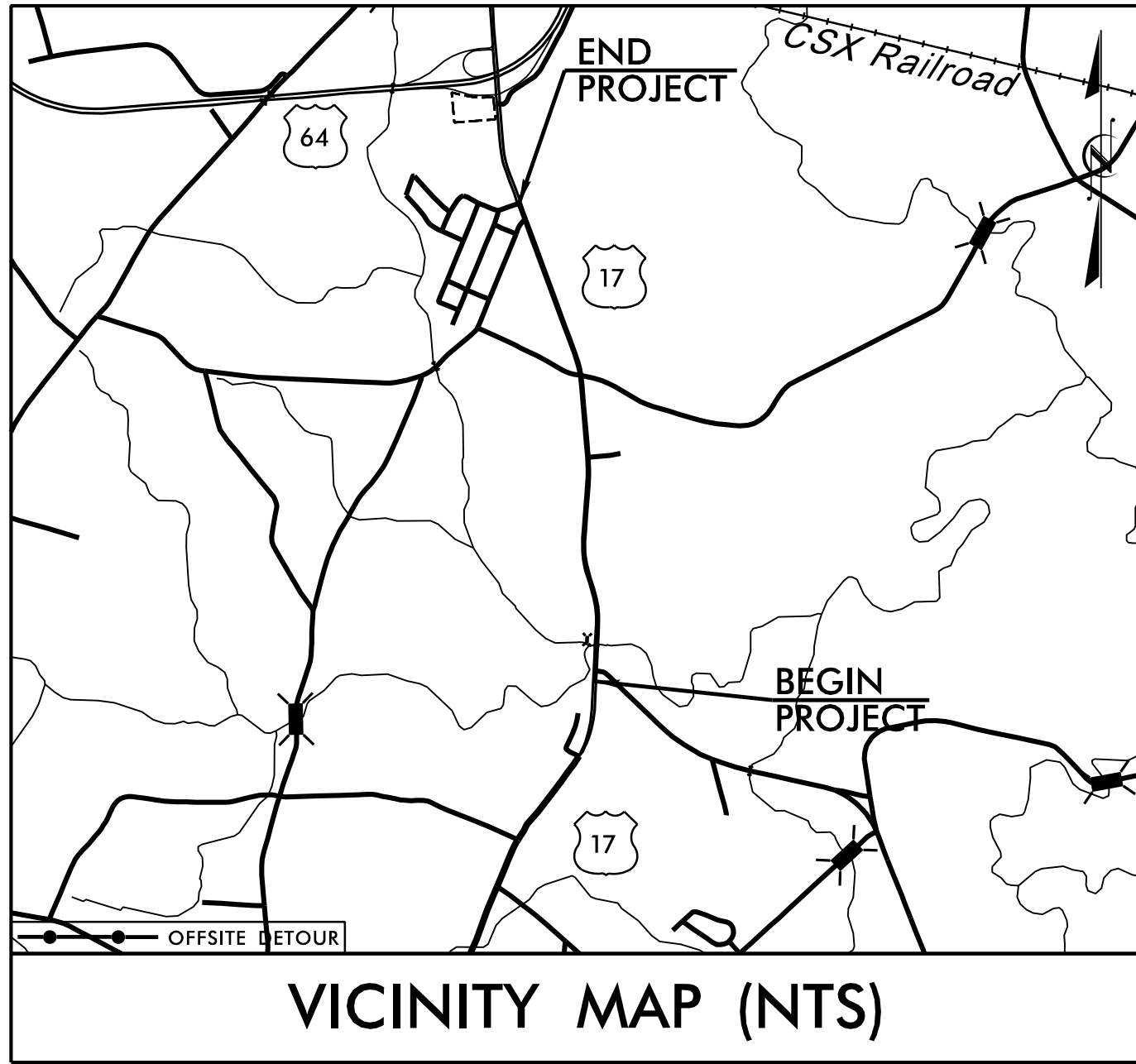


09/08/99

TIP PROJECT: R-5810



VICINITY MAP (NTS)

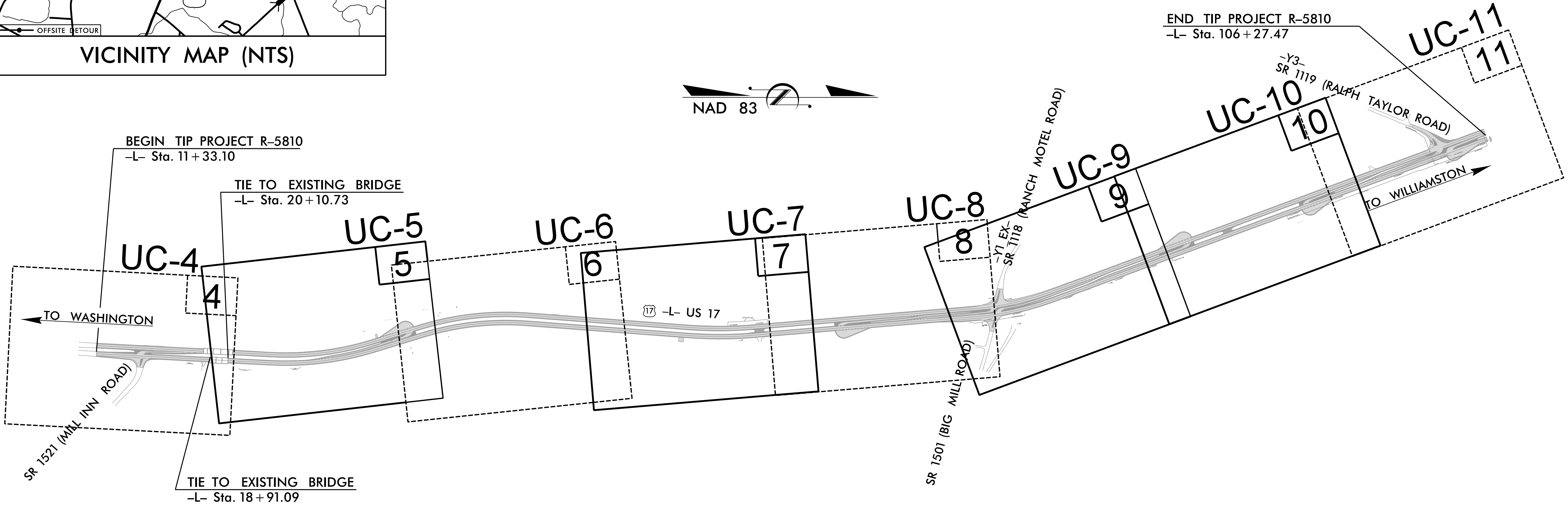
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

UTILITY CONSTRUCTION PLANS
MARTIN COUNTY

LOCATION: US 17 FROM SR 1521 (MILL INN ROAD) TO
SR 1119 (RALPH TAYLOR ROAD)

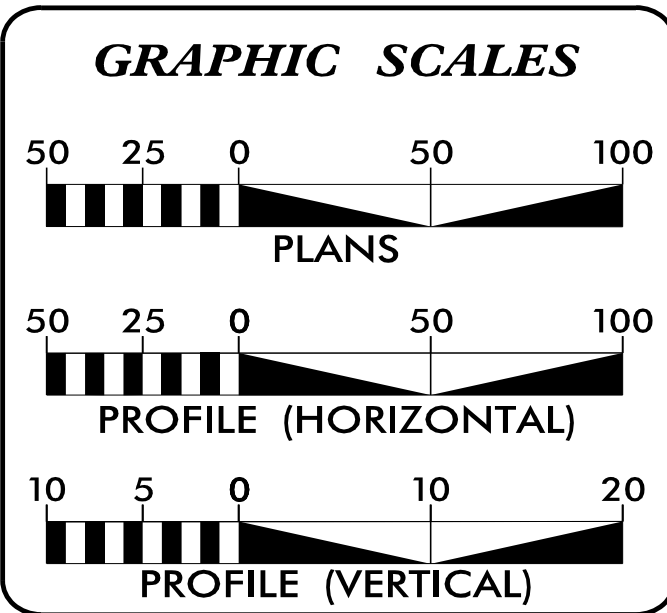
TYPE OF WORK: WATERLINE RELOCATION

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-5810	UC-1	15
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	



NO UTILITY CONFLICTS
ON THESE SHEETS

DOCUMENT NOT CONSIDERED FINAL
UNTIL ALL SIGNATURES ARE COMPLETED



SHEET NO.:	DESCRIPTION:
UC-1	TITLE SHEET
UC-2	UTILITY SYMBOLOGY
UC-3	NOTES
UC-3A AND UC-3B	DETAILS
UC-4 THRU UC-11	UTILITY CONSTRUCTION SHEETS
UC-12 THRU UC-13	PROFILE SHEETS

WATER AND SEWER
OWNERS ON PROJECT
(A) TOWN OF WILLIAMSTON - WATER

PREPARED IN THE OFFICE OF

RK&K

RUMMEL, KLEPPER & KAHL, LLP
8601 SIX FORKS ROAD, FORUM 1, SUITE 700
RALEIGH, NORTH CAROLINA 27615-3960
1-888-521-4455 OR 919-878-9560

Bryan Badey, P.E. CONSULTANT CONTACT #1
Sebastian Vera del Carpio, E.I. CONSULTANT CONTACT #2
CONSULTANT CONTACT #3

SEAL

NORTH CAROLINA
PROFESSIONAL
ENGINEER
BRYAN M. BADEY
32634
8/19/2026

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

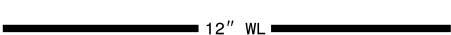
Justin Smith DIVISION PROJECT MANAGER
Daniel Merritt DIVISION UTILITIES COORDINATOR
Tanga Sampson REGIONAL UTILITY COORDINATOR

STATE OF NORTH CAROLINA

DIVISION OF HIGHWAYS

UTILITIES PLAN SHEET SYMBOLS

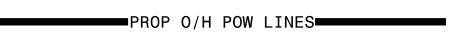
PROPOSED WATER SYMBOLS

Water Line (Sized as Shown)	
11¼ Degree Bend	
22½ Degree Bend	
45 Degree Bend	
90 Degree Bend	
Plug	
Tee	
Cross	
Reducer	
Gate Valve	
Butterfly Valve	
Tapping Valve	
Line Stop	
Line Stop with Bypass	
Blow Off	
Fire Hydrant	
Relocate Fire Hydrant	
Remove Fire Hydrant	
Water Meter	
Relocate Water Meter	
Remove Water Meter	
Water Pump Station	
RPZ Backflow Preventer	
DCV Backflow Preventer	
Relocate RPZ Backflow Preventer	
Relocate DCV Backflow Preventer	

PROPOSED SEWER SYMBOLS

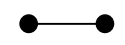
Gravity Sewer Line (Sized as Shown)	
Force Main Sewer Line (Sized as Shown)	
Manhole (Sized per Note)	
Sewer Pump Station	

