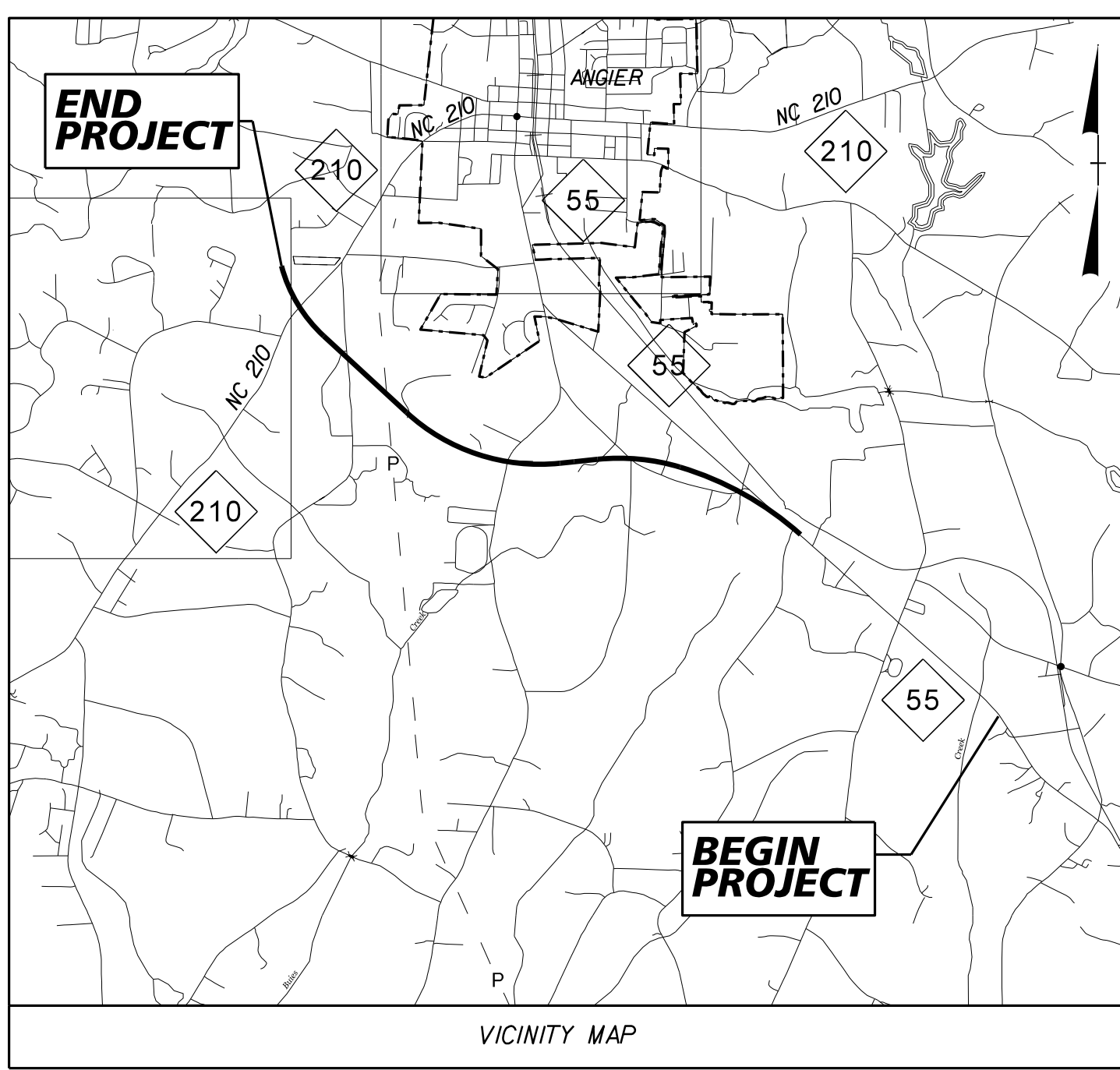




**TIP PROJECT: R-5705A**

T.I.P. NO.	SHEET NO.
R-5705A	UC-1

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



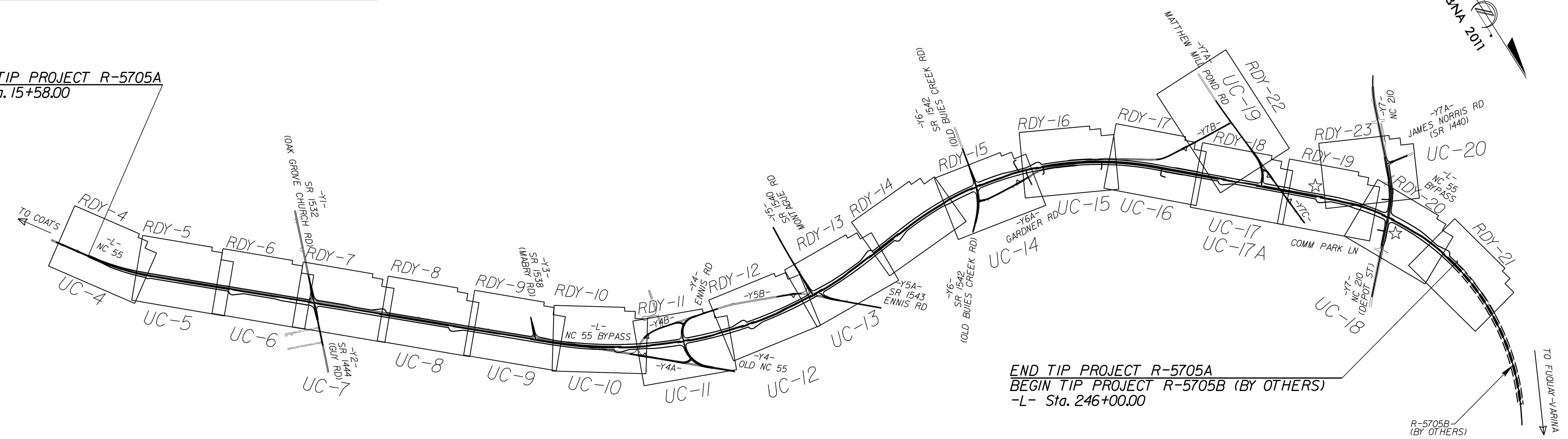
STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

# UTILITY CONSTRUCTION PLANS HARNETT COUNTY

**LOCATION: NC 55 FROM SOUTH OF SR 1532 (OAK GROVE CHURCH ROAD)  
TO NORTH OF NC 210**

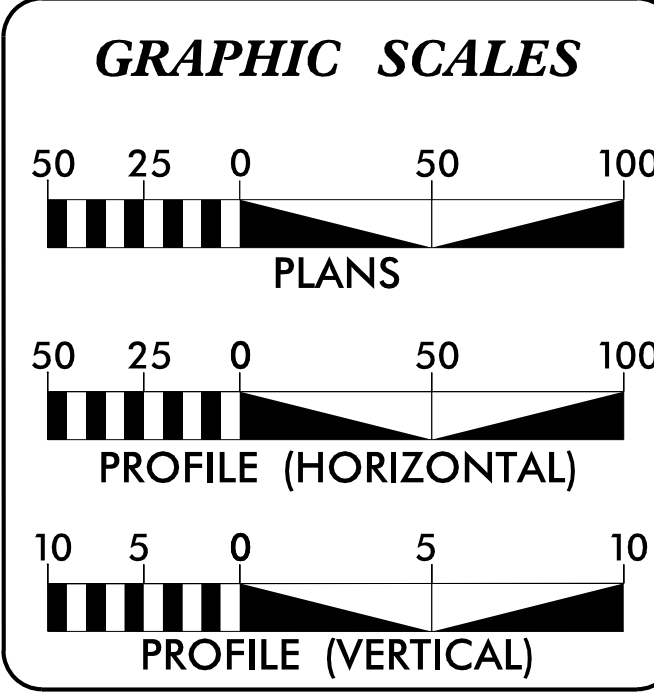
**TYPE OF WORK: RELOCATE WATER LINE (HARNETT REGIONAL WATER)**

BEGIN TIP PROJECT R-5705A  
-L- Sta. 15+58.00



END TIP PROJECT R-5705A  
BEGIN TIP PROJECT R-5705B (BY OTHERS)  
-L- Sta. 246+00.00

30-MAY-2023 15:35  
M:\200\050058\3AM  
R-5705 AB&C\R-5705A\Water Wastewater\R-5705A\_ut\_UC01.tsh.dgn  
\$\$\$\$\$SERNAME\$\$\$\$\$



**INDEX OF SHEETS**

SHEET NO.:	DESCRIPTION:
UC-1	TITLE SHEET
UC-2	UTILITY SYMBOLOGY
UC-3	NOTES
UC-3A TO UC-3B	DETAILS
UC-4 TO UC-20	WATER LINE PLAN SHEETS
UC-21 TO UC-33	WATER LINE PROFILE SHEETS

**WATER OWNER  
ON PROJECT**

**WATER - HARNETT REGIONAL  
WATER**

PREPARED IN THE OFFICES OF

**KCI**  
Engineers • Planners • Scientists • Construction Managers  
4505 Falls of Neuse Road, Suite 400  
Raleigh, NC 27609  
Phone (919) 783-9214 • Fax (919) 783-9266  
License No. C-764

**TUCKER MARTIN, PE** PROJECT MANAGER  
(UTILITY CONSTRUCTION)

**Kimley»Horn**  
421 FAYETTEVILLE STREET, SUITE 600  
RALEIGH, NC 27601

**NATE HARVEY, PE** PROJECT ENGINEER  
(IRRIGATION)

**UTILITY CONSTRUCTION ENGINEER**

**TUCKER R. MARTIN**  
NORTH CAROLINA PROFESSIONAL SEAL  
039117  
DocuSigned by:  
Tucker Martin  
6/13/2023  
P.E.

**IRRIGATION ENGINEER**

**NATE HARVEY**  
NORTH CAROLINA PROFESSIONAL SEAL  
045249  
DocuSigned by:  
Nate Harvey  
6/13/2023  
P.E.

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

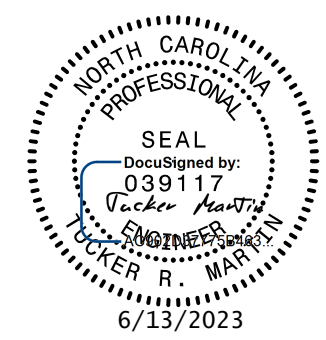
**NABIL HAMDAN** UTILITIES REGIONAL ENGINEER  
**KELVIN MARTIN, EI** UTILITIES ENGINEER  
**TANGA SAMPSON** REGIONAL UTILITIES COORDINATOR  
**KELVIN MARTIN, EI** UTILITIES COORDINATOR







# WATER LINE DETAILS

PROJECT REFERENCE NO. <i>R-5705A</i>	SHEET NO. <i>UC-3A</i>
DESIGNED BY: <i>CS</i>	
DRAWN BY: <i>CS</i>	
CHECKED BY: <i>MM</i>	
APPROVED BY: <i>TH</i>	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	UTILITY CONSTRUCTION PLANS ONLY

**KCI** Engineers • Planners • Scientists • Construction Managers  
 4505 Falls of Neuse Road, Suite 400  
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**UTILITY CONSTRUCTION**  
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L=MINIMUM LENGTH TO BE RESTRAINED ON EACH SIDE OF FITTING (FEET)

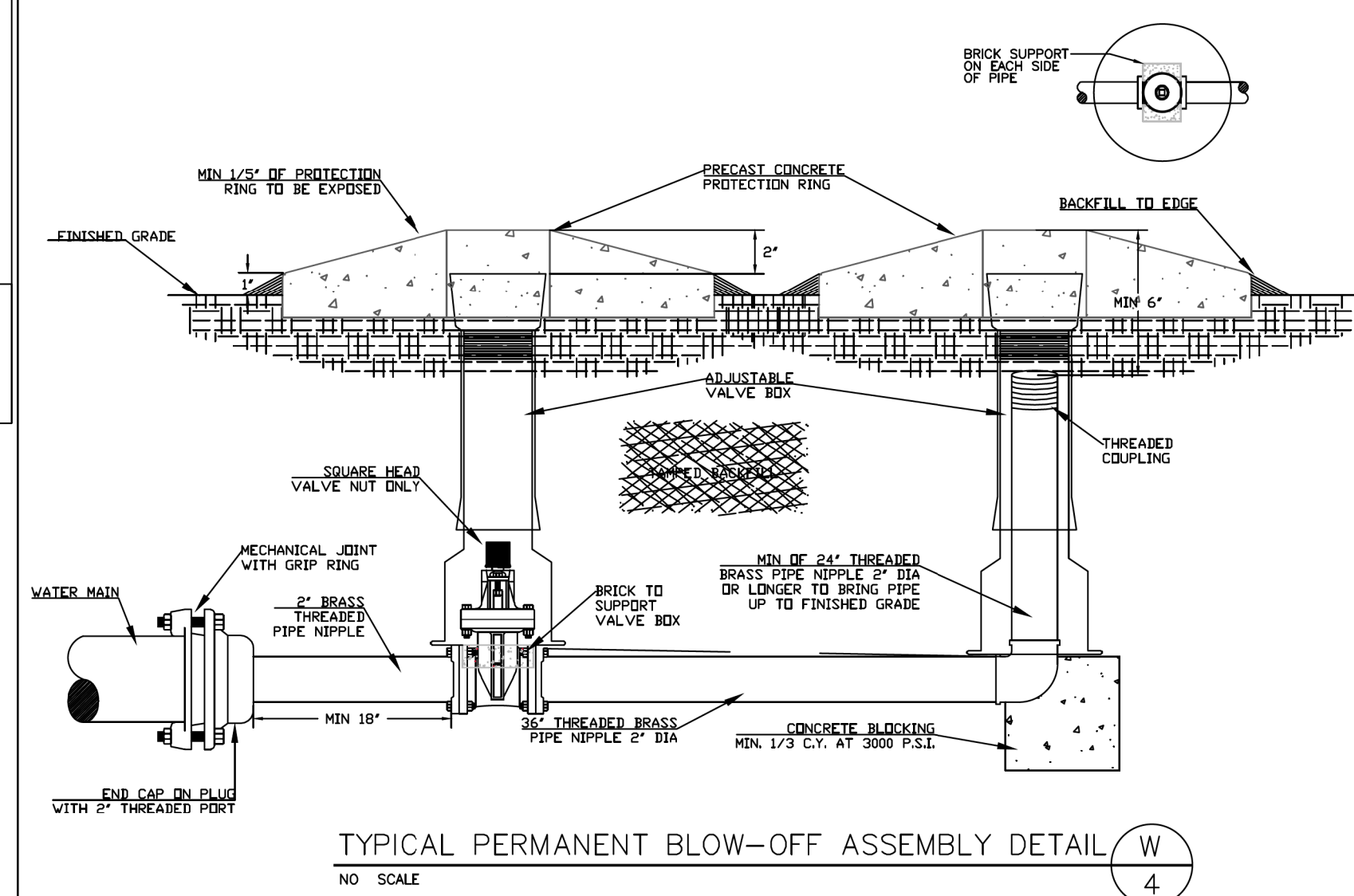
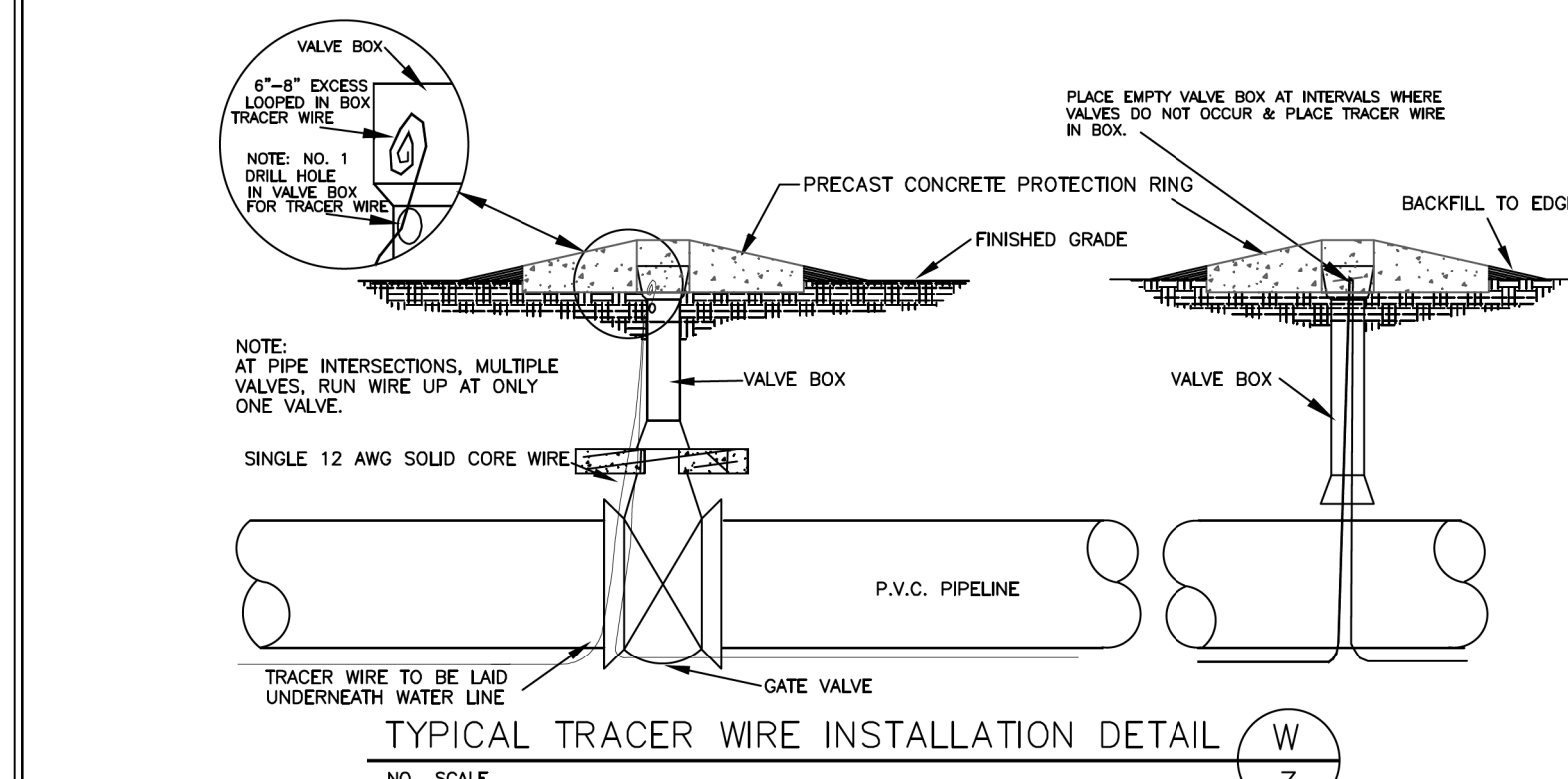
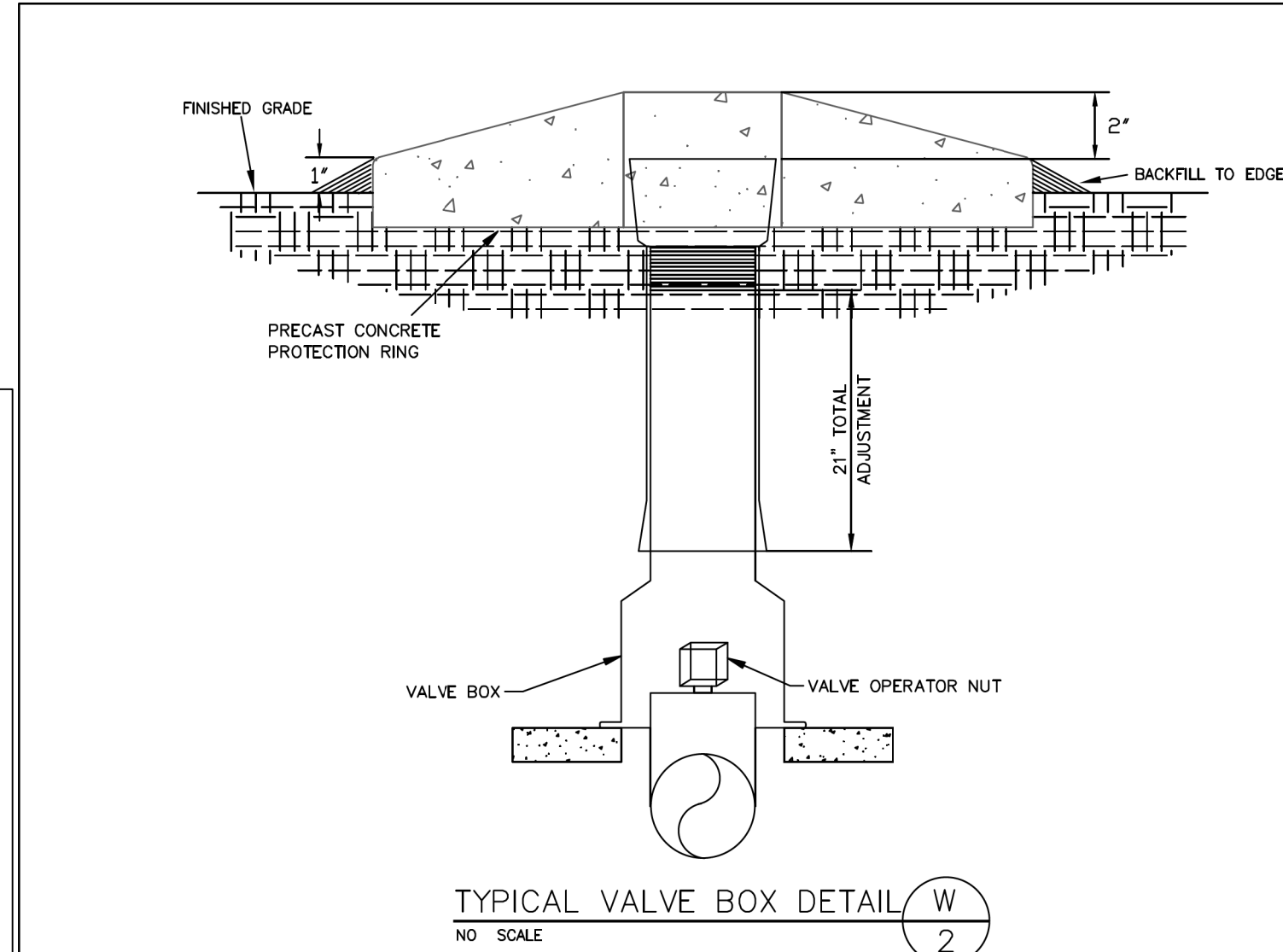
NOMINAL PIPE SIZE (INCHES)	HORIZONTAL ELBOW					HORIZONTAL TEES	HORIZONTAL PLUGS & VALVES			
	1 1/4"	2"	3"	4"	6"		45° UPPER LENGTH	45° LOWER LENGTH	22 1/2° UPPER LENGTH	22 1/2° LOWER LENGTH
4	5	11	21	51		20 - RUN	27 - BRANCH	117	49 / 8	24 / 4
6	7	15	30	71		20 - RUN	64 - BRANCH	164	68 / 11	33 / 6
8	10	19	39	93		20 - RUN	103 - BRANCH	215	89 / 15	43 / 7
12	13	26	54	129		20 - RUN	171 - BRANCH	303	126 / 21	61 / 10
16	17	33	68	164		20 - RUN	236 - BRANCH	388	161 / 27	78 / 13
20	20	39	82	196		20 - RUN	300 - BRANCH	469	195 / 33	94 / 16

NOMINAL PIPE SIZE (INCHES)	REDUCED PIPE SIZE (INCHES)				
	4	6	8	12	16
6	85				
8	154	90			
12	263	220	161		
16	359	327	283	165	
20	446	421	387	294	165

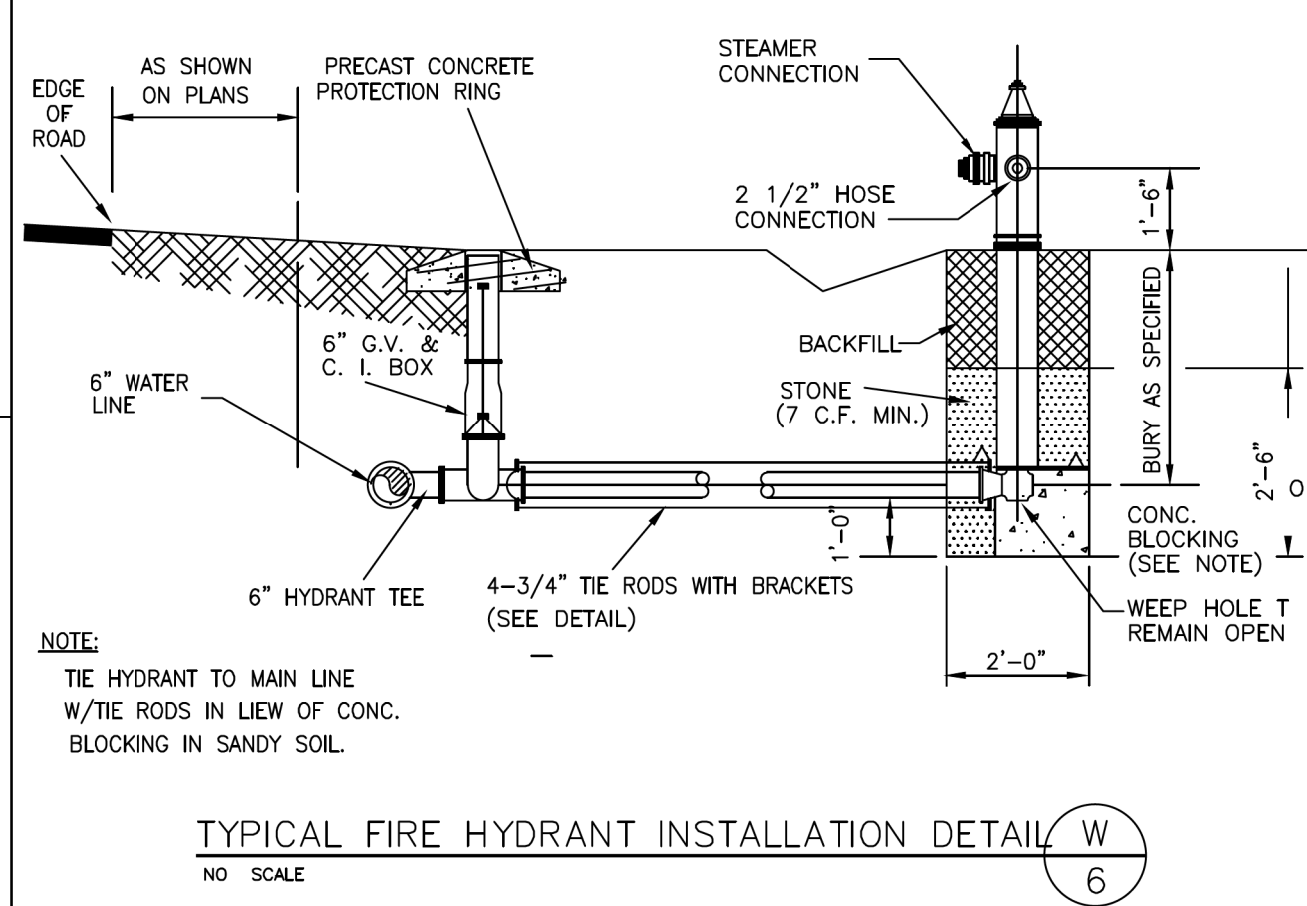
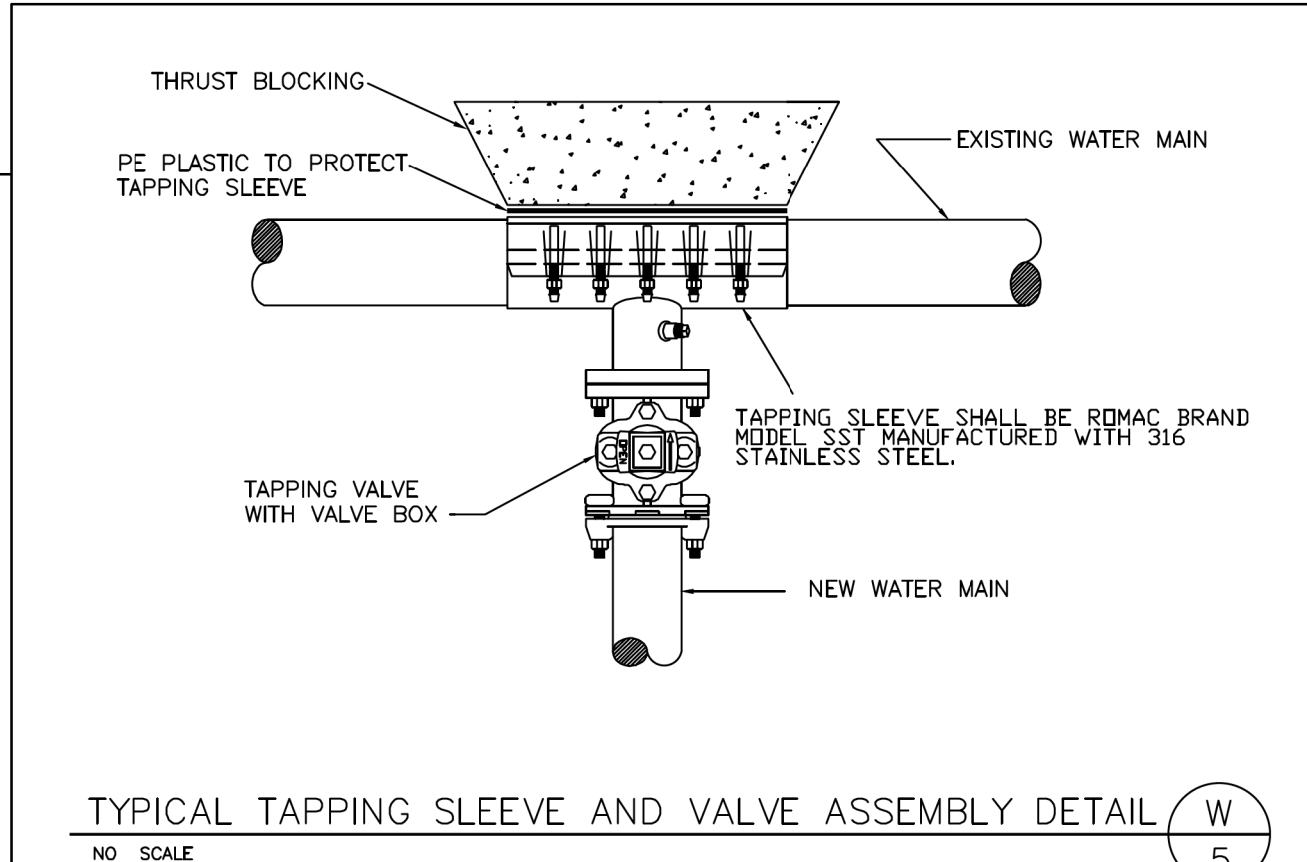
**NOTES**

