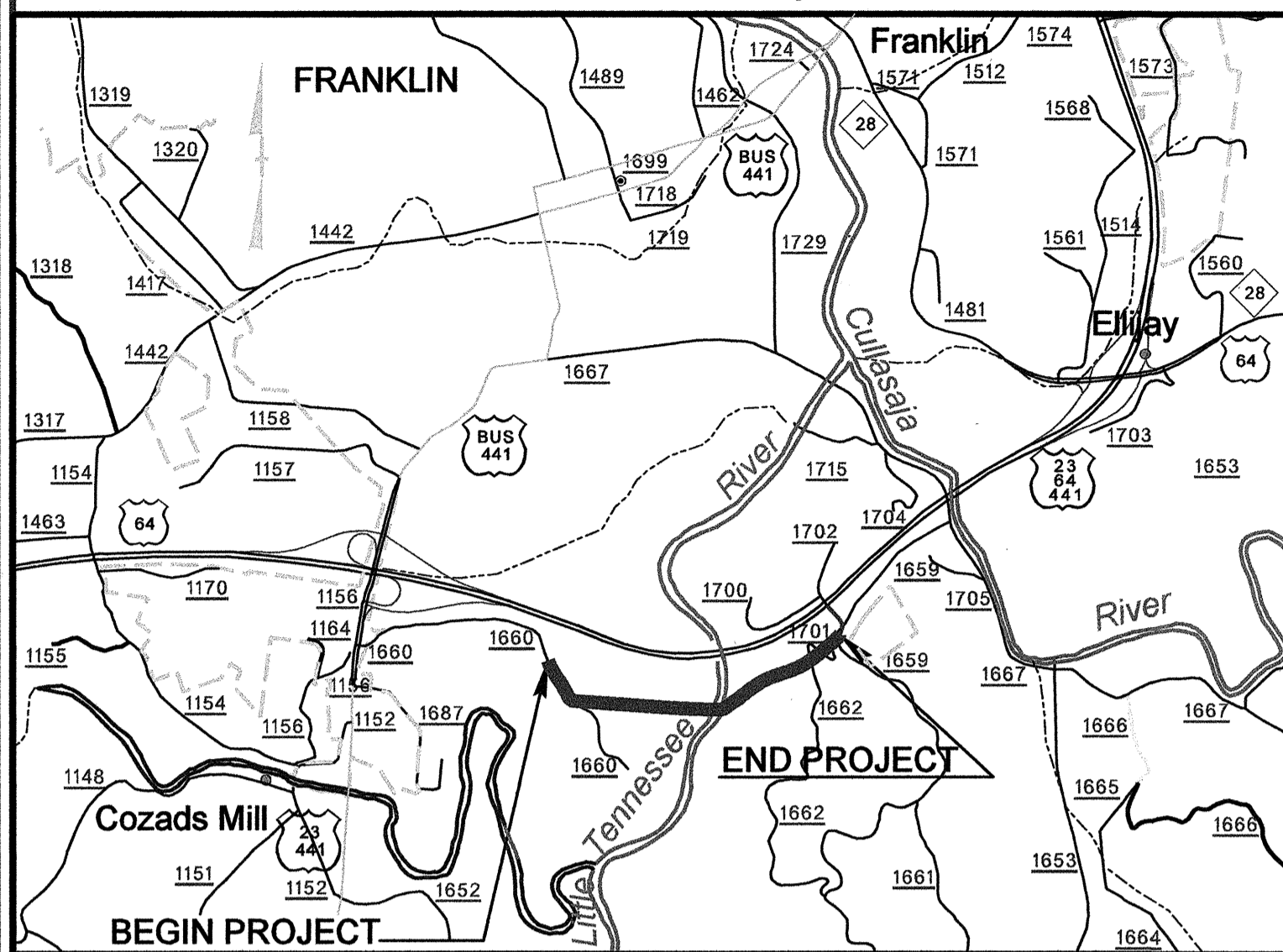


TIP PROJECT: R-4748

CONTRACT: C202556

See Sheet 1-A For Index of Sheets  
See Sheet 1-B For Conventional Symbols



VICINITY MAP

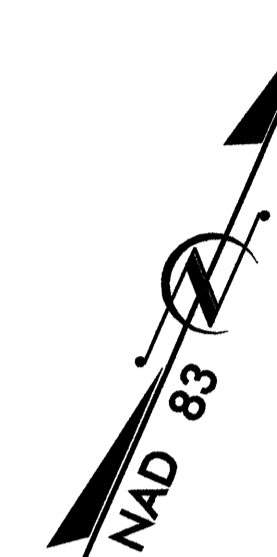
STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

# UTILITY CONSTRUCTION PLANS MACON COUNTY

LOCATION: FRANKLIN - NEW ROUTE FROM SR 1660 (SILER ROAD)  
TO SR 1662 (WILEY BROWN ROAD) SOUTH OF US 441

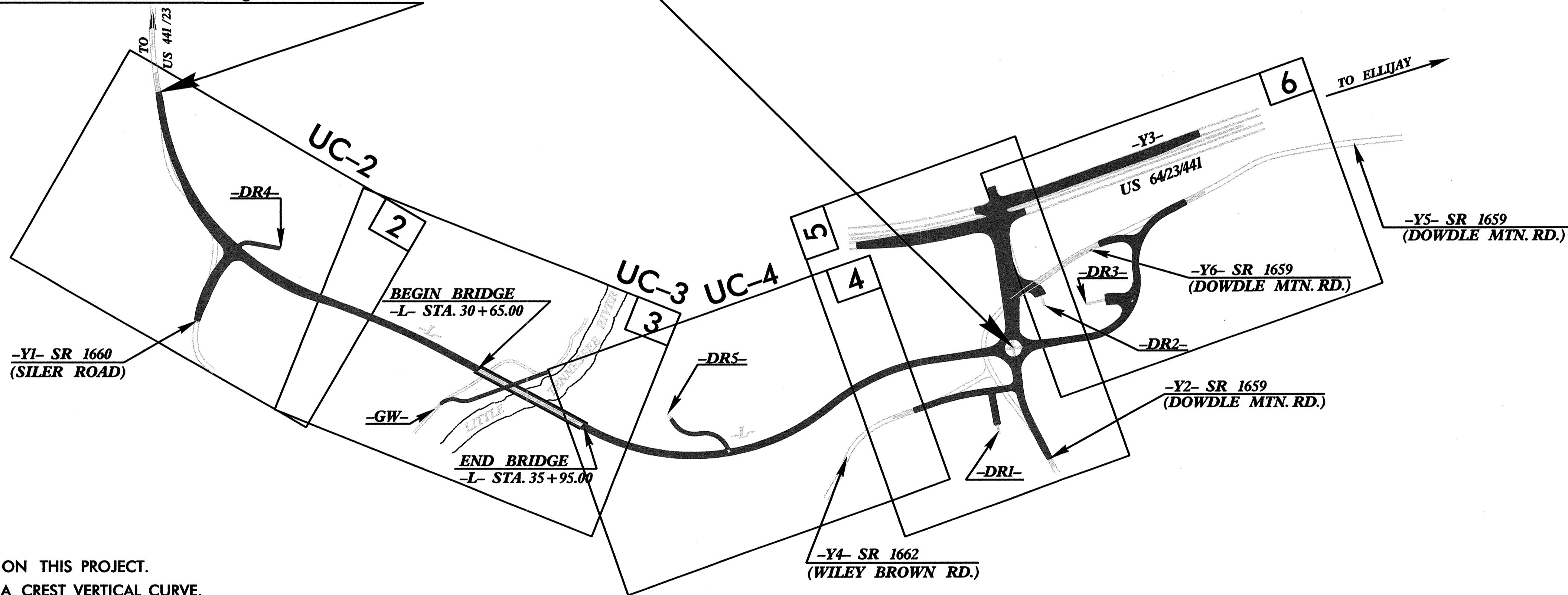
TYPE OF WORK: UTILITIES CONSTRUCTION

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.
N.C.	R-4748	UC-1
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION



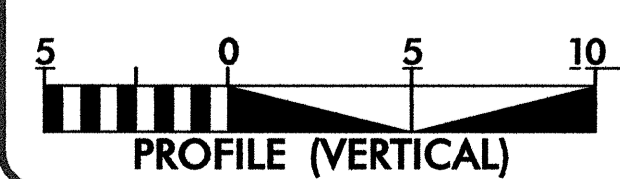
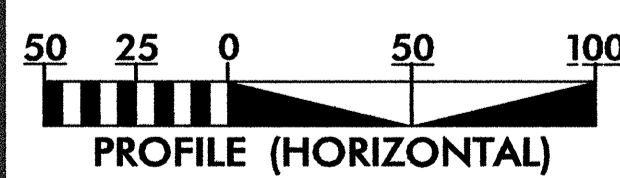
STA. 56+10.89 -L- END TIP PROJECT R-4748

STA. 10+90.00 -L- BEGIN TIP PROJECT R-4748



THERE IS NO CONTROL OF ACCESS ON THIS PROJECT.  
DESIGN EXCEPTION REQUIRED FOR A CREST VERTICAL CURVE.

GRAPHIC SCALES

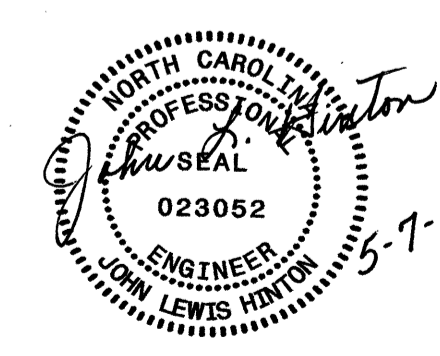


INDEX OF SHEETS


SHEET No.	DESCRIPTION
UC-1	TITLE SHEET
UC-2 TO UC-4	UTILITY CONSTRUCTION PLAN SHEETS
UC-5	UTILITY CONSTRUCTION PROFILE SHEET
UC-6	UTILITY CONSTRUCTION DETAIL SHEET

UTILITY OWNERS ON PROJECT

- (1.) TOWN OF FRANKLIN (WATER)
- (2.) MACON COUNTY (SEWER)



PREPARED BY

**Municipal Services**  **Engineering Company, P.A.**

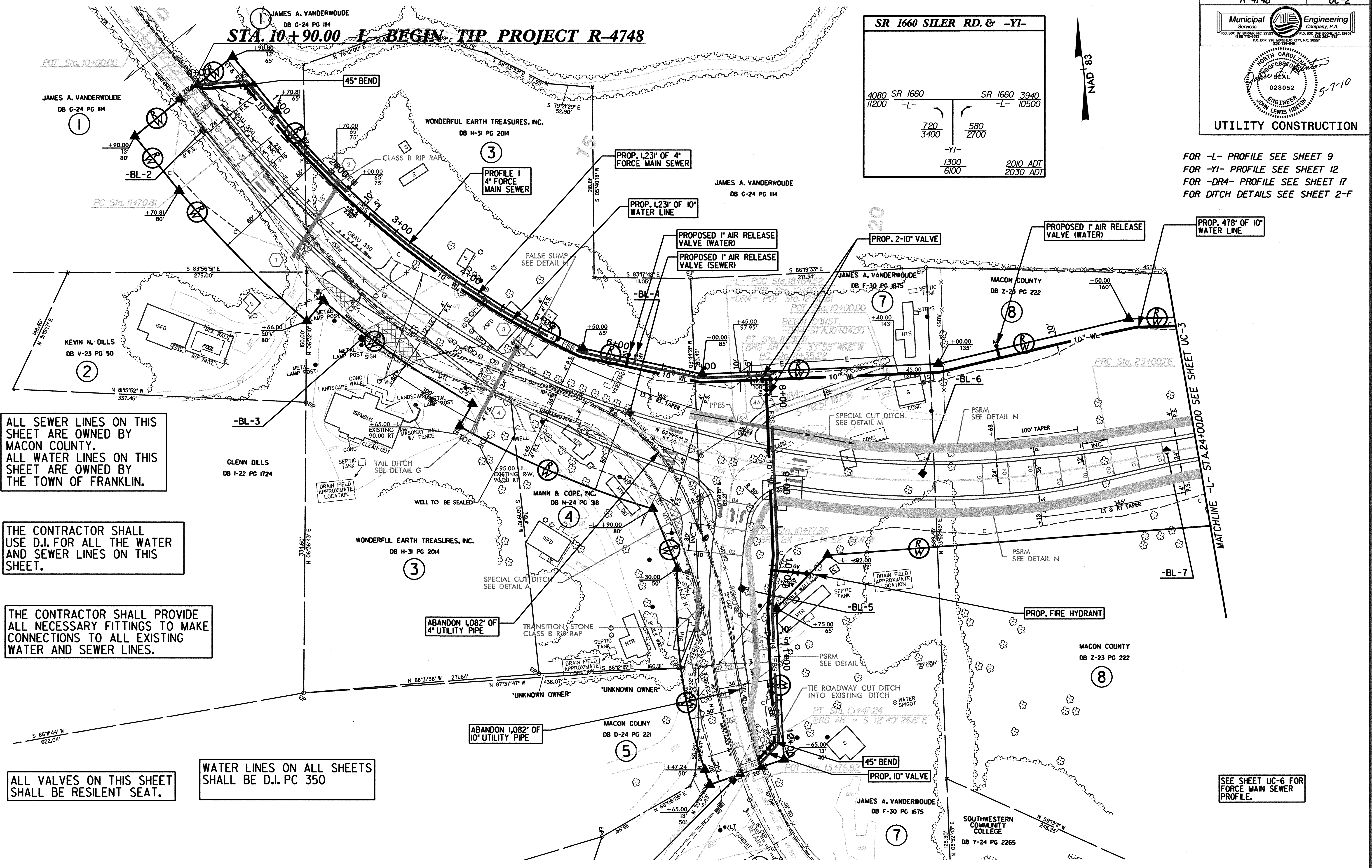
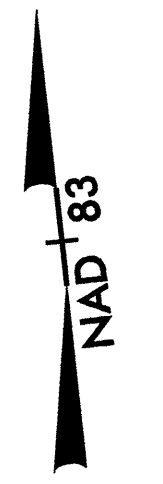
P.O. BOX 97 GARNER, N.C. 27529 (919) 772-5393  
P.O. BOX 349 BOONE, N.C. 28607 (828) 262-1767  
P.O. BOX 276 MOREHEAD CITY, N.C. 28557 (252) 726-9481

UTILITY DESIGN ENGINEER JOHN L. HINTON P.E.



FOR -L- PROFILE SEE SHEET 9  
 FOR -YI- PROFILE SEE SHEET 12  
 FOR -DR4- PROFILE SEE SHEET 17  
 FOR DITCH DETAILS SEE SHEET 2-F

SR 1660 SILER RD. & -YI-	
4080 SR 1660 11200 -L-	SR 1660 3940 -L- 10500
720 3400	580 2700
1300 6100	2010 ADT 2030 ADT



ALL SEWER LINES ON THIS SHEET ARE OWNED BY MACON COUNTY.  
 ALL WATER LINES ON THIS SHEET ARE OWNED BY THE TOWN OF FRANKLIN.

THE CONTRACTOR SHALL USE D.I. FOR ALL THE WATER AND SEWER LINES ON THIS SHEET.

