

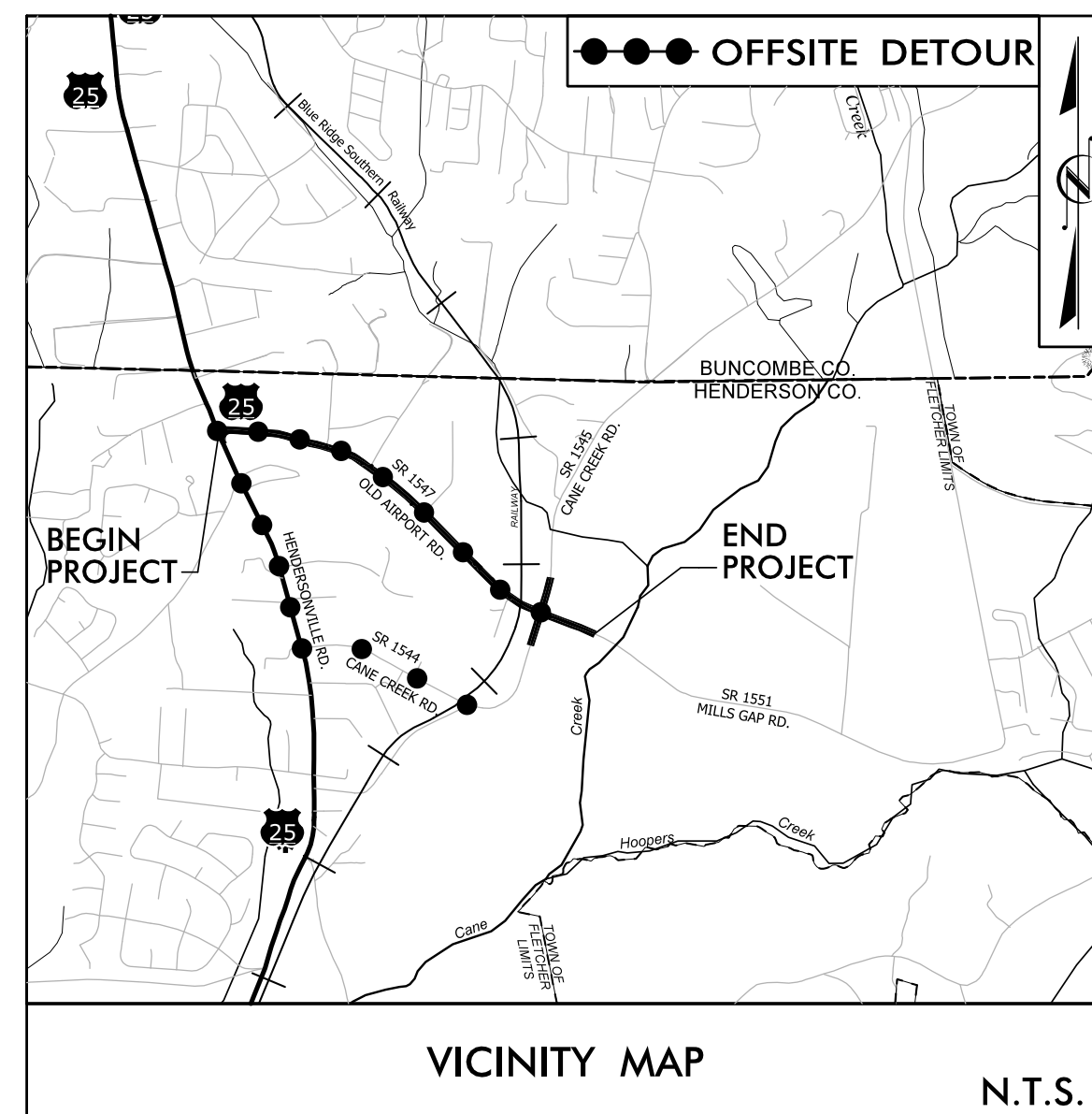
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TIP PROJECT: U-5840

See Sheet UC-1 For Index of Sheets
See Sheet UC-2 For Standard Symbology Sheet



FINAL PLANS

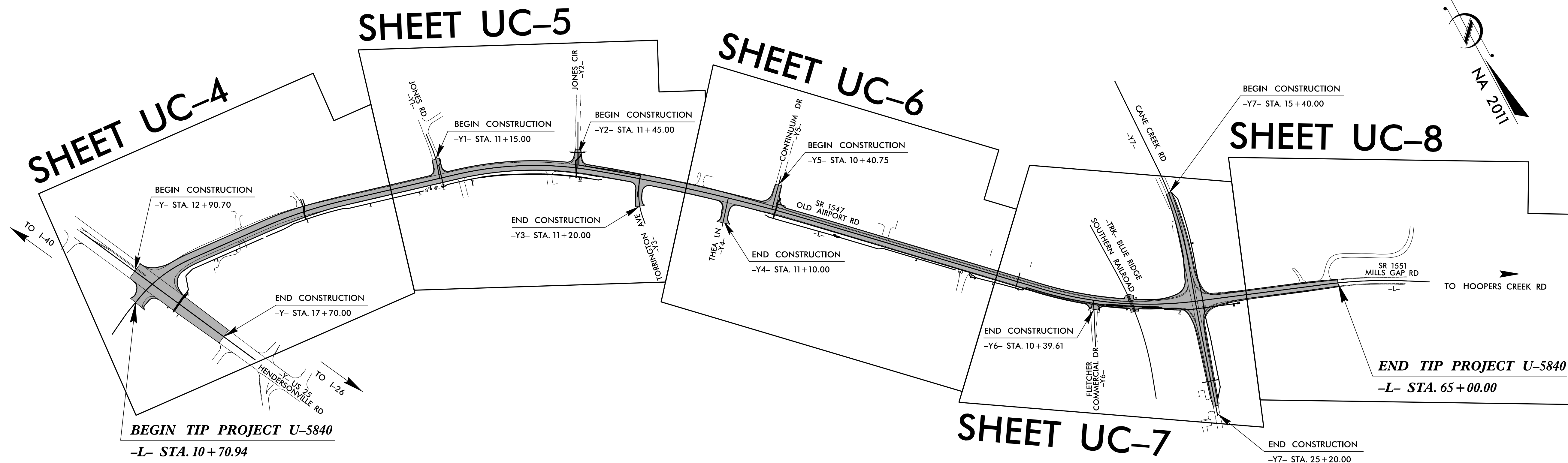
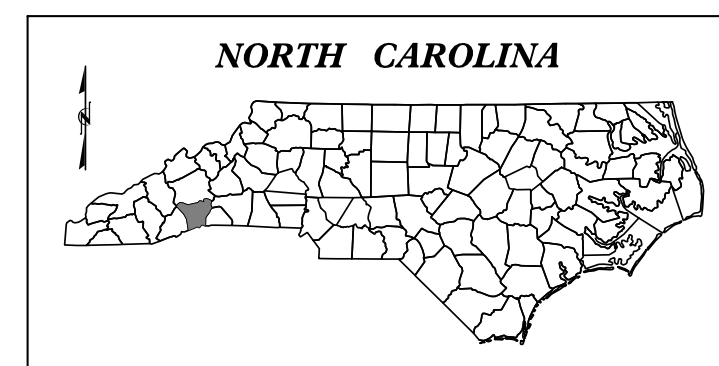
STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

UTILITY CONSTRUCTION PLANS HENDERSON COUNTY

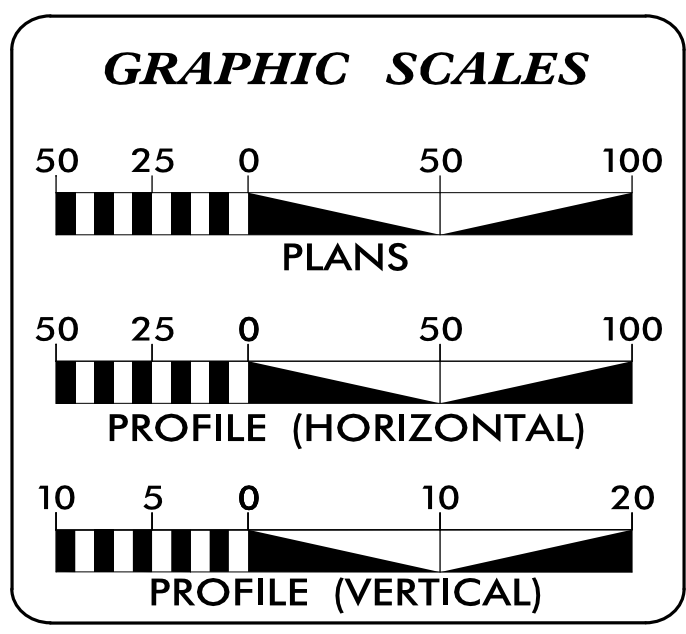
**LOCATION: SR 1547 (OLD AIRPORT ROAD) FROM US 25 (HENDERSONVILLE ROAD)
TO SR 1551 (MILLS GAP ROAD)**

TYPE OF WORK: WATER LINE RELOCATIONS AND SANITARY SEWER CONSTRUCTION

T.I.P. NO.	SHEET NO.
U-5840	UC-1



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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-3H	DETAILS
UC-4 THRU UC-8	UTILITY CONSTRUCTION SHEETS
UC-9 THRU UC-11	PROFILE SHEETS

WATER AND SEWER OWNERS ON PROJECT

(A) WATER - CITY OF HENDERSONVILLE
(B) SANITARY SEWER - CANE CREEK WATER & SEWER DISTRICT

PREPARED IN THE OFFICE OF

STV 100 Years
STV Engineers, Inc.
300 West Trade St., Suite 715
Charlotte, NC 28202
NC License Number F-0991
(704) 372-1885 FAX: (704) 372-3393

<u>NIKKI HONEYCUTT, PE</u>	CONSULTANT CONTACT #1
<u>SEAN C. STEPHENS, PE</u>	CONSULTANT CONTACT #2
<u>ANDREW VANE, PE</u>	CONSULTANT CONTACT #3

SEAL

**DIVISION OF HIGHWAYS
UTILITIES UNIT**

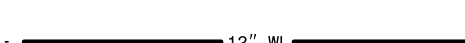




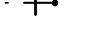


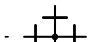














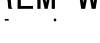
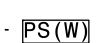

1555 MAIL SERVICES CENTER
RALEIGH, NC 27699-1555
PHONE (919) 707-6690
FAX (919) 250-4151

<u>BYRON SANDERS, PE</u>	UTILITIES REGIONAL ENGINEER
<u>BOB GOLDING</u>	UTILITIES ENGINEER
<u>AMY DUPREE</u>	UTILITIES AREA COORDINATOR
<u>BILL GREEN</u>	UTILITIES COORDINATOR

STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

UTILITIES PLAN SHEET SYMBOLS






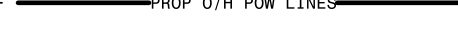
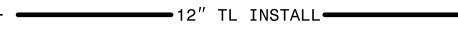
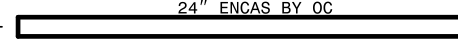
PROPOSED WATER SYMBOLS

Water Line (Sized as Shown)	
11¼ Degree Bend	
22½ Degree Bend	
45 Degree Bend	
90 Degree Bend	
Plug	
Tee	
Cross	
Reducer	
Gate Valve	
Butterfly Valve	
Tapping Valve	
Line Stop	
Line Stop with Bypass	
Blow Off	
Fire Hydrant	
Relocate Fire Hydrant	
Remove Fire Hydrant	
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 (Type as Shown)	
Trenchless Installation	
Encasement by Open Cut	
Encasement	

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

EXISTING UTILITIES SYMBOLS

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

*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 2018.

2. THE EXISTING WATER UTILITIES BELONG TO THE CITY OF HENDERSONVILLE AND THE EXISTING SEWER UTILITIES BELONG TO CANE CREEK WATER & SEWER DISTRICT.

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. 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.

7. 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.

8. 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.

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.

CONSTRUCTION SEQUENCING:

1. INSTALL NEW WATER LINE FROM -WL2- STA. 10+00 TO 21+60±. TEST, DISINFECT WATER LINE, AND MAKE TEMPORARY CONNECTION TO EXISTING WATER LINE. COORDINATE ALL WORK WITH TRAFFIC CONTROL DESIGN.

2. ONCE ROADWAY WORK ON NORTH SIDE OF OLD AIRPORT ROAD HAS CREATED A NEW LANE FOR TRAFFIC, INSTALL WATER LINE FROM -WL2- STA. 21+60± TO 29+00±. TEST, DISINFECT WATER LINE, AND MAKE TEMPORARY CONNECTION TO EXISTING WATER LINE. COORDINATE WATER LINE CONSTRUCTION WITH RETAINING WALL CONSTRUCTION.

3. INSTALL REMAINING WATER LINE WORK EAST OF -WL2- STA. 29+00± IN COORDINATION WITH TRAFFIC CONTROL FOR ROADWAY CLOSURE.

4. INSTALL NEW 16" WATER LINE ACROSS CULVERT NEAR -WL3- STA. 17+00± IN COORDINATION WITH NEW CULVERT INSTALLATION.

5. SEWER INSTALLATION AT JONES CIRCLE SHALL BE COORDINATED WITH TRAFFIC CONTROL DESIGN.

PROJECT SPECIFIC NOTES:

1. WATER LINE CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE CITY OF HENDERSONVILLE STANDARD DETAILS AND THE PROJECT SPECIAL PROVISIONS.

2. SEWER CONSTRUCTION SHALL BE IN ACCORDANCE WITH MSD OF BUNCOMBE COUNTY DETAILS AND THE PROJECT SPECIAL PROVISIONS.

3. THE CONTRACTOR'S ATTENTION IS DIRECTED TO THE PIPELINE OCCUPANCY OF RAILROAD PROPERTY FROM BLUE RIDGE SOUTHERN RAILROAD. REFER TO EXECUTED RAILROAD ENCROACHMENT.

4. 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.

5. THE CONTRACTOR SHALL SUPPORT AND PROTECT ANY EXISTING UNDERGROUND UTILITIES ENCOUNTERED DURING TRENCH EXCAVATION AND/OR PIPE INSTALLATION.

6. ALL SHORING SHALL BE IN ACCORDANCE WITH OSHA TRENCHING STANDARDS PART 1926, SUBPART P, AS AMENDED TO DATE.

7. THE CONTRACTOR SHALL LIMIT THE LANE CLOSURES INSTALLING THE 8", 10", AND 16" WATER LINES. SEE TRAFFIC CONTROL PLANS.

8. ANY BENDS OF WATER PIPE NOT SPECIFICALLY CALLED OUT WITH A 90, 45, 22.5, OR 11.25 DEGREE BEND FITTING, SHALL BE CONSTRUCTED BY A RADIAL BEND OF THE PIPE AS NOTED ON THE PLANS OR IN ACCORDANCE WITH THE PIPE MANUFACTURER'S SPECIFICATIONS (WHICHEVER IS MORE STRINGENT) - OR A COMBINATION OF BEND FITTINGS AND A RADIAL BEND OF THE PIPE.

9. THE CITY OF HENDERSONVILLE SHALL BE NOTIFIED MIN. TWO WEEKS PRIOR TO THE BEGINNING OF WATER WORK.

10. CANE CREEK WATER & SEWER DISTRICT SHALL BE NOTIFIED MIN. TWO WEEKS PRIOR TO THE BEGINNING OF SEWER WORK.

11. ALL FITTINGS SHALL BE MECHANICAL JOINT WITH MEGA-LUG RESTRAINT OR EQUAL.

12. WATER AND SEWER LINES ARE TO REMAIN ACTIVE DURING CONSTRUCTION. IF THIS IS NOT POSSIBLE, THEN THE CONTRACTOR SHALL FOLLOW PROCEDURES AS OUTLINED IN THE SPECIAL PROVISIONS REGARDING OUTAGE AND TEMPORARY WATER SERVICE.

13. EXISTING WATER METERS TO REMAIN SHALL BE RECONNECTED TO THE PROPOSED WATER MAIN WITH NEW WATER SERVICE LINES.

14. CONTRACTOR TO RETURN ALL EXISTING WATER METERS AND FIRE HYDRANTS MARKED FOR REMOVAL TO THE UTILITY OWNER. EXISTING WATER LINES AND VALVES NO LONGER IN SERVICE SHALL BE ABANDONED IN PLACE OR REMOVED AS NEEDED.

15. 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/RECEIVING PIT DESIGNED AND SEALED BY A LICENSED NORTH CAROLINA PROFESSIONAL ENGINEER. NO DAMAGE IS ALLOWED TO RIVER, WETLANDS, OR BUFFER ZONES.

16. PRIOR TO FINAL ACCEPTANCE OF THE WATER LINE WORK, CONTRACTOR SHALL PROVIDE SURVEYED AS-BUILT RECORD DRAWINGS.

17. ANY PROPOSED CHANGES TO WATER LINE WORK SHALL BE APPROVED IN ADVANCE AND IN WRITING BY THE CITY OF HENDERSONVILLE.

18. BEGIN WATER LINE REPLACEMENT AT WESTERN END (US25) LAYING EAST ACROSS US25.

19. WHEN OPEN-CUT INSTALLING WATER LINE ACROSS US25, CONTRACTOR MAY BE REQUIRED TO USE SHORTER LENGTHS OF PIPE AND CASING TO COMPLY WITH TRAFFIC CONTROL PLANS.