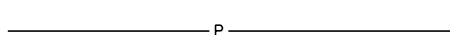
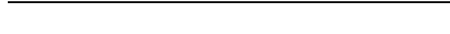
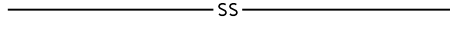
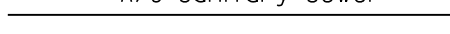
PROPOSED MISCELLANEOUS UTILITIES SYMBOLS

Power Pole	
Telephone Pole	
Joint Use Pole	
Telephone Pedestal	
Utility Line by Others (Type as Shown)	
Trenchless Installation	
Encasement by Open Cut	
Encasement	
Underground Conduit	

Thrust Block	
Air Release Valve	
Utility Vault	
Concrete Pier	
Steel Pier	
Plan Note	
Pay Item Note	

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	
End of Information	

*Underground Power Line	
*Underground Telephone Cable	
*Underground Telephone Conduit	
*Underground Fiber Optics Telephone Cable	
*Underground TV Cable	
*Underground Fiber Optics TV Cable	
*Underground Gas Pipeline	
Aboveground Gas Pipeline	
*Underground Water Line	
Aboveground Water Line	
*Underground Gravity Sanitary Sewer Line	
Aboveground Gravity Sanitary Sewer Line	
*Underground SS Forced Main Line	
Underground Unknown Utility Line	
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)	



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UTILITY CONSTRUCTION

GENERAL NOTES:

1. THE PROPOSED UTILITY CONSTRUCTION SHALL MEET THE APPLICABLE REQUIREMENTS OF THE NC DEPARTMENT OF TRANSPORTATION'S "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" DATED JANUARY 2024.
2. THE EXISTING UTILITIES BELONG TO TOWN OF WILLIAMSTON. THE CONTACT PERSON IS THE PUBLIC WORKS DIRECTOR STACY STALLS, 252-792-1025.
3. ALL WATER LINES TO BE INSTALLED WITHIN COMPLIANCE OF THE RULES AND REGULATIONS OF THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL QUALITY, DIVISION OF WATER RESOURCES, PUBLIC WATER SUPPLY SECTION. ALL SEWER LINES TO BE INSTALLED WITHIN COMPLIANCE OF THE RULES AND REGULATIONS OF THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENT QUALITY, DIVISION OF WATER RESOURCES, WATER QUALITY SECTION. PERFORM ALL WORK IN ACCORDANCE WITH THE APPLICABLE PLUMBING CODES.
4. THE UTILITY OWNER OWNS THE EXISTING UTILITY FACILITIES AND WILL OWN THE NEW UTILITY FACILITIES AFTER ACCEPTANCE BY THE DEPARTMENT. THE DEPARTMENT OWNS THE CONSTRUCTION CONTRACT AND HAS ADMINISTRATIVE AUTHORITY. COMMUNICATIONS AND DECISIONS BETWEEN THE CONTRACTOR AND UTILITY OWNER ARE NOT BINDING UPON THE DEPARTMENT OR THIS CONTRACT UNLESS AUTHORIZED BY THE ENGINEER. AGREEMENTS BETWEEN THE UTILITY OWNER AND CONTRACTOR FOR THE WORK THAT IS NOT PART OF THIS CONTRACT OR IS SECONDARY TO THIS CONTRACT ARE ALLOWED, BUT ARE NOT BINDING UPON THE DEPARTMENT.
5. PROVIDE ACCESS FOR THE DEPARTMENT PERSONNEL AND THE OWNER'S REPRESENTATIVES TO ALL PHASES OF CONSTRUCTION. NOTIFY DEPARTMENT PERSONNEL AND THE UTILITY OWNER TWO WEEKS PRIOR TO COMMENCEMENT OF ANY WORK AND ONE WEEK PRIOR TO SERVICE INTERRUPTION. KEEP UTILITY OWNERS' REPRESENTATIVES INFORMED OF WORK PROGRESS AND PROVIDE OPPORTUNITY FOR INSPECTION OF CONSTRUCTION AND TESTING.

6. THE PLANS DEPICT THE BEST AVAILABLE INFORMATION FOR THE LOCATION, SIZE, AND TYPE OF MATERIAL FOR ALL EXISTING UTILITIES. MAKE INVESTIGATIONS FOR DETERMINING THE EXACT LOCATION, SIZE, AND TYPE MATERIAL OF THE EXISTING FACILITIES AS NECESSARY FOR THE CONSTRUCTION OF THE PROPOSED UTILITIES AND FOR AVOIDING DAMAGE TO EXISTING FACILITIES. REPAIR ANY DAMAGE INCURRED TO EXISTING FACILITIES TO THE ORIGINAL OR BETTER CONDITION AT NO ADDITIONAL COST TO THE DEPARTMENT.
7. MAKE FINAL CONNECTIONS OF THE NEW WORK TO THE EXISTING SYSTEM WHERE INDICATED ON THE PLANS, AS REQUIRED TO FIT THE ACTUAL CONDITIONS, OR AS DIRECTED.
8. MAKE CONNECTIONS BETWEEN EXISTING AND PROPOSED UTILITIES AT TIMES MOST CONVENIENT TO THE PUBLIC, WITHOUT ENDANGERING THE UTILITY SERVICE, AND IN ACCORDANCE WITH THE UTILITY OWNER'S REQUIREMENTS. MAKE CONNECTIONS ON WEEKENDS, AT NIGHT, AND ON HOLIDAYS IF NECESSARY.
9. ALL UTILITY MATERIALS SHALL BE APPROVED PRIOR TO DELIVERY TO THE PROJECT. SEE 1500-7, " SUBMITTALS AND RECORDS" IN SECTION 1500 OF THE STANDARD SPECIFICATIONS.

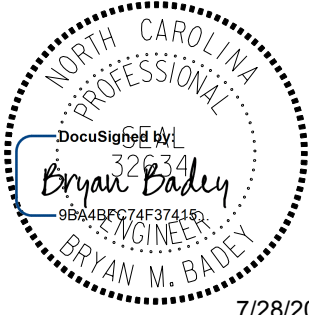
PROJECT SPECIFIC NOTES:

1. EXAMPLE TEXT, MAY GET REMOVED IF THERE ARE NO PROJECT SPECIFIC NOTES.

LIST OF STANDARD DRAWINGS

- TRENCH DETAIL
- GATE VALVE DETAIL
- VALVE BOX DETAIL
- STEEL CASING PIPE DETAILS
- THRUST BLOCKING DETAIL
- STANDARD VERTICAL BEND DETAIL
- CONCRETE CRADLE PROTECTION FOR WATER LINE CROSSINGS
- THRUST BLOCKING DESIGN QUANTITY TABLE

PROJECT REFERENCE NO.	SHEET NO.
R-5810	UC-3



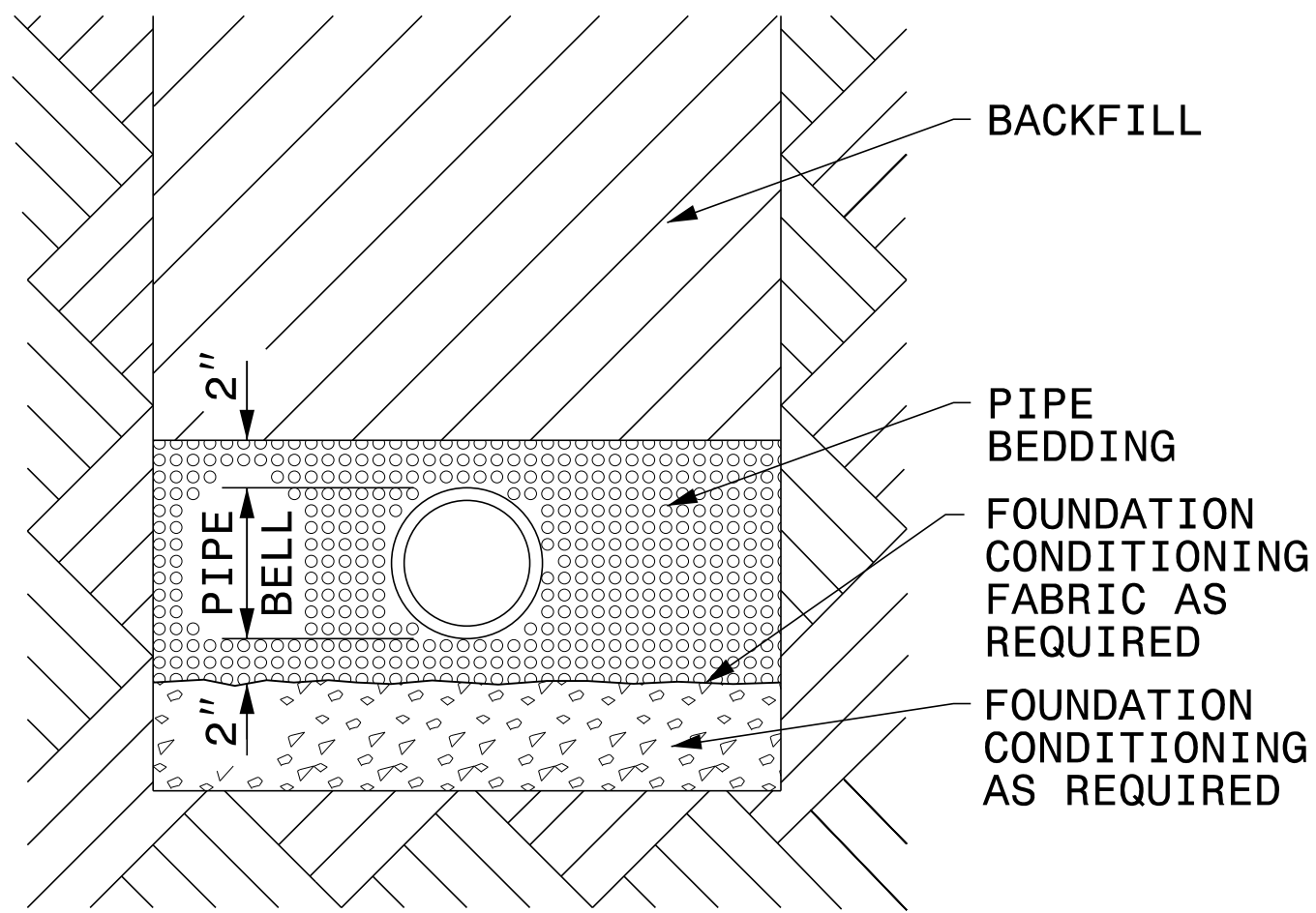
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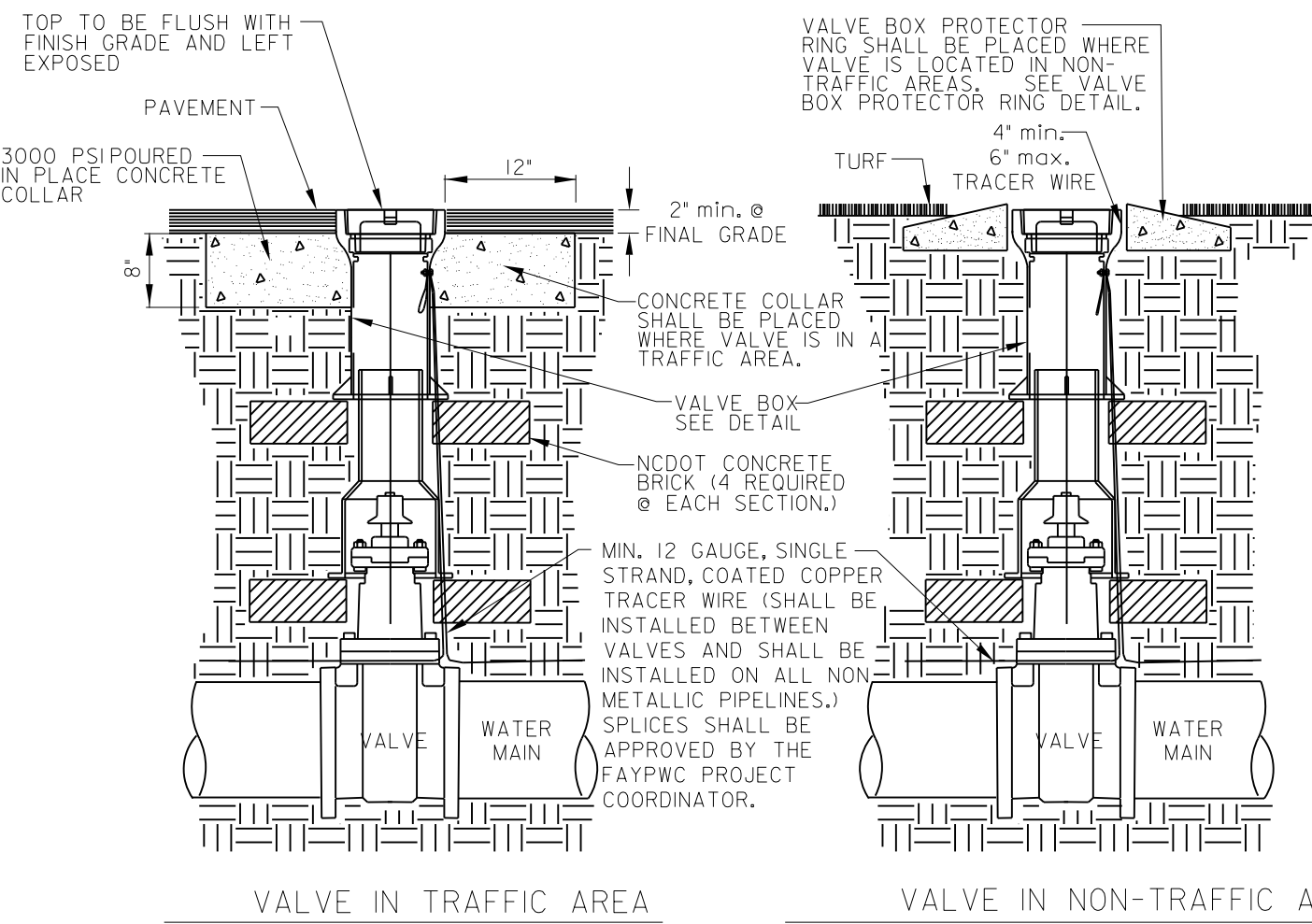
PROJECT TYPICAL DETAILS

