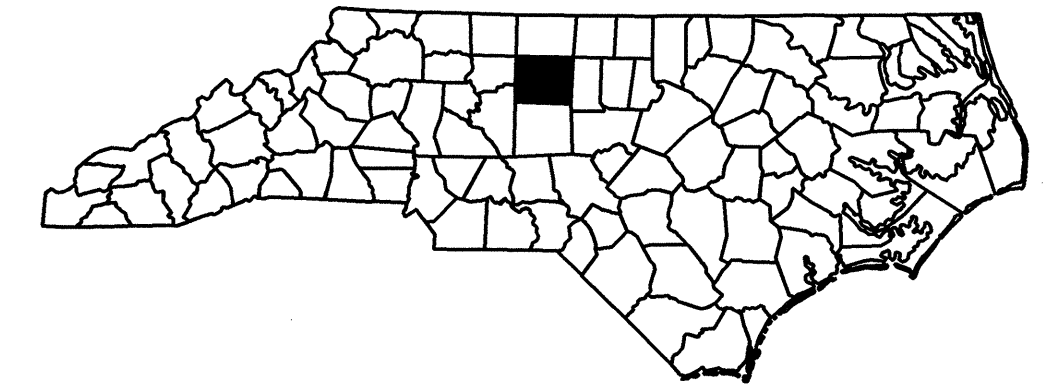


STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

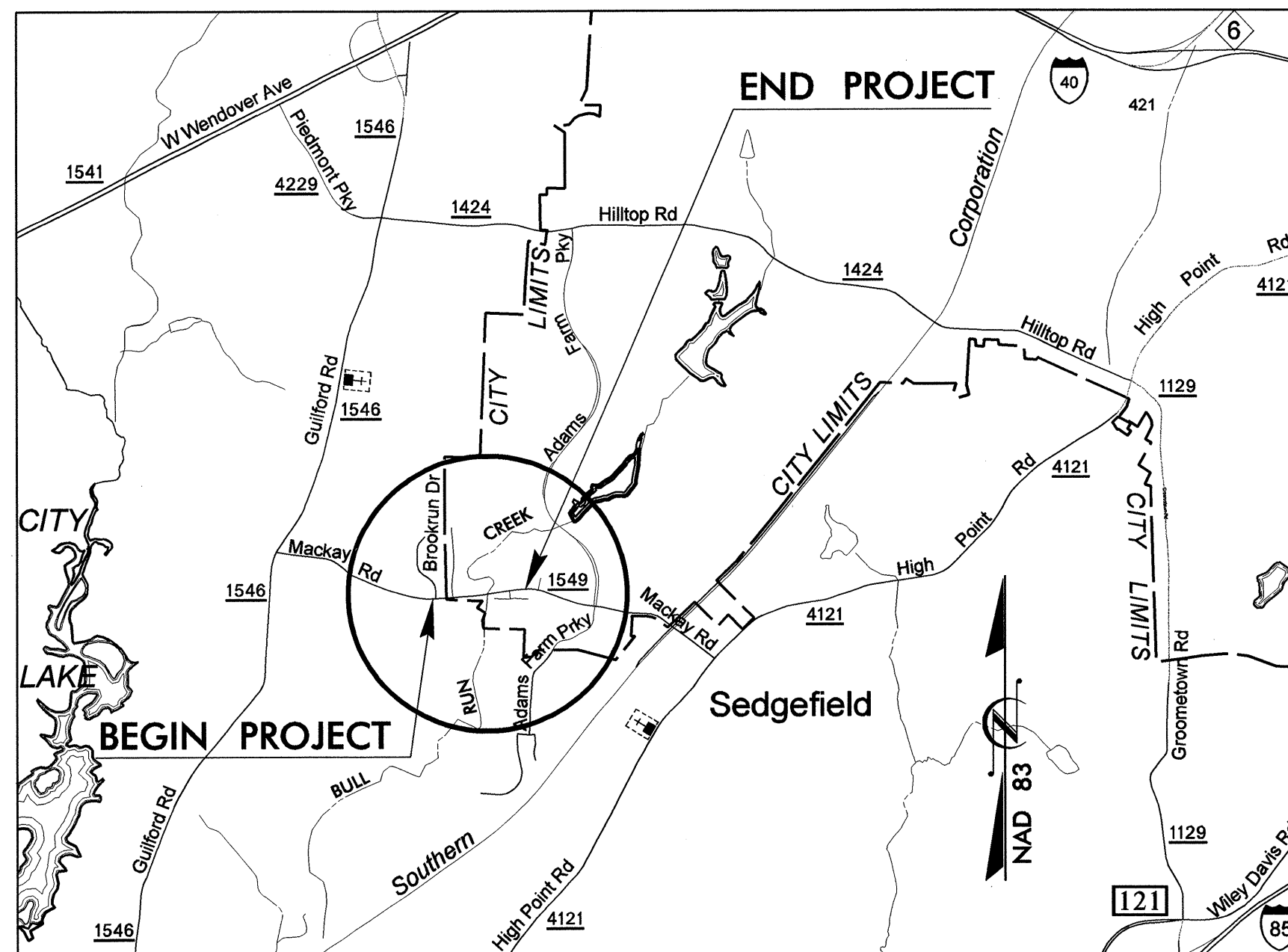
T.I.P. NO.	SHEET NO.
<b>B-4128</b>	<b>UC-1</b>

# GUILFORD COUNTY UTILITY CONSTRUCTION

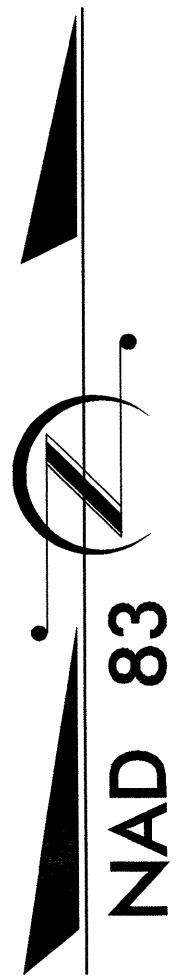
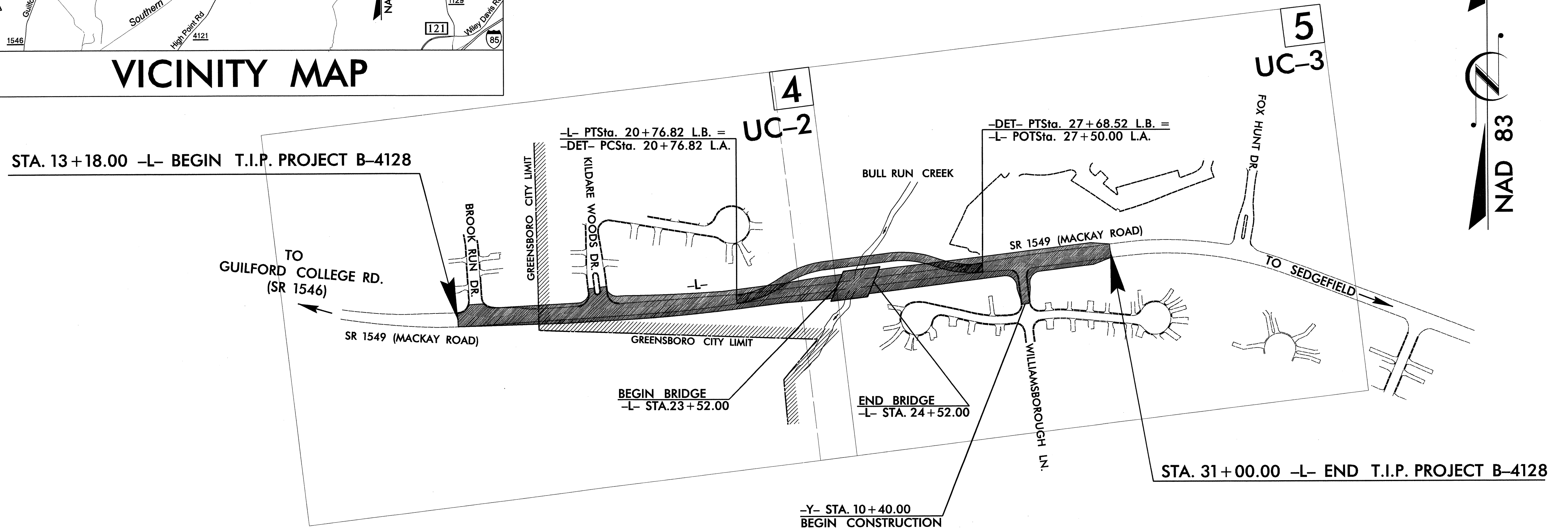
LOCATION: BRIDGE No. 73 OVER BULL RUN CREEK  
ON SR 1549 (MACKAY ROAD) IN GREENSBORO  
TYPE OF WORK: UTILITY CONSTRUCTION



TIP: B-4128



VICINITY MAP



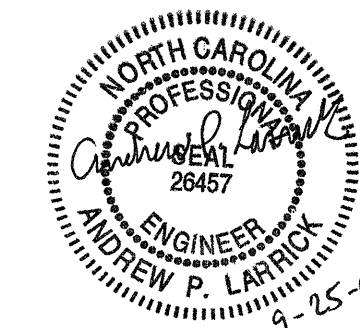
THIS PROJECT IS PARTIALLY WITHIN THE GREENSBORO CITY LIMITS.

**INDEX OF SHEETS**

SHEET NO.	DESCRIPTION
UC-1	TITLE SHEET
UC-2 THRU UC-3	UTILITY CONSTRUCTION PLAN SHEETS
UC-4	UTILITY CONSTRUCTION PROFILE SHEET
UC-5	UTILITY CONSTRUCTION DETAIL SHEET

**WATER AND SEWER OWNERS ON PROJECT**

WATER - CITY OF GREENSBORO  
SEWER - TOWN OF JAMESTOWN



PREPARED IN THE OFFICE OF:  
**DAVIS-MARTIN-POWELL  
AND ASSOCIATES, INC.**

6415 OLD PLANK ROAD  
HIGH POINT, NC 27265  
PHONE (336) 886-4821  
FAX (336) 886-4458

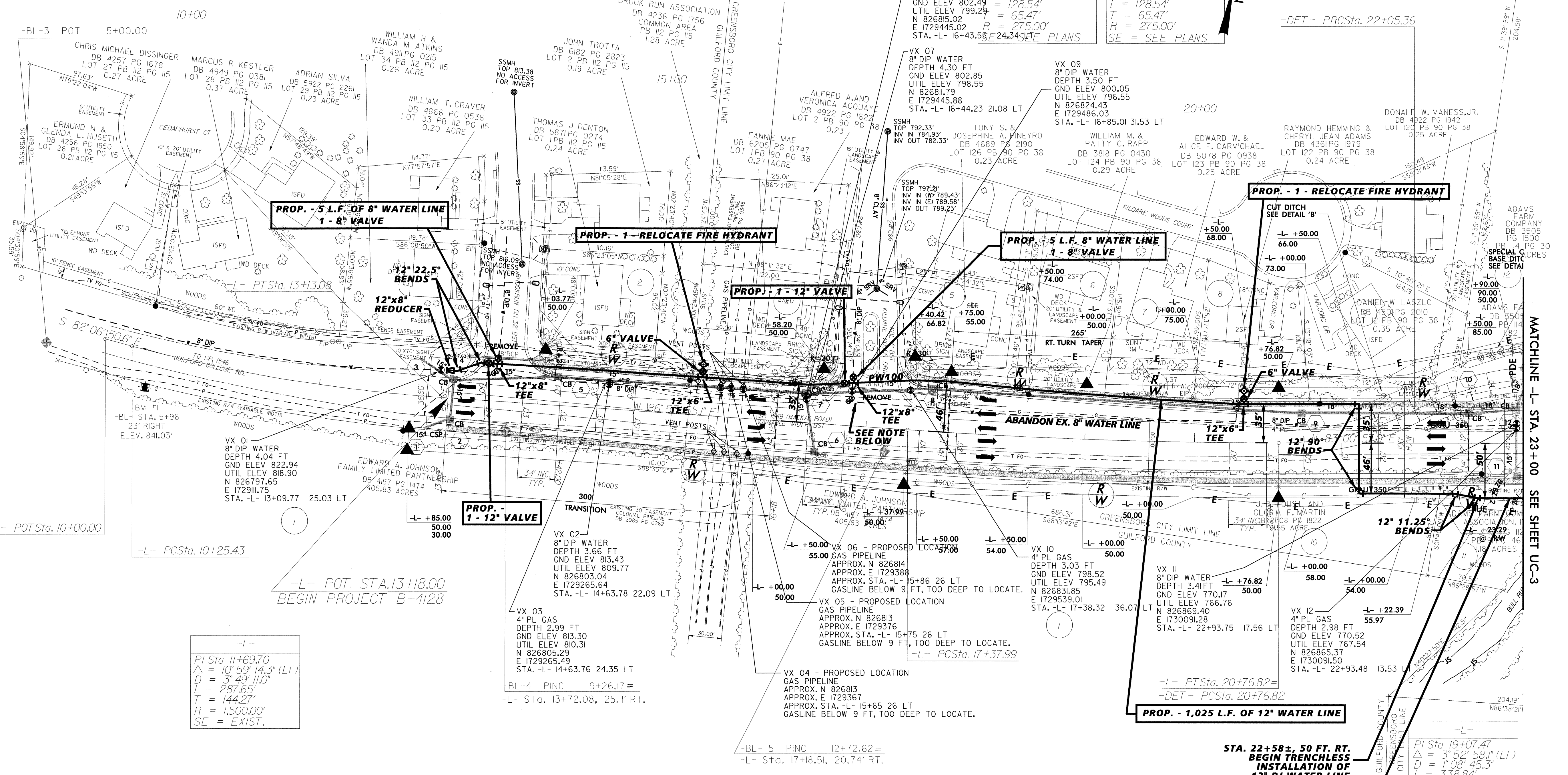
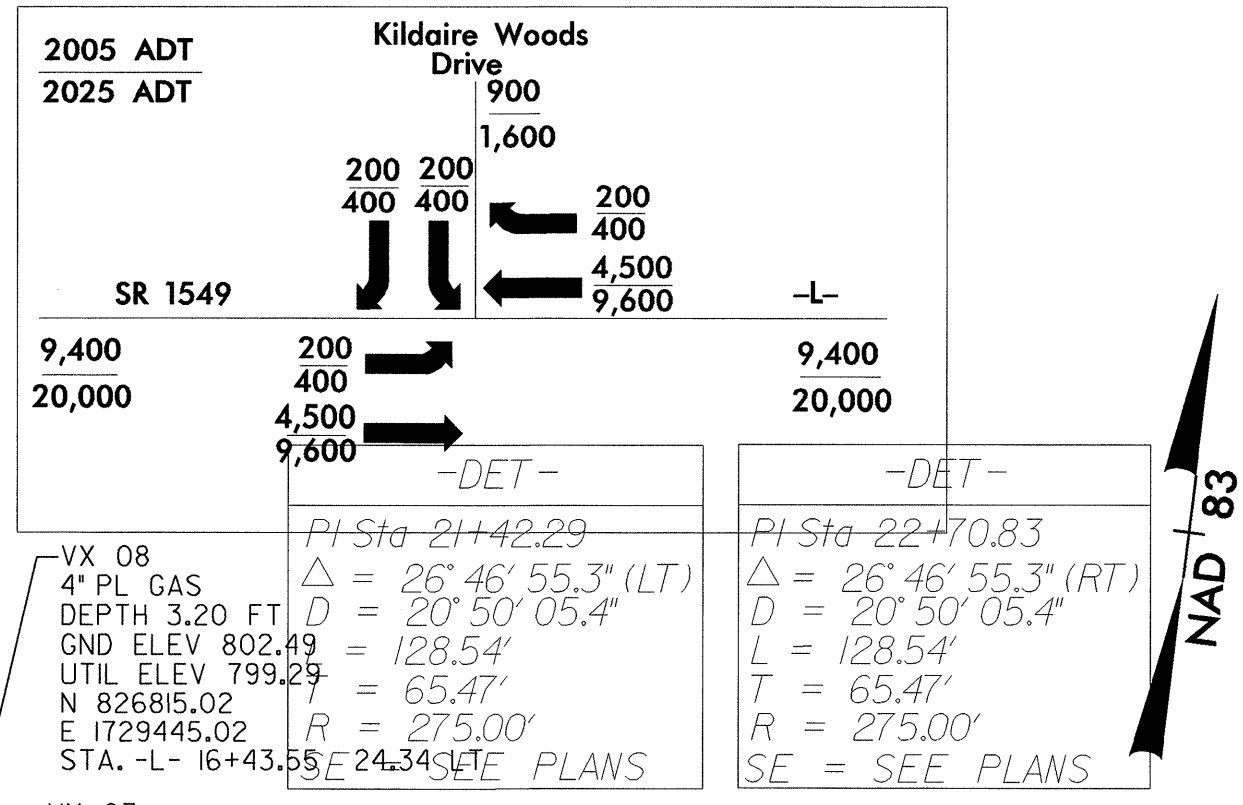
**Randy McNeill, P.E.** UTILITIES PROJECT MANAGER  
**Andy Larrick, P.E.** UTILITIES PROJECT ENGINEER  
**Andy Larrick, P.E.** UTILITIES PROJECT DESIGNER