20. FOR WORK IN PAVEMENTS, CONTRACTOR SHALL BACKFILL OR PLATE ALL OPEN EXCVATIONS AT THE END OF EACH WORK DAY.

21. ALL SANITARY GRAVITY SEWER SHALL HAVE TYPE 5 TRENCH.

PROJECT REFERENCE NO. U-5840	SHEET NO. UC-3
DESIGNED BY: CTH	
DRAWN BY: CTH	
CHECKED BY: ASV	
APPROVED BY: XMD	
REVISED:	
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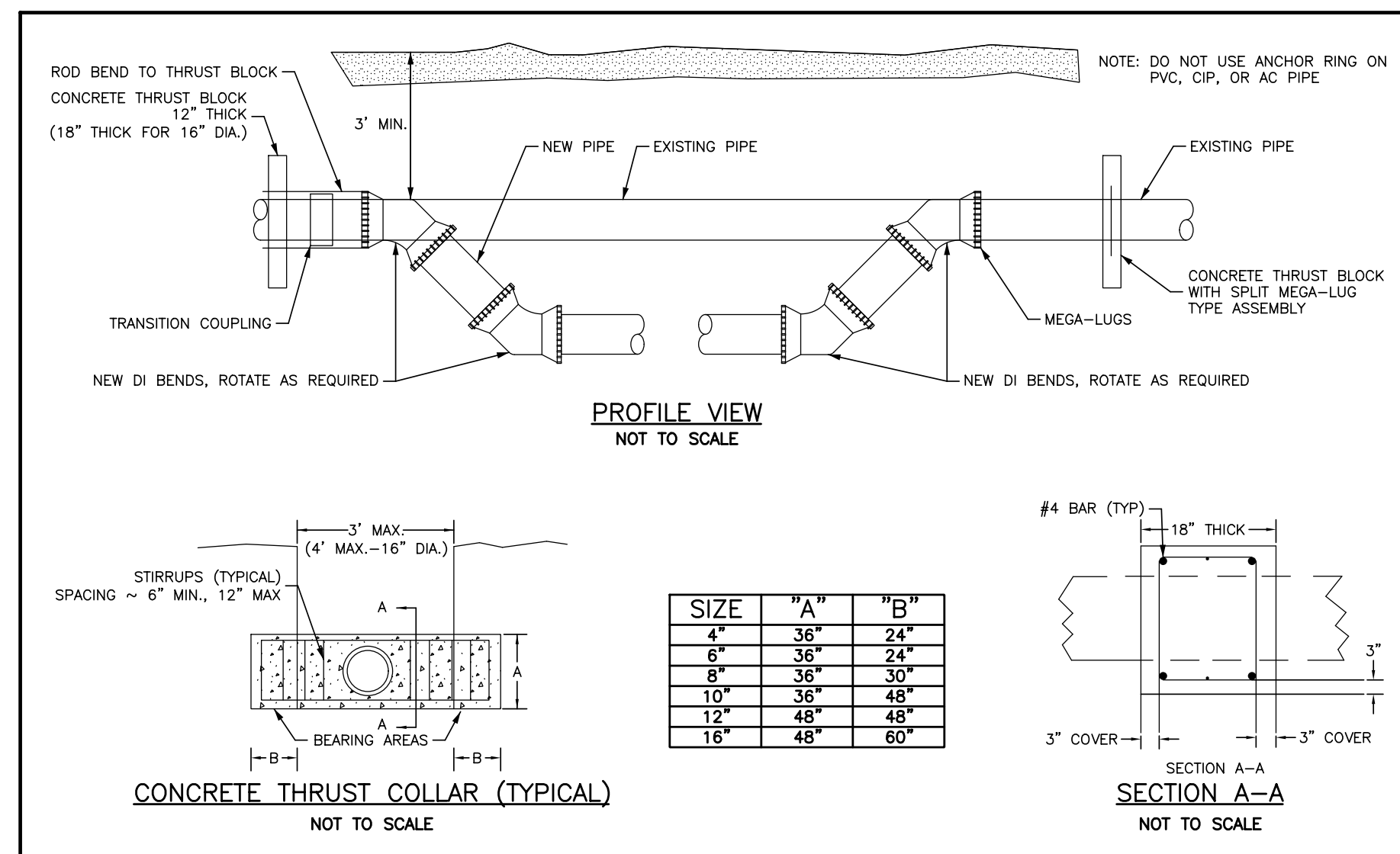
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U-5840	UC-3A
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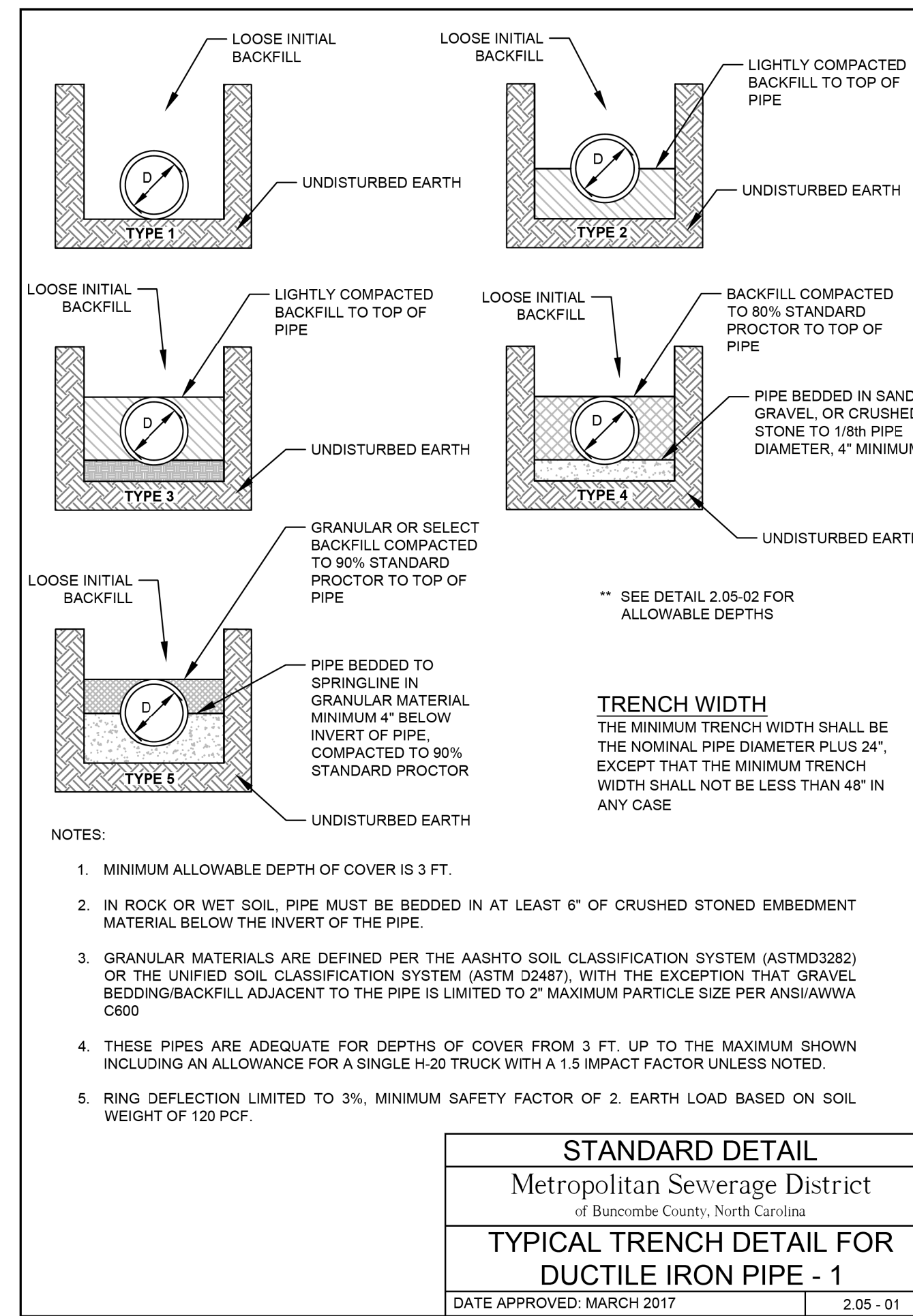
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PROJECT TYPICAL DETAILS



OWNER TYPICAL DETAILS



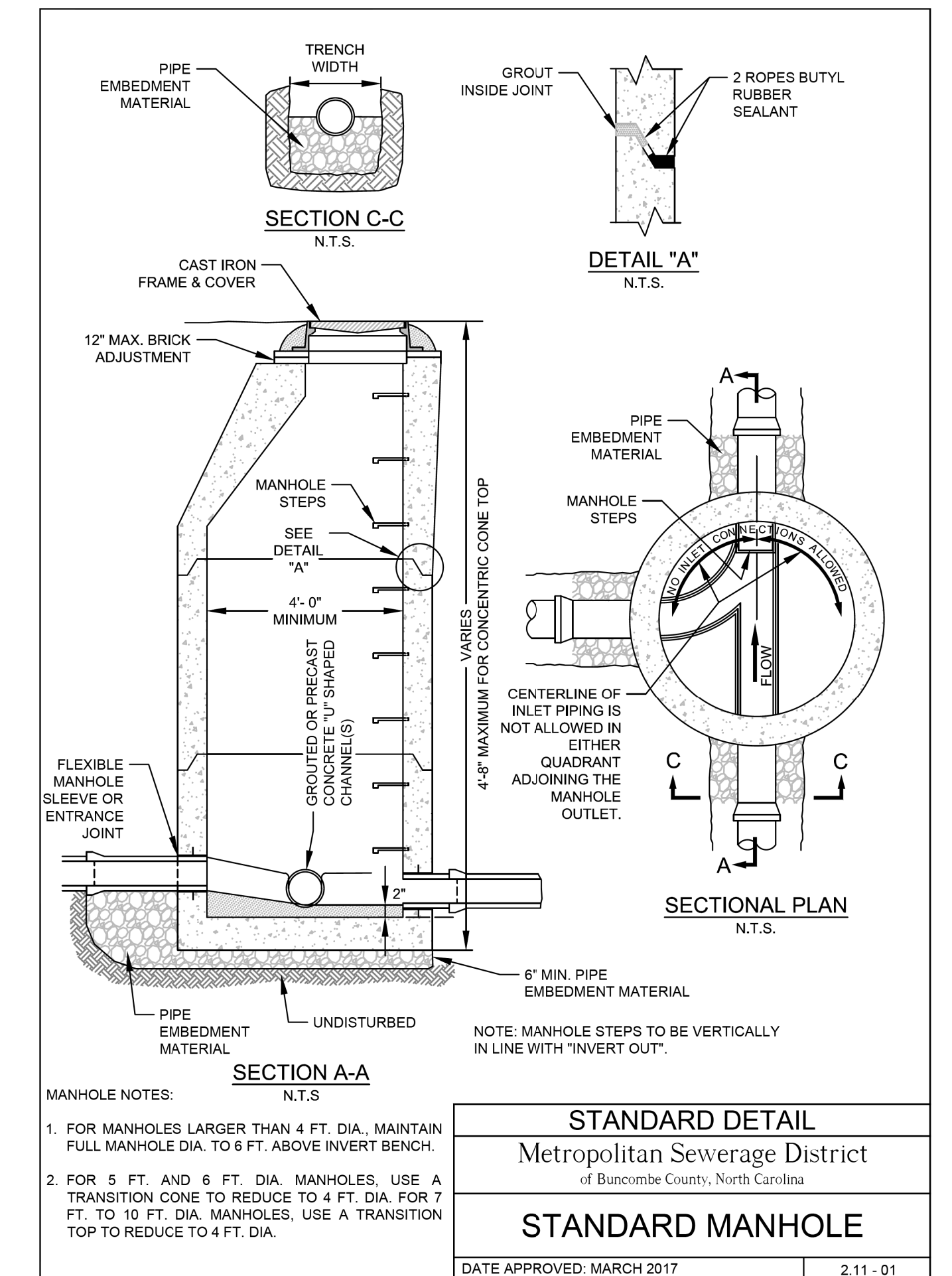
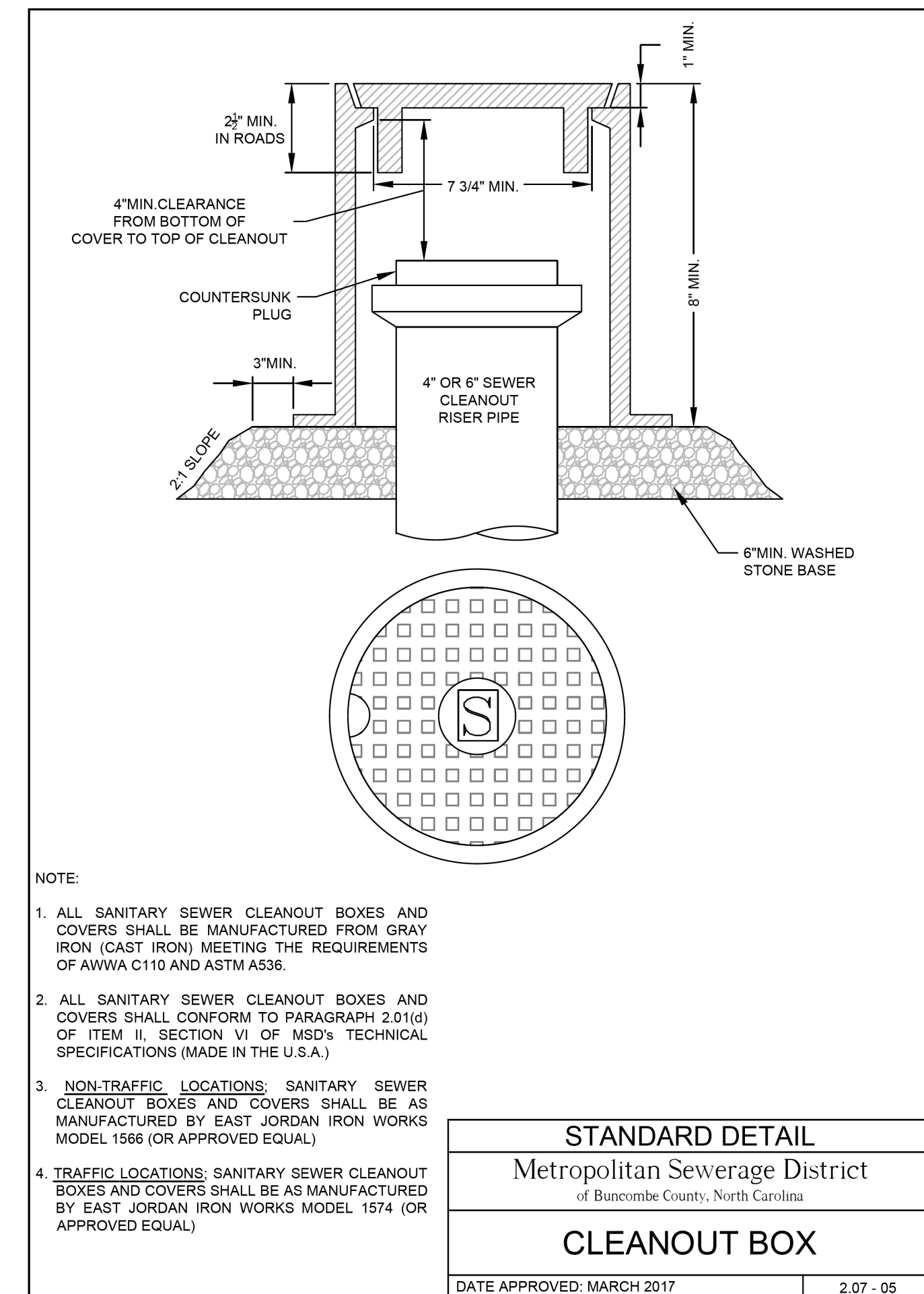
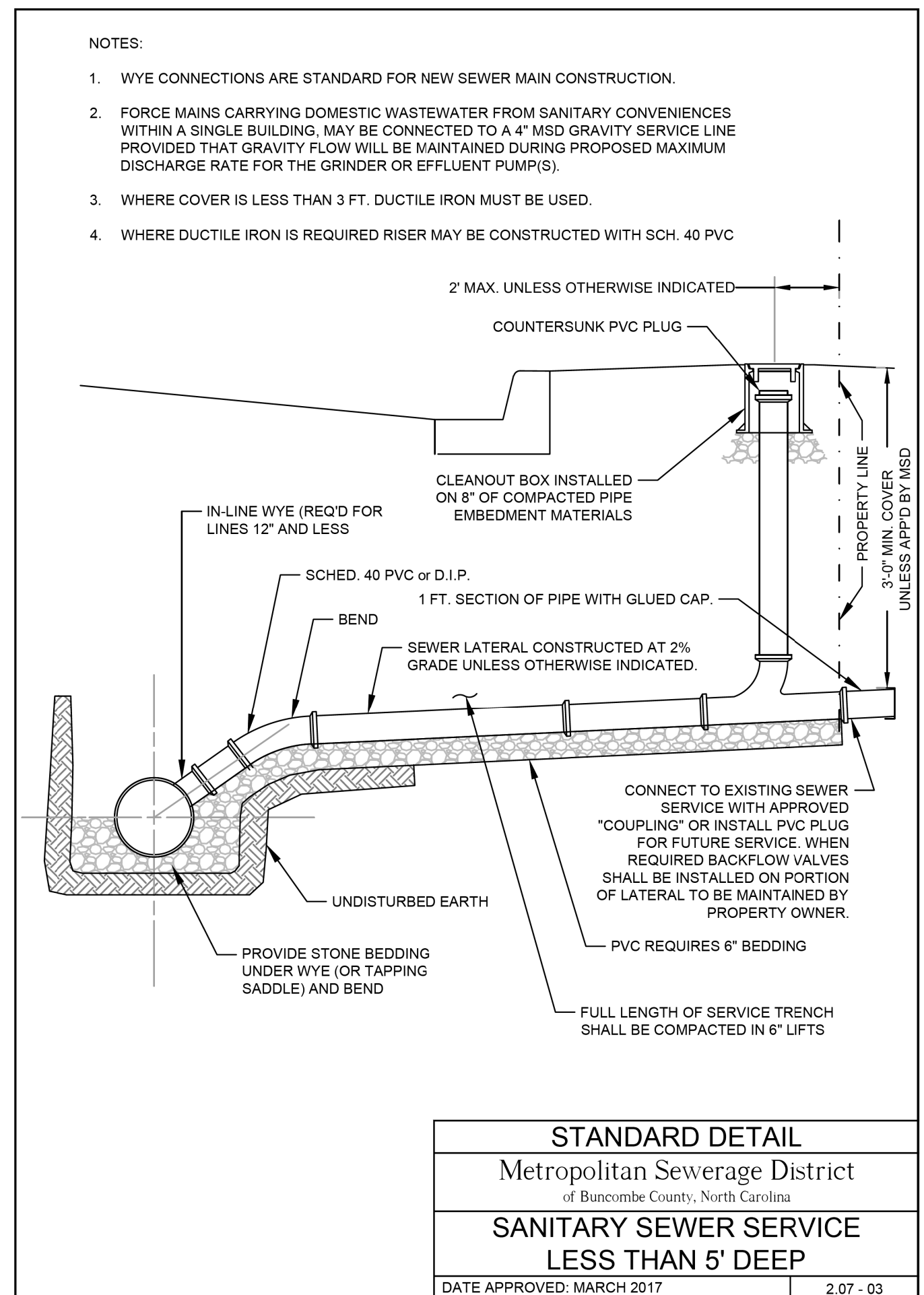
Maximum Depth of Cover for Ductile Iron Pipe w/ Cement Lining						
Pipe Size	Class	Type 1	Type 2	Type 3	Type 4	Type 5
4	350	53	61	69	85	100
6	350	26	31	37	47	65
8	350	16	20	25	34	50
10	350	11	15	19	28	45
12	350	10	15	19	28	44
14	250	-	11	15	23	36
14	300	-	13	17	26	42
14	350	-	14	19	27	44
16	250	-	11	15	24	34
16	300	-	13	17	26	39
16	350	-	15	20	28	44
18	250	-	10	14	22	31
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20	300	-	13	17	26	35
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60	350	-	15	18	22	30
64	200	-	8	11	14	21
64	250	-	10	13	16	24
64	300	-	12	15	19	26
64	350	-	15	17	21	29

SOURCE: Ductile Iron Pipe for Wastewater Applications, DIPRA 2006

STANDARD DETAIL
 Metropolitan Sewerage District
 of Buncombe County, North Carolina
TYPICAL TRENCH DETAIL FOR DUCTILE IRON PIPE - 2
 DATE APPROVED: MARCH 2017 | 2.05 - 02

OWNER TYPICAL DETAILS

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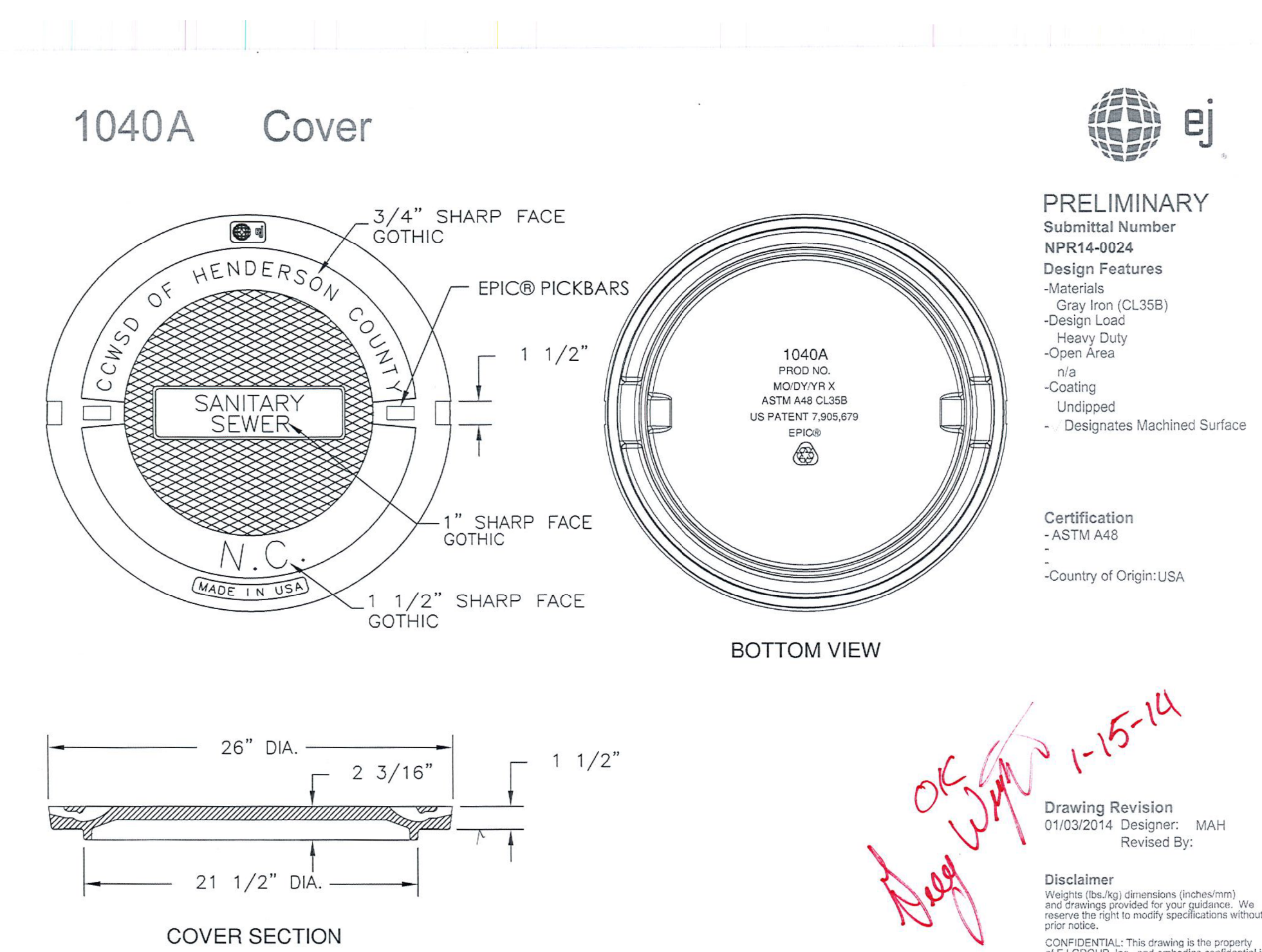
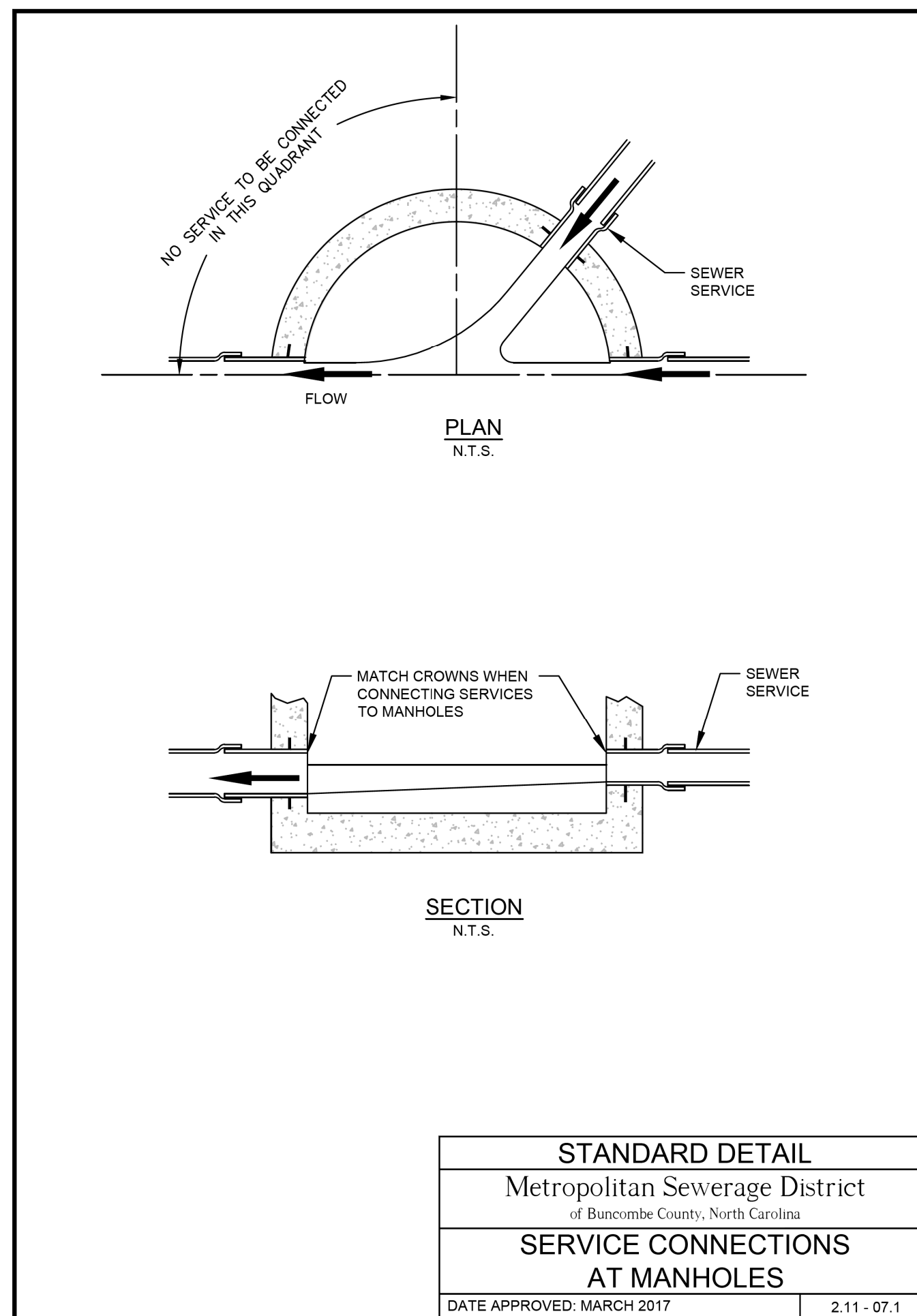
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PRELIMINARY
 Submittal Number
NPR14-0024
 Design Features
 -Materials
 -Gray Iron (CL35B)
 -Design Load
 -Heavy Duty
 -Open Area
 -1/8"
 -Coating
 -Undipped
 - Designates Machined Surface

