

09/08/09

T.I.P. NO.	SHEET NO.
R-2612A	UC-1

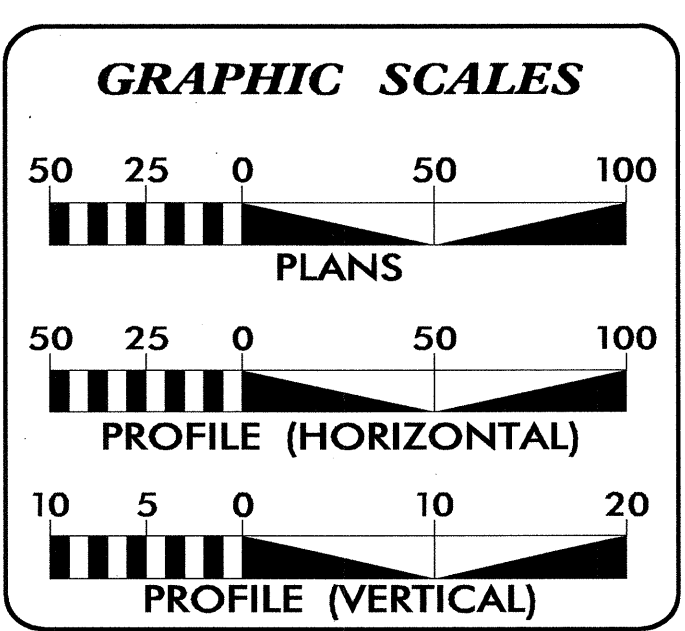
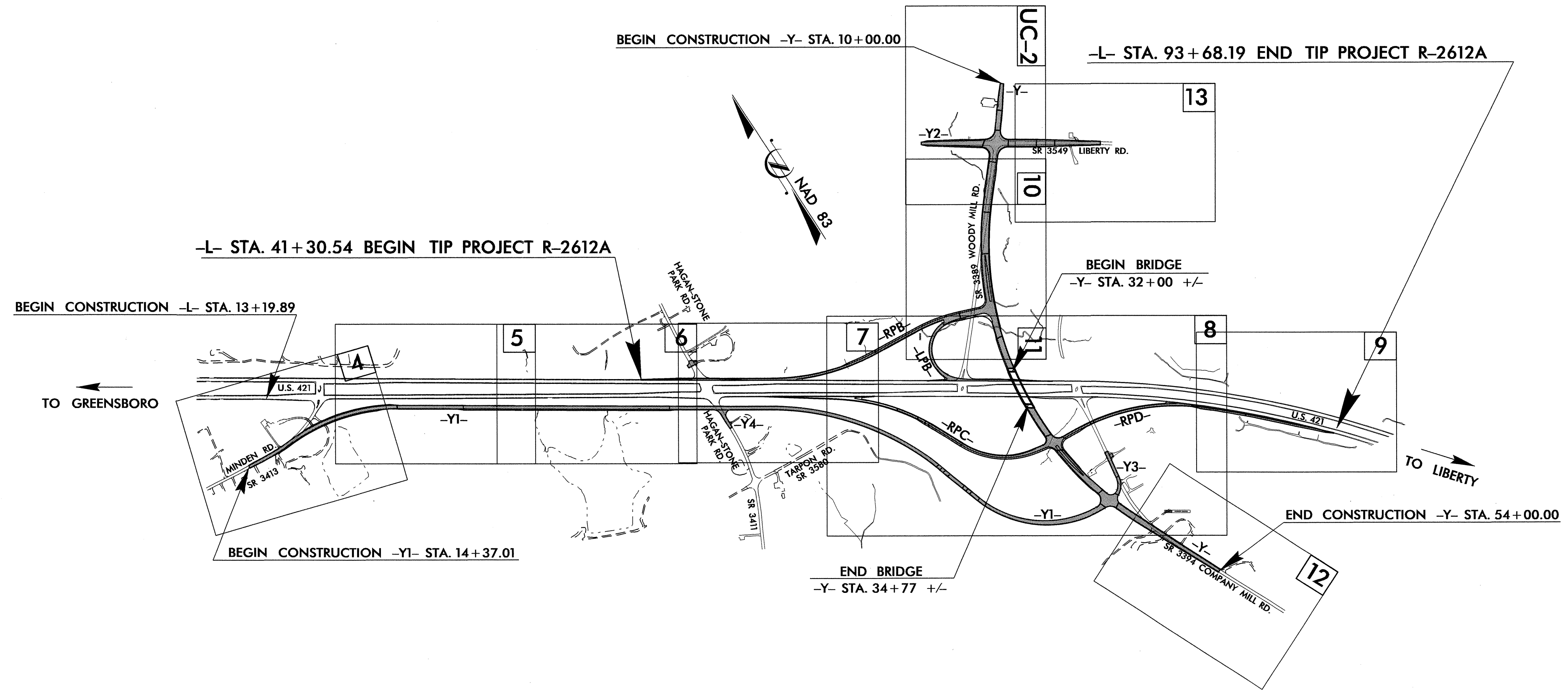
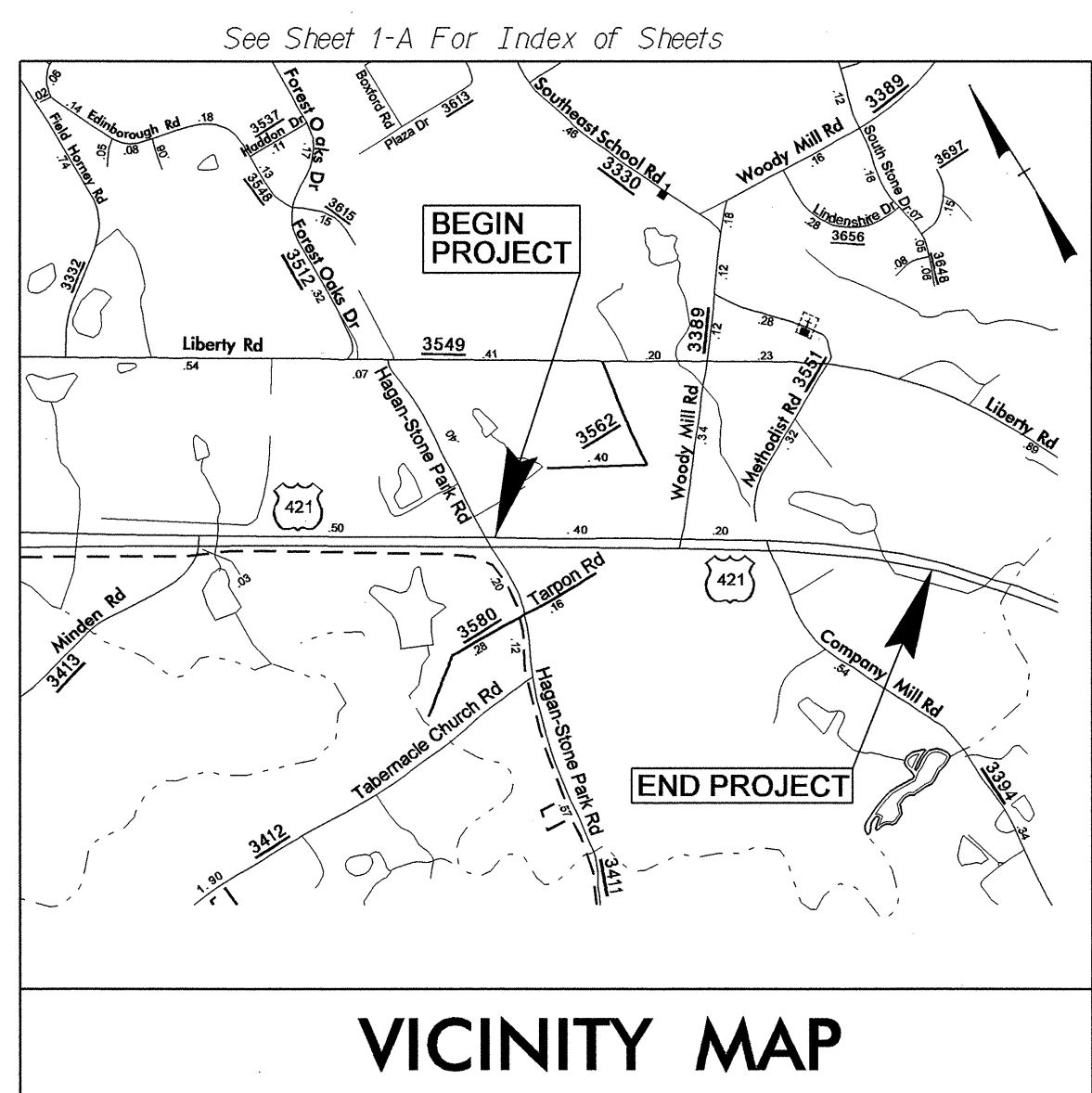
TIP PROJECT: R-2612A