TRENCH DETAIL

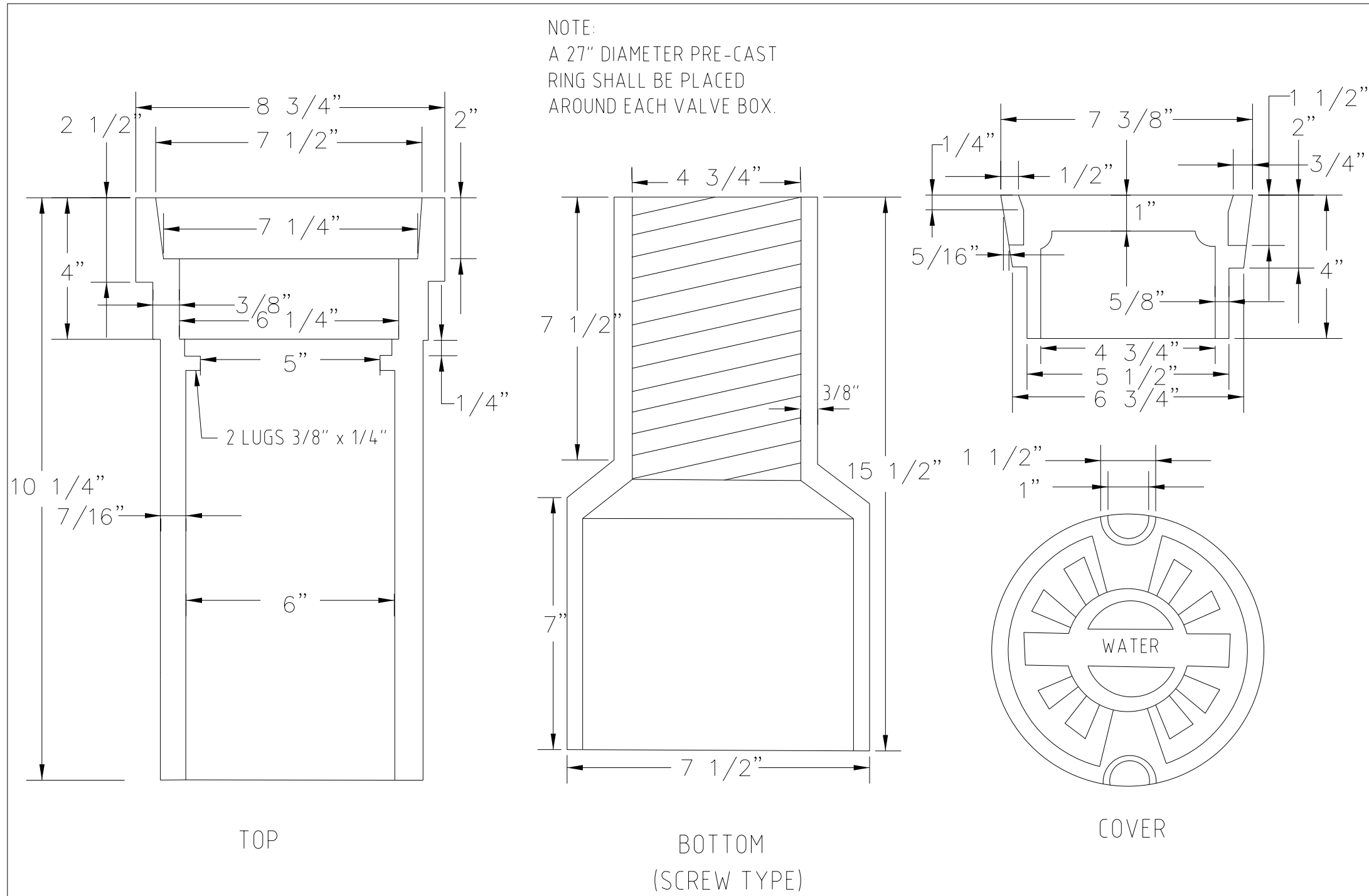


PLACE FOUNDATION CONDITIONING MATERIAL BELOW BEDDING IF REQUIRED, AS DIRECTED BY ENGINEER. PIPE BEDDED IN SELECT MATERIAL, CLASS II (TYPE 1) OR CLASS III. TRENCH BACKFILLED IN LOOSE 6" LAYERS COMPACTED TO TOP OF TRENCH USING LOCAL EXCAVATED MATERIAL IF APPROVED BY THE ENGINEER, OR SELECT MATERIAL. ALL MATERIAL SHALL BE FREE OF ROCKS, FOREIGN MATERIAL, AND FROZEN EARTH. COMPACTION SHALL BE TO APPROXIMATELY 95% DENSITY IN ACCORDANCE WITH AASHTO T-99 AS MODIFIED BY THE DEPARTMENT OF TRANSPORTATION.

