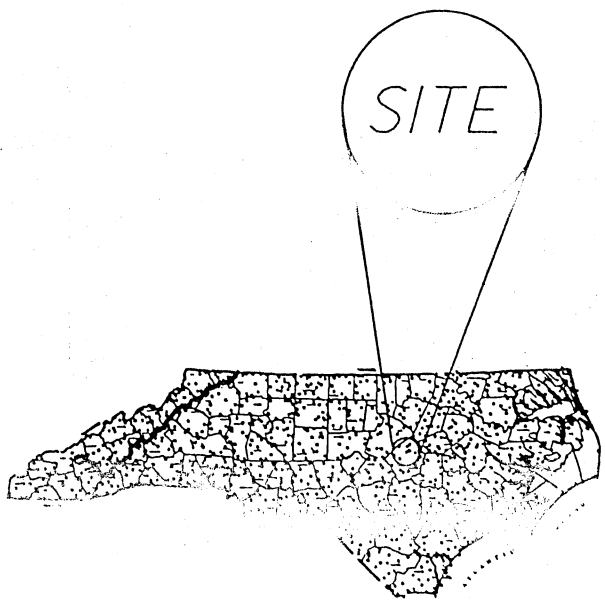


VICINITY MAP



NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 JOHNSTON COUNTY
 8.T311002 R-2552C
 US-70 CLAYTON BYPASS
 FROM EAST OF SR-1560
 TO US-70 EAST OF CLAYTON
 SCALE AS SHOWN
 SHEET 1 OF 23 SEPT. 15, 2004

MATCH LINE

SITE C-6

SITE C-5

SITE C-4

SITE C-3

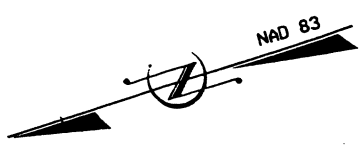
SITE C-1

SITE C-2

BEGIN TIP PROJECT R-2552C
 BEGIN F.A. PROJECT NHF-60-1(9)
 -L2- POT STA. 108+53.275
 -L2LT- POT STA. 108+56.959 (50m LT)
 -L2RT- POT STA. 108+51.599 (33.532m RT)

BEGIN CONSTRUCTION
 -L2- POT 108+35.000

-L2- POT 126+50.000 LA=
 -L2-LT ST 126+37.900 (10.5m LT) LB
 -L2-RT POT 126+50.325 (10.5m RT) LB



TO
 GARNER

SR 1563
 LITTLE CREEK
 CHURCH RD.

SR 1571
 PEELE RD

LITTLE CREEK

THIS IS A CONTROLLED-ACCESS PROJECT WITH ACCESS BEING LIMITED TO INTERCHANGES

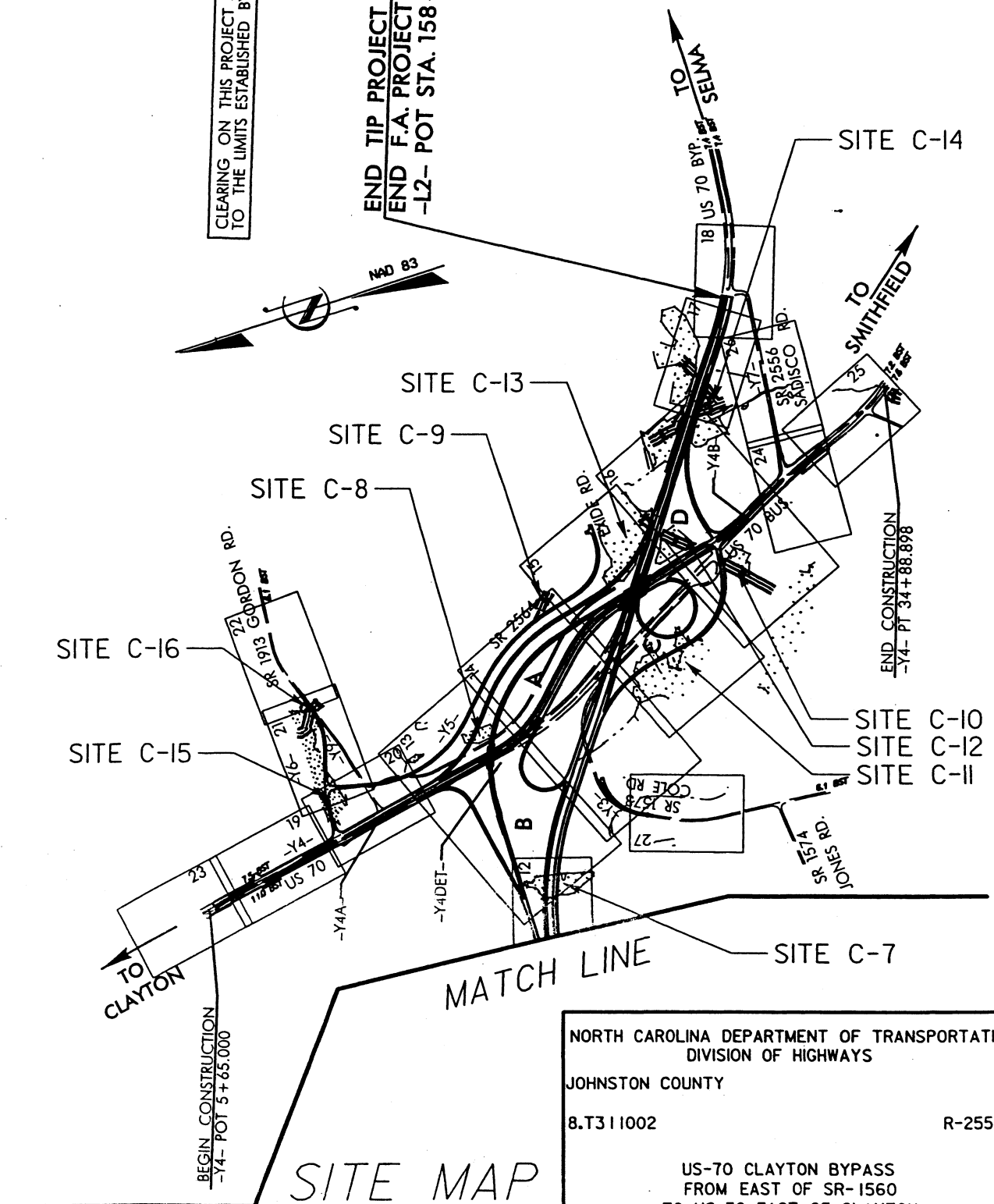
SITE MAP



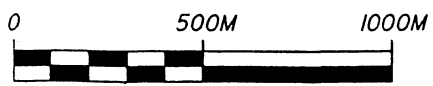
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 JOHNSTON COUNTY
 B.T311002 R-2552C
 US-70 CLAYTON BYPASS
 FROM EAST OF SR-1560
 TO US-70 EAST OF CLAYTON
 SCALE AS SHOWN
 SHEET 2 OF 23
 SEPT. 15, 2004

CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III.

END TIP PROJECT R-2552C
END F.A. PROJECT NHF-60-1(9)
-L2- POT STA. 158+55.000



SITE MAP



NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
JOHNSTON COUNTY
8.T311002 R-2552C
US-70 CLAYTON BYPASS
FROM EAST OF SR-1560
TO US-70 EAST OF CLAYTON
SCALE AS SHOWN
SHEET 3 OF 23
SEPT. 1974

**PROPERTY OWNERS
NAME AND ADDRESS**

| PARCEL No. | OWNER'S NAME | ADRESS |
|-------------------|---|--|
| 902 | Carolina Packers, Inc. | P. O. Drawer 1109 Smithfield, NC 27577 |
| 2 | Luther Shelby Durham | 4483 Little Creek Church Road Clayton, NC 27520 |
| 14 | Teresa Montgomery | 3731 Peele Road Clayton, NC 27520 |
| 15 | TAP Properties, LLC | 273-D Blue Pond Road Clayton, NC 27520 |
| 16 | Brenda C. Holt & Connie M. Boykin | 3687 Peele Road Clayton, NC 27520 |
| 20 | John Jennings Williams, Heirs | 4335 Little Creek Church Road Clayton, NC 27520 |
| 21 | Robert Hatcher, Jr. | 2498 Peele Road Clayton, NC 27520 |
| 26 | Scott D. Overbee | P. O. Box 1051 Clayton, NCD LK27520 |
| 30 | W. J. C. Blinson | 7595F US 70W Clayton, NC 27520 |
| 31 | Vergie B. Wood | 616 Barbour St. Clayton, NC 27520 |
| 32 | Lola's Beauty Shop Limited Partnership | 3307 Little Creek Church Road Clayton, NC 27520 |
| 35 | Norwood Godwin Jones, Jr., et. al. | 804 Chestnut Drive Smithfield, NC 27577 |
| 38 | Carl B. Dean | 2000 Neuse Colony Drive Clayton, NC 27520 |
| 39 | Donald H. Williamson | P. O. Box 605 1546 Piney Grove Church Road Kenly, NC 27542 |

**N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
JOHNSTON COUNTY
PROJECT: 8.T311002 R-2552C**

**US-70 CLAYTON BYPASS
FROM EAST OF SR-1560 TO US-70 EAST OF CLAYTON**

**PROPERTY OWNERS
NAME AND ADDRESS**

| PARCEL No. | OWNER'S NAME | ADRESS |
|------------|----------------------|---|
| 43 | William R. Jones | P. O. Box 393 Pine Level, NC 27568 |
| 45 | Daniel L. Heavner | P. O. Box 2346 Smithfield, NC 27577 |
| 47 | W. E. Lancaster | 31 Sadisco Road Clayton, NC 27520 |
| 34 | Worth Gurley | 318 S. McDowell St. Raleigh, NC 27601 |
| 52 | Theodore James Cihos | 7744 U.S. Hwy. 70 West Clayton, NC 27520 |
| 56 | Elbert D. Mitchell | 2367 Gordon Road Clayton, NC 27520 |
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**N.C. DEPT. OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 JOHNSTON COUNTY
 PROJECT: 8.T311002 R-2552C**

**US-70 CLAYTON BYPASS
 FROM EAST OF SR-1560 TO US-70 EAST OF CLAYTON**

Site #1

R-2552C Johnston Co. Affected Buffer Areas

Discharge is considered to be treated if it meets the following criteria:
 100 ft. of grass swale for every 1 acre of drainage area. AND
 2 yr. velocity is less than or equal to 2 ft./sec.

ASSUMPTIONS FOR ROADWAY CUT DITCHES:
 "V" BOTTOM DITCH
 MINIMUM GRADE AT SAGS = 0.2%

Date: September 15, 2004
 Dsn. By: RNS

| SHT. No. | Structure No. | Line | Station | STR. Type | Total D.A. ha | (ac) | Required length for treatment | | Channel Slope (%) | BASE WID (m) | SIDE SLOPES * | | Treated Discharge? | Q2 cfs | V.2 fps | Q10 cfs | V.10 fps | Treatment Provided | Remarks |
|----------|---------------|-------|-------------|-----------|---------------|------|-------------------------------|------|-------------------|--------------|---------------|-----|--------------------|--------|---------|---------|----------|--------------------|---------|
| | | | | | | | (ft.) | (m.) | | | Z1 | Z2 | | | | | | | |
| | 115 | L2 RT | 104+80 RT | 2-GI | 0.84 | 2.1 | 207.6 | 63 | 2.34 | 0.0 | 6 | 6 | YES | 6.9 | 1.8 | 8.6 | 2.0 | G.S. | |
| | 114 | L2 RT | 104+77 LT | 2-GI | 0.48 | 1.2 | 118.6 | 36 | 2.34 | 0.0 | 6 | 6 | YES | 3.1 | 1.2 | 3.8 | 1.3 | G.S. | |
| | 113 | L2 LT | 104+83 RT | 2-GI | 0.67 | 1.7 | 165.6 | 50 | 2.34 | 0.0 | 6 | 6 | YES | 5.3 | 1.6 | 6.6 | 1.7 | G.S. | |
| | 112 | L2 LT | 104+85 LT | 2-GI | 0.75 | 1.9 | 185.3 | 56 | 2.34 | 0.0 | 6 | 6 | YES | 4.6 | 1.5 | 5.7 | 1.6 | G.S. | |
| | 116 | L2 LT | 106+84 LT | 2-GI | 0.81 | 2.0 | 200.2 | 61 | 3.82 | 0.0 | 6 | 6 | YES | 4.7 | 1.8 | 5.9 | 2.1 | G.S. | |
| | 117 | L2 LT | 106+84 RT | 2-GI | 0.75 | 1.9 | 185.3 | 56 | 3.82 | 0.0 | 6 | 6 | YES | 5.8 | 2.0 | 7.3 | 2.3 | G.S. | |
| | 120 | L2 LT | 107+81 LT | 2-GI | 0.50 | 1.2 | 123.6 | 38 | 1.10 | 0.0 | 6 | 6 | YES | 2.8 | 0.8 | 3.5 | 0.9 | G.S. | |
| | 121 | L2 LT | 107+81 RT | 2-GI | 0.47 | 1.2 | 116.1 | 35 | 1.10 | 0.0 | 6 | 6 | YES | 3.4 | 0.9 | 4.3 | 1.0 | G.S. | |
| 4 | | L2 LT | 108+56 LT | 2-GI | 0.58 | 1.4 | 143.3 | 44 | SAG | 0.0 | 6 | 6 | YES | 6.0 | 0.5 | 7.5 | 0.6 | G.S. | |
| 4 | | L2 LT | 108+51 RT | 2-GI | 0.84 | 2.1 | 207.6 | 63 | SAG | 0.0 | 6 | 6 | YES | 5.1 | 0.5 | 6.5 | 0.6 | G.S. | |
| 4 | | L2 LT | 109+06 RT | OPEN | 6.69 | 16.5 | 1653.1 | 504 | N/A | N/A | N/A | N/A | N/A | 38.7 | N/A | 49.7 | N/A | N/A | 1 |
| 4 | 119 | L2 RT | 106+79 RT | 2-GI | 0.90 | 2.2 | 222.4 | 68 | 2.34 | 0.0 | 6 | 6 | YES | 6.6 | 1.7 | 8.2 | 2.0 | G.S. | |
| 4 | 118 | L2 RT | 106+78 LT | 2-GI | 0.62 | 1.5 | 153.2 | 47 | 2.34 | 0.0 | 6 | 6 | YES | 4.3 | 1.4 | 5.4 | 1.6 | G.S. | |
| 4 | | L2 RT | 108+65 LT | 2-GI | 0.65 | 1.6 | 160.6 | 49 | 0.20 | 0.0 | 6 | 6 | YES | 5.9 | 0.5 | 7.4 | 0.6 | G.S. | |
| 4 | | L2 RT | 108+77.5 RT | 2-GI | 0.59 | 1.5 | 145.8 | 44 | SAG | 0.0 | 6 | 6 | YES | 4.8 | 0.5 | 6.1 | 0.5 | G.S. | |
| 4 | | L2 RT | 109+15 RT | 2-GI | 0.00 | 0.0 | 0.0 | 0 | 0.58 | 0.0 | 6 | 6 | N/A | N/A | N/A | N/A | N/A | N/A | |
| 4 | | L2 RT | 109+97 RT | DITCH | 3.00 | 7.4 | 741.3 | 226 | 0.61 | 3.0 | 3 | 3 | YES | 19.0 | 1.7 | 24.2 | 2.0 | G.S. | 1 |
| 4 | | L2 RT | 108+77.5 LT | 2-GI | 0.12 | 0.3 | 29.7 | 9 | N/A | N/A | N/A | N/A | NO | 1.7 | N/A | 2.1 | N/A | N/A | |
| 4 | | L2 RT | 109+54 LT | 2-GI | 0.04 | 0.1 | 10.4 | 3 | N/A | N/A | N/A | N/A | NO | 0.6 | N/A | 0.7 | N/A | N/A | |
| 4 | | L2 RT | 109+79 LT | OPEN | 0.16 | 0.4 | 40.0 | 12 | N/A | N/A | N/A | N/A | NO | 2.3 | N/A | 2.9 | N/A | PSH | 1 |
| 4 | | L2 LT | 110+37 LT | 2-GI | 0.12 | 0.3 | 29.7 | 9 | N/A | N/A | N/A | N/A | NO | 1.6 | N/A | 1.9 | N/A | N/A | |
| 4 | | L2 LT | 109+95 LT | OPEN | 0.12 | 0.3 | 29.7 | 9 | N/A | N/A | N/A | N/A | NO | 1.6 | N/A | 1.9 | N/A | PSH | 1 |
| 5 | | L2 RT | 111+12 LT | 2-GI | 0.11 | 0.3 | 27.2 | 8 | N/A | N/A | N/A | N/A | N/A | 1.6 | N/A | 1.9 | N/A | N/A | 3 |
| 5 | | L2 RT | 112+77 LT | OTCB | 0.47 | 1.2 | 116.1 | 35 | 3.98 | 9.0 | 4 | 4 | YES | 3.4 | 0.8 | 4.2 | 0.9 | G.S. | |
| 5 | | L2 LT | 112+70 LT | 2-GI | 0.53 | 1.3 | 131.0 | 40 | 3.85 | 0.0 | 6 | 6 | YES | 4.1 | 1.8 | 5.1 | 1.9 | G.S. | |
| 5 | | L2 LT | 112+70 RT | 2-GI | 0.31 | 0.8 | 76.6 | 23 | 3.85 | 0.0 | 6 | 6 | YES | 2.0 | 1.2 | 2.5 | 1.3 | G.S. | |
| 5 | | L2 LT | 111+16 LT | 2-GI | 0.47 | 1.2 | 116.1 | 35 | 3.34 | 0.0 | 6 | 6 | YES | 4.5 | 1.7 | 5.6 | 1.9 | G.S. | |
| 4 | | L2 RT | 110+30 LT | DITCH | 3.20 | 7.9 | 790.7 | 241 | 2.00 | 6.0 | 3 | 3 | YES | 15.2 | 1.7 | 20.4 | 2.0 | G.S. | 1, 2 |

NOTE 1: TOTAL FOR THIS SYSTEM
 NOTE 2: NO CREDIT IS CLAIMED FOR THE DITCH FROM L2 RT STA. 111+71 TO STA. 112+45 LT
 NOTE 3: TREATMENT IS PROVIDED DOWNSTREAM

BDOS = BERM DRAINAGE OUTLET STRUCTURE
 OTCB = OPEN THROAT CATCH BASIN
 OPB = OPEN END PIPE
 PSH = PRE FORMED SCOUR HOLE
 LS = LEVEL SPREADER
 * SIDE SLOPES TAKEN FROM CROSS SECTIONS

2GI = 2 GRATED INLET
 SBG = SHOULDER BERM GUTTER
 CB = CATCH BASIN
 DDB = DRY DETENTION BASIN
 B = BASIN
 GS = GRASS SWALE

R-2552C Johnston Co. Affected Buffer Areas Site # 4

Date: September 15, 2004
Dsn. By: RNS

ASSUMPTIONS FOR ROADWAY CUT DITCHES:
"V" BOTTOM DITCH
MINIMUM GRADE AT SAGS = 0.2%

Discharge is considered to be treated if it meets the following criteria:
100 ft. of grass swale for every 1 acre of drainage area. AND
2 yr. velocity is less than or equal to 2 ft./sec.

| SHT. No. | Structure No. | Line | Station | STR. | | Total D.A. | | Required length for treatment | | PROVIDED Length (m) | Channel Slope (%) | SIDE SLOPES * | | Treated Discharge? | Q2 cfs | V 2 fps | Q10 cfs | V 10 fps | Treatment Provided | Remarks |
|----------|---------------|-------|-----------|-------|------|------------|-------|-------------------------------|----|---------------------|-------------------|---------------|-----|--------------------|--------|---------|---------|----------|--------------------|---------|
| | | | | Type | ha | (ac) | (ft.) | (m.) | Z1 | | | Z2 | | | | | | | | |
| 8 | | L2 LT | 120+80 LT | 2-GI | 0.14 | 0.3 | 34.6 | 11 | 0 | N/A | N/A | N/A | N/A | NO | 2.0 | N/A | 2.5 | N/A | PSH | 1 |
| 8 | | Y1 | 11+16 RT | DITCH | 0.30 | 0.7 | 74.1 | 23 | 26 | 3.33 | 4.00 | 3.00 | YES | 1.8 | 1.3 | 2.4 | 1.5 | G.S. | 1 | |
| 8 | | Y1 | 11+17 RT | DITCH | 0.12 | 0.3 | 29.7 | 9 | 43 | 2.70 | 4.00 | 3.00 | YES | 1.1 | 1.0 | 1.3 | 1.1 | G.S. | 1 | |
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NOTE 1: TOTAL FOR THIS SYSTEM

BDS = BERM DRAINAGE OUTLET STRUCTURE
OTCB = OPEN THROAT CATCH BASIN
OPEN = OPEN END PIPE
PSH = PRE FORMED SCOUR HOLE
LS = LEVEL SPREADER
* SIDE SLOPES TAKEN FROM CROSS SECTIONS

2GI = 2 GRATED INLET
SBG = SHOULDER BERM GUTTER
CB = CATCH BASIN
DDB = DRY DETENTION BASIN
B = BASIN
GS = GRASS SWALE

R-2552C Johnston Co. Affected Buffer Areas

Site # 5

Date: September 15, 2004
Dsn. By: RNS

ASSUMPTIONS FOR ROADWAY CUT DITCHES:
"V" BOTTOM DITCH
MINIMUM GRADE AT SAGS = 0.2%

Discharge is considered to be treated if it meets the following criteria:
100 ft. of grass swale for every 1 acre of drainage area. AND
2 yr. velocity is less than or equal to 2 ft./sec.

| SHT. No. | Structure No. | Line | Station | STR. Type | Total D.A. | | Required length for treatment | | PROVIDED Length (m) | SIDE SLOPES * | | Treated Discharge? | Q2 cfs | V 2 fps | Q10 cfs | V 10 fps | Treatment Provided | Remarks |
|----------|---------------|------|-----------|-----------|------------|-----|-------------------------------|------|---------------------|---------------|-----|--------------------|--------|---------|---------|----------|--------------------|---------|
| | | | | | ha | ac | (ft.) | (m.) | | Z1 | Z2 | | | | | | | |
| 9 | | L2 | 126+10 LT | 2-GI | 0.18 | 0.4 | 44.5 | 14 | 0 | N/A | N/A | NO | 2.5 | N/A | 3.2 | N/A | N/A | |
| 9 | | L2 | 126+10 M | 2-GI | 0.27 | 0.7 | 66.7 | 20 | 129 | 8 | 8 | YES | 1.8 | 0.8 | 2.2 | 0.8 | G.S. | |
| 9 | | L2 | 126+10 RT | 2-GI | 0.04 | 0.1 | 9.9 | 3 | 0 | N/A | N/A | NO | 0.6 | N/A | 0.7 | N/A | N/A | |
| 9 | | L2 | 125+88 RT | 2-GI | 0.20 | 0.5 | 49.4 | 15 | 0 | N/A | N/A | NO | 2.8 | N/A | 3.5 | N/A | N/A | |
| 9 | | L2 | 125+88 RT | OPEN | 0.69 | 1.7 | 170.5 | 52 | 129 | N/A | N/A | NO | 6.2 | N/A | 8.0 | N/A | PSH | 1 |
| 9 | | L2 | 126+00 LT | DITCH | 3.30 | 8.2 | 815.4 | 249 | N/A | N/A | N/A | NO | 12.1 | N/A | 16.5 | N/A | L.S. | 1 |
| 9 | | L2 | 126+40 RT | DITCH | 3.10 | 7.7 | 766.0 | 233 | N/A | N/A | N/A | NO | 10.6 | N/A | 14.6 | N/A | L.S. | 1 |

2GI = 2 GRATED INLET
SBG = SHOULDER BERM GUTTER
CB = CATCH BASIN
DDB = DRY DETENTION BASIN
B = BASIN
GS = GRASS SWALE

BDOS = BERM DRAINAGE OUTLET STRUCTURE
OTCB = OPEN THROAT CATCH BASIN
OPEN = OPEN END PIPE
PSH = PRE FORMED SCOUR HOLE
LS = LEVEL SPREADER
* SIDE SLOPES TAKEN FROM CROSS SECTIONS

NOTE 1: TOTAL FOR THIS SYSTEM

R-2552C Johnston Co. Affected Buffer Areas Site # 6

Date: September 15, 2004
Dsn. By: RNS

ASSUMPTIONS FOR ROADWAY CUT DITCHES:
"V" BOTTOM DITCH
MINIMUM GRADE AT SAGS = 0.2%

Discharge is considered to be treated if it meets the following criteria:
100 ft. of grass swale for every 1 acre of drainage area. AND
2 yr. velocity is less than or equal to 2 ft./sec.

| SHT. No. | Structure No. | Line | Station | STR. Type | Total D.A. (ac) | Required length for treatment | | PROVIDED Length (m) | Channel Slope (%) | BASE WID (m) | SIDE SLOPES * | | Treated Discharge? | Q2 cfs | V 2 fps | Q10 cfs | V 10 fps | Treatment Provided | Remarks |
|----------|---------------|---------|-----------|-----------|-----------------|-------------------------------|------|---------------------|-------------------|--------------|---------------|-----|--------------------|--------|---------|---------|----------|--------------------|---------|
| | | | | | | (ft.) | (m.) | | | | Z1 | Z2 | | | | | | | |
| 10 | | L2 | 129+68 RT | 2-GI | 0.38 | 93.9 | 29 | 239 | 0.77 | 0.0 | 6 | 6 | YES | 3.7 | 0.8 | 4.6 | 0.9 | G.S. | |
| 10 | | L2 | 129+68 M | 2-GI | 0.50 | 123.6 | 38 | 239 | 0.77 | 0.0 | 8 | 8 | YES | 2.9 | 0.7 | 3.6 | 0.7 | G.S. | |
| 10 | | L2 | 129+68 LT | 2-GI | 0.54 | 133.4 | 41 | 239 | 0.85 | 0.0 | 6 | 6 | YES | 4.8 | 1.0 | 6.1 | 1.1 | G.S. | |
| 10 | | L2 | 130+20 LT | 2-GI | 0.15 | 37.1 | 11 | 51 | 0.85 | 0.0 | 6 | 6 | YES | 1.5 | 0.6 | 1.9 | 0.7 | G.S. | |
| 10 | | L2 | 131+49 RT | 2-GI | 0.47 | 116.1 | 35 | 179 | 1.34 | 0.0 | 6 | 6 | YES | 4.5 | 1.1 | 5.7 | 1.3 | G.S. | |
| 10 | | L2 | 131+49 M | 2-GI | 0.38 | 93.9 | 29 | 179 | 1.34 | 0.0 | 8 | 8 | YES | 2.4 | 0.8 | 3.0 | 0.8 | G.S. | |
| 10 | | L2 | 131+47 LT | DITCH | 3.17 | 783.3 | 239 | 881 | 1.34 | 4.0 | 3 | 3 | YES | 17.6 | 1.9 | 23.3 | 2.3 | G.S. | |
| 11 | | L2 | 133+60 LT | DITCH | 4.70 | 1161.4 | 354 | 1218 | 0.33 | 4.0 | 3 | 3 | YES | 23.0 | 1.4 | 31.2 | 1.6 | G.S. | 1, 2 |
| 11 | | L2 | 132+60 M | 2-GI | 0.23 | 56.8 | 17 | 110 | 1.34 | 0.0 | 8 | 8 | YES | 1.6 | 0.7 | 2.0 | 0.7 | G.S. | |
| 11 | | L2 | 132+60 RT | 2-GI | 0.60 | 148.3 | 45 | 110 | 1.34 | 0.0 | 6 | 6 | YES | 3.2 | 0.9 | 8.1 | 1.6 | G.S. | |
| 11 | | L2 | 133+05 RT | DITCH | 3.40 | 840.1 | 256 | 245 | 1.00 | 1.2 | 3 | 3 | NO | 10.8 | 1.2 | 14.8 | 2.2 | G.S. | 1 |
| 11 | | L2 | 133+86 M | 2-GI | 0.43 | 106.3 | 32 | 169 | SAG | 0.0 | 8 | 8 | YES | 3.6 | 0.4 | 4.6 | 0.5 | G.S. | |
| 11 | | L2 | 133+86 RT | 2-GI | 0.07 | 17.3 | 5 | 0 | N/A | N/A | N/A | N/A | NO | 1.0 | N/A | 1.2 | N/A | N/A | |
| 11 | | L2 | 133+36 RT | 2-GI | 0.09 | 22.2 | 7 | 0 | N/A | N/A | N/A | N/A | NO | 1.3 | N/A | 1.6 | N/A | N/A | |
| 11 | | L2 | 133+36 RT | OPEN | 0.59 | 145.8 | 44 | N/A | N/A | N/A | N/A | N/A | NO | 5.6 | N/A | 7.1 | N/A | PSH | 1 |
| 11 | | L2 | 134+55 M | 2-GI | 0.45 | 111.2 | 34 | 157 | SAG | 0.0 | 6 | 6 | YES | 3.8 | 0.5 | 4.8 | 0.5 | G.S. | |
| 11 | | L2 | 134+55 RT | 2-GI | 0.20 | 49.4 | 15 | 0 | N/A | N/A | N/A | N/A | NO | 2.8 | N/A | 3.5 | N/A | N/A | |
| 11 | | L2 | 134+55 RT | OPEN | 0.65 | 160.6 | 49 | N/A | N/A | N/A | N/A | N/A | NO | 6.4 | N/A | 8.0 | N/A | RIP RAP PAD | 1, 3 |
| 12 | | FLYOVER | 2+68 RT | 2-GI | 0.80 | 197.7 | 60 | 425 | SAG | 0.0 | 6 | 6 | YES | 3.9 | 0.5 | 5.0 | 0.5 | G.S. | |
| 12 | | FLYOVER | 2+68 LT | 2-GI | 0.75 | 185.3 | 56 | 239 | 0.69 | 0.0 | 6 | 6 | YES | 6.2 | 0.8 | 7.9 | 0.9 | G.S. | |
| 12 | | FLYOVER | 2+06 LT | 2-GI | 0.15 | 37.1 | 11 | 61 | 0.69 | 0.0 | 6 | 6 | YES | 1.6 | 0.6 | 2.0 | 0.6 | G.S. | |
| 11 | | FLYOVER | 1+00 LT | DITCH | 3.25 | 803.1 | 245 | 802 | 0.81 | 4.0 | 3 | 3 | YES | 18.9 | 1.2 | 25.0 | 1.3 | G.S. | 1 |
| 11 | | FLYOVER | 0+70 LT | 2-GI | 0.13 | 32.1 | 10 | N/A | 0.22 | N/A | N/A | N/A | NO | 1.8 | N/A | 2.3 | N/A | G.S. | |
| 11 | | FLYOVER | 1+16.4 LT | 2-GI | 0.14 | 34.6 | 11 | N/A | SAG | N/A | N/A | N/A | NO | 2.0 | N/A | 2.5 | N/A | G.S. | |
| 11 | | FLYOVER | 1+16.4 LT | OPEN | 0.27 | 66.7 | 20 | N/A | 0.90 | N/A | N/A | N/A | NO | 3.8 | N/A | 4.8 | N/A | PSH | 1 |

NOTE 1: TOTAL FOR THIS SYSTEM
NOTE 2: No credit is claimed for 4M Base Ditch from -12- Sta. 132+00 to Sta. 133+30 LT.
NOTE 3: OUTLETS INTO WETLAND

BDOS = BERM DRAINAGE OUTLET STRUCTURE
OTCB = OPEN THROAT CATCH BASIN
OPEN = OPEN END PIPE
PSH = PRE FORMED SCOUR HOLE
LS = LEVEL SPREADER
* SIDE SLOPES TAKEN FROM CROSS SECTIONS

