

TIP PROJECT: R-2904

See Sheet 1-A For Index of Sheets  
See Sheet 1-B For Symbology

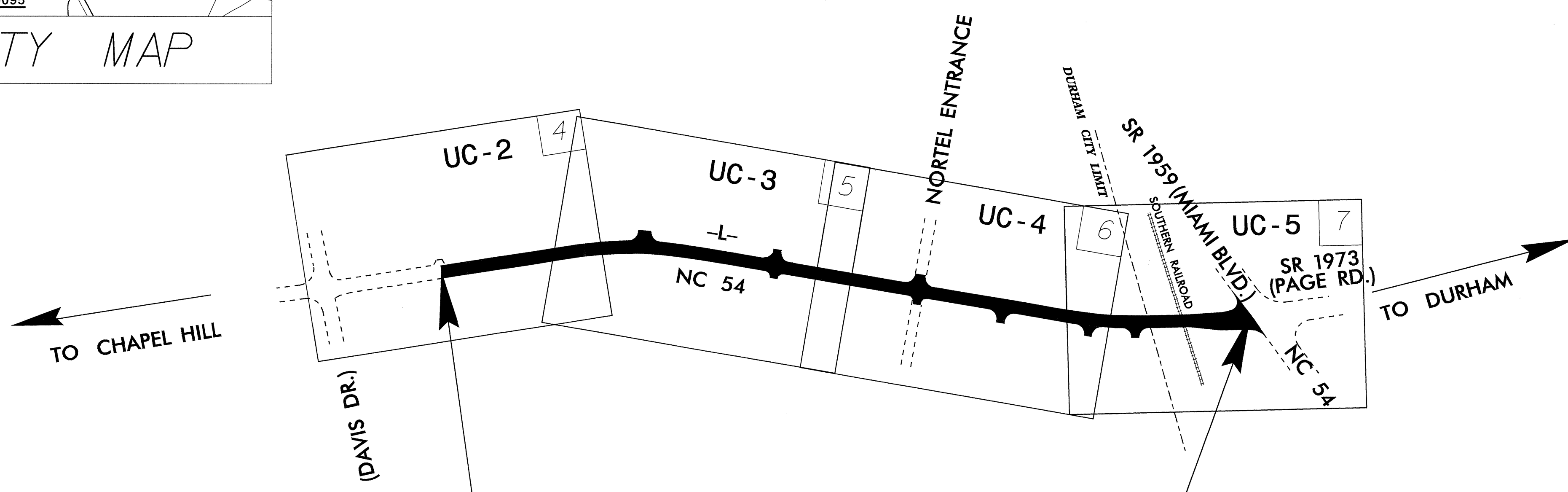
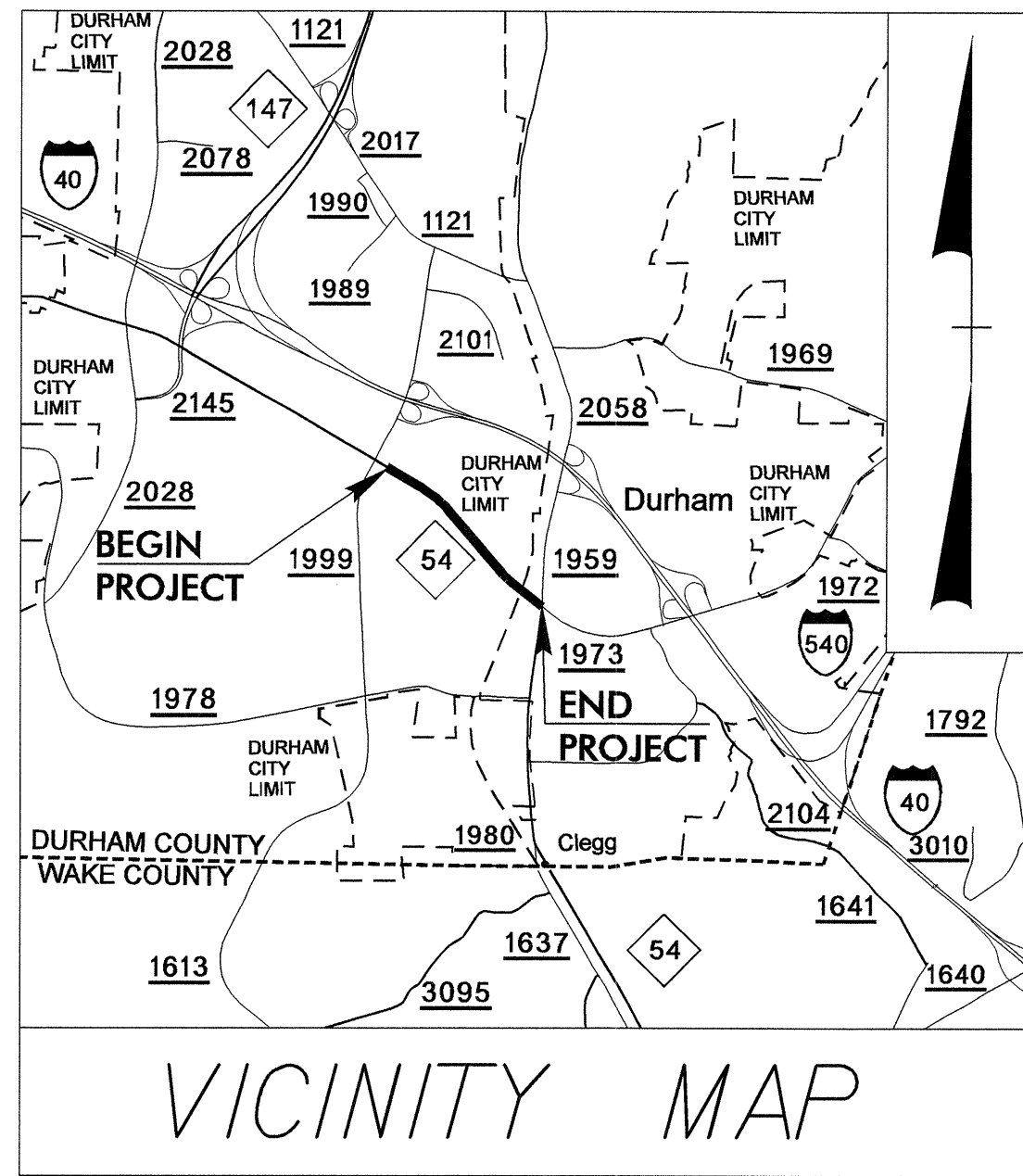
T.I.P. NO.	SHEET NO.
R-2904	UC-1

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**DURHAM COUNTY**

**LOCATION: NC 54 FROM SR 1999 (DAVIS DRIVE) TO SR 1959 (MIAMI BLVD.)**

**TYPE OF WORK: WATER LINE RELOCATIONS**



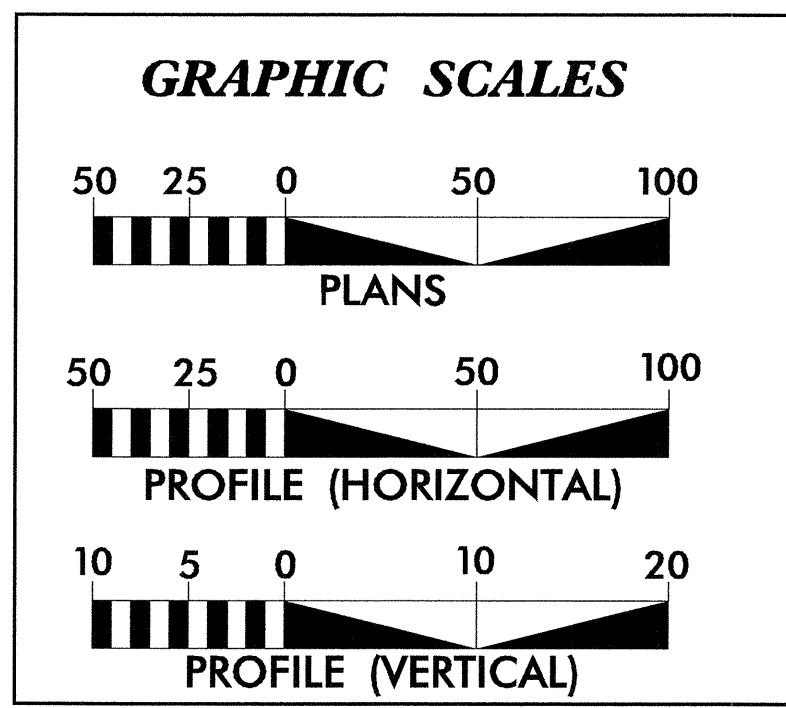
**NOTES TO THE CONTRACTOR:**

AT THE LOCATIONS WHERE THE PROPOSED DRAINAGE PIPES ARE CROSSING UNDER THE EXISTING 16" WATER LINE, THE COST TO SUPPORT THE WATER LINE (IF NEEDED) DURING THE INSTALLATION WILL BE CONSIDERED INCIDENTAL TO THE COST OF THE PROPOSED DRAINAGE PIPE.

THE EXISTING 16" WATER LINE MAY NOT BE IN CONFLICT WITH PROPOSED DRAINAGE AS SHOWN IN THE PLANS, THE EXACT TOP ELEVATION OF THE EXISTING 16" WATER LINE WAS NOT KNOWN.

STA. 15+90.64 -L- BEGIN TIP PROJECT R-2904

STA. 57+38.87 -L- END TIP PROJECT R-2904

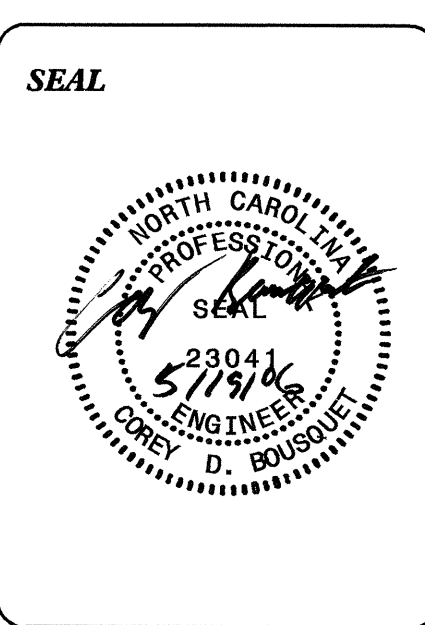


**INDEX OF SHEETS**

SHEET NO.	DESCRIPTION
UC-1	TITLE SHEET
UC-2 THRU UC-5	UTILITY CONSTRUCTION PLAN SHEETS
UC-6	PROFILE SHEET
UC-7	DETAILS SHEET

**WATER AND SEWER OWNERS ON PROJECT**

(1) WATER - CITY OF DURHAM  
(2) SANITARY SEWER - DURHAM COUNTY

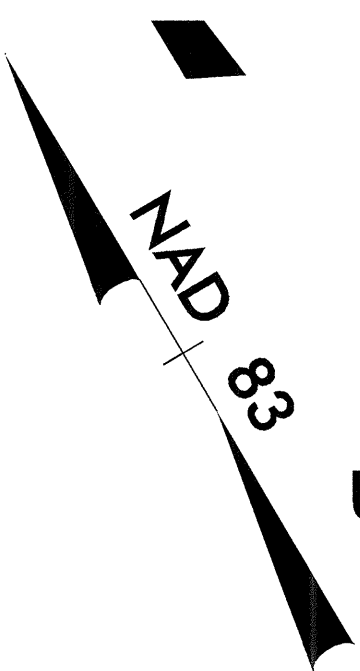


PREPARED IN THE OFFICE OF:  
**DIVISION OF HIGHWAYS  
DESIGN SERVICES  
UTILITY SECTION**

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

**Roger Worthington, P.E.** UTILITIES SECTION ENGINEER  
**Corey Bousquet, P.E.** UTILITIES SQUAD LEADER PROJECT ENGINEER  
**Jamshid Hafshejani** UTILITIES PROJECT DESIGNER

PROJECT REFERENCE NO.	SHEET NO.
R-2904	UC-2
DESIGNED BY: JH	
DRAWN BY: JH	
CHECKED BY: CDB	
APPROVED BY: CDB	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DESIGN SERVICES UNIT PHONE: (919) 250-4128 FAX: (919) 250-4119	
UTILITY CONSTRUCTION PLANS ONLY	



-L-  
 PIs Sta 23+02.76  
 Fs = 3'00' 56.0"  
 Ls = 200.00  
 LT = 133.35  
 ST = 66.68

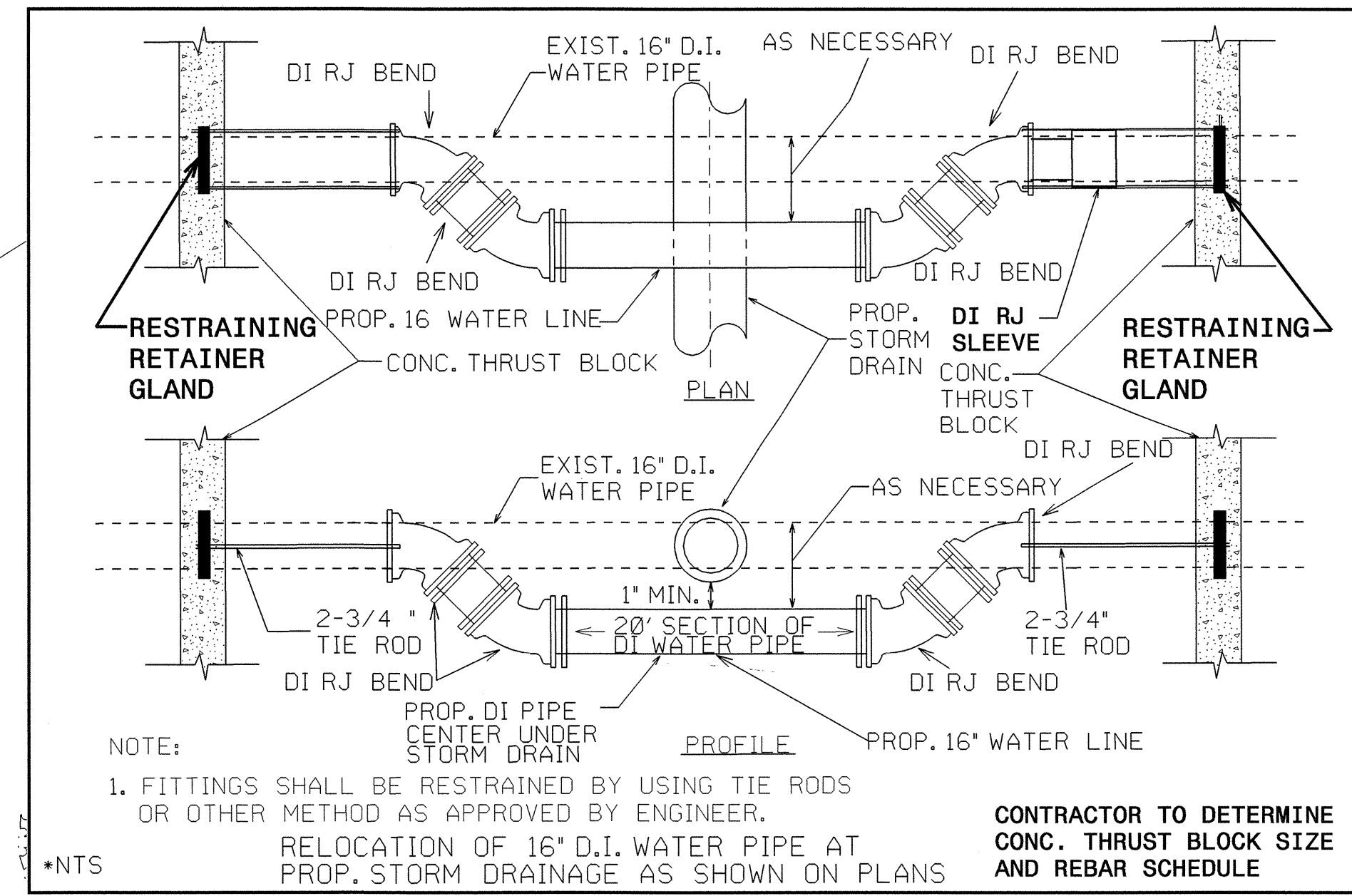
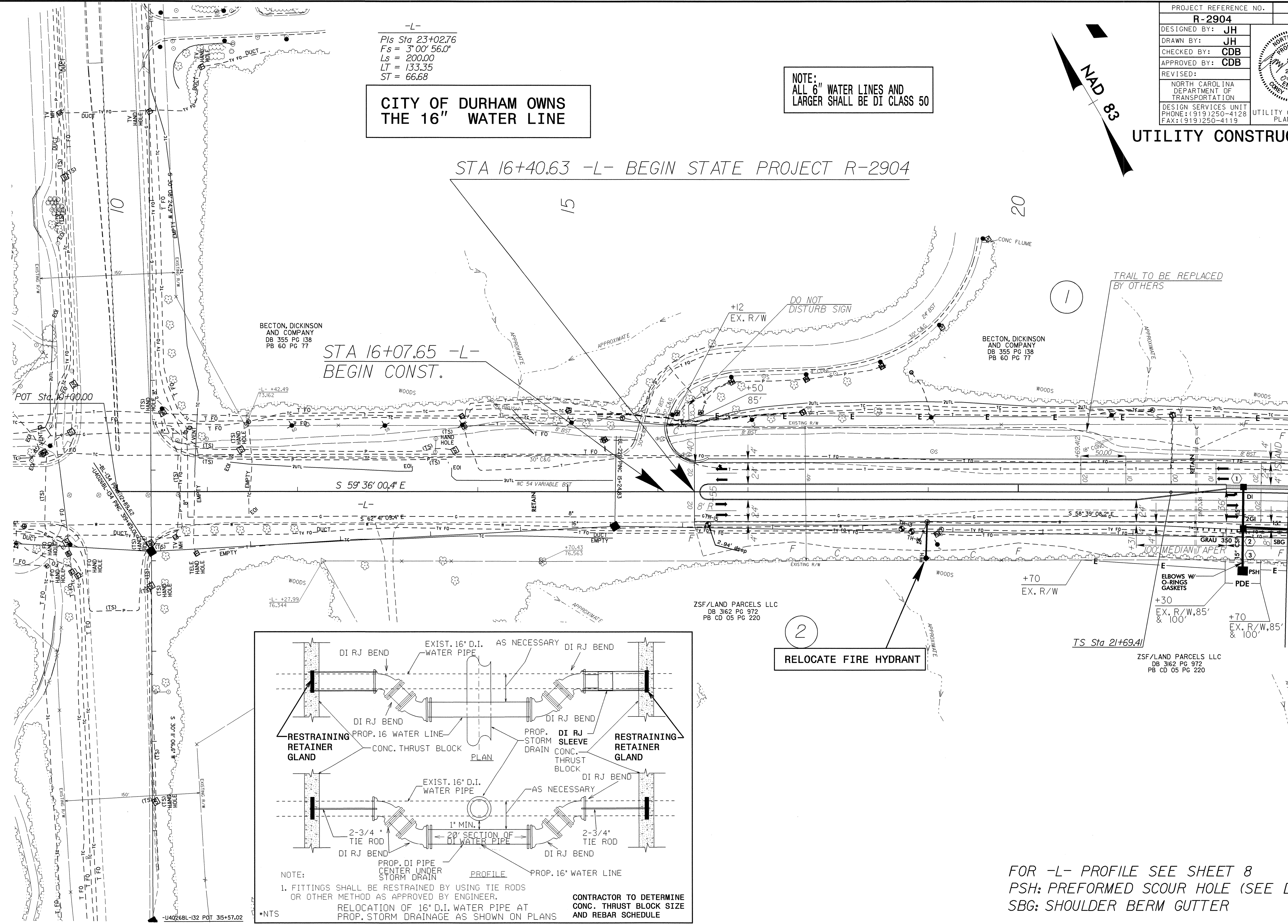
**CITY OF DURHAM OWNS  
 THE 16" WATER LINE**

**NOTE:  
 ALL 6" WATER LINES AND  
 LARGER SHALL BE DI CLASS 50**

STA 16+40.63 -L- BEGIN STATE PROJECT R-2904

STA 16+07.65 -L-  
 BEGIN CONST.