GATE VALVE DETAIL

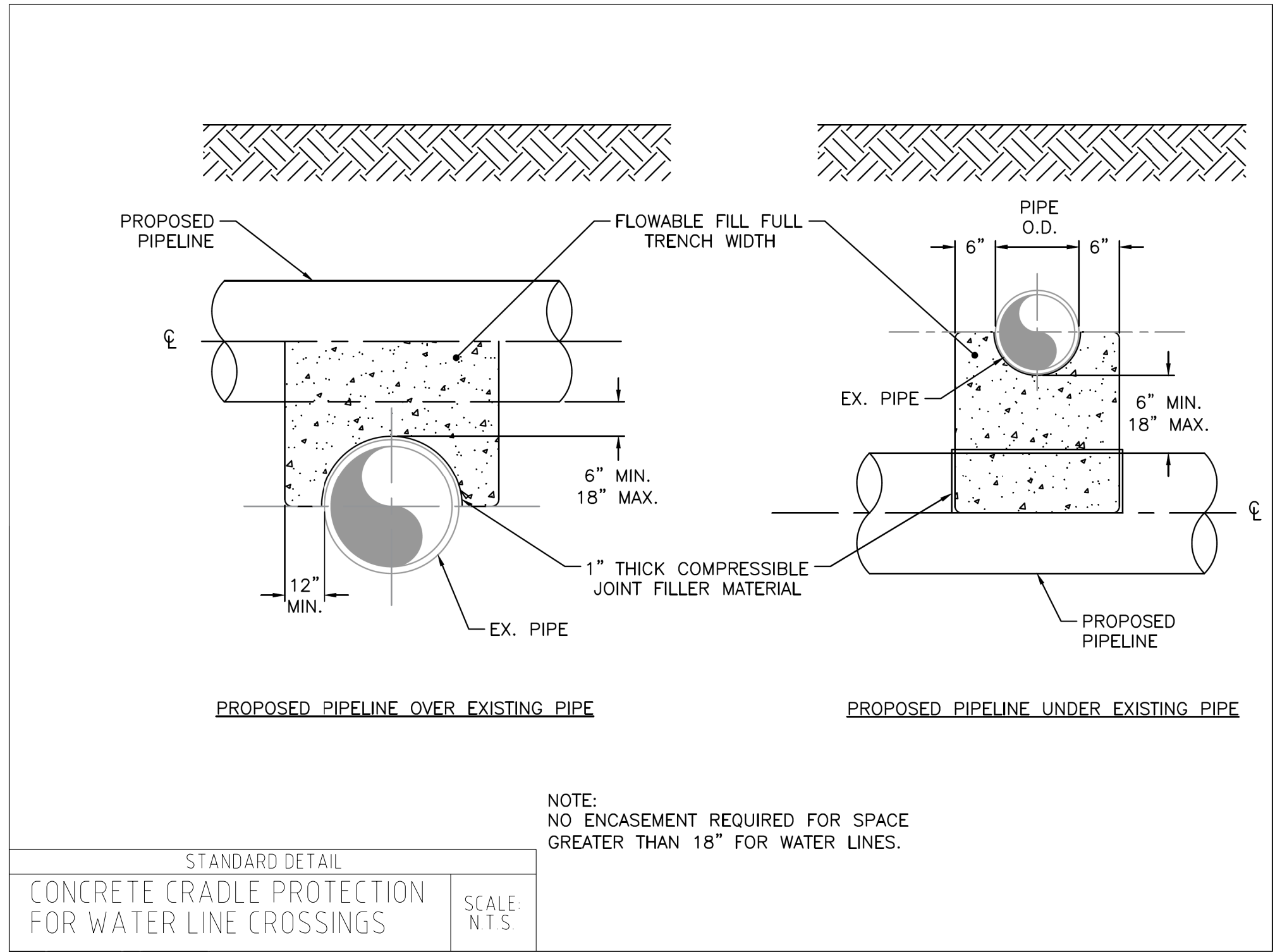


- NOTES:
1. ALL MATERIALS SHALL BE IN ACCORDANCE WITH BEAUFORT COUNTY STANDARDS.
 2. ALL VALVES SHALL HAVE 2" SQUARE OPERATING NUT AND SHALL OPEN COUNTERCLOCKWISE.
 3. VALVE BODY, BONNET AND GATE SHALL BE IN ACCORDANCE WITH AWWA C-509/C-515 AND NSF61.
 4. VALVE BODY AND BONNET SHALL BE COATED ON ALL INTERIOR AND EXTERIOR SURFACES WITH A FUSION BONDED EPOXY IN ACCORDANCE WITH AWWA C-550-90.
 5. ALL VALVES 24" AND SMALLER SHALL HAVE A SAFE WORKING PRESSURE OF 250 PSI.
 6. SEE VALVE BOX DETAIL FOR ADDITIONAL INFORMATION.
 7. SEE VALVE BOX PROTECTOR RING DETAIL FOR ADDITIONAL INFORMATION.
 8. VALVE BOX SECTIONS ARE REQUIRED, THE USE OF PIPE IN LIEU OF VALVE BOX SECTIONS SHALL NOT BE PERMITTED.



STANDARD DETAIL
VALVE BOX

SCALE:
N.T.S.



STANDARD DETAIL
CONCRETE CRADLE PROTECTION
FOR WATER LINE CROSSINGS

SCALE:
N.T.S.

NOTE:
NO ENCASEMENT REQUIRED FOR SPACE
GREATER THAN 18" FOR WATER LINES.

PROJECT REFERENCE NO.	SHEET NO.
R-5810	UC-3A

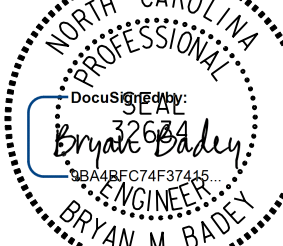
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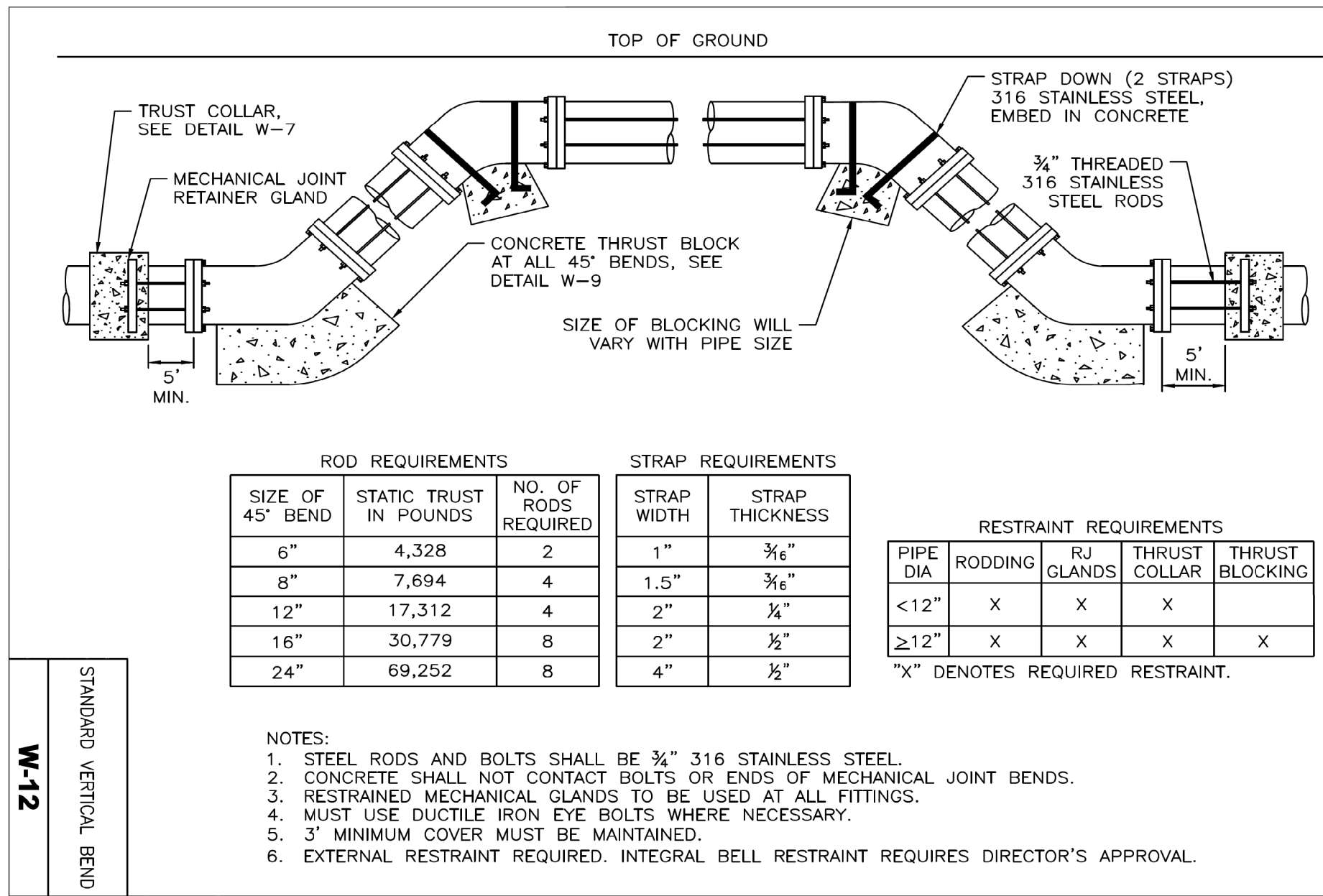
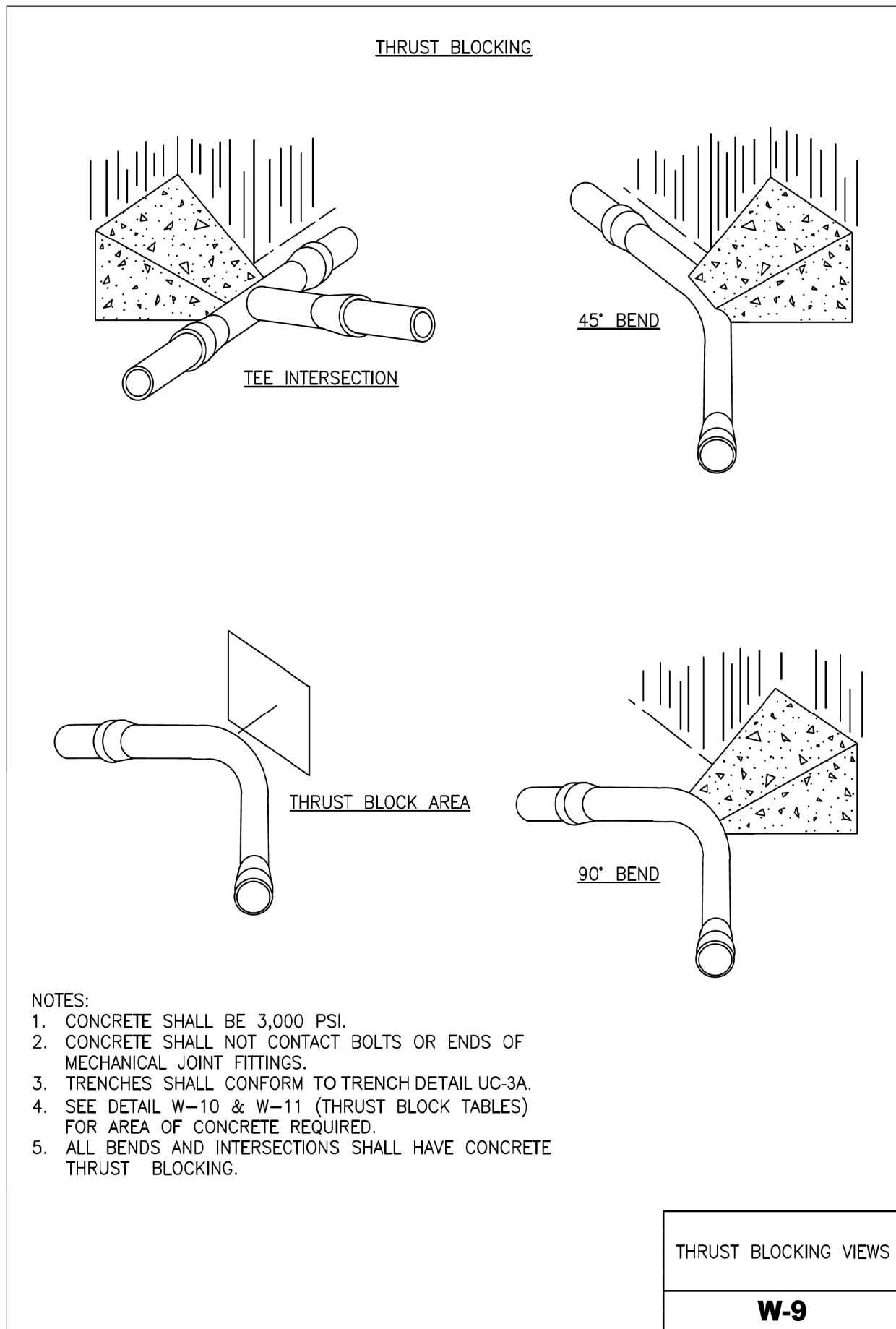
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PROJECT TYPICAL DETAILS

PROJECT REFERENCE NO.	SHEET NO.
R-5810	UC-3B
	
7/28/2026	
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REACTION BEARING AREAS FOR HORIZONTAL WATER PIPE BENDS BASED ON TEST PRESSURE OF 200 PSI										
ALL AREAS GIVEN IN SQUARE FEET										
SIZE OF BEND	DEGREE OF BEND	STATIC THRUST IN POUNDS	MODERATELY DRY CLAY 4,000 LBS/FT²	SOFT CLAY 2,000 LBS/FT²	1,600 LBS/FT² GRAVEL/COARSE SAND	8,000 LBS/FT² DRY CLAY (ALWAYS DRY)	SAND, COMPACT FIRM 8,000 LBS/FT²	SAND—CLEAN DRY 4,000 LBS/FT²	SOIL 1,000 LBS/FT² QUICKSAND (VERY POOR)	ROCK—POOR 10,000 LBS/FT²
6"	11 ½°	1,108	1	1	1	1	1	1	2	1
	22 ½°	2,207	1	2	2	1	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 ½°	1,970	1	1	2	1	1	1	2	1
	22 ½°	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 ½°	4,433	2	3	3	1	1	2	5	1
	22 ½°	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 ½°	7,881	2	4	5	1	1	2	8	1
	22 ½°	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

NOTES:

1. 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.
2. USE 6" 90° BEND VALUE FOR HYDRANTS FOR ADDITIONAL SAFETY FACTOR.