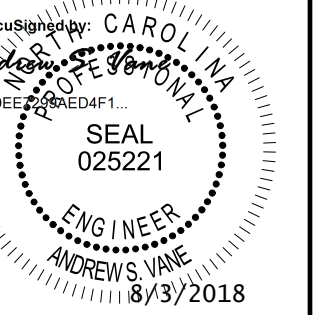
Certification
 - ASTM A48
 -
 -Country of Origin: USA

Drawing Revision
 01/03/2014 Designer: MAH
 Revised By:

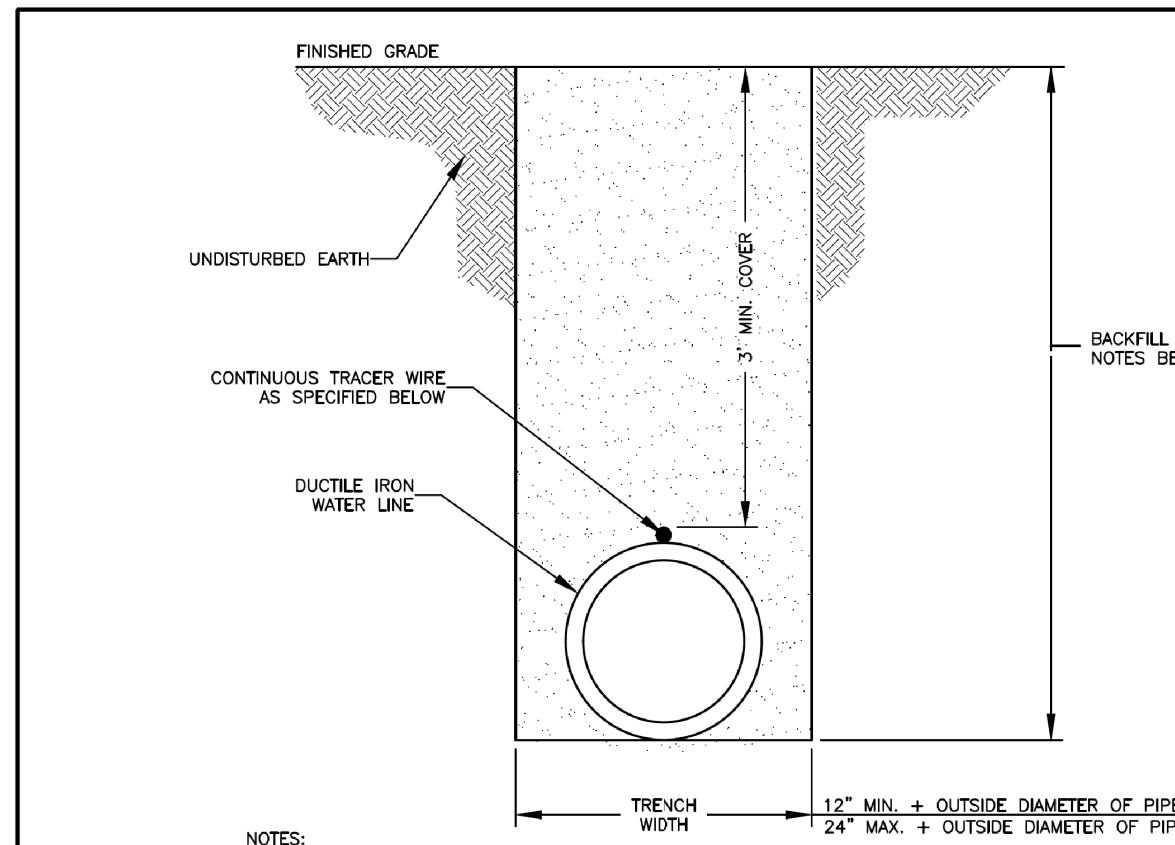
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UTILITIES ENGINEERING SECTION
PHONE: (919) 707-6690
FAX: (919) 250-4151
UTILITY CONSTRUCTION PLANS ONLY



OWNER TYPICAL DETAILS



NOTES:

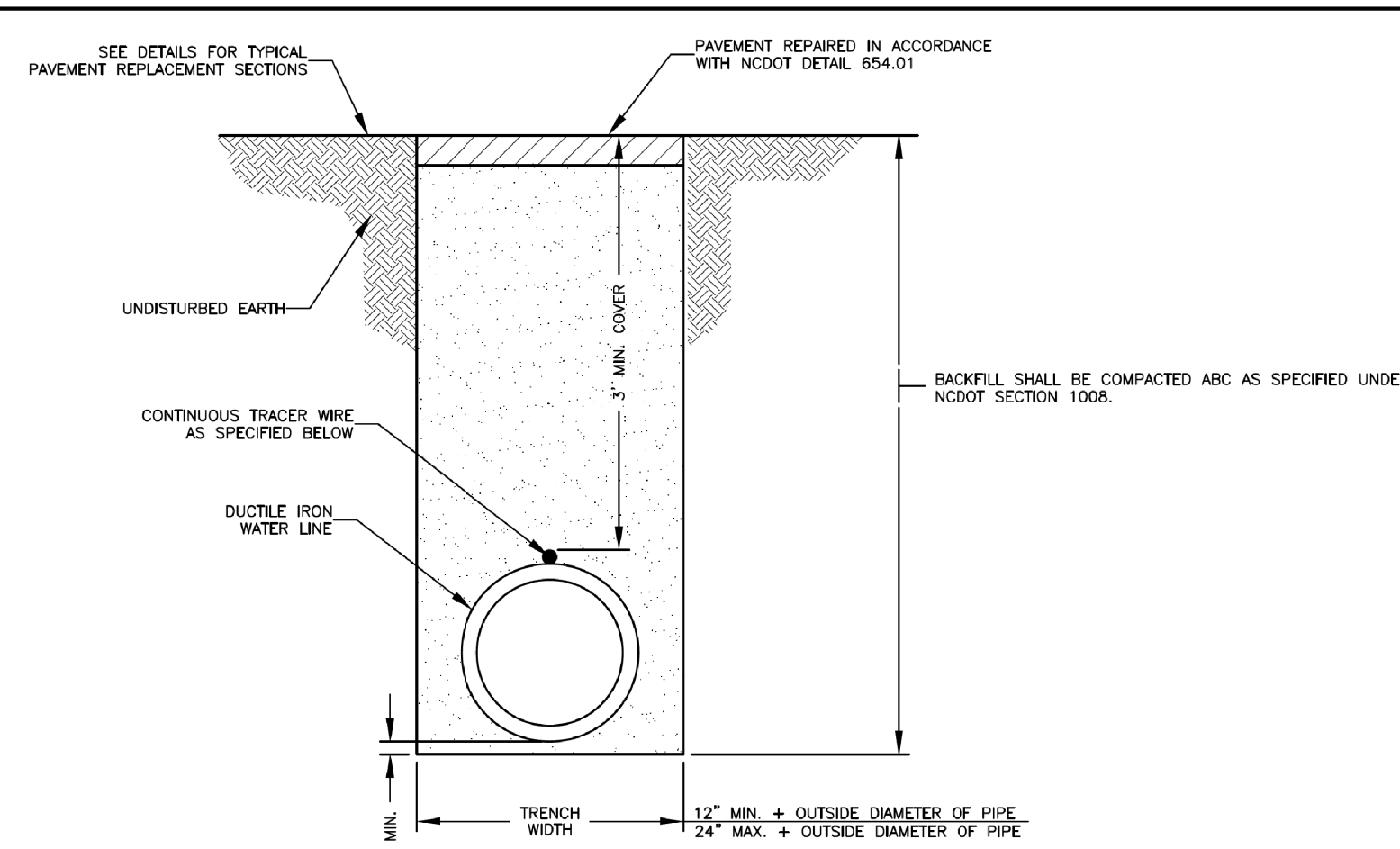
- 1. TRENCHES EXCAVATED OUTSIDE EXISTING ROAD AND RAILWAY RIGHTS-OF-WAY SHALL BE BACKFILLED WITH COMMON BACKFILL MATERIAL...

WHERE EXCAVATED MATERIAL AFTER REMOVAL OF ROCKS, STUMPS, PLANT MATERIAL, AND OTHER EXTRANEOUS MATERIAL AND PROPER Dewatering, DRYING, PROTECTION, AND STORAGE OF THE EXCAVATION BY THE CONTRACTOR, CANNOT BE PREPARED TO MEET THE REQUIREMENTS FOR COMMON BACKFILL...

- 2. THE WATER LINE SHALL HAVE A MINIMUM OF 3" OF COVER AT FINISHED GRADE.

TRACER WIRE WILL BE A 18 GAUGE, TIN COATED, COPPER CONDUCTOR WITH POLYETHYLENE INSULATION, CORE MATERIAL COMPRISED OF HIGH-TENSACITY, WOVEN POLYESTER WITH WATER BLOCKING YARNS ENCAPSULATED IN 30 MIL BLUE HOPE JACKET...

TRACER WIRE SHALL BE EXTENDED ALONG ALL WATER LINES, FITTINGS, VALVES, SERVICES, AND HYDRANTS. LOCATING CLIPS SHALL BE PROVIDED AT ALL VALVES, HYDRANT VALVES AND METER BOXES...



NOTES:

- 1. THIS TRENCH BACKFILL DETAIL APPLIES TO AREAS UNDER PAVEMENT AND AREAS WHERE THE TRENCH IS WITHIN FIVE (5) FEET OF THE EDGE OF PAVEMENT.

- 2. COMPACTION OF THE BACKFILL SHALL BE ACHIEVED THROUGH THE USE OF AN APPROVED VIBRATORY PLATE TAMPER OR ROLLER.

- 3. COMPACTION TESTING OF THE BACKFILL SHALL BE PROVIDED, DIRECTED AND COORDINATED BY THE OWNER. INTERVALS OF TESTING SHALL BE AT THE TOTAL DISCRETION OF THE OWNER AND MAY BE CHANGED AT ANY TIME.

IF A TEST DOES NOT PASS, THE CONTRACTOR SHALL REMOVE THE DEFECTIVE BACKFILL, REDO THE WORK AND THE AREA WILL BE RETESTED. THE CONTRACTOR SHALL BE AWARE OF THE LEVEL OF COMPACTION REQUIRED.

IF THE WORK IS SUSPECT TO BE DEFECTIVE BY THE OWNER, THE WORK SHALL BE RETESTED.

THE WATER CONTENT OF THE BACKFILL MATERIAL SHALL ALSO BE TESTED AND RECORDED FOR EACH TEST COMPLETED. THE CONTRACTOR WILL BE ALLOWED TO ADD WATER TO THE BACKFILL MATERIAL IN ORDER TO OBTAIN THE OPTIMUM WATER CONTENT...

- 4. THE WATER LINE SHALL HAVE A MINIMUM OF 3" OF COVER AT FINISHED GRADE.

- 5. TRACER WIRE WILL BE A 18 GAUGE, TIN COATED, COPPER CONDUCTOR WITH POLYETHYLENE INSULATION, CORE MATERIAL COMPRISED OF HIGH-TENSACITY, WOVEN POLYESTER WITH WATER BLOCKING YARNS ENCAPSULATED IN 30 MIL BLUE HOPE JACKET...

TRACER WIRE SHALL BE EXTENDED ALONG ALL WATER LINES, FITTINGS, VALVES, SERVICES, AND HYDRANTS. LOCATING CLIPS SHALL BE PROVIDED AT ALL VALVES, HYDRANT VALVES AND METER BOXES...

1 WATER TRENCH CONSTRUCTION OUTSIDE PAVEMENT



04/04/18

2 WATER TRENCH CONSTRUCTION UNDER PAVEMENT



04/04/18

GENERAL NOTES:

- 1. WATER CONSTRUCTION ON THIS SITE IS AUTHORIZED BY PERMITS ISSUED BY THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL QUALITY (NCDEQ) AND THE CITY OF HENDERSONVILLE...

TESTING & INSPECTION:

- 1. NOTIFY THE CITY OF HENDERSONVILLE AND ENGINEER AT LEAST 72 HOURS BEFORE STARTING CONSTRUCTION OF WATER FACILITIES...

3 WATER DETAILS GENERAL NOTES



04/04/18

DISCLAIMER:

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IRON RETAINING GLAND M.J. RESTRAINT

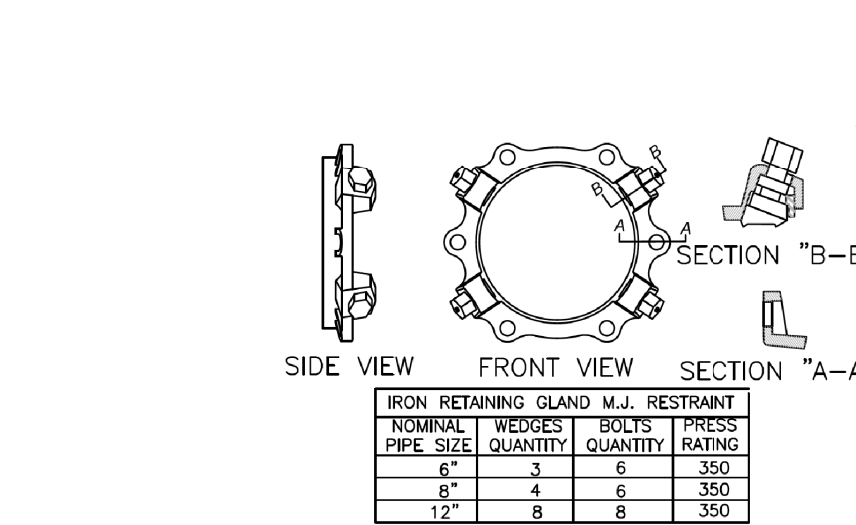
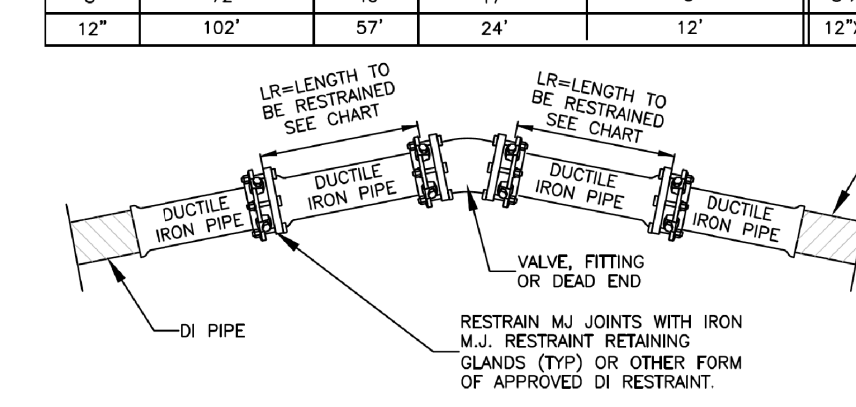


Table with columns: PIPE SIZE, VALVES DEAD ENDS, 90° ELBOWS, 45° ELBOW & CROSSES, 22-1/2" ELBOWS, REDUCER. Rows for 6", 8", 12" pipe sizes.

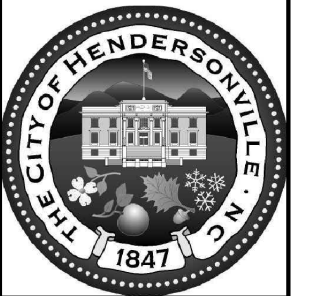
BASED ON 200 psig pressure, Safety Factor of 2.0:1, BASE DI PIPE AND M. SOL. 1.5" COVER. Chart does not apply to pipes wrapped in polyethylene wrap.



4 DUCTILE IRON PIPE RESTRAINT DETAIL



04/04/18



CITY OF HENDERSONVILLE, NC "The City of Four Seasons"
City of Hendersonville Engineering Department
HENDERSONVILLE, NC 28702
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(828) 697-3000 (fax)
www.hendersonville.org

CITY OF HENDERSONVILLE STANDARD WATER DETAILS
CITY OF HENDERSONVILLE, NORTH CAROLINA
HENDERSON COUNTY, NORTH CAROLINA

Table with columns: NO., DATE, DESCRIPTION.

