

09/08/99

TIP PROJECT: R-2307B / I-5717

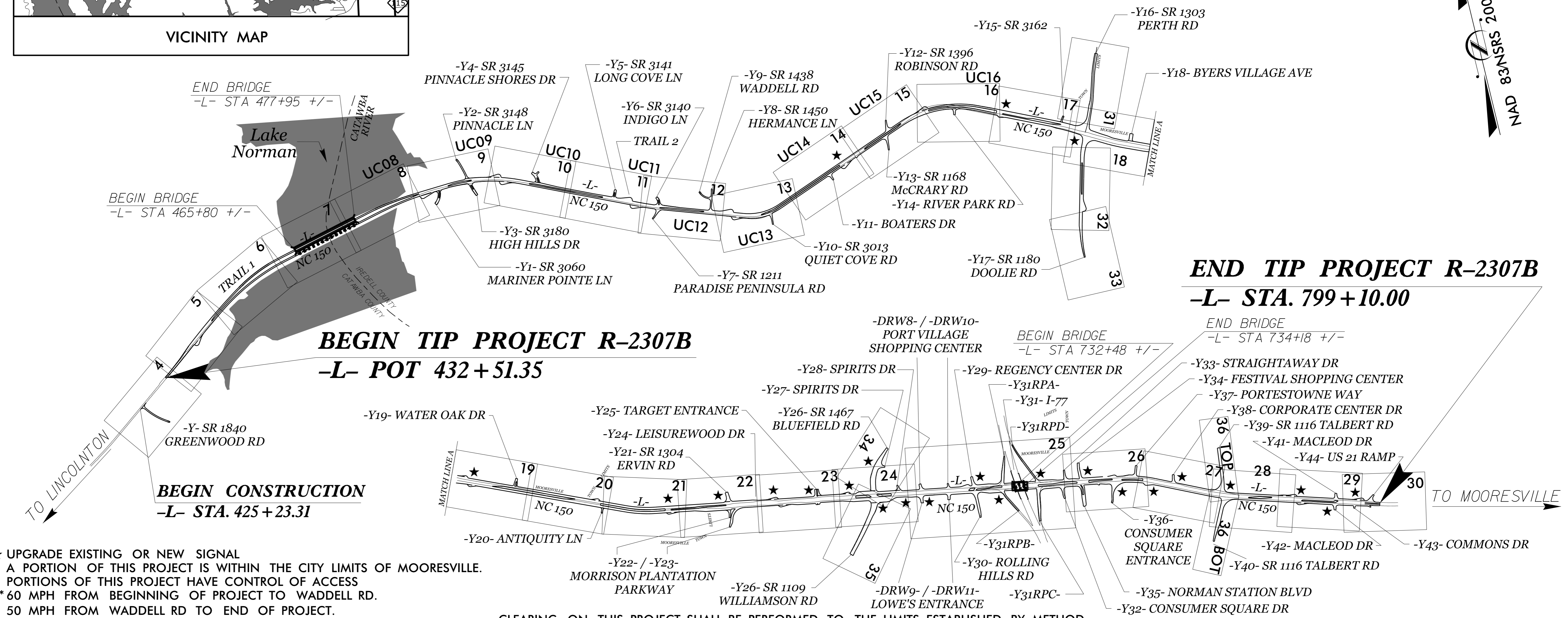
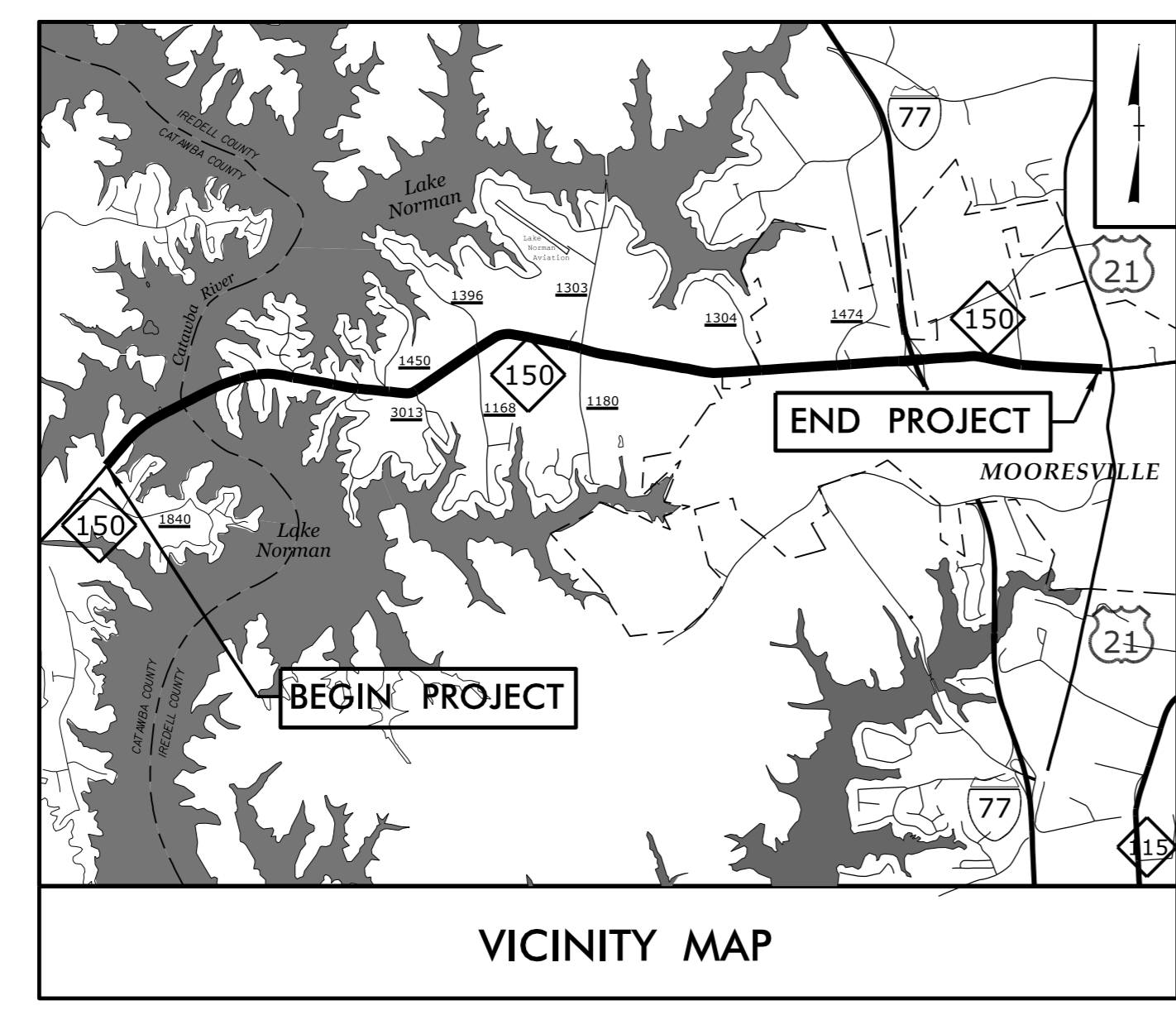
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

T.I.P. NO.	SHEET NO.
R-2307B / I-5717	UC-1

CATAWBA & IREDELL COUNTIES

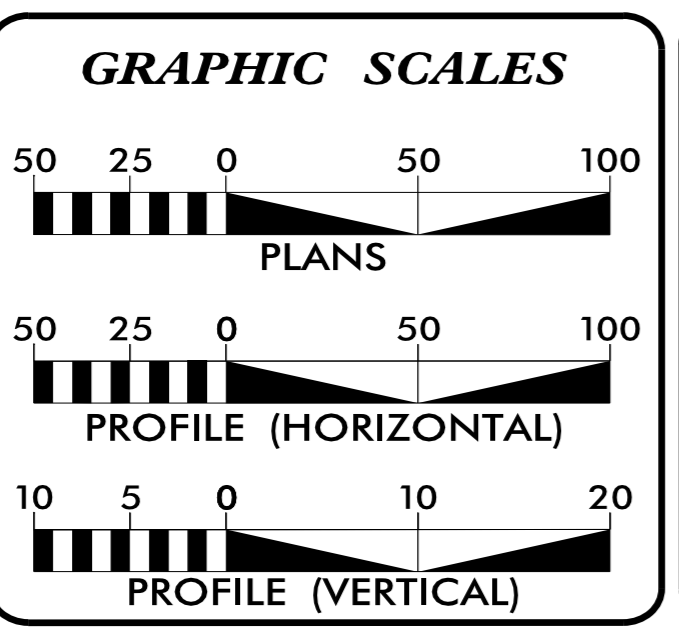
LOCATION: NC 150 FROM SR 1840 (GREENWOOD RD) IN CATAWBA COUNTY TO US 21 IN IREDELL COUNTY

TYPE OF WORK: WATER AND SEWER LINE RELOCATION



★ UPGRADE EXISTING OR NEW SIGNAL
A PORTION OF THIS PROJECT IS WITHIN THE CITY LIMITS OF MOORESVILLE.
PORTIONS OF THIS PROJECT HAVE CONTROL OF ACCESS
** 60 MPH FROM BEGINNING OF PROJECT TO WADDELL RD.
50 MPH FROM WADDELL RD TO END OF PROJECT.

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



INDEX OF SHEETS

SHEET NO.:	DESCRIPTION:
UC1	TITLE SHEET
UC2	UTILITY SYMBOLOGY
UC3A	NOTES
UC3B THRU UC3E	DETAILS
UC9 THRU UC16	UTILITY CONSTRUCTION PLAN & PROFILE SHEETS

WATER AND SEWER OWNERS ON PROJECT

(A) AQUA NORTH CAROLINA

PREPARED IN THE OFFICE OF

Dewberry 2610 WYCLIFF ROAD, SUITE 410
RALEIGH, NC 27607
919.881.9939
NCBELS: NO. F-0929

JOHN AKERS, PE	CONSULTANT CONTACT #1
PARROTT HOOD, PE	CONSULTANT CONTACT #2
JEFF WING, PE	CONSULTANT CONTACT #3

SEAL

8/21/2024

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

DONALD E. HAMPTON	UTILITIES REGIONAL ENGINEER
JONG-TAE YOON, PE	UTILITIES ENGINEER
AMY DUPLEE YORK	UTILITIES AREA COORDINATOR
STEVEN C. TREXLER	UTILITIES COORDINATOR

\$\$\$\$\$SYTIME\$\$\$\$\$
\$\$\$\$\$DGN\$\$\$\$\$
\$\$\$\$\$USERNAME\$\$\$\$\$

STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS CONVENTIONAL PLAN SHEET SYMBOLS

Note: Not to Scale *S.U.E. = Subsurface Utility Engineering

BOUNDARIES AND PROPERTY:

State Line	-----
County Line	-----
Township Line	-----
City Line	-----
Reservation Line	-----
Property Line	-----
Existing Iron Pin	○ EP
Property Corner	----->
Property Monument	□ EDM
Parcel/Sequence Number	⑫③
Existing Fence Line	-x-x-x-
Proposed Woven Wire Fence	○
Proposed Chain Link Fence	□
Proposed Barbed Wire Fence	◇
Existing Wetland Boundary	----- WLB
Proposed Wetland Boundary	----- WLB
Existing Endangered Animal Boundary	----- EAB
Existing Endangered Plant Boundary	----- EPB
Existing Historic Property Boundary	----- HPB
Known Contamination Area: Soil	☠
Potential Contamination Area: Soil	☠?
Known Contamination Area: Water	☠
Potential Contamination Area: Water	☠?
Contaminated Site: Known or Potential	☠?

BUILDINGS AND OTHER CULTURE:

Gas Pump Vent or U/G Tank Cap	○
Sign	○ S
Well	○ W
Small Mine	✕
Foundation	□
Area Outline	□
Cemetery	□
Building	□
School	□
Church	□
Dam	□

HYDROLOGY:

Stream or Body of Water	-----
Hydro, Pool or Reservoir	-----
Jurisdictional Stream	----- JS
Buffer Zone 1	----- BZ 1
Buffer Zone 2	----- BZ 2
Flow Arrow	←
Disappearing Stream	-----
Spring	○
Wetland	-----
Proposed Lateral, Tail, Head Ditch	-----
False Sump	-----

RAILROADS:

Standard Gauge	-----
RR Signal Milepost	○ MILEPOST 35
Switch	□ SWITCH
RR Abandoned	-----
RR Dismantled	-----

RIGHT OF WAY:

Baseline Control Point	◆
Existing Right of Way Marker	△
Existing Right of Way Line	-----
Proposed Right of Way Line	----- RW
Proposed Right of Way Line with Iron Pin and Cap Marker	----- RW
Proposed Right of Way Line with Concrete or Granite R/W Marker	----- RW
Proposed Control of Access Line with Concrete CA Marker	----- CA

Existing Control of Access	----- CA
Proposed Control of Access	----- CA
Existing Easement Line	----- E
Proposed Temporary Construction Easement	----- E
Proposed Temporary Drainage Easement	----- TDE
Proposed Permanent Drainage Easement	----- PDE
Proposed Permanent Drainage / Utility Easement	----- DUE
Proposed Permanent Utility Easement	----- PUE
Proposed Temporary Utility Easement	----- TUE
Proposed Aerial Utility Easement	----- AUE
Proposed Permanent Easement with Iron Pin and Cap Marker	-----

ROADS AND RELATED FEATURES:

Existing Edge of Pavement	-----
Existing Curb	-----
Proposed Slope Stakes Cut	----- C
Proposed Slope Stakes Fill	----- F
Proposed Curb Ramp	----- CR
Existing Metal Guardrail	-----
Proposed Guardrail	-----
Existing Cable Guiderail	-----
Proposed Cable Guiderail	-----
Equality Symbol	⊕
Pavement Removal	-----

VEGETATION:

Single Tree	☼
Single Shrub	☼
Hedge	-----
Woods Line	-----

Orchard	☼☼☼☼
Vineyard	□ Vineyard

EXISTING STRUCTURES:

MAJOR:	
Bridge, Tunnel or Box Culvert	----- CONC
Bridge Wing Wall, Head Wall and End Wall	----- CONC WW
MINOR:	
Head and End Wall	----- CONC HW
Pipe Culvert	-----
Footbridge	-----
Drainage Box: Catch Basin, DI or JB	□ CB
Paved Ditch Gutter	-----
Storm Sewer Manhole	○ S
Storm Sewer	----- S

UTILITIES:

POWER:	
Existing Power Pole	●
Proposed Power Pole	○
Existing Joint Use Pole	●
Proposed Joint Use Pole	○
Power Manhole	⊕
Power Line Tower	⊠
Power Transformer	⊠
U/G Power Cable Hand Hole	○
H-Frame Pole	●●
U/G Power Line LOS B (S.U.E.*)	----- P
U/G Power Line LOS C (S.U.E.*)	----- P
U/G Power Line LOS D (S.U.E.*)	----- P

TELEPHONE:

Existing Telephone Pole	●
Proposed Telephone Pole	○
Telephone Manhole	⊕
Telephone Pedestal	⊠
Telephone Cell Tower	⊠
U/G Telephone Cable Hand Hole	○
U/G Telephone Cable LOS B (S.U.E.*)	----- T
U/G Telephone Cable LOS C (S.U.E.*)	----- T
U/G Telephone Cable LOS D (S.U.E.*)	----- T
U/G Telephone Conduit LOS B (S.U.E.*)	----- TC
U/G Telephone Conduit LOS C (S.U.E.*)	----- TC
U/G Telephone Conduit LOS D (S.U.E.*)	----- TC
U/G Fiber Optics Cable LOS B (S.U.E.*)	----- T FO
U/G Fiber Optics Cable LOS C (S.U.E.*)	----- T FO
U/G Fiber Optics Cable LOS D (S.U.E.*)	----- T FO

WATER:

Water Manhole	⊕
Water Meter	○
Water Valve	⊗
Water Hydrant	⊕
U/G Water Line LOS B (S.U.E.*)	----- W
U/G Water Line LOS C (S.U.E.*)	----- W
U/G Water Line LOS D (S.U.E.*)	----- W
Above Ground Water Line	----- A/G Water

TV:

TV Pedestal	⊠
TV Tower	⊗
U/G TV Cable Hand Hole	○
U/G TV Cable LOS B (S.U.E.*)	----- TV
U/G TV Cable LOS C (S.U.E.*)	----- TV
U/G TV Cable LOS D (S.U.E.*)	----- TV
U/G Fiber Optic Cable LOS B (S.U.E.*)	----- TV FO
U/G Fiber Optic Cable LOS C (S.U.E.*)	----- TV FO
U/G Fiber Optic Cable LOS D (S.U.E.*)	----- TV FO

GAS:

Gas Valve	◇
Gas Meter	⊕
U/G Gas Line LOS B (S.U.E.*)	----- G
U/G Gas Line LOS C (S.U.E.*)	----- G
U/G Gas Line LOS D (S.U.E.*)	----- G
Above Ground Gas Line	----- A/G Gas

SANITARY SEWER:

Sanitary Sewer Manhole	⊕
Sanitary Sewer Cleanout	⊕
U/G Sanitary Sewer Line	----- SS
Above Ground Sanitary Sewer	----- A/G Sanitary Sewer
SS Forced Main Line LOS B (S.U.E.*)	----- FSS
SS Forced Main Line LOS C (S.U.E.*)	----- FSS
SS Forced Main Line LOS D (S.U.E.*)	----- FSS

MISCELLANEOUS:

Utility Pole	●
Utility Pole with Base	□
Utility Located Object	○
Utility Traffic Signal Box	⊠
Utility Unknown U/G Line LOS B (S.U.E.*)	----- ?U/L
U/G Tank; Water, Gas, Oil	□
Underground Storage Tank, Approx. Loc.	⊕
A/G Tank; Water, Gas, Oil	□
Geoenvironmental Boring	⊕
U/G Test Hole LOS A (S.U.E.*)	○
Abandoned According to Utility Records	AATUR
End of Information	E.O.I.

04/05/15

5/14/24

5/14/24

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 AQUA AMERICA.

3. ALL WATER LINES SHALL BE INSTALLED IN COMPLIANCE WITH THE RULES AND REGULATIONS OF THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL QUALITY, DIVISION OF WATER RESOURCES, PUBLIC WATER SUPPLY SECTION. ALL SEWER LINES SHALL BE INSTALLED IN COMPLIANCE WITH THE RULES AND REGULATIONS OF THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENT QUALITY, DIVISION OF WATER RESOURCES, WATER QUALITY SECTION. PERFORM ALL WORK IN ACCORDANCE WITH THE APPLICABLE PLUMBING CODES.

