

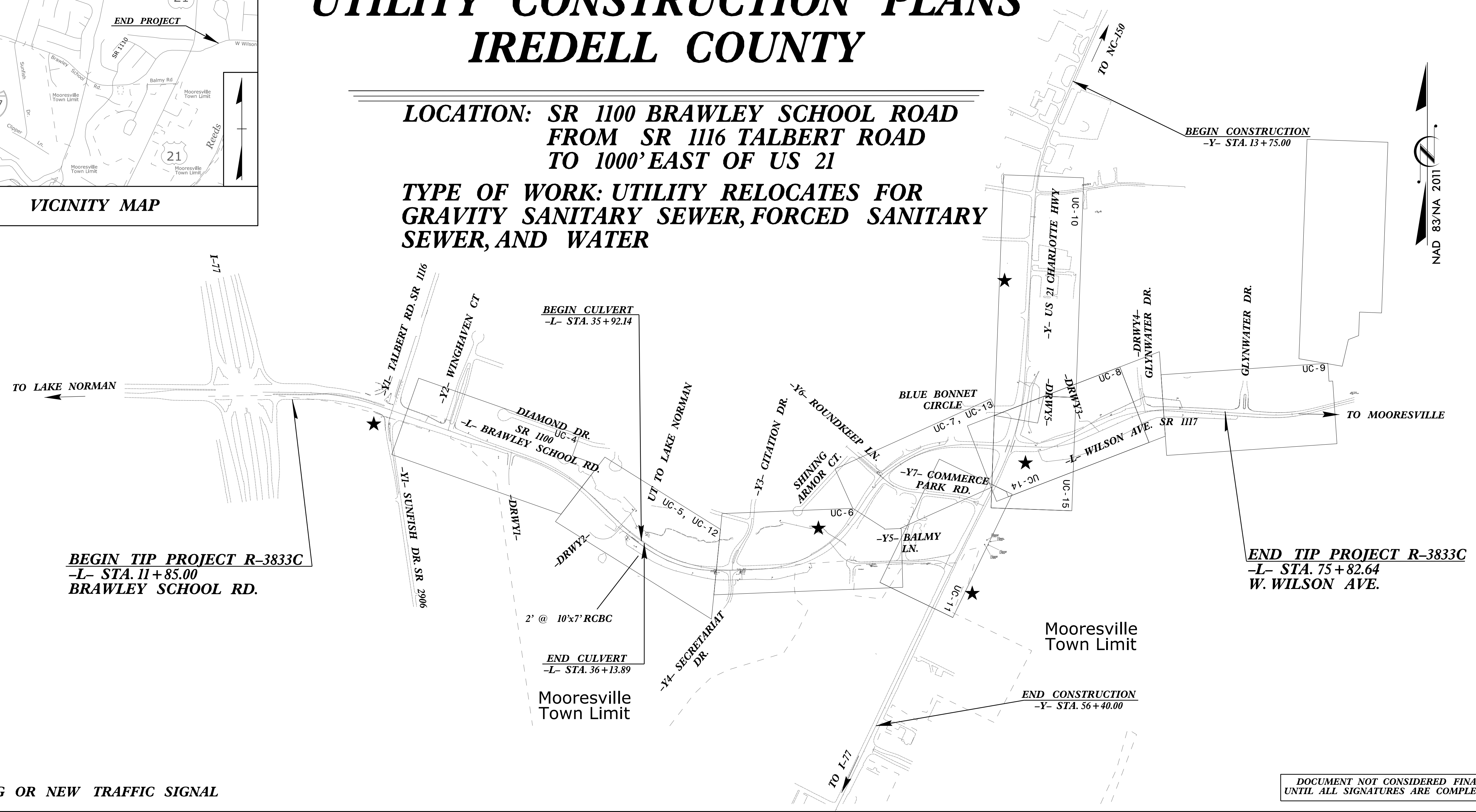
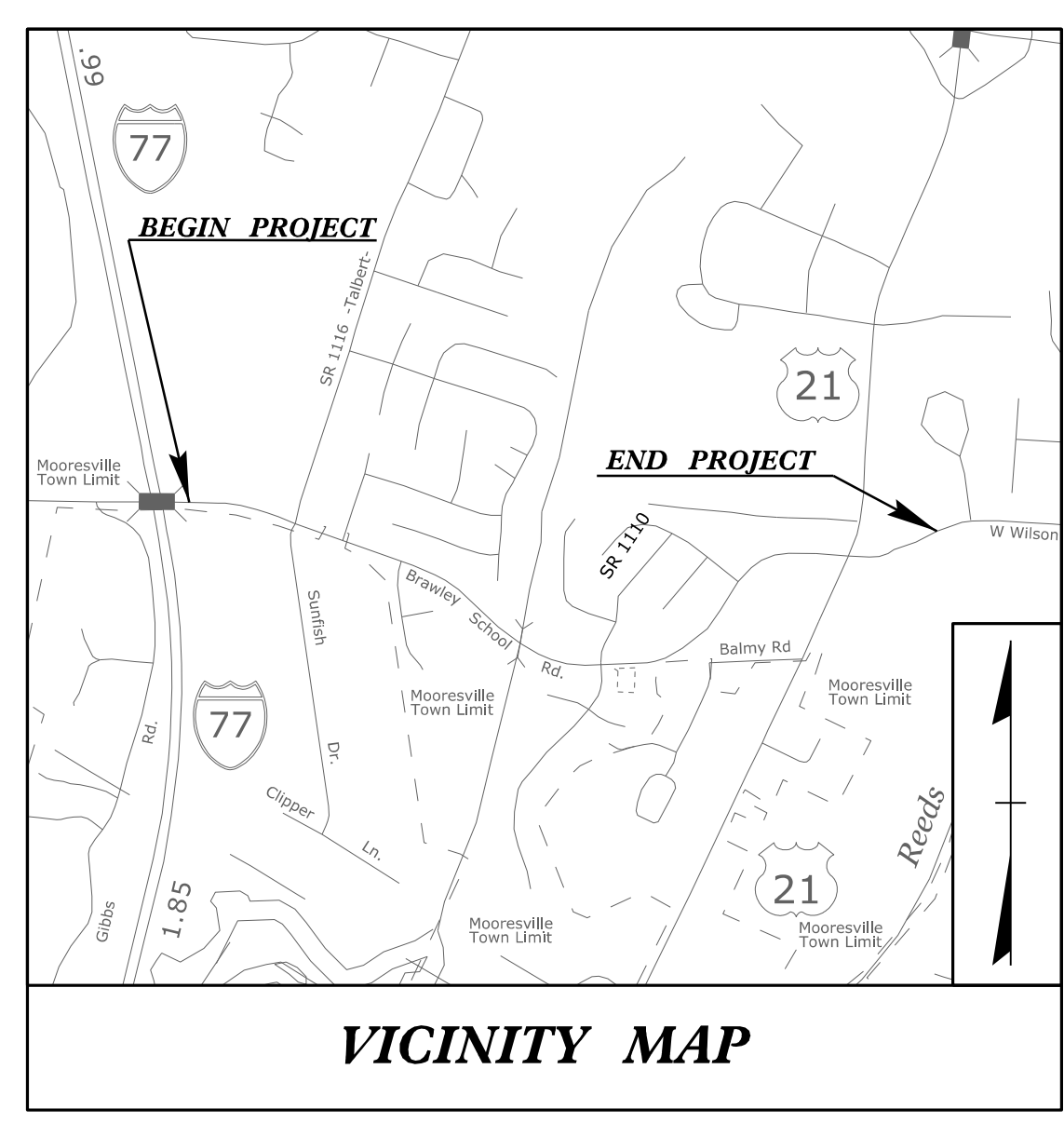
TIP PROJECT: R-3833C

STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

UTILITY CONSTRUCTION PLANS IREDELL COUNTY

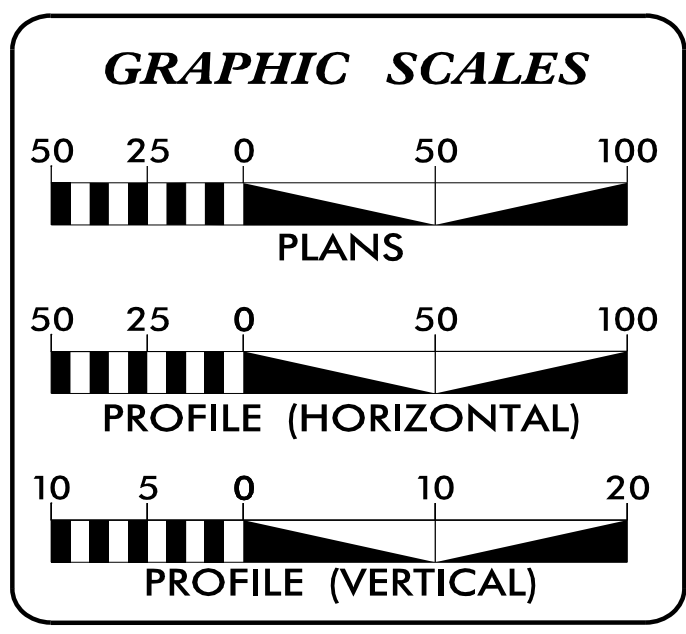
**LOCATION: SR 1100 BRAWLEY SCHOOL ROAD
FROM SR 1116 TALBERT ROAD
TO 1000' EAST OF US 21**

**TYPE OF WORK: UTILITY RELOCATES FOR
GRAVITY SANITARY SEWER, FORCED SANITARY
SEWER, AND WATER**



★ EXISTING OR NEW TRAFFIC SIGNAL

DOCUMENT NOT CONSIDERED FINAL
UNTIL ALL SIGNATURES ARE COMPLETED



SHEET NO.:	DESCRIPTION:
UC-1	TITLE SHEET
UC-2	UTILITY SYMBOLOGY
UC-3	NOTES
UC-3A - UC-3I	DETAILS
UC-4 - UC-15	UTILITY CONSTRUCTION PLAN AND PROFILE SHEETS

WATER AND SEWER OWNERS ON PROJECT

TOWN OF MOORESVILLE PUBLIC UTILITIES
413 NORTH MAIN STREET
MOORESVILLE, NC 28115

PREPARED IN THE OFFICE OF

Stantec

STANTEC CONSULTING SERVICES INC.
801 JONES FRANKLIN ROAD
SUITE 300
RALEIGH, NC 27686
TEL: (919) 851-6865
FAX: (919) 851-7024
www.stantec.com
License No.: F-0672

DEAN SARVIS, PE CONSULTANT CONTACT #1
LINDA PASS, PE CONSULTANT CONTACT #2
LAURA WILSON, PE CONSULTANT CONTACT #3

SEAL

8/24/2023

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

MICHAEL BRIGHT UTILITIES REGIONAL ENGINEER
CHAD DREWERY UTILITIES ENGINEER
AMY DUPREE UTILITIES AREA COORDINATOR
WARREN ANDERSON UTILITIES COORDINATOR

STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

UTILITIES PLAN SHEET SYMBOLS

PROPOSED WATER SYMBOLS

Water Line (Sized as Shown)	
11 1/4 Degree Bend	
22 1/2 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 MISCELLANEOUS UTILITIES SYMBOLS

Power Pole	
Telephone Pole	
Joint Use Pole	
Telephone Pedestal	
Utility Line by Others	
Trenchless Installation	
Encasement by Open Cut	
Encasement	

Thrust Block	
Air Release Valve	
Utility Vault	
Abandon Utility (Sized as Shown)	
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	
Aboveground Power	
*Underground Telephone Conduit	
*Underground Fiber Optics Telephone Cable	
*Underground TV Cable	
*Underground Fiber Optics TV Cable	
*Underground Gas Main Pipeline	
Aboveground Gas Main 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 WILL MEET THE APPLICABLE REQUIREMENTS OF THE NC DEPARTMENT OF TRANSPORTATION'S "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" DATED JANUARY 2018.
2. THE EXISTING UTILITIES BELONG TO THE TOWN OF MOORESVILLE, NC.
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 WILL BE APPROVED PRIOR TO DELIVERY TO THE PROJECT. SEE 1500-7, " SUBMITTALS AND RECORDS" IN SECTION 1500 OF THE STANDARD SPECIFICATIONS.

STANDARD DETAIL DRAWINGS

1. STANDARD DETAILS ARE PROVIDED FOR THE PROJECT. TOWN OF MOORESVILLE STANDARD DETAILS ARE TO BE USED WHEN APPLICABLE. A COPY OF TOWN STANDARD DETAILS ARE AVAILABLE ON LINE: www.mooreville.nc.us

2. IF NO STANDARD DETAILS ARE PROVIDED IN DRAWINGS OR BY TOWN, THEN USE NCDOT STANDARD SPECIFICATIONS, DIVISION 15 STANDARD DETAILS FOR UTILITY CONSTRUCTION.

PROJECT SPECIFIC NOTES:

1. ALL NEW WATER LINE WILL BE D.I.R.J. (DUCTILE IRON RESTRAINED JOINT) PIPE UNLESS OTHERWISE INDICATED ON THE DRAWINGS.

2. WATER MAINS OR SEWER LINES CROSSING UNDER STORM DRAIN PIPE WILL HAVE 18" MINIMUM VERTICAL CLEARANCE UNLESS SPECIFIED ON THE PLAN/PROFILE DRAWINGS.


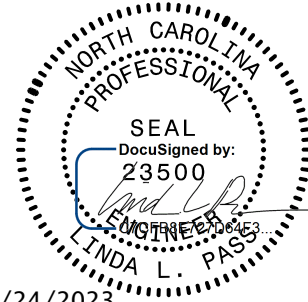
3. CONTRACTOR'S ATTENTION IS DIRECTED TO SECTIONS 102, 107, AND 1550 OF THE STANDARD SPECIFICATIONS CONCERNING TRENCHLESS INSTALLATION. IT IS CONTRACTOR'S RESPONSIBILITY TO HAVE BORE DESIGNED AND SEALED BY A LICENSED NORTH CAROLINA PROFESSIONAL ENGINEER. NO DAMAGE IS ALLOWED TO RIVER, WETLANDS, OR BUFFER ZONES.

4. ALL MATERIALS AND CONSTRUCTION PERTAINING TO WATER AND SEWER LINE CONSTRUCTION WILL BE IN ACCORDANCE WITH THE LATEST STANDARDS AND SPECIFICATIONS OF TOWN OF MOORESVILLE.

5. CONTRACTOR WILL OBTAIN THE LATEST STANDARDS, SPECIFICATIONS OF TOWN OF MOORESVILLE AND NCDOT.

6. RESTRAINED JOINT DEVELOPMENT LENGTH CALCULATIONS SHALL BE PERFORMED USING THE DUCTILE IRON PIPE RESEARCH ASSOCIATION (DIPRA) THRUST RESTRAINT DESIGN FOR DUCTILE IRON PIPE COMPUTER PROGRAM WHICH CAN BE DOWNLOADED FROM [HTTP://WWW.DIPRA.ORG/](http://WWW.DIPRA.ORG/). THE OUTPUT SHALL BE SUBMITTED TO THE TOWN FOR REVIEW AND APPROVAL THE ENGINEERING SERVICES DIRECTOR RESERVES THE RIGHT TO SPECIFY THE TYPE OF RESTRAINED PIPE TO BE USED ON SPECIFIC PROJECTS AND SPECIFIC FIELD APPLICATIONS.

7. RETURN ABANDONED MANHOLE FRAMES AND COVERS TO OWNER.

	PROJECT REFERENCE NO.	SHEET NO.
	R-3833C	UC-03
Stantec Consulting Services Inc. 801 Jones Franklin Road Suite 300 Raleigh, NC 27606 Tel. (919) 851-6866 Fax. (919) 851-7024 www.stantec.com License No. F-0672	DESIGNED BY: WMH	
	DRAWN BY: RGR/WMH	
	CHECKED BY: MCM	
	APPROVED BY:	
	REVISED:	
	NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	8/24/2023 UTILITY CONSTRUCTION PLANS ONLY	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		

UTILITY CONSTRUCTION

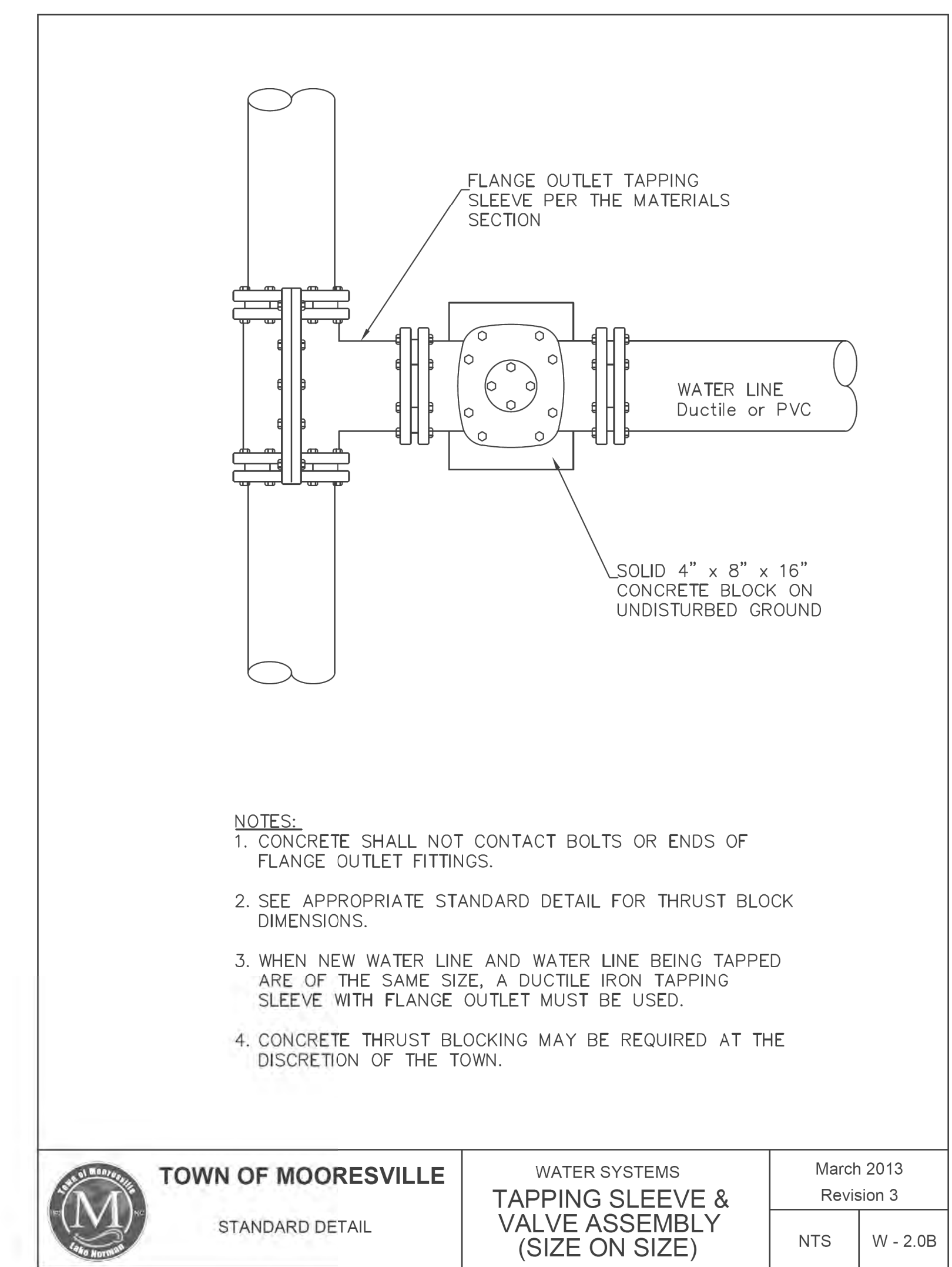
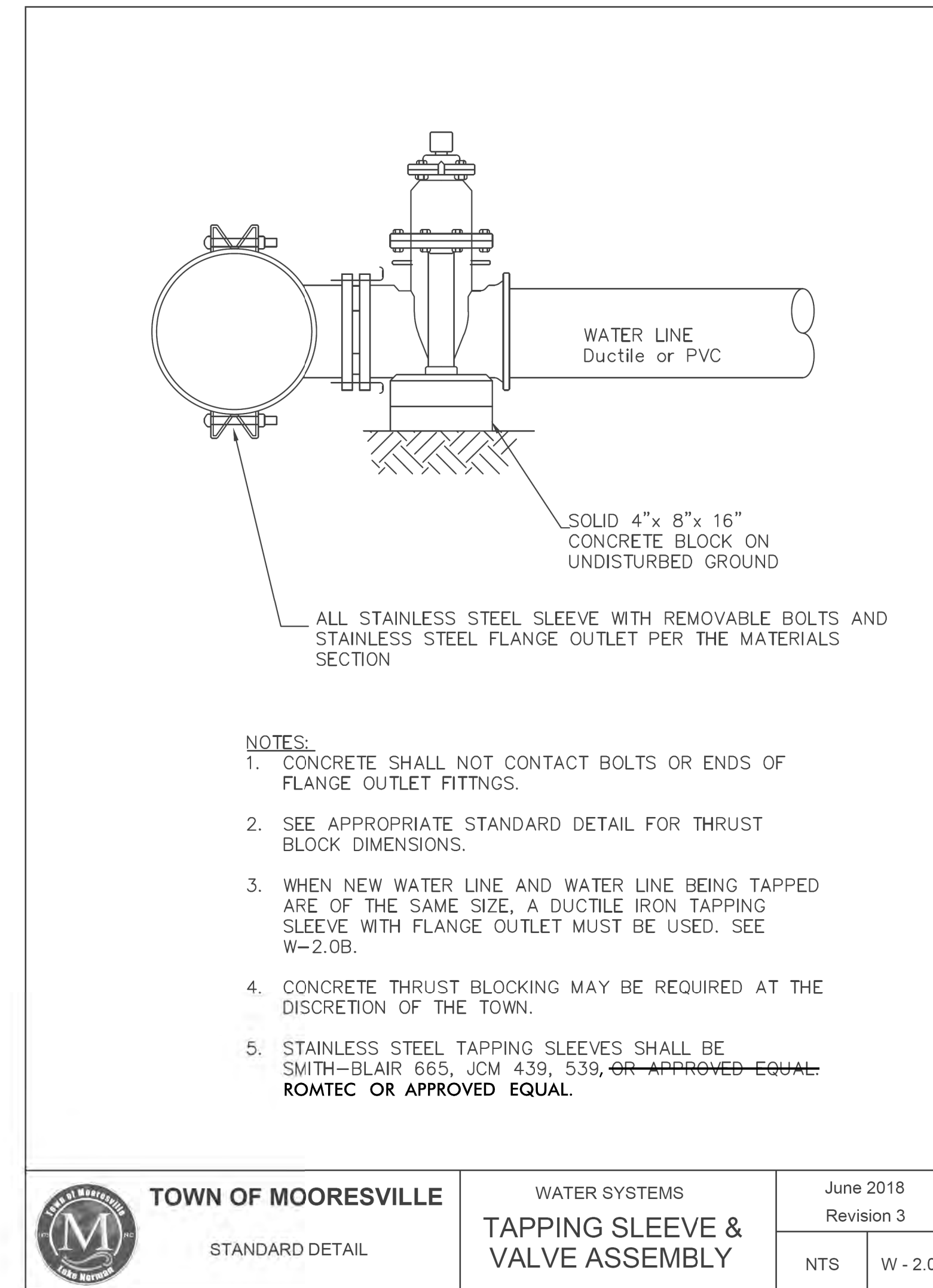
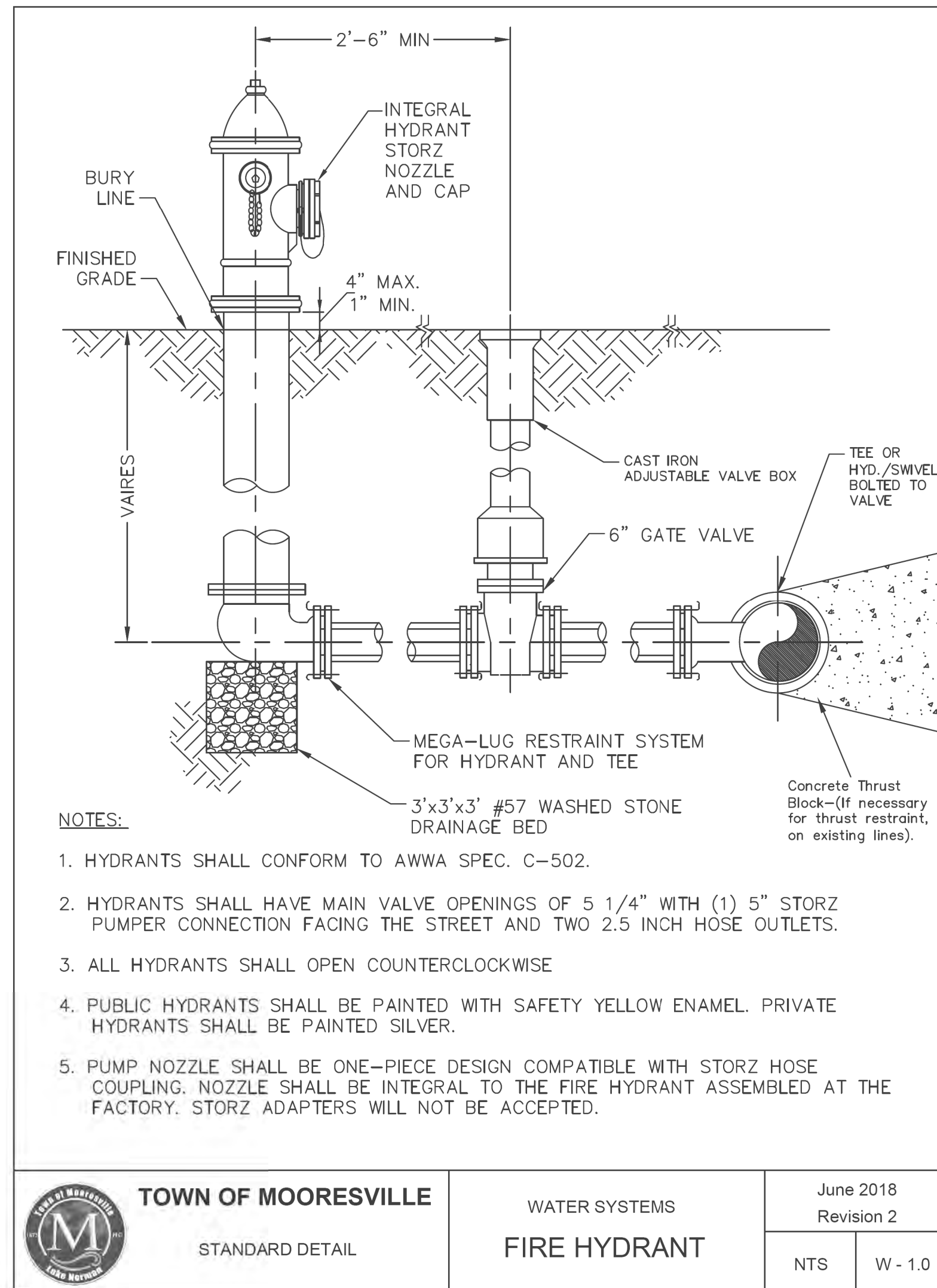
PROJECT TYPICAL DETAILS

NOTES:

1. CONSTRUCTION OF TRENCHES WILL COMPLY WITH ALL FEDERAL, STATE, AND LOCAL SAFETY AND HEALTH REGULATIONS WHICH HAVE JURISDICTION AT THE PROJECT SITE. IT IS THE CONTRACTORS RESPONSIBILITY TO BE FAMILIAR WITH THE APPLICABLE REGULATION AND FOLLOW THEM ACCORDINGLY.
2. PAYMENT FOR ROCK EXCAVATION AND SELECT BACKFILL IN TRENCH WILL BE FOR ACTUAL QUANTITIES AND WILL NOT EXCEED THE WIDTH OF TRENCH SHOWN IN THE DETAILS.
3. FOUNDATION STONE WILL BE NCDOT STANDARD #57 STONE.
4. BELL HOLES NOT SHOWN.

