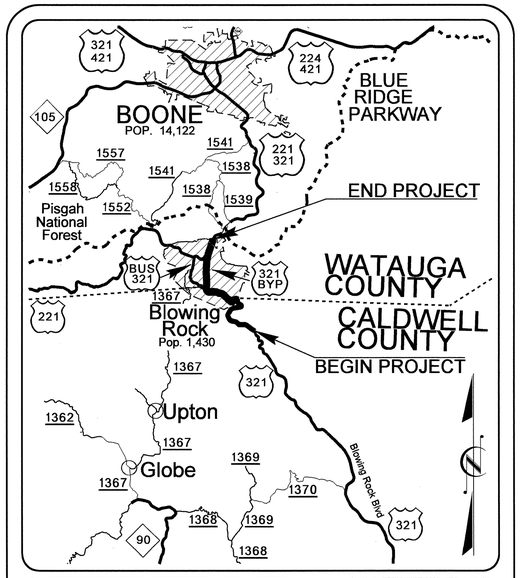
T.I.P. NO.	SHEET NO.
R-2237C	UC-1

TIP PROJECT: R-2237C

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

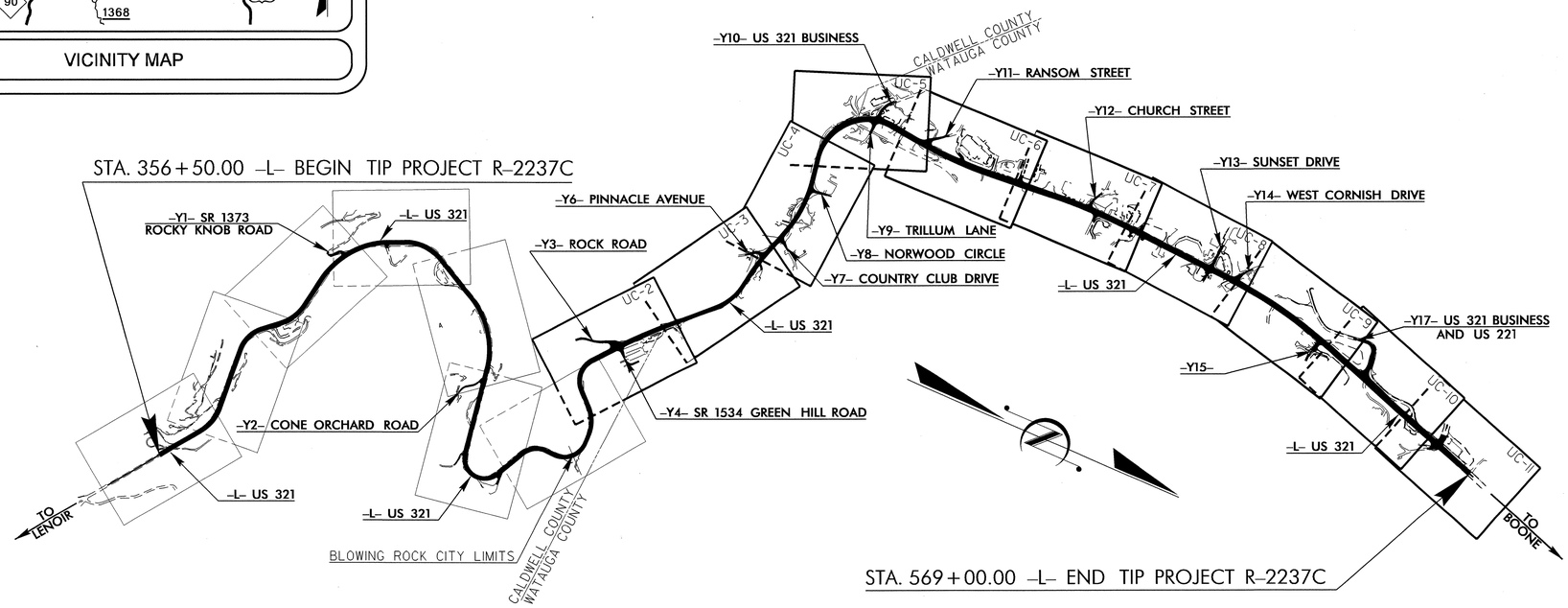
UTILITY CONSTRUCTION PLANS
WATAUGA COUNTY



VICINITY MAP

LOCATION: US 321 FROM SR 1500 (BLACKBERRY ROAD) TO US 221 AT BLOWING ROCK

TYPE OF WORK: UTILITY CONSTRUCTION



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-11	UTILITY CONSTRUCTION PLAN SHEETS
UC-12	PROFILE SHEET
UC-13	DETAILS SHEET

WATER AND SEWER OWNERS ON PROJECT

(1) WATER - TOWN OF BLOWING ROCK
(2) SANITARY SEWER - TOWN OF BLOWING ROCK

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 10157 ENGINEER RONALD B. WILKINS

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
R. B. WILKINS, P.E. UTILITIES SQUAD LEADER PROJECT ENGINEER
MICHAEL R. BRIGHT UTILITIES PROJECT DESIGNER

09/08/99
28-FEB-2011 10:21
R:\Utilities\Rdy_Ut\Proj\Conduit\r-2237c_ut_title_uc1_psh.dgn
$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
R-2237C	UC-2
DESIGNED BY: MRB	
DRAWN BY: MRB	
CHECKED BY: RBW	
APPROVED BY: RBW	
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 ENGINEER 10157 RONALD B. WILKINS

UTILITY CONSTRUCTION

NOTE: ALL PROPOSED WATER LINES THIS SHEET TO BE DUCTILE IRON

-Y3-

PI Sta 10+71.75
Δ = 36° 17' 18.8" (RT)
D = 38° 11' 49.9"
L = 95.00'
T = 49.16'
R = 150.00'

PI Sta 11+96.30
Δ = 7° 18' 59.4" (LT)
D = 28° 38' 52.4"
L = 25.54'
T = 12.79'
R = 200.00'

PI Sta 12+79.60
Δ = 9° 27' 58.8" (LT)
D = 28° 38' 52.4"
L = 33.04'
T = 16.56'
R = 200.00'

PI Sta 14+64.00
Δ = 67° 00' 18.1" (RT)
D = 114° 35' 29.6"
L = 58.47'
T = 33.10'
R = 50.00'

DETAIL D
SPECIAL CUT DITCH
(Not to Scale)
Natural Ground, 2:1, D, 4:1 or Flatter, Front Ditch Slope
Min. D=1.5 Ft.

FROM STA.446+00 TO STA.446+50 -L- LT.

-L-
PI Sta 447+15.16
Δ = 86° 11' 25.6" (RT)
D = 22° 55' 05.9"
L = 376.08'
T = 233.91'
R = 250.00'

-LI-
PI Sta 454+87.91
Δ = 6° 26' 30.9" (RT)
D = 1° 08' 45.3"
L = 562.16'
T = 281.38'
R = 5,000.00'

PROP. 349' OF 8" WATER LINE
PROP. 1 - 8" TAPPING VALVE
PROP. 307' OF ABANDON 8" UTILITY PIPE

PROP. 244' OF 12" WATER LINE
PROP. 18' OF 6" WATER LINE
PROP. 1 - 12" VALVE
PROP. 1 - 6" VALVE
PROP. 1 - FIRE HYDRANT
PROP. 252' OF ABANDON 12" UTILITY PIPE

SEE SHEET UC-14 TO REFER TO PLAN SHEET showing DETAILED CONDUIT DESIGNS

DETAIL L
LATERAL BASE DITCH
(Not to Scale)
Natural Ground, 2:1, D, 2:1, Fill Slope, Filter Fabric, b, B, 1'/Ft.
Min. D=2.0 Ft.
Max. D=2.0 Ft.
B=5.0 Ft.
b=5.0 Ft.
Type of Liner= CLASS I Rip-Rap

FROM STA.445+00 TO STA.449+25 -L- RT.

DETAIL M
PIPE OUTLET CHANNEL
(Not to Scale)
Natural Ground, Existing Bank, b, d= ?, Channel Bed (Variable)
Length= 20 Ft.
D= 2 Ft.
Est.= 15 Tons of Class 'I' Rip-Rap

-L-
PI Sta 455+79.22
Δ = 8° 35' 35.2" (RT)
D = 1° 08' 45.3"
L = 749.89'
T = 375.65'
R = 5,000.00'

-Y4-

PI Sta 11+60.68	PI Sta 12+26.93	PI Sta 12+76.56
Δ = 9° 18' 33.2" (LT)	Δ = 78° 13' 11.1" (LT)	Δ = 3° 50' 58.4" (LT)
D = 18° 58' 19.6"	D = 130° 13' 03.7"	D = 11° 30' 18.6"
L = 49.07'	L = 60.07'	L = 33.46'
T = 24.59'	T = 35.77'	T = 16.74'
R = 302.00'	R = 44.00'	R = 498.00'

POT Sta. 10+00.00 -Y3-
PT Sta. 11+17.59 -Y3-
PCSta. 11+83.52 -Y3-
PT Sta. 12+09.06 -Y3-
PCSta. 12+63.04 -Y3-
PT Sta. 12+96.08 -Y3-
PCSta. 10+22.59 -Y3-
PCSta. 14+30.90 -Y3-
PT Sta. 14+89.37 -Y3-
PCSta. 452+06.53 -LI-
POT Sta. 450+30.00 -L- = POT Sta. 450+30.00 -LI-
POT Sta. 15+23.04 -Y3- AND POT Sta. 10+00.00 -Y4- = POT Sta. 452+03.57 -LI-
PT Sta. 448+57.33 -L-
PCSta. 452+03.57 -L-
PCSta. 11+36.09 -Y4-
PT Sta. 11+85.16 -Y4-
PT Sta. 457+68.69 -LI-

N 43° 58' 12.2" W
N 7° 40' 53.4" W
N 14° 59' 52.8" W
N 24° 27' 56.4" W
N 42° 32' 26.5" E
N 50° 20' 15.8" W
N 43° 53' 44.8" W

BLOWING ROCK ATTRACTIONS, INC. DB 1120 PG 1579 (64)-(642)
JOHN H. STEELE DB 1332 PG 1493 PB 1 PG 90 (63)
BLOWING ROCK COUNTRY CLUB DB 654 PG 1502 DB 1197 PG 0046 PB 21 PG 157 (62)
LEE OVAL JAYNE DB 687 PG 1046 (66)
ROGER K. MCGUIRE DB 1393 PG 842 (67)
JAMES C. CHERRY LILLIAN CHERRY DENNIS DB 1056 PG 0364 (68)
APPALACHIAN STATE UNIVERISTY PB 25 PG 59 (69)-(692)
ANN C. MEADE DB 1166 PG 405 PB 1 PG 1 (74)
ALLISON MARIE MEADE DB 870 PG 1970 PB 3 PG 79 (73)
TOWNES AT GREENHILL, LLC DB 1598 PG 1750 PB 20 PG 44 (72)-(122)
HFMI PROPERTIES INC. DB 1188 PG 1306 (75)-(752)
ELLARON, LLC DB 627 PG 675 DB 1339 PG 245 PB 10 PG 380 PB 14 PG 51 (70)-(702)

TELEPHONE
CATV
FIBER OPTIC

APPALACHIAN STATE UNIVERSITY
APPROXIMATE LIMIT OF HISTORIC DISTRICT
TRACT LINE
COUNTY LINE
MATCH LINE
SEE SHEET UC-3
NAD 83/95

5/14/99
28-FEB-2011 10:19
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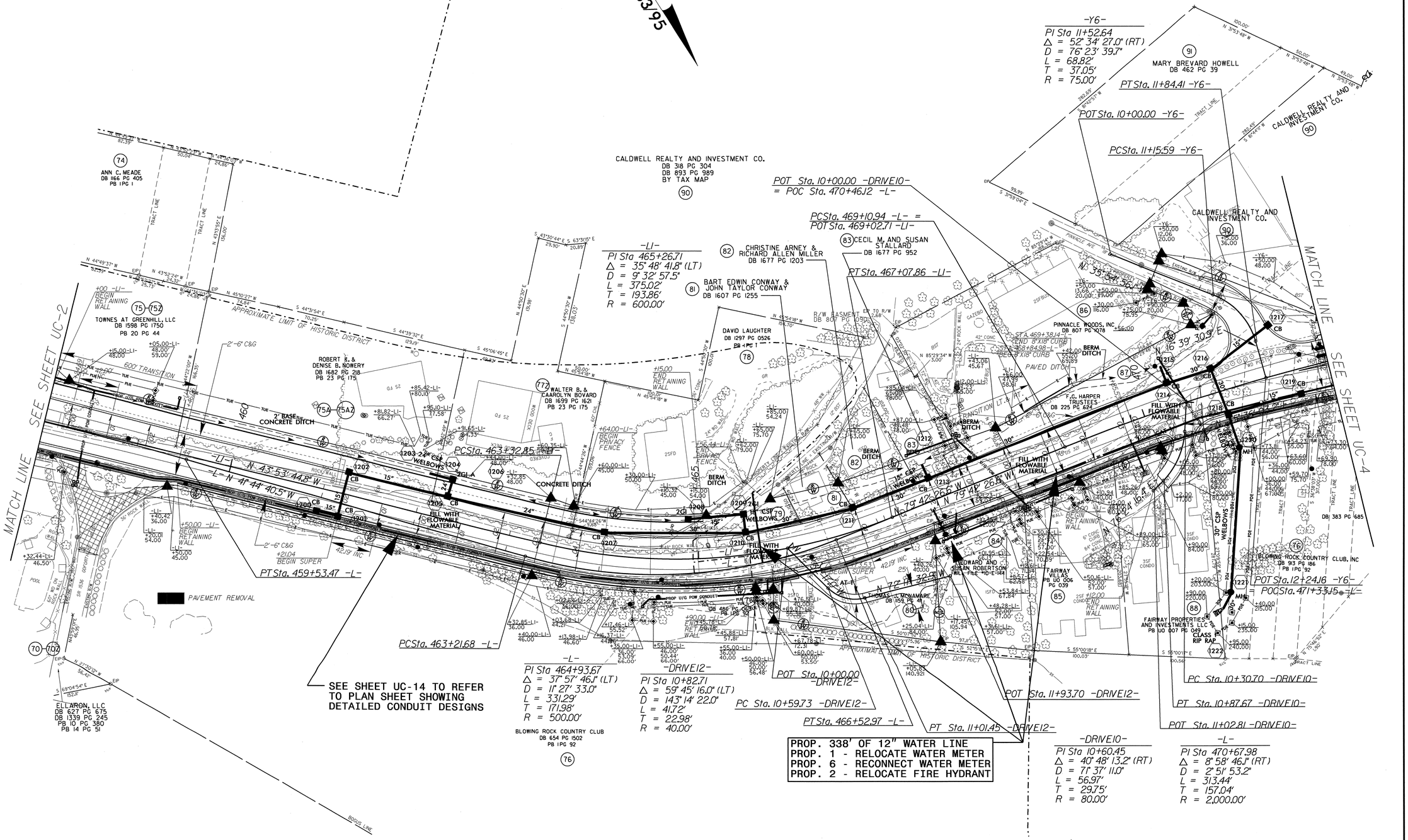
PROJECT REFERENCE NO.	SHEET NO.
R-2237C	UC-3
DESIGNED BY: MRB	
DRAWN BY: MRB	
CHECKED BY: RBW	
APPROVED BY: RBW	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE:(919)250-4128 FAX:(919)250-4119	UTILITY CONSTRUCTION PLANS ONLY

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 10157 RONALD B. WATKINS

UTILITY CONSTRUCTION

NOTE: ALL PROPOSED WATER LINES THIS SHEET TO BE DUCTILE IRON



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05-APR-2011 10:19
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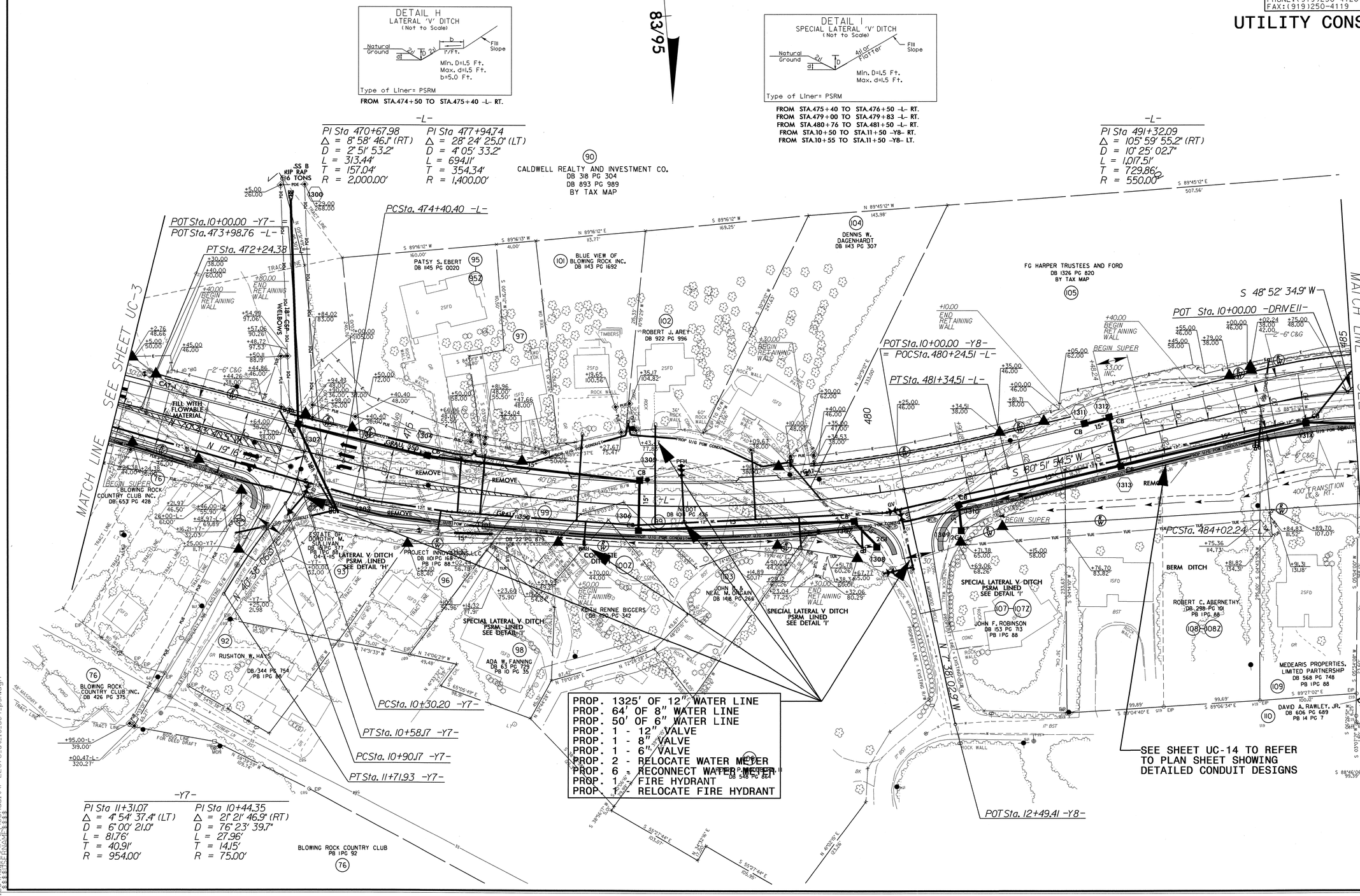
PROJECT REFERENCE NO.	SHEET NO.
R-2237C	UC-4
DESIGNED BY: MRB	
DRAWN BY: MRB	
CHECKED BY: RBW	
APPROVED BY: RBW	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE:(919)250-4128 FAX:(919)250-4119	UTILITY CONSTRUCTION PLANS ONLY

NORTH CAROLINA PROFESSIONAL SEAL 10157 ENGINEER RONALD B. WILKINS

UTILITY CONSTRUCTION

NOTE: ALL PROPOSED WATER LINES THIS SHEET TO BE DUCTILE IRON

NAD 83/95



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PROJECT REFERENCE NO.	SHEET NO.
R-2237C	UC-5
DESIGNED BY: MRB	
DRAWN BY: MRB	
CHECKED BY: RBW	
APPROVED BY: RBW	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE:(919)250-4128 FAX:(919)250-4119	UTILITY CONSTRUCTION PLANS ONLY

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 10157 RONALD B. WILKINS

UTILITY CONSTRUCTION

NOTE: ALL PROPOSED WATER LINES THIS SHEET TO BE DUCTILE IRON

PROP. 832' OF 12" WATER LINE
PROP. 100' OF 6" WATER LINE
PROP. 1 - 12" VALVE
PROP. 1 - 6" VALVE
PROP. 1 - 6" TAPPING VALVE
PROP. 4 - RELOCATE WATER METER
PROP. 4 - RECONNECT WATER METER
PROP. 2 - RELOCATE FIRE HYDRANT
PROP. 696' OF ABANDON 8" UTILITY PIPE
PROP. 140' OF ABANDON 12" UTILITY PIPE

-L-
PI Sta 491+32.09
△ = 105° 59' 55.2" (RT)
D = 10° 25' 02.7"
L = 1,017.51'
T = 729.86'
R = 550.00'

DETAIL J
STANDARD 'V' DITCH
(Not to Scale)
Natural Ground, 2:1, D, 2:1, Natural Ground
Min. D=1.0 Ft.
FROM STA.491+00 TO STA.492+15 -L- LT.

-DRIVE11-

PI Sta 10+64.99	PI Sta 12+05.16
△ = 47° 10' 54.0" (RT)	△ = 21° 23' 07.9" (RT)
D = 45° 50' 11.8"	D = 19° 05' 54.9"
L = 102.93'	L = 111.97'
T = 54.59'	T = 56.65'
R = 125.00'	R = 300.00'
PI Sta 13+39.75	PI Sta 13+91.55
△ = 7° 27' 11.2" (RT)	△ = 91° 50' 17.1" (RT)
D = 14° 19' 26.2"	D = 229° 10' 59.2"
L = 52.03'	L = 40.07'
T = 26.05'	T = 25.82'
R = 400.00'	R = 25.00'

-Y10REV-
PI Sta 2+15.10
△ = 51° 08' 17.8" (LT)
D = 33° 42' 12.2"
L = 152.27'
R = 170.00'

~~-Y10-~~
~~PI Sta 11+48.58~~
~~△ = 42° 50' 45.9" (LT)~~
~~D = 26° 38' 57.1"~~
~~L = 160.78'~~
~~T = 84.36'~~
~~R = 215.00'~~

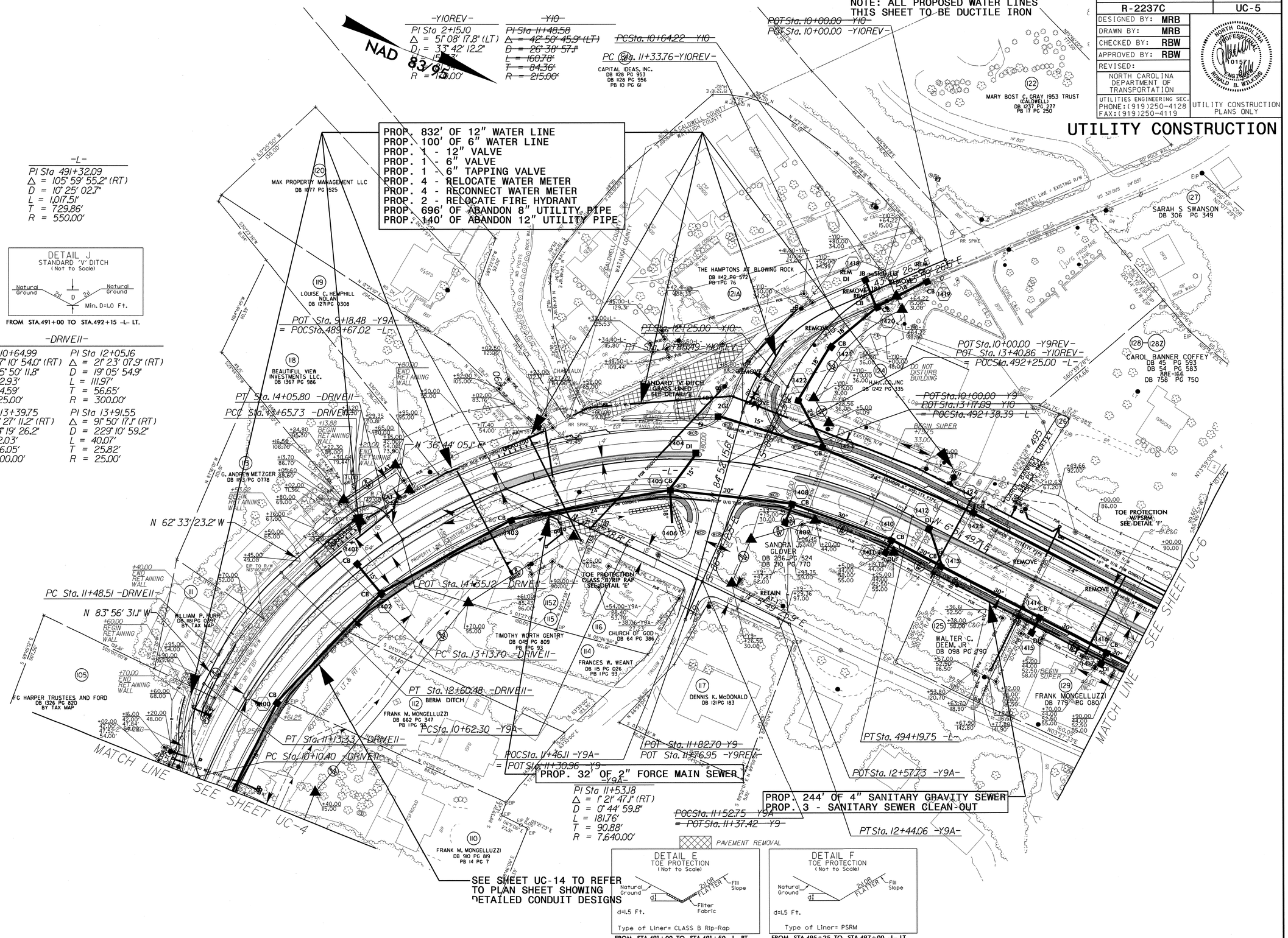
~~PCSta. 10+64.22 -Y10-~~

PC Sta. 11+33.76-Y10REV-

-L-
PI Sta 11+53.18
△ = 1° 21' 47.1" (RT)
D = 0° 44' 59.8"
L = 181.76'
T = 90.88'
R = 7,640.00'

PROP. 32' OF 2" FORCE MAIN SEWER

PROP. 244' OF 4" SANITARY GRAVITY SEWER
PROP. 3 - SANITARY SEWER CLEAN-OUT



DETAIL E
TOE PROTECTION
(Not to Scale)
Natural Ground, d, 2:1 OR FLATTER, Fill Slope, Filter Fabric
d=1.5 Ft.
Type of Liner= CLASS B Rip-Rap
FROM STA.491+00 TO STA.491+50 -L- RT.
FROM STA.10+75 TO STA.11+00 -Y9- RT.

DETAIL F
TOE PROTECTION
(Not to Scale)
Natural Ground, d, 2:1 OR FLATTER, Fill Slope
d=1.5 Ft.
Type of Liner= PSRM
FROM STA.495+25 TO STA.497+00 -L- LT.

5/14/99

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PROJECT REFERENCE NO.	SHEET NO.
R-2237C	UC-6
DESIGNED BY: MRB	
DRAWN BY: MRB	
CHECKED BY: RBW	
APPROVED BY: RBW	
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 10151 ENGINEER RONALD B. WILKINS

UTILITY CONSTRUCTION

OUTBACK STEAKHOUSE OF FLORIDA
DB 445 PG 546

NOTE: ALL PROPOSED WATER LINES THIS SHEET TO BE DUCTILE IRON

-Y11-

PI Sta 11+24.62
Δ = 3° 48' 59.4" (RT)
D = 4° 00' 24.1"
L = 95.25'
T = 47.64'
R = 1,430.00'

PI Sta 12+47.21
Δ = 49° 42' 41.5" (LT)
D = 114° 35' 29.6"
L = 43.38'
T = 23.16'
R = 50.00'

-DRIVE3-

PI Sta 10+14.25
Δ = 75° 13' 19.2" (LT)
D = 309° 42' 24.9"
L = 24.29'
T = 14.25'
R = 18.50'

PI Sta 10+53.14
Δ = 33° 46' 59.3" (LT)
D = 60° 18' 40.8"
L = 56.01'
T = 28.85'
R = 95.00'

PI Sta 11+52.71
Δ = 63° 43' 39.3" (RT)
D = 220° 22' 06.2"
L = 28.92'
T = 16.16'
R = 26.00'

DETAIL F
TOE PROTECTION
(Not to Scale)

Natural Ground — d — 2:1 OR FLATTER — Fill Slope

d=1.5 Ft.

Type of Liner= PSRM

FROM -L- STA. 497+00 TO STA. 497+90 LT.

NAD 83/95

PROP. 1290' OF 12" WATER LINE
PROP. 132' OF 8" WATER LINE
PROP. 155' OF 6" WATER LINE
PROP. 1 - 12" VALVE
PROP. 2 - 8" VALVE
PROP. 1 - 6" VALVE
PROP. 2 - RELOCATE WATER METER
PROP. 2 - RECONNECT WATER METER
PROP. 1 - FIRE HYDRANT
PROP. 1 - RELOCATE FIRE HYDRANT
PROP. 1432' OF ABANDON 8" UTILITY PIPE

PCSta. 10+76.97 -Y11-
POT Sta. 10+00.00 -Y11-
PCC Sta. 10+24.29 -DRIVE3-
PT Sta. 10+80.30 -DRIVE3-
PC Sta. 11+36.54 -DRIVE3-
PT Sta. 11+72.23 -Y11-
PCSta. 12+24.05 -Y11-
PT Sta. 11+65.46 -DRIVE3-
PT Sta. 505+99.89 -L-
PT Sta. 12+67.43 -Y11-
POT Sta. 13+01.40 -Y11- = POC Sta. 498+34.46 -L-
PCSta. 498+01.70 -L-
POT Sta. 11+97.86 -DRIVE3- = POC Sta. 502+84.00 -L-

-L-

PI Sta 502+02.13
Δ = 11° 26' 00.0" (LT)
D = 1° 25' 56.6"
L = 798.20'
T = 400.43'
R = 4,000.00'

PROP. 86' OF 4" SANITARY GRAVITY SEWER
PROP. 1 - SANITARY SEWER CLEAN-OUT

SEE SHEET UC-14 TO REFER TO PLAN SHEET SHOWING DETAILED CONDUIT DESIGNS

MATCH LINE SEE SHEET UC-5

MATCH LINE SEE SHEET UC-7

SARAH S SWANSON DB 306 PG 349

GREGORY H. HAMPTON DB 290 PG 013 DB 290 PG 018

RANSOM STREET LLC DB 1319 PG 680

MILAN INC. DB 506 PG 261 DB 065 PG 587

TRIPLETT & HOUSTON DB 552 PG 236 DB 088 PG 868 DB 107 PG 889

PAUL CABELL GRAGG DB 77 PG 539

RICHARD K CHESNUTT DB 351 PG 818

ARTHUR M. SKIBBE, JR. DB 040 PG 784

ROSEMARY FOWLER DB 1317 PG 163

WILSON E. DEAL DB 339 PG 195

TAMMY LEA GREENE DB 407 PG 659

CHARLES L. SIZER DB 156 PG 024

PRESTON R. TAYLOR, JR. DB 091 PG 484 DB 1066 PG 386

THOMAS L. GRAGG ET AL DB 254 PG 737 DB 110 PG 62 DB 77 PG 539

STONETREE DEVELOPMENT INC DB 324 PG 699

FRANK MONGELLUZZI DB 779 PG 080

JACQUELINE A. ROBERTS DB 222 PG 140

CHARLES GLENN PETHEL DB 416 PG 042

BETTY BUCKNER WADE DB 566 PG 891 DB 990 PG 833

EVERETT H. WALKER, JR. DB 462 PG 096 DB 470 PG 156

MELISA L. STRIPLING DB 692 PG 366 DB 975 PG 860 PB 17 PG 394

CHRISTOPHER M. ESTES DB 548 PG 159 DB 612 PG 220 DB 975 PG 857 PB 17 PG 394

TOE PROTECTION W/PSRM SEE DETAIL 'F'

FILL WITH ABANDONED MATERIAL

FILL WITH FLOWABLE MATERIAL

BEGIN RETAINING WALL

END RETAINING WALL

BEGIN SUPER

END SUPER

BERM DITCH

10' SEWER EASEMENT PB 9 PG 197

R/W EASEMENT DB 506 PG 266

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$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
R-2237C	UC-7
DESIGNED BY: MRB	
DRAWN BY: MRB	
CHECKED BY: RBW	
APPROVED BY: RBW	
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 015577 ENGINEER RONALD B. WILKINS

UTILITY CONSTRUCTION

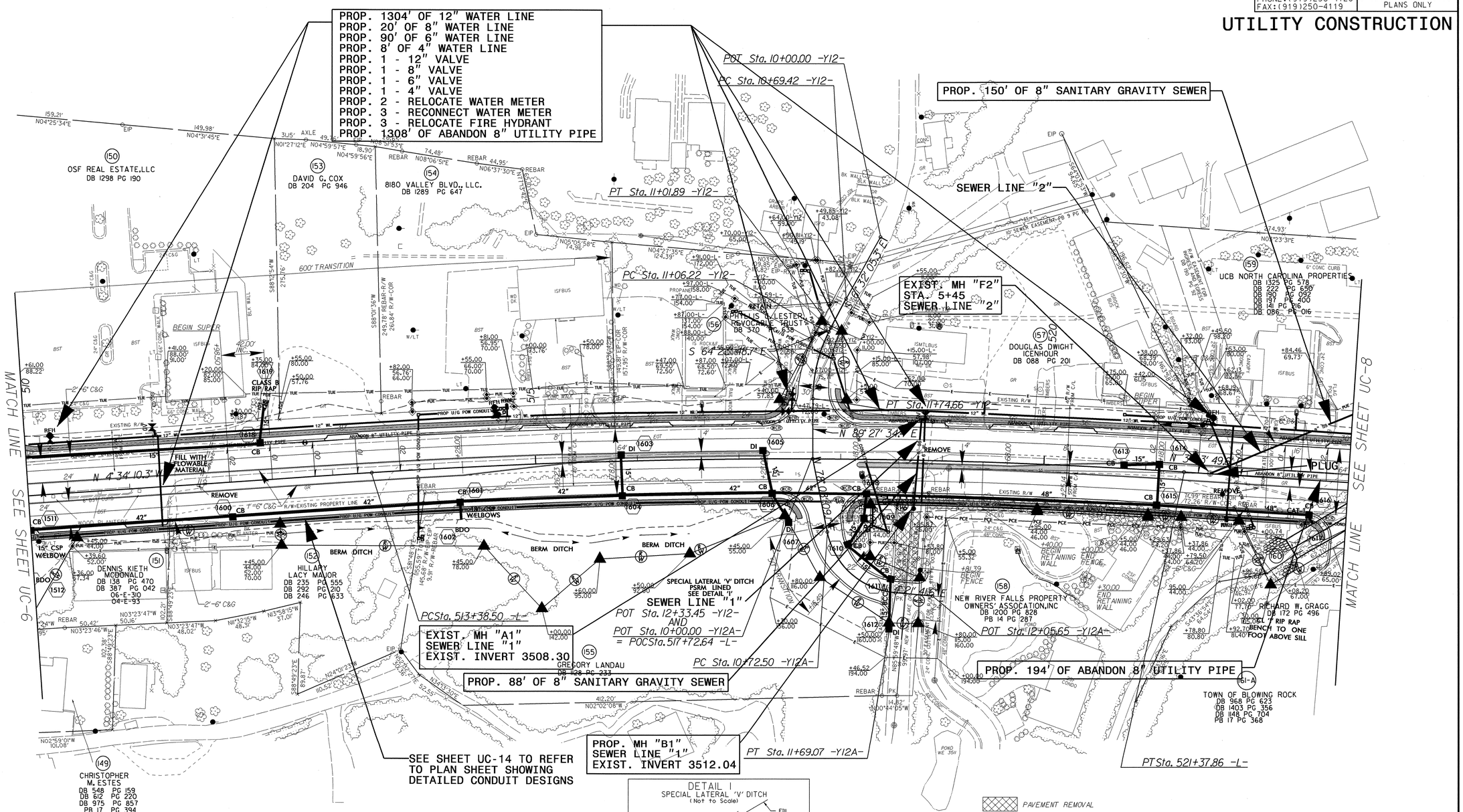
-Y12-

PI Sta 10+85.66
Δ = 2° 51' 43.3" (LT)
D = 8° 48' 53.0"
L = 32.47'
T = 16.24'
R = 650.00'

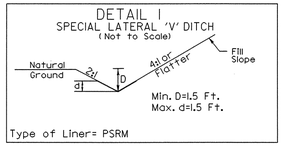
PI Sta 11+41.05
Δ = 26° 08' 36.9" (LT)
D = 38° 11' 49.9"
L = 68.44'
T = 34.83'
R = 150.00'

NAD 83/95

NOTE: ALL PROPOSED WATER AND SEWER LINES THIS SHEET TO BE DUCTILE IRON



DETAIL I
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



FROM STA.516+50 TO STA.517+00 -L- RT.

-L-

PI Sta 517+38.77
Δ = 7° 37' 59.8" (RT)
D = 0° 57' 17.7"
L = 799.36'
T = 400.27'
R = 6,000.00'

-Y12A-

PI Sta 11+28.78
Δ = 73° 46' 27.5" (LT)
D = 76° 23' 39.7"
L = 96.57'
T = 56.29'
R = 75.00'

5/14/99

28-FEB-2011 10:23
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$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
R-2237C	UC-8
DESIGNED BY: MRB	
DRAWN BY: MRB	
CHECKED BY: RBW	
APPROVED BY: RBW	
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 10157 ENGINEER RONALD B. WILKINS

UTILITY CONSTRUCTION

NOTE: ALL PROPOSED WATER AND SEWER LINES THIS SHEET TO BE DUCTILE IRON

NAD 83/95

PROP. 20' OF 8" SANITARY GRAVITY SEWER

PROP. MH "E2" STA. 3+75 SEWER LINE "2"

PROP. 47' OF 8" SANITARY GRAVITY SEWER

PROP. MH "D2" STA. 3+28 SEWER LINE "2"

PROP. 40' OF 8" SANITARY GRAVITY SEWER

PROP. MH "C2" STA. 2+88 SEWER LINE "2"

PROP. 250' OF 8" SANITARY GRAVITY SEWER

PROP. 1 - REMOVE UTILITY MANHOLE

PROP. MH "B2" STA. 0+98 SEWER LINE "2"

EXIST. MH "A2" STA. 0+00 SEWER LINE "2"

PROP. 38' OF 8" SANITARY GRAVITY SEWER

PROP. 240' OF 4" SANITARY GRAVITY SEWER

PROP. 3 SANITARY SEWER CLEAN-OUT

SEE SHEET UC-14 TO REFER TO PLAN SHEET SHOWING DETAILED CONDUIT DESIGNS

-DRIVE4-
PI Sta 10+41.51
Δ = 50° 30' 20.0" (LT)
D = 65° 06' 31.8"
L = 77.57'
T = 41.51'
R = 88.00'

PC Sta. 10+00.00 -DRIVE4-
PT Sta. 10+77.57 -DRIVE4-

-Y14-
PI Sta 10+42.11
Δ = 7° 48' 42.8" (LT)
D = 19° 05' 54.9"
L = 40.90'
T = 20.48'
R = 300.00'

PI Sta 12+01.54
Δ = 33° 34' 19.0" (LT)
D = 114° 35' 29.6"
L = 29.30'
T = 15.08'
R = 50.00'

-L-
PI Sta 541+24.83
Δ = 15° 26' 30.6" (RT)
D = 0° 57' 17.7"
L = 1,617.07'
T = 813.46'
R = 6,000.00'

POT Sta. 10+00.00 -Y13-

POT Sta. 12+96.03 -Y13-
= POT Sta. 532+58.85 -L-

POT Sta. 10+00.00 -Y14-
PC Sta. 10+21.63 -Y14-

PT Sta. 10+62.53 -Y14-

PC Sta. 11+86.45 -Y14-
PT Sta. 12+15.75 -Y14-

PC Sta. 13+30.48 -Y13-

PT Sta. 13+69.22 -Y13-

PC Sta. 533+11.37 -L-

POT Sta. 12+49.80 -Y14-
= POC Sta. 535+56.07 -L-

POT Sta. 11+42.51 -DRIVE4-
= POT Sta. 523+78.86 -L-

PC Sta. 14+25.73 -Y13-

PT Sta. 14+53.03 -Y13-

-Y13-
PI Sta 13+49.96
Δ = 2° 46' 29.6" (RT)
D = 7° 09' 43.1"
L = 38.74'
T = 19.38'
R = 800.00'

PI Sta 14+39.41
Δ = 8° 41' 22.5" (RT)
D = 31° 49' 51.6"
L = 27.30'
T = 13.68'
R = 180.00'

PROP. 1404' OF 12" WATER LINE
PROP. 30' OF 10" WATER LINE
PROP. 120' OF 8" WATER LINE
PROP. 26' OF 6" WATER LINE
PROP. 88' OF 2" WATER LINE
PROP. 2 - 12" VALVE
PROP. 2 - 8" VALVE
PROP. 1 - 6" VALVE
PROP. 1 - 2" VALVE
PROP. 3 - RELOCATE WATER METER
PROP. 2 - RECONNECT WATER METER
PROP. 3 - RELOCATE FIRE HYDRANT
PROP. 1310' OF ABANDON 8" UTILITY PIPE

DETAIL P
ROCK FILL IN POND
(Not to Scale)
Proposed
Existing
Earth Fill
Rock Fill To Berm
3.0'
1.0'
Elev.= 3493.5'
N.W.S. Elev.= 3492.5'

DETAIL N
BERM BASE DITCH
(Not to Scale)
Natural Ground
Min. D=1.5 Ft.
B=2.0 Ft.
b=5.0 Ft.
FROM STA.525+00 TO STA.526+50-L- RT.
FROM STA.526+60 TO STA.527+50-L- RT.

DETAIL O
SPECIAL LATERAL BASE DITCH
(Not to Scale)
Natural Ground
4:1 or Flatter
Fill Slope
Min. D=1.5 Ft.
B=2.0 Ft.
FROM STA.527+50 TO STA.528+81-L- RT.

MATCH LINE SEE SHEET UC-7

MATCH LINE SEE SHEET UC-9

CARY T. KILKELLY DB 767 PG 748

BROTHERS IN ARMS LLC DB 581 PG 292 DB 152 PG 435 DB 153 PG 908

TOWN OF BLOWING ROCK ABC BOARD DB 152 PG 435 DB 153 PG 906 DB 153 PG 908 DB 66 PG 332

CHARMING INNS OF BLOWING ROCK

THE GLENWOOD DB 255 PG 181 DB 255 PG 161 DB 69 PG 121

FRANK MONGELLUZZI DB 1023 PG 181

KEITH MCDONALD DB 060 PG 493 DB 060 PG 495 DB 069 PG 121 DB 066 PG 424

FRANK MONGELLUZZI DB 805 PG 809

DAVID L. BROWN DB 170 PG 660 DB 079 PG 425

TOWN OF BLOWING ROCK DB 1041 PG 167

CHRISTIAN SCIENCE SOCIETY DB 287 PG 414 DB 145 PG 754

RONALD CAMBRIA DB 358

GREGORY H. HAMPTON DB 336 PG 681

THAMENA HANNA DB 12 PG 289

RICHARD W. GRAGG DB 050 PG 064 DB 1069 PG 730

DEBORAH KEYES BUXTON DB 1403 PG 356

TOWN OF BLOWING ROCK DB 968 PG 623 DB 1403 PG 356 DB 1148 PG 704 PB 17 PG 368

28-FEB-2011 10:24
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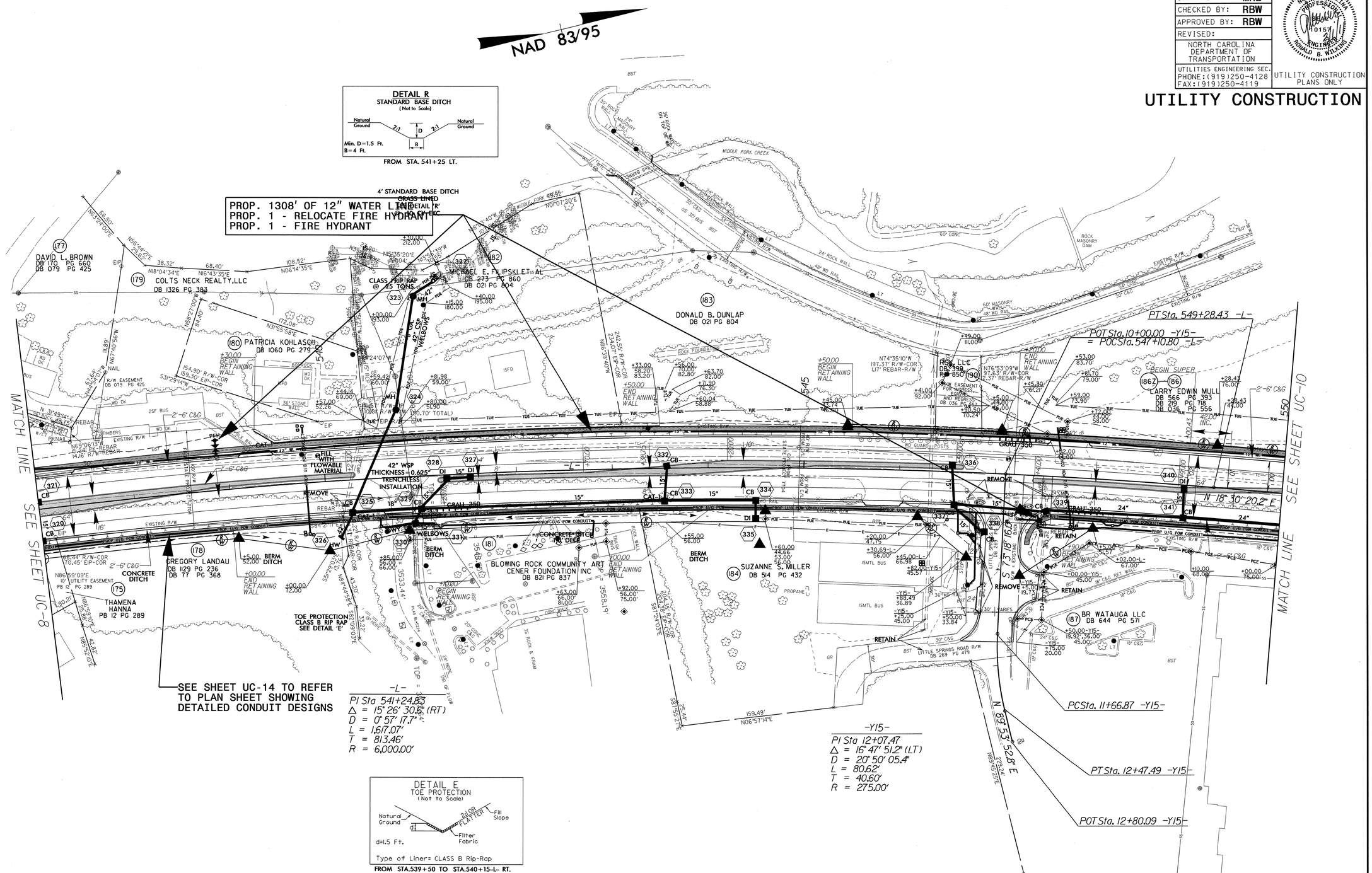
$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
R-2237C	UC-9
DESIGNED BY: MRB	
DRAWN BY: MRB	
CHECKED BY: RBW	
APPROVED BY: RBW	
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 01557 ENGINEER RONALD B. WILKINS

NOTE: ALL PROPOSED WATER LINES THIS SHEET TO BE DUCTILE IRON

UTILITY CONSTRUCTION



5/14/99

28-FEB-2011 11:13
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PROJECT REFERENCE NO.	SHEET NO.
R-2237C	UC-10
DESIGNED BY: MRB	
DRAWN BY: MRB	
CHECKED BY: RBW	
APPROVED BY: RBW	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE:(919)250-4128 FAX:(919)250-4119	UTILITY CONSTRUCTION PLANS ONLY

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 10157 RONALD B. WILKINS

UTILITY CONSTRUCTION

NOTE: ALL WATER AND SEWER LINES THIS SHEET TO BE DUCTILE IRON

NAD 83/95

-Y17-

PI Sta 12+60.28
Δ = 88° 57' 09.9" (RT)
D = 52° 05' 13.5"
L = 170.78'
T = 108.01'
R = 110.00'

PI Sta 14+93.08
Δ = 27° 21' 43.9" (RT)
D = 19° 05' 54.9"
L = 143.27'
T = 73.03'
R = 300.00'

DETAIL Q
STANDARD BASE DITCH
(Not to Scale)
Natural Ground, 3:1, D, 3:1, Natural Ground
Min. D=1.5 Ft.
B=2.0 Ft.

