

TIP PROJECT: B-3919

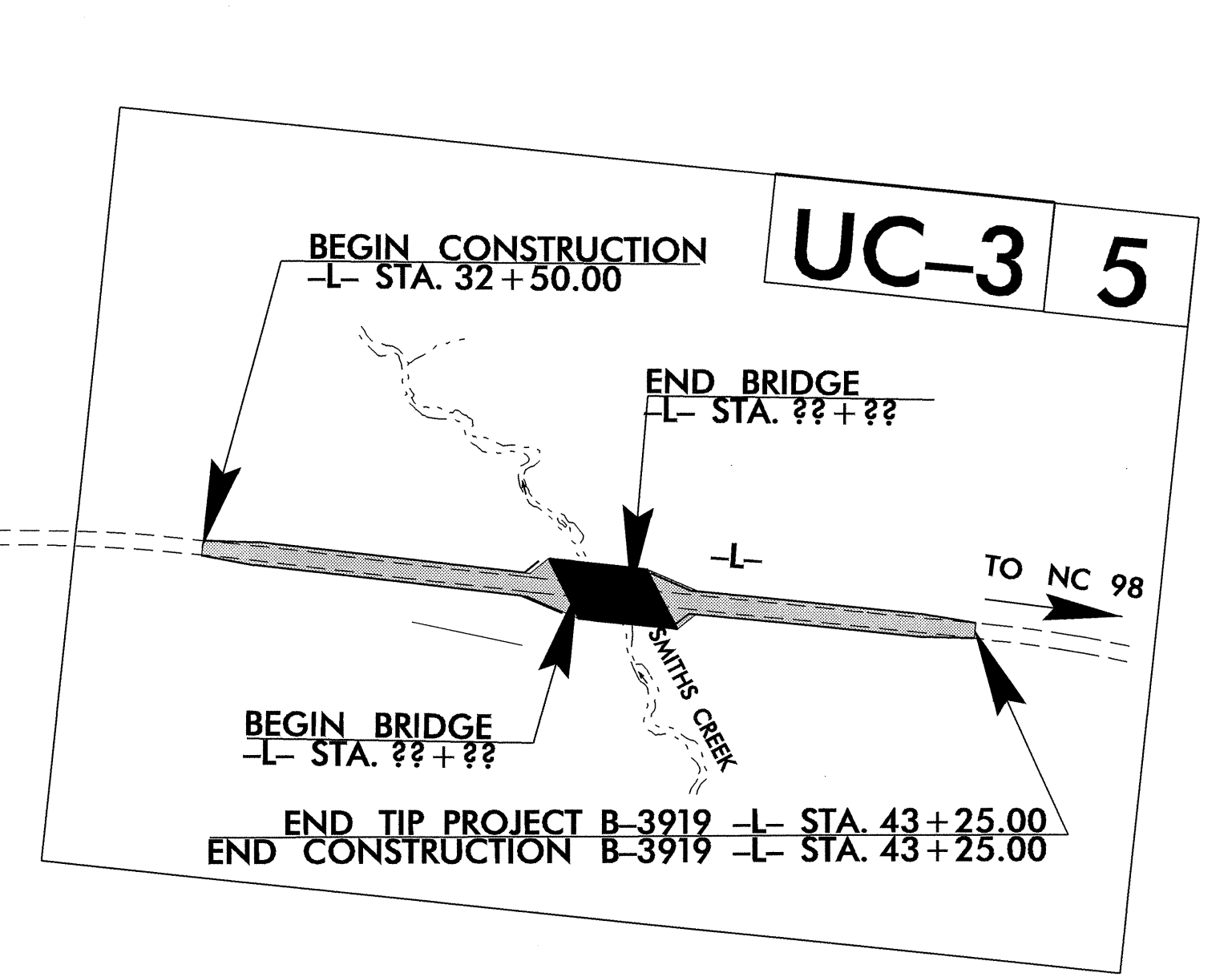
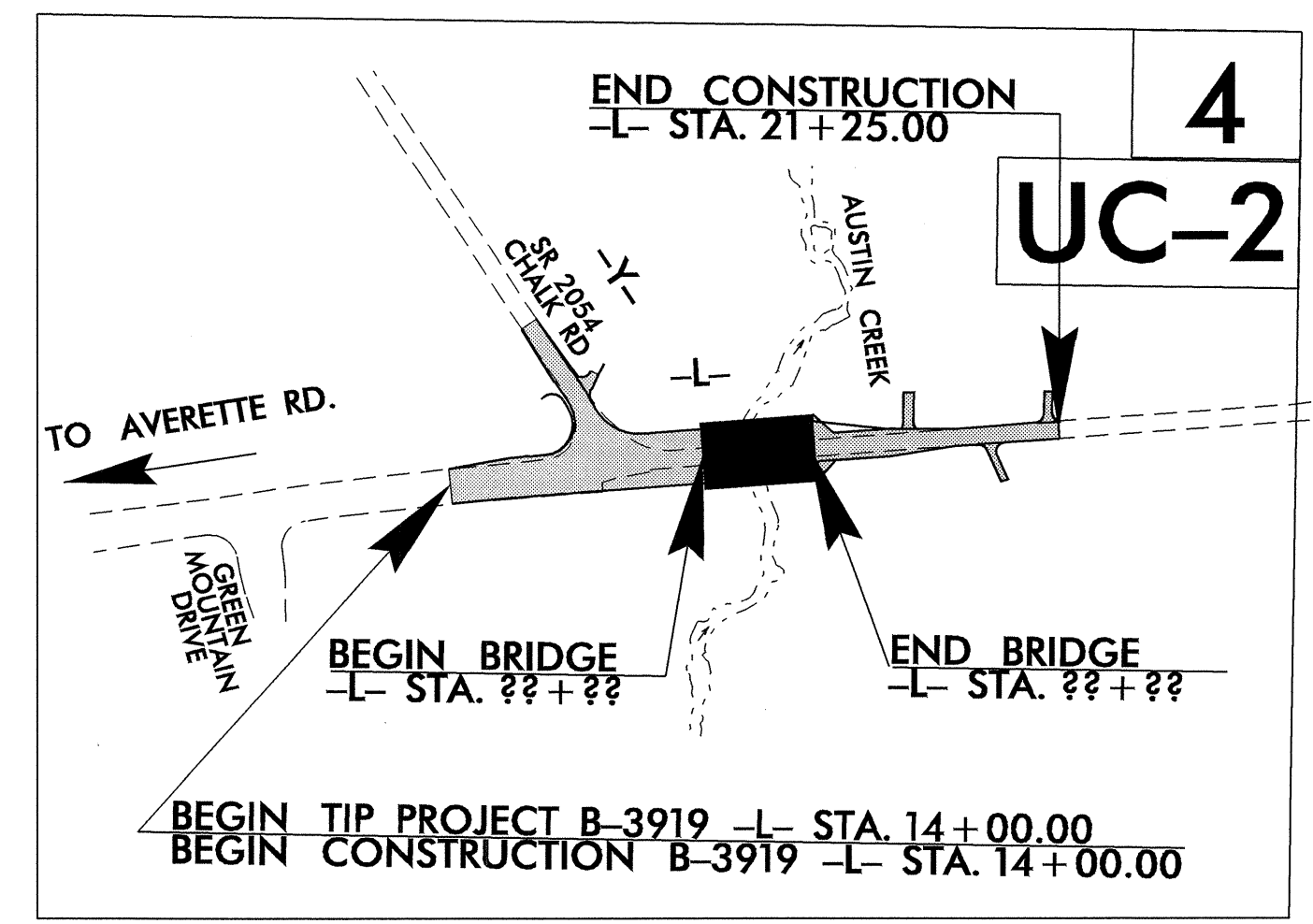
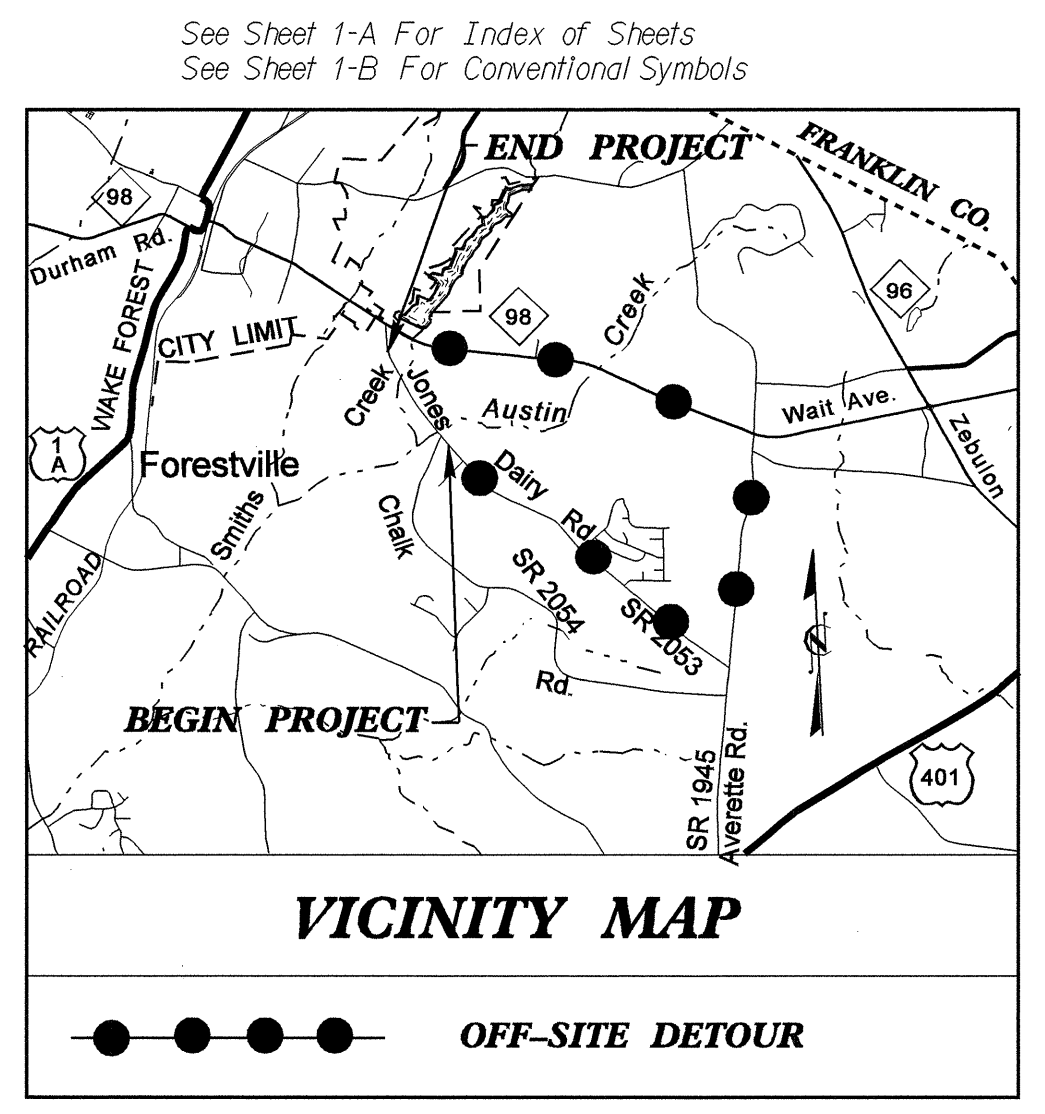
T.I.P. NO.	SHEET NO.
B-3919	UC-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

**UTILITY CONSTRUCTION PLANS
WAKE COUNTY**

**LOCATION: BRIDGE NO. 448 OVER AUSTIN CREEK AND
BRIDGE NO. 140 OVER SMITHS CREEK AND
APPROACHES ON SR 2053 (JONES DAIRY RD.)**

TYPE OF WORK: UTILITIES



ATTENTION CONTRACTORS

The **Construction Contractor** responsible for the extension of water, sewer, and/or reuse, as approved in these plans, is responsible for **contacting** the **Public Works Department** at (919) 831-6810, and the **Public Utilities Department** at (919) 857-4540 at least **twenty four hours** prior to beginning any of their construction.

Failure to notify both **City Departments** in advance of beginning construction, will result in the issuance of **monetary fines**, and require reinstallation of any water or sewer facilities not inspected as a result of this notification failure.

Failure to call for **Inspection, Install a Downstream Plug**, have **Permitted Plans** on the **Jobsite**, or any other **Violation of City of Raleigh Standards** will result in a **Fine and Possible Exclusion** from future work in the **City of Raleigh**.

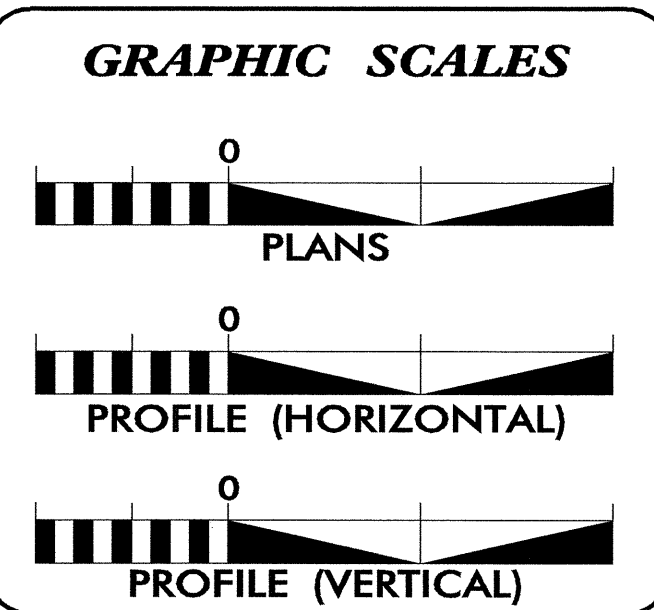
Public
Water Collection / Extension System

The City of Raleigh consents to the connection and extension of the City's public water system as shown on this plan. The material and Construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook.