- TABLE ASSUMPTIONS: PVC PIPE, SAFETY FACTOR = 2.0, TEST PRESSURE = 250 PSI, SOIL = MH OR ML, 3 FT. BURY DEPTH TO TOP OF PIPE, TRENCH TYPE 3, BRANCH ON TEE IS THE SAME SIZE OF RUN OF TEE SIZE AND 20 FEET OF PIPE IS INSTALLED PAST THE TEE ON THE RUN SIDE. VERTICAL OFFSETS ARE 3 FEET DEEP ON TOP AND 8 FEET DEEP ON BOTTOM. REDUCERS ARE CALCULATED FOR ONE SIZE REDUCTION. OTHER CONDITIONS WILL REQUIRE ADDITIONAL CALCULATIONS.
- ALL FITTINGS MUST BE RESTRAINED. ONE OF THE FOLLOWING METHODS MAY BE USED:
  - MECHANICAL RESTRAINTS AT FITTING AND AT ADJACENT JOINTS TO A LENGTH AS SPECIFIED IN CHART.
  - TIE RODS AT FITTING AND THROUGH JOINTS TO A LENGTH AS SPECIFIED IN CHART.
- VALVE RESTRAINTS SHALL BE RESTRAINED THE SAME DISTANCE AS HORIZONTAL PLUGS.

**MECHANICAL RESTRAINT LENGTHS**



NOTE: SEE TYPICAL VALVE BOX DETAIL FOR BRICK INSTALLATION

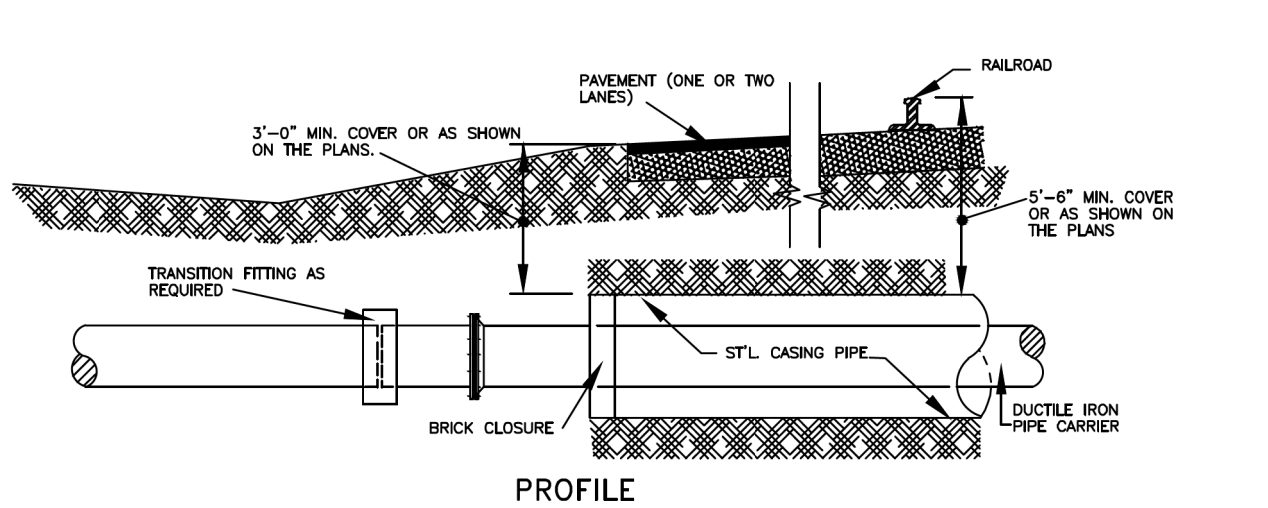
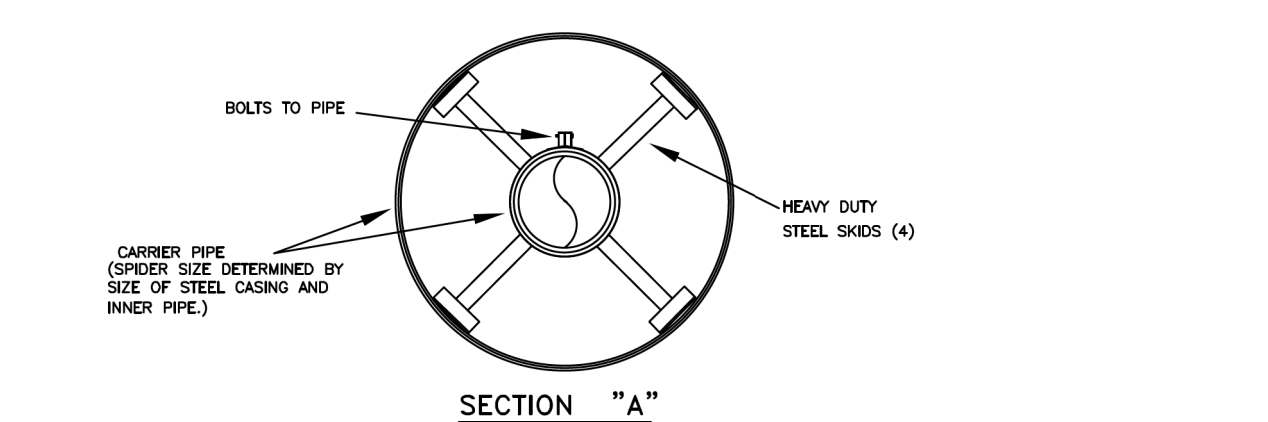
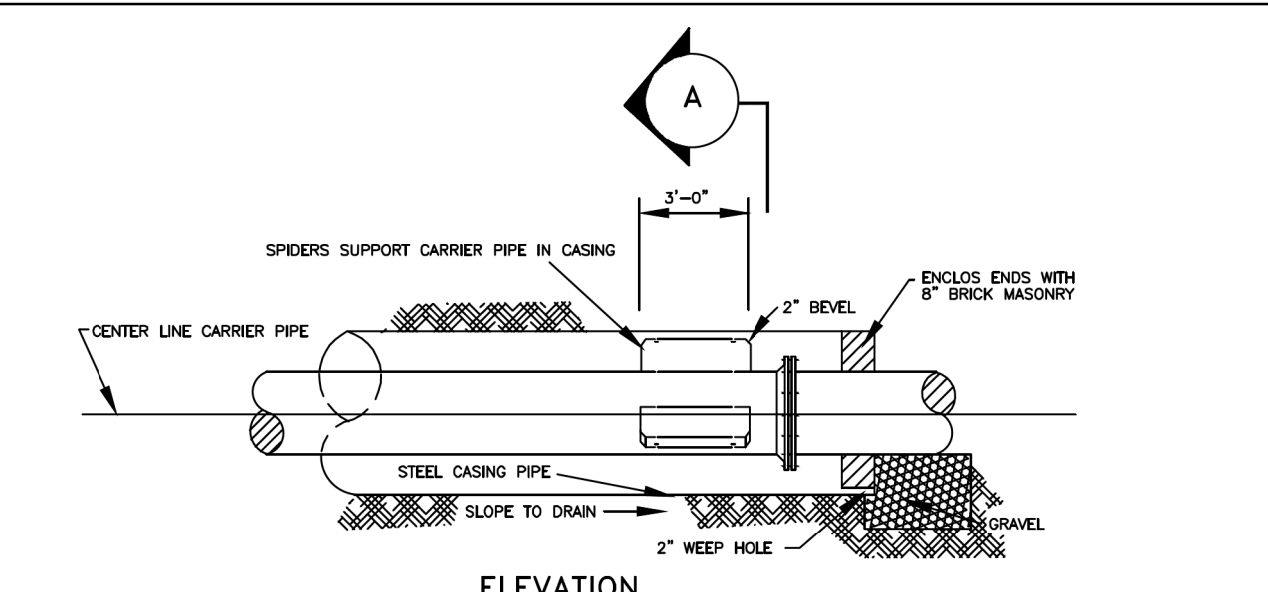


**REACTION BEARING AREAS FOR HORIZONTAL WATER PIPE BENDS**  
 BASED ON TEST PRESSURE OF 200 P.S.I. AND SAFETY FACTOR OF 2.0

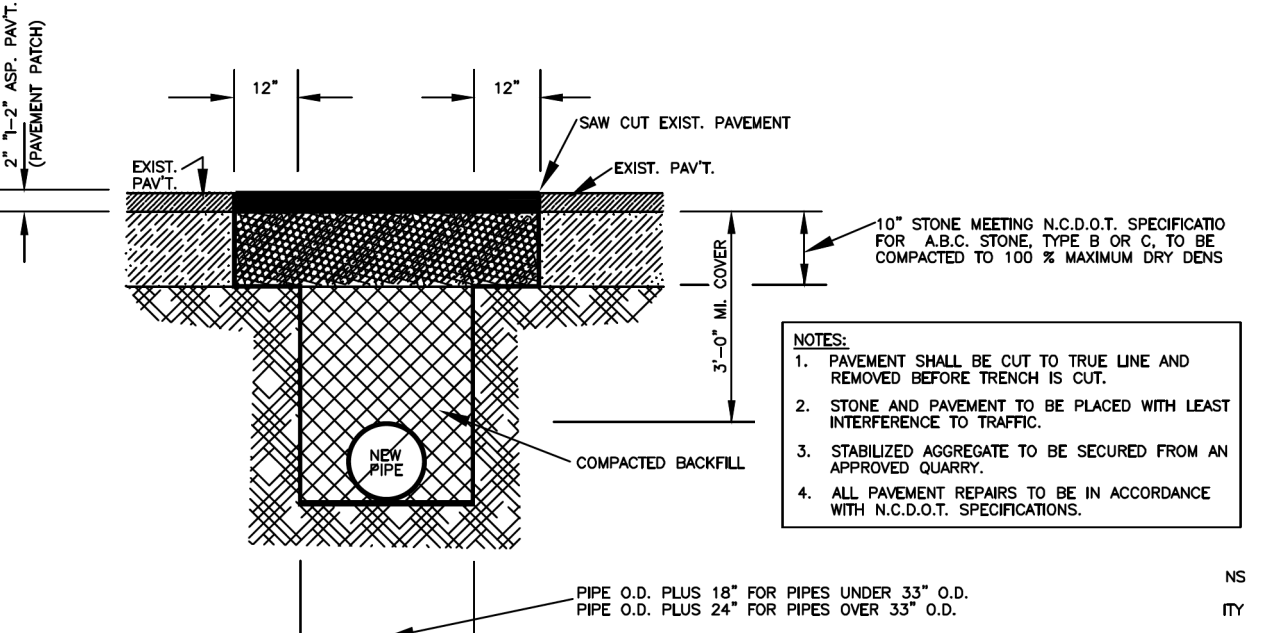
ALL AREAS GIVEN IN SQUARE FEET.

SIZE AND DEGREE OF BEND	STATIC THRUST IN POUNDS	MODERATELY DRY CLAY 4000 LBS/SF	SOFT CLAY 2000 LBS/SF	GRAVEL / COARSE SAND 1000 LBS/SF	DRY CLAY - ALWAYS DRY 5000 LBS/SF	SAND - COMPACT FIRM 2000 LBS/SF	SAND - CLEAN DRY 1000 LBS/SF	2% QUICKSAND - LEVEEPOOR 10,000 LBS/SF	ROCK 7000 LBS/SF
6"									
11 1/4"	1,108	1	1	1	1	1	2	1	
22 1/2"	2,207	1	2	2	1	1	3	1	
45°	4,328	2	3	3	1	1	2	5	1
90°	7,996	2	4	5	1	1	2	8	1
PLUG	5,655	2	3	4	1	1	2	6	1
8"									
11 1/4"	1,970	1	1	2	1	1	1	2	1
22 1/2"	3,922	1	2	3	1	1	1	4	1
45°	7,694	2	4	5	1	1	2	8	1
90°	14,215	4	8	9	2	2	4	15	2
PLUG	10,053	3	5	6	2	2	3	10	1
12"									
11 1/4"	4,433	2	3	3	1	1	2	5	1
22 1/2"	8,826	3	5	6	2	2	3	9	1
45°	17,312	5	9	11	3	3	5	18	2
90°	31,983	8	16	19	4	4	8	32	4
PLUG	22,619	6	12	14	3	3	6	23	3
16"									
11 1/4"	7,881	2	4	5	1	1	2	8	1
22 1/2"	15,691	4	8	10	2	2	4	16	2
45°	30,779	8	16	19	4	4	8	31	4
90°	56,861	15	29	35	8	8	15	57	6
PLUG	40,213	10	21	25	5	5	10	41	5

REACTION BEARING AREAS ARE IN SQUARE FEET MEASURED IN A VERTICAL PLANE IN THE TRENCH SIDE AT AN ANGLE OF 90° TO THE THRUST VECTOR.  
 USE 6° - 90° BEND VALUE FOR HYDRANTS FOR ADDITIONAL SAFETY FACTOR.



**TYPICAL BORING & JACKING DETAIL (W 8)**  
NO SCALE



NOTES:  
 1. PAVEMENT SHALL BE CUT TO TRUE LINE AND REMOVED BEFORE TRENCH IS CUT.  
 2. STONE AND PAVEMENT TO BE PLACED WITH LEAST INTERFERENCE TO TRAFFIC.  
 3. STABILIZED AGGREGATE TO BE SECURED FROM AN APPROVED QUARRY.  
 4. ALL PAVEMENT REPAIRS TO BE IN ACCORDANCE WITH M.C.D.O.T. SPECIFICATIONS.

8/17/99  
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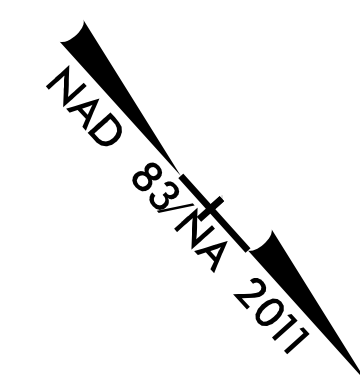




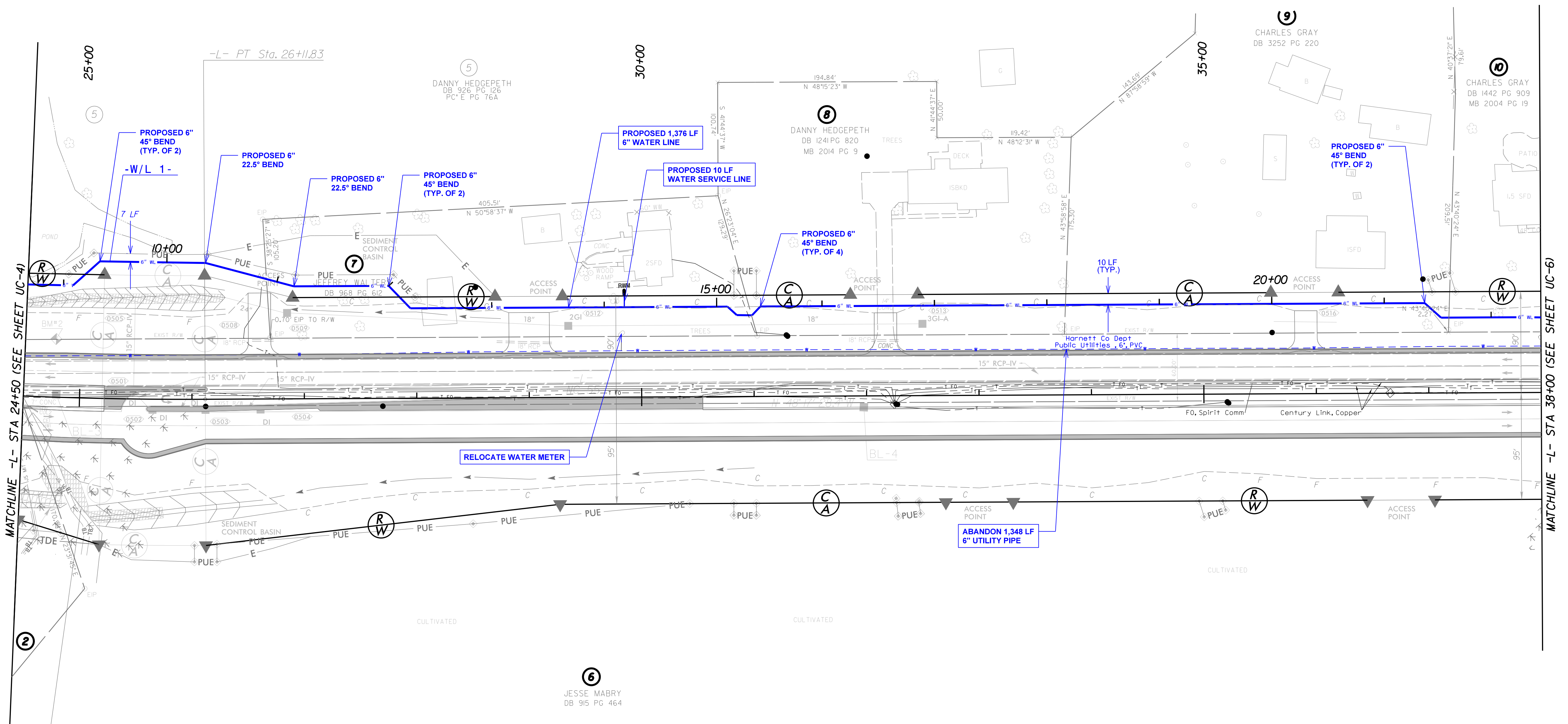


PROJECT REFERENCE NO.	SHEET NO.
R-5705A	UC-5
DESIGNED BY: AP	
DRAWN BY: AP	
CHECKED BY: TM	
APPROVED BY: 0%	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151 UTILITY CONSTRUCTION PLANS ONLY	
Engineers • Planners • Scientists • Construction Managers 4505 Falls of Neuse Road, Suite 400 Raleigh, NC 27609 Phone (919) 783-9214 • Fax (919) 783-9266 License No. C-764	

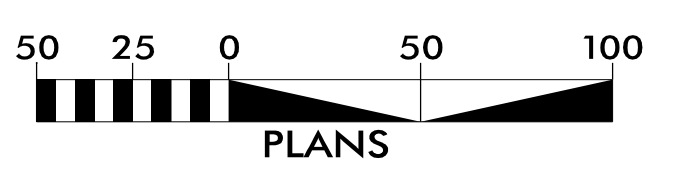
NOTES:  
 1. UC-5 CORRESPONDS TO RDY-5.



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



PROPOSED 1,050 POUNDS OF DUCTILE IRON WATER PIPE FITTINGS





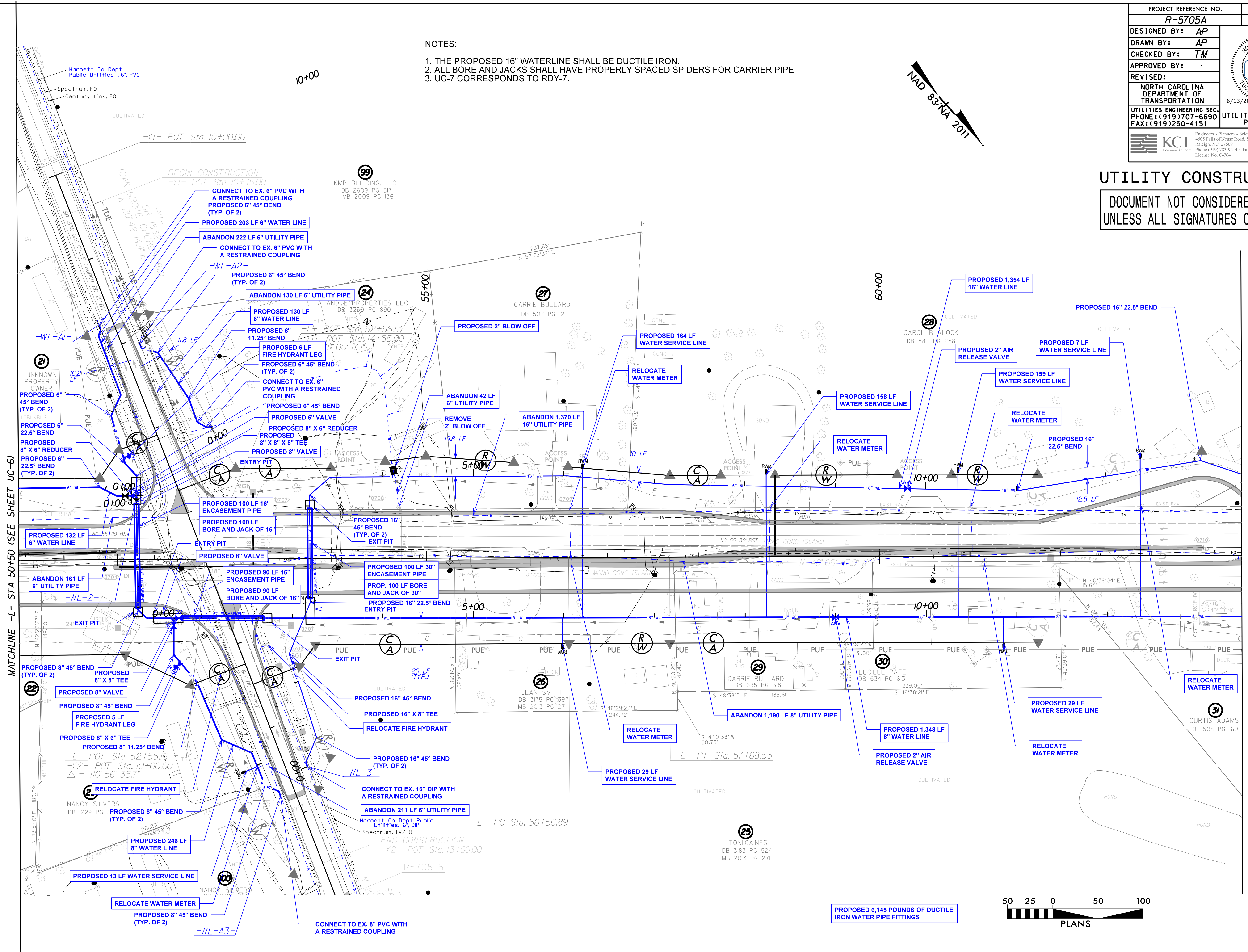
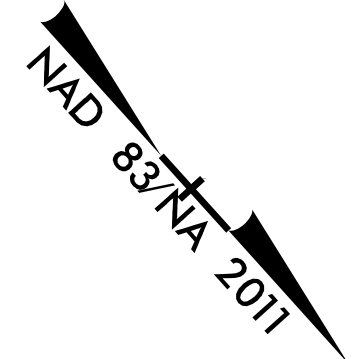




PROJECT REFERENCE NO. <b>R-5705A</b>	SHEET NO. <b>UC-7</b>
DESIGNED BY: <b>AP</b>	
DRAWN BY: <b>AP</b>	
CHECKED BY: <b>TM</b>	
APPROVED BY:	
REVISED:	<b>NORTH CAROLINA DEPARTMENT OF TRANSPORTATION</b> UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151

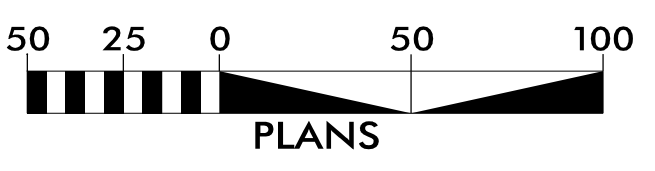
**UTILITY CONSTRUCTION**  
 DOCUMENT NOT CONSIDERED FINAL  
 UNLESS ALL SIGNATURES COMPLETED

- NOTES:
1. THE PROPOSED 16" WATERLINE SHALL BE DUCTILE IRON.
  2. ALL BORE AND JACKS SHALL HAVE PROPERLY SPACED SPIDERS FOR CARRIER PIPE.
  3. UC-7 CORRESPONDS TO RDY-7.