PROP. 1200' OF 12" WATER LINE
PROP. 310' OF 8" WATER LINE
PROP. 100' OF 6" WATER LINE
PROP. 1 - 12" VALVE
PROP. 2 - 8" VALVE
PROP. 1 - 6" VALVE
PROP. 1 - FIRE HYDRANT
PROP. 1 - RELOCATE FIRE HYDRANT
PROP. 1226' OF ABANDON 8" UTILITY PIPE

-PARKINGLOT-

PI Sta 10+41.49
Δ = 42° 04' 12.3" (RT)
D = 90° 56' 44.5"
L = 46.26'
T = 24.23'
R = 63.00'

PI Sta 10+89.08
Δ = 47° 55' 47.7"
D = 229° 10' 59.2
L = 20.91'
T = 11.11'
R = 25.00'

POT Sta. 10+00.00 -Y17-
PCSta. 11+52.27 -Y17-
PT Sta. 13+23.05 -Y17-
PCSta. 14+20.06 -Y17-
PTSta. 15+63.33 -Y17-
POT Sta. 16+09.63 -Y17-
= POT Sta. 553+22.27 -L-
PC Sta. 10+17.26
POT Sta. 10+00.00 -PARKLOT-
PT Sta. 10+63.52
PC Sta. 10+77.97
PT Sta. 10+98.88

PROP. 28' OF 12" SANITARY GRAVITY SEWER
PROP. 12' OF 8" SANITARY GRAVITY SEWER
(SAME ALIGNMENT SAME GRADE AS EXIST. PIPE)

SEE SHEET UC-14 TO REFER TO PLAN SHEET SHOWING DETAILED CONDUIT DESIGNS

PAVEMENT REMOVAL

MATCH LINE SEE SHEET UC-9

MATCH LINE SEE SHEET UC-11

(186Z)-(186) LARRY EDWIN MULL
DB 566 PG 393
DB 219 PG 718
DB 036 PG 556

(187) BR WATAUGA LLC
DB 644 PG 571

(188) CLIFF DWELLWERS ENTERPRISES INC
DB 126 PG 148

(189) CONCRETE DITCH 1.0' DEEP

(190) RSK, LLC
DB 399 PG 850

(191) JEREMIAH G. SUMNER
DB 1245 PG 106
PB 16 PG 157
PB 3 PG 23

(192) JEREMIAH G. SUMNER
DB 1245 PG 106
PB 16 PG 157
PB 3 PG 23

(193) RODERICK E. MCCASKILL I
MARGARET ELLEN LLOYD
DB 172 PG 859

(194) CLIFF DWELLERS INTERPRISES INC
DB 126 PG 148

(195) TANAWHA LLC
DB 733 PG 710
DB 168 PG 232

(196) TANGER PROPERTIES LIMITED PARTNERSHIP
DB 427 PG 856
DB 518 PG 133
DB 593 PG 067
DB 166 PG 247
DB 166 PG 250

(197) SUSIE W. UNDERWOOD
DB 418 PG 765
DB 168 PG 385

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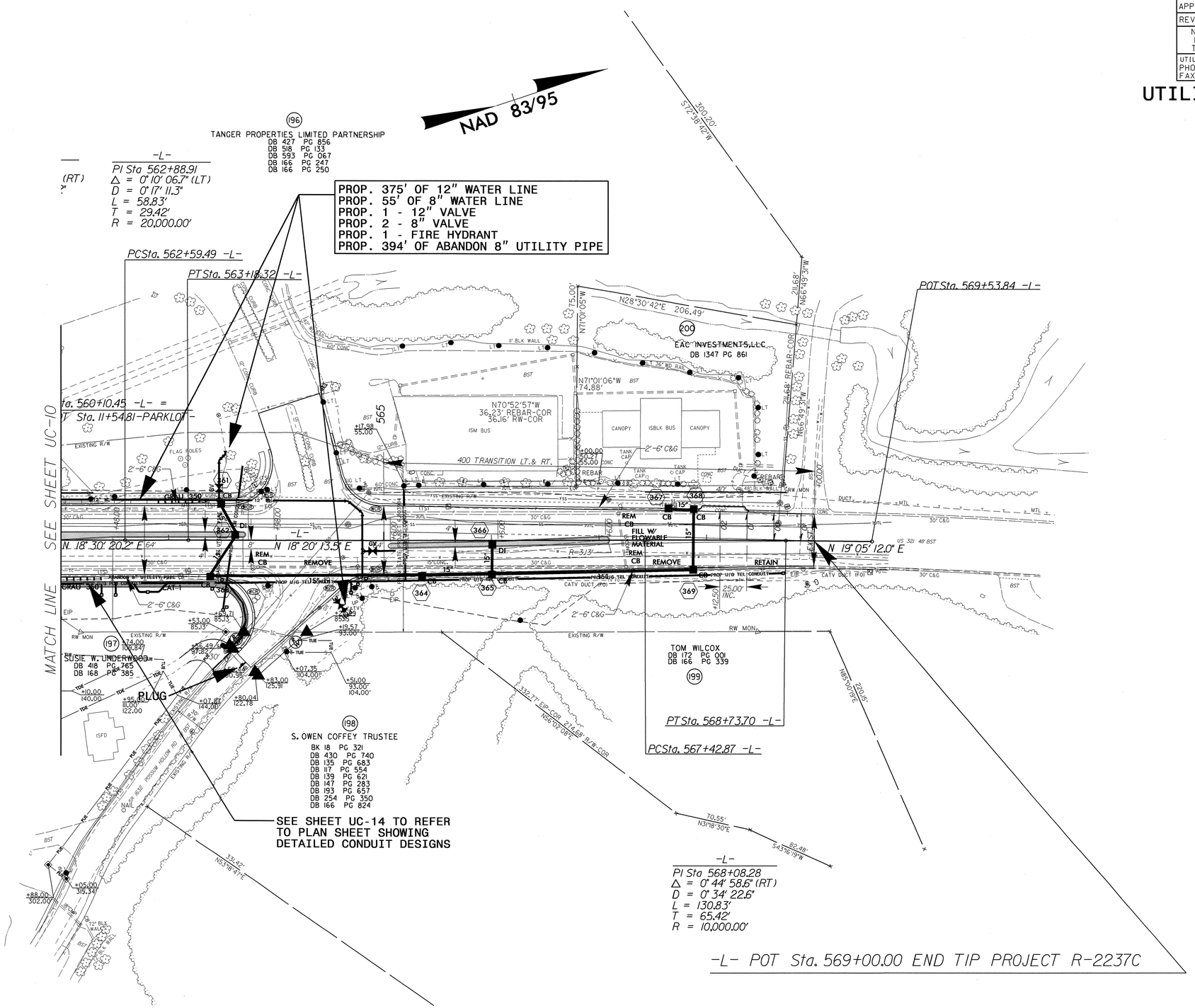
$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
R-2237C	UC-11
DESIGNED BY: MRB	
DRAWN BY: MRB	
CHECKED BY: RBW	
APPROVED BY: RBW	
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 024571 ENGINEER RONALD B. WILKINS

UTILITY CONSTRUCTION

NOTE: ALL PROPOSED WATER LINES THIS SHEET TO BE DUCTILE IRON



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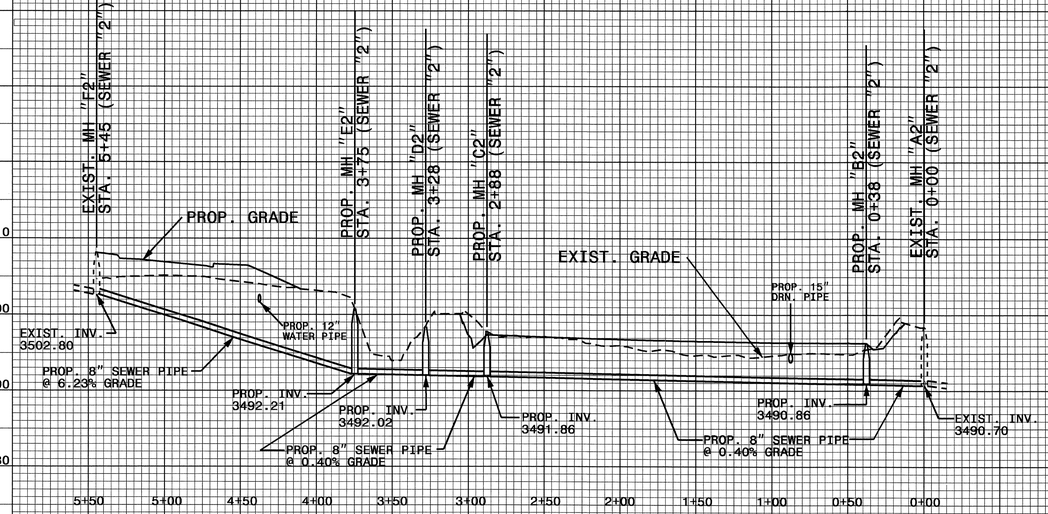

PROP. SEWER LINE "2"

PROJECT REFERENCE NO.	SHEET NO.
R-2237C	UC-12

DESIGNED BY: MRB
DRAWN BY: MRB
CHECKED BY: RBW
APPROVED BY: RBW
REVISED:

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

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

NORTH CAROLINA PROFESSIONAL SEAL 019121 ENGINEER RONALD B. WILKINS

UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION

5/14/99

28-FEB-2011 10:10
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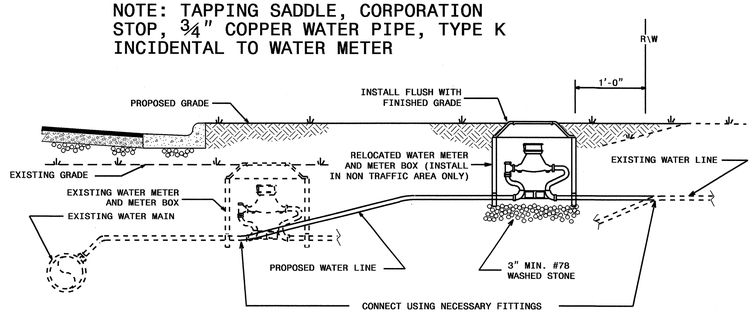
$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
R-2237C	UC-13
DESIGNED BY: MRB	
DRAWN BY: MRB	
CHECKED BY: RBW	
APPROVED BY: RBW	
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 10157 ENGINEER RONALD B. WILKINS

UTILITY CONSTRUCTION

NOTE: TAPPING SADDLE, CORPORATION STOP, ¾" COPPER WATER PIPE, TYPE K INCIDENTAL TO WATER METER

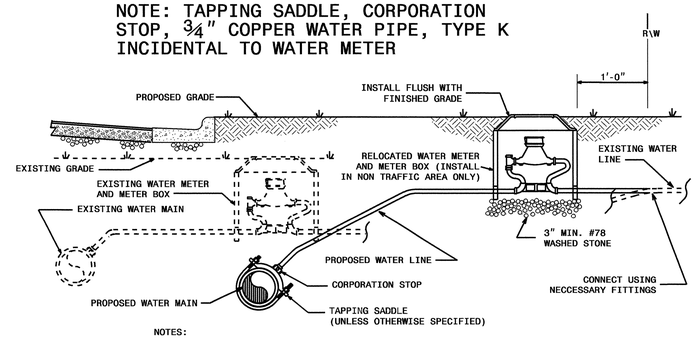


NOTES:

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 MINIMUN OF 36" COVER BELOW FINISHED GRADE.

WATER METER RELOCATION DETAIL

NOTE: TAPPING SADDLE, CORPORATION STOP, ¾" COPPER WATER PIPE, TYPE K INCIDENTAL TO WATER METER



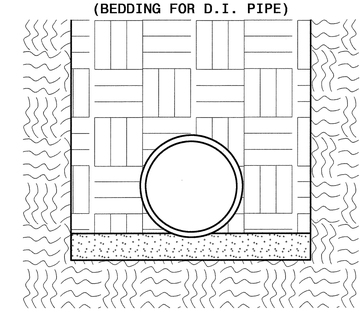
NOTES:

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 MINIMUN OF 36" COVER BELOW FINISHED GRADE.

WATER METER RELOCATION DETAIL

TYPE "3"

(BEDDING FOR D.I. PIPE)

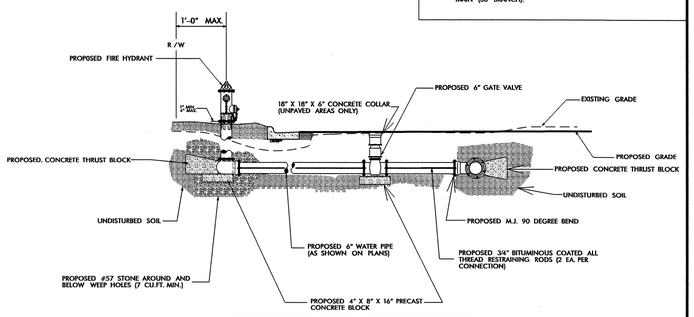


PIPE BEDDED IN 4" MINIMUM LOOSE SOIL. TRENCH BACKFILLED IN LOOSE 6" LAYERS COMPACTED TO TOP OF TRENCH USING LOCAL EXCAVATED MATERIAL, IF APPROVED BY THE ENGINEER, OR SELECT MATERIAL. ALL MATERIAL SHALL BE FREE OF ROCKS, FOREIGN MATERIAL, AND FROZEN EARTH. COMPACTION SHALL BE TO APPROX. 95% DENSITY IN ACCORDANCE WITH AASHTO T-99 AS MODIFIED BY THE DEPARTMENT OF TRANSPORTATION.

NOTE: DI FITTINGS, 6" GATE VALVE, DI PIPE AND RESTRAINT INCIDENTAL TO FIRE HYDRANT

GENERAL NOTES:

1. RELOCATED FIRE HYDRANTS SHALL BE PLACED A MINIMUM DISTANCE OF 6 FEET BACK OF CURB IN CURB AND GUTTER SECTIONS AND 6 FEET BACK OF DITCH IN ROADWAY SECTIONS. WHERE THERE IS NO DITCH, THE HYDRANT SHALL BE PLACED AS FAR AS POSSIBLE FROM THE PAVEMENT EDGE WITHIN RIGHT OF WAY OUTER LIMITS. PUMPER NOZZLE SHALL BE PERPENDICULAR TO ROADWAY.
2. SWIVEL (LOCKED JOINTS) FITTINGS MAY BE USED IN LIEU OF 3/4" RESTRAINING RODS.
3. ALL CONCRETE SHALL BE CLASS "B".
4. HYDRANT BRANCH LINE SHALL HAVE THE SAME COVER AS THE MAIN (36" BRANCH).

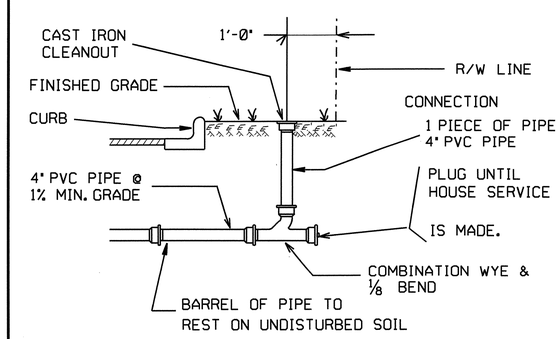


FIRE HYDRANT INSTALLATION DETAIL

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		

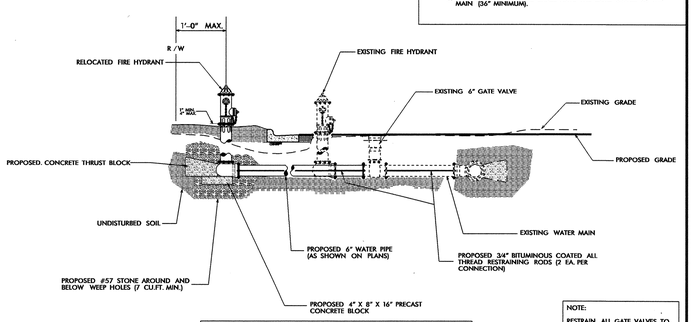
SANITARY SEWER CLEANOUT



NOTE: DI FITTINGS, DI PIPE, AND RESTRAINT INCIDENTAL TO RELOCATE FIRE HYDRANT

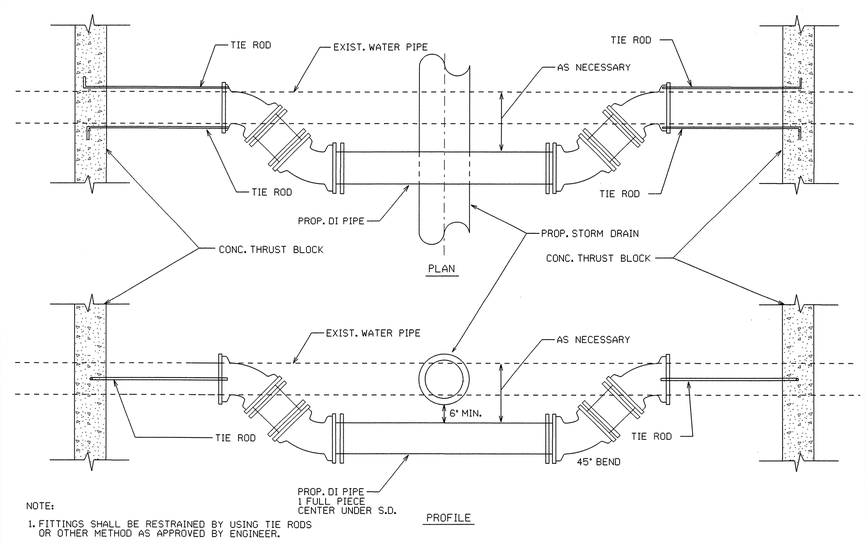
GENERAL NOTES:

1. FIRE HYDRANTS SHALL BE PLACED A MINIMUM DISTANCE OF 6 FEET BACK OF CURB IN CURB AND GUTTER SECTIONS AND 6 FEET BACK OF DITCH IN ROADWAY SECTIONS. WHERE THERE IS NO DITCH, THE HYDRANT SHALL BE PLACED AS FAR AS POSSIBLE FROM THE PAVEMENT EDGE WITHIN RIGHT OF WAY OUTER LIMITS. PUMPER NOZZLE SHALL BE PERPENDICULAR TO ROADWAY.
2. SWIVEL (LOCKED JOINTS) FITTINGS MAY BE USED IN LIEU OF 3/4" RESTRAINING RODS.
3. ALL CONCRETE SHALL BE CLASS "B".
4. HYDRANT BRANCH LINE SHALL HAVE THE SAME COVER AS THE MAIN (36" MINIMUM).



NOTE:
RESTRAIN ALL GATE VALVES TO WATER MAIN BEFORE REMOVING FIRE HYDRANT FOR RELOCATION

FIRE HYDRANT RELOCATION DETAIL



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

*NTS

RELOCATION OF WATER PIPE AT PROP. STORM DRAINAGE AS SHOWN ON PLANS

5/14/99

03-MAR-2011 09:18
$$$$USERNAME$$$$
Utilities\Proj_Utl\R-2237c_Conduit\r-2237c_ut_UC13_udt.dgn

Booth&Associates, Inc.
1011 Schaub Drive | Raleigh, NC 27606 CONSULTING ENGINEERS NC F-0221

NORTH CAROLINA PROFESSIONAL SEAL 035023 ENGINEER WILLIAM P. JORDAN
09-23-2011 P.E.
ELECTRIC UTILITY ENGINEER
Certifies engineering herein for:
- 15kv Underground Distribution System
- Joint-use Conduit System

NORTH CAROLINA PROFESSIONAL SEAL 032620 ENGINEER JOHN BURTON WILLIAMS
9-23-11 P.E.
ELECTRIC UTILITY ENGINEER
Certifies engineering herein for:
- Roadway Intersection and Pedestrian Lighting
- 100 kV Underground Transmission System

Electric Utility General Notes:

Danger!! All lines are to be considered energized unless grounded in accordance with owner's or contractor's safety regulations and procedures, whichever is more stringent.

Location of electrical lines are approximate and are intended for geographic reference only.

Base Roadway Design Plans provided to Booth & Associates, Inc. by the Division of Highways, North Carolina Department of Transportation (N.C.D.O.T.) for project R-2237C. "Current as of March 11, 2011."

Telephone and CATV facilities (existing and proposed) located and provided to Booth & Associates, Inc. by their respective owners for Project R-2237C.

Electric facilities, both existing and proposed, have been added by Booth & Associates, Inc., Consulting Engineers, Raleigh, North Carolina.

Engineering provided by Booth & Associates, Inc. covers only that work pertaining to the Electric Utility and Joint-use Conduit System Construction as shown on these plans and covered by the Project Special Provisions.

All other work shown is by others.

Engineer of record covers only work provided by Booth & Associates, Inc.

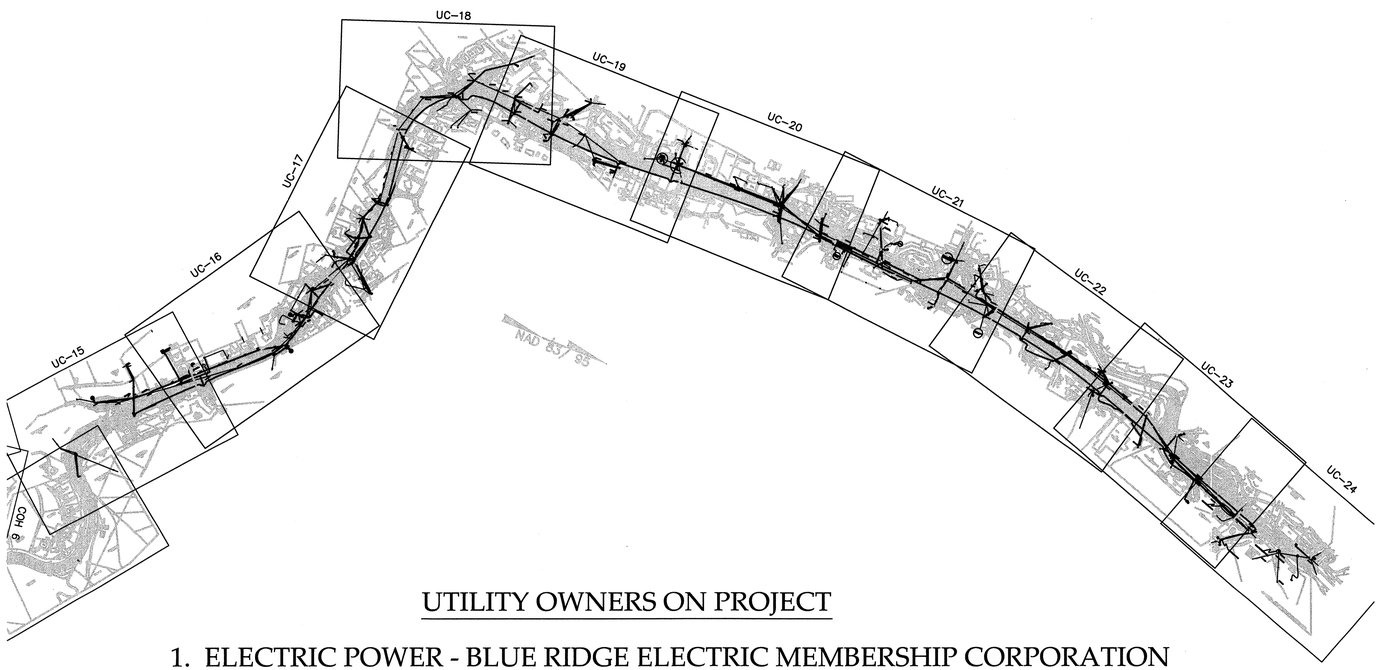
Existing and proposed electric facilities are owned by Blue Ridge EMC, Lenoir, North Carolina.

NO.	REVISIONS	DATE	
1	ISSUE FOR CONSTRUCTION REVISED	01/31/11	WPJ
2	ISSUE FOR CONSTRUCTION REVISED W/LIGHTING	03/25/11	WPJ
3	ISSUE FOR CONSTRUCTION REVISED	09/19/11	WPJ

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

WATAUGA COUNTY

LOCATION: THE TOWN OF BLOWING ROCK, NORTH CAROLINA - US 321 FROM SR 1632 (POSSUM HOLLOW ROAD) TO SR 1534 (GREEN HILL ROAD)
TIP PROJECT: R-2237C



UTILITY OWNERS ON PROJECT

1. ELECTRIC POWER - BLUE RIDGE ELECTRIC MEMBERSHIP CORPORATION
2. ELECTRIC FIBER OPTIC - BLUE RIDGE ELECTRIC MEMBERSHIP CORPORATION
3. LIGHTING - BLUE RIDGE ELECTRIC MEMBERSHIP CORPORATION
4. TELEPHONE - AT&T INC.
5. CATV - CHARTER COMMUNICATIONS

PROPOSED JOINT- USE UTILITY CONDUIT SYSTEM PLAN

PROJECT REFERENCE NO.	SHEET NO.
R-2237C	UC-14
DESIGNED BY: WPJ	
DRAWN BY: BDE/GQJ	
CHECKED BY: JBW	
APPROVED BY: WPJ/JBW	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE: (919)250-4128 FAX: (919)250-4119	UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION

LEGEND

CONDUIT PLAN

- PROPOSED JOINT USE DUCTBANK - ENCASED (MAINLINE)
- PROPOSED JOINT USE DUCTBANK - ENCASED (TAP LINE)
- PROPOSED CONDUIT - DIRECT BURY CONDUIT/TRENCH (TAP LINE)
- CONDUIT TURN-UP (QUANTITY AND SIZE INDICATED)

POWER UTILITY

- POLE LOCATION - TO BE RETAINED
- POLE LOCATION - TO BE REPLACED (BY OTHERS)
- POLE LOCATION - TO BE INSTALLED (BY OTHERS)
- OVERHEAD 15kV DISTRIBUTION LINE - EXISTING TO BE RETAINED (PHASES & NEUTRAL INDICATED)
- DF# UNDERGROUND 15kV DISTRIBUTION LINE - EXISTING TO BE RETAINED (PHASES INDICATED)
- T OVERHEAD SECONDARY/SERVICE - EXISTING TO BE RETAINED (WIRE TYPE INDICATED)
- S# UNDERGROUND SECONDARY/SERVICE - EXISTING TO BE RETAINED (PHASE INDICATED)
- GUY AND ANCHOR COMBINATION - EXISTING TO BE RETAINED
- GUY AND ANCHOR COMBINATION - TO BE INSTALLED (BY OTHERS)
- OVERHEAD 1-PHASE TRANSFORMER - EXISTING TO BE RETAINED
- OVERHEAD TRANSFORMER BANK - EXISTING TO BE RETAINED
- PADMOUNT 1-PHASE TRANSFORMER - EXISTING TO BE RETAINED
- PADMOUNT 1-PHASE TRANSFORMER - TO BE INSTALLED
- PADMOUNT 3-PHASE TRANSFORMER - TO BE INSTALLED
- POLE NUMBER
- SECURITY OR DECORATIVE LIGHT - EXISTING TO BE RETAINED
- UVE# POWER UTILITY VAULT (SIZE INDICATED)
- PRIMARY JUNCTION ENCLOSURE - PJE (TYPE AS INDICATED)
- SERVICE PEDESTAL (BY OTHERS)
- SECTIONALIZING SWITCH - PME (TYPE AS INDICATED)
- 3-PHASE 15kV DISTRIBUTION RISER POLE
- 2-PHASE 15kV DISTRIBUTION RISER POLE
- 1-PHASE 15kV DISTRIBUTION RISER POLE
- SR SECONDARY DISTRIBUTION RISER POLE
- FV# FIBER OPTIC VAULT (30"W x 48"L x 36"D)
- F# FIBER OPTIC HANDHOLE (24"W x 36"L x 24"D)
- FR FIBER OPTIC RISER POLE
- INTERSECTION LIGHT - 400 W HPS (ARROWS INDICATE DIRECTIONAL THROW OF LIGHT)
- PEDESTRIAN LIGHT - 100 W HPS (ARROWS INDICATE DIRECTIONAL THROW OF LIGHT)
- SL# LIGHTING HANDHOLE (13"W x 24"L x 18"D)

CATV UTILITY

- CV# CATV UTILITY VAULT (24"W x 36"L x 24"D)
- C# CATV PEDESTAL
- CR CATV RISER POLE

TELEPHONE UTILITY

- TV# TELEPHONE UTILITY VAULT (6'W x 12'L x 7'D - INTERIOR DIM.)
- T# TELEPHONE PEDESTAL
- TR TELEPHONE RISER POLE

MISCELLANEOUS

- PROPOSED N.C.D.O.T. TRAFFIC SIGNAL WITH MAST ARM (DESIGNED AND INSTALLED BY N.C.D.O.T.)
- PROPOSED N.C.D.O.T. TRAFFIC SIGNAL CABINET (DESIGNED AND INSTALLED BY N.C.D.O.T.)

INDEX OF SHEETS

UC-14 TITLE SHEET
UC-15 THRU UC-24 CONDUIT SYSTEM PLAN SHEETS
UC-25 THRU UC-30 CONSTRUCTION DETAIL SHEETS

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R2237C_RDY_COVER-SHEET

Booth&Associates, Inc.
1011 Schaub Drive | Raleigh, NC 27606 CONSULTING ENGINEERS NC F-0221

NORTH CAROLINA PROFESSIONAL SEAL 036029 ELECTRICAL ENGINEER WILLIAM P. JORDAN

09-23-2011 P.E.
ELECTRIC UTILITY ENGINEER
Certifies engineering herein for:
– 15kV Underground Distribution System
– Joint-use Conduit System

NORTH CAROLINA PROFESSIONAL SEAL 032620 ENGINEER JOHN BUXTON WILLIAMS

9-23-2011 P.E.
ELECTRIC UTILITY ENGINEER
Certifies engineering herein for:
– Roadway Intersection and Pedestrian Lighting (See Note 10.)

CONDUIT SCHEDULES

* INSTALLATION BY BLUE RIDGE EMC

ELECTRIC POWER (E.P.) (REV. 1)

FROM	TO	QTY.	SIZE	TYPE
PME#17	P–11–0	4	4"	EP1
PME#17	P–11–3	4	4"	EP2
P–11–0*	SIGN	1	2"	

ELECTRIC FIBER OPTICS (E.F.) (REV. 1)

FROM	TO	QTY.	SIZE
FV#17	F#14	2	2"
FV#17	FV#18	2	4"
F#14	P–11–3	1	2"

TELEPHONE (TEL.) (REV. 1,2)

FROM	TO	QTY.	SIZE
TV#16	P–11–3	4	4"
TV#16	T#41	2	4"
TV#16	TV#17	6	4"
TV#17	P–11–0	4	4"

CABLE TELEVISION (CATV) (REV. 1)

FROM	TO	QTY.	SIZE
CV#21	CV#22	1	4"
CV#22	C#75	1	4"
CV#21	C#74	1	4"
CV#21	CV#23	2	4"
C#74	C#75	2	4"
C#74	C#76	1	4"
C#75	P–11–3	2	4"
CV#23	C#76	1	4"

LIGHTING (L) (REV. 2)

FROM	TO	QTY.	SIZE
SL#116	SL#117	2"	2"
SL#117	SL#118	2"	2"
SL#118	SL#119	2"	2"
SL#119	SL#120	2"	2"
SL#120	SL#121	2"	2"

PROJECT REFERENCE NO.	SHEET NO.
R–2237C	UC–15
DESIGNED BY: WPJ	
DRAWN BY: BDE/GQJ	
CHECKED BY: JBW	
APPROVED BY: WPJ/JBW	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE: (919)250–4128 FAX: (919)250–4119	UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION

Electric Utility General Notes:

Danger!! All lines are to be considered energized unless grounded in accordance with owner's or contractor's safety regulations and procedures, whichever is more stringent.

Location of electrical lines are approximate and are intended for geographic reference only.

Base Roadway Design Plans provided to Booth & Associates, Inc. by the Division of Highways, North Carolina Department of Transportation (N.C.D.O.T.) for project R–2237C. "Current as of March 11, 2011."

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All other work shown is by others.

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Existing and proposed electric facilities are owned by Blue Ridge EMC, Lenoir, North Carolina.

NO.	REVISIONS	DATE
1	ISSUE FOR CONSTRUCTION REVISED	01/31/11
2	ISSUE FOR CONSTRUCTION REVISED W/LIGHTING	03/25/11
3	ISSUE FOR CONSTRUCTION REVISED	09/19/11

DUCTBANK DETAIL SCHEDULE (REV. 1)

SECTION TYPE	STATION FROM	STATION TO
A2	446+85	451+48
A4	451+48	452+44 (PME#17)
B1	452+44 (PME#17)	458+00
C1	452+44 (PME#17)	RD CROSSING (P–11–3)

VAULT & EQUIPMENT SCHEDULE

ELECTRIC POWER UTILITY (Rev. 1, 2)

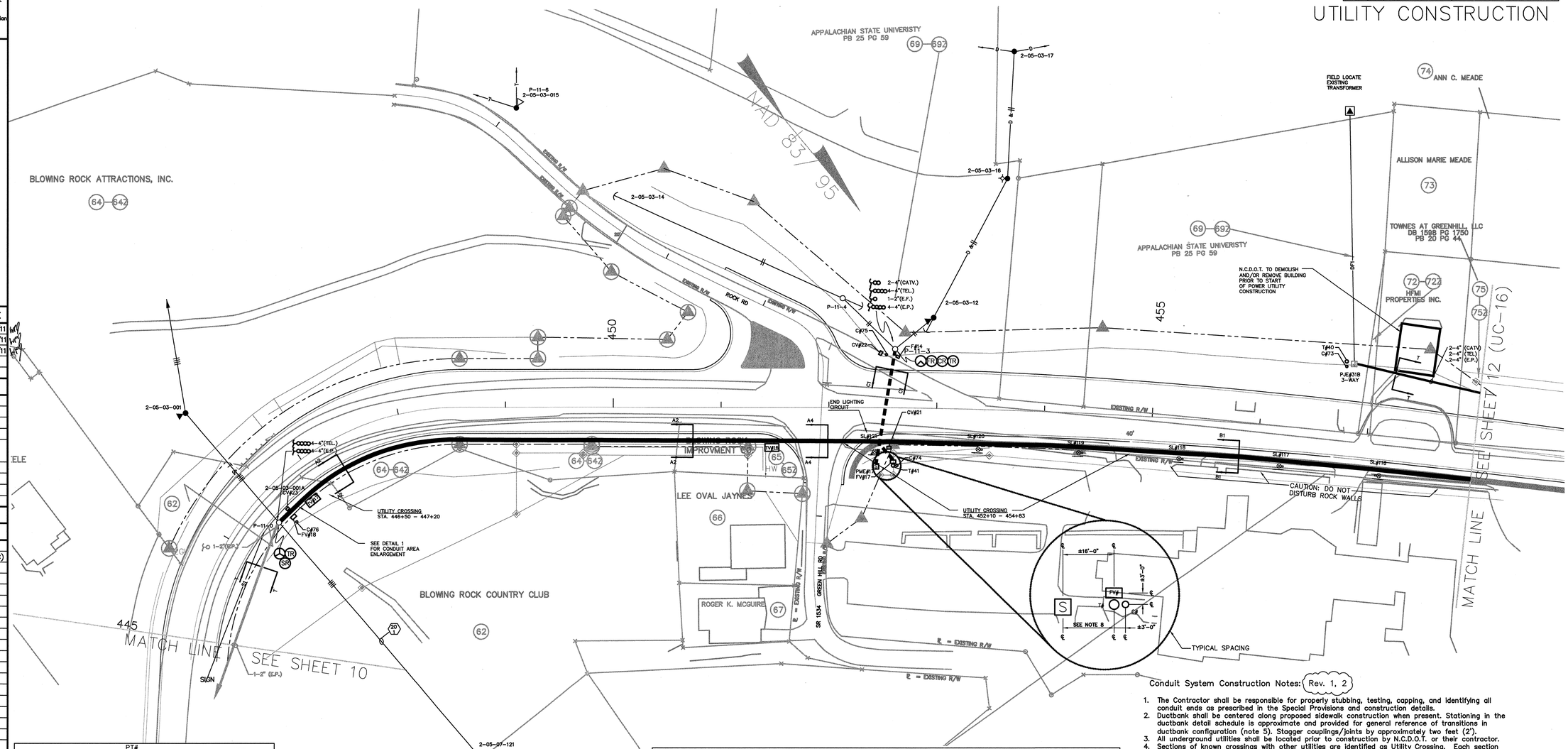
ID	STATION –L–	OFFSET (–R/L)	TYPE
PJE#31B	456+80	63'–L	1PH (BY BREMC)
F#14	452+63	46'–L	24"x36"x24"
PME#17	452+44	54'–R	PME – 9
FV#17	452+60	50'–R	30"x48"x36"
FV#18	446+47	35'–R	30"x48"x36"
SL#116	457+71	37'–R	13"x24"x18"
SL#117	456+23	37'–R	13"x24"x18"
SL#118	455+30	37'–R	13"x24"x18"
SL#119	454+36	36'–R	13"x24"x18"
SL#120	453+42	37'–R	13"x24"x18"
SL#121	452+39	42'–R	13"x24"x18"

TELEPHONE UTILITY

ID	STATION –L–	OFFSET (–R/L)	TYPE
TV#16	451+48	37'–R	6'x12'x7'
TV#17	446+85	36'–R	6'x12'x7'

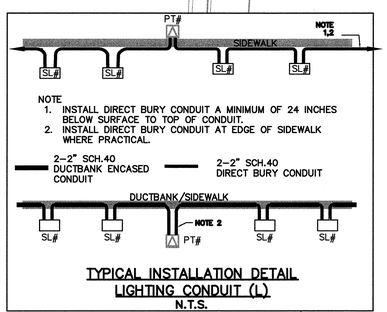
CABLE TELEVISION UTILITY (REV. 1)

ID	STATION –L–	OFFSET (–R/L)	TYPE
CV#21	452+56	37'–R	24"x36"x24"
CV#22	452+48	50'–L	24"x36"x24"
CV#23	446+62	27'–R	24"x36"x24"



Conduit System Construction Notes: (Rev. 1, 2)

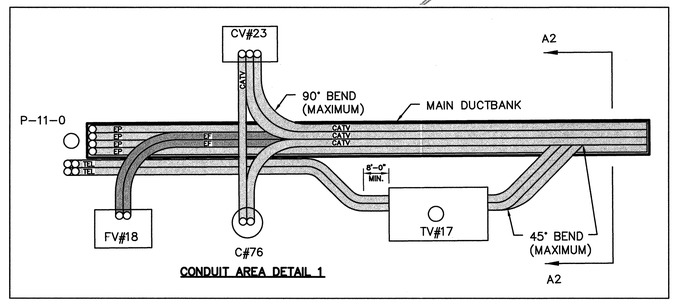
1. The Contractor shall be responsible for properly stubbing, testing, capping, and identifying all conduit ends as prescribed in the Special Provisions and construction details.
2. Ductbank shall be centered along proposed sidewalk construction when present. Stationing in the ductbank detail schedule is approximate and provided for general reference of transitions in ductbank configuration (note 5). Stagger couplings/joints by approximately two feet (2').
3. All underground utilities shall be located prior to construction by N.C.D.O.T. or their contractor.
4. Sections of known crossings with other utilities are identified as Utility Crossing. Each section with multiple crossings shall be of uniform depth to prevent unnecessary rise and fall of the ductbank. See sheet UC–25 for typical ductbank crossing detail.
5. The Contractor shall be responsible for carefully completing all transitions between ductbank configurations. Transition areas shall be minimal, generally within forty feet (40'), and span equally each side of common station point. Gradual changes in elevation and direction due to controlled longitudinal bending of conduit shall not exceed twelve inches (12") every ten feet (10') without prior engineer approval.
6. Pad–mounted equipment, pedestals, and other aboveground enclosures shall keep a minimum of four feet (4') clearance from fire hydrants.
7. The sum of all bends/sweeps/gradual changes in individual conduit shall not exceed 270° between exposed ends without prior engineer approval. Manufactured sweeps/elbows shall have a radius of no less than forty–eight inches (48").
8. All pad–mounted equipment (PME's, PJE's and PT's) shall maintain a minimum of 12'–0" separation off face of access door(s) from other above ground equipment or obstacles. See UC–25 for typical installation details.
9. Conduit system work by Blue Ridge EMC shown grey–lined.
10. Roadway Intersection and Pedestrian Lighting Design and Layout subject to N.C.D.O.T approval. Installation of light poles & fixture by Blue Ridge EMC. Contractor to install lighting conduit and handholes. If necessary to place handhole in any portion of sidewalk, install center of sidewalk only.
11. All permanent utility easements (PUEs) are subject to acceptance and acquisition by N.C.D.O.T.



TYPICAL INSTALLATION DETAIL
LIGHTING CONDUIT (L)
N.T.S.

(REV. 2)

PROP. 463' DUCTBANK – TYPE A2
PROP. 96' DUCTBANK – TYPE A4
PROP. 556' DUCTBANK – TYPE B1
PROP. 105' DUCTBANK – TYPE C1 (REV. 1)
PROP. 135' DIRECT BURY CONDUIT/TRENCH (REV. 2)
PROP. 2 (TWO) ELECTRIC F. O. VAULT (FV) – TYPE 30"x48"x36"
PROP. 2 (TWO) TELEPHONE VAULT (TV) – TYPE 6'x12'x7'
PROP. 1 (ONE) BOX PAD – PME TYPE 9
PROP. 1 (ONE) ELECTRIC F. O. HANDHOLE (F) – TYPE 24"x36"x24"
PROP. 3 (THREE) CABLE TV VAULT (CV) – TYPE 24"x36"x24"
PROP. 6 (SIX) STREET LIGHT HANDHOLE (SL) – TYPE 13"x24"x18" (REV. 2)



CONDUIT AREA DETAIL 1

SCALE: 1" = 50'

50 25 0 50 100 150 200

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R2237C_RDY_PSH11

Booth & Associates, Inc.
1011 Schaub Drive | Raleigh, NC 27606 CONSULTING ENGINEERS NC F-0221

NORTH CAROLINA PROFESSIONAL SEAL 035029 ENGINEER WILLIAM P. JORDAN
09-23-2011 P.E.
ELECTRIC UTILITY ENGINEER
Certifies engineering herein for:
– 15kv Underground Distribution System
– Joint-use Conduit System

NORTH CAROLINA PROFESSIONAL SEAL 032020 ENGINEER JOEL BUXTON WILLIAMS
9-23-11 P.E.
ELECTRIC UTILITY ENGINEER
Certifies engineering herein for:
– Roadway Intersection and Pedestrian Lighting (See Note 10.)

Electric Utility General Notes:

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Location of electrical lines are approximate and are intended for geographic reference only.

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All other work shown is by others.

Engineer of record covers only work provided by Booth & Associates, Inc.

Existing and proposed electric facilities are owned by Blue Ridge EMC, Lenoir, North Carolina.

NO.	REVISIONS	DATE	
1	ISSUE FOR CONSTRUCTION REVISED	01/31/11	WPJ
2	EASEMENT CORRECTION	02/16/11	WPJ
3	ISSUE FOR CONSTRUCTION REVISED W/LIGHTING	03/25/11	WPJ
4	ISSUE FOR CONSTRUCTION	09/19/11	WPJ

DUCTBANK DETAIL SCHEDULE

SECTION TYPE	STATION FROM	STATION TO
A4	470+57 (PME#15)	472+00
B1	458+00	458+45 (PJE#31)
B1	458+74 (TV#15)	465+75 (CV#20)
B1	468+48 (PJE#28)	470+57 (PME#15)
B3	458+45 (PJE#31)	458+74 (TV#15)
B3	465+75 (CV#20)	468+48 (PJE#28)
C2	458+45 (PJE#31)	RD CROSSING (F#13)
C3	468+48 (PJE#28)	RD CROSSING (PJE#29)
D1	470+57 (PME#15)	RD CROSSING (PJE#28A)

ELECTRIC POWER UTILITY (REV. 1, 3)

ID	STATION –L–	OFFSET (–R/L)	TYPE
PME#15	470+57	43'–R	PME – 9
PJE#28A	470+26	55'–L	1PH (BY BREMC)
PJE#28B	469+06	43'–R	1PH (BY BREMC)
PJE#28	468+48	42'–R	3PH, 200A
FV#15	468+41	43'–R	30"x48"x36"
PJE#29	468+11	51'–L	3PH, 200A
PT#25	468+03	64'–L	(BY BREMC)
F#11	468+00	56'–L	24"x36"x24"
PT#26	467+63	52'–L	(BY BREMC)
PT#27	467+47	40'–R	(BY BREMC)
F#12	467+40	39'–R	24"x36"x24"
PME#16	465+96	38'–R	PME – 11
PJE#30A	464+48	33'–R	3PH, 600A
PJE#31A	459+20	62'–L	1PH (BY BREMC)
FV#16	458+53	53'–R	30"x48"x36"
F#13	458+44	34'–L	24"x36"x24"
PJE#31	458+45	53'–R	3PH, 200A
PJE#30	465+76	30'–R	3PH, 200A
SL#100	471+60	42'–R	13"x24"x18"
SL#101	470+69	39'–R	13"x24"x18"
SL#102	469+82	29'–R	13"x24"x18"
SL#103	468+87	28'–R	13"x24"x18"
SL#104	467+94	27'–R	13"x24"x18"
SL#105	467+01	27'–R	13"x24"x18"
SL#106	466+14	29'–R	13"x24"x18"
SL#107	465+24	18'–R	13"x24"x18"
SL#108	464+32	12'–R	13"x24"x18"
SL#109	463+41	12'–R	13"x24"x18"
SL#110	462+50	15'–R	13"x24"x18"
SL#111	461+53	19'–R	13"x24"x18"
SL#112	460+58	22'–R	13"x24"x18"
SL#113	459+63	26'–R	13"x24"x18"
SL#114	458+98	34'–R	13"x24"x18"
SL#115	458+05	36'–R	13"x24"x18"

VAULT & EQUIPMENT SCHEDULE (CONTINUED)

TELEPHONE UTILITY

ID	STATION –L–	OFFSET (–R/L)	TYPE
TV#14	466+28	32'–R	6'x12'x7'
TV#15	458+74	37'–R	6'x12'x7'

CABLE TELEVISION UTILITY

ID	STATION –L–	OFFSET (–R/L)	TYPE
CV#20	465+75	22'–R	24"x36"x24"

CONDUIT SCHEDULES

ELECTRIC POWER (E.P.) * INSTALLATION BY BLUE RIDGE EMC (REV. 1)

FROM	TO	QTY.	SIZE	TYPE	FROM	TO	QTY.	SIZE	TYPE
PME#15	PME#16	4	4"	EP1	PME#16	PJE#30	4	4"	EP2
PME#16	PME#17	4	4"	EP1	PJE#30	PJE#31	4	4"	EP2
PME#15	PJE#28A	2	4"	EP2	PME#16	PJE#30A	4	4"	EP1
PME#15	PJE#28	4	4"	EP2	PJE#31	PME#17	4	4"	EP2
PJE#28	PJE#29	4	4"	EP2	PJE#31	PJE#31A	2	4"	EP2
PJE#29	PT#25	4	4"		PJE#31	PJE#31B	2	4"	EP2
PJE#29	PT#26	2	4"						
PJE#28	PT#27	2	4"						
PJE#28*	PJE#28B	2	4"						
PJE#28	PME#16	4	4"	EP2					

ELECTRIC FIBER OPTICS (E.F.)

FROM	TO	QTY.	SIZE
FV#15	F#11	2	2"
FV#15	F#12	2	2"
F#12	P-12-3-3	1	2"
FV#15	FV#16	2	4"
FV#16	F#13	2	2"
FV#16	FV#17	2	4"

TELEPHONE (TEL.)