4. THE UTILITY OWNER OWNS THE EXISTING UTILITY FACILITIES AND WILL OWN THE NEW UTILITY FACILITIES AFTER ACCEPTANCE BY THE DEPARTMENT. THE DEPARTMENT OWNS THE CONSTRUCTION CONTRACT AND HAS ADMINISTRATIVE AUTHORITY. COMMUNICATIONS AND DECISIONS BETWEEN THE CONTRACTOR AND UTILITY OWNER ARE NOT BINDING UPON THE DEPARTMENT OR THIS CONTRACT UNLESS AUTHORIZED BY THE ENGINEER. AGREEMENTS BETWEEN THE UTILITY OWNER AND CONTRACTOR FOR THE WORK THAT IS NOT PART OF THIS CONTRACT OR IS SECONDARY TO THIS CONTRACT ARE ALLOWED, BUT ARE NOT BINDING UPON THE DEPARTMENT.

5. PROVIDE ACCESS FOR THE DEPARTMENT PERSONNEL AND THE OWNER'S REPRESENTATIVES TO ALL PHASES OF CONSTRUCTION. NOTIFY DEPARTMENT PERSONNEL AND THE UTILITY OWNER TWO WEEKS PRIOR TO COMMENCEMENT OF ANY WORK AND ONE WEEK PRIOR TO SERVICE INTERRUPTION. KEEP UTILITY OWNERS' REPRESENTATIVES INFORMED OF WORK PROGRESS AND PROVIDE OPPORTUNITY FOR INSPECTION OF CONSTRUCTION AND TESTING.

6. THE PLANS DEPICT THE BEST AVAILABLE INFORMATION FOR THE LOCATION, SIZE, AND TYPE OF MATERIAL FOR ALL EXISTING UTILITIES. MAKE INVESTIGATIONS FOR DETERMINING THE EXACT LOCATION, SIZE, AND TYPE MATERIAL OF THE EXISTING FACILITIES AS NECESSARY FOR THE CONSTRUCTION OF THE PROPOSED UTILITIES AND FOR AVOIDING DAMAGE TO EXISTING FACILITIES. REPAIR ANY DAMAGE INCURRED TO EXISTING FACILITIES TO THE ORIGINAL OR BETTER CONDITION AT NO ADDITIONAL COST TO THE DEPARTMENT.

7. MAKE FINAL CONNECTIONS OF THE NEW WORK TO THE EXISTING SYSTEM WHERE INDICATED ON THE PLANS, AS REQUIRED TO FIT THE ACTUAL CONDITIONS, OR AS DIRECTED.

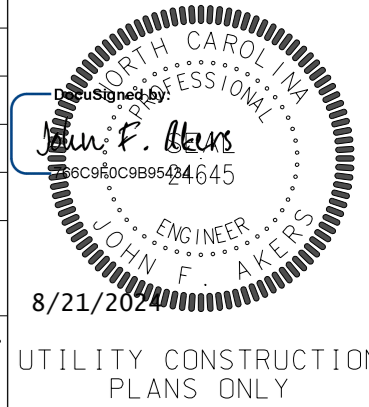
8. MAKE CONNECTIONS BETWEEN EXISTING AND PROPOSED UTILITIES AT TIMES MOST CONVENIENT TO THE PUBLIC, WITHOUT ENDANGERING THE UTILITY SERVICE, AND IN ACCORDANCE WITH THE UTILITY OWNER'S REQUIREMENTS. MAKE CONNECTIONS ON WEEKENDS, AT NIGHT, AND ON HOLIDAYS IF NECESSARY.

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

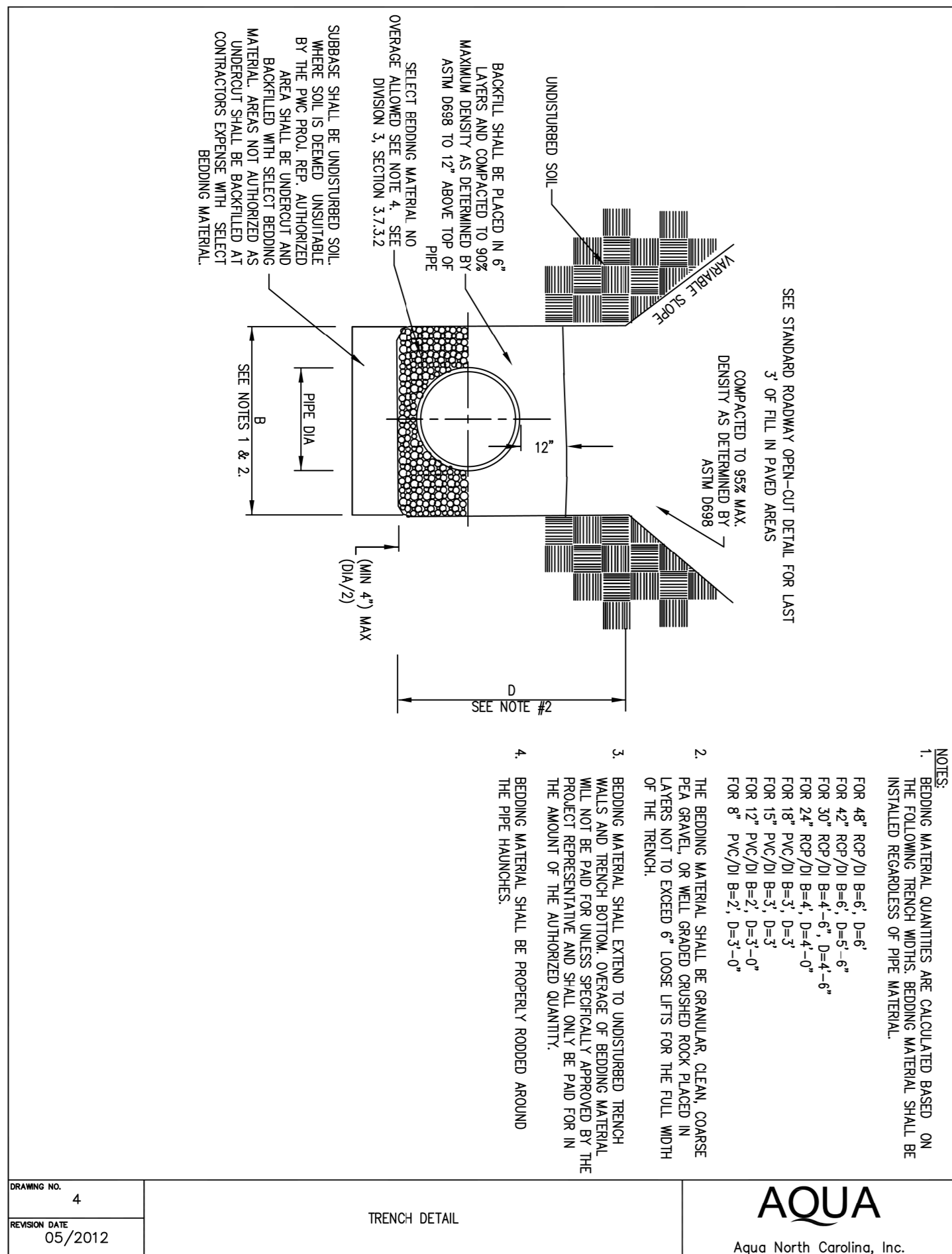
PROJECT REFERENCE NO.	SHEET NO.
R-2307B/I-5717	UC-3A
DESIGNED BY: JFA	
DRAWN BY: ACB	
CHECKED BY: EPH	
APPROVED BY: JJW	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	8/21/2024
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION

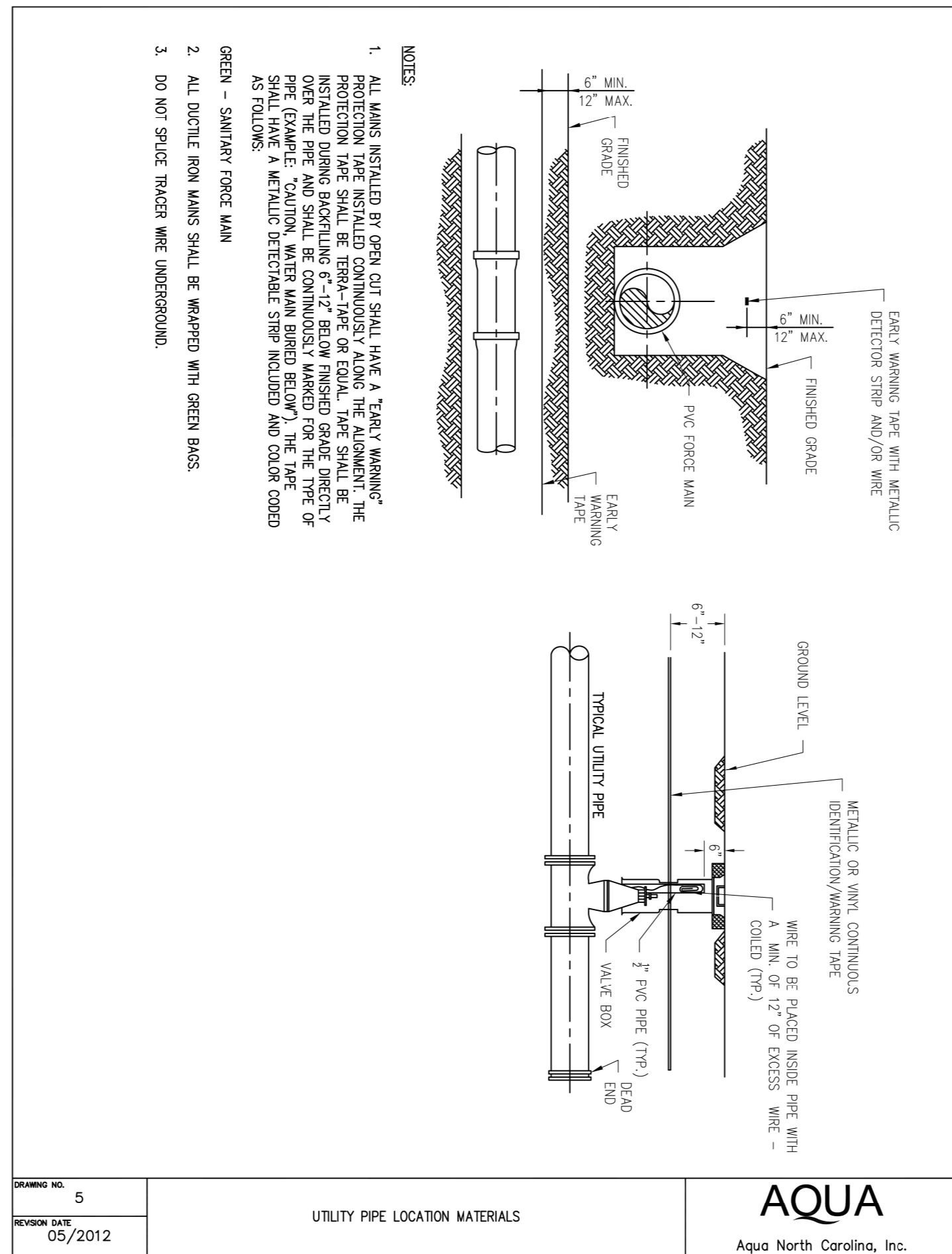
**DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED**



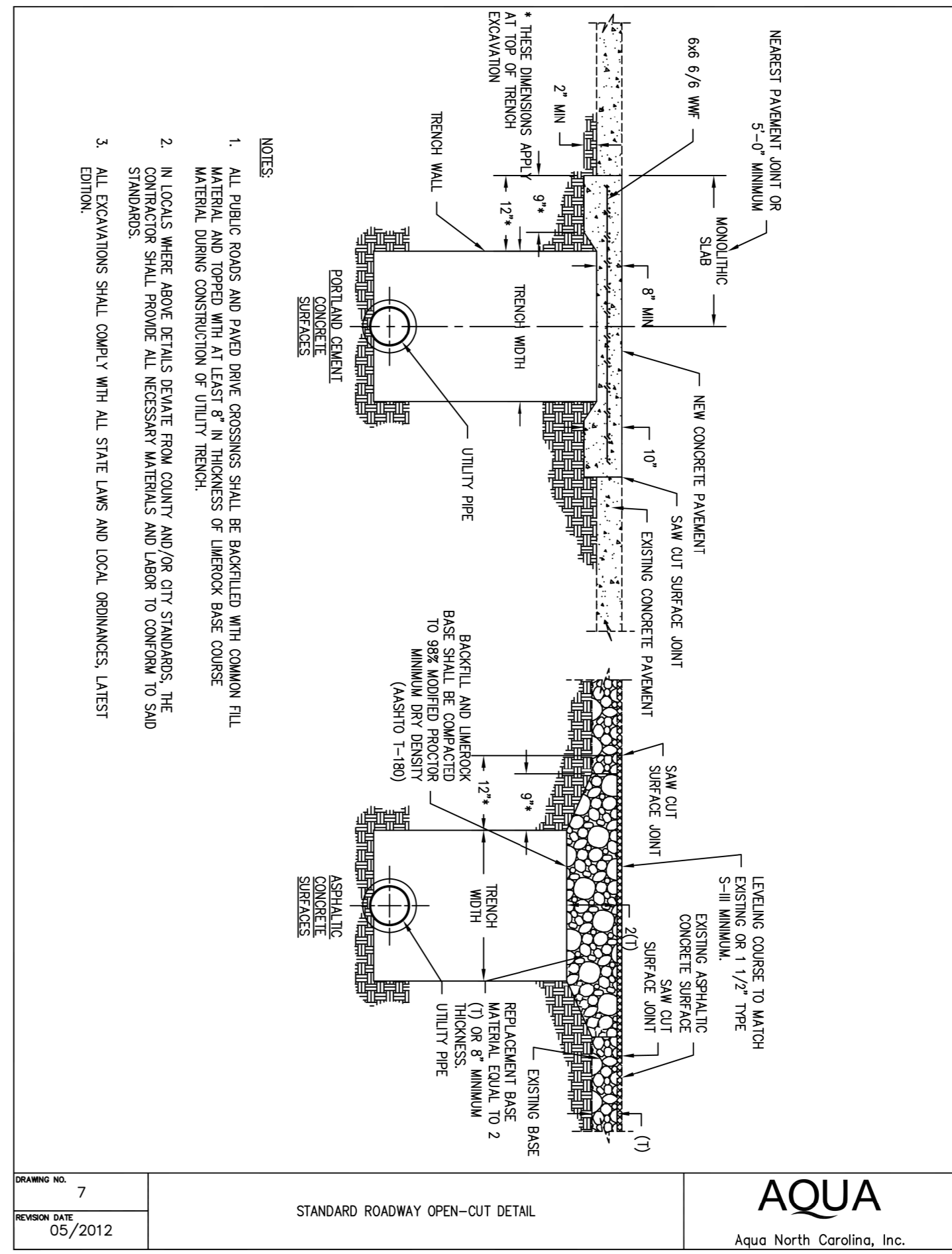
UTILITY CONSTRUCTION
 UTILITY CONSTRUCTION PLANS ONLY



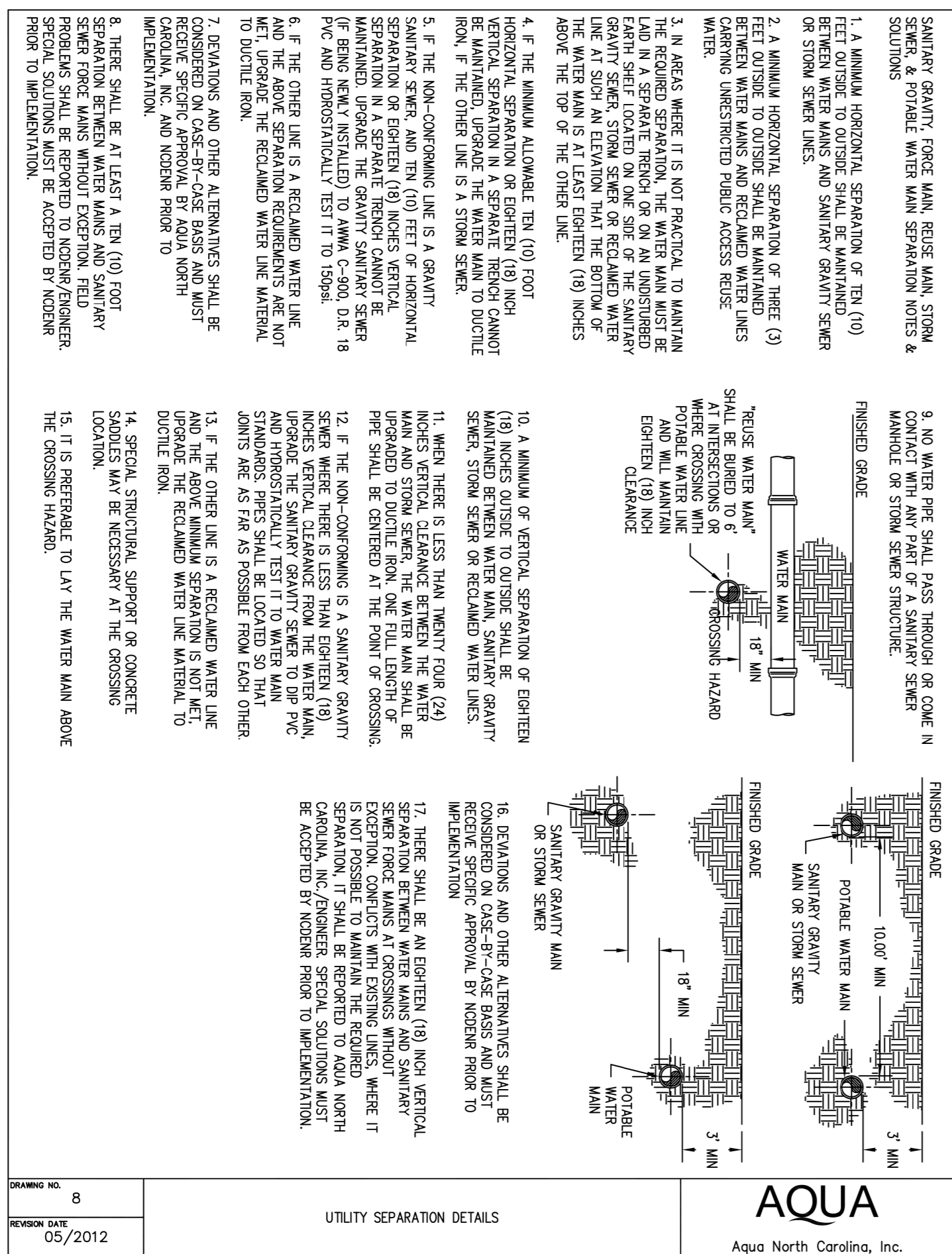
AQUA
 Aqua North Carolina, Inc.
 DRAWING NO. 4
 REVISION DATE 05/2012



