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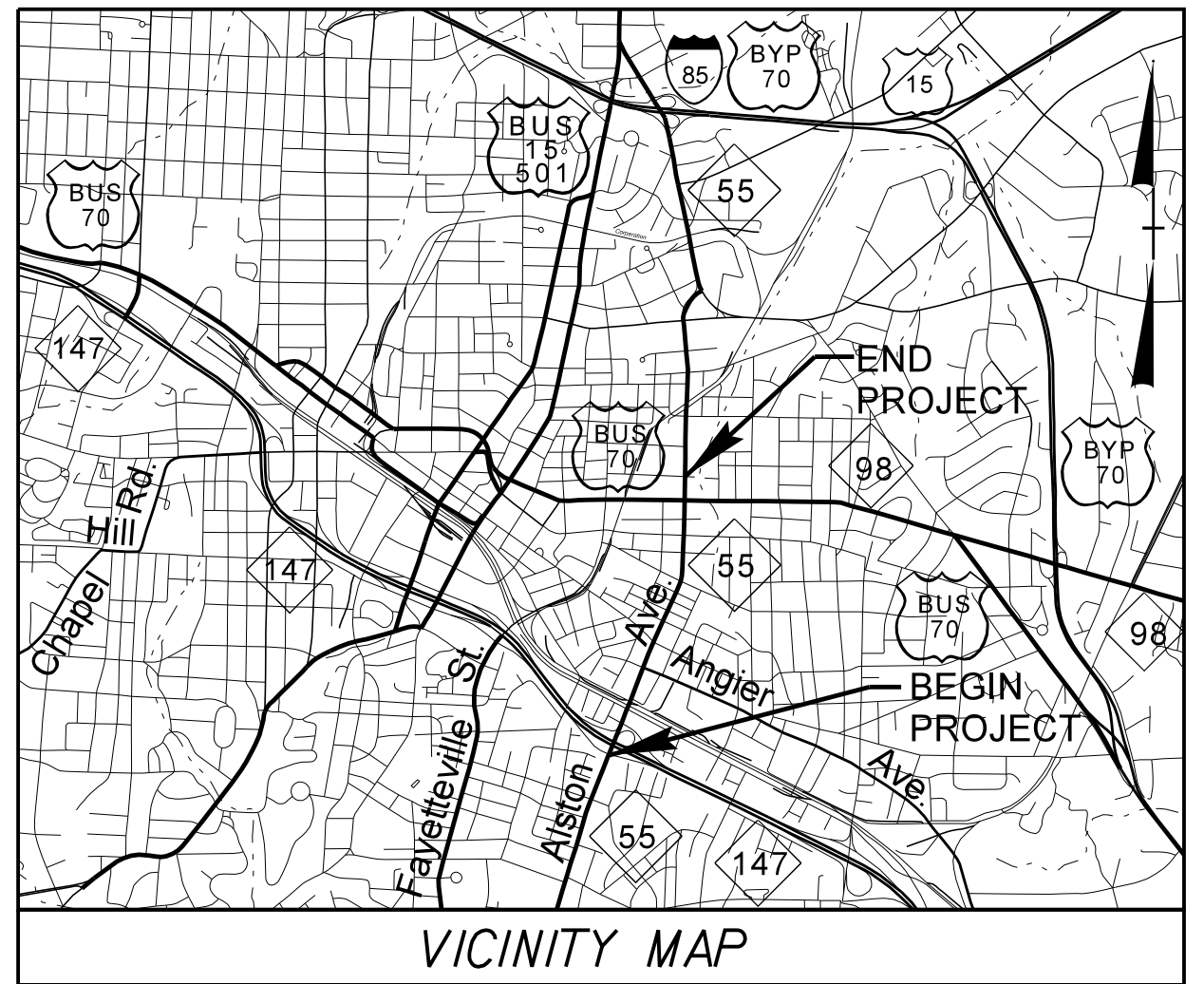
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09/08/19
 SYSTEM TIME
 DCON
 USER NAME

TIP PROJECT: U-3308

See Sheet UC-1 For Index of Sheets
See Sheet UC-2 For CONVENTIONAL SYMBOLS



STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

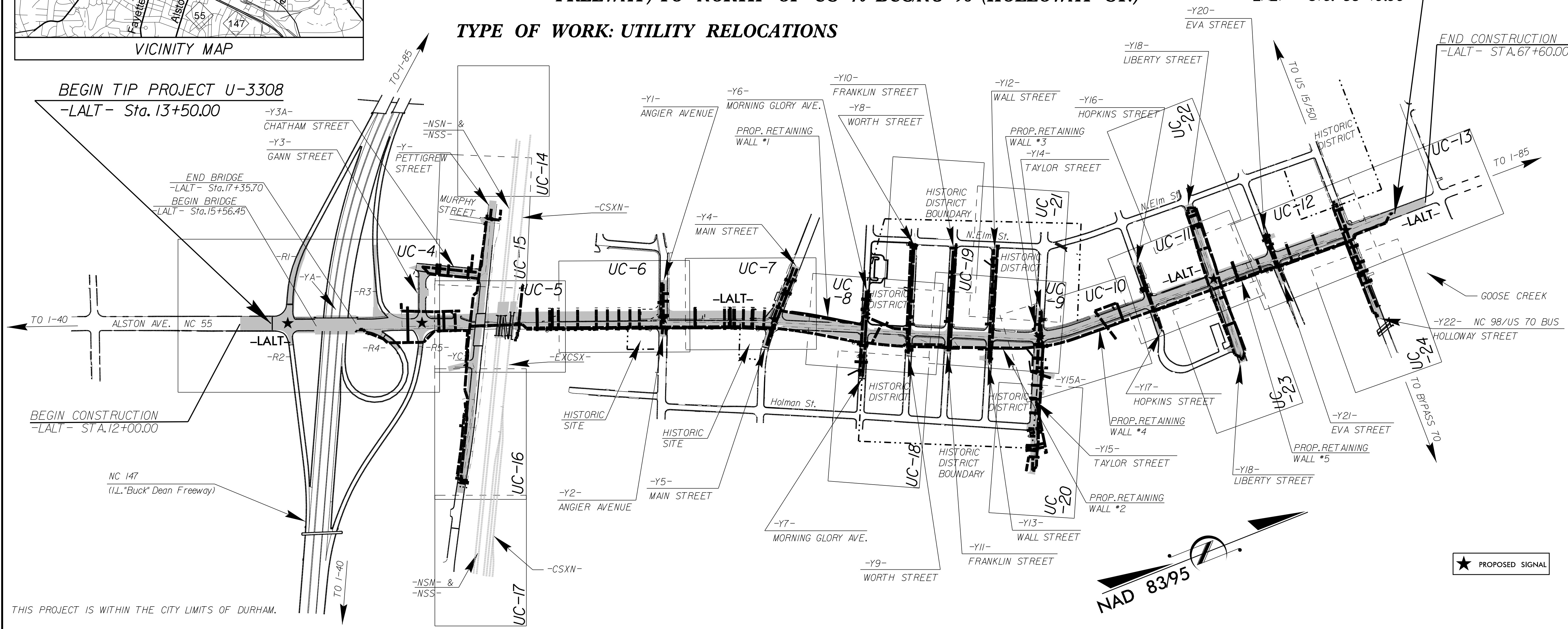
**UTILITY CONSTRUCTION PLANS
DURHAM COUNTY**

T.I.P. NO.	SHEET NO.
U-3308	UC-1

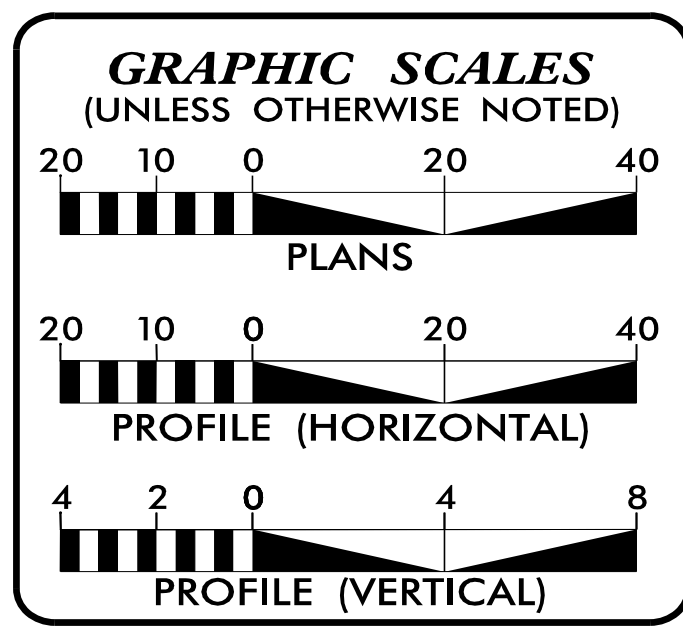
UTILITY CONSTRUCTION

LOCATION: NC 55 (ALSTON AVE.) FROM NC 147 (I.L. "BUCK" DEAN FREEWAY) TO NORTH OF US 70 BUS/NC 98 (HOLLOWAY ST.)

TYPE OF WORK: UTILITY RELOCATIONS



THIS PROJECT IS WITHIN THE CITY LIMITS OF DURHAM.
CLEARING SHALL BE PERFORMED ON THIS PROJECT TO THE LIMITS ESTABLISHED BY METHOD III



SHEET NO.	DESCRIPTION
UC-1	TITLE SHEET
UC-2	UTILITY SYMBOLOGY
UC-3	NOTES
UC-3A THRU UC-3D	DETAILS
UC-4 THRU UC-24	UTILITY CONSTRUCTION SHEETS
UC-25 THRU UC-49	PROFILE SHEETS

WATER AND SEWER OWNERS ON PROJECT

(1) WATER - CITY OF DURHAM
(2) SANITARY SEWER - CITY OF DURHAM

NCDOT IS RESPONSIBLE FOR THE COST OF THIS PROJECT.

SEAL

PREPARED IN THE OFFICE OF:
**DIVISION OF HIGHWAYS
UTILITIES UNIT
UTILITIES ENGINEERING**

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

Roger Worthington, P.E. UTILITIES SECTION ENGINEER
Steve McKee, P.E. UTILITIES SQUAD LEADER PROJECT ENGINEER
Jeffrey J. Wing, PE UTILITIES PROJECT DESIGNER

5/14/99

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	PWM
Relocate Water Meter	RWM
Remove Water Meter	REM WM
Water Pump Station	PS(W)
RPZ Backflow Preventer	RPZ
DCV Backflow Preventer	PBFP
Relocate RPZ Backflow Preventer	RRPZ
Relocate DCV Backflow Preventer	RBFP

PROPOSED SEWER SYMBOLS

Gravity Sewer Line (Sized as Shown)	12" SS
Force Main Sewer Line (Sized as Shown)	12" FSS
Manhole (Sized per Note)	•
Sewer Pump Station	PST(SS)

PROPOSED MISCELLANEOUS UTILITIES SYMBOLS

Power Pole	⊖
Telephone Pole	⊖
Joint Use Pole	⊖
Telephone Pedestal	TEL PED
Utility Line by Others (Type as Shown)	PROP O/H POW LINES
Trenchless Installation	12" TL INSTALL
Encasement by Open Cut	24" ENCAS BY OC
Encasement	24" ENCASMENT

Thrust Block	
Air Release Valve	AR
Utility Vault	UV
Concrete Pier	CP
Steel Pier	SP
Plan Note	NOTE
Pay Item Note	PAY ITEM

EXISTING UTILITIES SYMBOLS

Power Pole	•
Telephone Pole	•
Joint Use Pole	•
Utility Pole	•
Utility Pole with Base	□
H-Frame Pole	•—•
Power Transmission Line Tower	⊠
Water Manhole	⊙
Power Manhole	⊙
Telephone Manhole	⊙
Sanitary Sewer Manhole	⊙
Hand Hole for Cable	⊠
Power Transformer	⊠
Telephone Pedestal	⊠
CATV Pedestal	⊠
Gas Valve	◇
Gas Meter	◇
Located Miscellaneous Utility Object	○
Abandoned According to Utility Records	AATUR
End of Information	E.O.I.

*Underground Power Line	P
*Underground Telephone Cable	T
*Underground Telephone Conduit	TC
*Underground Fiber Optics Telephone Cable	T FO
*Underground TV Cable	TV
*Underground Fiber Optics TV Cable	TV FO
*Underground Gas Pipeline	G
Aboveground Gas Pipeline	A/G Gas
*Underground Water Line	W
Aboveground Water Line	A/G Water
*Underground Gravity Sanitary Sewer Line	SS
Aboveground Gravity Sanitary Sewer Line	A/G Sanitary Sewer
*Underground SS Forced Main Line	FSS
Underground Unknown Utility Line	?UTL
SUE Test Hole	⊕
Water Meter	⊙
Water Valve	⊙
Fire Hydrant	⊕
Sanitary Sewer Cleanout	⊙

*For Existing Utilities

Utility Line Drawn from Record (Type as Shown)

Designated Utility Line (Type as Shown)

UTILITY CONSTRUCTION

PROJECT REFERENCE NO.		SHEET NO.	
U-3308		UC-3	
DESIGNED BY:	DGB		11/30/2015 UTILITY CONSTRUCTION PLANS ONLY
DRAWN BY:	JGB		
CHECKED BY:	KFC		
APPROVED BY:	JJW		
REVISED:			
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION			
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151			

PREPARED IN THE OFFICE OF:
Kimley»Horn
 P.O. BOX 33068
 RALEIGH, NORTH CAROLINA 27636-3068
 PHONE: (919) 677-2000
 FAX: (919) 677-2050
 PE NO. P-0102

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 2012.
2. THE EXISTING WATER AND SEWER UTILITIES BELONG TO THE CITY OF DURHAM.
3. ALL WATERLINES SHALL BE INSTALLED IN COMPLIANCE OF THE RULES AND REGULATIONS OF THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL AND NATURAL RESOURCES, DIVISION OF WATER RESOURCES, PUBLIC WATER SUPPLY SECTION. ALL SEWER LINES SHALL BE INSTALLED IN COMPLIANCE OF THE RULES AND REGULATIONS OF THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES, 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 OPPROTUNITY FOR INSPECTION OF CONSTRUCTION AND TESTING.
6. THE DRAWINGS DEPICT THE BEST AVAILABLE INFORMATION FOR THE LOCATION, SIZE, ORIENTATION, ELEVATION, AND TYPE OF MATERIAL FOR ALL EXISTING UTILITIES. MAKE INVESTIGATIONS FOR DETERMINING THE EXACT LOCATION, SIZE, ORIENTATION, ELEVATION, AND TYPE MATERIAL OF THE EXISTING UTILITIES AS NECESSARY FOR THE CONSTRUCTION OF THE PROPOSED UTILITIES AND FOR AVOIDING DAMAGE TO EXISTING UTILITIES. REPAIR ANY DAMAGE INCURRED TO EXISTING UTILITIES TO THE ORIGINAL OR BETTER CONDITION AT NO ADDITONAL COST TO THE DEPARTMENT.

7. THE CONTRACTOR SHALL COORDINATE THE RELOCATION AND/OR PROTECTION OF THE EXISTING GAS, CABLE, COMMUNICATION, ELECTRIC, ETC. UTILITIES WHERE IN CONFLICT WITH THE PROPOSED WATER AND SEWER UTILITIES, AT NO ADDITIONAL COST TO THE OWNER.
8. MAKE FINAL CONNECTIONS OF THE NEW WORK TO THE EXISTING SYSTEM WHERE INDICATED ON THE DRAWINGS, AS REQUIRED TO FIT THE ACTUAL CONDITIONS, OR AS DIRECTED.
9. PRIOR TO PLACEMENT OF PROPOSED SANITARY GRAVITY SEWER THE CONTRACTOR SHALL LOCATE ALL EXISTING SEWER SERVICE LATERALS (DEPTH AND PIPE DIAMETER) AND NOTIFY THE RESIDENT ENGINEER IF THERE ARE COMPLICATIONS WITH CONNECTING TO THE PROPOSED SANITARY GRAVITY SEWER. THE CONTRACTOR'S COST FOR ALL WORK ASSOCIATED WITH SEWER SERVICES, IS INCIDENTAL TO SEWER SERVICE PAYMENT ITEM.
10. PRIOR TO PLACEMENT OF PROPOSED WATERLINE THE CONTRACTOR SHALL LOCATE ALL EXISTING WATER SERVICE LATERALS (DEPTH AND PIPE DIAMETER) AND NOTIFY THE RESIDENT ENGINEER IF THERE ARE COMPLICATIONS WITH CONNECTING TO THE PROPOSED WATERLINE. THE CONTRACTOR'S COST FOR ALL WORK ASSOCIATED WITH WATER SERVICES, IS INCIDENTAL TO WATER SERVICE PAYMENT ITEM.
11. THE CONTRACTOR SHALL COORDINATE THE INSTALLATION OF WATER AND SEWER IMPROVEMENTS WITH OTHER WORK INCLUDING GRADING, RETAINING WALL PLACEMENT, BRIDGE WORK, ETC. TO AVOID DAMAGE TO THE UTILITIES.
12. 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.
13. 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.
14. THE CONTRACTOR SHALL REFER TO THE "UTILITIES BY OTHERS" PLANS FOR PROPOSED GAS, TELECOMMUNICATION, AND POWER UTILITY RELOCATIONS.

PROJECT SPECIFIC NOTES:

1. ALL PROPOSED WATER LINE 2" IN DIAMETER SHALL BE COPPER PIPE. ALL PROPOSED WATER LINE 4"-12" IN DIAMETER SHALL BE DI (DUCTILE IRON PUSH-ON) PC 350 PIPE, UNLESS SPECIFIED TO BE RESTRAINED JOINT PIPE AND/OR SPECIAL THICKNESS CLASS AS SHOWN ON THE PLAN/PROFILE. ALL PROPOSED WATER LINE 16" IN DIAMETER AND LARGER SHALL BE DI (DUCTILE IRON PUSH-ON) PC 250 PIPE, UNLESS SPECIFIED TO BE RESTRAINED JOINT PIPE AND/OR SPECIAL THICKNESS CLASS AS SHOWN ON THE PLAN/PROFILE.
2. ALL PROPOSED GRAVITY SEWER LINES 12" IN DIAMETER AND SMALLER SHALL BE PROTECTO 401 LINED DI (DUCTILE IRON PUSH-ON) PC 350 PIPE. ALL PROPOSED GRAVITY SEWER LINES 16" IN DIAMETER AND GREATER SHALL BE PROTECTO 401 LINED DI (DUCTILE IRON PUSH-ON) PC 250 PIPE.
3. ALL DUCTILE IRON PIPE AND FITTINGS SHALL BE WRAPPED WITH POLYETHYLENE ENCASEMENT.
4. ALL VALVES 16 INCHES AND SMALLER SHALL BE 250 PSI RESILIENT SEAT GATE VALVES. ALL VALVES LARGER THAN 16 INCHES SHALL BE CLASS 150B BUTTERFLY VALVES, UNLESS OTHERWISE SHOWN ON THE DRAWINGS.
5. PRIOR TO DEFLECTING THE WATER LINE AROUND THE EXISTING OR PROPOSED DRAINAGE STRCTURE OR ANY OTHER DEFLECTION, THE CONTRACTOR SHALL NOTIFY THE RESIDENT ENGINEER. THE CONTRACTOR'S COST FOR ALL WORK ASSOCIATED WITH THESE DEFLECTIONS IS INCIDENTAL TO THE WATER LINE PAYMENT ITEM.
6. ALL WATER AND SEWER SERVICES TO BE REMOVED THAT ARE CONNECTED TO ACTIVE MAINS SHALL BE ABANDONED FROM SERVICE TO MAIN.
7. CONTRACTOR'S ATTENTION IS DIRECTED TO SECTIONS 102, 107, AND 1550 OF THE STANDARD SPECIFICATIONS CONCERNING TRENCHLESS INSTALLATION. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO HAVE THE BORING AND JACKING DESIGNED AND SEALED BY A LICENSED NORTH CAROLINA PROFESSIONAL ENGINEER. NO DAMAGE IS ALLOWED TO RIVER, WETLANDS, OR BUFFER ZONES.

UTILITY CONSTRUCTION

11/30/2015
 UTILITY CONSTRUCTION
 PLANS ONLY

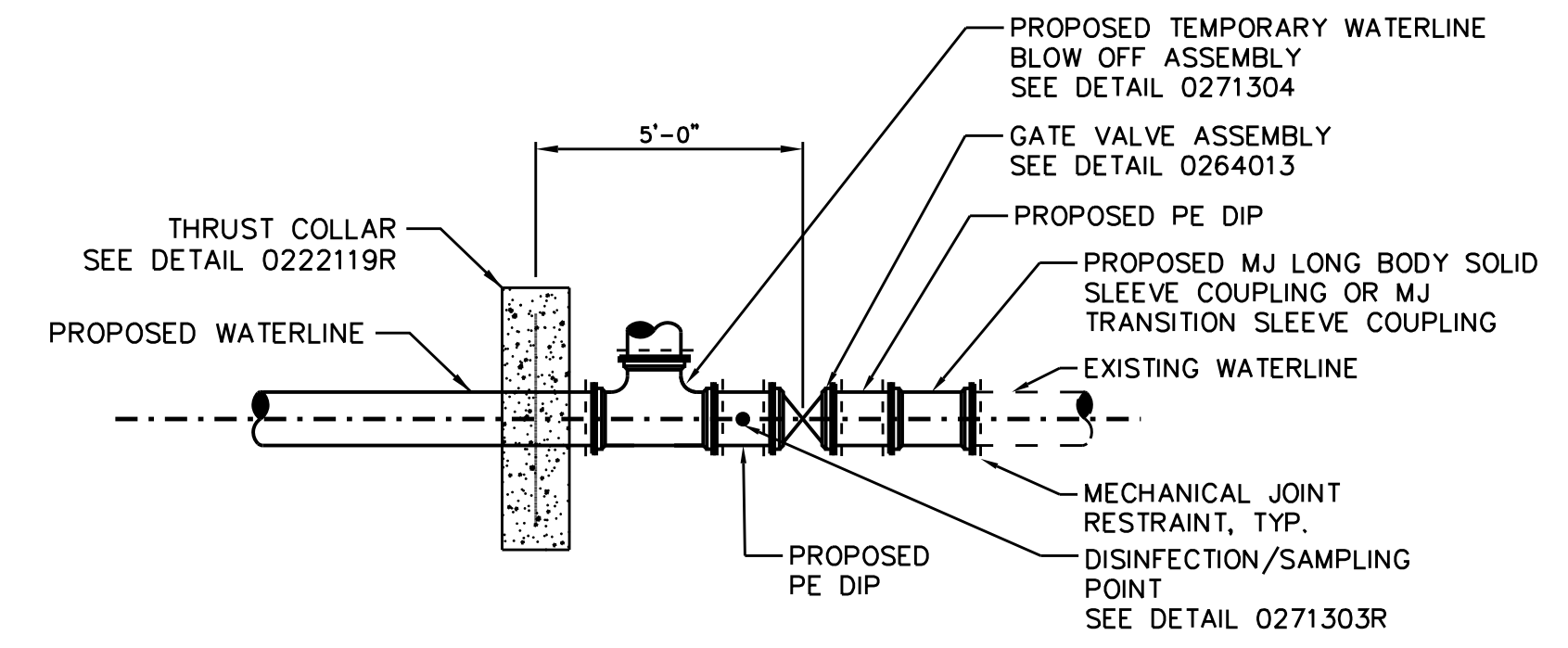
5/14/99

PROJECT REFERENCE NO.	SHEET NO.
U-3308	UC-3A
DESIGNED BY: KFC	
DRAWN BY: JGB	
CHECKED BY: KFC	
APPROVED BY: JJW	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	
UTILITY CONSTRUCTION PLANS ONLY	

Kimley»Horn

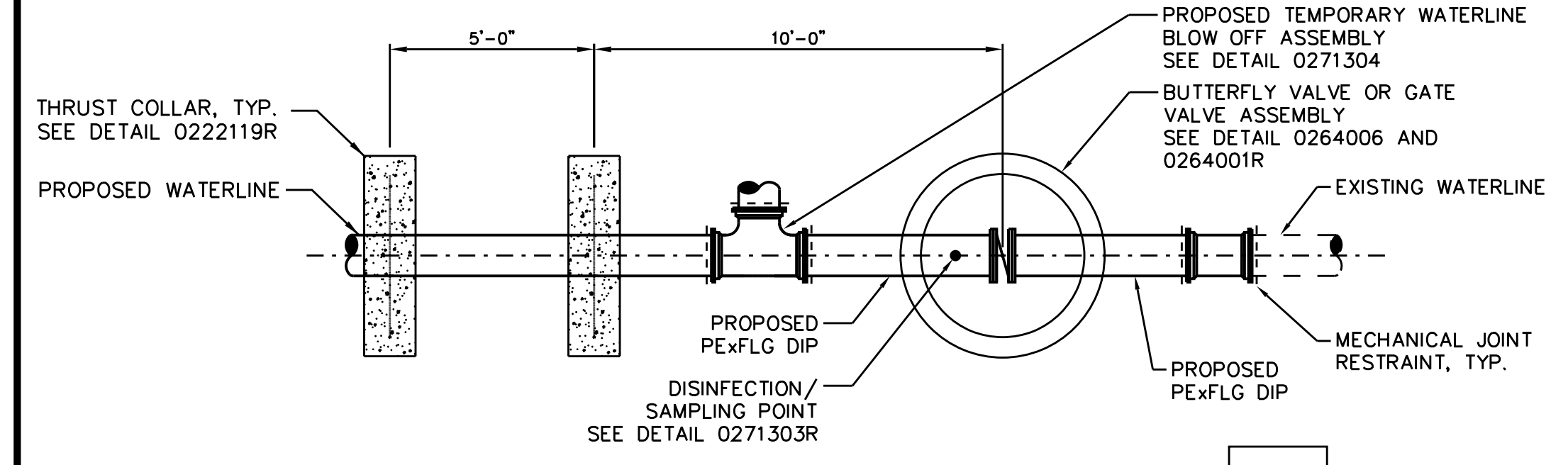
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 FAX: (919) 677-2050
 PE NO. F-0102

UTILITY CONSTRUCTION



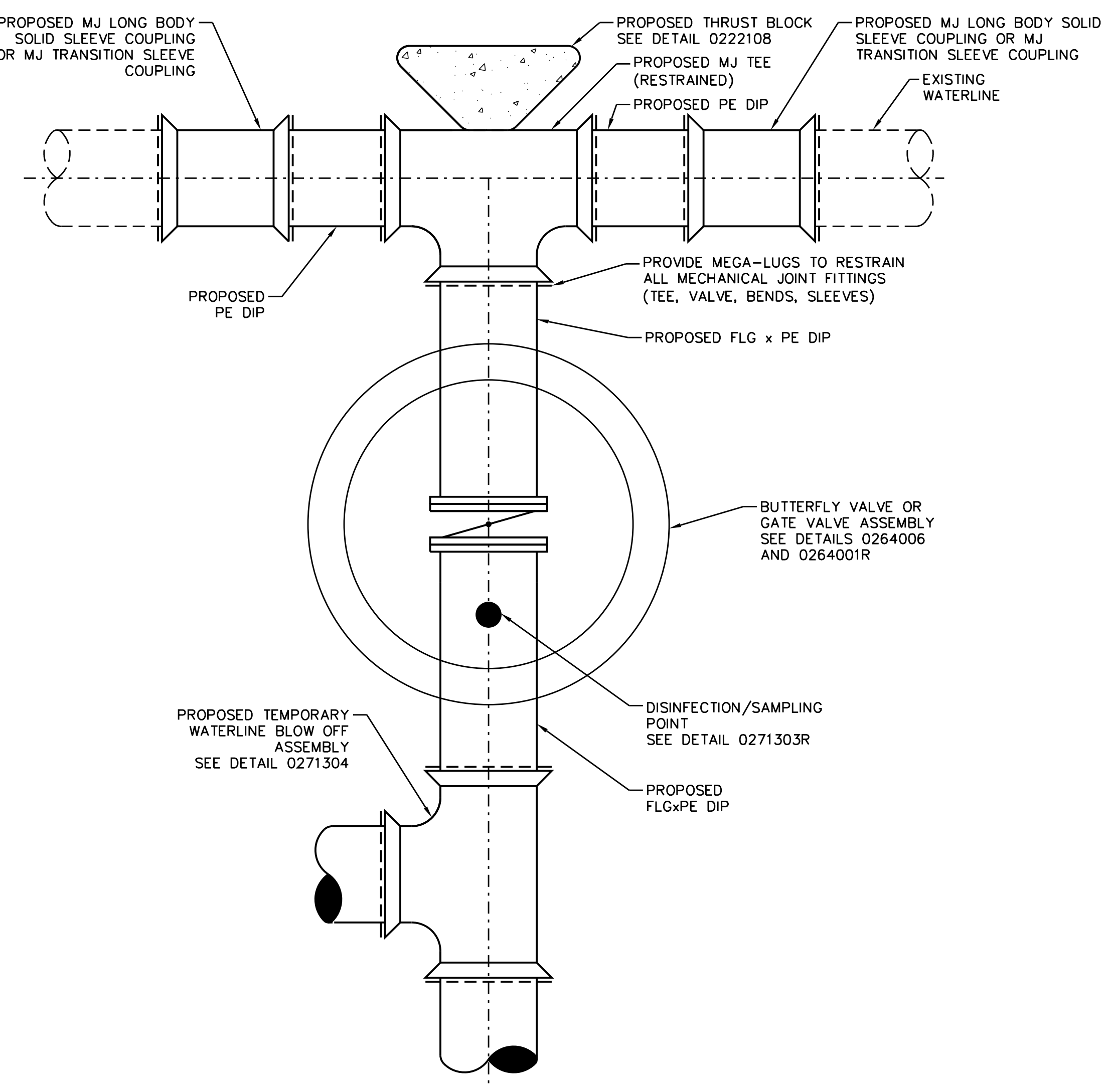
CONNECTION DETAIL NO. 1 (12" DIA AND LESS)
 SCALE: NTS

1
UC-3A



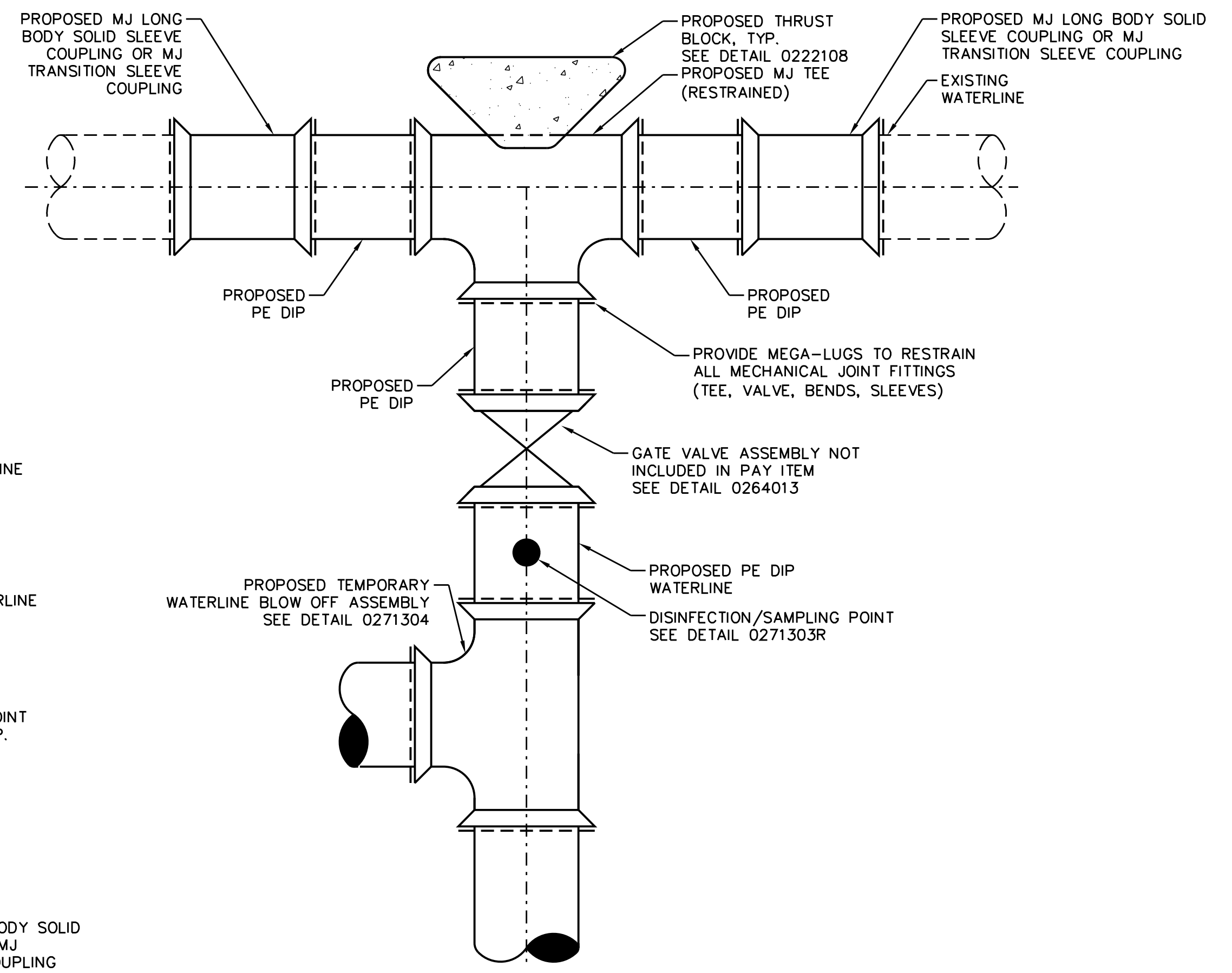
CONNECTION DETAIL NO. 2 (GREATER THAN 12" DIA)
 SCALE: NTS

2
UC-3A



CONNECTION DETAIL NO. 3 (12" DIA AND LESS)
 SCALE: NTS

3
UC-3A

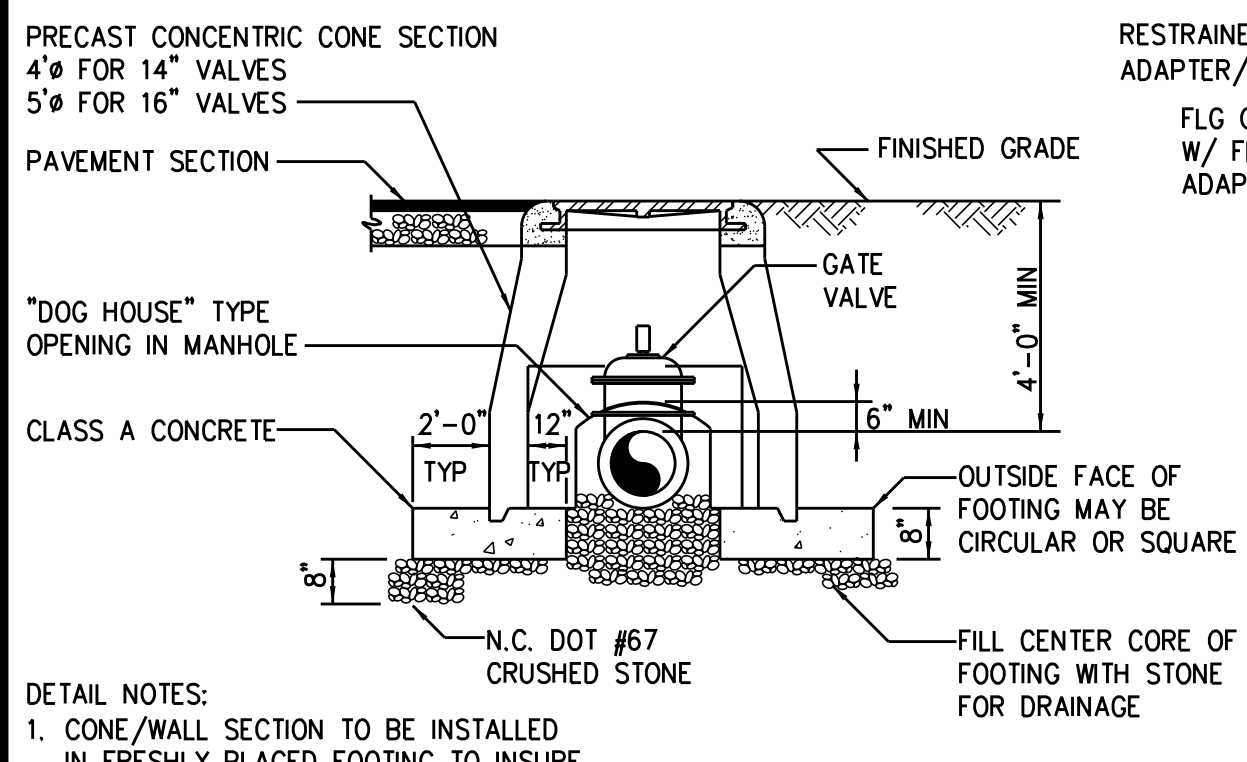


CONNECTION DETAIL NO. 4 (GREATER THAN 12" DIA)
 SCALE: NTS

NOTES:

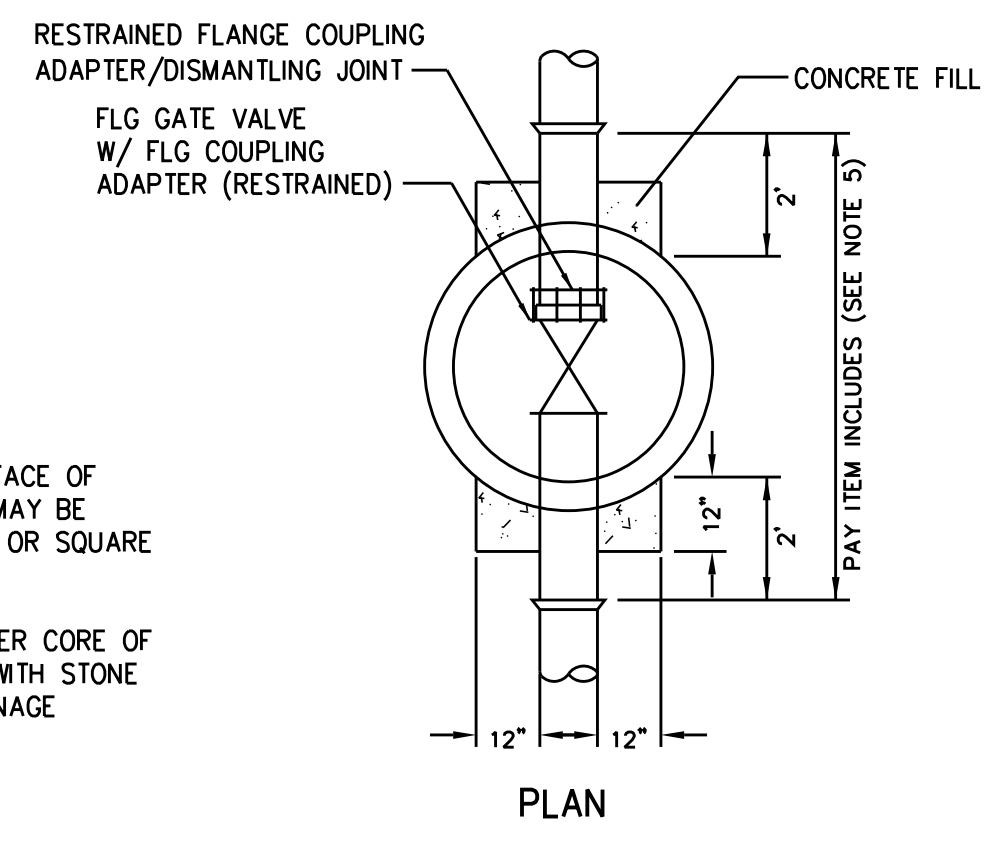
1. THE CONTRACTOR SHALL FIELD VERIFY EXACT ELEVATION, LOCATION, ORIENTATION, DIMENSION, AND MATERIAL OF PIPING TO BE CONNECTED TO PRIOR TO ORDERING MATERIALS.
2. THE CONTRACTOR SHALL PROVIDE A MEANS TO KEEP ALL NEW PIPING COMPLETELY ISOLATED FROM EXISTING PIPING UNTIL ALL NEW PIPING HAS BEEN TESTED, DISINFECTED, AND ACCEPTED BY NCDOT AND THE CITY OF DURHAM FOR SERVICE.
3. DESIGN PRESSURE IS 350 PSI.
4. 12" OF NCDOT NO. 67 STONE BEDDING SHALL EXTEND UNDER ENTIRE LENGTH OF DIP IN THE CONNECTION PAY ITEM LIMIT.
5. ALL CONNECTION FITTINGS AND JOINTS SHALL BE RESTRAINED DIP USING MECHANICAL JOINT RESTRAINT.
6. CONCRETE THRUST COLLARS SHALL BE PLACED AND CURED THREE DAYS PRIOR TO RE-PRESSURIZING THE PIPE.

5/14/99



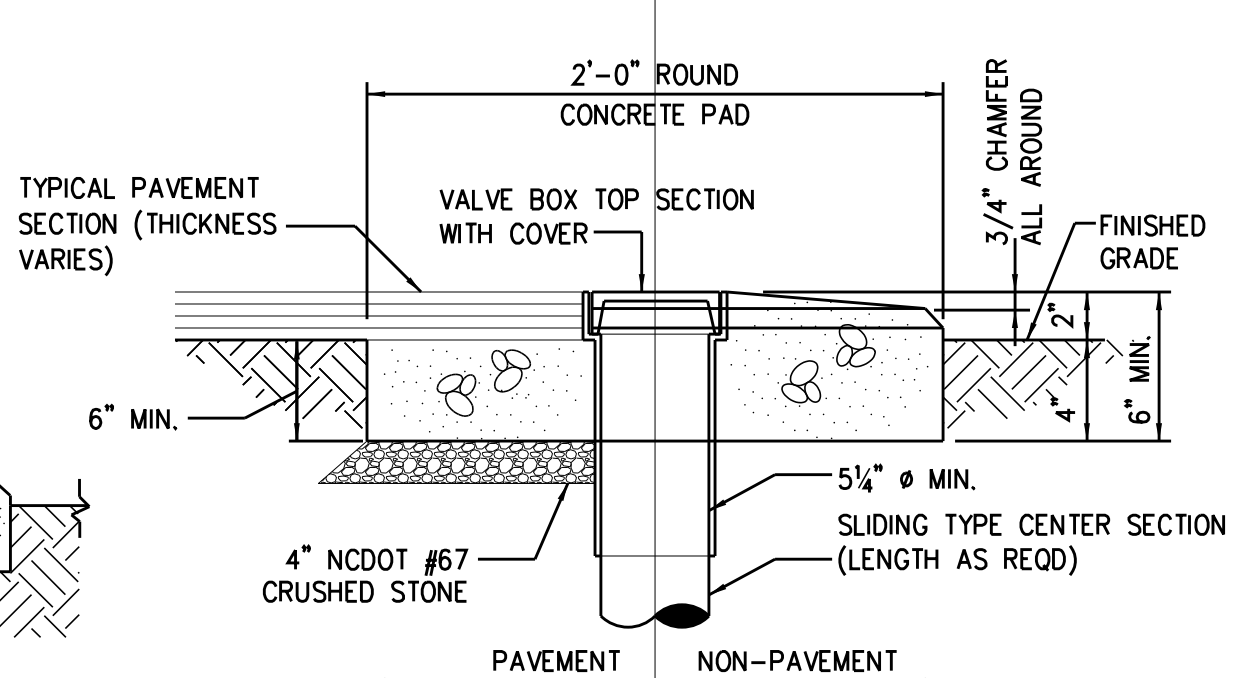
- DETAIL NOTES:**
1. CONE/WALL SECTION TO BE INSTALLED IN FRESHLY PLACED FOOTING TO INSURE UNIFORM BEARING.
 2. ADD BARREL SECTIONS TO MANHOLE AS NECESSARY.
 3. ELIMINATE FOOTING AT OPENING.
 4. 2'-0" MAXIMUM DISTANCE FROM OUTSIDE OF MANHOLE TO FIRST PIPE JOINT. (EACH SIDE OF MANHOLE)
 5. PAY ITEM DOES NOT INCLUDE PIPING.

SECTION

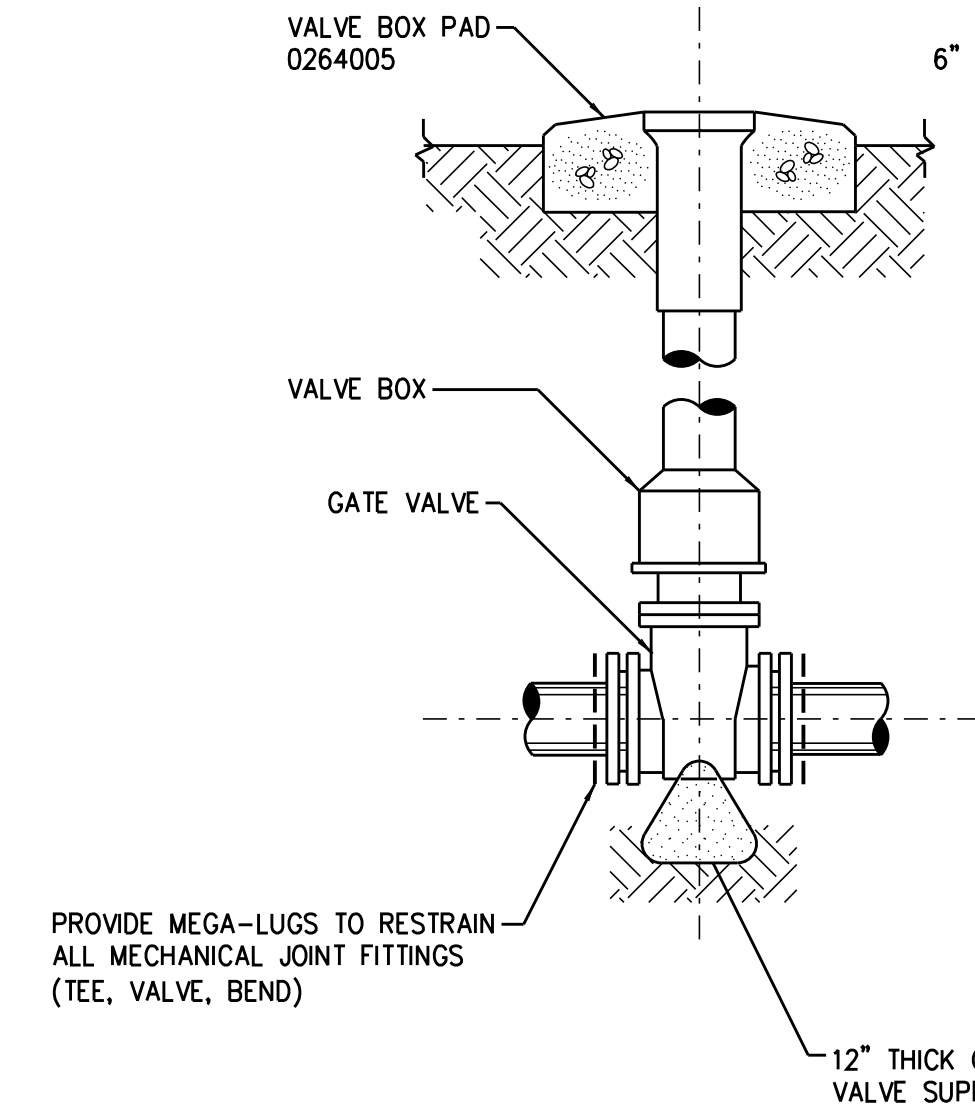


PLAN

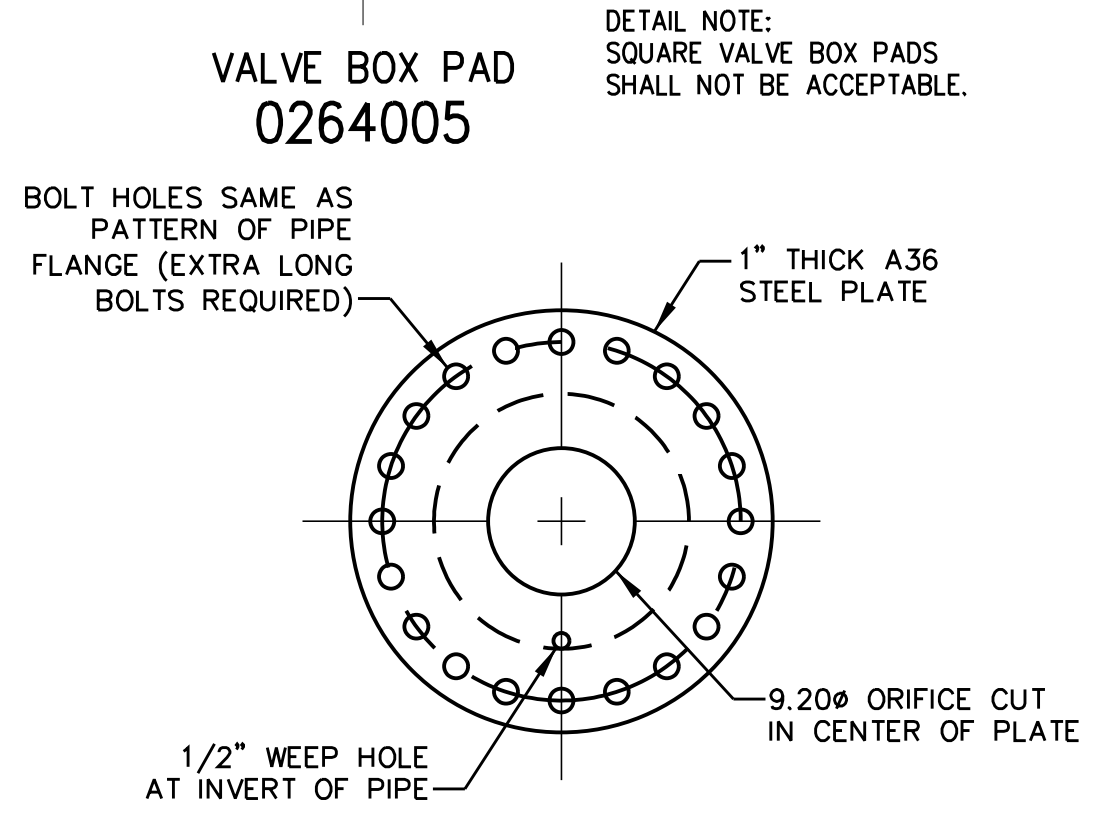
GATE VALVE ASSEMBLY (FOR 14" AND 16" VALVES) 0264001R