2GI = 2 GRATED INLET
SBG = SHOULDER BERM GUTTER
CB = CATCH BASIN
DDB = DRY DETENTION BASIN
B = BASIN
GS = GRASS SWALE

R-2552C Johnston Co. Affected Buffer Areas Site # 9

Date: September 15, 2004
Dsn. By: RNS

ASSUMPTIONS FOR ROADWAY CUT DITCHES:
"V" BOTTOM DITCH
MINIMUM GRADE AT SAGS = 0.2%

Discharge is considered to be treated if it meets the following criteria:
100 ft. of grass swale for every 1 acre of drainage area. AND
2 yr. velocity is less than or equal to 2 ft./sec.

| SHT. No. | Structure No. | Line | Station | STR. Type | Total D.A. | | Required length for treatment | | PROVIDED Length (m) | Channel Slope (%) | BASE WID (m) | SIDE SLOPES * | | Treated Discharge? | Q2 cfs | V 2 fps | Q10 cfs | V 10 fps | Treatment Provided | Remarks |
|----------|---------------|---------|-----------|-----------|------------|-----|-------------------------------|------|---------------------|-------------------|--------------|---------------|-----|--------------------|--------|---------|---------|----------|--------------------|---------|
| | | | | | ha | ac | (ft.) | (m.) | | | | Z1 | Z2 | | | | | | | |
| 14 | | FLYOVER | 12+46 RT | 2-GI | 0.12 | 0.3 | 29.7 | 9 | N/A | N/A | N/A | N/A | N/A | N/A | 1.7 | N/A | 2.1 | N/A | N/A | 3 |
| 14 | | FLYOVER | 13+60 RT | 2-GI | 0.13 | 0.3 | 32.1 | 10 | N/A | N/A | N/A | N/A | N/A | N/A | 1.8 | N/A | 2.3 | N/A | N/A | 3 |
| 14 | | FLYOVER | 12+86 RT | DITCH | 1.10 | 2.7 | 271.8 | 83 | 118 | 0.83 | 0.0 | 3 | 3 | YES | 5.0 | 1.3 | 6.7 | 1.5 | G.S. | |
| 14 | | RAMP A | 6+55.5 LT | DITCH | 0.25 | 0.6 | 61.8 | 19 | 55 | 0.88 | 0.0 | 6 | 3 | YES | 2.0 | 0.7 | 2.6 | 0.8 | G.S. | |
| 14 | | RAMP A | 6+56.5 LT | DITCH | 0.75 | 1.9 | 185.3 | 56 | 148 | 2.40 | 0.0 | 6 | 3 | YES | 5.4 | 1.9 | 6.8 | 2.1 | G.S. | |
| 14 | | RAMP A | 6+37.5 RT | DITCH | 0.20 | 0.5 | 49.4 | 15 | 72 | 0.75 | 0.0 | 5 | 4 | YES | 0.9 | 0.6 | 1.1 | 0.6 | G.S. | |
| 14 | | RAMP A | 6+38.5 RT | DITCH | 0.70 | 1.7 | 173.0 | 53 | 131 | 2.00 | 0.0 | 6 | 4 | YES | 4.5 | 1.5 | 5.6 | 1.6 | G.S. | |
| 14 | | Y-5- | 18+80 LT | DITCH | 0.55 | 1.4 | 135.9 | 41 | 165 | 2.90 | 0.0 | 4 | 4 | YES | 4.3 | 1.9 | 5.4 | 2.1 | G.S. | |
| 14 | | Y-5- | 19+93 LT | DITCH | 3.80 | 9.4 | 939.0 | 286 | 777 | 0.35 | 0.6 | 3 | 3 | YES | 15.6 | 1.5 | 21.5 | 1.7 | G.S. | 1 |
| 14 | | FLYOVER | 14+26 RT | 2-GI | 0.08 | 0.2 | 19.8 | 6 | N/A | N/A | N/A | N/A | N/A | N/A | 1.1 | N/A | 1.4 | N/A | N/A | 3 |
| 14 | | FLYOVER | 13+92 RT | DITCH | 0.66 | 1.6 | 163.1 | 50 | 55 | 0.91 | 0.0 | 3 | 3 | YES | 4.8 | 1.3 | 6.1 | 1.5 | G.S. | |
| 14 | | RAMP A | 5+40 LT | 2-GI | 0.28 | 0.7 | 69.2 | 21 | 59 | 1.01 | 0.0 | 6 | 6 | YES | 2.3 | 0.7 | 2.9 | 0.8 | G.S. | |
| 14 | | Y-5- | 19+95 RT | DITCH | 0.26 | 0.6 | 64.2 | 20 | 85 | 1.60 | 0.0 | 4 | 4 | YES | 2.0 | 0.9 | 2.4 | 1.1 | G.S. | |
| 14 | | Y-5- | 19+96 LT | OPEN | 1.20 | 3.0 | 296.5 | 90 | 199 | N/A | N/A | N/A | N/A | NO | 8.1 | N/A | 10.3 | N/A | N/A | 1 |

2GI = 2 GRATED INLET
SBG = SHOULDER BERM GUTTER
CB = CATCH BASIN
DDB = DRY DETENTION BASIN
B = BASIN
GS = GRASS SWALE

BDOS = BERM DRAINAGE OUTLET STRUCTURE
OTCB = OPEN THROAT CATCH BASIN
OPEN = OPEN END PIPE
PSH = PRE FORMED SCOUR HOLE
LS = LEVEL SPREADER
* SIDE SLOPES TAKEN FROM CROSS SECTIONS

NOTE 1: TOTAL FOR THIS SYSTEM
NOTE 3: TREATMENT IS PROVIDED DOWNSTREAM

R-2552C Johnston Co. Affected Buffer Areas

Discharge is considered to be treated if it meets the following criteria:
 100 ft. of grass swale for every 1 acre of drainage area. AND
 2 yr. velocity is less than or equal to 2 ft./sec.

Site # 10

ASSUMPTIONS FOR ROADWAY CUT DITCHES:
 "V" BOTTOM DITCH
 MINIMUM GRADE AT SAGS = 0.2%

Date: September 15, 2004
 Des. By: RNS

| SHT. No. | Structure No. | Line | Station | STR. Type | Total D.A. ha | Required length for treatment (ft.) | PROVIDED Length (m) | Channel Slope (%) | BASE WID (m) | SIDE SLOPES * | | Treated Discharge? | Q2 cfs | V 2 fps | Q10 cfs | V 10 fps | Treatment Provided | Remarks | |
|----------|---------------|------|----------|-----------|---------------|-------------------------------------|---------------------|-------------------|--------------|---------------|----|--------------------|--------|---------|---------|----------|--------------------|---------|--|
| | | | | | | | | | | Z1 | Z2 | | | | | | | | |
| 16 | | Y-4 | 27+40 RT | DITCH | 0.31 | 76.6 | 150 | 2.00 | 0.0 | 5 | 4 | YES | 1.6 | 0.9 | 2.0 | 1.0 | G.S. | 1 | |
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2GI = 2 GRATED INLET
 SBG = SHOULDER BERM GUTTER
 CB = CATCH BASIN
 DDB = DRY DETENTION BASIN
 B = BASIN
 GS = GRASS SWALE

BDS = BERM DRAINAGE OUTLET STRUCTURE
 OTCB = OPEN THROAT CATCH BASIN
 OPEN = OPEN END PIPE
 PSH = PRE FORMED SCOUR HOLE
 LS = LEVEL SPREADER
 * SIDE SLOPES TAKEN FROM CROSS SECTIONS

NOTE 1: TOTAL FOR THIS SYSTEM

R-2552C Johnston Co. Affected Buffer Areas Site # 12

Date: September 15, 2004
Dsn. By: RNS

ASSUMPTIONS FOR ROADWAY CUT DITCHES:

"V" BOTTOM DITCH
MINIMUM GRADE AT SAGS = 0.2%

Discharge is considered to be treated if it meets the following criteria:

100 ft. of grass swale for every 1 acre of drainage area. AND
2 yr. velocity is less than or equal to 2 ft./sec.

| SHT. No. | Structure No. | Line | Station | STR. Type | Total D.A. ha | ac | Required length for treatment | | PROVIDED Length (m) | SIDE SLOPES * | | Treated Discharge? | Q2 cfs | V 2 fps | Q10 cfs | V 10 fps | Treatment Provided | Remarks |
|----------|---------------|------|-----------|-----------|---------------|-----|-------------------------------|------|---------------------|---------------|------|--------------------|--------|---------|---------|----------|--------------------|---------|
| | | | | | | | (ft.) | (m.) | | Z1 | Z2 | | | | | | | |
| 16 | | Y-4 | 26+88 M | 2-GI | 0.32 | 0.8 | 79.1 | 24 | 240 | 6 | 6 | YES | 2.3 | 0.7 | 2.9 | 0.7 | G.S. | |
| 16 | | Y-4 | 26+88 LT | 2-GI | 0.26 | 0.6 | 64.2 | 20 | 0 | N/A | N/A | N/A | 3.7 | N/A | 4.6 | N/A | G.S. | 3 |
| 16 | | Y-4 | 28+86 LT | 2-GI | 0.04 | 0.1 | 9.9 | 3 | 4 | 6 | 6 | YES | 0.4 | 0.3 | 0.5 | 0.3 | G.S. | |
| 16 | | Y-4 | 28+72 LT | 2-GI | 0.05 | 0.1 | 12.4 | 4 | 6 | 6 | 6 | YES | 0.5 | 0.3 | 0.7 | 0.3 | G.S. | |
| 16 | | Y-4 | 27+50 LT | 2-GI | 0.32 | 1.3 | 128.5 | 39 | 105 | 6 | 6 | YES | 5.5 | 0.8 | 6.8 | 0.9 | G.S. | |
| 16 | | Y-4 | 27+40 M | 2-GI | 0.36 | 0.9 | 89.0 | 27 | 170 | 6 | 6 | YES | 3.2 | 0.6 | 4.0 | 0.6 | G.S. | |
| 16 | | Y-4 | 26+59 LT | DITCH | 1.76 | 4.3 | 434.9 | 133 | 571 | 3 | 3 | YES | 14.1 | 1.9 | 18.1 | 2.1 | G.S. | 1 |
| 15 | | Y-4 | 25+04 LT | 2-GI | 0.20 | 0.5 | 49.4 | 15 | 0 | N/A | N/A | N/A | 2.8 | N/A | 3.5 | N/A | PSH | |
| 15 | | L2- | 149+41 M | 2-GI | 0.23 | 0.6 | 56.8 | 17 | 150 | 5 | 5 | YES | 1.8 | 0.4 | 2.3 | 0.4 | G.S. | |
| 16 | | L2- | 150+19 RT | DITCH | 1.15 | 2.8 | 284.2 | 87 | 269 | 4.00 | 4.00 | YES | 5.8 | 1.3 | 7.5 | 1.5 | G.S. | 1, 4 |
| 16 | | L2- | 151+63 RT | 2-GI | 0.11 | 0.3 | 27.2 | 8 | 74 | 6 | 6 | YES | 0.8 | 0.4 | 1.0 | 0.4 | G.S. | |
| 16 | | L2- | 150+25 RT | DITCH | 1.31 | 3.2 | 323.7 | 99 | 225 | 6 | 4 | YES | 3.3 | 1.0 | 4.5 | 1.2 | G.S. | 1, 4 |

2GI = 2 GRATED INLET
SBG = SHOULDER BERM GUTTER
CB = CATCH BASIN
DDB = DRY DETENTION BASIN
B = BASIN
GS = GRASS SWALE

BDOS = BERM DRAINAGE OUTLET STRUCTURE
OTCB = OPEN THROAT CATCH BASIN
OPEN = OPEN END PIPE
PSH = PRE FORMED SCOUR HOLE
LS = LEVEL SPREADER
* SIDE SLOPES TAKEN FROM CROSS SECTIONS

NOTE 1: TOTAL FOR THIS SYSTEM
NOTE 3: TREATMENT IS PROVIDED DOWNSTREAM
NOTE 4: EXISTING DITCH

R-252C Johnston Co. Affected Buffer Areas Site # 14

Date: September 15, 2004
Dsn. By: RNS

ASSUMPTIONS FOR ROADWAY CUT DITCHES:
"V" BOTTOM DITCH
MINIMUM GRADE AT SAGS = 0.2%

Discharge is considered to be treated if it meets the following criteria:
100 ft. of grass swale for every 1 acre of drainage area. AND
2 yr. velocity is less than or equal to 2 ft./sec.

| SHT. No. | Structure No. | Line | Station | STR. Type | Total D.A. | | Required length for treatment | | PROVIDED Length (m) | Channel Slope (%) | BASE WID (m) | SIDE SLOPES * | | Treated Discharge? | Q2 cfs | V2 fps | Q10 cfs | V10 fps | Treatment Provided | Remarks |
|----------|---------------|--------|-----------|-----------|------------|------|-------------------------------|------|---------------------|-------------------|--------------|---------------|----|--------------------|--------|--------|---------|---------|--------------------|---------|
| | | | | | ha | (ac) | (ft.) | (m.) | | | | Z1 | Z2 | | | | | | | |
| 16 | | L2 | 152+62 LT | DITCH | 0.22 | 0.5 | 54.4 | 17 | 92 | 3.50 | 0.0 | 4 | 3 | YES | 2.0 | 1.5 | 2.5 | 1.7 | G.S. | 1, 4 |
| 16 | | L2 | 152+64 RT | 2-GI | 0.59 | 1.5 | 145.8 | 44 | 307 | 2.09 | 0.0 | 6 | 6 | YES | 3.7 | 1.3 | 4.7 | 1.4 | G.S. | |
| 16 | | RAMP D | 2+40 LT | 2-GI | 2.20 | 5.4 | 543.6 | 166 | 284 | 0.32 | 0.0 | 6 | 6 | YES | 12.2 | 1.0 | 16.4 | 1.1 | G.S. | |
| 16 | | L2 | 153+33 M | 2-GI | 0.24 | 0.6 | 59.3 | 18 | 165 | 0.44 | 0.0 | 6 | 6 | YES | 1.6 | 0.5 | 2.0 | 0.5 | G.S. | |
| 16 | | L2 | 153+80 RT | DITCH | 3.70 | 9.1 | 914.3 | 279 | 796 | 0.24 | 1.0 | 3 | 3 | YES | 17.5 | 1.3 | 23.7 | 1.5 | G.S. | 1 |
| 17 | | L2 | 154+64.5 | 2-GI | 0.40 | 1.0 | 98.8 | 30 | 283 | SAG | 0.0 | 5 | 5 | YES | 2.8 | 0.4 | 3.5 | 0.5 | G.S. | 1 |
| 17 | | L2 | 156+20 M | 2-GI | 0.22 | 0.5 | 54.4 | 17 | 117 | 0.90 | 0.0 | 6 | 6 | YES | 2.0 | 0.7 | 2.5 | 0.7 | G.S. | |
| 17 | | L2 | 157+38.5 | 2-GI | 0.32 | 0.8 | 79.1 | 24 | 101 | 0.80 | 0.0 | 6 | 4 | YES | 3.8 | 0.9 | 4.7 | 1.0 | G.S. | |
| 17 | | L2 | 156+25 RT | DITCH | 1.70 | 4.2 | 420.1 | 128 | 207 | 1.63 | 3.0 | 3 | 3 | YES | 12.0 | 1.9 | 15.5 | 2.2 | G.S. | 2 |
| 17 | | L2 | 155+30 RT | DITCH | 2.20 | 5.4 | 543.6 | 166 | 409 | 0.75 | 2.0 | 3 | 3 | YES | 14.4 | 1.8 | 19.0 | 2.0 | G.S. | 1 |

2GI = 2 GRATED INLET
SBG = SHOULDER BERM GUTTER
CB = CATCH BASIN
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B = BASIN
GS = GRASS SWALE

BDOS = BERM DRAINAGE OUTLET STRUCTURE
OTCB = OPEN THROAT CATCH BASIN
OPEN = OPEN END PIPE
PSH = PRE FORMED SCOUR HOLE
LS = LEVEL SPREADER
* SIDE SLOPES TAKEN FROM CROSS SECTIONS

NOTE 1: TOTAL FOR THIS SYSTEM
NOTE 2: NO CREDIT IS CLAIMED FOR THE DITCH FROM L2 STA. 156+15 TO STA. 156+25 RT AND FROM STA. 157+20 RT AHEAD
NOTE 4: EXISTING DITCH

R-2552C Johnston Co. Affected Buffer Areas

Discharge is considered to be treated if it meets the following criteria:
100 ft. of grass swale for every 1 acre of drainage area. AND
2 yr. velocity is less than or equal to 2 ft./sec.

ASSUMPTIONS FOR ROADWAY CUT DITCHES:
"V" BOTTOM DITCH
MINIMUM GRADE AT SAGS = 0.2%

| SHT. No. | Structure No. | Line | Station | STR. Type | Total D.A. ha | Required length for treatment (ft.) | Required length for treatment (m.) | PROVIDED Length (m) | Channel Slope (%) | BASE WID (m) | SIDE SLOPES * | | Treated Discharge? | Q2 cfs | V 2 fps | Q10 cfs | V 10 fps | Treatment Provided | Remarks | | |
|-------------|------------------|------|----------|--------------|------------------|--|---------------------------------------|------------------------|----------------------|-----------------|---------------|----|-----------------------|-----------|------------|------------|-------------|-----------------------|---------|--|--|
| | | | | | | | | | | | Z1 | Z2 | | | | | | | | | |
| 21 | | Y-6 | 14+30 LT | DITCH | 0.07 | 17.8 | 5 | 30 | 1.06 | 0.0 | 6 | 4 | YES | 0.7 | 0.6 | 0.9 | 0.6 | G.S. | 1 | | |
| 21 | | Y-6 | 14+40 RT | DITCH | 1.50 | 370.7 | 113 | 140 | 3.50 | 0.0 | 4 | 3 | N/A | 7.2 | 2.8 | 9.7 | 3.1 | PSH | 1, 5 | | |
| 22 | | Y-6 | 14+90 LT | DITCH | 0.19 | 46.9 | 14 | 59 | 0.33 | 0.0 | 3 | 4 | YES | 1.7 | 0.5 | 2.1 | 0.5 | G.S. | 1 | | |
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NOTE 1: TOTAL FOR THIS SYSTEM

- BDOS = BERM DRAINAGE OUTLET STRUCTURE
- OTCB = OPEN THROAT CATCH BASIN
- OPEN = OPEN END PIPE
- PSH = PRE FORMED SCOUR HOLE
- LS = LEVEL SPREADER
- * SIDE SLOPES TAKEN FROM CROSS SECTIONS

- 2GI = 2 GRATED INLET
- SBG = SHOULDER BERM GUTTER
- CB = CATCH BASIN
- DDB = DRY DETENTION BASIN
- B = BASIN
- GS = GRASS SWALE

NOTE 5: NO HIGHWAY PAVEMENT DRAINS TO THIS SITE

BUFFER IMPACTS SUMMARY (English)

| SITE NO. | STRUCTURE SIZE / TYPE | STATION (FROM/TO) | IMPACT | | | | | | BUFFER REPLACEMENT | | | |
|---------------|--|--|---------------|-----------------|---------------------------|---------------------------|--------------------------|---------------------------|--------------------------|---------------------------|---------------------------|---------------------------|
| | | | TYPE | | ALLOWABLE | | MITTIGABLE | | TOTAL (ft ²) | ZONE 1 (ft ²) | ZONE 2 (ft ²) | |
| | | | ROAD CROSSING | PARALLEL IMPACT | ZONE 1 (ft ²) | ZONE 2 (ft ²) | TOTAL (ft ²) | ZONE 1 (ft ²) | | | | ZONE 2 (ft ²) |
| 1 | DUAL BRIDGES | L2 LT LN 108+84 / 110+28 L2 RT LN 109+72 / 111+02 | X | | 25272 | 13712 | 38985 | | | | | |
| 4 | 750 RCP | Y1 11+06 / 11+35 RT | X | | 2097 | 861 | 2958 | | | | | |
| 5 | 1500 RCP | L2 126+12 / 126+49 | X | | | | | 19889 | 13157 | 33046 | | |
| 6 | DBL 2.7x1.8 RCBC 1200 RCP | L2 133+87 / 134+23 | X | | | | | 19472 | 13196 | 32668 | | |
| | 3.7x2.4 RCBC | | | | | | | | | | | |
| 9 | 750 RCP | Y5 20+10 / 20+30 | | X | | | | 549 | 958 | 1507 | | |
| 10 | 2.7x1.8 RCBC 1800 RCP | Rd C 7+68 / 8+16 | X | | 5479 | 2099 | 7578 | | | | | |
| 12 | 1200 RCP | L2 150+05 / 150+42 RT | X | | 2712 | 1087 | 3800 | | | | | |
| 13 | 1050 RCP | L2 150+27 / 150+68 LT | X | | 1937 | 850 | 2788 | | | | | |
| 14 | 2.44x1.83 RCBC 1500 STEEL PIPE 900 RCP & 600 RCP | L2 153+64 LT / 155+54 RT | X | | 4801 | 2390 | 7190 | | | | | |
| 16 | DBL 1500 RCP | Y6 14+24 / 14+76 | X | | 4176 | 2153 | 6329 | | | | | |
| TOTAL: | | | | | 46475 | 23152 | 69628 | 39910 | 27311 | 67221 | | |

N.C. DEPT. OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 JOHNSTON COUNTY
 PROJECT: 8.T311002 (R-2552C)
 US-70 CLAYTON BYPASS
 FROM EAST OF SR-1560
 TO US-70 EAST OF CLAYTON

BUFFER IMPACTS SUMMARY (Metric)

| SITE NO. | STRUCTURE SIZE / TYPE | STATION (FROM/TO) | IMPACT | | | | | | BUFFER REPLACEMENT | | |
|---------------|--|--|---------------|-----------------|--------------------------|--------------------------|-------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| | | | TYPE | | ALLOWABLE | | MITIGABLE | | ZONE 1 (m ²) | ZONE 2 (m ²) | |
| | | | ROAD CROSSING | PARALLEL IMPACT | ZONE 1 (m ²) | ZONE 2 (m ²) | TOTAL (m ²) | ZONE 1 (m ²) | | | ZONE 2 (m ²) |
| 1 | DUAL BRIDGES | L2 LT LN 108+84 / 110+28 L2 RT LN 109+72 / 111+02 | X | | 2348 | 1274 | 3622 | | | | |
| 4 | 750 RCP | Y1 11+06 / 11+35 RT | X | | 195 | 80 | 275 | | | | |
| 5 | 1500 RCP | L2 126+12 / 126+49 | X | | | | | 1848 | 1222 | 3070 | |
| 6 | DBL 2.7x1.8 RCBC 1200 RCP 3.7x2.4 RCBC | L2 133+87 / 134+23 | X | | | | | 1809 | 1226 | 3035 | |
| 9 | 750 RCP | Y5 20+10 / 20+30 | | X | | | | 51 | 89 | 140 | |
| 10 | 2.7x1.8 RCBC 1800 RCP | Rp C 7+68 / 8+16 | X | | 509 | 195 | 704 | | | | |
| 12 | 1200 RCP | L2 150+05 / 150+42 RT | X | | 252 | 101 | 353 | | | | |
| 13 | 1050 RCP | L2 150+27 / 150+68 LT | X | | 180 | 79 | 259 | | | | |
| 14 | 2.44x1.83 RCBC 1500 STEEL PIPE 900 RCP & 600 RCP | L2 153+64 LT / 155+54 RT | X | | 446 | 222 | 668 | | | | |
| 16 | DBL 1500 RCP | Y6 14+24 / 14+76 | X | | 388 | 200 | 588 | | | | |
| TOTAL: | | | | | 4318 | 2151 | 6469 | 3708 | 2537 | 6245 | |

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

JOHNSTON COUNTY
PROJECT: 8.T311002 (R-2552C)
US-70 CLAYTON BYPASS
FROM EAST OF SR-1560
TO US-70 EAST OF CLAYTON

BUFFER IMPACTS SUMMARY (METRIC)

| Site | Station (FROM/TO) | WETLANDS IN BUFFER | | MECH. CLEARING IN BUFFER | | | TOTAL | |
|---------------|--|--------------------|--------------|--------------------------|--------------|--------------|--------------|---|
| | | ZONE 1 (M^2) | ZONE 2 (M^2) | ZONE 1 (M^2) | ZONE 2 (M^2) | ZONE 1 (M^2) | ZONE 2 (M^2) | |
| | | | | | | | | |
| C-1 | L2 LT LN 108+84 / 110+28 L2 RT LN 109+72 / 111+02 | 0 | 0 | 0 | 8 | 0 | 8 | 0 |
| C-4 | Y1 11+06 / 11+35 RT | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| C-5 | L2 126+12 / 126+49 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| C-6 | L2 133+87 / 134+23 | 1407 | 910 | 402 | 247 | 1809 | 1157 | |
| C-9 | Y5 20+10 / 20+30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| C-10 | Rp C 7+68 / 8+16 | 51 | 0 | 128 | 7 | 179 | 7 | |
| C-12 | L2 150+05 / 150+42 RT | 0 | 0 | 104 | 7 | 104 | 7 | |
| C-13 | L2 150+27 / 150+68 LT | 94 | 39 | 62 | 38 | 156 | 77 | |
| C-14 | L2 153+64 LT / 155+54 RT | 131 | 61 | 135 | 74 | 266 | 135 | |
| C-16 | Y6 14+24 / 14+76 | 1 | 0 | 54 | 30 | 55 | 30 | |
| TOTAL: | | 1684 | 1010 | 885 | 411 | 2569 | 1421 | |

**N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS**

**JOHNSTON COUNTY
PROJECT 8.T311002 (R-2552C)**

**US-70 CLAYTON BYPASS
FROM EAST OF SR-1560
TO US-70 EAST OF CLAYTON**

BUFFER IMPACTS SUMMARY (ENGLISH)

| Site | Station (FROM/TO) | WETLANDS IN BUFFER | | MECH. CLEARING IN BUFFER | | TOTAL | |
|---------------|--|--------------------|---------------|--------------------------|---------------|---------------|---------------|
| | | ZONE 1 (FT^2) | ZONE 2 (FT^2) | ZONE 1 (FT^2) | ZONE 2 (FT^2) | ZONE 1 (FT^2) | ZONE 2 (FT^2) |
| C-1 | L2 LT LN 108+84 / 110+28 L2 RT LN 109+72 / 111+02 | 0 | 0 | 0 | 86 | 0 | 86 |
| C-4 | Y1 11+06 / 11+35 RT | 0 | 0 | 0 | 0 | 0 | 0 |
| C-5 | L2 126+12 / 126+49 | 0 | 0 | 0 | 0 | 0 | 0 |
| C-6 | L2 133+87 / 134+23 | 15145 | 9795 | 4327 | 2659 | 19472 | 12454 |
| C-9 | Y5 20+10 / 20+30 | 0 | 0 | 0 | 0 | 0 | 0 |
| C-10 | Rp C 7+68 / 8+16 | 550 | 0 | 1379 | 75 | 1929 | 75 |
| C-12 | L2 150+05 / 150+42 RT | 0 | 0 | 1119 | 75 | 1119 | 75 |
| C-13 | L2 150+27 / 150+68 LT | 1014 | 419 | 662 | 410 | 1676 | 829 |
| C-14 | L2 153+64 LT / 155+54 RT | 1410 | 657 | 1453 | 797 | 2863 | 1453 |
| C-16 | Y6 14+24 / 14+76 | 12 | 0 | 581 | 321 | 593 | 321 |
| TOTAL: | | 18131 | 10870 | 9522 | 4423 | 27652 | 15293 |

31926

**N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS**

**JOHNSTON COUNTY
PROJECT 8.T311002 (R-2552C)**

**US-70 CLAYTON BYPASS
FROM EAST OF SR-1560
TO US-70 EAST OF CLAYTON**

TIP PROJECT: R-2552C

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS



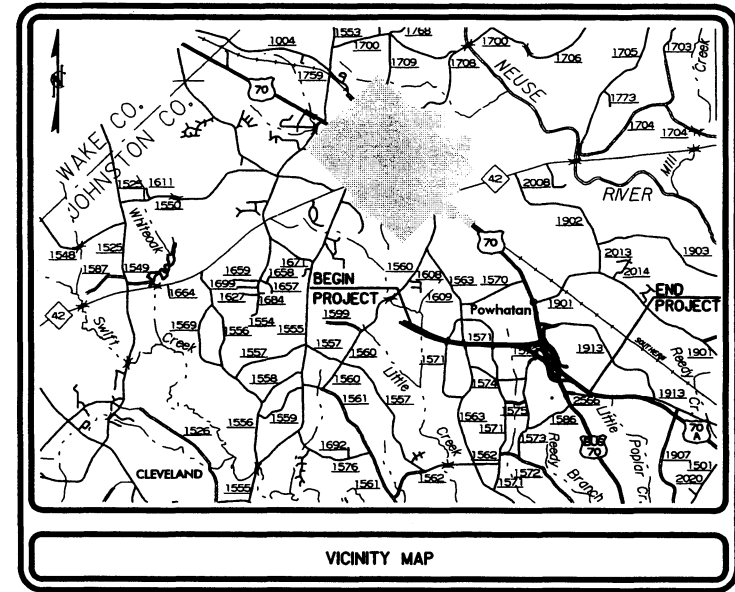
ALL DIMENSIONS IN THESE PLANS ARE IN METERS AND/OR MILLIMETERS UNLESS OTHERWISE SHOWN

| STATE | STATE PROJECT REFERENCE NO. | SHEET NO. | TOTAL SHEETS |
|-----------------|-----------------------------|--------------|--------------|
| N.C. | R-2552C | 1 | |
| STATE PROJ. NO. | F.A. PROJ. NO. | DESCRIPTION | |
| 34459.1.6 | NHF-60-1(9) | P.E. | |
| 34459.2.7 | | R.W. & UTIL. | |

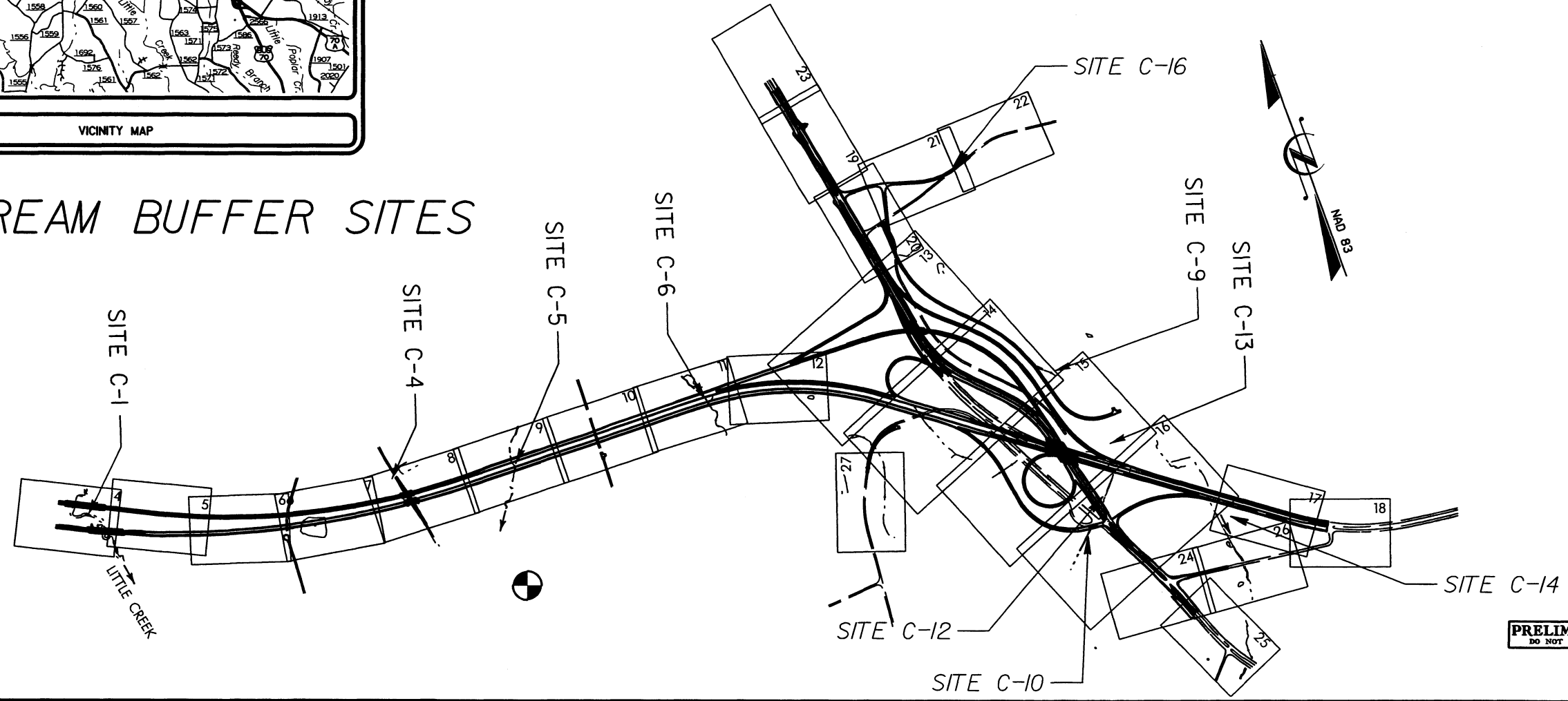
See Sheet 1-A For Index of Sheets
See Sheet 1-B For Conventional Symbols

JOHNSTON COUNTY

LOCATION: US 70 (CLAYTON BYPASS) FROM EAST OF SR 1560 TO US 70 EAST OF CLAYTON
TYPE OF WORK: GRADING, DRAINAGE, PAVING, GUARDRAIL, SIGNALS, STRUCTURES AND CULVERTS



STREAM BUFFER SITES



PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

CONTRACT:

GRAPHIC SCALE

5 m 0 10 m
PLANS

5 m 0 10 m
PROFILE (HORIZONTAL)

1 m 0 2 m
PROFILE (VERTICAL)

DESIGN DATA

ADT 2005 = 29,500
ADT 2025 = 55,800
DHV = 10 %
D = 65 %
T = 16 % *
V = 110 km/h

* TTST 10% + DUAL 6%

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT R-2552C = 4.842 km
LENGTH STRUCTURE TIP PROJECT R-2552C = 0.160 km
TOTAL LENGTH TIP PROJECT R-2552C = 5.002 km

-L2-RT WAS USED TO DETERMINE STRUCTURE LENGTH

Prepared In the Office of:
LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612
FOR THE NORTH CAROLINA DIVISION OF HIGHWAYS

2002 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
May 16, 2003

LETTING DATE:
May 17, 2005

Stephen C. Browde, P.E.
PROJECT ENGINEER

Thomas A. McCloskey, P.E.
PROJECT DESIGN ENGINEER

N.C.D.O.T. CONTACT:
Teresa Bruton, P.E.
PROJECT ENGINEER - DESIGN SERVICES

HYDRAULICS ENGINEER

P.E.