MATCHLINE -L- STA 50+50 (SEE SHEET UC-6)

MATCHLINE -L- STA 64+00 (SEE SHEET UC-8)



PROPOSED 6,145 POUNDS OF DUCTILE IRON WATER PIPE FITTINGS

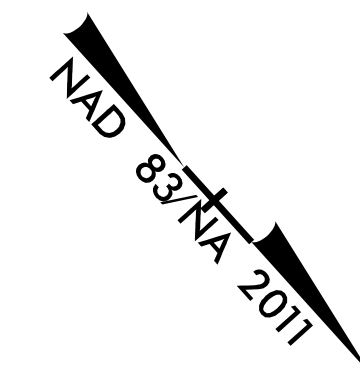
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 USER: JRM



PROJECT REFERENCE NO.	SHEET NO.
R-5705A	UC-8
DESIGNED BY: AP	
DRAWN BY: AP	
CHECKED BY: TM	
APPROVED BY: GZ	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151 UTILITY CONSTRUCTION PLANS ONLY	

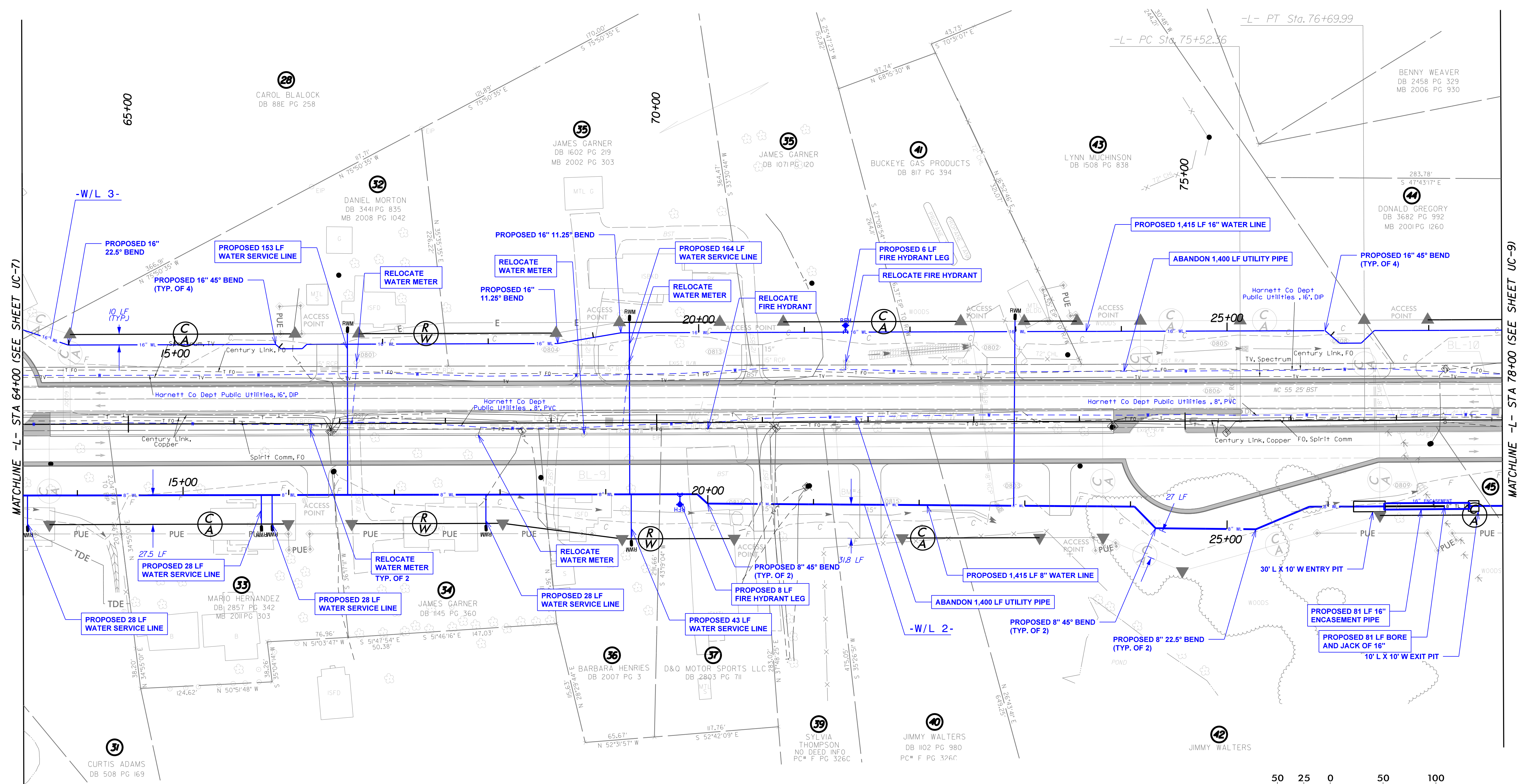
NOTES:

1. THE PROPOSED 16" WATERLINE SHALL BE DUCTILE IRON.
2. ALL BORE AND JACKS SHALL HAVE PROPERLY SPACED SPIDERS FOR CARRIER PIPE.
3. UC-8 CORRESPONDS TO RDY-8.



UTILITY CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

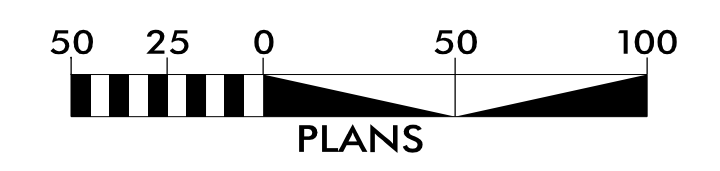


MATCHLINE -L- STA 64+00 (SEE SHEET UC-7)

MATCHLINE -L- STA 76+00 (SEE SHEET UC-9)

07:11:20 2017 15:43  
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 \$\$\$\$\$\$USER\$NAME\$\$\$\$\$\$

PROPOSED 5,350 POUNDS OF DUCTILE IRON WATER PIPE FITTINGS

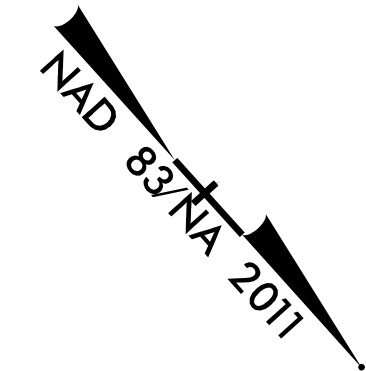




PROJECT REFERENCE NO.	SHEET NO.
R-5705A	UC-9
DESIGNED BY: AP	
DRAWN BY: AP	
CHECKED BY: JM	
APPROVED BY: JTK	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	
UTILITY CONSTRUCTION PLANS ONLY Engineers • Planners • Scientists • Construction Managers 4505 Falls of Neuse Road, Suite 400 Raleigh, NC 27609 Phone (919) 783-9214 • Fax (919) 783-9266 License No. C-764	

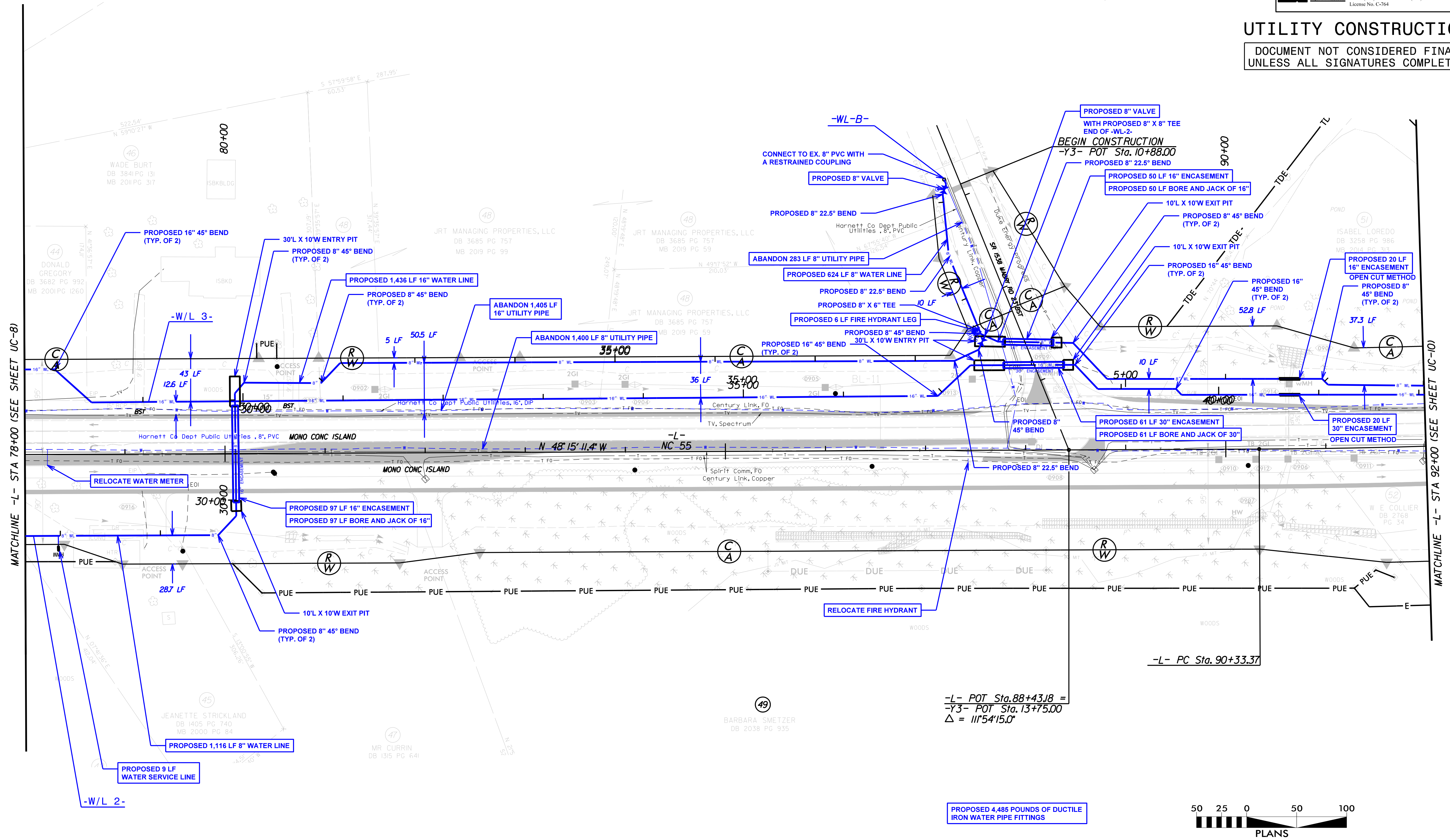
NOTES:

1. THE PROPOSED 16" WATERLINE SHALL BE DUCTILE IRON.
2. ALL BORE AND JACKS SHALL HAVE PROPERLY SPACED SPIDERS FOR CARRIER PIPE.
3. UC-9 CORRESPONDS TO RDY-9.

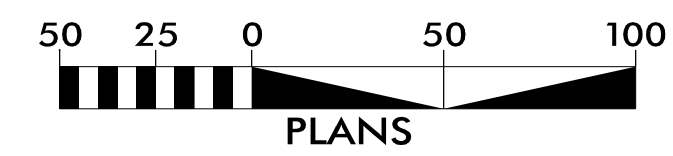


UTILITY CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



PROPOSED 4,485 POUNDS OF DUCTILE IRON WATER PIPE FITTINGS





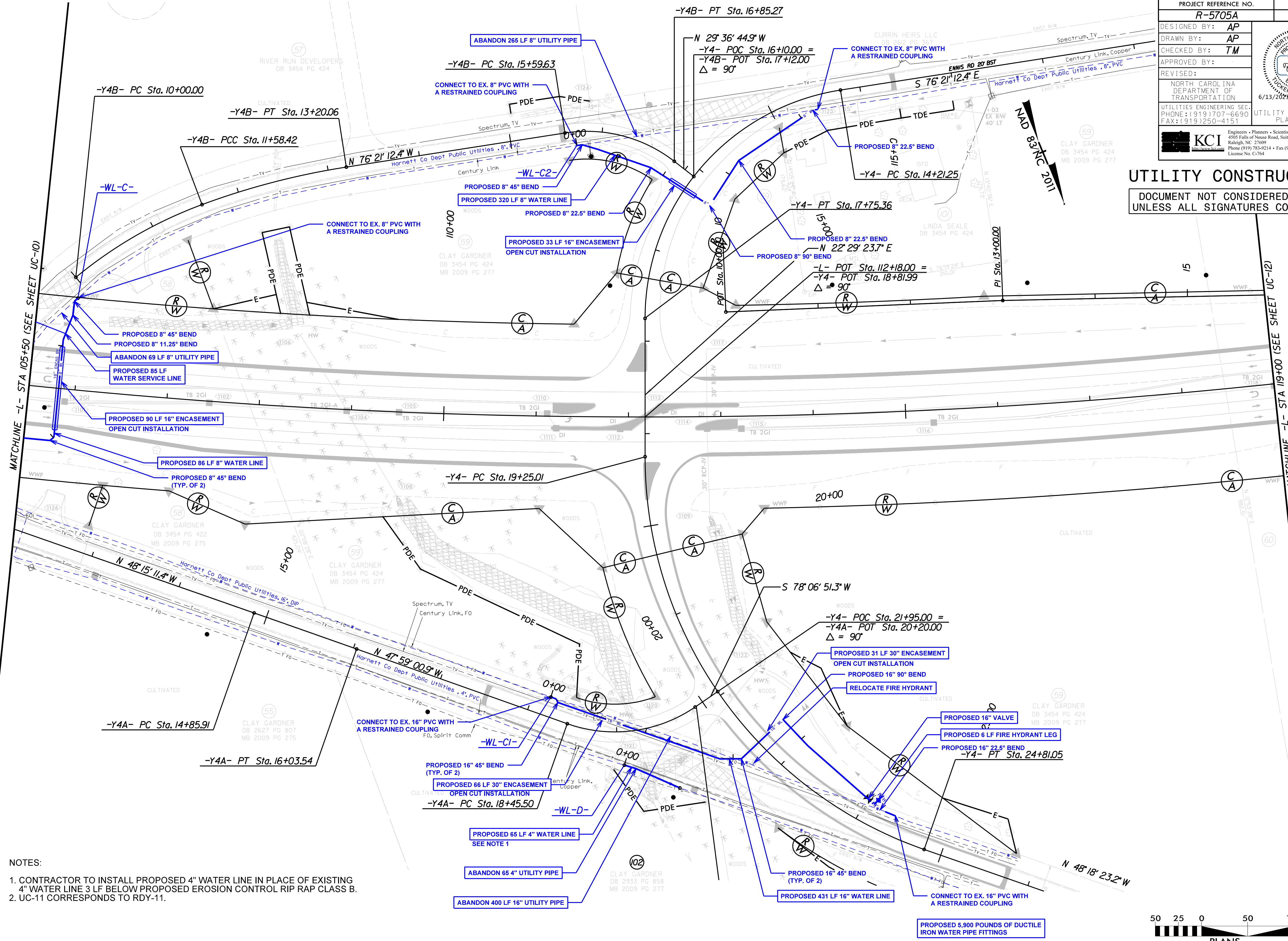




PROJECT REFERENCE NO.	R-5705A	SHEET NO.	UC-11
DESIGNED BY:	AP		
DRAWN BY:	AP		
CHECKED BY:	TM		
APPROVED BY:	TM		
REVISED:			
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION		UTILITY CONSTRUCTION PLANS ONLY	
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151		 Engineers • Planners • Scientists • Construction Managers 4505 Falls of Neuse Road, Suite 400 Raleigh, NC 27609 Phone (919) 783-9214 • Fax (919) 783-9266 License No. C-764	

# UTILITY CONSTRUCTION

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- NOTES:
- CONTRACTOR TO INSTALL PROPOSED 4" WATER LINE IN PLACE OF EXISTING 4" WATER LINE 3 LF BELOW PROPOSED EROSION CONTROL RIP RAP CLASS B.
  - UC-11 CORRESPONDS TO RDY-11.



07:41:20 2023 10:30:33 AM R-5705A AB&C\R-5705A\Water\_Wastewater\_VR5705A.ut...rdj11\_UC11.dgn  
 USER:RDM



NOTES:

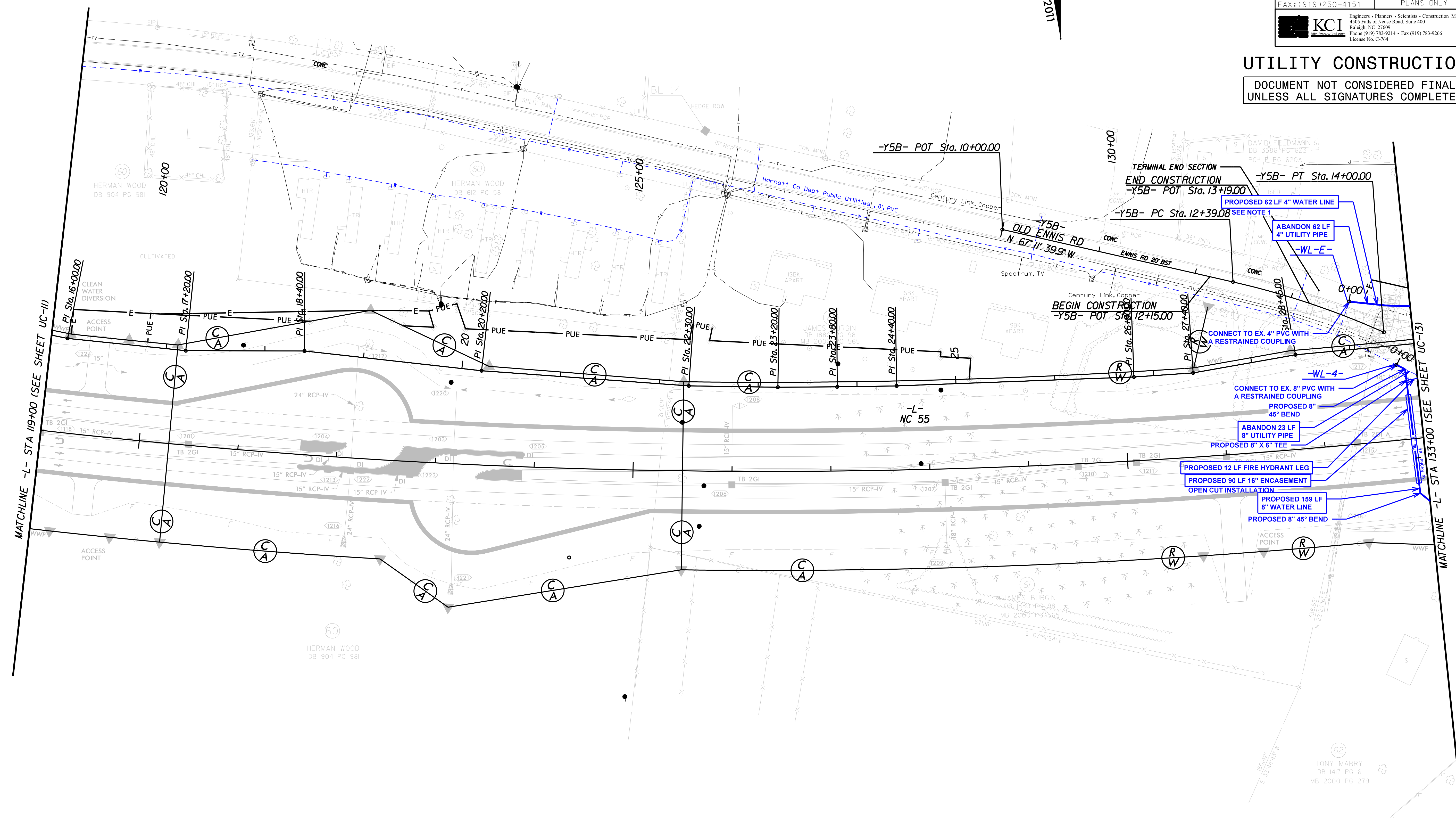
1. CONTRACTOR TO INSTALL PROPOSED 4" WATER LINE IN PLACE OF EXISTING 4" WATER LINE 3 LF BELOW PROPOSED EROSION CONTROL RIP RAP CLASS B.
2. CONTRACTOR TO FIND AND RELOCATE EXISTING WATER SERVICE LINE AS REQUIRED TO MAINTAIN WATER SERVICE TO ADDRESS 6061 NC55 ON PARCEL 60.
3. UC-12 CORRESPONDS TO RDY-12.

PROJECT REFERENCE NO. <b>R-5705A</b>	SHEET NO. <b>UC-12</b>
DESIGNED BY: <b>AP</b>	
DRAWN BY: <b>AP</b>	
CHECKED BY: <b>TM</b>	
APPROVED BY: <b>JK</b>	
REVISED:	NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151
KCI Engineers • Planners • Scientists • Construction Managers 4505 Falls of Neuse Road, Suite 400 Raleigh, NC 27609 Phone (919) 783-9214 • Fax (919) 783-9266 License No. C-764	



### UTILITY CONSTRUCTION

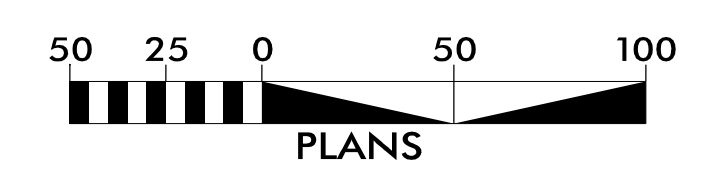
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UNLESS ALL SIGNATURES COMPLETED



MATCHLINE -L- STA 119+00 (SEE SHEET UC-11)

MATCHLINE -L- STA 133+00 (SEE SHEET UC-13)

PROPOSED 420 POUNDS OF DUCTILE  
IRON WATER PIPE FITTINGS





PROJECT REFERENCE NO. <b>R-5705A</b>	SHEET NO. <b>UC-13</b>
DESIGNED BY: <b>AP</b>	
DRAWN BY: <b>AP</b>	
CHECKED BY: <b>TM</b>	
APPROVED BY: <b>GA</b>	
REVISED:	NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151
KCI Engineers • Planners • Scientists • Construction Managers 4505 Falls of Neuse Road, Suite 400 Raleigh, NC 27609 Phone (919) 783-9214 • Fax (919) 783-9266 License No. C-764	

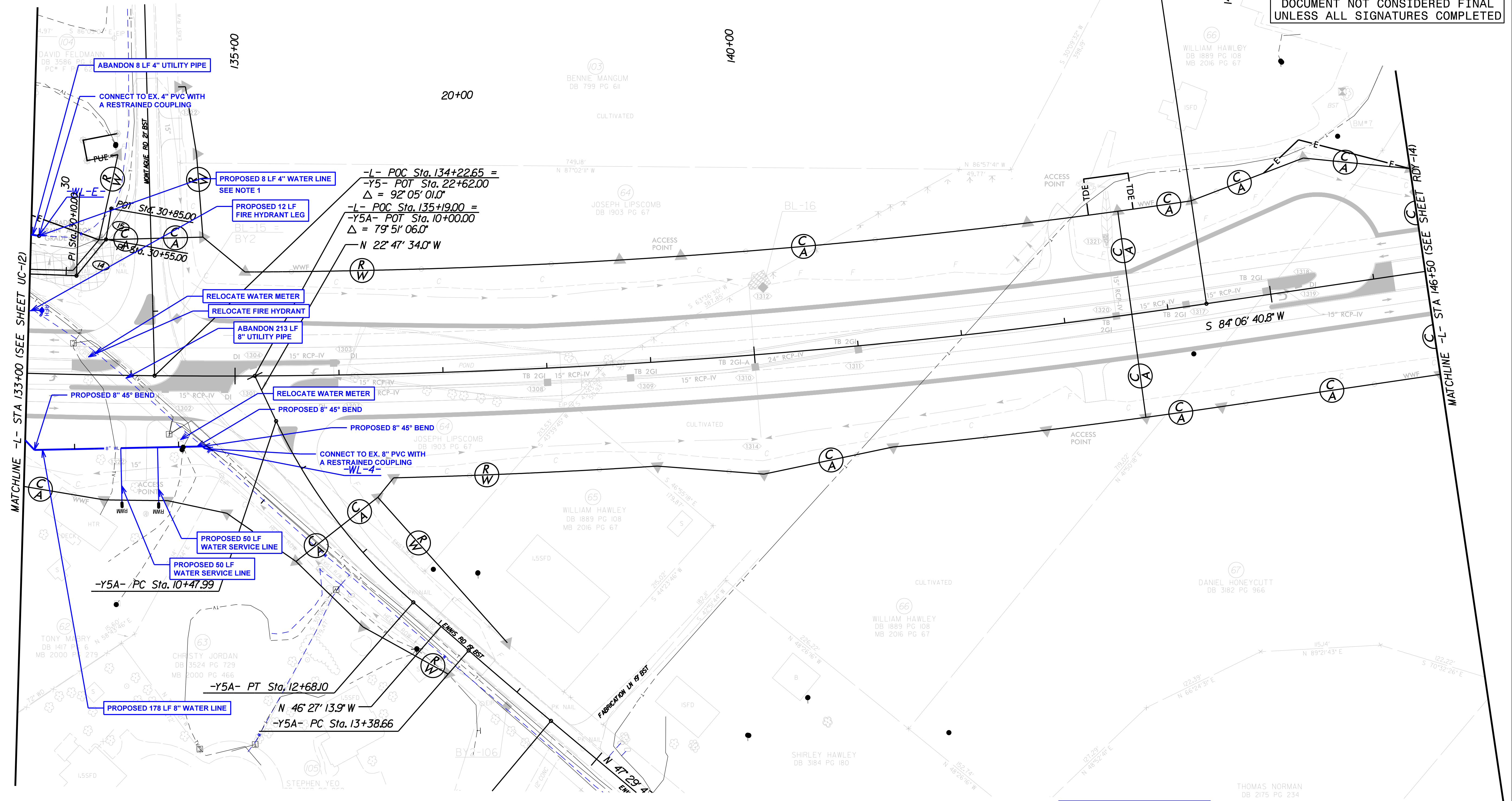
NOTES:

1. CONTRACTOR TO INSTALL PROPOSED 4" WATER LINE IN PLACE OF EXISTING 4" WATER LINE 3 LF BELOW PROPOSED EROSION CONTROL RIP RAP CLASS B.
2. UC-13 CORRESPONDS TO RDY-13.