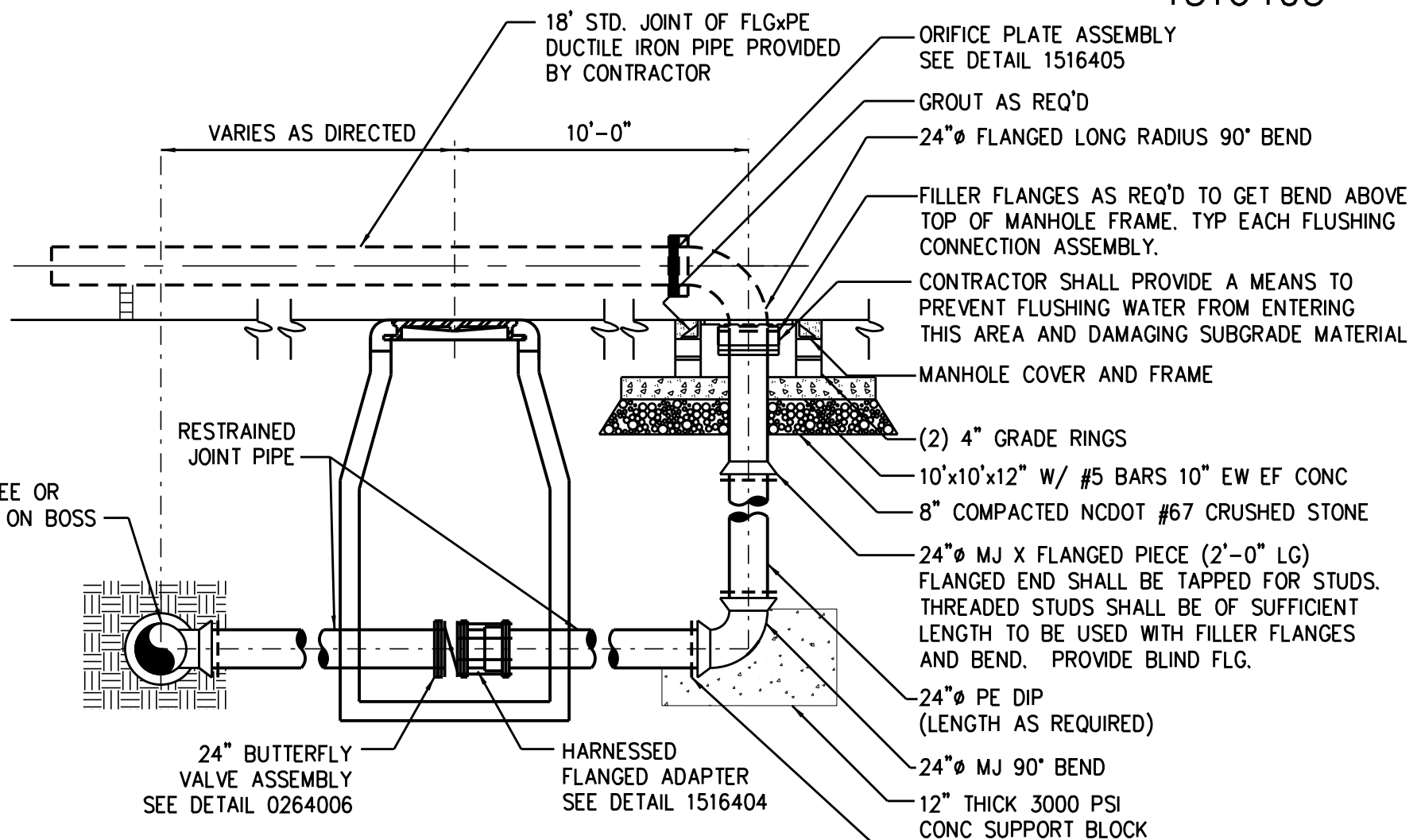
VALVE BOX PAD 0264005



GATE VALVE ASSEMBLY (FOR 4" THRU 12" VALVES) 0264013

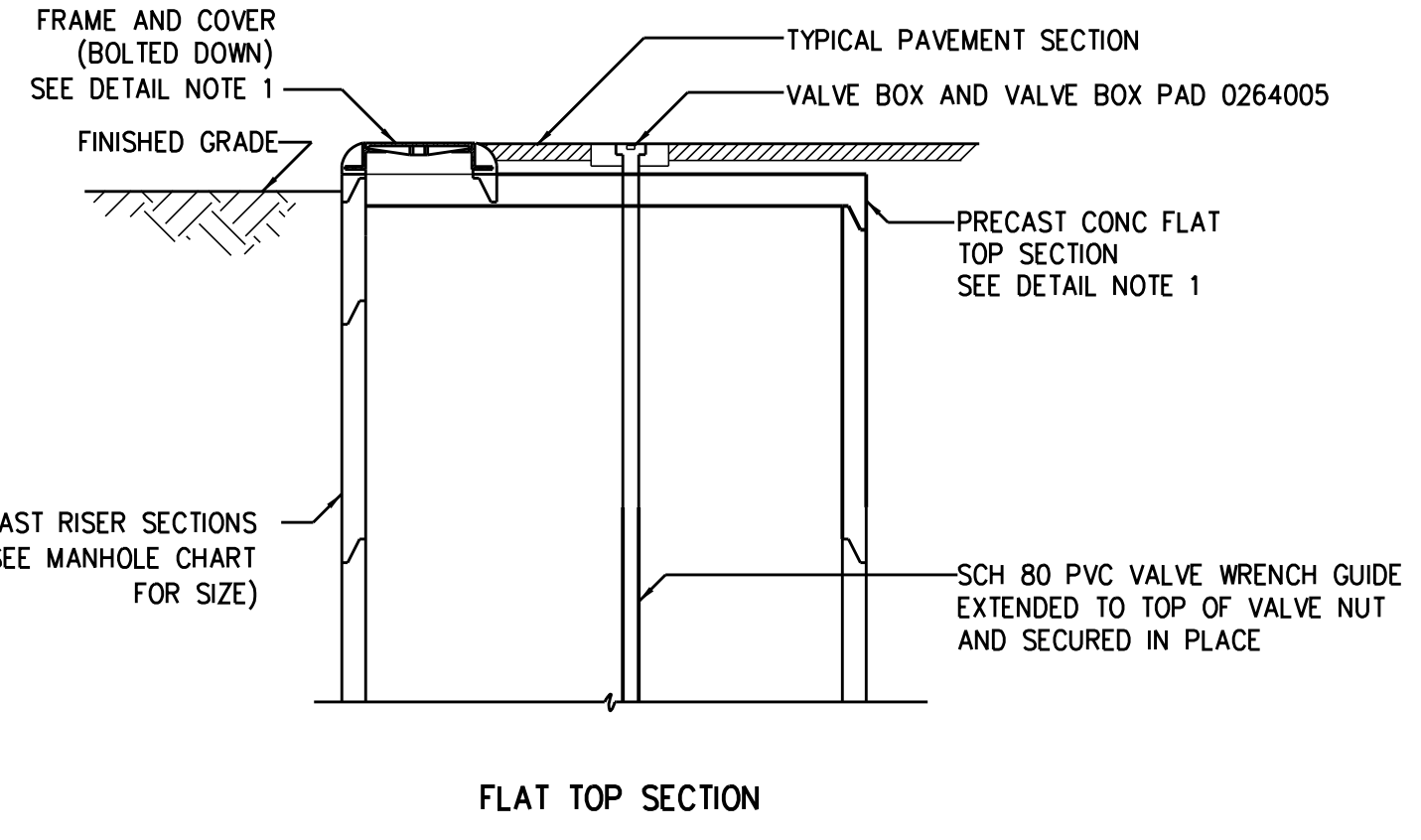


ORIFICE PLATE ASSEMBLY 1516405



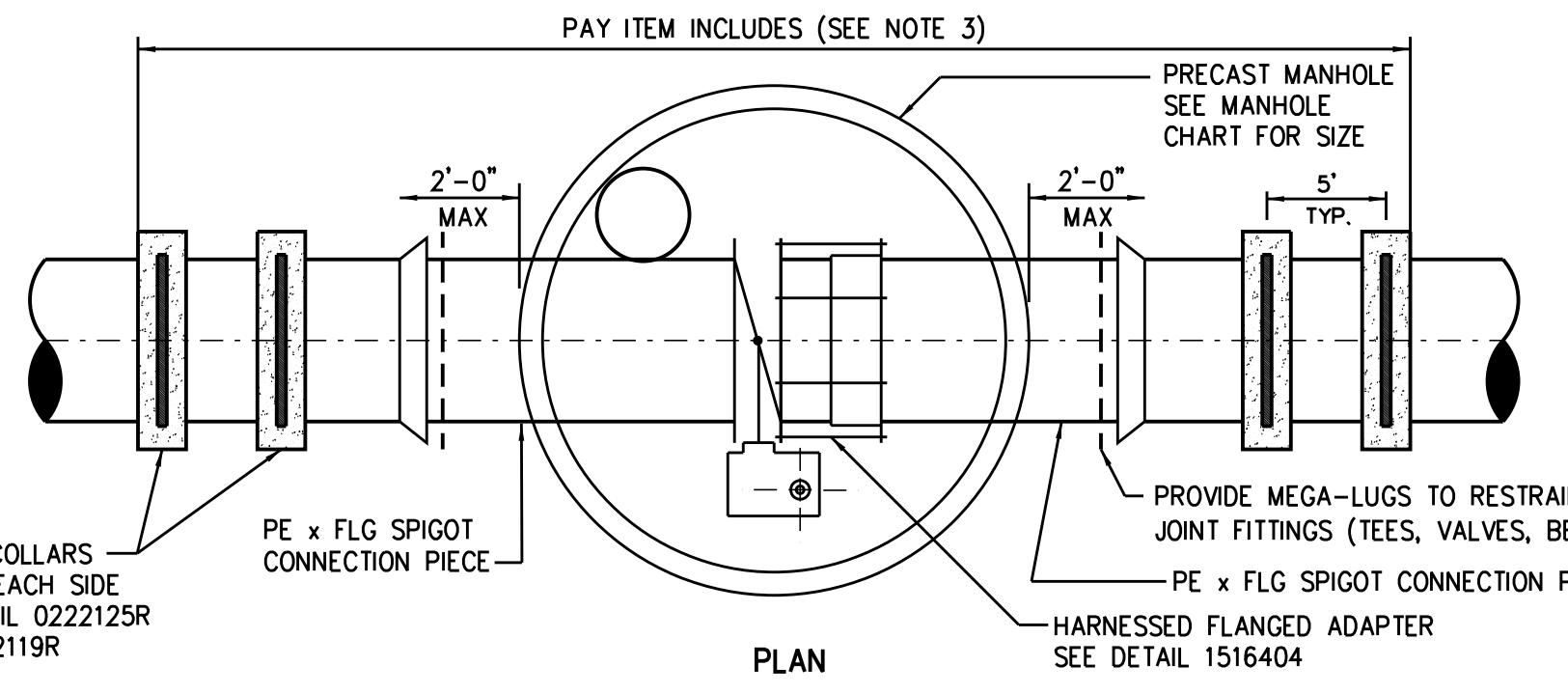
FLUSHING CONNECTION ASSEMBLY 0260118

NOTE: THE CONTRACTOR SHALL COORDINATE WITH THE RESIDENT ENGINEER/CITY OF DURHAM FOR CONTROL OF FLUSHING WATER



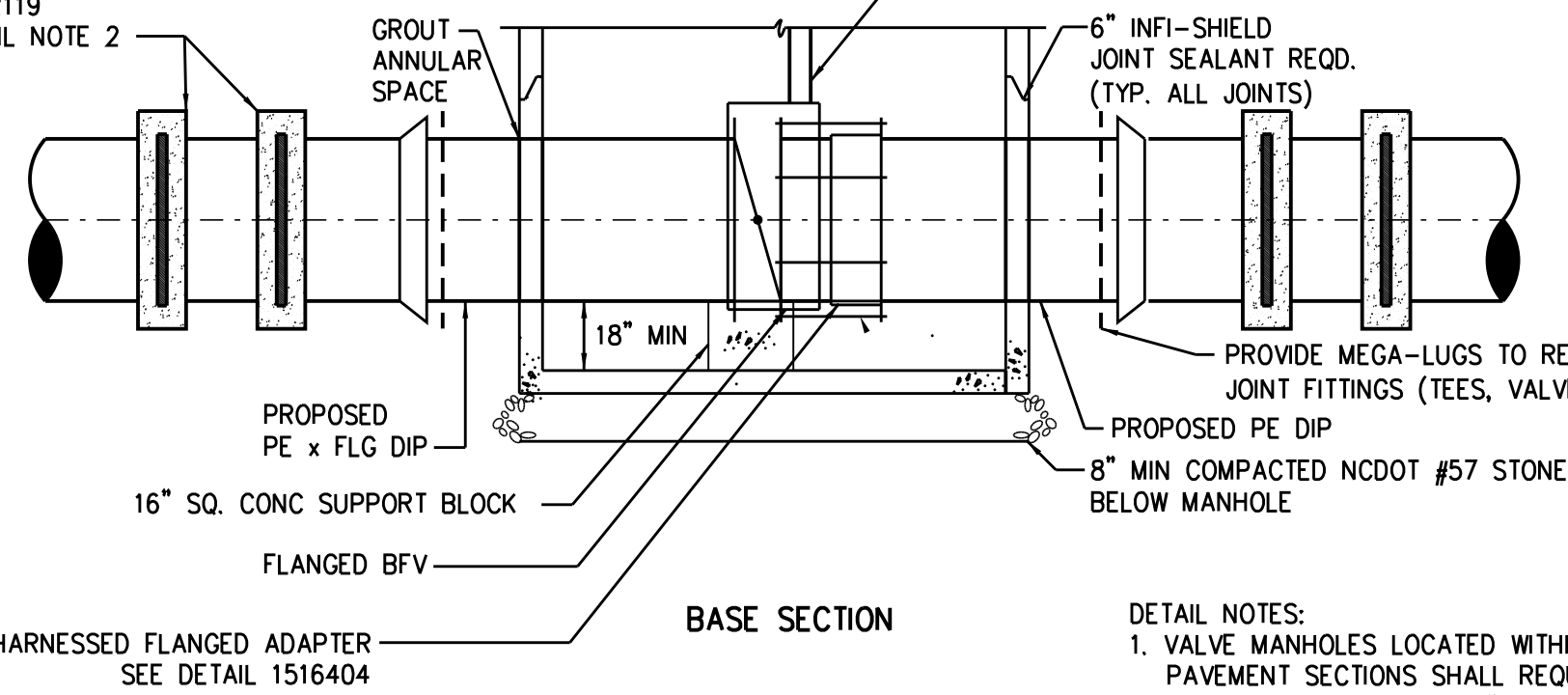
FLAT TOP SECTION

MANHOLE CHART	
VALVE SIZE	MANHOLE SIZE
18"	6'-0" DIA
20"	6'-0" DIA
24"	7'-0" DIA
30"	7'-0" DIA
36"	8'-0" DIA
42"	10'-0" DIA



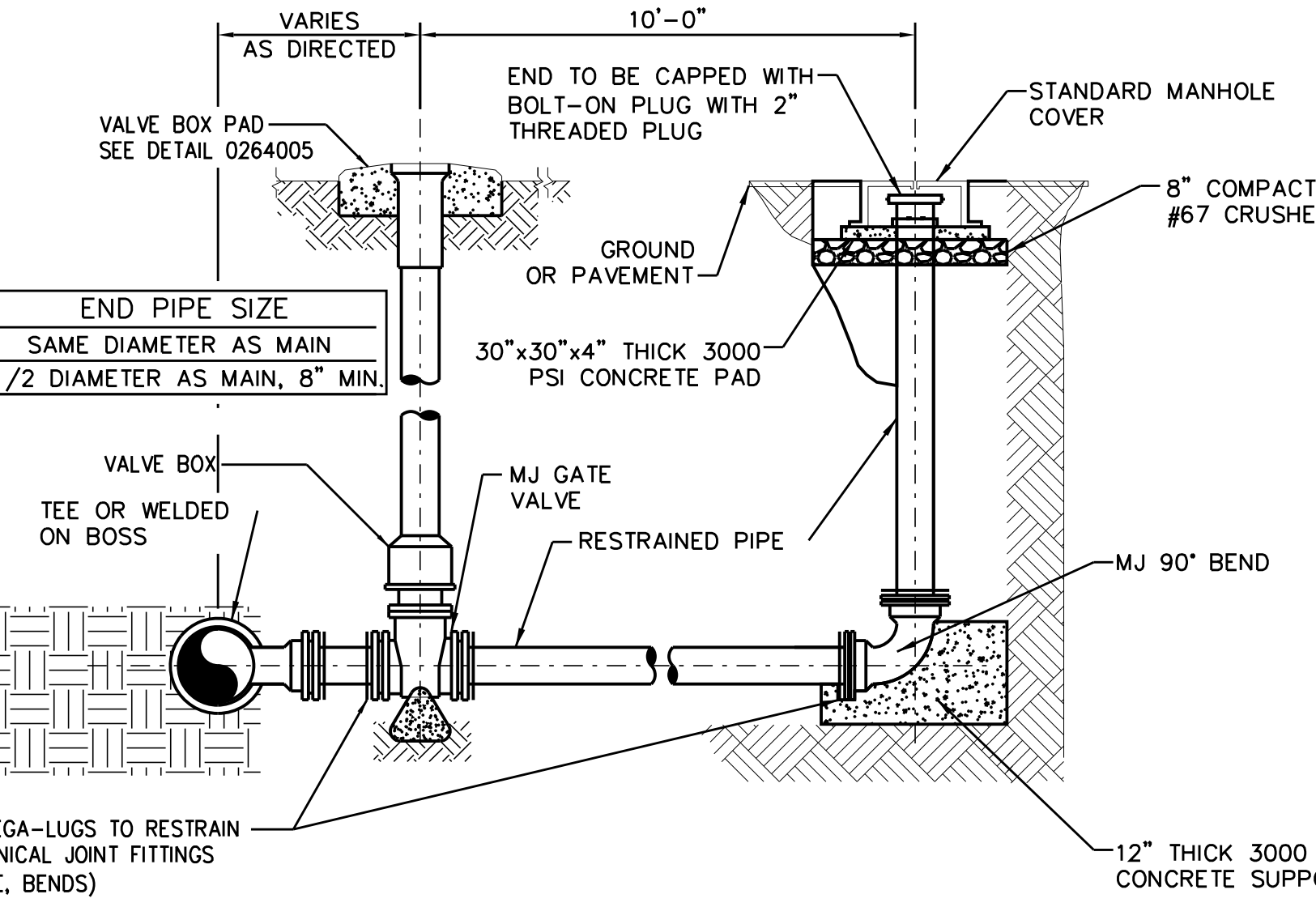
PLAN

TYPICAL BUTTERFLY VALVE ASSEMBLY (FOR 18-INCH THRU 36-INCH VALVES) 0264006

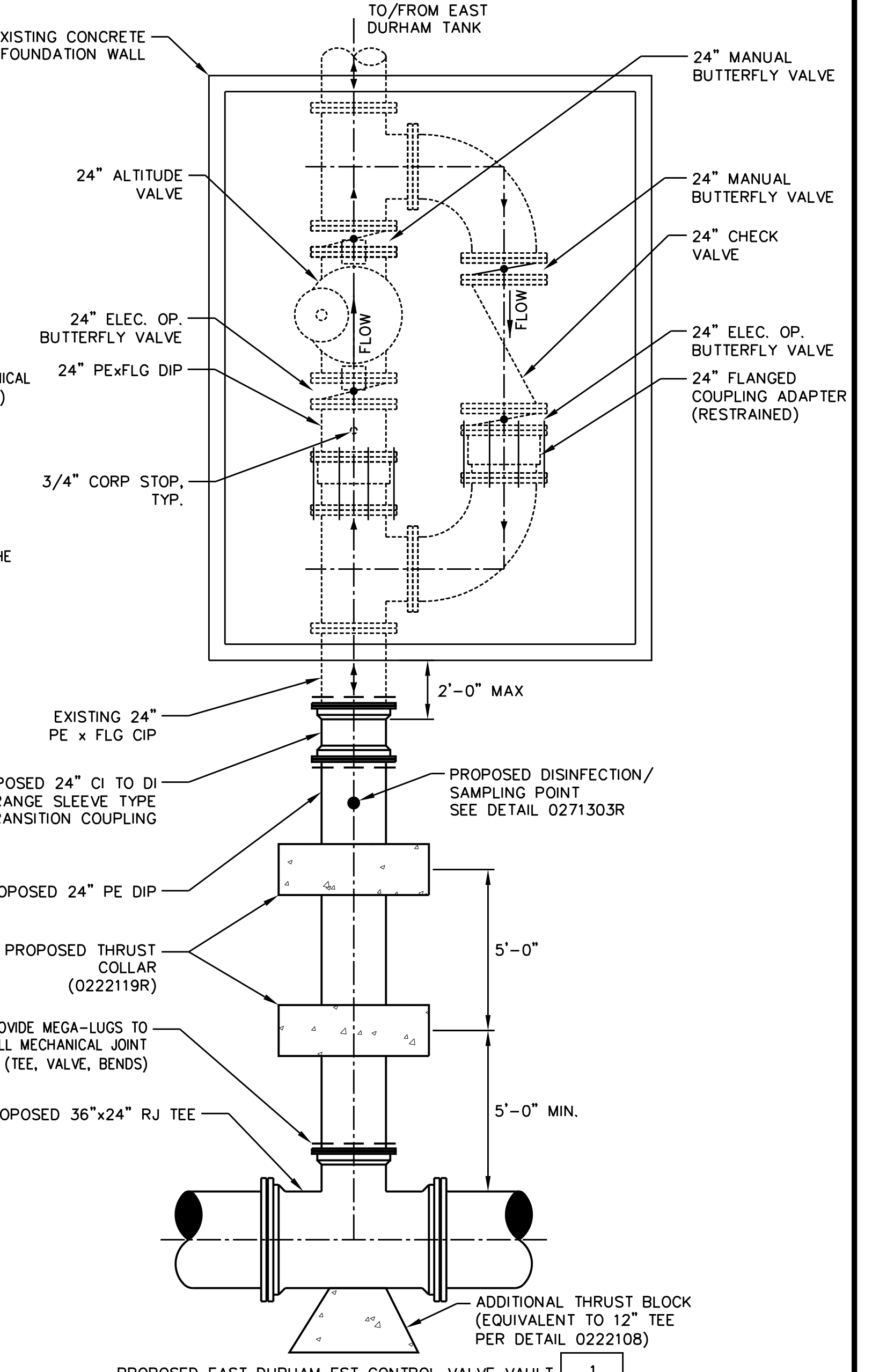


BASE SECTION

MAIN SIZE	END PIPE SIZE
6" - 12"	SAME DIAMETER AS MAIN
16" - 36"	1/2 DIAMETER AS MAIN, 8" MIN.



TEMPORARY WATERLINE BLOW OFF ASSEMBLY 0271304



PROPOSED EAST DURHAM EST CONTROL VALVE VAULT 1 UC-3B

PROJECT REFERENCE NO. U-3308 SHEET NO. UC-3B

DESIGNED BY: JAR
DRAWN BY: JGB
CHECKED BY: JJW
APPROVED BY: JJW

PREPARED IN THE OFFICE OF:
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PE NO. F-0102

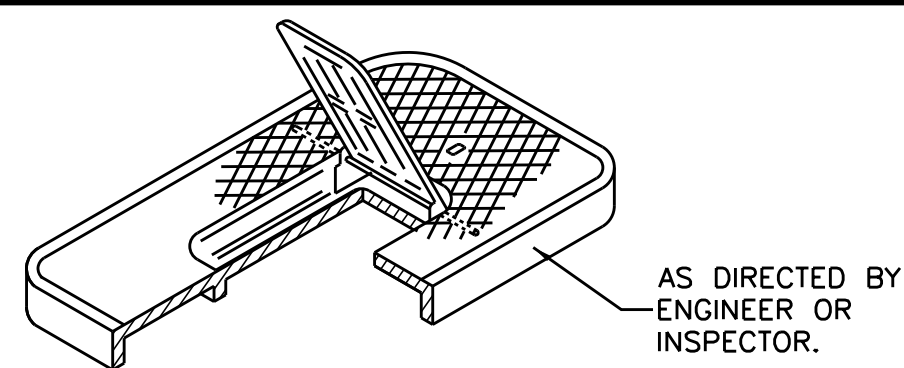
UTILITY ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151

UTILITY CONSTRUCTION PLANS ONLY

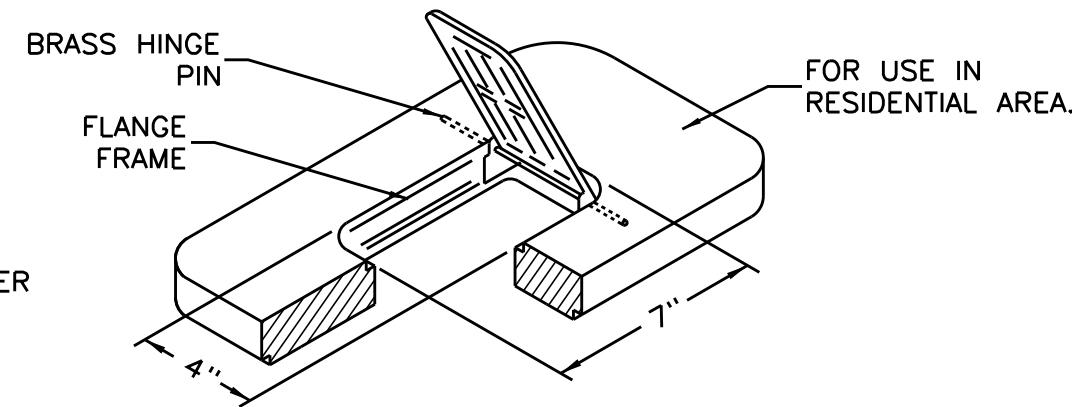
UTILITY CONSTRUCTION PLANS ONLY

5/14/99

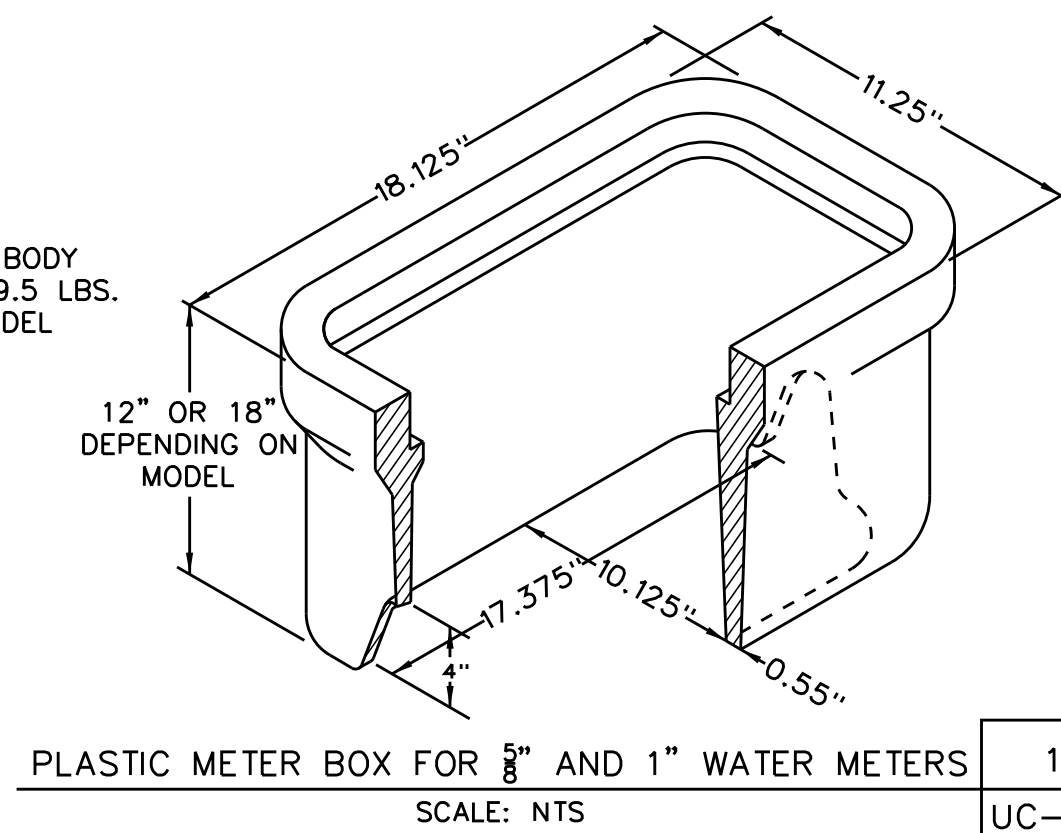
NO. 33. T - DUCTILE IRON COVER WITH DUCTILE IRON HINGE LID WEIGHT 18 LBS.



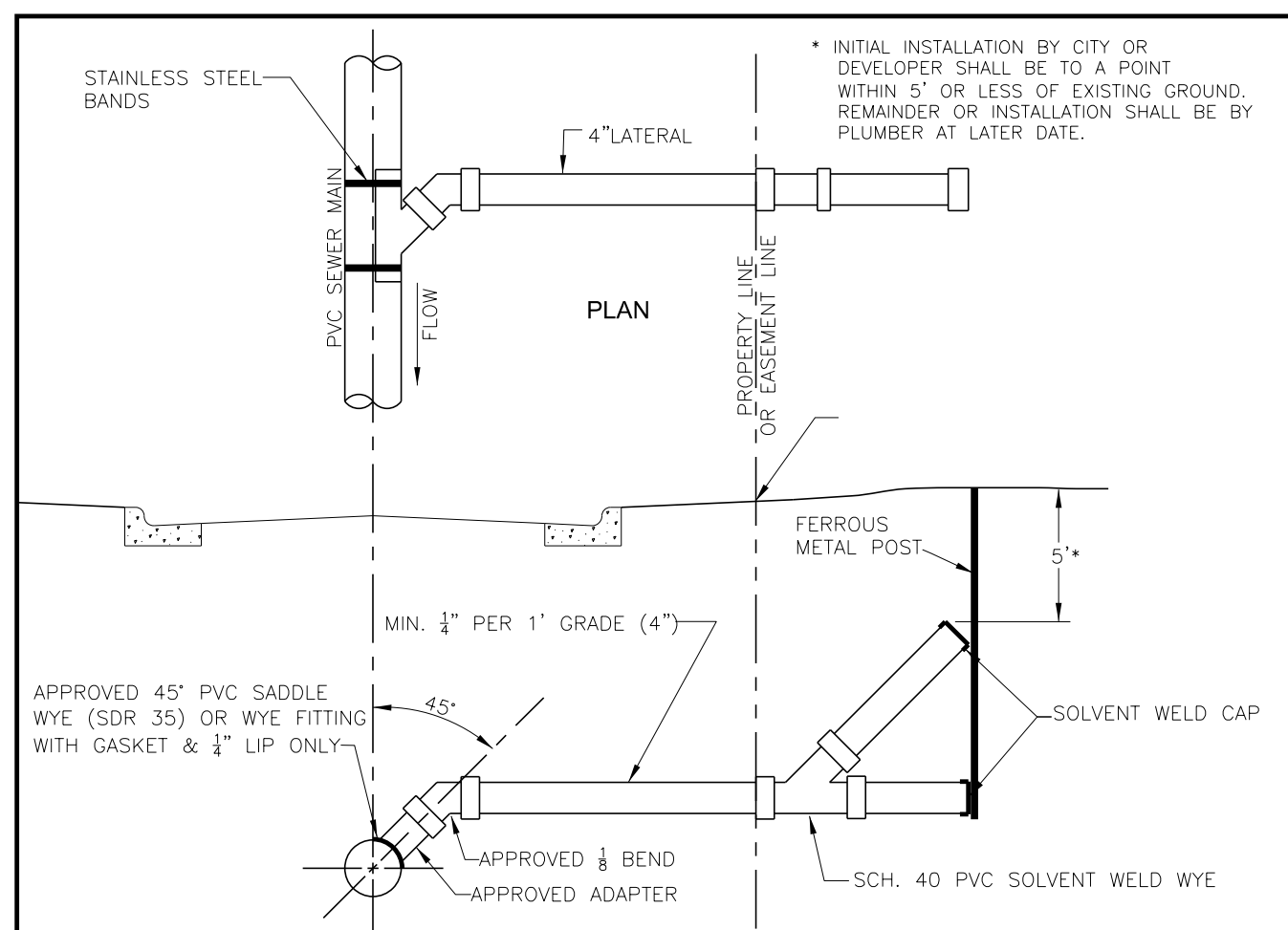
NO. 33. H - PLASTIC COVER WITH PLASTIC HINGE LID WEIGHT 8 LBS.



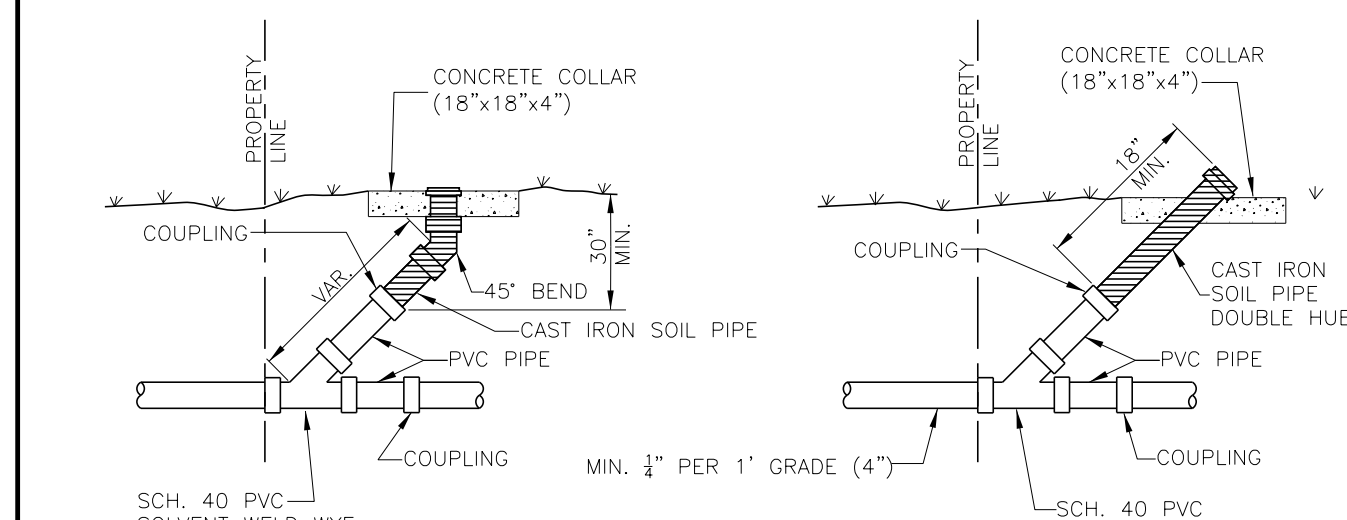
NO. 33. - PLASTIC BODY WEIGHT 15 LBS. OR 19.5 LBS. DEPENDING ON MODEL



1 UC-3C



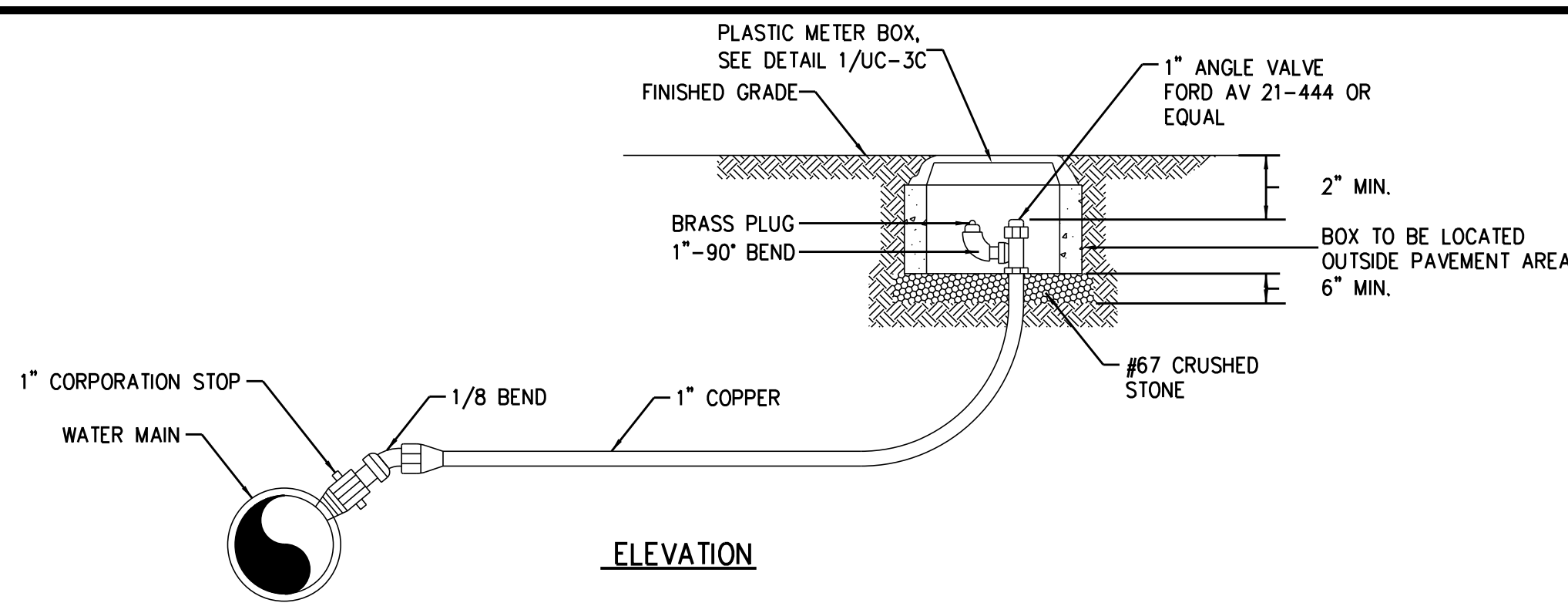
STANDARD SEWER MAIN LATERAL STUB-OUT



CLEAN OUT DETAILS

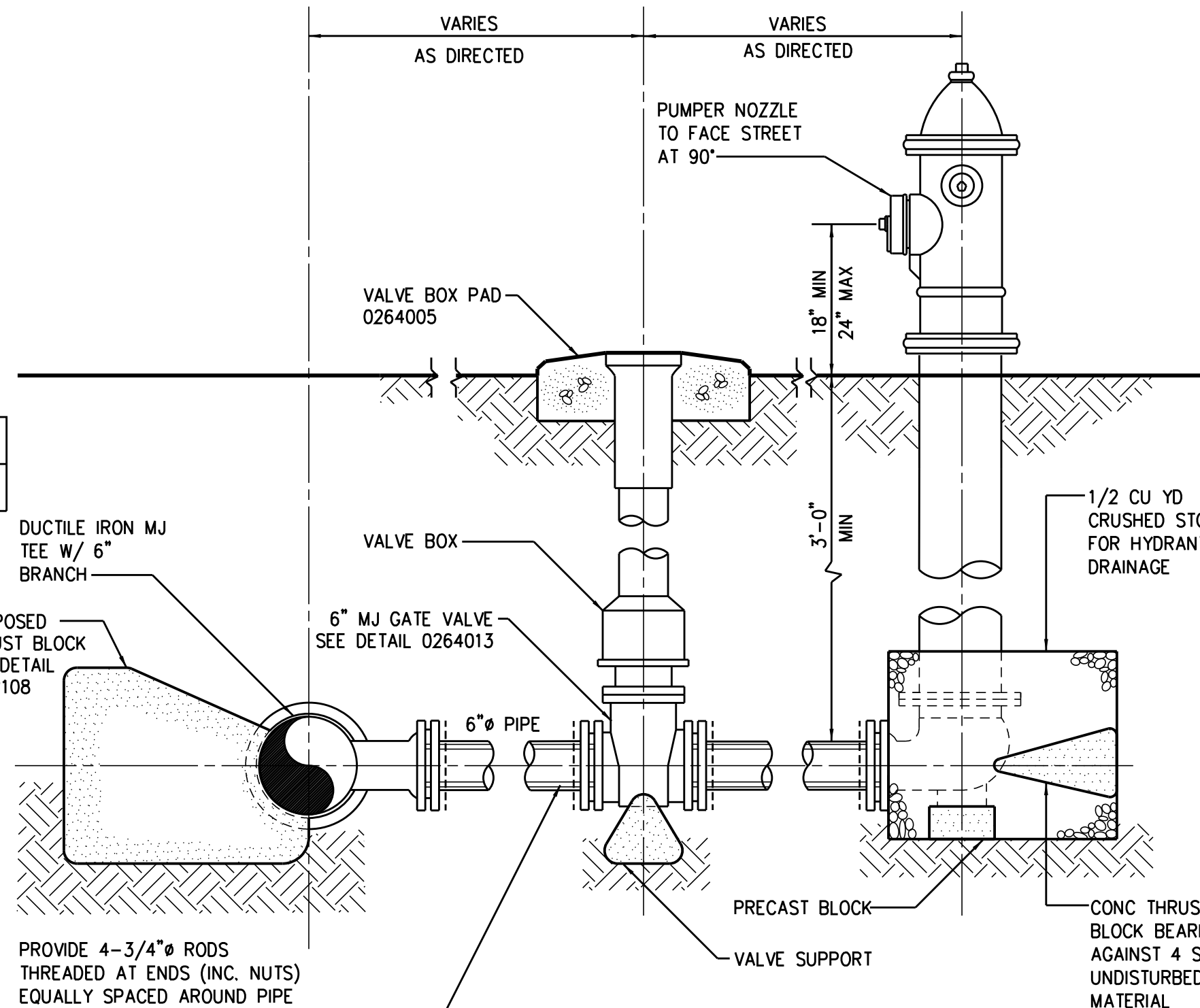
DURHAM CITY OF RESPONSE	SANITARY SEWER LATERAL		SCALE: NTS
	4" SEWER LATERAL		DETAIL NO. SS-1.0
	REVISION DATE: 05/21/2008	CITY OF DURHAM, NORTH CAROLINA DEPARTMENT OF PUBLIC WORKS	

NOTE: CONTRACTOR SHALL FIELD LOCATE EXISTING SANITARY SEWER SERVICES PRIOR TO INSTALLATION OF PROPOSED MAIN LINE SANITARY SEWER.



ELEVATION

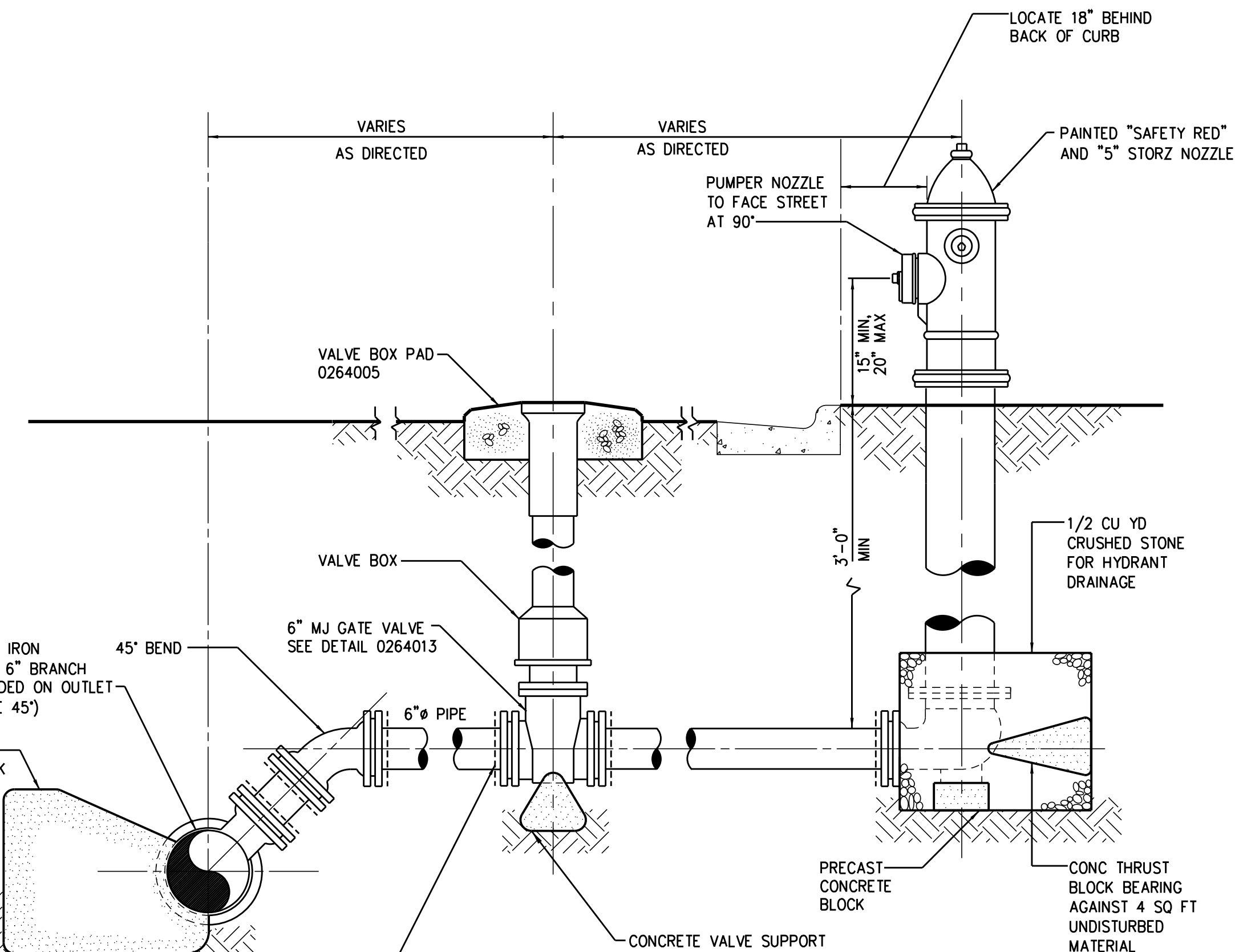
DISINFECTION AND SAMPLING POINT 0271303R



FIRE HYDRANT 1553000

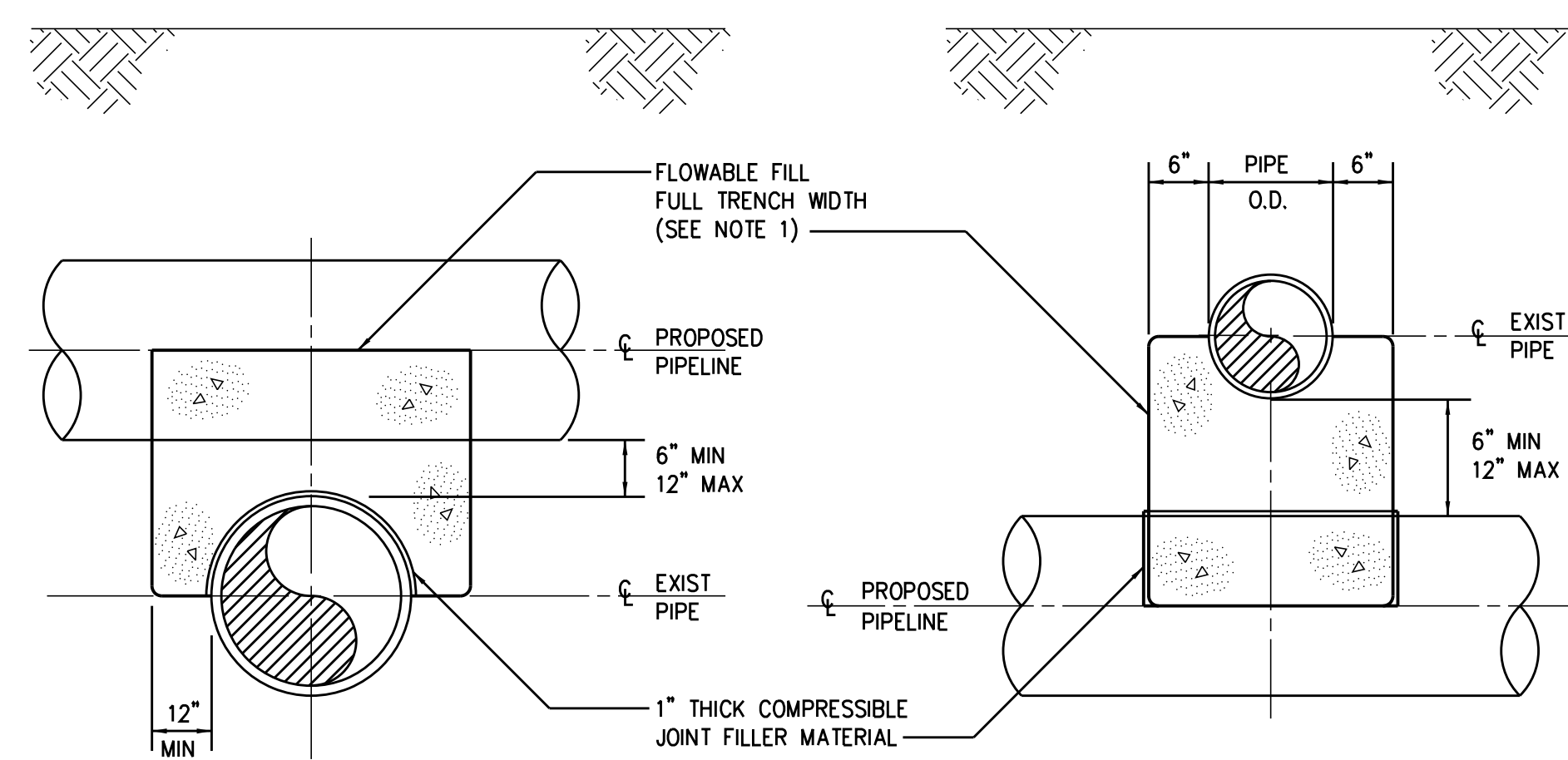
PROVIDE 4-3/4" RODS THREADED AT ENDS (INC. NUTS) EQUALLY SPACED AROUND PIPE BETWEEN ALL MECHANICAL JOINT FITTINGS (TEE, VALVE, BEND)

- DETAIL NOTES:
1. LOCATE HYDRANT 18" FROM BACK OF CURB OR 12" INSIDE R/W.
 2. ALL PIPE AND FITTINGS SHALL BE RESTRAINED WITH MECHANICAL JOINT RETAINER GLANDS



AIR RELEASE ASSEMBLY (USED IN-LIEU OF ARV) 1553000R

PROVIDE MEGA-LUGS TO RESTRAIN ALL MECHANICAL JOINT FITTINGS (TEE, VALVE, BEND)

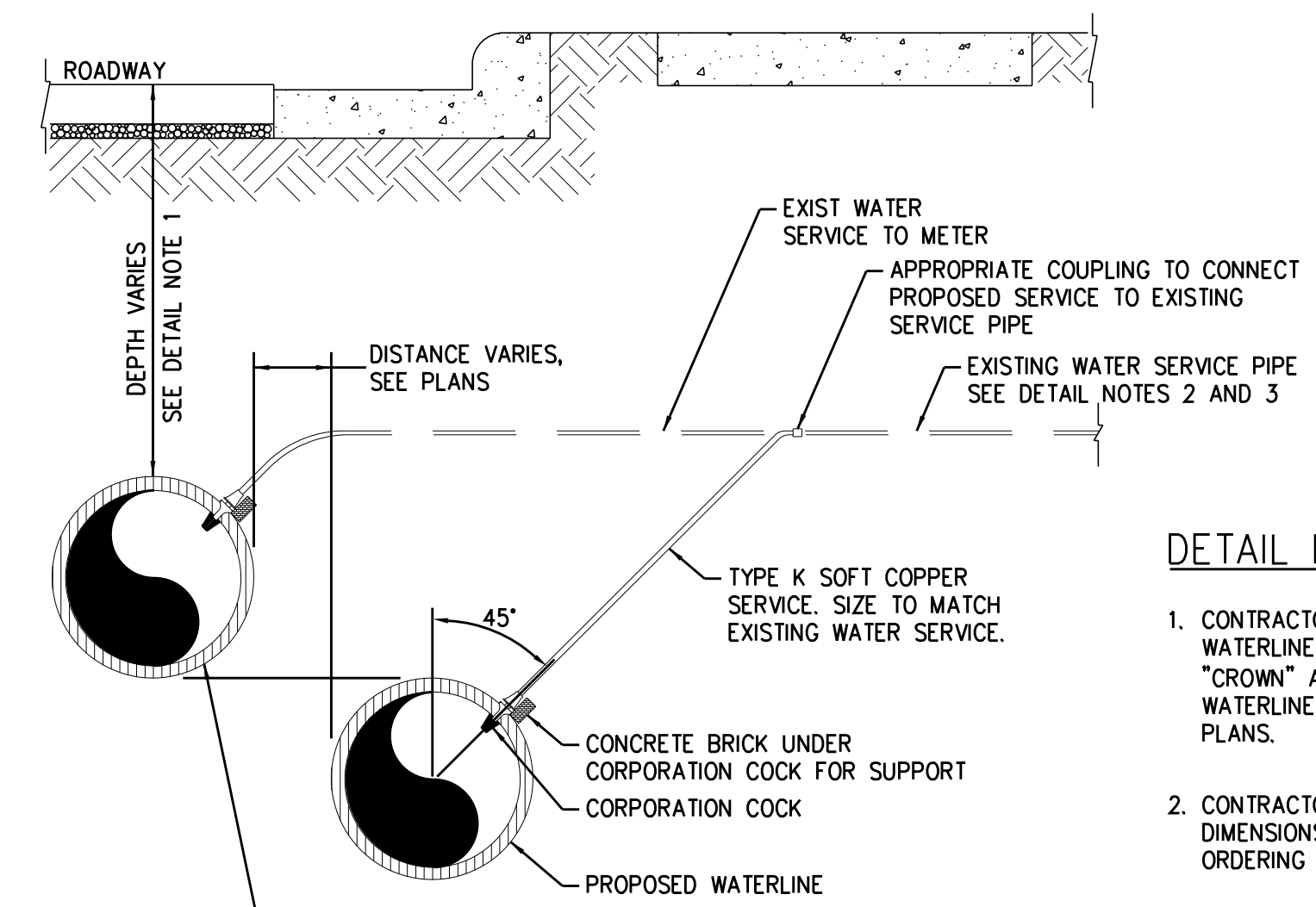


PROPOSED PIPELINE OVER EXIST PIPE

PROPOSED PIPELINE UNDER EXIST PIPE

0222118

NOTE: NO ENCASEMENT REQUIRED FOR SPACE GREATER THAN 12"



TYPICAL SERVICE CONNECTION

0260121

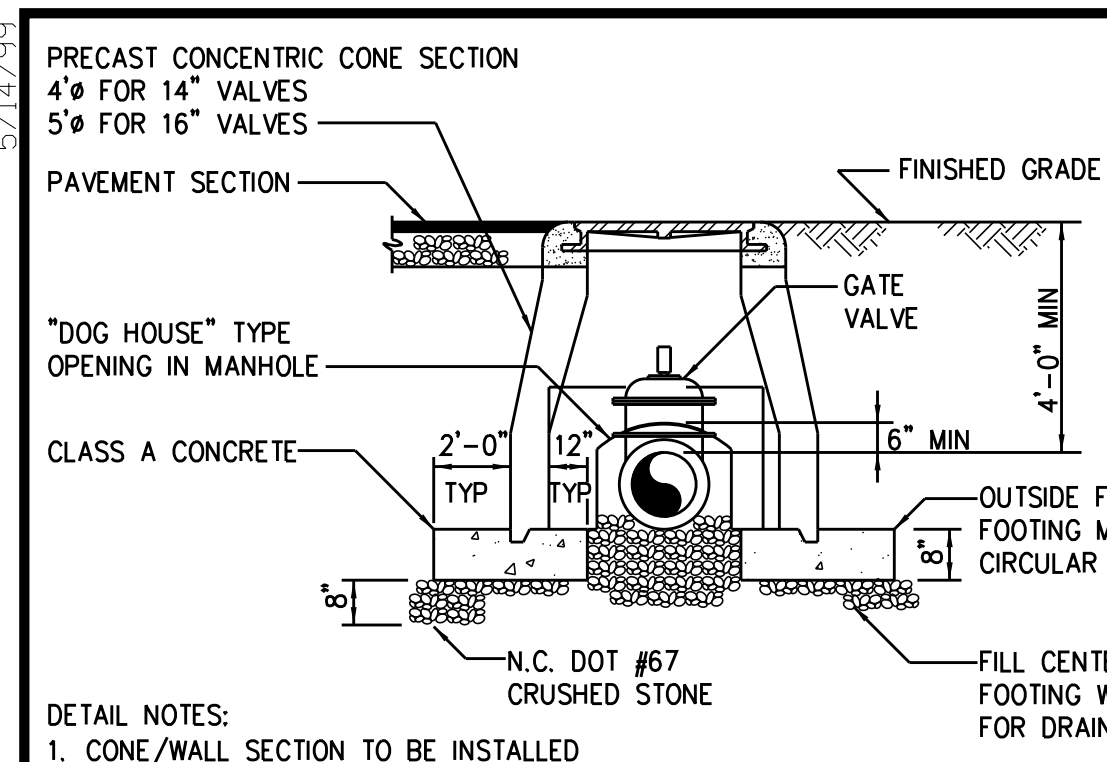
DETAIL NOTES:

1. CONTRACTOR SHALL VERIFY DEPTH OF EXISTING WATERLINE AND LOCATE PROPOSED WATERLINE "CROWN" AT THE "INVERT" OF THE EXISTING WATERLINE, UNLESS OTHERWISE SHOWN ON THE PLANS.
2. CONTRACTOR SHALL VERIFY EXACT MATERIALS AND DIMENSIONS OF EXISTING WATER SERVICES PRIOR TO ORDERING MATERIALS.
3. CONTRACTOR SHALL NOTIFY THE RESIDENT ENGINEER IF THERE ARE COMPLICATIONS WITH CONNECTING TO THE EXISTING WATERLINE.