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

**UTILITY CONSTRUCTION PLANS
GUILFORD COUNTY**

**LOCATION: US 421 AT SR 3389 (WOODY MILL ROAD)
SOUTH OF GREENSBORO**

TYPE OF WORK: UTILITY CONSTRUCTION

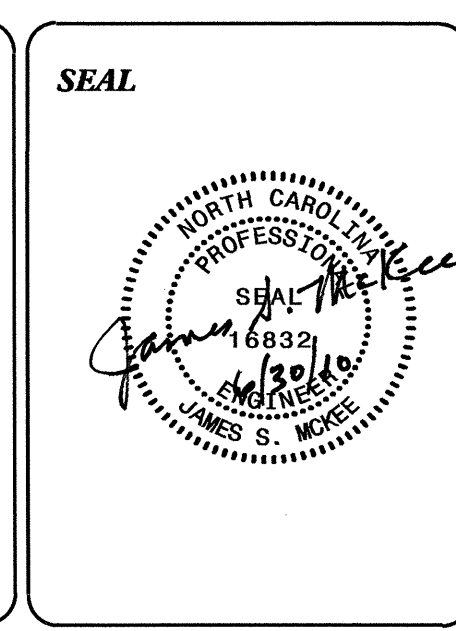


INDEX OF SHEETS

SHEET NO.	DESCRIPTION
UC-1	TITLE SHEET
UC-2	UTILITY CONSTRUCTION PLAN SHEET
UC-3	DETAILS SHEET

WATER AND SEWER OWNERS ON PROJECT

(1) WATER City of Greensboro



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

1591 MAIL SERVICES CENTER
RALEIGH NC 27699-1591
PHONE (919) 250-4128
FAX (919) 250-4119

Roger Worthington, P.E. UTILITIES SECTION ENGINEER
Steve Mckee, P.E. UTILITIES SQUAD LEADER
Jamshid Hafshejani UTILITIES PROJECT DESIGNER

30-JUN-2010 09:21 P:\Utilities\Rock\Projects\2612a\uc1_rdy_tsh.dgn

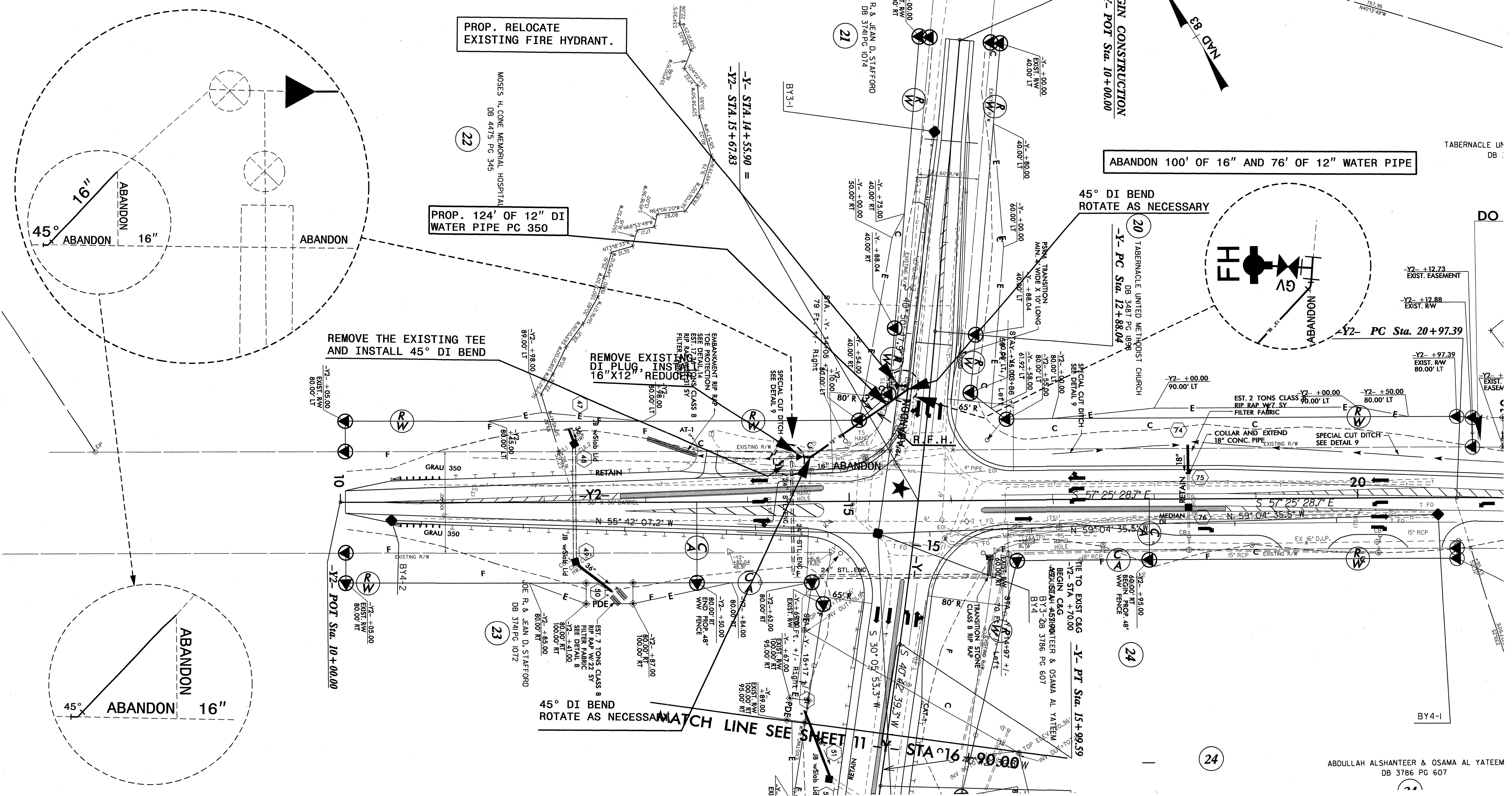
5/14/99
 14-JUL-2010 16:15
 R:\Utilities\Projects\2612a\2612a-uc2_rdy-psd\psd10.dgn

PROJECT REFERENCE NO.	SHEET NO.
R-2612A	UC-2
DESIGNED BY: JH	
DRAWN BY: JH	
CHECKED BY: JSM	
APPROVED BY: JSM	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 250-4128 FAX: (919) 250-4119	
UTILITY CONSTRUCTION PLANS ONLY	

UTILITY CONSTRUCTION

NOTE:
 The Owner of the existing water line is the City of Greensboro.
 The Contractor will be required to limit interruption of service to water to a one time maximum 8 hour period for each.
 Service can only be interrupted between the hours of 10 PM and 6 AM or as directed by the Engineer.

The Contractor shall be responsible for field verifying location, size, type, and elevation of all existing underground utilities, as well as reconnecting any water and / or sanitary sewer services disturbed during construction even if they are not shown on the plan. This work will be considered incidental to the various other pay items in the contract.



5/14/99

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PROJECT REFERENCE NO.	SHEET NO.
R-2612A	UC-3
DESIGNED BY: JH	
DRAWN BY: JH	
CHECKED BY: JSM	
APPROVED BY: JSM	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 250-4128 FAX: (919) 250-4119	
UTILITY CONSTRUCTION PLANS ONLY	

UTILITY CONSTRUCTION

THRUST BLOCKS ARE DESIGNED FOR 200 P.S.I.

HORIZONTAL RESTRAINT (ALL AREAS GIVEN ARE IN SQUARE FEET)									VERTICAL RESTRAINT (ALL VOLUMES GIVEN ARE IN CUBIC YARDS)**									
PIPE SIZE	DEGREE OF BEND	LBS. STATIC THRUST *	ALLOWABLE SOIL BEARING (PSF)								PIPE SIZE	RESTRAINING RODS NO./REQ'D	DIA.	DEGREE OF BEND				
			1000	2000	3000	4000	5000	6000	7000	8000				11 1/4°	22 1/2°	45°		
4"	11 1/4°	616	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	22 1/2°	1,236	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
	45°	2,405	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
	90°	4,444	4	2	1	1	1	1	1	1	1	1	1	1	1	1	1	
	TEE/PLUG	3,143	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1	
6"	11 1/4°	1,395	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
	22 1/2°	2,758	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1	
	45°	5,409	5	3	2	2	1	1	1	1	1	1	1	1	1	1	1	
	90°	9,593	10	5	3	3	2	2	2	2	2	2	2	2	2	2	2	
	TEE/PLUG	7,068	7	4	3	2	2	2	2	2	2	2	2	2	2	2	2	
8"	11 1/4°	2,524	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
	22 1/2°	4,904	5	3	2	2	1	1	1	1	1	1	1	1	1	1	1	
	45°	9,809	10	5	3	3	2	2	2	2	2	2	2	2	2	2	2	
	90°	17,773	18	9	6	4	4	3	3	3	3	3	3	3	3	3	3	
	TEE/PLUG	12,568	13	6	4	3	3	2	2	2	2	2	2	2	2	2	2	
10"	11 1/4°	3,846	4	2	2	1	1	1	1	1	1	1	1	1	1	1	1	
	22 1/2°	7,681	8	4	3	2	2	2	2	2	2	2	2	2	2	2	2	
	45°	15,028	15	8	5	4	3	3	3	3	3	3	3	3	3	3	3	
	90°	27,168	28	14	9	7	6	5	4	4	4	4	4	4	4	4	4	
	TEE/PLUG	19,632	20	10	7	5	4	3	3	3	3	3	3	3	3	3	3	
12"	11 1/4°	5,543	6	3	2	2	1	1	1	1	1	1	1	1	1	1	1	
	22 1/2°	11,032	11	6	4	3	2	2	2	2	2	2	2	2	2	2	2	
	45°	21,641	22	11	7	5	4	4	4	4	4	4	4	4	4	4	4	
	90°	39,987	40	20	13	10	8	7	6	5	5	5	5	5	5	5	5	
	TEE/PLUG	28,274	28	14	9	7	6	5	4	4	4	4	4	4	4	4	4	
14"	11 1/4°	7,544	8	4	3	2	2	2	2	2	2	2	2	2	2	2	2	
	22 1/2°	15,016	15	8	5	4	3	3	3	3	3	3	3	3	3	3	3	
	45°	29,455	29	15	10	7	6	5	4	4	4	4	4	4	4	4	4	
	90°	54,426	54	27	18	14	11	9	8	7	7	7	7	7	7	7	7	
	TEE/PLUG	38,495	38	19	13	10	8	6	5	5	5	5	5	5	5	5	5	
16"	11 1/4°	9,854	10	5	3	3	2	2	2	2	2	2	2	2	2	2	2	
	22 1/2°	19,612	20	10	7	5	4	3	3	3	3	3	3	3	3	3	3	
	45°	38,471	38	17	13	10	8	6	5	5	5	5	5	5	5	5	5	
	90°	71,095	71	36	24	18	14	12	10	9	9	9	9	9	9	9	9	
	TEE/PLUG	50,265	50	25	17	13	10	8	7	6	6	6	6	6	6	6	6	

