

09_08/19

T.I.P. NO.	SHEET NO.
U-4902D	UC-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

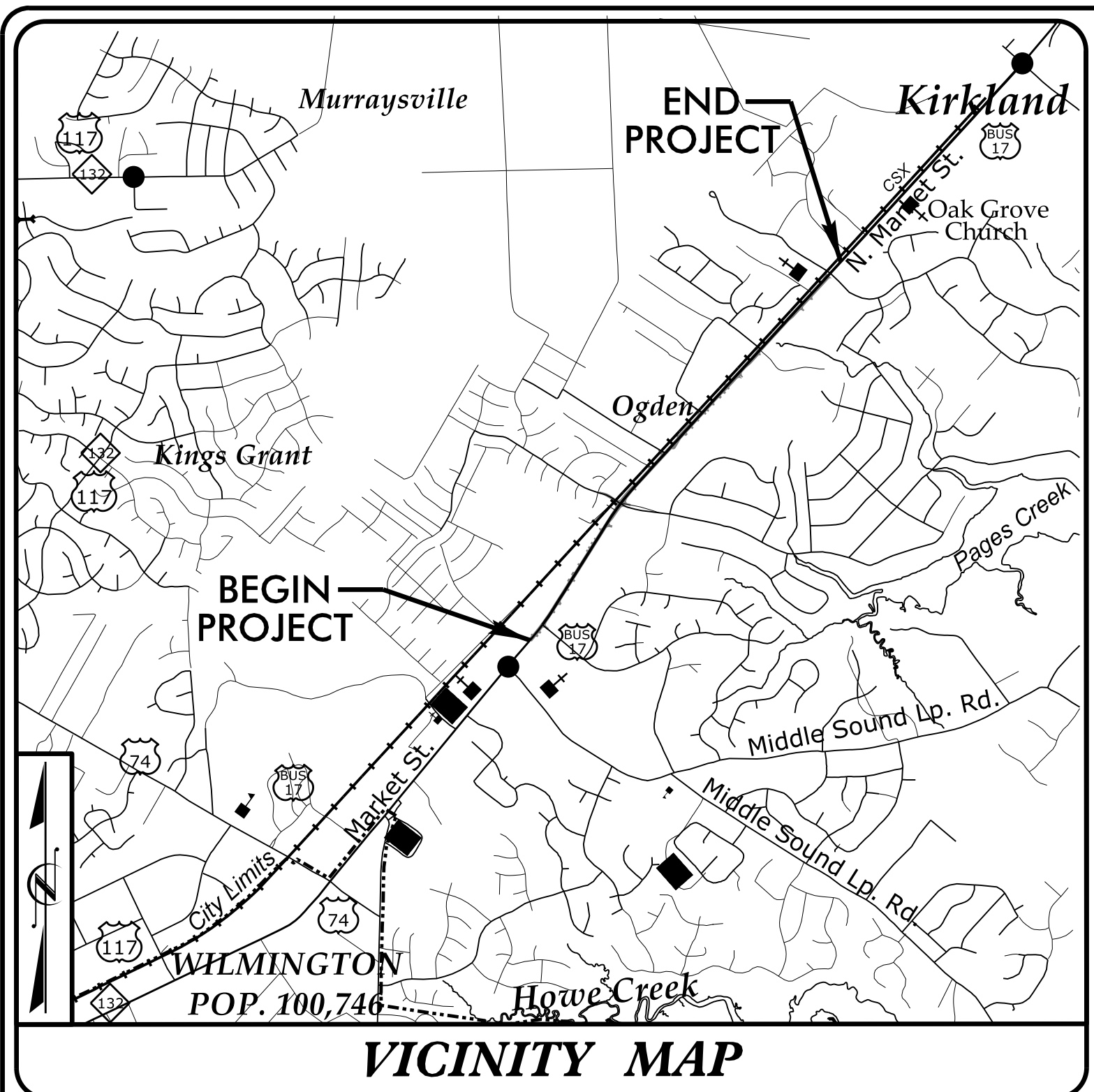
**UTILITY CONSTRUCTION PLANS
NEW HANOVER COUNTY**

**LOCATION: US 17 BUS (MARKET STREET) FROM
SR 1403 (MIDDLE SOUND LOOP ROAD)
TO SR 2290 (MENDENHALL DRIVE)/
SR 2734 (MARSH OAKS DRIVE)**

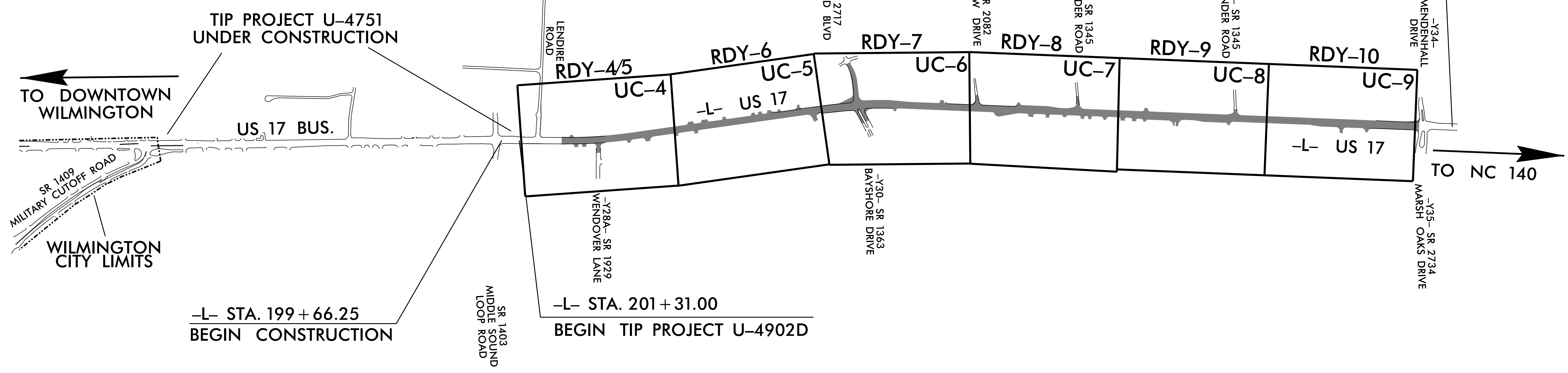
TYPE OF WORK: RELOCATION OF WATER AND SEWER FACILITIES



TIP PROJECT: U-4902D

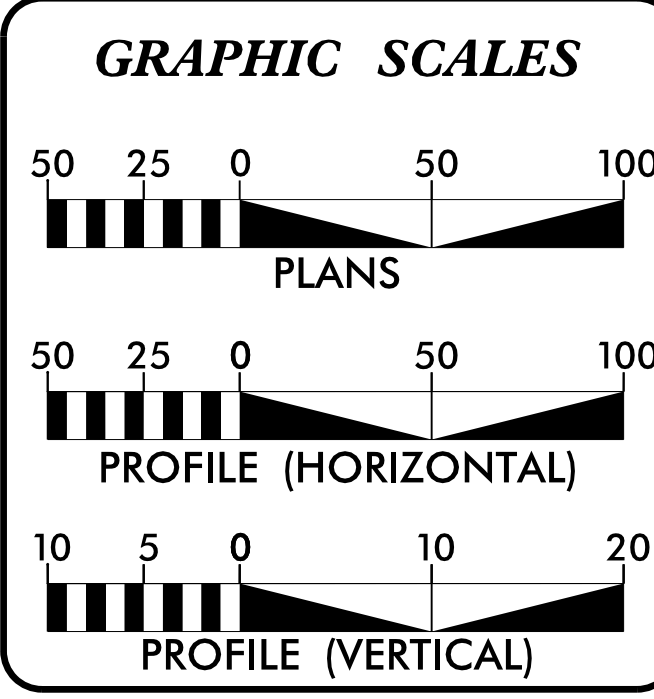


VICINITY MAP



CONTRACT: C202280

**DOCUMENT NOT CONSIDERED FINAL
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INDEX OF SHEETS

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UC-1	TITLE SHEET
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UC-4 THRU UC-9	PLAN SHEETS
UC-10 THRU UC-15	PROFILE SHEETS

WATER AND SEWER OWNERS ON PROJECT

(1) WATER - CAPE FEAR PUBLIC UTILITY AUTHORITY (CFPUA)
 (2) SANITARY SEWER (GRAVITY) - CFPUA
 (3) SANITARY SEWER (FORCE MAIN) - CFPUA

PREPARED IN THE OFFICE OF
M A Engineering Consultants, Inc.
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FOR
HNTB
 HNTB NORTH CAROLINA, P.C.
 343 E. Six Forks Road, Suite 200
 Raleigh, North Carolina 27609
 NC License No: C-1554

KEVIN C. ZDEB, PE PROJECT ENGINEER
SAM FORSTER PROJECT DESIGN ENGINEER
WEBB WHITE PROJECT UTILITY COORDINATOR

SEAL

9/17/2018

**DIVISION OF HIGHWAYS
DIVISION 3**
 5501 BARBADOS BLVD
 CASTLE HAYNE NC 28429
 PHONE (910) 341-2000
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KEVIN G. BOWEN, PE DIVISION CONSTRUCTION ENGINEER
LONNY A. SLEEPER DIVISION UTILITY ENGINEER
KRISTA H. KIMMEL ENGINEER - ADVANCED

8/20/2018 E:\J085\0659\090\10400\U4902D\Utilities\Engineering\UC\Proj\U4902D_ut_UC-01-f.sh.dgn 7:48:26 AM

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	-----PEH-----
Relocate Fire Hydrant	-----REH-----
Remove Fire Hydrant	-----REM FH-----
Water Meter	-----PMM-----
Relocate Water Meter	-----PMM-----
Remove Water Meter	-----REM WM-----
Water Pump Station	-----PST(W)-----
RPZ Backflow Preventer	-----PRPZ-----
DCV Backflow Preventer	-----PBFP-----
Relocate RPZ Backflow Preventer	-----PRPZ-----
Relocate DCV Backflow Preventer	-----PBFP-----

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	-----PST(SS)-----

PROPOSED MISCELLANEOUS UTILITIES SYMBOLS

Power Pole	-----o-----
Telephone Pole	-----o-----
Joint Use Pole	-----o-----
Telephone Pedestal	-----TE 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	-----o-----	*Underground Power Line	-----P-----
Telephone Pole	-----o-----	*Underground Telephone Cable	-----T-----
Joint Use Pole	-----o-----	*Underground Telephone Conduit	-----TC-----
Utility Pole	-----o-----	*Underground Fiber Optics Telephone Cable	-----T FO-----
Utility Pole with Base	-----□-----	*Underground TV Cable	-----TV-----
H-Frame Pole	-----o-----	*Underground Fiber Optics TV Cable	-----TV FO-----
Power Transmission Line Tower	-----⊠-----	*Underground Gas Pipeline	-----G-----
Water Manhole	-----⊙-----	Aboveground Gas Pipeline	-----A/G Gas-----
Power Manhole	-----⊙-----	*Underground Water Line	-----W-----
Telephone Manhole	-----⊙-----	Aboveground Water Line	-----A/G Water-----
Sanitary Sewer Manhole	-----⊙-----	*Underground Gravity Sanitary Sewer Line	-----SS-----
Hand Hole for Cable	-----⊠-----	Aboveground Gravity Sanitary Sewer Line	-----A/G Sanitary Sewer-----
Power Transformer	-----⊠-----	*Underground SS Forced Main Line	-----FSS-----
Telephone Pedestal	-----⊠-----	Underground Unknown Utility Line	-----?U/L-----
CATV Pedestal	-----⊠-----	SUE Test Hole	-----•-----
Gas Valve	-----◇-----	Water Meter	-----o-----
Gas Meter	-----◇-----	Water Valve	-----⊙-----
Located Miscellaneous Utility Object	-----o-----	Fire Hydrant	-----◇-----
Abandoned According to Utility Records	-----AATUR-----	Sanitary Sewer Cleanout	-----⊙-----
End of Information	-----E.O.I.-----		

*For Existing Utilities
 Utility Line Drawn from Record (Type as Shown) -----
 Designated Utility Line (Type as Shown) -----

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 REV: 2/1/2012

UTILITY CONSTRUCTION

GENERAL NOTES:

1. THE PROPOSED UTILITY CONSTRUCTION SHALL MEET THE APPLICABLE REQUIREMENTS OF THE NC DEPARTMENT OF TRANSPORTATION'S "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" DATED JANUARY 2018 AND THE CAPE FEAR PUBLIC UTILITY AUTHORITY (CFPUA) STANDARD SPECIFICATIONS AND DETAILS, LATEST EDITION (MONTH YEAR).

2. THE EXISTING WATER AND SEWER UTILITIES BELONG TO CAPE FEAR PUBLIC UTILITY AUTHORITY (CFPUA).

 CONTACT: DAVID DAILEY
 PHONE: 910-332-6626

3. ALL WATER LINES TO BE INSTALLED WITHIN COMPLIANCE OF THE RULES AND REGULATIONS OF THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL AND NATURAL RESOURCES, DIVISION OF ENVIRONMENTAL HEALTH.

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.

10. CONTRACTOR SHALL NOT OPERATE ANY VALVES ON THE EXISTING UTILITY SYSTEMS. CONTRACTOR SHALL CONTACT THE UTILITY OWNER TO CONDUCT STRATEGIC OPERATION OF VALVES FOR SERVICE INTERRUPTION IN ORDER TO PERFORM SPECIFIC WORK.

11. CONTRACTOR SHALL CONTACT THE UTILITY OWNER PRIOR TO PERFORMING SYSTEM FLUSHING OR BLOW-OFF OPERATIONS.

PROJECT SPECIFIC NOTES:

1. CONTRACTOR'S ATTENTION IS DIRECTED TO THE UTILITY CONSTRUCTION PROJECT SPECIAL PROVISIONS PROVIDED ALONG WITH THIS PLAN SET.

2. CONTRACTOR SHALL, UPON MOBILIZATION TO THE PROJECT SITE, CONSTRUCT THE GRAVITY SEWER (ON SHEET UC-7) LOCATED FROM L STA. 249+17 RT TO STA 253+46 RT WITHIN THE FIRST THREE (3) MONTHS OF CONSTRUCTION WORK.

3. PVC PIPE MANUFACTURED MORE THAN 12 MONTHS BEFORE INSTALLATION DATE WILL NOT BE ACCEPTED.

4. ALL WATER LINE, WATER SERVICES, SANITARY SEWER MAIN, AND SANITARY SEWER SERVICES SHALL BE INSTALLED WITH A CONTINUOUS TRACER WIRE FOR LOCATION PURPOSES BY MEANS OF AN ELECTRONIC TRACER.

5. WATER LINE PIPE SHALL BE EITHER PVC OR DUCTILE IRON. PVC PIPE SHALL BE DR-18 AWWA C900 OR AWWA C905 WITH D.I.P. EQUIVALENT OUTSIDE DIAMETERS AND CERTIFIED NSF61 FOR POTABLE WATER USE. DUCTILE IRON PIPE SHALL BE MANUFACTURED IN ACCORDANCE WITH AWWA C150 AND C151 AND SHALL BE A MINIMUM PRESSURE CLASS OF 350 AND THICKNESS CLASS 52.

6. DUCTILE IRON PIPE SHALL BE EITHER PUSH-ON, MECHANICAL JOINT, OR RESTRAINED JOINT CONSTRUCTION.

7. ALL WATER LINE FITTINGS SHALL BE DUCTILE IRON, MECHANICAL JOINT OR RESTRAINED JOINT COMPACT FITTINGS AND SHALL CONFORM WITH ANSI/AWWA C153/A21.53 UNLESS OTHERWISE DIRECTED. FITTINGS 4-INCH THROUGH 24-INCH DIAMETER SHALL HAVE A MINIMUM PRESSURE RATING OF 350 PSI.

8. ALL PROPOSED FITTINGS (BENDS, TEES, CROSSES, REDUCERS, PLUGS, ETC.) SHALL BE ADEQUATELY RESTRAINED BY THE USE OF RESTRAINED JOINT CONSTRUCTION AND/OR CAST IN PLACE CONCRETE THRUST RESTRAINS AS DETAILED ON THESE DRAWINGS, OR AS DIRECTED BY THE RESIDENT ENGINEER.

9. TRENCHLESS INSTALLATION OF WATER LINE, 4" THROUGH 24", SHALL UTILIZE PVC C900 OR C905 DR-18 PIPE WITH FUSIBLE JOINTS AND D.I.P. EQUIVALENT OUTSIDE DIAMETERS.

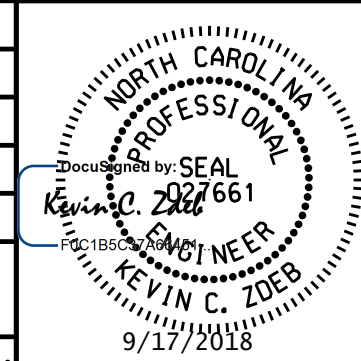

10. CONTRACTOR'S ATTENTION IS DIRECTED TO SECTIONS 102, 107, AND 1550 OF THE STANDARD SPECIFICATIONS CONCERNING TRENCHLESS INSTALLATION. IT IS THE CONTRACTOR'S RESPONSIBILITY TO HAVE BORE DESIGNED AND SEALED BY A LICENSED NORTH CAROLINA PROFESSIONAL ENGINEER. NO DAMAGE IS ALLOWED TO RIVER, WETLANDS,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

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

12. EXISTING WATER METERS TO BE RELOCATED SHALL BE CONNECTED TO THE EXISTING OR PROPOSED WATER LINE WITH NEW WATER SERVICE LINES. ANY EXTENSIONS OR MODIFICATIONS TO THE EXISTING SERVICE LINES ON THE CUSTOMER SIDE OF THE WATER METER SHALL BE INCIDENTAL TO THE RELOCATION OF THE WATER METER. ALL WORK SHALL BE CONDUCTED WITH LIKE PIPE MATERIALS AS THE EXISTING PIPES, UNLESS THE EXISTING MATERIALS ARE FOUND TO BE UNSUITABLE (I.E. GALVANIZED OR LEAD), THEN CONTRACTOR SHALL USE COPPER WATER PIPE AND TUBING CONFORMING TO ASTM B88 SOFT ANNEALED TYPE K. USE FLARED OR COMPRESSION TYPE FITTINGS CONFORMING TO ANSI/AWWA C800.

13. ALL NEW OR RELOCATED WATER METERS SHALL BE INSTALLED WITH THE BACK (CUSTOMER SIDE) OF THE METER BOX AT THE RIGHT-OF-WAY LINE, UNLESS OTHERWISE DIRECTED BY THE RESIDENT ENGINEER.

14. EXISTING WATER SERVICE LINES BETWEEN THE EXISTING WATER LINE AND THE REMOVED WATER METER SHALL BE ABANDONED IN PLACE OR REMOVED AS NEEDED AS PER SECTION 1530 OF THE NCDOT SPECIFICATIONS OR AS DIRECTED BY THE RESIDENT ENGINEER.

PROJECT REFERENCE NO. U-4902D	SHEET NO. UC-3
DESIGNED BY: SHF	
DRAWN BY: SHF	
CHECKED BY: KCZ	
APPROVED BY: KCZ	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	
UTILITY CONSTRUCTION PLANS ONLY	
	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

UTILITY CONSTRUCTION

UTILITY CONSTRUCTION

PROJECT SPECIFIC NOTES (CONTINUED):

15. HYDRANTS AND WATER METERS LABELLED TO BE REMOVED SHALL NOT BE USED AS NEW MATERIALS IN THE PROPOSED CONSTRUCTION UNLESS OTHERWISE DIRECTED BY THE UTILITY OWNER'S REPRESENTATIVE.

16. EXISTING HYDRANTS AND WATER METERS TO BE REMOVED AND/OR RELOCATED SHALL BE RETURNED TO THE UTILITY OWNER FOR INSPECTION. CONTRACTOR SHALL DELIVER THESE UTILITY ITEMS TO A MUTUALLY AGREED UPON LOCATION. ALL OTHER PARTS, PIPING, AND METER BOXES REMOVED FROM THE SYSTEM SHALL REMAIN THE PROPERTY OF THE CONTRACTOR AND BE PROPERLY DISPOSED OF IN ACCORDANCE WITH ALL LOCAL, STATE, AND FEDERAL REGULATIONS.

17. ALL HYDRANTS, PROPOSED OR RELOCATED, SHALL BE INSTALLED 2 FEET BEHIND THE SIDEWALK, OR WITHIN ONE FOOT OF THE R/W LINE, OR AS DIRECTED BY THE RESIDENT ENGINEER.

18. WATER METER BOXES SHALL NOT BE INSTALLED WITHIN PAVED OR SIDEWALK AREA UNLESS APPROVED BY UTILITY OWNER.

19. SANITARY FORCE MAIN PIPE SHALL BE EITHER PVC OR DUCTILE IRON PIPE.

20. ALL SANITARY FORCE MAIN PIPE SHALL BE INSTALLED WITH A MINIMUM COVER OF FOUR (4) FEET. WHERE COVER IS LESS THAN FOUR (4) FEET, CONTRACTOR SHALL USE DUCTILE IRON PIPE, UNLESS OTHERWISE DIRECTED BY THE UTILITY OWNER AND/OR THE RESIDENT ENGINEER.

21. ALL WATER AND SEWER SERVICES SHALL BE INSTALLED PERPENDICULAR TO THE MAIN AND TERMINATE AT THE RIGHT-OF-WAY LINE.

22. ALL STAINLESS STEEL FASTENERS SHALL BE OF GRADE 316.

23. SANITARY SEWER CLEANOUTS SHALL BE LOCATED A MINIMUM OF 12 FEET FROM ALL PROPERTY CORNERS.

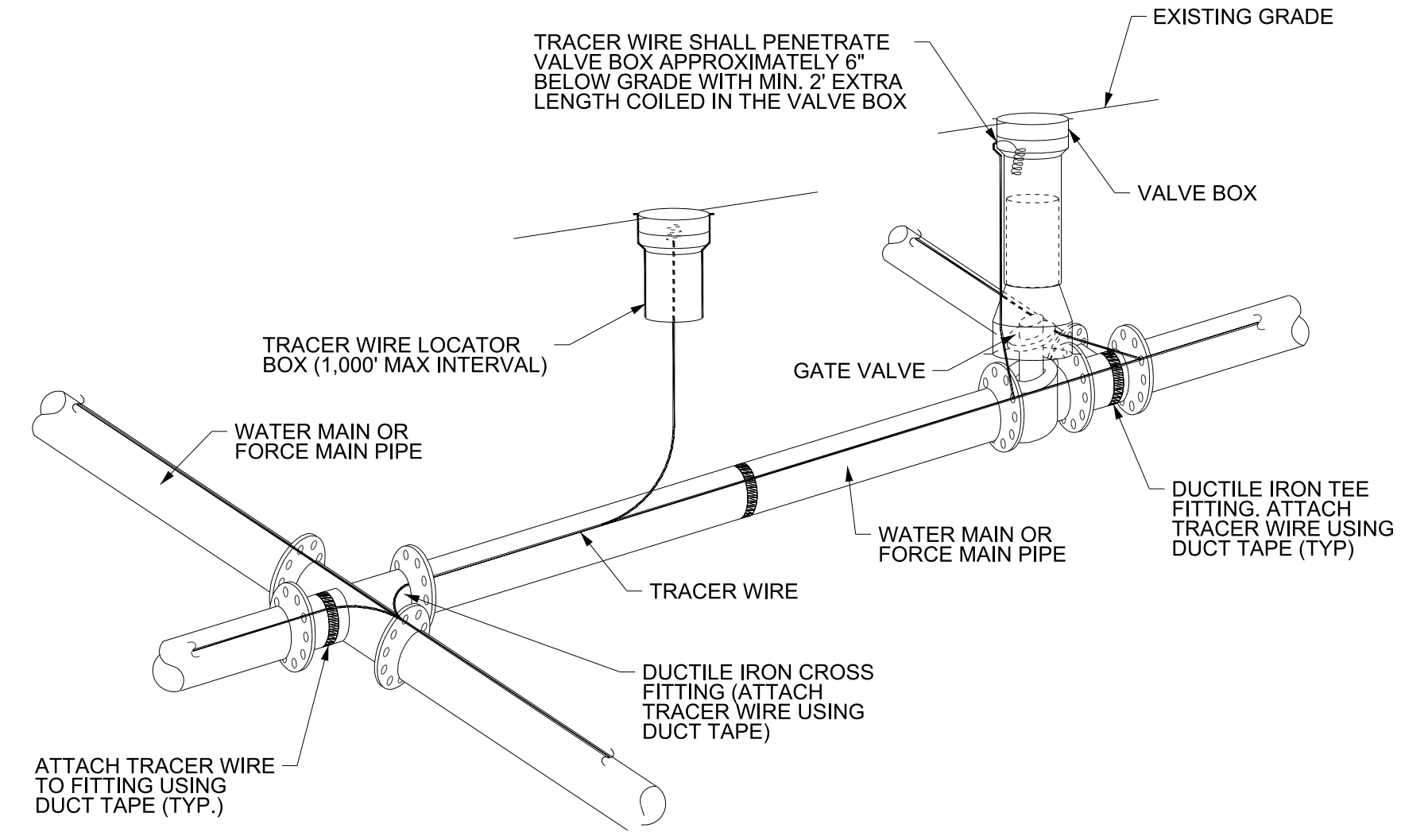
24. WATER METER BOXES SHALL BE LOCATED A MINIMUM OF 5 FEET FROM ALL PROPERTY CORNERS.

PROJECT REFERENCE NO. U-4902D	SHEET NO. UC-3A
DESIGNED BY: SHF	
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NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	
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UTILITY CONSTRUCTION

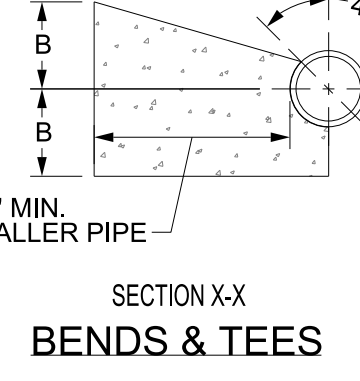
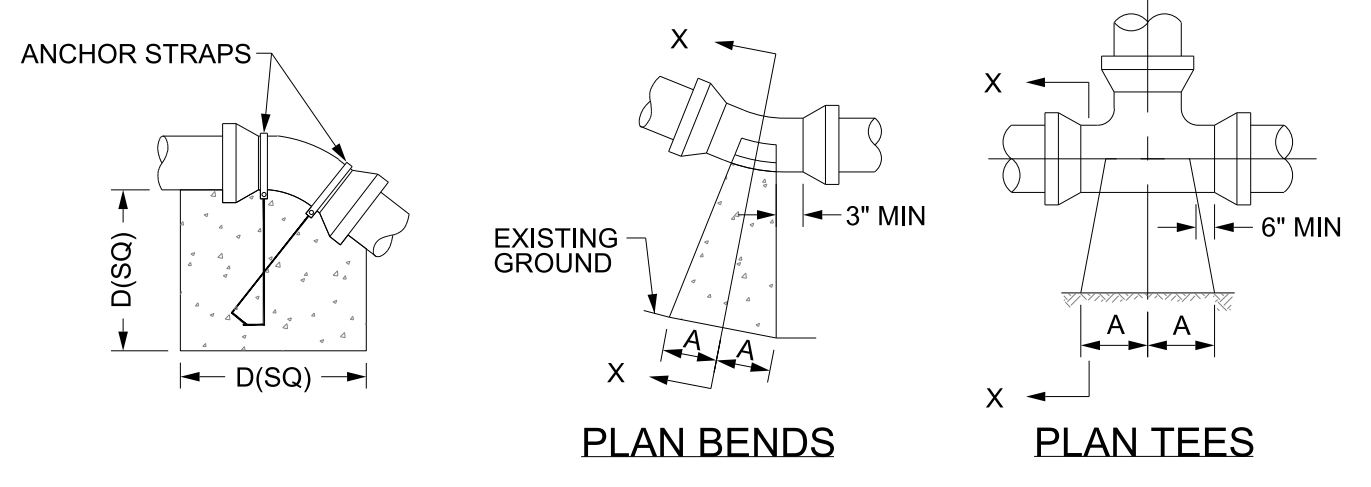
5/14/19

REVISIONS
09.27.2019 - AS PER CAPE FEAR PUBLIC UTILITY AUTHORITY COMMENTS DATED 05.17.2019.



- NOTES:
1. TRACER WIRE SHALL BE #10 COPPER SOLID CORE WIRE WITH GAS AND OIL RESISTANT INSULATION.
 2. WIRE SHALL BE STRAPPED TO ALL PVC WATER AND FORCE MAIN PIPING WITH DUCT TAPE AT 12 FOOT INTERVALS ALONG THE PIPE.
 3. SECURE WIRE TO ALL TEE AND CROSS FITTINGS WITH DUCT TAPE.
 4. ALL SPLICES IN THE WIRE SHALL BE MADE WITH 3M DBR DIRECT BURST SPLICE KIT AN UNDERGROUND RATED, WATERTIGHT AND APPROVED SPLICE CONNECTOR OR APPROVED EQUAL.

