
90 Degree Bend	
Plug	
Tee	
Cross	
Reducer	
Gate Valve	
Butterfly Valve	
Tapping Valve	
Line Stop	
Line Stop with Bypass	
Blow Off	
Fire Hydrant	
Relocate Fire Hydrant	
Remove Fire Hydrant	
Water Meter	
Relocate Water Meter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

PROPOSED SEWER SYMBOLS

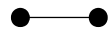
Gravity Sewer Line (Sized as Shown)	
Force Main Sewer Line (Sized as Shown)	
Manhole (Sized per Note)	
Sewer Pump Station	

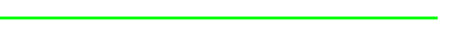
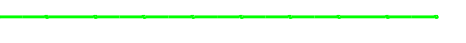
PROPOSED MISCELLANOUS UTILITIES SYMBOLS

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

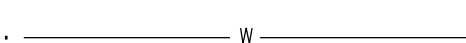
Thrust Block	
Air Release Valve	
Utility Vault	
Concrete Pier	
Steel Pier	
Plan Note	
Pay Item Note	

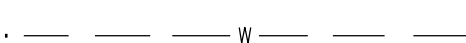
EXISTING UTILITIES SYMBOLS

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	
End of Information	

*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) 

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 WINSTON-SALEM / FORSYTH COUNTY UTILITIES. PLEASE CONTACT TODD LEWIS 336-747-6842 OR TODDL@CITYOFWS.ORG
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. CARRIER PIPE INSTALLED THROUGH ENCASEMENT SHALL BE DUCTILE IRON FLEXIBLE RESTRAINED JOINT. IN CASES WHERE THE CONNECTION TO EXISTING IS WITHIN 40 LF OF THE END OF THE ENCASEMENT PIPE, THE CARRIER. PIPE WILL BE RESTRAINED JOINT UP TO THE CONNECTION.
2. SEWER WYES OR TAPS WILL NOT BE ALLOWED WITHIN 5 FEET OF A MANHOLE.

3. NO INTERRUPTION TO SEWAGE FLOW SHALL BE PERMITTED. IF APPLICABLE, CONTRACTOR SHALL PROVIDE TEMPORARY BYPASS PUMPING SEWAGE FLOWS. BYPASS OPERATIONS SHALL BE 24 HOUR PER DRY DURING THE WORK PERIOD. CONTRACTOR MUST SUBMIT A BYPASS PUMPING PLAN PRIOR TO THE START OF TEMPORARY BYPASS PUMPING.
4. CONTRACTOR SHALL NOTIFY WINSTON SALEM AT LEAST 72 HOURS PRIOR TO ANY BYPASSING OR DEVIATING OF FLOW.
5. CONTRACTOR SHALL CLEAN AND TELEWISE ALL SANITARY SEWER MAINS PRIOR TO REQUESTING FINAL INSPECTION.
6. ANY WATER CONNECTIONS THAT ARE TO BE RELOCATED THAT ARE GALVANIZED FROM MAIN TO METER SHALL BE REPLACED WITH A NEW COPPER CONNECTION.
7. ALL MANHOLE RINGS AND VALVE BOXES LOCATED WITHIN ANY PAVED AREAS (INCLUDING GRAVEL AND DIRT STREETS) SHALL HAVE PLACED AROUND THEM A CONCRETE COLLAR CONSTRUCTED OF CLASS A (3000 PSI) CONCRETE., 6" THICK, EXTENDING A MINIMUM OF 12" FROM THE OUTSIDE CIRCUMFERENCE OF THE STRUCTURE.
8. CONTRACTOR SHALL ABANDON EXISTING WATER MAIN IN PLACE WHERE REMOVAL IS REQUIRED FOR PROPOSED WORK OR WHERE NOTED, WITHIN THE RIGHT-OF-WAY OF NCDOT MAINTAINED ROADS, CONTRACTOR SHALL FILL ABANDONED WATER MAINS WITH FLOWABLE FILL. ABANDON EXISTING WATER MAINS PER NCDOT 2024 STANDARD SPECIFICATION SECTION 1530.
9. EXISTING WATER MAIN SHALL REMAIN IN SERVICE UNTIL PROPOSED WATER MAIN HAS BEEN TESTED, DISINFECTED, AND APPROVED.

FORSYTH COUNTY

PROJECT REFERENCE NO.		SHEET NO.	
U-6005		UC-3	
DESIGNED BY:	ELM	Seal Professional Engineer North Carolina Seal 20212 5/29/2024 11:58:15 AM EDT	
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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT SPECIFIC NOTES
(CONT'D):

10. FOR ALL WATER SERVICES TO BE CONNECTED TO THE PROPOSED WATER MAIN, CONTRACTORS SHALL REPLACE ALL WATER SERVICE PIPING WHICH IS NOT TYPE K COPPER OR IS IN POOR CONDITION AS DIRECTED BY THE ENGINEER TO DETERMINE WATER SERVICES PIPING MATERIAL AND CONDITION. CONTRACTOR SHALL EXPOSE, IN THE PRESENCE OF THE ENGINEER, EACH WATER SERVICE AT THE TIE TO THE EXIST ING MAIN, APPROXIMATELY TWO FEET FROM THE METER ON THE WATER MAIN SIDE, AND APPROXIMATELY TWO FEET FROM THE METER BOXES ON THE SERVICE SIDE.

11. FOR ALL WATER SERVICES TO BE DISTURBED BY CONSTRUCTION, THE CONTRACTOR SHALL REPLACE ALL WATER METER BOXES WHICH DO NOT MEET THE REQUIREMENTS OF THE CAST IRON METER BOX FOR 5/8" AND 1" METERS DETAIL C-49, AS DIRECTED BY THE ENGINEER TO DETERMINE COMPLIANCE OF THE WATER METER BOXES, CONTRACTOR SHALL EXPOSE, IN THE PRESENCE OF THE ENGINEER, EACH WATER METER BOX, CONTRACTOR SHALL LOCATE NEW WATER METER BOX PER V** AND 1" WATER CONNECTION DETAIL C-46-48. CITY/COUNCIL UTILITIES WILL PROVIDE THE NEW WATER METER BOXES TO THE CONTRACTOR.

12. CONTRACTOR IS RESPONSIBLE FOR FURNISHING BYPASS PUMPING FOR EXISTING SANITARY SEWER MAINS OR SERVICES AS NECESSARY DURING CONSTRUCTION. CONTRACTOR SHALL GIVE A MINIMUM OF 48 HOURS NOTICE PRIOR TO BEGINNING SUCH CONSTRUCTION. TRAFFIC CONTROL MEASURES, ROAD RAMPS, ETC. SHALL BE PROVIDED AS REQUIRED TO ACCOMODATE BYPASS OPERATIONS.

13. PROVIDE CONCRETE THRUST BLOCKS AT ALL WATER MAIN BENDS, TEES, AND CAPS UNLESS OTHERWISE NOTED

14. PROPOSED WATER LINE SHALL BE D.I. (DUCTILE IRON PIPE).

15. STABILIZATION STONE UNDER PIPING TO BE PLACED AS REQUIRED BY CITY INSPECTOR WHEN CONDITIONS WARRANT

16. PRIOR TO REQUESTING A FINAL INSPECTION, THE CONTRACTOR MUST SUBMIT RECORD DRAWINGS AND ENGINEER'S CERTIFICATION TO THE ENGINEERING DIVISION'S RECORD CENTER. THE OWNER MUST ALSO SUBMIT THE CONSTRUCTION CHECKLIST TO THE CITY INSPECTOR.

17. CONTACT UTILITIES FIELD OPERATIONS AT 336-462-2199 TO ARRANGE FOR CONSTRUCTION INSPECTION. A CITY INSPECTOR WILL APPROVE BACKFLOW PREVENTER TYPE, VAULT, EXACT LOCATION, AND INSPECTION REQUIREMENTS PRIOR TO INSTALLATION. A CITY INSPECTOR SHALL BE PRESENT WHEN MAKING OR TERMINATING WATER AND SEWER CONNECTIONS INTO NEW OR EXISTING WATER AND SEWER LINE.

18. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING THE ENGINEER WITH A SET OF SURVEY RECORDS (AS-BUILT) DRAWINGS PREPARED BY A NORTH CAROLINA REGISTERED LAND SURVEYOR CERTIFYING THE ACCURACY OF THE SURVEY HORIZONTAL AND VERTICAL LOCATIONS TO ONE TENTH (0.10) OF A FOOT, SURVEY SHALL BE TIED TO THE NORTH CAROLINA STATE PLANS COORDINATE SYSTEM (NAD83 FEET) HORIZONTALLY, AND ELEVATIONS SHALL BE NORTH AMERICAN VERTICAL DATUM (NAVD88). SURVEY POINT INFORMATION SHALL BE PROVIDED IN AN ELECTRONIC FORMAT FILE OR AN ASCII POINT TEXT FILE (X-Y COORDINATES)

THESE DRAWINGS SHALL AT A MINIMUM SHOW THE FINAL ELEVATIONS AND HORIZONTAL LOCA TIONS FOR THE FOLLOWING:

ALL RELOCATION, INCLUDING VAULTS BELOW GRADE FITTINGS, VALVES, WATER METERS AND BACKFLOW PREVENTION DEVICES ALONG THE WATER LINE ALIGNMENT. CONTRACTOR SHALL PROVIDE THE ENGINEER WITH A LETTER CERTIFYING TO THEIR COMPLIANCE WITH THE CONTRACT DRAWINGS.

UTILITY CONSTRUCTION

FORSYTH COUNTY

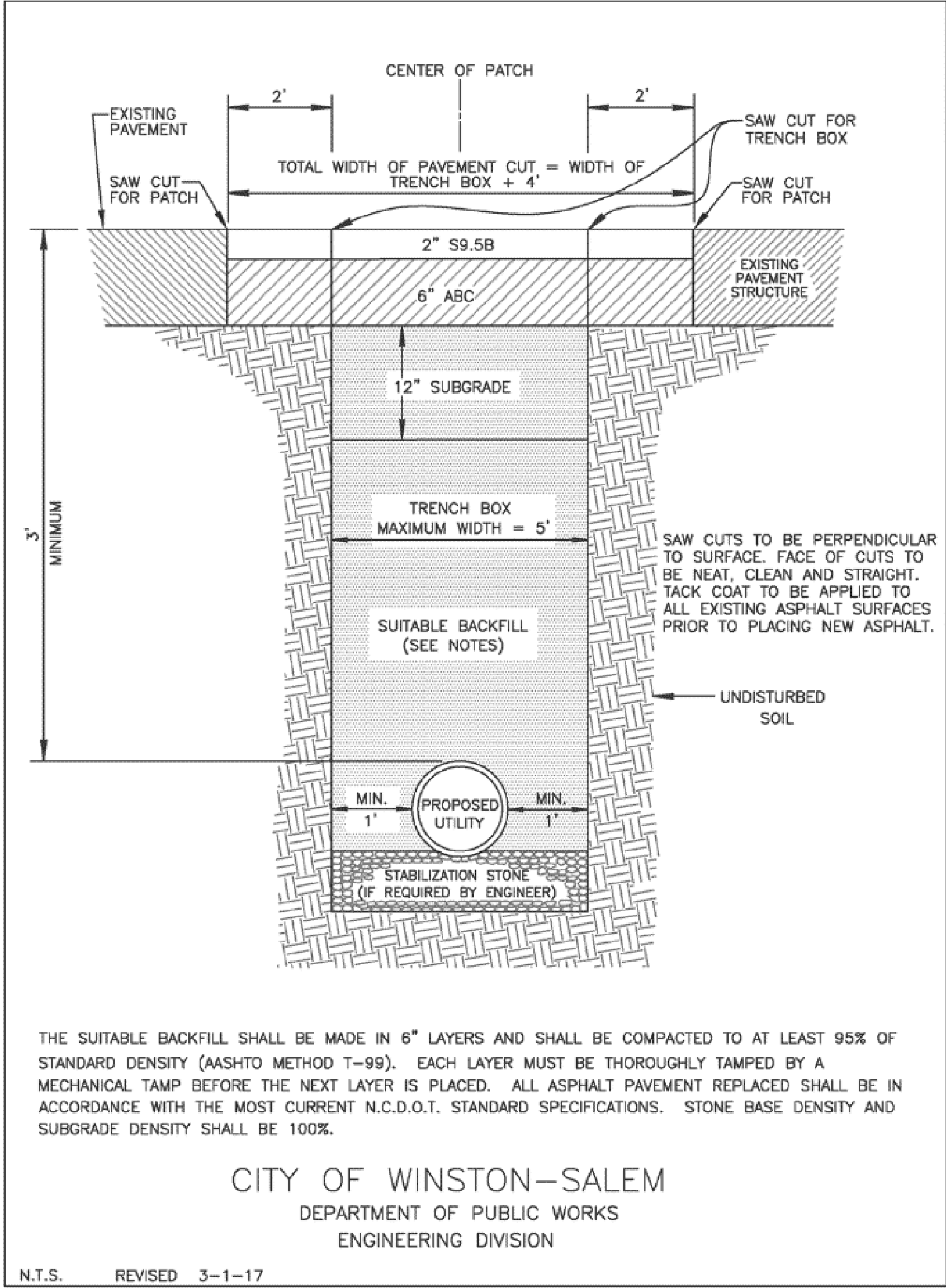
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DRAWN BY:	ELM		
CHECKED BY:	MUP		
APPROVED BY:	MUP		
REVISED:			
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION			
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151		UTILITY CONSTRUCTION PLANS ONLY	
UTILITY CONSTRUCTION			
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			

PROJECT REFERENCE NO.		SHEET NO.	
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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

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

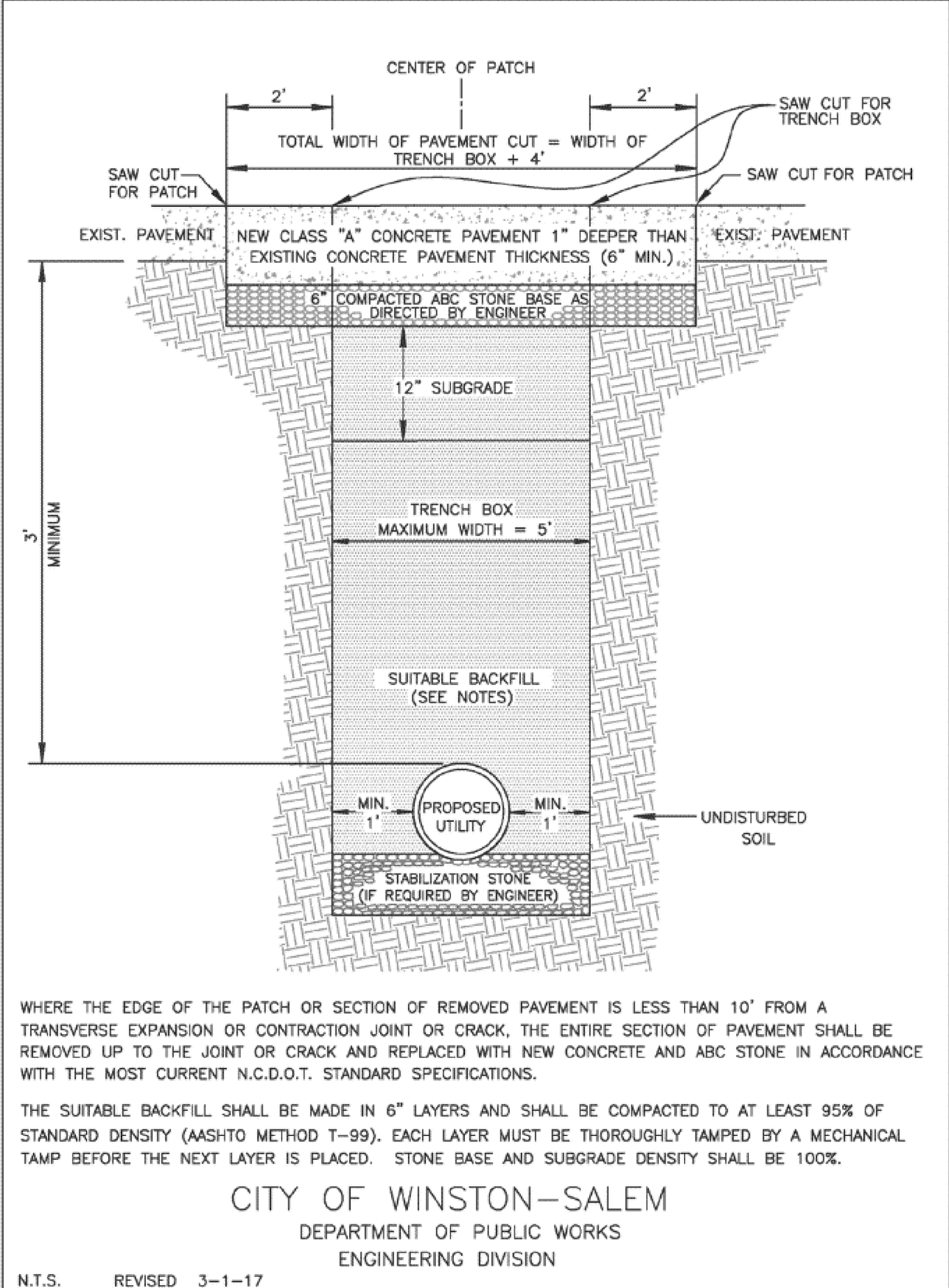
Asphalt Driveway Repair



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C-3

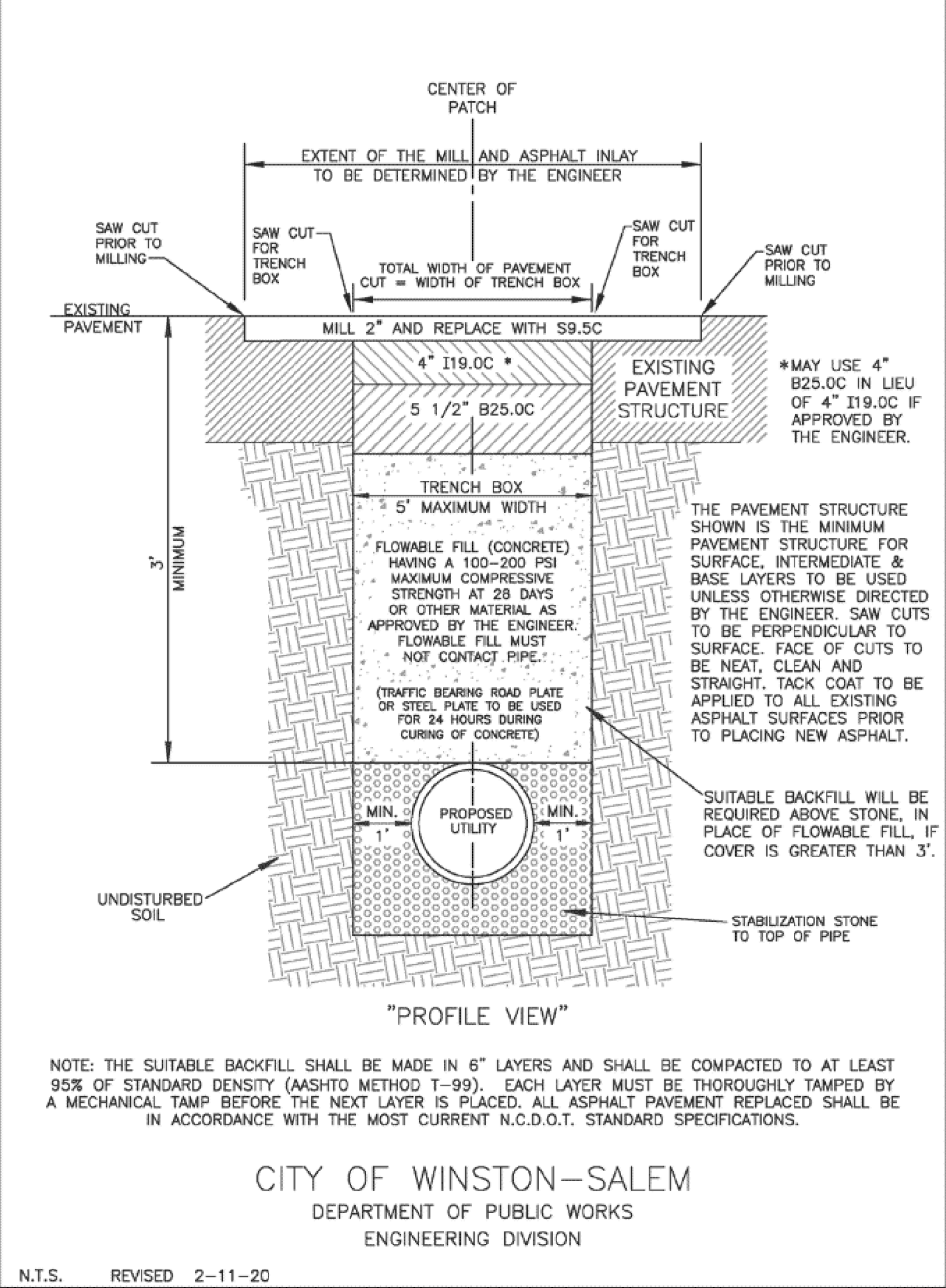
Concrete Pavement and Driveway Repair



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C-4

Mill and Patch Method - Option A (For State Maintained Roads)