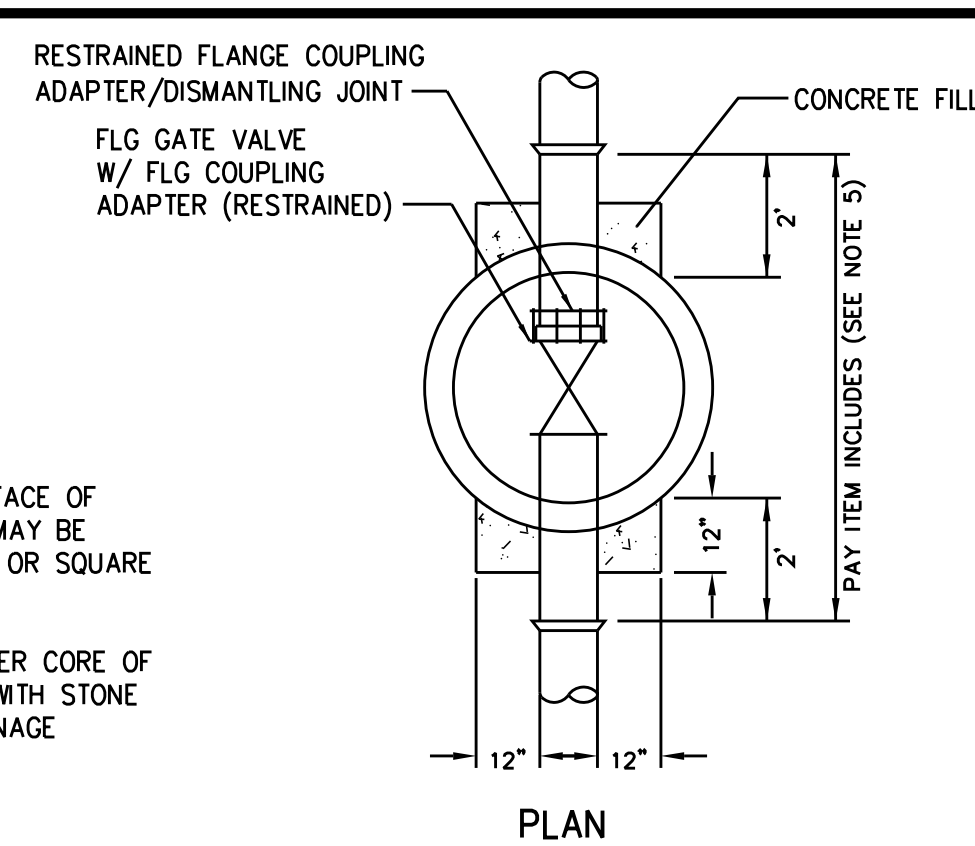
PROJECT REFERENCE NO. U-3308	SHEET NO. UC-3C
DESIGNED BY: KFC	
DRAWN BY: JGB	
CHECKED BY: DGB	
APPROVED BY: JJW	
REVISED:	NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151
UTILITY CONSTRUCTION PLANS ONLY	

PREPARED IN THE OFFICE OF:
Kimley»Horn
P.O. BOX 33068
RALEIGH, NORTH CAROLINA 27636-3068
PHONE: (919) 677-2000
FAX: (919) 677-2050
PE NO. F-0102

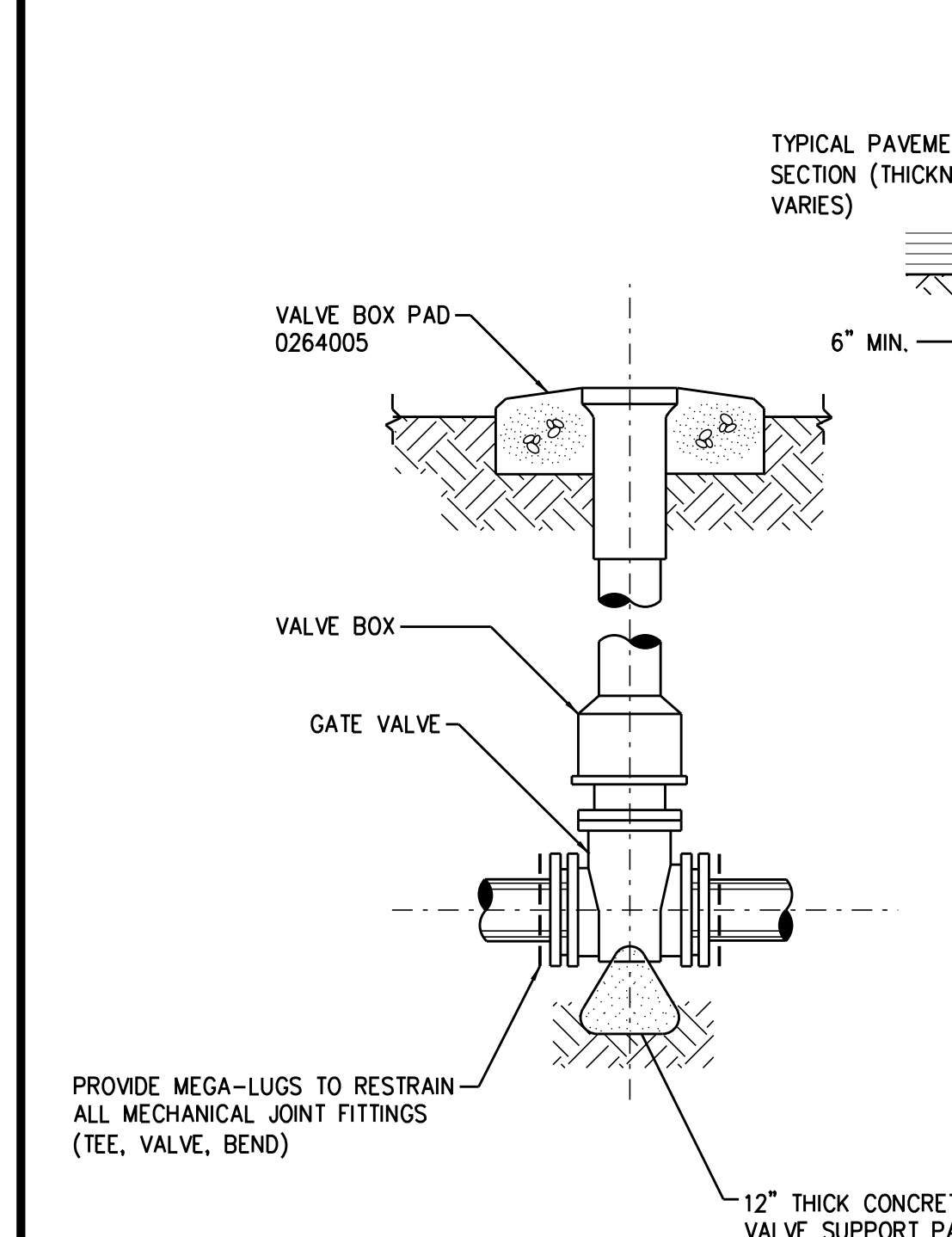
5/14/19



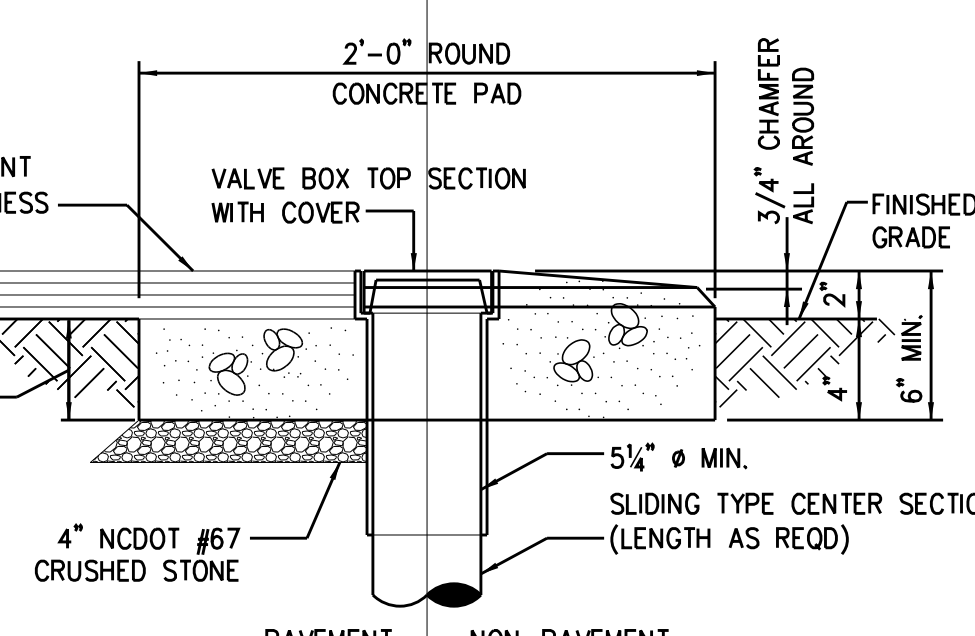
- DETAIL NOTES:
1. CONE/WALL SECTION TO BE INSTALLED IN FRESHLY PLACED FOOTING TO INSURE UNIFORM BEARING.
 2. ADD BARREL SECTIONS TO MANHOLE AS NECESSARY.
 3. ELIMINATE FOOTING AT OPENING.
 4. 2'-0" MAXIMUM DISTANCE FROM OUTSIDE OF MANHOLE TO FIRST PIPE JOINT. (EACH SIDE OF MANHOLE)
 5. PAY ITEM DOES NOT INCLUDE PIPING.



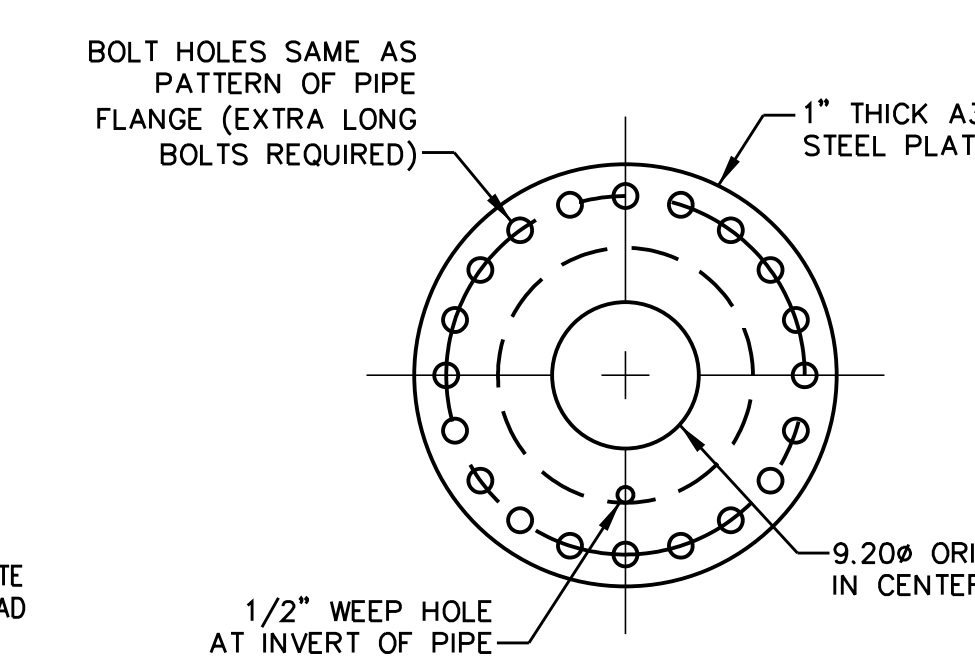
**GATE VALVE ASSEMBLY
(FOR 14" AND 16" VALVES)
0264001R**



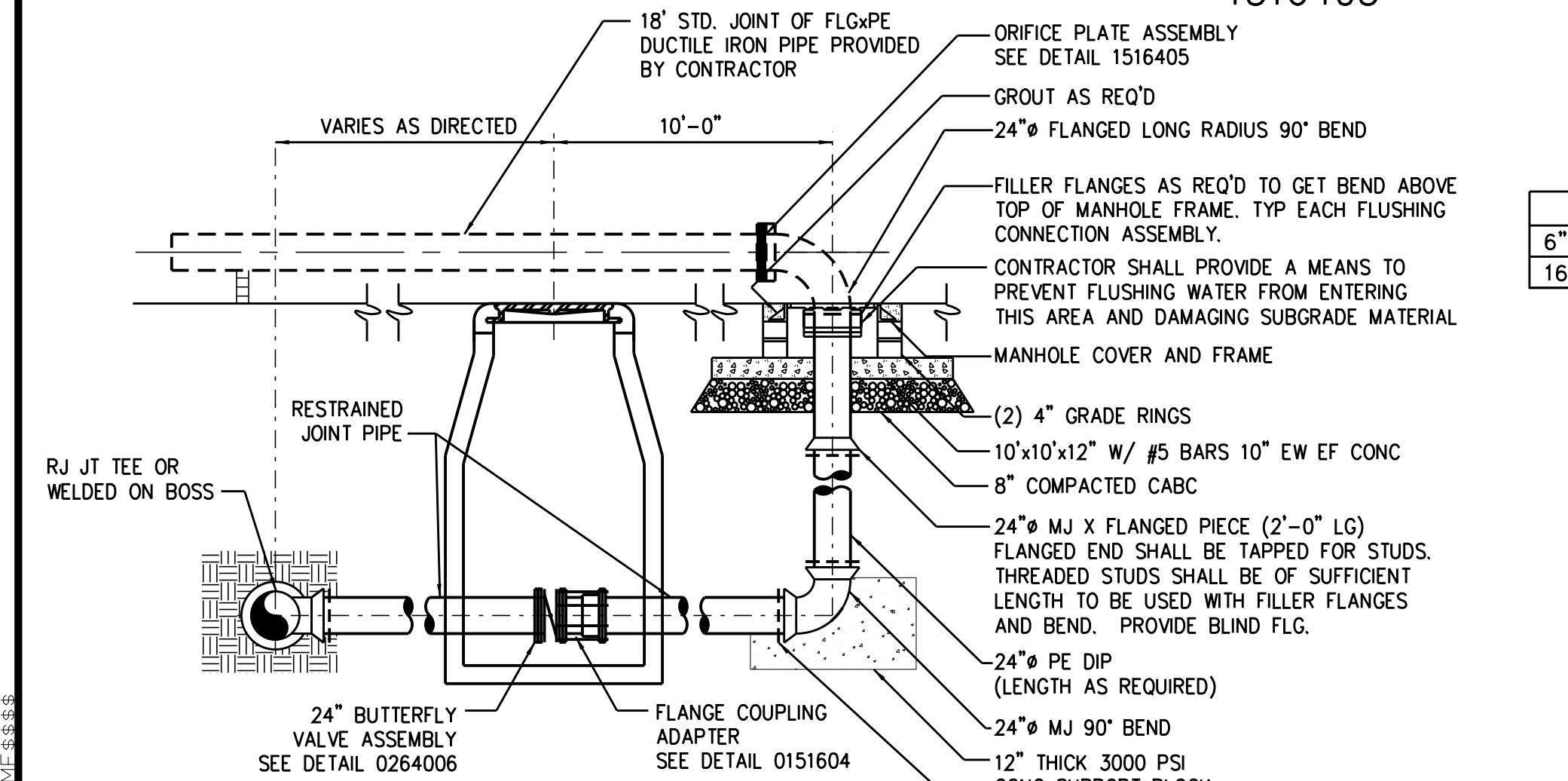
**GATE VALVE ASSEMBLY
(FOR 4" THRU 12" VALVES)
0264013**



**VALVE BOX PAD
0264005**

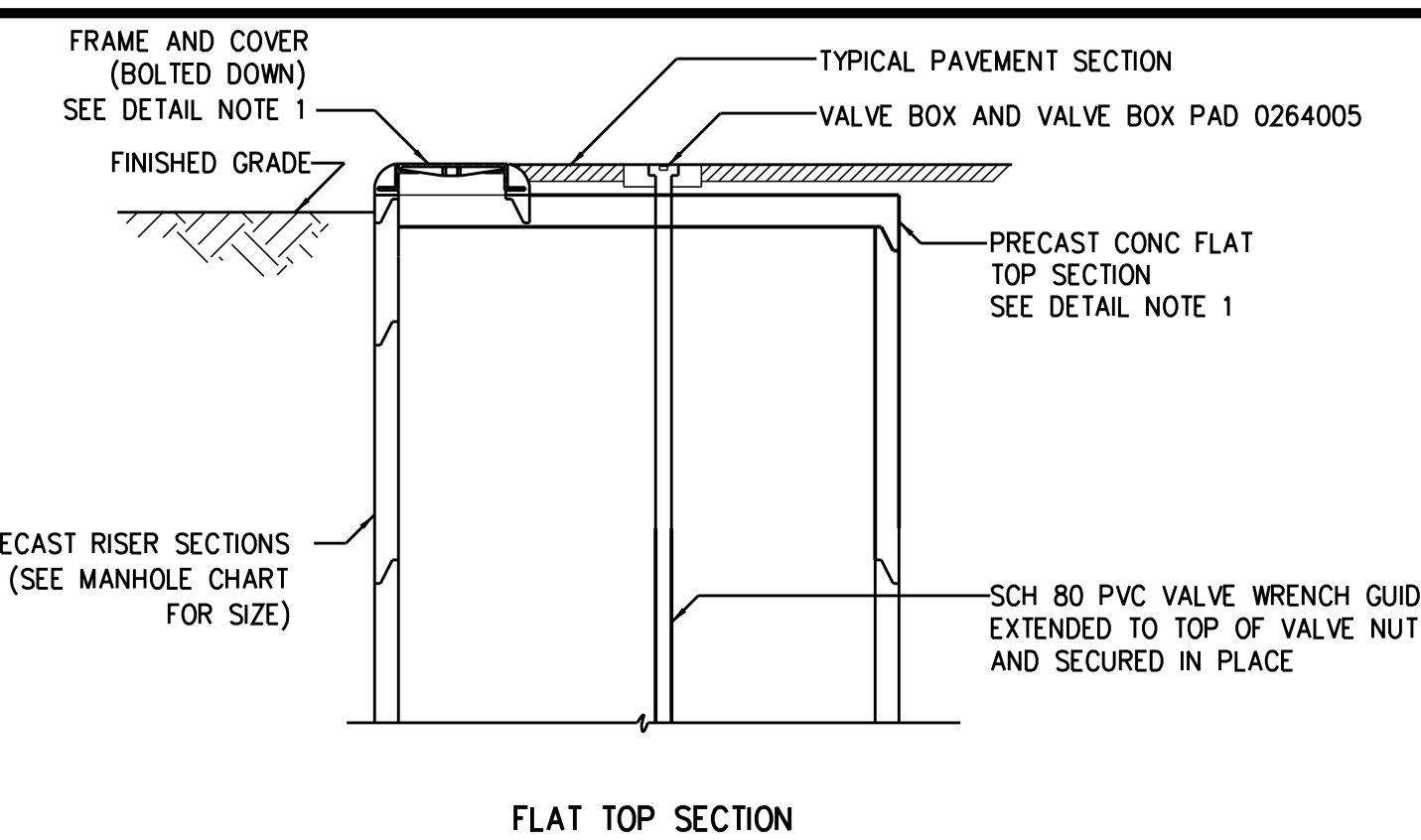


**ORIFICE PLATE ASSEMBLY
1516405**

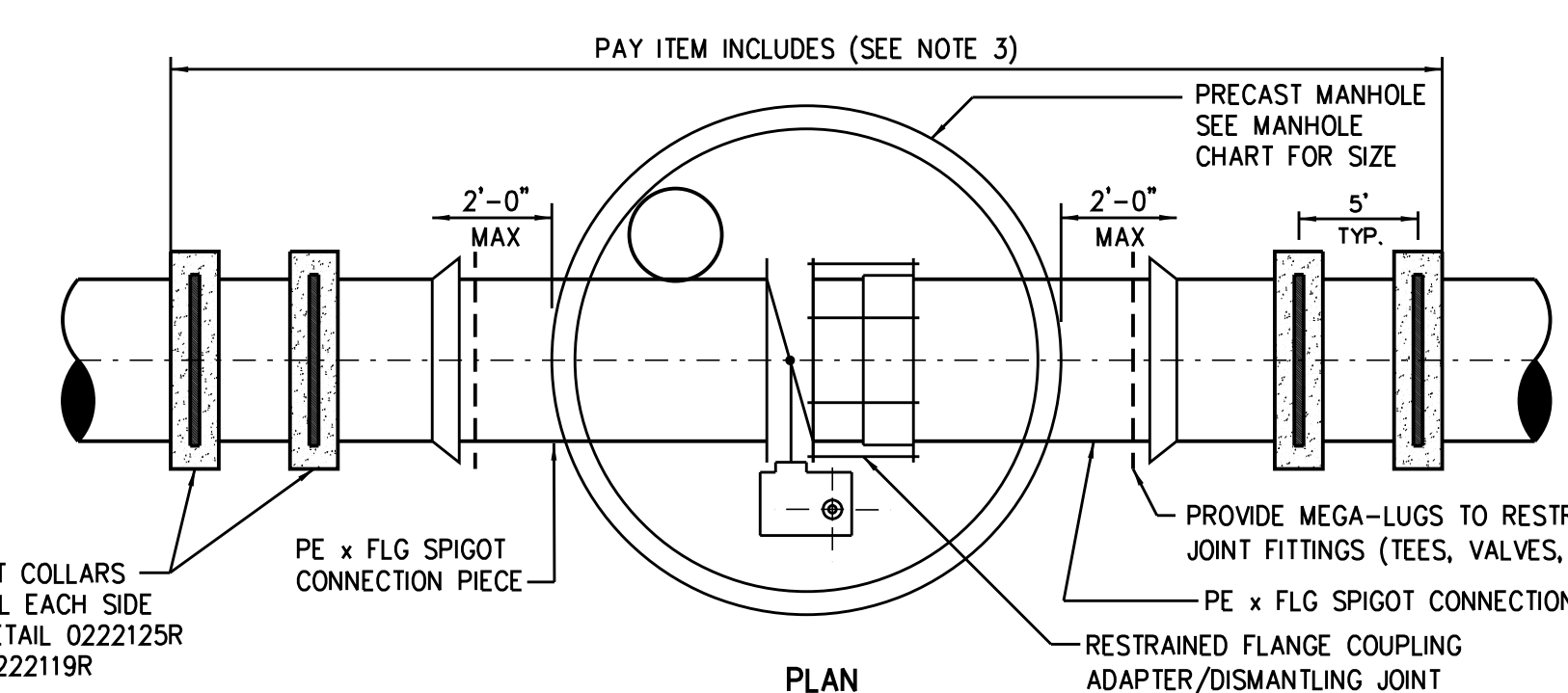


**FLUSHING CONNECTION ASSEMBLY
0260118**

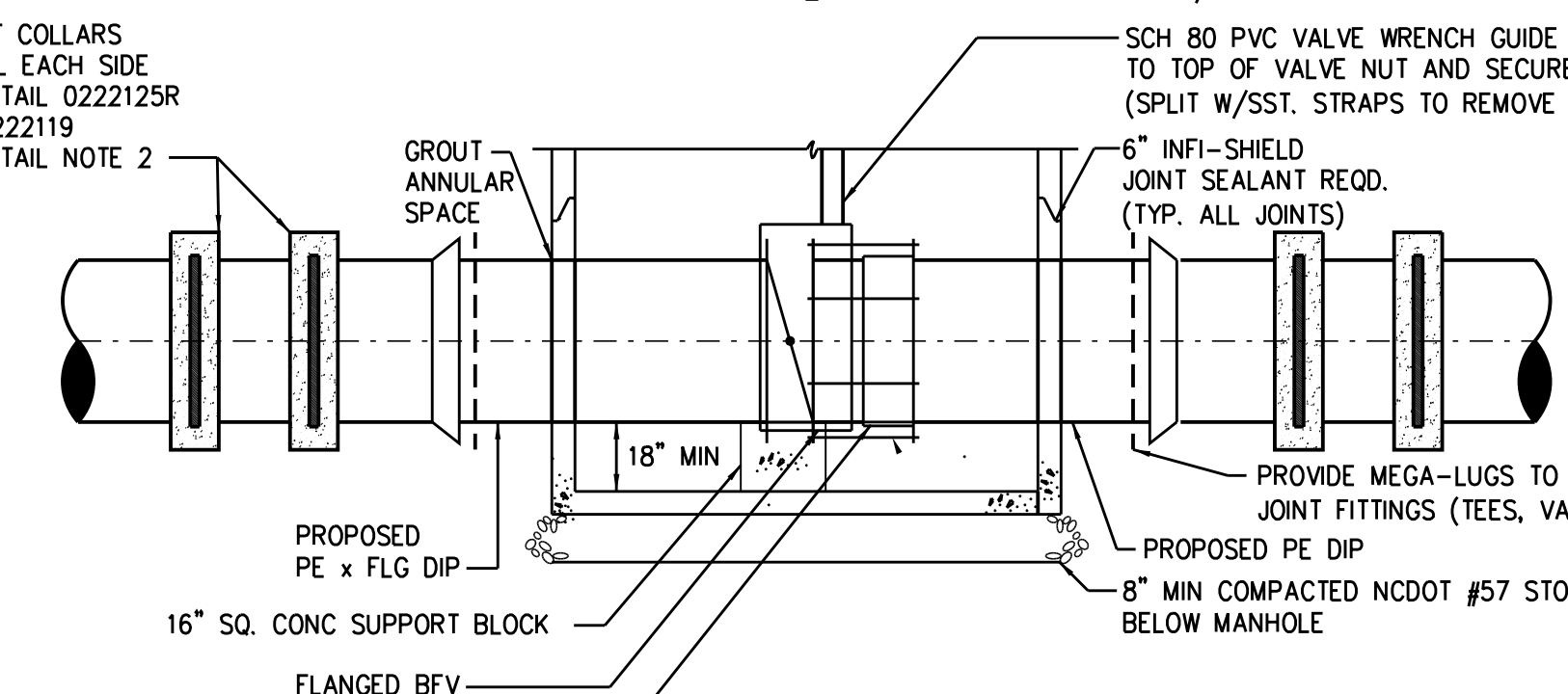
NOTE: THE CONTRACTOR SHALL COORDINATE WITH THE RESIDENT ENGINEER/CITY OF DURHAM FOR CONTROL OF FLUSHING WATER



FLAT TOP SECTION

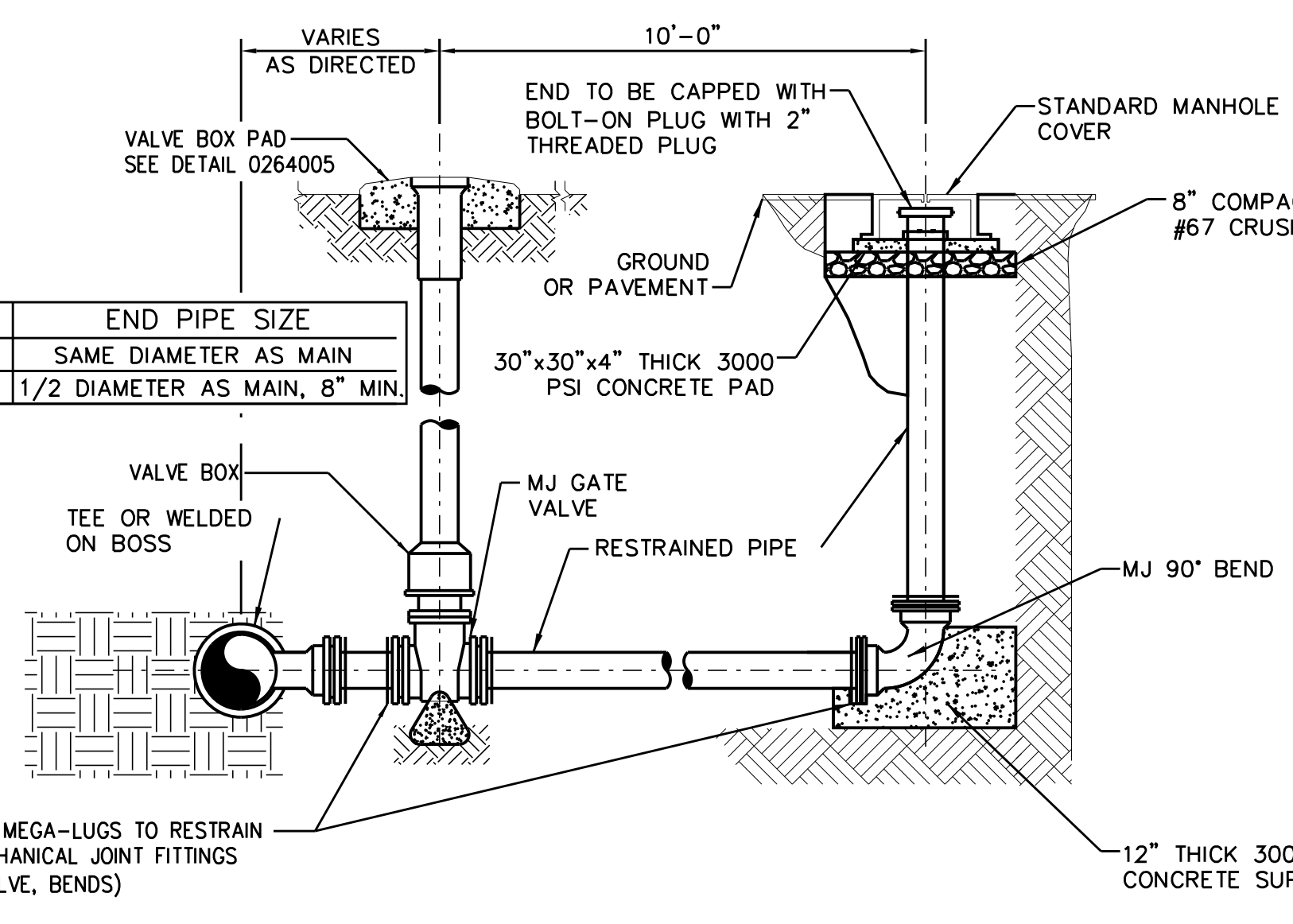


PLAN



BASE SECTION

**TYPICAL BUTTERFLY VALVE ASSEMBLY
(FOR 18-INCH THRU 36-INCH VALVES)
0264006**



**TEMPORARY WATERLINE
BLOW OFF ASSEMBLY
0271304**

MANHOLE CHART	
VALVE SIZE	MANHOLE SIZE
18"	6'-0" DIA
20"	6'-0" DIA
24"	7'-0" DIA
30"	7'-0" DIA
36"	8'-0" DIA
42"	10'-0" DIA

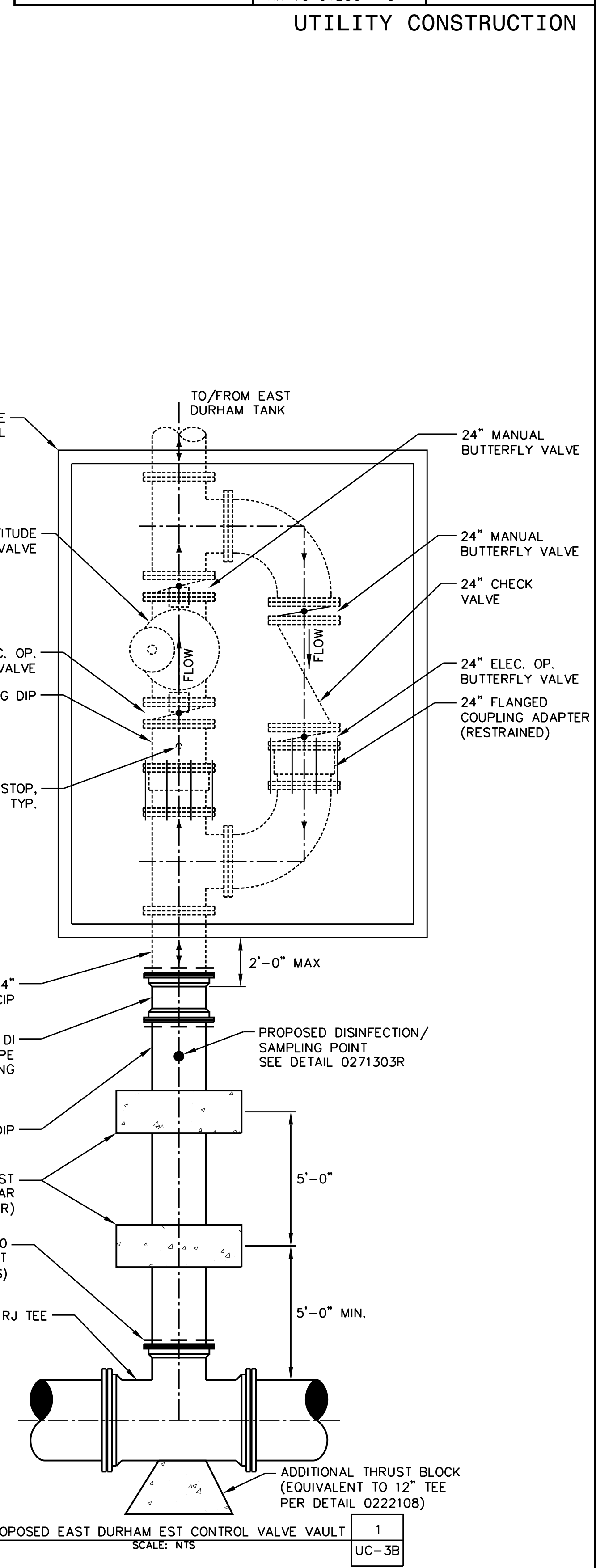
PROJECT REFERENCE NO. U-3308 SHEET NO. UC-3B

DESIGNED BY: JAR
DRAWN BY: JGB
CHECKED BY: JJW
APPROVED BY: JJW

PREPARED IN THE OFFICE OF:
Kimley»Horn
P.O. BOX 33068
RALEIGH, NORTH CAROLINA 27636-3068
PHONE: (919) 677-2000
FAX: (919) 677-2050
PE NO. F-0102

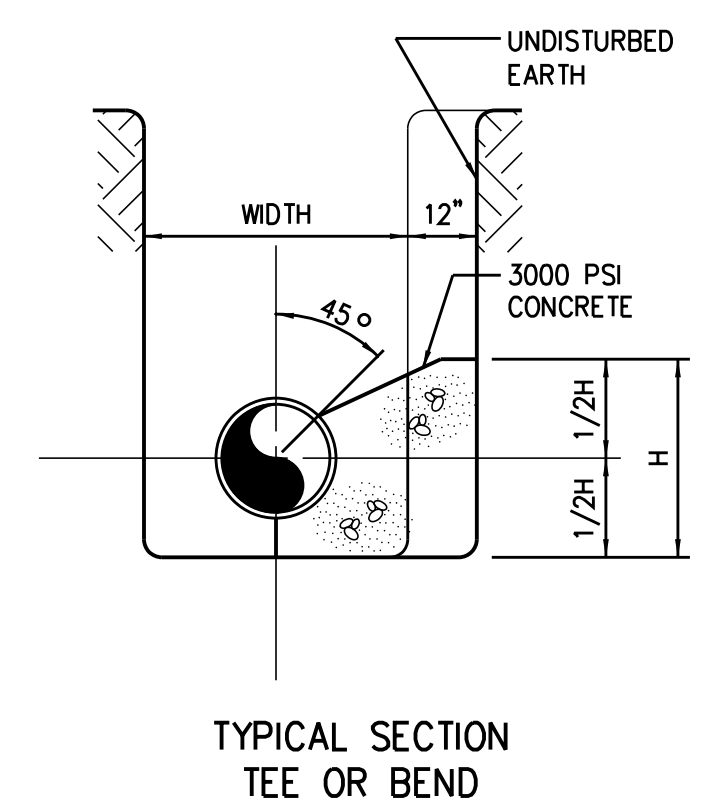
UTILITY ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151

UTILITY CONSTRUCTION PLANS ONLY



PROPOSED EAST DURHAM EST CONTROL VALVE VAULT
SCALE: NTS

5/14/99

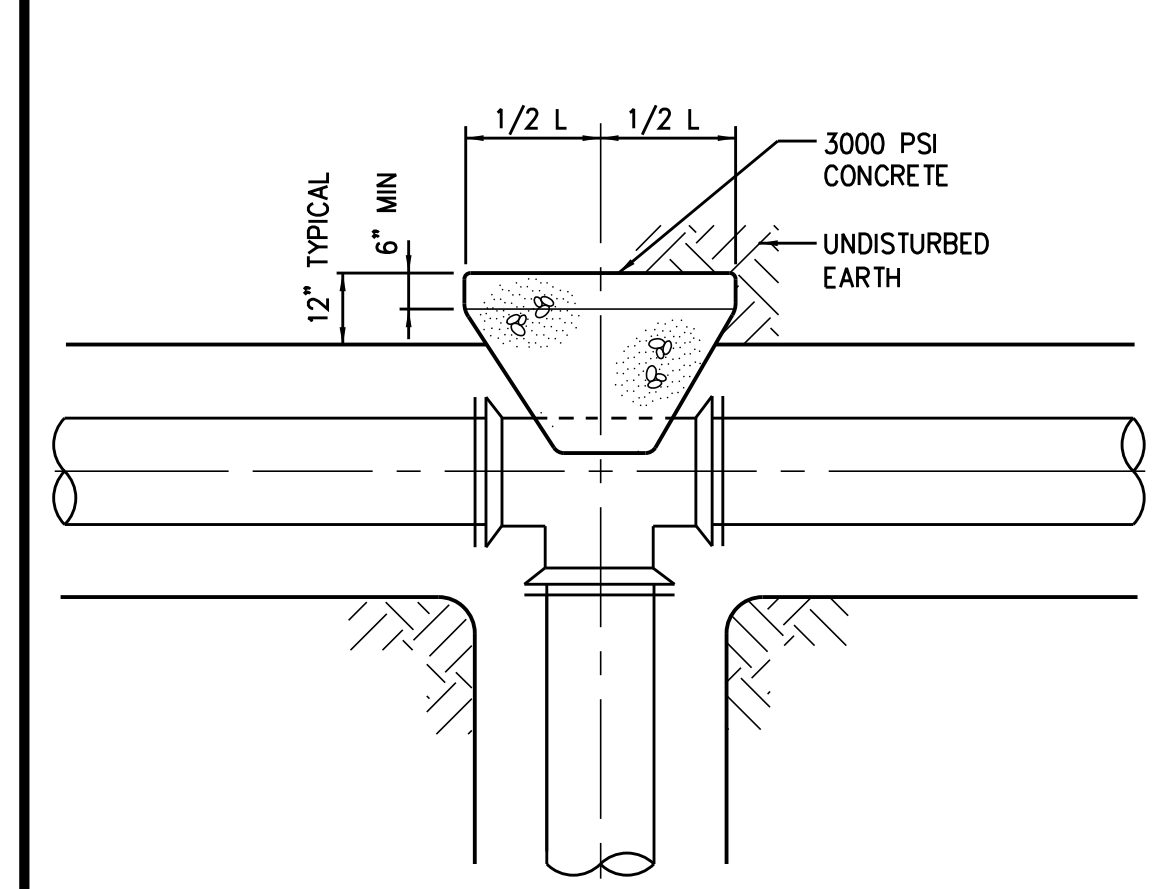


TYPICAL SECTION
TEE OR BEND

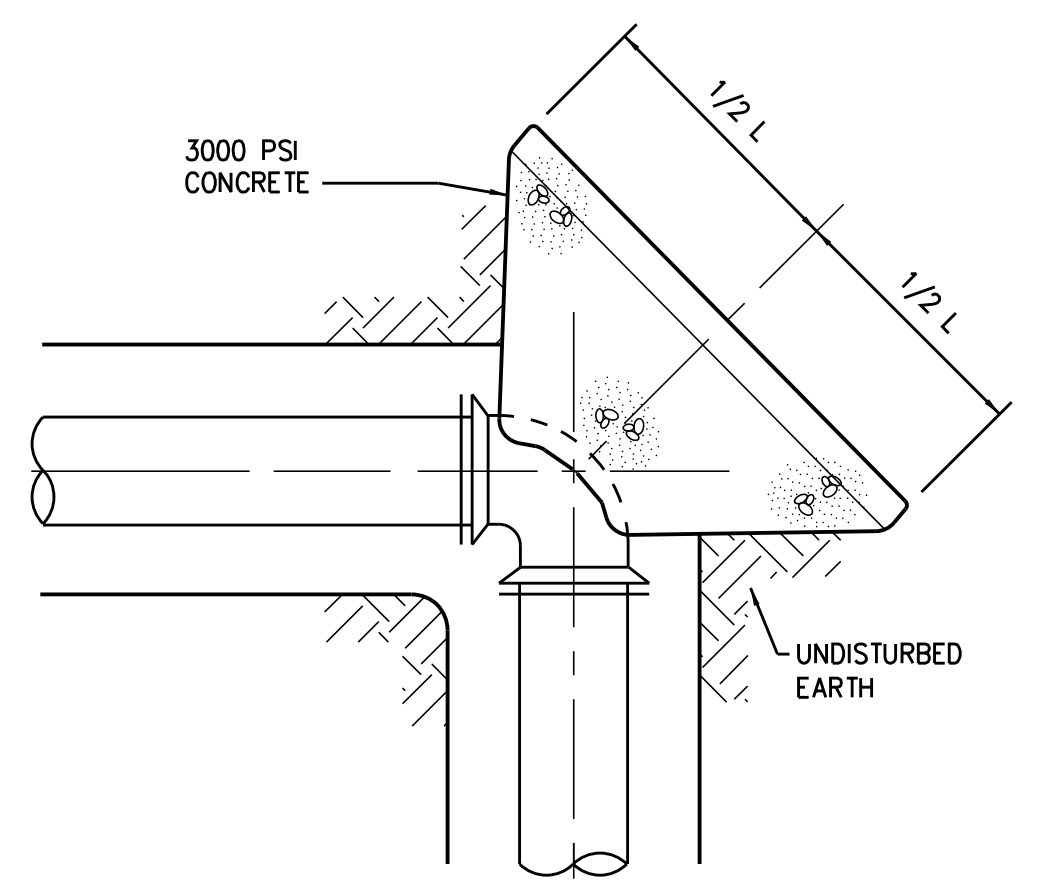
PIPE SIZE (IN)	CONCRETE THRUST BLOCK SCHEDULE*										DESIGN PRESSURE (PSI)
	90° TEE					BEND					
	H	L	H	L	H	L	H	L	H	L	
6.0	2.6	5.3	1.9	3.9	1.4	2.8	1.0	2.0	1.0	2.0	350
8.0	3.5	7.0	2.5	5.1	1.8	3.7	1.3	2.6	1.3	2.6	350
10.0	4.2	8.5	3.1	6.3	2.2	4.5	1.6	3.2	1.6	3.2	350
12.0	5.0	10.1	3.7	7.5	2.6	5.3	1.9	3.8	1.9	3.8	350
14.0	5.8	11.7	4.3	8.6	3.1	6.2	2.2	4.4	2.2	4.4	350
16.0	6.6	13.3	4.9	9.8	3.5	7.0	2.5	5.0	2.5	5.0	350
18.0	7.4	14.9	5.5	11.0	3.9	7.9	2.8	5.6	2.8	5.6	350
20.0	8.2	16.5	6.1	12.2	4.3	8.7	3.1	6.2	3.1	6.2	350
24.0	9.9	19.8	7.2	14.5	5.2	10.4	3.7	7.4	3.7	7.4	350
30.0	12.2	24.5	9.0	18.0	6.4	12.9	4.5	9.1	4.5	9.1	350
36.0	14.6	29.3	10.8	21.6	7.7	15.4	5.4	10.9	5.4	10.9	350
42.0	17.0	34.0	12.5	25.0	8.9	17.9	6.3	12.7	6.3	12.7	350
48.0	19.4	38.8	14.3	28.6	10.2	20.4	7.2	14.5	7.2	14.5	350
54.0	22.0	44.0	16.2	32.4	11.5	23.1	8.2	16.4	8.2	16.4	350
60.0	23.5	47.1	17.3	34.7	12.4	24.8	8.8	17.6	8.8	17.6	350
64.0	25.1	50.2	18.4	36.9	13.2	26.4	9.3	18.7	9.3	18.7	350

* BASED ON AVERAGE SOIL PASSIVE BEARING STRENGTH OF 2000 PSF USING SF OF 1.5

0222114R



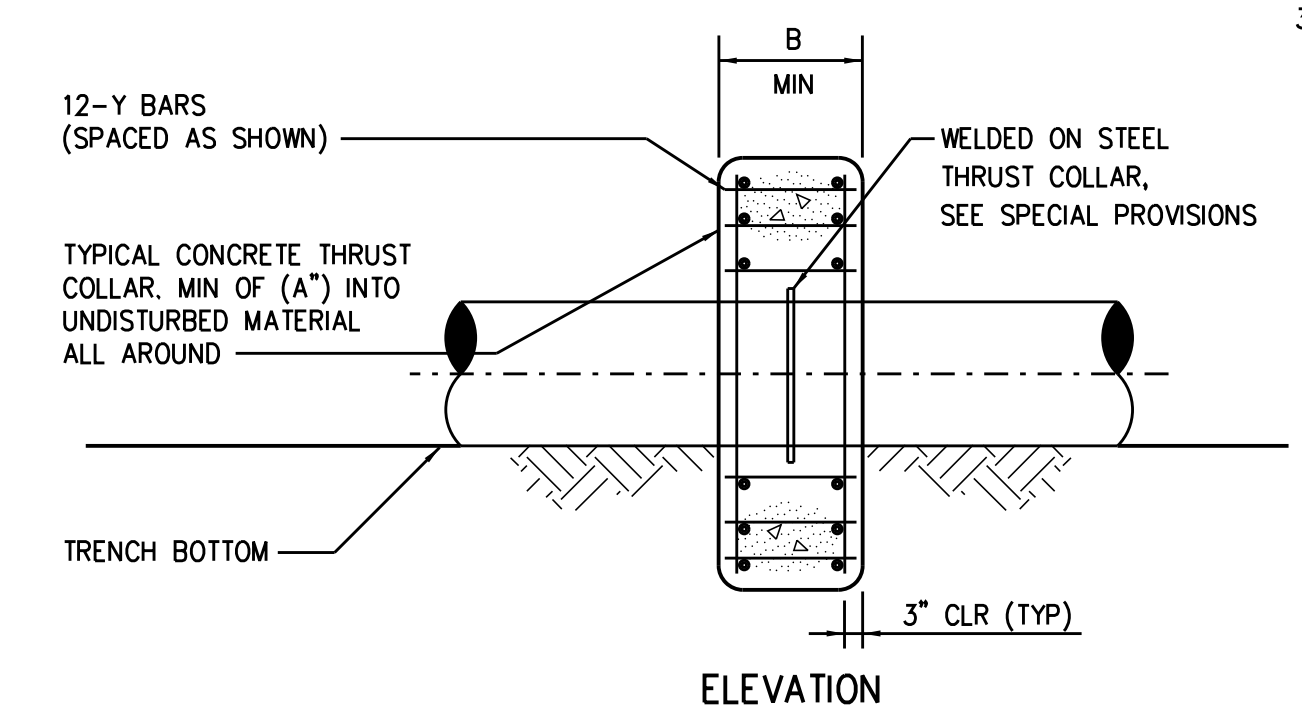
PLAN - TEE



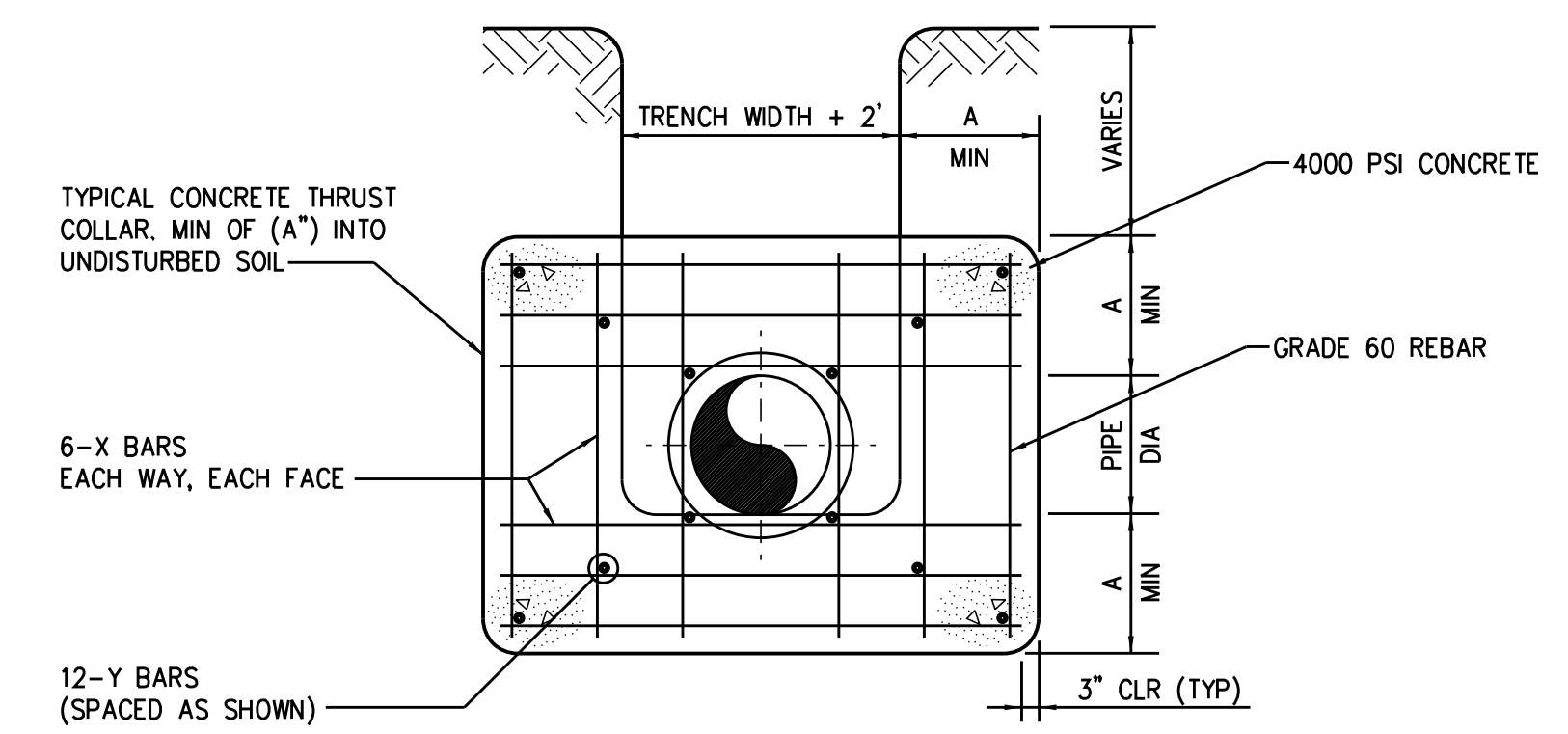
PLAN - BEND

0222108

- DETAIL NOTES:
1. CONCRETE THRUST BLOCKS, ARCH/ENCASEMENTS, ETC., SHALL BE FORMED USING PLYWOOD OR SAND BAGS TO PROVIDE REQUIRED SHAPE.
 2. CONCRETE THRUST BLOCKS SHALL ONLY BE USED IN LIEU OF RESTRAINED JOINT PIPE, NOT IN CONJUNCTION WITH.
 3. CONCRETE THRUST BLOCKING SHALL BE USED ONLY AS APPROVED BY THE ENGINEER.