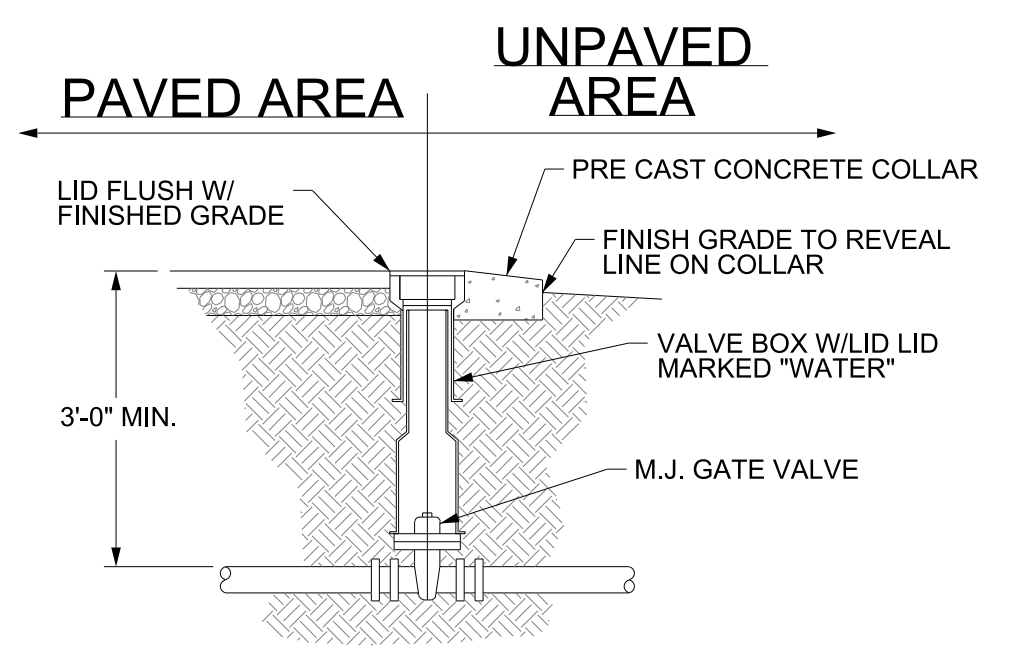
TRACER WIRE DETAIL
NOT TO SCALE



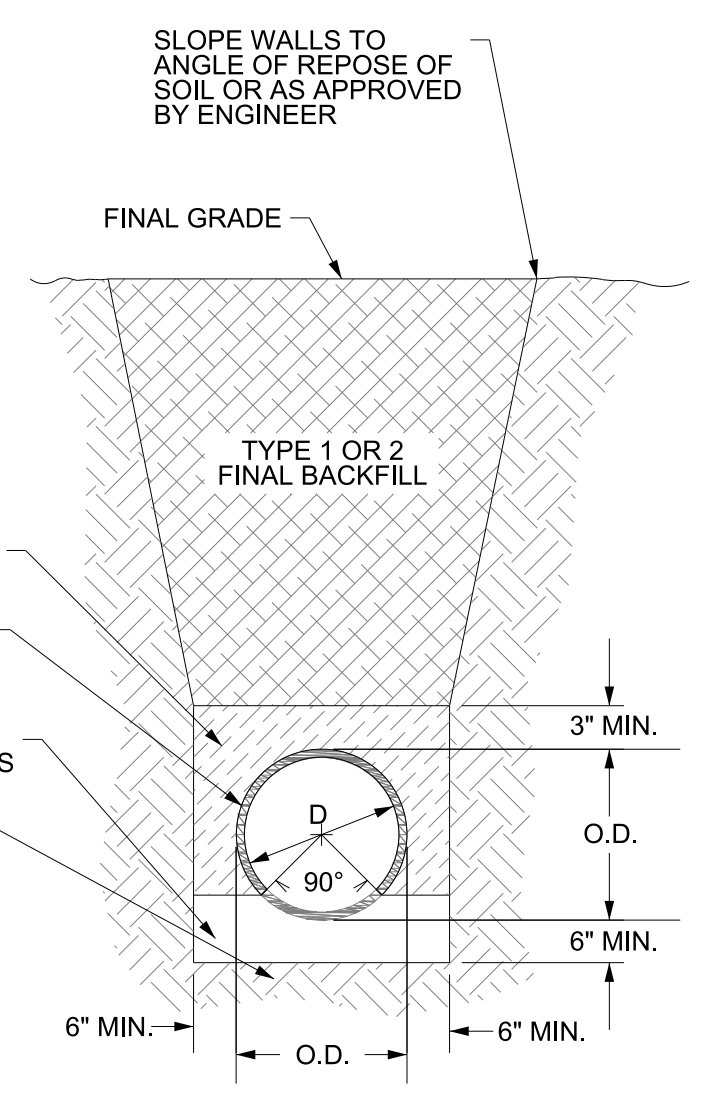
SIZE	90 BENDS		45 BENDS		22 1/2 BENDS		TEES/PLUGS		45 VERT BENDS
	A	B	A	B	A	B	A	B	
3"	8"	6"	5"	6"	3"	7"	6"	8"	27"
4"	8"	9"	5"	8"	3"	11"	6"	9"	28"
6"	14"	11"	9"	9"	8"	8"	12"	9"	36"
8"	16"	16"	12"	12"	10"	13"	14"	13"	42"
10"	18"	22"	15"	14"	14"	16"	18"	15"	50"
12"	20"	28"	18"	17"	16"	16"	22"	18"	62"
14"	26"	29"	21"	19"	18"	18"	26"	20"	72"
16"	33"	29"	25"	21"	20"	21"	32"	21"	83"
18"	40"	30"	28"	24"	22"	23"	36"	24"	88"

- NOTES:
1. BASED ON 160 PSI TEST PRESSURE AND 2000 PSF SOIL BEARING CAPACITY.
 2. ALL BEARING SURFACES TO BE CARRIED TO UNDISTURBED GROUND.
 3. USE MEGA-LUG (PREFERRED) IN LIEU OF BLOCKING AND RODDING.

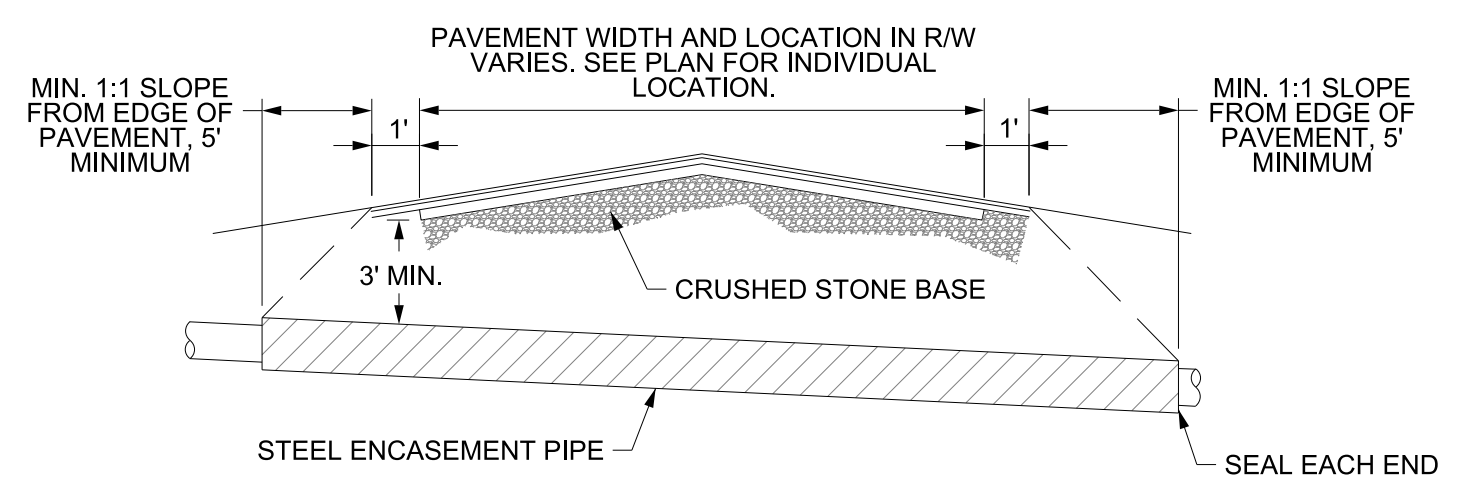
THRUST BLOCK DETAIL
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VALVE DETAIL
NOT TO SCALE

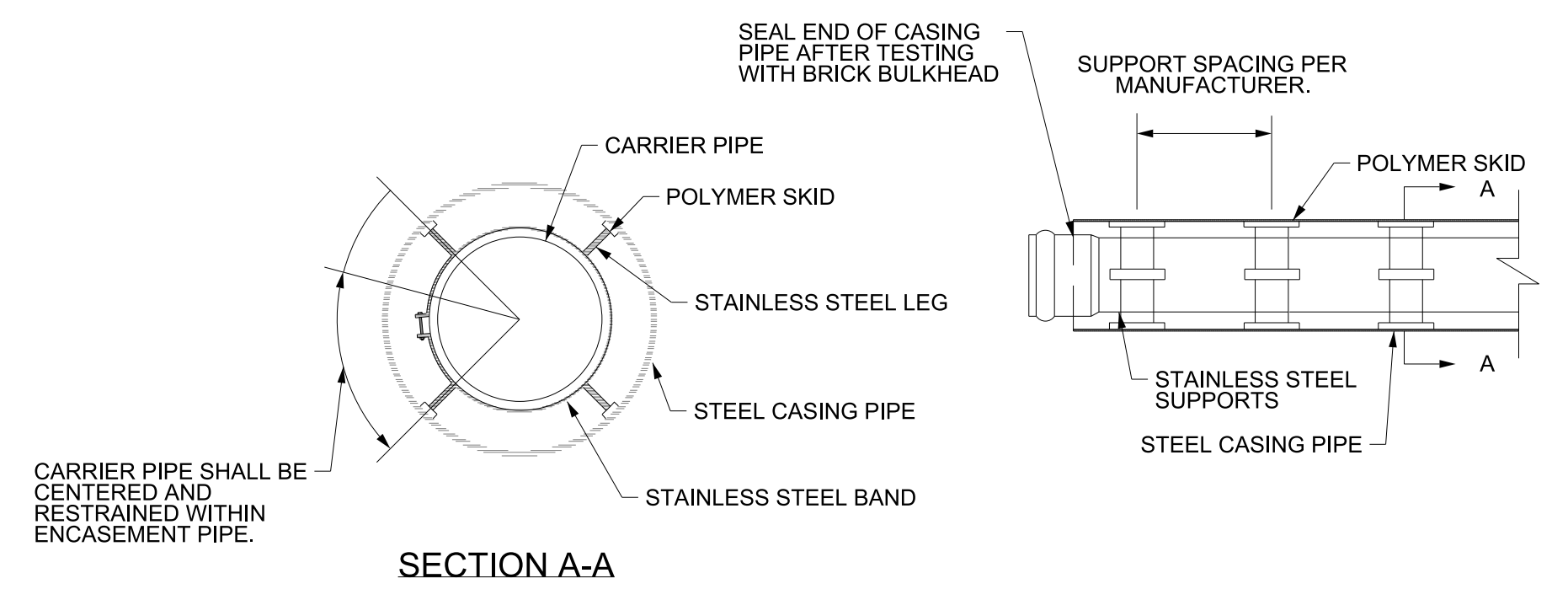


TYPICAL TRENCH DETAIL
NOT TO SCALE



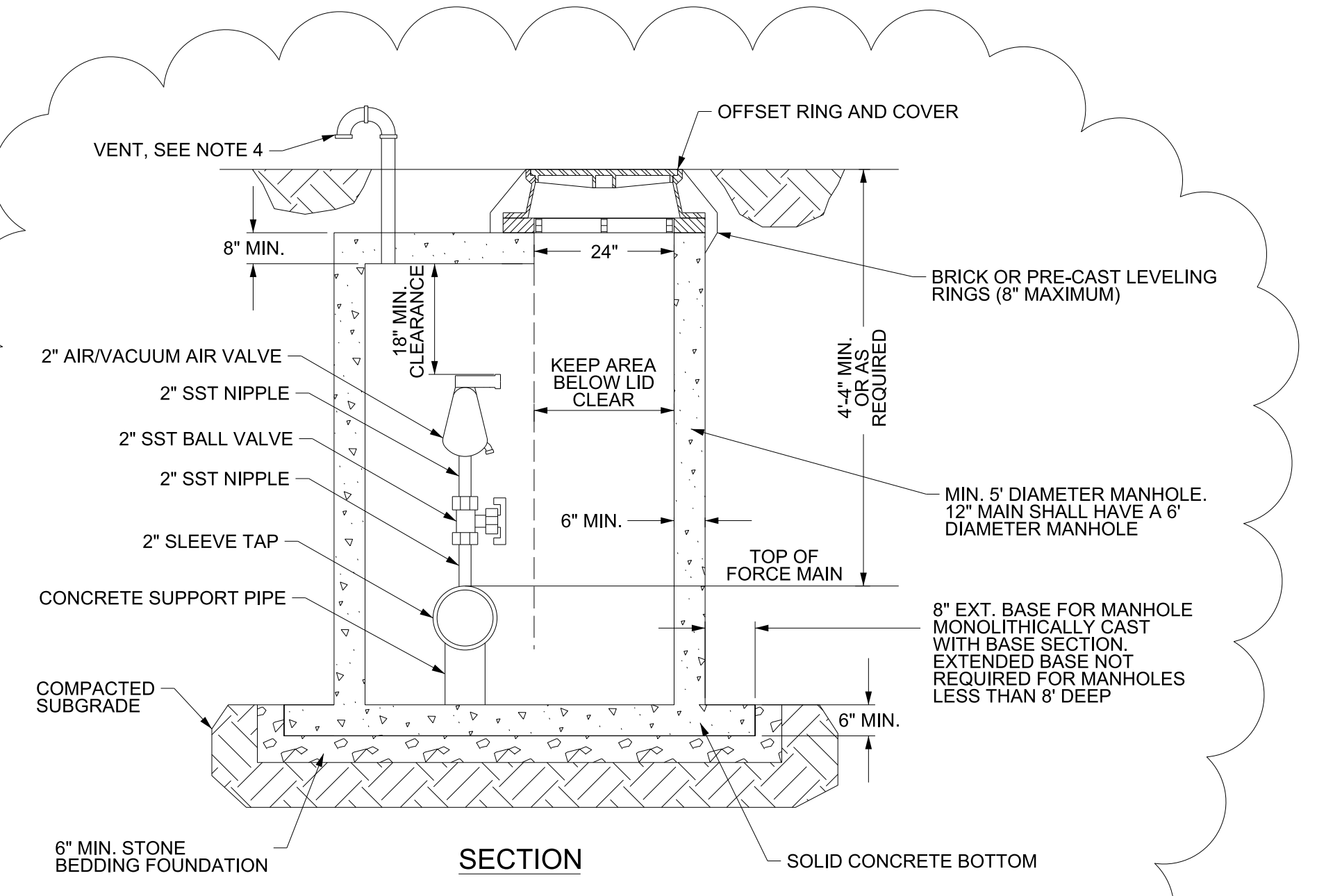
- NOTES:
1. CASING WILL BE INSTALLED AT LINE AND GRADE SHOWN ON INDIVIDUAL PROFILE FOR EACH CROSSING. BORING/JACKING TO LINE AND GRADE IS REQUIRED.
 2. TRACER WIRE SHALL BE CONTINUED THROUGH CASING

TYPICAL BORING/JACKING DETAIL
NOT TO SCALE

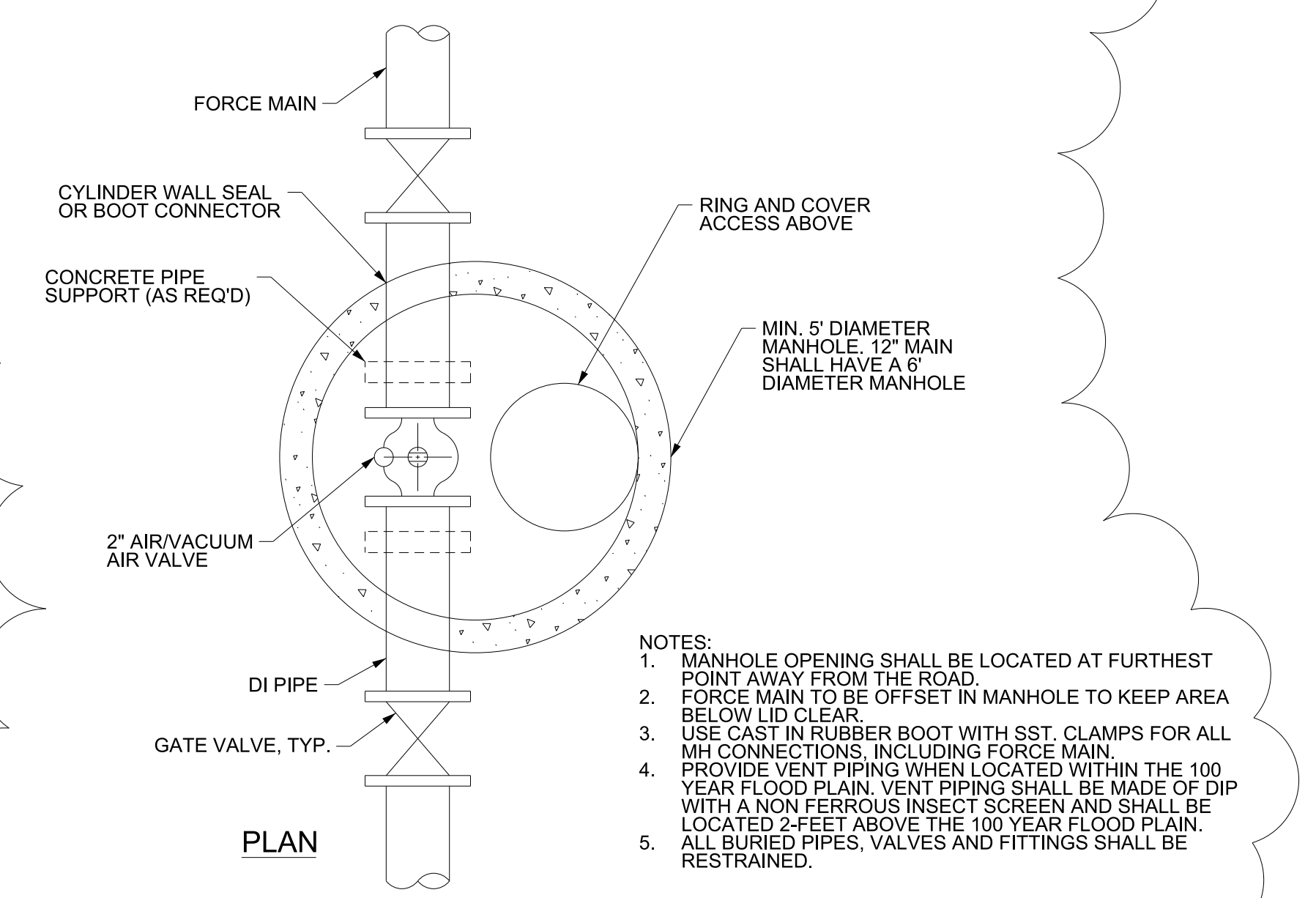


- NOTES:
1. PIPE SUPPORT TO BE PLACED TO PROVIDE PROPER SUPPORT, ALIGNMENT, AND GRADE AS SPECIFIED. CONTINUOUS SUPPORTS MAY BE USED AS ALTERNATIVE. OIL, GREASE OR PETROLEUM PRODUCT MAY NOT BE USED AS LUBRICANT.
 2. ALL STAINLESS STEEL PARTS TO BE 316 SST.

PIPE CASING SUPPORT
NOT TO SCALE



SECTION



PLAN

FORCE MAIN 2\"/>

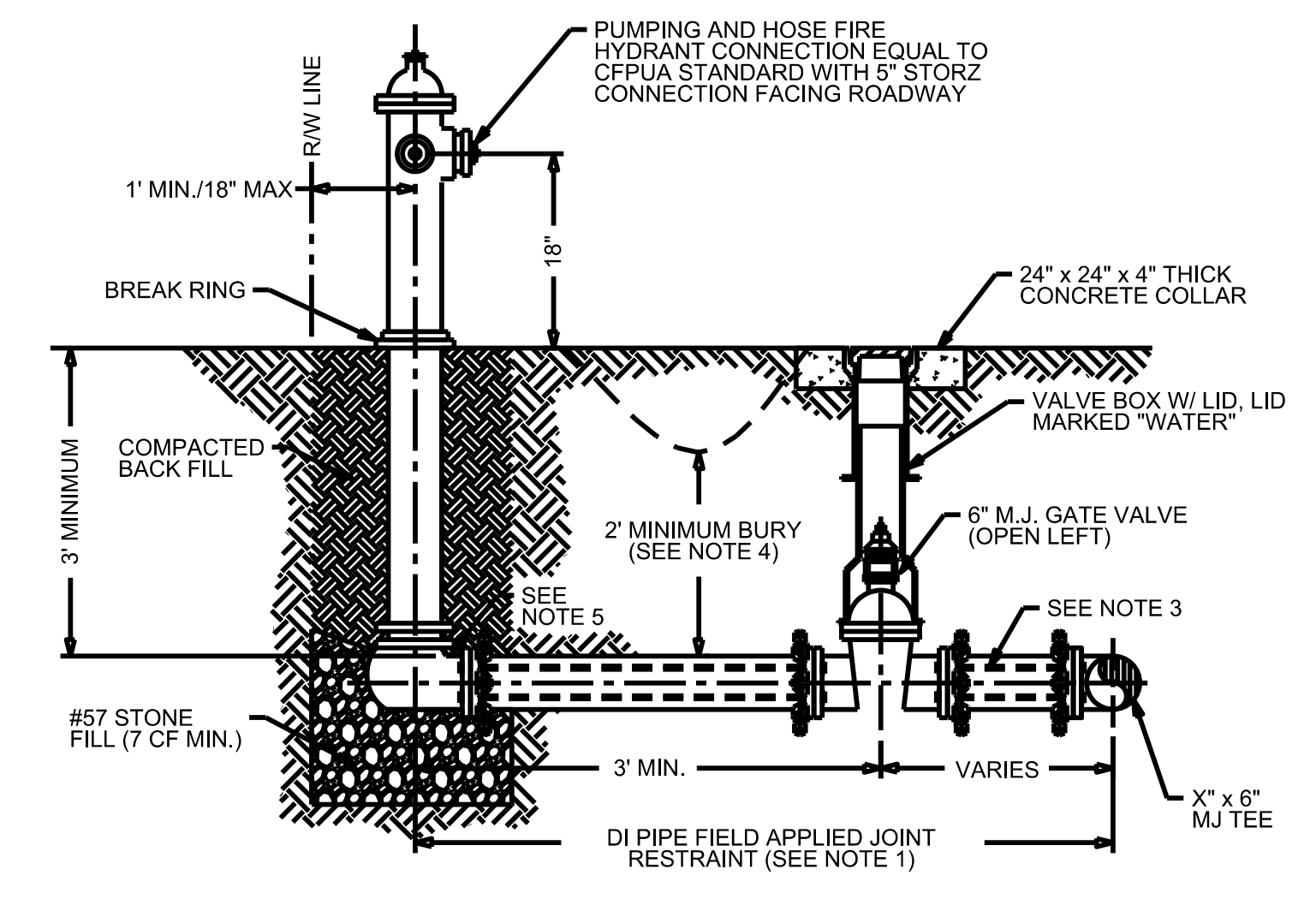
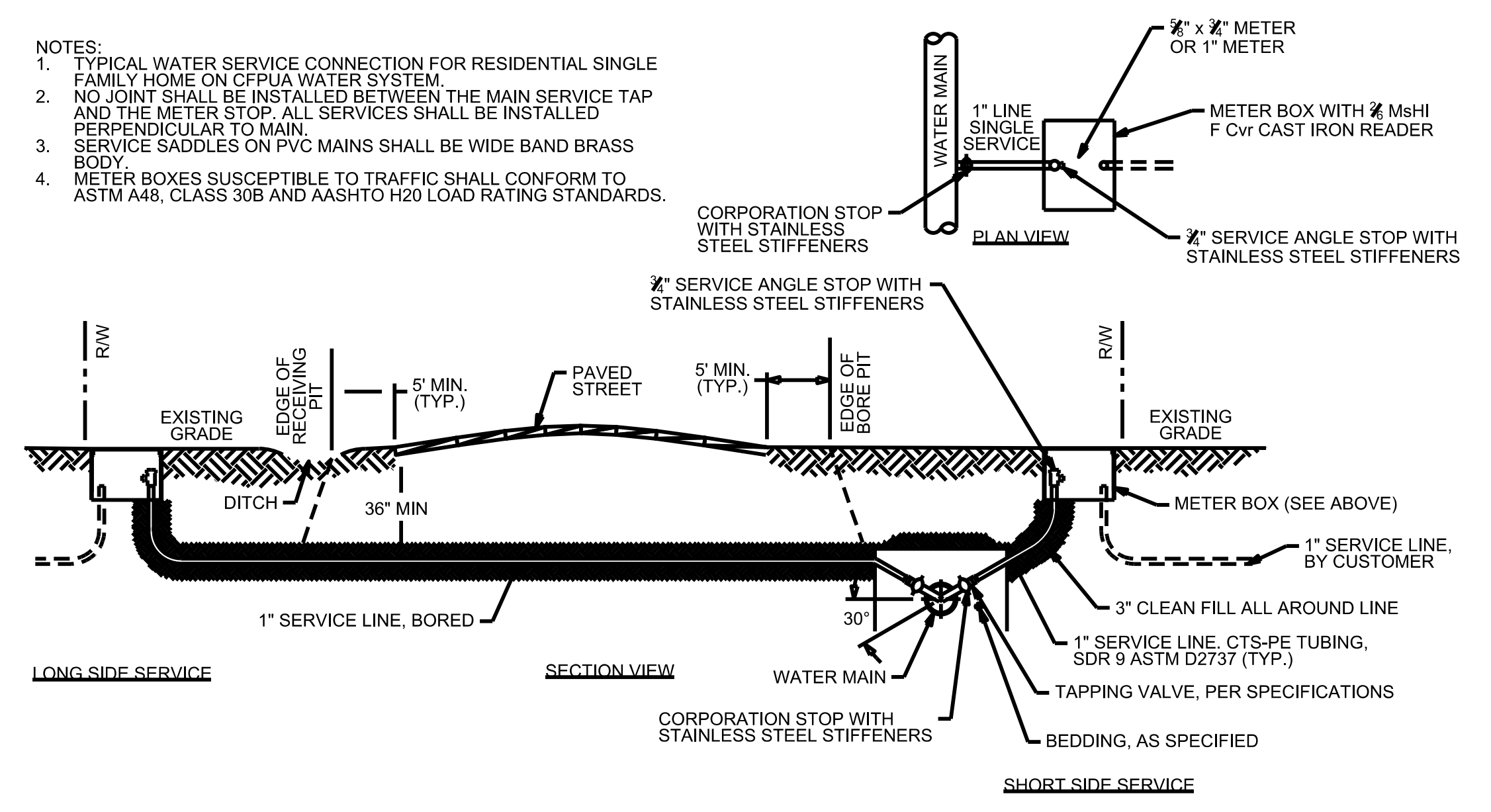
- NOTES:
1. MANHOLE OPENING SHALL BE LOCATED AT FURTHEST POINT AWAY FROM THE ROAD.
 2. FORCE MAIN TO BE OFFSET IN MANHOLE TO KEEP AREA BELOW LID CLEAR.
 3. USE CAST IN RUBBER BOOT WITH SST. CLAMPS FOR ALL MH CONNECTIONS, INCLUDING FORCE MAIN.
 4. PROVIDE VENT PIPING WHEN LOCATED WITHIN THE 100 YEAR FLOOD PLAIN. VENT PIPING SHALL BE MADE OF DIP WITH A NON FERROUS INSECT SCREEN AND SHALL BE LOCATED 2-FEET ABOVE THE 100 YEAR FLOOD PLAIN.
 5. ALL BURIED PIPES, VALVES AND FITTINGS SHALL BE RESTRAINED.