MATCH TO SHEET UC-3 STA. 23+00



NOTE:  
 1. FITTINGS SHALL BE RESTRAINED BY USING TIE RODS OR OTHER METHOD AS APPROVED BY ENGINEER.  
 RELOCATION OF 16" D.I. WATER PIPE AT PROP. STORM DRAINAGE AS SHOWN ON PLANS  
 CONTRACTOR TO DETERMINE CONC. THRUST BLOCK SIZE AND REBAR SCHEDULE

2  
**RELOCATE FIRE HYDRANT**

FOR -L- PROFILE SEE SHEET 8  
 PSH: PREFORMED SCOUR HOLE (SEE DETAIL)  
 SBG: SHOULDER BERM GUTTER

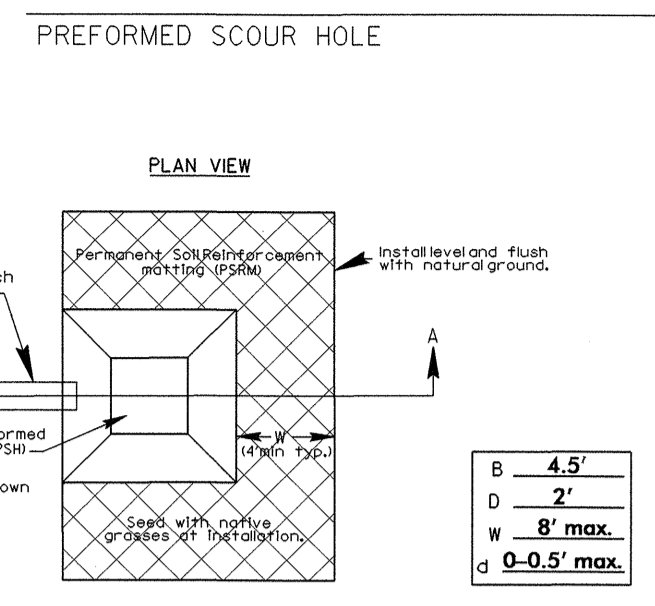
REVISIONS

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8/17/99

PROJECT REFERENCE NO.	SHEET NO.
R-2904	UC-3
DESIGNED BY: JH	
DRAWN BY: JH	
CHECKED BY: CDB	
APPROVED BY: CDB	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DESIGN SERVICES UNIT PHONE: (919) 250-4128 FAX: (919) 250-4119	
UTILITY CONSTRUCTION PLANS ONLY	

**THE DURHAM COUNTY OWNS  
THE 8" SEWER LINE**



DETAIL FALSE SUMP

Median Ditch

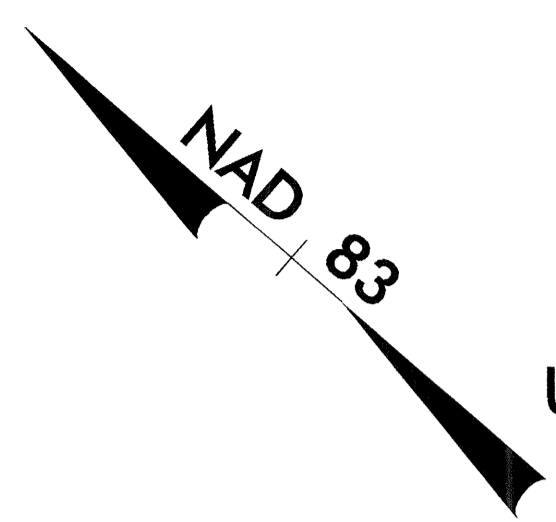
Ditch Grade

Ditch Grade	L	Ditch Grade	L
0.0% To 2.0%	20'	Over 4.0% To 6.0%	40'
Over 2.0% To 4.0%	30'	Over 6.0%	50'

(Not to Scale)

-L-

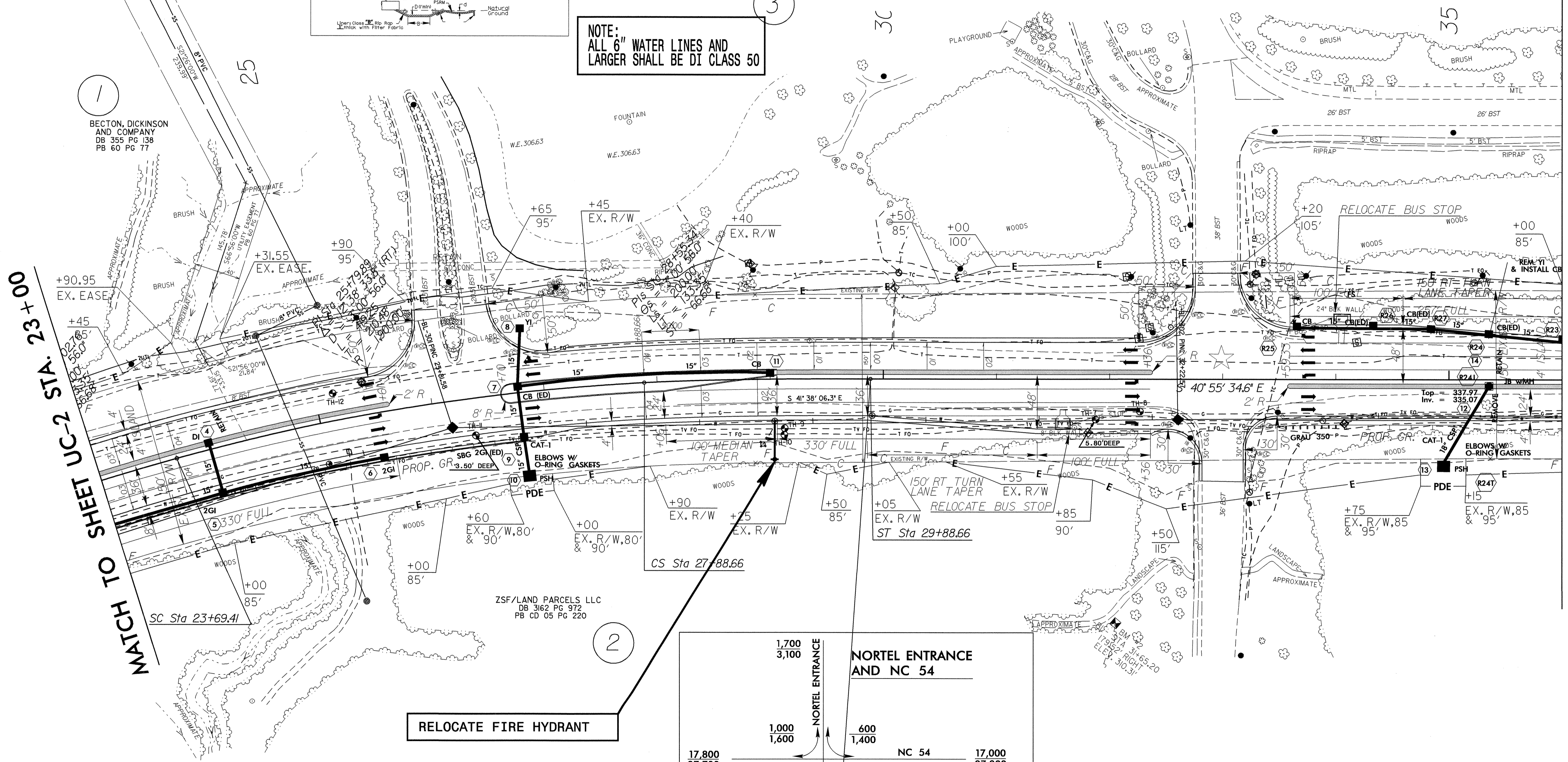
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Ls = 200.00	D = 3' 00" 56.0"	Ls = 200.00
LT = 133.35	L = 419.25	LT = 133.35
ST = 66.68	T = 210.48	ST = 66.68



STATE STREET BANK & TRUST COMPANY,  
DB 3162 PG 790  
PB 95 PG 197  
PB 99 PG 147

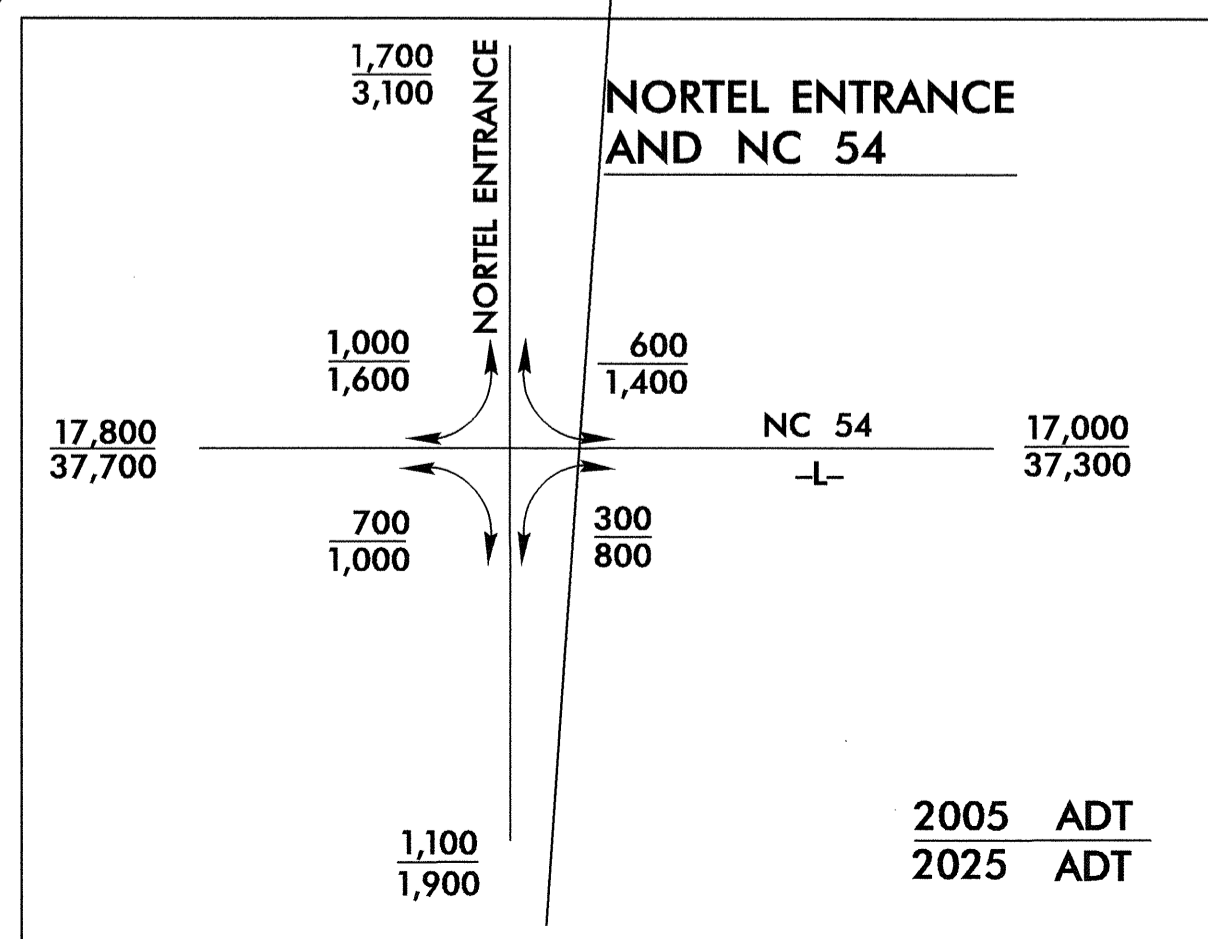
**CITY OF DURHAM OWNS  
THE 16" WATER LINE**

**NOTE:  
ALL 6" WATER LINES AND  
LARGER SHALL BE DI CLASS 50**



BECTON, DICKINSON  
AND COMPANY  
DB 355 PG 138  
PB 60 PG 77

ZSF/LAND PARCELS LLC  
DB 3162 PG 972  
PB CD 05 PG 220



☆ EXIST. SIGNAL  
FOR -L- PROFILE SEE SHEET 8  
PSH: PREFORMED SCOUR HOLE (SEE DETAIL)  
SBG: SHOULDER BERM GUTTER

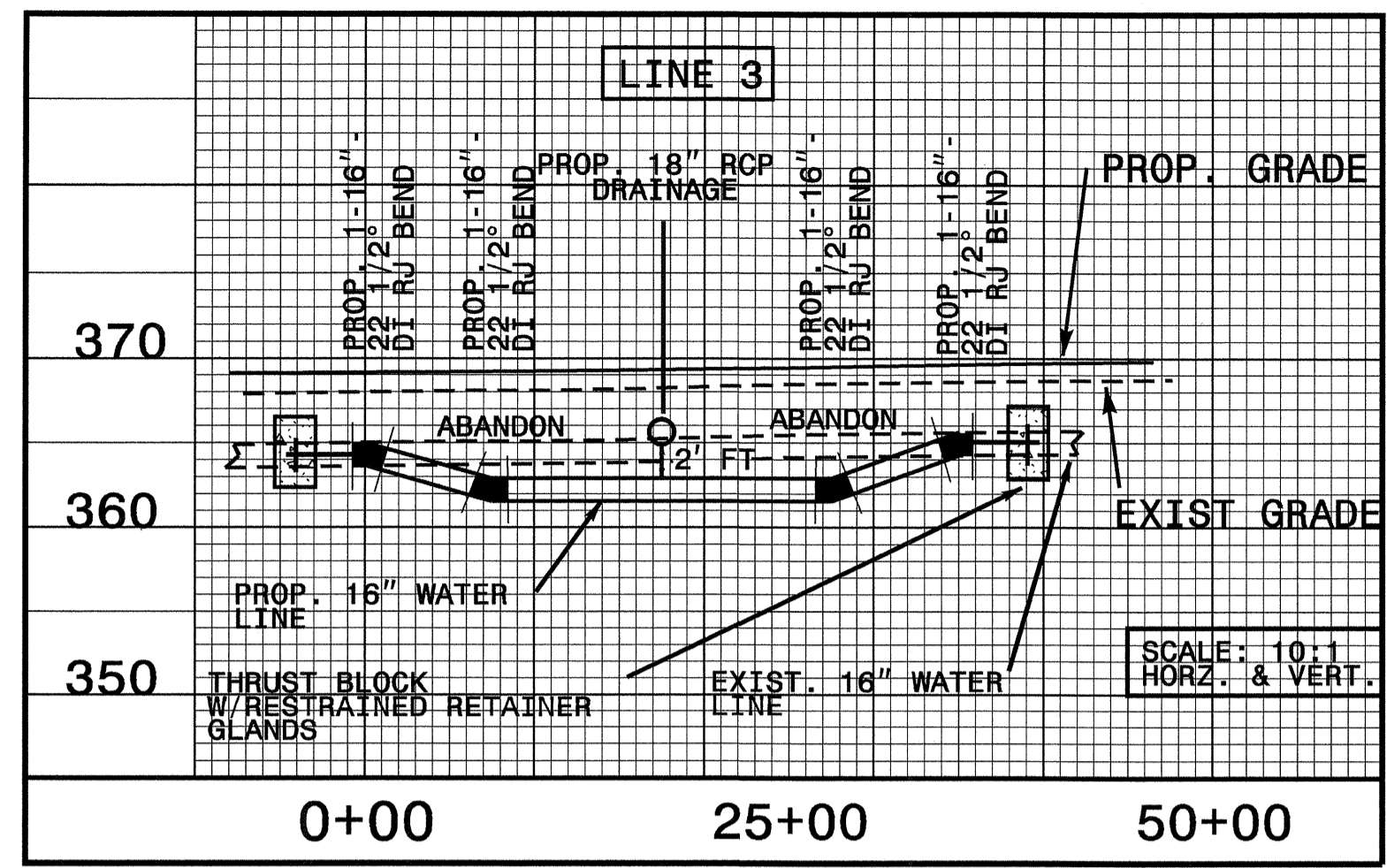
REVISIONS

MATCH TO SHEET UC-2 STA. 23+00

MATCH TO SHEET UC-4 STA. 36+00

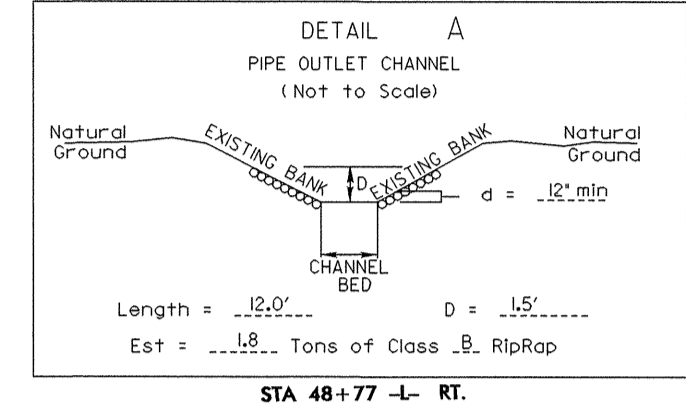
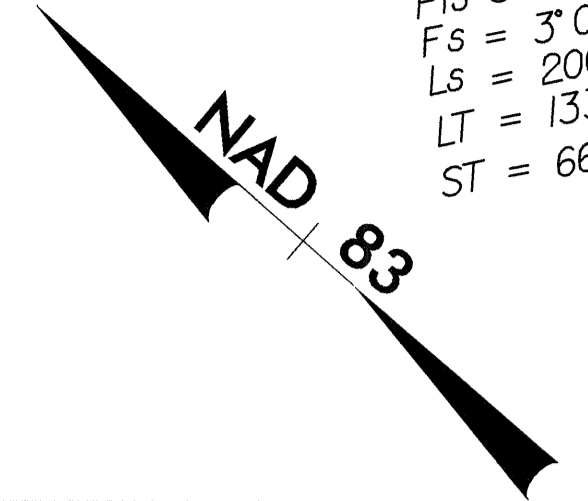
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### UTILITY CONSTRUCTION