FROM	TO	QTY.	SIZE
TV#14	T#35	2	4"
TV#14	T#36	2	4"
TV#14	T#37	2	4"
TV#14	T#38	2	4"
TV#14	TV#15	6	4"
TV#15	T#39	2	4"
TV#15	T#40	2	4"
TV#15	TV#16	6	4"

CABLE TELEVISION (CATV)

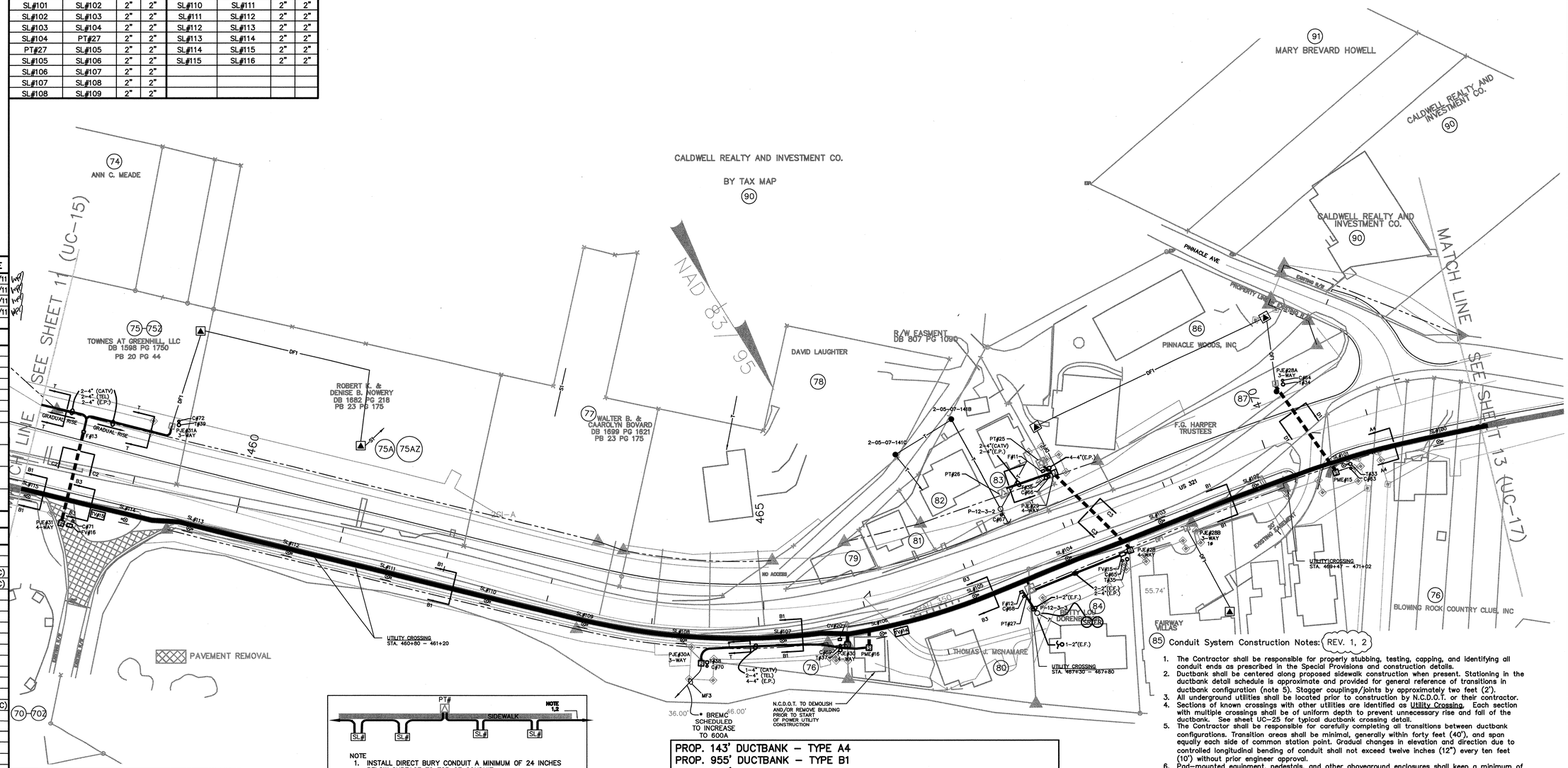
FROM	TO	QTY.	SIZE	FROM	TO	QTY.	SIZE
CV#20	C#69	1	4"	C#71	C#72	2	4"
CV#20	CV#21	2	4"	C#71	C#73	2	4"
C#63	C#64	2	4"	C#71	C#74	1	4"
C#63	C#65	1	4"				
C#65	C#66	2	4"				
C#66	C#67	1	4"				
C#65	C#68	1	4"				
C#68	C#69	1	4"				
C#69	C#70	1	4"				
C#69	C#71	1	4"				

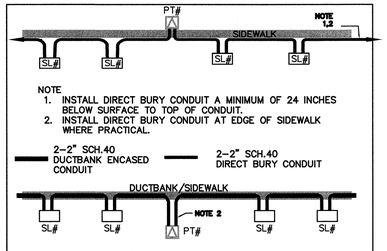
LIGHTING (L) (REV. 3)

FROM	TO	QTY.	SIZE	FROM	TO	QTY.	SIZE
SL#100	SL#101	2"	2"	SL#109	SL#110	2"	2"
SL#101	SL#102	2"	2"	SL#110	SL#111	2"	2"
SL#102	SL#103	2"	2"	SL#111	SL#112	2"	2"
SL#103	SL#104	2"	2"	SL#112	SL#113	2"	2"
SL#104	PT#27	2"	2"	SL#113	SL#114	2"	2"
PT#27	SL#105	2"	2"	SL#114	SL#115	2"	2"
SL#105	SL#106	2"	2"	SL#115	SL#116	2"	2"
SL#106	SL#107	2"	2"				
SL#107	SL#108	2"	2"				
SL#108	SL#109	2"	2"				

PROJECT REFERENCE NO.	SHEET NO.
R-2237C	UC-16
DESIGNED BY: WPJ	
DRAWN BY: BDE/GQJ	
CHECKED BY: JBW	
APPROVED BY: WPJ/JBW	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE: (919)250-4128 FAX: (919)250-4119	UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION





NOTE
1. INSTALL DIRECT BURY CONDUIT A MINIMUM OF 24 INCHES BELOW SURFACE TO TOP OF CONDUIT.
2. INSTALL DIRECT BURY CONDUIT AT EDGE OF SIDEWALK WHERE PRACTICAL.

2–2" SCH.40 DUCTBANK ENCASED CONDUIT — 2–2" SCH.40 DIRECT BURY CONDUIT

TYPICAL INSTALLATION DETAIL
LIGHTING CONDUIT (L)
N.T.S.

REV. 3

PROP. 143' DUCTBANK – TYPE A4
PROP. 955' DUCTBANK – TYPE B1
PROP. 302' DUCTBANK – TYPE B3
PROP. 84' DUCTBANK – TYPE C2
PROP. 96' DUCTBANK – TYPE C3
PROP. 96' DUCTBANK – TYPE D1
PROP. 496' DIRECT BURY CONDUIT/TRENCH (REV. 3)
PROP. 1 (ONE) BOX PAD – PME TYPE 9
PROP. 1 (ONE) BOX PAD – PME TYPE 11 (REV. 1)
PROP. 1 (ONE) BOX PAD – PJE TYPE 3–PH, 600A
PROP. 4 (FOUR) BOX PAD – PJE TYPE 3–PH, 200A
PROP. 2 (TWO) ELECTRIC F. O. VAULT (FV) – TYPE 30"x48"x36"
PROP. 3 (THREE) ELECTRIC F. O. HANDHOLE (F) – TYPE 24"x36"x24"
PROP. 2 (TWO) TELEPHONE VAULT (TV) – TYPE 6'x12'x7'
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PROP. 16 (SIXTEEN) STREET LIGHT HANDHOLE (SL) – TYPE 13"x24"x18" (REV. 3)

Conduit System Construction Notes: (REV. 1, 2)

1. The Contractor shall be responsible for properly stubbing, testing, capping, and identifying all conduit ends as prescribed in the Special Provisions and construction details.
2. Ductbank shall be centered along proposed sidewalk construction when present. Stationing in the ductbank detail schedule is approximate and provided for general reference of transitions in ductbank configuration (note 5). Stagger couplings/joints by approximately two feet (2').
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9. Conduit system work by Blue Ridge EMC shown grey–lined.
10. Roadway Intersection and Pedestrian Lighting Design and Layout subject to N.C.D.O.T approval. Installation of light poles & fixture by Blue Ridge EMC. Contractor to install lighting conduit and handholes. If necessary to place handhole in any portion of sidewalk, install center of sidewalk only.
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SCALE: 1" = 50'

50 25 0 50 100 150 200

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R2237C_RDY_PSH12

Booth & Associates, Inc.
1011 Schaub Drive | Raleigh, NC 27606 CONSULTING ENGINEERS NC F-0221

NORTH CAROLINA PROFESSIONAL SEAL 036929 ENGINEER WILLIAM P. JORDAN
09-23-2011 P.E.
ELECTRIC UTILITY ENGINEER
Certifies engineering herein for:
– 15kv Underground Distribution System
– Joint-use Conduit System

NORTH CAROLINA PROFESSIONAL SEAL 032620 ENGINEER BUXTON WILLIAMS
9-23-11 P.E.
ELECTRIC UTILITY ENGINEER
Certifies engineering herein for:
– Roadway Intersection and Pedestrian Lighting (See Note 10.)

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NO.	REVISIONS	DATE
1	ISSUE FOR CONSTRUCTION REVISED	01/31/11 WPJ
2	ISSUE FOR CONSTRUCTION REVISED W/LIGHTING	03/25/11 WPJ
3	ISSUE FOR CONSTRUCTION REVISED	09/19/11 WPJ

DUCTBANK DETAIL SCHEDULE (REV. 1,2)

SECTION TYPE	STATION FROM	STATION TO
A1	474+70 (TV#13)	479+72 (PME#13)
A4	472+00	474+30
A5	474+30	474+70 (TV#13)
B1	481+20 (TV#12)	485+00
B3	479+72 (PME#13)	481+00 (PJE#26)
B4	481+00 (PJE#26)	481+20 (TV#12)
C3	481+00 (PJE#26)	RD CROSSING (PJE#25)
C4	474+48 (PME#14)	RD CROSSING (PJE#27)
D1	479+72 (PME#13)	RD CROSSING (PT#22)

VAULT & EQUIPMENT SCHEDULE

ELECTRIC POWER UTILITY (REV. 2)

ID	STATION –L–	OFFSET (–R/L)	TYPE
F#8	483+86	95'–R	24"x36"x24"
F#7	481+04	32'–L	24"x36"x24"
PJE#25	481+00	32'–L	3PH, 200A
PJE#26	481+00	55'–R	3PH, 200A
FV#13	480+88	54'–R	30"x48"x36"
PME#13	479+72	55'–R	PME – 9
PT#22	479+24	40'–L	(BY BREMC)
PT#23	477+33	87'–L	(BY BREMC)
PT#24	475+75	41'–L	(BY BREMC)
FV#14	474+64	50'–R	30"x48"x36"
PME#14	474+48	64'–R	PME – 9
PJE#27	473+79	32'–L	3PH, 200A
F#9	473+47	59'–L	24"x36"x24"
F#10	473+64	105'–R	24"x36"x24"
SL#86	484+60	38'–R	13"x24"x18"
SL#87	483+62	37'–R	13"x24"x18"
SL#88	482+68	37'–R	13"x24"x18"
SL#89	481+77	37'–R	13"x24"x18"
SL#90	480+79	39'–R	13"x24"x18"
SL#91	479+78	40'–R	13"x24"x18"
SL#92	478+96	30'–R	13"x24"x18"
SL#93	478+06	29'–R	13"x24"x18"
SL#94	477+15	29'–R	13"x24"x18"
SL#95	476+23	40'–R	13"x24"x18"
SL#96	475+34	47'–R	13"x24"x18"
SL#97	474+38	51'–R	13"x24"x18"
SL#98	473+42	51'–R	13"x24"x18"
SL#99	472+49	46'–R	13"x24"x18"

TELEPHONE UTILITY (REV. 2)

ID	STATION –L–	OFFSET (–R/L)	TYPE
TV#12	481+20	39'–R	6'x12'x7'
TV#13	474+70	52'–R	6'x12'x7'

CABLE TELEVISION UTILITY

ID	STATION –L–	OFFSET (–R/L)	TYPE
CV#18	479+54	28'–R	24"x36"x24"
CV#19	474+61	54'–R	24"x36"x24"

CONDUIT SCHEDULES

ELECTRIC POWER (E.P.) (REV. 2)

FROM	TO	QTY.	SIZE	TYPE	FROM	TO	QTY.	SIZE	TYPE
PME#13	PME#14	4	4"	EP1	PME#14	PJE#27	4	4"	EP2
PME#14	PME#15	4	4"	EP1	PJE#27	P-13-5-1	4	4"	
PJE#26	PME#13	4	4"	EP2					
PJE#26	PJE#25	4	4"	EP2					
PJE#26	2-05-07-165	2	4"						
PME#13	PT#22	2	4"	EP2					
PT#22	PT#23	2	4"						
PT#23	PT#24	2	4"						
PT#24	PJE#27	2	4"						
PME#14	P-13-5-2	4	4"						

ELECTRIC FIBER OPTICS (E.F.)

FROM	TO	QTY.	SIZE
FV#13	F#7	2	2"
FV#13	F#8	2	2"
FV#13	FV#14	2	4"
FV#14	F#9	2	2"
F#9	P-13-5-1	2	2"
FV#14	F#10	2	2"
FV#14	FV#15	2	4"

TELEPHONE (TEL.) (REV. 2)

FROM	TO	QTY.	SIZE
TV#12	T#28	2	4"
TV#12	TV#13	6	4"
TV#12	T#30	2	4"
TV#12	T#31	2	4"
TV#13	T#32	4	4"
T#32	P-13-5-1	2	4"
T#32	P-13-4-1	2	4"
TV#13	TV#14	6	4"
TV#13	T#33	2	4"
TV#13	T#34	2	4"
TV#12	T#29	2	4"

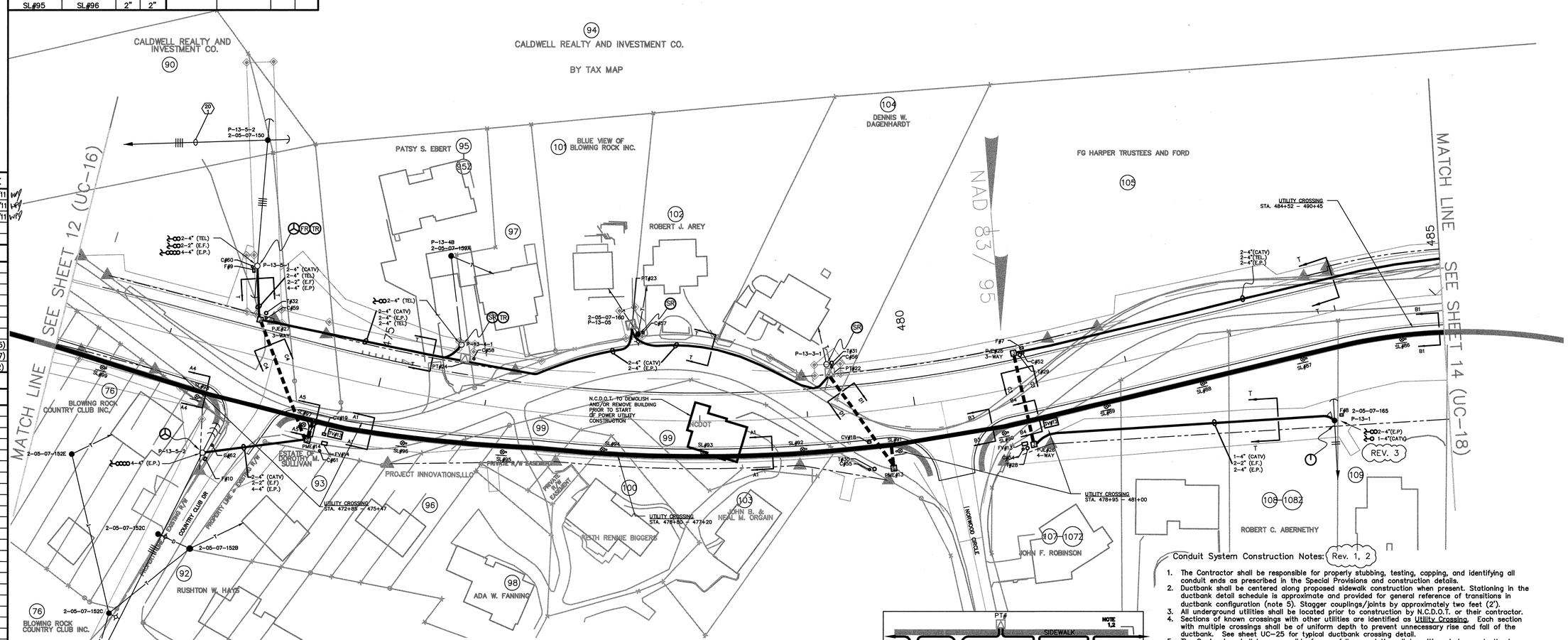
CABLE TELEVISION (CATV) (REV. 2)

FROM	TO	QTY.	SIZE	FROM	TO	QTY.	SIZE
CV#18	C#55	1	4"	C#59	C#60	2	4"
CV#18	CV#19	2	4"	C#59	C#61	2	4"
CV#19	C#61	1	4"	C#55	C#61	1	4"
CV#19	CV#20	2	4"	C#61	C#62	2	4"
C#54	C#55	1	4"	C#61	C#63	1	4"
C#54	C#52	2	4"	C#54	P-13-1	1	4"
C#55	C#56	2	4"				
C#56	C#57	2	4"				
C#57	C#58	2	4"				
C#58	C#59	2	4"				

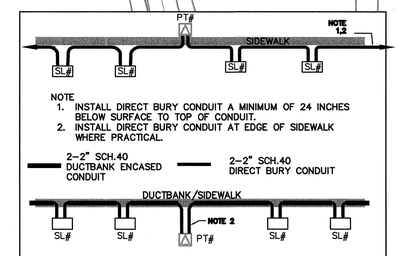
(REV. 3)

LIGHTING (L) (REV. 2)

FROM	TO	QTY.	SIZE	FROM	TO	QTY.	SIZE
SL#86	SL#87	2"	2"	SL#96	SL#97	2"	2"
SL#87	SL#88	2"	2"	SL#97	SL#98	2"	2"
SL#88	SL#89	2"	2"	SL#98	SL#99	2"	2"
SL#89	SL#90	2"	2"	SL#99	SL#100	2"	2"
SL#90	SL#91	2"	2"				
SL#91	SL#92	2"	2"				
SL#92	SL#93	2"	2"				
SL#93	SL#94	2"	2"				
SL#94	SL#95	2"	2"				
SL#95	SL#96	2"	2"				



PROP. 502' DUCTBANK – TYPE A1
PROP. 230' DUCTBANK – TYPE A4
PROP. 40' DUCTBANK – TYPE A5
PROP. 380' DUCTBANK – TYPE B1
PROP. 128' DUCTBANK – TYPE B3
PROP. 20' DUCTBANK – TYPE B4
PROP. 83' DUCTBANK – TYPE C3 (REV. 2)
PROP. 115' DUCTBANK – TYPE C4
PROP. 102' DUCTBANK – TYPE D1
PROP. 1,436' DIRECT BURY CONDUIT/TRENCH (REV. 2)
PROP. 2 (TWO) BOX PAD – PME TYPE 9
PROP. 3 (THREE) BOX PAD – PJE TYPE 3–PH, 200A
PROP. 2 (TWO) ELECTRIC F. O. VAULT (FV) – TYPE 30"x48"x36"
PROP. 4 (FOUR) ELECTRIC F. O. HANDHOLE (F) – TYPE 24"x36"x24"
PROP. 2 (TWO) TELEPHONE VAULT (TV) – TYPE 6'x12'x7'
PROP. 2 (TWO) CABLE TV VAULT (CV) – TYPE 24"x36"x24"
PROP. 14 (FOURTEEN) STREET LIGHT HANDHOLE (SL) – TYPE 13"x24"x18" (REV. 2)



TYPICAL INSTALLATION DETAIL
LIGHTING CONDUIT (L)
N.T.S.

(REV. 2)

Conduit System Construction Notes: (Rev. 1, 2)

1. The Contractor shall be responsible for properly stubbing, testing, capping, and identifying all conduit ends as prescribed in the Special Provisions and construction details.
2. Ductbank shall be centered along proposed sidewalk construction when present. Stationing in the ductbank detail schedule is approximate and provided for general reference of transitions in ductbank configuration (note 5). Stagger couplings/joints by approximately two feet (2').
3. All underground utilities shall be located prior to construction by N.C.D.O.T. or their contractor.
4. Sections of known crossings with other utilities are identified as Utility Crossing. Each section with multiple crossings shall be of uniform depth to prevent unnecessary rise and fall of the ductbank. See sheet UC-25 for typical ductbank crossing detail.
5. The Contractor shall be responsible for carefully completing all transitions between ductbank configurations. Transition areas shall be minimal, generally within forty feet (40'), and span equally each side of common station point. Gradual changes in elevation and direction due to controlled longitudinal bending of conduit shall not exceed twelve inches (12") every ten feet (10') without prior engineer approval.
6. Pad–mounted equipment, pedestals, and other aboveground enclosures shall keep a minimum of four feet (4') clearance from fire hydrants.
7. The sum of all bends/sweeps/gradual changes in individual conduit shall not exceed 270° between exposed ends without prior engineer approval. Manufactured sweeps/elbows shall have a radius of no less than forty–eight inches (48").
8. All pad–mounted equipment (PME's, PJE's and PT's) shall maintain a minimum of 12'–0" separation off face of access door(s) from other above ground equipment or obstacles. See UC–25 for typical installation details.
9. Conduit system work by Blue Ridge EMC shown grey–lined.
10. Roadway Intersection and Pedestrian Lighting Design and Layout subject to N.C.D.O.T approval. Installation of light poles & fixture by Blue Ridge EMC. Contractor to install lighting conduit and handholes. If necessary to place handhole in any portion of sidewalk, install center of sidewalk only.
11. All permanent utility easements (PUEs) are subject to acceptance and acquisition by N.C.D.O.T.

SCALE: 1" = 50'

50 25 0 50 100 150 200

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R2237C_RDY_PSH13

PROJECT REFERENCE NO.	SHEET NO.
R-2237C	UC-17
DESIGNED BY: WPJ	
DRAWN BY: BDE/GQJ	
CHECKED BY: JBW	
APPROVED BY: WPJ/JBW	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE: (919)250–4128 FAX: (919)250–4119	UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION

Booth & Associates, Inc.
1011 Schaub Drive | Raleigh, NC 27606 CONSULTING ENGINEERS NC F-0221

NORTH CAROLINA PROFESSIONAL SEAL 035029 ENGINEER WILLIAM P. JORDAN
09-23-2011 P.E.
ELECTRIC UTILITY ENGINEER
Certifies engineering herein for:
– 15kv Underground Distribution System
– Joint-use Conduit System

NORTH CAROLINA PROFESSIONAL SEAL 032620 ENGINEER JOHN BUXTON WILLIAMS
9/13/11 P.E.
ELECTRIC UTILITY ENGINEER
Certifies engineering herein for:
– Roadway Intersection and Pedestrian Lighting (See Note 10.)

Electric Utility General Notes:

Danger!! All lines are to be considered energized unless grounded in accordance with owner's or contractor's safety regulations and procedures, whichever is more stringent.

Location of electrical lines are approximate and are intended for geographic reference only.

Base Roadway Design Plans provided to Booth & Associates, Inc. by the Division of Highways, North Carolina Department of Transportation (N.C.D.O.T.) for project R-2237C. "Current as of March 11, 2011."

Telephone and CATV facilities (existing and proposed) located and provided to Booth & Associates, Inc. by their respective owners for Project R-2237C.

Electric facilities, both existing and proposed, have been added by Booth & Associates, Inc., Consulting Engineers, Raleigh, North Carolina.

Engineering provided by Booth & Associates, Inc. covers only that work pertaining to the Electric Utility and Joint-use Conduit System Construction as shown on these plans and covered by the Project Special Provisions.

All other work shown is by others.

Engineer of record covers only work provided by Booth & Associates, Inc.

Existing and proposed electric facilities are owned by Blue Ridge EMC, Lenoir, North Carolina.

NO.	REVISIONS	DATE	
1	ISSUE FOR CONSTRUCTION REVISED	01/31/11	WPJ
2	ISSUE FOR CONSTRUCTION REVISED W/LIGHTING	03/25/11	WPJ
3	ISSUE FOR CONSTRUCTION REVISED	09/19/11	WPJ

DUCTBANK DETAIL SCHEDULE

SECTION TYPE	STATION FROM	STATION TO
A1	490+73	495+69 (PJE#23)
A6	490+13 (PJE#24)	490+73
A7	490+73	RD CROSSING P–14–4–2
B1	485+00	489+73 (TV#11)
B2	495+69 (PJE#23)	497+00
B4	489+73 (TV#11)	490+13 (PJE#24)
D1	490+13 (PJE#24)	RD CROSSING (PT#19)
D1	495+69 (PJE#23)	RD CROSSING (PT#17)
J1	SL#279	SL#280

VAULT & EQUIPMENT SCHEDULE

ELECTRIC POWER UTILITY (REV. 1, 2)

ID	STATION –L–	OFFSET (–R/L)	TYPE
PT#17	495+69	62'–L	(BY BREMC)
PJE#23	495+69	61'–R	3PH, 200A
PT#16	495+69	106'–R	(BY BREMC)
FV#11	492+51	162'–L	30"x48"x36"
PME#12	490+45	60'–R	PME – 11
PT#18	490+43	73'–R	(BY BREMC)
FV#12	490+31	58'–R	30"x48"x36"
PT#19	490+32	55'–L	(BY BREMC)
PJE#24	490+13	62'–R	3PH, 200A
PT#20	488+68	49'–L	(BY BREMC)
PT#21	485+10	33'–L	(BY BREMC)
SL#74	496+77	46'–R	13"x24"x18"
SL#75	495+80	46'–R	13"x24"x18"
SL#76	494+81	45'–R	13"x24"x18"
SL#77	493+86	47'–R	13"x24"x18"
SL#78	492+75	46'–R	13"x24"x18"
SL#79	491+56	47'–R	13"x24"x18"
SL#80	490+68	47'–R	13"x24"x18"
SL#81	489+57	41'–R	13"x24"x18"
SL#82	488+57	42'–R	13"x24"x18"
SL#83	487+57	45'–R	13"x24"x18"
SL#84	486+53	42'–R	13"x24"x18"
SL#85	485+53	40'–R	13"x24"x18"
SL#274	496+68	49'–L	13"x24"x18"
SL#275	495+75	46'–L	13"x24"x18"
SL#276	494+80	47'–L	13"x24"x18"
SL#277	493+90	47'–L	13"x24"x18"
SL#278	493+04	47'–L	13"x24"x18"
SL#279	492+48	76'–L	13"x24"x18"
SL#280	491+21	47'–L	13"x24"x18"

TELEPHONE UTILITY (REV. 2)

ID	STATION –L–	OFFSET (–R/L)	TYPE
TV#11	489+73	49'–R	6'x12'x7'

CABLE TELEVISION UTILITY (REV. 2)

ID	STATION –L–	OFFSET (–R/L)	TYPE
CV#16	490+05	45'–R	24"x36"x24"
CV#17	492+51	150'–L	24"x36"x24"

CONDUIT SCHEDULES

ELECTRIC POWER (E.P.) * INSTALLATION BY BLUE RIDGE EMC (REV. 1,2)

FROM	TO	QTY.	SIZE	TYPE	FROM	TO	QTY.	SIZE	TYPE
PME#12	P–14–4–2	4	4"	EP1	PJE#24	PT#18	2	4"	
PME#12	PME#13	4	4"	EP1	PT#18*	P–14–5A	2	4"	
PJE#23	PT#16	2	4"		PJE#25	PT#21	2	4"	EP2
PJE#23	PT#17	2	4"	EP2	PT#20	2–05–07–176	2	4"	
PT#17	2–05–07–185	2	4"						
PT#17	2–05–07–182	2	4"						
PME#12	PJE#24	4	4"	EP2					
PJE#24	PJE#26	4	4"	EP2					
PJE#24	PT#19	2	4"	EP2					
PT#19	PT#20	2	4"						

ELECTRIC FIBER OPTICS (E.F.)

FROM	TO	QTY.	SIZE
FV#12	FV#11	2	4"
FV#12	FV#13	2	4"

TELEPHONE (TEL.) (REV. 2)

FROM	TO	QTY.	SIZE
T#24	T#25	2	4"
TV#11	P–14–4–2	4	4"
TV#11	T#26	2	4"
T#26	T#27	2	4"
TV#11	TV#12	6	4"
T#29	T#29A	2	4"

CABLE TELEVISION (CATV)

FROM	TO	QTY.	SIZE	FROM	TO	QTY.	SIZE
C#43	C#44	2	4"	C#52	C#53	2	4"
C#44	C#42	1	4"	CV#16	CV#17	1	4"
C#44	C#45	1	4"	CV#17	C#48	1	4"
C#43	C#46	1	4"	CV#16	CV#18	2	4"
C#46	C#47	1	4"				
C#47	P–14–5A	2	4"				
C#46	C#48	1	4"				
C#46	C#49	2	4"				
C#49	C#51	1	4"				
C#46	C#54	1	4"				

NOTE: THERE IS NO C#50

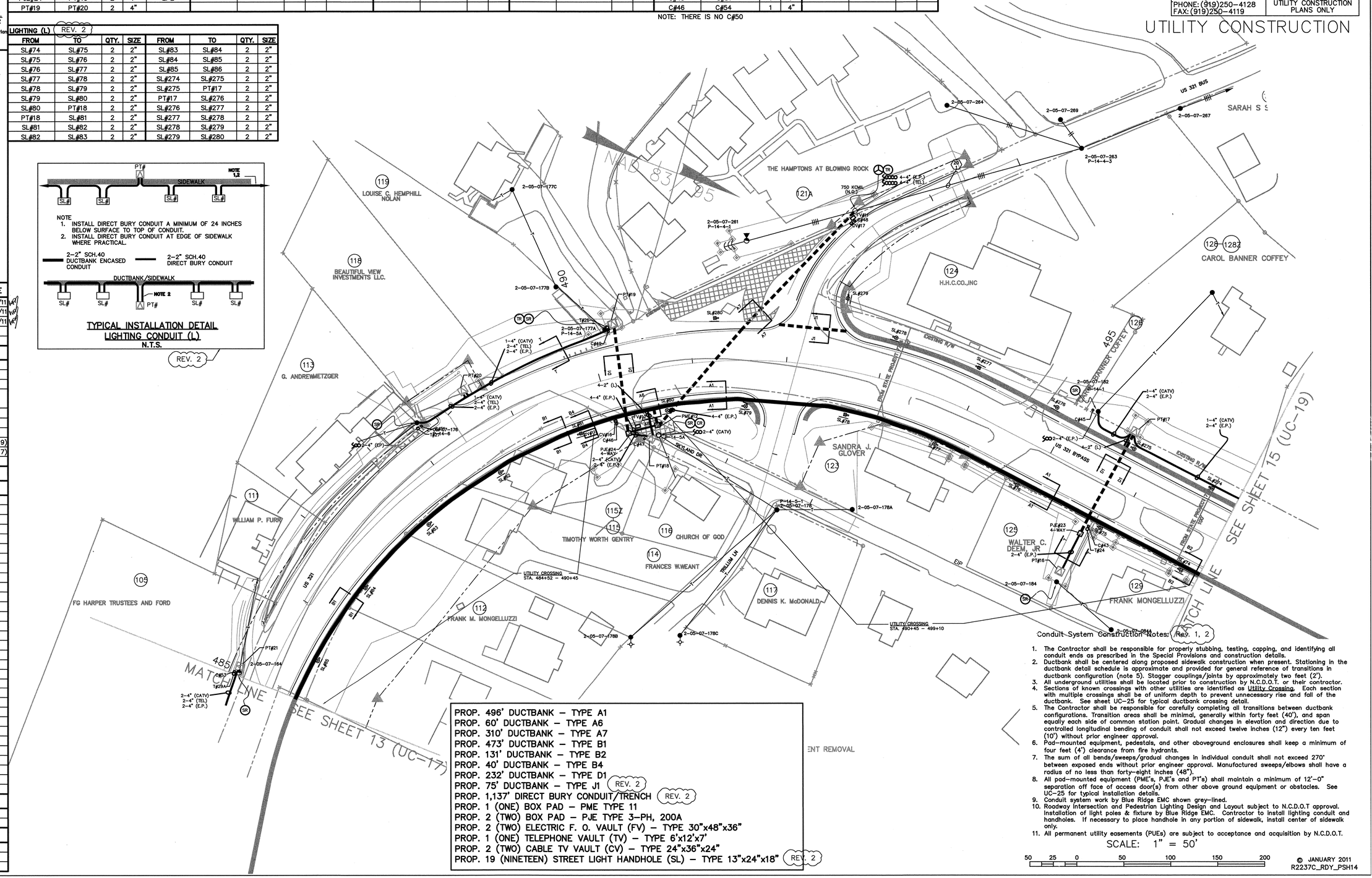
LIGHTING (L) (REV. 2)

FROM	TO	QTY.	SIZE	FROM	TO	QTY.	SIZE
SL#74	SL#75	2	2"	SL#83	SL#84	2	2"
SL#75	SL#76	2	2"	SL#84	SL#85	2	2"
SL#76	SL#77	2	2"	SL#85	SL#86	2	2"
SL#77	SL#78	2	2"	SL#274	SL#275	2	2"
SL#78	SL#79	2	2"	SL#275	PT#17	2	2"
SL#79	SL#80	2	2"	PT#17	SL#276	2	2"
SL#80	PT#18	2	2"	SL#276	SL#277	2	2"
PT#18	SL#81	2	2"	SL#277	SL#278	2	2"
SL#81	SL#82	2	2"	SL#278	SL#279	2	2"
SL#82	SL#83	2	2"	SL#279	SL#280	2	2"

TYPICAL INSTALLATION DETAIL
LIGHTING CONDUIT (L)
N.T.S.
(REV. 2)

PROJECT REFERENCE NO.	SHEET NO.
R–2237C	UC–18
DESIGNED BY: WPJ	
DRAWN BY: BDE/GQJ	
CHECKED BY: JBW	
APPROVED BY: WPJ/JBW	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE: (919)250–4128 FAX: (919)250–4119	UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION



PROP. 496' DUCTBANK – TYPE A1
PROP. 60' DUCTBANK – TYPE A6
PROP. 310' DUCTBANK – TYPE A7
PROP. 473' DUCTBANK – TYPE B1
PROP. 131' DUCTBANK – TYPE B2
PROP. 40' DUCTBANK – TYPE B4
PROP. 232' DUCTBANK – TYPE D1
PROP. 75' DUCTBANK – TYPE J1 (REV. 2)
PROP. 1,137' DIRECT BURY CONDUIT/TRENCH (REV. 2)
PROP. 1 (ONE) BOX PAD – PME TYPE 11
PROP. 2 (TWO) BOX PAD – PJE TYPE 3–PH, 200A
PROP. 2 (TWO) ELECTRIC F. O. VAULT (FV) – TYPE 30"x48"x36"
PROP. 1 (ONE) TELEPHONE VAULT (TV) – TYPE 6'x12'x7'
PROP. 2 (TWO) CABLE TV VAULT (CV) – TYPE 24"x36"x24"
PROP. 19 (NINETEEN) STREET LIGHT HANDHOLE (SL) – TYPE 13"x24"x18" (REV. 2)

Conduit System Construction Notes: (REV. 1, 2)

1. The Contractor shall be responsible for properly stubbing, testing, capping, and identifying all conduit ends as prescribed in the Special Provisions and construction details.
2. Ductbank shall be centered along proposed sidewalk construction when present. Stationing in the ductbank detail schedule is approximate and provided for general reference of transitions in ductbank configuration (note 5). Stagger couplings/joints by approximately two feet (2').
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6. Pad–mounted equipment, pedestals, and other aboveground enclosures shall keep a minimum of four feet (4') clearance from fire hydrants.
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9. Conduit system work by Blue Ridge EMC shown grey–lined.
10. Roadway Intersection and Pedestrian Lighting Design and Layout subject to N.C.D.O.T approval. Installation of light poles & fixture by Blue Ridge EMC. Contractor to install lighting conduit and handholes. If necessary to place handhole in any portion of sidewalk, install center of sidewalk only.
11. All permanent utility easements (PUEs) are subject to acceptance and acquisition by N.C.D.O.T.

SCALE: 1" = 50'

50 25 0 50 100 150 200

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R2237C_RDY_PSH14

Booth&Associates, Inc.
1011 Schaub Drive | Raleigh, NC 27606 CONSULTING ENGINEERS NC F-0221

PROJECT REFERENCE NO.	SHEET NO.
R-2237C	UC-19

DESIGNED BY: WPJ
DRAWN BY: BDE/GQJ
CHECKED BY: JBW
APPROVED BY: WPJ/JBW
REVISED:

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

UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION

SEAL 035029 — NORTH CAROLINA PROFESSIONAL ENGINEER — WILLIAM P. JORDAN
09-23-2011 P.E.
ELECTRIC UTILITY ENGINEER
Certifies engineering herein for:
– 15kv Underground Distribution System
– Joint-use Conduit System

SEAL 032620 — NORTH CAROLINA PROFESSIONAL ENGINEER — JOHN BUXTON WILLIAMS
P.E.
ELECTRIC UTILITY ENGINEER
Certifies engineering herein for:
– Roadway Intersection and Pedestrian Lighting (See Note 10.)

Electric Utility General Notes:

Danger!! All lines are to be considered energized unless grounded in accordance with owner's or contractor's safety regulations and procedures, whichever is more stringent.

Location of electrical lines are approximate and are intended for geographic reference only.

Base Roadway Design Plans provided to Booth & Associates, Inc. by the Division of Highways, North Carolina Department of Transportation (N.C.D.O.T.) for project R-2237C. "Current as of March 11 2011."

Telephone and CATV facilities (existing and proposed) located and provided to Booth & Associates, Inc. by their respective owners for Project R-2237C.

Electric facilities, both existing and proposed, have been added by Booth & Associates, Inc., Consulting Engineers, Raleigh, North Carolina.

Engineering provided by Booth & Associates, Inc. covers only that work pertaining to the Electric Utility and Joint-use Conduit System Construction as shown on these plans and covered by the Project Special Provisions.

All other work shown is by others.

Engineer of record covers only work provided by Booth & Associates, Inc.

Existing and proposed electric facilities are owned by Blue Ridge EMC, Lenoir, North Carolina.

NO.	REVISIONS	DATE
1	ISSUE FOR CONSTRUCTION REVISED	01/31/11
2	ISSUE FOR CONSTRUCTION REVISED W/LIGHTING	03/25/11
3	ISSUE FOR CONSTRUCTION REVISED	09/19/11

CONDUIT SCHEDULES

ELECTRIC POWER (E.P.)
* INSTALLATION BY BLUE RIDGE EMC

FROM	TO	QTY.	SIZE	TYPE	FROM	TO	QTY.	SIZE	TYPE
PME#10	PME#11	4	4"	EP1	PJE#22	P-15-4-1	4	4"	
PME#11	PME#12	4	4"	EP1	PJE#22	PME#11	4	4"	EP2
PME#10	PJE#20	4	4"	EP2	PME#11	PJE#23	4	4"	EP2
PJE#20	PT#13	2	4"		PT#14 *	2-05-07-216	4	4"	
PJE#20 *	PT#14	4	4"						
PT#14 *	2-05-07-298	1	4"						
PJE#21	PT#15	2	4"						
PJE#21	PJE#22	4	4"	EP2					
PJE#21	2-05-07-191	2	4"						
PJE#22	P-15-2	4	4"	EP2					

ELECTRIC FIBER OPTICS (E.F.)

FROM	TO	QTY.	SIZE
FV#9	F#5	2	2"
FV#9	FV#9A	2	4"
FV#9A	FV#10	2	4"
FV#9A	F#5A	2	2"
FV#10	F#6	2	2"
FV#10	FV#12	2	4"

TELEPHONE (TEL.)

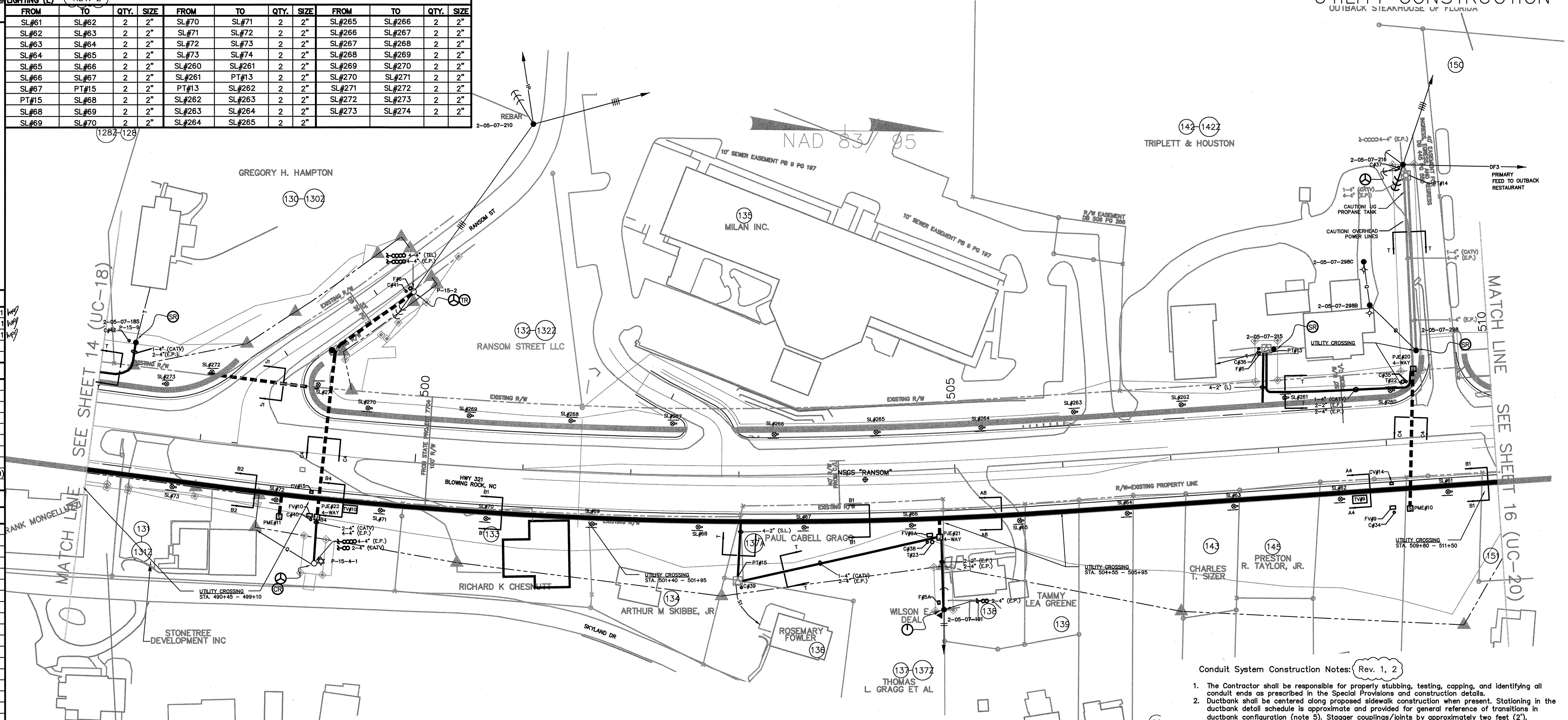
FROM	TO	QTY.	SIZE
TV#9	T#22	4	4"
TV#9	TV#10	6	4"
TV#9	T#23	2	4"
TV#10	P-15-2	4	4"
TV#10	TV#11	6	4"
TV#10	T#24	2	4"

CABLE TELEVISION (CATV)

FROM	TO	QTY.	SIZE	FROM	TO	QTY.	SIZE
CV#14	C#34	1	4"	C#40	C#41	2	4"
CV#14	CV#15	2	4"	C#40	P-15-4-1	2	4"
CV#15	C#40	1	4"	C#40	C#43	1	4"
CV#15	CV#16	2	4"				
C#34	C#35	2	4"				
C#35	C#36	1	4"				
C#35	C#37	1	4"				
C#34	C#38	1	4"				
C#38	C#39	1	4"				
C#38	C#40	1	4"				

LIGHTING (L) (REV. 2)

FROM	TO	QTY.	SIZE	FROM	TO	QTY.	SIZE	FROM	TO	QTY.	SIZE
SL#61	SL#62	2	2"	SL#70	SL#71	2	2"	SL#265	SL#266	2	2"
SL#62	SL#63	2	2"	SL#71	SL#72	2	2"	SL#266	SL#267	2	2"
SL#63	SL#64	2	2"	SL#72	SL#73	2	2"	SL#267	SL#268	2	2"
SL#64	SL#65	2	2"	SL#73	SL#74	2	2"	SL#268	SL#269	2	2"
SL#65	SL#66	2	2"	SL#260	SL#261	2	2"	SL#269	SL#270	2	2"
SL#66	SL#67	2	2"	SL#261	PT#13	2	2"	SL#270	SL#271	2	2"
SL#67	PT#15	2	2"	PT#13	SL#262	2	2"	SL#271	SL#272	2	2"
PT#15	SL#68	2	2"	SL#262	SL#263	2	2"	SL#272	SL#273	2	2"
SL#68	SL#69	2	2"	SL#263	SL#264	2	2"	SL#273	SL#274	2	2"
SL#69	SL#70	2	2"	SL#264	SL#265	2	2"				



DUCTBANK DETAIL SCHEDULE

SECTION TYPE	STATION FROM	STATION TO
A4	508+71 (TV#9)	509+18 (PME#10)
A8	504+84 (PJE#21)	508+71 (TV#9)
B1	499+44 (TV#10)	504+84 (PJE#21)
B1	509+18 (PME#10)	510+00
B2	497+00	499+15 (PJE#22)
B4	499+15 (PJE#22)	499+44 (TV#10)
C4	499+15 (PJE#22)	RD CROSSING (P-15-2)
C4	509+18 (PME#10)	RD CROSSING (PJE#20)
J1	SL#271	SL#272

VAULT & EQUIPMENT SCHEDULE

ELECTRIC POWER UTILITY (Rev. 1, 2, 3)

ID	STATION -L-	OFFSET (-R/L)	TYPE
PJE#20	509+28	69'-L	3PH, 200A
PME#10	509+18	60'-R	PME - 9
PT#14	509+35	248'-L	(BY BREMC)
FV#9	509+02	58'-R	30"x48"x36"
PT#13	507+94	97'-L	(BY BREMC)
F#5	507+89	85'-L	24"x36"x24"
PJE#21	504+84	59'-R	3PH, 200A
F#5A	504+81	119'-R	24"x36"x24"
FV#9A	504+74	57'-R	30"x48"x36"
PT#15	503+01	96'-R	(BY BREMC)
F#6	499+81	160'-L	24"x36"x24"
PJE#22	499+15	59'-R	3PH, 200A
FV#10	499+08	58'-R	30"x48"x36"
PME#11	498+80	62'-R	PME -9
SL#61	509+57	47'-R	13"x24"x18"
SL#62	508+57	47'-R	13"x24"x18"
SL#63	507+58	47'-R	13"x24"x18"
SL#64	506+61	47'-R	13"x24"x18"
SL#65	505+61	47'-R	13"x24"x18"
SL#66	504+61	47'-R	13"x24"x18"
SL#67	503+62	47'-R	13"x24"x18"
SL#68	502+64	47'-R	13"x24"x18"
SL#69	501+69	47'-R	13"x24"x18"
SL#70	500+71	47'-R	13"x24"x18"
SL#71	499+74	46'-R	13"x24"x18"
SL#72	498+72	46'-R	13"x24"x18"
SL#73	497+82	47'-R	13"x24"x18"
SL#260	509+10	51'-L	13"x24"x18"
SL#261	508+12	51'-L	13"x24"x18"
SL#262	507+16	51'-L	13"x24"x18"
SL#263	506+15	51'-L	13"x24"x18"
SL#264	505+26	41'-L	13"x24"x18"
SL#265	504+32	40'-L	13"x24"x18"
SL#266	503+37	40'-L	13"x24"x18"
SL#267	502+41	49'-L	13"x24"x18"
SL#268	501+45	48'-L	13"x24"x18"
SL#269	500+50	47'-L	13"x24"x18"
SL#270	499+55	47'-L	13"x24"x18"
SL#271	499+03	61'-L	13"x24"x18"

VAULT & EQUIPMENT SCHEDULE (CONTINUED)

ELECTRIC POWER UTILITY (CONT.) (Rev. 1, 2)

ID	STATION -L-	OFFSET (-R/L)	TYPE
SL#272	497+99	62'-L	13"x24"x18"
SL#273	497+61	47'-L	13"x24"x18"

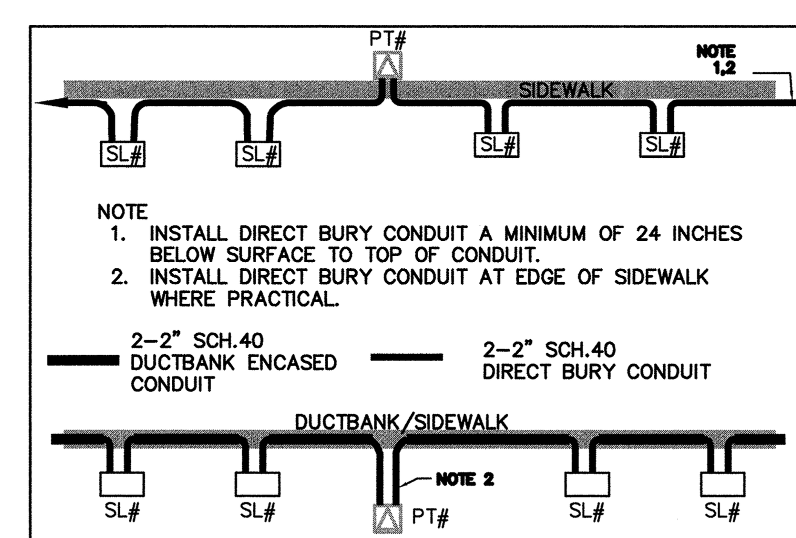
TELEPHONE UTILITY

ID	STATION -L-	OFFSET (-R/L)	TYPE
TV#9	508+71	48'-R	6'x12'x7'
TV#10	499+44	48'-R	6'x12'x7'

CABLE TELEVISION UTILITY

ID	STATION -L-	OFFSET (-R/L)	TYPE
CV#14	509+02	36'-R	24"x36"x24"
CV#15	499+07	36'-R	24"x36"x24"

PROP. 47' DUCTBANK – TYPE A4
PROP. 387' DUCTBANK – TYPE A8
PROP. 622' DUCTBANK – TYPE B1
PROP. 215' DUCTBANK – TYPE B2
PROP. 29' DUCTBANK – TYPE B4
PROP. 369' DUCTBANK – TYPE C4 (REV. 3)
PROP. 102' DUCTBANK – TYPE J1 (REV. 2)
PROP. 1,805' DIRECT BURY CONDUIT/TRENCH (REV. 3)
PROP. 2 (TWO) BOX PAD – PME TYPE 9
PROP. 3 (THREE) BOX PAD – PJE TYPE 3-PH, 200A
PROP. 3 (THREE) ELECTRIC F.O. VAULT (FV) – TYPE 30"x48"x36"
PROP. 3 (THREE) ELECTRIC F.O. HANDHOLE (F) – TYPE 24"X36"X24"
PROP. 2 (TWO) TELEPHONE VAULT (TV) – TYPE 6'x12'x7'
PROP. 2 (TWO) CABLE TV VAULT (CV) – TYPE 24"x36"x24"
PROP. 27 (TWENTY-SEVEN) STREET LIGHT HANDHOLE (SL) – TYPE 13"x24"x18" (REV. 2)



TYPICAL INSTALLATION DETAIL
LIGHTING CONDUIT (L)
N.T.S.
(REV. 2)

Conduit System Construction Notes: (Rev. 1, 2)

1. The Contractor shall be responsible for properly stubbing, testing, capping, and identifying all conduit ends as prescribed in the Special Provisions and construction details.
2. Ductbank shall be centered along proposed sidewalk construction when present. Stationing in the ductbank detail schedule is approximate and provided for general reference of transitions in ductbank configuration (note 5). Stagger couplings/joints by approximately two feet (2').
3. All underground utilities shall be located prior to construction by N.C.D.O.T. or their contractor.
4. Sections of known crossings with other utilities are identified as Utility Crossing. Each section with multiple crossings shall be of uniform depth to prevent unnecessary rise and fall of the ductbank. See sheet UC-25 for typical ductbank crossing detail.
5. The Contractor shall be responsible for carefully completing all transitions between ductbank configurations. Transition areas shall be minimal, generally within forty feet (40'), and span equally each side of common station point. Gradual changes in elevation and direction due to controlled longitudinal bending of conduit shall not exceed twelve inches (12") every ten feet (10') without prior engineer approval.
6. Pad-mounted equipment, pedestals, and other aboveground enclosures shall keep a minimum of four feet (4') clearance from fire hydrants.
7. The sum of all bends/sweeps/gradual changes in individual conduit shall not exceed 270° between exposed ends without prior engineer approval. Manufactured sweeps/elbows shall have a radius of no less than forty-eight inches (48").
8. All pad-mounted equipment (PME's, PJE's and PT's) shall maintain a minimum of 12'-0" separation off face of access door(s) from other above ground equipment or obstacles. See UC-25 for typical installation details.
9. Conduit system work by Blue Ridge EMC shown grey-lined.
10. Roadway Intersection and Pedestrian Lighting Design and Layout subject to N.C.D.O.T approval. Installation of light poles & fixture by Blue Ridge EMC. Contractor to install lighting conduit and handholes. If necessary to place handhole in any portion of sidewalk, install center of sidewalk only.
11. All permanent utility easements (PUEs) are subject to acceptance and acquisition by N.C.D.O.T.