THRUST BLOCKING DESIGN QUANTITY TABLE
W-10

REACTION BEARING AREAS FOR HORIZONTAL WATER PIPE BENDS BASED ON TEST PRESSURE OF 200 PSI										
ALL AREAS GIVEN IN SQUARE FEET										
SIZE OF BEND	DEGREE OF BEND	STATIC THRUST IN POUNDS	MODERATELY DRY CLAY 4,000 LBS/FT²	SOFT CLAY 2,000 LBS/FT²	1,600 LBS/FT² GR/CLAY/ COARSE SAND	8,000 LBS/FT² DRY CLAY (ALWAYS DRY)	SAND, COMPACT FIRM 8,000 LBS/FT²	SAND— CLEAN DRY 4,000 LBS/FT²	SOIL 1,000 LBS/FT² QUICKSAND (VERY POOR)	ROCK— POOR 10,000 LBS/FT²
24"	11 ½"	17,734	5	9	11	3	3	5	18	2
	22 ½"	35,305	9	18	22	5	5	9	36	4
	45"	69,252	18	35	42	9	9	18	70	7
	90"	127,936	32	64	77	16	16	32	128	113
	PLUG	90,478	23	46	55	12	12	23	91	10
30"	11 ½"	27,709	7	14	17	4	4	7	2	3
	22 ½"	55,163	14	28	34	7	7	14	56	6
	45"	108,206	28	55	65	14	14	28	109	11
	90"	199,900	50	100	120	25	25	50	200	20
	PLUG	141,372	36	71	85	18	18	36	142	15
36"	11 ½"	39,901	10	20	24	5	5	10	40	4
	22 ½"	79,439	20	40	48	10	10	20	30	8
	45"	155,816	39	78	94	20	20	39	156	16
	90"	287,855	72	144	172	36	36	72	288	29
	PLUG	203,575	51	102	122	26	26	51	204	21
48"	11 ½"	70,935	18	36	43	9	9	18	71	8
	22 ½"	141,218	36	71	85	18	18	36	142	15
	45"	277,007	70	139	166	35	35	70	277	28
	90"	511,742	128	256	320	64	64	128	512	52
	PLUG	361,911	91	181	217	46	46	91	362	37

NOTES:

1. 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.
2. USE 6" 90° BEND VALUE FOR HYDRANTS FOR ADDITIONAL SAFETY FACTOR.

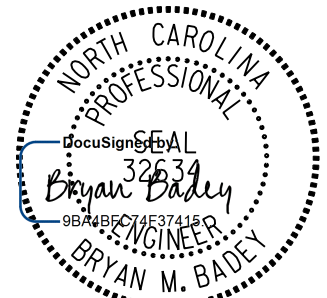
THRUST BLOCKING DESIGN
QUANTITY TABLE

W-11

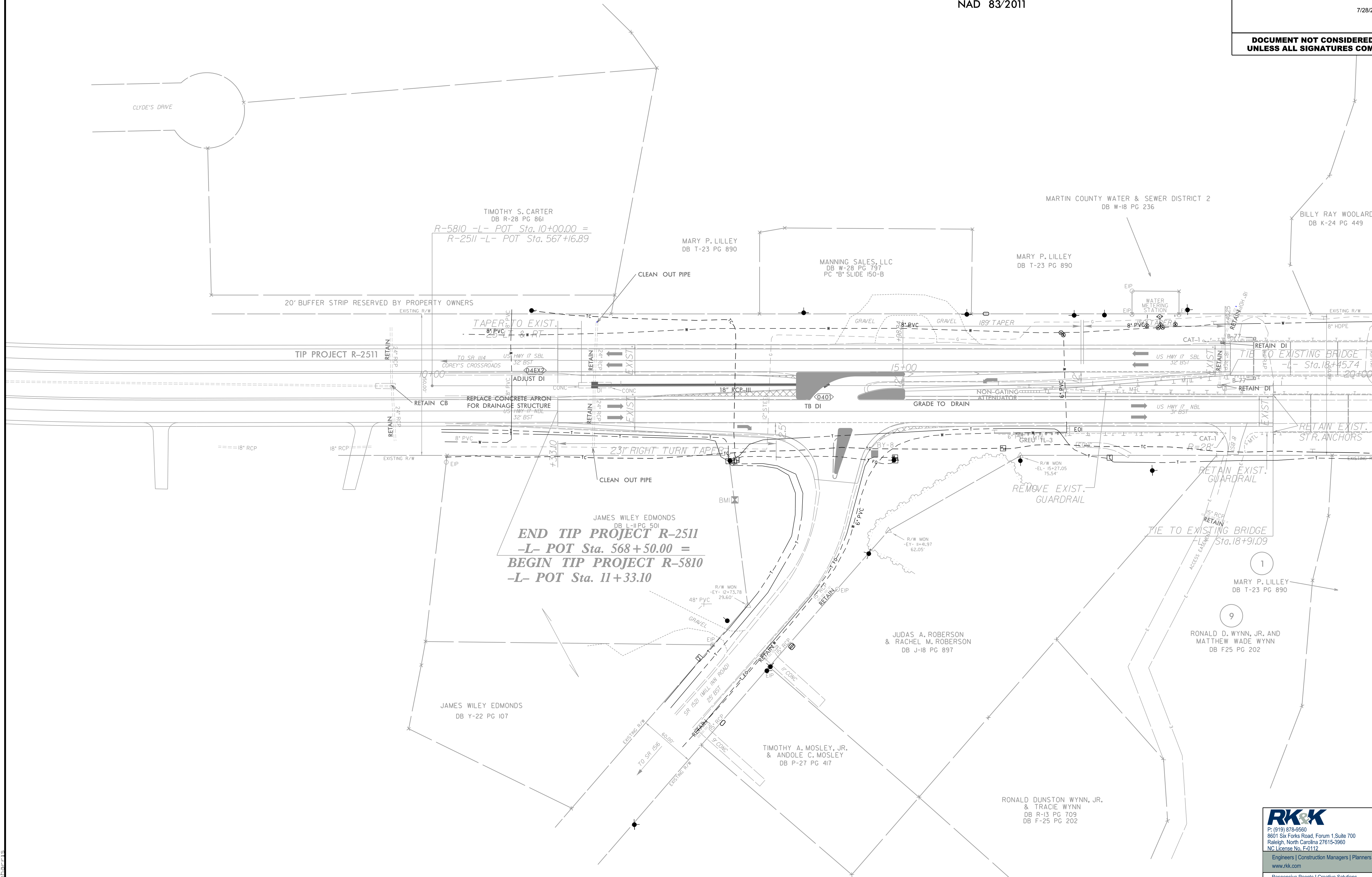
8/17/99
7/28/2026
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chris

NO WATER/SEWER CONFLICTS

NAD 83/2011

PROJECT REFERENCE NO. R-5810	SHEET NO. UC-4
 7/28/2026	
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MATCHLINE -L- STA. 20+00 SEE SHEET UC-5



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DocuSign Envelope ID: 32634
 Bryan Badley
 08/24/2017
 PROFESSIONAL ENGINEER
 NORTH CAROLINA
 BRYAN M. BADEY

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NAD 83/2011



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PROJECT REFERENCE NO.	SHEET NO.
R-5810	UC-6
7/28/2026	
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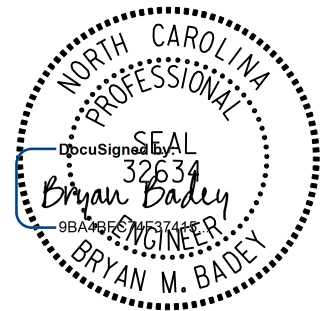


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7/28/2026
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chris

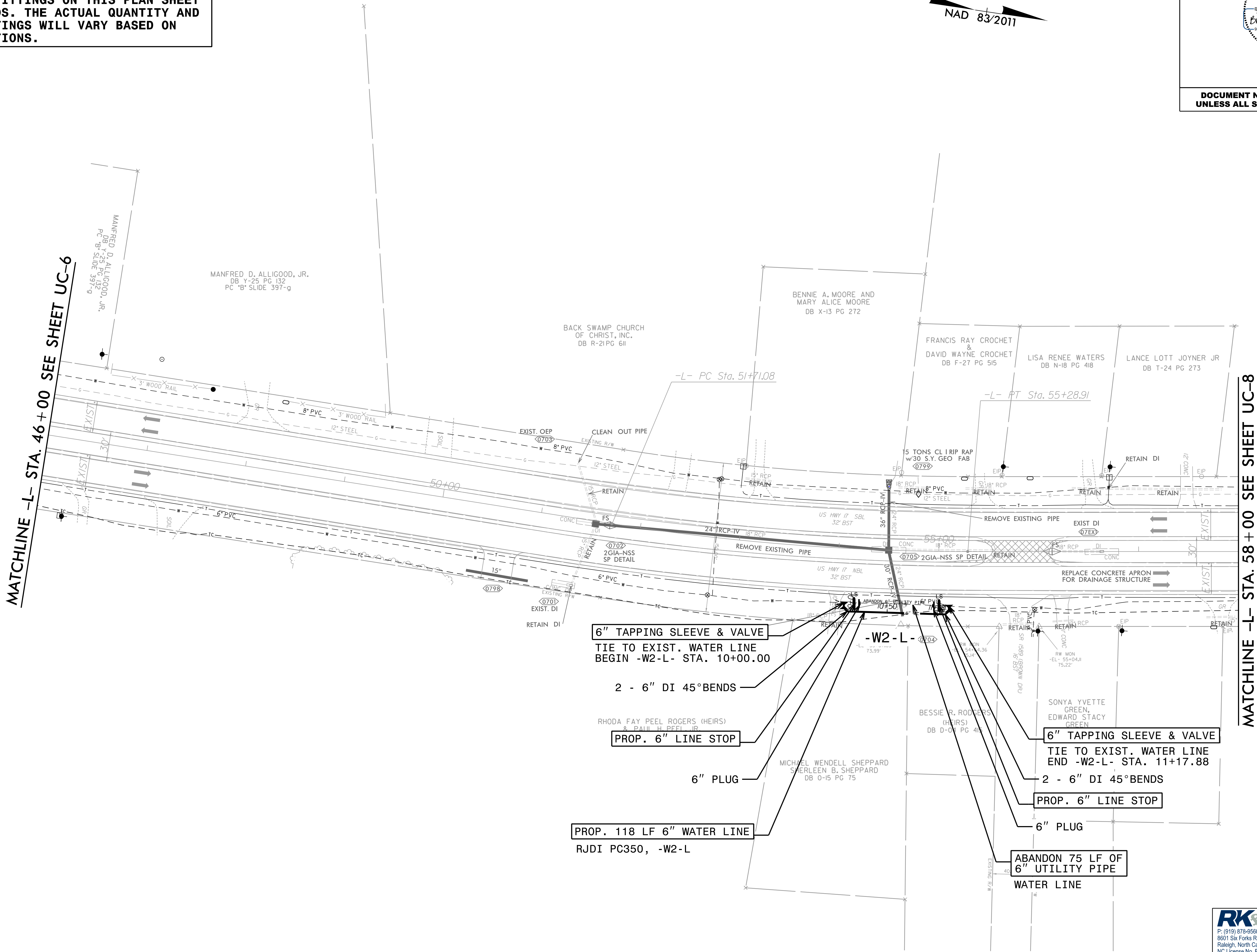
NOTE:
THE ESTIMATED QUANTITY OF DUCTILE IRON
WATER PIPE FITTINGS ON THIS PLAN SHEET
IS 350 POUNDS. THE ACTUAL QUANTITY AND
TYPE OF FITTINGS WILL VARY BASED ON
FIELD CONDITIONS.