NAD 83/NA 2011

UTILITY CONSTRUCTION

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PROPOSED 615 POUNDS OF DUCTILE IRON WATER PIPE FITTINGS

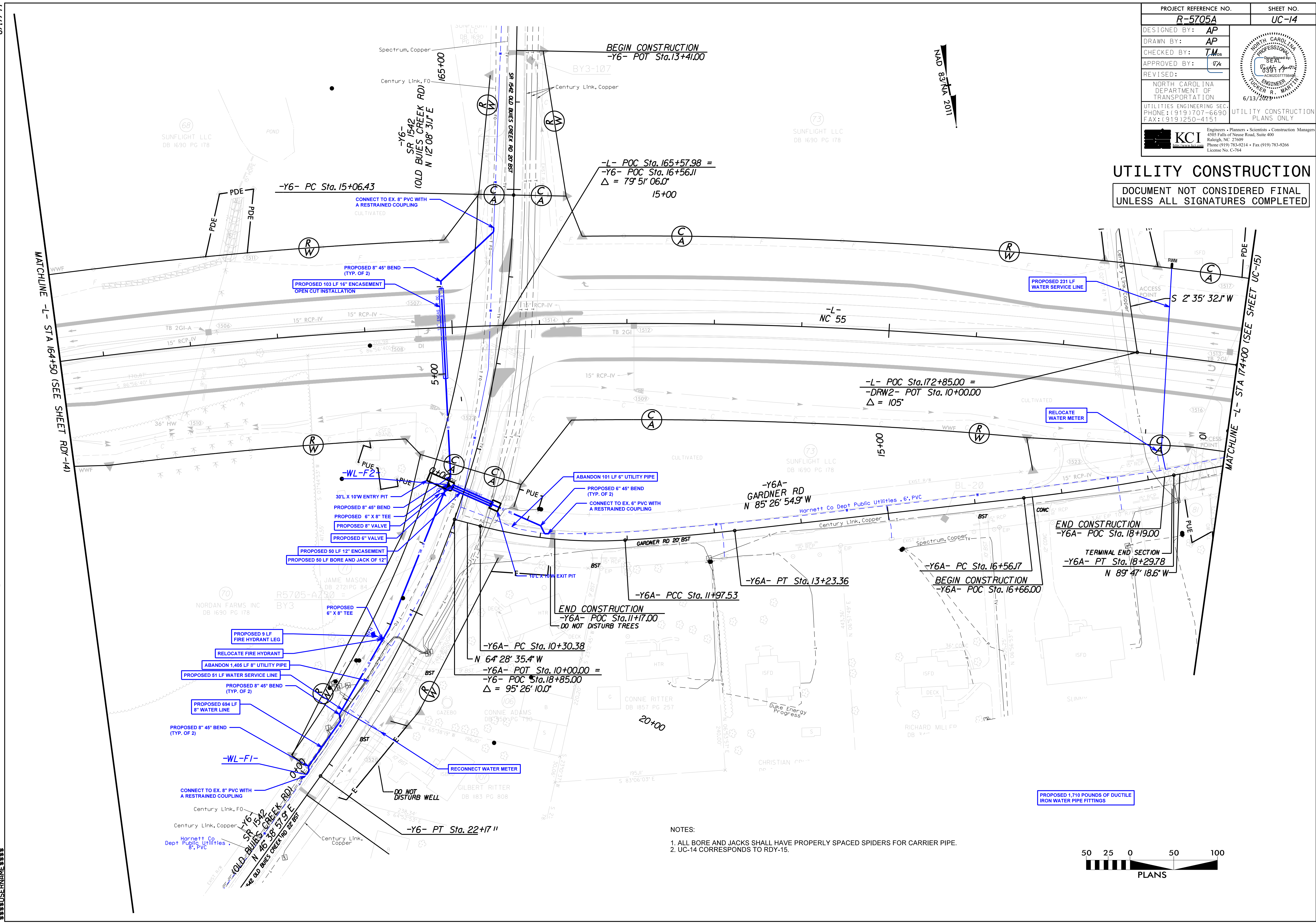


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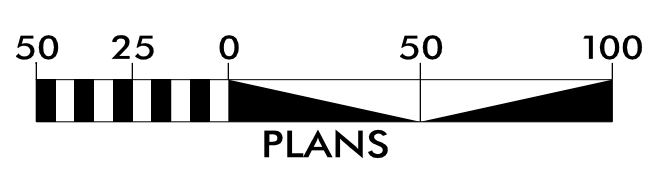


PROJECT REFERENCE NO.	SHEET NO.
R-5705A	UC-14
DESIGNED BY: AP	
DRAWN BY: AP	
CHECKED BY: TMO	
APPROVED BY: TMO	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SECTION PHONE: (919) 707-6690 FAX: (919) 250-4151	
UTILITY CONSTRUCTION PLANS ONLY 	

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 UNLESS ALL SIGNATURES COMPLETED



- NOTES:
1. ALL BORE AND JACKS SHALL HAVE PROPERLY SPACED SPIDERS FOR CARRIER PIPE.
  2. UC-14 CORRESPONDS TO RDY-15.



07:41:20 2017 10:00 AM R-5705A UC-14.dgn  
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 USER: JAMES







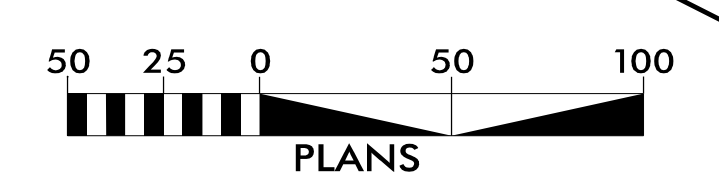
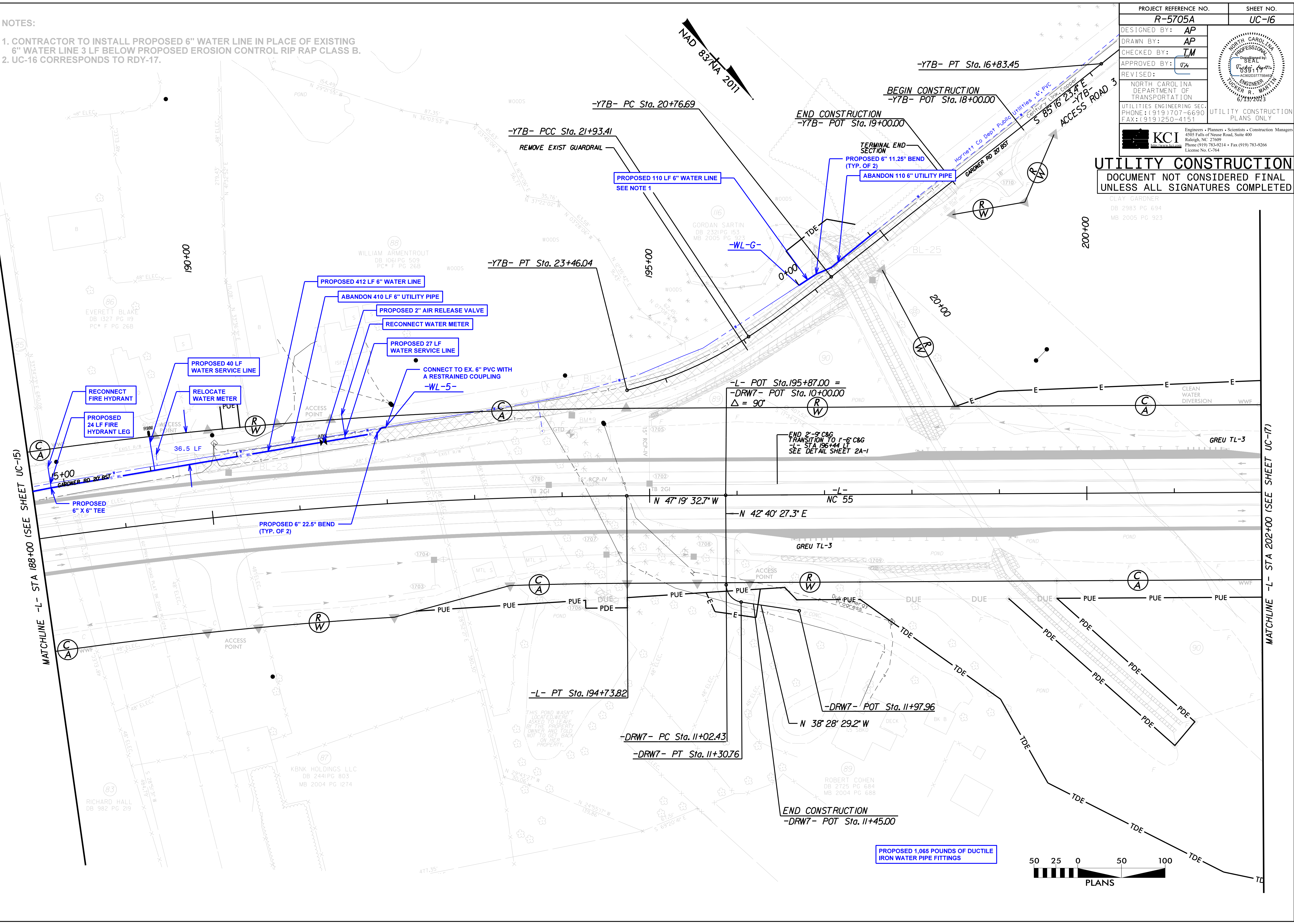
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**NOTES:**

- CONTRACTOR TO INSTALL PROPOSED 6" WATER LINE IN PLACE OF EXISTING 6" WATER LINE 3 LF BELOW PROPOSED EROSION CONTROL RIP RAP CLASS B.
- UC-16 CORRESPONDS TO RDY-17.

PROJECT REFERENCE NO.	R-5705A	SHEET NO.	UC-16
DESIGNED BY:	AP		
DRAWN BY:	AP		
CHECKED BY:	TM		
APPROVED BY:	TM		
REVISED:			
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151		UTILITY CONSTRUCTION PLANS ONLY Engineers • Planners • Scientists • Construction Managers 4505 Falls of Neuse Road, Suite 400 Raleigh, NC 27609 Phone (919) 783-9214 • Fax (919) 783-9266 License No. C-764	

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



07 JUN 2017 10:03 AM R-5705A.Water.Water-VRE705A.ut.-rdj17\_UC17.dgn  
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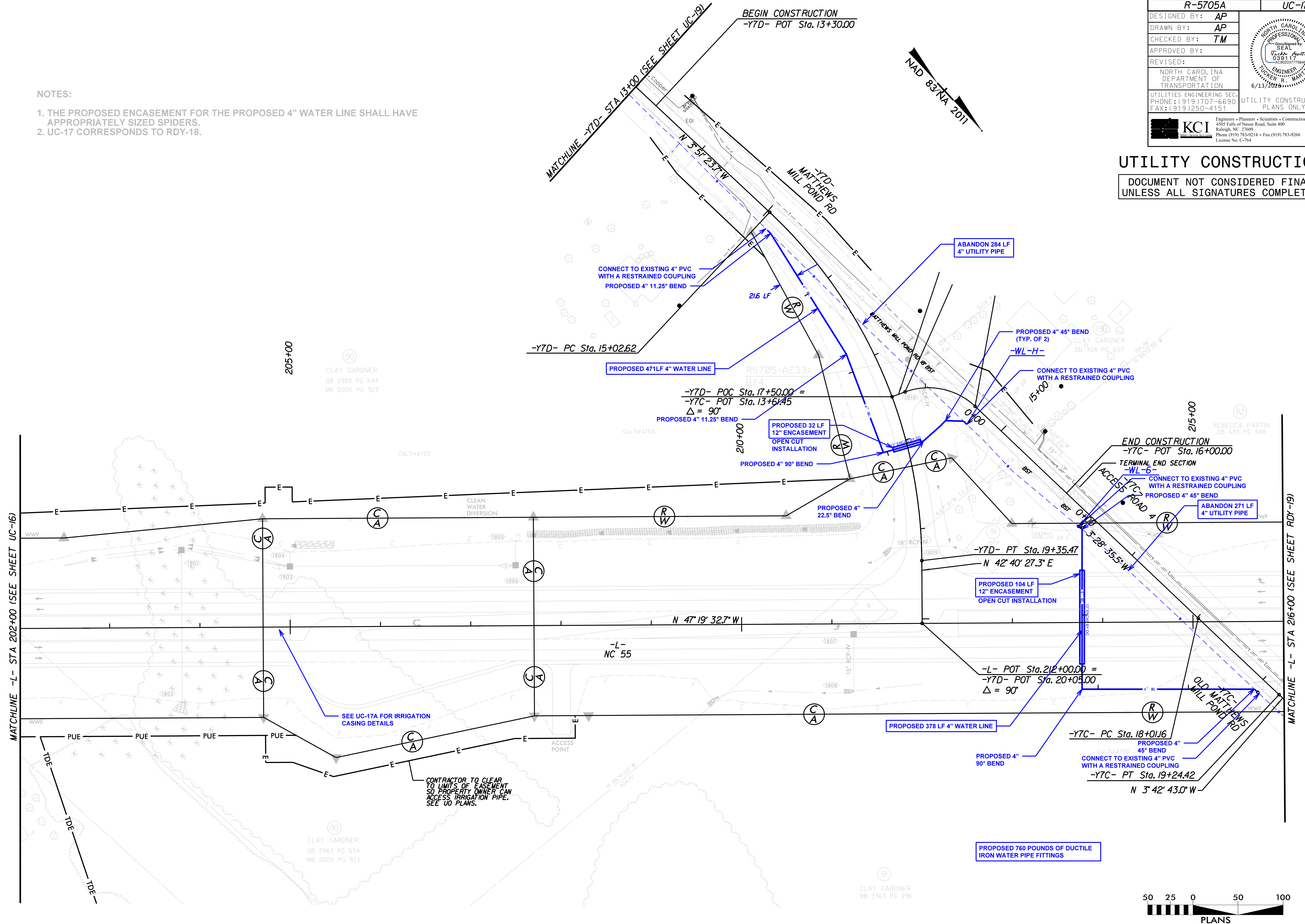
PROJECT REFERENCE NO.	SHEET NO.
R-5705A	UC-17
DESIGNED BY: AP	
DRAWN BY: AP	
CHECKED BY: TM	
APPROVED BY:	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151 UTILITY CONSTRUCTION PLANS ONLY	
Engineers • Planners • Scientists • Construction Managers 4505 Falls of Neuse Road, Suite 400 Raleigh, NC 27609 Phone (919) 783-9214 • Fax (919) 783-9266 License No. C-764	

NOTES:

1. THE PROPOSED ENCASUREMENT FOR THE PROPOSED 4" WATER LINE SHALL HAVE APPROPRIATELY SIZED SPIDERS.
2. UC-17 CORRESPONDS TO RDY-18.

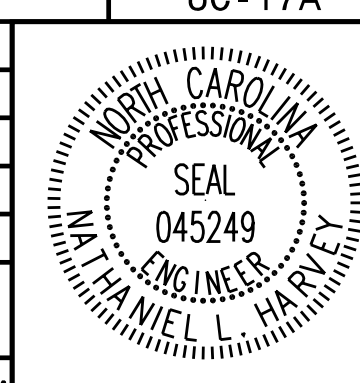
UTILITY CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED





5/14/99

PROJECT REFERENCE NO.	R-5705A	SHEET NO.	UC-17A
DESIGNED BY:	NLH		
DRAWN BY:	JNB		
CHECKED BY:	CPM		
APPROVED BY:	NLH		
REVISED:		NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	
			UTILITY CONSTRUCTION PLANS ONLY

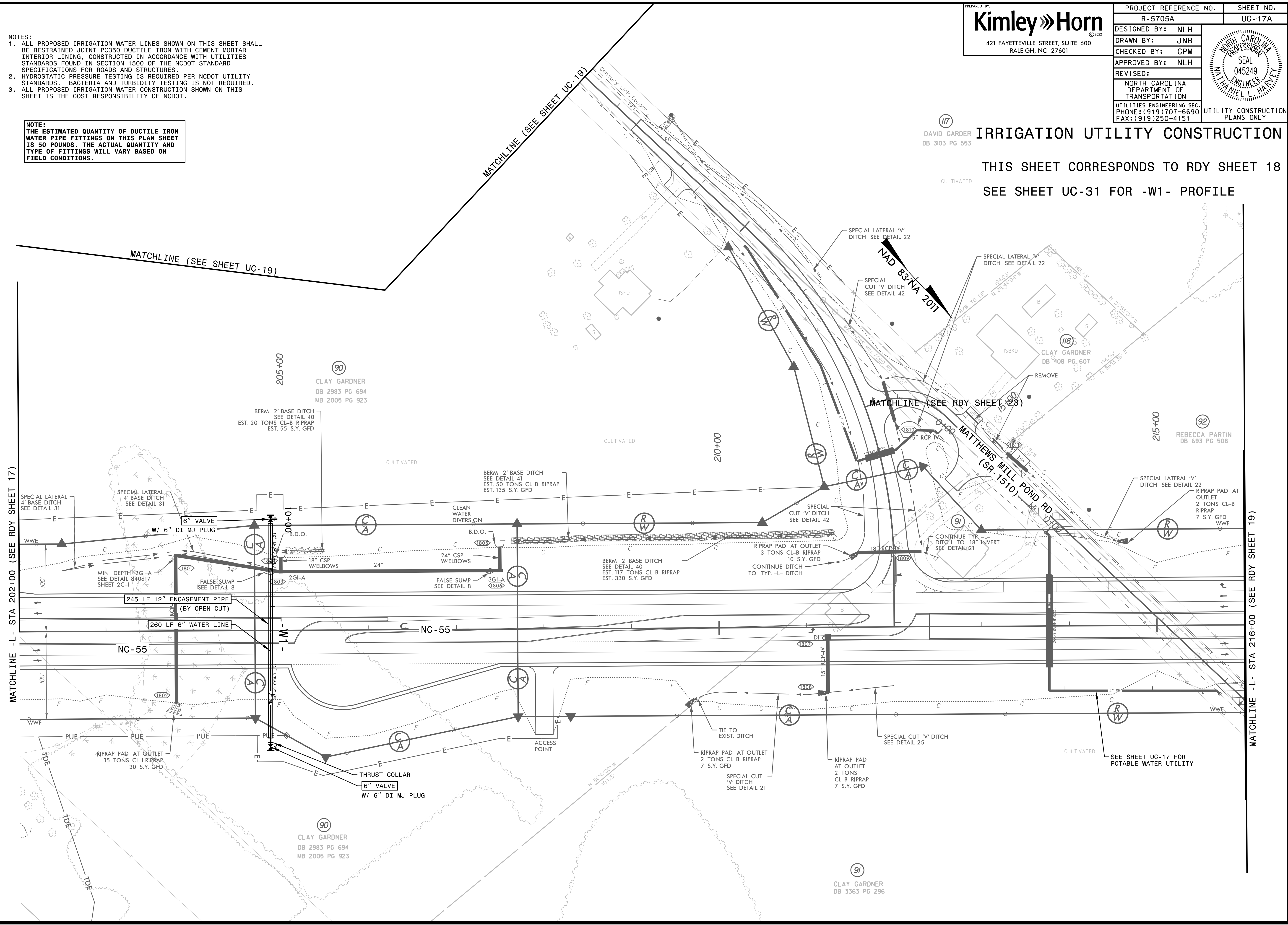
- NOTES:
- ALL PROPOSED IRRIGATION WATER LINES SHOWN ON THIS SHEET SHALL BE RESTRAINED JOINT PC350 DUCTILE IRON WITH CEMENT MORTAR INTERIOR LINING, CONSTRUCTED IN ACCORDANCE WITH UTILITIES STANDARDS FOUND IN SECTION 1500 OF THE NCDOT STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES.
  - HYDROSTATIC PRESSURE TESTING IS REQUIRED PER NCDOT UTILITY STANDARDS. BACTERIA AND TURBIDITY TESTING IS NOT REQUIRED.
  - ALL PROPOSED IRRIGATION WATER CONSTRUCTION SHOWN ON THIS SHEET IS THE COST RESPONSIBILITY OF NCDOT.

NOTE:  
 THE ESTIMATED QUANTITY OF DUCTILE IRON WATER PIPE FITTINGS ON THIS PLAN SHEET IS 50 POUNDS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.

DAVID GARDNER  
 DB 3103 PG 553

**IRRIGATION UTILITY CONSTRUCTION**

THIS SHEET CORRESPONDS TO RDY SHEET 18  
 SEE SHEET UC-31 FOR -W1- PROFILE

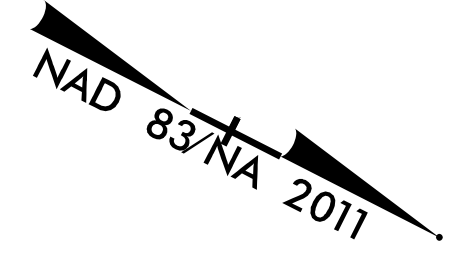


MATCHLINE -L- STA 216+00 (SEE RDY SHEET 19)

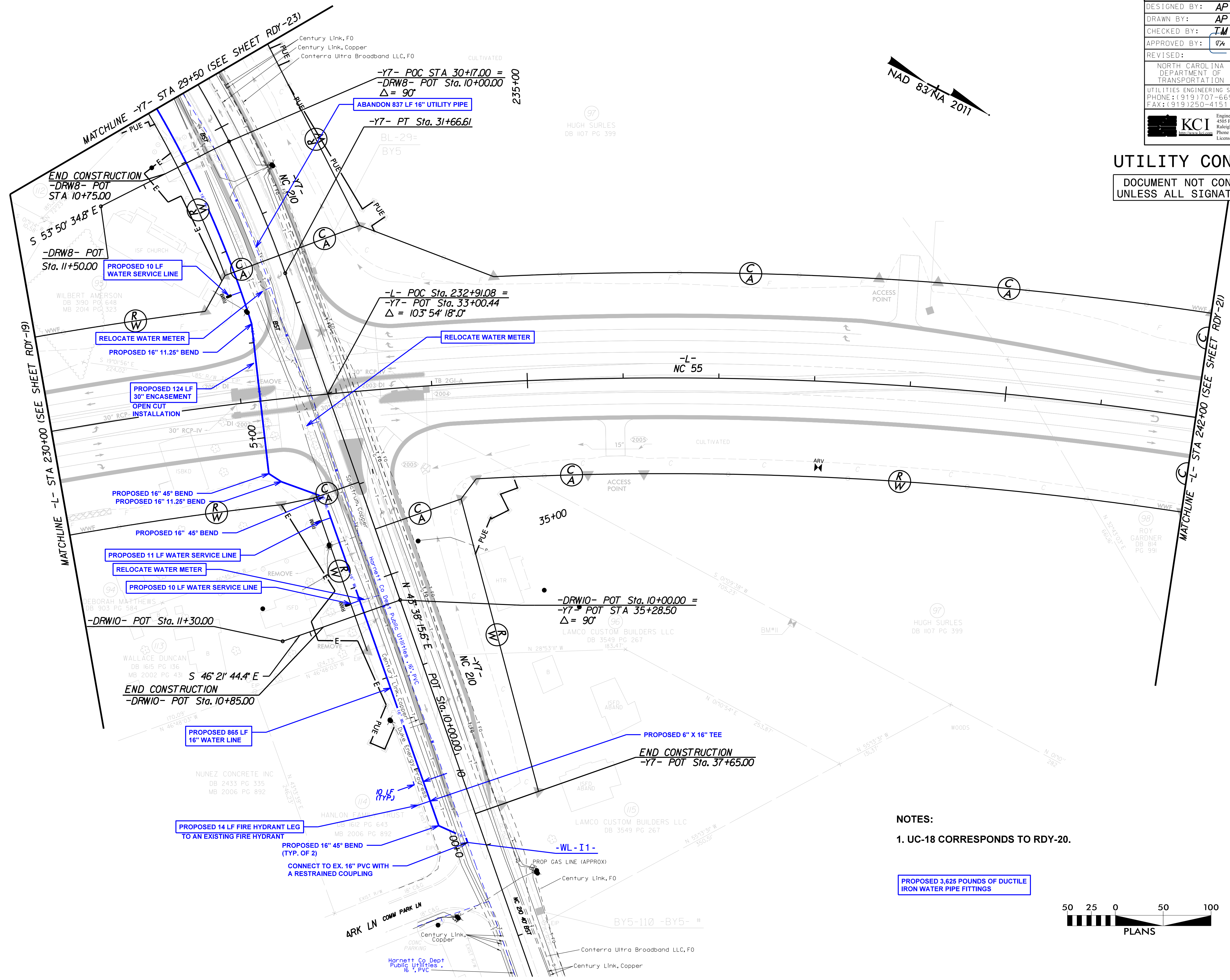
MATCHLINE -L- STA 202+00 (SEE RDY SHEET 17)



PROJECT REFERENCE NO.	SHEET NO.
R-5705A	UC-18
DESIGNED BY: AP	
DRAWN BY: AP	
CHECKED BY: TM	
APPROVED BY: GZ	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151 UTILITY CONSTRUCTION PLANS ONLY	
KCI Engineers • Planners • Scientists • Construction Managers 4505 Falls of Neuse Road, Suite 400 Raleigh, NC 27609 Phone (919) 783-9214 • Fax (919) 783-9266 License No. C-764	

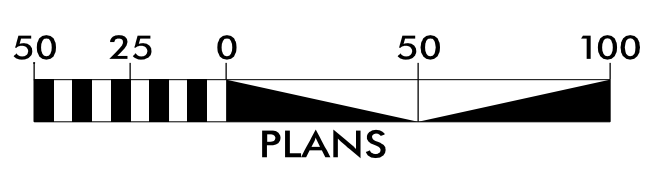


**UTILITY CONSTRUCTION**  
 DOCUMENT NOT CONSIDERED FINAL  
 UNLESS ALL SIGNATURES COMPLETED

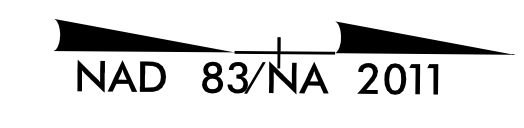


**NOTES:**  
 1. UC-18 CORRESPONDS TO RDY-20.

PROPOSED 3.625 POUNDS OF DUCTILE IRON WATER PIPE FITTINGS



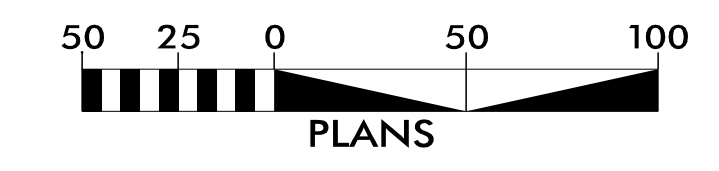
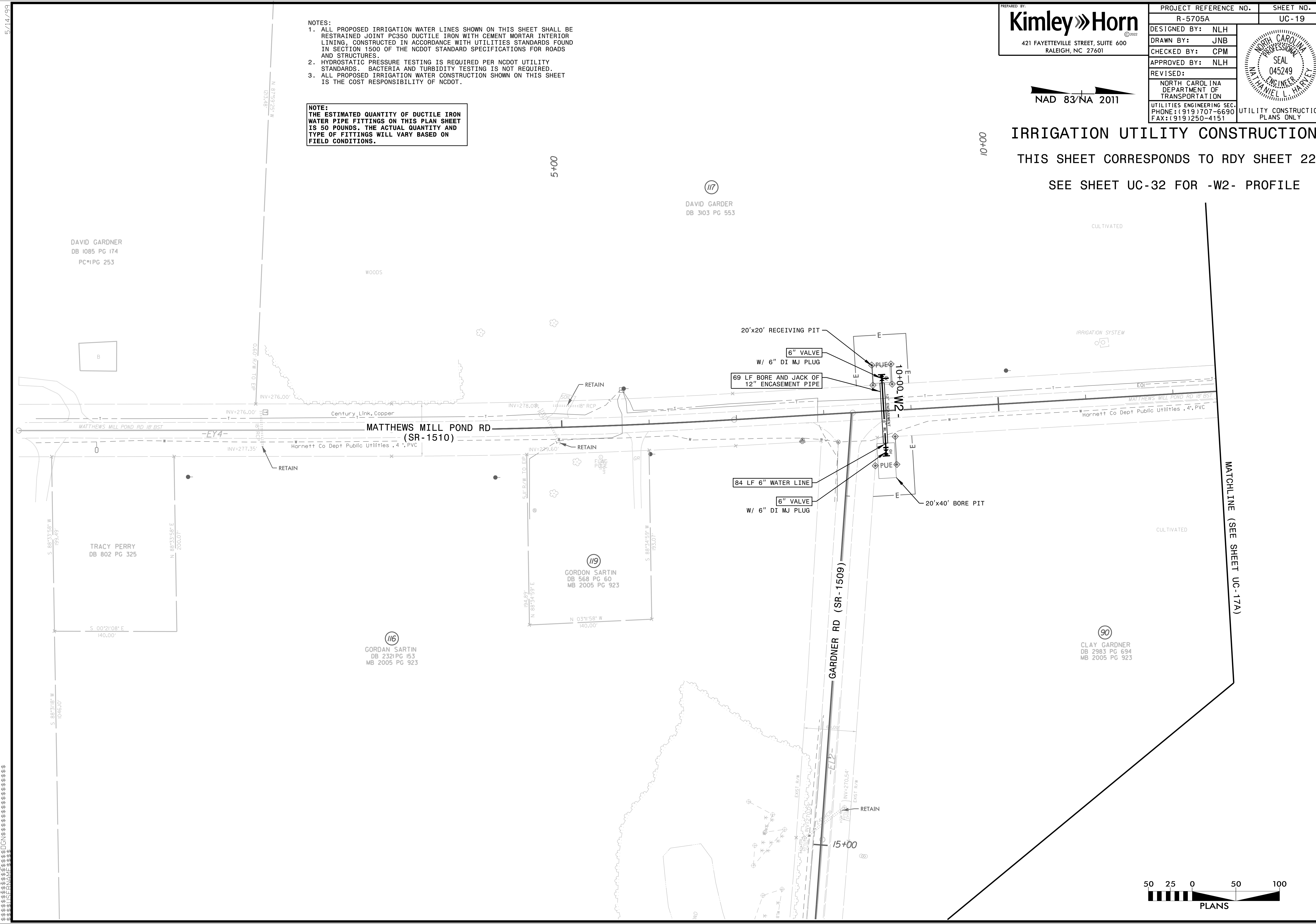




**IRRIGATION UTILITY CONSTRUCTION**  
 THIS SHEET CORRESPONDS TO RDY SHEET 22  
 SEE SHEET UC-32 FOR -W2- PROFILE

- NOTES:**
1. ALL PROPOSED IRRIGATION WATER LINES SHOWN ON THIS SHEET SHALL BE RESTRAINED JOINT PC350 DUCTILE IRON WITH CEMENT MORTAR INTERIOR LINING, CONSTRUCTED IN ACCORDANCE WITH UTILITIES STANDARDS FOUND IN SECTION 1500 OF THE NCDOT STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES.
  2. HYDROSTATIC PRESSURE TESTING IS REQUIRED PER NCDOT UTILITY STANDARDS. BACTERIA AND TURBIDITY TESTING IS NOT REQUIRED.
  3. ALL PROPOSED IRRIGATION WATER CONSTRUCTION SHOWN ON THIS SHEET IS THE COST RESPONSIBILITY OF NCDOT.