SCALE: 1" = 50'

50 25 0 50 100 150 200

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R2237C_RDY_PSH15

Booth & Associates, Inc.

1011 Schaub Drive | Raleigh, NC 27606 CONSULTING ENGINEERS NC F-0221

NORTH CAROLINA PROFESSIONAL SEAL 036929 ENGINEER WILLIAM P. JORDAN

09-23-2011 P.E.
ELECTRIC UTILITY ENGINEER
Certifies engineering herein for:
- 15kv Underground Distribution System
- Joint-use Conduit System

NORTH CAROLINA PROFESSIONAL SEAL 032020 ENGINEER JOHN BUXTON WILLIAMS

9-23-11 P.E.
ELECTRIC UTILITY ENGINEER
Certifies engineering herein for:
- Roadway Intersection and Pedestrian Lighting (See Note 10.)

Electric Utility General Notes:

Danger!! All lines are to be considered energized unless grounded in accordance with owner's or contractor's safety regulations and procedures, whichever is more stringent.

Location of electrical lines are approximate and are intended for geographic reference only.

Base Roadway Design Plans provided to Booth & Associates, Inc. by the Division of Highways, North Carolina Department of Transportation (N.C.D.O.T.) for project R-2237C. "Current as of March 11, 2011."

Telephone and CATV facilities (existing and proposed) located and provided to Booth & Associates, Inc. by their respective owners for Project R-2237C.

Electric facilities, both existing and proposed, have been added by Booth & Associates, Inc., Consulting Engineers, Raleigh, North Carolina.

Engineering provided by Booth & Associates, Inc. covers only that work pertaining to the Electric Utility and Joint-use Conduit System Construction as shown on these plans and covered by the Project Special Provisions.

All other work shown is by others.

Engineer of record covers only work provided by Booth & Associates, Inc.

Existing and proposed electric facilities are owned by Blue Ridge EMC, Lenoir, North Carolina.

NO.	REVISIONS	DATE
1	ISSUE FOR CONSTRUCTION REVISED	01/31/11
2	ISSUE FOR CONSTRUCTION REVISED W/LIGHTING	03/25/11
3	ISSUE FOR CONSTRUCTION REVISED	09/19/11

DUCTBANK DETAIL SCHEDULE

SECTION TYPE	STATION FROM	STATION TO
A1	518+67 (TV#8)	522+17 (PME#8)
A4	518+30 (PME#9)	518+67 (TV#8)
B1	510+00	513+83 (PJE#18)
B3	513+83 (PJE#18)	518+30 (PME#9)
B5	522+17 (PME#8)	523+00
C4	518+45 (PJE#16)	RD CROSSING (PJE#17)
C5	513+83 (PJE#18)	RD CROSSING (PJE#19)
C5	522+17 (PME#8)	RD CROSSING (PJE#15)
J1	SL#250	SL#251

VAULT & EQUIPMENT SCHEDULE

ELECTRIC POWER UTILITY (Rev. 1, 2)

ID	STATION –L–	OFFSET (–R/L)	TYPE
PME#8	522+17	50'–R	PME – 9
PJE#15	521+56	60'–L	3PH, 200A
PT#9	521+56	52'–L	(BY BREMC)
PJE#16	518+45	64'–R	3PH, 200A
PME#9	518+30	59'–R	PME – 9
PJE#17	517+95	98'–L	3PH, 200A
F#4	518+11	123'–L	24"x36"x24"
FV#8	518+14	59'–R	30'x48"x36"
PT#10	517+73	186'–L	(BY BREMC)
PT#11	517+08	143'–L	(BY BREMC)
PT#12	514+76	53'–L	(BY BREMC)
PJE#19	513+93	52'–L	3PH, 200A
PJE#18	513+83	59'–R	3PH, 200A
SL#47	522+92	47'–R	13"x24"x18"
SL#48	522+02	48'–R	13"x24"x18"
SL#49	521+07	37'–R	13"x24"x18"
SL#50	520+23	37'–R	13"x24"x18"
SL#51	519+23	47'–R	13"x24"x18"
SL#52	518+24	47'–R	13"x24"x18"
SL#53	517+26	47'–R	13"x24"x18"
SL#54	516+31	47'–R	13"x24"x18"
SL#55	515+33	47'–R	13"x24"x18"
SL#56	514+36	47'–R	13"x24"x18"
SL#57	513+39	47'–R	13"x24"x18"
SL#58	512+46	47'–R	13"x24"x18"
SL#59	511+50	47'–R	13"x24"x18"
SL#60	510+56	47'–R	13"x24"x18"
SL#245	522+58	47'–L	13"x24"x18"
SL#246	521+53	47'–L	13"x24"x18"
SL#247	520+84	47'–L	13"x24"x18"
SL#248	520+08	46'–L	13"x24"x18"
SL#249	519+12	47'–L	13"x24"x18"
SL#250	518+17	48'–L	13"x24"x18"
SL#251	517+32	50'–L	13"x24"x18"
SL#252	516+40	47'–L	13"x24"x18"
SL#253	515+37	47'–L	13"x24"x18"
SL#254	514+54	47'–L	13"x24"x18"
SL#255	513+65	48'–L	13"x24"x18"
SL#256	512+76	49'–L	13"x24"x18"

CONDUIT SCHEDULES

ELECTRIC POWER (E.P.) * INSTALLATION BY BLUE RIDGE EMC

FROM	TO	QTY.	SIZE	TYPE	FROM	TO	QTY.	SIZE	TYPE
PME#8	PME#9	4	4"	EP1	PJE#18	PJE#19	4	4"	EP2
PME#9	PME#10	4	4"	EP1	PJE#19	PT#12	2	4"	
PME#8	PJE#15	4	4"	EP2	PJE#18	PME#10	4	4"	EP2
PJE#15 *	PT#9	2	4"						
PME#9	PJE#16	4	4"	EP2					
PJE#16	PJE#17	4	4"	EP2					
PJE#17	PT#10	2	4"						
PJE#17	PT#11	3	4"						
PJE#17	P–16–2S	2	4"						
PME#9	PJE#18	4	4"	EP2					

ELECTRIC FIBER OPTICS (E.F.)

FROM	TO	QTY.	SIZE
FV#8	F#4	2	2"
FV#8	FV#9	2	4"

TELEPHONE (TEL.)

FROM	TO	QTY.	SIZE
T#14	T#15	2	4"
TV#8	T#16	4	4"
T#16	T#17	2	4"
T#16	P–16–2S	2	4"
T#16	T#18	2	4"
TV#8	TV#9	6	4"
TV#8	T#20	2	4"
T#20	T#19	2	4"
TV#8	T#21	2	4"

CABLE TELEVISION (CATV) (Rev. 1)

FROM	TO	QTY.	SIZE	FROM	TO	QTY.	SIZE
CV#13	C#27	1	4"	C#31	C#32	2	4"
CV#13	CV#14	2	4"	C#32	C#33	1	4"
C#22	C#23	2	4"	C#31	C#34	1	4"
C#22	C#25	1	4"				
C#25	C#26	1	4"				
C#25	C#27	2	4"				
C#27	C#28	1	4"				
C#27	C#29	1	4"				
C#27	C#30	1	4"				
C#26	C#31	1	4"				

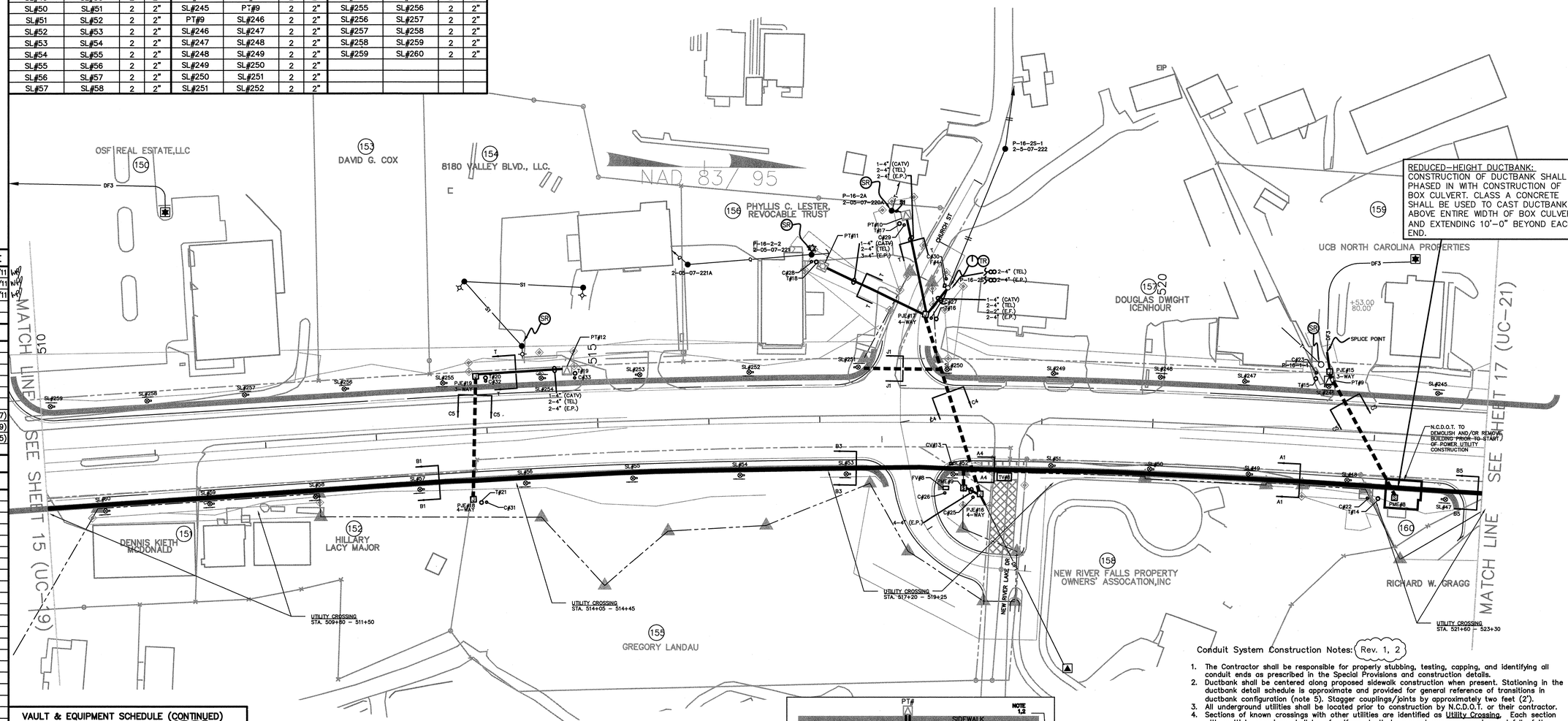
NOTE: THERE IS NO C#24.

LIGHTING (L) (REV. 2)

FROM	TO	QTY.	SIZE	FROM	TO	QTY.	SIZE	FROM	TO	QTY.	SIZE
SL#47	SL#48	2	2"	SL#58	SL#59	2	2"	SL#252	SL#253	2	2"
SL#48	SL#49	2	2"	SL#59	SL#60	2	2"	SL#253	SL#254	2	2"
SL#49	SL#50	2	2"	SL#60	SL#61	2	2"	SL#254	SL#255	2	2"
SL#50	SL#51	2	2"	SL#245	PT#9	2	2"	SL#255	SL#256	2	2"
SL#51	SL#52	2	2"	PT#9	SL#246	2	2"	SL#256	SL#257	2	2"
SL#52	SL#53	2	2"	SL#246	SL#247	2	2"	SL#257	SL#258	2	2"
SL#53	SL#54	2	2"	SL#247	SL#248	2	2"	SL#258	SL#259	2	2"
SL#54	SL#55	2	2"	SL#248	SL#249	2	2"	SL#259	SL#260	2	2"
SL#55	SL#56	2	2"	SL#249	SL#250	2	2"				
SL#56	SL#57	2	2"	SL#250	SL#251	2	2"				
SL#57	SL#58	2	2"	SL#251	SL#252	2	2"				

PROJECT REFERENCE NO.	SHEET NO.
R–2237C	UC–20
DESIGNED BY: WPJ	
DRAWN BY: BDE/GQJ	
CHECKED BY: JBW	
APPROVED BY: WPJ/JBW	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE: (919)250–4128 FAX: (919)250–4119	UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION



VAULT & EQUIPMENT SCHEDULE (CONTINUED)

ELECTRIC POWER UTILITY (CONT.) (Rev. 1, 2)

ID	STATION –L–	OFFSET (–R/L)	TYPE
SL#257	511+87	49'–L	13"x24"x18"
SL#258	510+99	50'–L	13"x24"x18"
SL#259	510+11	51'–L	13"x24"x18"

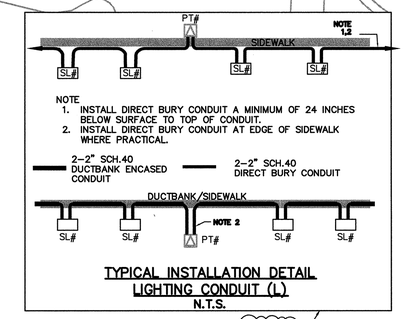
TELEPHONE UTILITY

ID	STATION –L–	OFFSET (–R/L)	TYPE
TV#8	518+67	48'–R	6'x12'x7'

CABLE TELEVISION UTILITY

ID	STATION –L–	OFFSET (–R/L)	TYPE
CV#13	518+19	36'–R	24"x36"x24"

PROP. 350' DUCTBANK – TYPE A1
PROP. 37' DUCTBANK – TYPE A4
PROP. 383' DUCTBANK – TYPE B1
PROP. 447' DUCTBANK – TYPE B3
PROP. 83' DUCTBANK – TYPE B5
PROP. 164' DUCTBANK – TYPE C4
PROP. 230' DUCTBANK – TYPE C5 (REV. 2)
PROP. 70' DUCTBANK – TYPE J1
PROP. 1,601' DIRECT BURY CONDUIT/TRENCH (Rev. 1, 2)
PROP. 2 (TWO) BOX PAD – PME TYPE 9
PROP. 5 (FIVE) BOX PAD – PJE TYPE 3–PH, 200A
PROP. 1 (ONE) ELECTRIC F.O. VAULT (FV) – TYPE 30"x48"x36"
PROP. 1 (ONE) ELECTRIC F.O. HANDHOLE (F) – TYPE 24"X36"X24"
PROP. 1 (ONE) TELEPHONE VAULT (TV) – TYPE 6'x12'x7'
PROP. 1 (ONE) CABLE TV VAULT (CV) – TYPE 24"x36"x24"
PROP. 29 (TWENTY–NINE) STREET LIGHT HANDHOLE (SL) – TYPE 13"x24"x18" (REV. 2)



TYPICAL INSTALLATION DETAIL
LIGHTING CONDUIT (L)
N.T.S.
REV. 2

Conduit System Construction Notes: (Rev. 1, 2)

1. The Contractor shall be responsible for properly stubbing, testing, capping, and identifying all conduit ends as prescribed in the Special Provisions and construction details.
2. Ductbank shall be centered along proposed sidewalk construction when present. Stationing in the ductbank detail schedule is approximate and provided for general reference of transitions in ductbank configuration (note 5). Stagger couplings/joints by approximately two feet (2').
3. All underground utilities shall be located prior to construction by N.C.D.O.T. or their contractor.
4. Sections of known crossings with other utilities are identified as Utility Crossing. Each section with multiple crossings shall be of uniform depth to prevent unnecessary rise and fall of the ductbank. See sheet UC–25 for typical ductbank crossing detail.
5. The Contractor shall be responsible for carefully completing all transitions between ductbank configurations. Transition areas shall be minimal, generally within forty feet (40'), and span equally each side of common station point. Gradual changes in elevation and direction due to controlled longitudinal bending of conduit shall not exceed twelve inches (12") every ten feet (10') without prior engineer approval.
6. Pad–mounted equipment, pedestals, and other aboveground enclosures shall keep a minimum of four feet (4') clearance from fire hydrants.
7. The sum of all bends/sweeps/gradual changes in individual conduit shall not exceed 270° between exposed ends without prior engineer approval. Manufactured sweeps/elbows shall have a radius of no less than forty–eight inches (48").
8. All pad–mounted equipment (PME's, PJE's and PT's) shall maintain a minimum of 12'–0" separation off face of access door(s) from other above ground equipment or obstacles. See UC–25 for typical installation details.
9. Conduit system work by Blue Ridge EMC shown grey–lined.
10. Roadway Intersection and Pedestrian Lighting Design and Layout subject to N.C.D.O.T approval. Installation of light poles & fixture by Blue Ridge EMC. Contractor to install lighting conduit and handholes. If necessary to place handhole in any portion of sidewalk, install center of sidewalk only.
11. All permanent utility easements (PUEs) are subject to acceptance and acquisition by N.C.D.O.T.

SCALE: 1" = 50'

50 25 0 50 100 150 200

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R2237C_RDY_PSH16

Booth & Associates, Inc.

1011 Schaub Drive | Raleigh, NC 27606 CONSULTING ENGINEERS NC F-0221

NORTH CAROLINA PROFESSIONAL SEAL 085029 ENGINEER WILLIAM P. JORDAN

09-23-2011 P.E.

ELECTRIC UTILITY ENGINEER

Certifies engineering herein for:
- 15kV Underground Distribution System
- Joint-use Conduit System

NORTH CAROLINA PROFESSIONAL SEAL 032026 ENGINEER JOHN BUXTON WILLIAMS

9-23-11 P.E.

ELECTRIC UTILITY ENGINEER

Certifies engineering herein for:
- Roadway Intersection and Pedestrian Lighting (See Note 10.)

Electric Utility General Notes:

Danger!! All lines are to be considered energized unless grounded in accordance with owner's or contractor's safety regulations and procedures, whichever is more stringent.

Location of electrical lines are approximate and are intended for geographic reference only.

Base Roadway Design Plans provided to Booth & Associates, Inc. by the Division of Highways, North Carolina Department of Transportation (N.C.D.O.T.) for project R-2237C. "Current as of March 11, 2011."

Telephone and CATV facilities (existing and proposed) located and provided to Booth & Associates, Inc. by their respective owners for Project R-2237C.

Electric facilities, both existing and proposed, have been added by Booth & Associates, Inc., Consulting Engineers, Raleigh, North Carolina.

Engineering provided by Booth & Associates, Inc. covers only that work pertaining to the Electric Utility and Joint-use Conduit System Construction as shown on these plans and covered by the Project Special Provisions.

All other work shown is by others.

Engineer of record covers only work provided by Booth & Associates, Inc.

Existing and proposed electric facilities are owned by Blue Ridge EMC, Lenoir, North Carolina.

NO.	REVISIONS	DATE
1	ISSUE FOR CONSTRUCTION REVISED	01/31/11
2	ISSUE FOR CONSTRUCTION REVISED W/LIGHTING	03/25/11
3	ISSUE FOR CONSTRUCTION REVISED	09/19/11

DUCTBANK DETAIL SCHEDULE

SECTION TYPE	STATION FROM	STATION TO
A1	530+31 (PJE#12)	532+91 (TV#6)
A3	523+38 (PJE#14)	524+70 (PT#8)
A4	524+70 (PT#8)	526+78 (PME#7)
A4	532+91 (TV#6)	534+66 (PJE#10)
A9	532+28 (PME#6)	RD CROSSING (EX-TV)
A11	EX-TV	2-05-11-221
B1	527+04 (TV#7)	530+31 (PJE#12)
B1	534+66 (PJE#10)	537+00
B4	526+78 (PME#7)	527+04 (TV#7)
B5	523+00	523+38 (PJE#14)
C3	526+78 (PME#7)	RD CROSSING (PJE#13)
C5	534+66 (PJE#10)	RD CROSSING (PJE#11)
J1	SL#234	SL#235
J1	SL#230	SL#321
J2	532+91 (TV#6)	RD CROSSING (EX-TV)

VAULT & EQUIPMENT SCHEDULE

ELECTRIC POWER UTILITY (Rev. 1, 2)

ID	STATION -L-	OFFSET (-R/L)	TYPE
PJE#11	535+07	53'-L	3PH, 200A
PJE#10	534+66	51'-R	3PH, 200A
PME#6	532+28	51'-R	PME - 10
FV#5	532+16	50'-R	30"x48"x36"
F#2A	532+22	154'-R	24"x36"x24"
FV#6	532+40	256'-L	30"x48"x36"
PJE#12	530+31	51'-R	3PH, 200A
PME#7	526+78	61'-R	PME - 9
FV#7	526+61	61'-R	30"x48"x36"
PJE#13	526+58	56'-L	3PH, 200A
F#3	526+54	51'-L	24"x36"x24"
PT#7	526+62	69'-L	(BY BREMC)
PT#8	524+70	58'-R	(BY BREMC)
PJE#14	523+38	59'-R	3PH, 200A
SEC. PED.	527+34	149'-L	(BY BREMC)
SL#31	536+86	37'-R	13"x24"x18"
SL#32	535+89	37'-R	13"x24"x18"
SL#33	534+91	37'-R	13"x24"x18"
SL#34	533+81	48'-R	13"x24"x18"
SL#35	532+95	47'-R	13"x24"x18"
SL#36	531+99	47'-R	13"x24"x18"
SL#37	531+15	47'-R	13"x24"x18"
SL#38	530+23	47'-R	13"x24"x18"
SL#39	529+31	47'-R	13"x24"x18"
SL#40	528+38	47'-R	13"x24"x18"
SL#41	527+48	47'-R	13"x24"x18"
SL#42	526+56	47'-R	13"x24"x18"
SL#43	525+66	47'-R	13"x24"x18"
SL#44	524+76	47'-R	13"x24"x18"
SL#45	523+82	47'-R	13"x24"x18"
SL#46	524+22	47'-R	13"x24"x18"
SL#230	536+19	49'-L	13"x24"x18"
SL#231	535+21	54'-L	13"x24"x18"
SL#232	534+66	48'-L	13"x24"x18"
SL#233	533+85	48'-L	13"x24"x18"

CONDUIT SCHEDULES

ELECTRIC POWER (E.P.) (REV. 2) * INSTALLATION BY BLUE RIDGE EMC

FROM	TO	QTY.	SIZE	TYPE	FROM	TO	QTY.	SIZE	TYPE
PME#6	2-05-11-221	4	4"	EP1	PJE#13 *	2-05-07-232	3	4"	
PME#6	PME#7	4	4"	EP1	PT#7 *	SEC. PED. 1	2	4"	
PME#7	PME#8	4	4"	EP1	PT#8	PJE#14	2	4"	EP2
PJE#10	P-17-1-1	2	4"		PJE#14	EX.-PT	4	4"	
PJE#10	PJE#11	4	4"	EP2	PJE#14	PME#8	4	4"	EP2
PJE#11 *	P-17-2-1	3	4"						
PME#6 *	P-17-3-1	4	3"	EP1					
PJE#12	PME#7	4	4"	EP2					
PME#7	PJE#13	4	4"	EP2					
PJE#13	PT#7	2	4"						

ELECTRIC FIBER OPTICS (E.F.)

FROM	TO	QTY.	SIZE
FV#5	FV#6	2	4"
FV#5	FV#7	2	4"
FV#5	F#2A	2	2"
FV#7	F#3	2	2"
FV#7	FV#8	2	4"

TELEPHONE (TEL.)

FROM	TO	QTY.	SIZE	FROM	TO	QTY.	SIZE
TV#6	T#8	2	4"	TV#7	T#12	2	4"
TV#6	T#10	2	4"	T#12	T#13	2	4"
T#10	T#9	2	4"	TV#7	T#14	2	4"
T#9	P-17-2-1	2	4"				
TV#6	EX-TV	9	4"				
EX-TV	2-05-11-221	2	4"				
TV#6	TV#7	6	4"				
TV#7	T#11	2	4"				
T#11	2-05-07-232	2	4"				
TV#7	TV#8	6	4"				

CABLE TELEVISION (CATV)

FROM	TO	QTY.	SIZE	FROM	TO	QTY.	SIZE
CV#8	CV#9	2	4"	C#14	C#16	1	4"
CV#8	CV#10	2	4"	C#16	P-17-3-1	1	4"
CV#8	C#16	1	4"	C#16	2-05-11-221	2	4"
CV#8	CV#11	2	4"	C#16	C#17	1	4"
CV#11	C#18	1	4"	C#17	C#18	1	4"
CV#11	CV#12	2	4"	C#18	C#19	2	4"
CV#12	CV#13	2	4"	C#18	C#20	1	4"
CV#12	C#21	1	4"	C#20	C#21	1	4"
C#14	C#12	2	4"	C#21	C#22	1	4"
C#14	C#15	2	4"				

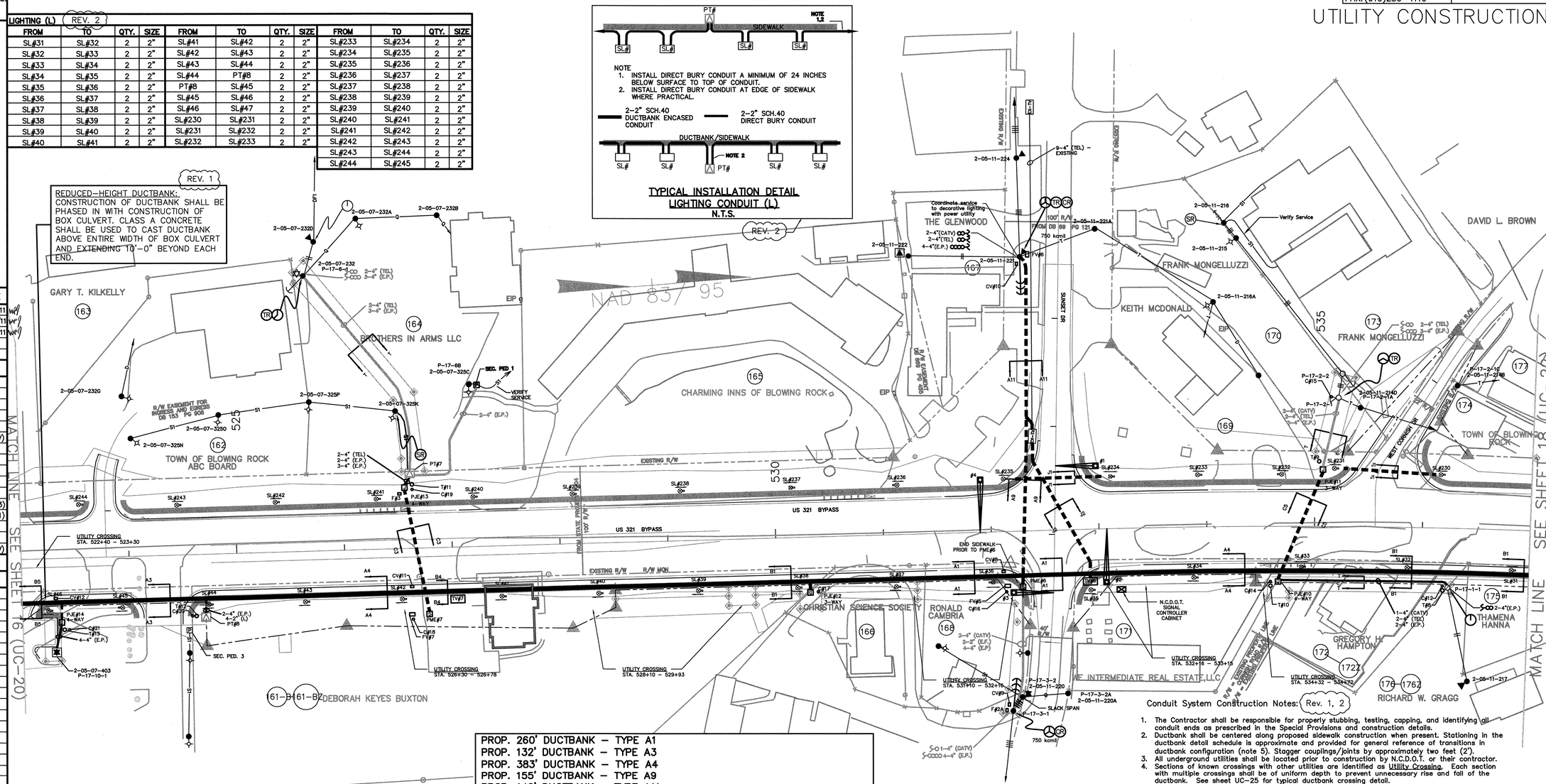
LIGHTING (L) (REV. 2)

FROM	TO	QTY.	SIZE	FROM	TO	QTY.	SIZE	FROM	TO	QTY.	SIZE
SL#31	SL#32	2	2"	SL#41	SL#42	2	2"	SL#233	SL#234	2	2"
SL#32	SL#33	2	2"	SL#42	SL#43	2	2"	SL#234	SL#235	2	2"
SL#33	SL#34	2	2"	SL#43	SL#44	2	2"	SL#235	SL#236	2	2"
SL#34	SL#35	2	2"	SL#44	PT#8	2	2"	SL#236	SL#237	2	2"
SL#35	SL#36	2	2"	PT#8	SL#45	2	2"	SL#237	SL#238	2	2"
SL#36	SL#37	2	2"	SL#45	SL#46	2	2"	SL#238	SL#239	2	2"
SL#37	SL#38	2	2"	SL#46	SL#47	2	2"	SL#239	SL#240	2	2"
SL#38	SL#39	2	2"	SL#230	SL#231	2	2"	SL#240	SL#241	2	2"
SL#39	SL#40	2	2"	SL#231	SL#232	2	2"	SL#241	SL#242	2	2"
SL#40	SL#41	2	2"	SL#232	SL#233	2	2"	SL#242	SL#243	2	2"
								SL#243	SL#244	2	2"
								SL#244	SL#245	2	2"

TYPICAL INSTALLATION DETAIL
LIGHTING CONDUIT (L)
N.T.S.

PROJECT REFERENCE NO.	SHEET NO.
R-2237C	UC-21
DESIGNED BY: WPJ	
DRAWN BY: BDE/GQJ	
CHECKED BY: JBW	
APPROVED BY: WPJ/JBW	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE: (919)250-4128 FAX: (919)250-4119	UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION



VAULT & EQUIPMENT SCHEDULE (CONTINUED)

ELECTRIC POWER UTILITY (CONT.) (Rev. 1, 2)

ID	STATION -L-	OFFSET (-R/L)	TYPE
SL#234	533+14	48'-L	13"x24"x18"
SL#235	532+16	49'-L	13"x24"x18"
SL#236	531+10	48'-L	13"x24"x18"
SL#237	530+08	46'-L	13"x24"x18"
SL#238	529+14	46'-L	13"x24"x18"
SL#239	528+14	46'-L	13"x24"x18"
SL#240	527+23	46'-L	13"x24"x18"
SL#241	526+34	46'-L	13"x24"x18"
SL#242	525+40	46'-L	13"x24"x18"
SL#243	524+48	46'-L	13"x24"x18"
SL#244	523+58	49'-L	13"x24"x18"

TELEPHONE UTILITY

ID	STATION -L-	OFFSET (-R/L)	TYPE
TV#6	532+91	48'-R	6'x12'x7'
TV#7	527+04	48'-R	6'x12'x7'

CABLE TELEVISION UTILITY (REV. 1)

ID	STATION -L-	OFFSET (-R/L)	TYPE
CV#8	532+11	37'-R	24"x36"x24"
CV#9	532+12	160'-R	24"x36"x24"
CV#10	532+32	247'-L	24"x36"x24"
CV#11	526+62	36'-R	24"x36"x24"
CV#12	523+32	37'-R	24"x36"x24"

PROP. 260' DUCTBANK - TYPE A1
PROP. 132' DUCTBANK - TYPE A3
PROP. 383' DUCTBANK - TYPE A4
PROP. 155' DUCTBANK - TYPE A9
PROP. 146' DUCTBANK - TYPE A11
PROP. 561' DUCTBANK - TYPE B1
PROP. 26' DUCTBANK - TYPE B4
PROP. 38' DUCTBANK - TYPE B5
PROP. 114' DUCTBANK - TYPE C3
PROP. 107' DUCTBANK - TYPE C5
PROP. 166' DUCTBANK - TYPE J1 (REV. 2)
PROP. 139' DUCTBANK - TYPE J2
PROP. 1,478' DIRECT BURY CONDUIT/TRENCH (REV. 2)
PROP. 1 (ONE) BOX PAD - PME TYPE 9
PROP. 1 (ONE) BOX PAD - PME TYPE 10
PROP. 5 (FIVE) BOX PAD - PJE TYPE 3-PH, 200A
PROP. 3 (THREE) ELECTRIC F.O. VAULT (FV) - TYPE 30"x48"x36"
PROP. 2 (TWO) ELECTRIC F.O. HANDHOLE (F) - TYPE 24"X36"X24"
PROP. 2 (TWO) TELEPHONE VAULT (TV) - TYPE 6'x12'x7'
PROP. 5 (FIVE) CABLE TV VAULT (CV) - TYPE 24'x36'x24"
PROP. 31 (THIRTY-ONE) STREET LIGHT HANDHOLE (SL) - TYPE 13"x24"x18" (REV. 2)

Conduit System Construction Notes: (Rev. 1, 2)

1. The Contractor shall be responsible for properly stubbing, testing, capping, and identifying all conduit ends as prescribed in the Special Provisions and construction details.
2. Ductbank shall be centered along proposed sidewalk construction when present. Stationing in the ductbank detail schedule is approximate and provided for general reference of transitions in ductbank configuration (note 5). Stagger couplings/joints by approximately two feet (2').
3. All underground utilities shall be located prior to construction by N.C.D.O.T. or their contractor.
4. Sections of known crossings with other utilities are identified as Utility Crossing. Each section with multiple crossings shall be of uniform depth to prevent unnecessary rise and fall of the ductbank. See sheet UC-25 for typical ductbank crossing detail.
5. The Contractor shall be responsible for carefully completing all transitions between ductbank configurations. Transition areas shall be minimal, generally within forty feet (40'), and span equally each side of common station point. Gradual changes in elevation and direction due to controlled longitudinal bending of conduit shall not exceed twelve inches (12") every ten feet (10') without prior engineer approval.
6. Pad-mounted equipment, pedestals, and other aboveground enclosures shall keep a minimum of four feet (4') clearance from fire hydrants.
7. The sum of all bends/sweeps/gradual changes in individual conduit shall not exceed 270° between exposed ends without prior engineer approval. Manufactured sweeps/elbows shall have a radius of no less than forty-eight inches (48").
8. All pad-mounted equipment (PME's, PJE's and PT's) shall maintain a minimum of 12'-0" separation off face of access door(s) from other above ground equipment or obstacles. See UC-25 for typical installation details.
9. Conduit system work by Blue Ridge EMC shown grey-lined.
10. Roadway intersection and Pedestrian Lighting Design and Layout subject to N.C.D.O.T approval. Installation of light poles & fixture by Blue Ridge EMC. Contractor to install lighting conduit and handholes. If necessary to place handhole in any portion of sidewalk, install center of sidewalk only.
11. All permanent utility easements (PUEs) are subject to acceptance and acquisition by N.C.D.O.T.

SCALE: 1" = 50'

25 0 50 100 150 200

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R2237C_RDY_PSH17

Booth & Associates, Inc.
1011 Schaub Drive | Raleigh, NC 27606 CONSULTING ENGINEERS NC F-0221

NORTH CAROLINA PROFESSIONAL SEAL 035029 ENGINEER WILLIAM P. JORDAN
09-23-2011 P.E.
ELECTRIC UTILITY ENGINEER
Certifies engineering herein for:
- 15kv Underground Distribution System
- Joint-use Conduit System

NORTH CAROLINA PROFESSIONAL SEAL 032620 ENGINEER BONI BUXTON WILLIAMS
9-23-2011 P.E.
ELECTRIC UTILITY ENGINEER
Certifies engineering herein for:
- Roadway Intersection and Pedestrian Lighting (See Note 10.)
- 100 kV Underground Transmission System

Electric Utility General Notes:

Danger!! All lines are to be considered energized unless grounded in accordance with owner's or contractor's safety regulations and procedures, whichever is more stringent.

Location of electrical lines are approximate and are intended for geographic reference only.

Base Roadway Design Plans provided to Booth & Associates, Inc. by the Division of Highways, North Carolina Department of Transportation (N.C.D.O.T.) for project R-2237C. "Current as of March 11. 2011."

Telephone and CATV facilities (existing and proposed) located and provided to Booth & Associates, Inc. by their respective owners for Project R-2237C.

Electric facilities, both existing and proposed, have been added by Booth & Associates, Inc., Consulting Engineers, Raleigh, North Carolina.

Engineering provided by Booth & Associates, Inc. covers only that work pertaining to the Electric Utility and Joint-use Conduit System Construction as shown on these plans and covered by the Project Special Provisions.

All other work shown is by others.

Engineer of record covers only work provided by Booth & Associates, Inc.

Existing and proposed electric facilities are owned by Blue Ridge EMC, Lenoir, North Carolina.

NO.	REVISIONS	DATE
1	ISSUE FOR CONSTRUCTION REVISED	01/31/11
2	ISSUE FOR CONSTRUCTION REVISED W/LIGHTING	03/25/11
3	ISSUE FOR CONSTRUCTION REVISED	09/19/11

DUCTBANK DETAIL SCHEDULE (REV. 3)

SECTION TYPE	STATION FROM	STATION TO
A1	540+48 (PME#4)	546+43 (TV#4)
A10	546+43 (TV#4)	547+43 (UVE#3)
B1	537+00	539+75 (PJE#8)
B1	539+98 (TV#5)	540+48 (PME#4)
B1	547+67 (PJE#6)	548+00
B2	539+75 (PJE#8)	539+98 (TV#5)
C7	547+67 (PJE#6)	RD CROSSING (PJE#9)
D1	539+75 (PJE#8)	RD CROSSING (PT#4)
E1	548+00	550+00
E7	547+43 (UVE#3)	AS SHOWN
J3	547+43 (UVE#3)	547+67 (PJE#6)

VAULT & EQUIPMENT SCHEDULE

ELECTRIC POWER UTILITY (Rev. 1, 2)

ID	STATION –L–	OFFSET (–R/L)	TYPE
UVE#2	547+57	80'–R	8' x 18'
PME#3	547+72	62'–R	PME – 11
PJE#6	547+67	54'–R	3PH, 600A
PJE#9	547+52	50'–L	3PH, 600A
UVE#3	547+43	62'–R	6' x 8'
FV#3	547+44	73'–R	30"x48"x36"
PME#3A	546+71	65'–R	PME – 9
PT#3	542+59	70'–R	(BY BREMC)
PME#4	540+48	51'–R	PME – 9
PJE#7	542+70	68'–R	3PH, 200A
PJE#8	539+75	51'–R	3PH, 200A
PT#4	539+75	50'–L	(BY BREMC)
FV#4	539+65	52'–R	30"x48"x36"
PT#6	537+19	82'–L	(BY BREMC)
SL#17	549+99	37'–R	13"x24"x18"
SL#18	540+22	37'–R	13"x24"x18"
SL#19	548+44	37'–R	13"x24"x18"
SL#20	547+54	54'–R	13"x24"x18"
SL#21	546+50	46'–R	13"x24"x18"
SL#22	545+50	46'–R	13"x24"x18"
SL#23	544+57	47'–R	13"x24"x18"
SL#24	543+57	46'–R	13"x24"x18"
SL#25	542+57	37'–R	13"x24"x18"
SL#26	541+57	37'–R	13"x24"x18"
SL#27	540+52	46'–R	13"x24"x18"
SL#28	539+82	46'–R	13"x24"x18"
SL#29	538+84	37'–R	13"x24"x18"
SL#30	537+85	37'–R	13"x24"x18"
SL#216	549+63	45'–L	13"x24"x18"
SL#217	548+65	45'–L	13"x24"x18"
SL#218	547+61	48'–L	13"x24"x18"
SL#219	546+72	37'–L	13"x24"x18"
SL#220	545+76	37'–L	13"x24"x18"
SL#221	544+84	37'–L	13"x24"x18"
SL#222	543+88	37'–L	13"x24"x18"
SL#223	542+97	37'–L	13"x24"x18"
SL#224	542+00	37'–L	13"x24"x18"

VAULT & EQUIPMENT SCHEDULE (CONTINUED)

ELECTRIC POWER UTILITY (CONT.)

ID	STATION –L–	OFFSET (–R/L)	TYPE
SL#225	541+04	37'–L	13"x24"x18"
SL#226	540+07	37'–L	13"x24"x18"
SL#227	539+03	47'–L	13"x24"x18"
SL#228	538+13	47'–L	13"x24"x18"
SL#229	537+18	48'–L	13"x24"x18"

TELEPHONE UTILITY

ID	STATION –L–	OFFSET (–R/L)	TYPE
TV#4	546+43	48'–R	6'x12'x7'
TV#5	539+98	49'–R	6'x12'x7'

CABLE TELEVISION UTILITY

ID	STATION –L–	OFFSET (–R/L)	TYPE
CV#6	547+62	37'–R	24'x36"x24"
CV#7	540+66	36'–R	24'x36"x24"

PROP. 595' DUCTBANK – TYPE A1
PROP. 100' DUCTBANK – TYPE A10 (REV. 2)
PROP. 358' DUCTBANK – TYPE B1 (REV. 2)
PROP. 23' DUCTBANK – TYPE B2
PROP. 110' DUCTBANK – TYPE C7
PROP. 96' DUCTBANK – TYPE D1
PROP. 200' DUCTBANK – TYPE E1 (REV. 2)
PROP. 86' DUCTBANK – TYPE E7
PROP. 24' DUCTBANK – TYPE J3
PROP. 2,200' DIRECT BURY CONDUIT/TRENCH (REV. 1, 2)
PROP. 1 (ONE) ELECTRIC VAULT (UVE) – TYPE 8'X18'X6'–6"
PROP. 1 (ONE) ELECTRIC VAULT (UVE) – TYPE 6'X8'X6'–6"
PROP. 2 (TWO) BOX PAD – PME TYPE 9
PROP. 1 (ONE) BOX PAD – PME TYPE 11
PROP. 2 (TWO) BOX PAD – PJE TYPE 3–PH, 600A (REV. 1)
PROP. 2 (TWO) BOX PAD – PJE TYPE 3–PH, 200A
PROP. 2 (TWO) ELECTRIC F. O. VAULT (FV) – TYPE 30"x48"x36"
PROP. 2 (TWO) TELEPHONE VAULT (TV) – TYPE 6'x12'x7'
PROP. 2 (TWO) CABLE TV VAULT (CV) – TYPE 24"x36"x24"
PROP. 28 (TWENTY–EIGHT) STREET LIGHT HANDHOLE (SL) – TYPE 13"x24"x18" (REV. 2)

CONDUIT SCHEDULES

ELECTRIC POWER (E.P.) NOTE: THERE IS NO PME#5 OR PT#5. (REV. 3)

FROM	TO	QTY.	SIZE	TYPE	FROM	TO	QTY.	SIZE	TYPE
UVE#2	NEW SUB.	4	6"	TEP	PJE#7	PT#3	2	4"	
PJE#6	PJE#9	4	4"	EP1 (20–2)	PME#4	PJE#8	4	4"	EP2
PJE#6	UVE#3	4	4"	EP1 (20–2)	PJE#8	PT#4	2	4"	EP2
PME#3	UVE#3	4	4"	EP1 (20–1)	PT#4	PT#6	2	4"	
UVE#3	PME#3A	4	4"	EP1 (20–1)	PJE#8	PJE#10	4	4"	EP2
PME#3A	PME#4	4	4"	EP1	UVE#3	NEW SUB.	16	4"	EP1
PME#4	PME#6	4	4"	EP1	UVE#3	PJE#9	4	4"	EP1 (CKT 3)
PME#3	PJE#5A	4	4"	(20–1)	PJE#9	P–18–2	4	4"	
PME#3A	2–05–11–178	2	4"	(20–1)					
PME#4	PJE#7	4	4"	EP2					

ELECTRIC FIBER OPTICS (E.F.)

FROM	TO	QTY.	SIZE
FV#3	NEW SUB.	2	4"
FV#3	P–18–2	2	4"
FV#3	FV#4	2	4"
FV#4	FV#5	2	4"

TELEPHONE (TEL.)