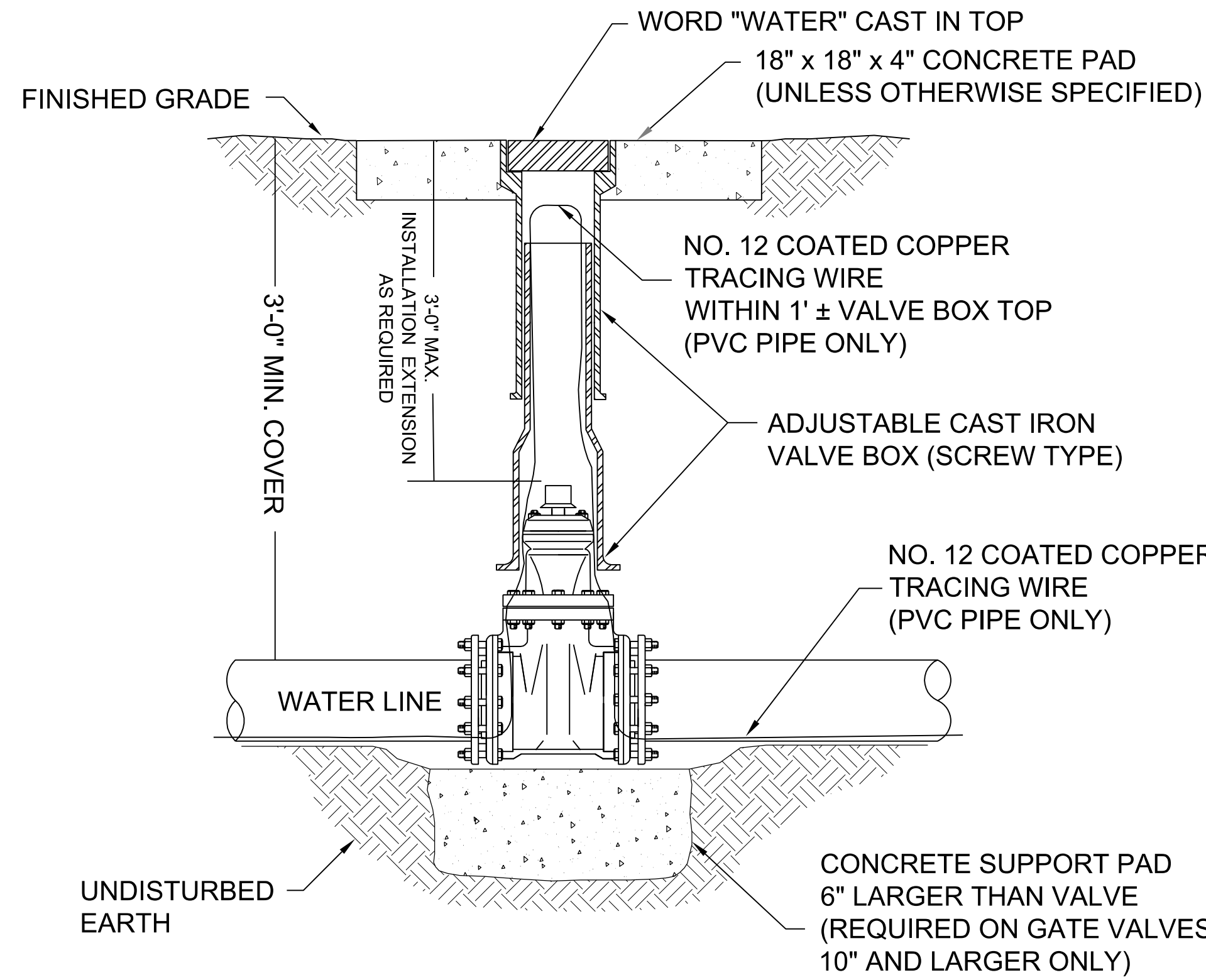
	PROJECT REFERENCE NO.	SHEET NO.
	R-3833C	UC-03A
Stantec Consulting Services Inc. 801 Jones Franklin Road Suite 300 Raleigh, NC 27606 Tel. (919) 851-6866 Fax. (919) 851-7024 www.stantec.com License No. F-0672	DESIGNED BY: MCM	
	DRAWN BY: RGR/MCM	
	CHECKED BY: MCM	
	APPROVED BY:	
	REVISED:	
UTILITIES ENGINEERING SEC.	8/24/2023	UTILITY CONSTRUCTION PLANS ONLY
PHONE: (919) 707-6690		
FAX: (919) 250-4151		
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		

UTILITY CONSTRUCTION

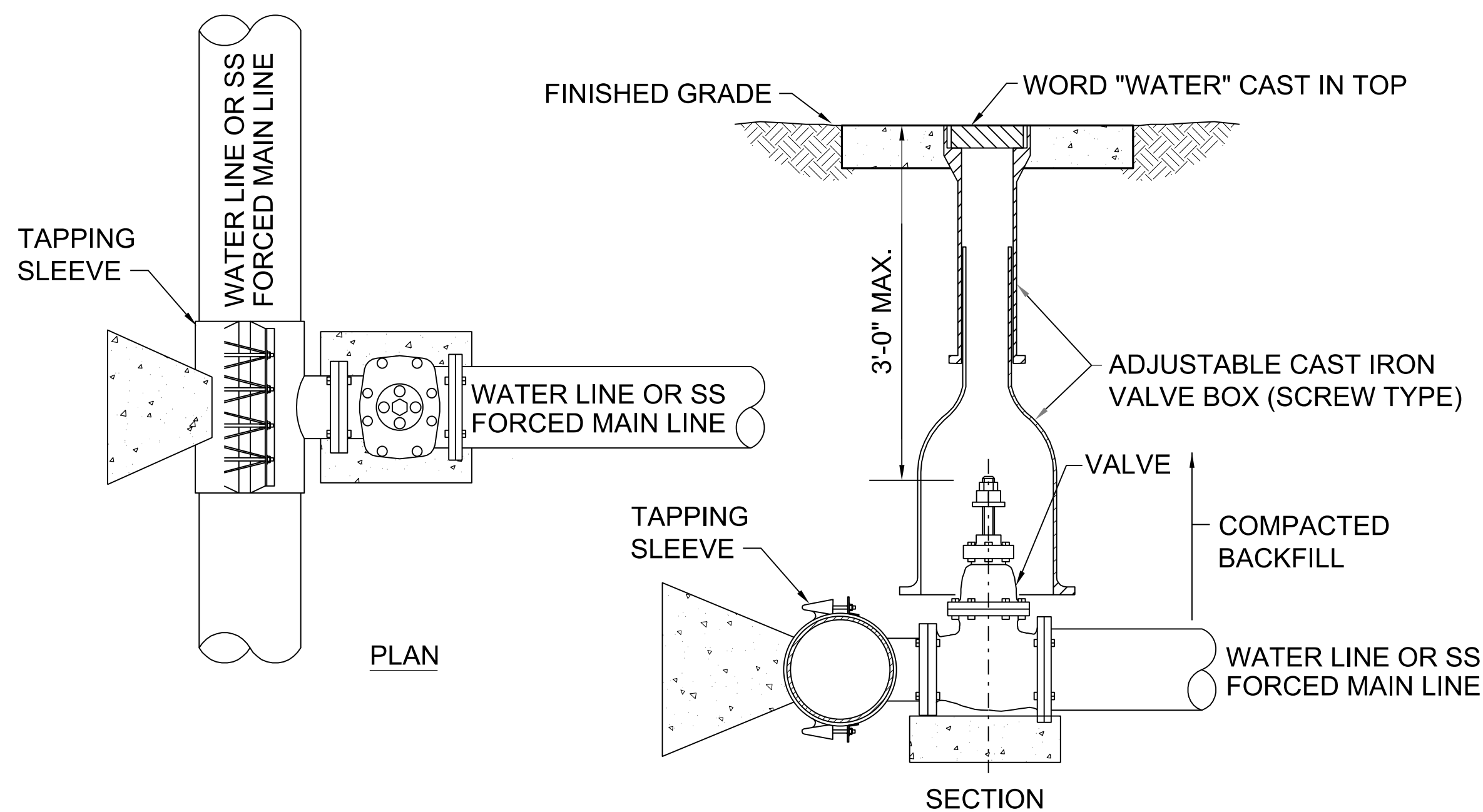


8/23/2023 11:11:11:traces\...UC\Pro\N\3833C-ut-dt1_UC03a.dgn

PROJECT TYPICAL DETAILS

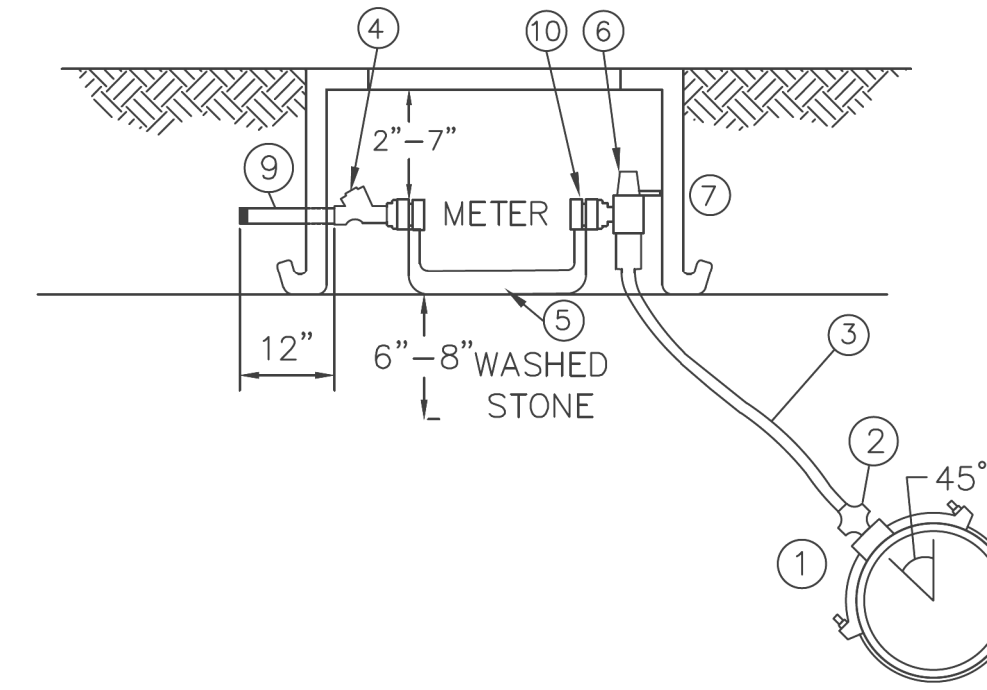


GATE VALVE INSTALLATION DETAIL



- NOTES:**
1. TAPPING SLEEVE WILL BE JCM, SMITH BLAIR, OR ROMTEC
 2. TAPPING VALVE WILL BE CLOW VALVE, M & H VALVE, US PIPE AND FOUNDRY, MULLER, OR KENNEDY VALVE COMPANY
 3. USE SOLID CONCRETE OR BRICK BLOCKING FOR DUCTILE IRON PIPE. 3000 PSI CONCRETE REQUIRED FOR PVC PIPE.
 4. CONCRETE WILL NOT CONTACT BOLTS OR ENDS OF MECHANICAL JOINT FITTINGS.
 5. REFER TO APPROPRIATE STANDARD DETAILS FOR THRUST BLOCK DIMENSIONS.
 6. COVER FITTINGS WITH POLYETHYLENE PLASTIC PRIOR TO POURING THRUST BLOCK.

TAPPING SLEEVE AND VALVE DETAIL



NOTES:

1. METER TO BE FURNISHED AND INSTALLED BY TOWN OF MOORESVILLE. ALL COMPONENTS PROVIDED SHALL BE COMPATIBLE WITH A FORD METER.
2. LEGEND:
 - 1 ROMAC INDUSTRIES STYLE 202S TAPPING SADDLE OR APPROVED EQUAL, NO DIRECT TAPS
 - 2 ~~MUELLER B-2500B~~ CORPORATION STOP BALL VALVE WITH COMPRESSION FITTING OR APPROVED EQUAL
 - 3 1" COPPER TUBING, TYPE K.
 - 4 RESIDENTIAL USE: STRAIGHT DUAL CHECK VALVE, (MUELLER) H-11247N OR EQUIVALENT. COMMERCIAL USE WITH SEPARATE BACKFLOW DEVICE: CHECK VALVE
 - 5 FORD METER YOKE Y502, MUELLER, OR MCDONALD METER YOKE
 - 6 90° ANGLE BALL VALVE OR ANGLE KEY VALVE
 - 7 BLACK POLYETHYLENE METER BOX MANUFACTURED BY SOUTHEASTERN DISTRIBUTION.
 - 3/4" SERVICE - MB16-176 & SOLID LID 176 WE-36
 - 1" SERVICE - MB17-178 & SOLID LID 174 WE-37
 - 8 6"-8" WASHED STONE BELOW METER BOX
 - 9 3/4"x12" or 1"x12" THREADED BRASS NIPPLE
 - 10 STAR NUT (MUELLER) PART NO. 589316 OR EQUIVALENT 3/4" STAR LOCK NUT AND WASHER

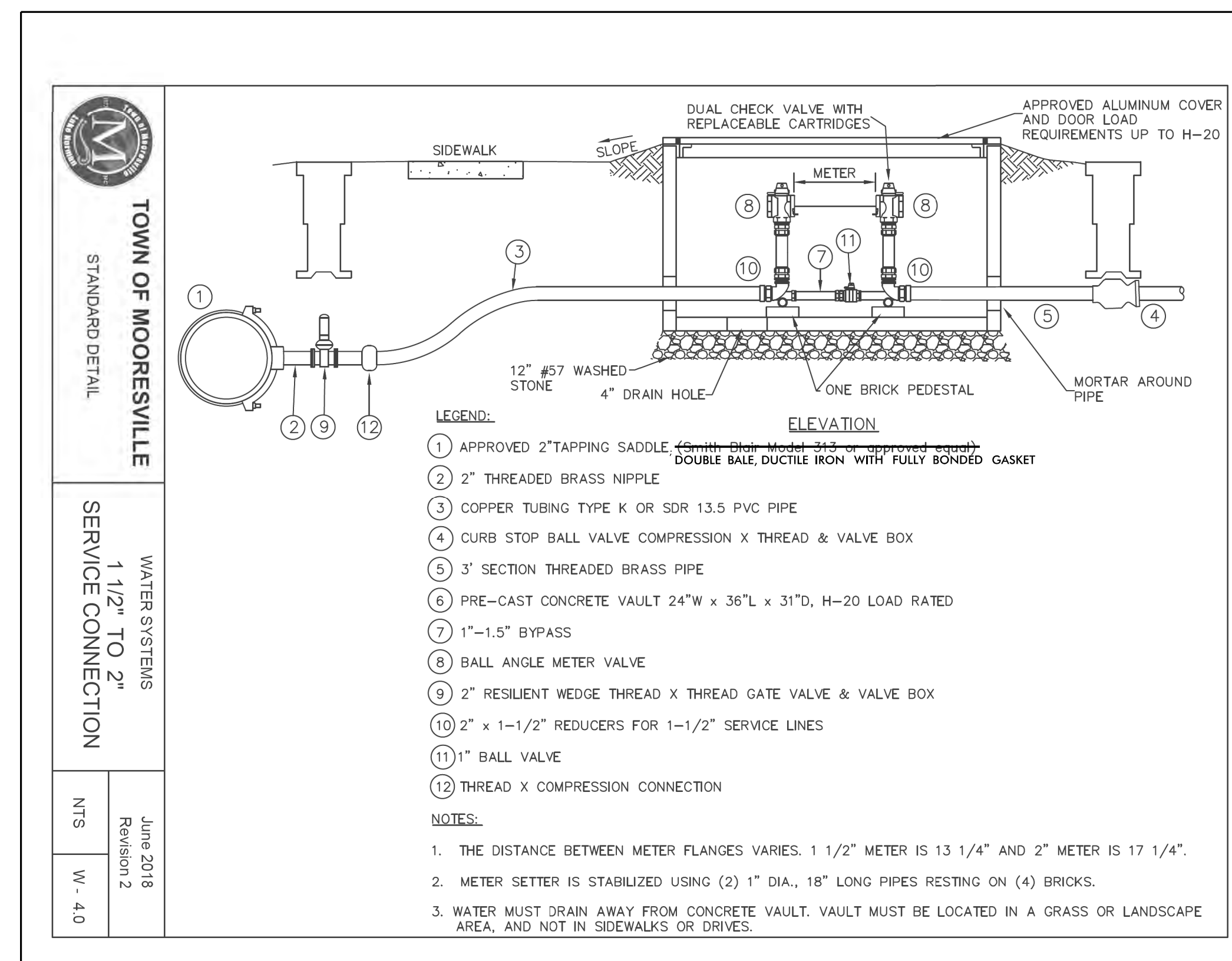
	TOWN OF MOORESVILLE	WATER SYSTEMS	June 2018
	STANDARD DETAIL	3/4" & 1" SERVICE CONNECTION	Revision 3
			NTS W-3.0



Stantec Consulting Services Inc.
801 Jones Franklin Road
Suite 300
Raleigh, NC 27606
Tel. (919) 851-6866
Fax. (919) 851-7024
www.stantec.com
License No. F-0672

PROJECT REFERENCE NO.	SHEET NO.
R-3833C	UC-03B
DESIGNED BY: MCM	
DRAWN BY: RGR/MCM	
CHECKED BY: MCM	
APPROVED BY:	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	8/24/2023
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	UTILITY CONSTRUCTION PLANS ONLY
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

UTILITY CONSTRUCTION



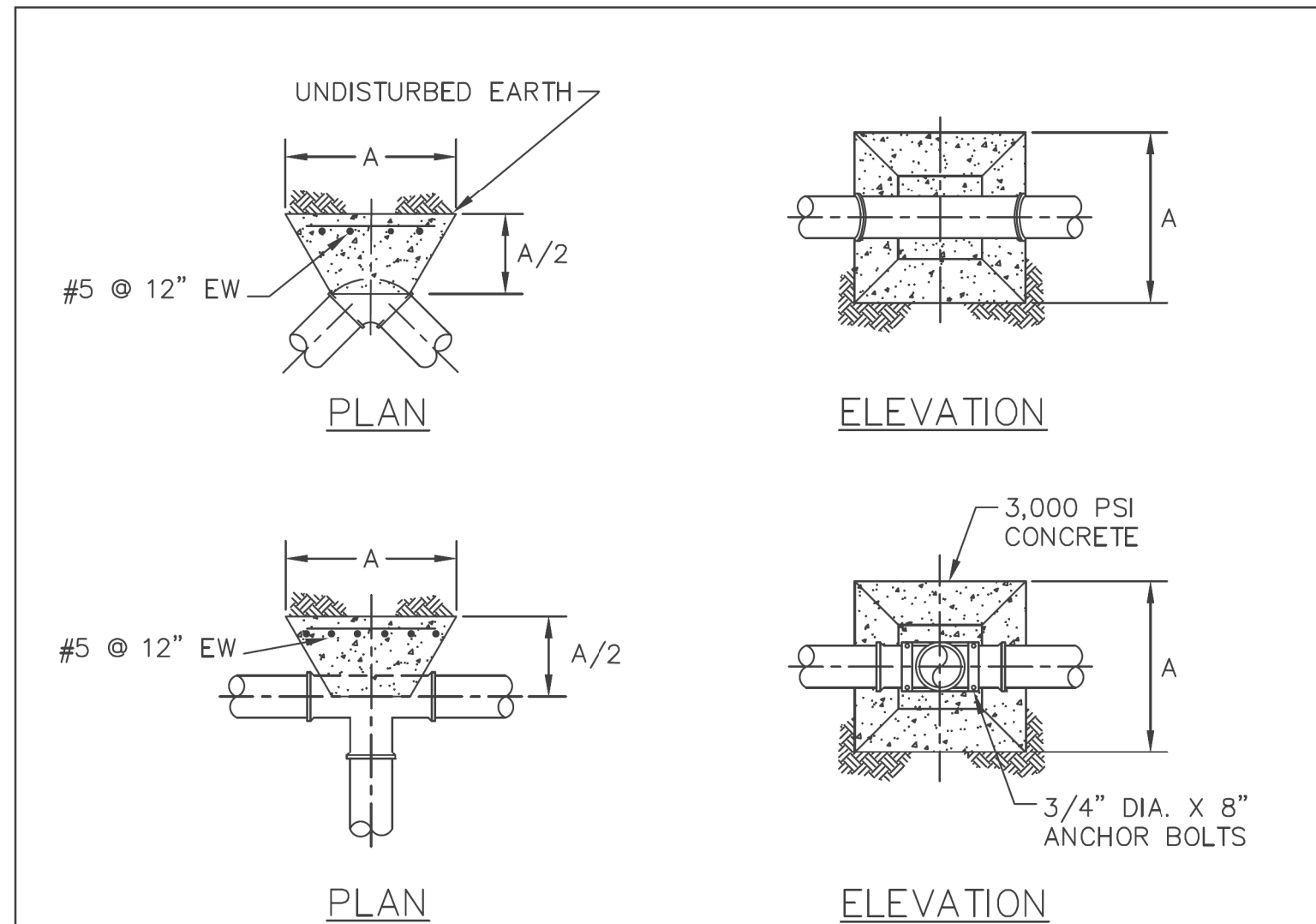
PROJECT TYPICAL DETAILS



Stantec Consulting Services Inc.
 801 Jones Franklin Road
 Suite 300
 Raleigh, NC 27606
 Tel. (919) 851-6866
 Fax. (919) 851-7024
 www.stantec.com
 License No. F-0672

PROJECT REFERENCE NO. R-3833C	SHEET NO. UC-03C
DESIGNED BY: MCM	
DRAWN BY: RGR/MCM	
CHECKED BY: MCM	
APPROVED BY:	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	4/28/2023
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	UTILITY CONSTRUCTION PLANS ONLY
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

UTILITY CONSTRUCTION



NOTES:

1. ALL FACES OF THE BLOCK SHALL REST AGAINST UNDISTURBED SOIL.
2. PIPE JOINTS, BOLTS, NUTS, RETAINER GLANDS ARE NOT TO BE ENCASED IN CONCRETE.
3. DIMENSIONS BASED ON 150 PSI TEST PRESSURE 1,000 PSF BEARING CAPACITY.
4. THRUST BLOCKS ARE ALLOWED ONLY WHEN THERE IS NOT ENOUGH PIPE LENGTH TO PROVIDE SUFFICIENT THRUST RESTRAINT VIA RESTRAINED JOINT PIPE, OR WHEN CONNECTING TO AN EXISTING PIPE THAT IS NOT RESTRAINED JOINT.

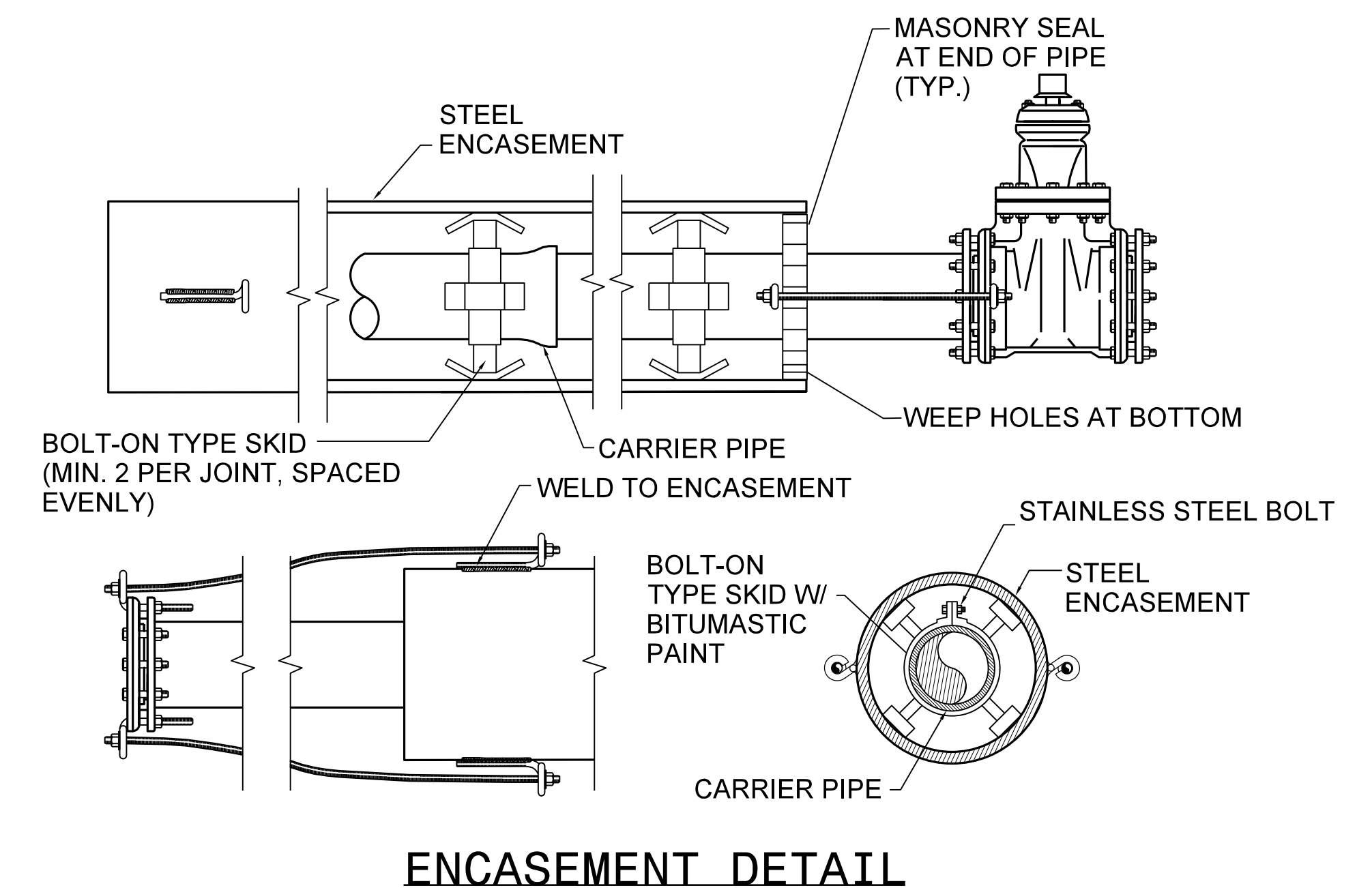
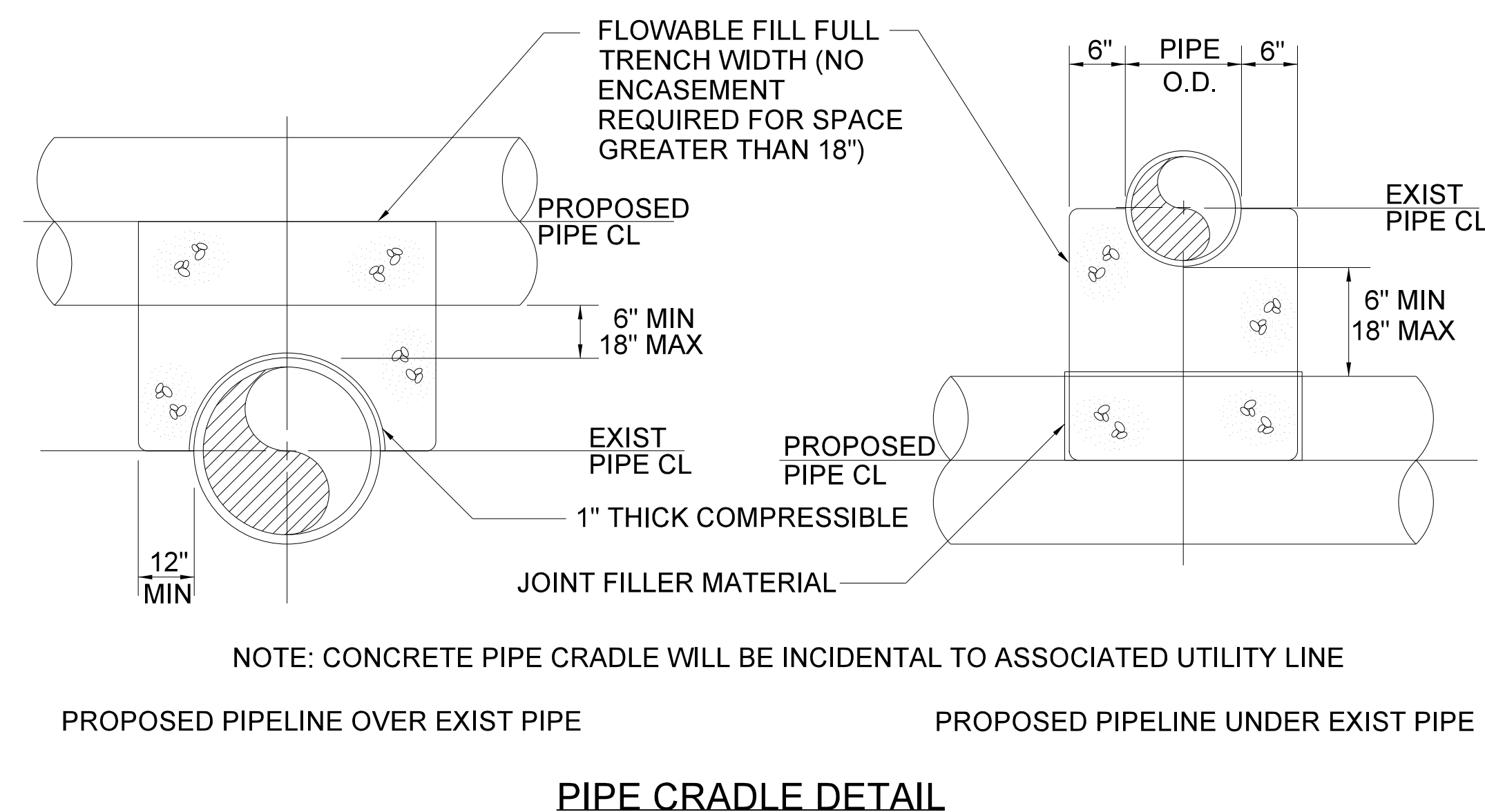
FITTING	DIMENSION "A"			
	PIPE SIZE			
	4"	6"	8"	12"
11 1/4 BEND	1'-6"	1'-6"	1'-6"	2'-0"
22 1/2 BEND	1'-6"	1'-6"	2'-0"	2'-8"
45 BEND	1'-6"	2'-0"	2'-6"	3'-8"
90 BEND	1'-8"	2'-6"	3'-4"	5'-0"
TEE	1'-8"	2'-6"	3'-4"	5'-0"