SIGNATURE:

ROADWAY DESIGN ENGINEER

P.E.

SIGNATURE:

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

P.E.

STATE DESIGN ENGINEER

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED
DIVISION ADMINISTRATOR

DATE

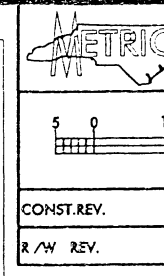
SYSTEMS

REVISIONS

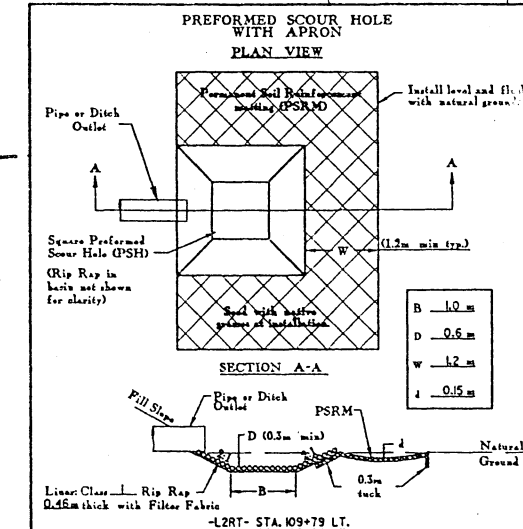
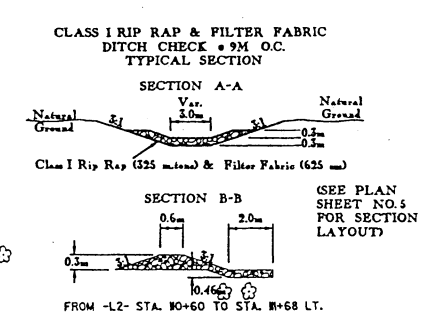
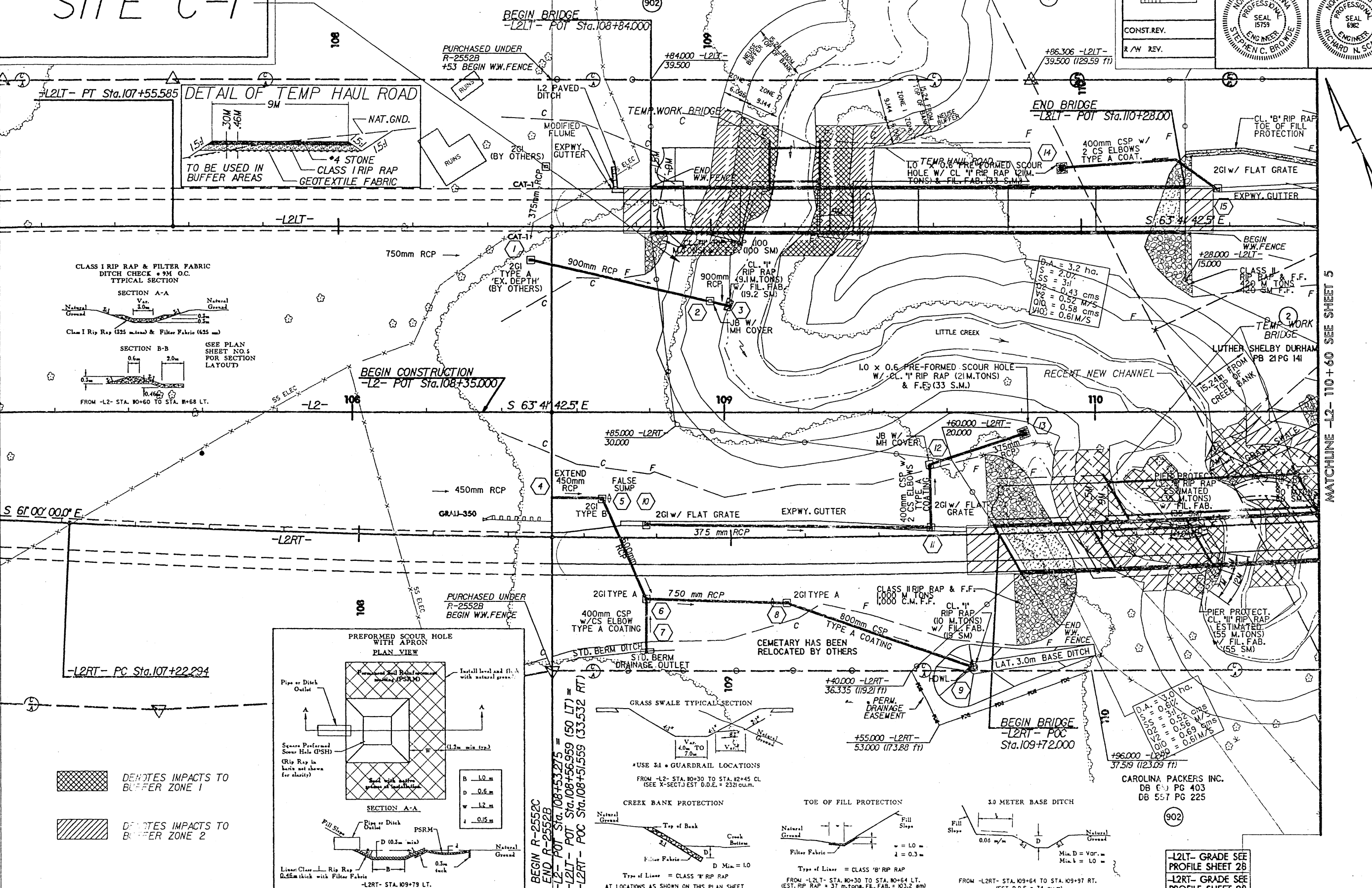
SITE C-1

CAROLINA PACKERS INC.
DB 610 PG 403
DB 557 PG 225

HENERY C DURHAM
PB 21PG 141
DB 866 PG 101



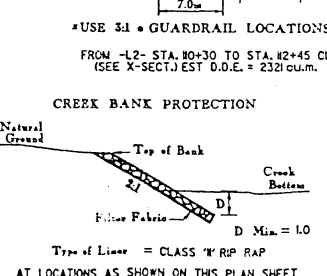
| | | | |
|-------------------------|--|-----------|---|
| PROJECT REFERENCE NO. | R-2552C | SHEET NO. | 4 |
| R/W SHEET NO. | | | |
| ROADWAY DESIGN ENGINEER | NORTH CAROLINA PROFESSIONAL SEAL 15759 STEPHEN C. BRODIE | | |
| HYDRAULICS ENGINEER | NORTH CAROLINA PROFESSIONAL SEAL 6982 RICHARD N. SCARCE | | |



DENOTES IMPACTS TO BUFFER ZONE 1

DENOTES IMPACTS TO BUFFER ZONE 2

BEGIN R-2552C
END R-2552B
-L2- POT Sta. 108+53.275 =
-L2LT- POT Sta. 108+56.959 (50 LT) =
-L2RT- POT Sta. 108+51.559 (33.532 RT)

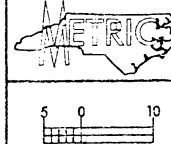


-L2LT- GRADE SEE PROFILE SHEET 28
-L2RT- GRADE SEE PROFILE SHEET 28

MATCHLINE -L2- 110 + 60 SEE SHEET 5

SITE C-1

| | |
|----------------------------------|---------------------|
| PROJECT REFERENCE NO. R-2552C | SHEET NO. 4 |
| R/W SHEET NO. | HYDRAULICS ENGINEER |
| ROADWAY DESIGN ENGINEER | SEAL 15753 |
| ENGINEER | SEAL 6902 |
| STEPHEN C. BRODIE | RICHARD N. SCARCE |



CONST. REV.
R/W REV.

CAROLINA PACKERS INC.
DB 610 PG 403
DB 557 PG 225

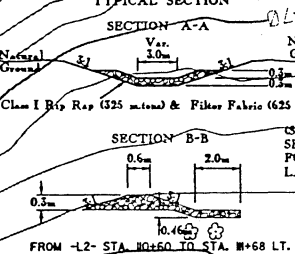
HENRY C DURHAM
PB 21 PG 141
DB 866 PG 101

BEGIN BRIDGE
-L2LT- POT Sta. 108+84.000

END BRIDGE
-L2LT- POT Sta. 110+28.00

DETAIL OF TEMP HAUL ROAD
-L2LT- PT Sta. 107+55.585

CLASS I RIP RAP & FILTER FABRIC
DITCH CHECK 9M O.C.
TYPICAL SECTION



BEGIN CONSTRUCTION
-L2- POT Sta. 108+35.000

D.A. = 3.2 ha.
S = 2.0%
SS = 3%
V2 = 0.43 cms
V10 = 0.52 M/S
V100 = 0.58 cms
V100 = 0.61 M/S

S 61°00'00" E

S 63°44'25" E

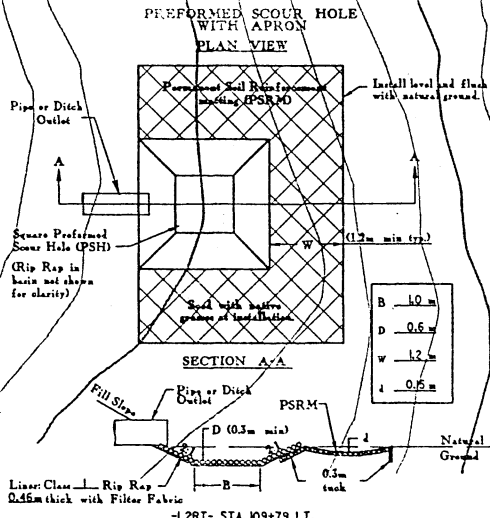
RECENT NEW CHANNEL

-L2RT- PC Sta. 107+22.294

BEGIN BRIDGE
-L2RT- POC Sta. 109+72.000

DENOTES IMPACTS TO BUFFER ZONE 1

DENOTES IMPACTS TO BUFFER ZONE 2



GRASS SWALE TYPICAL SECTION

Var. 4.0m TO 7.0m

CREEK BANK PROTECTION

Top of Bank

Creek Bottom

Filler Fabric

Min. D = 1.0m

AT LOCATIONS AS SHOWN ON THIS PLAN SHEET

CEMETARY HAS BEEN RELOCATED BY OTHERS

TOB OF FILL PROTECTION

Fill Slope

Min. D = 1.0m
Min. S = 1.0%

10 METER BASE DITCH

Fill Slope

Min. D = 1.0m
Min. S = 1.0%

-L2LT- GRADE SEE PROFILE SHEET 28
-L2RT- GRADE SEE PROFILE SHEET 28

MATCHLINE -L2- 110+60 SEE SHEET 5

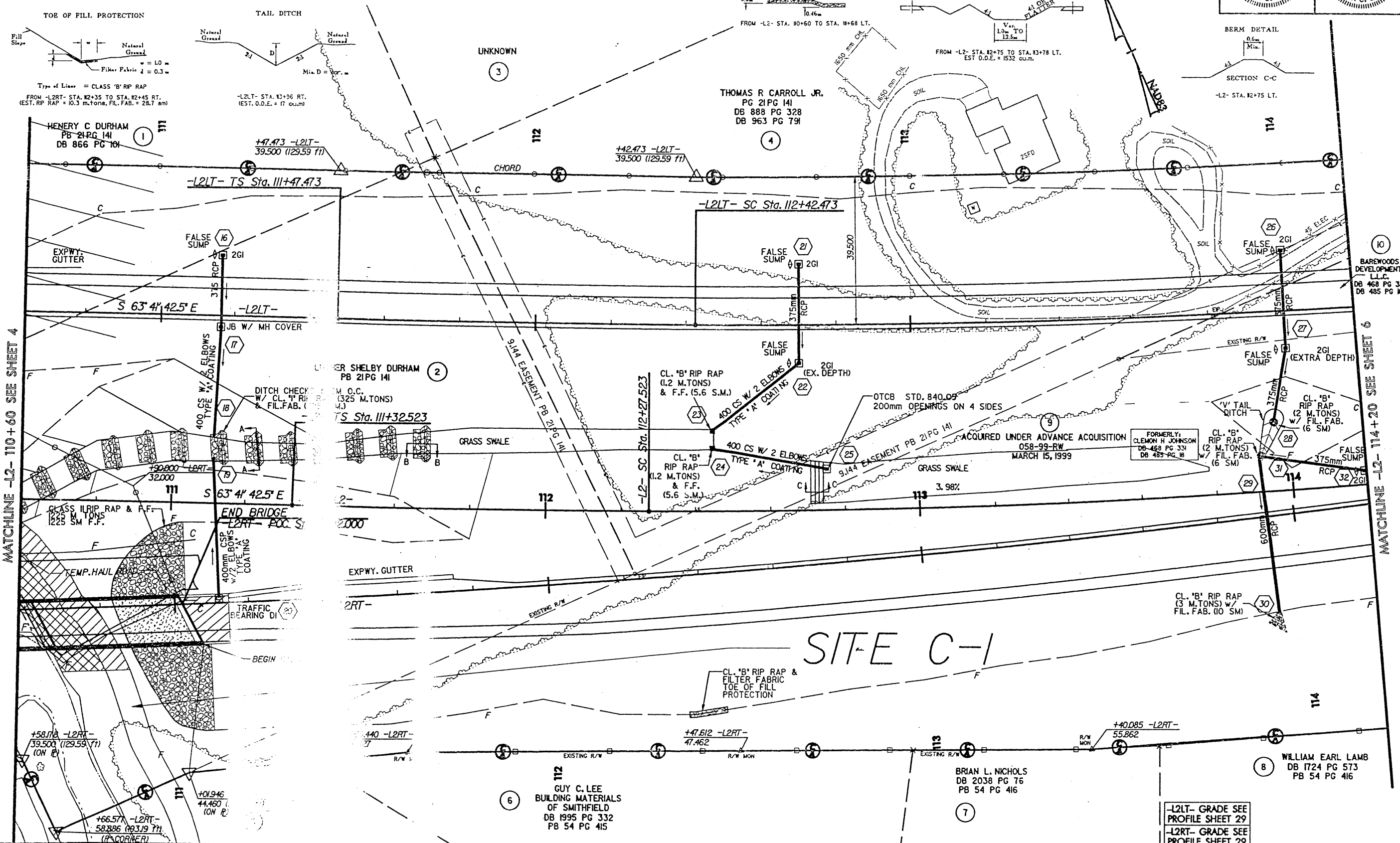
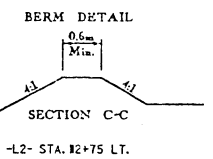
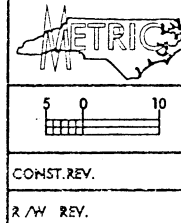
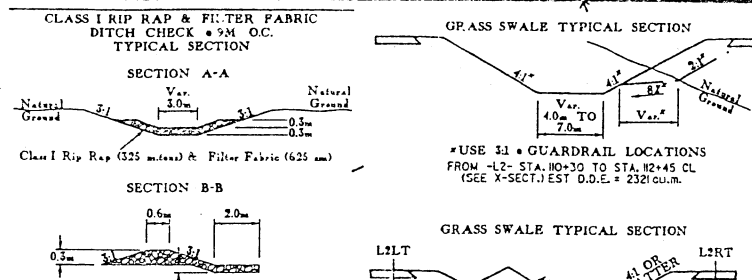
DATE PLOTTED: 11/15/05 10:58 AM

REVISIONS

| | |
|----------------------------------|---------------------|
| PROJECT REFERENCE NO. R-2552C | SHEET NO. 5 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |
| | |

DENOTES IMPACTS TO BUFFER ZONE 1

DENOTES IMPACTS TO BUFFER ZONE 2

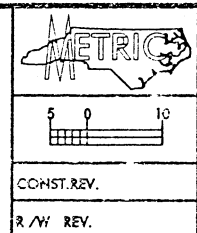
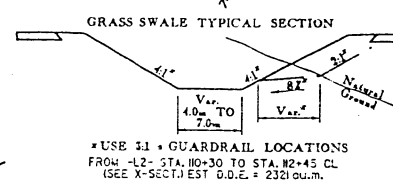
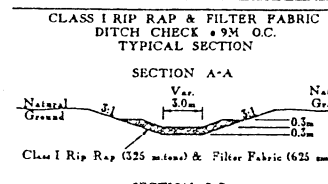


SITE C-1

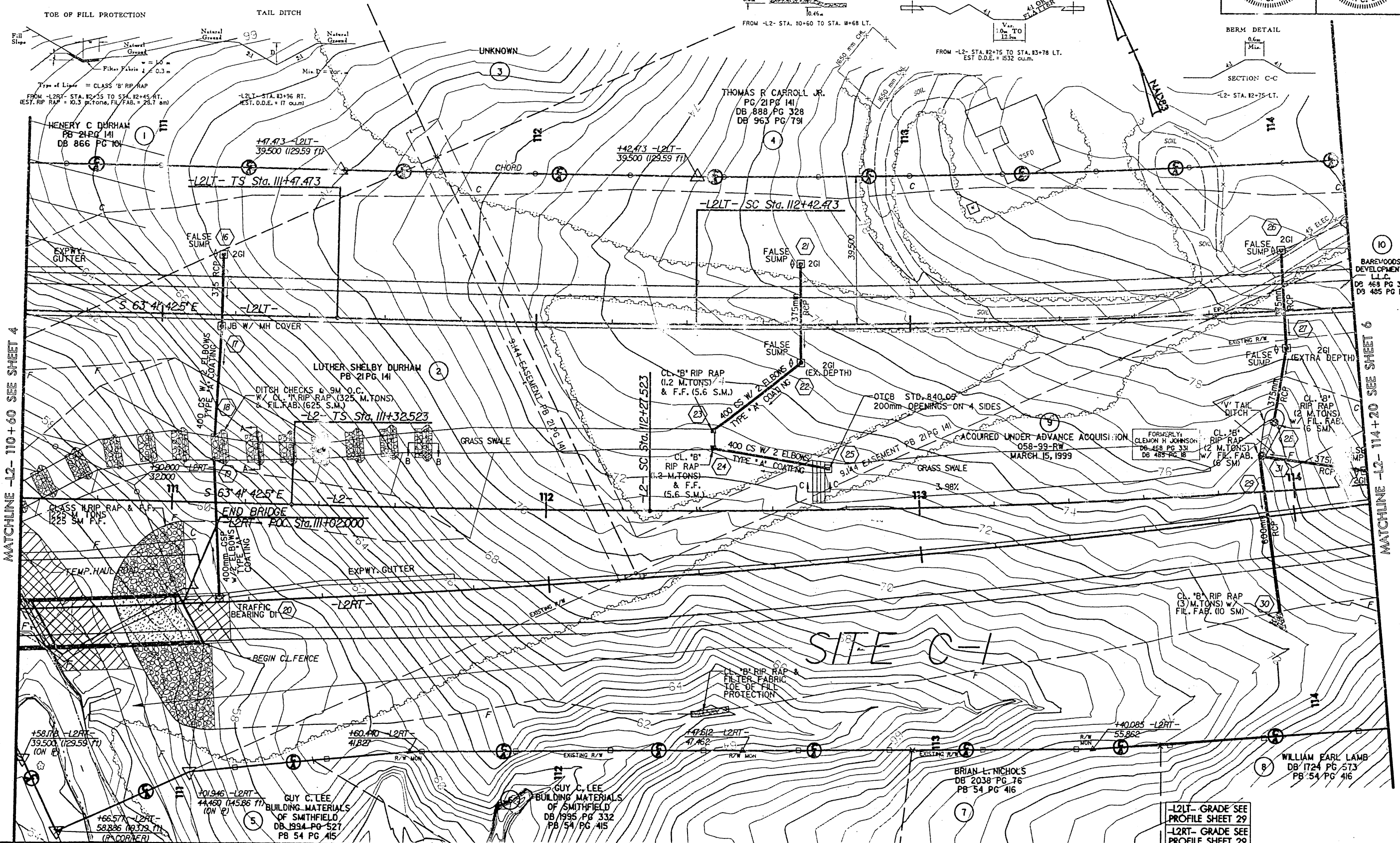
-L2LT- GRADE SEE PROFILE SHEET 29
-L2RT- GRADE SEE PROFILE SHEET 29

REVISIONS

DENOTES IMPACTS TO BUFFER ZONE 1
DENOTES IMPACTS TO BUFFER ZONE 2



PROJECT REFERENCE NO. R-2552C SHEET NO. 5
ROADWAY DESIGN ENGINEER SEAL 15759
HYDRAULICS ENGINEER SEAL 15759
STEPHEN C. BRODIE



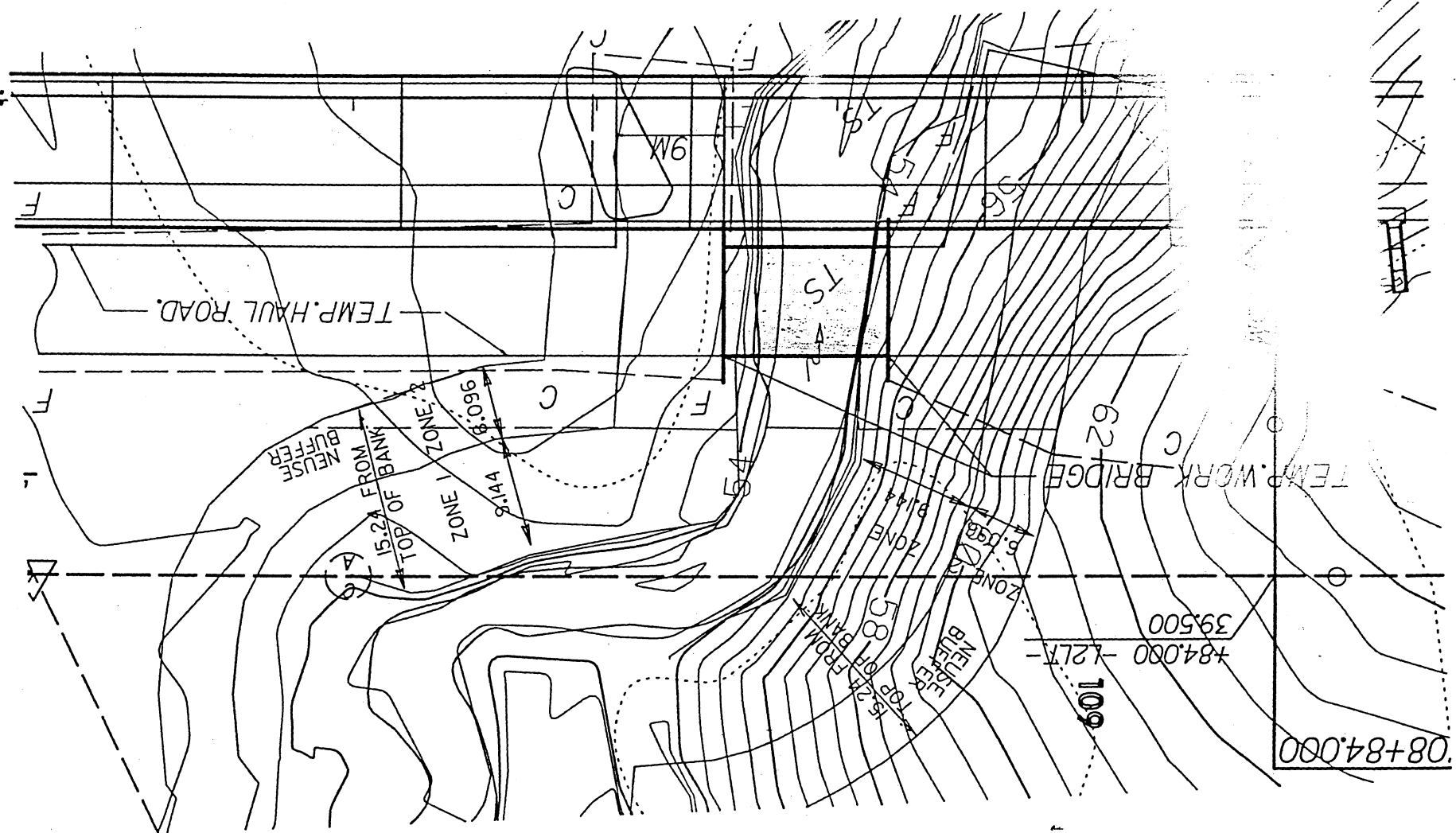
MATCHLINE -L2- 110+60 SEE SHEET 4

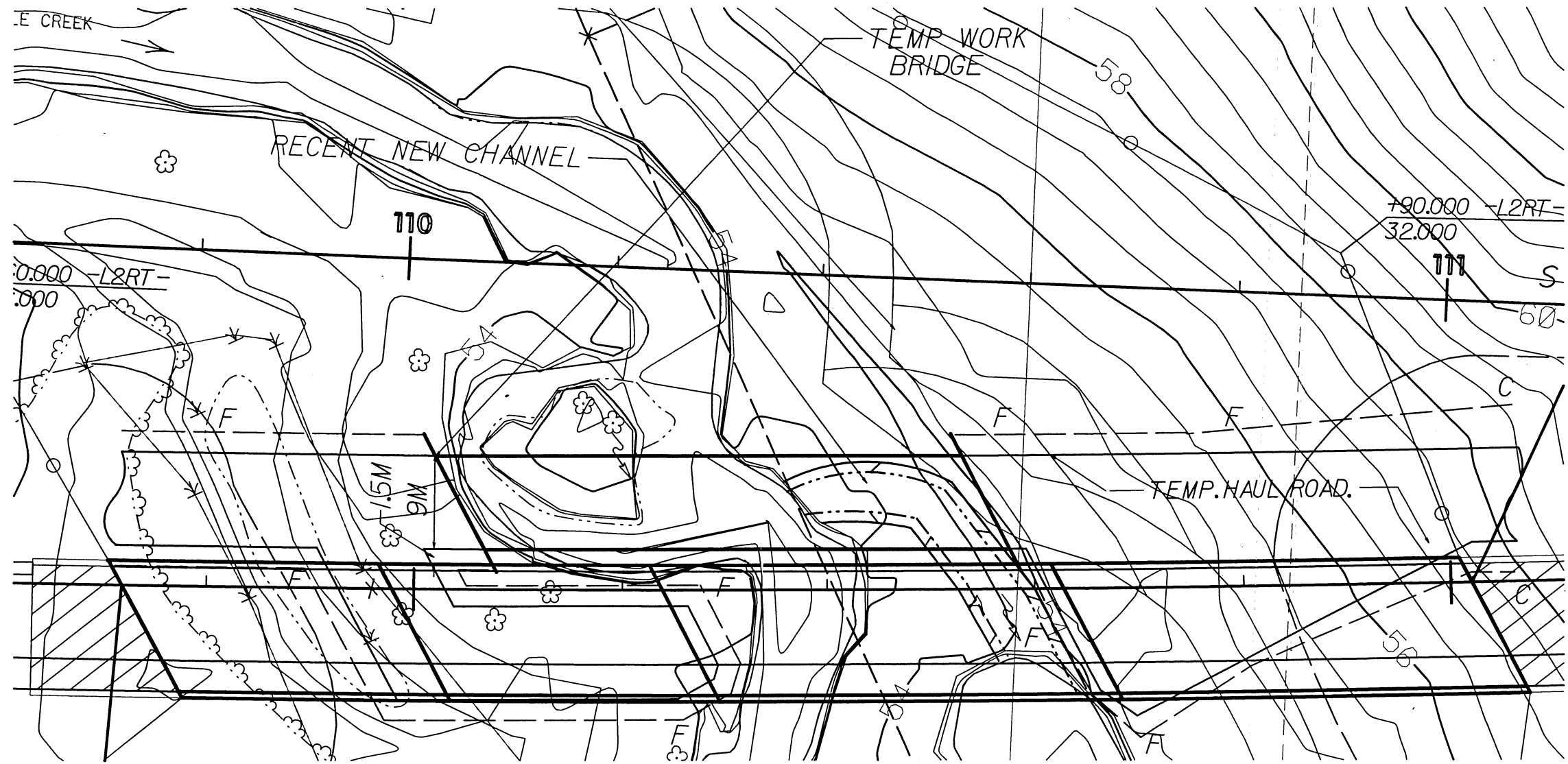
MATCHLINE -L2- 114+20 SEE SHEET 6

SITE C-1

-L2LT- GRADE SEE PROFILE SHEET 29
-L2RT- GRADE SEE PROFILE SHEET 29

L2 27 27 ←







PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PI = 110+43.000
EL = 63.382 m
VC = 210 m
K = 63

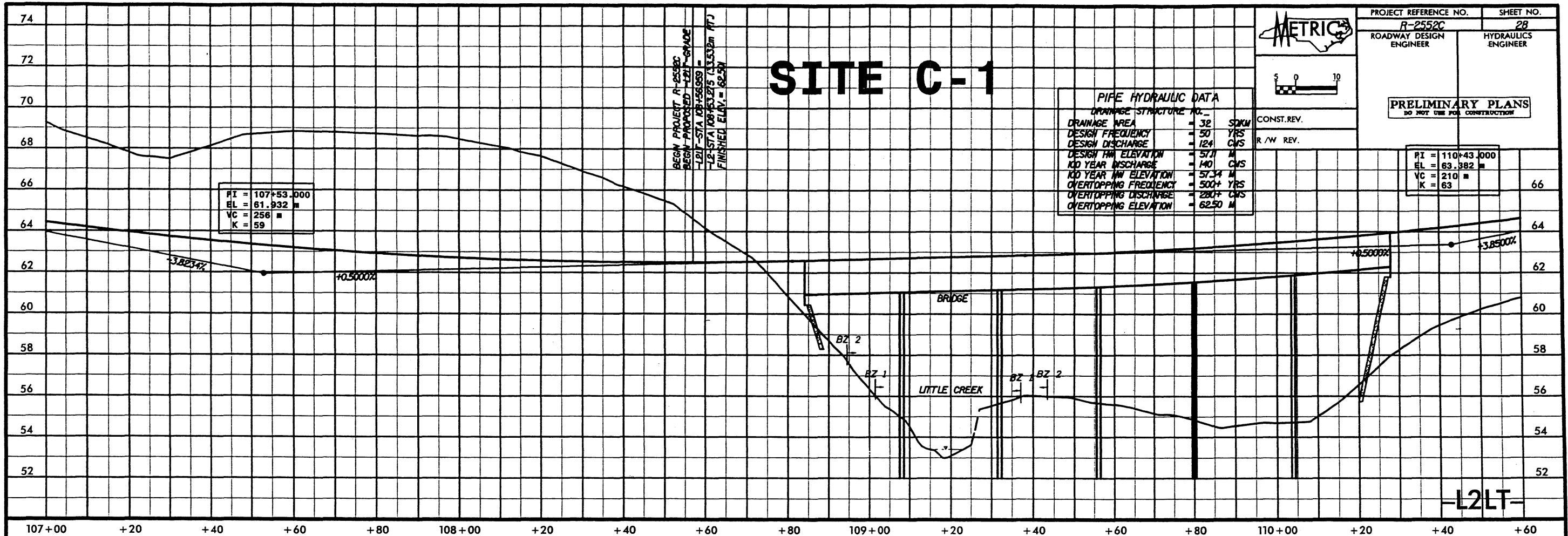
| PIPE HYDRAULIC DATA | |
|------------------------|------------|
| DRAINAGE STRUCTURE NO. | - |
| DRAINAGE AREA | = 32 SQKM |
| DESIGN FREQUENCY | = 50 YRS |
| DESIGN DISCHARGE | = 124 CFS |
| DESIGN HW ELEVATION | = 57.71 M |
| 100 YEAR DISCHARGE | = 140 CFS |
| 100 YEAR HW ELEVATION | = 57.34 M |
| OVERTOPPING FREQUENCY | = 500+ YRS |
| OVERTOPPING DISCHARGE | = 280+ CFS |
| OVERTOPPING ELEVATION | = 62.50 M |

CONST. REV.
R/W REV.