City of Raleigh
Public Utilities Department Permit # W-2891

Authorization to Construct Jamshid Hafshejani

Date 9/1/09

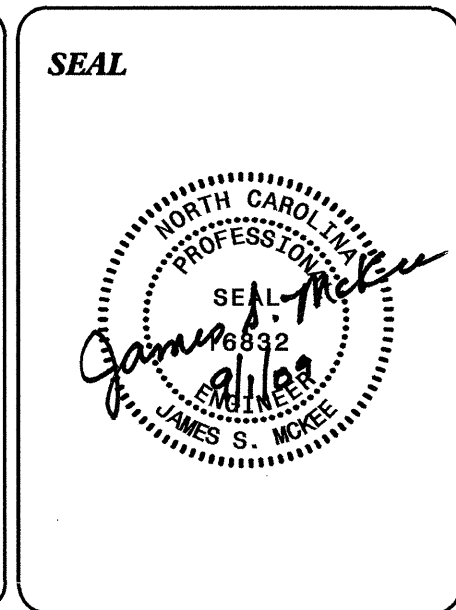


INDEX OF SHEETS

SHEET NO.	DESCRIPTION
UC-1	TITLE SHEET
UC-2 THRU UC-3	UTILITY CONSTRUCTION PLAN SHEETS
UC-4	DETAILS SHEET(S)

WATER AND SEWER OWNERS ON PROJECT

(1) WATER: CITY OF RALEIGH
(2) SANITARY SEWER: CITY OF RALEIGH



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

1591 MAIL SERVICES CENTER
RALEIGH NC 27699-1591
PHONE (919) 259-4128
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

01-SEP-2009 13:55
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\$\$\$\$\$USERNAME\$\$\$\$\$

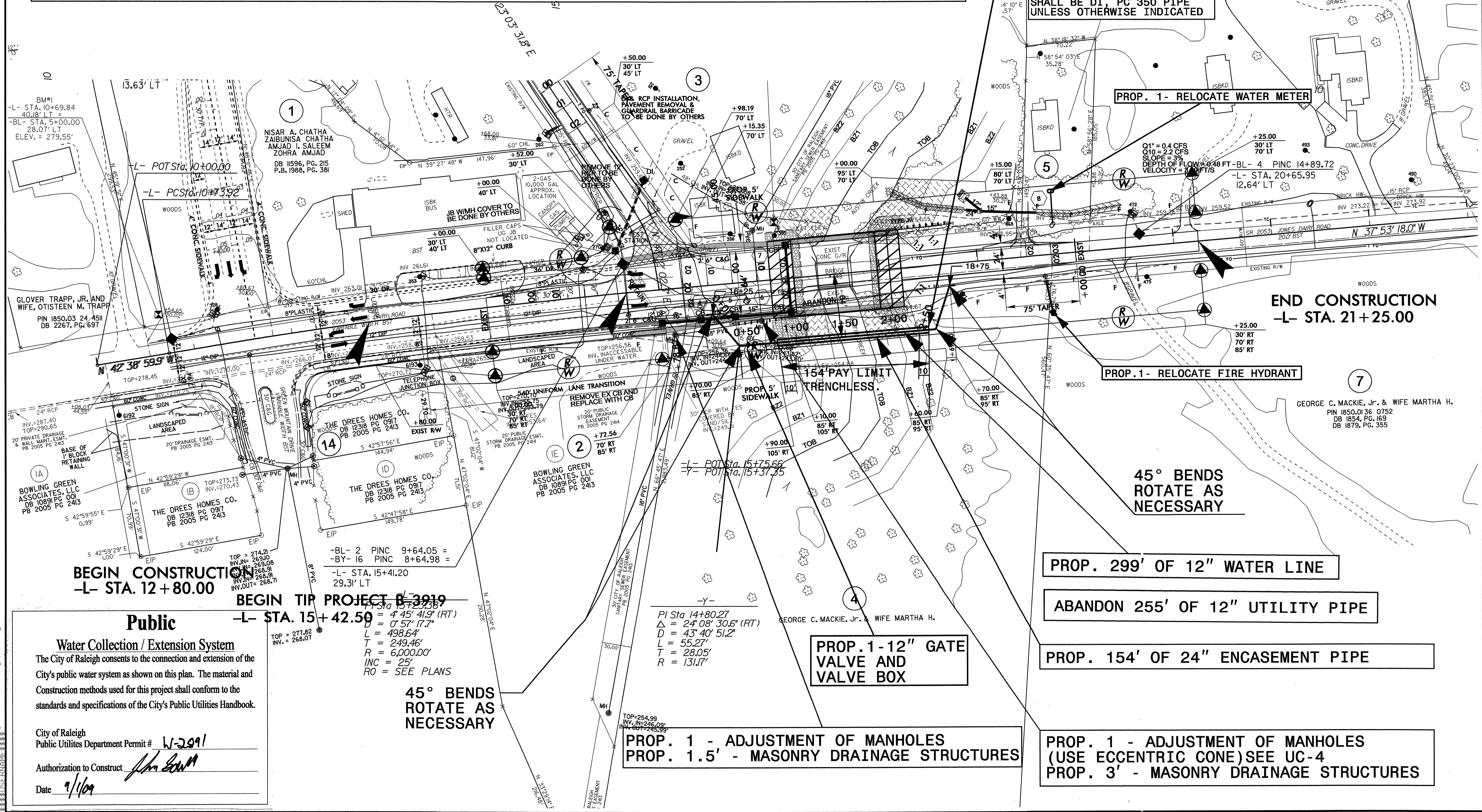
5/14/2009

Note:
 Subaqueous lines (trenchless) must be replaced at a depth of
 1: Five feet (5') minimum below the lowest depth of creek.
 2: Three feet (3') minimum below the wet land and in the other areas.

PROP. 77' - TRENCHLESS INSTALLATION OF 24" ENCASEMENT IN SOIL
PROP. 77' - TRENCHLESS INSTALLATION OF 24" ENCASEMENT NOT IN SOIL
154' IS THE PAY LIMIT FOR ALL TRENCHLESS INSTALLATION.

PROJECT REFERENCE NO.	SHEET NO.
B-3919	UC-2
DESIGNED BY: JH	
DRAWN BY: JH	
CHECKED BY: JSM	
APPROVED BY: JSM	
REVISOR:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SECTION PHONE: (919) 250-4128 FAX: (919) 250-4119	
UTILITY CONSTRUCTION PLANS ONLY	

Note:
 The Utility company's Contractor's attention is directed to Section 1550, 102 and 107 of the Standard Specifications concerning the trenchless installation.
 No damage is allowed to the wetlands or stream by the trenchless installation.
 The Contractor's Engineer shall design the installation method and provide on-site oversight.



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City of Raleigh
 Public Utilities Department Permit # W-2091
 Authorization to Construct [Signature]
 Date 9/1/09

BEGIN TIP PROJECT B-3919
 -L- STA. 15+42.50 = 4' 45" 41.9' (RT)
 D = 0' 57" 17.7'
 L = 498.64'
 T = 249.46'
 R = 6,000.00'
 INC = 25'
 RO = SEE PLANS

45° BENDS ROTATE AS NECESSARY

Pi Sta. 14+80.27
 Δ = 24' 08" 30.6' (RT)
 D = 43' 40" 51.2'
 L = 55.27'
 T = 28.05'
 R = 131.7'

PROP. 1 - ADJUSTMENT OF MANHOLES
PROP. 1.5' - MASONRY DRAINAGE STRUCTURES

PROP. 299' OF 12" WATER LINE

ABANDON 255' OF 12" UTILITY PIPE

PROP. 154' OF 24" ENCASEMENT PIPE

PROP. 1 - ADJUSTMENT OF MANHOLES (USE ECCENTRIC CONE) SEE UC-4
PROP. 3' - MASONRY DRAINAGE STRUCTURES

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5/14/99
09-SEP-2009 14:02
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\$\$\$\$\$BURNED\$\$\$\$\$

PROJECT REFERENCE NO.	SHEET NO.
B-3919	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	

ABANDON 490' OF 12" UTILITY PIPE

BEGIN CONSTRUCTION
-YI- STA. 11+90.00

UTILITY CONSTRUCTION

PROP. 1 - ADJUSTMENT OF MANHOLE (USE ECCENTRIC CONE) SEE UC-4
PROP. 5' - MASONRY DRAINAGE STRUCTURES

PROP. 1 - ADJUSTMENT OF MANHOLE
PROP. 3' - MASONRY DRAINAGE STRUCTURES

BEGIN CONSTRUCTION
-L- STA. 32+50.00

BEGIN CONSTRUCTION
-L- STA. 35+00.00

END CONSTRUCTION
-DR- STA. 10+66.00 -DR- STA. 10+75.00

END TIP PROJECT B-3919
END CONSTRUCTION
-L- STA. 41+80.00

PROP. 500' OF 12" WATER LINE

45° BENDS ROTATE AS NECESSARY

45° BENDS ROTATE AS NECESSARY

178' PAY LIMIT TRENCHLESS

PI Sta 31+29.48
Δ = 6' 38" 47.8" (RT)
D = 2' 5" 53.2"
L = 232.0'
T = 116.14'
R = 2,000.00'

PI Sta 38+32.70
Δ = 0' 35" 42.1" (LT)
D = 0' 17" 11.3"
L = 207.70'
T = 103.85'
R = 20,000.00'
INC = 25'
RO = SEE PLANS

PROP. 1-12" GATE VALVE AND VALVE BOX

PROP. 178' OF 24" ENCASEMENT PIPE

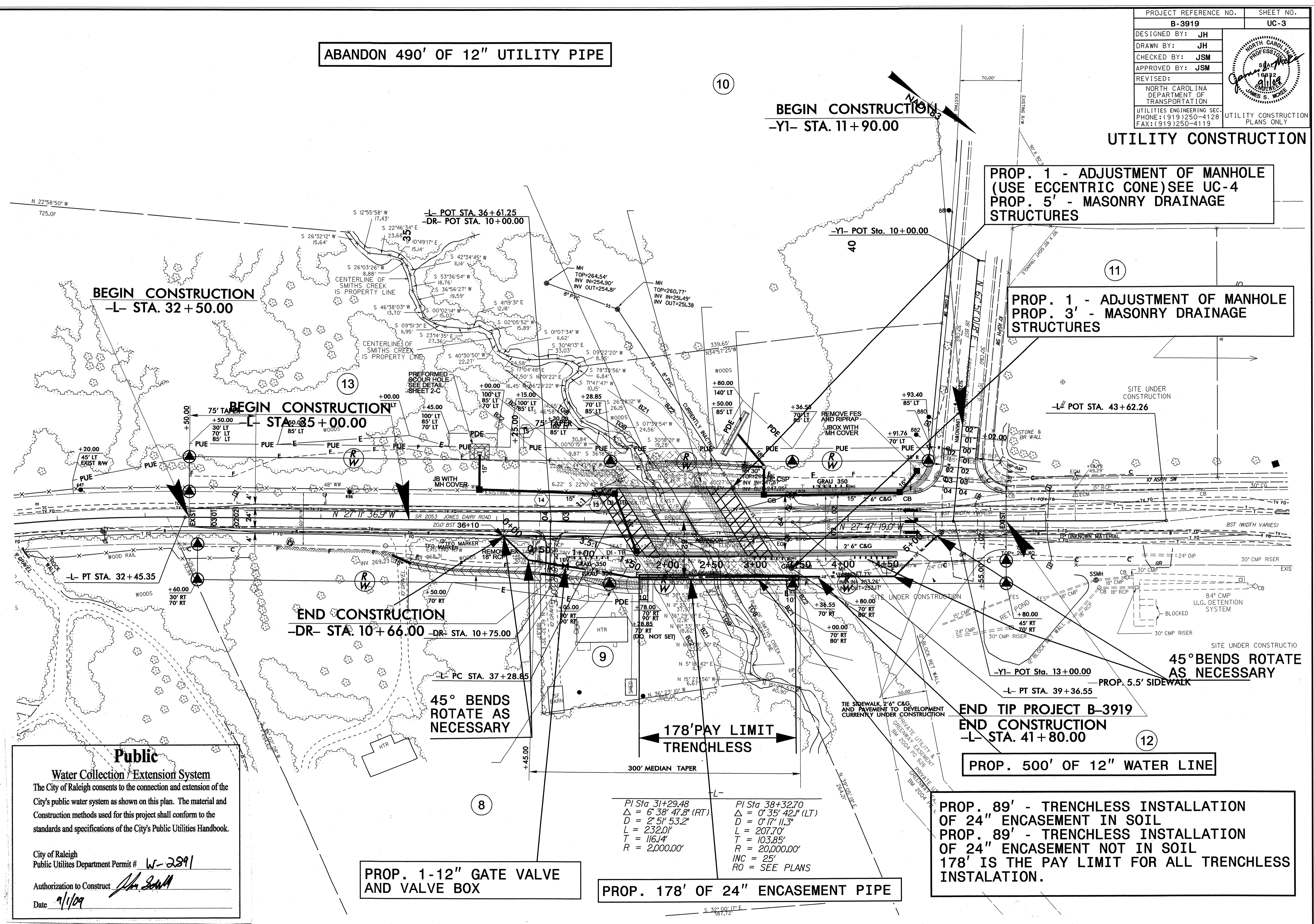
PROP. 89' - TRENCHLESS INSTALLATION OF 24" ENCASEMENT IN SOIL
PROP. 89' - TRENCHLESS INSTALLATION OF 24" ENCASEMENT NOT IN SOIL
178' IS THE PAY LIMIT FOR ALL TRENCHLESS INSTALLATION.

Public
Water Collection / Extension System
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City of Raleigh
Public Utilities Department Permit # **W-2891**

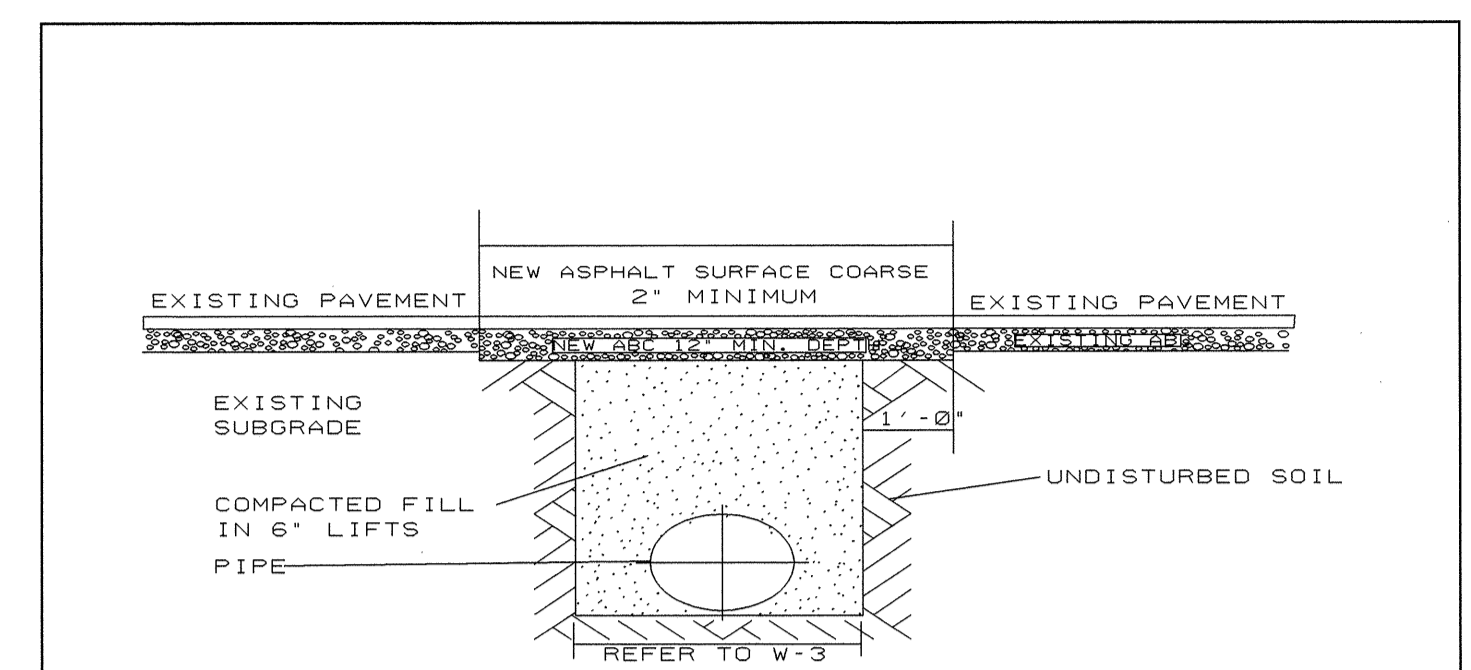
Authorization to Construct *JH*

Date **7/1/09**



PROJECT REFERENCE NO.	B-3919	SHEET NO.	UC-4
DESIGNED BY:	JH		
DRAWN BY:	JH		
CHECKED BY:	JSM		
APPROVED BY:	JSM		
REVISED:			
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION		UTILITIES CONSTRUCTION PLANS ONLY	
Utilities Eng. Sec. PHONE: (919) 250-4128 FAX: (919) 250-4119			