**NOTE:**  
 THE ESTIMATED QUANTITY OF DUCTILE IRON WATER PIPE FITTINGS ON THIS PLAN SHEET IS 50 POUNDS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.



5/14/99  
 10+00  
 15+00  
 MATCHLINE (SEE SHEET UC-17A)



PROJECT REFERENCE NO. <b>R-5705A</b>	SHEET NO. <b>UC-20</b>
DESIGNED BY: <b>AP</b>	
DRAWN BY: <b>AP</b>	
CHECKED BY: <b>TM</b>	
APPROVED BY:	
REVISED:	
<b>NORTH CAROLINA DEPARTMENT OF TRANSPORTATION</b> UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151 UTILITY CONSTRUCTION PLANS ONLY	
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**UTILITY CONSTRUCTION**  
 DOCUMENT NOT CONSIDERED FINAL  
 UNLESS ALL SIGNATURES COMPLETED

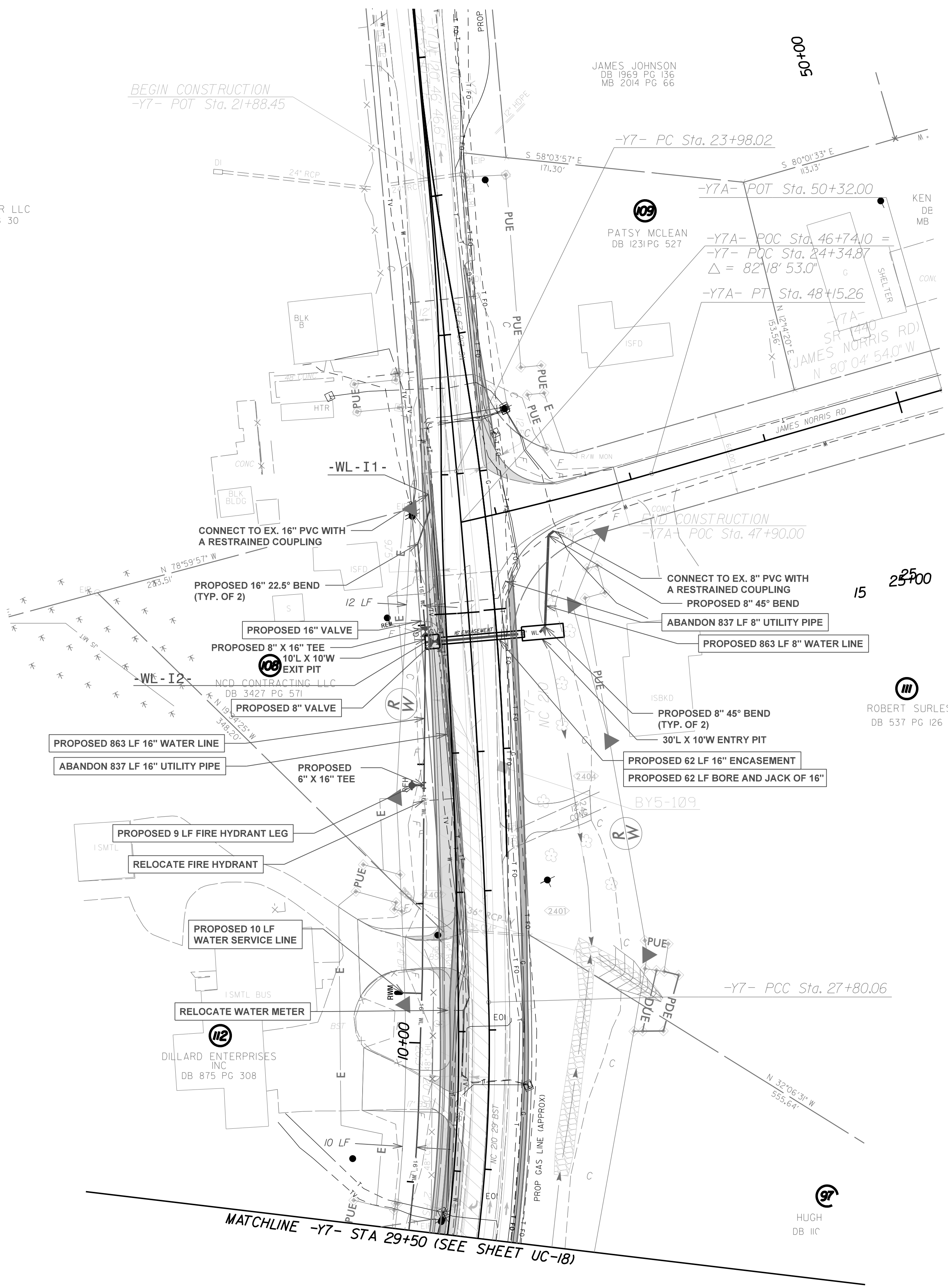
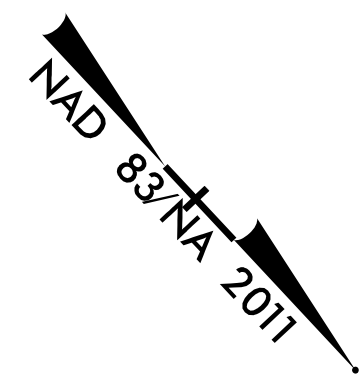
NC DUMPSTER LLC  
 DB 3337 PG 30

JAMES JOHNSON  
 DB 1969 PG 136  
 MB 2014 PG 66

PATSY MCLEAN  
 DB 1231 PG 527

ROBERT SURLE  
 DB 537 PG 126

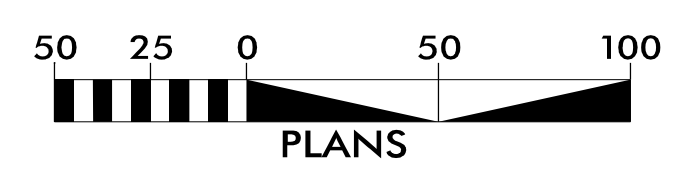
MATCHLINE -Y7- STA 29+50 (SEE SHEET UC-18)



**NOTES:**

1. ALL BORE AND JACKS SHALL HAVE PROPERLY SPACED SPIDERS FOR CARRIER PIPE.

PROPOSED 2,330 POUNDS OF DUCTILE IRON WATER PIPE FITTINGS











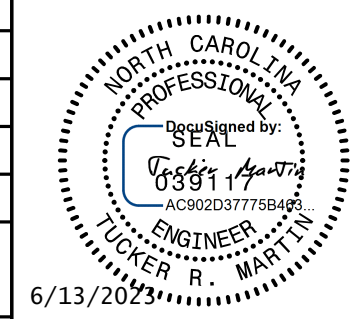


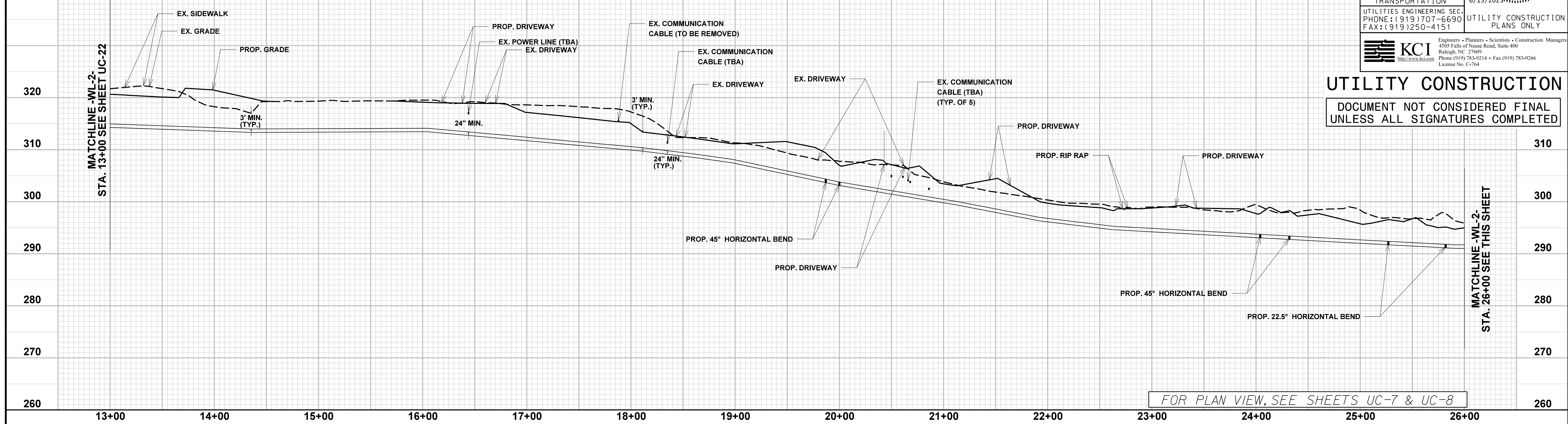
5/28/99

NOTES:

1. CONTRACTOR TO VERIFY LOCATION, DEPTH, AND SIZE OF EXISTING UTILITIES AND STORMWATER PIPES. CONTRACTORS SHALL MAINTAIN A 24" MINIMUM VERTICAL SEPARATION FROM PROPOSED WATERLINE, UNLESS OTHERWISE NOTED ON THE PLANS.

# -WL-2-

PROJECT REFERENCE NO. R-5705A	SHEET NO. UC-23
DESIGNED BY: AP	
DRAWN BY: AP	
CHECKED BY: TM	
APPROVED BY: MM	
REVISED:	NORTH CAROLINA DEPARTMENT OF TRANSPORTATION 6/13/2023
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	UTILITY CONSTRUCTION PLANS ONLY Engineers • Planners • Scientists • Construction Managers 4508 Falls of Neuse Road, Suite 400 Raleigh, NC 27609 Phone (919) 783-9214 • Fax (919) 783-9266 License No. C-764

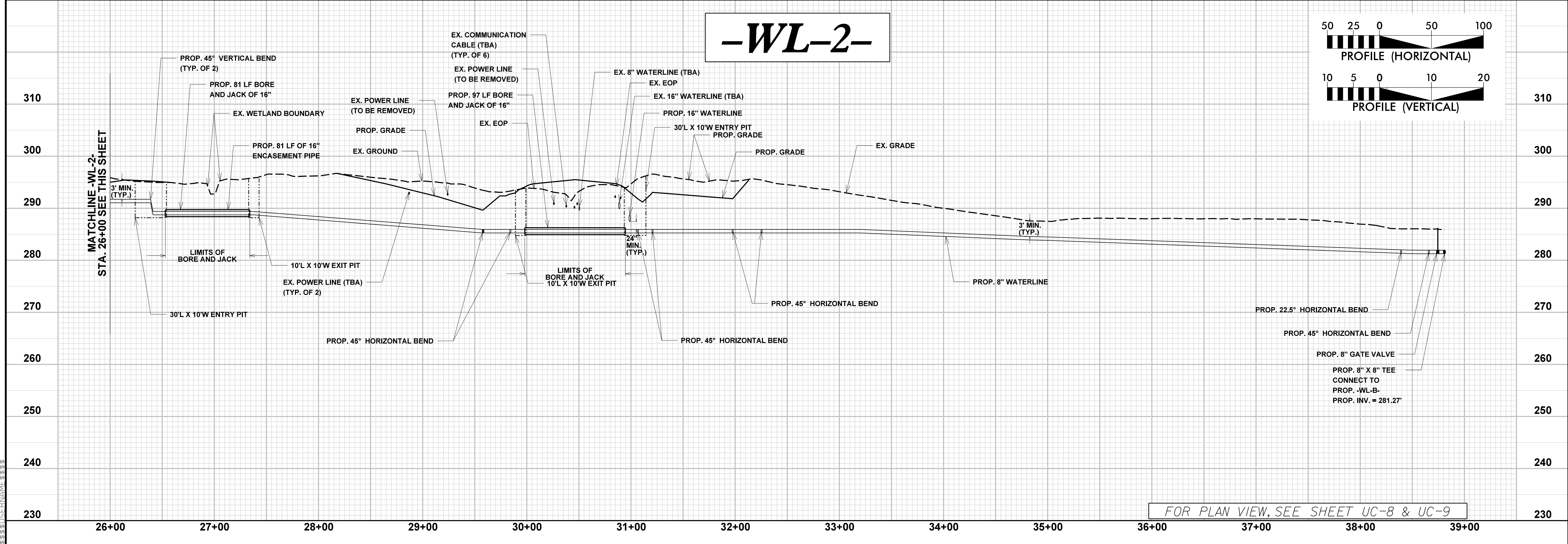
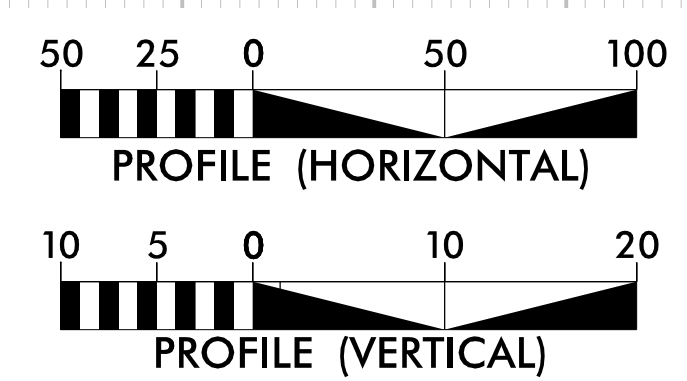


UTILITY CONSTRUCTION  
DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED

FOR PLAN VIEW, SEE SHEETS UC-7 & UC-8

IS: JAN 2023 14:12 M:\2016\05\001633AM R-5705 AB&C\R-5705A\Water\_Wastewater\R5705A\_ut\_wtr\_UC23.pfl.dgn

# -WL-2-



FOR PLAN VIEW, SEE SHEET UC-8 & UC-9





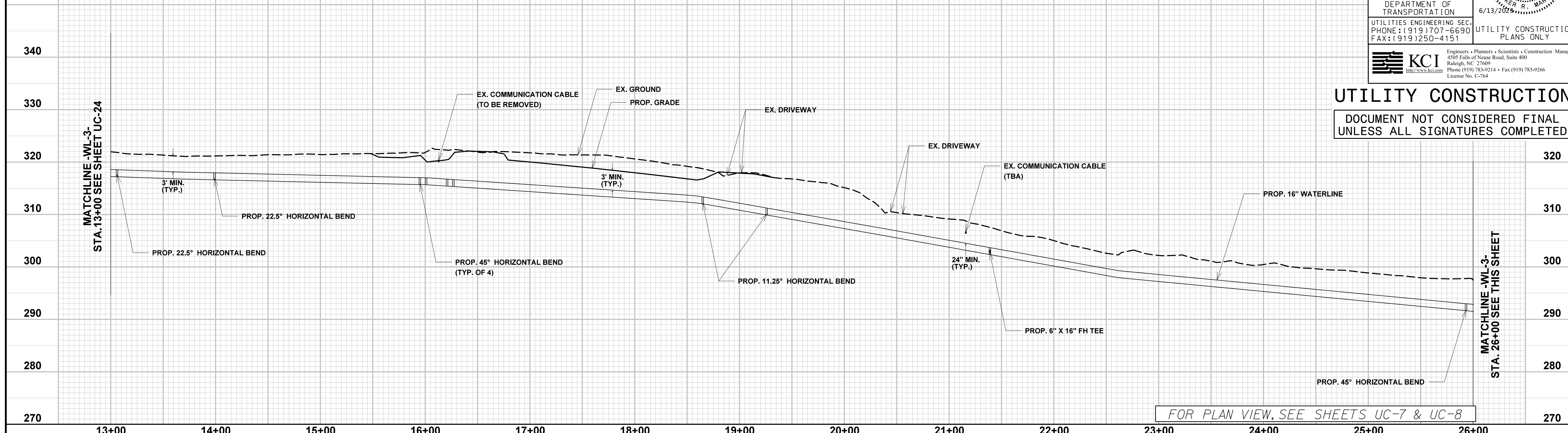


5/28/99

PROJECT REFERENCE NO.	SHEET NO.
R-5705A	UC-25
DESIGNED BY: AP	
DRAWN BY: AP	
CHECKED BY: TM	
APPROVED BY: MM	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	
ENGINEERS • PLANNERS • SCIENTISTS • CONSTRUCTION MANAGERS 4508 Falls of Neuse Road, Suite 400 Raleigh, NC 27609 Phone (919) 783-9214 • Fax (919) 783-9266 License No. C-764	

NOTES:  
 1. CONTRACTOR TO VERIFY LOCATION, DEPTH, AND SIZE OF EXISTING UTILITIES AND STORMWATER PIPES. CONTRACTORS SHALL MAINTAIN A 24" MINIMUM VERTICAL SEPARATION FROM PROPOSED WATERLINE, UNLESS OTHERWISE NOTED ON THE PLANS.

# -WL-3-

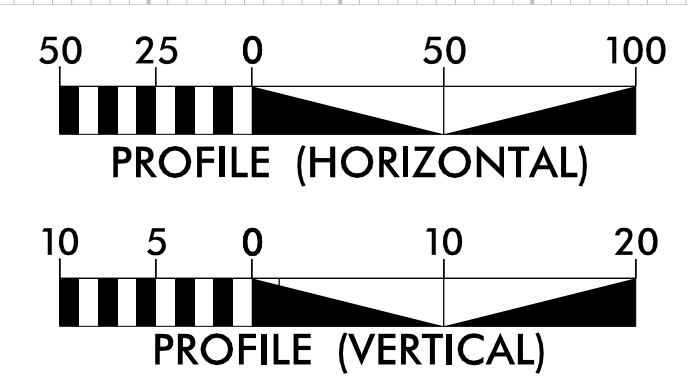
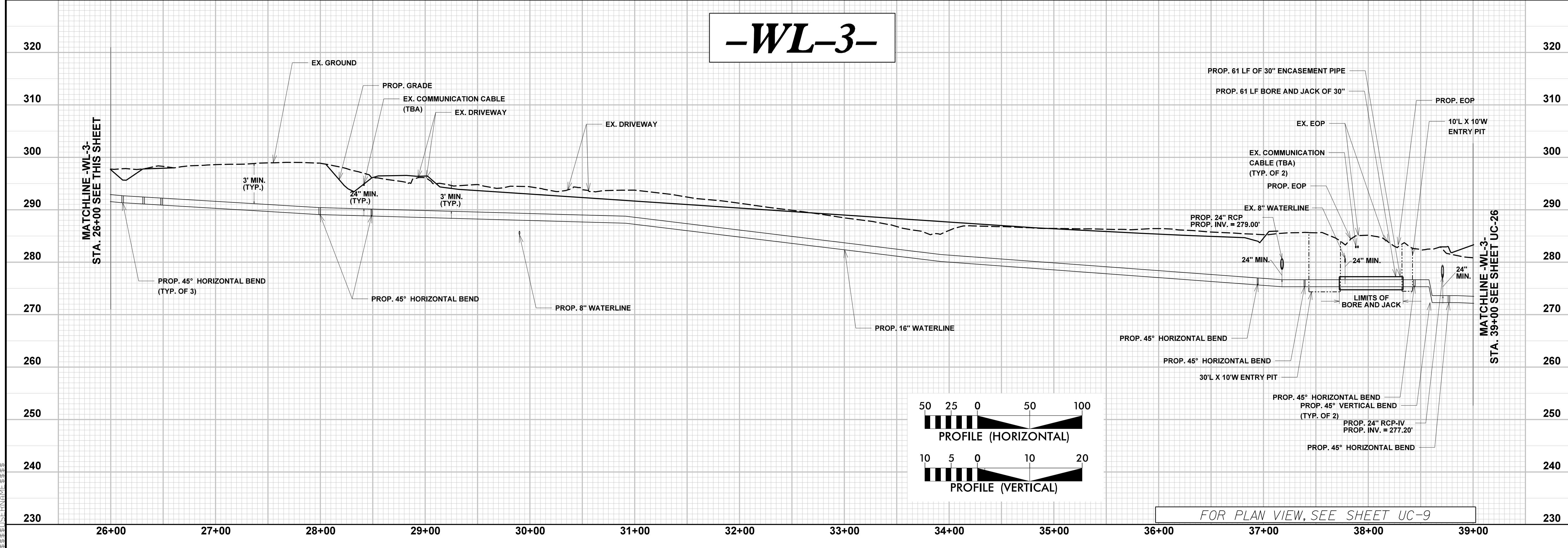


**UTILITY CONSTRUCTION**  
 DOCUMENT NOT CONSIDERED FINAL  
 UNLESS ALL SIGNATURES COMPLETED

FOR PLAN VIEW, SEE SHEETS UC-7 & UC-8

17 MAY 2003 10:30 AM  
 M:\2003\05\00\5705A\Water\Wastewater\RS5705A\_ut\_wtr\_UC27\_p1.dgn  
 5/28/99

# -WL-3-



FOR PLAN VIEW, SEE SHEET UC-9







5/28/99

# -WL-4-

NOTES:  
1. CONTRACTOR TO VERIFY LOCATION, DEPTH, AND SIZE OF EXISTING UTILITIES AND STORMWATER PIPES. CONTRACTORS SHALL MAINTAIN A 24" MINIMUM VERTICAL SEPARATION FROM PROPOSED WATERLINE, UNLESS OTHERWISE NOTED ON THE PLANS.

PROJECT REFERENCE NO. R-5705A	SHEET NO. UC-27
DESIGNED BY: AP	
DRAWN BY: AP	
CHECKED BY: TM	
APPROVED BY: TM	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION 6/13/2028	
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	UTILITY CONSTRUCTION PLANS ONLY

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Engineers • Planners • Scientists • Construction Managers  
4508 Falls of Neuse Road, Suite 400  
Raleigh, NC 27609  
Phone (919) 783-9214 • Fax (919) 783-9266  
License No. C-764

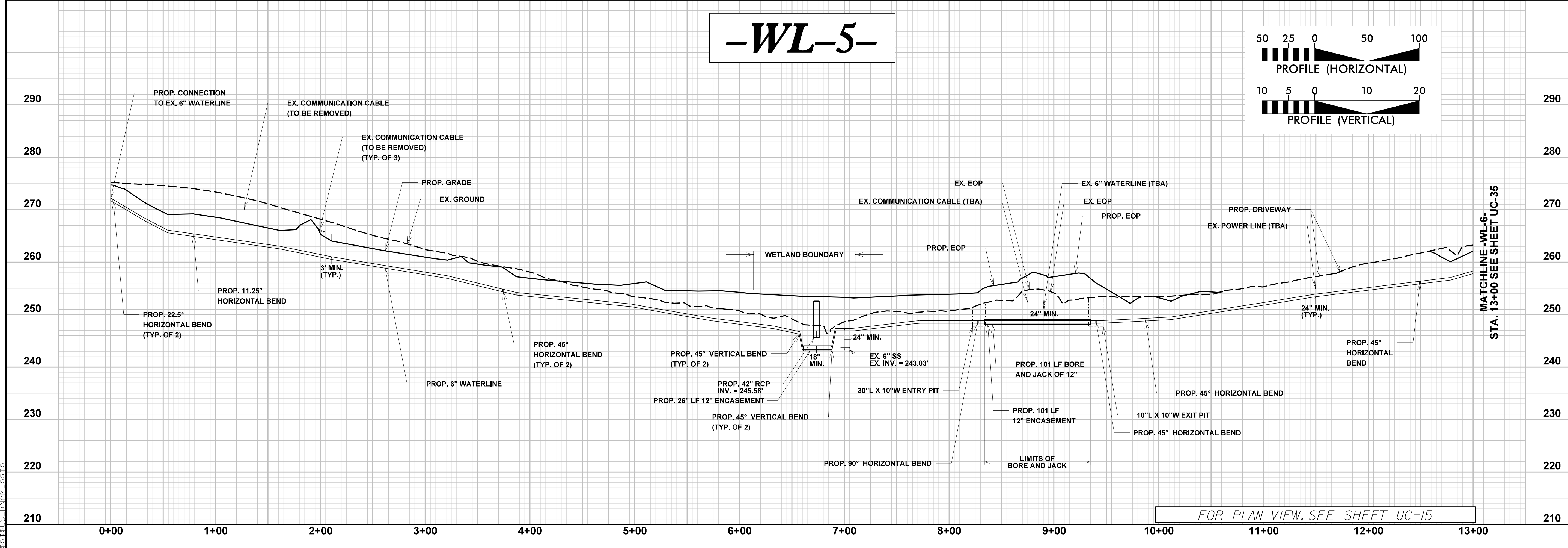
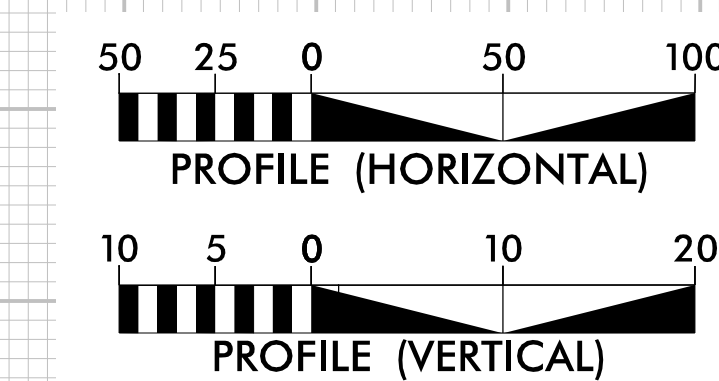
## UTILITY CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED



FOR PLAN VIEW, SEE SHEETS UC-12 & UC-13

# -WL-5-



FOR PLAN VIEW, SEE SHEET UC-15

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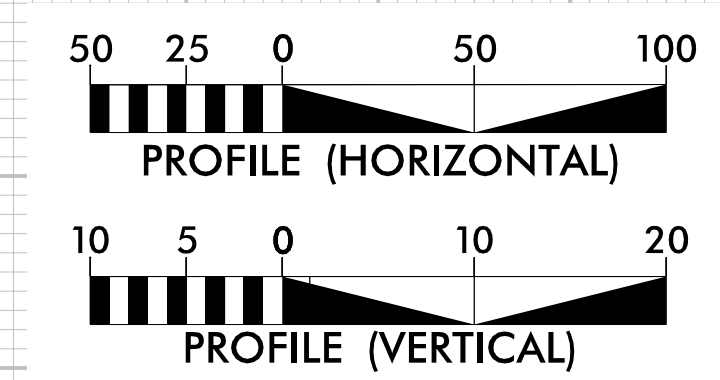
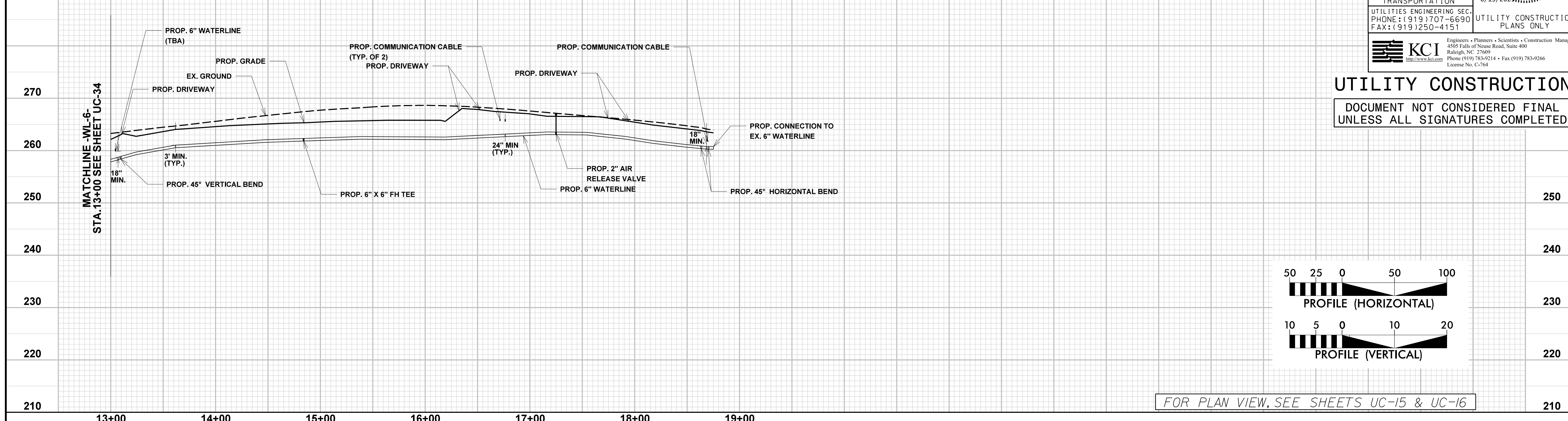


5/28/99

PROJECT REFERENCE NO. R-5705A	SHEET NO. UC-28
DESIGNED BY: AP	
DRAWN BY: AP	
CHECKED BY: TM	
APPROVED BY: TM	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	
ENGINEERS • PLANNERS • SCIENTISTS • CONSTRUCTION MANAGERS 4508 Falls of Neuse Road, Suite 400 Raleigh, NC 27609 Phone (919) 783-9214 • Fax (919) 783-9266 License No. C-764	

# -WL-5-

NOTES:  
 1. CONTRACTOR TO VERIFY LOCATION, DEPTH, AND SIZE OF EXISTING UTILITIES AND STORMWATER PIPES. CONTRACTORS SHALL MAINTAIN A 24" MINIMUM VERTICAL SEPARATION FROM PROPOSED WATERLINE, UNLESS OTHERWISE NOTED ON THE PLANS.