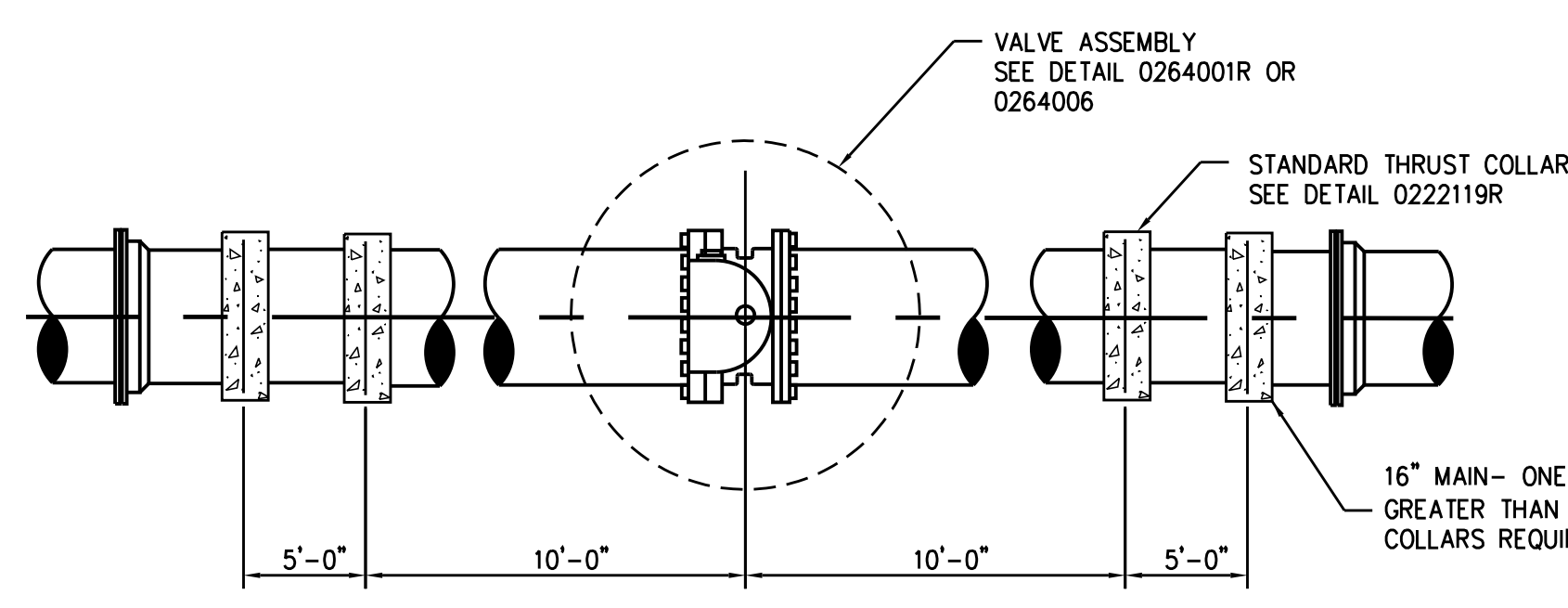
ELEVATION



THRUST COLLAR

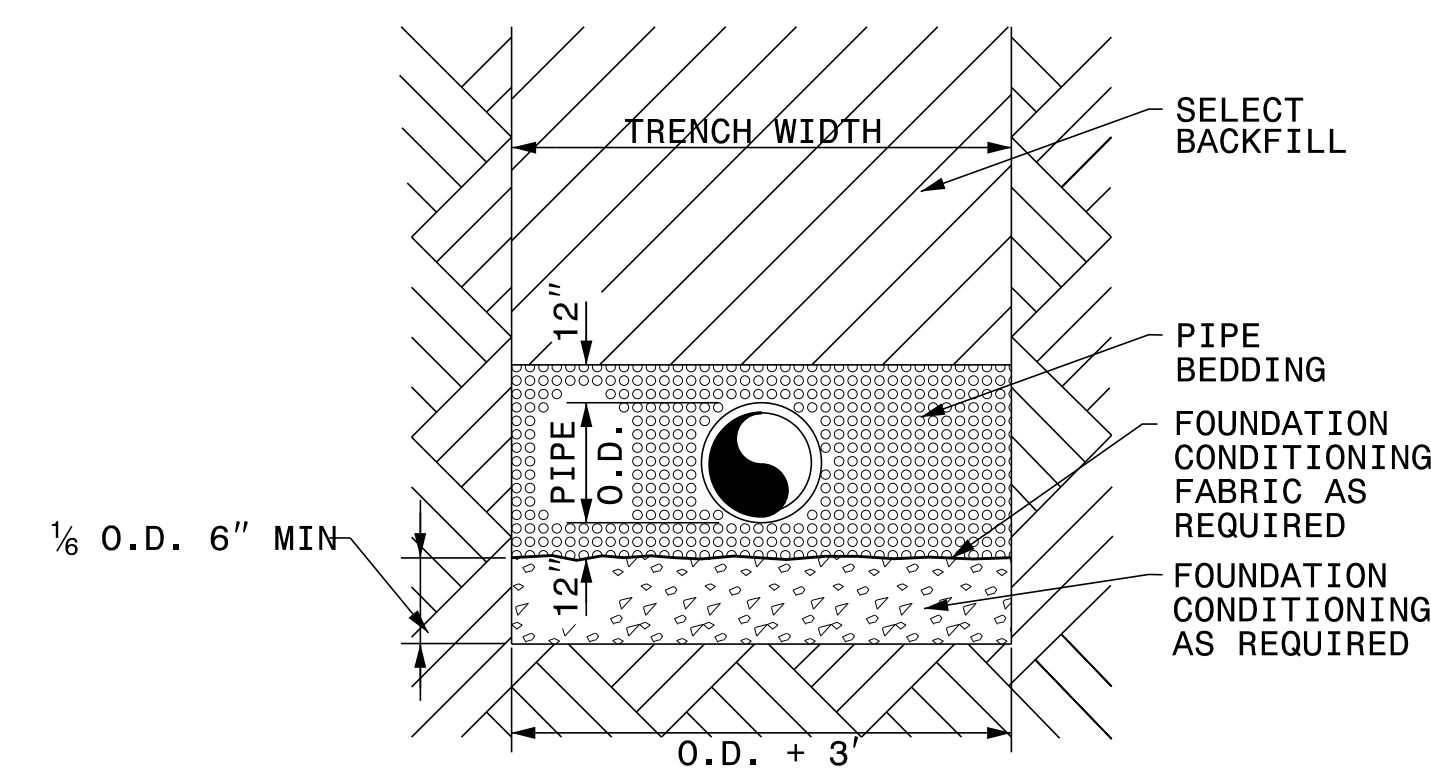
PIPE SIZE	X BARS	Y BARS	A	B
4"-36"	#5	#5	1'-4"	1'-7"
42"& >	#6	#6	1'-8"	1'-9"

0222119R



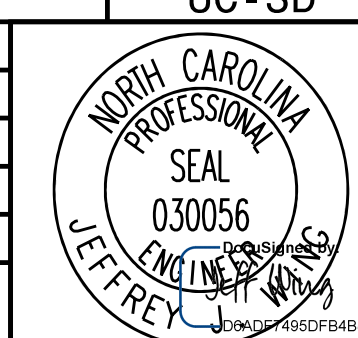
THRUST COLLARS AT VALVES
16" AND LARGER

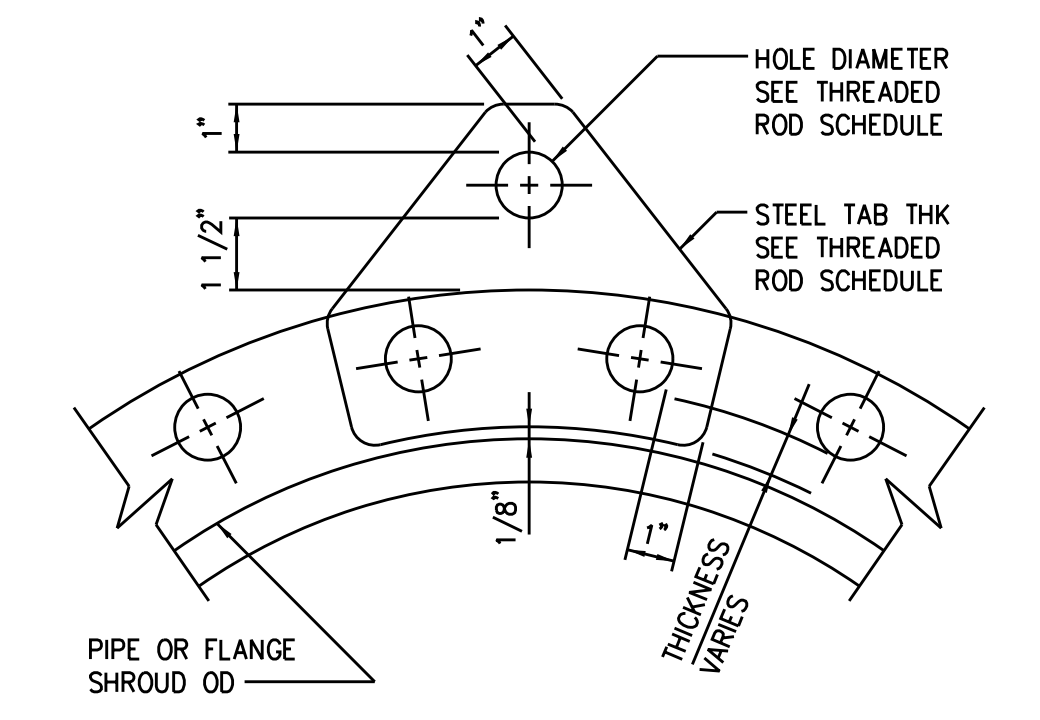
0222125R



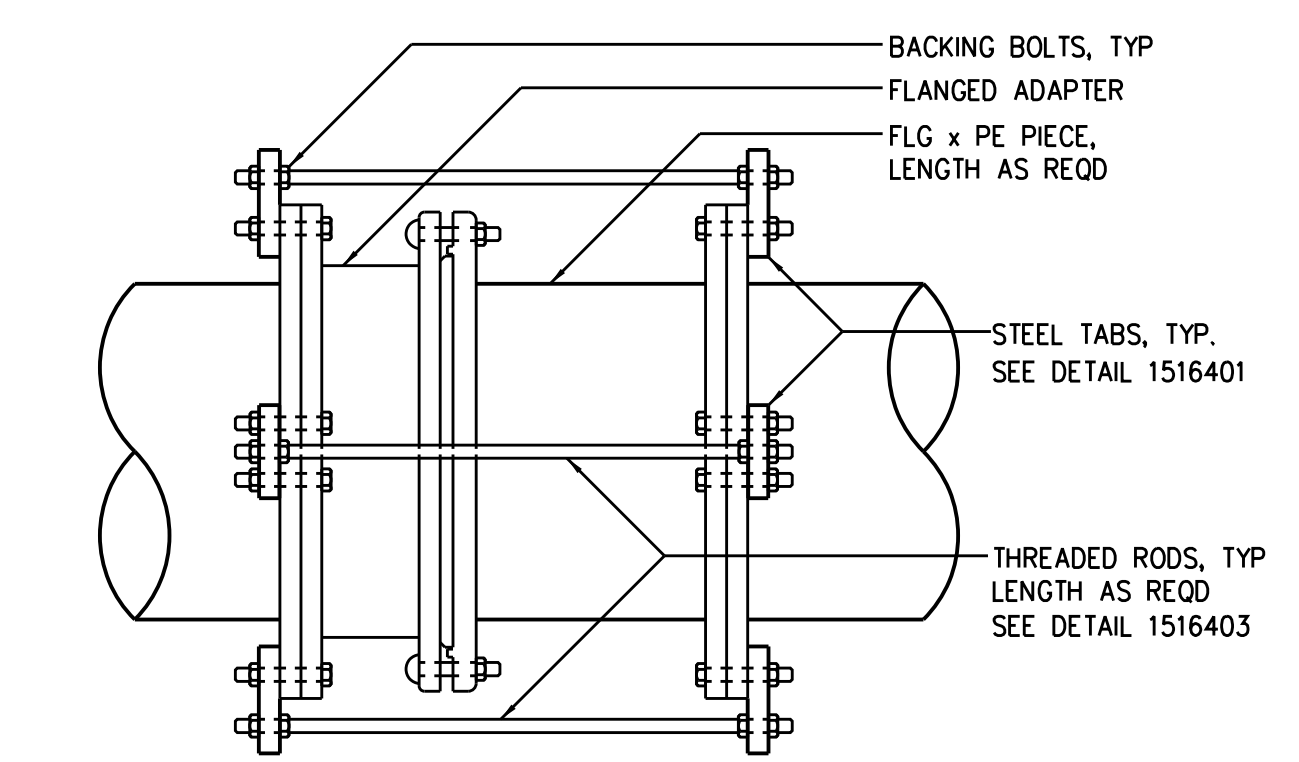
TYPICAL TRENCH DETAIL

0222132

PROJECT REFERENCE NO. U-3308	SHEET NO. UC-3D
DESIGNED BY: KFC	
DRAWN BY: JGB	
CHECKED BY: DGB	
APPROVED BY: JJW	
REVISED:	NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151
UTILITY CONSTRUCTION PLANS ONLY	

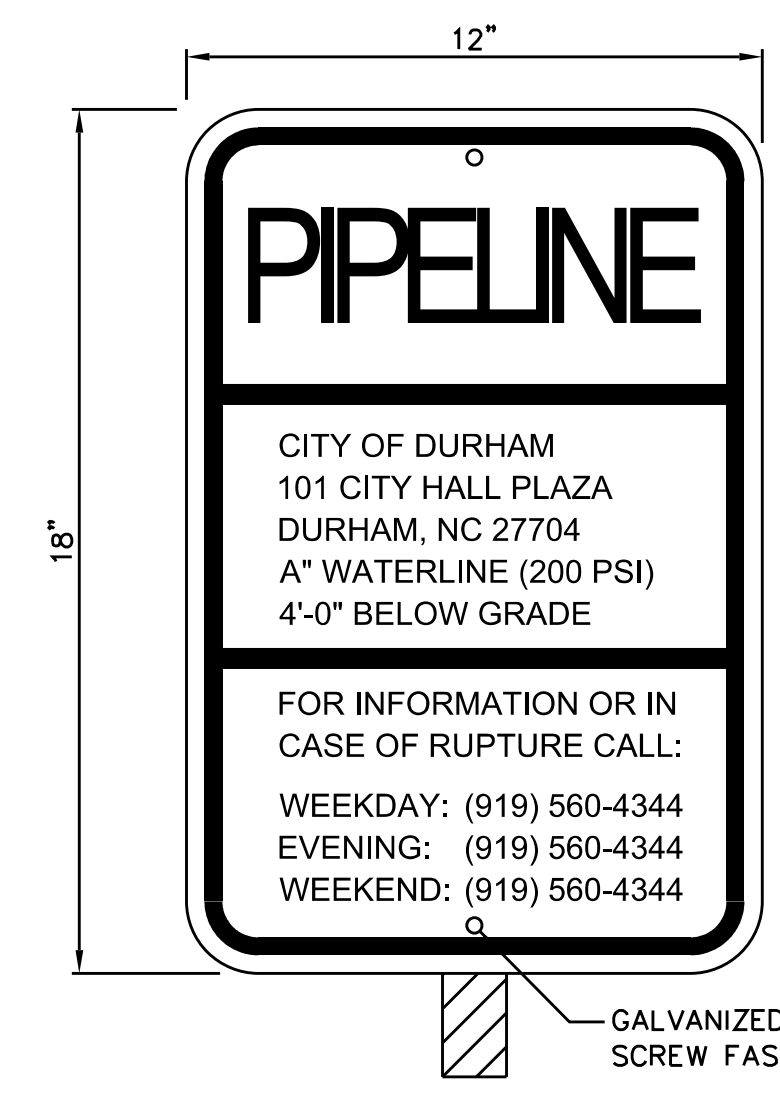


STEEL TAB
1516401



NOTE: ALL FLANGED ADAPTERS SHALL BE HARNESSED AND BACK BOLTED TO PREVENT MOVEMENT IN EITHER DIRECTION. SEE THREADED ROD SCHEDULE FOR ROD DIAMETER, MATERIAL AND STEEL TAB THICKNESS.

HARNESSED FLANGED ADAPTER
1516402



RAILROAD RIGHT OF WAY MARKER SIGN

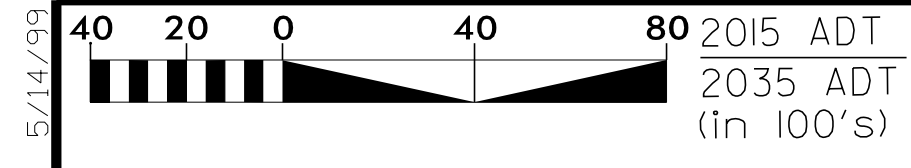
0281000

- SIGN DATA:
- 1/8" ALUMINUM PANEL
 - 3M SCOTCH LITE "ENGINEER GRADE" SHEETING OR EQUAL
 - RED COPY ON WHITE BACKGROUND
 - MOUNT SIGN PANEL 5' ABOVE GRADE (MIN.)
 - USE 2 LB/FT U-CHANNEL POST (MIN.)
 - MOUNT SIGNS BACK-TO-BACK ON POST
 - "A" = WATERLINE SIZE

PIPE SIZE	THREADED ROD SCHEDULE													
	DESIGN PRESSURE (DIMENSIONS IN INCHES)													
	50 PSI		100 PSI		150 PSI		200 PSI		250 PSI		300 PSI		350 PSI	
BOLTS NO-DIA	TAB THK	BOLTS NO-DIA	TAB THK	BOLTS NO-DIA	TAB THK	BOLTS NO-DIA	TAB THK	BOLTS NO-DIA	TAB THK	BOLTS NO-DIA	TAB THK	BOLTS NO-DIA	TAB THK	
4,6	2-3/4	1	2-3/4	1	2-3/4	1	2-3/4	1	2-3/4	1	2-3/4	1	2-3/4	1
8	2-3/4	1 1/4	2-3/4	1 1/4	2-3/4	1 1/4	2-3/4	1 1/4	2-3/4	1 1/4	2-3/4	1 1/4	2-3/4	1 1/4
10	2-3/4	1 1/4	2-3/4	1 1/4	2-3/4	1 1/4	2-3/4	1 1/4	2-3/4	1 1/4	2-3/4	1 1/4	2-3/4	1 1/4
12	2-3/4	1 1/4	2-3/4	1 1/4	2-3/4	1 1/4	2-3/4	1 1/4	2-3/4	1 1/4	2-3/4	1 1/4	2-3/4	1 1/4
14	2-3/4	1 1/2	4-3/4	1 1/2	4-3/4	1 1/2	4-3/4	1 1/2	4-3/4	1 1/2	4-3/4	1 1/2	4-3/4	1 1/2
16	2-3/4	1 1/2	4-3/4	1 1/2	6-3/4	1 1/2	4-3/4	1 1/2	4-3/4	1 1/2	4-3/4	1 1/2	6-3/4	1 1/2
18	2-3/4	1 3/4	4-3/4	1 3/4	6-3/4	1 3/4	4-3/4	1 3/4	4-3/4	1 3/4	6-3/4	1 3/4	6-3/4	1 3/4
20	4-3/4	1 3/4	4-3/4	1 3/4	4-3/4	1 3/4	4-3/4	1 3/4	6-3/4	1 3/4	6-3/4	1 3/4	8-3/4	1 3/4
24	4-3/4	2	4-3/4	2	6-3/4	2	6-3/4	2	8-3/4	2	10-3/4	2	10-3/4	2
30	4-1	2 1/4	4-1	2 1/4	4-1	2 1/4	6-1	2 1/4	6-1	2 1/4	10-1	2 1/4	10-1	2 1/4
36	4-1	2 1/2	4-1	2 1/2	6-1	2 1/2	8-1	2 1/2	10-1	2 1/2	12-1	2 1/2	14-1	2 1/2
42	4-1 1/4	2 3/4	4-1 1/4	2 3/4	6-1 1/4	2 3/4	8-1 1/4	2 3/4	10-1 1/4	2 3/4	12-1 1/4	2 3/4	14-1 1/4	2 3/4
48	6-1 1/4	2 3/4	4-1 1/4	2 3/4	6-1 1/4	2 3/4	8-1 1/4	2 3/4	12-1 1/4	2 3/4	12-1 1/4	2 3/4	14-1 1/4	2 3/4
54	6-1 1/4	3	6-1 1/4	3	8-1 1/4	3	12-1 1/4	3	14-1 1/4	3	16-1 1/4	3	18-1 1/4	3

1. THREADED RODS FOR ALL PIPE DIAMETERS IN THE SHADED AREA SHALL BE ASTM A193 (GRADE B7).
2. ALL OTHER THREADED RODS SHALL BE ASTM A36. ALL TABS SHALL BE ASTM A572 GR50.
3. ASTM A193 (GRADE B7) RODS SHALL BE LABELED AND BUNDLED SEPARATELY.
4. THIS SCHEDULE SHALL APPLY FOR HARNESSED FLANGED ADAPTERS, HARNESSED FLEXIBLE COUPLINGS AND ALL MECHANICAL JOINT COUPLINGS, SLEEVES ETC. THAT ARE REQUIRED TO BE HARNESSED.
5. RODS THREADED AT ENDS (INCLUDING NUTS) SHALL BE EQUALLY SPACED AROUND PIPE BETWEEN ALL MECHANICAL JOINT FITTINGS (TEE, VALVES, BEND, PLUG, ETC.) OR AS OTHERWISE SHOWN ON THE CONTRACT DRAWINGS. THREADED RODS SHALL BE AS SHOWN IN THE THREADED ROD SCHEDULE. SEE NOTE 6.
6. RODS, NUTS, ETC., IN CONTACT WITH SOIL SHALL BE PAINTED WITH TWO COATS COAL TAR (MIN 26 DRY MIL THICKNESS) NEMEC 46-465 HI-BUILD OR EQUAL.

1516403



- (17) CITY OF DURHAM DB 312 PG 131
- (80) MECHANICS & FARMERS BANK DB 2734 PG 941
- (81) CITY OF DURHAM DB 314 PG 609

PROJECT REFERENCE NO. U-3308 SHEET NO. UC-4

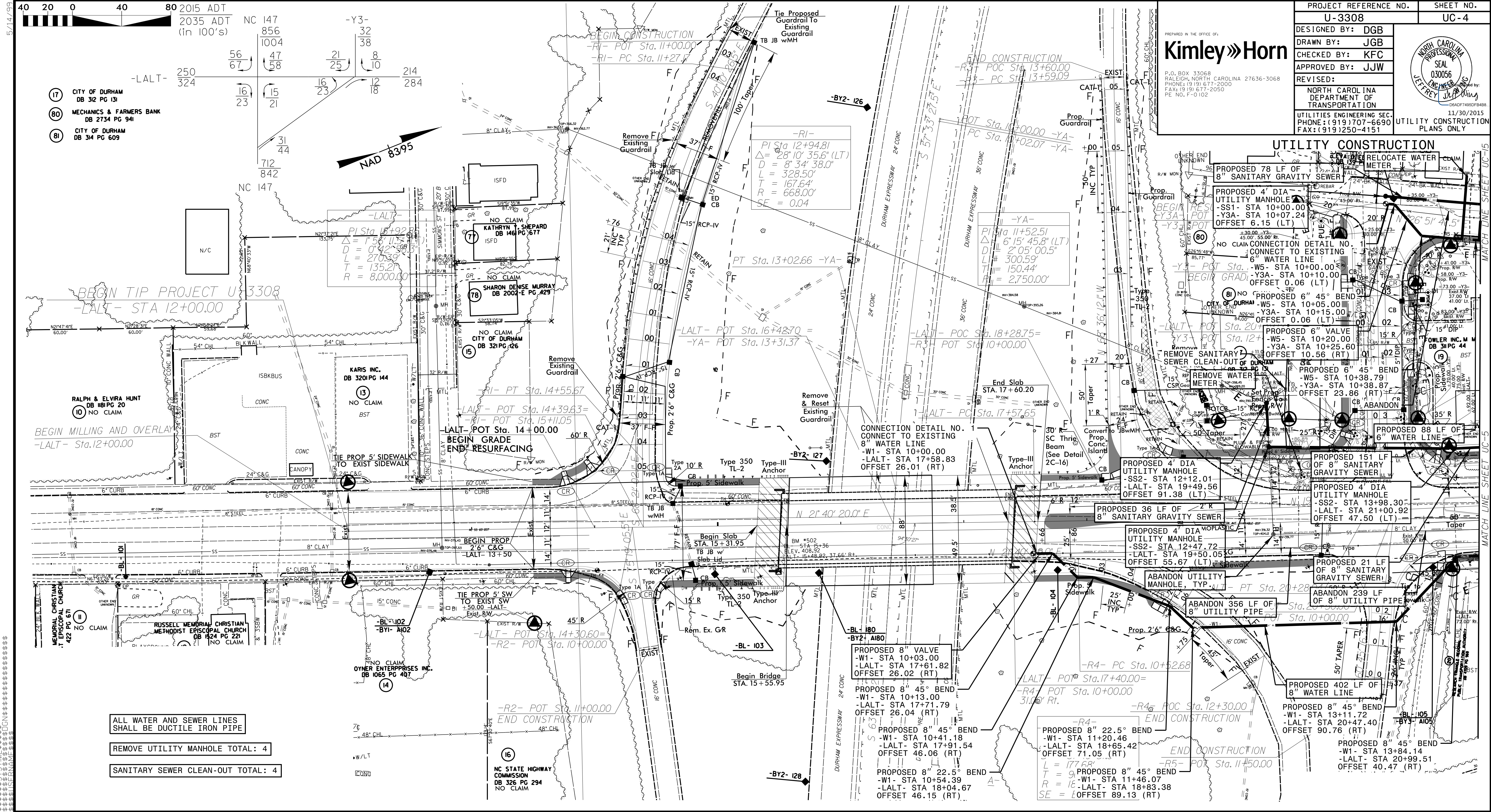
DESIGNED BY: DGB
DRAWN BY: JGB
CHECKED BY: KFC
APPROVED BY: JJW
REVISED:

Kimley»Horn
P.O. BOX 33068
RALEIGH, NORTH CAROLINA 27636-3068
PHONE: (919) 677-2000
FAX: (919) 677-2050
PE. NO. F-0102

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

UTILITY CONSTRUCTION PLANS ONLY

11/30/2015



ALL WATER AND SEWER LINES SHALL BE DUCTILE IRON PIPE

REMOVE UTILITY MANHOLE TOTAL: 4

SANITARY SEWER CLEAN-OUT TOTAL: 4

5/14/2015
 09:01
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MATCH LINE SHEET UC-5

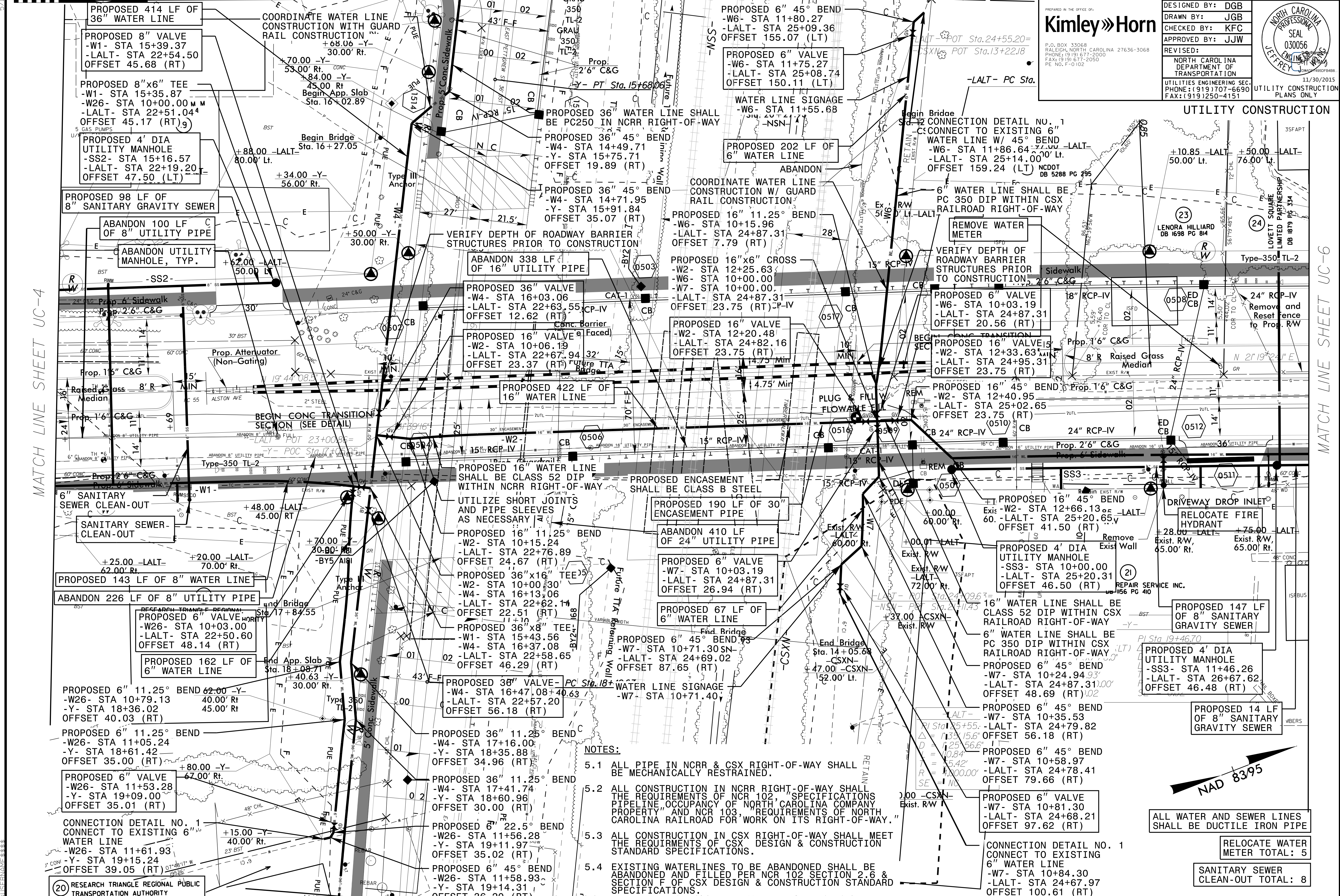
MATCH LINE SHEET UC-15

DESIGNED BY: DGB
 DRAWN BY: JGB
 CHECKED BY: KFC
 APPROVED BY: JJW

Kimley»Horn

P.O. BOX 33068
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 PHONE: (919) 677-2000
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 PE NO. F-0102

11/30/2015
 UTILITY CONSTRUCTION PLANS ONLY



MATCH LINE SHEET UC-4

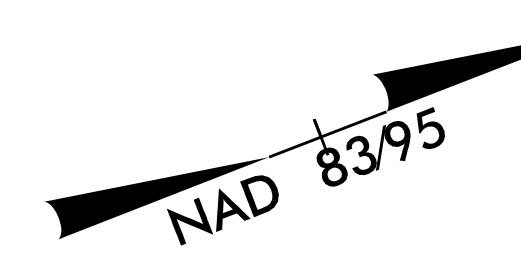
MATCH LINE SHEET UC-6

5/14/2015

RESEARCH TRIANGLE REGIONAL
 TRANSPORTATION AUTHORITY
 DB 4709 PG 969

NOTES:

- ALL PIPE IN NCR & CSX RIGHT-OF-WAY SHALL BE MECHANICALLY RESTRAINED.
- ALL CONSTRUCTION IN NCR RIGHT-OF-WAY SHALL MEET THE REQUIREMENTS OF NCR 102, 'SPECIFICATIONS PIPELINE OCCUPANCY OF NORTH CAROLINA COMPANY PROPERTY' AND NCR 103, 'REQUIREMENTS OF NORTH CAROLINA RAILROAD FOR WORK ON ITS RIGHT-OF-WAY.'
- ALL CONSTRUCTION IN CSX RIGHT-OF-WAY SHALL MEET THE REQUIREMENTS OF CSX DESIGN & CONSTRUCTION STANDARD SPECIFICATIONS.
- EXISTING WATER LINES TO BE ABANDONED SHALL BE ABANDONED AND FILLED PER NCR 102 SECTION 2.6 & SECTION F OF CSX DESIGN & CONSTRUCTION STANDARD SPECIFICATIONS.



ALL WATER AND SEWER LINES SHALL BE DUCTILE IRON PIPE

RELOCATE WATER METER TOTAL: 5

SANITARY SEWER CLEAN-OUT TOTAL: 8

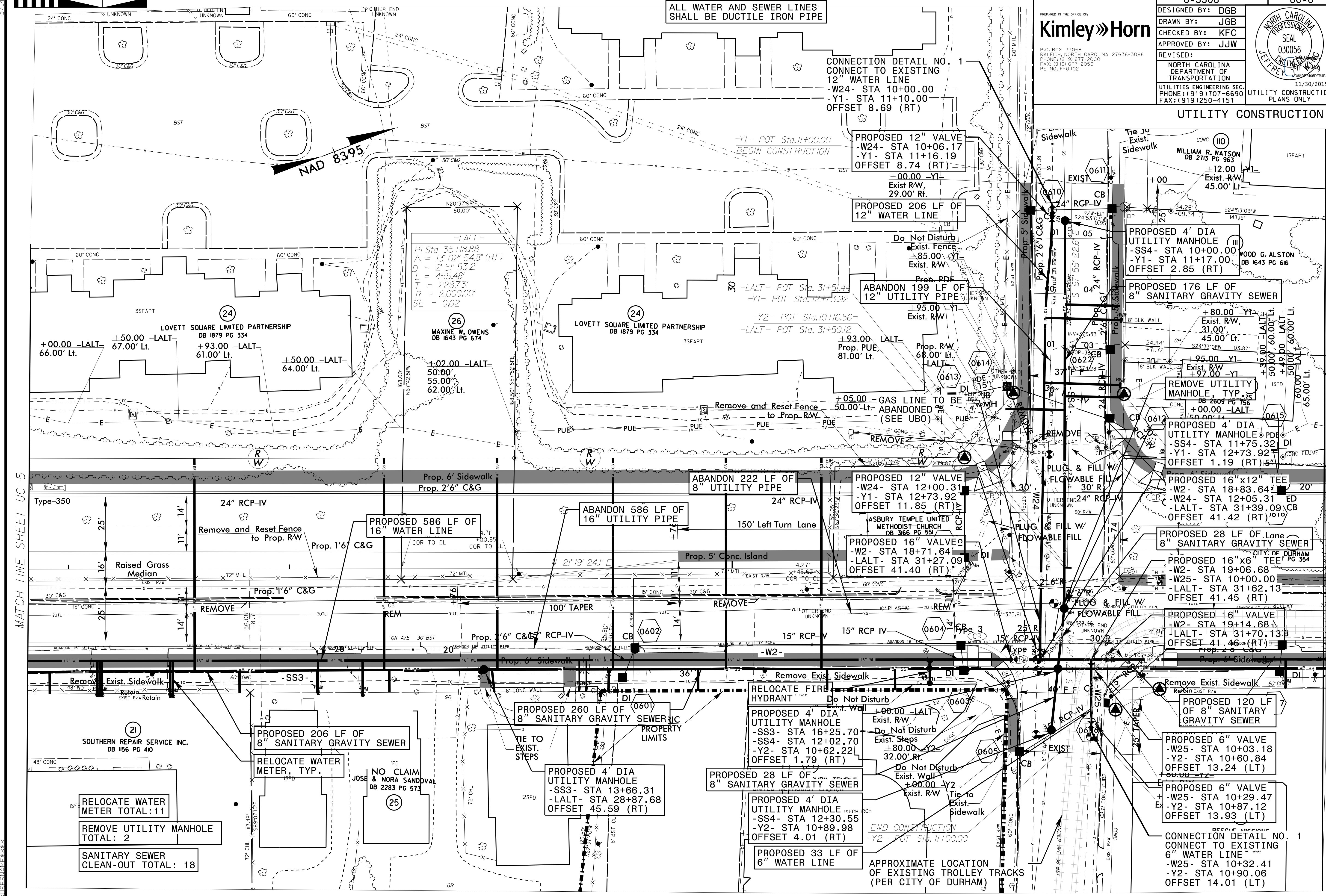
MATCH LINE SHEET 16

MATCH LINE SHEET 16

ALL WATER AND SEWER LINES SHALL BE DUCTILE IRON PIPE

Kimley»Horn

PROJECT REFERENCE NO.	U-3308	SHEET NO.	UC-6
DESIGNED BY:	DGB		
DRAWN BY:	JGB		
CHECKED BY:	KFC		
APPROVED BY:	JJW		
REVISED:			
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION		UTILITY CONSTRUCTION PLANS ONLY	
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151		11/30/2015	



MATCH LINE SHEET UC-5

MATCH LINE SHEET UC-7

5/14/15

SOUTHERN REPAIR SERVICE INC. DB #56 PG 410

RELOCATE WATER METER TOTAL: 11

REMOVE UTILITY MANHOLE TOTAL: 2

SANITARY SEWER CLEAN-OUT TOTAL: 18

NO CLAIM & NORA SANDVAL DB 2283 PG 573

PROPOSED 4' DIA UTILITY MANHOLE
 -SS3- STA 13+66.31
 -LALT- STA 28+87.68
 OFFSET 45.59 (RT)

PROPOSED 28 LF OF 8" SANITARY GRAVITY SEWER

PROPOSED 4' DIA UTILITY MANHOLE
 -SS4- STA 12+30.55
 -Y2- STA 10+89.98
 OFFSET 4.01 (RT)

PROPOSED 33 LF OF 6" WATER LINE

APPROXIMATE LOCATION OF EXISTING TROLLEY TRACKS (PER CITY OF DURHAM)

PROPOSED 120 LF OF 8" SANITARY GRAVITY SEWER

PROPOSED 6" VALVE
 -W25- STA 10+03.18
 -Y2- STA 10+60.84
 OFFSET 13.24 (LT)

PROPOSED 6" VALVE
 -W25- STA 10+29.47
 -Y2- STA 10+87.12
 OFFSET 13.93 (LT)

CONNECTION DETAIL NO. 1
 CONNECT TO EXISTING 6" WATER LINE
 -W25- STA 10+32.41
 -Y2- STA 10+90.06
 OFFSET 14.01 (LT)

CONNECTION DETAIL NO. 1
 CONNECT TO EXISTING 12" WATER LINE
 -W24- STA 10+00.00
 -Y1- STA 11+10.00
 OFFSET 8.69 (RT)

PROPOSED 12" VALVE
 -W24- STA 10+06.17
 -Y1- STA 11+16.19
 OFFSET 8.74 (RT)

PROPOSED 206 LF OF 12" WATER LINE

ABANDON 199 LF OF 12" UTILITY PIPE

PROPOSED 12" VALVE
 -W24- STA 12+00.31
 -Y1- STA 12+73.92
 OFFSET 11.85 (RT)

PROPOSED 16" VALVE
 -W2- STA 18+71.64
 -LALT- STA 31+27.09
 OFFSET 41.40 (RT)

RELOCATE FIRE HYDRANT

PROPOSED 28 LF OF 8" SANITARY GRAVITY SEWER

PROPOSED 4' DIA UTILITY MANHOLE
 -SS4- STA 12+30.55
 -Y2- STA 10+89.98
 OFFSET 4.01 (RT)

PROPOSED 4' DIA UTILITY MANHOLE
 -SS4- STA 10+00.00
 -Y1- STA 11+17.00
 OFFSET 2.85 (RT)

PROPOSED 176 LF OF 8" SANITARY GRAVITY SEWER

REMOVE UTILITY MANHOLE, TYP.

PROPOSED 4' DIA UTILITY MANHOLE
 -SS4- STA 11+75.32
 -Y1- STA 12+73.92
 OFFSET 1.19 (RT)

PROPOSED 16"x12" TEE
 -W2- STA 18+83.64
 -W24- STA 12+05.31
 -LALT- STA 31+39.09
 OFFSET 41.42 (RT)

PROPOSED 28 LF OF Lane 8" SANITARY GRAVITY SEWER

PROPOSED 16"x6" TEE
 -W2- STA 19+06.68
 -W25- STA 10+00.00
 -LALT- STA 31+62.13
 OFFSET 41.45 (RT)

PROPOSED 16" VALVE
 -W2- STA 19+14.68
 -LALT- STA 31+70.13
 OFFSET 41.46 (RT)

PROPOSED 120 LF OF 8" SANITARY GRAVITY SEWER

PROPOSED 6" VALVE
 -W25- STA 10+03.18
 -Y2- STA 10+60.84
 OFFSET 13.24 (LT)

PROPOSED 6" VALVE
 -W25- STA 10+29.47
 -Y2- STA 10+87.12
 OFFSET 13.93 (LT)

CONNECTION DETAIL NO. 1
 CONNECT TO EXISTING 6" WATER LINE
 -W25- STA 10+32.41
 -Y2- STA 10+90.06
 OFFSET 14.01 (LT)



ALL WATER AND SEWER LINES SHALL BE DUCTILE IRON PIPE

REMOVE UTILITY MANHOLE TOTAL: 2

RELOCATE WATER METER TOTAL: 8

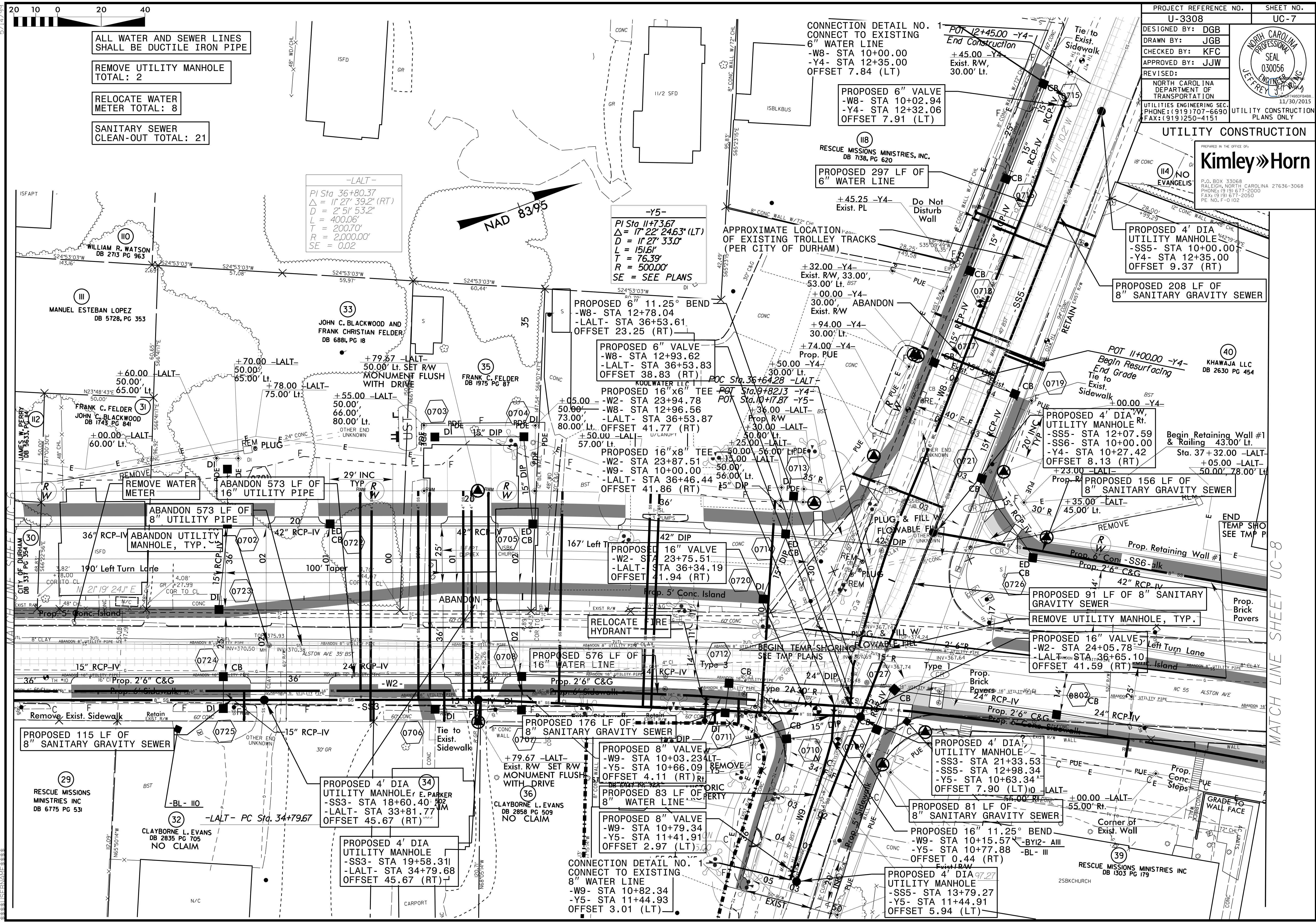
SANITARY SEWER CLEAN-OUT TOTAL: 21

PROJECT REFERENCE NO.	SHEET NO.
U-3308	UC-7
DESIGNED BY: DGB	
DRAWN BY: JGB	
CHECKED BY: KFC	
APPROVED BY: JJW	
REVISED:	NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SECTION PHONE: (919) 707-6690 FAX: (919) 250-4151
UTILITY CONSTRUCTION PLANS ONLY	

PREPARED IN THE OFFICE OF:

Kimley»Horn

P.O. BOX 33068
 RALEIGH, NORTH CAROLINA 27636-3068
 PHONE: (919) 677-2000
 FAX: (919) 677-2050
 FE. NO. F-0-102



MATCH LINE SHEET UC-8

MATCH LINE SHEET UC-6



ALL WATER AND SEWER LINES SHALL BE DUCTILE IRON PIPE

REMOVE UTILITY MANHOLE TOTAL: 7

RELOCATE WATER METER TOTAL: 15
RELOCATE FIRE HYDRANT TOTAL: 4

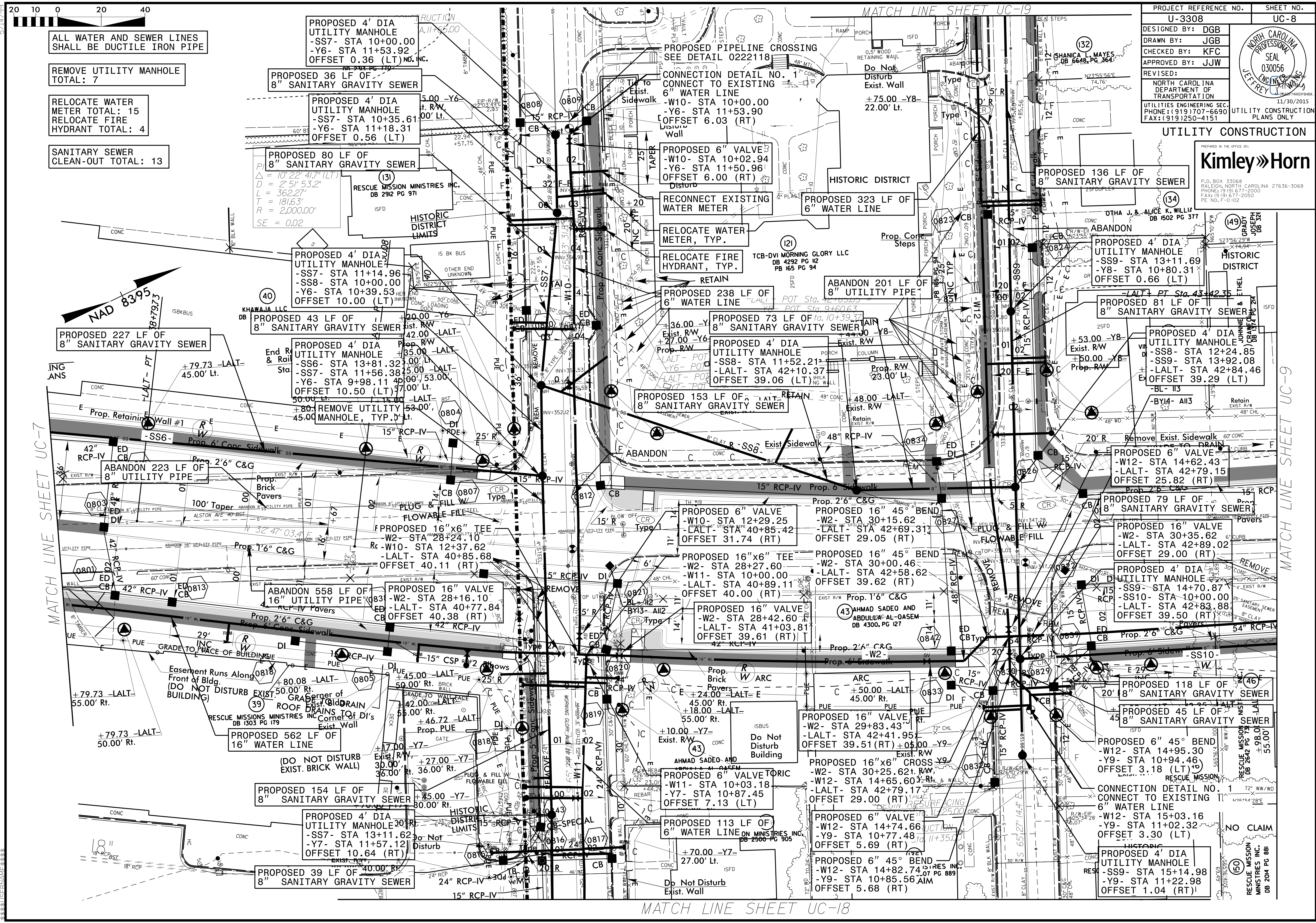
SANITARY SEWER CLEAN-OUT TOTAL: 13

PROJECT REFERENCE NO.	UC-8
U-3308	
DESIGNED BY:	DGB
DRAWN BY:	JGB
CHECKED BY:	KFC
APPROVED BY:	JJW
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	
UTILITY CONSTRUCTION PLANS ONLY	



Kimley»Horn

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PHONE: (919) 677-2000
FAX: (919) 677-2050
REG. NO. F-0-102



MATCH LINE SHEET UC-7

MATCH LINE SHEET UC-18

MATCH LINE SHEET UC-9

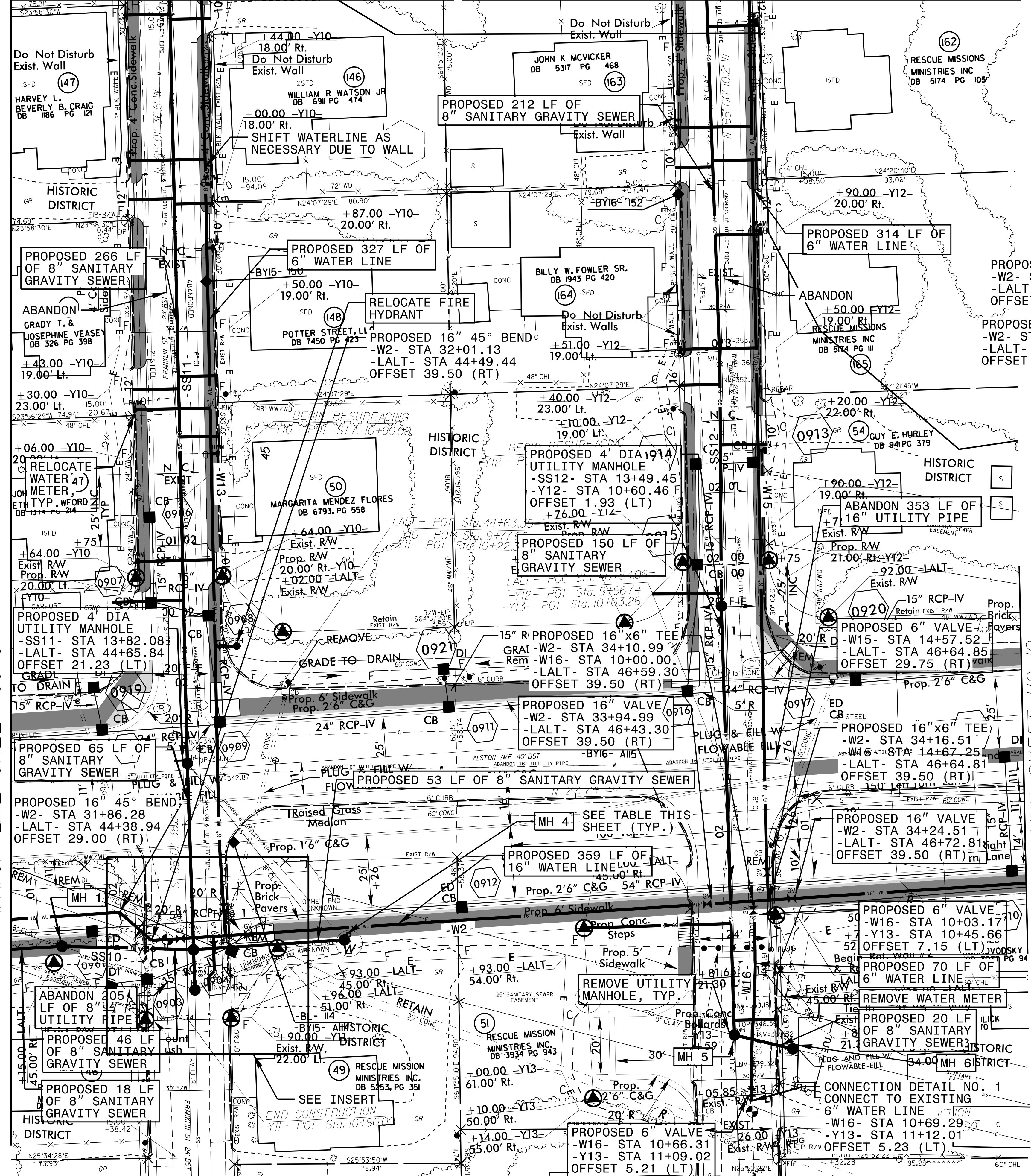
5/14/2019



MATCH LINE SHEET UC-19

MATCH LINE SHEET UC-21

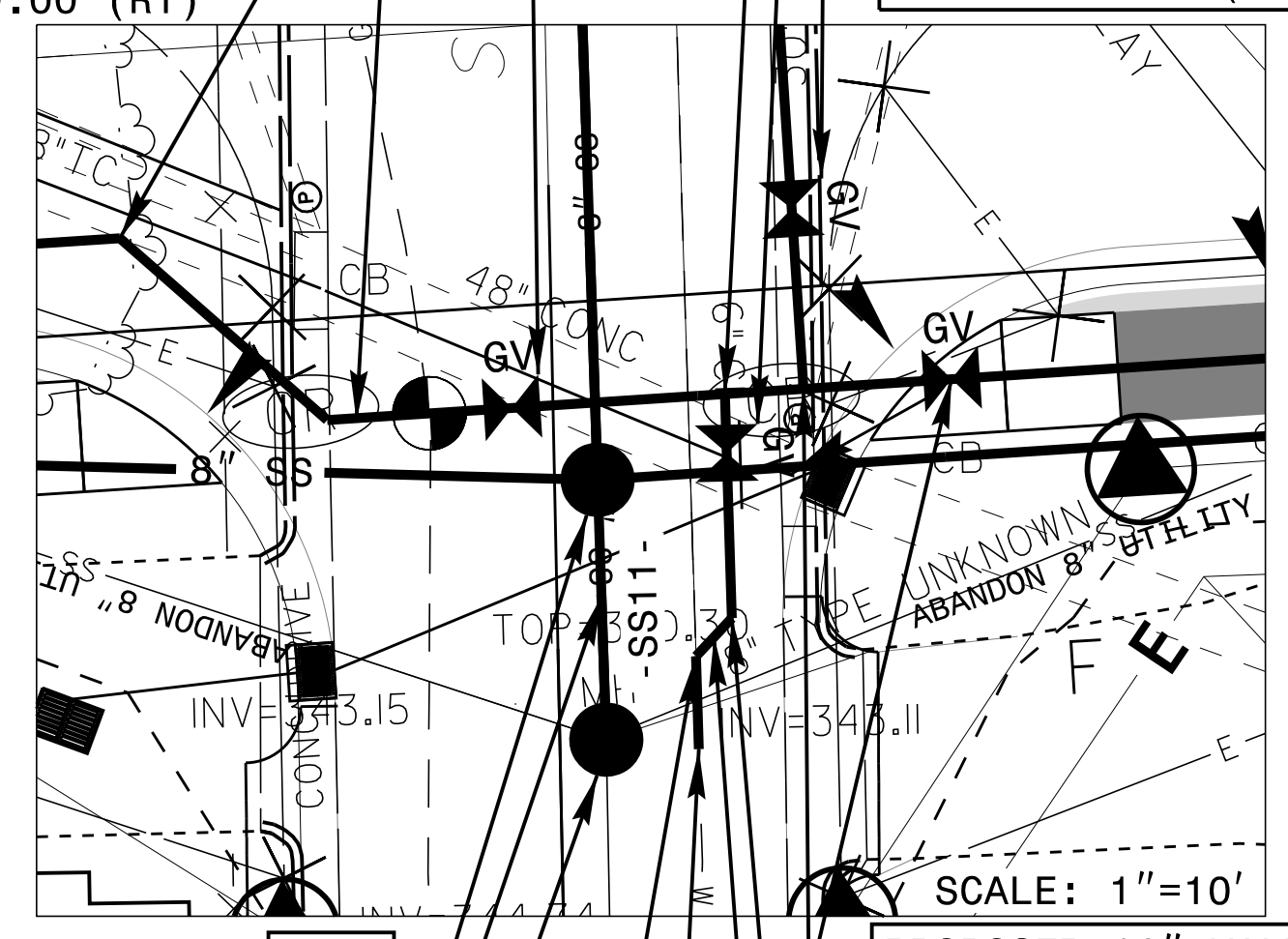
PROJECT REFERENCE NO.	SHEET NO.
U-3308	UC-9
DESIGNED BY: DGB	
DRAWN BY: JGB	
CHECKED BY: KFC	
APPROVED BY: JJW	
REVISOR:	UTILITY CONSTRUCTION PLANS ONLY
PREPARED IN THE OFFICE OF: Kimley»Horn P.O. BOX 33068 RALEIGH, NORTH CAROLINA 27636-3068 PHONE: (919) 677-2000 FAX: (919) 677-2050 PE NO. F-0102	