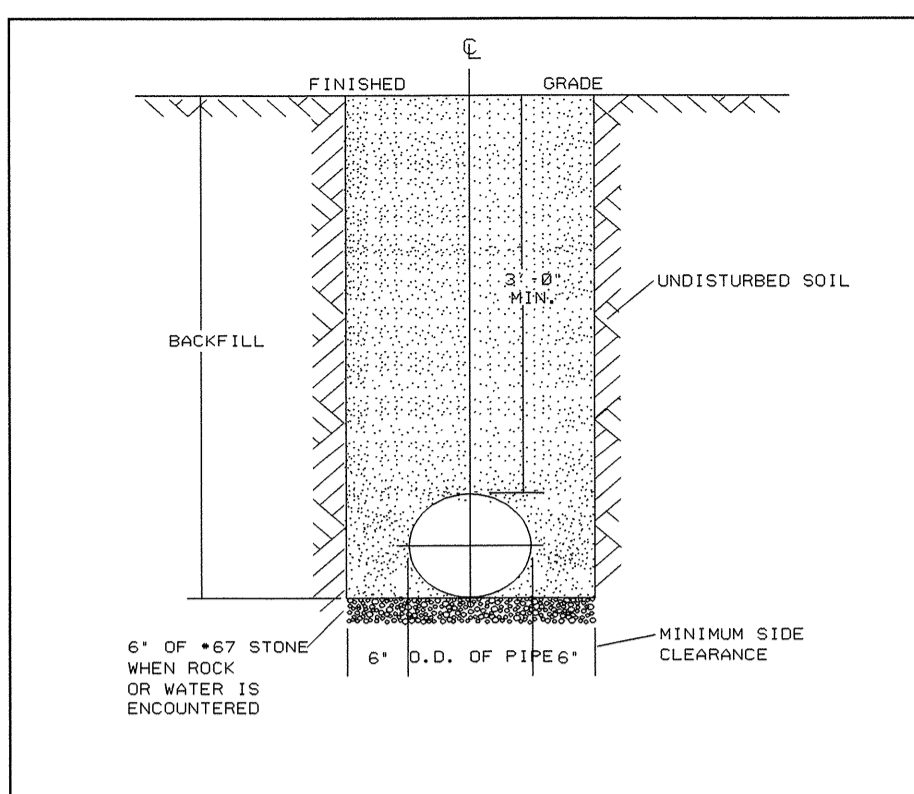
UTILITY CONSTRUCTION



NOTES:

1. THE PAVEMENT CUT SHALL BE DEFINED BY A STRAIGHT EDGE AND CUT WITH AN APPROVED SAW CUT MACHINE.
2. THE TRENCH SUBGRADE MATERIAL SHALL BE BACKFILLED WITH SUITABLE MATERIAL AND COMPACTED TO A DENSITY OF AT LEAST 90% OF THAT OBTAINED BY COMPACTING A SAMPLE OF THE MATERIAL IN ACCORDANCE WITH ASHTO T-99 AS MODIFIED BY NCDOT.
3. THE FINAL 1" OF FILL SHALL CONSIST OF ABC MATERIAL COMPACTED TO A DENSITY EQUAL TO 100% OF THAT OBTAINED BY COMPACTING A SAMPLE OF THE MATERIAL IN ACCORDANCE WITH ASHTO T-99 AS MODIFIED BY NCDOT.
4. THE ENTIRE THICKNESS/ VERTICAL EDGE OF CUT SHALL BE TACKED.
5. THE SAME DEPTH OF PAVEMENT MATERIAL WHICH EXISTS SHALL BE REINSTALLED, BUT IN NO CASE SHALL THE ASPHALT BE LESS THAN 2" THICK.
6. THE ASPHALT PAVEMENT MATERIAL SHALL BE INSTALLED AND COMPACTED THOROUGHLY WITH A SMOOTH DRUM ROLLER TO ACHIEVE A SMOOTH LEVEL PATCH.
7. REFER TO CITY OF RALEIGH STANDARDS FOR TRENCHES AND PIPE BEDDING, W-3, FOR ADDITIONAL DETAILS.
8. NO HAND PATCHING ALLOWED.
9. PAVEMENT CUTS WITHIN NCDOT ROW SHALL CONFORM TO THE APPROVED ON SITE ENCROACHMENT PERMIT.

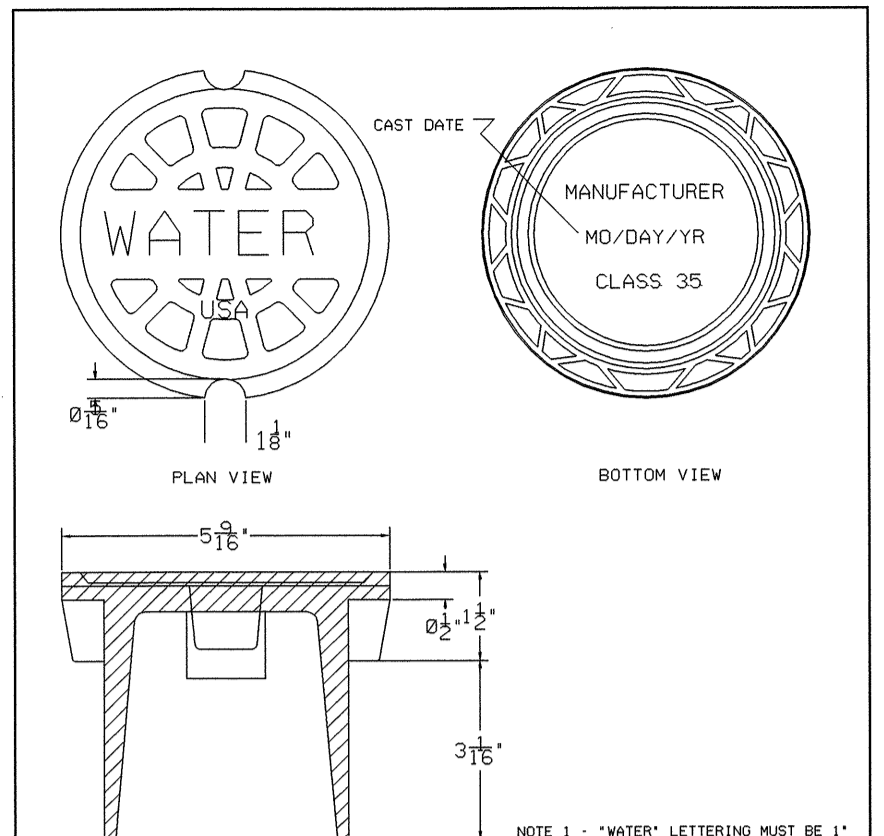
CITY OF RALEIGH DEPARTMENT OF PUBLIC UTILITIES			
STANDARD ASPHALT PAVEMENT PATCH DETAIL			
DWG. NO.	REVISIONS	DATE	REVISIONS
W-2	RRH	3-31-00	A.B.B.
			4-16-04



NOTES:

1. TRENCHES REQUIRING SHORING AND BRACING, DIMENSIONS SHALL BE TAKEN FROM THE INSIDE FACE OF THE SHORING AND BRACING.
2. NO ROCKS OR BOULDERS 4" OR LARGER TO BE USED IN BACKFILL.
3. ALL BACKFILL MATERIAL SHALL BE SUITABLE NATIVE MATERIAL.
4. BACKFILL SHALL BE TAMPED IN LIFTS.
5. ACHIEVE 95% COMPACTION IN BACKFILL.

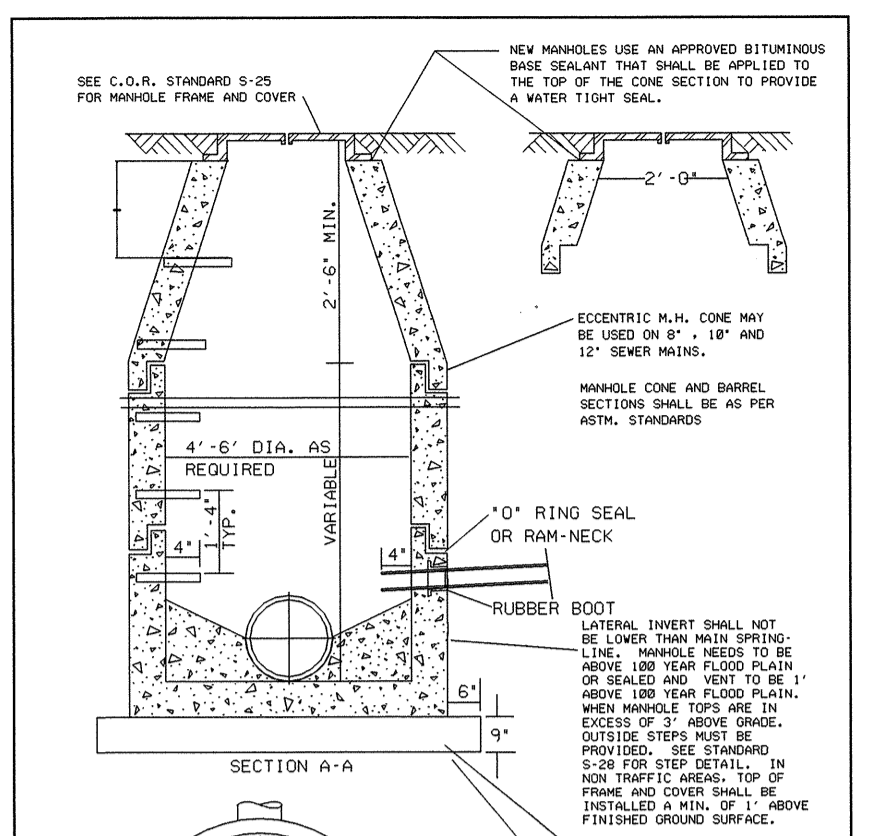
CITY OF RALEIGH DEPARTMENT OF PUBLIC UTILITIES			
5 1/4" VALVE BOX DROP LID 4" SKIRT			
DWG. NO.	REVISIONS	DATE	REVISIONS
W-18	D.W.C.	11-7-94	RRH
			2-14-00



NOTES:

1. "WATER" LETTERING MUST BE 1" HIGHER (RESSED) FLUSH.
2. VALVE COVER SHALL BE DOMESTICALLY CAST.
3. COVER MUST HAVE A MINIMUM WEIGHT OF 25 POUNDS.
4. COVER MUST BE CLASS 35 OR GREATER.
5. COVER MUST MEET OR EXCEED ASHTO H-20 LOAD REQUIREMENTS.

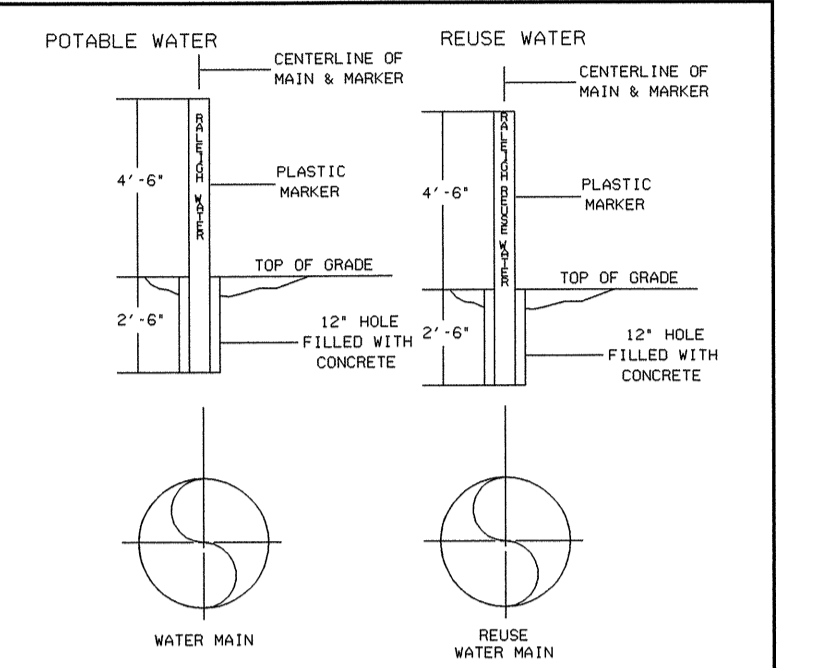
CITY OF RALEIGH DEPARTMENT OF PUBLIC UTILITIES			
STANDARD PRECAST SANITARY SEWER MANHOLE			
DWG. NO.	REVISIONS	DATE	REVISIONS
5-20	RRH	3-30-99	RRH
			3-31-00



NOTES:

1. LATERAL SHEET SHALL NOT BE LOWER THAN MAIN SPRING. "RING" MUST BE 1" ABOVE 180 YEAR FLOOD PLAIN OR BEAD AND MUST BE 1" ABOVE 100 YEAR FLOOD PLAIN. WHEN MANHOLE TOPS ARE ON OR ABOVE 100 YEAR FLOOD PLAIN, OUTSIDE STEPS MUST BE PROVIDED. SEE STANDARD S-38 FOR STEP DETAIL. IN HIGH TRAFFIC AREAS, TOP OF FRAME AND COVER SHALL BE INSTALLED A MIN. OF 1" ABOVE FINISHED GRADE SURFACE.
2. MIN. 9" COMPACTED #57 STONE BASE TO BE INSTALLED.
3. IN HIGH TRAFFIC AREAS, TOP OF FRAME AND COVER SHALL BE INSTALLED A MIN. OF 1" ABOVE FINISHED GRADE SURFACE.

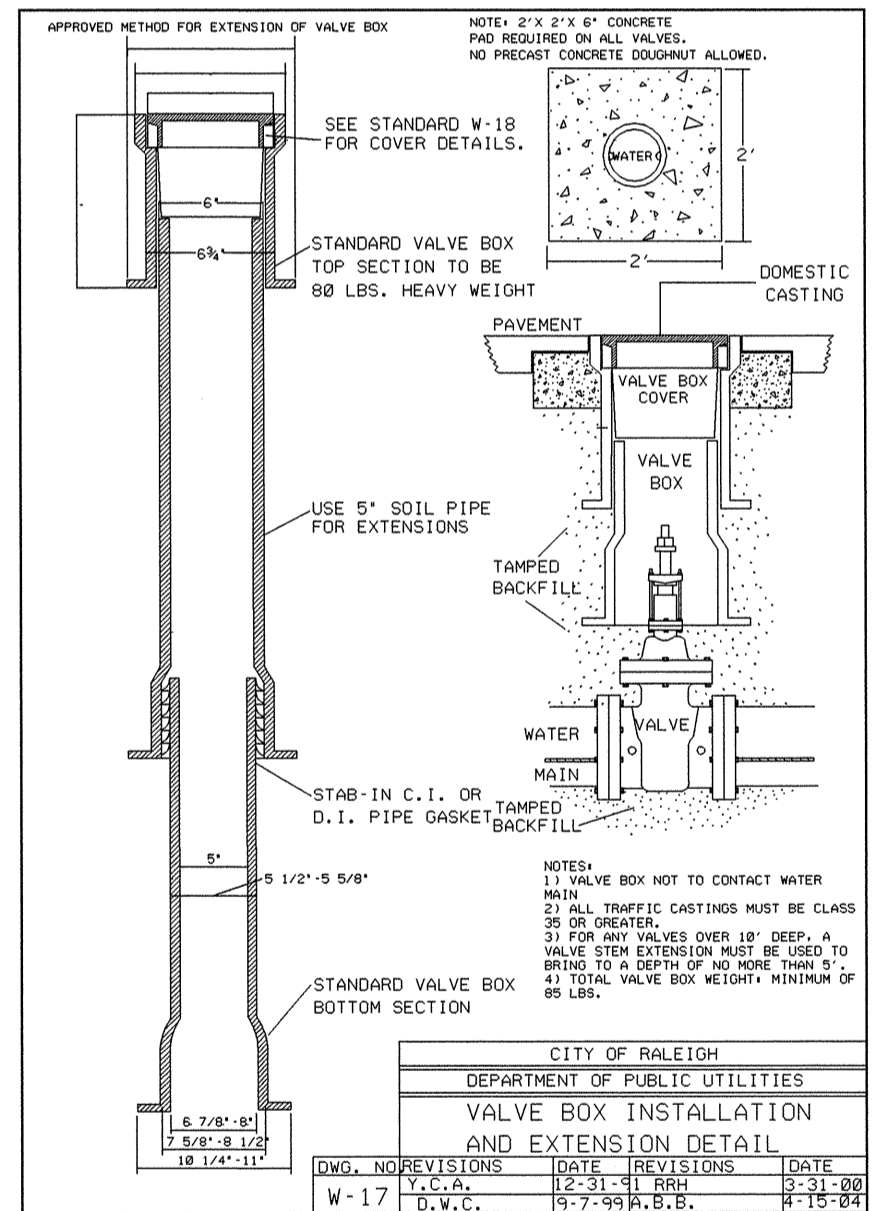
CITY OF RALEIGH DEPARTMENT OF PUBLIC UTILITIES			
STANDARD PRECAST SANITARY SEWER MANHOLE			
DWG. NO.	REVISIONS	DATE	REVISIONS
5-20	RRH	3-30-99	RRH
			3-31-00



NOTES:

1. POTABLE WATER MARKER TO BE BLUE IN COLOR.
2. POTABLE WATER MARKER TO BE LABELED "RALEIGH WATER".
3. REUSE WATER MARKER TO BE PURPLE IN COLOR.
4. REUSE WATER MARKER TO BE LABELED "RALEIGH REUSE WATER".
5. TO BE SPACED EVERY 300 FEET ON EACH SIDE OF ROADWAY OR TRENCH.
6. MARKERS TO BE ROUND AND 4" IN DIAMETER.