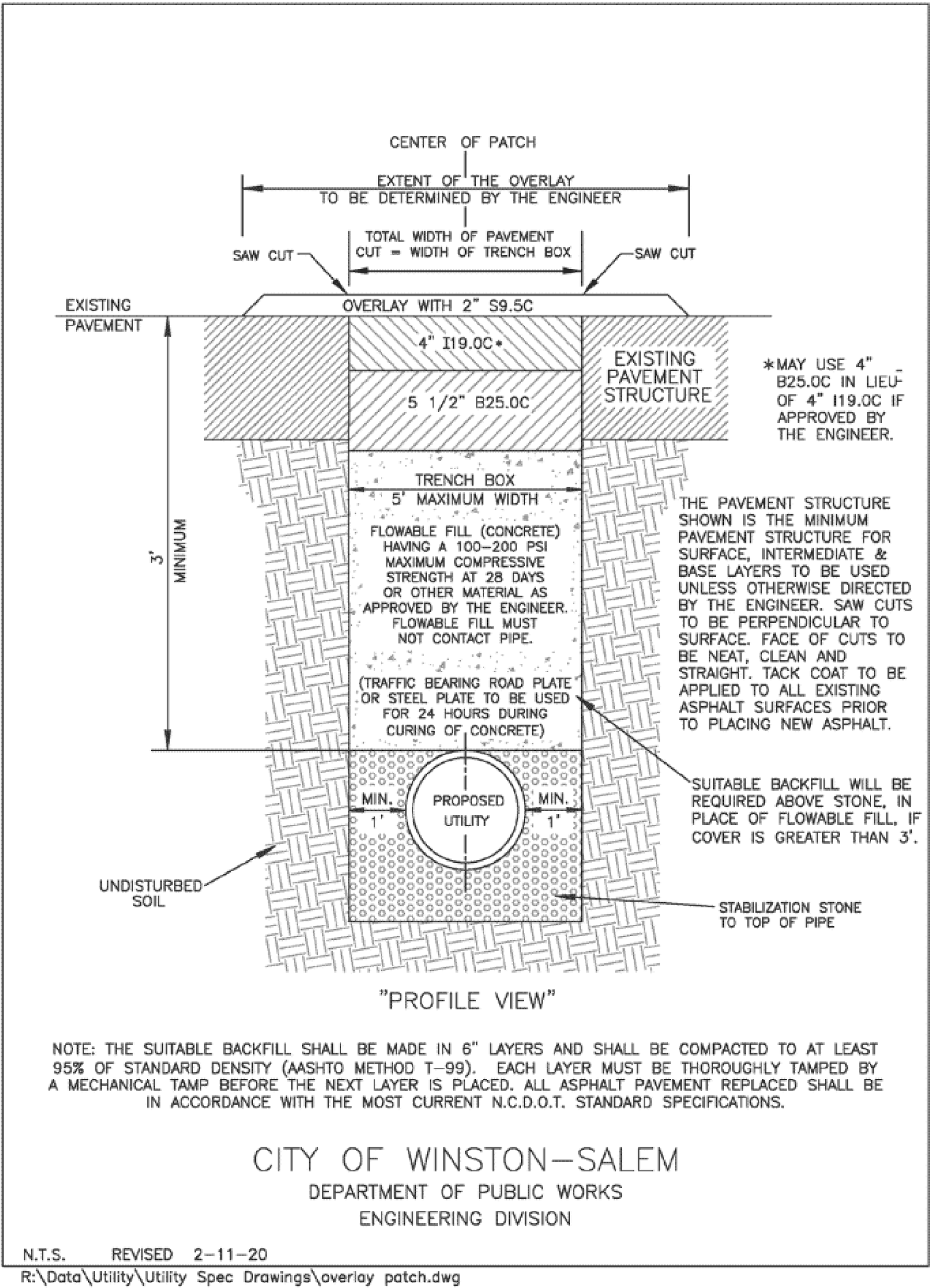
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C-5

FORSYTH COUNTY

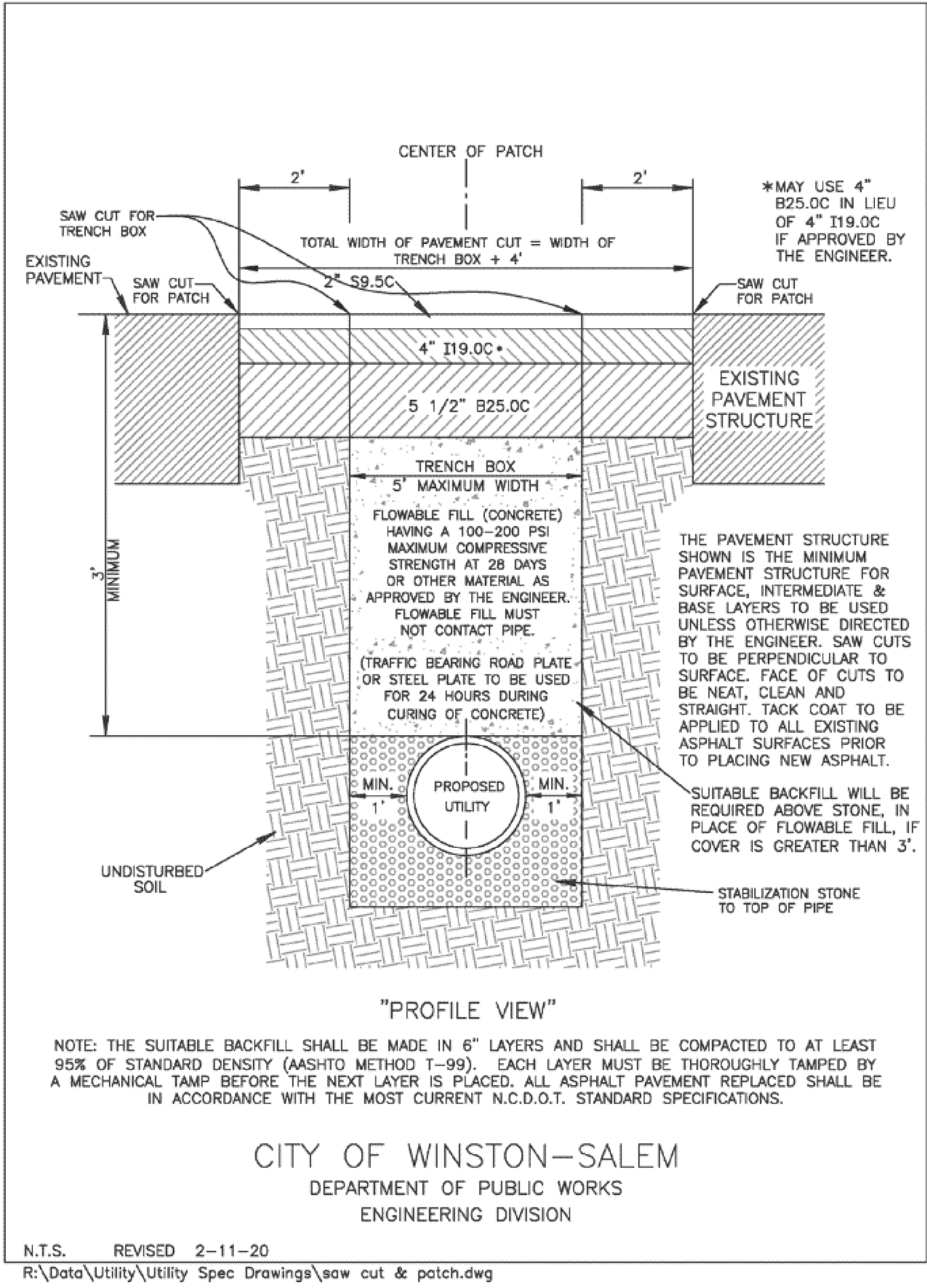
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U-6005		UC-3C
DESIGNED BY:	ELM	SEAL 20212 2/12/2025 11:30 AM EST
DRAWN BY:	ELM	
CHECKED BY:	MUP	
APPROVED BY:	MUP	
REVISED:		
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION		
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151		UTILITY CONSTRUCTION PLANS ONLY
UTILITY CONSTRUCTION		
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		

Overlay and Patch Method - Option B (For State Maintained Roads)



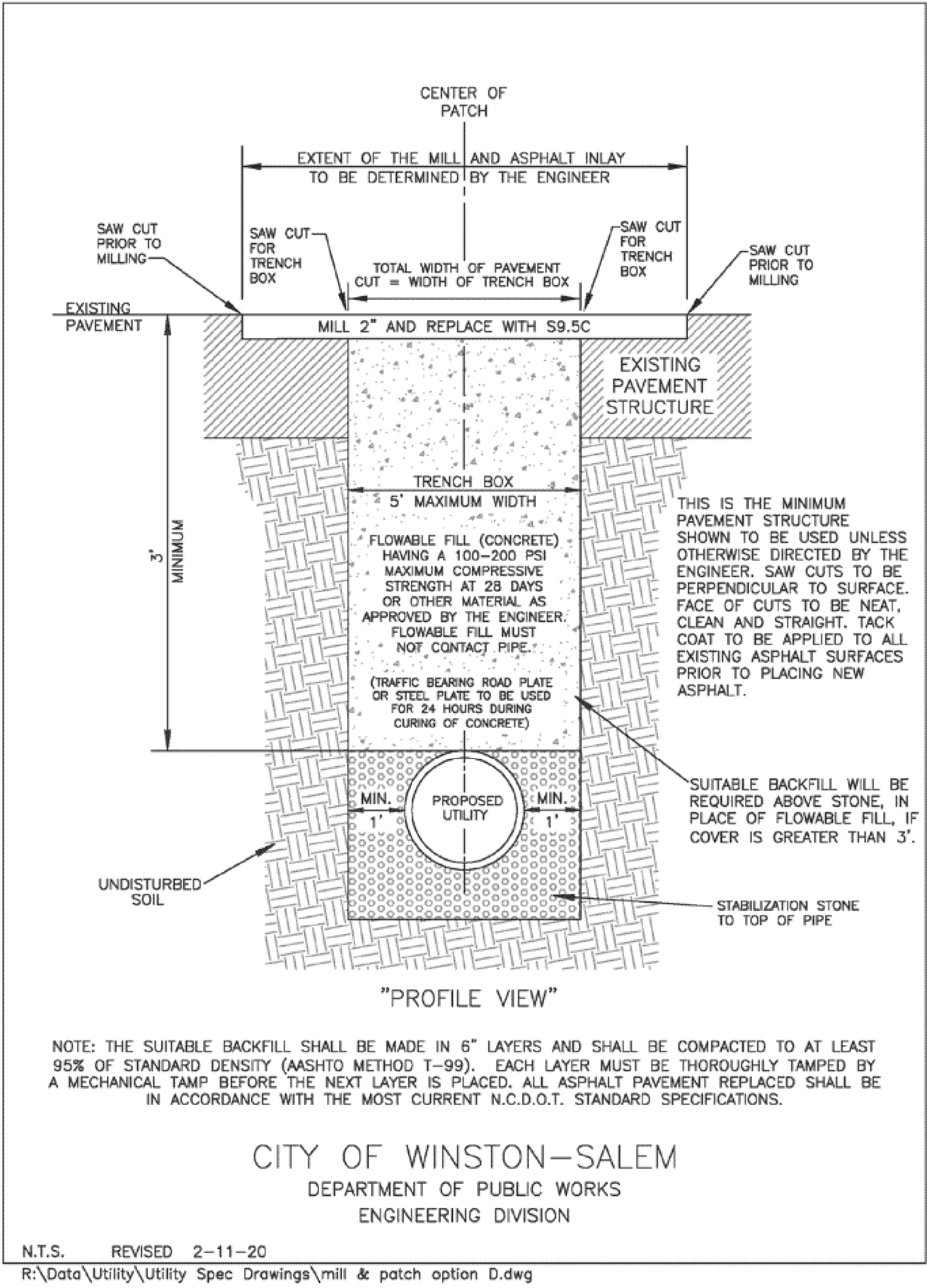
C-6

Saw Cut and Patch Method - Option C (For State Maintained Roads)



C-7

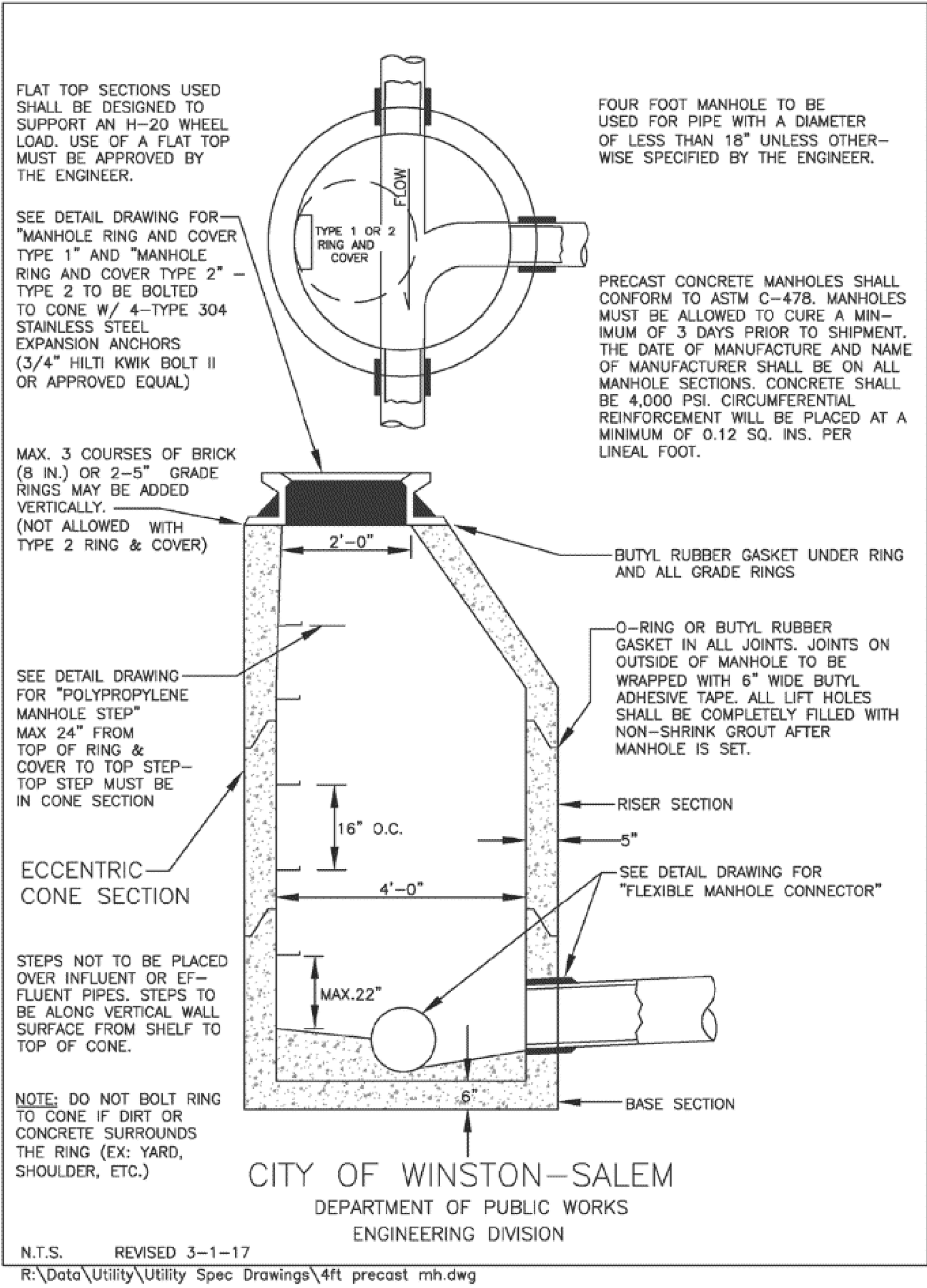
Mill and Patch Method - Option D (For State Maintained Roads)



C-8

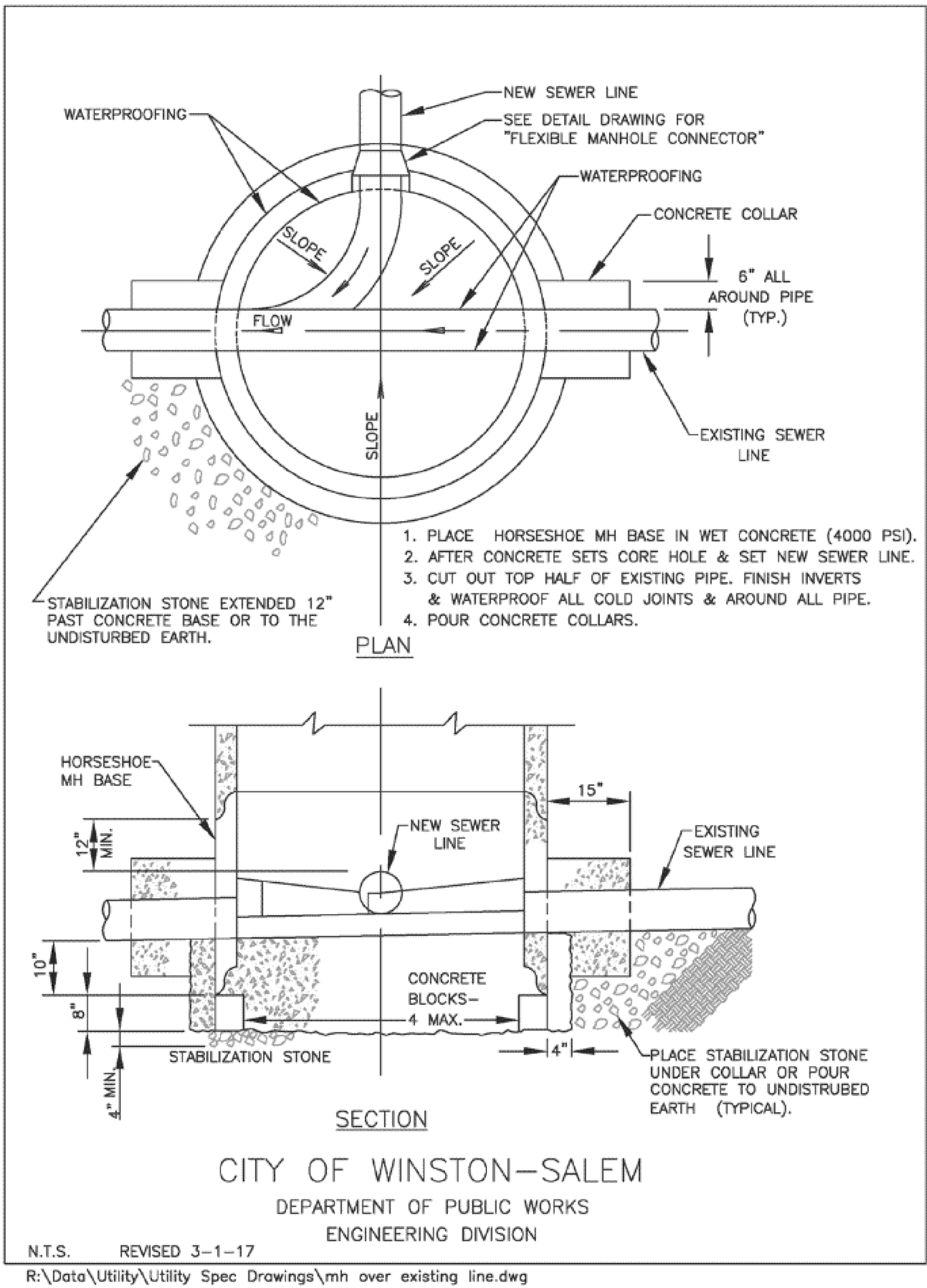
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DRAWN BY:	ELM	
CHECKED BY:	MUP	
APPROVED BY:	MUP	
REVISED:		
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION		UTILITY CONSTRUCTION PLANS ONLY
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151		
UTILITY CONSTRUCTION		
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		