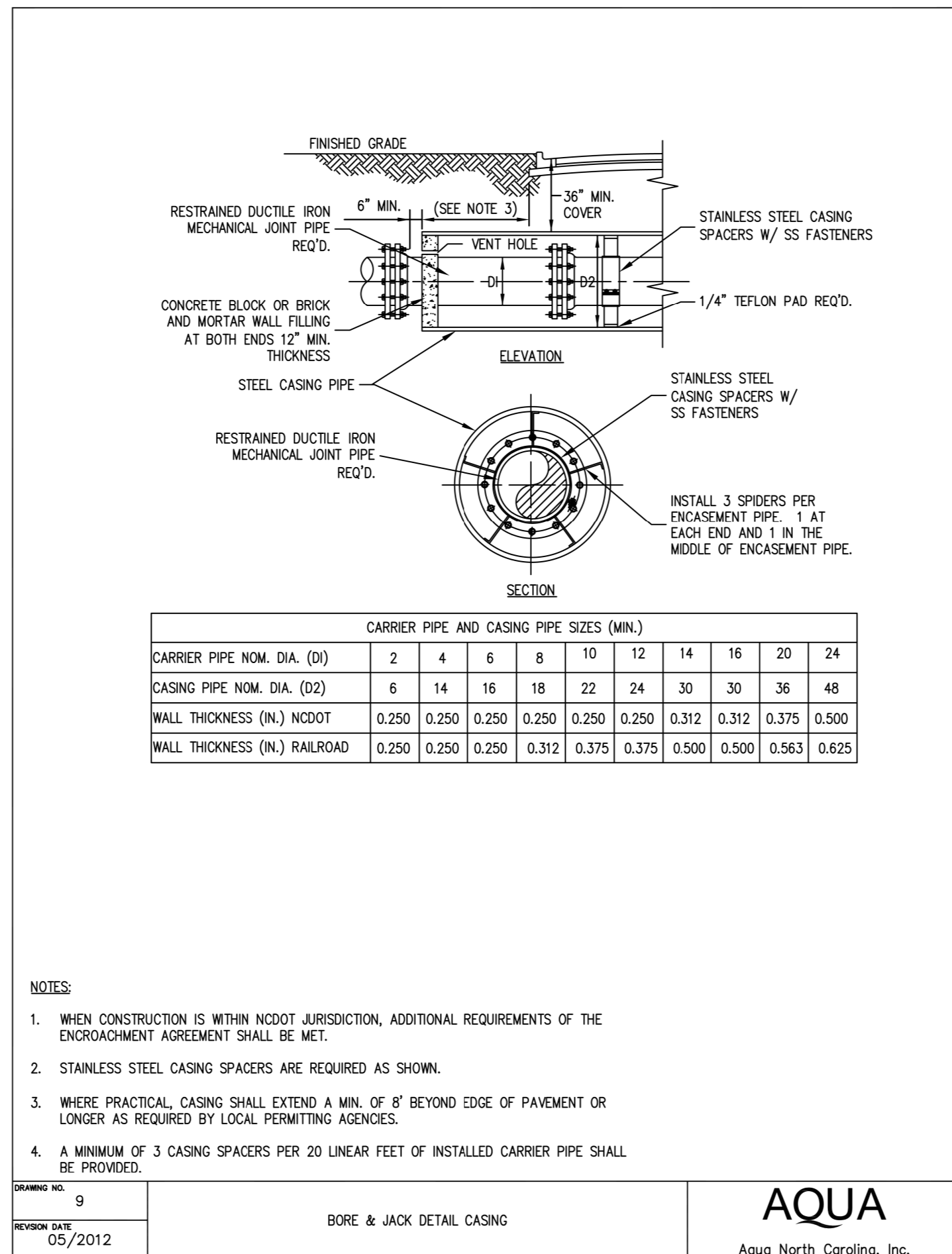
AQUA
 Aqua North Carolina, Inc.
 DRAWING NO. 5
 REVISION DATE 05/2012



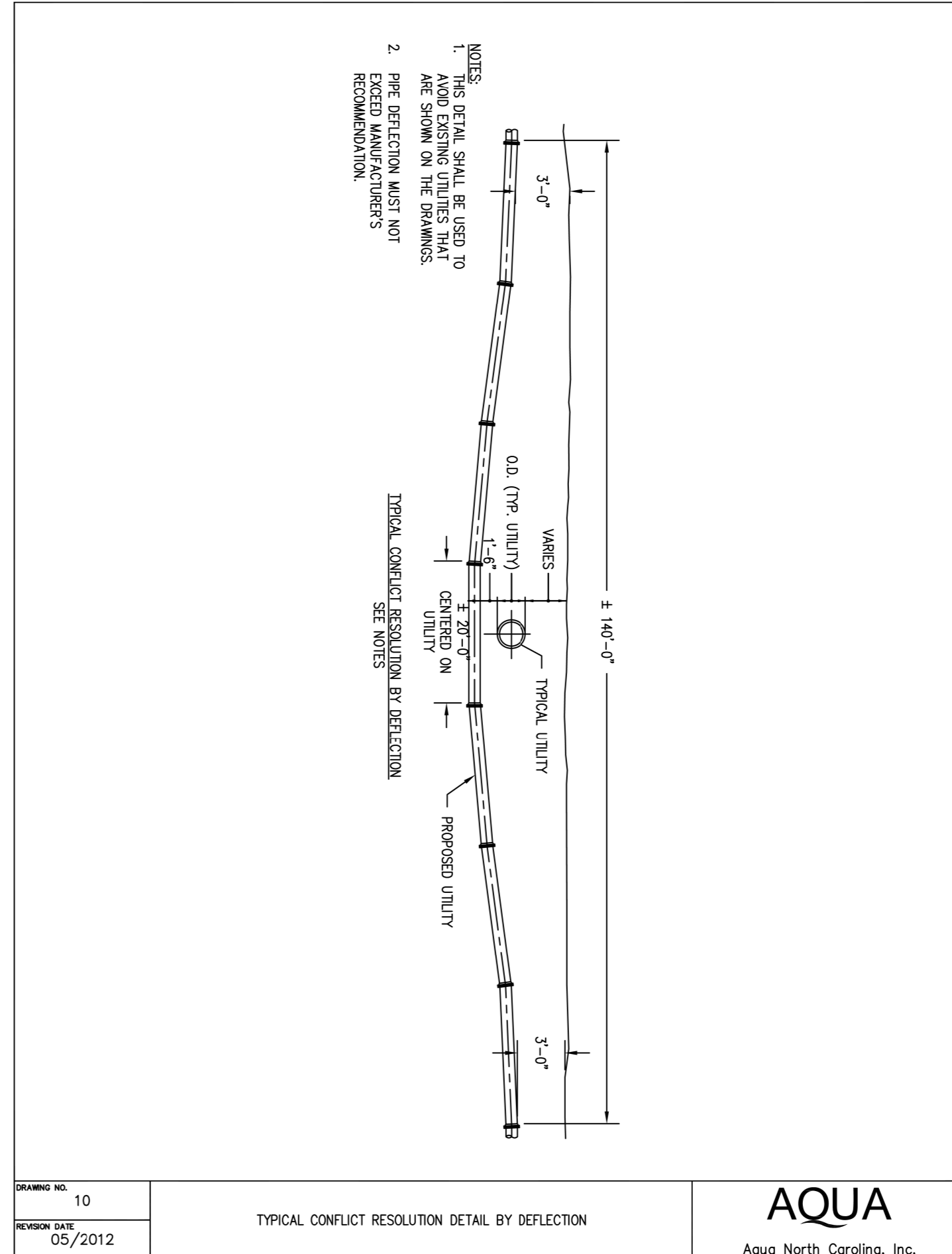
AQUA
 Aqua North Carolina, Inc.
 DRAWING NO. 7
 REVISION DATE 05/2012



AQUA
 Aqua North Carolina, Inc.
 DRAWING NO. 8
 REVISION DATE 05/2012



AQUA
 Aqua North Carolina, Inc.
 DRAWING NO. 9
 REVISION DATE 05/2012



AQUA
 Aqua North Carolina, Inc.
 DRAWING NO. 10
 REVISION DATE 05/2012

UTILITY CONSTRUCTION

LENGTH IN FEET REQUIRED FOR DIP RESTRAINED JOINTS									
SIZE	DEAD END	TEE & PLUG	90° BEND	45° BEND	22 1/2° BEND	11 1/4° BEND	SIZE	DEAD END	TEE & PLUG
4"	37 (35)	37 (35)	21 (26)	18 (18)	18 (18)	18 (18)	4"	43	43
6"	52 (50)	52 (50)	30 (36)	18 (18)	18 (18)	18 (18)	6"	82	82
8"	67 (65)	67 (65)	42 (48)	18 (18)	18 (18)	18 (18)	8"	98	98
10"	82 (80)	82 (80)	54 (60)	18 (18)	18 (18)	18 (18)	10"	116	116
12"	97 (95)	97 (95)	66 (72)	18 (18)	18 (18)	18 (18)	12"	148	148
14"	107 (105)	107 (105)	78 (84)	18 (18)	18 (18)	18 (18)	14"	179	179
16"	124 (122)	124 (122)	90 (96)	18 (18)	18 (18)	18 (18)	16"	208	208
18"	141 (139)	141 (139)	102 (108)	18 (18)	18 (18)	18 (18)	18"	244	244
20"	157 (155)	157 (155)	114 (120)	18 (18)	18 (18)	18 (18)	20"	288	288

LENGTH IN FEET REQUIRED FOR PVC RESTRAINED JOINTS									
SIZE	DEAD END	TEE & PLUG	90° BEND	45° BEND	22 1/2° BEND	11 1/4° BEND	SIZE	DEAD END	TEE & PLUG
4"	43	43	20	18	18	18	4"	43	43
6"	82	82	30	18	18	18	6"	82	82
8"	98	98	44	18	18	18	8"	98	98
10"	116	116	51	18	18	18	10"	116	116
12"	148	148	63	18	18	18	12"	148	148
14"	179	179	75	18	18	18	14"	179	179
16"	208	208	87	18	18	18	16"	208	208
18"	244	244	99	18	18	18	18"	244	244

TABLE APPLIES TO DUCTILE IRON FOR FOLLOWING CONDITIONS:
 1. TEST PRESSURE: 150 PSIG
 2. SOIL TYPE: SP
 3. DEPTH OF COVER: 3'
 4. SAFETY FACTOR: 1.5
 5. COMPACTION: AS SHOWN ON DETAIL DRAWINGS

VALUES IN PARENTHESES ARE FOR PIPE ENCLOSED IN POLYETHYLENE

RESTRAINED JOINT DETAIL

AQUA
Aqua North Carolina, Inc.

MIN. BEARING AREA EACH DIRECTION OF THRUST IN SQUARE FEET (based on soil supporting value of 2000 psf @ 200 paig test pressure)

PIPE SIZE	TEES & DEAD ENDS	90° ELBOWS	45° ELBOW & CROSSES	22-1/2° ELBOWS
6"	4	6	3	2
8"	7	10	5	3
12"	15	21	11	6

TYPICAL THRUST BLOCK

AQUA
Aqua North Carolina, Inc.

GATE VALVE AND EXTENSION

AQUA
Aqua North Carolina, Inc.

AIR RELEASE VALVE DETAIL

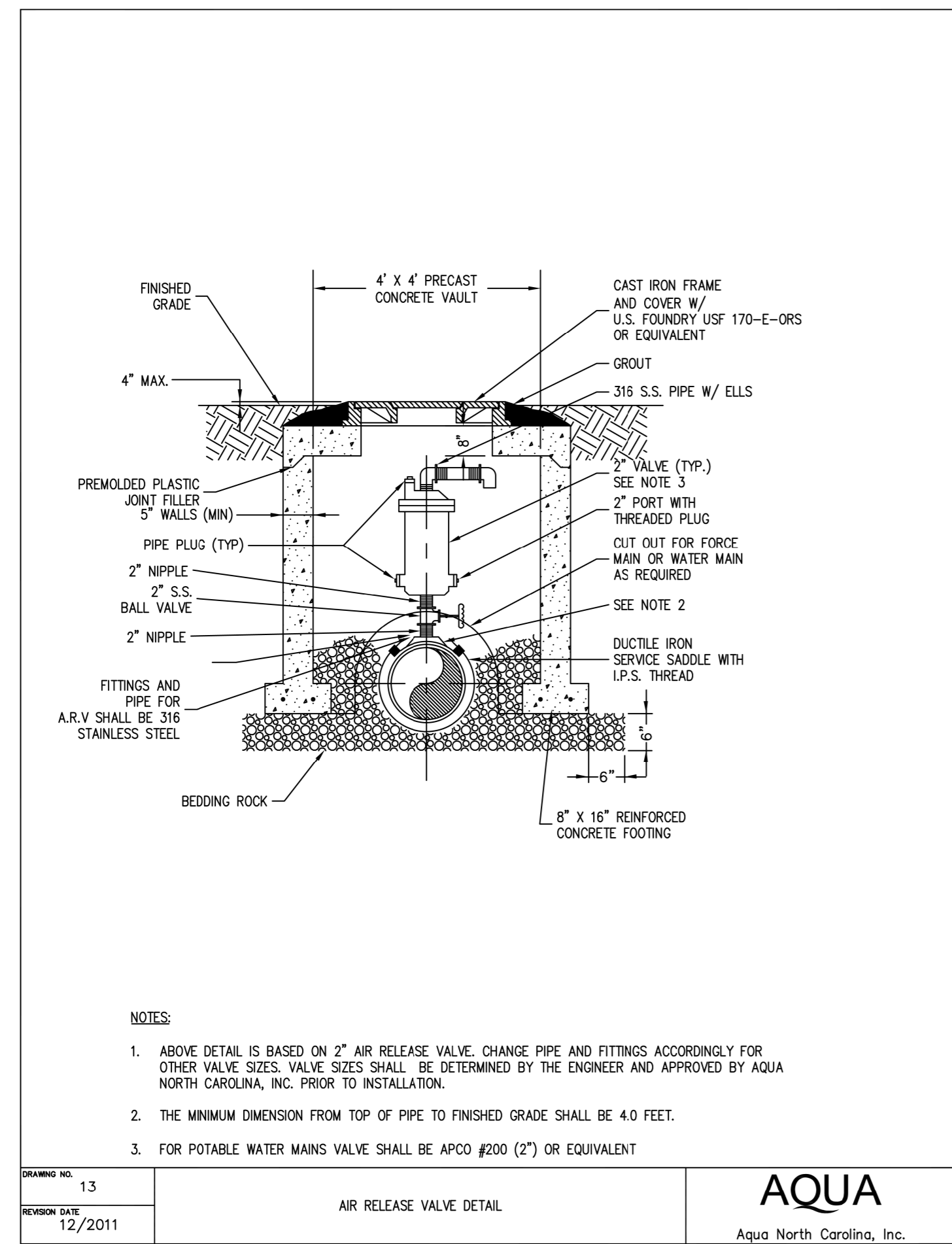
AQUA
Aqua North Carolina, Inc.

TYPICAL SERVICE LATERAL DETAIL

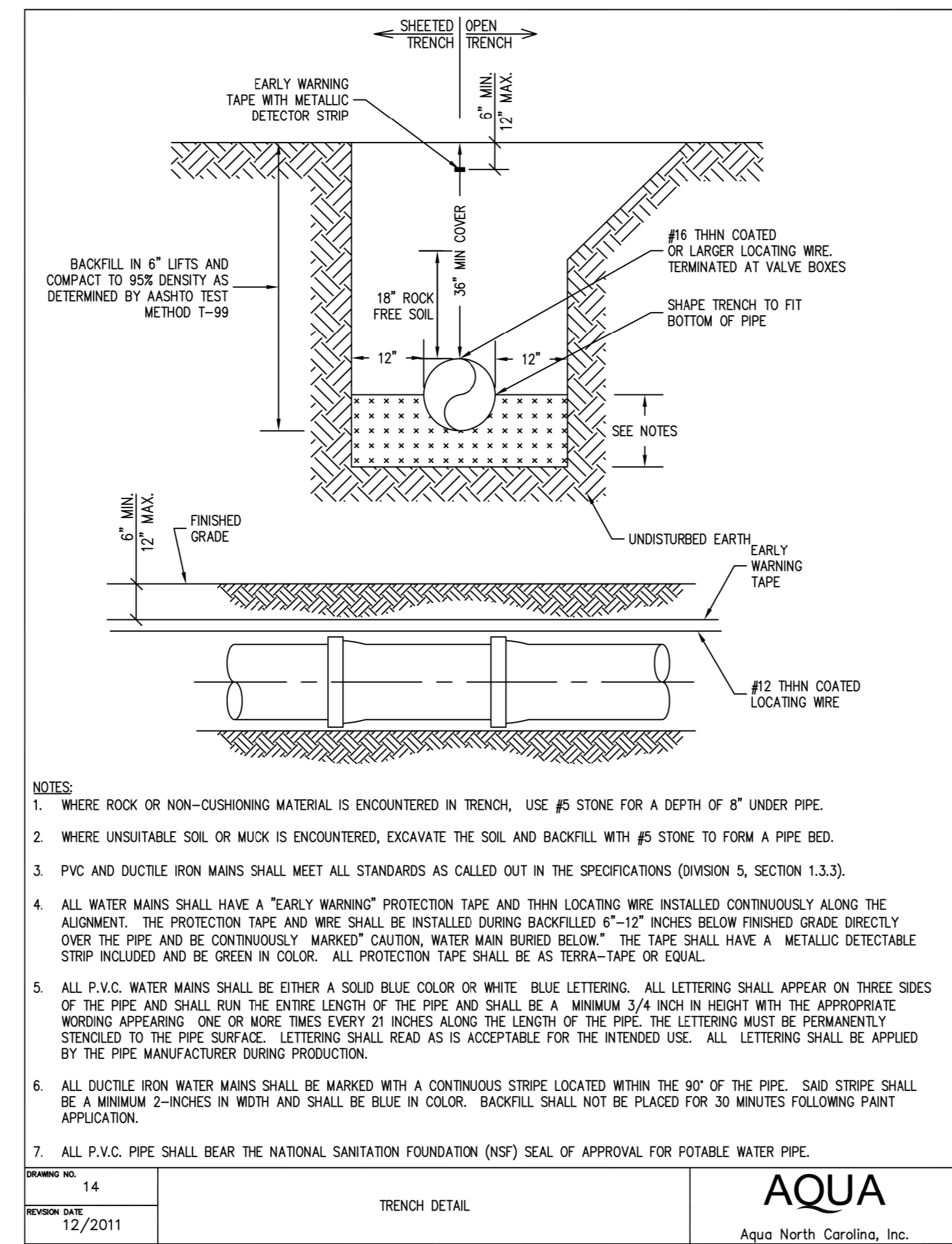
AQUA
Aqua North Carolina, Inc.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

