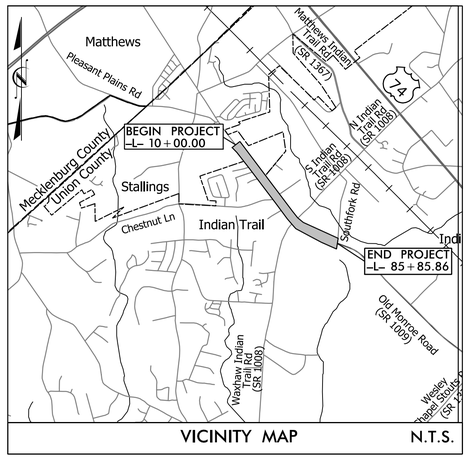
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10/1/2026
DrakeE

TIP PROJECT: U-4714BA

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



STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

T.I.P. NO.	SHEET NO.
U–4714BA	UC–1

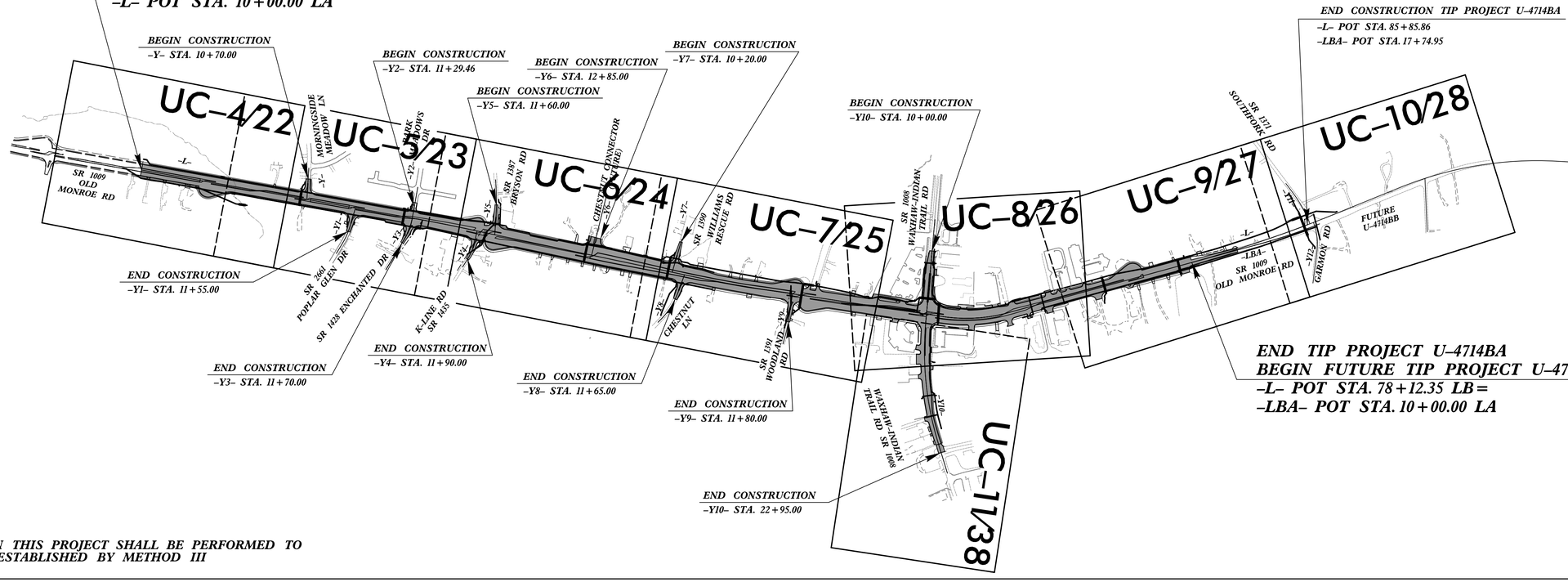
UTILITY CONSTRUCTION PLANS
UNION COUNTY

LOCATION: SR 1009 (OLD MONROE ROAD) FROM WEST OF MORNINGSIDE MEADOW LANE TO EAST OF SR 1377 (WESLEY CHAPEL–STOUTS RD)

TYPE OF WORK: WATER LINE AND SANITARY SEWER RELOCATIONS

NAD 83
NA 2011

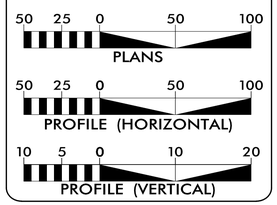
END TIP PROJECT U–4714AC
–L– POT STA. 193+50.61 LB=
BEGIN TIP PROJECT U–4714BA
–L– POT STA. 10+00.00 LA



END TIP PROJECT U–4714BA
BEGIN FUTURE TIP PROJECT U–4714BB
–L– POT STA. 78+12.35 LB=
–LBA– POT STA. 10+00.00 LA

CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III

GRAPHIC SCALES



INDEX OF SHEETS

SHEET NO.:	*DESCRIPTION:*
UC–1	*TITLE SHEET*
UC–2	*UTILITY SYMBOLOGY*
UC–3 – UC–3A	*NOTES*
UC–3B – UC–3J	*DETAILS*
UC–4 – UC–11	*UTILITY CONSTRUCTION SHEETS*
UC–22 – UC–28, UC–38	*ABANDONMENT & ADJUSTMENT SHEETS*
UC–40 – UC–44, UC–51 – UC–57,	*PROFILE SHEETS*
UC–62, UC–65 – UC–66	

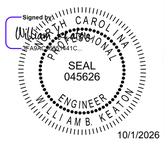
WATER AND SEWER OWNERS ON PROJECT

(A) WATER – UNION COUNTY WATER
(B) SANITARY SEWER – UNION COUNTY WATER

PREPARED IN THE OFFICE OF
STV Engineers, Inc.
2151 Hawkins St., Suite 1400
Charlotte, NC 28203
NC License Number F-0991

SEAN STEPHENS, PE	*CONSULTANT CONTACT #1*
WILLIAM KEATON, PE	*CONSULTANT CONTACT #2*
DAN PEPLINSKI, PE	*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

DONALD E. HAMPTON	*WESTERN UTILITIES MANAGER*
JONG–TAE YOON	*SENIOR UTILITIES ENGINEER*
DAYTON C. MARTIN, III	*REGIONAL UTILITY COORDINATOR*
MARK A. COLE	*UTILITIES COORDINATOR*

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5/14/99

PROJECT REFERENCE NO.	SHEET NO.
U-4714BA	UC-2

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

UTILITIES PLAN SHEET SYMBOLS

PROPOSED WATER SYMBOLS

- Water Line (Sized as Shown) — 12" WL
- 11¼ Degree Bend
- 22½ Degree Bend
- 45 Degree Bend
- 90 Degree Bend
- Plug
- Tee
- Cross
- Reducer
- Gate Valve — GV
- Butterfly Valve — BV
- Tapping Valve — TGV
- Line Stop — LS
- Line Stop with Bypass — LS/BP
- Blow Off — BO
- Fire Hydrant — PFH
- Relocate Fire Hydrant — RFH
- Remove Fire Hydrant — REM FH
- Water Meter — PWM
- Relocate Water Meter — RWM
- Remove Water Meter — REM WM
- Water Pump Station — PS(W)
- RPZ Backflow Preventer — PRPZ
- DCV Backflow Preventer — PBFP
- Relocate RPZ Backflow Preventer — RRPZ
- Relocate DCV Backflow Preventer — RBFP

PROPOSED SEWER SYMBOLS

- Gravity Sewer Line (Sized as Shown) — 12" SS
- Force Main Sewer Line (Sized as Shown) — 12" FSS
- Manhole (Sized per Note)
- Sewer Pump Station — PS(SS)

PROPOSED MISCELLANEOUS UTILITIES SYMBOLS

- Power Pole
- Telephone Pole
- Joint Use Pole
- Telephone Pedestal — TEL_PED
- Utility Line by Others (Type as Shown) — PROP O/H POW LINES
- Trenchless Installation — 12" TL INSTALL
- Encasement by Open Cut — 24" ENCAS BY OC
- Encasement — 24" ENCASEMENT
- Thrust Block
- Air Release Valve — AR
- Utility Vault — UV
- Concrete Pier — CP
- Steel Pier — SP
- Plan Note — NOTE
- Pay Item Note — PAY ITEM

EXISTING UTILITIES SYMBOLS

- Power Pole
- Telephone Pole
- Joint Use Pole
- Utility Pole
- Utility Pole with Base
- H-Frame Pole
- Power Transmission Line Tower
- Water Manhole
- Power Manhole
- Telephone Manhole
- Sanitary Sewer Manhole
- Hand Hole for Cable
- Power Transformer
- Telephone Pedestal
- CATV Pedestal
- Gas Valve
- Gas Meter
- Located Miscellaneous Utility Object
- Abandoned According to Utility Records — AATUR
- End of Information — E.O.I.
- *Underground Power Line — P
- *Underground Telephone Cable — T
- *Underground Telephone Conduit — TC
- *Underground Fiber Optics Telephone Cable — T FO
- *Underground TV Cable — TV
- *Underground Fiber Optics TV Cable — TV FO
- *Underground Gas Pipeline — G
- Aboveground Gas Pipeline — A/G Gas
- *Underground Water Line — W
- Aboveground Water Line — A/G Water
- *Underground Gravity Sanitary Sewer Line — SS
- Aboveground Gravity Sanitary Sewer Line — A/G Sanitary Sewer
- *Underground SS Forced Main Line — FSS
- Underground Unknown Utility Line — ?UTL
- 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)

REV: 2/1/2012

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UTILITY CONSTRUCTION

GENERAL NOTES:

1. THE PROPOSED UTILITY CONSTRUCTION SHALL MEET THE APPLICABLE REQUIREMENTS OF THE NC DEPARTMENT OF TRANSPORTATION'S "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" DATED JANUARY 2024.

2. THE EXISTING UTILITIES BELONG TO UNION COUNTY WATER .

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 ENVIRONMENTAL 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 OWNER'S REPRESENTATIVES INFORMED OF WORK PROGRESS AND PROVIDE OPPORTUNITY FOR INSPECTION OF CONSTRUCTION AND TESTING.

6. 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.

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 CONNECTIONS BETWEEN EXISTING AND PROPOSED UTILITIES AT TIMES MOST CONVENIENT TO THE PUBLIC, WITHOUT ENDANGERING THE UTILITY SERVICE, AND IN ACCORDANCE WITH THE UTILITY OWNER'S REQUIREMENTS. MAKE CONNECTIONS ON WEEKENDS, AT NIGHT, AND ON HOLIDAYS IF NECESSARY.

9. ALL UTILITY MATERIALS SHALL BE APPROVED PRIOR TO DELIVERY TO THE PROJECT. SEE 1500-7, " SUBMITTALS AND RECORDS" IN SECTION 1500 OF THE STANDARD SPECIFICATIONS.

PROJECT SPECIFIC NOTES:

1. ALL CONSTRUCTED AND PROPOSED WATER LINES TO BE TESTED PER UNION COUNTY WATER, NCDOT, AND NCDEQ STANDARD SPECIFICATIONS.

2. THE UTILITY OWNER OWNS THE EXISTING UTILITY FACILITIES AND WILL OWN THE NEW UTILITY FACILITIES AFTER ACCEPTANCE BY UNION COUNTY WATER REPRESENTATIVE.

3. IF THE PROPOSED WATER AND/OR SANITARY SEWER MAIN IS INSTALLED WITHIN 12" IN ANY DIRECTION (VERTICALLY OR HORIZONTALLY) OF A GAS MAIN THEN THE CONTRACTOR SHALL CALL PIEDMONT NATURAL GAS COMPANY AT (704) 525-5585 AND INFORM THEM.

4. THE CONTRACTOR SHALL USE EROSION CONTROL MEASURES, AS DIRECTED.

5. IF ADDITIONAL WORK SPACE IS NEEDED, AN ENCROACHMENT IS TO BE AGREED UPON BETWEEN THE CONTRACTOR AND THE PROPERTY OWNER.

6. CONCRETE THRUST BLOCKING, WALL BLOCKING, RODDING, OR OTHER APPROVED METHOD SHALL BE PROVIDED BY CONTRACTOR AS NEEDED ON EXISTING WATER LINES AT THE PROPOSED RELOCATION TIE-IN POINTS.

7. 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 WILL 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.

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

9. MINIMUM PIPE SEPARATION: 10 FEET HORIZONTAL SEPARATION OR 18" VERTICAL SEPARATION SHALL BE MAINTAINED BETWEEN WATER MAINS OVER SEWER MAINS. WHEN WATER MAINS ARE BELOW SEWER MAINS OR THE ABOVE MINIMUM SEPARATIONS CANNOT BE MAINTAINED, DUCTILE IRON PIPE SHALL BE USED FOR BOTH MAINS TO 10 FEET ON EITHER SIDE OF THE CROSSINGS, AND ALL ALONG THE LENGTH OF MAINS WHERE MINIMUM SEPARATION CANNOT BE MAINTAINED.

10. ALL PROPOSED 6"-12" WATER LINES TO BE DUCTILE IRON PC350, AND 16" WATER LINES TO BE DUCTILE IRON PC250.

11. WELL IN ADVANCE OF BEGINING UTILITY WORK, SOFT DIGS SHALL BE PERFORMED BY CONTRACTOR TO VERIFY ACTUAL WATER LINE DEPTH AND MATERIAL AT PROPOSED TIE-IN LOCATIONS.

12. LAY PIPE STRAIGHT IN ALIGNMENT AND GRADIENT OR FOLLOW TRUE CURVES AS NEARLY AS POSSIBLE. DO NOT DEFLECT ANY JOINT MORE THAN HALF THE MAXIMUM DEFLECTION RECOMMENDED BY THE MANUFACTURER.

13. CONTRACTOR SHALL ADHERE TO SECTION 1530 "ABANDON OR REMOVE UTILITIES" FOR ABANDONMENT OF EXISTING WATER LINES.

14. CONTRACTOR SHALL COORDINATE SHUTDOWNS OF WATER LINES FOR TIE-INS A MINIMUM OF 96 HOURS IN ADVANCE OF TIE-IN OPERATIONS. COORDINATE WITH UNION COUNTY FIELD REPRESENTATIVE.

15. ALL DUCTILE IRON WATER PIPE SHALL BE FURNISHED WITH CEMENT MORTAL LINING AND SEAL COATING IN ACCORDANCE WITH ANSI/AWWA A21.4/C104.

16. ALL DUCTILE IRON SEWER PIPE SHALL BE FURNISHED WITH CERAMIC EPOXY LINING, TNEMEC 431 OR EQUAL, AND SEAL COATED IN ACCORDANCE WITH ANSI/AWWA A21.4/C104.

17. PRIOR TO THE START OF PROJECT, CONTRACTOR MUST CONTACT THOMAS MANN, CIP PROGRAM MANAGER, OF UNION COUNTY WATER. UNION COUNTY WATER MAY INSPECT THE WORK AT ANY TIME.

18. NO INTERRUPTION OF EXISTING WATER SERVICE SHALL BE MADE DURING CONSTRUCTION UNTIL AUTHORIZED BY UNION COUNTY WATER. UNION COUNTY WATER WILL BE COPIED ON BOTH THE WATER MAIN PRESSURE TEST REPORT AND THE WATER MAIN CHLORINATION TEST REPORT. UNION COUNTY COLLECTS SAMPLES FOR BACTERIOLOGICAL TESTING. SAMPLES WILL BE COLLECTED ONLY ON WEDNESDAY MORNINGS, USUALLY BEFORE 9:00 AM. SCHEDULE WATER INSTALLATIONS AND PRESSURE TESTING ACCORDINGLY. THERE WILL BE NO COST TO THE CONTRACTOR FOR BACTERIOLOGICAL TESTING FOR THE FIRST SAMPLES COLLECTED FOR EACH SEGMENT. CONTRACTOR WILL BE RESPONSIBLE FOR COSTS RELATED TO RE-TESTING FOR FAILING BACTERIOLOGICAL SAMPLES AT THE PREVAILING RATES OF THE TESTING LABORATORY. PRICE IS SUBJECT TO CHANGE. UNION COUNTY WILL NOT ACCEPT TEST RESULTS FROM OUTSIDE TESTING LABS.

19. EXISTING WATER VALVES ARE TO BE OPERATED BY UNION COUNTY OPERATIONS STAFF.

20. WHEN ABANDONING VALVES, CLOSE VALVE BEFORE REMOVING VALVE BOX.

21. INSTALLATION OF PIPE MAY REQUIRE EXCAVATING AROUND AND BENEATH RELOCATED TELECOMMUNICATION AND OTHER UTILITY LINES FOR WATER RELOCATION.

22. PROPOSED WATER SERVICE LINE SHALL BE TYPE "K" COPPER TUBING. SPLICING OF COPPER SERVICE LINE BETWEEN THE WATER METER AND EXISTING OR NEW WATER LINES WILL NOT BE ALLOWED FOR ANY CASE. PROVIDE AND INSTALL A CONTINUOUS SEGMENT OF COPPER WATER SERVICE LINE BETWEEN THE CORPORATION STOP AND WATER MATER. IN THE EVENT A WATER SERVICE PIPE IS DAMAGED DURING THE COURSE OF CONSTRUCTION, A NEW REPLACEMENT COPPER SERVICE LINE IS TO BE INSTALLED BETWEEN THE WATER LINE AND WATER METER AT NO COST TO UNION COUNTY OR NCDOT.

PROJECT REFERENCE NO.	SHEET NO.
U-4714BA	UC-3
DESIGNED BY: RTK	
DRAWN BY: RTK	
CHECKED BY: DKP	
APPROVED BY:	
REVISED:	

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
UTILITIES ENGINEERING SEC.
PHONE:(919)707-6690
FAX:(919)250-4151

Signed
NORTH CAROLINA
PROFESSIONAL ENGINEER
SEAL 045626
ENGINEER
WILLIAM B. KEATON
9/16/2026

UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STV Engineers, Inc.
2151 Hawkins Street, Suite 1400
Charlotte, NC 28203
NC License Number F-0991

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UTILITY CONSTRUCTION

PROJECT SPECIFIC NOTES:

23. IN ACCORDANCE WITH SECTION 1500-7 - SUBMITTALS AND RECORDS,CONTRACTOR TO PROVIDE AS-BUILT PLANS OF THE INSTALLED UTILITY. UPON COMPLETION OF PRESSURE TESTING AND BACTERIOOGICAL TESTING AND PRIOR TO REQUESTING WATER SYSTEM ISOLATION FOR CONNECTION OF THE NEW WATER PIPE TO THE EXISTING WATER SYSTEM, PROVIDE RED-LINE MARK-UPS OF THE WATER LINE IMPROVEMENTS TO UNION COUNTY FOR REVIEW AND COMMENT. UNION COUNTY WILL THEN REQUEST ACCEPTANCE OF THE WATER IMPROVEMENTS FROM NCDEQ PUBLIC WATER SUPPLY SECTION. UPON ACCEPTANCE BY PUBLIC WATER SUPPLY SECTION, UNION COUNTY WILL WORK WITH CONTRACTOR TO SCHEDULE TIE-INS TO THE EXITING SYSTEM.