- * INCLUDES 1.25 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.

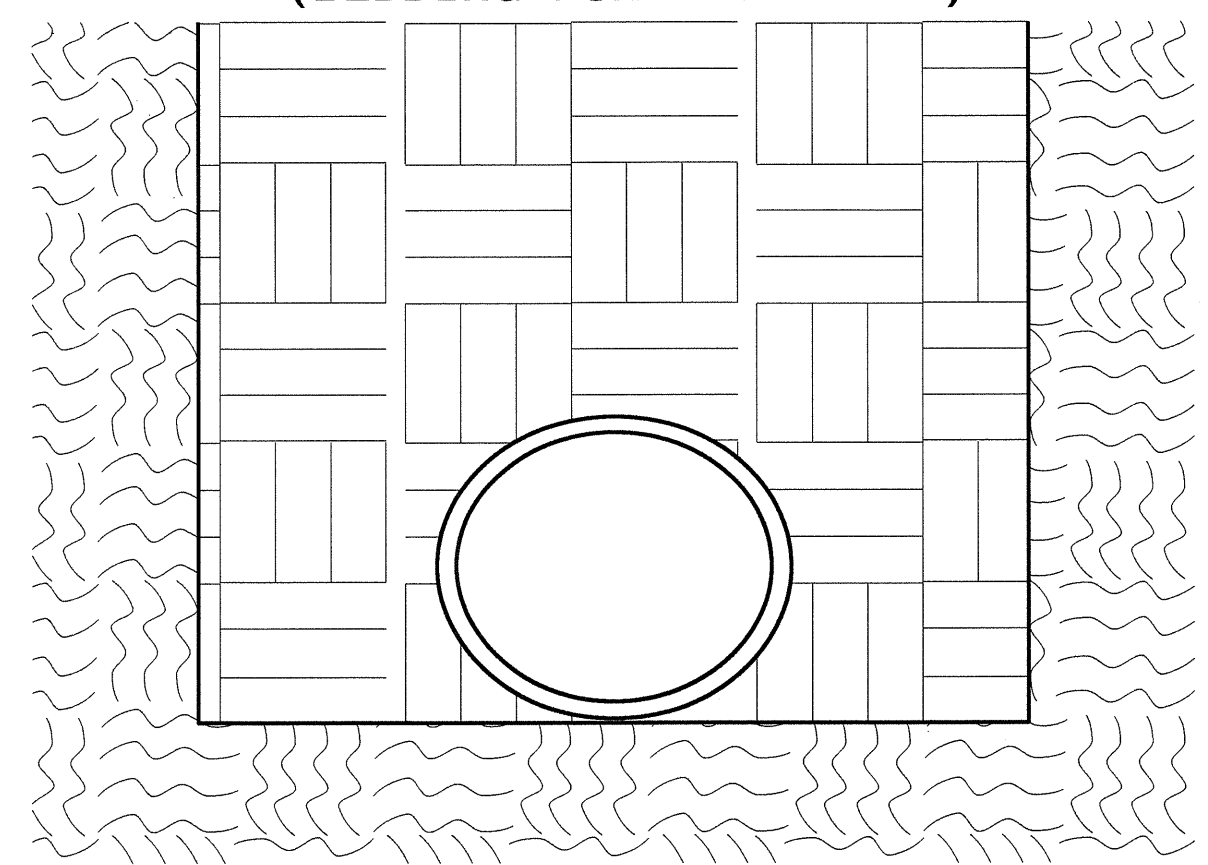
REVISIONS	
NO.	DESCRIPTION

SHEET 2 OF 2

THRUST RESTRAINT FOR WATER MAINS

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

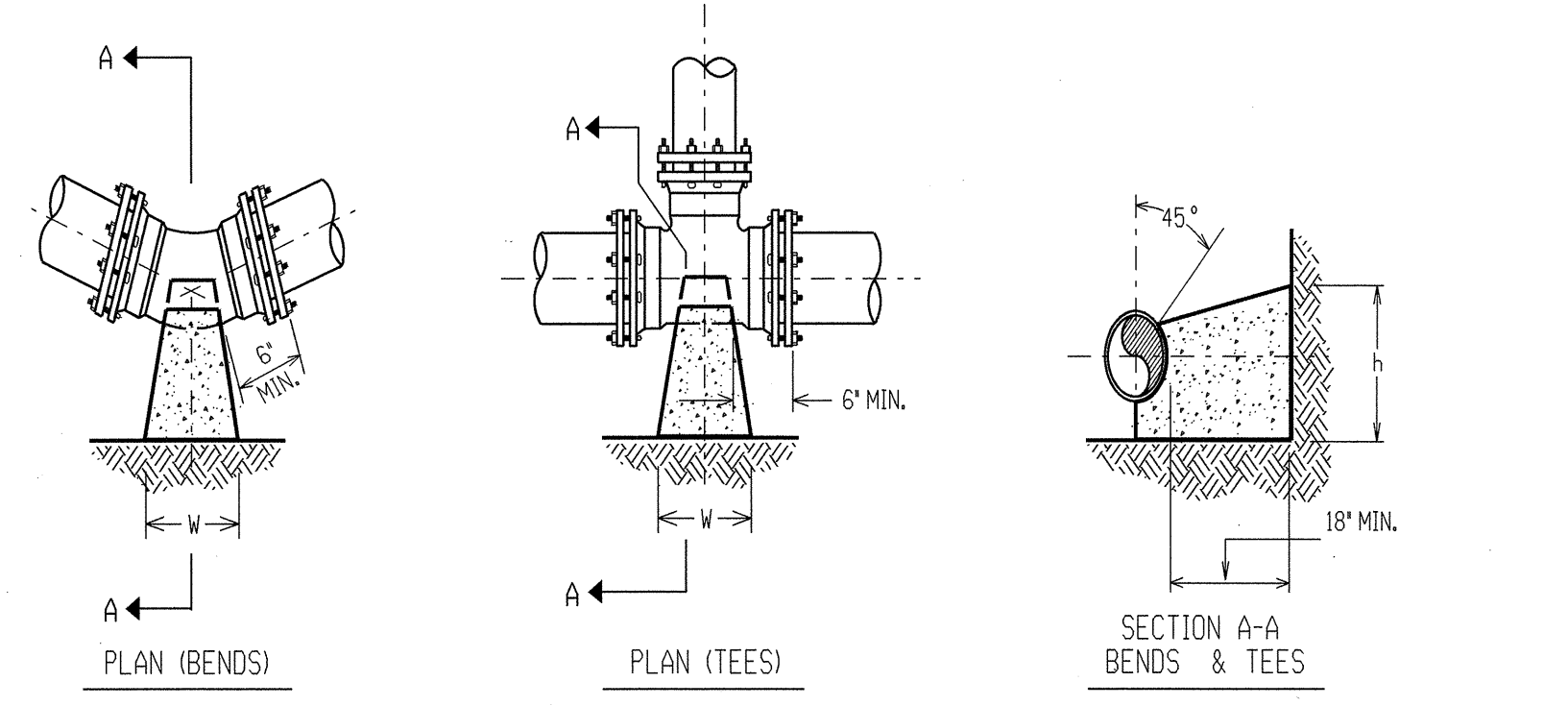
**TYPE "2"
(BEDDING FOR D.I. PIPE)**



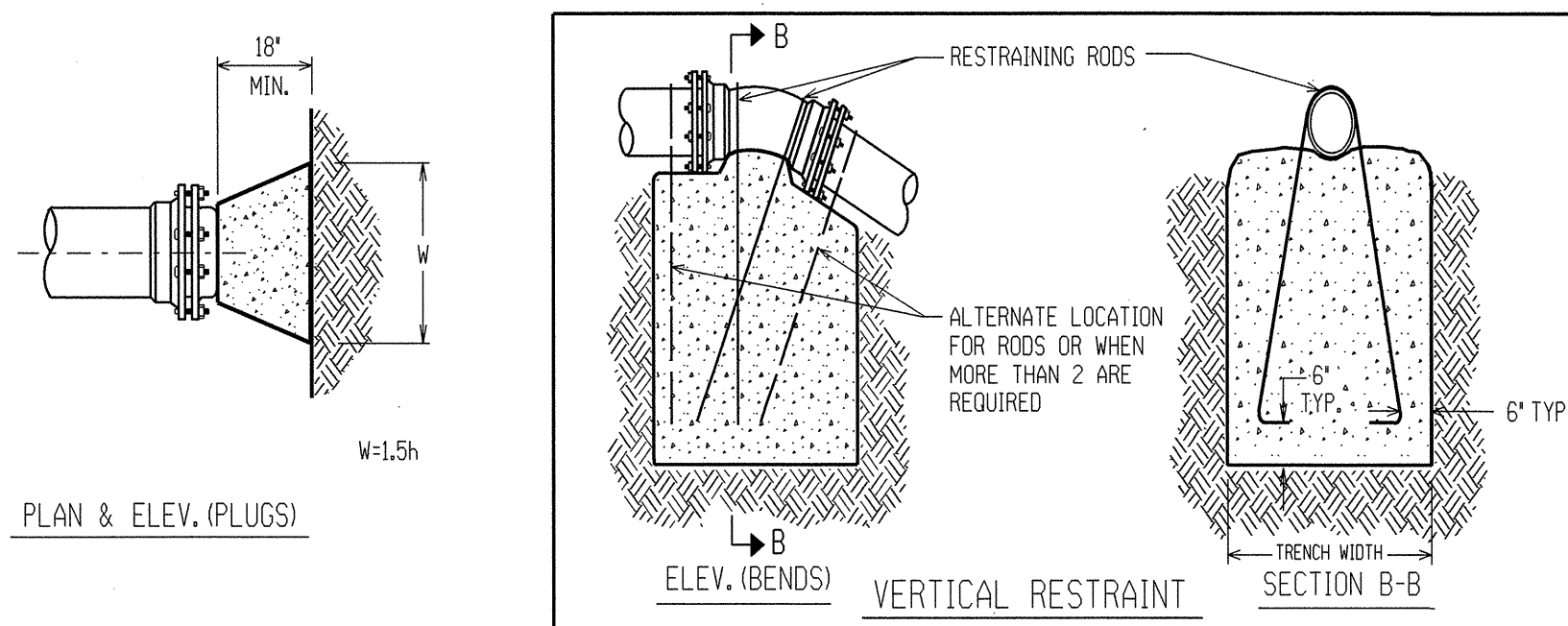
PIPE BEDDED IN FLAT-BOTTOM TRENCH. TRENCH BACKFILLED IN LOOSE 6" LAYERS COMPACTED TO TOP OF TRENCH USING LOCAL EXCAVATED MATERIAL, IF