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9/8/2021 UC-Pr-o\N5021.Lt.-notes_UC59...psh.dgn

UTILITY CONSTRUCTION

NOTES PERTAIN TO SOUTH EAST BRUNSWICK SANITARY DISTRICT AND CITY OF SOUTHPORT

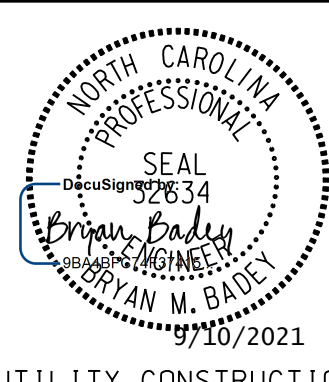
GENERAL NOTES:

1. THE PROPOSED UTILITY CONSTRUCTION SHALL MEET THE APPLICABLE REQUIREMENTS OF THE NC DEPARTMENT OF TRANSPORTATION'S "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" DATED JANUARY 2018.
2. THE EXISTING UTILITIES BELONG TO SOUTHEAST BRUNSWICK SANITARY DISTRICT AND THE CITY OF SOUTHPORT.
3. ALL WATER LINES TO BE INSTALLED WITHIN COMPLIANCE OF THE RULES AND REGULATIONS OF THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL QUALITY, DIVISION OF WATER RESOURCES, PUBLIC WATER SUPPLY SECTION. ALL SEWER LINES TO BE INSTALLED WITHIN COMPLIANCE OF THE RULES AND REGULATIONS OF THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENT QUALITY, DIVISION OF WATER RESOURCES, WATER QUALITY SECTION. PERFORM ALL WORK IN ACCORDANCE WITH THE APPLICABLE PLUMBING CODES.
4. THE UTILITY OWNER OWNS THE EXISTING UTILITY FACILITIES AND WILL OWN THE NEW UTILITY FACILITIES AFTER ACCEPTANCE BY THE DEPARTMENT. THE DEPARTMENT OWNS THE CONSTRUCTION CONTRACT AND HAS ADMINISTRATIVE AUTHORITY. COMMUNICATIONS AND DECISIONS BETWEEN THE CONTRACTOR AND UTILITY OWNER ARE NOT BINDING UPON THE DEPARTMENT OR THIS CONTRACT UNLESS AUTHORIZED BY THE ENGINEER. AGREEMENTS BETWEEN THE UTILITY OWNER AND CONTRACTOR FOR THE WORK THAT IS NOT PART OF THIS CONTRACT OR IS SECONDARY TO THIS CONTRACT ARE ALLOWED, BUT ARE NOT BINDING UPON THE DEPARTMENT.
5. PROVIDE ACCESS FOR THE DEPARTMENT PERSONNEL AND THE OWNER'S REPRESENTATIVES TO ALL PHASES OF CONSTRUCTION. NOTIFY DEPARTMENT PERSONNEL AND THE UTILITY OWNER TWO WEEKS PRIOR TO COMMENCEMENT OF ANY WORK AND ONE WEEK PRIOR TO SERVICE INTERRUPTION. KEEP UTILITY OWNERS' REPRESENTATIVES INFORMED OF WORK PROGRESS AND PROVIDE OPPORTUNITY, IF REQUESTED BY OWNER, 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'S ATTENTION IS DIRECTED TO SECTIONS 102, 107, AND 1550 OF THE STANDARD SPECIFICATIONS CONCERNING TRENCHLESS INSTALLATION. IT IS CONTRACTOR'S RESPONSIBILITY TO HAVE BORE DESIGNED AND SEALED BY A LICENSED NORTH CAROLINA PROFESSIONAL ENGINEER. NO DAMAGE IS ALLOWED TO RIVER, WETLANDS, OR BUFFER ZONES.
11. CONTRACTOR RESPONSIBLE FOR RE-CONNECTION OF ALL EXISTING SERVICES WHETHER SHOWN OR NOT, AND WHETHER ACTIVE OR NOT UNLESS OTHERWISE NOTED ON PLAN.

12. ALL SANITARY SEWER DUCTILE IRON PIPE SHALL BE PROTECTO 401 LINED AND REPAIRED AT CUT PIPE LOCATIONS TO ENSURE NO UNLINED PIPE OR FITTING IS EXPOSED TO SEWER FLOW.
13. CONTRACTOR SHALL FACILITATE ALL TEMPORARY TIE -INS FOR BOTH WATER AND SEWER RELOCATIONS. CONTRACTOR SHALL COORDINATE WTH UTILITY OWNER TO CONFORM TO OWNER REGULATIONS TO MAINTAIN SERVICE AND MINIMIZE SHUTDOWN TIMES.

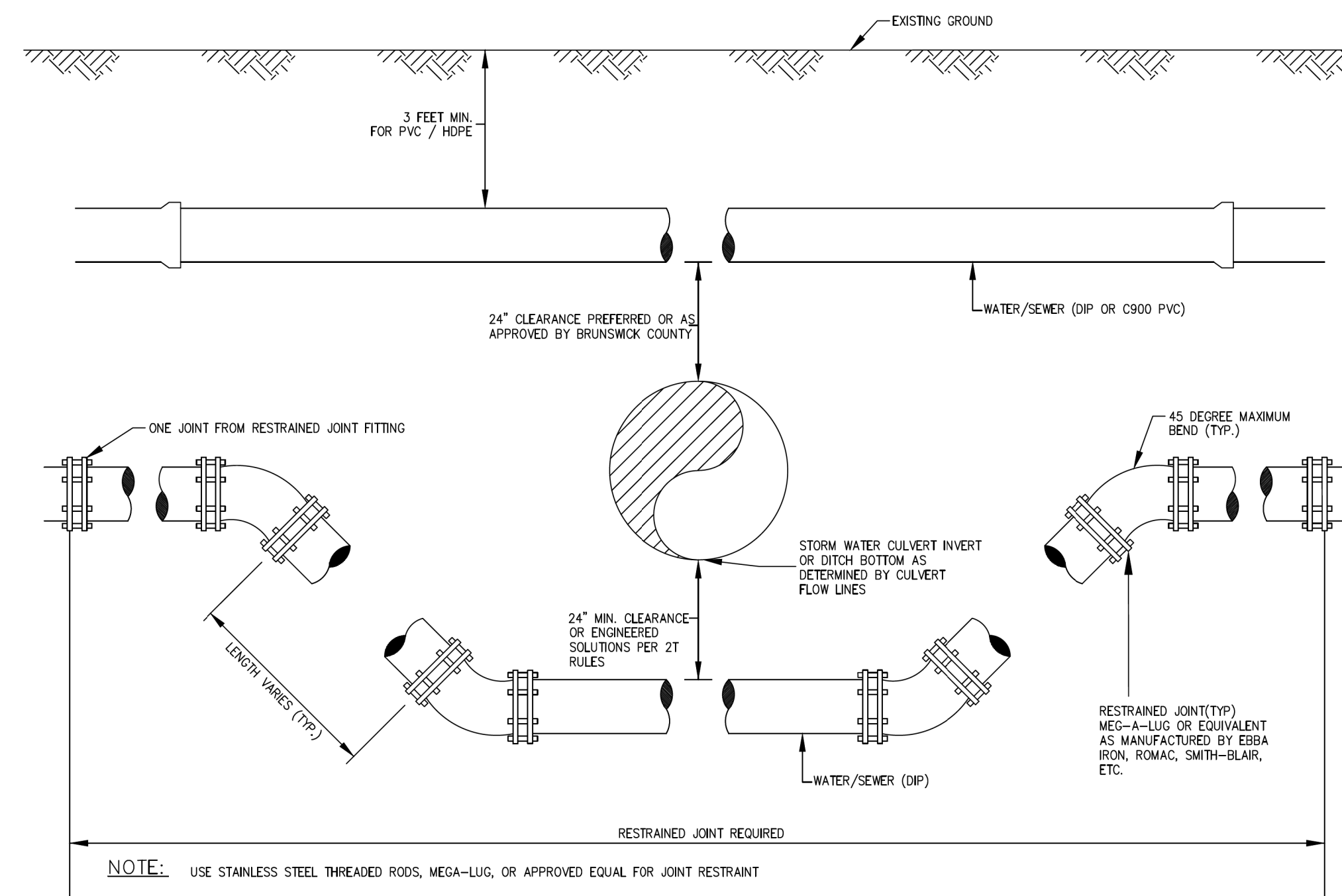
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PROJECT REFERENCE NO.	SHEET NO.
R-5021	UC-59
DESIGNED BY: MEP	
DRAWN BY: MEP	
CHECKED BY: BMB	
APPROVED BY: BMB	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	
UTILITY CONSTRUCTION PLANS ONLY	

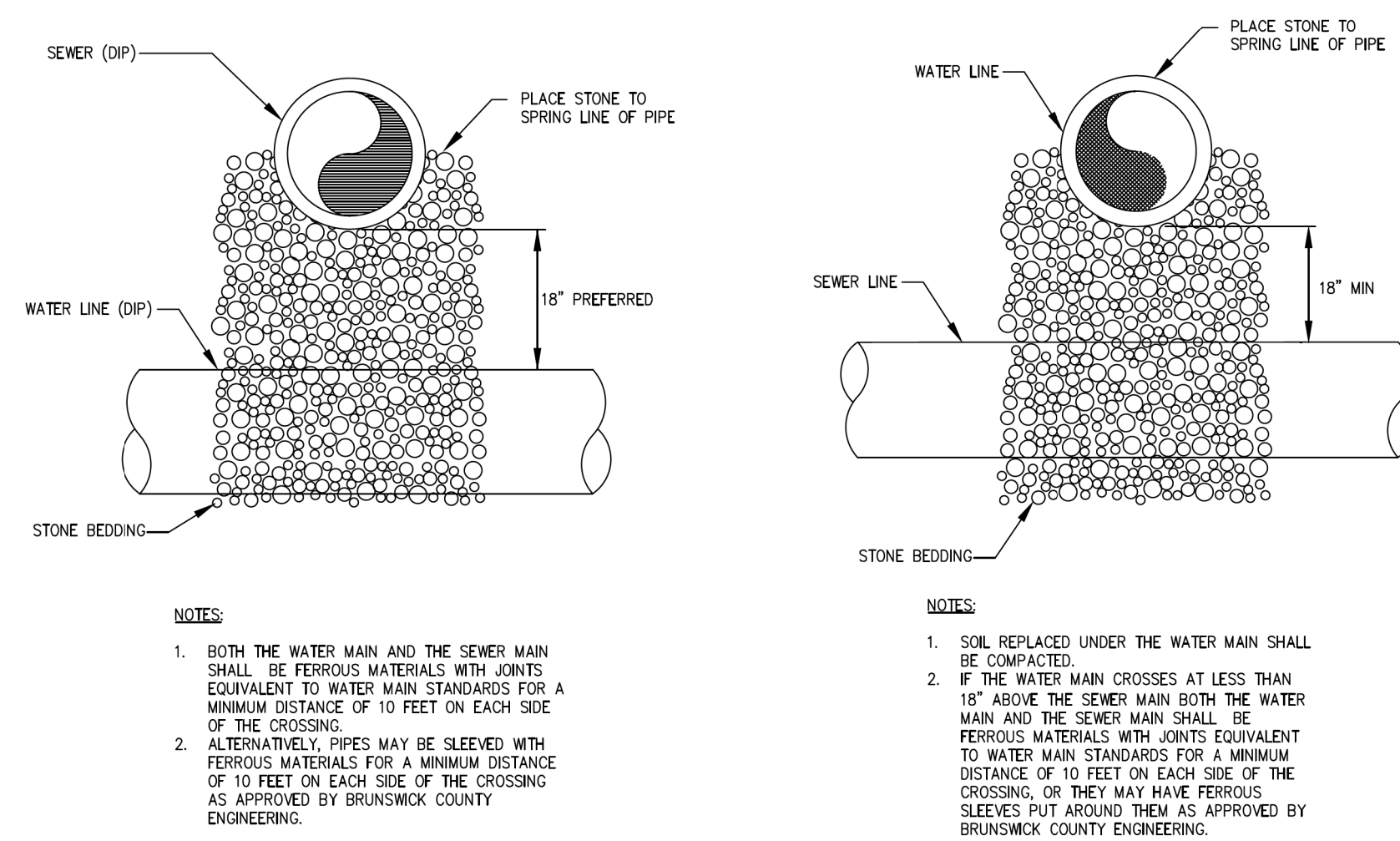
UTILITY CONSTRUCTION

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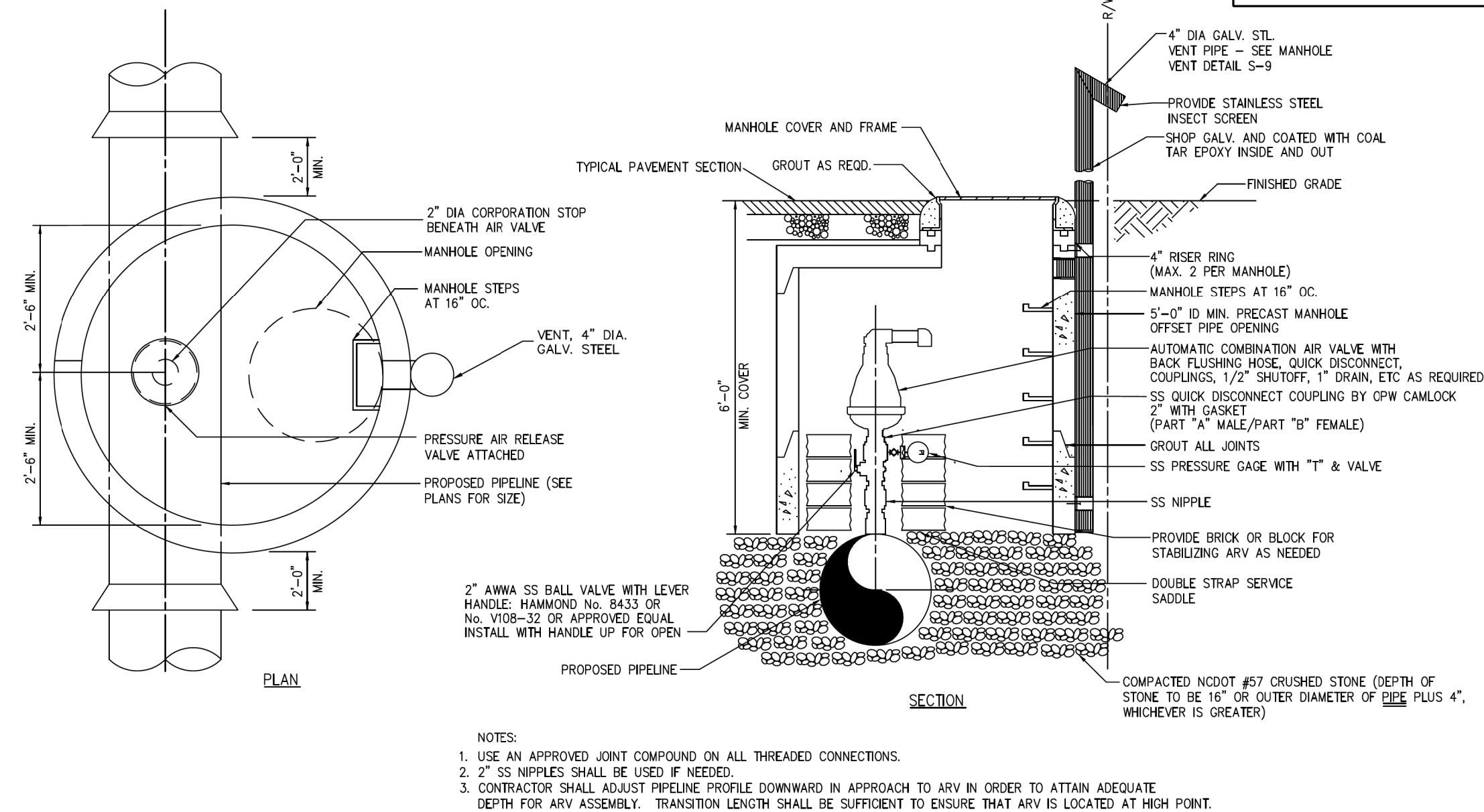
DITCH AND/OR STORM DRAIN CROSSING
OFFSETS BETWEEN WATER/SEWER
PRESSURE MAIN AND STORM DRAIN
DETAIL WS-1



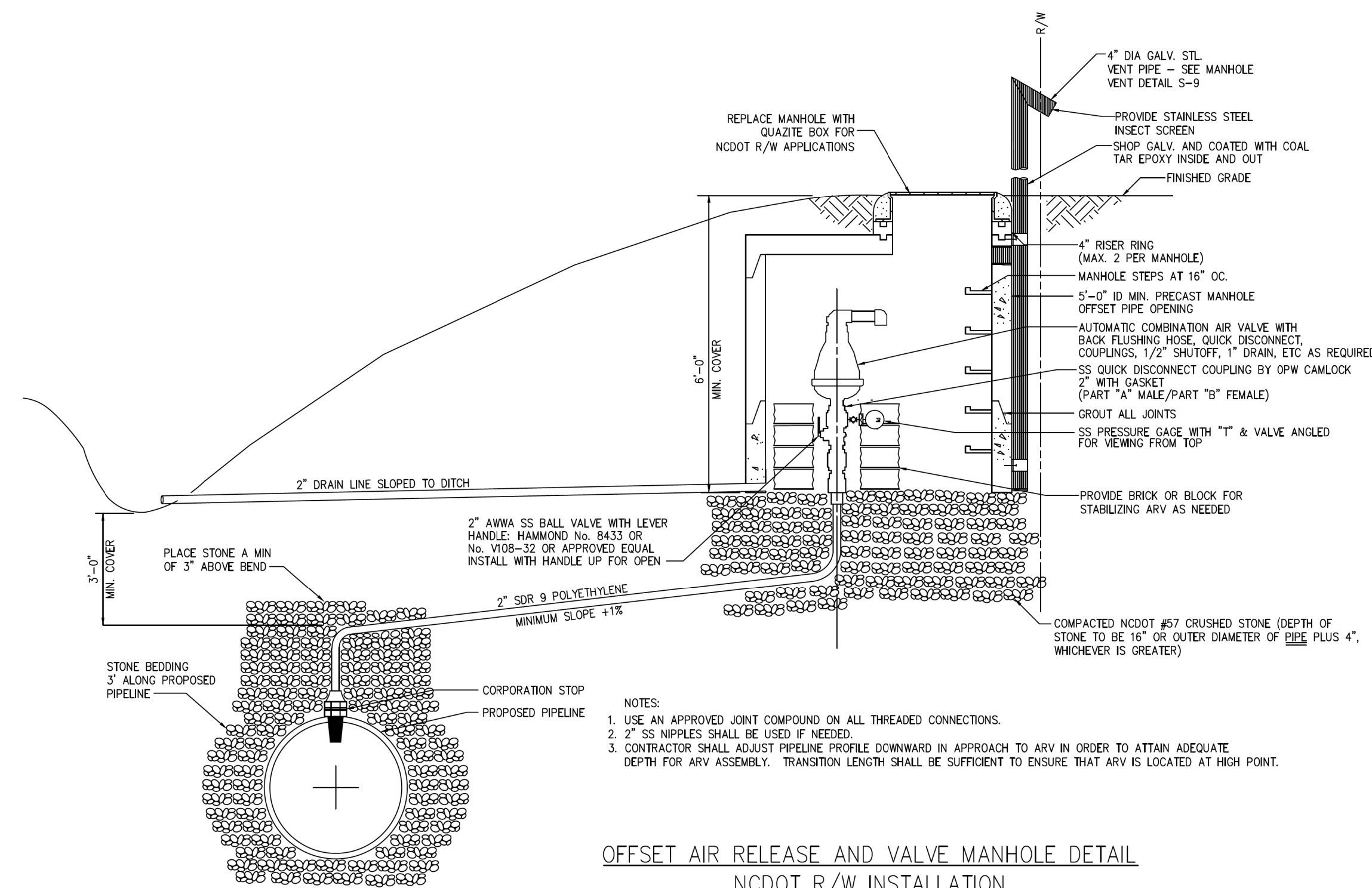
SEWER CROSSING ABOVE WATER LINE

SEWER CROSSING BELOW WATER LINE

SEWER OFFSETS ABOVE AND
BELOW WATER MAINS



STANDARD MANHOLE AND AIR RELEASE VALVE
NON-NCDOT R/W
DETAIL WS-2



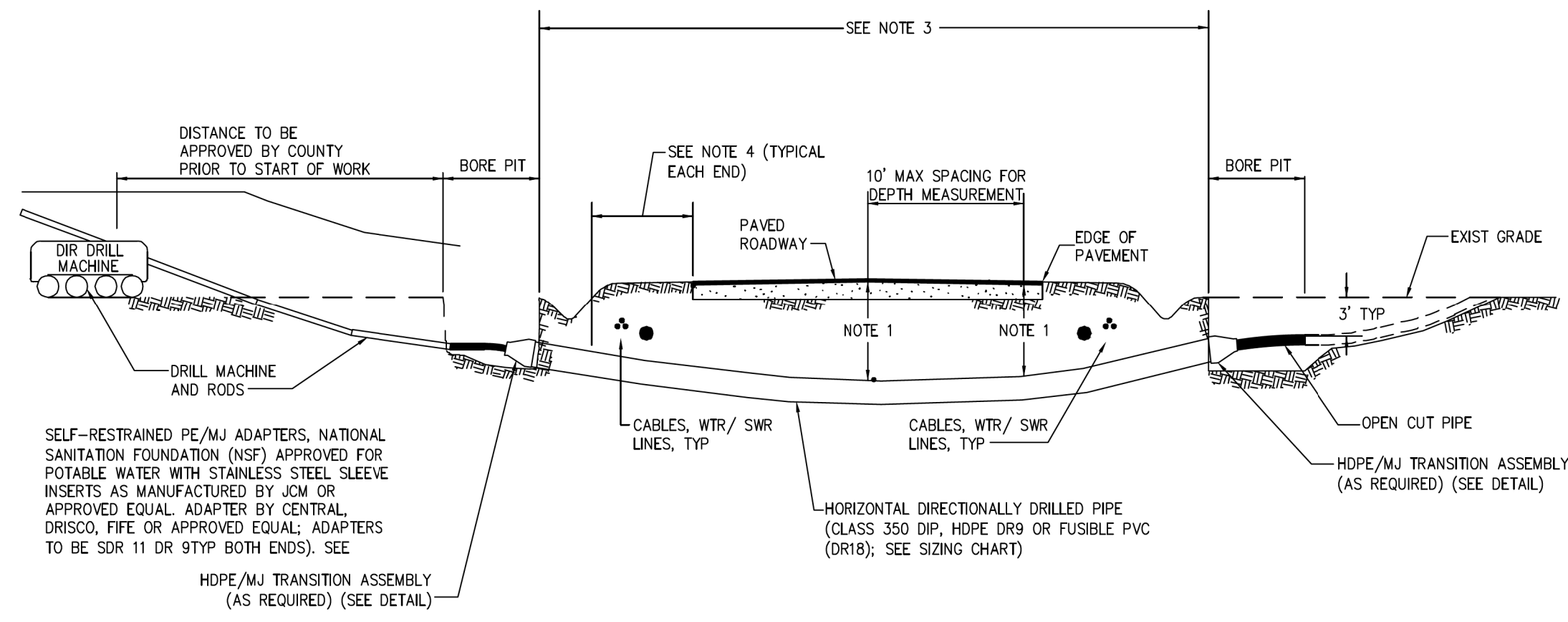
OFFSET AIR RELEASE AND VALVE MANHOLE DETAIL
NCDOT R/W INSTALLATION
DETAIL WS-3

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Utilities\Eng\Bryan M. Bailey



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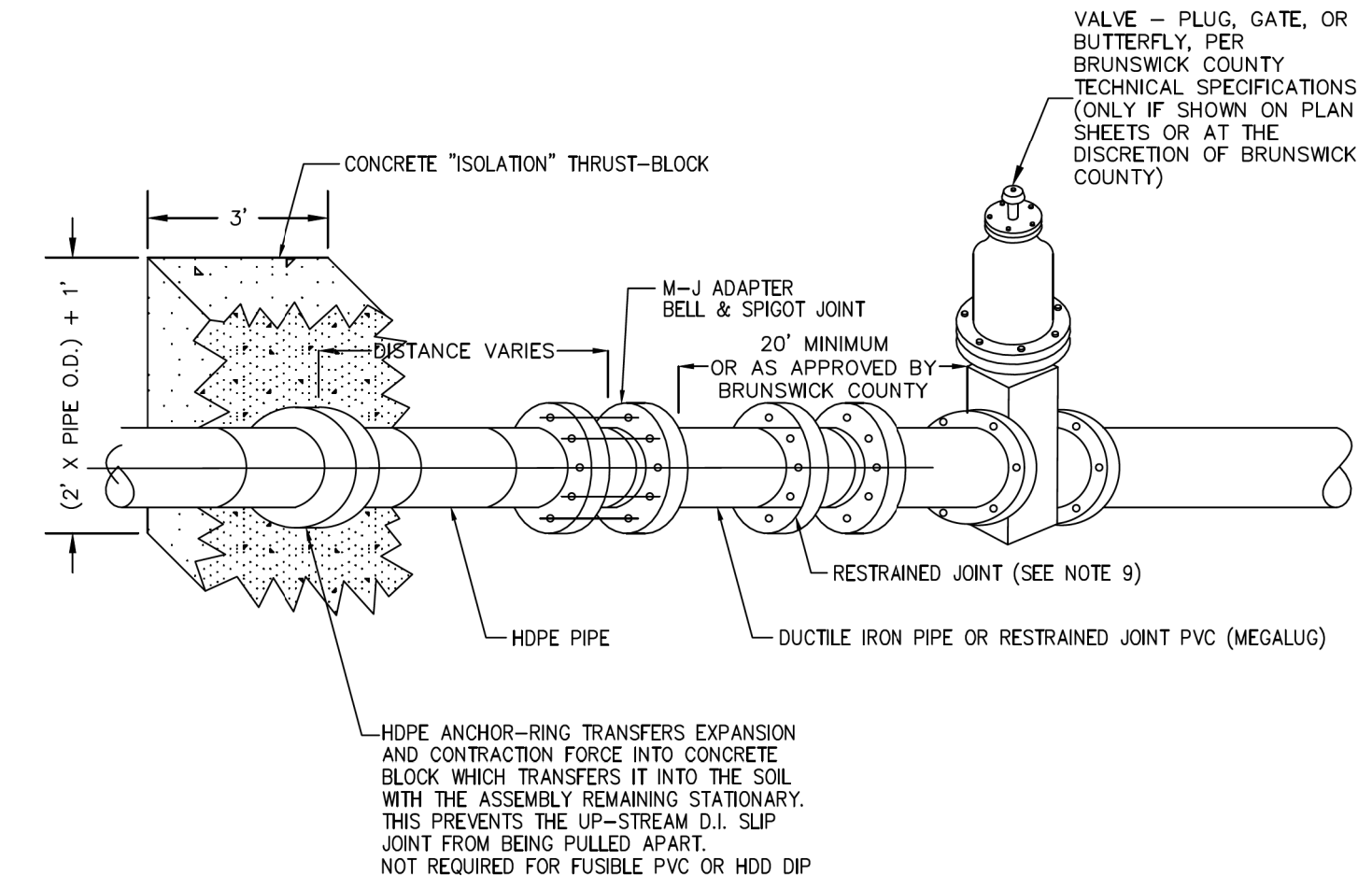
HDPE DIAMETER CONVERSION TABLE

NOMINAL OPEN CUT PIPE SIZE (INCHES)	NOMINAL HDPE DR9 HD PIPE SIZE (INCHES)
3	3
4	6
6	8
8	10
10	12
12	16
14	18
16	20
18	24
20	24
24	30
30	36

- NOTES:
- AN AS-BUILT PLAN AND PROFILE SHALL BE PROVIDED FROM ENTRY TO EXIT FOR EACH DIRECTIONAL BORE SECTION BY THE DIRECTIONAL BORE CONTRACTOR. THIS SHALL INCLUDE ACCURATE HORIZONTAL AND VERTICAL DIMENSIONS AND SHALL MEET OR EXCEED NCDOT VERTICAL REQUIREMENTS FROM HD PIPE TO EDGE OF PAVEMENT.
 - ALL BORE SECTIONS SHALL BE HYDROSTATICALLY TESTED PER COUNTY STANDARDS AFTER INSTALLATION, AND PRIOR TO CONNECTION TO THE OPEN CUT WATER/SEWER LINE. A FINAL TEST WILL BE A PART OF THE TOTAL MAIN LINE SYSTEM TEST.
 - LENGTH OF CROSSING, LOCATION OF INSPECTION/OBSERVATION EXCAVATION, NUMBER OF HD PIPE JOINTS, LOCATION OF DRILL MACHINE, AUGER ENTRANCE LOCATION AND TIE-IN POINTS ARE TO BE APPROVED BY COUNTY PRIOR TO ANY START OF WORK.
 - ON CONVENTIONAL HIGHWAYS, AS A MINIMUM, THE HD PIPE SHALL EXTEND TO THE SHOULDER BREAK OR 10 FEET BEYOND THE EDGE OF PAVEMENT ON FULL SLOPES, WHICHEVER IS GREATER; 3 FEET BEYOND THE DITCH LINE IN CUTS; AND ON CURBED SECTIONS TO THE BACK OF THE SIDEWALK AREA. ON FREEWAYS, EXPRESSWAYS, AND OTHER CONTROLLED ACCESS HIGHWAYS, THE HD PIPE WILL BE REQUIRED TO EXTEND TO THE ACCESS CONTROL LINES, TO THE OUTSIDE OF FRONTAGE ROADS, OR A SUFFICIENT DISTANCE TO ALLOW FOR FUTURE HIGHWAY IMPROVEMENTS, OR AS REQUIRED BY THE NCDOT ENCROACHMENT AGREEMENT.
 - THE BORE DEVELOPED FOR THE DIRECTIONALLY DRILLED PIPE SHALL BE KEPT AT A MINIMUM DIAMETER FOR THE PIPE INSTALLATION. THE AUGER HEAD SIZE SHALL BE APPROVED BY THE COUNTY PRIOR TO THE START OF WORK.
 - HORIZONTAL DIRECTIONAL DRILL OF NCDOT STATE ROADS TO BE APPROVED BY NCDOT PRIOR TO CONSTRUCTION. PIPE MATERIAL AND THICKNESS MAY VARY.
 - THE CONTRACTOR SHALL ALLOW SUFFICIENT LENGTHS OF PIPE TO EXTEND PAST THE TERMINATION POINT TO ALLOW FOR CONTRACTION. PULLED HD PIPE SHALL BE ALLOWED TO RELAX 7 DAYS OR THE AMOUNT OF TIME RECOMMENDED BY THE MANUFACTURER PRIOR TO MAKING CONNECTIONS.
 - FUSIBLE PVC HAS BEEN APPROVED FOR USE WITHIN NCDOT RIGHT-OF-WAYS.
 - MINIMUM OF (3) RESTRAINED JOINTS ARE REQUIRED UPSTREAM AND DOWNSTREAM OF DIP/HDPE/FUSIBLE PVC MJ ADAPTER ON EACH END OF THE HORIZONTAL DIRECTIONALLY DRILLED PIPE UNLESS OTHERWISE APPROVED BY BRUNSWICK COUNTY.

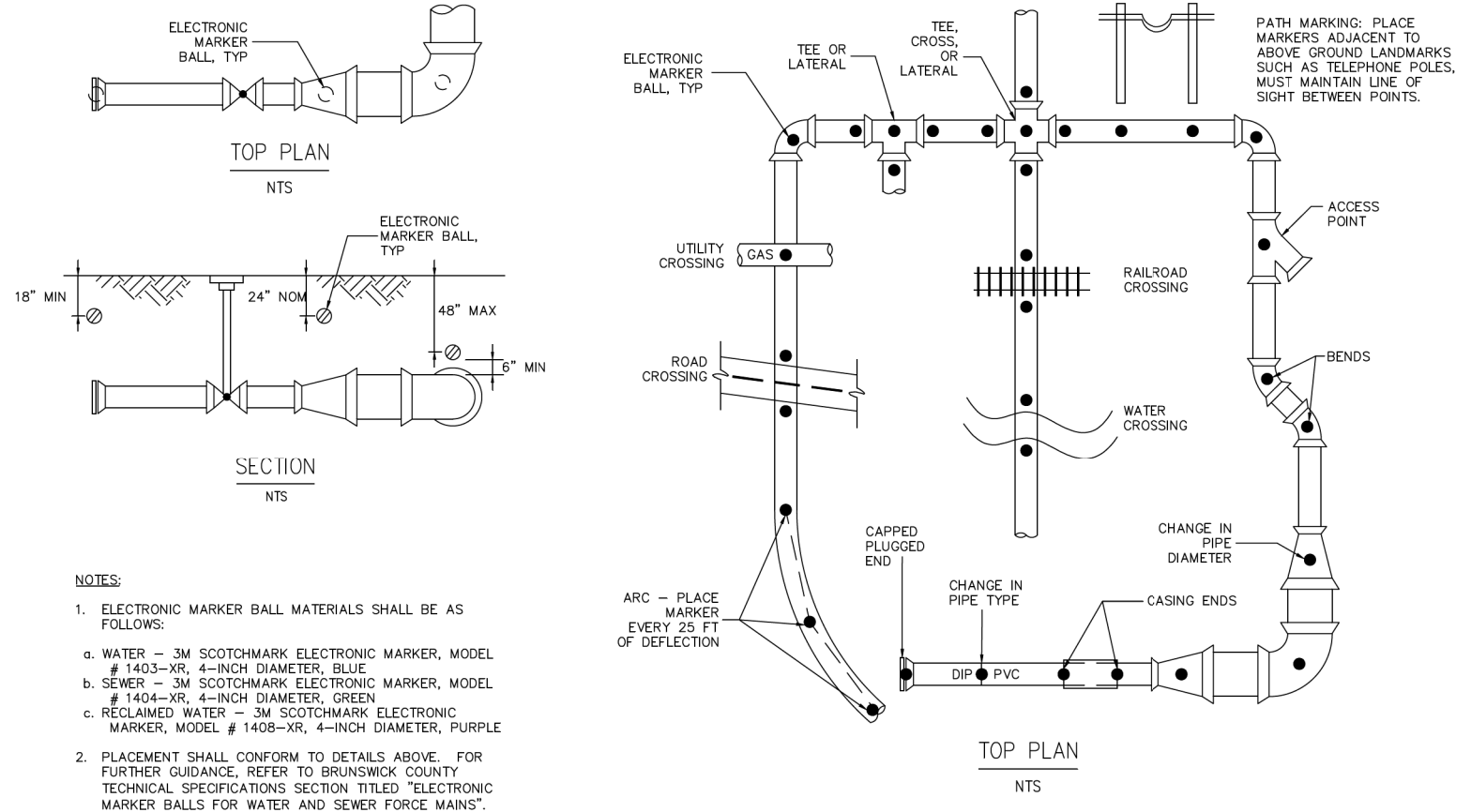
SELF-RESTRAINED PE/MJ ADAPTERS, NATIONAL SANITATION FOUNDATION (NSF) APPROVED FOR POTABLE WATER WITH STAINLESS STEEL SLEEVE INSERTS AS MANUFACTURED BY JOM OR APPROVED EQUAL ADAPTER BY CENTRAL, DRISCO, FIFE OR APPROVED EQUAL ADAPTERS TO BE SDR 11 DR 9TYP BOTH ENDS. SEE
 HDPE/MJ TRANSITION ASSEMBLY (AS REQUIRED) (SEE DETAIL)