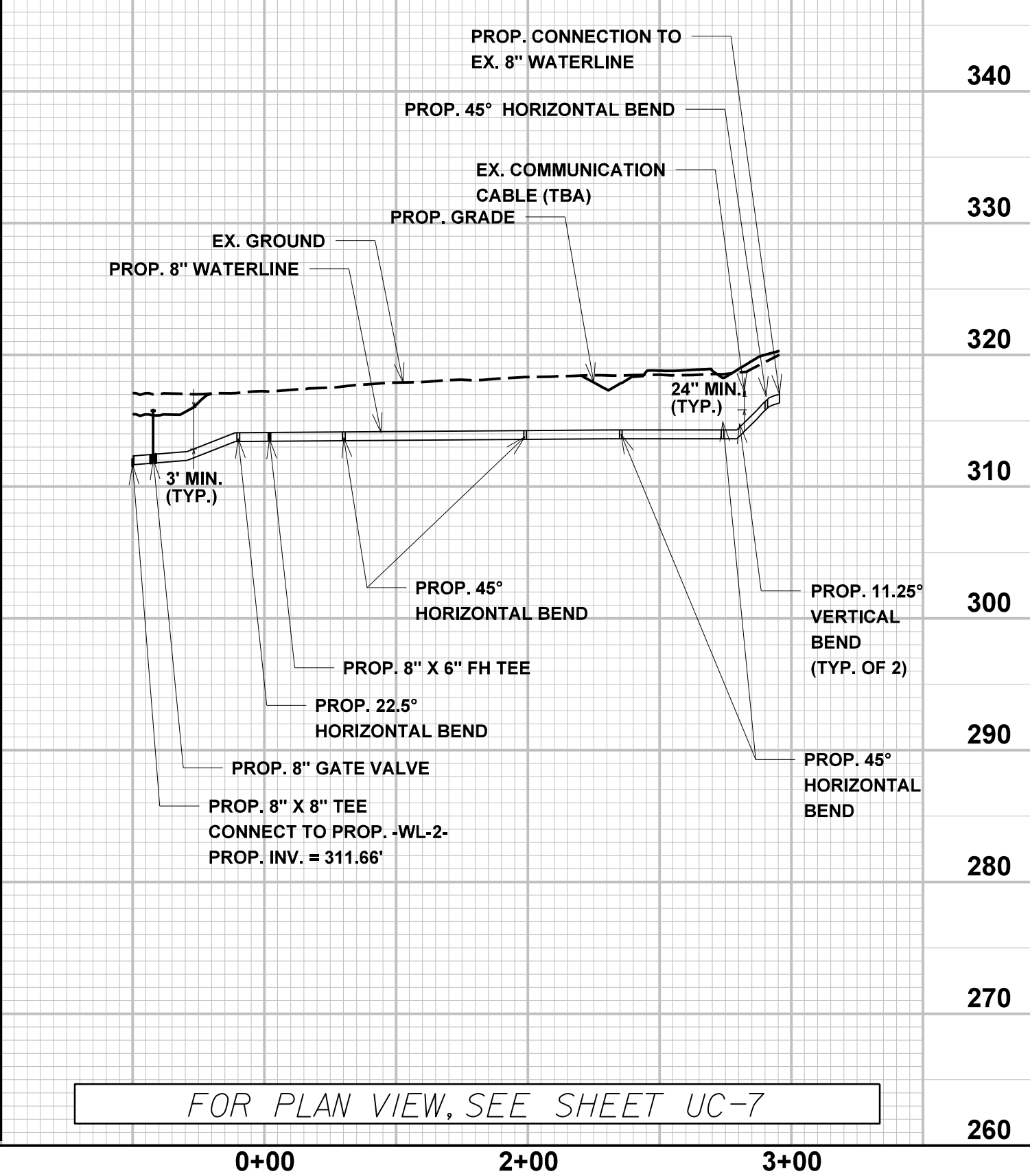
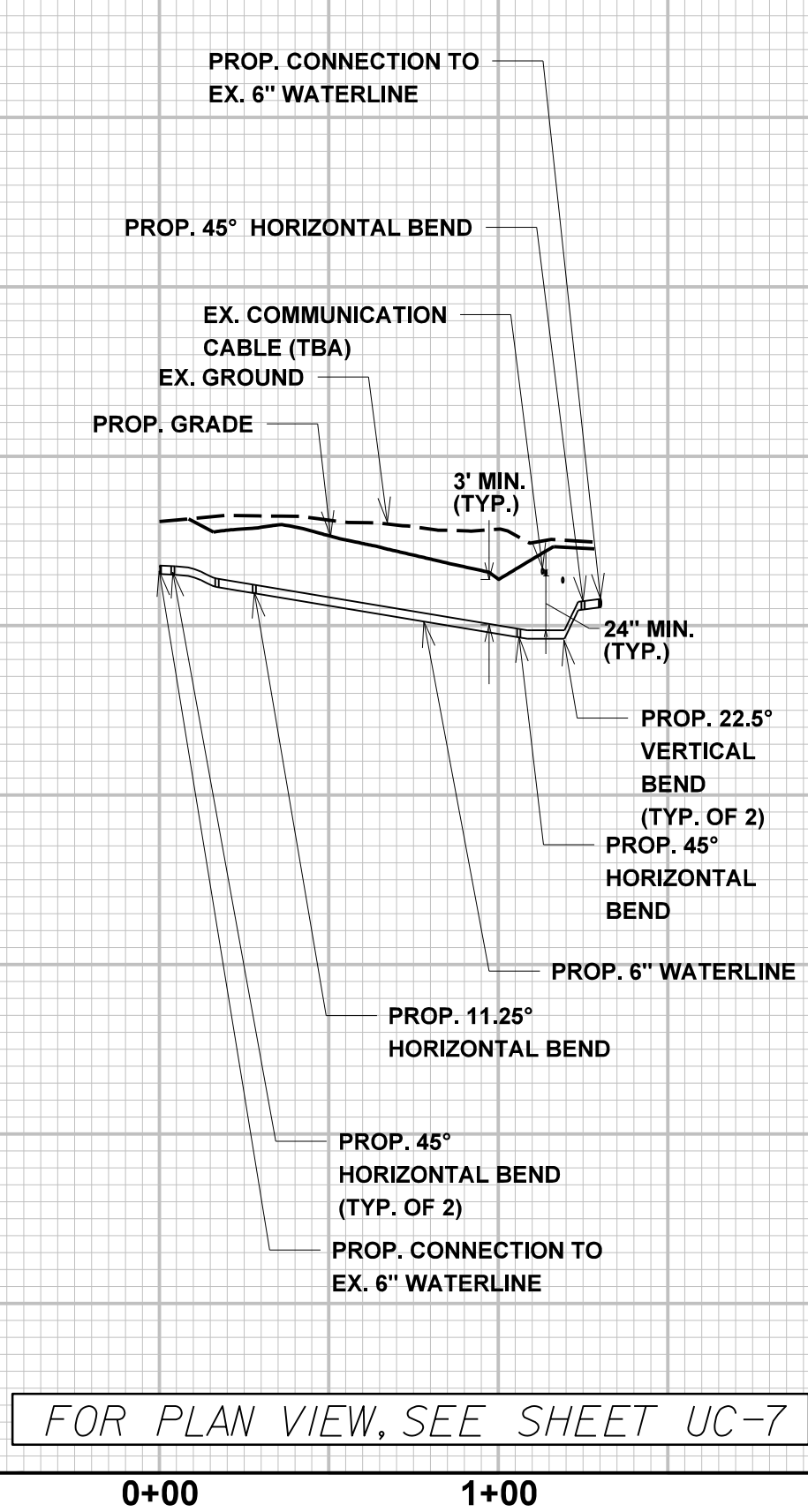
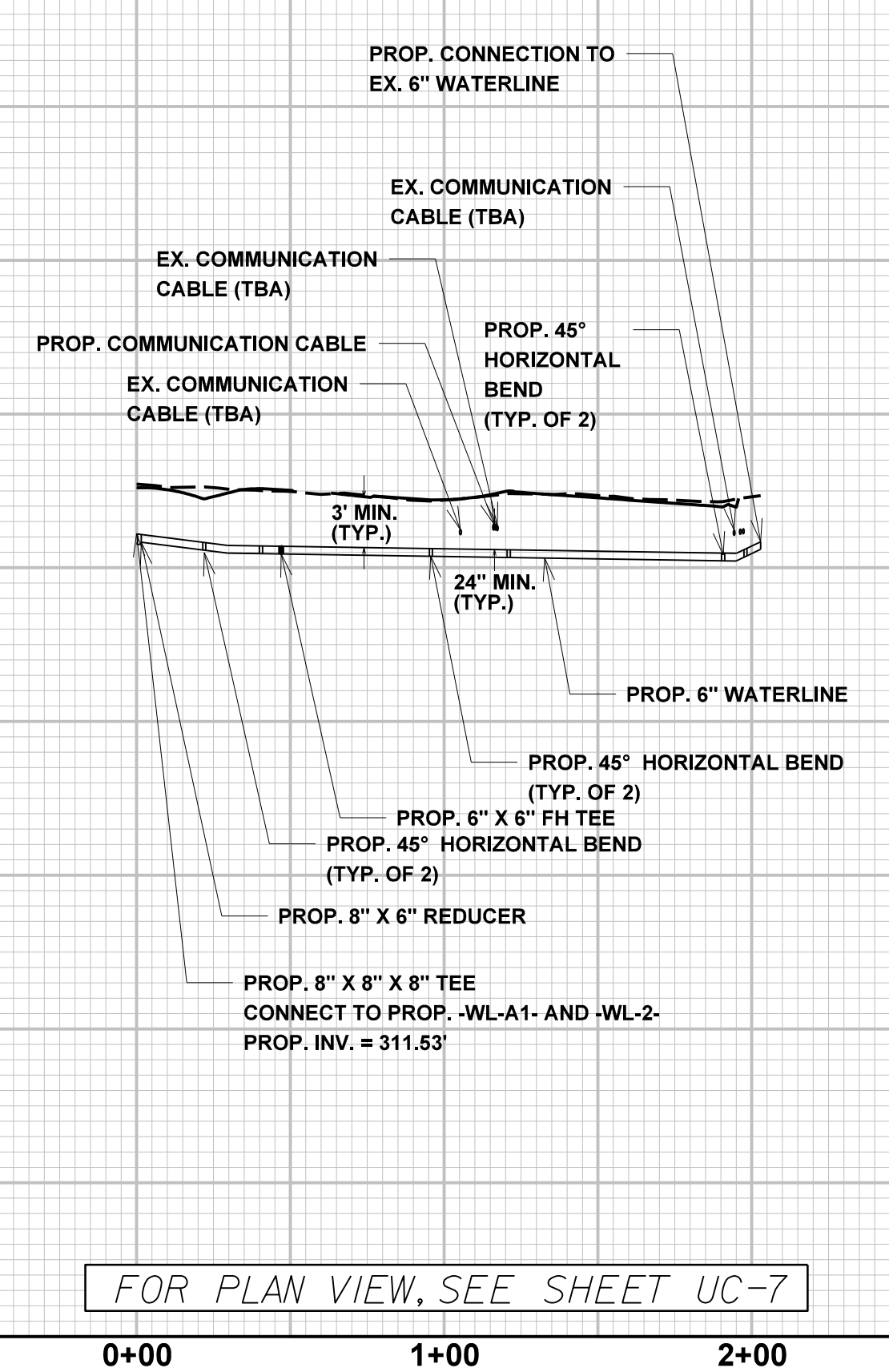
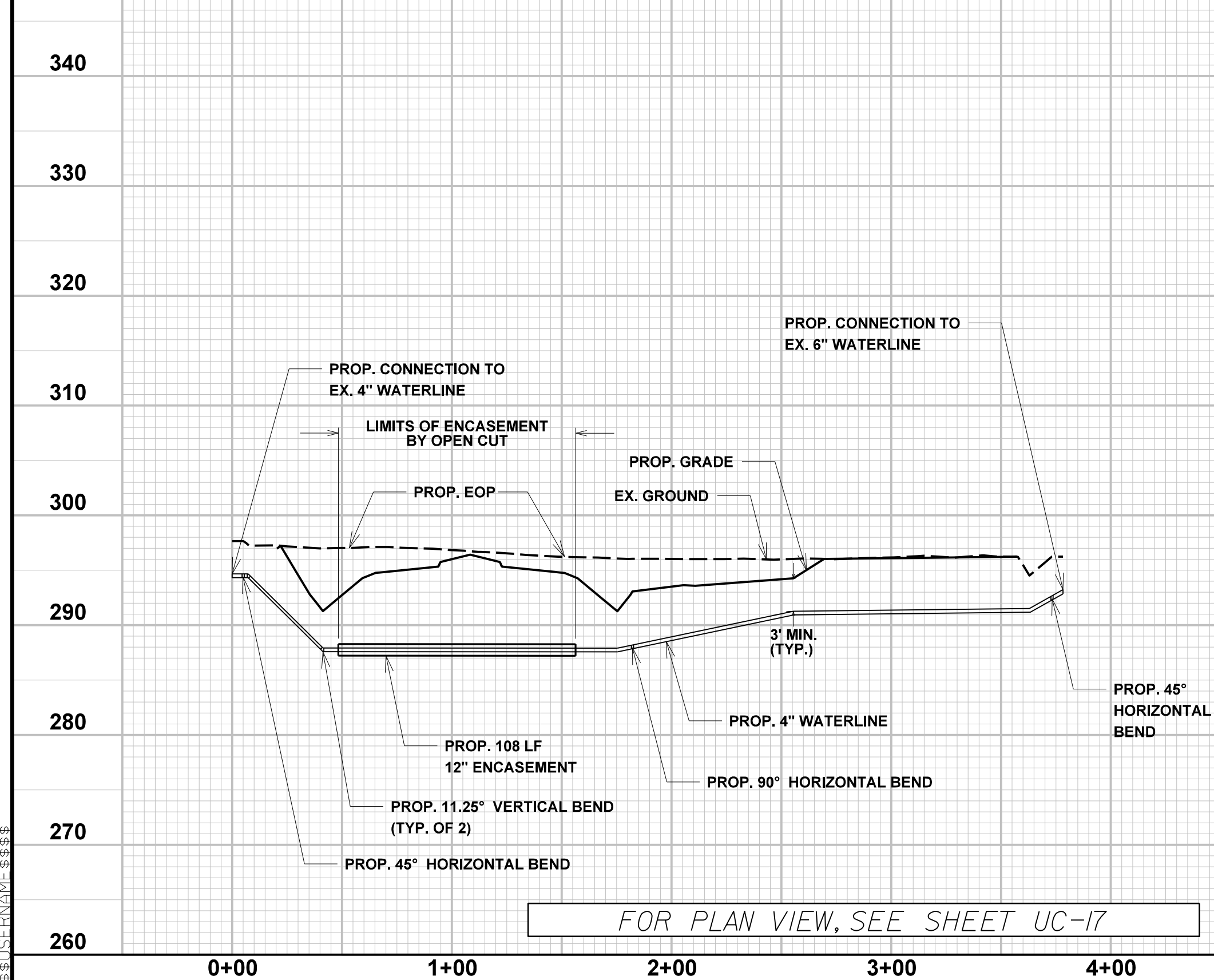
FOR PLAN VIEW, SEE SHEETS UC-15 & UC-16

# -WL-6-

# -WL-A1-

# -WL-A2-

# -WL-A3-



FOR PLAN VIEW, SEE SHEET UC-17

FOR PLAN VIEW, SEE SHEET UC-7

FOR PLAN VIEW, SEE SHEET UC-7

FOR PLAN VIEW, SEE SHEET UC-7

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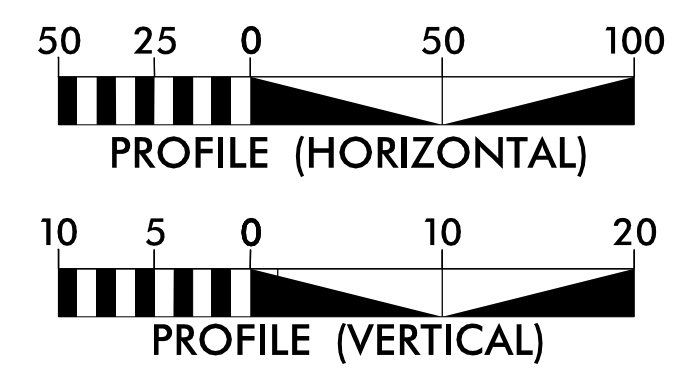
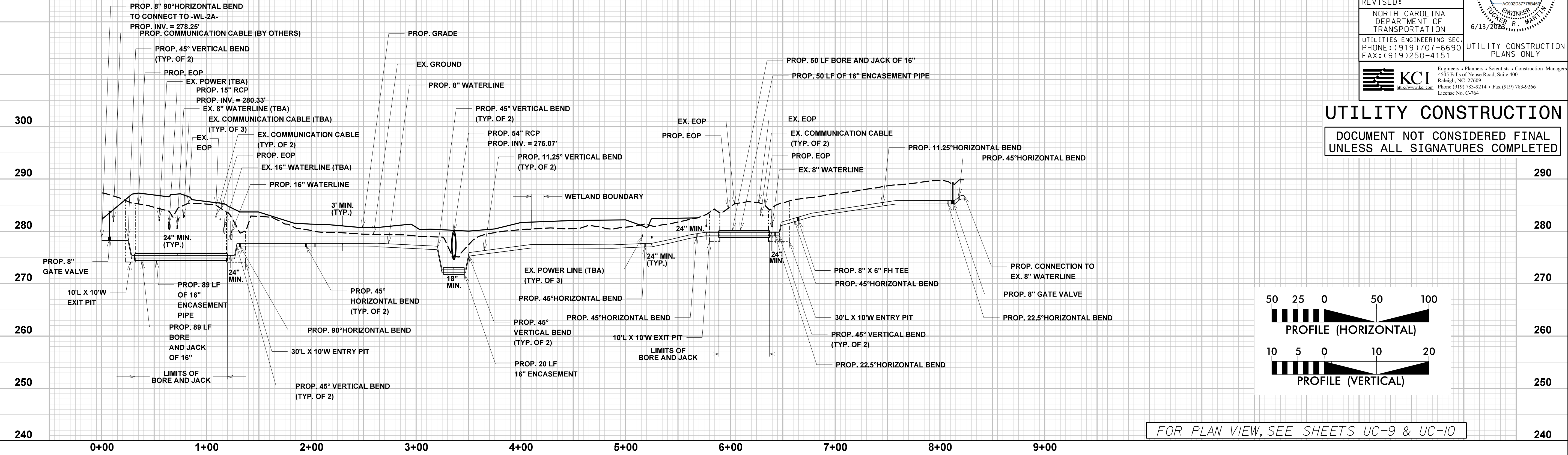


5/28/99

# -WL-B-

NOTES:  
 1. CONTRACTOR TO VERIFY LOCATION, DEPTH, AND SIZE OF EXISTING UTILITIES AND STORMWATER PIPES. CONTRACTORS SHALL MAINTAIN A 24" MINIMUM VERTICAL SEPARATION FROM PROPOSED WATERLINE, UNLESS OTHERWISE NOTED ON THE PLANS.

PROJECT REFERENCE NO. R-5705A	SHEET NO. UC-29
DESIGNED BY: AP	
DRAWN BY: AP	
CHECKED BY: TM	
APPROVED BY: TM	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	
UTILITY CONSTRUCTION PLANS ONLY Engineers • Planners • Scientists • Construction Managers 4508 Falls of Neuse Road, Suite 400 Raleigh, NC 27609 Phone (919) 783-9214 • Fax (919) 783-9266 License No. C-764	