\*\*\*\*\*  
 SYSTEM TIME \*\*\*\*\*  
 \*\*\*\*\*  
 DGN \*\*\*\*\*  
 \*\*\*\*\*  
 USERNAME \*\*\*\*\*  
 \*\*\*\*\*



**WATER AND SEWER NOTES:**

- PIPE & FITTINGS FOR WATER LINES 6" AND LARGER SHALL BE DUCTILE IRON, PC 350.
- PIPE FOR SANITARY GRAVITY SEWER LINES 8" AND LARGER SHALL BE DUCTILE IRON, PC 350.
- ALL WATER LINE VALVES SHALL BE RESILIENT-SEAT TYPE GATE VALVES, 200 PSI MIN. WORKING PRESSURE.
- CONTRACTOR SHALL USE 12" D.I. RESTRAINED JOINT PIPE, PC 350 FOR TRENCHLESS INSTALLATION



-L-  
 PI Sta 11+69.70  
 $\Delta = 10^{\circ} 59' 14.3''$  (LT)  
 $D = 3^{\circ} 49' 11.0''$   
 $L = 287.65'$   
 $T = 144.27'$   
 $R = 1,500.00'$   
 SE = EXIST.

-L- STA. 13+72.08, 25.11' RT.

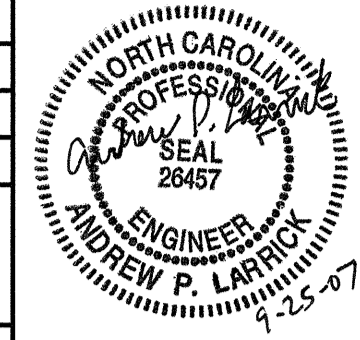
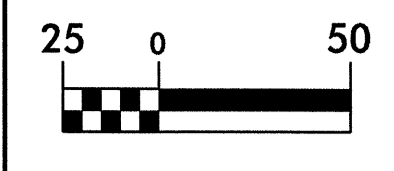
-L- STA. 17+8.51, 20.74' RT.

-L- PT Sta. 20+76.82=  
 -DET- PCSta. 20+76.82

PROP. - 42 L.F. OF 12" WATER LINE,  
 42 L.F. OF TRENCHLESS INSTALLATION  
 OF 12" IN SOIL

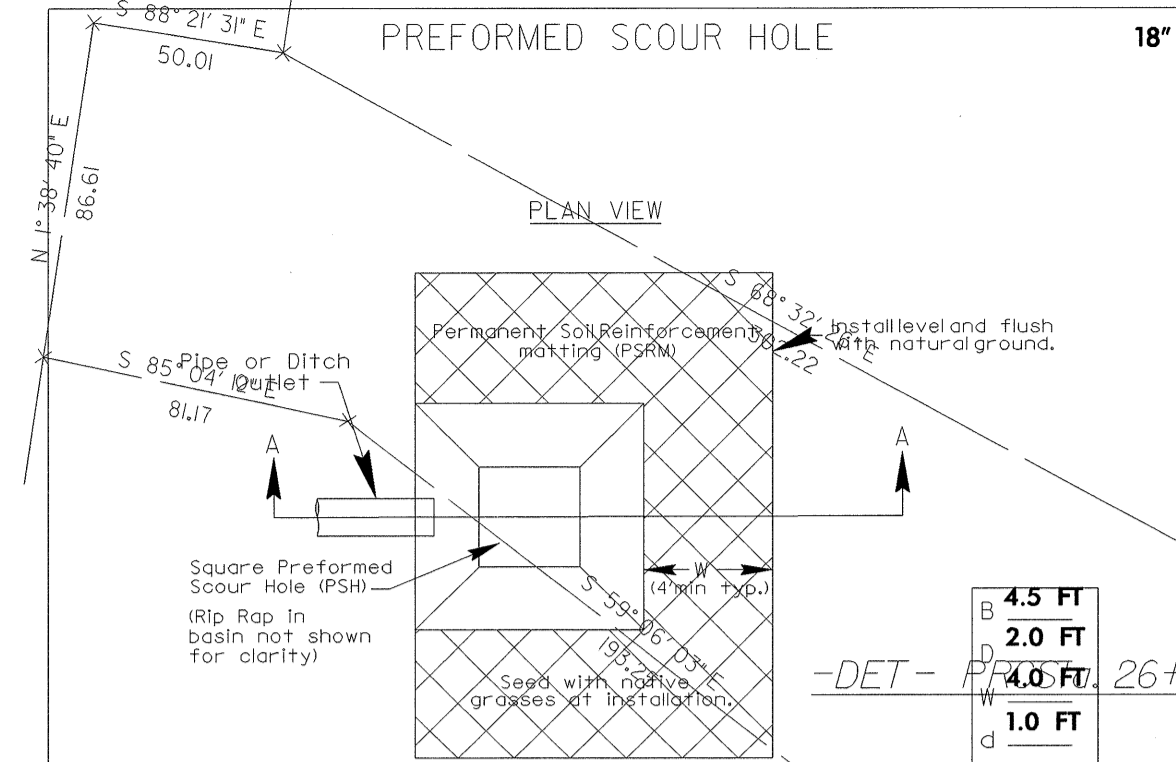
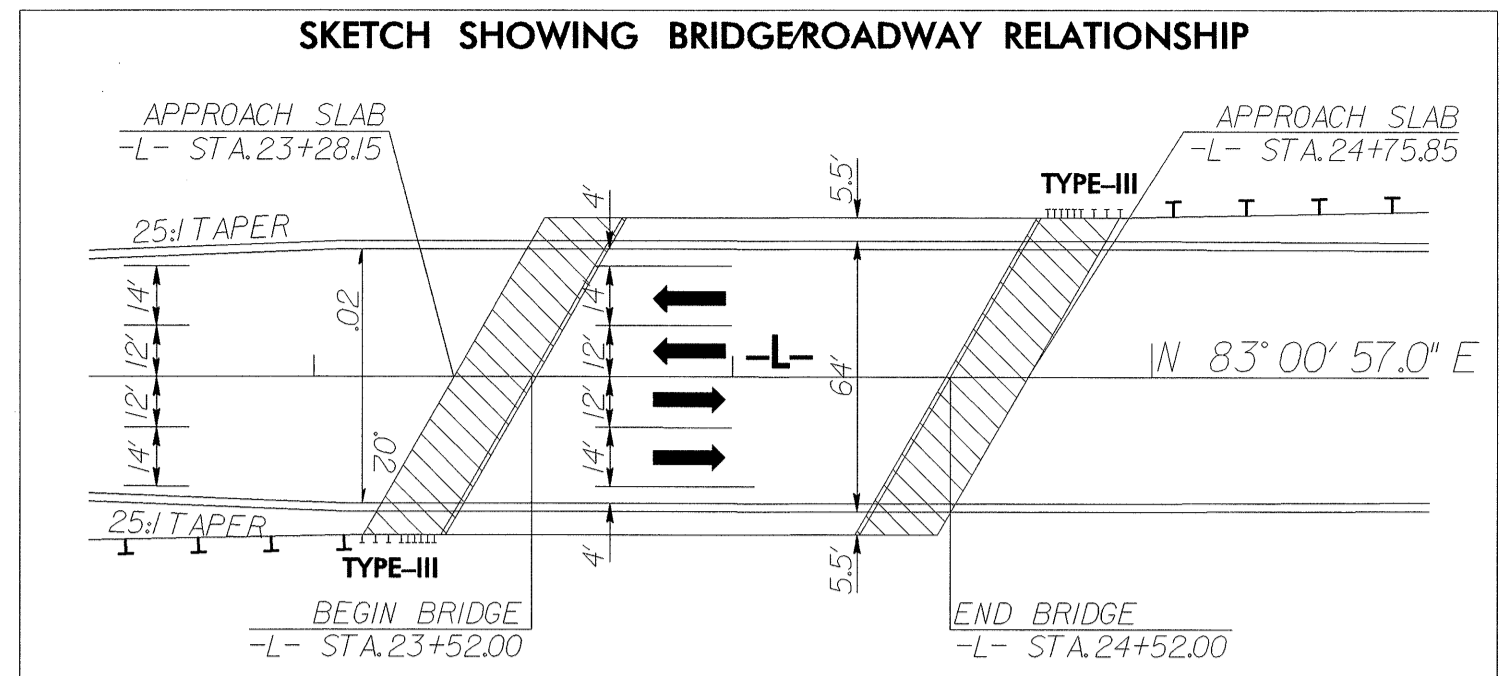
**NOTE:**  
 DEPENDING ON THE CONTRACTOR'S SEQUENCE OF CONSTRUCTION, TO MINIMIZE DISRUPTION OF WATER SERVICE, THE CITY OF GREENSBORO MAY REQUIRE AN 8" VALVE TO BE INSERTED ON THE EXISTING 8" WATER LINE JUST EAST OF THE BRANCH LINE INTO KILDARE WOODS DRIVE.