SITE C-1

BEGIN PROJECT R-2552C
BEGIN PROPOSED L2LT GRADE
-L2LT STA 108+53.275 (33.532m RTJ)
FINISHED ELEV. = 62.5m

PI = 107+53.000
EL = 61.932 m
VC = 256 m
K = 59



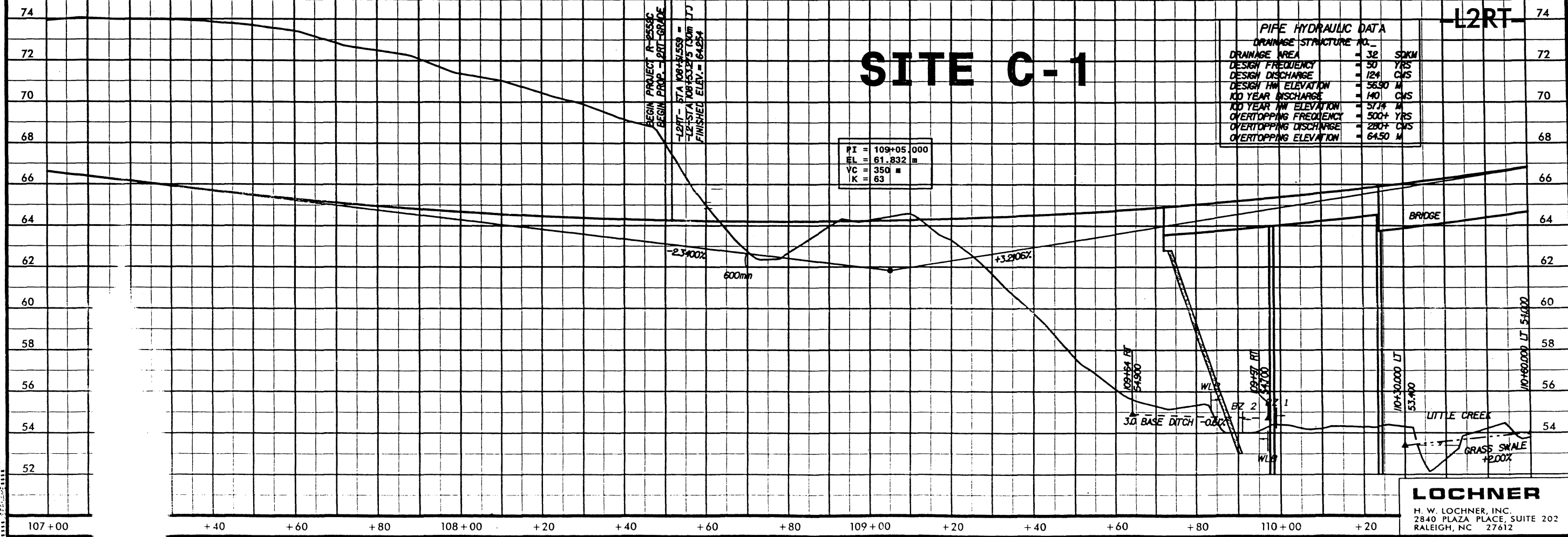
-L2LT-

SITE C-1

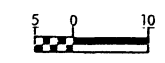
BEGIN PROJECT R-2552C
BEGIN PROPOSED L2RT GRADE
-L2RT STA 108+53.275 (33.532m RTJ)
FINISHED ELEV. = 64.254

PI = 109+05.000
EL = 61.832 m
VC = 350 m
K = 63

| PIPE HYDRAULIC DATA | |
|------------------------|------------|
| DRAINAGE STRUCTURE NO. | - |
| DRAINAGE AREA | = 32 SQKM |
| DESIGN FREQUENCY | = 50 YRS |
| DESIGN DISCHARGE | = 124 CFS |
| DESIGN HW ELEVATION | = 56.90 M |
| 100 YEAR DISCHARGE | = 140 CFS |
| 100 YEAR HW ELEVATION | = 57.14 M |
| OVERTOPPING FREQUENCY | = 500+ YRS |
| OVERTOPPING DISCHARGE | = 280+ CFS |
| OVERTOPPING ELEVATION | = 64.50 M |



-L2RT-



PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

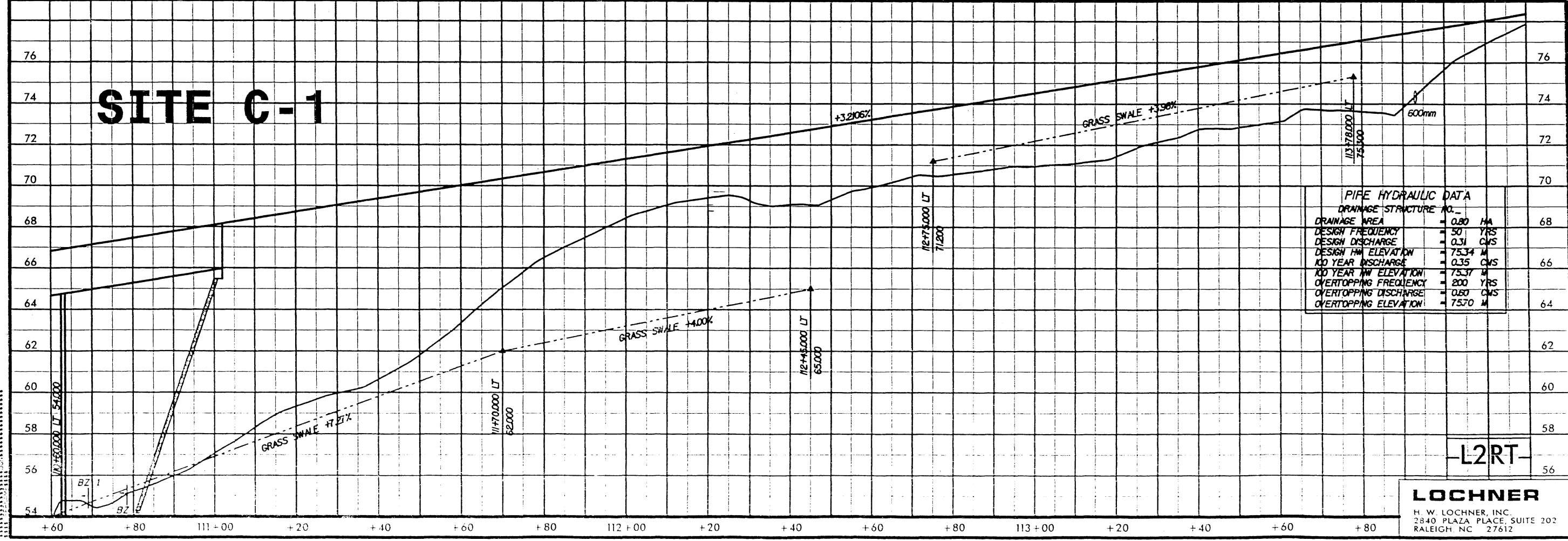
BM#BL-5 BL STA. 118+72.34
144.943 FT
ELEV. = 69.536
N 206079.7872
E 459156.0477

CONST. REV.
R/W REV.



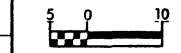
L2LT

SITE C-1



| PIPE HYDRAULIC DATA | |
|------------------------------|------------|
| DRAINAGE STRUCTURE NO. _____ | |
| DRAINAGE AREA | = 0.80 HA |
| DESIGN FREQUENCY | = 50 YRS |
| DESIGN DISCHARGE | = 0.31 CMS |
| DESIGN HW ELEVATION | = 75.34 M |
| 100 YEAR DISCHARGE | = 0.35 CMS |
| 100 YEAR HW ELEVATION | = 75.37 M |
| OVERTOPPING FREQUENCY | = 200 YRS |
| OVERTOPPING DISCHARGE | = 0.60 CMS |
| OVERTOPPING ELEVATION | = 75.70 M |

L2RT



CONST. REV.

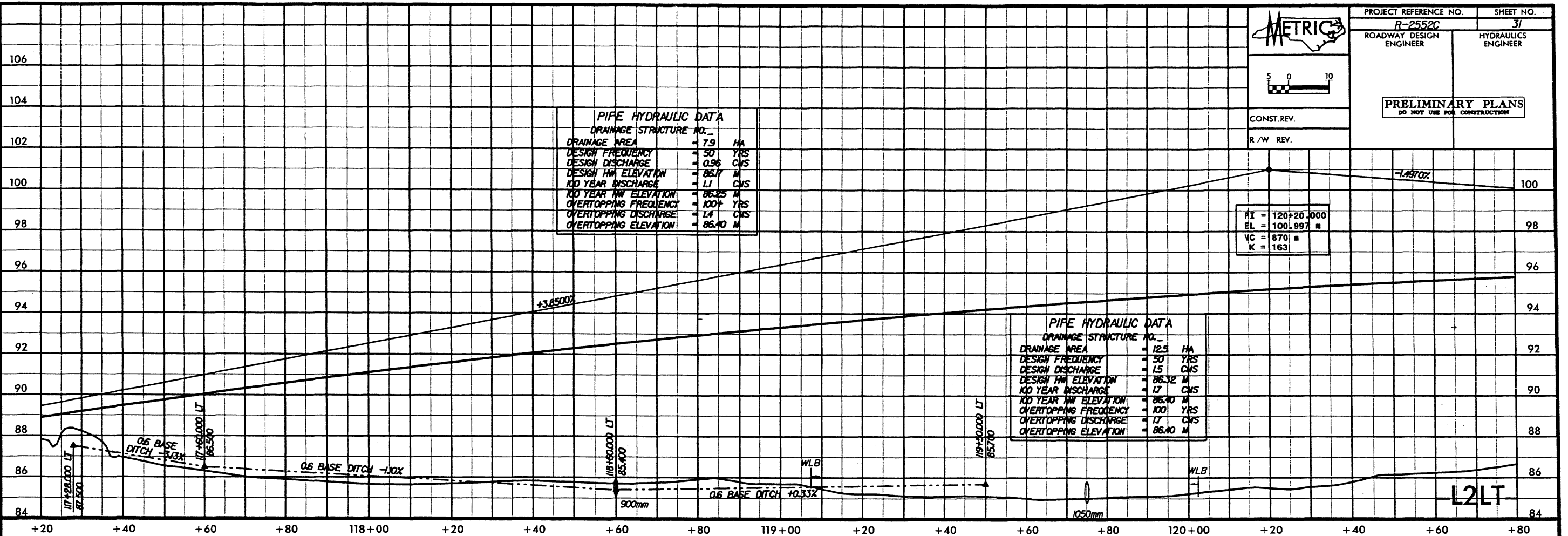
R / W REV.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

| PIPE HYDRAULIC DATA | |
|--------------------------|------------|
| DRAINAGE STRUCTURE NO. 1 | |
| DRAINAGE AREA | = 7.9 HA |
| DESIGN FREQUENCY | = 50 YRS |
| DESIGN DISCHARGE | = 0.96 CMS |
| DESIGN HW ELEVATION | = 86.7 M |
| 100 YEAR DISCHARGE | = 1.1 CMS |
| 100 YEAR HW ELEVATION | = 86.25 M |
| OVERTOPPING FREQUENCY | = 100 YRS |
| OVERTOPPING DISCHARGE | = 1.4 CMS |
| OVERTOPPING ELEVATION | = 86.40 M |

| PIPE HYDRAULIC DATA | |
|--------------------------|-----------|
| DRAINAGE STRUCTURE NO. 2 | |
| DRAINAGE AREA | = 12.5 HA |
| DESIGN FREQUENCY | = 50 YRS |
| DESIGN DISCHARGE | = 1.5 CMS |
| DESIGN HW ELEVATION | = 86.32 M |
| 100 YEAR DISCHARGE | = 1.7 CMS |
| 100 YEAR HW ELEVATION | = 86.40 M |
| OVERTOPPING FREQUENCY | = 100 YRS |
| OVERTOPPING DISCHARGE | = 1.7 CMS |
| OVERTOPPING ELEVATION | = 86.40 M |

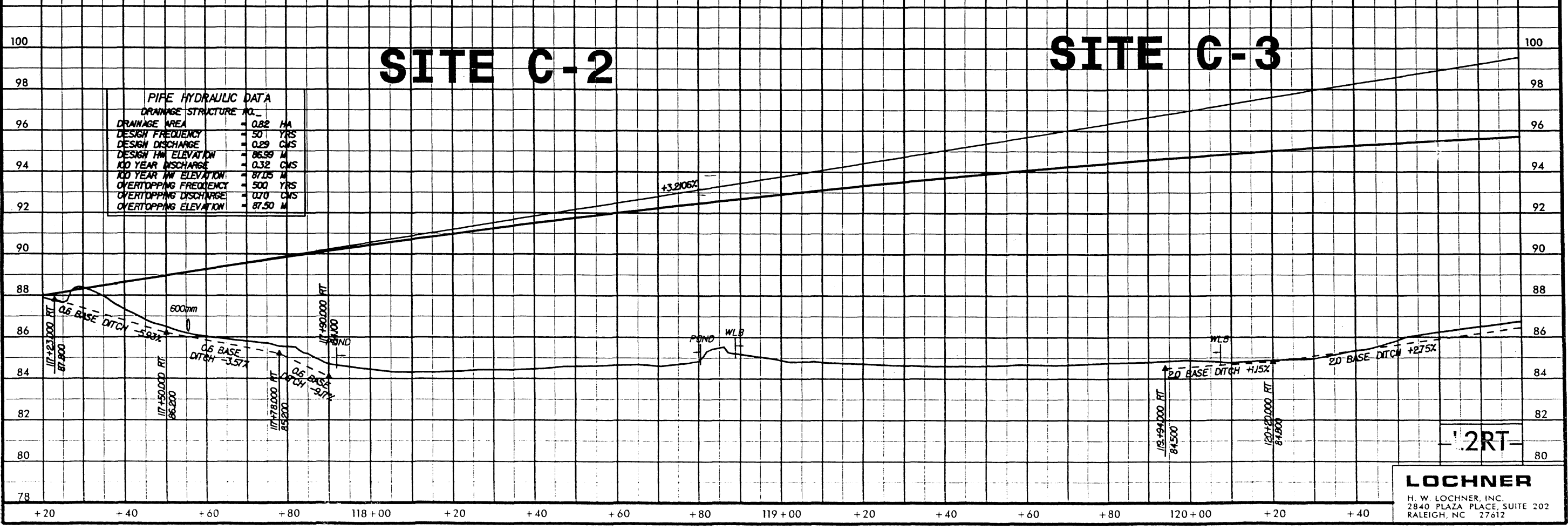
| |
|-----------------|
| PI = 120+20.000 |
| EL = 100.997 |
| VC = 870 |
| K = 163 |



SITE C-2

SITE C-3

| PIPE HYDRAULIC DATA | |
|--------------------------|------------|
| DRAINAGE STRUCTURE NO. 3 | |
| DRAINAGE AREA | = 0.82 HA |
| DESIGN FREQUENCY | = 50 YRS |
| DESIGN DISCHARGE | = 0.29 CMS |
| DESIGN HW ELEVATION | = 86.99 M |
| 100 YEAR DISCHARGE | = 0.32 CMS |
| 100 YEAR HW ELEVATION | = 87.05 M |
| OVERTOPPING FREQUENCY | = 500 YRS |
| OVERTOPPING DISCHARGE | = 0.70 CMS |
| OVERTOPPING ELEVATION | = 87.50 M |



REVISIONS

JOHN JENNINGS WILLIAMS, HEIRS
DB 922 PG 682

20

+84283 -YI-
7.620 (25.00 FT)
D.A. = 0.30' (9.14 M)
+84283 -YI-
7.620 (25.00 FT)
Q2 = 0.051 cms
V2 = 0.40 M/S
Q10 = 0.068 cms
V10 = 0.46 M/S

+84283 -YI-
12.190 (40.00 FT)
+84283 -YI-
7.620 (25.00 FT)
+100.000 -YI-
12.190 (40.00 FT)

+30.000 -YI-
12.190 (40.00 FT)
D.A. = 0.12' (3.66 M)
S = 2.70%
SS = 3H & 4V
Q2 = 0.031 cms
V2 = 0.30 M/S
Q10 = 0.037 cms
V10 = 0.34 M/S

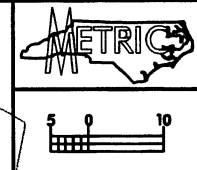
+30.000 -YI-
12.190 (40.00 FT)
BEGIN W.W.FENCE -YI- POT Sta. 11+96.591
BEGIN C/A

-L2LT- POC Sta. 121+97.157
 $\Delta = 72' 25" 37.9$
-YI- POT Sta. 12+14.221
-L2- POS Sta. 122+13.539
 $\Delta = 73' 51" 59.8$

SITE C-4

JOHN JENNINGS WILLIAMS, HEIRS
DB 922 PG 682

20



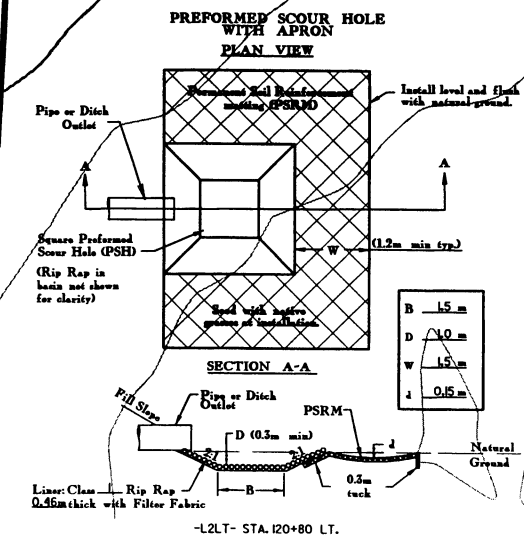
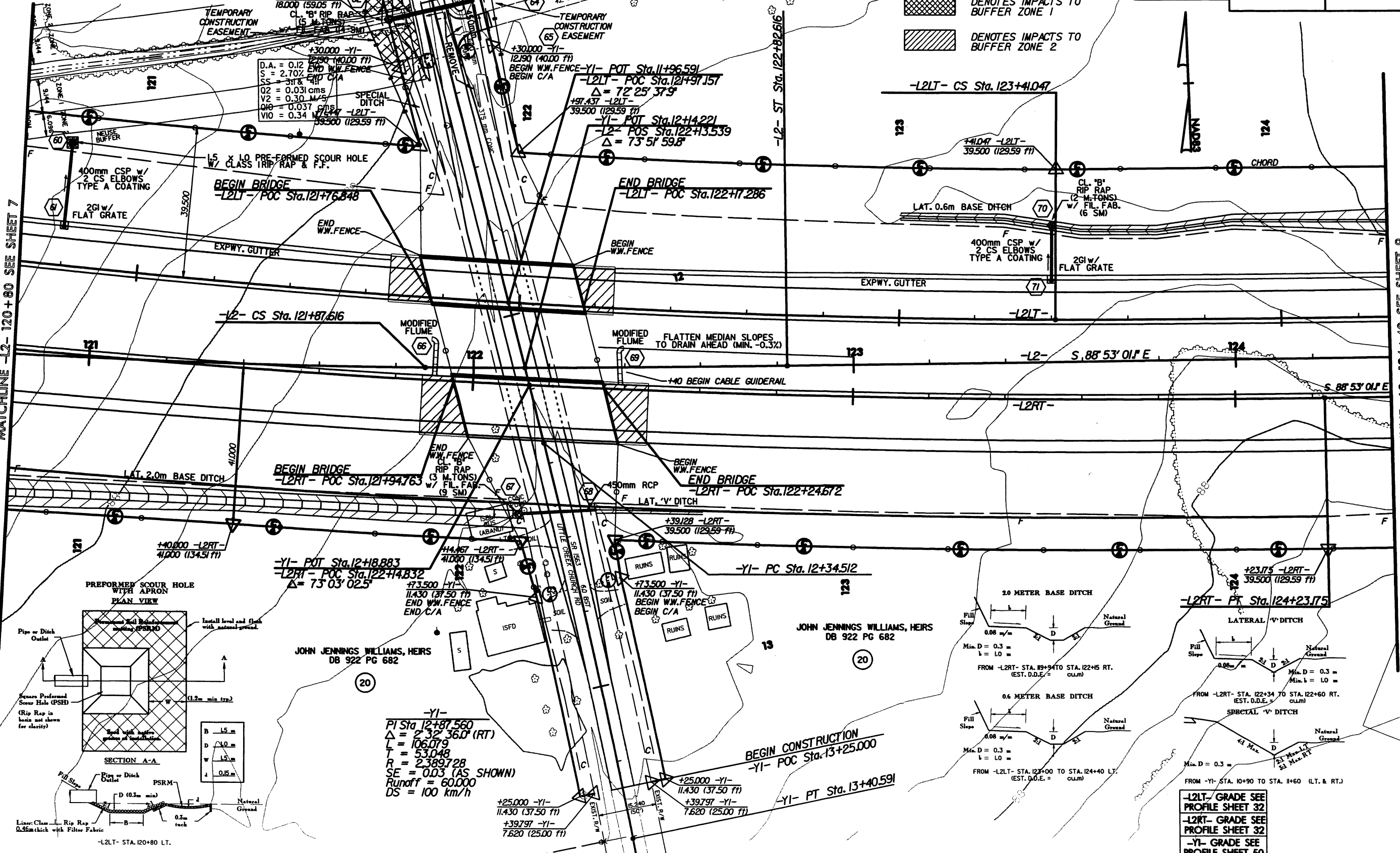
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|---|---------|---------------------|---|
| PROJECT REFERENCE NO. | R-2552C | SHEET NO. | 8 |
| R/W SHEET NO. | | | |
| ROADWAY DESIGN ENGINEER | | HYDRAULICS ENGINEER | |
| PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION | | | |
| CONST. REV. | | | |
| R/W REV. | | | |

DENOTES IMPACTS TO BUFFER ZONE 1
DENOTES IMPACTS TO BUFFER ZONE 2



MATCHLINE -L2- 120+80 SEE SHEET 7

MATCHLINE -L2- 124+40 SEE SHEET 9



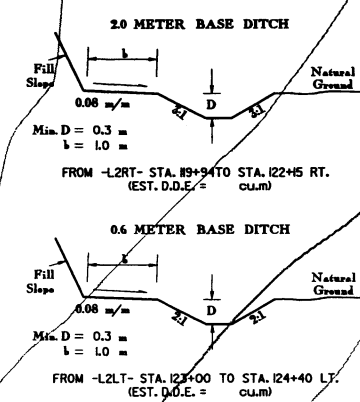
JOHN JENNINGS WILLIAMS, HEIRS
DB 922 PG 682

20

-YI-
PI Sta. 12+87.560
 $\Delta = 2' 32" 36.0$ (RT)
L = 106.079
T = 53.048
R = 2,389.728
SE = 0.03 (AS SHOWN)
Runoff = 60.000
DS = 100 km/h

+25.000 -YI-
11.430 (37.50 FT)
+39.797 -YI-
7.620 (25.00 FT)

BEGIN CONSTRUCTION
-YI- POC Sta. 13+25.000
-YI- PT Sta. 13+40.591



-L2LT- GRADE SEE PROFILE SHEET 32
-L2RT- GRADE SEE PROFILE SHEET 32
-YI- GRADE SEE PROFILE SHEET 50

REVISIONS

JOHN JENNINGS WILLIAMS, HEIRS
DB 922 PG 682

(20)

+84283 -YI-
7.620 (25.00 FT)
D.A. = 0.30 Ha.
+8428333YI-
8.850 (27.00 FT)
Q2 = 0.051 cms
V2 = 0.40 M/S
Q10 = 0.068 cms
V10 = 0.46 M/S

+100.000 -YI-
12.190 (40.00 FT) 750mm
RCP

+14.924 -YI-
18.000 (59.05 FT)
CL. "B" RIP RAP
(5 M. TONS)
w/ FIL. FAB. (4 SM)

+30.000 -YI-
12.190 (40.00 FT)
D.A. = 0.12
S = 2.70%
SS = 3.11 & 4.11
Q2 = 0.031 cms
V2 = 0.30 M/S
Q10 = 0.037 cms
V10 = 0.34 M/S

+84283 -YI-
7.620 (25.00 FT)

+84283 -YI-
7.620 (25.00 FT)

+100.000 -YI-
12.190 (40.00 FT)

+14.924 -YI-
18.000 (59.05 FT)

+30.000 -YI-
12.190 (40.00 FT)

+100.000 -YI-
12.190 (40.00 FT)

+14.924 -YI-
18.000 (59.05 FT)

+30.000 -YI-
12.190 (40.00 FT)

+100.000 -YI-
12.190 (40.00 FT)

+14.924 -YI-
18.000 (59.05 FT)

+30.000 -YI-
12.190 (40.00 FT)

+100.000 -YI-
12.190 (40.00 FT)

+14.924 -YI-
18.000 (59.05 FT)

+30.000 -YI-
12.190 (40.00 FT)

+100.000 -YI-
12.190 (40.00 FT)

+14.924 -YI-
18.000 (59.05 FT)

+30.000 -YI-
12.190 (40.00 FT)

+100.000 -YI-
12.190 (40.00 FT)

+14.924 -YI-
18.000 (59.05 FT)

+30.000 -YI-
12.190 (40.00 FT)

+100.000 -YI-
12.190 (40.00 FT)

+14.924 -YI-
18.000 (59.05 FT)

+30.000 -YI-
12.190 (40.00 FT)

+100.000 -YI-
12.190 (40.00 FT)

+14.924 -YI-
18.000 (59.05 FT)

+30.000 -YI-
12.190 (40.00 FT)

+100.000 -YI-
12.190 (40.00 FT)

+14.924 -YI-
18.000 (59.05 FT)

+30.000 -YI-
12.190 (40.00 FT)

+100.000 -YI-
12.190 (40.00 FT)

+14.924 -YI-
18.000 (59.05 FT)

+30.000 -YI-
12.190 (40.00 FT)

+100.000 -YI-
12.190 (40.00 FT)

+14.924 -YI-
18.000 (59.05 FT)

+30.000 -YI-
12.190 (40.00 FT)

+100.000 -YI-
12.190 (40.00 FT)

+14.924 -YI-
18.000 (59.05 FT)

+30.000 -YI-
12.190 (40.00 FT)

+100.000 -YI-
12.190 (40.00 FT)

+14.924 -YI-
18.000 (59.05 FT)

+30.000 -YI-
12.190 (40.00 FT)

+100.000 -YI-
12.190 (40.00 FT)

+14.924 -YI-
18.000 (59.05 FT)

+30.000 -YI-
12.190 (40.00 FT)


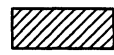
+100.000 -YI-
12.190 (40.00 FT)

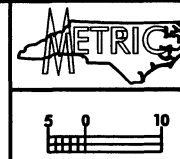
+14.924 -YI-
18.000 (59.05 FT)

SITE C-4

JOHN JENNINGS WILLIAMS, HEIRS
DB 922 PG 682

(20)