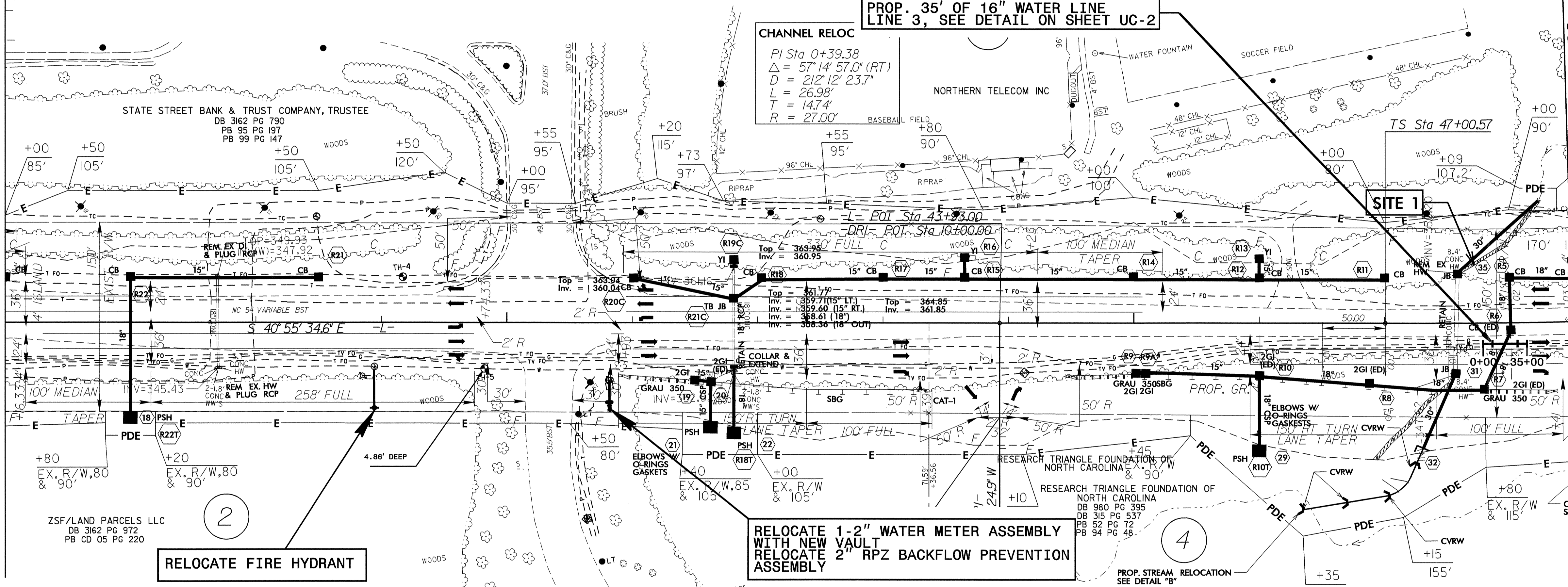


CITY OF DURHAM OWNS THE 16" WATER LINE

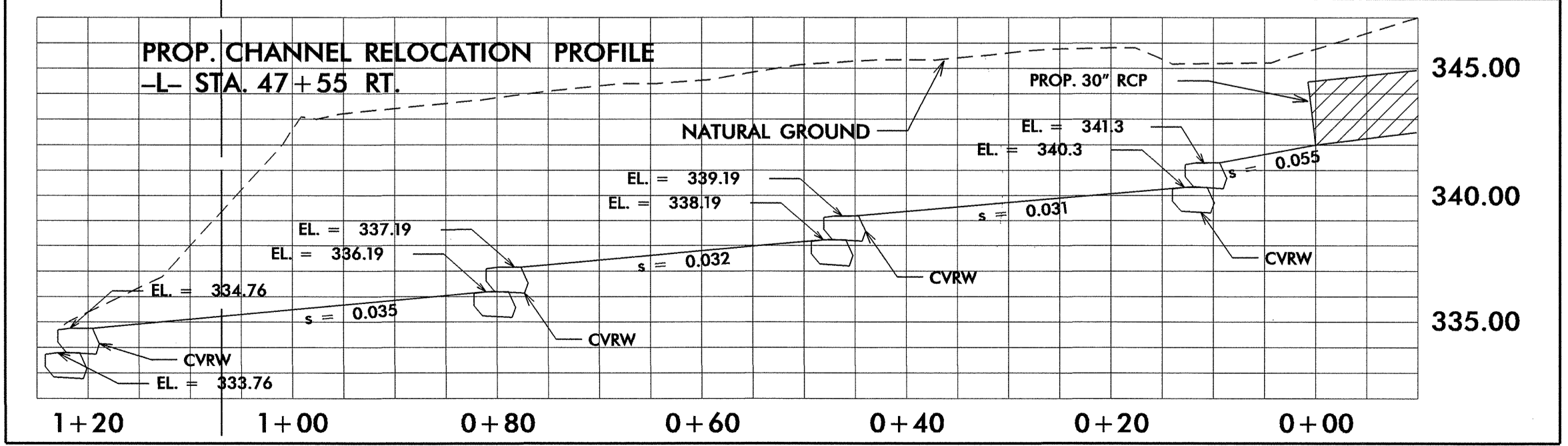
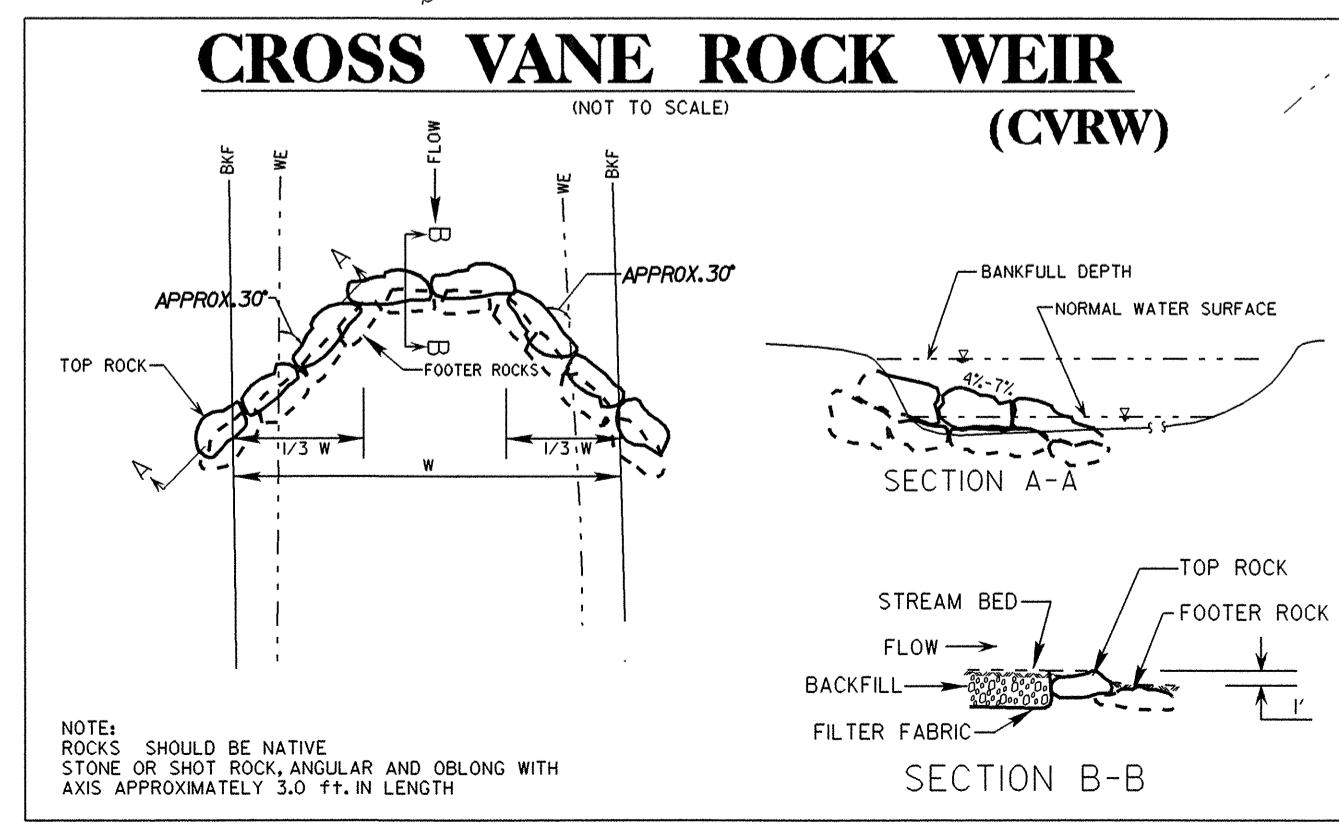
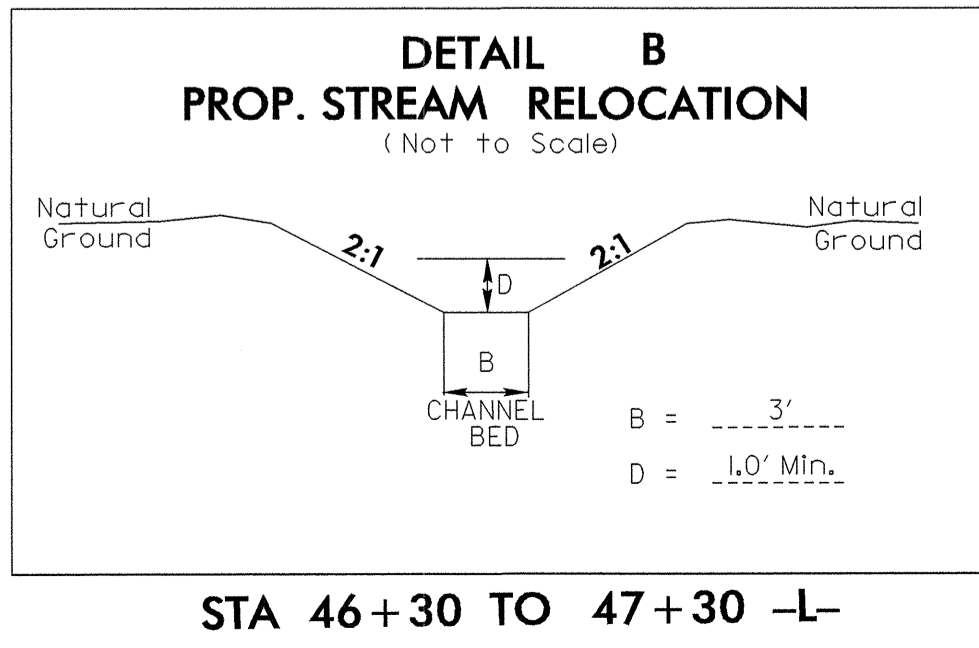
NOTE: ALL 6" WATER LINES AND LARGER SHALL BE DI CLASS 50



MATCH TO SHEET UC-3 STA. 36+00



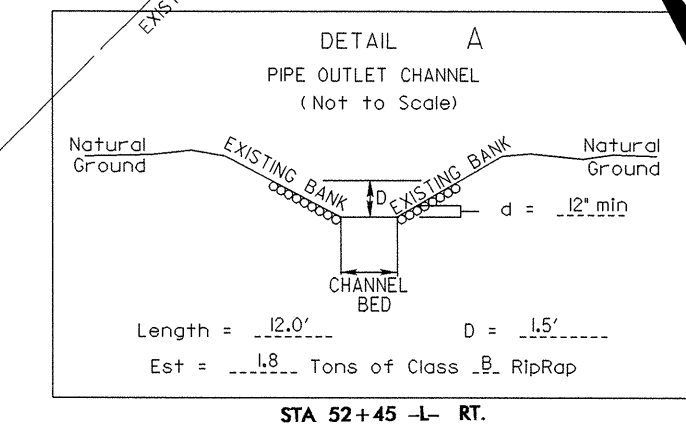
MATCH TO SHEET UC-5 STA. 48+50



NAD 83

**CITY OF DURHAM OWNS THE 16" WATER LINE**

**NOTE: THE 30" STEEL ENCASUREMENT AND 16" WATER LINE BEING INSTALLED UNDER THE RAILROAD OVERPASS IS LOCATED IN THE CITY OF DURHAM (DURHAM COUNTY)**



RESTRAIN 30' ON EACH SIDE OF THE 22 1/2° BEND STA. 0+00, LINE 1

SEE THE PROFILE ON SHEET UC-6 FOR RESTRAINING THE 16" - 22 1/2° BENDS AT THE FOLLOWING LOCATIONS:

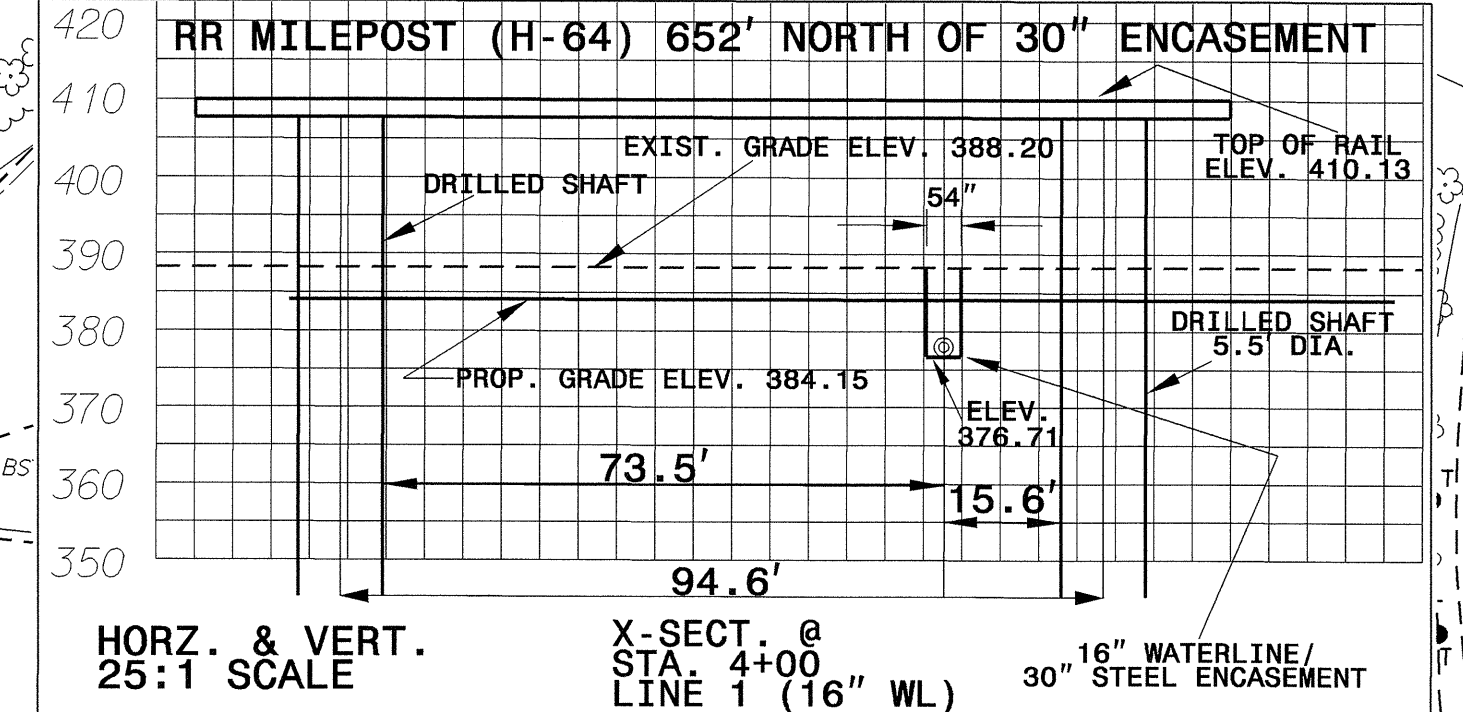
- 16" WATER LINE (LINE 1)
- |              |              |
|--------------|--------------|
| STA. 0+00.00 | STA. 2+38.02 |
| STA. 1+01.51 | STA. 3+20.46 |
| STA. 6+64.26 | STA. 5+76.64 |
| STA. 8+46.26 |              |

HORZ. 50:1 SCALE  
FILL IN SURFACE WATER

STA 57+38.87 -L- END STATE PROJECT R-2904

ABANDON 1000' OF 16" UTILITY PIPE

PROP. 42' OF 16" WATER LINE FOR INSTALLING THE TEMPORARY PIPE SEE SHEET UC-7 DETAIL 1 AND 2 AT THE TWO 16" - 90° BENDS USE THRUST BLOCKING AS SHOWN IN THE CITY OF DURHAM WATER AND SEWER SPECIFICATIONS



RELOCATE WATER METER

PROP. 168' OF 16" WATER LINE 1-16" GATE VALVE AND MANHOLE 200# WP AT THE 11 1/4° 45° BENDS AND 16" X 16" TEE USE THRUST BLOCKING AS SHOWN IN THE CITY OF DURHAM WATER AND SEWER SPECIFICATIONS

**NOTE: BLASTING IS NOT ALLOWED ON NCRR PROPERTY.**  
CONSTRUCTION TO CONFORM TO THE REQUIREMENTS OF NCR 102, SPECIFICATIONS FOR PIPELINE OCCUPANCY OF NORTH CAROLINA RAILROAD COMPANY PROPERTY.

PROP. 846' OF 16" WATER LINE 2-16" GATE VALVES AND MANHOLES 200# WP

PROP. 220' OF 30" STEEL ENCASUREMENT PIPE, 0.500" THICK BY OPEN CUT

RELOCATE FIRE HYDRANT AT 16" X 6" TEE USE THRUST BLOCKING AS SHOWN IN THE CITY OF DURHAM WATER AND SEWER SPECIFICATIONS

RELOCATE 1-2" WATER METER ASSEMBLY WITH NEW VAULT. RELOCATE 2" RPZ BACKFLOW PREVENTION ASSEMBLY WITH NEW VAULT

**NOTE: ALL 6" WATER LINES AND LARGER SHALL BE DI CLASS 50**

INSURANCE COMPANY  
DB 2396 PG 266  
PB 147 PG 133

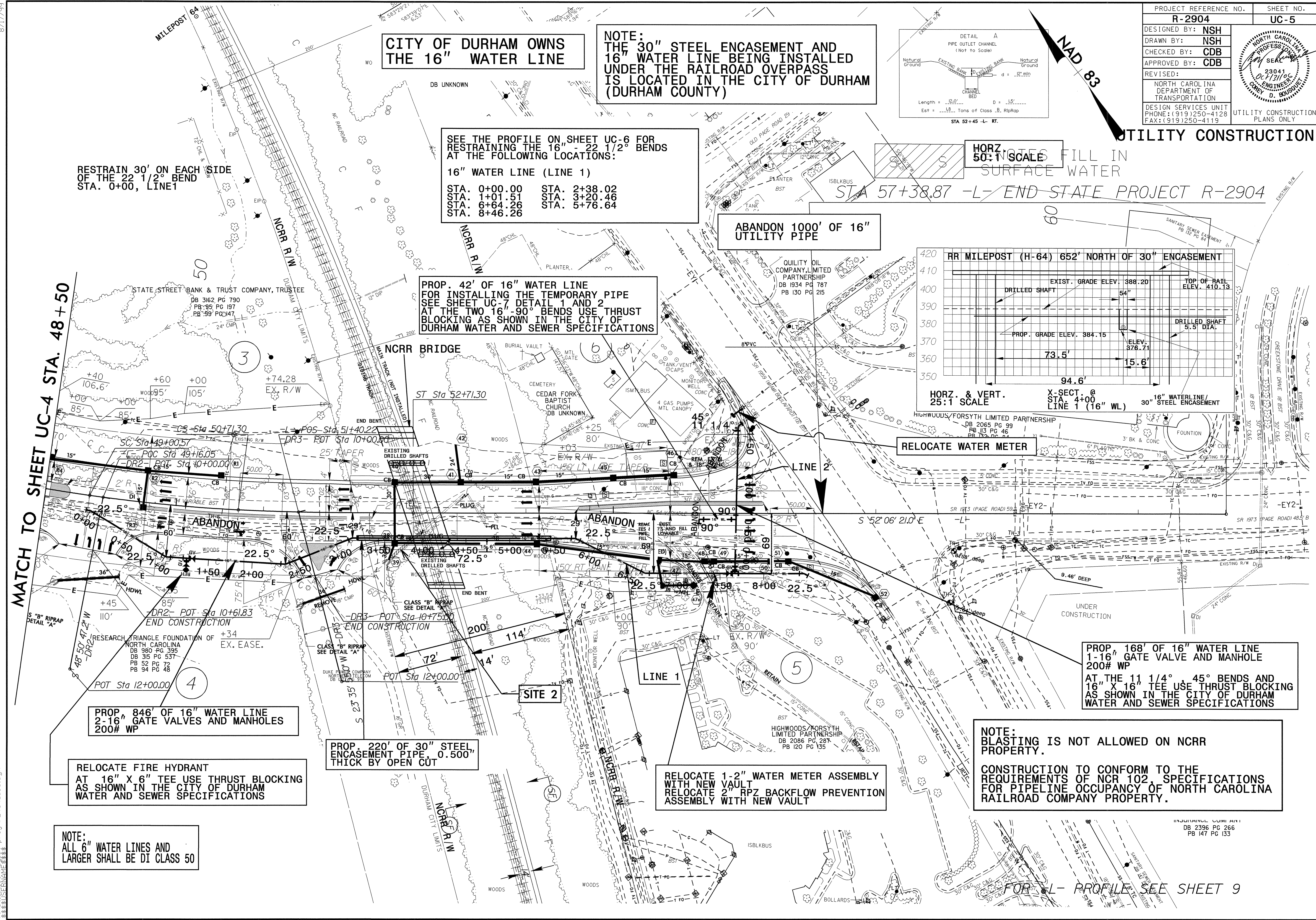
FOR ALL PROFILE SEE SHEET 9

5/18/2006 Rev. 3  
Revised 30" Encasement Alignment  
Offset 29' South of centerline

5/8/2006 Rev. 2  
Revised 30" Encasement Alignment  
Offset 24' South of centerline