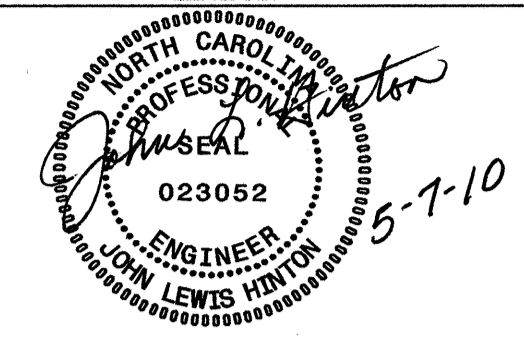
THE CONTRACTOR SHALL PROVIDE ALL NECESSARY FITTINGS TO MAKE CONNECTIONS TO ALL EXISTING WATER AND SEWER LINES.

ALL VALVES ON THIS SHEET SHALL BE RESILENT SEAT.

WATER LINES ON ALL SHEETS SHALL BE D.I. PC 350

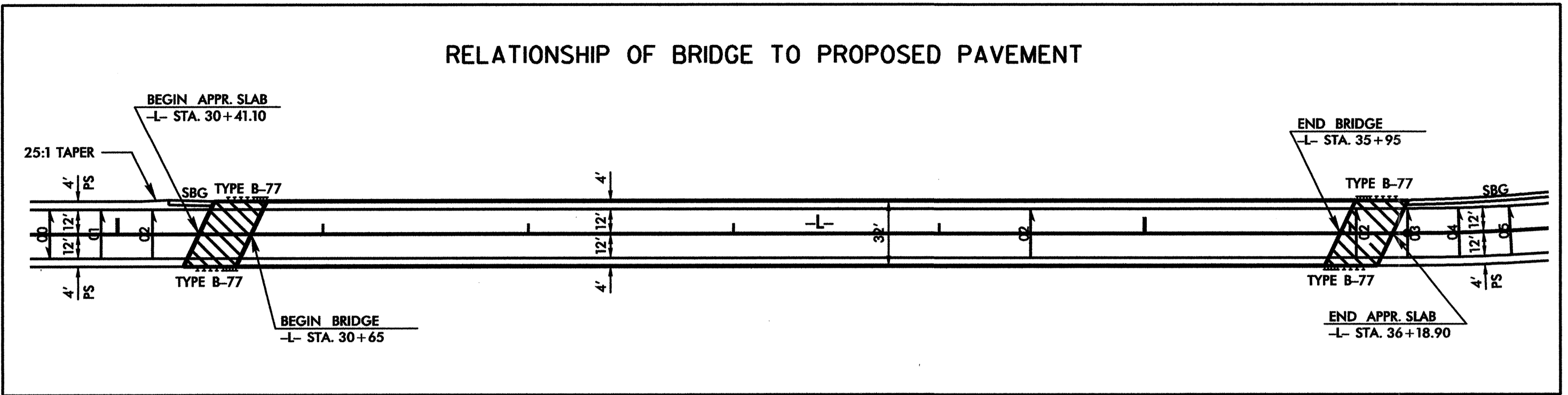
SEE SHEET UC-6 FOR FORCE MAIN SEWER PROFILE.



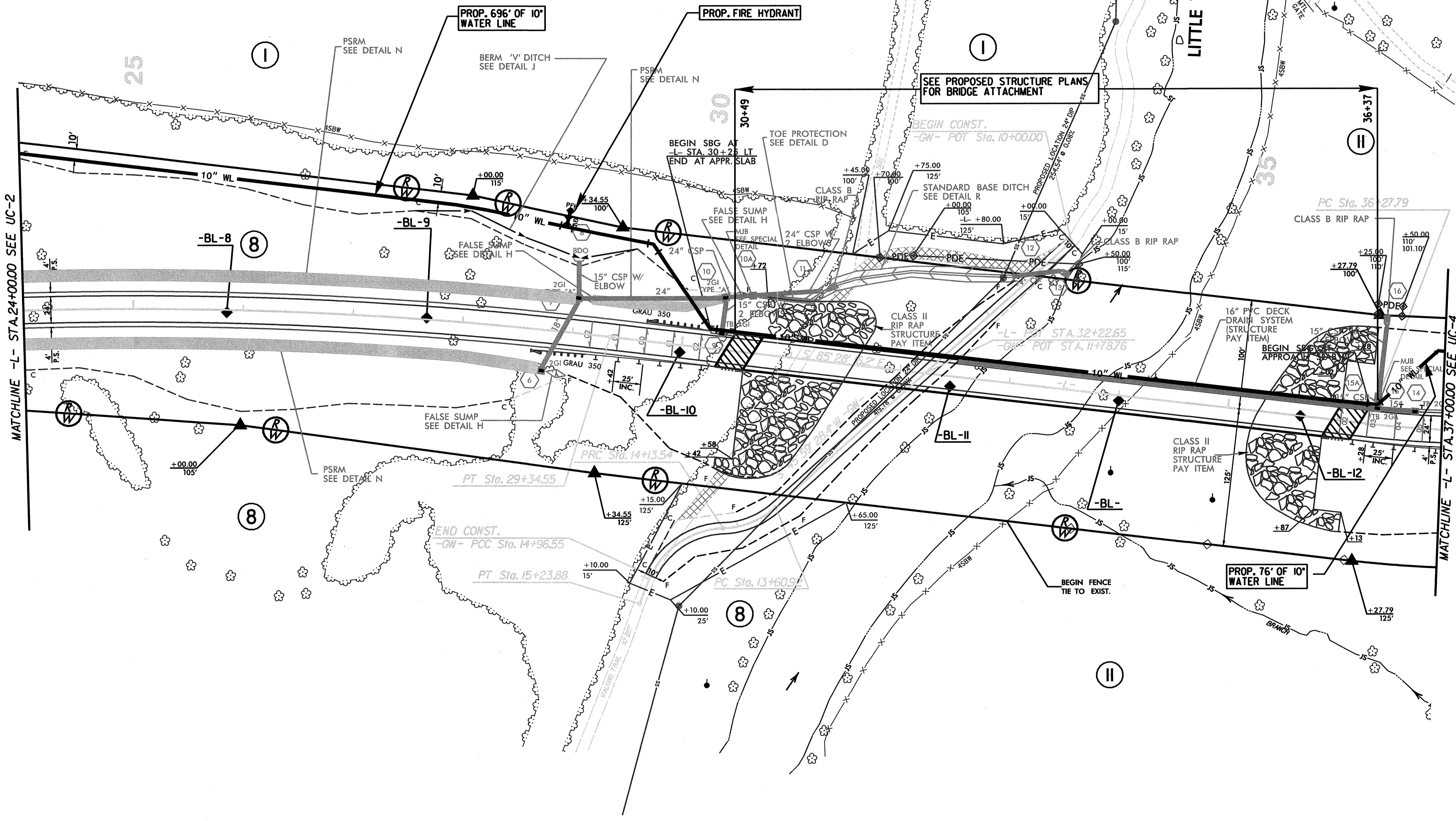
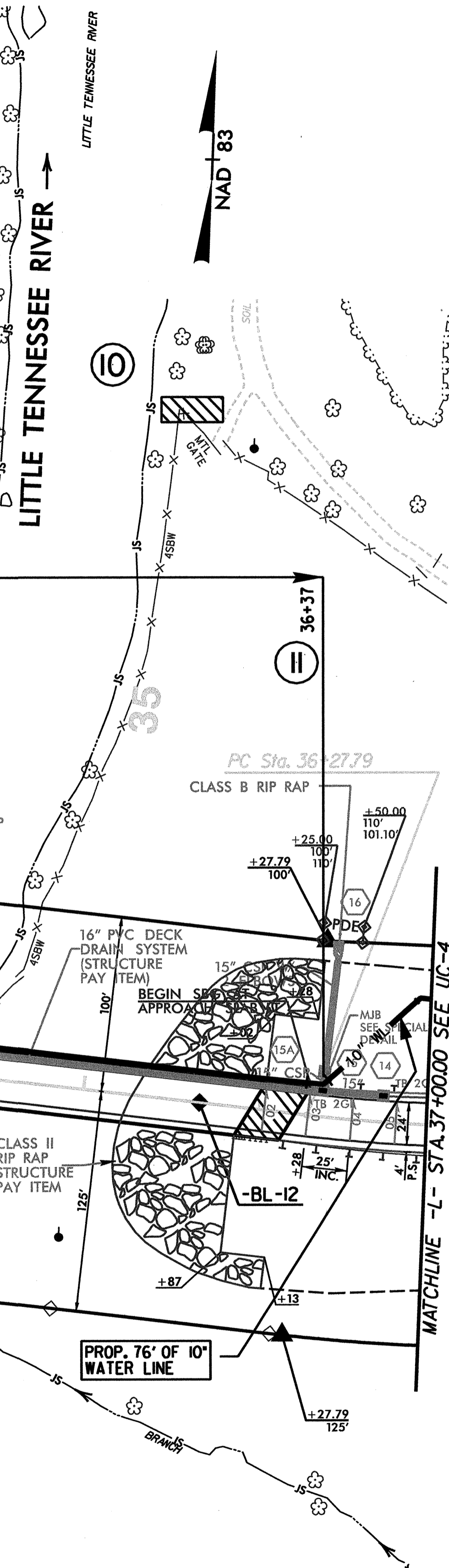


**UTILITY CONSTRUCTION**

FOR -L- PROFILE SEE SHEET 10  
 FOR -GW- PROFILE SEE SHEET 17  
 FOR DITCH DETAILS SEE SHEET 2-F  
 FOR STRUCTURE PLANS SEE SHEETS S-1 TO S-??  
**BRIDGE APPROACH SLAB**



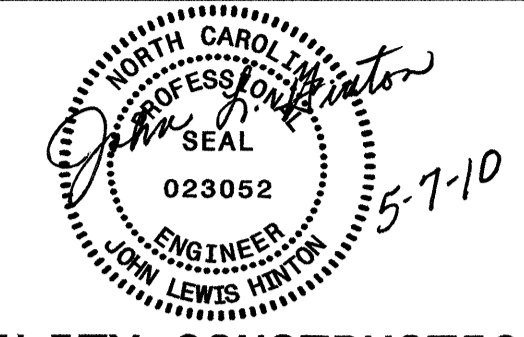
THE PROPOSED LOCATION OF A  
 MACON COUNTY SANITARY SEWER LINE  
 AS DESIGNED BY  
 MCGILL ASSOCIATES, PA  
 P.O. BOX 2259  
 ASHEVILLE, N.C. 28802  
 Contact Information  
 Persons: Mr. Vann Waters, P.L.S.  
 Phone: (828) 252-0575  
 e-mail: vann@mcgillengineers.com



MATCHLINE -L- STA. 24+00.00 SEE UC-2

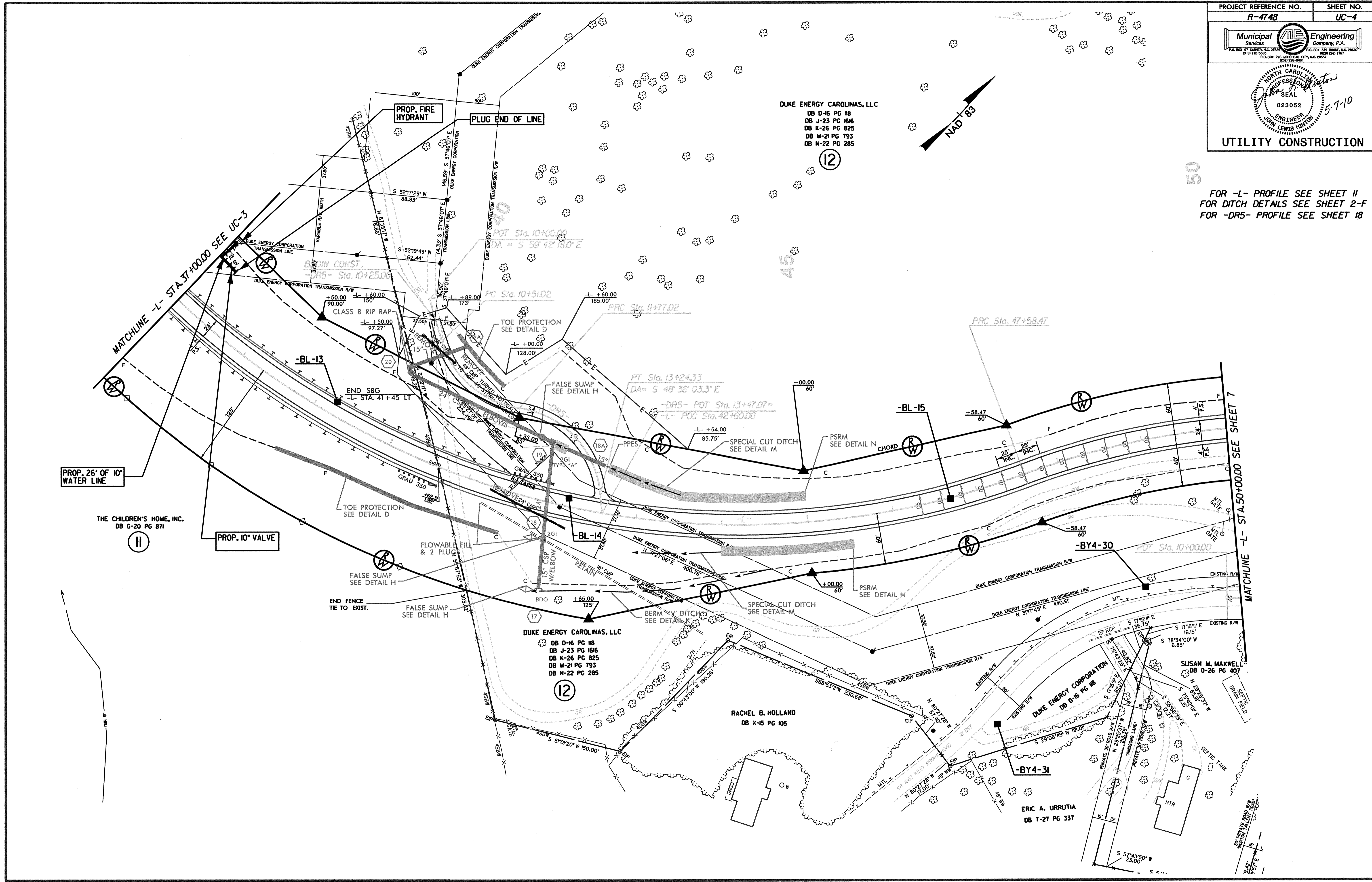
MATCHLINE -L- STA. 37+00.00 SEE UC-4



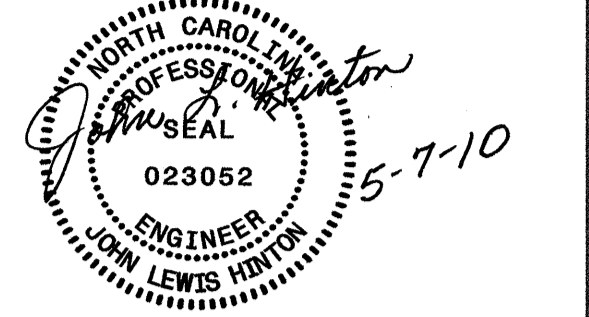
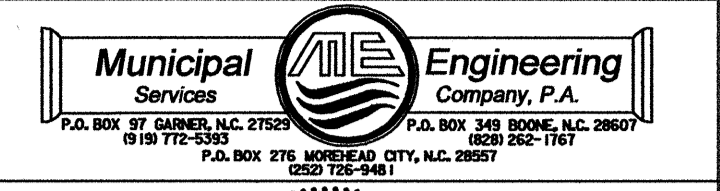