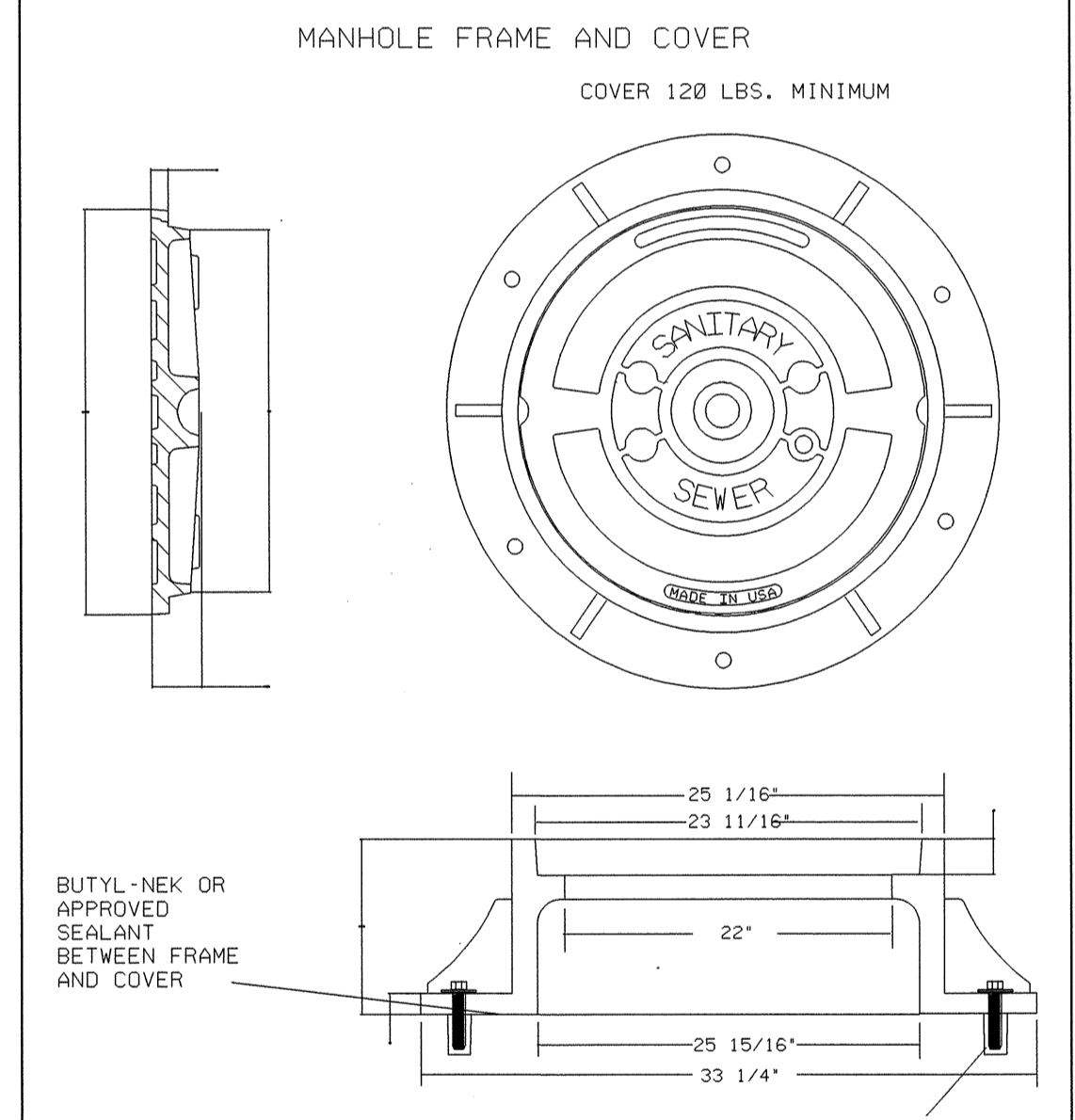
CITY OF RALEIGH DEPARTMENT OF PUBLIC UTILITIES			
STANDARD MAIN & VALVE MARKERS FOR POTABLE & REUSE WATER			
DWG. NO.	REVISIONS	DATE	REVISIONS
W-13	D.W.C.	11-7-94	RRH
			3-31-00



NOTES:

1. VALVE BOX NOT TO CONTACT WATER MAIN.
2. ALL TRAFFIC CASTINGS MUST BE CLASS 35 OR GREATER.
3. IF ANY EXTENSION MUST BE DEEPER THAN 18" FROM VALVE BOX, EXTENSION MUST BE TO A DEPTH OF NO MORE THAN 30" FROM VALVE BOX WITHIN MINIMUM OF 85 LBS.

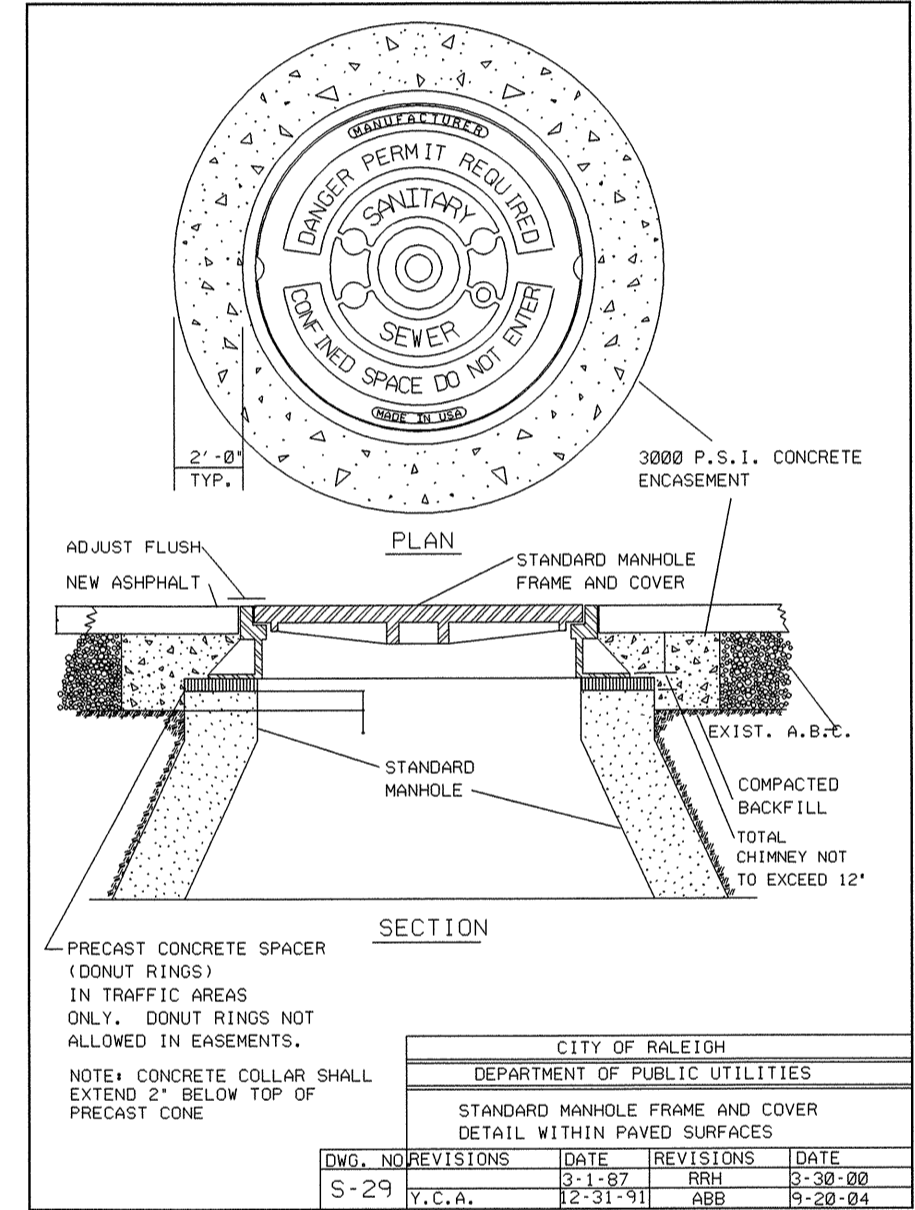
CITY OF RALEIGH DEPARTMENT OF PUBLIC UTILITIES			
VALVE BOX INSTALLATION AND EXTENSION DETAIL			
DWG. NO.	REVISIONS	DATE	REVISIONS
W-17	L.L.A.L.	8-23-01	RRH
			8-31-00
			11-17-00



NOTES:

1. ALL MANHOLE FRAMES SHALL BE DOMESTICALLY CAST.
2. FRAME SHALL BE A MINIMUM WEIGHT OF 182 LBS. WITHIN PUBLIC ROW AND 160 LBS. WITHIN EASEMENTS.
3. COVER SHALL WEIGH A MIN. OF 120 LBS.
4. ALL MANHOLE FRAMES OUTSIDE OF PAVED SURFACES SHALL BE BOLTED TO THE CONE SECTION OR RING WITH A MINIMUM OF 4 BOLTS PER FRAME.

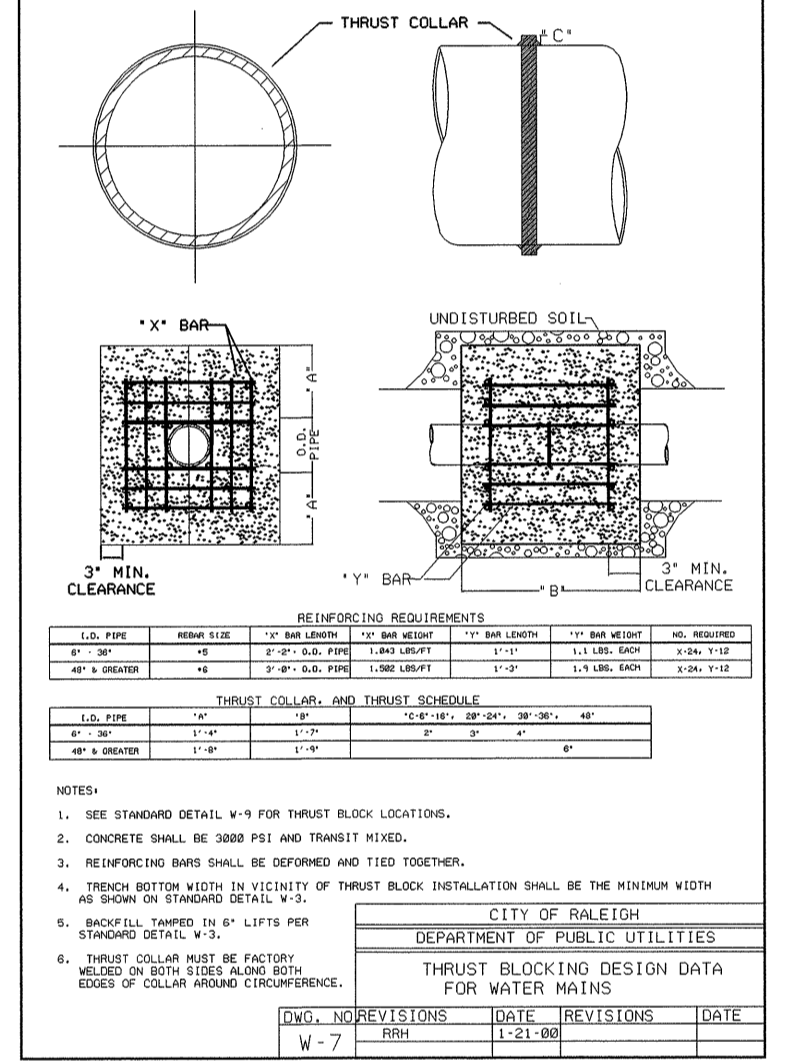
CITY OF RALEIGH DEPARTMENT OF PUBLIC UTILITIES			
STANDARD MANHOLE COVER			
DWG. NO.	REVISIONS	DATE	REVISIONS
S-25	RRH	3-1-87	A.B.B.
			2-9-05
			3-30-00



NOTES:

1. PRECAST CONCRETE SPACER (DONUT RINGS) IN TRAFFIC AREAS ONLY. DONUT RINGS NOT ALLOWED IN EASEMENTS.
2. NOTE: CONCRETE COLLAR SHALL EXTEND 2" BELOW TOP OF PRECAST CONE.

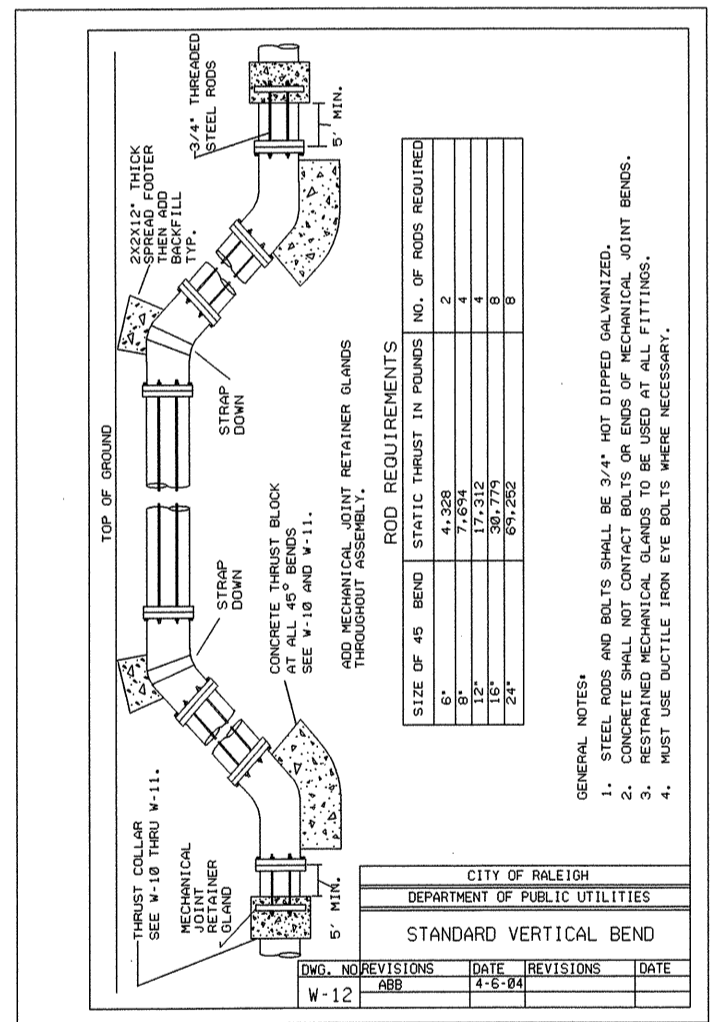
CITY OF RALEIGH DEPARTMENT OF PUBLIC UTILITIES			
STANDARD MANHOLE FRAME AND COVER DETAIL WITHIN PAVED SURFACES			
DWG. NO.	REVISIONS	DATE	REVISIONS
S-29	Y.C.A.	12-31-91	RRH
			5-20-04



NOTES:

1. SEE STANDARD DETAIL W-7 FOR THRUST BLOCK LOCATIONS.
2. CONCRETE SHALL BE 3000 PSI AND THROTTLED.
3. REINFORCING BARS SHALL BE DEFORMED AND TIED TOGETHER.
4. TRENCH BOTTOM WIDTH IN VICINITY OF THRUST BLOCK INSTALLATION SHALL BE THE MINIMUM WIDTH AS SHOWN ON STANDARD DETAIL W-7.
5. BACKFILL TAMPED IN 6" LIFTS PER STANDARD DETAIL W-3.
6. THRUST COLLAR MUST BE FACTORY WELDED ON BOTH SIDES ALONG EDGES OF COLLAR AROUND CIRCUMFERENCE.

