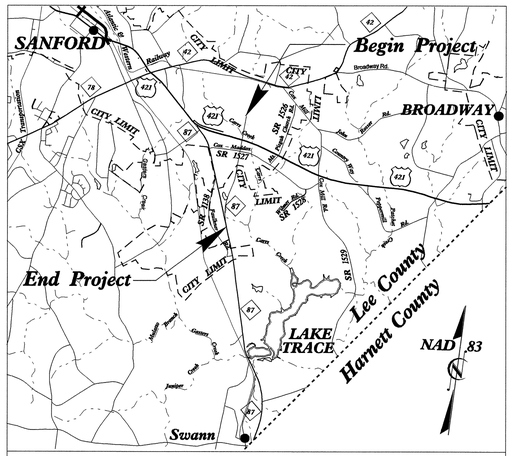
T.I.P. NO.	SHEET NO.
R-2417C	UC-1

TIP PROJECT: R-2417C

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

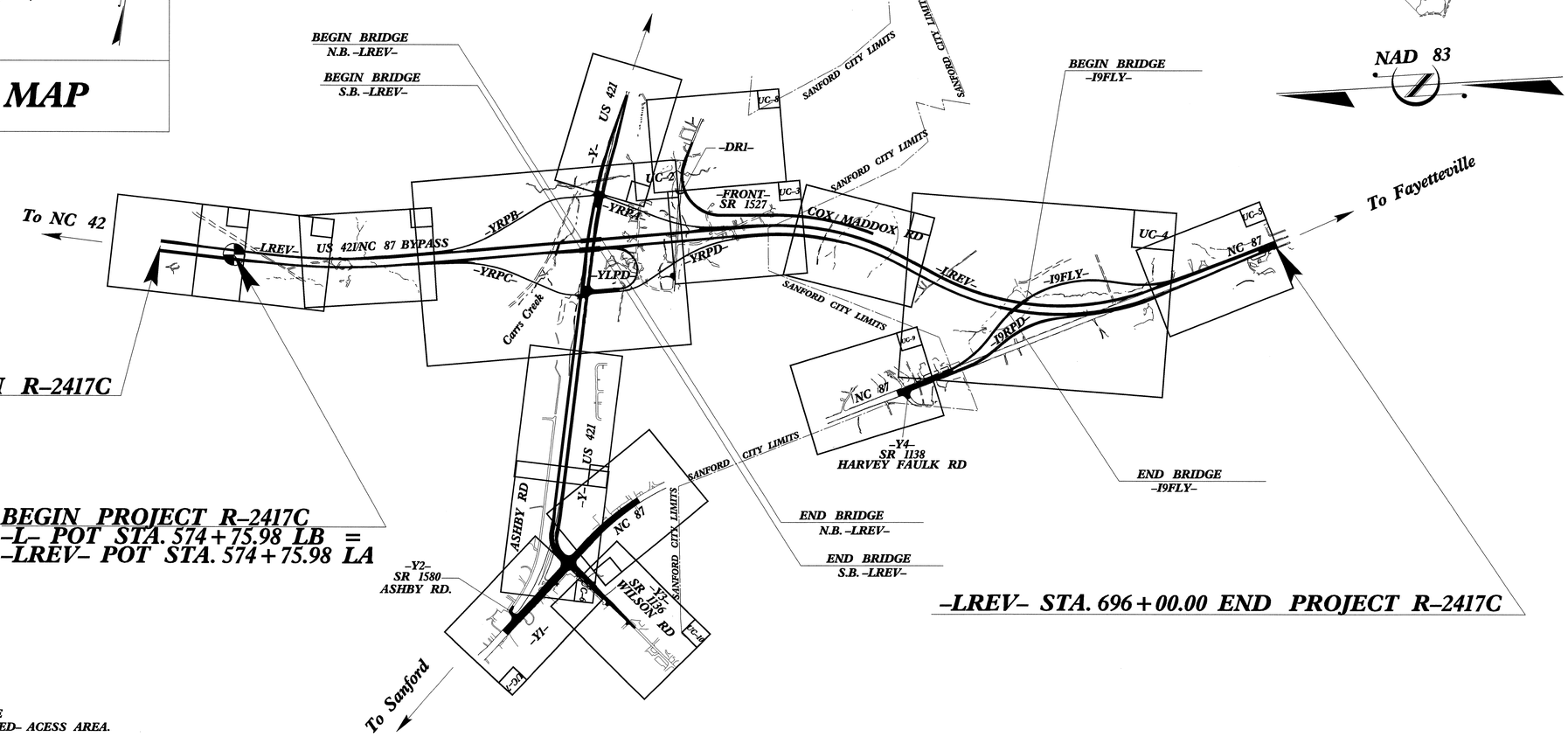


VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

UTILITY CONSTRUCTION PLANS
LEE COUNTY

LOCATION: US 421/NC 87 (SANFORD BYPASS) FROM EAST OF NC 42 TO NC 87 NEAR SR 1138
TYPE OF WORK: WATER AND SEWER RELOCATION



BEGIN CONSTRUCTION R-2417C
-L- STA. 566+20.63

BEGIN PROJECT R-2417C
-L- POT STA. 574+75.98 LB =
-LREV- POT STA. 574+75.98 LA

THE 8" AND 12" GRAVITY SEWER PIPE SHALL BE CLASS 52 INSIDE CONROLLED- ACESS AREA.

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

INDEX OF SHEETS

SHEET NO.	DESCRIPTION
UC-1	TITLE SHEET
UC-2 THRU UC-10	UTILITY CONSTRUCTION PLAN SHEETS
UC-11 THRU UC-21	PROFILE SHEETS
UC-22 THRU UC-23	DETAIL SHEETS

WATER AND SEWER OWNERS ON PROJECT

(1) WATER- CITY OF SANFORD
(2) SANITARY SEWER- CITY OF SANFORD

SEAL

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
Carl Barclay, P.E.	UTILITIES SQUAD LEADER PROJECT ENGINEER
Ali Koucheki, P.E.	UTILITIES PROJECT DESIGNER

06/08/99
31-AUG-2009 12:01
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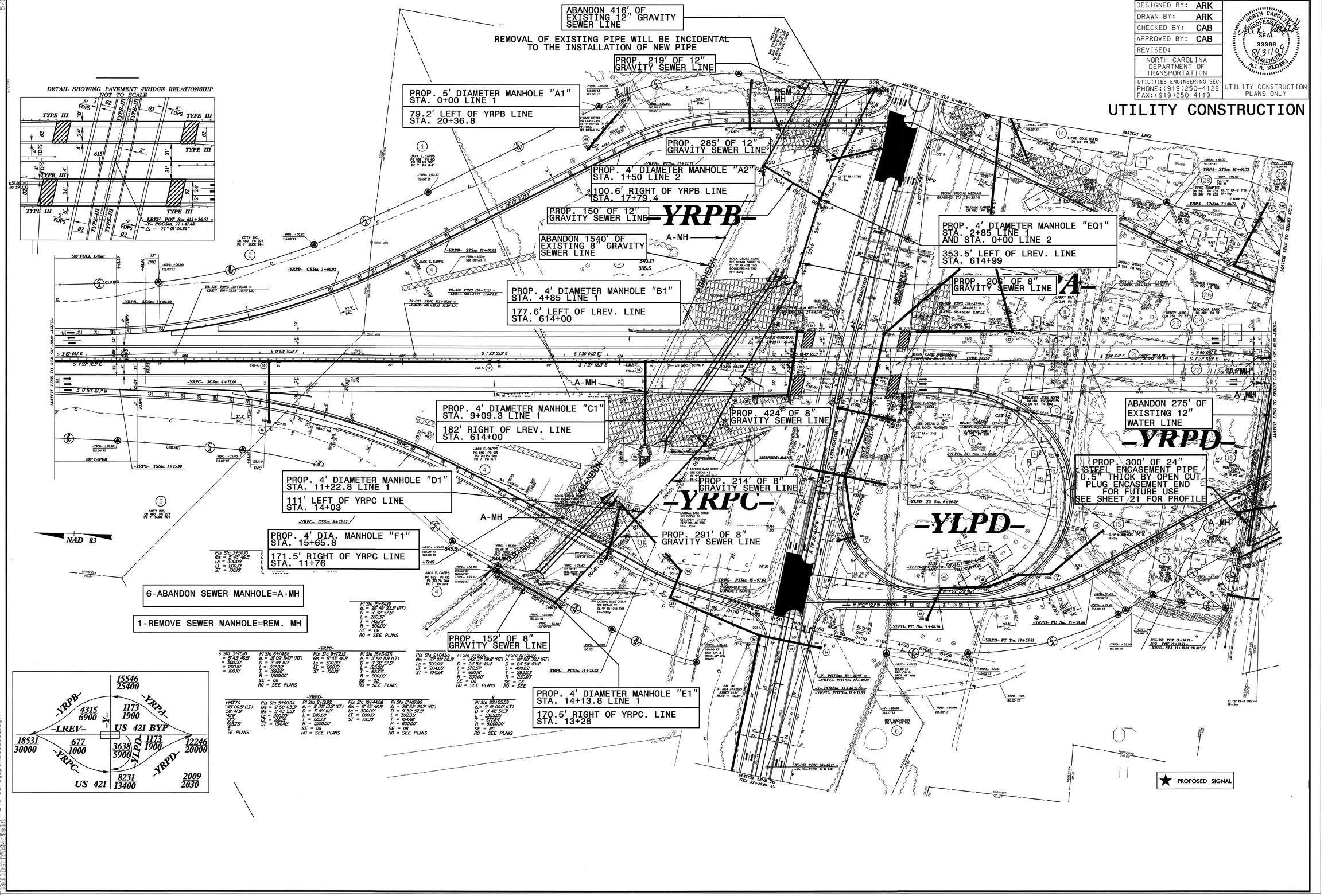
PROJECT REFERENCE NO.	SHEET NO.
R-2417C	UC-2
DESIGNED BY: ARK	
DRAWN BY: ARK	
CHECKED BY: CAB	
APPROVED BY: CAB	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE:(919)250-4128 FAX:(919)250-4119	UTILITY CONSTRUCTION PLANS ONLY

NORTH CAROLINA PROFESSIONAL SEAL 33366 ENGINEER ALT R. KLOCKER 8/31/09

UTILITY CONSTRUCTION



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PROJECT REFERENCE NO.	SHEET NO.
R-2417C	UC-3
DESIGNED BY: ARK	
DRAWN BY: ARK	
CHECKED BY: CAB	
APPROVED BY: CAB	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 33366 8/31/09 ALT R. HAUSKEN

UTILITY CONSTRUCTION

NAD 83

PROP. 320' OF 8" GRAVITY SEWER LINE

PROP. 1- NEW FIRE HYDRANT

PROP. 4' DIAMETER MANHOLE "EQ 4"
STA. 5+26.6 LINE 4 AND
STA. 0+00 LINE 5

40' LEFT OF FRONT LINE
STA. 19+66.4

PROP. 4' DIAMETER MANHOLE "C4"
STA. 8+87 LINE 4

46.5' LEFT OF FRONT LINE
STA. 23+40.6

22.5° BEND
STA. 19+90 LINE FRONT
71' LEFT

PROP. 360' OF 8"
GRAVITY SEWER LINE

PROP. ABANDON EXISTING 8"
GRAVITY SEWER LINE

PROP. 358' OF 8"
GRAVITY SEWER LINE

PROP. 4' DIAMETER MANHOLE "D4"
STA. 12+49 LINE 4

100' LEFT OF FRONT LINE
STA. 27+00

90° BEND
STA. 26+54 FRONT LINE
19' LEFT

PROP. 106' OF 8" SEWER PIPE

PROP. 450' OF 24"
STEEL ENCASEMENT PIPE
0.5" THICK BY OPEN CUT
PLUG ENCASEMENT END
FOR FUTURE USE

PROP. 4' DIAMETER MANHOLE "A5"
STA.1+06 LINE 5

61.5' RIGHT OF FRONT LINE
STA. 19+96.8

PROP. 2468' OF 12" WATER LINE
3- 12" VALVE

PROP. 426' OF 8" GRAVITY SEWER LINE

PROP. 375' OF 30" STEEL
ENCASEMENT 0.312"
THICK BY OPEN CUT

ABANDON 2275' OF EXISTING
12" UTILITY PIPE

16-REMOVE EXISTING
WATER METER

PROP. 1- NEW FIRE HYDRANT

4-REMOVE EXISTING FIRE HYDRANT

ABANDON 2920' OF EXISTING
GRAVITY SEWER LINE

6-ABANDON SEWER MANHOLE=A-MH

SITE 5

PROP. 4' DIAMETER MANHOLE "B5"
STA. 5+31.7 LINE 3

138.78' LEFT OF YRPD LINE
STA. 7+13.6

PROP. 198' OF 8" GRAVITY SEWER LINE

PROP. 4' DIAMETER MANHOLE "C5"
STA. 7+30 LINE 5

141' LEFT OF YRPD LINE
STA. 9+31

PROP. 302' OF 8" GRAVITY SEWER LINE

PROP. 4' DIAMETER MANHOLE "D5"
STA. 10+32 LINE 5

137' LEFT OF YRPD LINE
STA. 12+50

MATCH LINE TO SHEET UC-8 STA 16+50.00 -FRONT-

MATCH LINE TO SHEET UC-2 STA 625+00.00 -LREV-

MATCH LINE TO STA 639+00.00 -LREV-

-FRONT- PCSta. 0+00.00 = -OTSta. 0+00.00 = -OTSta 632+50.00 59' LT.

-FRONT- PCSta. 27+01.68

-YRPD- PCSta. 0+00.00 = -LREV- SCSta. 635+59.49 59' RT.

-LREV- SCSta. 635+59.49

-YRPD- SC Sta. 6+94.79

-YRPD- CS Sta. 3+94.79

90° BEND
STA. 635+60 LREV.
182' RIGHT

580' FULL LANE

W. C. WILSON JR.
DB 699 PG 350

33

NOTES:

1) SEE SHEETS 20 AND 21 FOR -LREV- PROFILE
2) SEE SHEET 27 FOR -FRONT- PROFILE
3) SEE SHEET 28 FOR -YRPA- PROFILE
4) SEE SHEET 30 FOR -YRPD- PROFILE

-FRONT-

Sta 18+90.57
= 111° 48' 37.3" (LT)
= 12' 56' 10.1"
= 864.33'
= 654.31'
= 442.91'
SE= 08
RO = SEE PLANS

PI Sta 33+01.96
Δ = 22° 45' 32.3" (RT)
D = 1° 56' 25.5"
L = 1,172.89'
T = 594.28'
R = 2,952.75'
SE = NC
RO = SEE PLANS

-YRPA-

PI Sta 6+08.95
Δ = 12° 05' 52.2" (RT)
D = 3° 49' 11.0"
L = 316.72'
T = 158.95'
R = 1,500.00'
SE= 08
RO = SEE PLANS

PIs Sta 8+66.82
Θs = 5° 43' 46.5"
Ls = 300.00'
LT = 200.10'
ST = 100.10'

SANFORD CITY LIMITS

REVISIONS

6/17/99

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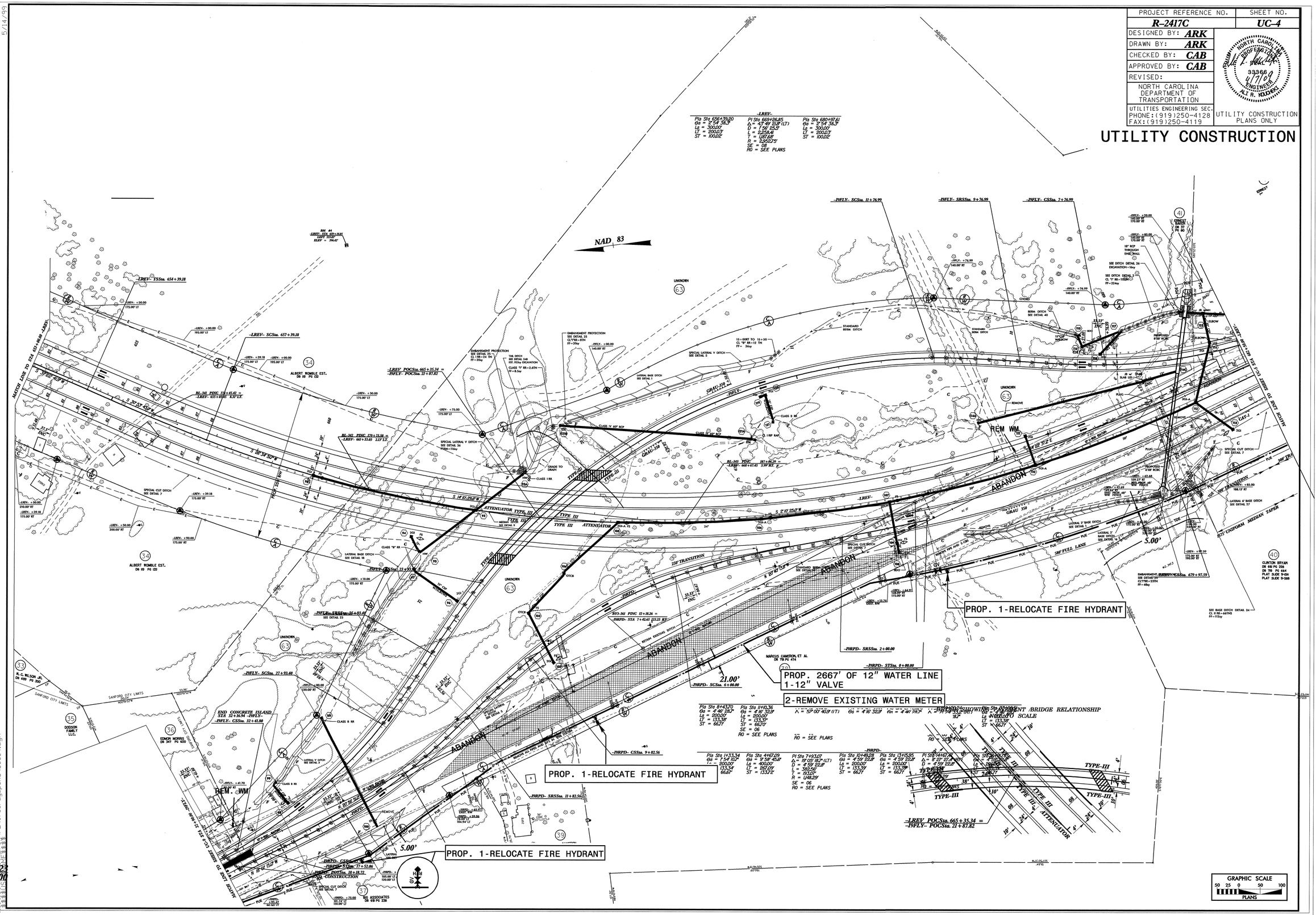
PROJECT REFERENCE NO.	SHEET NO.
R-2417C	UC-4
DESIGNED BY: ARK	
DRAWN BY: ARK	
CHECKED BY: CAB	
APPROVED BY: CAB	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE:(919)250-4128 FAX:(919)250-4119	UTILITY CONSTRUCTION PLANS ONLY

NORTH CAROLINA PROFESSIONAL SEAL 33366 ENGINEER ALI R. KOLDAS 4/7/09

UTILITY CONSTRUCTION



-LREV-

PIs Sta. 656+39.20	PI Sta 662+26.85	PIs Sta. 680+97.61
Gs = 2°54'36.3"	Δ = 43°49'22.8" (LT)	Gs = 2°54'36.3"
Ls = 300.00'	D = 1°56'25.9"	Ls = 300.00'
LT = 200.03'	L = 2,229.41'	LT = 200.03'
ST = 100.02'	T = 1,187.85'	ST = 100.02'
	R = 2,950.75'	
	SE = 06	
	RO = SEE PLANS	