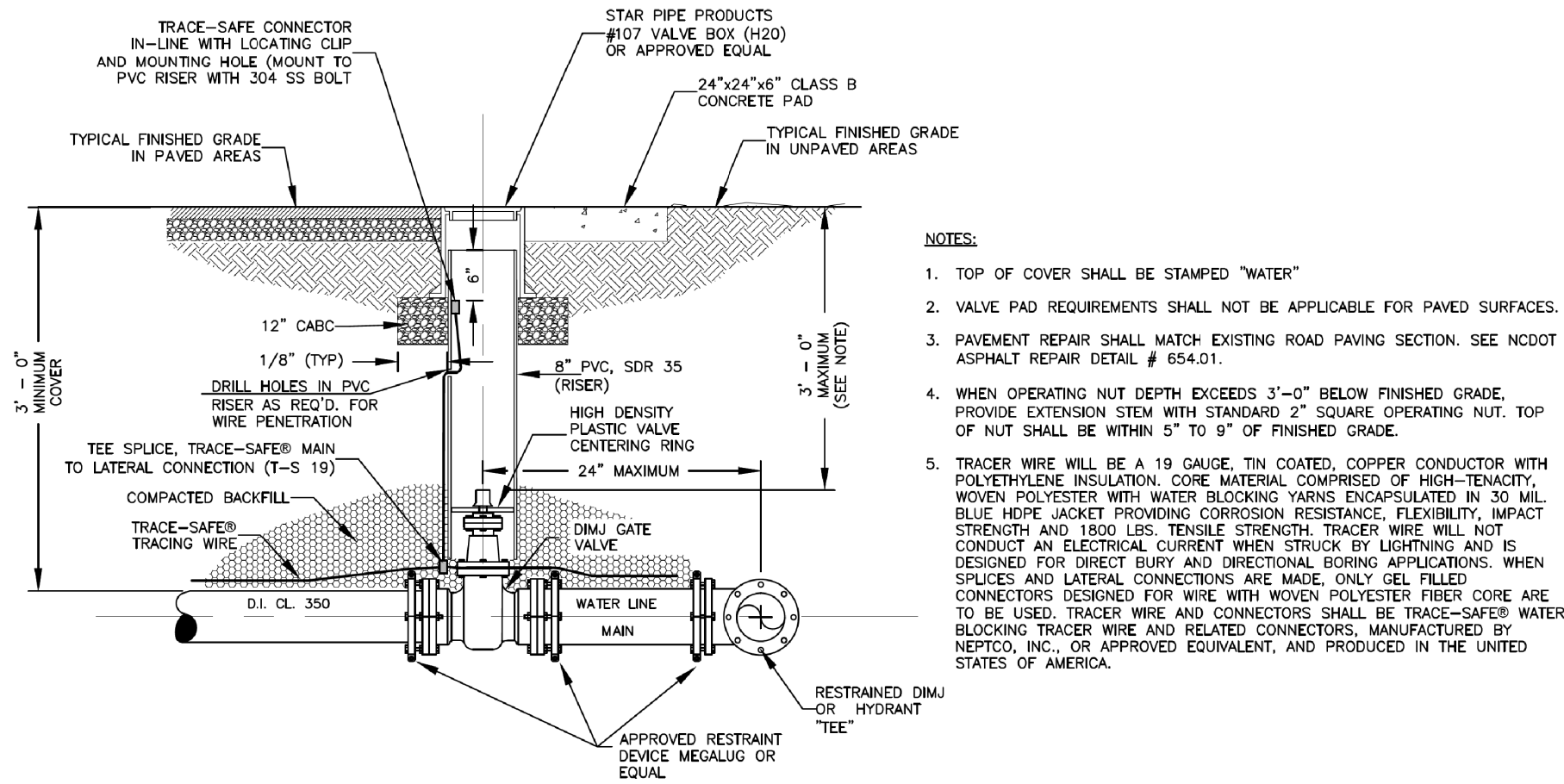
DATE: MARCH 23, 2018
DRAWN BY: MMP
PROJECT NO.:

WD-1

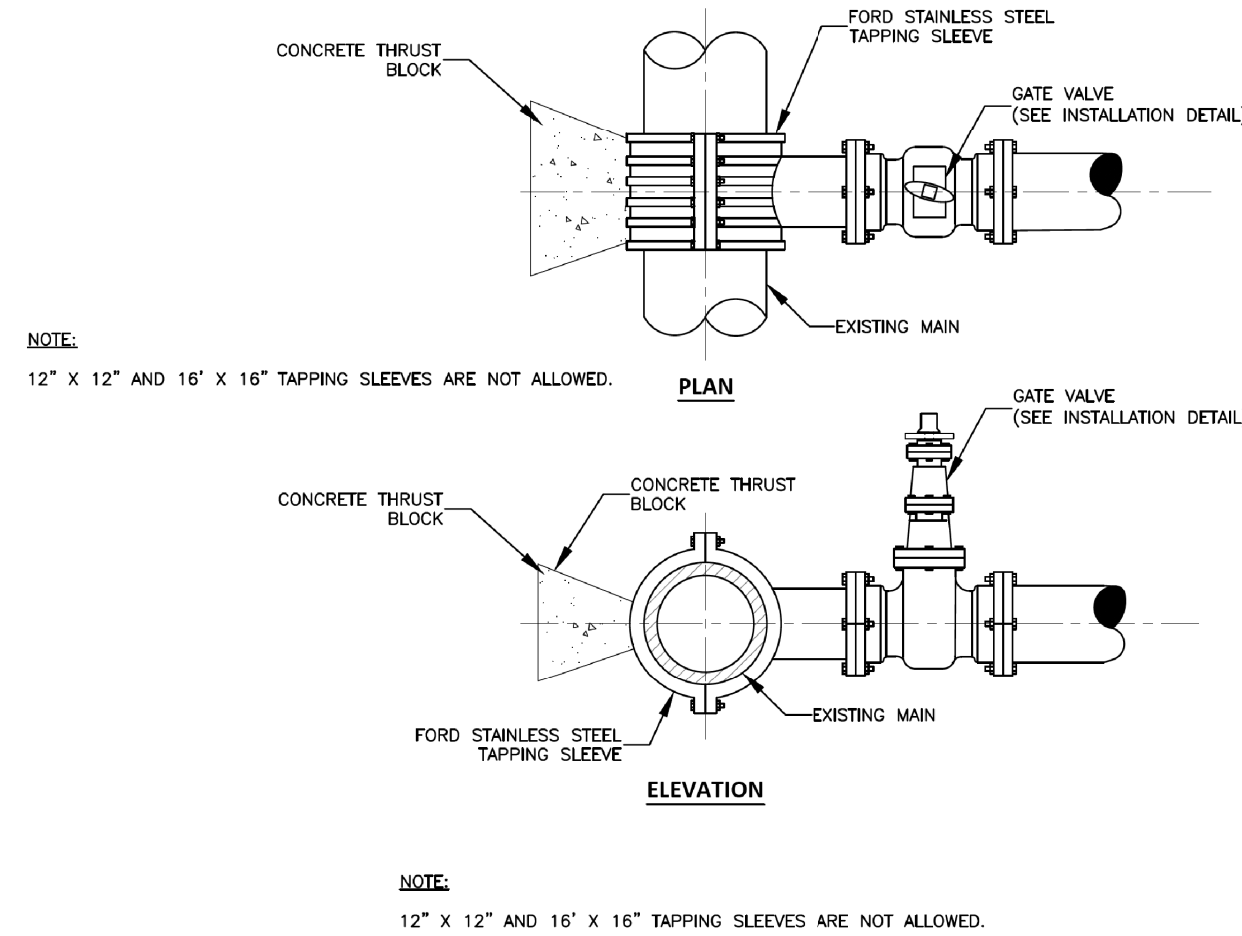
OWNER TYPICAL DETAILS

STV 100 Years
STV Engineers, Inc.
 300 West Trade St., Suite 715
 Charlotte, NC 28202
 NC License Number F-0991

PROJECT REFERENCE NO. U-5840	SHEET NO. UC-3E
DESIGNED BY: CTH	
DRAWN BY: CTH	
CHECKED BY: ASV	
APPROVED BY: XMD	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	UTILITY CONSTRUCTION PLANS ONLY
UTILITY CONSTRUCTION	



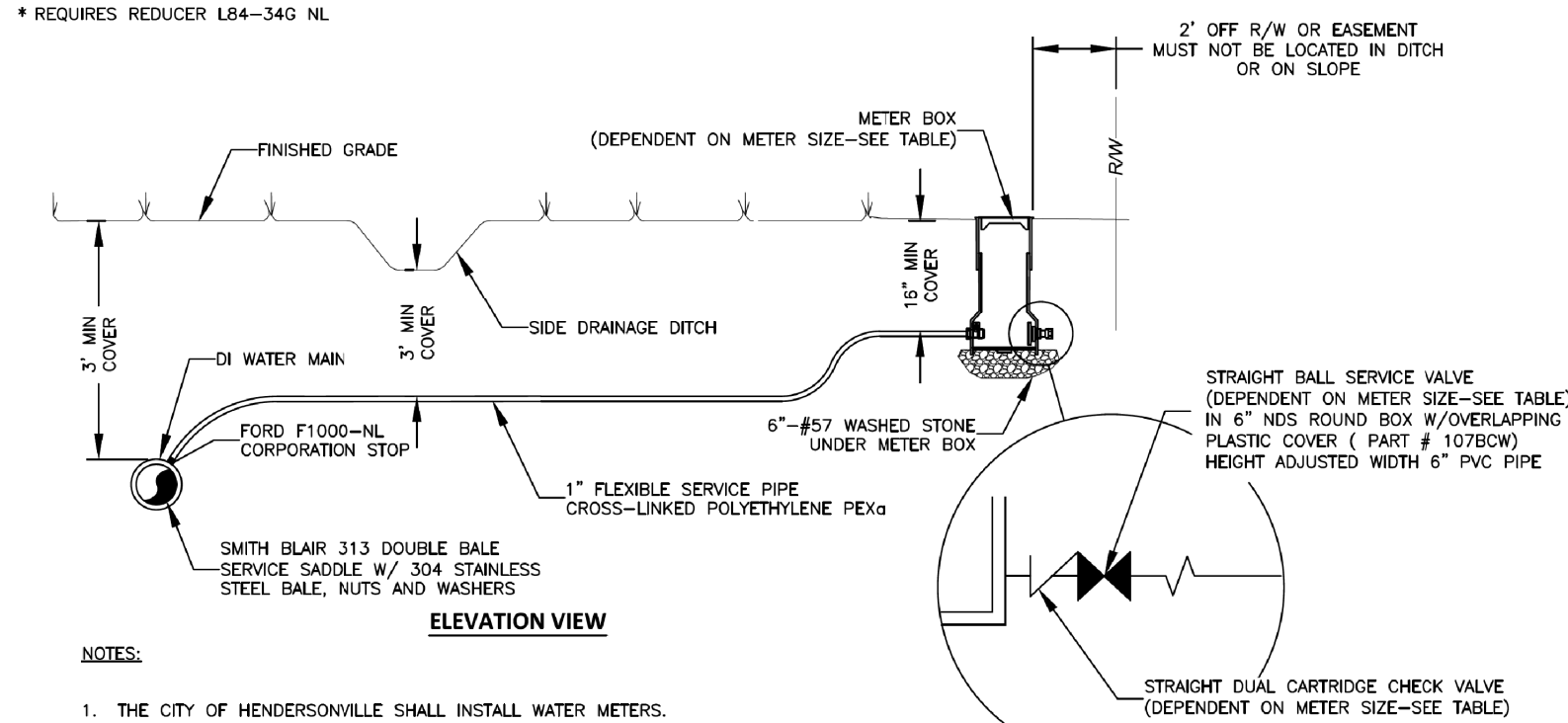
5 VALVE INSTALLATION DETAIL
 WD-2 NOT TO SCALE 04/04/18



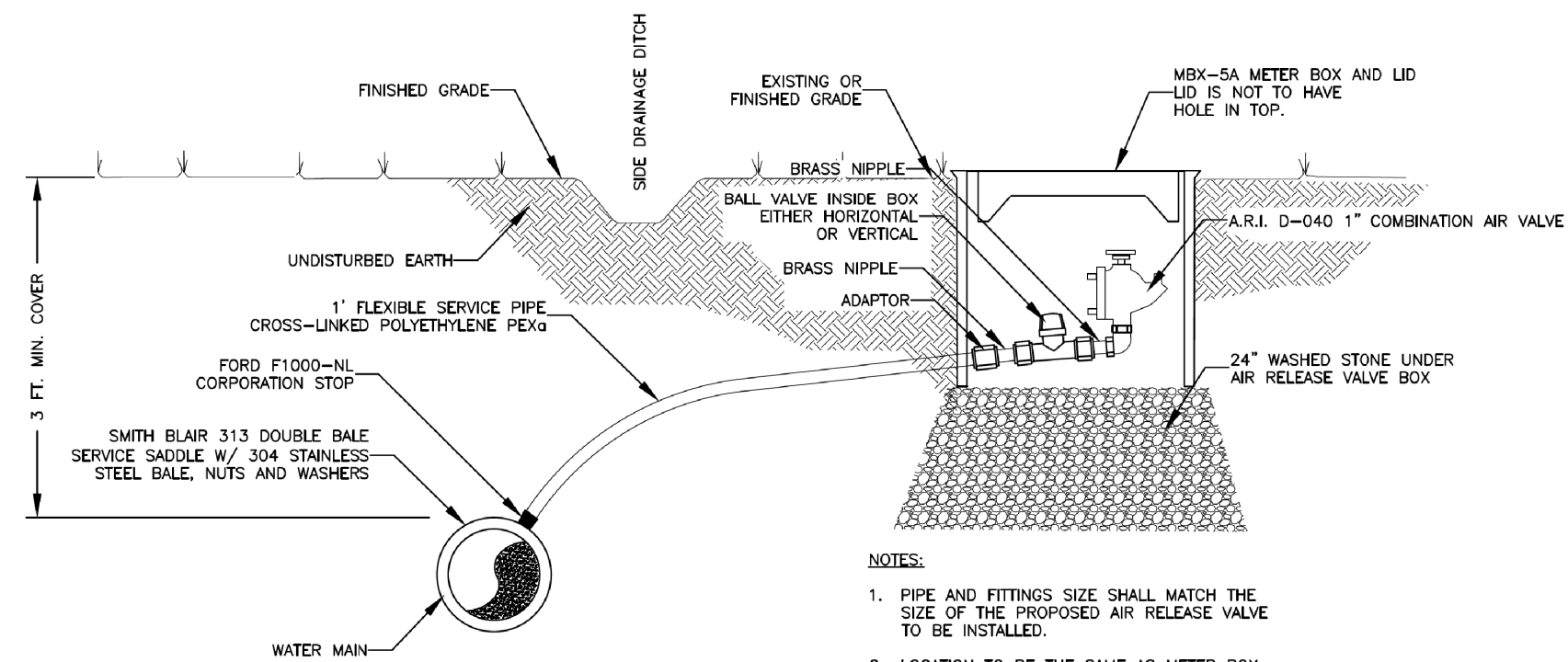
6 STANDARD TAPPING SLEEVE AND VALVE ASSEMBLY
 WD-2 NOT TO SCALE 04/04/18

METER SIZE	METER BOX SIZE	METER BOX	STRAIGHT BALL SERVICE VALVE	STRAIGHT DUAL CARTRIDGE CHECK VALVE
3/4" *	3/4"	FORD CB111-233-NL	FORD B81-233W-NL	HHC81-333-NL
1"	1"	FORD CB111-444-L-T-NL	FORD B81-344W-NL	HHC81-444-NL

* REQUIRES REDUCER L84-340 NL



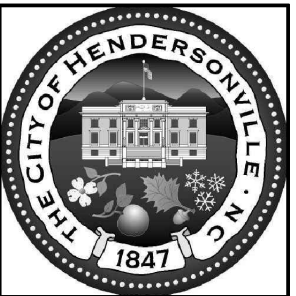
8 MINIMUM SERVICE LINE: 1" SERVICE LATERAL INSTALLATION
 WD-2 NOT TO SCALE 02/16/18



7 STANDARD AIR RELEASE VALVE INSTALLATION
 WD-2 NOT TO SCALE 04/04/18

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CITY OF HENDERSONVILLE, NC
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 www.cityofhendersonville.com

**CITY OF HENDERSONVILLE
 STANDARD WATER DETAILS**
 HENDERSON COUNTY, NORTH CAROLINA

NO.	DATE	BY	DESCRIPTION

DATE: MARCH 23, 2018
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 PROJECT NO.:

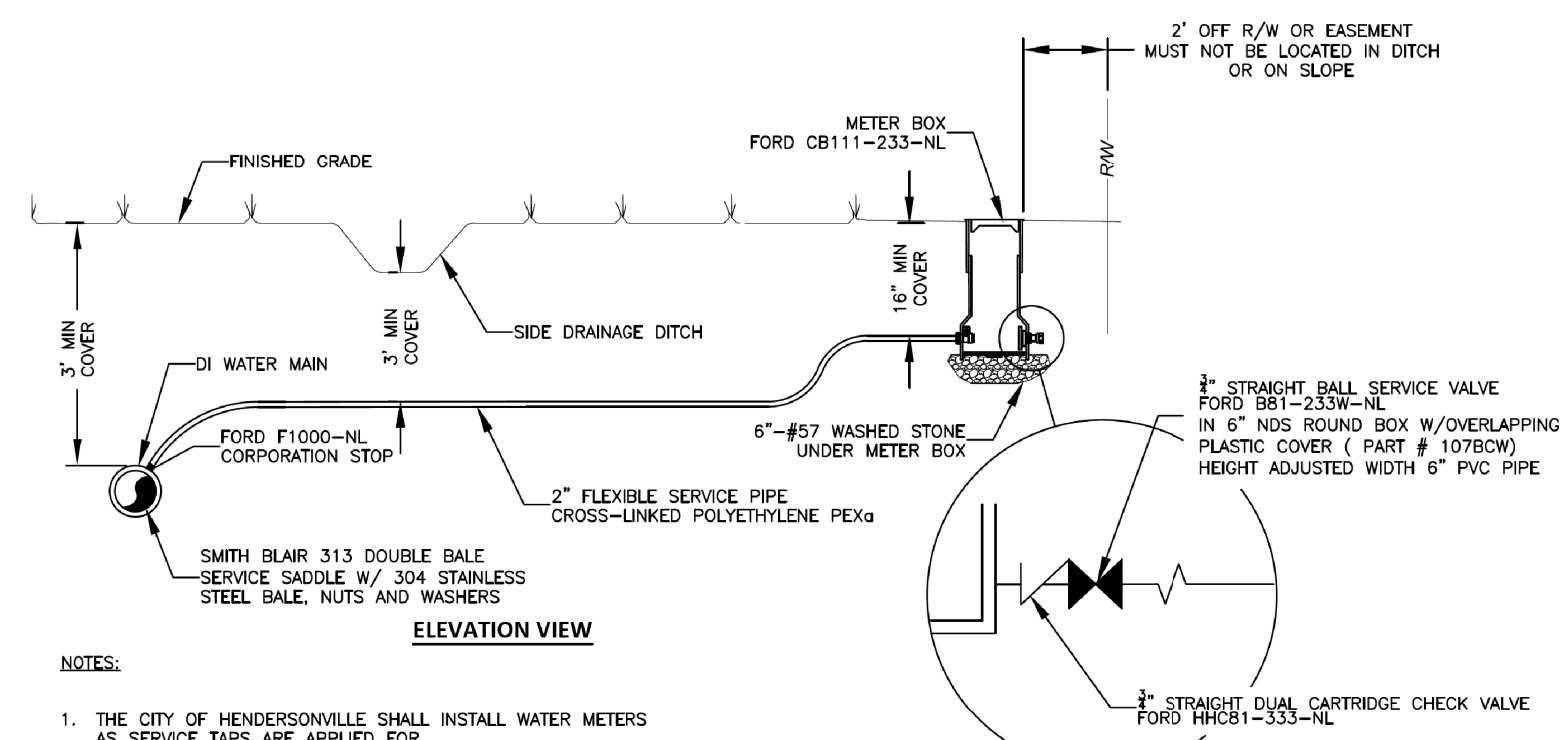
WD-2

OWNER TYPICAL DETAILS

STV 100 Years
 STV Engineers, Inc.
 500 West Trade St., Suite 715
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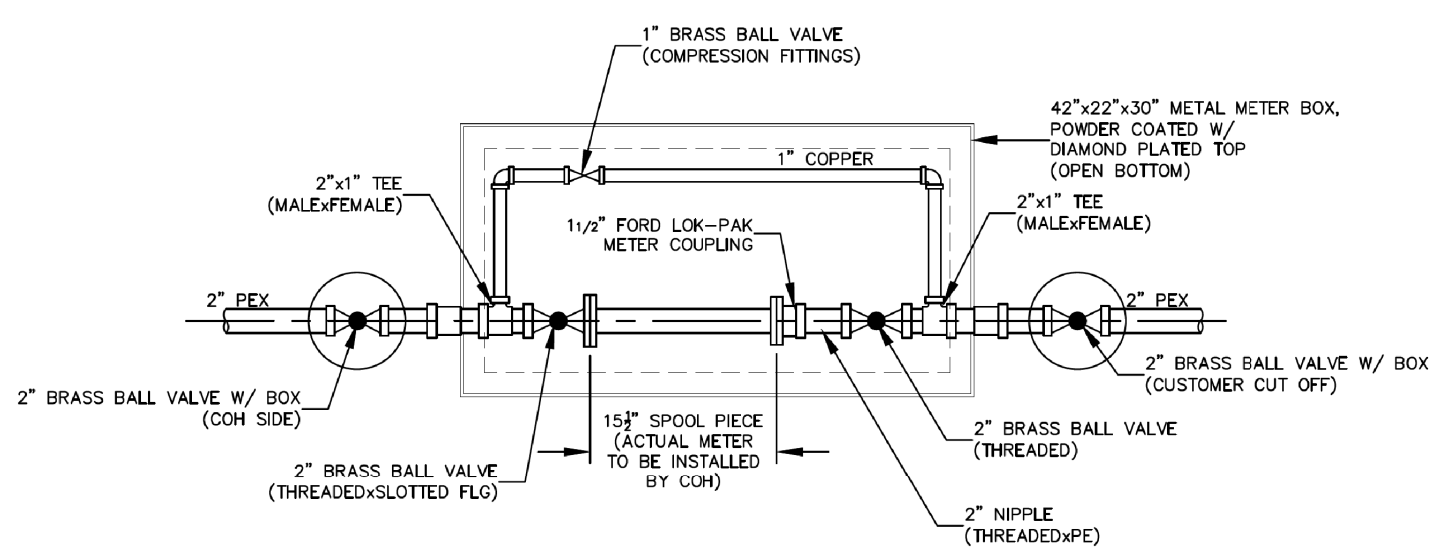
PROJECT REFERENCE NO. U-5840	SHEET NO. UC-3F
DESIGNED BY: CTH	
DRAWN BY: CTH	
CHECKED BY: ASV	
APPROVED BY: XMD	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	
UTILITY CONSTRUCTION PLANS ONLY	