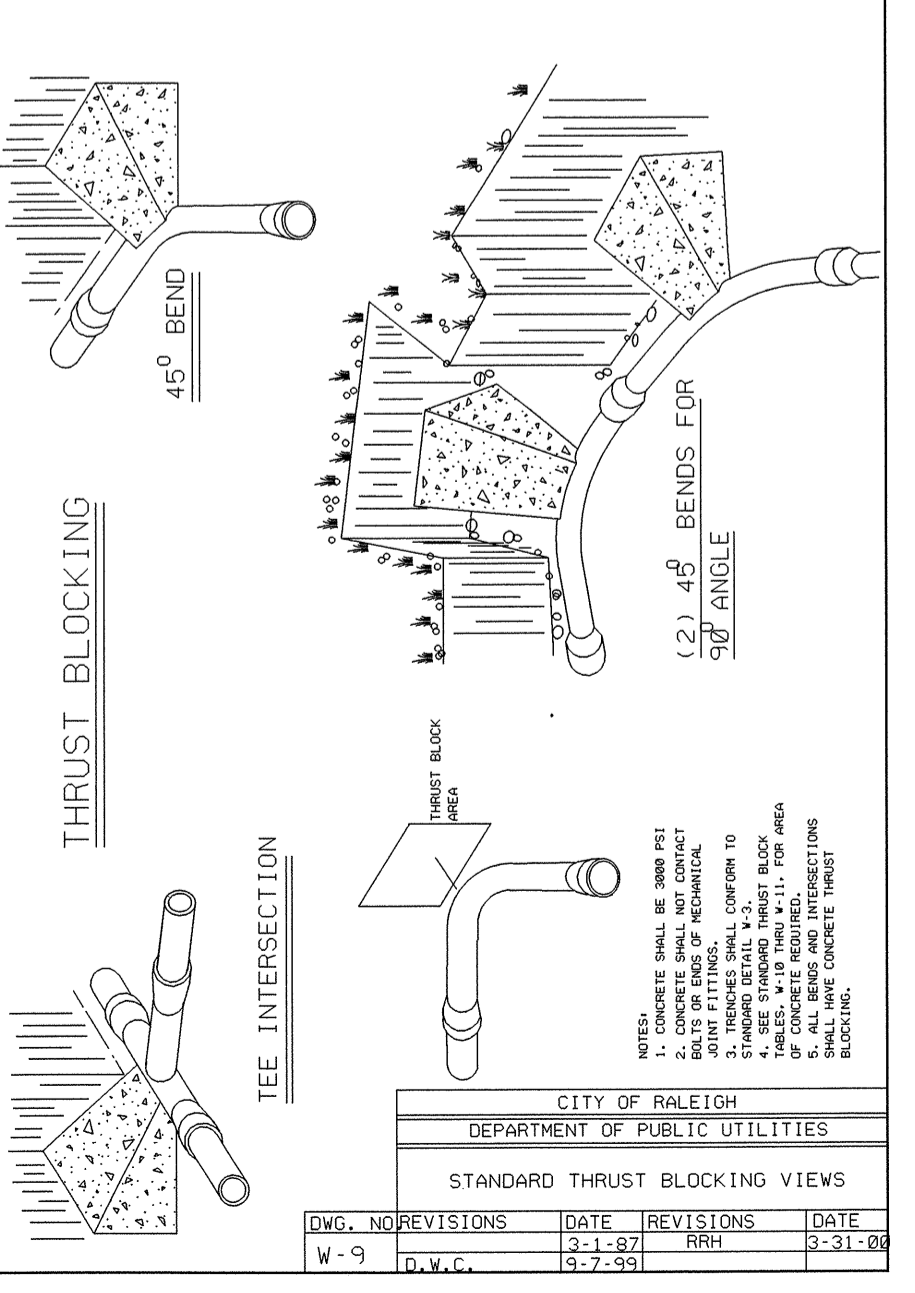
CITY OF RALEIGH DEPARTMENT OF PUBLIC UTILITIES			
THRUST BLOCKING DESIGN DATA FOR WATER MAINS			
DWG. NO.	REVISIONS	DATE	REVISIONS
W-7	RRH	11-21-99	RRH



NOTES:

1. STEEL BARS AND BOLTS SHALL BE 3/4" NOT DIPPED GALVANIZED.
2. CONCRETE SHALL NOT CONTACT BELLY OR EDGE OF MECHANICAL JOINT TRENCH.
3. CONCRETE SHALL BE 3000 PSI AND THROTTLED.
4. MUST USE DUCTILE IRON PIPE FITTINGS (DIPLOM).

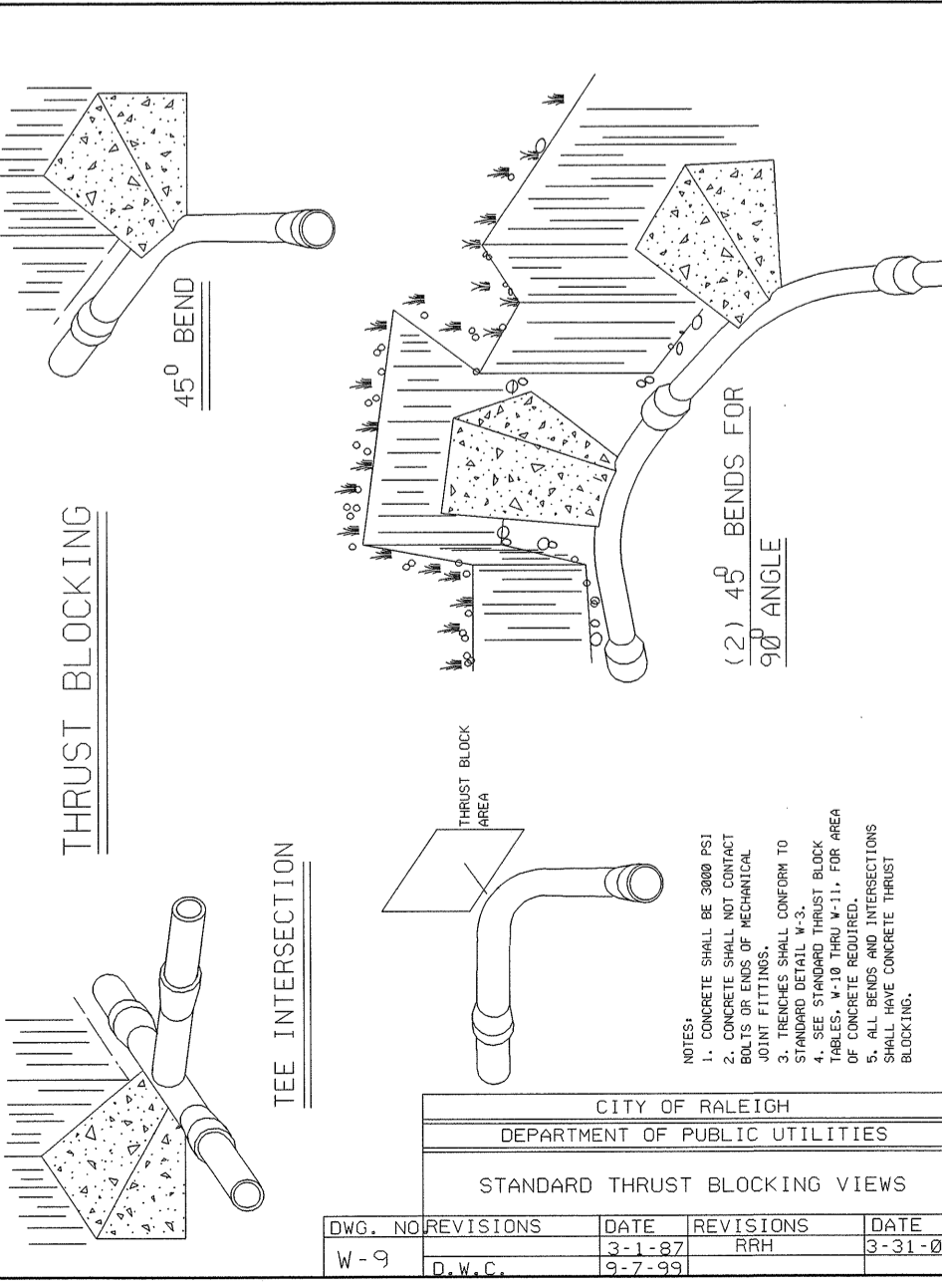
CITY OF RALEIGH DEPARTMENT OF PUBLIC UTILITIES			
STANDARD VERTICAL BEND			
DWG. NO.	REVISIONS	DATE	REVISIONS
W-12	RRH	2-16-98	RRH



NOTES:

1. CONCRETE SHALL BE 3000 PSI.
2. CONCRETE SHALL NOT CONTACT BELLY OR EDGE OF MECHANICAL JOINT TRENCH.
3. CONCRETE SHALL BE 3000 PSI AND THROTTLED.
4. MUST USE DUCTILE IRON PIPE FITTINGS (DIPLOM).

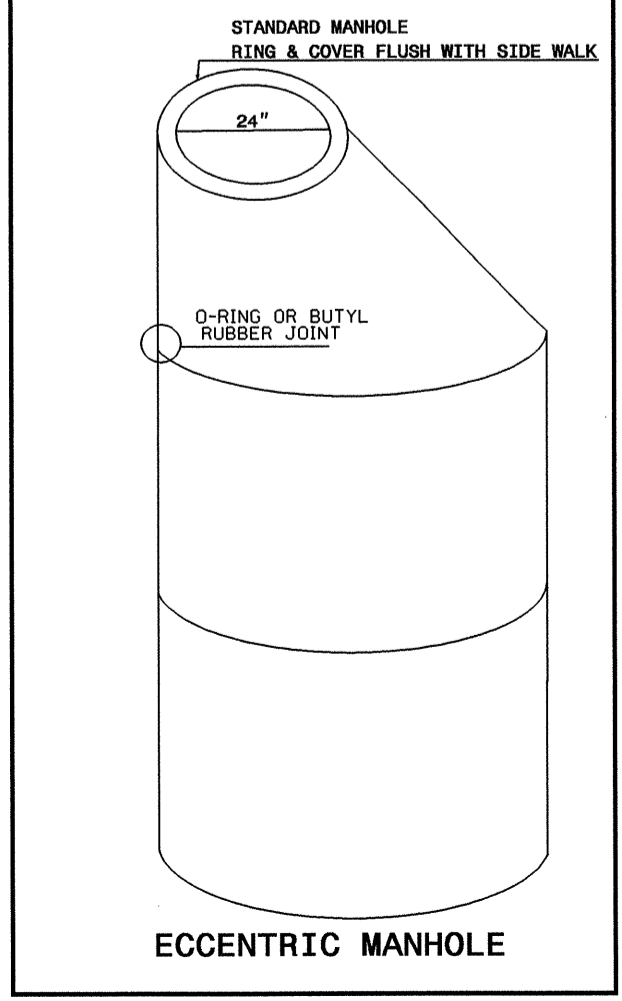
CITY OF RALEIGH DEPARTMENT OF PUBLIC UTILITIES			
STANDARD THRUST BLOCKING VIEWS			
DWG. NO.	REVISIONS	DATE	REVISIONS
W-9	D.W.C.	9-7-99	RRH
			3-31-00



NOTES:

1. CONCRETE SHALL BE 3000 PSI.
2. CONCRETE SHALL NOT CONTACT BELLY OR EDGE OF MECHANICAL JOINT TRENCH.
3. CONCRETE SHALL BE 3000 PSI AND THROTTLED.
4. MUST USE DUCTILE IRON PIPE FITTINGS (DIPLOM).

CITY OF RALEIGH DEPARTMENT OF PUBLIC UTILITIES			
STANDARD THRUST BLOCKING VIEWS			
DWG. NO.	REVISIONS	DATE	REVISIONS
W-9	D.W.C.	9-7-99	RRH
			3-31-00



NOTES:

1. CONCRETE SHALL BE 3000 PSI.
2. CONCRETE SHALL NOT CONTACT BELLY OR EDGE OF MECHANICAL JOINT TRENCH.
3. CONCRETE SHALL BE 3000 PSI AND THROTTLED.
4. MUST USE DUCTILE IRON PIPE FITTINGS (DIPLOM).

CITY OF RALEIGH DEPARTMENT OF PUBLIC UTILITIES			
STANDARD MANHOLE RING & COVER FLUSH WITH SIDE WALK			
DWG. NO.	REVISIONS	DATE	REVISIONS
W-10	D.W.C.	8-29-99	RRH

SIZE (IN. DIAM. / 100 FT. LENGTH)	BEND ANGLE	ALL WELLS (100 FT. LENGTH)				ALL WELLS (50 FT. LENGTH)			
		1/2"	3/4"	1"	1 1/2"	1/2"	3/4"	1"	1 1/2"
1 1/4"	45°	1,189	1	1	1	1	1	1	2
1 1/4"	90°	2,287	1	2	2	1	1	1	3
1 1/4"	45°	4,328	2	3	3	1	1	2	5
1 1/4"	90°	7,996	2	4	5	1	1	2	8
1 1/4"	FLUSH	9,495	2	3	4	1	1	2	6
1 1/2"	45°	1,970	1	2	1	1	1	1	2
1 1/2"	90°	3,942	1	2	3	1	1	1	4
1 1/2"	45°	7,884	2	4	5	1	1	2	8
1 1/2"	90°	14,215	4	8	9	2	2	4	15
1 1/2"	FLUSH	18,053	3	5	6	2	2	3	18
1 3/4"	45°	4,433	2	3	3	1	1	2	5
1 3/4"	90°	8,866	3	5	6	2	2	3	9
1 3/4"	45°	17,732	5	9	11	3	3	5	18
1 3/4"	90°	31,983	6	10	14	4	4	6	32
1 3/4"	FLUSH	32,614	6	12	14	3	3	6	33
2"	45°	7,901	2	4	5	1	1	2	8
2"	90°	15,801	4	8	10	2	2	4	16
2"	45°	31,602	6	16	19	4	4	8	31
2"	90°	56,881	10	24	29	6	6	12	57
2"	FLUSH	48,233	10	21	25	5	5	10	41

Public Water Collection / Extension System

The City of Raleigh consents to the connection and extension of the City's public water system as shown on this plan. The material and Construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook.