-PRPD-

PIs Sta 8+43.70	PIs Sta 11+10.36	PI Sta 7+93.07	PIs Sta 10+40.28	PIs Sta 13+15.95
Gs = 4°46'28.7"	Gs = 4°16'32.9"	Δ = 19°05'16.7" (LT)	Gs = 4°59'22.8"	Gs = 4°59'22.8"
Ls = 200.00'	Ls = 200.00'	D = 4°59'22.8"	Ls = 200.00'	Ls = 200.00'
LT = 133.39'	LT = 133.37'	L = 382.56'	LT = 133.39'	LT = 133.39'
ST = 66.71'	ST = 66.70'	T = 193.01'	ST = 66.71'	ST = 66.71'
	SE = 06	R = 1,146.29'		
	RO = SEE PLANS	SE = 06		
		RO = SEE PLANS		

PIs Sta 14+33.34	PIs Sta 4+67.09	PI Sta 14+67.09	PIs Sta 16+76.78
Gs = 1°54'00"	Gs = 9°58'45.8"	Δ = 10°21'27.4" (RT)	Gs = 2°54'36.3"
Ls = 200.00'	Ls = 400.00'	D = 4°59'22.8"	Ls = 300.00'
LT = 133.34'	LT = 267.09'	L = 402.54'	LT = 200.03'
ST = 66.67'	ST = 133.72'	T = 202.07'	ST = 100.02'
		R = 1,146.29'	
		SE = 06	
		RO = SEE PLANS	

-PRPD- SUPERELEVATION DIAGRAM / BRIDGE RELATIONSHIP

RO = SEE PLANS

RO = SEE PLANS

RO = SEE PLANS

TYPE-III

TYPE-III

TYPE-III

TYPE-III

TYPE-III

TYPE-III

TYPE-III

TYPE-III

ATTENUATOR

-LREV POCSta. 665+35.34 = -PFLY- POCSta. 21+87.82

18923
31200

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PROJECT REFERENCE NO.	SHEET NO.
R-2417C	UC-5

DESIGNED BY: ARK
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APPROVED BY: CAB
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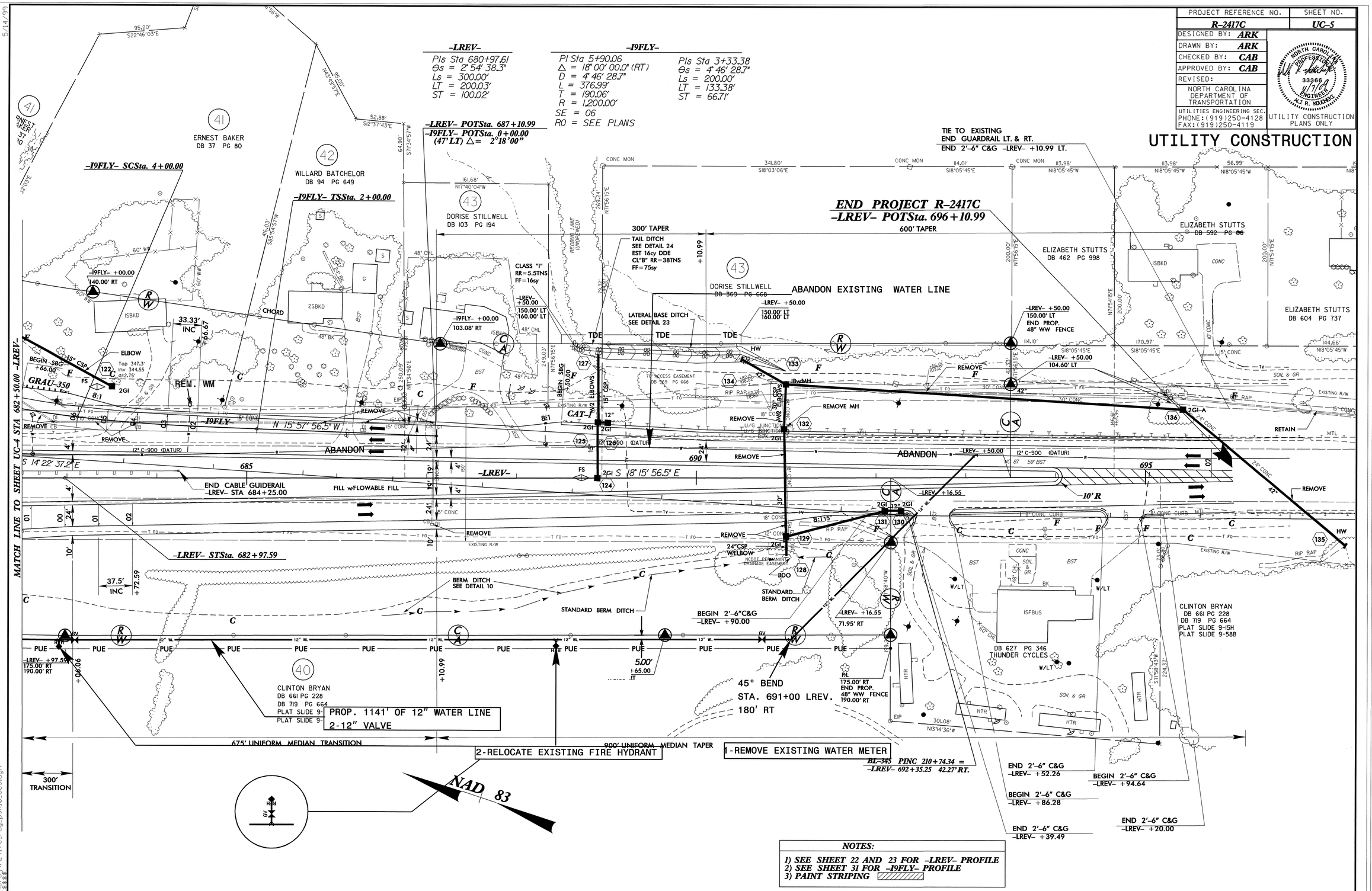
FAX: (919)250-4119

UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION



NOTES:

1) SEE SHEET 22 AND 23 FOR -LREV- PROFILE
2) SEE SHEET 31 FOR -I9FLY- PROFILE
3) PAINT STRIPING

REVISIONS

8/17/99
5/14/99

31-MAR-2009 08:14
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PROJECT REFERENCE NO.	SHEET NO.
R-2417C	UC-6

DESIGNED BY: ARK
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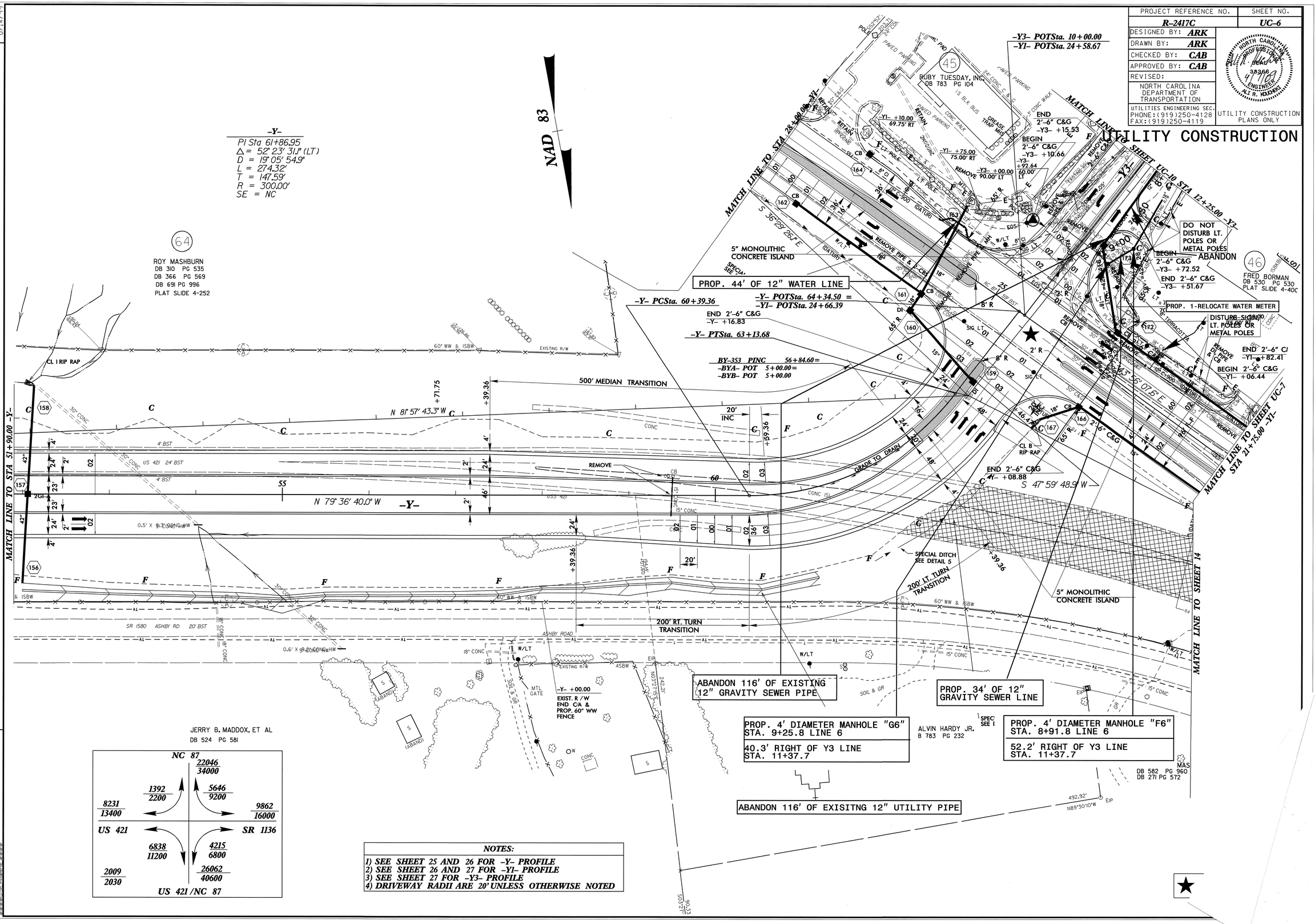
FAX:(919)250-4119

NORTH CAROLINA PROFESSIONAL SEAL 38366 ENGINEER ALI R. KOCHEKI

UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION



NOTES:

1) SEE SHEET 25 AND 26 FOR -Y- PROFILE
2) SEE SHEET 26 AND 27 FOR -Y1- PROFILE
3) SEE SHEET 27 FOR -Y3- PROFILE
4) DRIVEWAY RADII ARE 20' UNLESS OTHERWISE NOTED

REVISIONS

040108 - TLW - R/W REVISION: CORRECTED THE OFFSET INFORMATION ON TEMPORARY CONSTRUCTION EASEMENT AT -Y1- STA. 25+75 FROM LT. TO RT. ON PARCEL 45 AND UPDATED STATION OR OFFSET INFORMATION ON TEMPORARY CONSTRUCTION EASEMENT AND A RIGHT OF WAY MONUMNET ON PARCEL 45 AND TEMPORARY CONSTRUCTION EASEMENT ON PARCEL 46 TO REFLECT FIELD SURVEYS.

6/14/99

PROJECT REFERENCE NO.	SHEET NO.
R-2417C	UC-7

DESIGNED BY: ARK
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APPROVED BY: CAB
REVISED:

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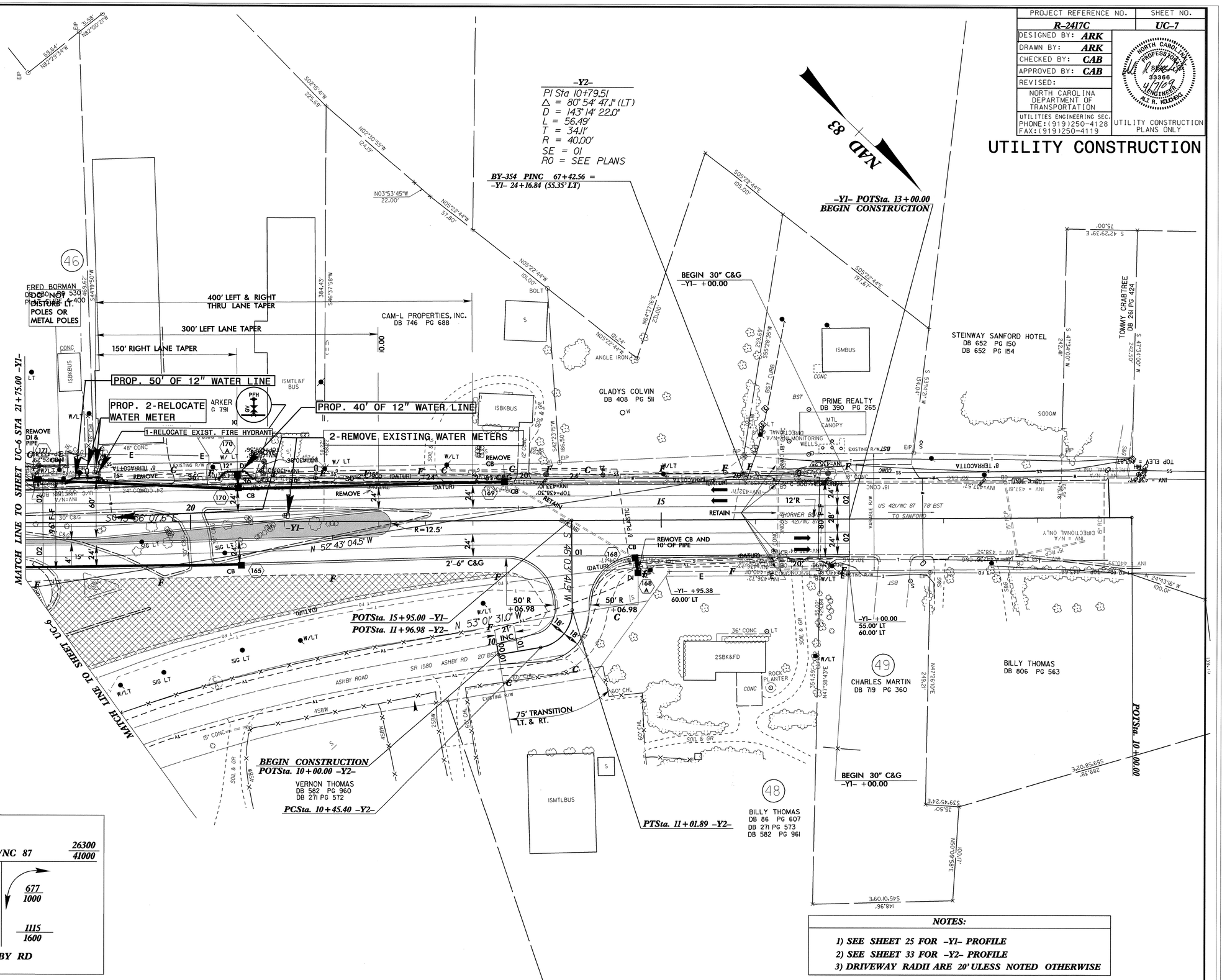
FAX: (919)250-4119

UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION



NOTES:

1) SEE SHEET 25 FOR -Y1- PROFILE
2) SEE SHEET 33 FOR -Y2- PROFILE
3) DRIVEWAY RADII ARE 20' ULESS NOTED OTHERWISE

8/17/99

31-MAR-2009 08:35
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PROJECT REFERENCE NO.	SHEET NO.
R-2417C	UC-8

DESIGNED BY: ARK
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APPROVED BY: CAB
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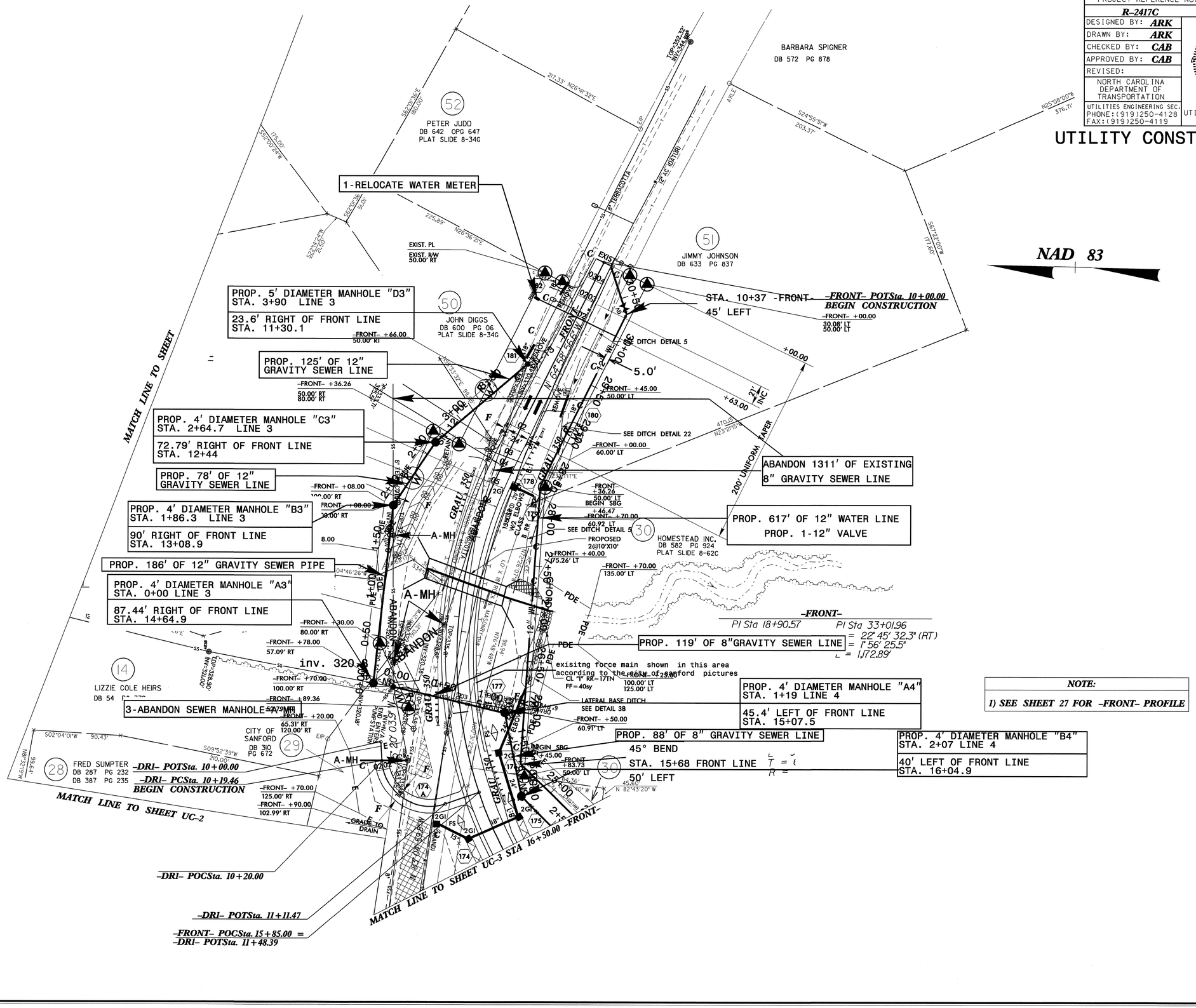
FAX:(919)250-4119

UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION



NOTE:
1) SEE SHEET 27 FOR -FRONT- PROFILE

8/17/99

31-MAR-2009 08:36
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PROJECT REFERENCE NO.	SHEET NO.
R-2417C	UC-9
DESIGNED BY: ARK	
DRAWN BY: ARK	
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APPROVED BY: CAB	
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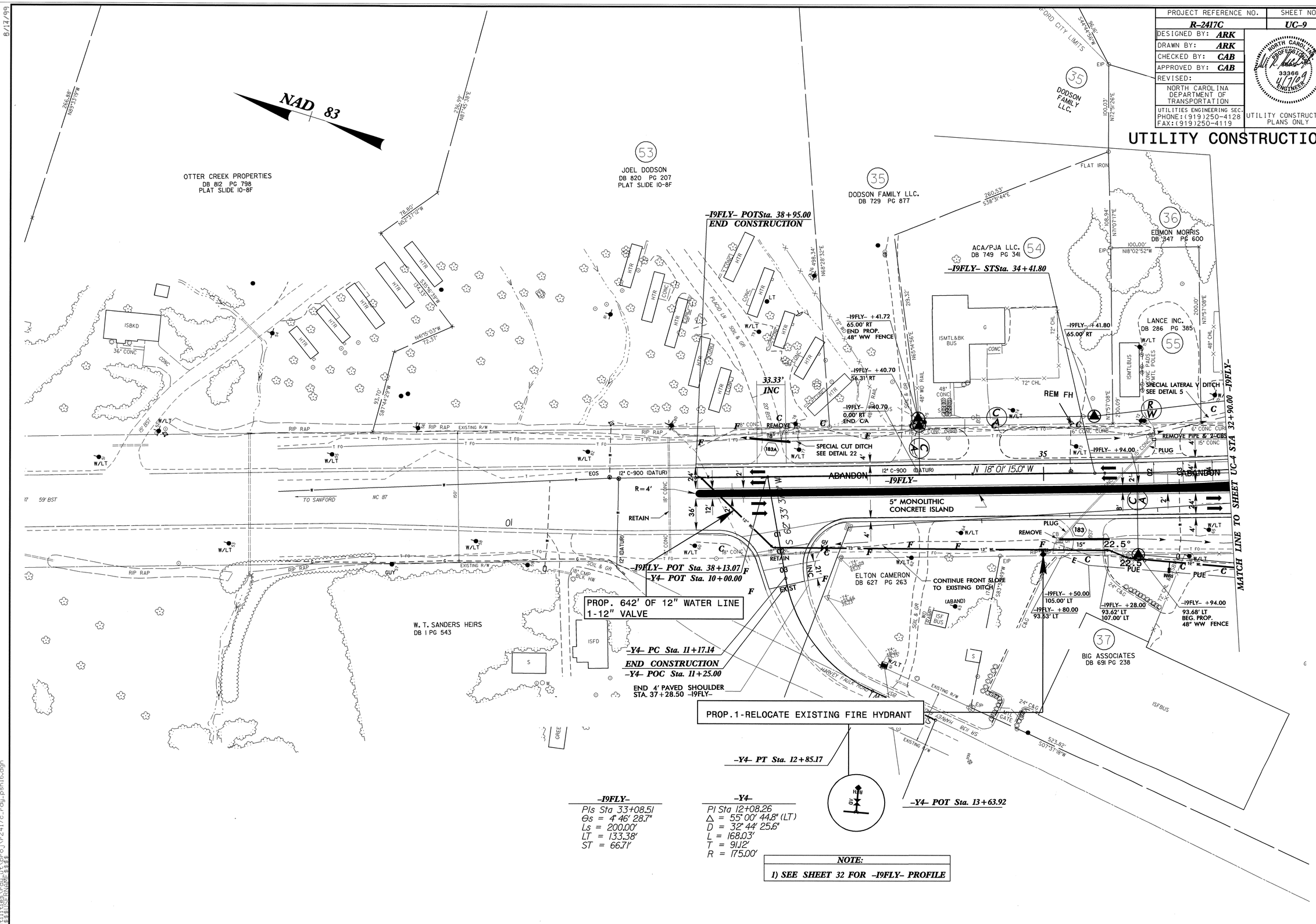
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE:(919)250-4128 FAX:(919)250-4119	UTILITY CONSTRUCTION PLANS ONLY

NORTH CAROLINA PROFESSIONAL SEAL 33366 ENGINEER 4/7/09

UTILITY CONSTRUCTION



REVISIONS

8/13/99

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PROJECT REFERENCE NO.	SHEET NO.
R-2417C	UC-10
DESIGNED BY: ARK	
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CHECKED BY: CAB	
APPROVED BY: CAB	
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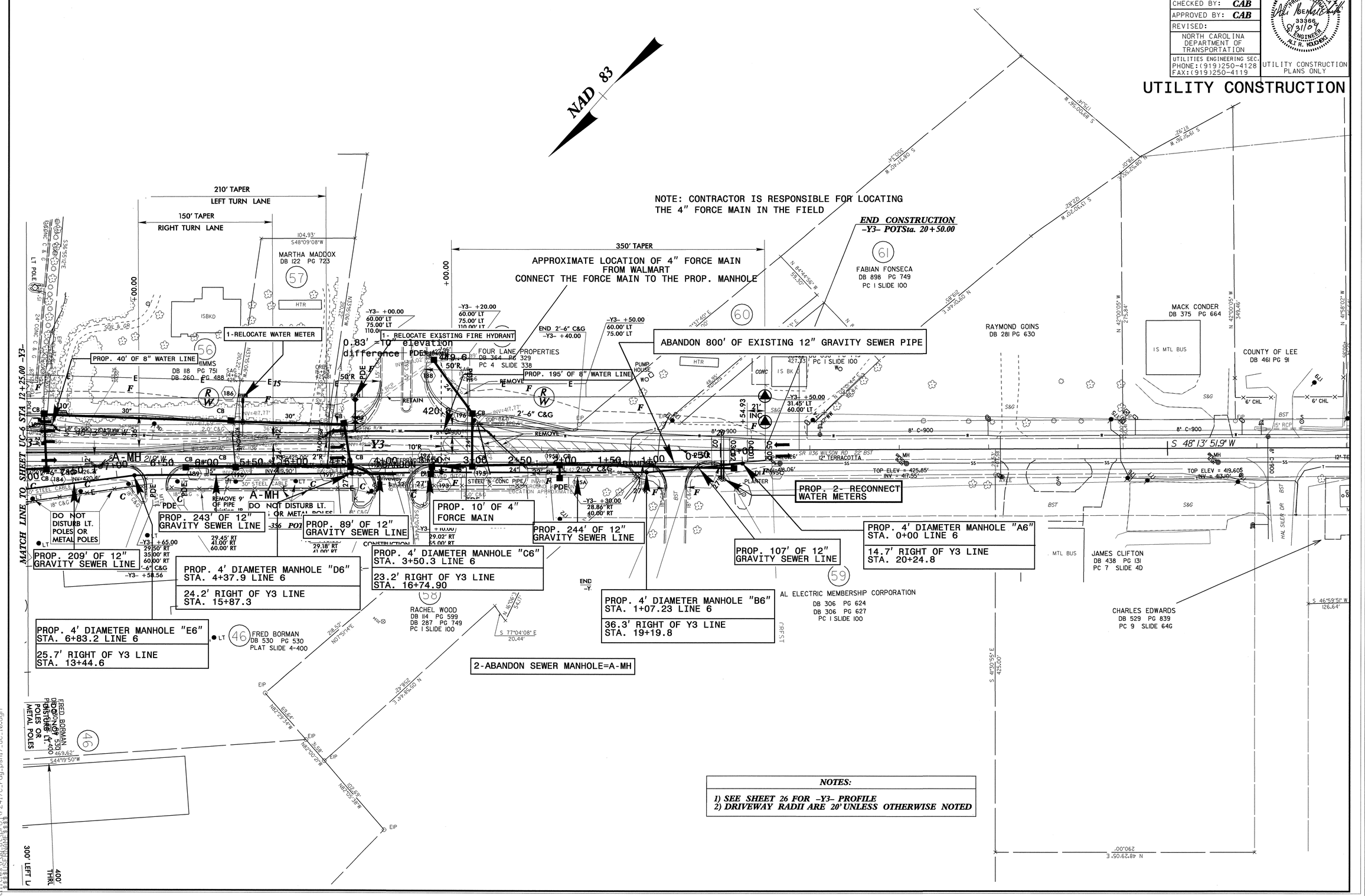
UTILITIES ENGINEERING SEC. PHONE:(919)250-4128 FAX:(919)250-4119	UTILITY CONSTRUCTION PLANS ONLY

NORTH CAROLINA PROFESSIONAL SEAL ENGINEER 33366 ALI R. KOLDEL 8/31/09

UTILITY CONSTRUCTION



NOTES:

1) SEE SHEET 26 FOR -Y3- PROFILE
2) DRIVEWAY RADII ARE 20' UNLESS OTHERWISE NOTED

8/17/99
8/14/99

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PROJECT REFERENCE NO.	SHEET NO.
R-2417C	UC-11

DESIGNED BY: ARK
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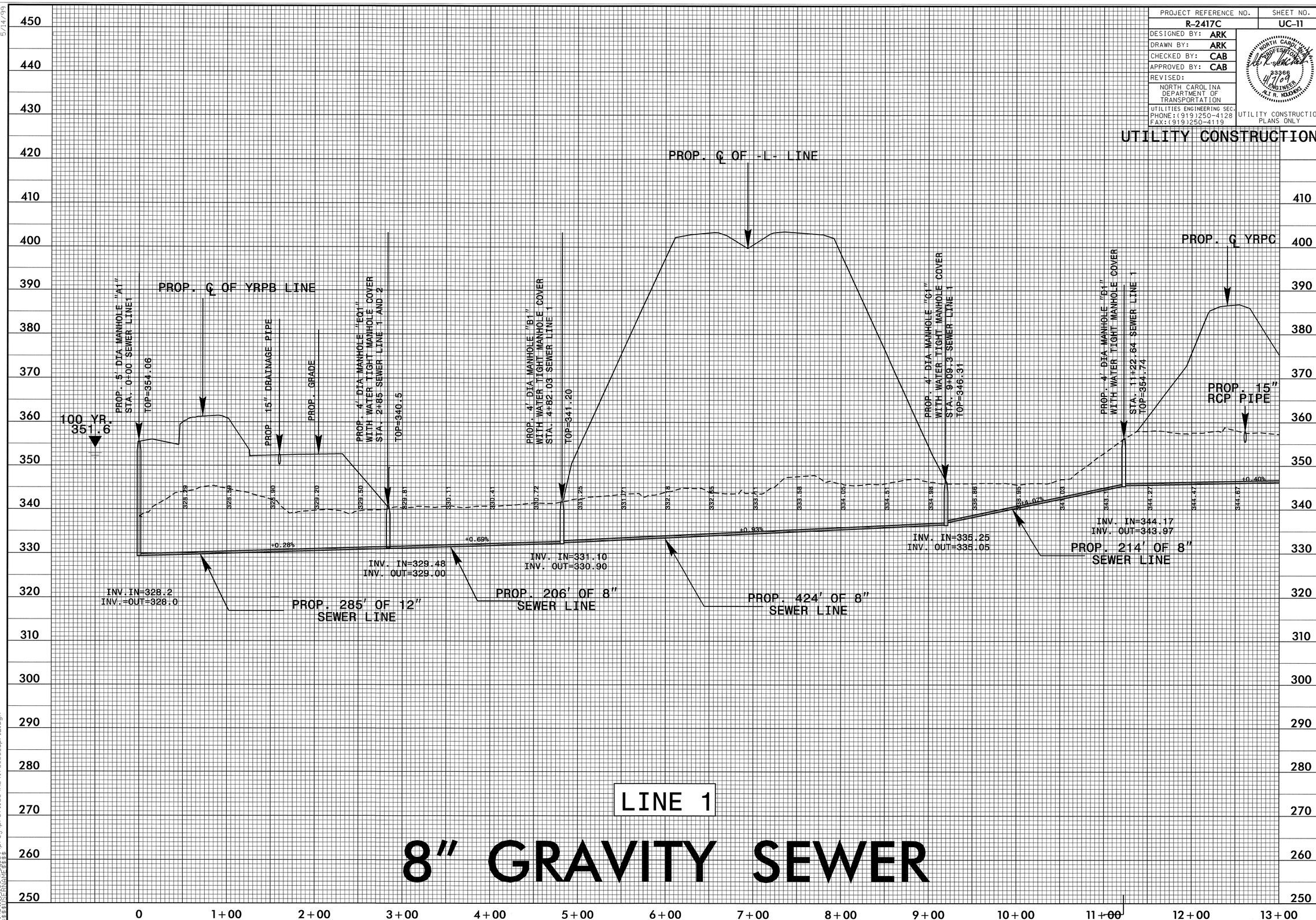

LINE 1

8" GRAVITY SEWER

5/14/99

31-MAR-2009 09:06
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PROJECT REFERENCE NO.	SHEET NO.
R-2417C	UC-12

DESIGNED BY: ARK
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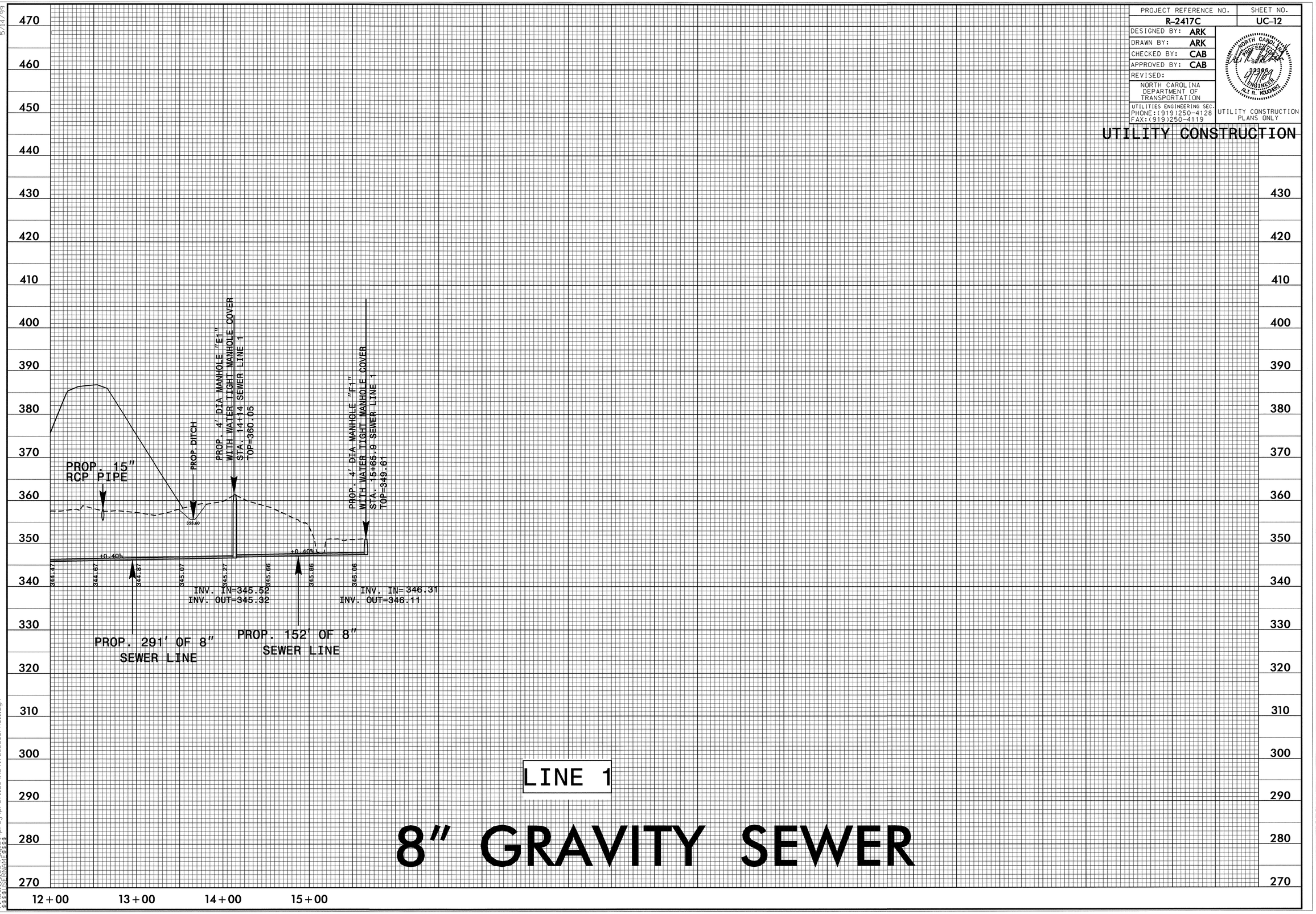
UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION



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PROJECT REFERENCE NO.	SHEET NO.
R-2417C	UC-13

DESIGNED BY: ARK
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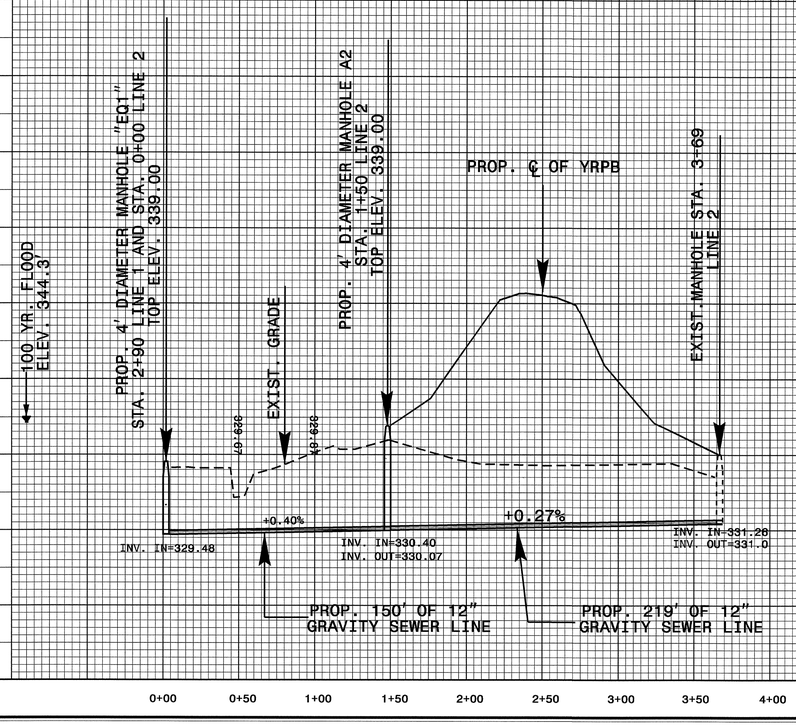
FAX:(919)250-4119

NORTH CAROLINA PROFESSIONAL SEAL 33366 ENGINEER ALI R. KOLCHERI

UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION



LINE 2

5/14/99

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PROJECT REFERENCE NO.	SHEET NO.
R-2417C	UC-14