HDPE/MJ TRANSITION ASSEMBLY WS-4A

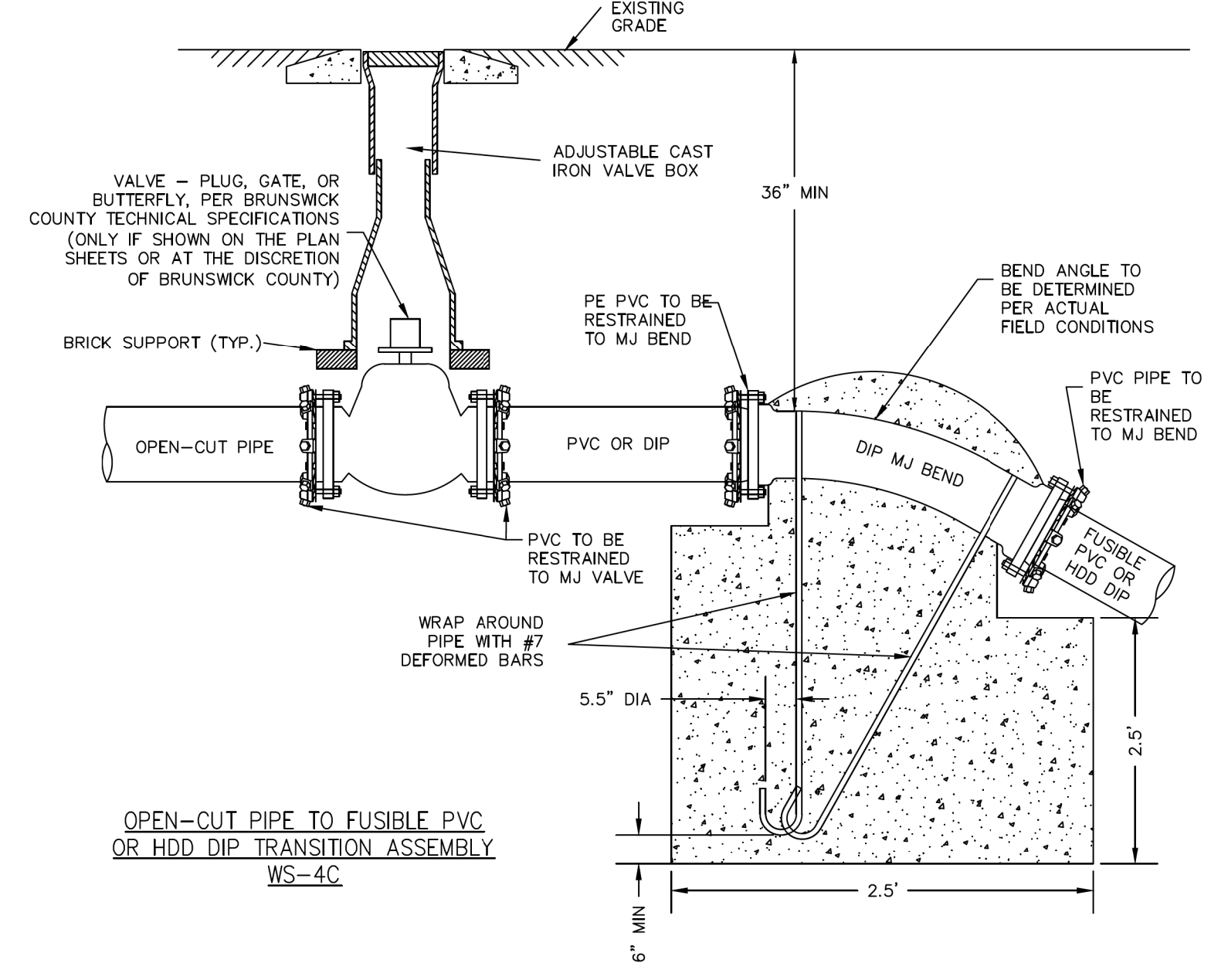


HDPE/MJ TRANSITION ASSEMBLY WS-4B

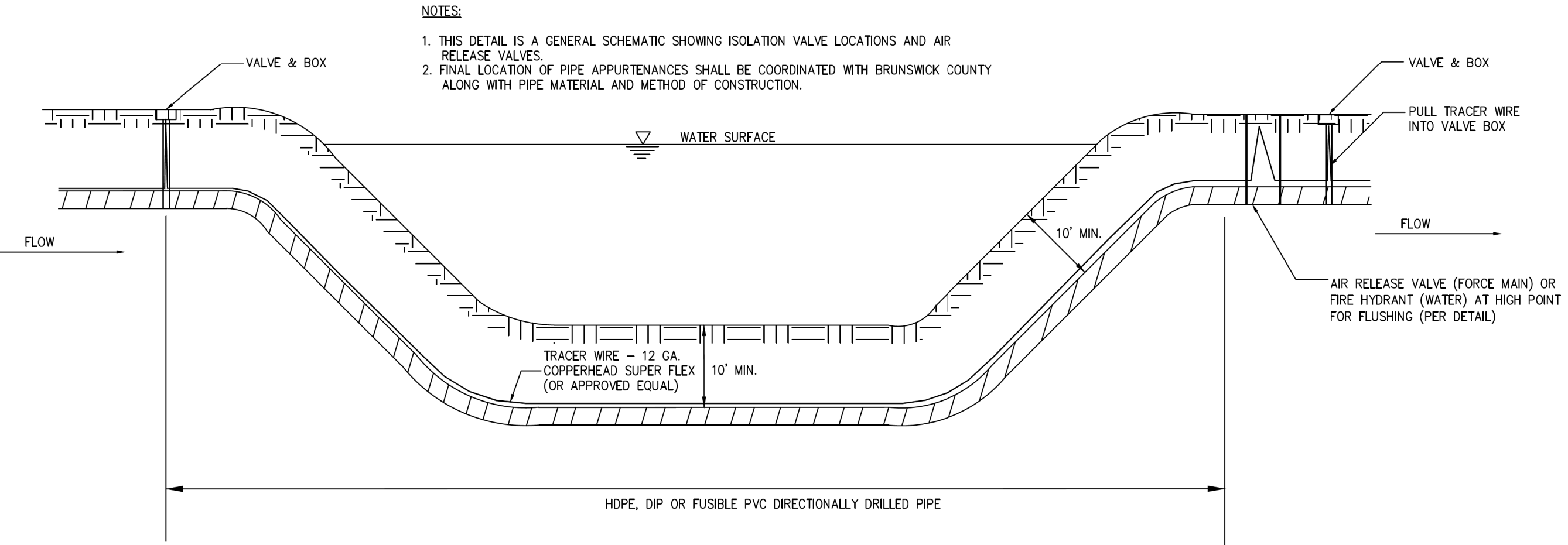
DIRECTIONAL DRILL
DETAIL WS-4



ELECTRONIC MARKER BALL PLACEMENT DETAIL



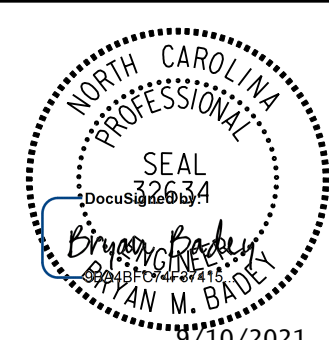
OPEN-CUT PIPE TO FUSIBLE PVC OR HDPE DIP TRANSITION ASSEMBLY WS-4C



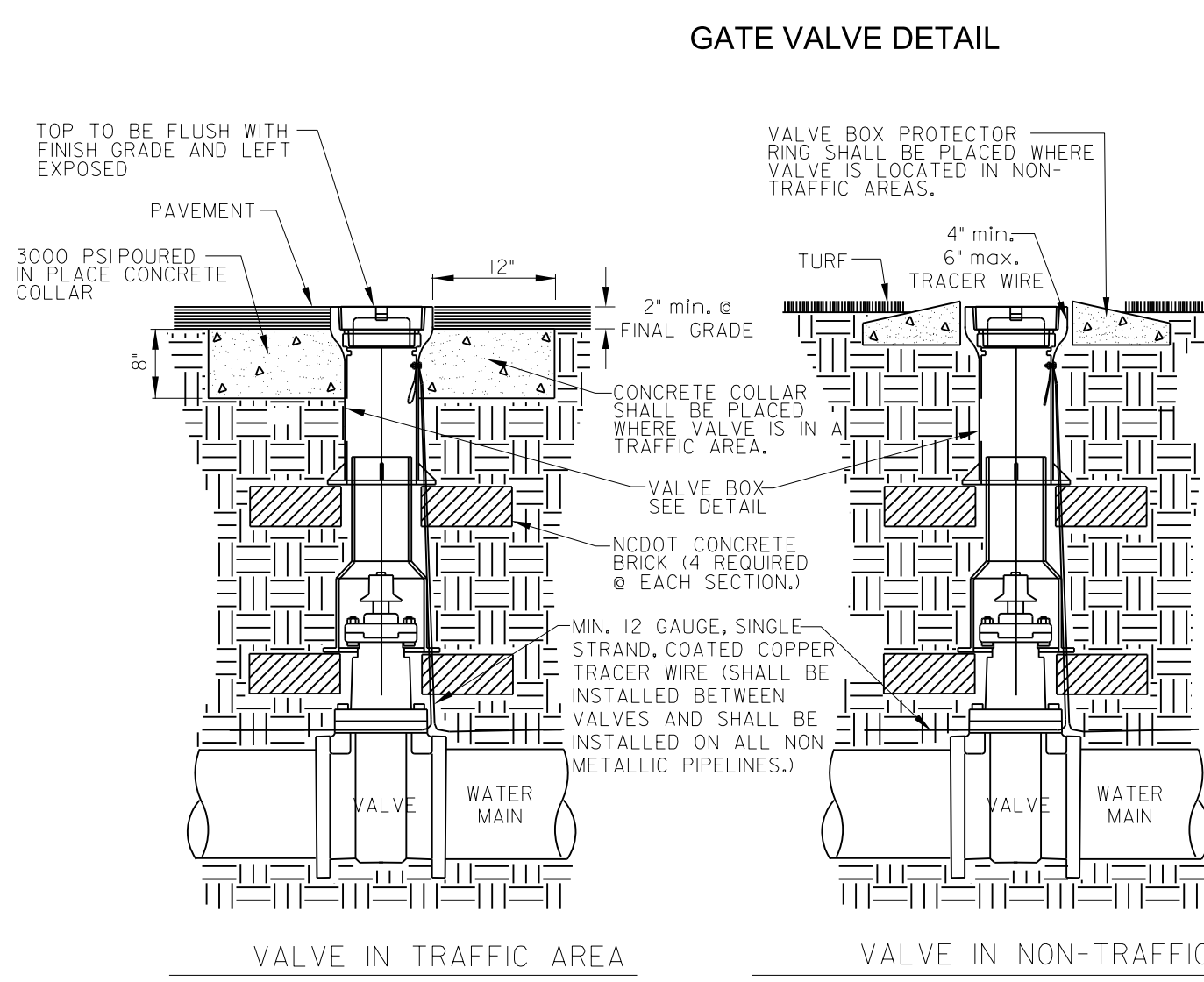
VALVE LOCATIONS FOR DIRECTIONAL DRILL OF PIPE UNDER WETLANDS/WATER BODY
 DETAIL WS-5

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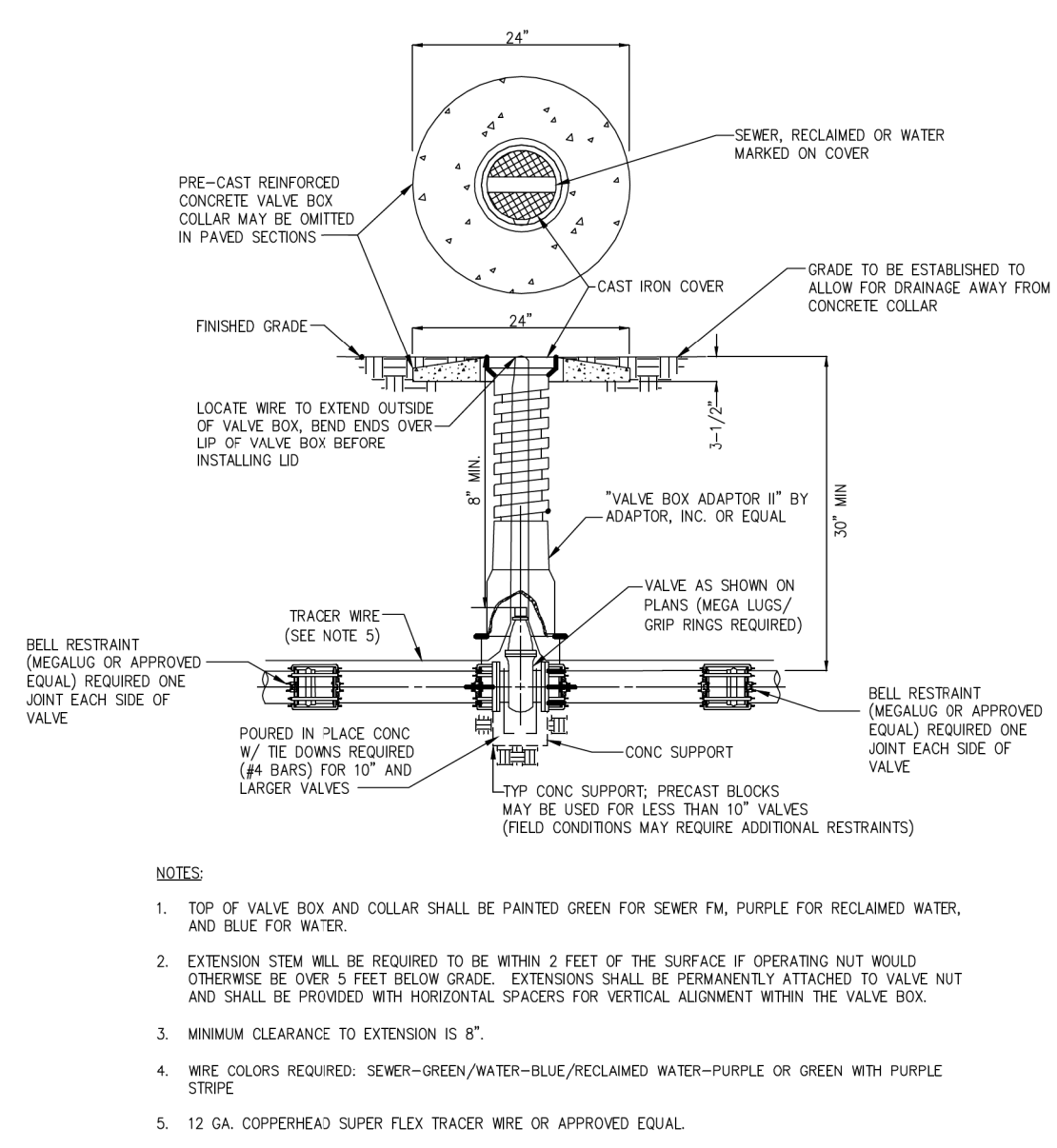
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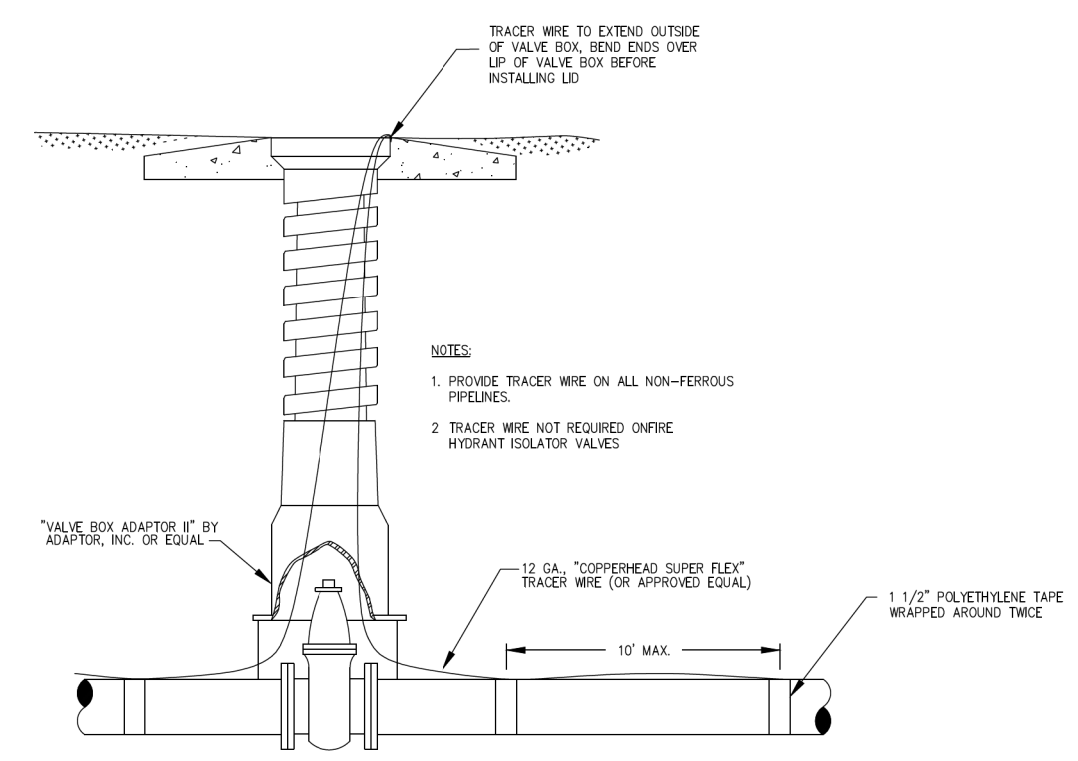
UTILITY CONSTRUCTION



- NOTES:**
1. ALL MATERIALS SHALL BE IN ACCORDANCE WITH NCDOT STANDARDS.
 2. RESILIENT WEDGE GATE VALVE SHALL BE AS MANUFACTURED BY MUELLER CORP., AMERICAN DARLING OR CLOW CORP.
 3. ALL VALVES SHALL HAVE 2" SQUARE OPERATING NUT AND SHALL OPEN COUNTERCLOCKWISE.
 4. VALVE BODY, BONNET AND GATE SHALL BE IN ACCORDANCE WITH AWWA C-509/C-515 AND NSF 61.
 5. VALVE BODY AND BONNET SHALL BE COATED ON ALL INTERIOR AND EXTERIOR SURFACES WITH A FUSION BONDED EPOXY IN ACCORDANCE WITH AWWA C-550-90.
 6. ALL VALVES 24" AND SMALLER SHALL HAVE A SAFE WORKING PRESSURE OF 250 PSI.
 7. SEE VALVE BOX DETAIL FOR ADDITIONAL INFORMATION.
 8. SEE VALVE BOX DETAIL FOR ADDITIONAL INFORMATION.
 9. VALVE BOX SECTIONS ARE REQUIRED. THE USE OF PIPE IN LIEU OF VALVE BOX SECTIONS SHALL NOT BE PERMITTED.



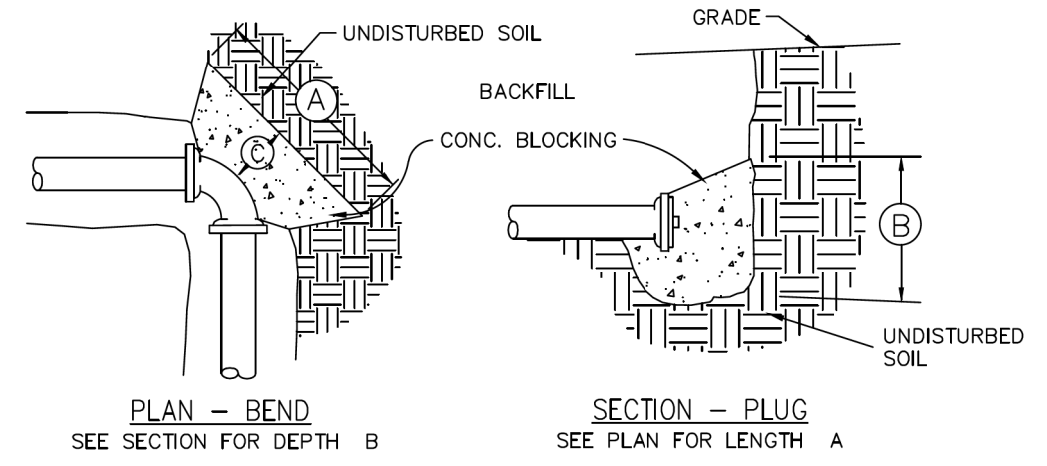
- NOTES:**
1. TOP OF VALVE BOX AND COLLAR SHALL BE PAINTED GREEN FOR SEWER, PURPLE FOR RECLAIMED WATER, AND BLUE FOR WATER.
 2. EXTENSION STEM WILL BE REQUIRED TO BE WITHIN 2 FEET OF THE SURFACE IF OPERATING NUT WOULD OTHERWISE BE OVER 5 FEET BELOW GRADE. EXTENSIONS SHALL BE PERMANENTLY ATTACHED TO VALVE NUT AND SHALL BE PROVIDED WITH HORIZONTAL SPACERS FOR VERTICAL ALIGNMENT WITHIN THE VALVE BOX.
 3. MINIMUM CLEARANCE TO EXTENSION IS 8".
 4. WIRE COLORS REQUIRED: SEWER-GREEN/WATER-BLUE/RECLAIMED WATER-PURPLE OR GREEN WITH PURPLE STRIPE.
 5. 12 GA. COPPERHEAD SUPER FLEX TRACER WIRE OR APPROVED EQUAL.



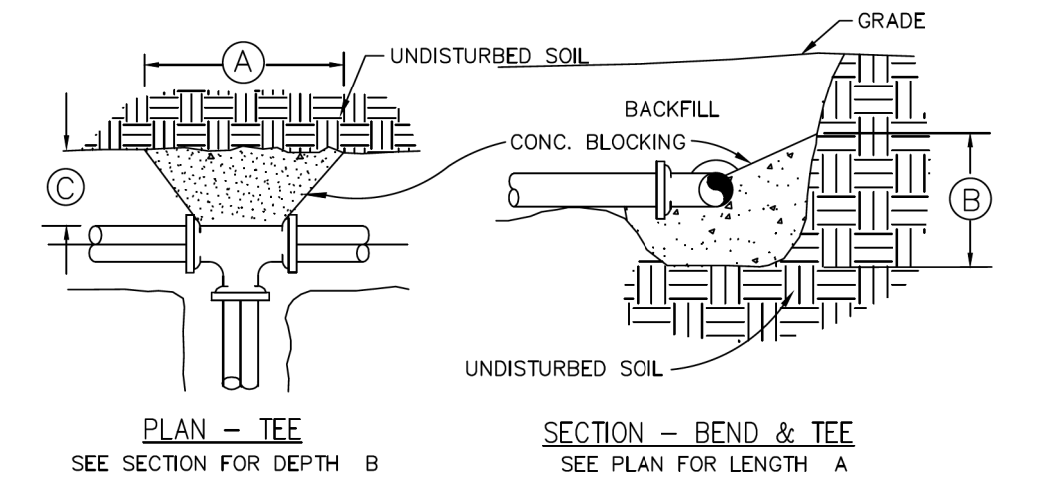
- NOTE:**
- 1. WIRE COLOR REQUIRED: SEWER-GREEN
 - 2. RECLAIMED WATER-PURPLE OR GREEN WITH PURPLE STRIPE

BLOCKING DIMENSIONS

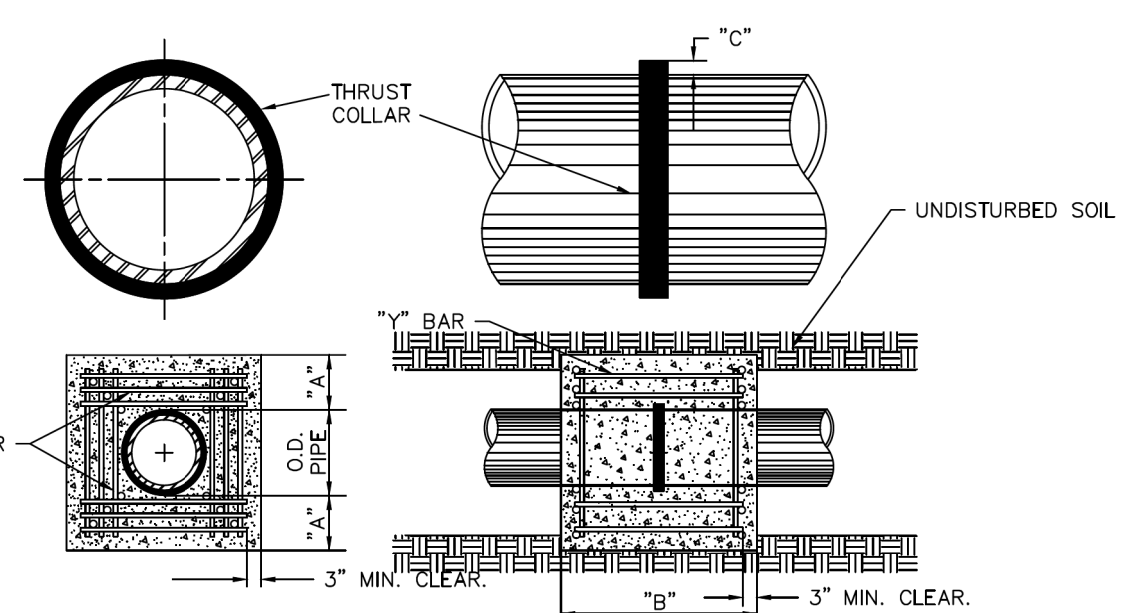
PIPE SIZE	A	B	C
UP TO 10"	4' - 0"	2' - 6"	1' - 6"
12" TO 16"	5' - 0"	4' - 0"	2' - 0"
18" TO 24"	8' - 0"	6' - 0"	3' - 0"



- NOTES:**
1. 2500 P.S.I. CONC.
 2. REMOVE LOOSE EARTH AND POUR AGAINST UNDISTURBED SOIL.
 3. BACKFILL TO EXISTING/FINISH GRADE AFTER CONCRETE HAS CURED FOR 24 HOURS.
 4. CONCRETE SHALL NOT COVER FLANGES, BOLTS, MEGA-LUGS, RODS, ETC.



THRUST BLOCKS



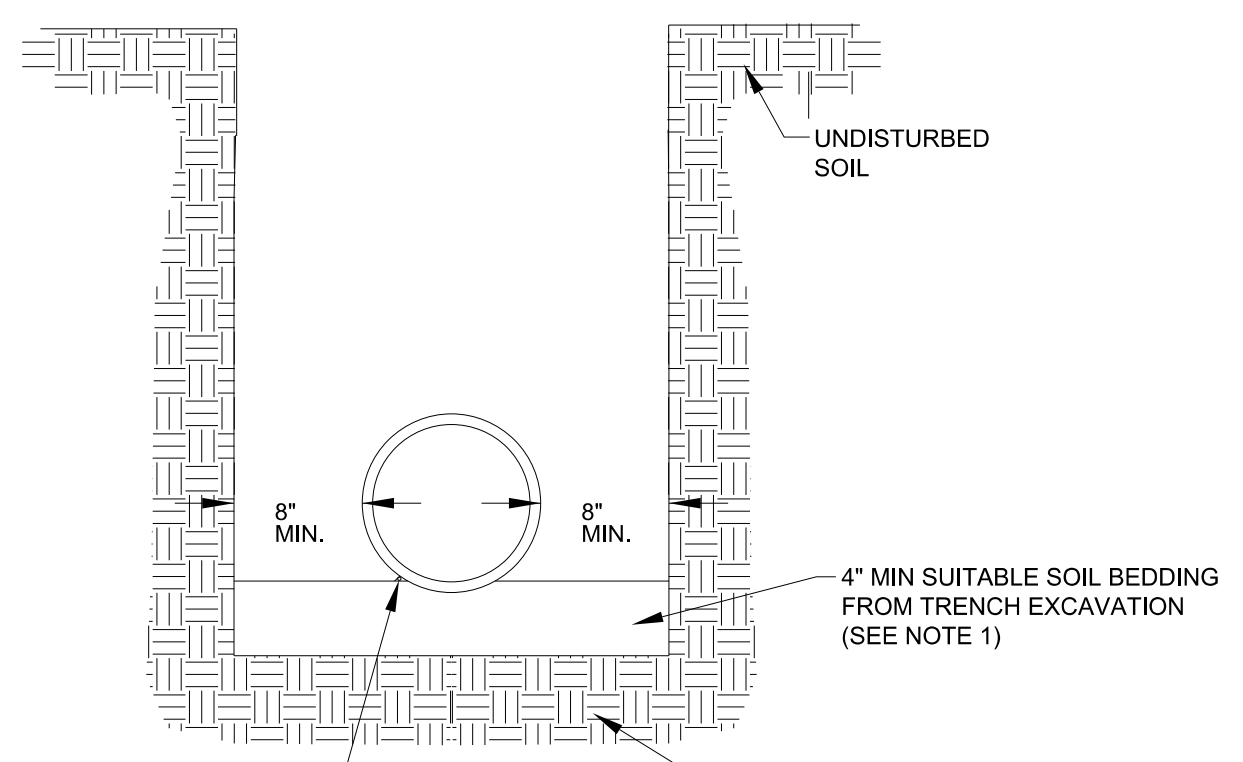
- NOTES:**
1. CONCRETE SHALL BE 2500 P.S.I. MIN.
 2. REINFORCING BARS SHALL BE DEFORMED AND TIED TOGETHER.
 3. TRENCH BOTTOM WIDTH IN VICINITY OF THRUST BLOCK(S) INSTALLATION SHALL BE MINIMUM WIDTH.
 4. BACKFILL TAMPED IN 6" LAYERS.

REINFORCING REQUIREMENTS

I.D. PIPE	REBAR SIZE	X BAR LENGTH	Y BAR WGT.	Y BAR LENGTH	Y BAR WGT.	NO. REQD.
6"-36"	#5	2'-2" O.D. PIPE	1.043 LBS./FT	1'-1"	1.1 LBS. EA.	X-24, Y-12
48"	#6	3'-0" O.D. PIPE	1.502 LBS./FT	1'-3"	1.9 LBS. EA.	X-24, Y-12

THRUST COLLAR FOR WATER MAINS

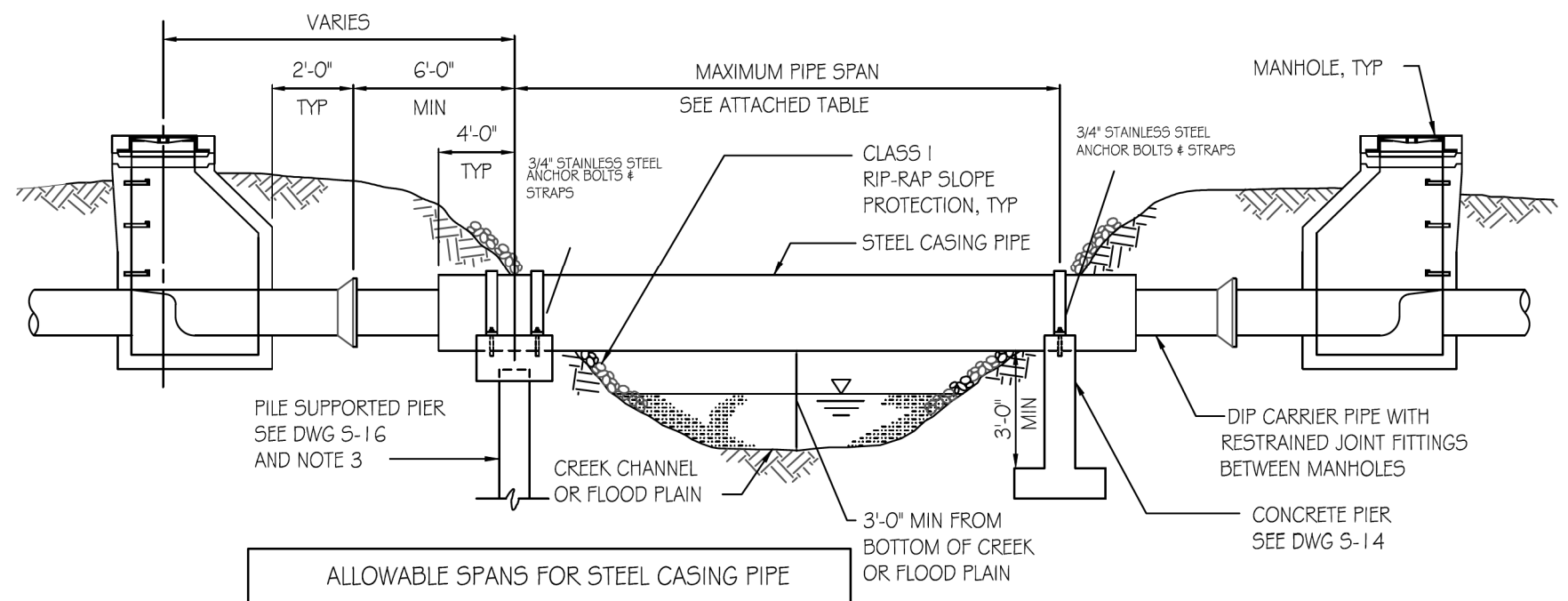
WATER MAIN BEDDING DETAIL



- NOTES:**
1. SUITABLE SOIL BEDDING IS DEFINED AS "NATIVE" SOIL EXCAVATED FROM THE TRENCH, FREE OF ROCKS, FOREIGN MATERIAL, AND FROZEN EARTH.
 2. SUITABLE BEDDING MATERIAL SHALL EXTEND TO UNDISTURBED TRENCH WALLS.
 3. IF GROUND CONDITIONS WARRANT, IT MAY BE NECESSARY TO BED DUCTILE IRON WATER MAINS IN SELECT BEDDING MATERIAL (No.5 OR No.57 STONE) TO THE SPRINGLINE OF THE PIPE. SUCH INSTALLATION SHALL BE AS DIRECTED BY THE FAYPWC PROJECT COORDINATOR.

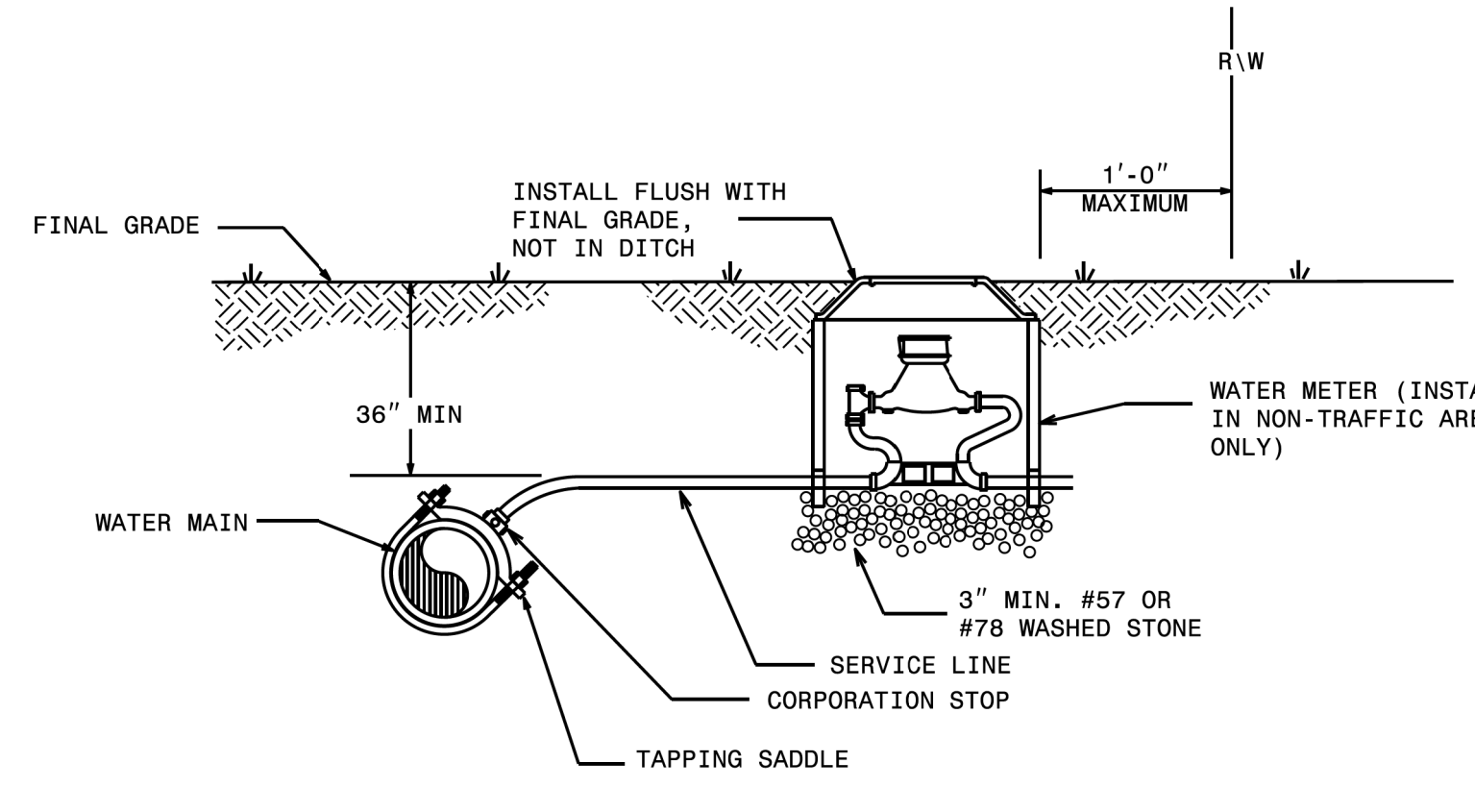
CONTINUOUS 12 GA. SINGLE STRAND COATED COPPER WIRE OR COPPER CLAD STEEL TRACING WIRE REQUIRED FOR ALL NON-FERROUS PIPE (FROM VALVE BOX TO VALVE BOX)

SUBBASE SHALL BE UNDISTURBED SOIL. WHERE SOIL IS DEEMED UNSUITABLE BY THE FAYPWC PROJECT COORDINATOR AUTHORIZED AREA SHALL BE UNDERCUT AND BACKFILLED WITH SELECT BEDDING MATERIAL (SEE NOTE 3).