City of Raleigh
Public Utilities Department Permit # **W-291**

Authorization to Construct *[Signature]*
Date **9/1/09**

PROJECT REFERENCE NO. **B-3919** SHEET NO. **UC-5**

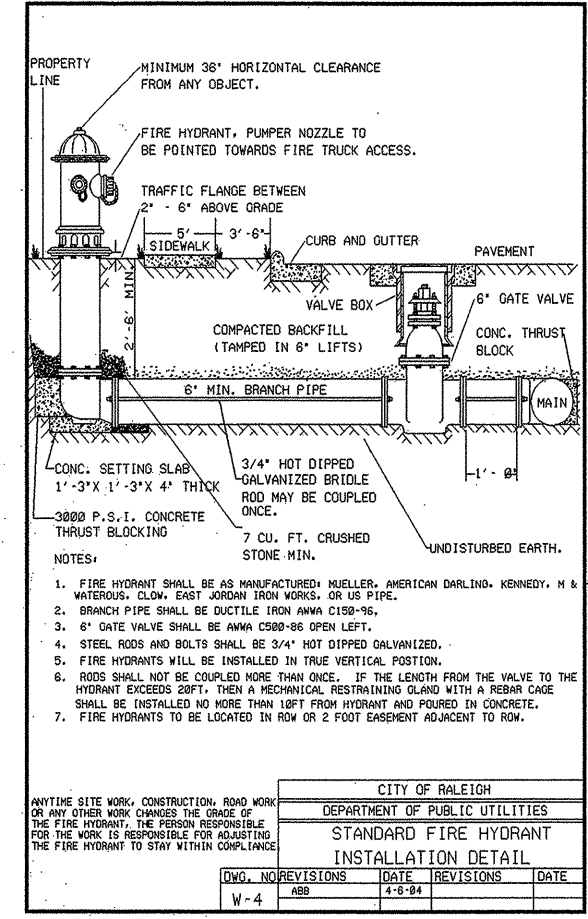
DESIGNED BY: **JH**
 CHECKED BY: **JSM**
 APPROVED BY: **JSM**
 REVISED:

NORTH CAROLINA
 DEPARTMENT OF
 TRANSPORTATION

Utilities Eng. Sec.
 PHONE: (919)250-4128
 FAX: (919)250-4119

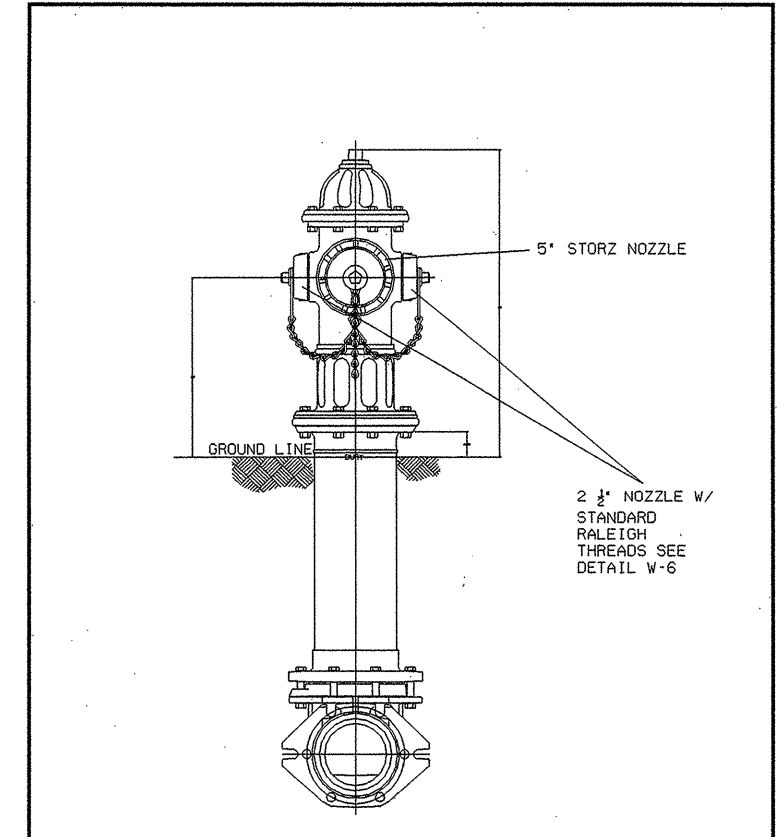
UTILITY CONSTRUCTION
 PLANS ONLY

UTILITY CONSTRUCTION

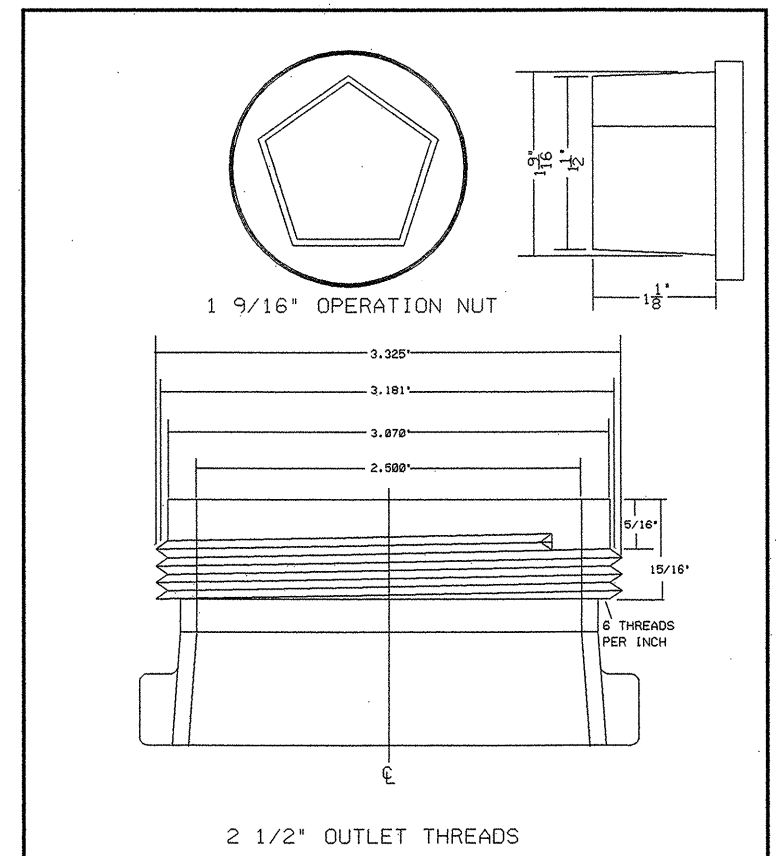


1. THE HYDRANT SHALL BE AN MANUFACTURED MODEL, AMERICAN QUALITY, RATED, # 1 MATERIAL CLASS, WITH 100 PSI WORKING PRESSURE.
2. BRASS PIPE SHALL BE GALVANIZED FROM AMERICAN COUNTRIES.
3. 4" DIA. VALVE SHALL BE AMERICAN COUNTRIES.
4. STEEL RODS AND BOLTS SHALL BE 3/4" DIA. HOT DIPPED GALVANIZED.
5. FIRE HYDRANTS SHALL BE INSTALLED IN THE VERTICAL POSITION.
6. HOOD SHALL NOT BE COULDED MORE THAN ONCE. IF THE HOOD FROM THE VALVE TO THE HYDRANT EXCEEDS 10 FT., THEN A REDUCING, INSULATING HOOD WITH A BURNING GAS SHALL BE INSTALLED IN ONE END OF THE HOOD FROM HYDRANT AND HOOD IN CONCRETE.
7. FIRE HYDRANTS TO BE LOCATED IN 10' OR 2' FOOT SPACING ALONG TO ROW.

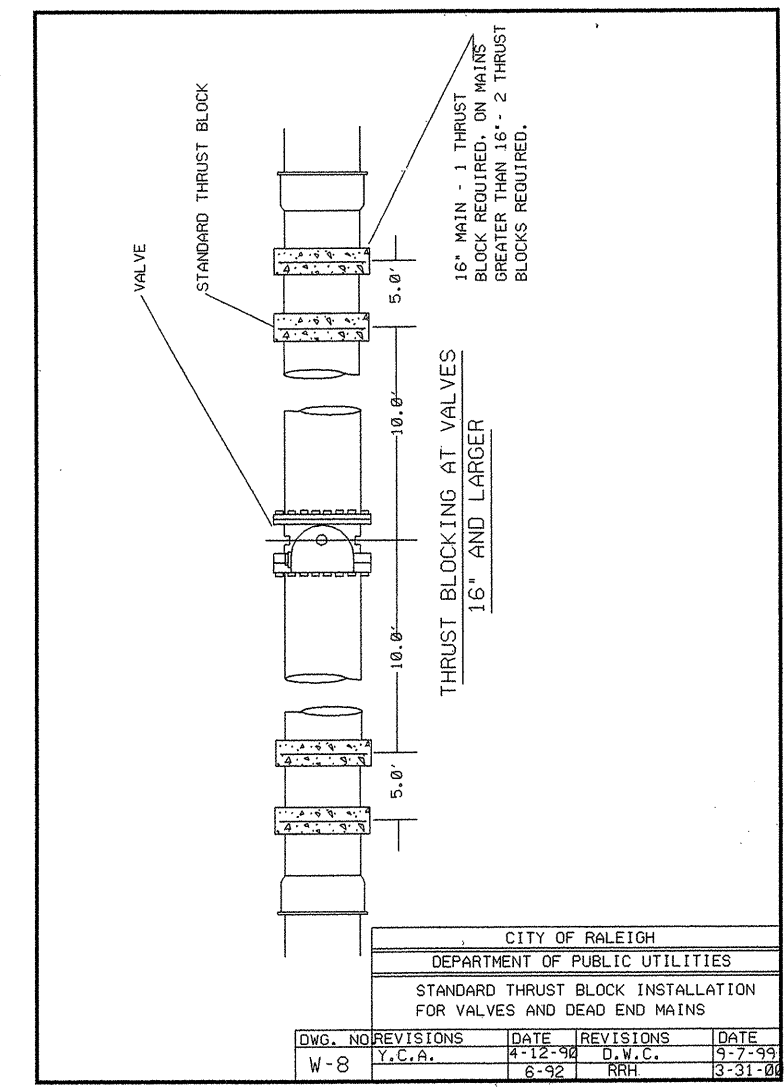
CITY OF RALEIGH			
DEPARTMENT OF PUBLIC UTILITIES			
STANDARD FIRE HYDRANT			
DWG. NO.	REVISIONS	DATE	BY
M-4			



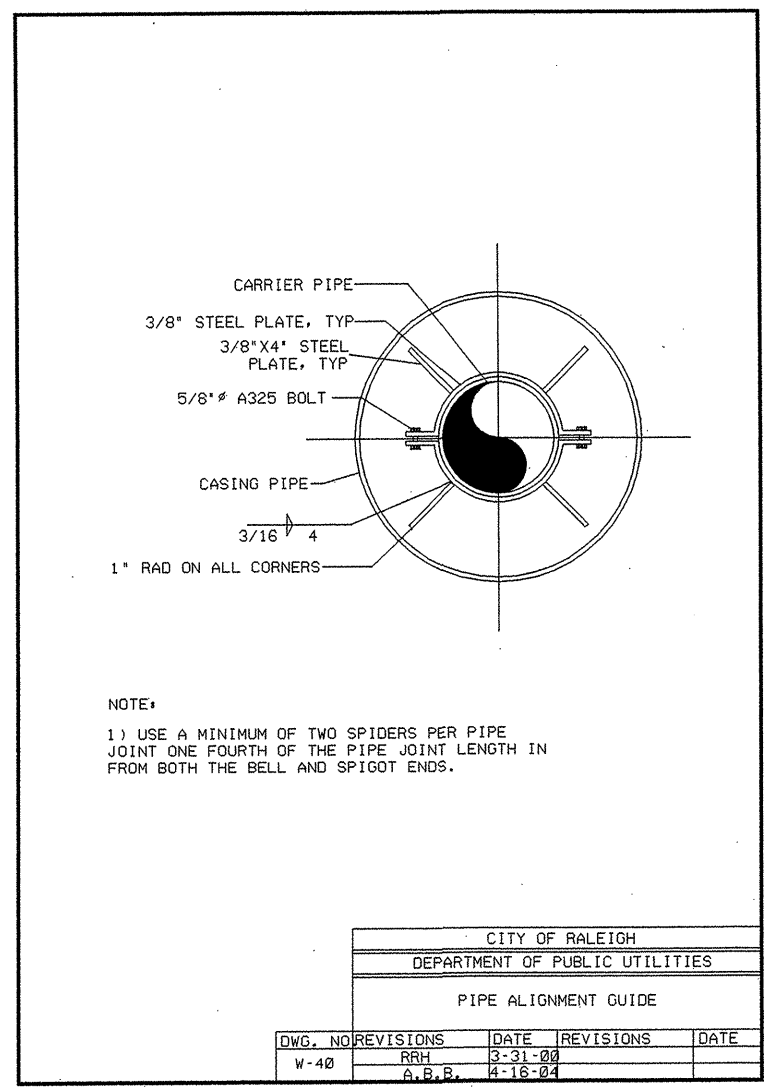
CITY OF RALEIGH			
DEPARTMENT OF PUBLIC UTILITIES			
STANDARD FIRE HYDRANT WITH 5' STORZ PUMPER NOZZLE			
DWG. NO.	REVISIONS	DATE	BY
M-5			



CITY OF RALEIGH			
DEPARTMENT OF PUBLIC UTILITIES			
HYDRANT OPERATING NUT AND 2 1/2" OUTLET THREADS			
DWG. NO.	REVISIONS	DATE	BY
M-6			



CITY OF RALEIGH			
DEPARTMENT OF PUBLIC UTILITIES			
STANDARD THRUST BLOCK INSTALLATION FOR VALVES AND DEAD END MAINS			
DWG. NO.	REVISIONS	DATE	BY
M-8			



NOTE:
 1) USE A MINIMUM OF TWO SPIDERS PER PIPE JOINT ONE FOURTH OF THE PIPE JOINT LENGTH IN FROM BOTH THE BELL AND SPIGOT ENDS.

CITY OF RALEIGH			
DEPARTMENT OF PUBLIC UTILITIES			
PIPE ALIGNMENT GUIDE			
DWG. NO.	REVISIONS	DATE	BY
M-9			

REACTION BEARING AREAS FOR HORIZONTAL WATER PIPE BENDS
 BASED ON TEST PRESSURE OF 200 P.S.I.
 ALL AREAS GIVEN IN SQUARE FEET.