APPROVED BY THE ENGINEER, OR SELECT MATERIAL. ALL MATERIAL SHALL BE FREE OF ROCKS, FOREIGN MATERIAL, AND FROZEN EARTH. COMPACTION SHALL BE TO APPROX. 95% DENSITY IN ACCORDANCE WITH AASHTO T-99 AS MODIFIED BY THE DEPARTMENT OF TRANSPORTATION.

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		

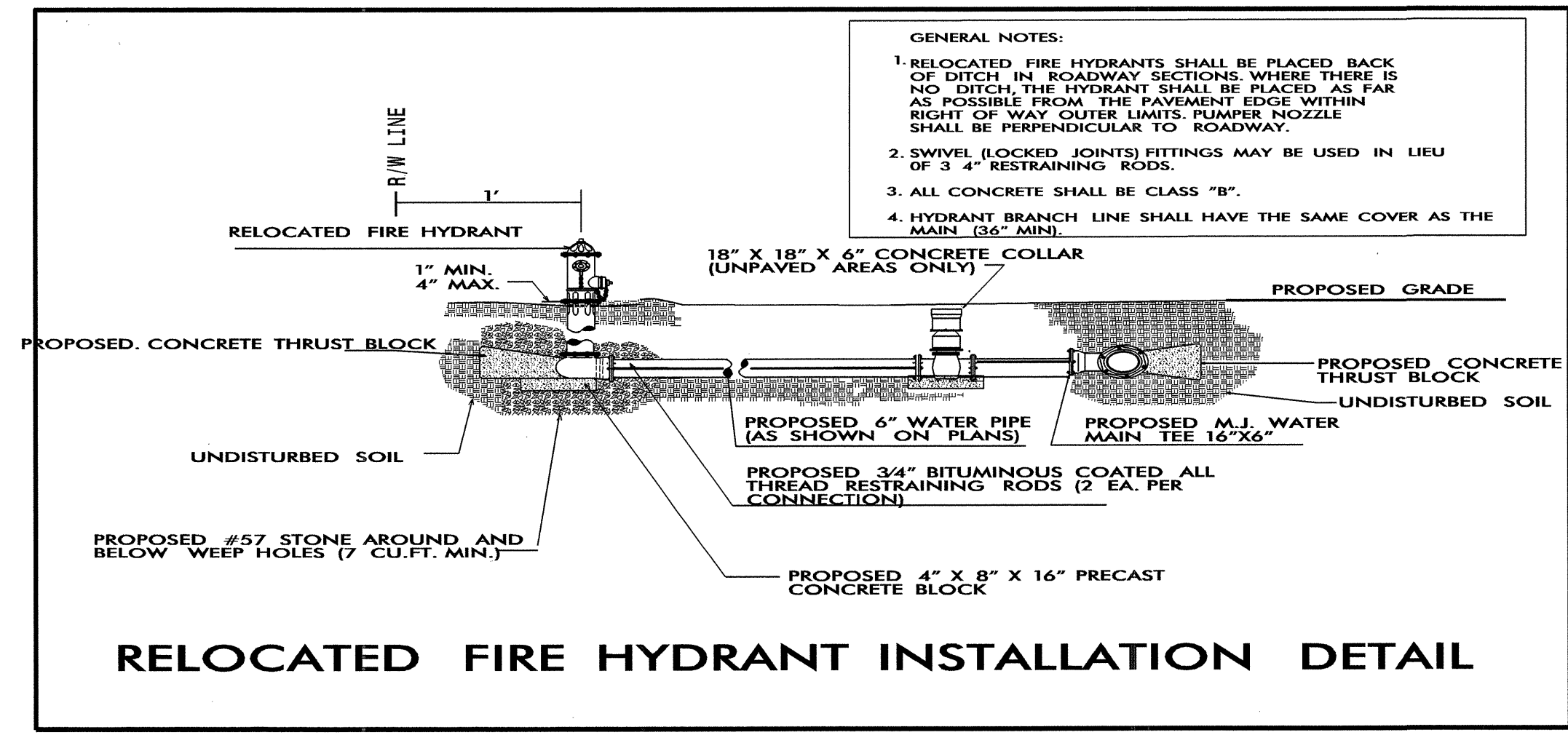


HORIZONTAL RESTRAINT



VERTICAL RESTRAINT

THRUST RESTRAINT FOR PIPE LINES



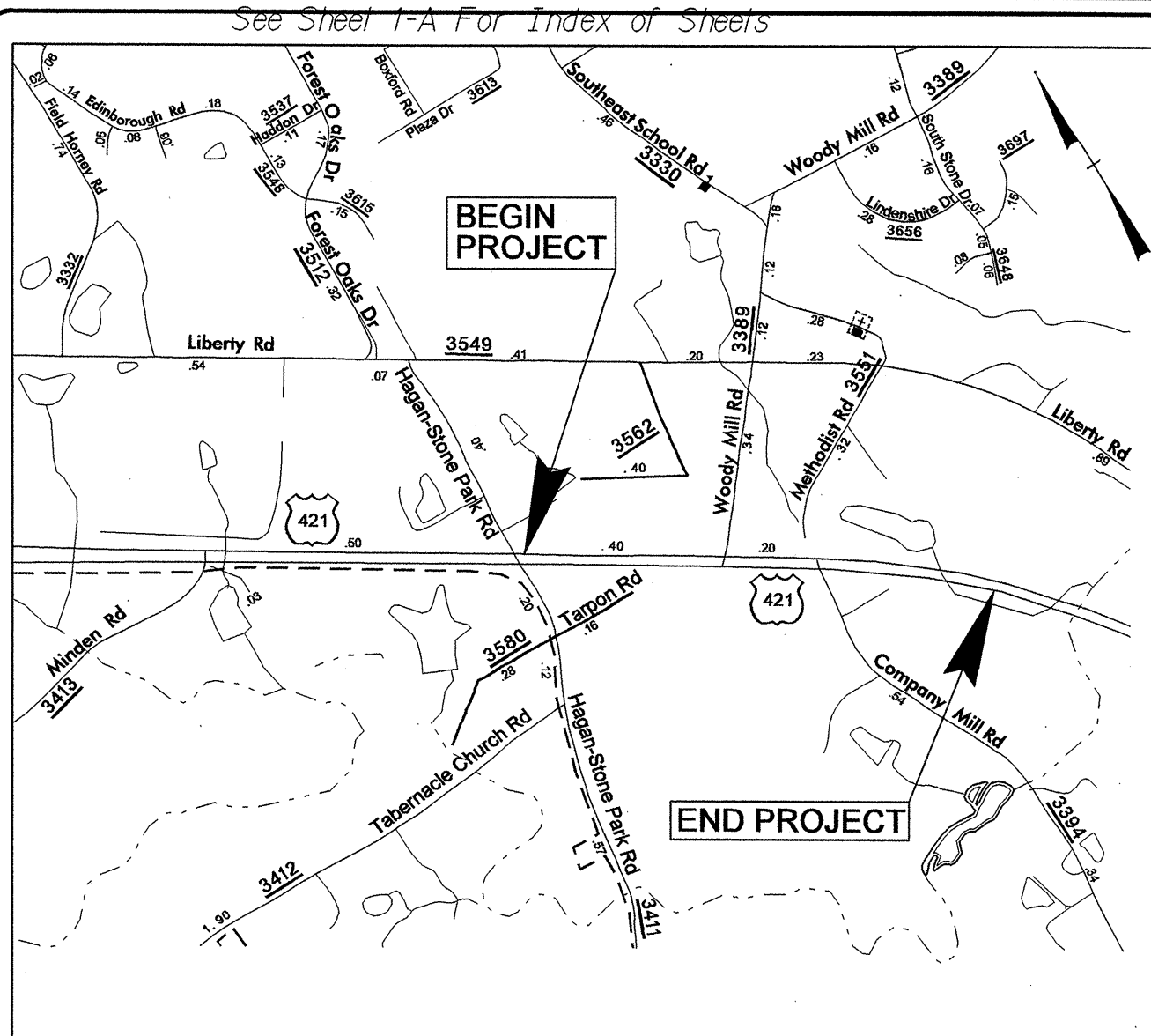
RELOCATED FIRE HYDRANT INSTALLATION DETAIL