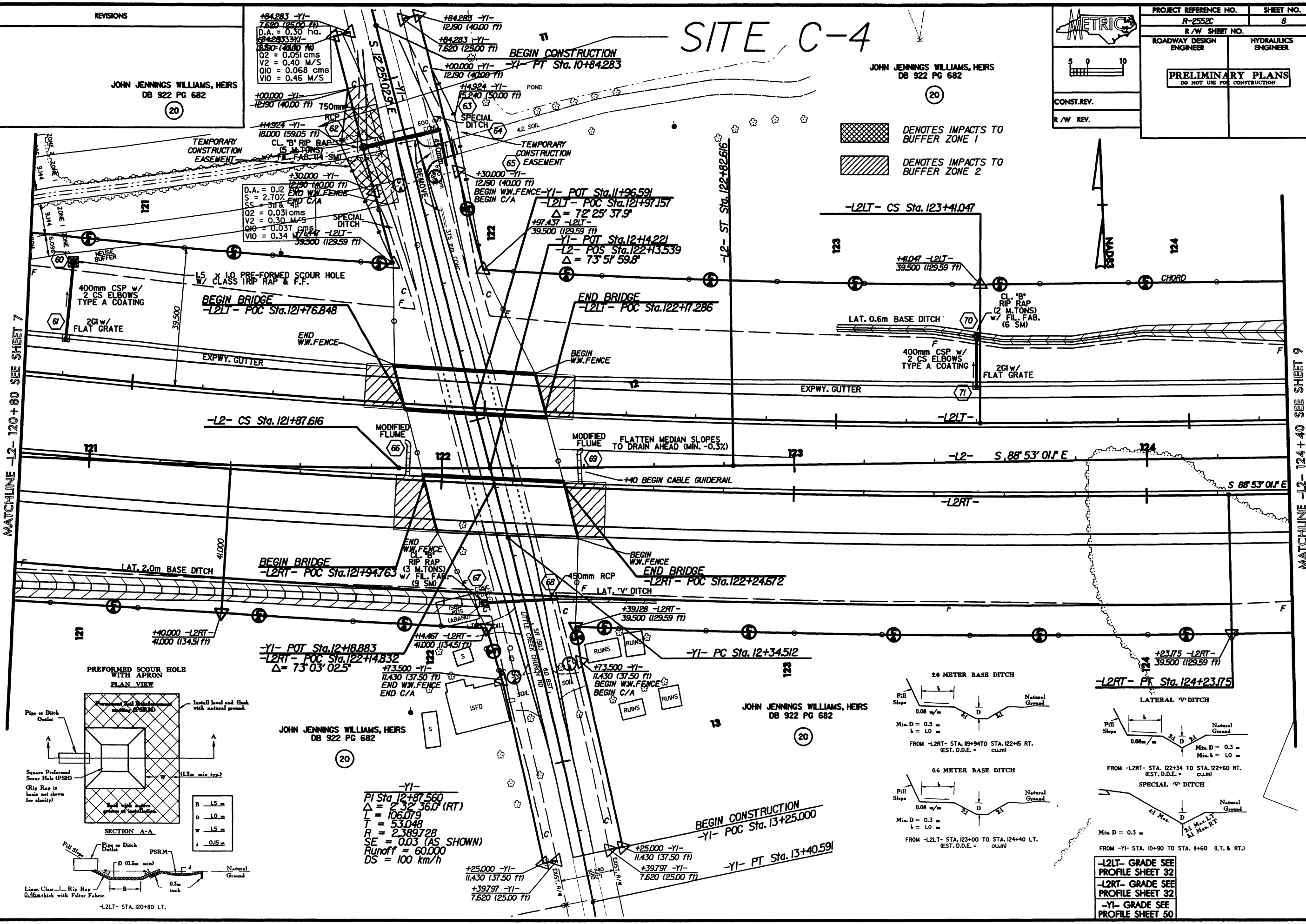
 DENOTES IMPACTS TO BUFFER ZONE 1
 DENOTES IMPACTS TO BUFFER ZONE 2



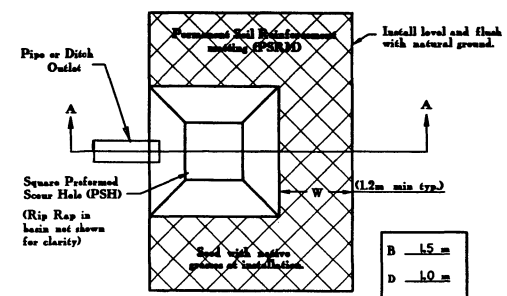
| | | | |
|---|---------|---------------------|---|
| PROJECT REFERENCE NO. | R-2552C | SHEET NO. | 8 |
| R/W SHEET NO. | | | |
| ROADWAY DESIGN ENGINEER | | HYDRAULICS ENGINEER | |
| PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION | | | |
| CONST. REV. | | | |
| R/W REV. | | | |

MATCHLINE -L2- 120+80 SEE SHEET 7

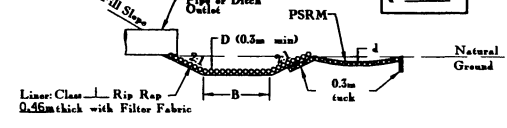
MATCHLINE -L2- 124+40 SEE SHEET 9



PREFORMED SCOUR HOLE WITH APRON PLAN VIEW



SECTION A-A



JOHN JENNINGS WILLIAMS, HEIRS
DB 922 PG 682

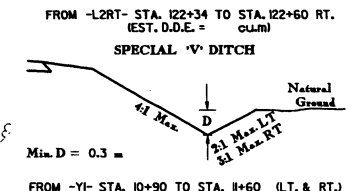
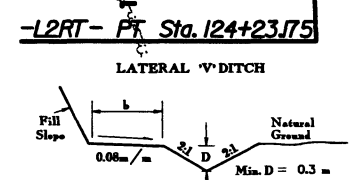
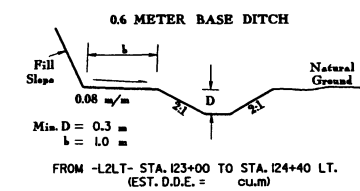
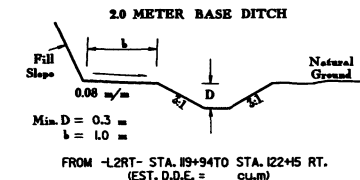
(20)

-YI-
PI Sta 12+87.560
 $\Delta = 2' 32" 36.0" (RT)$
 $L = 106.079$
 $T = 53.048$
 $R = 2,389.728$
 $SE = 0.03 (AS SHOWN)$
 $Runoff = 60,000$
 $DS = 100 km/h$

+25.000 -YI-
11.430 (37.50 FT)
+39.797 -YI-
7.620 (25.00 FT)

BEGIN CONSTRUCTION
-YI- POC Sta. 13+25.000

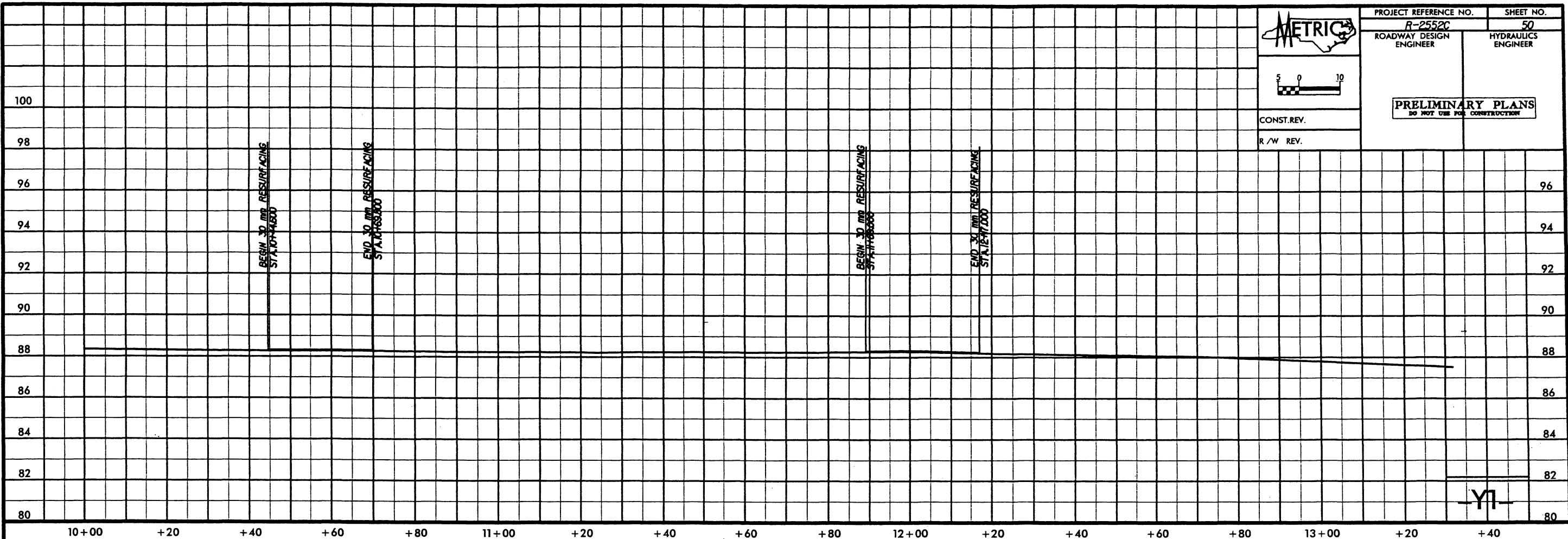
-YI- PT Sta. 13+40.591



-L2LT- GRADE SEE PROFILE SHEET 32
-L2RT- GRADE SEE PROFILE SHEET 32
-YI- GRADE SEE PROFILE SHEET 50



| | |
|---|------------------------|
| PROJECT REFERENCE NO. R-2552C | SHEET NO. 50 |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |
| PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION | |
| CONST. REV. | |
| R/W REV. | |



SITE C-4

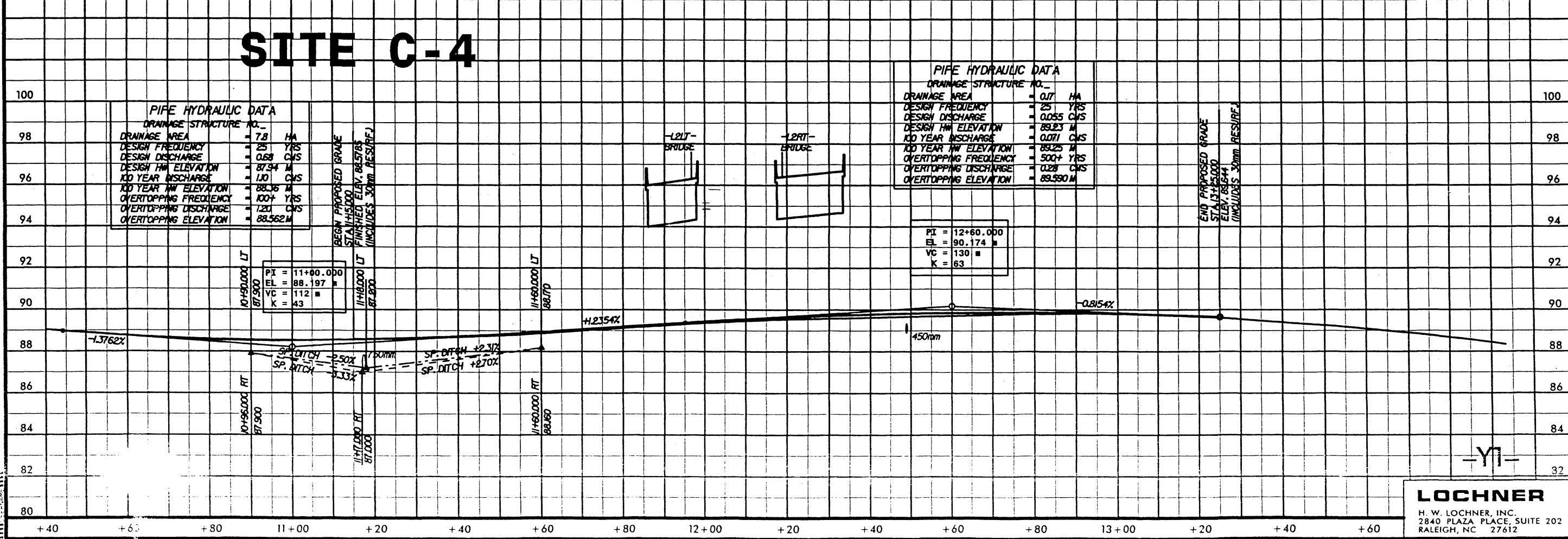
| PIPE HYDRAULIC DATA | |
|--------------------------|------------|
| DRAINAGE STRUCTURE NO. 1 | |
| DRAINAGE AREA | = 7.8 HA |
| DESIGN FREQUENCY | = 25 YRS |
| DESIGN DISCHARGE | = 0.69 CMS |
| DESIGN HW ELEVATION | = 87.94 M |
| 100 YEAR DISCHARGE | = 1.10 CMS |
| 100 YEAR HW ELEVATION | = 88.36 M |
| OVERTOPPING FREQUENCY | = 100+ YRS |
| OVERTOPPING DISCHARGE | = 1.21 CMS |
| OVERTOPPING ELEVATION | = 88.562 M |

BEGIN PROPOSED GRADE
STA. 11+50.000
FINISHED ELEV. 88.1575
(INCLUDES 30mm RESURF.)

| PIPE HYDRAULIC DATA | |
|--------------------------|-------------|
| DRAINAGE STRUCTURE NO. 2 | |
| DRAINAGE AREA | = 0.17 HA |
| DESIGN FREQUENCY | = 25 YRS |
| DESIGN DISCHARGE | = 0.055 CMS |
| DESIGN HW ELEVATION | = 89.23 M |
| 100 YEAR DISCHARGE | = 0.071 CMS |
| 100 YEAR HW ELEVATION | = 89.25 M |
| OVERTOPPING FREQUENCY | = 500+ YRS |
| OVERTOPPING DISCHARGE | = 0.28 CMS |
| OVERTOPPING ELEVATION | = 89.590 M |

PI = 12+60.000
EL = 90.174 M
VC = 130 M
K = 63

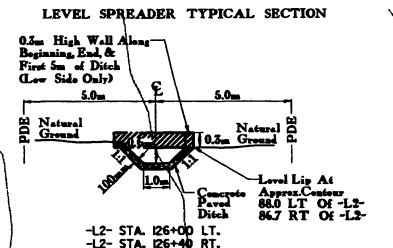
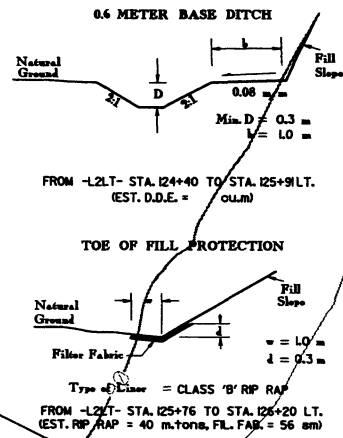
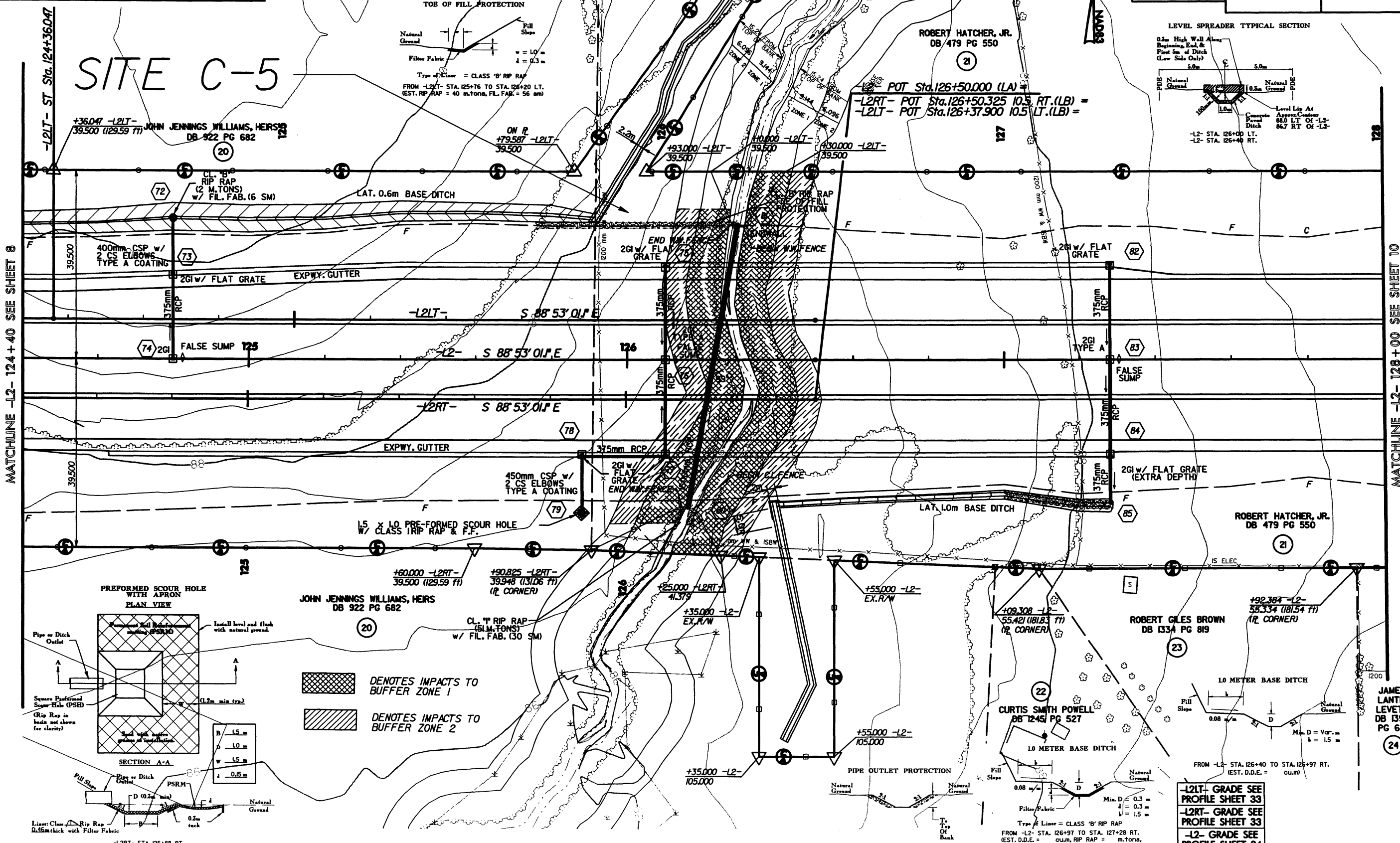
END PROPOSED GRADE
STA. 13+50.000
ELEV. 88.644
(INCLUDES 30mm RESURF.)



REVISIONS

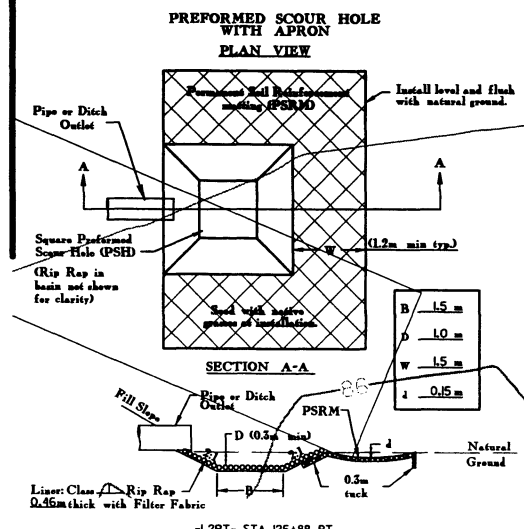
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|---|--|---------------------|--|
| PROJECT REFERENCE NO. R-2552C | | SHEET NO. 9 | |
| ROADWAY DESIGN ENGINEER | | HYDRAULICS ENGINEER | |
| PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION | | | |
| CONST. REV. | | R/W REV. | |

SITE C-5



MATCHLINE -L2- 124 + 40 SEE SHEET 8

MATCHLINE -L2- 128 + 00 SEE SHEET 10



DENOTES IMPACTS TO BUFFER ZONE 1

DENOTES IMPACTS TO BUFFER ZONE 2

-L2LT- GRADE SEE PROFILE SHEET 33
 -L2RT- GRADE SEE PROFILE SHEET 33
 -L2- GRADE SEE PROFILE SHEET 34

*****SYTIME*****
 *****SYTIME*****
 *****SYTIME*****
 *****SYTIME*****
 *****SYTIME*****

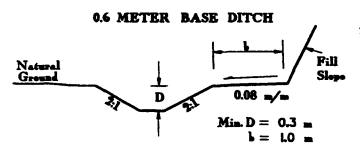
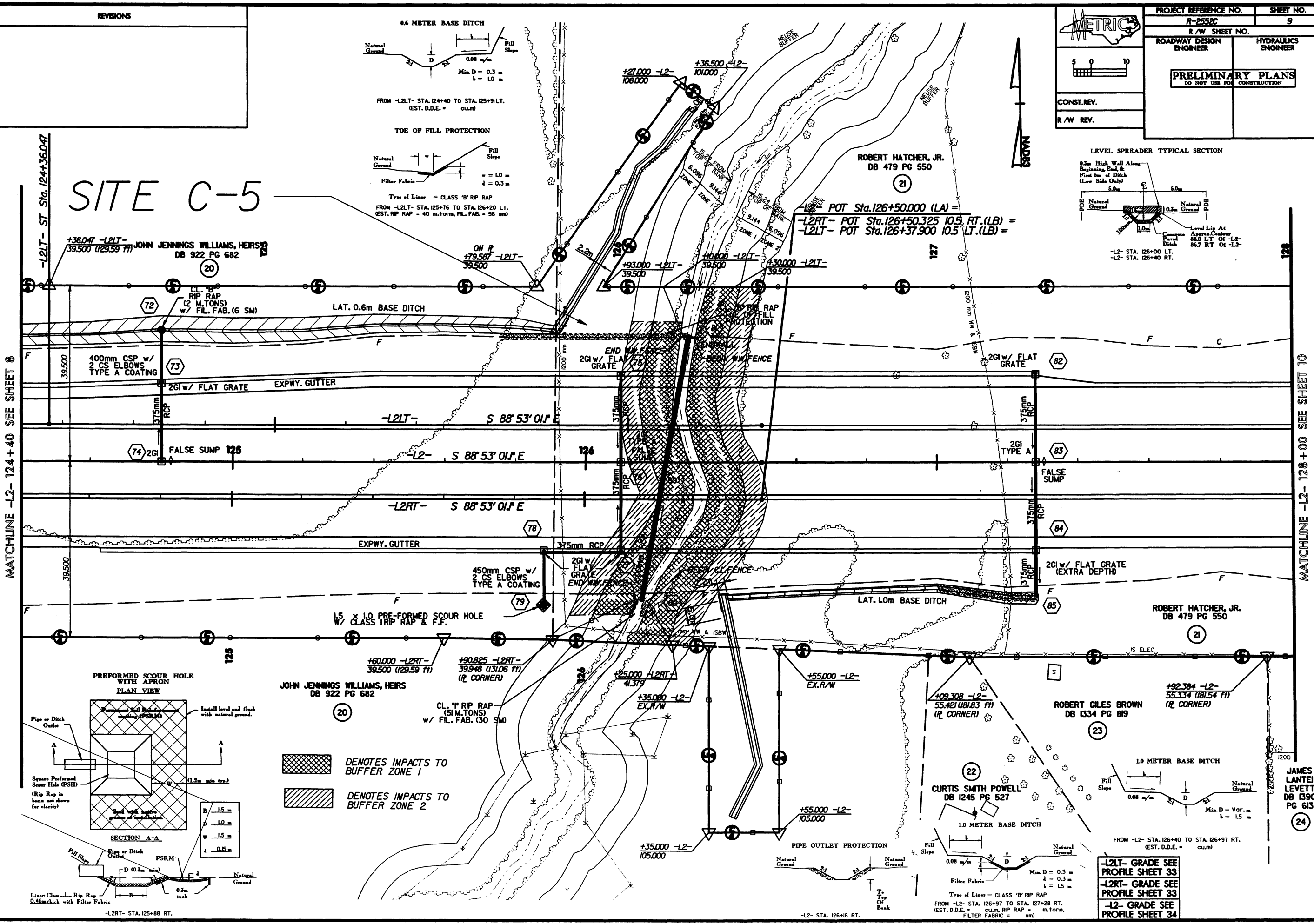
REVISIONS

| | | | |
|---|--|---------------------|--|
| PROJECT REFERENCE NO. | | SHEET NO. | |
| R-2552C | | 9 | |
| R/W SHEET NO. | | HYDRAULICS ENGINEER | |
| ROADWAY DESIGN ENGINEER | | | |
| PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION | | | |
| CONST. REV. | | | |
| R/W REV. | | | |

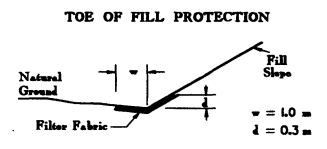
SITE C-5

MATCHLINE -L2- 124 + 40 SEE SHEET 8

MATCHLINE -L2- 128 + 00 SEE SHEET 10

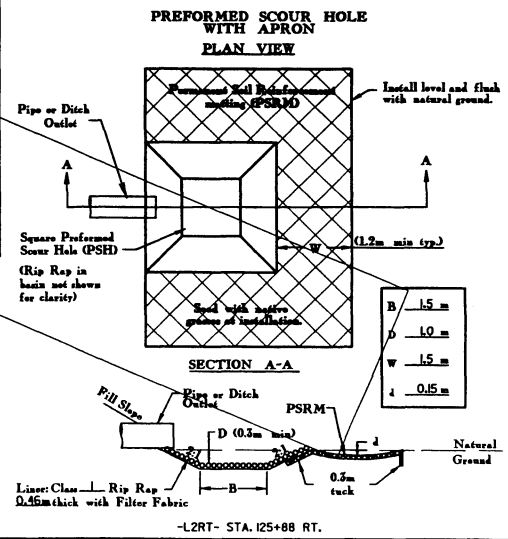
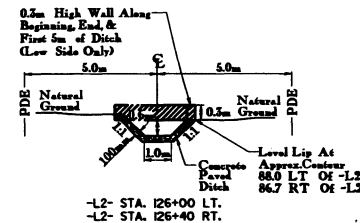


FROM -L2LT- STA. 124+40 TO STA. 125+91 LT.
(EST. D.D.E. = cu.m)



FROM -L2LT- STA. 125+76 TO STA. 126+20 LT.
(EST. RIP RAP = 40 m.tons, FL. FAB. = 56 sm)

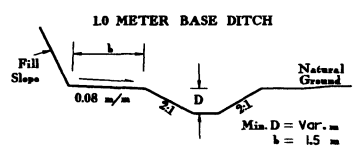
LEVEL SPREADER TYPICAL SECTION



JOHN JENNINGS WILLIAMS, HERS
DB 922 PG 682

DENOTES IMPACTS TO BUFFER ZONE 1
 DENOTES IMPACTS TO BUFFER ZONE 2

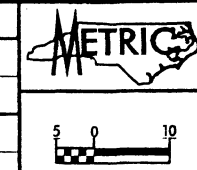
CL. 1" RIP RAP
(51 M.TONS)
w/ FIL. FAB. (30 SM)



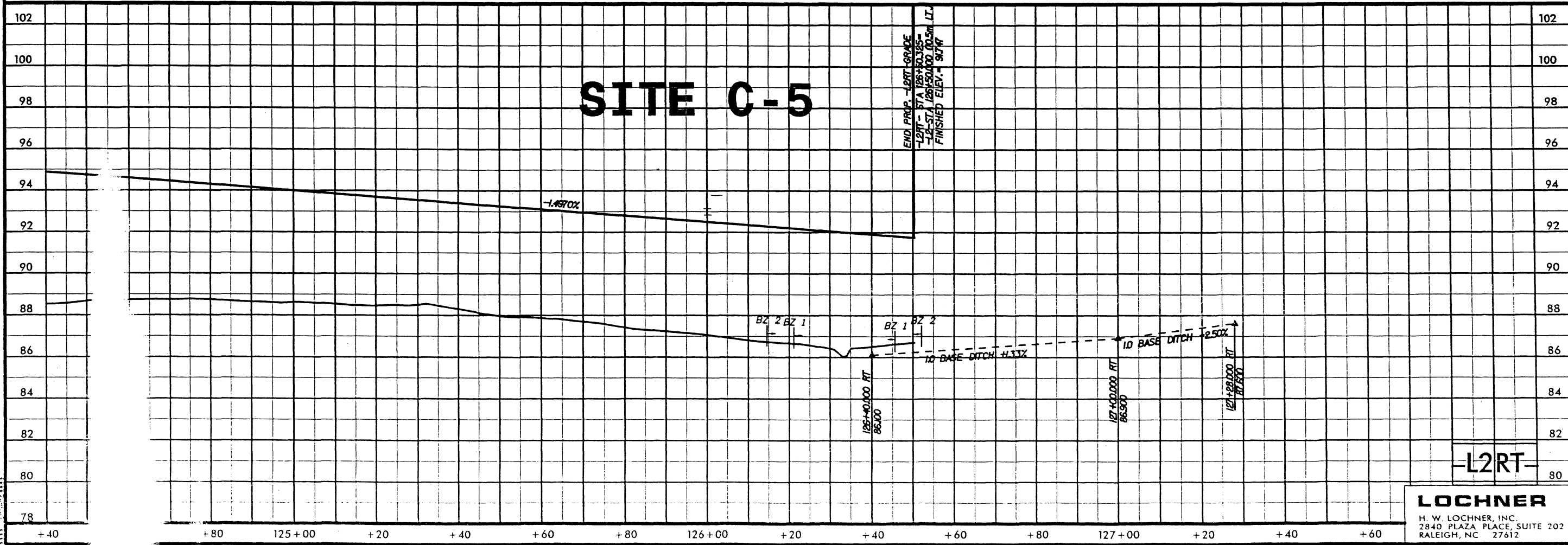
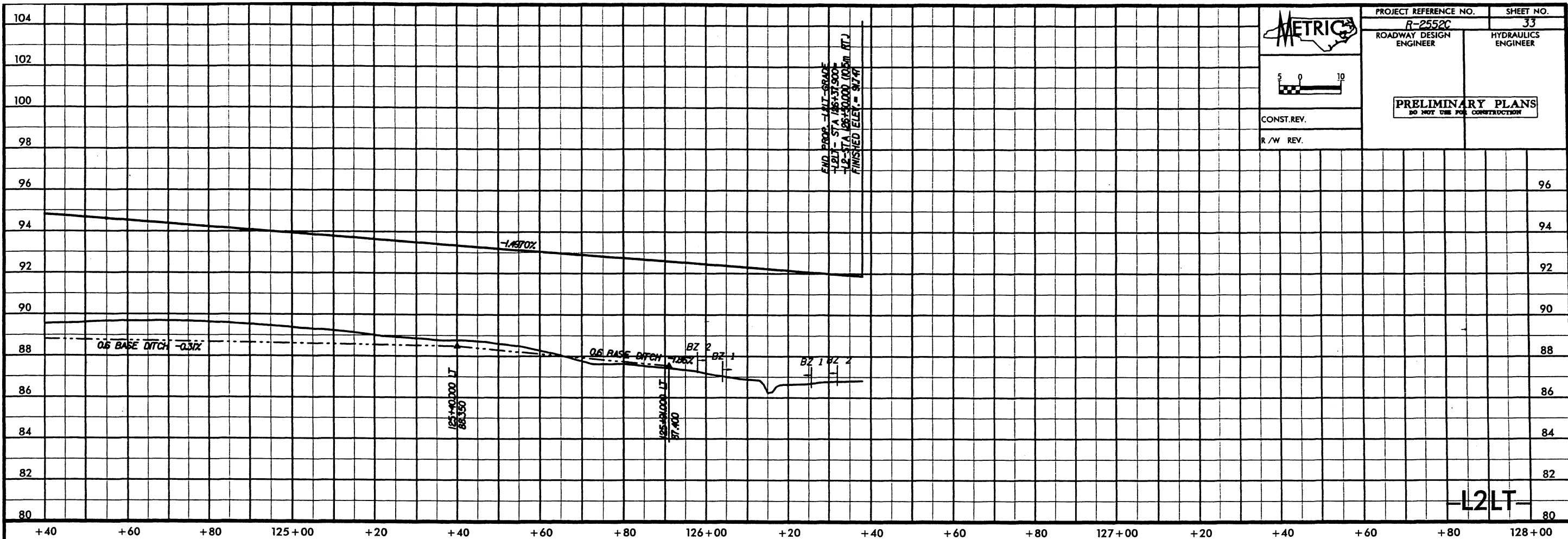
FROM -L2- STA. 126+40 TO STA. 126+97 RT.
(EST. D.D.E. = cu.m)

-L2LT- GRADE SEE PROFILE SHEET 33
-L2RT- GRADE SEE PROFILE SHEET 33
-L2- GRADE SEE PROFILE SHEET 34

*****SYSTEMS*****
*****DATE*****
*****TIME*****



| | | | |
|---|---------|---------------------|----|
| PROJECT REFERENCE NO. | R-2552C | SHEET NO. | 33 |
| ROADWAY DESIGN ENGINEER | | HYDRAULICS ENGINEER | |
| PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION | | | |
| CONST. REV. | | | |
| R/W REV. | | | |