4' Precast Reinforced Concrete Manhole



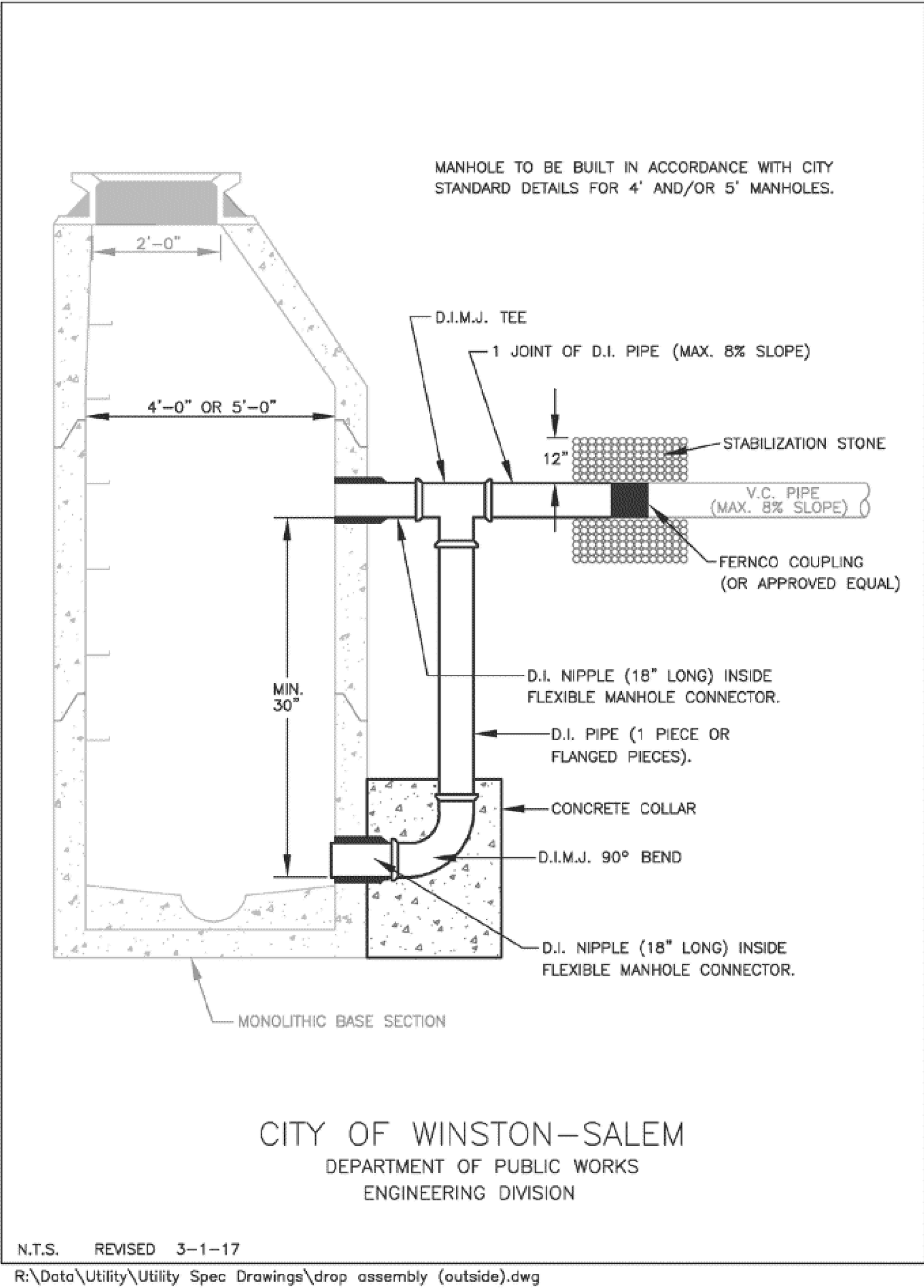
C-10

Manhole Built Over Existing Line



C-13

Drop Assembly (Outside)



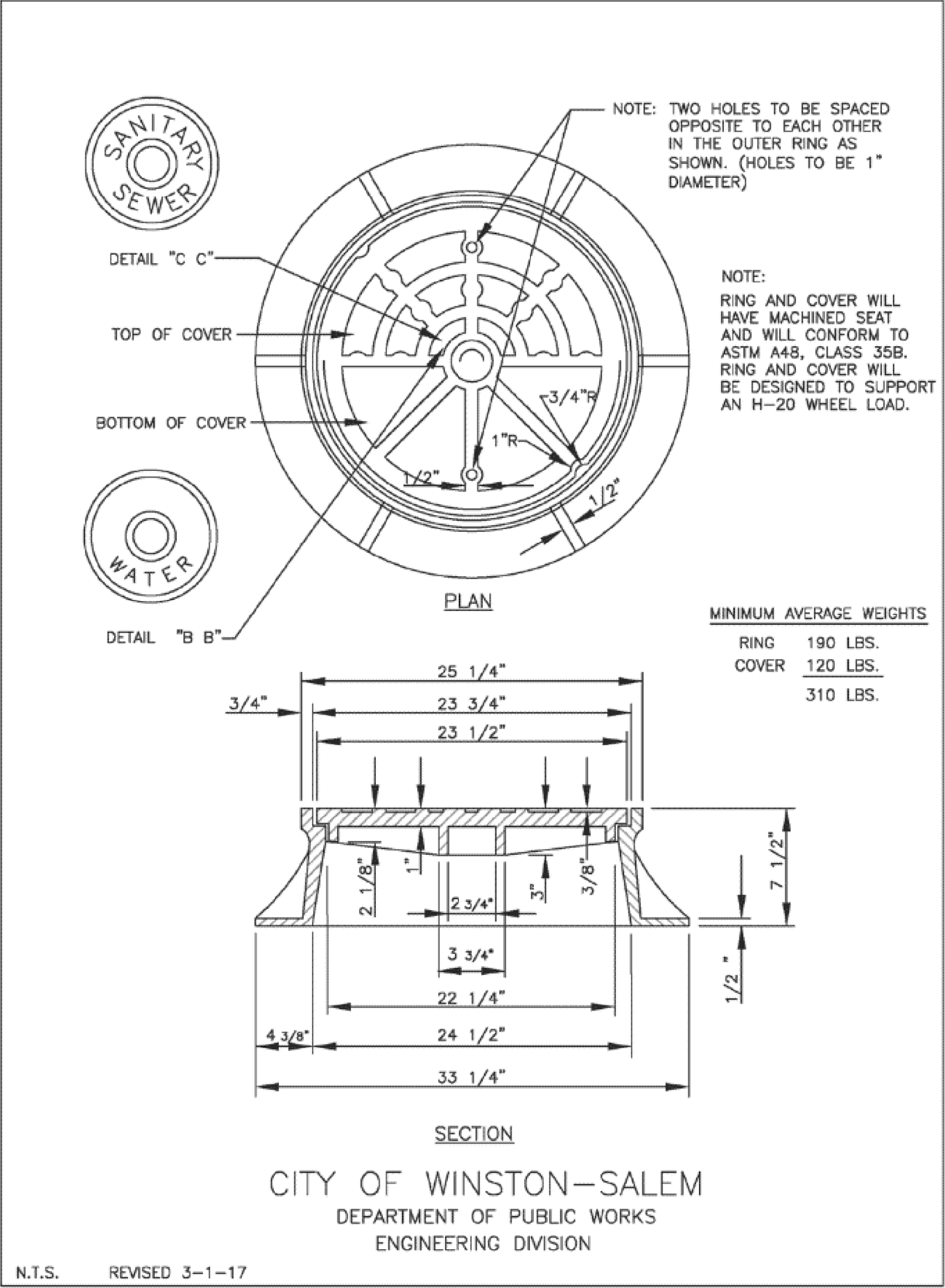
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PROJECT REFERENCE NO.		SHEET NO.	
U-6005		UC-3E	
DESIGNED BY:	ELM		
DRAWN BY:	ELM		
CHECKED BY:	MUP		
APPROVED BY:	MUP		
REVISED:		NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC.		UTILITY CONSTRUCTION PLANS ONLY	
PHONE: (919) 707-6690			
FAX: (919) 250-4151			

UTILITY CONSTRUCTION

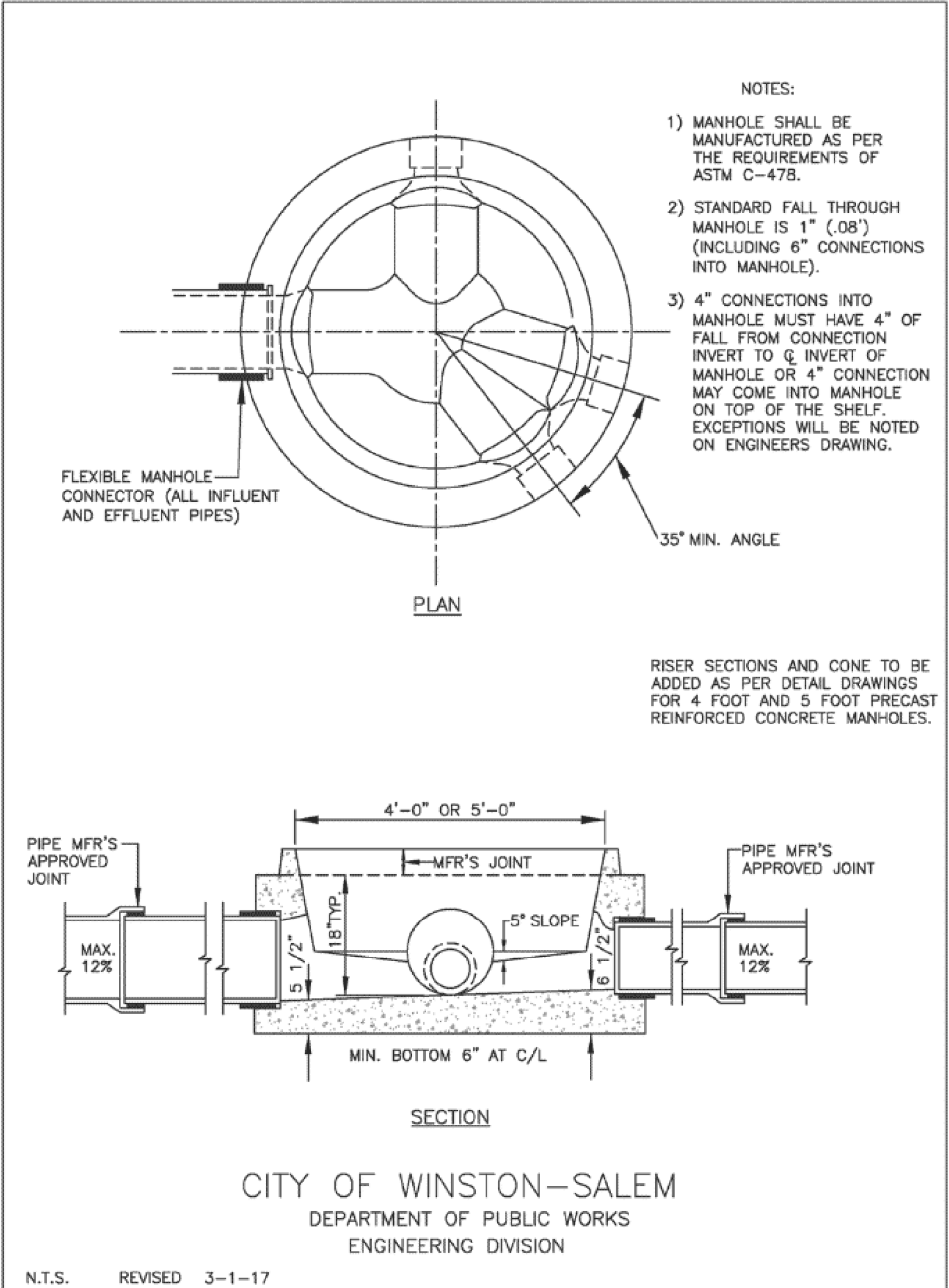
**DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED**

Manhole Ring and Cover (Type 1)



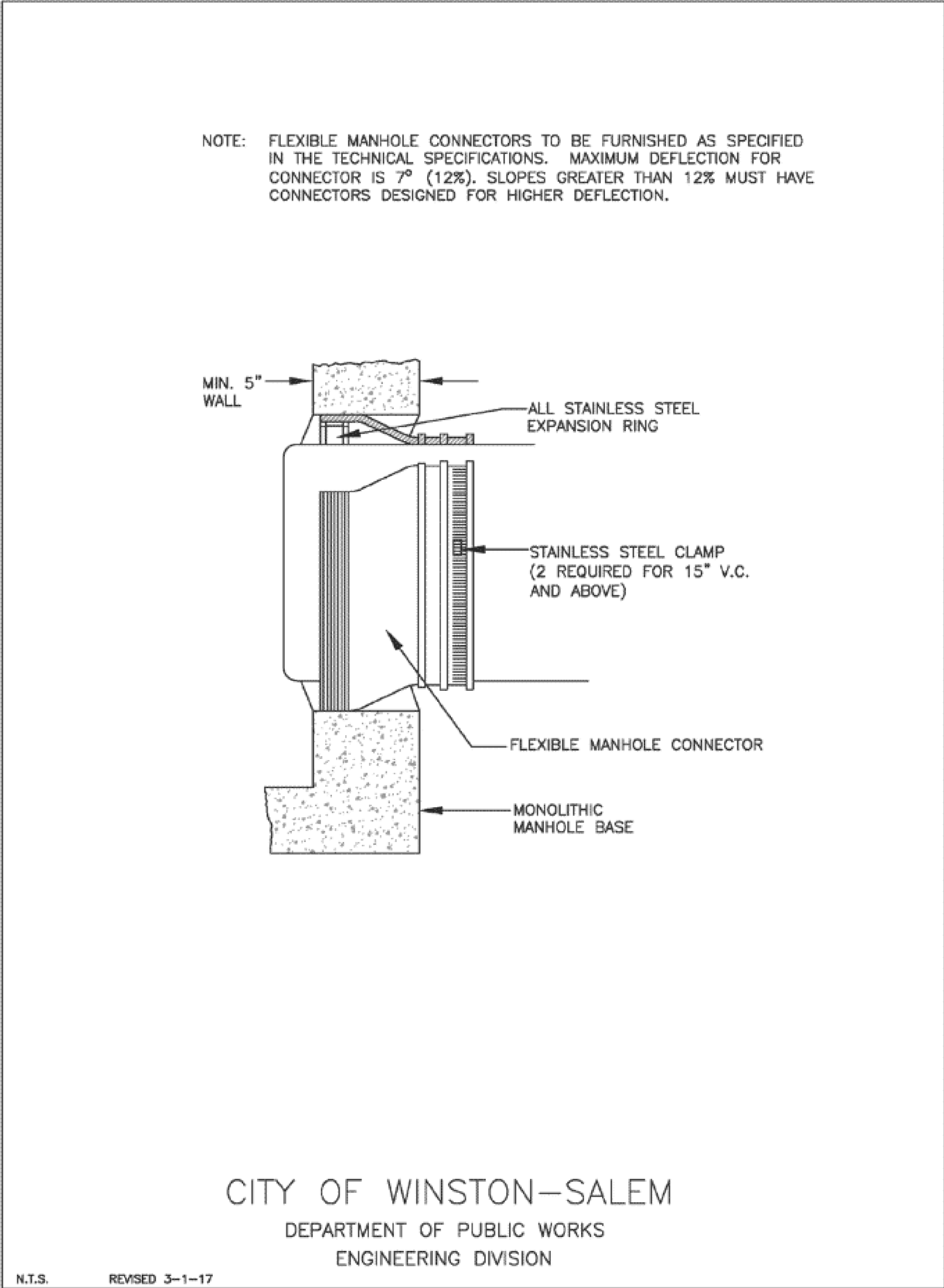
R:\Data\Utility\Utility Spec Drawings\mh ring & cover type 1.dwg

Precast Reinforced Concrete Manhole with Precast Invert



R:\Data\Utility\Utility Spec Drawings\precast mh with precast invert.dwg

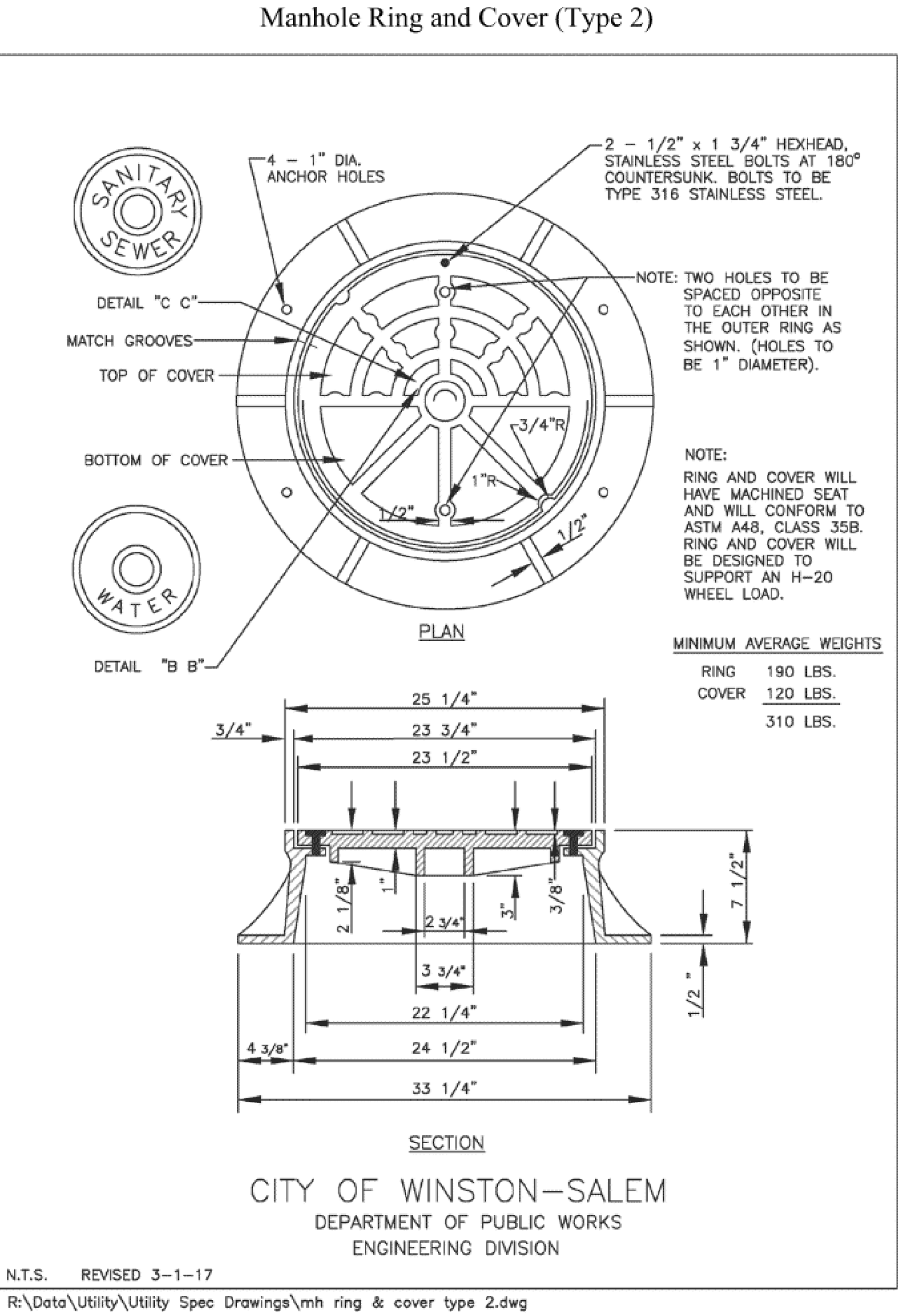
Flexible Manhole Connector



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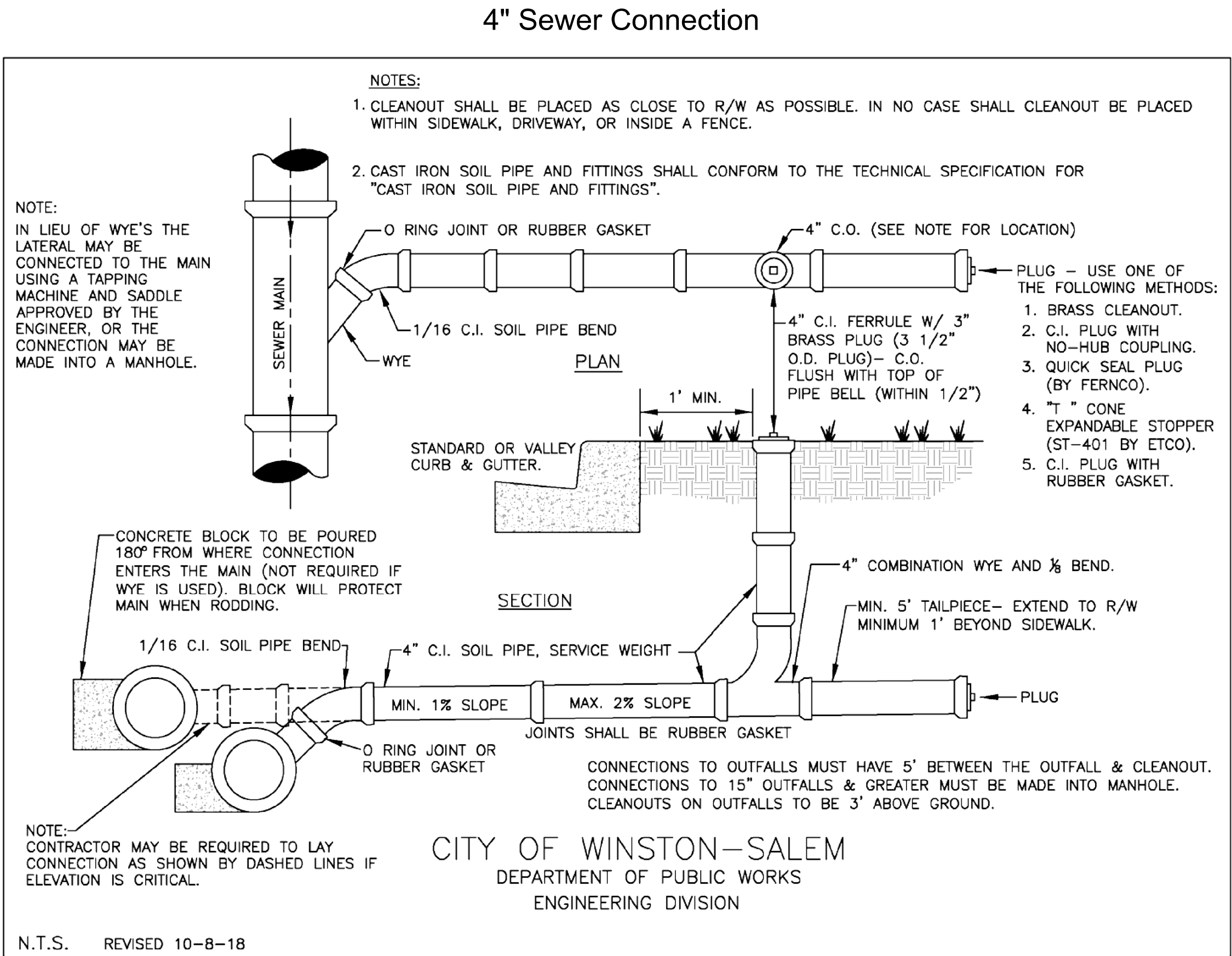
12/1/23