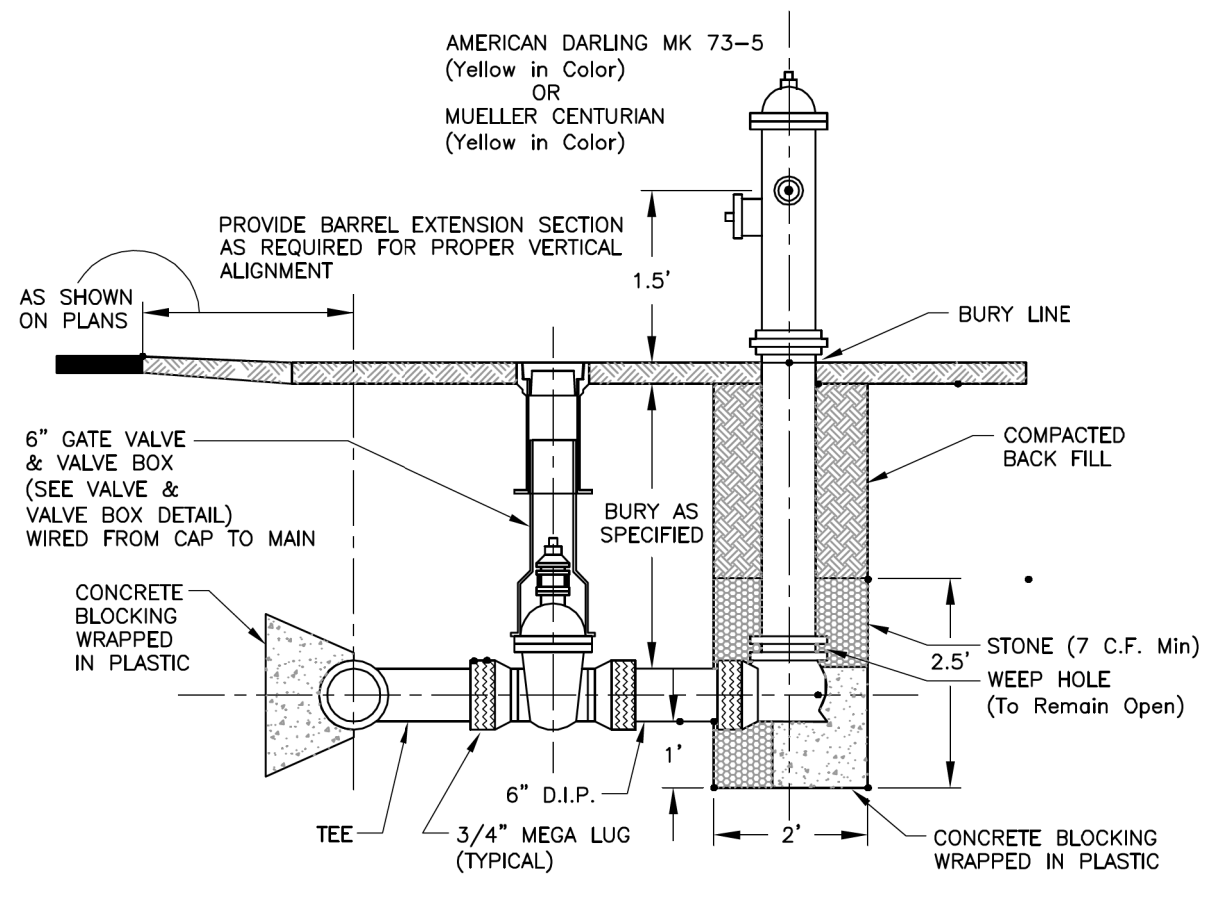


ALLOWABLE SPANS FOR STEEL CASING PIPE

CARRIER PIPE, DIP DIAMETER (IN.)	CASING PIPE, STEEL DIAMETER (IN.)	MINIMUM CASING PIPE WALL THICKNESS (IN.)	ALLOWABLE SPAN (FT.)
6	14	0.3750	40
8	16	0.3750	45
10	18	0.3750	50
12	20	0.3750	50
14	24	0.3750	55
16	26	0.3750	55
18	30	0.3750	60
20	32	0.3750	60
24	36	0.4375	65
30	42	0.4375	65
36	48	0.5000	65
42	56	0.5000	65



- NOTES:**
1. THIS DETAIL SHOWS THE TYPICAL FINAL WATER METER CONFIGURATION AFTER INSTALLATION OF A PROPOSED WATER METER, RECONNECTION OF AN EXISTING WATER METER, OR RELOCATION OF A WATER METER.



FIRE HYDRANT ASSEMBLY

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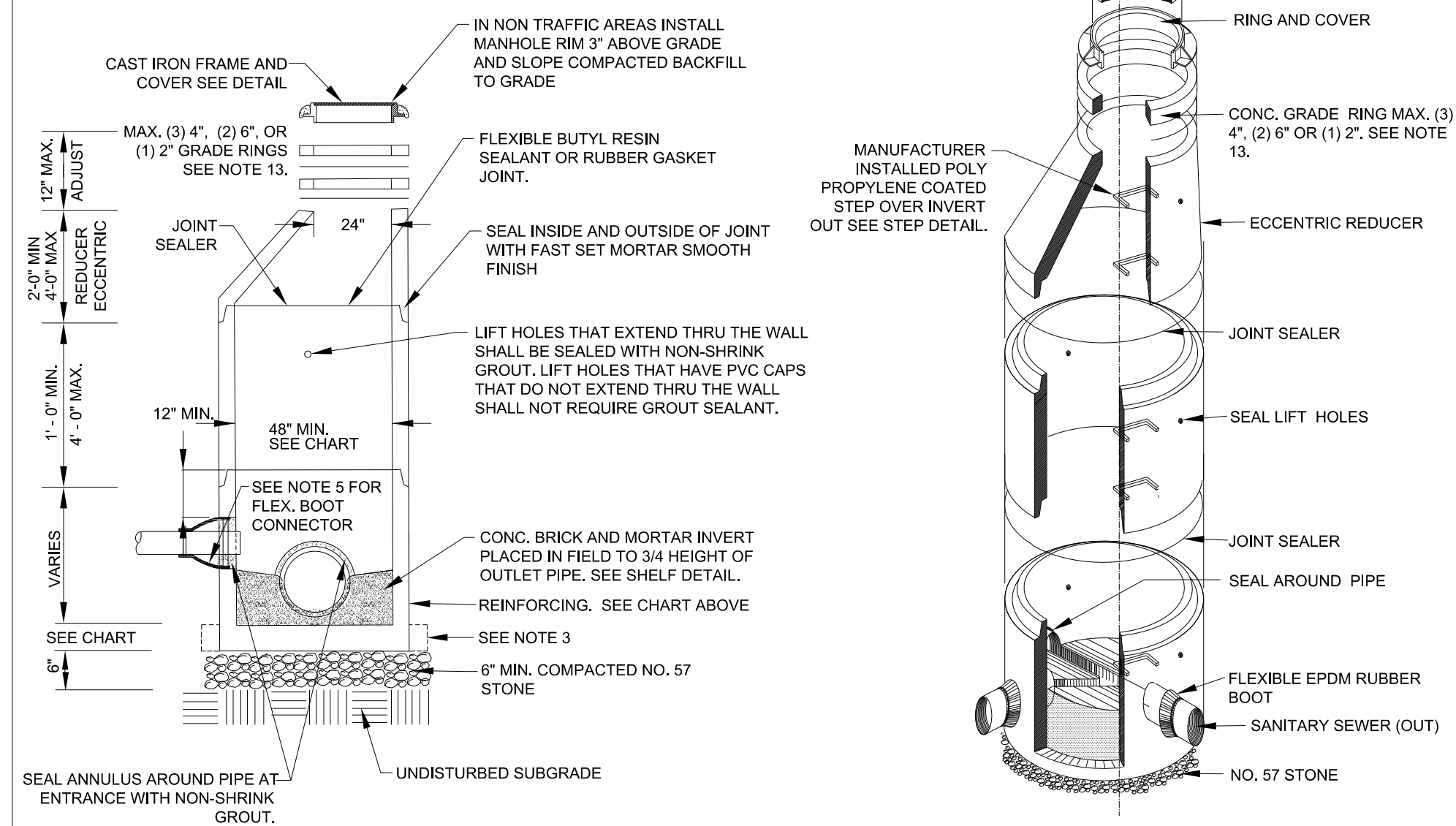
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UTILITY CONSTRUCTION

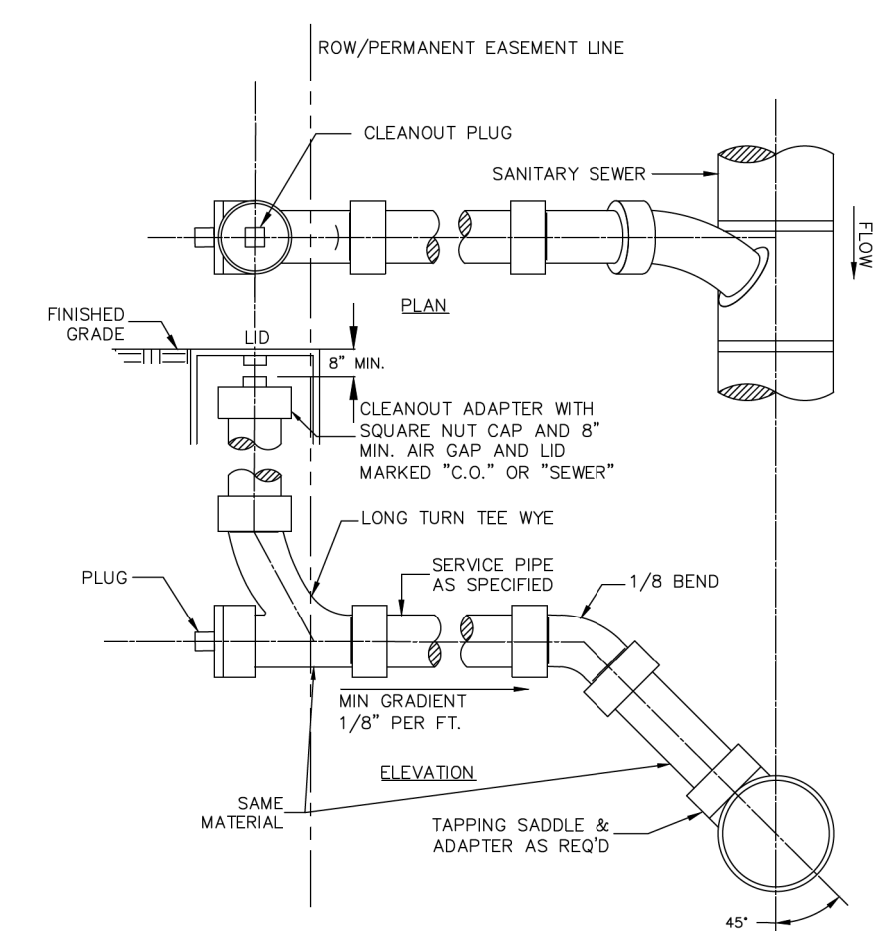
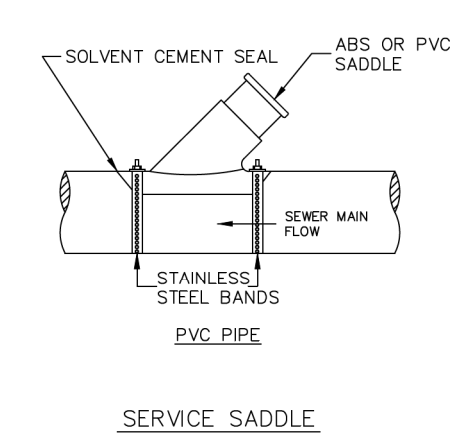
STANDARD MANHOLE

MANHOLE DIAMETER SIZES MAY BE ADJUSTED ON THE PLANS TO REFLECT SPECIAL CIRCUMSTANCES. REDUCING SLABS ARE NOT ACCEPTABLE ON MANHOLES LESS THAN 6' DIAMETER.

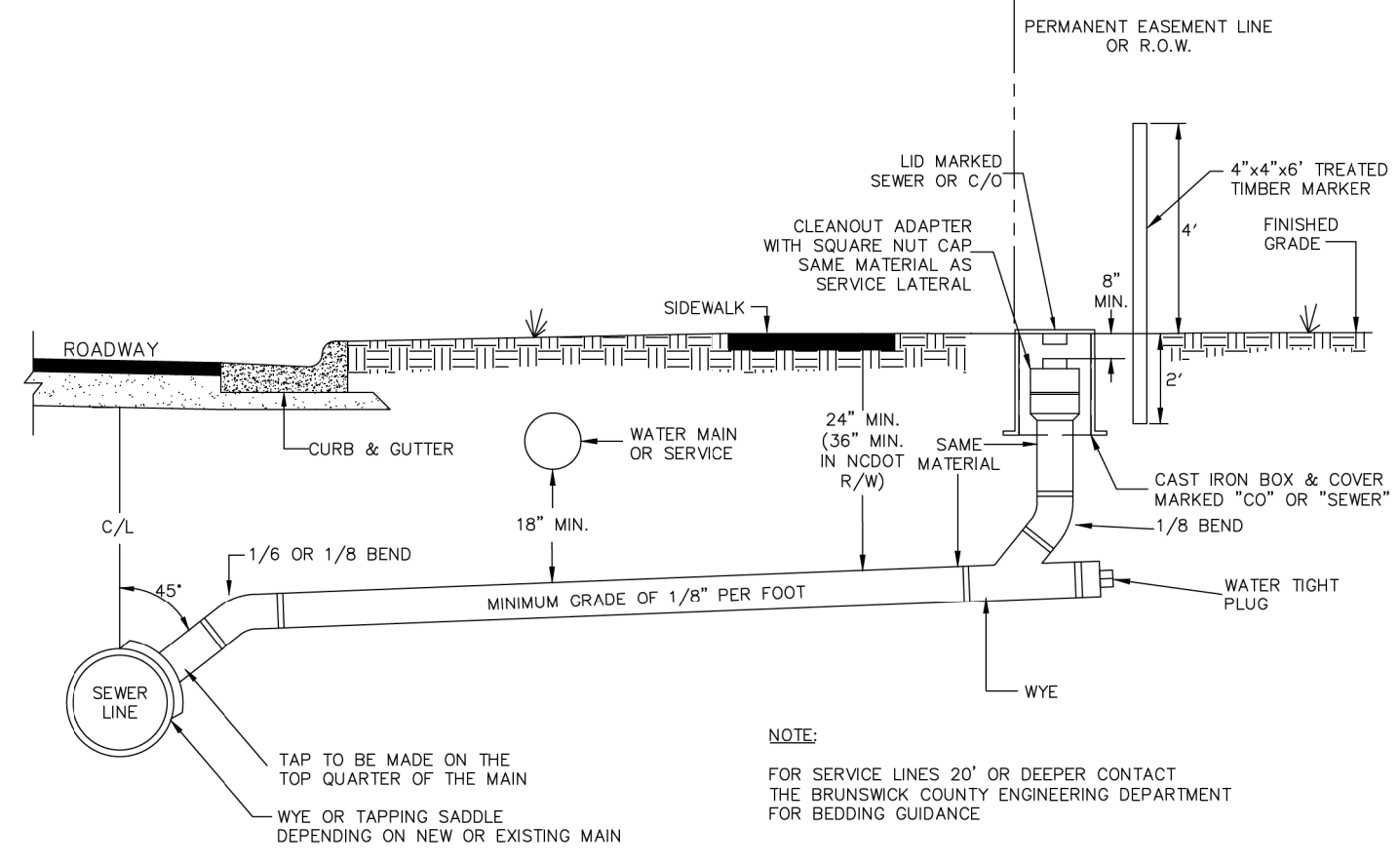


STANDARD MANHOLE

- NOTES:
- PRECAST REINFORCED CONCRETE MANHOLES SHALL BE IN ACCORDANCE WITH ASTM C-478.
 - MINIMUM CONCRETE COMPRESSIVE STRENGTH SHALL BE 4,000PSI.
 - MANHOLES GREATER THAN 12' DEPTH SHALL HAVE MINIMUM 6" EXTENDED BASE.
 - FLEXIBLE BUTYL RESIN JOINT SEALANT SHALL BE IN ACCORDANCE WITH ASTM C990. RUBBER GASKET JOINTS SHALL BE IN ACCORDANCE WITH ASTM C-443.
 - FLEXIBLE EPDM RUBBER BOOT CONNECTORS SHALL BE IN ACCORDANCE WITH ASTM C923. INSTALLED BY MANUFACTURER WITH STAINLESS STEEL COMPRESSION RING AND TAKE-UP CLAMP. CONNECTION TO MAIN SHALL BE BY CONTRACTOR WITH STAINLESS STEEL PIPE CLAMP.
 - CONNECTIONS TO EXISTING MANHOLES SHALL BE BY CORING MANHOLE AND FIELD INSTALLING A FLEXIBLE EPDM RUBBER BOOT CONNECTOR. DO NOT ALLOW DEBRIS TO ENTER SYSTEM.
 - MORTAR SHALL BE QUICK SETTING, NON-SHRINK GROUT MIXED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
 - MANHOLE STEPS SHALL BE IN ACCORDANCE WITH ASTM C478 AND OSHA REGULATIONS. ALIGN STEPS WITH INVERT OUT.
 - PRECAST INVERTS ARE NOT ALLOWED.
 - VERTICAL DROPS BETWEEN THE INFLOW PIPES AND OUTFLOW PIPES SHALL REQUIRE THE FOLLOWING:
 - GREATER THAN 2.5' SEE DROP STRUCTURE DETAIL (MIN. 5' DIAMETER MH REQUIRED).
 - LESS THAN 2.5' SEE PIPE SLIDE DETAIL.
 - AN ECCENTRIC CONE SHALL BE UTILIZED ON ALL MANHOLES.
 - INVERT ON PLANS IS TO MANHOLE CENTERLINE.
 - CONCRETE GRADE RINGS SHALL NOT BE USED FOR ABOVE GRADE ADJUSTMENTS (IE: OUTFALL AREAS). USE OF GRADE RINGS ARE ALLOWABLE IN YARD AREAS AND PAVEMENT, WHERE THE RING AND COVER ARE AT GROUND LEVEL.
 - THE MINIMUM SLOPE ACROSS THE INVERT OF THE MANHOLE SHALL BE 1%. STANDING WATER IN INVERT OF MANHOLE IS NOT ACCEPTABLE.
 - THE EXTERIOR MANHOLE RISER JOINTS, INCLUDING THE JOINT AT THE CONE, SHALL BE SEALED ON THE OUTSIDE BY AN APPROVED JOINT WRAP.
 - MANHOLE BOOT FOR 4-INCH LATERALS. SHOULD IT BE NECESSARY TO INSTALL A 4-INCH LATERAL INTO A MANHOLE, THE RUBBER BOOT THAT THE LATERAL IS INSERTED INTO SHALL BE SECURELY FASTENED TO THE CORE HOLE BY UTILIZING A STAINLESS STEEL BAND THAT IS TIGHTENED USING A JACK OR A TORQUE WRENCH (DIRECT DRIVE). BOTH STANDARD SIZE AND STEP DOWN BOOTS ARE ALLOWED. THE TORQUE WRENCH SHALL BE SUPPLIED BY THE MANUFACTURER. NO OTHER TYPE BANDS OR METHOD OF SECURING THE BOOT TO THE MANHOLE SHALL BE ACCEPTED.
 - FOR FOUR (4) INCH SDR 26 LATERALS, THE PIPE OUTSIDE DIAMETER RANGE OF THE BOOT SHALL BE 3.5 INCHES TO 4.25 INCHES.
 - FOR FOUR (4) INCH DUCTILE IRON LATERALS, THE PIPE OUTSIDE DIAMETER RANGE OF THE BOOT SHALL EITHER BE AS FOR VC OR 4.25 INCHES TO 4.81 INCHES.
 - IN ALL CASES, THE BOOT SHALL BE TIGHTENED ON THE LATERAL BY MEANS OF A SINGLE STAINLESS STEEL STRAP. THE LATERAL INVERT SHALL BE AT THE TOP OF THE SHELF.
 - NO MORE THAN 4 FOUR INCH LATERALS OR 3 SIX INCH LATERALS SHALL ENTER A 4' DIAMETER TERMINAL MANHOLE. NO MORE THAN 2 LATERALS (REGARDLESS OF SIZE) SHALL ENTER ALL OTHER 4' DIAMETER MANHOLES. ALL LATERALS SHALL HAVE AN INDIVIDUAL TROUGH. 5' DIAMETER MANHOLES SHALL BE USED IF THE ABOVE CONDITIONS ARE NOT MET.
 - NO MORE THAN 5 LATERALS SHALL ENTER A 5' DIAMETER MANHOLE.
 - USE OF TEE-WYES ON LATERALS IS NOT ALLOWED.
 - ALL MANHOLES SHALL BE VACUUM TESTED.



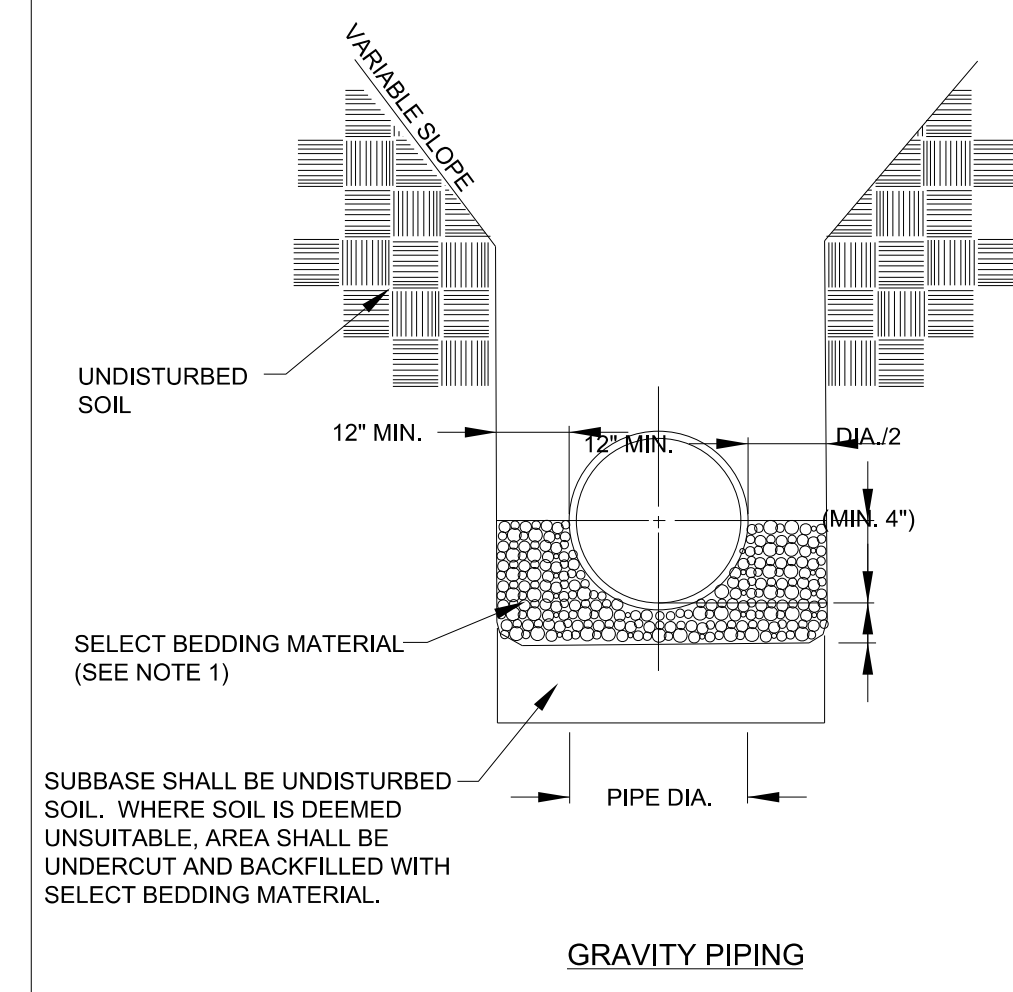
SANITARY SEWER GRAVITY TAPS & SERVICE LATERALS



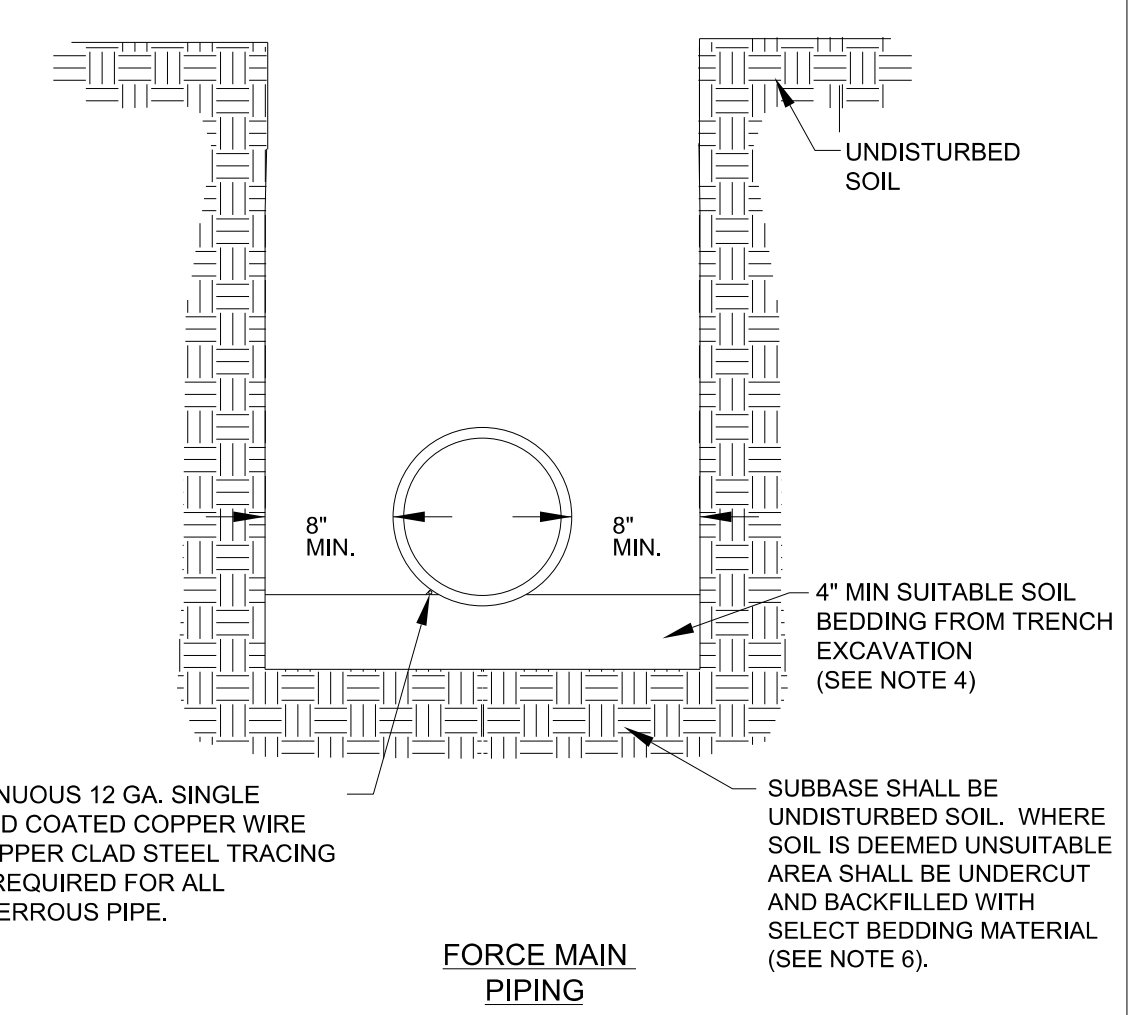
NOTE:
FOR SERVICE LINES 20' OR DEEPER CONTACT THE BRUNSWICK COUNTY ENGINEERING DEPARTMENT FOR BEDDING GUIDANCE.

SEWER BEDDING DETAIL

- NOTES:
- THE SELECT BEDDING MATERIAL SHALL BE WELL GRADED CRUSHED ROCK (NO. 5 OR NO. 57 STONE) FOR THE FULL WIDTH OF THE TRENCH.
 - SELECT BEDDING MATERIAL SHALL EXTEND TO UNDISTURBED TRENCH WALLS.
 - SELECT BEDDING MATERIAL SHALL BE PROPERLY PLACED TO THE SPRING LINE OF THE PIPE FOR ITS ENTIRE LENGTH.
 - SUITABLE SOIL BEDDING IS DEFINED AS "NATIVE" SOIL EXCAVATED FROM THE TRENCH, FREE OF ROCKS, FOREIGN MATERIAL, AND FROZEN EARTH.
 - SUITABLE BEDDING MATERIAL SHALL EXTEND TO UNDISTURBED TRENCH WALLS.
 - IF GROUND CONDITIONS WARRANT, IT MAY BE NECESSARY TO BED DUCTILE IRON FORCE MAINS IN SELECT BEDDING MATERIAL (NO. 5 OR NO. 57 STONE) TO THE SPRINGLINE OF THE PIPE.



GRAVITY PIPING



FORCE MAIN PIPING

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

PROJECT REFERENCE NO.	SHEET NO.
R-5021	UC-60
DESIGNED BY: MEP	
DRAWN BY: MEP	
CHECKED BY: BMB	
APPROVED BY: BMB	
REVISED:	NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	UTILITY CONSTRUCTION PLANS ONLY

THE ESTIMATED QUANTITY OF DUCTILE IRON SEWER PIPE FITTING ON THIS PLAN SHEET IS 4550 POUNDS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.

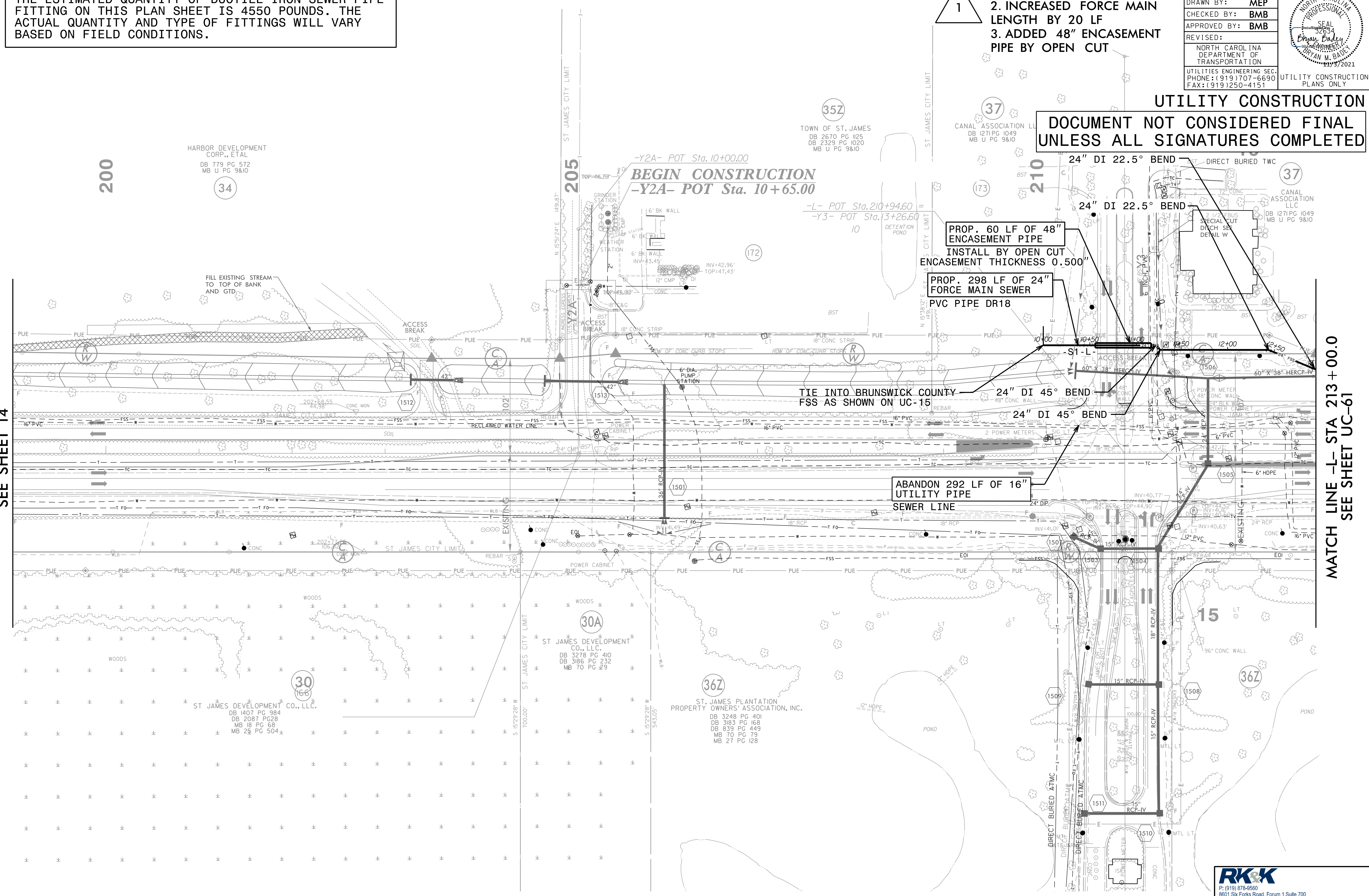
1. UPSIZED 16" FSS TO 24" FSS
2. INCREASED FORCE MAIN LENGTH BY 20 LF
3. ADDED 48" ENCASEMENT PIPE BY OPEN CUT

UTILITY CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

MATCH LINE -L- STA 199 + 00.00 SEE SHEET 14

MATCH LINE -L- STA 213 + 00.00 SEE SHEET UC-61



I:\3_2021\UC\Prj\N-5021-ut-r\dj15_UC60_psh.dgn 5/14/99

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FOR -S1-L- PROFILE, SEE SHEET UC-79

PROJECT REFERENCE NO.	SHEET NO.
R-5021	UC-61
DESIGNED BY: MEP	
DRAWN BY: MEP	
CHECKED BY: BMB	
APPROVED BY: BMB	
REVISER:	UTILITY CONSTRUCTION PLANS ONLY
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	

UTILITY CONSTRUCTION

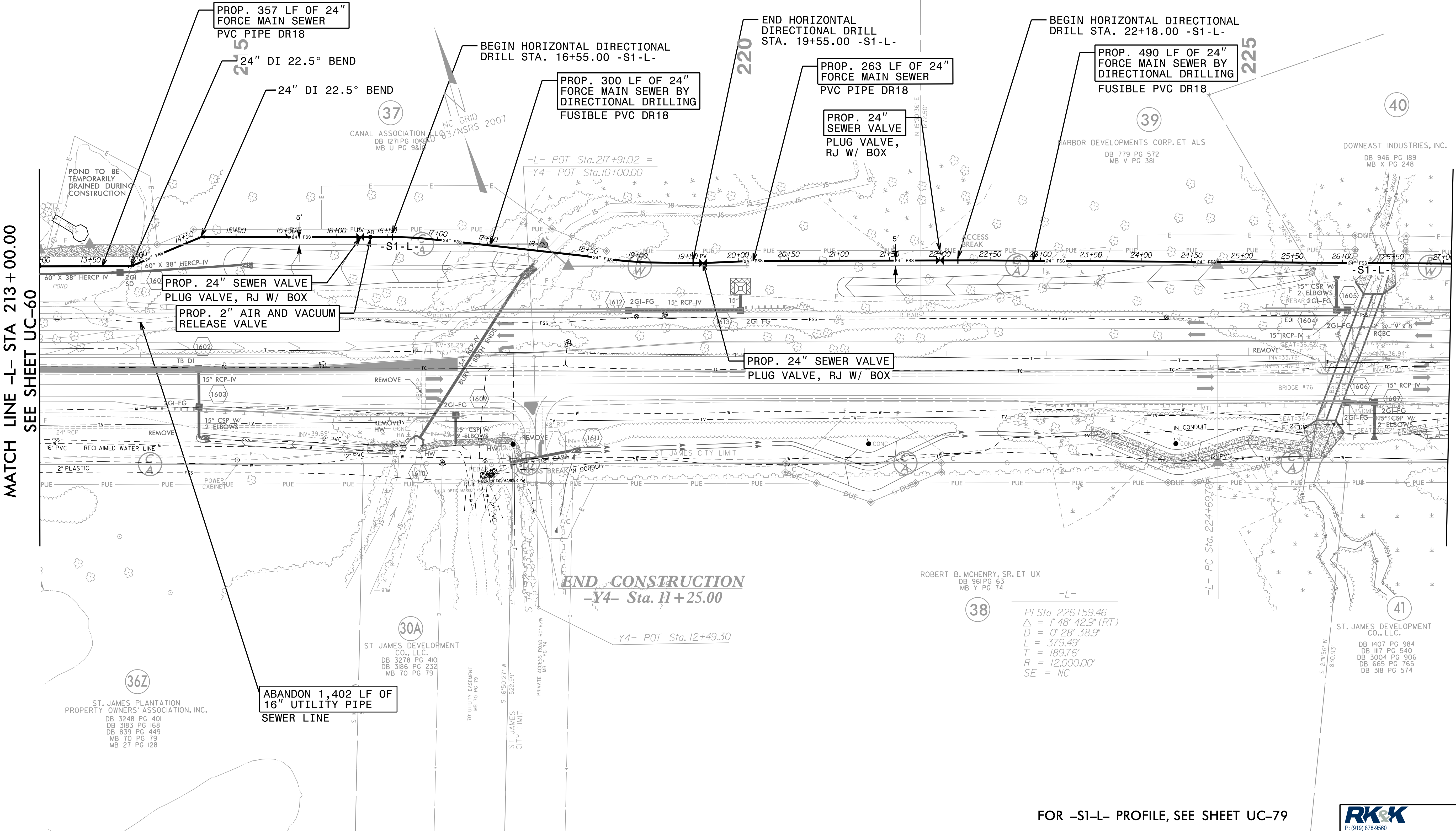
THE ESTIMATED QUANTITY OF DUCTILE IRON SEWER PIPE FITTING ON THIS PLAN SHEET IS 1530 POUNDS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.