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

UTILITIES BY OTHERS PLANS
GUILFORD COUNTY

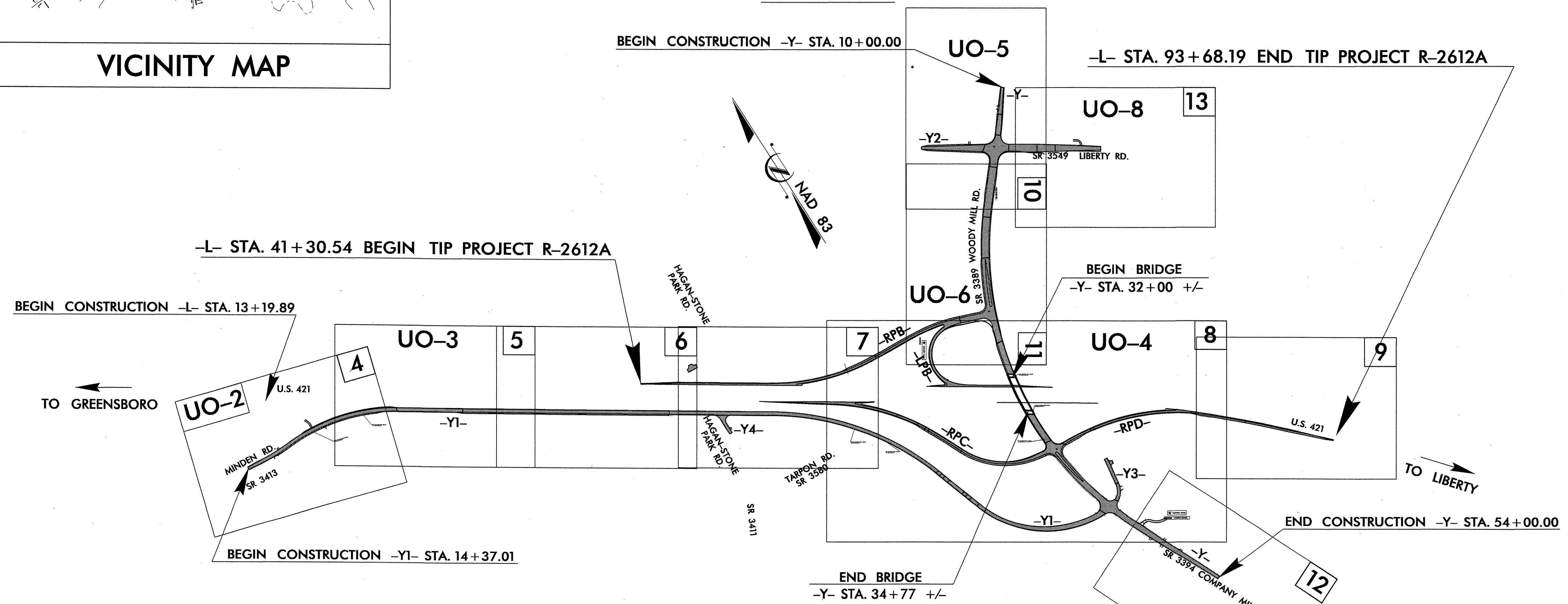
LOCATION: US 421 AT SR 3389 (WOODY MILL ROAD
SOUTH OF GREENSBORO

TYPE OF WORK: UTILITIES

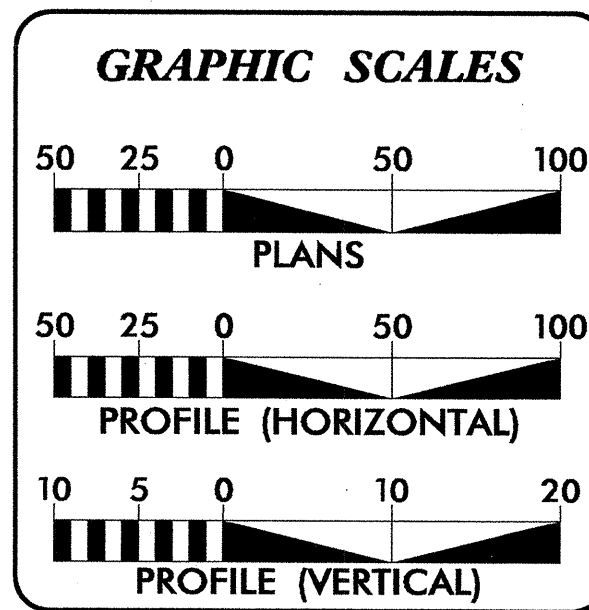


VICINITY MAP

TIP PROJECT: R-2612A



THIS PROJECT HAS FULL AND PARTIAL CONTROLLED ACCESS.
THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES.
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD II & III.



INDEX OF SHEETS	
SHEET NO.	DESCRIPTION
UO-1	TITLE SHEET
UO-2 THRU UO-8	UTILITY BY OTHERS PLAN SHEETS

- UTILITY OWNERS ON PROJECT**
- (1) Duke Energy: Power.
 - (2) AT&T: Telephone.
 - (3) Piedmont Natural Gas: Gas.
 - (4) Colonial Pipeline CO.: Gas.
 - (5) Time Warner Cable: TV Cable.