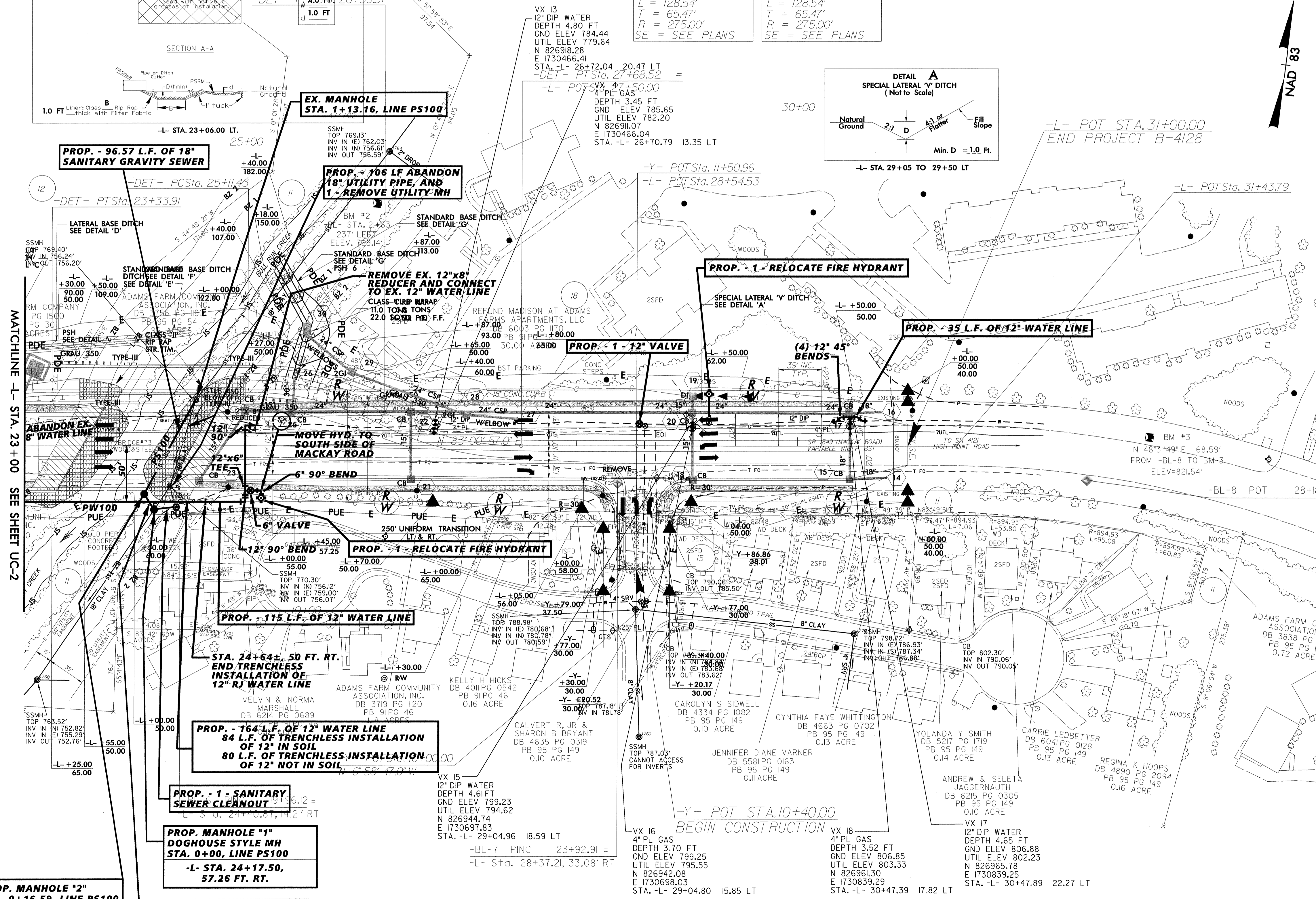
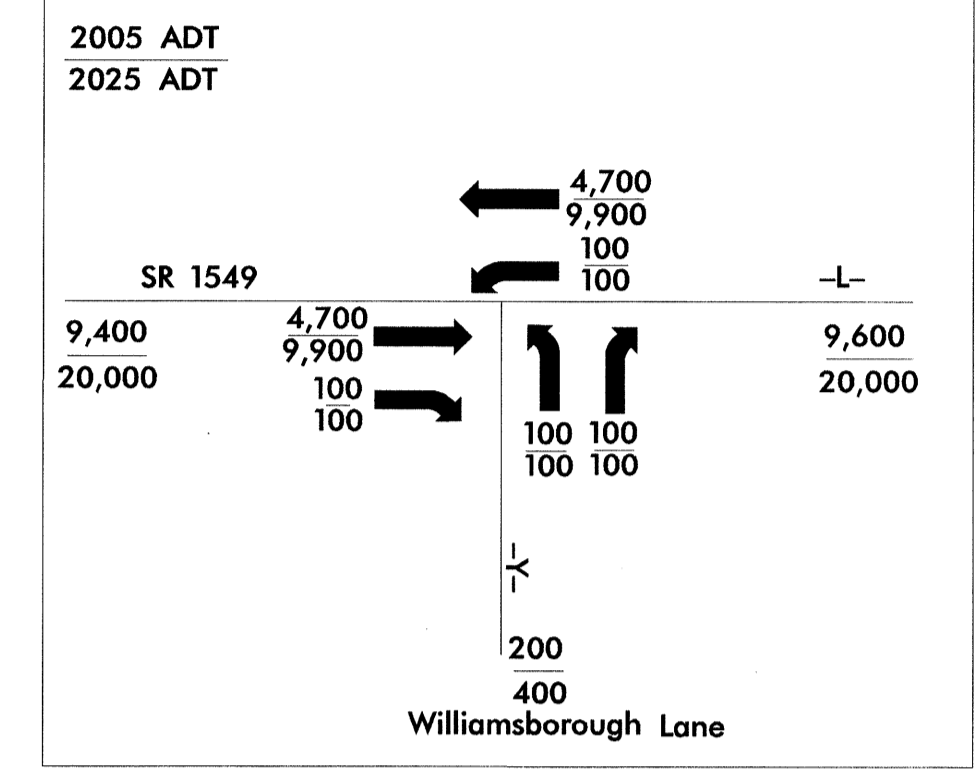
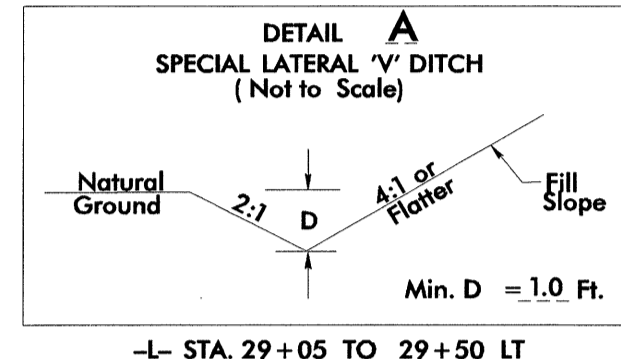


**WATER AND SEWER NOTES:**

- PIPE & FITTINGS FOR WATER LINES 6" AND LARGER SHALL BE DUCTILE IRON, PC 350.
- PIPE FOR SANITARY GRAVITY SEWER LINES 8" AND LARGER SHALL BE DUCTILE IRON, PC 350.
- ALL WATER LINE VALVES SHALL BE RESILIENT-SEAT TYPE GATE VALVES, 200 PSI MIN. WORKING PRESSURE.
- CONTRACTOR SHALL USE 12" D.I. RESTRAINED JOINT PIPE, PC 350 FOR TRENCHLESS INSTALLATION



-DET-	-DET-
PI Sta 25+76.90 Δ = 26' 46" 55.3" (RT) D = 20' 50" 05.4" L = 128.54' T = 65.47' R = 275.00' SE = SEE PLANS	PI Sta 27+05.44 Δ = 26' 46" 55.3" (LT) D = 20' 50" 05.4" L = 128.54' T = 65.47' R = 275.00' SE = SEE PLANS



**PROP. MANHOLE "2"**  
 STA. 0+16.59, LINE PS100  
 -L- STA. 24+08.50,  
 43.52 FT. RT.

**PROP. - 16.59 L.F. OF 18"**  
 SANITARY GRAVITY SEWER

**PROP. MANHOLE "1"**  
 DOGHOUSE STYLE MH  
 STA. 0+0+00, LINE PS100  
 -L- STA. 24+17.50,  
 57.26 FT. RT.

**PROP. - 1 - SANITARY**  
 SEWER CLEANOUT

**PROP. - 164 L.F. OF 12" WATER LINE**  
 84 L.F. OF TRENCHLESS INSTALLATION  
 OF 12" IN SOIL  
 80 L.F. OF TRENCHLESS INSTALLATION  
 OF 12" NOT IN SOIL

**PROP. - 115 L.F. OF 12" WATER LINE**

**PROP. - 1 - RELOCATE FIRE HYDRANT**

**PROP. - 1 - 12" VALVE**

**PROP. - 1 - RELOCATE FIRE HYDRANT**

**PROP. - 106 LF ABANDON 18" UTILITY PIPE, AND 1 - REMOVE UTILITY MH**

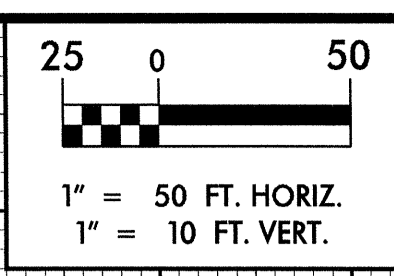
**PROP. - 96.57 L.F. OF 18" SANITARY GRAVITY SEWER**



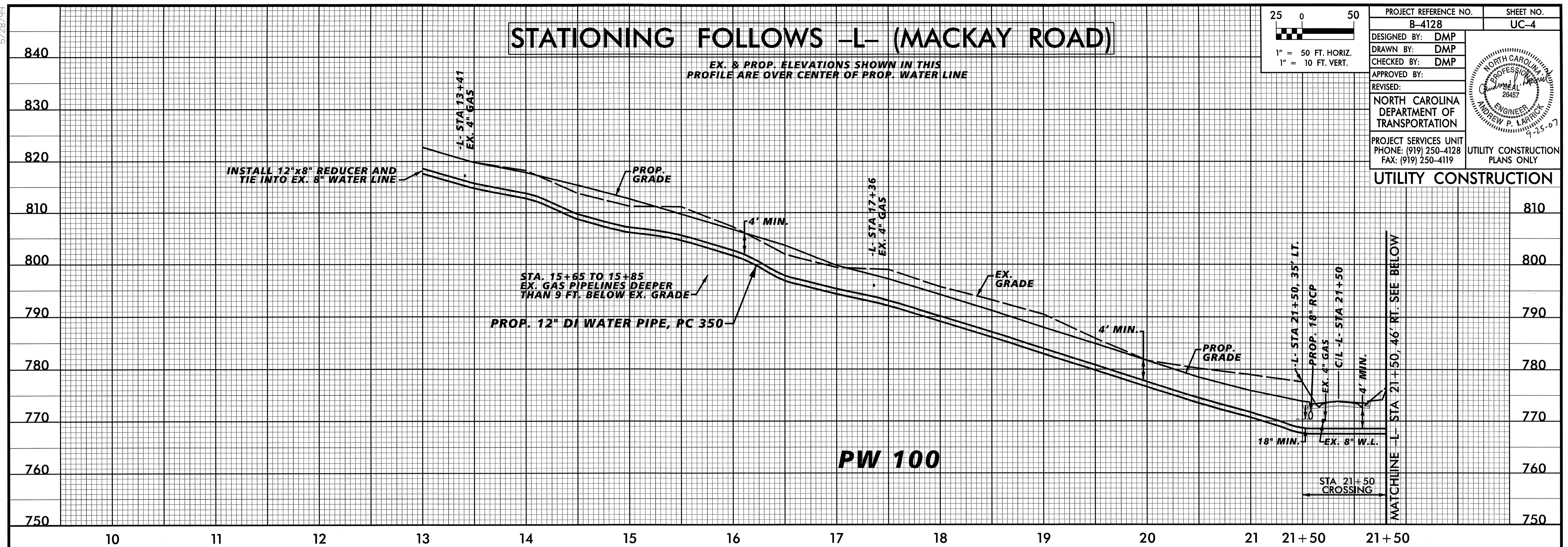
5/28/99

# STATIONING FOLLOWS -L- (MACKAY ROAD)

EX. & PROP. ELEVATIONS SHOWN IN THIS PROFILE ARE OVER CENTER OF PROP. WATER LINE



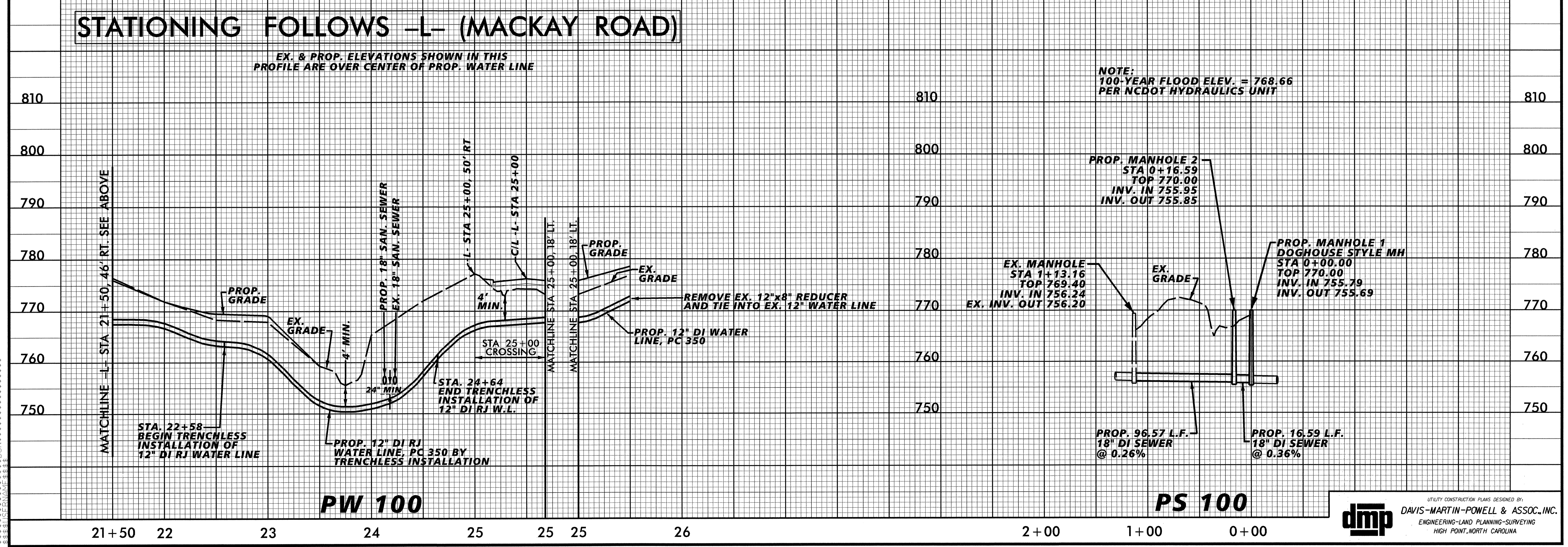
PROJECT REFERENCE NO. B-4128	SHEET NO. UC-4
DESIGNED BY: DMP	
DRAWN BY: DMP	
CHECKED BY: DMP	
APPROVED BY:	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
PROJECT SERVICES UNIT PHONE: (919) 250-4128 FAX: (919) 250-4119	UTILITY CONSTRUCTION PLANS ONLY