24. IN ACCORDANCE WITH SECTION 1500-7 - SUBMITTALS AND RECORDS, CONTRACTOR TO PROVIDE AS-BUIT PLANS OF THE INSTALLED UTILITY. IN ADDITION TO THE HARD COPIES REQUIRED BY THE SPECIFICATIONS, PROVIDE THE SAME PDF FILES REQUIRED FOR SUBMISSION TO NCDOT TO UNION COUNTY. UNION COUNTY WILL NOT ACCEPT THE WORK FROM CONTRACTOR AND NCDOT UNTIL AS-BUILTS ARE RECEIVED AS AS-BUILTS ARE NEEDED AS PART OF THE FINAL PERMIT APPROVALS FROM NCDEQ PUBLIC WATER SUPPLY SECTION.

25.UTILITY CONTRACTOR(S) SHALL BE PRESENT AND ASSIST WITH FINAL INSPECTIONS OF NEW WATER AND SEWER LINES AND SERVICES.

26. WHEN ENCASEMENT IS TO BE INSTALLED BY JACK AND BORE AND OPEN CUT, THE CONTRACTOR SHALL WELD THE SECTIONS TOGETHER IN THE FIELD.

27. PROVIDE RJ PIPE SEGMENTS WHERE SHOWN ON THE CORRESPONDING PROFILE SHEETS.

PROJECT REFERENCE NO.	SHEET NO.
U-4714BA	UC-3A
DESIGNED BY: RTK	
DRAWN BY: RTK	
CHECKED BY: DKP	
APPROVED BY:	
REVISED:	

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

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WILLIAM B. KEATON
SEAL 045626
ENGINEER
9/16/2026

UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION

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PROJECT TYPICAL DETAILS

PROJECT REFERENCE NO.	SHEET NO.
U-4714BA	UC-3B
DESIGNED BY: RTK	
DRAWN BY: RTK	
CHECKED BY: DKP	
APPROVED BY:	
REVISED:	

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

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Signed
NORTH CAROLINA
WILLIAM B. KEATON
SEAL 045626
ENGINEER
9/16/2026

UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION

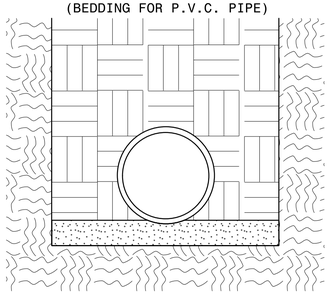
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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NC License Number F-0991

MAXIMUM TRENCH WIDTH
AT TOP OF PIPE

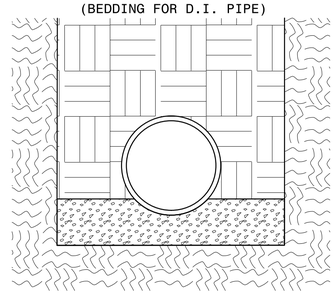
NOMINAL PIPE SIZE (INCHES)	TRENCH WIDTH (INCHES)	NOMINAL PIPE SIZE (INCHES)	TRENCH WIDTH (INCHES)
4	28	20	44
6	30	24	48
8	32	30	54
10	34	36	60
12	36	42	66
14	38	48	72
16	40	54	78
18	42		

CLASS "C"
(BEDDING FOR P.V.C. PIPE)

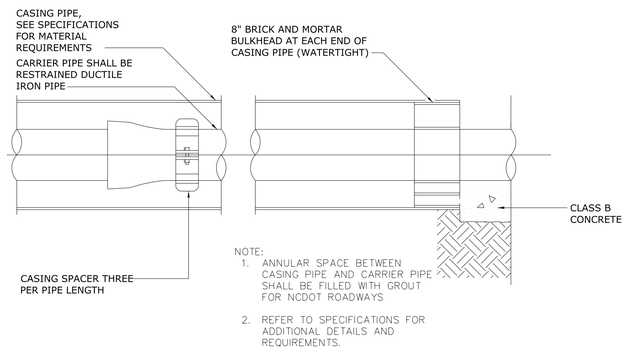


PIPE BEDDED IN LOOSE MATERIAL, LIGHTLY TAMPED WITH A MINIMUM OF 6" UNDER PIPE. TRENCH BACKFILLED IN LOOSE 6" LAYERS COMPACTED TO TOP OF TRENCH USING LOCAL EXCAVATED MATERIAL, IF APPROVED BY THE ENGINEER, OR SELECT MATERIAL. ALL MATERIAL SHALL BE FREE OF ROCKS, FOREIGN MATERIAL, AND FROZEN EARTH. COMPACTION SHALL BE TO APPROX. 95% DENSITY IN ACCORDANCE WITH AASHTO T-99 AS MODIFIED BY THE DEPARTMENT OF TRANSPORTATION.

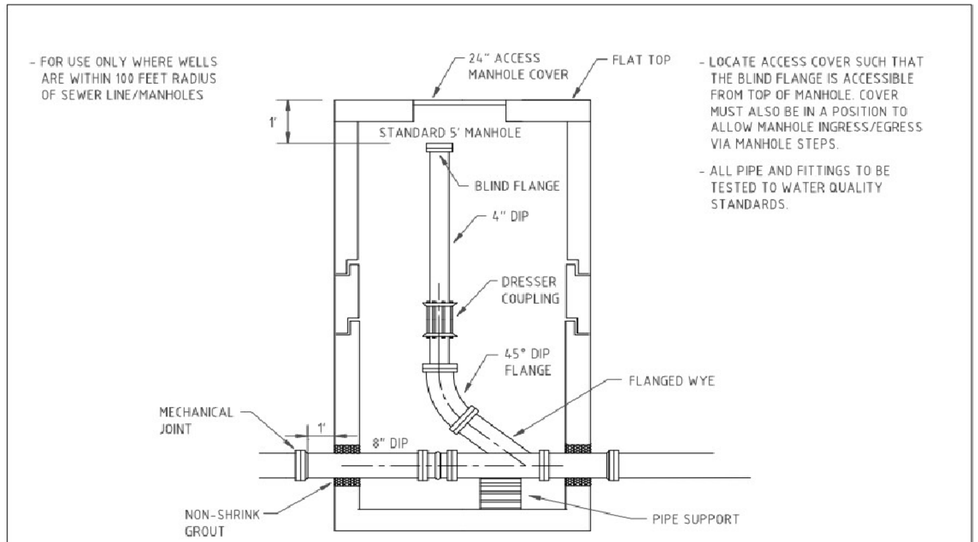
TYPE "4"
(BEDDING FOR D.I. PIPE)



PIPE BEDDED IN SAND, GRAVEL OR CRUSHED STONE TO A DEPTH OF 1/8 PIPE DIAMETER, 4" MINIMUM UNDER PIPE. TRENCH BACKFILLED IN LOOSE 6" LAYERS COMPACTED TO TOP OF TRENCH USING LOCAL EXCAVATED MATERIAL, IF APPROVED BY THE ENGINEER, OR SELECT MATERIAL. ALL MATERIAL SHALL BE FREE OF ROCKS, FOREIGN MATERIAL, AND FROZEN EARTH. COMPACTION SHALL BE TO APPROX. 95% DENSITY IN ACCORDANCE WITH AASHTO T-99 AS MODIFIED BY THE DEPARTMENT OF TRANSPORTATION.



TYPICAL CASING FOR BORE/TUNNEL FOR NCDOT/CDOT ROADWAYS



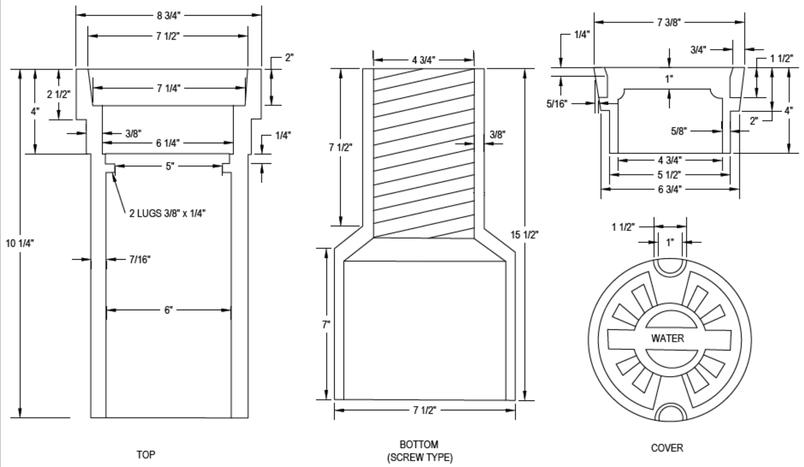
UNION COUNTY PUBLIC WORKS DEPARTMENT UNION COUNTY, N.C.	STANDARD DETAIL CLEANOUT MANHOLE	DATE: 7-29-08	10A

8/3/2026
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Plotted

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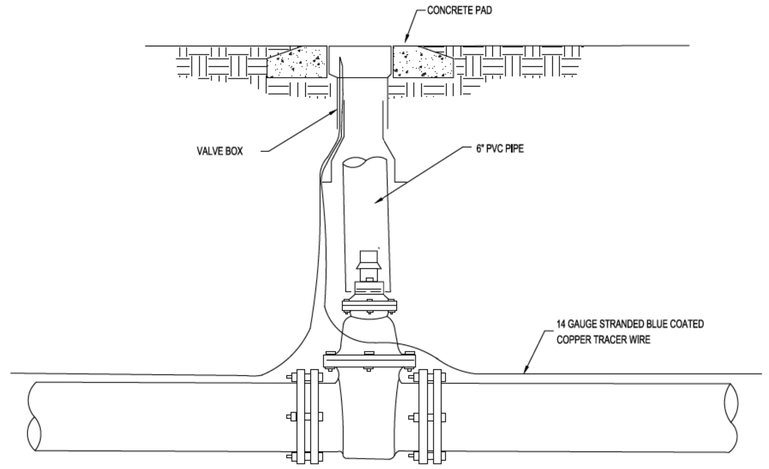
PROJECT TYPICAL DETAILS

NOTES:
1. 2" GATE VALVES SHALL BE AWWA C515 COMPLIANT
2. 2" GATE VALVES SHALL BE NSF 61 COMPLIANT
3. 3" OR LARGER GATE VALVES SHALL BE AWWA C500 AND C509 COMPLIANT

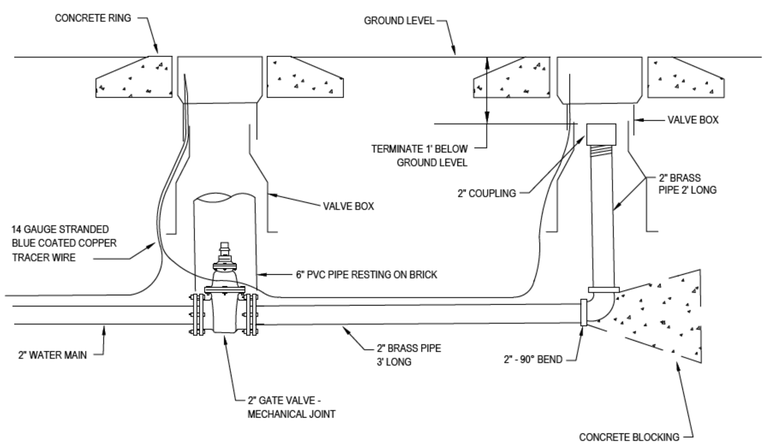


UNION COUNTY WATER	STANDARD DETAIL	SCALE: N.T.S.	1
	VALVE BOX	DATE: 09-13-24	

NOTES:
1. A 27" DIAMETER CONCRETE PAD SHALL BE PLACED AROUND EACH VALVE BOX
2. MINIMUM 18" SEPARATION BETWEEN GV AND MECHANICAL JOINT FITTINGS

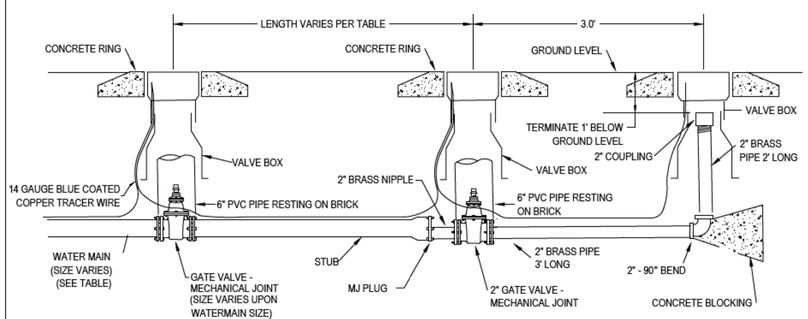


UNION COUNTY WATER	STANDARD DETAIL	SCALE: N.T.S.	1A
	VALVE BOX INSTALLATION	DATE: 09-13-24	



UNION COUNTY WATER	STANDARD DETAIL	SCALE: N.T.S.	2
	2" BLOW OFF	DATE: 11-07-23	

TABLE	
SIZE OF PIPE	LENGTH OF PIPE
6"	40'
8"	40'
12" AND LARGER	BY ENGINEER



UNION COUNTY WATER	STANDARD DETAIL	SCALE: N.T.S.	2A
	LONG MAIN LINE FUTURE EXTENSION WITH BLOW OFF	DATE: 09-13-24	

PROJECT REFERENCE NO.	SHEET NO.
U-4714BA	UC-3C
DESIGNED BY: RTK	
DRAWN BY: RTK	
CHECKED BY: DKP	
APPROVED BY:	
REVISED:	

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

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

Signed by: NORTH CAROLINA LICENSED ENGINEER, SEAL 045626, ENGINEER, WILLIAM B. KEATON, 9/16/2026

UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STV Engineers, Inc.
2151 Hawkins Street, Suite 1400
Charlotte, NC 28203
NC License Number F-0991

8/3/2026
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User:

Docusign Envelope ID: 0562D33A-00E9-83FD-83DF-A9B7DD17E0E3

ALL NAMED MANUFACTURERS SERVE AS A BASIS OF DESIGN.
CONTRACTOR SHALL PROVIDE NAMED MANUFACTURER OR
ALTERNATE MANUFACTURER AS APPROVED IN WRITING FROM THE UTILITY OWNER.

PROJECT TYPICAL DETAILS

PROJECT REFERENCE NO.	SHEET NO.
U-4714BA	UC-3D
DESIGNED BY: RTK	
DRAWN BY: RTK	
CHECKED BY: DKP	
APPROVED BY:	
REVISED:	

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
UTILITIES ENGINEERING SEC.
PHONE:(919)707-6690
FAX:(919)250-4151

Signed NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 045626 ENGINEER WILLIAM B. KEATON 9/16/2026

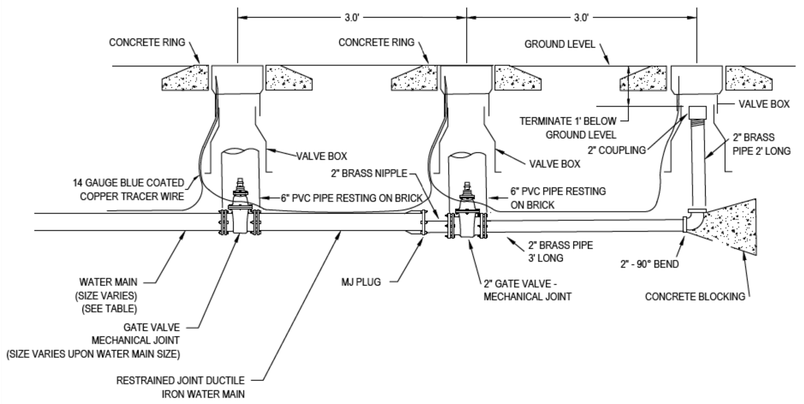
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2151 Hawkins Street, Suite 1400
Charlotte, NC 28203
NC License Number F-0991

SIZE OF PIPE	LENGTH OF PIPE
6"	54'
8"	54'
12" AND LARGER	BY ENGINEER



UNION COUNTY WATER

STANDARD DETAIL

SHORT MAIN LINE FUTURE EXTENSION WITH BLOW OFF

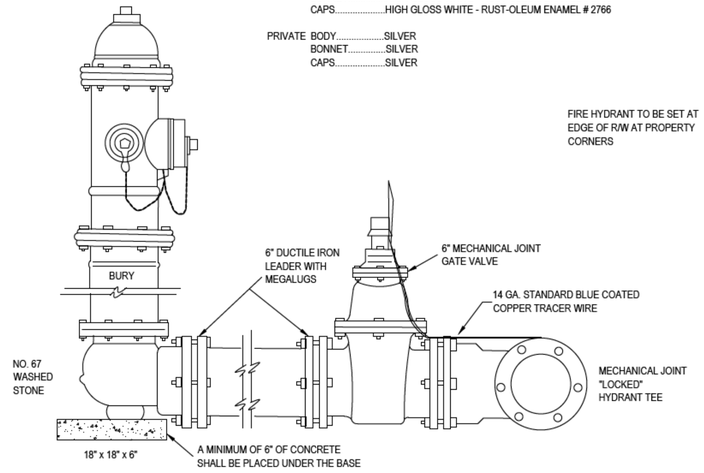
SCALE: N.T.S.
DATE: 09-13-24

2B

PAINT COLORS
PUBLIC BODY.....FIRE HYDRANT RED - RUST-OLEUM ENAMEL # 1210 FIRE HYDRANT RED
BONNET.....HIGH GLOSS WHITE - RUST-OLEUM ENAMEL # 2766
CAPS.....HIGH GLOSS WHITE - RUST-OLEUM ENAMEL # 2766