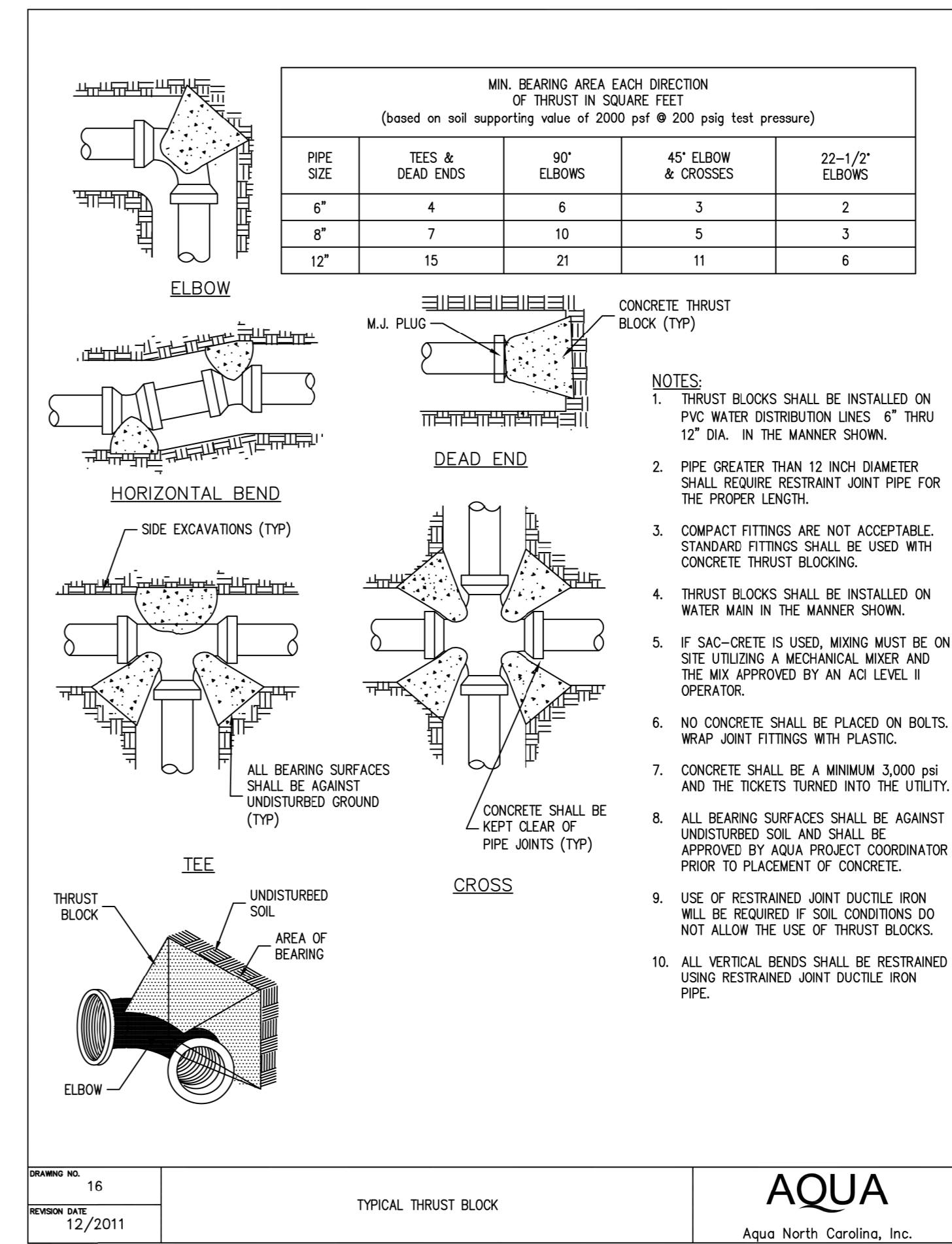
5/14/99



DRAWING NO. 13
REVISION DATE 12/2011
AIR RELEASE VALVE DETAIL
AQUA
Aqua North Carolina, Inc.



DRAWING NO. 14
REVISION DATE 12/2011
TRENCH DETAIL
AQUA
Aqua North Carolina, Inc.



DRAWING NO. 16
REVISION DATE 12/2011
TYPICAL THRUST BLOCK
AQUA
Aqua North Carolina, Inc.

PROJECT REFERENCE NO. **R-2307B/I-5717** SHEET NO. **UC-3D**

DESIGNED BY: JFA
DRAWN BY: ACB
CHECKED BY: EPH
APPROVED BY: JJW

REVISED:

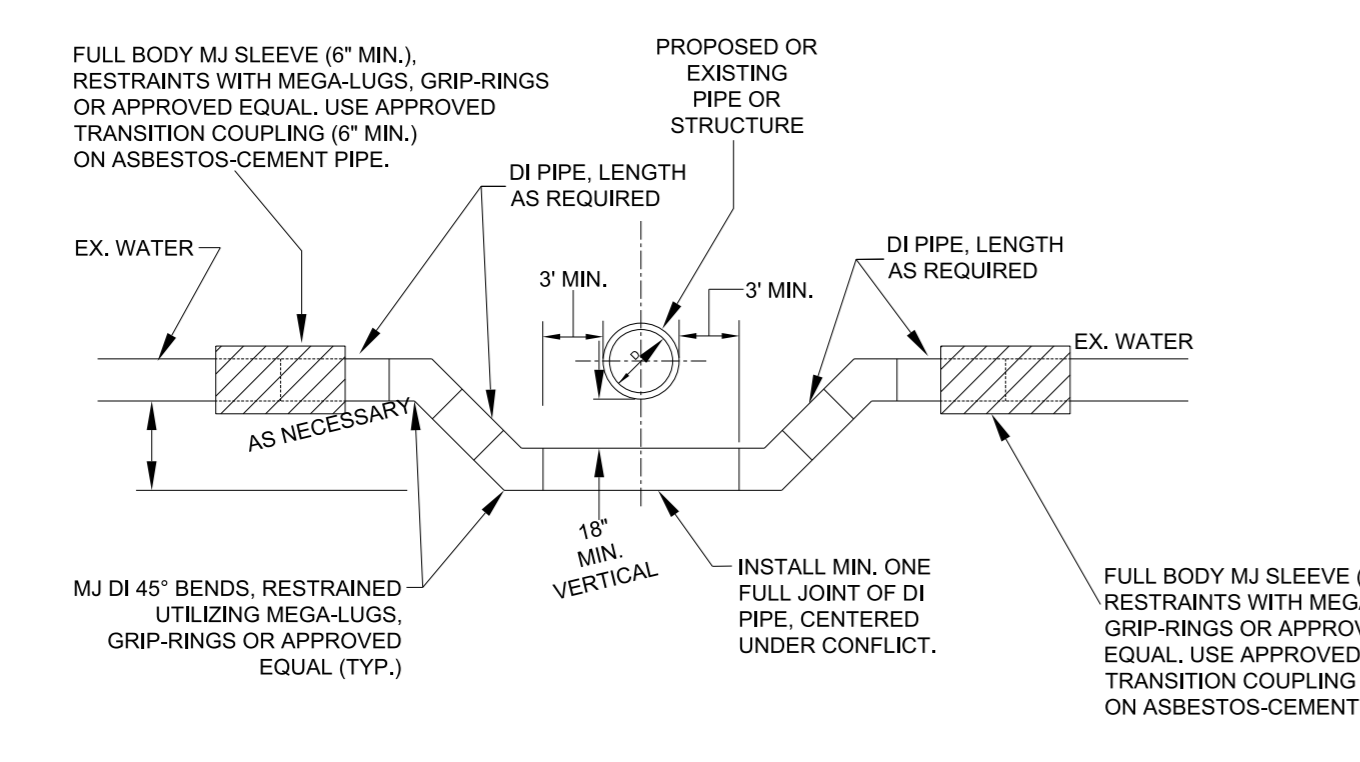
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
8/21/2024

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

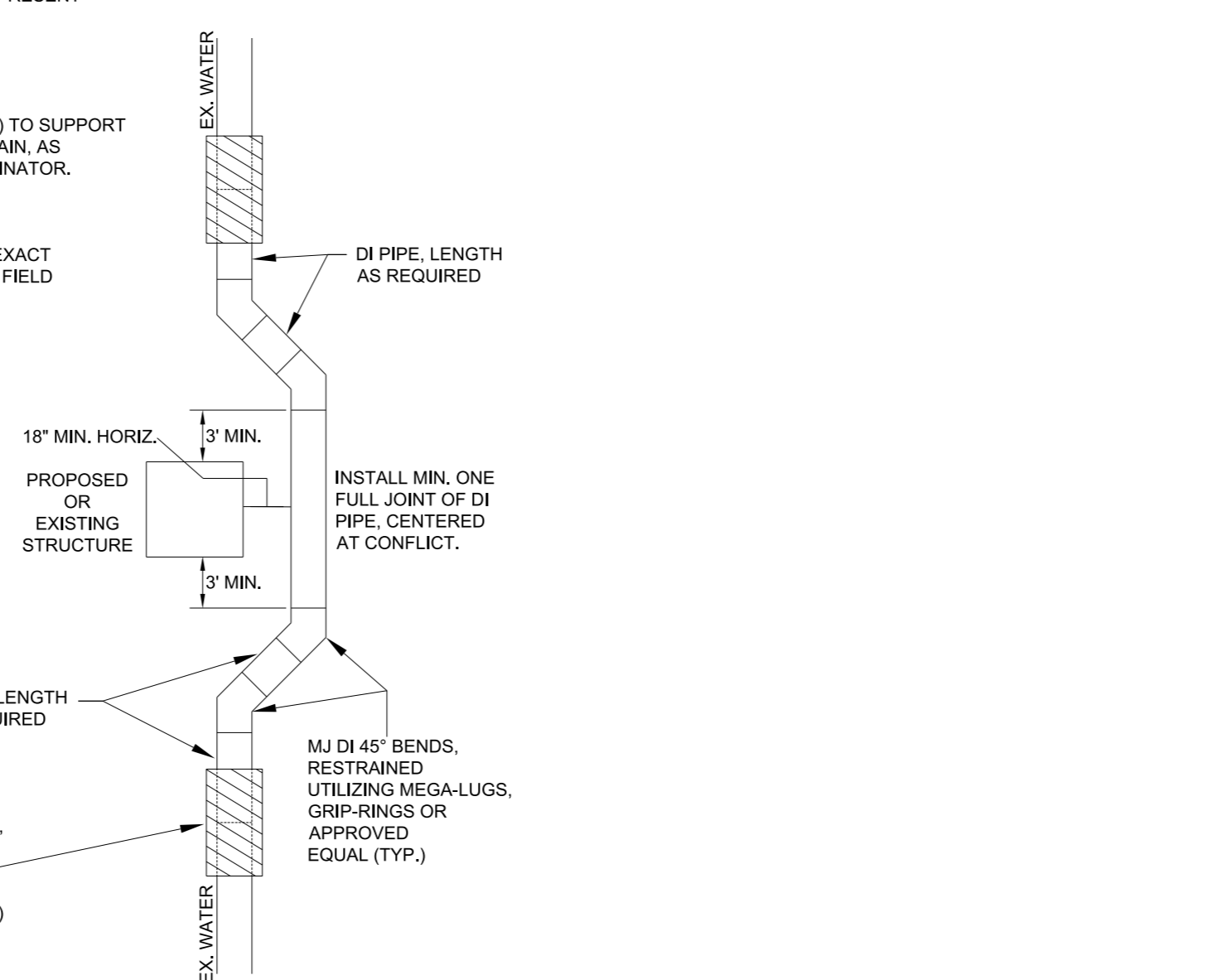
UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION

- NOTES:
- ALL PIPE AND FITTINGS SHALL BE APPROVED BY AQUA.
 - CONTRACTOR TO COORDINATE NECESSARY OUTAGES WITH AQUA AND AFFECTED CUSTOMERS. MINIMUM 48 HOUR NOTICE REQUIRED.
 - NEW WATER MAIN TO BE SWABBED WITH A CHLORINE SOLUTION AND FLUSHED PRIOR TO PLACING INTO SERVICE.
 - ALL NEW FITTINGS AND PIPE TO BE RESTRAINED UTILIZING MEGA-LUGS, GRIP-RINGS OR APPROVED EQUAL.
 - ALL PIPE AND FITTINGS TO BE DUCTILE IRON.
 - CITY OF HICKORY PROJECT COORDINATOR TO BE PRESENT DURING WORK.
 - BACKFILL AND COMPACT TO AQUA OR N.C.D.O.T. REQUIREMENTS.
 - PROVIDE STONE BEDDING (NO. 5 OR NO. 57 STONE) TO SUPPORT RELOCATED WATER MAIN AND/OR NEW STORM DRAIN, AS APPROVED BY CITY OF HICKORY PROJECT COORDINATOR.
 - MJ RESTRAINTS NOT ALLOWED ON PVC PIPE.
 - DIMENSIONS ARE GIVEN AS GENERAL GUIDANCE, EXACT DIMENSIONS ARE SUBJECT TO CHANGE BASED ON FIELD CONDITIONS AND AS DIRECTED BY AQUA.



VERTICAL RELOCATION



HORIZONTAL RELOCATION

PIPE RELOCATION DETAIL
N.T.S.

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

UTILITY CONSTRUCTION

NOTES:

- LOCATING WIRE SHALL TERMINATE AT MAIN AND METER BOX.
- ALL FITTINGS SHALL BE BRASS MUELLER COMPRESSION TYPE OR STAINLESS STEEL. A PLASTIC INSERT SHALL BE INSTALLED AT ALL TERMINATIONS WHERE POLYETHYLENE PIPE IS USED.
- ALL SERVICE PIPES UNDER ROADS OR DRIVEWAYS SHALL BE SLEEVED WITH SCH 40 PVC A MINIMUM 1 FOOT OUTSIDE OF PAVEMENT EDGE.

DRAWING NO. 7
REVISION DATE 12/2011

SERVICE CONNECTION

AQUA
Aqua North Carolina, Inc.

NOTES:

- ALL MATERIALS SHALL BE IN ACCORDANCE WITH AQUA NORTH CAROLINA STANDARDS.
- TAPPING SLEEVES SHALL BE AS MANUFACTURED BY ROMAC.
- STAINLESS STEEL TAPPING SLEEVES MAY BE UTILIZED FOR ALL REQUIRE FILL BODY DI. ALL TAPPING SLEEVES (SEE DETAIL W.9).
- PIPE AND LUGS SHALL BE STAINLESS STEEL PER ASTM A 240, TYPE 304 AND 304L.
- BOLTS SHALL BE 5/8" UNC FINE THREADED STAINLESS STEEL PER ASTM A 193 TYPE 304 & NUTS PER ASTM A 194, TYPE 304.
- NUTS SHALL BE HEAVY HEX STAINLESS STEEL PER ASTM A 194, TYPE 304.
- WASHERS SHALL BE STEEL AND PLATING LUBRICATING WASHER.
- COASERS SHALL BE VARIOUS PER PER ASTM D 2000 MAA 610, COMPOUNDED FOR WATER AND SERVICE SERVICE.
- FLANGE SHALL BE DUCTILE IRON PER ASTM 536, GRADE 65-42-12 OR STAINLESS STEEL PER ASTM A 240, TYPE 304. DIMENSIONS SHOWN ARE FOR REFERENCE AND MAY VARY BASED UPON MANUFACTURER. SLEEVES SHALL BE SMOOTH IN NATURE DETAILS SHOWN AND SHALL NOT DETRAIT IN INSTALLATION.
- PIPE SURFACES SHALL BE CLEANED THOROUGHLY TO REMOVE ALL OILS AND DEBRIS FROM TO INSTALLATION.
- ALL TAPPING SLEEVES SHALL BE HYDROSTATICALLY PRESSURE TEST APPROVED BY AQUA NORTH CAROLINA PROJECT COORDINATOR PRIOR TO BEGINNING TAPPING PROCESS.
- LISTING OF BOLTS, NUTS AND WASHERS SHOWN ARE FOR REFERENCE ONLY. ACTUAL QUANTITY SHALL BE AS RECOMMENDED BY THE SLEEVE MANUFACTURER FOR THE REQUIRED SERVICE.
- SEE TAPPING VALVE DETAIL (W.9) FOR ADDITIONAL INFORMATION.

DRAWING NO. 8
REVISION DATE 12/2011

TAPPING SLEEVE (1 OF 2)

AQUA
Aqua North Carolina, Inc.

NOTES:

- ALL MATERIALS SHALL BE IN ACCORDANCE WITH AQUA NORTH CAROLINA STANDARDS.
- TAPPING SLEEVES SHALL BE AS MANUFACTURED BY ROMAC.
- STAINLESS STEEL TAPPING SLEEVES MAY BE UTILIZED FOR ALL REQUIRE FILL BODY DI. ALL TAPPING SLEEVES (SEE DETAIL W.9).
- PIPE AND LUGS SHALL BE STAINLESS STEEL PER ASTM A 240, TYPE 304 AND 304L.
- BOLTS SHALL BE 5/8" UNC FINE THREADED STAINLESS STEEL PER ASTM A 193 TYPE 304 & NUTS PER ASTM A 194, TYPE 304.
- NUTS SHALL BE HEAVY HEX STAINLESS STEEL PER ASTM A 194, TYPE 304.
- WASHERS SHALL BE STEEL AND PLATING LUBRICATING WASHER.
- COASERS SHALL BE VARIOUS PER PER ASTM D 2000 MAA 610, COMPOUNDED FOR WATER AND SERVICE SERVICE.
- FLANGE SHALL BE DUCTILE IRON PER ASTM 536, GRADE 65-42-12 OR STAINLESS STEEL PER ASTM A 240, TYPE 304. DIMENSIONS SHOWN ARE FOR REFERENCE AND MAY VARY BASED UPON MANUFACTURER. SLEEVES SHALL BE SMOOTH IN NATURE DETAILS SHOWN AND SHALL NOT DETRAIT IN INSTALLATION.
- PIPE SURFACES SHALL BE CLEANED THOROUGHLY TO REMOVE ALL OILS AND DEBRIS FROM TO INSTALLATION.
- ALL TAPPING SLEEVES SHALL BE HYDROSTATICALLY PRESSURE TEST APPROVED BY AQUA NORTH CAROLINA PROJECT COORDINATOR PRIOR TO BEGINNING TAPPING PROCESS.
- LISTING OF BOLTS, NUTS AND WASHERS SHOWN ARE FOR REFERENCE ONLY. ACTUAL QUANTITY SHALL BE AS RECOMMENDED BY THE SLEEVE MANUFACTURER FOR THE REQUIRED SERVICE.
- SEE TAPPING VALVE DETAIL (W.9) FOR ADDITIONAL INFORMATION.

DRAWING NO. 9
REVISION DATE 12/2011

TAPPING SLEEVE (2 OF 2)

AQUA
Aqua North Carolina, Inc.

NOTES:

- GATE VALVES SHALL COMPLY WITH AWWA C-500 AND BE IRON BODY, PARALLEL SEAT TYPE, BRONZE FITTED W/ RESILIENT SEAT. LEFT HAND OPEN (CCW).
- BROOKS 24" VALVE BOX COLLAR MAY BE USED.

DRAWING NO. 10
REVISION DATE 12/2011

GATE VALVE AND EXTENSION

AQUA
Aqua North Carolina, Inc.