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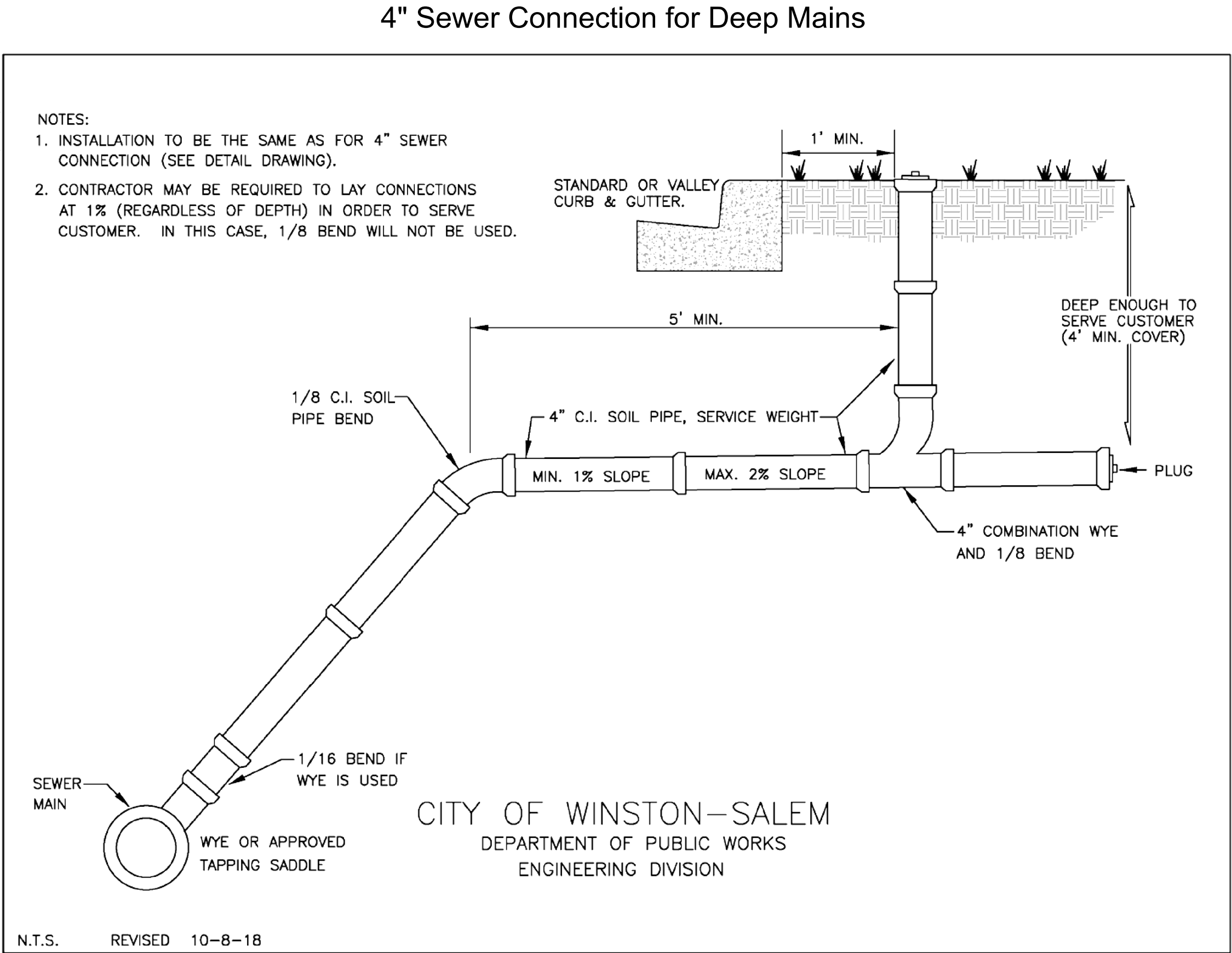


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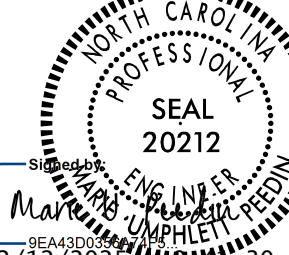
C-22



C-23

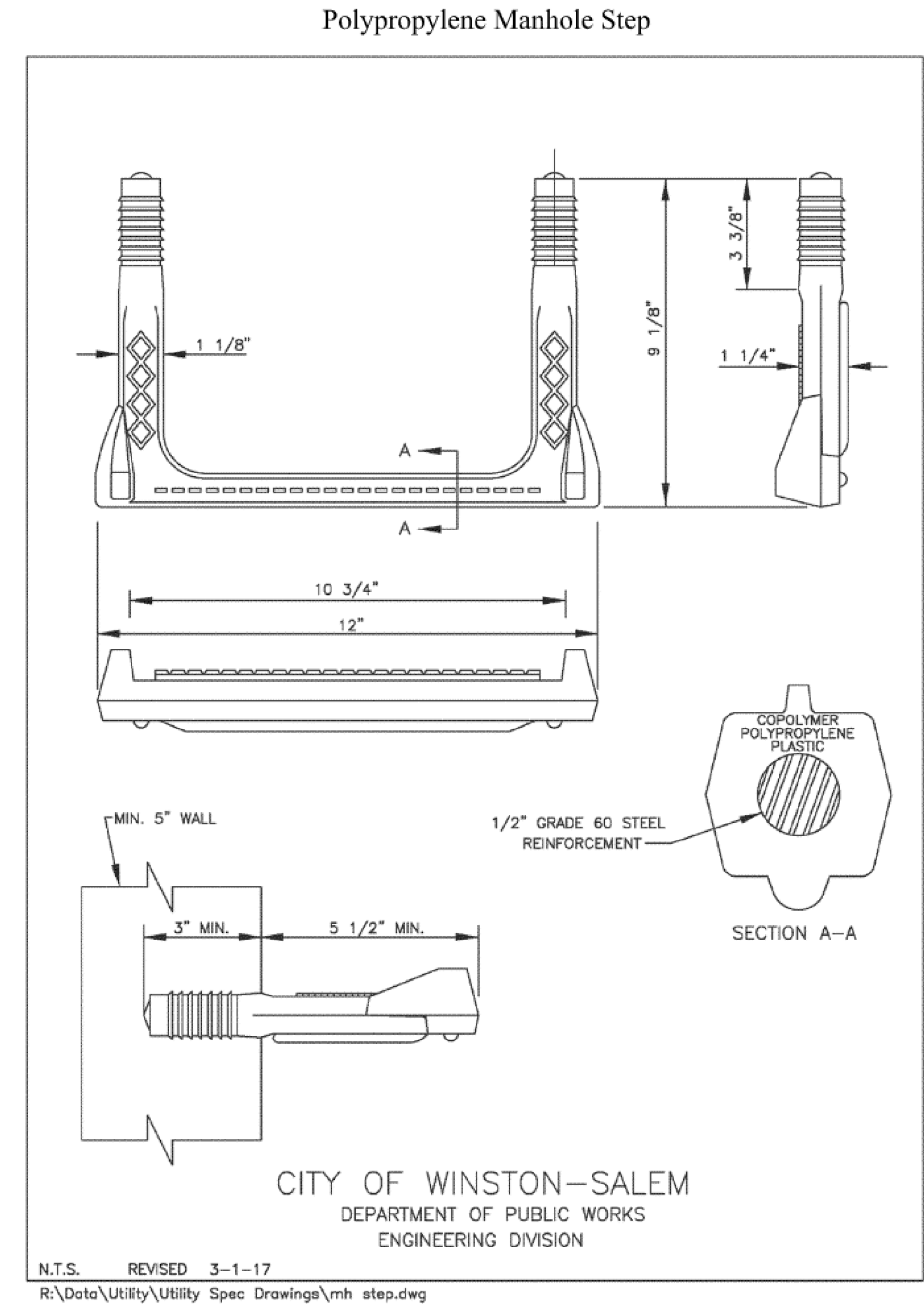


FORSYTH COUNTY

PROJECT REFERENCE NO.		SHEET NO.	
U-6005		UC-3F	
DESIGNED BY: ELM		UTILITY CONSTRUCTION PLANS ONLY	
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			
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			

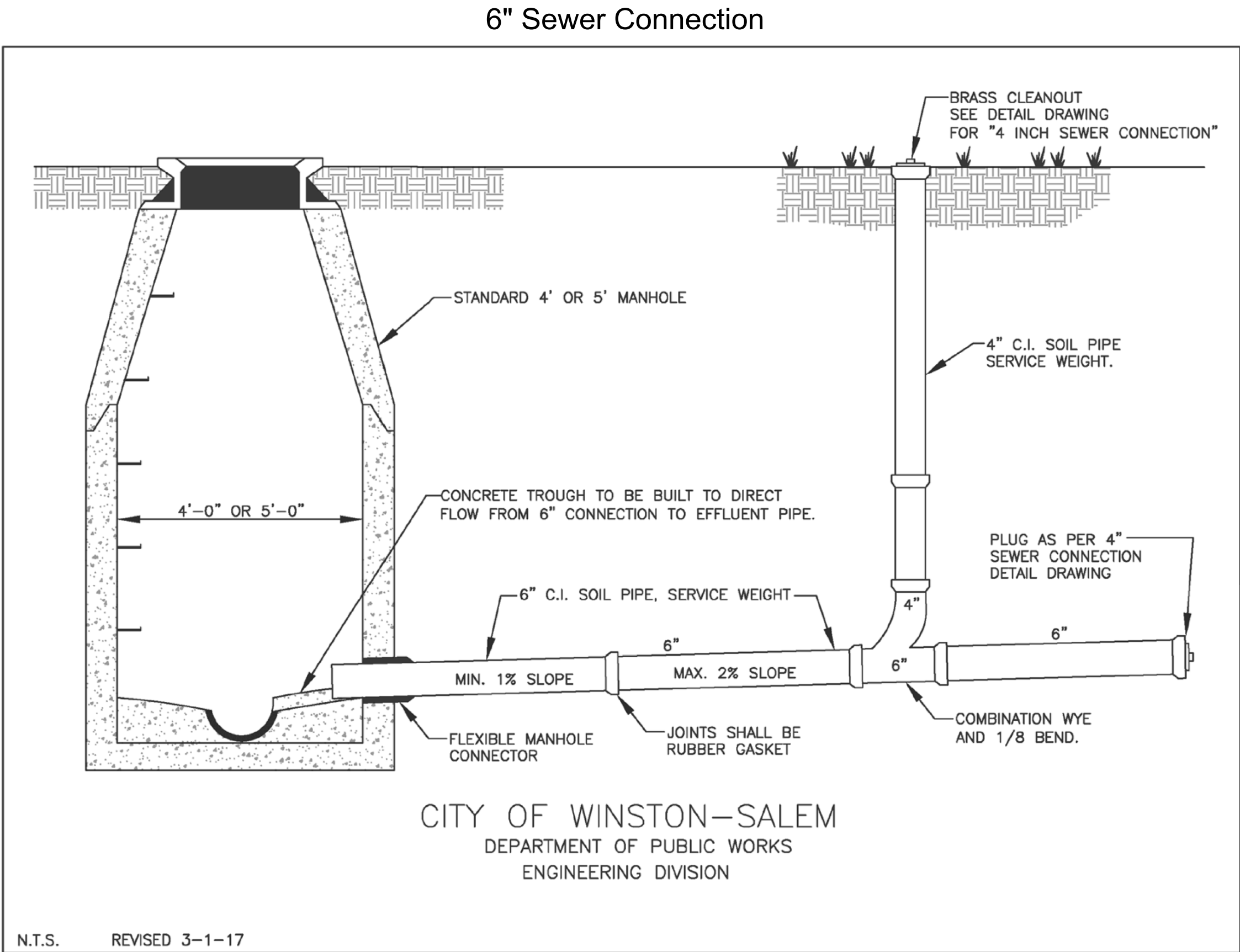
12/1/23

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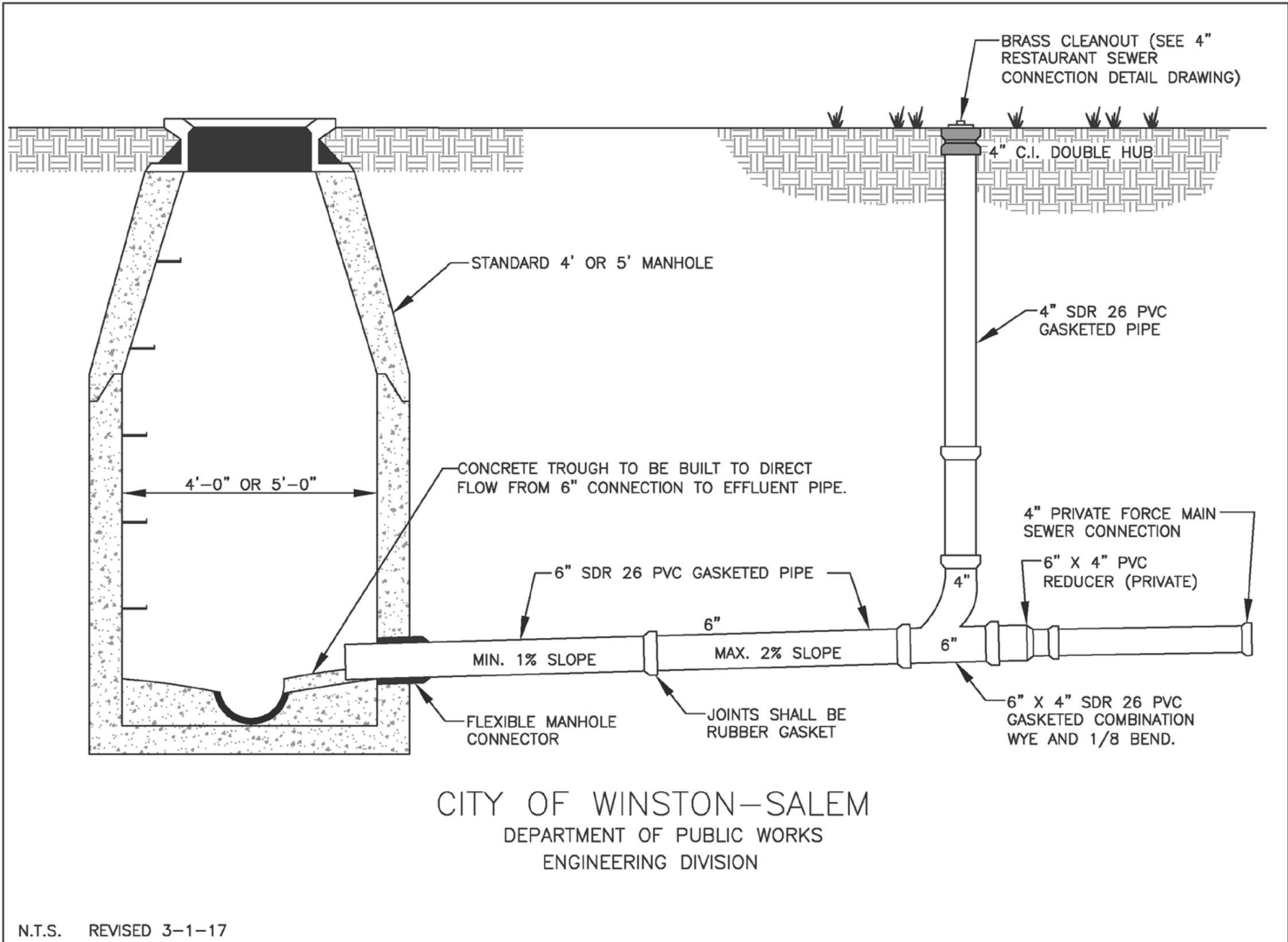


C-21

C-24



C-28



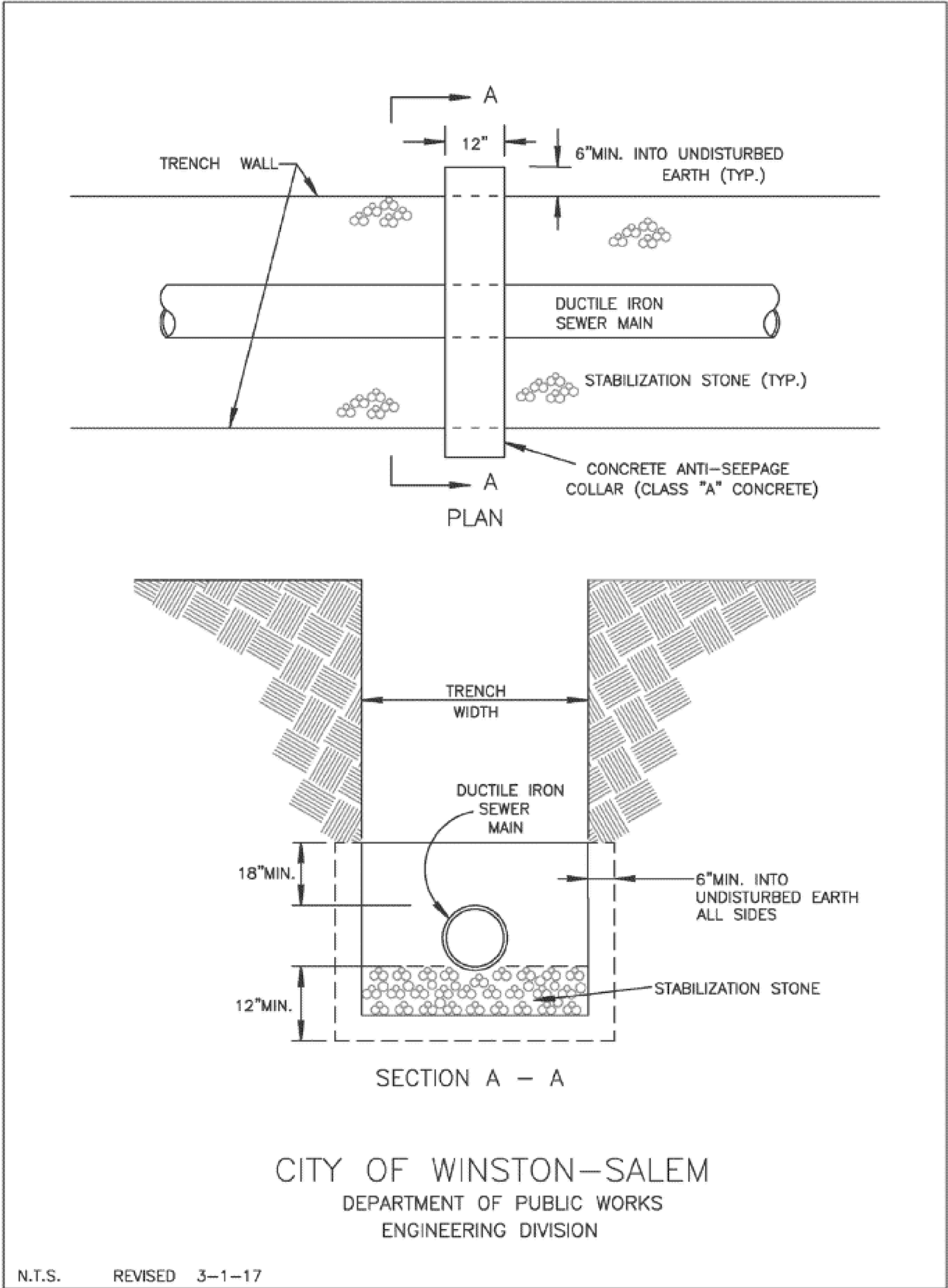
FORSYTH COUNTY

PROJECT REFERENCE NO.		SHEET NO.	
U-6005		UC-3G	
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			
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			