PRIVATE BODY.....SILVER
BONNET.....SILVER
CAPS.....SILVER

FIRE HYDRANT TO BE SET AT EDGE OF R/W AT PROPERTY CORNERS



UNION COUNTY WATER

STANDARD DETAIL

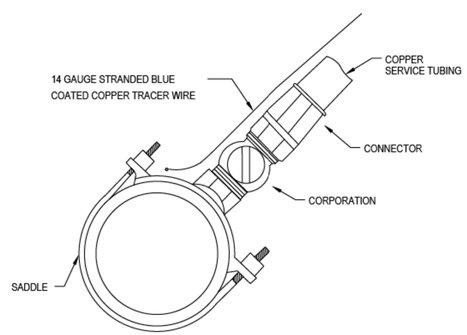
FIRE HYDRANT INSTALLATION

SCALE: N.T.S.
DATE: 09-13-24

3

NOTE:
1. ROMAC 101N SHALL REPLACE MUELLER FOR PIPE DIAMETER UP TO 8"
2. SMITH BLAIR 317, FORD FC 202 OR ROMAC 202N SHALL REPLACE MUELLER FOR PIPE DIA. 12" AND UP
3. SERVICE SADDLES SHALL HAVE TWO FLAT STRAPS (PER UCW SPECIFICATION SECTION 5, 5.01, B)
4. EXISTING SERVICES BEING CONNECTED TO NEW LINES SHALL BE ONE CONTINUOUS ROLL OF COPPER
5. MINIMUM 18-INCH SEPARATION BETWEEN SERVICE CONNECTION AND MECHANICAL JOINT FITTINGS

APPROVED SERVICE HARDWARE			
		MUELLER	FORD
SADDLE	2" PVC	H-13420	S70
	UP TO 8"	SEE NOTE	FC 101
BALL CORPORATION		B-25008	FB1000G
YOKE		H-5020	Y 502
ANGLE BALL VALVE		B-24273	BA94-323WG
CHECK VALVE		H-14247-A	HHS91-323
CONNECTORS	COPPER	STYLE 110	GRIP JOINT
EXPANSION CONNECTION			EC 23



UNION COUNTY WATER

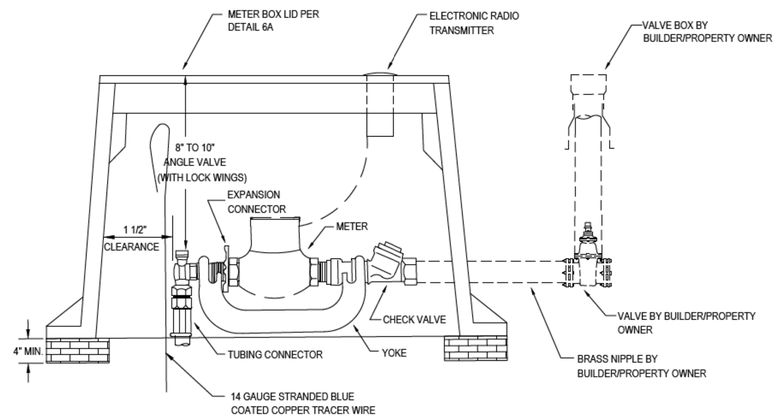
STANDARD DETAIL

SERVICE CONNECTION

SCALE: N.T.S.
DATE: 09-13-24

5

GENERAL NOTES
1. BUILDER/PROPERTY OWNER TO INSTALL NIPPLE, VALVE AND VALVE BOX BEFORE METER WILL BE SET.
2. FOR SUBDIVISION WITH SIDEWALKS EXTEND COPPER TUBING AFTER THE METER BOX 2 FT BEYOND PROPOSED SIDEWALK
3. CONTRACTOR SHALL USE ONE CONTINUOUS ROLL OF COPPER FROM TAP TO METER. NO SPLICING IS PERMITTED
4. METER AND ERT BY UNION COUNTY AT PREVAILING RATE



UNION COUNTY WATER

STANDARD DETAIL

METER INSTALLATION FOR ¾" AND 1" METERS

SCALE: N.T.S.
DATE: 09-13-24

6

8/3/2026
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User:

Docusign Envelope ID: 0562D33A-00E9-83FD-83DF-A9B7DD17E0E3

PROJECT TYPICAL DETAILS

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DESIGNED BY: RTK	
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APPROVED BY:	
REVISED:	

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

UTILITIES ENGINEERING SEC.
PHONE:(919)707-6690
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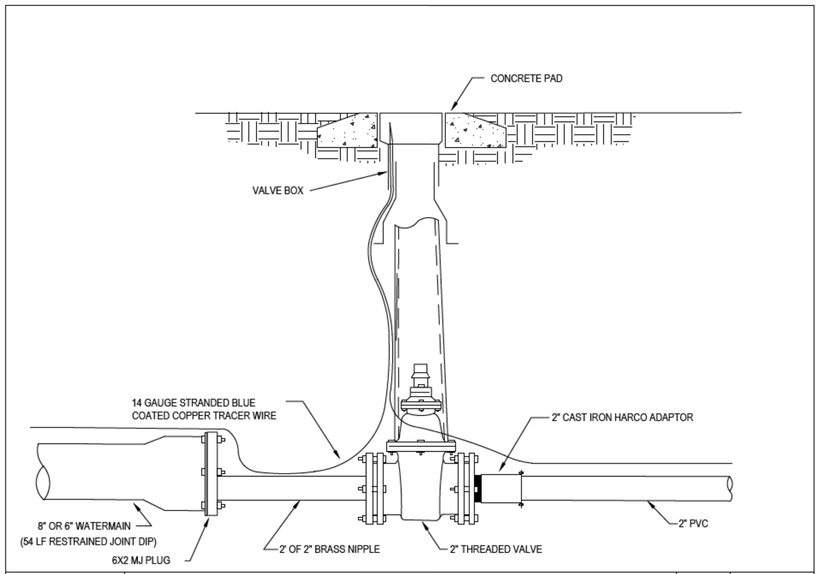
Signed NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 045626 WILLIAM B. KEATON 9/16/2026

UTILITY CONSTRUCTION PLANS ONLY

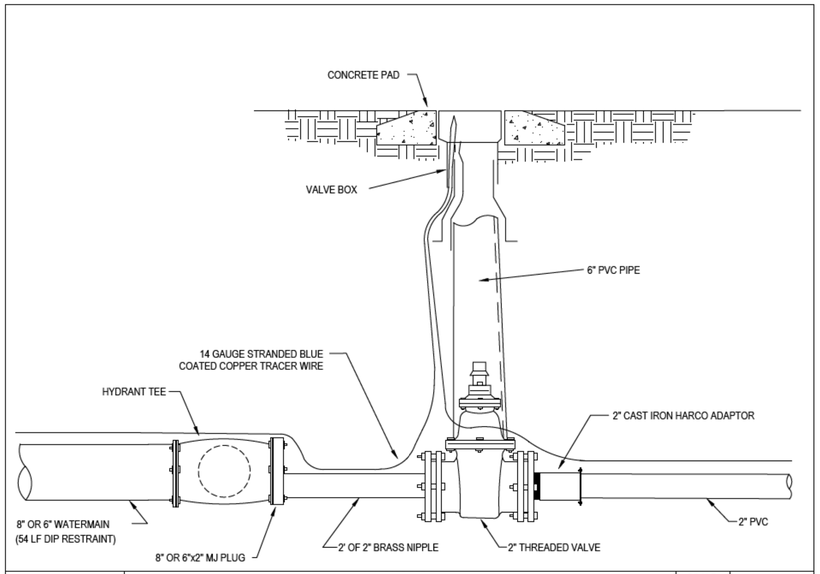
UTILITY CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

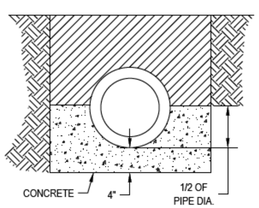
STV Engineers, Inc.
2151 Hawkins Street, Suite 1400
Charlotte, NC 28203
NC License Number F-0991



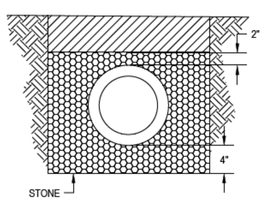
STANDARD DETAIL — 8" OR 6" x 2" REDUCER — SCALE: N.T.S. — DATE: 10-04-11 — 7



STANDARD DETAIL — HYDRANT TEE x 2" REDUCER — SCALE: N.T.S. — DATE: 10-04-11 — 7A



CLASS A



CLASS B

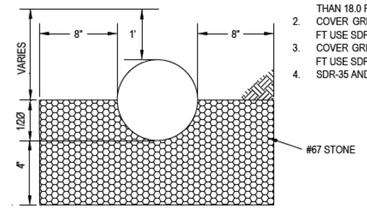
NOTES:
ALL CONCRETE = 3000 PSI
ALL STONE = N.C.D.O.T. NO. 67

STANDARD DETAIL — PIPE BEDDING — SCALE: N.T.S. — DATE: 11-17-06 — 8

NOTES

1. CAREFULLY COMACTED BACK FILL 1 FT ABOVE PIPE
2. NO STONES LARGER THAN # 67 SONE SHALL BE USED IN SELECT BACKFILL
3. 14 GA. STANDARD BLUE COATED COPPER TRACER WIRE STALL BE INSTALLED MANHOLE TO MANHOLE
4. MINIMUM PIPE SLOPE IS 0.50%

GRAVITY SEWER - BEDDING DETAIL



REQUIRED MATERIAL FOR DEPTH OF BURY:

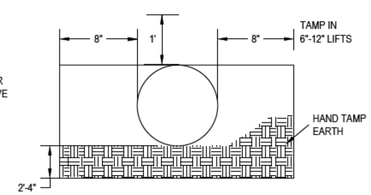
1. COVER GREATER LESS THAN 3.0 FT OR GREATER THAN 18.0 FT USE DUCTILE IRON PIPE
2. COVER GREATER THAN 3.0 FT BUT LESS THAN 10.0 FT USE SDR-35
3. COVER GREATER THAN 10.0 FT BUT LESS THAN 18.0 FT USE SDR-26
4. SDR-35 AND SDR-26 REQUIRED CELL CLASS 12454

CLASS C

GRAVITY SEWER MINIMUM COVER IS 3.0' AND MAXIMUM COVER IS 14.0' UNLESS PRIOR APPROVAL IS GRANTED BY UCW

NOTES

1. CAREFULLY COMACTED BACK FILL 1 FT ABOVE PIPE
2. 14 GA. STANDARD BLUE COATED COPPER TRACER WIRE STALL BE INSTALLED VALVE BOX TO VALVE BOX
4. PIPE 8-IN AND LESSER MINIMUM RESTRAINED JOINT DIP LENGTH 54 LF.
5. PIPE 12-IN AND LARGER LENGTH TO BE DETERMINED BY ENGINEER. MINIMUM LENGTH OF RESTRAINT JOINT DIP 54 LF FINAL



FORCE MAIN

FORCE MAIN MINIMUM COVER IS 3.0' AND MAXIMUM COVER IS 5.0' UNLESS PRIOR APPROVAL IS GRANTED BY UCW

STANDARD DETAIL — SEWER BEDDING — SCALE: N.T.S. — DATE: 09-13-24 — 8A

8/3/2026
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User:

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PROJECT TYPICAL DETAILS

PROJECT REFERENCE NO.	SHEET NO.
U-4714BA	UC-3F
DESIGNED BY: RTK	
DRAWN BY: RTK	
CHECKED BY: DKP	
APPROVED BY:	
REVISED:	

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

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

Signed NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 045626 ENGINEER WILLIAM B. KEATON 9/16/2026

UTILITY CONSTRUCTION PLANS ONLY

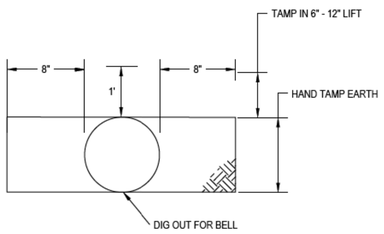
UTILITY CONSTRUCTION

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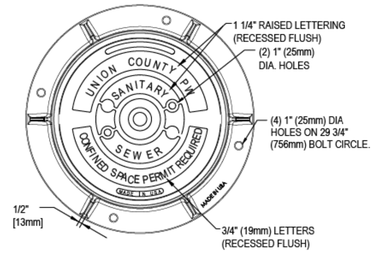
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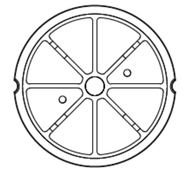
1. 2" PVC SDR 21
2. 6"-8" PVC SDR 18
3. 12" OR LARGER DIP
4. CAREFULLY COMACTED BACK FILL 1 FT ABOVE PIPE
5. NO STONES LARGER THAN # 67 SONE SHALL BE USED IN SELECT BACKFILL
6. 14 GA. STANDARD BLUE COATED COPPER TRACER WIRE STALL BE INSTALLED VALVE TO VALVE
7. PIPE 8-IN AND LESSER MINIMUM RESTRAINED JOINT DIP LENGTH 54 LF.
8. PIPE 12-IN AND LARGER MINIMUM LENGTH OF RESTRAINT JOINT DIP 54 LF FINAL LENGTH TO BE DETERMINED BY ENGINEER.



WATER MAIN MINIMUM COVER IS 3.0' AND MAXIMUM COVER IS 6.0' UNLESS PRIOR APPROVAL IS GRANTED BY UCW

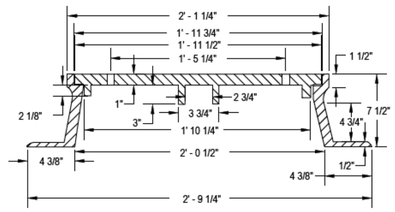
UNION COUNTY WATER	STANDARD DETAIL	SCALE: N.T.S.	8B
	WATER TRENCH	DATE: 09-13-24	





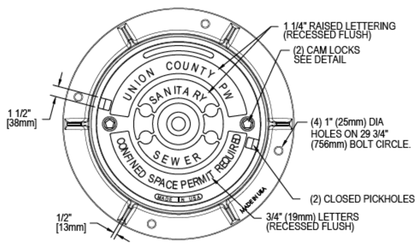
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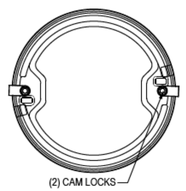
1. ALL CASTINGS TO BE FREE FROM SAND HOLES. NO PLUGGING ALLOWED.
2. MACHINE ALL CONTACT SURFACES BETWEEN RING AND COVER.
3. PROVIDE TWO VENT HOLES IN COVER, 1" DIA. TAPERED TO 1-1/8" ON REVERSE SIDE.
4. MINIMUM WEIGHTS: COVER - 120 LBS. RING - 190 LBS.
5. ALL MANHOLE RINGS OUT OF ROAD RIGHT OF WAY SHALL BE BOLTED INTO MANHOLE WITH 5/8" DIAMETER KWIK BOLT STUD ANCHOR SYSTEM. HILTI BRAND OR APPROVED EQUAL.



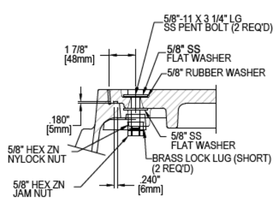
(U.S. FOUNDRY - 669, VULCAN - 1384 OR EQUAL)

UNION COUNTY WATER	STANDARD DETAIL	SCALE: N.T.S.	9
	RING AND COVER	DATE: 09-09-11	

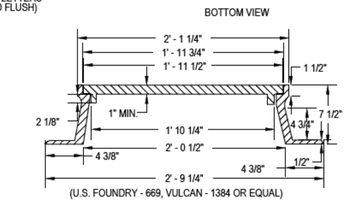




BOTTOM VIEW



CAM & GASKET GROOVE DETAIL

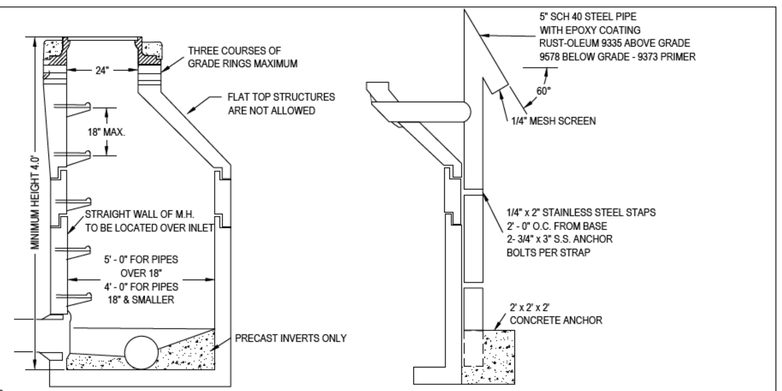


(U.S. FOUNDRY - 669, VULCAN - 1384 OR EQUAL)

NOTES:

1. ALL CASTINGS TO BE FREE FROM SAND HOLES. NO PLUGGING ALLOWED.
2. MACHINE ALL CONTACT SURFACES BETWEEN RING AND COVER.
3. PROVIDE 2 CLOSED PICKHOLES
4. MINIMUM WEIGHTS: COVER - 95 LBS. RING - 190 LBS.
5. ALL MANHOLE RINGS OUT OF ROAD RIGHT OF WAY SHALL BE BOLTED INTO MANHOLE WITH 5/8" DIAMETER KWIK BOLT STUD ANCHOR SYSTEM. HILTI BRAND OR APPROVED EQUAL.