- MH 1
PROPOSED 4' DIA
UTILITY MANHOLE
-SS10- STA 11+35.41
-LALT- STA 44+18.14
OFFSET 39.50 (RT)
- MH 2
PROPOSED 4' DIA
UTILITY MANHOLE
-SS10- STA 11+81.22
-SS11- STA 14+47.01
-LALT- STA 44+63.76
OFFSET 43.67 (RT)
- MH 3
PROPOSED 4' DIA
UTILITY MANHOLE
-SS11- STA 14+61.01
-LALT- STA 44+63.31
OFFSET 57.66 (RT)
- MH 4
PROPOSED 4' DIA
UTILITY MANHOLE
-SS10- STA 12+33.86
-LALT- STA 45+16.40
OFFSET 43.67 (RT)

- ALL WATER AND SEWER LINES SHALL BE DUCTILE IRON PIPE
- REMOVE UTILITY MANHOLE TOTAL: 5
- RELOCATE WATER METER TOTAL: 11
- SANITARY SEWER CLEAN-OUT TOTAL: 18

- PROPOSED 16" VALVE
-W2- STA 32+11.11
-LALT- STA 44+59.41
OFFSET 39.50 (RT)
- PROPOSED 16"x6" TEE
-W2- STA 32+22.61
-W14- STA 10+00.00
-LALT- STA 44+70.91
OFFSET 39.50 (RT)
- PROPOSED 6" VALVE
-W14- STA 10+03.18
-Y11- STA 10+64.65
OFFSET 9.31 (LT)
- PROPOSED 6" VALVE
-W13- STA 14+61.67
-Y10- STA 9+77.66
OFFSET 13.07 (RT)
- PROPOSED 6" 45° BEND
-W2- STA 32+01.13
-LALT- STA 44+49.44
OFFSET 39.50 (RT)
- PROPOSED 6" 45° BEND
-W2- STA 31+86.28
-LALT- STA 44+38.94
OFFSET 29.00 (RT)
- PROPOSED 16" VALVE
-W2- STA 32+34.84
-LALT- STA 44+83.14
OFFSET 39.50 (RT)
- PROPOSED 16"x6" TEE
-W2- STA 32+26.84
-W13- STA 14+71.40
-LALT- STA 44+75.14
OFFSET 39.50 (RT)
- PROPOSED 6" 45° BEND
-W14- STA 10+14.91
-Y11- STA 10+75.56
OFFSET 7.43 (LT)
- PROPOSED 6" 45° BEND
-W14- STA 10+12.08
-Y11- STA 10+73.54
OFFSET 9.40 (LT)
- PROPOSED 20 LF OF 6" WATER LINE
- PROPOSED 16" VALVE
-W16- STA 10+03.17
-Y13- STA 10+45.66
OFFSET 7.15 (LT)
- PROPOSED 70 LF OF 6" WATER LINE
- PROPOSED 20 LF OF 8" SANITARY GRAVITY SEWER
- PROPOSED 6" VALVE
-W16- STA 10+69.29
-Y13- STA 11+12.01
OFFSET 5.23 (LT)

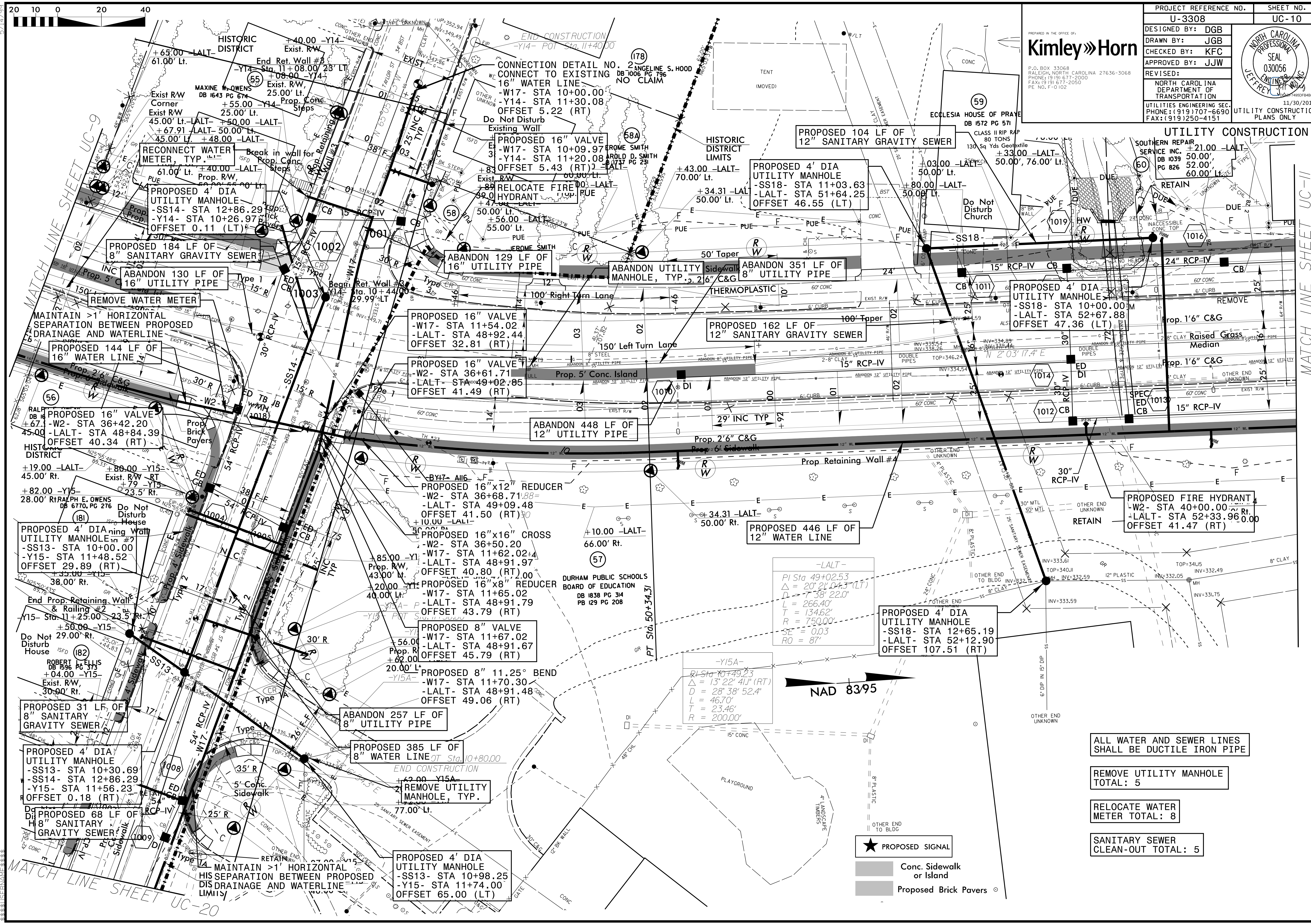


- CONNECTION DETAIL NO. 1
CONNECT TO EXISTING 6" WATER LINE
-W14- STA 10+19.91
-Y11- STA 10+80.56
OFFSET 7.48 (LT)

- MH 5
PROPOSED 4' DIA
UTILITY MANHOLE
-SS12- STA 14+98.87
-Y13- STA 10+88.96
OFFSET 0.42 (RT)
- MH 6
PROPOSED 4' DIA
UTILITY MANHOLE
-SS12- STA 15+19.78
-Y13- STA 10+94.18
OFFSET 19.83 (LT)



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 PE NO. F-0102



- ALL WATER AND SEWER LINES SHALL BE DUCTILE IRON PIPE
- REMOVE UTILITY MANHOLE TOTAL: 5
- RELOCATE WATER METER TOTAL: 8
- SANITARY SEWER CLEAN-OUT TOTAL: 5

★ PROPOSED SIGNAL

■ Conc. Sidewalk or Island

■ Proposed Brick Pavers

NAD 8395

-Y15A-
 RI Sta 10+74.23
 Δ = 13° 22' 41" (RT)
 D = 28° 38' 52.4"
 L = 46.70'
 T = 23.46'
 R = 200.00'

-LALT-
 PI Sta 49+02.53
 Δ = 20° 21' 04.5" (LT)
 D = 7° 38' 22.0"
 L = 266.40'
 T = 134.62'
 SE = 0.03
 RO = 87'

MATCH LINE SHEET UC-20

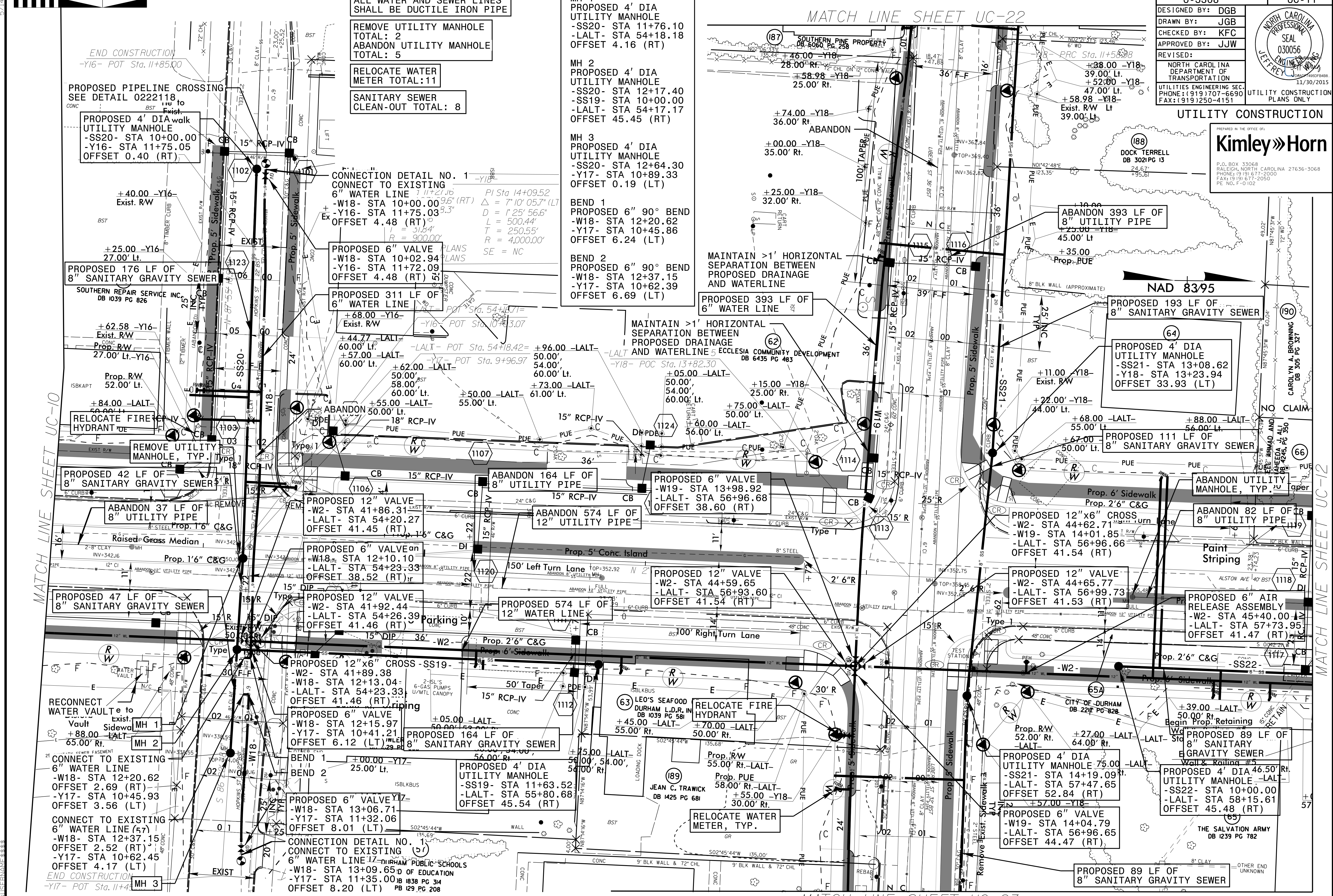
MATCH LINE SHEET UC-11

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PROJECT REFERENCE NO.	SHEET NO.
U-3308	UC-11
DESIGNED BY: DGB	
DRAWN BY: JGB	
CHECKED BY: KFC	
APPROVED BY: JJW	
REVISOR:	NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151
UTILITY CONSTRUCTION PLANS ONLY	

PREPARED IN THE OFFICE OF
Kimley»Horn
 P.O. BOX 33068
 RALEIGH, NORTH CAROLINA 27636-3068
 PHONE: (919) 677-2000
 FAX: (919) 677-2050
 REG. NO. F-0102



ALL WATER AND SEWER LINES SHALL BE DUCTILE IRON PIPE

REMOVE UTILITY MANHOLE TOTAL: 2
 ABANDON UTILITY MANHOLE TOTAL: 5

RELOCATE WATER METER TOTAL: 11

SANITARY SEWER CLEAN-OUT TOTAL: 8

MH 1
 PROPOSED 4' DIA UTILITY MANHOLE
 -SS20- STA 11+76.10
 -LALT- STA 54+18.18
 OFFSET 4.16 (RT)

MH 2
 PROPOSED 4' DIA UTILITY MANHOLE
 -SS20- STA 12+17.40
 -SS19- STA 10+00.00
 -LALT- STA 54+17.17
 OFFSET 45.45 (RT)

MH 3
 PROPOSED 4' DIA UTILITY MANHOLE
 -SS20- STA 12+64.30
 -Y17- STA 10+89.33
 OFFSET 0.19 (LT)

BEND 1
 PROPOSED 6" 90° BEND
 -W18- STA 12+20.62
 -Y17- STA 10+45.86
 OFFSET 6.24 (LT)

BEND 2
 PROPOSED 6" 90° BEND
 -W18- STA 12+37.15
 -Y17- STA 10+62.39
 OFFSET 6.69 (LT)

MATCH LINE SHEET UC-10

MATCH LINE SHEET UC-22

MATCH LINE SHEET UC-23

MATCH LINE SHEET UC-12

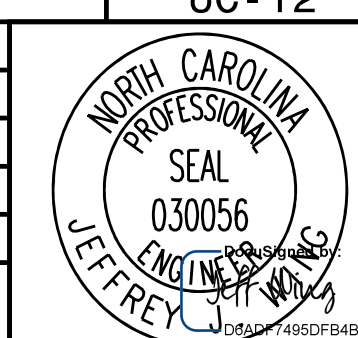
20 10 0 20 40

ALL WATER AND SEWER LINES SHALL BE DUCTILE IRON PIPE
REMOVE UTILITY MANHOLE TOTAL: 2
RELOCATE WATER METER TOTAL: 15
SANITARY SEWER CLEAN-OUT TOTAL: 14

Kimley Horn

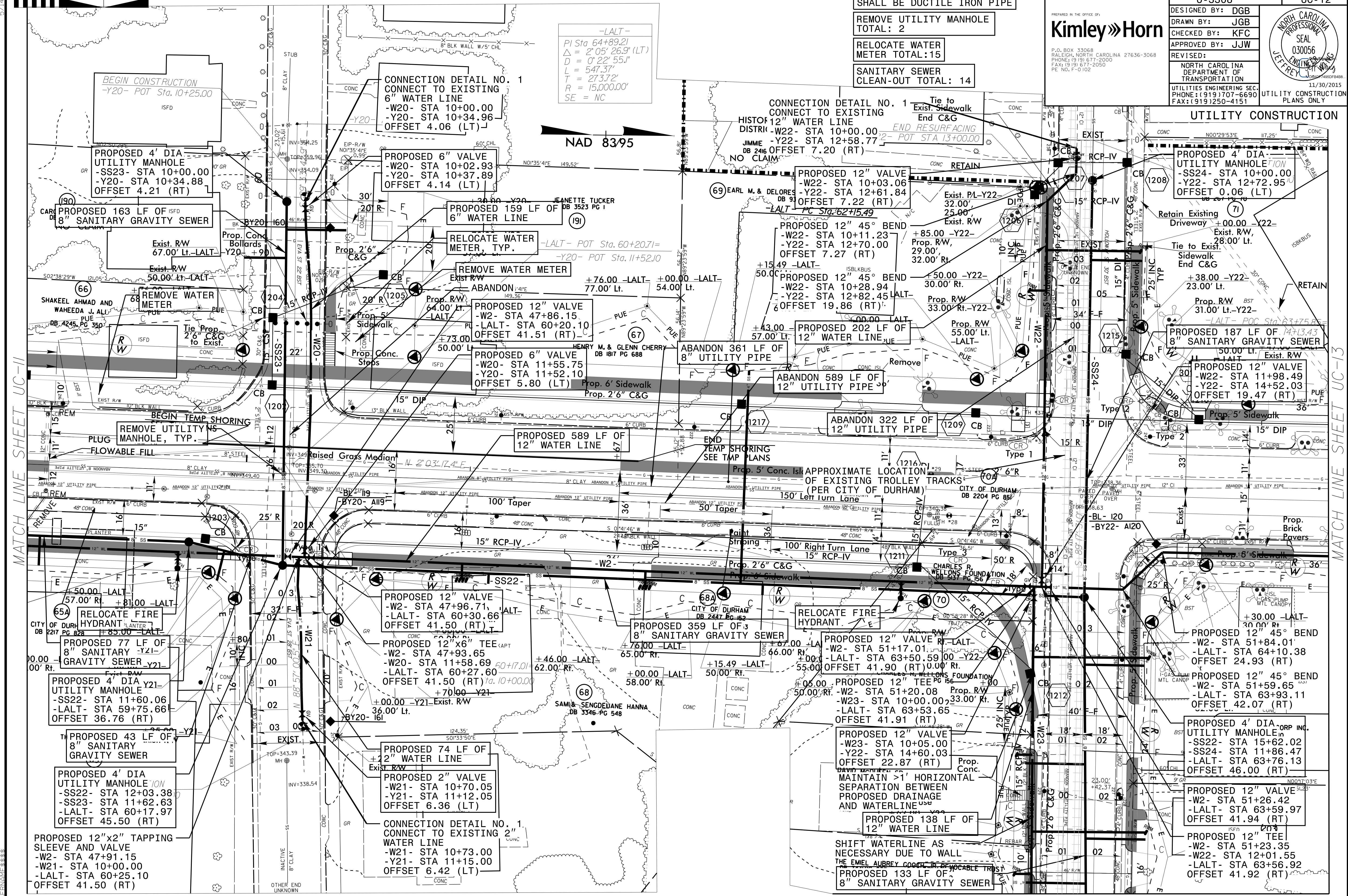
P.O. BOX 33068
RALEIGH, NORTH CAROLINA 27636-3068
PHONE: (919) 677-2000
FAX: (919) 677-2050
PE NO. F-0102

PROJECT REFERENCE NO.	UC-12
SHEET NO.	U-3308
DESIGNED BY:	DGB
DRAWN BY:	JGB
CHECKED BY:	KFC
APPROVED BY:	JJW
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SECTION	
PHONE: (919) 707-6690	
FAX: (919) 250-4151	
UTILITY CONSTRUCTION PLANS ONLY	



-LALT-
PI Sta 64+89.21
Δ = 2° 05' 26.9" (LT)
D = 0° 22' 55.1"
L = 547.37'
T = 273.72'
R = 15,000.00'
SE = NC

NAD 83/95



MATCH LINE SHEET UC-11

MATCH LINE SHEET UC-13

MATCH LINE SHEET UC-24

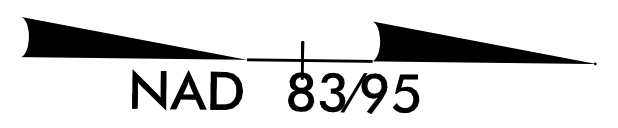
5/14/19



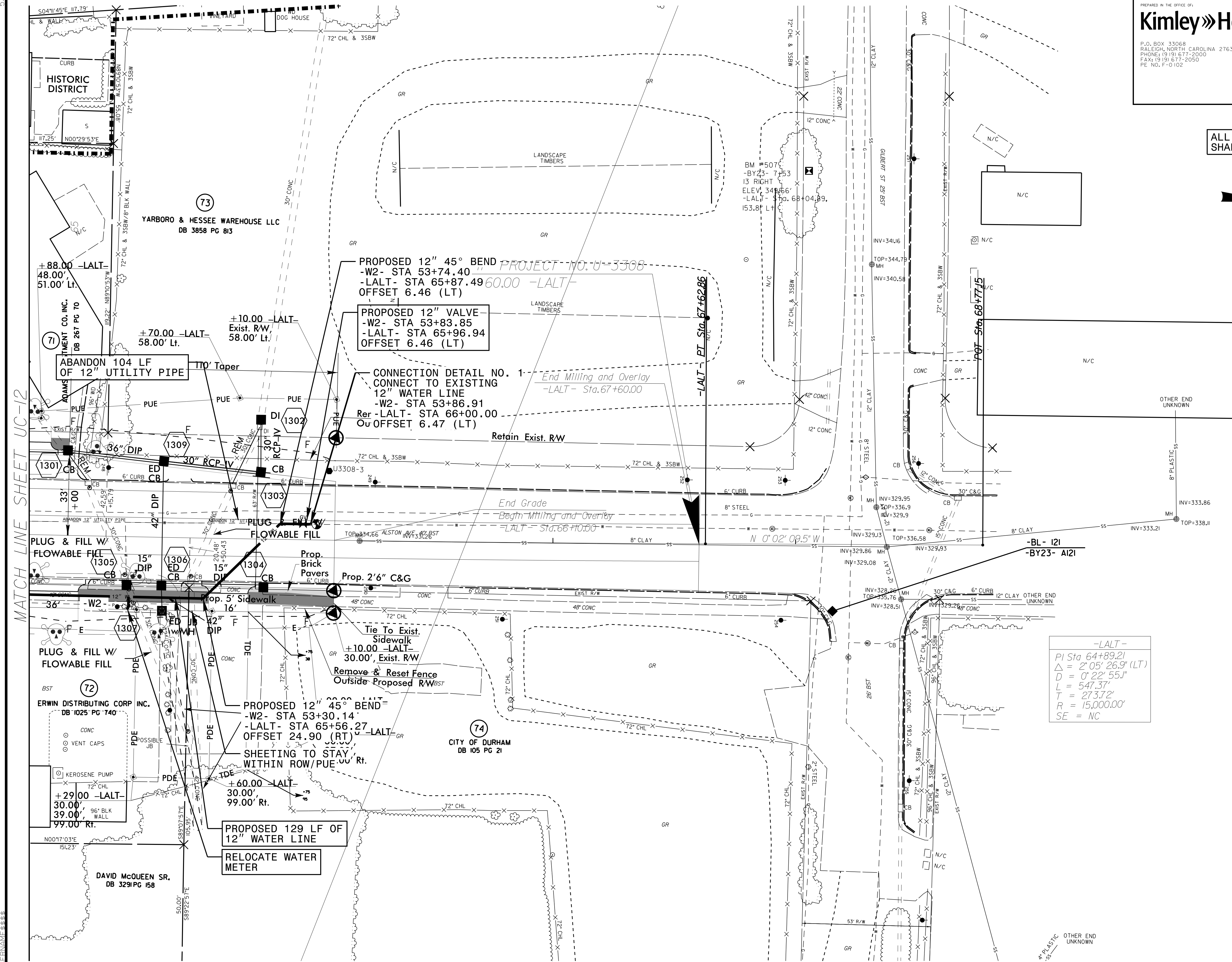
PROJECT REFERENCE NO.	SHEET NO.
U-3308	UC-13
DESIGNED BY: DGB	
DRAWN BY: JGB	
CHECKED BY: KFC	
APPROVED BY: JJW	
REVISIONS:	NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151
UTILITY CONSTRUCTION	

PREPARED IN THE OFFICE OF:
Kimley»Horn
 P.O. BOX 33068
 RALEIGH, NORTH CAROLINA 27636-3068
 PHONE: (919) 677-2000
 FAX: (919) 677-2050
 PE NO. F-0102

ALL WATER AND SEWER LINES
 SHALL BE DUCTILE IRON PIPE



MATCH LINE SHEET UC-12



-LALT-
 PI Sta 64+89.21
 $\Delta = 2' 05" 26.9" (LT)$
 $D = 0' 22" 55.1"$
 $L = 547.37'$
 $T = 273.72'$
 $R = 15,000.00'$
 $SE = NC$

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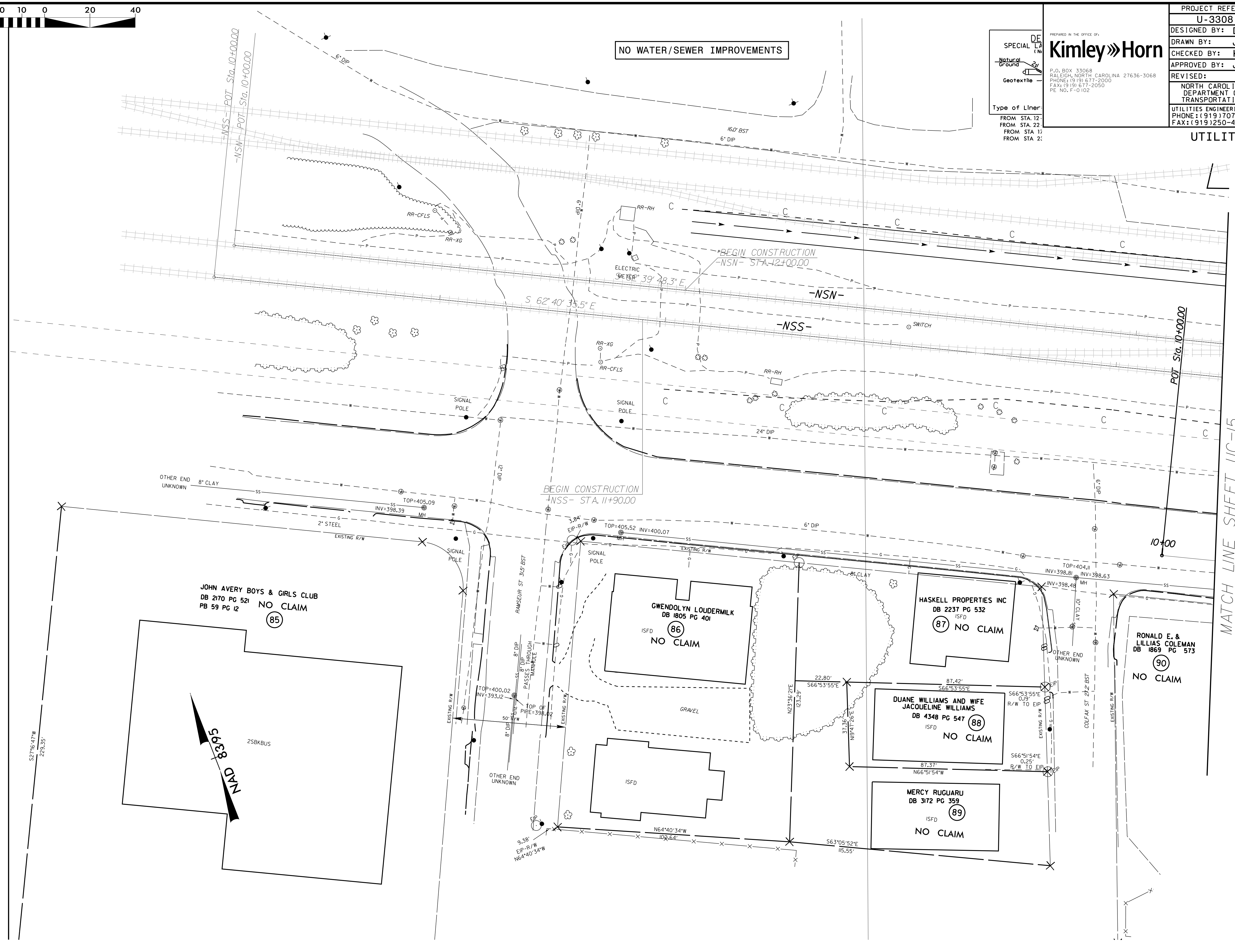
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SPECIAL L.A.
 Natural Ground
 Geotextile
 Type of Liner
 FROM STA. 12
 FROM STA. 22
 FROM STA. 17
 FROM STA. 2:

PREPARED IN THE OFFICE OF:
Kimley»Horn
 P.O. BOX 33068
 RALEIGH, NORTH CAROLINA 27636-3068
 PHONE: (919) 677-2000
 FAX: (919) 677-2050
 PE NO. F-0102

PROJECT REFERENCE NO.	SHEET NO.
U-3308	UC-14
DESIGNED BY: DGB	
DRAWN BY: JGB	
CHECKED BY: KFC	
APPROVED BY: JJW	
REVISED:	NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151
UTILITY CONSTRUCTION PLANS ONLY	

NO WATER/SEWER IMPROVEMENTS

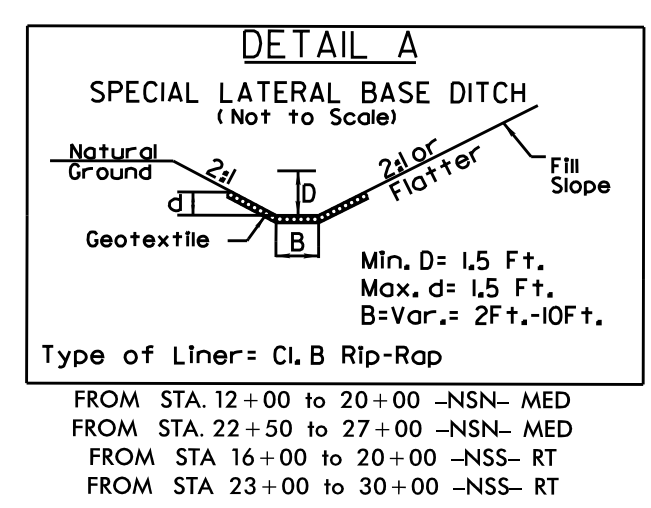




PROJECT REFERENCE NO.	SHEET NO.
U-3308	UC-16
DESIGNED BY: DGB	
DRAWN BY: JGB	
CHECKED BY: KFC	
APPROVED BY: JJW	
REVISED:	NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
UTILITIES ENGINEERING SEC.	UTILITY CONSTRUCTION PLANS ONLY
PHONE: (919) 707-6690	
FAX: (919) 250-4151	

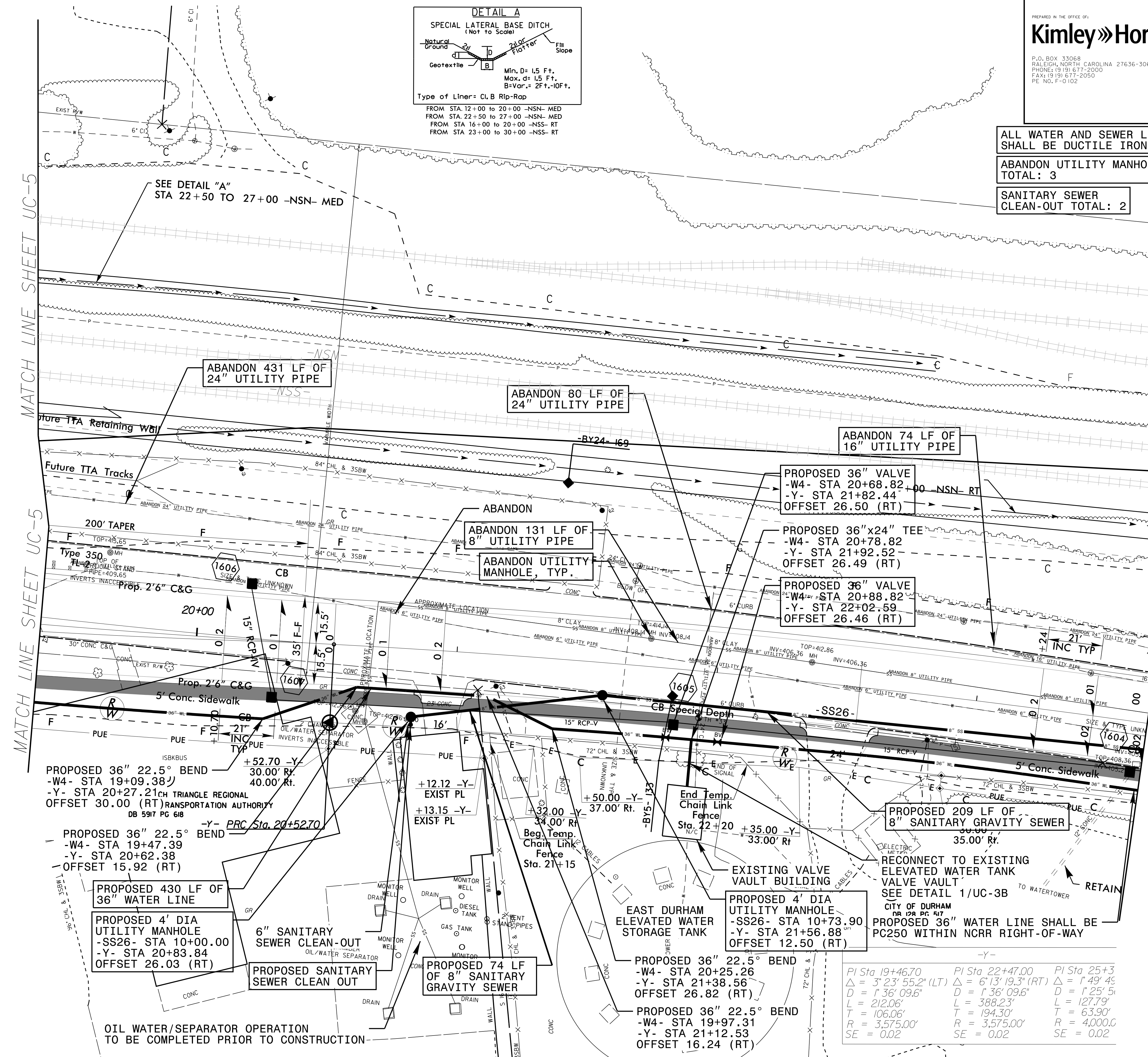
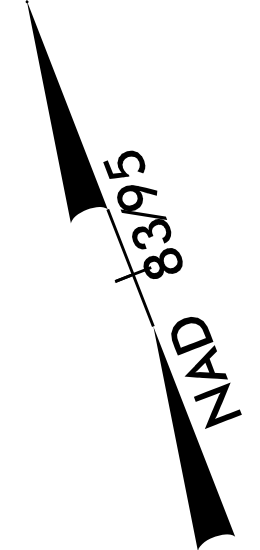
PREPARED IN THE OFFICE OF:
Kimley»Horn
 P.O. BOX 33068
 RALEIGH, NORTH CAROLINA 27636-3068
 PHONE: (919) 677-2000
 FAX: (919) 677-2050
 PE NO. F-0102

ALL WATER AND SEWER LINES SHALL BE DUCTILE IRON PIPE
 UTILITY CONSTRUCTION
 ABANDON UTILITY MANHOLE TOTAL: 3
 SANITARY SEWER CLEAN-OUT TOTAL: 2



MATCH LINE SHEET UC-5

MATCH LINE SHEET UC-17



PROPOSED 36" 22.5° BEND
 -W4- STA 19+09.38
 -Y- STA 20+27.21
 OFFSET 30.00 (RT)
 TRANSPORTATION AUTHORITY
 DB 5917 PG 618

PROPOSED 36" 22.5° BEND
 -W4- STA 19+47.39
 -Y- STA 20+62.38
 OFFSET 15.92 (RT)

PROPOSED 430 LF OF 36" WATER LINE

PROPOSED 4' DIA UTILITY MANHOLE
 -SS26- STA 10+00.00
 -Y- STA 20+83.84
 OFFSET 26.03 (RT)

6" SANITARY SEWER CLEAN-OUT

PROPOSED SANITARY SEWER CLEAN OUT

PROPOSED 74 LF OF 8" SANITARY GRAVITY SEWER

PROPOSED 36" 22.5° BEND
 -W4- STA 20+25.26
 -Y- STA 21+38.56
 OFFSET 26.82 (RT)

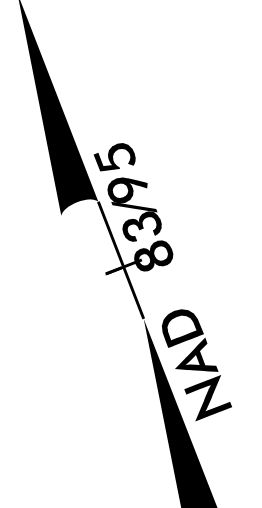
PROPOSED 36" 22.5° BEND
 -W4- STA 19+97.31
 -Y- STA 21+12.53
 OFFSET 16.24 (RT)

PROPOSED 4' DIA UTILITY MANHOLE
 -SS26- STA 10+73.90
 -Y- STA 21+56.88
 OFFSET 12.50 (RT)

PROPOSED 209 LF OF 8" SANITARY GRAVITY SEWER
 35.00' R/L

PI Sta 19+46.70	PI Sta 22+47.00	PI Sta 25+3
Δ = 3' 23' 55.2" (LT)	Δ = 6' 13' 19.3" (RT)	Δ = 1' 49' 45"
D = 1' 36' 09.6"	D = 1' 36' 09.6"	D = 1' 25' 5"
L = 212.06'	L = 388.23'	L = 127.79'
T = 106.06'	T = 194.30'	T = 63.90'
R = 3,575.00'	R = 3,575.00'	R = 4,000.0'
SE = 0.02	SE = 0.02	SE = 0.02

OIL WATER/SEPARATOR OPERATION TO BE COMPLETED PRIOR TO CONSTRUCTION



NOTES:

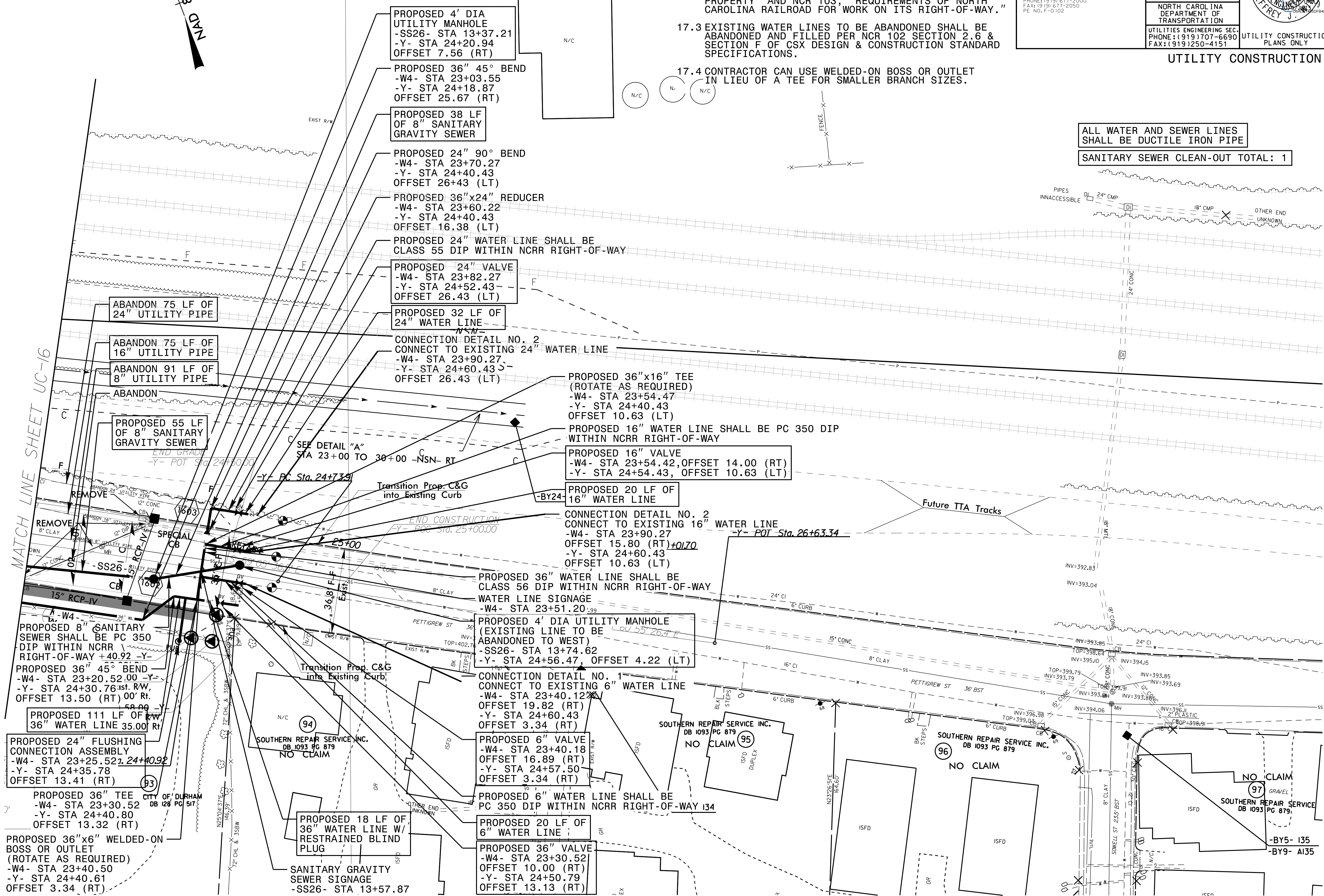
- 17.1 ALL PIPE IN NCRR RIGHT-OF-WAY SHALL BE MECHANICALLY RESTRAINED.
- 17.2 ALL CONSTRUCTION IN NCRR RIGHT-OF-WAY SHALL BE PER THE REQUIREMENTS OF NCR 102, "SPECIFICATIONS PIPELINE OCCUPANCY OF NORTH CAROLINA COMPANY PROPERTY" AND NCR 103, "REQUIREMENTS OF NORTH CAROLINA RAILROAD FOR WORK ON ITS RIGHT-OF-WAY."
- 17.3 EXISTING WATER LINES TO BE ABANDONED SHALL BE ABANDONED AND FILLED PER NCR 102 SECTION 2.6 & SECTION F OF CSX DESIGN & CONSTRUCTION STANDARD SPECIFICATIONS.
- 17.4 CONTRACTOR CAN USE WELDED-ON BOSS OR OUTLET IN LIEU OF A TEE FOR SMALLER BRANCH SIZES.