FORSYTH COUNTY

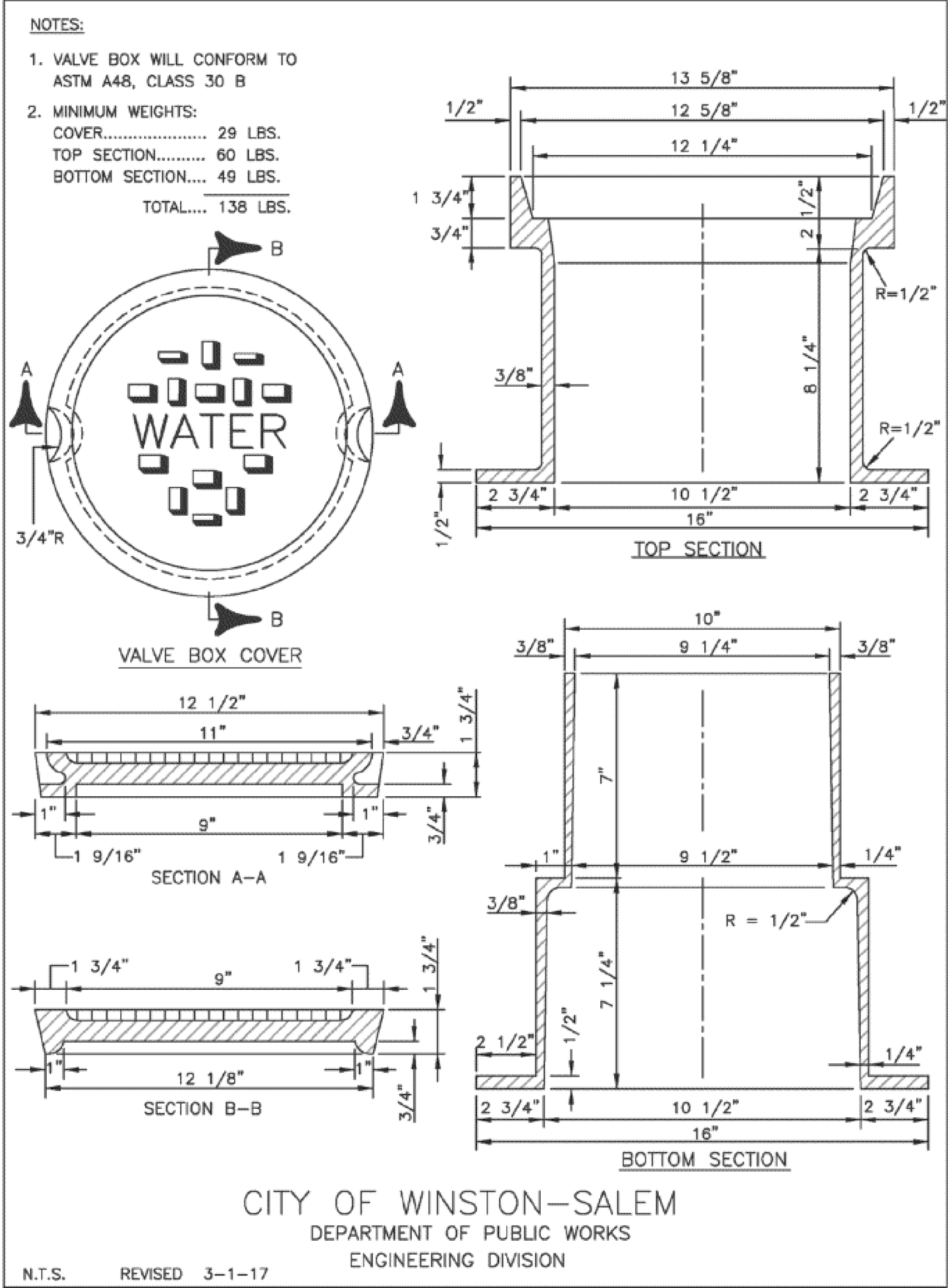
PROJECT REFERENCE NO.		SHEET NO.
U-6005		UC-3H
DESIGNED BY:	ELM	SEAL 20212 PROFESSIONAL ENGINEER 7/12/2025 9:41:30 AM EST
DRAWN BY:	ELM	
CHECKED BY:	MUP	
APPROVED BY:	MUP	
REVISED:		
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION		
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151		UTILITY CONSTRUCTION PLANS ONLY
UTILITY CONSTRUCTION		
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		

Concrete Anti-Seepage Collar



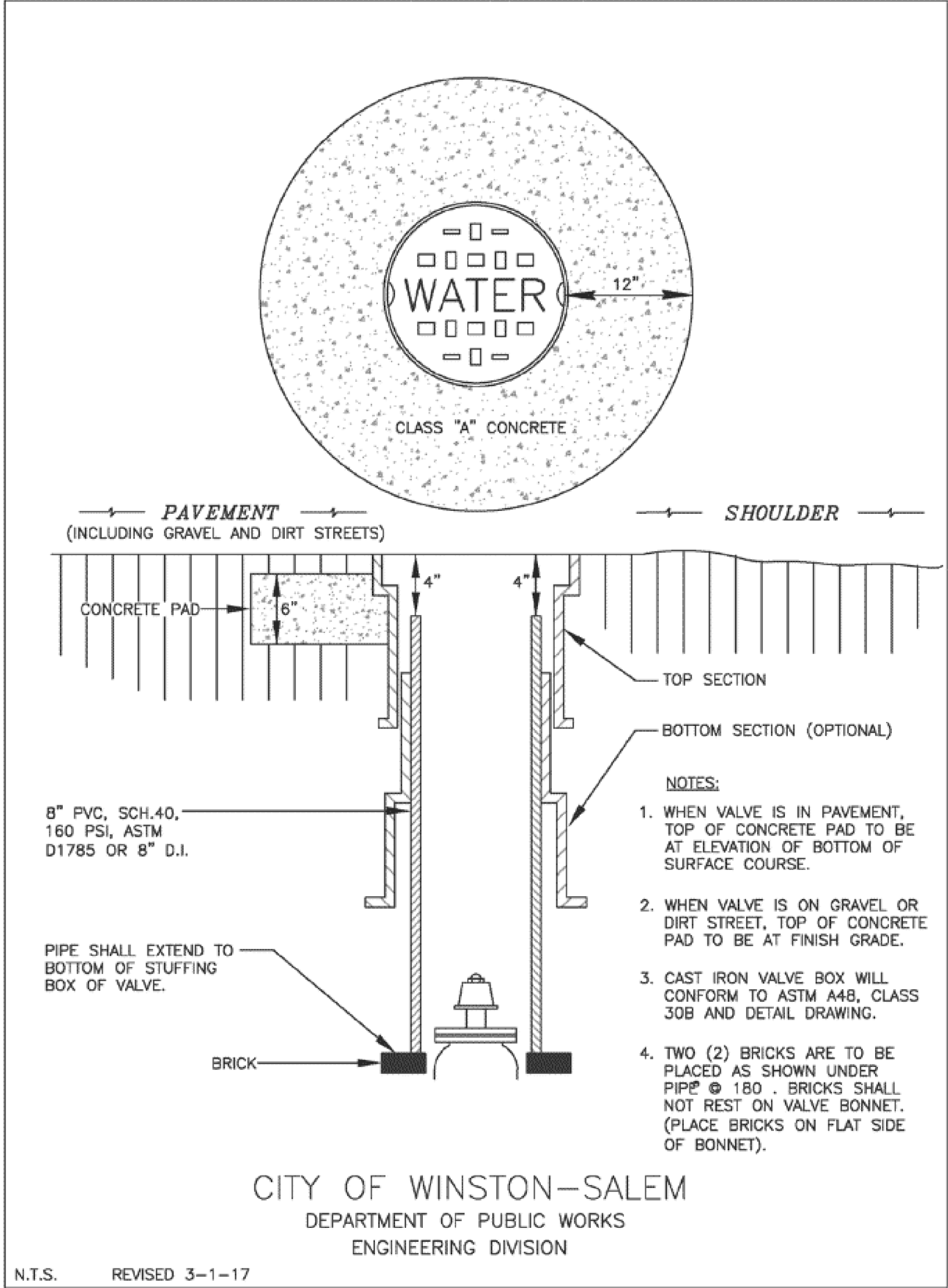
C-29

Cast Iron Valve Box



C-39

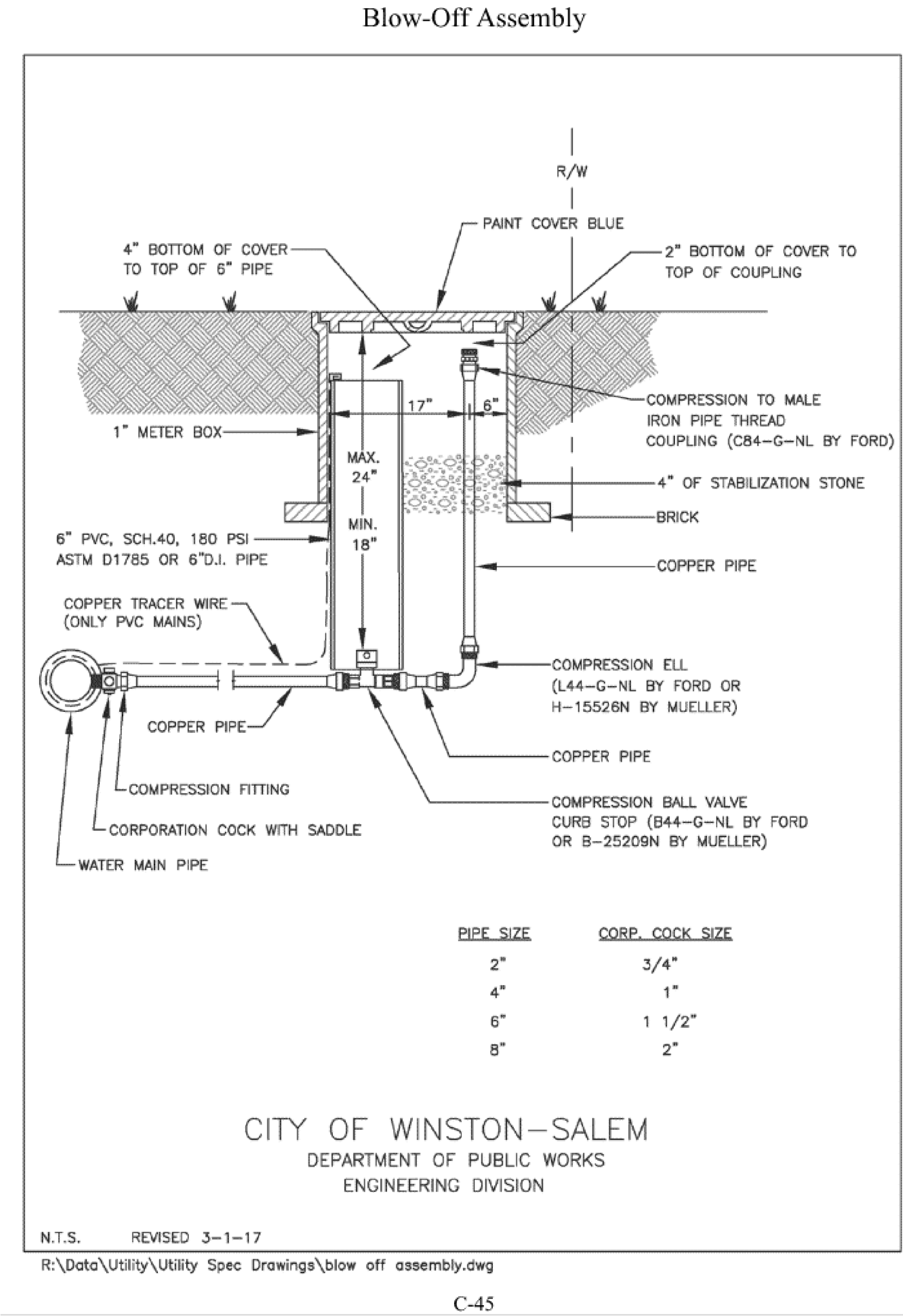
Valve Box Installation



C-40

12/1/23

V:\Aeneville\structures\31748-40 Johnston 50 BR-0026\Utilities\BR-0026-UTL-UC-3.dgn

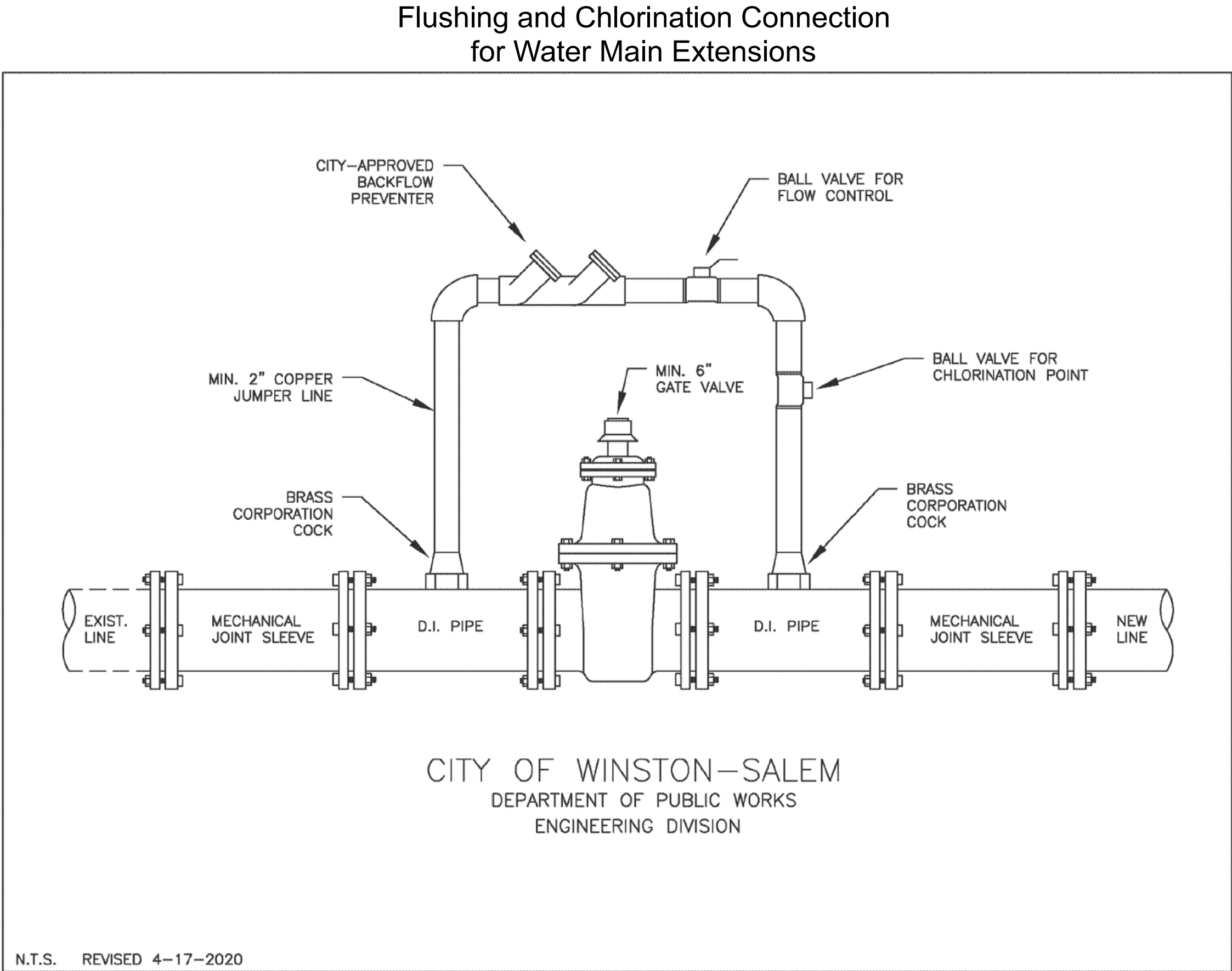
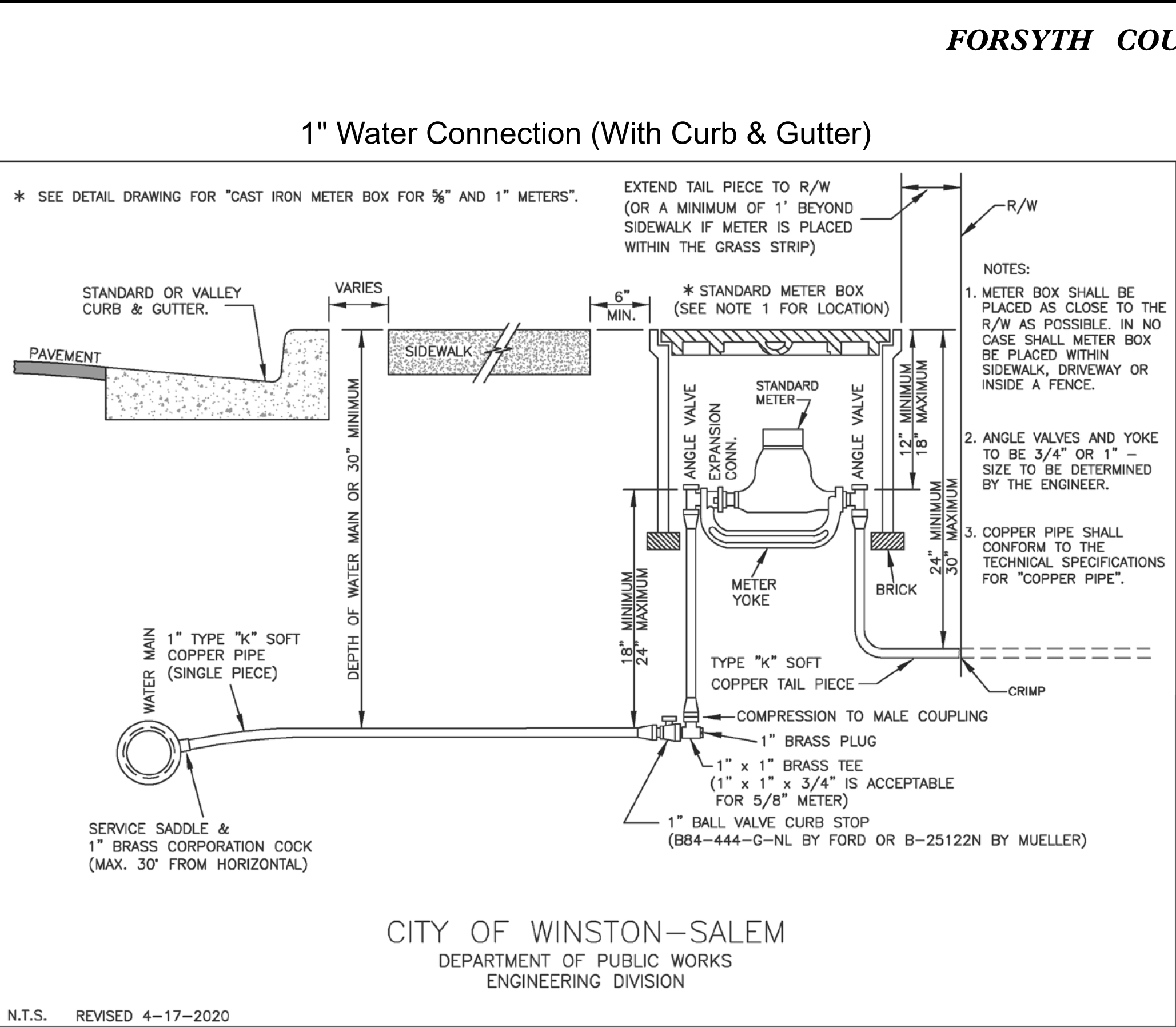


C-45

C-46

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C-55

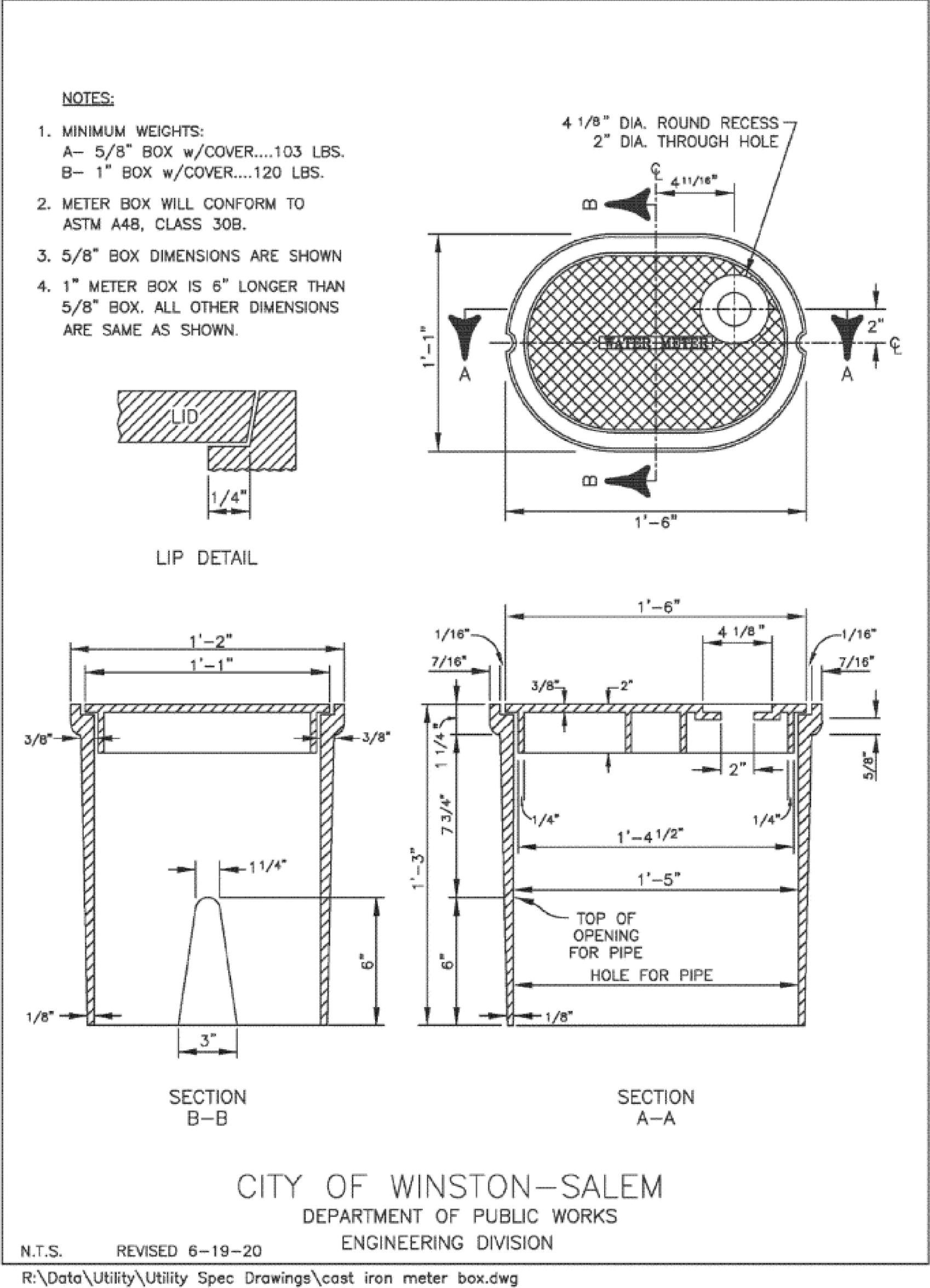


PROJECT REFERENCE NO.		SHEET NO.	
U-6005		UC-3K	
DESIGNED BY:	ELM		
DRAWN BY:	ELM		
CHECKED BY:	MUP		
APPROVED BY:	MUP		
REVISED:		NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151		UTILITY CONSTRUCTION PLANS ONLY	