UNION COUNTY WATER	STANDARD DETAIL	SCALE: N.T.S.	9A
	RING AND COVER FOR SEALED MANHOLES	DATE: 09-25-12	



NOTES:

1. 1 ROLL OF MASTIC AND A 6" EXTERNAL JOINT/SEAM WRAP INSTALLED ON EACH MANHOLE SECTION
2. MANHOLE VACUUM TESTING - AFTER EACH MANHOLE IS INSTALLED AND ALL PIPES ARE CONNECTED, BUT BEFORE BACKFILLING, THE MANHOLE SHALL BE VACUUM TESTED. ALL PIPES ENTERING THE MANHOLE SHALL BE PLUGGED AND BRACED. THE CONTRACTOR SHALL FURNISH ALL MATERIALS, LABOR AND EQUIPMENT NECESSARY TO PERFORM THE TESTING. A VACUUM OF 10 INCHES OF MERCURY SHALL BE CREATED ON THE INSIDE OF THE MANHOLE. AT THE VACUUM OF 10 INCHES OF MERCURY, THE PUMP SHALL BE STOPPED AND THE TIME SHALL BE MEASURED FOR THE VACUUM TO DROP TO 9 INCHES. FAILURE OF THE TEST SHALL BE ANY AMOUNT OF TIME LESS THAN THE FOLLOWING.
   - 4 FT. DIAMETER MANHOLE = 60 SECONDS — 7 FT. DIAMETER MANHOLE = 105 SECONDS
   - 5 FT. DIAMETER MANHOLE = 75 SECONDS — 8 FT. DIAMETER MANHOLE = 120 SECONDS
   - 6 FT. DIAMETER MANHOLE = 90 SECONDS — 10 FT. DIAMETER MANHOLE = 150 SECONDS

   UPON TEST FAILURE, THE CONTRACTOR SHALL REPAIR ALL LEAKS AND RETEST THE MANHOLE UNTIL THE TEST HAS PASSED.
3. 0.20' INSIDE DROP REQUIRED
4. INSTALL MANHOLE RIM AT 0.10' ABOVE GRADE IN LANDSCAPED AREAS AND WHILE ADJACENT TO RIGHTS-OF-WAY
5. INSTALL MANHOLE RIM AT 2.0' ABOVE GRADE IN SEWER EASEMENTS THAT ARE NOT LANDSCAPED.

UNION COUNTY WATER	STANDARD DETAIL	SCALE: N.T.S.	10
	MANHOLE	DATE: 09-13-24	

8/31/2026
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REVISED:	

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

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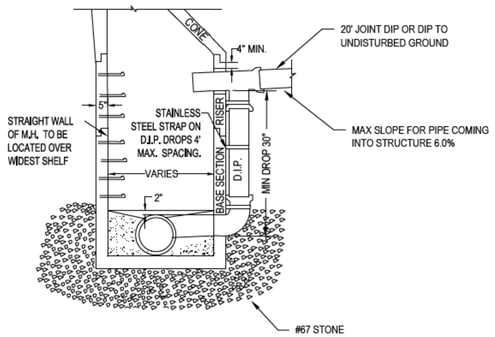
Signed NORTH CAROLINA UNIVERSITY LICENSURE SEAL 045626 ENGINEER WILLIAM B. KEATON 9/16/2026

UTILITY CONSTRUCTION PLANS ONLY

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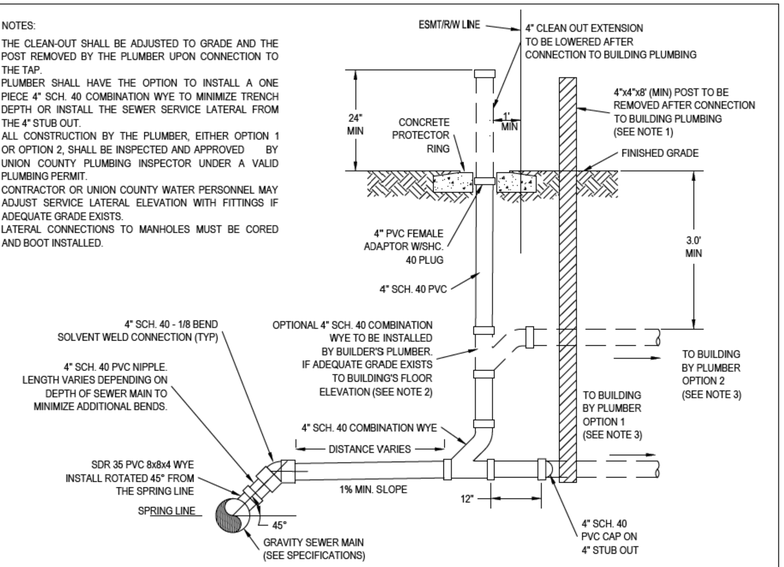
GENERAL NOTES

1. CARE MUST BE TAKEN TO FORM A SMOOTH FINISHED TROUGH FROM ENTRANCE PIPES TO EXIT PIPE, AND IN CURVED MANHOLES THE TROUGH MUST BE A SMOOTH CIRCULAR ARC TANGENT TO THE INSIDE WALLS OF THE PIPES AT THEIR ENDS.
2. THE SLOPE OF THE OUTSIDE DROP TROUGH SHALL BE 1/4" PER FOOT.
3. ALL PIPE OPENINGS TO BE NO GREATER THAN 3" LARGER THAN O.D. OF PIPE AND ADDITIONALLY REINFORCED WITH A MINIMUM OF 0.20 SQ. IN. OF STEEL AT 90 DEGREES. PIPE TO BE CENTERED IN OPENINGS. ADDITIONAL REINFORCING NOT REQUIRED FOR CORED OPENINGS.
4. OUTSIDE DROP SHALL NOT ENTER MANHOLE IN CONE SECTION.
5. MATCH DROP INFLUENT CROWN TO CROWN WITH EFFLUENT PIPE.
6. 0.20' INSIDE DROP REQUIRED
7. INSTALL MANHOLE RIM AT 0.10' ABOVE GRADE IN LANDSCAPED AREAS AND WHILE ADJACENT TO RIGHTS-OF-WAY
8. INSTALL MANHOLE RIM AT 2.0' ABOVE GRADE IN SEWER EASEMENTS THAT ARE NOT LANDSCAPED.

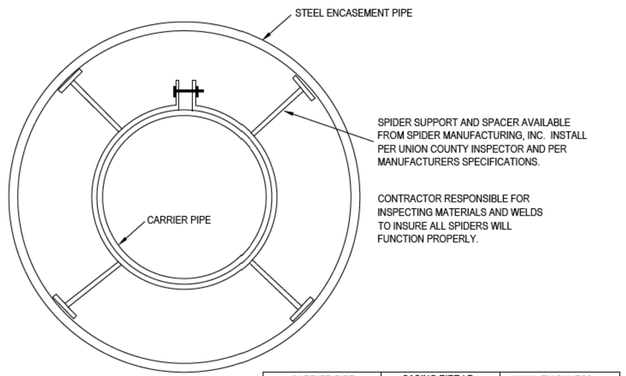
UNION COUNTY WATER | STANDARD DETAIL | OUTSIDE DROP MANHOLE | SCALE: N.T.S. | DATE: 09-13-24 | 10B

NOTES:

1. THE CLEAN-OUT SHALL BE ADJUSTED TO GRADE AND THE POST REMOVED BY THE PLUMBER UPON CONNECTION TO THE TAP.
2. PLUMBER SHALL HAVE THE OPTION TO INSTALL A ONE PIECE 4" SCH. 40 COMBINATION WYE TO MINIMIZE TRENCH DEPTH OR INSTALL THE SEWER SERVICE LATERAL FROM THE 4" STUB OUT.
3. ALL CONSTRUCTION BY THE PLUMBER, EITHER OPTION 1 OR OPTION 2, SHALL BE INSPECTED AND APPROVED BY UNION COUNTY PLUMBING INSPECTOR UNDER A VALID PLUMBING PERMIT.
4. CONTRACTOR OR UNION COUNTY WATER PERSONNEL MAY ADJUST SERVICE LATERAL ELEVATION WITH FITTINGS IF ADEQUATE GRADE EXISTS.
5. LATERAL CONNECTIONS TO MANHOLES MUST BE CORED AND BOOT INSTALLED.



UNION COUNTY WATER | STANDARD DETAIL | SEWER LATERAL | SCALE: N.T.S. | DATE: 02-19-14 | 11

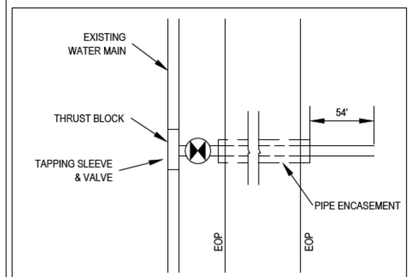


CARRIER PIPE	CASING PIPE I.D.	WALL THICKNESS
4"	8"	0.188"
6"	12"	0.188"
8"	16"	0.250"
10"	16"	0.250"
12"	20"	0.281"
16"	24"	0.344"
24"	30"	0.406"
30"	42"	0.500"
36"	48"	0.500"

NOTES:

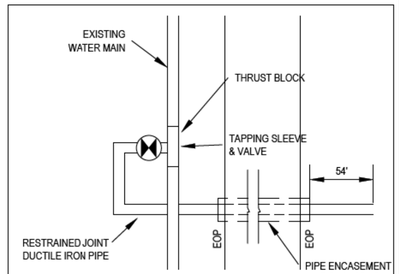
1. NO PIPE SHALL BE SUPPORTED BY BELL.
2. END SECTIONS LESS THAN 4' MAY BE UNSUPPORTED.
3. WALL THICKNESS AS PER TABLE UNLESS OTHERWISE SHOWN ON PLAN.
4. MASONRY SEAL AT ENDS – 2" x 4" WEEP HOLE AT LOW END
5. ALL PRESSURE PIPES TO HAVE TRACING WIRE IN ALL CASING BORES.

UNION COUNTY WATER | STANDARD DETAIL | PIPE ENCASEMENT | SCALE: N.T.S. | DATE: 11-17-06 | 14



OPTION "A"

FRONT SIDE TAP



OPTION "B"

BACK SIDE TAP

NOTES:

1. OPTION "A" OR "B" WILL BE REQUIRED, DEPENDING ON THE AMOUNT OF SPACE AVAILABLE, TO BE FIELD VERIFIED.
2. RESTRAINED JOINT DUCTILE IRON PIPE REQUIRED FROM VALVE TO 54 LF BEYOND CASING.

UNION COUNTY WATER | STANDARD DETAIL | TAPPING SLEEVE | SCALE: N.T.S. | DATE: 09-13-24 | 18

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User:

Docusign Envelope ID: 0562D33A-00E9-83FD-83DF-A9B7DD17E0E3

PROJECT TYPICAL DETAILS

PROJECT REFERENCE NO.	SHEET NO.
U-4714BA	UC-3H
DESIGNED BY: RTK	
DRAWN BY: RTK	
CHECKED BY: DKP	
APPROVED BY:	
REVISED:	

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

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

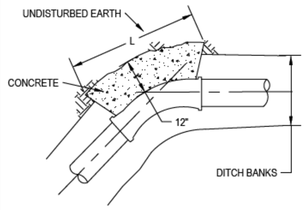
Signed NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 045626 WILLIAM B. KEATON 9/16/2026

UTILITY CONSTRUCTION PLANS ONLY

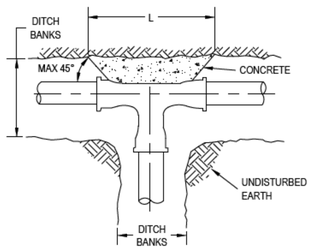
UTILITY CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

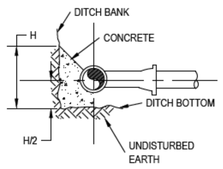
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2151 Hawkins Street, Suite 1400
Charlotte, NC 28203
NC License Number F-0991



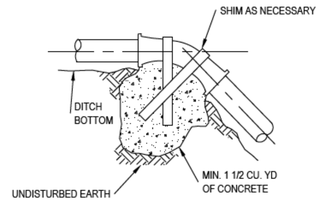
PLAN 45° BENDS
ALSO 90°, 22 1/2°, 11 1/2°



PLAN TEE



ELEVATION AT FITTINGS



VERTICAL BEND

STANDARD DETAIL	SCALE: N.T.S.	16
THRUST BLOCK	DATE: 11-17-06	

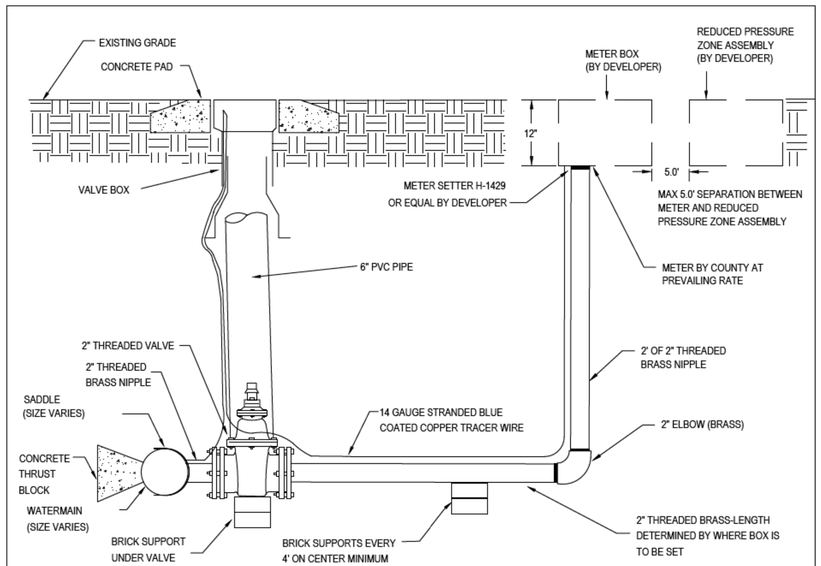
ANCHORAGE SCHEDULE

PIPE SIZE	11 1/4° BEND		22 1/2° BEND		45° BEND		90° BEND		TEE		TEST PRESSURE (P.S.I.)
	L	H	L	H	L	H	L	H	L	H	
6"	1'3"	1'0"	2'3"	1'0"	2'6"	1'6"	2'9"	1'6"	2'0"	1'6"	200
	1'6"	1'3"	2'3"	1'6"	3'0"	1'6"	4'0"	1'6"	3'0"	1'6"	300
8"	1'6"	1'6"	2'6"	1'9"	3'0"	2'0"	3'9"	2'0"	2'6"	2'0"	200
	2'0"	1'6"	3'0"	2'0"	3'9"	2'3"	4'6"	2'6"	3'6"	2'3"	300
12"	2'6"	1'9"	4'0"	2'3"	4'3"	3'0"	5'0"	3'3"	4'0"	3'0"	200
	3'6"	2'0"	5'3"	2'6"	6'0"	3'3"	7'0"	3'6"	5'0"	3'6"	300
14"	3'0"	1'0"	4'0"	3'0"	4'6"	3'9"	6'0"	3'9"	4'6"	3'6"	200
	4'0"	2'6"	5'3"	3'6"	6'0"	4'3"	6'6"	5'0"	5'0"	5'0"	300
16"	3'0"	2'9"	4'6"	3'6"	5'0"	4'6"	7'0"	4'3"	5'0"	4'0"	200
	4'0"	3'0"	6'3"	3'9"	6'5"	5'3"	8'0"	5'3"	7'6"	4'0"	300

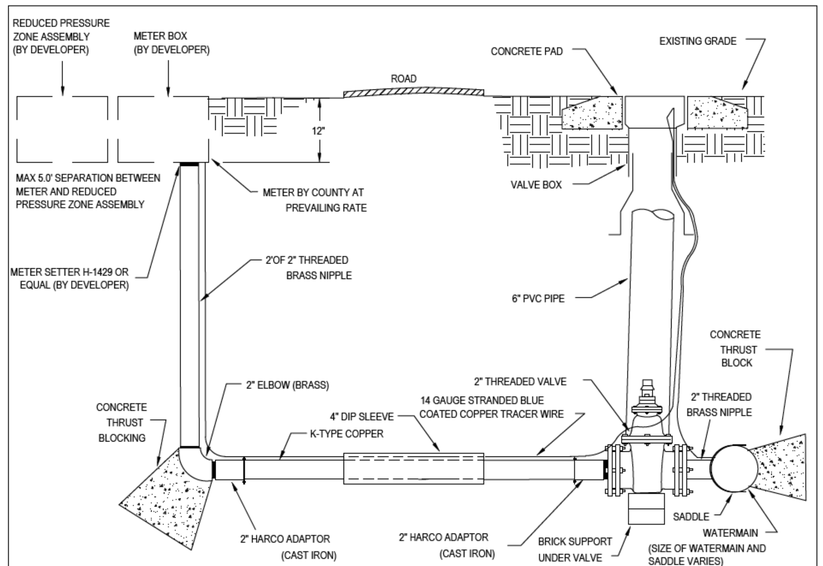
NOTES:

1. THRUST BLOCK DIMENSIONS BASED ON SOIL BEARING CAPACITY OF 2000 P.S.F. AND A WATER TEST PRESSURE OF 150 P.S.I. SIZES OF THRUST BLOCKS MAY BE REVISED BY THE ENGINEER WHERE BEARING CAPACITY OF SOIL VARIES.
2. PROVIDE TAR PAPER JOINT BETWEEN CONCRETE THRUST BLOCK AND PORTION OF PIPE BEING ANCHORED.
3. ALL CONCRETE THRUST BLOCKS SHALL BE 2500 P.S.I. CONCRETE.
4. MAXIMUM VERTICAL DEFLECTION SHALL BE 22 1/2°.
5. JOINTS SHALL REMAIN FREE OF CONCRETE FOR INSPECTION, REPAIR OR REPLACEMENT OF JOINTS.