PREPARED IN THE OFFICE OF:
DIVISION OF HIGHWAYS
UTILITIES ENGINEERING SECTION

1591 MAIL SERVICES CENTER
RALEIGH NC 27699-1591
PHONE (919) 250-4128
FAX (919) 250-4119

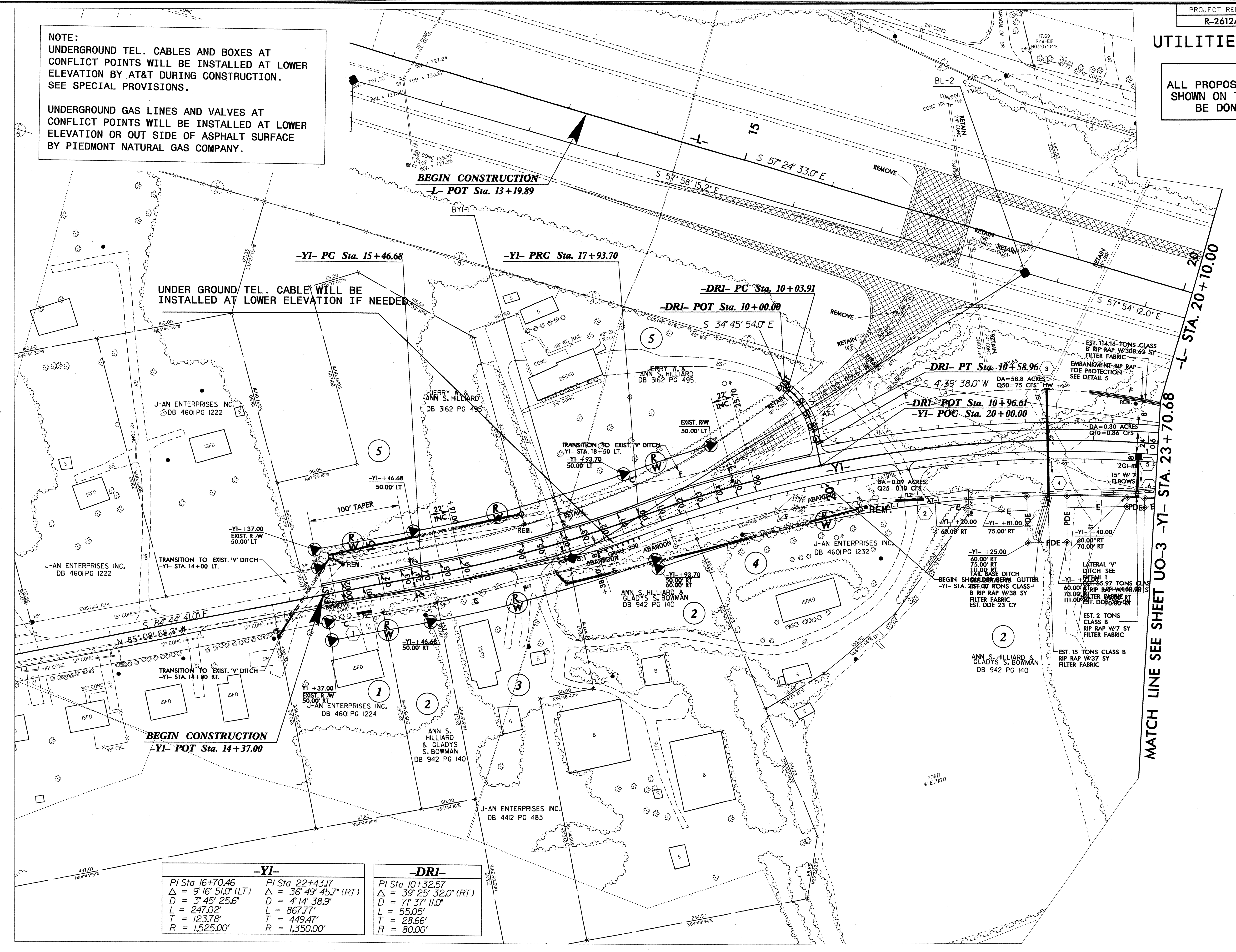
Roger Worthington, P.E. UTILITIES SECTION ENGINEER
Steve McKee, P.E. UTILITIES SQUAD LEADER PROJECT ENGINEER
Jamshid Hafshejani UTILITIES PROJECT DESIGNER

UTILITIES BY OTHERS

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

NOTE:
UNDERGROUND TEL. CABLES AND BOXES AT CONFLICT POINTS WILL BE INSTALLED AT LOWER ELEVATION BY AT&T DURING CONSTRUCTION. SEE SPECIAL PROVISIONS.

UNDERGROUND GAS LINES AND VALVES AT CONFLICT POINTS WILL BE INSTALLED AT LOWER ELEVATION OR OUT SIDE OF ASPHALT SURFACE BY PIEDMONT NATURAL GAS COMPANY.



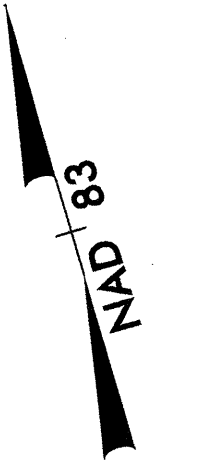
UNDER GROUND TEL. CABLE WILL BE INSTALLED AT LOWER ELEVATION IF NEEDED

BEGIN CONSTRUCTION
-YI- POT Sta. 14+37.00

BEGIN CONSTRUCTION
-L- POT Sta. 13+19.89

-YI-		-DRI-	
PI Sta 16+70.46	PI Sta 22+43.17	PI Sta 10+32.57	
Δ = 9° 16' 51.0" (LT)	Δ = 36° 49' 45.7" (RT)	Δ = 39° 25' 32.0" (RT)	
D = 3' 45' 25.6"	D = 4' 14' 38.9"	D = 7' 37' 11.0"	
L = 247.02'	L = 867.77'	L = 55.05'	
T = 123.78'	T = 449.47'	T = 28.66'	
R = 1,525.00'	R = 1,350.00'	R = 80.00'	

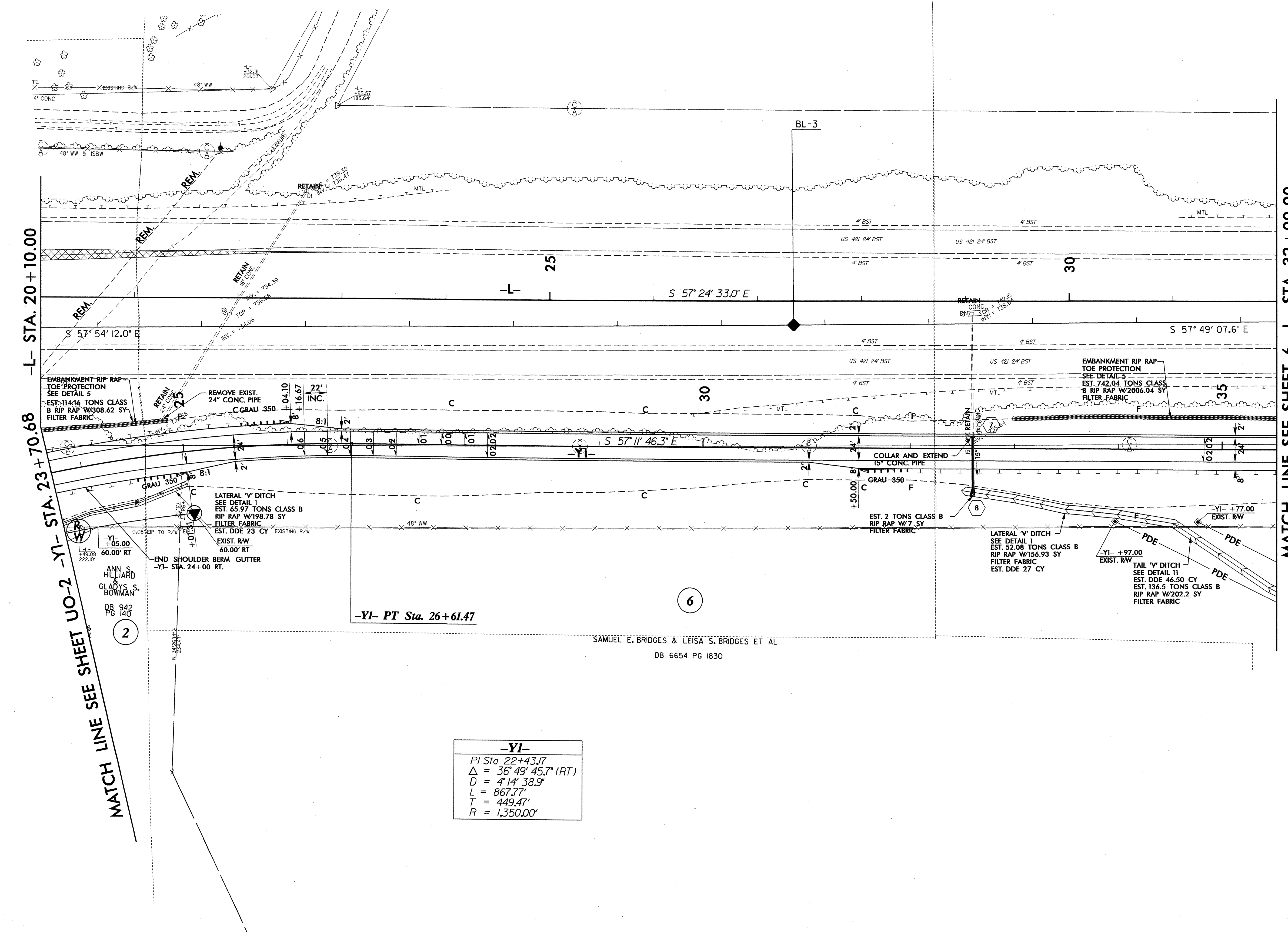
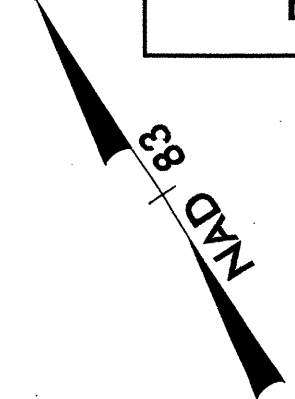
MATCH LINE SEE SHEET UO-3 -YI- STA. 23+70.68



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UTILITIES BY OTHERS

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



-L- STA. 20+10.00
-L- STA. 23+70.68
-YI- STA. 23+70.68
-YI- STA. 26+61.47

MATCH LINE SEE SHEET 6 -L- STA. 32+00.00

-YI-	
PI Sta	22+43.17
Δ	= 36° 49' 45.7" (RT)
D	= 4' 14" 38.9"
L	= 867.77'
T	= 449.47'
R	= 1,350.00'

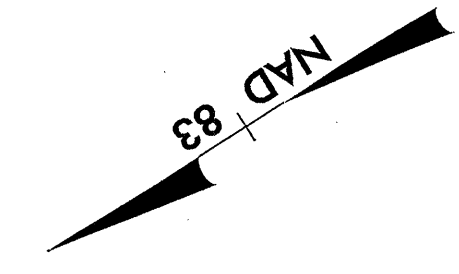
SAMUEL E. BRIDGES & LEISA S. BRIDGES ET AL
DB 6654 PG 1830

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UTILITIES BY OTHERS

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

MATCH LINE SEE SHEET UO-8 -Y2- STA 18+00.00



NOTE:
UNDERGROUND TEL. CABLES AND BOXES AT
CONFLICT POINTS WILL BE INSTALLED AT LOWER
ELEVATION BY AT&T DURING CONSTRUCTION.
SEE SPECIAL PROVISIONS.