NOTES:

- THIS DETAIL SHALL BE USED TO AVOID EXISTING UTILITIES THAT ARE SHOWN ON THE DRAWINGS.
- MANUFACTURER'S RECOMMENDATION.

NOTES:

- THIS DETAIL SHALL BE USED WHEN THE FOLLOWING CONDITIONS ARE MET:
- WHEN FITS IS SPECIFICALLY SHOWN ON THE DRAWINGS.
- WHEN UTILITIES NOT SHOWN ON THE PLAN ARE ENCOUNTERED.

DRAWING NO. 5
REVISION DATE 12/2011

TYPICAL CONFLICT RESOLUTION DETAIL BY DEFLECTION OR FITTINGS

AQUA
Aqua North Carolina, Inc.

NOTES:

- RESTRAINED JOINTS SHALL BE PROVIDED AT ALL BENDS, TEES AND DEAD ENDS AS INDICATED IN THESE TABLES OR AS SHOWN ON THE DRAWINGS FOR OTHER SPECIFIC CONDITIONS. THE USE OF CONCRETE THROST BLOOMING IS PROHIBITED, UNLESS OTHERWISE INDICATED ON THE DRAWINGS.
- MAXIMUM LENGTHS OF PIPE SHALL BE USED WITH RESTRAINED SECTIONS.
- LENGTH OF PIPE WITH RESTRAINED JOINTS IS BASED ON INSTALLATION IN SP SOILS. IF OTHER SOIL CONDITIONS ARE ENCOUNTERED, LENGTH OF RESTRAINED PIPE SHALL BE ADJUSTED ACCORDINGLY. ENGINEER SHALL SUPPLY CALCULATIONS TO AQUA NORTH CAROLINA, INC. FOR REVIEW.
- PIPE TRENCH AND INSTALLATION SHALL BE PER TYPE 4 AS SHOWN ON DETAILS SHEET.

SIZE	DEAD END	TE & DEAD END	90° BEND	45° BEND	22 1/2° BEND	11 1/2° BEND
3"	37 (53)	37 (53)	21 (26)	18 (18)	18 (18)	18 (18)
4"	52 (78)	52 (78)	30 (36)	18 (18)	18 (18)	18 (18)
6"	67 (100)	67 (100)	36 (45)	18 (18)	18 (18)	18 (18)
8"	81 (122)	81 (122)	44 (54)	18 (18)	18 (18)	18 (18)
10"	94 (141)	94 (141)	50 (63)	21 (26)	18 (18)	18 (18)
12"	107 (160)	107 (160)	60 (72)	23 (30)	18 (18)	18 (18)
14"	124 (180)	124 (180)	64 (80)	27 (33)	18 (18)	18 (18)
16"	144 (218)	144 (218)	80 (94)	32 (39)	18 (18)	18 (18)
20"	187 (290)	187 (290)	88 (108)	37 (45)	18 (18)	18 (18)

DRAWING NO. 6
REVISION DATE 12/2011

RESTRAINED JOINT DETAIL

AQUA
Aqua North Carolina, Inc.

NOTE:
THE ESTIMATED QUANTITY OF DUCTILE IRON SEWER PIPE FITTINGS ON THIS PLAN SHEET IS 800 POUNDS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.

Dewberry

PROJECT REFERENCE NO. R-2307B / I-5717 SHEET NO. UC09

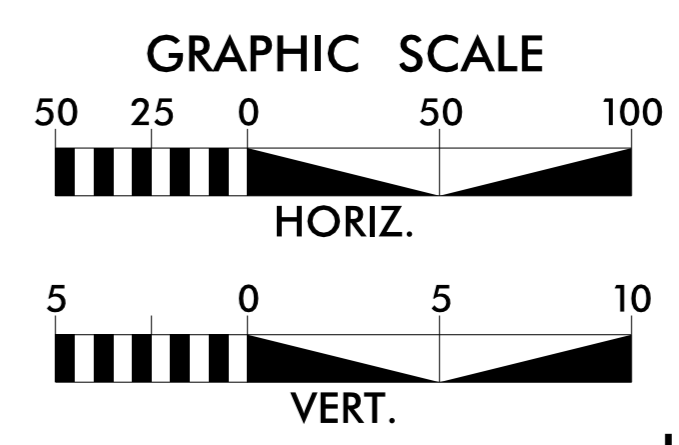
DESIGNED BY: JFA
DRAWN BY: ACB
CHECKED BY: EPH
APPROVED BY: JJW

REVISED:

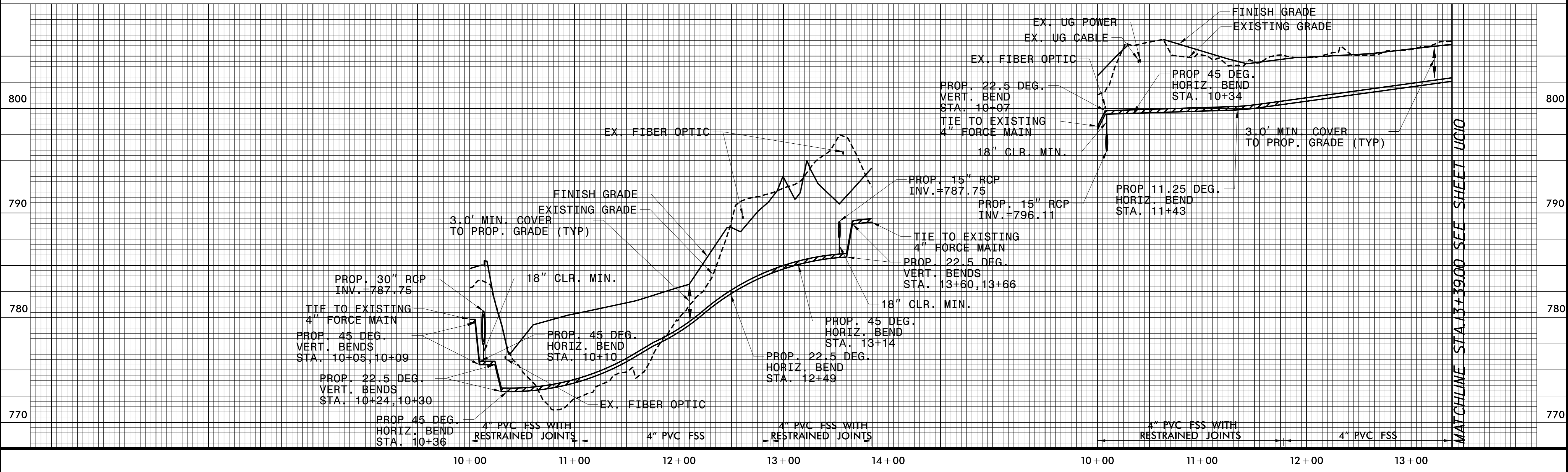
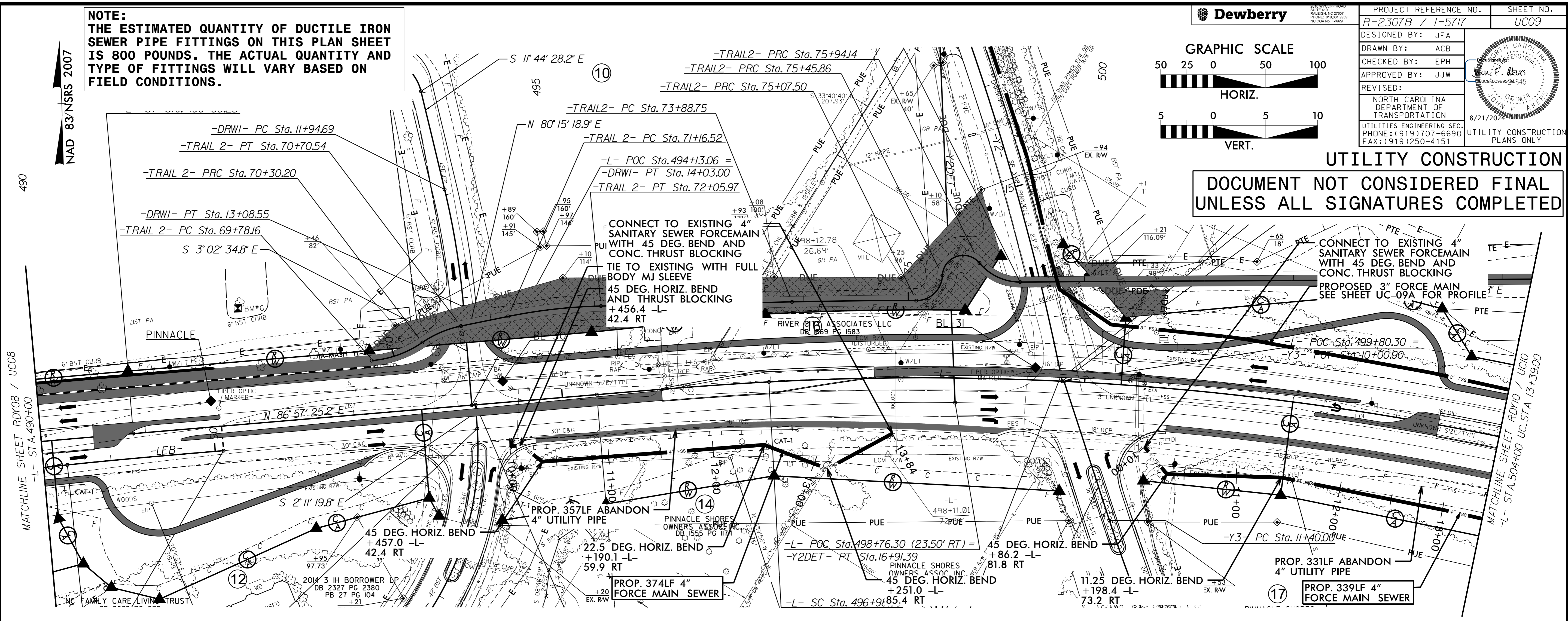
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
8/21/2024

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

UTILITY CONSTRUCTION PLANS ONLY



UTILITY CONSTRUCTION
DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



5/14/2024
NAD 83 NSRS 2007
490
MATCHLINE SHEET RDY08 / UC08
-L- STA. 490+00
MATCHLINE SHEET RDY10 / UC10
-L- STA. 504+00 UC STA. 13+39.00

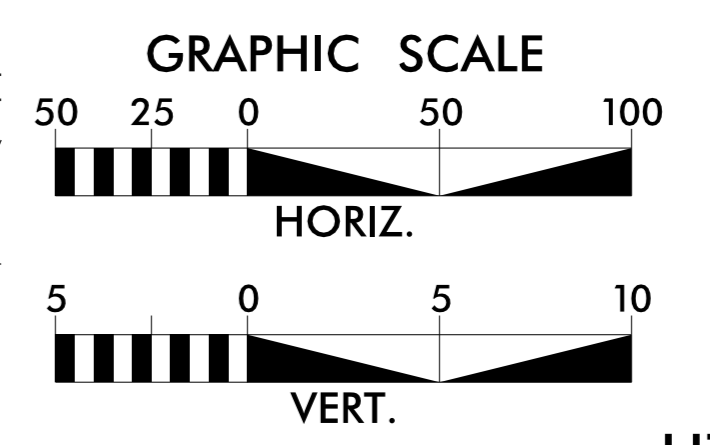
NOTE:
THE ESTIMATED QUANTITY OF DUCTILE IRON SEWER PIPE FITTINGS ON THIS PLAN SHEET IS 200 POUNDS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.

CONNECT TO EXISTING 4" SANITARY SEWER FORCEMAIN WITH 11.25 DEG. BEND AND CONC. THRUST BLOCKING

THIS AREA ALSO SUBJECT TO A PERMANENT TRAIL EASEMENT

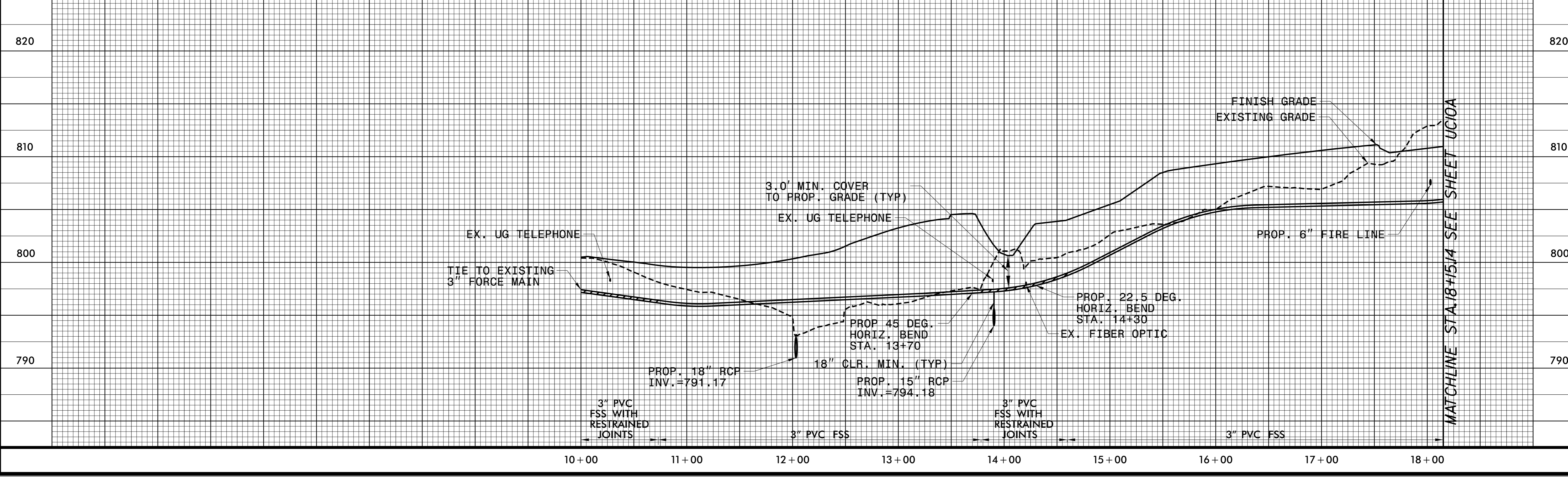
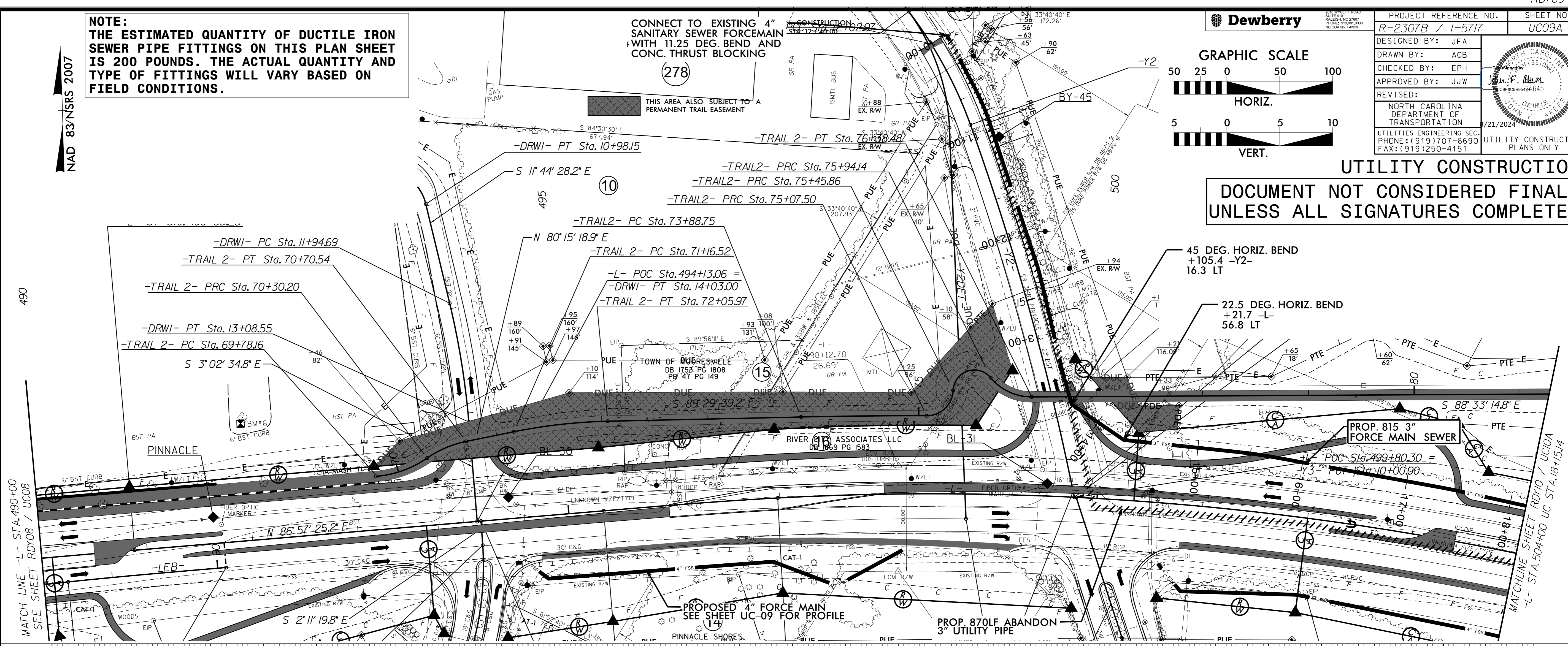


PROJECT REFERENCE NO.	SHEET NO.
R-2307B / 1-5717	UC09A
DESIGNED BY: JFA	
DRAWN BY: ACB	
CHECKED BY: EPH	
APPROVED BY: JJW	
REVISED:	8/21/2024
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	
UTILITY CONSTRUCTION PLANS ONLY	



UTILITY CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



MATCH LINE - L - STA. 490+00 SEE SHEET RDY08 / UC08

MATCHLINE SHEET RDY10 / UC10A -L- STA. 504+00 UC STA. 18+51.4

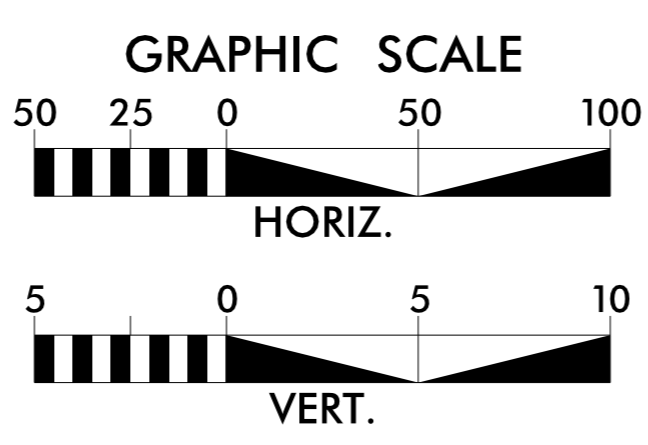
DATE PLOTTED: 8/21/2024 10:58:54 AM

MATCHLINE STA. 18+51.4 SEE SHEET UC10A

5/14/2017

700' 30" NAD 83

NOTE:
 THE ESTIMATED QUANTITY OF DUCTILE IRON SEWER PIPE FITTINGS ON THIS PLAN SHEET IS 400 POUNDS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.