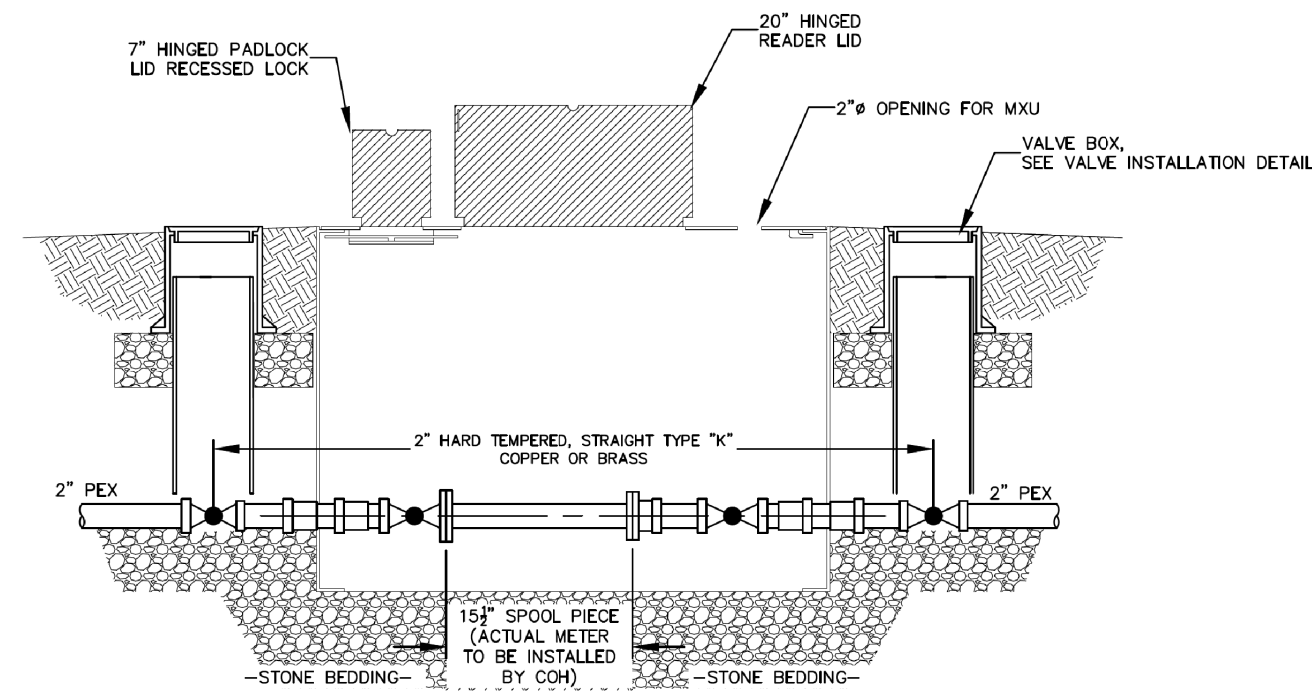
NOTES:

- THE CITY OF HENDERSONVILLE SHALL INSTALL WATER METERS AS SERVICE TAPS ARE APPLIED FOR.
- EXTEND TRACER WIRE FROM MAIN TO METER BOX. WIRE NOT SHOWN FOR CLARITY. TRACER WIRE WILL BE A 19 GAUGE, TIN COATED, COPPER CONDUCTOR WITH POLYETHYLENE INSULATION. CORE MATERIAL COMPOSED OF HIGH-TENSILITY, WOVEN POLYESTER WITH WATER BLOCKING HARNIS ENCAPSULATED IN 30 MIL BLUE HOPE JACKET, PROVIDING CORROSION RESISTANCE, FLEXIBILITY, IMPACT STRENGTH AND 1800 LBS. TENSILE STRENGTH. TRACER WIRE WILL NOT CONDUCT AN ELECTRICAL CURRENT WHEN STRUCK BY LIGHTNING AND IS DESIGNED FOR DIRECT BURY AND DIRECTIONAL BORING APPLICATIONS. WHEN SPLICES AND LATERAL CONNECTIONS ARE MADE, ONLY GEL FILLED CONNECTORS DESIGNED FOR WIRE WITH WOVEN POLYESTER FIBER CORE ARE TO BE USED. TRACER WIRE SHALL BE TERMINATED IN METER BOX AT MOUNTED TRACE-SAFE® LOCATING CLIP, MOUNTED A MAXIMUM OF 3" FROM TOP OF BOX WITH 304 SS BOLT. TRACER WIRE AND CONNECTORS SHALL BE TRACE-SAFE® WATER BLOCKING TRACER WIRE AND RELATED CONNECTORS, MANUFACTURED BY NEPTCO, INC., OR EQUIVALENT APPROVED BY ENGINEER, AND PRODUCED IN THE UNITED STATES OF AMERICA.

9 2" SERVICE LATERAL INSTALLATION
 WD-3 NOT TO SCALE 04/04/18

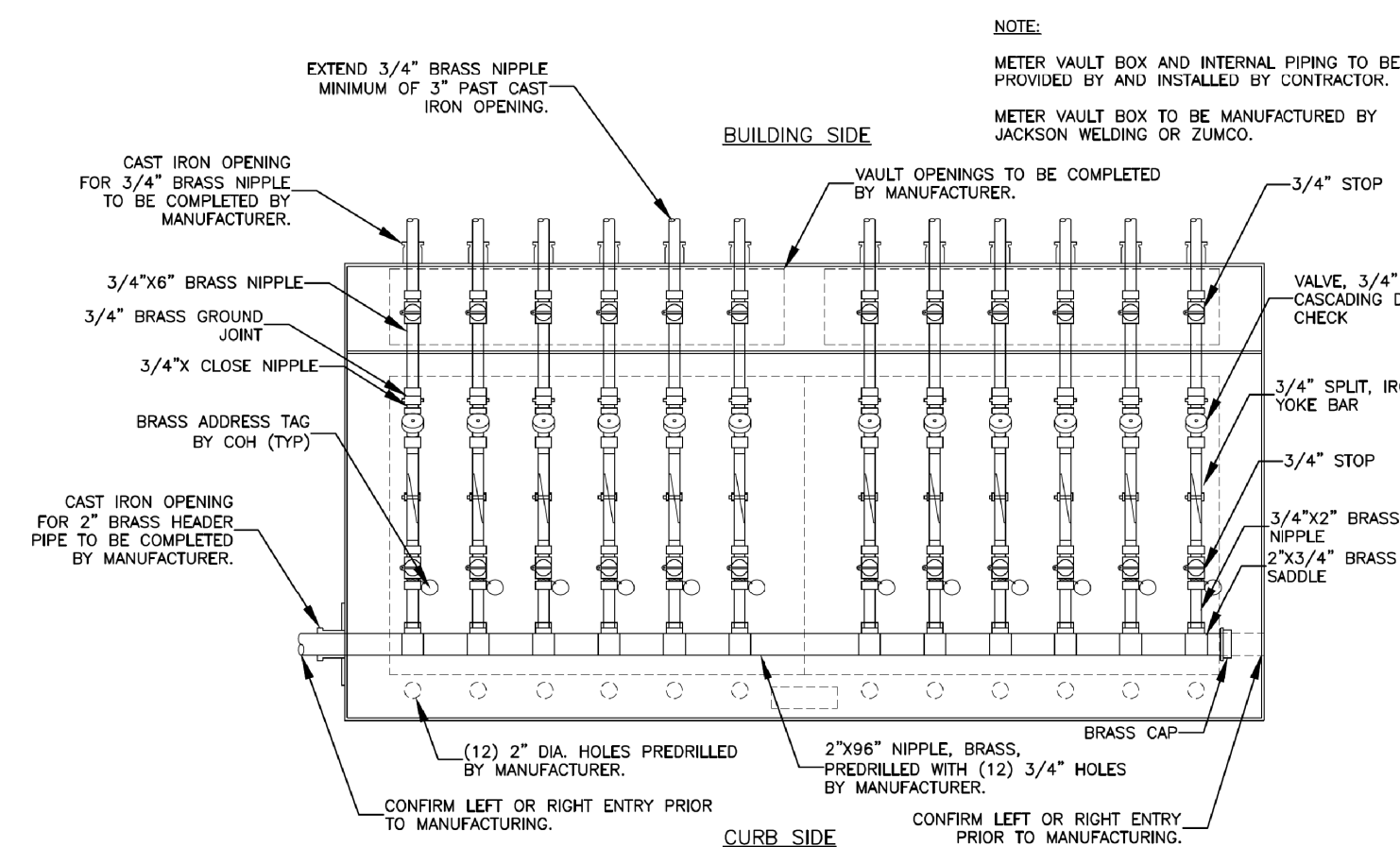


PLAN VIEW
 NOT TO SCALE



SECTION VIEW
 NOT TO SCALE

10 2" METER BOX
 WD-3 NOT TO SCALE 04/04/18



NOTE:

- METER VAULT BOX AND INTERNAL PIPING TO BE PROVIDED BY AND INSTALLED BY CONTRACTOR.
- METER VAULT BOX TO BE MANUFACTURED BY JACKSON WELDING OR ZUMCO.

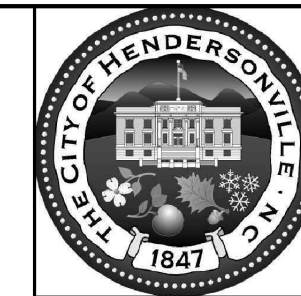
MULTI-METER VAULT ASSEMBLY PARTS LIST

QUANTITY	DESCRIPTION	CITY PART NUMBER
1 EA.	2"Y8" NIPPLE, BRASS	
12 EA.	2"x3/4" NPT SADDLE, BRASS NL	N-3686-12
12 EA.	3/4"X CLOSE NIPPLE, BRASS NL	N-3710-13
12 EA.	3/4"X2" NIPPLE, BRASS NL	N-3710-17
12 EA.	3/4"X6" NIPPLE, BRASS NL	N-3710-23
12 EA.	3/4" YOKER IRON YOKER BAR, SPLIT, 2-PIECE Y803	Y-0504-02
12 EA.	STOP, 3/4" STRAIGHT BALL VALVE FOR YOKER NL	S-7915-33
12 EA.	VALVE, 3/4" CASCADING DUEL CHECK, NL	V-0494-33
12 EA.	UNION, 3/4" BRASS GROUND JOINT, NL	U-5435-00
12 EA.	STOP, 3/4" CURB VALVE, MALE, NL	S-7915-00
1 EA.	CAP, 2" PIPE, BRASS NL	C-0882-08

NOTES:

- COH WILL PROVIDE STAMPED ADDRESS TAGS.
- THE CONTRACTOR WILL PROVIDE A LICENSED PLUMBER TO VERIFY LINE SERVICES IN ALL MULTI-METER BOXES.

11 MULTI-METER VAULT ASSEMBLY DETAIL
 WD-3 NOT TO SCALE 04/04/18



CITY OF HENDERSONVILLE, NC
 "The City of Four Seasons"
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 www.hendersonville-nc.gov

**CITY OF HENDERSONVILLE
 STANDARD WATER DETAILS**
 CITY OF HENDERSONVILLE
 HENDERSON COUNTY, NORTH CAROLINA

NO.	DATE	DESCRIPTION	BY

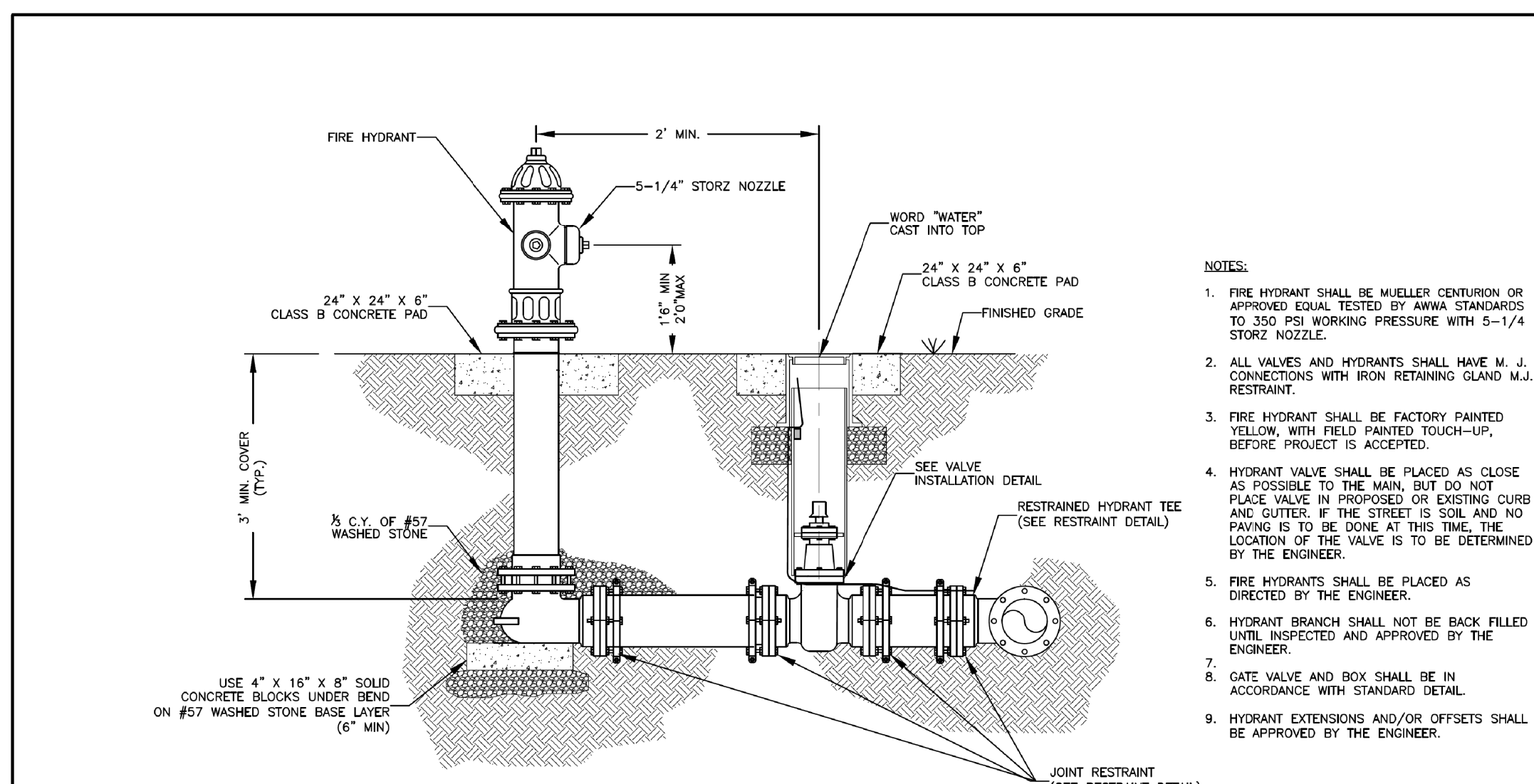
DATE: MARCH 23, 2018
 DRAWN BY: MMP
 PROJECT NO.:

WD-3

DISCLAIMER:

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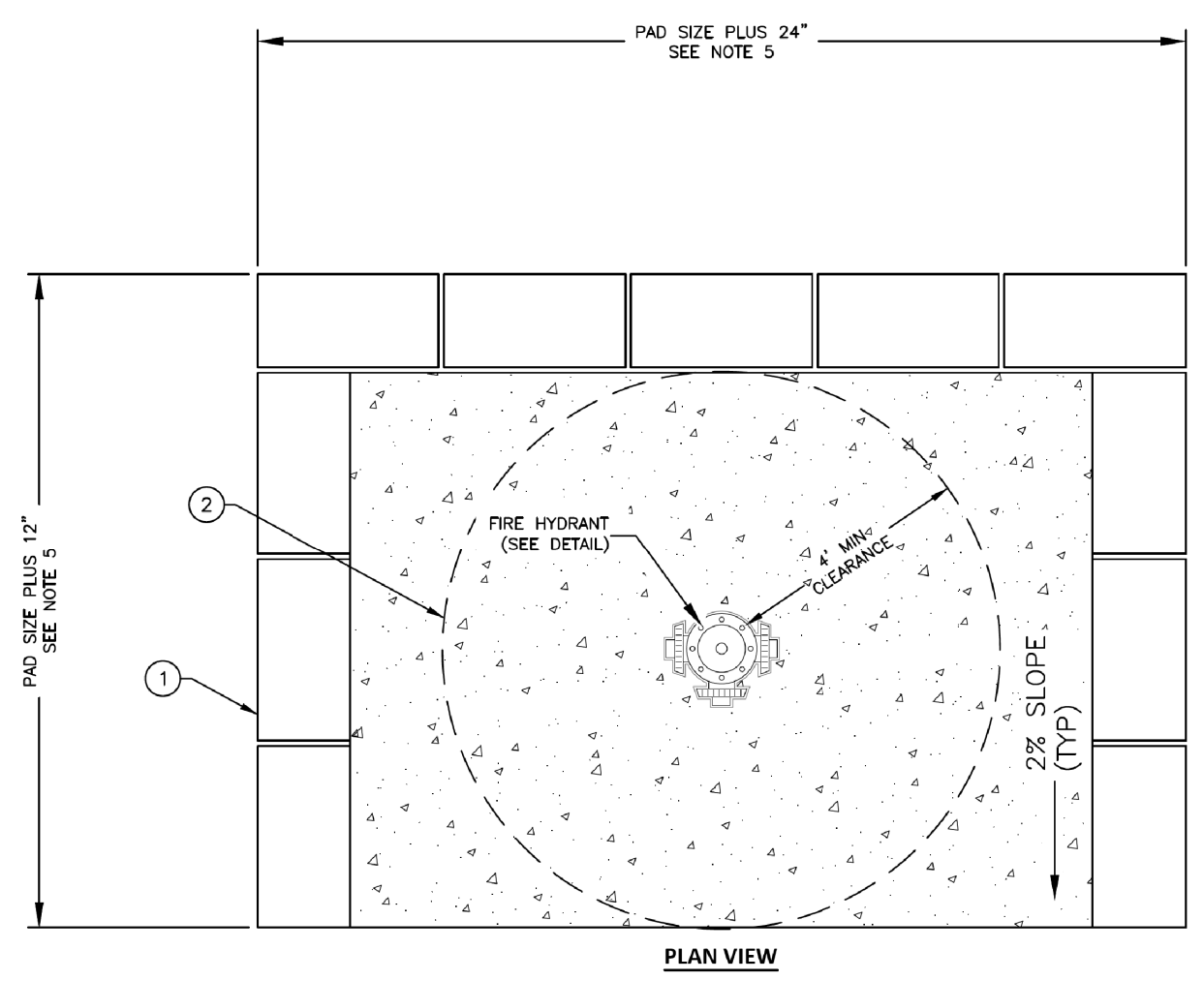
OWNER TYPICAL DETAILS



12 FIRE HYDRANT STANDARD INSTALLATION
 WD-4 NOT TO SCALE 04/04/18

- NOTES:**
1. FIRE HYDRANT SHALL BE MUELLER CENTURION OR APPROVED EQUAL TESTED BY AWWA STANDARDS TO 350 PSI WORKING PRESSURE WITH 5-1/4 STORZ NOZZLE.
 2. ALL VALVES AND HYDRANTS SHALL HAVE M. J. CONNECTIONS WITH IRON RETAINING GLAND M.J. RESTRAINT.
 3. FIRE HYDRANT SHALL BE FACTORY PAINTED YELLOW, WITH FIELD PAINTED TOUCH-UP, BEFORE PROJECT IS ACCEPTED.
 4. HYDRANT VALVE SHALL BE PLACED AS CLOSE AS POSSIBLE TO THE MAIN, BUT DO NOT PLACE VALVE IN PROPOSED OR EXISTING CURB AND GUTTER. IF THE STREET IS SOIL AND NO PAVING IS TO BE DONE AT THIS TIME, THE LOCATION OF THE VALVE IS TO BE DETERMINED BY THE ENGINEER.
 5. FIRE HYDRANTS SHALL BE PLACED AS DIRECTED BY THE ENGINEER.
 6. HYDRANT BRANCH SHALL NOT BE BACK FILLED UNTIL INSPECTED AND APPROVED BY THE ENGINEER.
 7. GATE VALVE AND BOX SHALL BE IN ACCORDANCE WITH STANDARD DETAIL.
 8. HYDRANT EXTENSIONS AND/OR OFFSETS SHALL BE APPROVED BY THE ENGINEER.

- NOTES:**
1. RETAINING WALLS FOR USE IN CONJUNCTION WITH THE INSTALLATION OF FIRE HYDRANTS SHALL BE INSTALLED WHERE SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER.
 2. FIGURES SHOWN REPRESENT MINIMUMS ONLY. ALL RETAINING WALLS ABOVE 4' SHALL BE DESIGNED BY THE ENGINEER OF WORK AND PERMITTED BY THE AGENCY OF JURISDICTION.
 3. VERTICAL BARS TO BE INSTALLED AT 16" ON CENTER. INSTALL MINIMUM 1-BAR IN THE CENTER OF THE FOOTING FOR WALL.
 4. PAD SIZE TO MATCH SIZE OF PAD REQUIRED FOR FIRE HYDRANT TO BE INSTALLED.
 5. GRAVITY WALL MAY BE INSTALLED ONLY WITH PRIOR APPROVAL OF SUBMITTAL FOR INSTALLATION.
 6. AN EASEMENT MAY BE REQUIRED DEPENDING ON THE LOCATION OF THE WALL.