PROJECT REFERENCE NO. U-3308		SHEET NO. UC-17	
DESIGNED BY: DGB			
DRAWN BY: JGB			
CHECKED BY: KFC			
APPROVED BY: JJW			
REVISED:		NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151		UTILITY CONSTRUCTION PLANS ONLY	

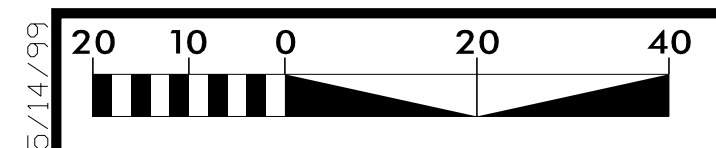
UTILITY CONSTRUCTION

ALL WATER AND SEWER LINES
SHALL BE DUCTILE IRON PIPE

SANITARY SEWER CLEAN-OUT TOTAL: 1



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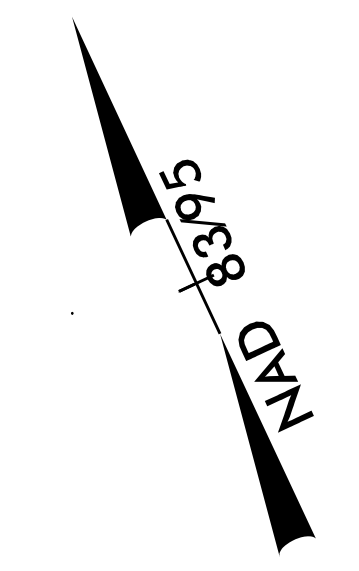


5/14/19

ALL WATER AND SEWER LINES SHALL BE DUCTILE IRON PIPE

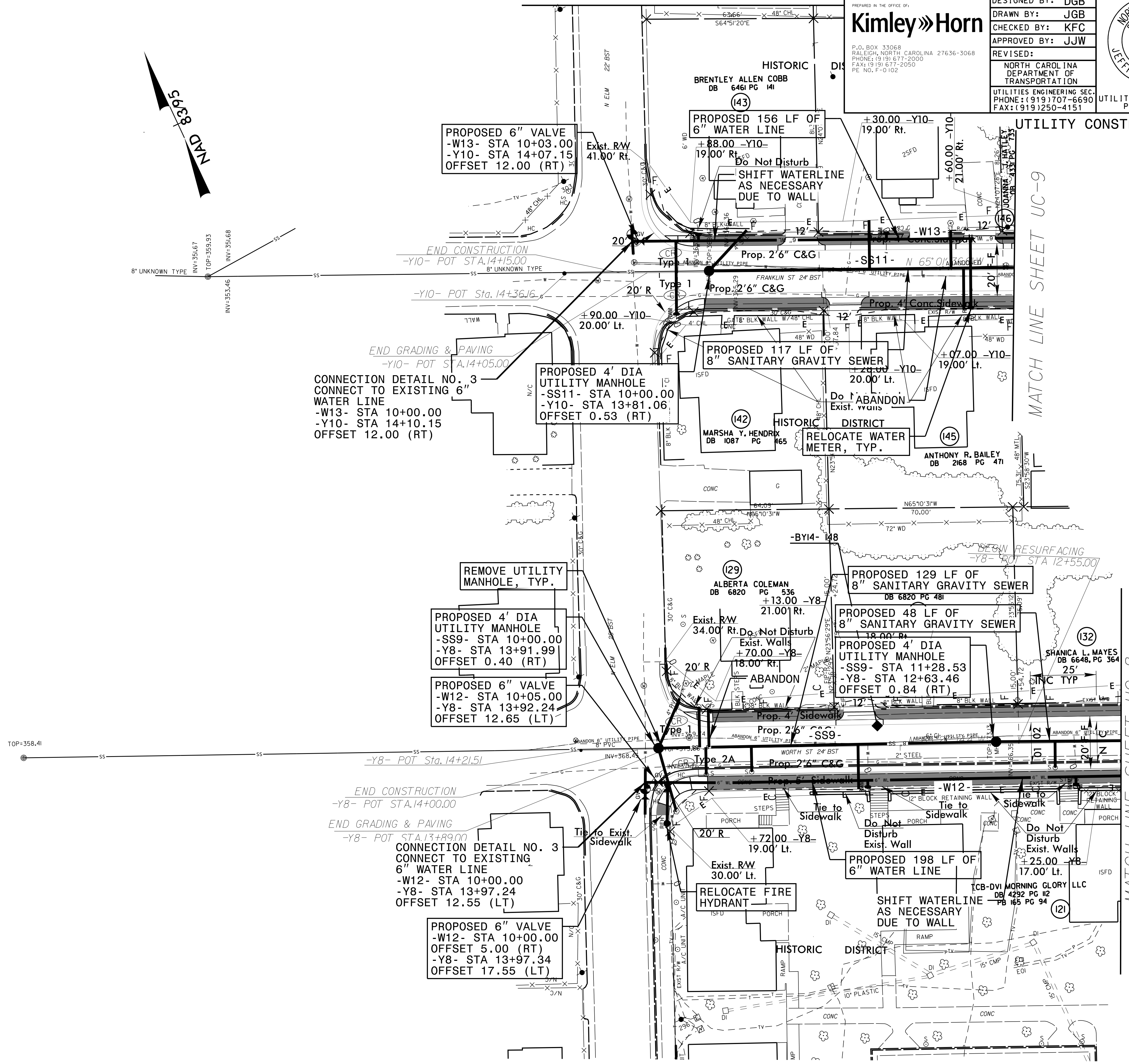
RELOCATE WATER METER TOTAL: 6

SANITARY SEWER CLEAN-OUT TOTAL: 12



MATCH LINE SHEET UC-21

PROJECT REFERENCE NO.	SHEET NO.
U-3308	UC-19
DESIGNED BY: DGB	
DRAWN BY: JGB	
CHECKED BY: KFC	
APPROVED BY: JJW	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SECTION PHONE: (919) 707-6690 FAX: (919) 250-4151	
UTILITY CONSTRUCTION PLANS ONLY	



MATCH LINE SHEET UC-9

MATCH LINE SHEET UC-8

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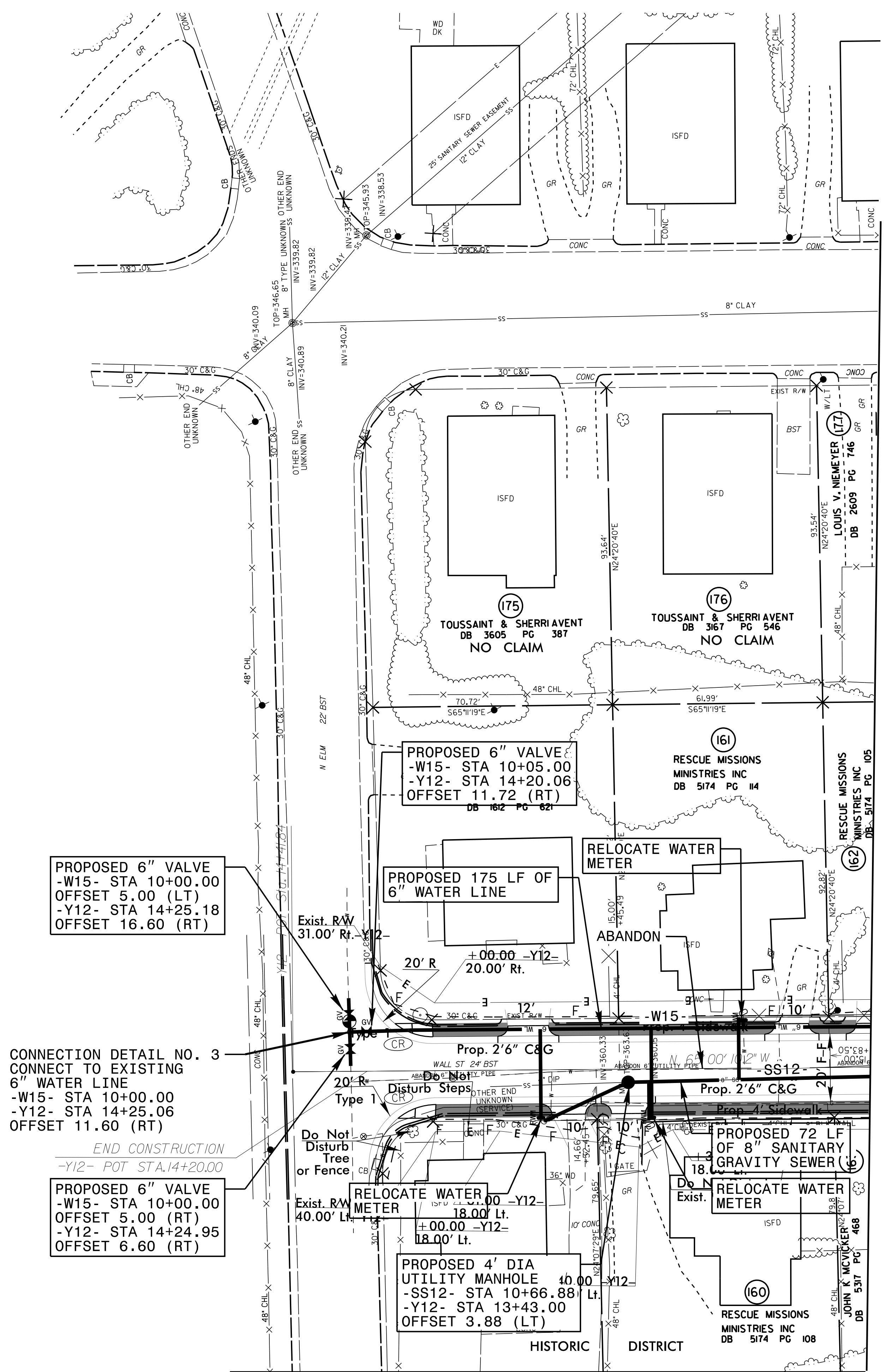
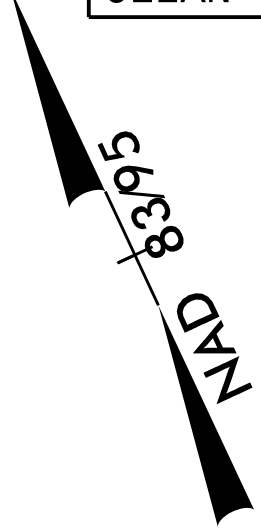


5/14/99

PROJECT REFERENCE NO.		SHEET NO.	
U-3308		UC-21	
DESIGNED BY:	DGB		
DRAWN BY:	JGB		
CHECKED BY:	KFC		
APPROVED BY:	JJW		
REVISED:		NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	
UTILITY CONSTRUCTION			UTILITY CONSTRUCTION PLANS ONLY

ALL WATER AND SEWER LINES SHALL BE DUCTILE IRON PIPE

SANITARY SEWER CLEAN-OUT TOTAL: 4



PROPOSED 6" VALVE
 -W15- STA 10+05.00
 -Y12- STA 14+20.06
 OFFSET 11.72 (RT)
 DB 162 PG 62

CONNECTION DETAIL NO. 3
 CONNECT TO EXISTING
 6" WATER LINE
 -W15- STA 10+00.00
 -Y12- STA 14+25.06
 OFFSET 11.60 (RT)

PROPOSED 6" VALVE
 -W15- STA 10+00.00
 OFFSET 5.00 (RT)
 -Y12- STA 14+24.95
 OFFSET 6.60 (RT)

PROPOSED 4' DIA
 UTILITY MANHOLE
 -SS12- STA 10+66.88
 -Y12- STA 13+43.00
 OFFSET 3.88 (LT)

MATCH LINE SHEET UC-9

MATCH LINE SHEET 19



5/14/99

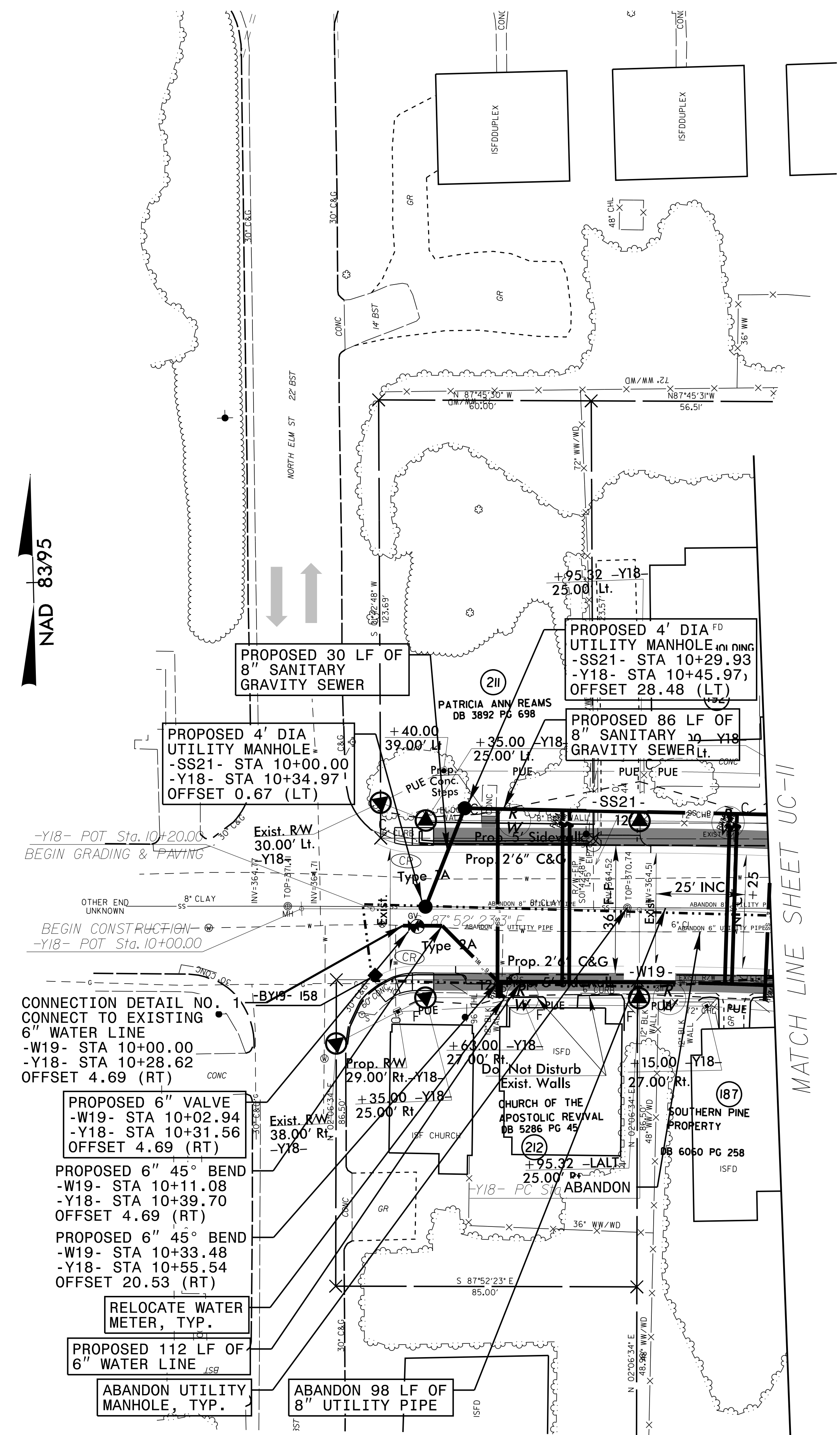
-Y18-
 PI Sta 11+27.16
 $\Delta = 4' 03'' 09.6''$ (RT)
 $D = 6' 21'' 58.3''$
 $L = 63.66'$
 $T = 31.84'$
 $R = 900.00'$
 SE = SEE PLANS
 RO = SEE PLANS

PROJECT REFERENCE NO.	SHEET NO.
U-3308	UC-22
DESIGNED BY: DGB	
DRAWN BY: JGB	
CHECKED BY: KFC	
APPROVED BY: JJW	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	
UTILITY CONSTRUCTION PLANS ONLY	

ALL WATER AND SEWER LINES
 SHALL BE DUCTILE IRON PIPE

SANITARY SEWER
 CLEAN-OUT: 6

NAD 8395



CONNECTION DETAIL NO. 1
 CONNECT TO EXISTING
 6" WATER LINE
 -W19- STA 10+00.00
 -Y18- STA 10+28.62
 OFFSET 4.69 (RT)

PROPOSED 6" VALVE
 -W19- STA 10+02.94
 -Y18- STA 10+31.56
 OFFSET 4.69 (RT)

PROPOSED 6" 45° BEND
 -W19- STA 10+11.08
 -Y18- STA 10+39.70
 OFFSET 4.69 (RT)

PROPOSED 6" 45° BEND
 -W19- STA 10+33.48
 -Y18- STA 10+55.54
 OFFSET 20.53 (RT)

RELOCATE WATER
 METER, TYP.

PROPOSED 112 LF OF
 6" WATER LINE

ABANDON UTILITY
 MANHOLE, TYP.

ABANDON 98 LF OF
 8" UTILITY PIPE

RELOCATE WATER
 METER TOTAL: 5

MATCH LINE SHEET UC-11

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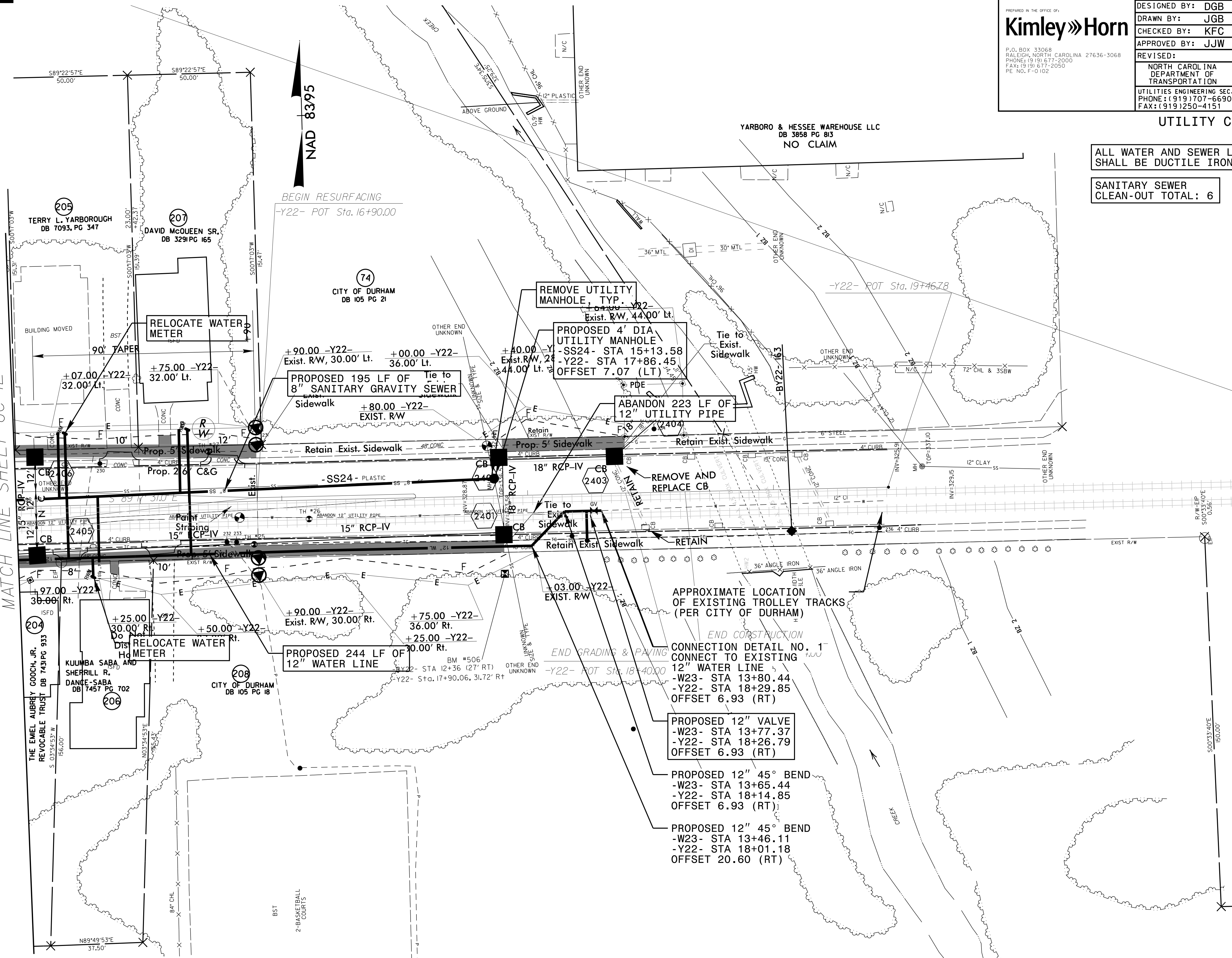
5/14/99

PROJECT REFERENCE NO. U-3308	SHEET NO. UC-24
DESIGNED BY: DGB	
DRAWN BY: JGB	
CHECKED BY: KFC	
APPROVED BY: JJW	
REVISED:	NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151
UTILITY CONSTRUCTION	

ALL WATER AND SEWER LINES SHALL BE DUCTILE IRON PIPE

SANITARY SEWER CLEAN-OUT TOTAL: 6

MATCH LINE SHEET UC-12



APPROXIMATE LOCATION OF EXISTING TROLLEY TRACKS (PER CITY OF DURHAM)

END CONSTRUCTION

CONNECTION DETAIL NO. 1
CONNECT TO EXISTING
12" WATER LINE
-W23- STA 13+80.44
-Y22- STA 18+29.85
OFFSET 6.93 (RT)

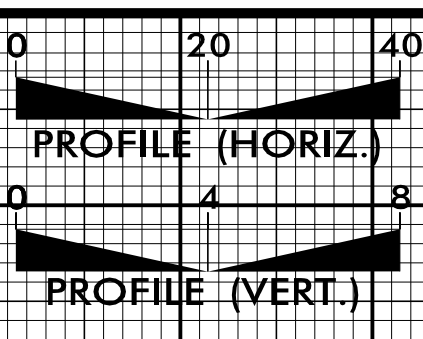
PROPOSED 12" VALVE
-W23- STA 13+77.37
-Y22- STA 18+26.79
OFFSET 6.93 (RT)

PROPOSED 12" 45° BEND
-W23- STA 13+65.44
-Y22- STA 18+14.85
OFFSET 6.93 (RT)

PROPOSED 12" 45° BEND
-W23- STA 13+46.11
-Y22- STA 18+01.18
OFFSET 20.60 (RT)

58

5/28/99



RESTRAINED JOINT PIPE

PROJECT REFERENCE NO. U-3308 SHEET NO. UC-25

DESIGNED BY: DGB
DRAWN BY: JGB
CHECKED BY: KFC
APPROVED BY: JJW

REVISIONS:

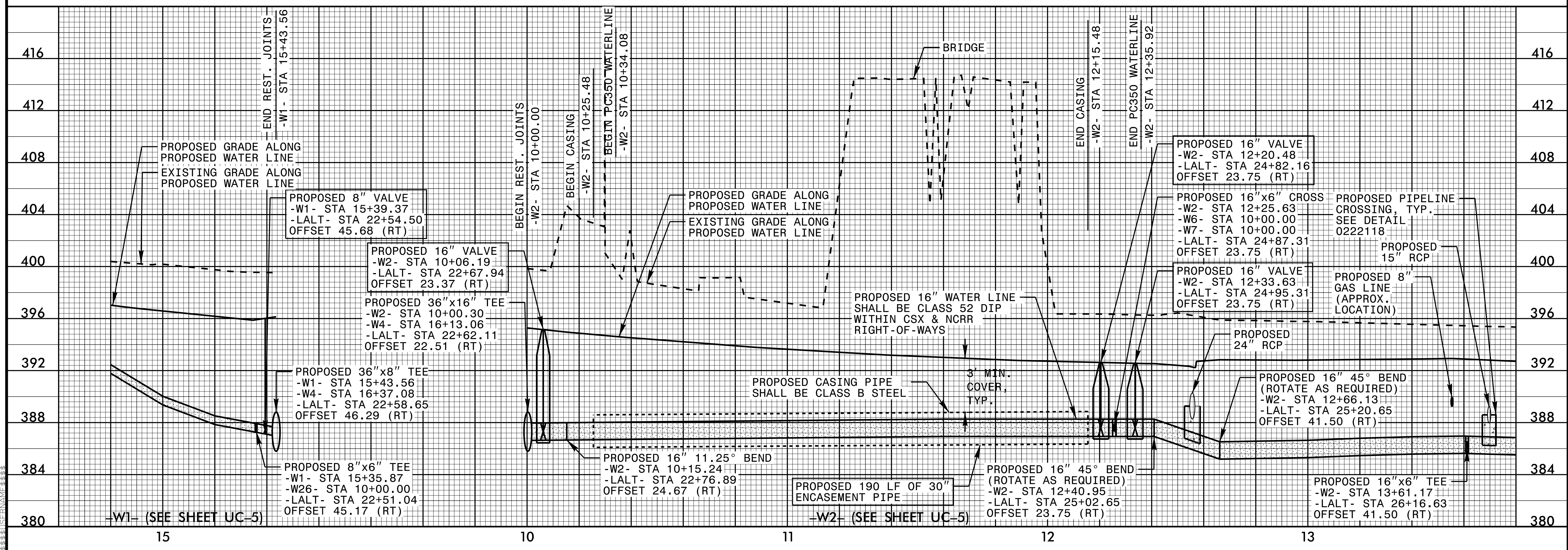
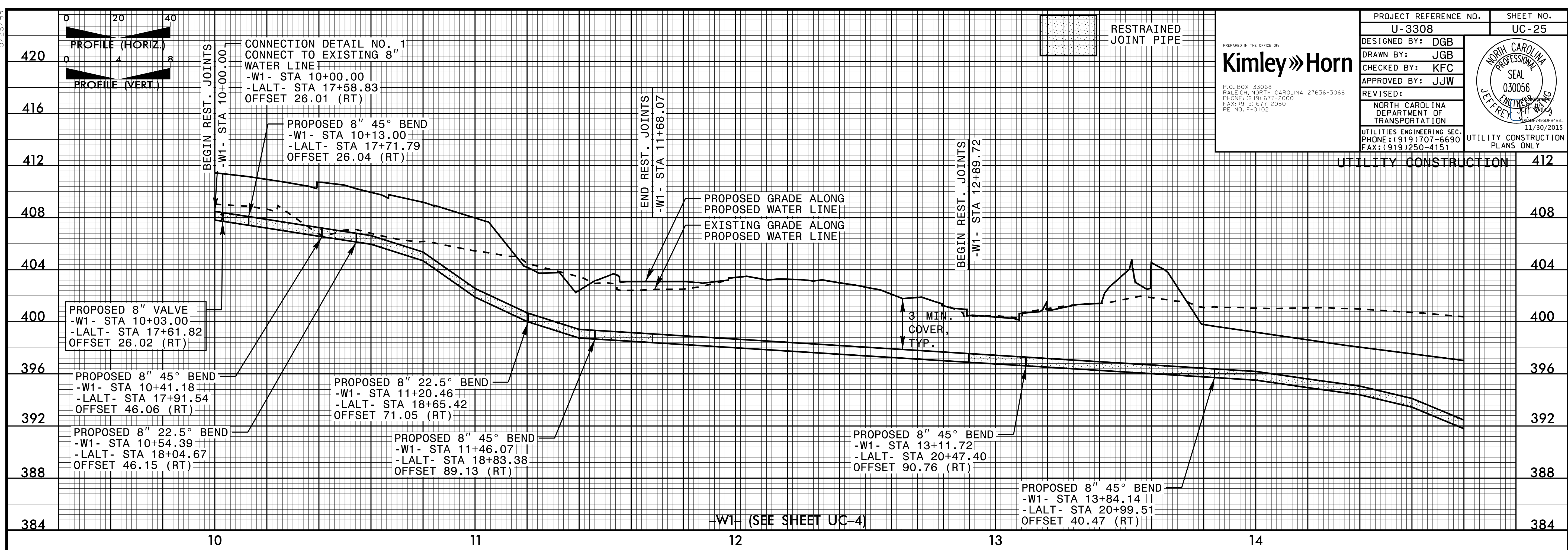
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

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

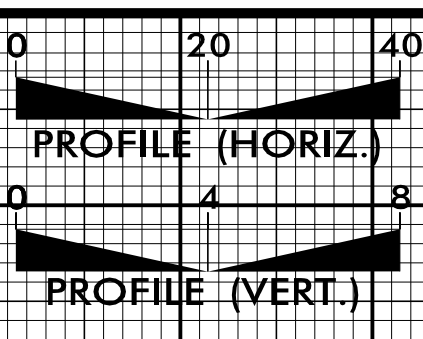
UTILITY CONSTRUCTION PLANS ONLY

PREPARED IN THE OFFICE OF:
Kimley»Horn
P.O. BOX 33068
RALEIGH, NORTH CAROLINA 27636-3068
PHONE: (919) 677-2000
FAX: (919) 677-2050
PE NO. P-0102

NORTH CAROLINA PROFESSIONAL SEAL
030056
JEFFREY J. WOOD
11/30/2015

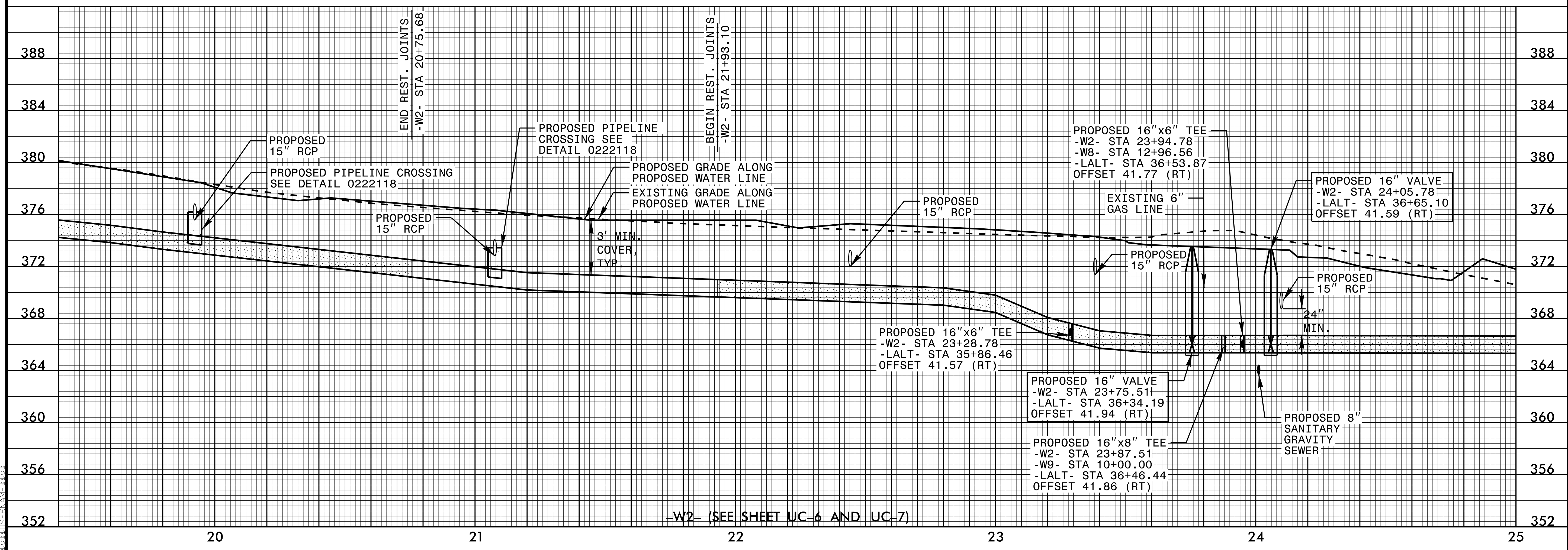
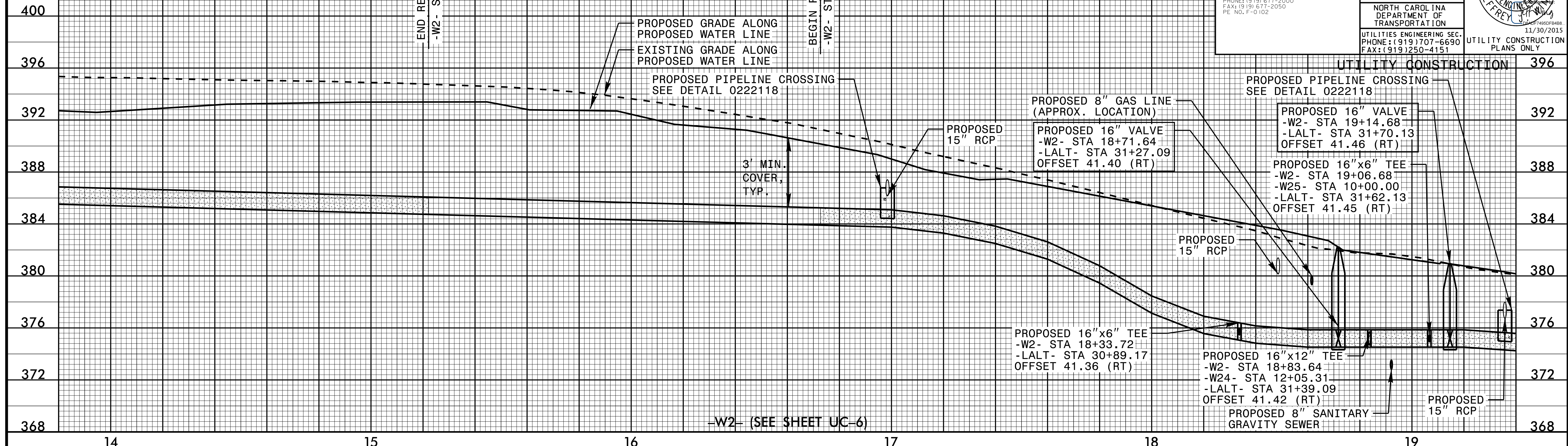


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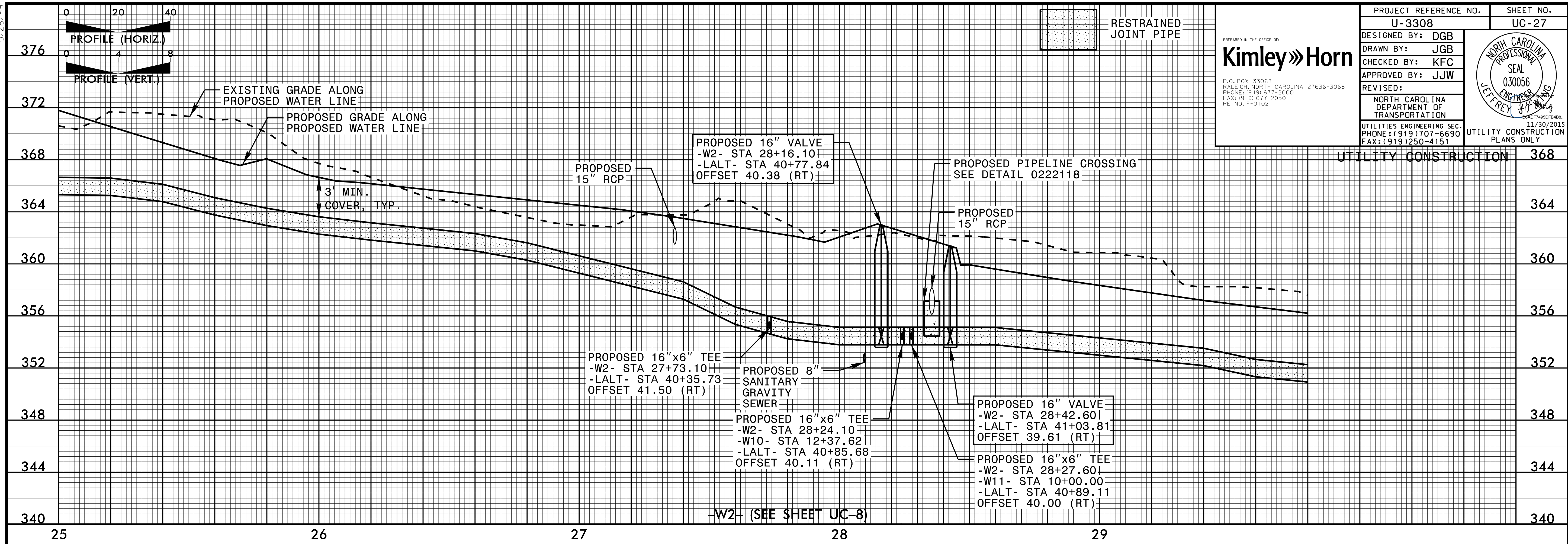
RESTRAINED JOINT PIPE

PROJECT REFERENCE NO. U-3308	SHEET NO. UC-26
DESIGNED BY: DGB	
DRAWN BY: JGB	
CHECKED BY: KFC	
APPROVED BY: JJW	REVISED:
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	
UTILITY CONSTRUCTION PLANS ONLY	



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5/28/99



PROJECT REFERENCE NO. U-3308 SHEET NO. UC-27

DESIGNED BY: DGB

DRAWN BY: JGB

CHECKED BY: KFC

APPROVED BY: JJW

REVISED:

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

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

UTILITY CONSTRUCTION PLANS ONLY

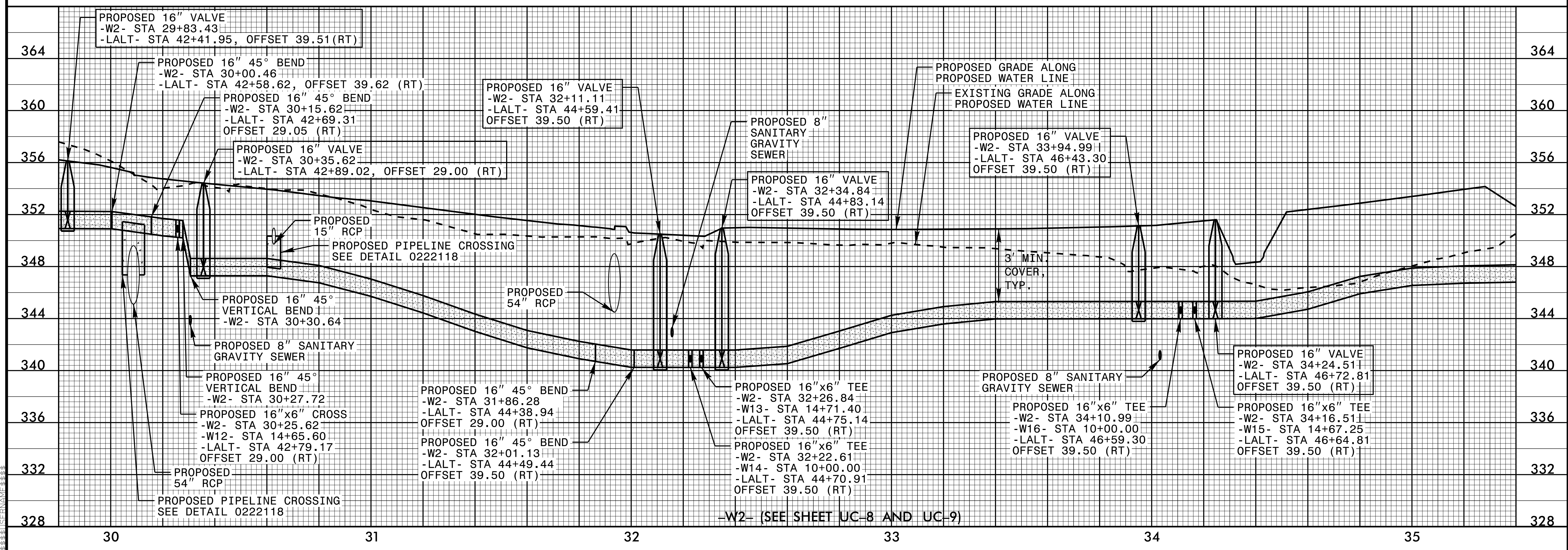
PREPARED IN THE OFFICE OF:

Kimley»Horn

P.O. BOX 33068 RALEIGH, NORTH CAROLINA 27636-3068
PHONE: (919) 677-2000
FAX: (919) 677-2050
PE NO. F-0102

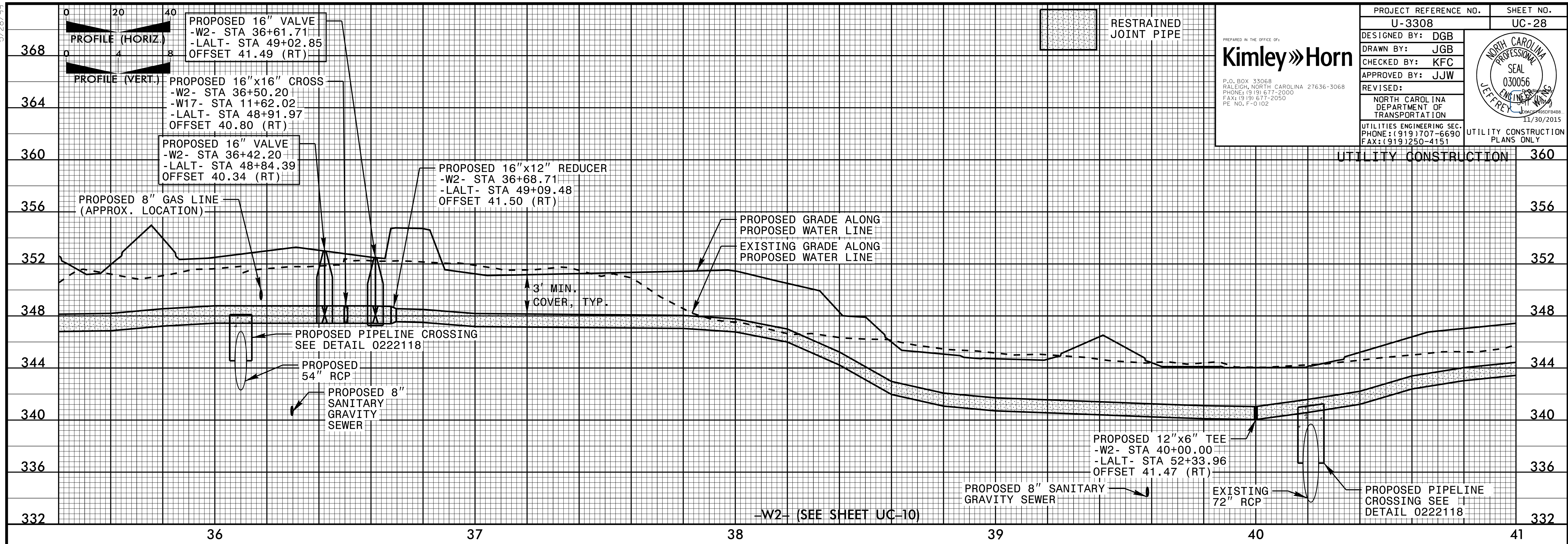
NORTH CAROLINA PROFESSIONAL SEAL
030056
JEFFREY J. HORN

11/30/2015



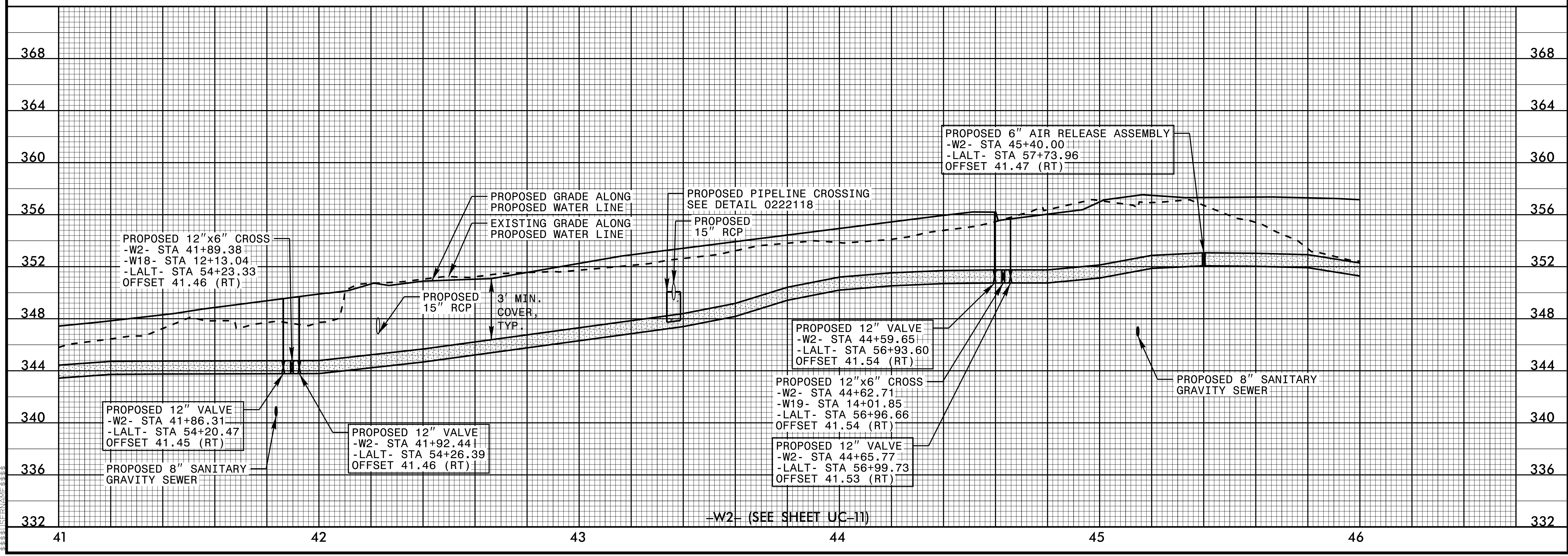
5/28/99

5/28/99

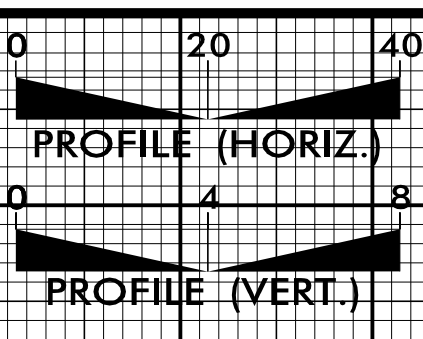


PROJECT REFERENCE NO. U-3308		SHEET NO. UC-28	
DESIGNED BY: DGB	 P.O. BOX 33068 RALEIGH, NORTH CAROLINA 27636-3068 PHONE: (919) 677-2000 FAX: (919) 677-2050 PE NO. F-0102		
DRAWN BY: JGB			
CHECKED BY: KFC			
APPROVED BY: JJW			
REVISED:			NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151
UTILITY CONSTRUCTION			360

5/28/99



5/28/99

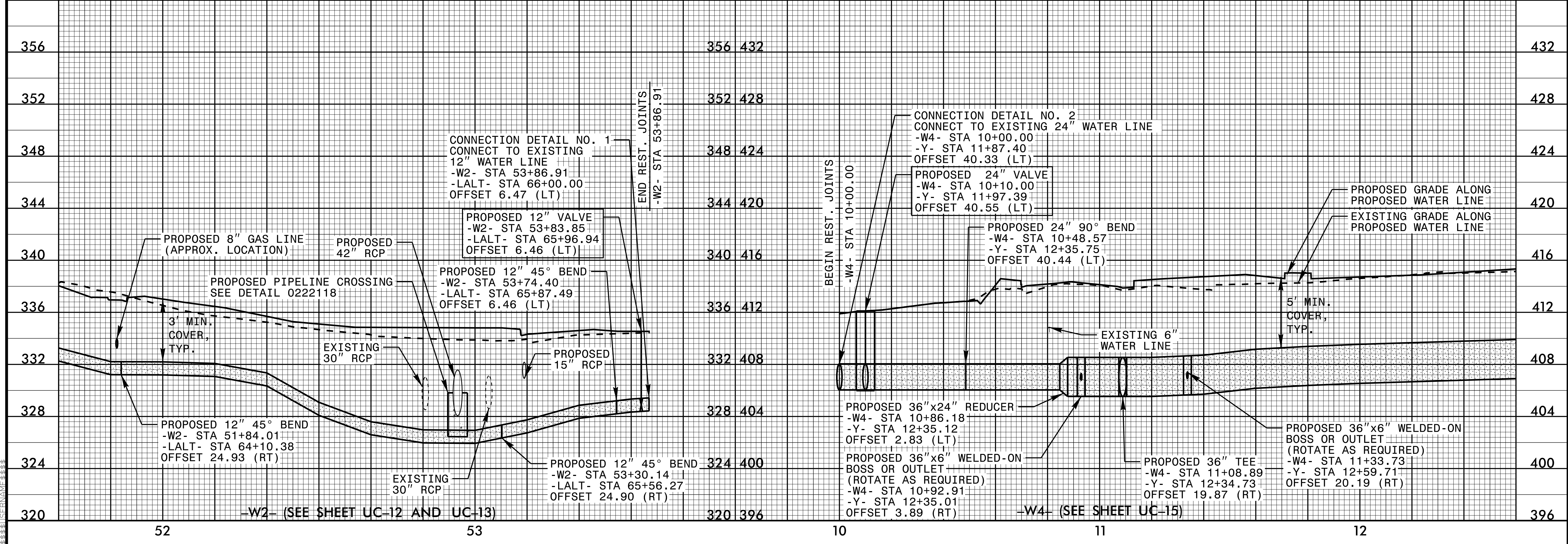
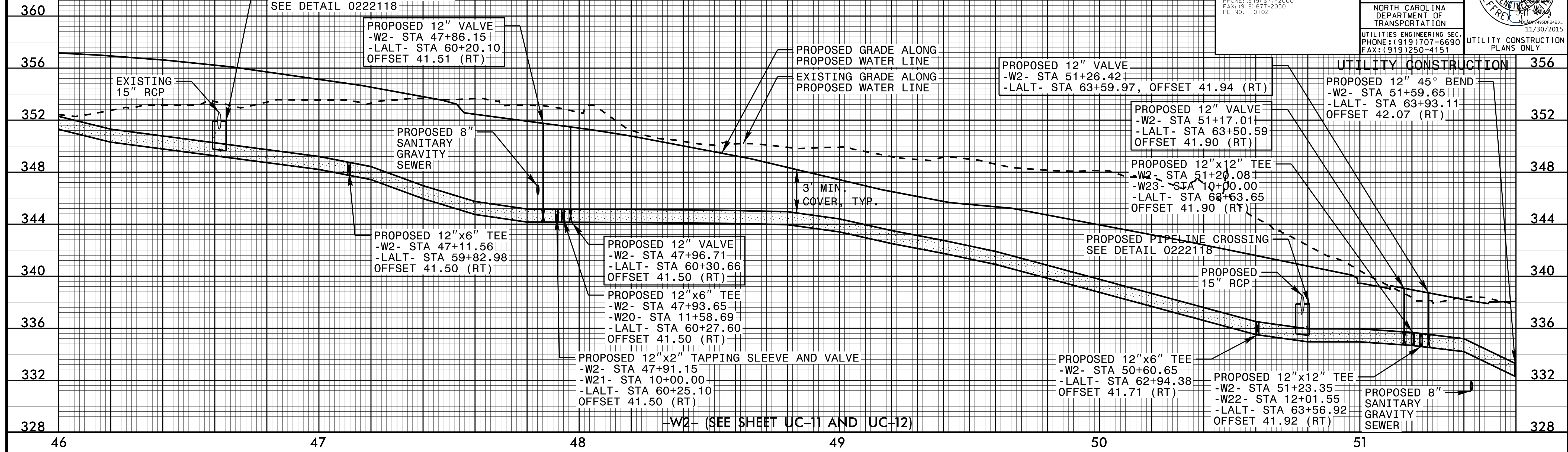


RESTRAINED JOINT PIPE

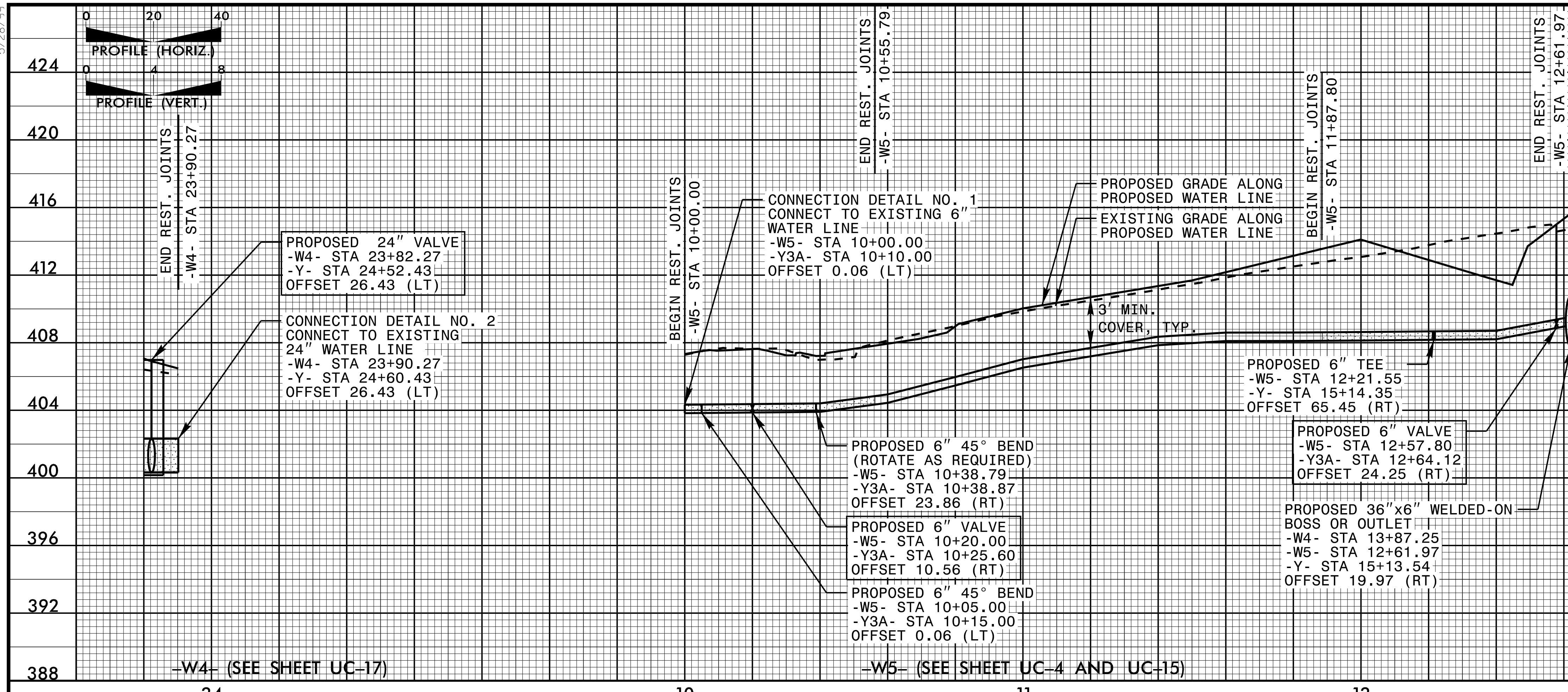
Kimley Horn

P.O. BOX 33068
RALEIGH, NORTH CAROLINA 27636-3068
PHONE: (919) 677-2000
FAX: (919) 677-2050
PE NO. F-0102

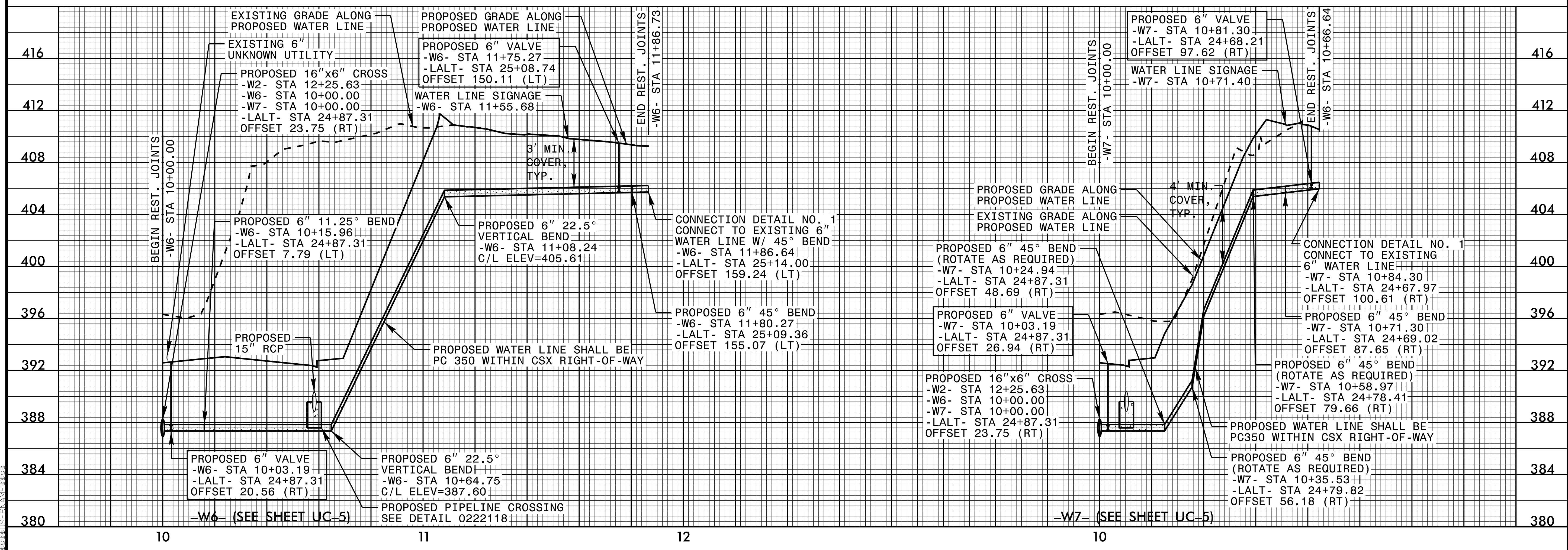
PROJECT REFERENCE NO. U-3308	SHEET NO. UC-29
DESIGNED BY: DGB	
DRAWN BY: JGB	
CHECKED BY: KFC	
APPROVED BY: JJW	REVISIONS:
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	UTILITY CONSTRUCTION PLANS ONLY



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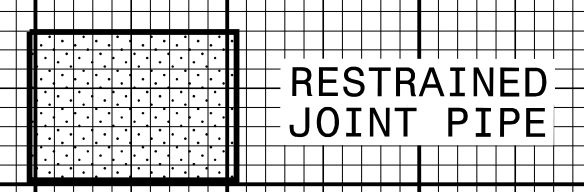
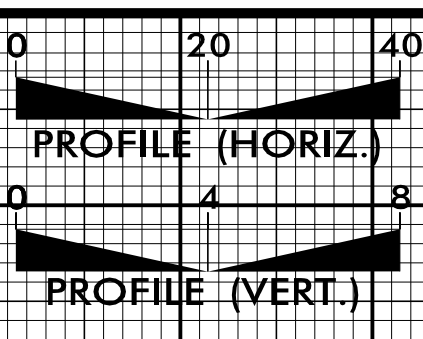


PROJECT REFERENCE NO. U-3308	SHEET NO. UC-31
DESIGNED BY: DGB	
DRAWN BY: JGB	
CHECKED BY: KFC	
APPROVED BY: JJW	NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151
REVISED:	UTILITY CONSTRUCTION PLANS ONLY