FROM	TO	QTY.	SIZE
TV#4	T#5	2	4"
T#5	T#4	2	4"
TV#4	P–18–2	4	4"
TV#5	T#6	2	4"
TV#5	T#7	2	4"
TV#5	TV#6	6	4"
T#7	P–18–6	2	4"
T#7	T#7A	2	4"

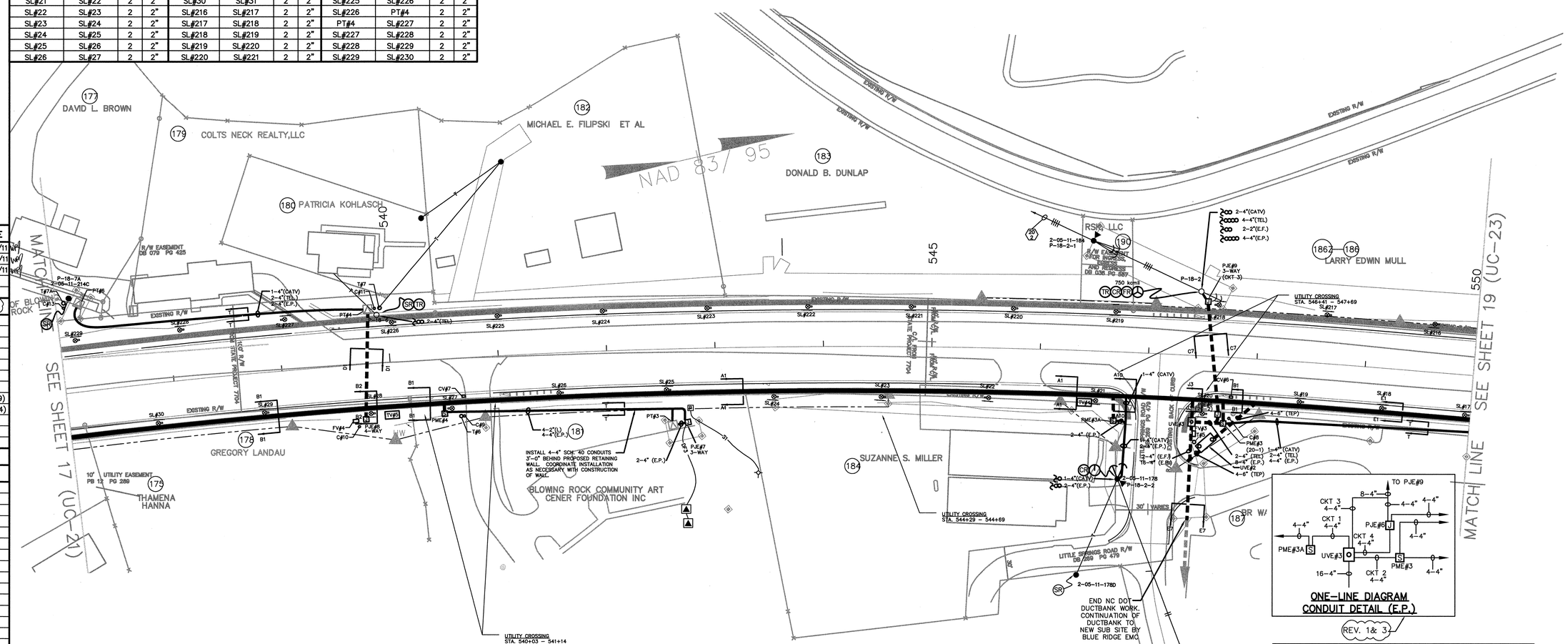
CABLE TELEVISION (CATV)

FROM	TO	QTY.	SIZE	FROM	TO	QTY.	SIZE
C#8	C#7	1	4"	C#10	C#14	1	4"
CV#6	P–18–2	2	4"				
CV#6	C#8	2	4"				
CV#6	CV#7	2	4"				
CV#7	CV#8	2	4"				
C#8	2–05–11–178	1	4"				
C#8	C#9	1	4"				
C#9	C#10	1	4"				
C#10	C#11	2	4"				
C#11	C#13	1	4"				

NOTE: THERE IS NO C#12.

LIGHTING (L) (REV. 2)

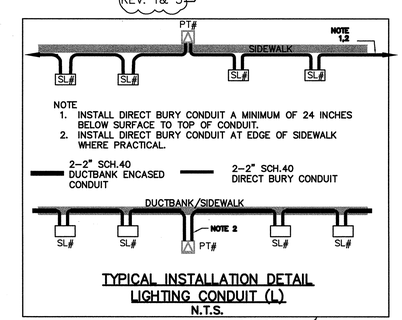
FROM	TO	QTY.	SIZE	FROM	TO	QTY.	SIZE	FROM	TO	QTY.	SIZE
SL#17	SL#18	2	2"	SL#27	PT#3	2	2"	SL#221	SL#222	2	2"
SL#18	SL#19	2	2"	PT#3	SL#28	2	2"	SL#222	SL#223	2	2"
SL#19	SL#20	2	2"	SL#28	SL#29	2	2"	SL#223	SL#224	2	2"
SL#20	SL#21	2	2"	SL#29	SL#30	2	2"	SL#224	SL#225	2	2"
SL#21	SL#22	2	2"	SL#30	SL#31	2	2"	SL#225	SL#226	2	2"
SL#22	SL#23	2	2"	SL#216	SL#217	2	2"	SL#226	PT#4	2	2"
SL#23	SL#24	2	2"	SL#217	SL#218	2	2"	PT#4	SL#227	2	2"
SL#24	SL#25	2	2"	SL#218	SL#219	2	2"	SL#227	SL#228	2	2"
SL#25	SL#26	2	2"	SL#219	SL#220	2	2"	SL#228	SL#229	2	2"
SL#26	SL#27	2	2"	SL#220	SL#221	2	2"	SL#229	SL#230	2	2"



Conduit System Construction Notes: (Rev. 1, 2)

1. The Contractor shall be responsible for properly stubbing, testing, capping, and identifying all conduit ends as prescribed in the Special Provisions and construction details.
2. Ductbank shall be centered along proposed sidewalk construction when present. Stationing in the ductbank detail schedule is approximate and provided for general reference of transitions in ductbank configuration (note 5). Stagger couplings/joints by approximately two feet (2').
3. All underground utilities shall be located prior to construction by N.C.D.O.T. or their contractor.
4. Sections of known crossings with other utilities are identified as Utility Crossing. Each section with multiple crossings shall be of uniform depth to prevent unnecessary rise and fall of the ductbank. See sheet UC–25 for typical ductbank crossing detail.
5. The Contractor shall be responsible for carefully completing all transitions between ductbank configurations. Transition areas shall be minimal, generally within forty feet (40'), and span equally each side of common station point. Gradual changes in elevation and direction due to controlled longitudinal bending of conduit shall not exceed twelve inches (12") every ten feet (10') without prior engineer approval.
6. Pad–mounted equipment, pedestals, and other aboveground enclosures shall keep a minimum of four feet (4') clearance from fire hydrants.
7. The sum of all bends/sweeps/gradual changes in individual conduit shall not exceed 270° between exposed ends without prior engineer approval. Manufactured sweeps/elbows shall have a radius of no less than sixty inches (60") on electric power transmission conduits and forty–eight (48") on all other conduits.
8. All pad–mounted equipment (PME's, PJE's and PT's) shall maintain a minimum of 12'–0" separation off face of access door(s) from other above ground equipment or obstacles. See UC–25 for typical installation details.
9. Conduit system work by Blue Ridge EMC shown grey–lined.
10. Roadway Intersection and Pedestrian Lighting Design and Layout subject to N.C.D.O.T approval. Installation of light poles & fixture by Blue Ridge EMC. Contractor to install lighting conduit and handholes. If necessary to place handhole in any portion of sidewalk, install center of sidewalk only.
11. All permanent utility easements (PUEs) are subject to acceptance and acquisition by N.C.D.O.T.

ONE–LINE DIAGRAM CONDUIT DETAIL (E.P.) (REV. 1& 3)



TYPICAL INSTALLATION DETAIL LIGHTING CONDUIT (L) N.T.S.

SCALE: 1" = 50' (REV. 2)

25 0 50 100 150 200

PROJECT REFERENCE NO.	SHEET NO.
R–2237C	UC–22
DESIGNED BY: WPJ	
DRAWN BY: BDE/GQJ	
CHECKED BY: JBW	
APPROVED BY: WPJ/JBW	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE: (919)250–4128 FAX: (919)250–4119	UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION

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R2237C_RDY_PSH18

Booth&Associates, Inc.
1011 Schaub Drive | Raleigh, NC 27606 CONSULTING ENGINEERS NC F-0221

NORTH CAROLINA PROFESSIONAL SEAL 035029 ENGINEER WILLIAM P. JORDAN
09-23-2011 P.E.
ELECTRIC UTILITY ENGINEER
Certifies engineering herein for:
- 15kv Underground Distribution System
- Joint-use Conduit System

NORTH CAROLINA PROFESSIONAL SEAL 032220 ENGINEER JOHN BURTON WILLIAMS
9-23-11 P.E.
ELECTRIC UTILITY ENGINEER
Certifies engineering herein for:
- Roadway Intersection and Pedestrian Lighting (See Note 10.)
- 100 kV Underground Transmission System

Electric Utility General Notes:

Danger!! All lines are to be considered energized unless grounded in accordance with owner's or contractor's safety regulations and procedures, whichever is more stringent.

Location of electrical lines are approximate and are intended for geographic reference only.

Base Roadway Design Plans provided to Booth & Associates, Inc. by the Division of Highways, North Carolina Department of Transportation (N.C.D.O.T.) for project R-2237C. "Current as of March 11, 2011."

Telephone and CATV facilities (existing and proposed) located and provided to Booth & Associates, Inc. by their respective owners for Project R-2237C.

Electric facilities, both existing and proposed, have been added by Booth & Associates, Inc., Consulting Engineers, Raleigh, North Carolina.

Engineering provided by Booth & Associates, Inc. covers only that work pertaining to the Electric Utility and Joint-use Conduit System Construction as shown on these plans and covered by the Project Special Provisions.

All other work shown is by others.

Engineer of record covers only work provided by Booth & Associates, Inc.

Existing and proposed electric facilities are owned by Blue Ridge EMC, Lenoir, North Carolina.

NO.	REVISIONS	DATE	
1	ISSUE FOR CONSTRUCTION REVISED	01/31/11	WPJ
2	ISSUE FOR CONSTRUCTION REVISED W/LIGHTING	03/25/11	WPJ
3	ISSUE FOR CONSTRUCTION REVISED	09/19/11	WPJ

DUCTBANK DETAIL SCHEDULE

SECTION TYPE	STATION FROM	STATION TO
C6	556+85	RD CROSSING (PJE#3A)
D1	561+87 (PT#1)	RD CROSSING (PED.2)
E1	550+00	554+27 (PME#2)
E2	556+85	561+75 (PJE#2)
E5	554+70 (TV#3)	556+85
E6	561+75 (PJE#2)	562+00
E8	554+27 (PME#2)	554+70 (TV#3)
J1	553+85	SL#213
J1	560+40	SL#205

VAULT & EQUIPMENT SCHEDULE

ELECTRIC POWER UTILITY (REV. 2)

ID	STATION -L-	OFFSET (-R/L)	TYPE
PT#1	561+87	53'-R	(BY BREMC)
SEC. PED.	561+92	77'-L	(BY BREMC)
PJE#2	561+75	51'-R	3PH, 200A
PT#1A	559+18	50'-L	(BY BREMC)
PT#2	557+54	82'-R	(BY BREMC)
PJE#3A	556+85	56'-L	3PH, 200A
PME#2	554+27	51'-R	PME - 9
PJE#3	554+17	58'-R	3PH, 200A
FV#2	554+11	50'-R	30"x48"x36"
PJE#4	553+57	51'-R	3PH, 600A
PJE#5	552+38	147'-R	(BY BREMC)
F#2	557+39	74'-R	24'x36"x24"
PJE#5A	550+88	57'-R	3PH, 200A
SL#4	561+95	46'-R	13"x24"x18"
SL#5	561+05	47'-R	13"x24"x18"
SL#6	560+20	47'-R	13"x24"x18"
SL#7	559+21	38'-R	13"x24"x18"
SL#8	558+23	37'-R	13"x24"x18"
SL#9	557+25	37'-R	13"x24"x18"
SL#10	556+30	37'-R	13"x24"x18"
SL#11	555+34	37'-R	13"x24"x18"
SL#12	554+40	47'-R	13"x24"x18"
SL#13	553+44	47'-R	13"x24"x18"
SL#14	552+54	47'-R	13"x24"x18"
SL#15	551+65	37'-R	13"x24"x18"
SL#16	550+75	37'-R	13"x24"x18"
SL#203	561+76	37'-L	13"x24"x18"
SL#204	560+86	37'-L	13"x24"x18"
SL#205	559+81	47'-L	13"x24"x18"
SL#206	558+88	47'-L	13"x24"x18"
SL#207	557+99	47'-L	13"x24"x18"
SL#208	557+06	47'-L	13"x24"x18"
SL#209	556+16	44'-L	13"x24"x18"
SL#210	555+08	49'-L	13"x24"x18"
SL#211	554+11	49'-L	13"x24"x18"
SL#212	553+47	91'-L	13"x24"x18"
SL#213	552+55	52'-L	13"x24"x18"
SL#214	551+57	44'-L	13"x24"x18"
SL#215	550+58	45'-L	13"x24"x18"

VAULT & EQUIPMENT SCHEDULE (CONTINUED)

TELEPHONE UTILITY

ID	STATION -L-	OFFSET (-R/L)	TYPE
TV#3	554+70	48'-R	6'x12'x7'

CABLE TELEVISION UTILITY

ID	STATION -L-	OFFSET (-R/L)	TYPE
CV#4	554+11	36'-R	24'x36"x24"
CV#5	554+09	91'-L	24'x36"x24"

CONDUIT SCHEDULES

ELECTRIC POWER (E.P.) * INSTALLATION BY BLUE RIDGE EMC

FROM	TO	QTY.	SIZE	TYPE
PJE#4	PJE#6	4	4"	EP1 (20-2)
PME#2	PME#3	4	4"	EP1 (20-1)
PT#1	SEC. PED.	2	4"	
PT#1	PJE#2	2	4"	
PT#1 *	P-19-1	1	4"	
PJE#2	PJE#3A	4	4"	EP2 (20-1)
PME#2	PJE#3	4	4"	EP2 (20-1)
PJE#3 *	PT#2	3	4"	(20-1)
PT#2 *	2-05-11-154C	1	2"	-
PT#2 *	2-05-11-144	3	4"	(20-1)
PJE#3A	PME#2	4	4"	EP2 (20-1)
PJE#5A *	PJE#5	4	4"	

ELECTRIC FIBER OPTICS (E.F.)

FROM	TO	QTY.	SIZE
FV#2	F#2	2	2"
FV#2	FV#3	2	4"

TELEPHONE (TEL.)

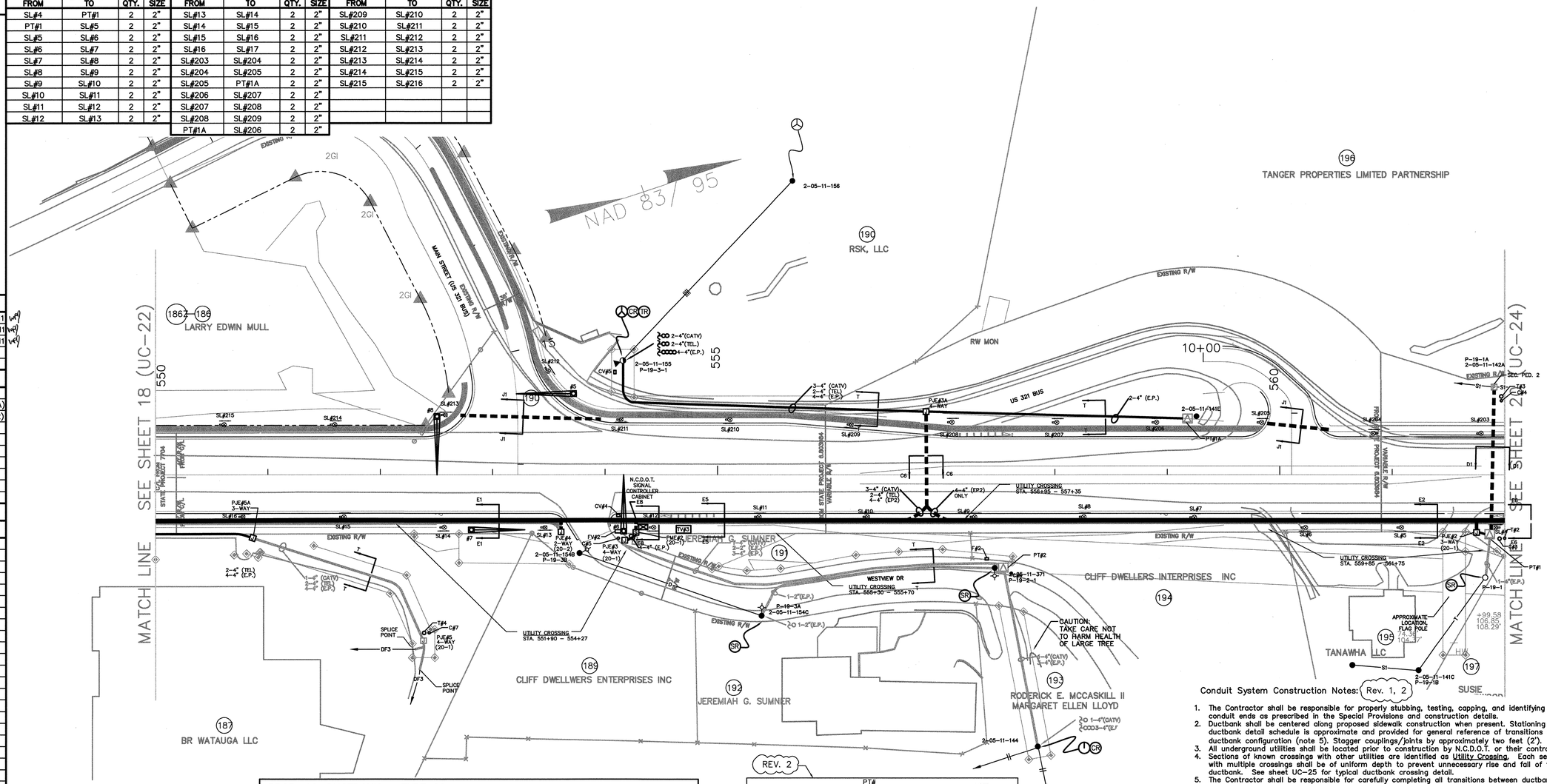
FROM	TO	QTY.	SIZE
TV#3	2-05-11-155	2	4"
TV#3	TV#4	6	4"

CABLE TELEVISION (CATV)

FROM	TO	QTY.	SIZE
C#3	C#4	2	4"
C#3	C#5	1	4"
C#5	C#6	1	4"
C#6	2-05-11-144	1	4"
CV#4	C#5	1	4"
CV#4	CV#5	1	4"
C#5	2-05-11-155	2	4"
CV#4	CV#6	2	4"
C#5	C#8	1	4"

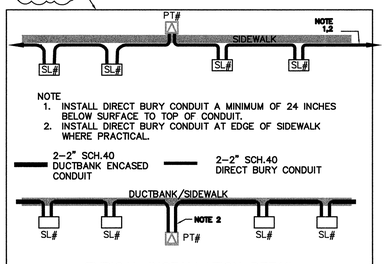
LIGHTING (L) (REV. 2)

FROM	TO	QTY.	SIZE	FROM	TO	QTY.	SIZE	FROM	TO	QTY.	SIZE
SL#4	PT#1	2	2"	SL#13	SL#14	2	2"	SL#209	SL#210	2	2"
PT#1	SL#5	2	2"	SL#14	SL#15	2	2"	SL#210	SL#211	2	2"
SL#5	SL#6	2	2"	SL#15	SL#16	2	2"	SL#211	SL#212	2	2"
SL#6	SL#7	2	2"	SL#16	SL#17	2	2"	SL#212	SL#213	2	2"
SL#7	SL#8	2	2"	SL#203	SL#204	2	2"	SL#213	SL#214	2	2"
SL#8	SL#9	2	2"	SL#204	SL#205	2	2"	SL#214	SL#215	2	2"
SL#9	SL#10	2	2"	SL#205	PT#1A	2	2"	SL#215	SL#216	2	2"
SL#10	SL#11	2	2"	SL#206	SL#207	2	2"				
SL#11	SL#12	2	2"	SL#207	SL#208	2	2"				
SL#12	SL#13	2	2"	SL#208	SL#209	2	2"				
				PT#1A	SL#206	2	2"				



PROP. 90' DUCTBANK - TYPE C6
PROP. 124' DUCTBANK - TYPE D1
PROP. 427' DUCTBANK - TYPE E1
PROP. 490' DUCTBANK - TYPE E2
PROP. 215' DUCTBANK - TYPE E5
PROP. 25' DUCTBANK - TYPE E6
PROP. 43' DUCTBANK - TYPE E8 (REV. 2)
PROP. 180' DUCTBANK - TYPE J1 (REV. 2)
PROP. 1,687' DIRECT BURY CONDUIT/TRENCH (REV. 2)
PROP. 1 (ONE) BOX PAD - PME TYPE 9
PROP. 1 (ONE) BOX PAD - PJE TYPE 3-PH, 600A
PROP. 4 (FOUR) BOX PAD - PJE TYPE 3-PH, 200A
PROP. 1 (ONE) ELECTRIC F.O. VAULT (FV) - TYPE 30"x48"x36"
PROP. 1 (ONE) ELECTRIC F.O. HANDHOLE (F) - TYPE 24"x36"x24"
PROP. 1 (ONE) TELEPHONE VAULT (TV) - TYPE 6'x12'x7'
PROP. 2 (TWO) CABLE TV VAULT (CV) - TYPE 24"x36"x24"
PROP. 26 (TWENTY-SIX) STREET LIGHT HANDHOLE (SL) - TYPE 13"x24"x18" (REV. 2)

(REV. 2)



TYPICAL INSTALLATION DETAIL
LIGHTING CONDUIT (L)
N.T.S.

Conduit System Construction Notes: (Rev. 1, 2)

1. The Contractor shall be responsible for properly stubbing, testing, capping, and identifying all conduit ends as prescribed in the Special Provisions and construction details.
2. Ductbank shall be centered along proposed sidewalk construction when present. Stationing in the ductbank detail schedule is approximate and provided for general reference of transitions in ductbank configuration (note 5). Stagger couplings/joints by approximately two feet (2').
3. All underground utilities shall be located prior to construction by N.C.D.O.T. or their contractor.
4. Sections of known crossings with other utilities are identified as Utility Crossing. Each section with multiple crossings shall be of uniform depth to prevent unnecessary rise and fall of the ductbank. See sheet UC-25 for typical ductbank crossing detail.
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9. Conduit system work by Blue Ridge EMC shown grey-lined.
10. Roadway intersection and Pedestrian Lighting Design and Layout subject to N.C.D.O.T approval. Installation of light poles & fixture by Blue Ridge EMC. Contractor to install lighting conduit and handholes. If necessary to place handhole in any portion of sidewalk, install center of sidewalk only.
11. All permanent utility easements (PUEs) are subject to acceptance and acquisition by N.C.D.O.T.

SCALE: 1" = 50'

25 0 50 100 150 200

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R2237C_RDY_PSH19

PROJECT REFERENCE NO.	SHEET NO.
R-2237C	UC-23
DESIGNED BY: WPJ	
DRAWN BY: BDE/GQJ	
CHECKED BY: JBW	
APPROVED BY: WPJ/JBW	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE: (919)250-4128 FAX: (919)250-4119	UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION

Booth&Associates, Inc.
1011 Schaub Drive | Raleigh, NC 27606 CONSULTING ENGINEERS NC F-0221

NORTH CAROLINA PROFESSIONAL SEAL 13525 ENGINEER WILLIAM P. JORDAN

09-23-2011 P.E.
ELECTRIC UTILITY ENGINEER
Certifies engineering herein for:
- 15kV Underground Distribution System
- Joint-use Conduit System

NORTH CAROLINA PROFESSIONAL SEAL 032826 ENGINEER JOHN BUXTON WILLING

9-23-2011 P.E.
ELECTRIC UTILITY ENGINEER
Certifies engineering herein for:
- Roadway Intersection and Pedestrian Lighting (See Note 10.)
- 100 kV Underground Transmission System

CONDUIT SCHEDULES (REV. 1)

ELECTRIC POWER (E.P.)

FROM	TO	QTY.	SIZE	TYPE
EX SUB.	UVE#1	4	6"	TEP
UVE#1	UVE#2	4	6"	TEP
2-05-11-141	PJE#1	4	4"	EP1(20-2)
PJE#1	PJE#4	4	4"	EP1(20-2)
P-20-1	PME#1	4	4"	EP1(20-1)
PME#1	PME#2	4	4"	EP1(20-1)
PME#1	PJE#0	4	4"	EP2
PJE#0	PT#0	2	4"	

ELECTRIC FIBER OPTICS (E.F.)

FROM	TO	QTY.	SIZE
FV#0	FV#1	2	4"
FV#1	F#1	2	2"
FV#1	FV#2	2	4"

TELEPHONE (TEL.)

FROM	TO	QTY.	SIZE
TV#1	TV#2	6	4"
TV#2	*NW HWY 321	4	4"
TV#2	T#1	2	4"
TV#2	2-05-11-141	4	4"
TV#2	T#2	2	4"
TV#2	T#3	2	4"
TV#2	TV#3	6	4"

CABLE TELEVISION (CATV)

FROM	TO	QTY.	SIZE
CV#1	CV#2	2	4"
CV#2	CV#3	2	4"
CV#2	CV#4	2	4"
C#1	C#2	2	4"
C#2	2-05-11-141	1	4"
C#2	C#3	1	4"
CV#1	C#1	1	4"
CV#2	C#2	1	4"

LIGHTING (L) (REV. 2)

FROM	TO	QTY.	SIZE
SL#1	SL#2	2	2"
SL#2	SL#3	2	2"
SL#3	SL#4	2	2"
SL#200	SL#200A	2	2"
SL#200A	SL#201	2	2"
SL#201	SL#202	2	2"
SL#202	SL#203	2	2"

* NW WHY 321 + POSSUM HOLLOW RD.

PROJECT REFERENCE NO.	SHEET NO.
R-2237C	UC-24
DESIGNED BY: WPJ	
DRAWN BY: BDE/GQJ	
CHECKED BY: JBW	
APPROVED BY: WPJ/JBW	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE: (919)250-4128 FAX: (919)250-4119	UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION

Electric Utility General Notes:

Danger!! All lines are to be considered energized unless grounded in accordance with owner's or contractor's safety regulations and procedures, whichever is more stringent.

Location of electrical lines are approximate and are intended for geographic reference only.

Base Roadway Design Plans provided to Booth & Associates, Inc. by the Division of Highways, North Carolina Department of Transportation (N.C.D.O.T.) for project R-2237C. "Current as of March 11, 2011."

Telephone and CATV facilities (existing and proposed) located and provided to Booth & Associates, Inc. by their respective owners for Project R-2237C.

Electric facilities, both existing and proposed, have been added by Booth & Associates, Inc., Consulting Engineers, Raleigh, North Carolina.

Engineering provided by Booth & Associates, Inc. covers only that work pertaining to the Electric Utility and Joint-use Conduit System Construction as shown on these plans and covered by the Project Special Provisions.

All other work shown is by others.

Engineer of record covers only work provided by Booth & Associates, Inc.

Existing and proposed electric facilities are owned by Blue Ridge EMC, Lenoir, North Carolina.

NO.	REVISIONS	DATE
1	ISSUE FOR CONSTRUCTION REVISED	01/31/11
2	ISSUE FOR CONSTRUCTION REVISED W/LIGHTING	03/25/11
3	ISSUE FOR CONSTRUCTION	09/19/11

DUCTBANK DETAIL SCHEDULE (REV. 1)

SECTION TYPE	STATION FROM	STATION TO
E1**	563+46 (TV#2)	P-20-1
E3*	P-20-1	02-05-11-141
E4*	02-05-11-141	EX SUB
E6	562+00	562+57 (PME#1)
E9	562+57 (PME#1)	563+46 (TV#2)
J1	563+61 (FV#1)	RD CROSSING (F#1)
J1	564+80	SL#201
J3	563+46 (TV#2)	564+78 (CV#1)
J4	565+10	568+76 (TV#1)
J5	565+10	RD CROSSING TIE INTO EX.
J6	564+78 (CV#1)	565+10

** PARTIAL INSTALLATION BY BREMC
* INSTALLATION BY BREMC

VAULT & EQUIPMENT SCHEDULE (Rev. 1, 2)

ELECTRIC POWER UTILITY

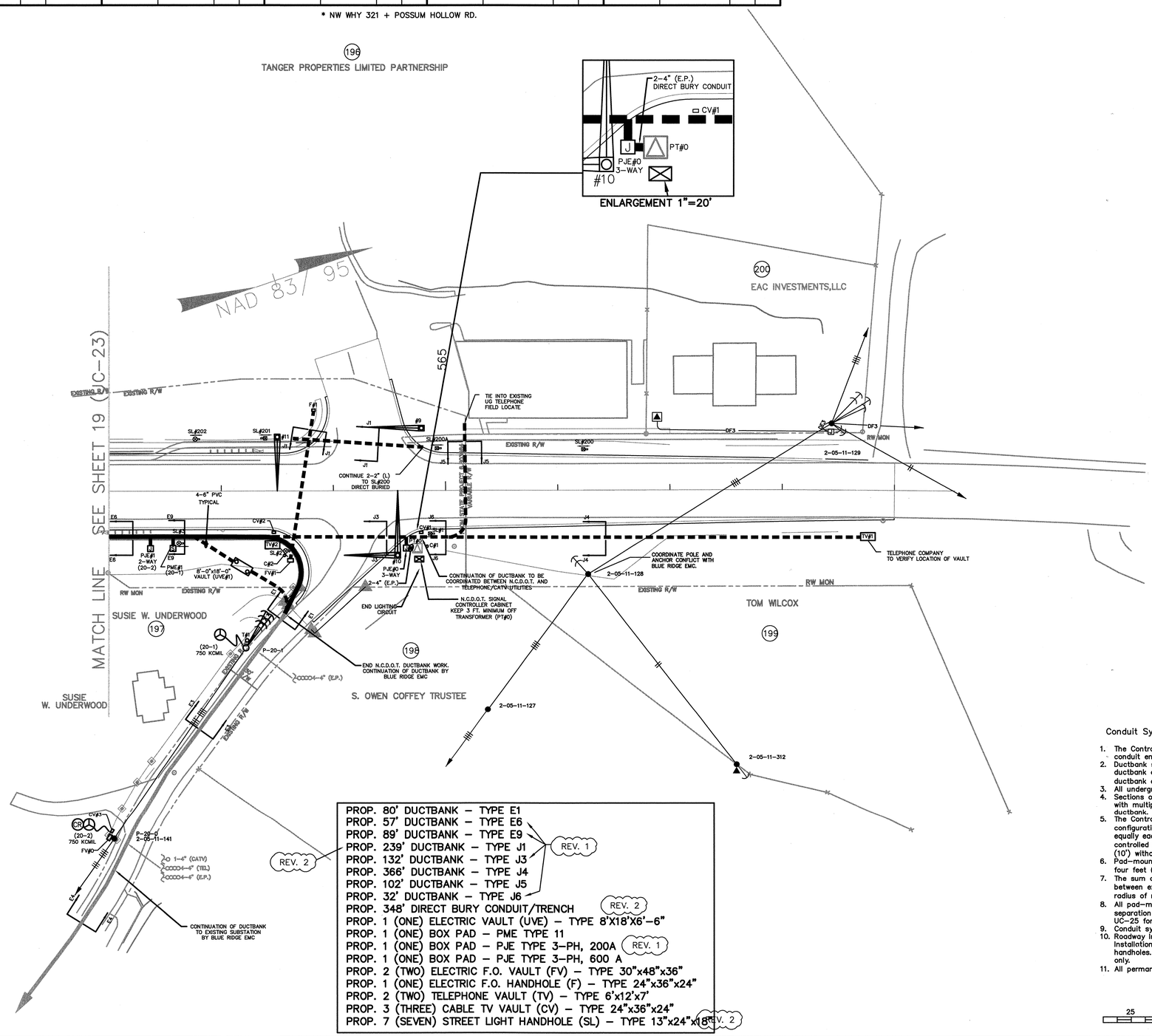
ID	STATION -L-	OFFSET (-R/L)	TYPE
FV#0	561+99	307'-R	30"x48"x36"
FV#1	563+61	61'-R	30"x48"x36"
F#1	563+82	72'-L	24'x36"x24"
UVE#1	563+18	67'-R	8' x 18'
PME#1	562+57	51'-R	PME - 11
PJE#1	562+37	51'-R	3PH, 600A
PJE#0	564+65	51'-R	3PH, 200A
PT#0	564+75	51'-R	(BY BREMC)
SL#1	564+89	38'-R	13"x24"x18"
SL#2	563+60	53'-R	13"x24"x18"
SL#3	562+65	46'-R	13"x24"x18"
SL#200	566+26	37'-L	13"x24"x18"
SL#200A	564+95	38'-L	13"x24"x18"
SL#201	563+56	47'-L	13"x24"x18"
SL#202	562+80	47'-L	13"x24"x18"

TELEPHONE UTILITY

ID	STATION -L-	OFFSET (-R/L)	TYPE
TV#1	568+76	41'-R	6'x12'x7'
TV#2	563+46	48'-R	6'x12'x7'

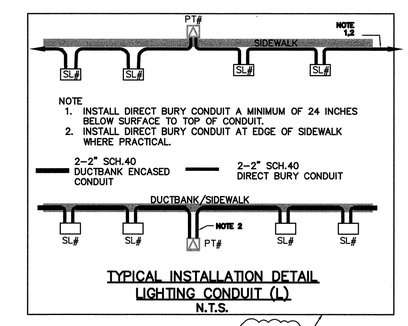
CABLE TELEVISION UTILITY

ID	STATION -L-	OFFSET (-R/L)	TYPE
CV#1	564+78	37'-R	24'x36"x24"
CV#2	563+47	37'-R	24'x36"x24"
CV#3	562+02	302'-R	24'x36"x24"



REV. 2

PROP. 80' DUCTBANK - TYPE E1
PROP. 57' DUCTBANK - TYPE E6
PROP. 89' DUCTBANK - TYPE E9
PROP. 239' DUCTBANK - TYPE J1
PROP. 132' DUCTBANK - TYPE J3
PROP. 366' DUCTBANK - TYPE J4
PROP. 102' DUCTBANK - TYPE J5
PROP. 32' DUCTBANK - TYPE J6
(REV. 1)
PROP. 348' DIRECT BURY CONDUIT/TRENCH (REV. 2)
PROP. 1 (ONE) ELECTRIC VAULT (UVE) - TYPE 8'X18'X6'-6"
PROP. 1 (ONE) BOX PAD - PME TYPE 11
PROP. 1 (ONE) BOX PAD - PJE TYPE 3-PH, 200A (REV. 1)
PROP. 1 (ONE) BOX PAD - PJE TYPE 3-PH, 600 A
PROP. 2 (TWO) ELECTRIC F.O. VAULT (FV) - TYPE 30"x48"x36"
PROP. 1 (ONE) ELECTRIC F.O. HANDHOLE (F) - TYPE 24"x36"x24"
PROP. 2 (TWO) TELEPHONE VAULT (TV) - TYPE 6'x12'x7'
PROP. 3 (THREE) CABLE TV VAULT (CV) - TYPE 24"x36"x24"
PROP. 7 (SEVEN) STREET LIGHT HANDHOLE (SL) - TYPE 13"x24"x18" (REV. 2)



TYPICAL INSTALLATION DETAIL
LIGHTING CONDUIT (L)
N.T.S.
REV. 2

Conduit System Construction Notes: (Rev. 1, 2)

1. The Contractor shall be responsible for properly stubbing, testing, capping, and identifying all conduit ends as prescribed in the Special Provisions and construction details.
2. Ductbank shall be centered along proposed sidewalk construction when present. Stationing in the ductbank detail schedule is approximate and provided for general reference of transitions in ductbank configuration (note 5). Stagger couplings/joints by approximately two feet (2').
3. All underground utilities shall be located prior to construction by N.C.D.O.T. or their contractor.
4. Sections of known crossings with other utilities are identified as Utility Crossing. Each section with multiple crossings shall be of uniform depth to prevent unnecessary rise and fall of the ductbank. See sheet UC-25 for typical ductbank crossing detail.
5. The Contractor shall be responsible for carefully completing all transitions between ductbank configurations. Transition areas shall be minimal, generally within forty feet (40'), and span equally each side of common station point. Gradual changes in elevation and direction due to controlled longitudinal bending of conduit shall not exceed twelve inches (12") every ten feet (10') without prior engineer approval.
6. Pad-mounted equipment, pedestals, and other aboveground enclosures shall keep a minimum of four feet (4') clearance from fire hydrants.
7. The sum of all bends/sweeps/gradual changes in individual conduit shall not exceed 270° between exposed ends without prior engineer approval. Manufactured sweeps/elbows shall have a radius of no less than forty-eight inches (48").
8. All pad-mounted equipment (PME's, PJE's and PT's) shall maintain a minimum of 12'-0" separation off face of access door(s) from other above ground equipment or obstacles. See UC-25 for typical installation details.
9. Conduit system work by Blue Ridge EMC shown grey-lined.
10. Roadway Intersection and Pedestrian Lighting Design and Layout subject to N.C.D.O.T approval. Installation of light poles & fixture by Blue Ridge EMC. Contractor to install lighting conduit and handholes. If necessary to place handhole in any portion of sidewalk, install center of sidewalk only.
11. All permanent utility easements (PUEs) are subject to acceptance and acquisition by N.C.D.O.T.

SCALE: 1" = 50'

25 0 50 100 150 200

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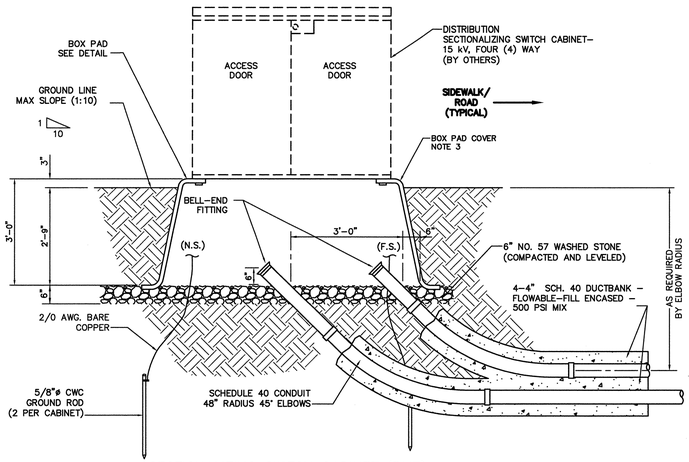
R2237C_RDY_PSH20

PROJECT REFERENCE NO.	SHEET NO.
R-2237C	UC-25
DESIGNED BY: WPJ	
DRAWN BY: BDE/GQJ	
CHECKED BY: JBW	
APPROVED BY: WPJ	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE: (919)250-4128 FAX: (919)250-4119	UTILITY CONSTRUCTION PLANS ONLY

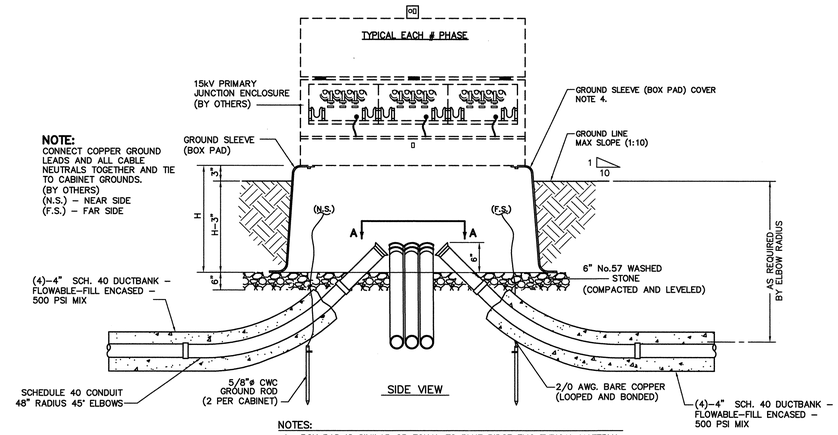
UTILITY CONSTRUCTION



NOTE:
CONNECT 2/0 AWG COPPER GROUND LEADS AND ALL CABLE NEUTRALS TOGETHER AND TIE TO CABINET GROUND BUS BARS. (BY OTHERS)
(N.S.) - NEAR SIDE
(F.S.) - FAR SIDE

SECTIONALIZING SWITCH CABINET (PME) INSTALLATION & EXCAVATION DETAILS

N.T.S.

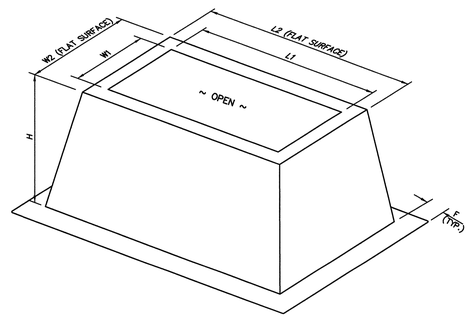


NOTE:
CONNECT COPPER GROUND LEADS AND ALL CABLE NEUTRALS TOGETHER AND TIE TO CABINET GROUNDS. (BY OTHERS)
(N.S.) - NEAR SIDE
(F.S.) - FAR SIDE

NOTES:
1. BOX PAD IS SIMILAR OR EQUAL TO BLUE RIDGE EMC TYPICAL MATERIAL.
2. NUMBER AND DIRECTION OF CONDUIT WILL VARY. ADJUST AS NECESSARY.
3. INSTALLATION OF GROUND RODS AND NECESSARY GROUNDING BY OTHERS.
4. THE CONTRACTOR WILL SUPPLY AND INSTALL AN APPROVED COVER ON EACH BOX PAD IN ACCORDANCE WITH OSHA SAFETY REGULATIONS. NO BOX PAD SHALL BE LEFT UNATTENDED UPON INSTALLATION WITHOUT FIRST BEING SECURELY COVERED AND MADE SAFE TO GENERAL PUBLIC. COVER SHALL EXTEND NO MORE THAN 1" BEYOND UPPER OUTER EDGE OF BOX (ALL SIDES) AND ALL CORNERS MADE SMOOTH.

PRIMARY JUNCTION ENCLOSURE (PJE) DETAILS

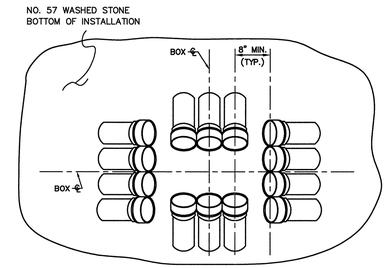
N.T.S.



PJE TYPE 3PH.	L1	W1	L2	W2	H	F
200A	54"	11"	61.5"	18.5"	30"	3.5"
600A	57"	18"	67"	23"	30"	4.5"

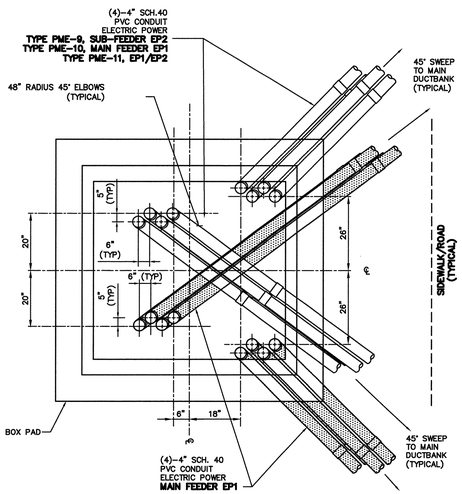
GROUND SLEEVE (BOX PAD) DETAIL

N.T.S.



NOTE: PROVIDE FOR ADEQUATE SEPARATION BETWEEN CONDUIT ENDS TO ENABLE CABLE INSTALLATION AND ROUTING.

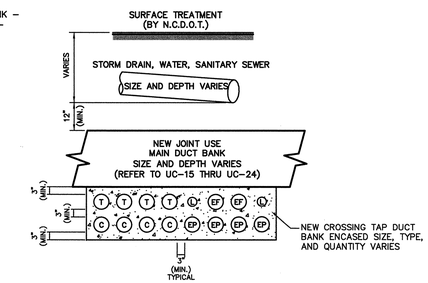
SECTION A-A



PLAN VIEW

PME CONDUIT ENTRANCE DETAIL

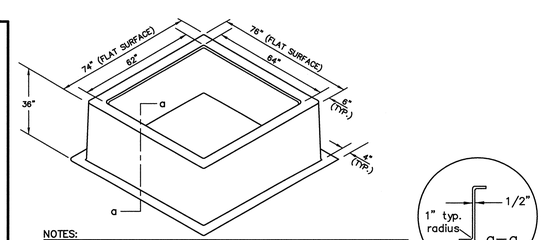
N.T.S.



NOTES:
1. DURING CONSTRUCTION THE FUNCTIONALITY OF OTHER UTILITIES IS TO BE MAINTAINED AT ALL TIMES. MECHANICAL SUPPORT SHALL BE PROVIDED TO ALL SUCH LINES WHILE EXPOSED. BACKFILL WITH CARE AROUND THESE LINES WHEN RESTORING TRENCH EXCAVATIONS.
2. THE DUCTBANK INSTALLATION SHALL NOT EXCEED A 1:10 (RISE:RUN) SLOPE TO REACH REQUIRED DEPTH AND CLEARANCES AROUND OTHER UTILITIES WITHOUT PRIOR ENGINEER APPROVAL.
3. MAINTAIN 1'-0" VERTICAL AND 3'-0" HORIZONTAL CLEARANCE FROM OTHER UTILITIES.

TYPICAL DUCT BANK CROSSING DETAIL

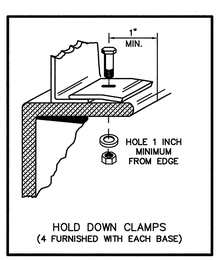
(N.T.S.)



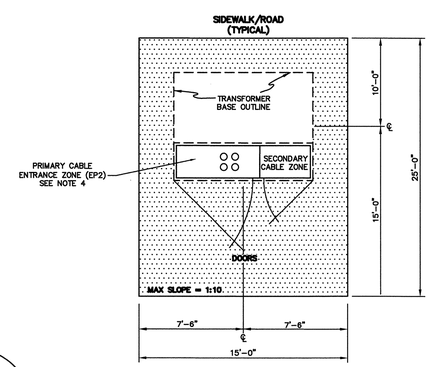
NOTES:
1. BOX PAD IS SIMILAR OR EQUAL TO BLUE RIDGE EMC TYPICAL MATERIAL. DIMENSIONS SHOWN FOR FIBERCRETE STYLE BOX PAD FOR PME TYPE - 9, 10, 11. SIZE AND STYLE BOX PAD SHALL BE MATCHED FOR PME TYPE SPECIFIED.
2. INSTALLATION OF GROUND RODS AND NECESSARY GROUNDING BY OTHERS.
3. THE CONTRACTOR WILL SUPPLY AND INSTALL AN APPROVED COVER ON EACH BOX PAD IN ACCORDANCE WITH OSHA SAFETY REGULATIONS. NO BOX PAD SHALL BE LEFT UNATTENDED UPON INSTALLATION WITHOUT FIRST BEING SECURELY COVERED AND MADE SAFE TO GENERAL PUBLIC. COVER SHALL EXTEND NO MORE THAN 1" BEYOND UPPER OUTER EDGE OF BOX (ALL SIDES) AND ALL CORNERS MADE SMOOTH.

PME BOX PAD DETAIL

N.T.S.