TOWN OF MOORESVILLE
STANDARD DETAIL

WATER SYSTEMS
THRUST BLOCK

January 2009
Revision 1
NTS W - 6.0



8/28/2023
 C:\Users\lamba\OneDrive\Engineering\UC\Proj\R3833C\ut-dtl\UC03c.dgn
 lamamba

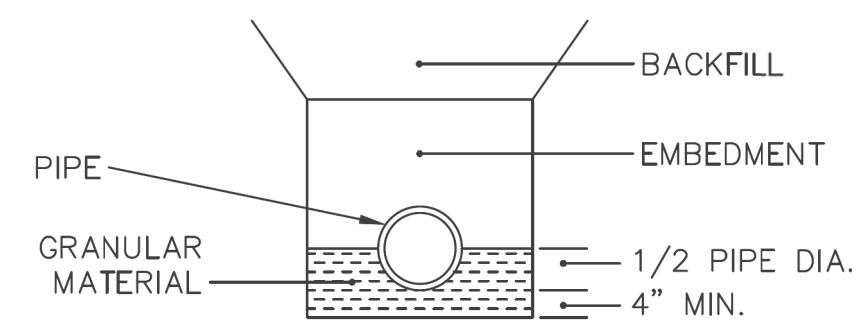
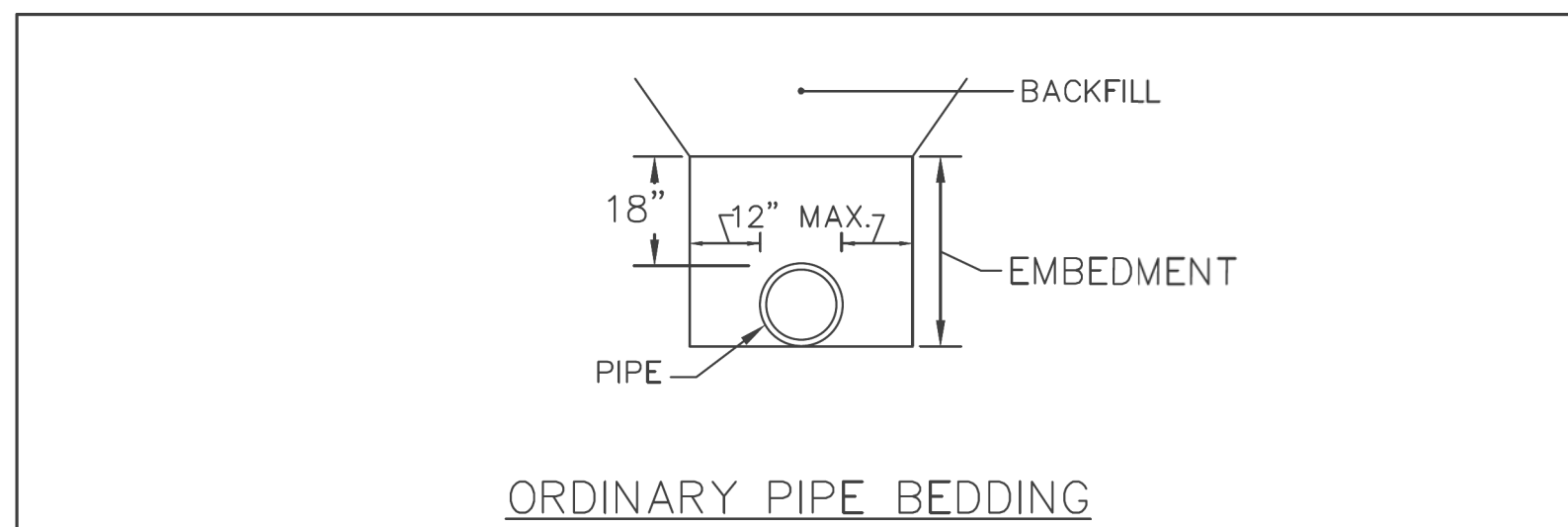
PROJECT TYPICAL DETAILS



Stantec Consulting Services Inc.
 801 Jones Franklin Road
 Suite 300
 Raleigh, NC 27606
 Tel. (919) 851-6866
 Fax. (919) 851-7024
 www.stantec.com
 License No. F-0672

PROJECT REFERENCE NO. R-3833C	SHEET NO. UC-03D
DESIGNED BY: MCM	
DRAWN BY: RGR	
CHECKED BY: MCM	
APPROVED BY:	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	8/24/2023 UTILITY CONSTRUCTION PLANS ONLY
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

UTILITY CONSTRUCTION



BEDDING	LIMITING INVERT DEPTHS				
	PIPE DIAMETER				
	6"	8"	10"	12"	16"
ORDINARY	4'-20'	4'-15'	4'-10'	4'-10'	4'-10'
TYPE "A"	-	15'-20'	10'-20'	10'-20'	10'-20'

NOTES

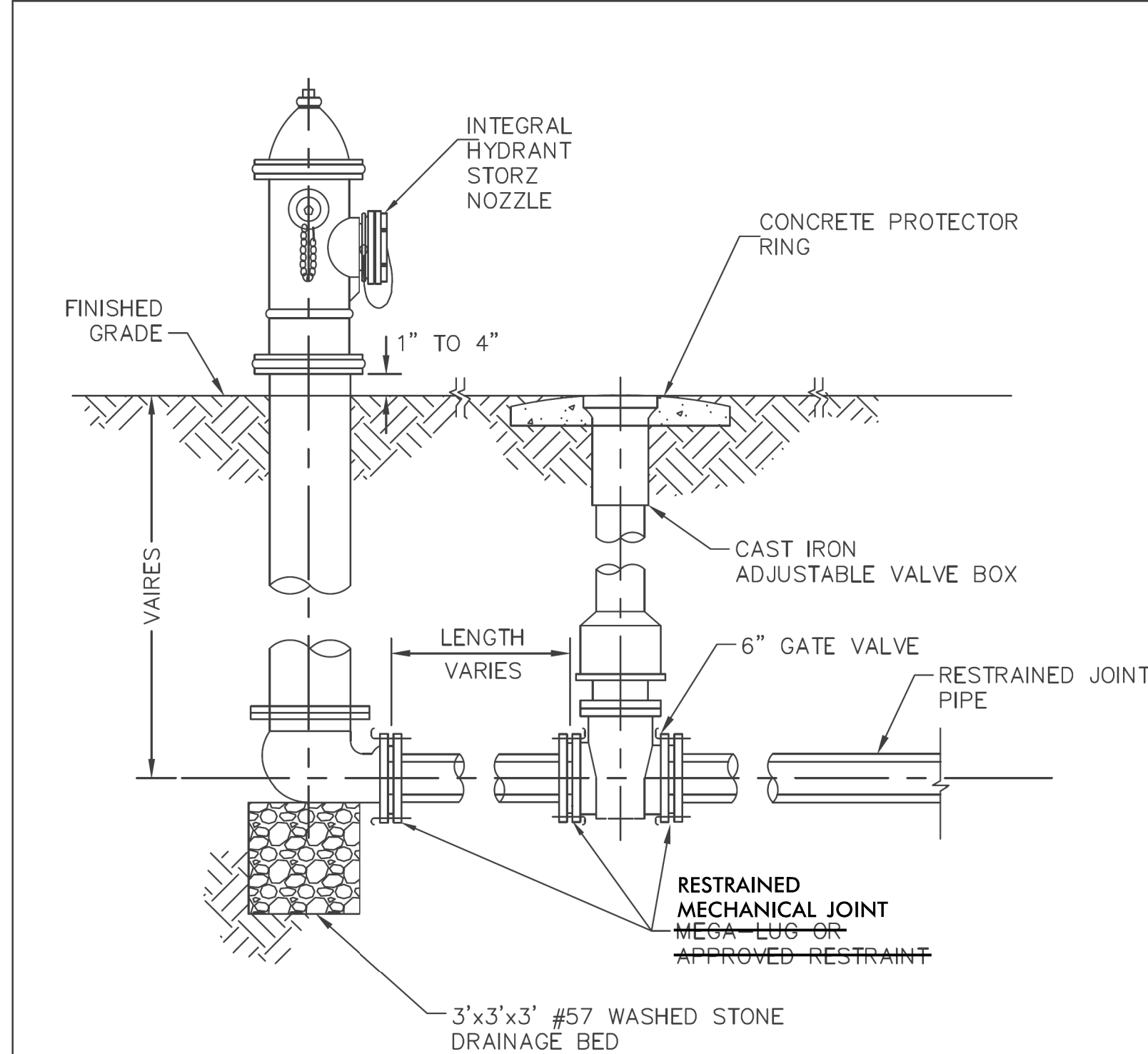
- PIPES AT DEPTHS GREATER THAN 12' MUST BE APPROVED BY THE DIRECTOR OF ENGINEERING.
- PIPE BEDDING SHALL BE DESIGNED ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.
- PIPE EMBEDMENT SHALL BE PLACED IN A MAXIMUM OF 6" LAYERS & COMPACTED TO 95% OF THE MAXIMUM LABORATORY DRY DENSITY AS DETERMINED BY THE STANDARD PROCTOR METHOD.
- PIPE EMBEDMENT SHALL EXTEND TO FINISHED GRADE FOR PIPELINES WITHIN ROAD RIGHT-OF-WAY.



TOWN OF MOORESVILLE
 STANDARD DETAIL

WATER SYSTEMS
 WATERLINE PIPING
 TRENCHING & BACKFILLING
 (UP TO 20' DEEP)

January 2009
 Revision 1
 NTS W - 8.0



NOTE:

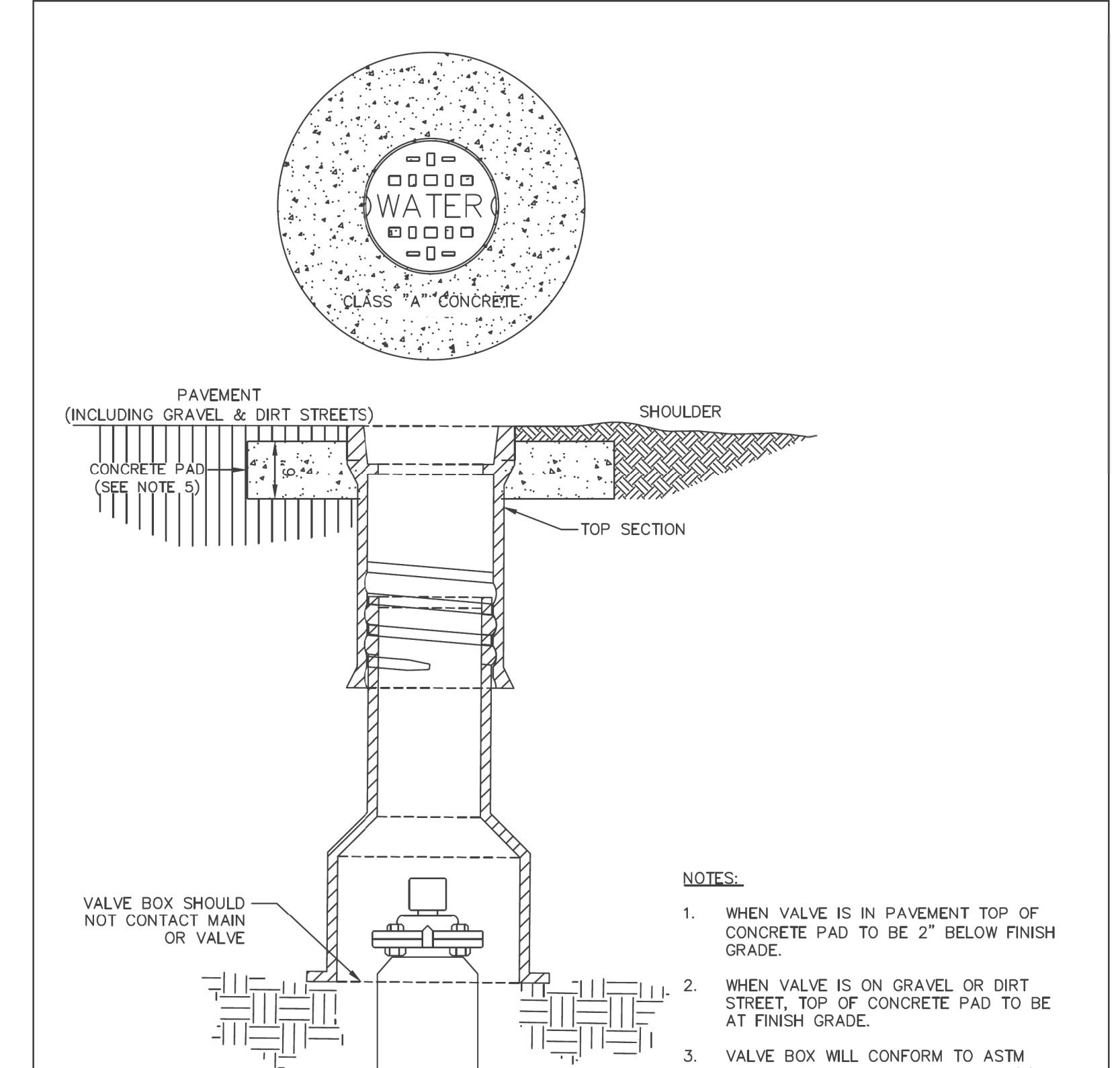
- WATER LINES 6" OR LARGER SHALL HAVE FIRE HYDRANT AS PERMANENT BLOW OFF.



TOWN OF MOORESVILLE
 STANDARD DETAIL

WATER SYSTEMS
 FIRE HYDRANT
 BLOW OFF

June 2018
 Revision 2
 NTS W - 12.0



NOTES:

- WHEN VALVE IS IN PAVEMENT TOP OF CONCRETE PAD TO BE 2" BELOW FINISH GRADE.
- WHEN VALVE IS ON GRAVEL OR DIRT STREET, TOP OF CONCRETE PAD TO BE AT FINISH GRADE.
- VALVE BOX WILL CONFORM TO ASTM A48, CLASS 30B. SEE SECTION 3.1(e).
- IF VALVE BOX IS TO BE EXTENDED, ONLY DIP MAY BE USED.
- BLACK COLORED CONCRETE SHALL BE USED FOR THE COLLAR WHEN LOCATED IN ASPHALT PAVEMENT.



TOWN OF MOORESVILLE
 STANDARD DETAIL

WATER SYSTEMS
 ROUND TOP VALVE
 BOX INSTALLATION

June 2018
 Revision 2
 NTS W - 15.0

PROJECT TYPICAL DETAILS



Stantec Consulting Services Inc.
801 Jones Franklin Road
Suite 300
Raleigh, NC 27606
Tel. (919) 851-6866
Fax. (919) 851-7024
www.stantec.com
License No. F-0672

PROJECT REFERENCE NO.	R-3833C	SHEET NO.	UC-03E
DESIGNED BY:	MCM		
DRAWN BY:	RGR		
CHECKED BY:	MCM		
APPROVED BY:			
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			

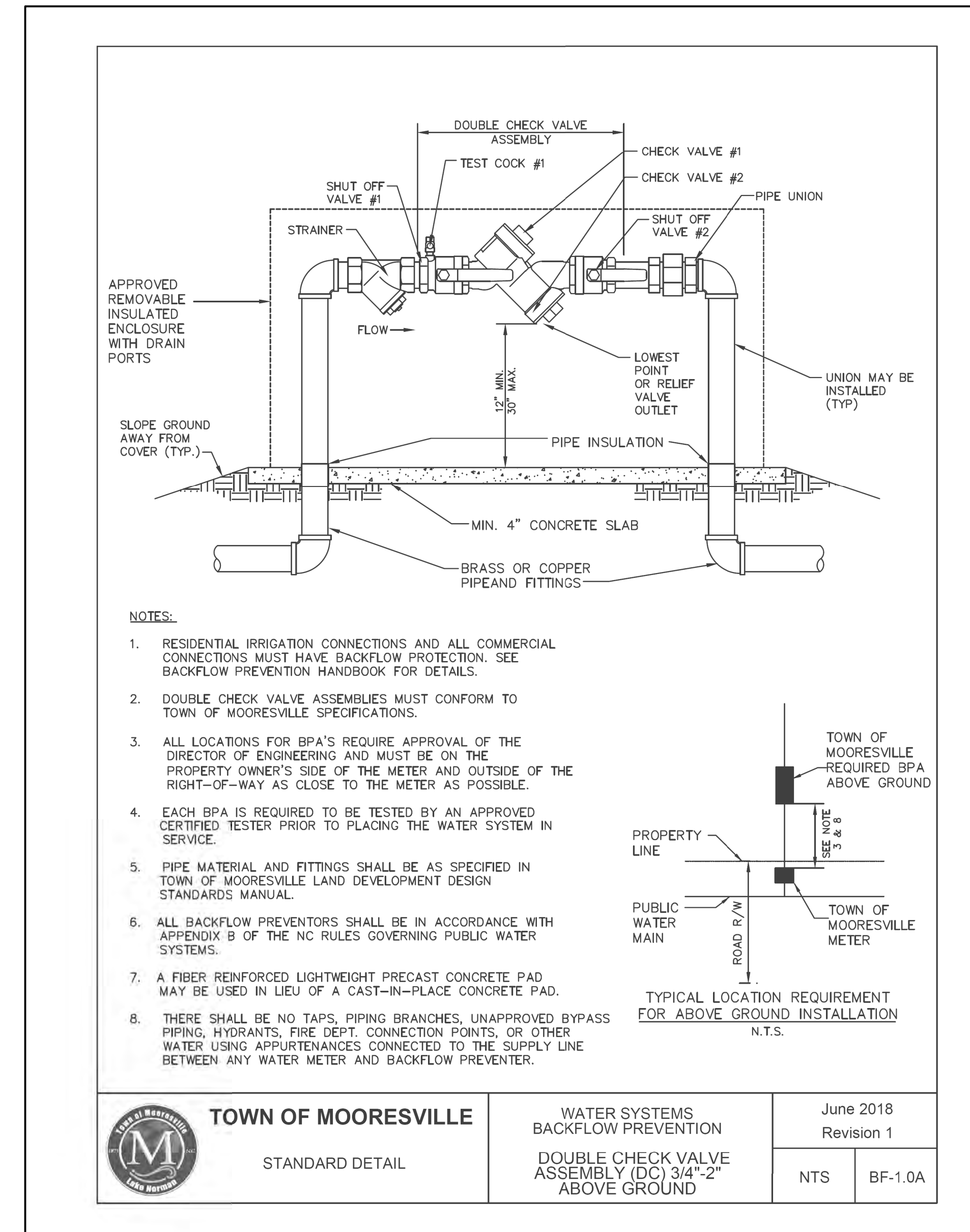
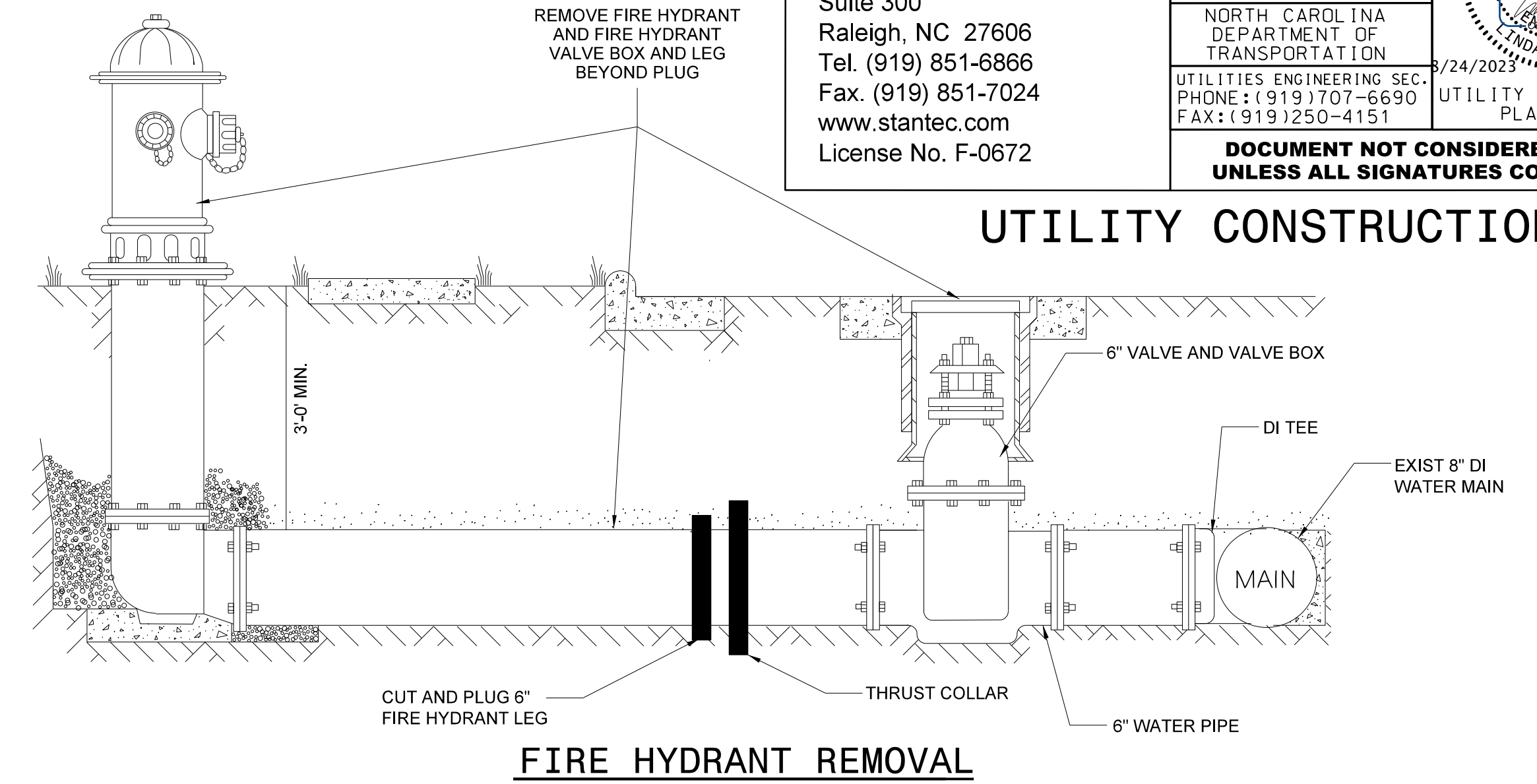
PIPE DIAMETER (INCHES)	RESTRAINED LENGTH IN FEET EACH SIDE OF FITTING JOINT					
	90°	45° (horizontal / vertical up)	45° (vertical down)	22.5°	11.25°	Dead End
6"	60'	25'	60'	15'	10'	145'
8"	75'	30'	80'	15'	10'	185'
10"	75'	40'	90'	20'	10'	225'
12"	75'	45'	110'	20'	10'	265'
16"	130'	55'	110'	25'	15'	335'

PIPE DIAMETER (INCHES)	RESTRAINED LENGTH IN FEET FOR REDUCER				
	6"	8"	10"	12"	16"
6"	-	-	-	-	-
8"	80'	-	-	-	-
10"	140'	75'	-	-	-
12"	190'	140'	75'	-	-
16"	280'	245'	200'	145'	-

PIPE DIAMETER (INCHES)	RESTRAINED LENGTH IN FEET EACH SIDE OF TEE				
	6"	8"	10"	12"	16"
6"	125'	-	-	-	-
8"	115'	165'	-	-	-
10"	110'	160'	200'	-	-
12"	100'	155'	200'	240'	-
16"	90'	145'	190'	235'	315'

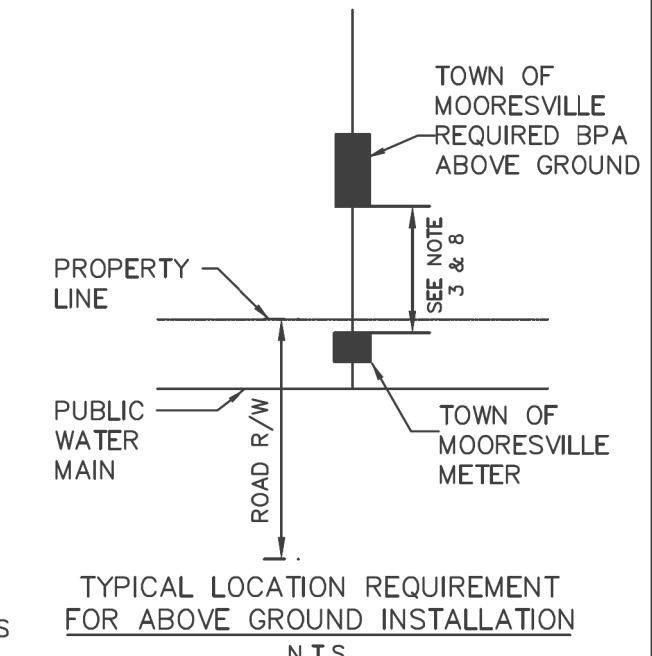
RESTRAINED JOINT TABLE

NOTES:
1. RESTRAINED JOINT TABLE DEVELOPED USING THE DUCTILE IRON PIPE RESEARCH ASSOCIATION (DIPRA) THRUST RESTRAINT DESIGN FOR DUCTILE IRON PIPE COMPUTER PROGRAM.



NOTES:

- RESIDENTIAL IRRIGATION CONNECTIONS AND ALL COMMERCIAL CONNECTIONS MUST HAVE BACKFLOW PROTECTION. SEE BACKFLOW PREVENTION HANDBOOK FOR DETAILS.
- DOUBLE CHECK VALVE ASSEMBLIES MUST CONFORM TO TOWN OF MOORESVILLE SPECIFICATIONS.
- ALL LOCATIONS FOR BPA'S REQUIRE APPROVAL OF THE DIRECTOR OF ENGINEERING AND MUST BE ON THE PROPERTY OWNER'S SIDE OF THE METER AND OUTSIDE OF THE RIGHT-OF-WAY AS CLOSE TO THE METER AS POSSIBLE.
- EACH BPA IS REQUIRED TO BE TESTED BY AN APPROVED CERTIFIED TESTER PRIOR TO PLACING THE WATER SYSTEM IN SERVICE.
- PIPE MATERIAL AND FITTINGS SHALL BE AS SPECIFIED IN TOWN OF MOORESVILLE LAND DEVELOPMENT DESIGN STANDARDS MANUAL.
- ALL BACKFLOW PREVENTORS SHALL BE IN ACCORDANCE WITH APPENDIX B OF THE NC RULES GOVERNING PUBLIC WATER SYSTEMS.
- A FIBER REINFORCED LIGHTWEIGHT PRECAST CONCRETE PAD MAY BE USED IN LIEU OF A CAST-IN-PLACE CONCRETE PAD.
- THERE SHALL BE NO TAPS, PIPING BRANCHES, UNAPPROVED BYPASS PIPING, HYDRANTS, FIRE DEPT. CONNECTION POINTS, OR OTHER WATER USING APPURTENANCES CONNECTED TO THE SUPPLY LINE BETWEEN ANY WATER METER AND BACKFLOW PREVENTER.