PROJECT REFERENCE NO. U-4902D	SHEET NO. UC-3B
DESIGNED BY: SHF	
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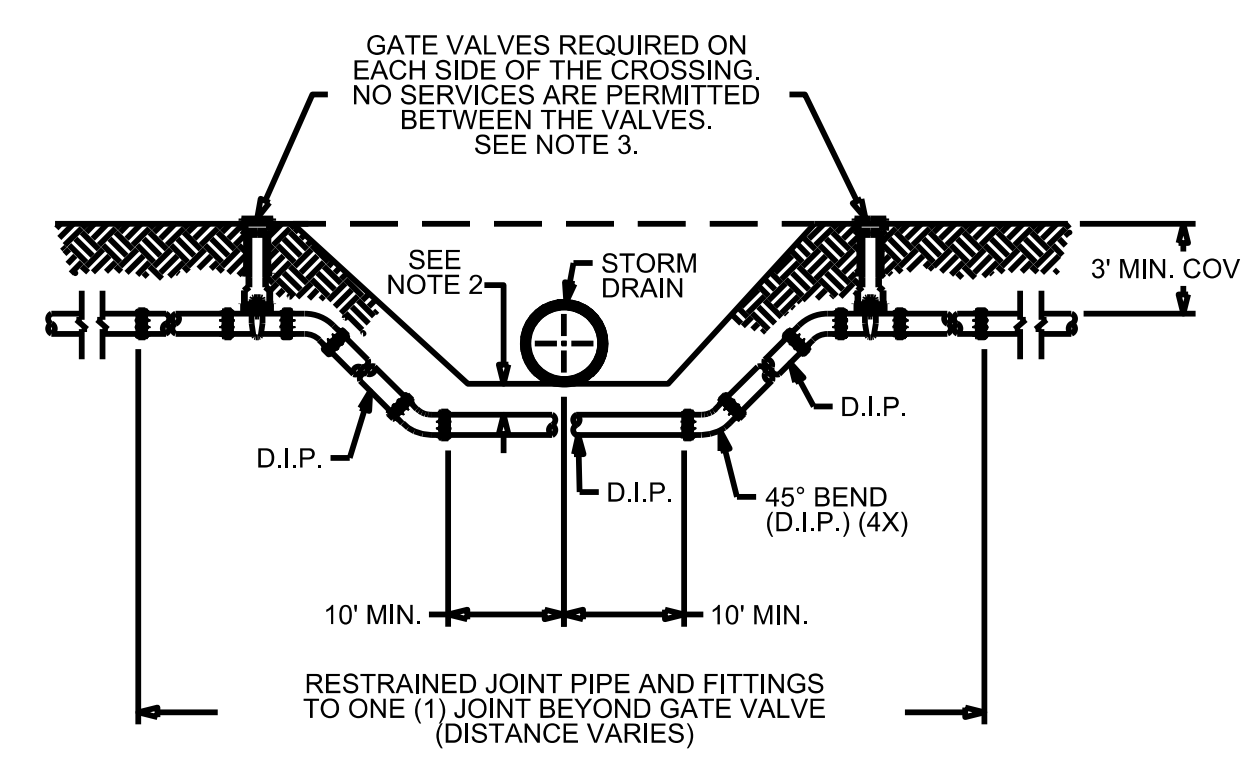
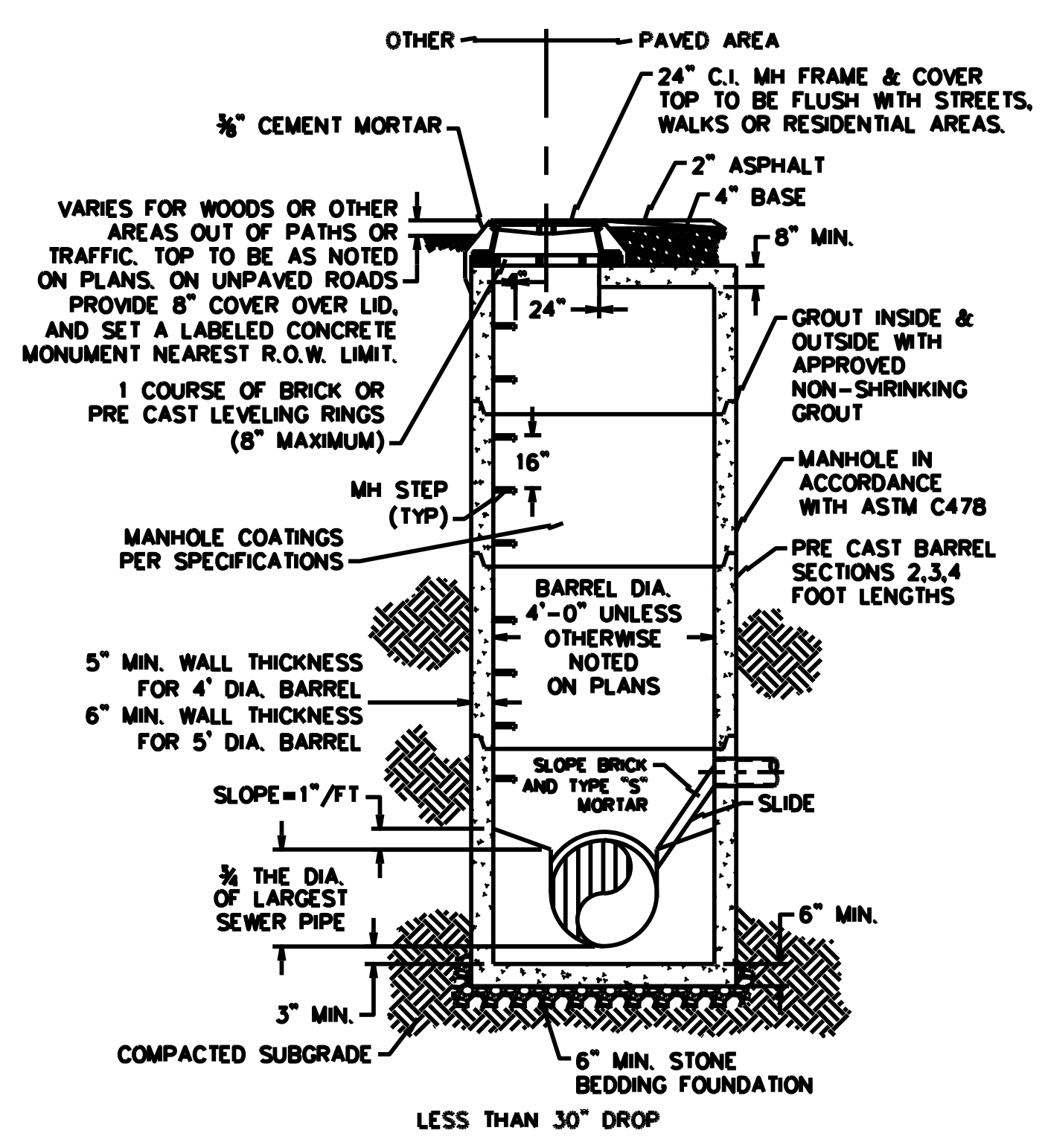
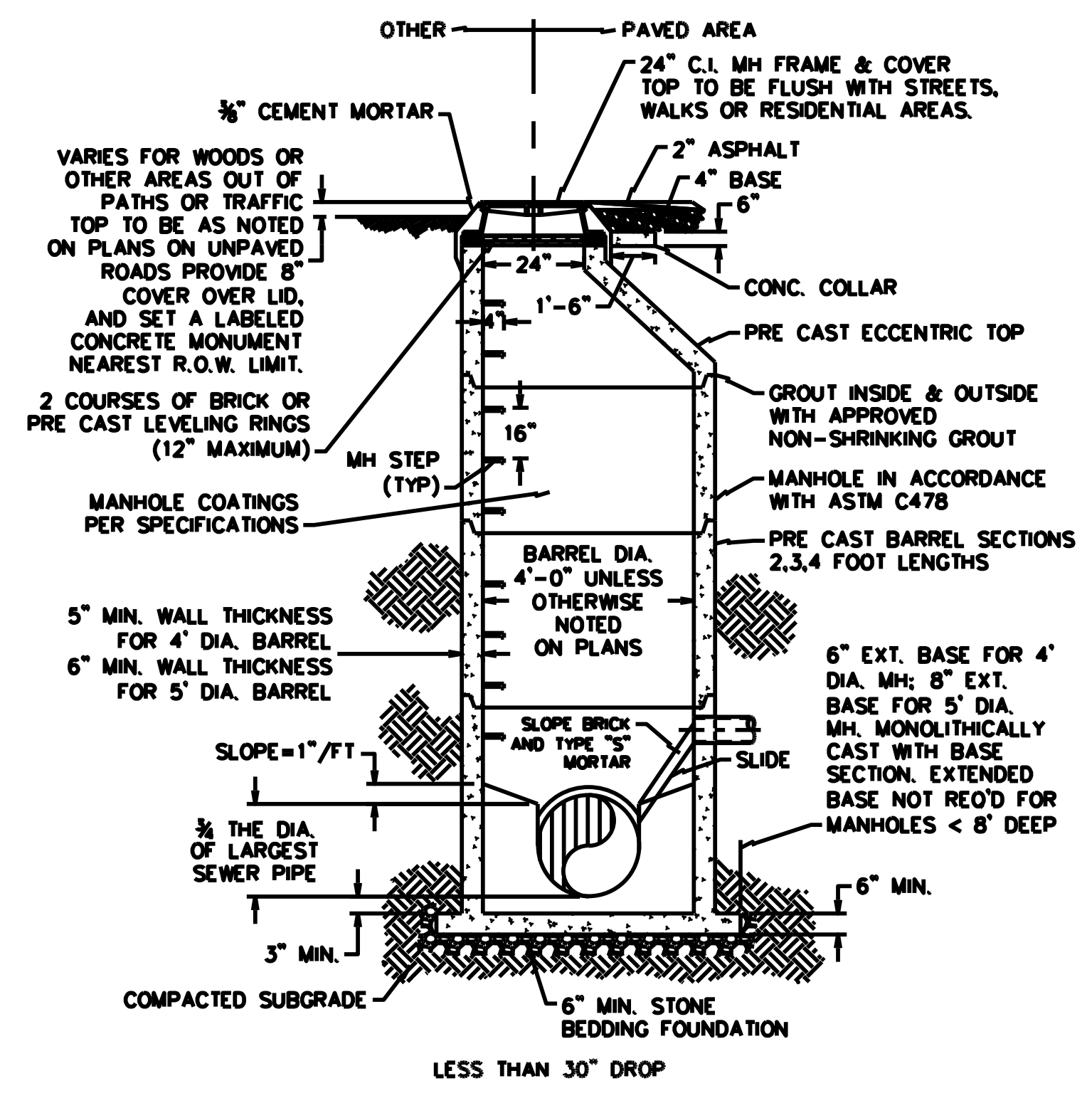
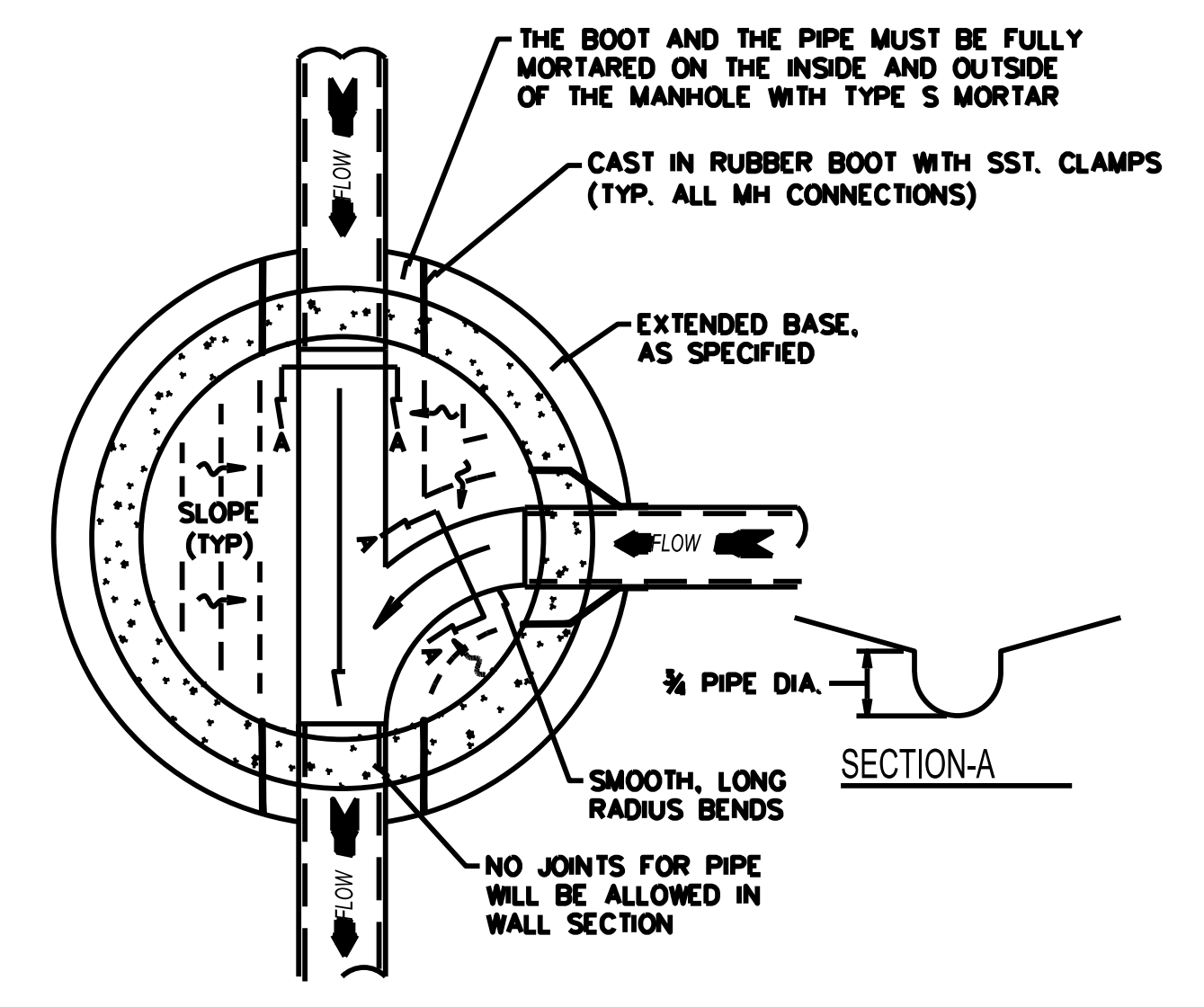
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PROJECT REFERENCE NO. U-4902D	SHEET NO. UC-3C
DESIGNED BY: SHF	
DRAWN BY: SHF	
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APPROVED BY: KCZ	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SECTION PHONE: (919) 707-6690 FAX: (919) 250-4151	
UTILITY CONSTRUCTION DOCUMENT NOT CONSIDERED FINAL UNTIL ALL SIGNATURES ARE COMPLETED	

- NOTES:
 1. TYPICAL WATER SERVICE CONNECTION FOR RESIDENTIAL SINGLE FAMILY HOME ON CDPWA WATER SYSTEM.
 2. NO JOINT SHALL BE INSTALLED BETWEEN THE MAIN SERVICE TAP AND THE METER STOP. ALL SERVICES SHALL BE INSTALLED PERPENDICULAR TO MAIN.
 3. SERVICE SADDLES ON PVC MAINS SHALL BE WIDE BAND BRASS BODY.
 4. METER BOXES SUSCEPTIBLE TO TRAFFIC SHALL CONFORM TO ASTM A48, CLASS 30B AND AASHTO H20 LOAD RATING STANDARDS.



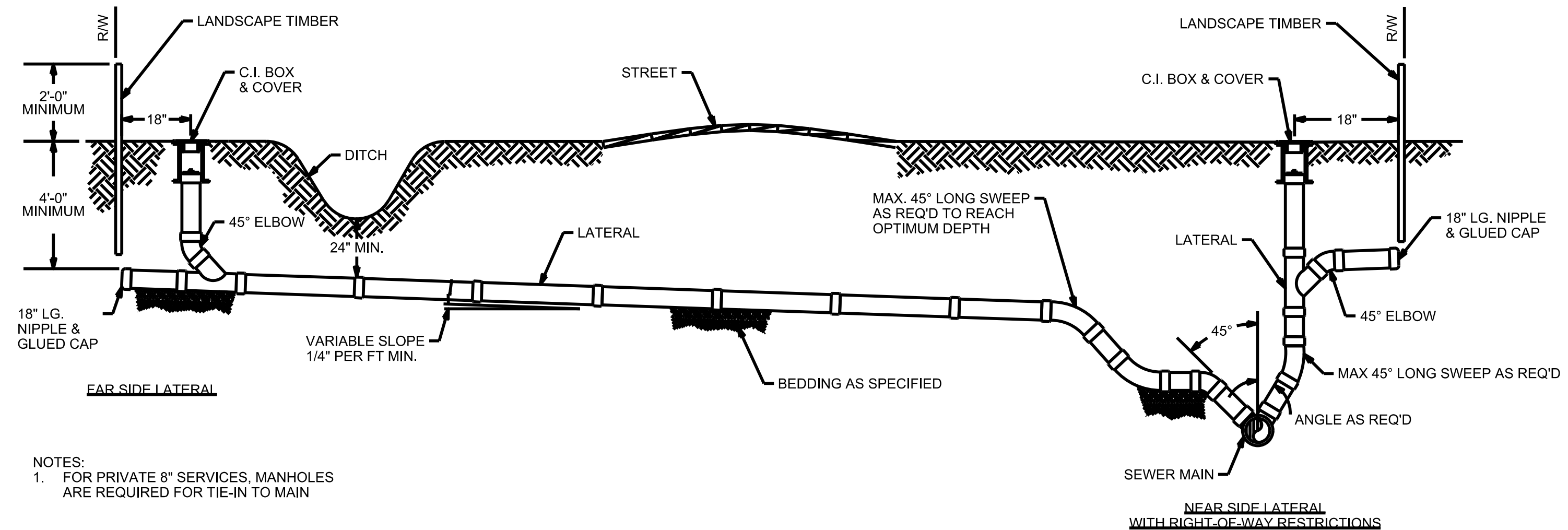
- NOTES:
 1. JOINT RESTRAINT SYSTEMS SHALL BE WEDGE ACTION STYLE FOR DI PIPE AS MANUFACTURED BY EBBA IRON, SIGMA, STAR PIPE PRODUCTS OR APPROVED EQUAL.
 2. WHEN HYDRANT LEGS REQUIRE FULL LENGTH PIPE SECTIONS, OVER BELL RESTRAINT SYSTEM SHALL HAVE 316 STAINLESS STEEL HARNESS AND FASTENERS.
 3. CONTINUOUS 316 STAINLESS STEEL RODS (TEE TO VALVE AND VALVE TO HYDRANT) MAY BE USED WITH COR-BLUE MJ T-BOLT AND GASKETS KITS, AS AN ALTERNATIVE.
 4. HYDRANT AND VALVE SHALL BE PLACED OUTSIDE DITCH LIMITS.
 5. WEEP HOLES OPEN AND UNBLOCKED TO DRAIN.



- NOTES:
 1. USE PRESSURE CLASS 350 D.I.P., UNLESS SPECIFIED OTHERWISE.
 2. MINIMUM DEPTH OF COVER REQUIRED UNLESS SPECIFIED OTHERWISE:
 A. IN DOT R/W, 36" MIN. TYPICAL, OR 24" MIN. WHEN CROSSING A DITCH LINE.
 B. ALL OTHER LOCATIONS, 30" MIN.
 C. WHEN STORM DRAIN INVERT IS BURIED AT OR BELOW ABOVE DEPTHS, 18" MIN. CLEARANCE BETWEEN PIPES IS REQUIRED.
 3. VALVE PLACEMENT AS SHOWN ON PLANS, OR AS DIRECTED BY RESIDENT ENGINEER AND APPROVAL OF UTILITY OWNER.

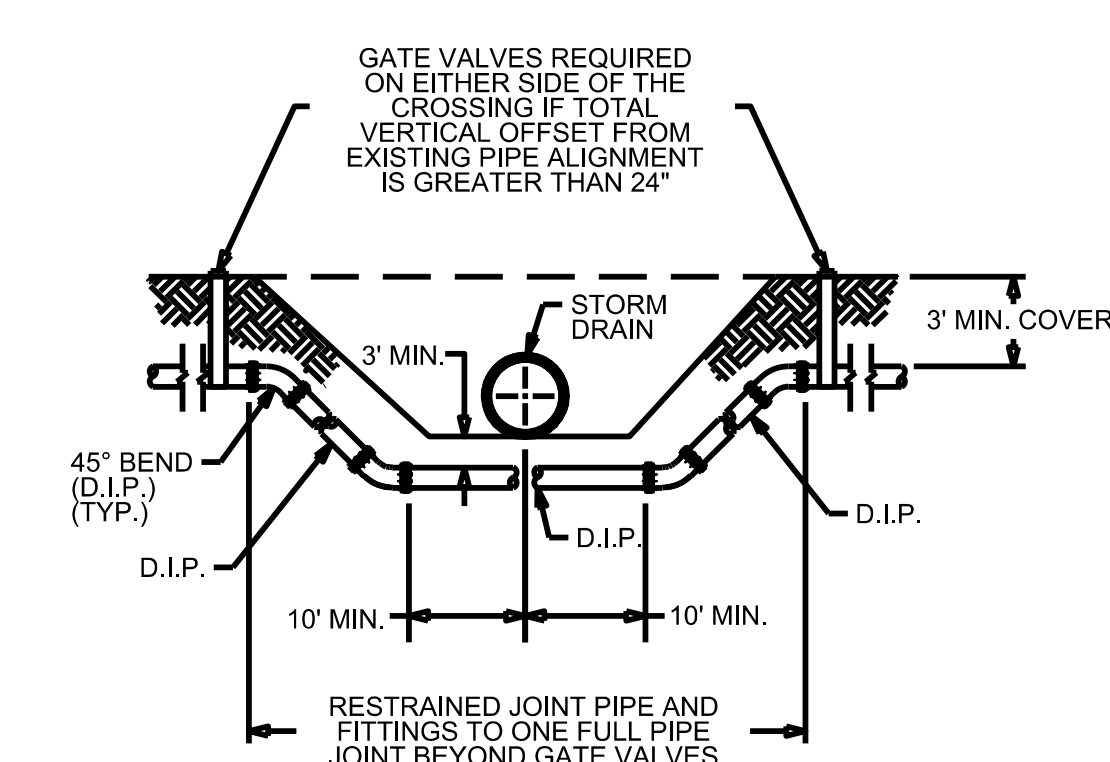
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PROJECT REFERENCE NO.	SHEET NO.
U-4902D	UC-3D
DESIGNED BY: SHF	
DRAWN BY: SHF	
CHECKED BY: KCZ	
APPROVED BY: KCZ	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SECTION PHONE: (919) 707-6690 FAX: (919) 250-4151	
UTILITY CONSTRUCTION PLANS ONLY	
UTILITY CONSTRUCTION	
M A Engineering Consultants, Inc. 598 East Chatham Street - Suite 137 Cary, NC 27511 Phone: 919.297.0220 Fax: 919.297.0221 N.C. License: F-0160	
DOCUMENT NOT CONSIDERED FINAL UNTIL ALL SIGNATURES ARE COMPLETED	



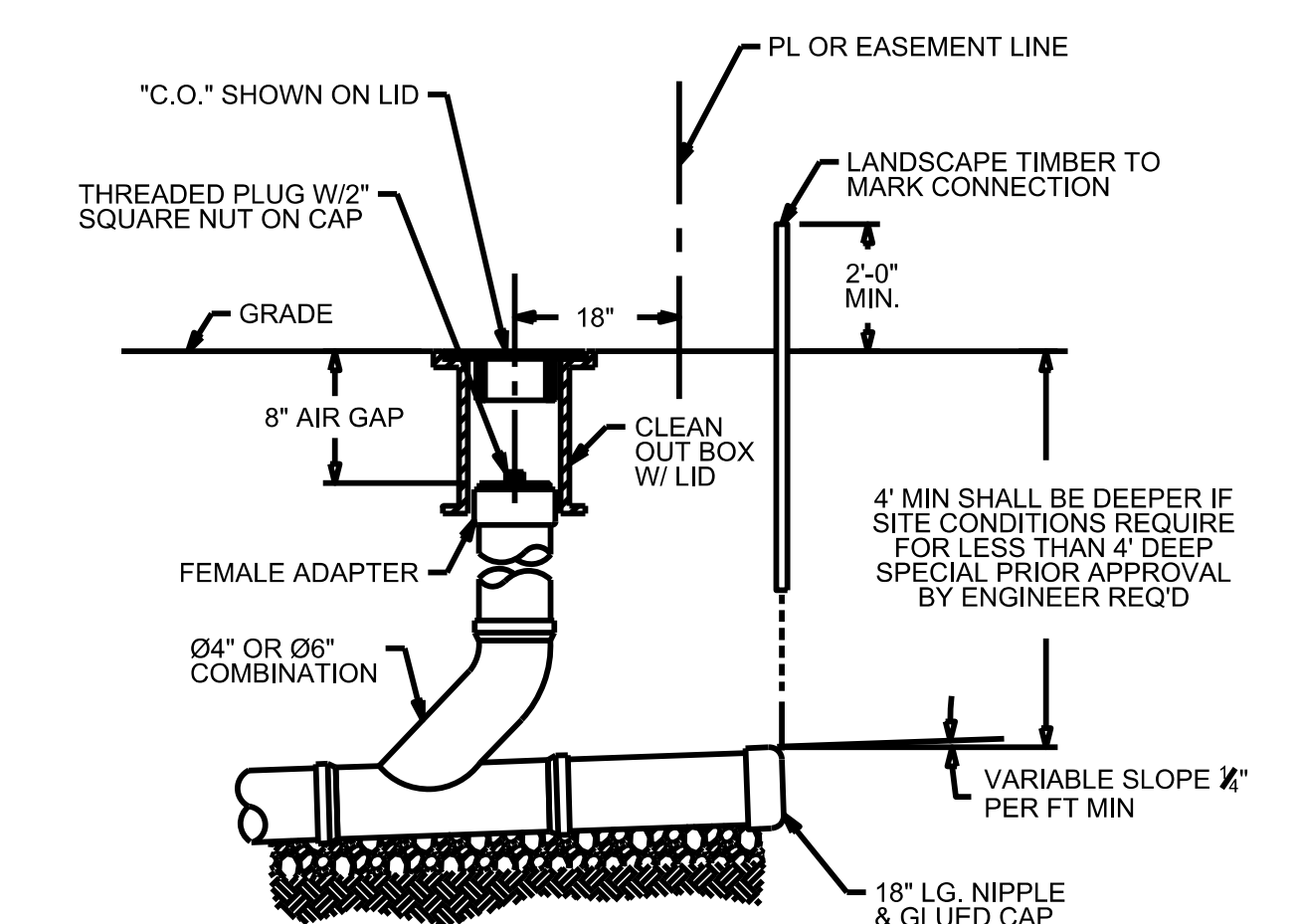
NOTES:
 1. FOR PRIVATE 8" SERVICES, MANHOLES ARE REQUIRED FOR TIE-IN TO MAIN

STANDARD SERVICE CONNECTION
 NOT TO SCALE



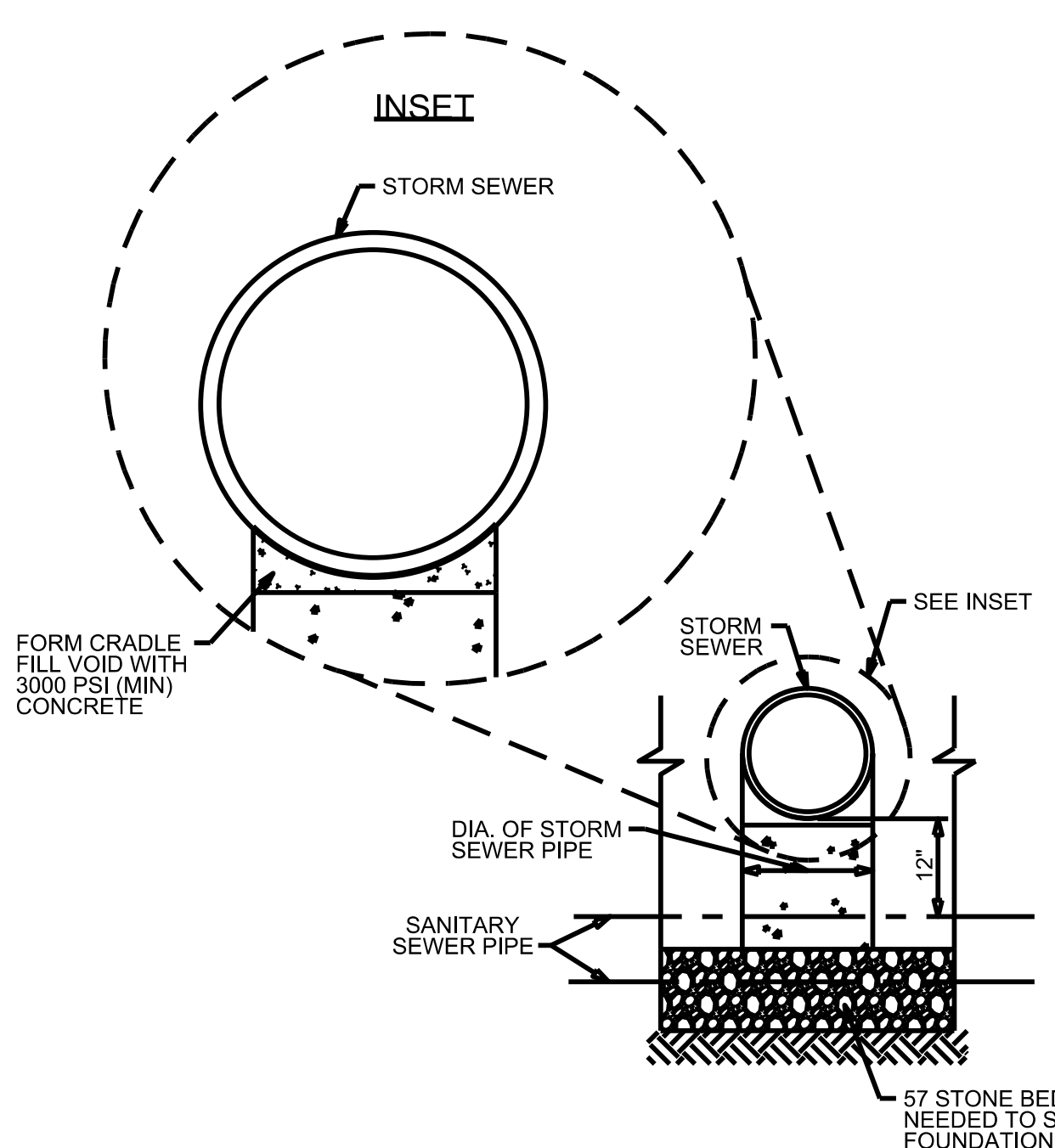
NOTE:
 1. USE D.I.P. (CL52, PRESSURE CLASS 350, OR BETTER)
 2. DISTANCE BETWEEN UPPER 45° BENDS VARIES DEPENDING ON DEPTH OF OFFSET RELOCATION
 3. GATE VALVES, WHEN NEEDED, SHALL BE INSTALLED 5 FEET FROM THE 45° BEND.

FORCE MAIN DITCH AND STORM DRAIN CROSSING
 NOT TO SCALE

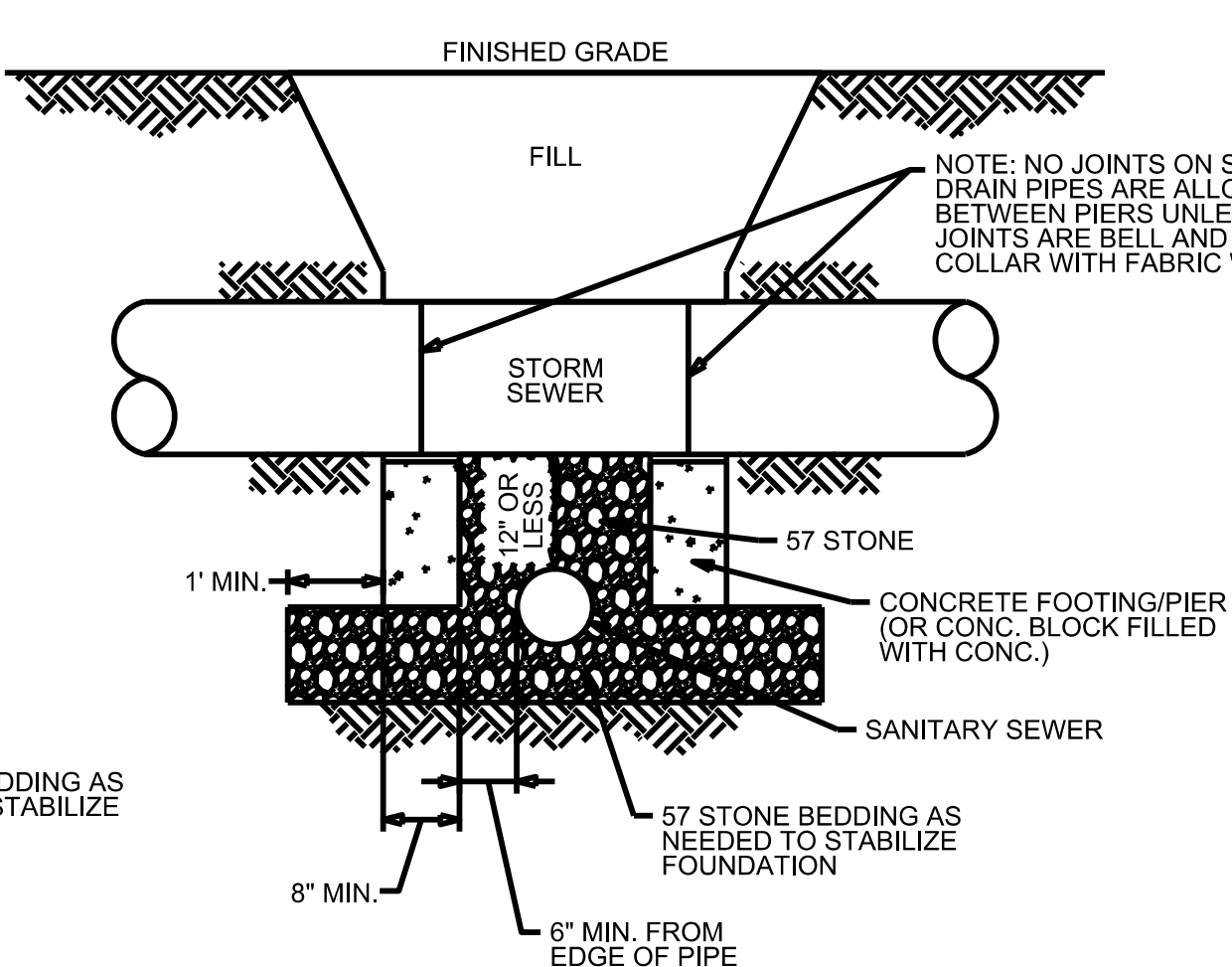


NOTES:
 1. PIPE MATERIAL* SCH. 40, SOLVENT WELD PVC 1120 ASTM D-1785
 2. FOR PRIVATE 8" SERVICES, MANHOLES ARE REQUIRED FOR CONNECTION TO SYSTEM AND AT THE PROPERTY LINE, WITH REQUIRED EASEMENT.