UTILITY CONSTRUCTION

FOR -L- PROFILE SEE SHEET 11  
FOR DITCH DETAILS SEE SHEET 2-F  
FOR -DR5- PROFILE SEE SHEET 18

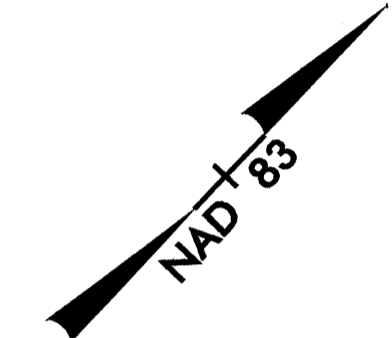
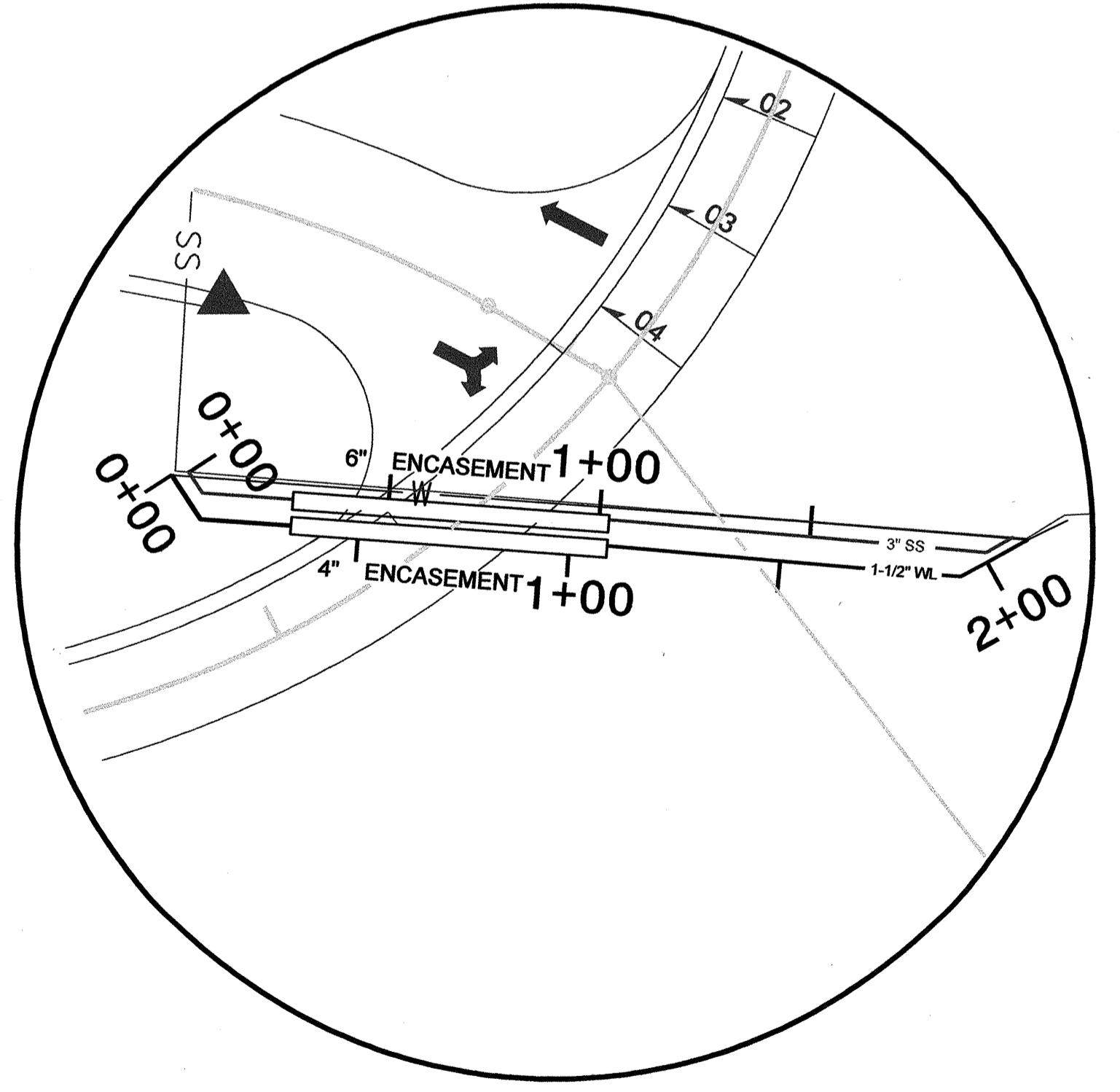
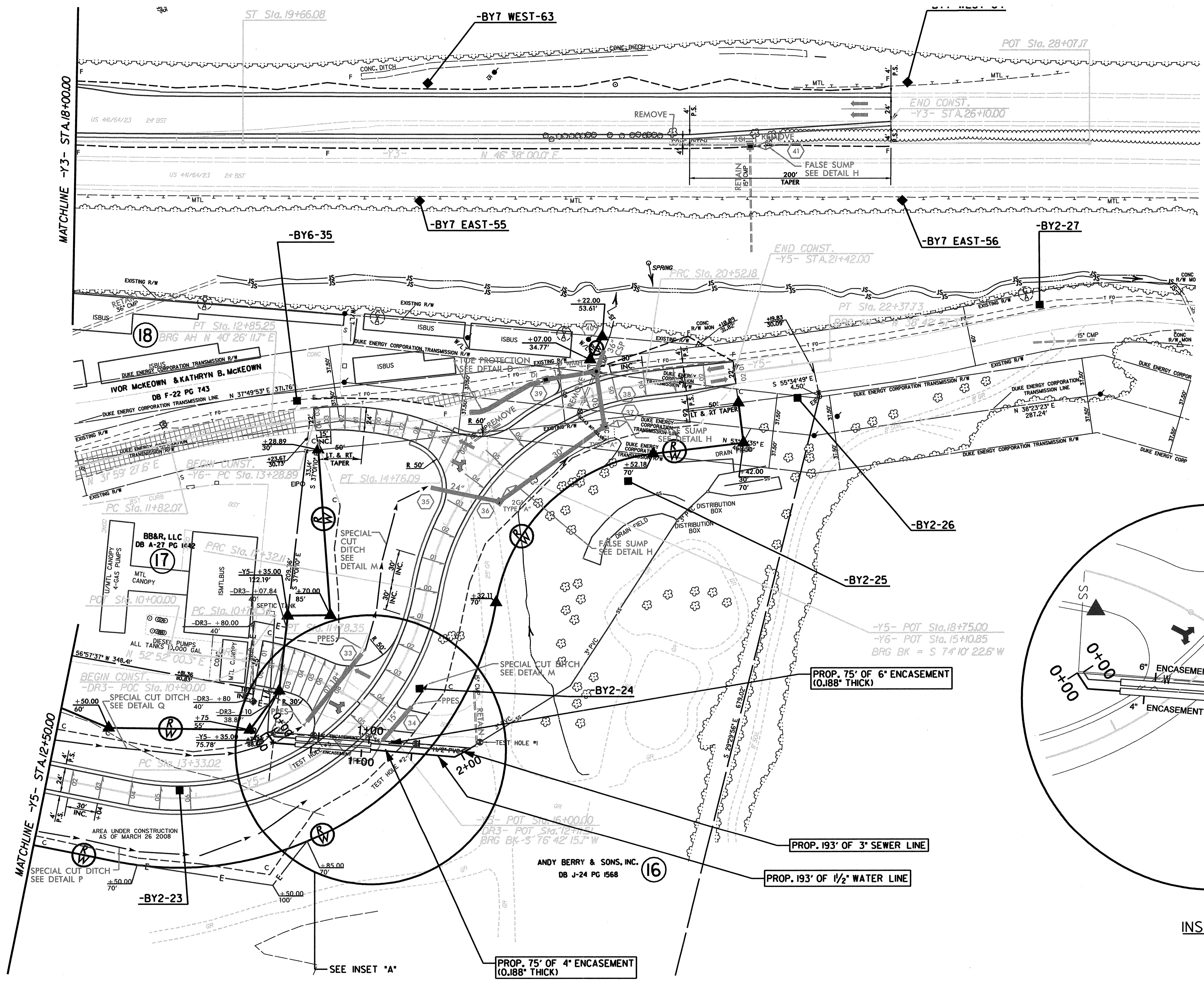




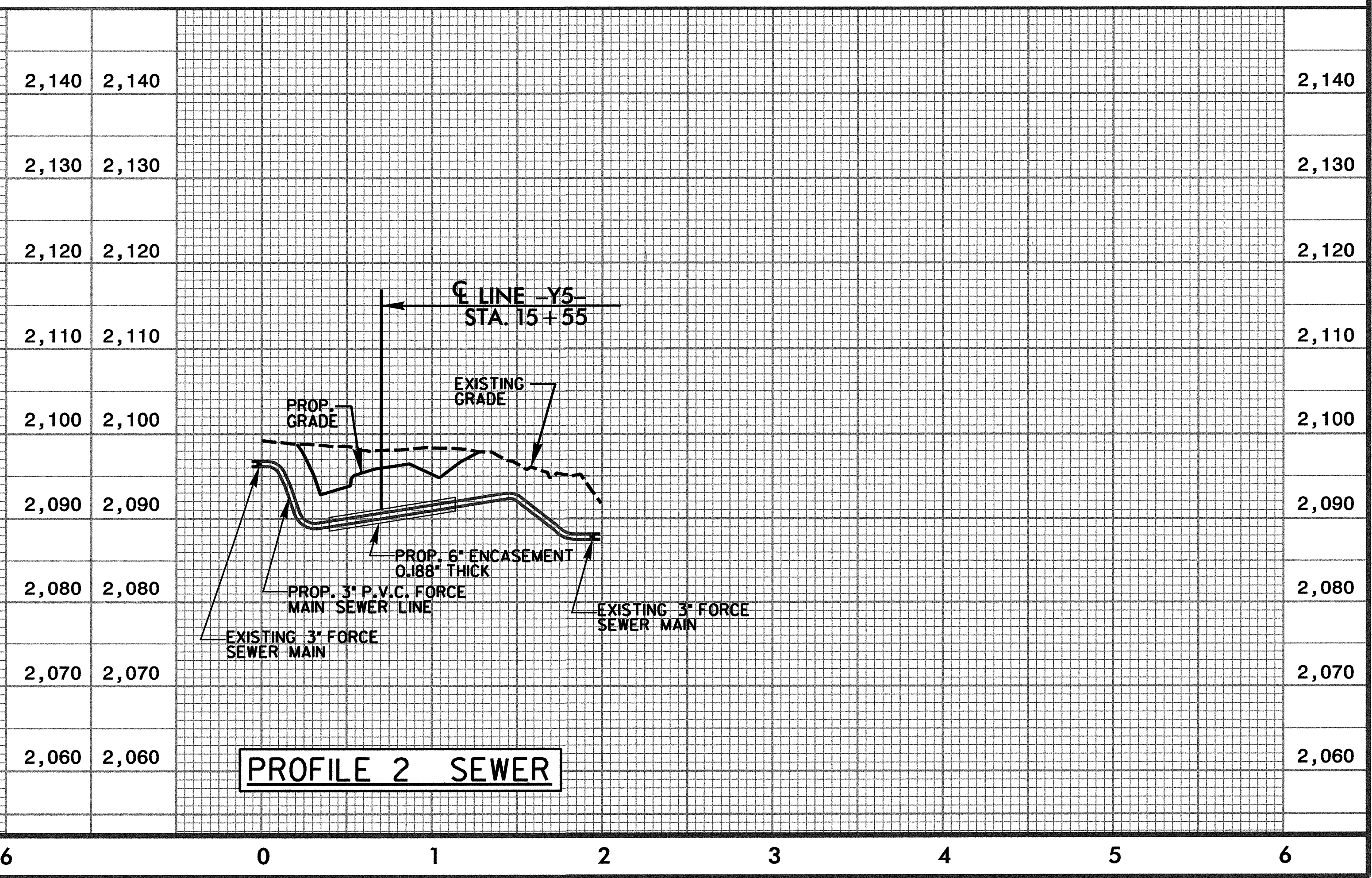
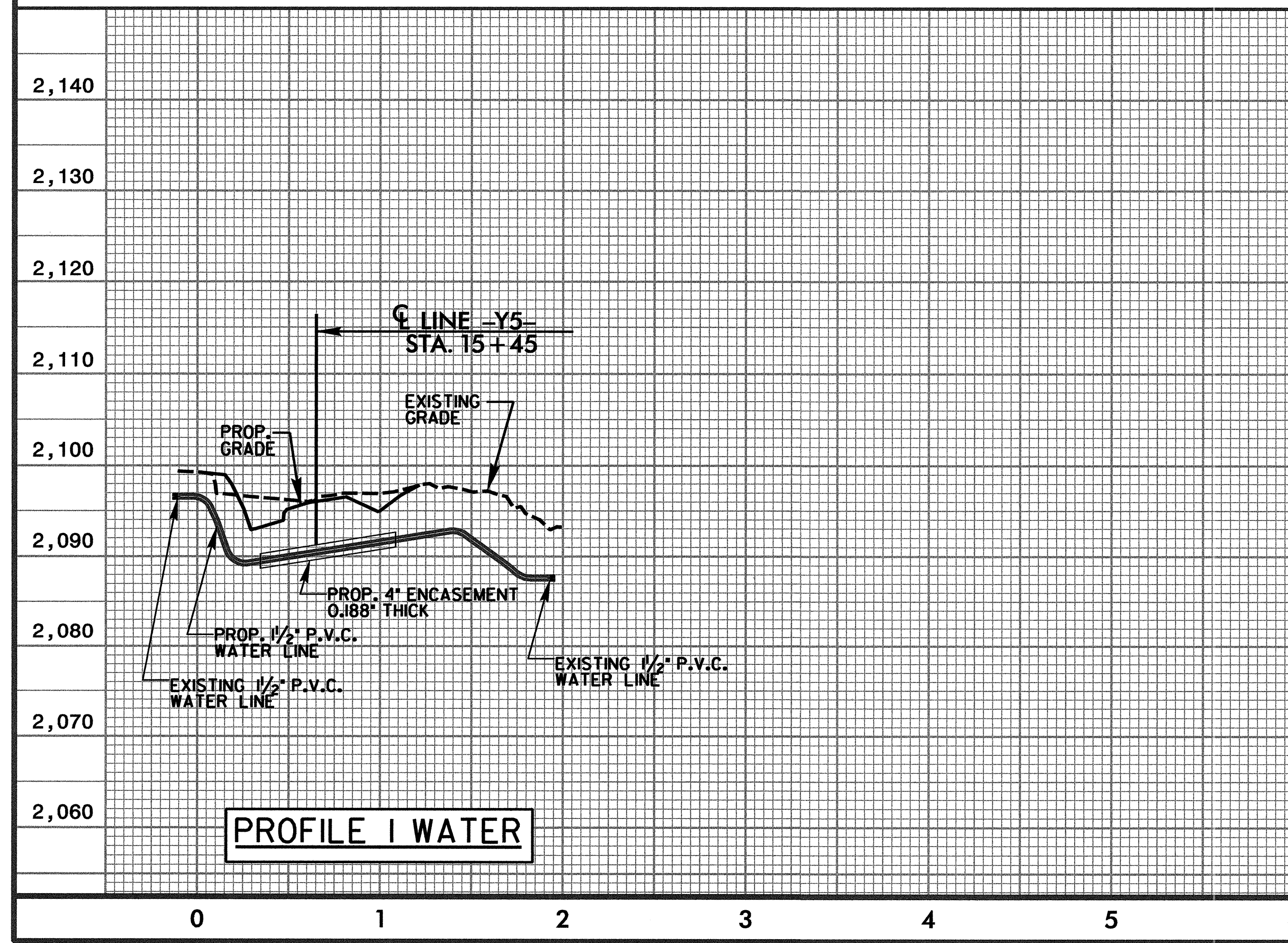
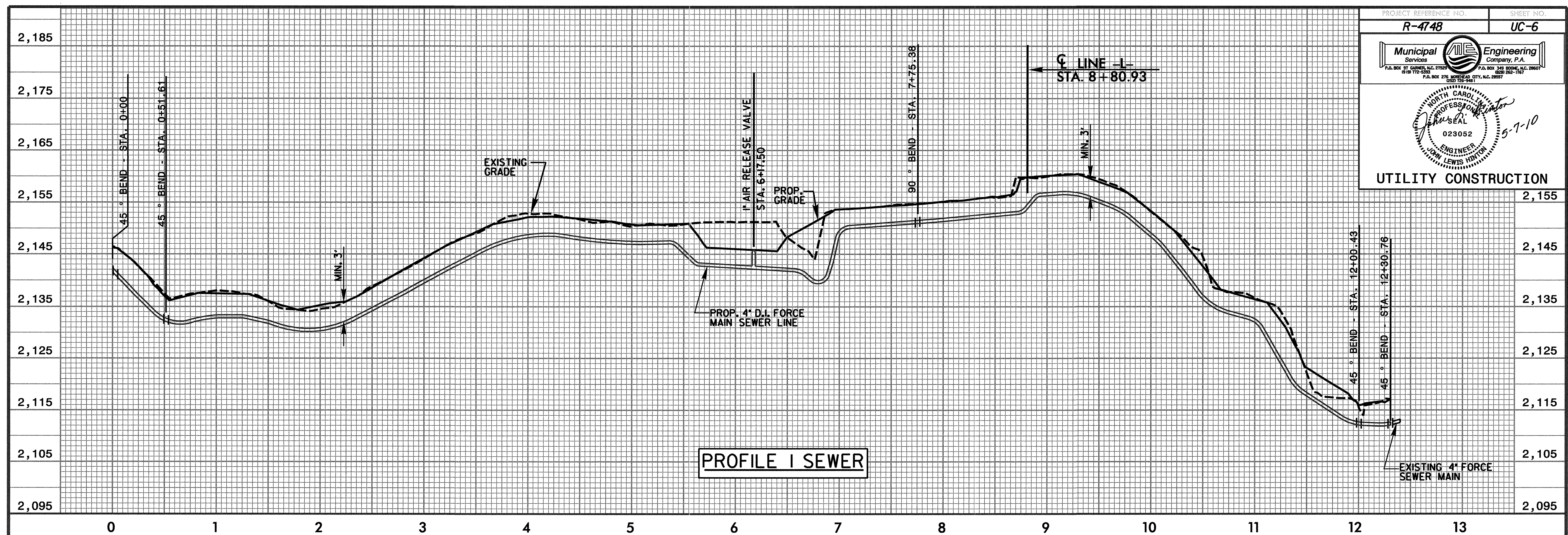