PRIOR TO COMMENCING WORK ON ANY TRENCHLESS INSTALLATION, PROVIDE A DESIGN FOR THE TRENCHLESS INSTALLATION CERTIFIED BY AN ENGINEER LICENSED BY THE STATE OF NORTH CAROLINA, AS REQUIRED BY SUBARTICLE 1550-3(B) OF THE STANDARD SPECIFICATIONS.

UPSIZING 16" FSS TO 24" FSS

MAD 8/3/NSRS 2007

1



MATCH LINE -L- STA 213+00.00
SEE SHEET UC-60

MATCH LINE -L- STA 227+00.00
SEE SHEET UC-62

END CONSTRUCTION
-Y4- Sta. 11+25.00

ROBERT B. MCHENRY, SR. ET UX
DB 96 PG 63
MB Y PG 74

38
-L-
PI Sta 226+59.46
Δ = 1' 48' 42.9" (RT)
D = 0' 28' 38.9"
L = 379.49'
T = 189.76'
R = 12,000.00'
SE = NC

367
ST. JAMES PLANTATION
PROPERTY OWNERS' ASSOCIATION, INC.
DB 3248 PG 401
DB 3163 PG 168
DB 839 PG 449
MB 70 PG 79
MB 27 PG 128

ABANDON 1,402 LF OF
16" UTILITY PIPE
SEWER LINE

30A
ST. JAMES DEVELOPMENT
CO., LLC.
DB 3278 PG 410
DB 3186 PG 232
MB 70 PG 79

ST. JAMES DEVELOPMENT
CO., LLC.
DB 1407 PG 984
DB 1117 PG 540
DB 3004 PG 906
DB 665 PG 765
DB 318 PG 574

FOR -S1-L- PROFILE, SEE SHEET UC-79

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I:\3_2021\UC-Proj\N-5021-ut.rdy\16_UC61.psh.dgn

PROJECT REFERENCE NO.	SHEET NO.
R-5021	UC-62
DESIGNED BY: MEP	
DRAWN BY: MEP	
CHECKED BY: BMB	
APPROVED BY: BMB	
REVISOR:	
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**

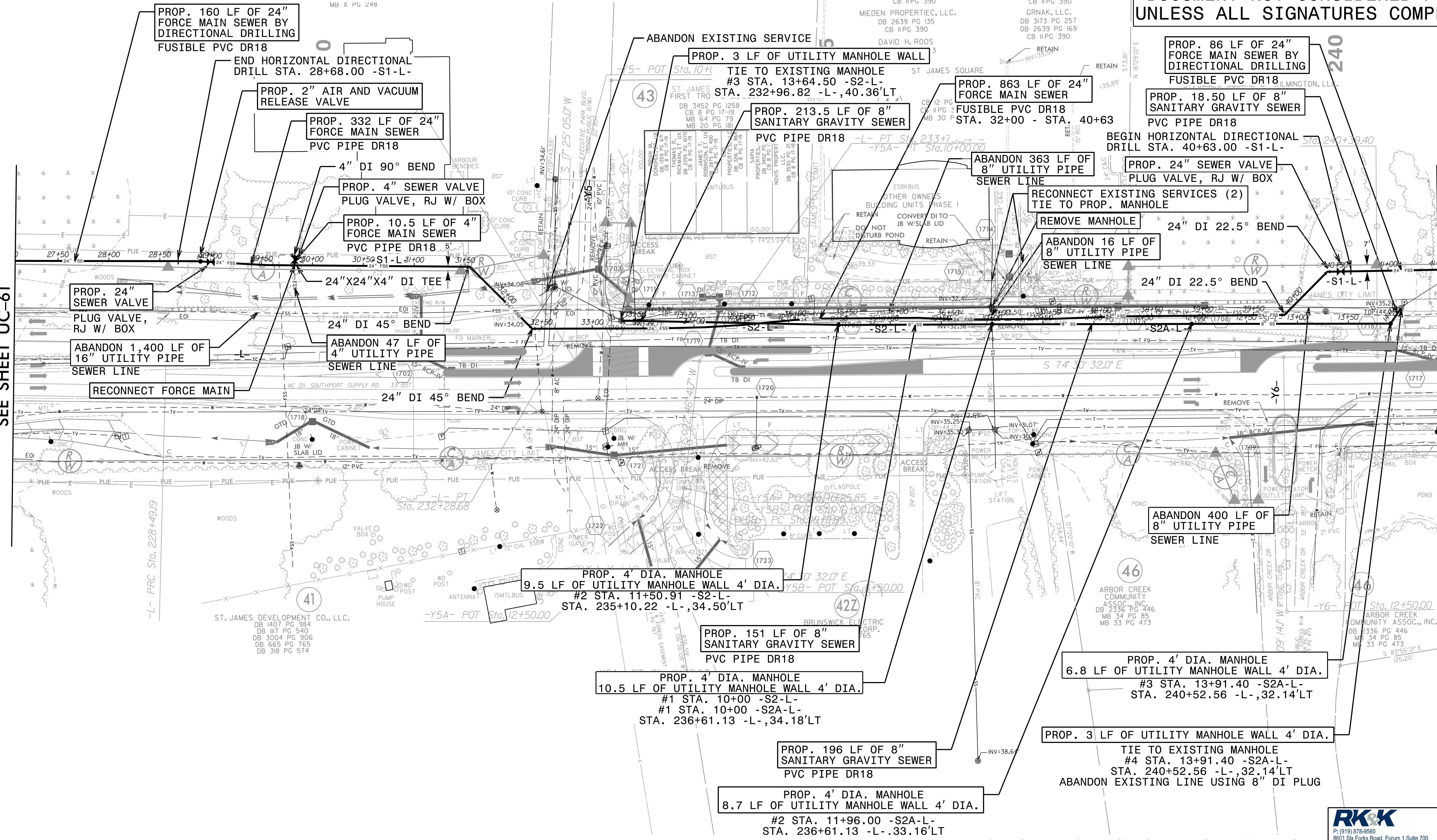
THE ESTIMATED QUANTITY OF DUCTILE IRON SEWER PIPE FITTING ON THIS PLAN SHEET IS 4025 POUNDS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.

PRIOR TO COMMENCING WORK ON ANY TRENCHLESS INSTALLATION, PROVIDE A DESIGN FOR THE TRENCHLESS INSTALLATION CERTIFIED BY AN ENGINEER LICENSED BY THE STATE OF NORTH CAROLINA, AS REQUIRED BY SUBARTICLE 1550-3(B) OF THE STANDARD SPECIFICATIONS.

1. UPSIZED 16" FSS TO 24" FSS
2. REMOVED NOTE "RECONNECT FORCE MAIN" ON PARCEL 43
3. REVISED SEWER ALIGNMENT -S2-L- TO EXTEND TO EXECUTIVE DR.
4. ADDED 3LF OF UTILITY MANHOLE WALL
5. ADDITIONAL ABANDONMENT OF 8' GRAVITY SEWER FROM 150 LF TO 363 LF
6. PIPE MATERIAL CHANGE FROM DI PC350 TO PVC DR18 FOR SEWER LINE -S2-L- & -S2A-L-

MATCH LINE -L- STA 227+00.00
SEE SHEET UC-61

MATCH LINE -L- STA 241+00.00
SEE SHEET UC-63



11/3/2021 UC-Prj01\Prj01\5021-ut-r.dwg UC62-psh.dgn

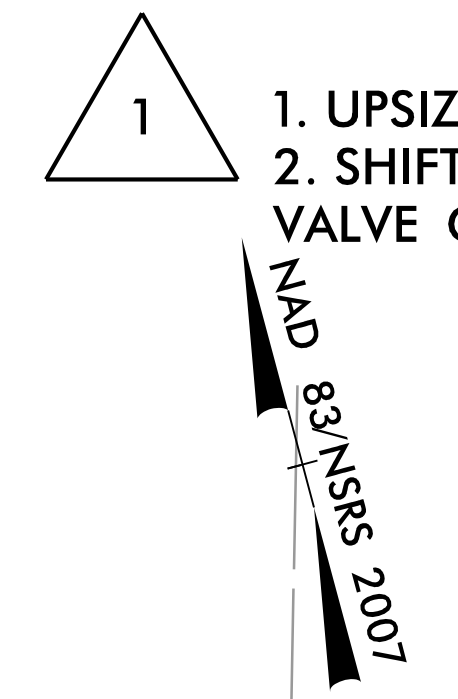
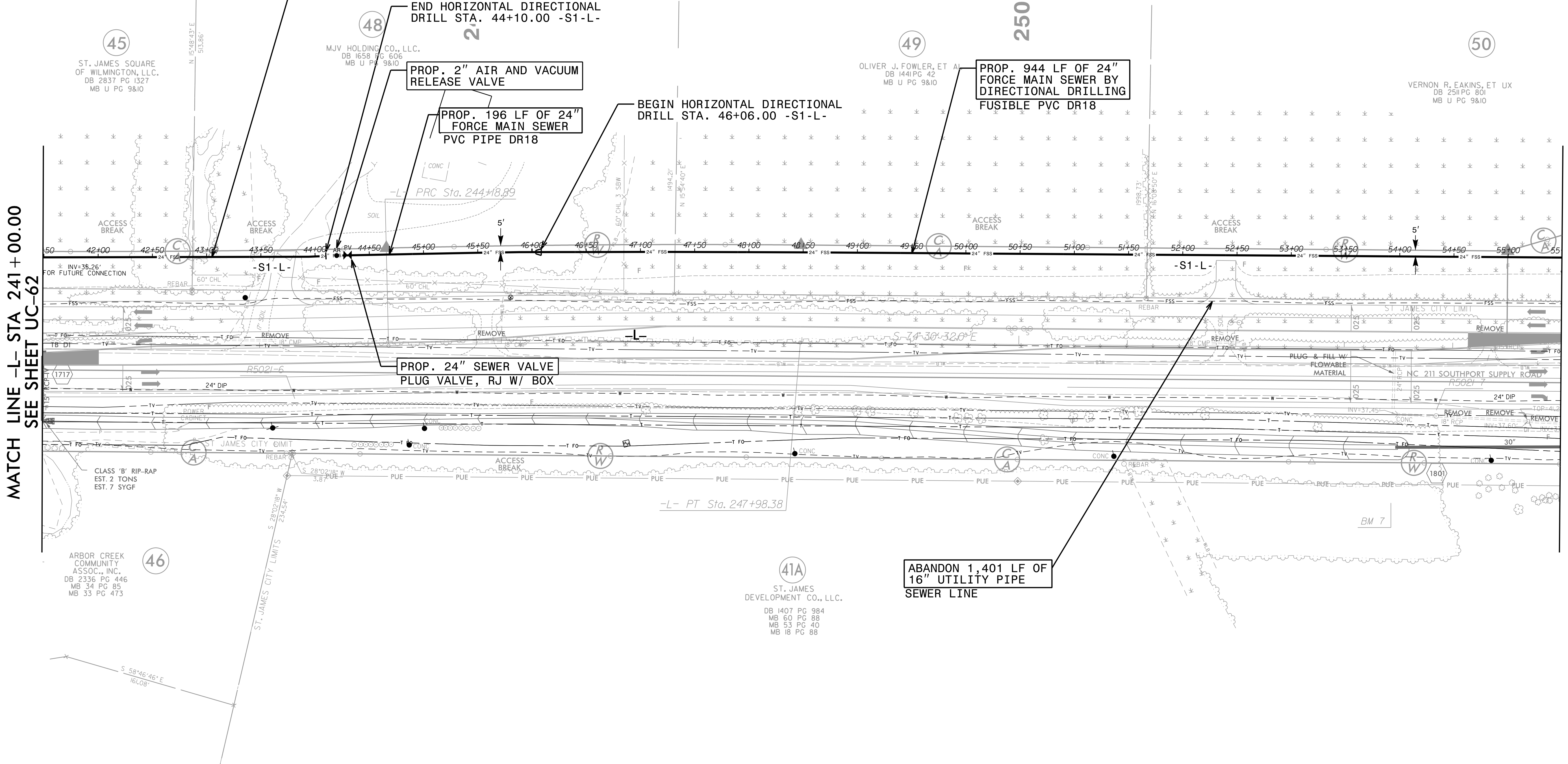
FOR -S1-L- PROFILE, SEE SHEET UC-79 AND UC-80
FOR -S2-L- PROFILE, SEE SHEET UC-83
FOR -S2A-L- PROFILE, SEE SHEET UC-83

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PRIOR TO COMMENCING WORK ON ANY TRENCHLESS INSTALLATION, PROVIDE A DESIGN FOR THE TRENCHLESS INSTALLATION CERTIFIED BY AN ENGINEER LICENSED BY THE STATE OF NORTH CAROLINA, AS REQUIRED BY SUBARTICLE 1550-3(B) OF THE STANDARD SPECIFICATIONS.

PROJECT REFERENCE NO.	SHEET NO.
R-5021	UC-63
DESIGNED BY: MEP	
DRAWN BY: MEP	
CHECKED BY: BMB	
APPROVED BY: BMB	
REVISER:	UTILITY CONSTRUCTION PLANS ONLY
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	

UTILITY CONSTRUCTION
DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



MATCH LINE -L- STA 241 + 00.00
SEE SHEET UC-62

MATCH LINE -L- STA 255 + 00.00
SEE SHEET UC-64

PROP. 261 LF OF 24" FORCE MAIN SEWER BY DIRECTIONAL DRILLING FUSIBLE PVC DR18

END HORIZONTAL DIRECTIONAL DRILL STA. 44+10.00 -S1-L-

PROP. 2" AIR AND VACUUM RELEASE VALVE

PROP. 196 LF OF 24" FORCE MAIN SEWER PVC PIPE DR18

BEGIN HORIZONTAL DIRECTIONAL DRILL STA. 46+06.00 -S1-L-

PROP. 944 LF OF 24" FORCE MAIN SEWER BY DIRECTIONAL DRILLING FUSIBLE PVC DR18

PROP. 24" SEWER VALVE PLUG VALVE, RJ W/ BOX

ABANDON 1,401 LF OF 16" UTILITY PIPE SEWER LINE

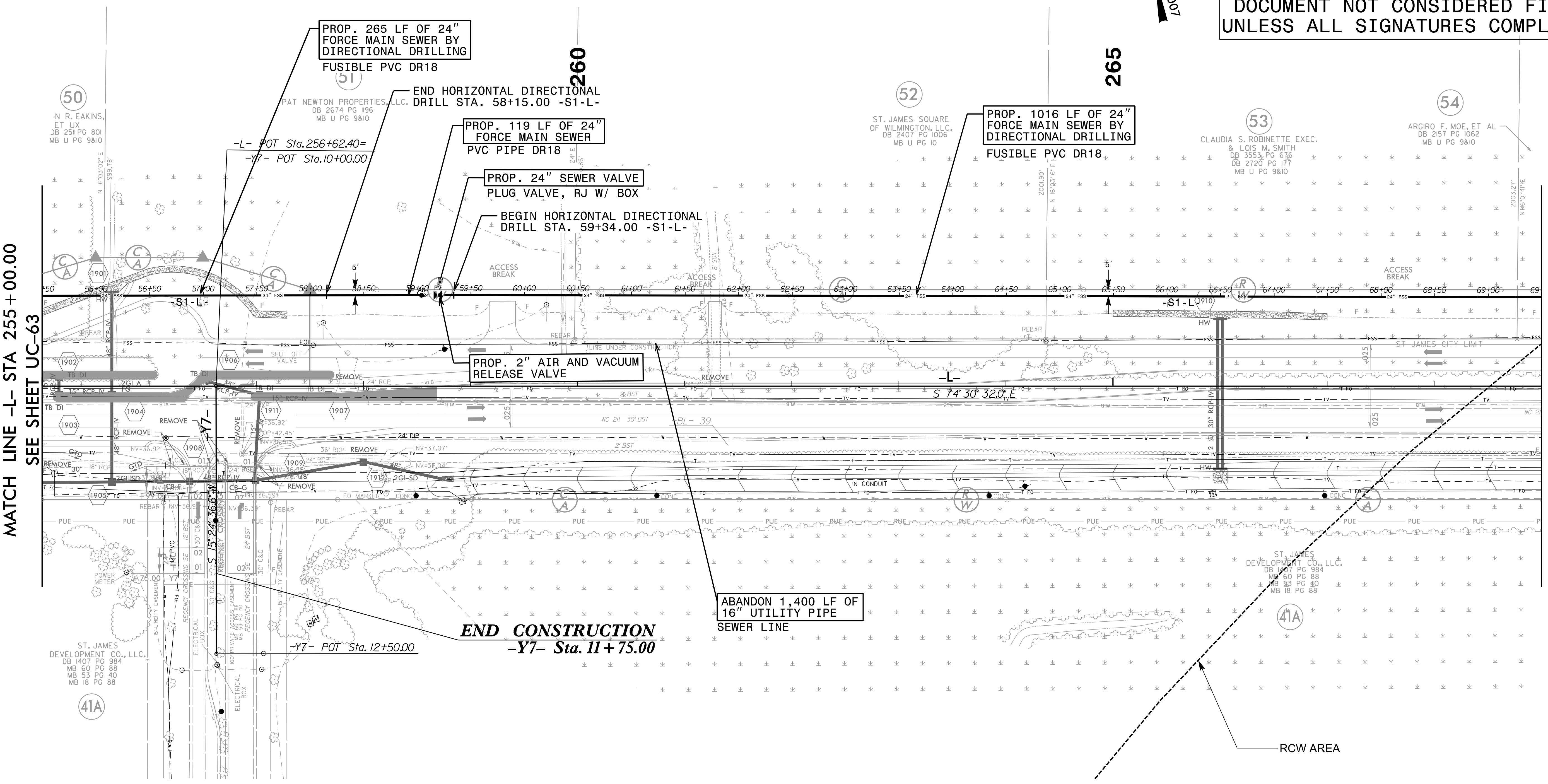
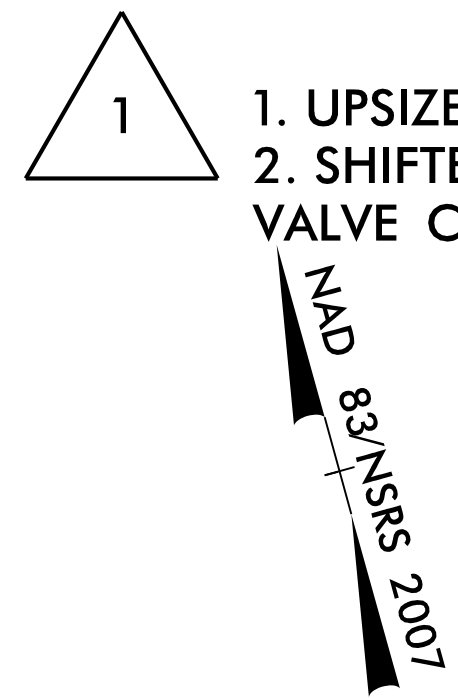
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FOR -S1-L- PROFILE, SEE SHEET UC-80

PROJECT REFERENCE NO.	SHEET NO.
R-5021	UC-64
DESIGNED BY: MEP	
DRAWN BY: MEP	
CHECKED BY: BMB	
APPROVED BY: BMB	
REVISOR:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151 UTILITY CONSTRUCTION PLANS ONLY	

PRIOR TO COMMENCING WORK ON ANY TRENCHLESS INSTALLATION, PROVIDE A DESIGN FOR THE TRENCHLESS INSTALLATION CERTIFIED BY AN ENGINEER LICENSED BY THE STATE OF NORTH CAROLINA, AS REQUIRED BY SUBARTICLE 1550-3(B) OF THE STANDARD SPECIFICATIONS.

UTILITY CONSTRUCTION
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FOR -S1-L- PROFILE, SEE SHEET UC-80 AND UC-81

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PRIOR TO COMMENCING WORK ON ANY TRENCHLESS INSTALLATION, PROVIDE A DESIGN FOR THE TRENCHLESS INSTALLATION CERTIFIED BY AN ENGINEER LICENSED BY THE STATE OF NORTH CAROLINA, AS REQUIRED BY SUBARTICLE 1550-3(B) OF THE STANDARD SPECIFICATIONS.

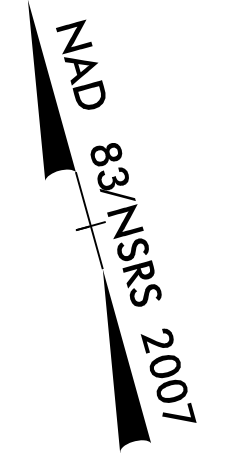
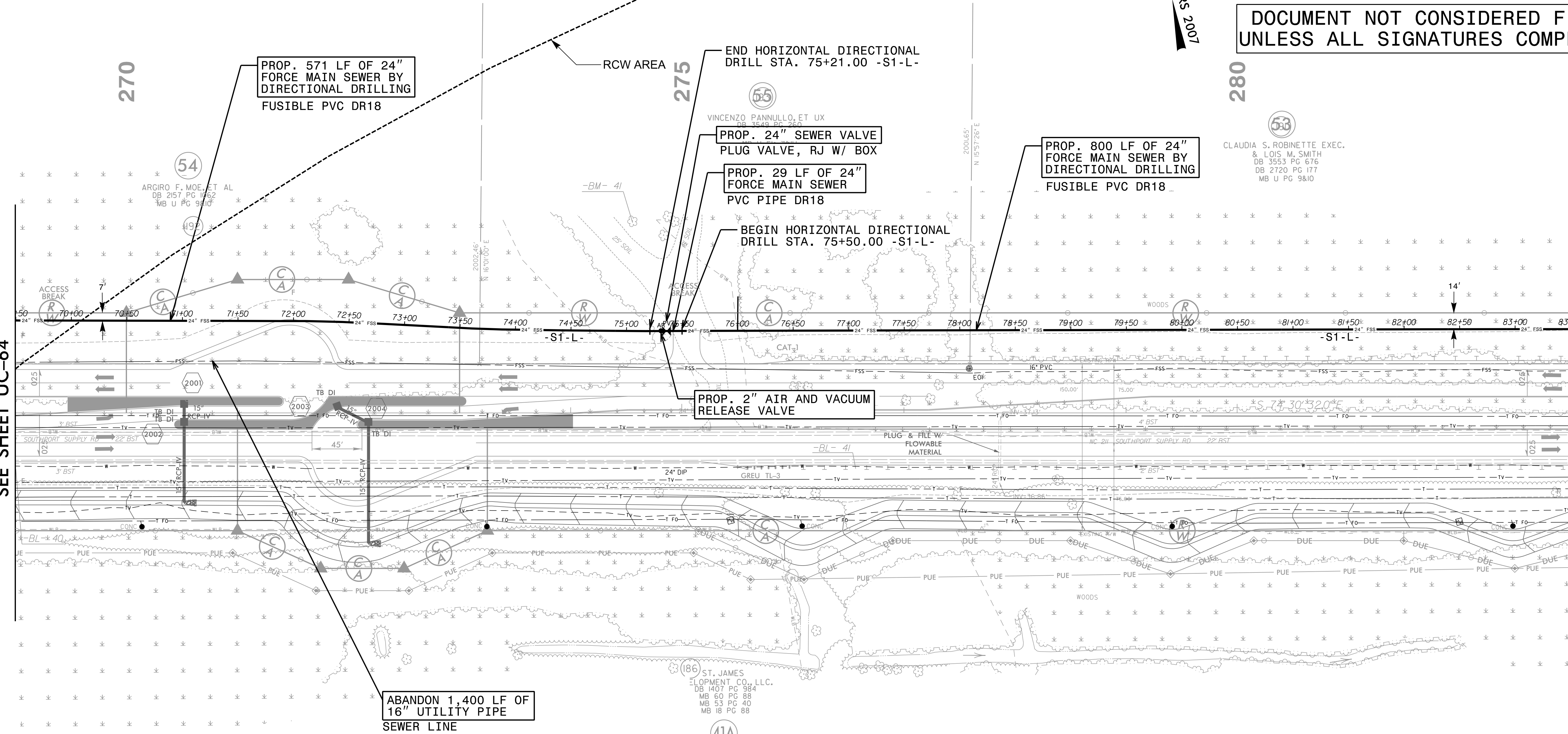
- 1. UPSIZED 16" FSS TO 24" FSS
- 2. ADDED BREAK IN HORIZONTAL DIRECTIONAL DRILL AT STATION 75+00

PROJECT REFERENCE NO.	SHEET NO.
R-5021	UC-65
DESIGNED BY: MEP	
DRAWN BY: MEP	
CHECKED BY: BMB	
APPROVED BY: BMB	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SECTION PHONE: (919) 707-6690 FAX: (919) 250-4151	
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UTILITY CONSTRUCTION
DOCUMENT NOT CONSIDERED FINAL
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MATCH LINE -L- STA 269+00.00
SEE SHEET UC-64

MATCH LINE -L- STA 283+00.00
SEE SHEET UC-66



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FOR -S1-L- PROFILE, SEE SHEET UC-81

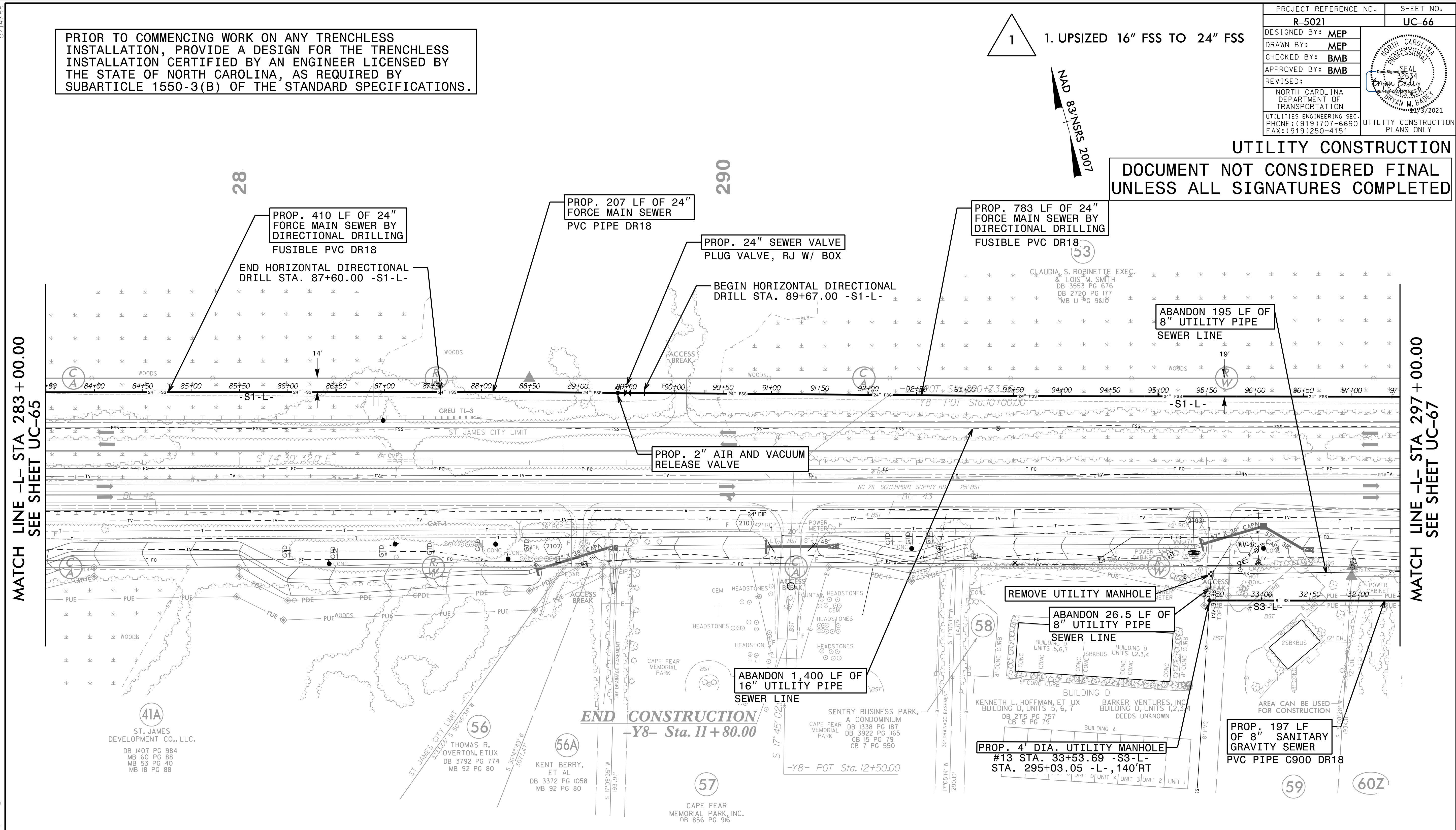
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PRIOR TO COMMENCING WORK ON ANY TRENCHLESS INSTALLATION, PROVIDE A DESIGN FOR THE TRENCHLESS INSTALLATION, CERTIFIED BY AN ENGINEER LICENSED BY THE STATE OF NORTH CAROLINA, AS REQUIRED BY SUBARTICLE 1550-3(B) OF THE STANDARD SPECIFICATIONS.

PROJECT REFERENCE NO.	SHEET NO.
R-5021	UC-66
DESIGNED BY: MEP	
DRAWN BY: MEP	
CHECKED BY: BMB	
APPROVED BY: BMB	
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



MATCH LINE -L- STA 283 + 00.00
SEE SHEET UC-65

MATCH LINE -L- STA 297 + 00.00
SEE SHEET UC-67

41A
ST. JAMES DEVELOPMENT CO., LLC.
DB 1407 PG 884
MB 60 PG 88
MB 53 PG 40
MB 18 PG 88

56
THOMAS R. OVERTON, ETUX
DB 3792 PG 774
MB 92 PG 80

56A
KENT BERRY, ET AL
DB 3372 PG 1058
MB 92 PG 80

57
CAPE FEAR MEMORIAL PARK, INC.
DB 856 PG 916

ABANDON 1,400 LF OF 16" UTILITY PIPE SEWER LINE
-Y8- Sta. 11+80.00
-Y8- POT Sta. 12+50.00

PROP. 4' DIA. UTILITY MANHOLE #13 STA. 33+53.69 -S3-L- STA. 295+03.05 -L-, 140'RT

PROP. 197 LF OF 8" SANITARY GRAVITY SEWER PVC PIPE C900 DR18

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FOR -S1-L- PROFILE, SEE SHEET UC-81 AND UC-82
FOR -S3-L- PROFILE, SEE SHEET UC-84

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 I:\3\2021\UC\Proj\NR-5021\ut-rdy\21_UC66_psh.dgn
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PROJECT REFERENCE NO.	SHEET NO.
R-5021	UC-67
DESIGNED BY: MEP	
DRAWN BY: MEP	
CHECKED BY: BMB	
APPROVED BY: BMB	
REVISER:	UTILITY CONSTRUCTION PLANS ONLY
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SECTION PHONE: (919) 707-6690 FAX: (919) 250-4151	

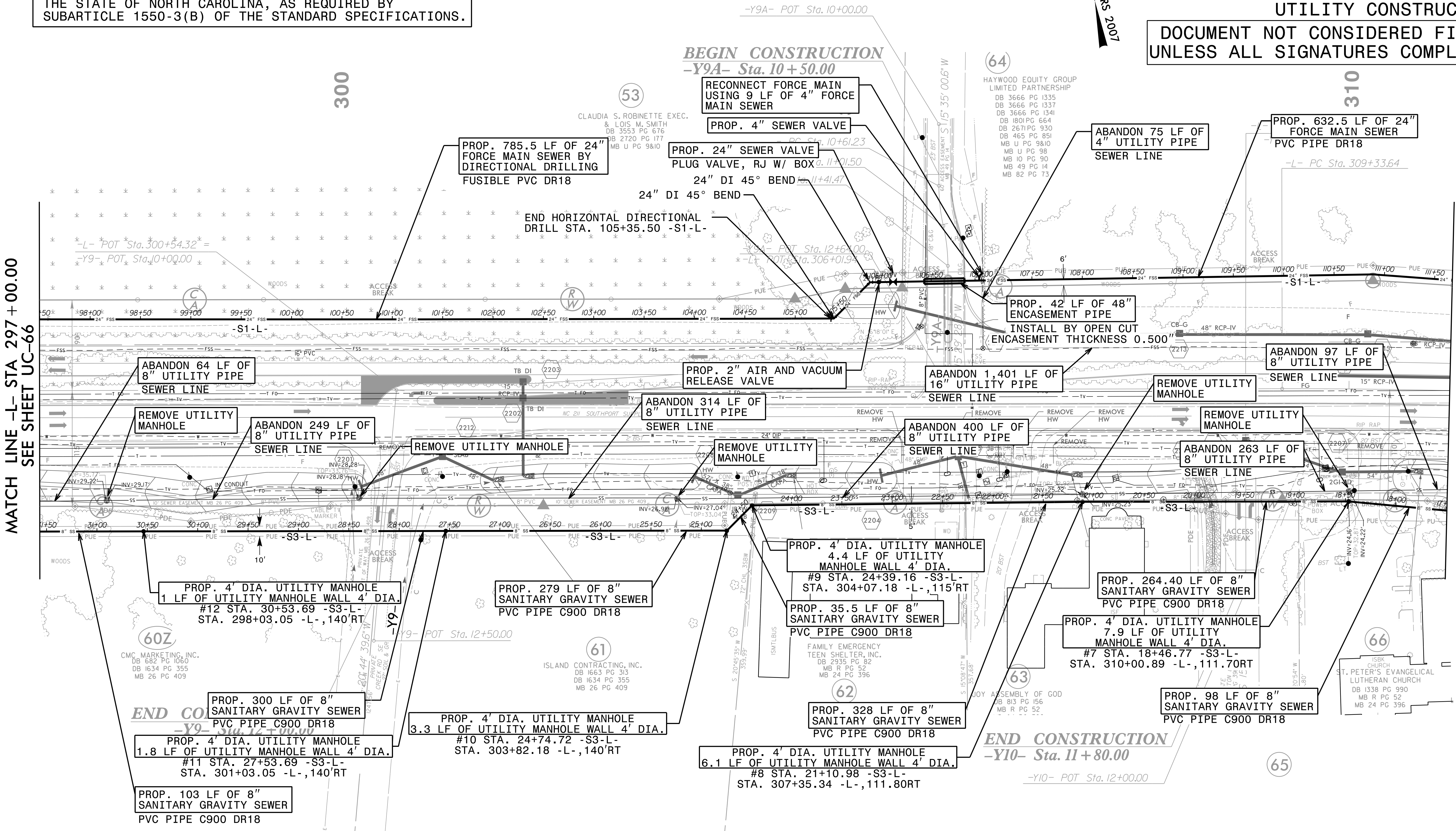
THE ESTIMATED QUANTITY OF DUCTILE IRON SEWER PIPE FITTING ON THIS PLAN SHEET IS 1510 POUNDS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.

PRIOR TO COMMENCING WORK ON ANY TRENCHLESS INSTALLATION, PROVIDE A DESIGN FOR THE TRENCHLESS INSTALLATION CERTIFIED BY AN ENGINEER LICENSED BY THE STATE OF NORTH CAROLINA, AS REQUIRED BY SUBARTICLE 1550-3(B) OF THE STANDARD SPECIFICATIONS.

1

1. UPSIZED 16" FSS TO 24" FSS
2. REMOVED DUPLICATE AIR RELEASE VALVE NEAR -L- STA. 309+00
3. UPDATED 4" TO BE ABANDONED FROM 84 LF TO 75 LF
4. RECONNECT FORCE MAIN
5. ADDED 42 LF OF 48" ENCASEMENT PIPE

UTILITY CONSTRUCTION
DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



MATCH LINE -L- STA 297 + 00.00
SEE SHEET UC-66

MATCH LINE -L- STA 311 + 00.00
SEE SHEET UC-68

60Z
CMC MARKETING, INC.
DB 682 PG 1060
DB 1634 PG 355
MB 26 PG 409

61
ISLAND CONTRACTING, INC.
DB 1663 PG 313
DB 1634 PG 355
MB 26 PG 409

62
FAMILY EMERGENCY
TEEN SHELTER, INC.
DB 2935 PG 82
MB R PG 52
MB 24 PG 396

63
JOY ASSEMBLY OF GOD
DB 813 PG 156
MB R PG 52

66
ST. PETER'S EVANGELICAL
LUTHERAN CHURCH
DB 1338 PG 990
MB R PG 52
MB 24 PG 396

FOR -S1-L- PROFILE, SEE SHEET UC-82
FOR -S3-L- PROFILE, SEE SHEET UC-84

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I:\3_2021\UC\Pro-0\NR-5021\util-0122_UC67_psh.dgn

THE ESTIMATED QUANTITY OF DUCTILE IRON SEWER PIPE FITTING ON THIS PLAN SHEET IS 1510 POUNDS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.