DESIGNED BY: ARK
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APPROVED BY: CAB
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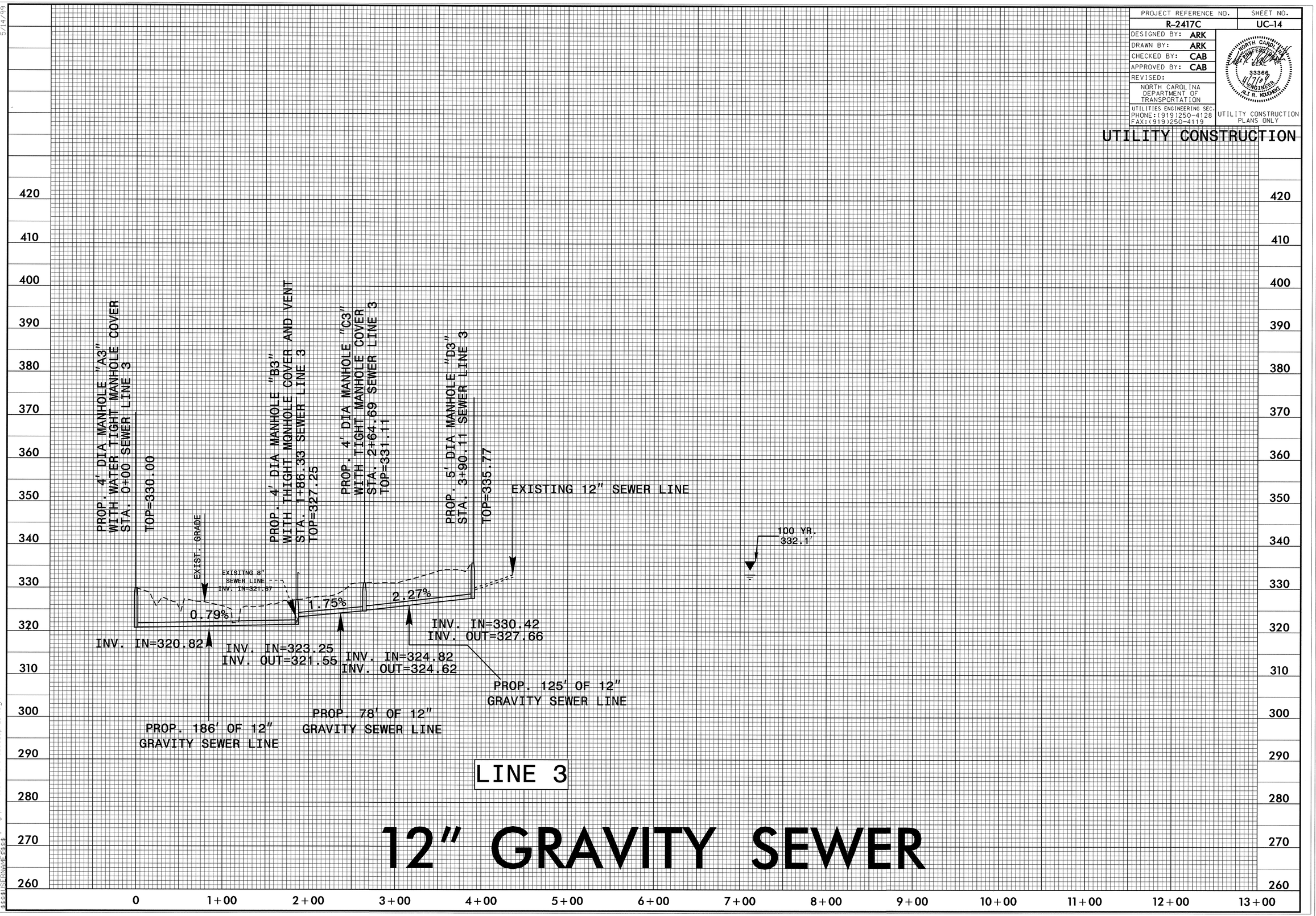
UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION



5/14/99

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PROJECT REFERENCE NO.	SHEET NO.
R-2417C	UC-15

DESIGNED BY: ARK
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APPROVED BY: CAB
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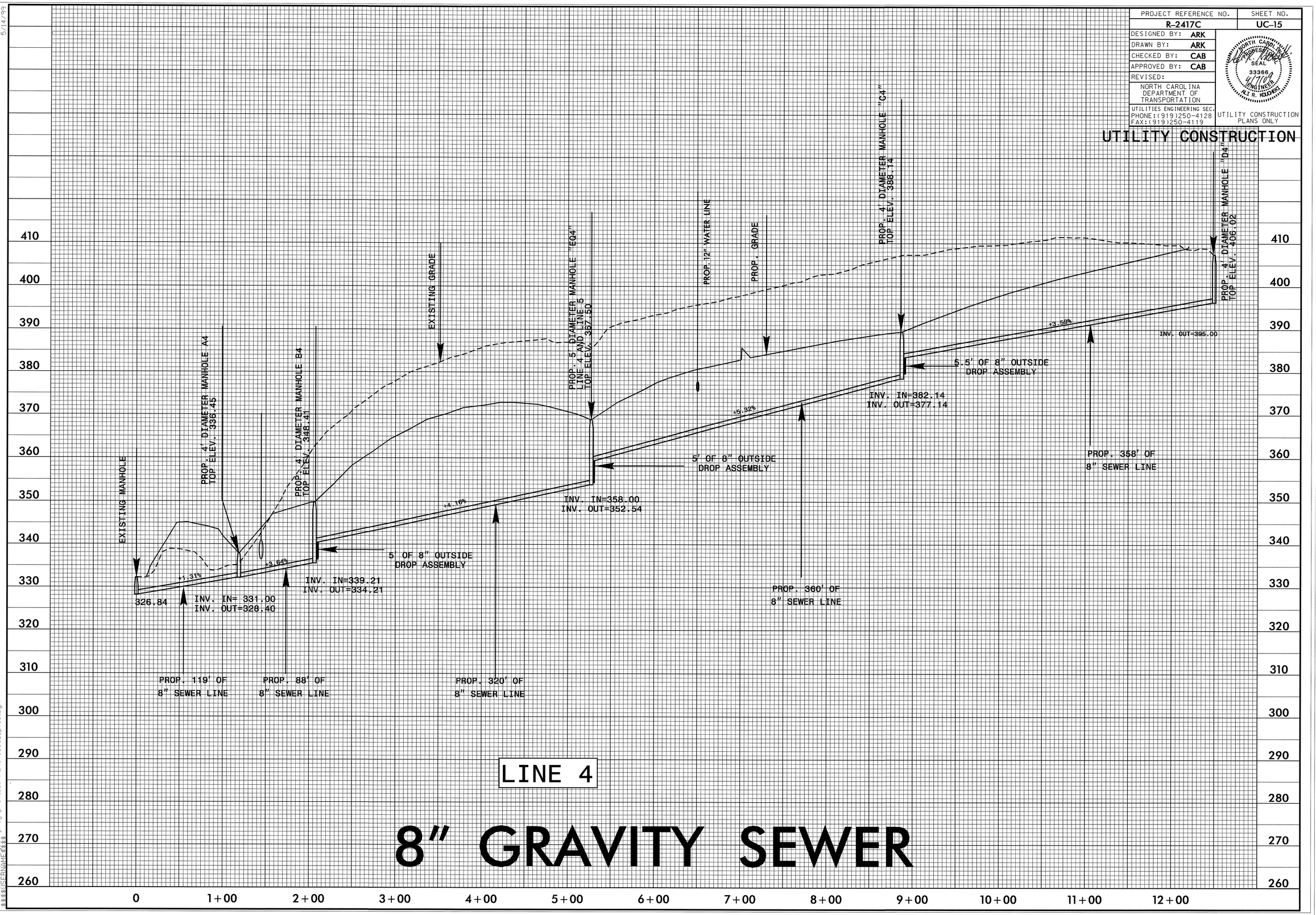
FAX:(919)250-4119

NORTH CAROLINA PROFESSIONAL SEAL 33366 ENGINEER ALI R. KOUCHEKI 4/7/09

UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION



LINE 4

8" GRAVITY SEWER

5/14/99

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PROJECT REFERENCE NO.	SHEET NO.
R-2417C	UC-16

DESIGNED BY: ARK
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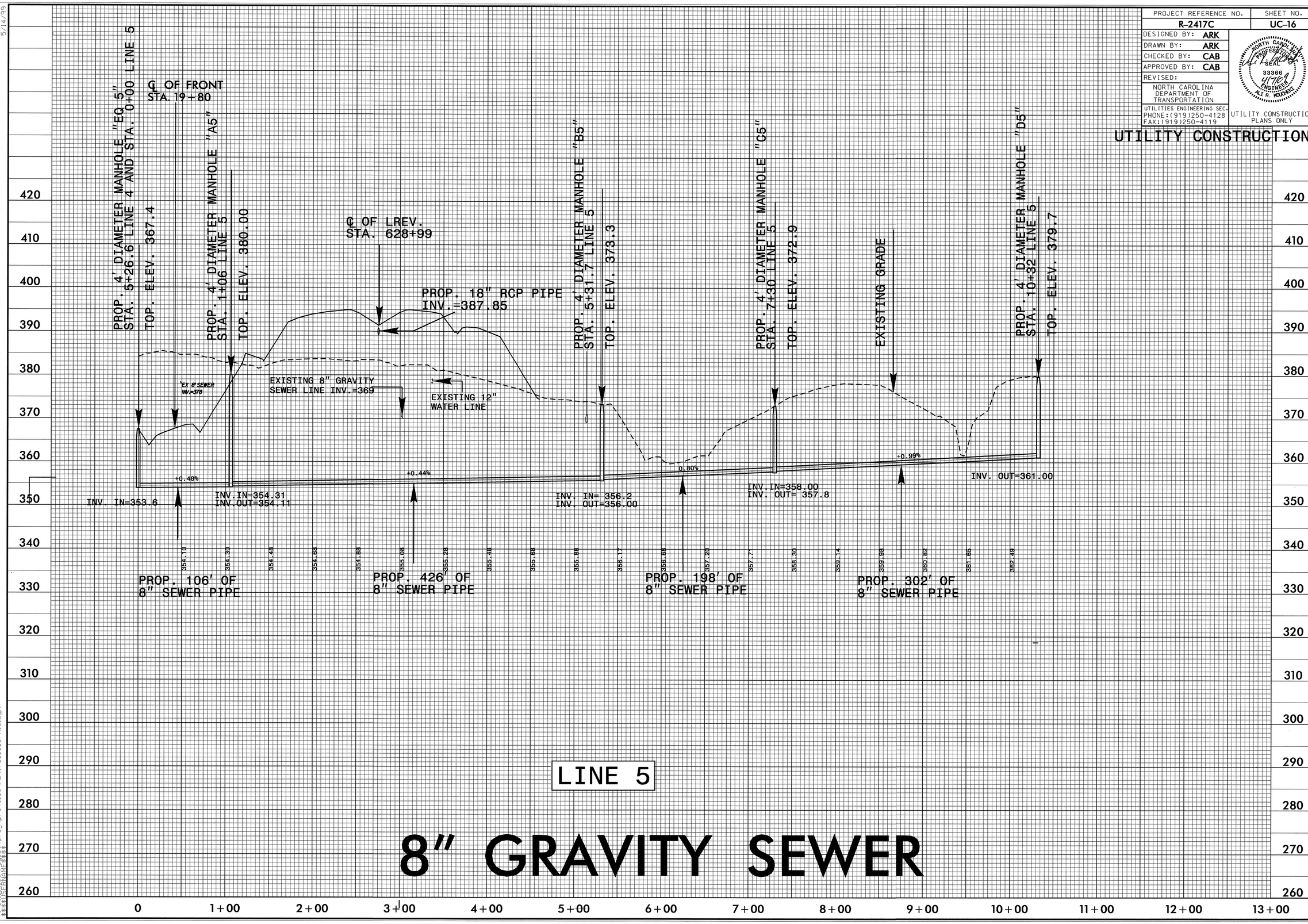
FAX:(919)250-4119

NORTH CAROLINA PROFESSIONAL SEAL 33366 ENGINEER ALI R. KOLCHERI

UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION



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PROJECT REFERENCE NO.	SHEET NO.
R-2417C	UC-17

DESIGNED BY: ARK
DRAWN BY: ARK
CHECKED BY: CAB
APPROVED BY: CAB
REVISED:

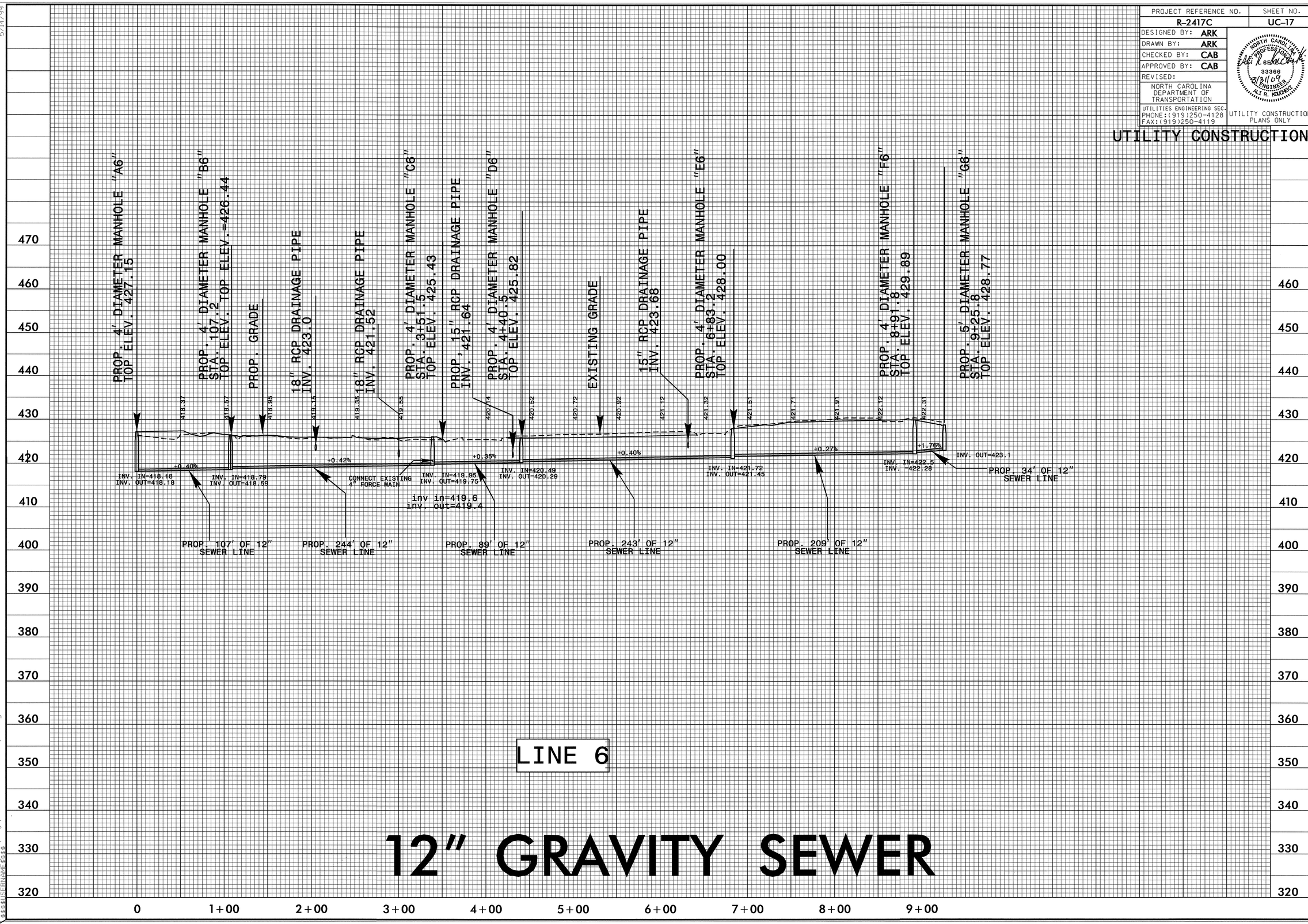
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

UTILITIES ENGINEERING SEC.
PHONE:(919)250-4128
FAX:(919)250-4119

NORTH CAROLINA PROFESSIONAL SEAL 33366 ENGINEER ALI R. KOUCHEKI 8/31/09

UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION



5/14/99

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PROJECT REFERENCE NO.	SHEET NO.
R-2417c	UC-18

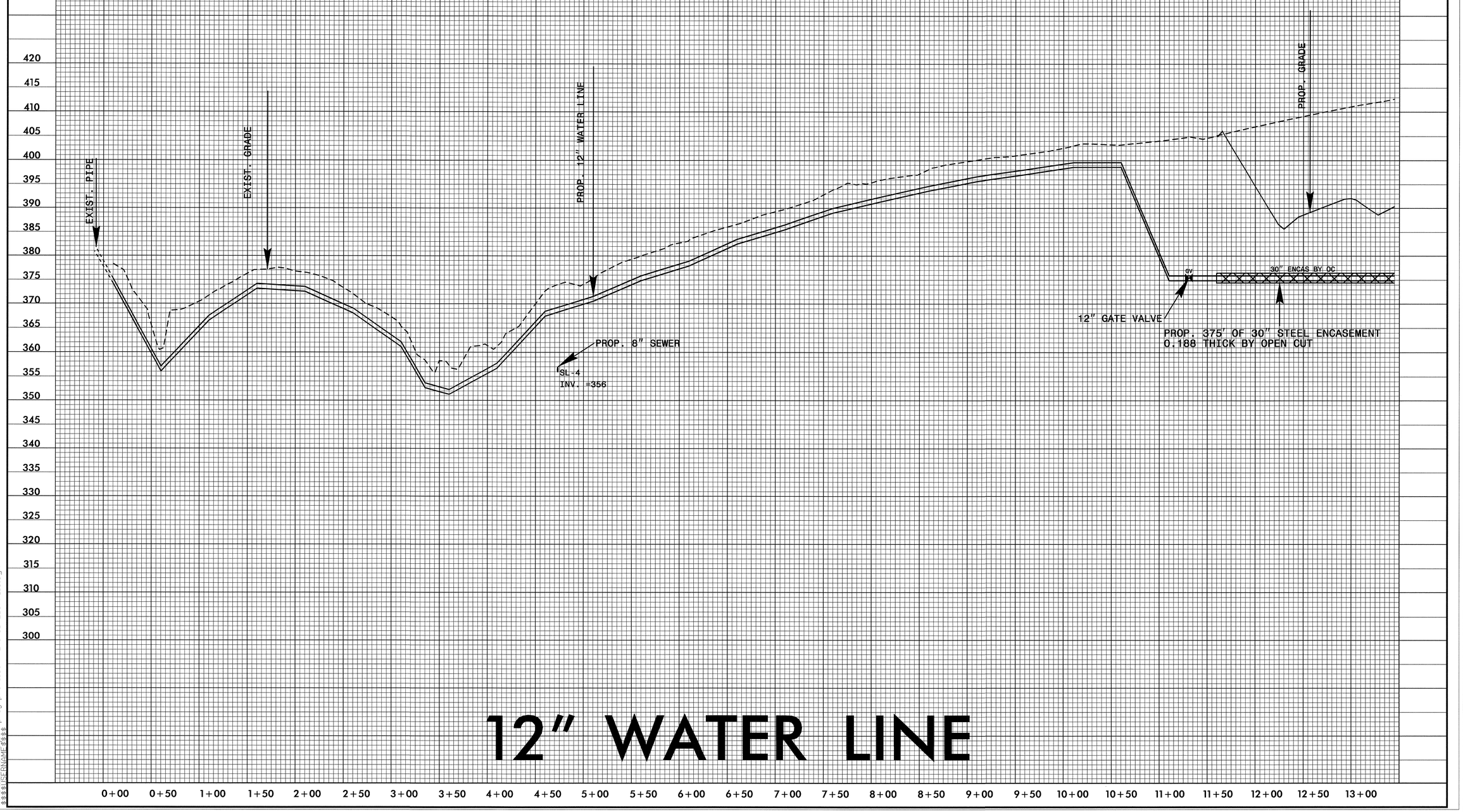
DESIGNED BY: ARK
DRAWN BY: ARK
CHECKED BY: CAB
APPROVED BY: CAB
REVISED:

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
UTILITIES ENGINEERING SEC.
PHONE:(919)250-4128
FAX:(919)250-4119

NORTH CAROLINA PROFESSIONAL SEAL 33366 ENGINEER ALI R. KOLCHEKI 4/7/09

UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION



12" WATER LINE

5/14/99

31-MAR-2009 10:15
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PROJECT REFERENCE NO.	SHEET NO.
R-2417c	UC-19

DESIGNED BY: ARK
DRAWN BY: ARK
CHECKED BY: CAB
APPROVED BY: CAB
REVISED:

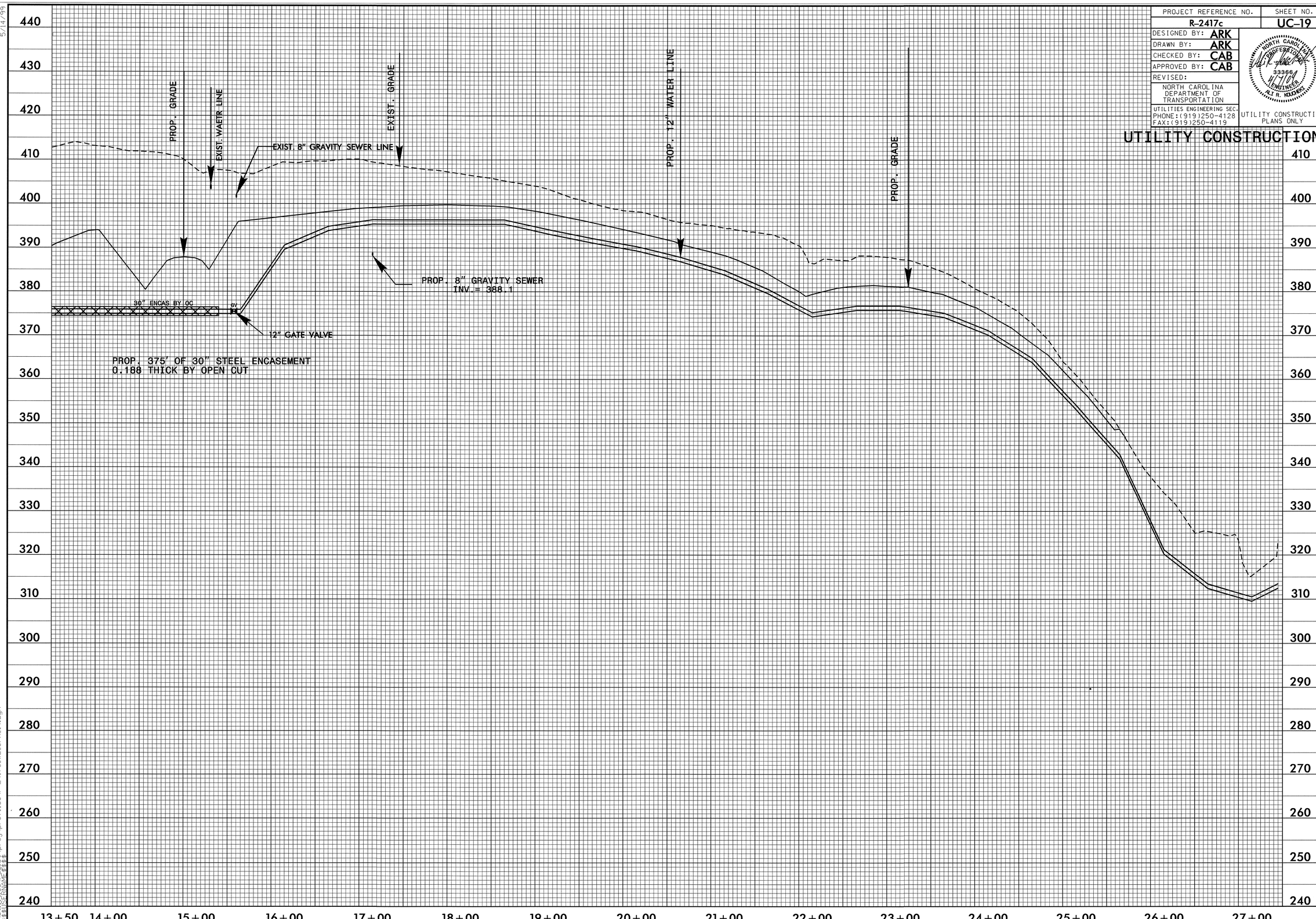
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

UTILITIES ENGINEERING SEC.
PHONE:(919)250-4128
FAX:(919)250-4119

NORTH CAROLINA PROFESSIONAL SEAL 33366 ENGINEER ALI R. KOLOOS

UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION



5/14/99

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PROJECT REFERENCE NO.	SHEET NO.
R-2417c	UC-20

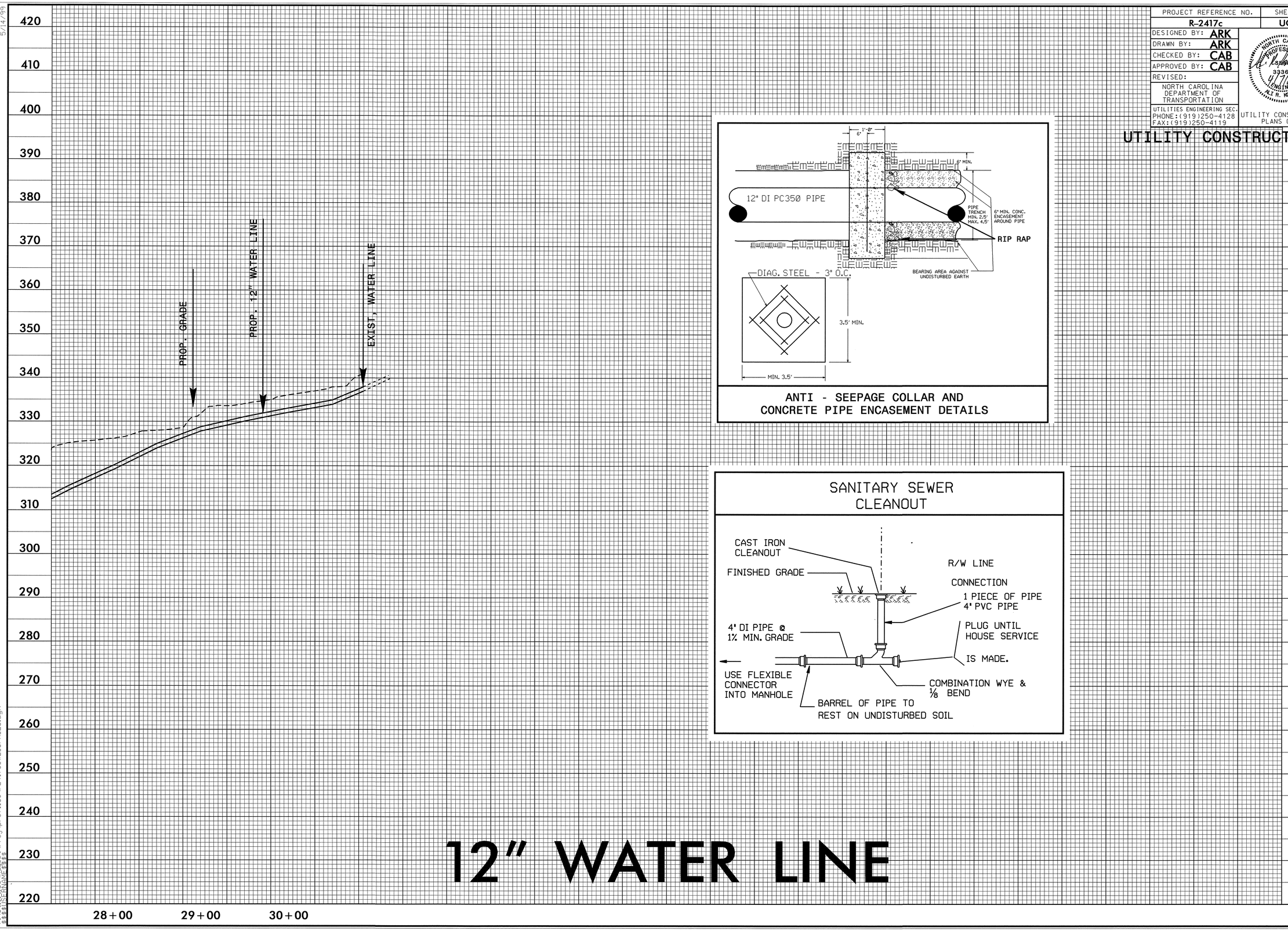
DESIGNED BY: ARK
DRAWN BY: ARK
CHECKED BY: CAB
APPROVED BY: CAB
REVISED:

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
UTILITIES ENGINEERING SEC.
PHONE:(919)250-4128
FAX:(919)250-4119

NORTH CAROLINA PROFESSIONAL SEAL 33366 ENGINEER ALI R. KOUCHEKI 4/7/09

UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION



ANTI - SEEPAGE COLLAR AND CONCRETE PIPE ENCASEMENT DETAILS

SANITARY SEWER CLEANOUT

12" WATER LINE

5/14/99
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PROJECT REFERENCE NO.	SHEET NO.
R-2417C	UC-21

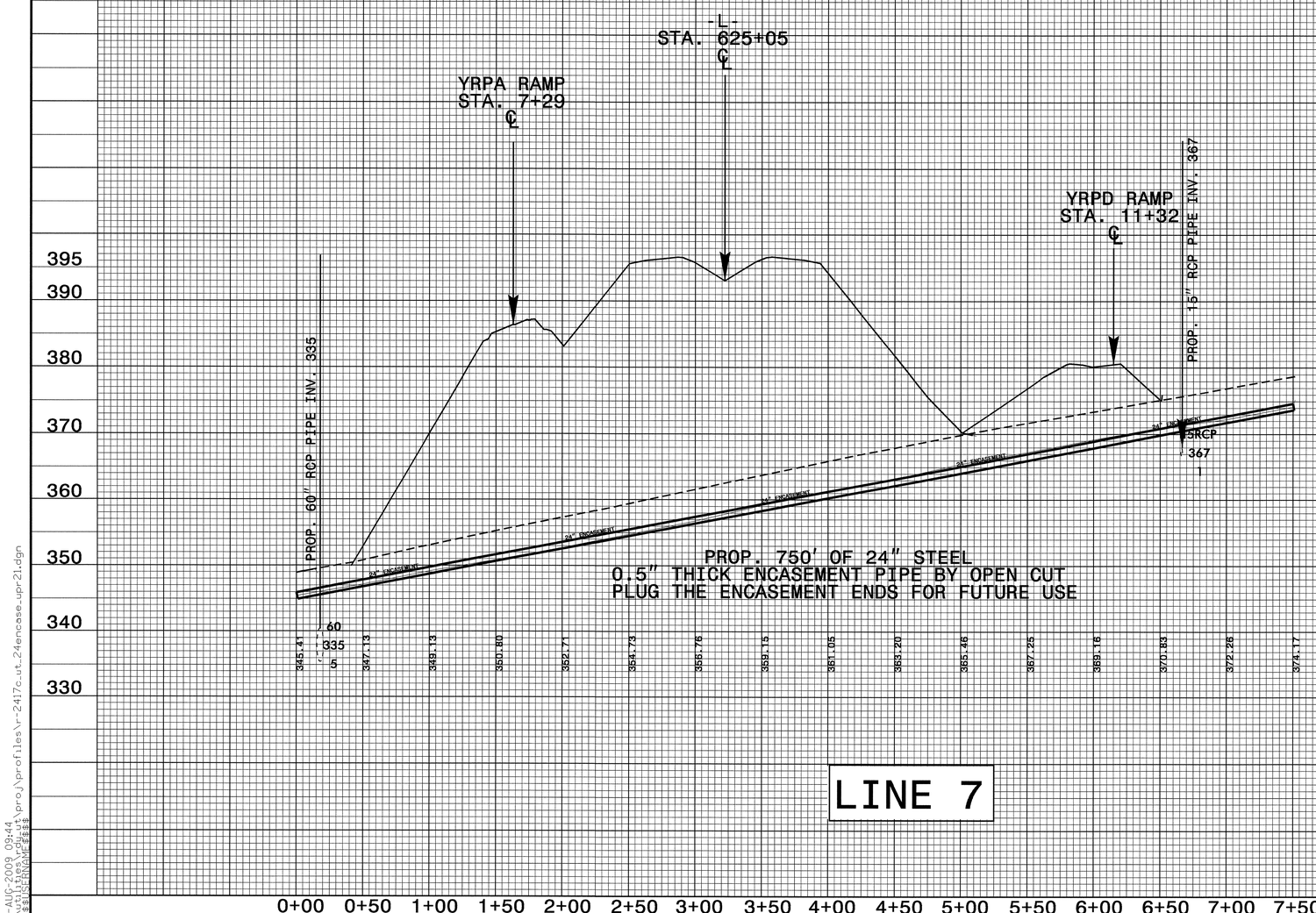
DESIGNED BY: ARK
DRAWN BY: ARK
CHECKED BY: CAB
APPROVED BY: CAB
REVISED:

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
UTILITIES ENGINEERING SEC.
PHONE:(919)250-4128
FAX:(919)250-4119

NORTH CAROLINA PROFESSIONAL SEAL 33366 ENGINEER ALI R. KOUCHEKI 8/31/09

UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION



LINE 7

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PROJECT REFERENCE NO.	SHEET NO.
R-2417C	UC-22

DESIGNED BY: ARK
DRAWN BY: ARK
CHECKED BY: CAB
APPROVED BY: CAB
REVISED:

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DESIGN SERVICES UNIT
PHONE:(919)250-4128
FAX:(919)250-4119

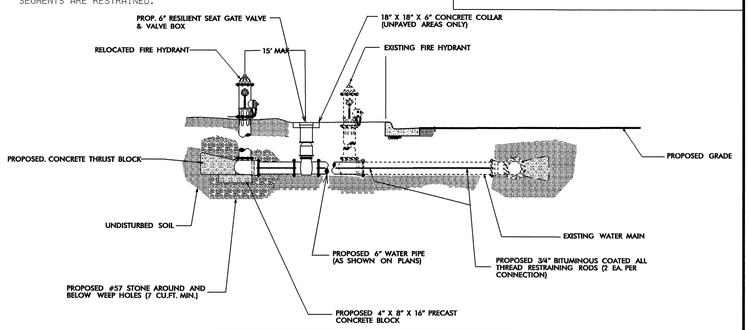
NORTH CAROLINA PROFESSIONAL SEAL 33366 ENGINEER ALI R. KOUSHKI 8/31/09

UTILITY CONSTRUCTION PLANS ONLY

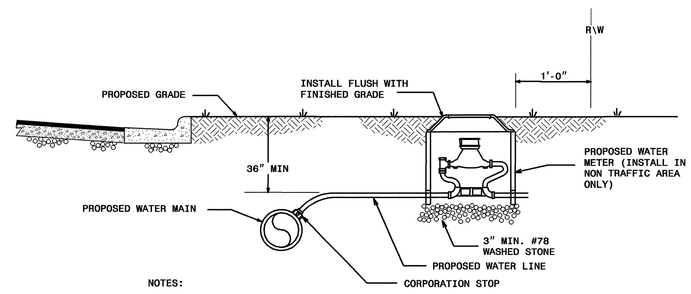
UTILITY CONSTRUCTION

NOTES:
1. TOP OF BLOCKING TO BE 2' FROM HYDRANT WEEP HOLES.
2. HYDRANT TEE MAY BE SUBSTITUTED FOR D.I.P. NIPPLE AND RODDING TO VALVE.
3. TAPPING SADDLES MAY BE USED INSTEAD OF A TEE FOR WATER LINES LARGER THAN 16 INCHES.
4. STD. RODDING AND BLOCKING FROM GATE VALVE TO HYDRANT MAY BE SUBSTITUTED WITH A CONCENTRIC RING RESTRAINT SYSTEM SUCH AS MUELLER AQUAGRIP OR AN APPROVED EQUAL PRODUCT PROVIDED ALL PIPE SEGMENTS ARE RESTRAINED.

GENERAL NOTES:
1. FIRE HYDRANTS SHALL BE PLACED AS FAR AS POSSIBLE FROM THE PAVEMENT EDGE WITHIN RIGHT OF WAY OUTER LIMITS. PUMPER NOZZLE SHALL BE PERPENDICULAR TO ROADWAY.
SWIVEL (LOCKED JOINTS) FITTINGS MAY BE USED IN LIEU OF 3/4" RESTRAINING RODS.
ALL CONCRETE SHALL BE CLASS "B".
2. HYDRANT BRANCH LINE SHALL HAVE THE SAME COVER AS THE MAIN (48" MINIMUM).
3.
4.



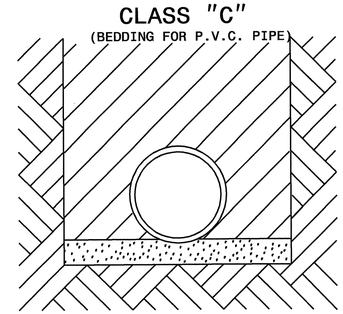
FIRE HYDRANT RELOCATION DETAIL



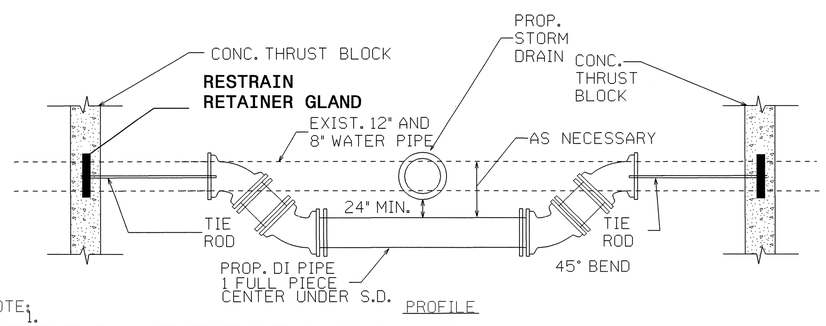
NOTES:
1. THE NEW WATER SERVICE LINE SHALL BE INSTALLED WITH A MINIMUN OF 48" COVER BELOW FINISHED GRADE.

WATER METER INSTALLATION DETAIL

CLASS "C"
(BEDDING FOR P.V.C. PIPE)



PIPE BEDDED IN LOOSE MATERIAL, LIGHTLY TAMPED WITH A MINIMUM OF 6" UNDER PIPE. 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.

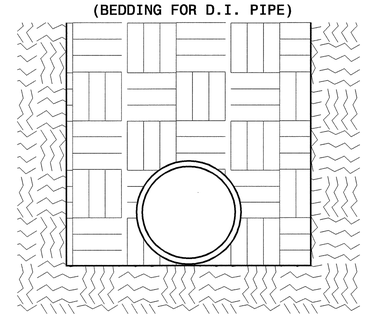


NOTE:
1. FITTINGS SHALL BE RESTRAINED BY USING TIE RODS OR OTHER METHOD AS APPROVED BY ENGINEER.