**UTILITY CONSTRUCTION**

FOR -Y3- PROFILE SEE SHEET 14  
 FOR -Y5- PROFILE SEE SHEET 16  
 FOR -Y6- PROFILE SEE SHEET 17  
 FOR -DR3- PROFILE SEE SHEET 17  
 FOR DITCH DETAILS SEE SHEET 2-F

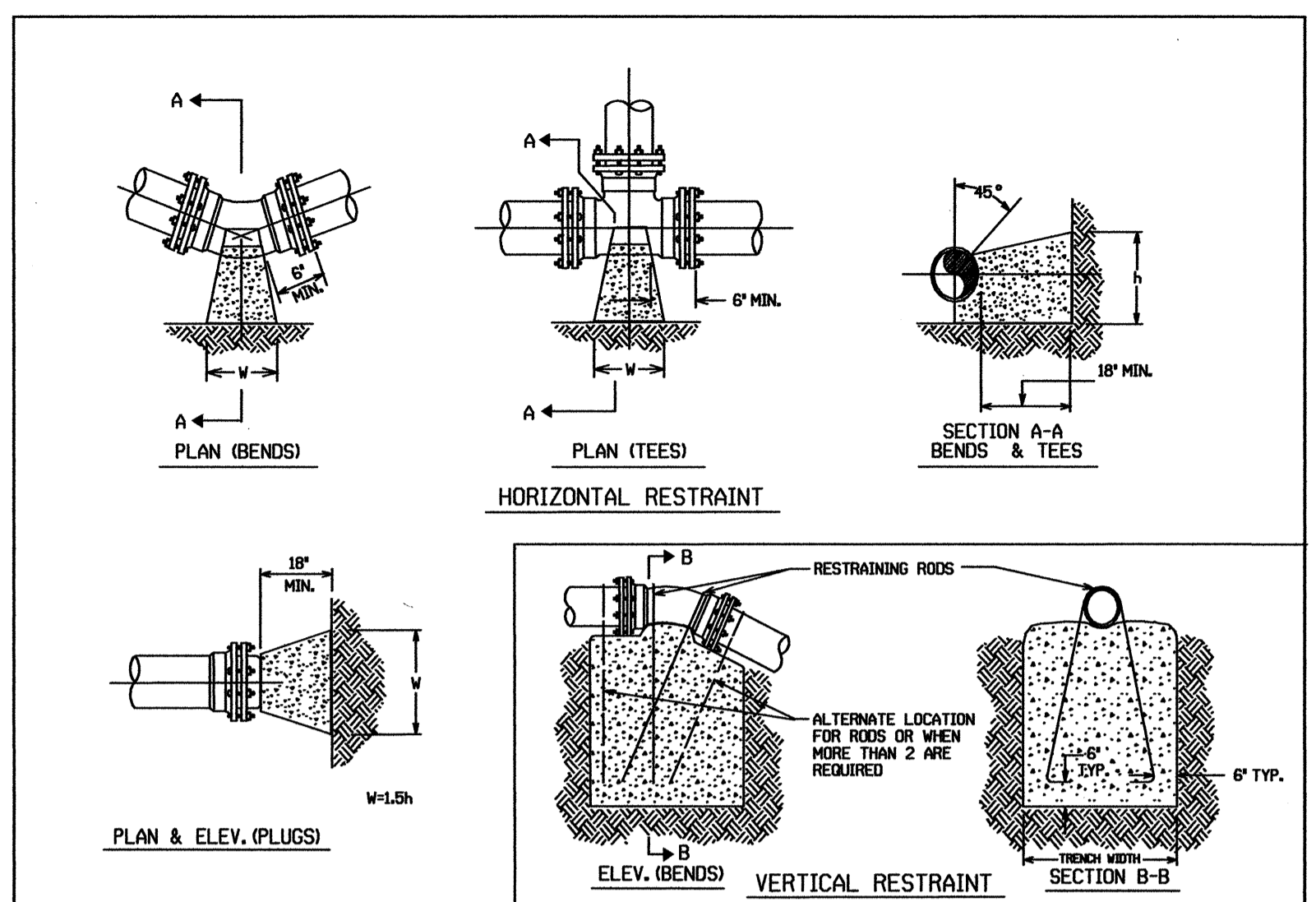




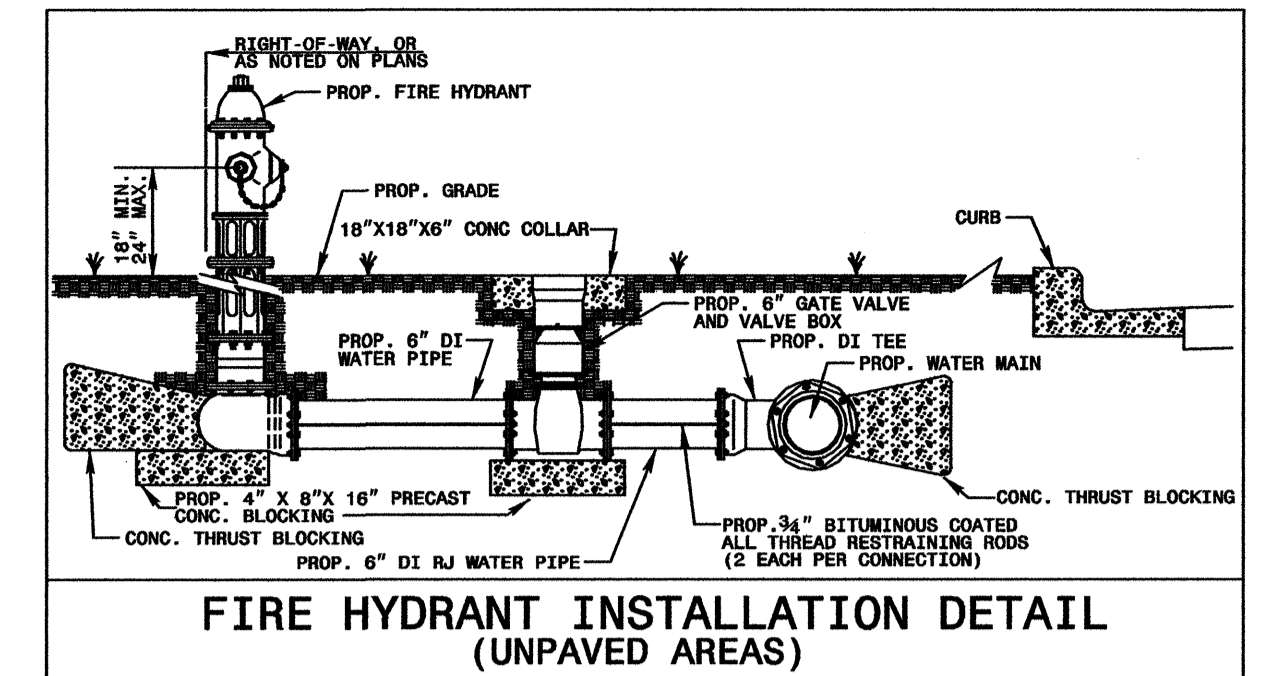
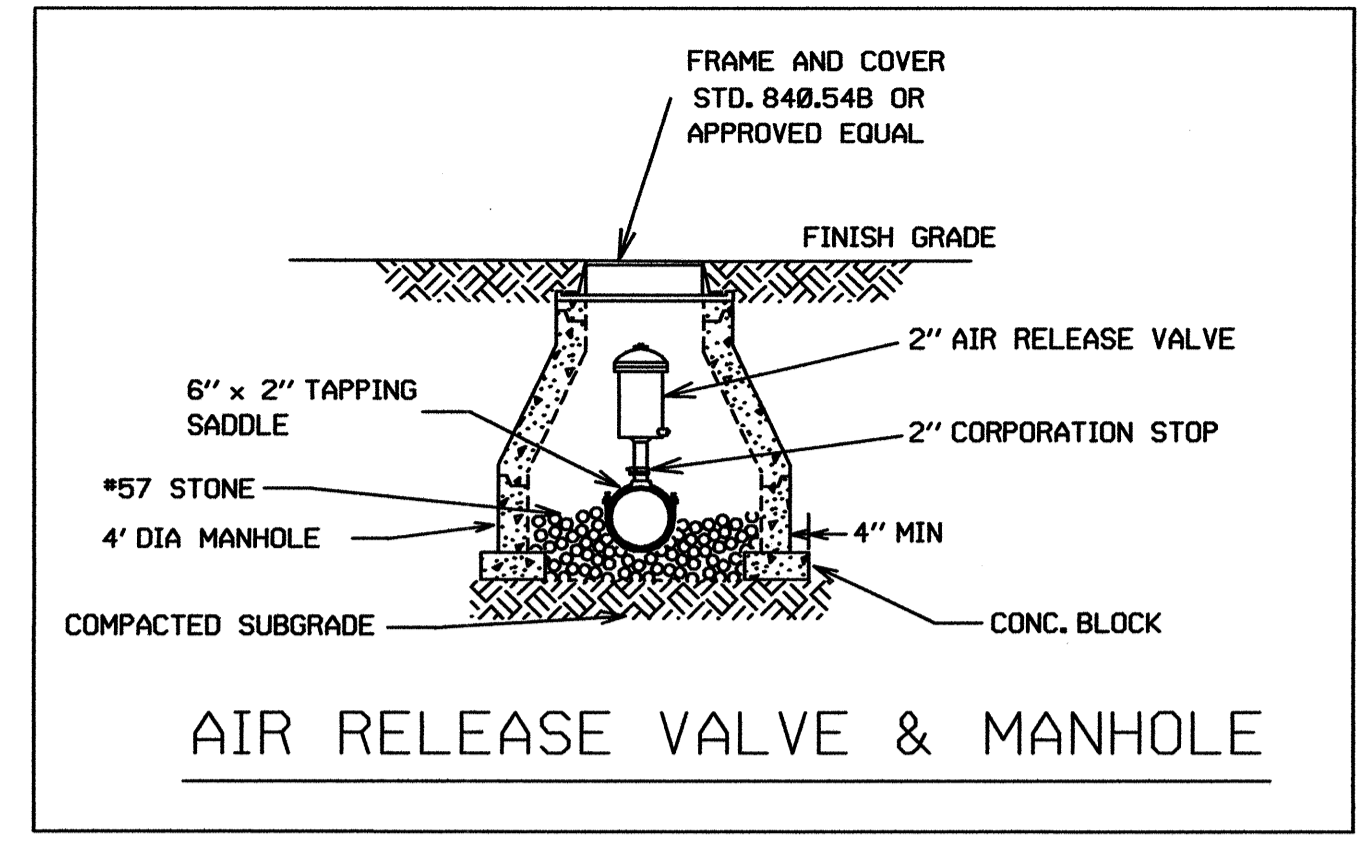




UTILITY CONSTRUCTION



THRUST RESTRAINT FOR PIPE LINES



BASED ON TEST PRESSURE OF 200 P.S.I.