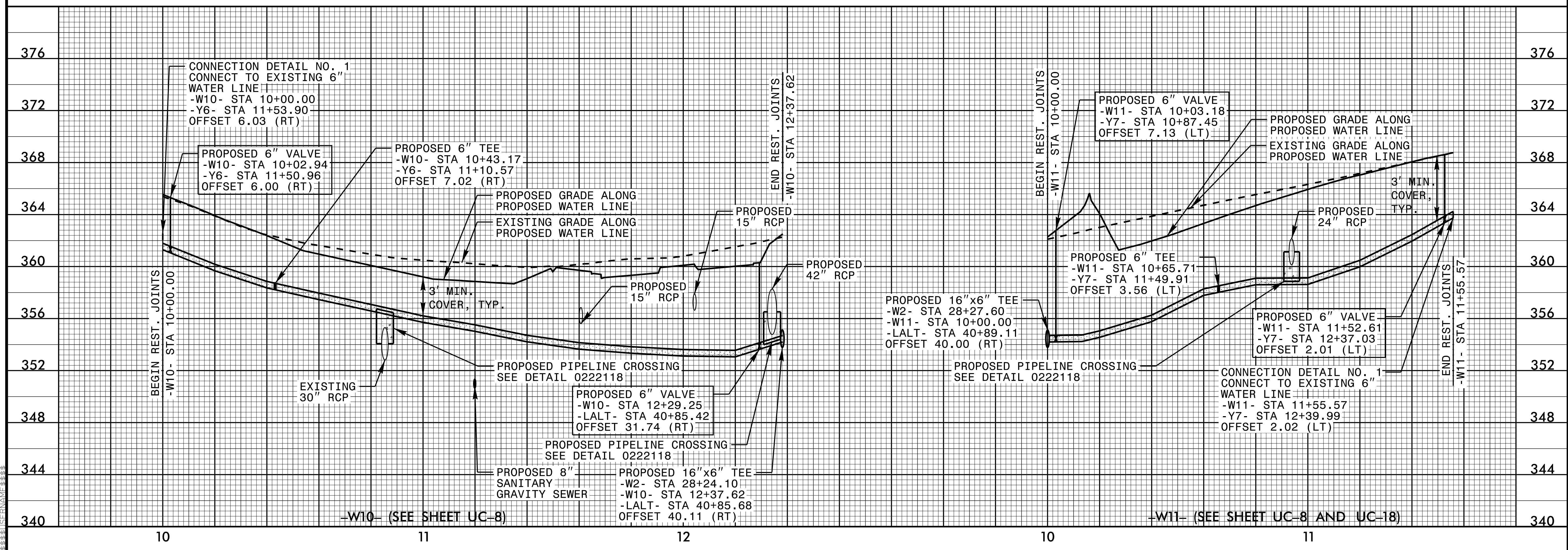
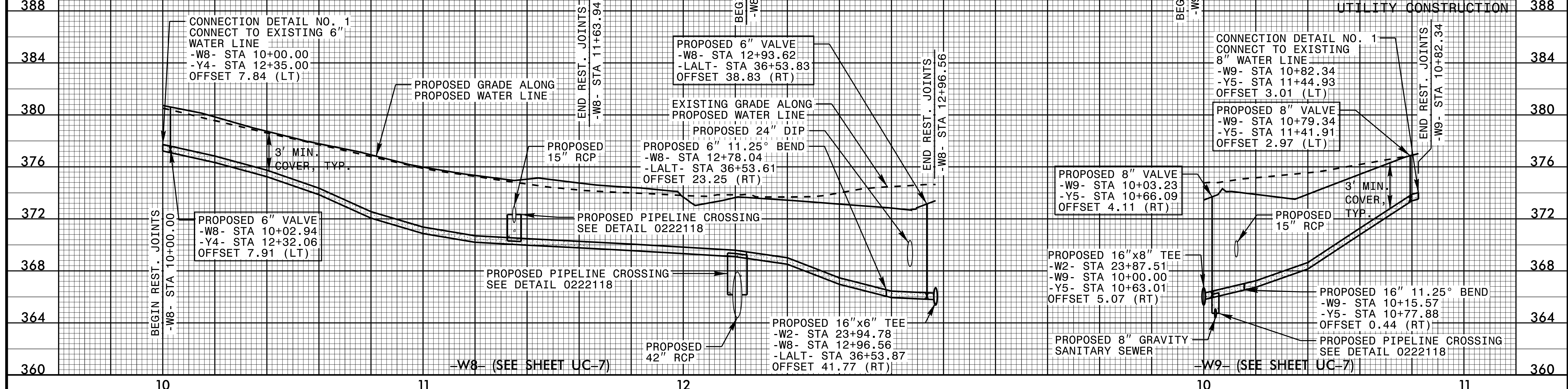


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5/28/99



PROJECT REFERENCE NO. U-3308	SHEET NO. UC-32
DESIGNED BY: DGB	
DRAWN BY: JGB	
CHECKED BY: KFC	
APPROVED BY: JJW	DATE: 12/2/2015
REVISIONS:	NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151
UTILITY CONSTRUCTION	

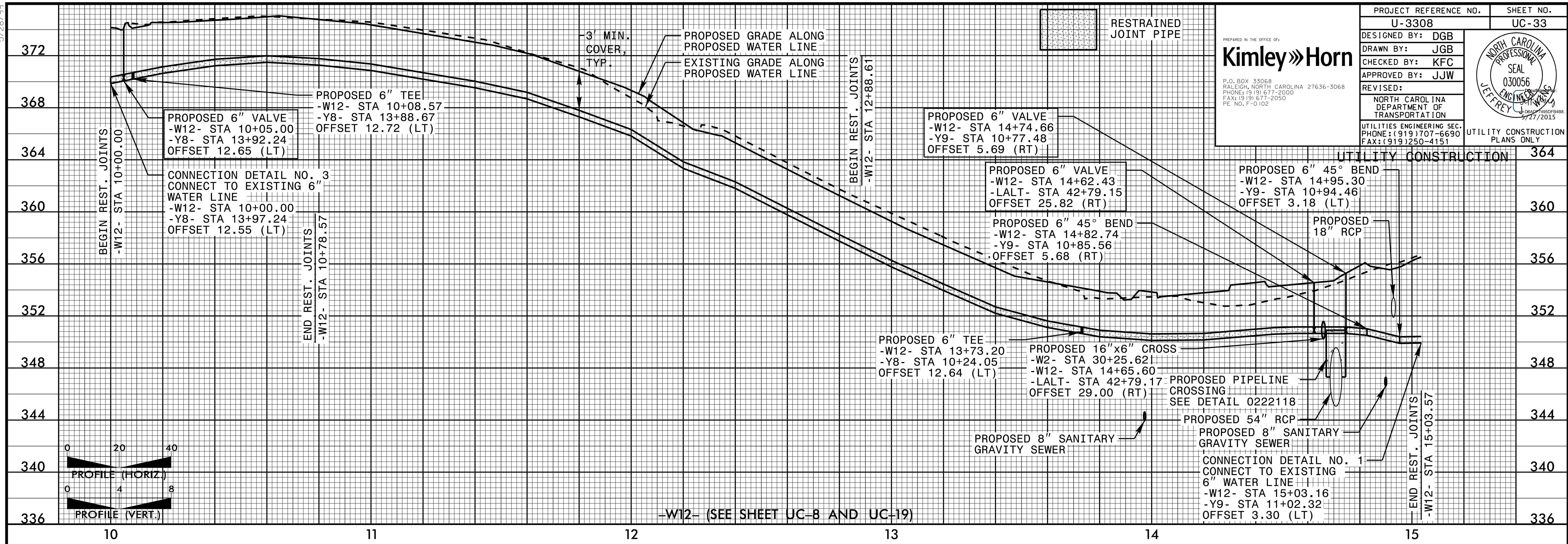


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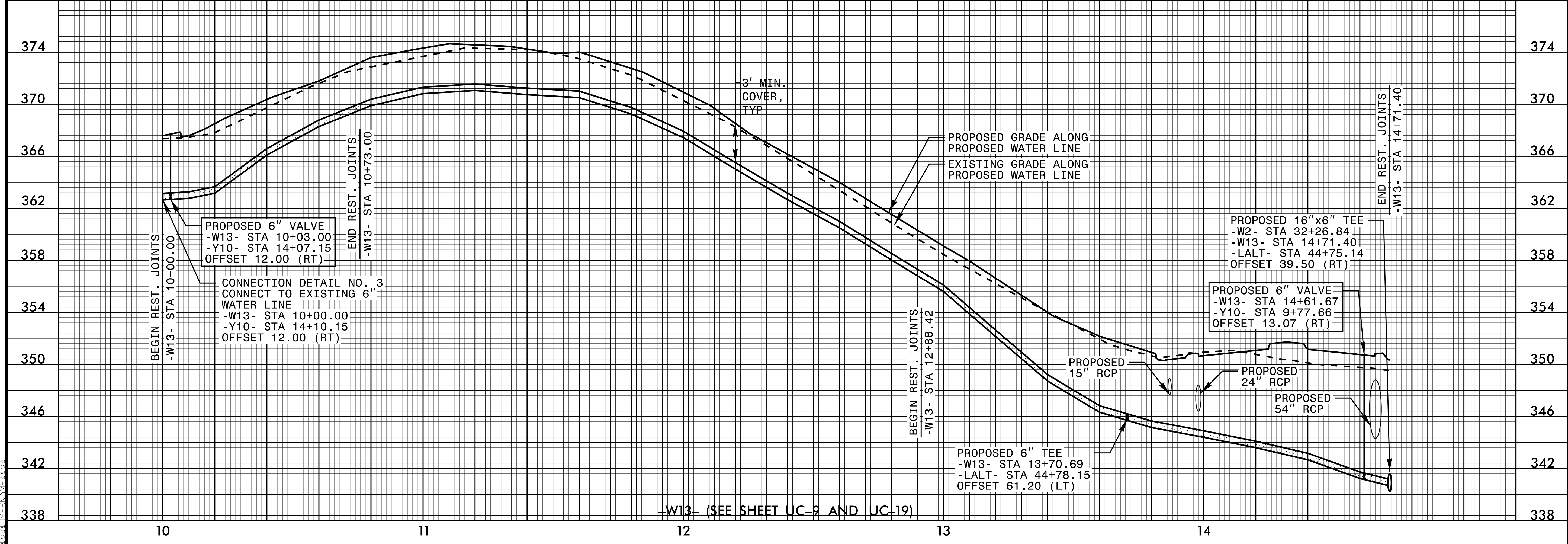
5/28/99

PROJECT REFERENCE NO. U-3308	SHEET NO. UC-33
DESIGNED BY: DGB	
DRAWN BY: JGB	
CHECKED BY: KFC	
APPROVED BY: JJW	REVISIONS:
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	UTILITY CONSTRUCTION PLANS ONLY

PREPARED IN THE OFFICE OF:
Kimley»Horn
 P.O. BOX 33068
 RALEIGH, NORTH CAROLINA 27636-3068
 PHONE: (919) 677-2000
 FAX: (919) 677-2050
 PE NO. P-0102



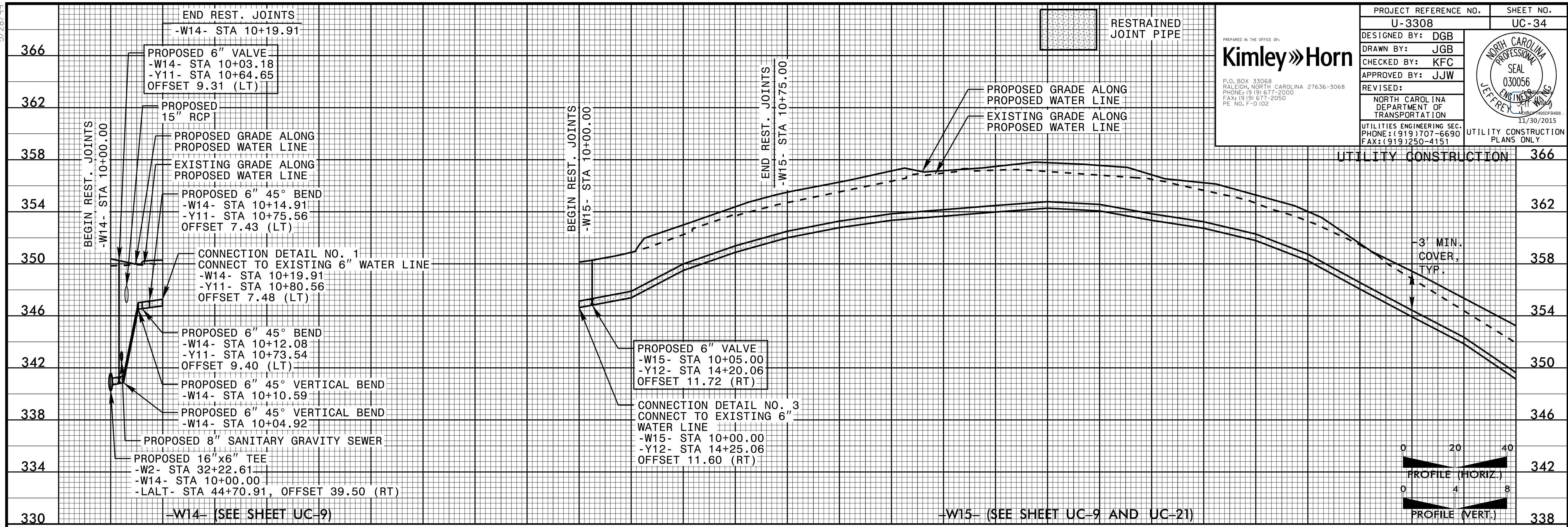
-W12- (SEE SHEET UC-8 AND UC-19)



-W13- (SEE SHEET UC-9 AND UC-19)

5/28/99

5/28/99



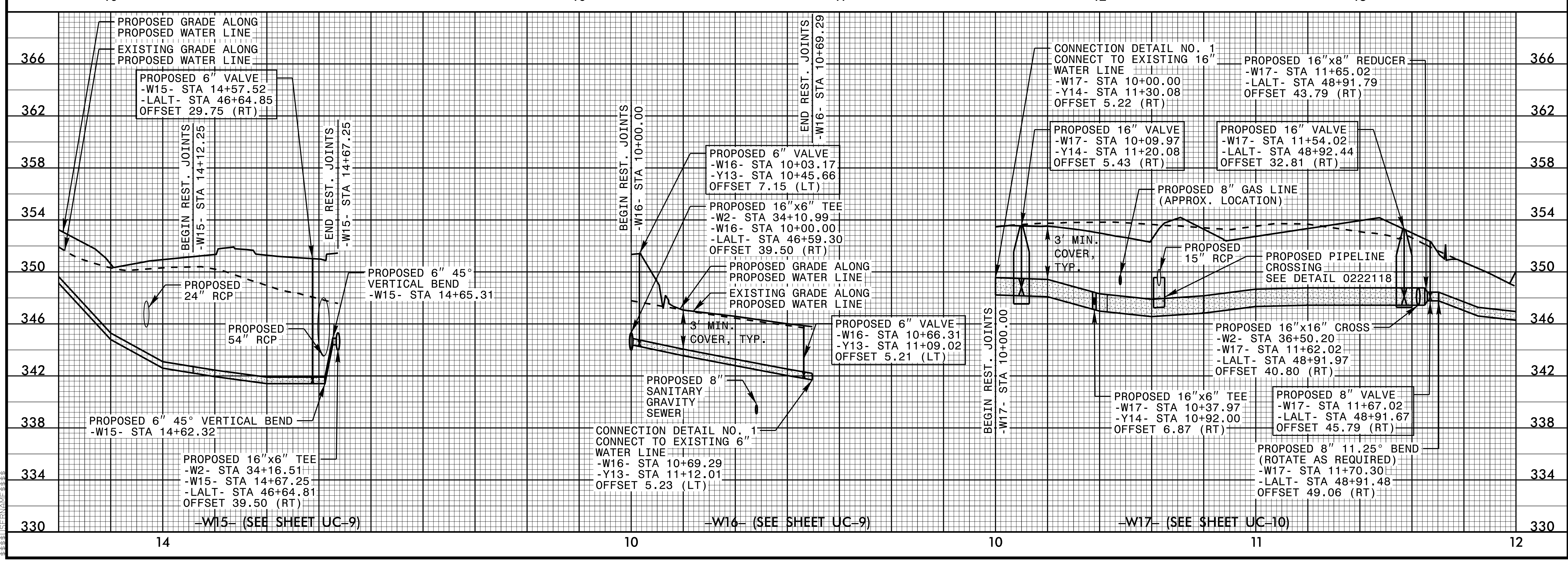
PROJECT REFERENCE NO. U-3308		SHEET NO. UC-34	
DESIGNED BY: DGB		DRAWN BY: JGB	
CHECKED BY: KFC		APPROVED BY: JJW	
REVISED:		NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151		UTILITY CONSTRUCTION PLANS ONLY	

Kimley»Horn
 P.O. BOX 33068
 RALEIGH, NORTH CAROLINA 27636-3068
 PHONE: (919) 677-2000
 FAX: (919) 677-2050
 PE NO. F-0102

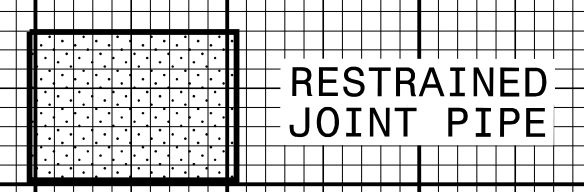
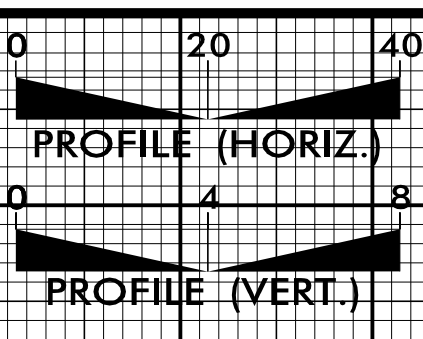
11/30/2015

030056
 NORTH CAROLINA PROFESSIONAL SEAL
 JEFFREY W. JEFFREY, P.E.

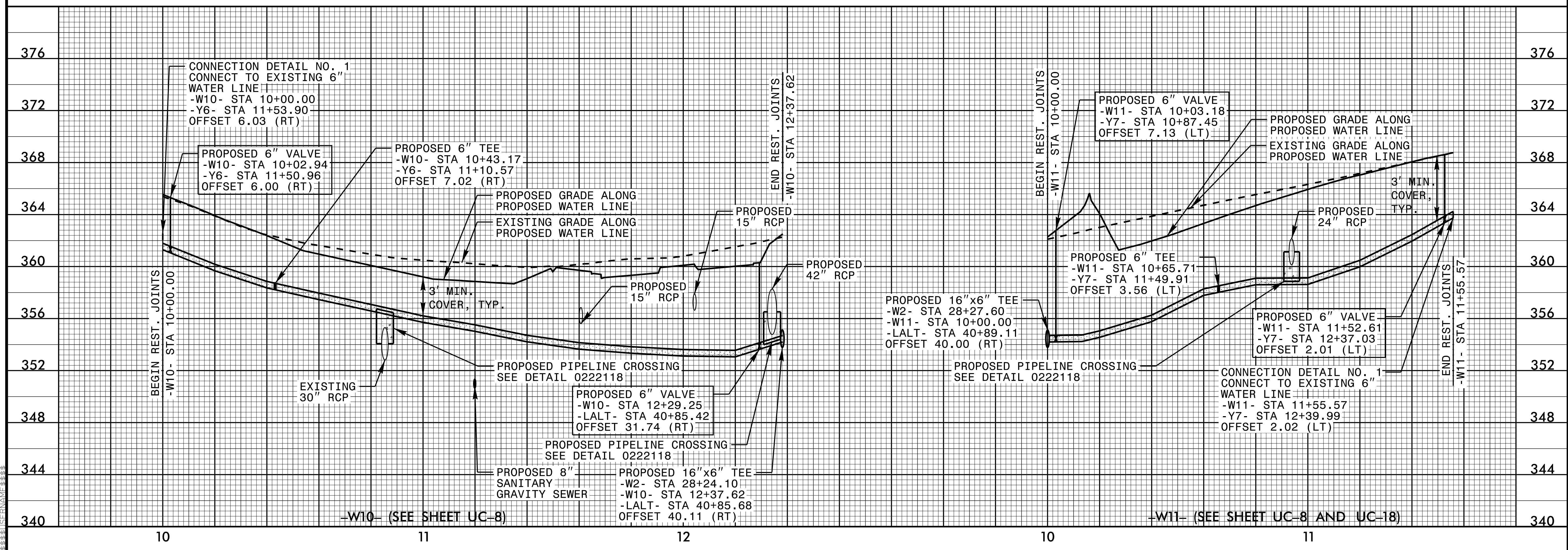
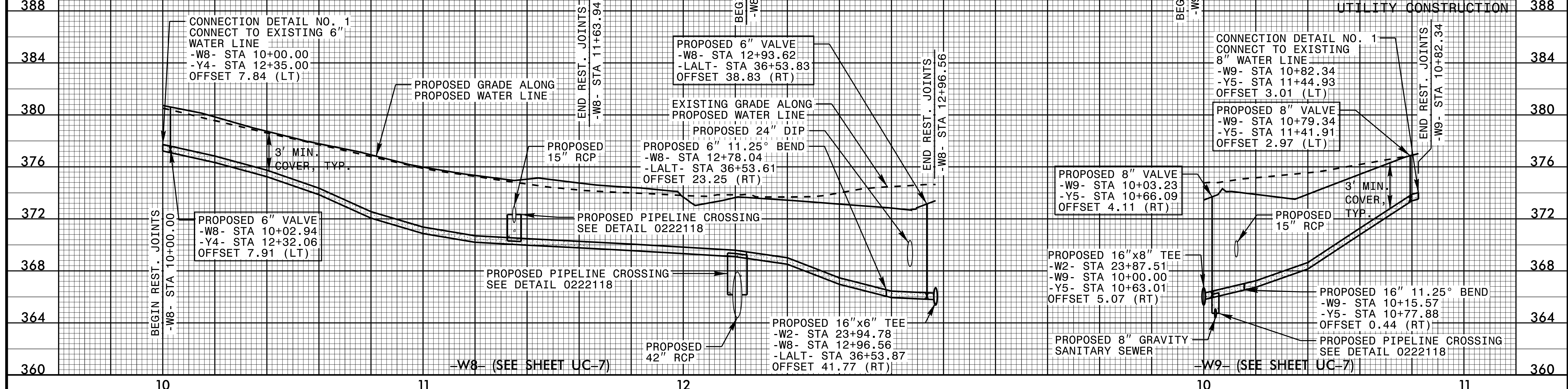
5/28/99



5/28/99

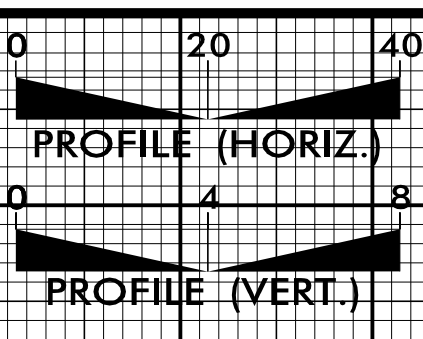


PROJECT REFERENCE NO. U-3308	SHEET NO. UC-32
DESIGNED BY: DGB	
DRAWN BY: JGB	
CHECKED BY: KFC	
APPROVED BY: JJW	REVISIONS:
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151 UTILITY CONSTRUCTION PLANS ONLY	



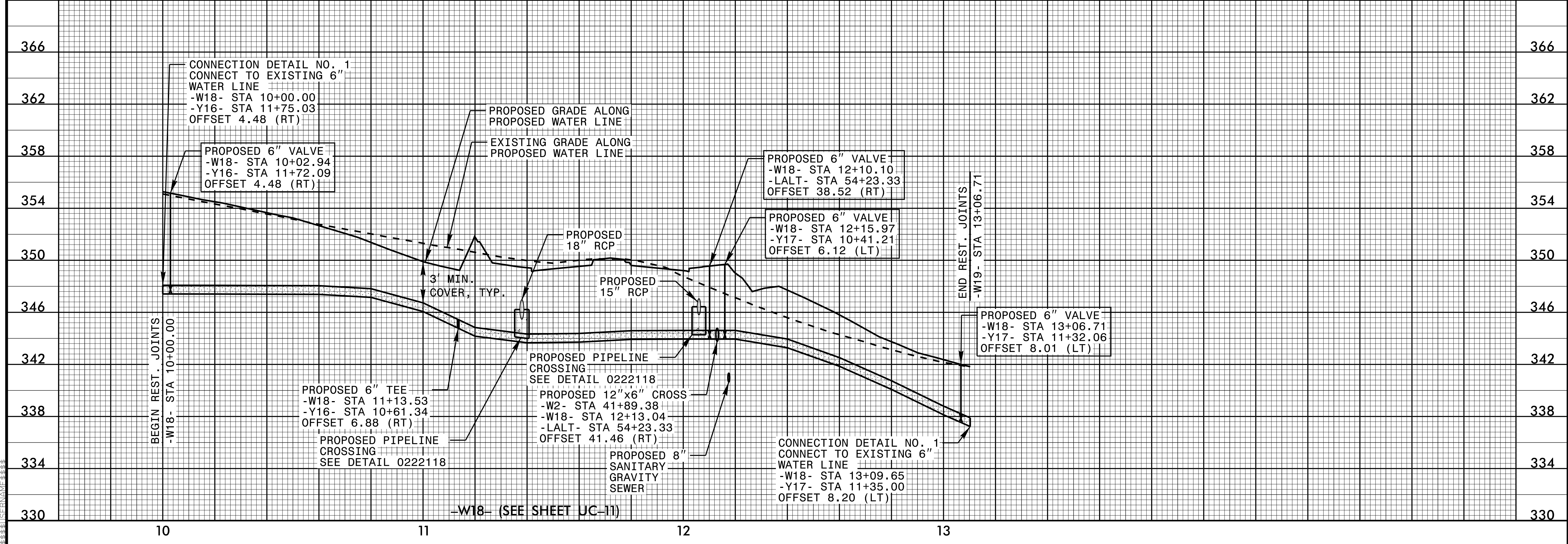
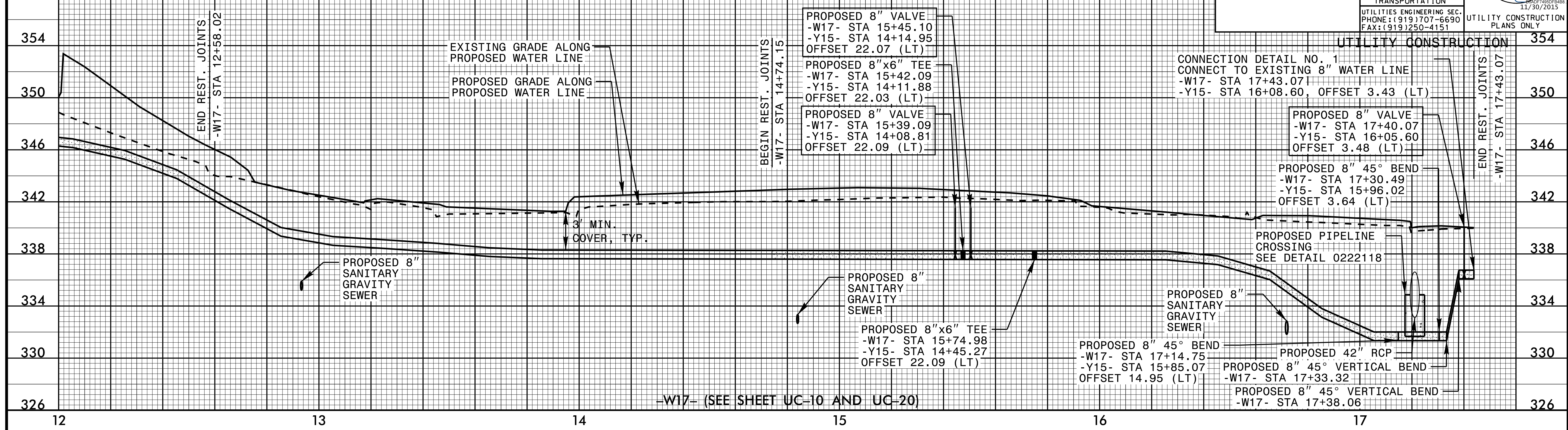
5/28/99

5/28/99



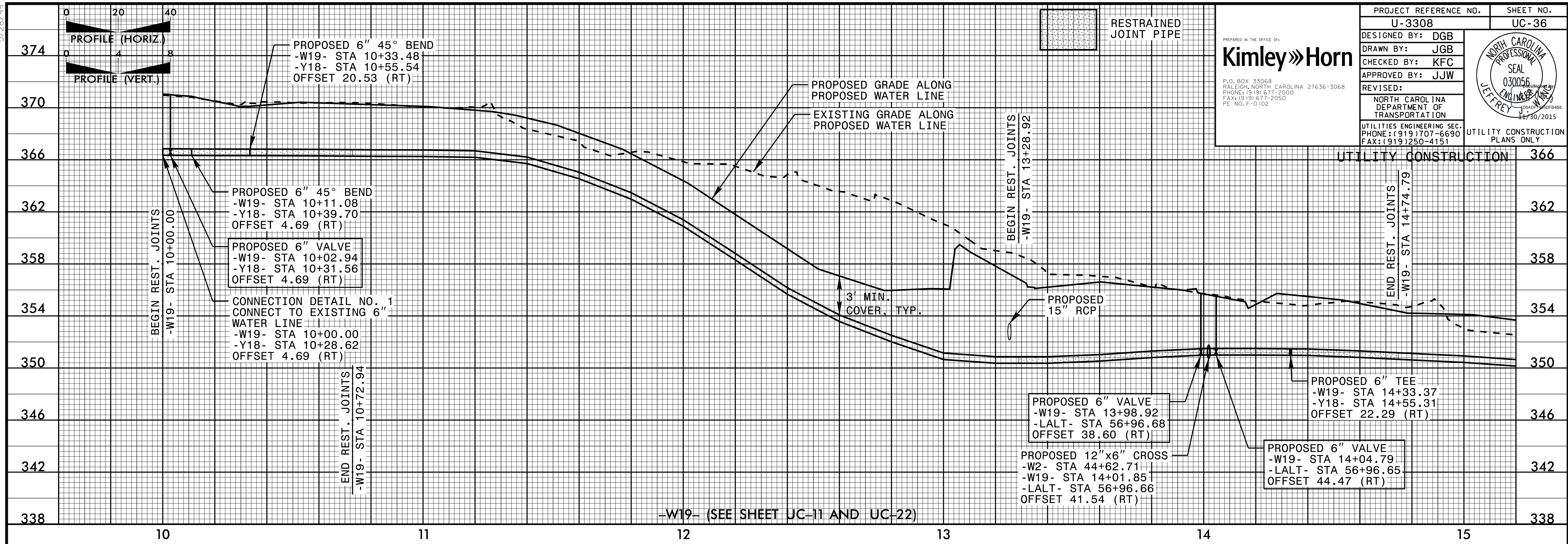
RESTRAINED JOINT PIPE

PROJECT REFERENCE NO. U-3308	SHEET NO. UC-35
DESIGNED BY: DGB	
DRAWN BY: JGB	
CHECKED BY: KFC	
APPROVED BY: JJW	
REVISED:	NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	UTILITY CONSTRUCTION PLANS ONLY



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5/28/99



PROJECT REFERENCE NO. U-3308 SHEET NO. UC-36

DESIGNED BY: DGB
DRAWN BY: JGB
CHECKED BY: KFC
APPROVED BY: JJW

REVISIONS:

Kimley»Horn

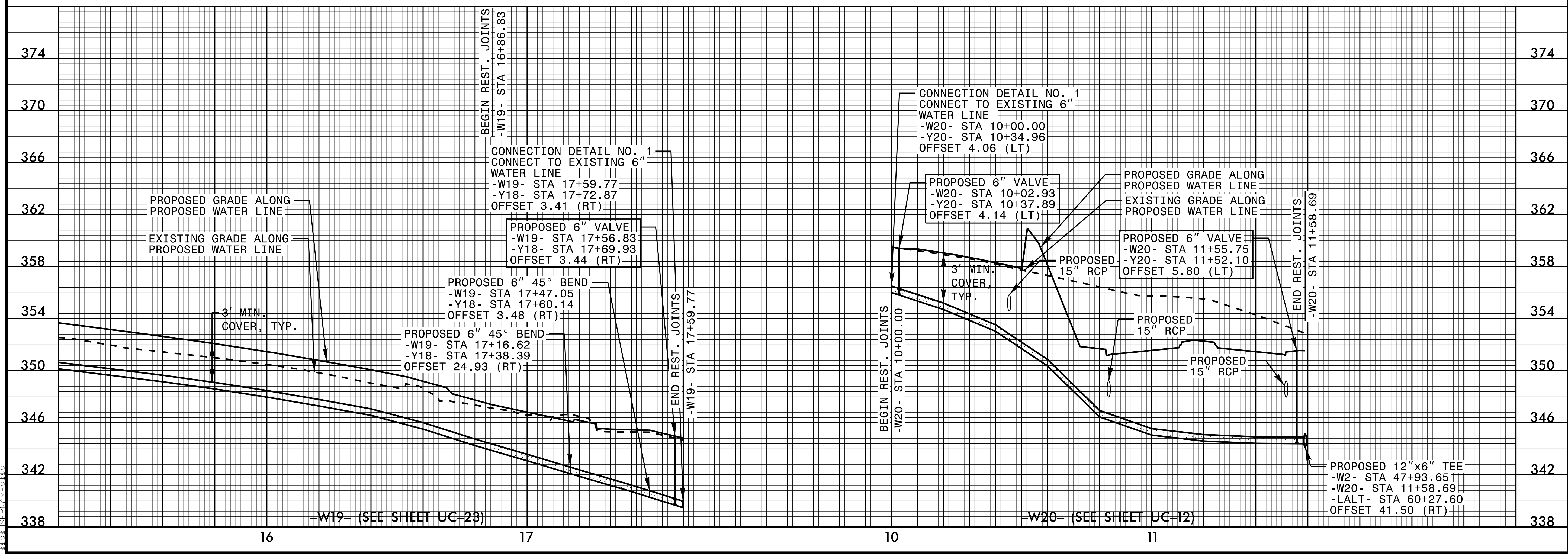
P.O. BOX 33068
RALEIGH, NORTH CAROLINA 27636-3068
PHONE: (919) 677-2000
FAX: (919) 677-2050
PE NO. P-0102

NORTH CAROLINA PROFESSIONAL SEAL
030056
JEFFREY J. HORN
11/30/2015

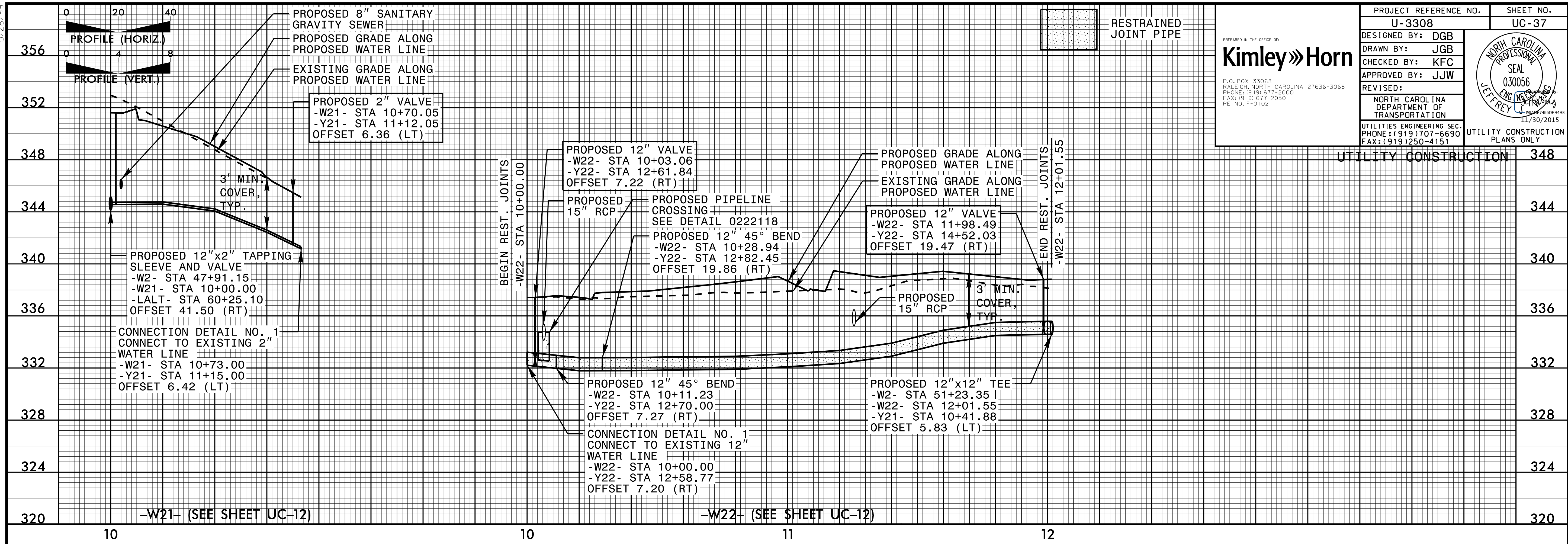
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690
FAX: (919) 250-4151

UTILITY CONSTRUCTION PLANS ONLY

5/28/99



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PROJECT REFERENCE NO. U-3308 SHEET NO. UC-37

DESIGNED BY: DGB
DRAWN BY: JGB
CHECKED BY: KFC
APPROVED BY: JJW

REVISED:

Kimley»Horn

P.O. BOX 33068
RALEIGH, NORTH CAROLINA 27636-3068
PHONE: (919) 677-2000
FAX: (919) 677-2050
PE NO. P-0102

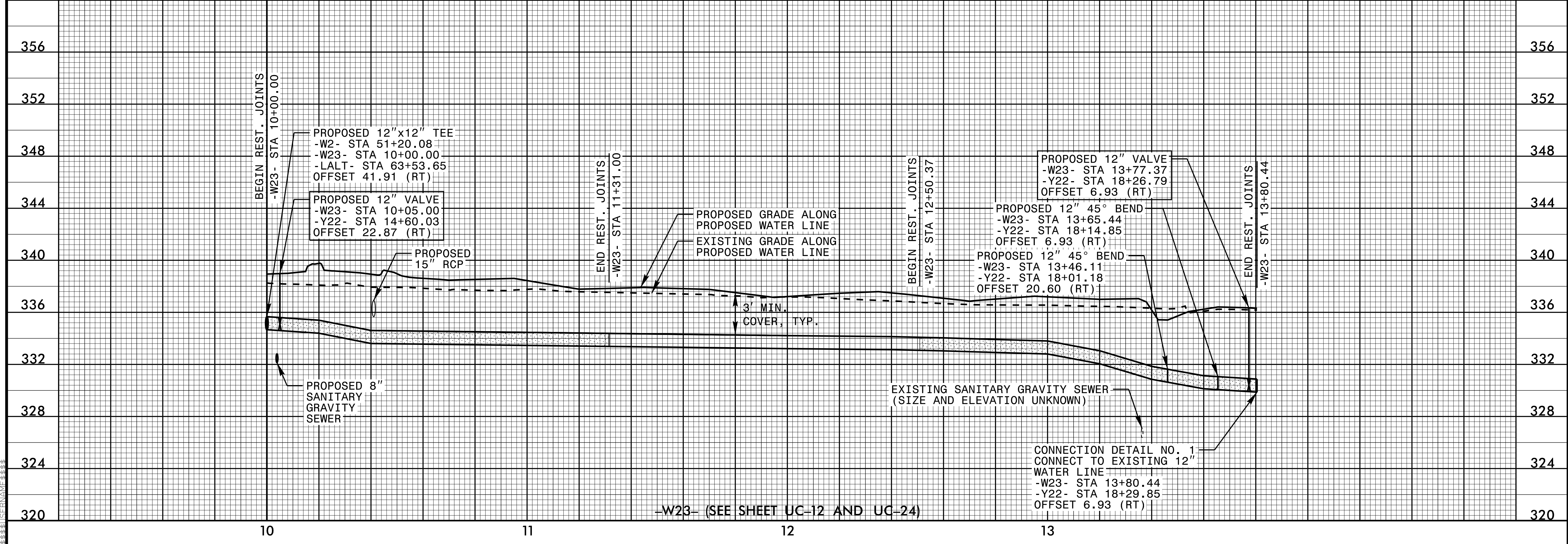
NORTH CAROLINA PROFESSIONAL SEAL
030056
JEFFREY J. HORN
11/30/2015

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

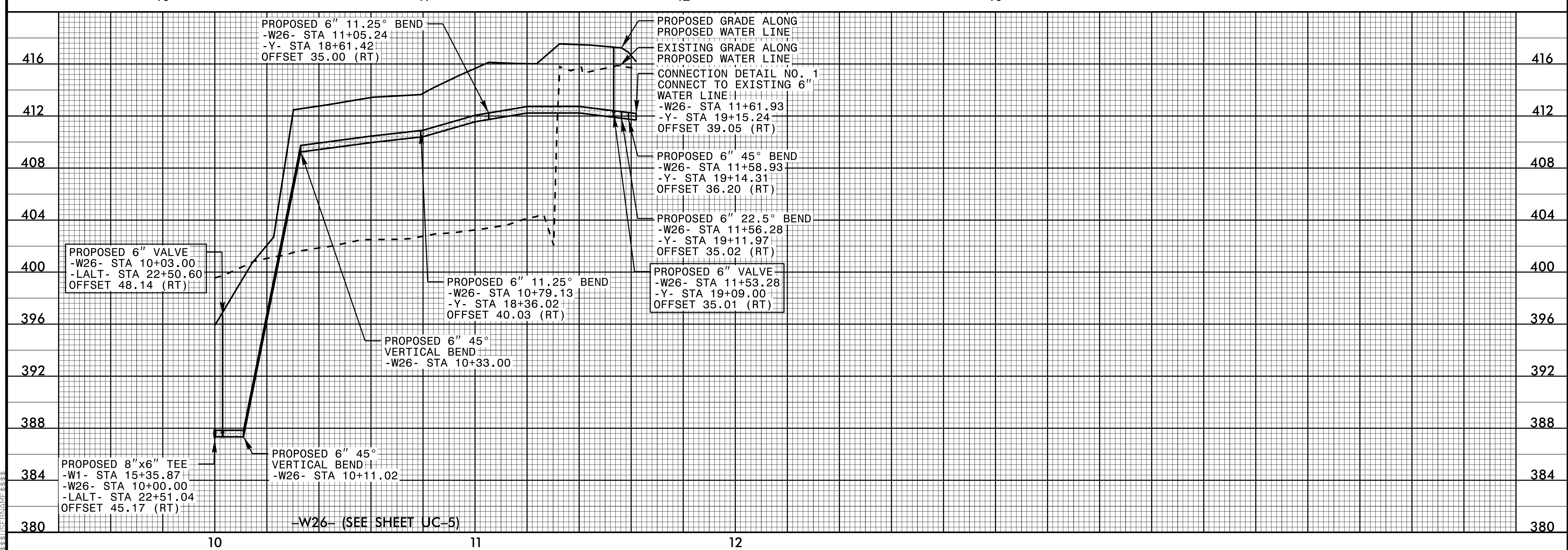
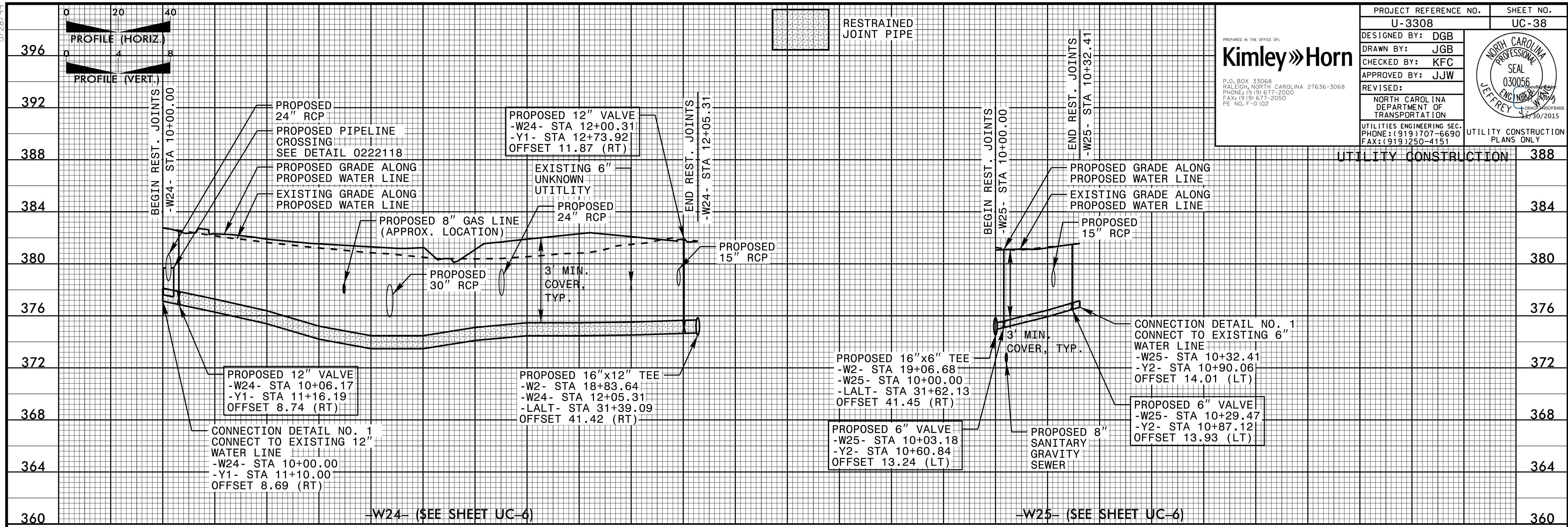
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151

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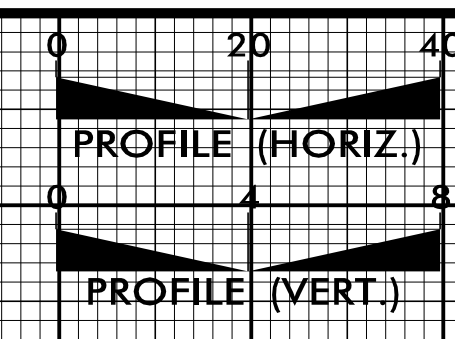


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5/28/99

5/28/99



PROJECT REFERENCE NO. U-3308 SHEET NO. UC-39

DESIGNED BY: DGB
DRAWN BY: JGB
CHECKED BY: KFC
APPROVED BY: JJW

REVISED:

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

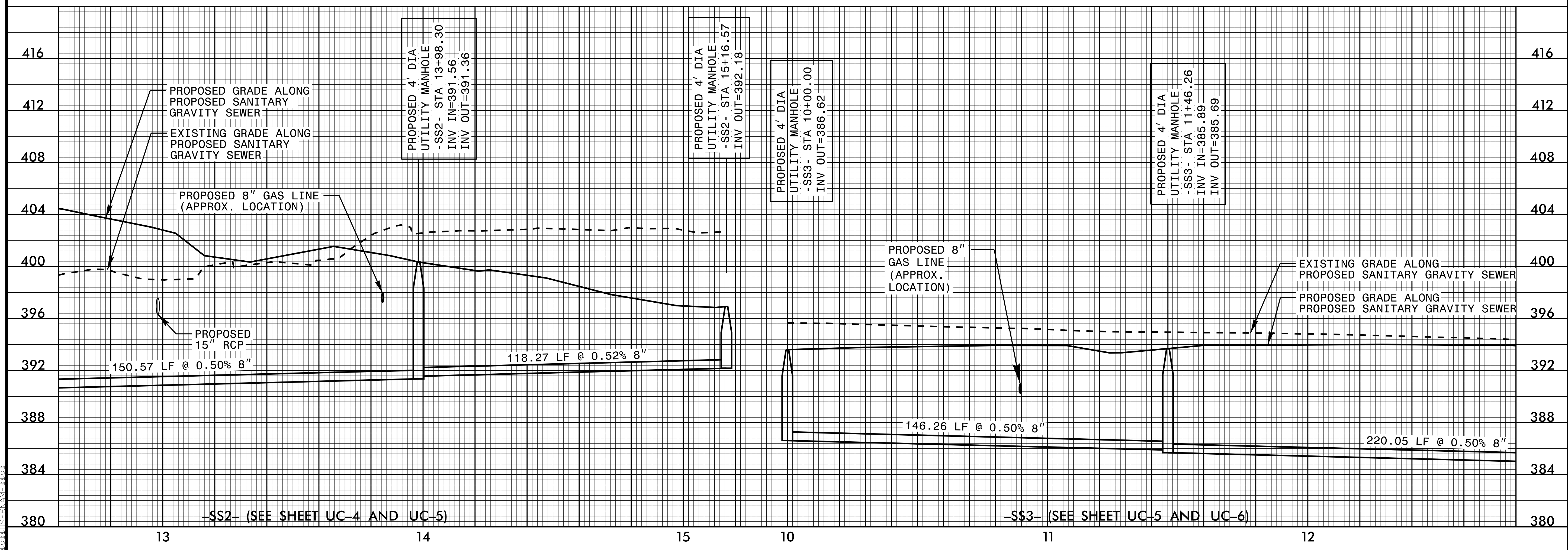
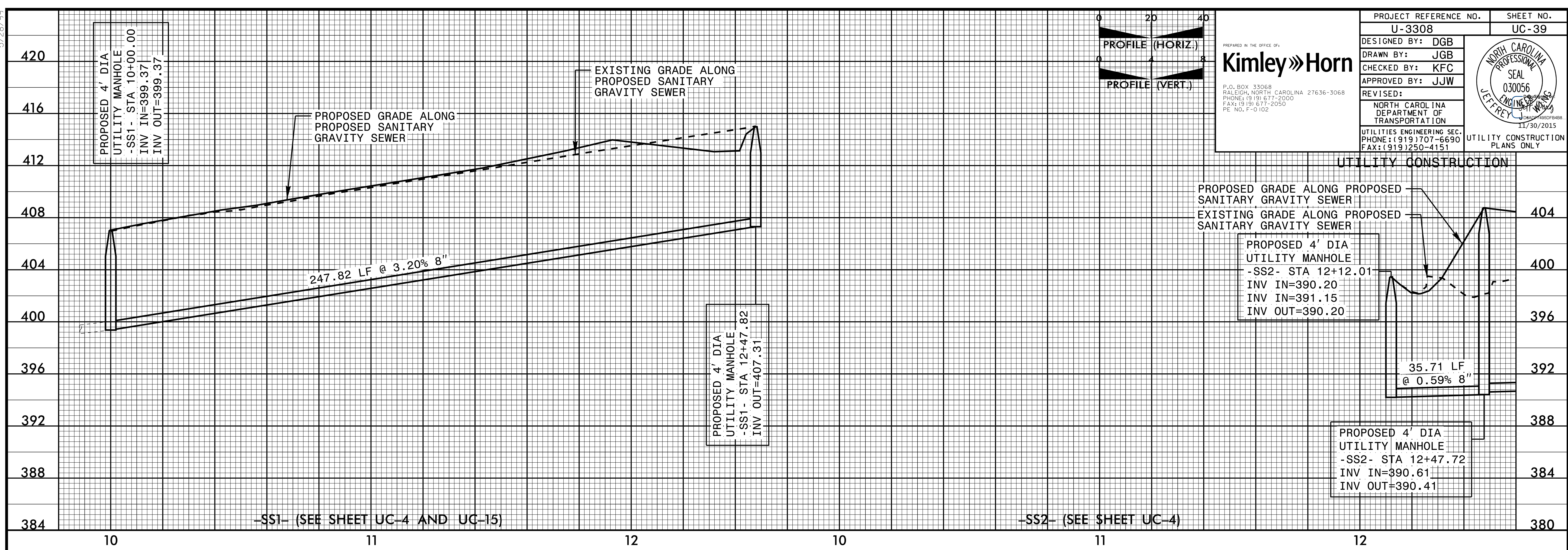
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151

UTILITY CONSTRUCTION PLANS ONLY

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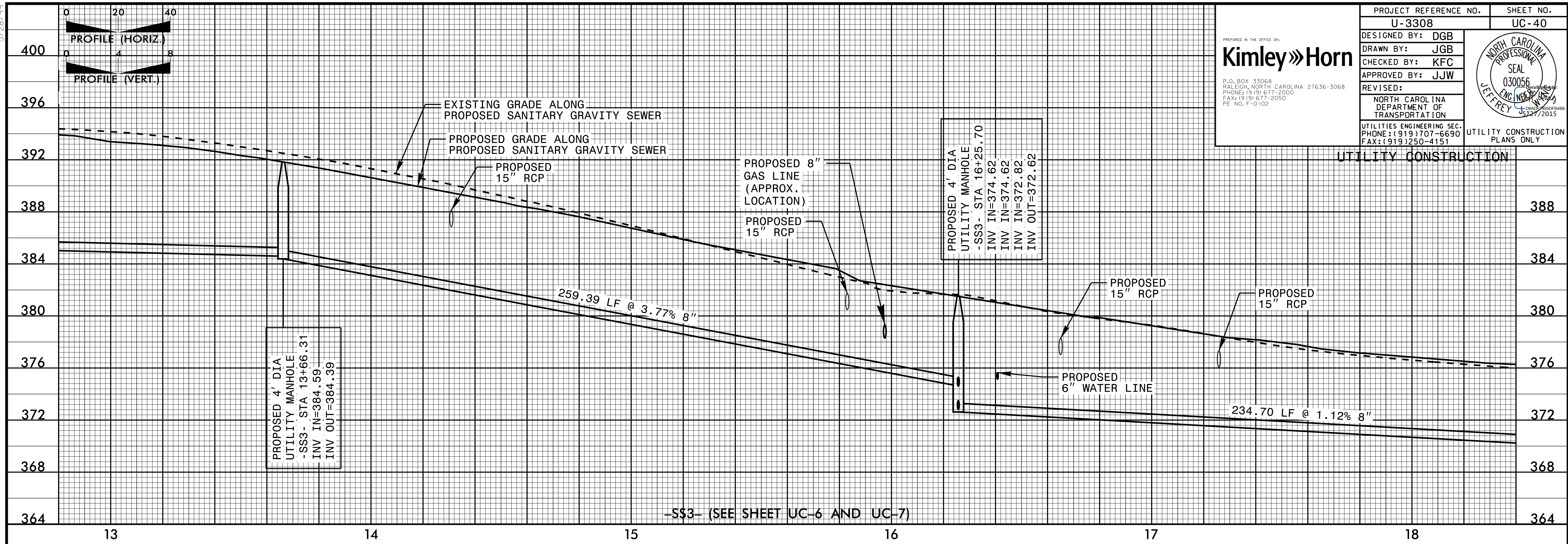
P.O. BOX 33068 RALEIGH, NORTH CAROLINA 27636-3068
PHONE: (919) 677-2000
FAX: (919) 677-2050
PE NO. P-0102