*NTS

RELOCATION OF 12" AND 8" D.I. WATER PIPE AT PROP. STORM DRAINAGE AS SHOWN ON PLANS

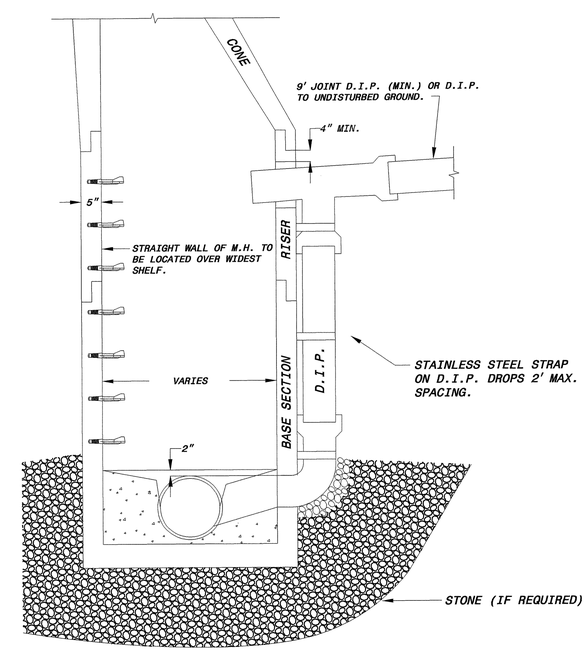
TYPE "2"
(BEDDING FOR D.I. PIPE)



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.

NOTES:

1. *CARE MUST BE TAKEN TO FORM A SMOOTH FINISHED TROUGH FROM ENTRANCE PIPES TO EXIT PIPE, AND IN CURVED MANHOLES THE TROUGH MUST BE A SMOOTH CIRCULAR ARC TANGENT TO THE INSIDE WALLS OF THE PIPES AT THEIR ENDS.*
2. *THE SLOPE OF THE OUTSIDE DROP TROUGH SHALL BE ¼" PER FOOT.*
3. *ALL PIPE OPENINGS TO BE NO GREATER THAN 3" LARGER THAN O.D. OF PIPE AND ADDITIONALLY REINFORCED WITH A MINIMUM OF 0.20 SQ. IN. OF STEEL AT 90 DEGREES. PIPE TO BE CENTERED IN OPENINGS. ADDITIONAL REINFORCING NOT REQUIRED FOR CORED OPENINGS.*
4. *OUTSIDE DROP SHALL NOT ENTER MANHOLE IN CONE SECTION.*
5. *MATCH DROP INFLUENT CROWN TO CROWN WITH EFFLUENT PIPE.*



OUTSIDE DROP MANHOLE DETAIL

8/17/99

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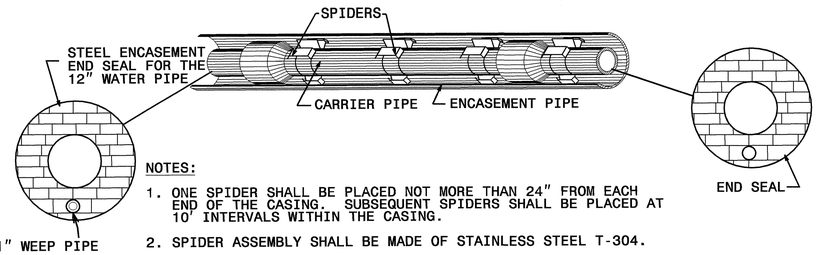
PROJECT REFERENCE NO.	SHEET NO.
R-2417C	UC-23
DESIGNED BY: ARK	
DRAWN BY: ARK	
CHECKED BY: CAB	
APPROVED BY: CAB	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
DESIGN SERVICES UNIT PHONE:(919)250-4128 FAX:(919)250-4119	UTILITY CONSTRUCTION PLANS ONLY

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 33366 8/31/09 ALI R. KOCHEKI

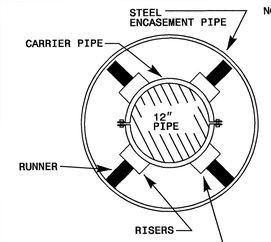
UTILITY CONSTRUCTION



NOTES:

1. ONE SPIDER SHALL BE PLACED NOT MORE THAN 24" FROM EACH END OF THE CASING. SUBSEQUENT SPIDERS SHALL BE PLACED AT 10' INTERVALS WITHIN THE CASING.
2. SPIDER ASSEMBLY SHALL BE MADE OF STAINLESS STEEL T-304.

PROPOSED PIPE ENCASEMENT DETAIL



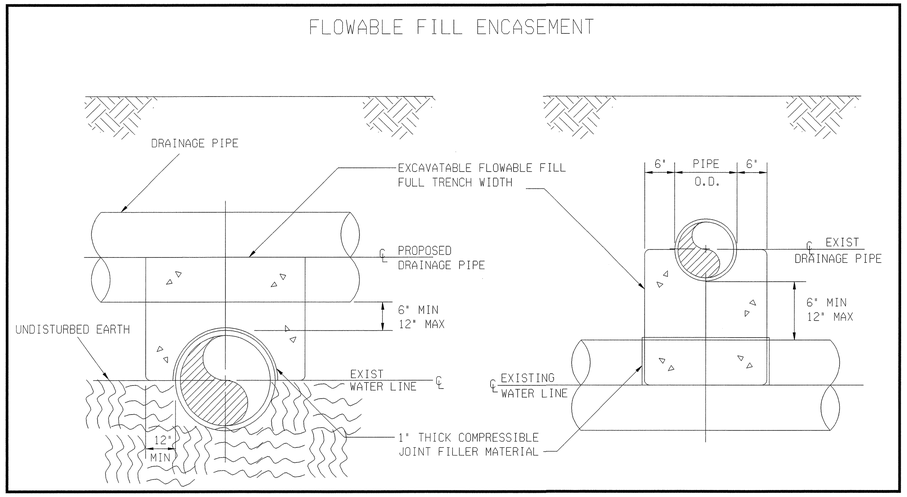
NOTES:

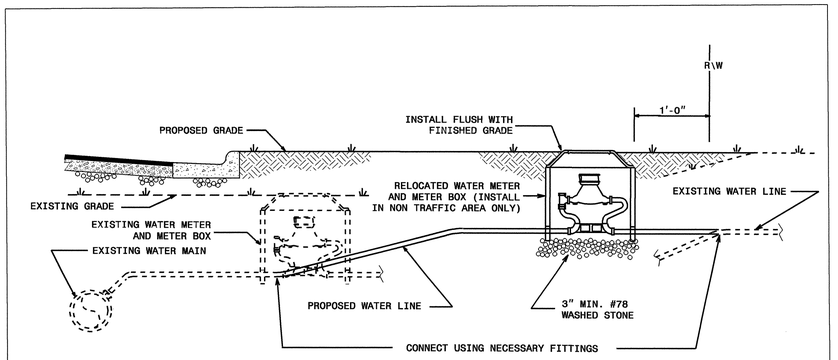
1. ONE SPIDER SHALL BE PLACED NOT MORE THAN 24" FROM EACH END OF THE CASING. SUBSEQUENT SPIDERS SHALL BE PLACED AT 10' INTERVALS WITHIN THE CASING.
2. CAP THE ENDS OF THE ENCASEMENT WITH BRICK AND MORTAR OR FLEXIBLE END SEAL, SEE DETAIL.
3. THE CASING SPIDERS SHALL BE MADE OF TWO PIECE SHELL T-304 STAINLESS STEEL OF A MINIMUM 14 GAGE THICKNESS. EACH CONNECTING FLANGE SHALL HAVE A MIN. OF 3 - 5/8", T-304 STAINLESS STEEL BOLTS. THE SHELL SHALL BE LINED WITH A RIBBED PVC EXTRUSION WITH A RETAINING SECTION THAT OVERLAPS THE EDGES OF THE SHELL AND PREVENTS SLIPPAGE.
4. RISERS SHALL BE MADE OF T-304 STAINLESS STEEL OF A MINIMUM THICKNESS OF 10 GAUGE. ALL RISERS OVER 6" IN HEIGHT SHALL HAVE ADDITIONAL REINFORCEMENT. RUNNERS SHALL BE MADE OF ULTRA HIGH MOLECULAR WEIGHT POLYMER WITH A LOW COEFFICIENT OF FRICTION.

STEEL ENCASEMENT PIPE

MAXIMUM TRENCH WIDTH AT TOP OF PIPE

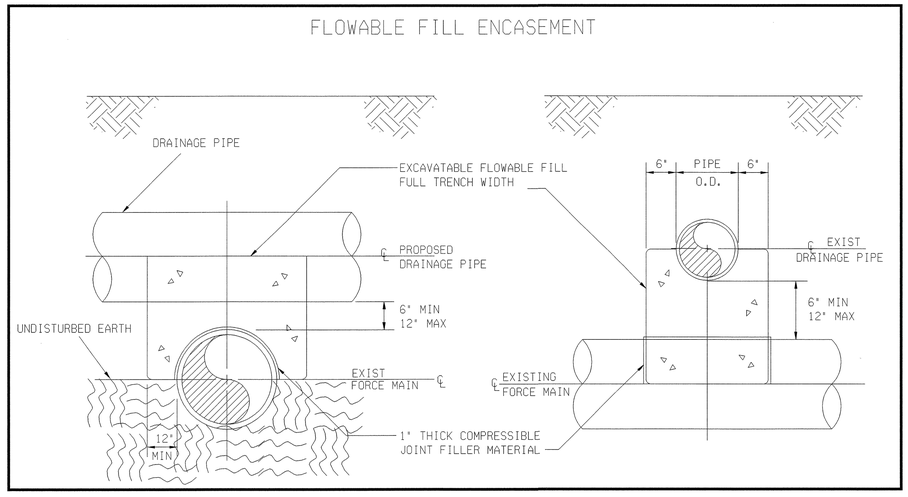
NOMINAL PIPE SIZE (INCHES)	TRENCH WIDTH (INCHES)	NOMINAL PIPE SIZE (INCHES)	TRENCH WIDTH (INCHES)
4	28	20	44
6	30	24	48
8	32	30	54
10	34	36	60
12	36	42	66
14	38	48	72
16	40	54	78
18	42		





1. 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.
2. THE NEW WATER SERVICE LINE SHALL BE INSTALLED WITH A MINIMUN OF 48" COVER BELOW FINISHED GRADE.

WATER METER RELOCATION DETAIL



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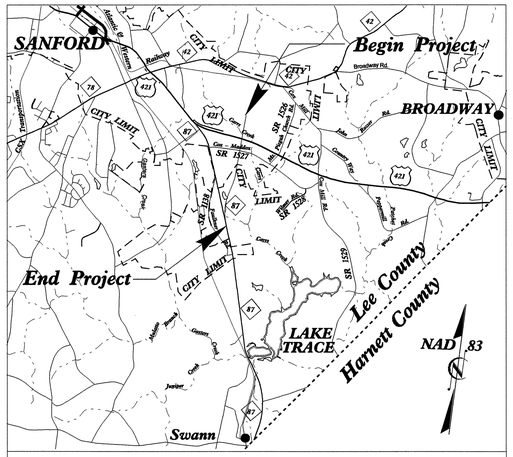
T.I.P. NO.	SHEET NO.
R-2417C	UO-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

UTILITIES BY OTHERS PLANS
LEE COUNTY

TIP PROJECT: R-2417C

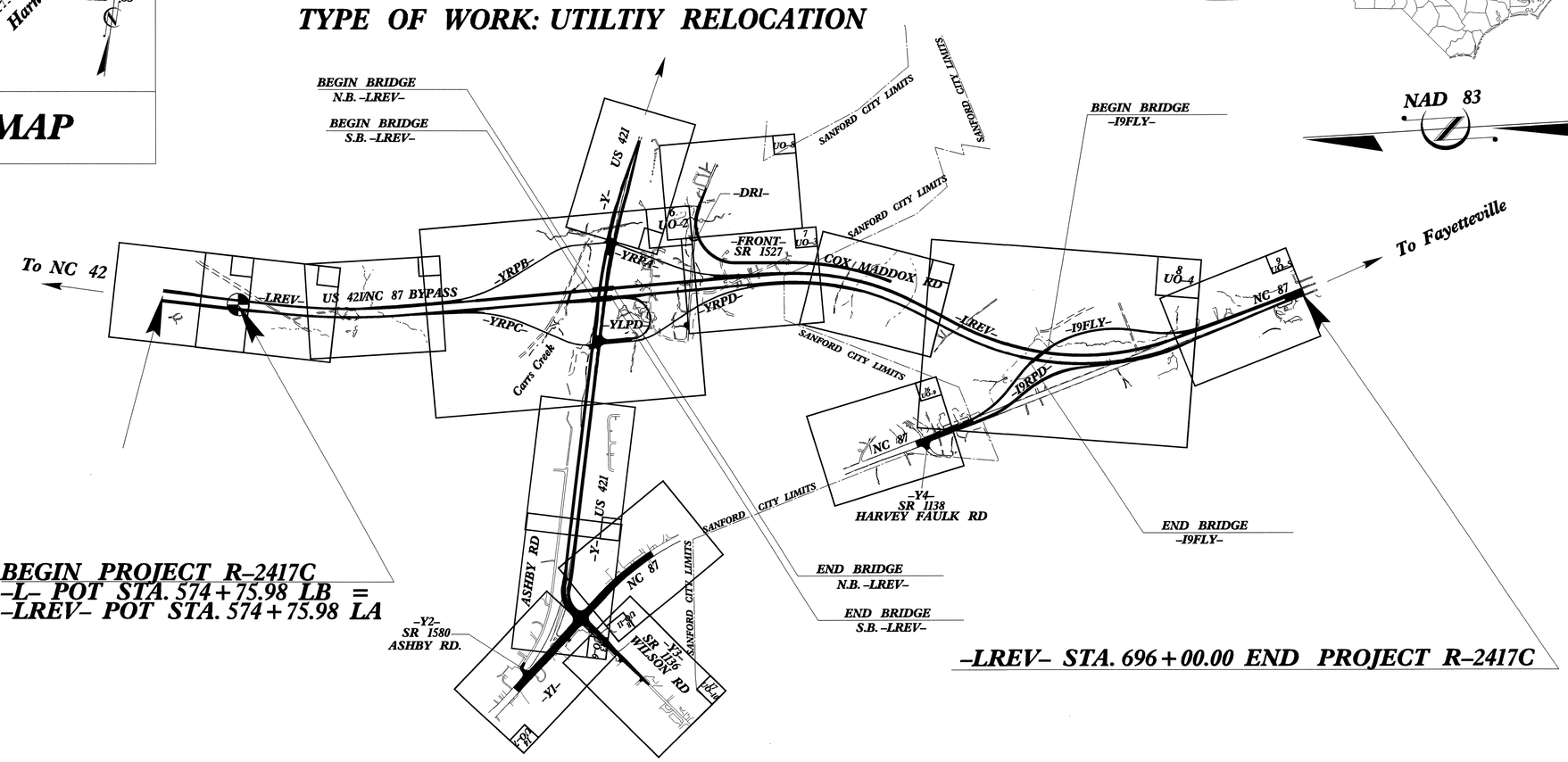
See Sheet 1-A For Index of Sheets
See Sheet 1-B For Conventional Symbols



VICINITY MAP

LOCATION: US42/NC 87 (SANFORD BYPASS) FROM EAST OF NC 42 TO NC 87 NEAR SR 1138

TYPE OF WORK: UTILTIY RELOCATION



BEGIN PROJECT R-2417C
-L- POT STA. 574+75.98 LB =
-LREV- POT STA. 574+75.98 LA

-LREV- STA. 696+00.00 END PROJECT R-2417C

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

INDEX OF SHEETS

SHEET NO.	DESCRIPTION
UO-1	TITLE SHEET
UO-2 THRU UO-11	UTILITY BY OTHERS PLAN SHEETS

UTILITY OWNERS ON PROJECT

(1) CENTRAL EMC
(2) WINDSTREAM
(3) PROGRESS ENERGY
(4) DIXIE PIPELINE
(5) AT&T

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
Carl Barclay, P.E. — UTILITIES SQUAD LEADER PROJECT ENGINEER
Ali Koucheki, P.E. — UTILITIES PROJECT DESIGNER

09/08/99
20-OCT-2009 06:57
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PROJECT REFERENCE NO.	SHEET NO.
R-2417C	UO-2

UTILITIES BY OTHERS

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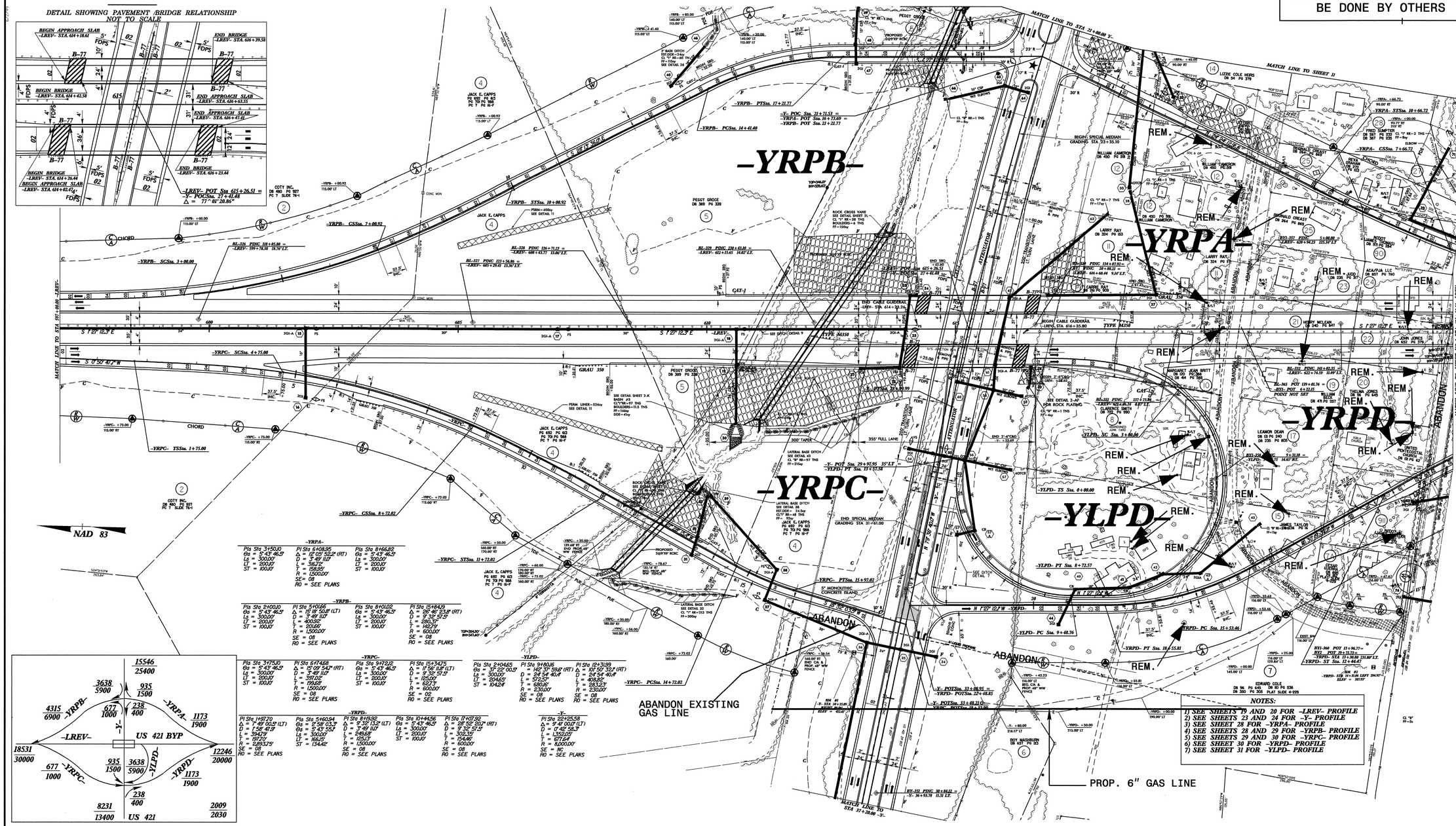