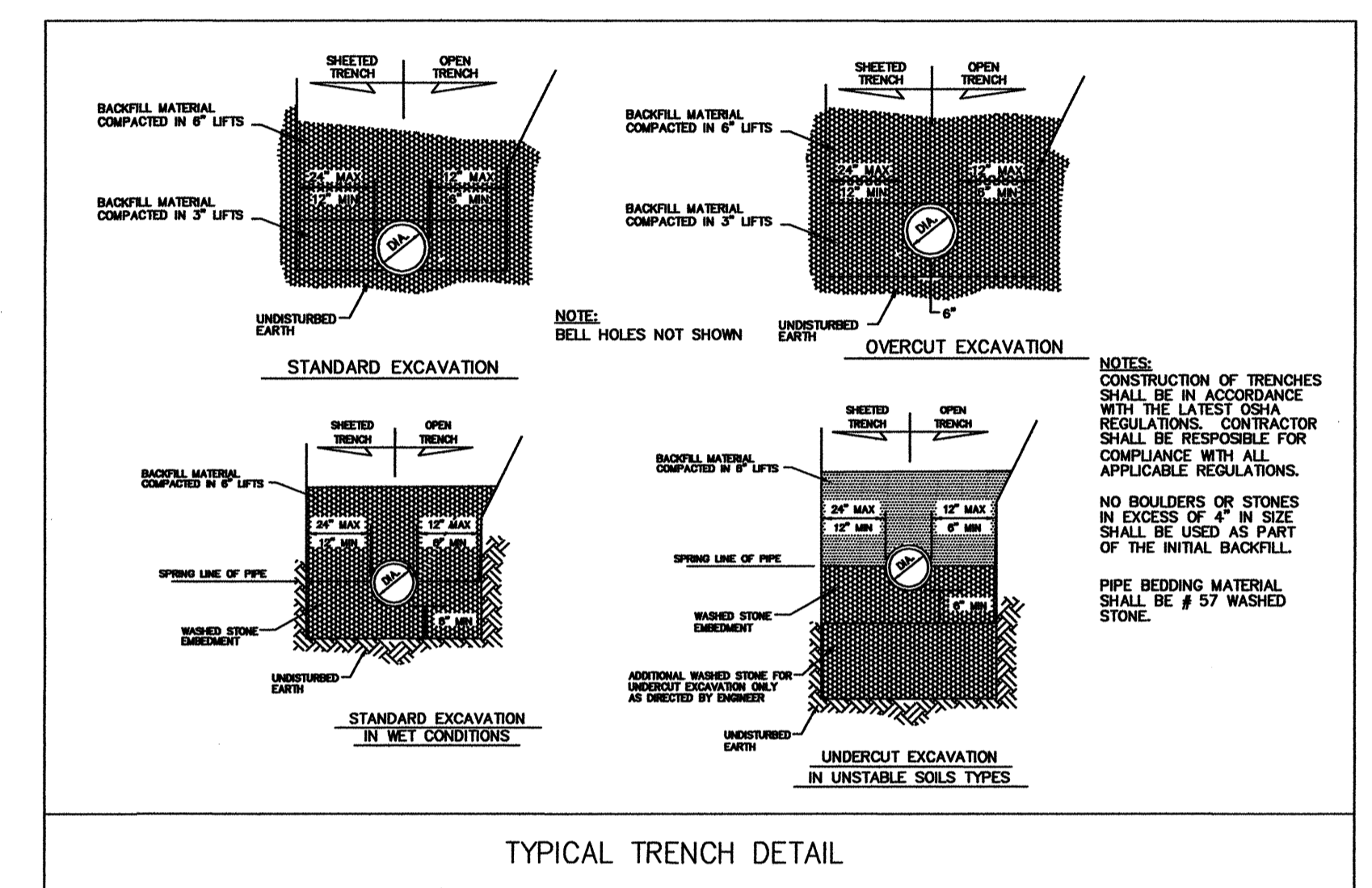
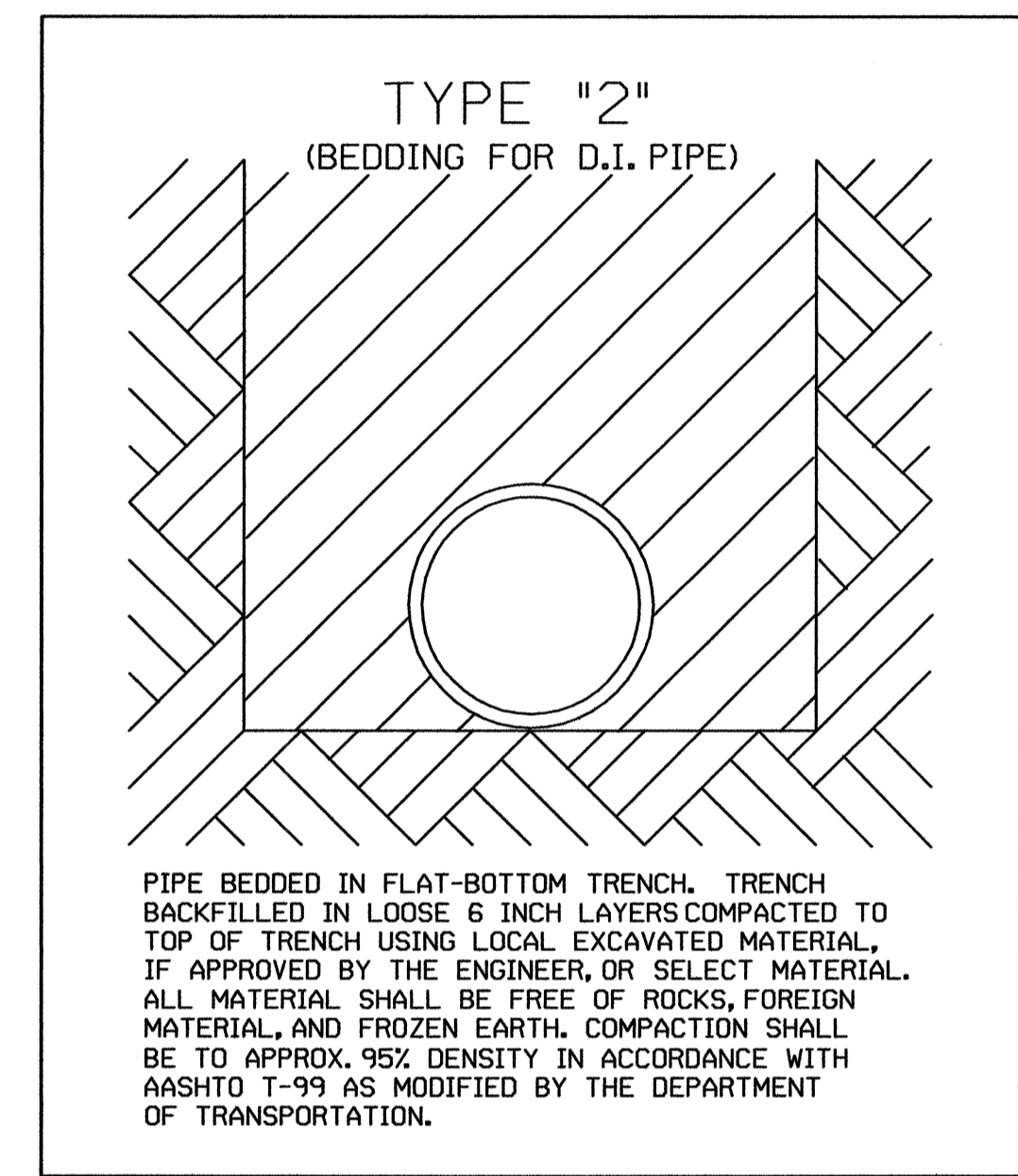
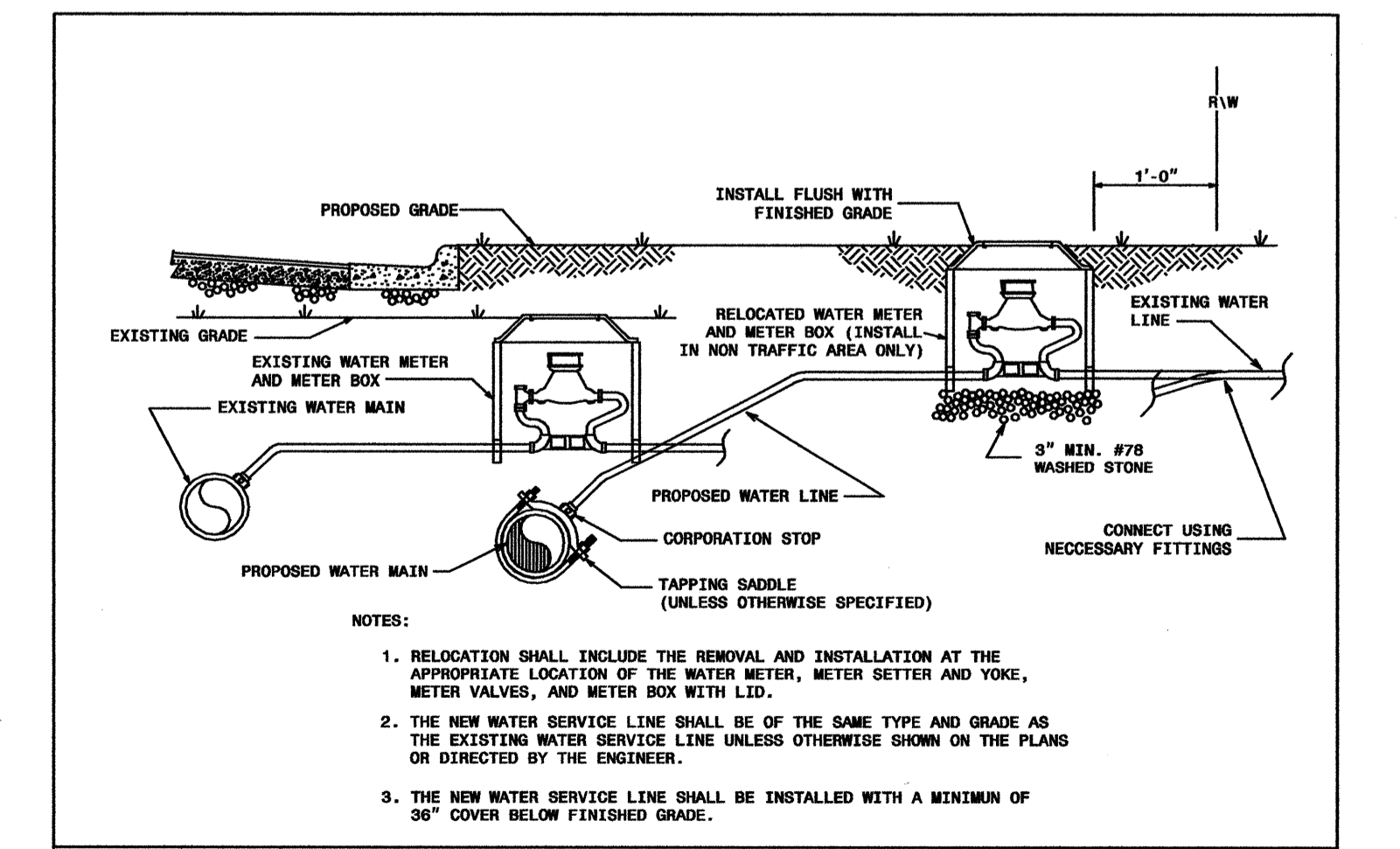
PIPE SIZE	DEGREE OF BEND	LBS. STATIC THRUST *	HORIZONTAL RESTRAINT (ALL AREAS GIVEN ARE IN SQUARE FEET)								VERTICAL RESTRAINT (ALL VOLUMES GIVEN ARE IN CUBIC YARDS)**				
			1000	2000	3000	4000	5000	6000	7000	8000	PIPE SIZE	RESTRAINING RODS	DEGREE OF BEND		
4"	1/2"	55								4"	2	1/2"	0.25	0.50	0.75
	90°	110								6"	2	1/2"	0.50	1.00	1.75
6"	1/2"	165								8"	2	5/8"	0.75	1.50	3.0
	90°	330								10"	2	3/4"	1.25	2.25	4.50
8"	1/2"	220								12"	2	7/8"	1.75	3.25	6.50
	90°	440								14"	4	5/8"	2.25	4.50	8.75
10"	1/2"	275								16"	4	3/4"	3.0	6.0	11.50
	90°	550													
12"	1/2"	330													
	90°	660													
14"	1/2"	385													
	90°	770													
16"	1/2"	440													
	90°	880													

\* INCLUDES 1.25 SAFETY FACTOR  
 \*\* INCLUDES 1.50 SAFETY FACTOR

GENERAL NOTES:  
 1. CONCRETE SHALL BE CLASS "B".  
 2. CONCRETE SHALL NOT CONTACT BOLTS ENDS OF MECHANICAL JOINT FITTINGS.  
 3. CONSULT WITH ENGINEER FOR CONCRETE REQUIREMENTS ON MAINS LARGER THAN 16 INCHES.  
 (FOR VERTICAL & HORIZONTAL BENDS)  
 4. ALLOWABLE SOIL BEARING SHALL BE DETERMINED BY THE ENGINEER.