STANDARD DETAIL	SCALE: N.T.S.	17
THRUST BLOCK SPECIFICATION	DATE: 02-19-14	



STANDARD DETAIL	SCALE: N.T.S.	19
2" SHORT SIDE SERVICE FOR 1½ OR 2" METERS	DATE: 09-13-24	



STANDARD DETAIL	SCALE: N.T.S.	20
2" LONG SIDE SERVICE FOR 1½ OR 2" METERS	DATE: 09-13-24	

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PROJECT TYPICAL DETAILS

PROJECT REFERENCE NO.	SHEET NO.
U-4714BA	UC-3I
DESIGNED BY: RTK	
DRAWN BY: RTK	
CHECKED BY: DKP	
APPROVED BY:	
REVISED:	

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
UTILITIES ENGINEERING SEC.
PHONE:(919)707-6690
FAX:(919)250-4151

Signed NORTH CAROLINA UNIVERSITY OF CHARLOTTE SEAL 045626 ENGINEER WILLIAM B. KEATON 9/16/2026

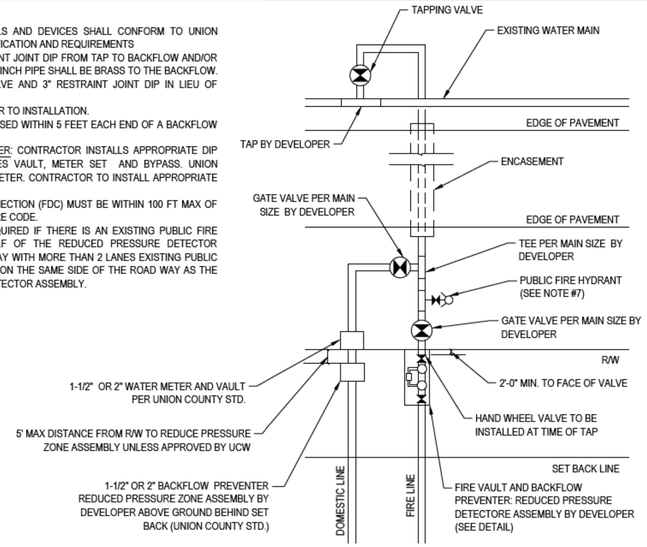
UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STV Engineers, Inc.
2151 Hawkins Street, Suite 1400
Charlotte, NC 28203
NC License Number F-0991

NOTES:
1. INSTALLATION, MATERIALS AND DEVICES SHALL CONFORM TO UNION COUNTY WATER'S SPECIFICATION AND REQUIREMENTS
2. ALL PIPE TO BE RESTRAINT JOINT DIP FROM TAP TO BACKFLOW AND/OR FIRE VAULT.THE 1-1/2 & 2 INCH PIPE SHALL BE BRASS TO THE BACKFLOW. ALTERNATE (3 INCH VALVE AND 3" RESTRAINT JOINT DIP IN LIEU OF BRASS)
3. FEES MUST BE PAID PRIOR TO INSTALLATION.
4. NO PVC PIPE SHALL BE USED WITHIN 5 FEET EACH END OF A BACKFLOW PREVENTER.
5. METERS 3 INCH & LARGER: CONTRACTOR INSTALLS APPROPRIATE DIP LINE THROUGH, SUPPLIES VAULT, METER SET AND BYPASS. UNION COUNTY WILL INSTALL METER. CONTRACTOR TO INSTALL APPROPRIATE SIZE RPZ.
6. FIRE DEPARTMENT CONNECTION (FDC) MUST BE WITHIN 100 FT MAX OF PUBLIC HYDRANT PER FIRE CODE.
7. FIRE HYDRANT NOT REQUIRED IF THERE IS AN EXISTING PUBLIC FIRE HYDRANT WITHIN 500 LF OF THE REDUCED PRESSURE DETECTOR ASSEMBLY. FOR ROADWAY WITH MORE THAN 2 LANES EXISTING PUBLIC FIRE HYDRANT MUST BE ON THE SAME SIDE OF THE ROAD WAY AS THE REDUCED PRESSURE DETECTOR ASSEMBLY.



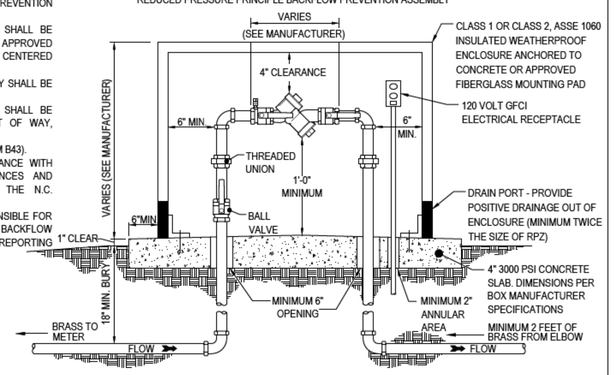
UNION COUNTY WATER | STANDARD DETAIL | SCALE: N.T.S. | DATE: 02-19-14

WATER CONNECTION

22

NOTES
1. RPZ SHALL BE INSTALLED FOR CUSTOMER APPLICATIONS APPROVED BY UNION COUNTY WATER.
2. REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTION ASSEMBLY SHALL COMPLY WITH ASSE 1013 & AWWA C511 (FEBCO 825Y, WILKINS MODEL 975XL, HERSEY MODEL FRPII OR EQUAL).
3. OWNER SHALL PROVIDE WRITTEN CERTIFICATION TO THE COUNTY THAT THE RPZ HAS BEEN TESTED BY A CERTIFIED BACKFLOW PREVENTION TECHNICIAN AFTER INSTALLATION.
4. BACKFLOW PREVENTION ASSEMBLY SHALL BE CENTERED ON CONCRETE OR APPROVED FIBERGLASS MOUNTING PAD AND CENTERED WITHIN ENCLOSURE.
5. REDUCER PRESSURE ZONE ASSEMBLY SHALL BE ABOVE GROUND ONLY.
6. BACKFLOW PREVENTION ASSEMBLY SHALL BE INSTALLED OUTSIDE OF THE RIGHT OF WAY, MAXIMUM OF 5 FEET.
7. PIPE MATERIAL SHALL BE BRASS (ASTM B43).
8. INSTALLATION SHALL BE IN COMPLIANCE WITH ALL APPLICABLE COUNTY ORDINANCES AND SPECIFICATIONS IN ADDITION TO THE N.C. PLUMBING CODE.
9. PROPERTY OWNER SHALL BE RESPONSIBLE FOR MAINTENANCE AND OPERATION OF BACKFLOW ASSEMBLY AND COMPLIANCE WITH REPORTING AND TESTING REQUIREMENTS.

REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTION ASSEMBLY



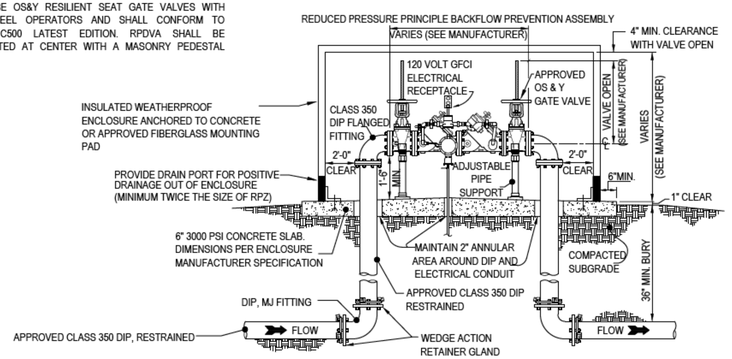
UNION COUNTY WATER | STANDARD DETAIL | SCALE: N.T.S. | DATE: 02-19-14

REDUCED PRESSURE ZONE ASSEMBLY
(¾" - 2")

24A

NOTES:
1. RPDA SHALL BE INSTALLED FOR CUSTOMER APPLICATIONS APPROVED BY UNION COUNTY WATER
2. REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTION ASSEMBLY SHALL COMPLY WITH ASSE 1047 & AWWA C511 (1) FEBCO 826YD, (2) WILKINS MODEL 375ADA, (3) AMES SERIES 5000 CIV. OR EQUAL
3. OWNER SHALL PROVIDE WRITTEN CERTIFICATION TO THE COUNTY THAT THE RPDVA =HAS BEEN TESTED BY A CERTIFIED BACKFLOW PREVENTION TECHNICIAN AFTER INSTALLATION.
4. COUNTY APPROVED 3"-10" RPDVA INCLUDES SHUTOFF VALVES AS PART OF THE ASSEMBLY. SHUT OFF VALVES SHALL BE OS&Y RESILIENT SEAT GATE VALVES WITH HANDWHEEL OPERATORS AND SHALL CONFORM TO AWWA C500 LATEST EDITION. RPDVA SHALL BE SUPPORTED AT CENTER WITH A MASONRY PEDESTAL ADEQUATE TO MAINTAIN THE WEIGHT OF THE STRUCTURE AND PLUS AN ADDITIONAL 1,000 POUND LOAD.
5. REDUCED PRESSURE DETECTOR ASSEMBLY SHALL BE ABOVE GROUND ONLY.
6. BACKFLOW PREVENTION ASSEMBLY SHALL BE INSTALLED OUTSIDE OF THE RIGHT OF WAY, MAXIMUM OF 5 FEET.
7. PROPERTY OWNER SHALL BE RESPONSIBLE FOR MAINTENANCE AND OPERATION OF BACKFLOW ASSEMBLY AND COMPLIANCE WITH REPORTING AND TESTING REQUIREMENTS.
8. 3/4" BYPASS DETECTOR AMI METER: SENSUS SRII WITH SMARTPOINT MODULE.

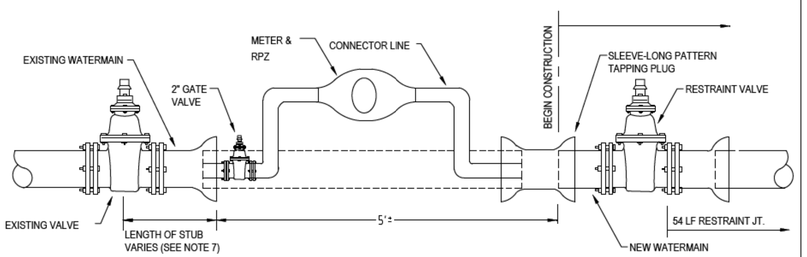
REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTION ASSEMBLY



UNION COUNTY WATER | STANDARD DETAIL | SCALE: N.T.S. | DATE: 01-02-14

REDUCED PRESSURE DETECTOR ASSEMBLY

24B



NOTES:
1. INSTALL CONNECTOR LINE FROM EXISTING BLOW OFF ASSEMBLY TO NEW MAIN FOR FILLING, TESTING AND STERILIZING NEW MAIN.
2. CONNECTOR LINE TO BE ASSEMBLED WITH RPZ AND METER BY CONTRACTOR AND TO BE OPERATED AND INDEPENDENT OF EXISTING MAIN.
3. BLOCKING ON EXISTING LINE NOT TO BE DISTURBED.
4. FINAL CONNECTION TO EXISTING MAIN TO BE MADE ONLY AFTER TOTAL PROJECT IS ACCEPTED BY UNION COUNTY WATER.
5. VALVES ON EXISTING SYSTEM TO BE OPERATED BY UCW FORCES ONLY.
6. ONLY ONE CONNECTION WILL BE ALLOWED BETWEEN THE EXISTING SYSTEM AND THE NEW CONSTRUCTION UNTIL TESTING AND DISINFECTION IS COMPLETE.
7. 6" OR 8" DIAMETER PIPE= 40 LF OF STUB, 12" OR 16" DIAMETER PIPE= 72 LF OF STUB

UNION COUNTY WATER | STANDARD DETAIL | SCALE: N.T.S. | DATE: 09-02-10

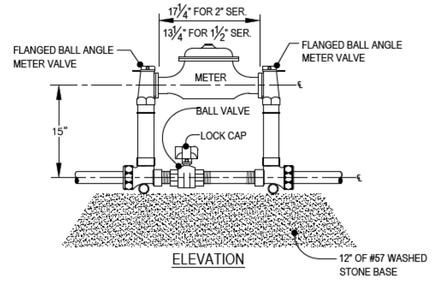
JUMPER CONNECTION

25

8/3/2026
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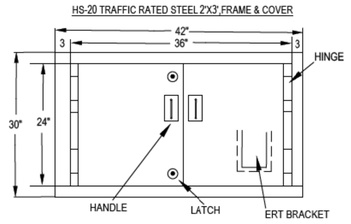
PROJECT TYPICAL DETAILS



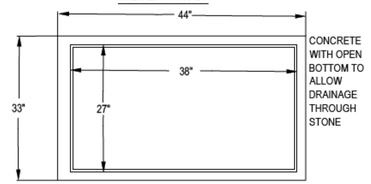
ELEVATION

NOTES:

1. PIPING TO BE BRASS AND COPPER TUBING. METER INLET AND OUTLET TO BE EQUIPPED WITH FLANGED BALL ANGLE METER.
2. CUSTOM SETTERS SHALL BE EQUIPPED WITH STANDARD LOW BYPASS WITH BALL VALVE AND PADLOCK WINGS.
3. CUSTOM SETTERS SHALL BE AS MANUFACTURED BY MUELLER, FORD, ANY MCDONALD, OR APPROVED EQUAL.
4. CUSTOM SETTER SHALL BE INSTALLED SUCH THAT METER REGISTER IS LOCATED 5 TO 8 INCHES BELOW METER BOX COVER.
5. METER BY COUNTY AT PREVAILING RATE.



METER VAULT



TOP VIEW

	STANDARD DETAIL	SCALE: N.T.S.	29
UNION COUNTY WATER	STANDARD 1.5" AND 2" METER INSTALLATION & VAULT	DATE: 06-13-14	

PROJECT REFERENCE NO.	SHEET NO.
U-4714BA	UC-3J
DESIGNED BY: RTK	
DRAWN BY: RTK	
CHECKED BY: DKP	
APPROVED BY:	
REVISED:	

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

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

Signed NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 045626 WILLIAM B. KEATON 9/16/2026

UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION

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2151 Hawkins Street, Suite 1400
Charlotte, NC 28203
NC License Number F-0991

8/3/2026
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User:

Docusign Envelope ID: 0562D33A-00E9-83FD-83DF-A9B7DD17E0E3

SCALE 1" = 50'

0 50 100 150 200

NAD 83/NA 2011

16" VALVE
-WL2- STA. 10+13.21

16" PLUG W/ 2" TAP
-WL2- STA. 10+08.21

11 LF 2" WATER LINE
-WL2- RJ BRASS

2" VALVE
-WL2- STA. 10+01.00

2" BLOW OFF
-WL2- STA. 9+98.00

CONNECT TO 16" WATER LINE BY REMOVING 2" BLOW OFF AND LINE AND MAKING CONNECTION AT 16" VALVE.
TIP PROJECT U-4714A BY OTHERS
N: 488019.3952
E:1494645.1291

END TIP PROJECT U-4714AC
-L- POT STA. 193+50.61 LB=
BEGIN TIP PROJECT U-4714BA
-L- POT STA. 10+00.00 LA

2-45° BEND (HORZ.)
-WL2- STA. 10+19.06
-WL2- STA. 10+55.18

710 LF 16" WATER LINE
-WL2- DIP PC250, 7765 LF TOTAL

20 LF 24" ENCASEMENT PIPE

CONTRACTOR TO FIELD LOCATE EXIST. 4" SEWER SERVICE AND EXTEND TO NEW R/W AND INSTALL NEW CLEAN-OUT
(CONTINUED ON UC-5)

72" CL-V RCP BURIED W/CONC. SILL SKEW=45 (DETAIL 4-3)

CL-1 RIP RAP EST. 40 TONS 100 S.Y. GEOTEXTILE

CL-B RIP RAP EST. 2 TONS 7 S.Y. GEOTEXTILE

CL-B RIP RAP EST. 5 TONS 14 S.Y. GEOTEXTILE

-WL1- STA. 8+78.26
CONNECT TO 6" WATER LINE
TIP PROJECT U-4714A BY OTHERS
22.5° BEND (HORZ.)
-WL1- STA. 9+03.26

RECONNECT WATER METER

107 LF 6" WATER LINE
-WL1- DIP PC350

8"X6" REDUCER
-WL1- STA. 9+84.69

RECONNECT WATER METER

22.5° BEND (HORZ.)
-WL1- STA. 10+12.95

8" VALVE
10+17.95

-WL1- DEFLECTION
BEGIN STA: 10+65.13
END STA: 10+94.28
BEND RADIUS: 459.0'

RECONNECT WATER METER

-WL1- DEFLECTION
BEGIN STA: 11+23.97
END STA: 11+45.76
BEND RADIUS: 459.0'

RECONNECT WATER METER

FIRE HYDRANT
6" VALVE
5 LF FIRE HYDRANT LEG

8"X8"X6" FH TEE
-WL1- STA. 12+61.12

-WL1- DEFLECTION
BEGIN STA: 13+17.28
END STA: 13+23.45
BEND RADIUS: 459.0'

831 LF 8" WATER LINE
-WL1- DIP PC350, 3854 LF TOTAL

RECONNECT WATER METER

10 LF 8" SANITARY GRAVITY SEWER
-SS1- PVC SDR 26
STUB-OUT OF MANHOLE #3A W/ PVC SDR 26, MAINTAIN SLOPE & INVERT OF EXIST. 8" SEWER

4' DIA. UTILITY MANHOLE
8.5 LF UTILITY MANHOLE WALL 4' DIA
SSMH-3, -SS1- STA. 3+40.30
OUTSIDE DROP MANHOLE

270 LF 8" SANITARY GRAVITY SEWER
-SS1- PVC SDR35

22.5° BEND (HORZ.)
-WL1- STA. 15+66.91

22.5° BEND (HORZ.)
-WL1- STA. 15+96.57

20 LF 16" ENCASEMENT PIPE
T=0.281

-WL1- DEFLECTION
BEGIN STA: 16+32.79
END STA: 16+54.42
BEND RADIUS: 459.0'

4' DIA. UTILITY MANHOLE
SSMH-2, -SS1- STA. 0+70.63

-WL1- DEFLECTION
BEGIN STA: 16+54.42
END STA: 16+76.13
BEND RADIUS: 459.0'

40 LF 16" ENCASEMENT PIPE
T=0.281

71 LF 8" SANITARY GRAVITY SEWER
-SS1-DIP PC350

4' DIA. UTILITY MANHOLE
0.1' LF UTILITY MAHOLE WALL 4' DIA
SSMH-1, -SS1- STA. 0+00.00

THE ESTIMATED QUANTITY OF DUCTILE IRON WATER PIPE FITTINGS ON THIS PLAN SHEET IS 2675 POUNDS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.

MATCHLINE – SEE SHEET UC-5

PROJECT REFERENCE NO.	SHEET NO.
U-4714BA	UC-4
DESIGNED BY: RTK	
DRAWN BY: RTK	
CHECKED BY: DKP	
APPROVED BY:	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE:(919)707-6690 FAX:(919)250-4151	UTILITY CONSTRUCTION PLANS ONLY

NORTH CAROLINA — Signed by: WILLIAM B. KEATON — SEAL 045626 — ENGINEER — WILLIAM B. KEATON — 9/16/2026

UTILITY CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STV Engineers, Inc.
2151 Hawkins Street, Suite 1400
Charlotte, NC 28203
NC License Number F-0991

8/3/2026
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NOTES:

1. CONTRACTOR TO FIELD LOCATE EXIST. 4" SANITARY SEWER. APPROX. LOCATION SHOWN.
2. SSMH-4 NO LONGER INCLUDED.
3. 8" VALVE TO BE CLOSED UPON ACTIVATION OF 16" & 8" WATER LINE.