# STATIONING FOLLOWS -L- (MACKAY ROAD)

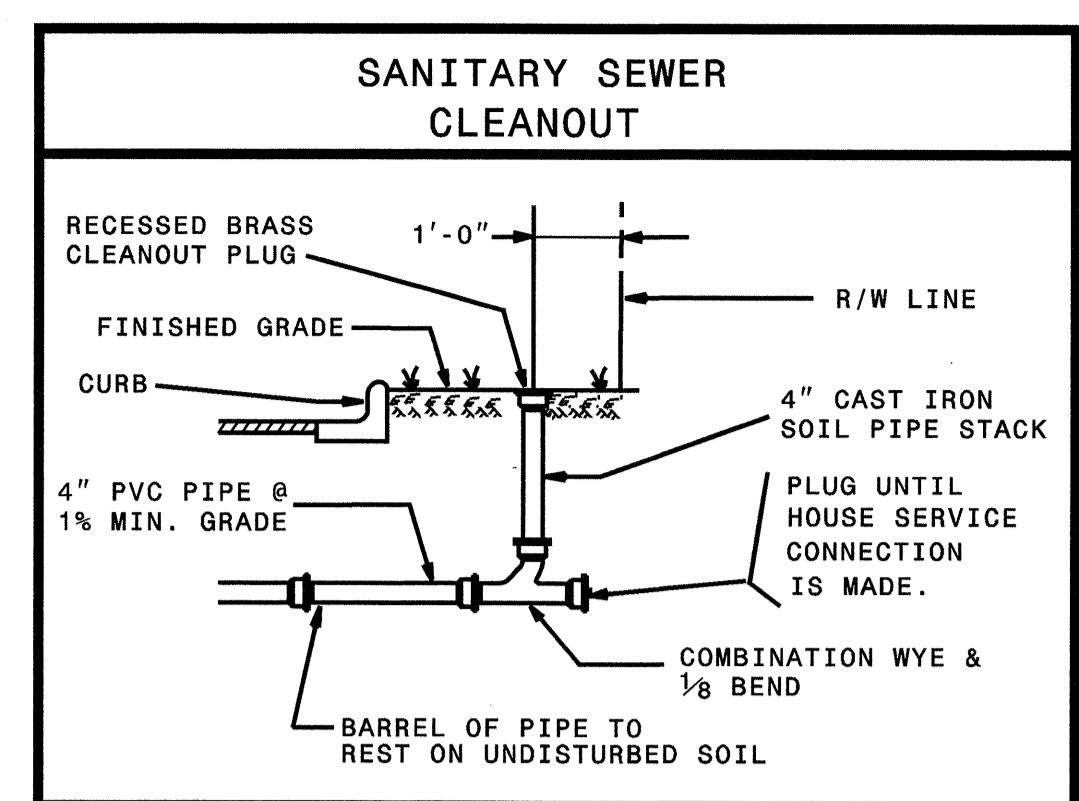
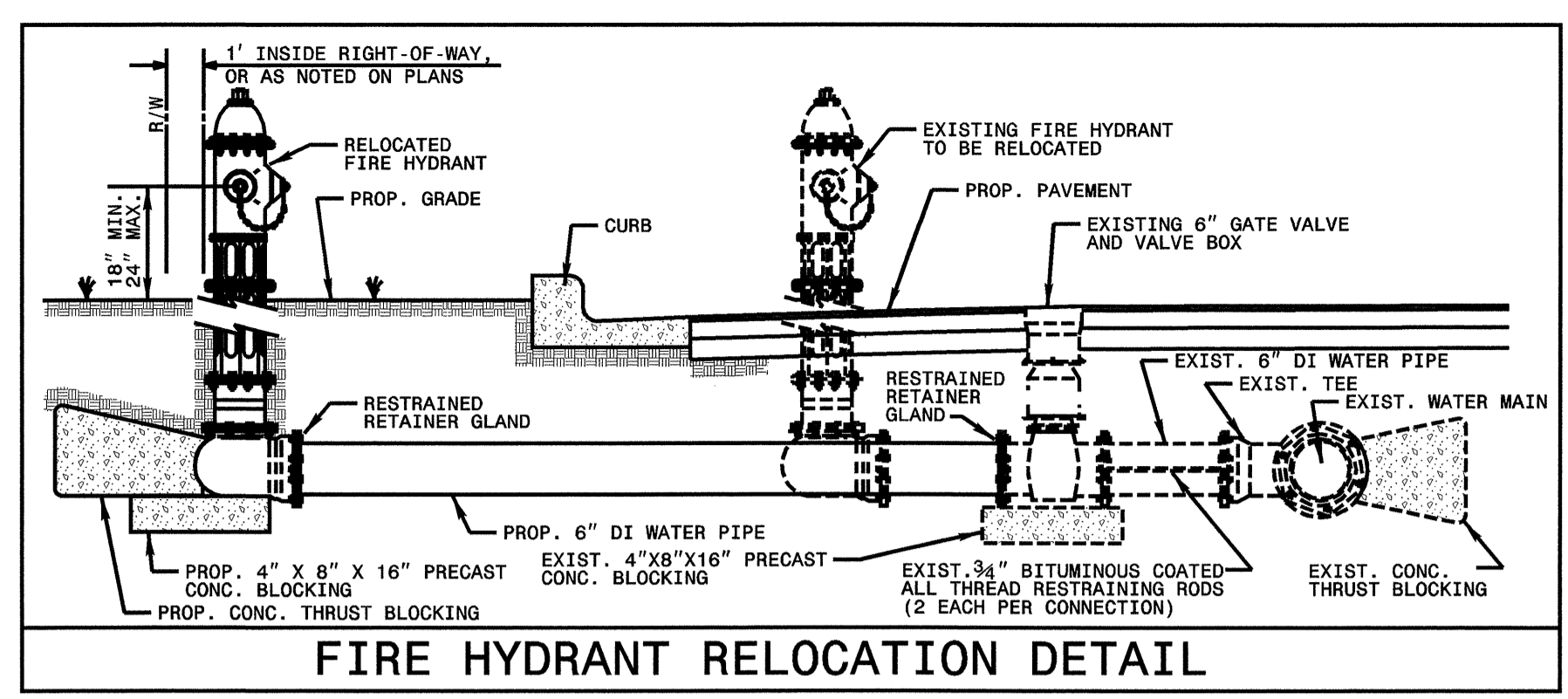
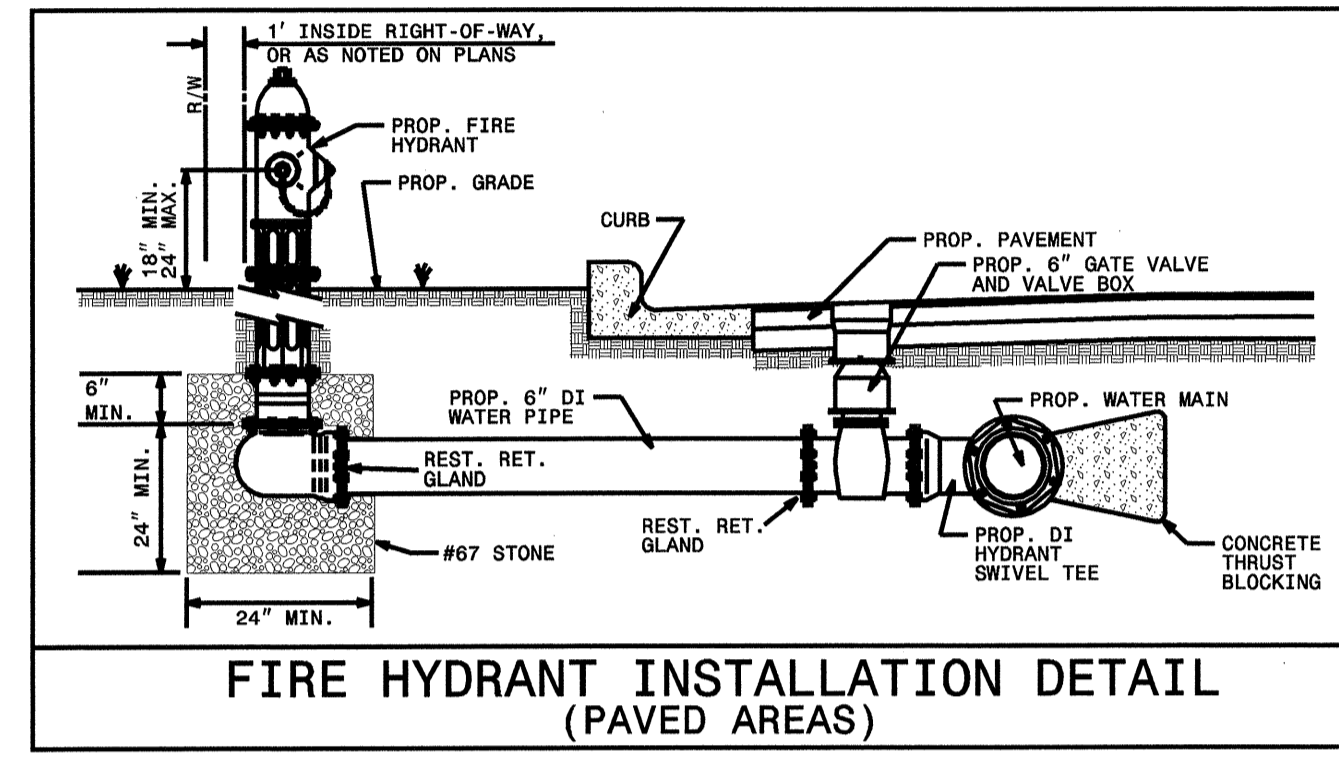
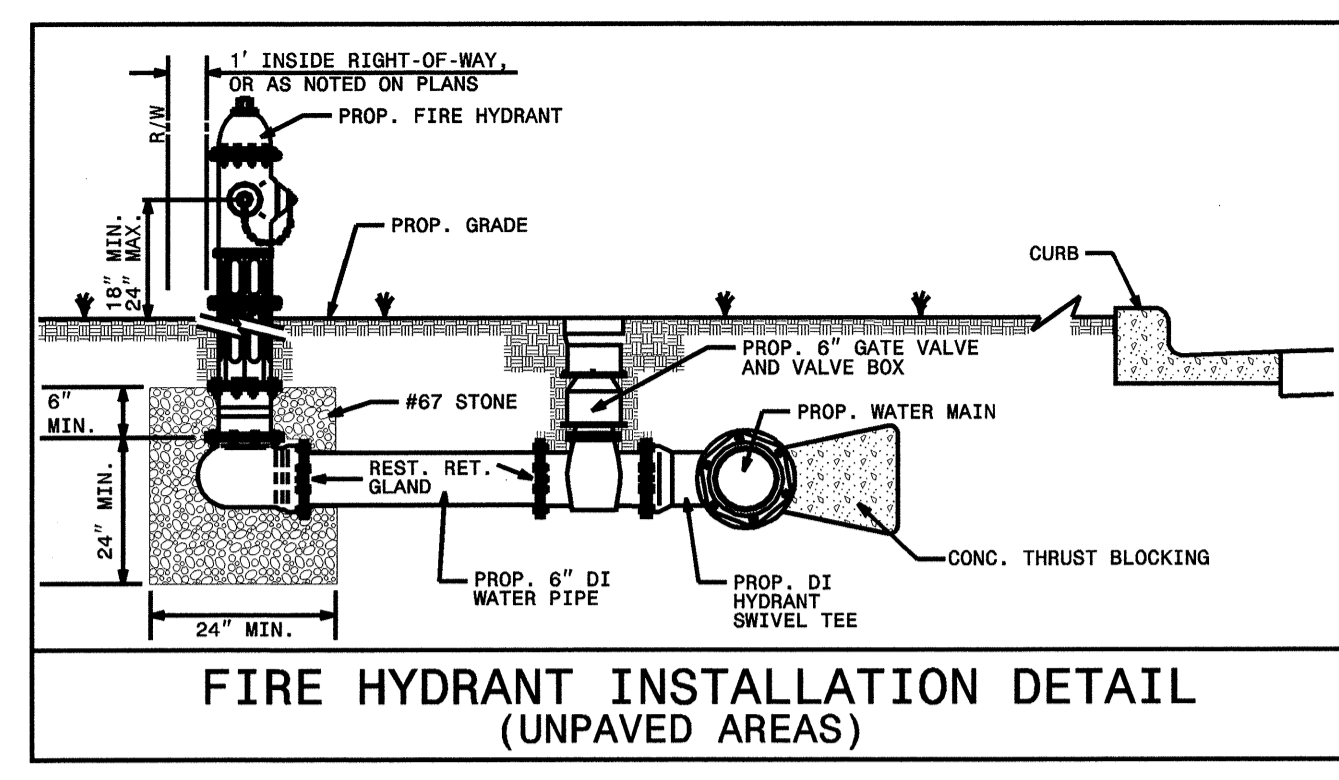
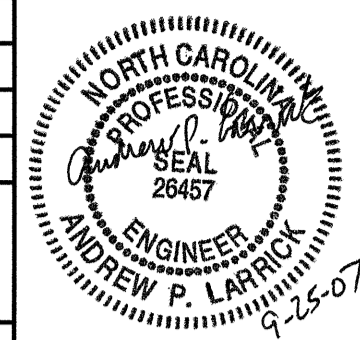
EX. & PROP. ELEVATIONS SHOWN IN THIS PROFILE ARE OVER CENTER OF PROP. WATER LINE