TOWN OF MOORESVILLE
STANDARD DETAIL

WATER SYSTEMS
BACKFLOW PREVENTION
DOUBLE CHECK VALVE
ASSEMBLY (DC) 3/4"-2"
ABOVE GROUND

June 2018
Revision 1
NTS BF-1.0A

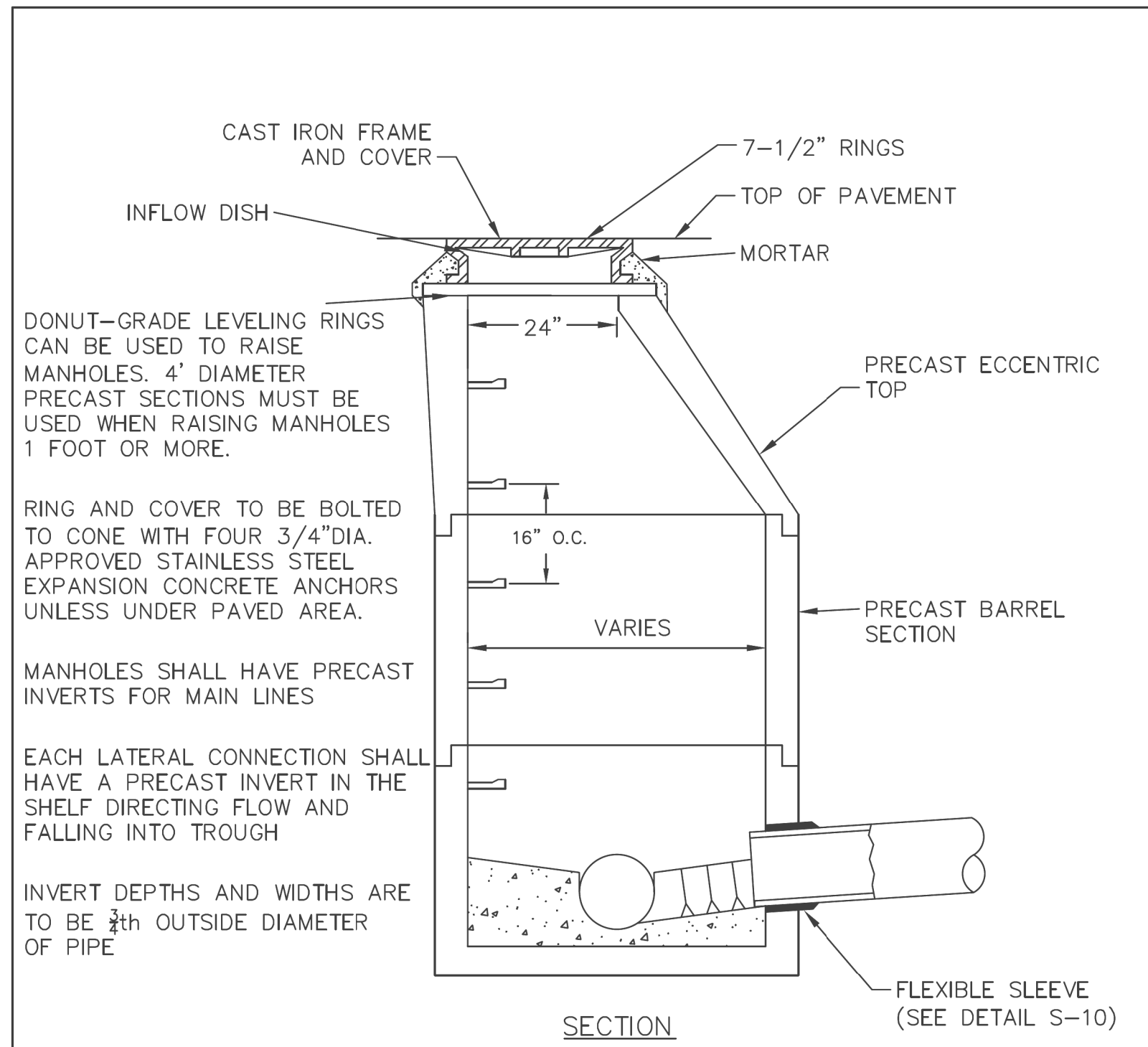
PROJECT TYPICAL DETAILS



Stantec Consulting Services Inc.
 801 Jones Franklin Road
 Suite 300
 Raleigh, NC 27606
 Tel. (919) 851-6866
 Fax. (919) 851-7024
 www.stantec.com
 License No. F-0672

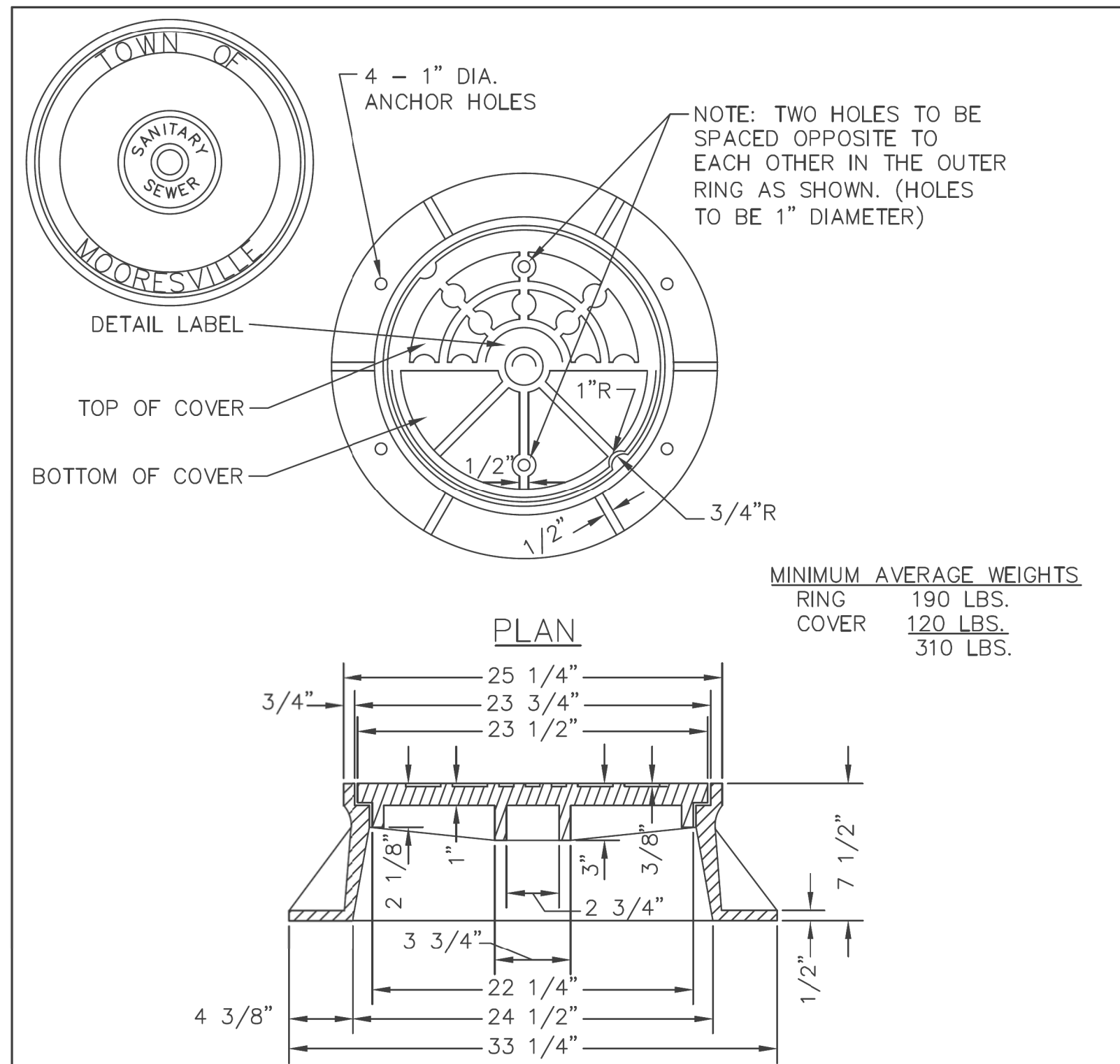
PROJECT REFERENCE NO. R-3833C	SHEET NO. UC-03F
DESIGNED BY: MCM	
DRAWN BY: RGR	
CHECKED BY: MCM	
APPROVED BY:	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	8/24/2023 UTILITY CONSTRUCTION PLANS ONLY
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

UTILITY CONSTRUCTION



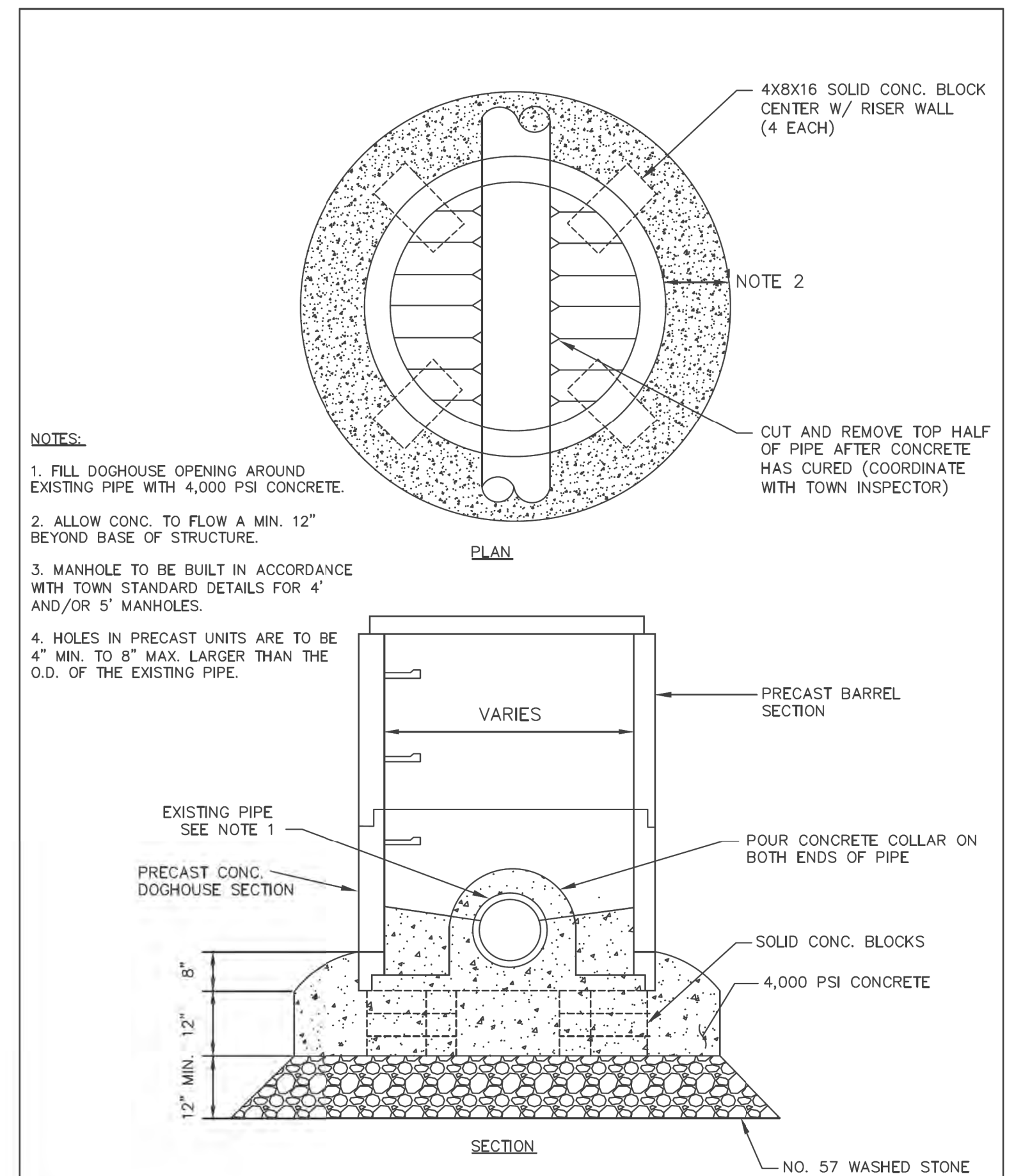
- NOTES:**
1. PRECAST MANHOLE SHALL CONFORM TO ASTM C478, WITH AASHTO M198 BUTYL SEALS BETWEEN JOINTS AND 6" ADHESIVE BUTYL TAPE ON THE OUTSIDE OF JOINTS.
 2. MANHOLE RIM SHALL BE FLUSH WITH PAVED SURFACES AND LAWNS AND 2 TO 3 FEET ABOVE GRADE IN UNIMPROVED AREAS.
 3. SEE DETAIL S-9 FOR PRECAST MANHOLE INVERTS.
 4. MANHOLES SHALL BE BEDDED ON 8" STABILIZATION STONE AS OR AS DIRECTED BY THE INSPECTOR OR SOIL ENGINEER.
 5. ALL VENTED MANHOLES SHALL HAVE AN MANHOLE INSERT DISH. SEE STANDARDS 4.4 b FOR DETAILS.

TOWN OF MOORESVILLE STANDARD DETAIL	SEWER SYSTEMS STANDARD MANHOLE	January 2009 Revision 1	
		NTS	S - 1.0



- NOTES:**
1. RING AND COVER WILL HAVE MACHINED SEAT AND WILL CONFORM TO ASTM A48, CLASS 35B. RING AND COVER WILL BE DESIGNED TO SUPPORT AN H-20 WHEEL LOAD ALSO MEETING NCDOT STANDARD 840.54.
 2. DIMENSIONS MAY VARY BUT MANHOLE RING AND COVER ARE TO BE INTERCHANGEABLE WITH DIMENSIONS SHOWN.
 3. FOUR-INCH RINGS IN ROADWAYS MUST BE APPROVED BY THE DIRECTOR OF ENGINEERING, AND SHALL BE BOLTED TO THE CONE WITH FOUR 3/4-INCH DIA. STAINLESS STEEL ANCHORS.

TOWN OF MOORESVILLE STANDARD DETAIL	SEWER SYSTEMS STANDARD RING & COVER	January 2014 Revision 2	
		NTS	S-2.0



TOWN OF MOORESVILLE STANDARD DETAIL	SEWER SYSTEMS DOGHOUSE MANHOLE	January 2009 Revision 1	
		NTS	S - 5.0

8/23/2023 C:\Utilities\Engineering\UC\Proj\NR3833C-ut.tbl\UC03F.dgn

PROJECT TYPICAL DETAILS



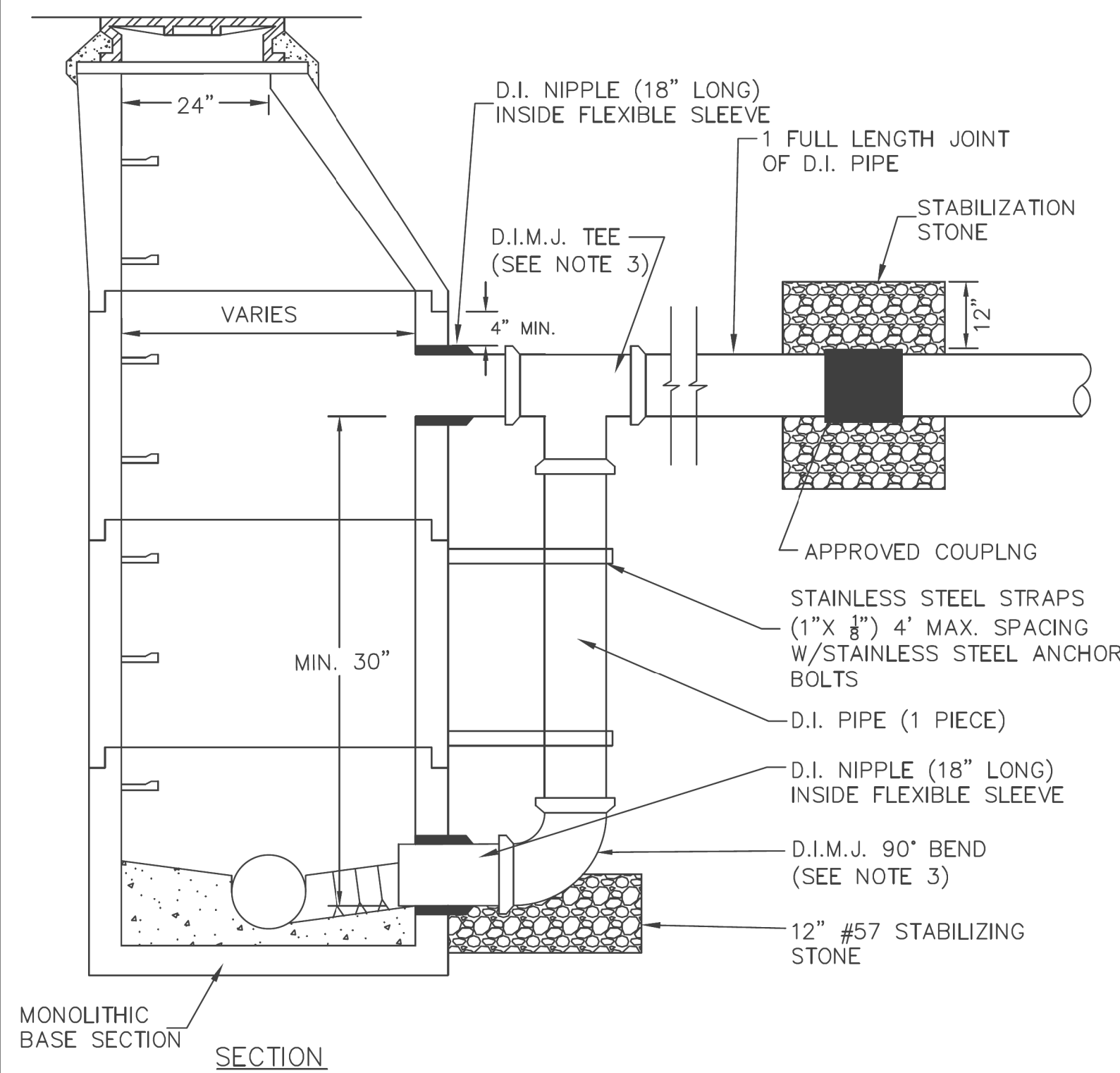
Stantec Consulting Services Inc.
 801 Jones Franklin Road
 Suite 300
 Raleigh, NC 27606
 Tel. (919) 851-6866
 Fax. (919) 851-7024
 www.stantec.com
 License No. F-0672

PROJECT REFERENCE NO. R-3833C	SHEET NO. UC-03G
DESIGNED BY: MCM	
DRAWN BY: RGR	
CHECKED BY: MCM	
APPROVED BY:	
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	

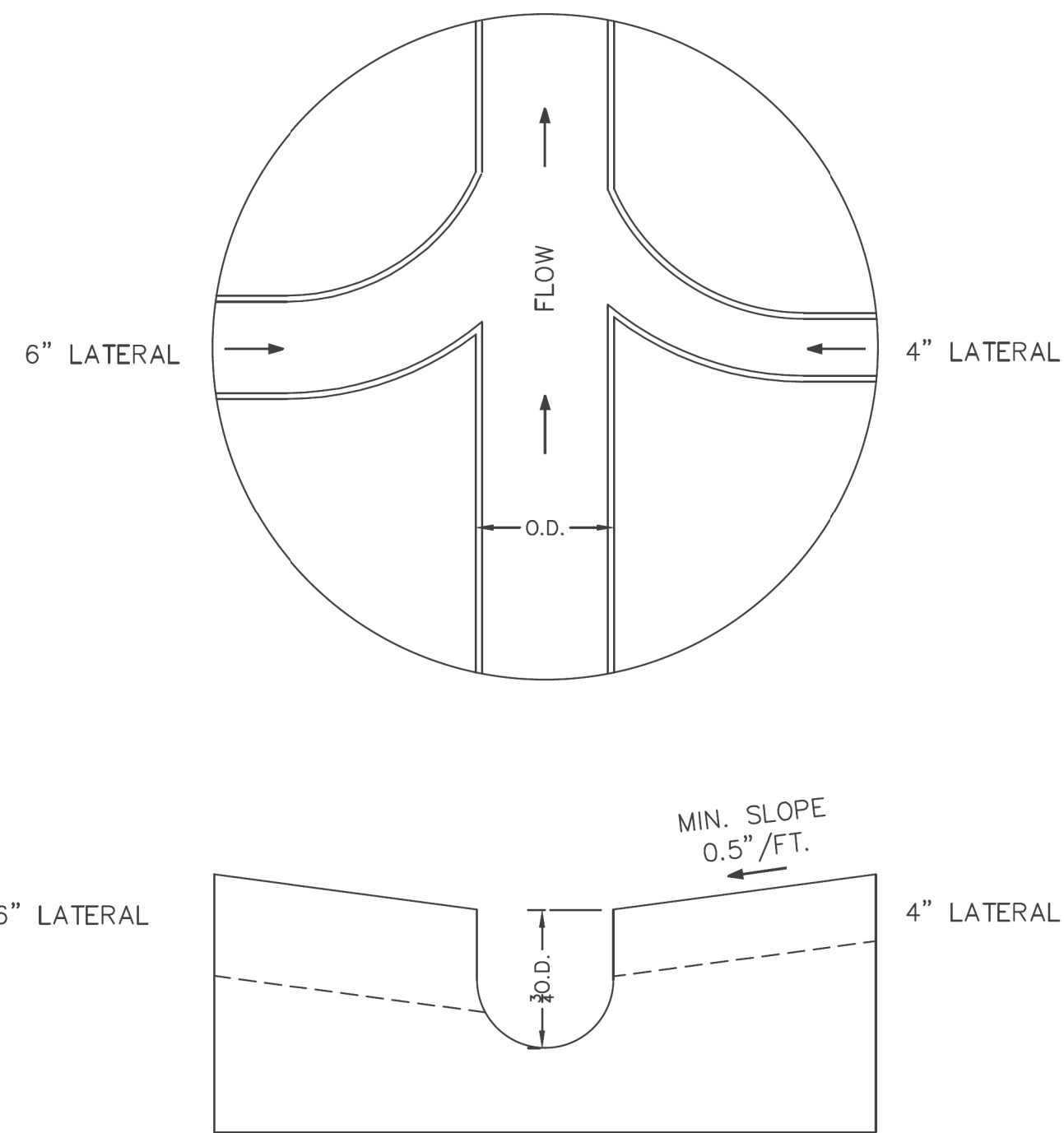
UTILITY CONSTRUCTION

NOTES:

1. MANHOLE TO BE BUILT IN ACCORDANCE WITH TOWN STANDARD DETAILS FOR 4' AND/OR 5' MANHOLES.
2. OUTSIDE DROP SHALL NOT ENTER MANHOLE IN CONE SECTION.
3. TEE AND 90° BEND CONNECTED TO PIPE WITH ~~MEGA-LUG TYPE RIGID RESTRAINTS~~ RESTRAINED MECHANICAL JOINT.



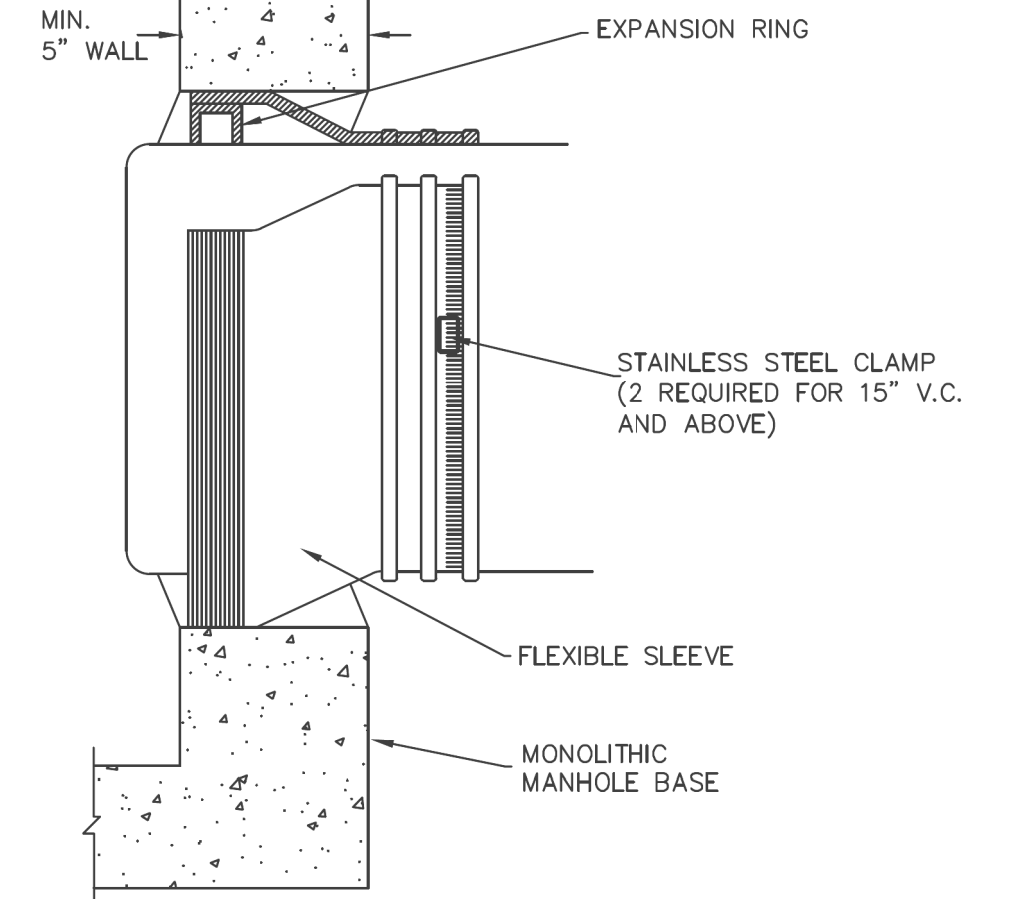
	TOWN OF MOORESVILLE	SEWER SYSTEMS OUTSIDE DROP MANHOLE	June 2018 Revision 2
	STANDARD DETAIL		NTS S-8.5



NOTES:

1. O.D. = SEWER MAIN OUTSIDE PIPE DIAMETER. (MIN. 8 INCHES)
2. MANHOLES SHALL HAVE PRECAST, 4000 PSI CONCRETE INVERTS. INVERT DEPTH = OUTSIDE DIAMETER OF PIPE. INVERT WIDTH = OUTSIDE DIAMETER OF PIPE.
3. EACH LATERAL CONNECTION SHALL HAVE A PRECAST INVERT DIRECTING FLOW IN THE DIRECTION OF THE SEWER. INVERT DEPTH = OUTSIDE DIAMETER OF PIPE. INVERT WIDTH = OUTSIDE DIAMETER OF PIPE.

	TOWN OF MOORESVILLE	SEWER SYSTEMS MANHOLE INVERTS	January 2014 Revision 2
	STANDARD DETAIL		NTS S-9.0



NOTES:

1. FLEXIBLE MANHOLE SLEEVES SHALL CONFORM TO ASTM 923. SLEEVES BY PRESS-SEAL GASKET CORPORATION, EPCO INC. OR NPC INC. OR EQUIVALENT ARE ACCEPTABLE. MAXIMUM DEFLECTION FOR SLEEVE IS 7" (12%). SLOPES GREATER THAN 12% MUST HAVE SLEEVES DESIGNED FOR HIGHER DEFLECTION.
2. 1/2" x 3" RUBBER LINER ADAPTER GASKET BY PRESS-SEAL GASKET CORP. MUST BE USED FOR D.I. PIPE. IF FLEXIBLE SLEEVE IS DESIGNED FOR V.C. PIPE GASKET TO BE INSTALLED UNDER S.S. CLAMP BETWEEN PIPE AND FLEXIBLE SLEEVE.