SCALE 1" = 50'

0 50 100 150 200

PROJECT REFERENCE NO.	SHEET NO.
U-4714BA	UC-5
DESIGNED BY: RTK	
DRAWN BY: RTK	
CHECKED BY: DKP	
APPROVED BY:	
REVISED:	

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

UTILITIES ENGINEERING SEC.
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Signature NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 045626 WILLIAM B. KEATON 9/16/2026

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MATCHLINE - SEE SHEET UC-4

MATCHLINE - SEE SHEET UC-6

122 LF 6" WATER LINE
-WL1B- DIP PC350, 685 LF TOTAL

46 LF 8" SANITARY GRAVITY SEWER
-SS2- PVC SDR 26
CONNECT TO EXISTING MANHOLE

1201 LF 16" WATER LINE
-WL2- DIP PC250, 7,765 LF TOTAL

6" VALVE
-WL1B- STA. 11+94.19

8"X6" REDUCER
-WL1B- STA. 11+86.69

TIE-IN TO EXIST. 8" PVC WATER LINE W/ SOLID SLEEVE W/ THRUST BLOCKING AS NEEDED

2-45° BEND

8" VALVE

8"X8"X8" TEE
-WL1B- STA. 11+35.05

FIRE HYDRANT
6" VALVE
10 LF FIRE HYDRANT LEG

6"X6"X6" FH TEE
-WL1B- STA. 11+19.79

187 LF 8" WATER LINE
-WL1B- DIP PC350

90° BEND
8"X8"X8" TEE
-WL1B- STA. 11+01.93
90° BEND

-WL1A- STA. 11+54.07
TIE-IN TO EXIST. 6" PVC WATER LINE W/ SOLID SLEEVE W/ THRUST BLOCKING AS NEEDED

45° BEND (HORZ.)
-WL1A- STA. 11+44.07

6" VALVE
-WL1A- STA. 11+24.98

2-22.5° BEND (ROTATED)
-WL1A- STA. 11+16.98
-WL1A- STA. 11+32.32

FIRE HYDRANT
6" VALVE
5 LF FIRE HYDRANT LEG

RELOCATE WATER METER

6"X6"X6" FH TEE
-WL1A- STA. 11+06.01

CONTRACTOR TO FIELD LOCATE EXIST. 4" SEWER SERVICE AND EXTEND TO NEW R/W AND INSTALL NEW CLEAN-OUT
(CONTINUED ON UC-4)

154 LF 6" WATER LINE
-WL1A- DIP PC350

RELOCATE WATER METER

35'x10' BORE PIT

8" VALVE
SEE NOTE 3
16"X16"X8" TEE
-WL2- STA. 26+91.78

90 LF 16" ENCASEMENT PIPE
58 LF BORE AND JACK OF 16"
T=0.281

CONTRACTOR TO VERIFY SANITARY SEWER LATERAL AND WATER METER ARE PLUGGED AND ABANDONED.

DEFLECT 1 JOINT 0.26°
-WL2- STA. 25+09.47

8" VALVE
-WL1- STA. 20+81.22

16" VALVE
-WL2- STA. 26+80.00

35'x10' BORE PIT

10'X10' RECEIVING PIT

90 LF 12" ENCASEMENT PIPE
51 LF BORE AND JACK OF 12"
T=0.250

-WL1- DEFLECTION
BEGIN STA: 17+54.88
END STA: 17+77.94
BEND RADIUS: 459.0'

RELOCATE WATER METER

-WL1- DEFLECTION
BEGIN STA: 17+12.94
END STA: 17+35.93
BEND RADIUS: 459.0' 8"X8"X6" TEE
-WL1- STA. 20+36.22
-WL1A- STA. 10+00.00
10'X10' RECEIVING PIT

1205 LF 8" WATER LINE
-WL1-DIP PC350, 3854 LF TOTAL

FIRE HYDRANT
6" VALVE
10 LF FIRE HYDRANT LEG

8"X8"X6" FH TEE
-WL1- STA. 23+09.39

8" VALVE
-WL1- STA. 23+35.00

8"X8"X6" TEE
-WL1- STA. 23+53.17

6" VALVE

RELOCATE WATER METER

11.25° BEND
RETAIN SANITARY SEWER CLEAN-OUT

84 LF 6" WATER LINE
DIP PC350
22.5° BEND
TIE-IN TO EXIST. 6" PVC WATER LINE W/ SOLID SLEEVE W/ THRUST BLOCKING AS NEEDED

45° BEND (HORZ.)
-WL1- STA. 25+88.26
45° BEND (ROTATED)
-WL1- STA. 26+01.82

8" VALVE
-WL1- STA. 27+01.93

8"X8"X8" TEE
-WL1- STA. 27+06.93
-WL1B- STA. 10+00.00

8" VALVE
-WL1- STA. 27+11.93

8"X8"X6" TEE
-WL1- STA. 27+19.67

6" VALVE
22.5° BEND

67 LF 6" WATER LINE
DIP PC350
45° BEND

TIE-IN TO EXIST. 6" PVC WATER LINE W/ SOLID SLEEVE W/ THRUST BLOCKING AS NEEDED

32 LF 16" ENCASEMENT PIPE
T=0.281

EXIST. 4" SANITARY SEWER
APPROX. LOCATION
CONNECT TO PROP. MANHOME

4' DIA. UTILITY MANHOLE
SSMH-7, -SS2- STA. 1+18.01
SEE NOTE 1

33 LF 8" SANITARY GRAVITY SEWER
-SS2- PVC SDR35

4' DIA. UTILITY MANHOLE
0.6 LF UTILITY MANHOLE WALL 4' DIA.
SSMH-6, -SS2- STA. 0+85.59

40 LF 8" SANITARY GRAVITY SEWER
-SS2- PVC SDR35

4' DIA. UTILITY MANHOLE
1.6 LF UTILITY MANHOLE WALL 4' DIA.
SSMH-5, -SS2- STA. 0+45.95

22.5° BEND (HORZ.)
-WL1- STA. 28+65.52

22.5° BEND (ROTATED)
-WL1- STA. 28+39.95

THE ESTIMATED QUANTITY OF DUCTILE IRON WATER PIPE FITTINGS ON THIS PLAN SHEET IS 5235 POUNDS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.

8/31/2026
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4′ DIA. UTILITY MANHOLE
2.1 LF MANHOLE WALL 4′ DIA.
SSMH-8, -SS3-
STA. 0+00.00
(DOGHOUSE MH)
SEE NOTE 2

FIRE HYDRANT
6″ VALVE
8 LF FIRE HYDRANT LEG
6″X6″X6″ FH TEE
-WL1B- STA. 16+52.55

62 LF 8″ SANITARY GRAVITY SEWER
-SS3- PVC SDR35

4′ DIA. UTILITY MANHOLE
2.3 LF UTILITY MANHOLE
WALL 4′ DIA.
SSMH-9, -SS3- STA. 0+62.09
(DOGHOUSE MH) SEE NOTE 2

-WL1B- DEFLECTION
BEGIN STA: 15+89.71
END STA: 16+55.36
BEND RADIUS: 764.0′

74 LF 16″ ENCASEMENT PIPE
T=0.281

-WL2- DEFLECTION
BEGIN STA: 31+89.64
END STA: 32+55.29
BEND RADIUS: 764.0′

-WL2- DEFLECTION
BEGIN STA: 31+08.41
END STA: 31+49.76
BEND RADIUS: 764.0′

-WL1B- DEFLECTION
BEGIN STA: 15+08.44
END STA: 15+49.79
BEND RADIUS: 764.0′

DEFLECT 1
JOINT 1.5°
-WL2- STA.
30+05.42
1.48°
DEFLECTION
-WL1B- STA.
14+05.89

MATCHLINE - SEE SHEET UC-5

NAD 83/NA 2011

-WL1B- STA. 18+71.13
TIE-IN TO EXIST. 6″ PVC
WATER LINE W/ SOLID SLEEVE
PROVIDE THRUST BLOCKING AS
NEEDED

45° BEND (ROTATED)
-WL1B- STA. 18+56.13

45° BEND (HORZ.)
-WL1B- STA. 18+39.47

563 LF 6″ WATER LINE
-WL1B- DIP PC350, 685 LF TOTAL

11.25° BEND (ROTATED)
-WL1B- STA. 16+90.86

6″ VALVE
-WL1B- STA. 17+31.02

90° BEND (ROTATED)
-WL1B- STA. 17+12.49

2-45° BEND
-WL2- STA. 33+51.74 (ROTATED)
-WL2- STA. 33+71.96 (HORZ.)

-WL2- DEFLECTION
BEGIN STA: 33+80.86
END STA: 34+05.62
BEND RADIUS: 764.0′

RELOCATE WATER METER

2-45° BEND (HORZ.)
-WL2- STA. 35+09.79
-WL2- STA. 35+30.04

117 LF 24″ ENCASEMENT PIPE

2″ BLOW OFF
-WL1C- STA. 11+58.80
REFER TO UNION COUNTY STANDARD
DETAIL 2A

12 LF 2″ WATER LINE
-WL1C- DIP PC350

2″ VALVE
-WL1C- STA. 11+55.80

8″ PLUG W/ 2″ TAP
-WL1C- STA. 11+47.15

8″ VALVE
-WL1C- STA. 11+42.15

160 LF 8″ WATER LINE
-WL1C- DIP PC350

FIRE HYDRANT
6″ VALVE
8 LF FIRE HYDRANT LEG
8″X8″X6″ FH TEE
-WL1C- STA. 11+30.39

10′X10′ RECEIVING PIT

22.5° BEND (ROTATED)
-WL2- STA. 38+91.74

16″ VALVE
-WL2- STA. 38+78.94

22.5° BEND (HORZ.)
-WL2- STA. 38+68.27

RELOCATE WATER METER

1421 LF 16″ WATER LINE
-WL2- DIP PC250, 7,765 LF TOTAL

2-45° BEND (HORZ.)
-WL2- STA. 37+01.59
-WL2- STA. 37+18.66

22.5° BEND
(HORZ.)
-WL2- STA.
40+54.05

22.5° BEND (HORZ.)
-WL2- STA. 40+62.59

2-22.5° BEND (HORZ.)
-WL2- STA. 41+24.45
-WL2- STA. 41+29.59

RELOCATE WATER METER

-WL2- DEFLECTION
BEGIN STA: 41+29.59
END STA: 41+74.87
BEND RADIUS: 764.0′

-WL2- DEFLECTION
BEGIN STA: 41+74.87
END STA: 42+40.34
BEND RADIUS: 764.0′

-WL2- DEFLECTION
BEGIN STA: 42+40.34
END STA: 42+75.43
BEND RADIUS: 764.0′

RELOCATE
WATER METER

MATCHLINE - SEE SHEET UC-7

11.25° BEND(HORZ.)
-WL1- STA:
31+21.00
11.25° BEND(HORZ.)
-WL1- STA. 31+64.49

RELOCATE WATER METER

1.75°
DEFLECTION(HORZ.)
-WL1- STA. 29+81.38

8″X8″X6″ TEE
-WL1- STA. 32+17.63
SEE NOTE 4

8″ VALVE
-WL1- STA. 32+22.13

FIRE HYDRANT
6″ VALVE
7 LF FIRE HYDRANT LEG
6″X6″X6″ FH TEE
SEE SHEET UC-3D FOR
DETAIL 7A

0.46° DEFLECTION(HORZ.)
-WL1- STA. 34+52.65

11.25° BEND(HORZ.)
-WL1- STA. 32+42.62

11.25° BEND(HORZ.)
-WL1- STA. 32+28.29

92 LF 8″ SANITARY GRAVITY SEWER
-SS3-DIP PC350

4′ DIA. UTILITY MANHOLE
0.3 LF UTILITY MANHOLE 4′
DIA.
SSMH-10, -SS3- STA. 1+53.56

6″ PLUG W/ 2″ TAP

2″ VALVE

45° BEND

21 LF 2″ WATER LINE
PVC 1120

22.5° BEND
CONNECT TO EXISTING 2″ PVC WATER LINE
WITH THRUST BLOCKING AS NEEDED

107 LF 8″ SANITARY GRAVITY SEWER
-SS3-DIP PC350

4′ DIA. UTILITY MANHOLE
0.3 LF UTILITY MANHOLE
WALL 4′ DIA.
SSMH-11, -SS3- STA. 2+61.14
SEE NOTE 1 & NOTE 3

EXIST. 4″ SAN. SEWER
APPROX. LOCATION

0.23° DEFLECTION(HORZ.)
-WL1- STA. 37+80.51

1400 LF 8″ WATER LINE
-WL1- DIP PC350, 3854 LF TOTAL

RELOCATE WATER METER

8″X8″X8″ TEE
-WL1- STA. 38+88.40
-WL1C- STA. 9+87.06

125 LF 16″ ENCASEMENT PIPE
65 LF BORE AND JACK OF 16″
T=0.281

8″ VALVE
-WL1- STA. 38+93.41

35′X10′ BORE PIT

3-RELOCATE WATER METER

1.20° DEFLECTION (HORZ.)
-WL1- STA: 40+38.54

2-RELOCATE WATER METER

THE ESTIMATED QUANTITY OF DUCTILE IRON WATER PIPE FITTINGS ON THIS PLAN SHEET IS 8000 POUNDS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.

NOTES:

1. CONTRACTOR TO FIELD LOCATE EXIST. 4″ SANITARY SEWER. APPROX. LOCATION SHOWN.
2. SSMH-8, SSMH-9, AND THE 8″ SEWER BETWEEN THEM ARE TO BE INSTALLED, TESTED, AND ACTIVATED IN ONE NIGHT OF WORK.
3. TEST ALL NEW DOWNSTREAM SEWER PIPE AND NEW MANHOLES PRIOR TO SETTING AND CONNECTING TO MANHOLE.
4. ALL WORK FOR CONNECTION TO EXISTING 2″ WATER LINE IS TO BE PERFORMED AT THE SAME TIME, INCLUDING TIE-IN.

SCALE 1" = 50'
0 50 100 150 200

PROJECT REFERENCE NO.	SHEET NO.
U-4714BA	UC-6

DESIGNED BY:	RTK
DRAWN BY:	RTK
CHECKED BY:	DKP
APPROVED BY:	
REVISED:	

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
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Signature NORTH CAROLINA WILLIAM B. KEATON SEAL 045626 ENGINEER
9/16/2026

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45° BEND (HORZ.)
-WL2 STA. 43+82.74

10 LF 8" SANITARY GRAVITY SEWER
-SS4A-DIP PC350
STUB-OUT OF MANHOLE # W/DIP PC350, MAINTAIN SLOPE & INVERT OF EXIST. 8" SEWER

4' DIA. UTILITY MANHOLE
4.5 LF UTILITY MANHOLE WALL 4' DIA.
SSMH-16, -SS4A- STA. 0+88.27
OUTSIDE DROP MANHOLE SEE NOTE 2

89 LF 8" SANITARY GRAVITY SEWER
-SS4A-DIP PC350
45° BEND (HORZ.)
-WL2- STA. 44+21.68
16" VALVE
-WL2- STA. 44+26.68

2-RELOCATE WATER METER

45° BEND
-WL1D- STA. 11+45.00

6" VALVE
-WL1D- STA. 11+60.00

6" PLUG W/ 2" TAP
-WL1D- STA. 11+65.00

-WL1D- STA. 11+81.48
TIE-IN TO EXIST. 2" PVC WATER LINE W/ SOLID SLEEVE

16 LF 2" WATER LINE
PVC 1120

45° BEND
-WL1D- STA. 11+71.48

FIRE HYDRANT
6" VALVE
6 LF FIRE HYDRANT LEG
6"X6"X6" FH TEE -WL1D- STA. 11+42.00

10'X10' RECEIVING PIT

4' DIA. UTILITY MANHOLE
3.5 LF MANHOLE WALL 4' DIA.
SSMH-12, -SS4- STA. 0+00.00
SSMH-12, -SS4A- STA. 0+00.00
DOGHOUSE MANHOLE

2-45° BEND (HORZ.)
-WL2- STA. 45+09.98
-WL2- STA. 45+27.70

42 LF 8" SANITARY GRAVITY SEWER
-SS4- PVC SDR26

4' DIA. UTILITY MANHOLE
4.1 LF UTILITY MANHOLE WALL 4' DIA.
SSMH-13, -SS4- STA. 0+42.39

11 LF 8" SANITARY GRAVITY SEWER
PVC SDR26 (EXTEND AT EXIST. SLOPE)

128 LF 8" SANITARY GRAVITY SEWER
-SS4- PVC SDR26

2-22.5° BEND (HORZ.)
-WL2- STA. 45+67.52
-WL2- STA. 45+87.16

RECONNECT WATER METER

149 LF 6" WATER LINE
-WL1D- DIP PC350

119 LF 12" ENCASEMENT PIPE
93 LF BORE AND JACK OF 12"
35'X10' BORE PIT

RELOCATE WATER METER

4' DIA. UTILITY MANHOLE
3.8 LF UTILITY MANHOLE WALL 4' DIA.
SSMH-15, -SS4- STA. 2+39.55
SEE NOTE 2

RELOCATE WATER METER
2" BLOWOFF UC DETAIL #2
2" VALVE

71 LF 8" SANITARY GRAVITY SEWER
-SS4-DIP PC350

4' DIA. UTILITY MANHOLE
2.2 LF UTILITY MANHOLE WALL 4' DIA.
SSMH-14, -SS4- STA. 1+69.30

8"X8"X6" TEE (ROTATED)
-WL1- STA. 44+25.86
-WL1D- STA. 10+00.00

8" VALVE
-WL1- STA. 44+30.96

2-22.5° BEND (HORZ.)
-WL1- STA. 44+60.27

-WL1- STA. 44+83.51

2" VALVE

227 LF 2" WATER LINE

8" PLUG W/ 2" TAP ON TEE
8"X8"X8" TEE
-WL1- STA. 44+95.26

8" VALVE
-WL1- STA. 45+13.31

11.25° BEND (HORZ.)
-WL1- STA. 45+18.31

45° BEND (HORZ.)
-WL1- STA. 45+23.06

22.5° BEND (HORZ.)
-WL1- STA. 45+83.43

418 LF 8" WATER LINE
-WL1- DIP PC350, 3854 LF TOTAL

8" PLUG

22.5° BEND (HORZ.)
-WL1- STA. 47+32.52
REMOVE EXIST. 90° BEND AND TIE-IN TO EXIST 8" PVC WATER LINE W/ 8" SLEEVE

THE ESTIMATED QUANTITY OF DUCTILE IRON WATER PIPE FITTINGS ON THIS PLAN SHEET IS 6805 POUNDS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.