FOR -S1-L- PROFILE, SEE SHEET UC-82 AND UC-82A
 FOR -S3-L- PROFILE, SEE SHEET UC-84
 FOR -S4-L- PROFILE, SEE SHEET UC-85

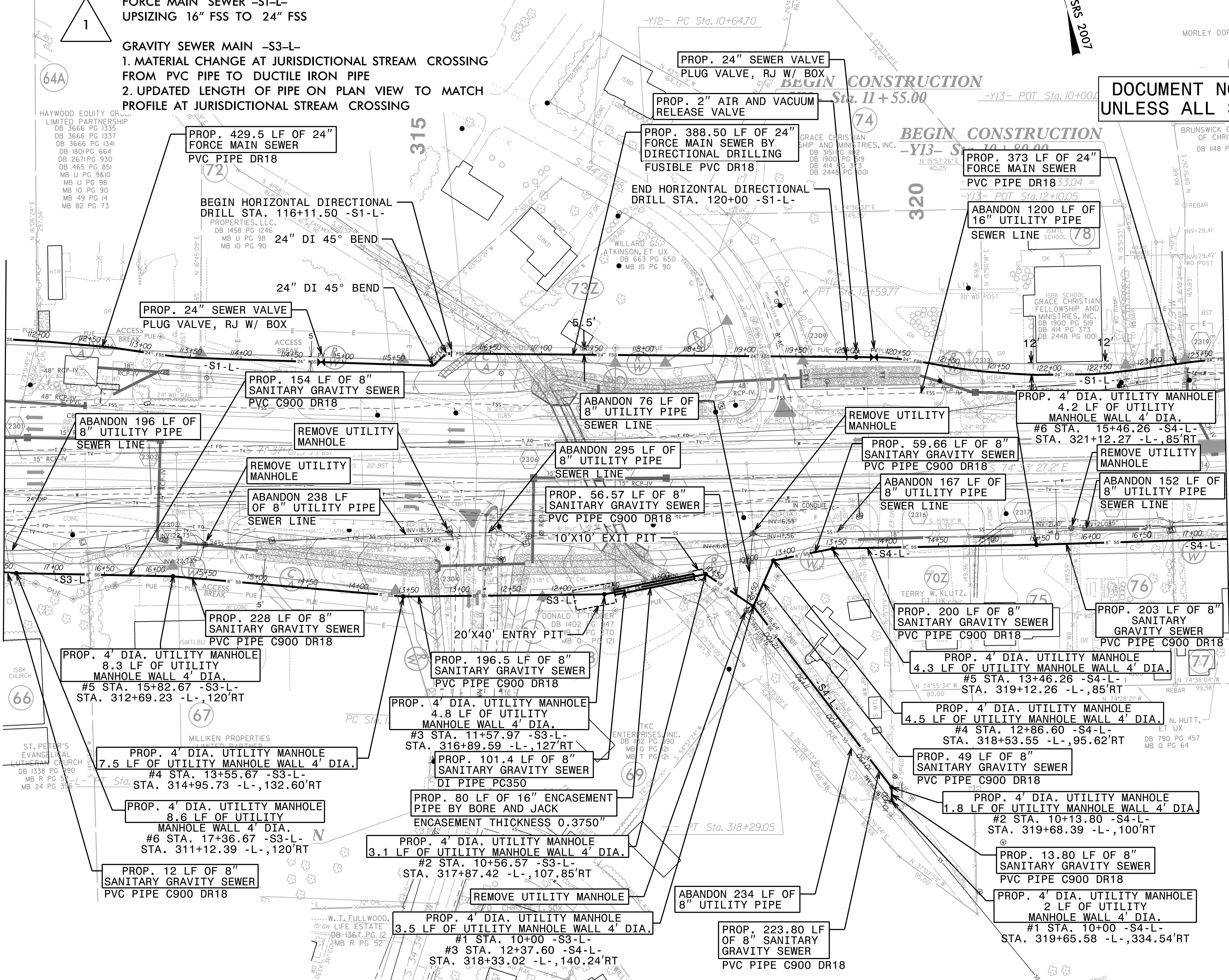
1
 FORCE MAIN SEWER -S1-L- UPSIZING 16" FSS TO 24" FSS

GRAVITY SEWER MAIN -S3-L-
 1. MATERIAL CHANGE AT JURISDICTIONAL STREAM CROSSING FROM PVC PIPE TO DUCTILE IRON PIPE
 2. UPDATED LENGTH OF PIPE ON PLAN VIEW TO MATCH PROFILE AT JURISDICTIONAL STREAM CROSSING

UTILITY CONSTRUCTION
 DOCUMENT NOT CONSIDERED FINAL
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MATCH LINE -L- STA 311+00.00
 SEE SHEET UC-67

MATCH LINE -L- STA 323+00.00
 SEE SHEET UC-69



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PROJECT REFERENCE NO.	SHEET NO.
R-5021	UC-69
DESIGNED BY: MEP	
DRAWN BY: MEP	
CHECKED BY: BMB	
APPROVED BY: BMB	
REVISER:	
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UTILITY CONSTRUCTION

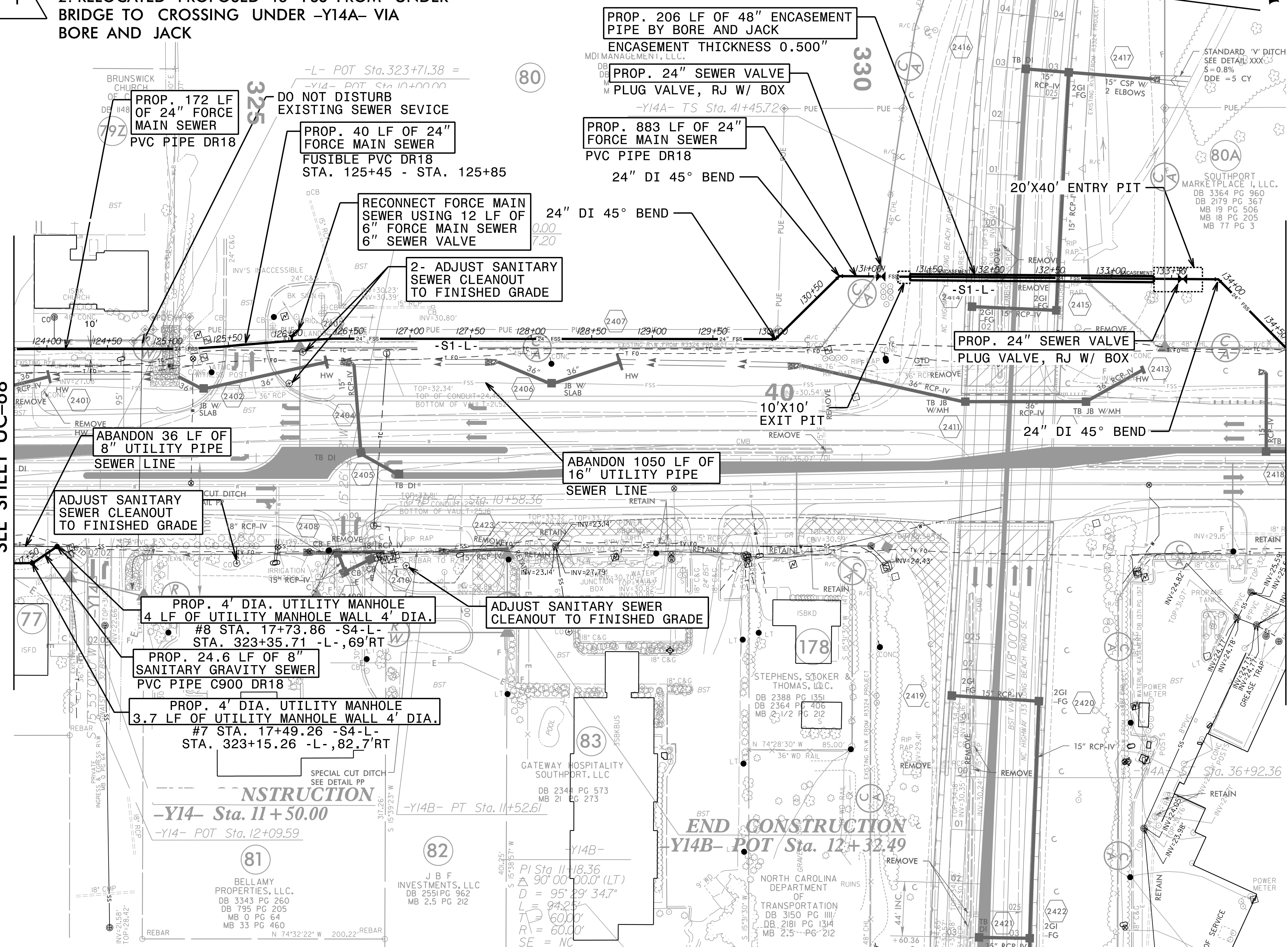
DOCUMENT NOT CONSIDERED FINAL
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THE ESTIMATED QUANTITY OF DUCTILE IRON SEWER PIPE FITTING ON THIS PLAN SHEET IS 3775 POUNDS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.

1. UPSIZED 16" FSS TO 24" FSS
2. RELOCATED PROPOSED 16" FSS FROM UNDER BRIDGE TO CROSSING UNDER -Y14A- VIA BORE AND JACK

MATCH LINE -L- STA 323 + 00.00
SEE SHEET UC-68

MATCH LINE -L- STA 333 + 50.00
SEE SHEET UC-70



MATCH LINE -Y14A- STA 35 + 50.00
SEE SHEET 35

5/14/99
I:\3_2021\UC\Proj\N-5021-ut-rl-0124_UC69_psh.dgn

FOR -S1-L- PROFILE, SEE SHEET UC-82A
FOR -S4-L- PROFILE, SEE SHEET UC-85

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PROJECT REFERENCE NO.	SHEET NO.
R-5021	UC-70
DESIGNED BY: MEP	
DRAWN BY: MEP	
CHECKED BY: BMB	
APPROVED BY: BMB	
REVISED BY:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SECTION PHONE: (919) 707-6690 FAX: (919) 250-4151	
UTILITY CONSTRUCTION PLANS ONLY	

UTILITY CONSTRUCTION

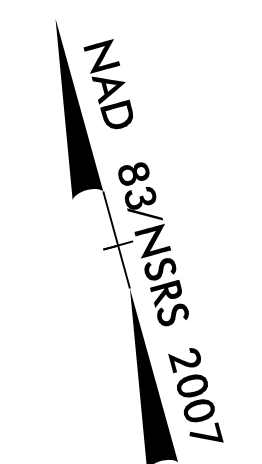
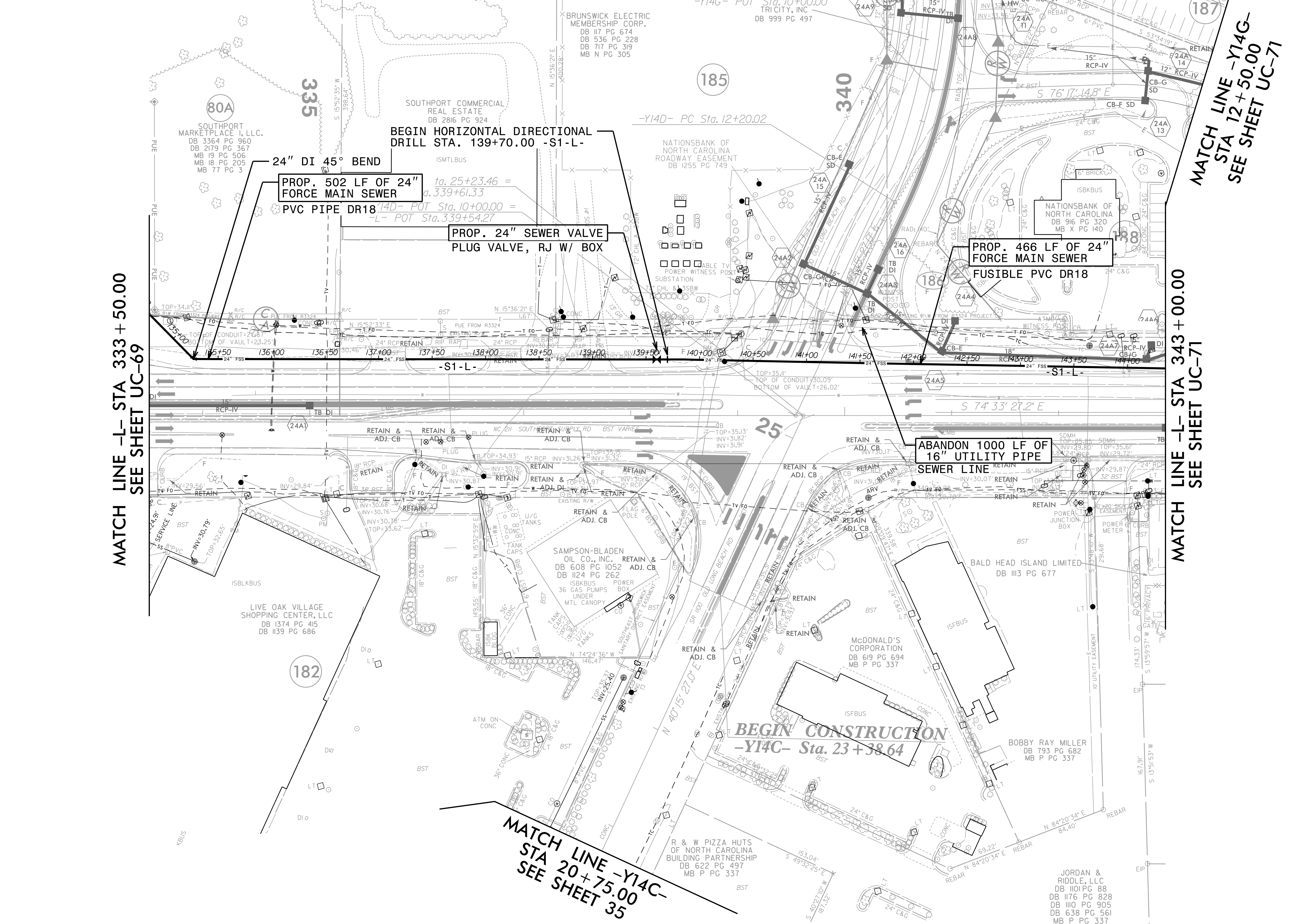
THE ESTIMATED QUANTITY OF DUCTILE IRON SEWER PIPE FITTING ON THIS PLAN SHEET IS 755 POUNDS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.

DO NOT DISTURB FENCE AROUND BRUNSWICK ELECTRIC PARCEL

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

MATCH LINE -Y14D- STA 14+50.00
SEE SHEET 36

1. UPSIZED 16" FSS TO 24" FSS
2. INCREASED ABANDON 16" FORCE MAIN SEWER BY 739 LF



FOR -S1-L- PROFILE, SEE SHEET UC-82A
FOR -S5-L- PROFILE, SEE SHEET UC-85
FOR -S6-L- PROFILE, SEE SHEET UC-85

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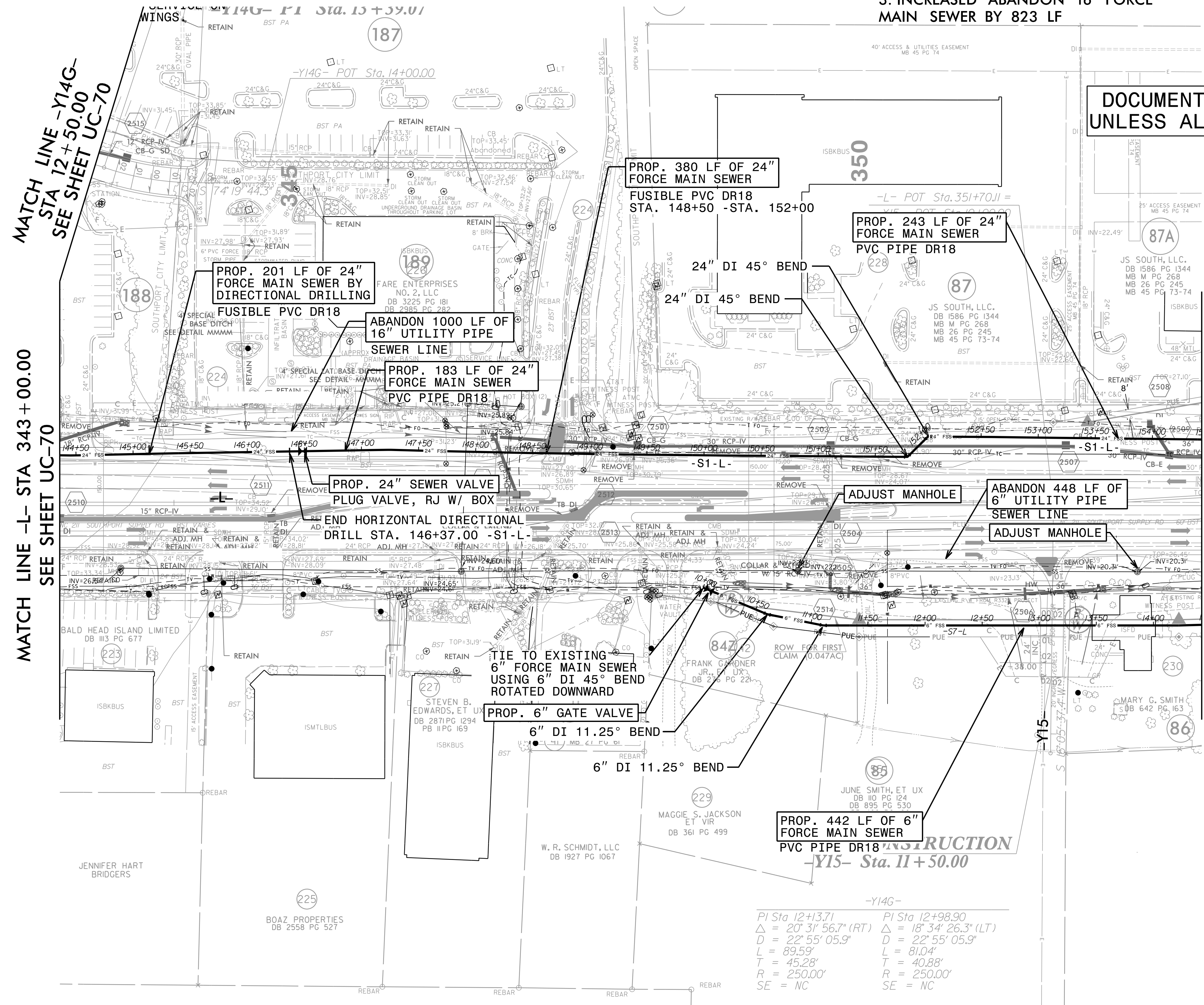
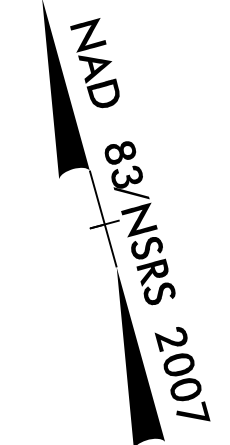
PROJECT REFERENCE NO.	SHEET NO.
R-5021	UC-71
DESIGNED BY: MEP	
DRAWN BY: MEP	
CHECKED BY: BMB	
APPROVED BY: BMB	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	
UTILITY CONSTRUCTION PLANS ONLY	

THE ESTIMATED QUANTITY OF DUCTILE IRON SEWER PIPE FITTING ON THIS PLAN SHEET IS 1510 POUNDS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.

1. UPSIZED 16" FSS TO 24" FSS
2. INCREASED SEWER LINE TO BE RELOCATED BY 828 LF
3. INCREASED ABANDON 16" FORCE MAIN SEWER BY 823 LF

UTILITY CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



MATCH LINE -Y14G- STA 12+50.00 SEE SHEET UC-70

MATCH LINE -L- STA 343+00.00 SEE SHEET UC-70

MATCH LINE -L- STA 353+00.00 SEE SHEET UC-72

PI Sta 12+13.71	PI Sta 12+98.90
Δ = 20' 31" 56.7" (RT)	Δ = 18' 34" 26.3" (LT)
D = 22' 55" 05.9"	D = 22' 55" 05.9"
L = 89.59'	L = 81.04'
T = 45.28'	T = 40.88'
R = 250.00'	R = 250.00'
SE = NC	SE = NC

FOR -S1-L- PROFILE, SEE SHEET UC-82A & 82B
FOR -S10-L- PROFILE, SEE SHEET UC-87

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Raleigh, North Carolina 27615-3960
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I:\3\2021\UC\Proj\N-5021-ut-rdy25-UC71.psthdgn
11:05:11 AM 5/14/2021

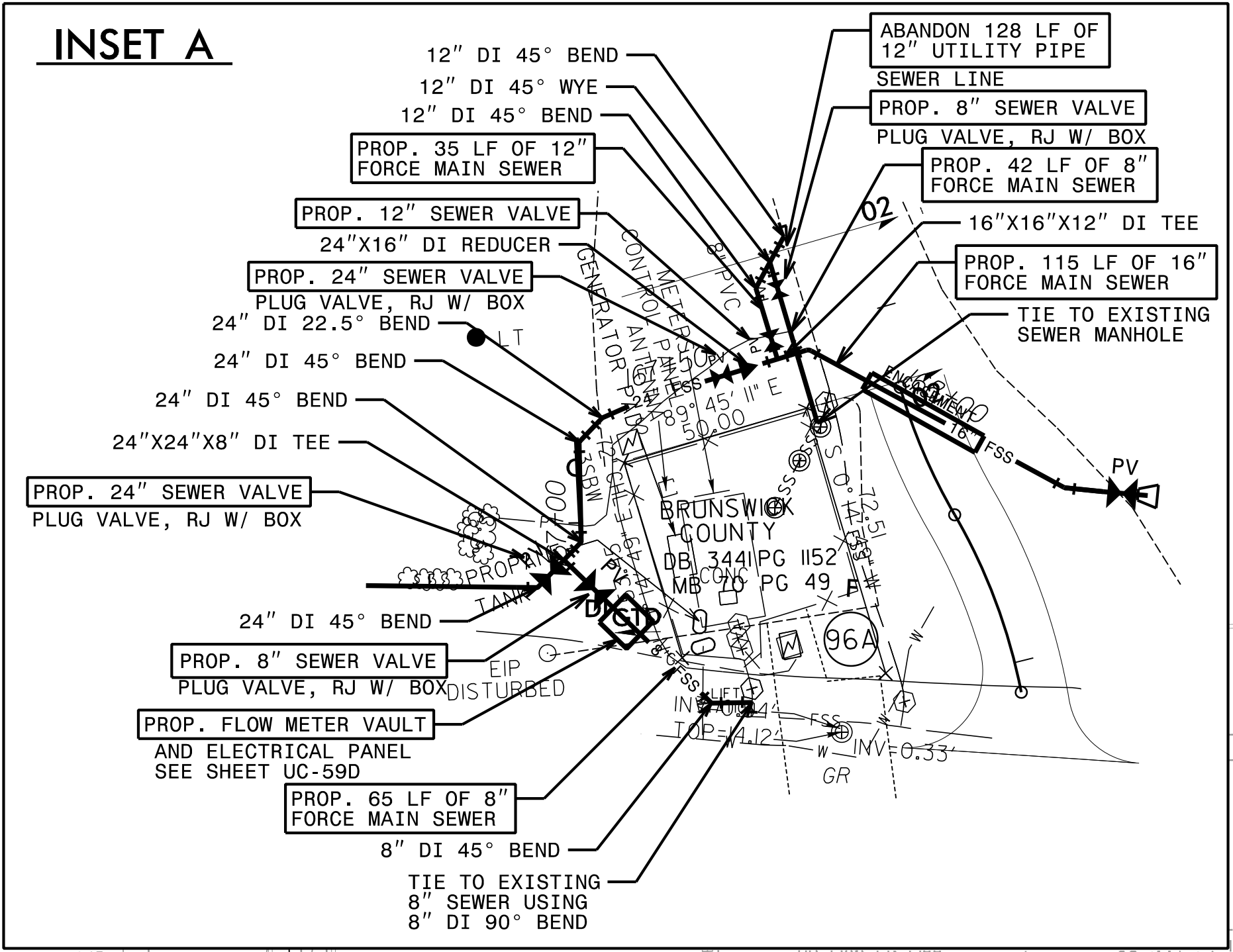
PROJECT REFERENCE NO. R-5021	SHEET NO. UC-72
DESIGNED BY: MEP	
DRAWN BY: MEP	
CHECKED BY: BMB	
APPROVED BY: BMB	
REVISED:	NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151
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UTILITY CONSTRUCTION
DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

FOR -S1-L- PROFILE, SEE SHEET UC-82B
 FOR -S7-L- PROFILE, SEE SHEET UC-86
 FOR -S8-L- PROFILE, SEE SHEET UC-87

THE ESTIMATED QUANTITY OF DUCTILE IRON SEWER PIPE FITTING ON THIS PLAN SHEET IS 9815 POUNDS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.

- 1
1. UPSIZED 16" FSS TO 24" FSS
 2. REMOVED DOGHOUSE MANHOLE FOR -S8-L- REPLACED WITH CUT-IN MANHOLE

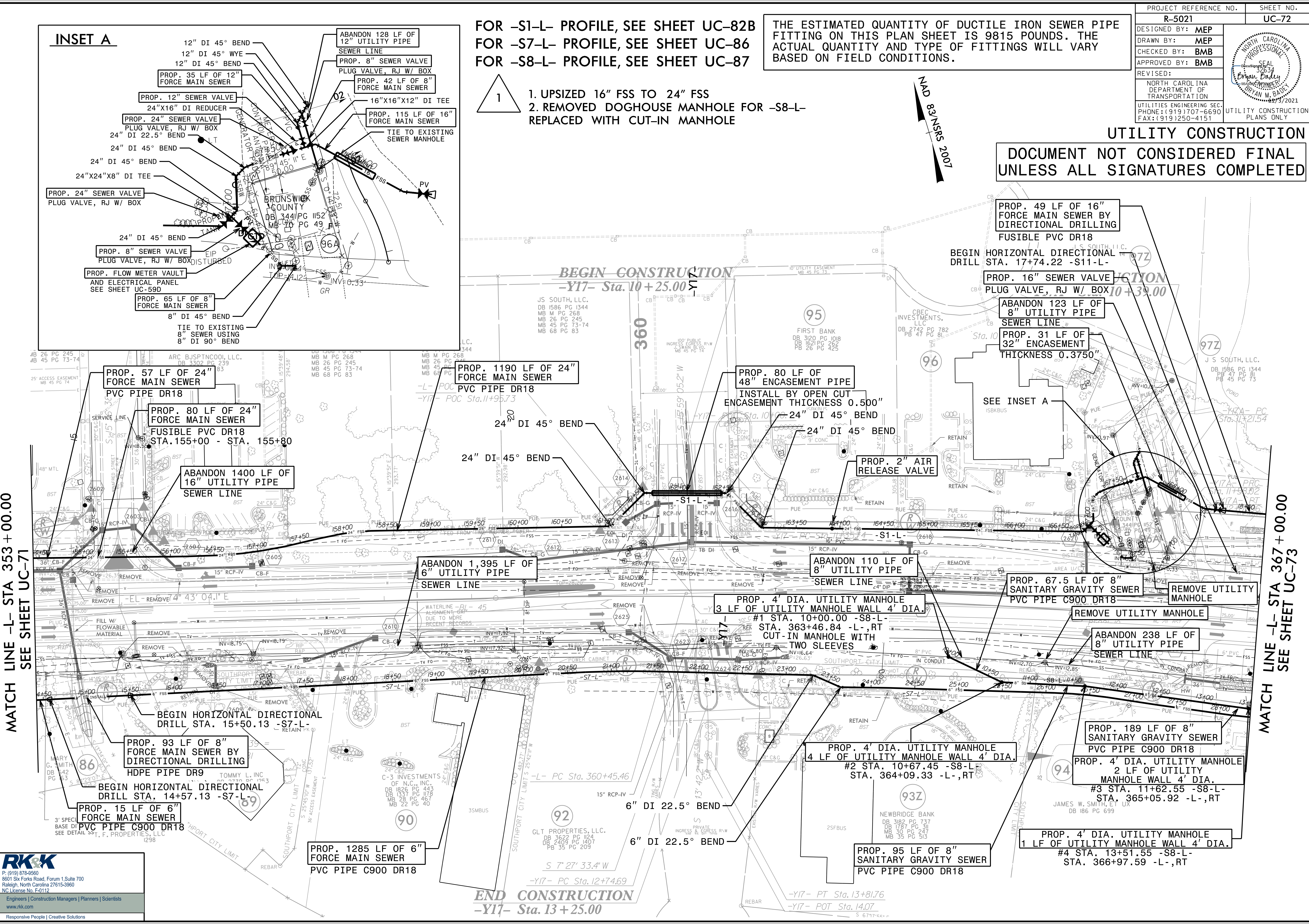


MATCH LINE -L- STA 353 + 00.00
SEE SHEET UC-71

MATCH LINE -L- STA 367 + 00.00
SEE SHEET UC-73

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PROJECT REFERENCE NO.	SHEET NO.
R-5021	UC-73
DESIGNED BY: MEP	
DRAWN BY: MEP	
CHECKED BY: BMB	
APPROVED BY: BMB	
REVISOR:	UTILITIES ENGINEERING SEC.
	PHONE: (919) 707-6690
	FAX: (919) 250-4151
	UTILITY CONSTRUCTION PLANS ONLY

THE ESTIMATED QUANTITY OF DUCTILE IRON SEWER PIPE FITTING ON THIS PLAN SHEET IS 4080 POUNDS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.

PRIOR TO COMMENCING WORK ON ANY TRENCHLESS INSTALLATION, PROVIDE A DESIGN FOR THE TRENCHLESS INSTALLATION CERTIFIED BY AN ENGINEER LICENSED BY THE STATE OF NORTH CAROLINA, AS REQUIRED BY SUBARTICLE 1550-3(B) OF THE STANDARD SPECIFICATIONS.

1. FORCE MAIN SEWER -S1-L- RELOCATED FLOW METER VAULT TO SHEET UC-72
2. FORCE MAIN SEWER -S7-L- LOWERED THE CROSSING DEPTH BELOW DUTCHMANS CREEK FROM 5.3' TO 10' INCREASED LENGTH OF TRENCHLESS INSTALL BY 33 LF

NOTES.

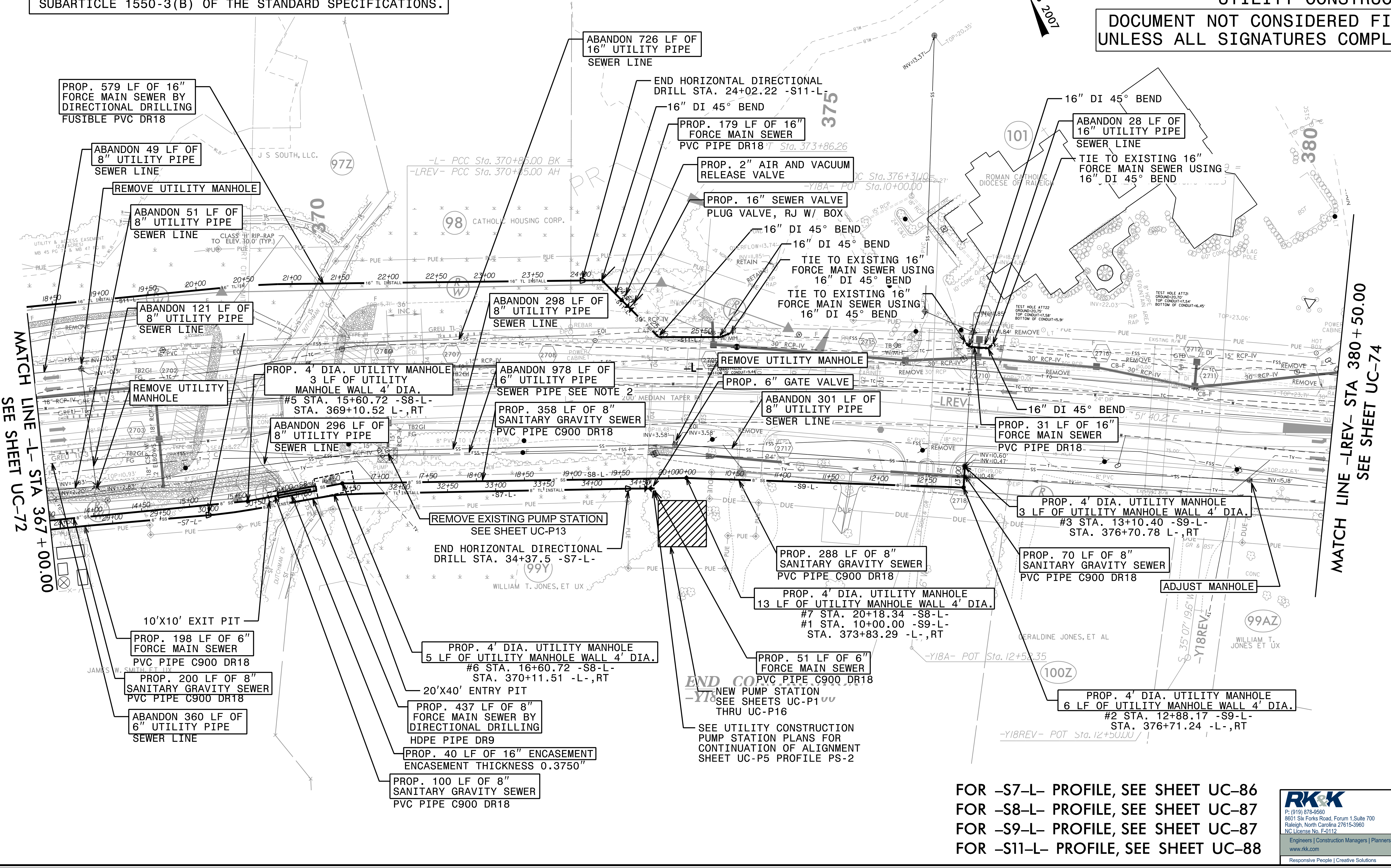
1. EXISTING 6" FSS IS NOT IN SERVICE BUT UNDER PRESSURE ACCORDING TO UTILITY OWNER

UTILITY CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

5/14/99

I:\3_2021\UC\Projo\NR-5021\ut-rc\q27 UC73_osh.dgn



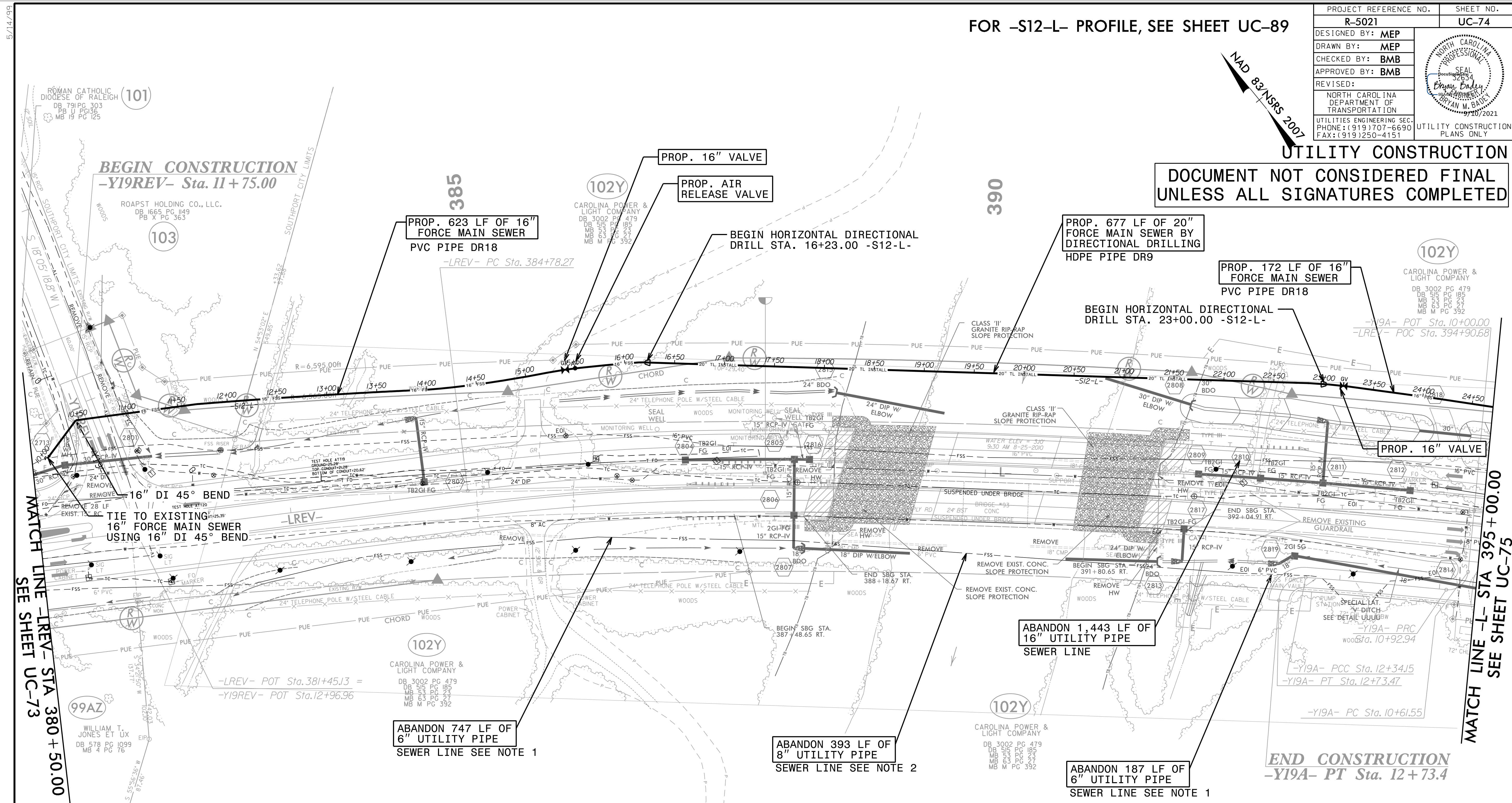
FOR -S7-L- PROFILE, SEE SHEET UC-86
FOR -S8-L- PROFILE, SEE SHEET UC-87
FOR -S9-L- PROFILE, SEE SHEET UC-87
FOR -S11-L- PROFILE, SEE SHEET UC-88



FOR -S12-L- PROFILE, SEE SHEET UC-89

PROJECT REFERENCE NO. R-5021	SHEET NO. UC-74
DESIGNED BY: MEP	
DRAWN BY: MEP	
CHECKED BY: BMB	
APPROVED BY: BMB	
REVISER:	NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151
UTILITY CONSTRUCTION PLANS ONLY	

UTILITY CONSTRUCTION
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THE ESTIMATED QUANTITY OF DUCTILE IRON SEWER PIPE FITTING ON THIS PLAN SHEET IS 680 POUNDS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.