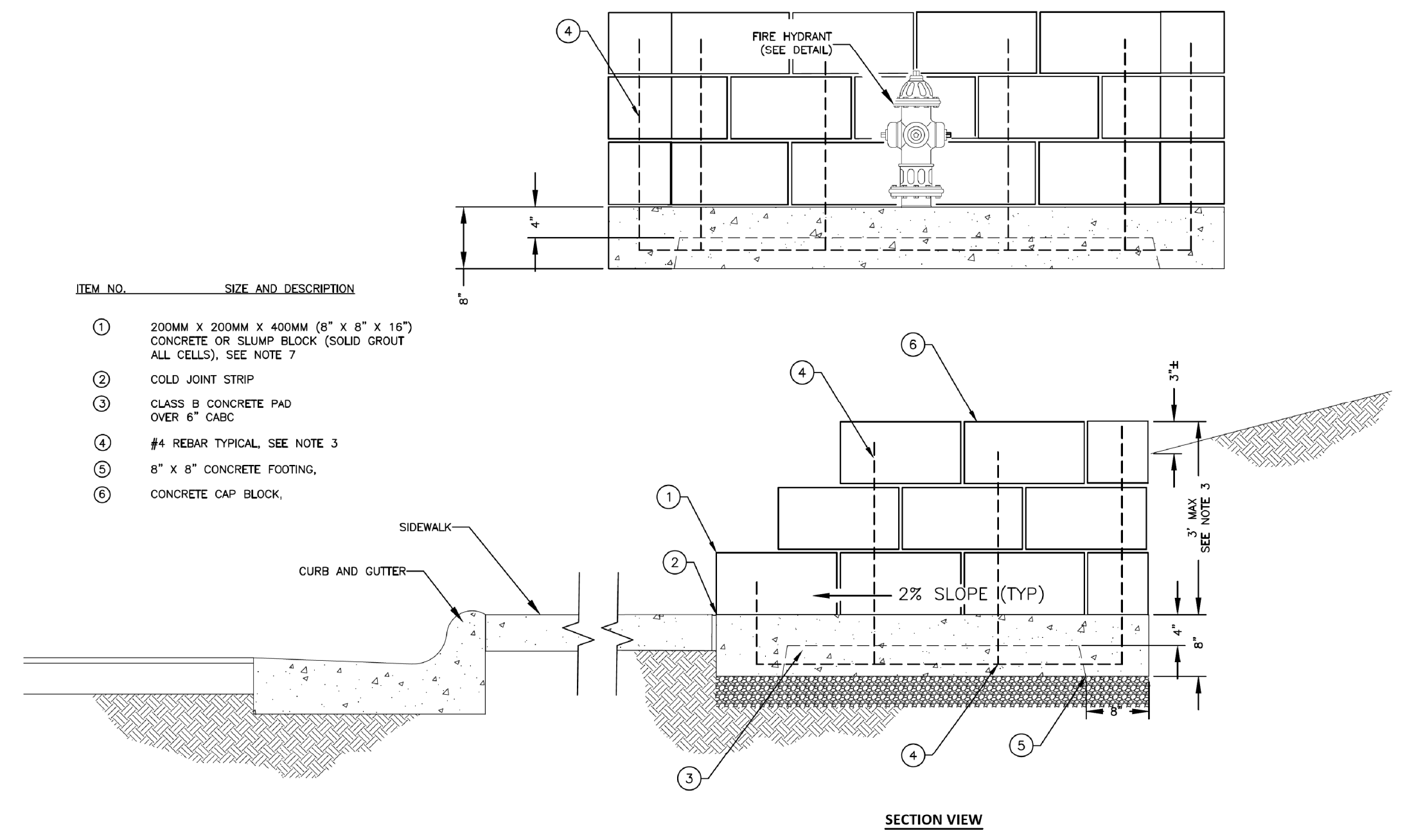
13 FIRE HYDRANT DITCH INSTALLATION
 WD-4 NOT TO SCALE 04/04/18

- NOTES:**
1. SEE FIRE HYDRANT STANDARD INSTALLATION DETAIL FOR ADDITIONAL REQUIREMENTS.
 2. ALL VALVES AND HYDRANTS SHALL HAVE M. J. CONNECTIONS WITH IRON RETAINING GLAND M.J. RESTRAINT.
 3. FIRE HYDRANT OFFSET CONNECTOR SHALL BE PLACED AS APPROVED BY THE ENGINEER.
 4. OFFSET CONNECTOR SHALL NOT BE BACK FILLED UNTIL INSPECTED AND APPROVED BY ENGINEER.

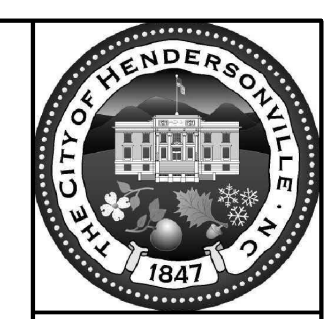
	6"x6"	6"x12"	6"x24"
A	18"	30"	41"
B	6"	12"	24"

SIZE 6" DIA. X OFFSET

- ITEM NO. SIZE AND DESCRIPTION**
1. 200MM X 200MM X 400MM (8" X 8" X 16") CONCRETE OR SLUMP BLOCK (SOLID GROUT ALL CELLS), SEE NOTE 7
 2. COLD JOINT STRIP
 3. CLASS B CONCRETE PAD OVER 6" CABG
 4. #4 REBAR TYPICAL (SEE NOTE 3)
 5. 8" X 8" CONCRETE FOOTING.
 6. CONCRETE CAP BLOCK.



14 FIRE HYDRANT SLOPE INSTALLATION
 WD-4 NOT TO SCALE 04/04/18



CITY OF HENDERSONVILLE, NC
 "The City of Four Seasons"
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 Hendersonville, NC 28792
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 www.hendersonville.org

**CITY OF HENDERSONVILLE
 STANDARD WATER DETAILS**
 CITY OF HENDERSONVILLE
 HENDERSON COUNTY, NORTH CAROLINA

NO.	DATE	BY	DESCRIPTION

DATE: MARCH 23, 2018
 DRAWN BY: MJP
 PROJECT NO.:

WD-4

OWNER TYPICAL DETAILS

STV 100 Years
 STV Engineers, Inc.
 800 West Trade St., Suite 715
 Charlotte, NC 28202
 NC License Number F-0991

PROJECT REFERENCE NO.
 U-5840

SHEET NO.
 UC-3H

DESIGNED BY: CTH
DRAWN BY: CTH
CHECKED BY: ASV
APPROVED BY: XMD
REVISED:

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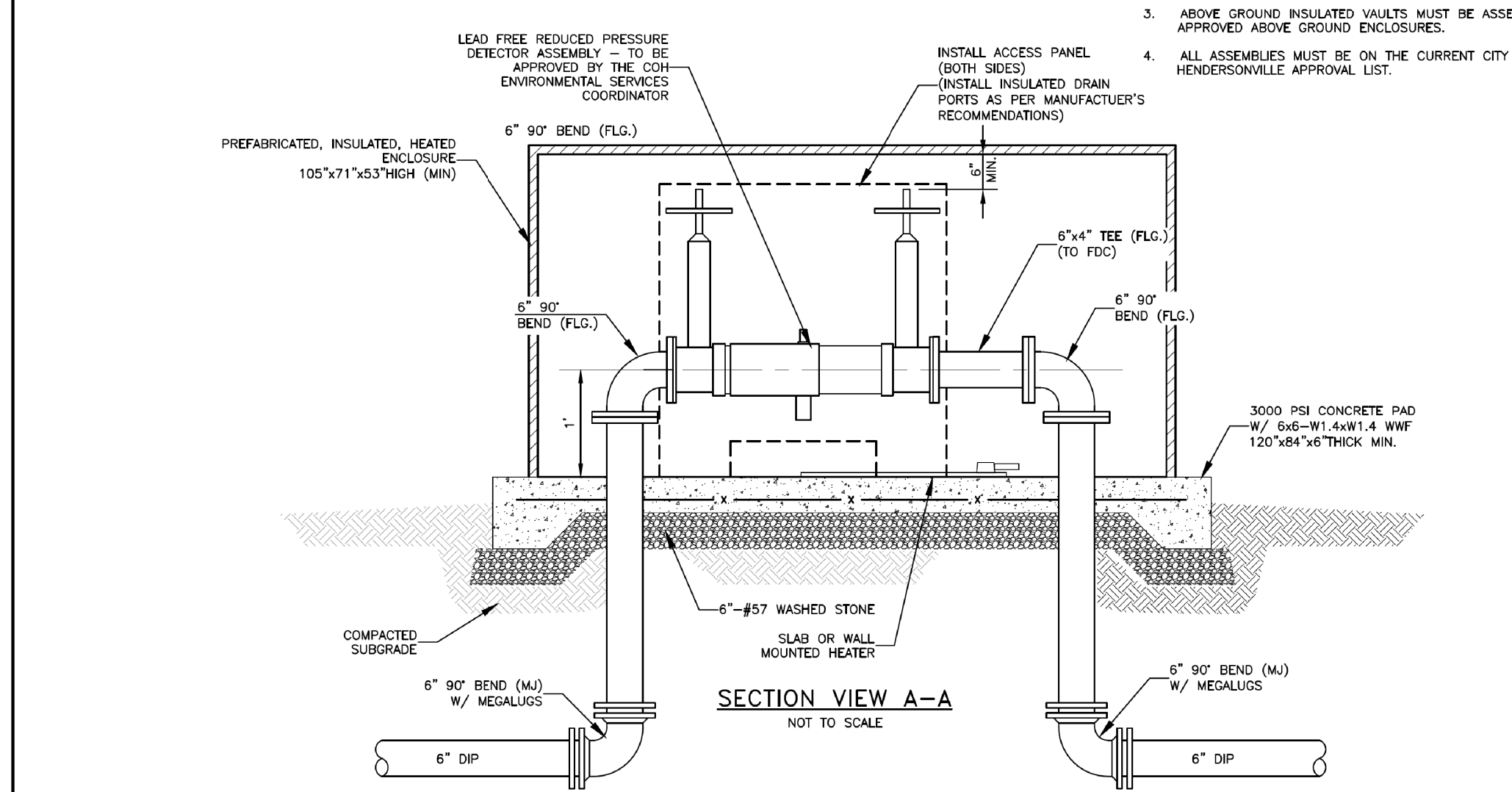
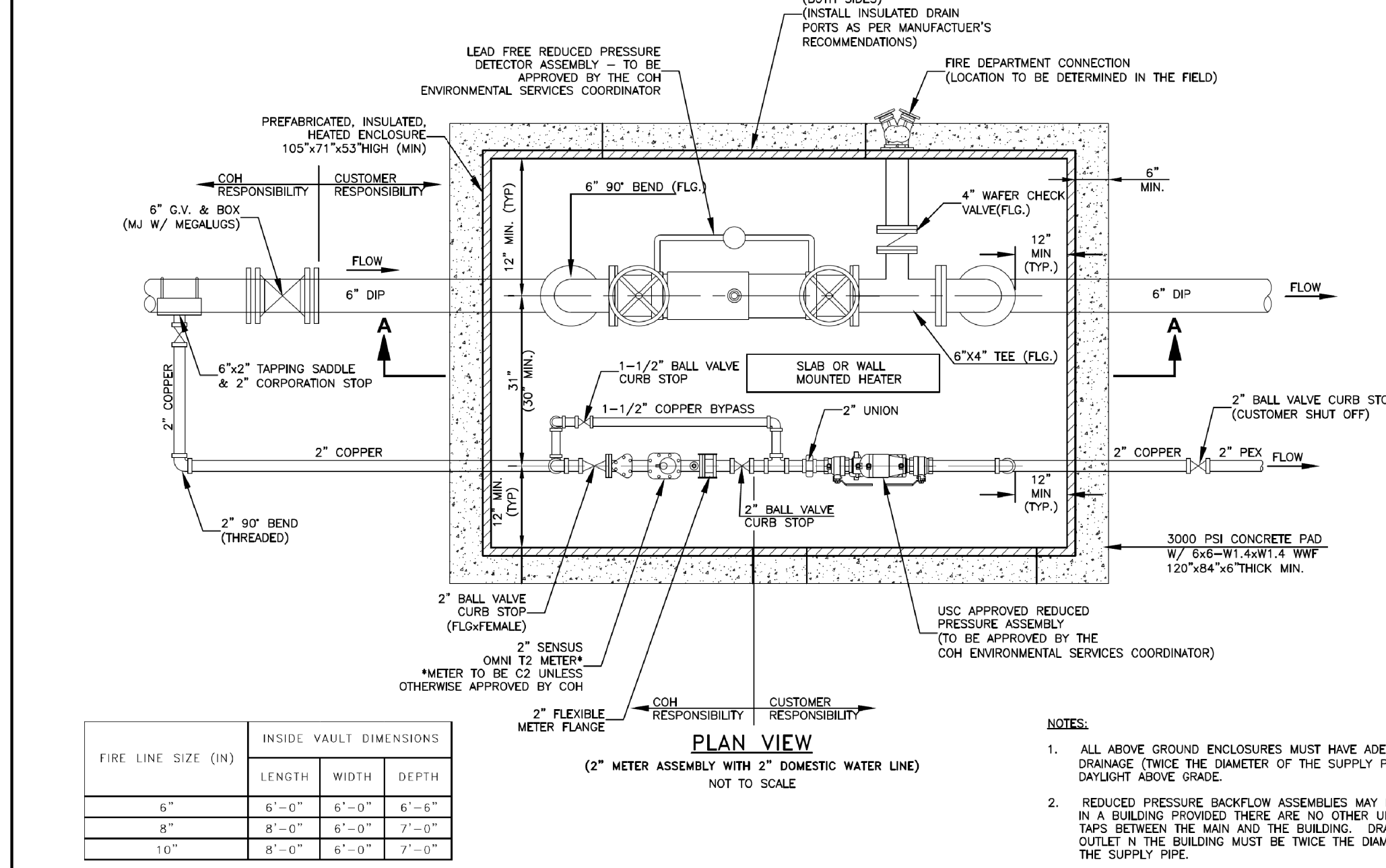
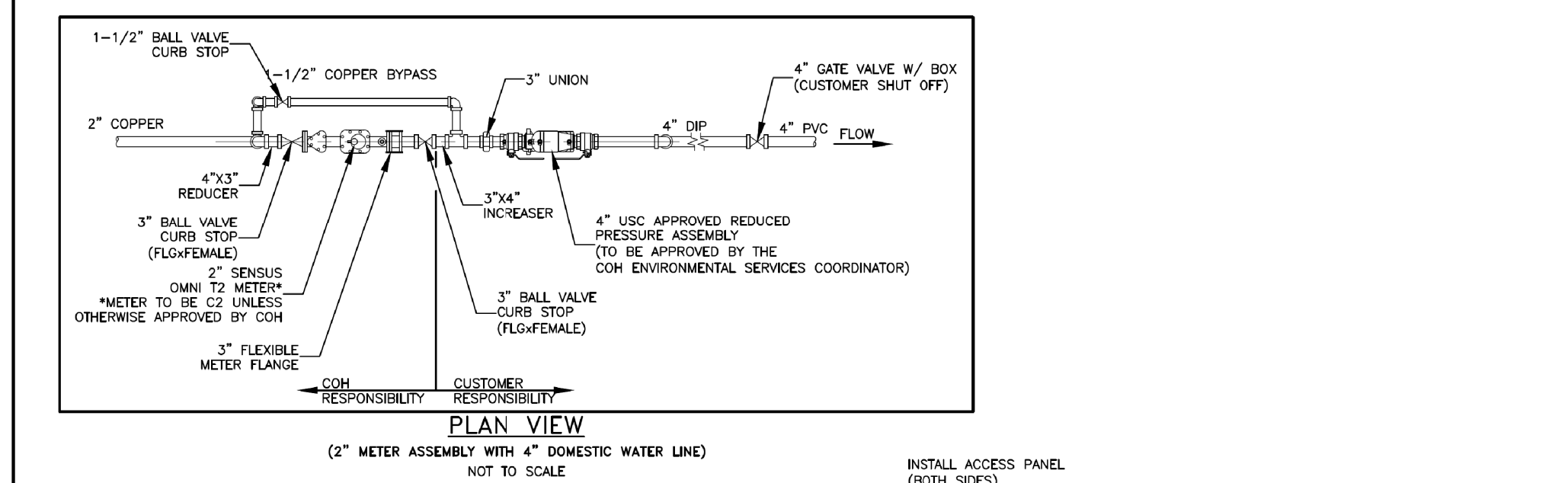
UTILITY CONSTRUCTION PLANS ONLY

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 Hendersonville, NC 28792
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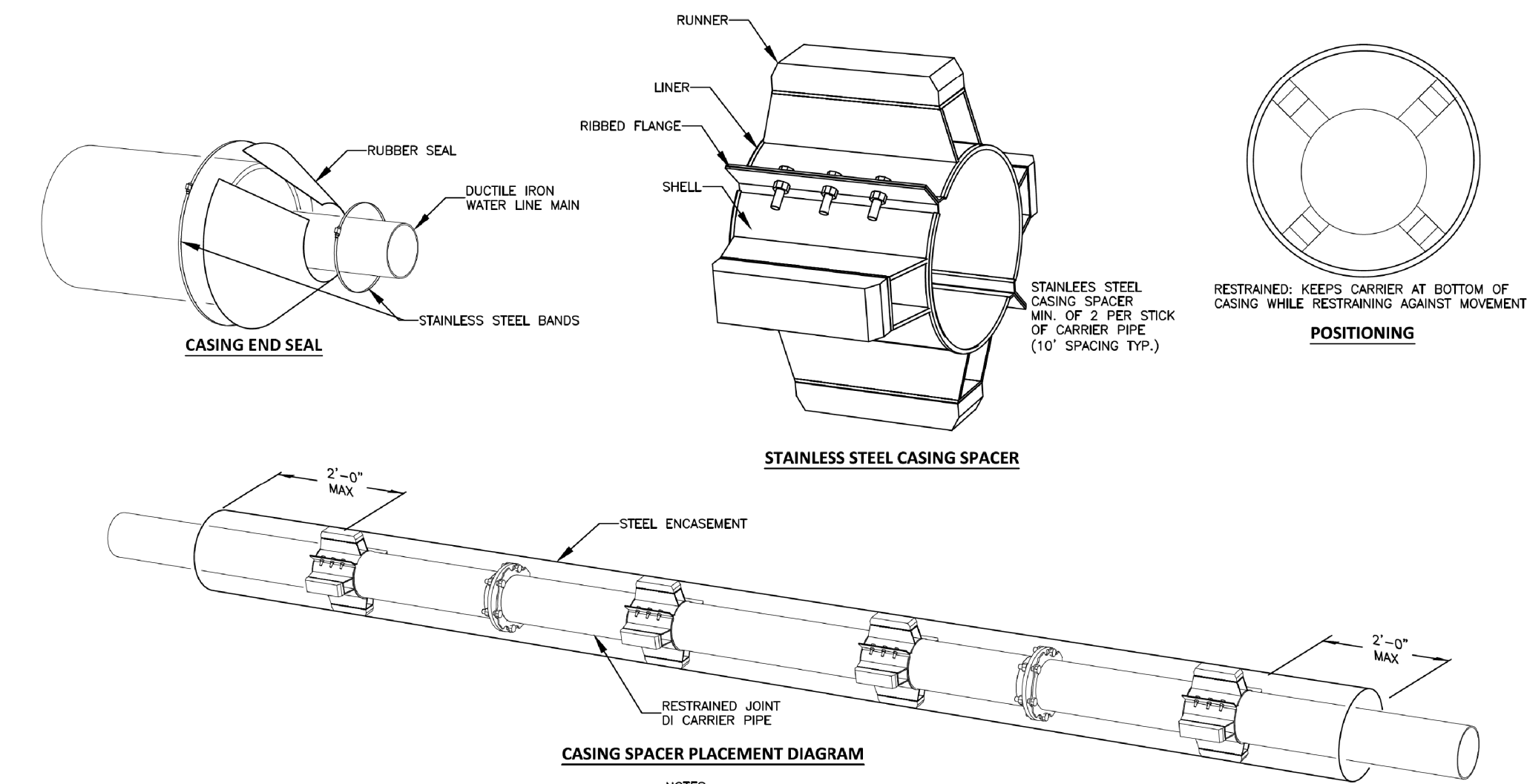
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 ENGINEER
 ANDREW'S VANE
 8/3/2018

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

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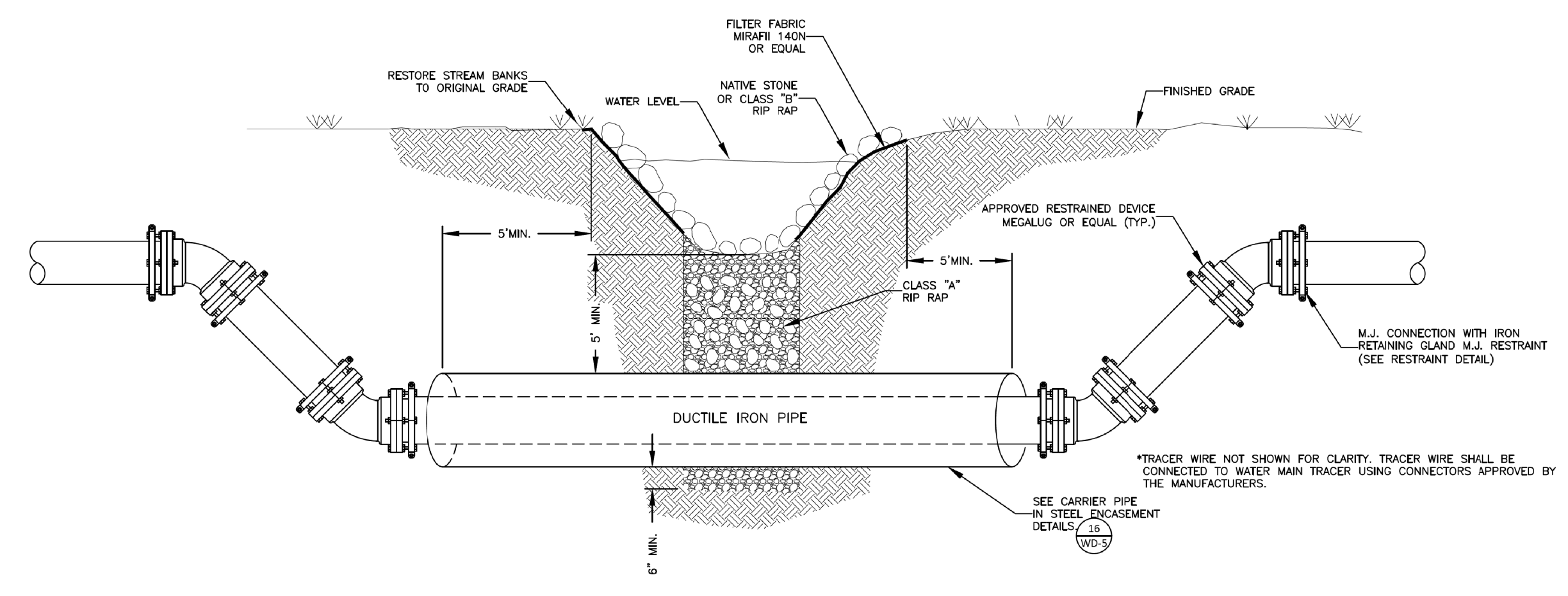


15
 WD-5
 COMMERCIAL WATER SERVICE W/ FIRE LINE
 04/04/18



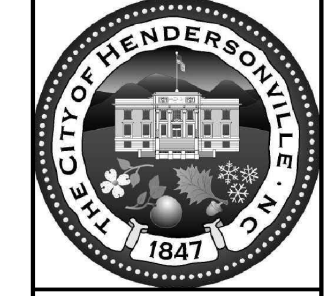
- NOTES:**
- RESTRAINED POSITIONING TO BE USED AT ALL TIMES.
 - CARRIER PIPE JOINTS SHALL BE MECHANICALLY RESTRAINED.
 - STAINLESS STEEL CASING SPACERS SHALL BE STYLE CCS AS MANUFACTURED BY CASCADE WATERWORKS MFG. CO. OF YORKVILLE, IL OR ENGINEER APPROVED EQUIVALENT.
 - CASING END SEAL SHALL BE STYLE CES AS MANUFACTURED BY CASCADE WATERWORKS MFG. CO. OF YORKVILLE, IL OR ENGINEER APPROVED EQUIVALENT.