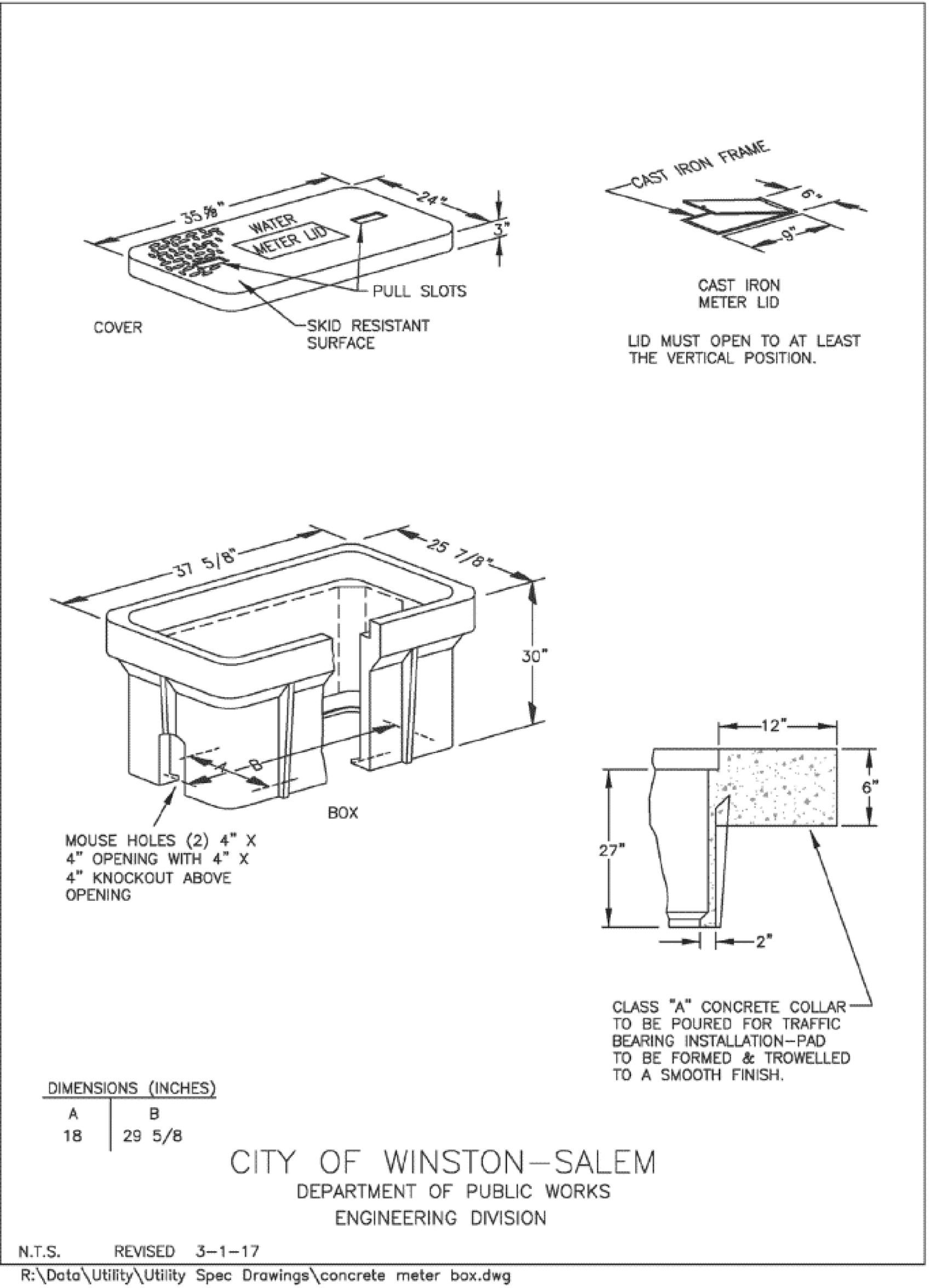
UTILITY CONSTRUCTION

**DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED**

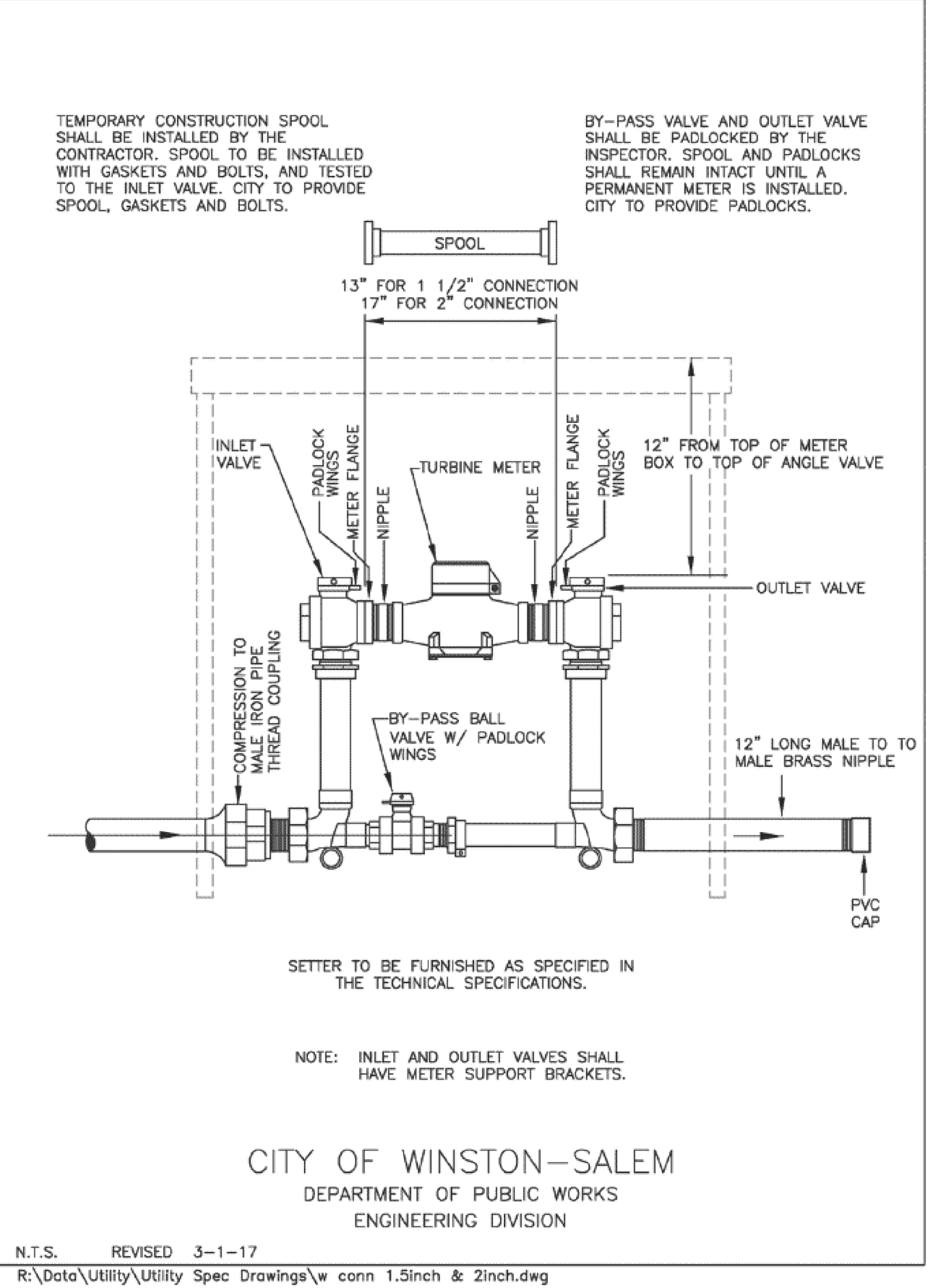
Cast Iron Meter Box for 5/8" and 1" Meters



Polymer Concrete Meter Box for 1 1/2" and 2" Meters



1 1/2" and 2" Water Connection



PROJECT REFERENCE NO.
U-6005

SHEET NO.
UC-3L

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

SEAL
20212

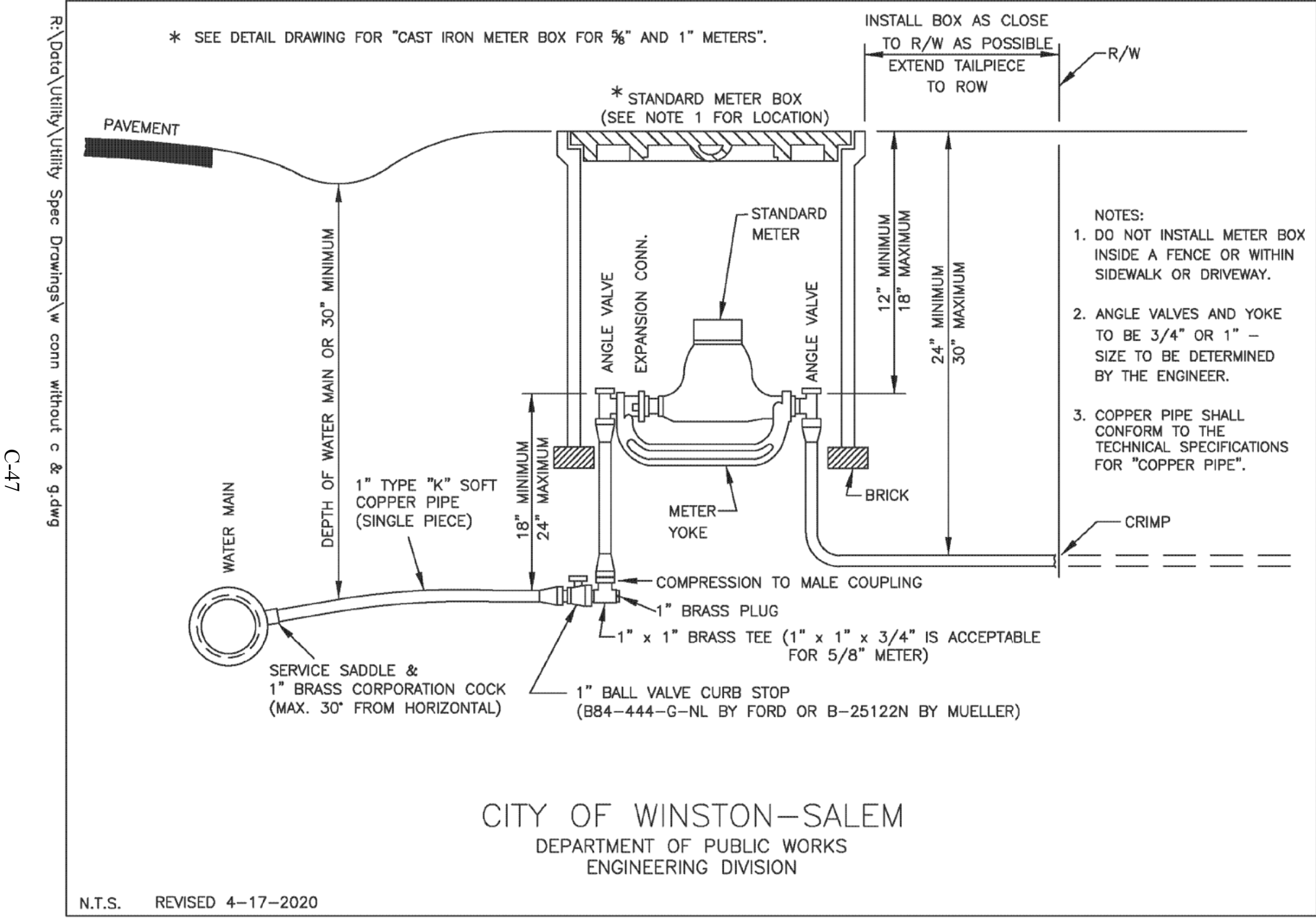
REGISTERED PROFESSIONAL
ENGINEER
MAY 1983
2/12/2025 11:41:30 AM EST

UTILITY CONSTRUCTION
PLANS ONLY

UTILITY CONSTRUCTION

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UNLESS ALL SIGNATURES COMPLETED

1" Water Connection (Without Curb & Gutter)



Horizontal & Vertical Up Bends

Pipe Size (inch)	Bend Angle	Pipeline Restraint Req. Each Side of Fitting (feet)
6"	11.25	8
	22.5	15
	45	31
	90	75
8"	11.25	10
	22.5	19
	45	40
	90	97
10"	11.25	12
	22.5	23
	45	48
	90	116
12"	11.25	13
	22.5	27
	45	56
	90	135
16"	11.25	17
	22.5	34
	45	71
	90	171

PIPE RESTRAINT CHARTS

Vertical Down Bends

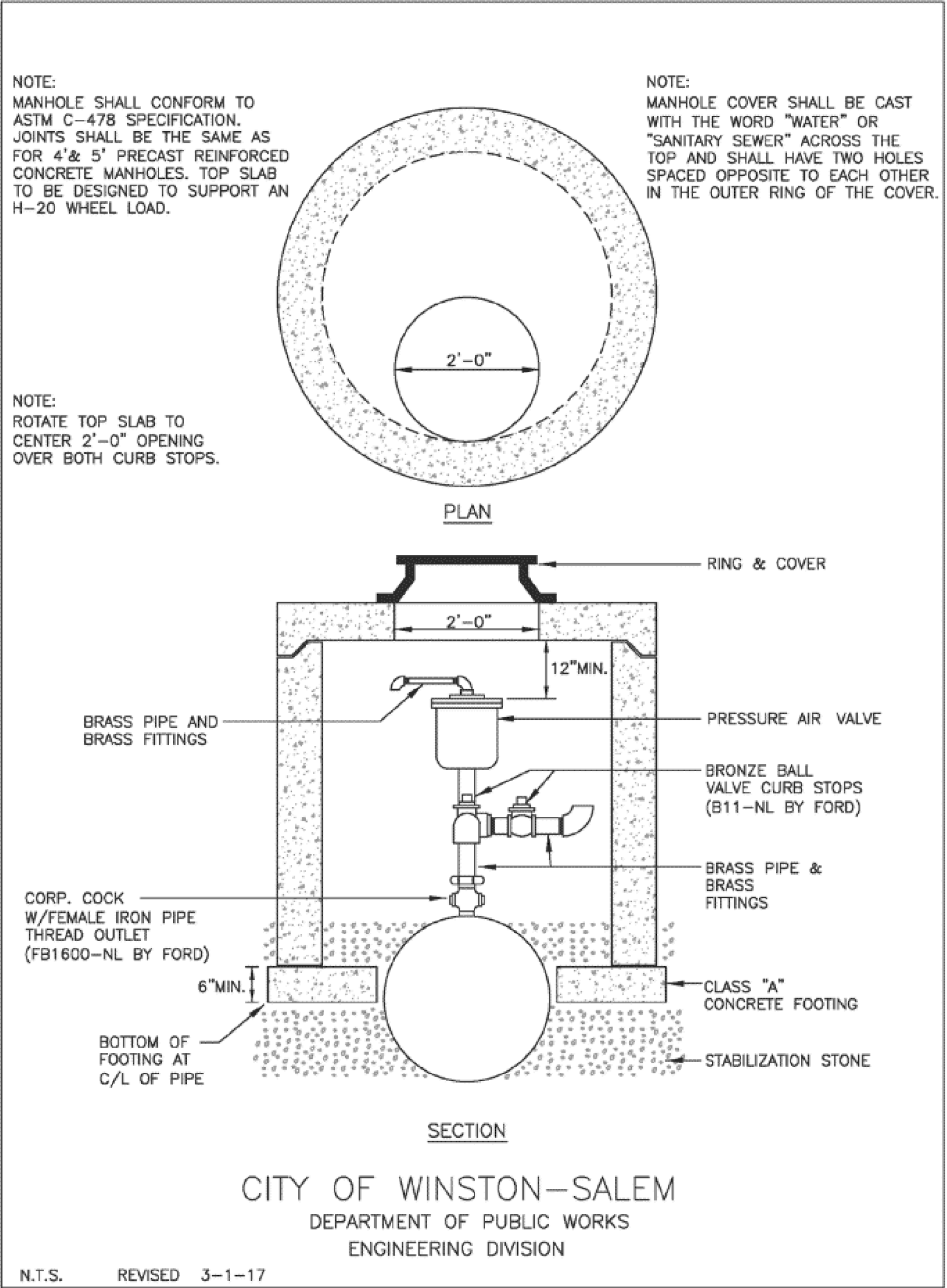
Pipe Size (inch)	Bend Angle	Pipeline Restraint Req. Each Side of Fitting (feet)
6"	11.25	16
	22.5	32
	45	66
	90	159
8"	11.25	20
	22.5	41
	45	85
	90	205
10"	11.25	25
	22.5	49
	45	102
	90	247
12"	11.25	29
	22.5	58
	45	120
	90	289
16"	11.25	37
	22.5	74
	45	153
	90	369

Tees, Reducers, Caps

Fitting	Size	Pipeline Restraint Req. Each Side of Fitting (feet)
Tee	4	68
	6	114
	8	160
	10	202
	12	244
	16	323
Reducer	6x4	120
	8x6	115
	10x4	488
	10x6	252
	10x8	104
	12x4	736
	12x6	422
	12x10	102
Cap	16x8	553
	16x10	360
	16x12	213
	4	112
	6	159
	8	205
	10	247
	12	289
	16	369

PROJECT REFERENCE NO.		SHEET NO.	
U-6005		UC-3M	
DESIGNED BY:	ELM	SEAL 20212 2/12/2025 9:41:30 AM EST 2/12/2025 9:41:30 AM EST	
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 PLANS ONLY			
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			

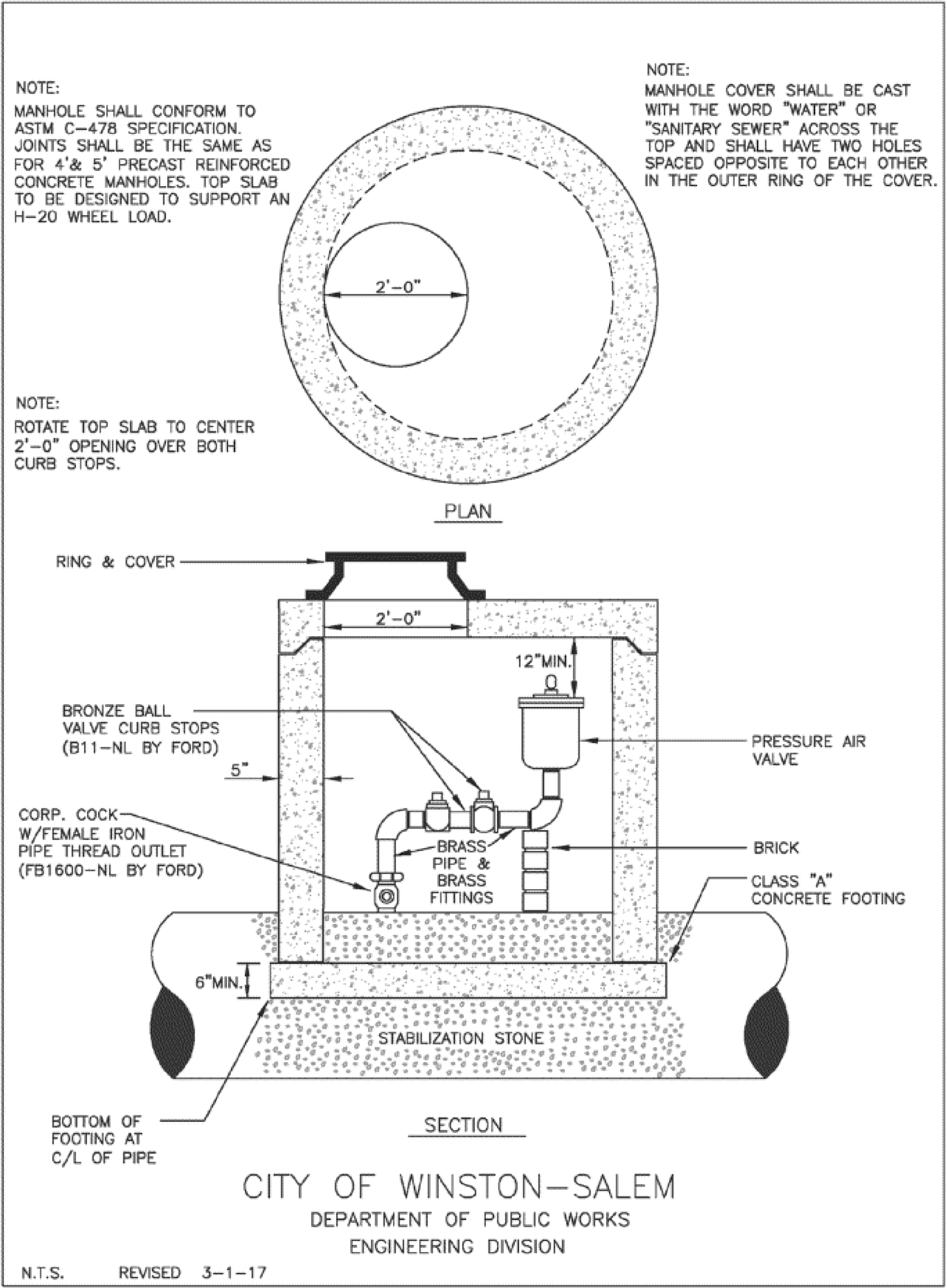
Air Release Valve (Section View)