8/8/2005 Rev. 1  
Steel Encasement Pipe  
Added 30" By Open Cut

31-OCT-2006 16:41  
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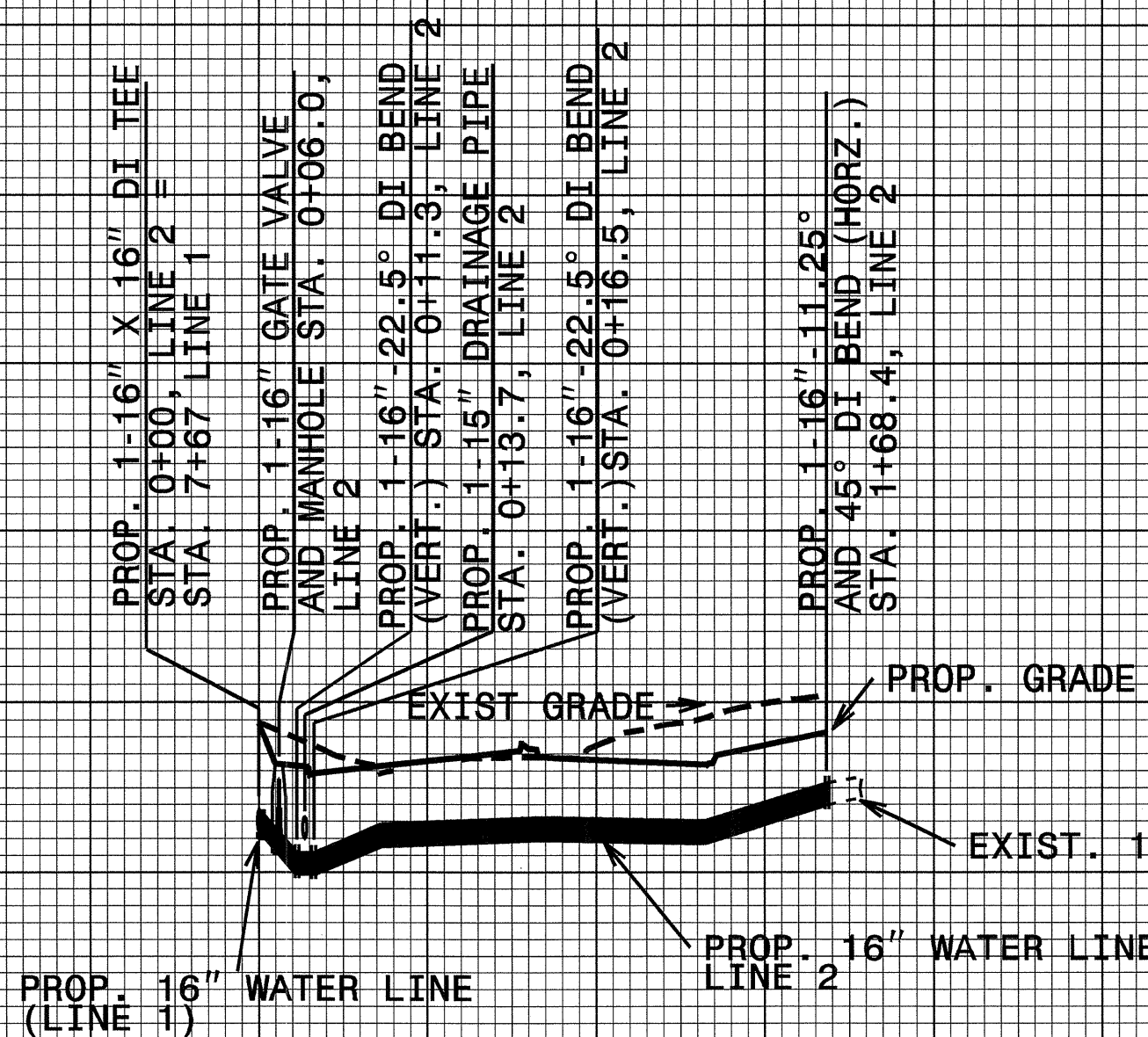
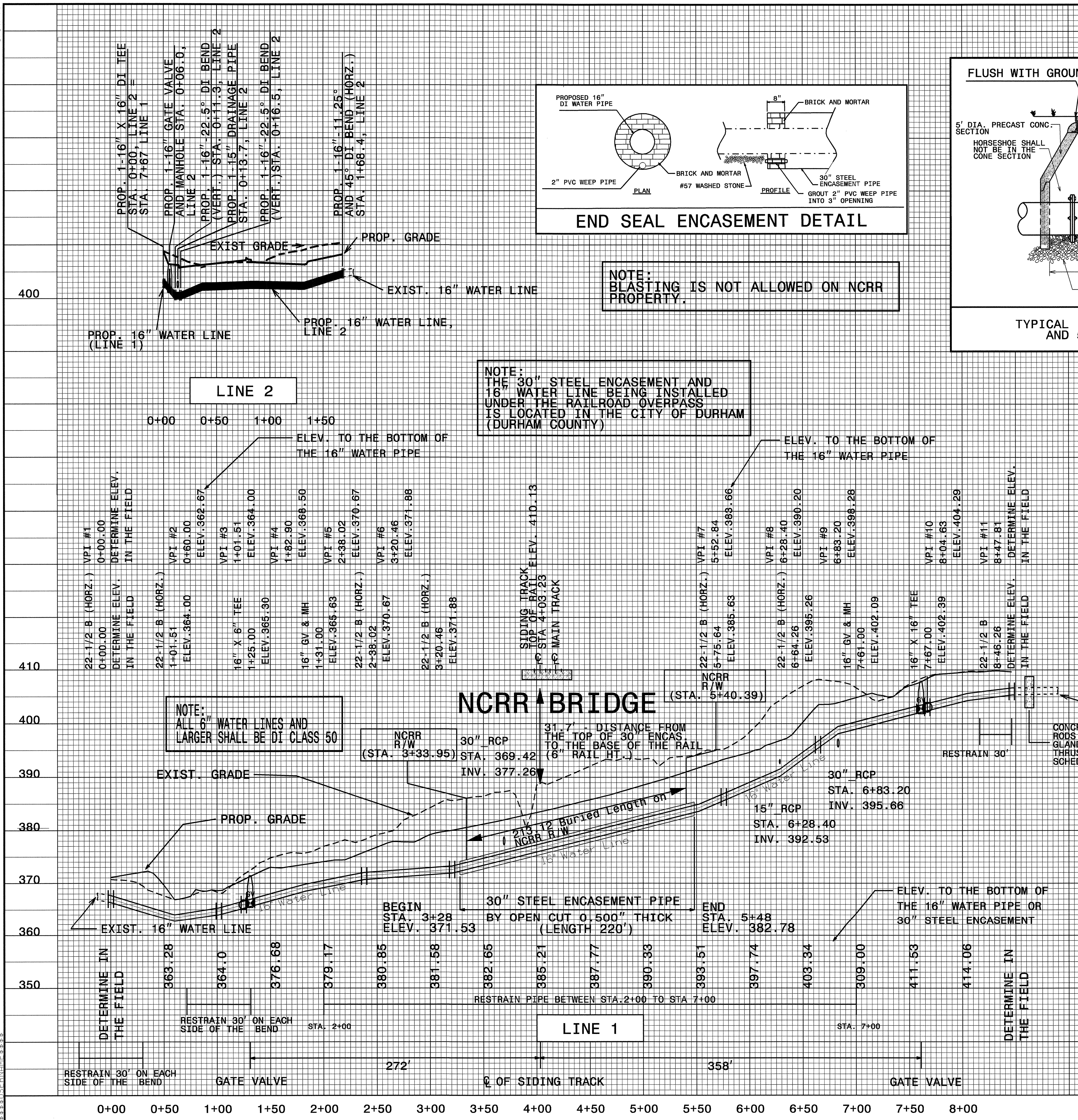


8/18/2006 Rev. 1  
 Added 30" Steel Encasement Pipe  
 By Open Cut

5/8/2006 Rev. 2  
 Encasement Alignment  
 Revised 30' South of centerline

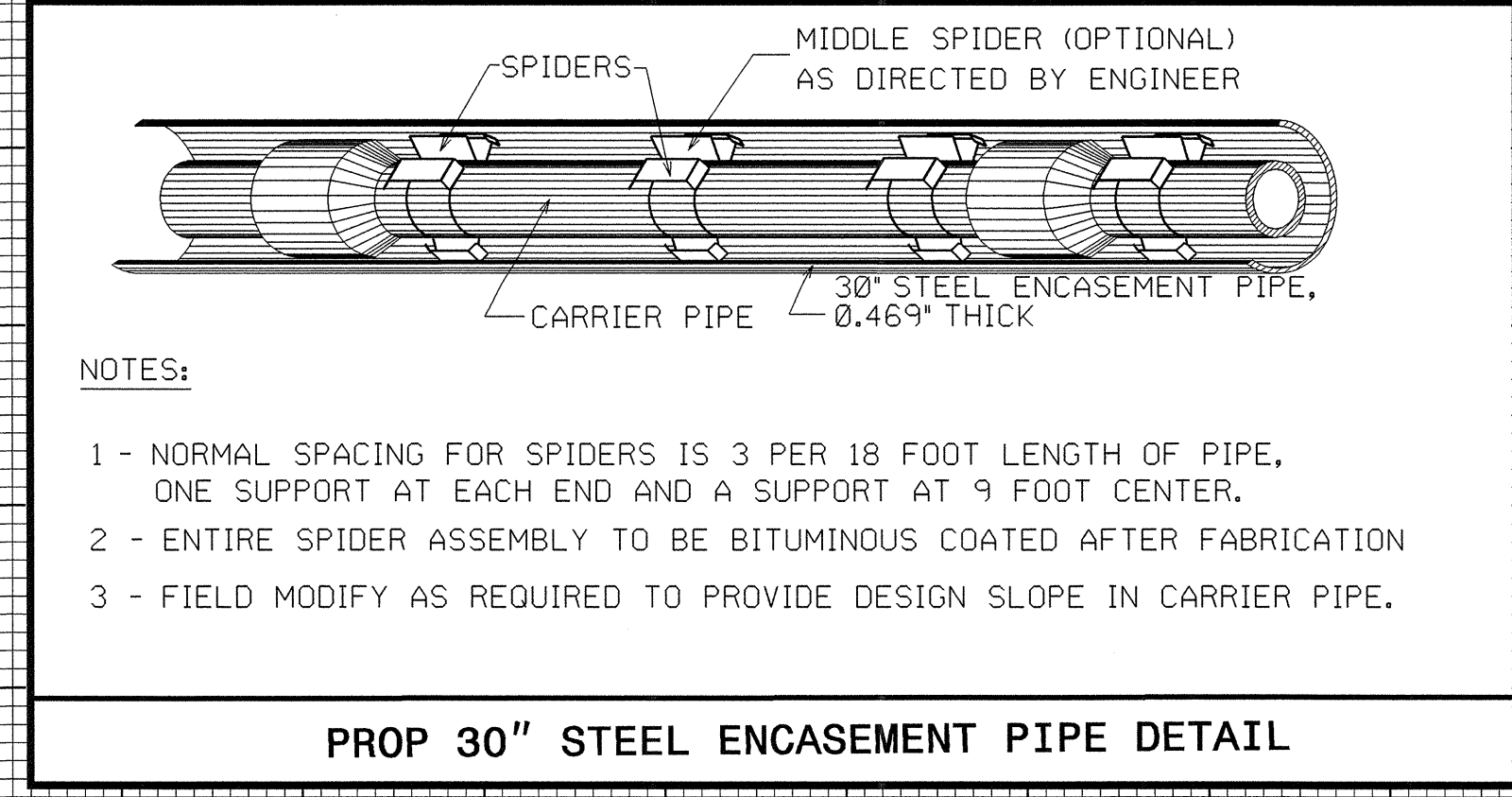
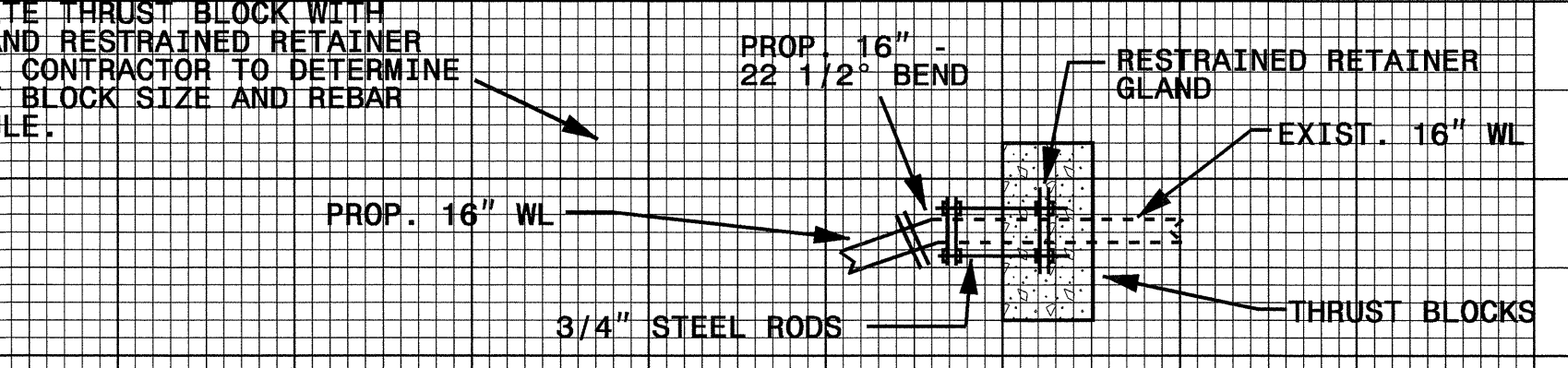
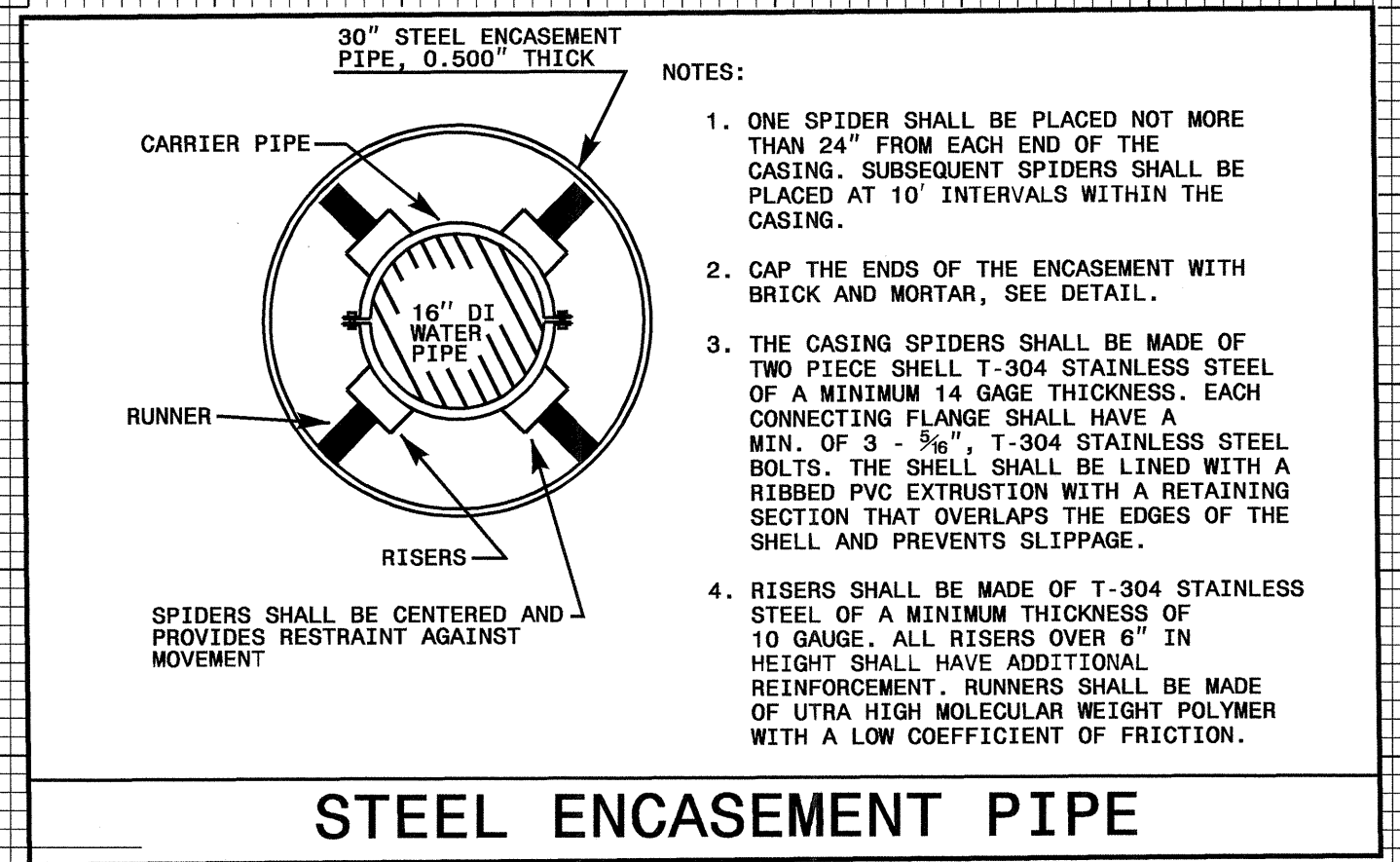
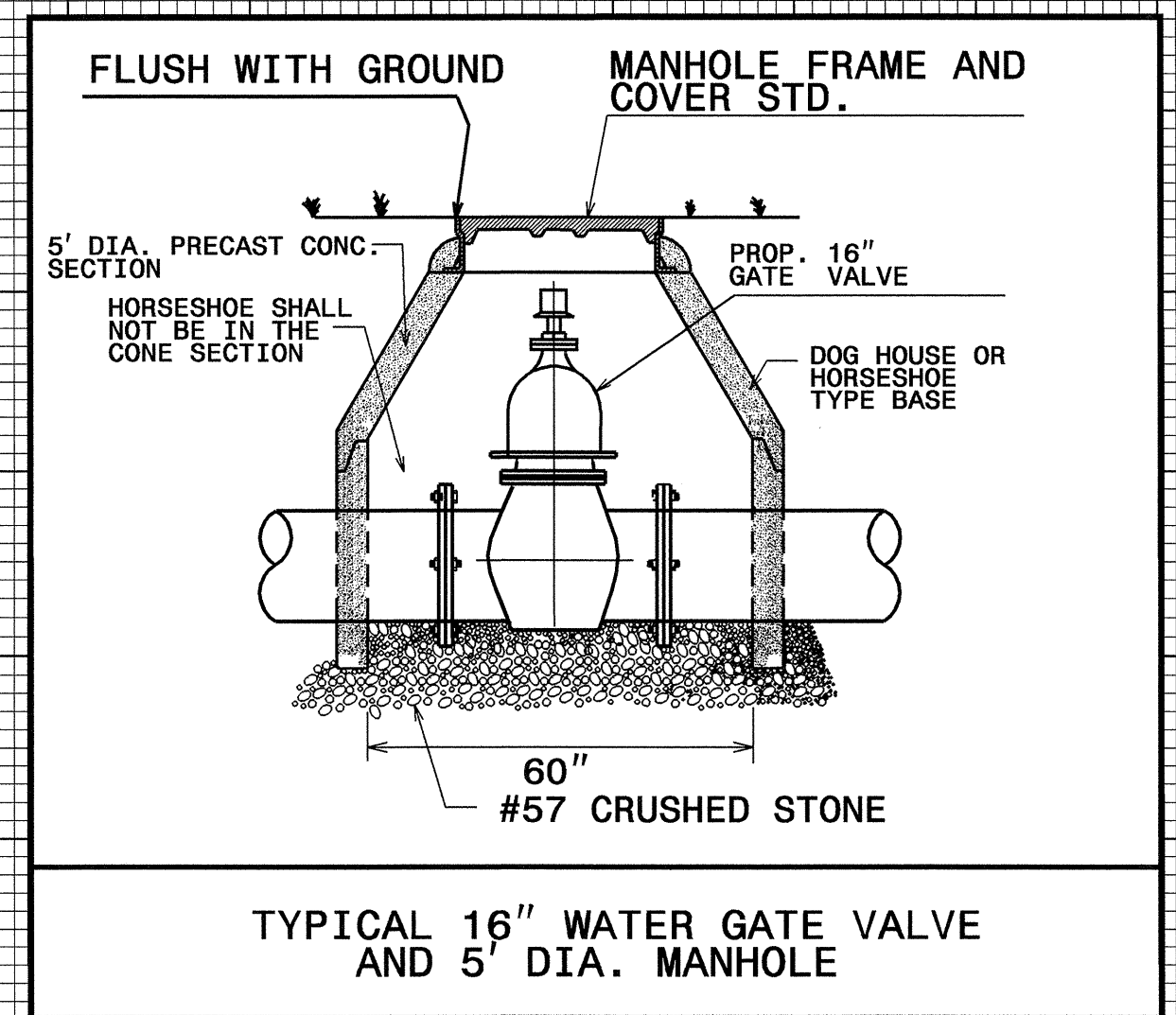
5/18/2006 Rev. 3  
 Encasement Alignment  
 Revised 30' South of centerline  
 Offset 29' South of centerline

5/14/99



**NOTE:**  
 BLASTING IS NOT ALLOWED ON NCRR PROPERTY.

**NOTE:**  
 THE 30" STEEL ENCASUREMENT AND 16" WATER LINE BEING INSTALLED UNDER THE RAILROAD OVERPASS IS LOCATED IN THE CITY OF DURHAM (DURHAM COUNTY)



PROJECT REFERENCE NO. **R-2904** SHEET NO. **UC-6**

DESIGNED BY: **NSH**  
 DRAWN BY: **NSH**  
 CHECKED BY: **CDB**  
 APPROVED BY: **CDB**  
 REVISED:

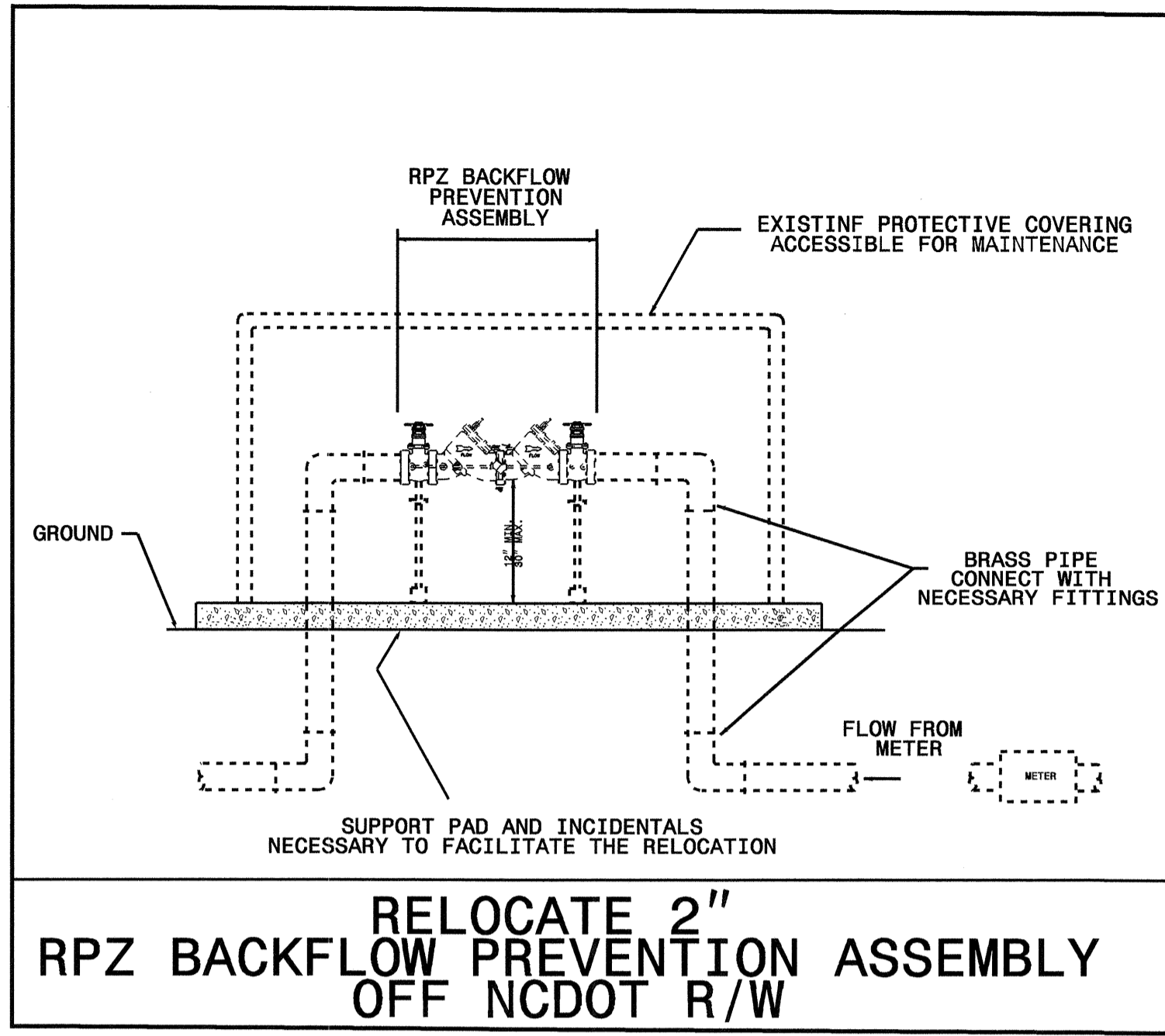
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
 DESIGN SERVICES UNIT  
 PHONE: (919)250-4128  
 FAX: (919)250-4119

UTILITY CONSTRUCTION PLANS ONLY  
 NORTH CAROLINA PROFESSIONAL ENGINEER  
 23041 1/1/06  
 COREY D. BOUSSET

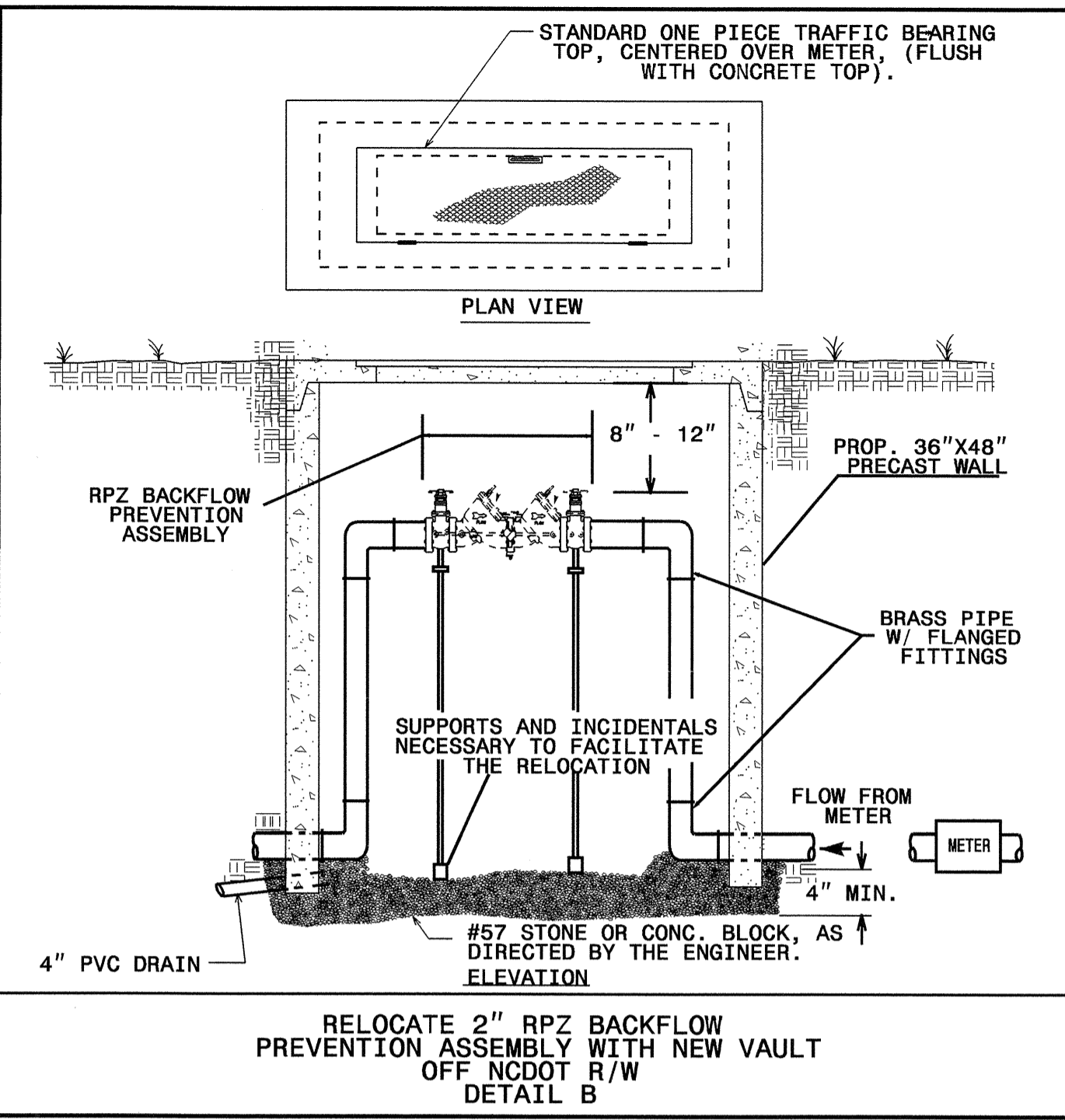
**UTILITY CONSTRUCTION**



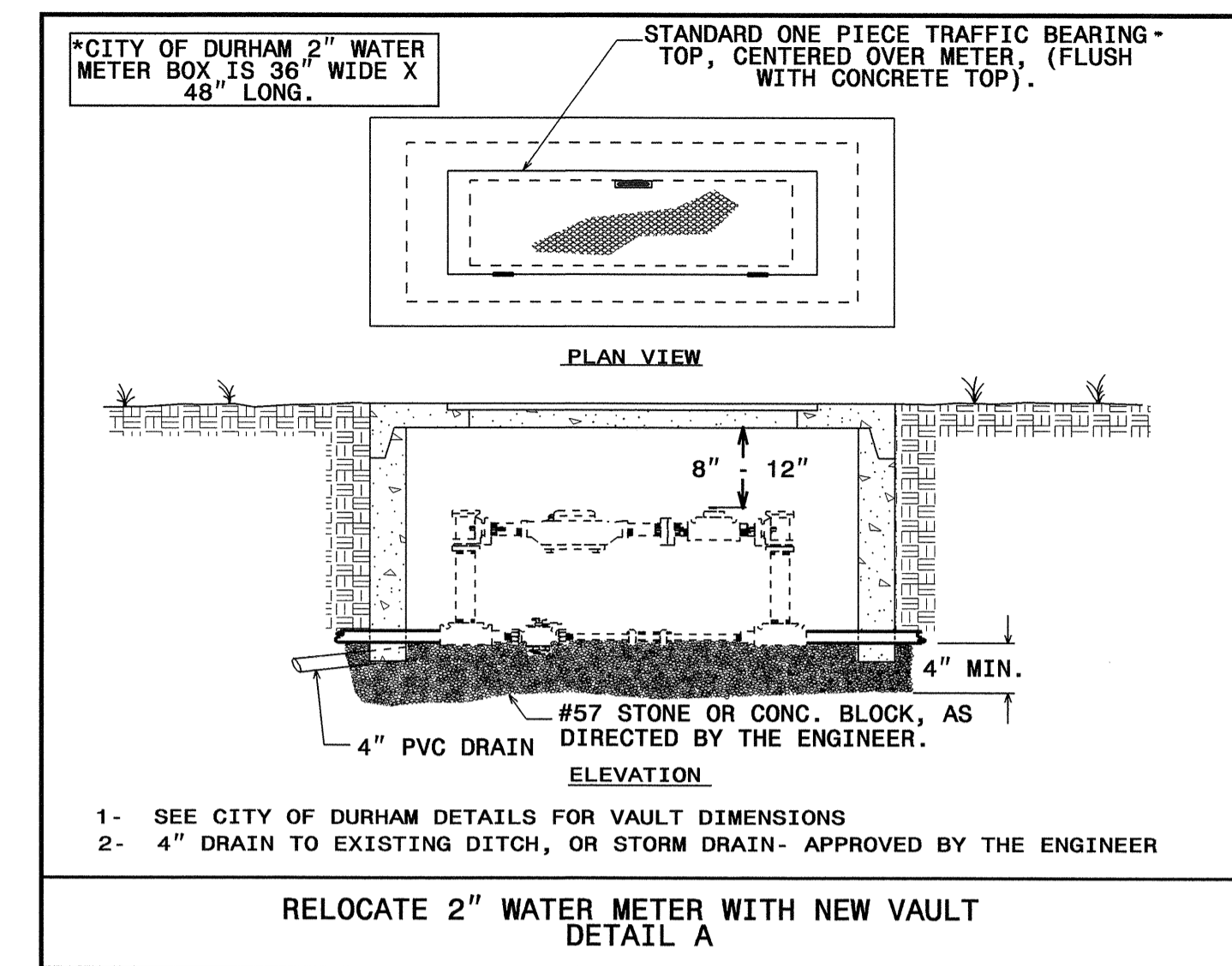
**UTILITY CONSTRUCTION**



**RELOCATE 2" RPZ BACKFLOW PREVENTION ASSEMBLY OFF NCDOT R/W**

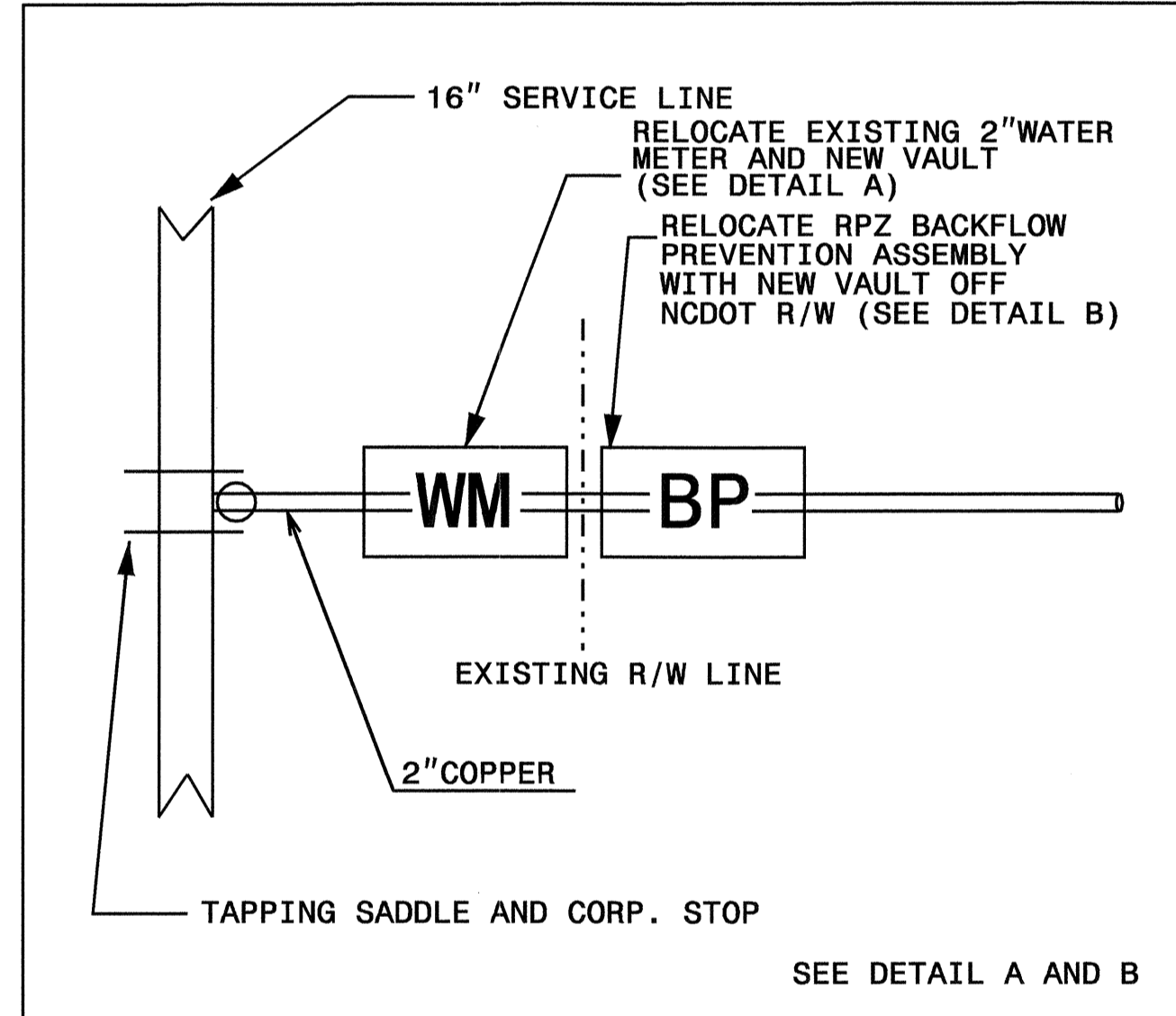


**RELOCATE 2" RPZ BACKFLOW PREVENTION ASSEMBLY WITH NEW VAULT OFF NCDOT R/W DETAIL B**

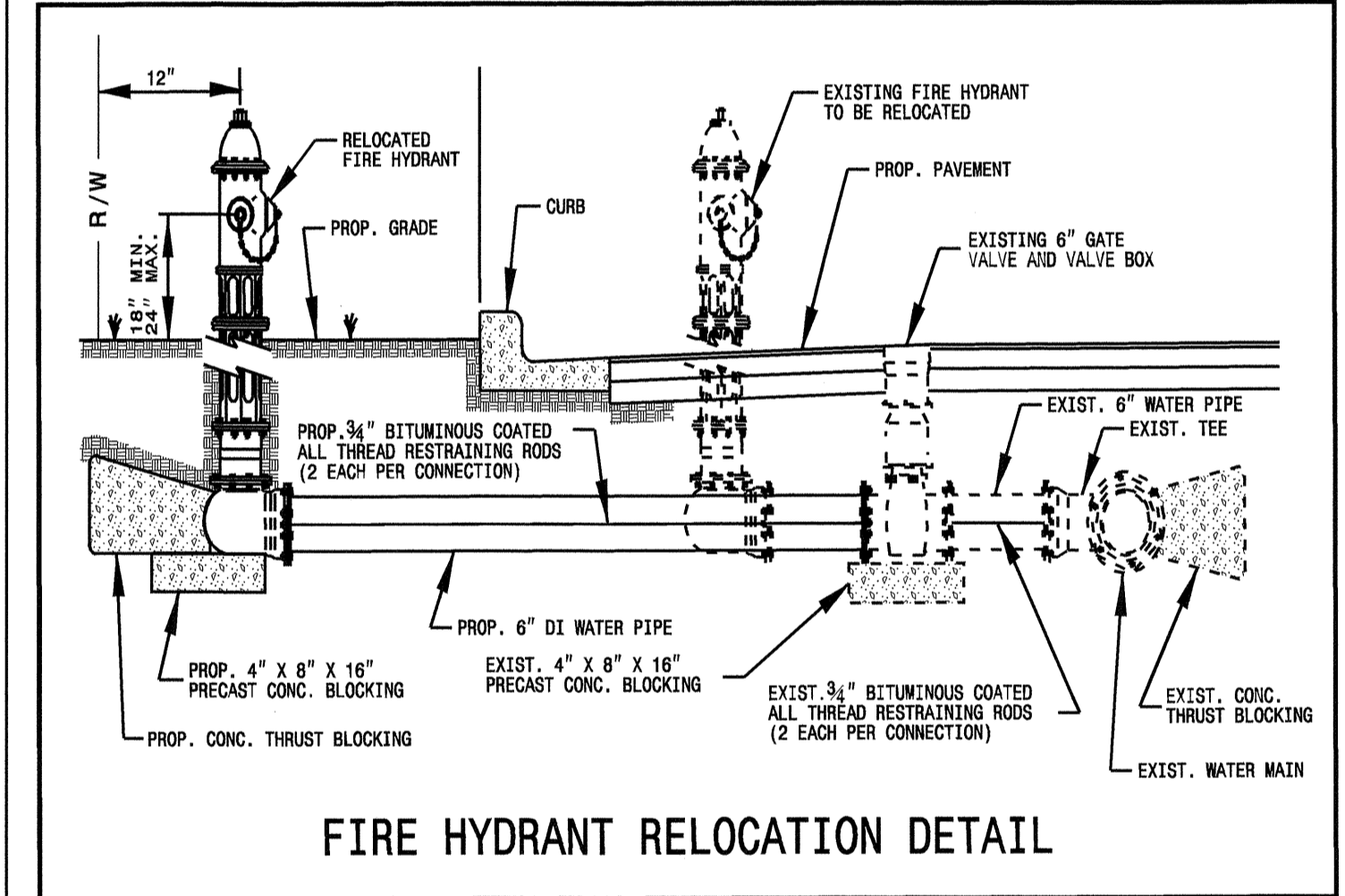


**RELOCATE 2" WATER METER WITH NEW VAULT DETAIL A**

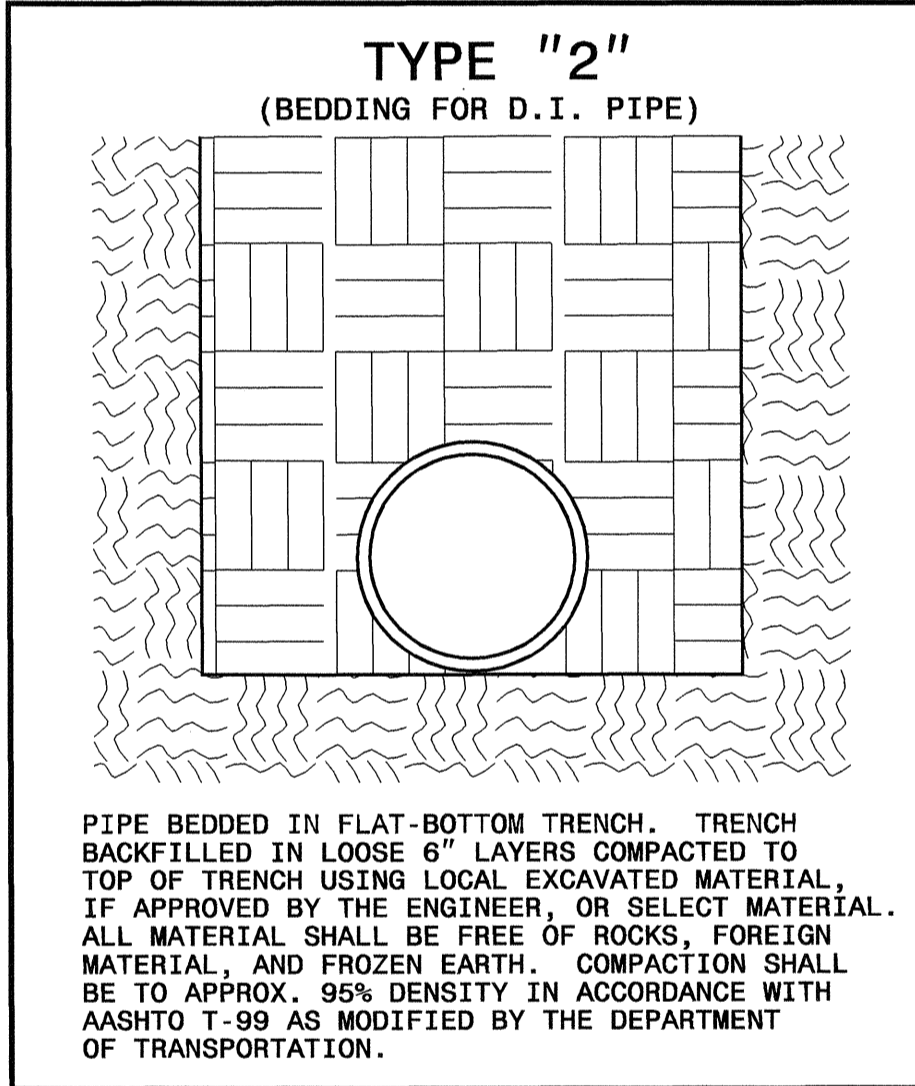
**NOTE:**  
 THE 30" STEEL ENCASUREMENT AND 16" WATER LINE BEING INSTALLED UNDER THE RAILROAD OVERPASS IS LOCATED IN THE CITY OF DURHAM (DURHAM COUNTY)