SITE C-5

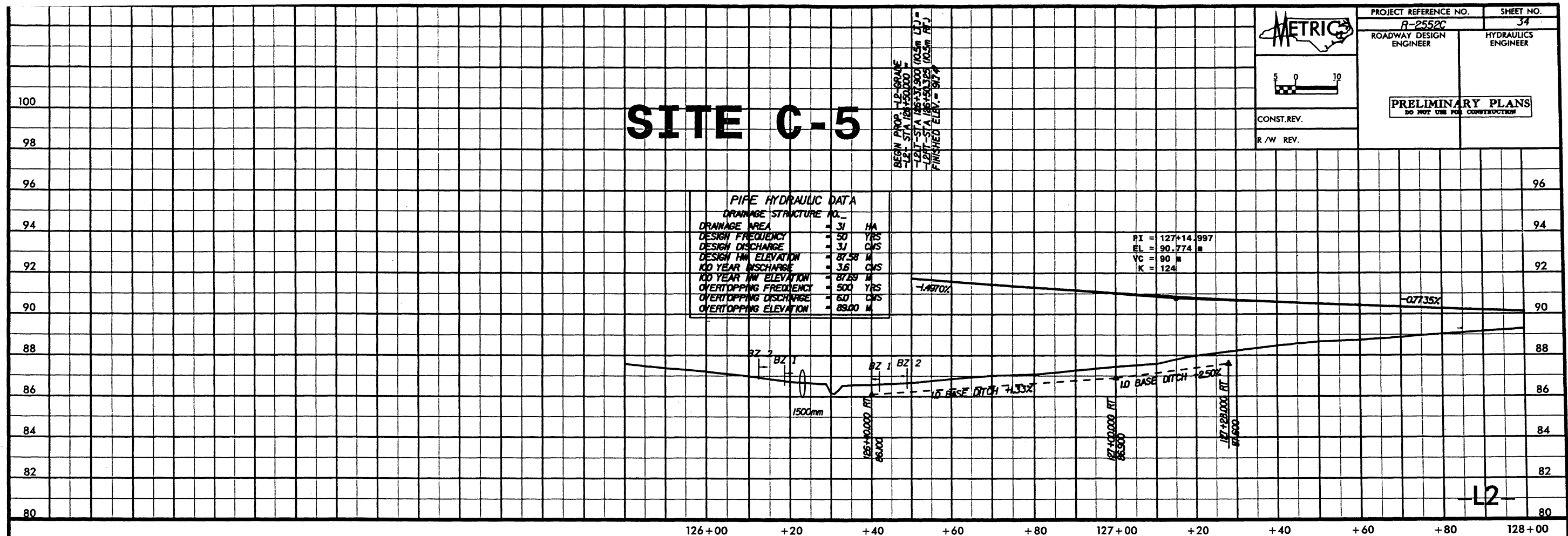
SITE C-5

BEGIN PROP. L.P. GRADE
 -L21 STA 126+50.000 F
 -L21 STA 126+37.900 (0.5m L1J -
 -L21 STA 126+50.325 (0.5m RT.)
 FINISHED ELEV. = 91.7

| | |
|---|---------------------|
| PROJECT REFERENCE NO. R-2552C | SHEET NO. 34 |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |
| PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION | |
| CONST. REV. | R/W REV. |

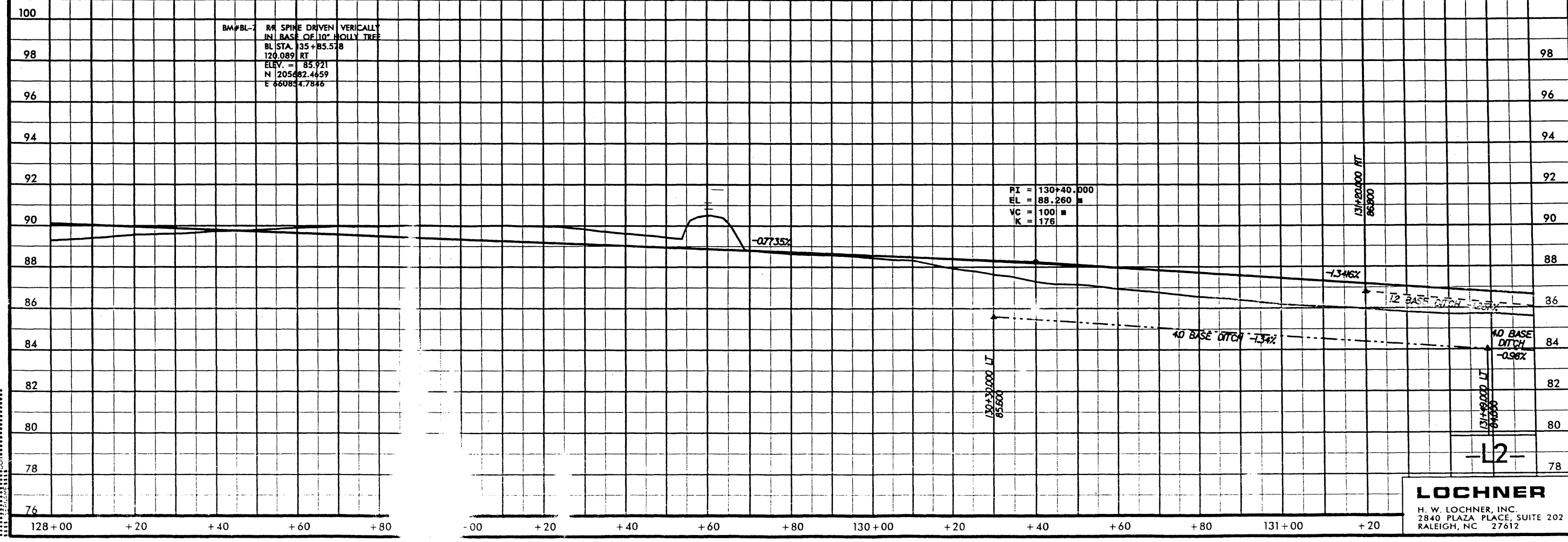
| PIPE HYDRAULIC DATA | |
|------------------------------|-----------|
| DRAINAGE STRUCTURE NO. _____ | |
| DRAINAGE AREA | = 31 HA |
| DESIGN FREQUENCY | = 50 YRS |
| DESIGN DISCHARGE | = 31 CFS |
| DESIGN HW ELEVATION | = 87.58 M |
| 10 YEAR DISCHARGE | = 3.6 CFS |
| 10 YEAR HW ELEVATION | = 87.89 M |
| OVERTOPPING FREQUENCY | = 500 YRS |
| OVERTOPPING DISCHARGE | = 6.0 CFS |
| OVERTOPPING ELEVATION | = 89.00 M |

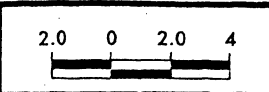
PI = 127+14.997
 EL = 90.774 M
 VC = 90 M
 K = 124



BM#BL-7 R# SPINE DRIVEN VERICALLY
 IN BASE OF 10" HOLLY TREE
 BL STA. 135+85.578
 120.089 RT
 ELEV. = 85.921
 N 205° 42.4459
 E 660854.7846

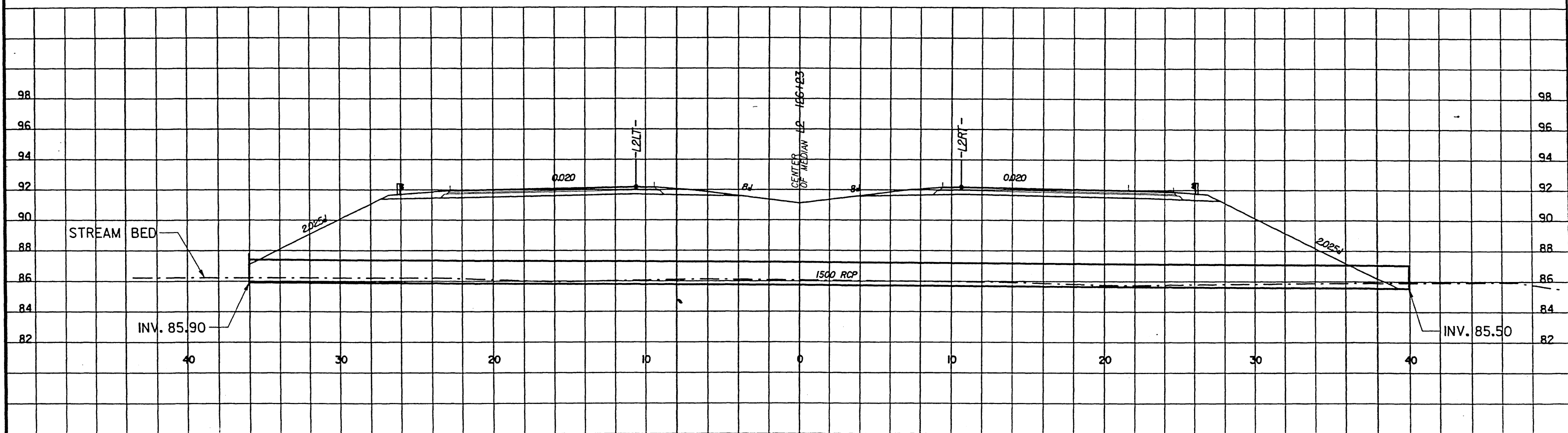
PI = 130+40.000
 EL = 88.260 M
 VC = 100 M
 K = 176





| | |
|-----------------------|-----------|
| PROJECT REFERENCE NO. | SHEET NO. |
| R-2552C | PP 1 |

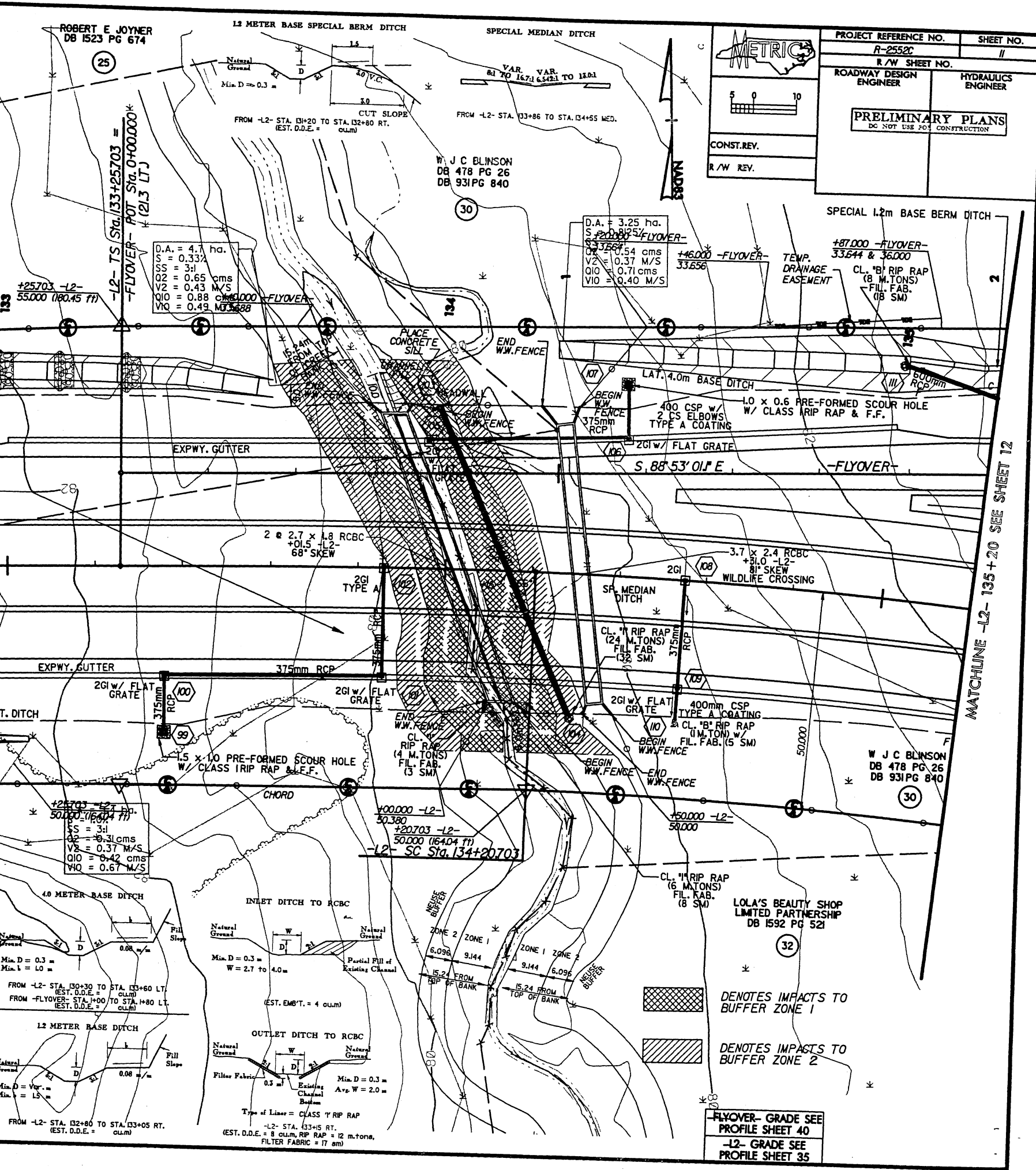
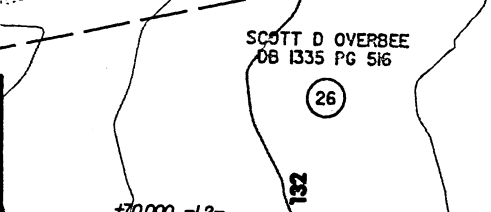
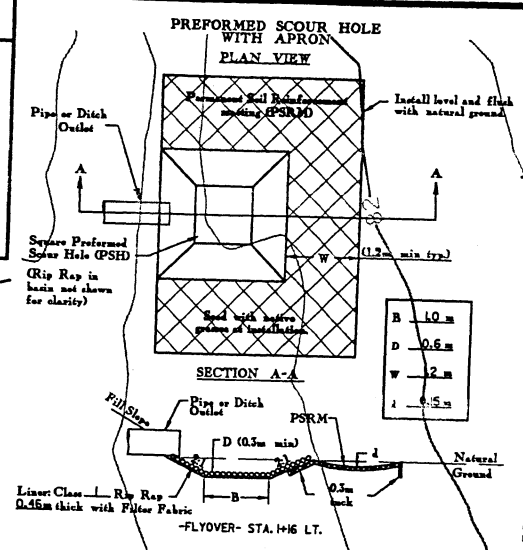
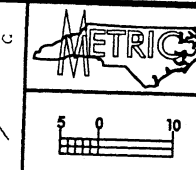
SITE C-5



PROFILE OF 1500 RCP
-L2- STA. 126+23
PLAN SHEET 9

REVISIONS

| | |
|---|---------------------|
| PROJECT REFERENCE NO. R-252C | SHEET NO. 11 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |
| PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION | |
| CONST. REV. | |
| R/W REV. | |



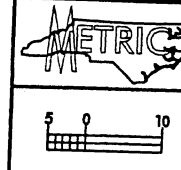
SITE C-6

MATCHLINE -L2- 131+60 SEE SHEET 10

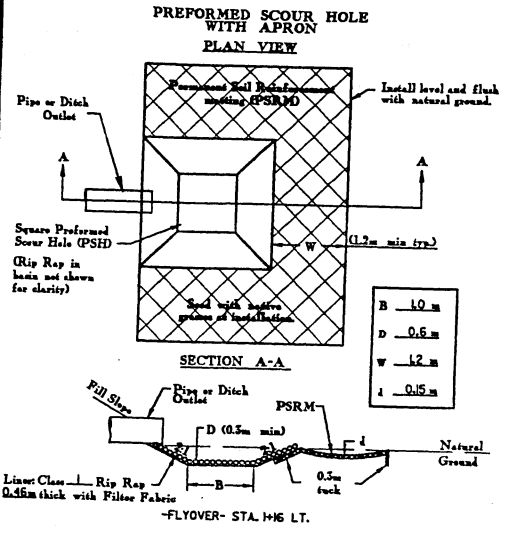
MATCHLINE -L2- 135+20 SEE SHEET 12

DENOTES IMPACTS TO BUFFER ZONE 1
 DENOTES IMPACTS TO BUFFER ZONE 2
 FLYOVER - GRADE SEE PROFILE SHEET 40
 -L2- GRADE SEE PROFILE SHEET 35

*****SYSTEMS ENGINEERING*****



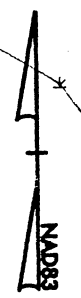
| | |
|---|---------------------|
| PROJECT REFERENCE NO. R-2552C | SHEET NO. 11 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |
| PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION | |
| CONST. REV. | |
| R/W REV. | |



ROBERT E JOYNER
DB 1523 PG 674

1.2 METER BASE SPECIAL BERM DITCH

SPECIAL MEDIAN DITCH



W J C BLINSON
DB 478 PG 26
DB 931 PG 840

SCOTT D OVERBEE
DB 1335 PG 516

26

MATCHLINE -L2- 131+60 SEE SHEET 10

SITE C-6

S, 88° 53' 01" E

FALSE SUMP -L2-

2GI w/ FLAT GRATE

2 @ 2.7 x 1.8 RCBC
+01.5 -L2-
68° SKEW

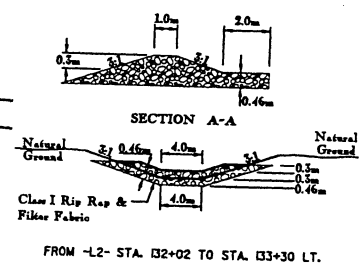
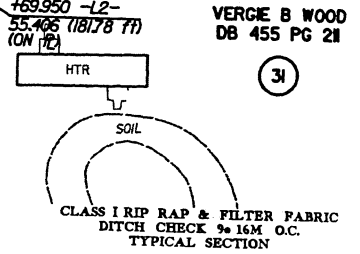
2GI TYPE A

3.7 x 2.4 RCBC
+31.0 -L2-
81° SKEW
WILDLIFE CROSSING

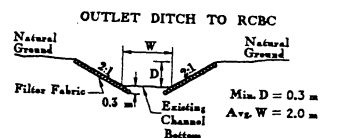
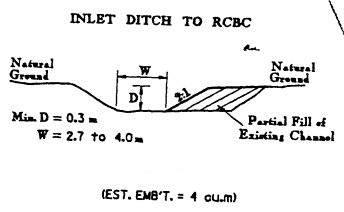
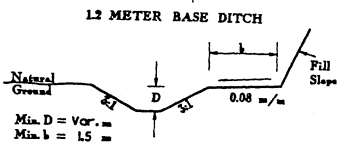
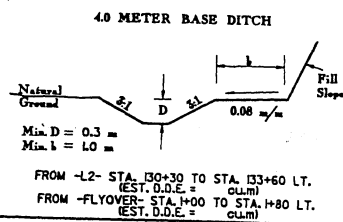
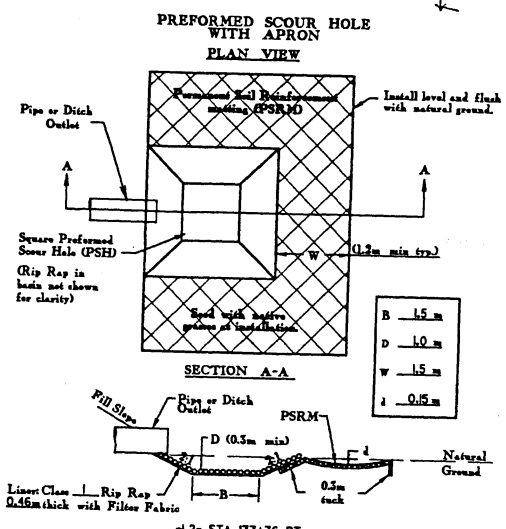
SP. MEDIAN DITCH

SCOTT D OVERBEE
DB 1335 PG 516

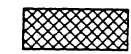
26



FROM -L2- STA. 132+02 TO STA. 133+30 LT.



100,000 -L2-
50,380
+20,703 -L2-
50,000 (164.04 FT)
-L2- SC Sta. 134+20,703



DENOTES IMPACTS TO BUFFER ZONE 1



DENOTES IMPACTS TO BUFFER ZONE 2

-FLYOVER- GRADE SEE PROFILE SHEET 40
-L2- GRADE SEE PROFILE SHEET 35

MATCHLINE -L2- 135+20 SEE SHEET 12

W J C BLINSON
DB 478 PG 26
DB 931 PG 840

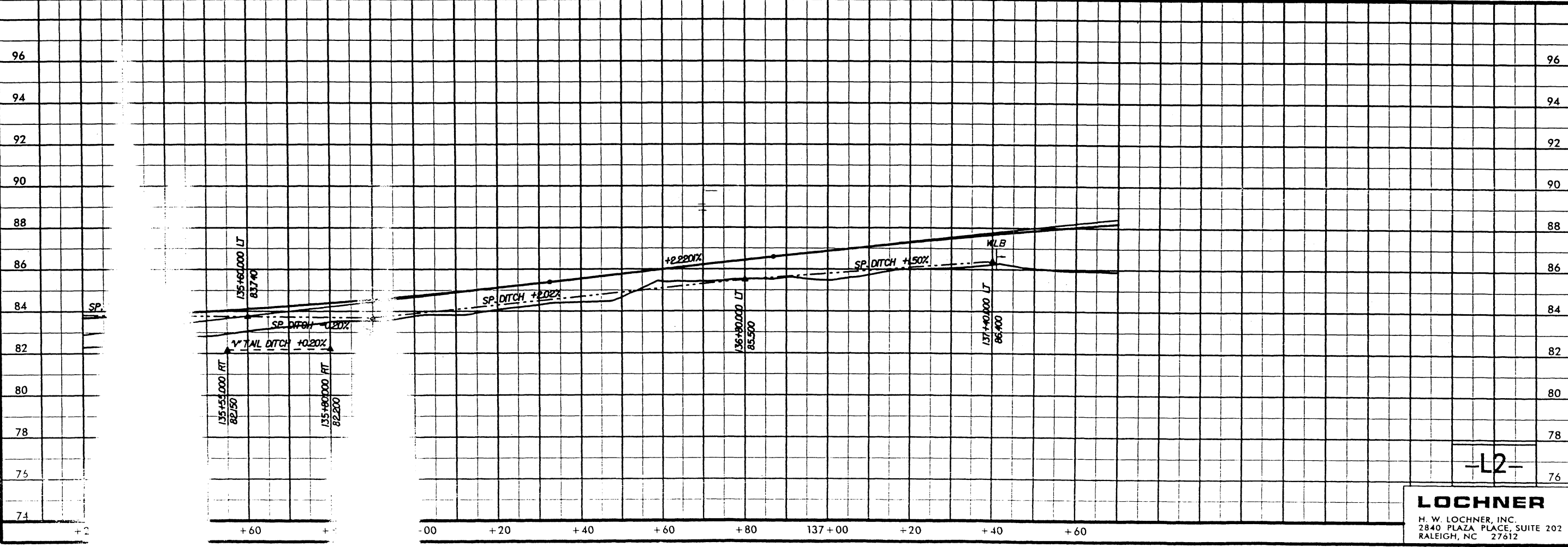
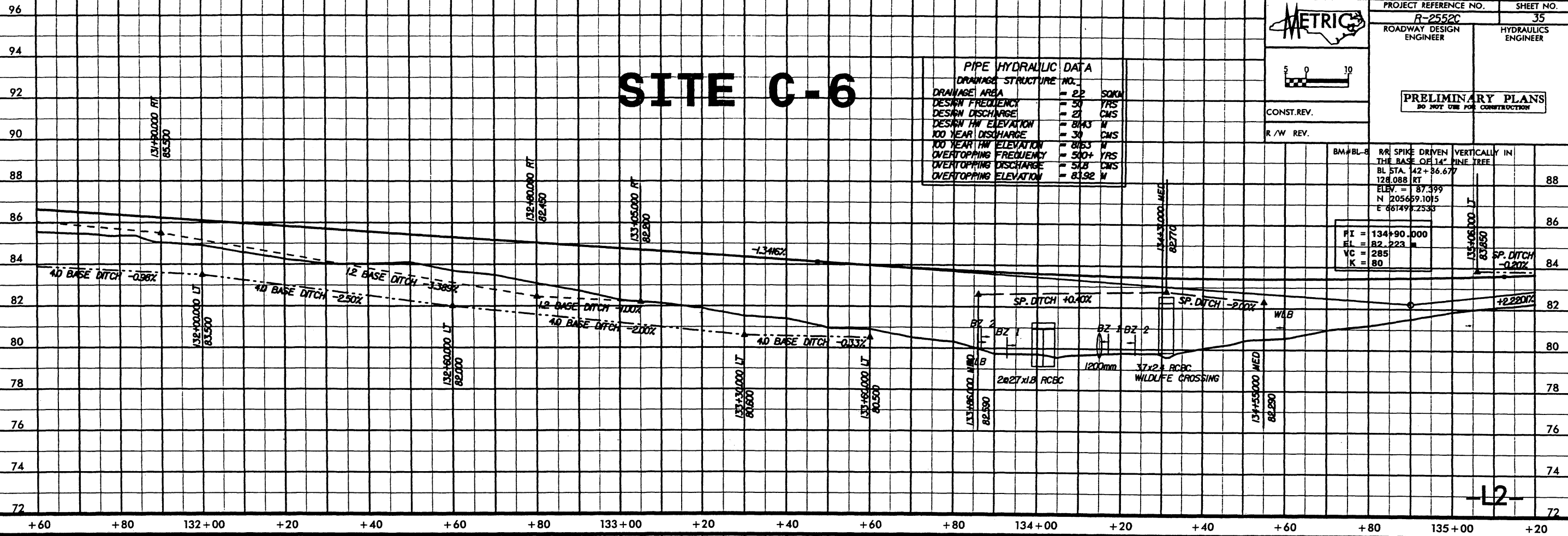
LOLA'S BEAUTY SHOP
LIMITED PARTNERSHIP
DB 1592 PG 521

32

*****SYSTEMS*****

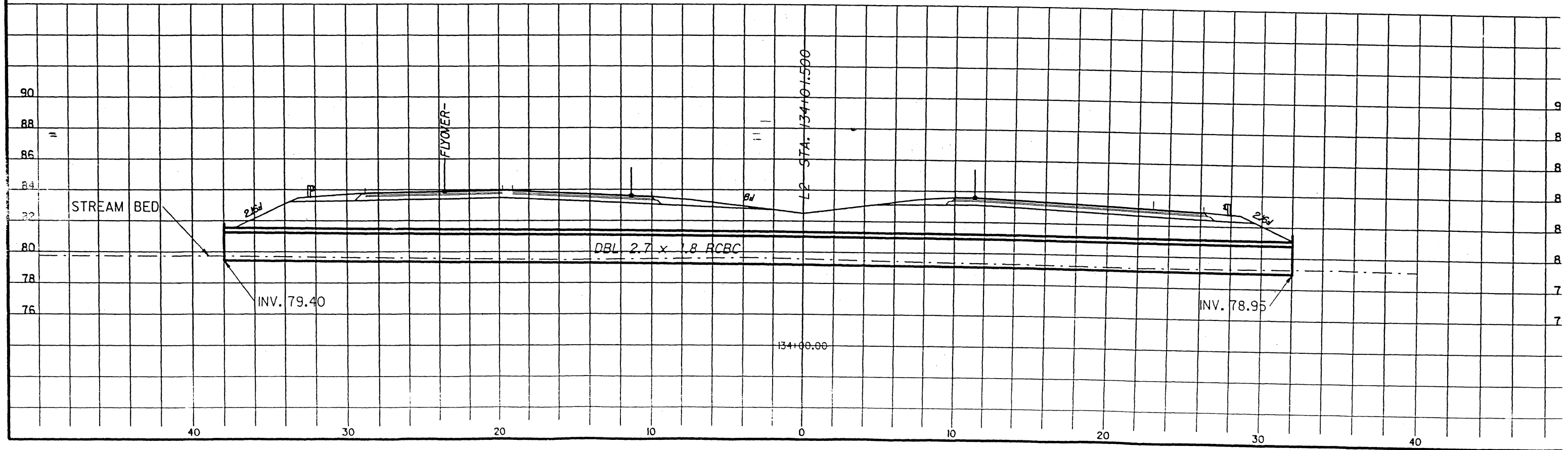
ALFRED STEWART JR.
DB 595 PG 496

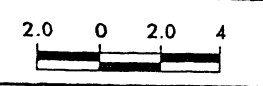
29



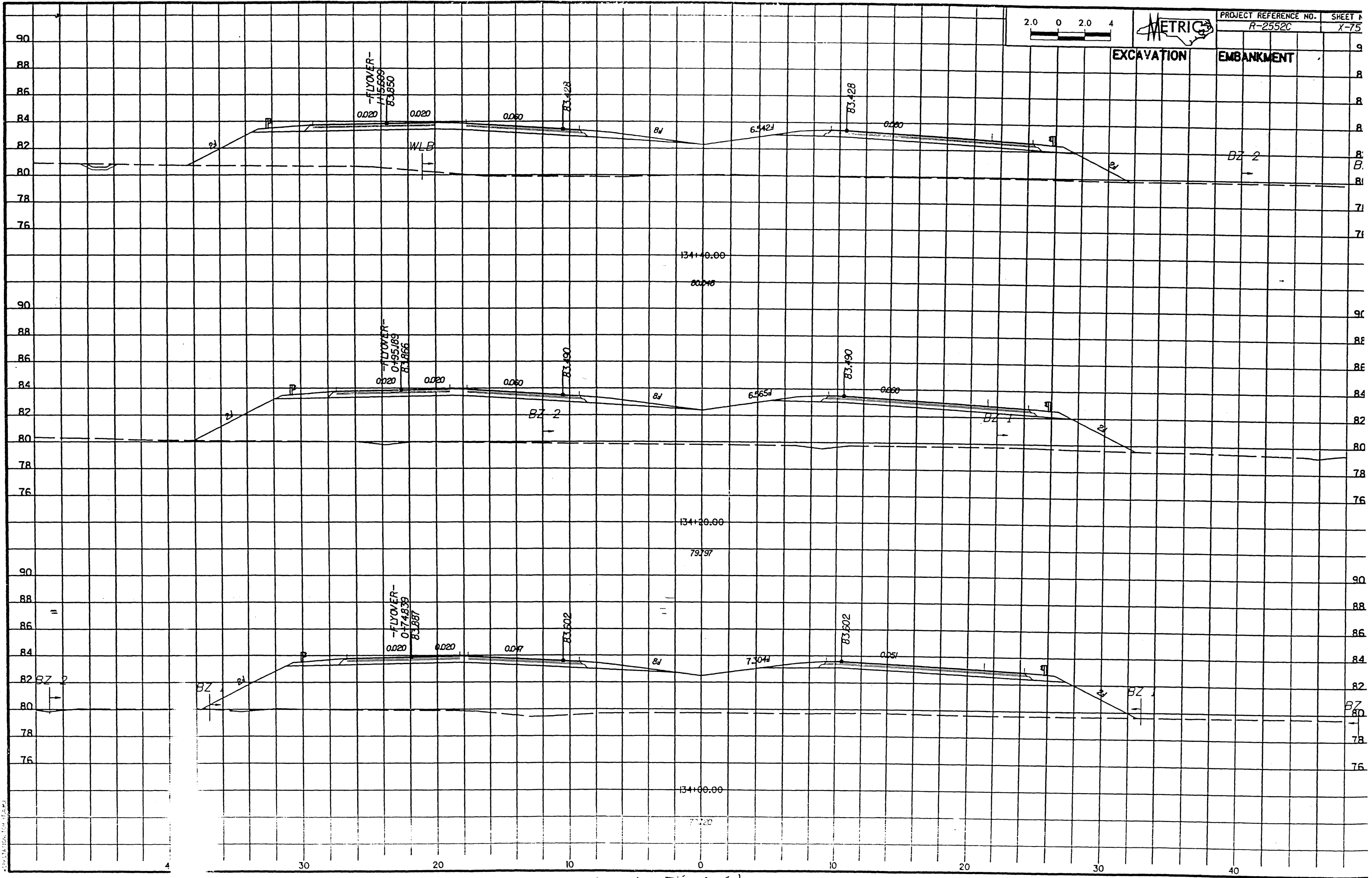
SITE C-6

PROFILE ALONG DBL 2.4 x 1.8 RCBC
 -L2- STA. 134+01.500
 PLAN SHEET 11





EXCAVATION EMBANKMENT

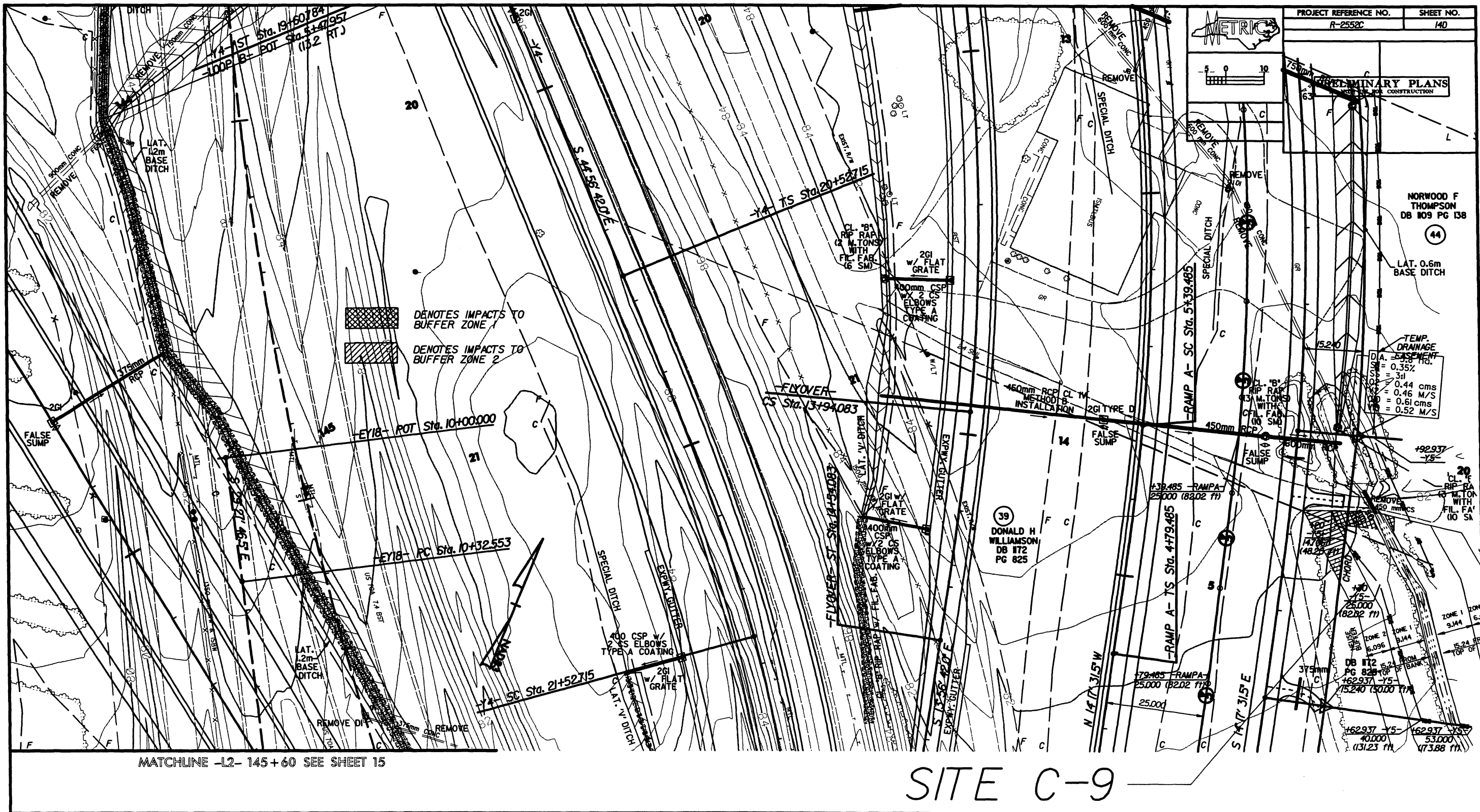


TYPICAL CROSS SECTION (SITE C-G)