PRIOR TO COMMENCING WORK ON ANY TRENCHLESS INSTALLATION, PROVIDE A DESIGN FOR THE TRENCHLESS INSTALLATION CERTIFIED BY AN ENGINEER LICENSED BY THE STATE OF NORTH CAROLINA, AS REQUIRED BY SUBARTICLE 1550-3(B) OF THE STANDARD SPECIFICATIONS.

- NOTES.
- EXISTING 6" FSS IS NOT IN SERVICE BUT UNDER PRESSURE ACCORDING TO UTILITY OWNER
 - EXISTING 8" FSS IS NOT IN SERVICE BUT UNDER PRESSURE ACCORDING TO UTILITY OWNER



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9/8/2021 UC-Proj\N\5021\UC-74-pshd.dgn

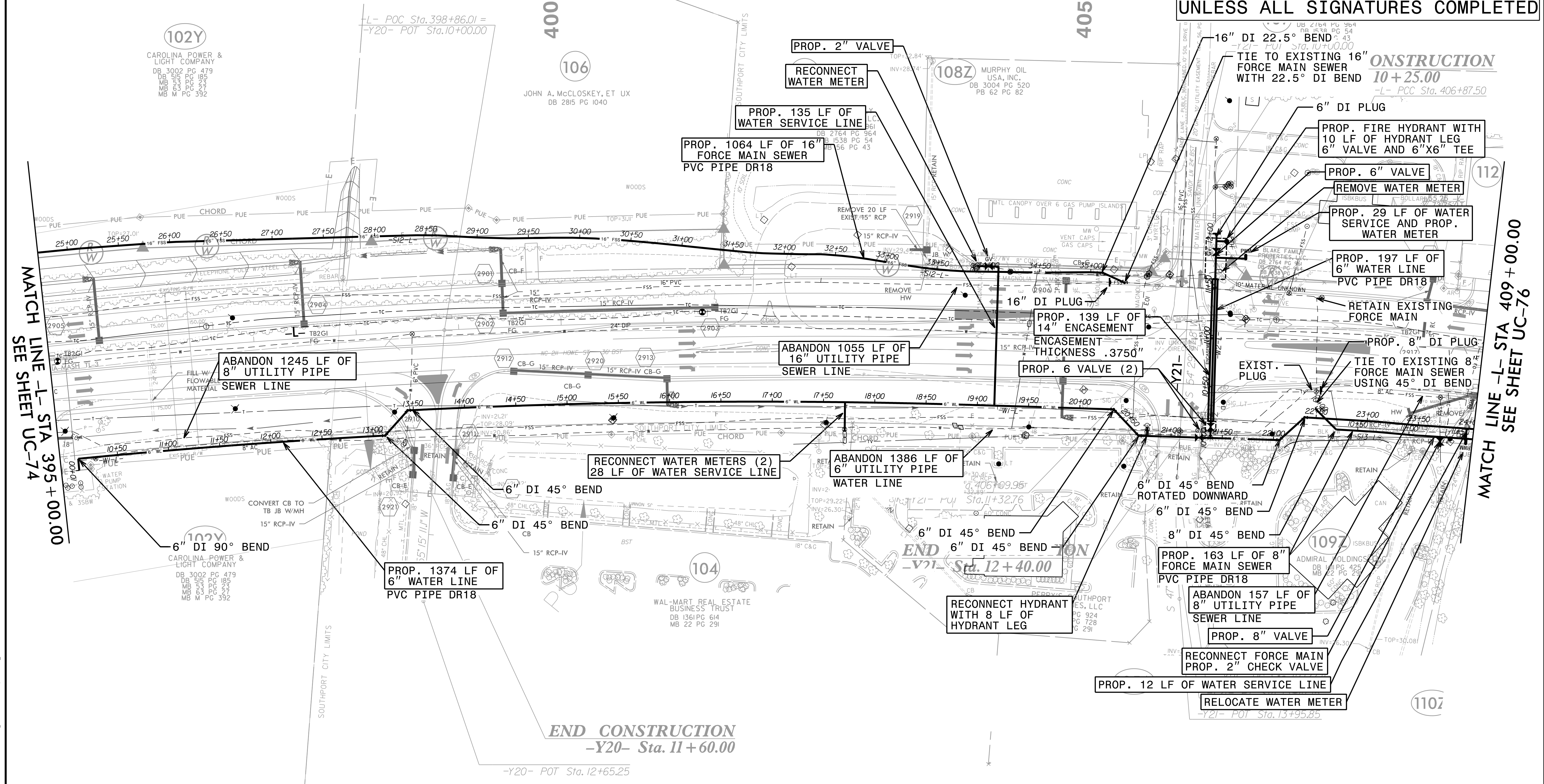
PROJECT REFERENCE NO.	SHEET NO.
R-5021	UC-75
DESIGNED BY: MEP	
DRAWN BY: MEP	
CHECKED BY: BMB	
APPROVED BY: BMB	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151 UTILITY CONSTRUCTION PLANS ONLY	

THE ESTIMATED QUANTITY OF DUCTILE IRON SEWER PIPE FITTING ON THIS PLAN SHEET IS 820 POUNDS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.

THE ESTIMATED QUANTITY OF DUCTILE IRON WATER PIPE FITTING ON THIS PLAN SHEET IS 845 POUNDS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.

UTILITY CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



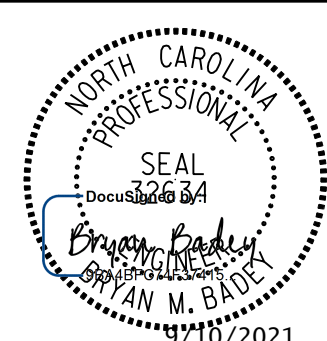
MATCH LINE -L- STA 395 + 00.00 SEE SHEET UC-74

MATCH LINE -L- STA 409 + 00.00 SEE SHEET UC-76

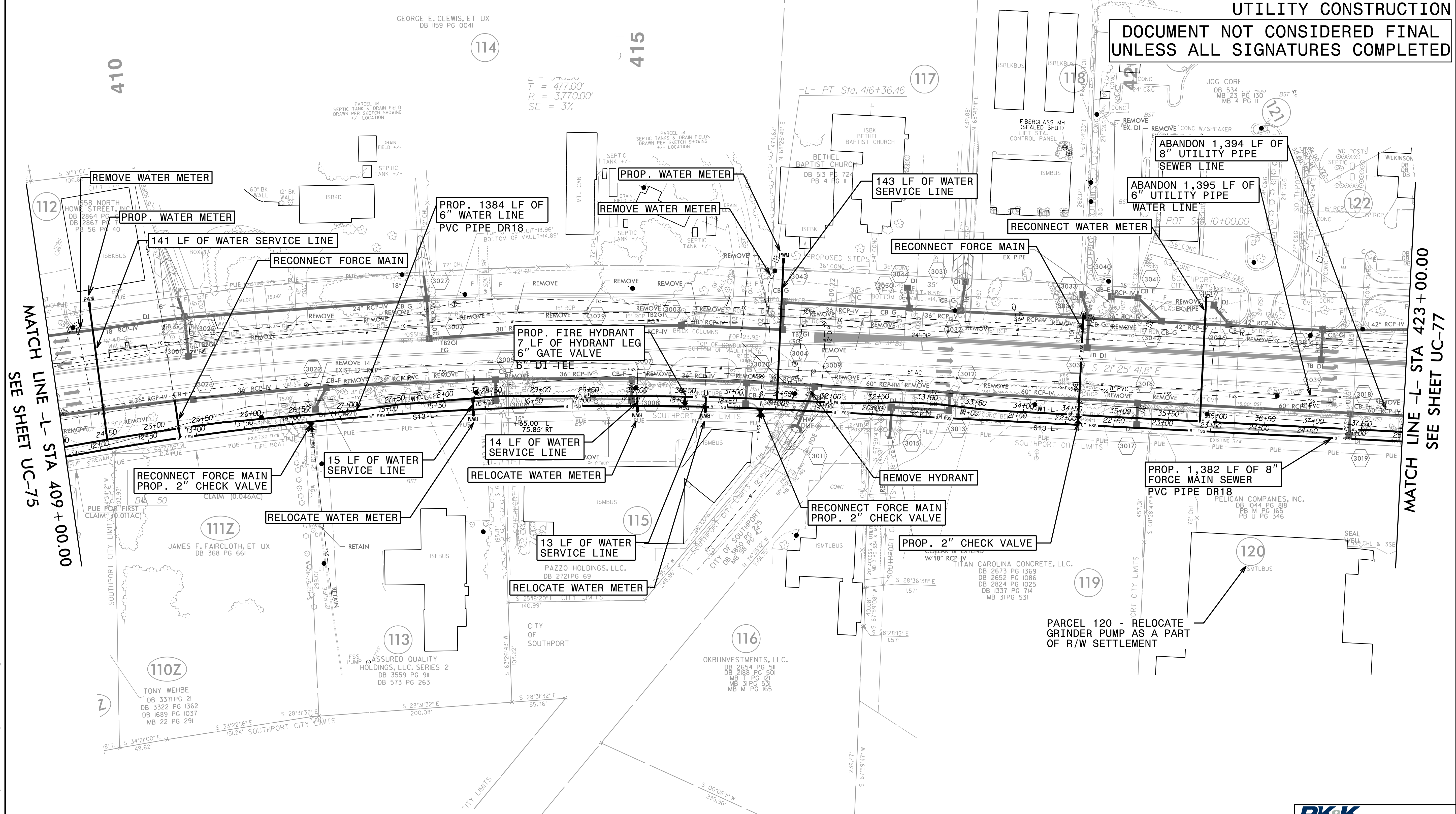
FOR -S12-L- PROFILE, SEE SHEET UC-89
 FOR -W1-L- PROFILE, SEE SHEET UC-92
 FOR -W2-L- PROFILE, SEE SHEET UC-93

5/14/99
 9/9/2021 UC:\Proo\NR-5021\ut-r-d\29_UC75_psh.dgn
 Utilities\Engineering\BMB

THE ESTIMATED QUANTITY OF DUCTILE IRON WATER PIPE FITTING ON THIS PLAN SHEET IS 425 POUNDS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.

PROJECT REFERENCE NO.	SHEET NO.
R-5021	UC-76
DESIGNED BY: MEP	
DRAWN BY: MEP	
CHECKED BY: BMB	
APPROVED BY: BMB	
REVISED:	
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UTILITY CONSTRUCTION
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UNLESS ALL SIGNATURES COMPLETED



MATCH LINE -L- STA 409 + 00.00
 SEE SHEET UC-75

MATCH LINE -L- STA 423 + 00.00
 SEE SHEET UC-77

FOR -S13-L- PROFILE, SEE SHEET UC-90
 FOR -W1-L- PROFILE, SEE SHEET UC-92 AND UC-93



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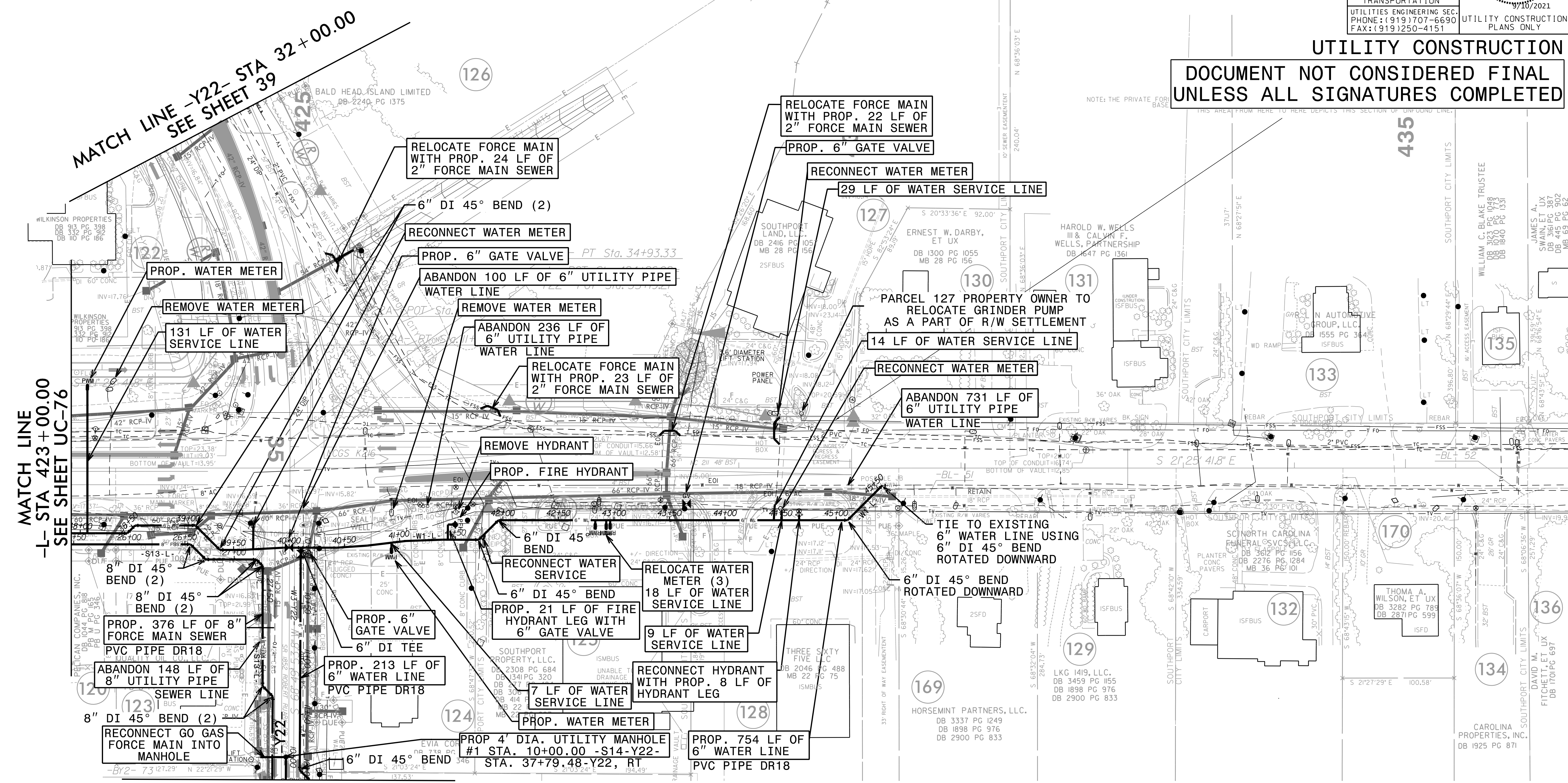
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 9/9/2021 UC-Proj\NR-5021-ut-l-rd\30_UC76_psh.dgn
 Utilities Engineering Department

PROJECT REFERENCE NO.	SHEET NO.
R-5021	UC-77
DESIGNED BY: MEP	
DRAWN BY: MEP	
CHECKED BY: BMB	
APPROVED BY: BMB	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SECTION PHONE: (919) 707-6690 FAX: (919) 250-4151	
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NAD 83/NSRS 2007



MATCH LINE -Y22- STA 32+00.00
SEE SHEET 39

MATCH LINE
-L- STA 423+00.00
SEE SHEET UC-76

MATCH LINE -Y22- STA 38+00.00
SEE SHEET UC-78

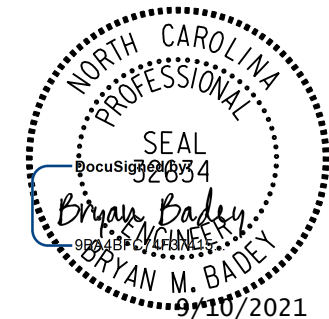
THE ESTIMATED QUANTITY OF DUCTILE IRON SEWER PIPE FITTING ON THIS PLAN SHEET IS 785 POUNDS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.

THE ESTIMATED QUANTITY OF DUCTILE IRON WATER PIPE FITTING ON THIS PLAN SHEET IS 950 POUNDS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.

FOR -S13-L- PROFILE, SEE SHEET UC-90
FOR -S14-Y22- PROFILE, SEE SHEET UC-91
FOR -W1-L- PROFILE, SEE SHEET UC-93
FOR -W3-Y22- PROFILE, SEE SHEET UC-93

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9/8/2021 UC-Proj.NP-5021-ut-rdy31 UC77 -psh.dgn

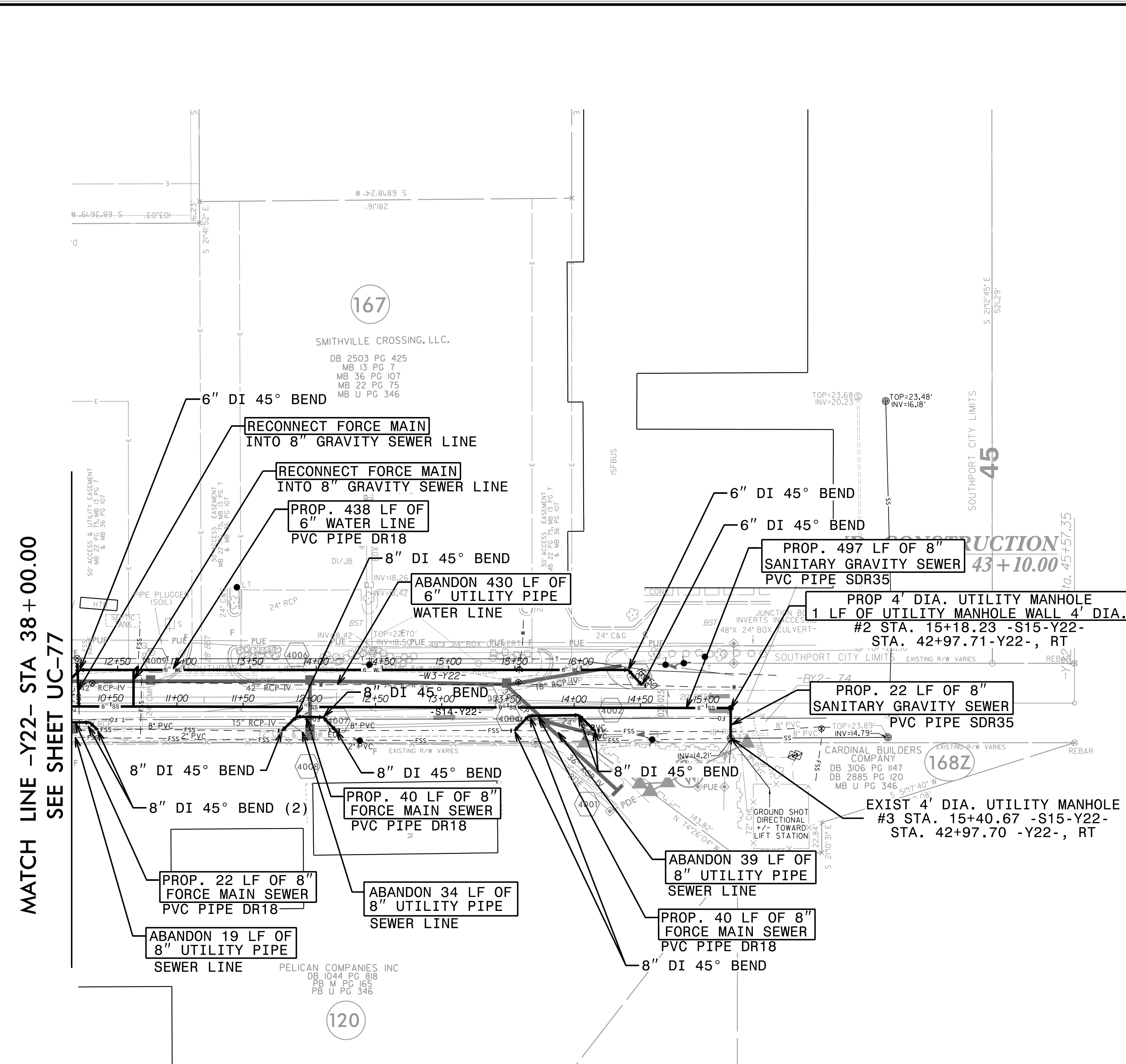
PROJECT REFERENCE NO.	SHEET NO.
R-5021	UC-78
DESIGNED BY: MEP	
DRAWN BY: MEP	
CHECKED BY: BMB	
APPROVED BY: BMB	
REVISER:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SECTION PHONE: (919) 707-6690 FAX: (919) 250-4151	
UTILITY CONSTRUCTION PLANS ONLY	

NAD 83 NSRS 2007

UTILITY CONSTRUCTION
DOCUMENT NOT CONSIDERED FINAL
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THE ESTIMATED QUANTITY OF DUCTILE IRON SEWER PIPE FITTING ON THIS PLAN SHEET IS 880 POUNDS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.

THE ESTIMATED QUANTITY OF DUCTILE IRON WATER PIPE FITTING ON THIS PLAN SHEET IS 375 POUNDS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.



MATCH LINE -Y22- STA 38 + 00.00
 SEE SHEET UC-77

FOR -S14-Y22- PROFILE, SEE SHEET UC-91
 FOR -W3-Y22- PROFILE, SEE SHEET UC-93



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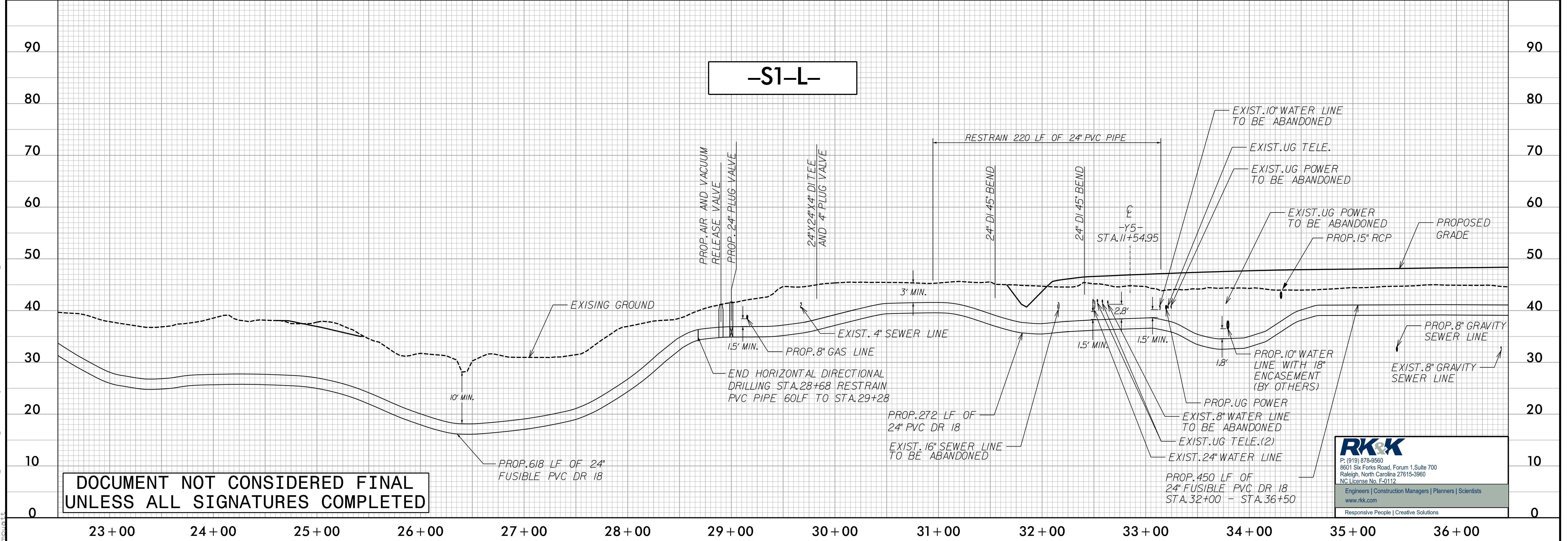
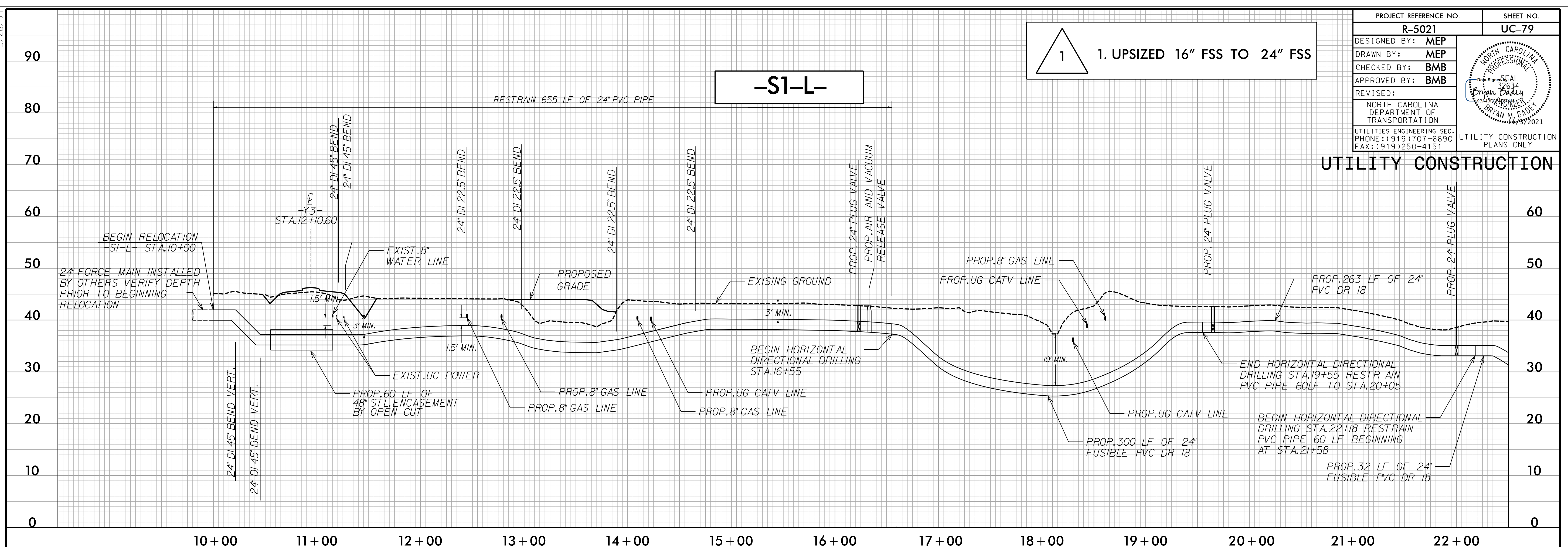
5/28/99

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1. UPSIZED 16" FSS TO 24" FSS

PROJECT REFERENCE NO. R-5021	SHEET NO. UC-79
DESIGNED BY: MEP	
DRAWN BY: MEP	
CHECKED BY: BMB	
APPROVED BY: BMB	
REVISED:	NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
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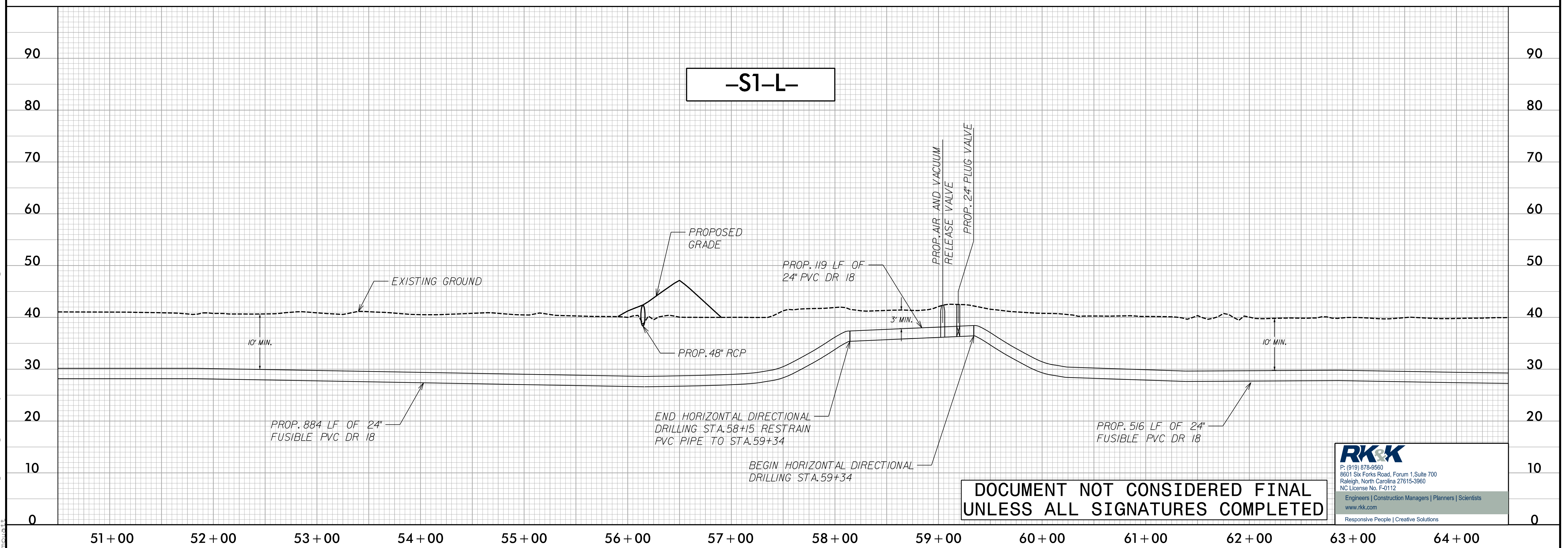
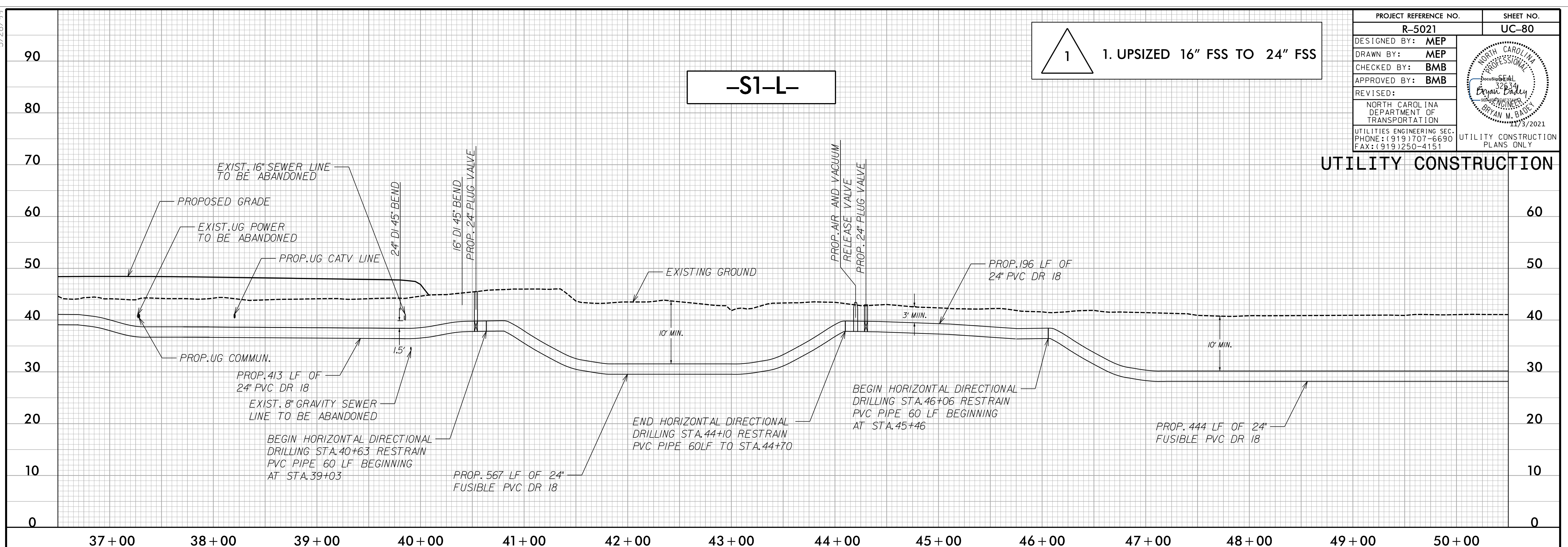
5/28/21