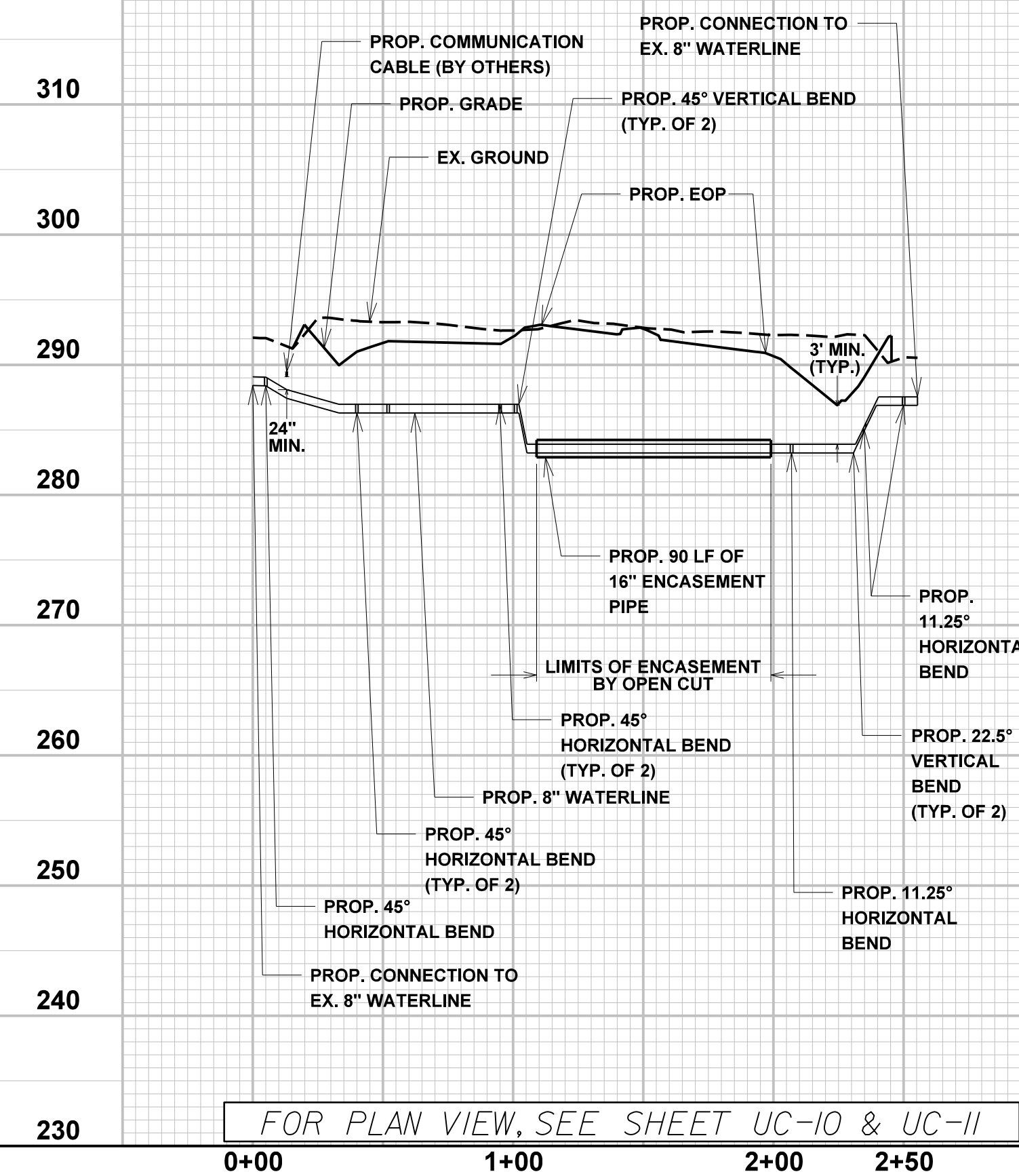


FOR PLAN VIEW, SEE SHEETS UC-9 & UC-10

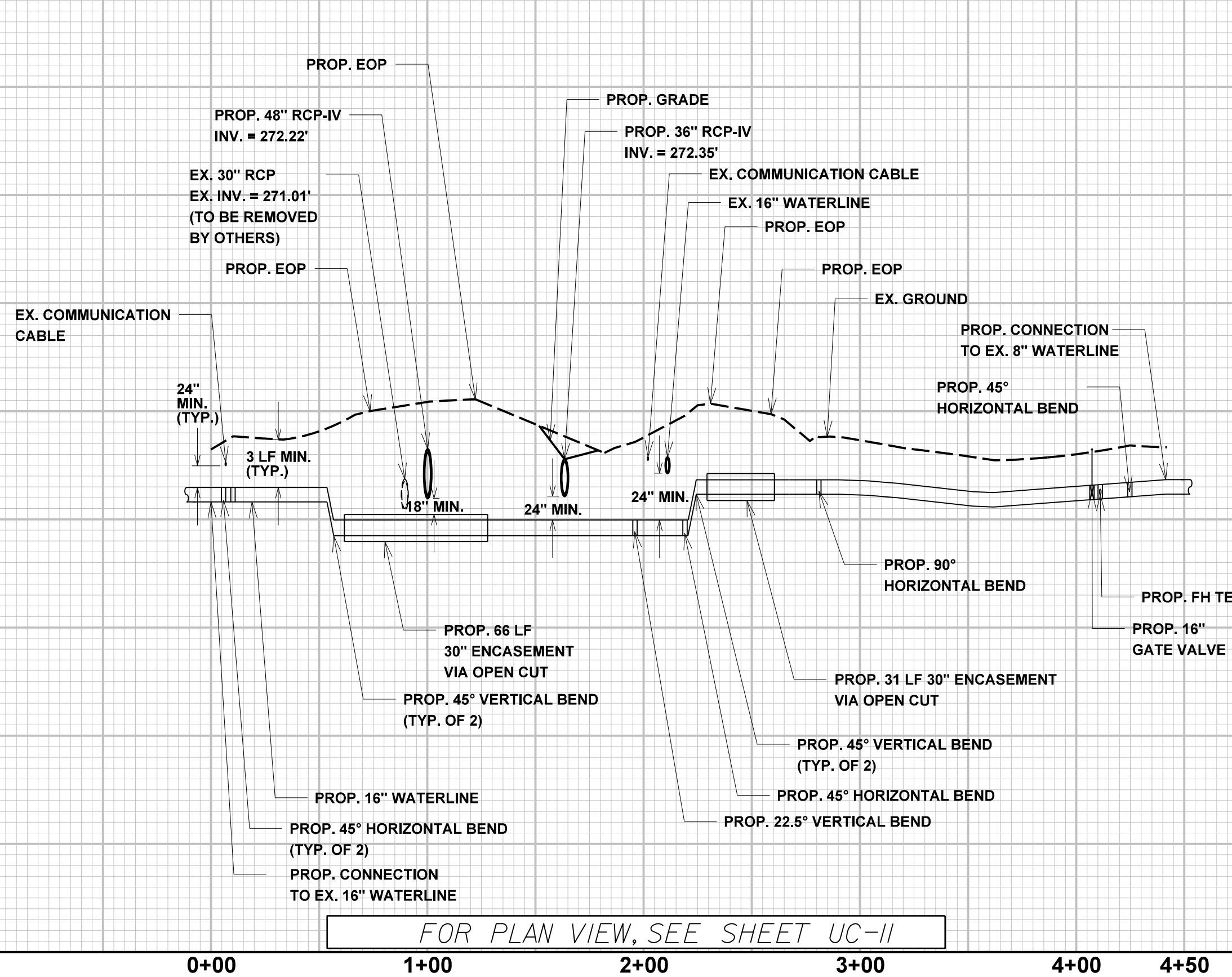
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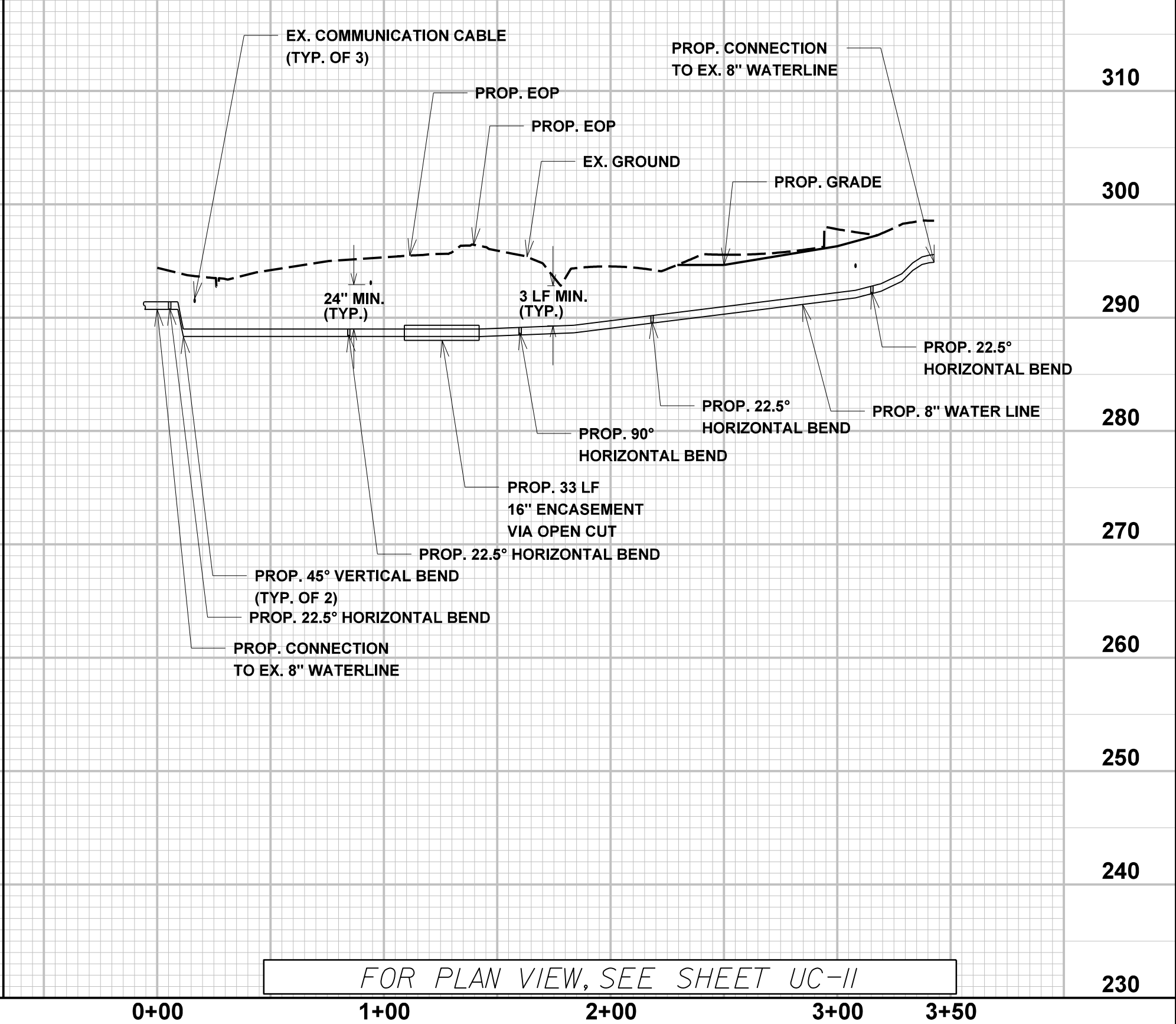
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FOR PLAN VIEW, SEE SHEET UC-10 & UC-11



FOR PLAN VIEW, SEE SHEET UC-11



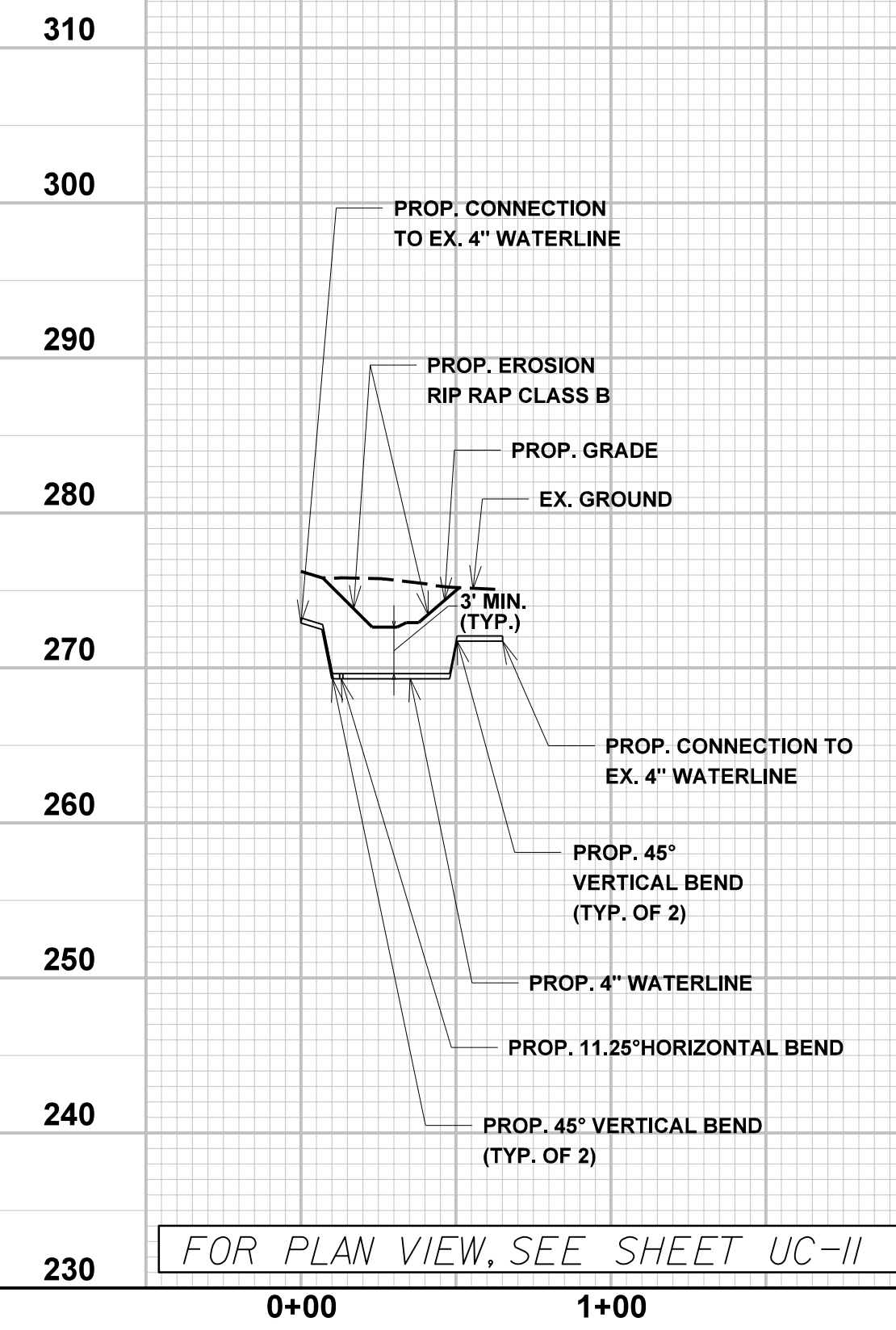
FOR PLAN VIEW, SEE SHEET UC-11

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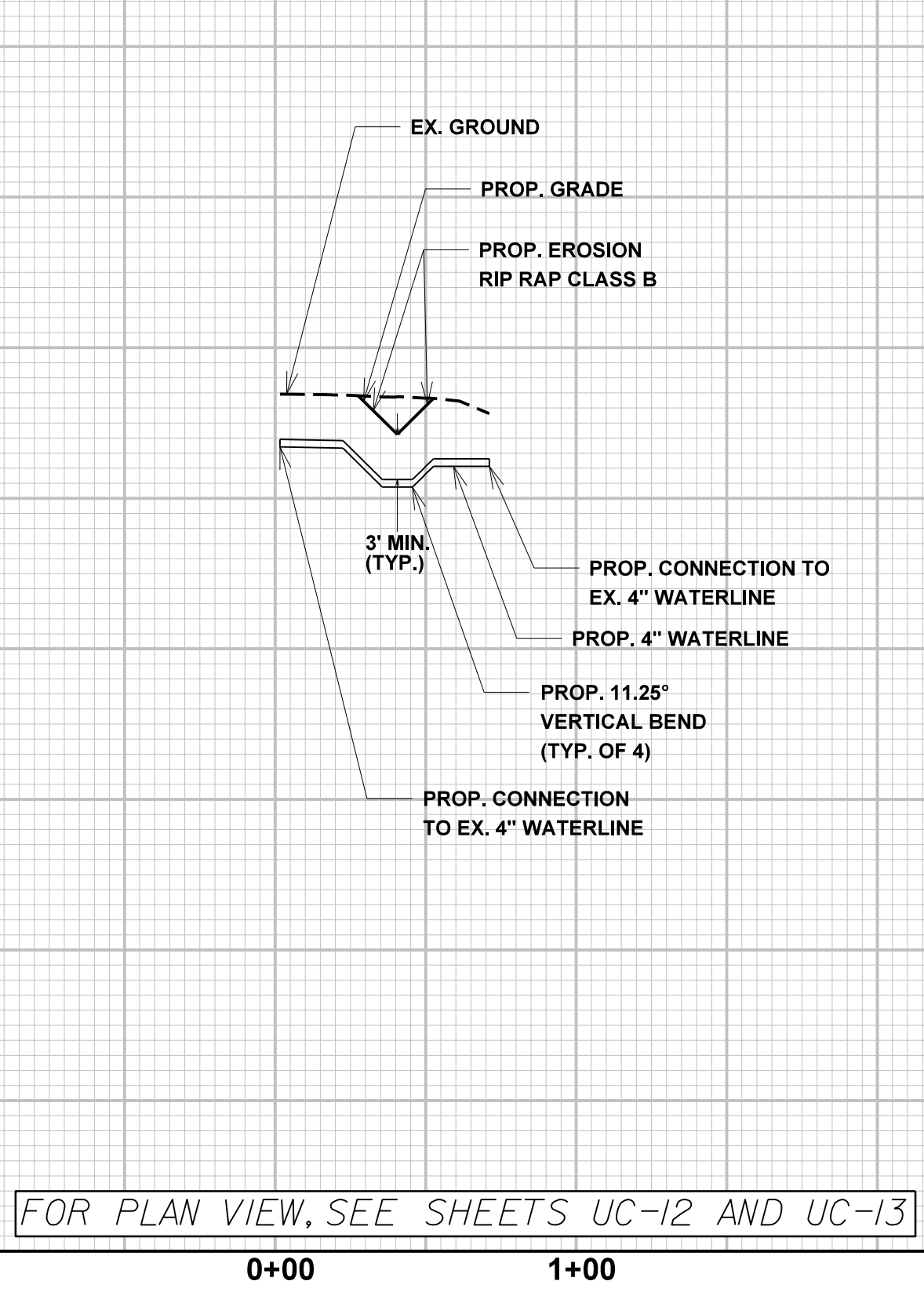
5/28/2019

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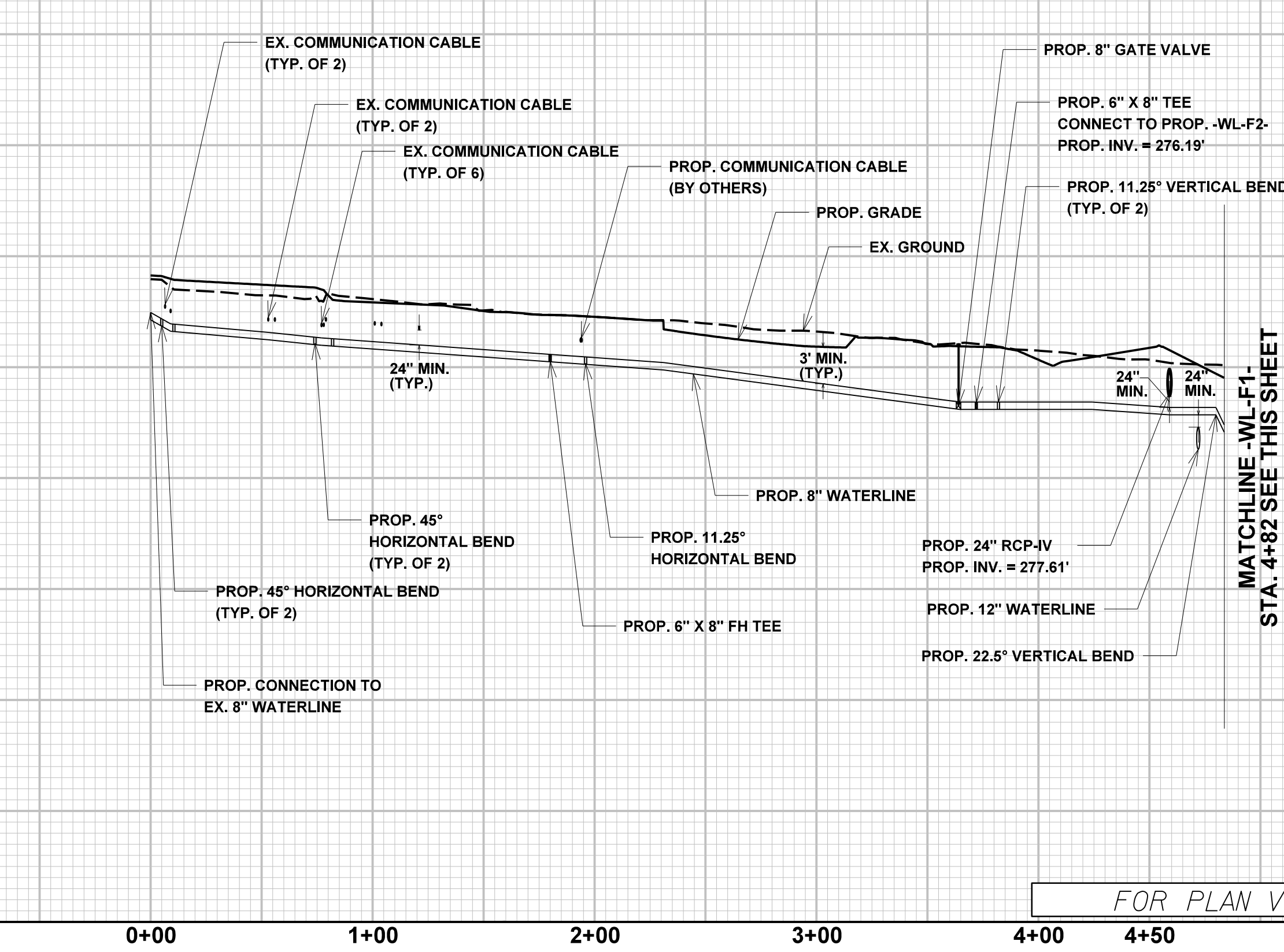
FOR PLAN VIEW, SEE SHEET UC-II

# -WL-E-



FOR PLAN VIEW, SEE SHEETS UC-12 AND UC-13

# -WL-F1-

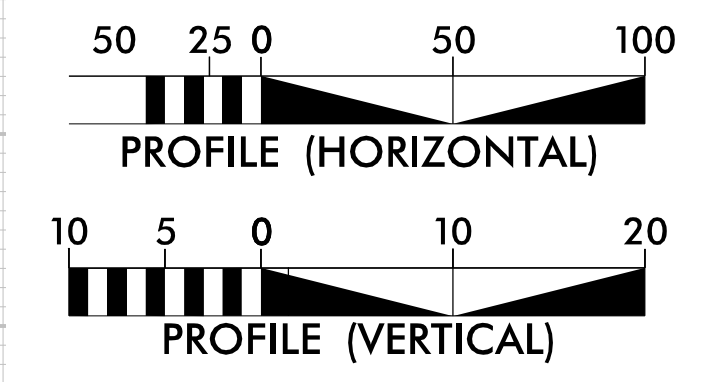


FOR PLAN VIEW, SEE SHEETS UC-14

NOTES:  
 1. CONTRACTOR TO VERIFY LOCATION, DEPTH, AND SIZE OF EXISTING UTILITIES AND STORMWATER PIPES. CONTRACTORS SHALL MAINTAIN A 24" MINIMUM VERTICAL SEPARATION FROM PROPOSED WATERLINE, UNLESS OTHERWISE NOTED ON THE PLANS.

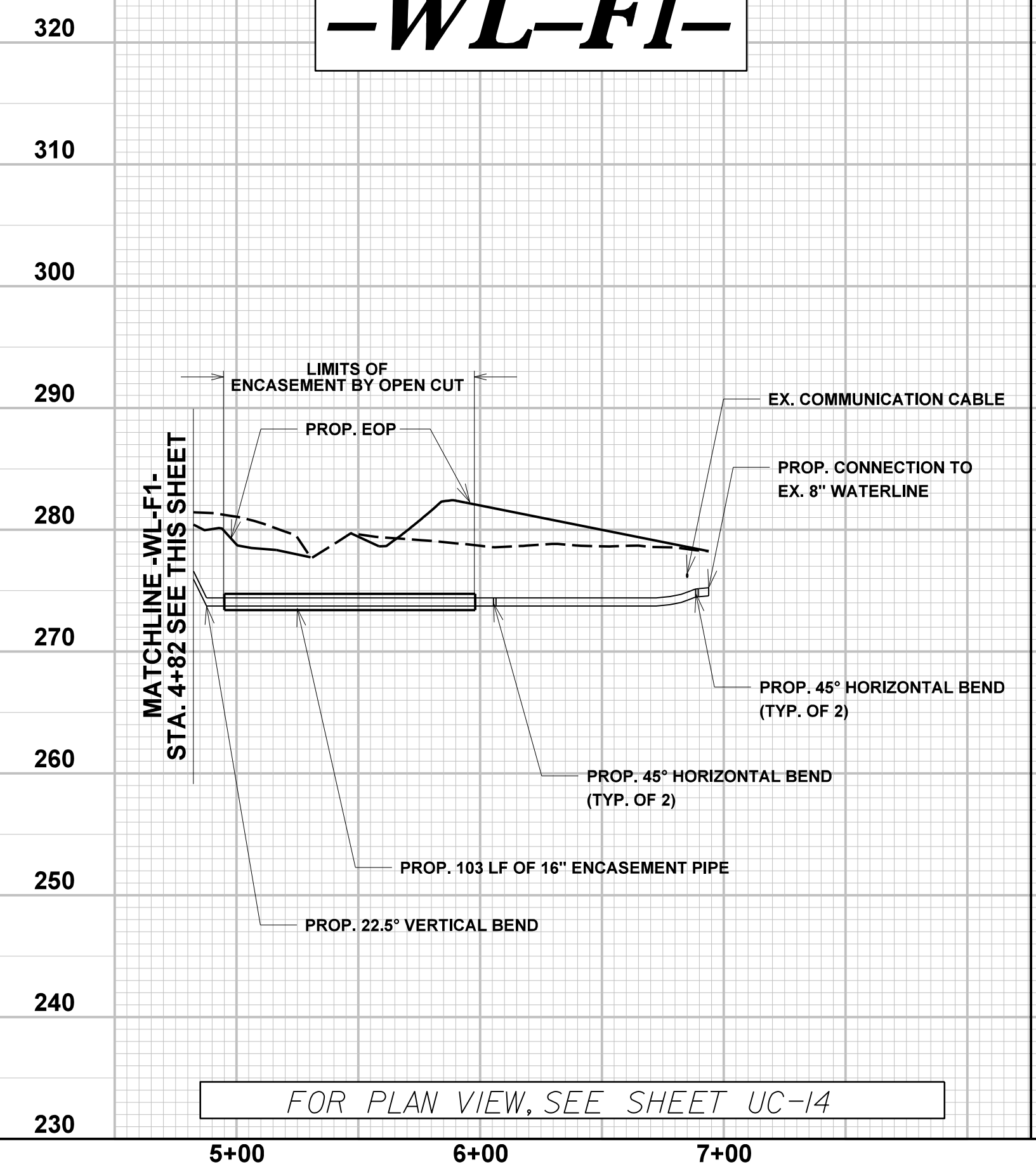
PROJECT REFERENCE NO. R-5705A	SHEET NO. UC-30
DESIGNED BY: AP	
DRAWN BY: AP	
CHECKED BY: TM	
APPROVED BY: TM	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151 UTILITY CONSTRUCTION PLANS ONLY	
Engineers • Planners • Scientists • Construction Managers 4508 Falls of Neuse Road, Suite 400 Raleigh, NC 27609 Phone (919) 783-9214 • Fax (919) 783-9266 License No. C-764	

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 UNLESS ALL SIGNATURES COMPLETED



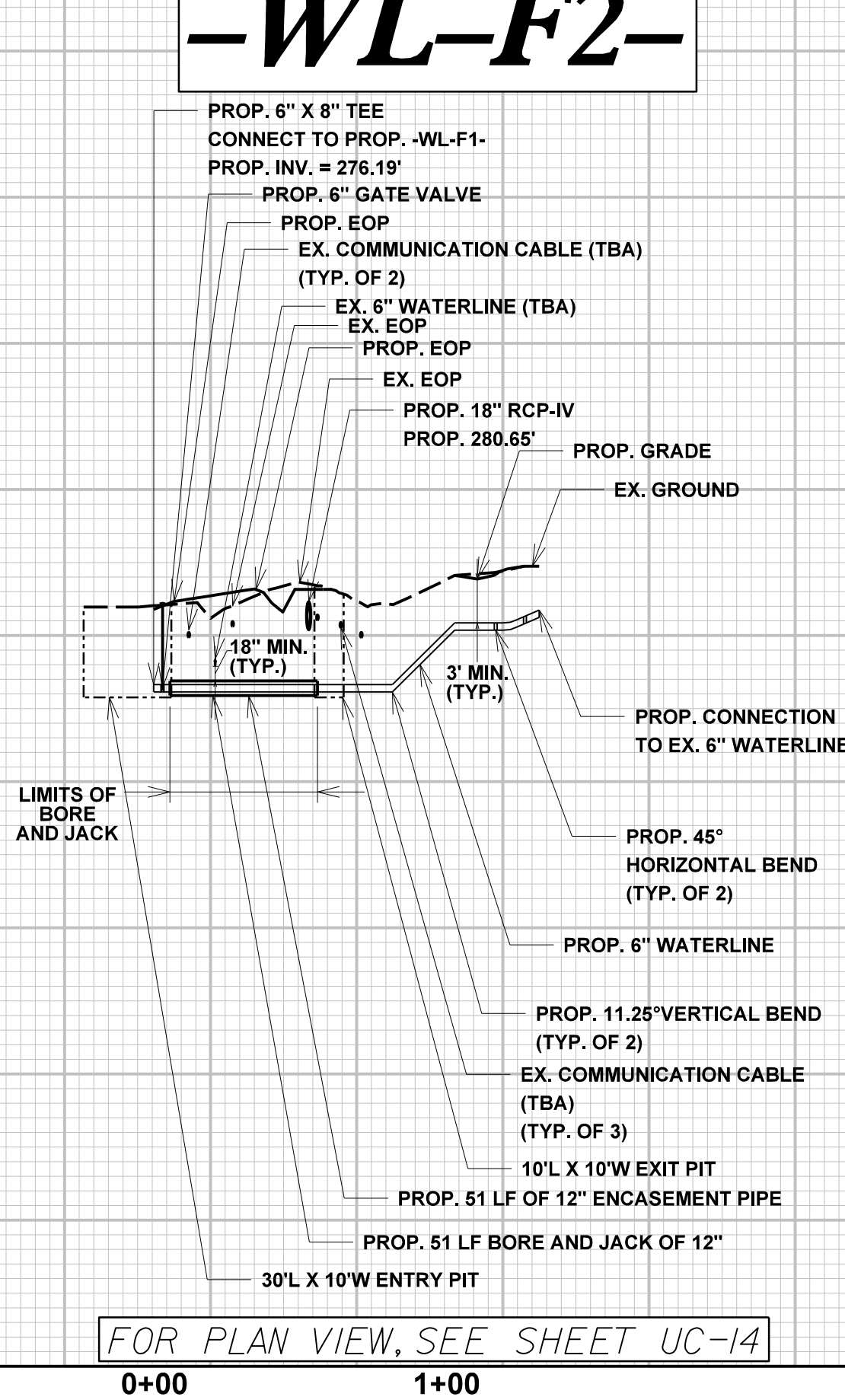
18 MAY 2019 08:45 AM R-5705 AB8\C\R-5705A\Water\_Wastewater\_VR5705A\_ut\_wtr\_UC37\_pfl.dgn