REVISIONS

5/14/99

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PROJECT REFERENCE NO.	SHEET NO.
R-2417C	UO-3

UTILITIES BY OTHERS

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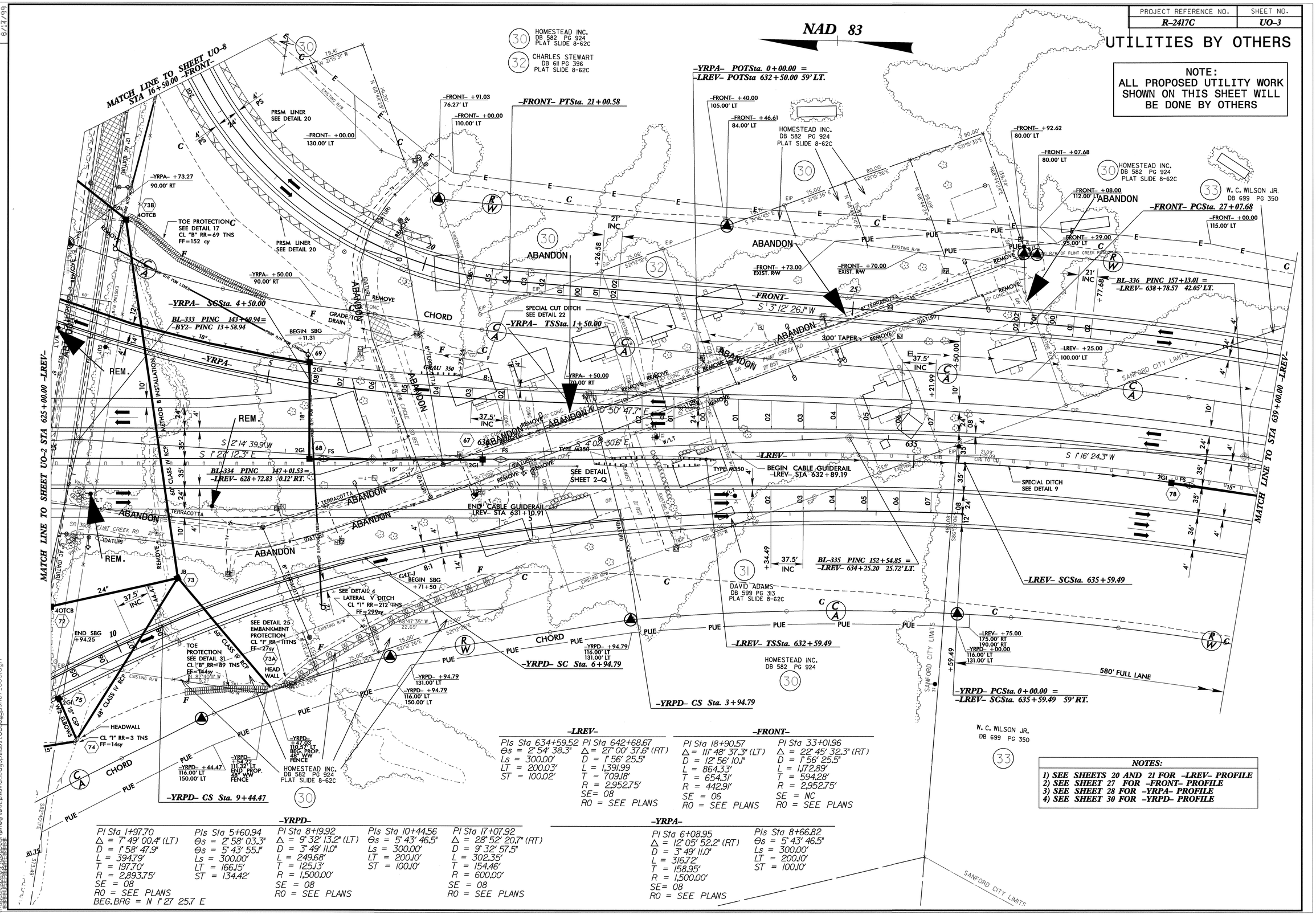

-LREV-

PIs Sta 634+59.52	PI Sta 642+68.67
Θs = 2° 54' 38.3"	Δ = 27° 00' 37.6" (RT)
Ls = 300.00'	D = 1° 56' 25.5"
LT = 200.03'	L = 1,391.99
ST = 100.02'	T = 709.18'
	R = 2,952.75'
	SE = 08
	RO = SEE PLANS

-FRONT-

PI Sta 18+90.57	PI Sta 33+01.96
Δ = 111° 48' 37.3" (LT)	Δ = 22° 45' 32.3" (RT)
D = 12° 56' 10.1"	D = 1° 56' 25.5"
L = 864.33'	L = 1,172.89'
T = 654.31'	T = 594.28'
R = 442.91'	R = 2,952.75'
SE = 06	SE = NC
RO = SEE PLANS	RO = SEE PLANS

-YRPD-

PI Sta 1+97.70	PIs Sta 5+60.94	PI Sta 8+19.92	PIs Sta 10+44.56	PI Sta 17+07.92
Δ = 7° 49' 00.4" (LT)	Θs = 2° 58' 03.3"	Δ = 9° 32' 13.2" (LT)	Θs = 5° 43' 46.5"	Δ = 28° 52' 20.7" (RT)
D = 1° 58' 47.9"	Θs = 5° 43' 55.1"	D = 3° 49' 11.0"	Ls = 300.00'	D = 9° 32' 57.5"
L = 394.79'	Ls = 300.00'	L = 249.68'	LT = 200.10'	L = 302.35'
T = 197.70'	LT = 166.15'	T = 125.13'	ST = 100.10'	T = 154.46'
R = 2,893.75'	ST = 134.42'	R = 1,500.00'		R = 600.00'
SE = 08		SE = 08		SE = 08
RO = SEE PLANS		RO = SEE PLANS		RO = SEE PLANS
BEG.BRG = N 1° 27' 25.7" E				

-YRPA-

PI Sta 6+08.95	PIs Sta 8+66.82
Δ = 12° 05' 52.2" (RT)	Θs = 5° 43' 46.5"
D = 3° 49' 11.0"	Ls = 300.00'
L = 316.72'	LT = 200.10'
T = 158.95'	ST = 100.10'
R = 1,500.00'	
SE = 08	
RO = SEE PLANS	

NOTES:

1) SEE SHEETS 20 AND 21 FOR -LREV- PROFILE
2) SEE SHEET 27 FOR -FRONT- PROFILE
3) SEE SHEET 28 FOR -YRPA- PROFILE
4) SEE SHEET 30 FOR -YRPD- PROFILE

REVISIONS

6/14/99

PROJECT REFERENCE NO.	SHEET NO.
R-2417C	U0-4

UTILITIES BY OTHERS

NOTE:
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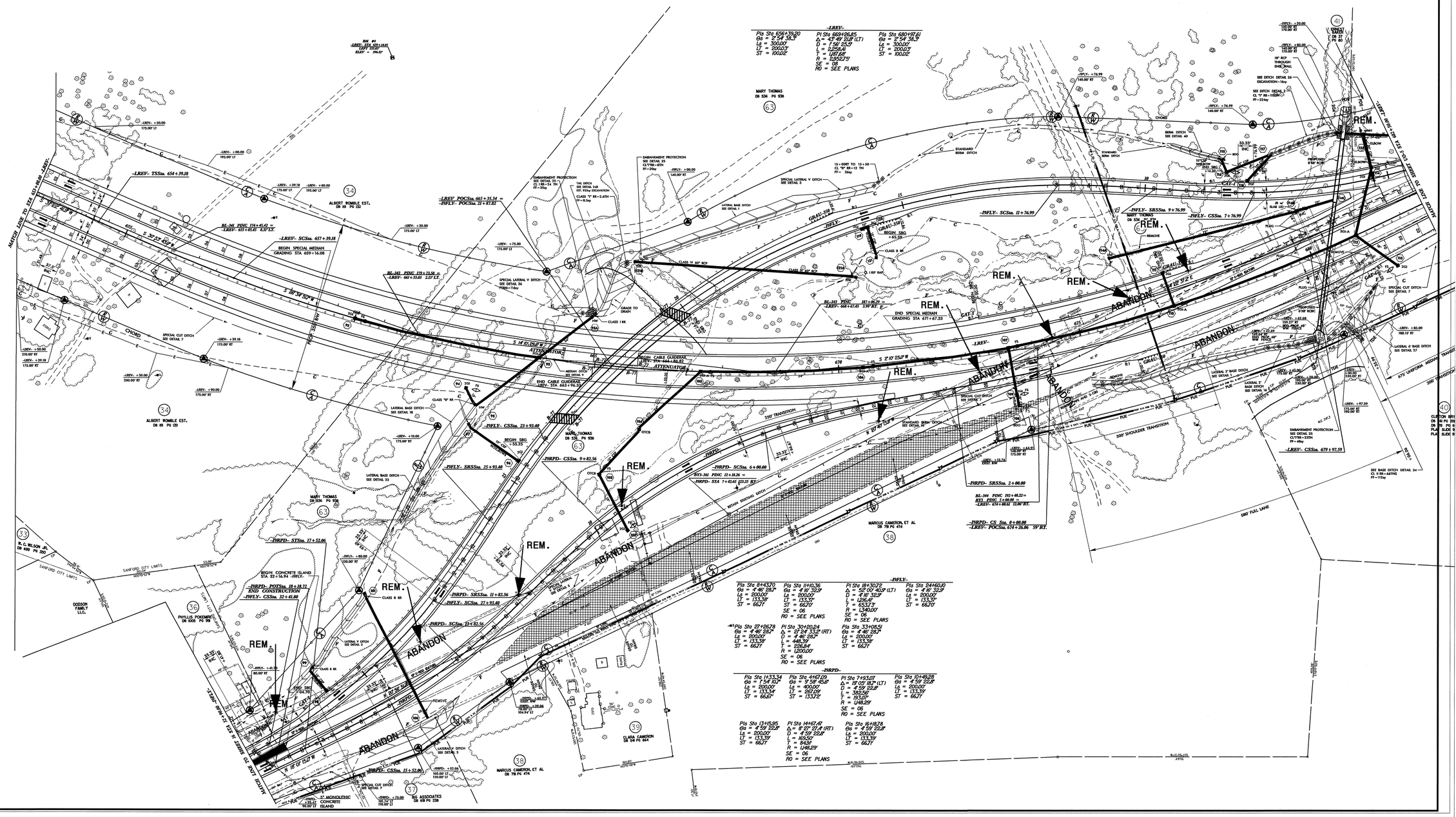

PROJECT REFERENCE NO.	SHEET NO.
R-2417C	U0-5

UTILITIES BY OTHERS

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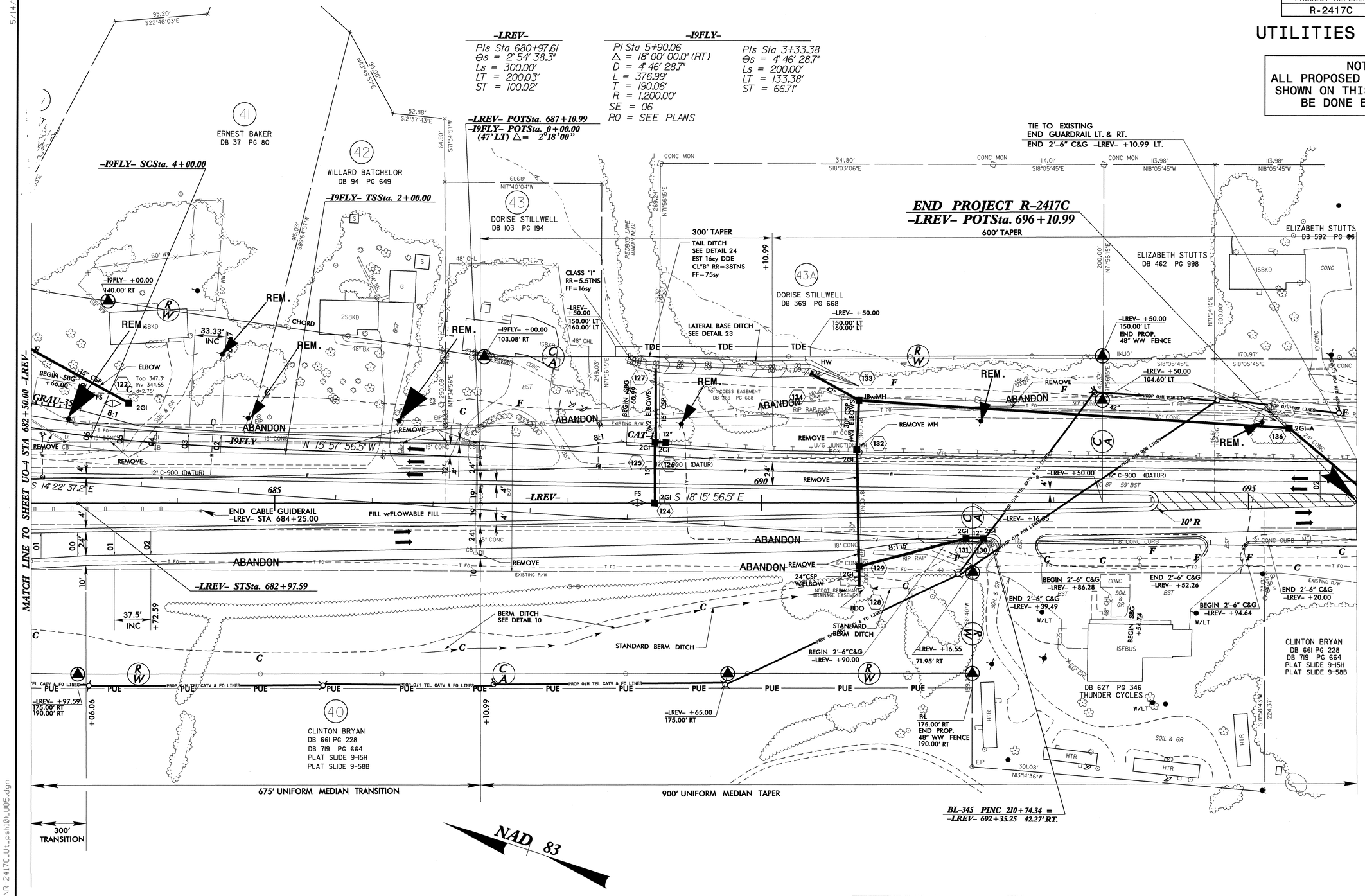

NOTES:

1) SEE SHEET 22 AND 23 FOR -LREV- PROFILE
2) SEE SHEET 31 FOR -I9FLY- PROFILE
3) PAINT STRIPING

5/14/99

07-APR-2009 11:13
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PROJECT REFERENCE NO.	SHEET NO.
R-2417C	UO-6

UTILITIES BY OTHERS

NOTE:
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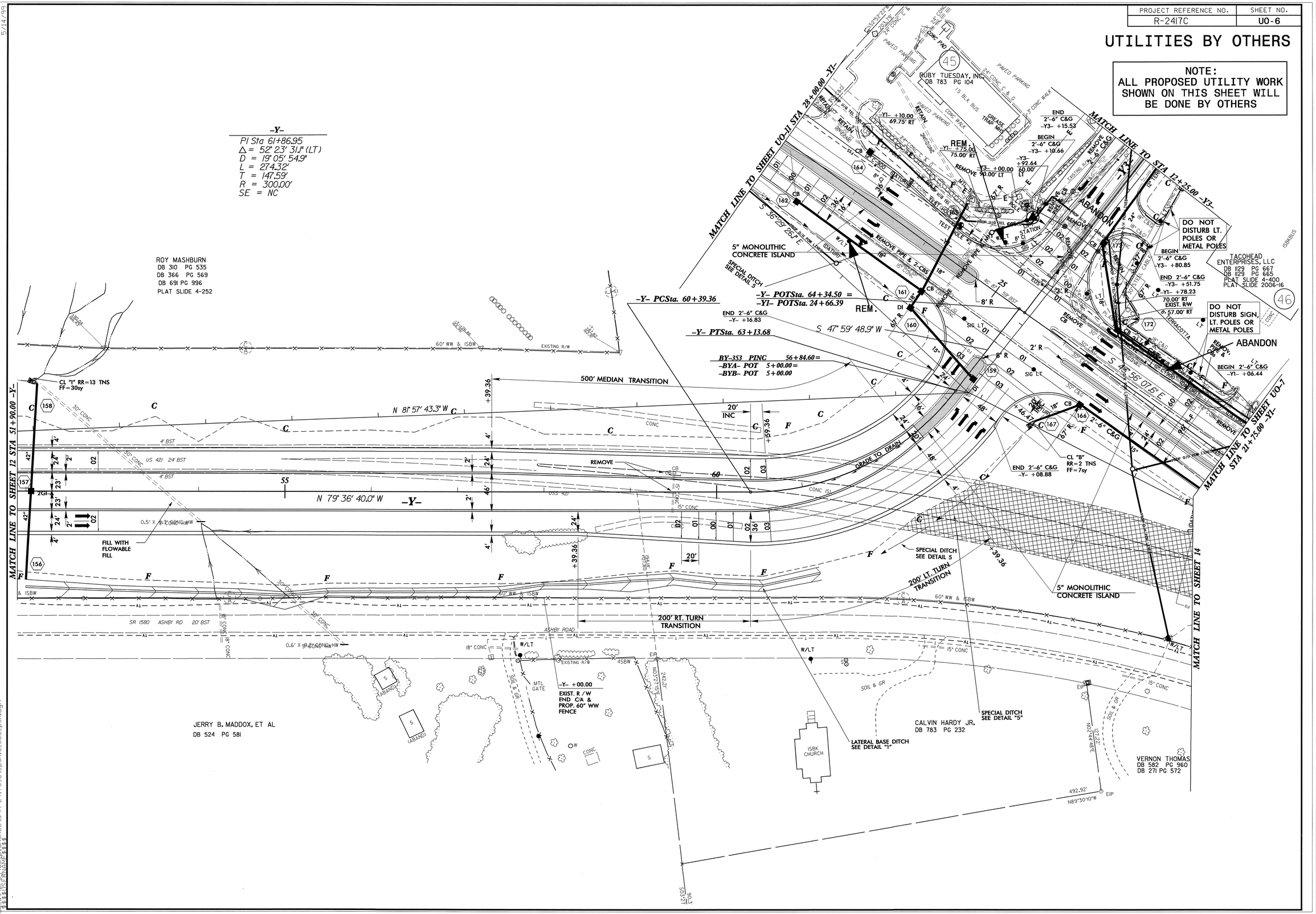