NOTES:

1. CONTRACTOR TO FIELD LOCATE EXIST. 4" SANITARY SEWER. APPROX. LOCATION SHOWN.
2. TEST DOWNSTREAM SEWER * PRIOR TO SETTING SSMH-15 AND SSMH-16 AND CONNECTING TO EX. 8" SEWER.

SCALE 1" = 50'
0 50 100 150 200

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FIRE HYDRANT
6" VALVE
6 LF FIRE HYDRANT LEG
16"X16"X6" FH TEE
-WL2- STA. 50+09.51

30 LF 6" WATER LINE
DIP PC350

1415 LF 16" WATER LINE
-WL2- DIP PC250, 7,765 LF TOTAL

16" VALVE
-WL2- STA. 53+92.11

58 LF 24" ENCASEMENT PIPE
T=0.375

16"X16"X6" TEE
-WL2- STA. 53+16.75
-WL2A- STA. 10+00.00

10'X10' RECEIVING PIT

-WL2- DEFLECTION
BEGIN STA: 52+51.59
END STA: 53+07.30
BEND RADIUS: 764.0'

-WL2- DEFLECTION
BEGIN STA: 51+38.63
END STA: 52+08.32
BEND RADIUS: 764.0'

123 LF 8" SANITARY GRAVITY SEWER
-SS5- PVC SDR 26

4' DIA. UTILITY MANHOLE
3.5 LF UTILITY MANHOLE WALL 4' DIA.
SSMH-17, -SS5- STA. 1+23.12

151 LF 8" SANITARY GRAVITY SEWER
-SS5- PVC SDR26

4' DIA. UTILITY MANHOLE
4.0 LF UTILITY MANHOLE WALL 4' DIA.
SSMH-18, -SS5- STA. 2+73.56
(DOGHOUSE MANHOLE) SEE NOTE 1

EXIST. 4" SAN. SEWER APPROX. LOCATION

TIE-IN TO EXIST. 6" PVC WATER LINE W/ SOLID SLEEVEDIP TO PVC TRANSITION COUPLING

22.5° BEND
11.25° BEND

16"X16"X6" TEE
-WL2- STA. 54+00.35
-WL2- DEFLECTION
BEGIN STA: 56+79.77
END STA: 57+62.02
BEND RADIUS: 764.0'

RELOCATE WATER METER

-WL2- DEFLECTION
BEGIN STA: 55+99.09
END STA: 56+72.53
BEND RADIUS: 764.0'

-WL2- DEFLECTION
BEGIN STA: 54+24.18
END STA: 54+51.61
BEND RADIUS: 764.0'

2-RELOCATE WATER METER

35'X10' BORE PIT

RELOCATE WATER METER

145 LF 12" ENCASEMENT PIPE
69 LF BORE AND JACK OF 12"
T=0.250

45° BEND (ROTATED)
-WL2A- STA. 11+59.97

219 LF 6" WATER LINE
-WL2A- DIP PC350

FIRE HYDRANT
6" VALVE
12 LF FIRE HYDRANT LEG
6"X6"X6" FH TEE
-WL2A- STA. 11+92.32
45° BEND (HORZ.)
-WL2A- STA. 12+08.88
-WL2A- STA. 12+18.88
TIE-IN TO EXIST. 6" PVC WATER LINE W/ SOLID SLEEVE

4' DIA. UTILITY MANHOLE
2.5 LF UTILITY MANHOLE WALL 4' DIA.
SSMH-25, -SS6- STA. 7+96.81

166 LF 8" SANITARY GRAVITY SEWER
-SS6- PVC SDR26 (230 LF TOTAL)

2-RELOCATE WATER METER

MATCHLINE - SEE SHEET UC-6

MATCHLINE - SEE SHEET UC-8

FEATURE		
Walk *	5	5
Ped Clear *	-	-
Min Green	7	12
Passage *	2.0	2.0
Max 1 *	15	90
Yellow Change	3.0	4.7
Red Clear	2.3	1.1
Red Revert	2.0	2.0
Added Initial *	-	25
Maximum Initial *	-	90
Time Before Reduction *	-	-
Time To Reduce *	-	-
Minimum Gap	-	3.0
Advance Walk	-	-
Non Lock Detector	X	-
Vehicle Recall	-	MIN RECALL
Dual Entry	-	-

* These values may be field adjusted. Do not adjust Min G is shown. Min Green for all other phases should not be l

PROJECT REFERENCE NO.	SHEET NO.
U-4714BA	UC-7
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DRAWN BY: RTK	
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NC License Number F-0991

8/27/2026
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16 LF 4" SANITARY GRAVITY SEWER
4' DIA. UTILITY MANHOLE
2.4 LF UTILITY MANHOLE WALL 4' DIA.
SSMH-20, -SS6- STA. 0+12.93
SANITARY SEWER CLEAN-OUT
207 LF 8" SANITARY GRAVITY SEWER
-SS6- PVC SDR26
2-RELOCATE WATER METER
1-RELOCATE 1" RPZ BACKFLOW PREVENTION ASSEMBLY
86 LF 24" ENCASEMENT PIPE T=0.375
4' DIA. UTILITY MANHOLE
5.6 LF UTILITY MANHOLE WALL 4' DIA.
SSMH-21, -SS6- STA. 2+19.73
45° BEND (HORZ.)
-WL2- STA. 60+79.12
21 LF 8" SANITARY GRAVITY SEWER
-SS6- PVC SDR26
RELOCATE WATER METER
RELOCATE 1" RPZ BACKFLOW PREVENTION ASSEMBLY
4' DIA. UTILITY MANHOLE
5.7 LF UTILITY MANHOLE WALL 4' DIA.
SSMH-22, -SS6- STA. 2+41.03
72 LF 8" SANITARY GRAVITY SEWER
-SS6- PVC SDR26
45° BEND (HORZ.)
-WL2- STA. 60+43.28
11.25° BEND (HORZ.)
-WL2- STA. 60+16.84
22.5° BEND (ROTATED)
-WL2- STA. 60+11.67
45° BEND (HORZ.)
-WL2- STA. 59+92.90
22.5° BEND (HORZ.)
-WL2- STA. 57+62.02
22.5° BEND (ROTATED)
-WL2- STA. 58+16.57
-WL2- DEFLECTION
BEGIN STA: 58+69.80
END STA: 59+90.02
BEND RADIUS: 764.0'
FIRE HYDRANT
6" VALVE
20 LF FIRE HYDRANT LEG
16"X16"X6" FH TEE
-WL2- STA. 59+25.00
13 LF 8" SANITARY GRAVITY SEWER
-SS6-DIP PC350
RECONNECT WATER METER
4' DIA. UTILITY MANHOLE
2.6 LF UTILITY MANHOLE WALL 4' DIA.
SSMH-19, -SS6- STA. 0+00.00
SSMH-19, -SS6B- STA. 0+00.00
DOGHOUSE MANHOLE
CONTRACTOR TO ENSURE CONSTRUCTION OF PROP. DRAINAGE CATCH BASIN DOES NOT IMPACT PROP. MANHOLE
-WL3- STA. 13+23.07
TIE-IN TO EXIST. 6" AC WATER LINE W/ EJ PRESCOTT STYLE 501 COUPLING OR EQUAL
10 LF 6" WATER LINE
-WL3- DIP PC350
8"X6" REDUCER
-WL3- STA. 13+13.07
8" VALVE
-WL3- STA. 13+08.07
57 LF 8" SANITARY GRAVITY SEWER
-SS6B-DIP PC350
20 LF 16" ENCASEMENT PIPE T=0.281
2-22.5° BEND (HORZ.)
-WL3- STA. 12+00.00
-WL3- STA. 12+23.07
293 LF 8" WATER LINE
-WL3- DIP PC350
2-45° BEND (HORZ.)
-WL3- STA. 10+15.00
-WL3- STA. 10+32.61
8" VALVE
-WL3- STA. 10+05.00
RECONNECT WATER METER
16"X16"X8" TEE
-WL2- STA. 61+75.79
-WL3- STA. 10+00.00
90° BEND (HORZ.)
-WL2- STA. 61+80.79
2-45° BEND (HORZ.)
-WL2- STA. 61+92.93
-WL2- STA. 62+14.38
16" VALVE
-WL2- STA. 62+23.91
16"X16"X16" TEE
-WL2- STA. 62+28.41
-WL4- STA. 10+00.00
115 LF 24" ENCASEMENT PIPE
62 LF BORE AND JACK OF 24" T=0.375
45° BEND (HORZ.)
-WL2- STA. 62+32.78
2-22.5° BEND (ROTATED)
-WL2- STA. 62+43.62
-WL2- STA. 62+65.70
2-RELOCATE WATER METER
1" RPZ BACKFLOW PREVENTION ASSEMBLY
REPLACE DCVA WITH RPZ
35'x10' BORE PIT
RELOCATE WATER METER
10'X10' RECEIVING PIT
90° BEND (ROTATED)
-WL4- STA. 11+34.00
16" VALVE
-WL4- STA. 11+42.68
45° BEND (HORZ.)
-WL4- STA. 11+52.68
22.5° BEND (HORZ.)
-WL4- STA. 11+72.68
22.5° BEND (HORZ.)
-WL4- STA. 11+96.73
RELOCATE WATER METER
SEE NOTE 1
389 LF 16" WATER LINE
-WL4- DIP PC250, 931 LF TOTAL
RELOCATE 1" RPZ BACKFLOW PREVENTION ASSEMBLY
RELOCATE WATER METER
RELOCATE WATER METER
RELOCATE 1" RPZ BACKFLOW PREVENTION ASSEMBLY
-WL2- DEFLECTION
BEGIN STA: 63+66.79
END STA: 65+49.82
BEND RADIUS: 764.0'
-WL2- DEFLECTION
BEGIN STA: 65+57.58
END STA: 66+47.63
BEND RADIUS: 764.0'
FIRE HYDRANT
6" VALVE
9 LF FIRE HYDRANT LEG
16"X16"X6" FH TEE
-WL2- STA. 66+62.27
2-22.5° BEND
-WL2- STA. 66+72.85 (HORZ.)
-WL2- STA. 67+01.21 (ROTATED)
10'x10' RECEIVING PIT
53 LF 24" ENCASEMENT PIPE
53 LF BORE AND JACK OF 24" T=0.375
35'x10' BORE PIT
1320 LF 16" WATER LINE
-WL2- DIP PC250, 7,765 LF TOTAL
RELOCATE WATER METER
RELOCATE 1" RPZ BACKFLOW PREVENTION ASSEMBLY
2-RELOCATE WATER METER
12 LF 8" SANITARY GRAVITY SEWER
-SS7- PVC SDR26
SEE NOTE 2
4' DIA. UTILITY MANHOLE
5.0 LF UTILITY MANHOLE WALL 4' DIA.
SSMH-33, -SS7- STA. 19+02.85
2-RELOCATE WATER METER
DO NOT DISTURB EXISTING BACKFLOW PREVENTORS
182 LF 8" SANITARY GRAVITY SEWER
-SS7- PVC SDR26, 400 LF TOTAL
4' DIA. UTILITY MANHOLE
5.2 LF UTILITY MANHOLE 4' DIA.
SSMH-24, -SS6- STA. 5+66.81
64 LF 8" SANITARY GRAVITY SEWER
-SS6- PVC SDR26 (230 LF TOTAL)
241LF 8" SANITARY GRAVITY SEWER
-SS6- PVC SDR26
4' DIA. UTILITY MANHOLE
9.2 LF UTILITY MANHOLE WALL 4' DIA.
SSMH-23, -SS6- STA. 3+21.63
SSMH-23, -SS6A- STA. 0+00.00
OUTSIDE DROP MANHOLE
46 LF 8" SANITARY GRAVITY SEWER
-SS6A- PVC SDR26
RELOCATE WATER METER
4' DIA. UTILITY MANHOLE
1.8 LF UTILITY MANHOLE 4' DIA.
SSMH-26, -SS6A- STA. 0+45.09
MATCHLINE - SEE SHEET UC-7
MATCHLINE - SEE SHEET UC-9
MATCHLINE - SEE SHEET UC-11
CL-B RIP RAP EST 5 TONS
14 S.Y. GEOTEXTILE
DO NOT DISTURB SIGN
SCALE 1" = 50'
0 50 100 150 200
NAD 83/NA 2011

PROJECT REFERENCE NO.	SHEET NO.
U-4714BA	UC-8
DESIGNED BY: RTK	
DRAWN BY: RTK	
CHECKED BY: DKP	
APPROVED BY:	
REVISED:	

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
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Signature NORTH CAROLINA WILLIAM B. KEATON 045626 ENGINEER WILLIAM B. KEATON 9/16/2026
SEAL 045626
UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION

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2151 Hawkins Street, Suite 1400
Charlotte, NC 28203
NC License Number F-0991

THE ESTIMATED QUANTITY OF DUCTILE IRON WATER PIPE FITTINGS ON THIS PLAN SHEET IS 8785 POUNDS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.

NOTES:

1. CONTRACTOR VERIFY 3/4" WATER METER FEEDS SERVICE LINE TO 1" RPZ. TRACE SERVICE LINES AS NEEDED. IF WATER METER FEEDS RPZ, RELOCATE METER TO STA. 13+00±. MATCH EXISTING SERVICE LINE DIAMETER.
2. CONTRACTOR TO VERIFY AND MATCH PIPE DIAMETER. IF EX. SS LATERAL IS 4" IN DIAMETER, EXTENSION SHOULD BE 4" SCH. 40 PVC.

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Mike.Gallagher

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SCALE 1" = 50'

0 50 100 150 200

NOTES:

1. PROPOSED RELOCATED METER WILL NOT BE CONNECTED TO EXISTING WATER SERVICE PIPE.

NAD 83/NA 2011

PROJECT REFERENCE NO.	SHEET NO.
U-4714BA	UC-9
DESIGNED BY: RTK	
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REVISED:	

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Signature NORTH CAROLINA LICENSED PROFESSIONAL ENGINEER SEAL 045626 ENGINEER WILLIAM B. KEATON 9/16/2026

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MATCHLINE - SEE SHEET UC-8

MATCHLINE - SEE SHEET UC-10

DEFLECT 1 JOINT 1.5°
-WL2- STA 71+03.41

RECONNECT WATER METER

RELOCATE WATER METER

RELOCATE RPZ 1" BACKFLOW PREVENTION ASSEMBLY

FIRE HYDRANT
6" VALVE
8 LF FIRE HYDRANT LEG

16"X16"X6" FH TEE
-WL2- STA. 72+31.55

16" VALVE
-WL2- STA. 72+86.53

25'x10' BORE PIT

16"X16"X8" TEE
-WL2- STA. 72+99.22
-WL2B- STA. 10+00.00

8" VALVE
-WL2B- STA. 10+05.00

88 LF 16" ENCASEMENT PIPE
83 LF BORE AND JACK OF 16"
T=0.281

172 LF 8" WATER LINE
-WL2B- DIP PC350

-WL2- DEFLECTION
BEGIN STA: 73+44.57
END STA: 74+09.60
BEND RADIUS: 764.0'

-WL2- DEFLECTION
BEGIN STA: 75+79.06
END STA: 76+73.59
BEND RADIUS: 764.0'

RELOCATE WATER METER

DO NOT DISTURB EXISTING BACKFLOW PREVENTOR

4' DIA. UTILITY MANHOLE
6.4 LF UTILITY MANHOLE WALL 4' DIA.

SSMH-32, -SS7- STA. 15+02.85

10'x10' BORE PIT

2-45° BEND
-WL2B- STA. 11+02.03
(ROTATED)
-WL2B- STA. 11+25.28
(HORZ.)

22.5° BEND (HORZ.)
-WL2B- STA. 11+36.09

22.5° BEND (ROTATED)
-WL2B- STA. 11+61.25

-WL2B- STA. 11+71.25
TIE-IN TO EXIST. 8" WATER LINE W/ SOLID SLEEVE

218 LF 8" SANITARY GRAVITY SEWER
-SS7- PVC SDR26, 400 LF TOTAL

RELOCATE WATER METER

400 LF 8" SANITARY GRAVITY SEWER
-SS7- PVC SDR26

RELOCATE WATER METER

4' DIA. UTILITY MANHOLE
4.1 LF UTILITY MANHOLE WALL 4' DIA.

SSMH-31, -SS7- STA. 11+02.85
SOLID LID

10'X10' RECEIVING PIT

2-RELOCATE 1" RPZ BACKFLOW PREVENTION ASSEMBLY

35'X10' BORE PIT

RELOCATE WATER METER

FIRE HYDRANT
6" VALVE
106 LF FIRE HYDRANT LEG

-WL2C- STA. 11+03.35 (VALVE)
-WL2C- STA. 11+06.35 (FH)
FIRE HYDRANT & VALVE TO BE LOCATED ON STALLINGS FIRE DEPT. PROPERTY
FIRE HYDRANT TO BE POINTED TOWARDS FIRE DEPT.

246 LF 8" SANITARY GRAVITY SEWER
-SS7- PVC SDR26

FIRE HYDRANT
6" VALVE
12 LF FIRE HYDRANT LEG

16"X16"X6" FH TEE
-WL2- STA. 78+37.61

1398 LF 16" WATER LINE
-WL2- DIP PC250, 7,765 LF TOTAL

RELOCATE WATER METER
SEE NOTE 1

-WL2- DEFLECTION
BEGIN STA: 78+00.57
END STA: 78+39.99
BEND RADIUS: 764.0'

16"X16"X6" TEE
-WL2- STA. 77+93.03
-WL2C- STA. 10+00.00

10'X10' RECEIVING PIT

-WL2- DEFLECTION
BEGIN STA: 77+21.72
END STA: 77+86.45
BEND RADIUS: 764.0'

RELOCATE WATER METER

END TIP PROJECT U-4714BA
BEGIN FUTURE TIP PROJECT U-4714BB
-L- POT STA. 78+12.35 LB
-LBA- POT STA. 10+00.00 LA

-WL2- DEFLECTION
BEGIN STA: 83+84.91
END STA: 85+40.10
BEND RADIUS: 764.0'

2-RELOCATE WATER METER

DEFLECT 1 JOINT 1.5°
-WL2- STA. 82+93.66

80 LF 12" ENCASEMENT PIPE
49 LF BORE AND JACK OF 12"
T=0.250

RELOCATE WATER METER

RELOCATE WATER METER

DEFLECT 1 JOINT 1.5°
-WL2- STA. 79+27.48

2-RELOCATE WATER METER

-WL2- DEFLECTION
BEGIN STA: 80+14.68
END STA: 80+52.39
BEND RADIUS: 764.0'

35'X10' BORE PIT

139 LF 8" SANITARY GRAVITY SEWER
-SS7- PVC SDR26, 377 LF TOTAL

4' DIA. UTILITY MANHOLE
3.0 LF UTILITY MANHOLE WALL 4' DIA.