# -WL-F1-



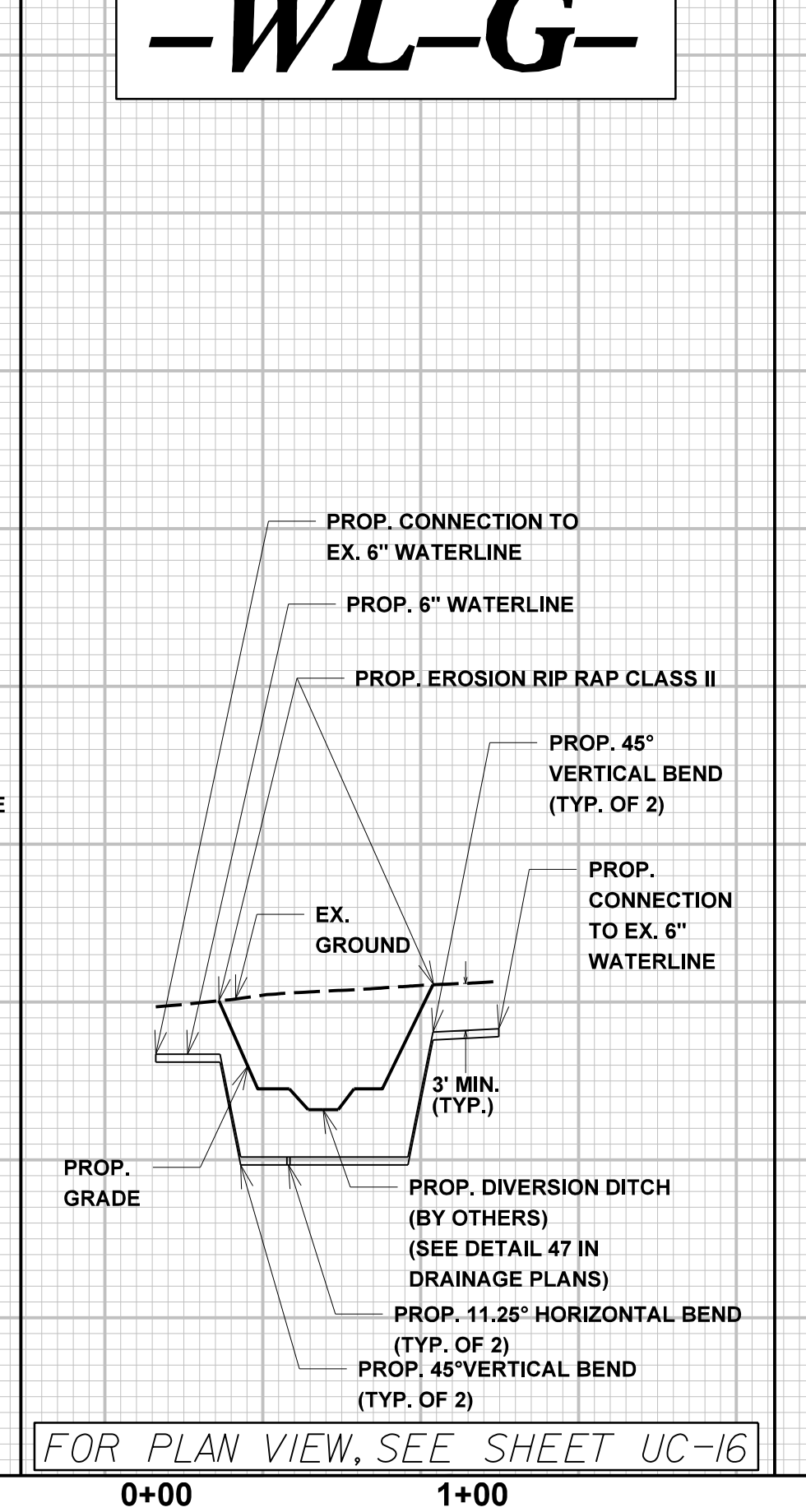
FOR PLAN VIEW, SEE SHEET UC-14

# -WL-F2-



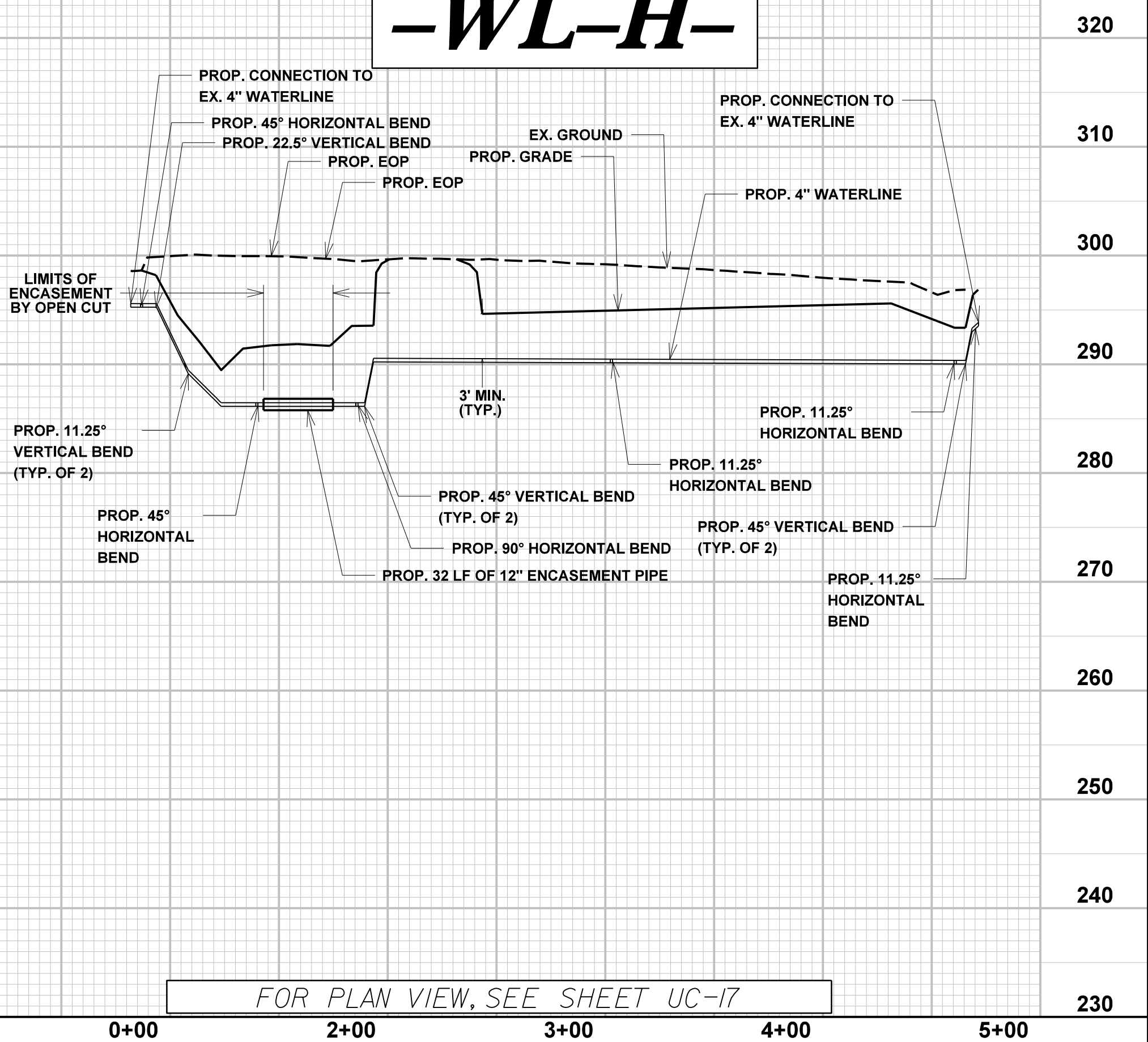
FOR PLAN VIEW, SEE SHEET UC-14

# -WL-G-



FOR PLAN VIEW, SEE SHEET UC-16

# -WL-H-



FOR PLAN VIEW, SEE SHEET UC-17



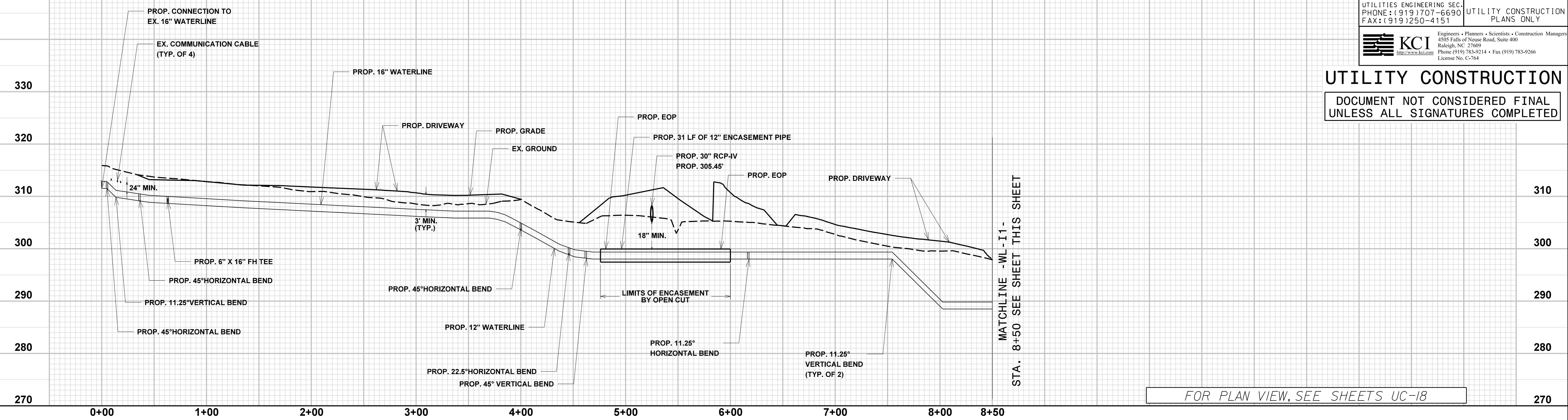
5/28/99

PROJECT REFERENCE NO. R-5705A	SHEET NO. UC-31
DESIGNED BY: AP	
DRAWN BY: AP	
CHECKED BY: TM	
APPROVED BY: MM	
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

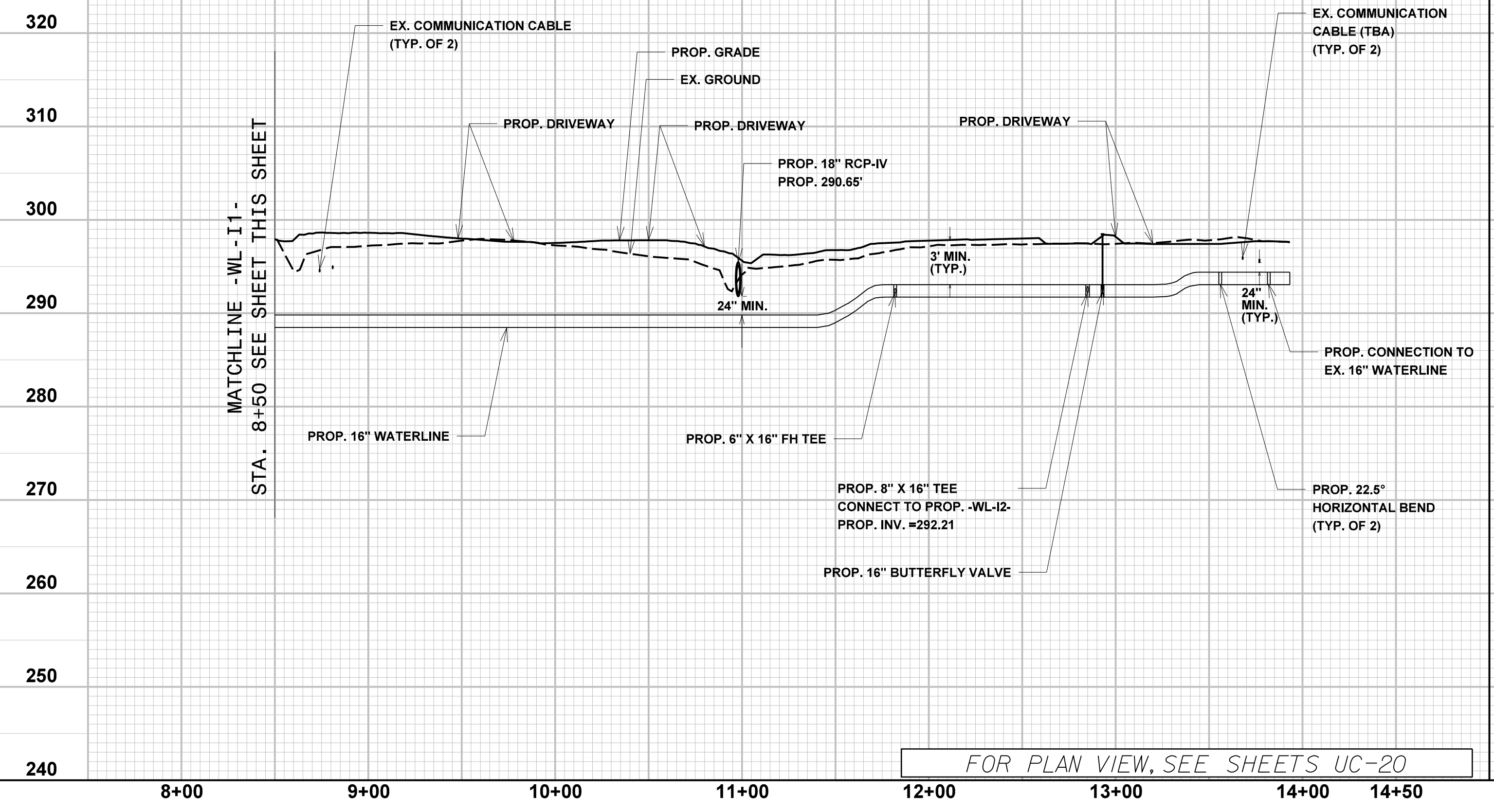
# -WL-II-

**NOTES:**  
1. CONTRACTOR TO VERIFY LOCATION, DEPTH, AND SIZE OF EXISTING UTILITIES AND STORMWATER PIPES. CONTRACTORS SHALL MAINTAIN A 24" MINIMUM VERTICAL SEPARATION FROM PROPOSED WATERLINE, UNLESS OTHERWISE NOTED ON THE PLANS.



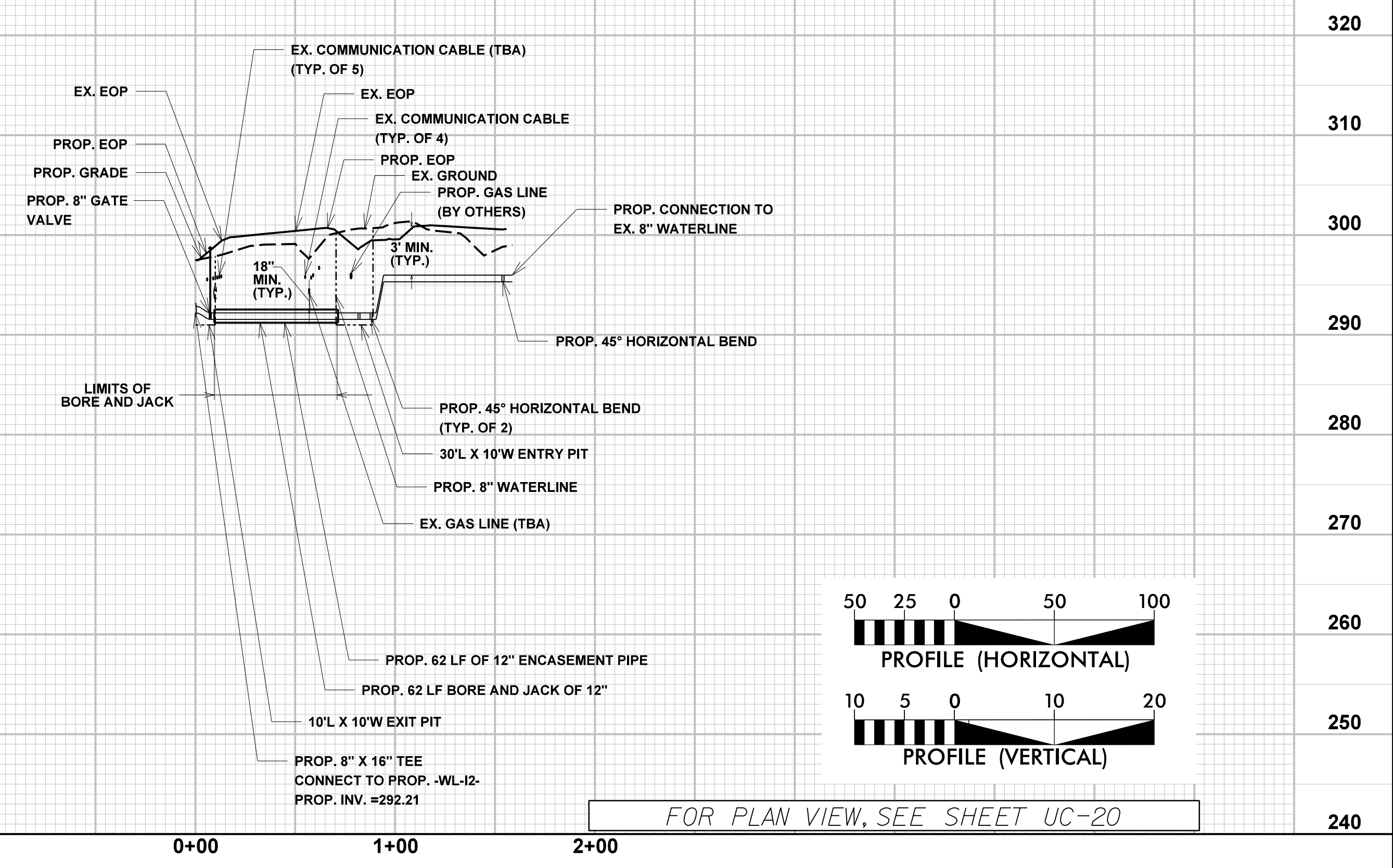
FOR PLAN VIEW, SEE SHEETS UC-18

# -WL-II-

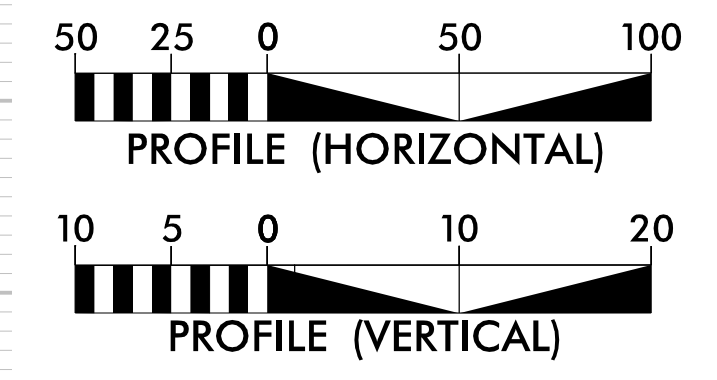


FOR PLAN VIEW, SEE SHEETS UC-20

# -WL-I2-



FOR PLAN VIEW, SEE SHEET UC-20





18 MAY 2003 07:58 AM R-5705 AB8\1\R-5705A\Water Wastewater-V85705A-ut-wtr\_UC38.pfl.dgn  
 10/10/2005 10:05:33 AM  
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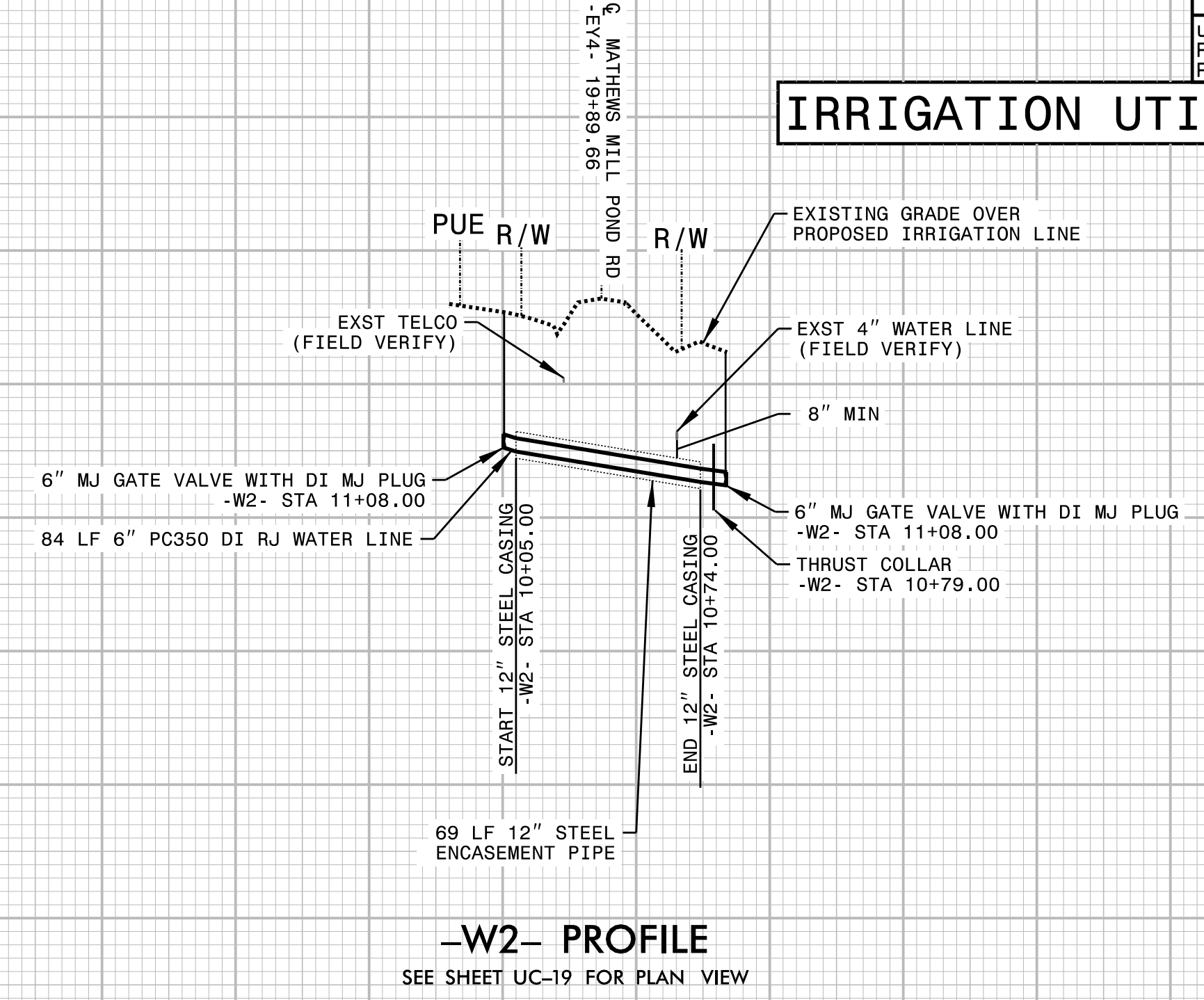
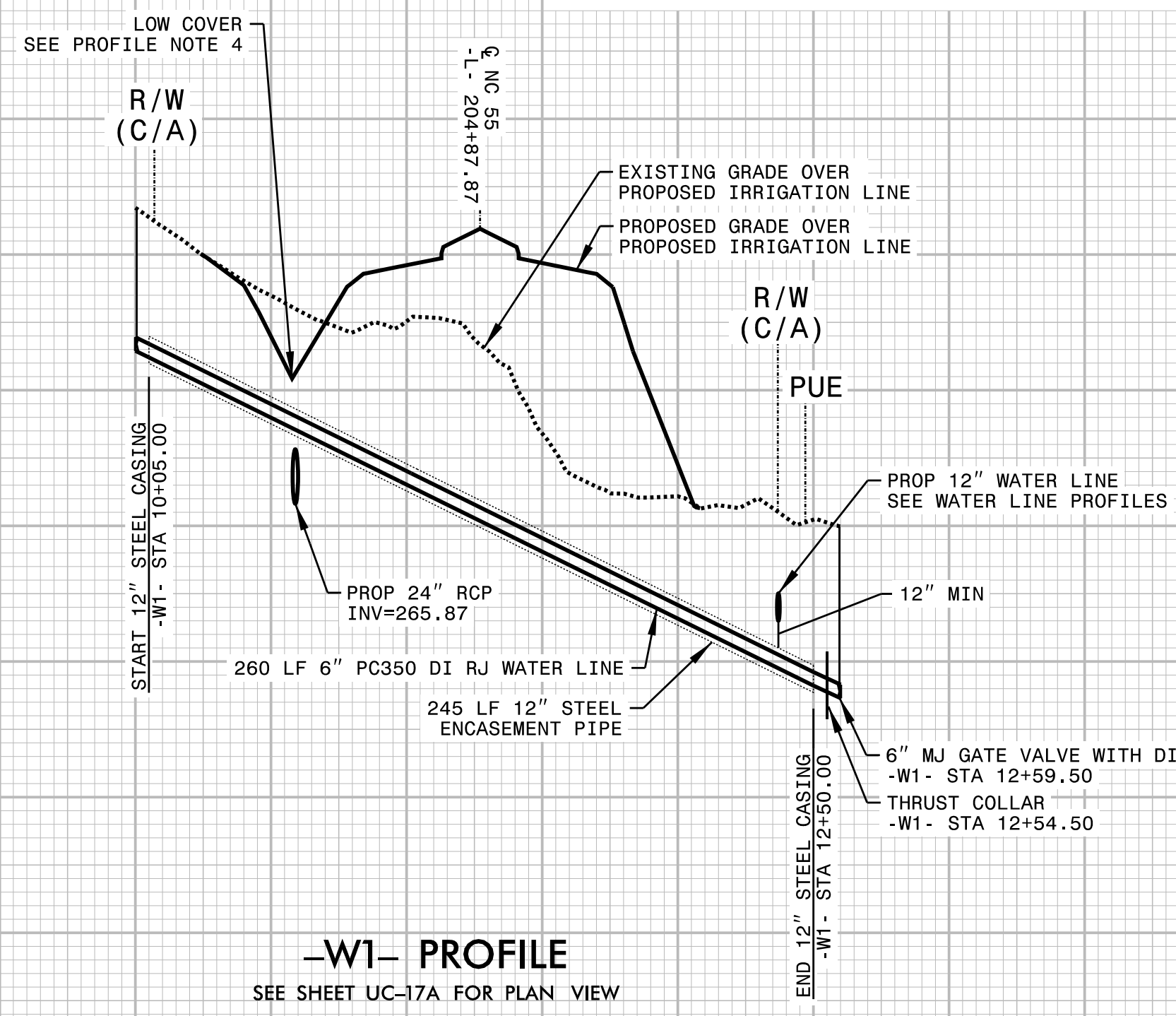
5/14/99

10/13/2022

- PROFILE NOTES (APPLICABLE TO THIS SHEET ONLY):
1. CONTRACTOR SHALL BE RESPONSIBLE TO FIELD VERIFY ELEVATION OF ALL CROSSING UTILITIES, WHETHER SHOWN OR NOT SHOWN ON THE DRAWINGS.
  2. UTILITIES SPECIFICALLY IDENTIFIED AS "(FIELD VERIFY)" ARE SHOWN IN PROFILE BASED ON THE STATION AT WHICH THE UTILITY CROSSES THE PROPOSED WATER AND SEWER MAINS AND ARE SHOWN AT TYPICAL DEPTHS.
  3. CONTRACTOR SHALL VERIFY ALL EXISTING CROSSING UTILITIES PRIOR TO CONSTRUCTING THE PROPOSED UTILITIES AND SHALL IMMEDIATELY NOTIFY THE ENGINEER OF ANY FIELD CONDITIONS WHICH DIFFER FROM THE DRAWINGS.
  4. PROPOSED ENCASED IRRIGATION WATER LINE HAS LOW COVER AT PROPOSED DITCH. EXERCISE CAUTION AND PHASE IRRIGATION UTILITY CONSTRUCTION AND GRADING TO PREVENT DAMAGE TO IRRIGATION AND ENCASEMENT.

PROJECT REFERENCE NO. R-5705A		SHEET NO. UC-32
		
421 FAYETTEVILLE STREET, SUITE 600 RALEIGH, NC 27601		
DESIGNED BY: NLH	DRAWN BY: JNB	
CHECKED BY: CPM	APPROVED BY: NLH	
REVISED:		
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION		UTILITY CONSTRUCTION PLANS ONLY
UTILITIES ENGINEERING SEC. PHONE: (919)707-6690 FAX: (919)250-4151		

### IRRIGATION UTILITY CONSTRUCTION



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