I:\3\2021\Utilities\Engineering\UC\Proj\NR-5021\ut-pf1 UC80_psh.dgn

1 1. UPSIZED 16" FSS TO 24" FSS

PROJECT REFERENCE NO. R-5021	SHEET NO. UC-80
DESIGNED BY: MEP	
DRAWN BY: MEP	
CHECKED BY: BMB	
APPROVED BY: BMB	
REVISID:	
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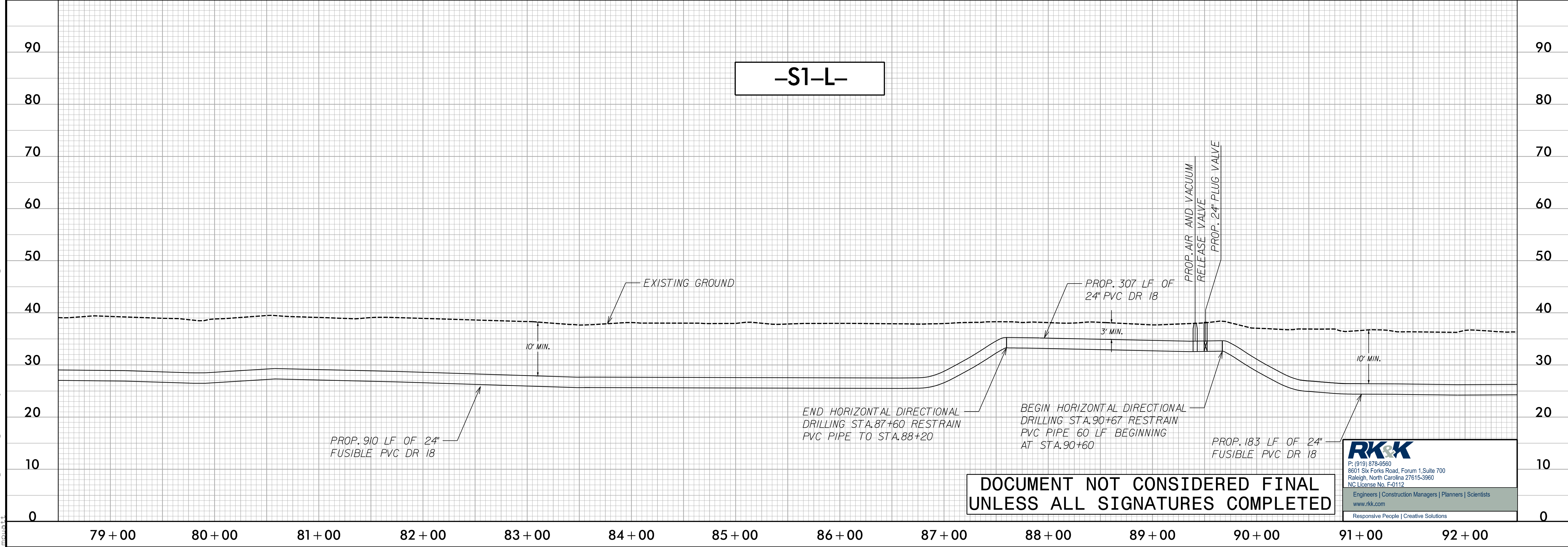
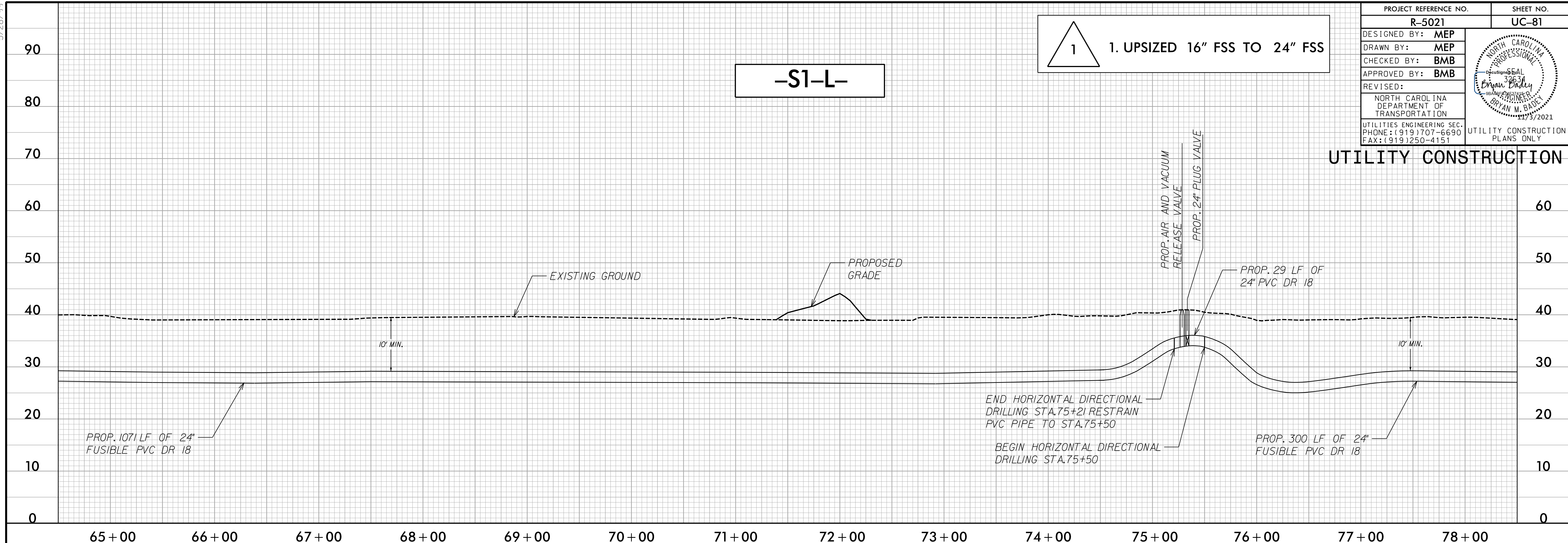
5/28/21

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1 1. UPSIZED 16" FSS TO 24" FSS

PROJECT REFERENCE NO. R-5021	SHEET NO. UC-81
DESIGNED BY: MEP	
DRAWN BY: MEP	
CHECKED BY: BMB	
APPROVED BY: BMB	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	
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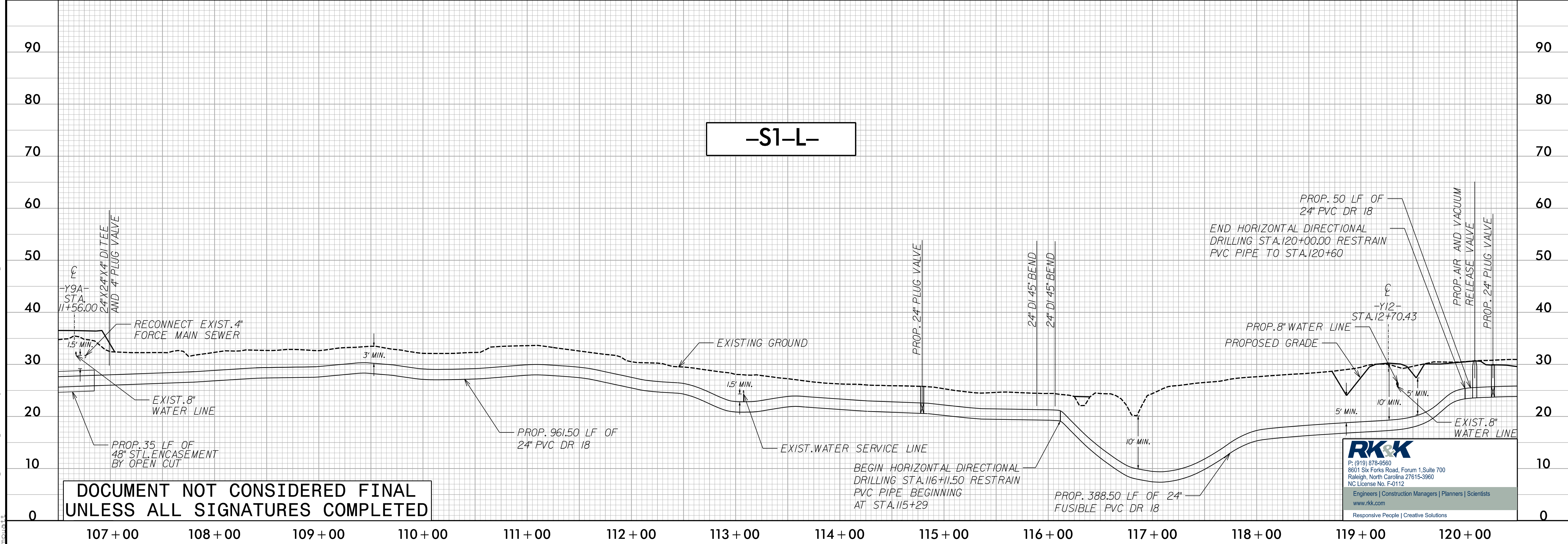
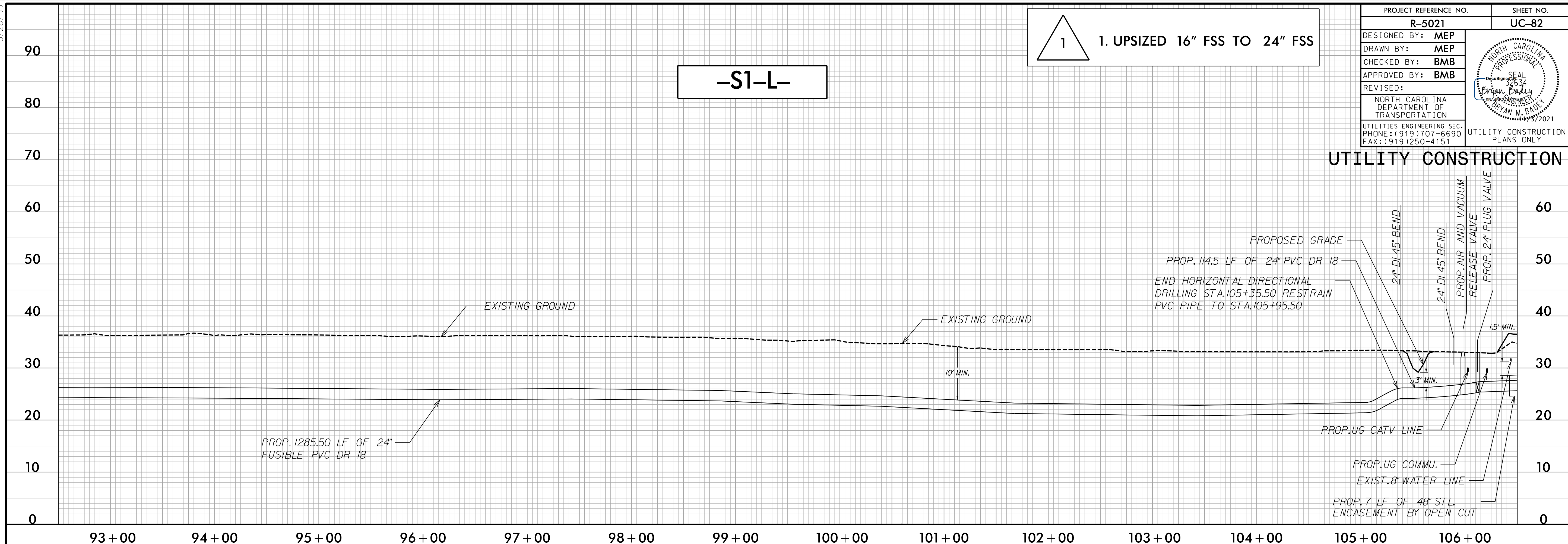
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1 1. UPSIZED 16" FSS TO 24" FSS

PROJECT REFERENCE NO. R-5021	SHEET NO. UC-82
DESIGNED BY: MEP	
DRAWN BY: MEP	
CHECKED BY: BMB	
APPROVED BY: BMB	
REVISER:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
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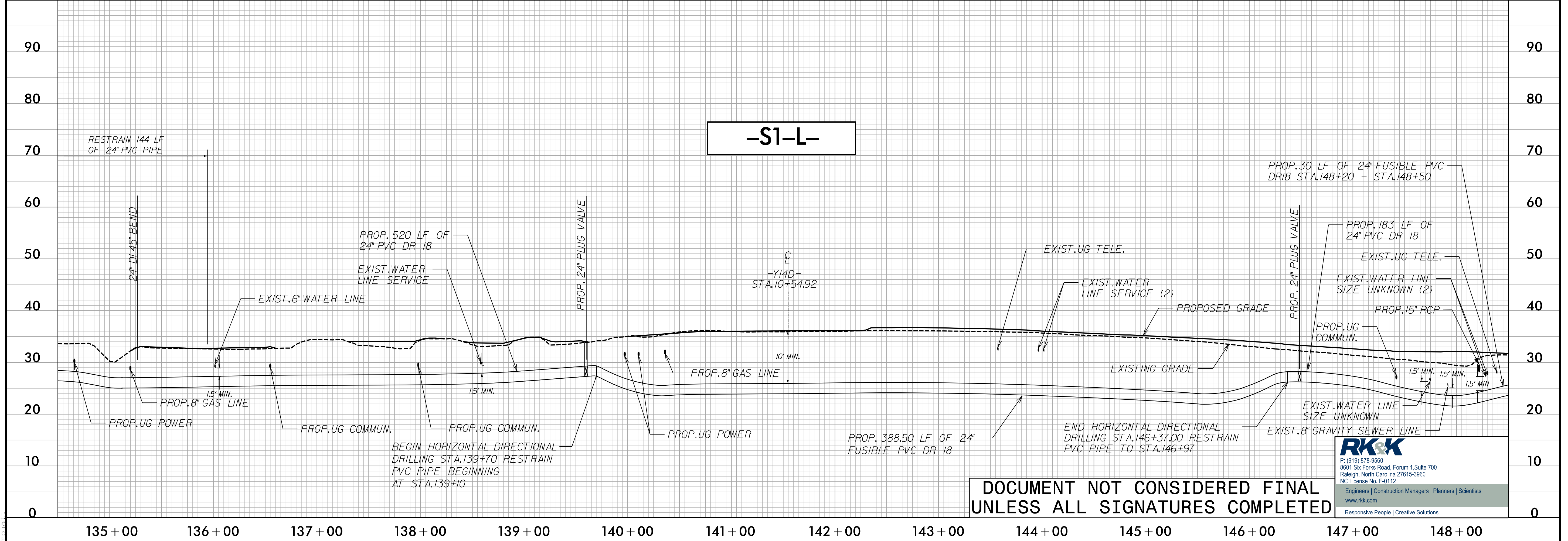
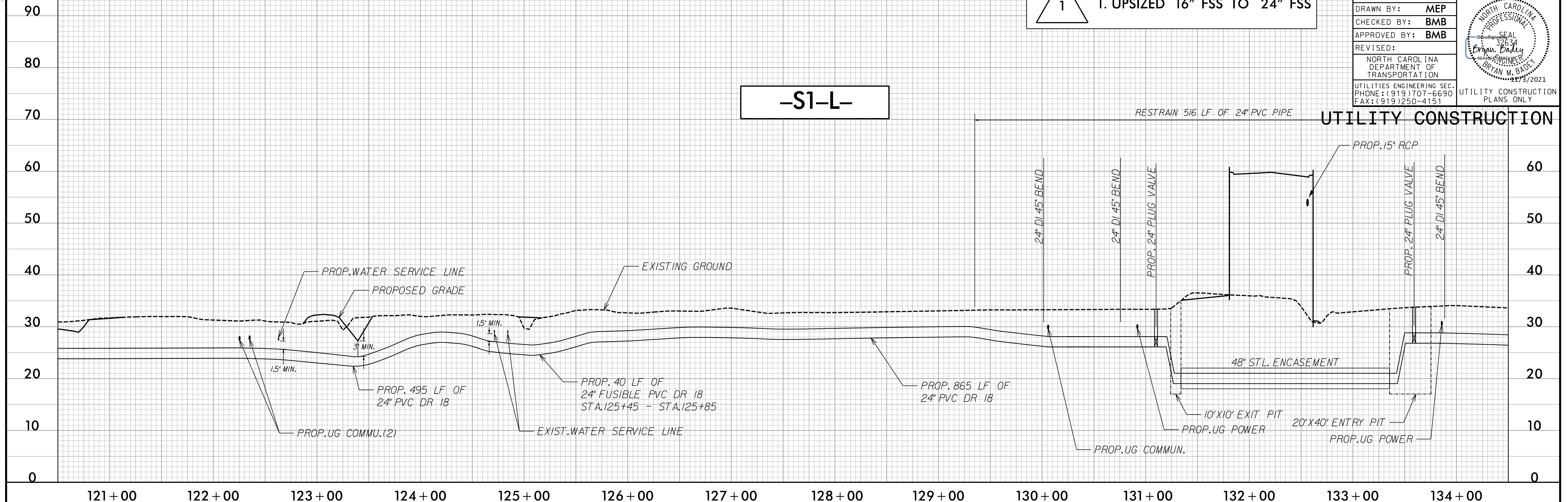
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1. UPSIZED 16" FSS TO 24" FSS

PROJECT REFERENCE NO. R-5021	SHEET NO. UC-82A
DESIGNED BY: MEP	
DRAWN BY: MEP	
CHECKED BY: BMB	
APPROVED BY: BMB	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SECTION PHONE: (919) 707-6690 FAX: (919) 250-4151	
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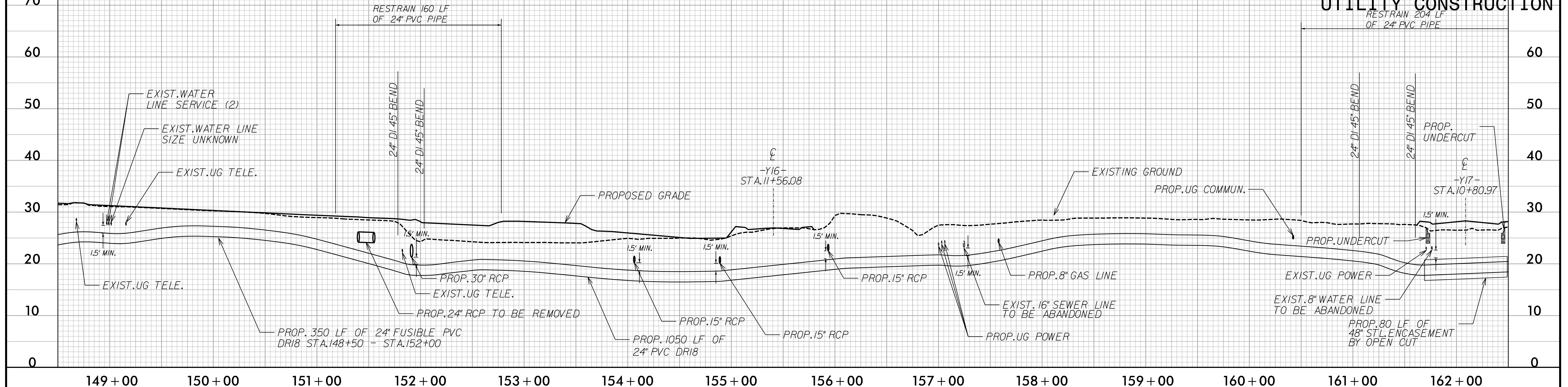
5/28/99

1 1. UPSIZED 16" FSS TO 24" FSS

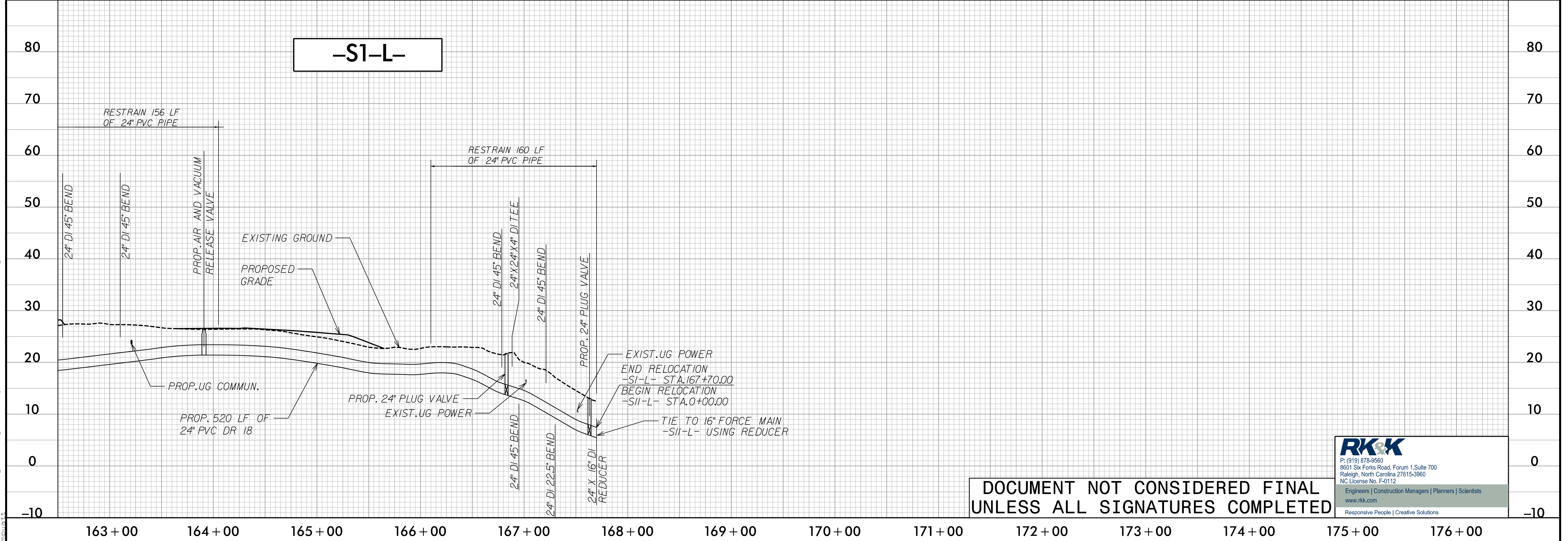
PROJECT REFERENCE NO. R-5021	SHEET NO. UC-82B
DESIGNED BY: MEP	
DRAWN BY: MEP	
CHECKED BY: BMB	
APPROVED BY: BMB	
REVISED:	
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-S1-L-

UTILITY CONSTRUCTION



-S1-L-



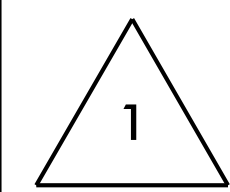
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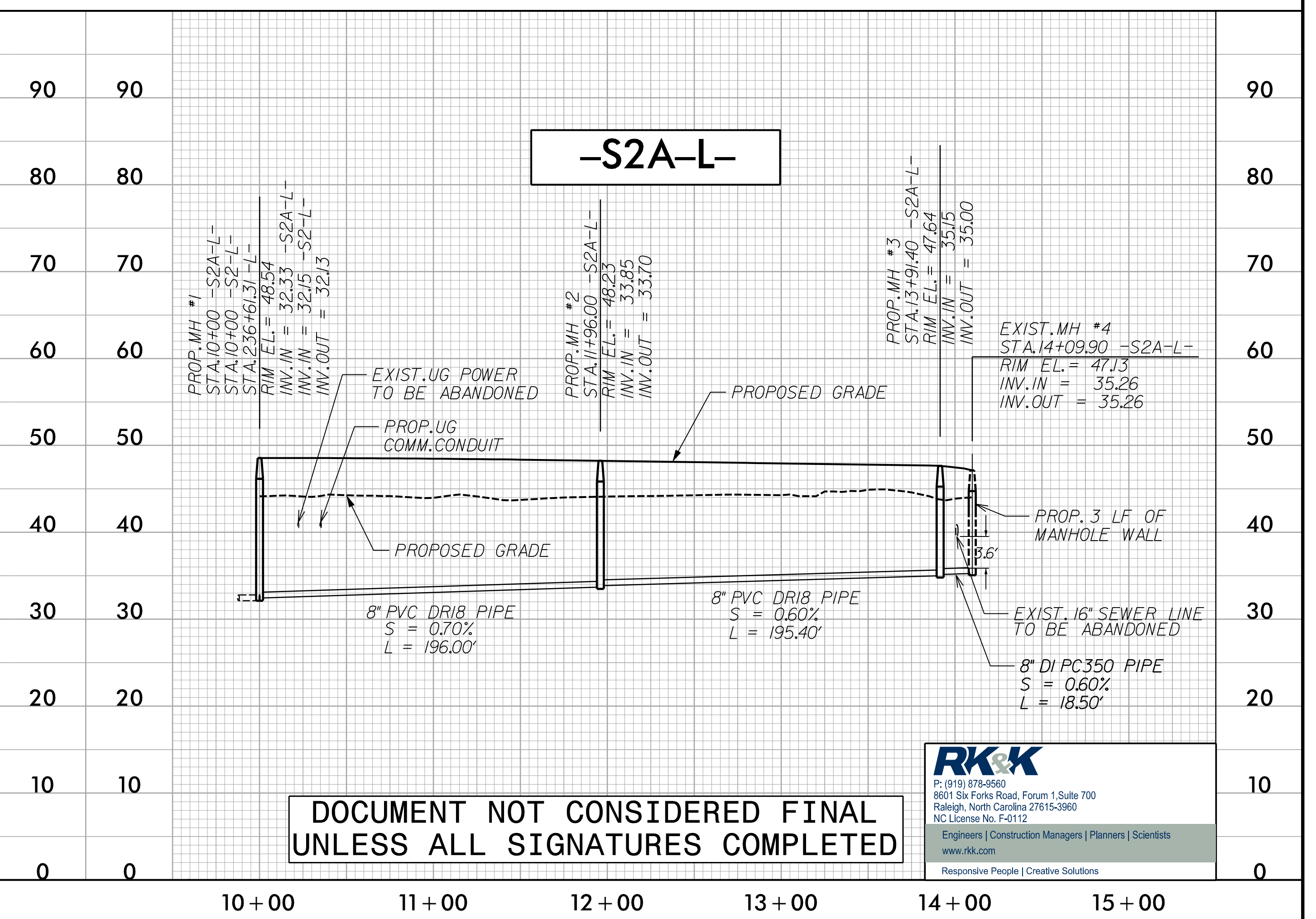
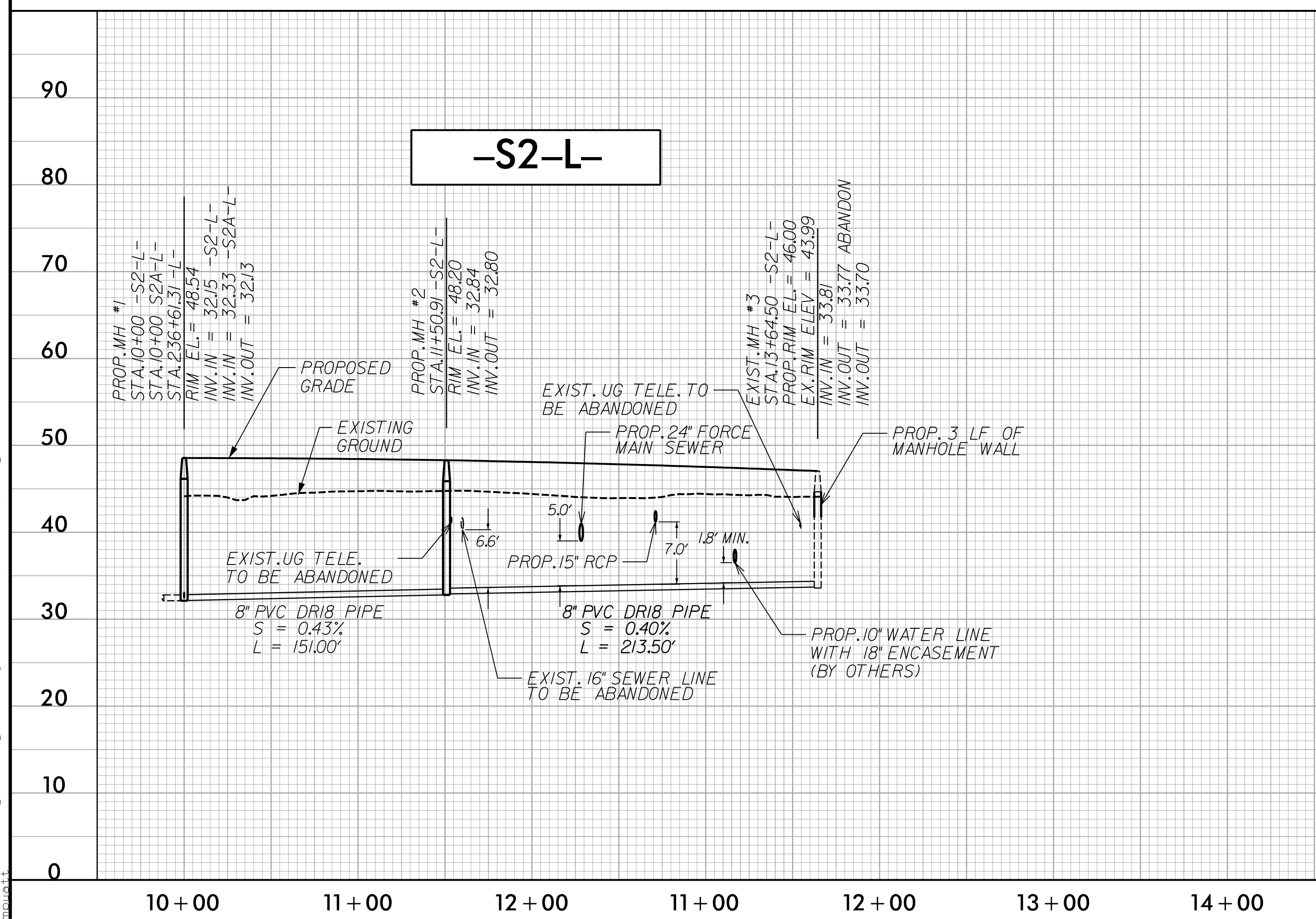
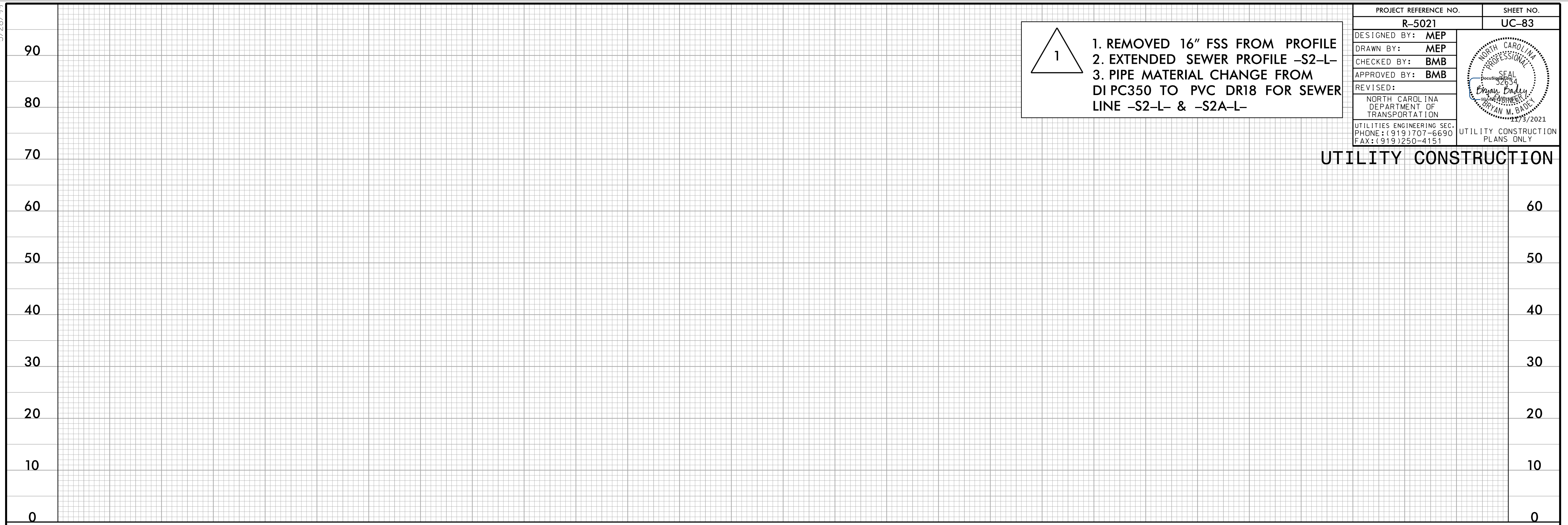
I:\3\2021\Utilities\Engineering\UC\Proj\NR-5021\ut-pl1 UC83_psh.dgn



- 1. REMOVED 16" FSS FROM PROFILE
- 2. EXTENDED SEWER PROFILE -S2-L-
- 3. PIPE MATERIAL CHANGE FROM DI PC350 TO PVC DR18 FOR SEWER LINE -S2-L- & -S2A-L-

PROJECT REFERENCE NO. R-5021	SHEET NO. UC-83
DESIGNED BY: MEP	
DRAWN BY: MEP	
CHECKED BY: BMB	
APPROVED BY: BMB	
REVISED:	NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151
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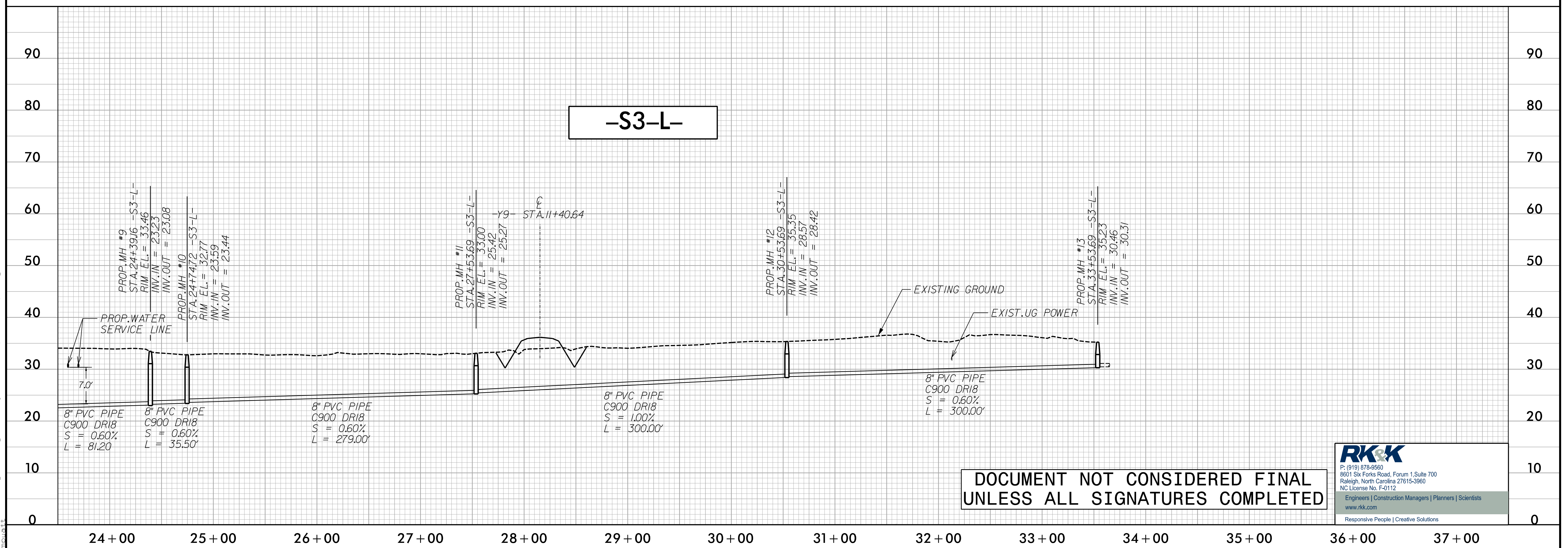
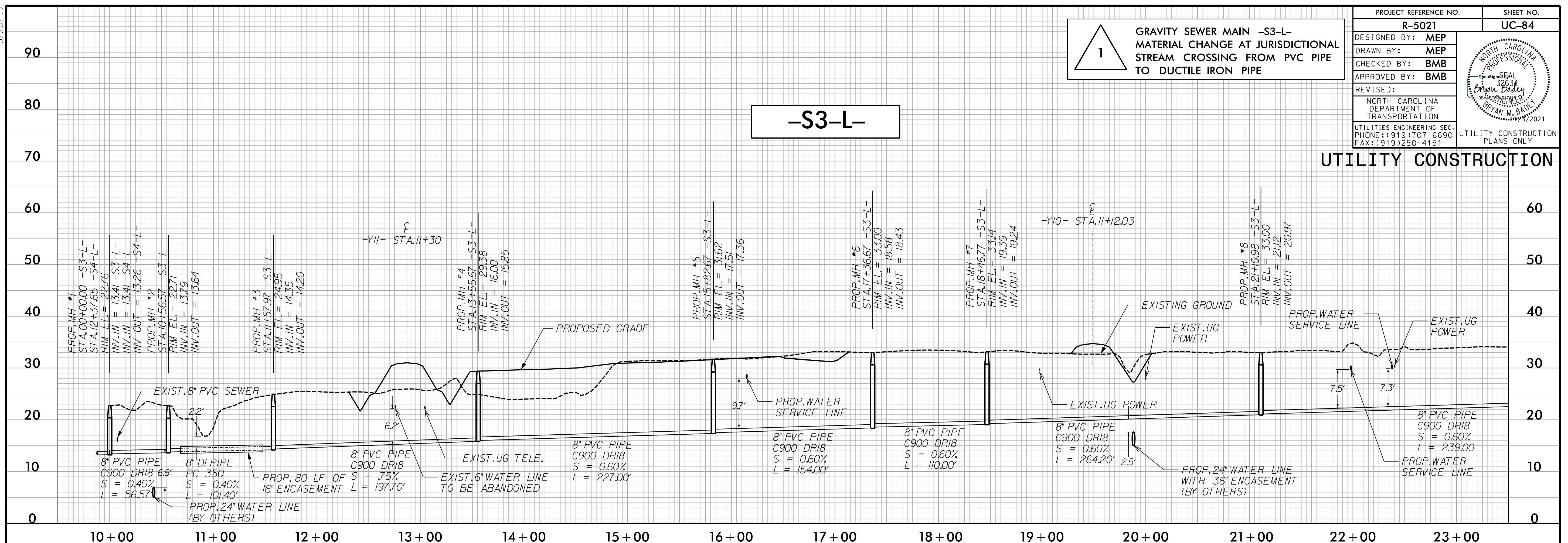
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1 GRAVITY SEWER MAIN -S3-L- MATERIAL CHANGE AT JURISDICTIONAL STREAM CROSSING FROM PVC PIPE TO DUCTILE IRON PIPE

PROJECT REFERENCE NO. R-5021		SHEET NO. UC-84	
DESIGNED BY: MEP		UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	
DRAWN BY: MEP		UTILITY CONSTRUCTION PLANS ONLY	
CHECKED BY: BMB			
APPROVED BY: BMB			
REVISED:			