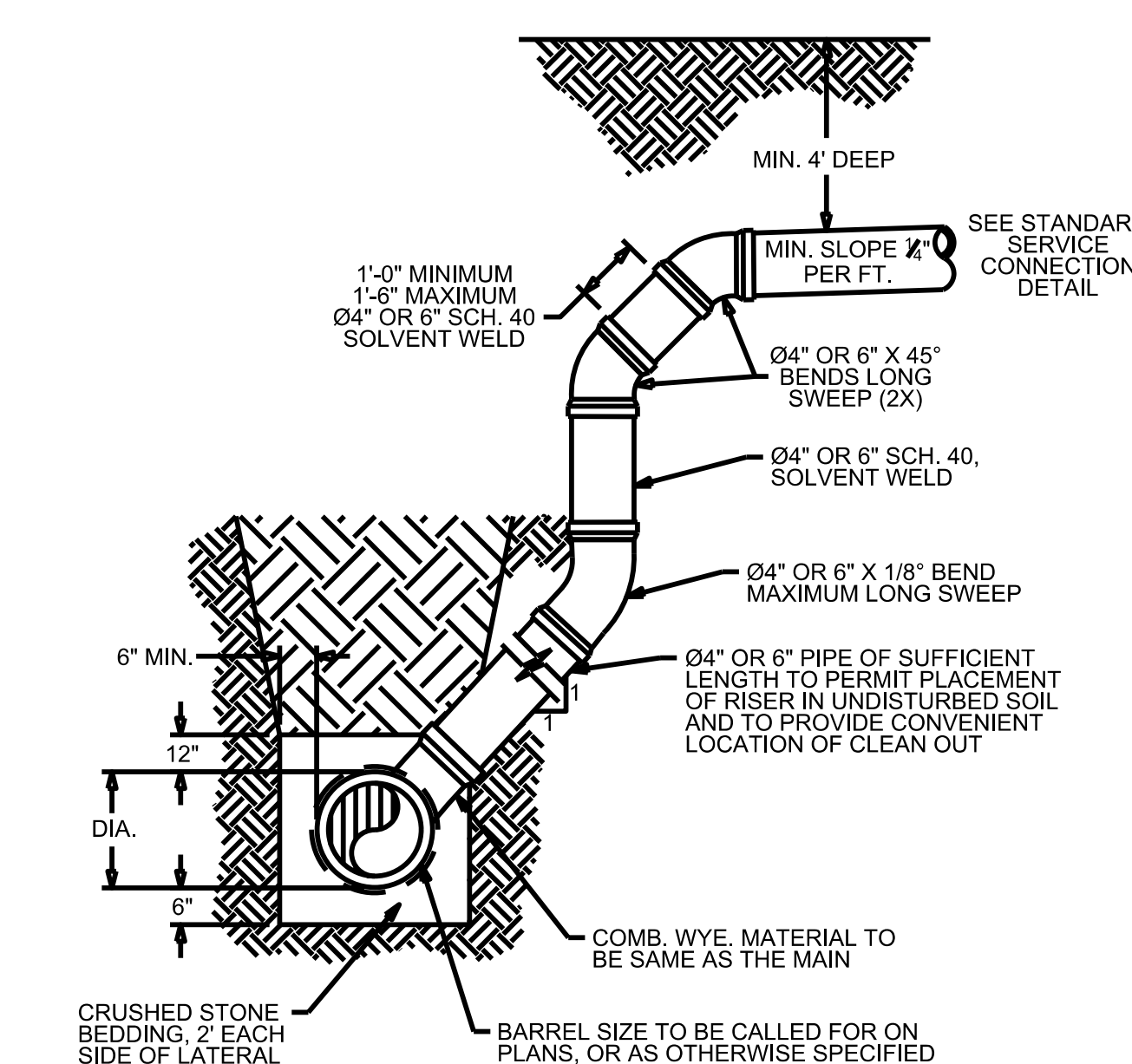
SERVICE CONNECTION AND CLEAN OUT
 NOT TO SCALE



THE FOLLOWING MUST BE FOLLOWED IN THE CASES OF GRAVITY SEWER UNDER STORM DRAIN:
 1. A SEPARATION OF LESS THAN 12" BETWEEN STORM DRAIN AND GRAVITY SEWER, STORM DRAIN MUST BE BRIDGED.
 2. A SEPARATION OF 12" TO LESS THAN 24" BETWEEN STORM DRAIN AND GRAVITY SEWER, GRAVITY SEWER CAN BE DIP OR STORM DRAIN CAN BE BRIDGED. (PER DWR REGULATIONS)
 3. A SEPARATION OF 24" OR GREATER BETWEEN STORM DRAIN AND GRAVITY SEWER REQUIRES NO BRIDGING OR DIP.

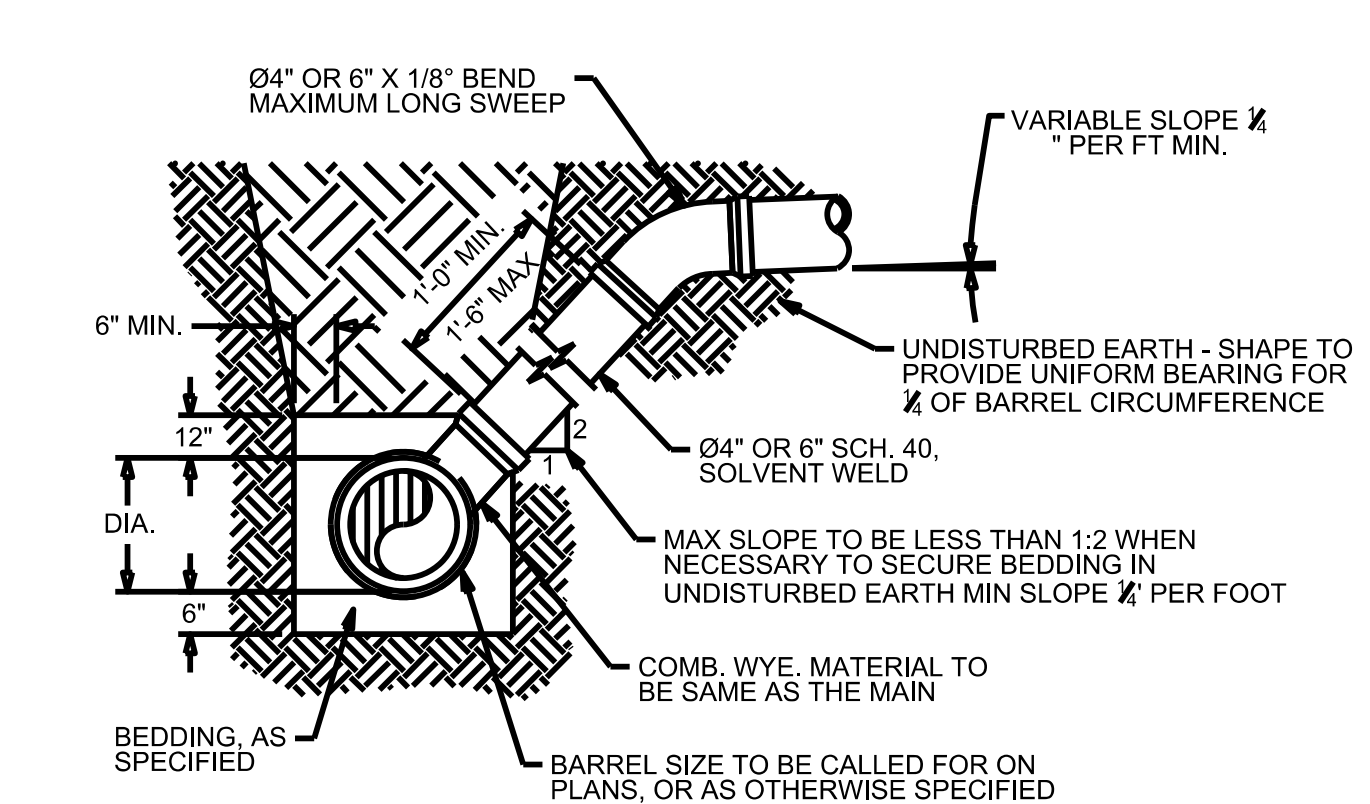


STRUCTURAL BRIDGING DETAIL FOR STORMWATER OVER GRAVITY SEWER INSTALLATIONS WITH LESS THAN 12" SEPARATION
 NOT TO SCALE



NOTES:
 1. FOR MAINS GREATER THAN 8 FT. SPECIAL CARE SHALL BE TAKEN DURING BACKFILL OPERATIONS. THE RISER SHALL BE PLUMB AND TRUE AT ALL TIMES, AND REST ON FIRM, STABLE FOUNDATION.
 2. FOR PRIVATE 8" SERVICES, MANHOLES ARE REQUIRED FOR CONNECTION TO SYSTEM AND AT THE PROPERTY LINE, WITH REQUIRED EASEMENT.

DEEP SERVICE LATERAL
 NOT TO SCALE



NOTES:
 1. FOR MAINS LESS THAN 8 FT.
 2. FOR PRIVATE 8" SERVICES, MANHOLES ARE REQUIRED FOR CONNECTION TO SYSTEM AND AT THE PROPERTY LINE, WITH REQUIRED EASEMENT.

STANDARD SERVICE LATERAL
 NOT TO SCALE

5/14/99
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5/14/19

REVISIONS
09.27.2019 - AS PER CAPE FEAR PUBLIC UTILITY AUTHORITY COMMENTS DATED 05.17.2019, 07.30.2019, 08.19.2019

NOTES:

1. PROPOSED DOWN AND UNDER RELOCATION OF WATER LINE. REFER TO DETAIL ON SHEET UC-3C.
2. VALVE SHALL BE INSTALLED A MINIMUM OF 3 FEET OUTSIDE OF THE CURB AND GUTTER.
3. ENCASEMENT PIPE IS FOR FUTURE IRRIGATION SERVICE FOR GRASSED MEDIAN. LINE SHOWN ACROSS RIGHT OF WAY IS FOR ALIGNMENT ORIENTATION.
4. 32" ENCASEMENT PIPE IS FOR FUTURE WATER LINE EXTENSION BY CFPUA. LINE SHOWN ACROSS RIGHT OF WAY IS FOR ALIGNMENT ORIENTATION.

REFER TO SHEET UC-10 FOR -FSS1- PROFILE.
 REFER TO SHEET UC-13 FOR -W1- PROFILE.
 REFER TO SHEET UC-15 FOR -C1- PROFILE.
 REFER TO SHEET UC-16 FOR -C7- PROFILE.

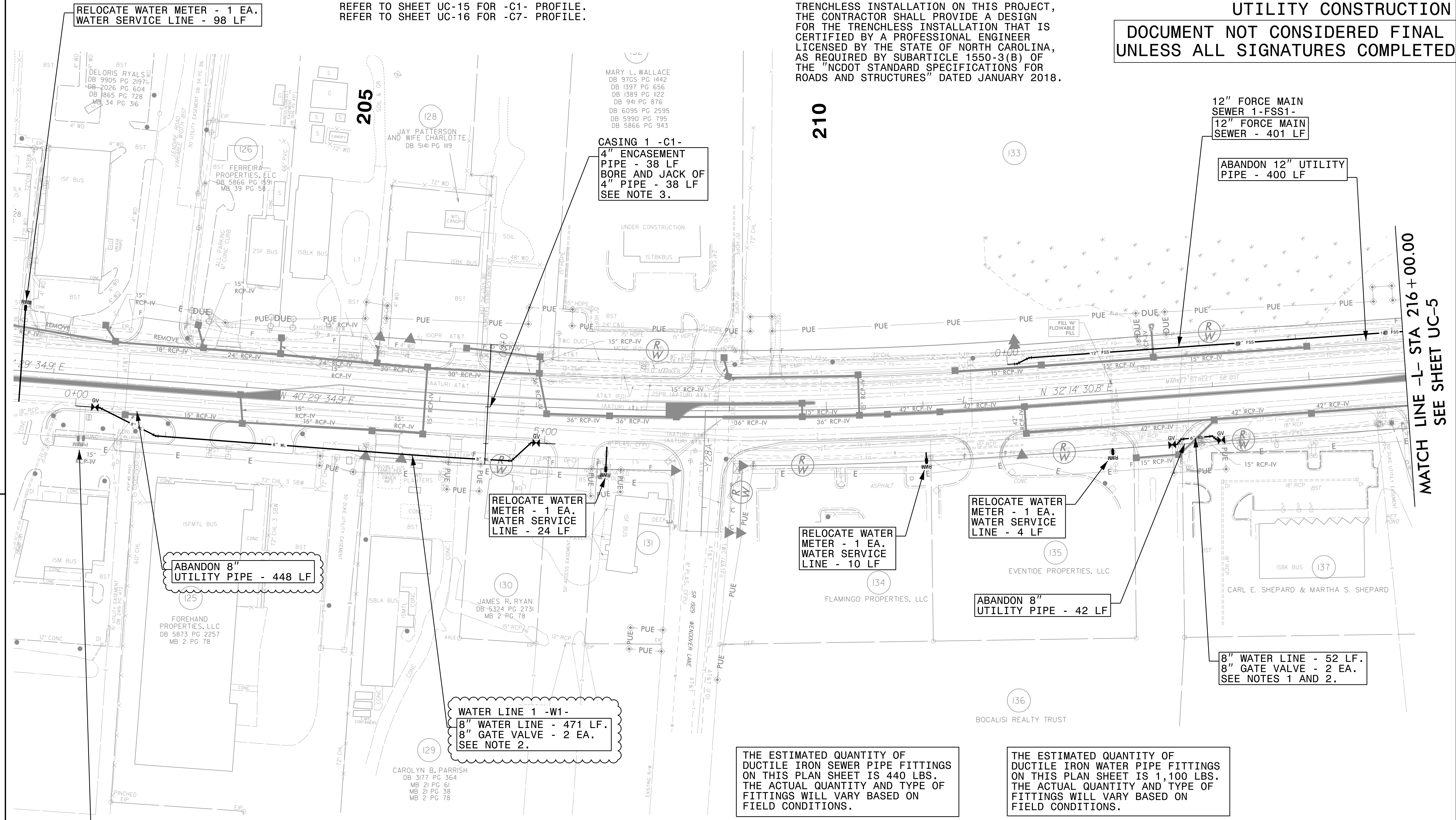
TRENCHLESS INSTALLATION NOTE:
 PRIOR TO COMMENCING ANY WORK ON ANY TRENCHLESS INSTALLATION ON THIS PROJECT, THE CONTRACTOR SHALL PROVIDE A DESIGN FOR THE TRENCHLESS INSTALLATION THAT IS CERTIFIED BY A PROFESSIONAL ENGINEER LICENSED BY THE STATE OF NORTH CAROLINA, AS REQUIRED BY SUBARTICLE 1550-3(B) OF THE "NCDOT STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" DATED JANUARY 2018.

UTILITY OWNERS ON THIS PROJECT:
 CFPUA
 UTILITY: 12" FORCEMAIN SS
 8" WATER LINE
 CONTACT: DAVID DAILEY
 PHONE: 910-332-6626

PROJECT REFERENCE NO.	SHEET NO.
U-4902D	UC-4
DESIGNED BY: SHF	
DRAWN BY: SHF	
CHECKED BY: KCZ	
APPROVED BY: KCZ	
REVISED: SHF	
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



RELOCATE WATER METER - 1 EA.
WATER SERVICE LINE - 98 LF

CASING 1 -C1-
4" ENCASEMENT PIPE - 38 LF
BORE AND JACK OF 4" PIPE - 38 LF
SEE NOTE 3.

12" FORCE MAIN SEWER 1-FSS1-
12" FORCE MAIN SEWER - 401 LF

ABANDON 12" UTILITY PIPE - 400 LF

RELOCATE WATER METER - 1 EA.
WATER SERVICE LINE - 24 LF

RELOCATE WATER METER - 1 EA.
WATER SERVICE LINE - 10 LF

RELOCATE WATER METER - 1 EA.
WATER SERVICE LINE - 4 LF

ABANDON 8" UTILITY PIPE - 42 LF

8" WATER LINE - 52 LF.
8" GATE VALVE - 2 EA.
SEE NOTES 1 AND 2.

WATER LINE 1 -W1-
8" WATER LINE - 471 LF.
8" GATE VALVE - 2 EA.
SEE NOTE 2.

THE ESTIMATED QUANTITY OF DUCTILE IRON SEWER PIPE FITTINGS ON THIS PLAN SHEET IS 440 LBS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.

THE ESTIMATED QUANTITY OF DUCTILE IRON WATER PIPE FITTINGS ON THIS PLAN SHEET IS 1,100 LBS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.

2 WATER METERS RELOCATED BY OTHERS PER T.I.P. PROJECT U-4751

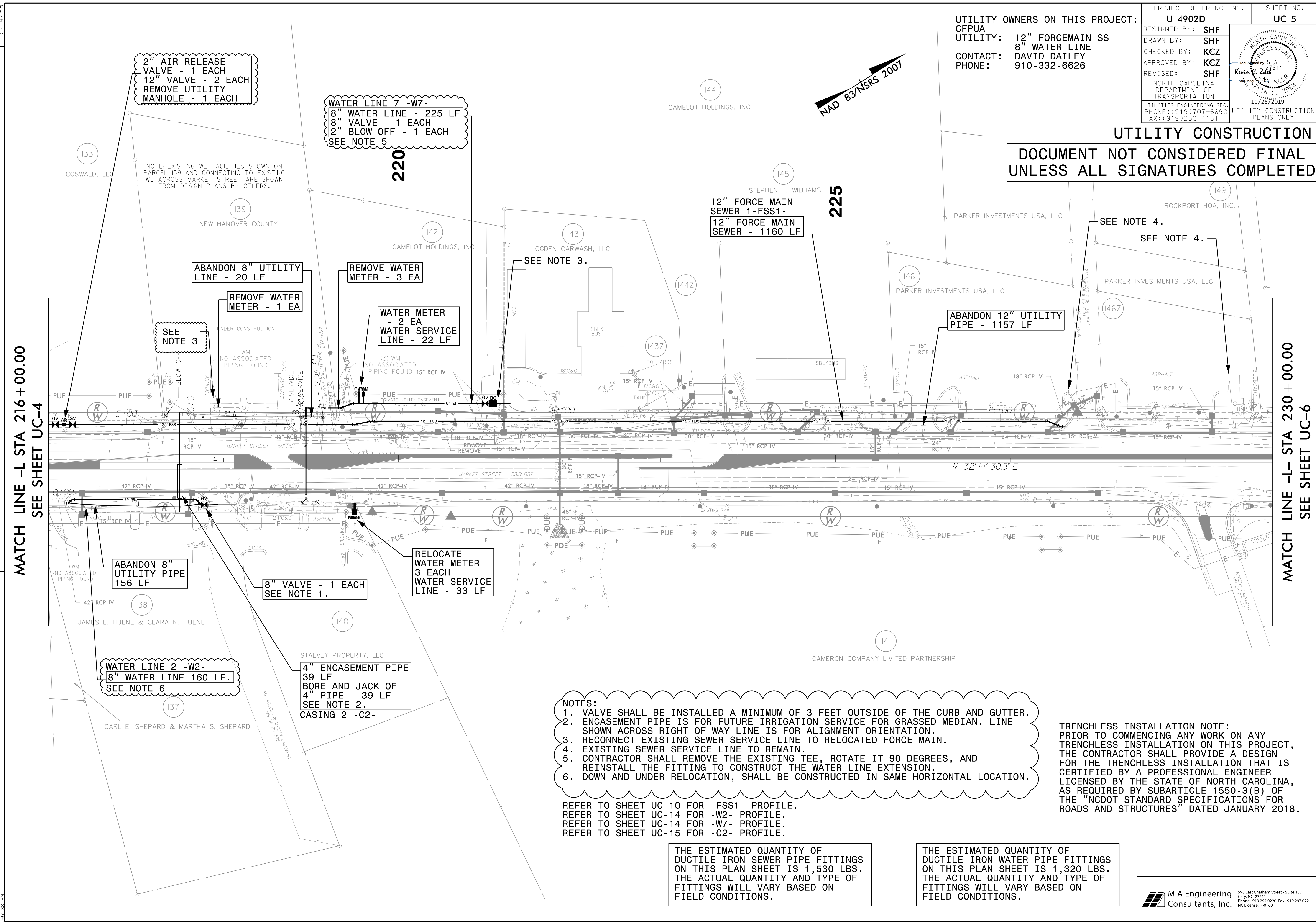
5/14/99

REVISIONS
09.27.2019 - AS PER CAPE FEAR PUBLIC UTILITY AUTHORITY COMMENTS DATED 05.17.2019, 07.30.2019, 08.19.2019.

10/29/2018
C:\Users\jld\Documents\Projects\14902D\14902D.dwg
M.A. Engineering, Inc. (UC, Proj.) Design
Current: 14902D.dwg UC: 05.apb.dgn
2:54:34 PM

MATCH LINE -L- STA 216+00.00
SEE SHEET UC-4

MATCH LINE -L- STA 230+00.00
SEE SHEET UC-6



UTILITY OWNERS ON THIS PROJECT:
 CFPUA
 UTILITY: 12" FORCE MAIN SS
 8" WATER LINE
 CONTACT: DAVID DAILEY
 PHONE: 910-332-6626

PROJECT REFERENCE NO.	U-4902D	SHEET NO.	UC-5
DESIGNED BY:	SHF		
DRAWN BY:	SHF		
CHECKED BY:	KCZ		
APPROVED BY:	KCZ		
REVISED:	SHF		
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

- NOTES:
1. VALVE SHALL BE INSTALLED A MINIMUM OF 3 FEET OUTSIDE OF THE CURB AND GUTTER.
 2. ENCASEMENT PIPE IS FOR FUTURE IRRIGATION SERVICE FOR GRASSED MEDIAN. LINE SHOWN ACROSS RIGHT OF WAY LINE IS FOR ALIGNMENT ORIENTATION.
 3. RECONNECT EXISTING SEWER SERVICE LINE TO RELOCATED FORCE MAIN.
 4. EXISTING SEWER SERVICE LINE TO REMAIN.
 5. CONTRACTOR SHALL REMOVE THE EXISTING TEE, ROTATE IT 90 DEGREES, AND REINSTALL THE FITTING TO CONSTRUCT THE WATER LINE EXTENSION.
 6. DOWN AND UNDER RELOCATION, SHALL BE CONSTRUCTED IN SAME HORIZONTAL LOCATION.

TRENCHLESS INSTALLATION NOTE:
 PRIOR TO COMMENCING ANY WORK ON ANY TRENCHLESS INSTALLATION ON THIS PROJECT, THE CONTRACTOR SHALL PROVIDE A DESIGN FOR THE TRENCHLESS INSTALLATION THAT IS CERTIFIED BY A PROFESSIONAL ENGINEER LICENSED BY THE STATE OF NORTH CAROLINA, AS REQUIRED BY SUBARTICLE 1550-3(B) OF THE "NCDOT STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" DATED JANUARY 2018.

REFER TO SHEET UC-10 FOR -FSS1- PROFILE.
 REFER TO SHEET UC-14 FOR -W2- PROFILE.
 REFER TO SHEET UC-14 FOR -W7- PROFILE.
 REFER TO SHEET UC-15 FOR -C2- PROFILE.

THE ESTIMATED QUANTITY OF DUCTILE IRON SEWER PIPE FITTINGS ON THIS PLAN SHEET IS 1,530 LBS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.

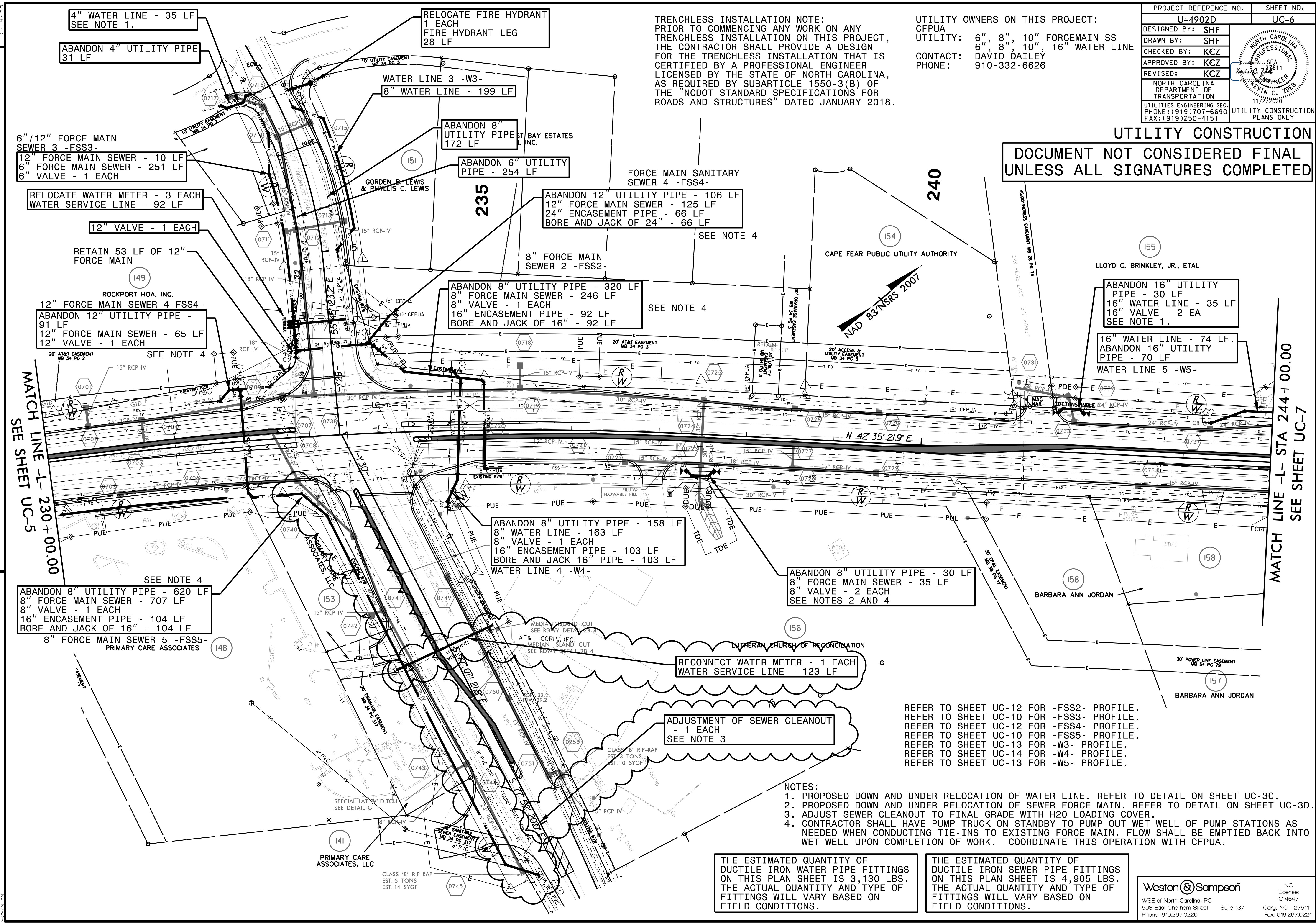
THE ESTIMATED QUANTITY OF DUCTILE IRON WATER PIPE FITTINGS ON THIS PLAN SHEET IS 1,320 LBS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.

PROJECT REFERENCE NO.	SHEET NO.
U-4902D	UC-6
DESIGNED BY: SHF	
DRAWN BY: SHF	
CHECKED BY: KCZ	
APPROVED BY: KCZ	
REVISED: KCZ	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	UTILITY CONSTRUCTION PLANS ONLY
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	

UTILITY OWNERS ON THIS PROJECT:
 CFPUA
 UTILITY: 6", 8", 10" FORCEMAIN SS
 6", 8", 10", 16" WATER LINE
 CONTACT: DAVID DAILEY
 PHONE: 910-332-6626

TRENCHLESS INSTALLATION NOTE:
 PRIOR TO COMMENCING ANY WORK ON ANY TRENCHLESS INSTALLATION ON THIS PROJECT, THE CONTRACTOR SHALL PROVIDE A DESIGN FOR THE TRENCHLESS INSTALLATION THAT IS CERTIFIED BY A PROFESSIONAL ENGINEER LICENSED BY THE STATE OF NORTH CAROLINA, AS REQUIRED BY SUBARTICLE 1550-3(B) OF THE "NCDOT STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" DATED JANUARY 2018.

UTILITY CONSTRUCTION
DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



4" WATER LINE - 35 LF
 SEE NOTE 1.

ABANDON 4" UTILITY PIPE
 31 LF

RELOCATE FIRE HYDRANT
 1 EACH
 FIRE HYDRANT LEG
 28 LF

WATER LINE 3 - W3 -
 8" WATER LINE - 199 LF

ABANDON 8" UTILITY PIPE
 172 LF

ABANDON 6" UTILITY PIPE
 PIPE - 254 LF

ABANDON 12" UTILITY PIPE - 106 LF
 12" FORCE MAIN SEWER - 125 LF
 24" ENCASEMENT PIPE - 66 LF
 BORE AND JACK OF 24" - 66 LF

ABANDON 8" UTILITY PIPE - 320 LF
 8" FORCE MAIN SEWER - 246 LF
 8" VALVE - 1 EACH
 16" ENCASEMENT PIPE - 92 LF
 BORE AND JACK OF 16" - 92 LF

6"/12" FORCE MAIN SEWER 3 - FSS3 -
 12" FORCE MAIN SEWER - 10 LF
 6" FORCE MAIN SEWER - 251 LF
 6" VALVE - 1 EACH

RELOCATE WATER METER - 3 EACH
 WATER SERVICE LINE - 92 LF

12" VALVE - 1 EACH

RETAIN 53 LF OF 12" FORCE MAIN

12" FORCE MAIN SEWER 4 - FSS4 -
 ABANDON 12" UTILITY PIPE - 91 LF
 12" FORCE MAIN SEWER - 65 LF
 12" VALVE - 1 EACH

MATCH LINE - L- 230 + 00.00
 SEE SHEET UC-5

ABANDON 8" UTILITY PIPE - 620 LF
 8" FORCE MAIN SEWER - 707 LF
 8" VALVE - 1 EACH
 16" ENCASEMENT PIPE - 104 LF
 BORE AND JACK OF 16" - 104 LF

ABANDON 8" UTILITY PIPE - 158 LF
 8" WATER LINE - 163 LF
 8" VALVE - 1 EACH
 16" ENCASEMENT PIPE - 103 LF
 BORE AND JACK 16" PIPE - 103 LF
 WATER LINE 4 - W4 -

ABANDON 8" UTILITY PIPE - 30 LF
 8" FORCE MAIN SEWER - 35 LF
 8" VALVE - 2 EACH
 SEE NOTES 2 AND 4

RECONNECT WATER METER - 1 EACH
 WATER SERVICE LINE - 123 LF

ADJUSTMENT OF SEWER CLEANOUT
 - 1 EACH
 SEE NOTE 3

REFER TO SHEET UC-12 FOR -FSS2- PROFILE.
 REFER TO SHEET UC-10 FOR -FSS3- PROFILE.
 REFER TO SHEET UC-12 FOR -FSS4- PROFILE.
 REFER TO SHEET UC-10 FOR -FSS5- PROFILE.
 REFER TO SHEET UC-13 FOR -W3- PROFILE.
 REFER TO SHEET UC-14 FOR -W4- PROFILE.
 REFER TO SHEET UC-13 FOR -W5- PROFILE.