SSMH-29, -SS7- STA. 4+57.11
SOLID LID

400 LF 8" SANITARY GRAVITY SEWER
-SS7- PVC SDR26

RELOCATE WATER METER

4' DIA. UTILITY MANHOLE
3.0 LF UTILITY MANHOLE WALL 4' DIA.

SSMH-30, -SS7- STA. 8+57.11
W/ SOLID LID

76 LF 6" SANITARY GRAVITY SEWER
PVC SDR35

SANITARY SEWER CLEAN-OUT

11 LF 6" SANITARY GRAVITY SEWER
PVC SDR35

SANITARY SEWER CLEAN-OUT

107 LF 16" ENCASEMENT PIPE
107 LF BORE AND JACK OF 16"

THE ESTIMATED QUANTITY OF DUCTILE IRON WATER PIPE FITTINGS ON THIS PLAN SHEET IS 3130 POUNDS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.

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NOTES:

1. PER UNION COUNTY INFORMATION THIS SEWER SEGMENT DOES NOT EXIST.
2. COORDINATE WITH UNION COUNTY FIELD REPRESENTATIVE FOR WATER AND SEWER AT THE GARMON STORAGE SITE.

SCALE 1" = 50'

0 50 100 150 200

NAD 83/NA 2011

PROJECT REFERENCE NO.	SHEET NO.
U-4714BA	UC-10
DESIGNED BY: RTK	
DRAWN BY: RTK	
CHECKED BY: DKP	
APPROVED BY:	
REVISED:	

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Signature NORTH CAROLINA LICENSED PROFESSIONAL ENGINEER SEAL 045626 ENGINEER WILLIAM B. KEATON
9/16/2026

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11.25° BEND (HORZ.)
-WL5- STA. 10+10.00

-WL5- STA. 10+00.00 TIE-IN TO EXIST. 12" WATER MAIN

11.25° BEND
-WL5- STA. 10+98.46

10' X 10' RECIEVING PIT

45 LF 24" ENCASEMENT PIPE
45 LF BORE AND JACK OF 24"
T=0.375

16" VALVE
-WL2- STA. 85+62.39

11.25° BEND (HORZ.)
-WL2- STA. 85+57.39

35'X10' BORE PIT

12"X8" REDUCER
-WL5- STA. 11+62.39

238 LF 8" SANITARY GRAVITY SEWER
-SS7- PVC SDR26, 377 LF TOTAL

11.25° BEND (HORZ.)
-WL5- STA. 11+23.53

12" VALVE
-WL5- STA. 11+28.53

162 LF 12" WATER LINE
-WL5- DIP PC350
35'X10' BORE PIT
16"X12" CROSS
-WL2- STA. 86+23.75
-WL5- STA. 11+59.47

312 LF 16" WATER LINE
-WL2- DIP PC250,
7,765 LF TOTAL

4' DIA. UTILITY MANHOLE
3.4 LF UTILITY MANHOLE WALL 4' DIA.
SSMH-27, -SS7- STA. 0+00.00

81 LF 8" SANITARY GRAVITY SEWER
-SS7- PVC SDR35
22.5° BEND (HORZ.)
-WL2- STA. 87+30.28

4' DIA. UTILITY MANHOLE
2.1 LF UTILITY MANHOLE WALL 4' DIA.
SSMH-28, -SS7- STA. 0+80.21
SSMH-28, -SS7A- STA. 0+00.00

16" VALVE
-WL2- STA. 87+63.49

16"X8" REDUCER
-WL2- STA. 87+73.48

89 LF 8" WATER LINE
-WL2- DIP PC350

22.5° BEND (HORZ.)
-WL2- STA. 88+52.75

-WL2- STA. 88+62.75
TIE-IN TO EXIST. 8" WATER MAIN WITH SOLID SLEEVE

SEE NOTE 2

SEE NOTE 1

ABANDON EXIST. WATER SERVICE

87 LF 8" SANITARY GRAVITY SEWER
-SS7A- PVC SDR26

3-RECONNECT WATER METER

120 LF 16" ENCASEMENT PIPE
120 LF BORE AND JACK OF 16"
T=0.281

END CONSTRUCTION
-L- POT STA. 85+85.86
-LBA- POT STA. 17+74.95

10' X 10' RECIEVING PIT

8" VALVE
-WL5- STA. 12+97.80

4' DIA. UTILITY MANHOLE
0.7 LF UTILITY MANHOLE WALL 4' DIA.
SSMH-37, -SS7A-

22.5° BEND (HORZ.)STA. 0+86.49
-WL5- STA. 13+17.80

FUTURE (PLANNED) GARMON STORAGE SSMH

45° BEND (HORZ.)
-WL5- STA. 13+74.28

222 LF 8" WATER LINE
-WL5- DIP PC350

-WL5- STA. 13+84.28
TIE-IN TO FUTURE 8" WATER MAIN BY GARMON STORAGE DEVELOPMENT.
IF LINE HAS NOT BEEN CONSTRUCTED, INSTALL BLOW OFF DETAIL 2B AND RELOCATE METERS AND TRANSFER WATER SERVICES TO NEW WATER MAIN.

THE ESTIMATED QUANTITY OF DUCTILE IRON WATER PIPE FITTINGS ON THIS PLAN SHEET IS 6145 POUNDS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.

MATCHLINE - SEE SHEET UC-9

BA BB

RAY B KILLOUGH DB 5106 PG 656

DENISE KILLOUGH WINDHAM
BRIAN NEAL WINDHAM
DB 4031 PG 737

RALPH KILLOUGH
DB N/F PG N/F

RAY BERNARD KILLOUGH
DB 3646 PG 330
REFERENCE MADE TO THIS DEED BUT NO DESCRIPTION FOUND

CREEKSIDE BIBLE CHURCH
DB 1572 PG 280

KENNETH GANTZ
INFO FOUND

LOT 4
ROBERT E JOHNSON
SALLY H JOHNSON
DB 1105 PG 848
PB B PG 158-B

LOT 3
JERRY B HUNEYCUTT
PB B PG 158-B

LOT 2
AKN HOLDINGS LLC
PB B PG 158-B

8/31/2026
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SCALE 1" = 50'

0 50 100 150 200

NAD 83/NA 2011

PROJECT REFERENCE NO.	SHEET NO.
U-4714BA	UC-11
DESIGNED BY: RTK	
DRAWN BY: RTK	
CHECKED BY: DKP	
APPROVED BY:	
REVISED:	

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Signature NORTH CAROLINA Licensed Professional Engineer SEAL 045626 ENGINEER WILLIAM B. KEATON 9/16/2026

UTILITY CONSTRUCTION PLANS ONLY

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2151 Hawkins Street, Suite 1400
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NC License Number F-0991

NOTES:

1. DCVA & VAULT MUST BE MOVED OUT OF R/W & BROUGHT TO CURRENT STANDARDS - RPZ

TIE-IN TO EXIST. 8" WATER LINE
33 LF 8" WATER LINE DIP PC350
2-22.5° BEND
8" VALVE
16"X16"X8" TEE -WL4- STA. 13+94.73
RELOCATE WATER METER
542 LF 16" WATER LINE -WL4- DIP PC250, 931 LF TOTAL
-WL4- DEFLECTION BEGIN STA: 13+88.86 END STA: 15+86.45 BEND RADIUS: ~~1300.0'~~
RELOCATE 1" RPZ BACKFLOW PREVENTION ASSEMBLY 1
RELOCATE WATER METER
2-45° BEND (HORZ.) -WL4- STA. 15+86.45 -WL4- STA. 16+11.36
1" RPZ BACKFLOW PREVENTION ASSEMBLY SEE NOTE 1 1
16"X16"X6" TEE -WL4- STA. 16+22.60
16"X16"X6" TEE -WL4- STA. 17+44.61
MATCHLINE - SEE SHEET UC-8
RELOCATE WATER METER
2" VALVE
RECONNECT WATER METER
FIRE HYDRANT 6" VALVE 7 LF FIRE HYDRANT LEG
16"X16"X6" FH TEE -WL4- STA. 16+60.00
CONTRACTOR TO FIELD LOCATE AND CONNECT TO EXIST. 2" WATER LINE
-WL4- DEFLECTION BEGIN STA: 16+85.76 END STA: 17+84.00 BEND RADIUS: 764.0'
2-45° BEND
75 LF 2" WATER LINE PVC 1120
2" VALVE
6" PLUG W/ 2" TAP ON TEE
RELOCATE WATER METER
16"X16"X8" TEE -WL4- STA. 19+00.46
16" VALVE -WL4- STA. 19+30.08
2" BLOW OFF -WL4- STA. 19+36.07 FOLLOW UC DETAIL 2B
5 LF 2" WATER LINE BRASS
2" VALVE -WL4- STA. 19+33.07
16" PLUG W/ 2" TAP -WL4- STA. 19+31.40
TIE-IN TO EXIST. 8" WATER LINE USING 8" SLEEVE AND CONCRETE THRUST BLOCKING
18 LF 8" WATER LINE DIP PC350
2-45° BEND (HORZ.)
8" PLUG ON EXISTING WATER LINE
RELOCATE WATER METER
CONNECT TO EXITING WATER SERVICE LINE

THE ESTIMATED QUANTITY OF DUCTILE IRON WATER PIPE FITTINGS ON THIS PLAN SHEET IS 3980 POUNDS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.

8/XX/2026
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Robert

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SCALE 1" = 50'

0 50 100 150 200

NAD 83/NA 2011

PROJECT REFERENCE NO.	SHEET NO.
U-4714BA	UC-22
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DRAWN BY: RTK	
CHECKED BY: DKP	
APPROVED BY:	
REVISED:	

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

NORTH CAROLINA UTILITIES SECTION SEAL 045626 ENGINEER WILLIAM B. KEATON 10/1/2026

UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STV Engineers, Inc.
2151 Hawkins Street, Suite 1400
Charlotte, NC 28203
NC License Number F-0991

END TIP PROJECT U-4714A
-L- POT STA. 193+50.61 =
BEGIN TIP PROJECT U-4714B
-L- POT STA. 10+00.00

U-4714A DESIGN BY OTHERS

(SEE SHEET UC-4)

REMOVE UTILITY MANHOLE

ABANDON 821 LF 6" UTILITY PIPE
5223 LF TOTAL

ABANDON 229 LF 8" UTILITY PIPE

ABANDON 32 LF 8" UTILITY PIPE

16 LF WATER SERVICE LINE

18 LF WATER SERVICE LINE

54 LF WATER SERVICE LINE

32 LF WATER SERVICE LINE

SANITARY SEWER CLEAN-OUT
RECONNECT CLEAN-OUT TO EXISTING SANITARY GRAVITY SEWER.

ADJUSTMENT OF MANHOLE

3-SANITARY SEWER CLEAN-OUT
RECONNECT CLEAN-OUT TO EXISTING SANITARY GRAVITY SEWER.

11 LF WATER SERVICE LINE

3-PLUGS

PLUG

SANITARY SEWER CLEAN-OUT
37 LF 4" GRAVITY SANITARY SEWER

REMOVE UTILITY MANHOLE

CL-I RIP RAP
EST. 40 TONS
100 S.Y. GEOTEXTILE

CL-B RIP RAP
EST. 5 TONS
14 S.Y. GEOTEXTILE

CL-B RIP RAP
EST. 2 TONS
7 S.Y. GEOTEXTILE

CL-8 RIP RAP
EST. 8 TONS
21 S.Y. GEOTEXTILE

CL-I OUTLET PROTECTION
EST. 55 TONS TOTAL
EST. 145 S.Y. GEOTEXTILE

18.0" 72° CL-V RCP BURIED W/CONC. SILL SKEW=45 (DETAIL 4-3)

MATCHLINE - SEE SHEET UC-23

SEE SHEET UC-4 FOR CORRESPONDING PROPOSED UTILITY NOTES

10/1/2026
U-4714BA_UC_Utilities\Sheets\AbandonU-4714B_UC_UC22.dgn

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SCALE 1" = 50'

0 50 100 150 200

NAD 83/NA 2011

PROJECT REFERENCE NO.	SHEET NO.
U-4714BA	UC-23
DESIGNED BY: RTK	
DRAWN BY: RTK	
CHECKED BY: DKP	
APPROVED BY:	
REVISED:	

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

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

Signed by: NORTH CAROLINA UTILITIES ENGINEER WILLIAM B. KEATON 3FA4F4C0035144C... SEAL 045626 ENGINEER WILLIAM B. KEATON 10/1/2026

UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION

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Charlotte, NC 28203
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MATCHLINE - SEE SHEET UC-22

MATCHLINE - SEE SHEET UC-24

SANITARY SEWER CLEAN-OUT
RECONNECT CLEAN-OUT TO EXISTING SANITARY GRAVITY SEWER. (SEE SHEET UC-5)

ABANDON 117 LF 6" UTILITY PIPE

REMOVE FIRE HYDRANT
CLOSE VALVE
REMOVE VALVE BOX

8 LF WATER SERVICE LINE

99 LF WATER SERVICE LINE

ABANDON 1200 LF 6" UTILITY PIPE
5223 LF TOTAL

ADJUSTMENT OF MANHOLE

VERIFY EXIST. WATER METER IS ABANDONED

ABANDON 104 LF 6" UTILITY PIPE

ADJUSTMENT OF MANHOLE

PLUG

PLUG

PLUG

PLUG

9 LF WATER SERVICE LINE

13 LF WATER SERVICE LINE

41 LF WATER SERVICE LINE

SANITARY SEWER CLEANOUT

9.03 LF 4" GRAVITY SANITARY SEWER

ABANDON 121 LF 6" UTILITY PIPE

REMOVE FIRE HYDRANT
CLOSE VALVE
REMOVE VALVE BOX

ADJUSTMENT OF MANHOLE

ABANDON 108 LF 6" UTILITY PIPE

ABANDON 107 LF 4" UTILITY PIPE

CONTRACTOR TO FIELD LOCATE EXIST. 4" SANITARY SEWER (APPROX. LOCATION SHOWN)

SEE SHEET UC-5 FOR CORRESPONDING PROPOSED UTILITY NOTES

10/1/2026
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SCALE 1" = 50'
0 50 100 150 200

NAD 83/NA 2011

PROJECT REFERENCE NO.	SHEET NO.
U-4714BA	UC-24
DESIGNED BY: RTK	
DRAWN BY: RTK	
CHECKED BY: DKP	
APPROVED BY:	
REVISED:	

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
UTILITIES ENGINEERING SEC.
PHONE:(919)707-6690
FAX:(919)250-4151

NORTH CAROLINA ENGINEERING SEAL 045626 WILLIAM B. KEATON
Signed by: WILLIAM KEATON
10/1/2026
UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STV Engineers, Inc.
2151 Hawkins Street, Suite 1400
Charlotte, NC 28203
NC License Number F-0991

MATCHLINE - SEE SHEET UC-23

MATCHLINE - SEE SHEET UC-25

BEGIN CONSTRUCTION

REMOVE FIRE HYDRANT

ABANDON 98 LF 2" UTILITY PIPE

154 LF WATER SERVICE LINE

CONNECT NEW METER LOCATION TO EXISTING WATER SERVICE LINE

SANITARY SEWER CLEAN-OUT
28 LF 4" GRAVITY SANITARY SEWER

ADJUSTMENT OF MANHOLE

SANITARY SEWER CLEAN-OUT
15 LF 4" GRAVITY SANITARY SEWER

ABANDON 1401 LF 6" UTILITY PIPE
5223 LF TOTAL

ABANDON 303 LF 6" UTILITY PIPE

ADJUSTMENT OF MANHOLE

123 LF WATER SERVICE LINE

SANITARY SEWER CLEAN-OUT
21 LF 4" GRAVITY SANITARY SEWER

SANITARY SEWER CLEAN-OUT
24 LF 4" GRAVITY SANITARY SEWER

126 LF WATER SERVICE LINE

SANITARY SEWER CLEAN-OUT
31 LF 4" GRAVITY SANITARY SEWER

ADJUSTMENT OF MANHOLE
PLUG AND ABANDON EXIST. SS LATERAL AND REMOVE EXIST. CLEAN-OUT

3-PLUGS

2-PLUGS

8 LF WATER SERVICE LINE

2-PLUGS

2-REMOVE WATER METER
CHECK W/ NCDOT R/W AGENT

ABANDON 52 LF 8" UTILITY PIPE

119 LF WATER SERVICE LINE

ABANDON UTILITY MANHOLE

SANITARY SEWER CLEAN-OUT
18 LF 4" GRAVITY SANITARY SEWER

SANITARY SEWER CLEAN-OUT
21 LF 4" GRAVITY SANITARY SEWER

ADJUSTMENT OF MANHOLE

ABANDON 176 LF 4" UTILITY PIPE

CONTRACTOR TO FIELD LOCATE EXIST. 4" SANITARY SEWER (APPROX. LOCATION SHOWN)

PLUG

ABANDON 78 LF 8" UTILITY PIPE

PLUG AND ABANDON EXIST. SS LATERAL AND REMOVE EXIST. CLEAN-OUT

SANITARY SEWER CLEAN-OUT
42 LF 4" GRAVITY SANITARY SEWER

11 LF WATER SERVICE LINE

SANITARY SEWER CLEAN-OUT
45 LF 4" GRAVITY SANITARY SEWER

21 LF WATER SERVICE LINE

SANITARY SEWER CLEAN-OUT
49 LF 4" GRAVITY SANITARY SEWER

SANITARY SEWER CLEAN-OUT
50 LF 4" GRAVITY SANITARY SEWER

10 LF WATER SERVICE LINE

SANITARY SEWER CLEAN-OUT
52 LF 4" GRAVITY SANITARY SEWER

22 LF WATER SERVICE LINE

SEE SHEET UC-6 FOR CORRESPONDING PROPOSED UTILITY NOTES

10/1/2026
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