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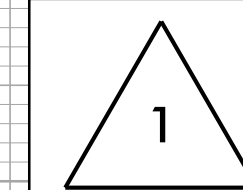
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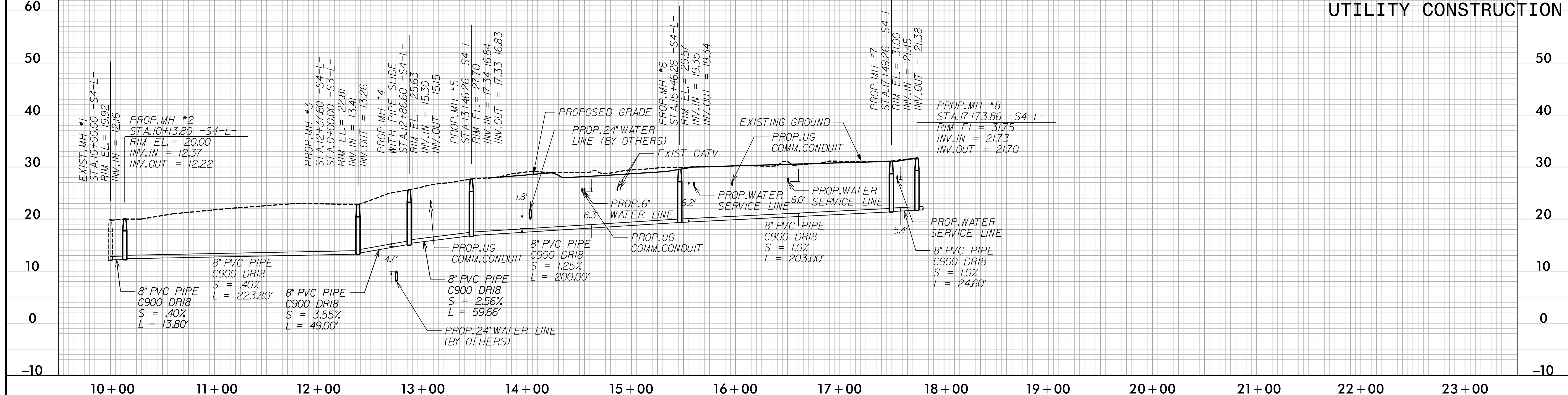
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- 1. REMOVED 16" FSS -S5-L- FROM PROFILE
- 2. REMOVED 16" FSS -S6-L- FROM PROFILE

PROJECT REFERENCE NO. R-5021	SHEET NO. UC-85
DESIGNED BY: MEP	
DRAWN BY: MEP	
CHECKED BY: BMB	
APPROVED BY: BMB	
REVISER:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	
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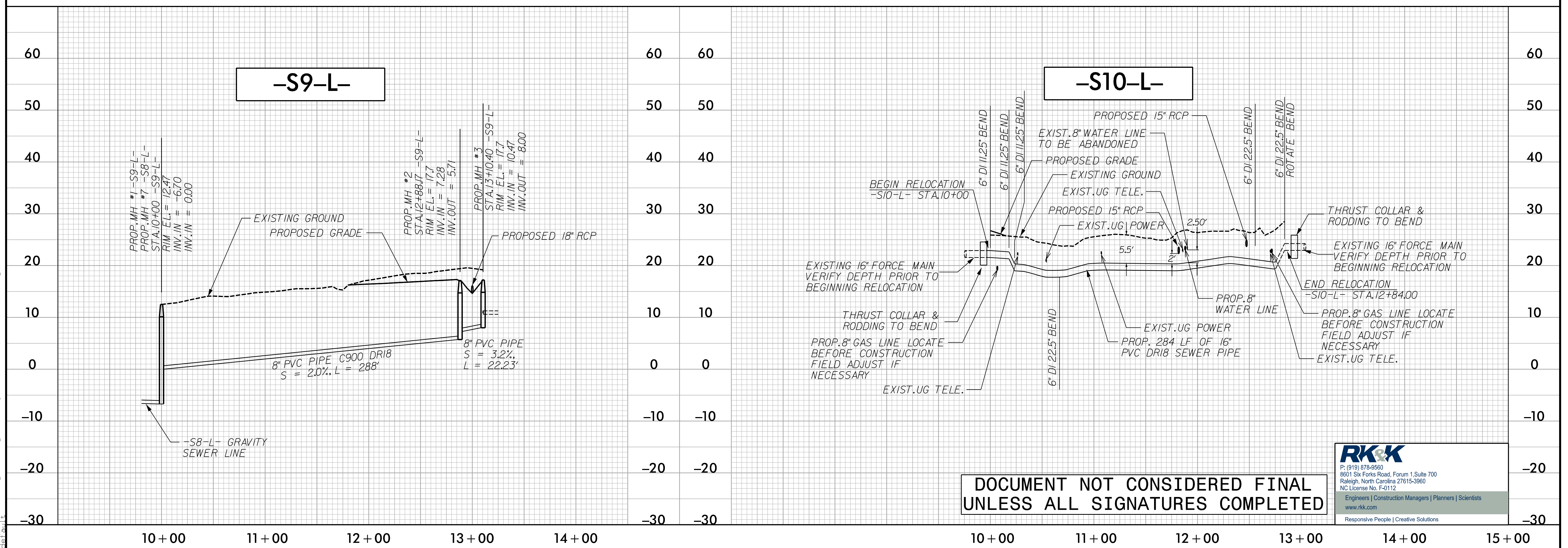
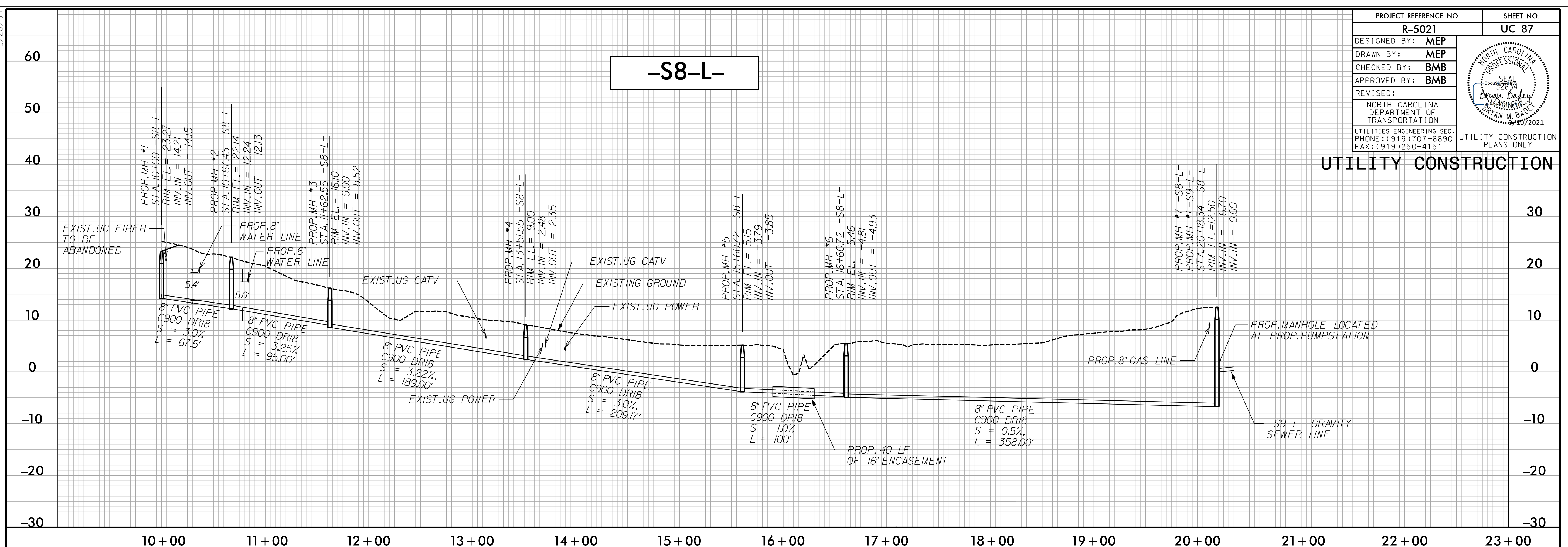
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PROJECT REFERENCE NO.	SHEET NO.
R-5021	UC-87
DESIGNED BY: MEP	
DRAWN BY: MEP	
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APPROVED BY: BMB	
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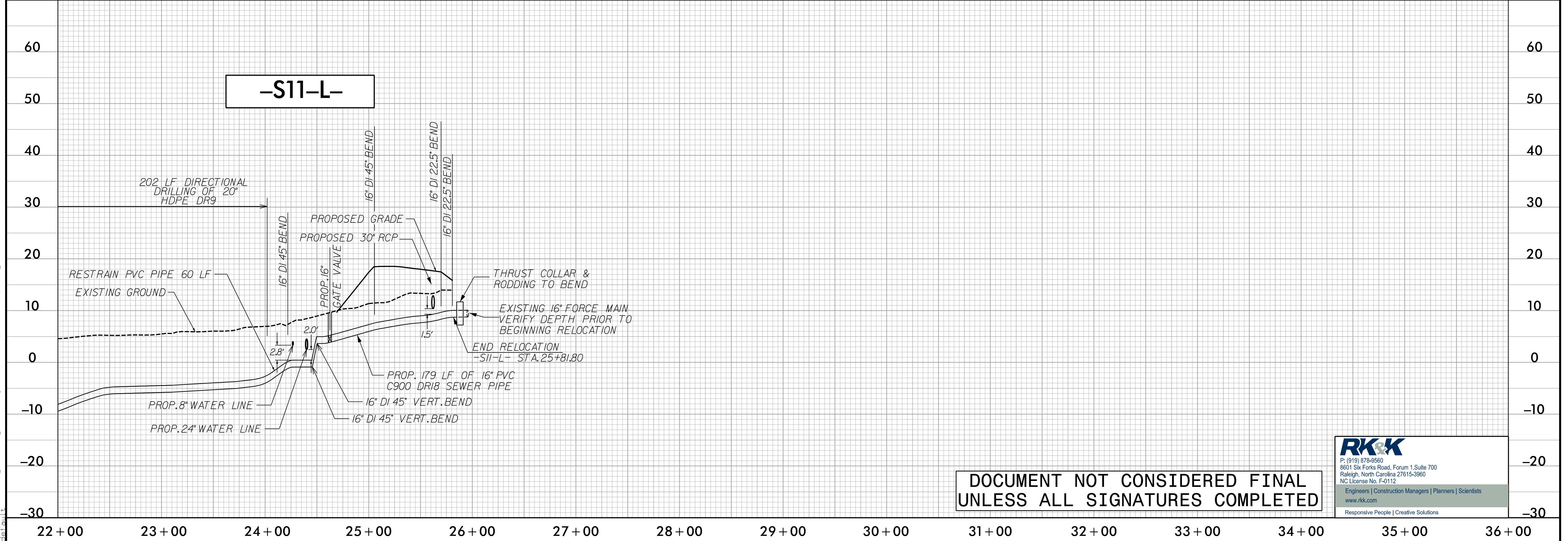
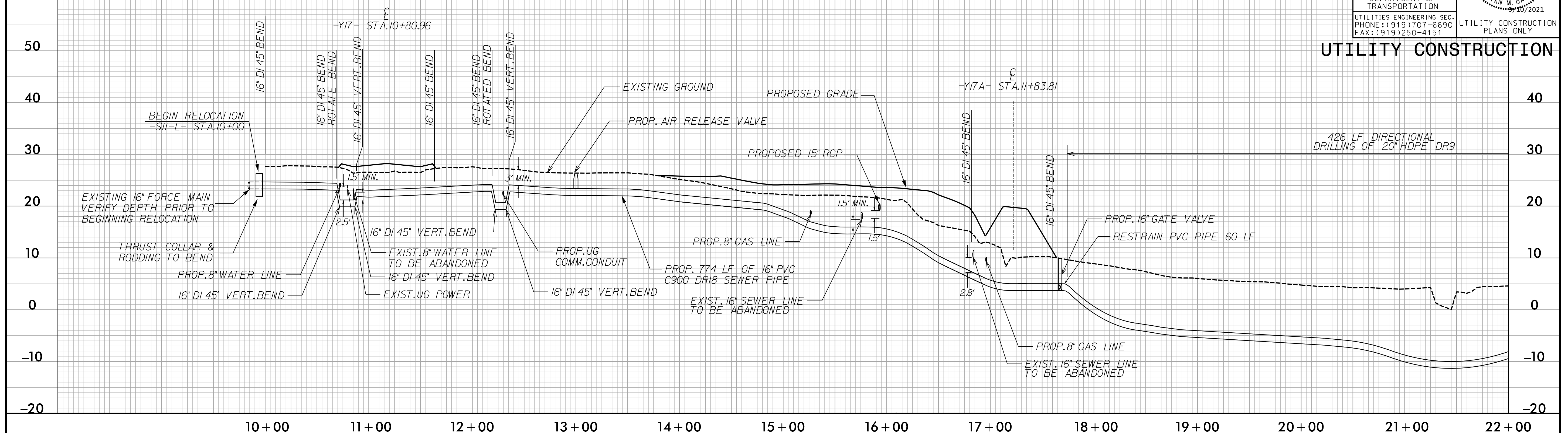
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PROJECT REFERENCE NO. R-5021	SHEET NO. UC-88
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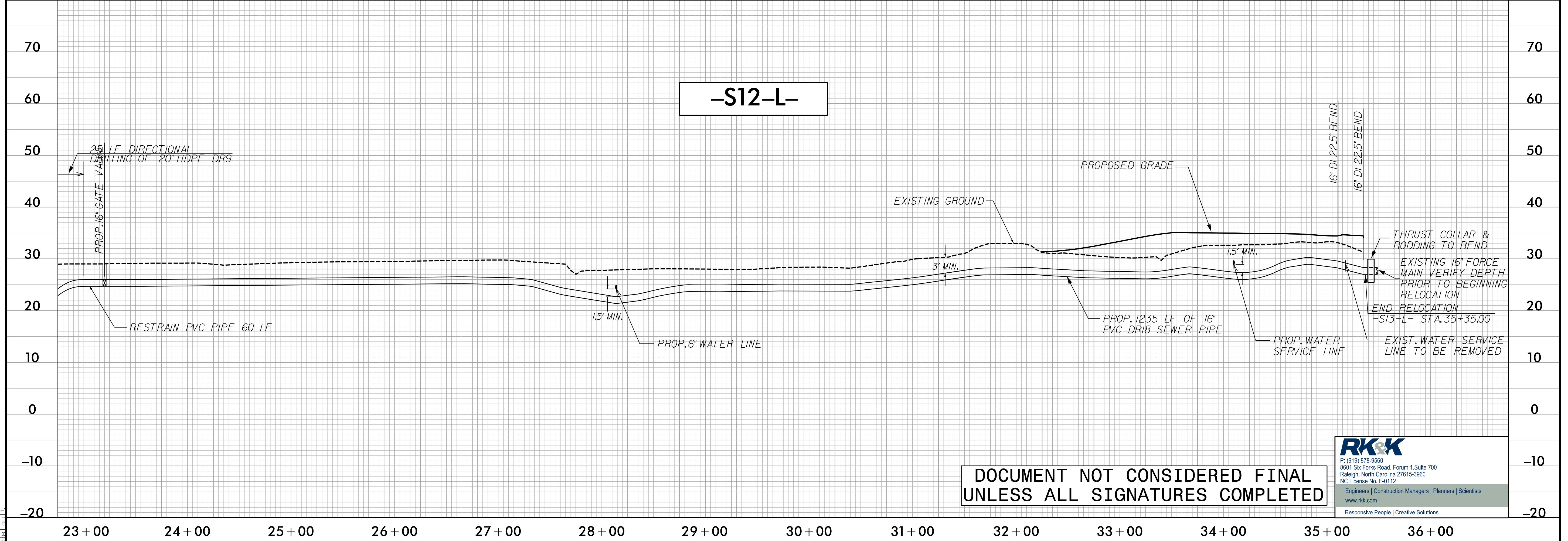
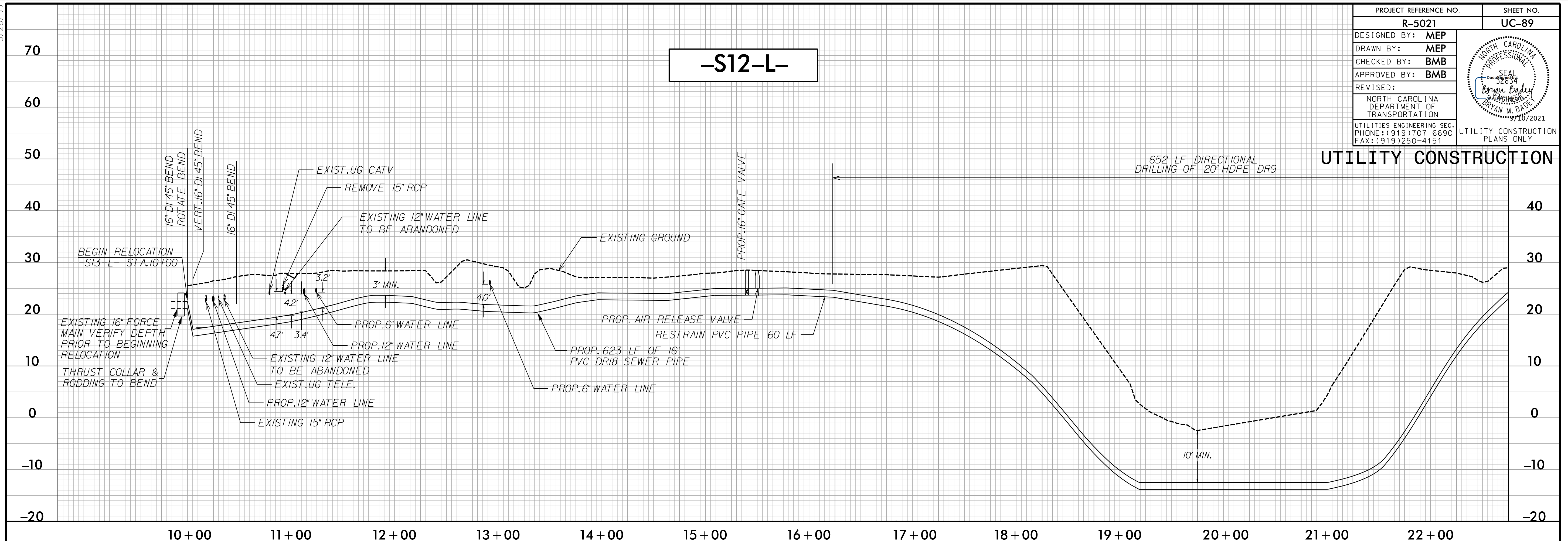
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PROJECT REFERENCE NO. R-5021	SHEET NO. UC-89
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CHECKED BY: BMB	
APPROVED BY: BMB	
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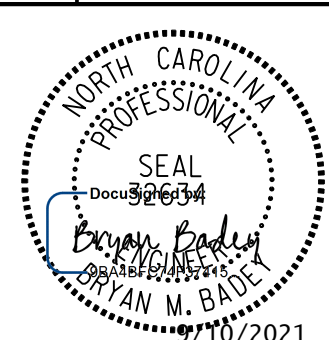


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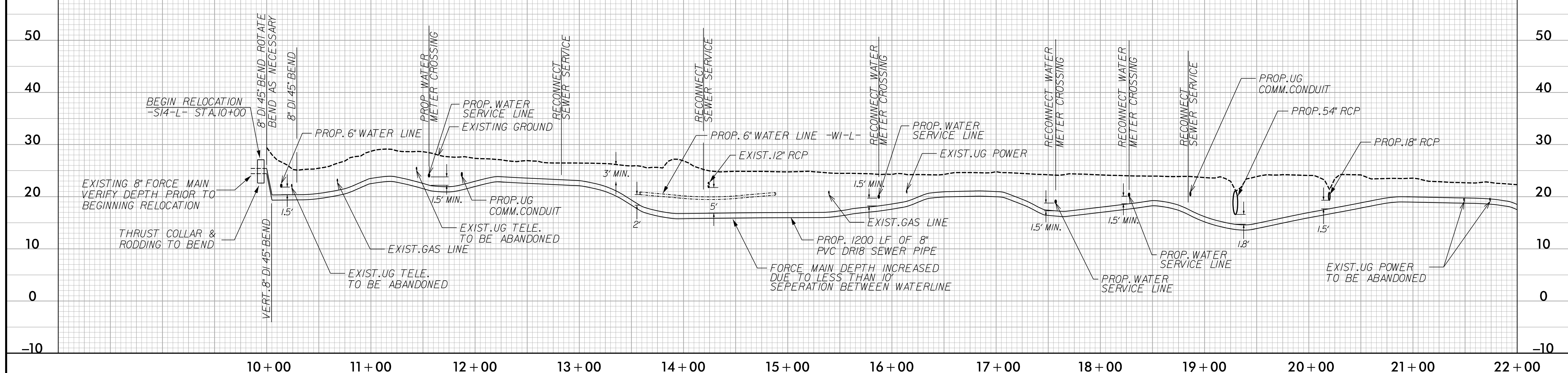
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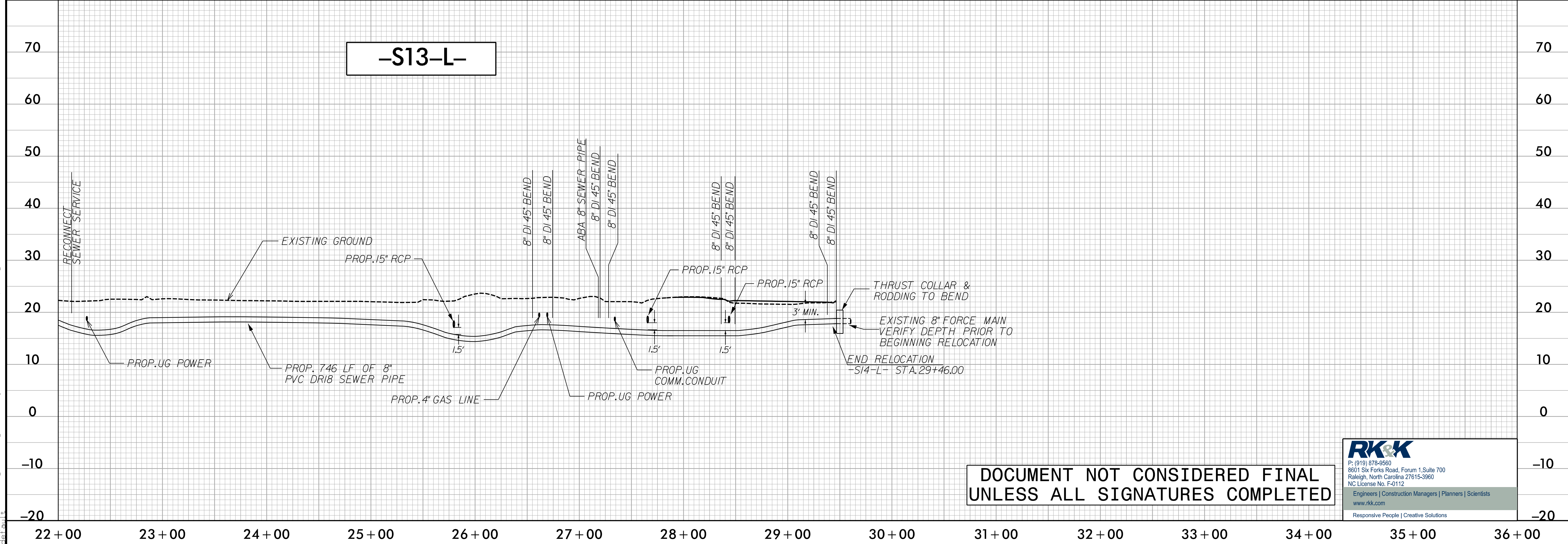
PROJECT REFERENCE NO. R-5021	SHEET NO. UC-90
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DRAWN BY: MEP	
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-S13-L-



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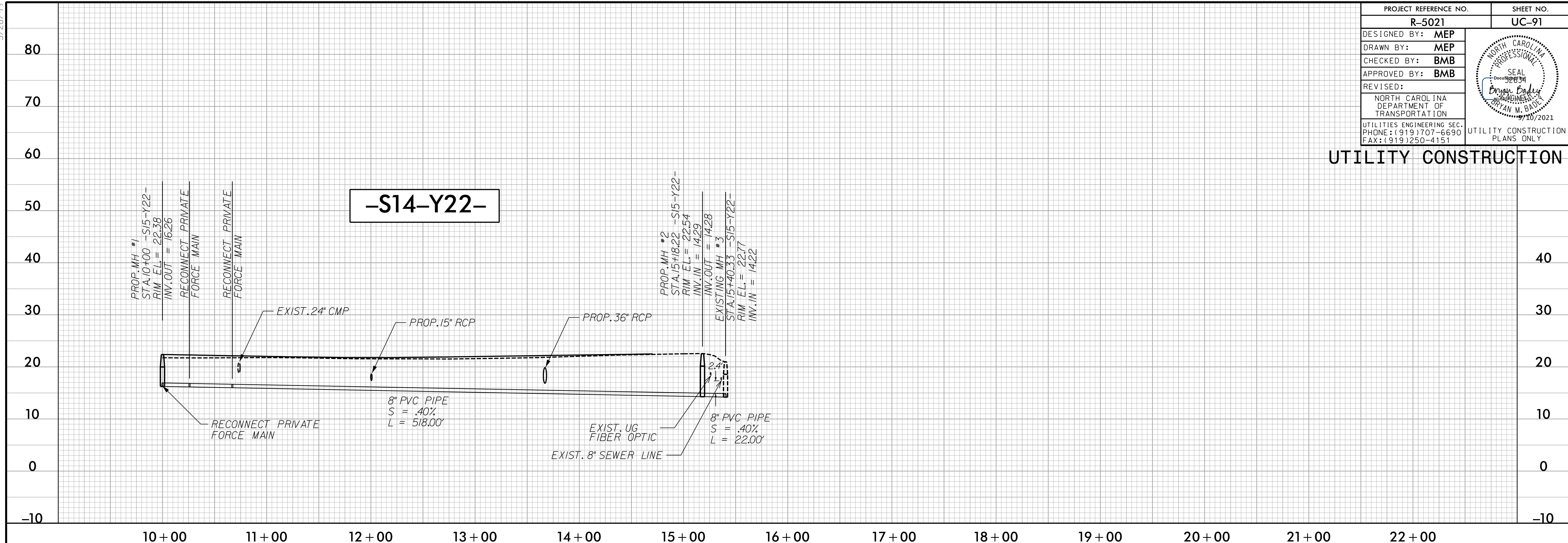
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PROJECT REFERENCE NO. R-5021	SHEET NO. UC-91
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DRAWN BY: MEP	
CHECKED BY: BMB	
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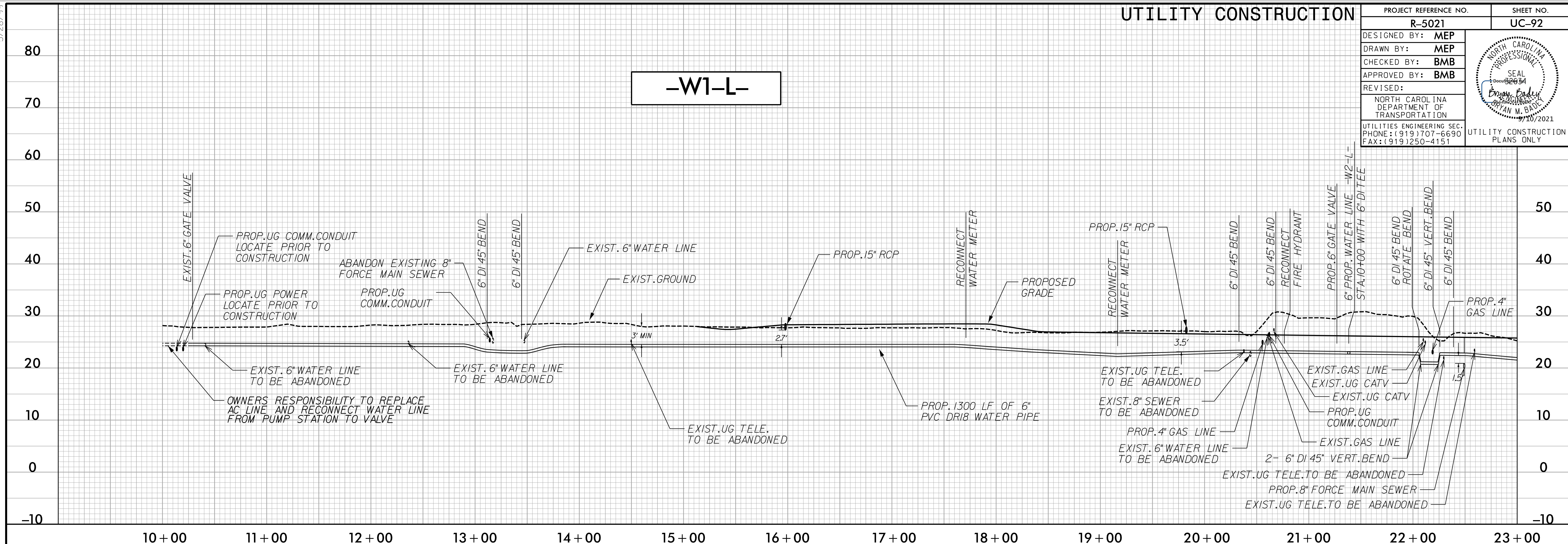
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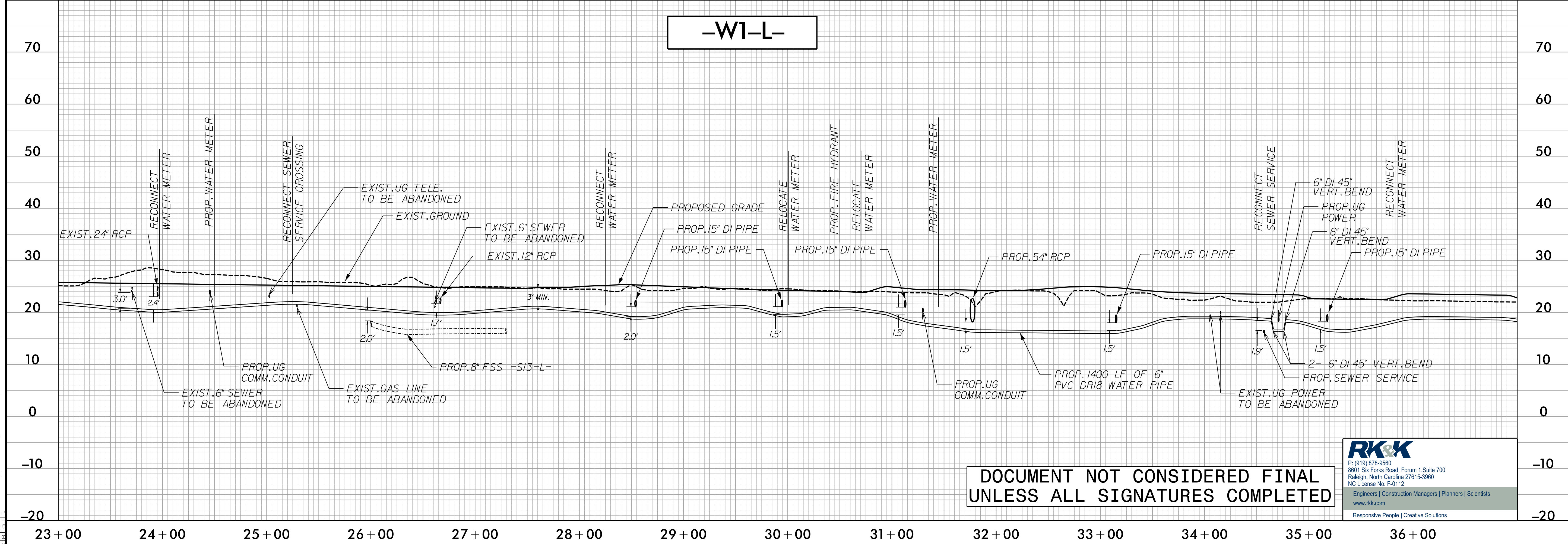
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PROJECT REFERENCE NO. R-5021	SHEET NO. UC-92
DESIGNED BY: MEP	
DRAWN BY: MEP	
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APPROVED BY: BMB	
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-W1-L-




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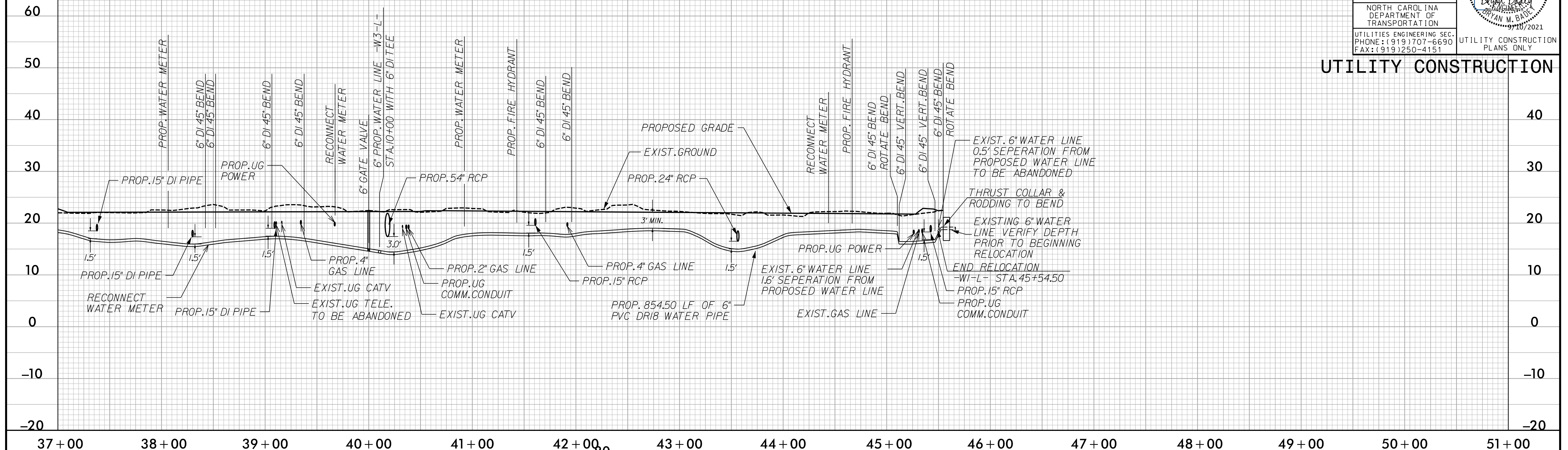
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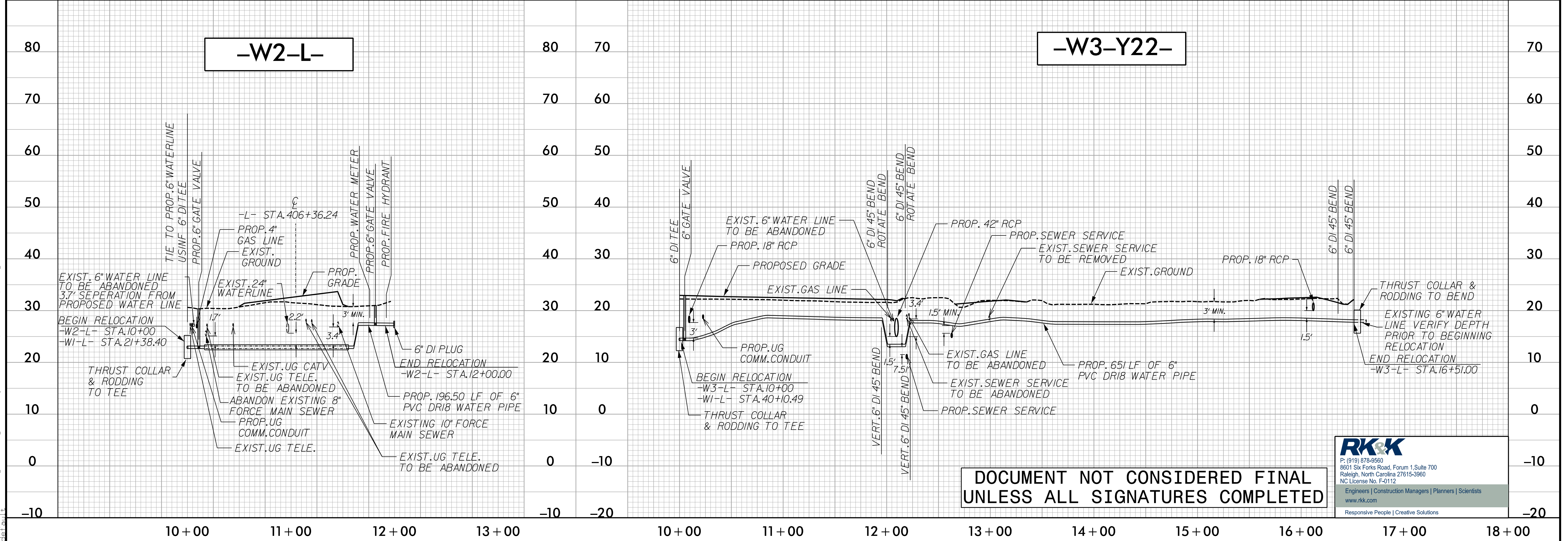
PROJECT REFERENCE NO.	SHEET NO.
R-5021	UC-93
DESIGNED BY: MEP	
DRAWN BY: MEP	
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APPROVED BY: BMB	
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