NOTE:  
100-YEAR FLOOD ELEV. = 768.66  
PER NCDOT HYDRAULICS UNIT



5/28/99  
D:\PROJECTS\99\0528\DWG\UC-4.DWG  
UC-4

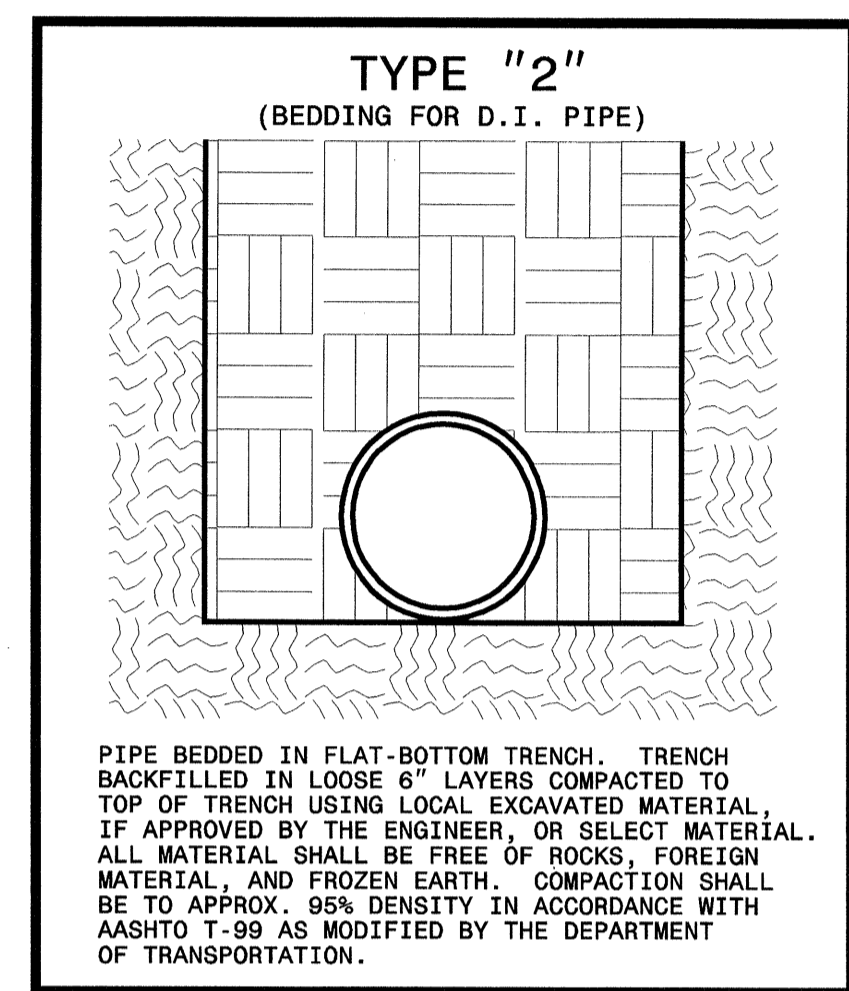




THE CONTRACTOR SHALL REPLACE ANY DAMAGED SEWER LATERALS AND/OR CLEANOUTS AS DIRECTED BY THE ENGINEER. THE NECESSARY QUANTITIES HAVE BEEN ADDED TO THE CONTRACT TO FACILITATE THIS PROCEDURE.

**MAXIMUM TRENCH WIDTH AT TOP OF PIPE**

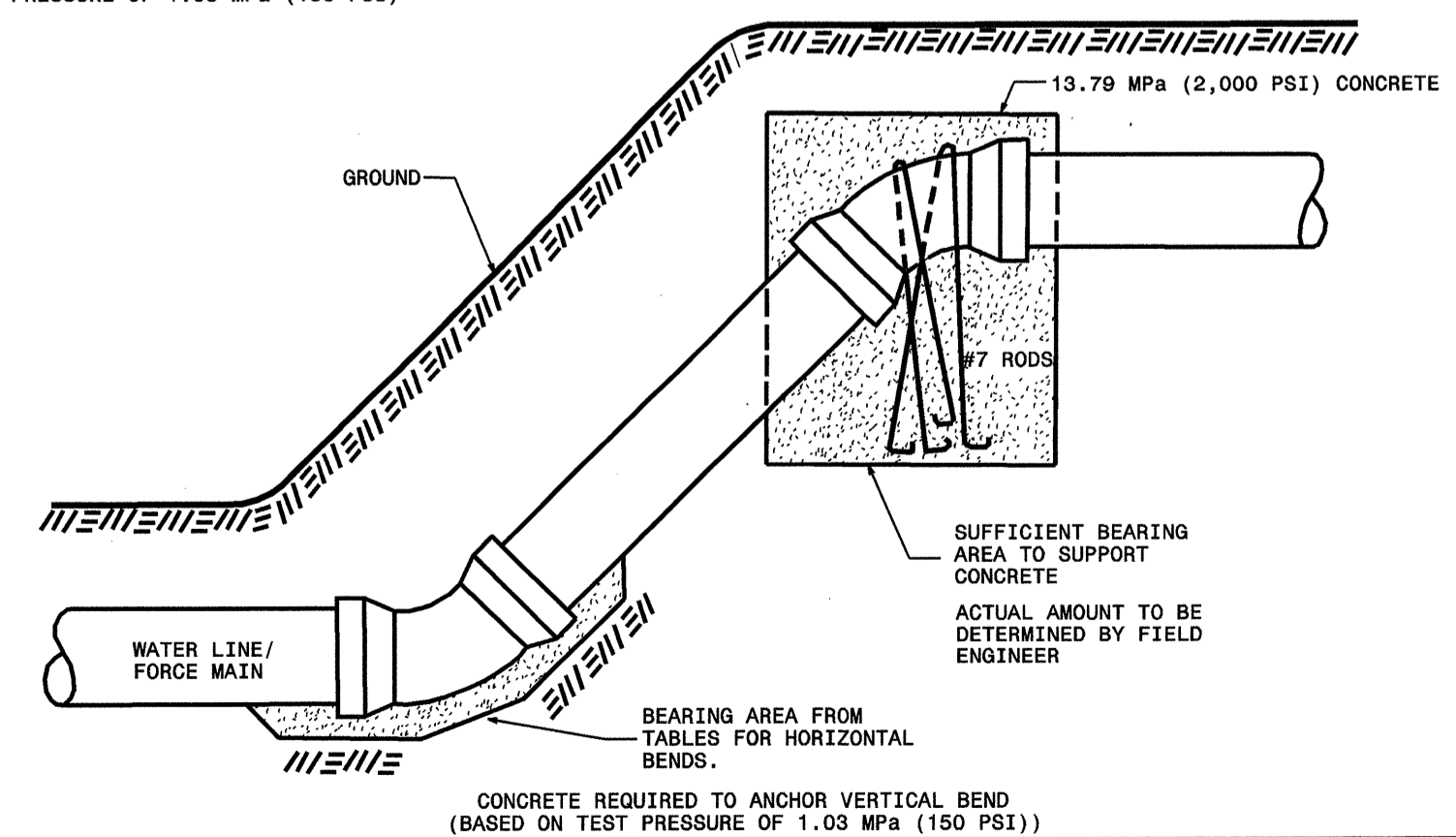
NOMINAL PIPE SIZE (INCHES)	TRENCH WIDTH (INCHES)	NOMINAL PIPE SIZE (INCHES)	TRENCH WIDTH (INCHES)
4	28	20	44
6	30	24	48
8	32	30	54
10	34	36	60
12	36	42	66
14	38	48	72
16	40	54	78
18	42		



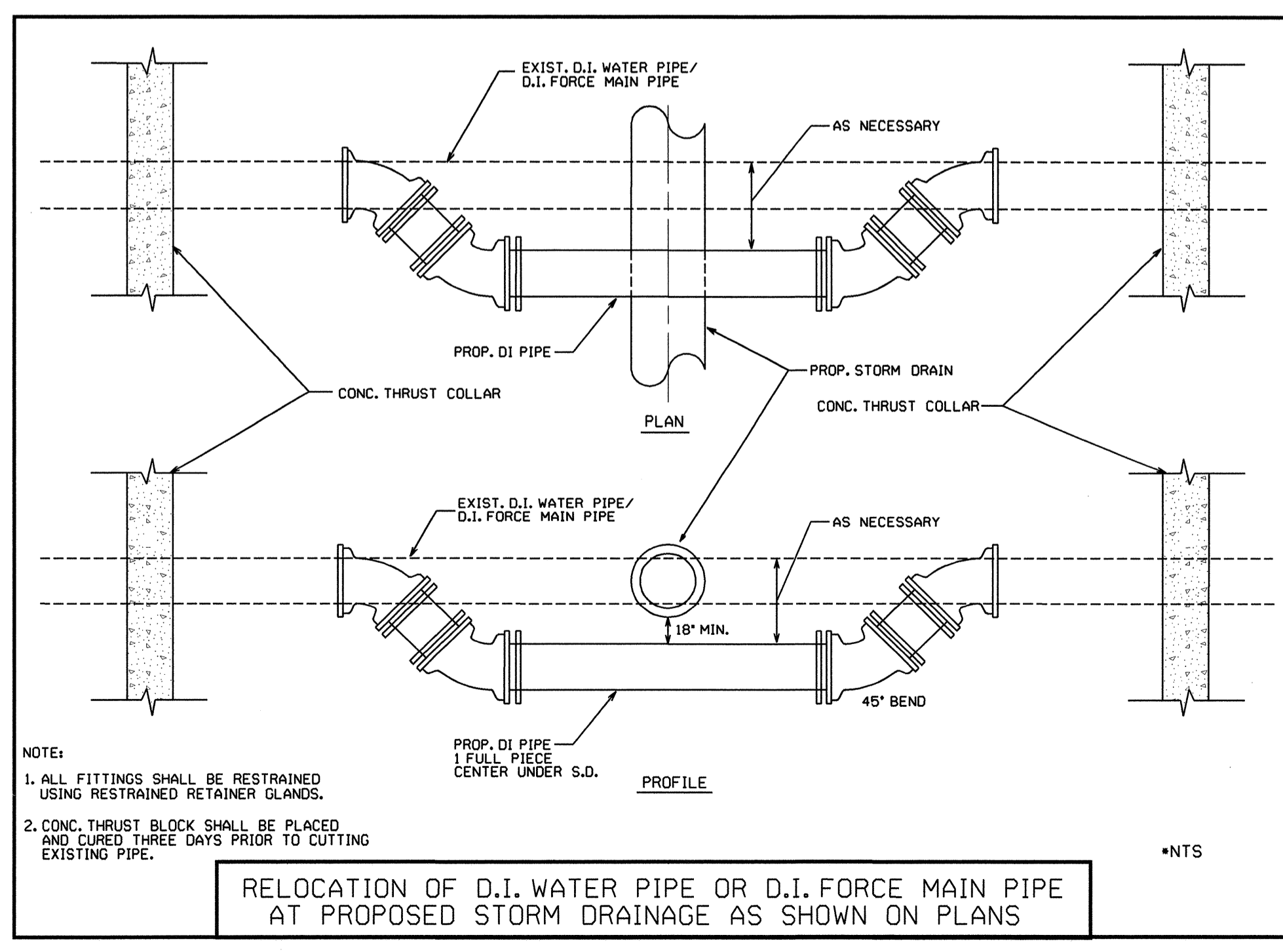
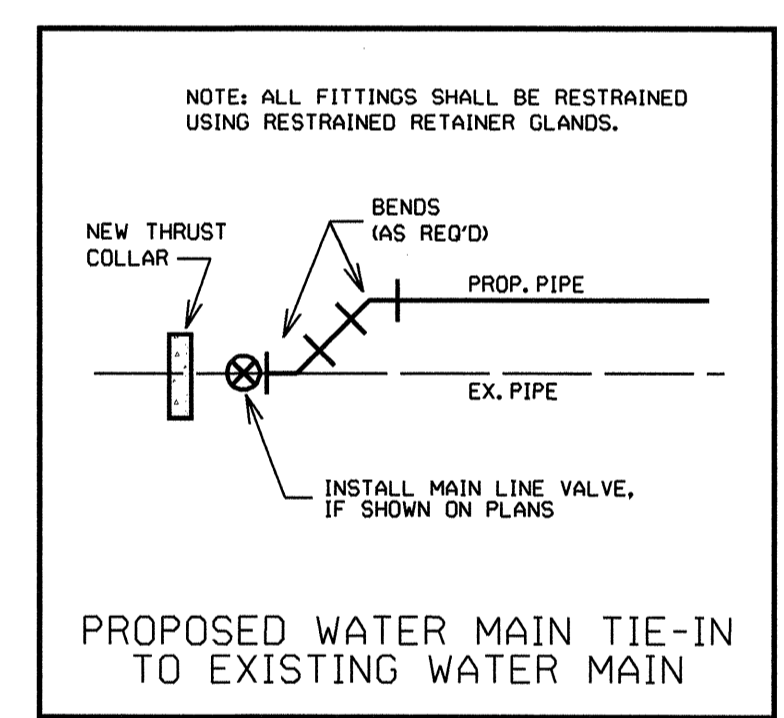
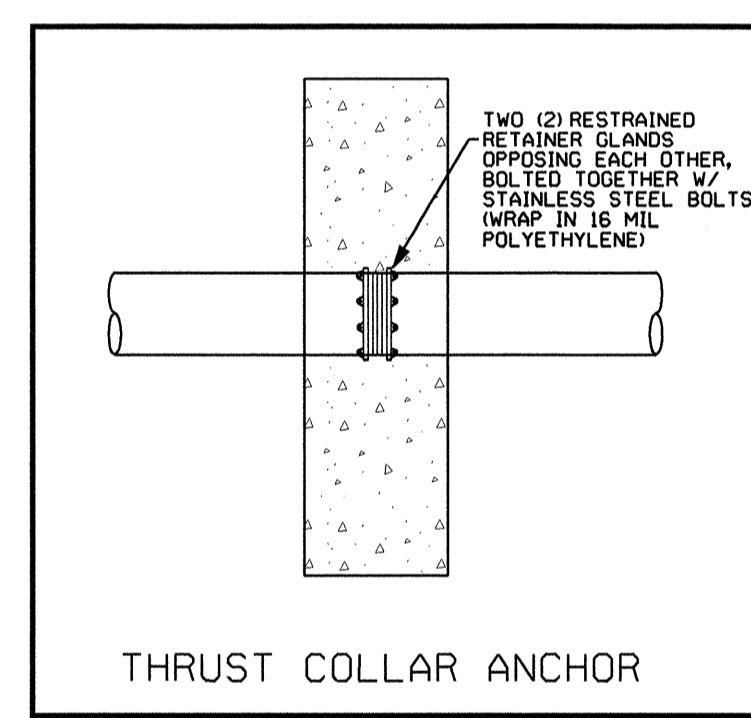
**REQUIRED BEARING AREAS**