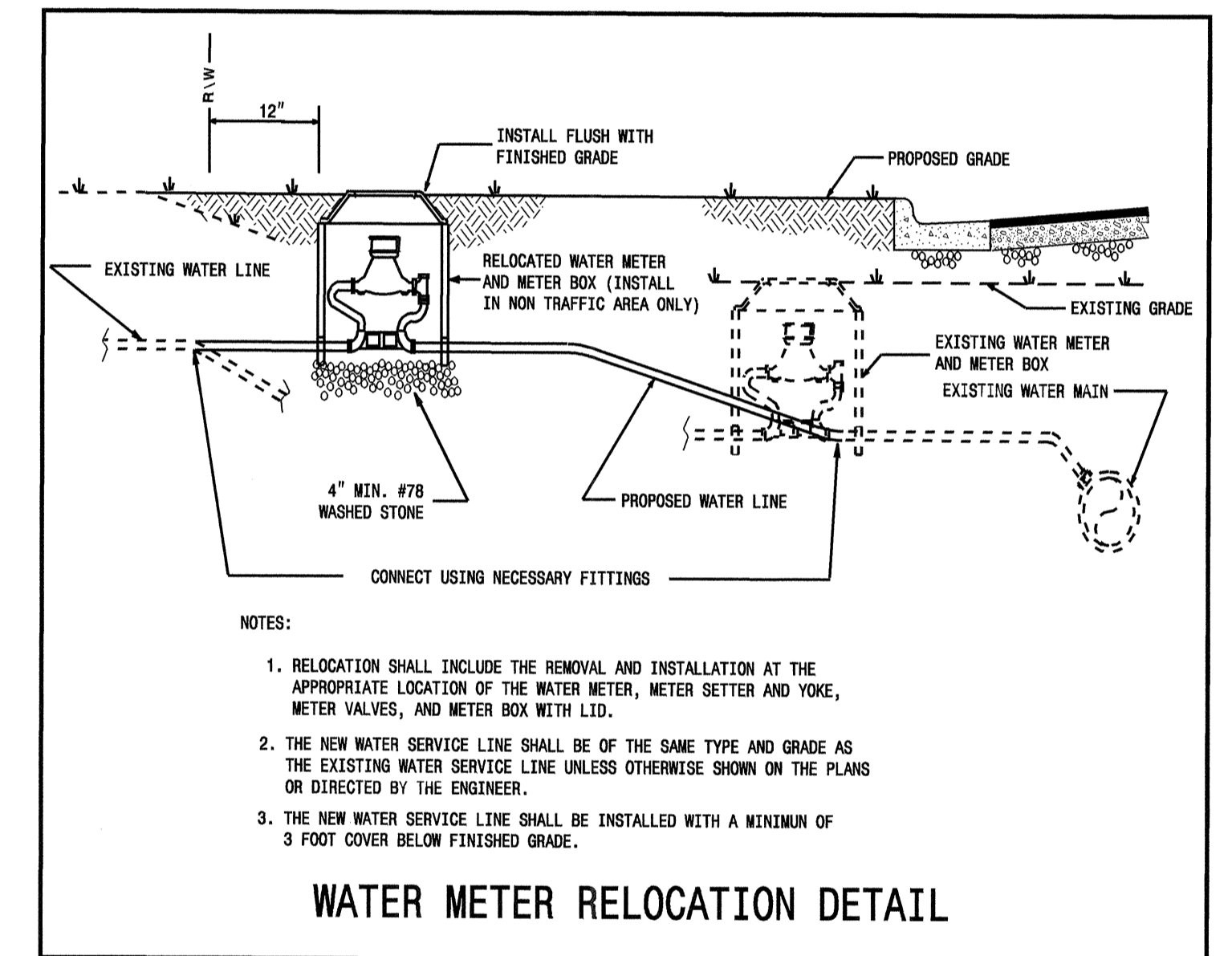
**2" WATER METER SERVICE AND BACKFLOW ASSEMBLY**



**FIRE HYDRANT RELOCATION DETAIL**



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.

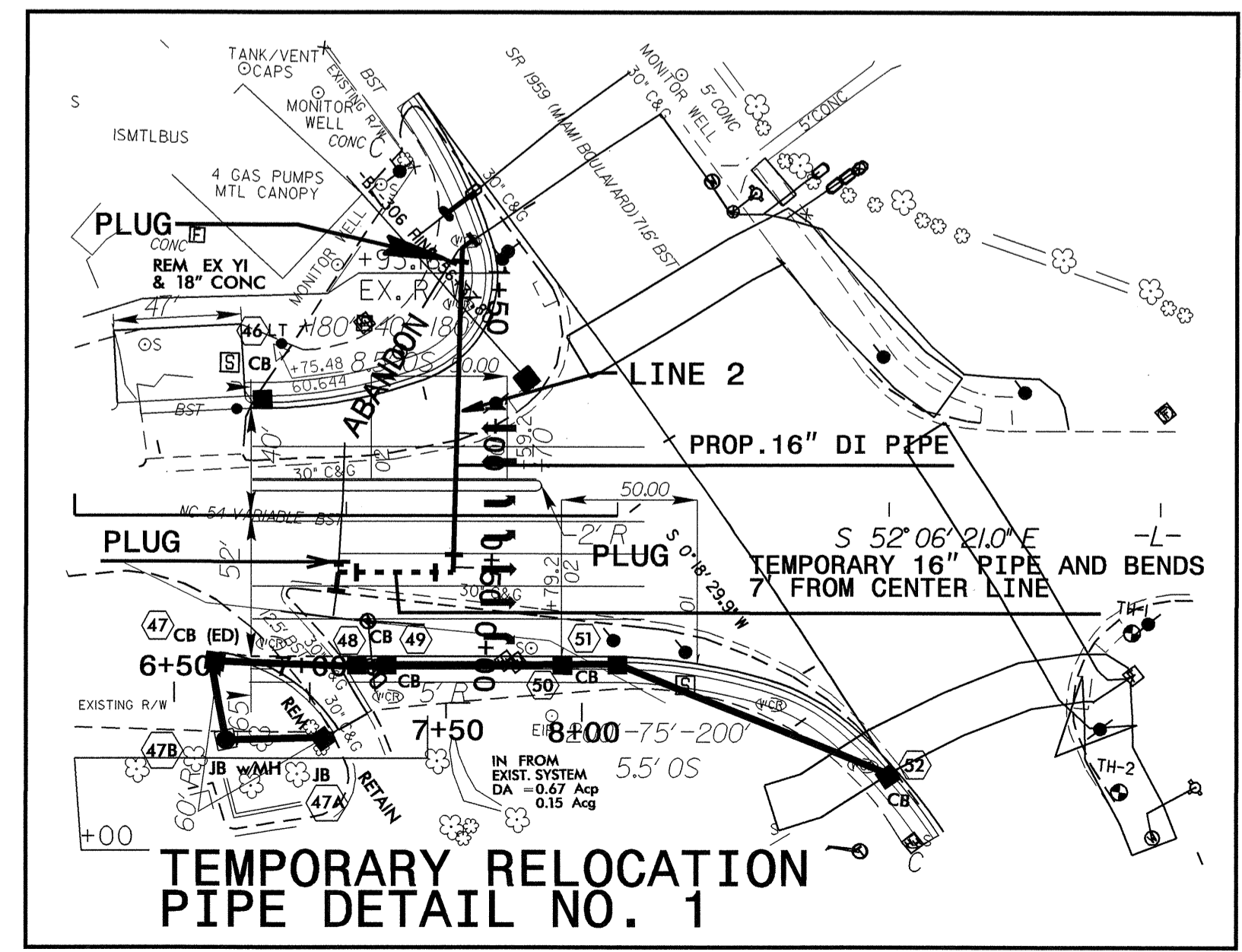


**NOTES:**  
 1. RELOCATION SHALL INCLUDE THE REMOVAL AND INSTALLATION AT THE APPROPRIATE LOCATION OF THE WATER METER, METER SETTER AND YOKE, METER VALVES, AND METER BOX WITH LID.  
 2. THE NEW WATER SERVICE LINE SHALL BE OF THE SAME TYPE AND GRADE AS THE EXISTING WATER SERVICE LINE UNLESS OTHERWISE SHOWN ON THE PLANS OR DIRECTED BY THE ENGINEER.  
 3. THE NEW WATER SERVICE LINE SHALL BE INSTALLED WITH A MINIMUM OF 3 FOOT COVER BELOW FINISHED GRADE.

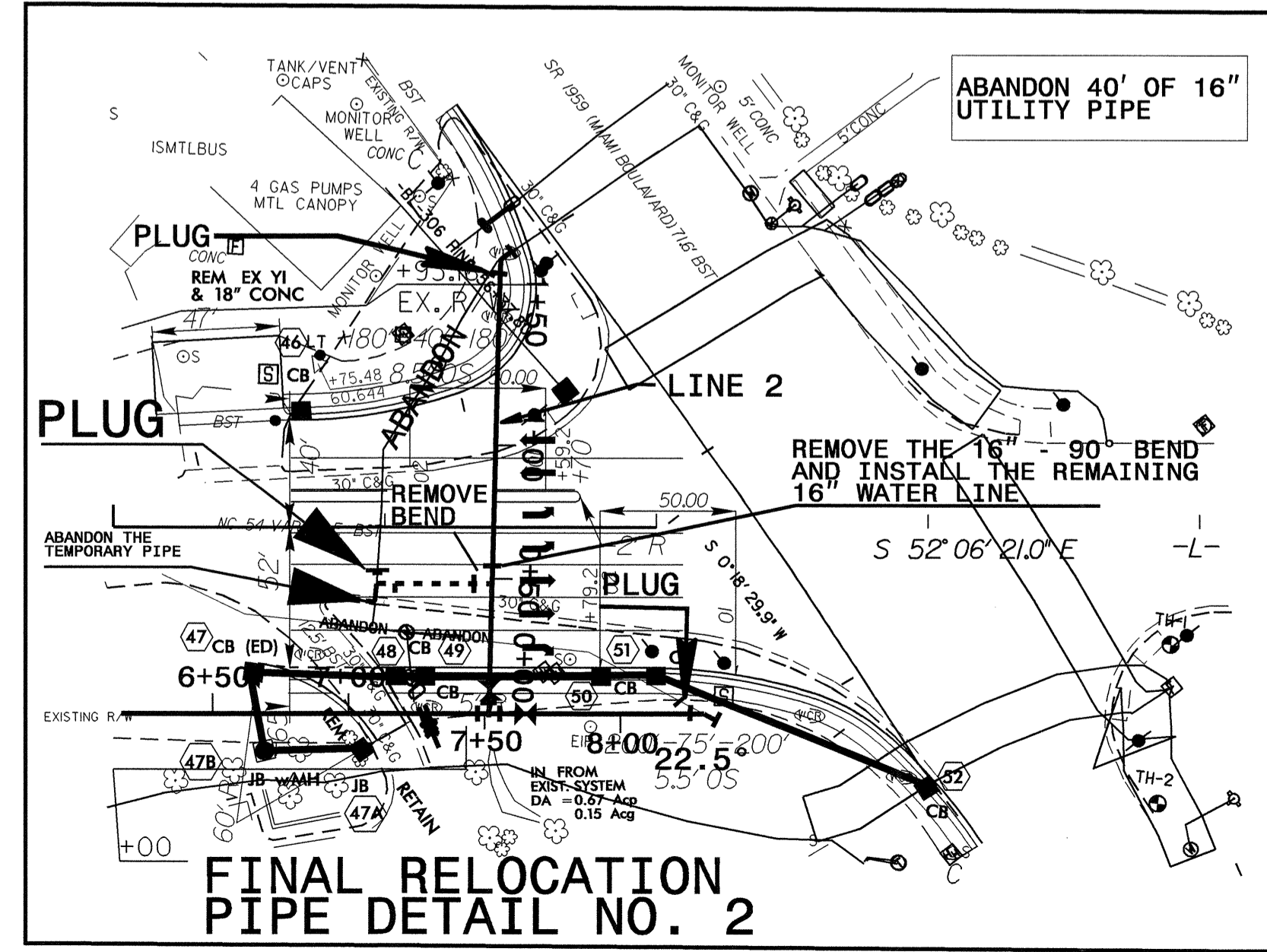
MAXIMUM TRENCH WIDTH AT TOP OF PIPE

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		

**ALL DETAILS NTS**



**TEMPORARY RELOCATION PIPE DETAIL NO. 1**

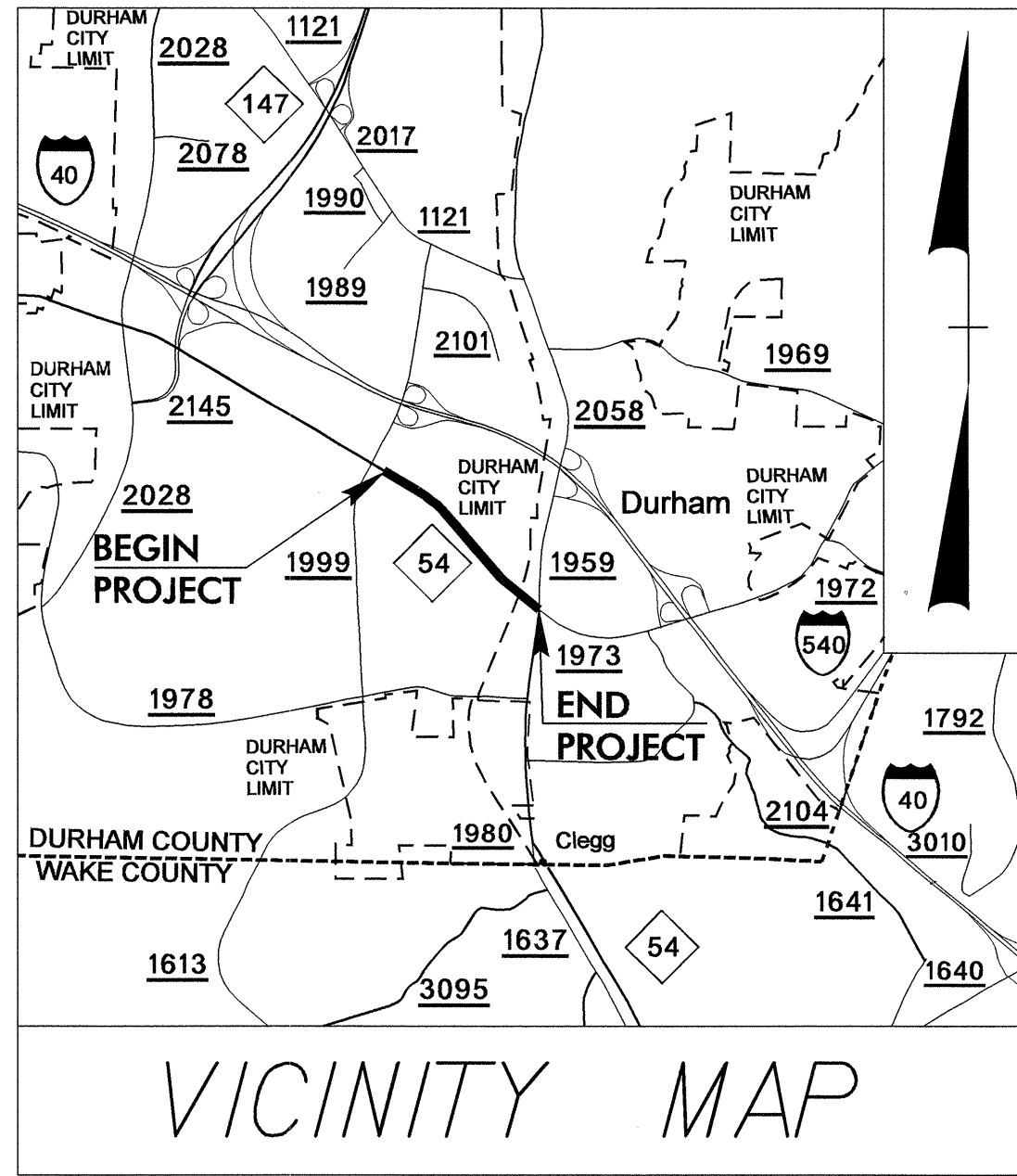


**FINAL RELOCATION PIPE DETAIL NO. 2**

5/14/09  
 19-MAY-2006 12:45 2904\_ut\_uc7\_uc1det1\_psh.dgn

**TIP PROJECT: R-2904**

See Sheet 1-A For Index of Sheets  
See Sheet 1-B For Symbology



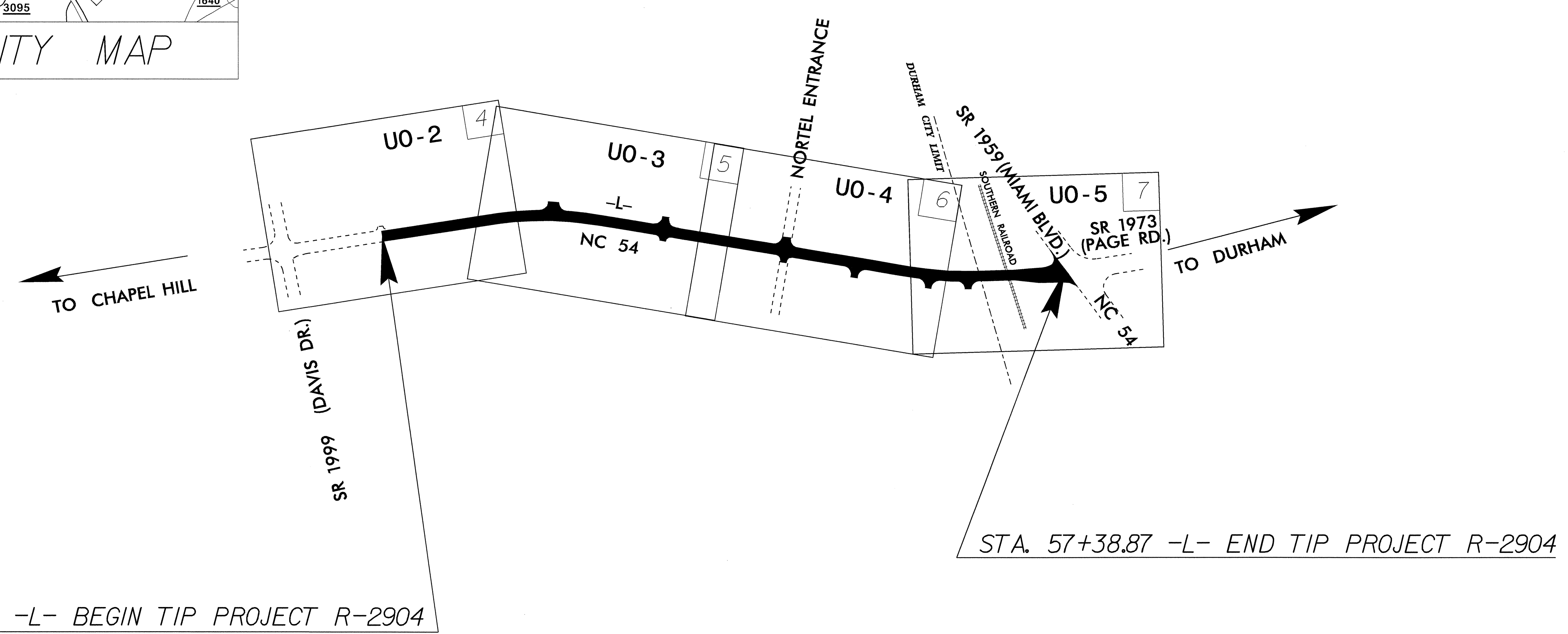
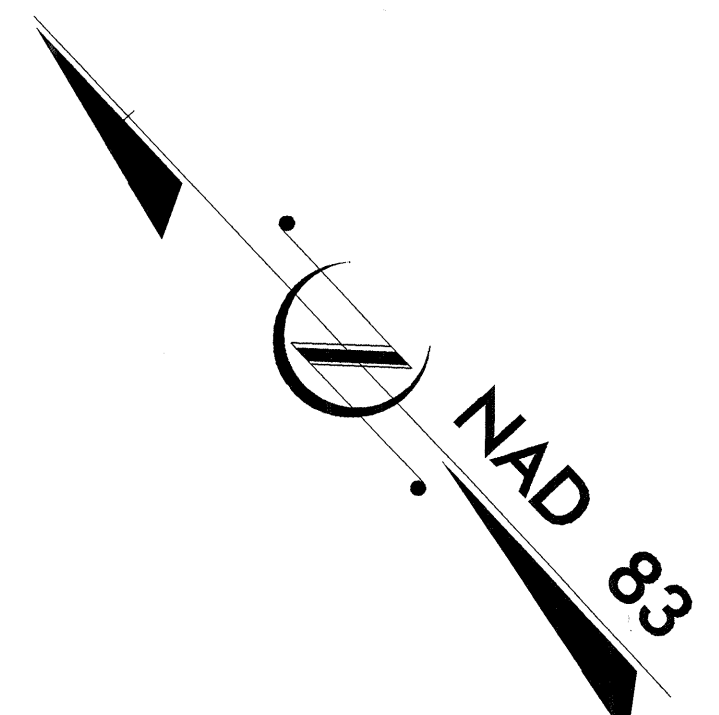
STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**DURHAM COUNTY**