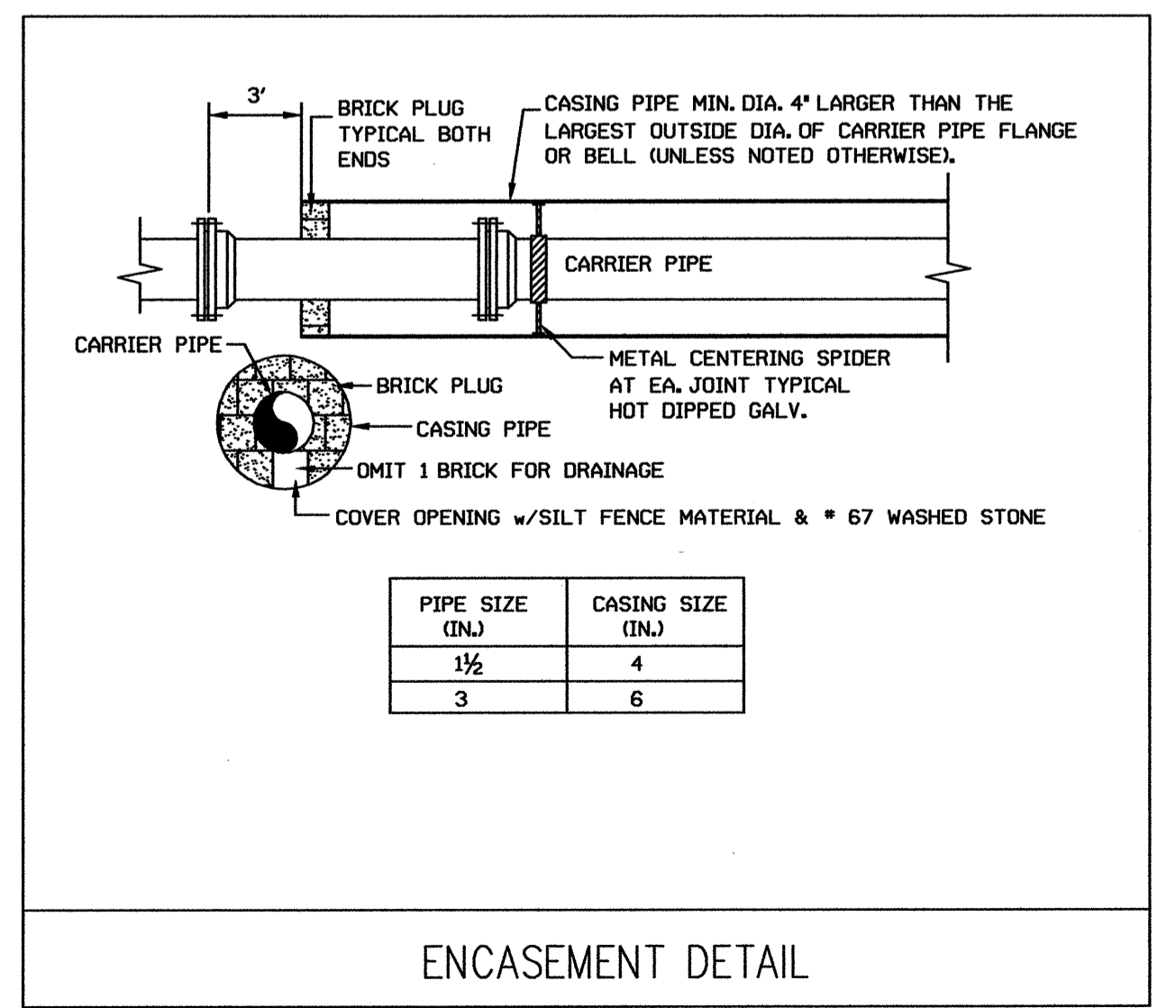
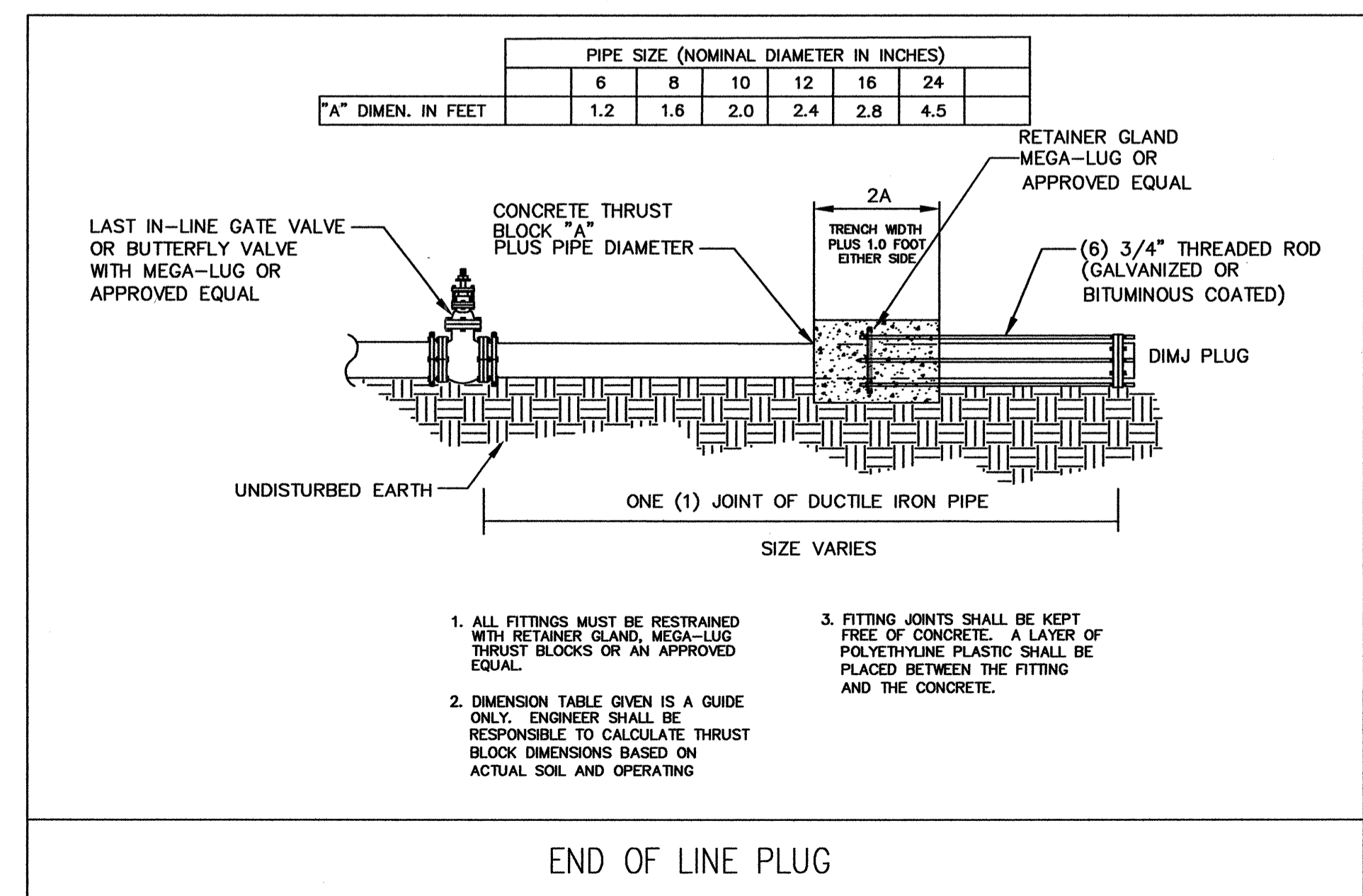
THRUST RESTRAINT FOR WATER MAINS

STATE OF NORTH CAROLINA  
 DIVISION OF HIGHWAYS  
 RALEIGH, N.C.



MAXIMUM TRENCH WIDTH AT TOP OF PIPE

NOMINAL PIPE SIZE (INCHES)	TRENCH WIDTH (INCHES)	NOMINAL PIPE SIZE (INCHES)	TRENCH WIDTH (INCHES)
4	28	20	44
6	30	24	48
8	32	30	54
10	34	36	60
12	36	42	66
14	38	48	72
16	40	54	78
18	42		

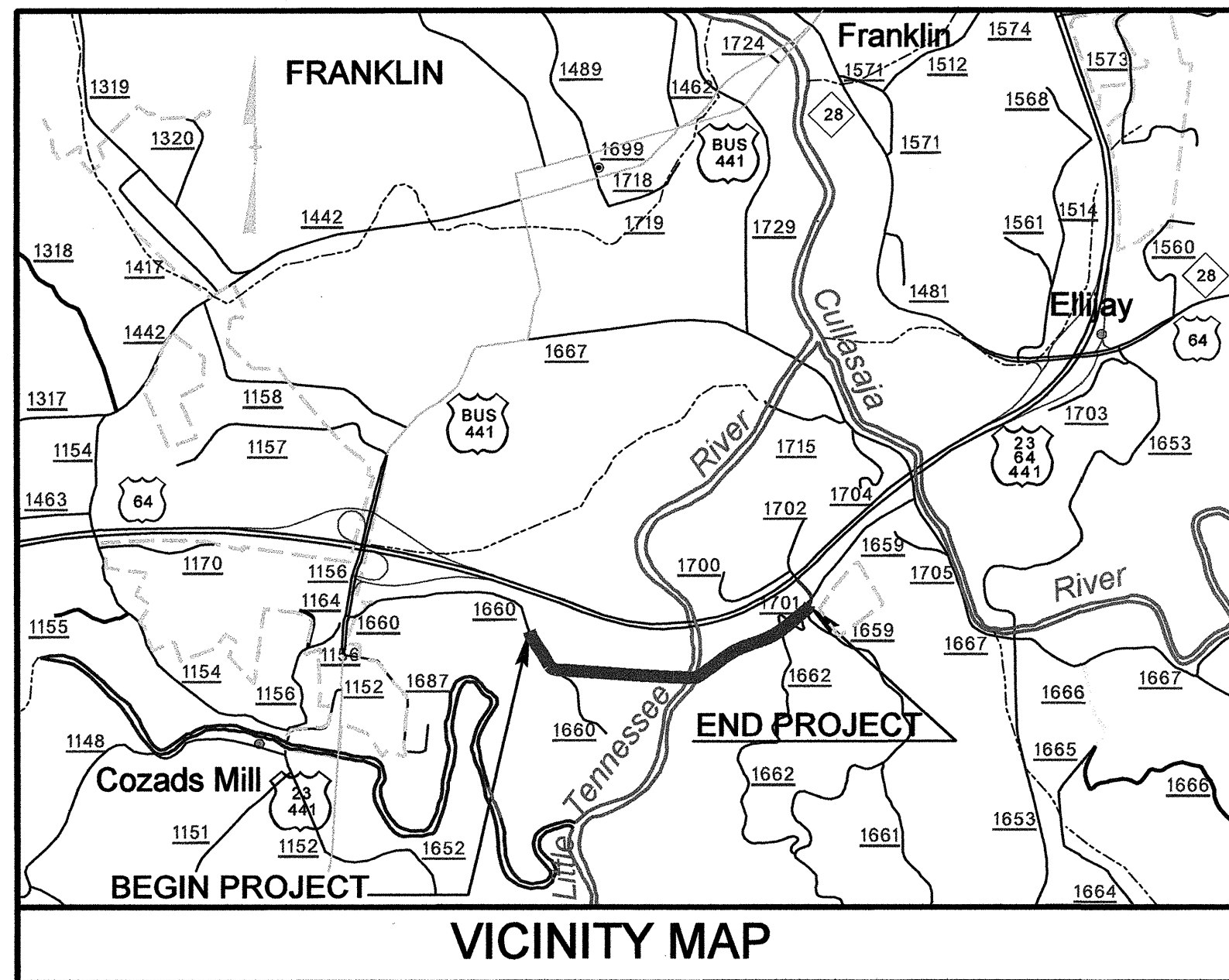




TIP PROJECT: R-4748

CONTRACT: C202556

See Sheet 1-A For Index of Sheets  
See Sheet 1-B For Conventional Symbols



VICINITY MAP

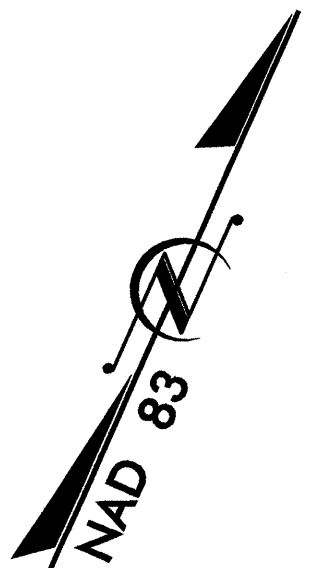
STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

# UTILITIES BY OTHERS MACON COUNTY

**LOCATION: FRANKLIN - NEW ROUTE FROM SR 1660 (SILER ROAD)  
TO SR 1662 (WILEY BROWN ROAD) SOUTH OF US 441**

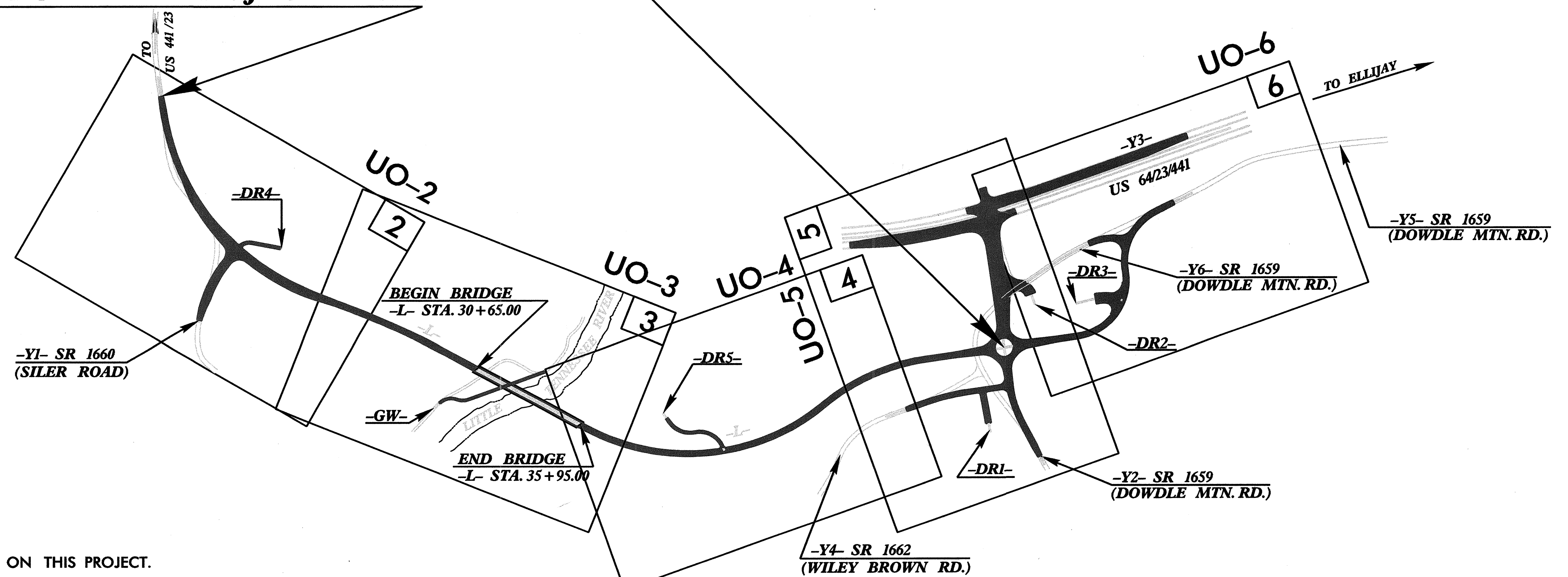
**TYPE OF WORK: UTILITIES RELOCATION**

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.
N.C.	R-4748	UO-1
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION



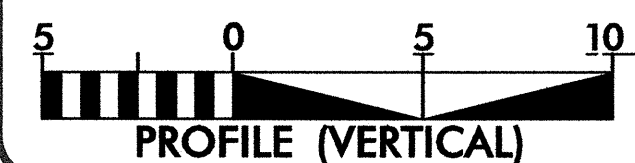
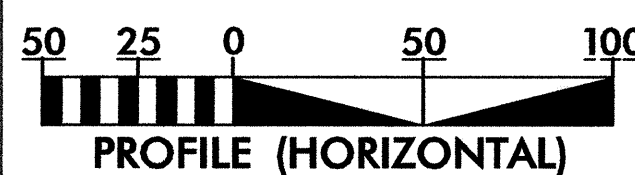
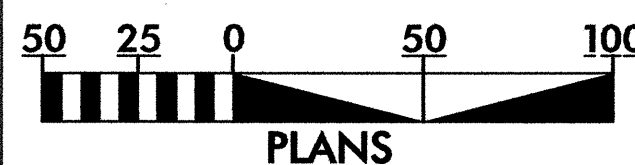
**STA. 56+10.89 -L- END TIP PROJECT R-4748**

**STA. 10+90.00 -L- BEGIN TIP PROJECT R-4748**



THERE IS NO CONTROL OF ACCESS ON THIS PROJECT.  
DESIGN EXCEPTION REQUIRED FOR A CREST VERTICAL CURVE.

**GRAPHIC SCALES**



**INDEX OF SHEETS**

SHEET No.	DESCRIPTION
UO-1	TITLE SHEET
UO-2 TO UO-6	UTILITIES BY OTHERS PLAN SHEETS

**UTILITY OWNERS ON PROJECT**

- (1) DUKE ENERGY (TRANSMISSION)
- (2) DUKE ENERGY (DISTRIBUTION)
- (3) VERIZON (TELEPHONE)
- (4) BALSAM WEST FIBERNET (CATV)
- (5) TOCCOA NATURAL GAS (GAS)

PREPARED BY

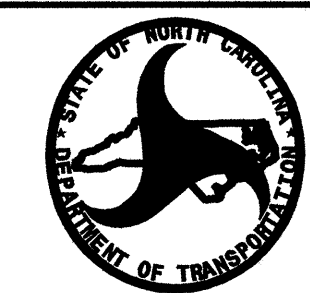
**Municipal Services**

P.O. BOX 97 GARNER, N.C. 27529  
(919) 772-5393

**Engineering Company, P.A.**

P.O. BOX 349 BOONE, N.C. 28607  
(828) 262-1767  
P.O. BOX 276 MOREHEAD CITY, N.C. 28557  
(252) 726-9481

UTILITY DESIGN ENGINEER JOHN L. HINTON, P.E.