SIZE (MM) (INCHES)	DEGREE OF BEND	STATIC THRUST*		FAIRLY DRY CLAY (FAIRLY DRY CLAY 0.192 Mpa (+4,000 PSF))		SOFT CLAY (SOFT CLAY 0.096 Mpa (+2,000 PSF))		GRAVEL, COARSE SAND (GRAVEL, COARSE SAND 0.796 Mpa (+16,000 PSF))		SAND, DRY (SAND, DRY 0.383 Mpa (+8,000 PSF))		SAND, COMPACT, FIRM (SAND, COMPACT, FIRM 0.383 Mpa (+8,000 PSF))		SAND, CLEAN, DRY (SAND, CLEAN, DRY 0.192 Mpa (+4,000 PSF))		SAND, SAND, VERY POOR (SAND, SAND, VERY POOR 0.046 Mpa (1,000 PSF))		ROCK, POOR (ROCK, POOR 0.479 Mpa (+10,000 PSF))		
		(NEWTONS)	(LBS.)	(SM)	(SF)	(SM)	(SF)	(SM)	(SF)	(SM)	(SF)	(SM)	(SF)	(SM)	(SF)	(SM)	(SF)	(SM)	(SF)	
150	6	11.25	3612	812	0.09	1	0.09	1	0.09	1	0.09	1	0.09	1	0.09	1	0.09	1	0.09	1
		22.5	7253	1653	0.09	1	0.09	1	0.09	1	0.09	1	0.09	1	0.09	1	0.09	1	0.09	1
		45	14443	3247	0.09	1	0.19	2	0.09	1	0.09	1	0.09	1	0.09	1	0.37	4	0.09	1
		90	28663	5994	0.19	2	0.28	3	0.09	1	0.09	1	0.19	2	0.56	6	0.09	1	0.09	1
		PLUG	18856	4239	0.09	1	0.19	2	0.09	1	0.09	1	0.19	1	0.09	1	0.37	4	0.09	1
200	8	11.25	6423	1444	0.09	1	0.09	1	0.09	1	0.09	1	0.09	1	0.09	1	0.19	2	0.09	1
		22.5	13073	2939	0.09	1	0.19	1	0.09	1	0.09	1	0.09	1	0.09	1	0.28	3	0.09	1
		45	25680	5773	0.19	2	0.28	3	0.09	1	0.09	1	0.19	2	0.56	6	0.09	1	0.09	1
		90	47400	10656	0.28	3	0.56	6	0.09	1	0.19	2	0.19	2	0.28	3	1.02	11	0.19	2
		PLUG	33522	7536	0.19	2	0.37	4	0.09	1	0.09	1	0.19	2	0.74	8	0.09	1	0.09	1
300	12	11.25	14448	3248	0.09	1	0.19	2	0.09	1	0.09	1	0.09	1	0.09	1	0.28	3	0.09	1
		22.5	29412	6612	0.19	2	0.37	4	0.09	1	0.09	1	0.19	2	0.65	7	0.09	1	0.09	1
		45	57774	12988	0.28	3	0.65	7	0.09	1	0.19	2	0.19	2	0.28	3	1.21	13	0.19	2
		90	106651	23976	0.56	6	1.11	12	0.19	2	0.28	3	0.28	3	0.56	6	2.23	24	0.28	3
		PLUG	75424	16956	0.37	4	0.84	9	0.09	1	0.19	2	0.19	2	0.37	4	1.58	17	0.19	2
400	16	11.25	25688	5775	0.19	2	0.28	3	0.09	1	0.09	1	0.09	1	0.19	2	0.56	6	0.09	1
		22.5	52293	11756	0.28	3	0.56	6	0.09	1	0.19	2	0.09	1	0.28	3	1.11	12	0.09	1
		45	102709	23090	0.56	6	1.11	12	0.19	2	0.28	3	0.28	3	0.56	6	2.14	23	0.28	3
		90	189601	42624	1.02	11	2.04	22	0.28	3	0.56	6	0.56	6	1.02	11	3.99	43	0.37	4
		PLUG	134087	30144	0.74	8	1.39	15	0.19	2	0.37	4	0.37	4	0.74	8	2.79	30	0.28	3

\*BASED ON TEST PRESSURE OF 1.03 MPa (150 PSI)



PIPE DIA. (INCHES) (MM)	11.25° BEND				22.5° BEND				45° BEND				
	RESULTANT FORCE (LBS.) (NEWTONS)	CONC. REQ'D (CY) (CM)	RESULTANT FORCE (LBS.) (NEWTONS)	CONC. REQ'D (CY) (CM)	RESULTANT FORCE (LBS.) (NEWTONS)	CONC. REQ'D (CY) (CM)	RESULTANT FORCE (LBS.) (NEWTONS)	CONC. REQ'D (CY) (CM)					
6	150	812	3612	---	1653	7353	0.50	0.014	3247	14443	1.00	0.028	
8	200	1444	6423	0.50	0.014	2939	13073	0.75	0.021	5773	25680	1.50	0.042
12	300	3248	14448	1.00	0.028	6612	29412	1.75	0.050	12988	57774	3.50	0.099
16	400	5775	25688	1.50	0.042	11756	52293	3.00	0.085	23090	102709	6.00	0.170

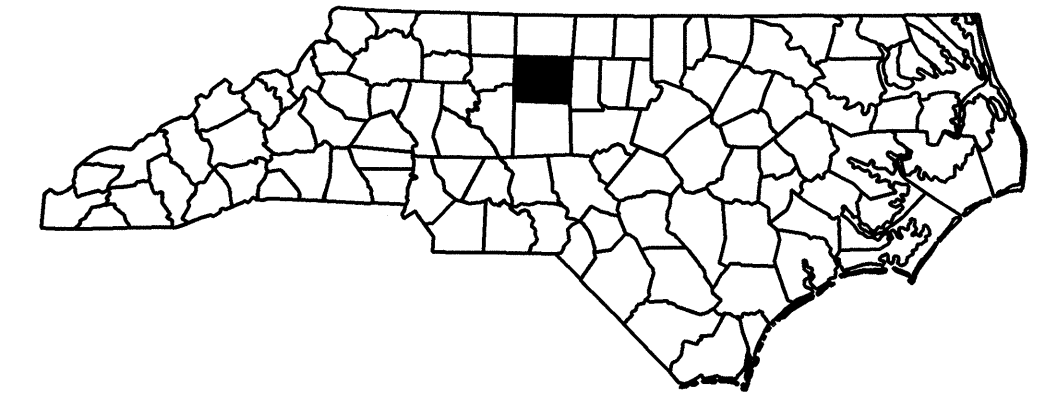


STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

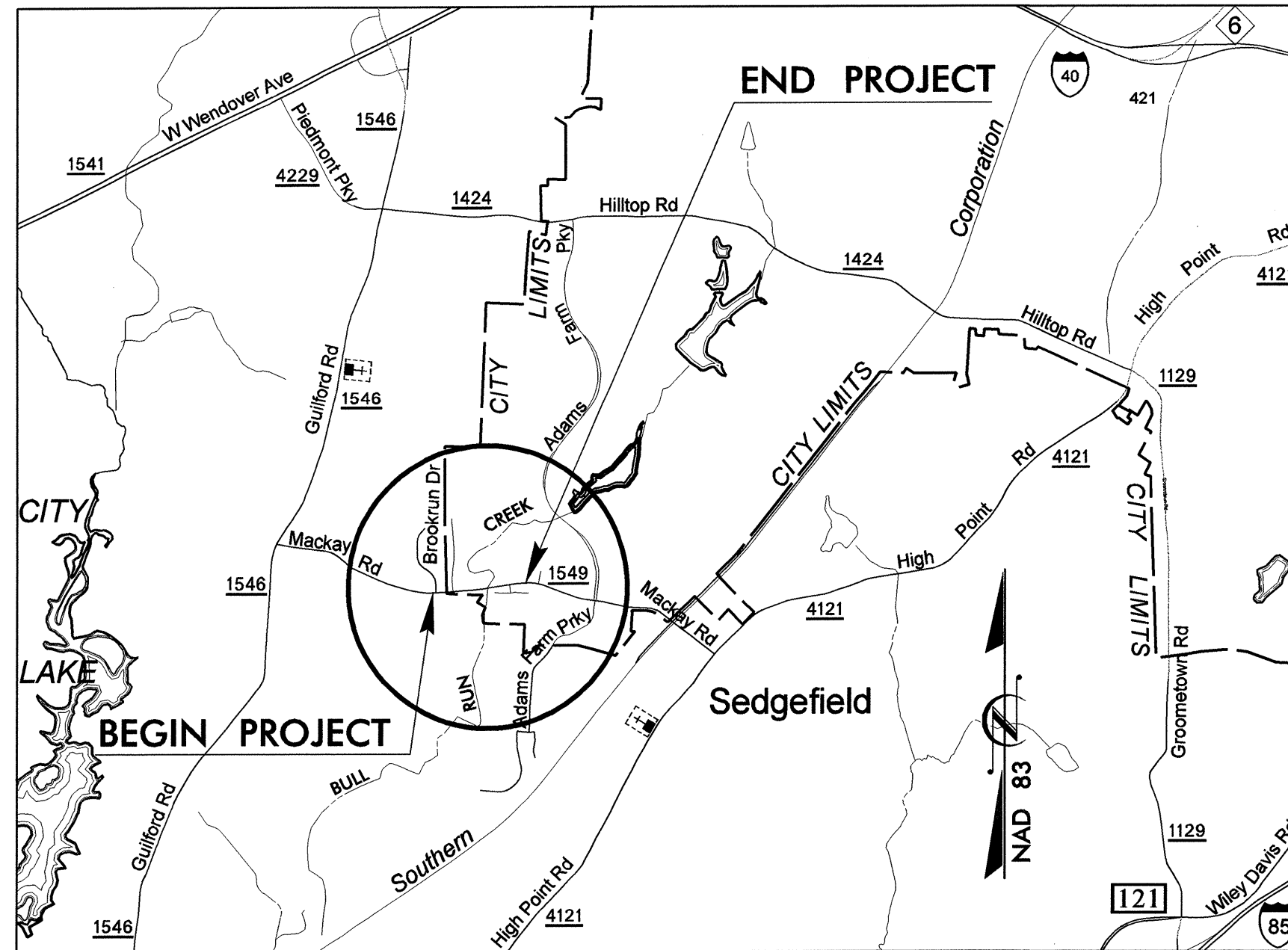
T.I.P. NO.	SHEET NO.
<b>B-4128</b>	<b>UO-1</b>

# GUILFORD COUNTY UTILITIES BY OTHERS

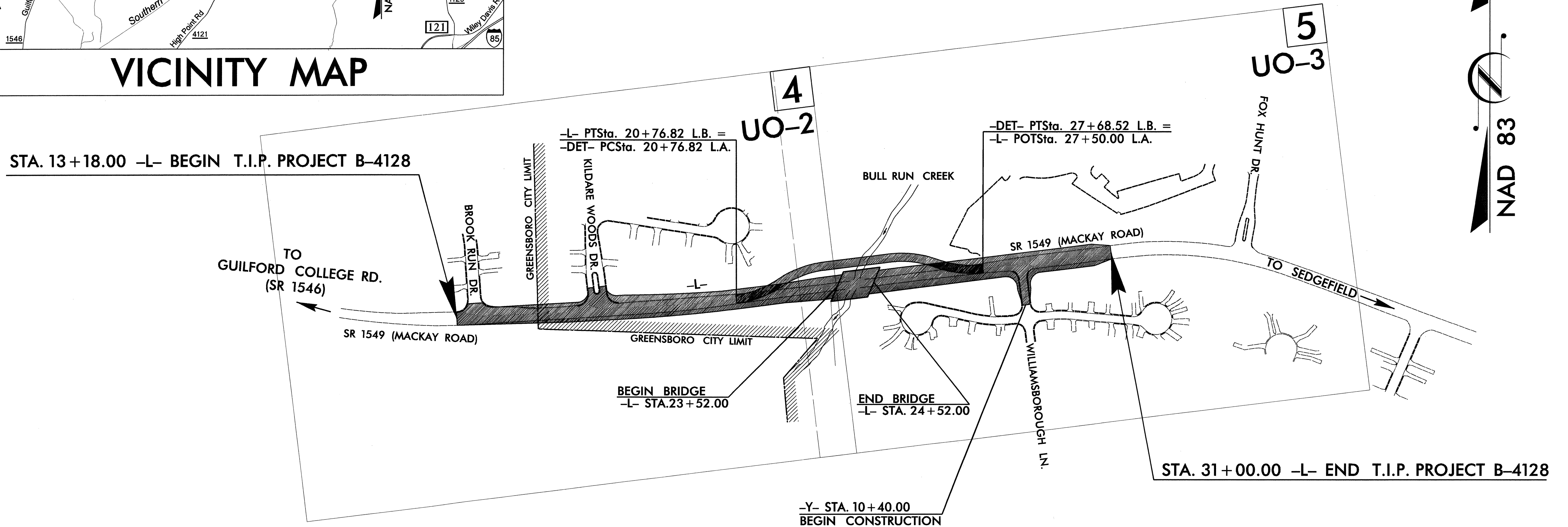
LOCATION: BRIDGE No. 73 OVER BULL RUN CREEK  
ON SR 1549 (MACKAY ROAD) IN GREENSBORO  
TYPE OF WORK: UTILITIES BY OTHERS



TIP: B-4128



VICINITY MAP



THIS PROJECT IS PARTIALLY WITHIN THE GREENSBORO CITY LIMITS.