**LOCATION: NC 54 FROM SR 1999 (DAVIS DRIVE) TO SR 1959 (MIAMI BLVD.)**

**TYPE OF WORK: UTILITY RELOCATIONS**

T.I.P. NO. <b>R-2904</b>	SHEET NO. <b>UO-1</b>
-----------------------------	--------------------------



<b>INDEX OF SHEETS</b>	
<u>SHEET NO.</u>	<u>DESCRIPTION</u>
UO-1	TITLE SHEET
UO-2 TO UO-5	UTILITY BY OTHERS PLAN SHEET

- UTILITIES BY OTHERS ON PROJECT**
- (1) DUKE POWER - Power
  - (2) VERIZON - Telephone
  - (3) TIME WARNER CABLE - CATV
  - (4) PSNC ENERGY - Gas
  - (5) DELTACOM - Fiber Optic
  - (6) AT&T - Telephone

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

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

Roger Worthington, P.E. UTILITIES SECTION ENGINEER

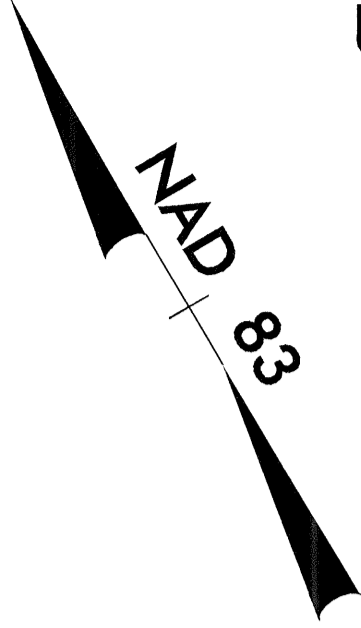
Corey Bousquet, P.E. UTILITIES SQUAD LEADER PROJECT ENGINEER

Nabil Hamdan UTILITIES PROJECT DESIGNER



UTILITIES BY OTHERS

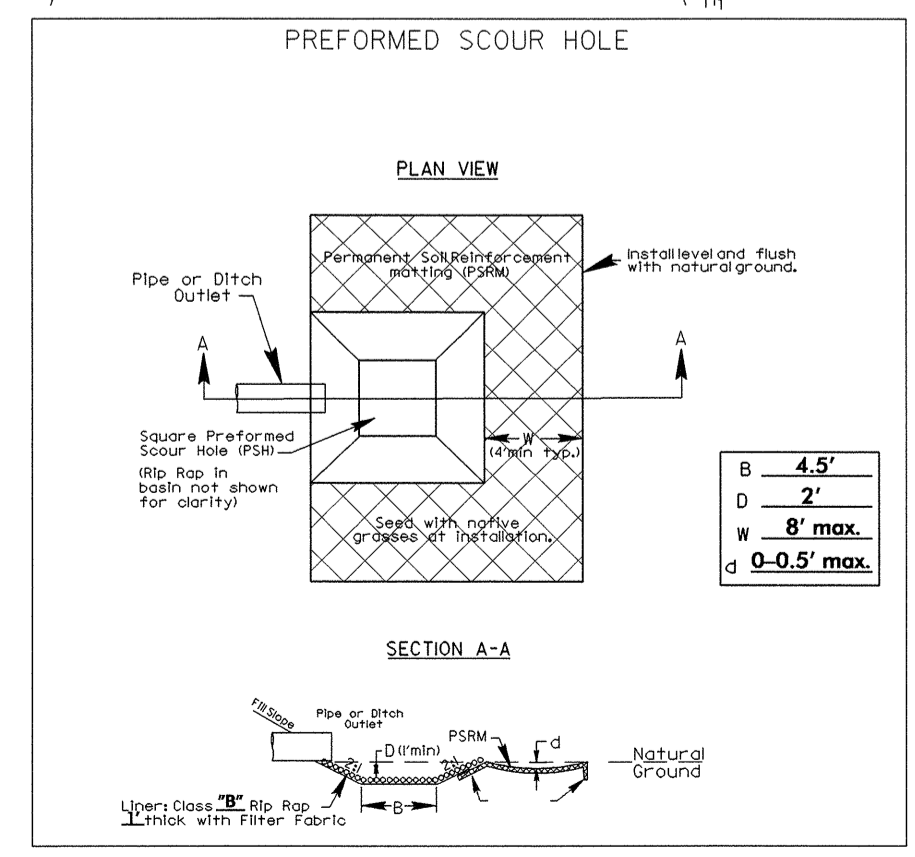
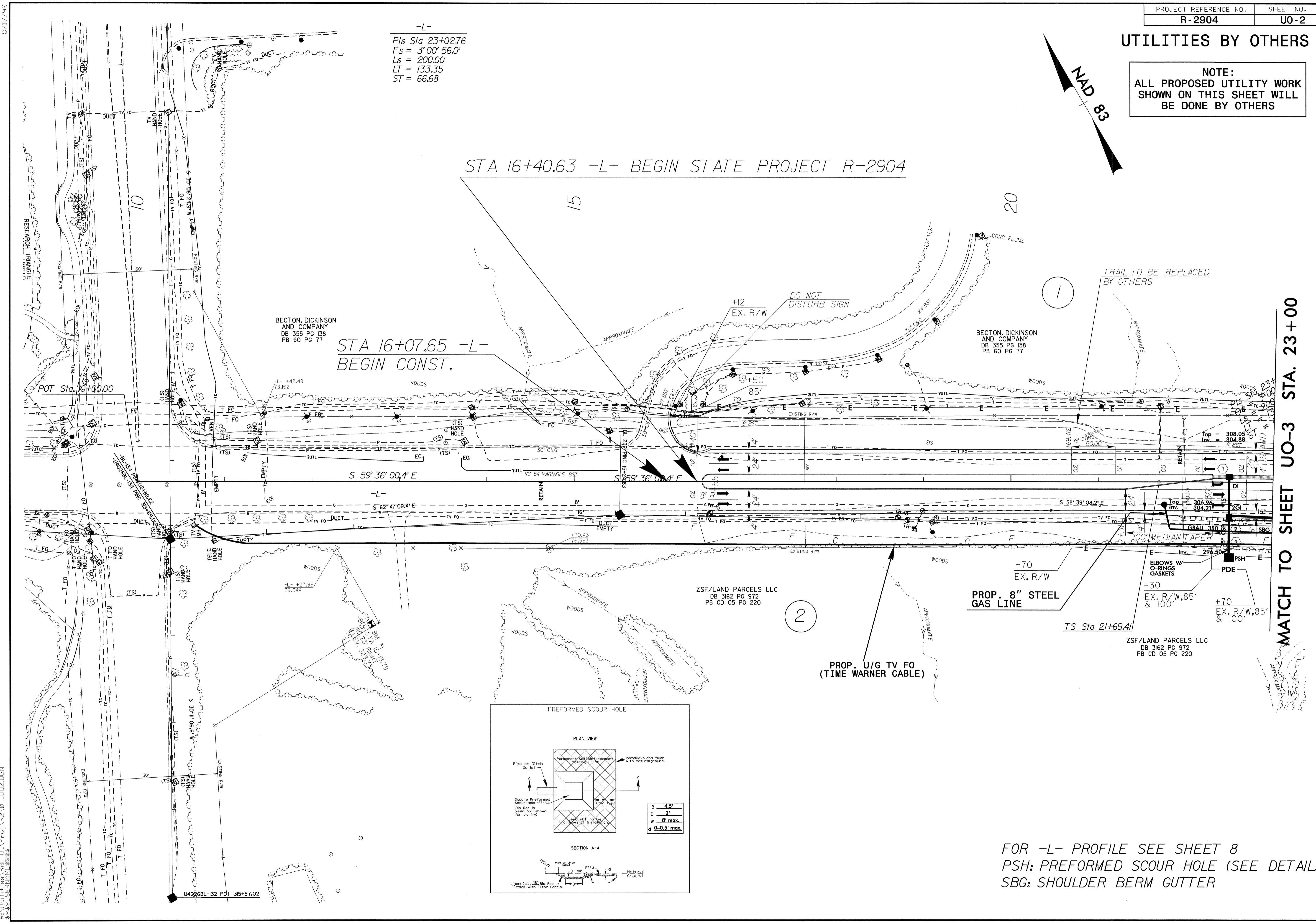
NOTE:  
ALL PROPOSED UTILITY WORK  
SHOWN ON THIS SHEET WILL  
BE DONE BY OTHERS



-L-  
Pls Sta 23+02.76  
Fs = 3° 00' 56.0"  
Ls = 200.00  
LT = 133.35  
ST = 66.68

STA 16+40.63 -L- BEGIN STATE PROJECT R-2904

STA 16+07.65 -L-  
BEGIN CONST.



PROP. 8" STEEL  
GAS LINE

PROP. U/G TV FO  
(TIME WARNER CABLE)

FOR -L- PROFILE SEE SHEET 8  
PSH: PREFORMED SCOUR HOLE (SEE DETAIL)  
SBG: SHOULDER BERM GUTTER

REVISIONS

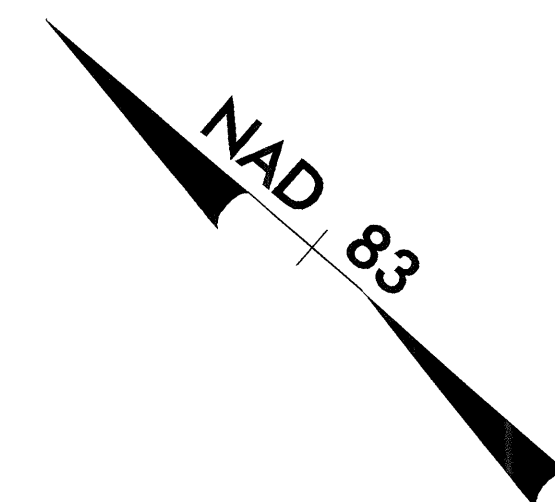
MATCH TO SHEET UO-3 STA. 23+00

8/17/99

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\$\$\$\$\$SYTIME\$\$\$\$\$

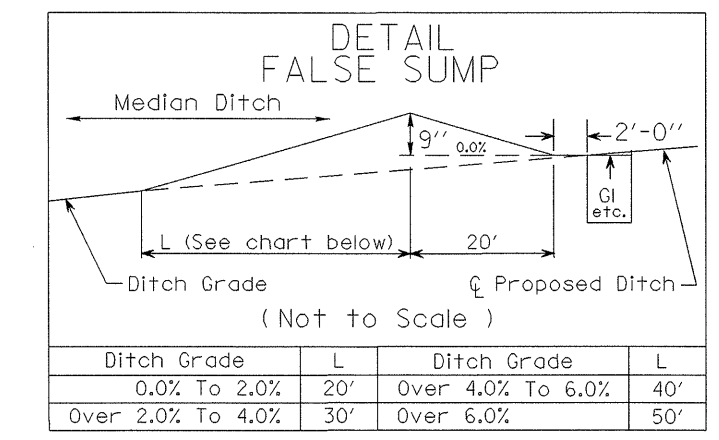
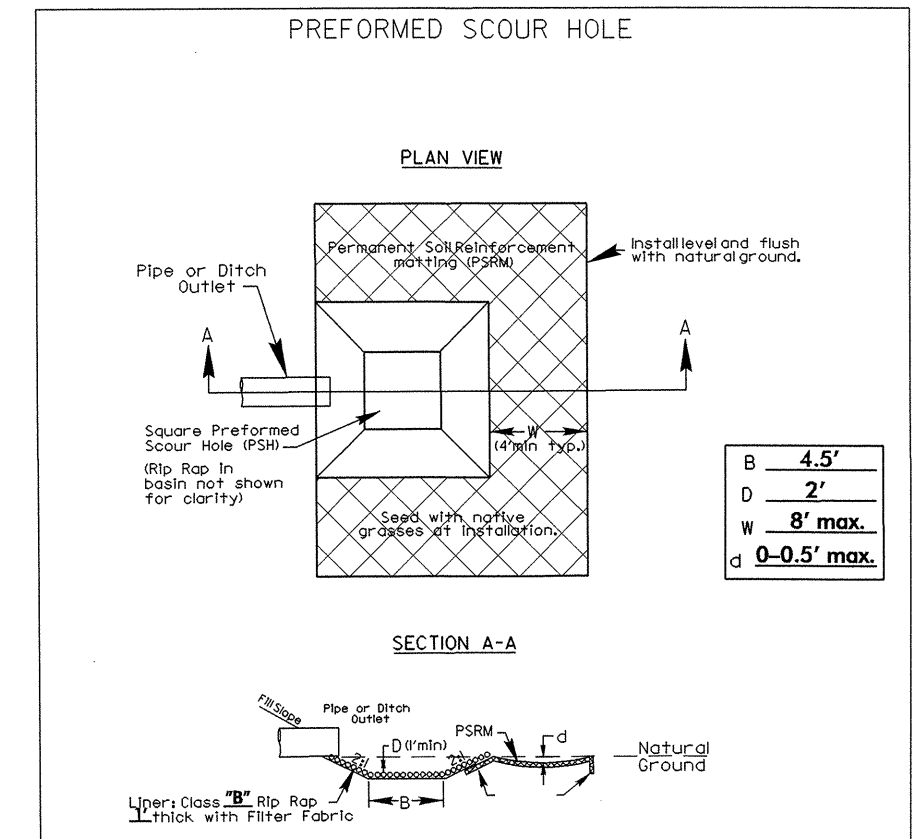
UTILITIES BY OTHERS

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



-L-

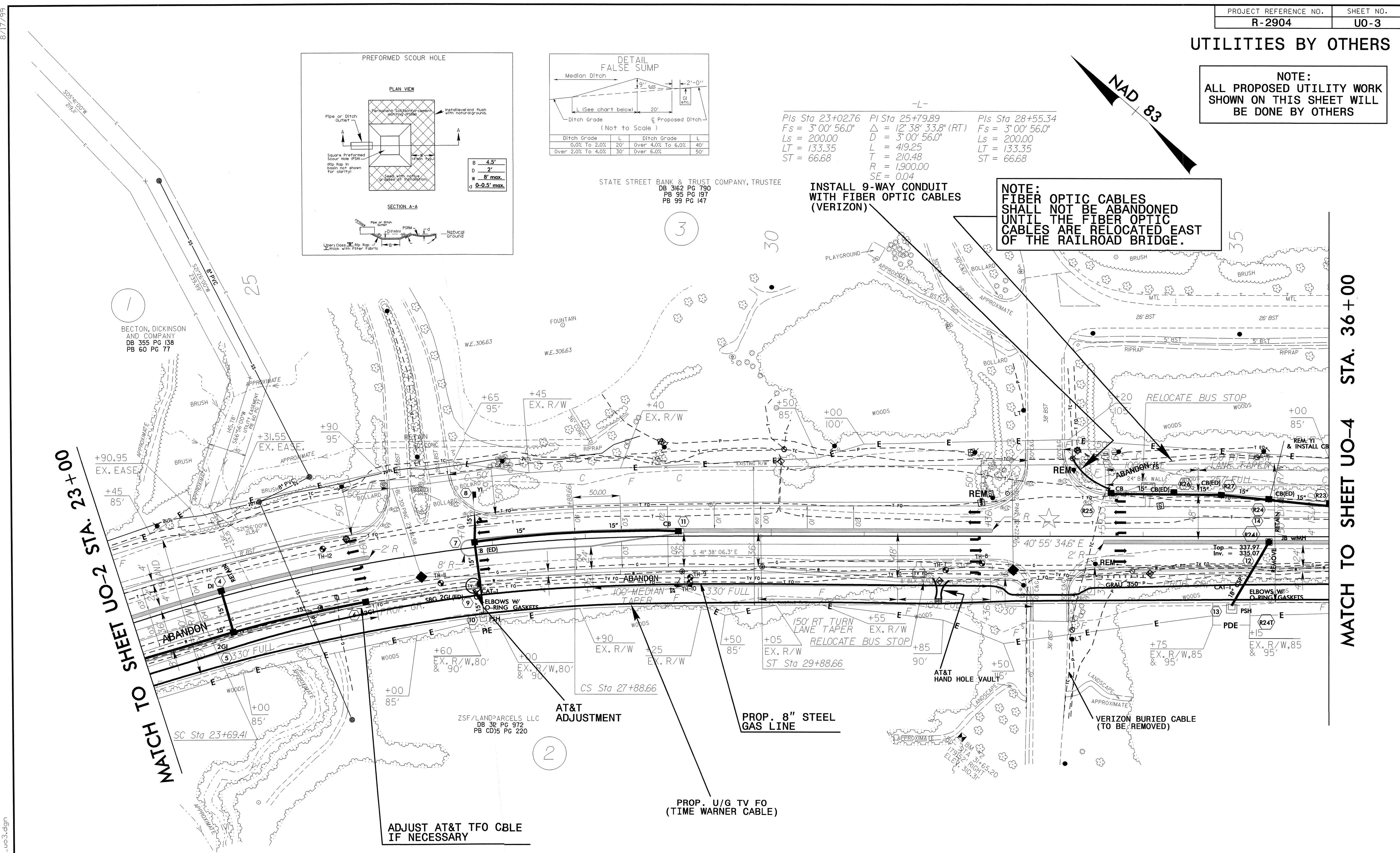
Pls Sta 23+02.76	Pl Sta 25+79.89	Pls Sta 28+55.34
Fs = 3'00'56.0"	Δ = 12'38'33.8" (RT)	Fs = 3'00'56.0"
Ls = 200.00	D = 3'00'56.0"	Ls = 200.00
LT = 133.35	L = 419.25	LT = 133.35
ST = 66.68	T = 210.48	ST = 66.68
	R = 1,900.00	
	SE = 0.04	



STATE STREET BANK & TRUST COMPANY, TRUSTEE  
DB 3162 PG 790  
PB 95 PG 197  
PB 99 PG 147

INSTALL 9-WAY CONDUIT  
WITH FIBER OPTIC CABLES  
(VERIZON)

NOTE:  
FIBER OPTIC CABLES  
SHALL NOT BE ABANDONED  
UNTIL THE FIBER OPTIC  
CABLES ARE RELOCATED EAST  
OF THE RAILROAD BRIDGE.