16
 WD-5
 CARRIER PIPE IN STEEL ENCASEMENT
 04/04/18



17
 WD-5
 OPEN CUT BELOW CREEK BOTTOM
 04/04/18

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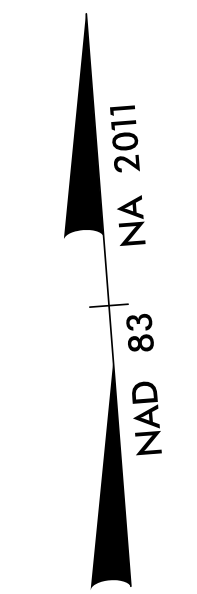
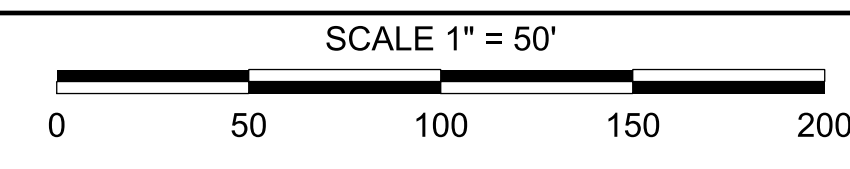
CITY OF HENDERSONVILLE
STANDARD WATER DETAILS
 HENDERSON COUNTY, NORTH CAROLINA

NO.	DATE	BY	DESCRIPTION

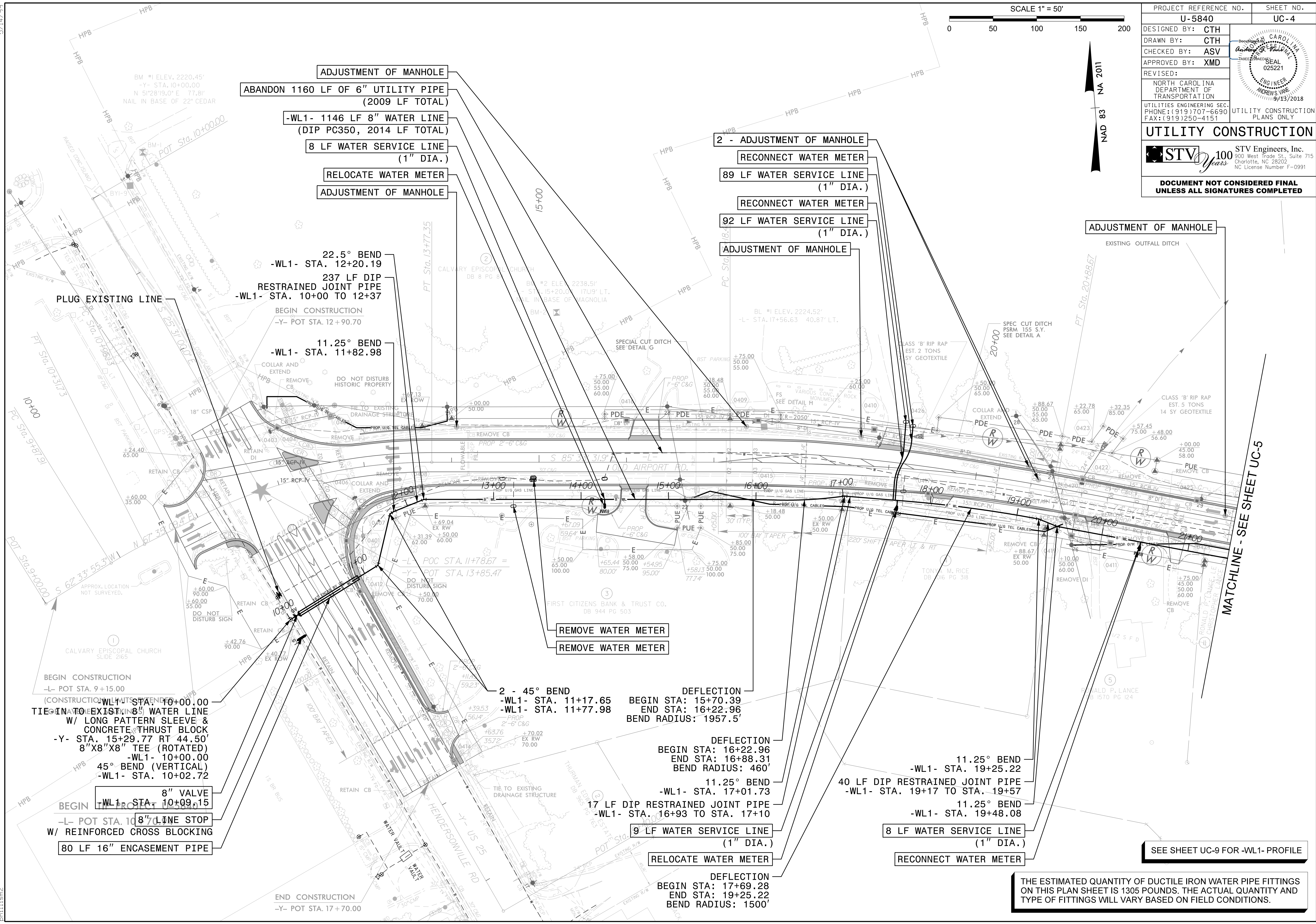
DATE: MARCH 23, 2018
 DRAWN BY: MMP
 PROJECT NO.:

WD-5

5/14/2018
9/13/2018
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PROJECT REFERENCE NO. U-5840	SHEET NO. UC-4
DESIGNED BY: CTH	
DRAWN BY: CTH	
CHECKED BY: ASV	
APPROVED BY: XMD	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151 UTILITY CONSTRUCTION PLANS ONLY	
UTILITY CONSTRUCTION	
STV Engineers, Inc. 900 West Trade St., Suite 715 Charlotte, NC 28202 NC License Number F-0991	
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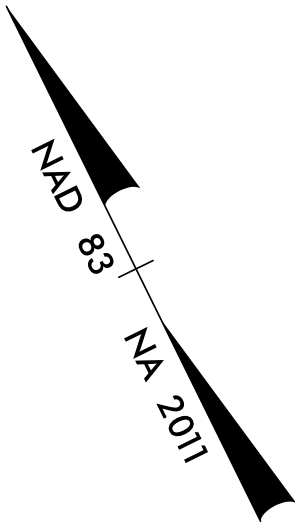
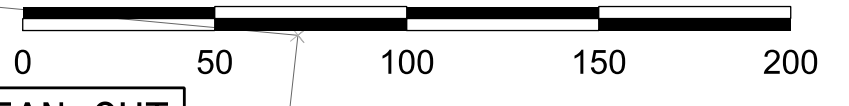


THE ESTIMATED QUANTITY OF DUCTILE IRON WATER PIPE FITTINGS ON THIS PLAN SHEET IS 1305 POUNDS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.

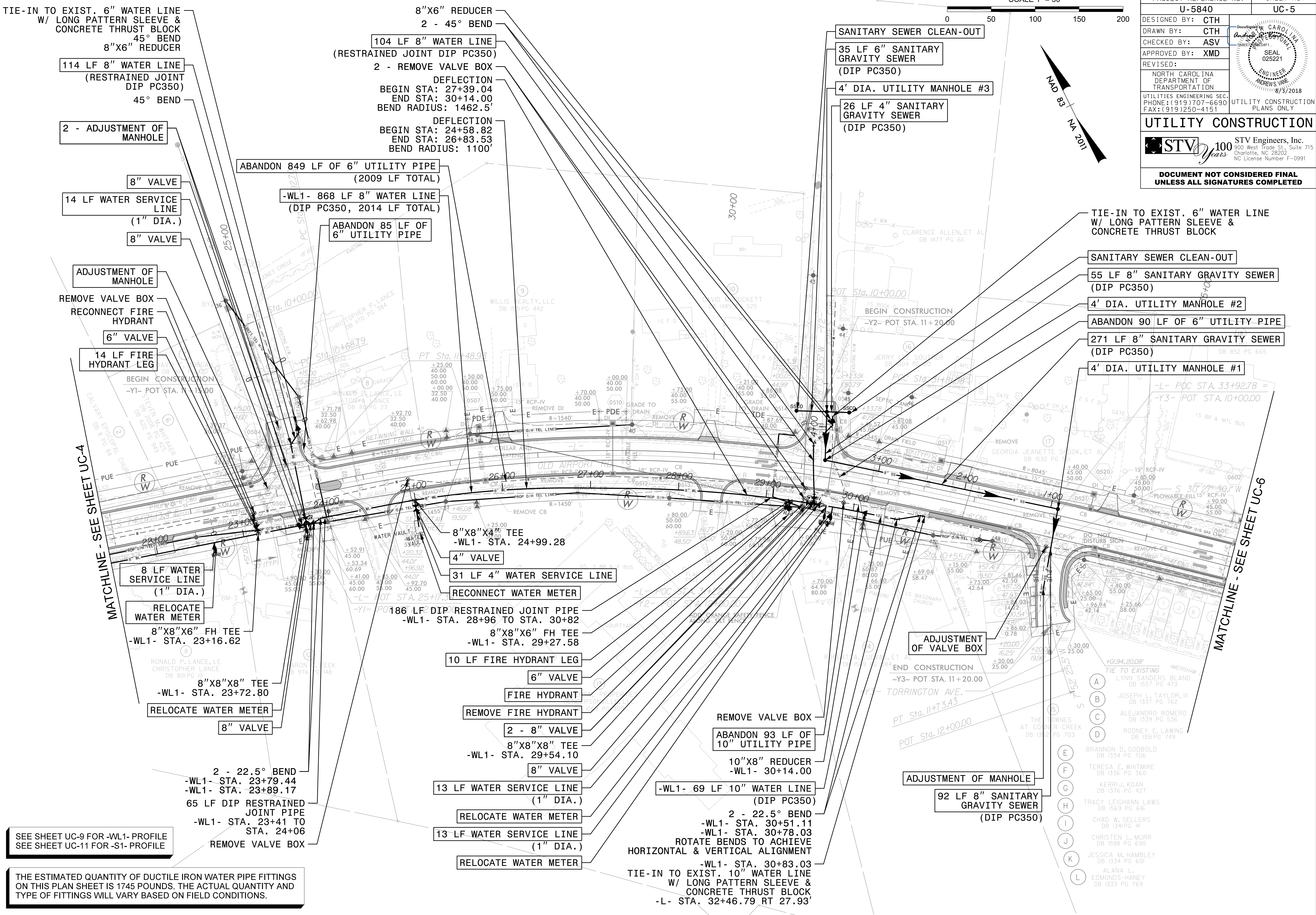
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SCALE 1" = 50'



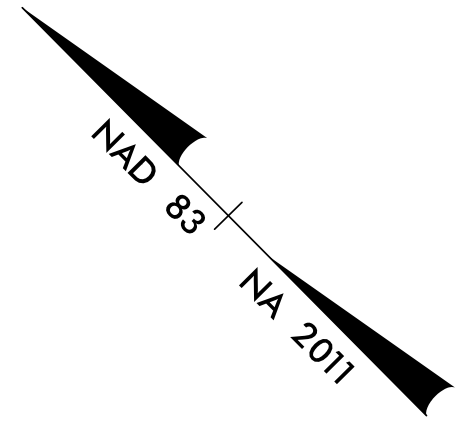
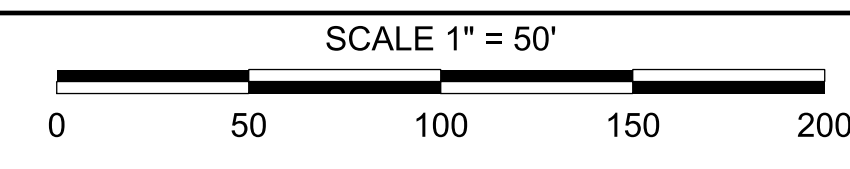
PROJECT REFERENCE NO. U-5840	SHEET NO. UC-5
DESIGNED BY: CTH	
DRAWN BY: CTH	
CHECKED BY: ASV	
APPROVED BY: XMD	
REVISED:	
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SEE SHEET UC-9 FOR -WL1- PROFILE
SEE SHEET UC-11 FOR -S1- PROFILE

THE ESTIMATED QUANTITY OF DUCTILE IRON WATER PIPE FITTINGS ON THIS PLAN SHEET IS 1745 POUNDS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.

5/14/19



PROJECT REFERENCE NO. U-5840	SHEET NO. UC-6
DESIGNED BY: CTH	
DRAWN BY: CTH	
CHECKED BY: ASV	
APPROVED BY: XMD	
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TIE-IN TO EXIST. 6" WATER LINE W/ LONG PATTERN SLEEVE & CONCRETE THRUST BLOCK

8"x6" REDUCER
 2 - 45° BEND

94 LF 8" WATER LINE (RESTRAINED JOINT DIP PC350)

10"x10"x6" FH TEE

ABANDON 1042 LF OF 10" UTILITY PIPE (1982 LF TOTAL)

60 LF DIP RESTRAINED JOINT PIPE -WL2- STA. 14+94 TO STA. 15+54

2 - 22.5° BEND
 -WL2- STA. 15+13.86
 -WL2- STA. 15+34.89

DEFLECTION
 BEGIN STA: 12+68.69
 END STA: 12+81.24
 BEND RADIUS: 916'

ADJUSTMENT OF MANHOLE

-WL2- STA. 10+00.00 TIE-IN TO EXIST. 10" WATER LINE W/ LONG PATTERN SLEEVE & CONCRETE THRUST BLOCK

-L- STA. 39+60.38 RT 31.88'

REMOVE VALVE BOX

ABANDON 70 LF OF 6" UTILITY PIPE

36 LF FIRE HYDRANT LEG

6" VALVE

FIRE HYDRANT

DEFLECTION
 BEGIN STA: 19+88.61
 BEND RADIUS: 5020.3'

DEFLECTION
 BEGIN STA: 19+66.23
 END STA: 19+88.61
 BEND RADIUS: 458.4'

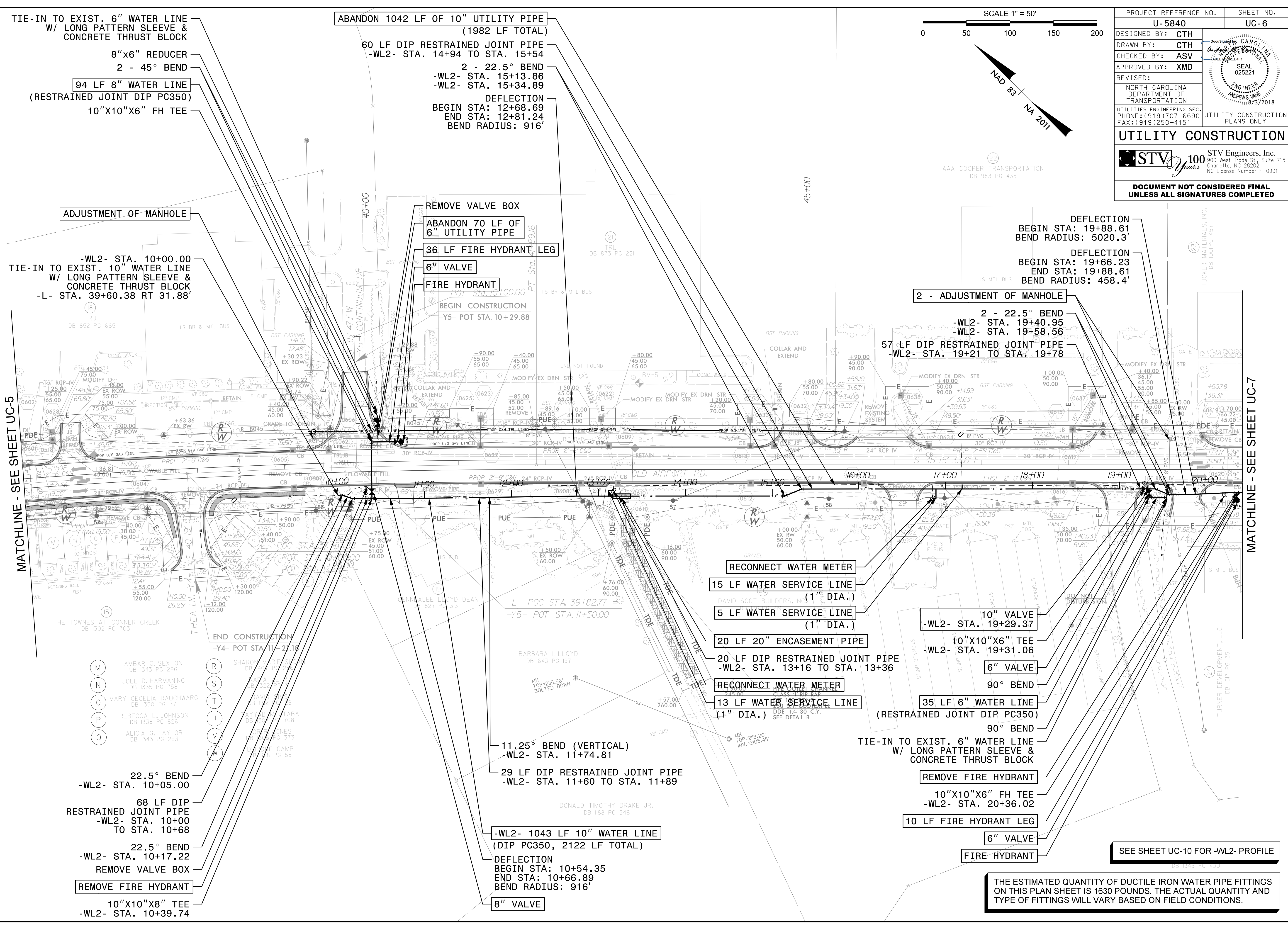
2 - ADJUSTMENT OF MANHOLE

2 - 22.5° BEND
 -WL2- STA. 19+40.95
 -WL2- STA. 19+58.56

57 LF DIP RESTRAINED JOINT PIPE -WL2- STA. 19+21 TO STA. 19+78

MATCHLINE - SEE SHEET UC-5

MATCHLINE - SEE SHEET UC-7



- (M) AMBAR G. SEXTON DB 1343 PG 296
- (N) JOEL D. HARMANING DB 1335 PG 758
- (O) MARY CECELIA RAUCHWARC DB 1350 PG 37
- (P) REBECCA L. JOHNSON DB 1338 PG 826
- (Q) ALICIA G. TAYLOR DB 1343 PG 293

22.5° BEND
 -WL2- STA. 10+05.00

68 LF DIP RESTRAINED JOINT PIPE
 -WL2- STA. 10+00 TO STA. 10+68

22.5° BEND
 -WL2- STA. 10+17.22

REMOVE VALVE BOX

REMOVE FIRE HYDRANT

10"x10"x8" TEE
 -WL2- STA. 10+39.74

-L- POC STA. 39+82.77
 -Y5- POT STA. 11+50.00

11.25° BEND (VERTICAL)
 -WL2- STA. 11+74.81

29 LF DIP RESTRAINED JOINT PIPE
 -WL2- STA. 11+60 TO STA. 11+89

-WL2- 1043 LF 10" WATER LINE (DIP PC350, 2122 LF TOTAL)

DEFLECTION
 BEGIN STA: 10+54.35
 END STA: 10+66.89
 BEND RADIUS: 916'