	TOWN OF MOORESVILLE	SEWER SYSTEMS FLEXIBLE MANHOLE SLEEVE	January 2009 Revision 1
	STANDARD DETAIL		NTS S-10.0

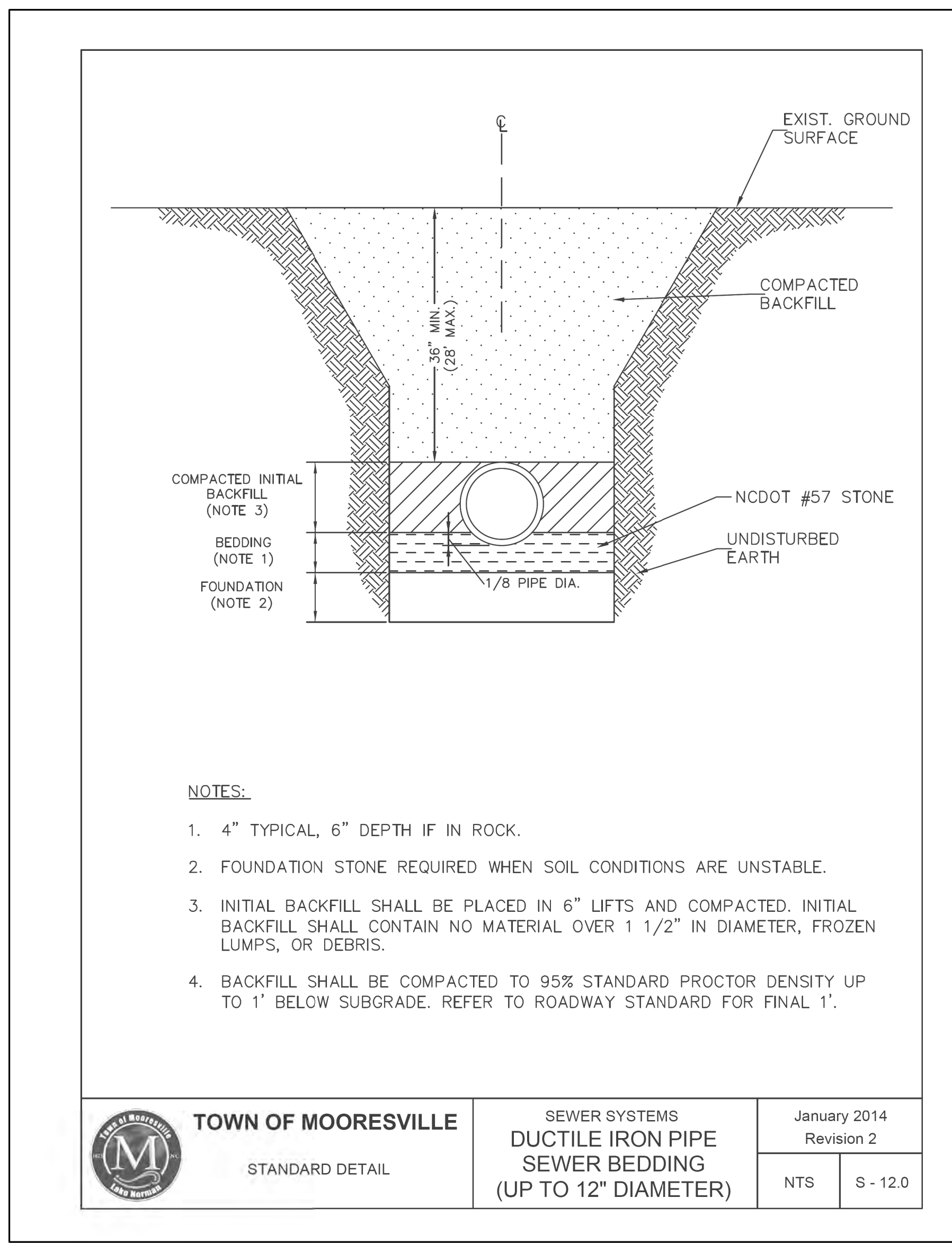
PROJECT TYPICAL DETAILS



PROJECT REFERENCE NO.	SHEET NO.
R-3833C	UC-03H
DESIGNED BY: MCM	
DRAWN BY: RGR	
CHECKED BY: MCM	
APPROVED BY:	
REVISER:	NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

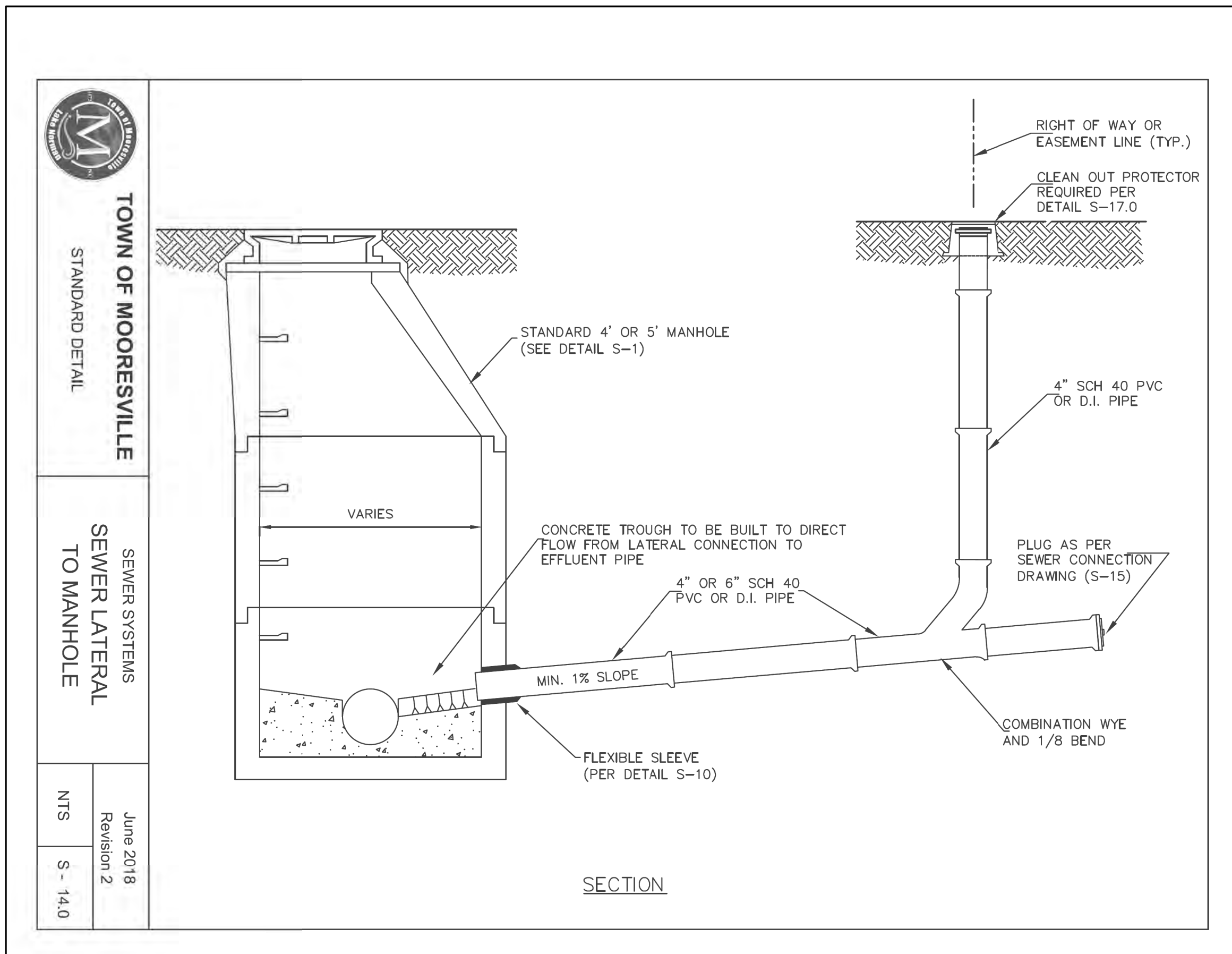
Stantec Consulting Services Inc.
 801 Jones Franklin Road
 Suite 300
 Raleigh, NC 27606
 Tel. (919) 851-6866
 Fax. (919) 851-7024
 www.stantec.com
 License No. F-0672

UTILITY CONSTRUCTION

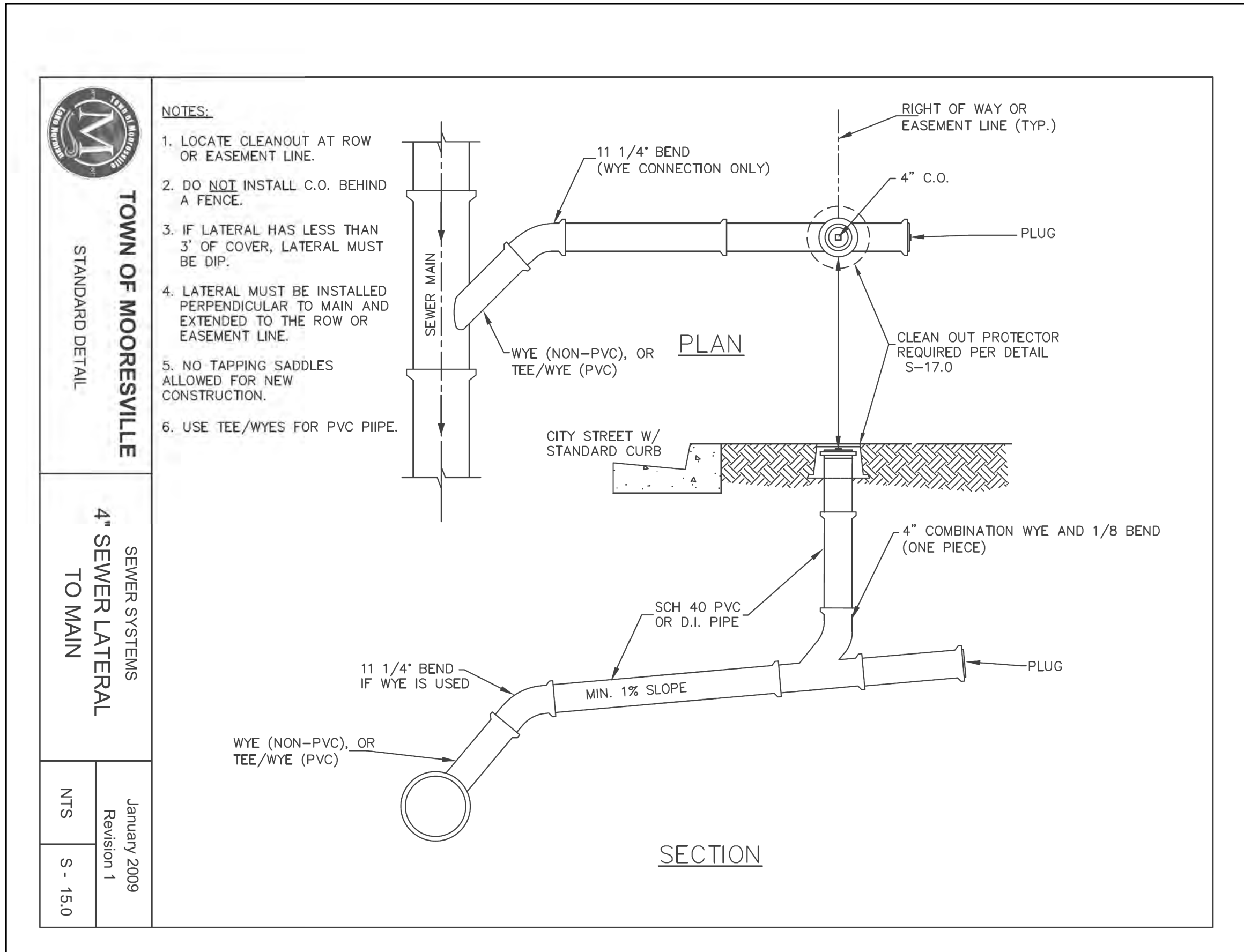


NOTES:

1. 4" TYPICAL, 6" DEPTH IF IN ROCK.
2. FOUNDATION STONE REQUIRED WHEN SOIL CONDITIONS ARE UNSTABLE.
3. INITIAL BACKFILL SHALL BE PLACED IN 6" LIFTS AND COMPACTED. INITIAL BACKFILL SHALL CONTAIN NO MATERIAL OVER 1 1/2" IN DIAMETER, FROZEN LUMPS, OR DEBRIS.
4. BACKFILL SHALL BE COMPACTED TO 95% STANDARD PROCTOR DENSITY UP TO 1' BELOW SUBGRADE. REFER TO ROADWAY STANDARD FOR FINAL 1'.



SECTION



NOTES:

1. LOCATE CLEANOUT AT ROW OR EASEMENT LINE.
2. DO NOT INSTALL C.O. BEHIND A FENCE.
3. IF LATERAL HAS LESS THAN 3' OF COVER, LATERAL MUST BE DIP.
4. LATERAL MUST BE INSTALLED PERPENDICULAR TO MAIN AND EXTENDED TO THE ROW OR EASEMENT LINE.
5. NO TAPPING SADDLES ALLOWED FOR NEW CONSTRUCTION.
6. USE TEE/WYES FOR PVC PIPE.

PLAN

SECTION

8/23/2023 C:\Utilities\Engineering\UC\Proj\NR3833C-ut.tbl_UC03h.dgn

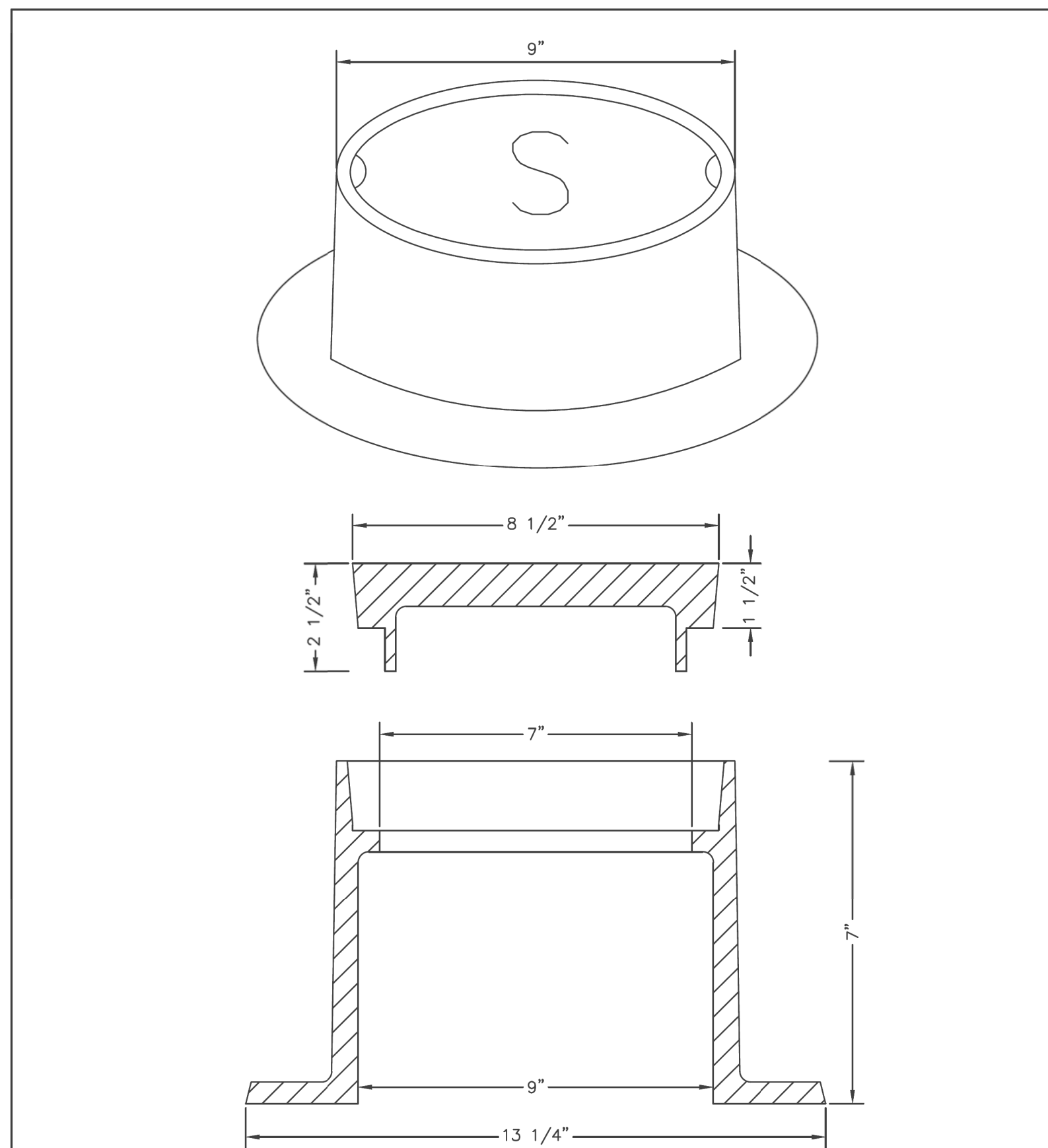
PROJECT TYPICAL DETAILS



Stantec Consulting Services Inc.
 801 Jones Franklin Road
 Suite 300
 Raleigh, NC 27606
 Tel. (919) 851-6866
 Fax. (919) 851-7024
 www.stantec.com
 License No. F-0672

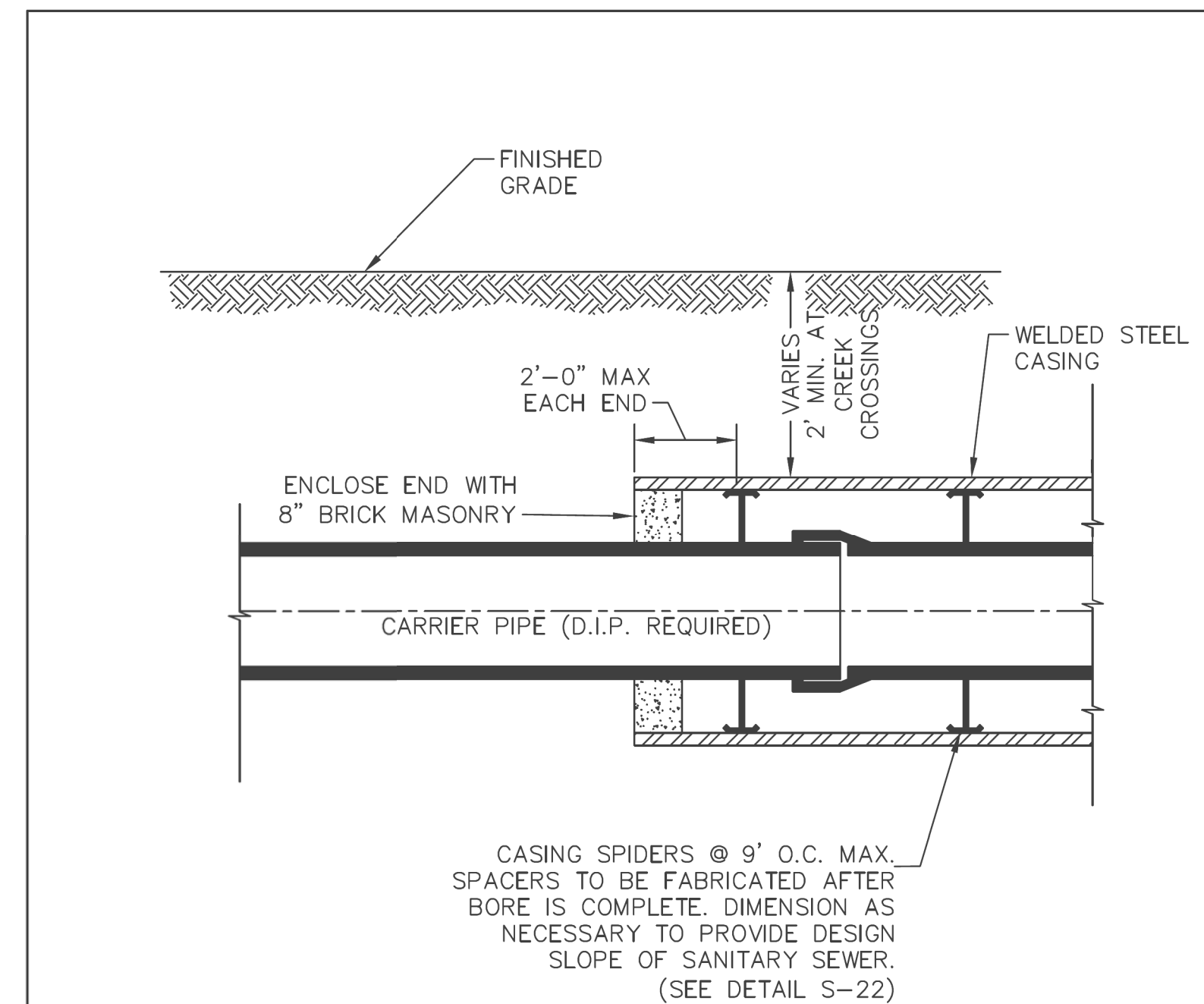
PROJECT REFERENCE NO. R-3833C	SHEET NO. UC-03I
DESIGNED BY: MCM	
DRAWN BY: RGR	
CHECKED BY: MCM	
APPROVED BY:	
REVISER:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	UTILITY CONSTRUCTION PLANS ONLY
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

UTILITY CONSTRUCTION



- NOTES:
1. MIN. TOTAL WEIGHT SHALL BE 55 LBS.
 2. CAST IRON CLEAN OUT PROTECTORS REQUIRED FOR ALL NEW CONSTRUCTION.
 3. ~~EAST JORDAN IRON WORKS (PART NO. 1566)~~
~~US FOUNDRY & MANUFACTURING CORP. (PART NO. 7610)~~

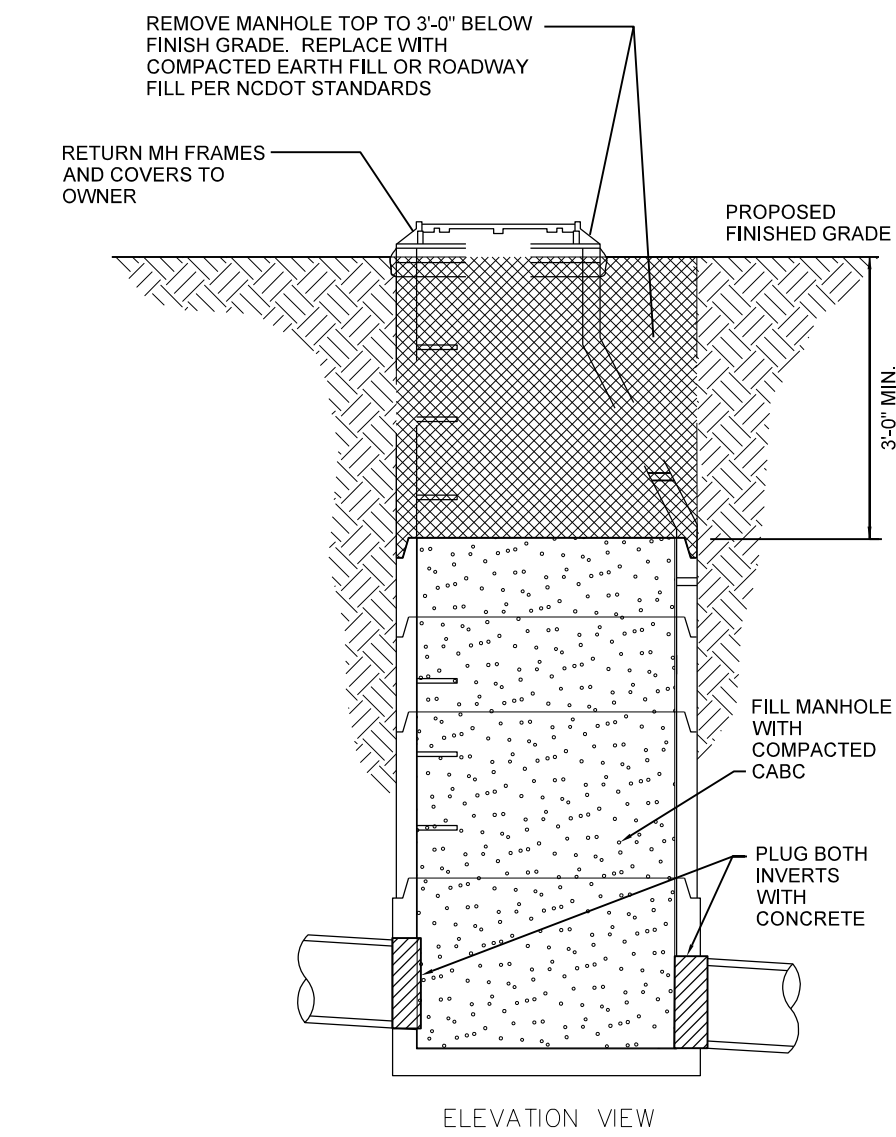
	TOWN OF MOORESVILLE SEWER SYSTEMS CLEAN OUT PROTECTOR STANDARD DETAIL	January 2009 Revision 1	
		NTS	S - 17.0



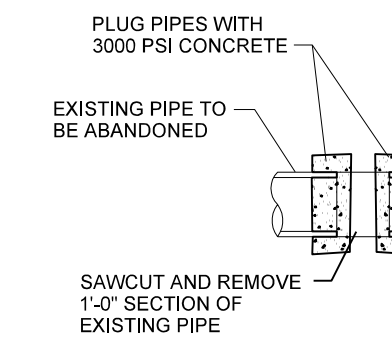
CASING SPIDERS @ 9' O.C. MAX. SPACERS TO BE FABRICATED AFTER BORE IS COMPLETE. DIMENSION AS NECESSARY TO PROVIDE DESIGN SLOPE OF SANITARY SEWER. (SEE DETAIL S-22)

- NOTES:
1. CASING SHALL MEET THE REQUIREMENTS OF N.C. DEPARTMENT OF TRANSPORTATION, RAILROAD OR OTHER APPLICABLE REGULATORY AGENCY.
 2. CASING SPIDERS TO BE APPROVED BY DIRECTOR OF ENGINEERING.
 3. ALL CARRIER PIPE SHALL BE RESTRAINED JOINT D.I.P.

	TOWN OF MOORESVILLE SEWER SYSTEMS CASING STANDARD DETAIL	March 2013 Revision 2	
		NTS	S - 21.0



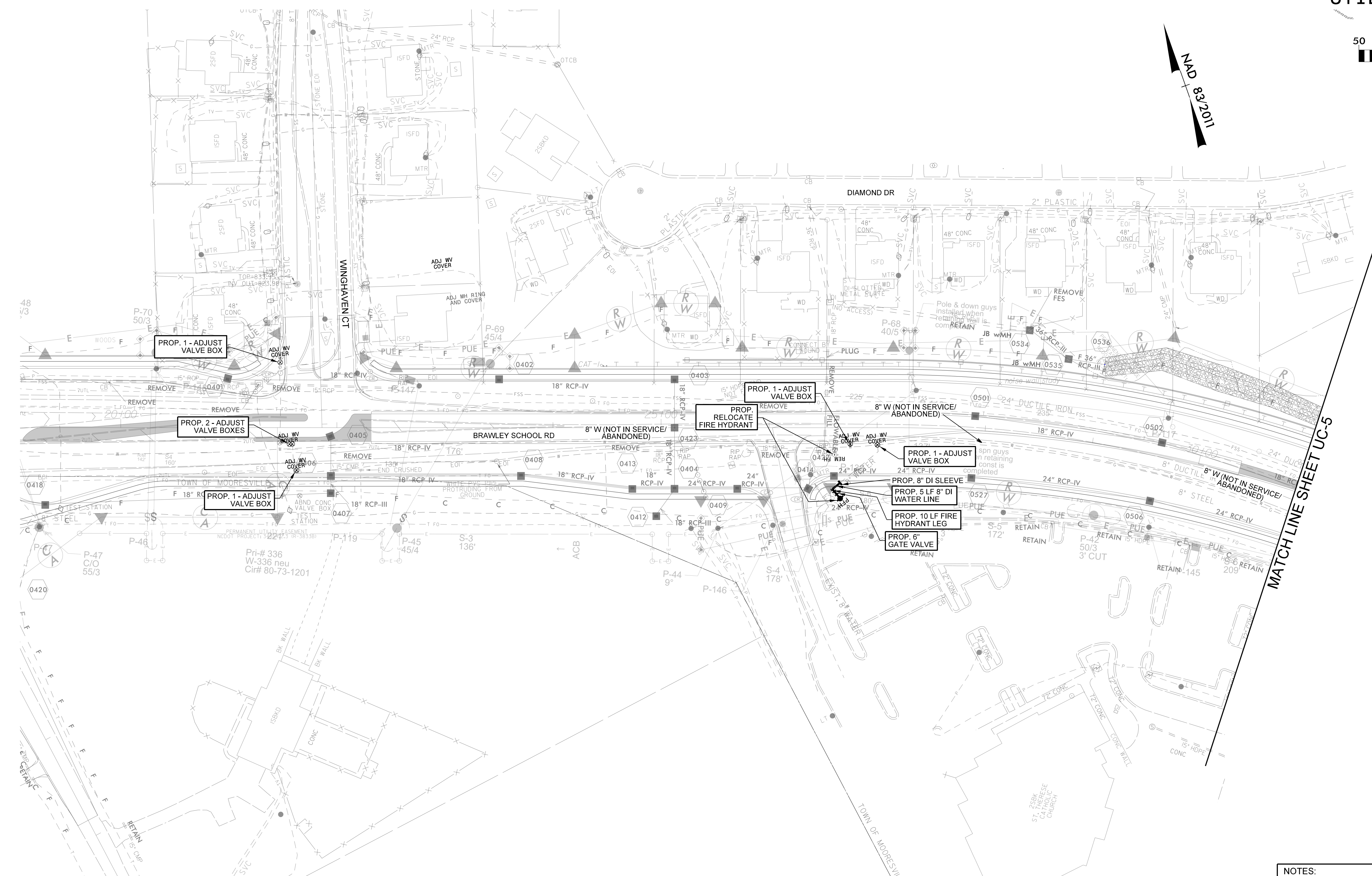
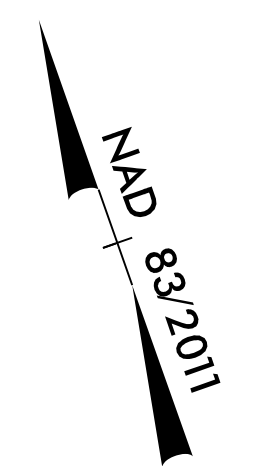
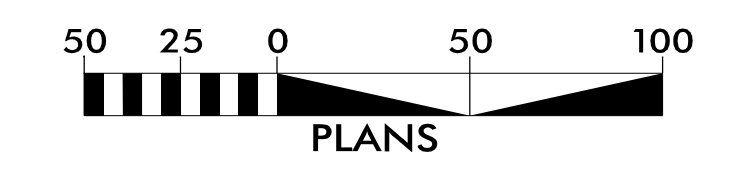
MANHOLE DEMOLITION AND ABANDONMENT