MATCH TO SHEET UO-2 STA. 23+00

MATCH TO SHEET UO-4 STA. 36+00

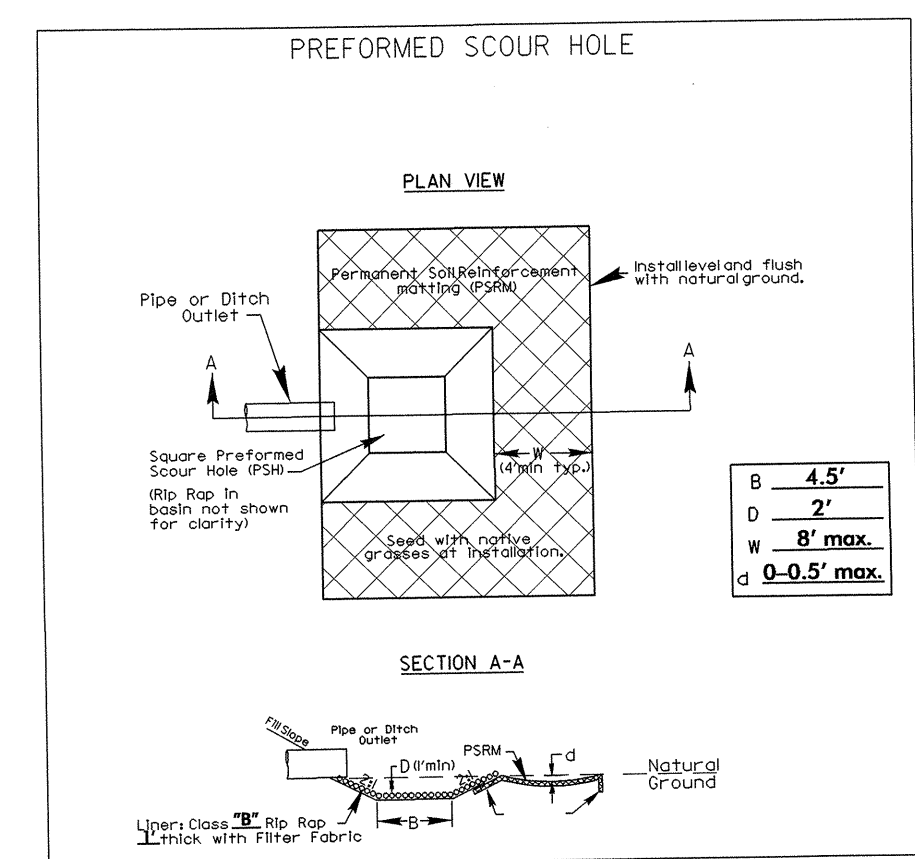
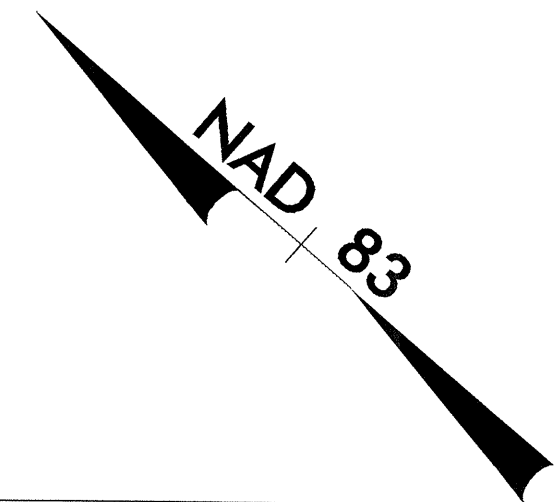
REVISIONS

07 JUN 2006 15:19 U:\A\Prj\2904\UO-3.dgn

☆ EXIST. SIGNAL  
FOR -L- PROFILE SEE SHEET 8  
PSH: PREFORMED SCOUR HOLE (SEE DETAIL)  
SBG: SHOULDER BERM GUTTER

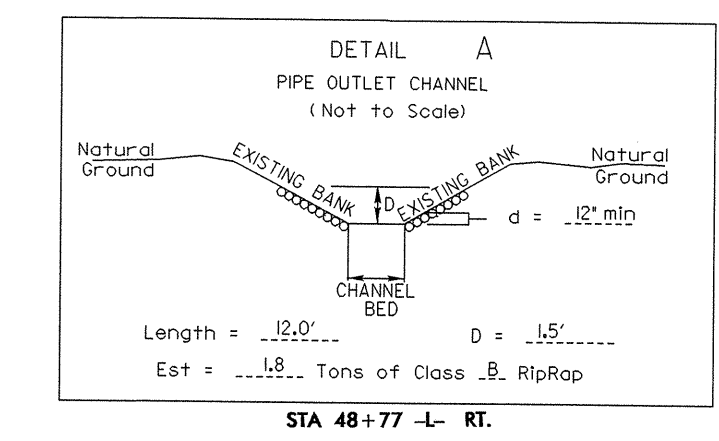
UTILITIES BY OTHERS

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



-L-  
Pls Sta 48+33.92  
Fs = 3' 00" 56.0"  
Ls = 200.00  
LT = 133.35  
ST = 66.68

DENOTES FILL IN SURFACE WATER

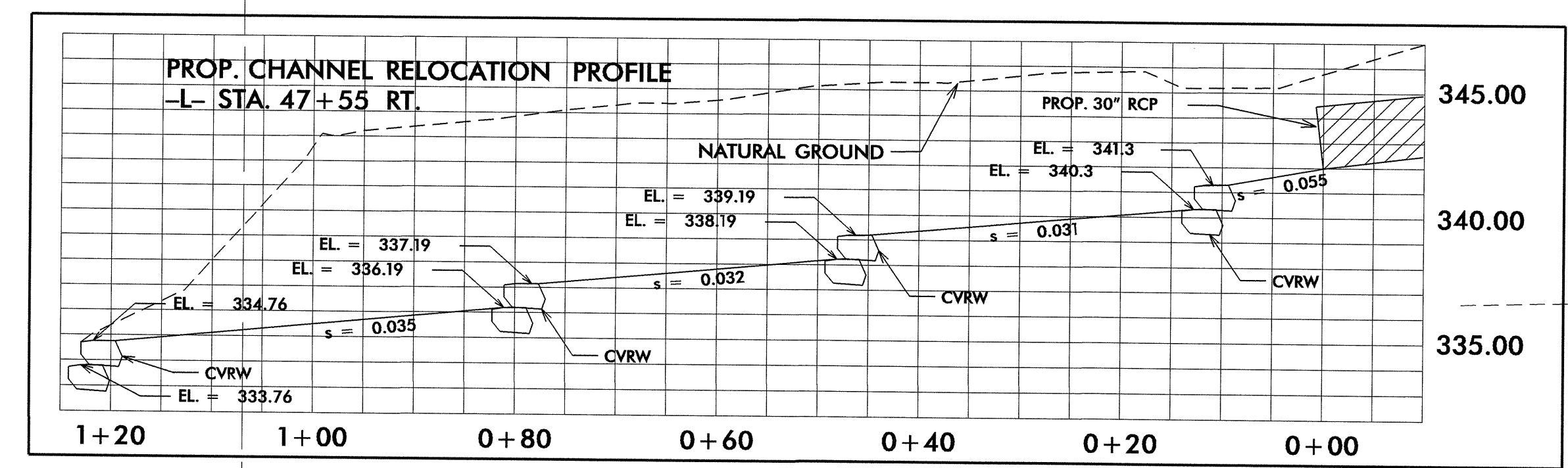
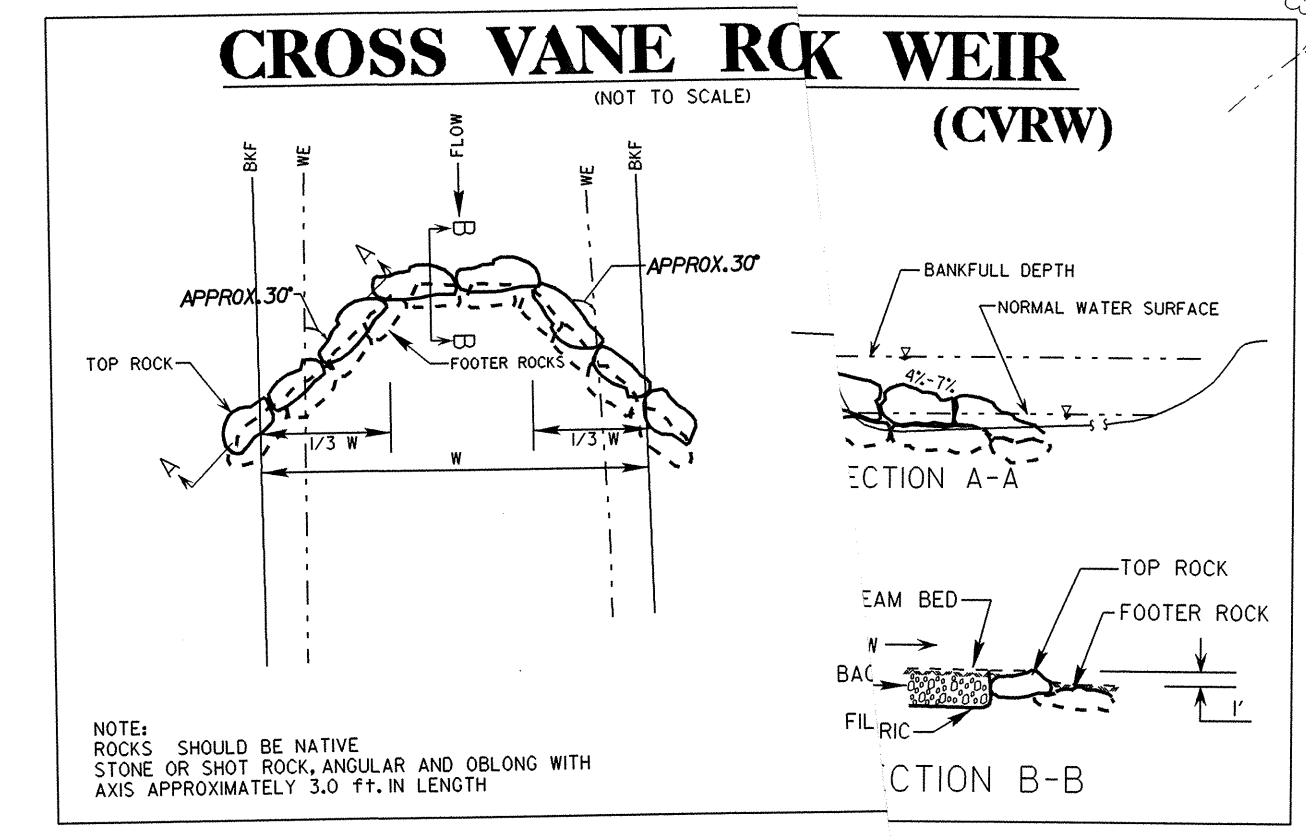
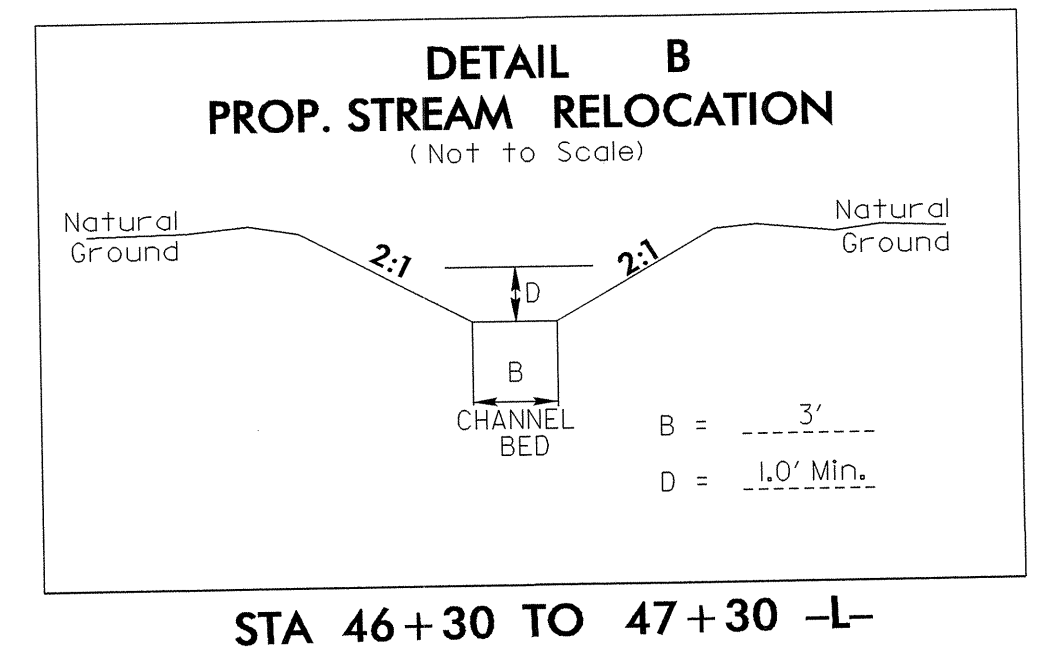
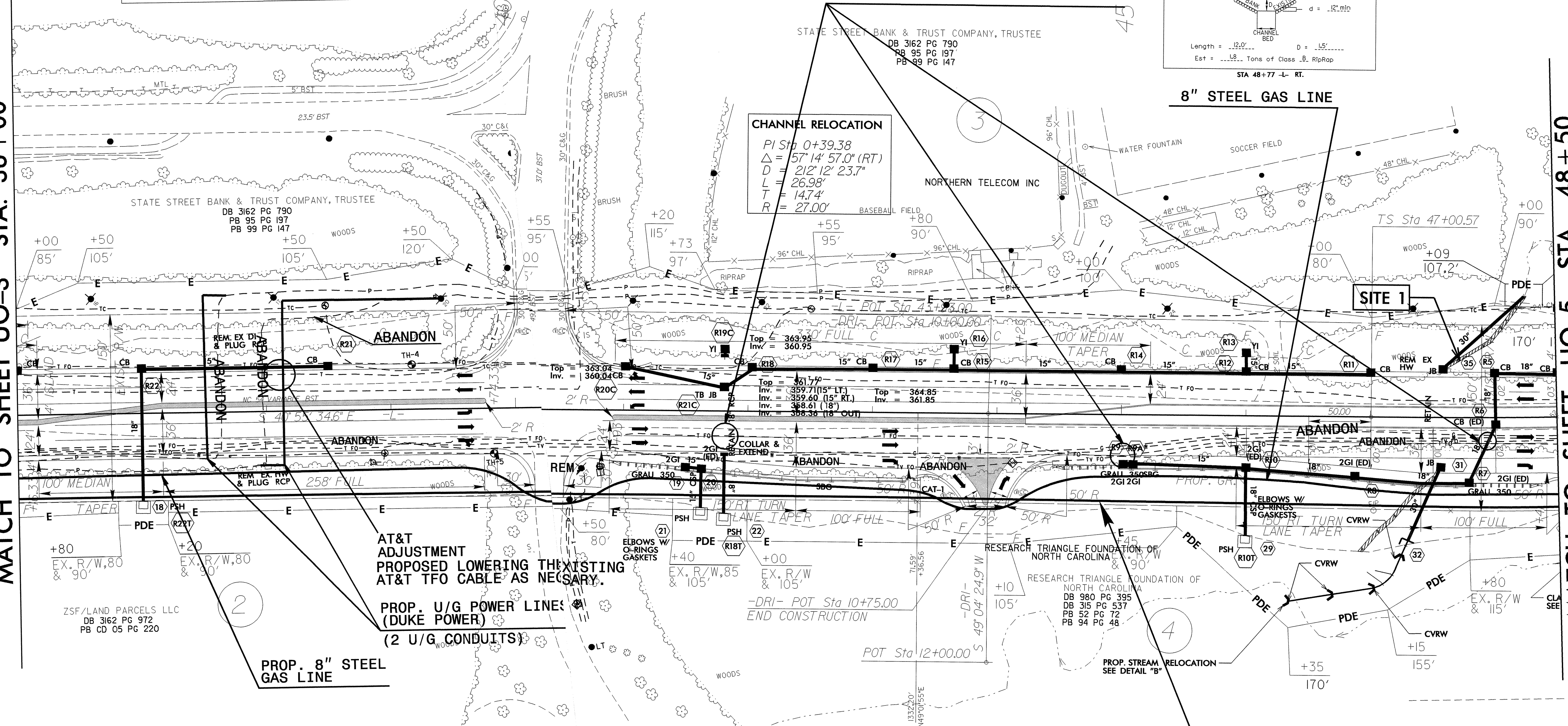


AT&T ADJUSTMENT  
PROPOSED LOWERING THE EXISTING  
AT&T TFO CABLE AS NECESSARY

CHANNEL RELOCATION  
Pls Sta 0+39.38  
 $\Delta = 57' 14" 57.0" (RT)$   
 $D = 212' 12" 23.7"$   
 $L = 26.98'$   
 $T = 147.4'$   
 $R = 27.00'$

MATCH TO SHEET UO-3 STA. 36+00

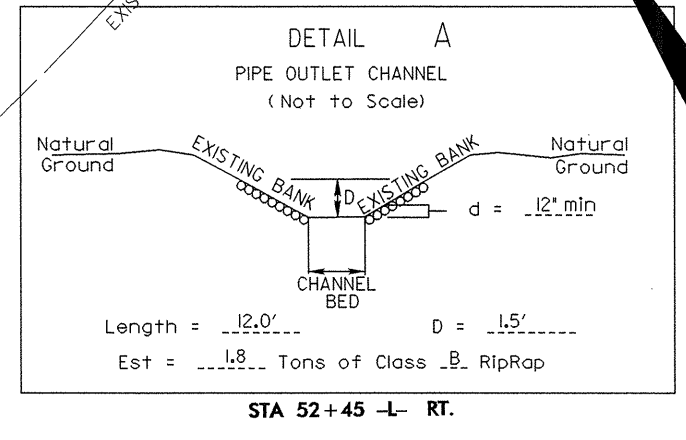
MATCH TO SHEET UO-5 STA. 48+50



8/17/99  
07-JUN-2006 15:22  
R:\Utilities\2904\UO4.DGN  
R:\Utilities\2904\UO4.DGN  
R:\Utilities\2904\UO4.DGN

### UTILITIES BY OTHERS

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



§ DENOTES FILL IN SURFACE WATER

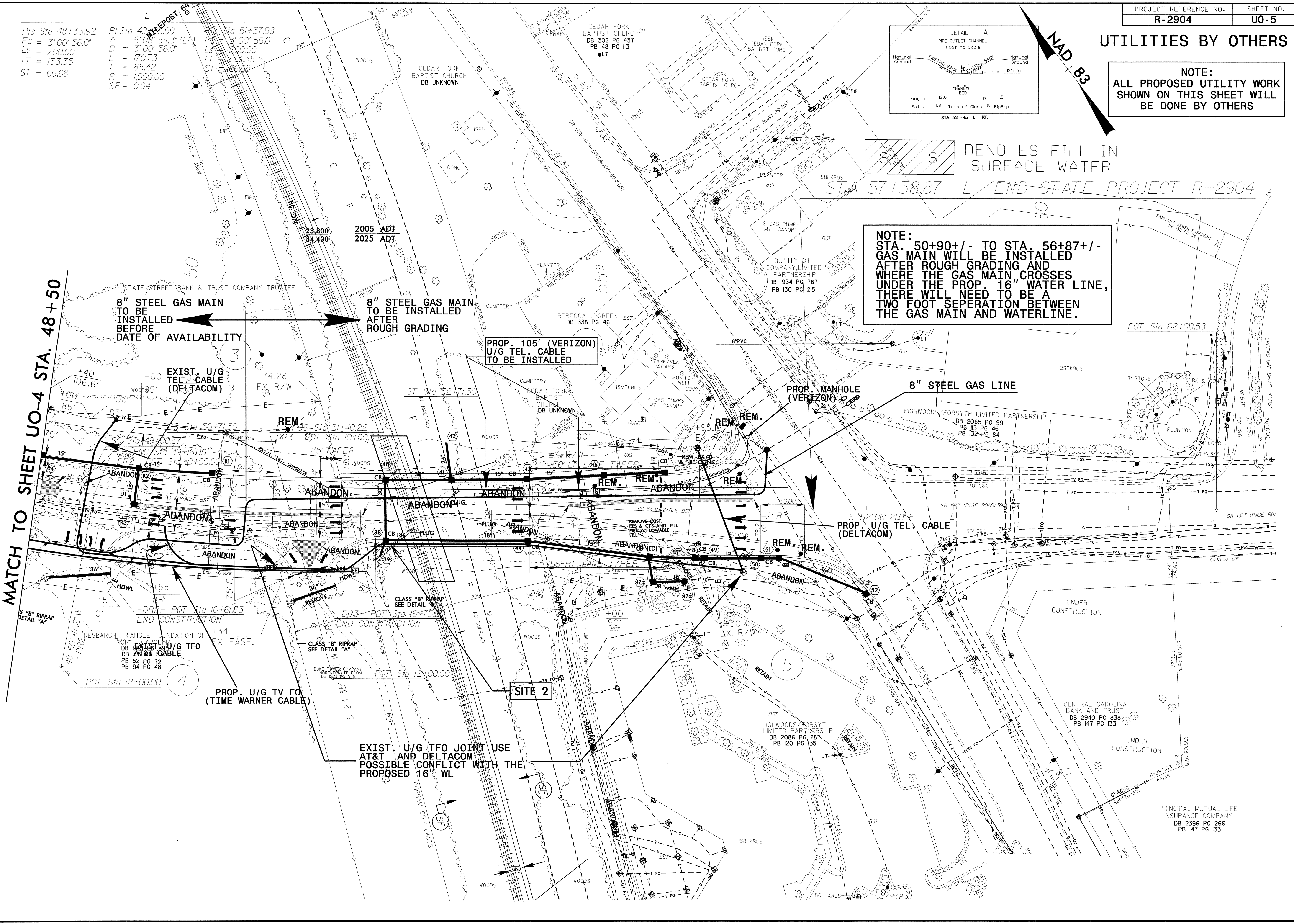
STA 57+38.87 -L- END STATE PROJECT R-2904

**NOTE:**  
STA. 50+90+/- TO STA. 56+87+/- GAS MAIN WILL BE INSTALLED AFTER ROUGH GRADING AND WHERE THE GAS MAIN CROSSES UNDER THE PROP. 16" WATER LINE, THERE WILL NEED TO BE A TWO FOOT SEPARATION BETWEEN THE GAS MAIN AND WATERLINE.

Pls Sta 48+33.92  
Fs = 3°00'56.0"  
Ls = 200.00  
LT = 133.35  
ST = 66.68

Pl Sta 49+36.99  
Δ = 5°08'54.3" (LT)  
D = 3°00'56.0"  
L = 170.73  
R = 85.42  
T = 1900.00  
SE = 0.04

Pl Sta 51+37.98  
Fs = 3°00'56.0"  
Ls = 200.00  
LT = 133.35  
ST = 66.68



MATCH TO SHEET UO-4 STA. 48+50

07-JUN-2006 15:23  
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PRINCIPAL MUTUAL LIFE INSURANCE COMPANY  
DB 2396 PG 266  
PB 147 PG 133