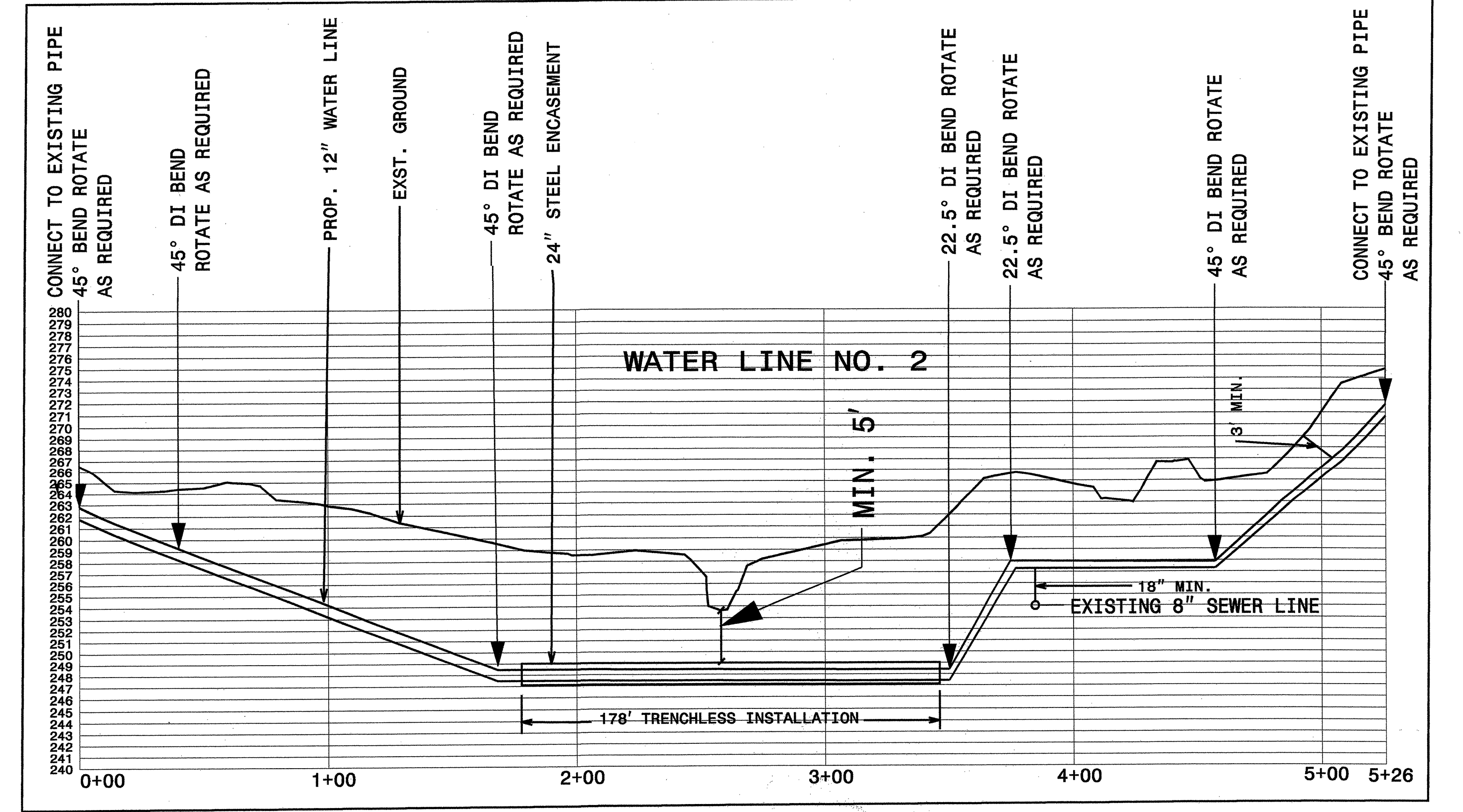
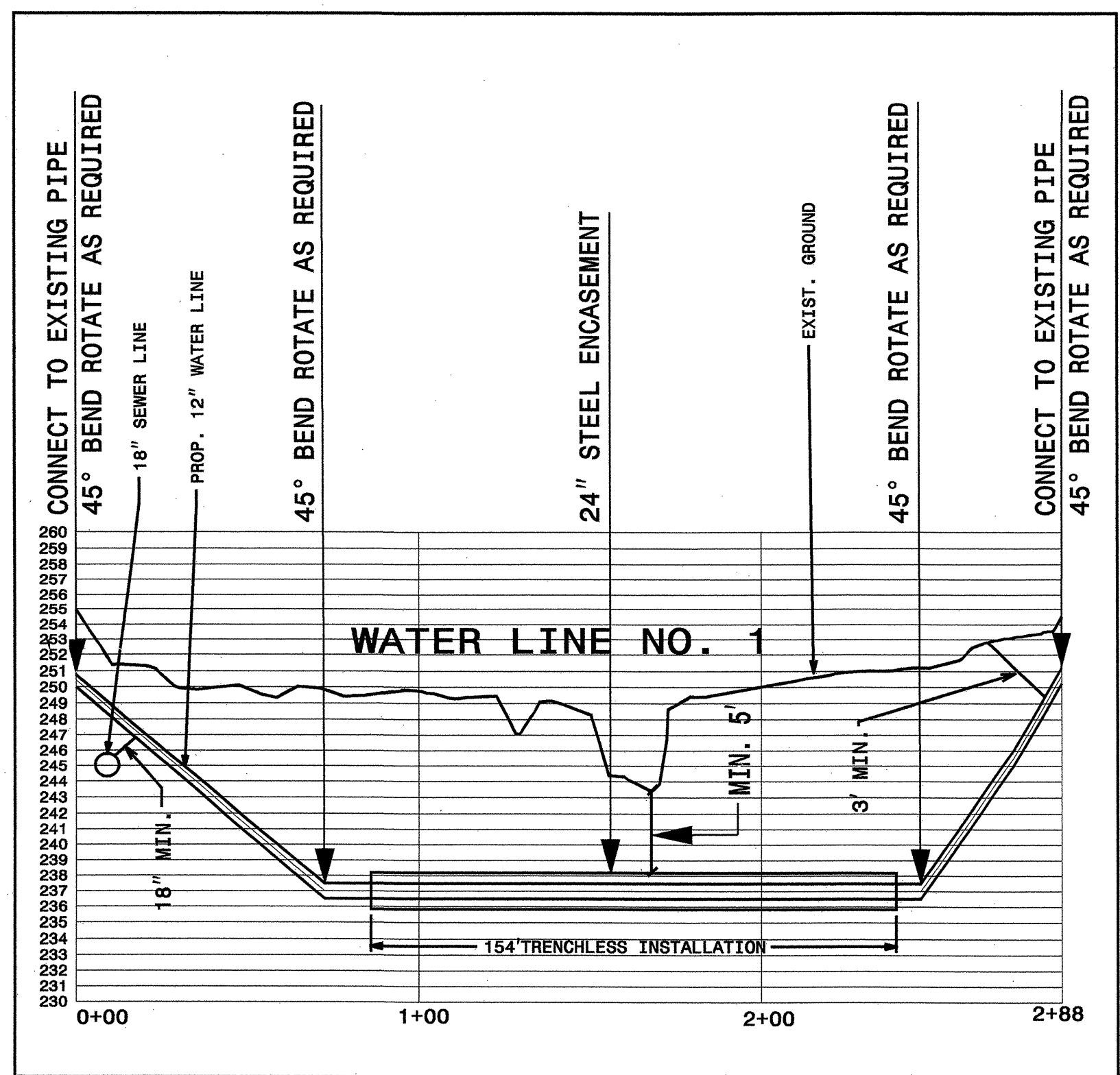
SIZE AND DEGREE OF BEND	STATIC THRUST IN POUNDS	MODERATELY DRY CLAY 1000 LB/SQ.FT.	SOFT CLAY 2000 LB/SQ.FT.	CRACKLED LARGE SAND 1000 LB/SQ.FT.	DRY CLAY - ALWAYS DRY 8000 LB/SQ.FT.	SAND, COMPACT FIRM 8000 LB/SQ.FT.	OUTSIDE SAND - VERY POOR 5000 LB/SQ.FT.	ROCK - POOR 10,000 LB/SQ.FT.
24"								
11 1/4	17,734	5	9	11	3	3	5	18
22 1/2	35,305	9	18	22	6	6	9	36
45°	69,252	18	35	42	9	9	18	70
90°	127,936	32	64	77	16	16	32	128
PLUG	90,478	23	46	55	12	12	23	91
30"								
11 1/4	27,709	7	14	17	4	4	7	2
22 1/2	55,163	14	28	34	7	7	14	56
45°	108,206	28	55	65	14	14	28	109
90°	199,900	50	100	120	25	25	50	200
PLUG	141,372	36	71	85	18	18	36	142
36"								
11 1/4	39,901	10	20	24	5	5	10	40
22 1/2	79,439	20	40	48	10	10	20	80
45°	155,816	39	78	94	20	20	39	156
90°	287,856	72	144	172	36	36	72	288
PLUG	203,576	51	102	122	26	26	51	204
48"								
11 1/4	70,935	18	36	43	9	9	18	71
22 1/2	141,218	36	71	85	18	18	36	142
45°	277,007	70	139	165	35	35	70	277
90°	511,742	128	256	320	64	64	128	512
PLUG	361,911	91	181	217	46	46	91	362

CITY OF RALEIGH			
DEPARTMENT OF PUBLIC UTILITIES			
THRUST BLOCKING DESIGN QUANTITY TABLE			
DWG. NO.	REVISIONS	DATE	BY
W-11			

Public
Water Collection / Extension System
 The City of Raleigh consents to the connection and extension of the City's public water system as shown on this plan. The material and construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook.

City of Raleigh
 Public Utilities Department Permit # **W-2891**

Authorization to Construct *[Signature]*
 Date **9/1/09**



09/08/99

TIP PROJECT: B-3919

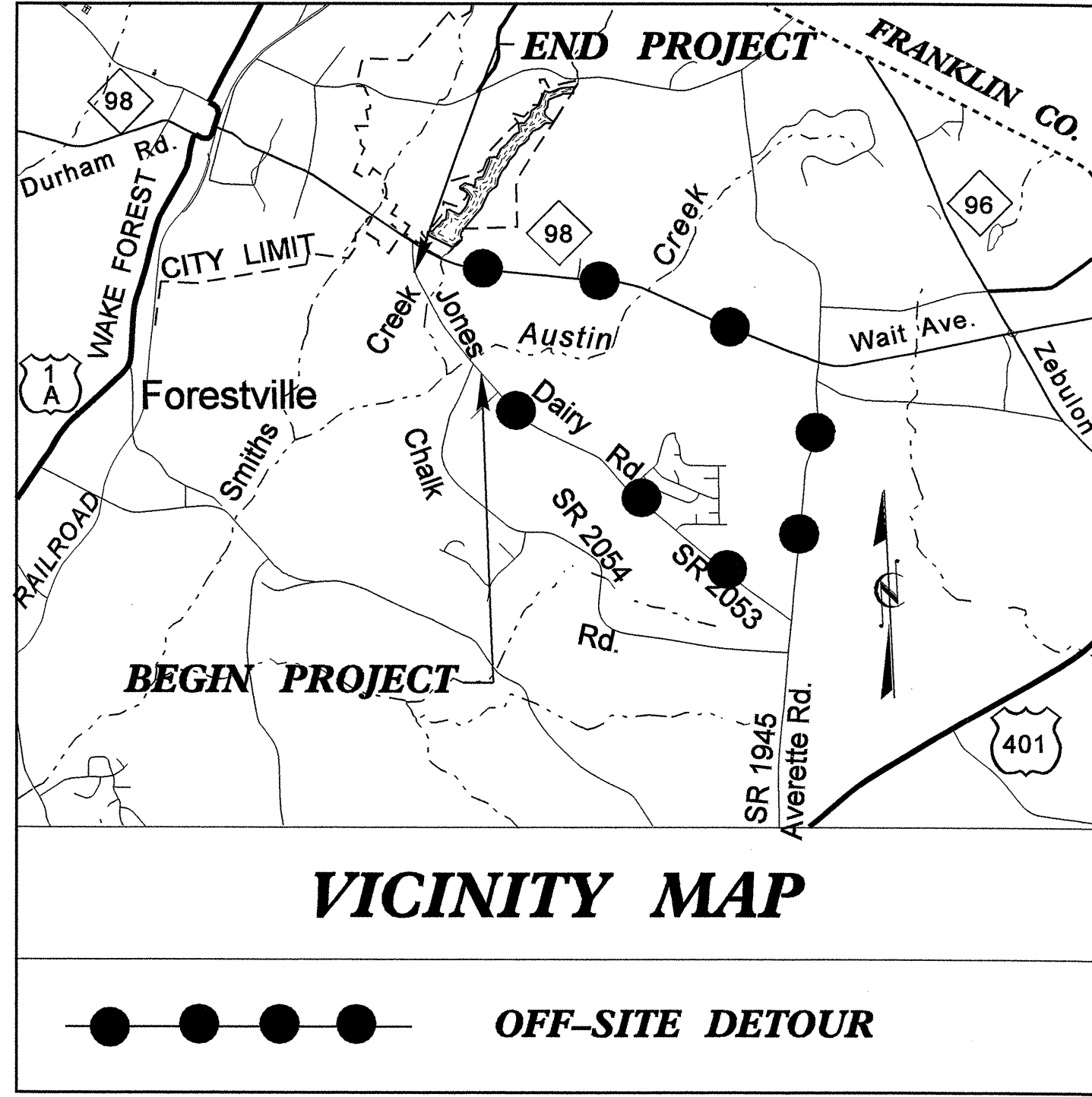
T.I.P. NO.	SHEET NO.
B-3919	UO-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

**UTILITIES BY OTHERS PLANS
WAKE COUNTY**

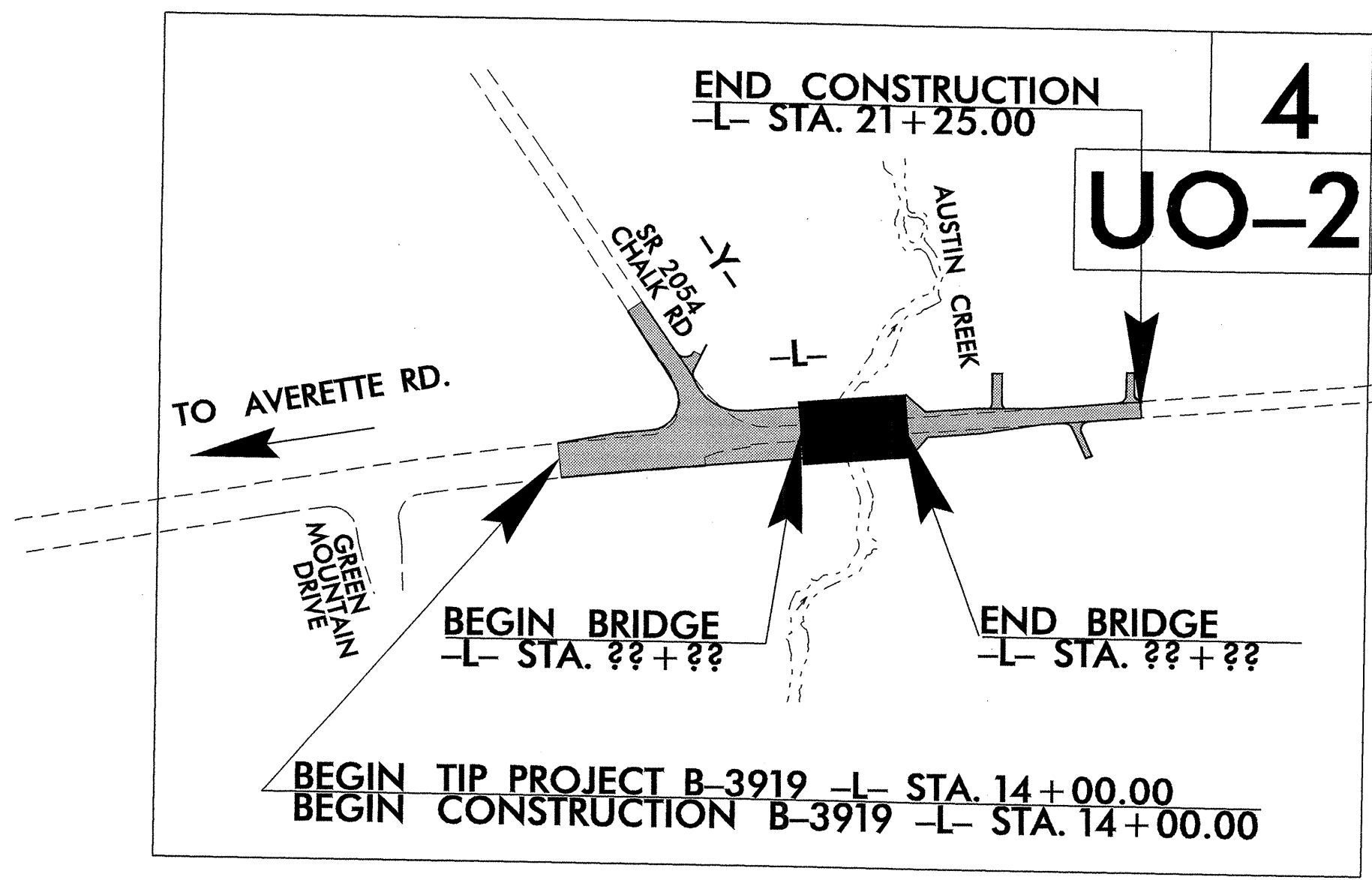
**LOCATION: BRIDGE NO. 448 OVER AUSTIN CREEK AND
BRIDGE NO. 140 OVER SMITHS CREEK AND
APPROACHES ON SR 2053 (JOINS DAIRY RD.)**