Vertical Datum
+156.00
+156.00
+156.00

MATCH LINE 14 A-D

MATCH LINE 14 C-D



MATCHLINE -L2- 145+60 SEE SHEET 15

SITE C-9

| PROJECT REFERENCE NO. | SHEET NO. |
|-----------------------|-----------|
| R-2552C | 140 |

PRELIMINARY PLANS
FOR CONSTRUCTION

NORWOOD F THOMPSON
DB 109 PG 138
LAT. 0.6m
BASE DITCH

TEMP. DRAINAGE
DIA. 450mm RCP
S₁ = 0.35%
S₂ = 3:1
Q₁ = 0.44 cms
Q₂ = 0.46 M/S
Q₃ = 0.61 cms
Q₄ = 0.52 M/S

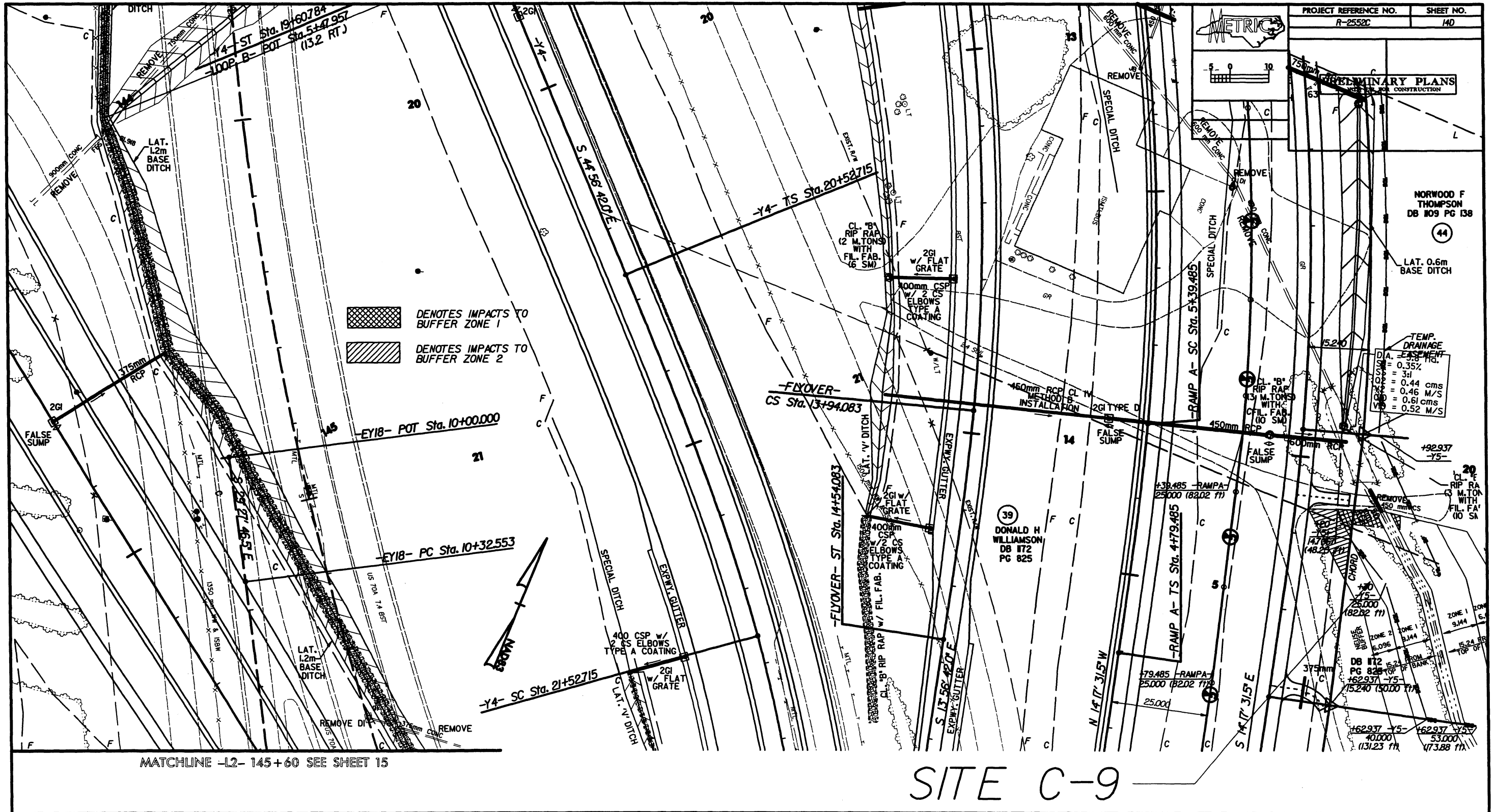
39
DONALD H
WILLIAMSON
DB 172
PG 825

20
CL. 1.8m
RIP RA
WITH
FIL. FA
(NO SA)

DB 172
PG 825
TOP OF BANK
15.240 (50.00 FT)
162.937 -Y5-
40.000
(131.23 FT)
162.937 -Y5-
53.000
(173.88 FT)

MATCH LINE 14 A-D

MATCH LINE 14 C-D



SITE C-9

SITE C-9



PROJECT REFERENCE NO. **R-2552C** SHEET NO. **59**
 ROADWAY DESIGN ENGINEER HYDRAULICS ENGINEER



PRELIMINARY PLANS
 DO NOT USE FOR CONSTRUCTION

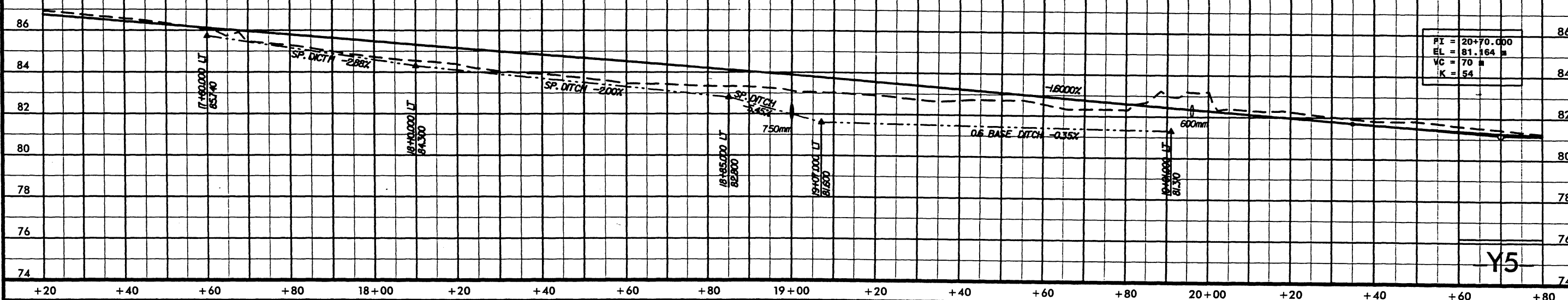
| PIPE HYDRAULIC DATA | |
|--------------------------|------------|
| DRAINAGE STRUCTURE NO. 1 | |
| DRAINAGE AREA | = 3.0 HA |
| DESIGN FREQUENCY | = 25 YRS |
| DESIGN DISCHARGE | = 0.65 CMS |
| DESIGN HW ELEVATION | = 82.52 M |
| 100 YEAR DISCHARGE | = 0.88 CMS |
| 100 YEAR HW ELEVATION | = 82.71 M |
| OVERTOPPING FREQUENCY | = 100 YRS |
| OVERTOPPING DISCHARGE | = 0.81 CMS |
| OVERTOPPING ELEVATION | = 82.70 M |

| PIPE HYDRAULIC DATA | |
|--------------------------|------------|
| DRAINAGE STRUCTURE NO. 2 | |
| DRAINAGE AREA | = 1.2 HA |
| DESIGN FREQUENCY | = 25 YRS |
| DESIGN DISCHARGE | = 0.36 CMS |
| DESIGN HW ELEVATION | = 81.77 M |
| 100 YEAR DISCHARGE | = 0.48 CMS |
| 100 YEAR HW ELEVATION | = 81.81 M |
| OVERTOPPING FREQUENCY | = 100 YRS |
| OVERTOPPING DISCHARGE | = 0.41 CMS |
| OVERTOPPING ELEVATION | = 81.90 M |

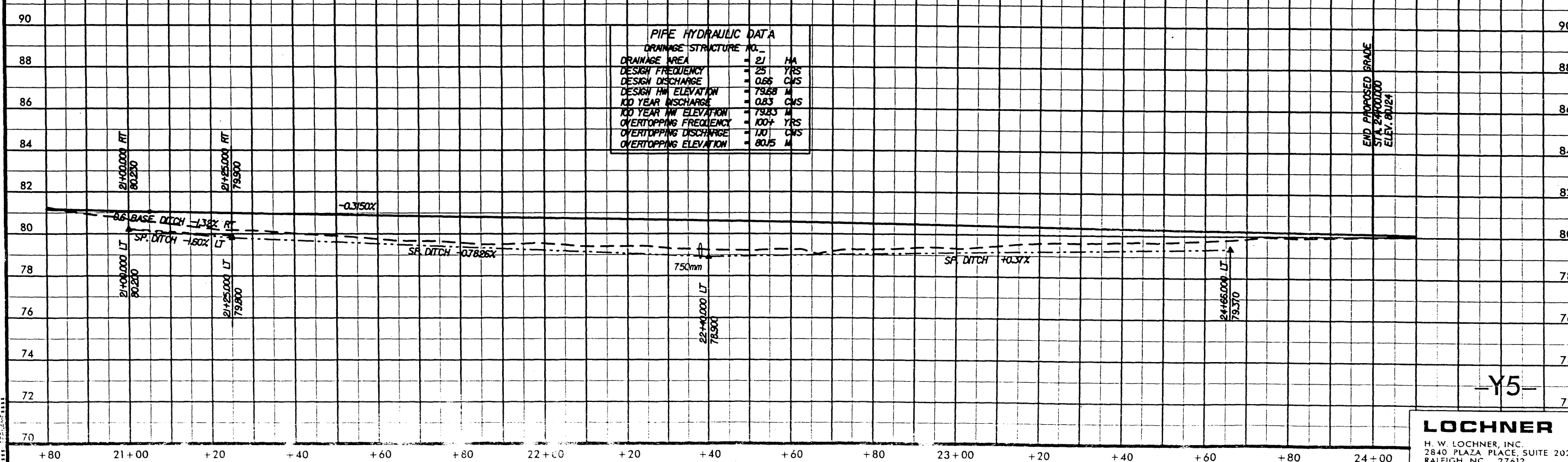
CONST. REV.

R/W REV.

PI = 20+70.000
 EL = 81.164 M
 VC = 70 M
 K = 54



| PIPE HYDRAULIC DATA | |
|--------------------------|------------|
| DRAINAGE STRUCTURE NO. 3 | |
| DRAINAGE AREA | = 2.1 HA |
| DESIGN FREQUENCY | = 25 YRS |
| DESIGN DISCHARGE | = 0.66 CMS |
| DESIGN HW ELEVATION | = 79.68 M |
| 100 YEAR DISCHARGE | = 0.83 CMS |
| 100 YEAR HW ELEVATION | = 79.83 M |
| OVERTOPPING FREQUENCY | = 100+ YRS |
| OVERTOPPING DISCHARGE | = 1.00 CMS |
| OVERTOPPING ELEVATION | = 80.15 M |



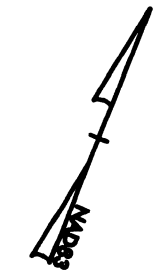
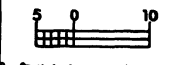
LOCHNER
 H. W. LOCHNER, INC.
 2840 PLAZA PLACE, SUITE 202
 RALEIGH, NC 27612

SITE C-12



PROJECT REFERENCE NO. R-2552C
SHEET NO. 16B

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



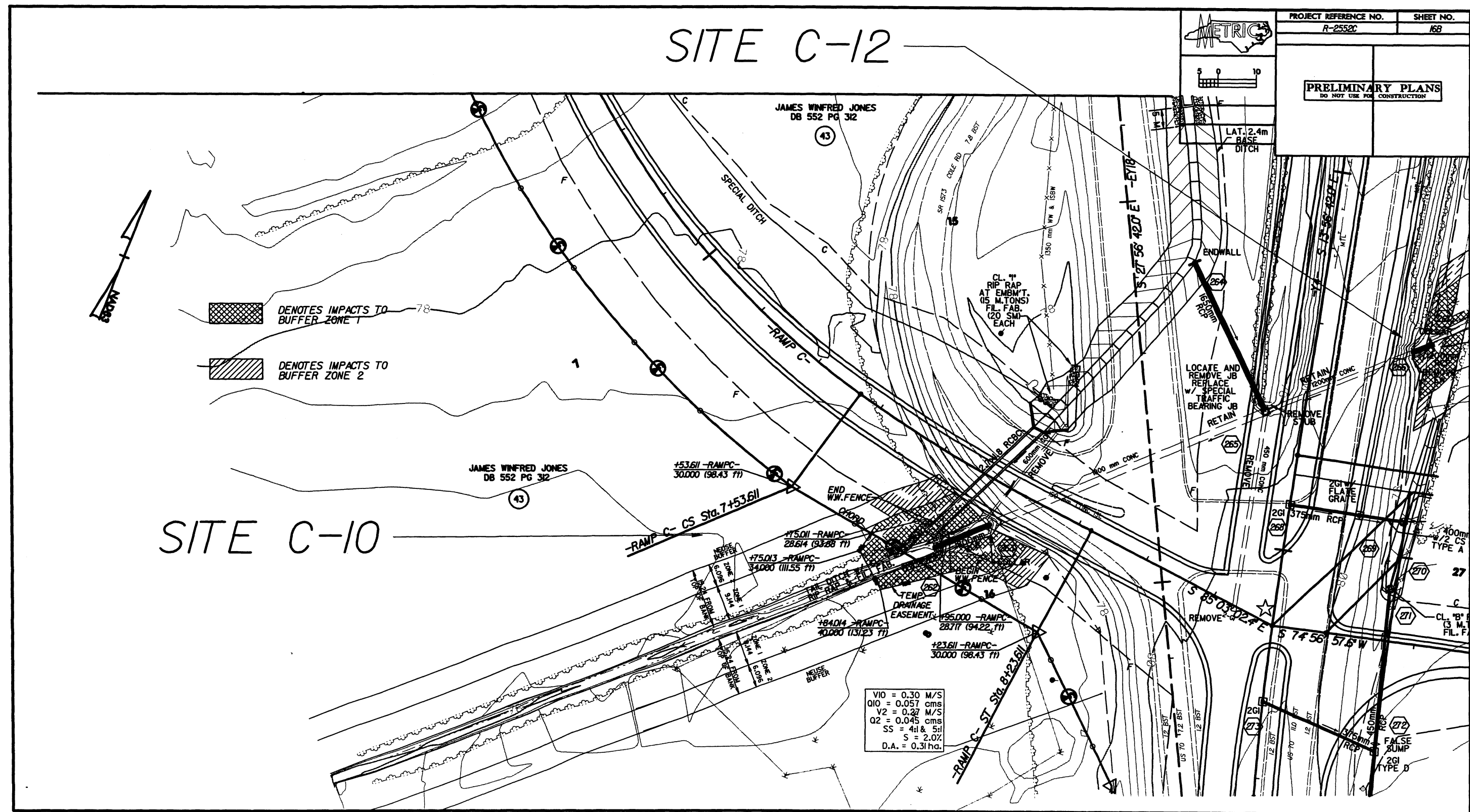
DENOTES IMPACTS TO BUFFER ZONE 1
 DENOTES IMPACTS TO BUFFER ZONE 2

SITE C-10

V10 = 0.30 M/S
Q10 = 0.057 cms
V2 = 0.27 M/S
Q2 = 0.045 cms
SS = 4:l & 5:l
S = 2.0%
D.A. = 0.31 ha.

MATCH LINE 16 B-C

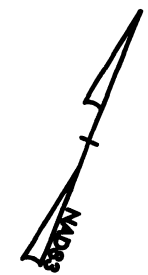
MATCH LINE 16 A-B





SITE C-12

PROJECT REFERENCE NO. R-2552C
SHEET NO. 16B

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



 DENOTES IMPACTS TO BUFFER ZONE 1
 DENOTES IMPACTS TO BUFFER ZONE 2

SITE C-10

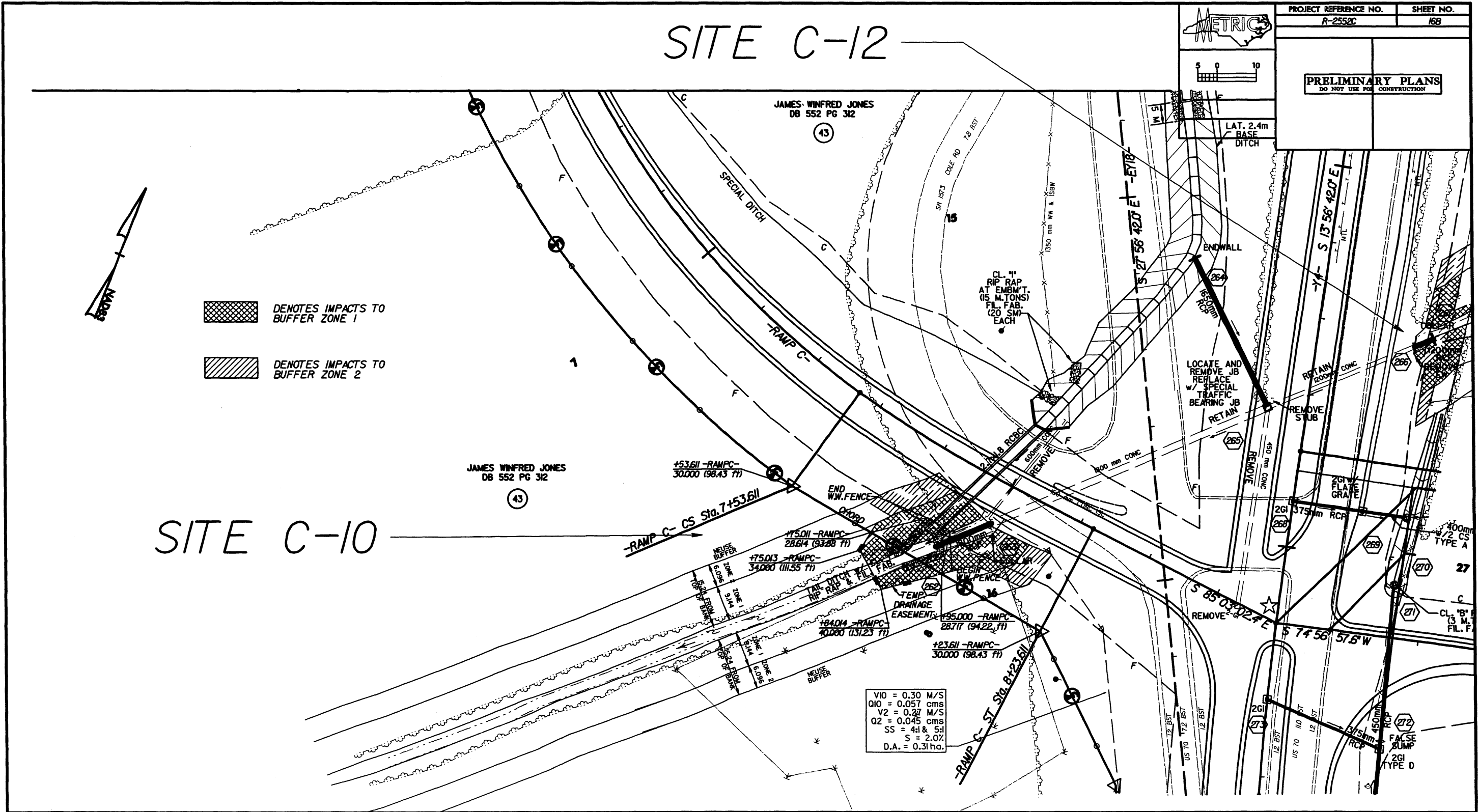
JAMES WINFRED JONES
DB 552 PG 312

JAMES WINFRED JONES
DB 552 PG 312

V10 = 0.30 M/S
Q10 = 0.057 cms
V2 = 0.27 M/S
Q2 = 0.045 cms
SS = 4H & S1
S = 2.0%
D.A. = 0.31ha.

MATCH LINE 16 B-C

MATCH LINE 16 A-B



SITE C-11

| PIPE HYDRAULIC DATA | |
|------------------------------|------------|
| DRAINAGE STRUCTURE NO. _____ | |
| DRAINAGE AREA | = 11.6 HA |
| DESIGN FREQUENCY | = 50 YRS |
| DESIGN DISCHARGE | = 17 CMS |
| DESIGN HW ELEVATION | = 80.07 M |
| 100 YEAR DISCHARGE | = 2.01 CMS |
| 100 YEAR HW ELEVATION | = 80.08 M |
| OVERTOPPING FREQUENCY | = 50+ YRS |
| OVERTOPPING DISCHARGE | = 1.79 CMS |
| OVERTOPPING ELEVATION | = 80.00 M |

METRIC

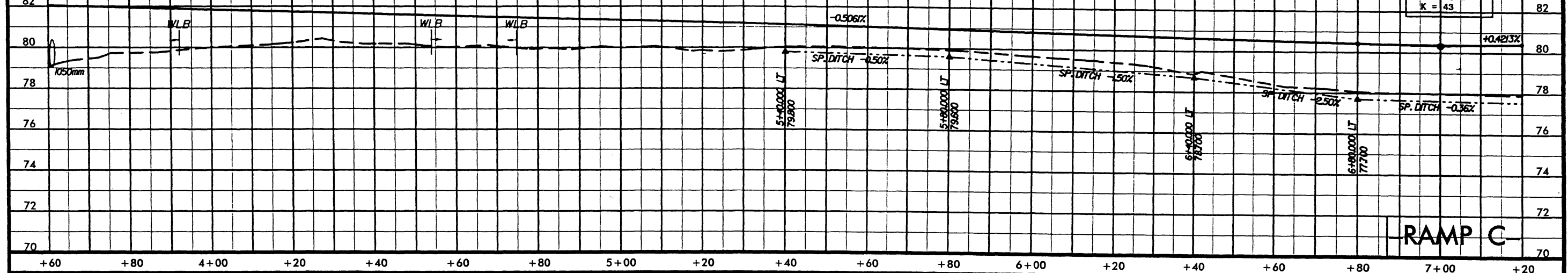
PROJECT REFERENCE NO. **R-2552C** SHEET NO. **47**

ROADWAY DESIGN ENGINEER HYDRAULICS ENGINEER

CONST. REV. _____
R/W REV. _____

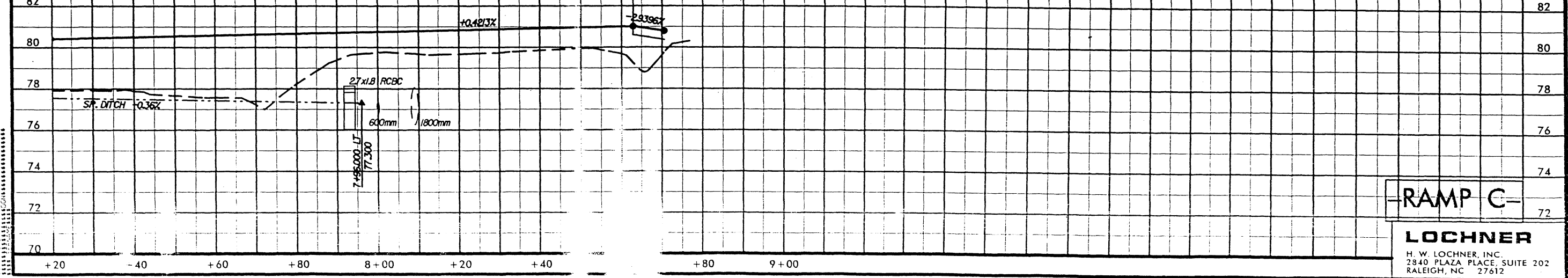
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Scale: 5 0 10



SITE C-10

| PIPE HYDRAULIC DATA | |
|------------------------------|------------|
| DRAINAGE STRUCTURE NO. _____ | |
| DRAINAGE AREA | = 5.9 HA |
| DESIGN FREQUENCY | = 50 YRS |
| DESIGN DISCHARGE | = 12.0 CMS |
| DESIGN HW ELEVATION | = 77.94 M |
| 100 YEAR DISCHARGE | = 1.40 CMS |
| 100 YEAR HW ELEVATION | = 78.08 M |
| OVERTOPPING FREQUENCY | = 500+ YRS |
| OVERTOPPING DISCHARGE | = 4.20 CMS |
| OVERTOPPING ELEVATION | = 80.995 M |

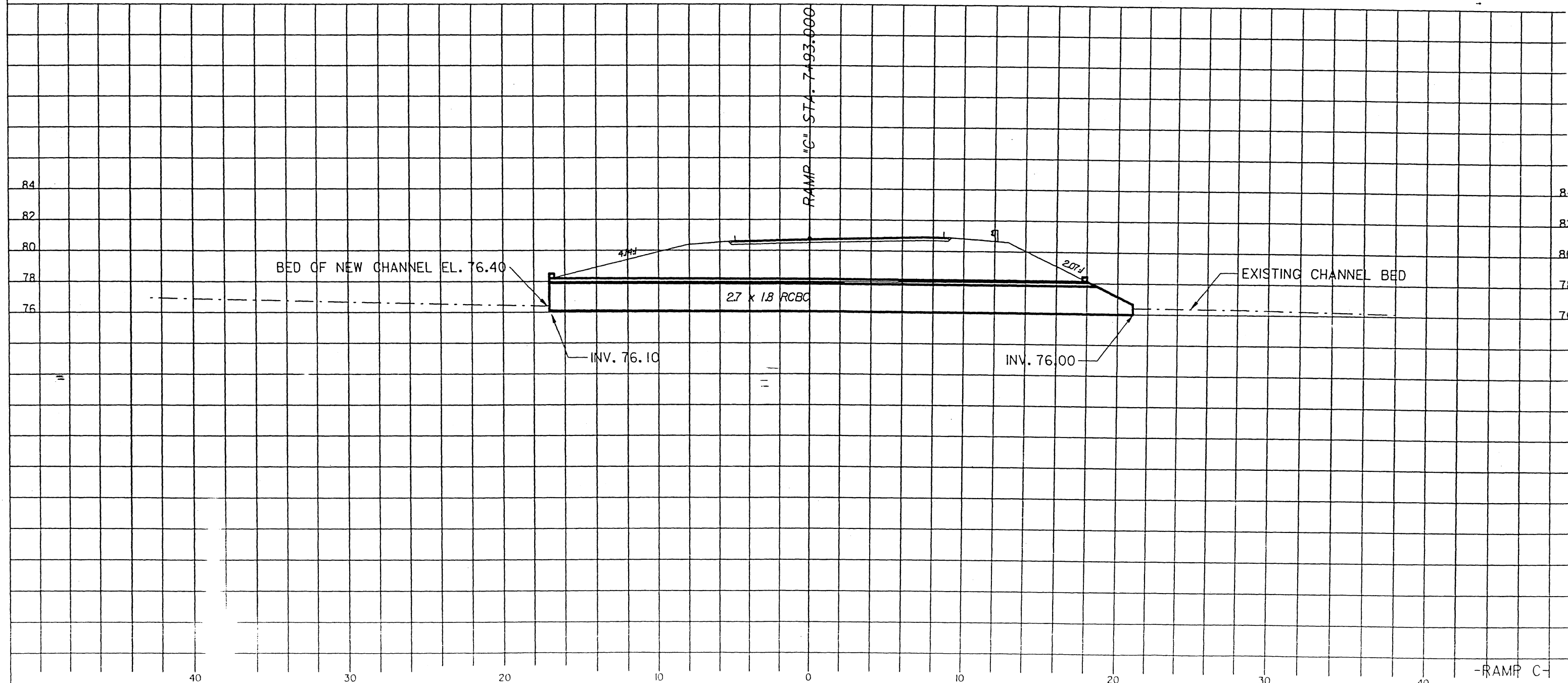


RAMP C

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

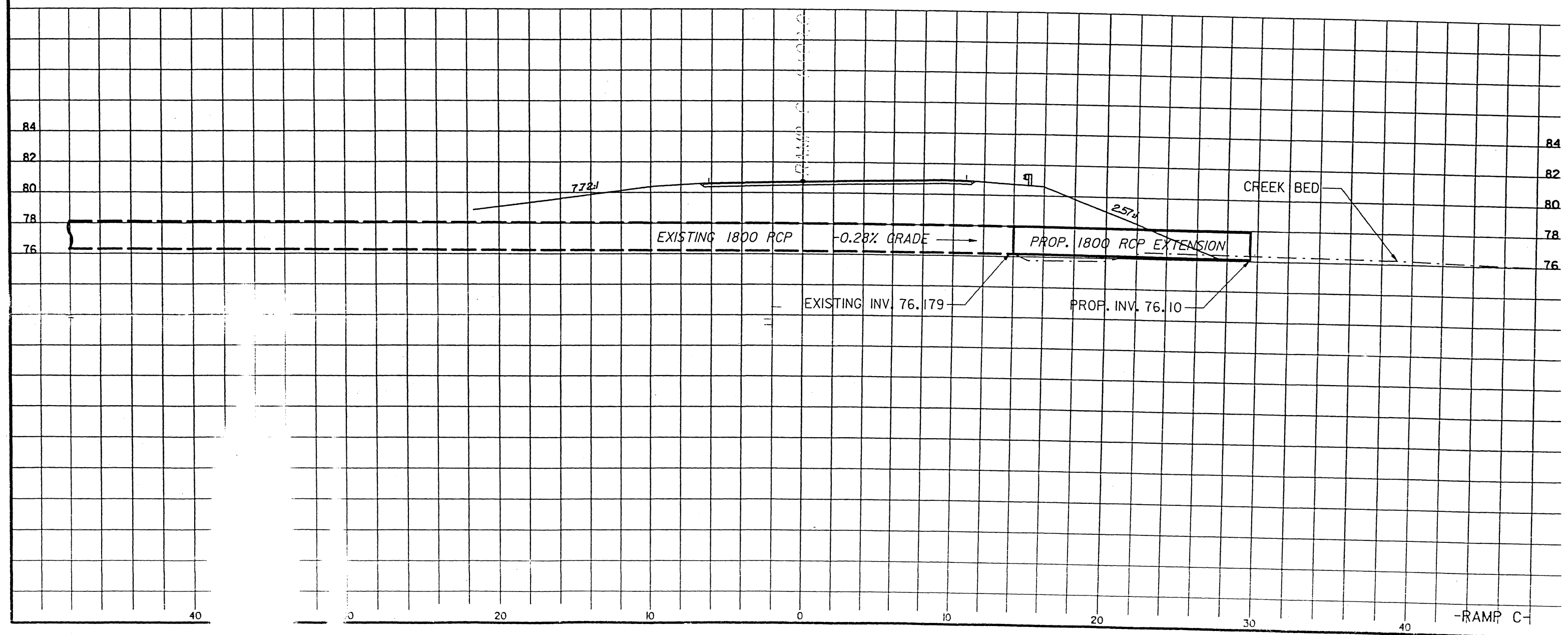
SITE C-10

PROFILE OF 2.7 x 1.8 RCBC
RAMP C - STA. 7+93.000
PLAN SHEET 16



SITE C-10

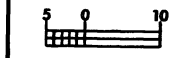
PIPE PROFILE OF 1800 RCP
RAMP C STA. 8+09.0