R:\Data\Utility\Utility Spec Drawings\air release valve section view.dwg

C-52

Air Release Valve (Profile View)



R:\Data\Utility\Utility Spec Drawings\air release valve profile view.dwg

C-53

5 2.5 0 5 1

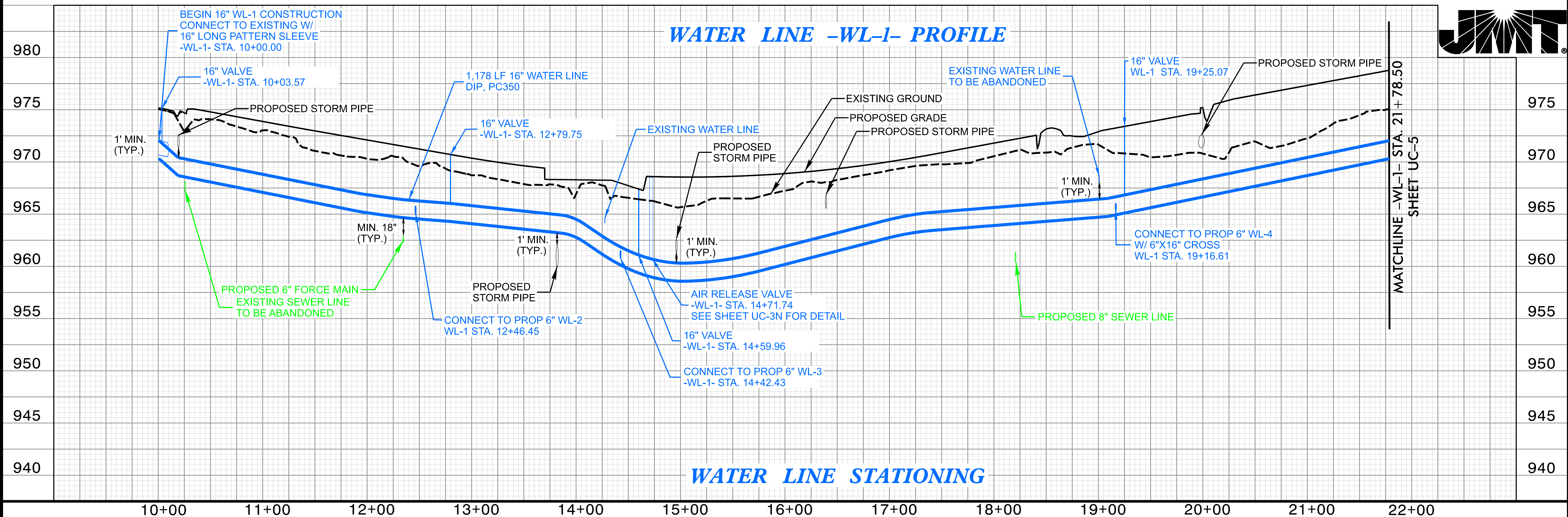
PROFILE SCALE: VERT. 1" = 5'

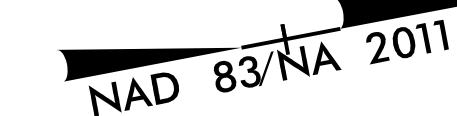
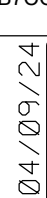
PLAN SCALE: HORIZ. 1" = 50'

NAD 83/NA 2011

Signed by: Lauren E. Peerdin
 2012
 NORTH CAROLINA PROFESSIONAL SEAL
 COMPLETE PEEDIN
 05/2022 06 PM

UTILITY CONSTRUCTION





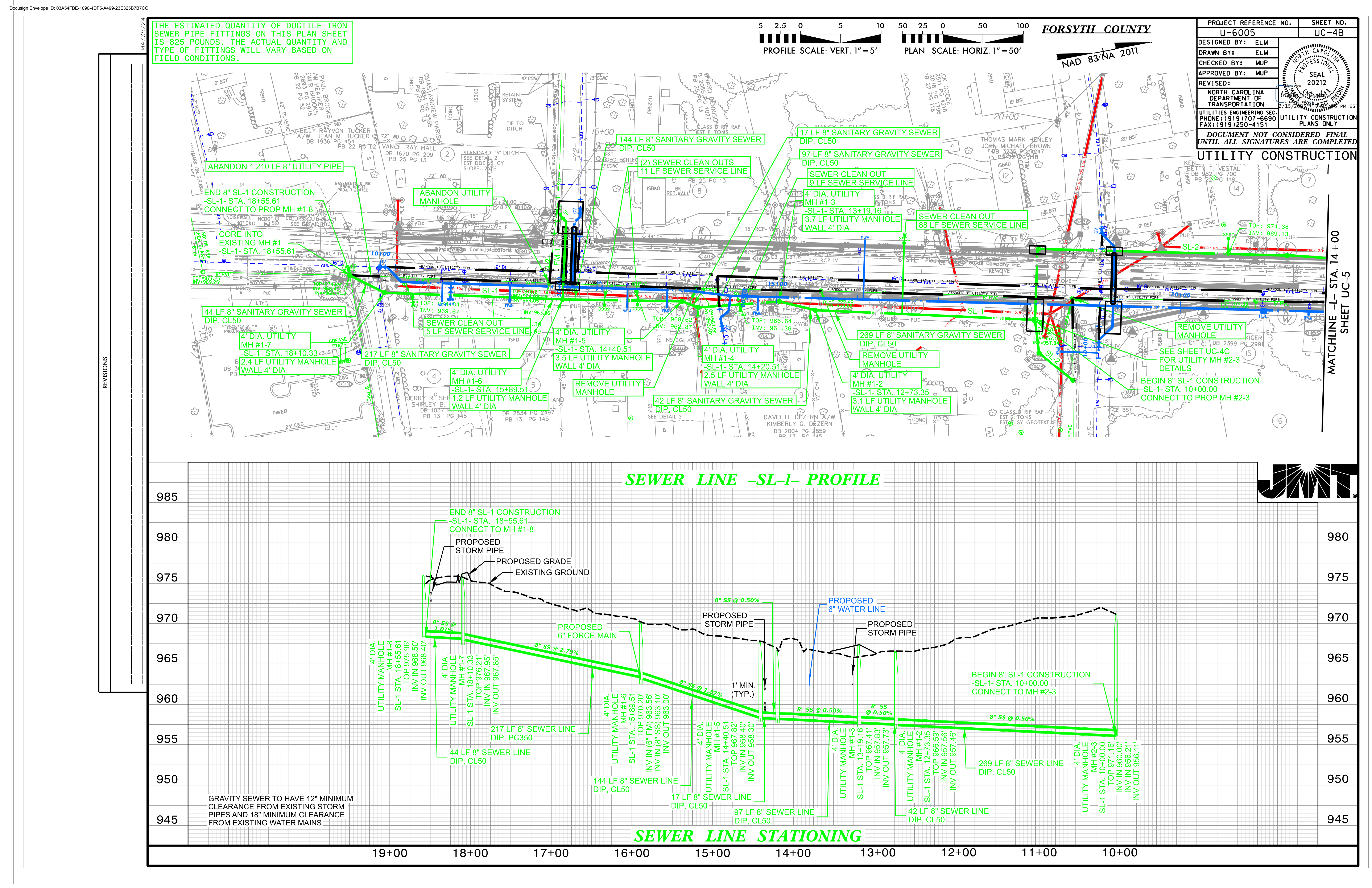
Signed by:

NORTH CAROLINA
PROFESSIONAL
SEAL
20212

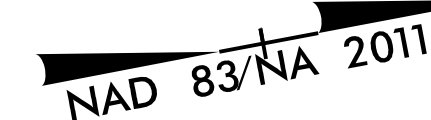
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2/15/2023 1:06 PM
UTILITY CONSTRUCTION
PLANS ONLY

**CONSIDERED FINAL
RES ARE COMPLETE**





04/09/24



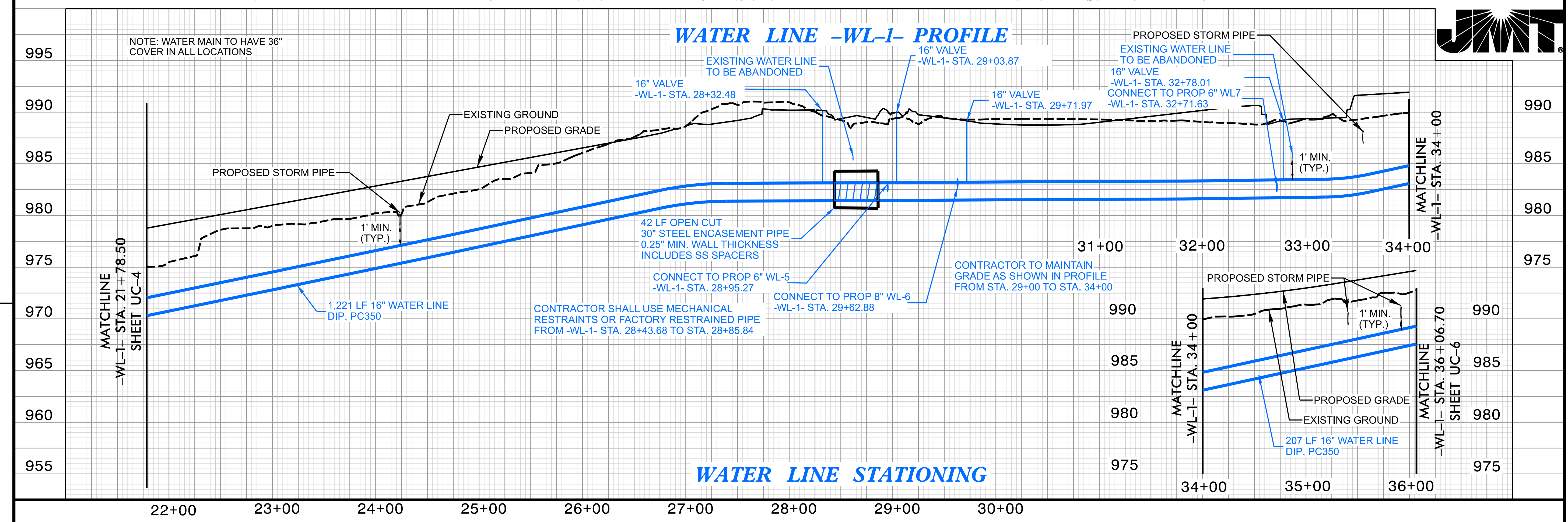
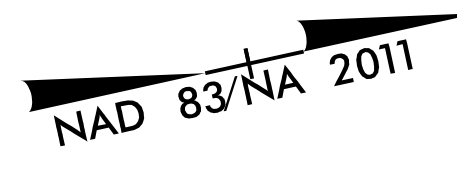
Seal of the Professional Engineer, North Carolina, License No. 35735, signed by Eric M. Tucker, dated 2/15/2016.

DOCUMENT NOT CONSIDERED FINAL
UNTIL ALL SIGNATURES ARE COMPLETED

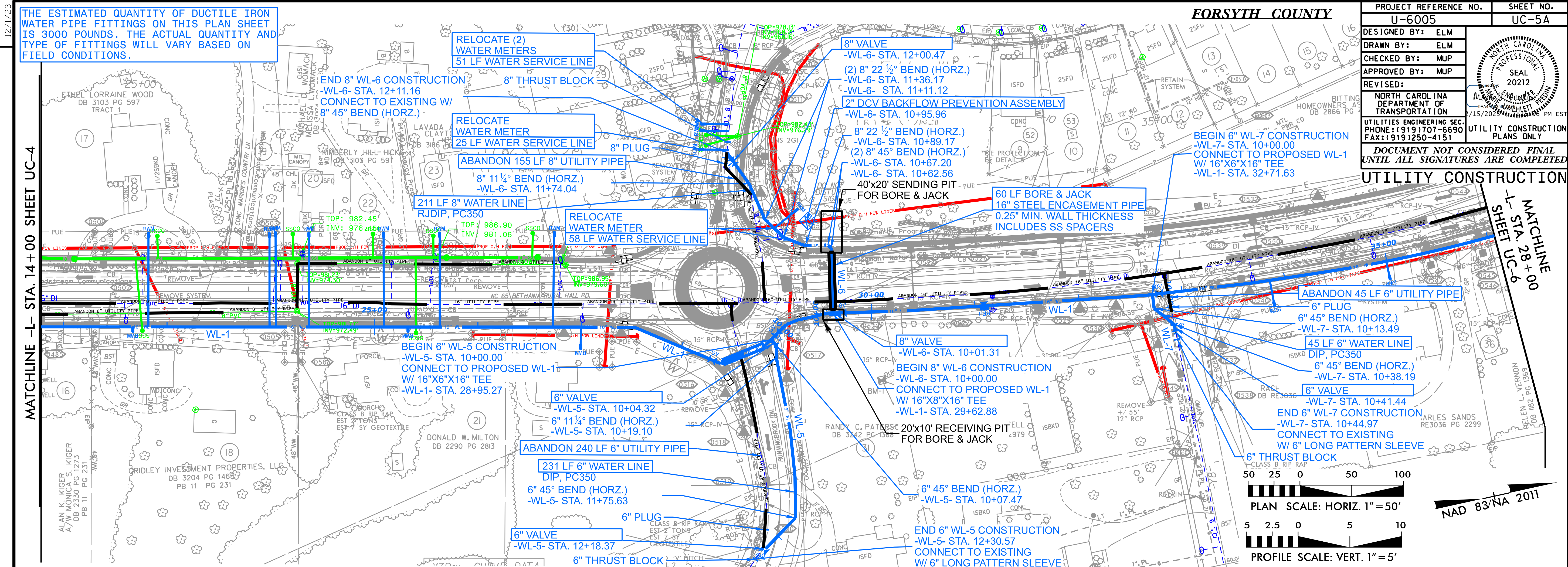
UTILITY CONSTRUCTION



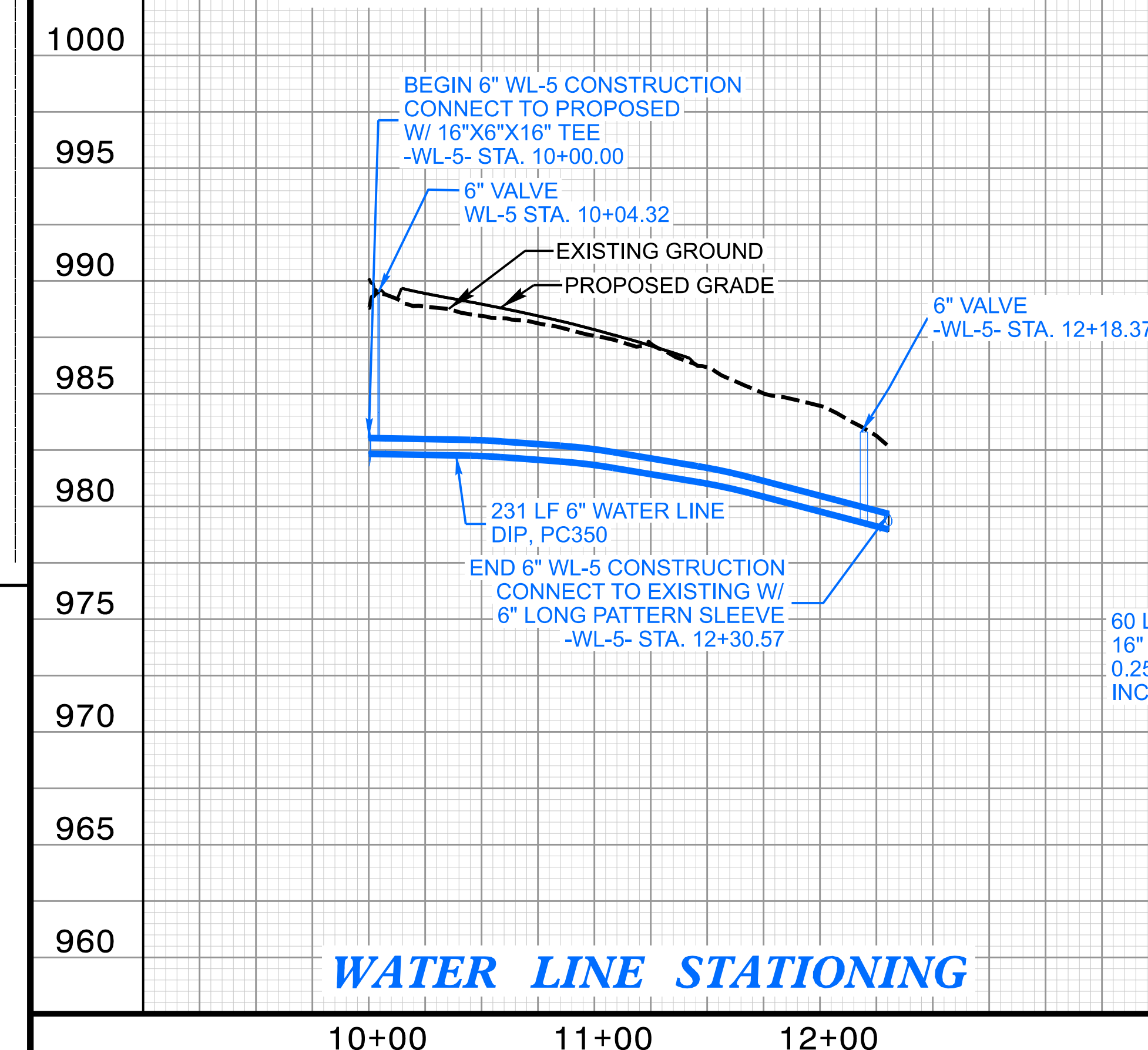
WATCHLINE -SL-2- STA. 15+26.40



12/11/23 THE ESTIMATED QUANTITY OF DUCTILE IRON
WATER PIPE FITTINGS ON THIS PLAN SHEET
IS 3000 POUNDS. THE ACTUAL QUANTITY AND
TYPE OF FITTINGS WILL VARY BASED ON
FIELD CONDITIONS.