TYPE OF WORK: UTILITIES

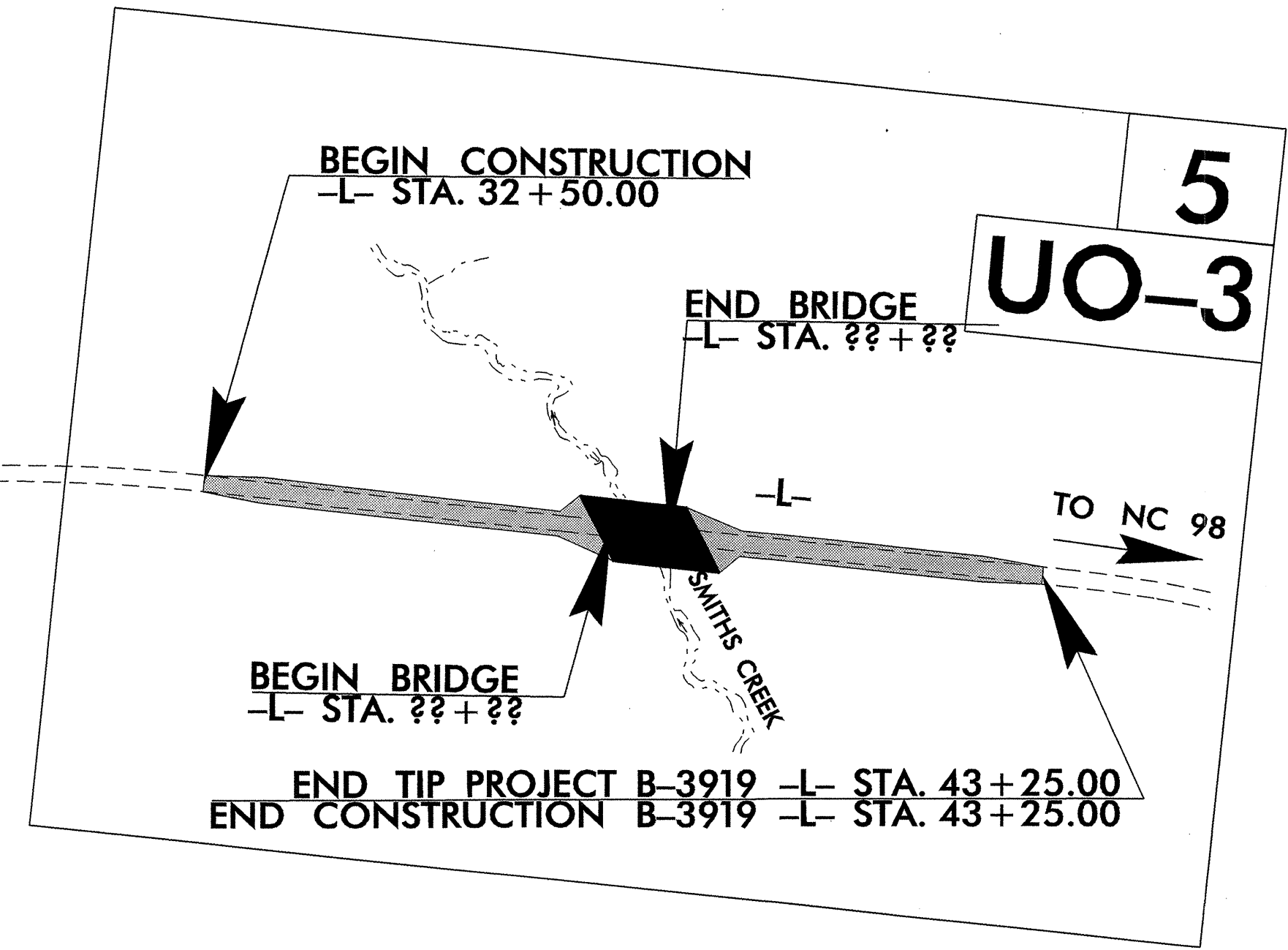


VICINITY MAP

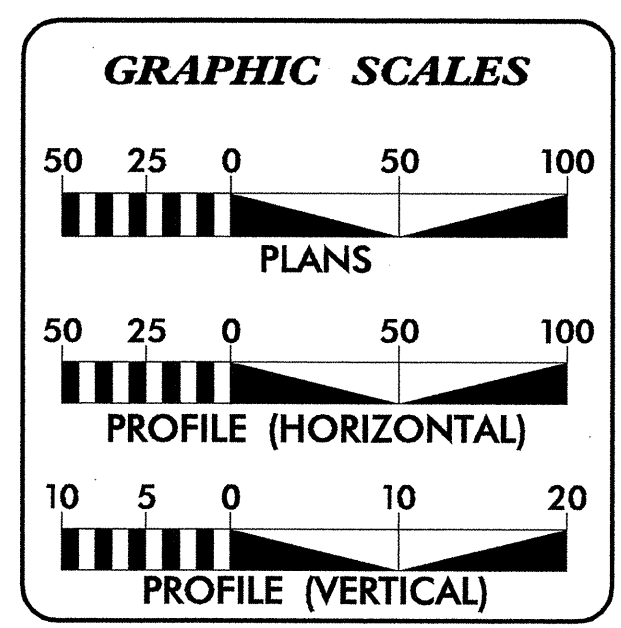
● ● ● ● OFF-SITE DETOUR



**4
UO-2**



**5
UO-3**

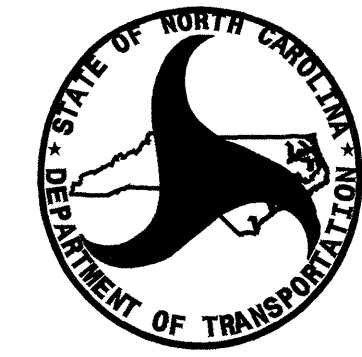


INDEX OF SHEETS

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

UTILITY OWNERS ON PROJECT

- Wake EMC. (Power)
- Embarq. (Telephone)
- Time Warner. (CATV)
- PSNC. Energy (Gas)



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

02-SEP-2009 10:17
r:\utilities\rdy\proj\b3919_uol_rdy.tsh.dgn
\$\$\$\$\$USERNAME\$\$\$\$\$

UTILITIES BY OTHERS

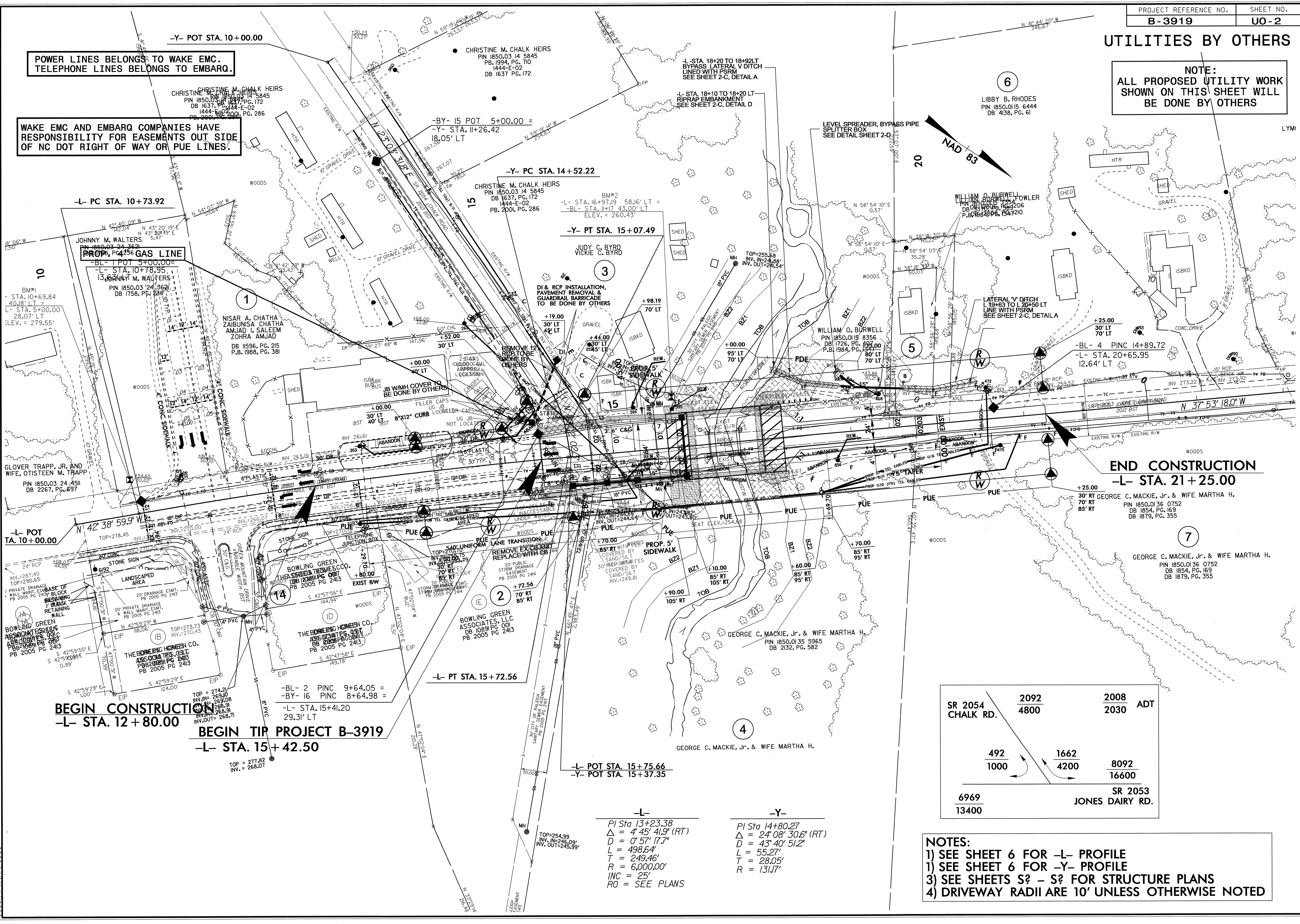
NOTE:
ALL PROPOSED UTILITY WORK SHOWN ON THIS SHEET WILL BE DONE BY OTHERS

POWER LINES BELONGS TO WAKE EMC.
TELEPHONE LINES BELONGS TO EMBARQ.

WAKE EMC AND EMBARQ COMPANIES HAVE RESPONSIBILITY FOR EASEMENTS OUT SIDE OF NC DOT RIGHT OF WAY OR PUE LINES.

5/14/99

21-AUG-2009 09:46
r:\utilities\chalk rd\proj\19_uo2_rdy_psh4.dgn



BEGIN CONSTRUCTION
-L- STA. 12+80.00

BEGIN TIP PROJECT B-3919
-L- STA. 15+42.50

END CONSTRUCTION
-L- STA. 21+25.00

SR 2054 CHALK RD.	2092	2008	ADT
	4800	2030	
	492	1662	
	1000	4200	
	6969	8092	
	13400	16600	
			SR 2053 JONES DAIRY RD.

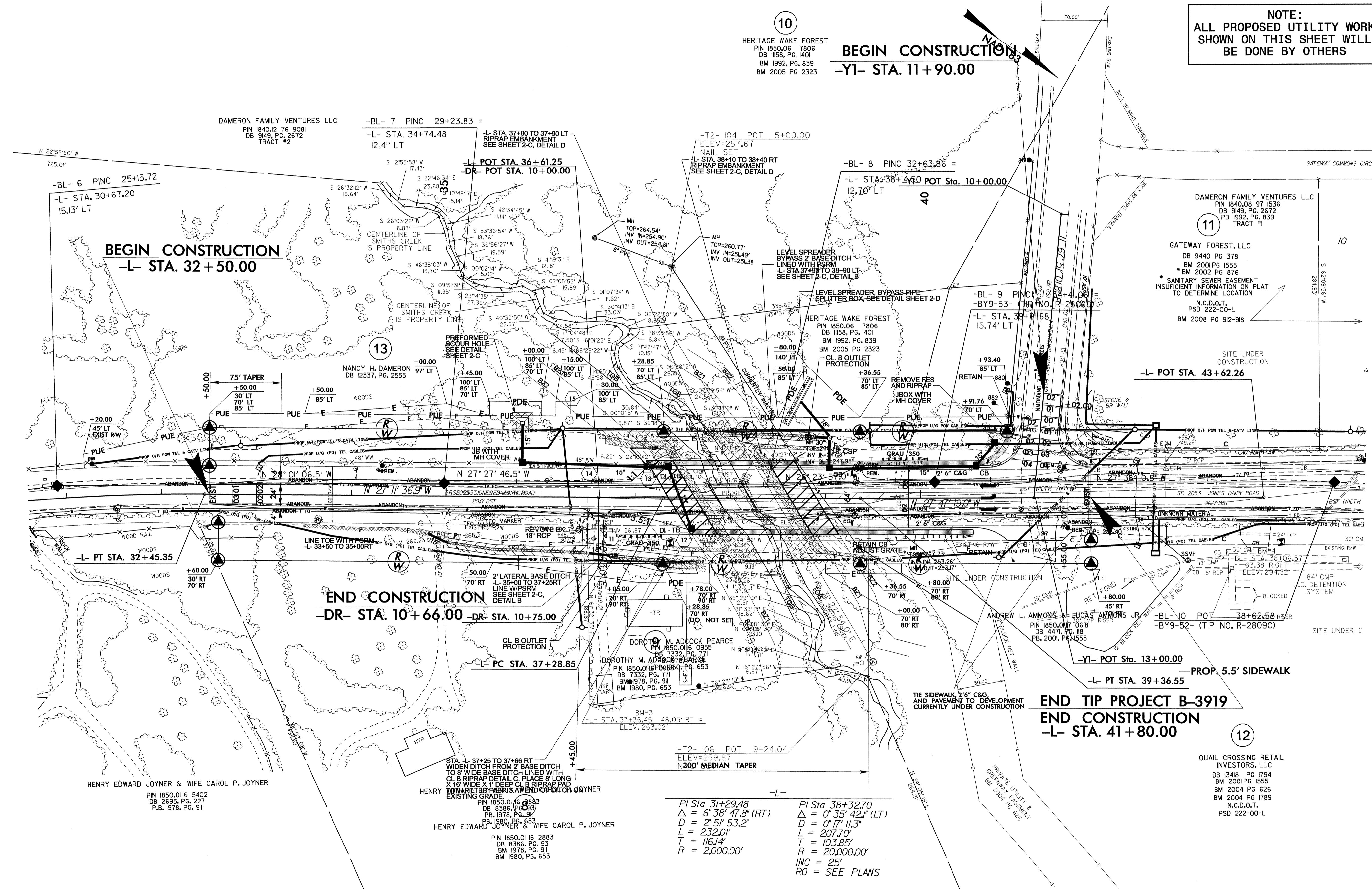
-L-
PI Sta 13+23.38
Δ = 4° 45' 41.9" (RT)
D = 0° 57' 17.7"
L = 498.64'
T = 249.46'
R = 6,000.00'
INC = 25'
RO = SEE PLANS

-Y-
PI Sta 14+80.27
Δ = 24° 08' 30.6" (RT)
D = 43° 40' 51.2"
L = 55.27'
T = 28.05'
R = 131.17'

NOTES:
1) SEE SHEET 6 FOR -L- PROFILE
1) SEE SHEET 6 FOR -Y- PROFILE
3) SEE SHEETS S? - S? FOR STRUCTURE PLANS
4) DRIVEWAY RADII ARE 10' UNLESS OTHERWISE NOTED

UTILITIES BY OTHERS

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



10

HERITANCE WAKE FOREST
 PIN 1850,06 7806
 DB 1158, PG. 1401
 BM 1992, PG. 839
 BM 2005 PG 2323

BEGIN CONSTRUCTION
 -YI- STA. 11+90.00

11

DAMERON FAMILY VENTURES LLC
 PIN 1840,08 97 1536
 DB 949, PG. 2672
 PB 1992, PG. 839
 TRACT #1

GATEWAY FOREST, LLC
 DB 9440 PG 378
 BM 2001 PG 1555
 BM 2002 PG 876

SANITARY SEWER EASEMENT
 INSUFFICIENT INFORMATION ON PLAT
 TO DETERMINE LOCATION

N.C.D.O.T.
 PSD 222-00-L
 BM 2008 PG 912-918

12

QUAIL CROSSING RETAIL
 INVESTORS, LLC
 DB 13418 PG 1794
 BM 2001 PG 1555
 BM 2004 PG 626
 BM 2004 PG 1789
 N.C.D.O.T.
 PSD 222-00-L

END TIP PROJECT B-3919
END CONSTRUCTION
 -L- STA. 41+80.00

-L-	PI Sta 31+29.48	PI Sta 38+32.70
	$\Delta = 6' 38" 47.8' (RT)$	$\Delta = 0' 35" 42.1' (LT)$
	$D = 2' 5' 53.2'$	$D = 0' 17' 11.3'$
	$L = 232.01'$	$L = 207.70'$
	$T = 116.14'$	$T = 103.85'$
	$R = 2,000.00'$	$R = 20,000.00'$
		$INC = 25'$
		$RO = SEE PLANS$

5/14/99
 2-AUG-2009 09:47
 r:\projects\B-3919\B-3919_uo3_rdu_psh5.dgn