NOTES:
 1. PROPOSED DOWN AND UNDER RELOCATION OF WATER LINE. REFER TO DETAIL ON SHEET UC-3C.
 2. PROPOSED DOWN AND UNDER RELOCATION OF SEWER FORCE MAIN. REFER TO DETAIL ON SHEET UC-3D.
 3. ADJUST SEWER CLEANOUT TO FINAL GRADE WITH H2O LOADING COVER.
 4. CONTRACTOR SHALL HAVE PUMP TRUCK ON STANDBY TO PUMP OUT WET WELL OF PUMP STATIONS AS NEEDED WHEN CONDUCTING TIE-INS TO EXISTING FORCE MAIN. FLOW SHALL BE EMPTIED BACK INTO WET WELL UPON COMPLETION OF WORK. COORDINATE THIS OPERATION WITH CFPUA.


THE ESTIMATED QUANTITY OF DUCTILE IRON WATER PIPE FITTINGS ON THIS PLAN SHEET IS 3,130 LBS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.

THE ESTIMATED QUANTITY OF DUCTILE IRON SEWER PIPE FITTINGS ON THIS PLAN SHEET IS 4,905 LBS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.

REVISIONS
 09.27.2019 - AS PER CAPE FEAR PUBLIC UTILITY AUTHORITY COMMENTS DATED 05.17.2019.
 10.09.2020 - CONSTRUCTION REVISION 6 BANSHORE ROAD REQUIRES RELOCATION OF 8" FSS AND RECONNECTION OF A WATER METER.

1/2/2020
 C:\Users\james\OneDrive\Documents\Projects\UC-6\Drawings\UC-6\Drawings\UC-6.dwg
 11/14/2019

5/14/19

PROJECT REFERENCE NO.	SHEET NO.
U-4902D	UC-7
DESIGNED BY: SHF	
DRAWN BY: SHF	
CHECKED BY: KCZ	
APPROVED BY: KCZ	
REVISED: SHF	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	
UTILITY CONSTRUCTION PLANS ONLY	

UTILITY OWNERS ON THIS PROJECT:
 CFPUA
 UTILITY: 8" FORCEMAIN SS
 8", 16" WATER LINE
 CONTACT: DAVID DAILEY
 PHONE: 910-332-6626

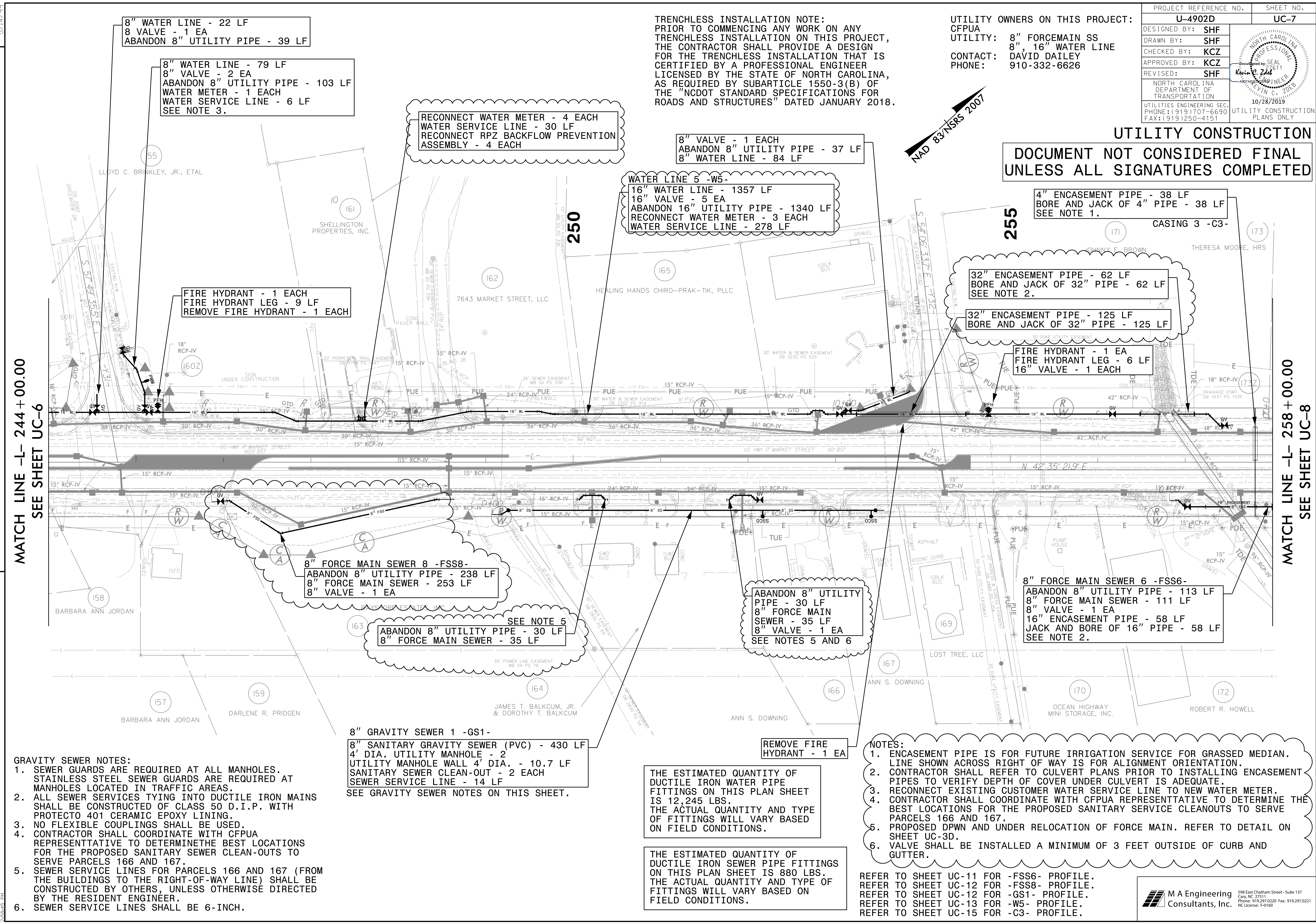
TRENCHLESS INSTALLATION NOTE:
 PRIOR TO COMMENCING ANY WORK ON ANY TRENCHLESS INSTALLATION ON THIS PROJECT, THE CONTRACTOR SHALL PROVIDE A DESIGN FOR THE TRENCHLESS INSTALLATION THAT IS CERTIFIED BY A PROFESSIONAL ENGINEER LICENSED BY THE STATE OF NORTH CAROLINA, AS REQUIRED BY SUBARTICLE 1550-3(B) OF THE "NCDOT STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" DATED JANUARY 2018.

UTILITY CONSTRUCTION
DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

REVISIONS
 09/27/2019 - AS PER CAPE FEAR PUBLIC UTILITY AUTHORITY COMMENTS DATED 05/17/2019, 07/30/2019, 08/19/2019.

MATCH LINE -L- 244 + 00.00
 SEE SHEET UC-6

MATCH LINE -L- 258 + 00.00
 SEE SHEET UC-8



8" WATER LINE - 22 LF
 8 VALVE - 1 EA
 ABANDON 8" UTILITY PIPE - 39 LF

8" WATER LINE - 79 LF
 8" VALVE - 2 EA
 ABANDON 8" UTILITY PIPE - 103 LF
 WATER METER - 1 EACH
 WATER SERVICE LINE - 6 LF
 SEE NOTE 3.

RECONNECT WATER METER - 4 EACH
 WATER SERVICE LINE - 30 LF
 RECONNECT RPZ BACKFLOW PREVENTION ASSEMBLY - 4 EACH

8" VALVE - 1 EACH
 ABANDON 8" UTILITY PIPE - 37 LF
 8" WATER LINE - 84 LF

WATER LINE 5 -W5-
 16" WATER LINE - 1357 LF
 16" VALVE - 5 EA
 ABANDON 16" UTILITY PIPE - 1340 LF
 RECONNECT WATER METER - 3 EACH
 WATER SERVICE LINE - 278 LF

4" ENCASEMENT PIPE - 38 LF
 BORE AND JACK OF 4" PIPE - 38 LF
 SEE NOTE 1.

32" ENCASEMENT PIPE - 62 LF
 BORE AND JACK OF 32" PIPE - 62 LF
 SEE NOTE 2.

32" ENCASEMENT PIPE - 125 LF
 BORE AND JACK OF 32" PIPE - 125 LF

FIRE HYDRANT - 1 EA
 FIRE HYDRANT LEG - 6 LF
 16" VALVE - 1 EACH

FIRE HYDRANT - 1 EACH
 FIRE HYDRANT LEG - 9 LF
 REMOVE FIRE HYDRANT - 1 EACH

8" FORCE MAIN SEWER 8 -FSS8-
 ABANDON 8" UTILITY PIPE - 238 LF
 8" FORCE MAIN SEWER - 253 LF
 8" VALVE - 1 EA

ABANDON 8" UTILITY PIPE - 30 LF
 8" FORCE MAIN SEWER - 35 LF

SEE NOTE 5

ABANDON 8" UTILITY PIPE - 30 LF
 8" FORCE MAIN SEWER - 35 LF
 8" VALVE - 1 EA
 SEE NOTES 5 AND 6

8" FORCE MAIN SEWER 6 -FSS6-
 ABANDON 8" UTILITY PIPE - 113 LF
 8" FORCE MAIN SEWER - 111 LF
 8" VALVE - 1 EA
 16" ENCASEMENT PIPE - 58 LF
 JACK AND BORE OF 16" PIPE - 58 LF
 SEE NOTE 2.

8" GRAVITY SEWER 1 -GS1-
 8" SANITARY GRAVITY SEWER (PVC) - 430 LF
 4' DIA. UTILITY MANHOLE - 2
 UTILITY MANHOLE WALL 4' DIA. - 10.7 LF
 SANITARY SEWER CLEAN-OUT - 2 EACH
 SEWER SERVICE LINE - 14 LF
 SEE GRAVITY SEWER NOTES ON THIS SHEET.

REMOVE FIRE HYDRANT - 1 EA

THE ESTIMATED QUANTITY OF DUCTILE IRON WATER PIPE FITTINGS ON THIS PLAN SHEET IS 12,245 LBS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.

THE ESTIMATED QUANTITY OF DUCTILE IRON SEWER PIPE FITTINGS ON THIS PLAN SHEET IS 880 LBS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.

NOTES:
 1. ENCASEMENT PIPE IS FOR FUTURE IRRIGATION SERVICE FOR GRASSED MEDIAN. LINE SHOWN ACROSS RIGHT OF WAY IS FOR ALIGNMENT ORIENTATION.
 2. CONTRACTOR SHALL REFER TO CULVERT PLANS PRIOR TO INSTALLING ENCASEMENT PIPES TO VERIFY DEPTH OF COVER UNDER CULVERT IS ADEQUATE.
 3. RECONNECT EXISTING CUSTOMER WATER SERVICE LINE TO NEW WATER METER.
 4. CONTRACTOR SHALL COORDINATE WITH CFPUA REPRESENTATIVE TO DETERMINE THE BEST LOCATIONS FOR THE PROPOSED SANITARY SERVICE CLEANOUTS TO SERVE PARCELS 166 AND 167.
 5. PROPOSED DPWN AND UNDER RELOCATION OF FORCE MAIN. REFER TO DETAIL ON SHEET UC-3D.
 6. VALVE SHALL BE INSTALLED A MINIMUM OF 3 FEET OUTSIDE OF CURB AND GUTTER.

REFER TO SHEET UC-11 FOR -FSS6- PROFILE.
 REFER TO SHEET UC-12 FOR -FSS8- PROFILE.
 REFER TO SHEET UC-12 FOR -GS1- PROFILE.
 REFER TO SHEET UC-13 FOR -W5- PROFILE.
 REFER TO SHEET UC-15 FOR -C3- PROFILE.

- GRAVITY SEWER NOTES:**
- SEWER GUARDS ARE REQUIRED AT ALL MANHOLES. STAINLESS STEEL SEWER GUARDS ARE REQUIRED AT MANHOLES LOCATED IN TRAFFIC AREAS.
 - ALL SEWER SERVICES TYING INTO DUCTILE IRON MAINS SHALL BE CONSTRUCTED OF CLASS 50 D.I.P. WITH PROTECTO 401 CERAMIC EPOXY LINING.
 - NO FLEXIBLE COUPLINGS SHALL BE USED.
 - CONTRACTOR SHALL COORDINATE WITH CFPUA REPRESENTATIVE TO DETERMINE THE BEST LOCATIONS FOR THE PROPOSED SANITARY SEWER CLEAN-OUTS TO SERVE PARCELS 166 AND 167.
 - SEWER SERVICE LINES FOR PARCELS 166 AND 167 (FROM THE BUILDINGS TO THE RIGHT-OF-WAY LINE) SHALL BE CONSTRUCTED BY OTHERS, UNLESS OTHERWISE DIRECTED BY THE RESIDENT ENGINEER.
 - SEWER SERVICE LINES SHALL BE 6-INCH.

5/14/19

REVISIONS
09.27.2019 - AS PER CAPE FEAR PUBLIC UTILITY AUTHORITY COMMENTS DATED 05.17.2019, 07.30.2019.

MATCH LINE -L- STA 258+00.00
SEE SHEET UC-7

MATCH LINE -L- STA 272+00.00
SEE SHEET UC-9

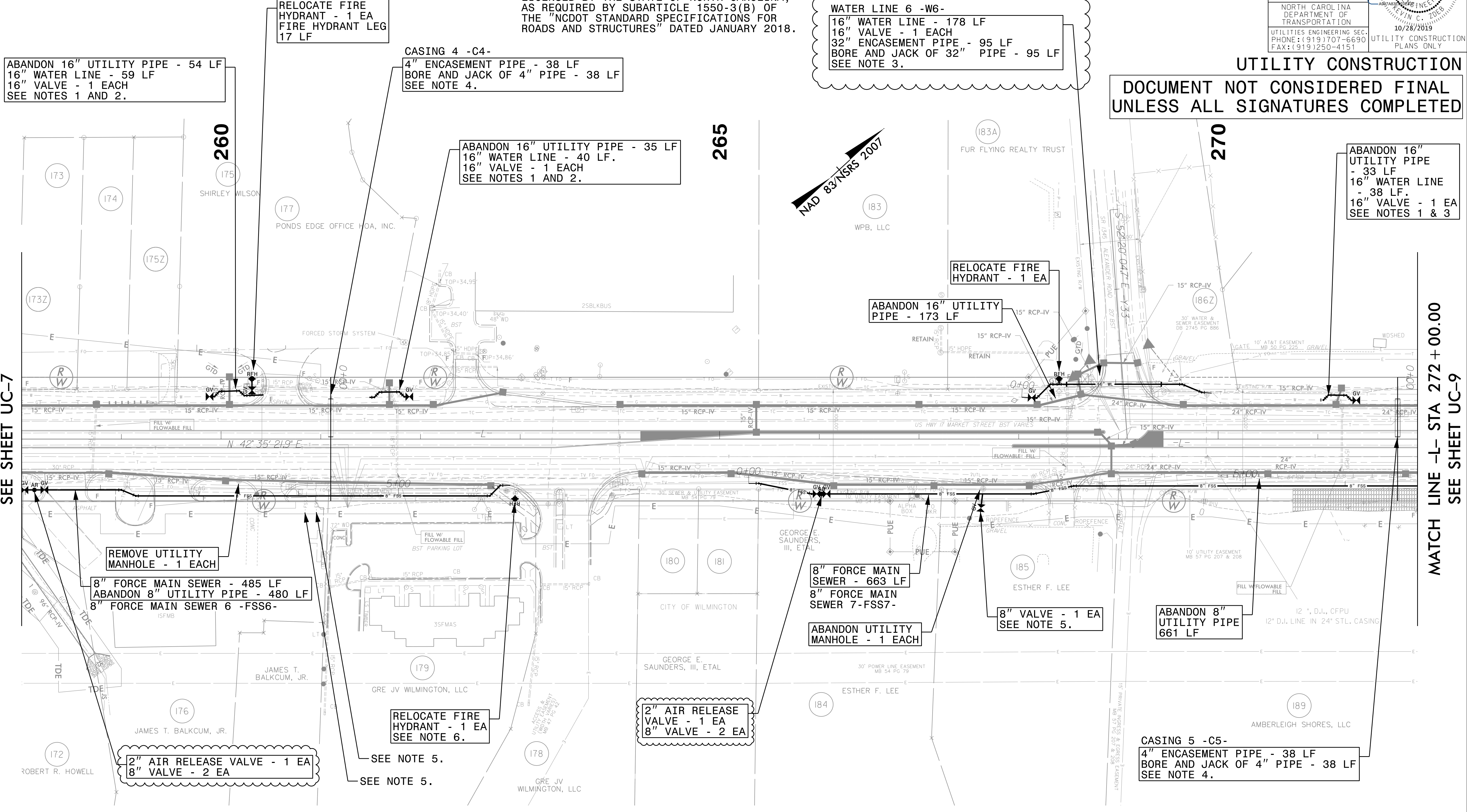
TRENCHLESS INSTALLATION NOTE:
PRIOR TO COMMENCING ANY WORK ON ANY TRENCHLESS INSTALLATION ON THIS PROJECT, THE CONTRACTOR SHALL PROVIDE A DESIGN FOR THE TRENCHLESS INSTALLATION THAT IS CERTIFIED BY A PROFESSIONAL ENGINEER LICENSED BY THE STATE OF NORTH CAROLINA, AS REQUIRED BY SUBARTICLE 1550-3(B) OF THE "NCDOT STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" DATED JANUARY 2018.

UTILITY OWNERS ON THIS PROJECT:
CFPUA
UTILITY: 8" FORCEMAIN SS
16" WATER LINE
CONTACT: DAVID DAILEY
PHONE: 910-332-6626

PROJECT REFERENCE NO.	SHEET NO.
U-4902D	UC-8
DESIGNED BY: SHF	
DRAWN BY: SHF	
CHECKED BY: KCZ	
APPROVED BY: KCZ	
REVISED: SHF	
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**



ABANDON 16" UTILITY PIPE - 54 LF
16" WATER LINE - 59 LF
16" VALVE - 1 EACH
SEE NOTES 1 AND 2.

RELOCATE FIRE HYDRANT - 1 EA
FIRE HYDRANT LEG
17 LF

CASING 4 -C4-
4" ENCASEMENT PIPE - 38 LF
BORE AND JACK OF 4" PIPE - 38 LF
SEE NOTE 4.

ABANDON 16" UTILITY PIPE - 35 LF
16" WATER LINE - 40 LF.
16" VALVE - 1 EACH
SEE NOTES 1 AND 2.

WATER LINE 6 -W6-
16" WATER LINE - 178 LF
16" VALVE - 1 EACH
32" ENCASEMENT PIPE - 95 LF
BORE AND JACK OF 32" PIPE - 95 LF
SEE NOTE 3.

ABANDON 16" UTILITY PIPE - 33 LF
16" WATER LINE - 38 LF.
16" VALVE - 1 EA
SEE NOTES 1 & 3

REMOVE UTILITY MANHOLE - 1 EACH
8" FORCE MAIN SEWER - 485 LF
ABANDON 8" UTILITY PIPE - 480 LF
8" FORCE MAIN SEWER 6 -FSS6-

2" AIR RELEASE VALVE - 1 EA
8" VALVE - 2 EA

RELOCATE FIRE HYDRANT - 1 EA
SEE NOTE 6.

8" FORCE MAIN SEWER - 663 LF
8" FORCE MAIN SEWER 7-FSS7-
ABANDON UTILITY MANHOLE - 1 EACH

2" AIR RELEASE VALVE - 1 EA
8" VALVE - 2 EA

8" VALVE - 1 EA
SEE NOTE 5.

ABANDON 8" UTILITY PIPE
661 LF

CASING 5 -C5-
4" ENCASEMENT PIPE - 38 LF
BORE AND JACK OF 4" PIPE - 38 LF
SEE NOTE 4.

- NOTES:**
1. PROPOSED DOWN AND UNDER RELOCATION OF WATER LINE. REFER TO DETAILS ON SHEET UC-3C.
 2. PERFORM BOTH THESE 16" WL RELOCATIONS AT THE SAME TIME FOR L STA 259+88.4 TO 261+88.8.
 3. PERFORM BOTH THESE 16" WL RELOCATIONS AT THE SAME TIME FOR L STA 268+13.0 TO 271+38.6.
 4. ENCASEMENT PIPE IS FOR FUTURE IRRIGATION SERVICE FOR GRASSED MEDIAN. LINE SHOWN ACROSS RIGHT OF WAY LINE IS FOR ALIGNMENT ORIENTATION.
 5. RECONNECT EXISTING SEWER SERVICE LINE TO RELOCATED FORCE MAIN.
 6. FIRE HYDRANT SHALL BE RELOCATED VERTICALLY AS NEEDED.

THE ESTIMATED QUANTITY OF DUCTILE IRON SEWER PIPE FITTINGS ON THIS PLAN SHEET IS 1,320 LBS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.

THE ESTIMATED QUANTITY OF DUCTILE IRON WATER PIPE FITTINGS ON THIS PLAN SHEET IS 6,520 LBS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.

REFER TO SHEET UC-11 FOR -FSS6- PROFILE.
REFER TO SHEET UC-11 FOR -FSS7- PROFILE.
REFER TO SHEET UC-13 FOR -W6- PROFILE.
REFER TO SHEET UC-15 FOR -C4- PROFILE.
REFER TO SHEET UC-15 FOR -C5- PROFILE.

5/14/19

TRENCHLESS INSTALLATION NOTE:
 PRIOR TO COMMENCING ANY WORK ON ANY TRENCHLESS INSTALLATION ON THIS PROJECT, THE CONTRACTOR SHALL PROVIDE A DESIGN FOR THE TRENCHLESS INSTALLATION THAT IS CERTIFIED BY A PROFESSIONAL ENGINEER LICENSED BY THE STATE OF NORTH CAROLINA, AS REQUIRED BY SUBARTICLE 1550-3(B) OF THE "NCDOT STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" DATED JANUARY 2018.



UTILITY OWNERS ON THIS PROJECT:
 CFPWA
 UTILITY: 2" 8" FORCEMAIN SS
 16" WATER LINE
 CONTACT: DAVID DAILEY
 PHONE: 910-332-6626

PROJECT REFERENCE NO.	SHEET NO.
U-4902D	UC-9
DESIGNED BY: SHF	
DRAWN BY: SHF	
CHECKED BY: KCZ	
APPROVED BY: KCZ	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	
UTILITY CONSTRUCTION PLANS ONLY	

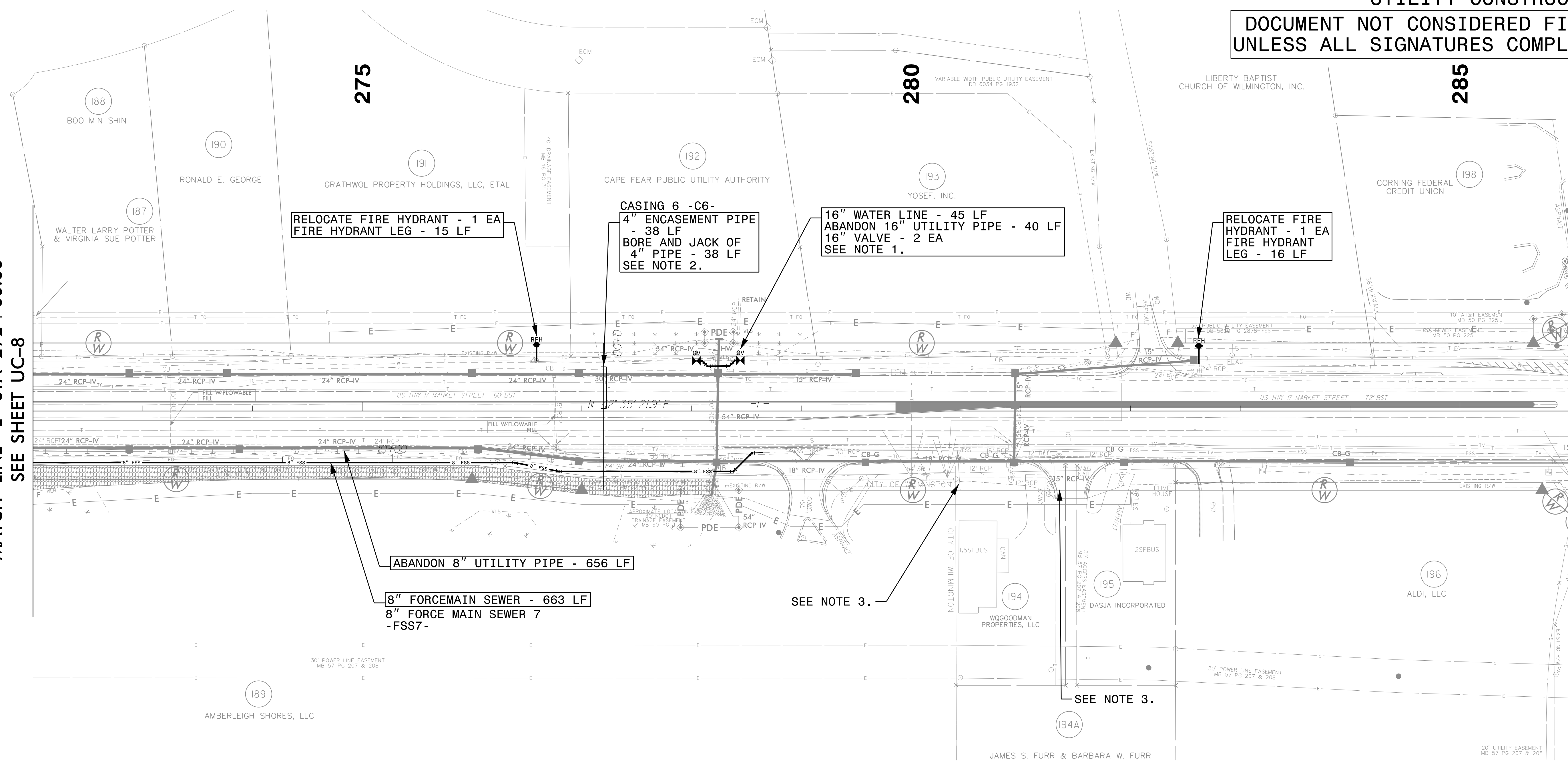
UTILITY CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS
 09.27.2019 - AS PER CAPE FEAR PUBLIC UTILITY AUTHORITY COMMENTS DATED 07.30.2019.

MATCH LINE -L- STA 272 +00.00
 SEE SHEET UC-8

-L- STA 286 +00.00
 END OF UC PLAN SHEETS



- NOTES:**
1. PROPOSED DOWN AND UNDER RELOCATION OF WATER LINE. REFER TO DETAIL ON SHEET UC-3C.
 2. ENCASEMENT PIPE IS FOR FUTURE IRRIGATION SERVICE FOR GRASSED MEDIAN. LINE SHOWN ACROSS RIGHT OF WAY LINE IS FOR ALIGNMENT ORIENTATION.
 3. EXISTING SEWER SERVICE LINE AND MANHOLE TO REMAIN.

REFER TO SHEET UC-11 FOR -FSS7- PROFILE.
 REFER TO SHEET UC-15 FOR -C6- PROFILE.

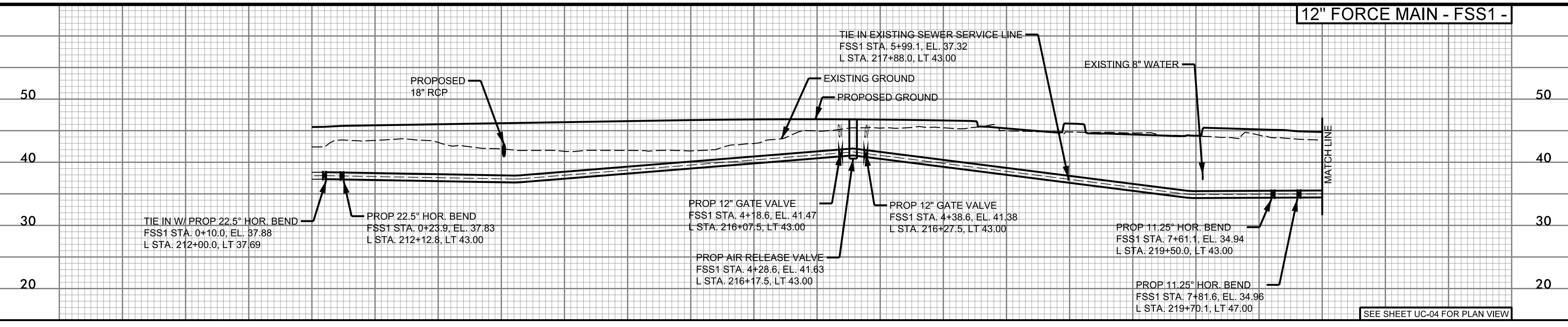
THE ESTIMATED QUANTITY OF DUCTILE IRON SEWER PIPE FITTINGS ON THIS PLAN SHEET IS 660 LBS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.

THE ESTIMATED QUANTITY OF DUCTILE IRON WATER PIPE FITTINGS ON THIS PLAN SHEET IS 1,380 LBS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.