PROJECT REFERENCE NO.	SHEET NO.
R-5810	UC-7



7/28/2026

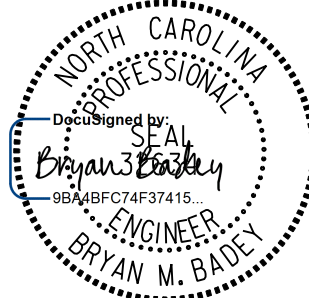
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8/17/99
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chris

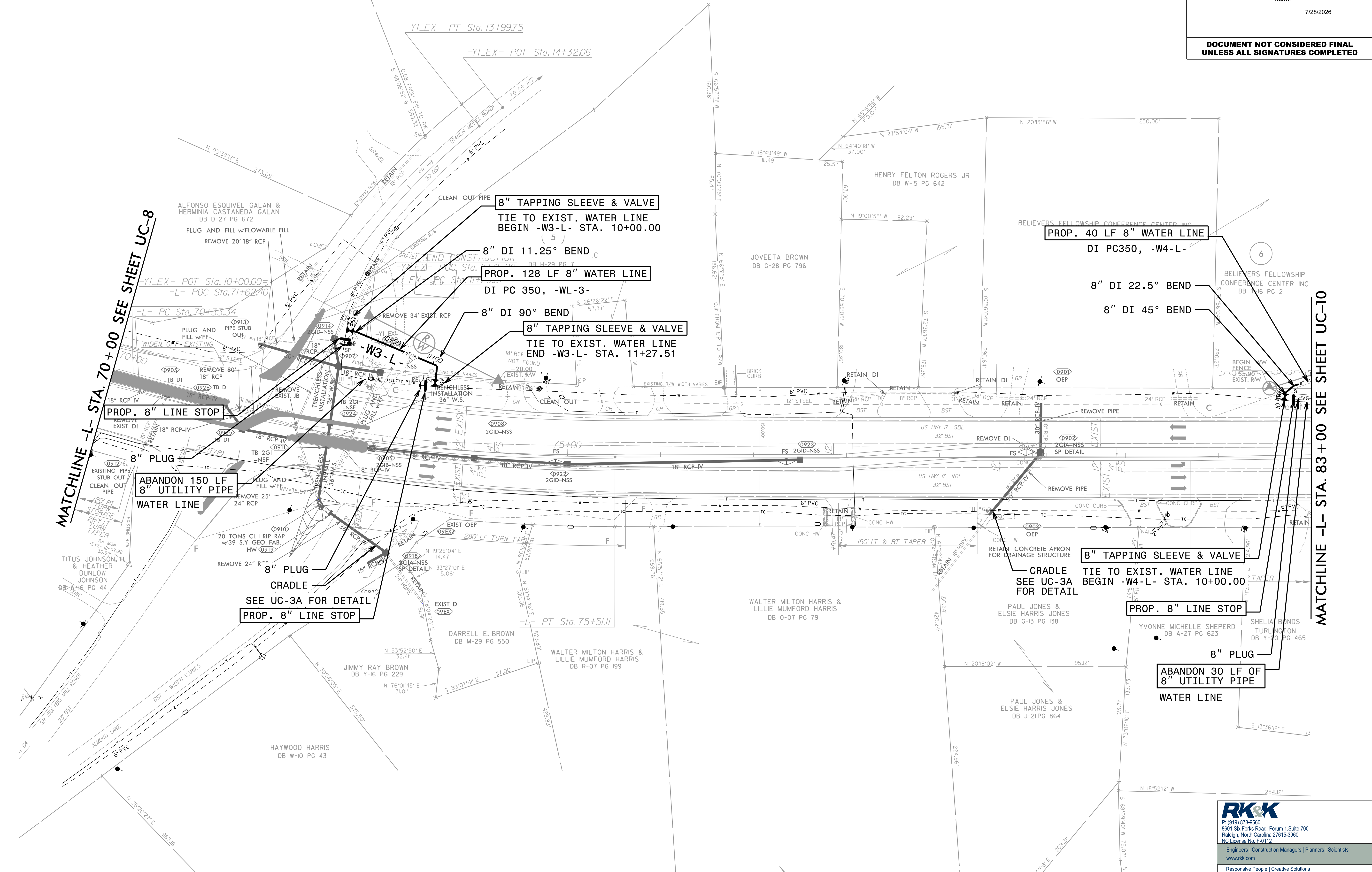
NOTE:
THE ESTIMATED QUANTITY OF DUCTILE IRON
WATER PIPE FITTINGS ON THIS PLAN SHEET
IS 590 POUNDS. THE ACTUAL QUANTITY AND
TYPE OF FITTINGS WILL VARY BASED ON
FIELD CONDITIONS.

PROJECT REFERENCE NO.	SHEET NO.
R-5810	UC-9



7/28/2026

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MATCHLINE -L- STA. 83+00 SEE SHEET UC-9