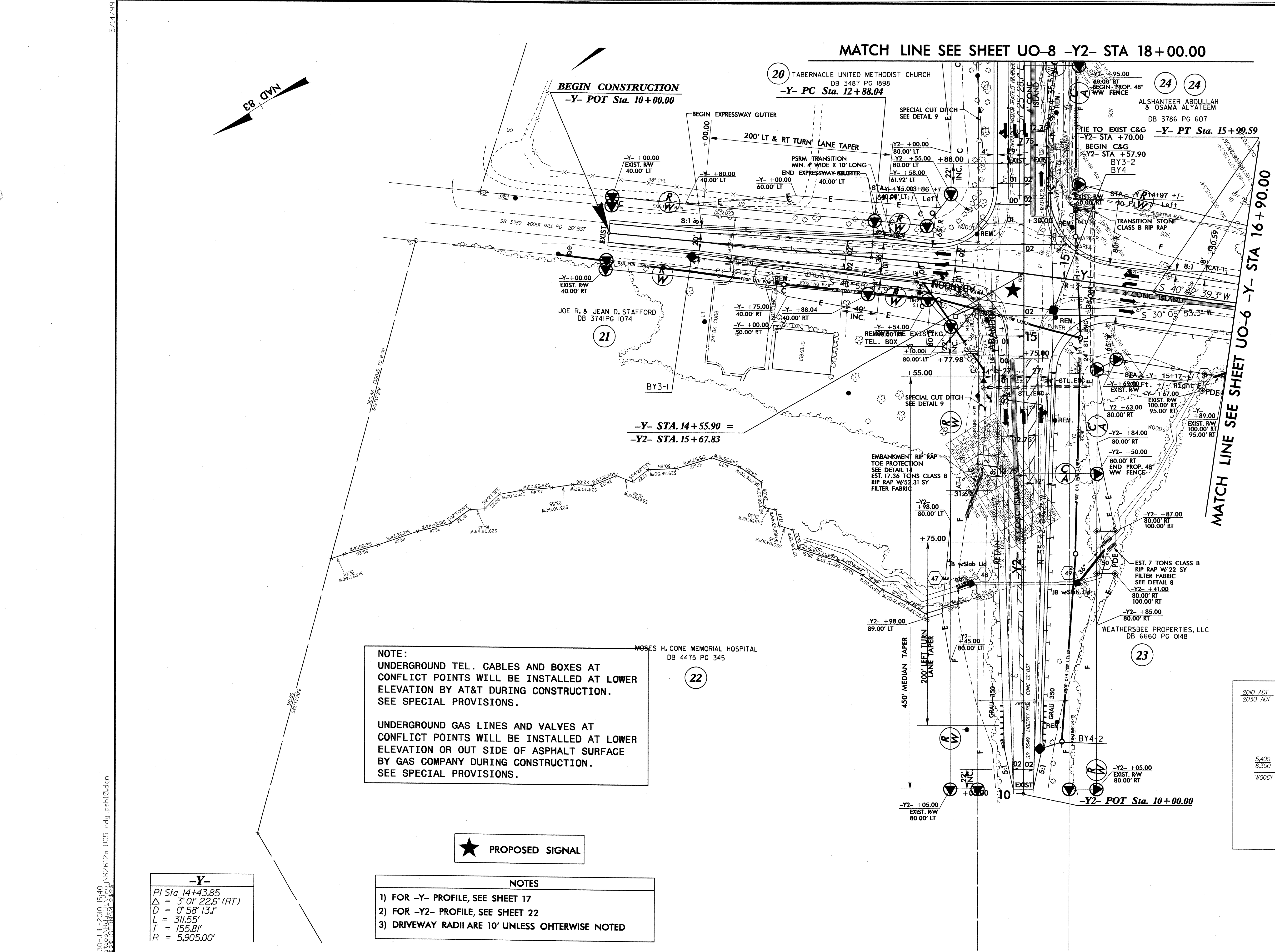
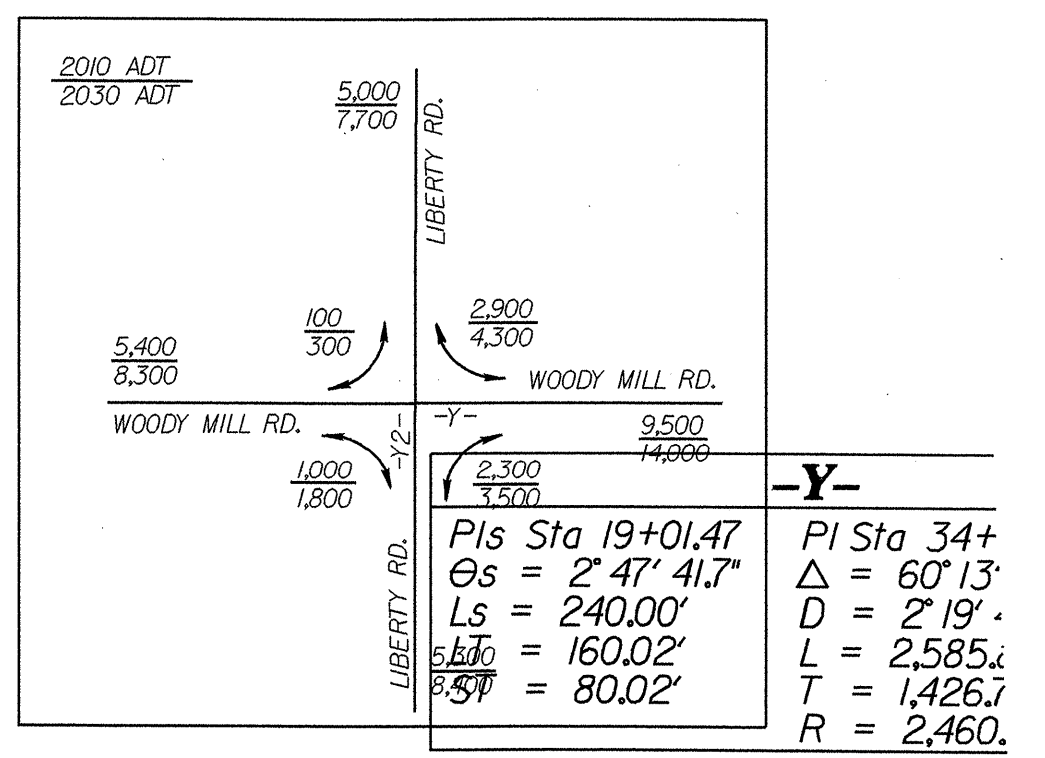
UNDERGROUND GAS LINES AND VALVES AT
CONFLICT POINTS WILL BE INSTALLED AT LOWER
ELEVATION OR OUT SIDE OF ASPHALT SURFACE
BY GAS COMPANY DURING CONSTRUCTION.
SEE SPECIAL PROVISIONS.

★ PROPOSED SIGNAL

- NOTES
- 1) FOR -Y- PROFILE, SEE SHEET 17
 - 2) FOR -Y2- PROFILE, SEE SHEET 22
 - 3) DRIVEWAY RADII ARE 10' UNLESS OTHERWISE NOTED