5/28/2019

REVISIONS
08/27/2019 - AS PER CAPE FEAR PUBLIC UTILITY AUTHORITY COMMENTS DATED 05/17/2019.
10/13/2020 - CONSTRUCTION REVISION 6 BAYSHORE DRIVE REQUIRES THE REVISION OF 8" FORCE MAIN - FSS5 -

1/2/2020
C:\projects\Bays\Projects\Bays\Engineering\Bays\Bays\Design\UC-06\Drawings\UC-06.dwg
Author: D. Cameron
Checked: J. Williams
Date: 1/2/2020



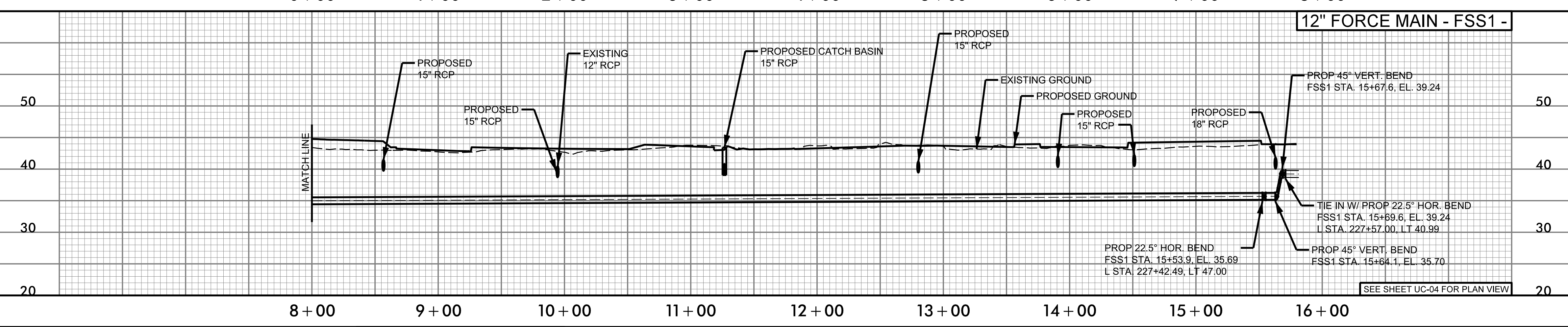
PROJECT REFERENCE NO.	SHEET NO.
U-4902D	UC-10
DESIGNED BY: SHF	
DRAWN BY: SHF	
CHECKED BY: KCZ	
APPROVED BY: KCZ	
REVISED: KCZ	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	
UTILITY CONSTRUCTION PLANS ONLY	

UTILITY CONSTRUCTION

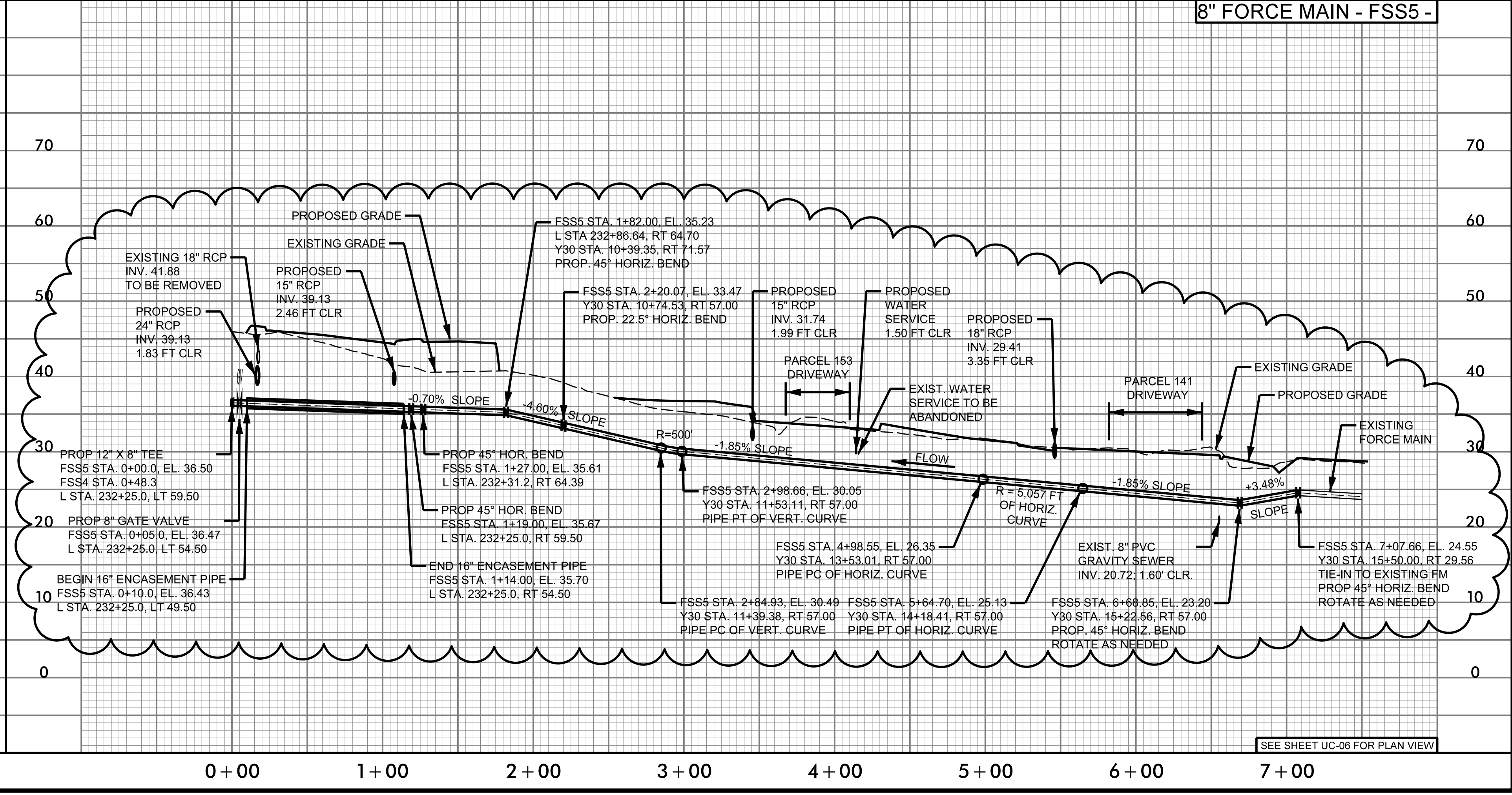
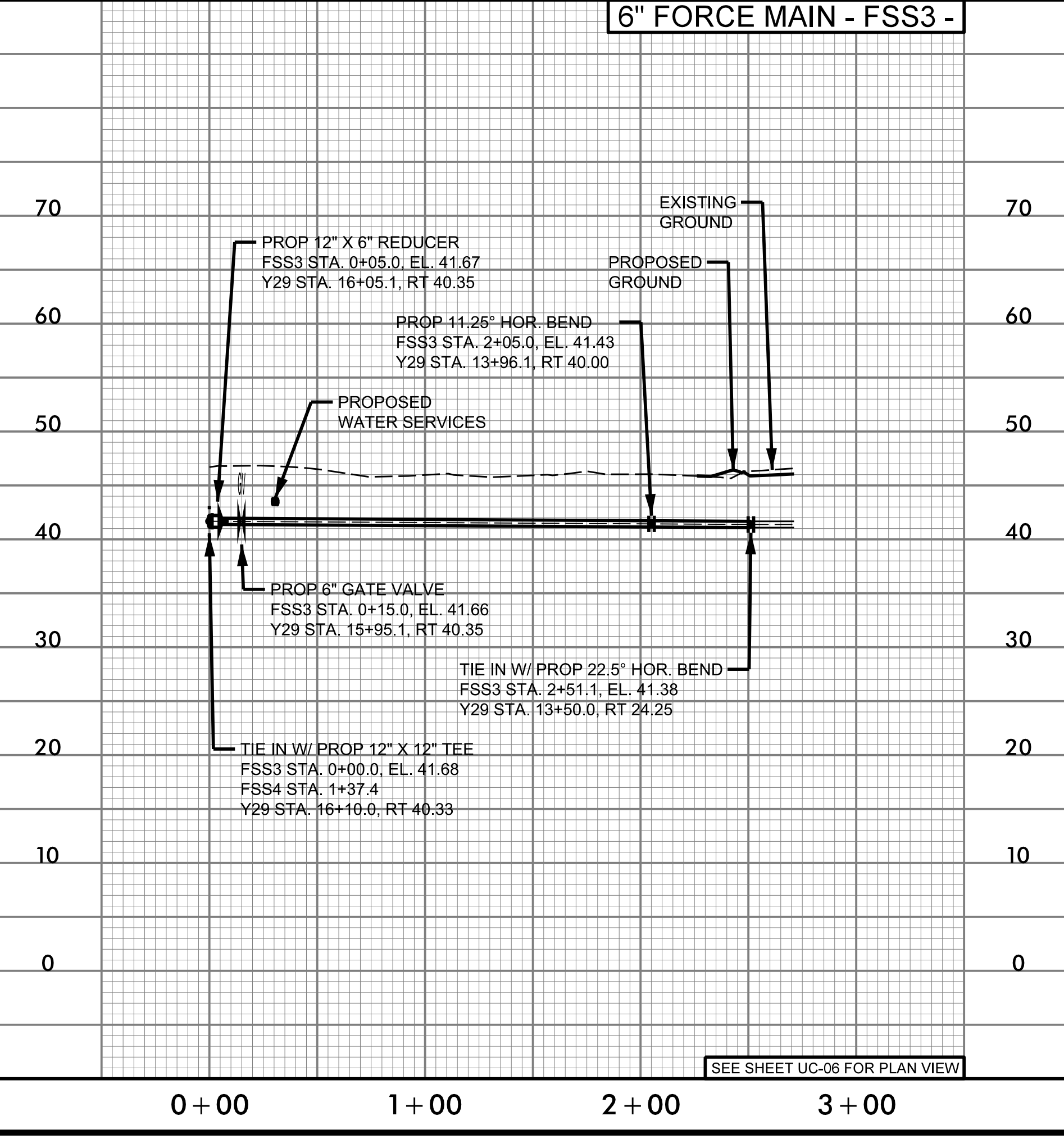
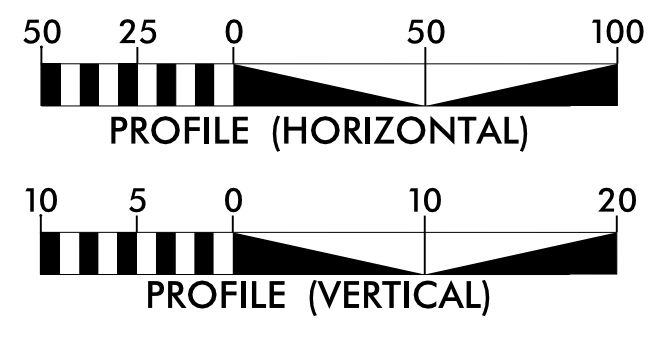
Weston Sampson
 WSE of North Carolina, PC
 598 East Chatham Street, Suite 137
 Phone: 919.297.0220

NC License: C-4847
 Cary, NC 27511
 Fax: 919.297.0221

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES ARE COMPLETED



- GENERAL NOTES THAT APPLY TO ALL PROFILES:
- EXISTING PIPE AT TIE-IN LOCATIONS ARE ESTIMATED BASED ON TEST HOLE INFORMATION OR AS-BUILTS PROVIDED BY OTHERS. CONTRACTOR SHALL VERIFY PIPE LOCATION BEFORE STARTING ANY WORK.
 - ALL PROPOSED PIPE ELEVATIONS ARE TO CENTERLINE OF PIPE, UNLESS NOTED AS AN INVERT.



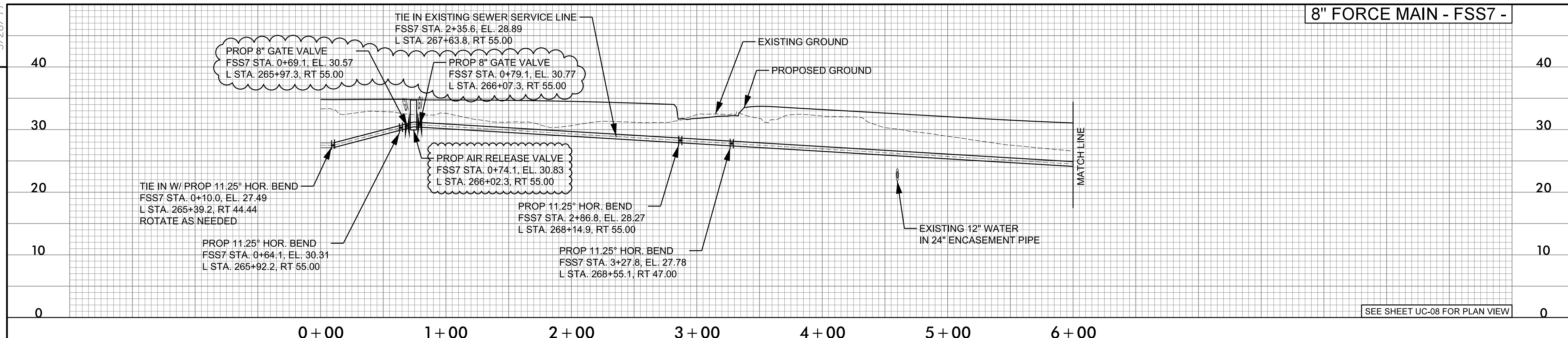
SEE SHEET UC-06 FOR PLAN VIEW

SEE SHEET UC-06 FOR PLAN VIEW

5/28/19

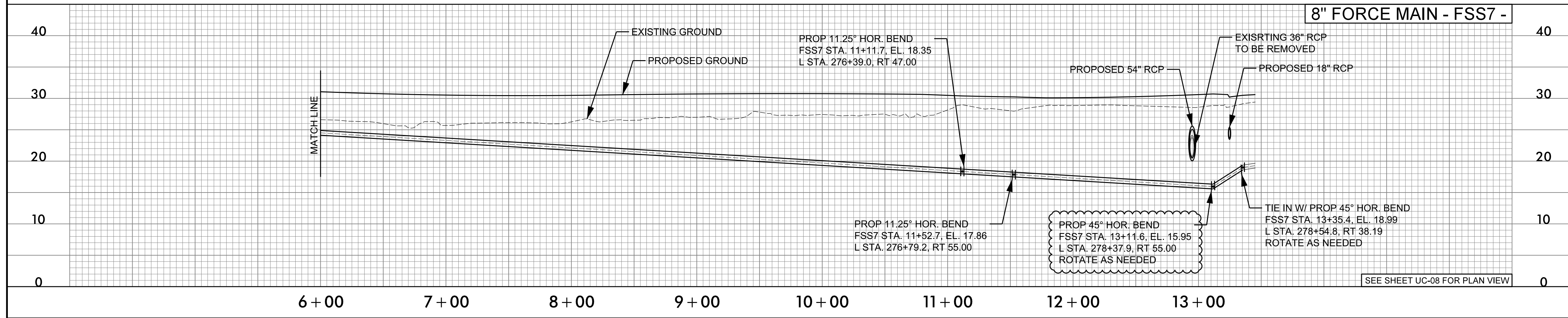
REVISIONS
09/27/2019 - AS PER CAPE FEAR PUBLIC UTILITY AUTHORITY COMMENTS DATED 05/17/2019.

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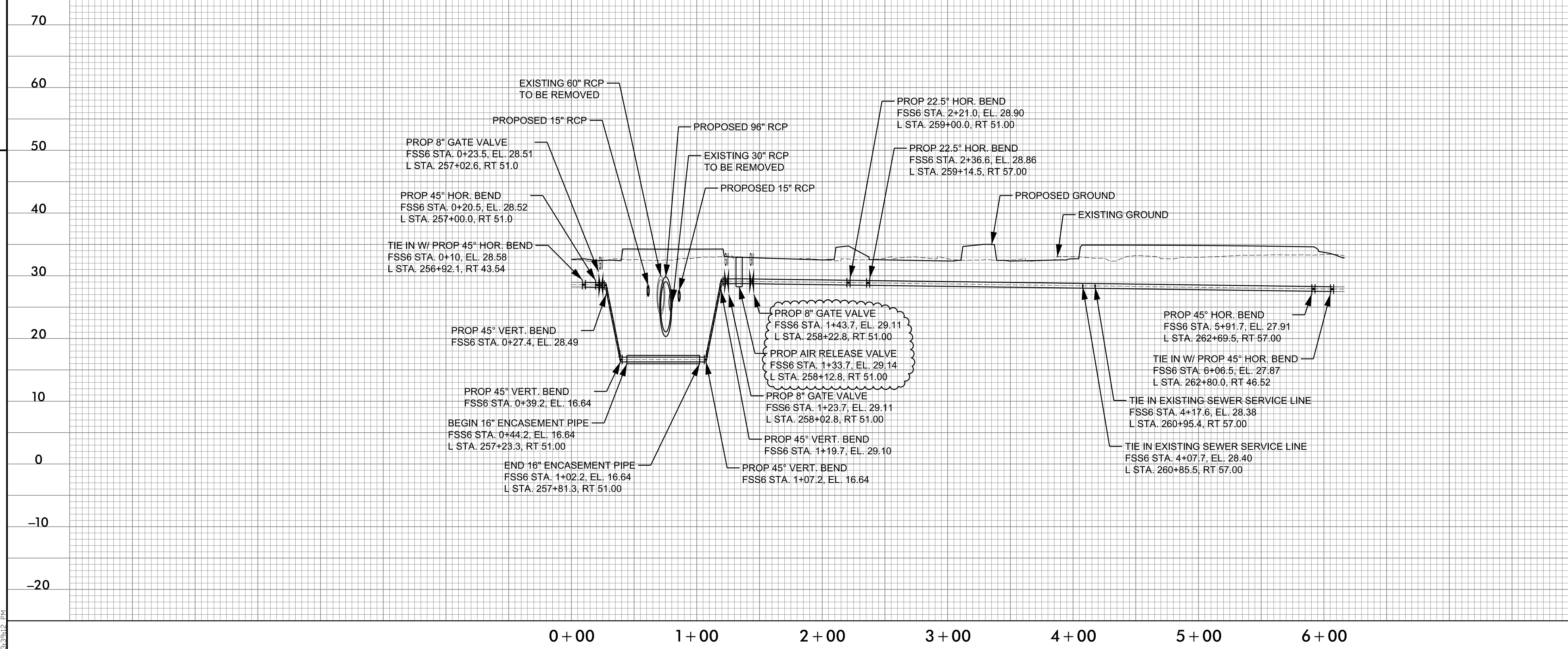
8" FORCE MAIN - FSS7 -

SEE SHEET UC-08 FOR PLAN VIEW



8" FORCE MAIN - FSS7 -

SEE SHEET UC-08 FOR PLAN VIEW



8" FORCE MAIN - FSS6 -

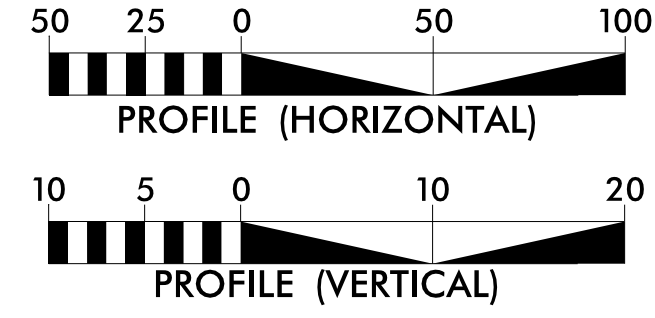
SEE SHEET UC-07 FOR PLAN VIEW

PROJECT REFERENCE NO.	SHEET NO.
U-4902D	UC-11
DESIGNED BY: SHF	
DRAWN BY: SHF	
CHECKED BY: KCZ	
APPROVED BY: KCZ	
REVISED: SHF	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	
UTILITY CONSTRUCTION PLANS ONLY	
UTILITY CONSTRUCTION	

M A Engineering Consultants, Inc.
598 East Chatham Street - Suite 137
Cary, NC 27511
Phone: 919.297.0220 Fax: 919.297.0221
NC License: F-0160

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES ARE COMPLETED

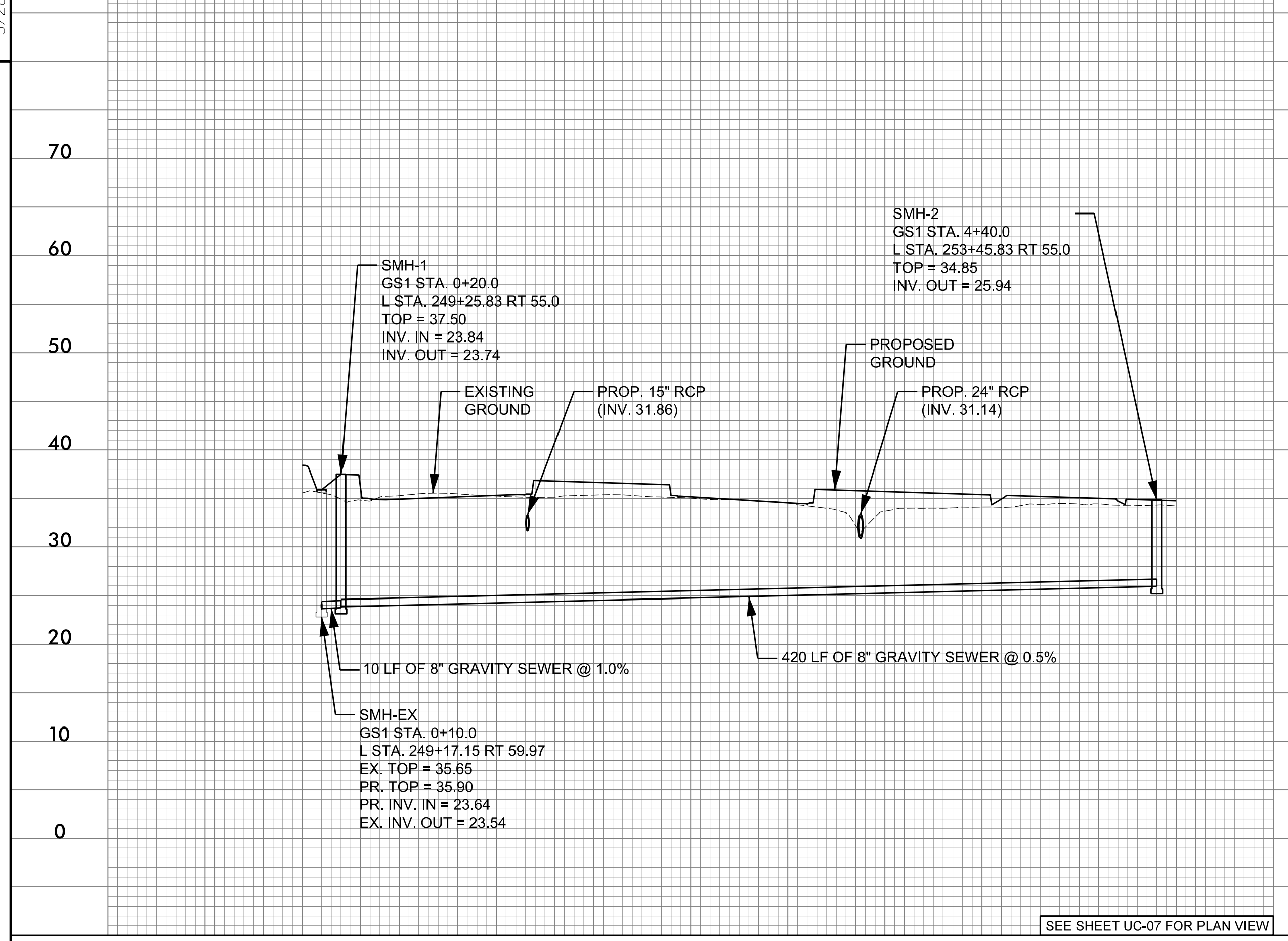
- GENERAL NOTES:**
APPLIES TO ALL PROFILES
- EXISTING PIPE AT TIE-IN LOCATIONS ARE ESTIMATED BASED ON TEST HOLE INFORMATION PROVIDED BY OTHERS. CONTRACTOR SHALL VERIFY PIPE LOCATION BEFORE STARTING WORK.
 - ALL PROPOSED PIPE ELEVATIONS ARE TO CL OF PIPE.



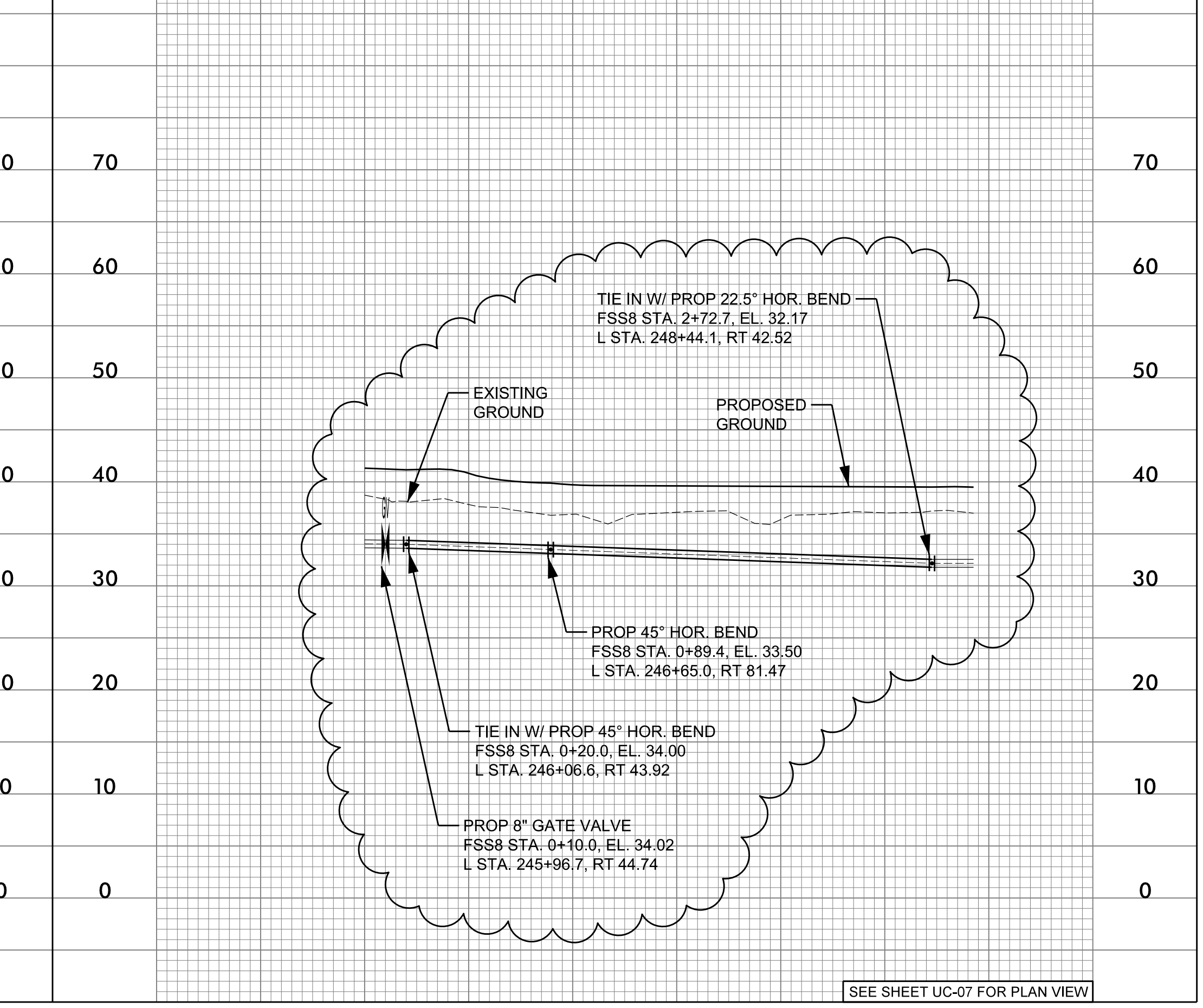
5/28/2019

REVISIONS
09.27.2018 - AS PER CAPE FEAR PUBLIC UTILITY AUTHORITY COMMENTS DATED 05.17.2019.

8" GRAVITY SEWER - GS1 -



8" FORCE MAIN - FSS8 -

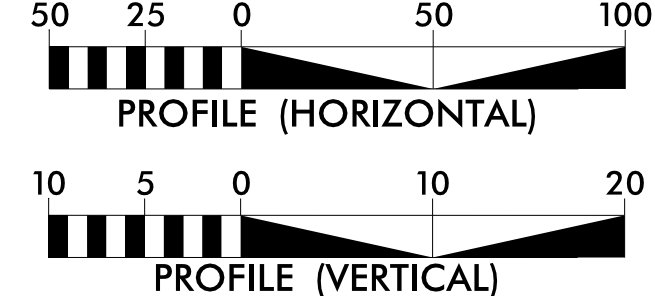


PROJECT REFERENCE NO.	UC-12
U-4902D	UC-12
DESIGNED BY: SHF	
DRAWN BY: SHF	
CHECKED BY: KCZ	
APPROVED BY: KCZ	
REVISED: SHF	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	
UTILITY CONSTRUCTION PLANS ONLY	
UTILITY CONSTRUCTION	

M A Engineering Consultants, Inc. 598 East Chatham Street - Suite 137 Cary, NC 27511 Phone: 919.297.0220 Fax: 919.297.0221 NC License: F-0160

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES ARE COMPLETED

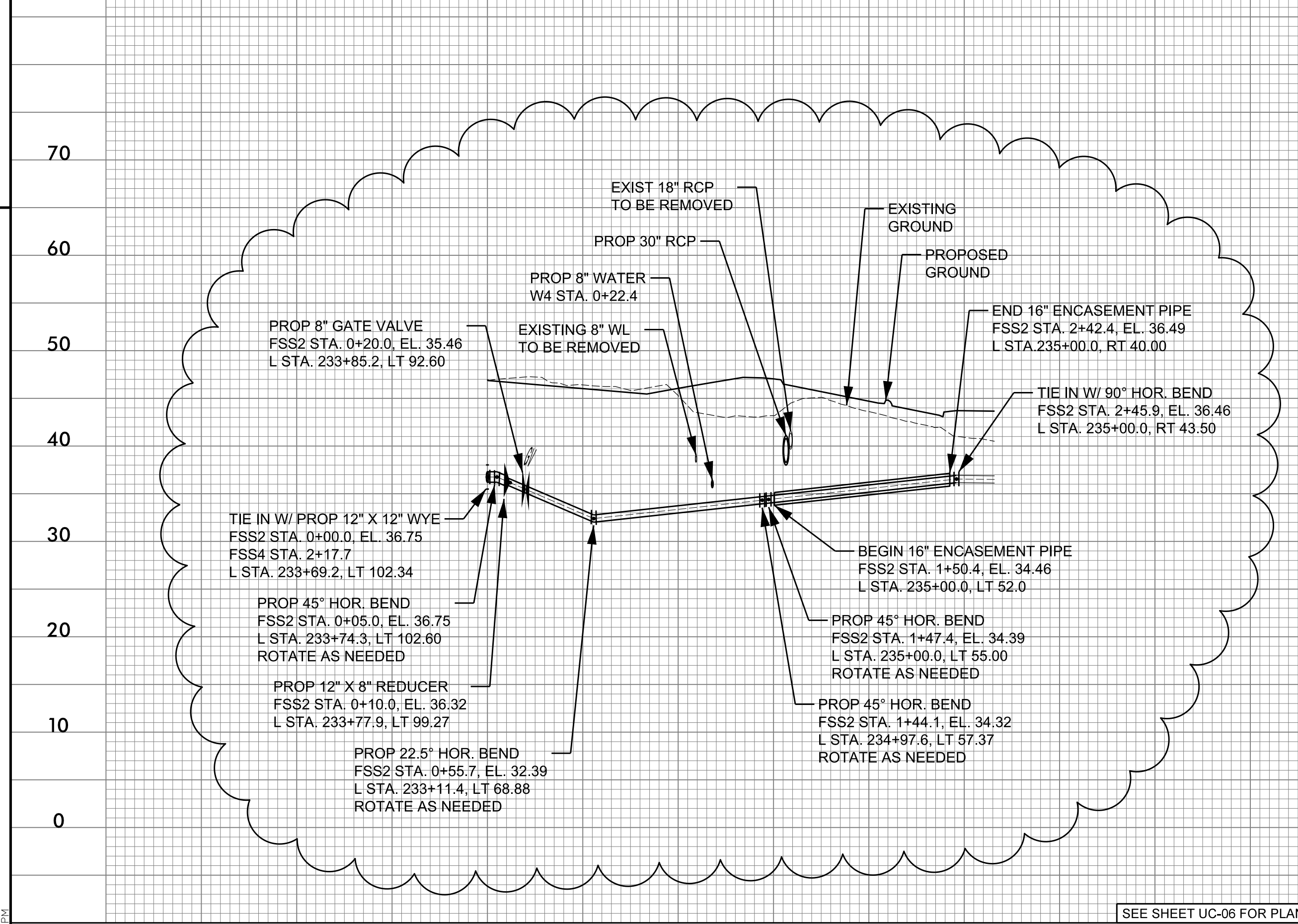
- GENERAL NOTES:**
APPLIES TO ALL PROFILES
 1. EXISTING PIPE AT TIE-IN LOCATIONS ARE ESTIMATED BASED ON TEST HOLE INFORMATION PROVIDED BY OTHERS. CONTRACTOR SHALL VERIFY PIPE LOCATION BEFORE STARTING WORK.
 2. ALL PROPOSED PIPE ELEVATIONS ARE TO CL OF PIPE.
 3. ALL PROPOSED GRAVITY SEWER PIPE ELEVATIONS ARE TO INVERT OF PIPE.