PREPARED IN THE OFFICE OF:  
DIVISION OF HIGHWAYS  
DESIGN SERVICES  
UTILITY SECTION

1591 MAIL SERVICES CENTER  
KALAMITH, NC 27099-1591  
PHONE: (919) 250-4122  
FAX: (919) 250-4119

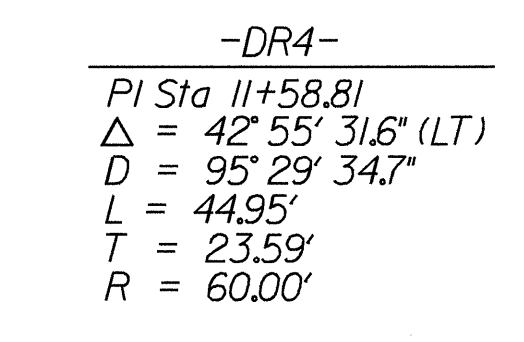
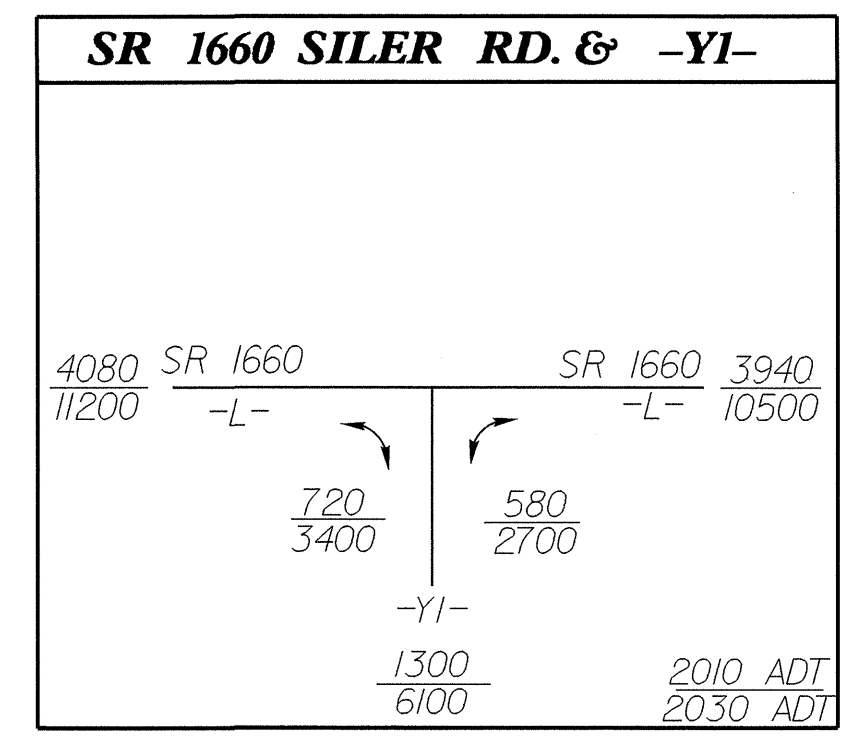
Roger Worthington, P.E. UTILITIES SECTION ENGINEER  
Carl Barclay, P.E. UTILITIES SQUAD LEADER PROJECT ENGINEER  
Bo Hemphill, P.E. UTILITIES PROJECT DESIGNER



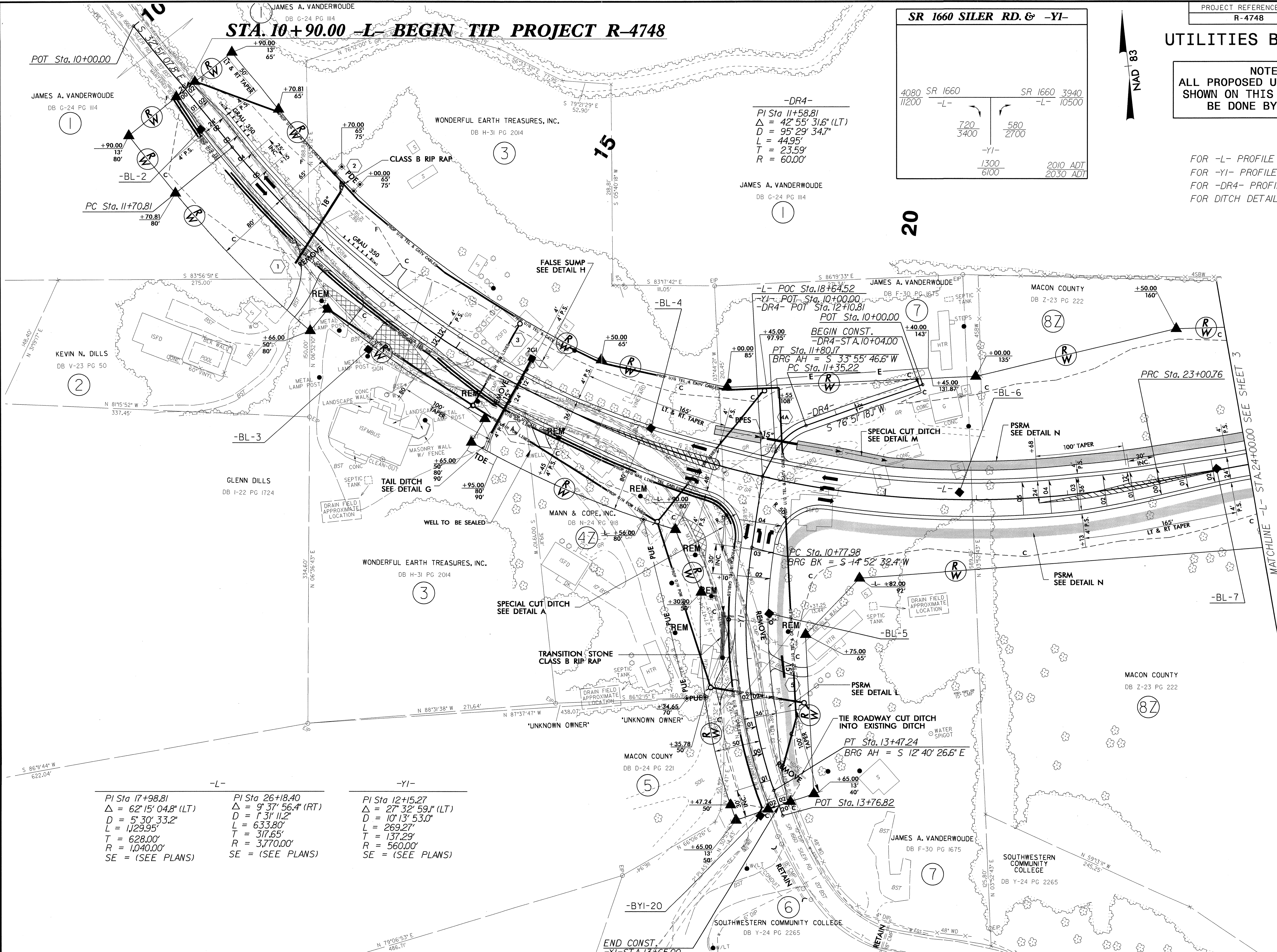
### UTILITIES BY OTHERS

NOTE:  
ALL PROPOSED UTILITY WORK  
SHOWN ON THIS SHEET WILL  
BE DONE BY OTHERS

FOR -L- PROFILE SEE SHEET 9  
FOR -YI- PROFILE SEE SHEET 12  
FOR -DR4- PROFILE SEE SHEET 18  
FOR DITCH DETAILS SEE SHEET 2-F



## STA. 10+90.00 -L- BEGIN TIP PROJECT R-4748



-L-	-YI-	-DR4-
PI Sta 17+98.81	PI Sta 26+18.40	PI Sta 12+15.27
Δ = 62° 15' 04.8" (LT)	Δ = 9° 37' 56.4" (RT)	Δ = 27° 32' 59.1" (LT)
D = 5° 30' 33.2"	D = 1° 31' 11.2"	D = 10° 13' 53.0"
L = 1,129.95'	L = 633.80'	L = 269.27'
T = 628.00'	T = 317.65'	T = 137.29'
R = 1,040.00'	R = 3,770.00'	R = 560.00'
SE = (SEE PLANS)	SE = (SEE PLANS)	SE = (SEE PLANS)

REVISIONS

08-SEP-2010 09:35  
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MATCHLINE -L- STA. 24+00.00 SEE SHEET 3

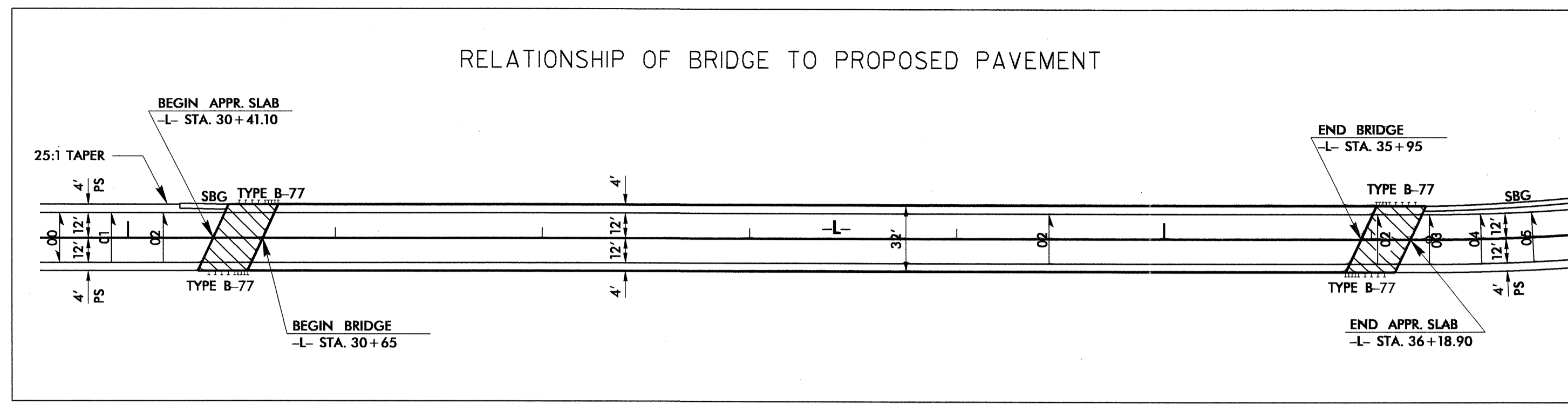


UTILITIES BY OTHERS

NOTE:  
ALL PROPOSED UTILITY WORK SHOWN ON THIS SHEET WILL BE DONE BY OTHERS

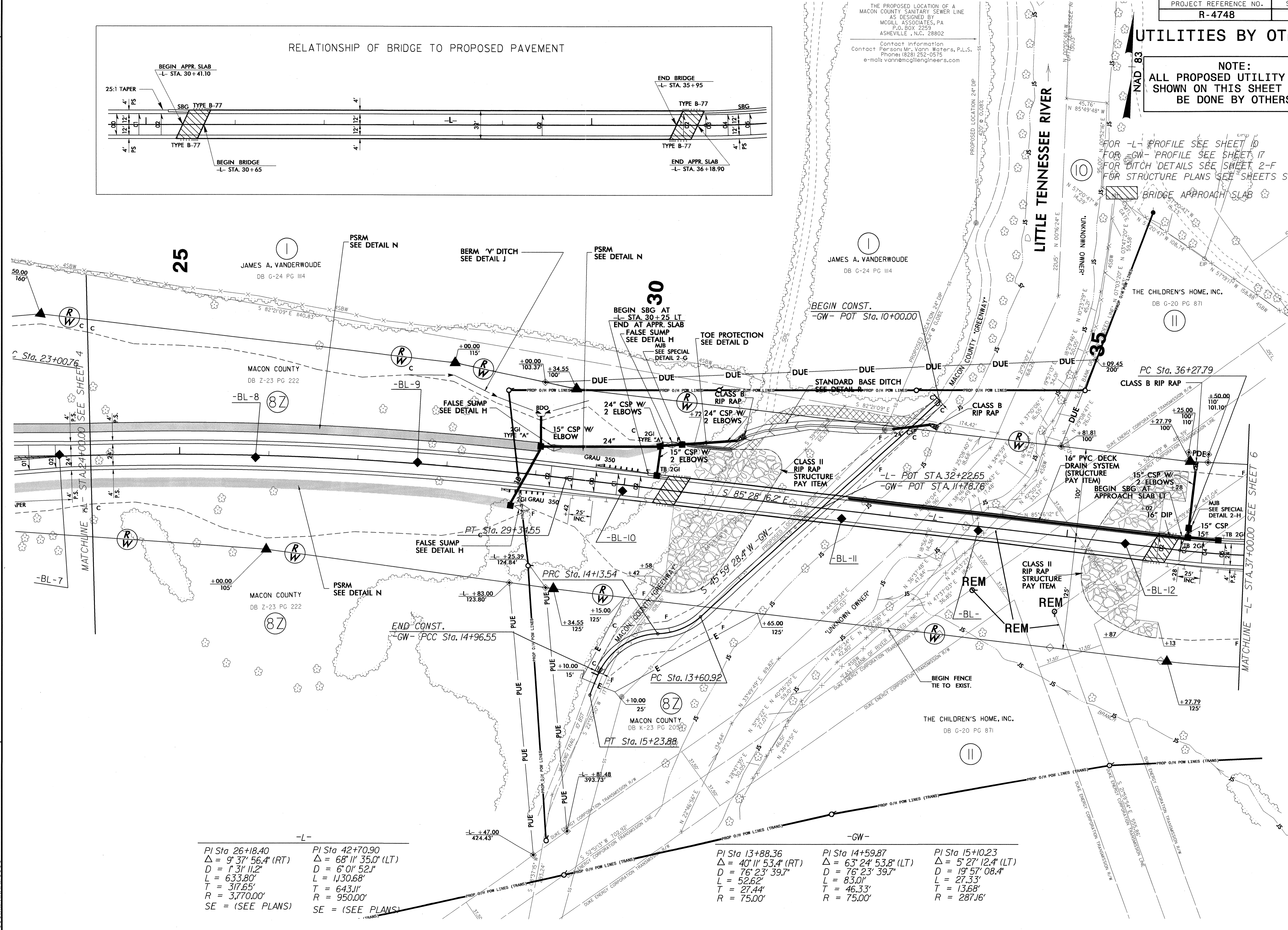
THE PROPOSED LOCATION OF A MACON COUNTY SANITARY SEWER LINE AS DESIGNED BY MCGILL ASSOCIATES, P.A. P.O. BOX 2259 ASHEVILLE, N.C. 28802

Contact Information  
Contact Person: Mr. Vann Waters, P.L.S.  
Phone: (828) 252-0575  
e-mail: vann@mcgillengineers.com