-Y-

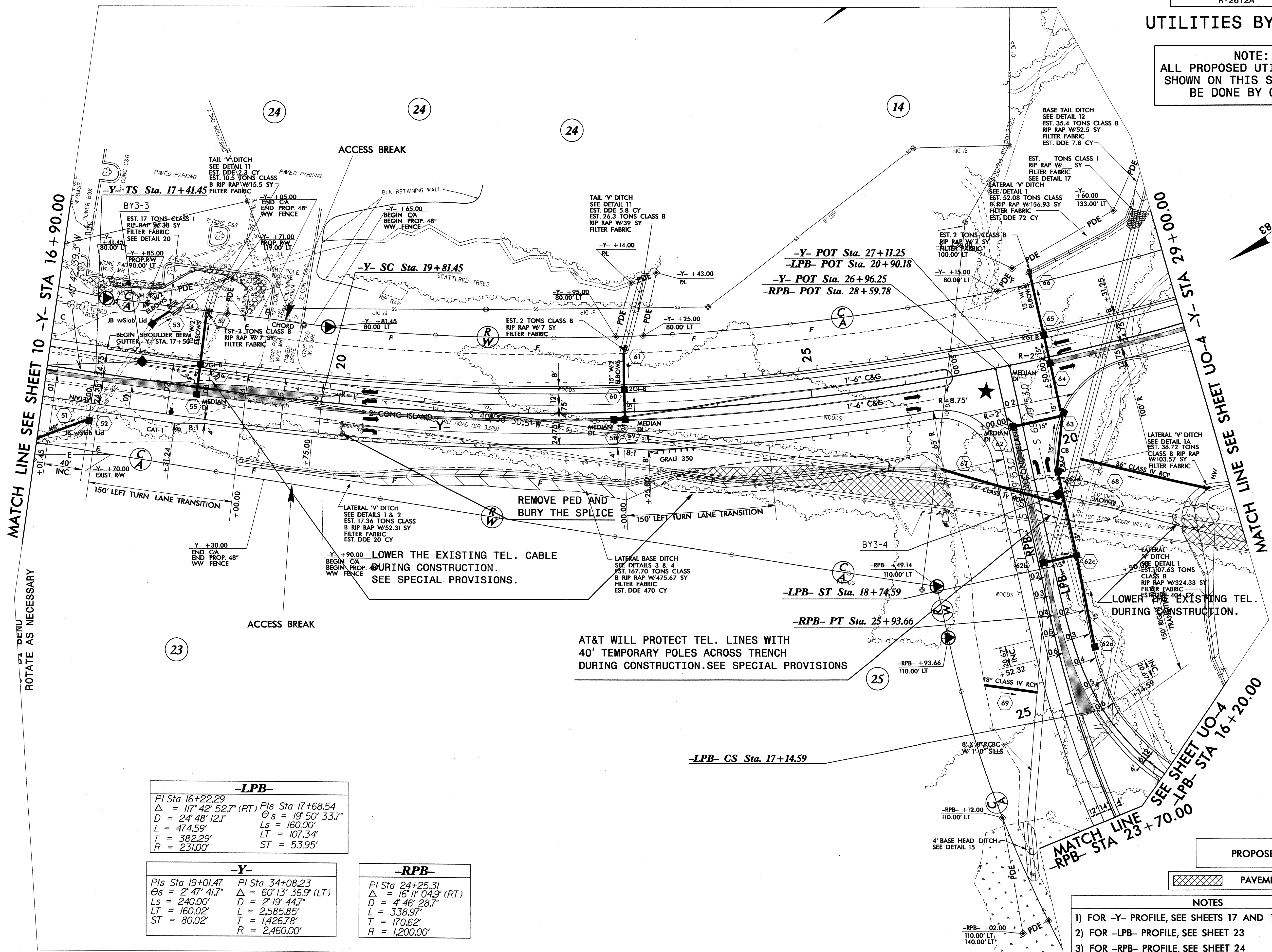
PI Sta 14+43.85
Δ = 3° 0' 22.6" (RT)
D = 0' 58' 13"
L = 311.55'
T = 155.81'
R = 5,905.00'



5/14/99
30-JUL-2000 15:40
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UTILITIES BY OTHERS

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



MATCH LINE SEE SHEET 10 -Y- STA 16+90.00
ROTATE AS NECESSARY

MATCH LINE SEE SHEET UO-4 -Y- STA 29+00.00
MATCH LINE SEE SHEET UO-4 -LPB- STA 16+20.00
MATCH LINE SEE SHEET UO-4 -RPB- STA 16+20.00

-LPB-

PI Sta 16+22.29	PIs Sta 17+68.54
$\Delta = 117' 42' 52.7''$ (RT)	$\Theta_s = 19' 50' 33.7''$
$D = 24' 48' 12.1''$	$L_s = 160.00'$
$L = 474.59'$	$LT = 107.34'$
$T = 382.29'$	$ST = 53.95'$
$R = 231.00'$	

-Y-

PIs Sta 19+01.47	PI Sta 34+08.23
$\Theta_s = 2' 47' 41.7''$	$\Delta = 60' 13' 36.9''$ (LT)
$L_s = 240.00'$	$D = 2' 19' 44.7''$
$LT = 160.02'$	$L = 2,585.85'$
$ST = 80.02'$	$T = 1,426.78'$
	$R = 2,460.00'$

-RPB-

PI Sta 24+25.31	
$\Delta = 16' 11' 04.9''$ (RT)	
$D = 4' 46' 28.7''$	
$L = 338.97'$	
$T = 170.62'$	
$R = 1,200.00'$	

REMOVE PED AND BURY THE SPLICE

LOWER THE EXISTING TEL. CABLE DURING CONSTRUCTION. SEE SPECIAL PROVISIONS.

AT&T WILL PROTECT TEL. LINES WITH 40' TEMPORARY POLES ACROSS TRENCH DURING CONSTRUCTION. SEE SPECIAL PROVISIONS

LOWER THE EXISTING TEL. CABLE DURING CONSTRUCTION.

PROPOSED SIGNAL

PAVEMENT REMOVAL

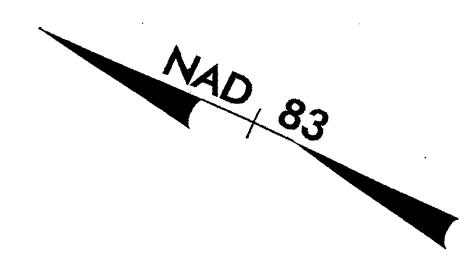
NOTES

- 1) FOR -Y- PROFILE, SEE SHEETS 17 AND 18
- 2) FOR -LPB- PROFILE, SEE SHEET 23
- 3) FOR -RPB- PROFILE, SEE SHEET 24

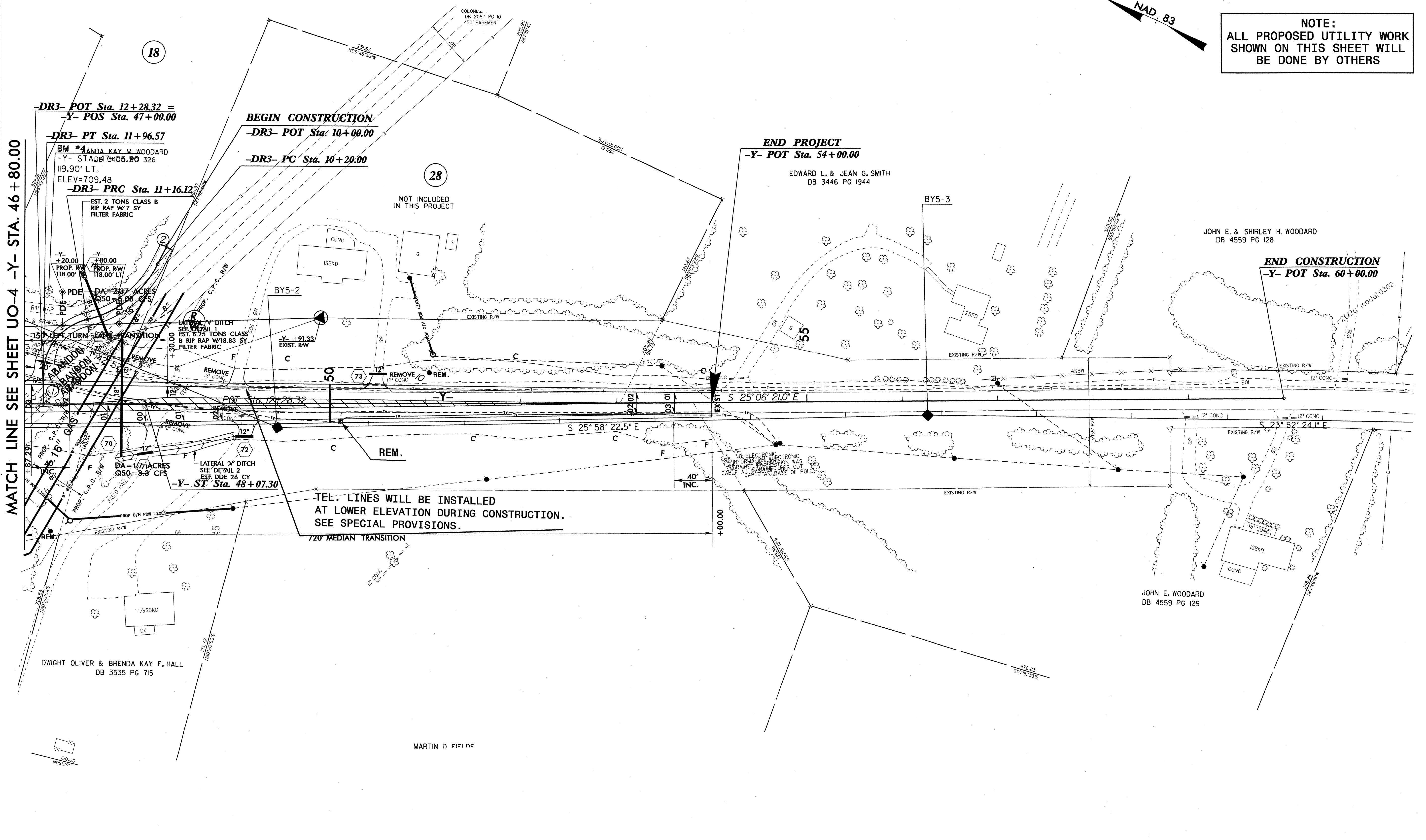
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UTILITIES BY OTHERS

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



MATCH LINE SEE SHEET UO-4 -Y- STA. 46+80.00



TEL. LINES WILL BE INSTALLED
AT LOWER ELEVATION DURING CONSTRUCTION.
SEE SPECIAL PROVISIONS.

NOTES

- 1) FOR -Y- PROFILE, SEE SHEET 18 & 19
- 2) DRIVEWAY RADII ARE 10' UNLESS NOTED OTHERWISE

5/14/99
30-JUL-2000 13:32 \\P2612a\U07_rdy_psh12.dgn