0+00 1+00 2+00 3+00 4+00

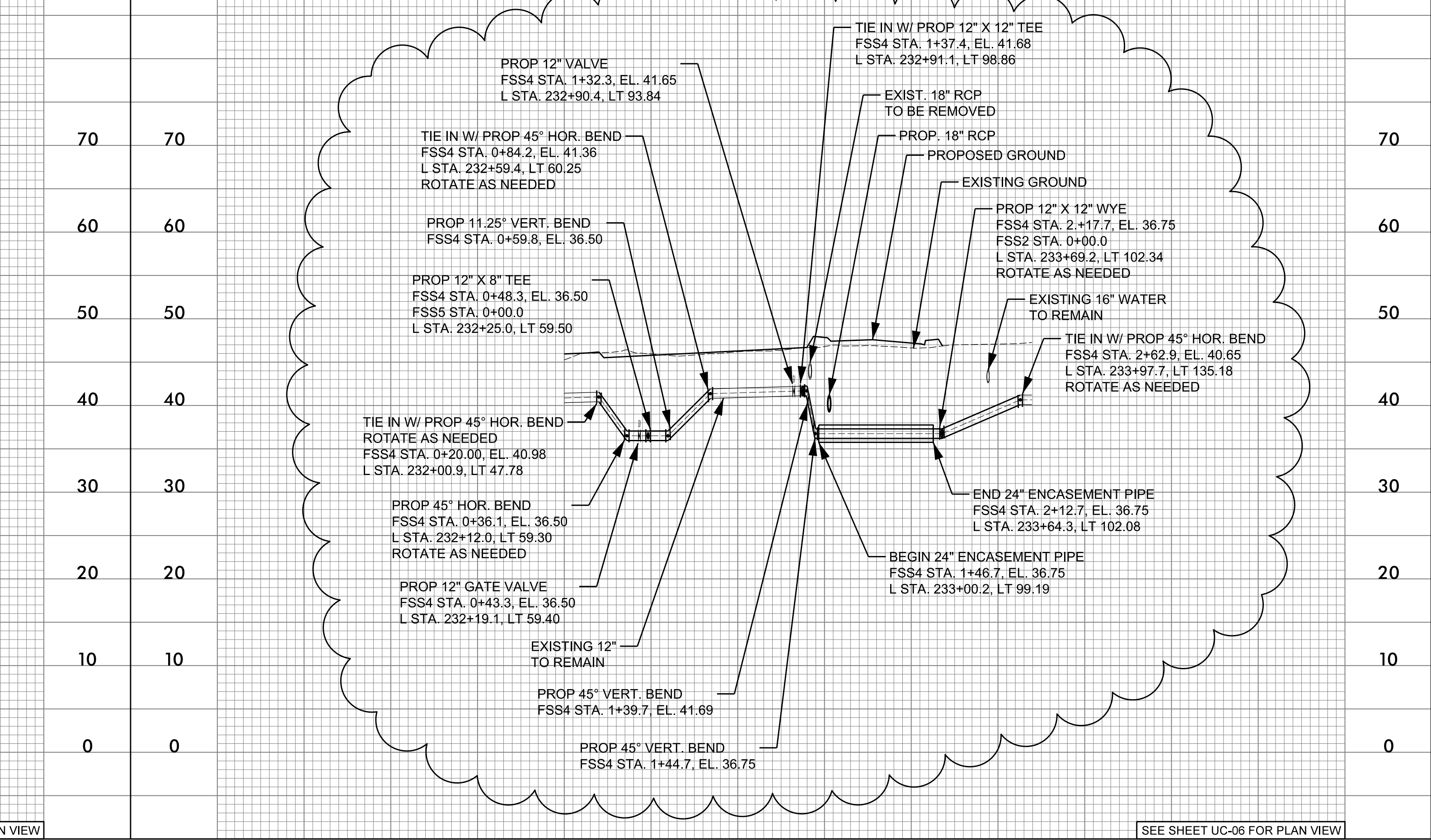
0+00 1+00 2+00 3+00

8" FORCE MAIN - FSS2 -



0+00 1+00 2+00 3+00

12" FORCE MAIN - FSS4 -



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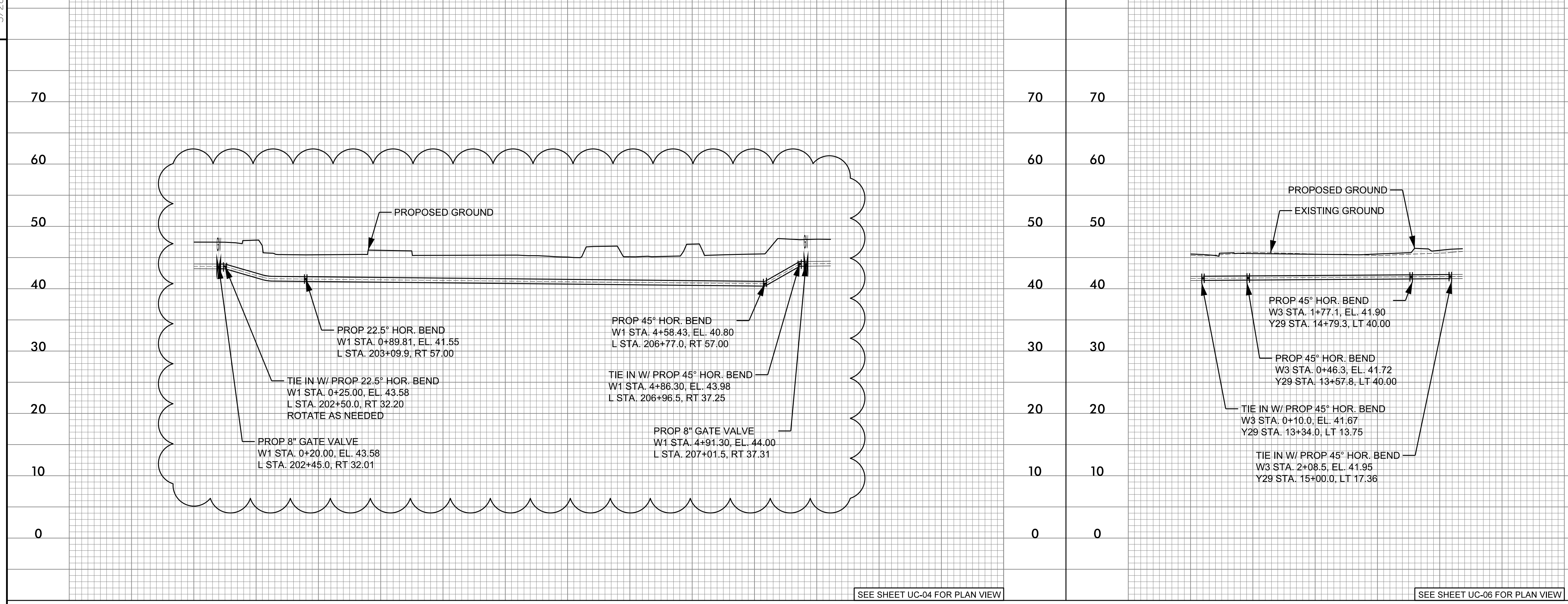
5/28/19

REVISIONS
09.27.2019 - AS PER CAPE FEAR PUBLIC UTILITY AUTHORITY COMMENTS DATED 05.17.2019, 08.19.2019

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3/28/19

8" WATER MAIN - W1 -

8" WATER MAIN - W3 -

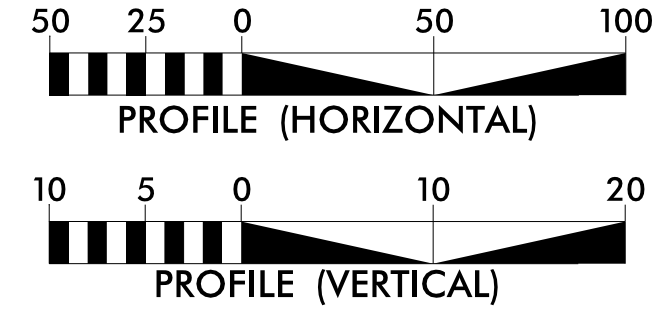


PROJECT REFERENCE NO.	UC-13
DESIGNED BY:	SHF
DRAWN BY:	SHF
CHECKED BY:	KCZ
APPROVED BY:	KCZ
REVISED:	SHF
UTILITIES ENGINEERING SEC.	UTILITY CONSTRUCTION PLANS ONLY
PHONE: (919) 707-6690	
FAX: (919) 250-4151	

UTILITY CONSTRUCTION
M A Engineering Consultants, Inc. 598 East Chatham Street - Suite 137 Cary, NC 27511 Phone: 919.297.0220 Fax: 919.297.0221 NC License: F-0160

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES ARE COMPLETED

GENERAL NOTES:
 APPLIES TO ALL PROFILES
 1. EXISTING PIPE AT TIE-IN LOCATIONS ARE ESTIMATED BASED ON TEST HOLE INFORMATION PROVIDED BY OTHERS. CONTRACTOR SHALL VERIFY PIPE LOCATION BEFORE STARTING WORK.
 2. ALL PROPOSED PIPE ELEVATIONS ARE TO CL OF PIPE.



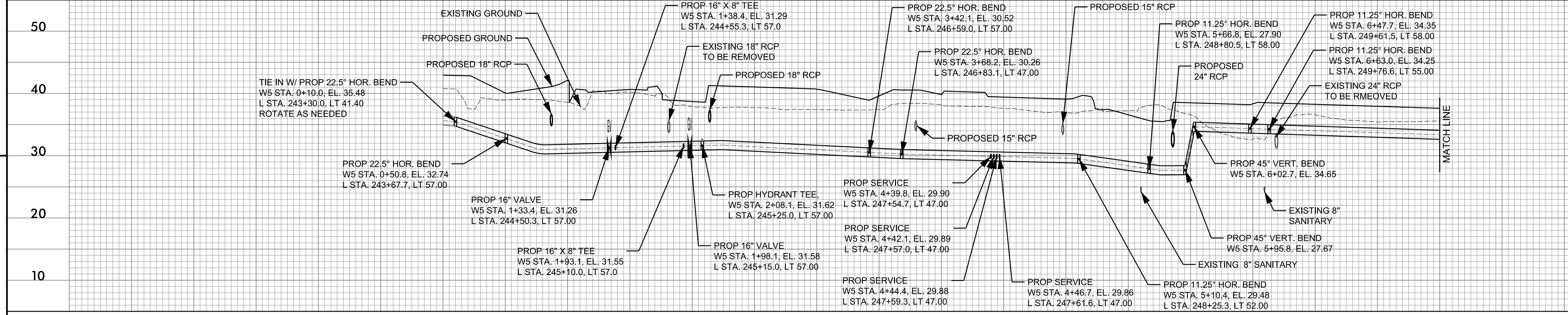
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SEE SHEET UC-04 FOR PLAN VIEW

SEE SHEET UC-06 FOR PLAN VIEW

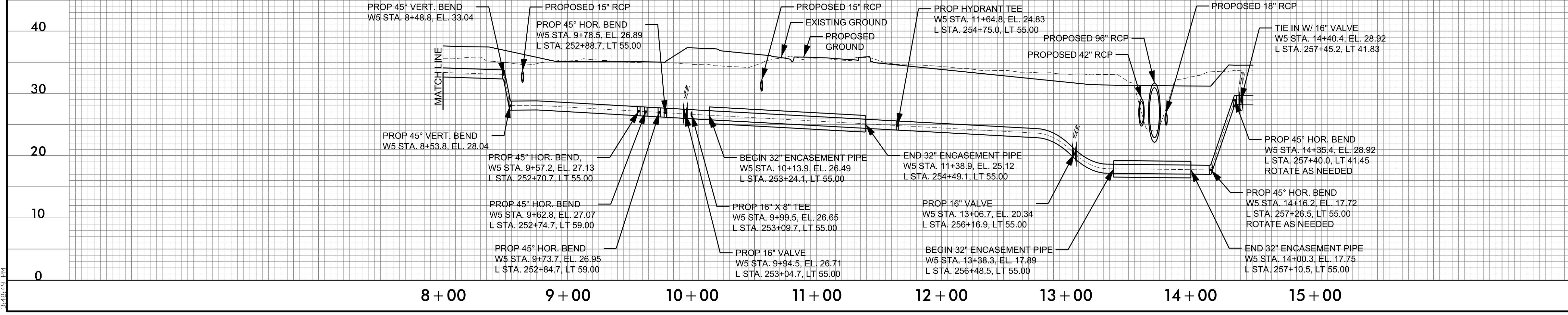
16" WATER MAIN - W5 -



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SEE SHEET UC-06 FOR PLAN VIEW

16" WATER MAIN - W5 -



8+00 9+00 10+00 11+00 12+00 13+00 14+00 15+00

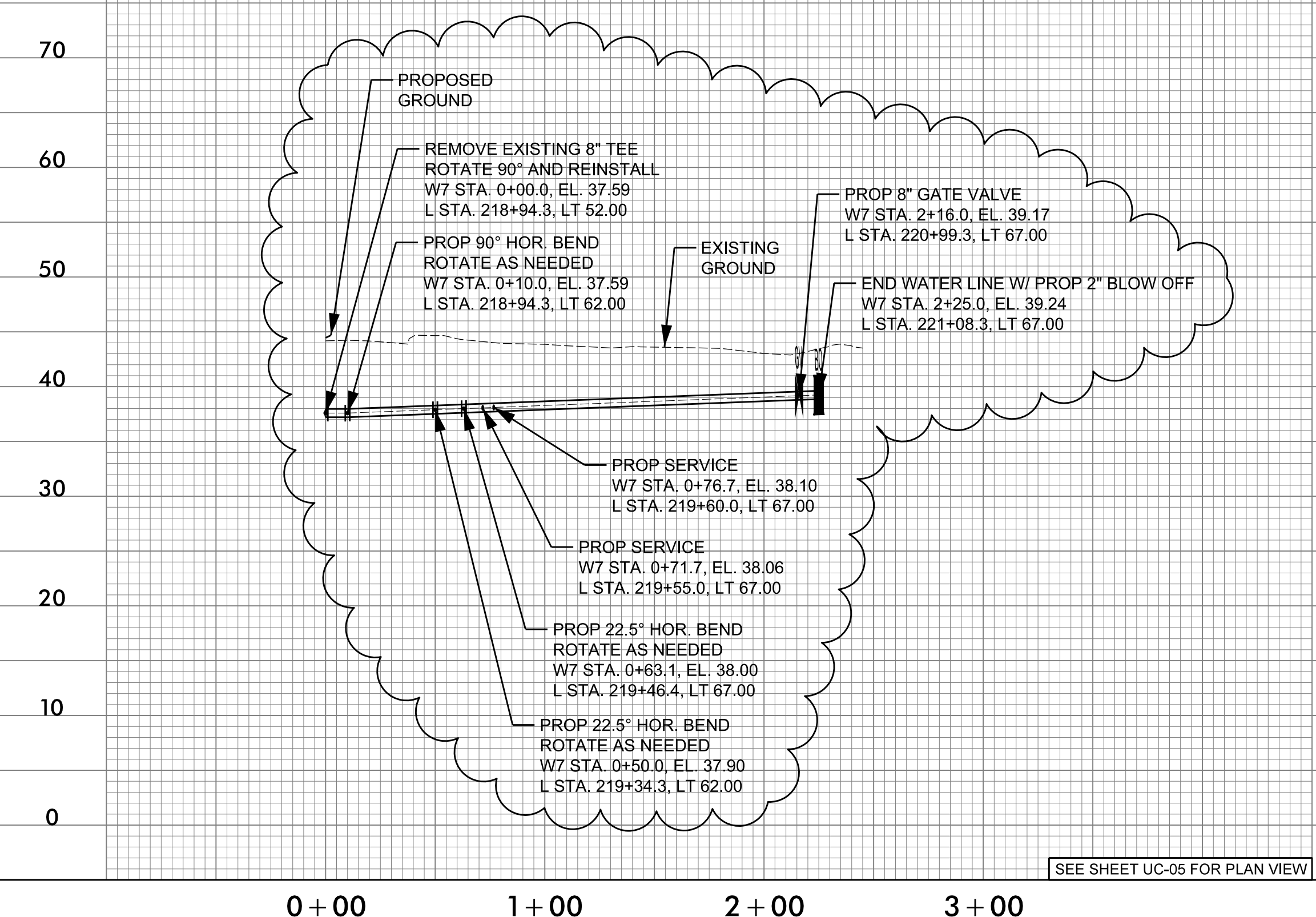
SEE SHEET UC-06 FOR PLAN VIEW

5/28/19

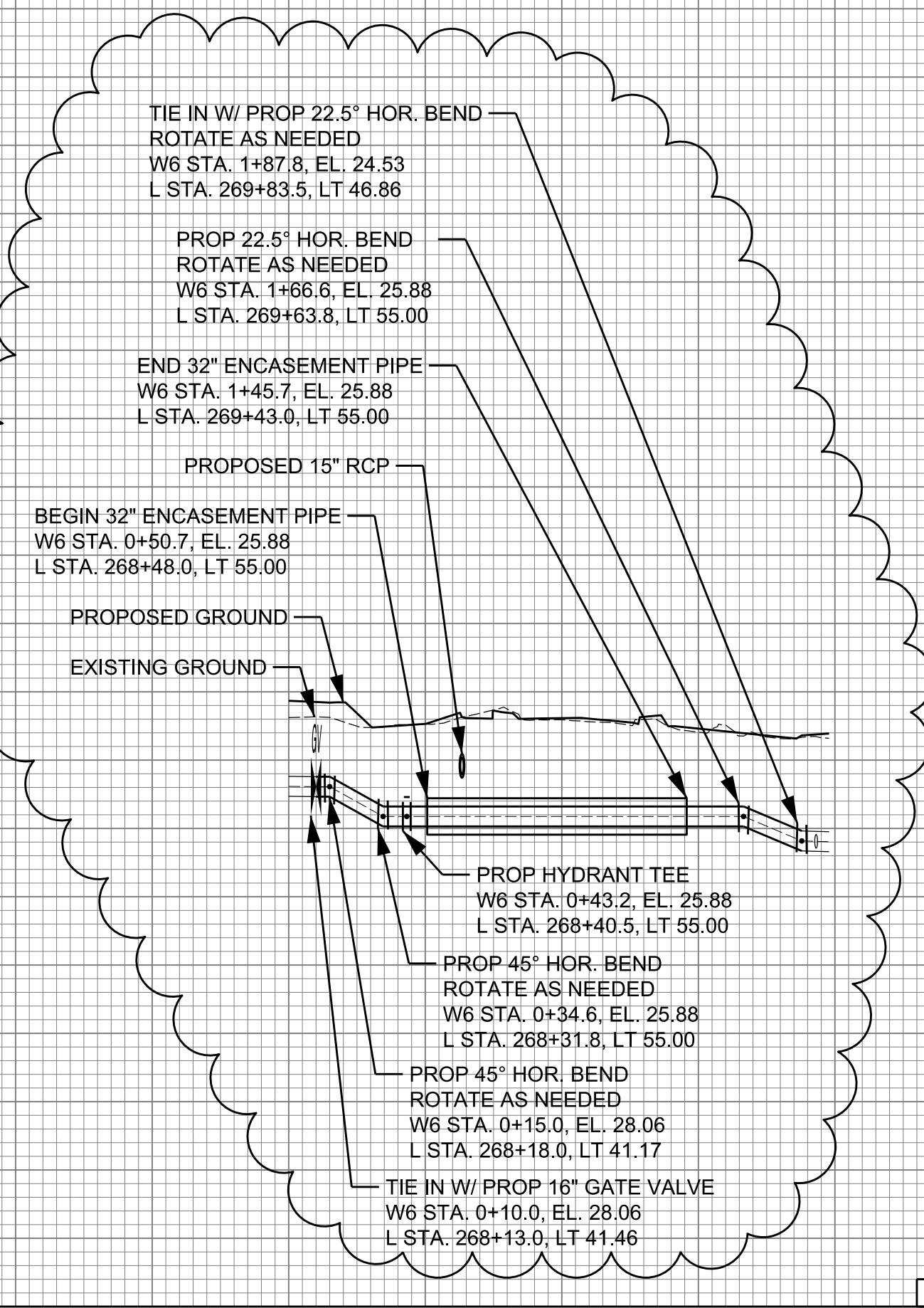
REVISIONS
09.27.2019 - AS PER CAPE FEAR PUBLIC UTILITY AUTHORITY COMMENTS DATED 05.17.2019, 07.30.2019, 08.19.2019.

8" WATER MAIN - W7 -

16" WATER MAIN - W6 -



70	70
60	60
50	50
40	40
30	30
20	20
10	10
0	0



PROJECT REFERENCE NO.	U-4902D	SHEET NO.	UC-14
DESIGNED BY:	SHF		
DRAWN BY:	SHF		
CHECKED BY:	KCZ		
APPROVED BY:	KCZ		
REVISED:	SHF	NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	
UTILITY CONSTRUCTION PLANS ONLY			

M A Engineering Consultants, Inc.

598 East Chatham Street - Suite 137
Cary, NC 27511
Phone: 919.297.0220 Fax: 919.297.0221
NC License: F-0160

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES ARE COMPLETED

GENERAL NOTES:
APPLIES TO ALL PROFILES

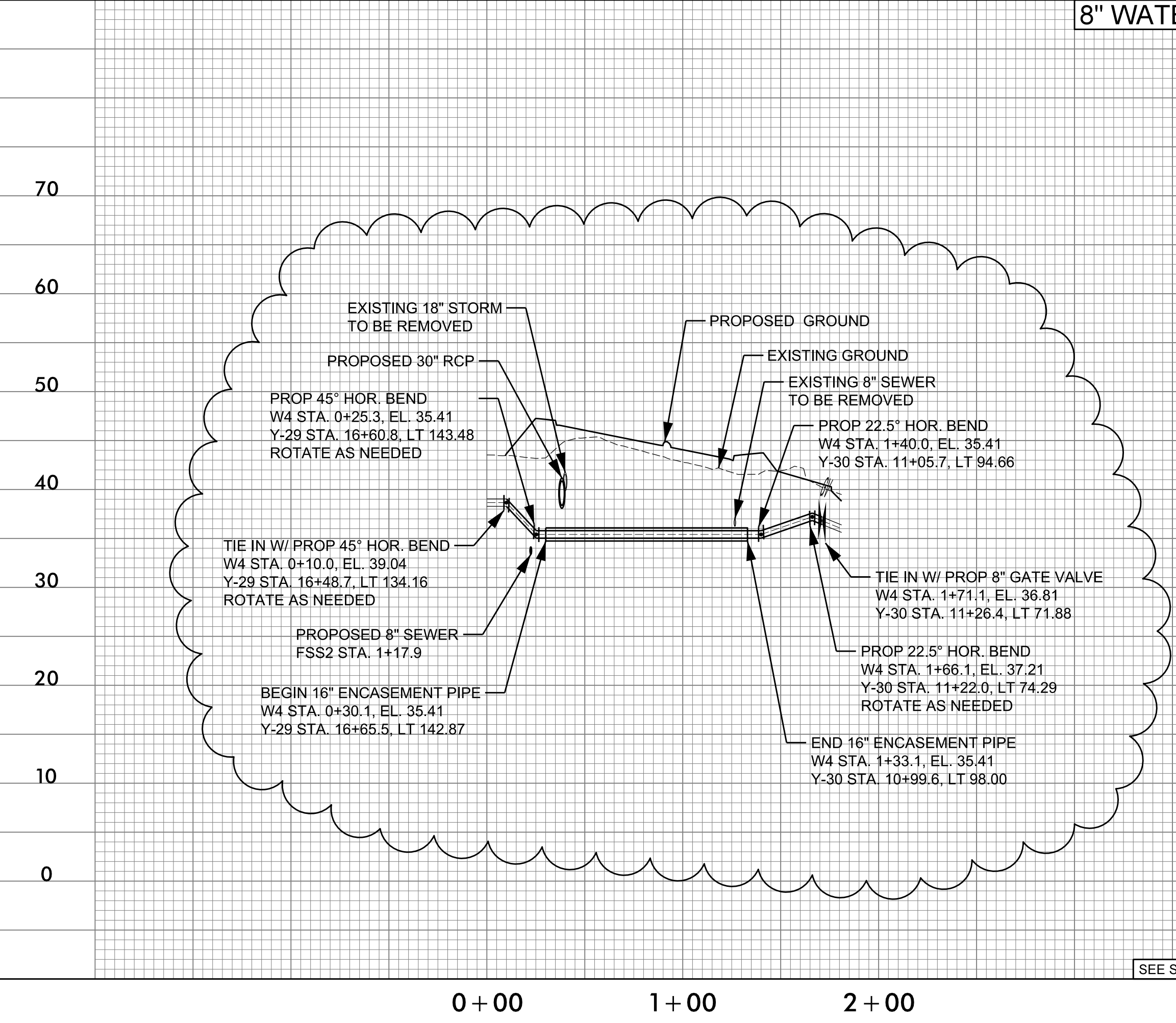
- EXISTING PIPE AT TIE-IN LOCATIONS ARE ESTIMATED BASED ON TEST HOLE INFORMATION PROVIDED BY OTHERS. CONTRACTOR SHALL VERIFY PIPE LOCATION BEFORE STARTING WORK.
- ALL PROPOSED PIPE ELEVATIONS ARE TO CL OF PIPE.
- CONTRACTOR SHALL VERIFY ELEVATION OF WATER MAIN W7 EXISTING TEE.