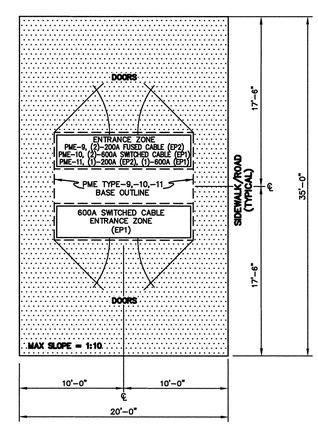
HOLD DOWN CLAMPS
(4 FURNISHED WITH EACH BASE)



TYPICAL PUE (TYPE I) PADMOUNT TRANSFORMER (PT)

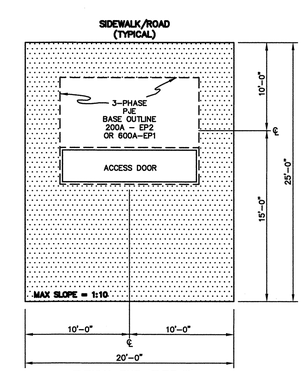
N.T.S

NOTES:
1. EQUIPMENT PUE SHALL BE CLEAR AND OPEN AT ALL TIMES FOR MAINTENANCE ACCESS.
2. EQUIPMENT DOORS SHALL HAVE A MINIMUM OF 12'-0" CLEARANCE FROM ANY OBSTRUCTION.
3. SITE OF INSTALLATION SHALL BE FLAT WITH MINIMAL SLOPE TO FACILITATE PROPER OPERATION AND MAINTENANCE OF EQUIPMENT. SITE SHALL BE GRADED TO DRAIN AWAY FROM EQUIPMENT IF POSSIBLE.
4. FINAL CONDUIT LOCATION FOR PADMOUNT TRANSFORMER AND SINGLE-PHASE JUNCTION ENCLOSURES TO BE COORDINATED WITH BLUE RIDGE EMC.



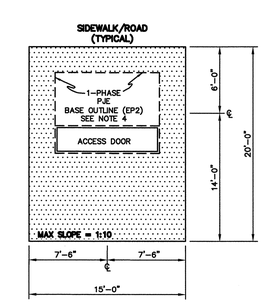
TYPICAL PUE (TYPE II) PADMOUNT SECTIONALIZING CABINET (PME)

N.T.S



TYPICAL PUE (TYPE III) THREE-PHASE PRIMARY JUNCTION ENCLOSURE (PJE)

N.T.S



TYPICAL PUE (TYPE IV) SINGLE-PHASE PRIMARY JUNCTION ENCLOSURE (PJE)

N.T.S

TYPICAL EQUIPMENT INSTALLATION AREA & PERMANENT UTILITY EASEMENT (PUE)

N.T.S

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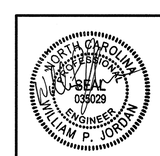
1706991CD



09-23-2011

NO.	REVISIONS	DATE
1	ISSUE FOR CONSTRUCTION REVISED	01/31/11
2	ISSUE FOR CONSTRUCTION REVISED	03/25/11
3	ISSUE FOR CONSTRUCTION REVISED	09/19/11

BLUE RIDGE ELECTRIC MEMBERSHIP CORPORATION
LENOIR, NORTH CAROLINA

ELECTRIC UTILITY RELOCATIONS FOR THE US 321 IMPROVEMENTS FROM SR 1832 (POSSUM HOLLOW RD) TO SR 1534 (GREEN HILL RD)
N.C.D.O.T. PROJECT 34402.2.6 (R-2237C)
CONSTRUCTION DETAILS
(WATAUGA COUNTY)

Booth&Associates Inc.
1011 Schaub Drive | Raleigh, NC 27609 CONSULTING ENGINEERS NC F-0291

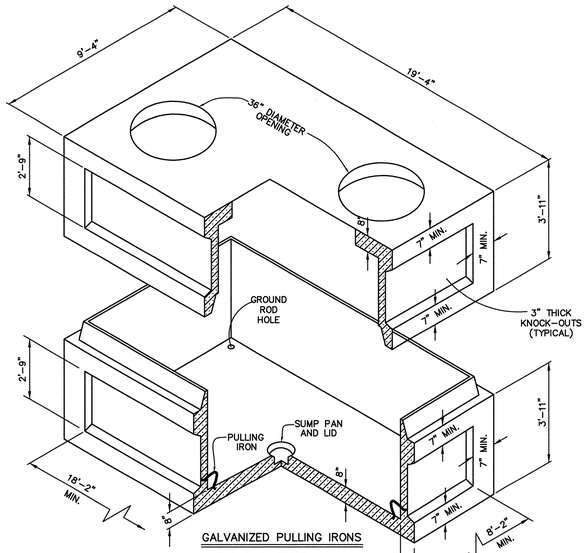
DWN. BDE/GQJ	DATE 01/31/11	DWG. NO. 170-6991
CKD. JBW	APPD. WPJ	CD 1 OF 6
SCALE: NONE		

PROJECT REFERENCE NO.	SHEET NO.
R-2237C	UC-26
DESIGNED BY: WPJ	
DRAWN BY: BDE/GQJ	
CHECKED BY: JBW	
APPROVED BY: WPJ	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE: (919)250-4128 FAX: (919)250-4119	UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION

NOTES:

1. CONDUIT BENDS SHALL NOT EXIST WITHIN 8'-0" OF VAULT WALL.
2. MAINTAIN DUCTBANK OFFSET TO 1'-0" FROM INSIDE WALL TO SIDE OF DUCT.
3. GROUT SMOOTH AROUND CONDUITS AFTER CONCRETE/FLOWABLE-FILL ENCASEMENT IS POURED. DUCTBANK SHOULD BE WATERPROOF AROUND CONDUITS. USE BELL-END FITTINGS ON CONDUITS.
4. VERTICAL CABLE RACK SUPPORTS TO BE INSTALLED AND MOUNTING HOLES TO BE FIELD DRILLED INTO INSIDE WALLS. INSERT HORIZONTAL CABLE RACKS, AS REQUIRED FOR PRIMARY CABLES. (BY OTHERS)
5. VAULT RING/COVER SHALL BE ADJUSTED USING MORTAR TO MATCH GRADE OF SURFACE TREATMENT.
6. INSTALL (2)-3/4"ø x 10'-0" CWC GROUND RODS PER VAULT SIX INCHES (6") ABOVE VAULT FLOOR. GROUND RODS TO BE INSTALLED PRIOR TO INSTALLATION OF UPPER SECTION OF TWO-PIECES VAULT. EACH GROUND ROD SHALL BE TESTED FOR 25.0 ohms OR LESS.
7. INSTALL LOOP OF 4/0 AWG BARE COPPER 3" ABOVE FLOOR LEVEL OF VAULT ON ALL FOUR WALLS TO CONNECT 2-3/4"ø x 10'-0" GROUND RODS AND ALL PRIMARY CIRCUIT NEUTRALS. (BY OTHERS)
8. CONNECT ALL CABLE RACKS TO GROUND LOOP WITH #2 AWG BARE COPPER. (BY OTHERS)



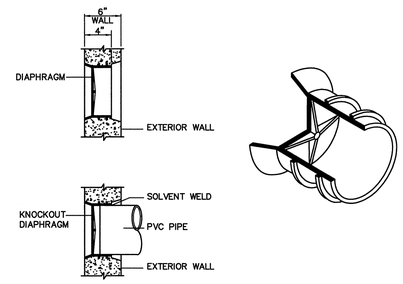
NOTES:

1. (2)-2" GROUND ROD HOLES PROVIDED
2. 7/8" PULLING IRONS ALL SIDES GALVANIZED

GALVANIZED PULLING IRONS

a) TWO (2) ON SHORT WALL AT 1/3 & 2/3 OF WALL LENGTH

b) THREE (3) ON LONG WALL AT 1/4, 1/2 & 3/4 OF WALL LENGTH



TYPICAL DUCT TERMINATORS-DETAILS

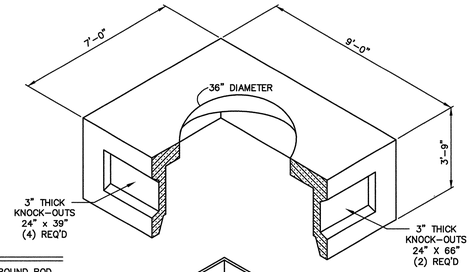
N.T.S

SCHEDULE	WIDTH X LENGTH X HEIGHT
INTERIOR DIMENSIONS	8'-0" X 18'-0" X 6'-6"
EXTERIOR DIMENSIONS	9'-4" X 19'-4" X 7'-10"
UTILITY VAULT (TOTAL OF 2)	

REINFORCED FOR HS20-44 BRIDGE LOAD

UTILITY VAULT UVE#1 & UVE#2 DETAIL ELECTRIC TRANSMISSION

N.T.S.



SCHEDULE	WIDTH X LENGTH X HEIGHT
INTERIOR DIMENSIONS	6'-0" X 8'-0" X 6'-6"
EXTERIOR DIMENSIONS	7'-0" X 9'-0" X 7'-6"
UTILITY VAULT (TOTAL OF 1)	

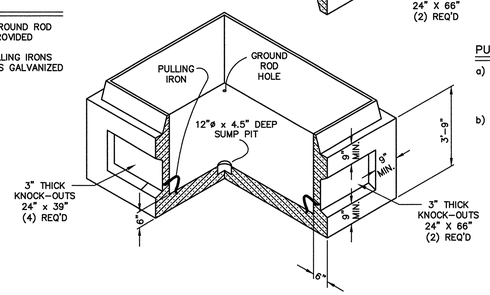
REINFORCED FOR HS20-44 BRIDGE LOAD

UTILITY VAULT UVE#3 DETAIL ELECTRIC DISTRIBUTION

N.T.S.

NOTES:

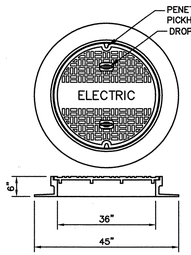
1. (2)-2" GROUND ROD HOLES PROVIDED
2. 7/8" PULLING IRONS ALL SIDES GALVANIZED



PULLING IRONS

a) TWO (2) ON SHORT WALL AT 1/3 & 2/3 OF WALL LENGTH

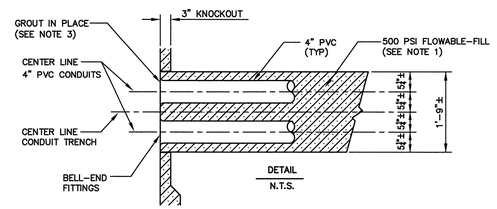
b) THREE (3) ON LONG WALL AT 1/4, 1/2 & 3/4 OF WALL LENGTH



CASTING WEIGHTS:
RING - 325 LBS.
COVER - 370 LBS.
TOTAL - 695 LBS.

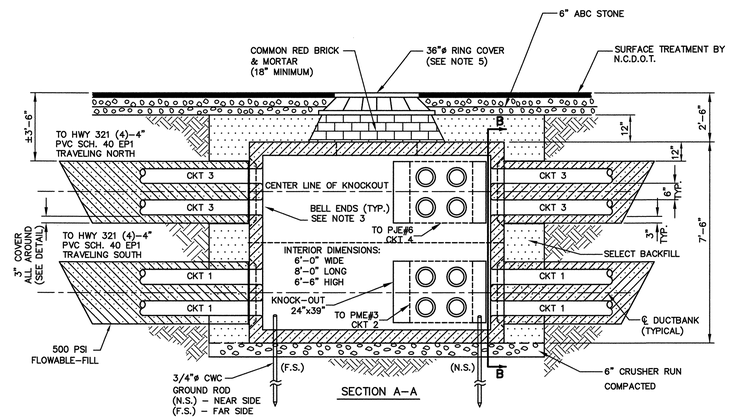
DETAIL - ELECTRIC VAULT VAULT RING & COVER

N.T.S.



DETAIL

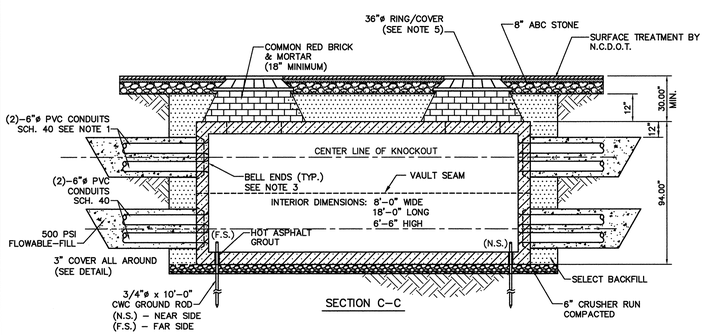
N.T.S.



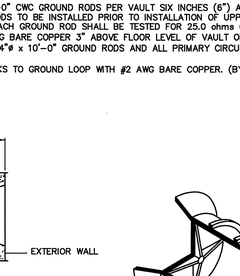
SECTION A-A

ELECTRIC 15kV DISTRIBUTION VAULT

N.T.S.



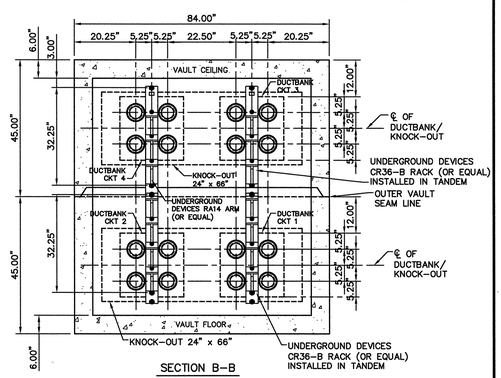
SECTION C-C



CASTING WEIGHTS:
RING - 325 LBS.
COVER - 370 LBS.
TOTAL - 695 LBS.

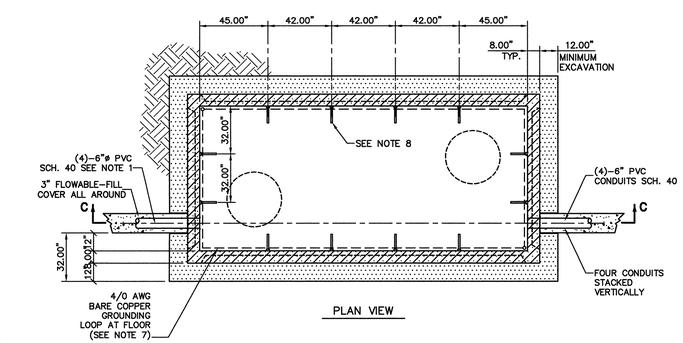
DETAIL - ELECTRIC VAULT VAULT RING & COVER

N.T.S.



SECTION B-B

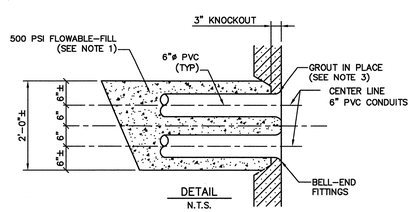
N.T.S.



PLAN VIEW

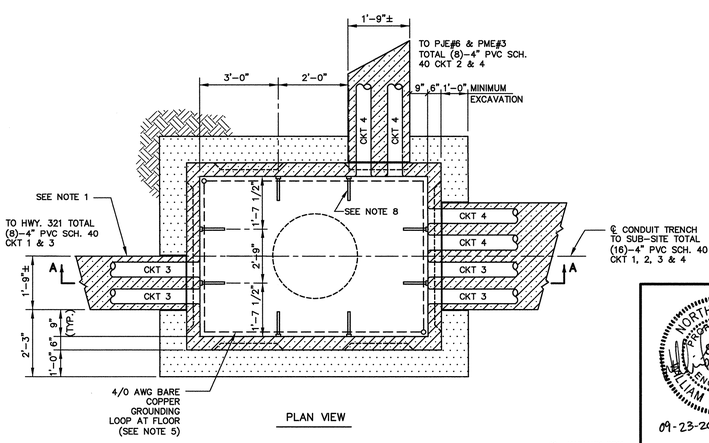
ELECTRIC 100kV TRANSMISSION VAULT

N.T.S.

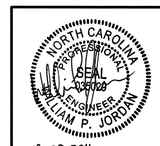


DETAIL

N.T.S.



PLAN VIEW



09-23-2011

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17069910D

NO.	REVISIONS	DATE
1	ISSUE FOR CONSTRUCTION REVISED	01/31/11
2	ISSUE FOR CONSTRUCTION REVISED	03/25/11
3	ISSUE FOR CONSTRUCTION REVISED	09/19/11

BLUE RIDGE ELECTRIC MEMBERSHIP CORPORATION
LENOIR, NORTH CAROLINA

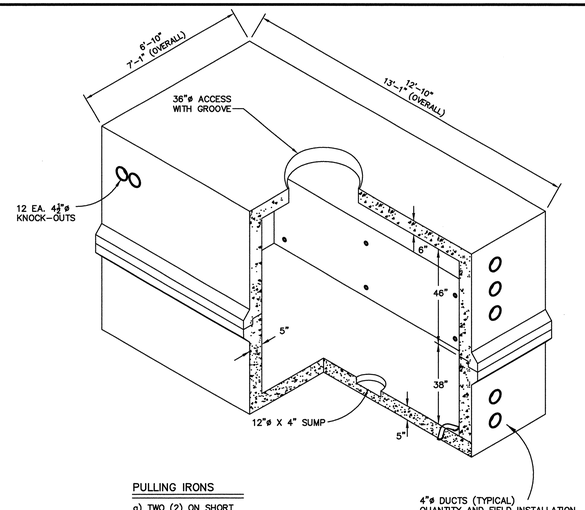
ELECTRIC UTILITY RELOCATIONS FOR THE US 321 IMPROVEMENTS FROM SR 1632 (POSSUM HOLLOW RD) TO SR 1534 (GREEN HILL RD)
N.C.D.O.T. PROJECT 34402.2.6 (R-2237C)
CONSTRUCTION DETAILS
(WATAUGA COUNTY)

Booth&Associates, Inc.
1011 Schaub Drive | Raleigh, NC 27606 CONSULTING ENGINEERS NC F-0221

DWN. BDE/GQJ	DATE 01/31/11	DWG. NO.
CKD. JBW	APPD. WPJ	170-6991
SCALE: NONE		CD 2 OF 6

PROJECT REFERENCE NO.	SHEET NO.
R-2237C	UC-27
DESIGNED BY: WPJ	
DRAWN BY: BDE/GQJ	
CHECKED BY: JBW	
APPROVED BY: WPJ	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE: (919)250-4128 FAX: (919)250-4119	UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION



PULLING IRONS

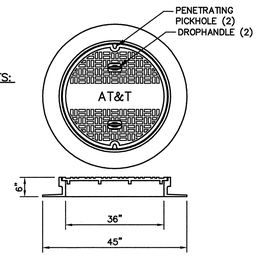
a) TWO (2) ON SHORT WALL AT 1/3 & 2/3 OF WALL LENGTH

b) THREE (3) ON LONG WALL AT 1/4, 1/2 & 3/4 OF WALL LENGTH

NOTES:

1. (2)-2" GROUND ROD HOLES PROVIDED
2. 7/8" PULLING IRONS ALL SIDES GALVANIZED

CASTING WEIGHTS:
RING – 325 LBS.
COVER – 370 LBS.
TOTAL – 695 LBS.

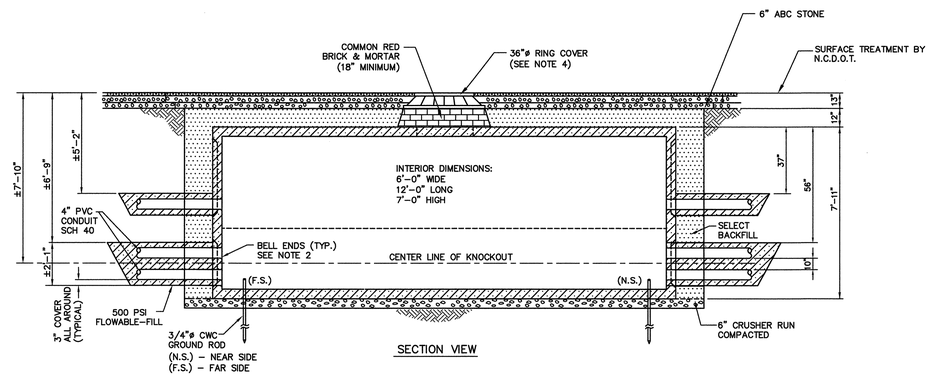


DETAIL
VAULT RING & COVER
N.T.S.

SCHEDULE	WIDTH X	LENGTH X	HEIGHT
INTERIOR DIMENSIONS	6'-0" X	12'-0" X	7'-0"
EXTERIOR DIMENSIONS	7'-1" X	13'-1" X	7'-11"
UTILITY VAULT			

REINFORCED FOR HS-2044 BRIDGE LOAD

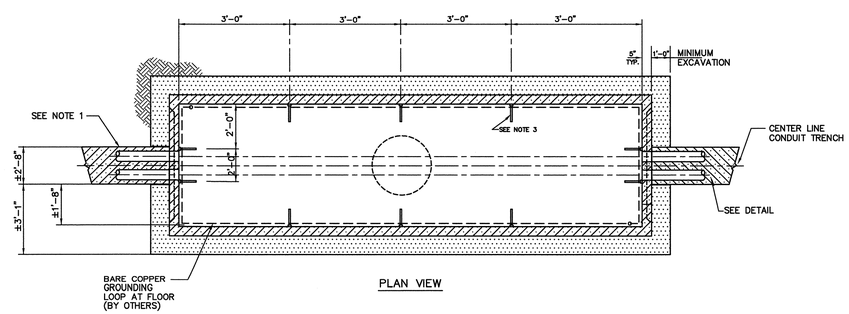
UTILITY VAULT (TV) DETAIL – TELEPHONE
N.T.S.



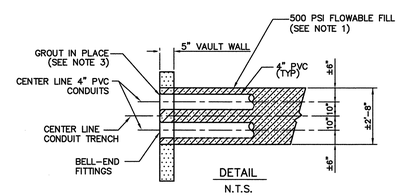
SECTION VIEW

NOTES:

1. CONDUIT BENDS SHALL NOT EXIST WITHIN 8'-0" OF VAULT WALL.
2. MAINTAIN DUCTBANK OFFSET TO 1'-0" MINIMUM FROM INSIDE WALL TO SIDE OF DUCT.
3. GROUT SMOOTH AROUND CONDUITS AFTER CONCRETE ENCASEMENT IS POURED. DUCTBANK SHOULD BE WATERPROOF AROUND CONDUITS. USE BELL-END FITTINGS ON CONDUITS.
4. INSTALL VAULT, RING AND COVER, DUCT TERMINATIONS AND GROUND RODS PER AT&T SPECIFICATIONS.
5. VAULT RING/COVER SHALL BE ADJUSTED USING MORTAR TO MATCH GRADE OF SURFACE TREATMENT.
6. INSTALL LOOP OF BARE COPPER 3" ABOVE FLOOR LEVEL OF VAULT ON ALL FOUR WALLS TO CONNECT 2-3/4"ø x 10'-0" GROUND RODS AND ALL PRIMARY CIRCUIT NEUTRALS. (BY OTHERS)
7. CONNECT ALL CABLE RACKS TO GROUND LOOP WITH #6 (MINIMUM) AWG BARE COPPER. (BY OTHERS)



PLAN VIEW



DETAIL
N.T.S.

TELEPHONE UTILITY VAULT – PLAN & SECTIONS
N.T.S.

© JANUARY 2011
1706991CD

NORTH CAROLINA PROFESSIONAL SEAL 035029 ENGINEER WILLIAM P. JORDAN
09-23-2011

NO.	REVISIONS	DATE
1	ISSUE FOR CONSTRUCTION REVISED	01/31/11
2	ISSUE FOR CONSTRUCTION REVISED	03/25/11
3	ISSUE FOR CONSTRUCTION REVISED	09/19/11

BLUE RIDGE ELECTRIC MEMBERSHIP CORPORATION
LENOIR, NORTH CAROLINA

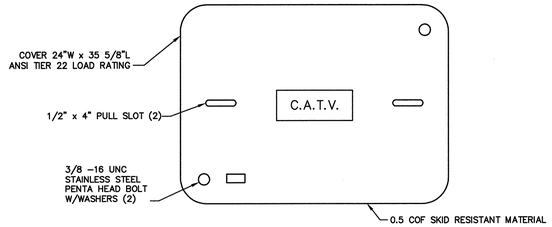
ELECTRIC UTILITY RELOCATIONS FOR THE US 321 IMPROVEMENTS FROM SR 1632 (POSSUM HOLLOW RD) TO SR 1534 (GREEN HILL RD)
N.C.D.O.T. PROJECT 34402.2.6 (R-2237C)
CONSTRUCTION DETAILS
(WATAUGA COUNTY)

Booth&Associates, Inc.
1011 Schaub Drive | Raleigh, NC 27606 CONSULTING ENGINEERS NC F-0221

DWN. BDE/GQJ	DATE 01/31/11	DWG. NO.
CKD. JBW	APPD. WPJ	170-6991
SCALE: NONE		CD 3 OF 6

PROJECT REFERENCE NO.	SHEET NO.
R-2237C	UC-28
DESIGNED BY: WPJ	
DRAWN BY: BDE/GQJ	
CHECKED BY: JBW	
APPROVED BY: WPJ	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE: (919)250-4128 FAX: (919)250-4119	UTILITY CONSTRUCTION PLANS ONLY

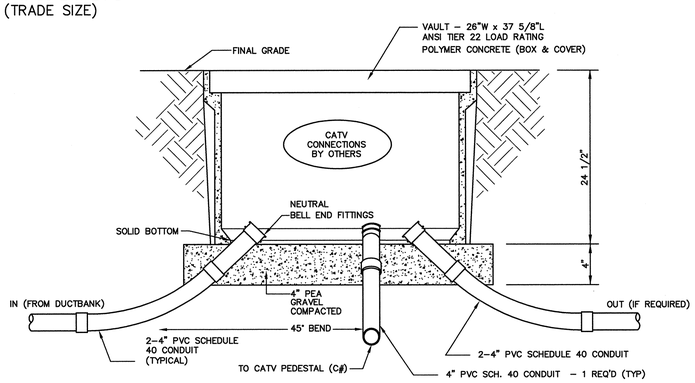
UTILITY CONSTRUCTION



CABLE TV VAULT COVER DETAIL

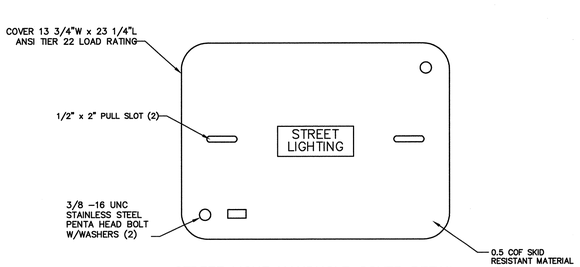
N.T.S.

TYPE
24"W x 36"L x 24"D
(TRADE SIZE)



CABLE TV UTILITY VAULT DETAIL

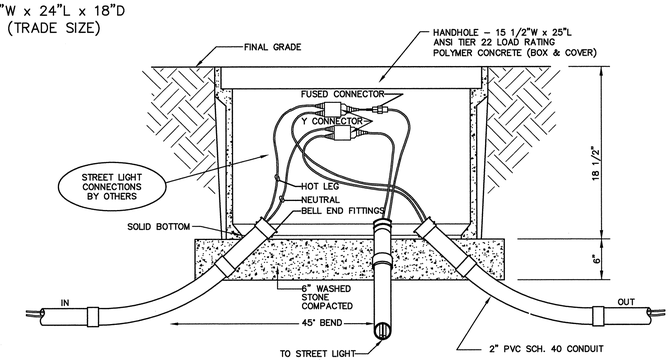
N.T.S.



STREET LIGHT HANDHOLE COVER DETAIL

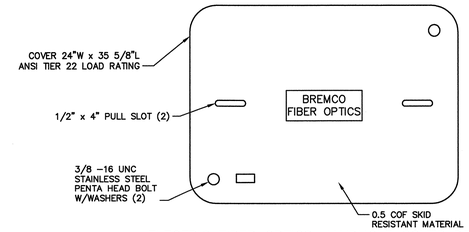
N.T.S.

TYPE
13"W x 24"L x 18"D
(TRADE SIZE)



STREET LIGHT HANDHOLE (SL#) DETAIL

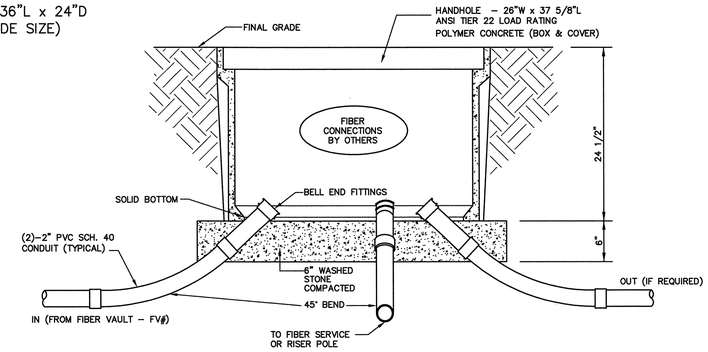
N.T.S.



ELECTRIC FIBER OPTICS HANDHOLE COVER DETAIL

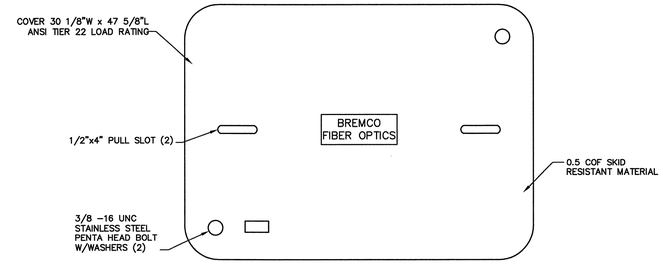
N.T.S.

TYPE
24"W x 36"L x 24"D
(TRADE SIZE)



ELECTRIC FIBER OPTICS HANDHOLE (F#) DETAIL

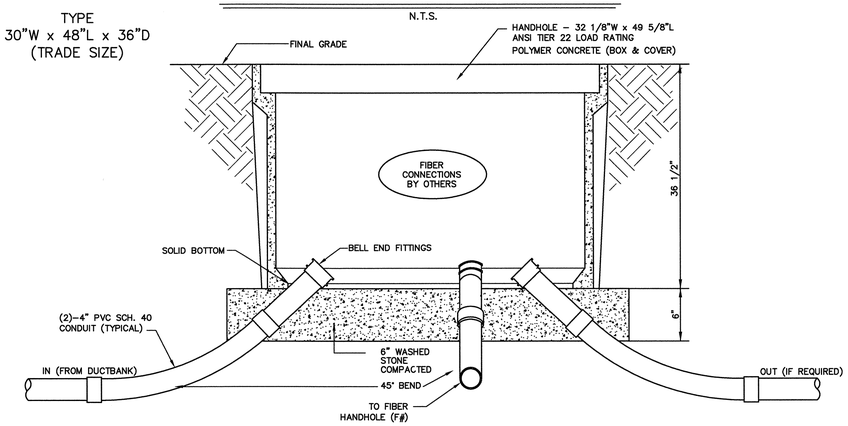
N.T.S.



ELECTRIC FIBER OPTICS UTILITY VAULT COVER DETAIL

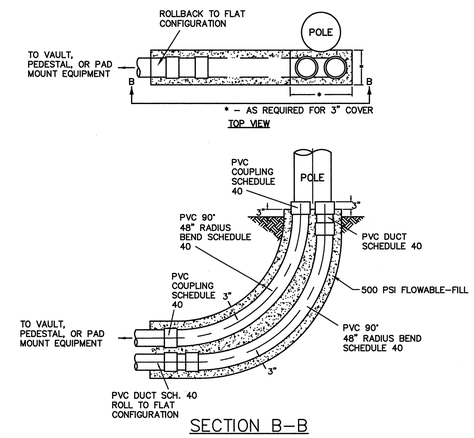
N.T.S.

TYPE
30"W x 48"L x 36"D
(TRADE SIZE)



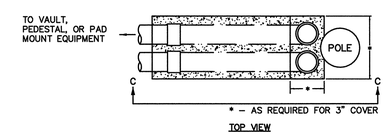
ELECTRIC FIBER OPTICS UTILITY VAULT (FV#) DETAIL

N.T.S.

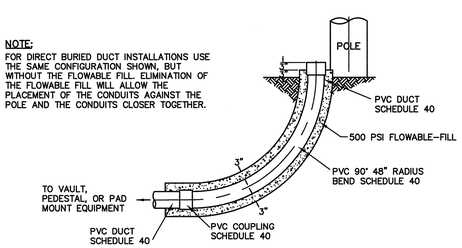


SECTION B-B

DUCT BANK AT RISER POLE DETAIL
(VERTICAL CONFIGURATION)

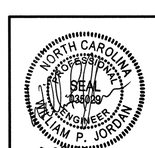


NOTE:
FOR DIRECT BURIED DUCT INSTALLATIONS USE THE SAME CONFIGURATION SHOWN, BUT WITHOUT THE FLOWABLE FILL. ELIMINATION OF THE FLOWABLE FILL WILL ALLOW THE PLACEMENT OF THE CONDUITS AGAINST THE POLE AND THE CONDUITS CLOSER TOGETHER.



SECTION C-C

DUCT BANK AT RISER POLE DETAIL
(FLAT CONFIGURATION)



NO.	REVISIONS	DATE	
1	ISSUE FOR CONSTRUCTION REVISED	01/31/11	
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BLUE RIDGE ELECTRIC MEMBERSHIP CORPORATION
LENOIR, NORTH CAROLINA

ELECTRIC UTILITY RELOCATIONS FOR THE US 321 IMPROVEMENTS FROM SR 1632 (POSSUM HOLLOW RD) TO SR 1534 (GREEN HILL RD)
N.C.D.O.T. PROJECT 34402.2.6 (R-2237C)
CONSTRUCTION DETAILS
(WATAUGA COUNTY)

Booth&Associates Inc.
1011 Schaub Drive / Raleigh, NC 27626 CONSULTING ENGINEERS NC F-0921

DWN. BDE/GQJ	DATE 01/31/11	DWG. NO.
CKD. JBW	APPD. WPJ	170-6991
SCALE: NONE		CD 4 OF 6

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1706991CD

PROJECT REFERENCE NO.	SHEET NO.
R-2237C	UC-29

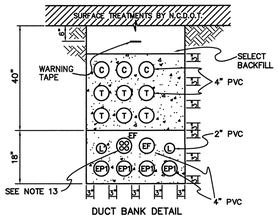
DESIGNED BY: WPJ
DRAWN BY: BDE/GQJ
CHECKED BY: JBW
APPROVED BY: WPJ
REVISED:

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

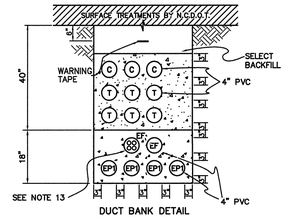
UTILITIES ENGINEERING SEC.
PHONE: (919)250-4128
FAX: (919)250-4119

UTILITY CONSTRUCTION PLANS ONLY

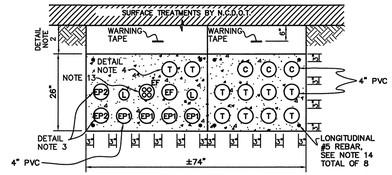
UTILITY CONSTRUCTION



DUCT BANK DETAIL
SECTION A1–A1



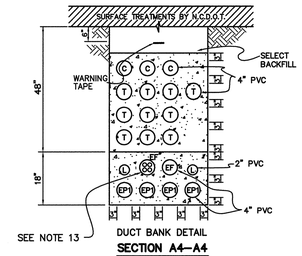
DUCT BANK DETAIL
SECTION A2–A2



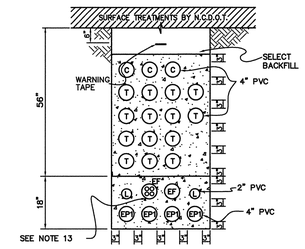
~ BOX CULVERT ~

NOTE:
1. CONSTRUCTION OF DUCTBANK SHALL BE PHASED IN WITH CONSTRUCTION OF BOX CULVERT. DUCTBANK SHALL BE CAST ABOVE FINISHED CULVERT **USING 3,000 PSI CONCRETE WITH RED TINT.**
2. 12" COMPACTED GROUND COVER MINIMUM.
3. (2)–4" PVC SCH. 40 CONDUITS (EP2) FROM PJE#14 TO PT#8 (UC–21).
4. (2)–4" PVC SCH. 40 CONDUITS (T) FROM T#12 TO T#13 (UC–21).

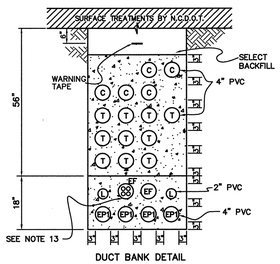
DUCT BANK DETAIL
SECTION A3–A3



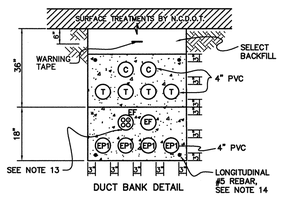
DUCT BANK DETAIL
SECTION A4–A4



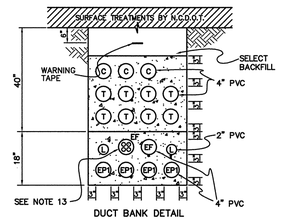
DUCT BANK DETAIL
SECTION A5–A5



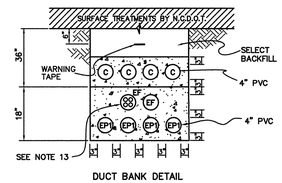
DUCT BANK DETAIL
SECTION A6–A6



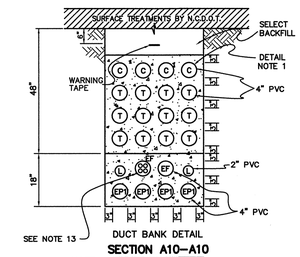
DUCT BANK DETAIL
SECTION A7–A7



DUCT BANK DETAIL
SECTION A8–A8

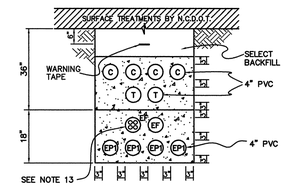


DUCT BANK DETAIL
SECTION A9–A9

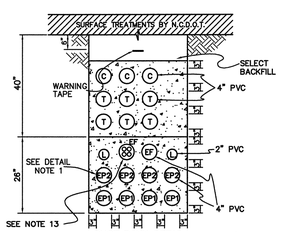


DUCT BANK DETAIL
SECTION A10–A10

NOTE:
1. (1)–4" PVC SCH. 40 CONDUIT FROM C#8 TO POLE 2–05–11–178 (UC–22).

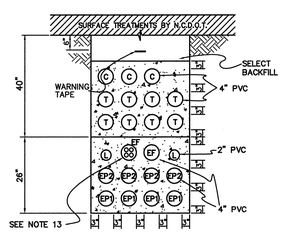


DUCT BANK DETAIL
SECTION A11–A11

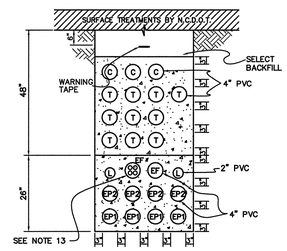


DUCT BANK DETAIL
SECTION B1–B1

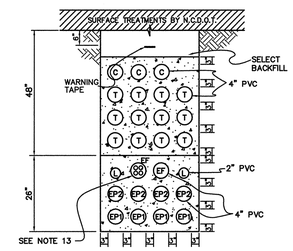
NOTE:
1. EP1 FROM PJE#6 TO STA. 548+30 (UC–22).



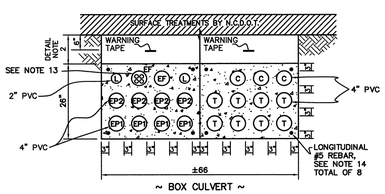
DUCT BANK DETAIL
SECTION B2–B2



DUCT BANK DETAIL
SECTION B3–B3



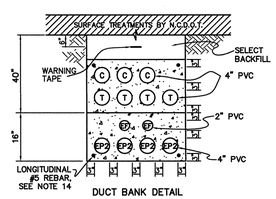
DUCT BANK DETAIL
SECTION B4–B4



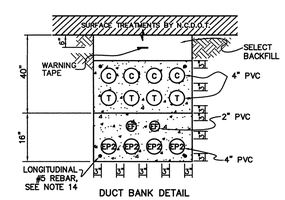
~ BOX CULVERT ~

NOTE:
1. CONSTRUCTION OF DUCTBANK SHALL BE PHASED IN WITH CONSTRUCTION OF BOX CULVERT. DUCTBANK SHALL BE CAST ABOVE FINISHED CULVERT **USING 3,000 PSI CONCRETE WITH RED TINT.**
2. 12" COMPACTED GROUND COVER MINIMUM.

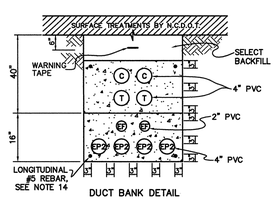
DUCT BANK DETAIL
SECTION B5–B5



DUCT BANK DETAIL
SECTION C1–C1



DUCT BANK DETAIL
SECTION C2–C2



DUCT BANK DETAIL
SECTION C3–C3

GENERAL NOTES:

1. DIMENSIONS AND TYPES OF SURFACE TREATMENTS BY N.C.D.O.T. IN ACCORDANCE WITH LOCAL AND STATE HIGHWAY REGULATIONS.
2. DUCT BANK CONFIGURATIONS ARE TYPICAL AND MAY VARY WITH SITE CONDITIONS.
3. SUBSURFACE CONDITIONS MAY VARY. ROUTE CONDUITS AS NEEDED TO CLEAR OBSTACLES. MAINTAIN SMOOTH RADIUS SWEEPS WHILE ROUTING CONDUITS. STAGGER COUPLINGS/JOINTS BY APPROXIMATELY TWO FEET (2').
4. MAINTAIN ADEQUATE SPACE BETWEEN CONDUITS AS SHOWN IN CROSS SECTIONS. DUCT SPACERS TO BE LOCATED EVERY 5'–0" ALONG LENGTH OF DUCTBANK. USE ADDITIONAL DUCT SPACERS IF NECESSARY TO PREVENT COLLAPSE OR FLOTATION DURING ENCASEMENT OPERATION.
5. 500 PSI FLOWABLE FILL SHALL BE USED FOR ALL DUCT BANK (UNLESS OTHERWISE SPECIFIED). FLOWABLE FILL SHALL HAVE A RED TINT MIXTURE ADDED PRIOR TO POURING.
6. MAINTAIN DEPTH OF BURIAL TO TOP OF DUCT BANK (OR CONDUITS FOR DIRECT BURIED CONDUIT). ADJUST TRENCH SPACING ACCORDINGLY, WHILE MAINTAINING 3" FLOWABLE FILL COVER BETWEEN AND AROUND CONDUITS. CONDUITS SHALL BE SUFFICIENTLY ANCHORED IN THE TRENCH TO MAINTAIN THE REQUIRED CONDUIT DEPTH DURING PLACEMENT OF FLOWABLE FILL.
7. LOCATE ALL UNDERGROUND UTILITIES PRIOR TO EXCAVATION. USE EXTREME CAUTION IN THE VICINITY OF BURIED ELECTRIC, GAS, WATER, WASTEWATER, AND STEAM LINES (IF PRESENT).
8. FOLLOW ALL OSHA REQUIREMENTS FOR SLOPING AND SHORING EXCAVATIONS. USE EXTREME CAUTION AGAINST CAVE–INS.
9. USE SCHEDULE 40 PVC CONDUITS FOR ALL DUCT BANK INSTALLATIONS.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CAREFULLY COMPLETING ALL TRANSITIONS BETWEEN DUCTBANK CONFIGURATIONS. TRANSITION AREAS SHALL BE MINIMAL, GENERALLY WITHIN FORTY FEET (40'), AND SPAN EQUALLY EACH SIDE OF COMMON STATION POINT. GRADUAL CHANGES IN ELEVATION AND DIRECTION DUE TO CONTROLLED LONGITUDINAL BENDING OF CONDUIT SHALL NOT EXCEED TWELVE INCHES (12") EVERY TEN FEET (10') WITHOUT PRIOR ENGINEER APPROVAL.
11. BOTTOM OF TRENCH TO BE SMOOTH AND FREE OF LOOSE OR SHARP ROCK AND DEBRIS THAT COULD DAMAGE THE CONDUIT. A TWO (2) INCH FLOWABLE FILL BED SHALL BE POURED IF BOTTOM IS ROCKY OR LEVELING IS REQUIRED.
12. ALL DIMENSIONS SHOWN ON THIS SHEET ARE MINIMUM. CONTRACTOR SHALL ACCOUNT FOR ADDITIONAL WIDTH AND DEPTH OF TRENCH REQUIRED FOR CONSTRUCTION METHODS.
13. FOUR (4) 1 1/4" INNER DUCT CONDUITS SHALL BE FACTORY INSTALLED IN ONE 4" SCHEDULE 40 ELECTRICAL FIBER OPTIC (EF) CONDUIT.
14. CONTRACTOR TO INSTALL 1–#5 REBAR LONGITUDINALLY AT EACH CORNER OF DUCTBANK AT ALL ROAD CROSSINGS AND WHERE ADDITIONAL STABILITY OF DUCTBANK MAY BE REQUIRED. ENCASEMENT COVER AROUND REINFORCING REBAR SHALL BE THREE INCHES (3") MINIMUM. TOTAL OF FOUR (4) TYPICAL UNLESS OTHERWISE SPECIFIED.
15. INSTALL HOLD–DOWN BARS A MAXIMUM OF EVERY 10'–0" LONGITUDINALLY, GENERALLY 5'–0" FROM EACH 20'–0" CONDUIT END. MAINTAIN MINIMUM CONDUIT DEPTH DURING PLACEMENT OF FLOWABLE FILL. EACH HOLD–DOWN BAR ASSEMBLY SHALL USE TWO (2) OR MORE #3 OR #4 REBAR STAKES ANCHORED IN TRENCH BOTTOM. REBAR STAKES SHALL EXTEND THROUGH ALL LEVELS OF DUCTBANK, FLUSH WITH TOP OF FINAL ENCASEMENT. INSTALL REBAR COVERS AS REQUIRED BY N.C.D.O.T.
16. THE SUM OF ALL BENDS/SWEEPS/GRADUAL CHANGES IN INDIVIDUAL CONDUIT SHALL NOT EXCEED 270° BETWEEN EXPOSED ENDS WITHOUT PRIOR ENGINEER APPROVAL. MANUFACTURED SWEEPS/ELBOWS SHALL HAVE A RADIUS OF NO LESS THAN SIXTY INCHES (60") FOR TRANSMISSION ELECTRIC POWER (TEP) AND FORTY–EIGHT INCHES (48") FOR ALL OTHER CONDUITS.
17. 3,000 PSI CONCRETE SHALL BE USED IN LIEU OF FLOWABLE FILL WHEN DUCTBANK/CONDUITS ARE TO CROSS BENEATH A PROPOSED RETAINING WALL. THE CONTRACTOR SHALL ENSURE PROPER COORDINATION WITH WALL CONSTRUCTION AT ALL TIMES. THE WALL FOUNDATION SHALL BE SUITABLY SUPPORTED TO PREVENT A TRANSFER OF LOAD CAUSING PERMANENT DAMAGE TO THE CONDUIT.