### INDEX OF SHEETS

SHEET NO.	DESCRIPTION
UO-1	TITLE SHEET
UO-2 THRU UO-3	UTILITIES BY OTHERS PLAN SHEETS

### UTILITY OWNERS ON PROJECT

- POWER - DUKE ENERGY
- TELEPHONE - NORTH STATE COMMUNICATIONS
- FIBER OPTIC - LEVEL 3 COMMUNICATIONS
- CATV - TIME WARNER CABLE
- GAS - PIEDMONT NATURAL GAS
- GAS (TRANSMISSION) - COLONIAL PIPELINE



PREPARED IN THE OFFICE OF:  
**DAVIS-MARTIN-POWELL AND ASSOCIATES, INC.**

6415 OLD PLANK ROAD  
HIGH POINT, NC 27265  
PHONE (336) 886-4821  
FAX (336) 886-4458

**Randy McNeill, P.E.** UTILITIES PROJECT MANAGER  
**Andy Larrick, P.E.** UTILITIES PROJECT ENGINEER  
**Andy Larrick, P.E.** UTILITIES PROJECT DESIGNER

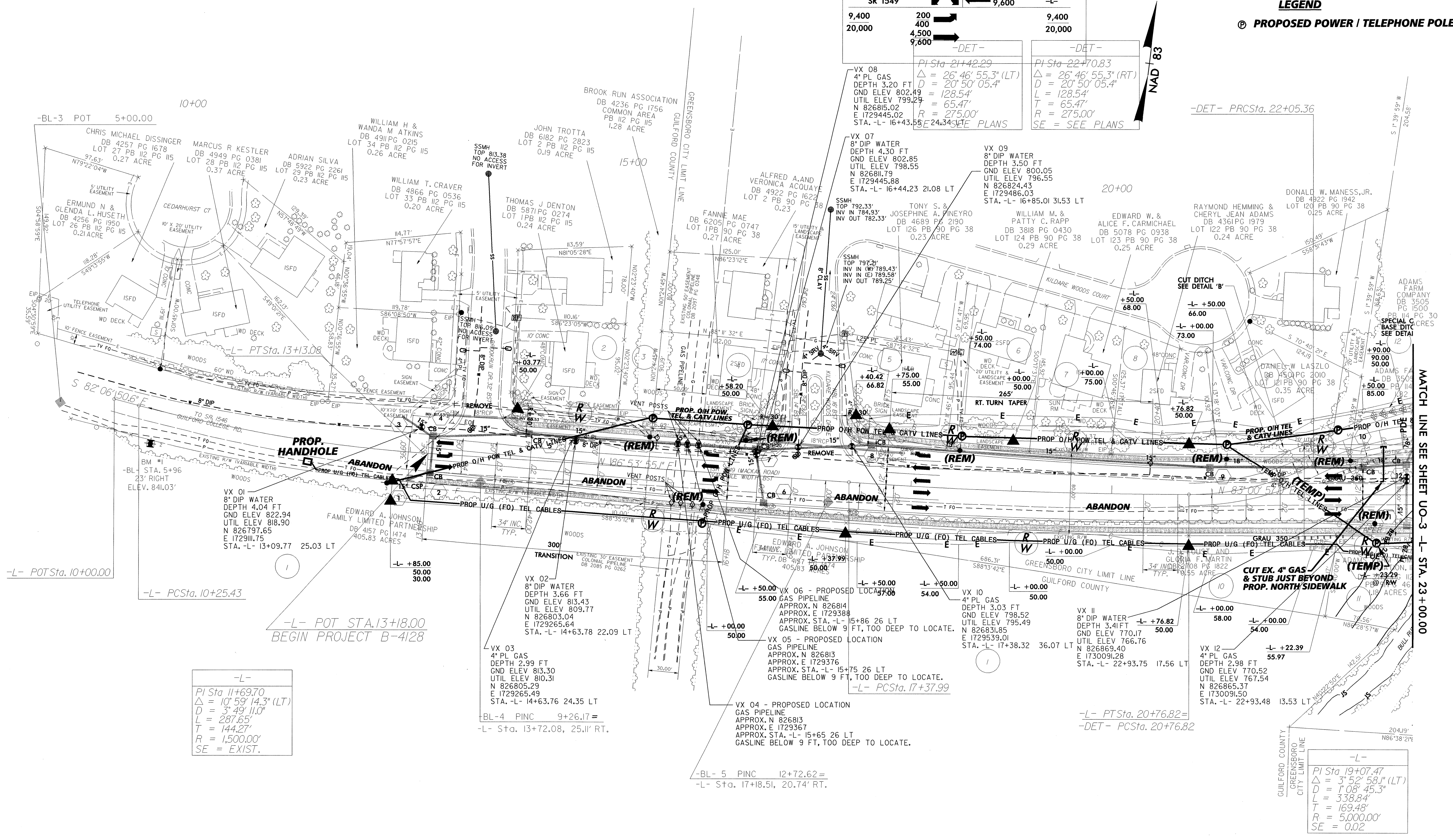
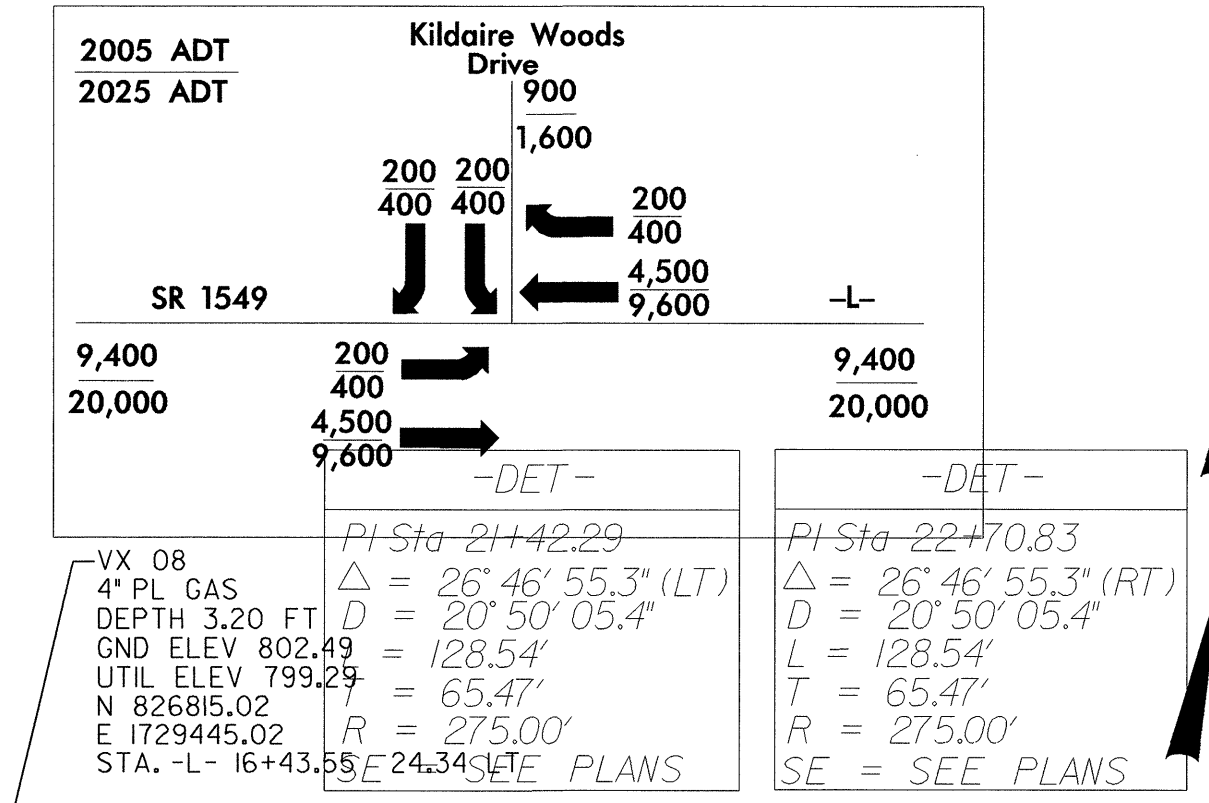
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\$\$\$\$\$DGN\$\$\$\$\$  
\$\$\$\$\$USERNAME\$\$\$\$\$



**UTILITIES BY OTHERS**

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

**LEGEND**  
**PROPOSED POWER / TELEPHONE POLE**



-L-  
 PI Sta 11+69.70  
 $\Delta = 10^{\circ} 59' 14.3''$  (LT)  
 $D = 3^{\circ} 49' 11.0''$   
 $L = 287.65'$   
 $T = 144.27'$   
 $R = 1,500.00'$   
 $SE = EXIST.$

VX 02 - 8" DIP WATER  
 DEPTH 3.66 FT  
 GND ELEV 822.94  
 UTIL ELEV 818.90  
 N 826803.04  
 E 1729265.64  
 STA. -L- 13+09.77 25.03 LT

VX 03 - 4" PL GAS  
 DEPTH 2.99 FT  
 GND ELEV 813.30  
 UTIL ELEV 810.31  
 N 826805.29  
 E 1729265.49  
 STA. -L- 14+63.76 24.35 LT

-BL-4 PINC 9+26.17=  
 -L- Sta. 13+72.08, 25.11' RT.

VX 04 - PROPOSED LOCATION  
 GAS PIPELINE  
 APPROX. N 826813  
 APPROX. E 1729367  
 APPROX. STA. -L- 15+65 26 LT  
 GASLINE BELOW 9 FT, TOO DEEP TO LOCATE.

VX 05 - PROPOSED LOCATION  
 GAS PIPELINE  
 APPROX. N 826813  
 APPROX. E 1729376  
 APPROX. STA. -L- 15+75 26 LT  
 GASLINE BELOW 9 FT, TOO DEEP TO LOCATE.

-L- PCSta. 17+37.99

VX 06 - PROPOSED LOCATION  
 GAS PIPELINE  
 APPROX. N 826814  
 APPROX. E 1729388  
 APPROX. STA. -L- 15+86 26 LT  
 GASLINE BELOW 9 FT, TOO DEEP TO LOCATE.

VX 07 - 8" DIP WATER  
 DEPTH 4.30 FT  
 GND ELEV 802.85  
 UTIL ELEV 798.55  
 N 826811.79  
 E 1729445.88  
 STA. -L- 16+44.23 21.08 LT

VX 08 - 4" PL GAS  
 DEPTH 3.20 FT  
 GND ELEV 802.49  
 UTIL ELEV 799.24  
 N 826815.02  
 E 1729445.02  
 STA. -L- 16+43.55

VX 09 - 8" DIP WATER  
 DEPTH 3.50 FT  
 GND ELEV 800.05  
 UTIL ELEV 796.55  
 N 826824.43  
 E 1729486.03  
 STA. -L- 16+85.01 31.53 LT

VX 10 - 4" PL GAS  
 DEPTH 3.03 FT  
 GND ELEV 798.52  
 UTIL ELEV 795.49  
 N 826831.85  
 E 1729539.01  
 STA. -L- 17+38.32 36.07 LT

VX 11 - 8" DIP WATER  
 DEPTH 3.41 FT  
 GND ELEV 770.17  
 UTIL ELEV 766.76  
 N 826869.40  
 E 1730091.28  
 STA. -L- 22+93.75 17.56 LT

VX 12 - 4" PL GAS  
 DEPTH 2.98 FT  
 GND ELEV 770.52  
 UTIL ELEV 767.54  
 N 826865.37  
 E 1730091.50  
 STA. -L- 22+93.48 13.53 LT

-L- PTSta. 20+76.82=  
 -DET- PCSta. 20+76.82

-L-  
 PI Sta 19+07.47  
 $\Delta = 3^{\circ} 52' 58.1''$  (LT)  
 $D = 1^{\circ} 08' 45.3''$   
 $L = 338.84'$   
 $T = 169.48'$   
 $R = 5,000.00'$   
 $SE = 0.02$