Dewberry

PROJECT REFERENCE NO. R-2307B / I-5717 SHEET NO. UC10

DESIGNED BY: JFA
 DRAWN BY: ACB
 CHECKED BY: EPH
 APPROVED BY: JJW

REVISED:

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

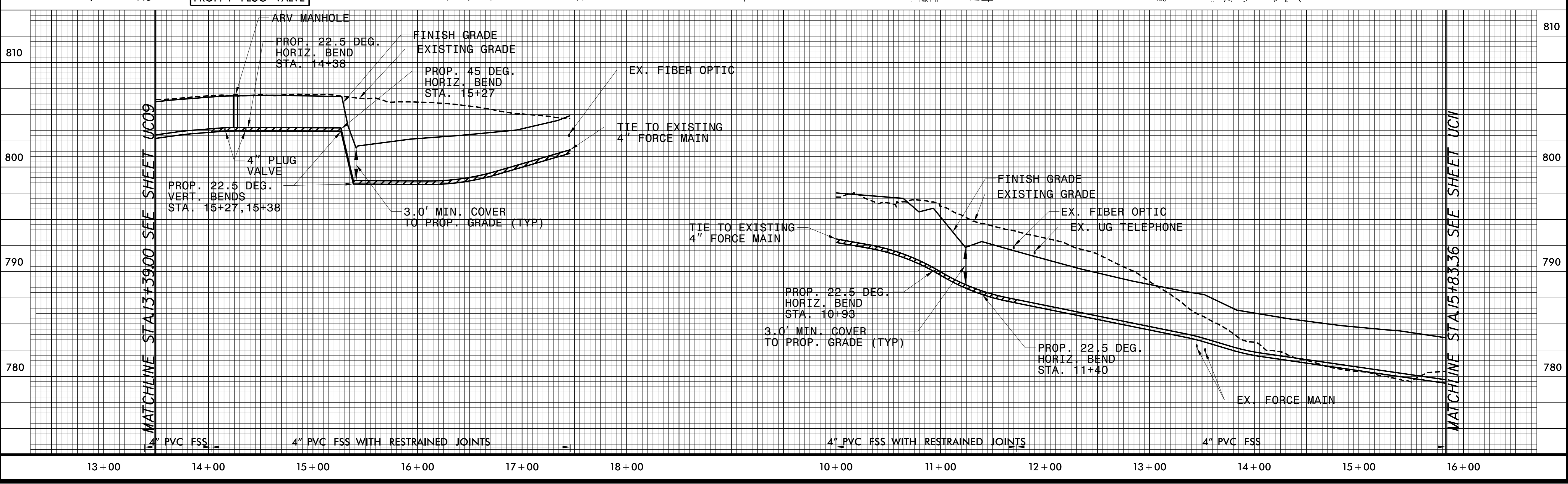
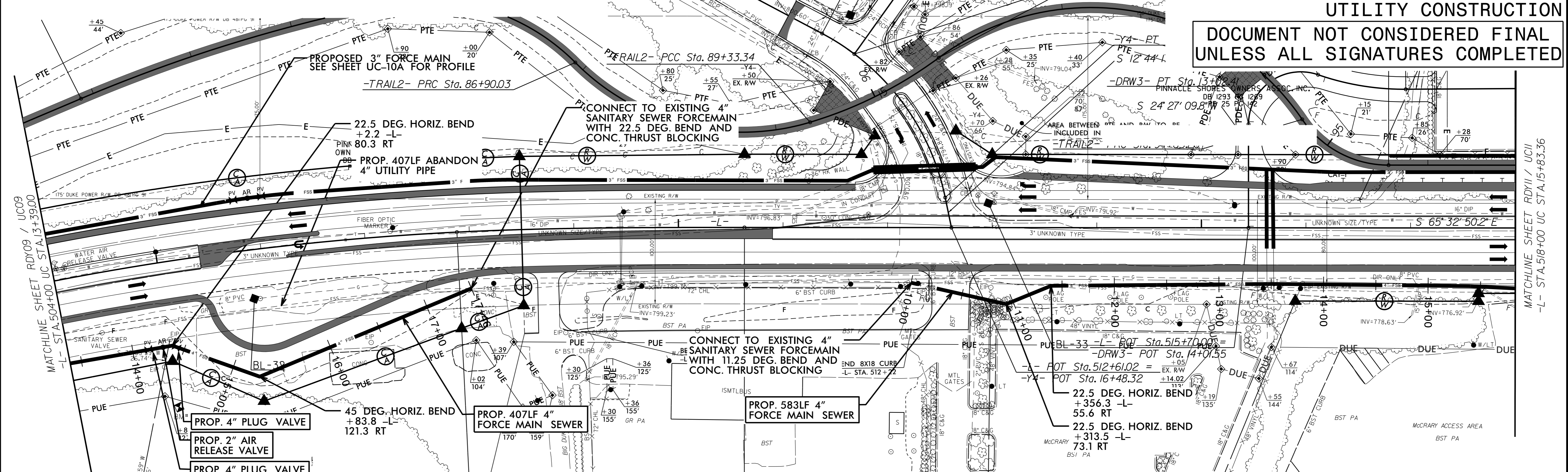
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151

UTILITY CONSTRUCTION PLANS ONLY

8/21/2024

UTILITY CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



UC10 UC11 UC12 UC13 UC14 UC15 UC16 UC17 UC18 UC19 UC20 UC21 UC22 UC23 UC24 UC25 UC26 UC27 UC28 UC29 UC30 UC31 UC32 UC33 UC34 UC35 UC36 UC37 UC38 UC39 UC40 UC41 UC42 UC43 UC44 UC45 UC46 UC47 UC48 UC49 UC50 UC51 UC52 UC53 UC54 UC55 UC56 UC57 UC58 UC59 UC60 UC61 UC62 UC63 UC64 UC65 UC66 UC67 UC68 UC69 UC70 UC71 UC72 UC73 UC74 UC75 UC76 UC77 UC78 UC79 UC80 UC81 UC82 UC83 UC84 UC85 UC86 UC87 UC88 UC89 UC90 UC91 UC92 UC93 UC94 UC95 UC96 UC97 UC98 UC99 UC100

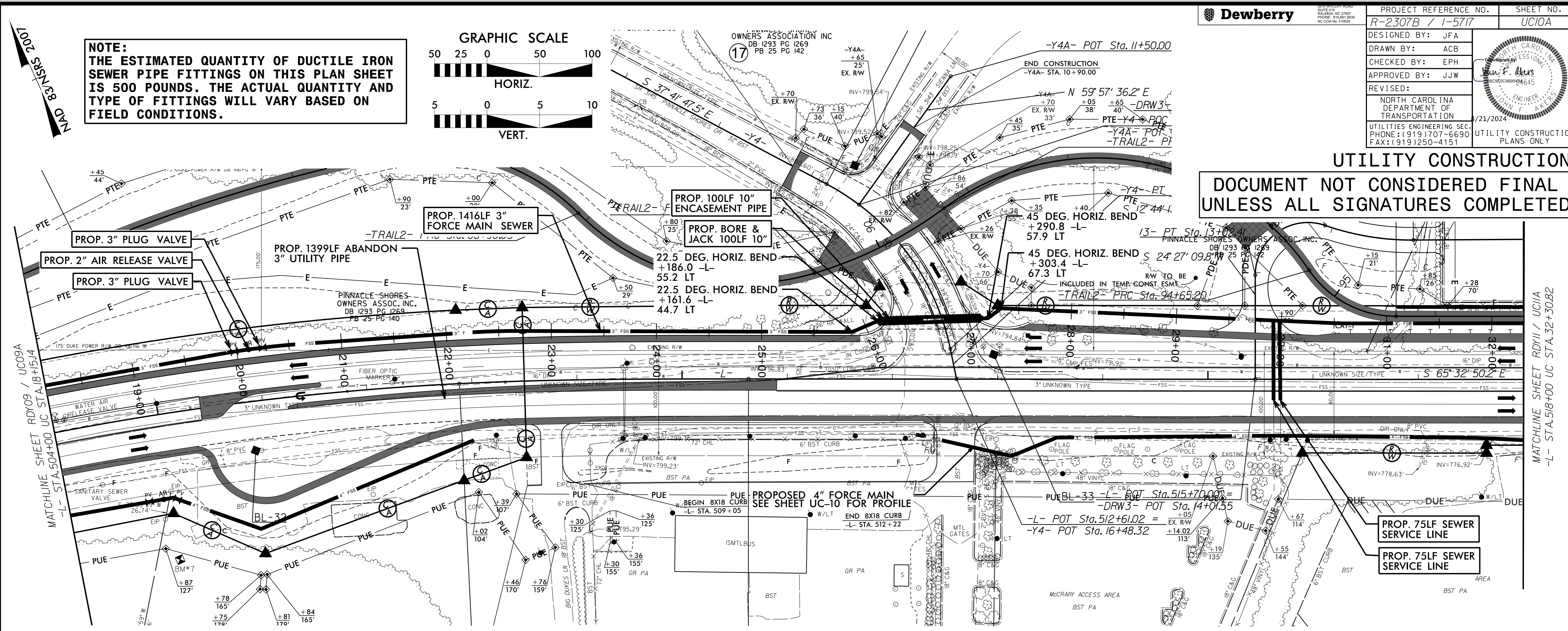
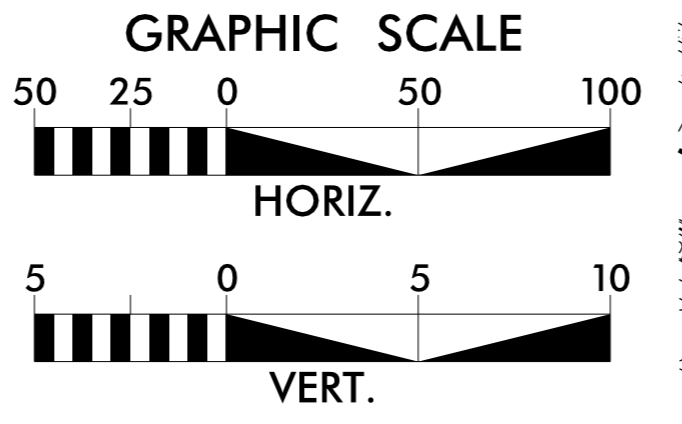
MATCHLINE STA. 13+39.00 SEE SHEET UC09

MATCHLINE STA. 15+83.36 SEE SHEET UC11

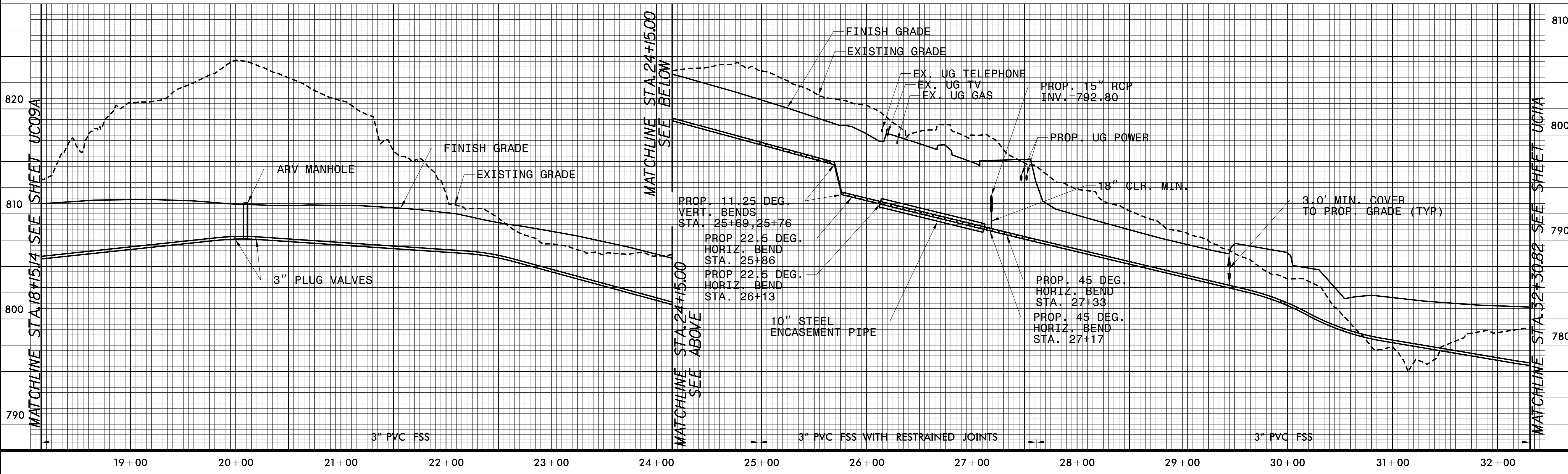


PROJECT REFERENCE NO. R-2307B / I-5717	SHEET NO. UC10A
DESIGNED BY: JFA	
DRAWN BY: ACB	
CHECKED BY: EPH	
APPROVED BY: JJW	
REVISED:	DATE: 8/21/2024
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	
UTILITY CONSTRUCTION PLANS ONLY	

NOTE:
THE ESTIMATED QUANTITY OF DUCTILE IRON SEWER PIPE FITTINGS ON THIS PLAN SHEET IS 500 POUNDS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.



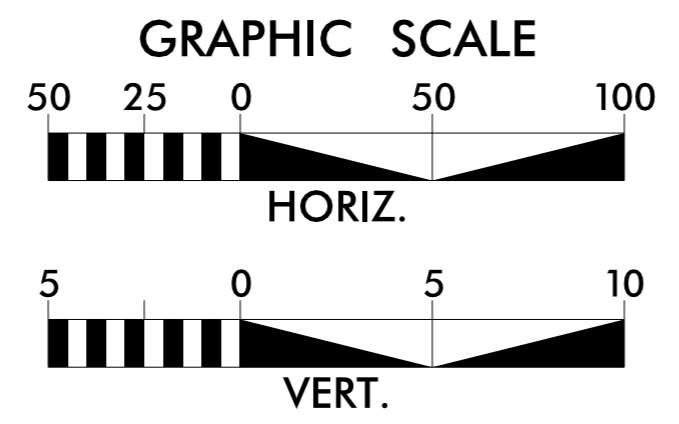
UTILITY CONSTRUCTION
DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



MATCHLINE STA. 18+51.4 SEE SHEET UC09A
 MATCHLINE STA. 24+15.00 SEE ABOVE
 MATCHLINE STA. 24+15.00 SEE BELOW
 MATCHLINE STA. 32+30.82 SEE SHEET UC11A

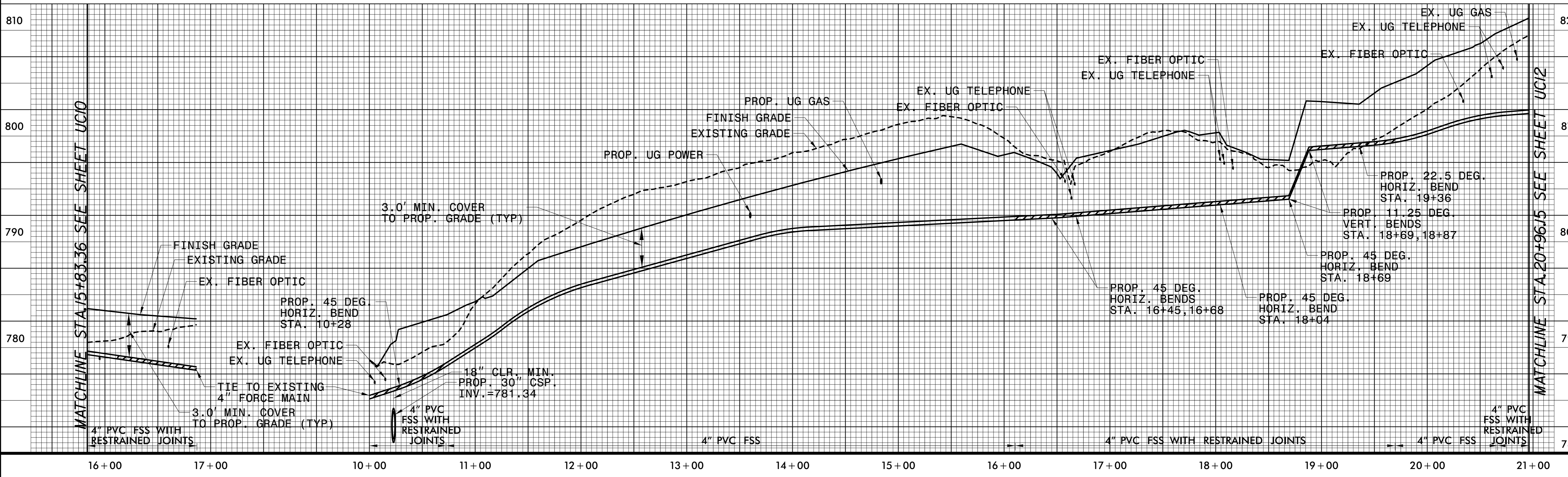
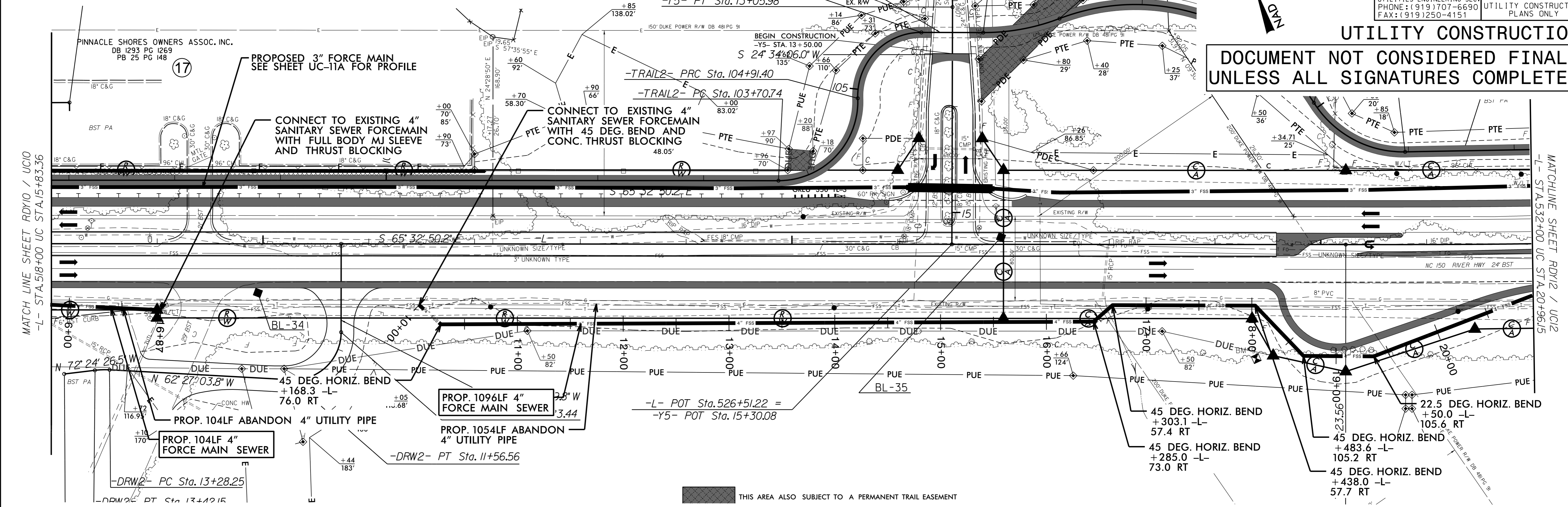
MATCHLINE SHEET RDY09 / UC09A
 -L- STA. 50+40.0 UC STA. 8+51.4
 MATCHLINE SHEET RDY11 / UC11A
 -L- STA. 58+00 UC STA. 32+30.82

NOTE:
 THE ESTIMATED QUANTITY OF DUCTILE IRON SEWER PIPE FITTINGS ON THIS PLAN SHEET IS 500 POUNDS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.