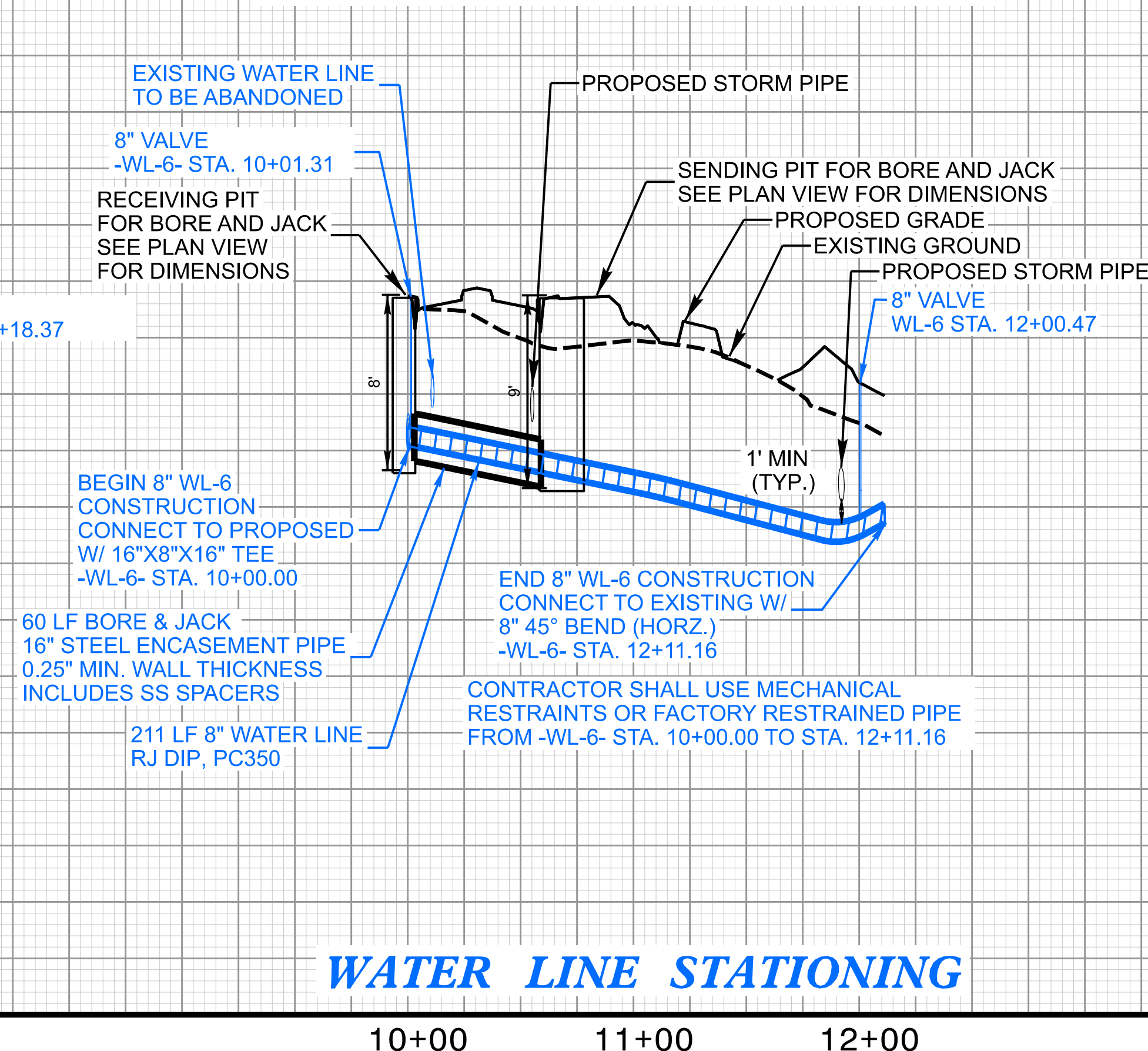


WATER LINE -WL-5- PROFILE



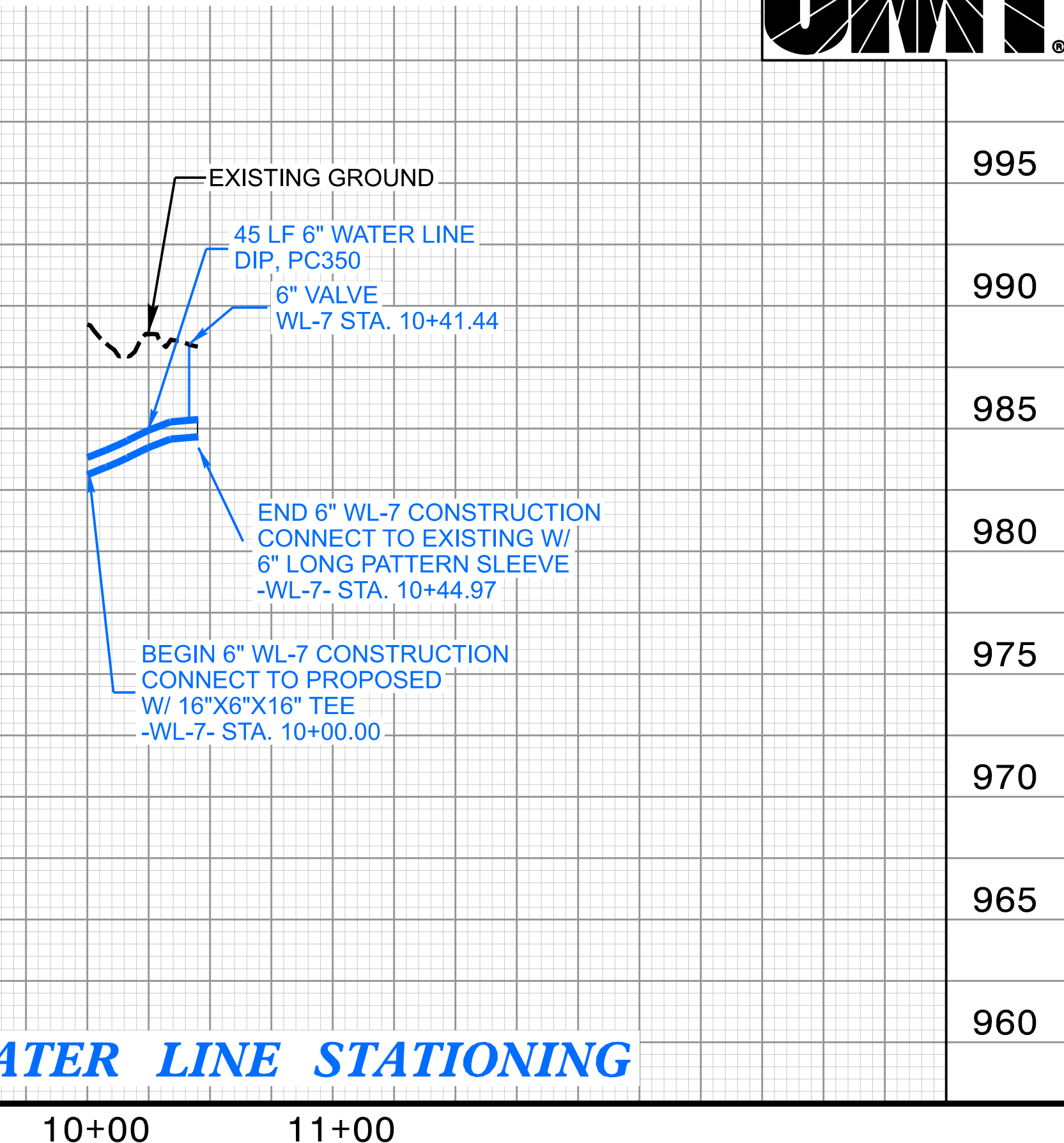
WATER LINE STATIONING

WATER LINE -WL-6- PROFILE



WATER LINE STATIONING

WATER LINE -WL-7- PROFILE



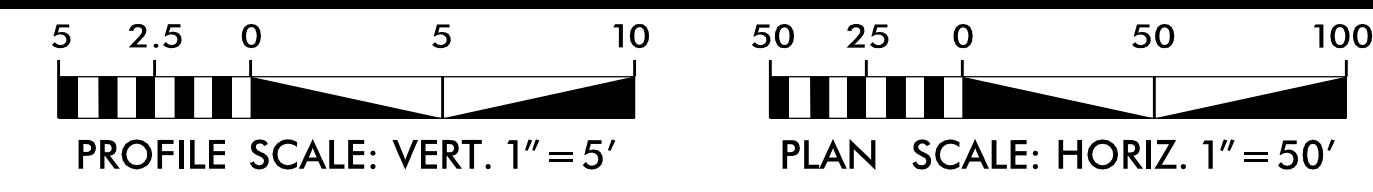
WATER LINE STATIONING

PROJECT REFERENCE NO.		SHEET NO.	
U-6005		UC-5A	
DESIGNED BY: ELM			
DRAWN BY: ELM			
CHECKED BY: MJP			
APPROVED BY: MJP			
REVISED:			
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION		6/15/2025 2:15 PM EST UTILITY CONSTRUCTION PLANS ONLY	
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151			
DOCUMENT NOT CONSIDERED FINAL UNTIL ALL SIGNATURES ARE COMPLETED			
UTILITY CONSTRUCTION			

UTILITY CONSTRUCTION

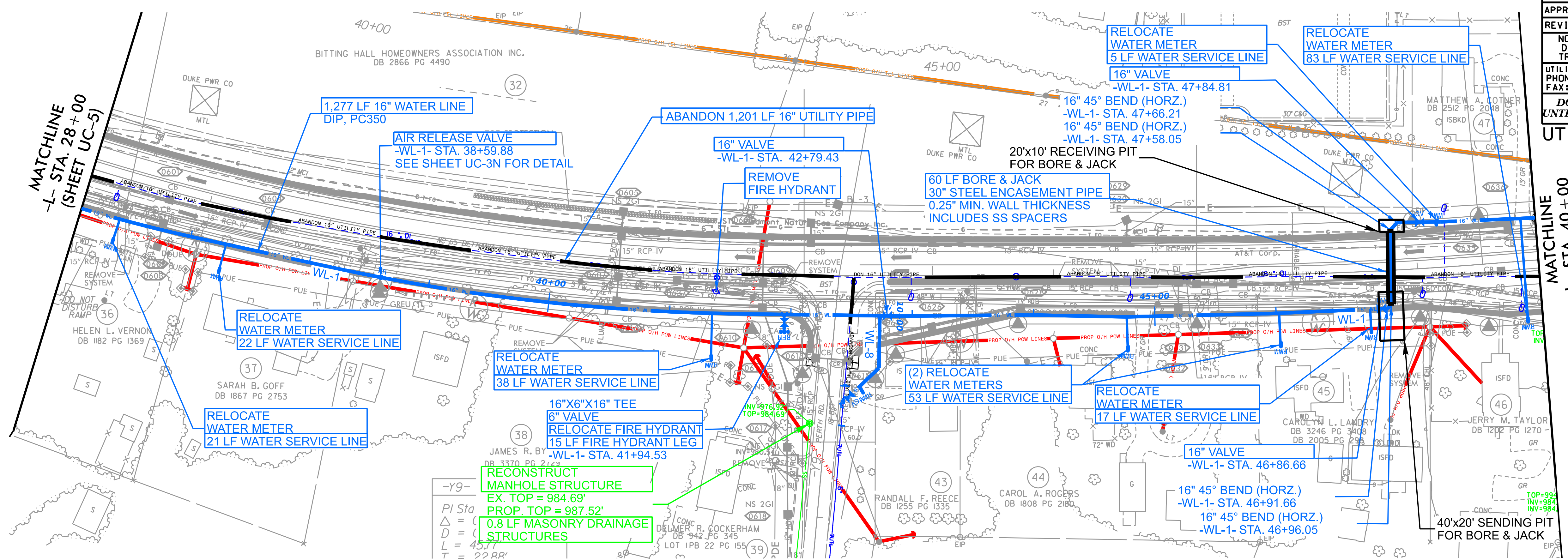
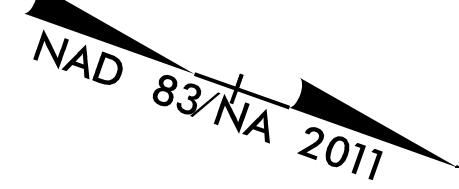
12/1/23

THE ESTIMATED QUANTITY OF DUCTILE IRON WATER PIPE FITTINGS ON THIS PLAN SHEET IS 1900 POUNDS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.

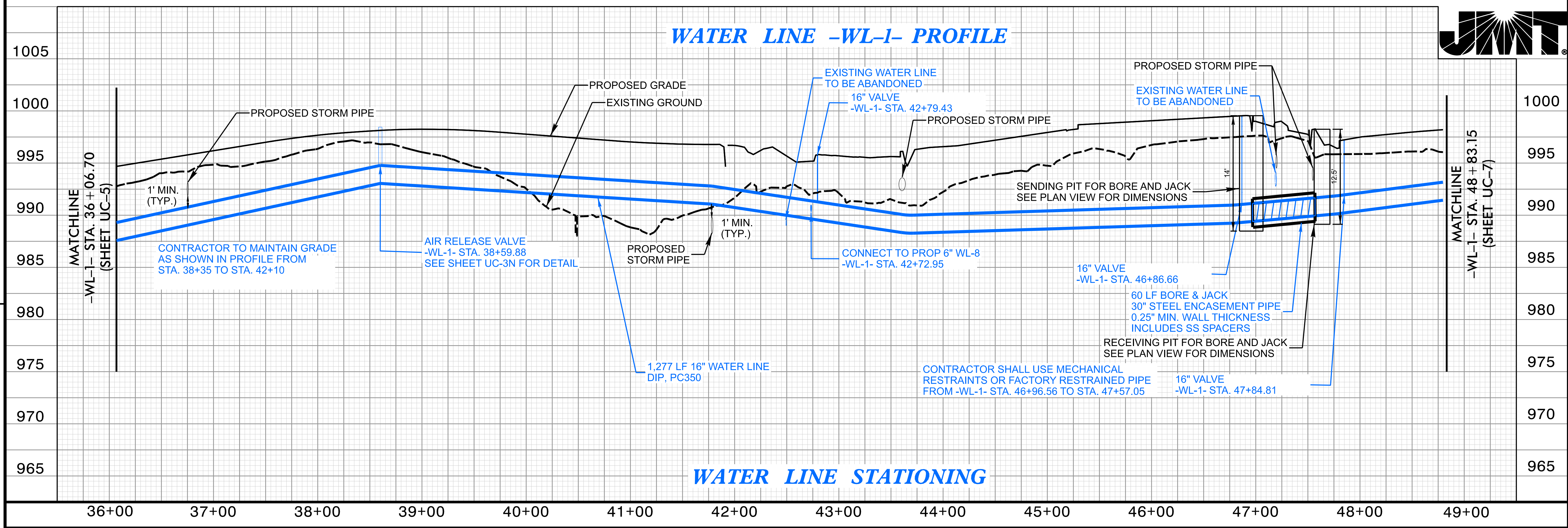


FORSYTH COUNTY

PROJECT REFERENCE NO. U-6005		SHEET NO. UC-6
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		
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UTILITY CONSTRUCTION		



WATER LINE -WL-1- PROFILE



WATER LINE STATIONING

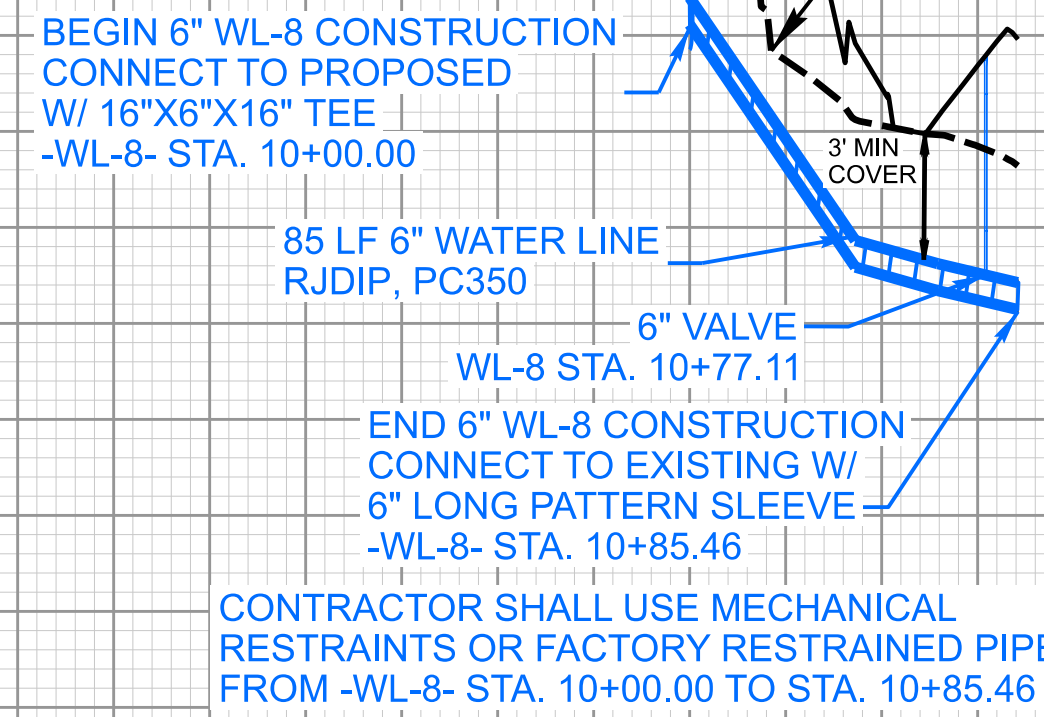


NAD 83/NA 2011

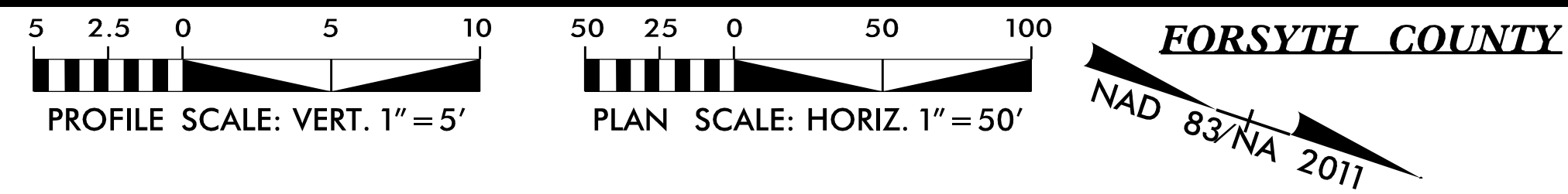


MATCHLINE
-L- STA. 40+00
(SHEET UC-7)

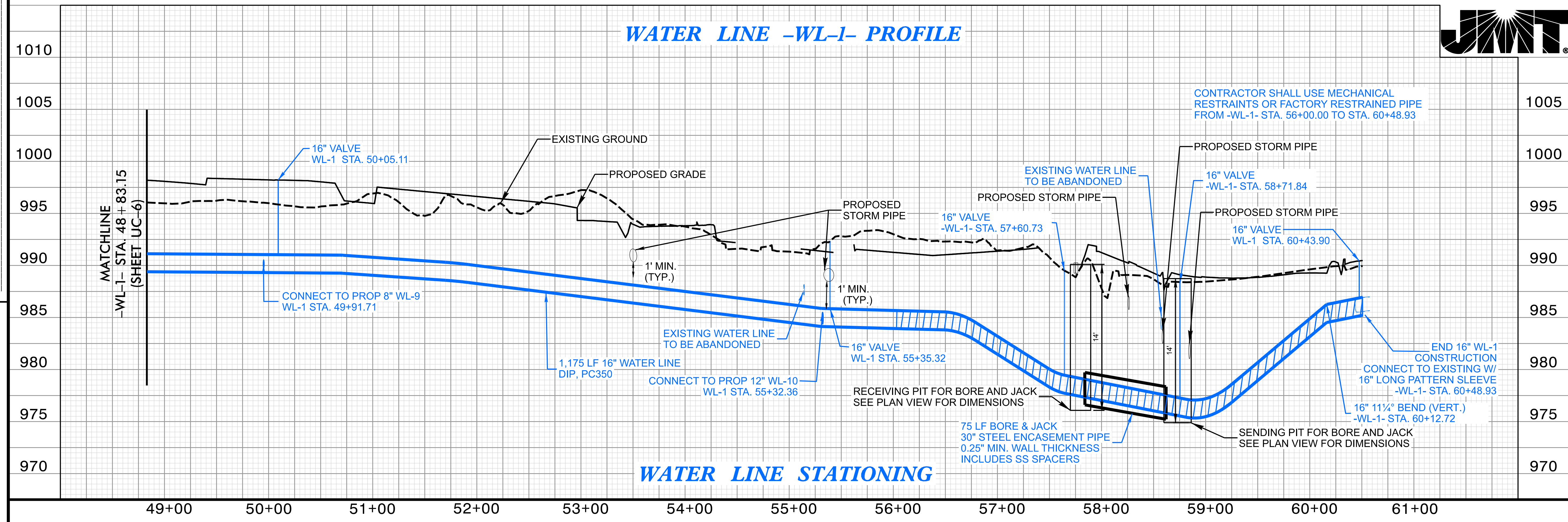
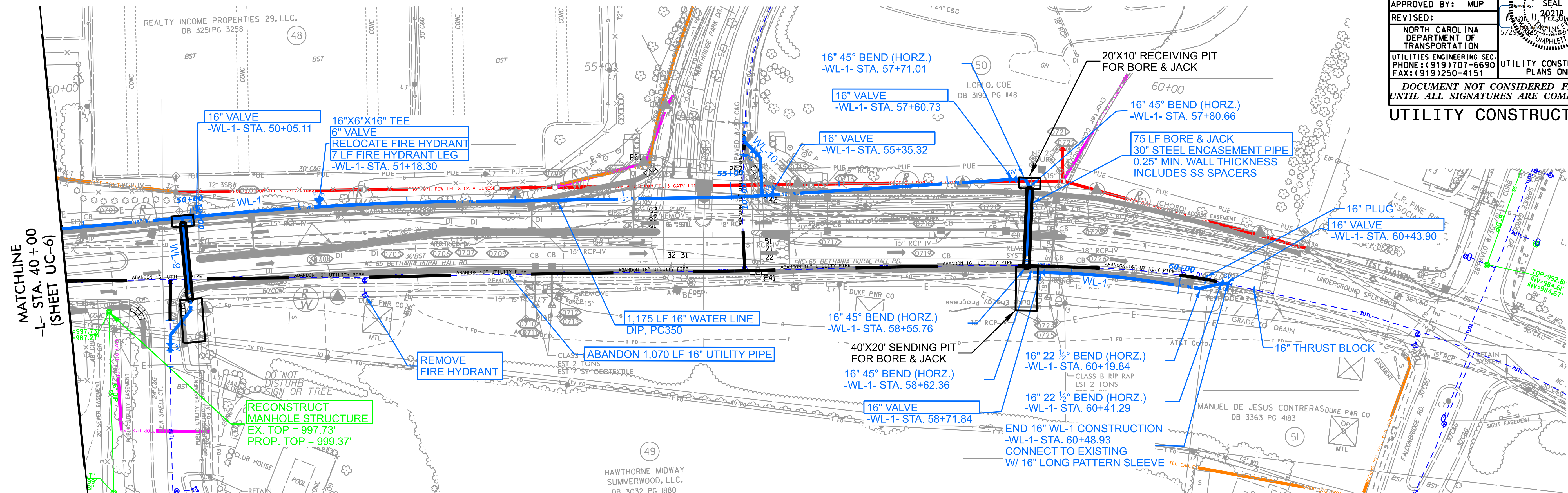
REVISIONS



12/1/23

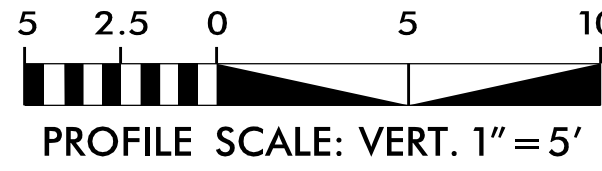


PROJECT REFERENCE NO.		SHEET NO.	
U-6005		UC-7	
DESIGNED BY: ELM		UTILITY CONSTRUCTION PLANS ONLY	
DRAWN BY: ELM			
CHECKED BY: MUP			
APPROVED BY: MUP			
REVISED:			
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION			
UTILITIES ENGINEERING SEC. PHONE: (919) 707-4590 FAX: (919) 250-4151			
DOCUMENT NOT CONSIDERED FINAL UNTIL ALL SIGNATURES ARE COMPLETED			
UTILITY CONSTRUCTION			



12/1/23

THE ESTIMATED QUANTITY OF DUCTILE IRON WATER PIPE FITTINGS ON THIS PLAN SHEET IS 2150 POUNDS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.



FORSYTH COUNTY
NAD 83/NA 2011

PROJECT REFERENCE NO. U-6005		SHEET NO. UC-7A	
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	
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UTILITY CONSTRUCTION			