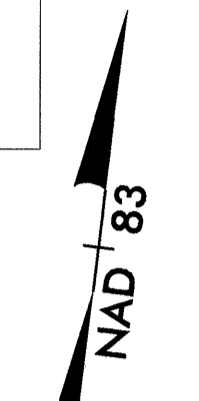
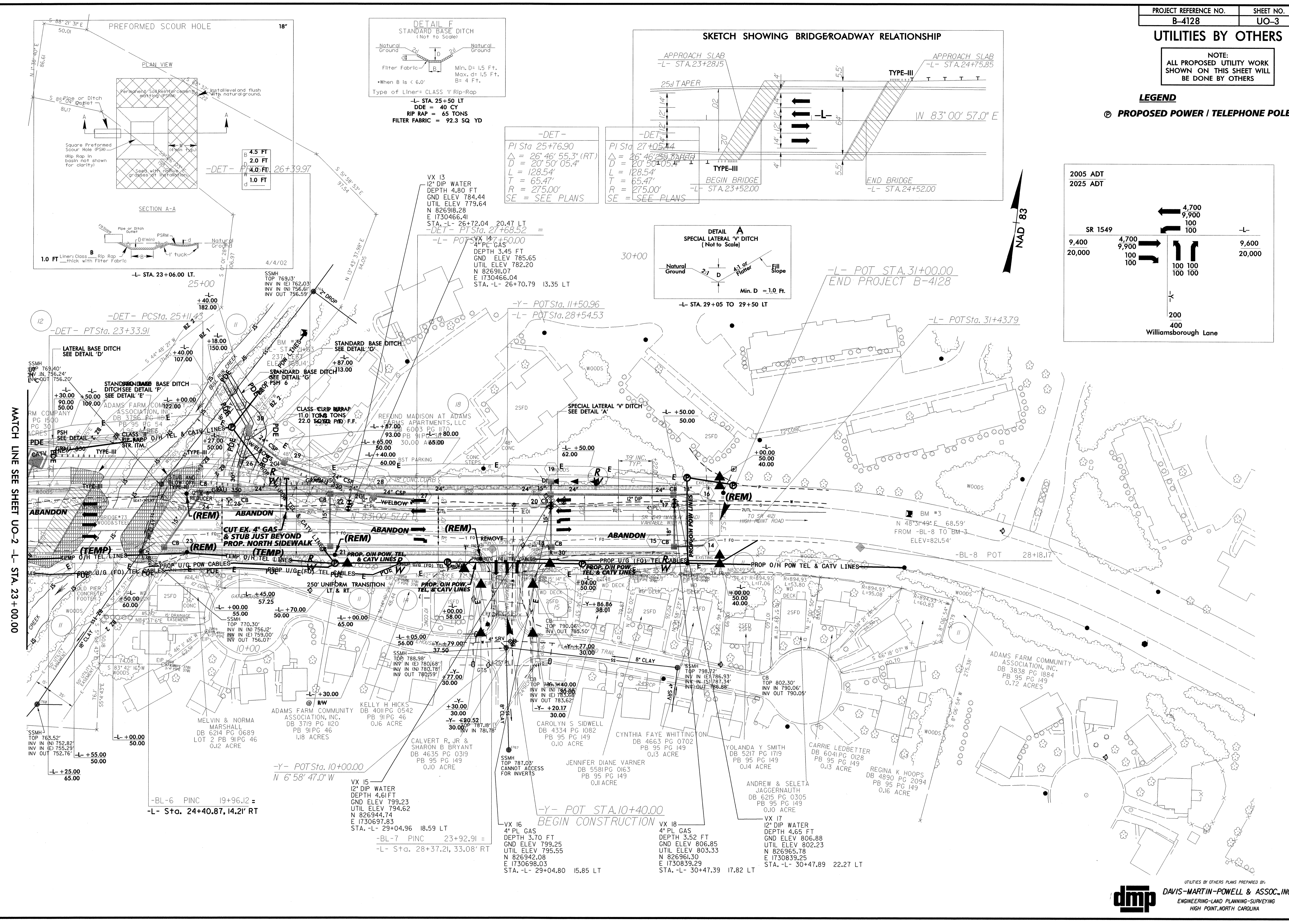
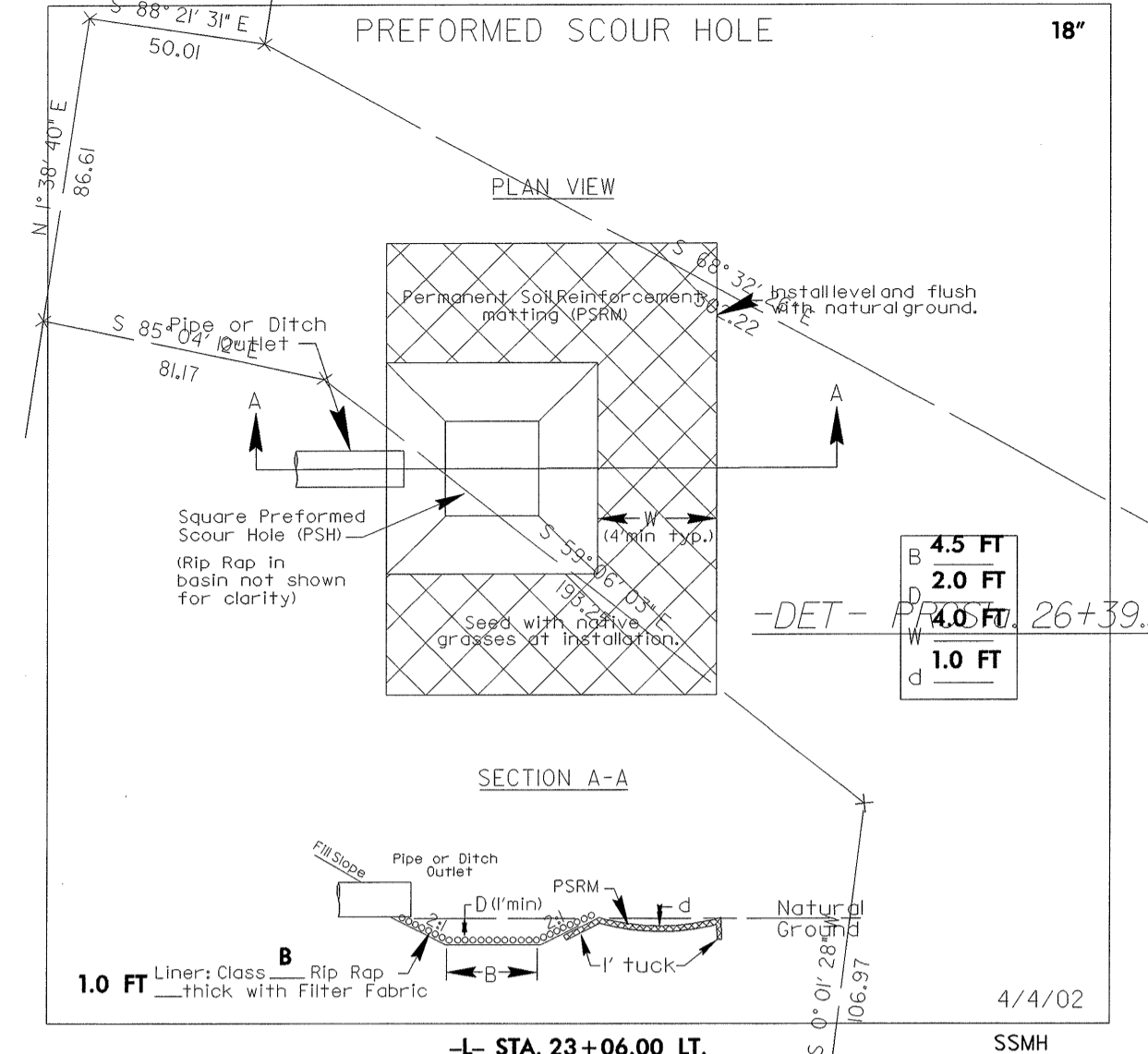
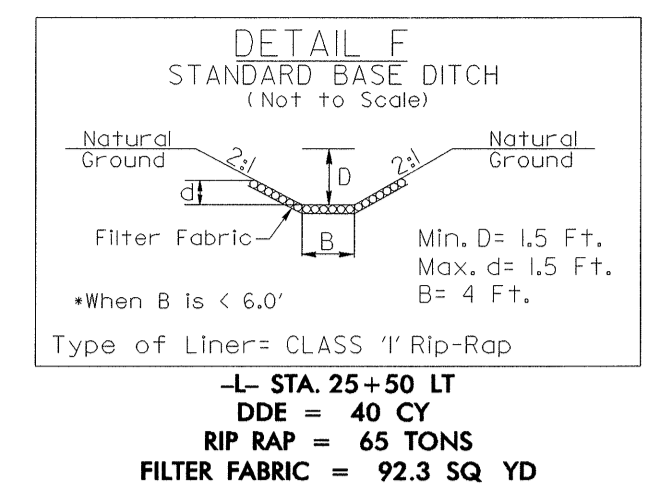
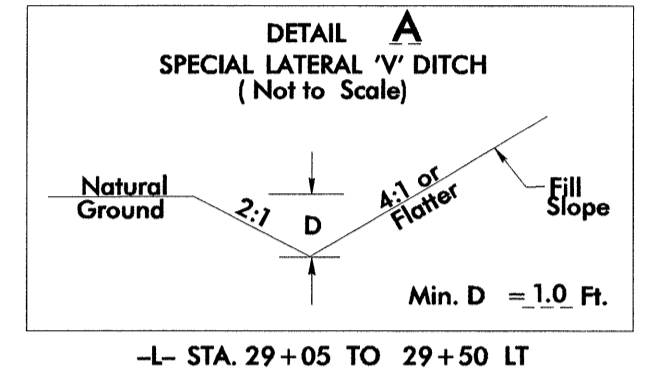
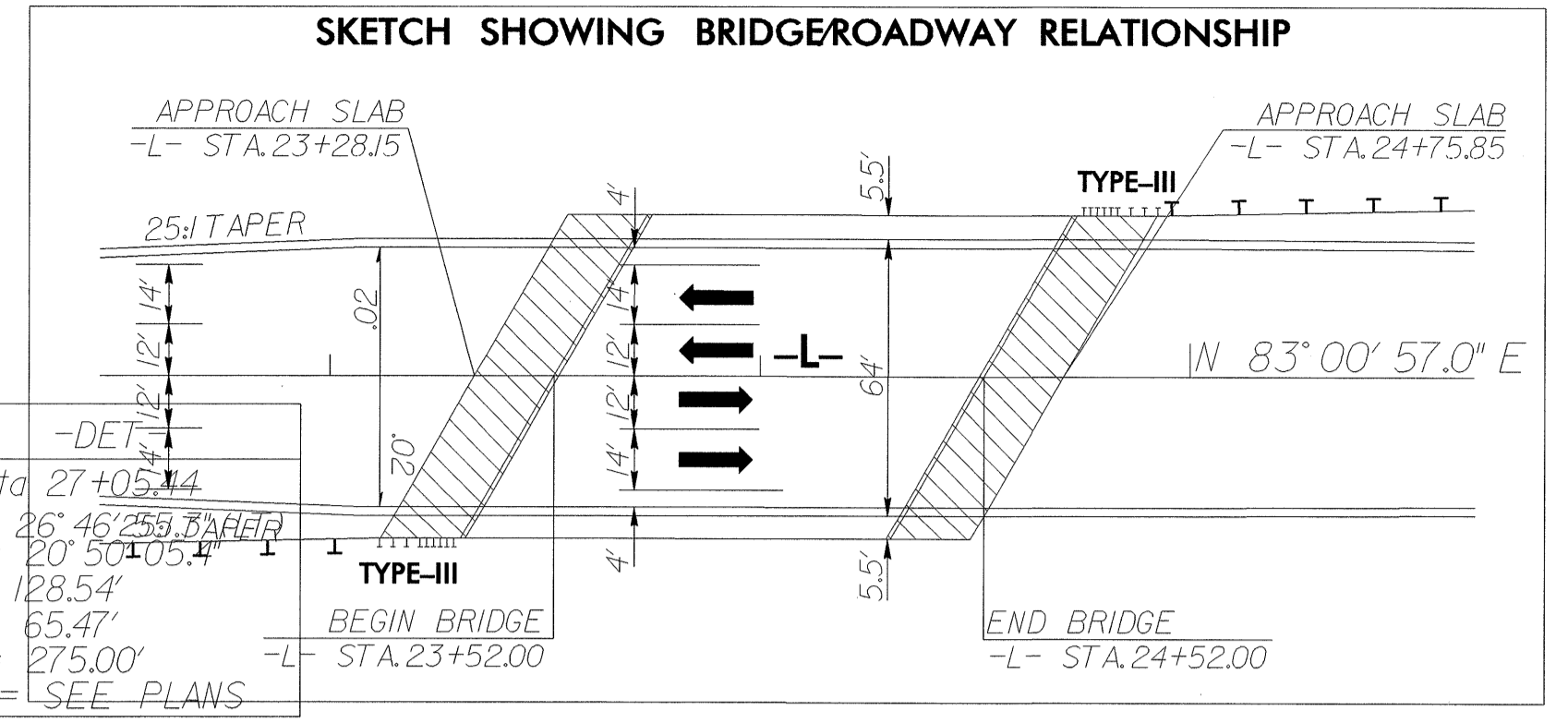
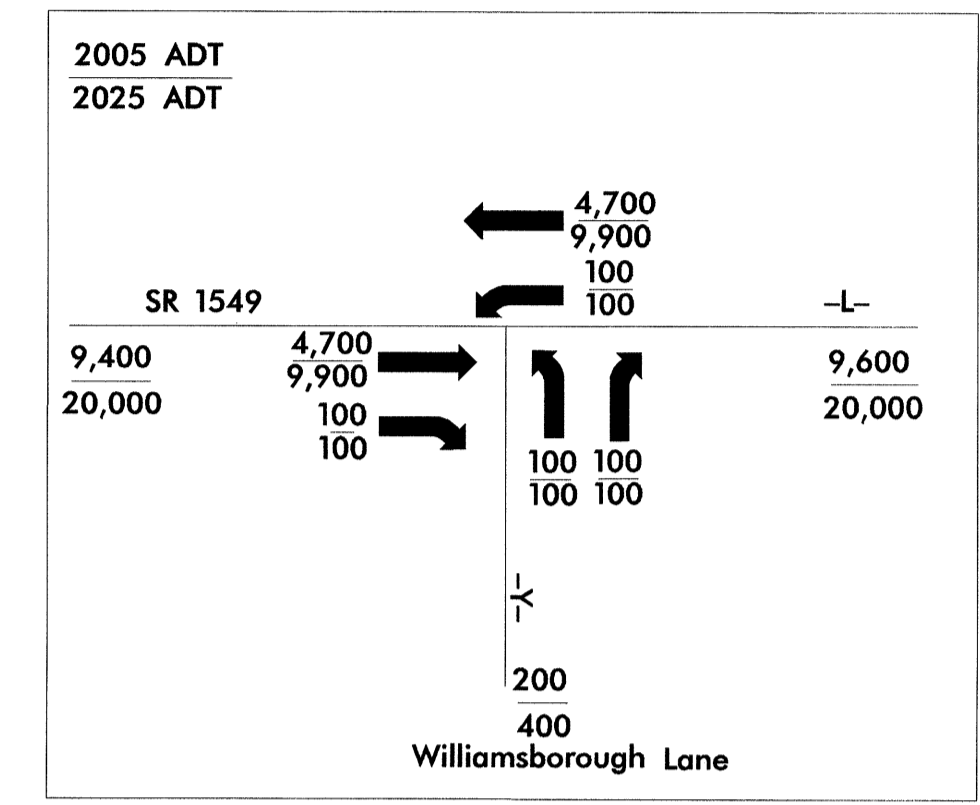


UTILITIES BY OTHERS

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

LEGEND

PROPOSED POWER / TELEPHONE POLE



MATCH LINE SEE SHEET UO-2 -L- STA. 23+00.00