LEGEND:

- (C) CATV
- (T) TELEPHONE
- (L) LIGHTING
- (EF) ELECTRIC FIBER OPTIC
- (EP1) 15 kV DISTRIBUTION ELECTRIC POWER – 600A MAIN FEEDER
- (EP2) 15 kV DISTRIBUTION ELECTRIC POWER – 200A SUB–FEEDER
- (TEP) 100 kV TRANSMISSION ELECTRIC POWER
- 500 PSI FLOWABLE FILL (UNLESS OTHERWISE NOTED)

NORTH CAROLINA PROFESSIONAL SEAL 035029 ENGINEER WILLIAM P. JORDAN

09-23-2011

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1706991CD

NO.	REVISIONS	DATE
1	ISSUE FOR CONSTRUCTION REVISED	01/31/11
2	ISSUE FOR CONSTRUCTION REVISED	03/25/11
3	ISSUE FOR CONSTRUCTION REVISED	09/19/11

BLUE RIDGE ELECTRIC MEMBERSHIP CORPORATION
LENOIR, NORTH CAROLINA

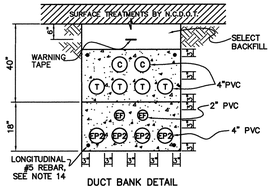
ELECTRIC UTILITY RELOCATIONS FOR THE US 321 IMPROVEMENTS FROM SR 1632 (POSSUM HOLLOW RD) TO SR 1534 (GREEN HILL RD)
N.C.D.O.T. PROJECT 34402.2.6 (R–2237C)
CONSTRUCTION DETAILS
(WATAUGA COUNTY)

Booth&Associates Inc.
1011 Schaub Drive | Raleigh, NC 27606 CONSULTING ENGINEERS NC P-0221

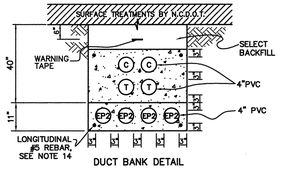
DWN. BDE/GQJ	DATE 01/31/11	DWG. NO.
CKD. JBW	APPD. WPJ	170–6991
SCALE: NONE		CD 5 OF 6

PROJECT REFERENCE NO.	SHEET NO.
R-2237C	UC-30
DESIGNED BY: WPJ	
DRAWN BY: BDE/GQJ	
CHECKED BY: JBW	
APPROVED BY: WPJ	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE: (919)250-4128 FAX: (919)250-4119	UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION



SECTION C4–C4



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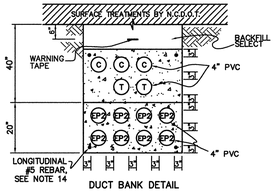

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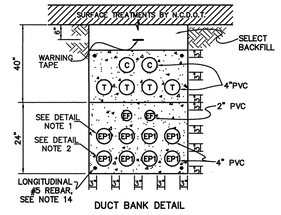
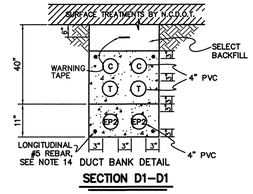


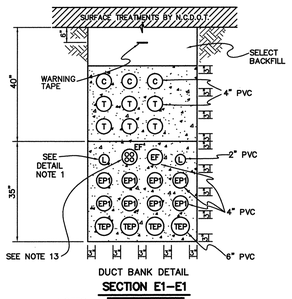
SECTION C7–C7

NOTES:

1. UPPER (4)–4" EP1 FROM UVE#3 TO PJE#9 (CKT 3, UC–22)
2. LOWER (4)–4" EP1 FROM PJE#6 TO P–18–2 (CKT 20–2, UC–22).



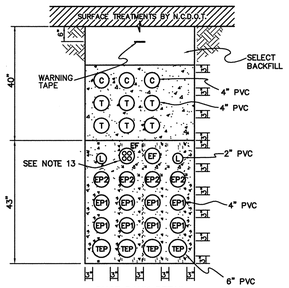
SECTION D1–D1



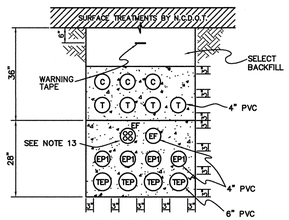
SECTION E1–E1

NOTES:

1. ELIMINATE 2–2" L CONDUIT SHEET UC–24 FROM 563+46 (TV#2) TO P–20–1
2. (4)–6" TEP CONDUIT SHALL DEPART AT STA. 563+58 WITH ±95' – 16 FT. RADIUS SWEEP AND ROLL VERTICALLY TO UVE#1. (SEE UC–24, UC–26)



SECTION E2–E2



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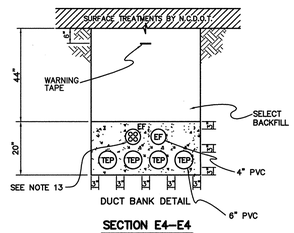

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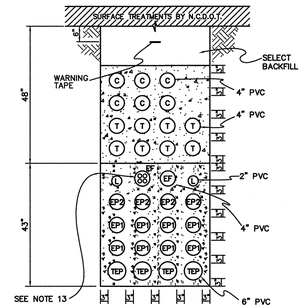

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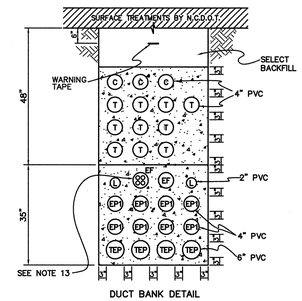
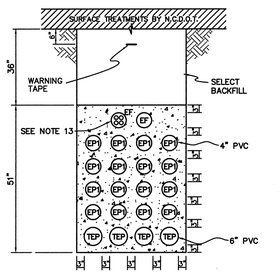
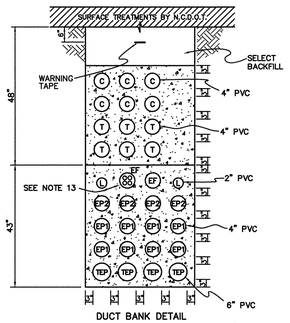


SECTION E6–E6



SECTION E7–E7



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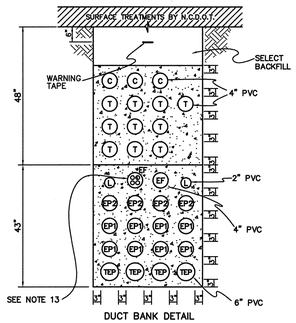
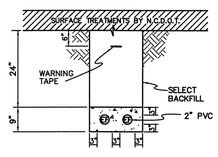


SECTION E9–E9

NOTE:

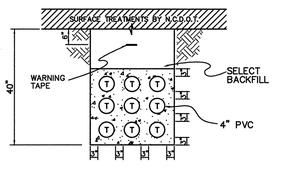
1. (4)–6" TEP CONDUIT SHALL DEPART AT STA. 562+77 WITH 30' – 6 FT. RADIUS BEND AND ROLL VERTICALLY TO UVE#1. (SEE UC–24, UC–26)



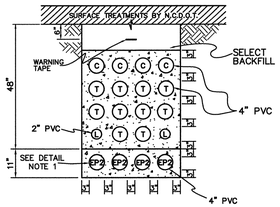
SECTION J1–J1

NOTE:

1. CONFIGURATION MAY ALSO BE REQUIRED FOR LIGHTING CONDUIT (L) AT ROAD CROSSINGS.



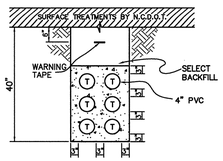
SECTION J2–J2



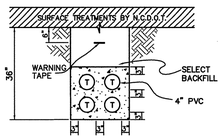
SECTION J3–J3

NOTE:

1. EP1 FROM UVE#3 TO PJE#6 (CKT 3, UC–22).



SECTION J4–J4



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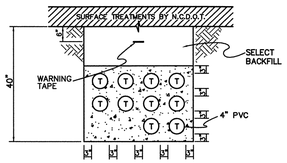
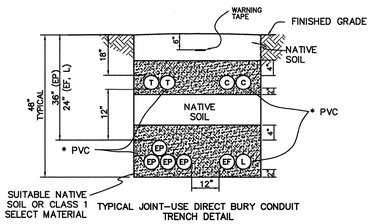


SECTION J6–J6



SECTION T–T

NOTES:

1. CONDUIT SHALL BE LAID ON A 2" BED OF SUITABLE NATIVE SOIL OR CLASS 1 SELECT MATERIAL, FREE OF ROCKS AND ANY OTHER DEBRIS.
2. BACKFILL TO AT LEAST 4" ABOVE CONDUIT WITH SUITABLE NATIVE SOIL OR CLASS 1 SELECT MATERIAL FOLLOWED BY COMPACTED NATIVE SOIL. PLACE A MINIMUM COVER OF 12" ABOVE CONDUIT BEFORE TAMPING. TAMP EVERY 6" AFTER.
3. NATIVE SOIL FOR BACKFILL SHALL BE APPROVED PRIOR TO USE.
4. MAINTAIN 12" SEPARATION BETWEEN UTILITIES.

* SIZE AS INDICATED ON CONDUIT PLAN

GENERAL NOTES:

1. DIMENSIONS AND TYPES OF SURFACE TREATMENTS BY N.C.D.O.T. IN ACCORDANCE WITH LOCAL AND STATE HIGHWAY REGULATIONS.
2. DUCT BANK CONFIGURATIONS ARE TYPICAL AND MAY VARY WITH SITE CONDITIONS.
3. SUBSURFACE CONDITIONS MAY VARY. ROUTE CONDUITS AS NEEDED TO CLEAR OBSTACLES. MAINTAIN SMOOTH RADIUS SWEEPS WHILE ROUTING CONDUITS. STAGGER COUPLINGS/JOINTS BY APPROXIMATELY TWO FEET (2').
4. MAINTAIN ADEQUATE SPACE BETWEEN CONDUITS AS SHOWN IN CROSS SECTIONS. DUCT SPACERS TO BE LOCATED EVERY 5'–0" ALONG LENGTH OF DUCTBANK. USE ADDITIONAL DUCT SPACERS IF NECESSARY TO PREVENT COLLAPSE OR FLOTATION DURING ENCASEMENT OPERATION.
5. 500 PSI FLOWABLE FILL SHALL BE USED FOR ALL DUCT BANK (UNLESS OTHERWISE SPECIFIED). FLOWABLE FILL SHALL HAVE A RED TINT MIXTURE ADDED PRIOR TO POURING.
6. MAINTAIN DEPTH OF BURIAL TO TOP OF DUCT BANK (OR CONDUITS FOR DIRECT BURIED CONDUIT). ADJUST TRENCH SPACING ACCORDINGLY, WHILE MAINTAINING 3" FLOWABLE FILL COVER BETWEEN AND AROUND CONDUITS. CONDUITS SHALL BE SUFFICIENTLY ANCHORED IN THE TRENCH TO MAINTAIN THE REQUIRED CONDUIT DEPTH DURING PLACEMENT OF FLOWABLE FILL.
7. LOCATE ALL UNDERGROUND UTILITIES PRIOR TO EXCAVATION. USE EXTREME CAUTION IN THE VICINITY OF BURIED ELECTRIC, GAS, WATER, WASTEWATER, AND STEAM LINES (IF PRESENT).
8. FOLLOW ALL OSHA REQUIREMENTS FOR SLOPING AND SHORING EXCAVATIONS. USE EXTREME CAUTION AGAINST CAVE–INS.
9. USE SCHEDULE 40 PVC CONDUITS FOR ALL DUCT BANK INSTALLATIONS.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CAREFULLY COMPLETING ALL TRANSITIONS BETWEEN DUCTBANK CONFIGURATIONS. TRANSITION AREAS SHALL BE MINIMAL, GENERALLY WITHIN FORTY FEET (40'), AND SPAN EQUALLY EACH SIDE OF COMMON STATION POINT. GRADUAL CHANGES IN ELEVATION AND DIRECTION DUE TO CONTROLLED LONGITUDINAL BENDING OF CONDUIT SHALL NOT EXCEED TWELVE INCHES (12") EVERY TEN FEET (10') WITHOUT PRIOR ENGINEER APPROVAL.
11. BOTTOM OF TRENCH TO BE SMOOTH AND FREE OF LOOSE OR SHARP ROCK AND DEBRIS THAT COULD DAMAGE THE CONDUIT. A TWO (2) INCH FLOWABLE FILL BED SHALL BE POURED IF BOTTOM IS ROCKY OR LEVELING IS REQUIRED.
12. ALL DIMENSIONS SHOWN ON THIS SHEET ARE MINIMUM. CONTRACTOR SHALL ACCOUNT FOR ADDITIONAL WIDTH AND DEPTH OF TRENCH REQUIRED FOR CONSTRUCTION METHODS.
13. FOUR (4) 1 1/4" INNER DUCT CONDUITS SHALL BE FACTORY INSTALLED IN ONE 4" SCHEDULE 40 ELECTRICAL FIBER OPTIC (EF) CONDUIT.
14. CONTRACTOR TO INSTALL 1–#5 REBAR LONGITUDINALLY AT EACH CORNER OF DUCTBANK AT ALL ROAD CROSSINGS AND WHERE ADDITIONAL STABILITY OF DUCTBANK MAY BE REQUIRED. ENCASEMENT COVER AROUND REINFORCING REBAR SHALL BE THREE INCHES (3") MINIMUM. TOTAL OF FOUR (4) TYPICAL UNLESS OTHERWISE SPECIFIED.
15. INSTALL HOLD–DOWN BARS A MAXIMUM OF EVERY 10'–0" LONGITUDINALLY, GENERALLY 5'–0" FROM EACH 20'–0" CONDUIT END. MAINTAIN MINIMUM CONDUIT DEPTH DURING PLACEMENT OF FLOWABLE FILL. EACH HOLD–DOWN BAR ASSEMBLY SHALL USE TWO (2) OR MORE #3 OR #4 REBAR STAKES ANCHORED IN TRENCH BOTTOM. REBAR STAKES SHALL EXTEND THROUGH ALL LEVELS OF DUCTBANK, FLUSH WITH TOP OF FINAL ENCASEMENT. INSTALL REBAR COVERS AS REQUIRED BY N.C.D.O.T.
16. THE SUM OF ALL BENDS/SWEEPS/GRADUAL CHANGES IN INDIVIDUAL CONDUIT SHALL NOT EXCEED 270° BETWEEN EXPOSED ENDS WITHOUT PRIOR ENGINEER APPROVAL. MANUFACTURED SWEEPS/ELBOWS SHALL HAVE A RADIUS OF NO LESS THAN SIXTY INCHES (60") FOR TRANSMISSION ELECTRIC POWER (TEP) AND FORTY–EIGHT INCHES (48") FOR ALL OTHER CONDUITS.
17. 3,000 PSI CONCRETE SHALL BE USED IN LIEU OF FLOWABLE FILL WHEN DUCTBANK/CONDUITS ARE TO CROSS BENEATH A PROPOSED RETAINING WALL. THE CONTRACTOR SHALL ENSURE PROPER COORDINATION WITH WALL CONSTRUCTION AT ALL TIMES. THE WALL FOUNDATION SHALL BE SUITABLY SUPPORTED TO PREVENT A TRANSFER OF LOAD CAUSING PERMANENT DAMAGE TO THE CONDUIT.

LEGEND:

- (C) CATV
- (T) TELEPHONE
- (L) LIGHTING
- (EF) ELECTRIC FIBER OPTIC
- (EP1) 15 kV DISTRIBUTION ELECTRIC POWER – 600A MAIN FEEDER
- (EP2) 15 kV DISTRIBUTION ELECTRIC POWER – 200A SUB–FEEDER
- (TEP) 100 kV TRANSMISSION ELECTRIC POWER
- 500 PSI FLOWABLE FILL (UNLESS OTHERWISE NOTED)

NORTH CAROLINA PROFESSIONAL SEAL 035029 ENGINEER WILLIAM P. JORDAN

09-23-2011

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1706991CD

NO.	REVISIONS	DATE
1	ISSUE FOR CONSTRUCTION REVISED	01/31/11
2	ISSUE FOR CONSTRUCTION REVISED	03/25/11
3	ISSUE FOR CONSTRUCTION REVISED	09/19/11

BLUE RIDGE ELECTRIC MEMBERSHIP CORPORATION
LENOIR, NORTH CAROLINA

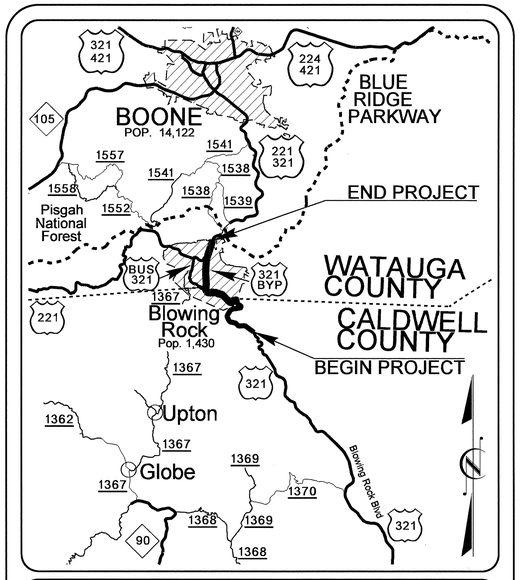
ELECTRIC UTILITY RELOCATIONS FOR THE US 321 IMPROVEMENTS FROM SR 1632 (POSSUM HOLLOW RD) TO SR 1534 (GREEN HILL RD)
N.C.D.O.T. PROJECT 34402.2.5 (R–2237C)
CONSTRUCTION DETAILS
(WATAUGA COUNTY)

Booth&Associates Inc.
1011 Schaub Drive | Raleigh, NC 27606 CONSULTING ENGINEERS NC F-0221

DWN. BDE/GQJ	DATE 01/31/11	DWG. NO.
CKD. JBW	APPD. WPJ	170–6991
SCALE: NONE		CD 6 OF 6

T.I.P. NO.	SHEET NO.
R-2237C	UO-1

TIP PROJECT: R-2237C



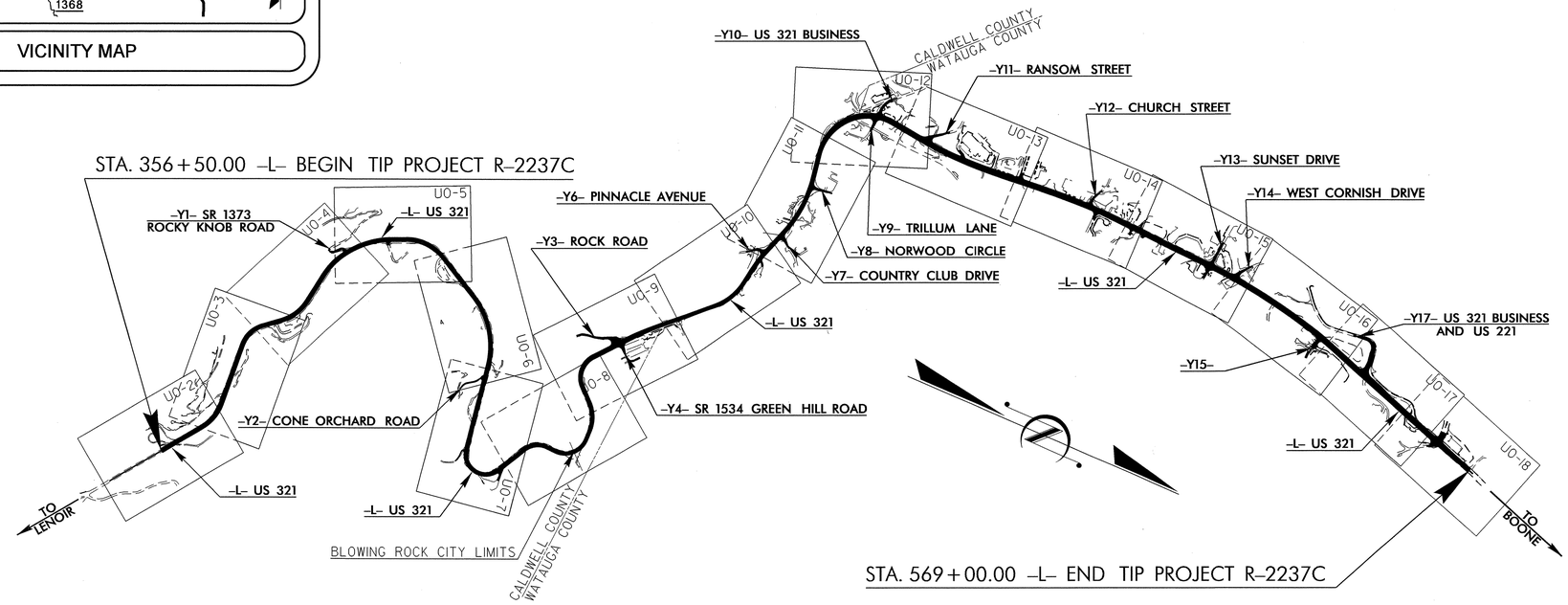
VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

UTILITIES BY OTHERS PLANS
WATAUGA COUNTY

LOCATION: US 321 FROM SR 1500 (BLACKBERRY ROAD) TO US 221 AT BLOWING ROCK

TYPE OF WORK: UTILITIES BY OTHERS



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-18	UTILITY BY OTHERS PLAN SHEETS

UTILITY OWNERS ON PROJECT

(1) BLUE RIDGE EMC - POWER DIST.
(2) BLUE RIDGE EMC - POWER TRANS.
(3) AT&T COMMUNICATIONS - TELEPHONE
(4) CHARTER COMMUNICATIONS - CATV

PREPARED IN THE OFFICE OF:
DIVISION OF HIGHWAYS
UTILITIES ENGINEERING
SECTION
1555 MAIL SERVICES CENTER
RALEIGH NC 27699-1555
PHONE (919) 250-4128
FAX (919) 250-4119

Roger Worthington, P.E. UTILITIES SECTION ENGINEER
R.B. WILKINS, P.E. UTILITIES SQUAD LEADER PROJECT ENGINEER
MICHAEL R. BRIGHT UTILITIES PROJECT DESIGNER

09/08/99
02-MAR-2011 15:39
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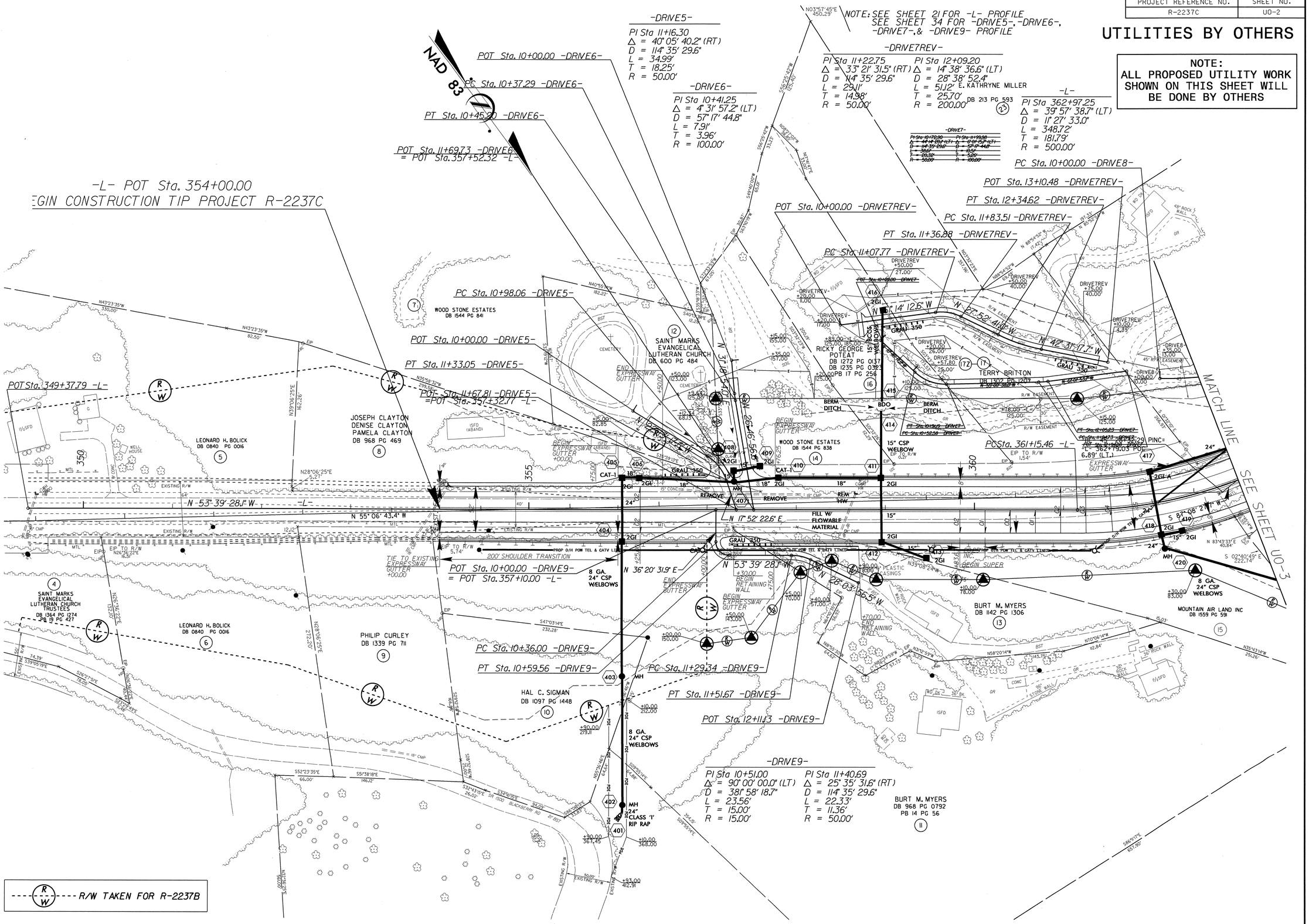
PROJECT REFERENCE NO.	SHEET NO.
R-2237C	U0-2

UTILITIES BY OTHERS

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

NOTE: SEE SHEET 21 FOR -L- PROFILE
SEE SHEET 34 FOR -DRIVE5-, -DRIVE6-, -DRIVE7-, & -DRIVE9- PROFILE



5/14/99

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PROJECT REFERENCE NO.	SHEET NO.
R-2237C	U0-3

NOTE: SEE SHEETS 21 & 22 FOR -L- PROFILE
SEE SHEET 34 FOR -DRIVE8- PROFILE

UTILITIES BY OTHERS

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

-DRIVE8-

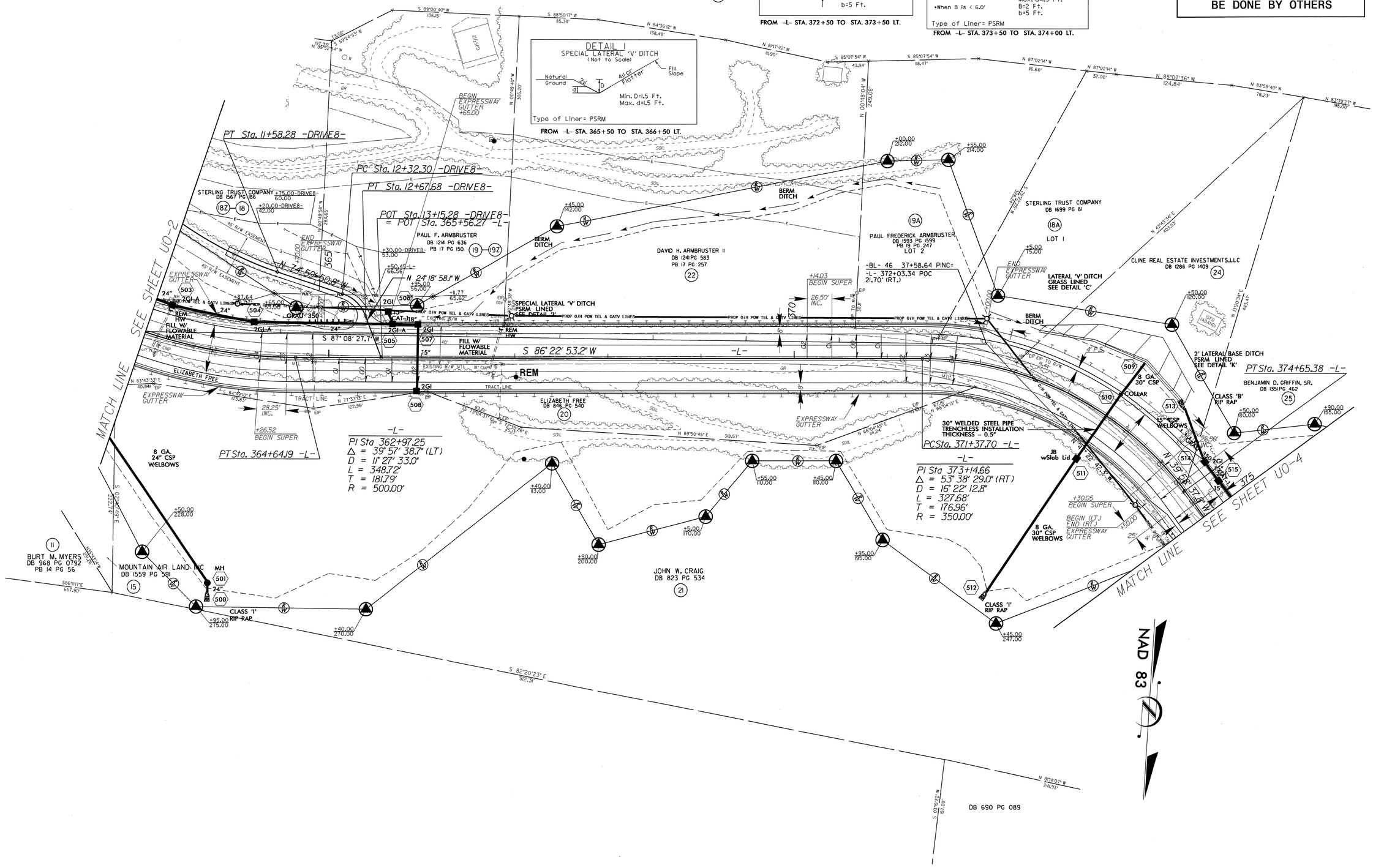
PI Sta 10+80.19
Δ = 22° 40' 18.7" (LT)
D = 14° 19' 26.2"
L = 158.28'
T = 80.19'
R = 400.00'

PI Sta 12+51.24
Δ = 50° 40' 52.7" (RT)
D = 143° 14' 22.0"
L = 35.38'
T = 18.94'
R = 40.00'

DETAIL C
LATERAL 'V' DITCH
(Not to Scale)
Natural Ground, 2:1, D, 2:1, b, 1'/Ft., Fill Slope
Min. D=1.5 Ft.
b=5 Ft.
FROM -L- STA. 372+50 TO STA. 373+50 LT.

DETAIL K
LATERAL BASE DITCH
(Not to Scale)
Natural Ground, 2:1, d, D, 2:1, B, b, 1'/Ft., Fill Slope
Min. D=1.5 Ft.
Max. d=1.5 Ft.
B=2 Ft.
b=5 Ft.
*When B is < 6.0'
Type of Liner= PSRM
FROM -L- STA. 373+50 TO STA. 374+00 LT.

DETAIL I
SPECIAL LATERAL 'V' DITCH
(Not to Scale)
Natural Ground, 2:1, D, d, 4:1 or Flatter, Fill Slope
Min. D=1.5 Ft.
Max. d=1.5 Ft.
Type of Liner= PSRM
FROM -L- STA. 365+50 TO STA. 366+50 LT.

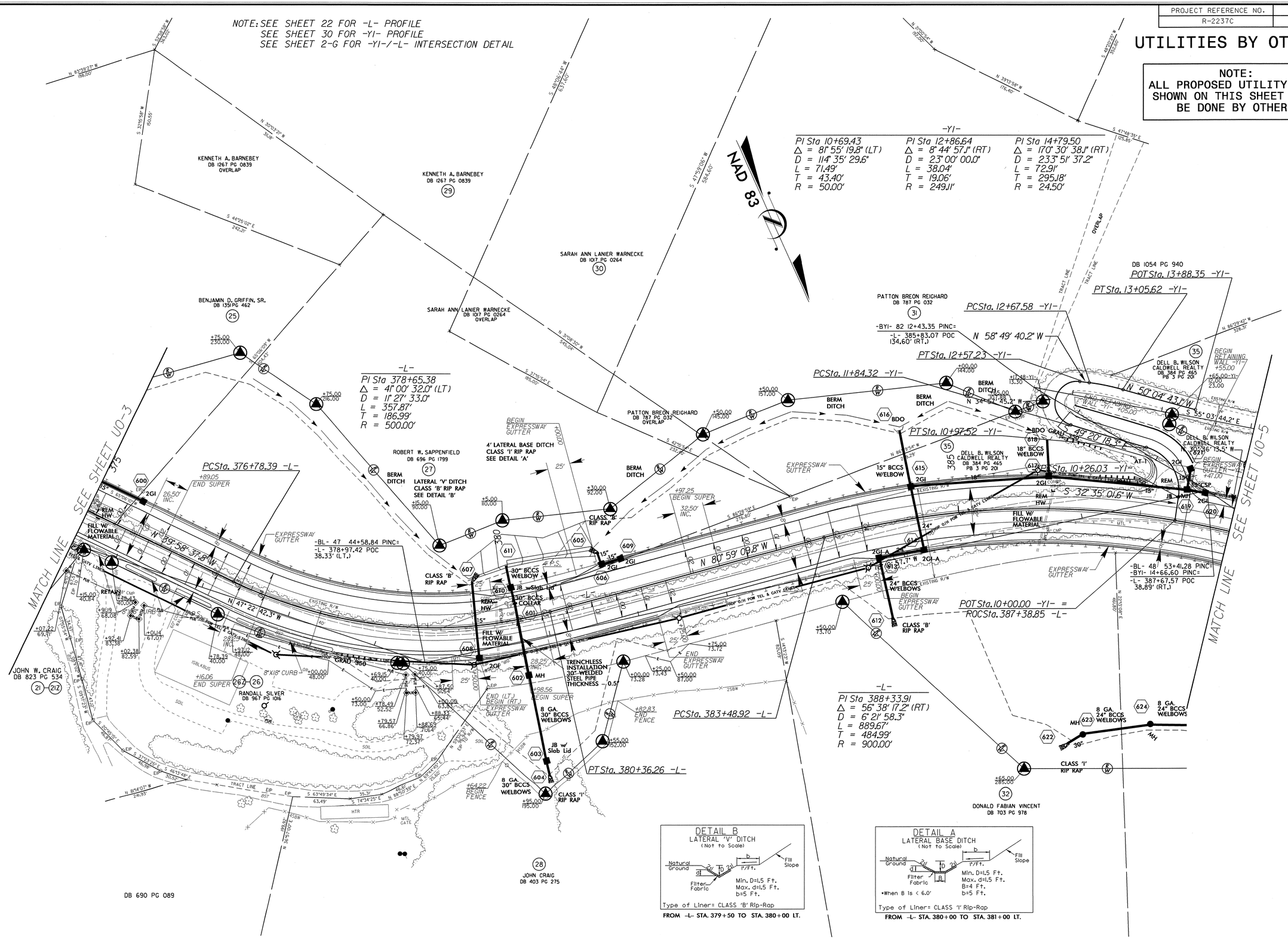


PROJECT REFERENCE NO.	SHEET NO.
R-2237C	U0-4

UTILITIES BY OTHERS

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

NOTE: SEE SHEET 22 FOR -L- PROFILE
SEE SHEET 30 FOR -Y1- PROFILE
SEE SHEET 2-G FOR -Y1-/-L- INTERSECTION DETAIL



FROM -L- STA. 379+50 TO STA. 380+00 LT.

FROM -L- STA. 380+00 TO STA. 381+00 LT.

5/14/99

04-MAR-2011 10:30
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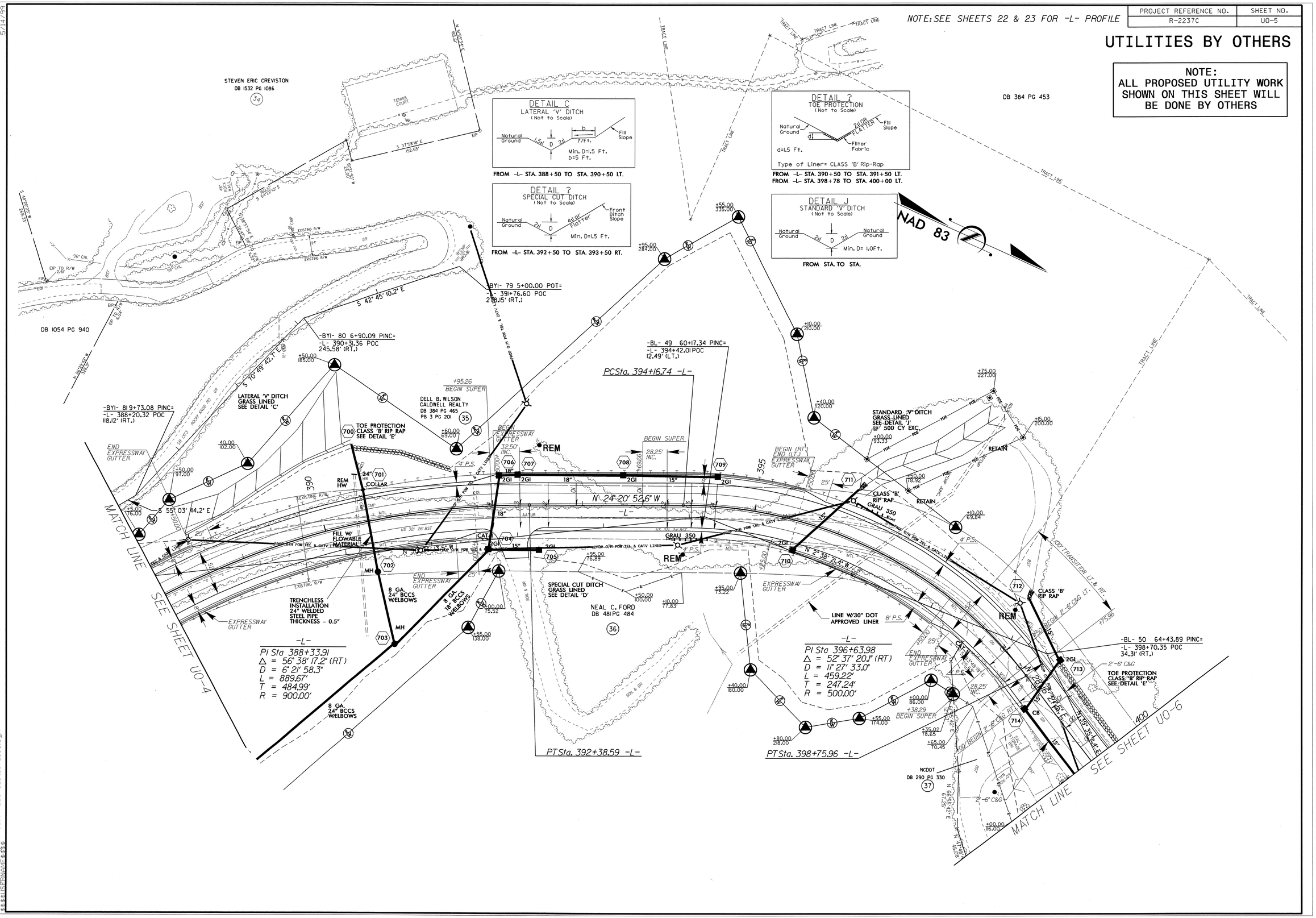
PROJECT REFERENCE NO.	SHEET NO.
R-2237C	U0-5

NOTE: SEE SHEETS 22 & 23 FOR -L- PROFILE

UTILITIES BY OTHERS

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



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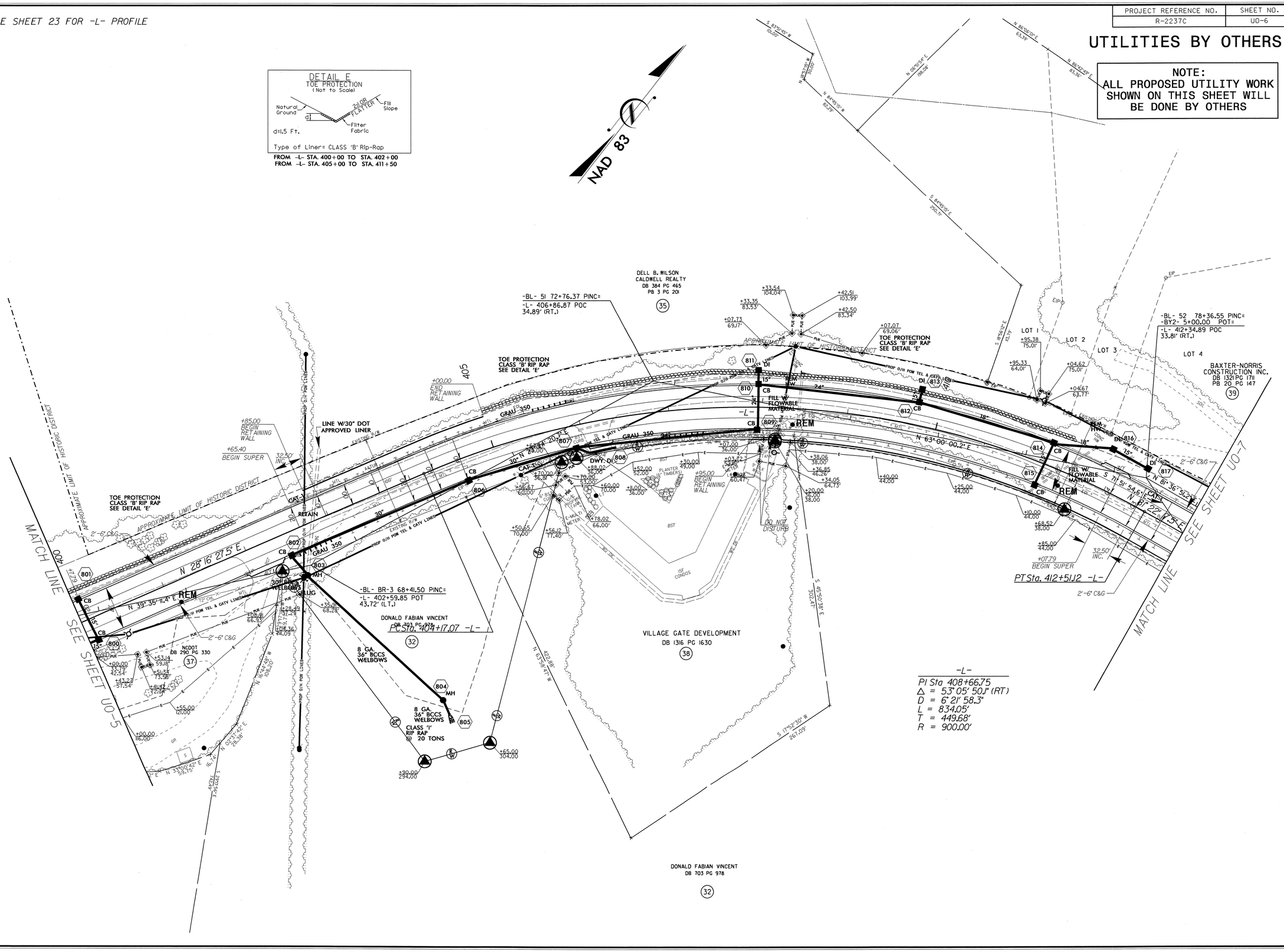
PROJECT REFERENCE NO.	SHEET NO.
R-2237C	U0-6

UTILITIES BY OTHERS

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

NOTE: SEE SHEET 23 FOR -L- PROFILE



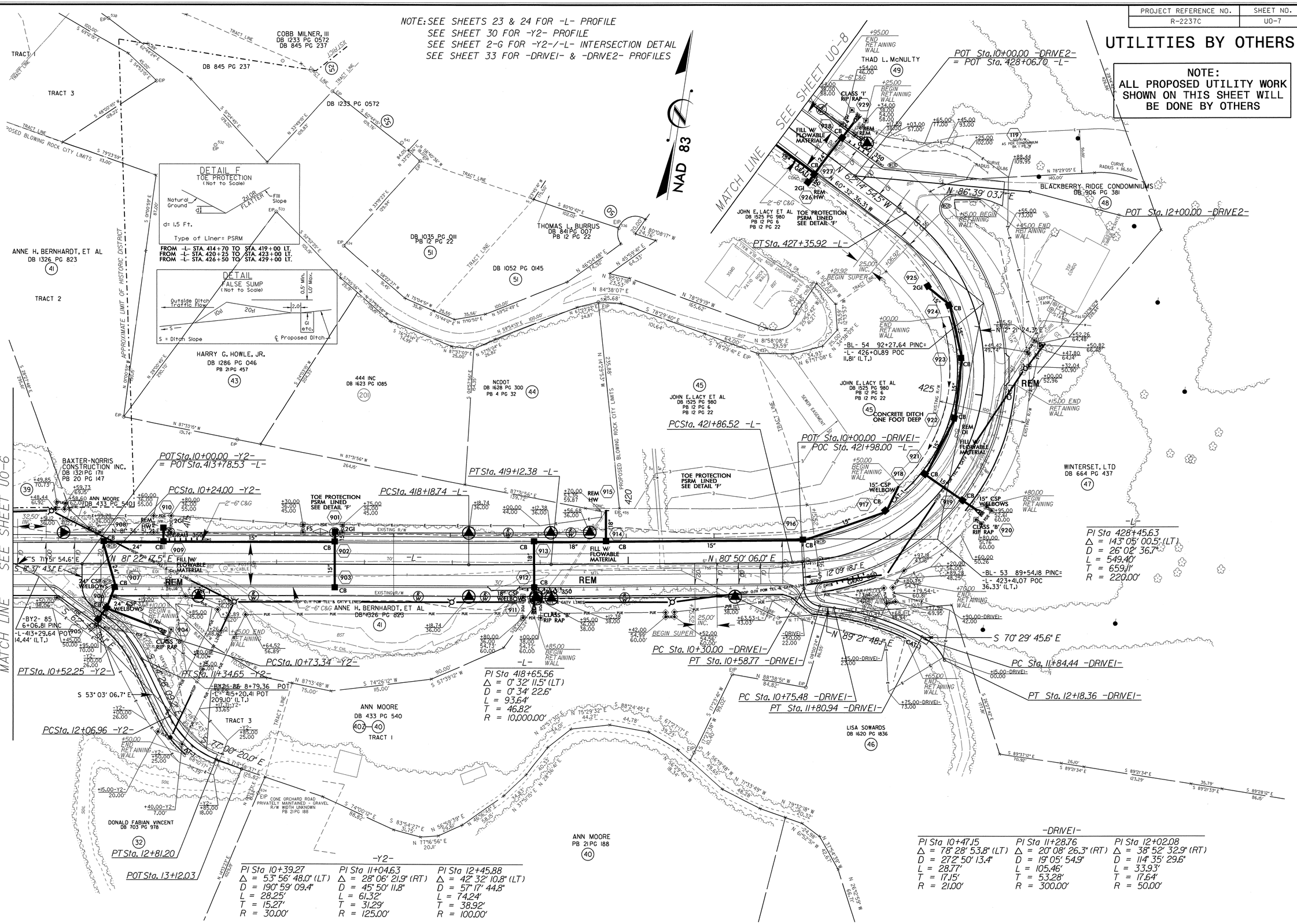
5/14/99
04-MAR-2011 10:31
\\Utilities\RDU_UTP-Fol\Conduit\r-2237c_ut_08_u06.dgn
$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
R-2237C	U0-7

UTILITIES BY OTHERS

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

NOTE: SEE SHEETS 23 & 24 FOR -L- PROFILE
SEE SHEET 30 FOR -Y2- PROFILE
SEE SHEET 2-G FOR -Y2-/-L- INTERSECTION DETAIL
SEE SHEET 33 FOR -DRIVE1- & -DRIVE2- PROFILES



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04-MAR-2011 10:31
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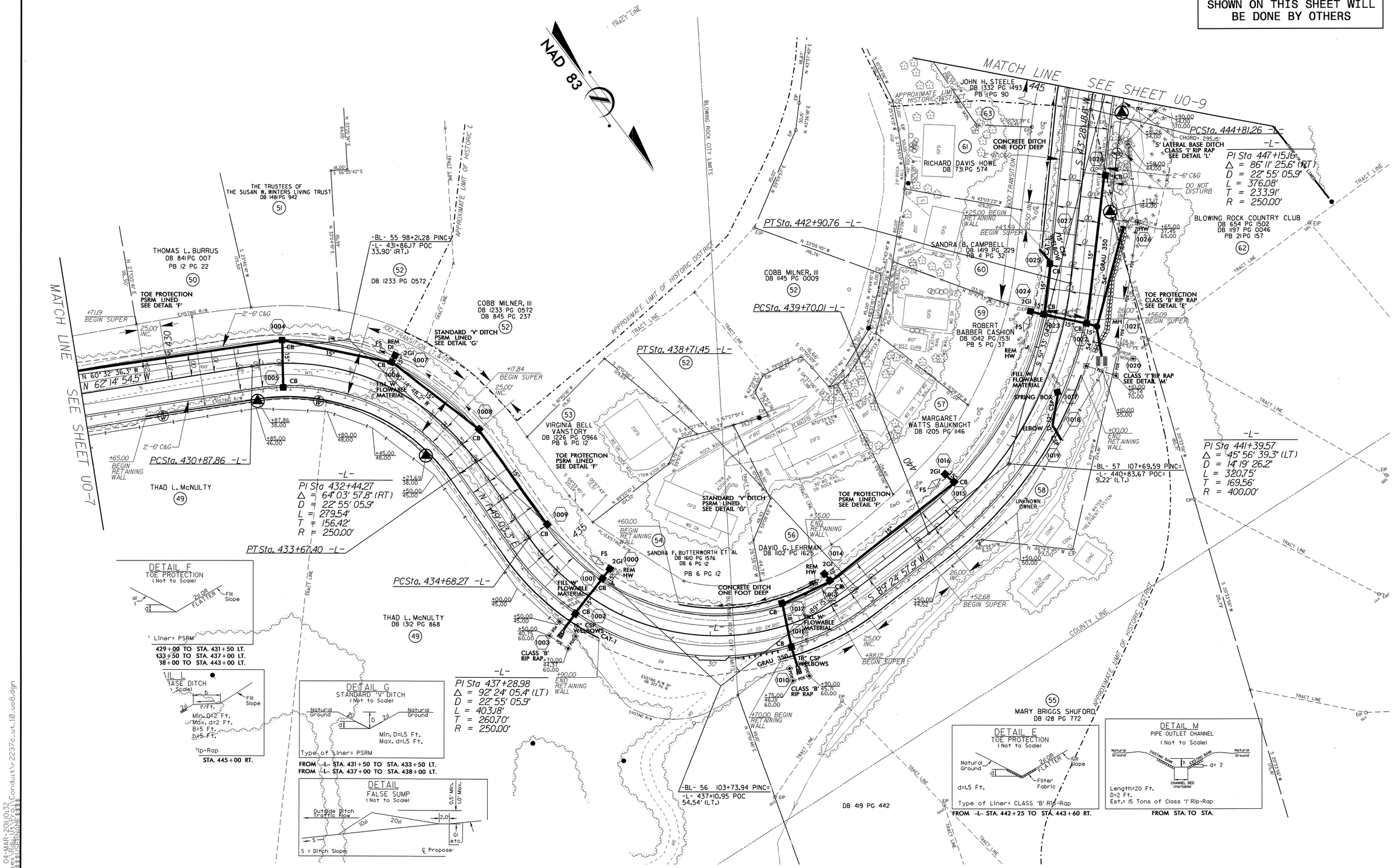
PROJECT REFERENCE NO.	SHEET NO.
R-2237C	U0-8