8" VALVE

RECONNECT WATER METER

15 LF WATER SERVICE LINE (1" DIA.)

5 LF WATER SERVICE LINE (1" DIA.)

20 LF 20" ENCASEMENT PIPE

20 LF DIP RESTRAINED JOINT PIPE -WL2- STA. 13+16 TO STA. 13+36

RECONNECT WATER METER

13 LF WATER SERVICE LINE (1" DIA.)

10" VALVE
 -WL2- STA. 19+29.37

10"x10"x6" TEE
 -WL2- STA. 19+31.06

6" VALVE

90° BEND

35 LF 6" WATER LINE (RESTRAINED JOINT DIP PC350)

90° BEND

TIE-IN TO EXIST. 6" WATER LINE W/ LONG PATTERN SLEEVE & CONCRETE THRUST BLOCK

REMOVE FIRE HYDRANT

10"x10"x6" FH TEE
 -WL2- STA. 20+36.02

10 LF FIRE HYDRANT LEG

6" VALVE

FIRE HYDRANT

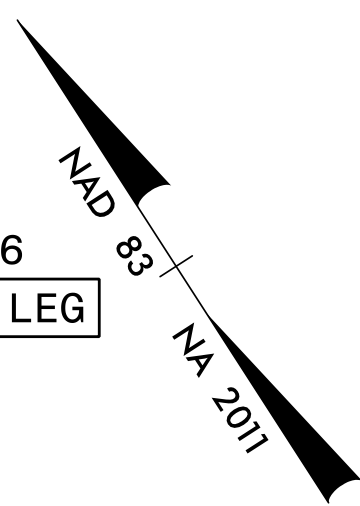
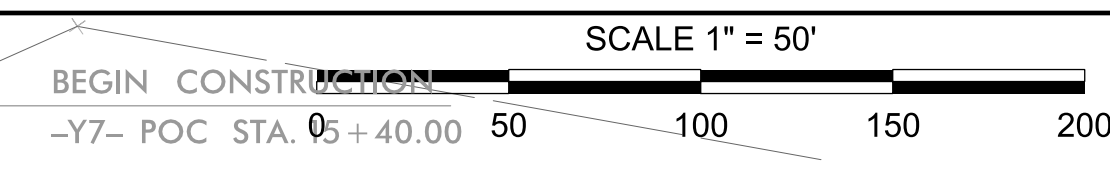
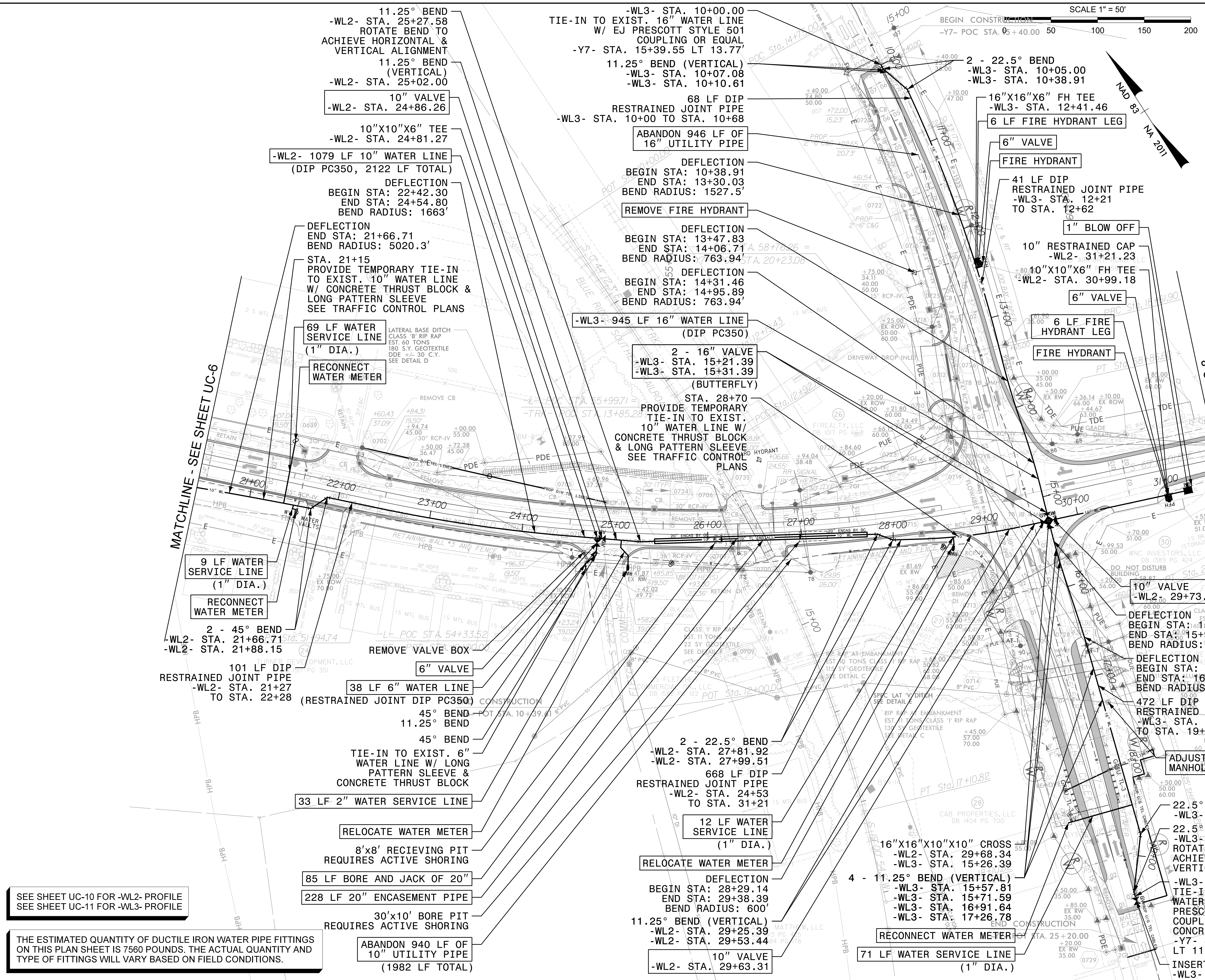
SEE SHEET UC-10 FOR -WL2- PROFILE

THE ESTIMATED QUANTITY OF DUCTILE IRON WATER PIPE FITTINGS ON THIS PLAN SHEET IS 1630 POUNDS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.

5/14/2018 P:\Utilities\Water and Sewer\Sheet Files\U-5840\WS_UC6.dgn

5/14/2018

F:\Utilities\Water and Sewer\Sheet Files\U-5840\WS_UC7.dgn



PROJECT REFERENCE NO.	SHEET NO.
U-5840	UC-7
DESIGNED BY: CTH	
DRAWN BY: CTH	
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APPROVED BY: XMD	
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SEE SHEET UC-10 FOR -WL2- PROFILE
 SEE SHEET UC-11 FOR -WL3- PROFILE

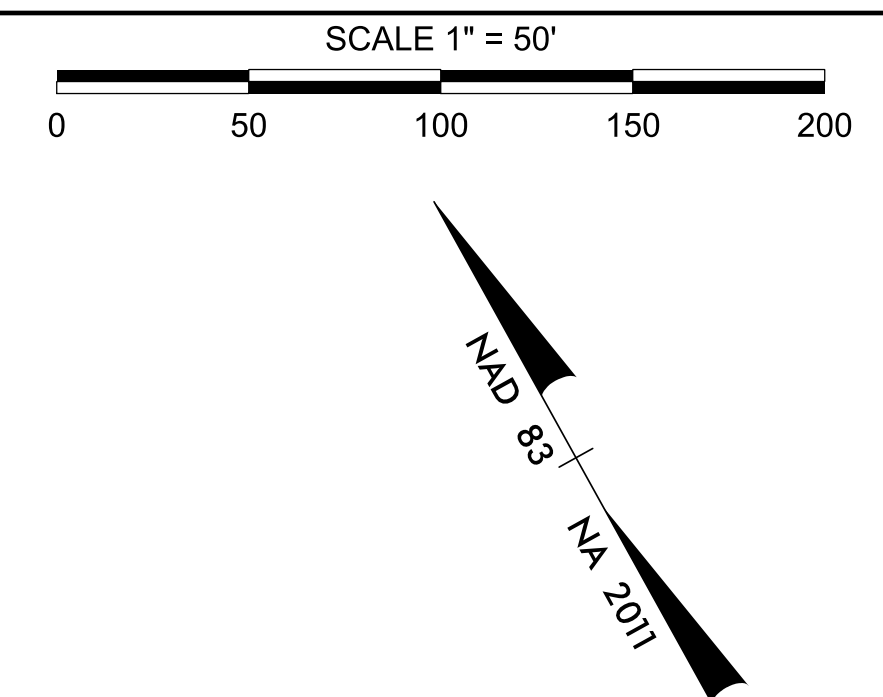
THE ESTIMATED QUANTITY OF DUCTILE IRON WATER PIPE FITTINGS ON THIS PLAN SHEET IS 7560 POUNDS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.

MATCHLINE - SEE SHEET UC-6

MATCHLINE - SEE SHEET UC-8

5/14/2018

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chillism2



PROJECT REFERENCE NO. U-5840	SHEET NO. UC-8
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DRAWN BY: CTH	
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APPROVED BY: XMD	
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SHEET UC-8 CORRESPONDS TO ROADWAY SHEET 8. NO UTILITY CONSTRUCTION TO OCCUR ON SHEET. FOR INFORMATION ONLY.

5/28/19

SCALE: 1" = 50' HORIZONTAL
1" = 10' VERTICAL

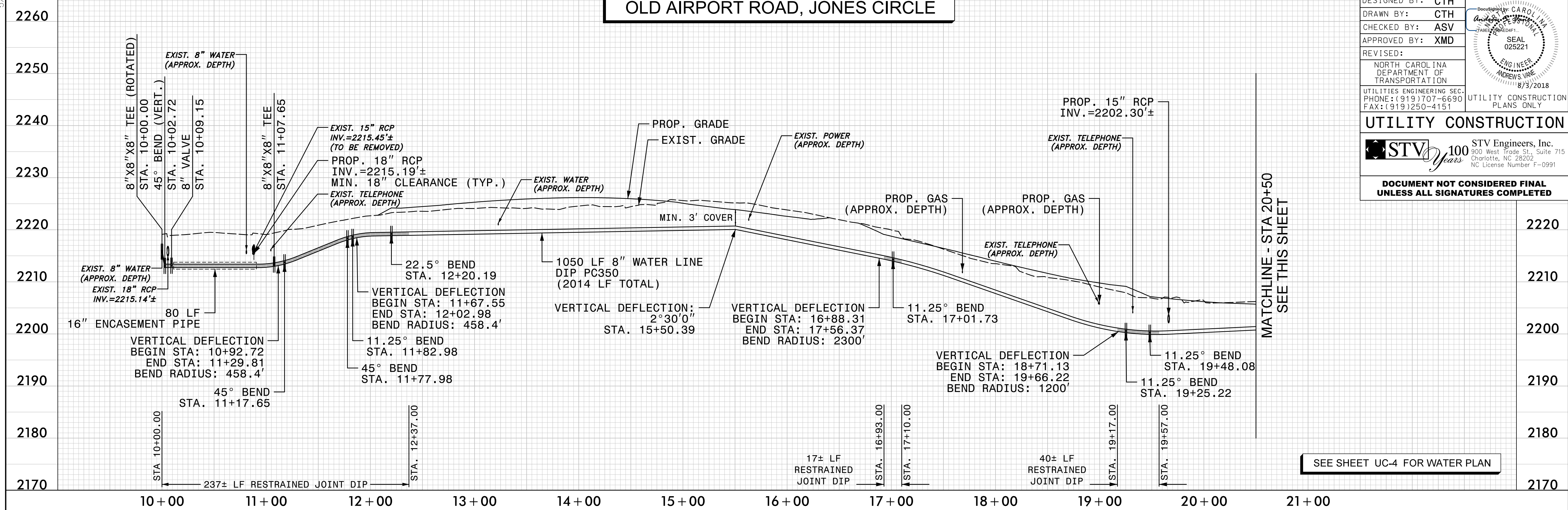
PROP. 8" WATER LINE -WL1- OLD AIRPORT ROAD, JONES CIRCLE

PROJECT REFERENCE NO.	SHEET NO.
U-5840	UC-9
DESIGNED BY: CTH	
DRAWN BY: CTH	
CHECKED BY: ASV	
APPROVED BY: XMD	
REVISED:	
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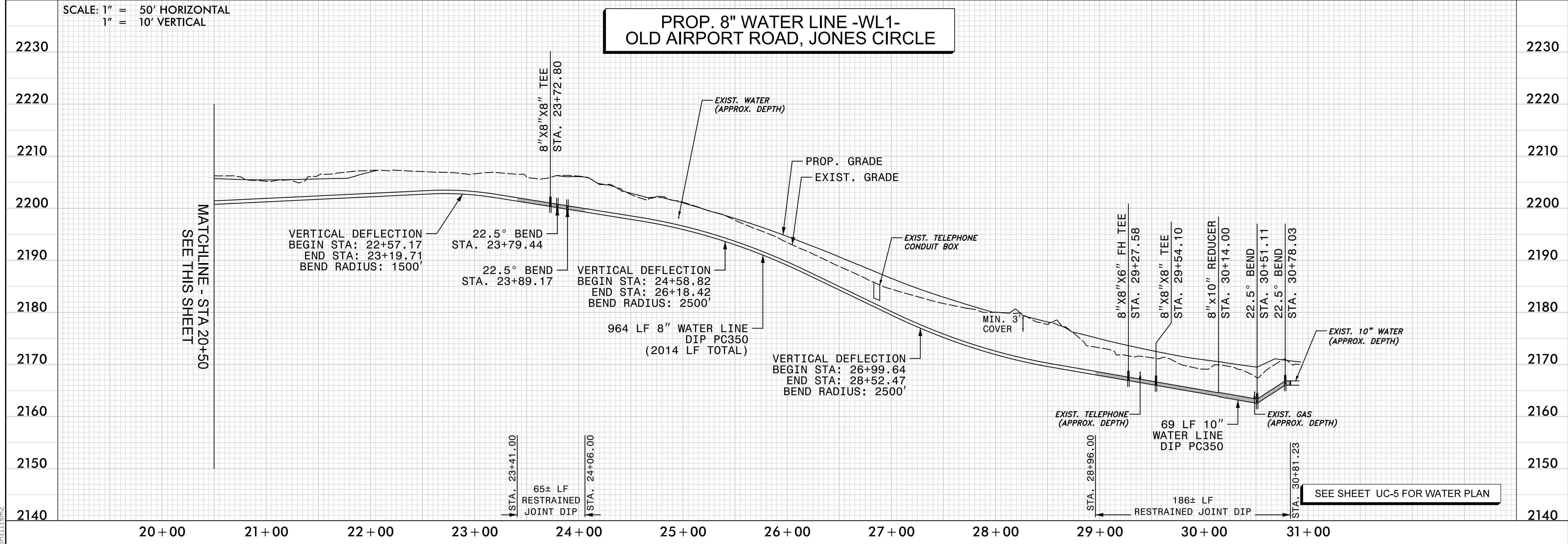
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SEE SHEET UC-4 FOR WATER PLAN

SCALE: 1" = 50' HORIZONTAL
1" = 10' VERTICAL

PROP. 8" WATER LINE -WL1- OLD AIRPORT ROAD, JONES CIRCLE



SEE SHEET UC-5 FOR WATER PLAN

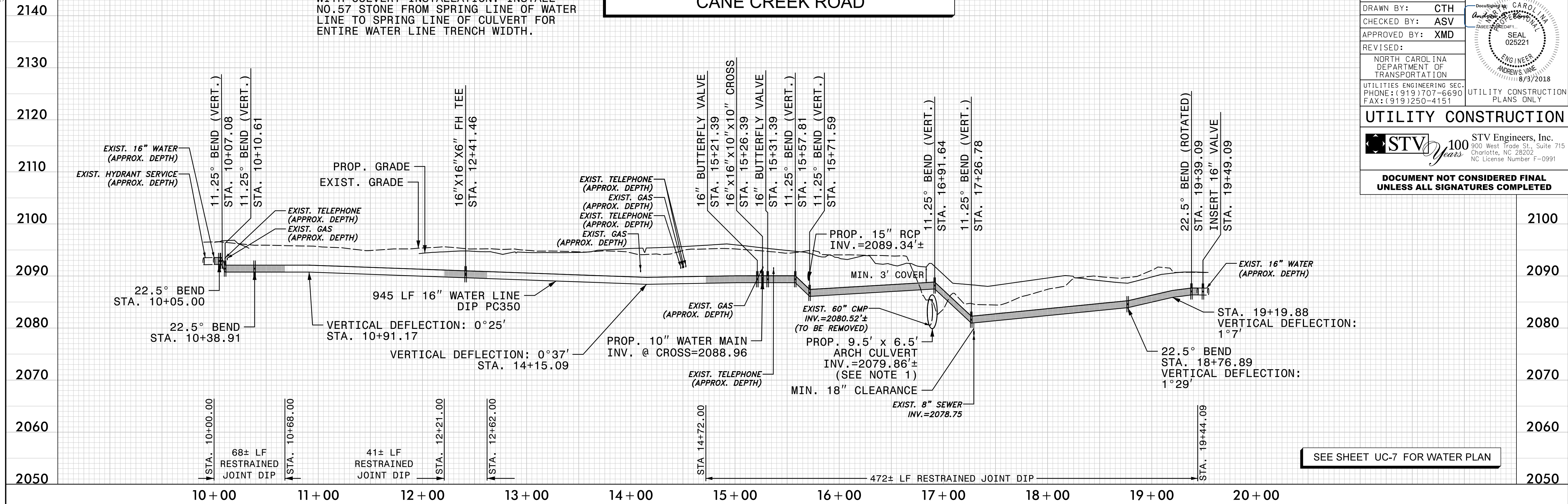
5/14/2018
F:\Utilities\Water and Sewer\Sheet Files\U-5840\WS_UC9.dgn
chilitsm2

5/28/19

SCALE: 1" = 50' HORIZONTAL
1" = 10' VERTICAL

NOTES:
1. COORDINATE WATER LINE CONSTRUCTION WITH CULVERT INSTALLATION. INSTALL NO. 57 STONE FROM SPRING LINE OF WATER LINE TO SPRING LINE OF CULVERT FOR ENTIRE WATER LINE TRENCH WIDTH.

PROP. 16" WATER LINE -WL3- CANE CREEK ROAD



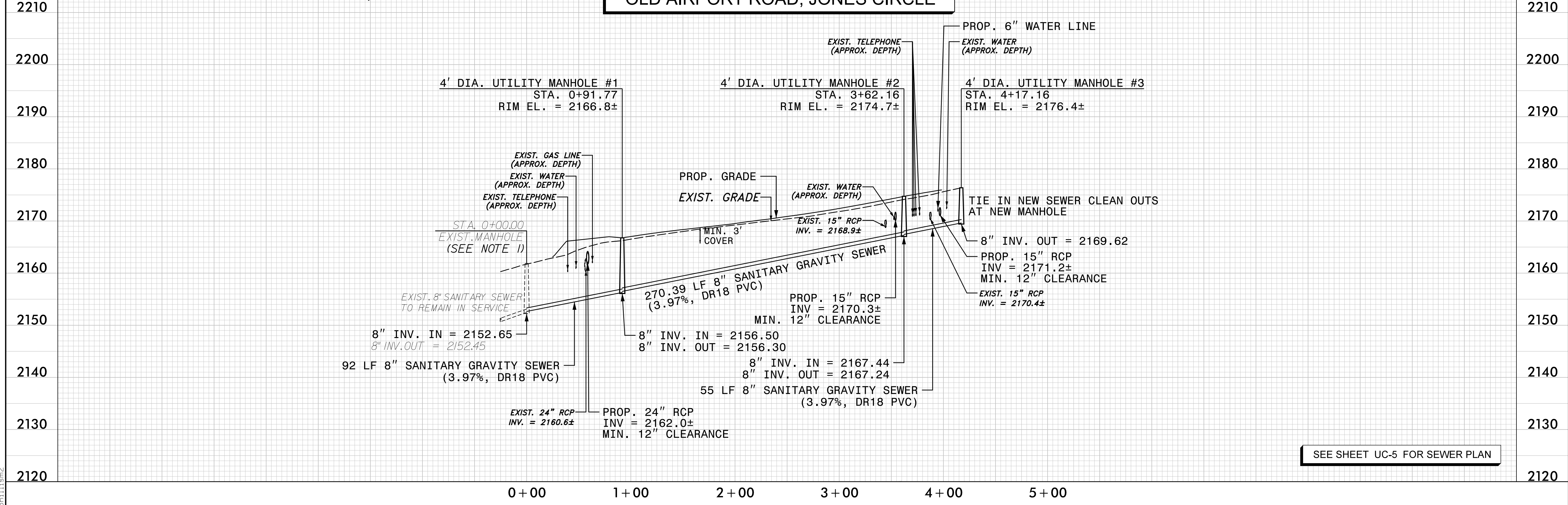
SEE SHEET UC-7 FOR WATER PLAN

PROJECT REFERENCE NO. U-5840	SHEET NO. UC-11
DESIGNED BY: CTH	
DRAWN BY: CTH	
CHECKED BY: ASV	
APPROVED BY: XMD	
REVISED:	
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SCALE: 1" = 50' HORIZONTAL
1" = 10' VERTICAL

NOTES:
1. CORE DRILL EXISTING MANHOLE AND CONNECT, REWORKING BENCH AND INVERTS

PROP. 8" SEWER LINE -S1- OLD AIRPORT ROAD, JONES CIRCLE



SEE SHEET UC-5 FOR SEWER PLAN

5/14/2018
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chilitem2