PROJECT REFERENCE NO.	R-2307B / 1-5717	SHEET NO.	UC11
DESIGNED BY:	JFA		
DRAWN BY:	ACB		
CHECKED BY:	EPH		
APPROVED BY:	JJW		
REVISED:		8/21/2024	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION		UTILITY CONSTRUCTION PLANS ONLY	
UTILITIES ENGINEERING SEC.		PHONE: (919) 707-6690	
		FAX: (919) 250-4151	

UTILITY CONSTRUCTION
 DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED



MATCH LINE SHEET RDY10 / UC10
 -L- STA. 518+00 UC STA. 15+83.36

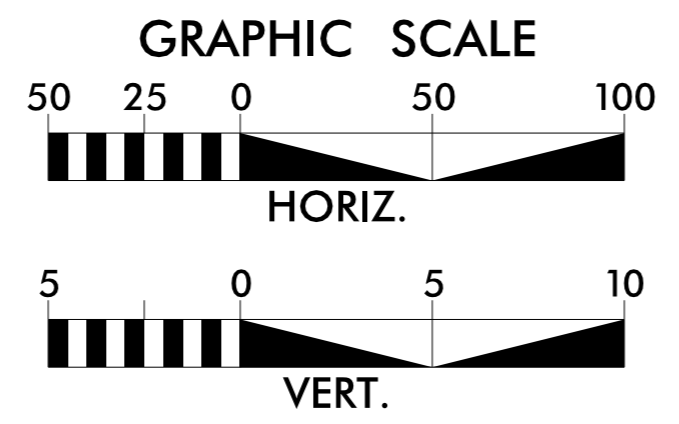
MATCHLINE SHEET RDY12 / UC12
 -L- STA. 532+00 UC STA. 20+96.15

MATCHLINE STA. 15+83.36 SEE SHEET UC10

MATCHLINE STA. 20+96.15 SEE SHEET UC12

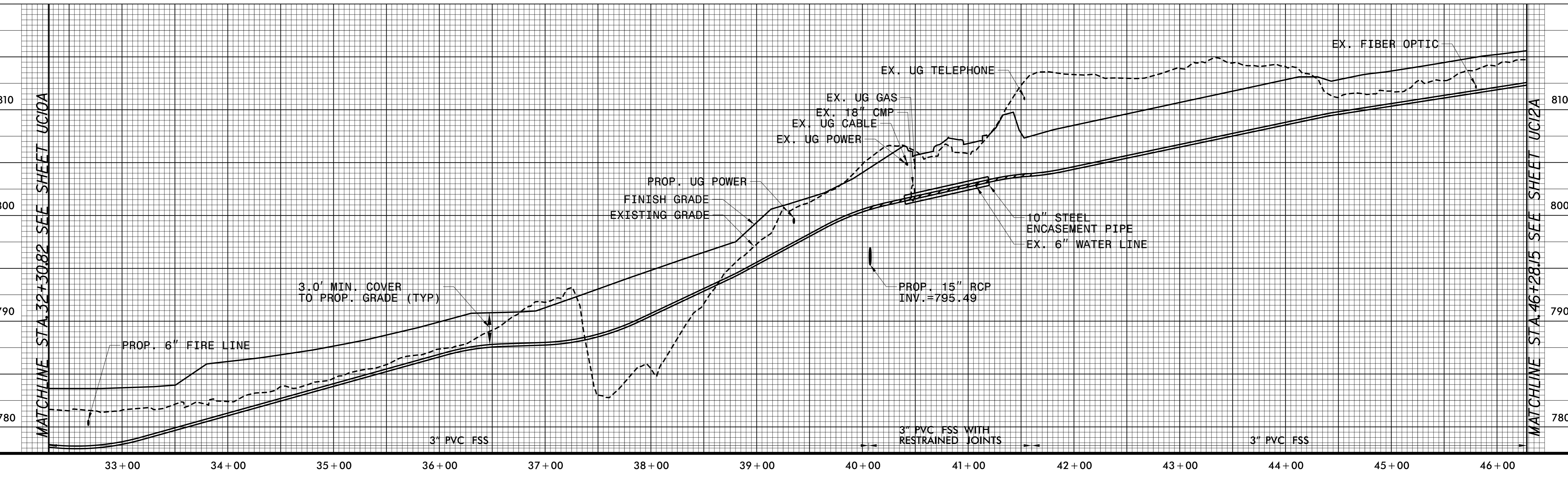
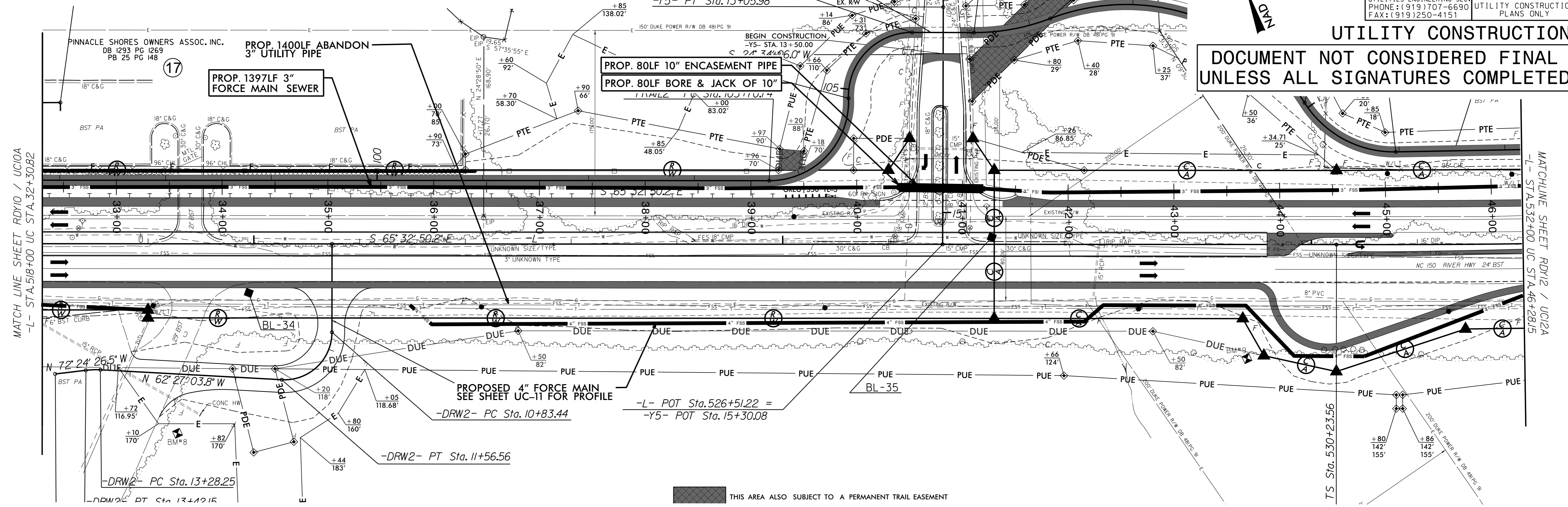
THIS AREA ALSO SUBJECT TO A PERMANENT TRAIL EASEMENT

NOTE:
 THE ESTIMATED QUANTITY OF DUCTILE IRON SEWER PIPE FITTINGS ON THIS PLAN SHEET IS 100 POUNDS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.



PROJECT REFERENCE NO. R-2307B / I-5717	SHEET NO. UC1A
DESIGNED BY: JFA	
DRAWN BY: ACB	
CHECKED BY: EPH	
APPROVED BY: JJW	
REVISED:	8/21/2024
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	
UTILITY CONSTRUCTION PLANS ONLY	

UTILITY CONSTRUCTION
 DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED



MATCHLINE SHEET RDY10 / UC10A
-L- STA.518+00 UC STA.32+30.82

MATCHLINE SHEET RDY12 / UC12A
-L- STA.532+00 UC STA.46+28.15

MATCHLINE STA.32+30.82 SEE SHEET UC10A

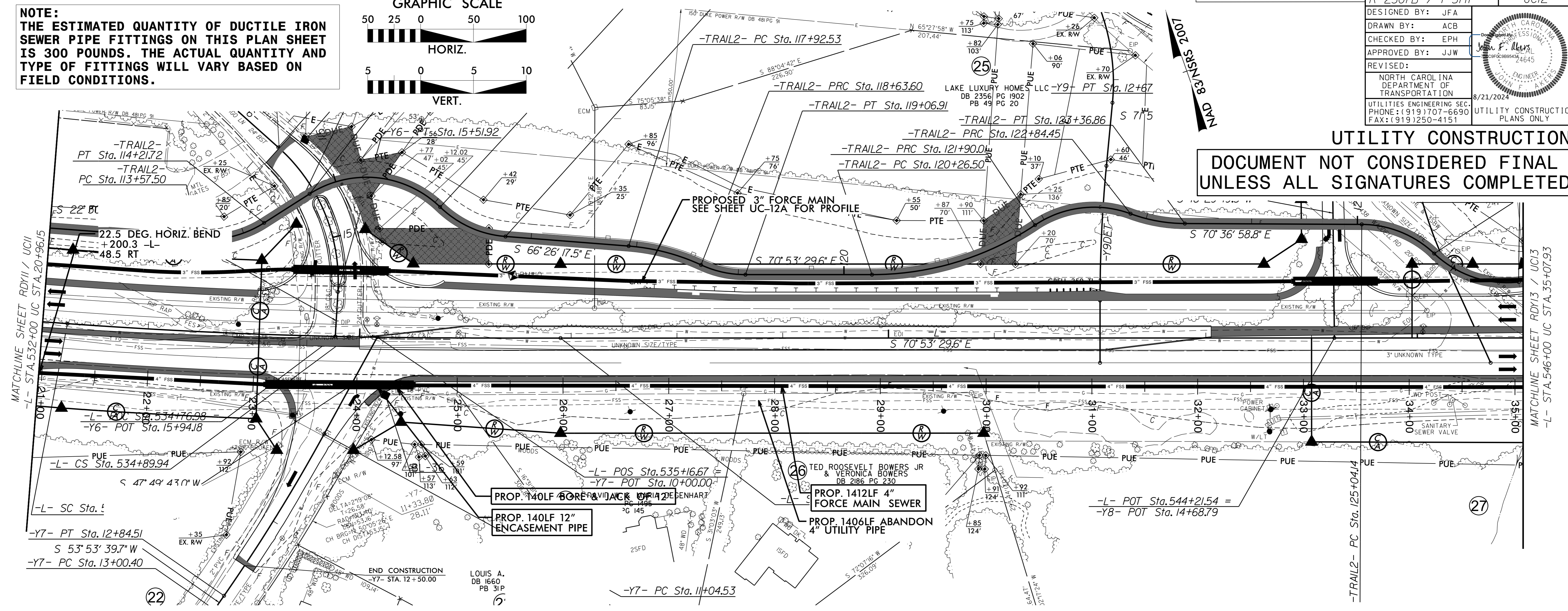
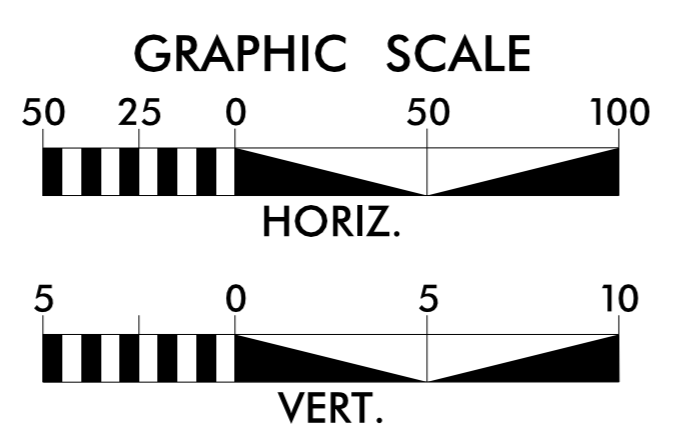
MATCHLINE STA.46+28.15 SEE SHEET UC12A

5/14/24

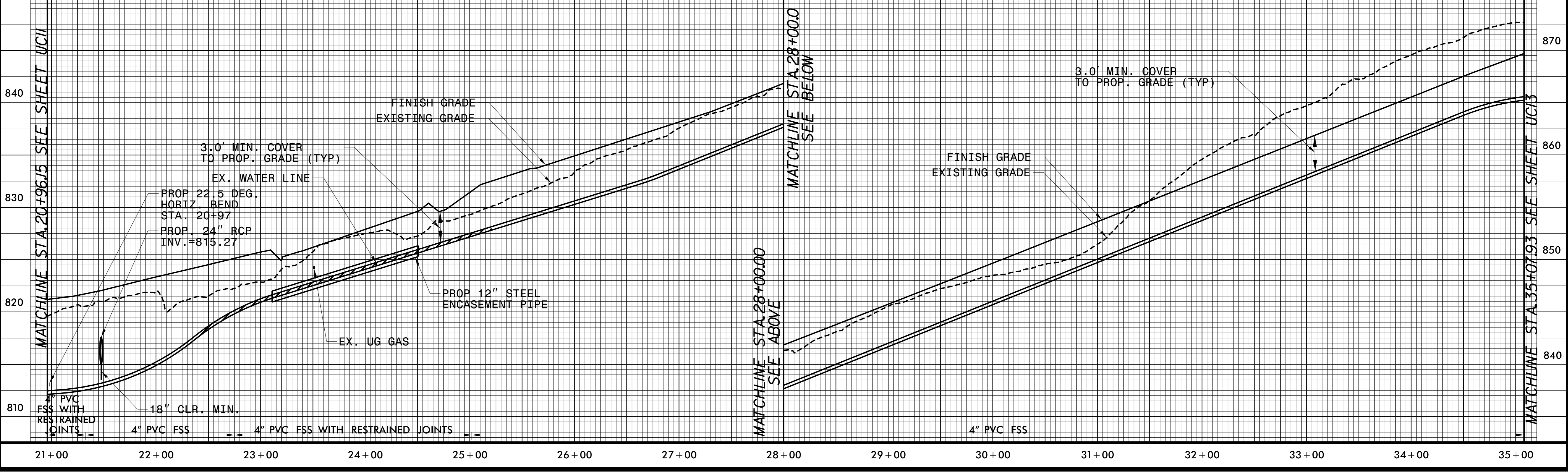


PROJECT REFERENCE NO.	R-2307B / 1-5717	SHEET NO.	UC12
DESIGNED BY:	JFA		
DRAWN BY:	ACB		
CHECKED BY:	EPH		
APPROVED BY:	JJW		
REVISED:		8/21/2024	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151		UTILITY CONSTRUCTION PLANS ONLY	

NOTE:
 THE ESTIMATED QUANTITY OF DUCTILE IRON SEWER PIPE FITTINGS ON THIS PLAN SHEET IS 300 POUNDS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.