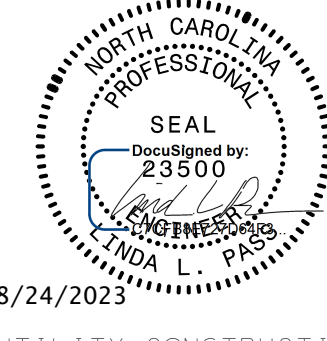
SEWER LINE ABANDONMENT (<24')

 Stantec Stantec Consulting Services Inc. 801 Jones Franklin Road Suite 300 Raleigh, NC 27606 Tel. (919) 851-6866 Fax. (919) 851-7024 www.stantec.com License No. F-0672	PROJECT REFERENCE NO. R-3833C	SHEET NO. UC-4
	DESIGNED BY: LLP	
DRAWN BY: RGR		
CHECKED BY: LLP		
APPROVED BY:		
REVISED:	NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	8/24/2023
	UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	UTILITY CONSTRUCTION PLANS ONLY

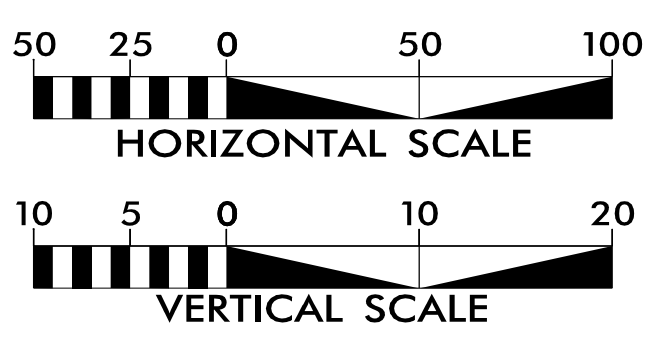
UTILITY CONSTRUCTION



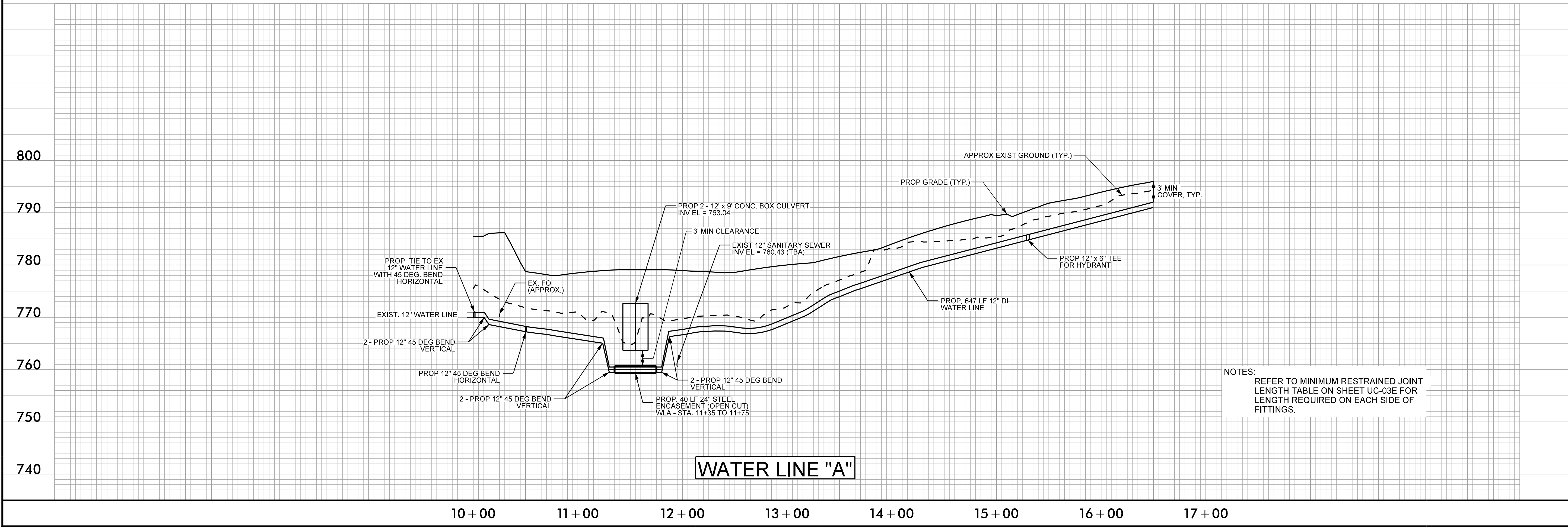
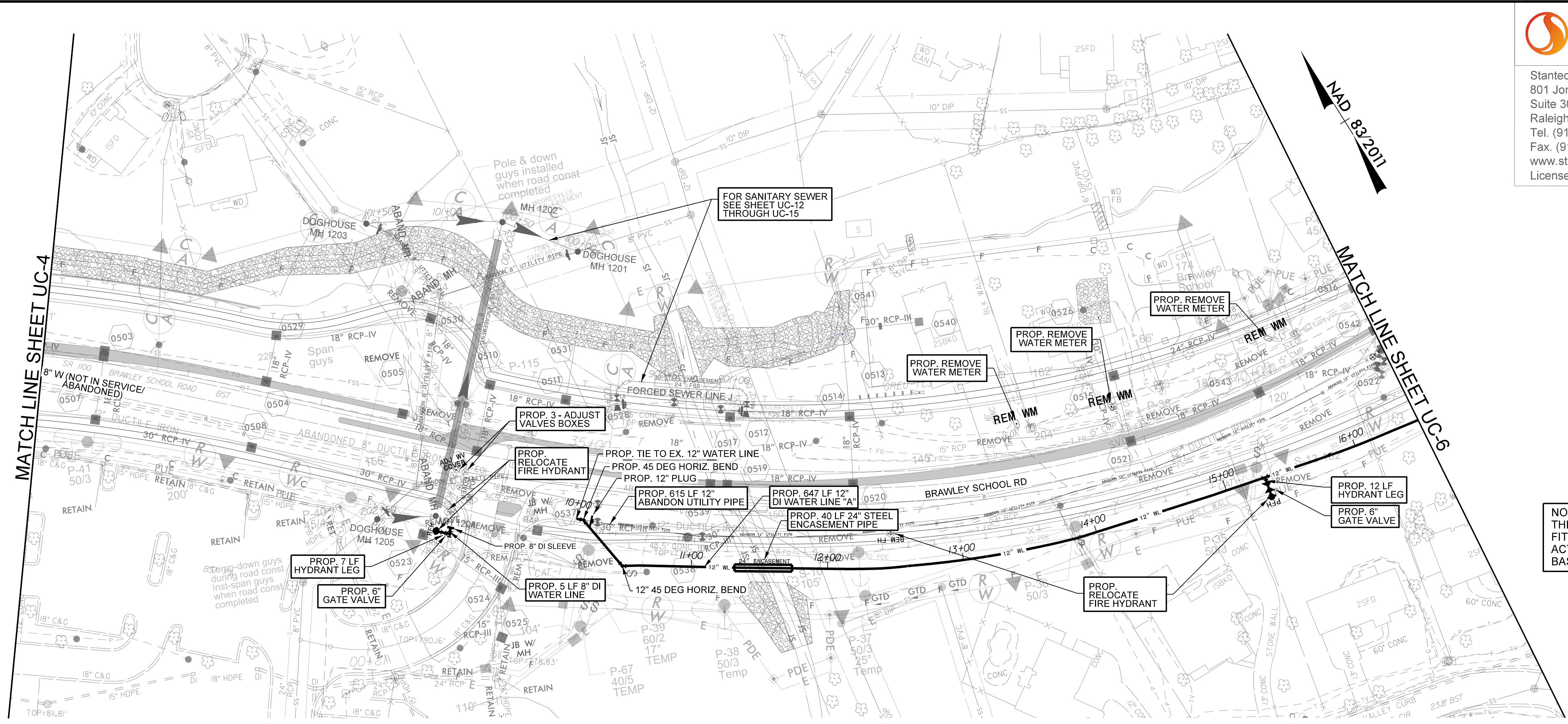
NOTES:
 THE ESTIMATED QUANTITY OF DUCTILE IRON WATER PIPE FITTINGS ON THIS PLAN SHEET IS 85 POUNDS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.

PROJECT REFERENCE NO.	SHEET NO.
R-3833C	UC-5
DESIGNED BY: LLP	
DRAWN BY: RGR	
CHECKED BY: LLP	
APPROVED BY:	
REVISED:	
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	8/24/2023

UTILITY CONSTRUCTION



NOTES:
THE ESTIMATED QUANTITY OF DUCTILE IRON WATER PIPE FITTINGS ON THIS PLAN SHEET IS 2540 POUNDS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.

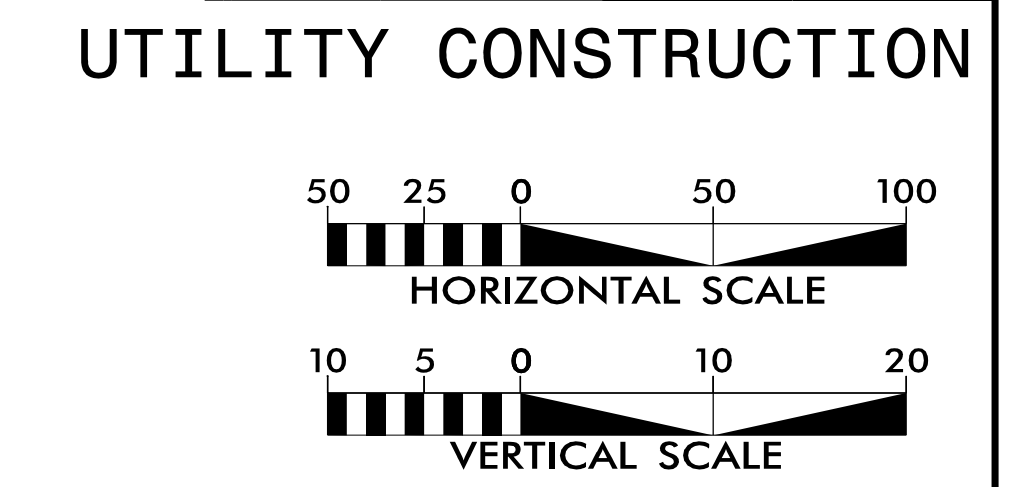
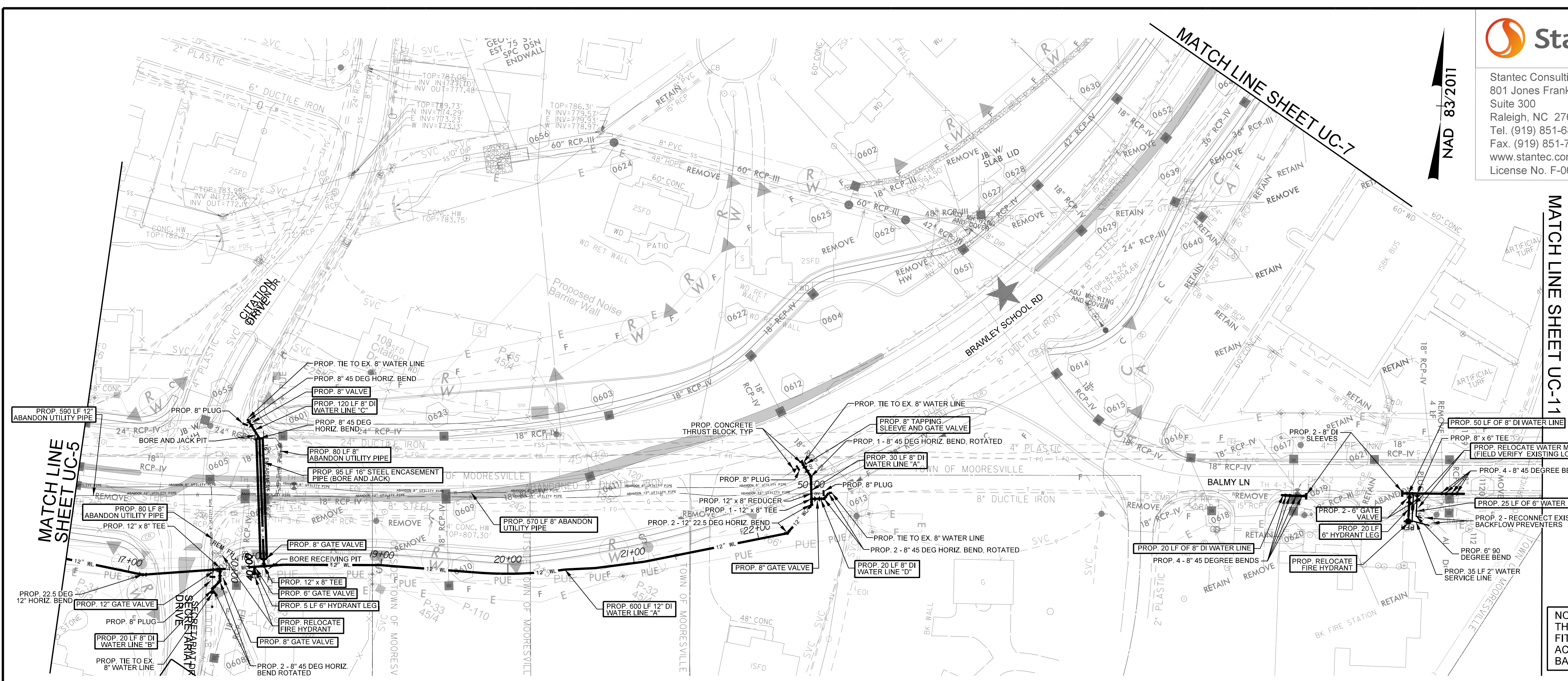


NOTES:
REFER TO MINIMUM RESTRAINED JOINT LENGTH TABLE ON SHEET UC-03E FOR LENGTH REQUIRED ON EACH SIDE OF FITTINGS.

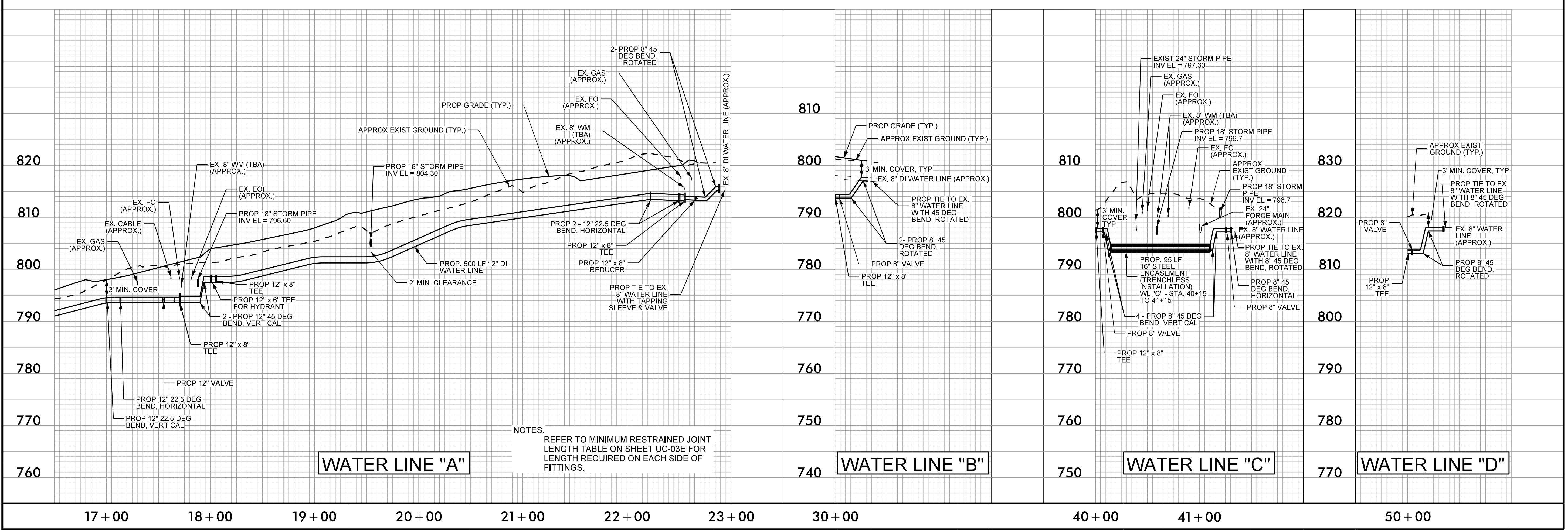


Stantec Consulting Services Inc.
801 Jones Franklin Road
Suite 300
Raleigh, NC 27606
Tel. (919) 851-6866
Fax. (919) 851-7024
www.stantec.com
License No. F-0672

PROJECT REFERENCE NO.	R-3833C	SHEET NO.	UC-6
DESIGNED BY:	LLP		
DRAWN BY:	RGR		
CHECKED BY:	LLP		
APPROVED BY:			
REVISED:			
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	 SEAL 23500 8/24/2023 UTILITY CONSTRUCTION PLANS ONLY		



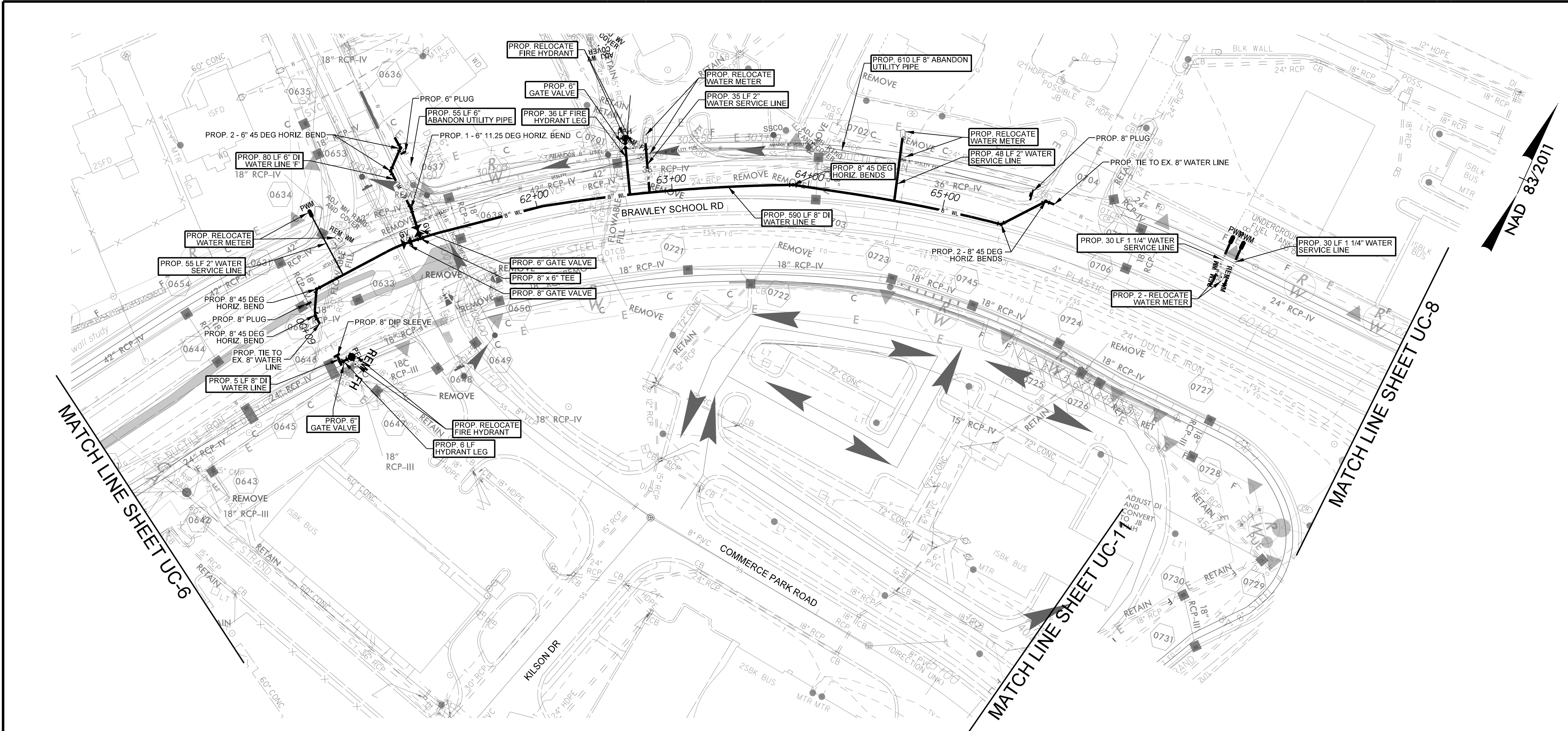
NOTES:
THE ESTIMATED QUANTITY OF DUCTILE IRON WATER PIPE FITTINGS ON THIS PLAN SHEET IS 6025 POUNDS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.



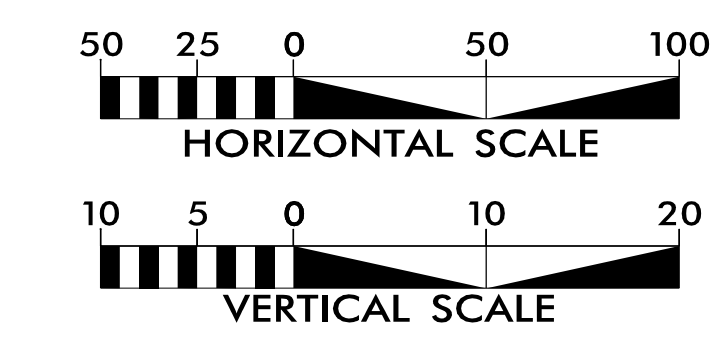
NOTES:
REFER TO MINIMUM RESTRAINED JOINT LENGTH TABLE ON SHEET UC-03E FOR LENGTH REQUIRED ON EACH SIDE OF FITTINGS.

Stantec
 Stantec Consulting Services Inc.
 801 Jones Franklin Road
 Suite 300
 Raleigh, NC 27606
 Tel. (919) 851-6866
 Fax. (919) 851-7024
 www.stantec.com
 License No. F-0672

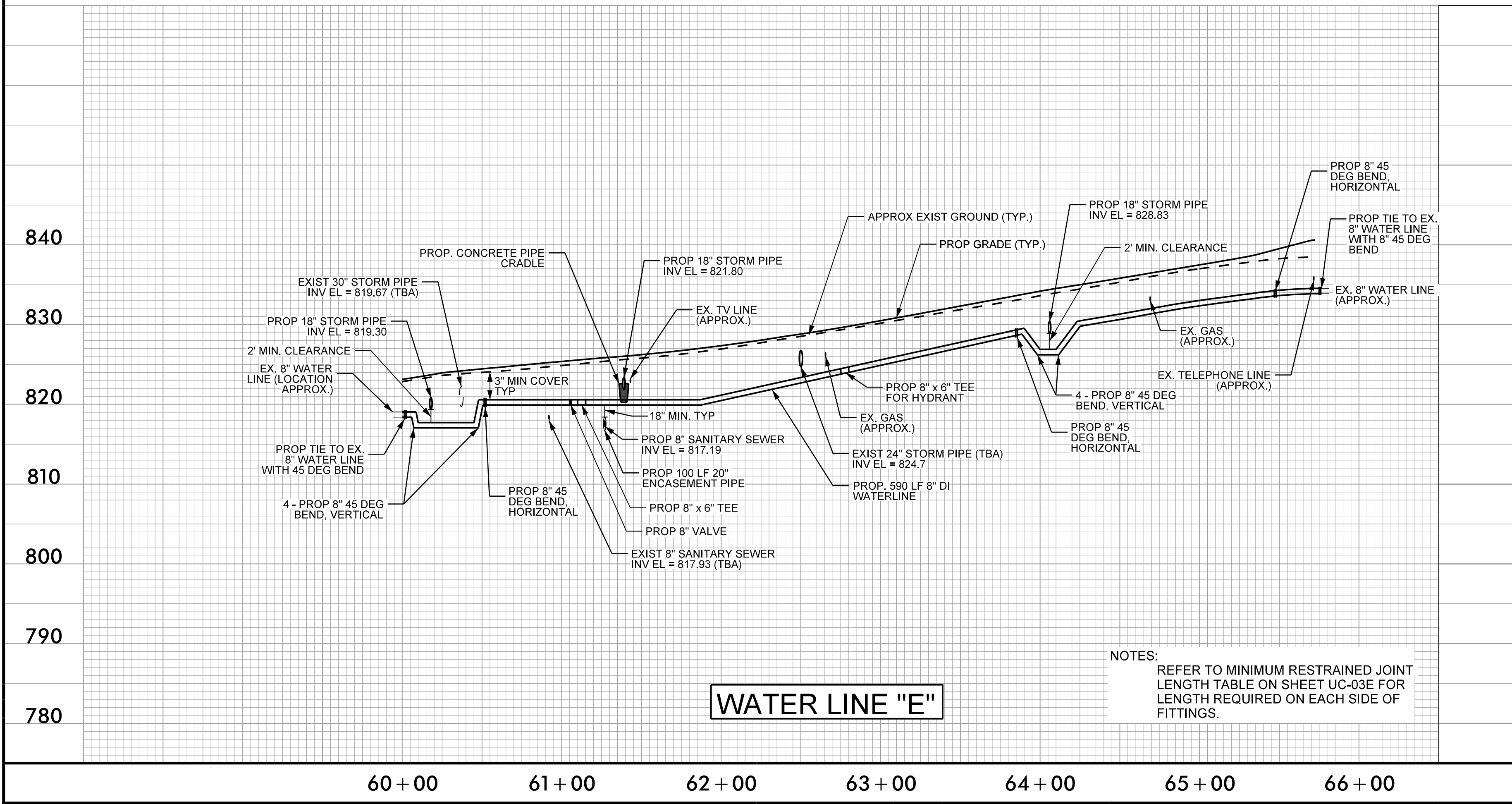
PROJECT REFERENCE NO.	R-3833C	SHEET NO.	UC-7
DESIGNED BY:	LLP		
DRAWN BY:	RGR		
CHECKED BY:	LLP		
APPROVED BY:			
REVISED:		NORTH CAROLINA DEPARTMENT OF TRANSPORTATION 8/24/2023 UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151 UTILITY CONSTRUCTION PLANS ONLY	



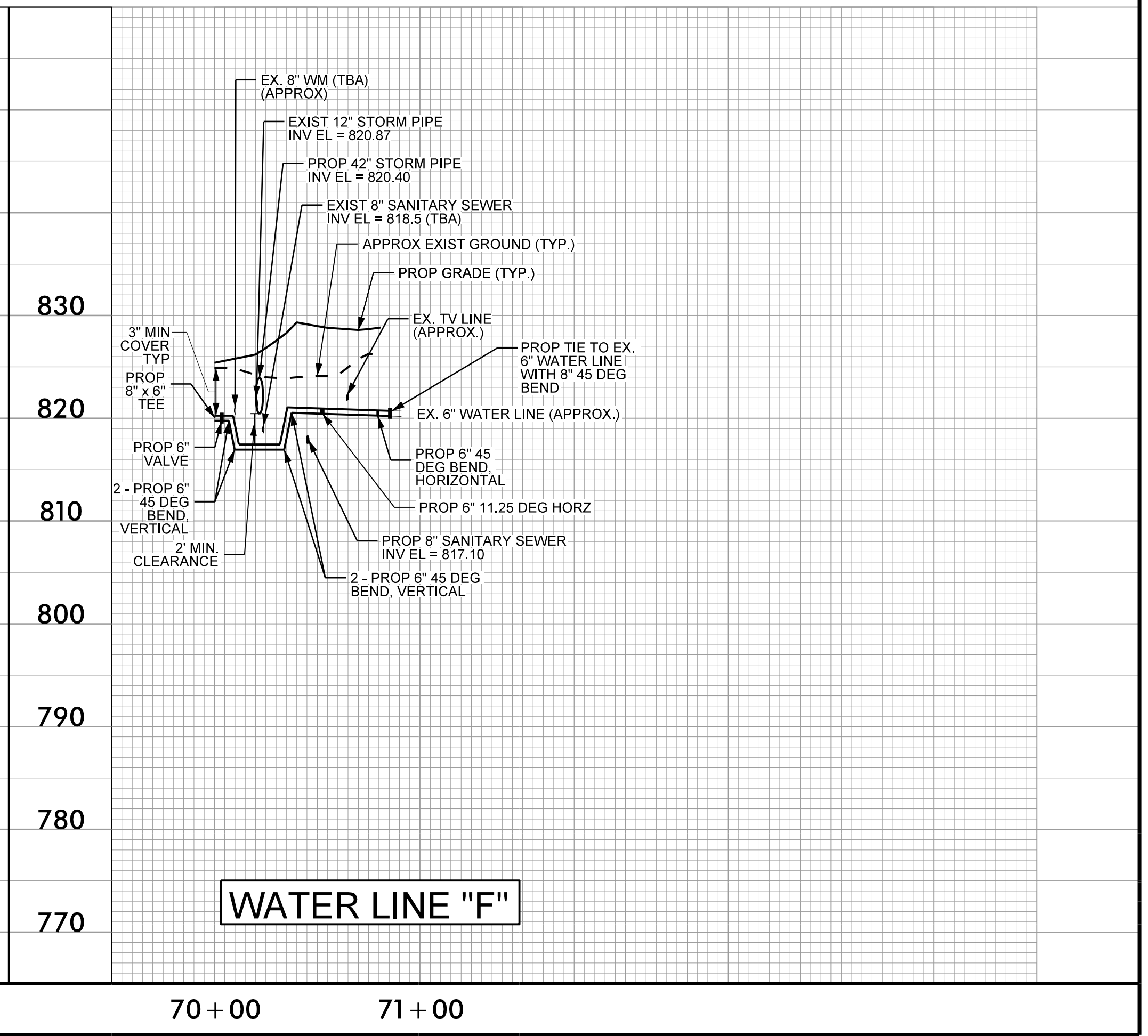
UTILITY CONSTRUCTION



NOTES:
 THE ESTIMATED QUANTITY OF DUCTILE IRON WATER PIPE FITTINGS ON THIS PLAN SHEET IS 2570 POUNDS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.