RELATIONSHIP OF BRIDGE TO PROPOSED PAVEMENT

REVISIONS




PI Sta 26+18.40 Δ = 9° 37' 56.4" (RT) D = 1° 31' 11.2" L = 633.80' T = 317.65' R = 3,770.00' SE = (SEE PLANS)	PI Sta 42+70.90 Δ = 68° 11' 35.0" (LT) D = 6° 01' 52.1" L = 1,130.68' T = 643.11' R = 950.00' SE = (SEE PLANS)
---	--

PI Sta 13+88.36 Δ = 40° 11' 53.4" (RT) D = 76° 23' 39.7" L = 52.62' T = 27.44' R = 75.00'	PI Sta 14+59.87 Δ = 63° 24' 53.8" (LT) D = 76° 23' 39.7" L = 83.01' T = 46.33' R = 75.00'	PI Sta 15+10.23 Δ = 5° 27' 12.4" (LT) D = 19° 57' 08.4" L = 27.33' T = 13.68' R = 287.16'
--	--	--

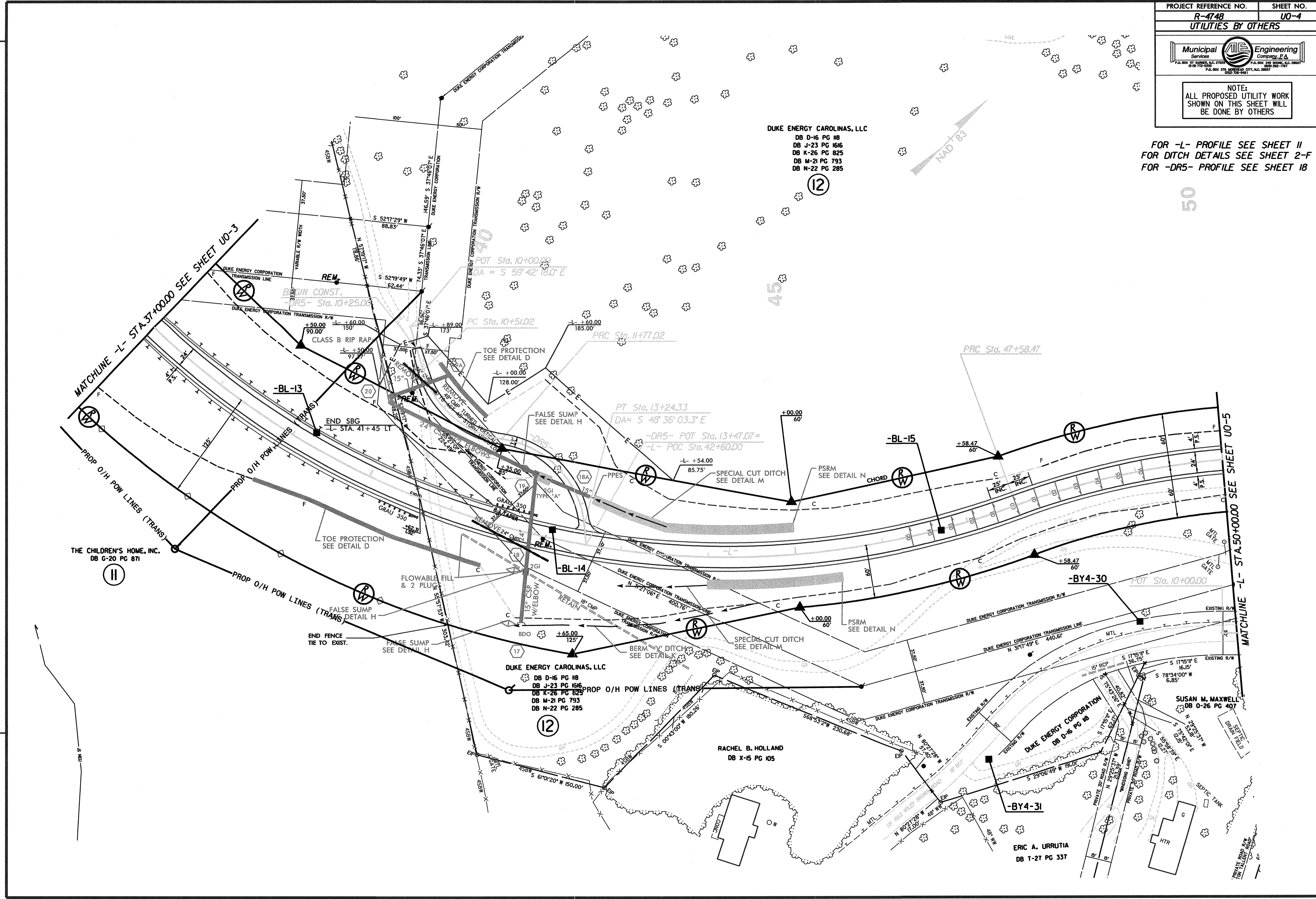
08-SEP-2010 09:35  
I:\Projects\Utilities\Projects\UO-4748-utl-psn-UO-03.dgn  
J:\Users\jvanderwoode\My Documents\Projects\UO-4748-utl-psn-UO-03.dgn



PROJECT REFERENCE NO.	SHEET NO.
R-4748	UO-4
<b>UTILITIES BY OTHERS</b>	
	
<small>NOTE: ALL PROPOSED UTILITY WORK SHOWN ON THIS SHEET WILL BE DONE BY OTHERS</small>	

FOR -L- PROFILE SEE SHEET II  
 FOR DITCH DETAILS SEE SHEET 2-F  
 FOR -DR5- PROFILE SEE SHEET 1B

REVISIONS





**SR 1659 & SR 1662**

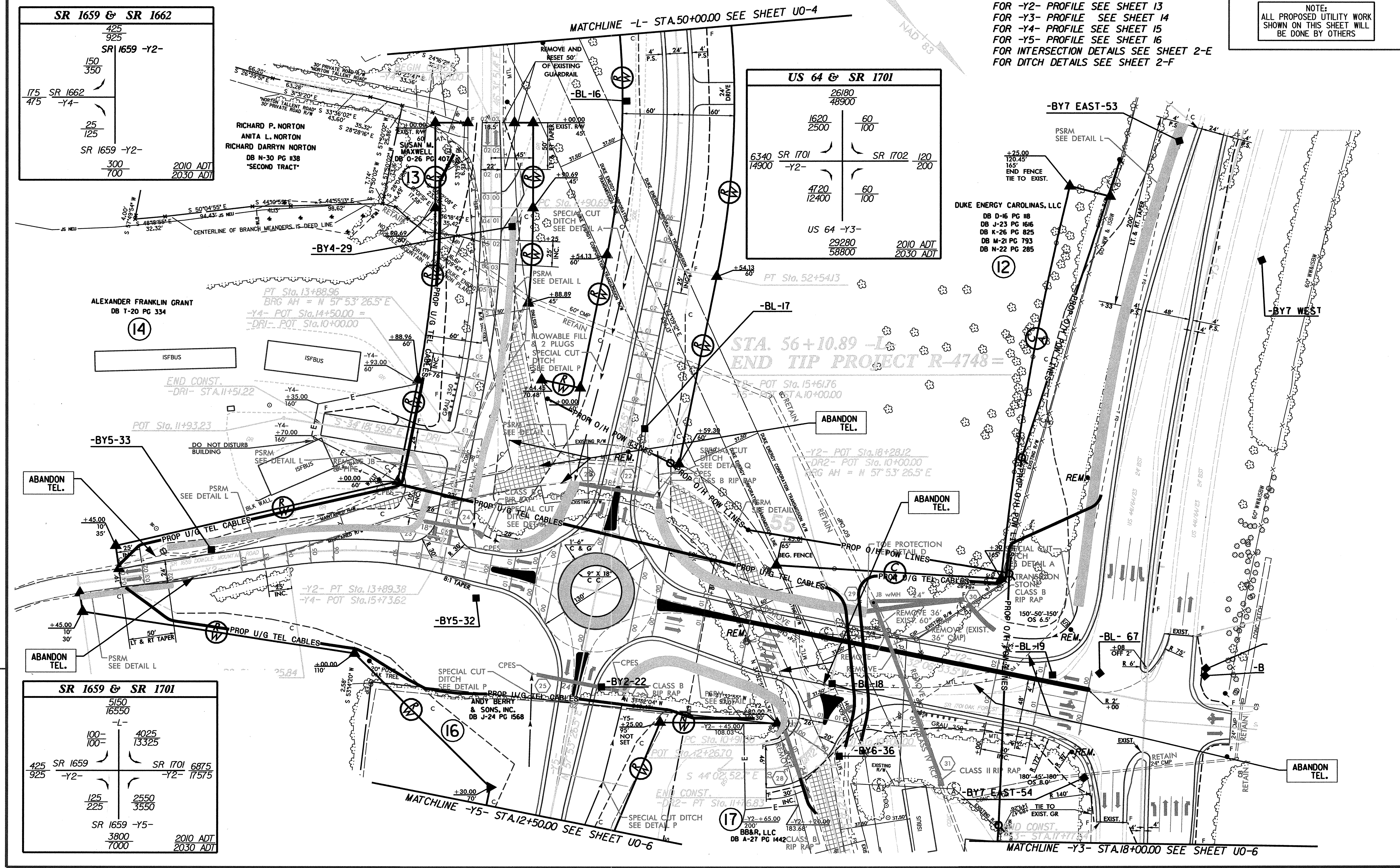
425 / 925	
SR 1659 -Y2-	
150 / 350	
175 SR 1662 / 475 -Y4-	
25 / 125	
SR 1659 -Y2-	
300 / 700	2010 ADT / 2030 ADT

**US 64 & SR 1701**

26180 / 48900	
1620 / 2500	60 / 100
6340 SR 1701 / 14900 -Y2-	SR 1702 / 120 / 200
4720 / 12400	60 / 100
US 64 -Y3-	
29280 / 58800	2010 ADT / 2030 ADT

**SR 1659 & SR 1701**

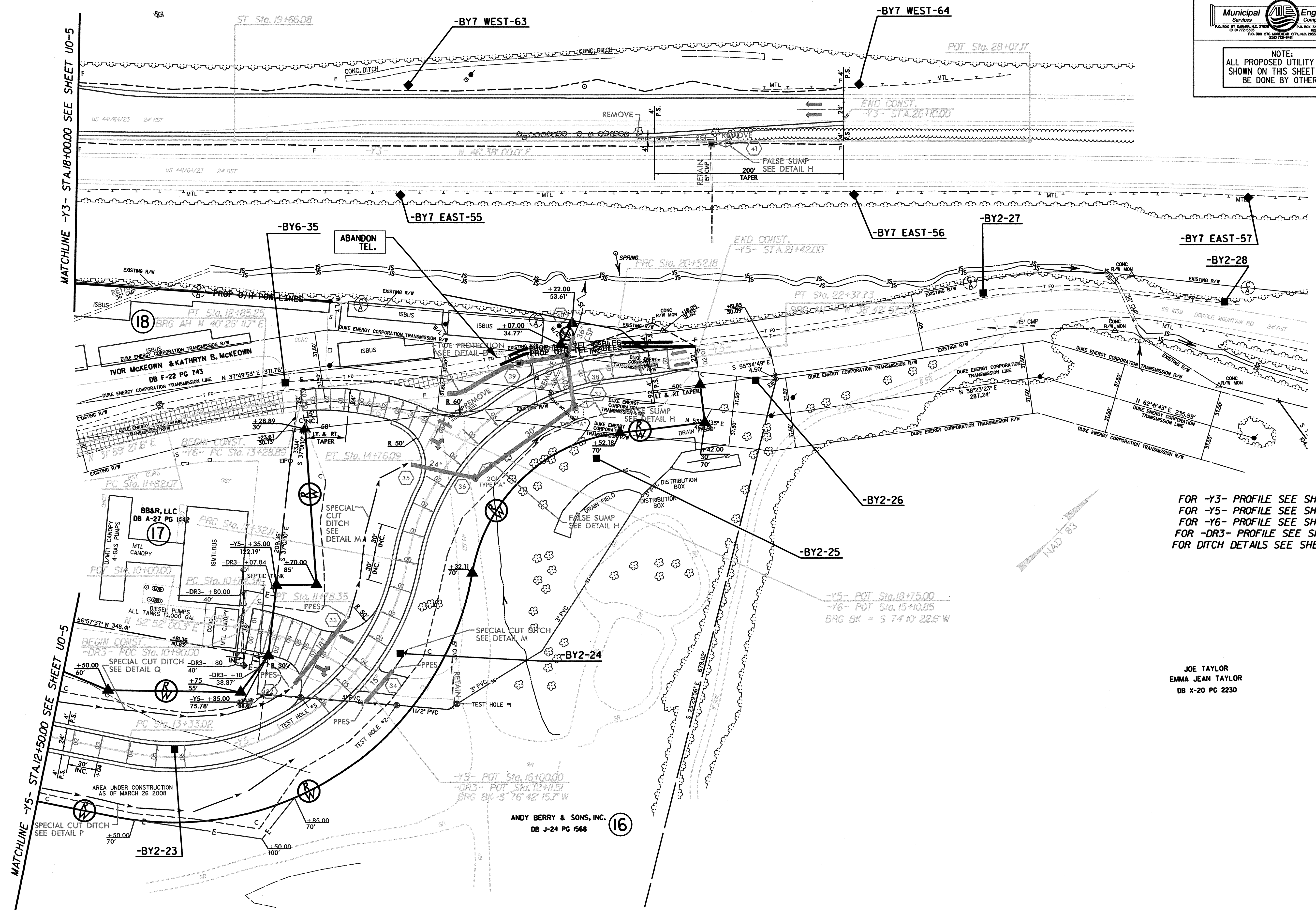
5150 / 16550	
-L-	
100 / 100	4025 / 13325
425 SR 1659 / 925 -Y2-	SR 1701 / 6875 / 17575 -Y2-
125 / 225	2550 / 3550
SR 1659 -Y5-	
3800 / 7000	2010 ADT / 2030 ADT



FOR -L- PROFILE SEE SHEET 12  
 FOR -Y2- PROFILE SEE SHEET 13  
 FOR -Y3- PROFILE SEE SHEET 14  
 FOR -Y4- PROFILE SEE SHEET 15  
 FOR -Y5- PROFILE SEE SHEET 16  
 FOR INTERSECTION DETAILS SEE SHEET 2-E  
 FOR DITCH DETAILS SEE SHEET 2-F

REVISIONS





FOR -Y3- PROFILE SEE SHEET 14  
 FOR -Y5- PROFILE SEE SHEET 16  
 FOR -Y6- PROFILE SEE SHEET 17  
 FOR -DR3- PROFILE SEE SHEET 17  
 FOR DITCH DETAILS SEE SHEET 2-F

-Y5- POT Sta. 18+75.00  
 -Y6- POT Sta. 15+10.85  
 BRG BK = S 74° 10' 22.6" W

JOE TAYLOR  
 EMMA JEAN TAYLOR  
 DB X-20 PG 2230

ANDY BERRY & SONS, INC.  
 DB J-24 PG 1568

REVISIONS

MATCHLINE -Y3- STA. 18+00.00 SEE SHEET UO-5

MATCHLINE -Y5- STA. 12+50.00 SEE SHEET UO-5