NOTE: SEE SHEETS 24 & 25 FOR -L- PROFILE

UTILITIES BY OTHERS

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



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04-MAR-2011 0:32
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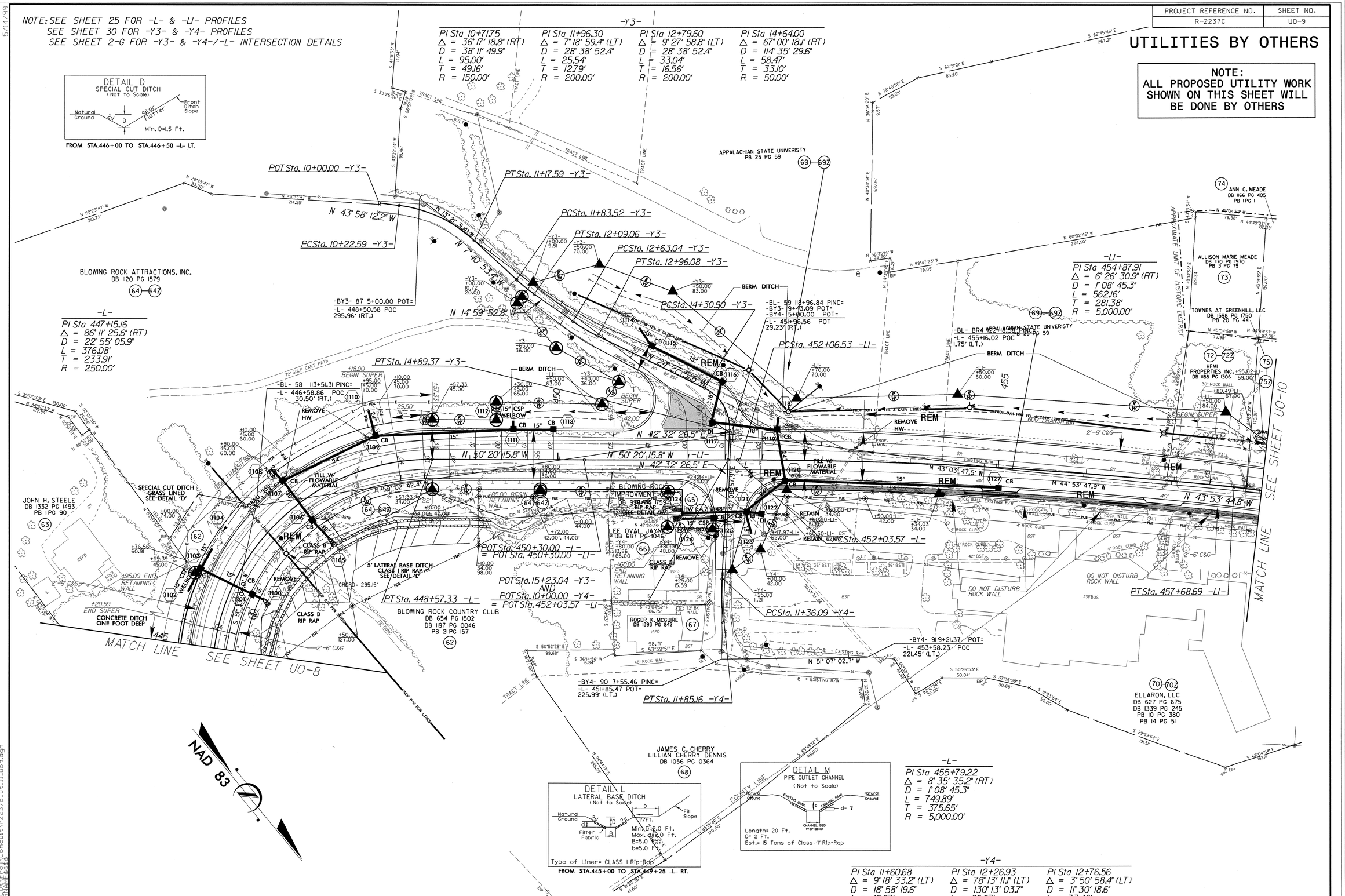
$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
R-2237C	U0-9

UTILITIES BY OTHERS

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

NOTE: SEE SHEET 25 FOR -L- & -LI- PROFILES
SEE SHEET 30 FOR -Y3- & -Y4- PROFILES
SEE SHEET 2-G FOR -Y3- & -Y4-/-L- INTERSECTION DETAILS



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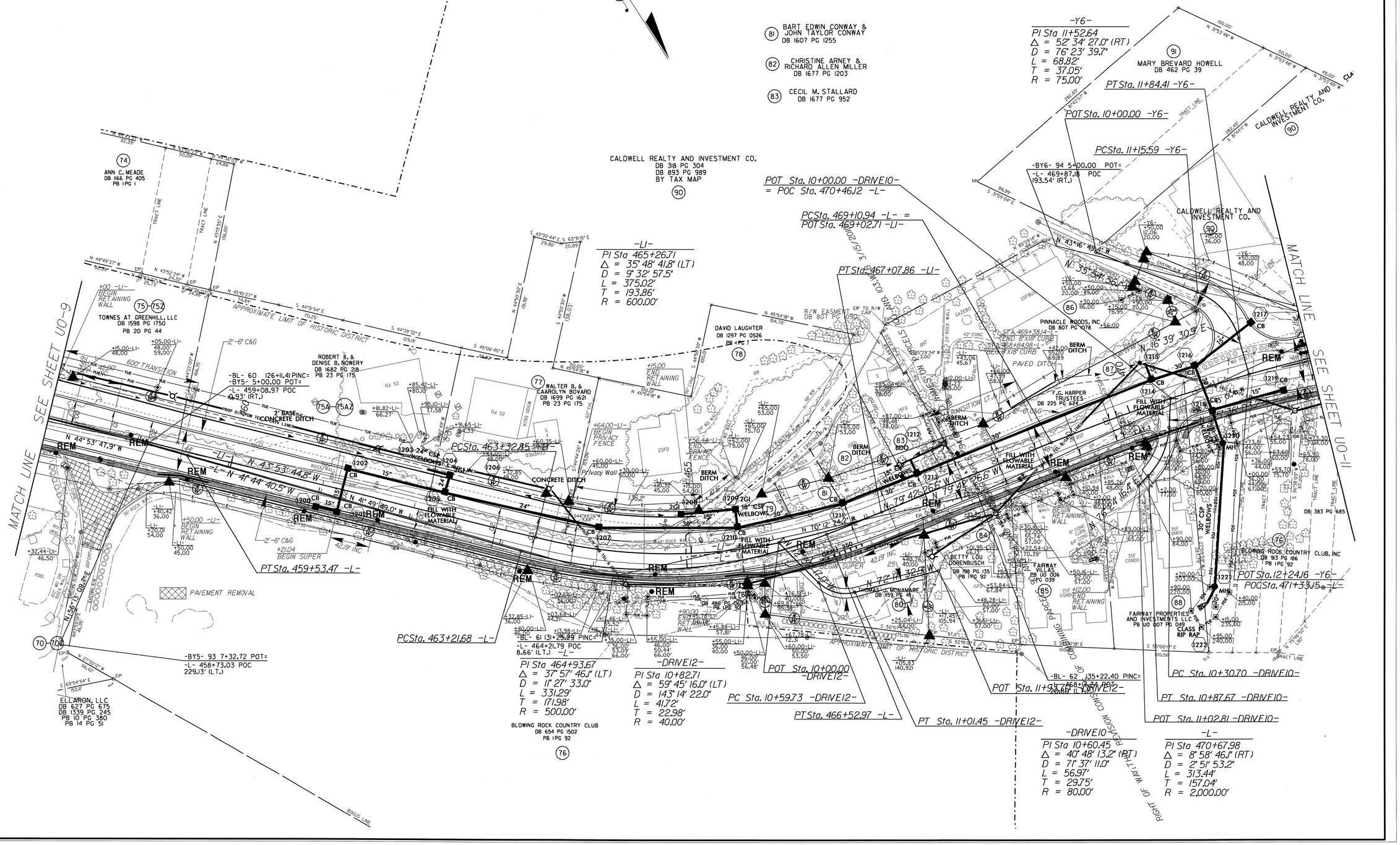
$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
R-2237C	U0-10

UTILITIES BY OTHERS

NOTE: SEE SHEETS 25 & 26 FOR -L- & -LI- PROFILES
SEE SHEET 30 FOR -Y6- PROFILE
SEE SHEET 34 FOR -DRIVE10- PROFILE
SEE SHEET 2-G FOR -Y6-/-L- INTERSECTION DETAIL

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



04-MAR-2011 10:33
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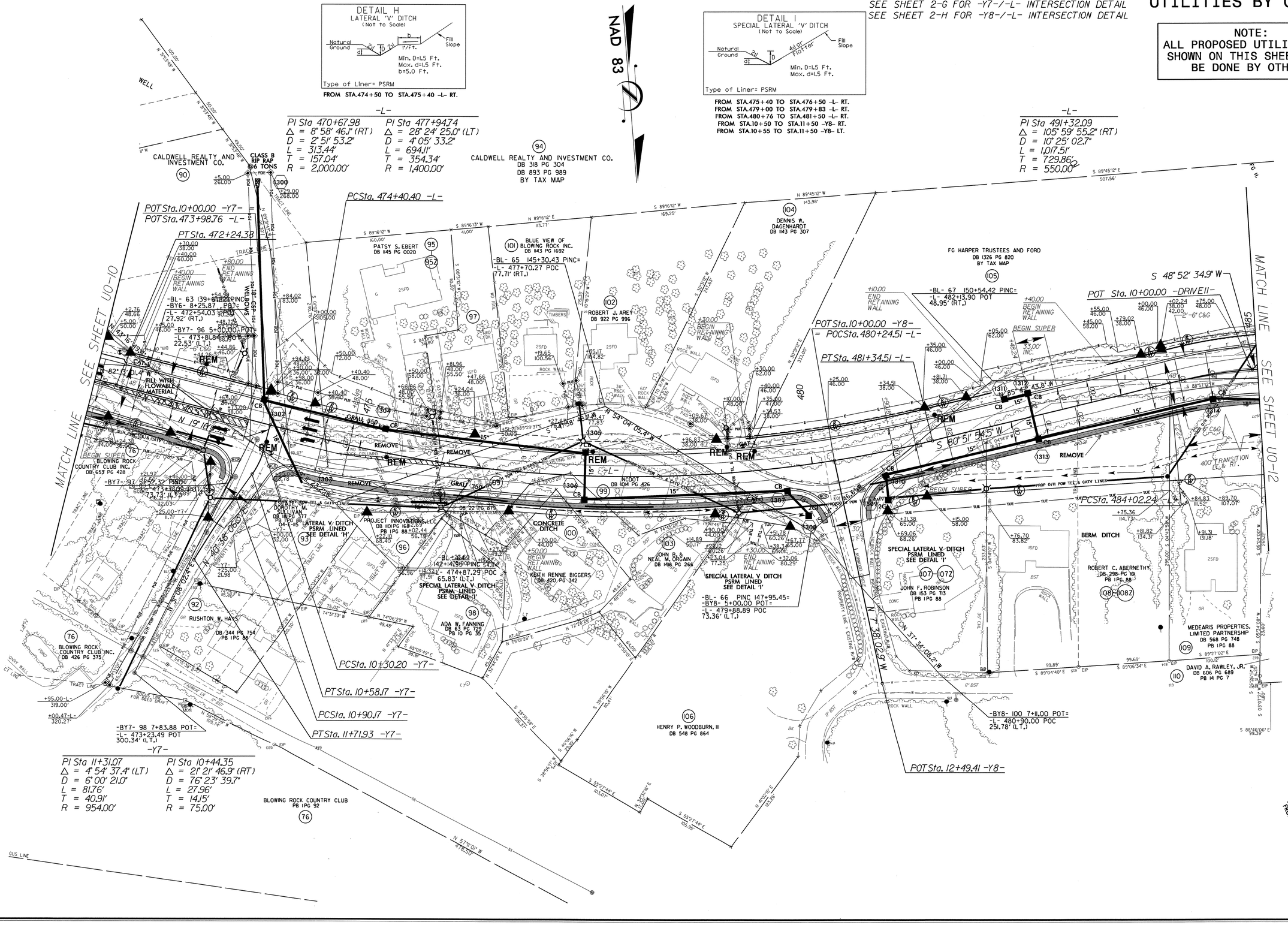
5/14/99

PROJECT REFERENCE NO.	SHEET NO.
R-2237C	U0-11

UTILITIES BY OTHERS

NOTE: SEE SHEET 26 FOR -L- PROFILE
SEE SHEET 31 FOR -Y7- & -Y8- PROFILES
SEE SHEET 2-G FOR -Y7-/-L- INTERSECTION DETAIL
SEE SHEET 2-H FOR -Y8-/-L- INTERSECTION DETAIL

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



PROJECT REFERENCE NO.	SHEET NO.
R-2237C	U0-12

UTILITIES BY OTHERS

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

NOTE: SEE SHEETS 26 & 27 FOR -L- PROFILE
SEE SHEET 31 FOR -Y9- & -Y10- PROFILES
SEE SHEET 2-H FOR -Y9- & -Y10-/-L- INTERSECTION DETAILS

-Y10REV-
PI Sta 2+15.10
Δ = 51° 08' 17.8" (LT)
D = 33° 42' 12.2"
L = 151.73'
T = [illegible] 34'
R = [illegible]

~~-Y10-~~
~~PI Sta 11+48.58~~
~~Δ = 42° 50' 45.9" (LT)~~
~~D = 26° 38' 57.1"~~
~~L = 160.78'~~
~~T = 84.36'~~
~~R = 215.00'~~

~~PCSta. 10+64.22 -Y10-~~

PC Sta. 11+33.76 -Y10REV-

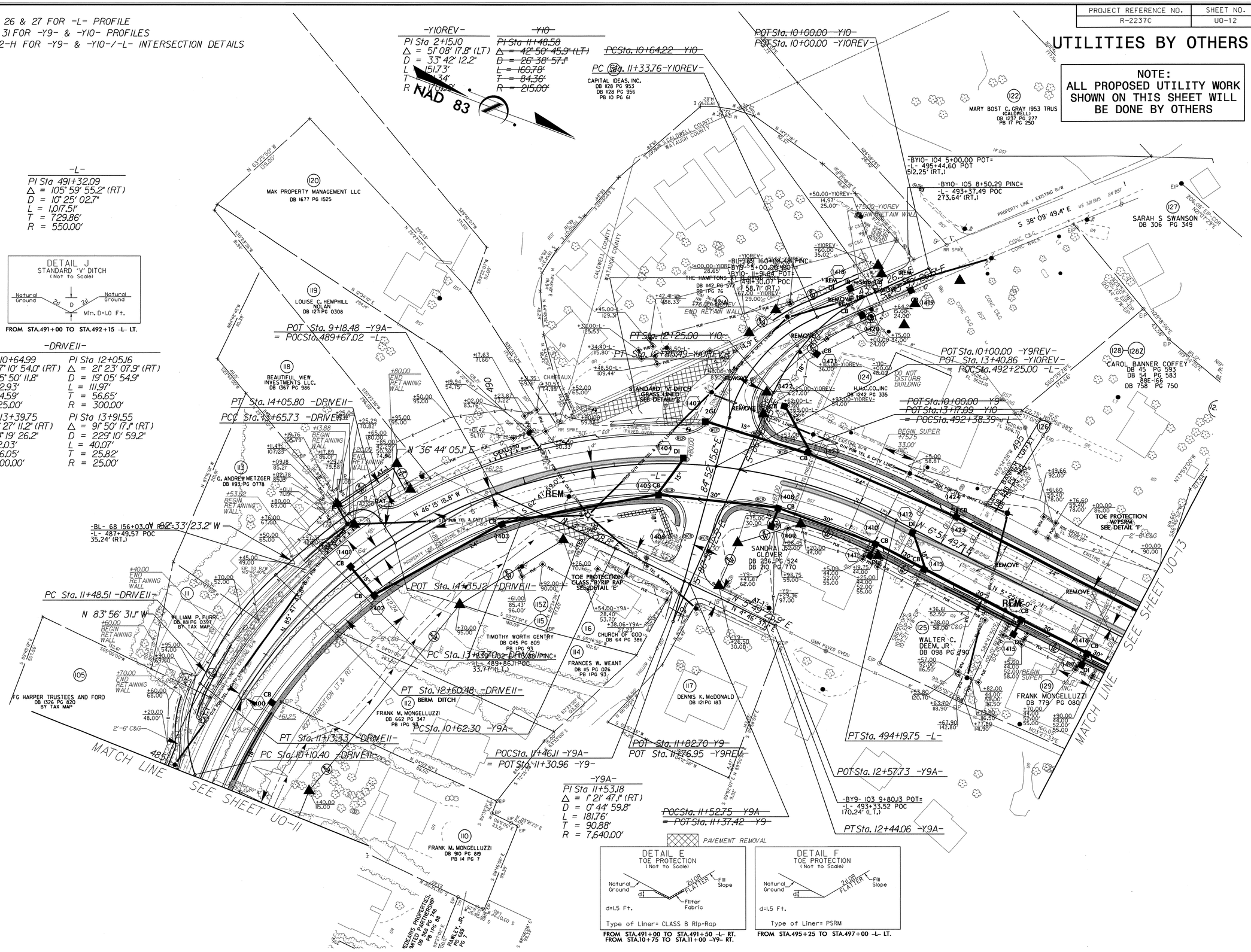
~~POT Sta. 10+00.00 -Y10-~~
POT Sta. 10+00.00 -Y10REV-

-L-
PI Sta 491+32.09
Δ = 105° 59' 55.2" (RT)
D = 10° 25' 02.7"
L = 1,017.51'
T = 729.86'
R = 550.00'

DETAIL J
STANDARD 'V' DITCH
(Not to Scale)
Natural Ground, 2:1, D, 2:1, Natural Ground
Min. D=1.0 Ft.
FROM STA.491+00 TO STA.492+15 -L- LT.

-DRIVE11-

PI Sta 10+64.99	PI Sta 12+05.16
Δ = 47° 10' 54.0" (RT)	Δ = 21° 23' 07.9" (RT)
D = 45° 50' 11.8"	D = 19° 05' 54.9"
L = 102.93'	L = 111.97'
T = 54.59'	T = 56.65'
R = 125.00'	R = 300.00'
PI Sta 13+39.75	PI Sta 13+91.55
Δ = 7° 27' 11.2" (RT)	Δ = 91° 50' 17.1" (RT)
D = 14° 19' 26.2"	D = 229° 10' 59.2"
L = 52.03'	L = 40.07'
T = 26.05'	T = 25.82'
R = 400.00'	R = 25.00'



-Y9A-
PI Sta 11+53.18
Δ = 1° 21' 47.1" (RT)
D = 0° 44' 59.8"
L = 181.76'
T = 90.88'
R = 7,640.00'

~~POCSta. 11+52.75 -Y9A-~~
~~= POT Sta. 11+37.42 -Y9-~~

DETAIL E
TOE PROTECTION
(Not to Scale)
Natural Ground, d, 2:1 OR FLATTER, Fill Slope, Filter Fabric
d=1.5 Ft.
Type of Liner= CLASS B Rip-Rap
FROM STA.491+00 TO STA.491+50 -L- RT.
FROM STA.10+75 TO STA.11+00 -Y9- RT.

DETAIL F
TOE PROTECTION
(Not to Scale)
Natural Ground, d, 2:1 OR FLATTER, Fill Slope
d=1.5 Ft.
Type of Liner= PSRM
FROM STA.495+25 TO STA.497+00 -L- LT.

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$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
R-2237C	U0-13

UTILITIES BY OTHERS

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

NOTE: SEE SHEET 27 FOR -L- PROFILE
SEE SHEET 31 FOR -Y11- PROFILE
SEE SHEET 2-H FOR -Y11-/-L- INTERSECTION DETAIL
SEE SHEET 33 FOR -DRIVE3- PROFILE

-Y11-

PI Sta 11+24.62
Δ = 3° 48' 59.4" (RT)
D = 4° 00' 24.1"
L = 95.25'
T = 47.64'
R = 1,430.00'

PI Sta 12+47.21
Δ = 49° 42' 41.5" (LT)
D = 114° 35' 29.6"
L = 43.38'
T = 23.16'
R = 50.00'

-DRIVE3-

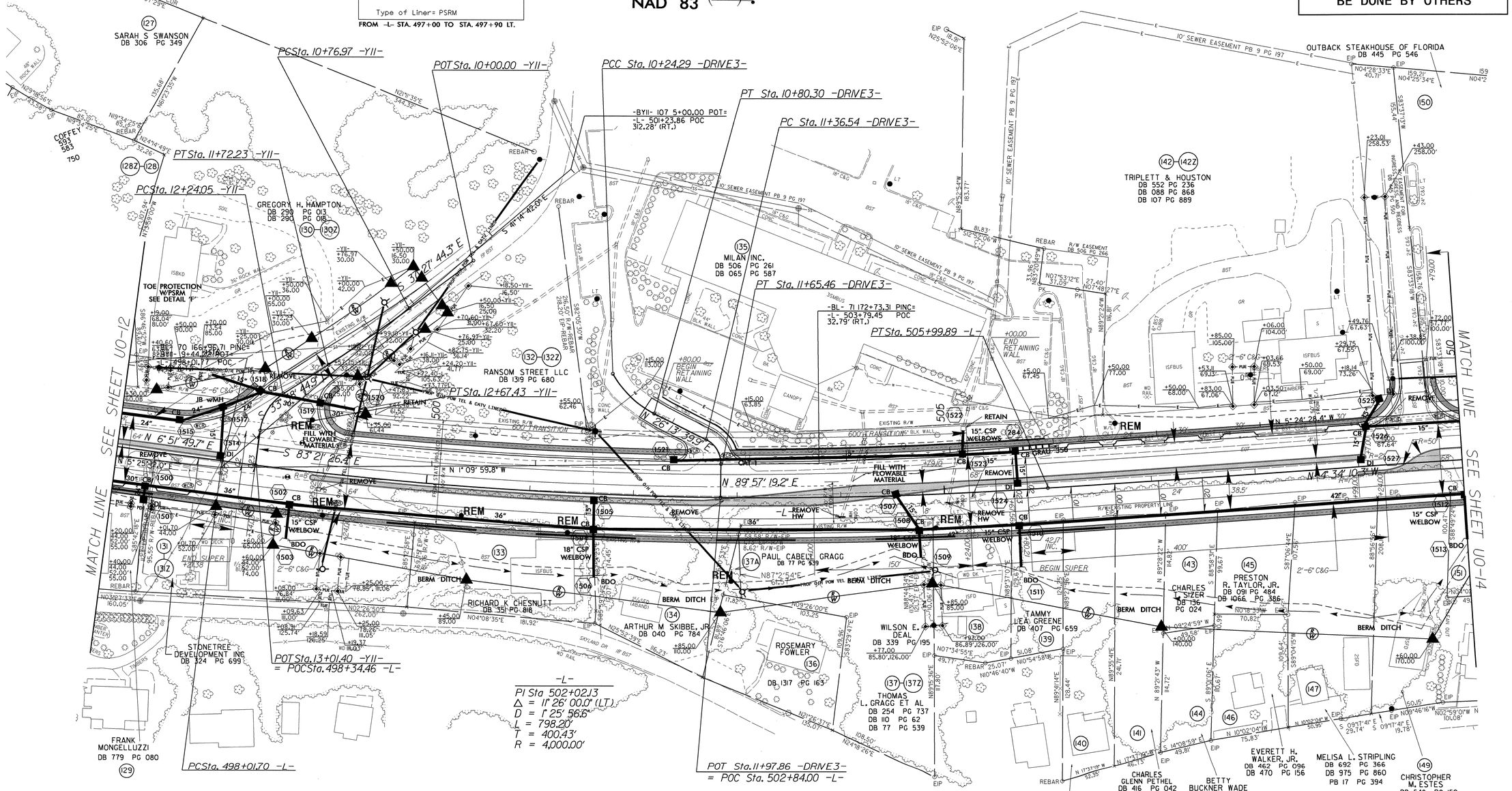
PI Sta 10+14.25
Δ = 75° 13' 19.2" (LT)
D = 309° 42' 24.9"
L = 24.29'
T = 14.25'
R = 18.50'

PI Sta 10+53.14
Δ = 33° 46' 59.3" (LT)
D = 60° 18' 40.8"
L = 56.01'
T = 28.85'
R = 95.00'

PI Sta 11+52.71
Δ = 63° 43' 39.3" (RT)
D = 220° 22' 06.2"
L = 28.92'
T = 16.16'
R = 26.00'

DETAIL F
TOE PROTECTION
(Not to Scale)
Natural Ground
d
2:1 OR FLATTER
Fill Slope
d=1.5 Ft.
Type of Liner= PSRM
FROM -L- STA. 497+00 TO STA. 497+90 LT.

NAD 83



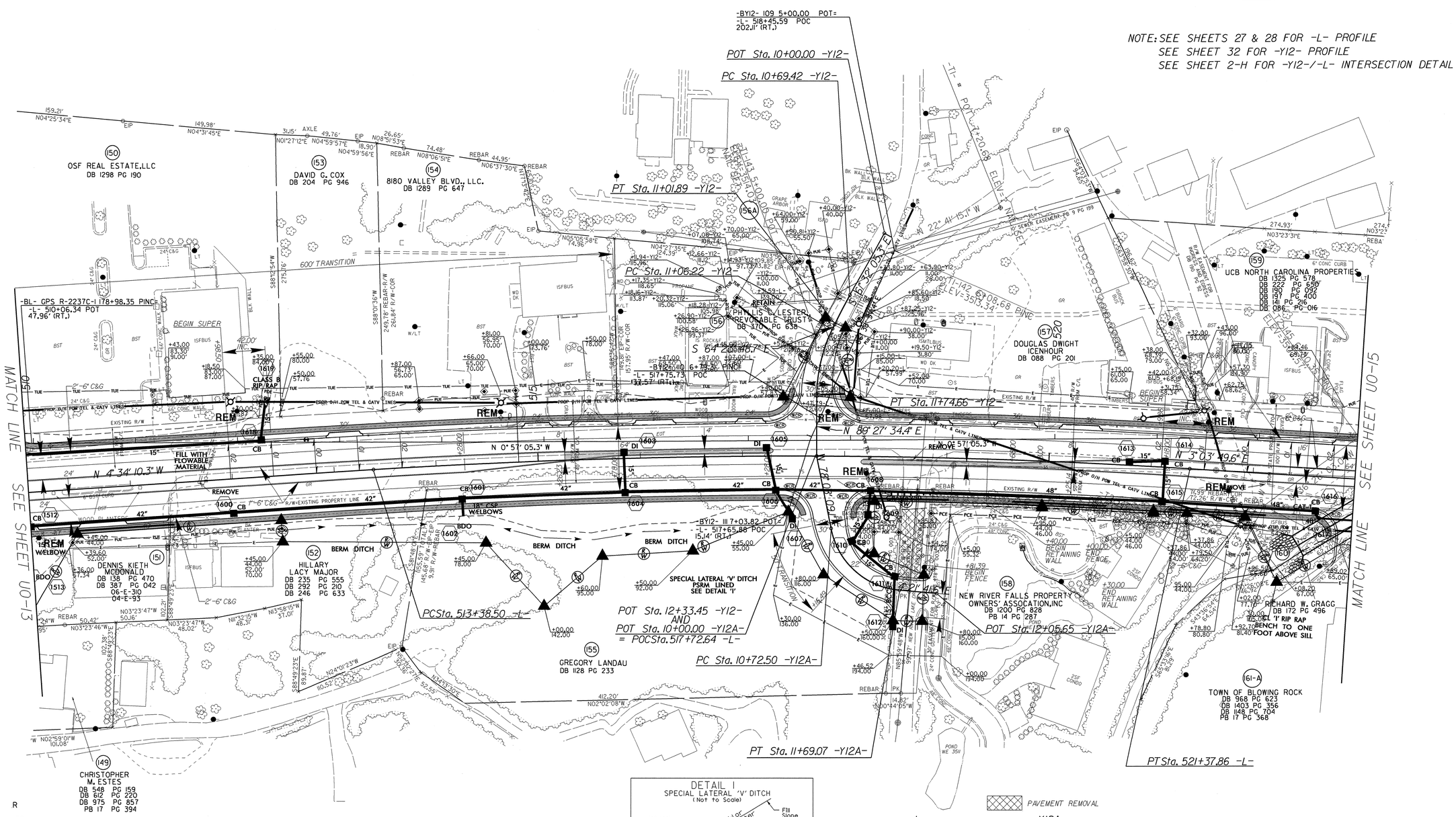
PROJECT REFERENCE NO.	SHEET NO.
R-2237C	U0-14

UTILITIES BY OTHERS

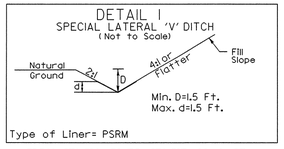
NOTE:
ALL PROPOSED UTILITY WORK SHOWN ON THIS SHEET WILL BE DONE BY OTHERS

NOTE: SEE SHEETS 27 & 28 FOR -L- PROFILE
SEE SHEET 32 FOR -Y12- PROFILE
SEE SHEET 2-H FOR -Y12-/-L- INTERSECTION DETAIL

NAD 83



DETAIL I
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



Type of Liner= PSRM

FROM STA.516+50 TO STA.517+00 -L- RT.

-L-

PI Sta 517+38.77
Δ = 7° 37' 59.8" (RT)
D = 0° 57' 17.7"
L = 799.36'
T = 400.27'
R = 6,000.00'

-Y12A-

PI Sta 11+28.78
Δ = 73° 46' 27.5" (LT)
D = 76° 23' 39.7"
L = 96.57'
T = 56.29'
R = 75.00'

PAVEMENT REMOVAL

5/14/99

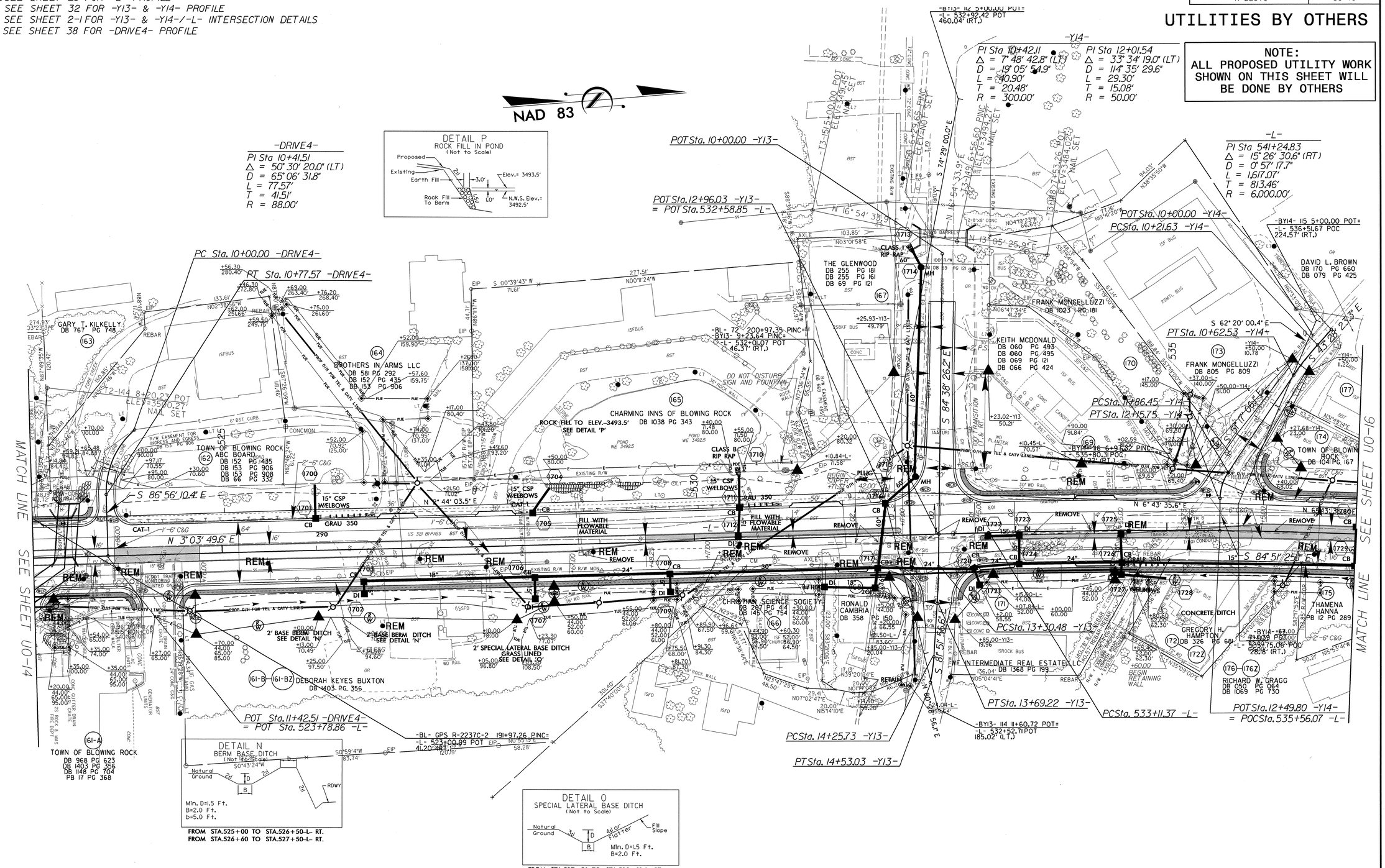
04-MAR-2011 10:35
Utilities\Rdwy\Utl(Proj)\Conduit\r2237c_ut_16_uo14.dgn
$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
R-2237C	U0-15

UTILITIES BY OTHERS

NOTE: SEE SHEET 28 FOR -L- PROFILE
SEE SHEET 32 FOR -Y13- & -Y14- PROFILE
SEE SHEET 2-1 FOR -Y13- & -Y14-/-L- INTERSECTION DETAILS
SEE SHEET 38 FOR -DRIVE4- PROFILE

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



-Y13-

PI Sta 13+49.85
Δ = 2° 46' 29.6" (RT)
D = 7° 09' 43.1"
L = 38.74'
T = 19.38'
R = 800.00'

PI Sta 14+39.41
Δ = 8° 41' 22.5" (RT)
D = 31° 49' 51.6"
L = 27.30'
T = 13.68'
R = 180.00'

5/14/99

04-MAR-2011 10:36
\Utilities\Proj\Conduit\r-2237c_ut_17_u015.dgn
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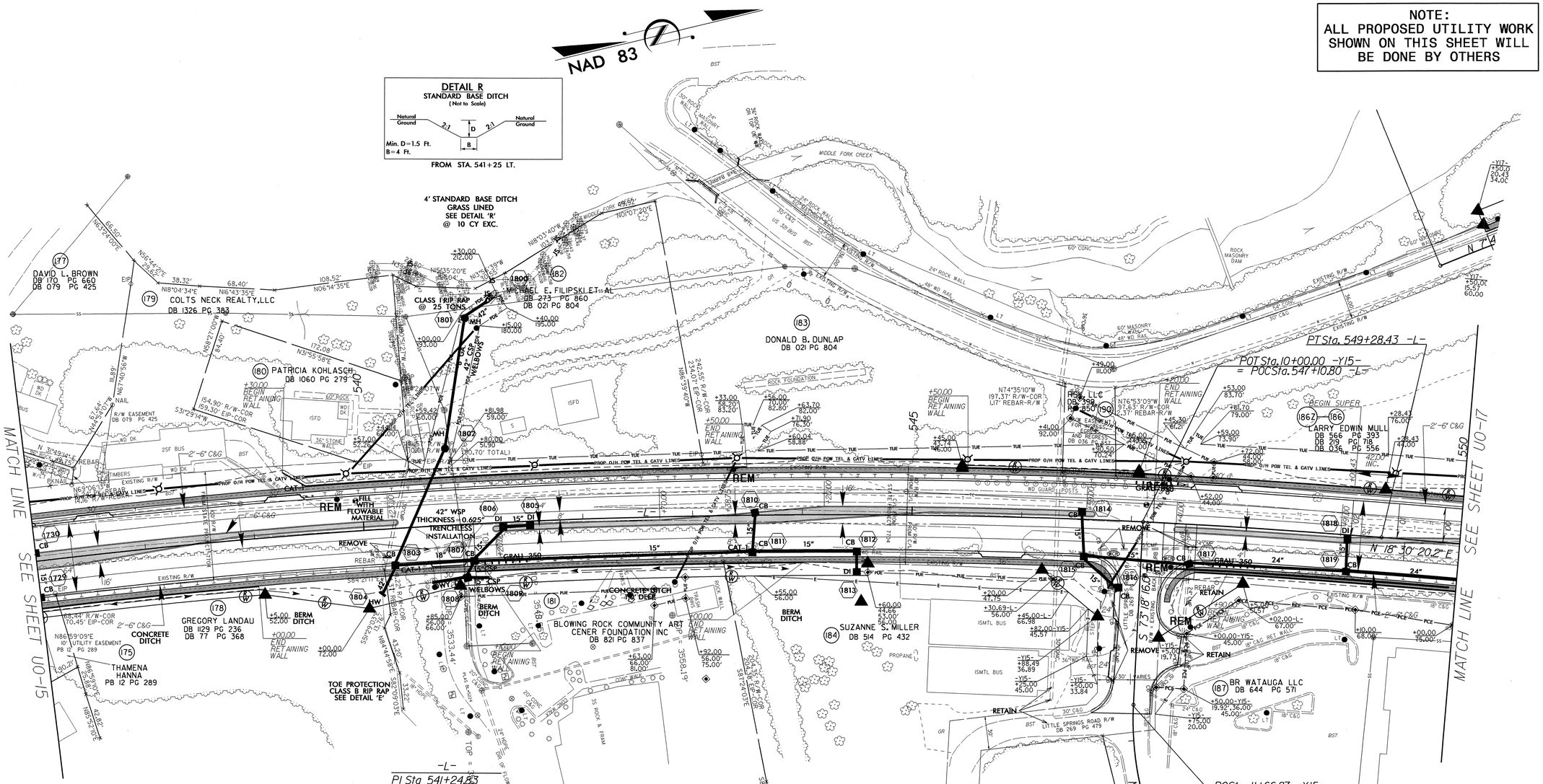
PROJECT REFERENCE NO.	SHEET NO.
R-2237C	U0-16

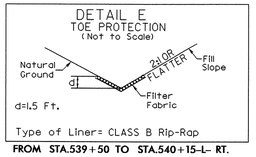
NOTE: SEE SHEETS 28 & 29 FOR -L- PROFILE
SEE SHEET 32 FOR -Y15- PROFILE
SEE SHEET 2-1 FOR -Y15-/-L- INTERSECTION DETAIL

UTILITIES BY OTHERS

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



DETAIL E
TOE PROTECTION
(Not to Scale)



FROM STA.539+50 TO STA.540+15-L- RT.

5/14/99

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Utilities\Roadway\Proj\Conduit\r-2237c_ut_18_u016.dgn
$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
R-2237C	U0-17

NOTE: SEE SHEET 29 FOR -L- PROFILE
SEE SHEET 33 FOR -Y17- PROFILE
SEE SHEET 2-1 FOR -Y17-/-L- INTERSECTION DETAIL

UTILITIES BY OTHERS

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

-Y17-

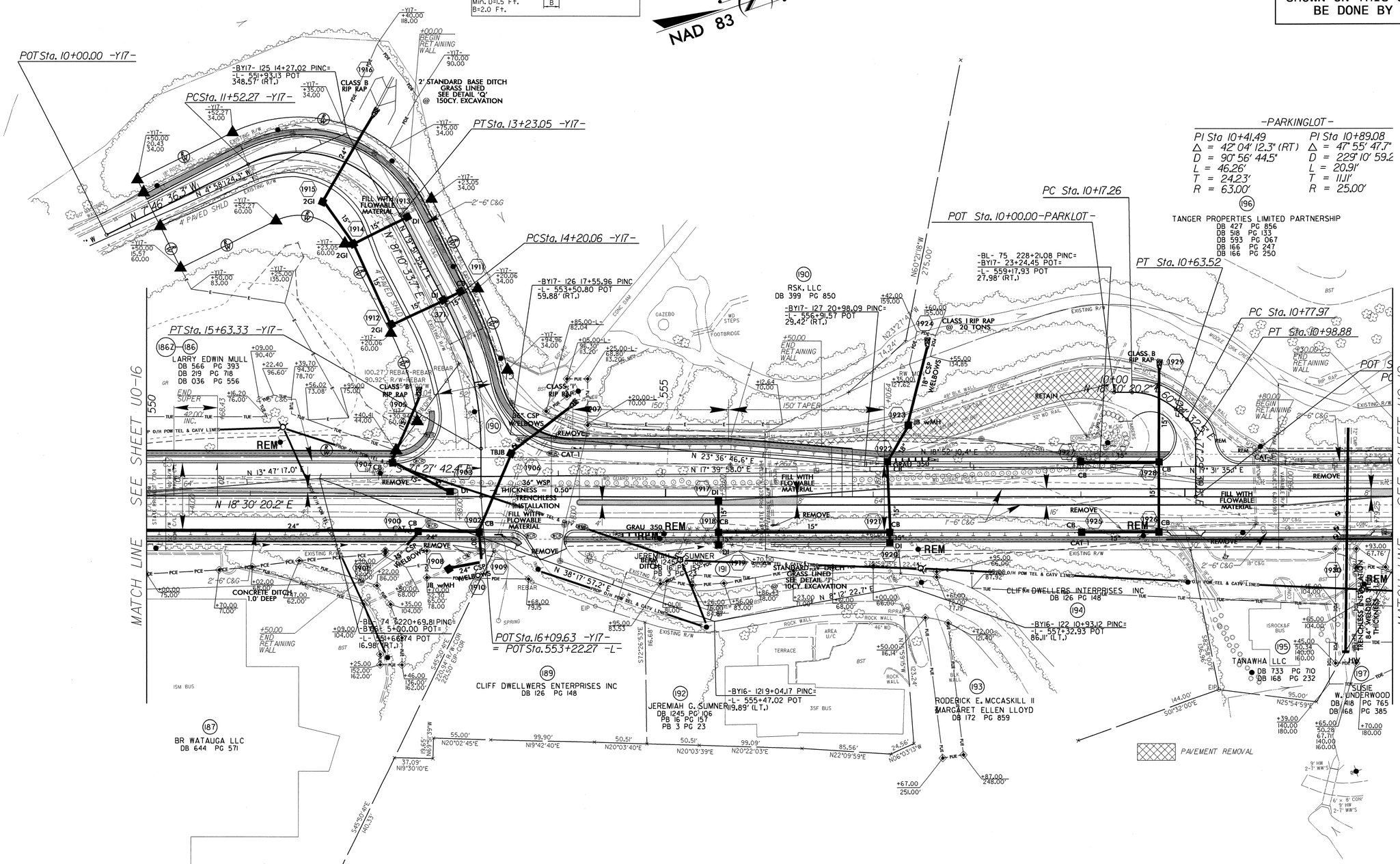
PI Sta 12+60.28	PI Sta 14+93.08
Δ = 88° 57' 09.9" (RT)	Δ = 27° 21' 43.9" (RT)
D = 52° 05' 13.5"	D = 19° 05' 54.9"
L = 170.78'	L = 143.27'
T = 108.01'	T = 73.03'
R = 110.00'	R = 300.00'

DETAIL Q
STANDARD BASE DITCH
(Not to Scale)
Natural Ground, 3:1, D, 3:1, Natural Ground, B
Min. D=1.5 Ft.
B=2.0 Ft.

NAD 83

-PARKINGLOT-

PI Sta 10+41.49	PI Sta 10+89.08
Δ = 42° 04' 12.3" (RT)	Δ = 47° 55' 47.7"
D = 90° 56' 44.5"	D = 229° 10' 59.2
L = 46.26'	L = 20.91'
T = 24.23'	T = 11.11'
R = 63.00'	R = 25.00'



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04-MAR-2011 10:37
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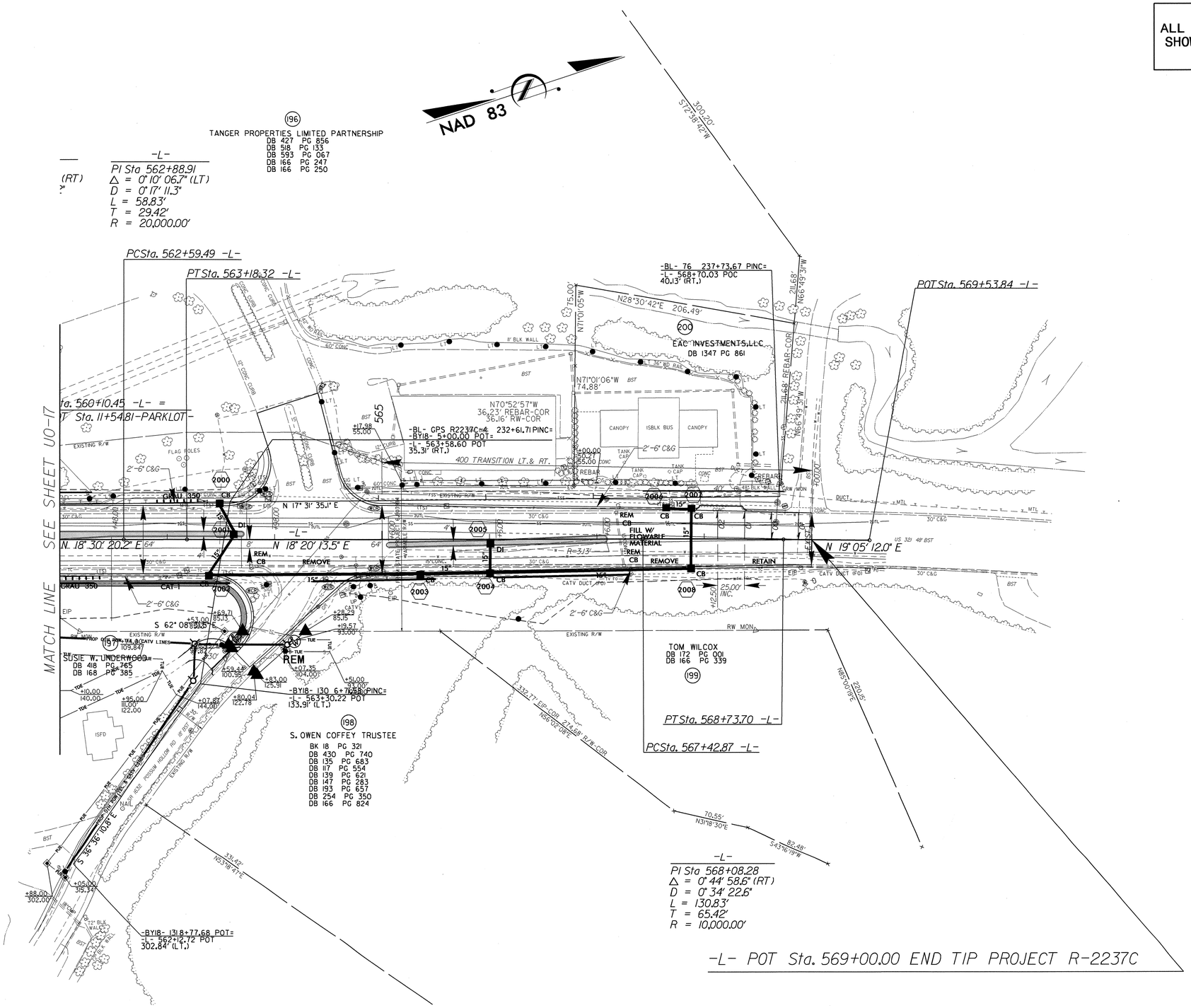
$$$$CHANGE$$$$

PROJECT REFERENCE NO.	SHEET NO.
R-2237C	U0-18

NOTE: SEE SHEET 29 FOR -L- PROFILE

UTILITIES BY OTHERS

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



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