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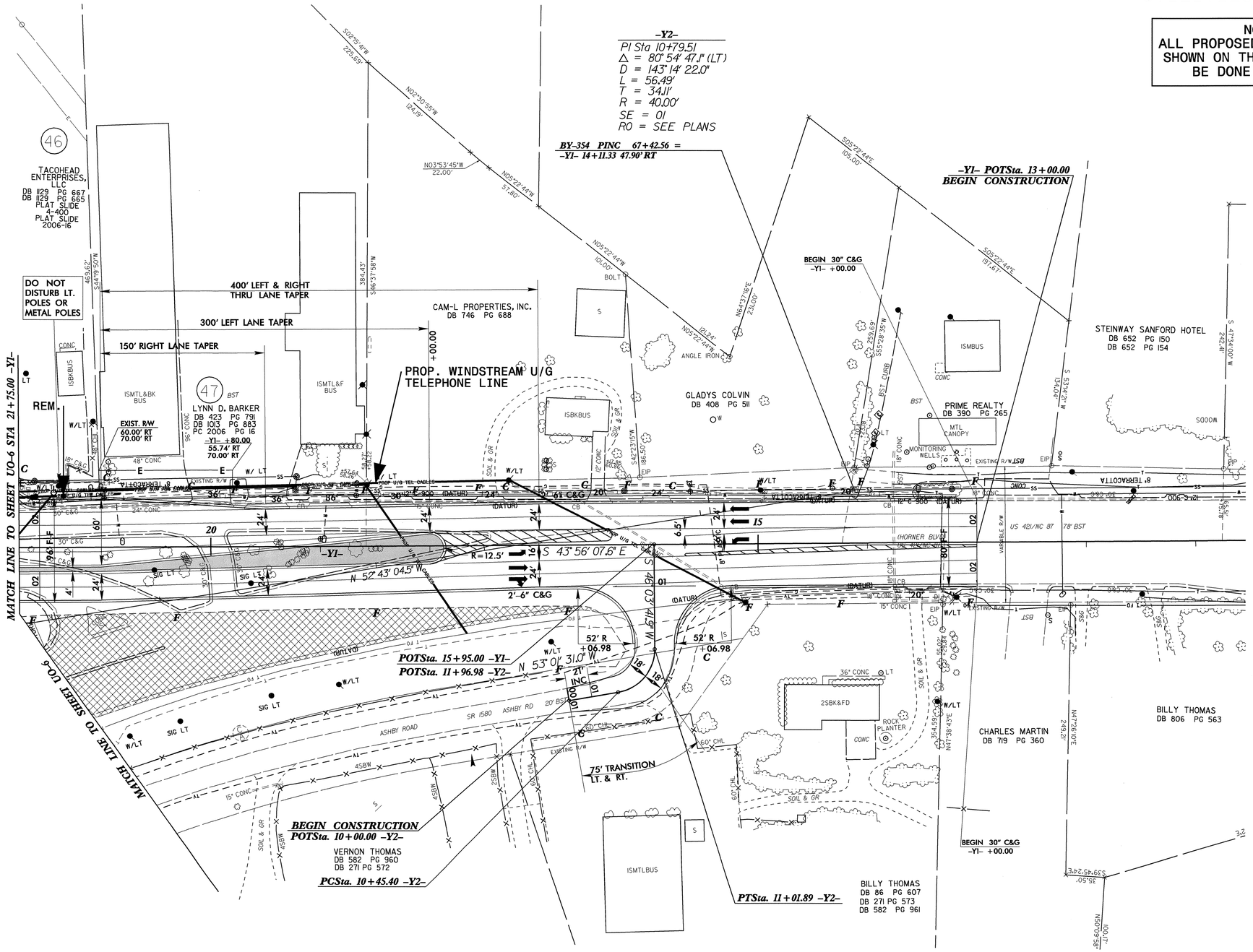
PROJECT REFERENCE NO.	SHEET NO.
R-2417C	UO-7

UTILITIES BY OTHERS

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



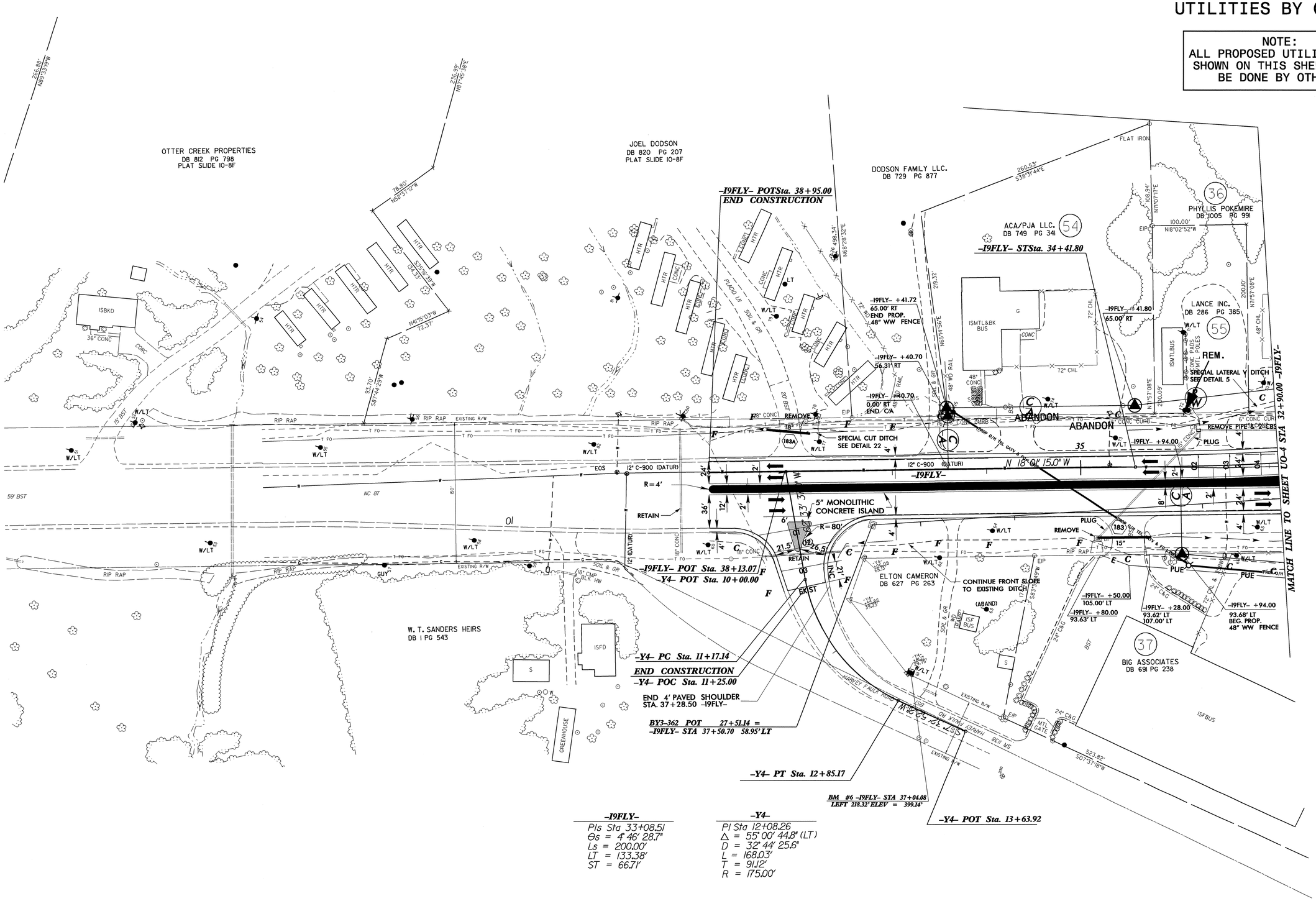
5/14/99

27-AUG-2009 13:45
s:\ts\projects\r2417c\roadwaysheets\R-2417C_Ut_pshi4_U07.dgn

PROJECT REFERENCE NO.	SHEET NO.
R-2417C	UO-8

UTILITIES BY OTHERS

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



-19FLY-

PIs Sta 33+08.51
Θs = 4° 46' 28.7"
Ls = 200.00'
LT = 133.38'
ST = 66.71'

-Y4-

PI Sta 12+08.26
Δ = 55° 00' 44.8" (LT)
D = 32° 44' 25.6"
L = 168.03'
T = 91.12'
R = 175.00'

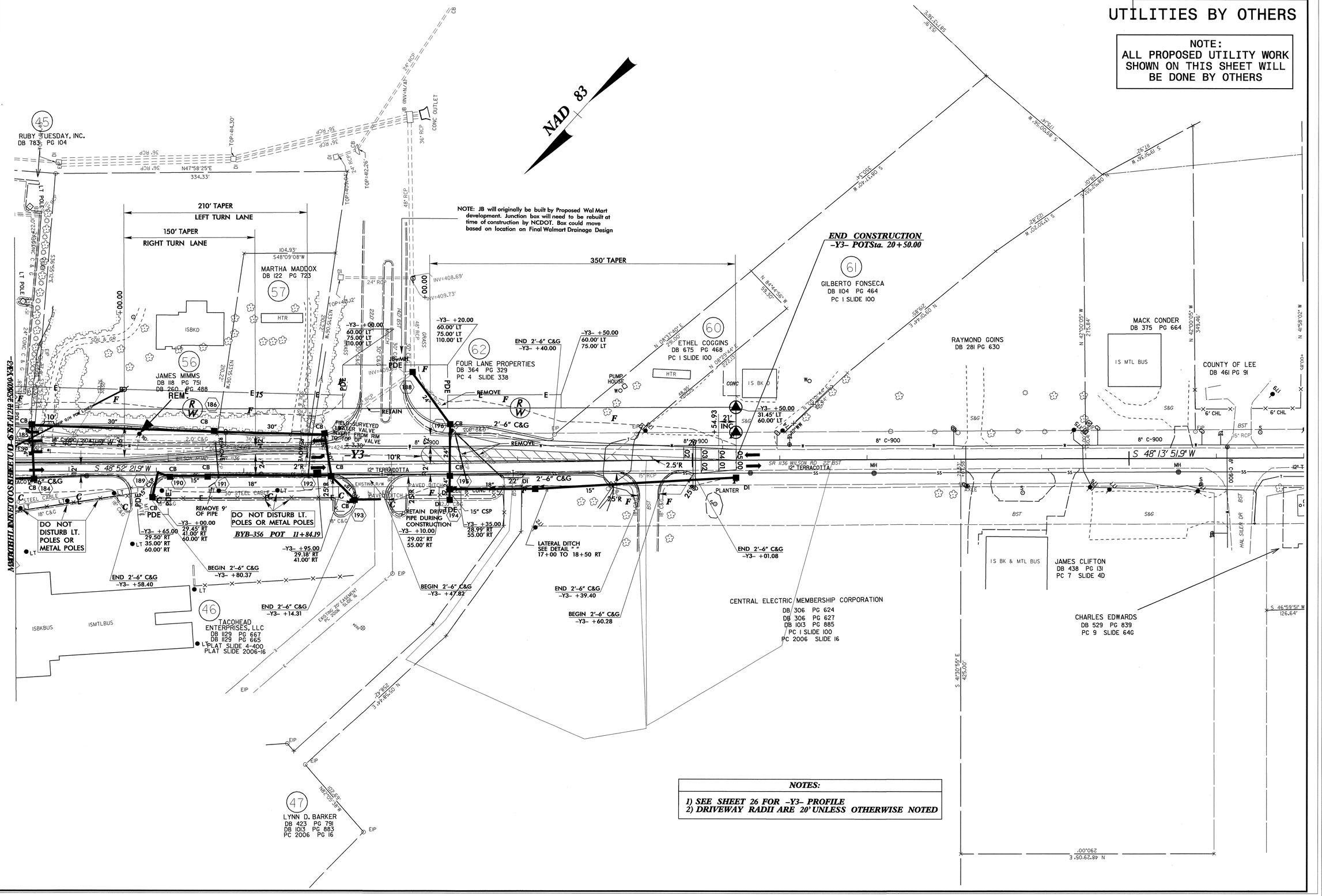
5/14/99

07-APR-2009 11:21
...es\Rdy_Ut\Pro\UO_PLANSHEETS\R-2417C_Ut_psh16_U08.dgn
$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
R-2417C	UO-9

UTILITIES BY OTHERS

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



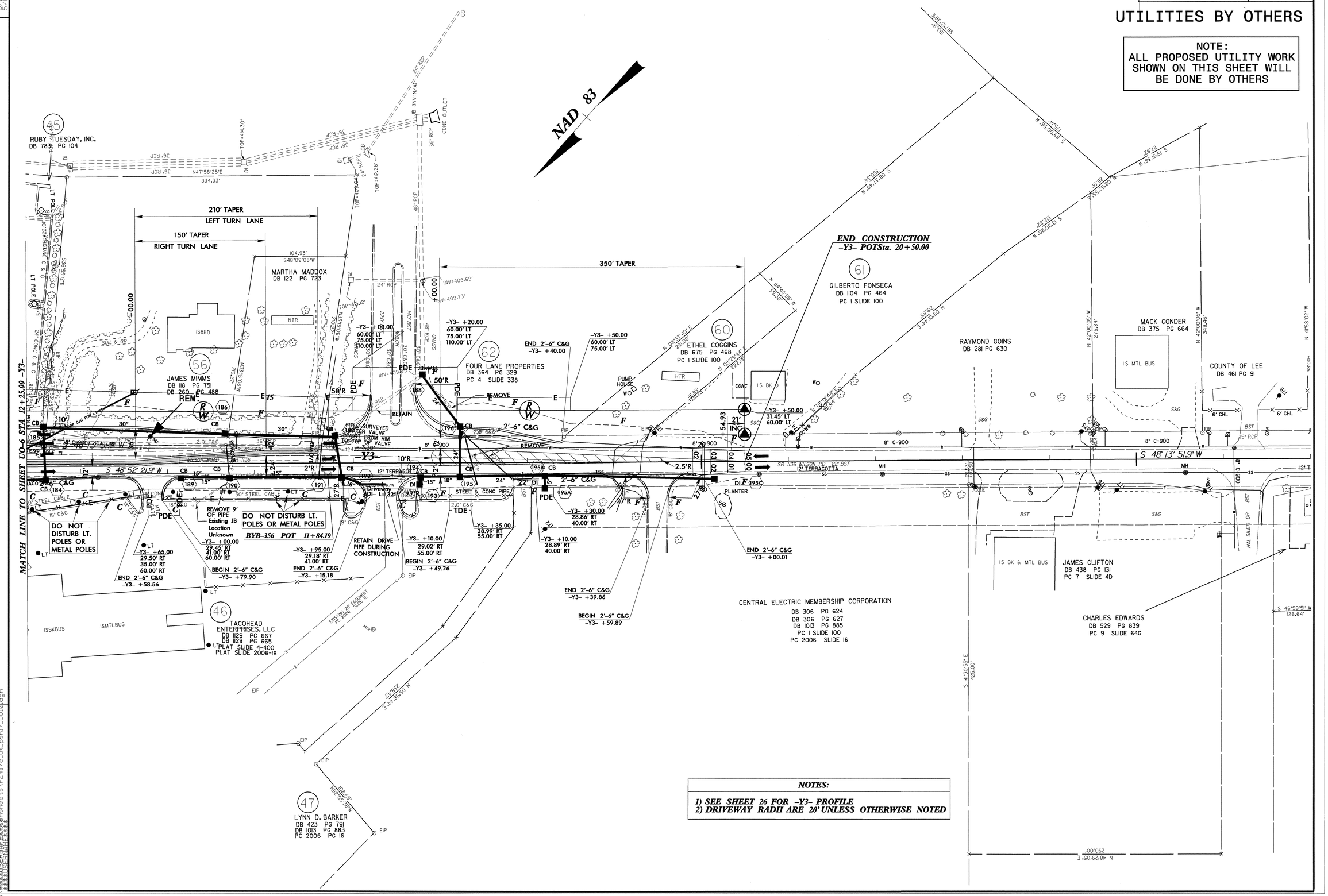
REVISIONS

8/17/99
5/14/99

PROJECT REFERENCE NO.	SHEET NO.
R-2417C	UO-10

UTILITIES BY OTHERS

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



NOTES:

1) SEE SHEET 26 FOR -Y3- PROFILE
2) DRIVEWAY RADII ARE 20' UNLESS OTHERWISE NOTED

REVISIONS

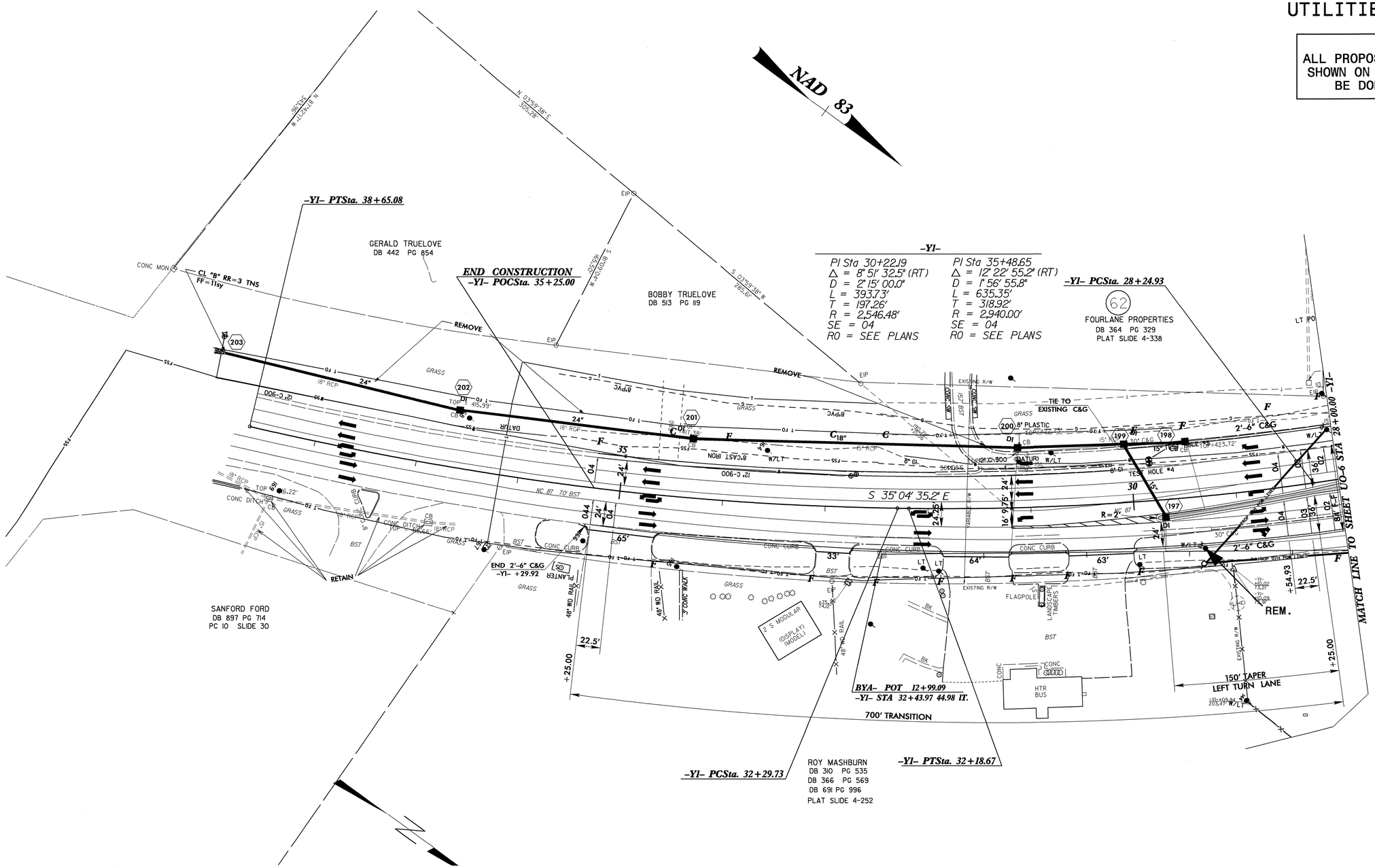
8/17/99
5/14/99

27-AUG-2009 13:47
r:\r2417c_ut_psh17_U010.dgn

PROJECT REFERENCE NO.	SHEET NO.
R-2417C	UO-11

UTILITIES BY OTHERS

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



NOTES:

1) SEE SHEET 26 FOR -Y1- PROFILE

REVISIONS

6/14/99

2/7/AWG2009 09:48
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