8" X 6" TEE
 -W4-L- STA. 10+67.32
 -W5-L- STA. 10+00.00

PROP. 6" VALVE
 GATE VALVE
 PROP. 42 LF
 6" WATER LINE
 DI PC 350, -W5-L-

6" DI 11.25° BEND

-W4-L-
 -W5-L-
 TIE TO EXIST. WATER VALVE
 END -W5-L- STA. 10+41.26

REMOVE 18" RCP
 REMOVE 18" RCP
 REMOVE 18" RCP
 REMOVE 18" RCP
 REMOVE 18" RCP

SHELIA BONDS
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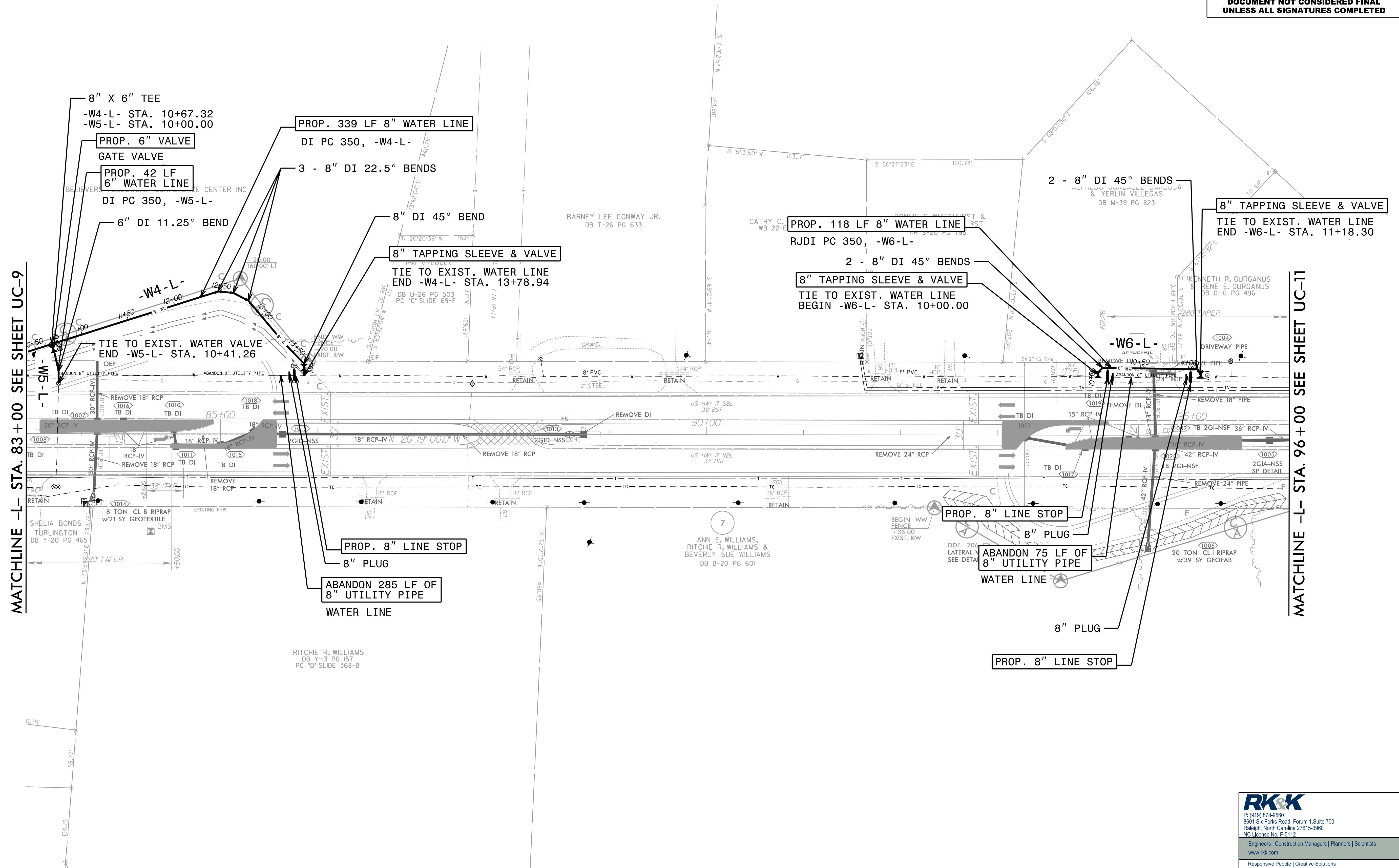
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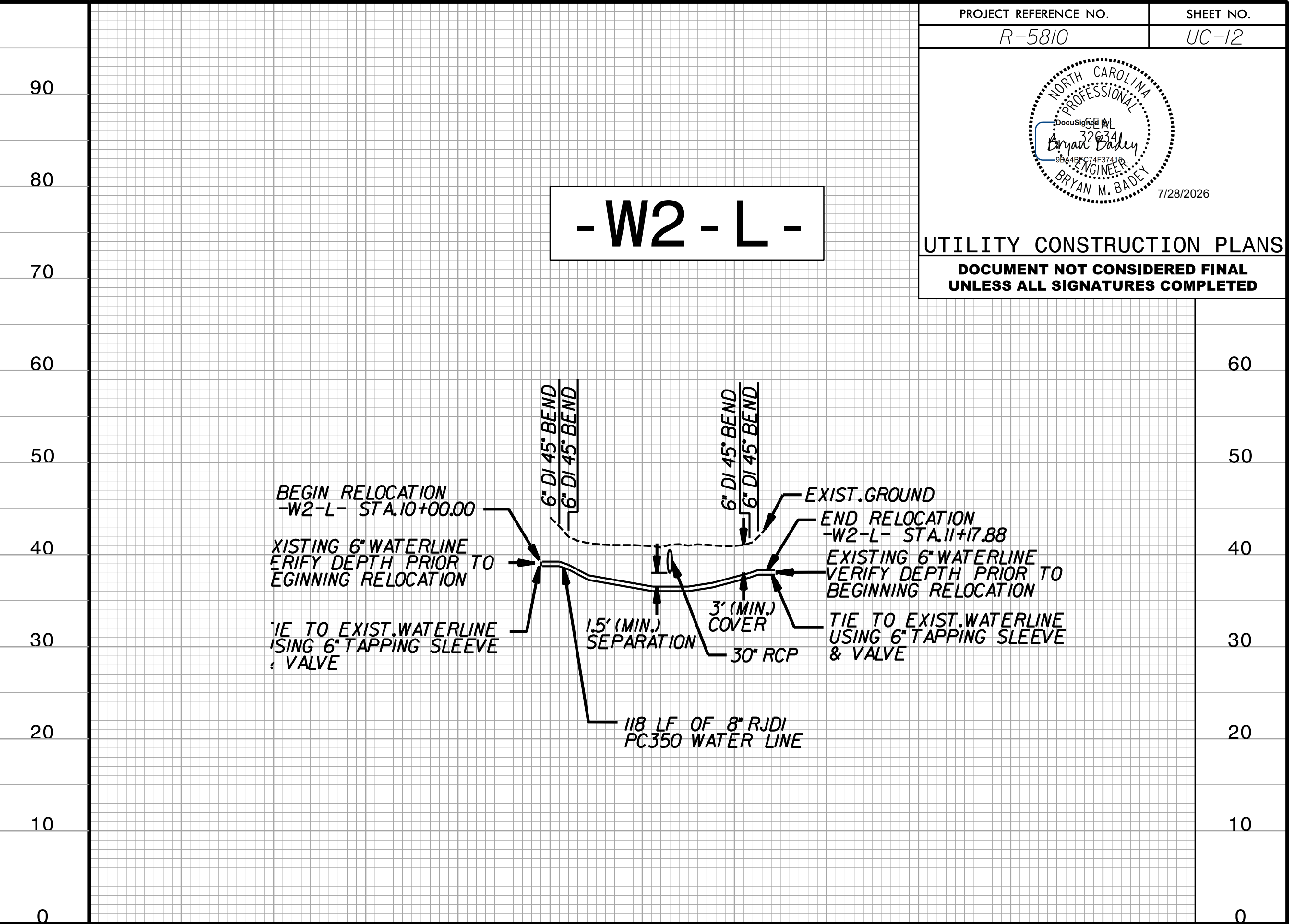
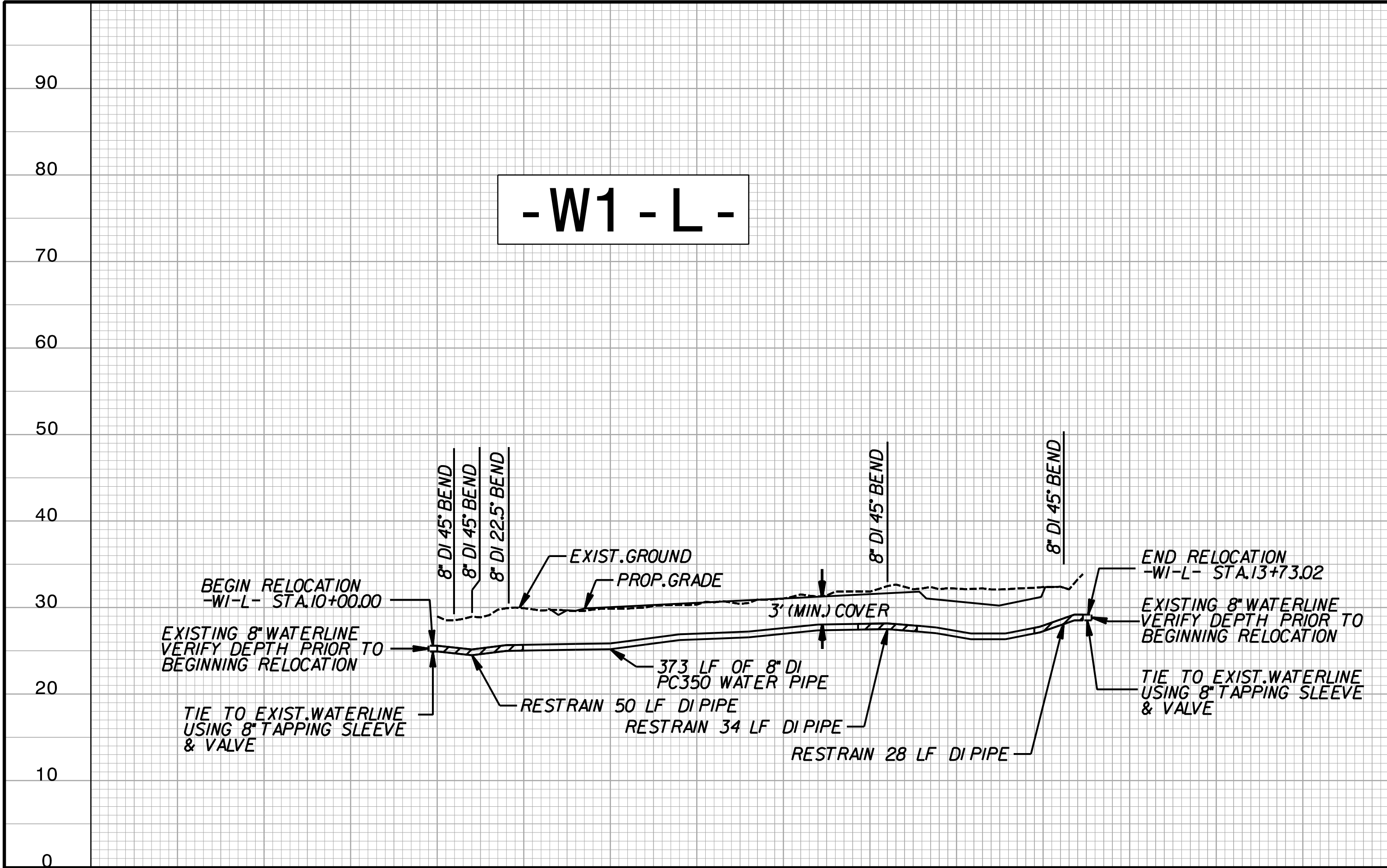
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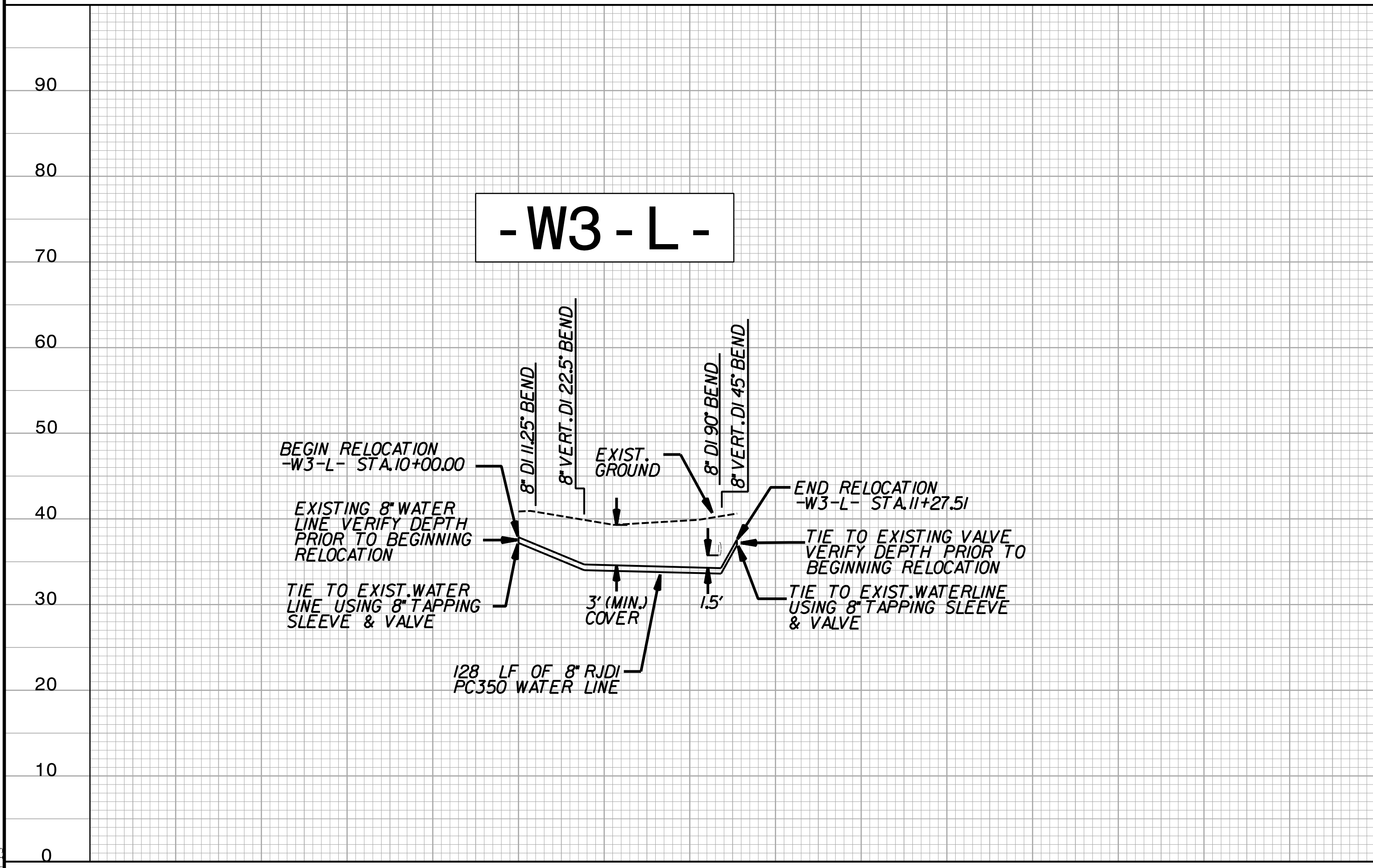
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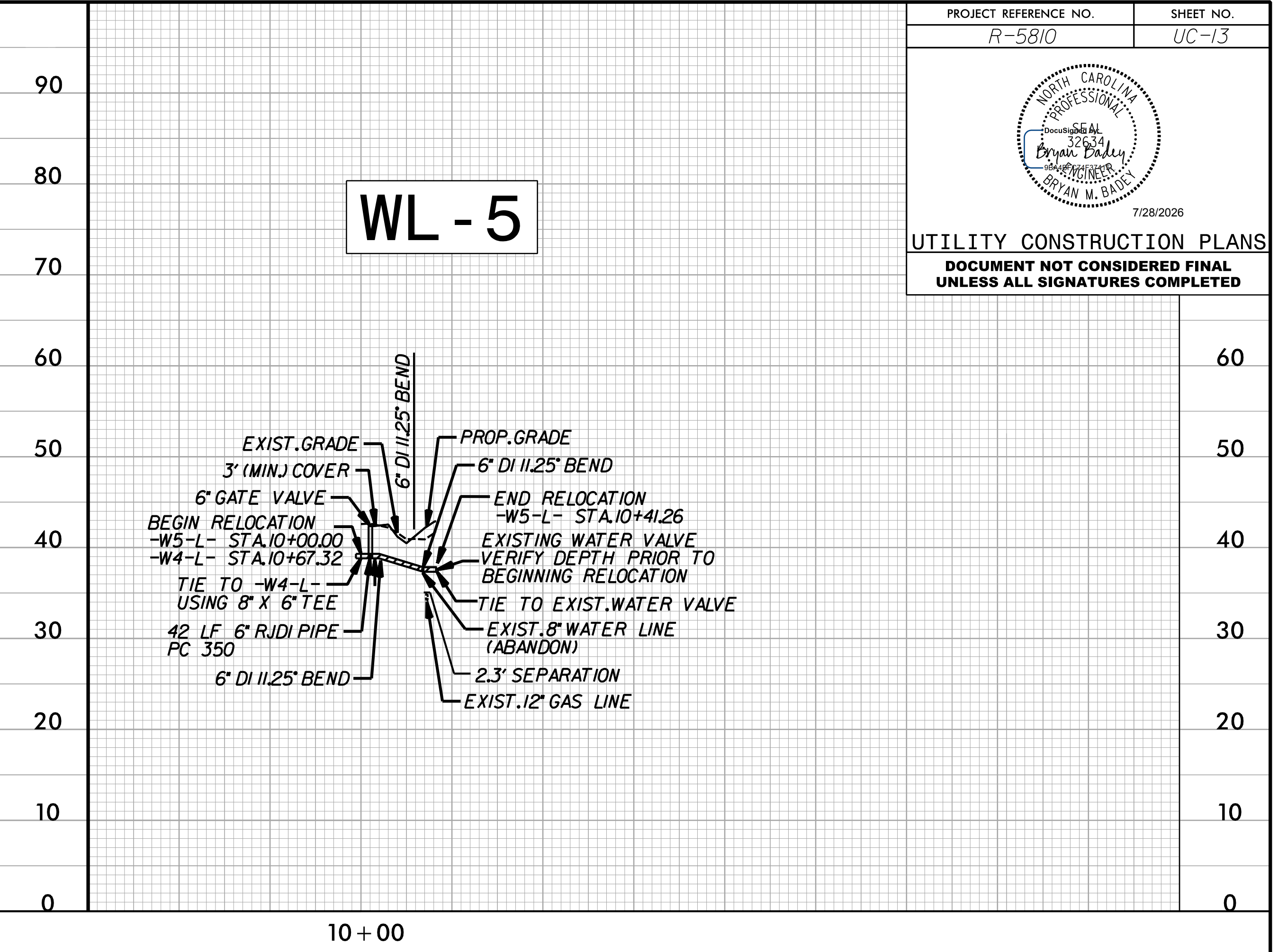
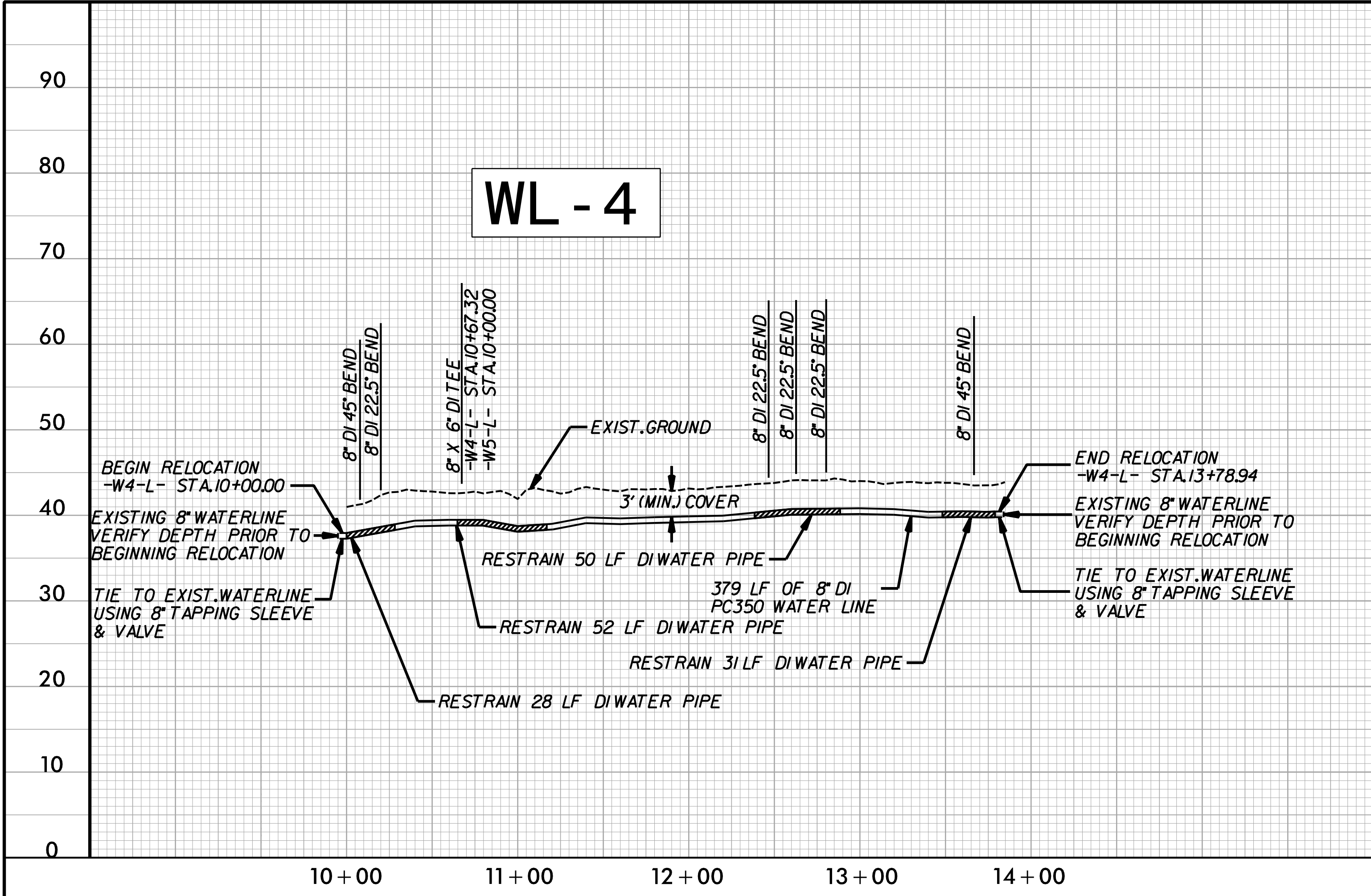