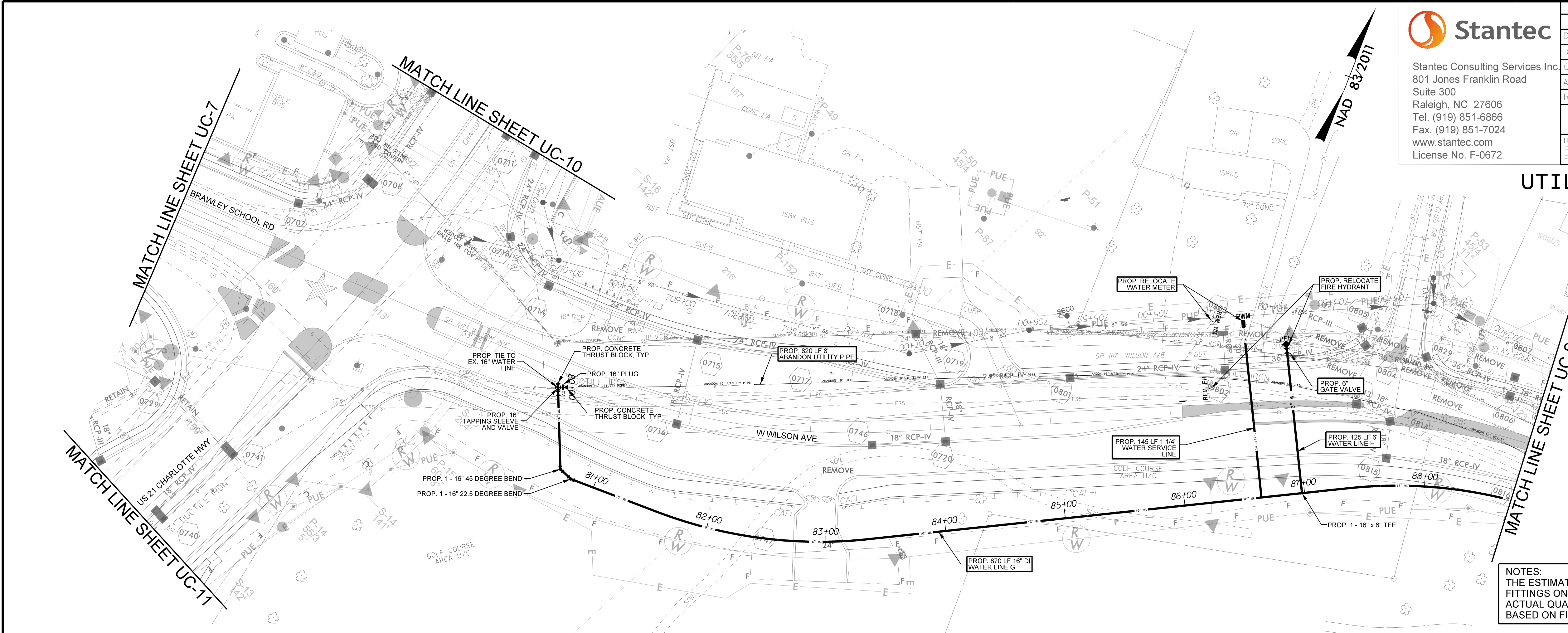


NOTES:
 REFER TO MINIMUM RESTRAINED JOINT LENGTH TABLE ON SHEET UC-03E FOR LENGTH REQUIRED ON EACH SIDE OF FITTINGS.

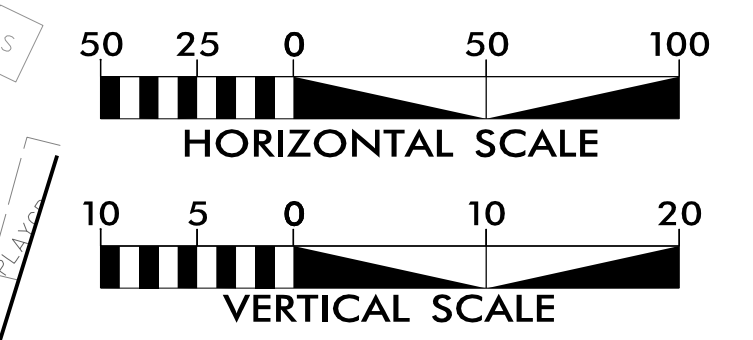


Stantec
 Stantec Consulting Services Inc.
 Suite 300
 Raleigh, NC 27606
 Tel. (919) 851-6866
 Fax. (919) 851-7024
 www.stantec.com
 License No. F-0672

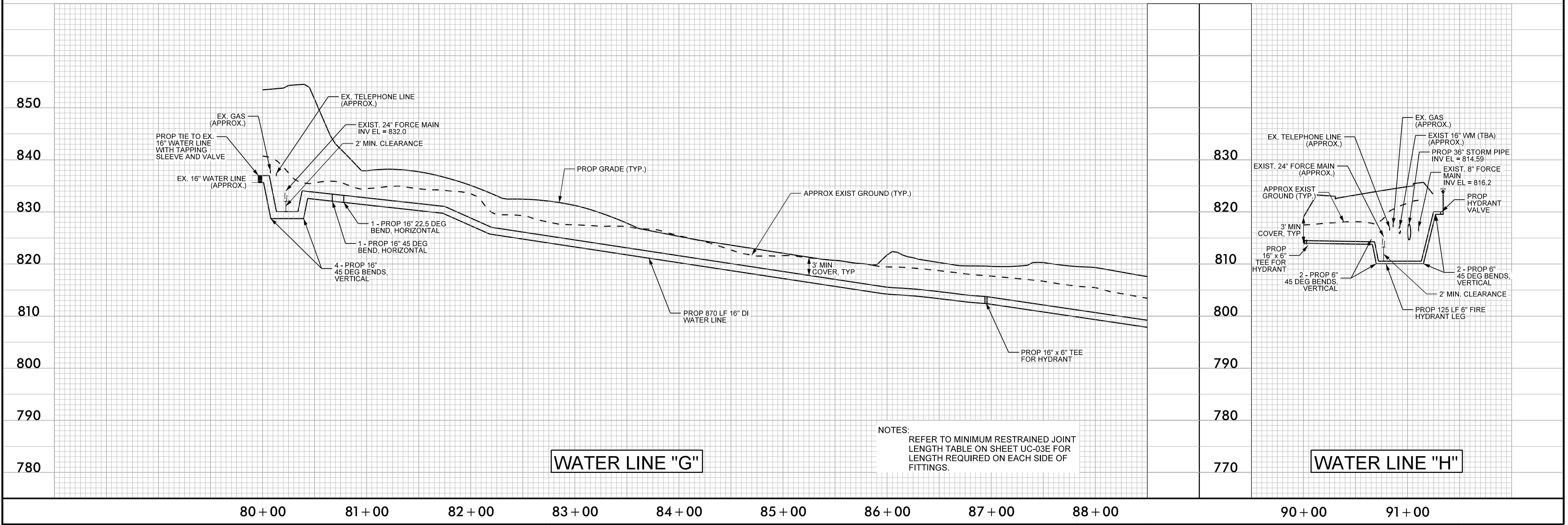
PROJECT REFERENCE NO.	R-3833C	SHEET NO.	UC-8
DESIGNED BY:	LLP		
DRAWN BY:	RGR		
CHECKED BY:	LLP		
APPROVED BY:			
REVISED:			
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL			
SEAL No. 23500			
EXPIRES 12/31/2023			
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION			
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151		8/24/2023	UTILITY CONSTRUCTION PLANS ONLY



UTILITY CONSTRUCTION



NOTES:
 THE ESTIMATED QUANTITY OF DUCTILE IRON WATER PIPE FITTINGS ON THIS PLAN SHEET IS 3035 POUNDS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.



WATER LINE "G"

WATER LINE "H"

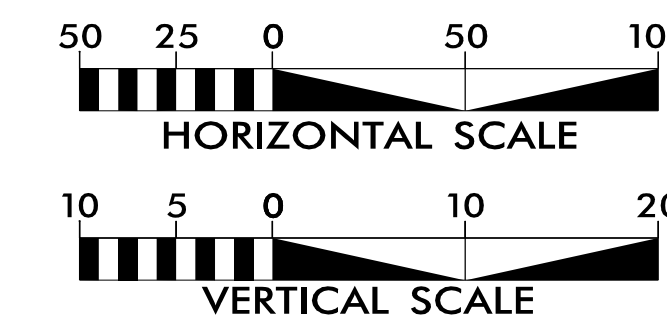
NOTES:
 REFER TO MINIMUM RESTRAINED JOINT LENGTH TABLE ON SHEET UC-03E FOR LENGTH REQUIRED ON EACH SIDE OF FITTINGS.



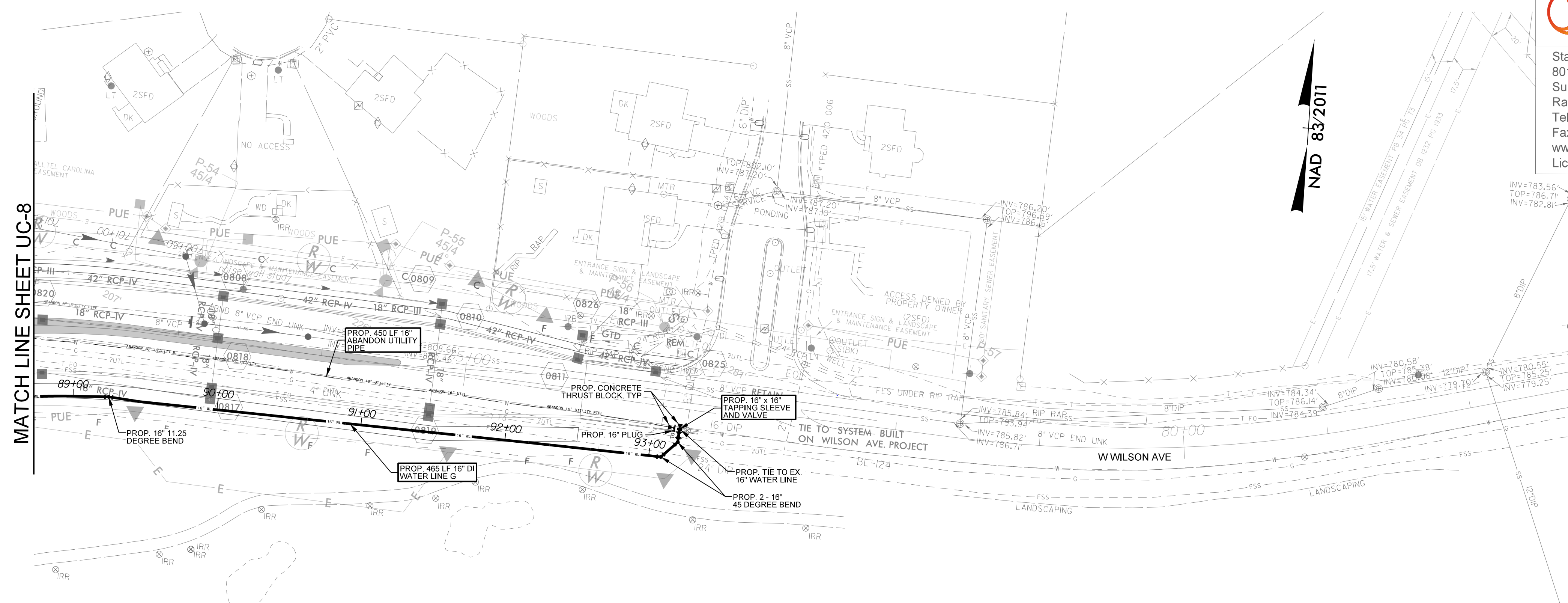
Stantec Consulting Services Inc.
801 Jones Franklin Road
Suite 300
Raleigh, NC 27606
Tel. (919) 851-6866
Fax. (919) 851-7024
www.stantec.com
License No. F-0672

PROJECT REFERENCE NO.	R-3833C	SHEET NO.	UC-9
DESIGNED BY:	LLP		
DRAWN BY:	RGR		
CHECKED BY:	LLP		
APPROVED BY:			
REVISED:			
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION		8/24/2023	UTILITY CONSTRUCTION PLANS ONLY

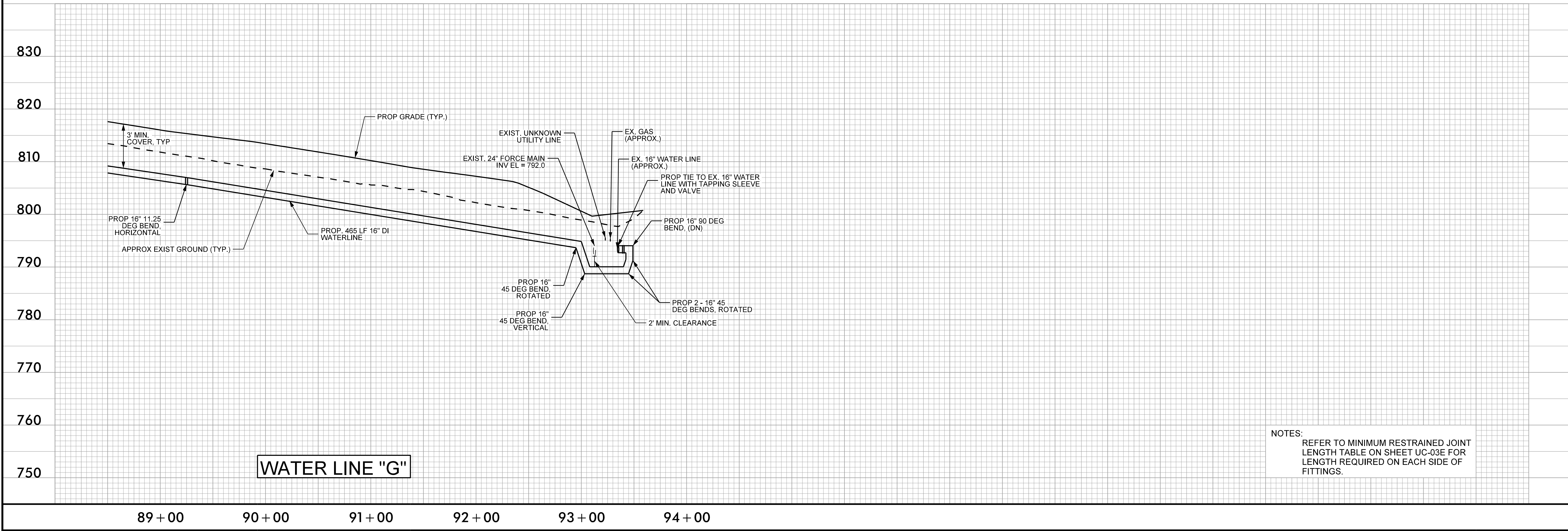
UTILITY CONSTRUCTION




MATCH LINE SHEET UC-8



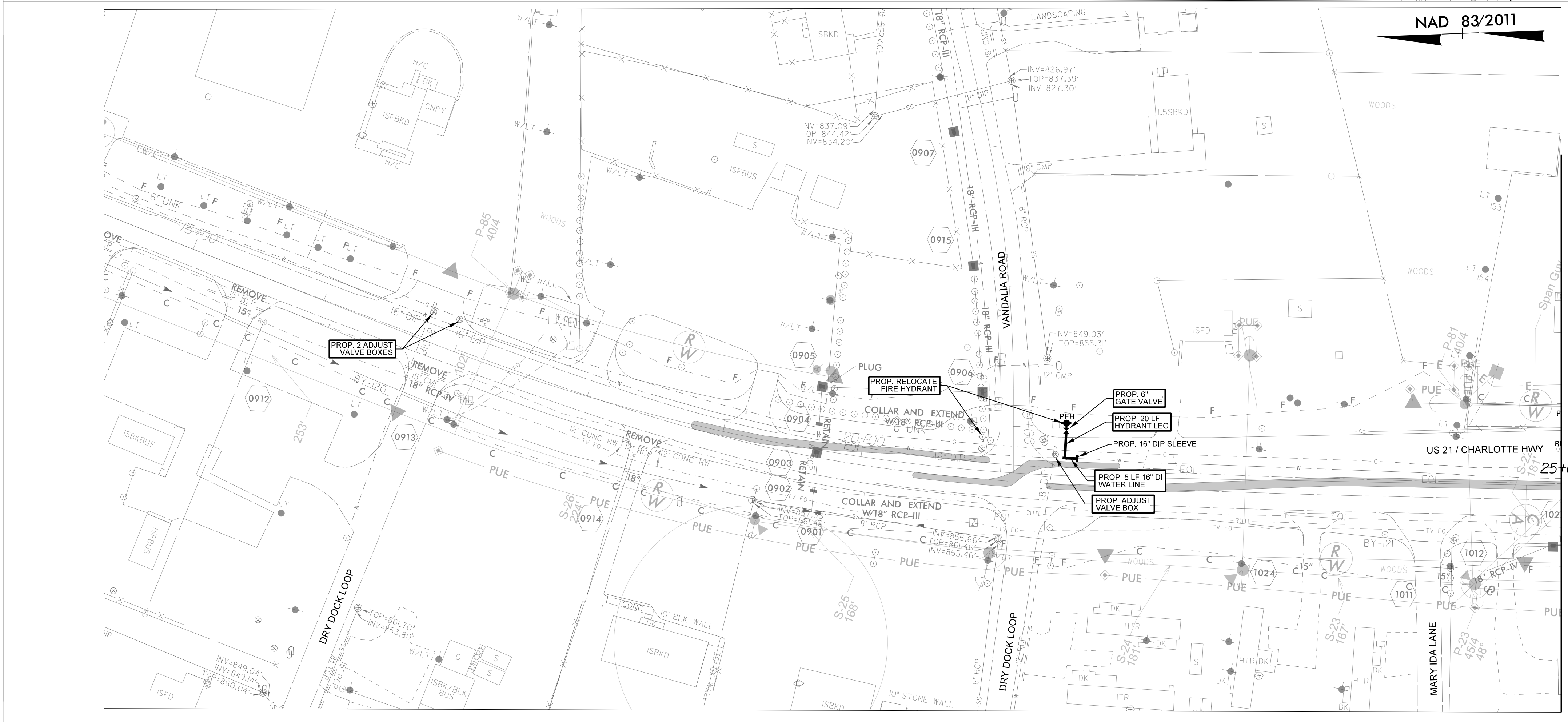
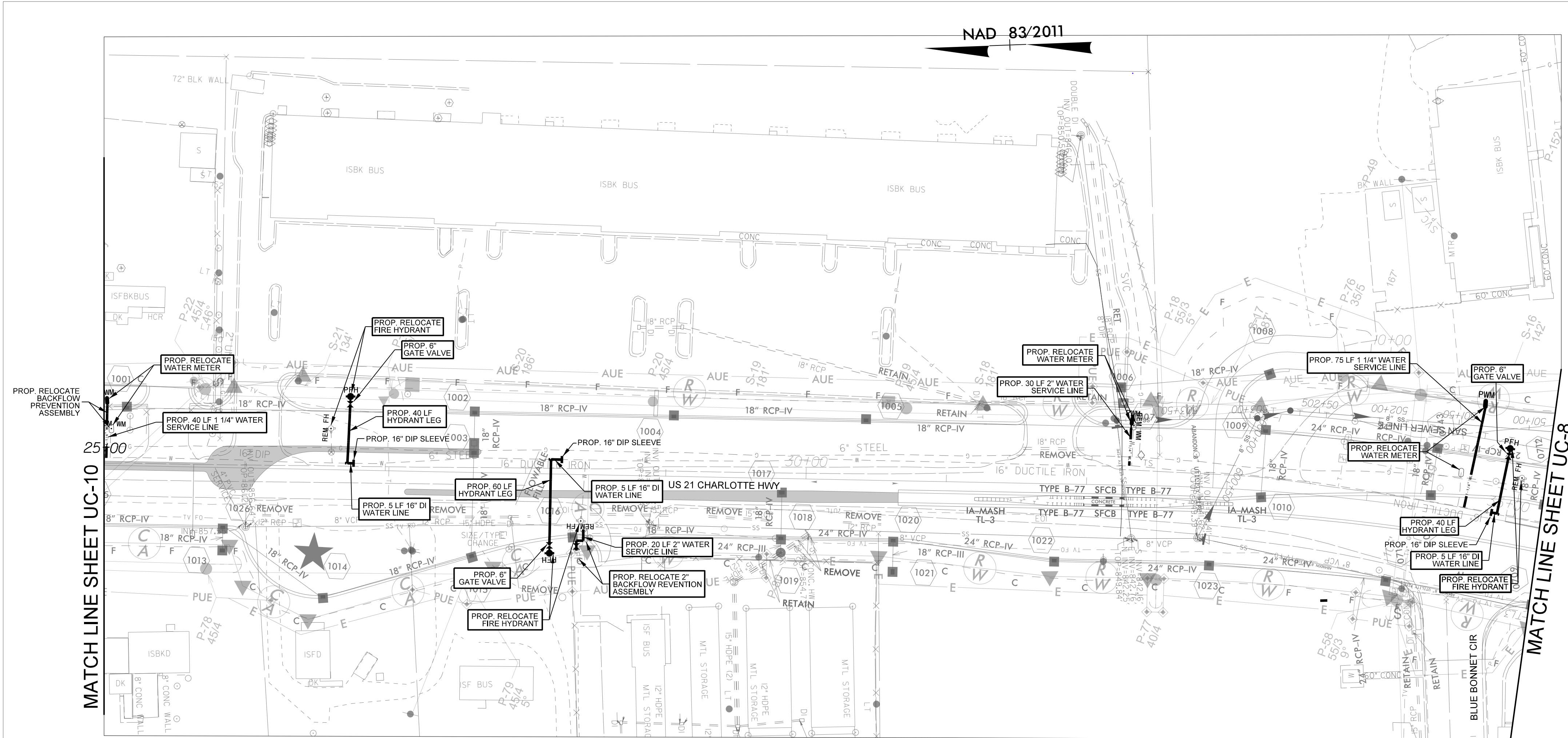
NOTES:
 THE ESTIMATED QUANTITY OF DUCTILE IRON WATER PIPE FITTINGS ON THIS PLAN SHEET IS 2285 POUNDS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.



NOTES:
 REFER TO MINIMUM RESTRAINED JOINT LENGTH TABLE ON SHEET UC-03E FOR LENGTH REQUIRED ON EACH SIDE OF FITTINGS.


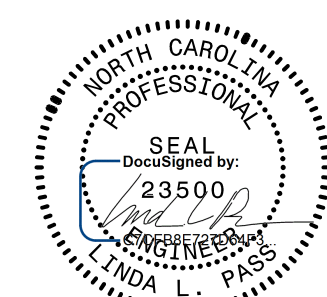
 <p>Stantec Consulting Services Inc. 801 Jones Franklin Road Suite 300 Raleigh, NC 27606 Tel. (919) 851-6866 Fax. (919) 851-7024 www.stantec.com License No. F-0672</p>	PROJECT REFERENCE NO.	R-3833C	SHEET NO.	UC-10
	DESIGNED BY:	LLP		
	DRAWN BY:	RCR		
	CHECKED BY:	LLP		
	APPROVED BY:			
REVISED:				
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151		NORTH CAROLINA DEPARTMENT OF TRANSPORTATION		8/24/2023
		UTILITY CONSTRUCTION PLANS ONLY		

UTILITY CONSTRUCTION

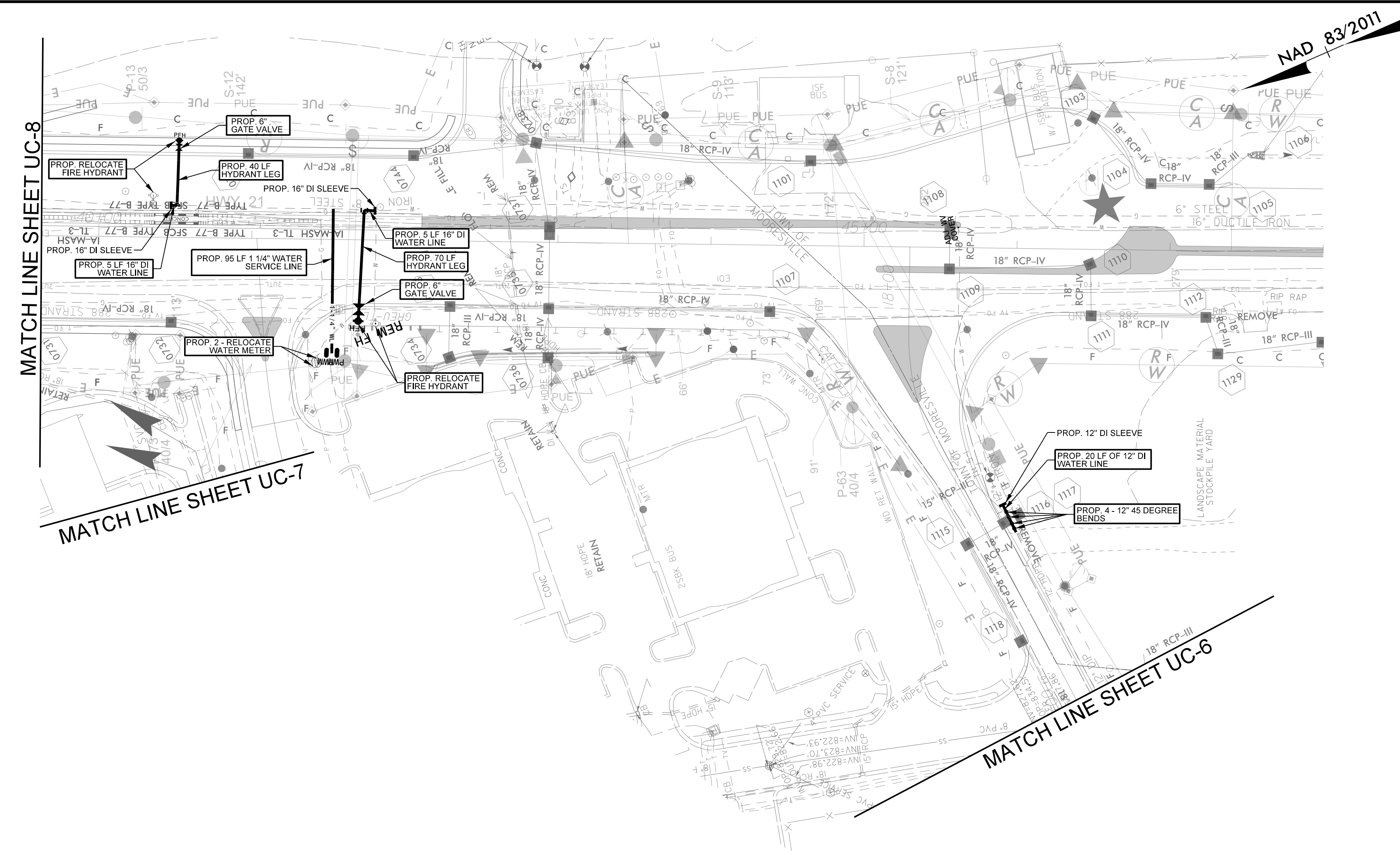
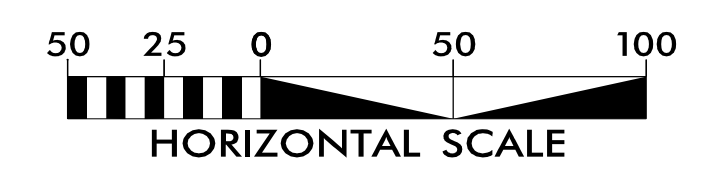


NOTES:
REFER TO MINIMUM RESTRAINED JOINT LENGTH TABLE ON SHEET UC-03E FOR LENGTH REQUIRED ON EACH SIDE OF FITTINGS.