NORTH CAROLINA PROFESSIONAL SEAL
030056
JEFFREY J. JEFFREY
11/30/2015



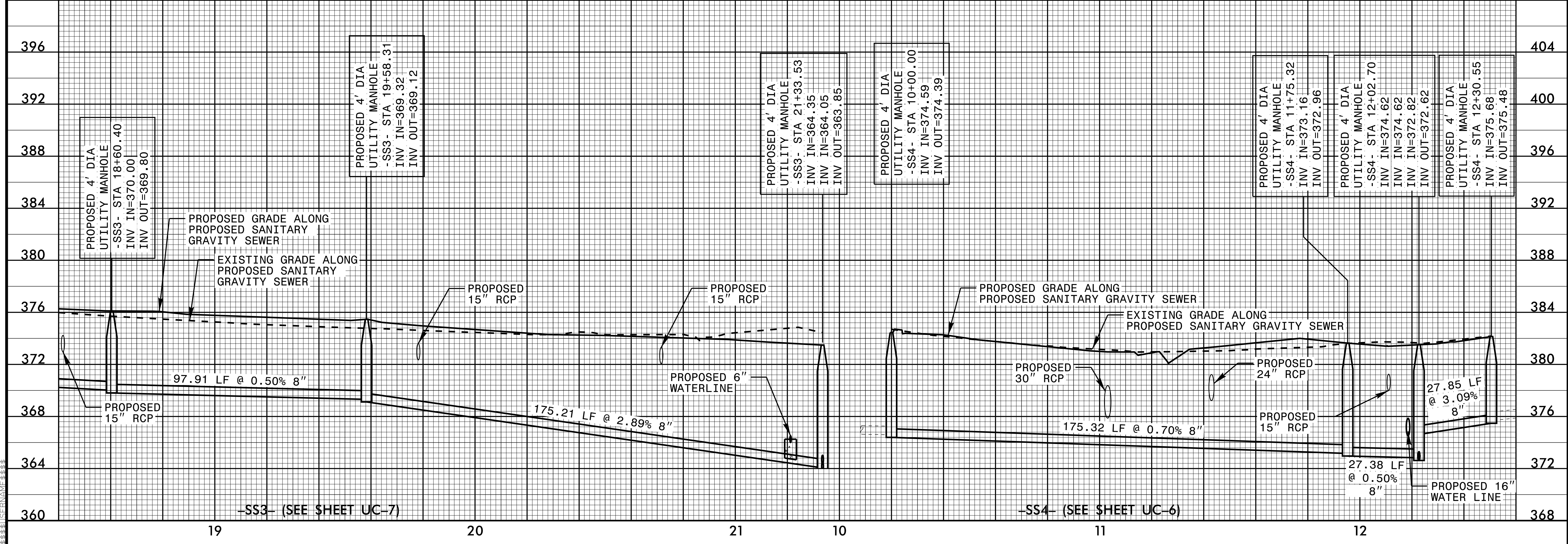
5/28/99

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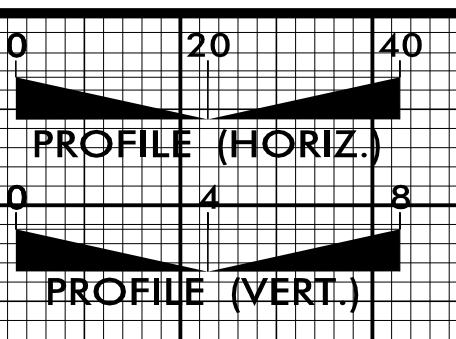
PROJECT REFERENCE NO. U-3308	SHEET NO. UC-40
DESIGNED BY: DGB	
DRAWN BY: JGB	
CHECKED BY: KFC	
APPROVED BY: JJW	REVISER:
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	
UTILITY CONSTRUCTION PLANS ONLY	

PREPARED IN THE OFFICE OF:
Kimley»Horn
 P.O. BOX 33068
 RALEIGH, NORTH CAROLINA 27636-3068
 PHONE: (919) 677-2000
 FAX: (919) 677-2050
 PE NO. F-0102



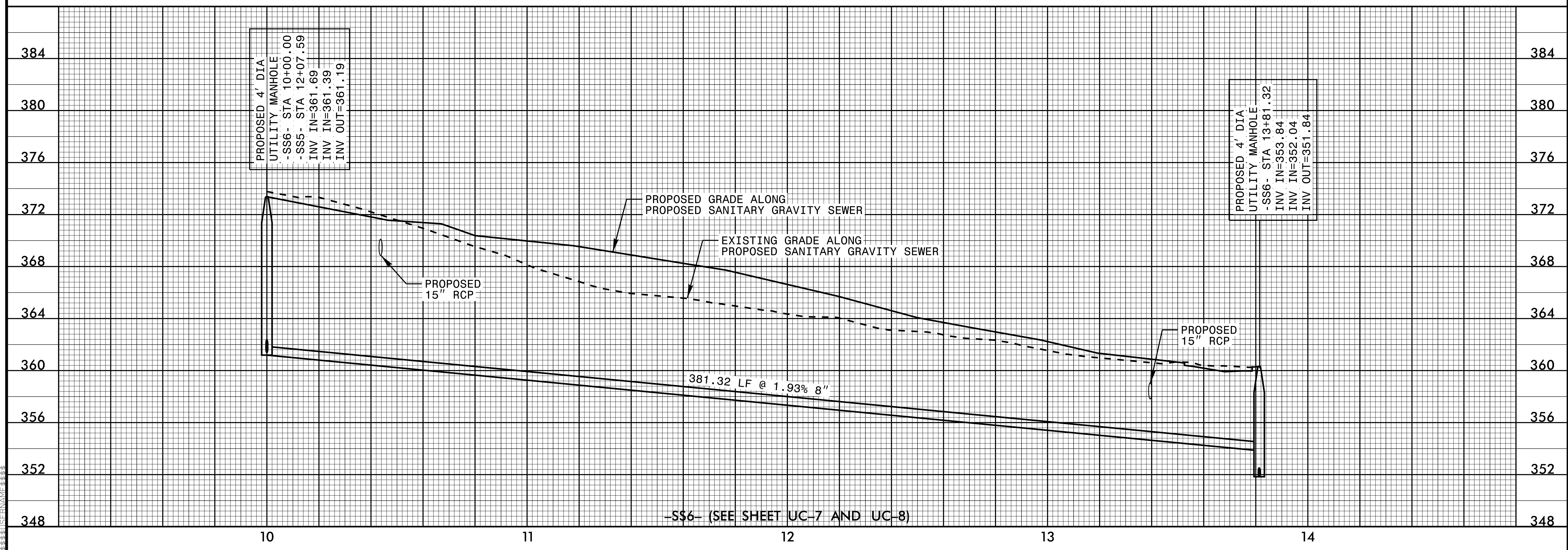
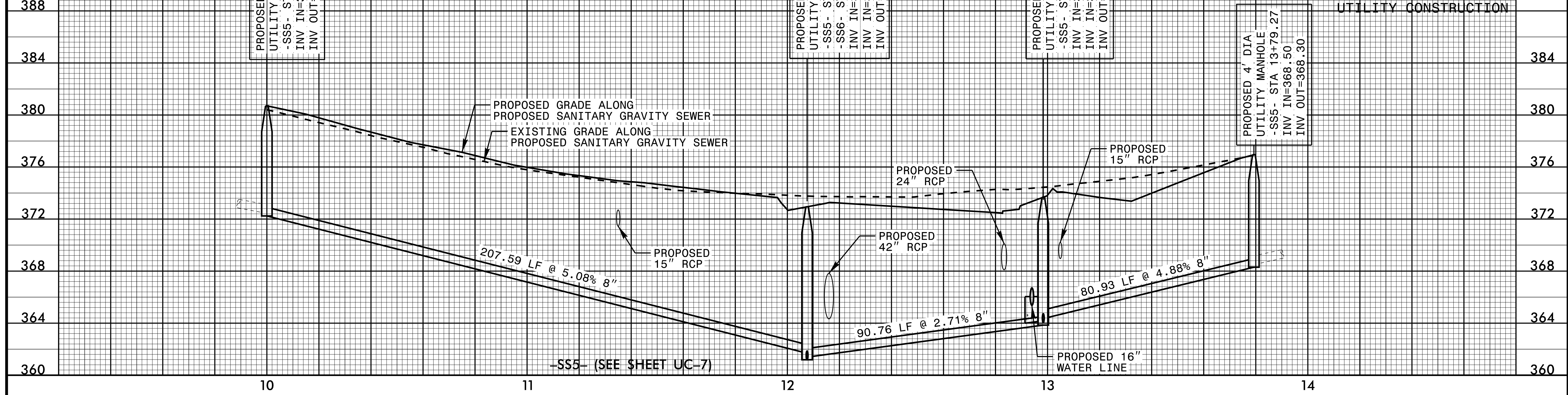
5/28/99
 JEFFREY J. FREEMAN
 PROFESSIONAL ENGINEER
 NO. 030056
 STATE OF NORTH CAROLINA

5/28/99



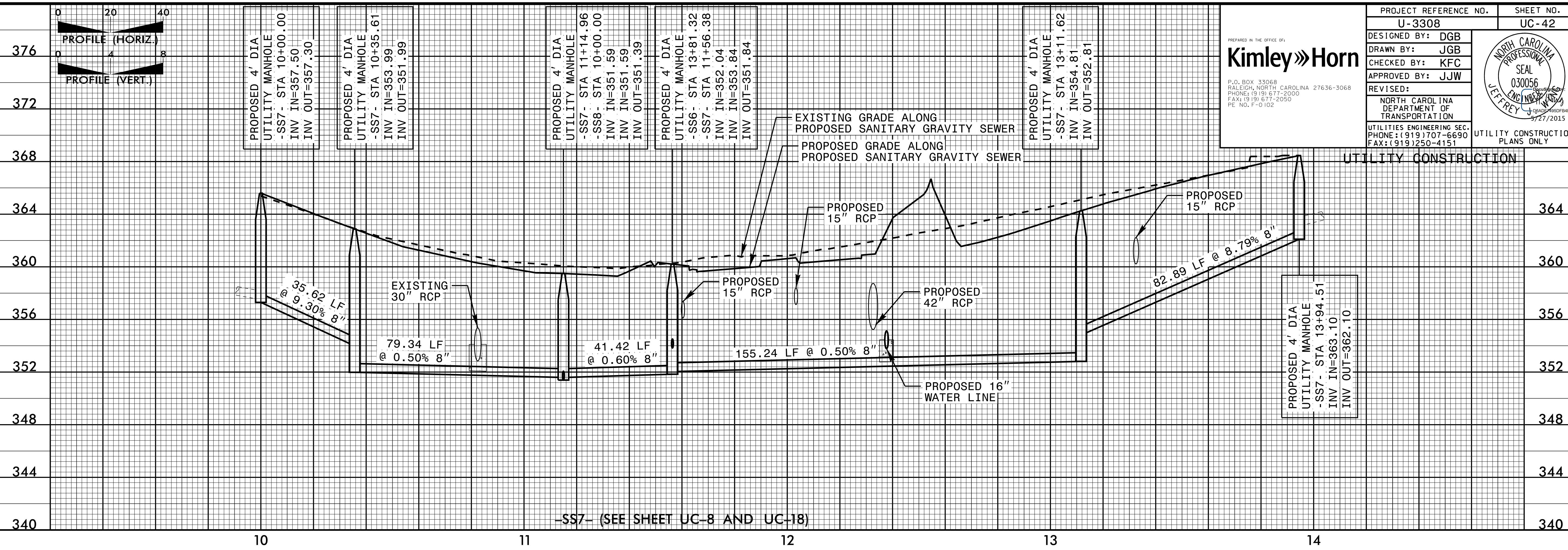
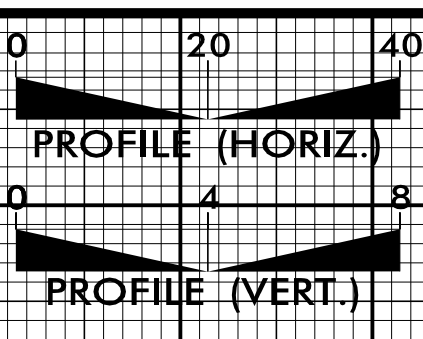
PROJECT REFERENCE NO. U-3308	SHEET NO. UC-41
DESIGNED BY: DGB	
DRAWN BY: JGB	
CHECKED BY: KFC	
APPROVED BY: JJW	REVISED:
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	
UTILITY CONSTRUCTION PLANS ONLY	

PREPARED IN THE OFFICE OF:
Kimley»Horn
P.O. BOX 33068
RALEIGH, NORTH CAROLINA 27636-3068
PHONE: (919) 677-2000
FAX: (919) 677-2050
PE NO. F-0102



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PROJECT REFERENCE NO. U-3308 SHEET NO. UC-42

DESIGNED BY: DGB
 DRAWN BY: JGB
 CHECKED BY: KFC
 APPROVED BY: JJW

REVISED:

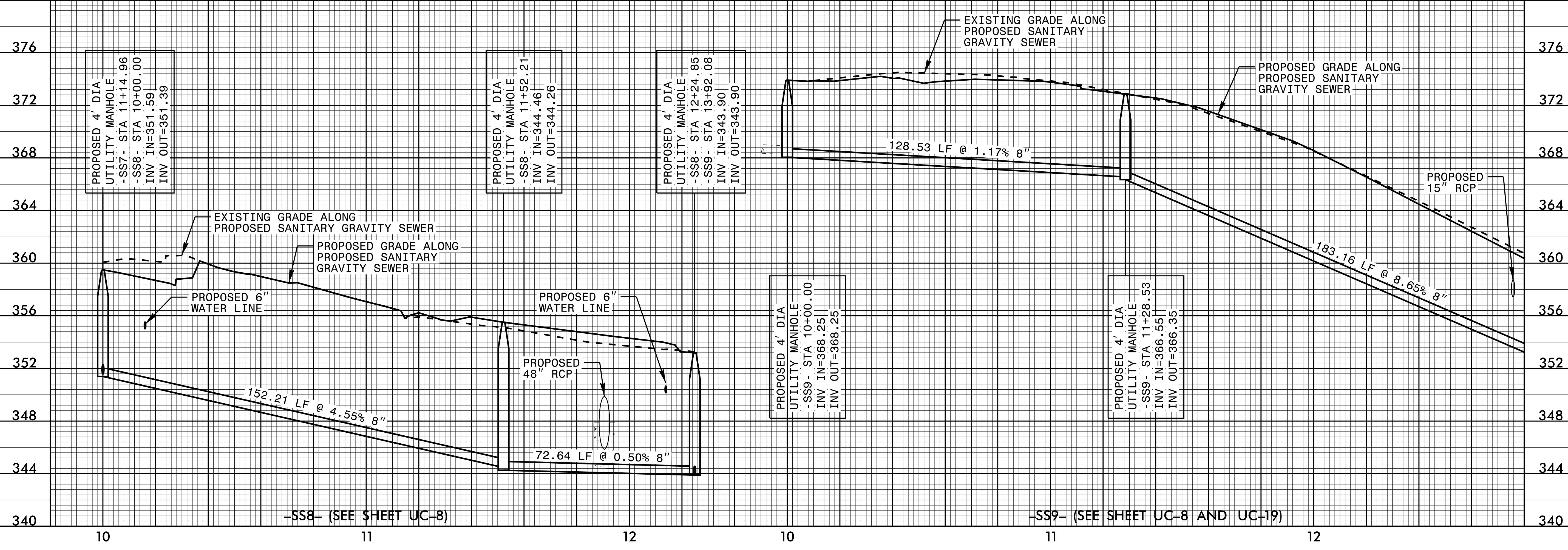
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

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

UTILITY CONSTRUCTION PLANS ONLY

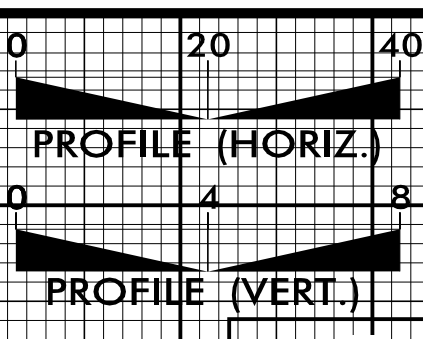
Kimley»Horn
 P.O. BOX 33068
 RALEIGH, NORTH CAROLINA 27636-3068
 PHONE: (919) 677-2000
 FAX: (919) 677-2050
 PE NO. P-0102

030056
 NORTH CAROLINA PROFESSIONAL SEAL
 JEFFREY J. JEFFREY
 5/27/2015

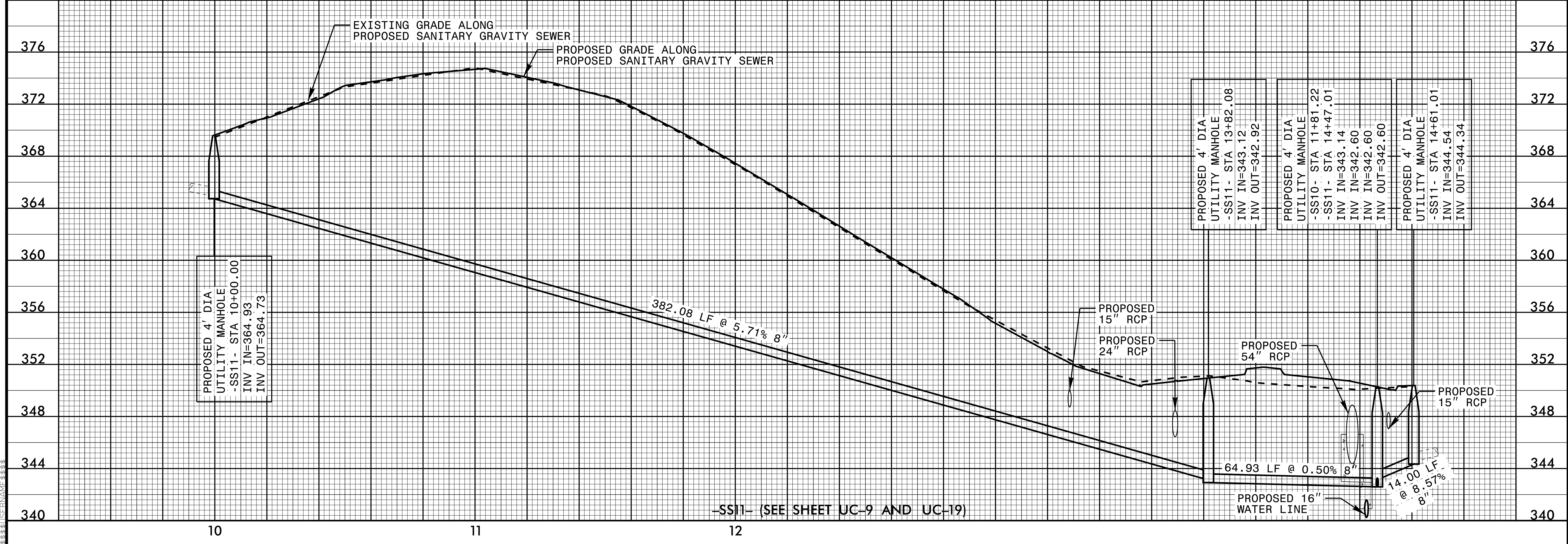
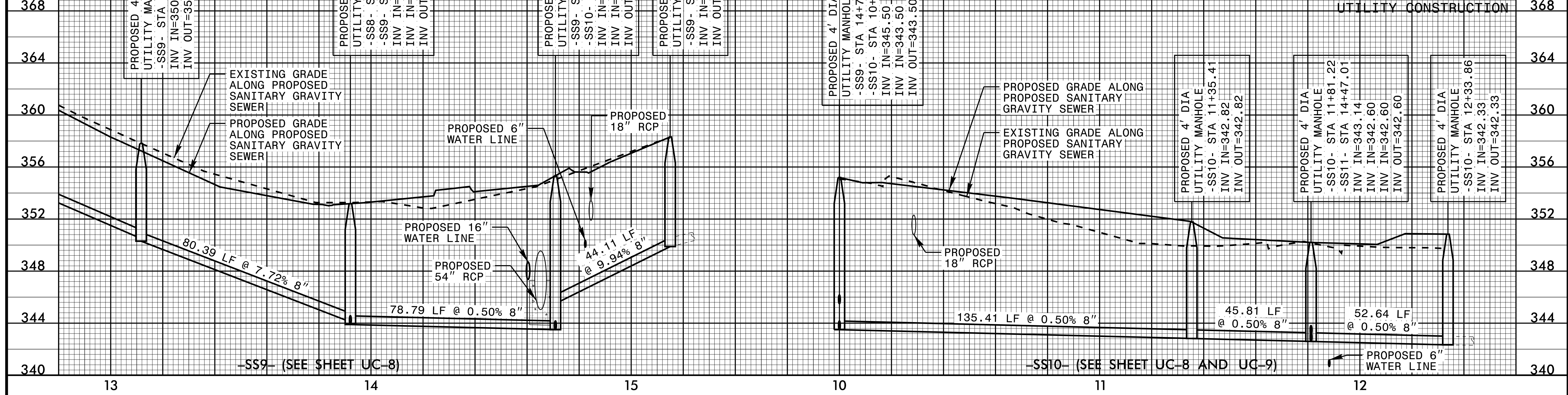


5/28/99

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PROJECT REFERENCE NO. U-3308	SHEET NO. UC-43
DESIGNED BY: DGB	
DRAWN BY: JGB	
CHECKED BY: KFC	
APPROVED BY: JJW	REVISED:
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	
UTILITY CONSTRUCTION PLANS ONLY	



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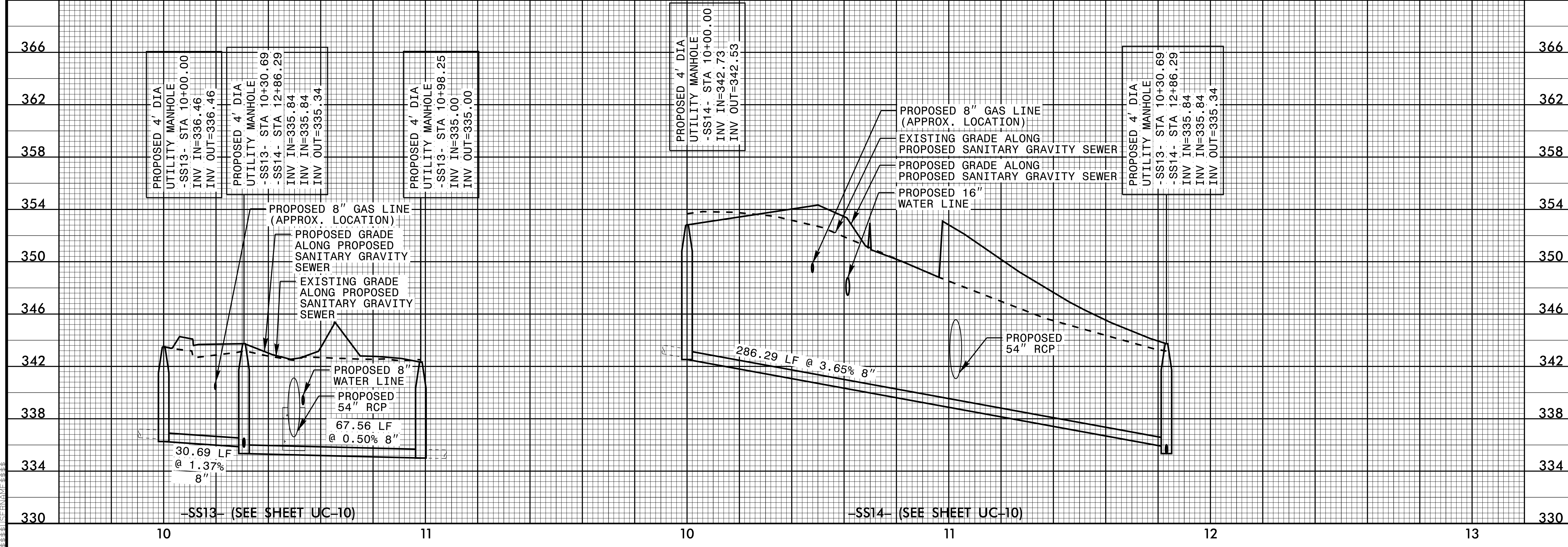
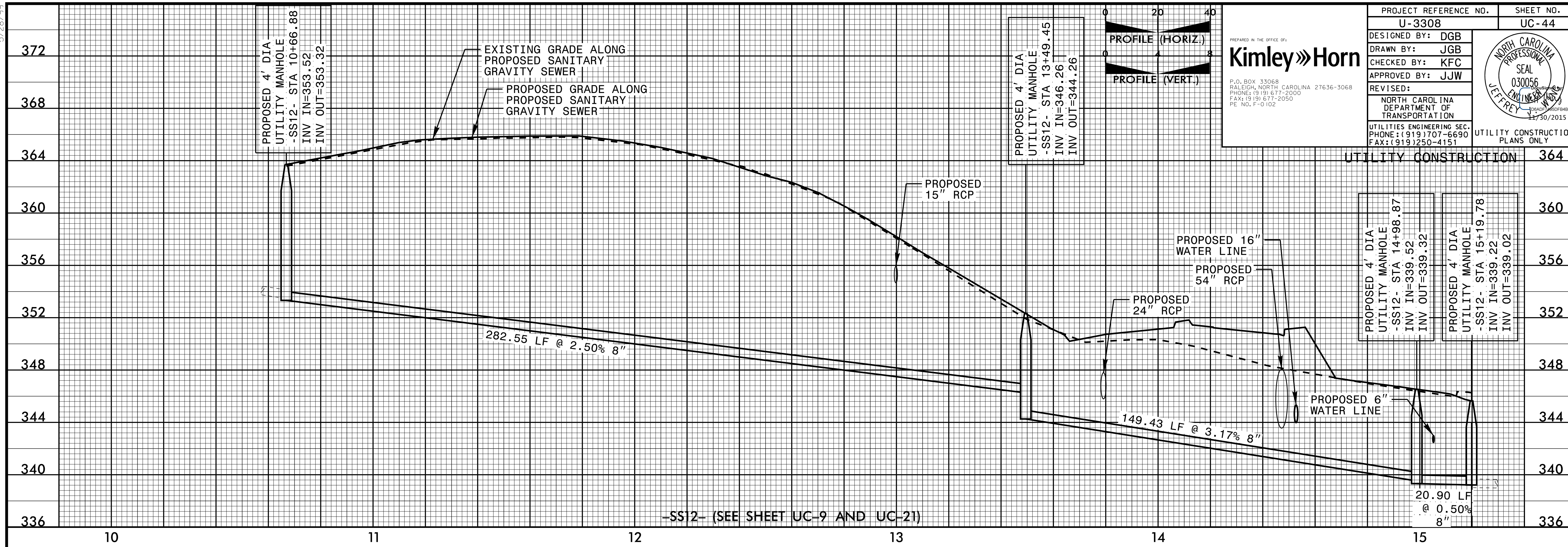
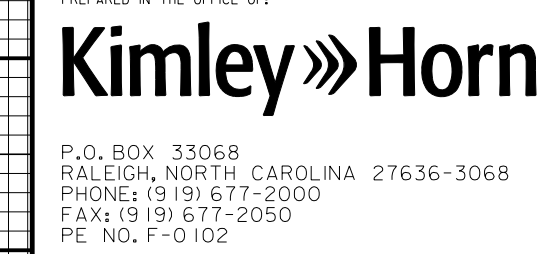
DESIGNED BY: DGB
 DRAWN BY: JGB
 CHECKED BY: KFC
 APPROVED BY: JJW

REVISIONS:

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

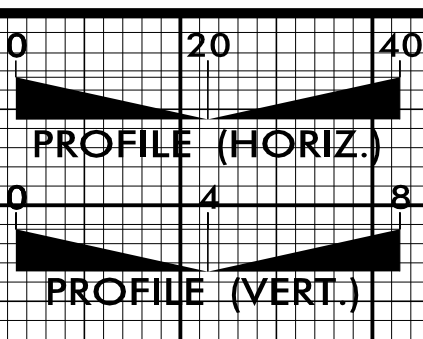
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151

UTILITY CONSTRUCTION PLANS ONLY

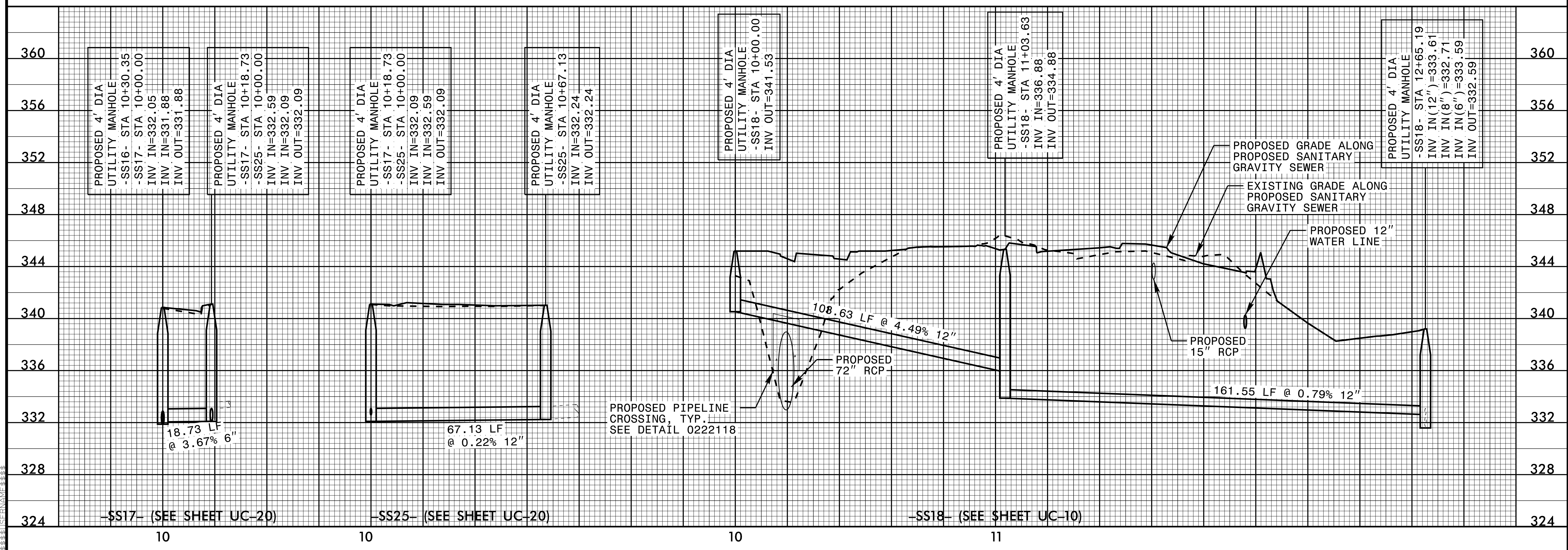
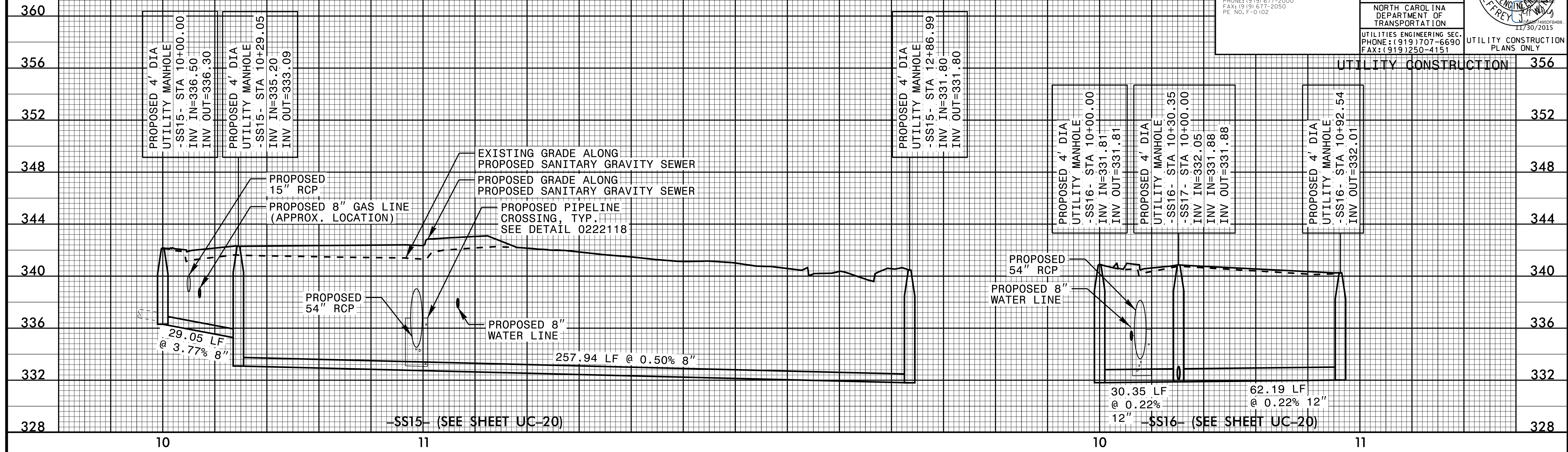


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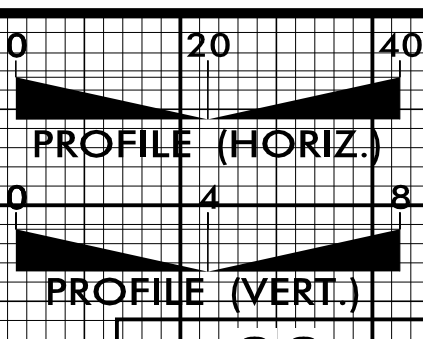


PROJECT REFERENCE NO. U-3308	SHEET NO. UC-45
DESIGNED BY: DGB	
DRAWN BY: JGB	
CHECKED BY: KFC	
APPROVED BY: JJW	
REVISED:	NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151
UTILITY CONSTRUCTION PLANS ONLY	

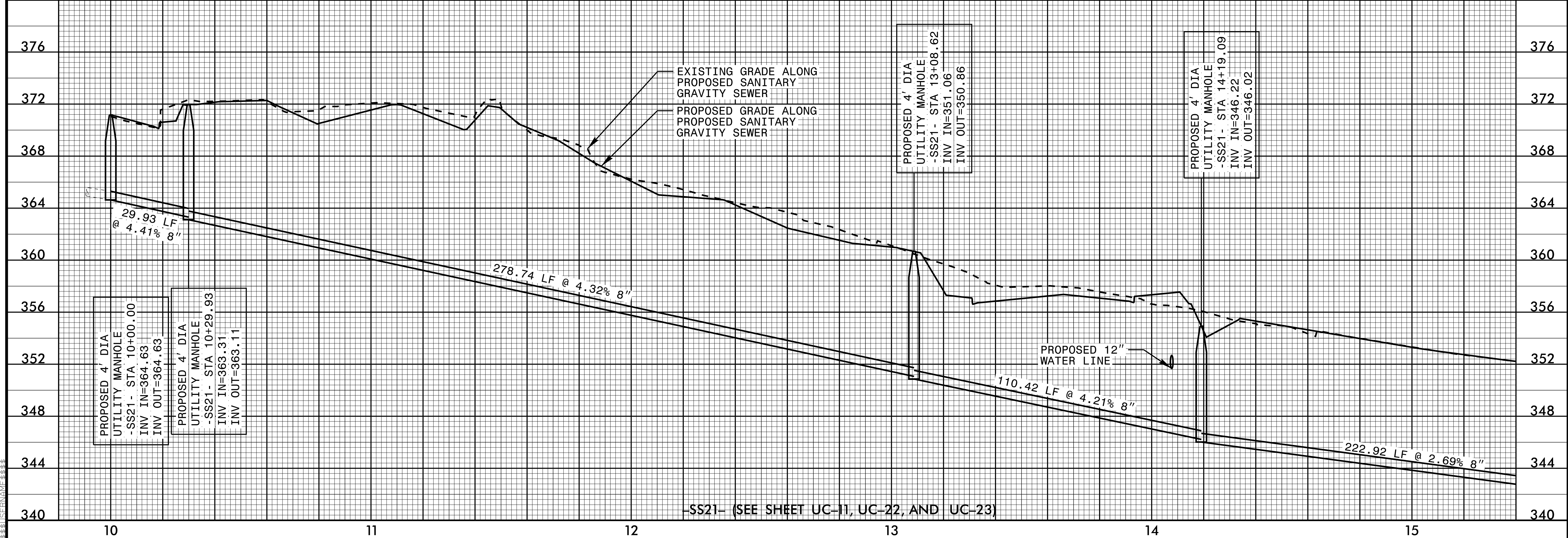
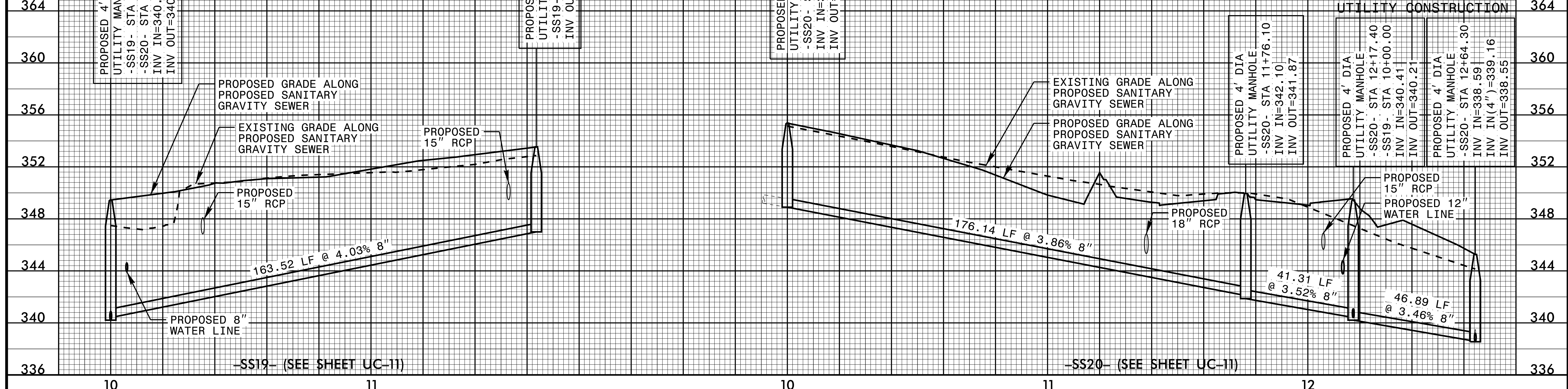


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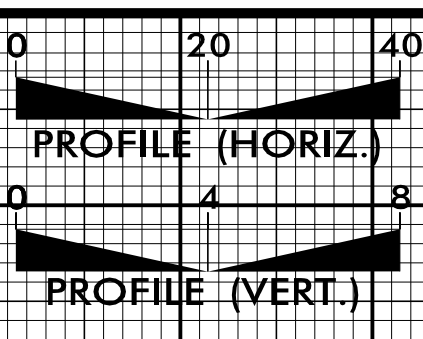


PROJECT REFERENCE NO. U-3308	SHEET NO. UC-46
DESIGNED BY: DGB	
DRAWN BY: JGB	
CHECKED BY: KFC	
APPROVED BY: JJW	REVIS: NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	

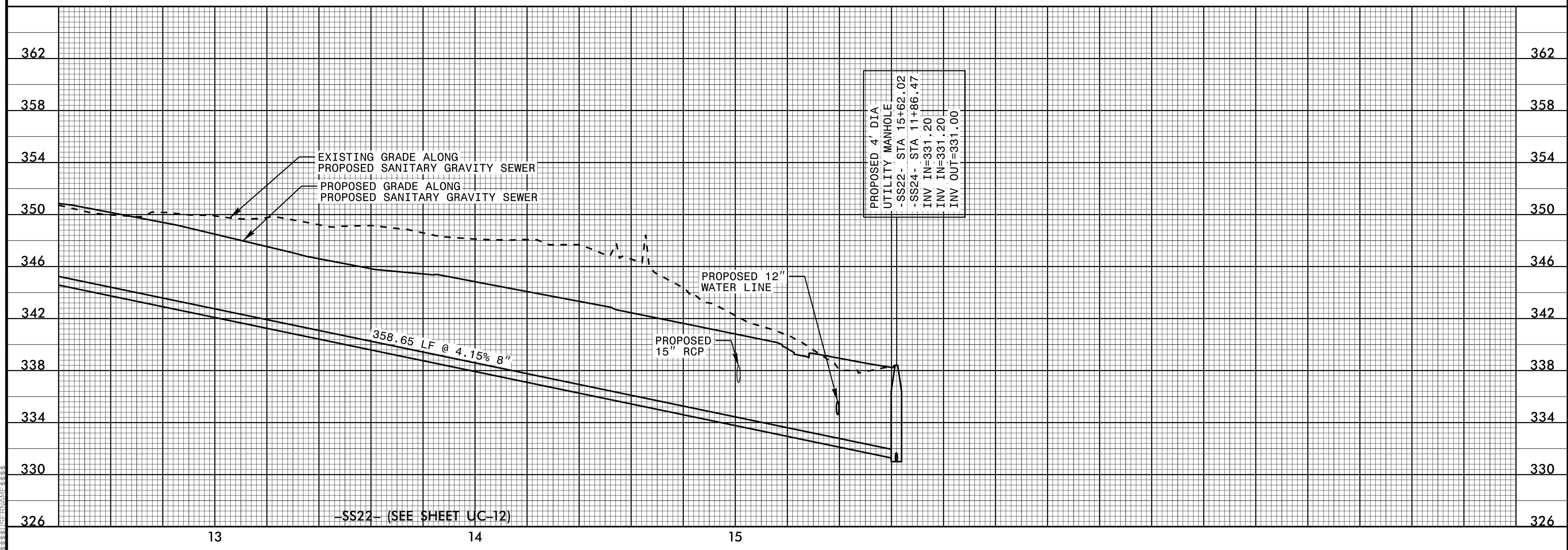
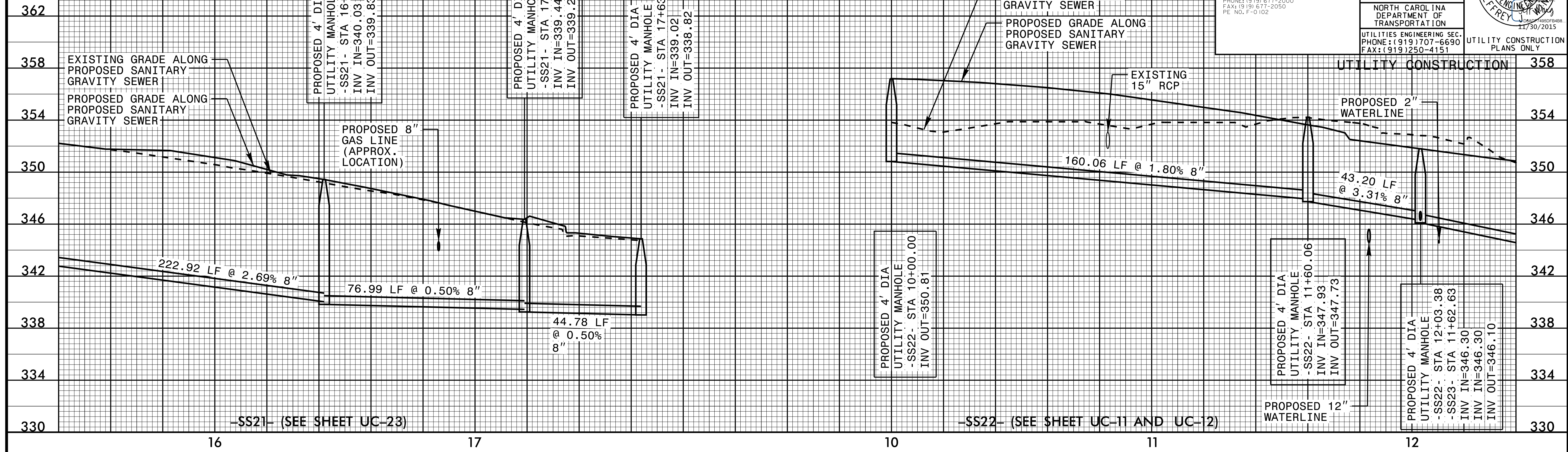


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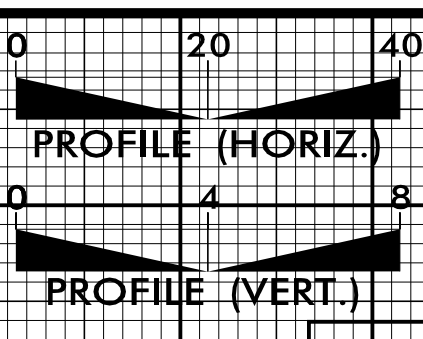


PROJECT REFERENCE NO. U-3308	SHEET NO. UC-47
DESIGNED BY: DGB	
DRAWN BY: JGB	
CHECKED BY: KFC	
APPROVED BY: JJW	
REVISED:	NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151
PREPARED IN THE OFFICE OF: Kimley»Horn P.O. BOX 33068 RALEIGH, NORTH CAROLINA 27636-3068 PHONE: (919) 677-2000 FAX: (919) 677-2050 PE NO. F-0102	
UTILITY CONSTRUCTION PLANS ONLY	

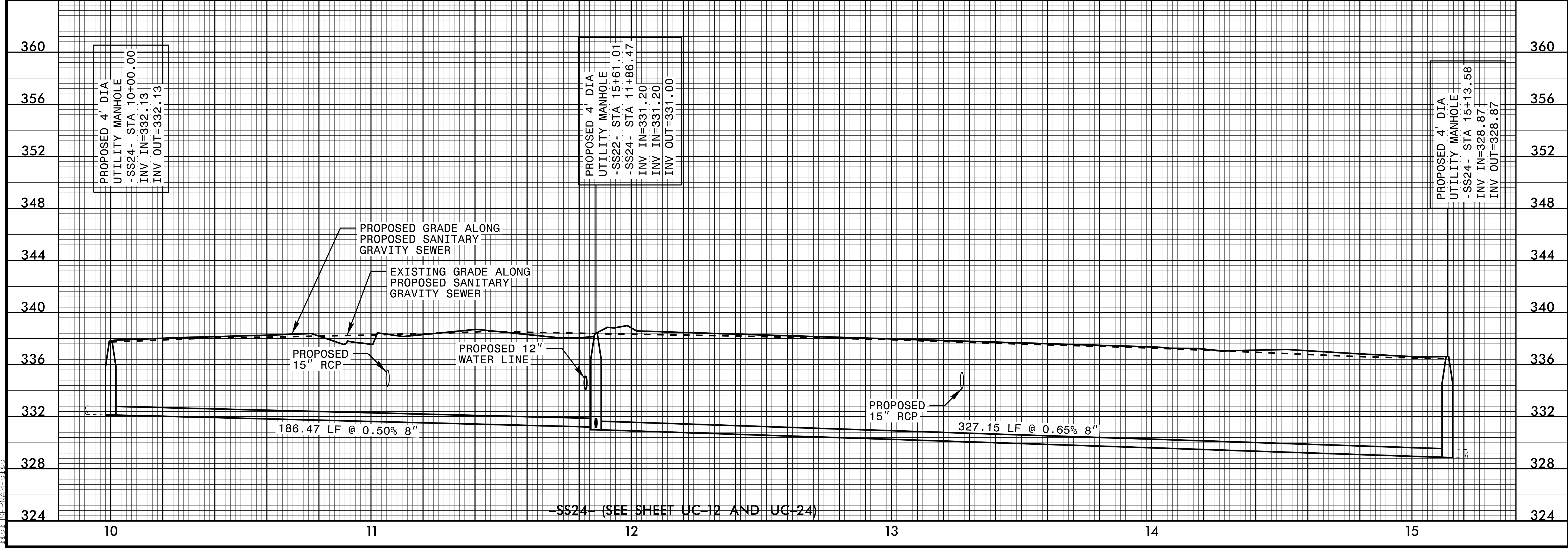
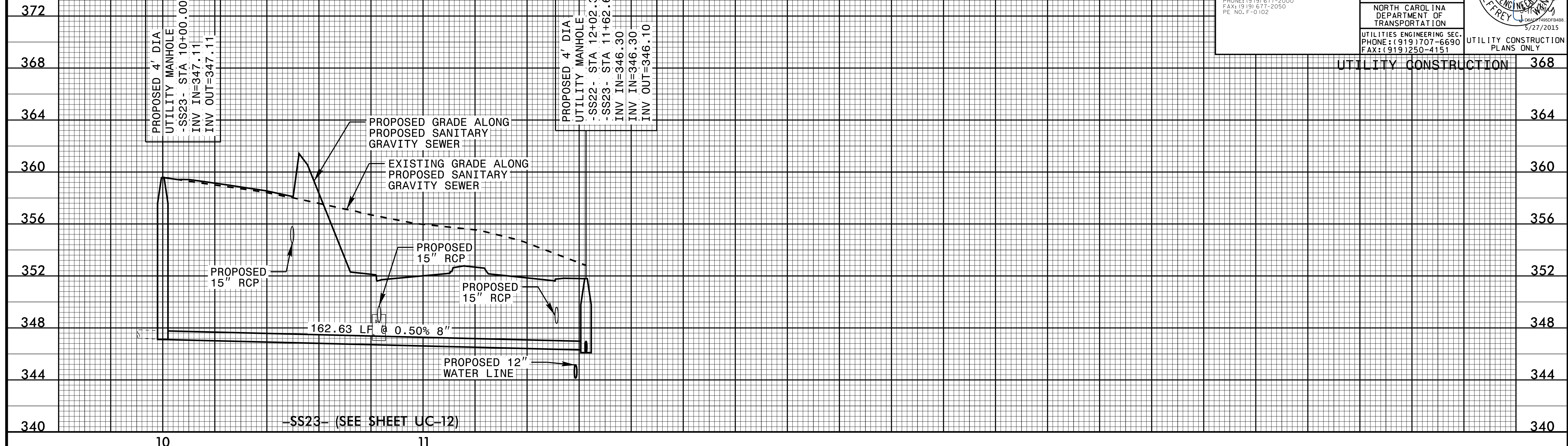


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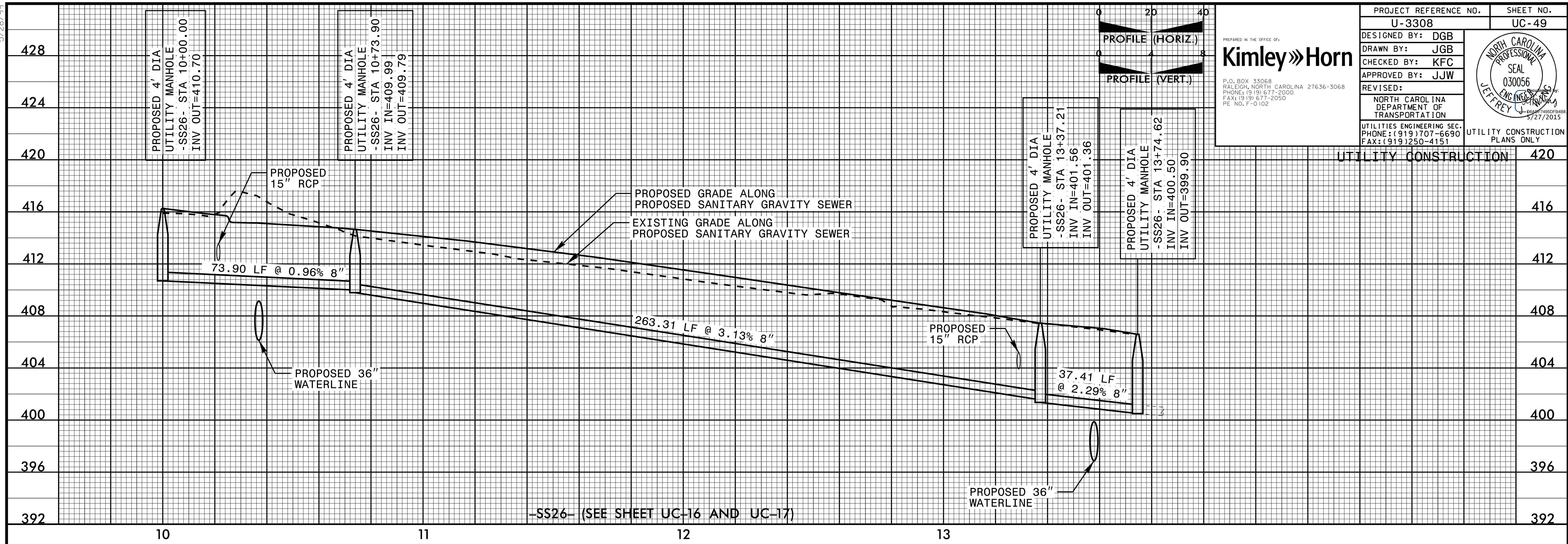


PROJECT REFERENCE NO. U-3308	SHEET NO. UC-48
DESIGNED BY: DGB	
DRAWN BY: JGB	
CHECKED BY: KFC	
APPROVED BY: JJW	REVISED:
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	
UTILITY CONSTRUCTION PLANS ONLY	



5/28/99

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PROJECT REFERENCE NO. U-3308 SHEET NO. UC-49

DESIGNED BY: DGB

DRAWN BY: JGB

CHECKED BY: KFC

APPROVED BY: JJW

REVISED:

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

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

UTILITY CONSTRUCTION PLANS ONLY

Kimley»Horn

PREPARED IN THE OFFICE OF:

P.O. BOX 33068 RALEIGH, NORTH CAROLINA 27636-3068 PHONE: (919) 677-2000 FAX: (919) 677-2050 PE NO. F-0102

NORTH CAROLINA PROFESSIONAL SEAL 030056 JEFFREY

5/28/99