SEE SHEET UC-5 FOR -W1-L-
SEE SHEET UC-7 FOR -W2-L-
SEE SHEET UC-7 FOR -W3-L-

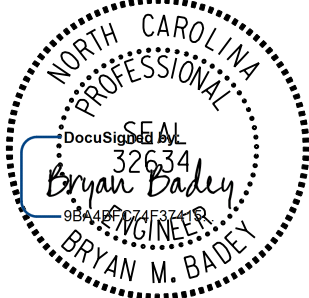
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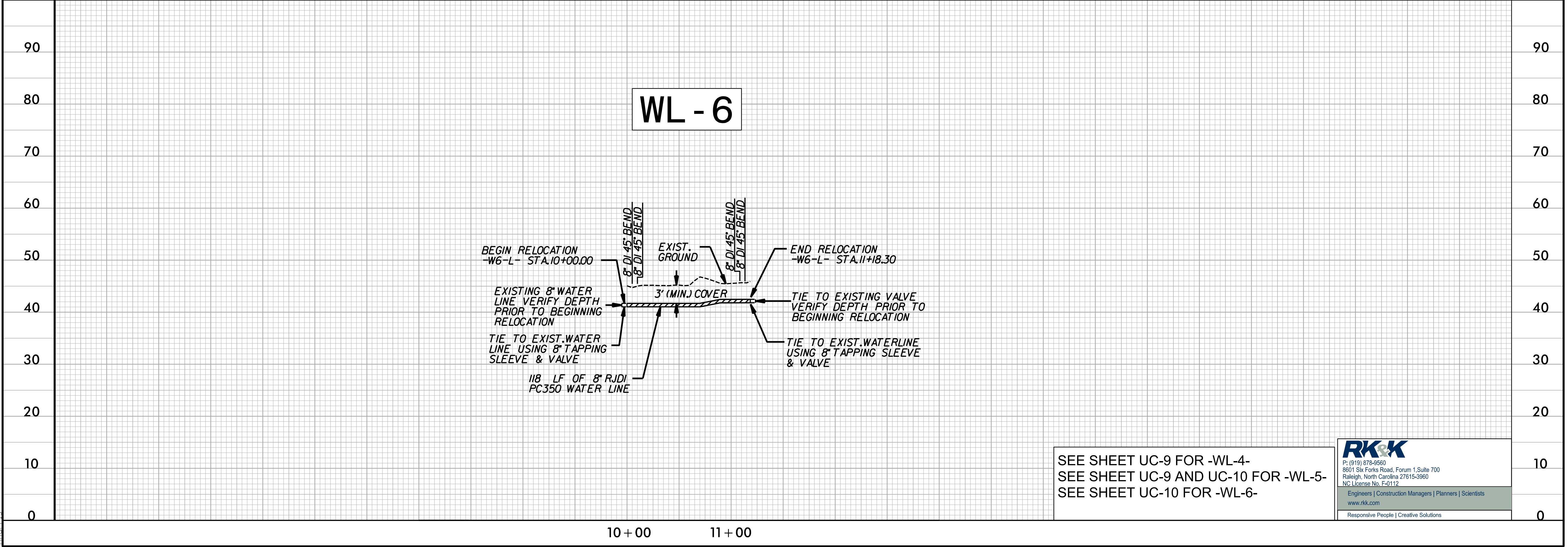
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SEE SHEET UC-10 FOR -WL-6-

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