NOTES:
THE ESTIMATED QUANTITY OF DUCTILE IRON WATER PIPE FITTINGS ON THIS PLAN SHEET IS 3260 POUNDS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.

 <p>Stantec Consulting Services Inc. 801 Jones Franklin Road Suite 300 Raleigh, NC 27606 Tel. (919) 851-6866 Fax. (919) 851-7024 www.stantec.com License No. F-0672</p>	PROJECT REFERENCE NO. R-3833C	SHEET NO. UC-11
	DESIGNED BY: LLP DRAWN BY: RGR CHECKED BY: LLP APPROVED BY: REVISED: NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	

UTILITY CONSTRUCTION

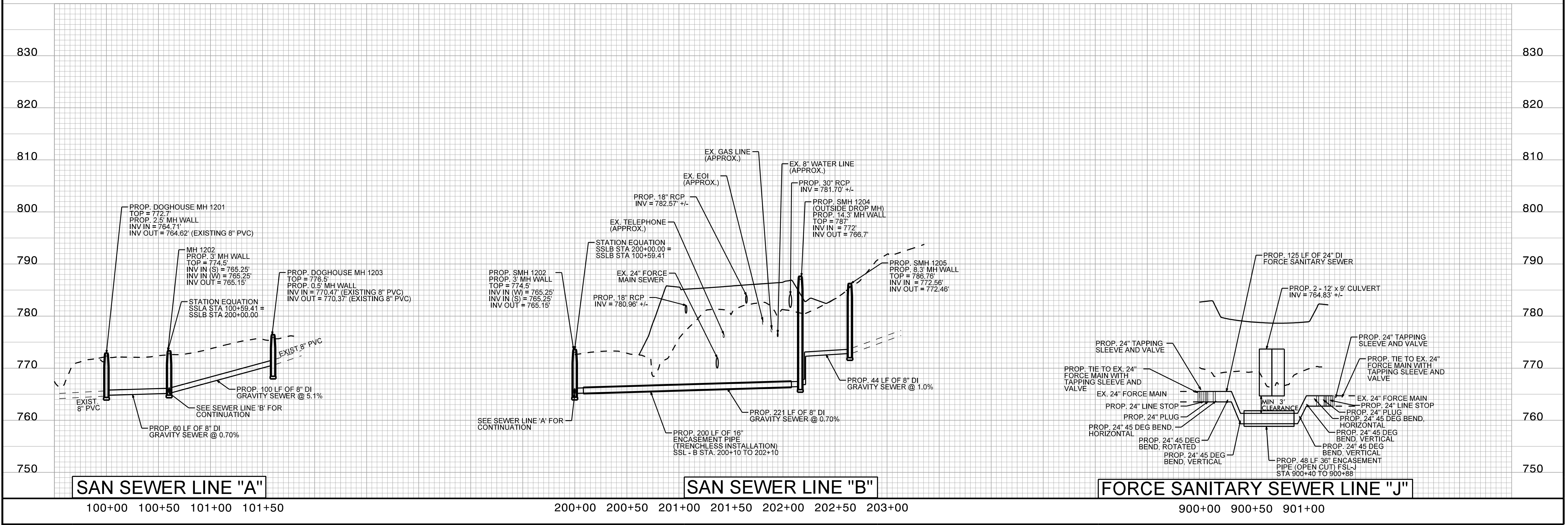
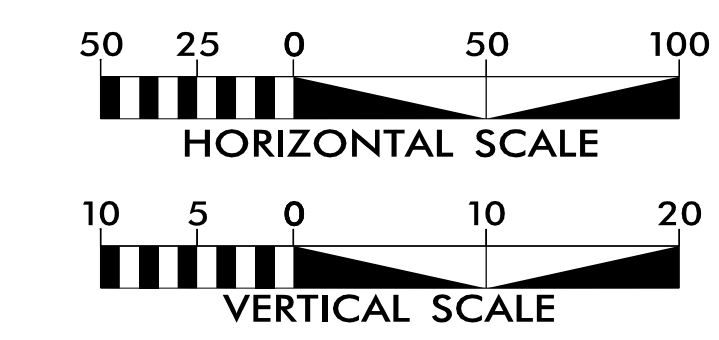
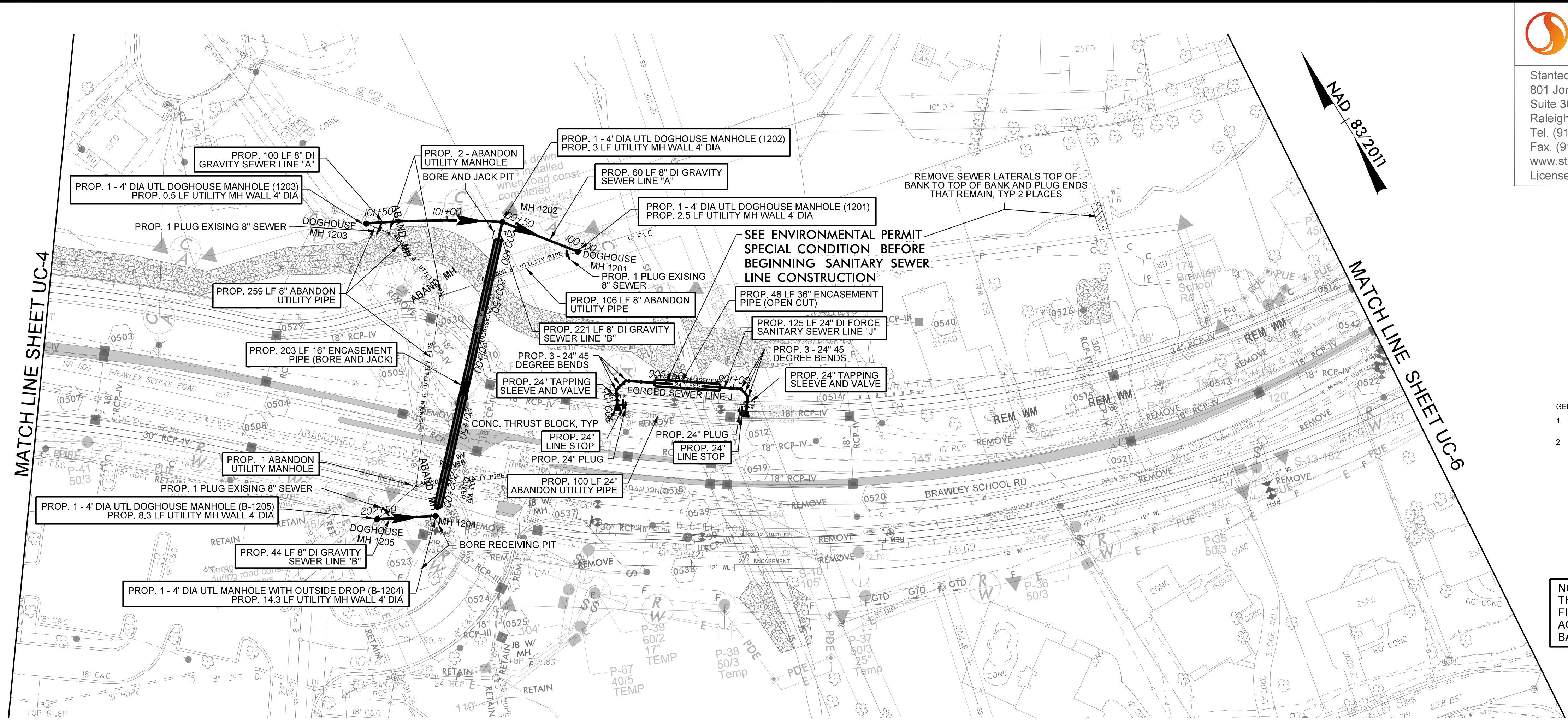


NOTES:
REFER TO MINIMUM RESTRAINED JOINT LENGTH TABLE ON SHEET UC-03E FOR LENGTH REQUIRED ON EACH SIDE OF FITTINGS.

NOTES:
THE ESTIMATED QUANTITY OF DUCTILE IRON WATER PIPE FITTINGS ON THIS PLAN SHEET IS 2635 POUNDS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.

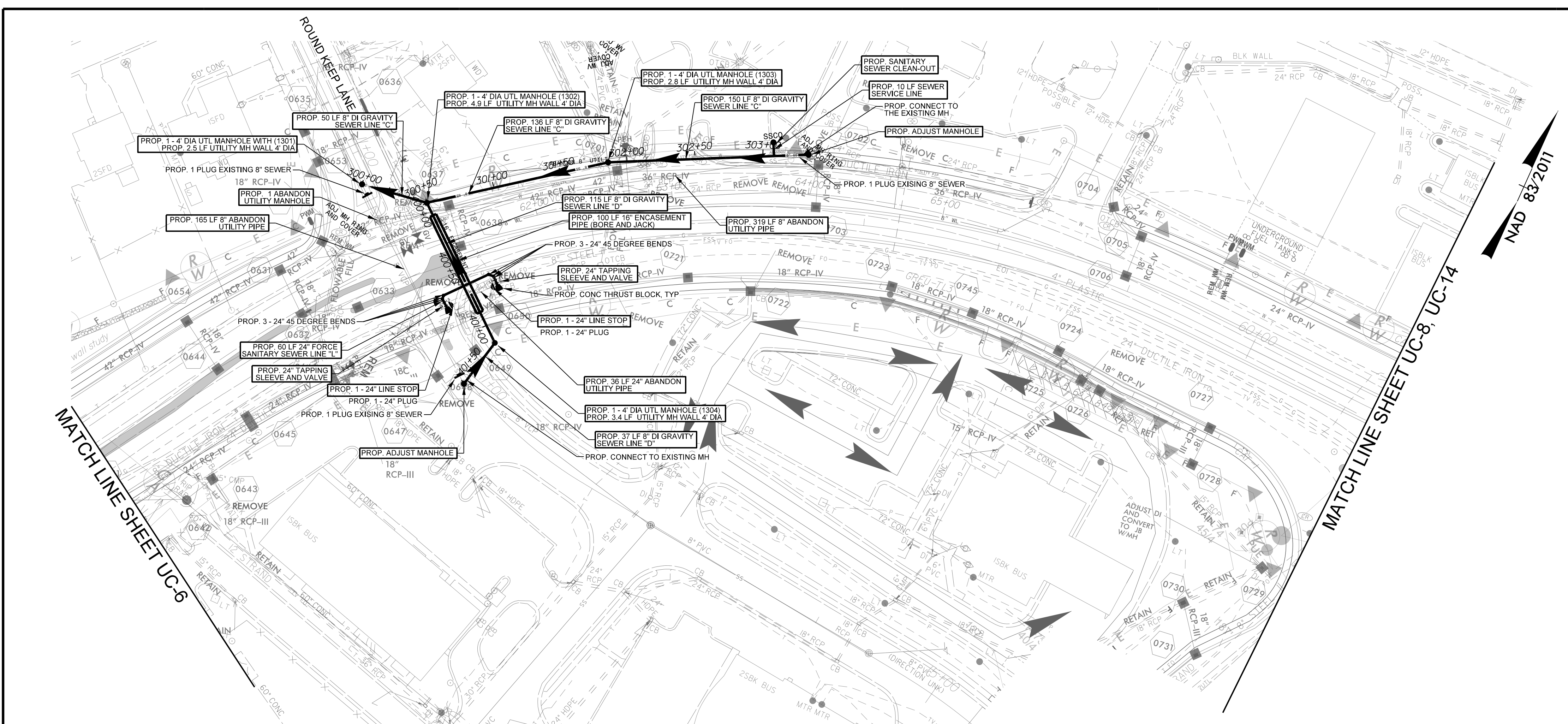
Stantec
 Stantec Consulting Services Inc.
 801 Jones Franklin Road
 Suite 300
 Raleigh, NC 27606
 Tel. (919) 851-6866
 Fax. (919) 851-7024
 www.stantec.com
 License No. F-0672

PROJECT REFERENCE NO.	R-3833C	SHEET NO.	UC-12
DESIGNED BY:	LLP		
DRAWN BY:	RGR		
CHECKED BY:	LLP		
APPROVED BY:			
REVISED:		NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	
UTILITY CONSTRUCTION PLANS ONLY			

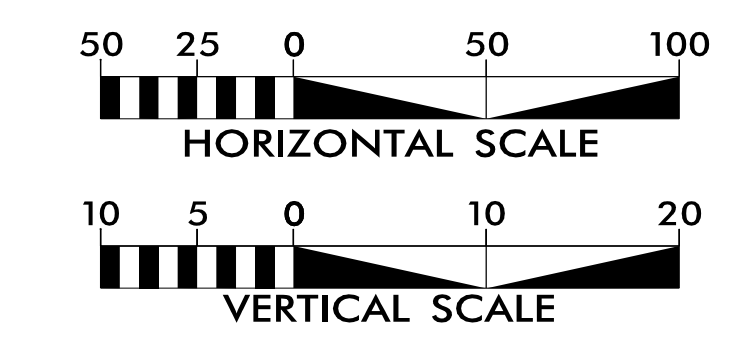


Stantec
 Stantec Consulting Services Inc.
 801 Jones Franklin Road
 Suite 300
 Raleigh, NC 27606
 Tel. (919) 851-6866
 Fax. (919) 851-7024
 www.stantec.com
 License No. F-0672

PROJECT REFERENCE NO.	R-3833C
SHEET NO.	UC-13
DESIGNED BY:	LLP
DRAWN BY:	RCR
CHECKED BY:	LLP
APPROVED BY:	
REVISED:	
NORTH CAROLINA PROFESSIONAL SEAL 23500 8/24/2023 NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	
UTILITY CONSTRUCTION PLANS ONLY	

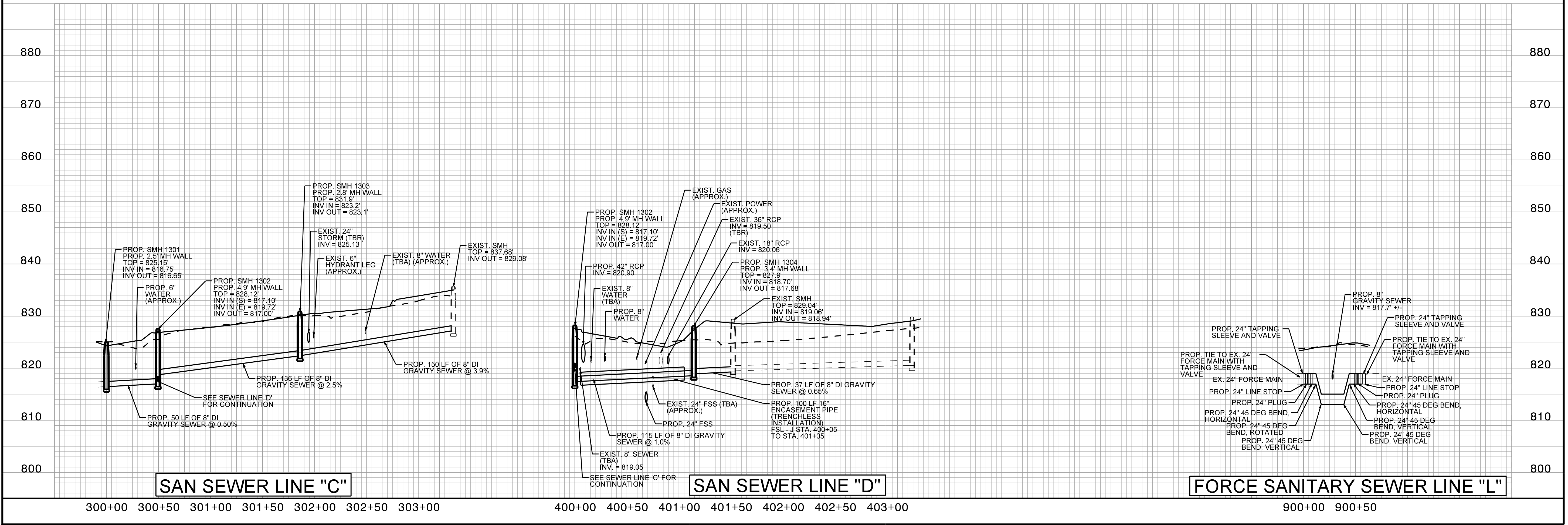


UTILITY CONSTRUCTION



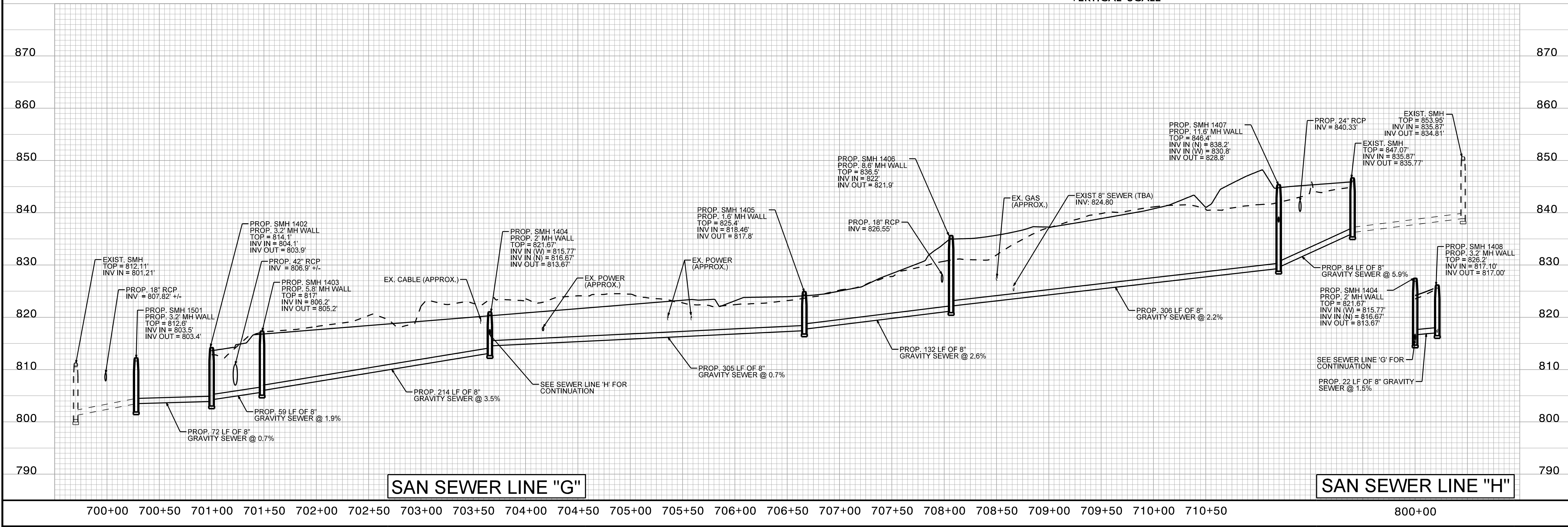
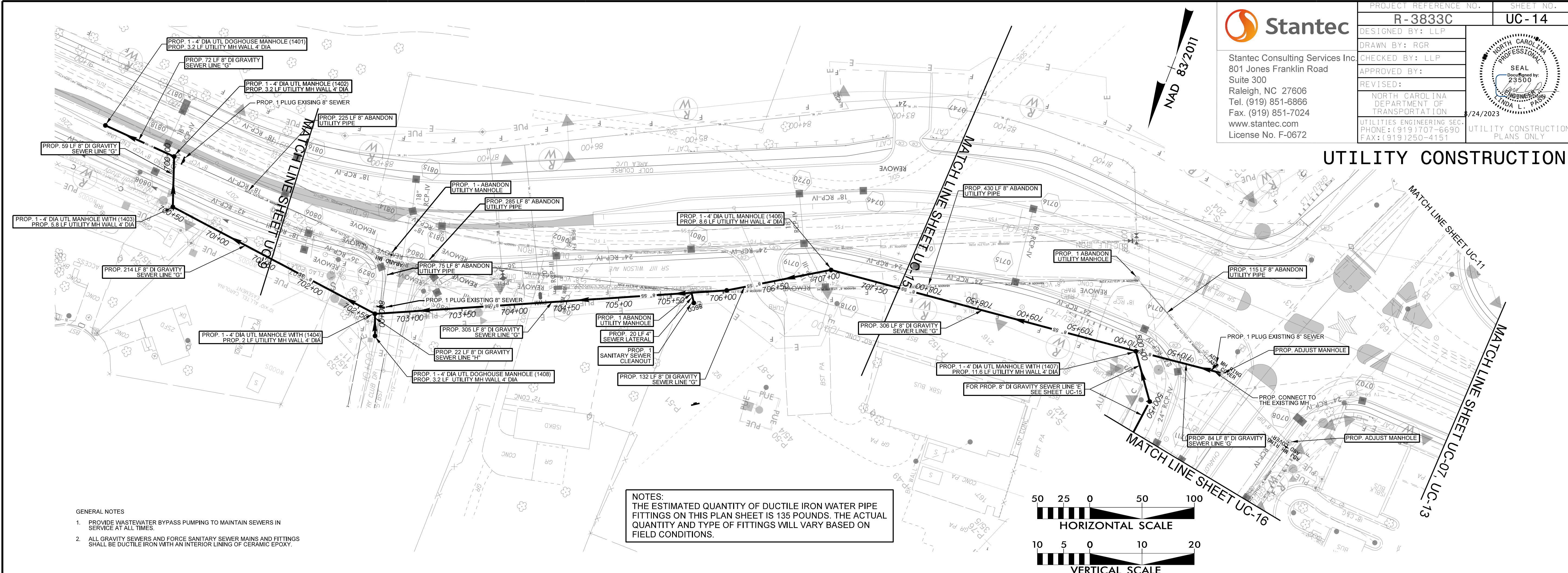
- GENERAL NOTES
1. PROVIDE WASTEWATER BYPASS PUMPING TO MAINTAIN SEWERS IN SERVICE AT ALL TIMES.
 2. ALL GRAVITY SEWERS AND FORCE SANITARY SEWER MAINS AND FITTINGS SHALL BE DUCTILE IRON WITH AN INTERIOR LINING OF CERAMIC EPOXY.

NOTES:
 THE ESTIMATED QUANTITY OF DUCTILE IRON WATER PIPE FITTINGS ON THIS PLAN SHEET IS 5335 POUNDS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.



Stantec
 Stantec Consulting Services Inc.
 801 Jones Franklin Road
 Suite 300
 Raleigh, NC 27606
 Tel. (919) 851-6866
 Fax. (919) 851-7024
 www.stantec.com
 License No. F-0672

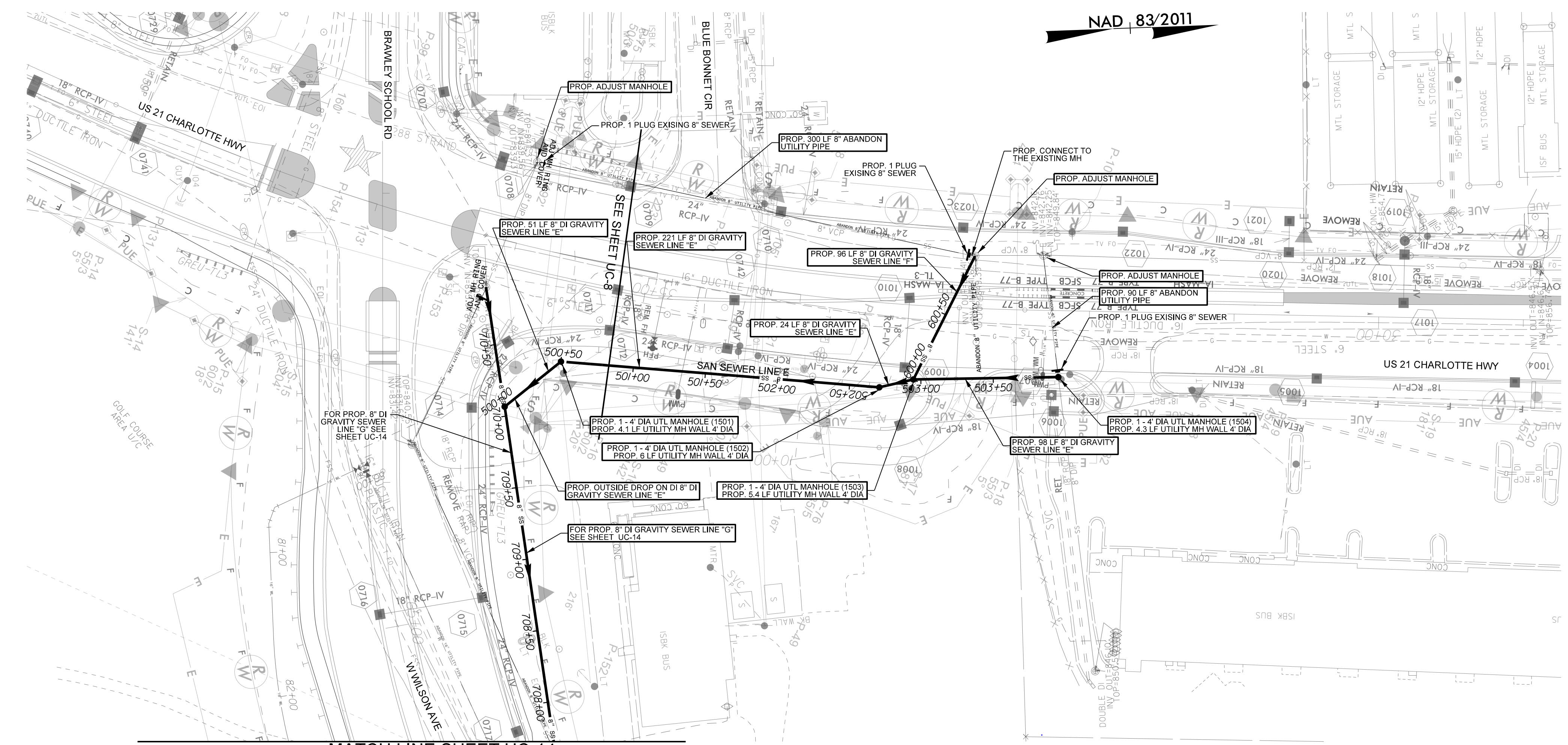
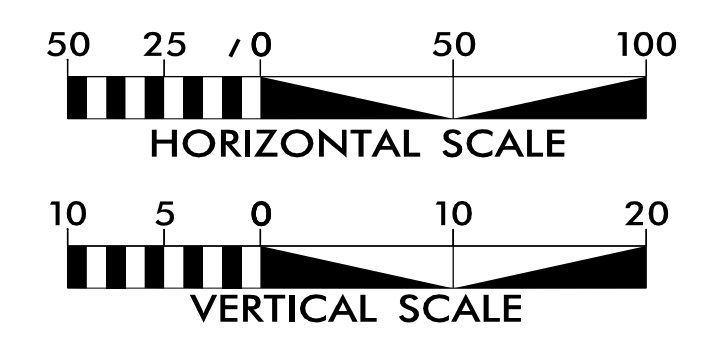
PROJECT REFERENCE NO.	R-3833C
SHEET NO.	UC-14
DESIGNED BY:	LLP
DRAWN BY:	RGR
CHECKED BY:	LLP
APPROVED BY:	
REVISED:	
NORTH CAROLINA PROFESSIONAL SEAL Documented by: 23500 EXPIRES: 12/31/2023	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SECTION PHONE: (919) 707-6690 FAX: (919) 250-4151	
UTILITY CONSTRUCTION PLANS ONLY	



Stantec
 Stantec Consulting Services Inc.
 801 Jones Franklin Road
 Suite 300
 Raleigh, NC 27606
 Tel. (919) 851-6866
 Fax. (919) 851-7024
 www.stantec.com
 License No. F-0672

PROJECT REFERENCE NO.	R-3833C	SHEET NO.	UC-15
DESIGNED BY:	LLP		
DRAWN BY:	RGR		
CHECKED BY:	LLP		
APPROVED BY:			
REVISED:		8/24/2023	
UTILITIES ENGINEERING SEC.		UTILITY CONSTRUCTION PLANS ONLY	
PHONE: (919) 707-6690			
FAX: (919) 250-4151			

UTILITY CONSTRUCTION



- GENERAL NOTES**
- PROVIDE WASTEWATER BYPASS PUMPING TO MAINTAIN SEWERS IN SERVICE AT ALL TIMES.
 - ALL GRAVITY SEWERS AND FORCE SANITARY SEWER MAINS AND FITTINGS SHALL BE DUCTILE IRON WITH AN INTERIOR LINING OF CERAMIC EPOXY.

NOTES:
 THE ESTIMATED QUANTITY OF DUCTILE IRON WATER PIPE FITTINGS ON THIS PLAN SHEET IS 135 POUNDS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.

MATCH LINE SHEET UC-14