PROFILE (HORIZONTAL)

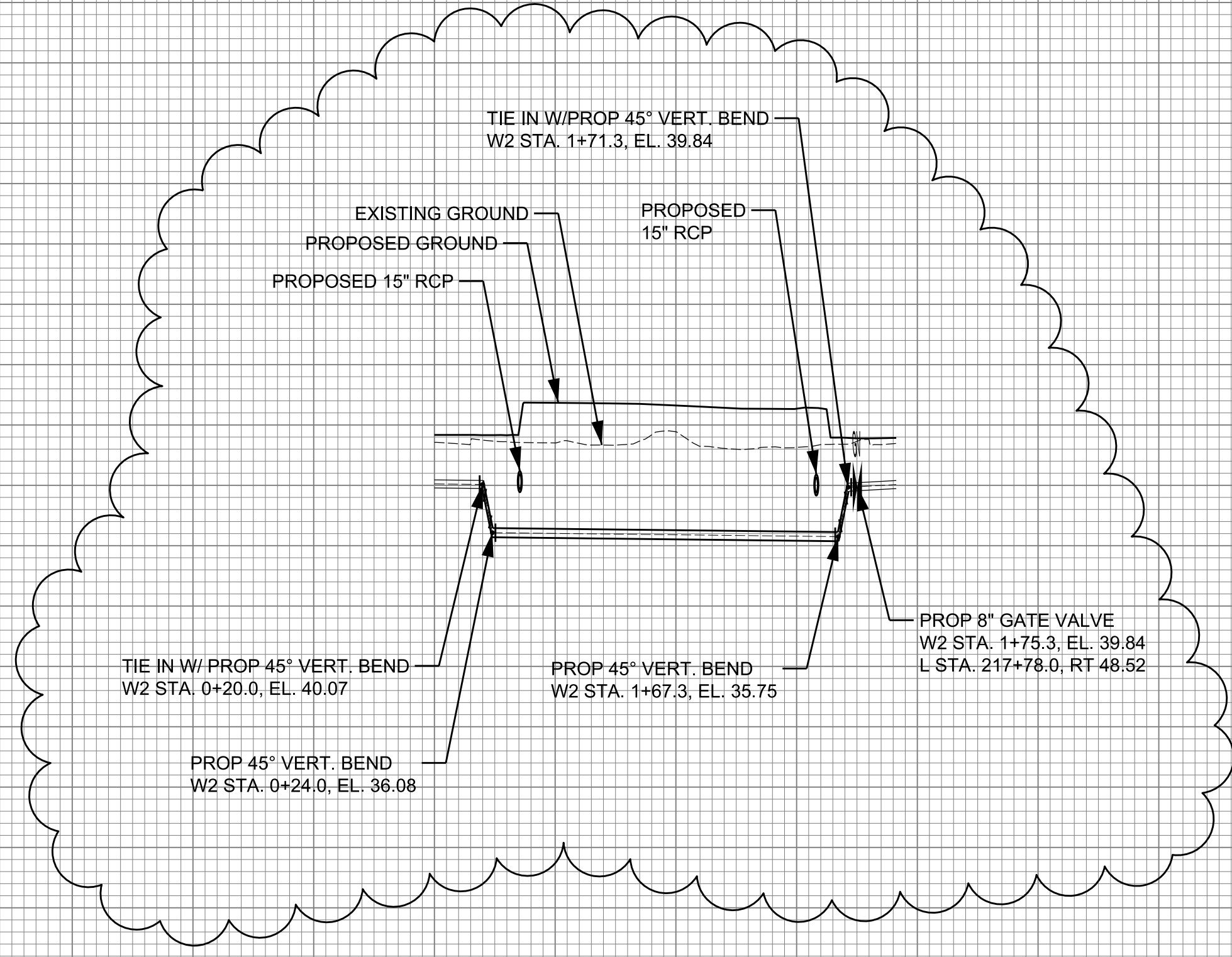
PROFILE (VERTICAL)

8" WATER MAIN - W4 -

8" WATER MAIN - W2 -



70	70
60	60
50	50
40	40
30	30
20	20
10	10
0	0



70	70
60	60
50	50
40	40
30	30
20	20
10	10
0	0

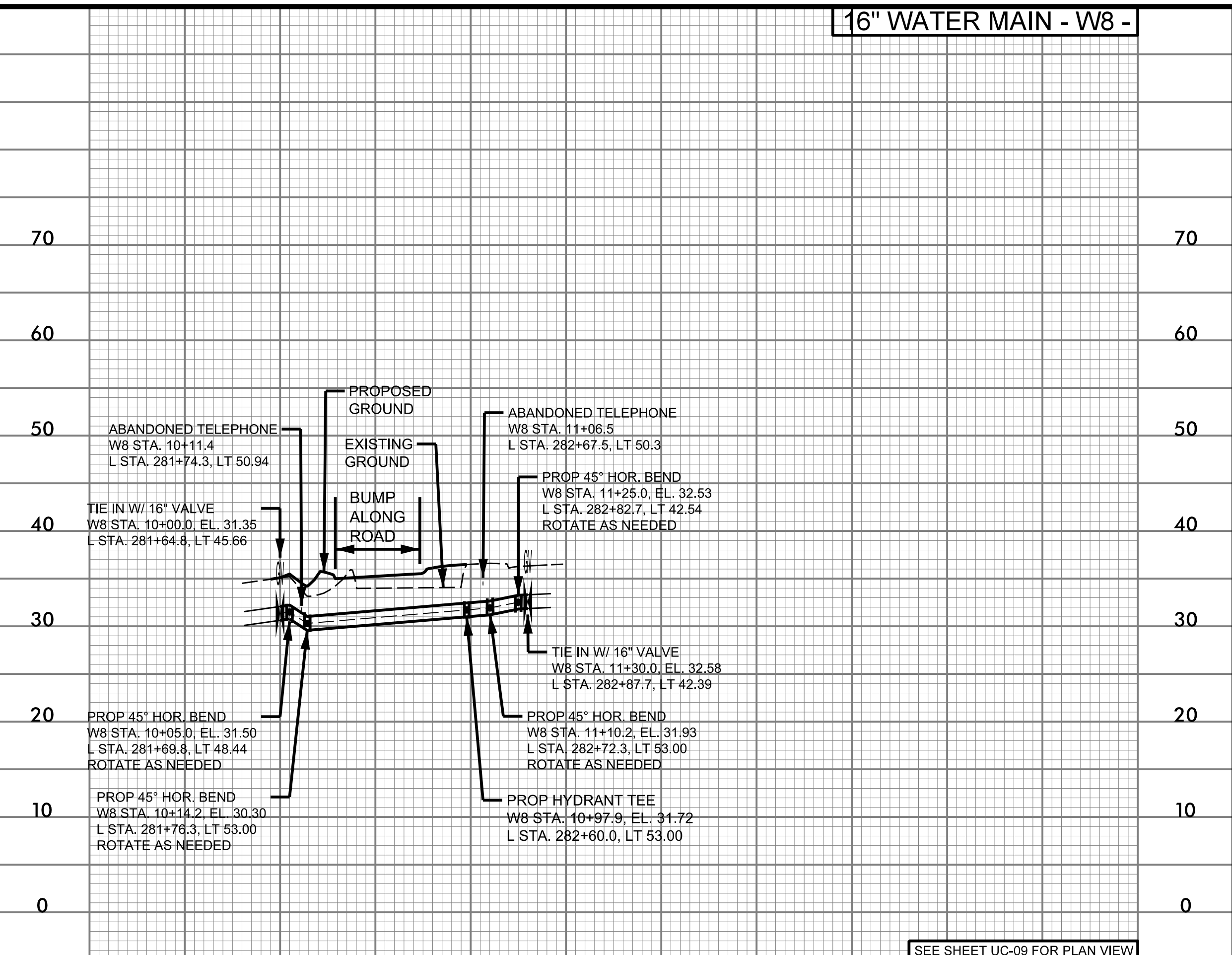
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3/28/19

5/28/19

16" WATER MAIN - W8 -

REVISIONS
 07/21/2020 - BAILEY SHOPPES RTL-CREATE SHEET AND WL 8 PROFILE.

8/6/2020 11:24:05 AM
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SEE SHEET UC-09 FOR PLAN VIEW

PROJECT REFERENCE NO. U-4902D	SHEET NO. UC-14A
DESIGNED BY: KSH	
DRAWN BY: KSH	
CHECKED BY: KCZ	
APPROVED BY: KCZ	
REVISED: -	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	
UTILITY CONSTRUCTION PLANS ONLY	

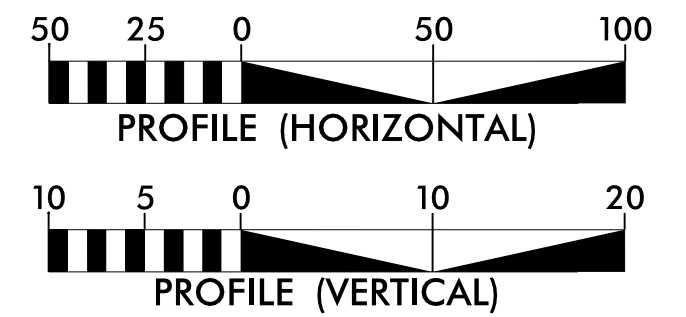
UTILITY CONSTRUCTION

Weston Sampson
 WSE of North Carolina, PC
 598 East Chatham Street Suite 137
 Phone: 919.297.0220

NC License: C-4647
 Cary, NC 27511
 Fax: 919.297.0221

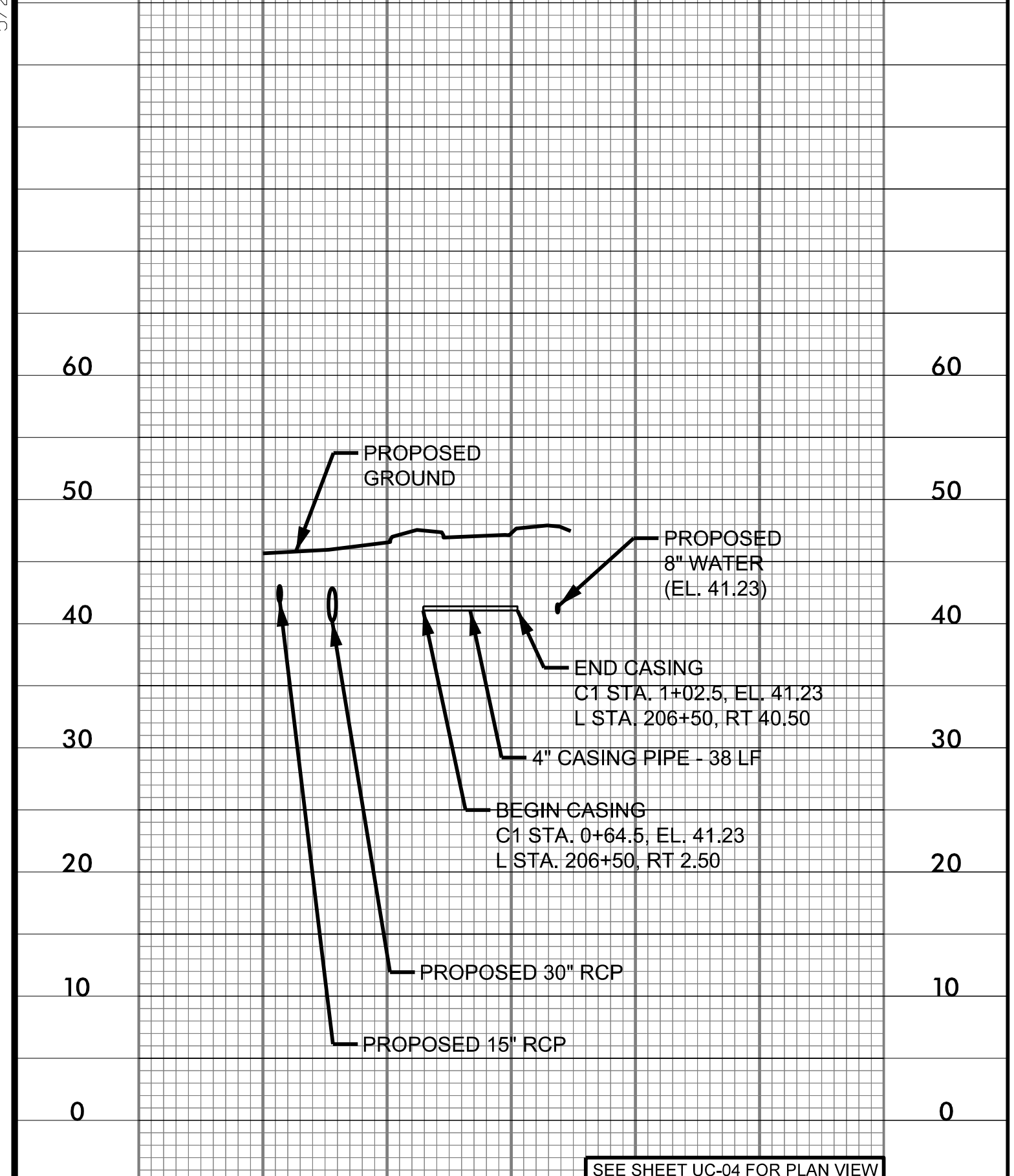
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES ARE COMPLETED

- GENERAL NOTES:**
 APPLIES TO ALL PROFILES:
- EXISTING PIPE AT TIE-IN LOCATIONS ARE ESTIMATED BASED ON TEST HOLE INFORMATION PROVIDED BY OTHERS, OR AN ASSUMED DEPTH OF COVER OF 3 FEET. CONTRACTOR SHALL VERIFY PIPE LOCATION BEFORE STARTING WORK.
 - ALL PROPOSED PIPE ELEVATIONS ARE TO CL OF PIPE, UNLESS OTHERWISE NOTED.
 - ALL PROPOSED WATER LINE SHALL BE INSTALLED WITH 3 FEET OF COVER MINIMUM FROM FINAL GRADE.

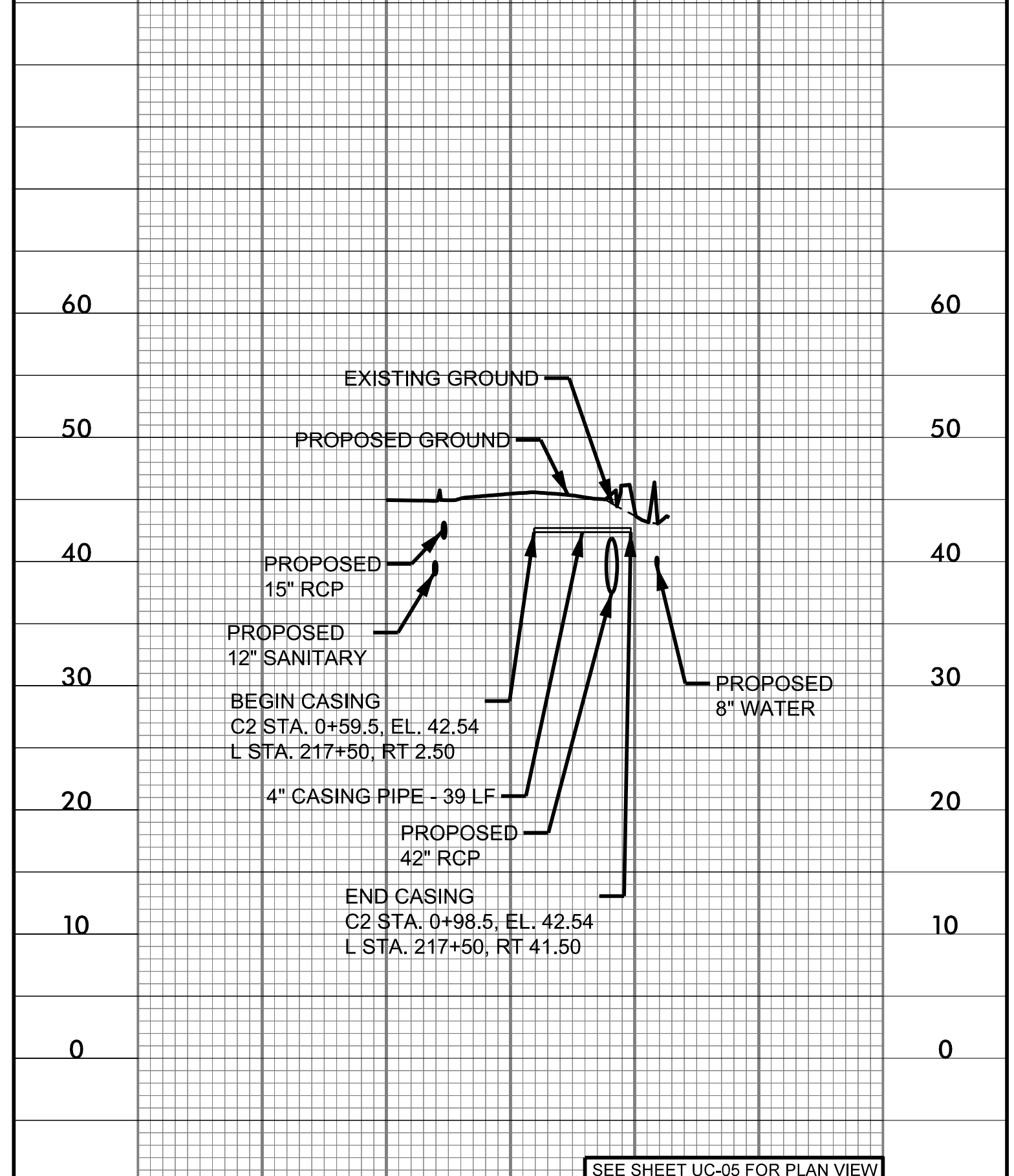


5/28/2018

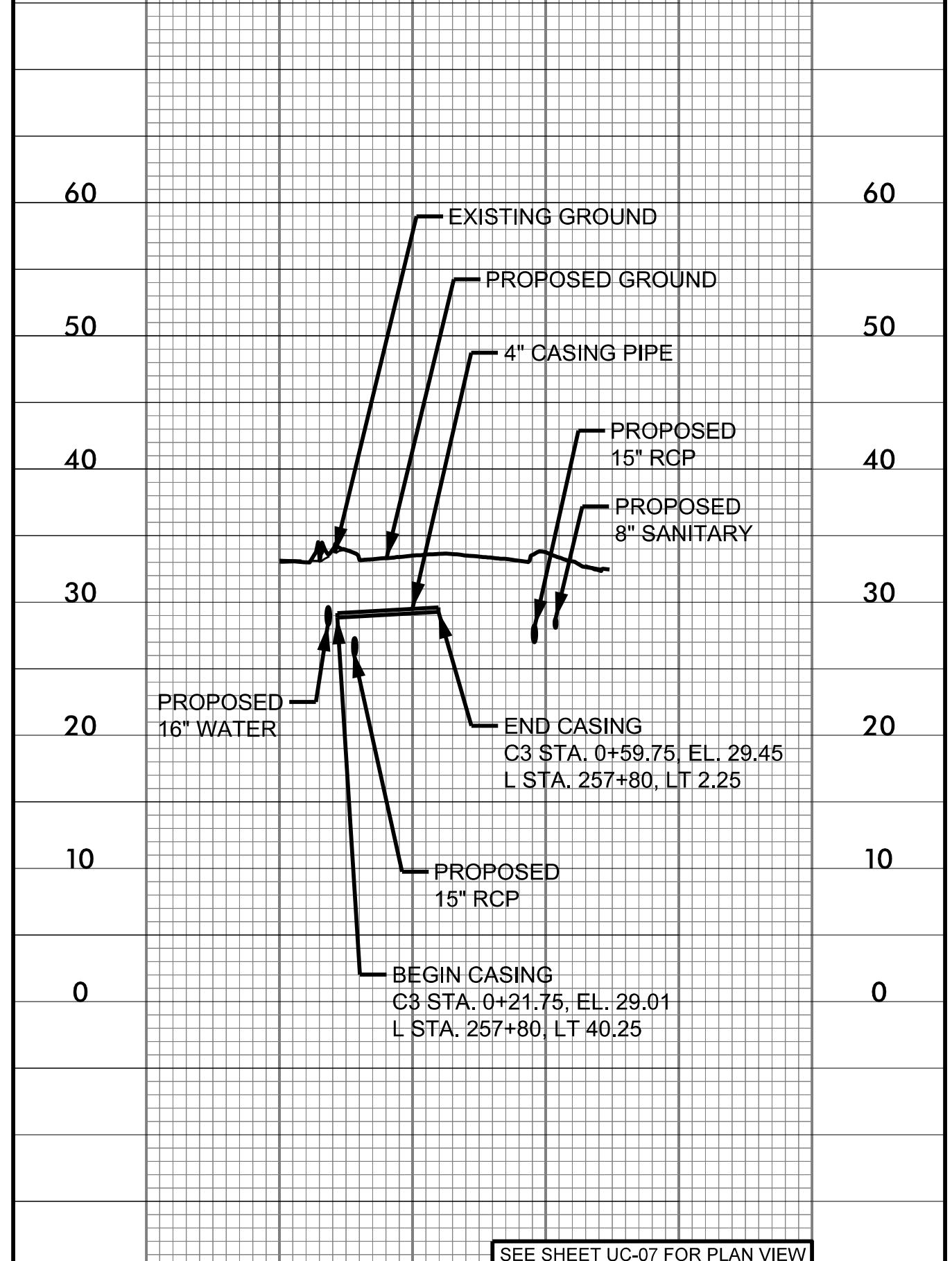
4" CASING - C1 -



4" CASING - C2 -



4" CASING - C3 -



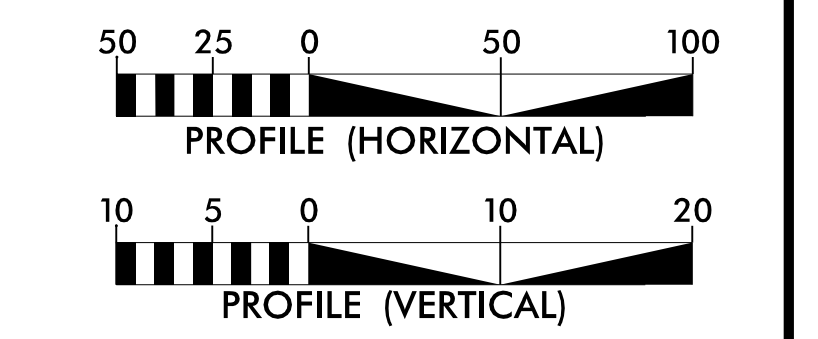
PROJECT REFERENCE NO. U-4902D	SHEET NO. UC-15
DESIGNED BY: SHF	
DRAWN BY: SHF	
CHECKED BY: KCZ	
APPROVED BY: KCZ	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	
UTILITY CONSTRUCTION PLANS ONLY	

UTILITY CONSTRUCTION

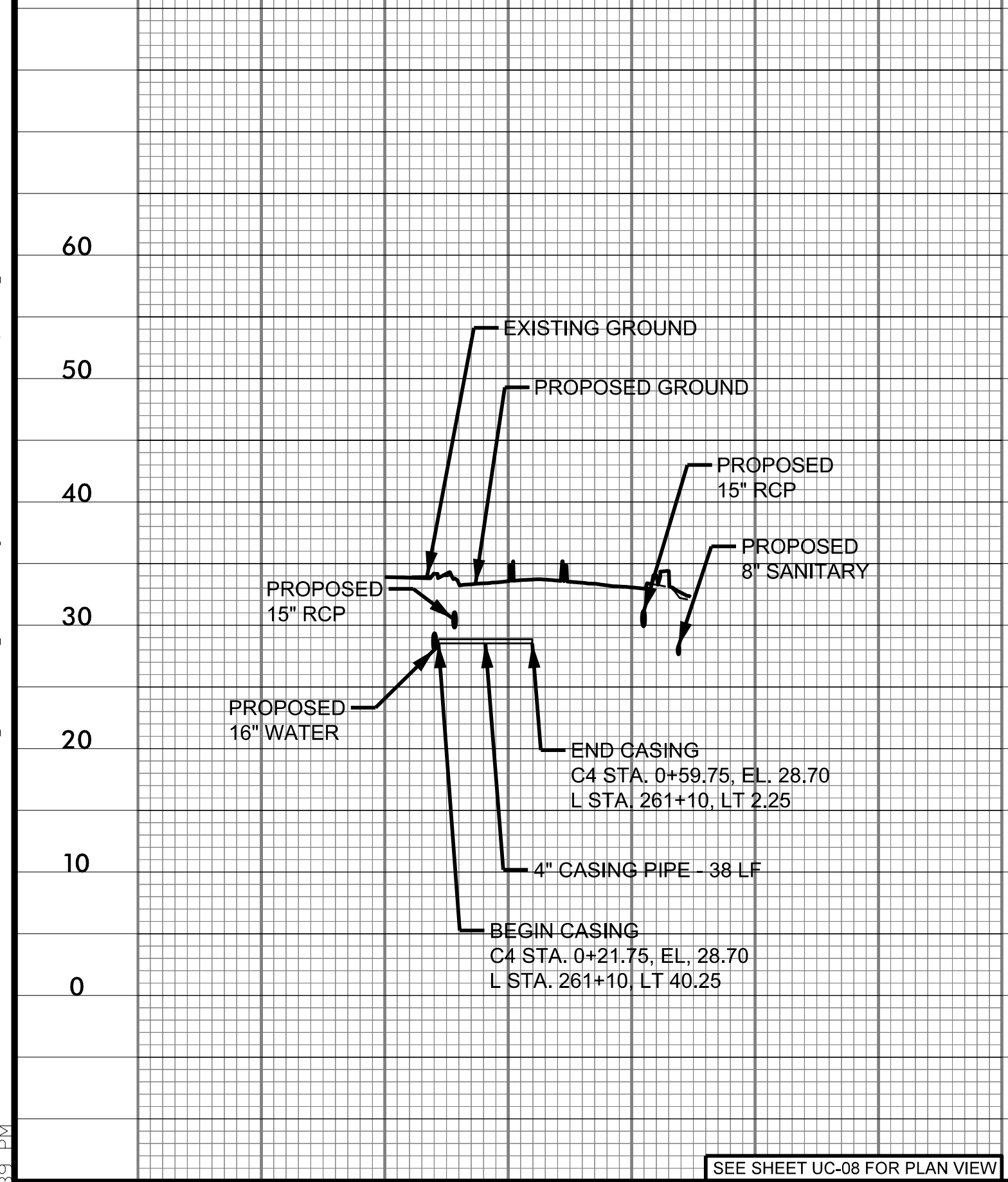
M A Engineering Consultants, Inc.
 598 East Chatham Street Suite 137 Cary, NC 27511
 Phone: 919.297.0220 Fax: 919.297.0221
 NC License: F-0160

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES ARE COMPLETED

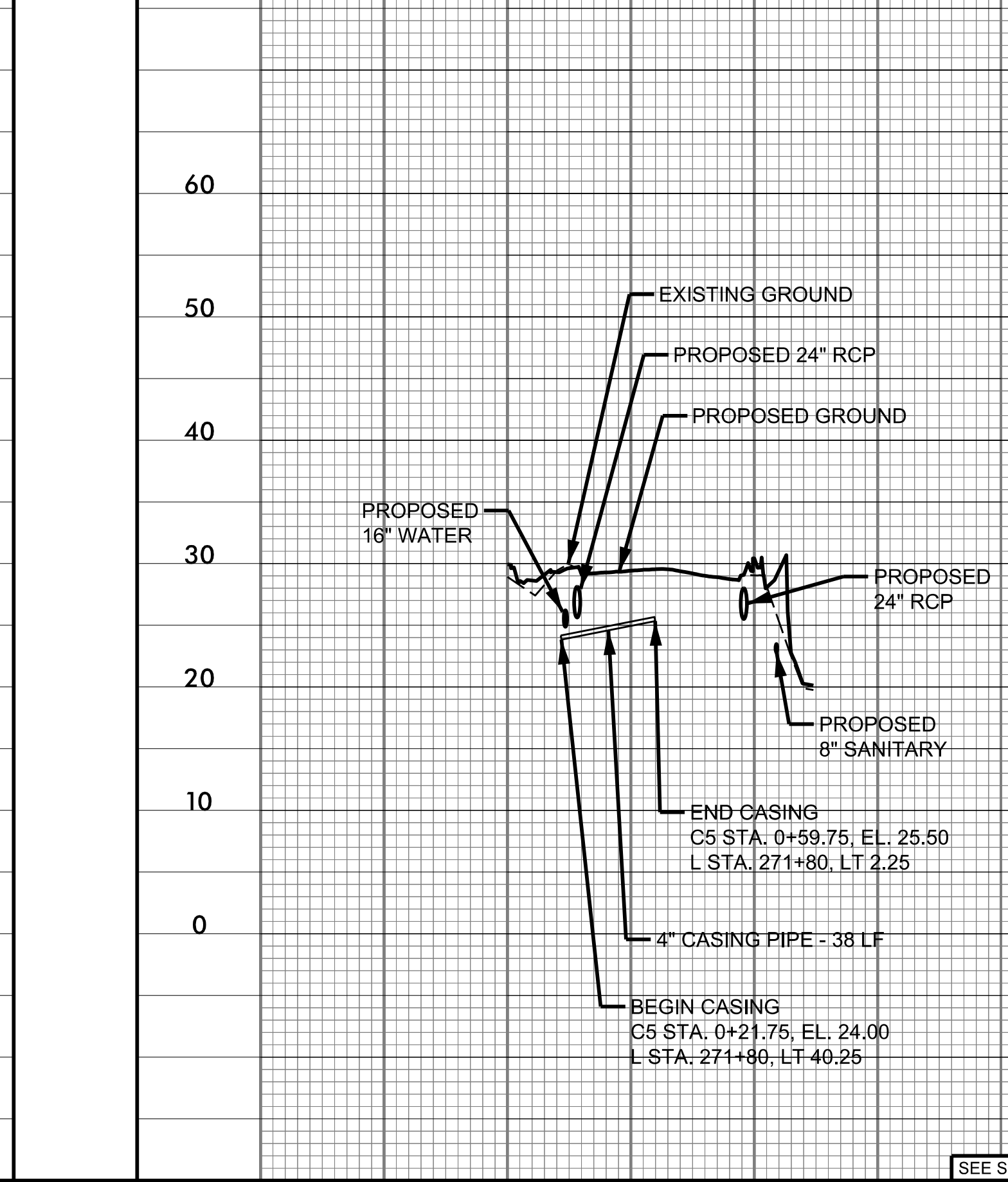
- GENERAL NOTES:**
 (APPLIES TO ALL PROFILES)
 1. EXISTING PIPE AT TIE-IN LOCATIONS ARE ESTIMATED BASED ON TEST HOLE INFORMATION PROVIDED BY OTHERS. CONTRACTOR SHALL VERIFY PIPE LOCATION BEFORE STARTING WORK.
 2. ALL PROPOSED PIPE ELEVATIONS ARE TO CL OF PIPE.



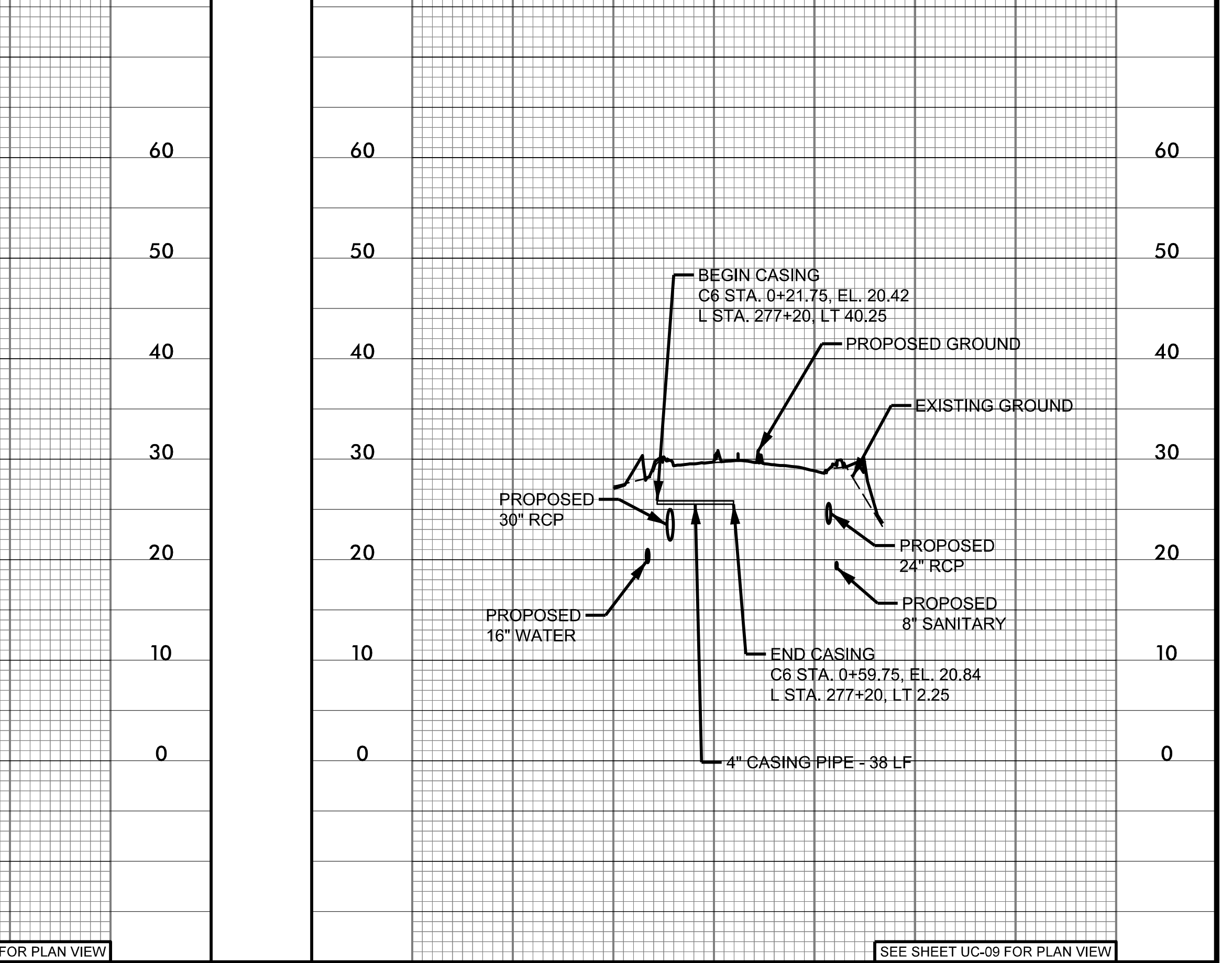
4" CASING - C4 -



4" CASING - C5 -



4" CASING - C6 -



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