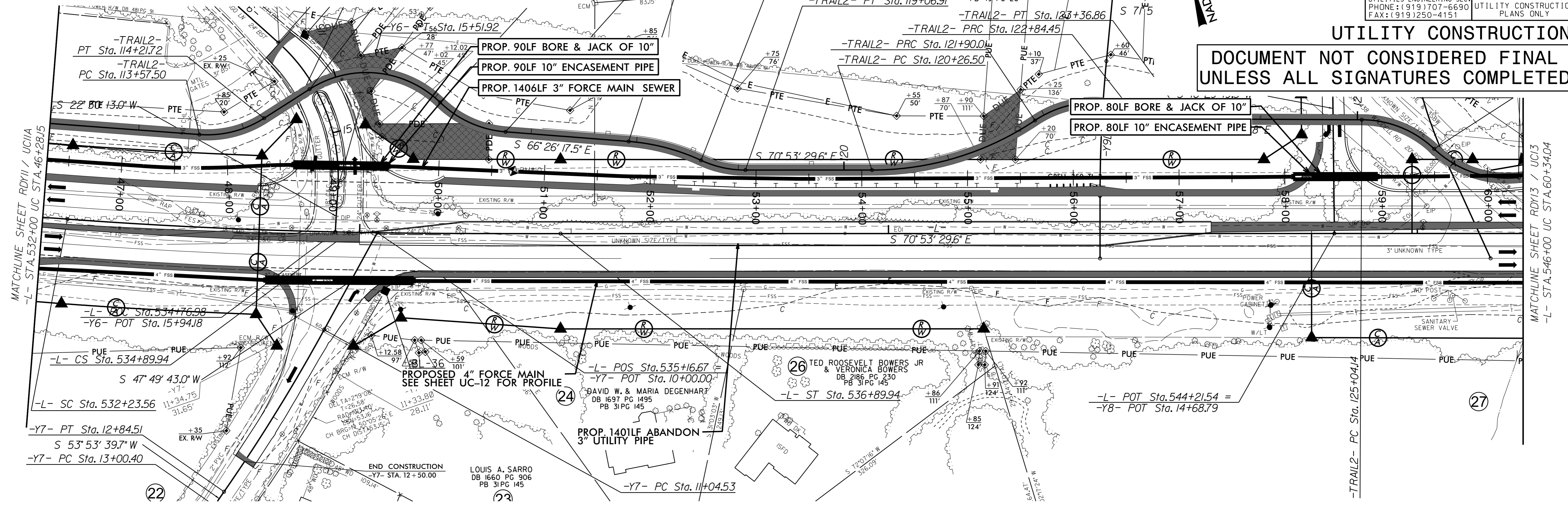
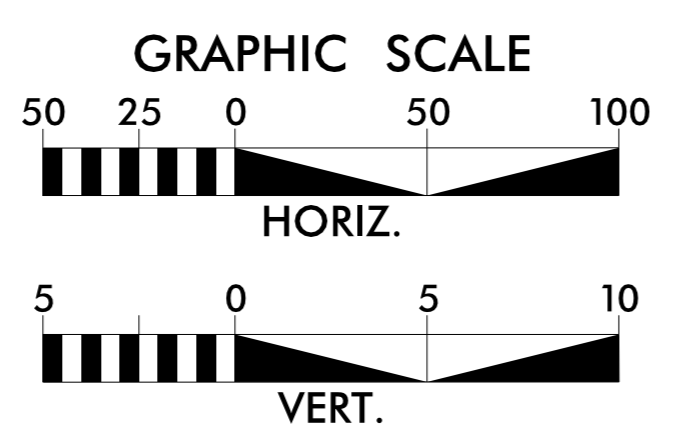
UTILITY CONSTRUCTION
 DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED



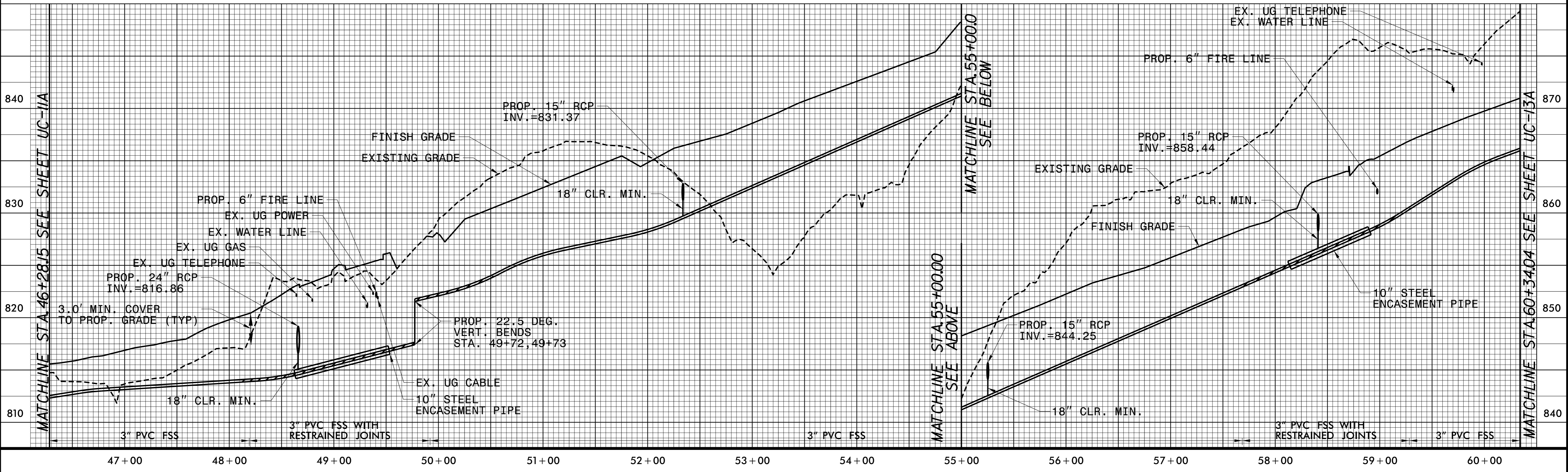


PROJECT REFERENCE NO.	R-2307B / I-5717	SHEET NO.	UC12A
DESIGNED BY:	JFA		
DRAWN BY:	ACB		
CHECKED BY:	EPH		
APPROVED BY:	JJW		
REVISED:		NORTH CAROLINA DEPARTMENT OF TRANSPORTATION 8/21/2024 UTILITY ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	
UTILITY CONSTRUCTION PLANS ONLY			

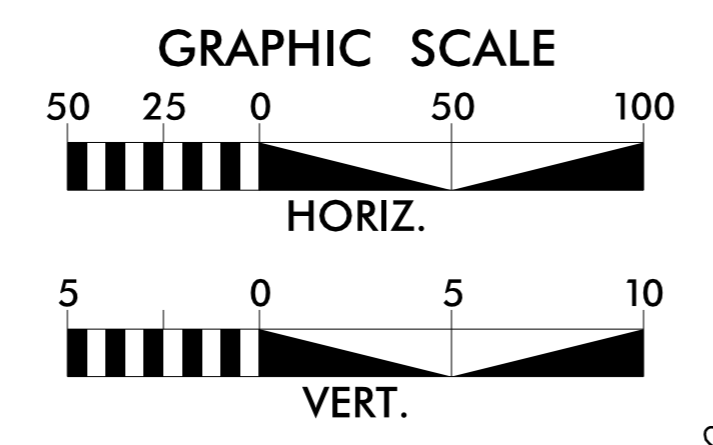
NOTE:
 THE ESTIMATED QUANTITY OF DUCTILE IRON SEWER PIPE FITTINGS ON THIS PLAN SHEET IS 400 POUNDS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.



UTILITY CONSTRUCTION
 DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED



NOTE:
 THE ESTIMATED QUANTITY OF DUCTILE IRON SEWER PIPE FITTINGS ON THIS PLAN SHEET IS 700 POUNDS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.



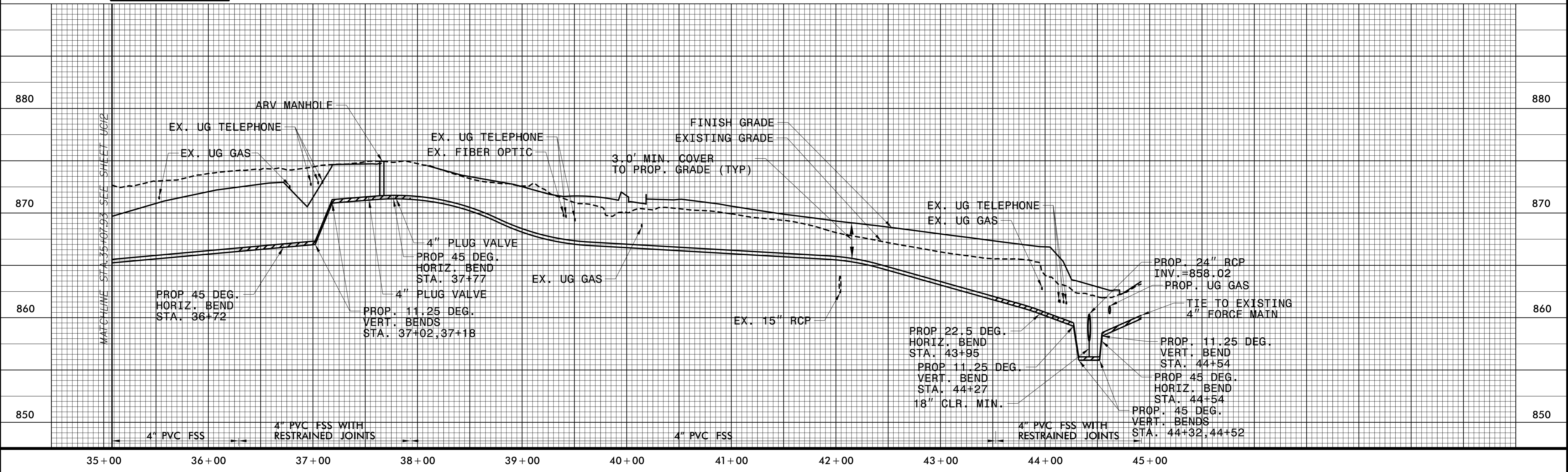
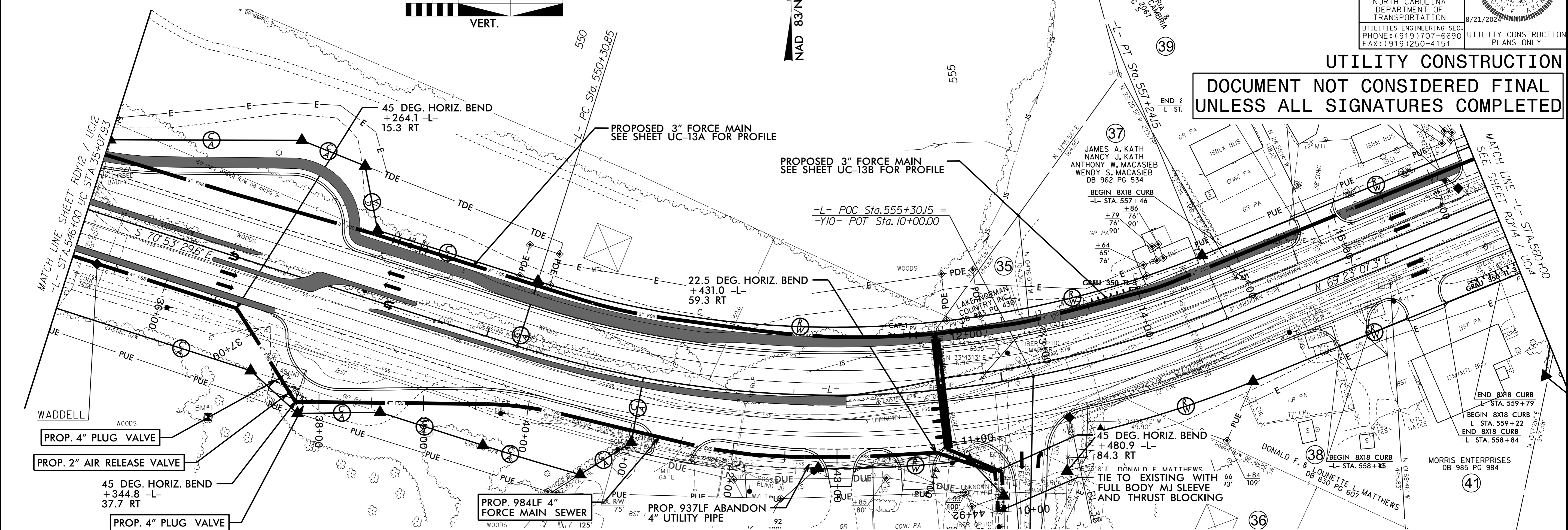
RONNIE L. SMITH & LEE A. SMITH
 DB 2084 PG 2258
 PB 57 PG 80

NAD 83/NSRS 2007



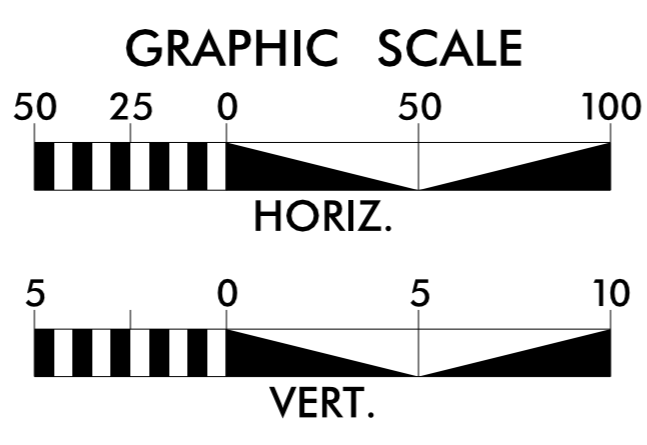
PROJECT REFERENCE NO.	R-2307B / I-5717	SHEET NO.	UC13
DESIGNED BY:	JFA		
DRAWN BY:	ACB		
CHECKED BY:	EPH		
APPROVED BY:	JJW		
REVISOR:		8/21/2024	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION		UTILITY CONSTRUCTION PLANS ONLY	
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151			

UTILITY CONSTRUCTION
 DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



5/14/24

NOTE:
THE ESTIMATED QUANTITY OF DUCTILE IRON SEWER PIPE FITTINGS ON THIS PLAN SHEET IS 200 POUNDS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.



RONNIE L. SMITH & LEE A. SMITH
DB 2084 PG 2258
PB 57 PG 80

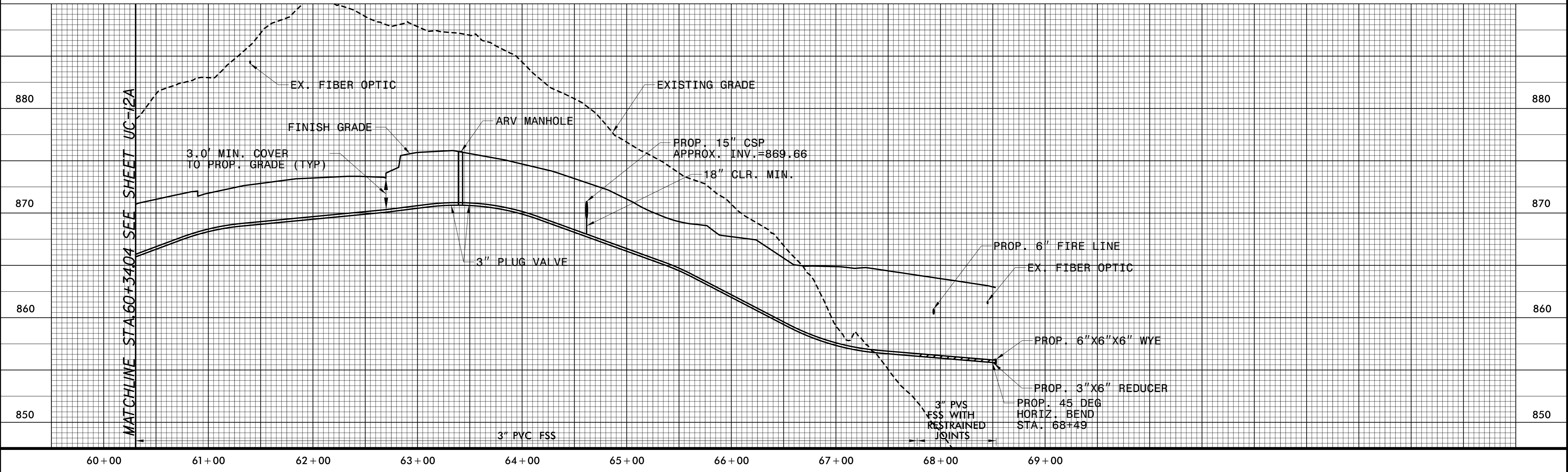
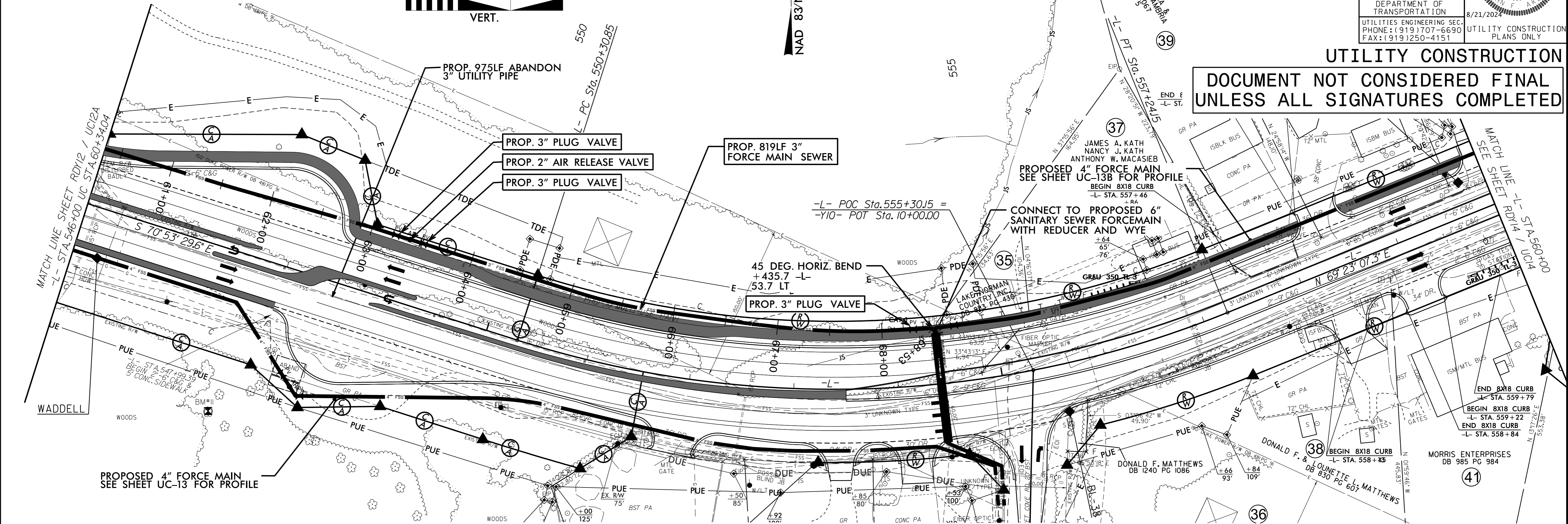
NAD 83/NSRS 2007



PROJECT REFERENCE NO.	R-2307B / 1-5717	SHEET NO.	UC13A
DESIGNED BY:	JFA		
DRAWN BY:	ACB		
CHECKED BY:	EPH		
APPROVED BY:	JJW		
REVISIONS:		8/21/2024	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION		UTILITY CONSTRUCTION PLANS ONLY	
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151			

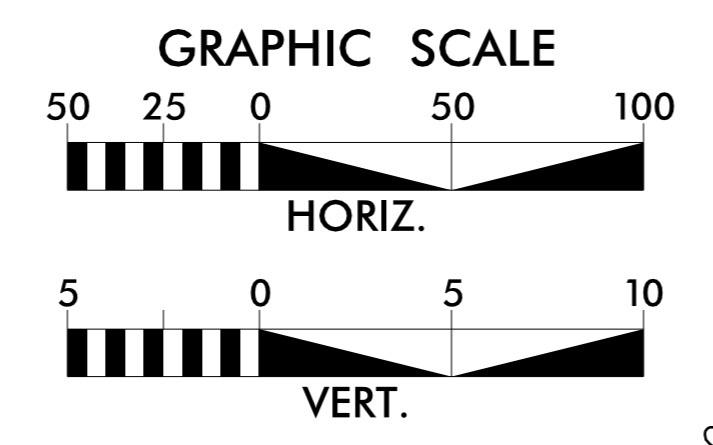
UTILITY CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



VERTICAL CURVE DATA:
STATIONING: 60+00 TO 69+00
VERTICAL CURVE DATA:
STATIONING: 60+00 TO 69+00

NOTE:
 THE ESTIMATED QUANTITY OF DUCTILE IRON SEWER PIPE FITTINGS ON THIS PLAN SHEET IS 700 POUNDS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.



RONNIE L. SMITH & LEE A. SMITH
 DB 2084 PG 2258
 PB 57 PG 80

NAD 83/NSRS 2007



PROJECT REFERENCE NO. R-2307B / I-5717	SHEET NO. UC13B
DESIGNED BY: JFA	
DRAWN BY: ACB	
CHECKED BY: EPH	
APPROVED BY: JJW	
REVISOR:	8/21/2007
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	
UTILITY CONSTRUCTION PLANS ONLY	

UTILITY CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