MATCHLINE -Y4- 25+80 SEE SHEET 15



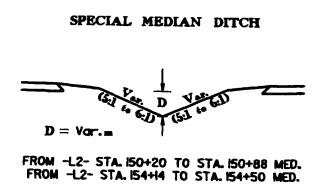
| | |
|---|---------------------|
| PROJECT REFERENCE NO. R-2552C | SHEET NO. 15A |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |
| PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION | |
| CONST. REV. | |
| R/W REV. | |



MATCH LINE 16 A-B



- DENOTES IMPACTS TO BUFFER ZONE 1
- DENOTES IMPACTS TO BUFFER ZONE 2





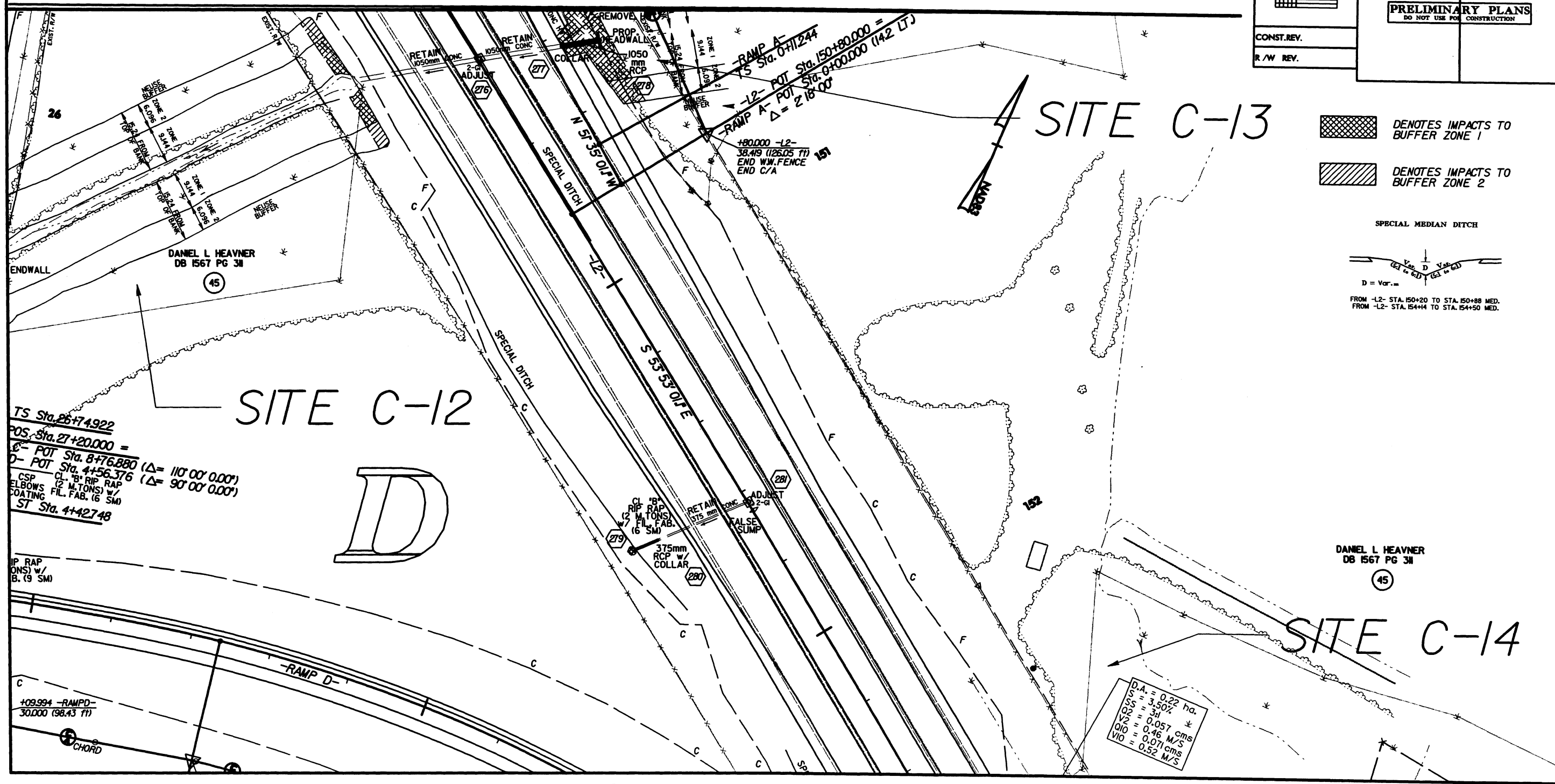
DANIEL L HEAVNER
DB 1567 PG 38
(45)



MATCH LINE 16 A-D

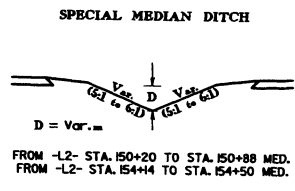
MATCH LINE 16 A-B

MATCHLINE -Y4- 25+80 SEE SHEET 15

| | | |
|---|-------------------------|---------------------|
|  | PROJECT REFERENCE NO. | SHEET NO. |
| | R-2552C | 16A |
|  | R/W SHEET NO. | |
| | ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |
| PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION | | |
| CONST. REV. | | |
| R/W REV. | | |



-  DENOTES IMPACTS TO BUFFER ZONE 1
-  DENOTES IMPACTS TO BUFFER ZONE 2



D.A. = 0.22 ha.
 S = 3.50%
 Q2 = 3H
 V2 = 0.057 cms
 Q10 = 0.46 M/S
 V10 = 0.071 cms
 V10 = 0.52 M/S

SITE C-12

SITE C-13

SITE C-14

D

TS Sta. 26+74.922
 POS. Sta. 27+20.000 =
 C- POT Sta. 8+76.880 ($\Delta = 110^{\circ} 00' 0.00''$)
 D- POT Sta. 4+56.376 ($\Delta = 90^{\circ} 00' 0.00''$)
 CSP CL. 'B' RIP RAP (2 M. TONS) W/ COATING FIL. FAB. (6 SM)
 ST Sta. 4+42.748

IP RAP (ONS) W/ B. (9 SM)

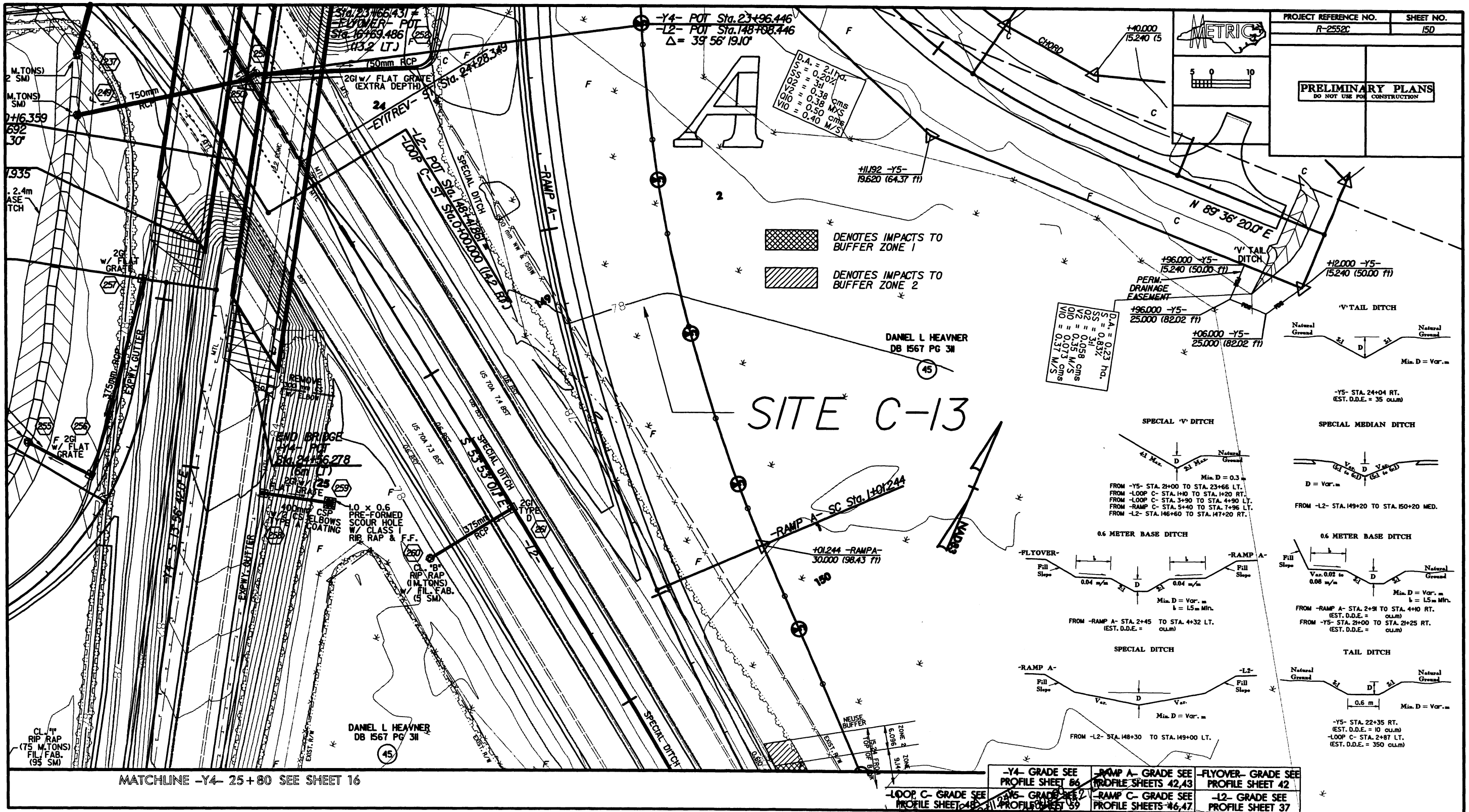
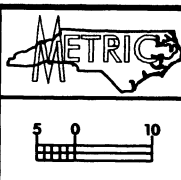
+09.994 -RAMPD- 30.000 (98.43 FT)

MATCH LINE 16 A-D

MATCH LINE 15 A-D

MATCH LINE 15 C-D

| | |
|---|------------------|
| PROJECT REFERENCE NO. R-2552C | SHEET NO. 15D |
| PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION | |

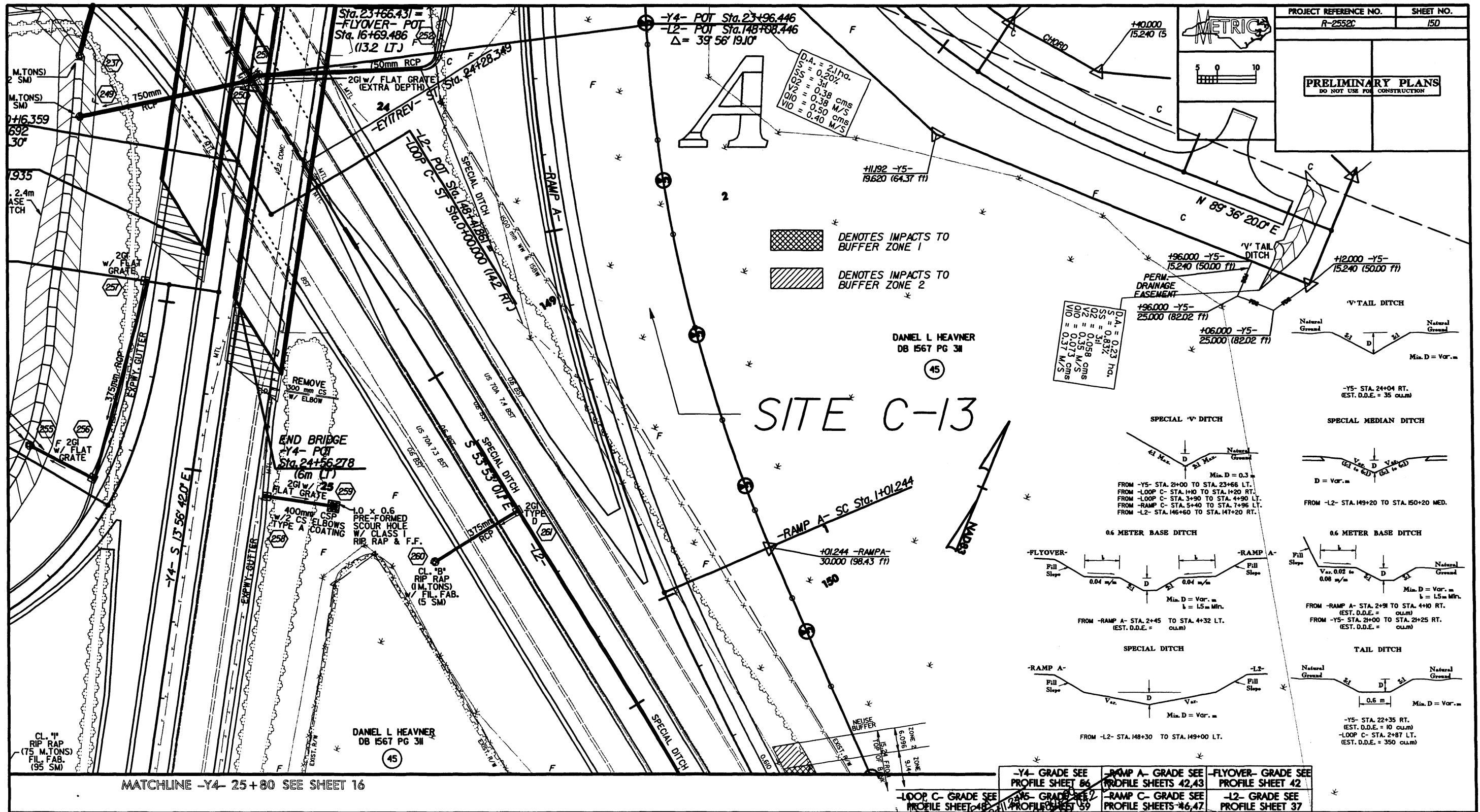


MATCHLINE -Y4- 25+80 SEE SHEET 16

| | | |
|-------------------------------------|---|--------------------------------------|
| -Y4- GRADE SEE PROFILE SHEET 48 | -RAMP A- GRADE SEE PROFILE SHEETS 42,43 | -FLYOVER- GRADE SEE PROFILE SHEET 42 |
| -LOOP C- GRADE SEE PROFILE SHEET 48 | -RAMP C- GRADE SEE PROFILE SHEETS 46,47 | -L2- GRADE SEE PROFILE SHEET 37 |

MATCH LINE 15 A-D

MATCH LINE 15 C-D



| | |
|--|-----------|
| PROJECT REFERENCE NO. | SHEET NO. |
| R-2552C | 150 |
| PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION | |

- DENOTES IMPACTS TO BUFFER ZONE 1
- DENOTES IMPACTS TO BUFFER ZONE 2

D.A. = 0.23 ha.
SS = 0.81%
V2 = 0.158 cms
Q10 = 0.373 cms
V10 = 0.373 cms
V10 = 0.373 M/S

SITE C-13

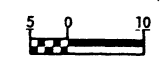
DANIEL L HEAVNER
DB 1567 PG 3H

MATCHLINE -Y4- 25+80 SEE SHEET 16

| | | |
|--|--|---|
| -Y4- GRADE SEE PROFILE SHEET 86 | -RAMP A- GRADE SEE PROFILE SHEETS 42,43 | -FLYOVER- GRADE SEE PROFILE SHEET 42 |
| -LOOP C- GRADE SEE PROFILE SHEET 42 | -RAMP C- GRADE SEE PROFILE SHEETS 46,47 | -L2- GRADE SEE PROFILE SHEET 37 |



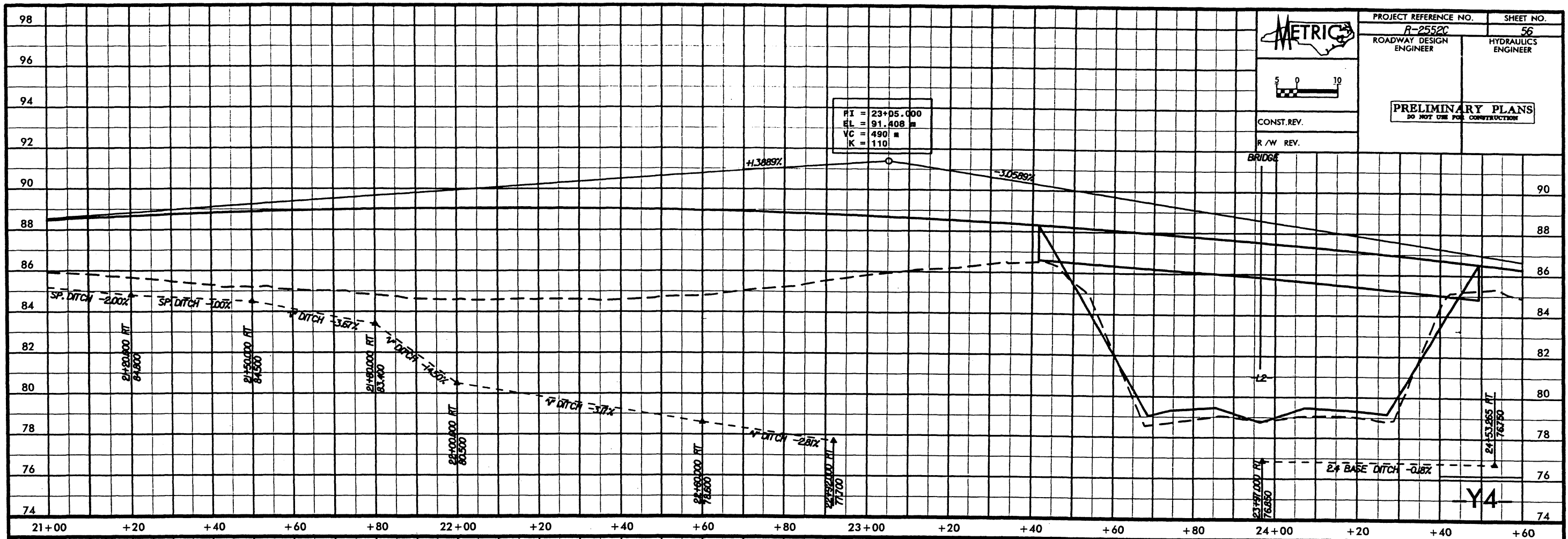
| | | | |
|---|---------|---------------------|----|
| PROJECT REFERENCE NO. | R-2552C | SHEET NO. | 56 |
| ROADWAY DESIGN ENGINEER | | HYDRAULICS ENGINEER | |
| PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION | | | |



CONST. REV.
R/W REV.

BRIDGE

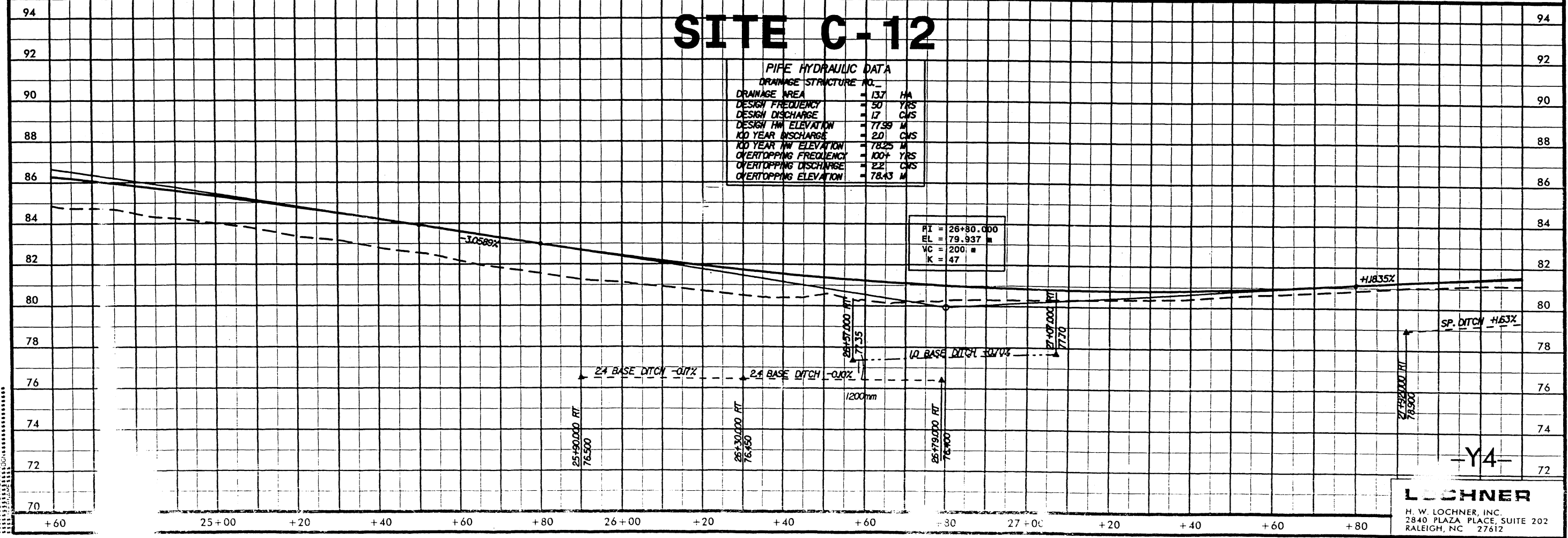
PI = 23+05.000
EL = 91.408 m
VC = 490' m
K = 110

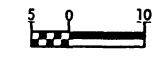


SITE C-12

| PIPE HYDRAULIC DATA | | |
|------------------------------|---------|-----|
| DRAINAGE STRUCTURE NO. _____ | | |
| DRAINAGE AREA | = 137 | HA |
| DESIGN FREQUENCY | = 50 | YRS |
| DESIGN DISCHARGE | = 17 | CFS |
| DESIGN HW ELEVATION | = 77.99 | M |
| 100 YEAR DISCHARGE | = 20 | CFS |
| 100 YEAR HW ELEVATION | = 78.25 | M |
| OVERTOPPING FREQUENCY | = 100+ | YRS |
| OVERTOPPING DISCHARGE | = 22 | CFS |
| OVERTOPPING ELEVATION | = 78.43 | M |

PI = 26+80.000
EL = 79.937 m
VC = 200' m
K = 47

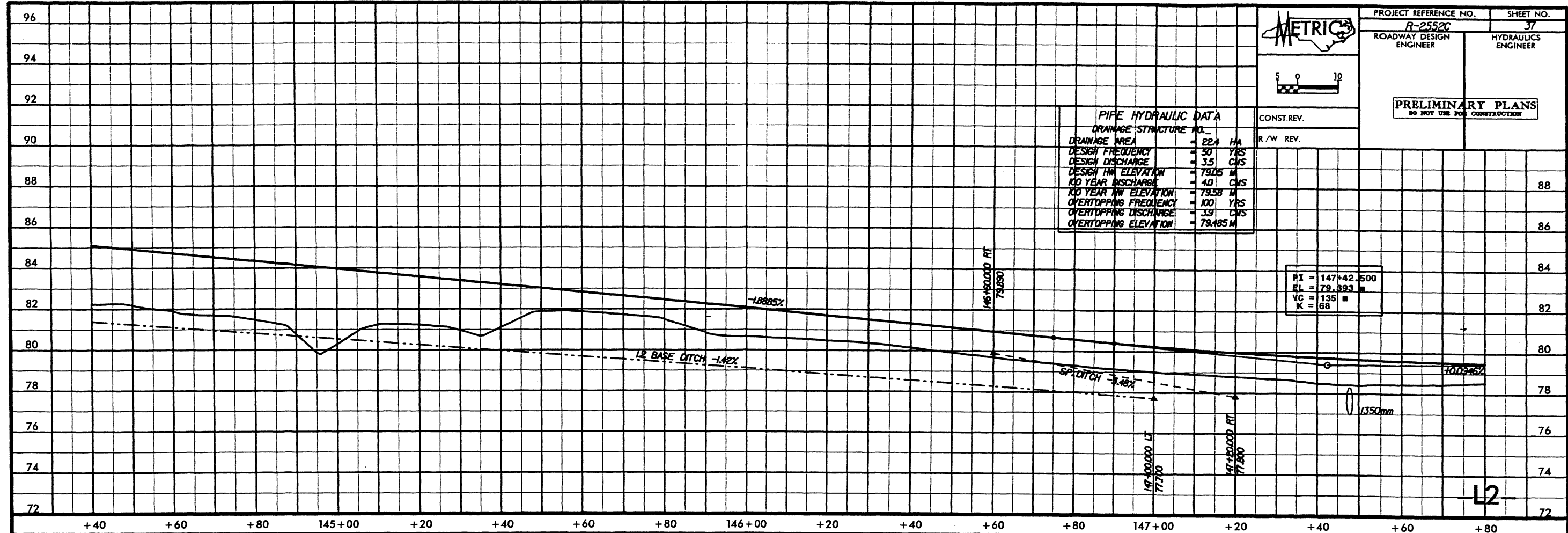




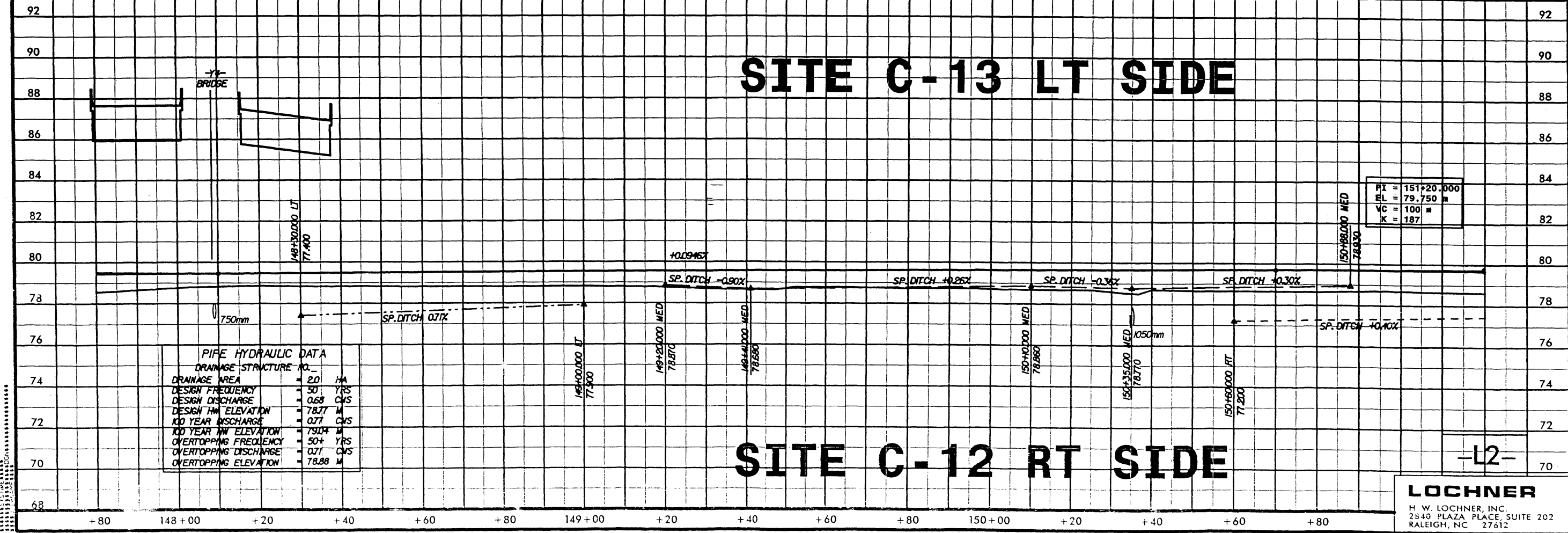
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

| PIPE HYDRAULIC DATA | |
|------------------------------|------------|
| DRAINAGE STRUCTURE NO. _____ | |
| DRAINAGE AREA | = 22.4 HA |
| DESIGN FREQUENCY | = 50 YRS |
| DESIGN DISCHARGE | = 3.5 CFS |
| DESIGN HW ELEVATION | = 79.05 M |
| 100 YEAR DISCHARGE | = 4.0 CFS |
| 100 YEAR HW ELEVATION | = 79.58 M |
| OVERTOPPING FREQUENCY | = 100 YRS |
| OVERTOPPING DISCHARGE | = 3.9 CFS |
| OVERTOPPING ELEVATION | = 79.485 M |

CONST. REV.
R/W REV.

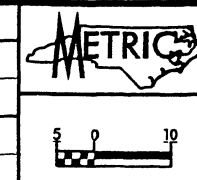


SITE C-13 LT SIDE

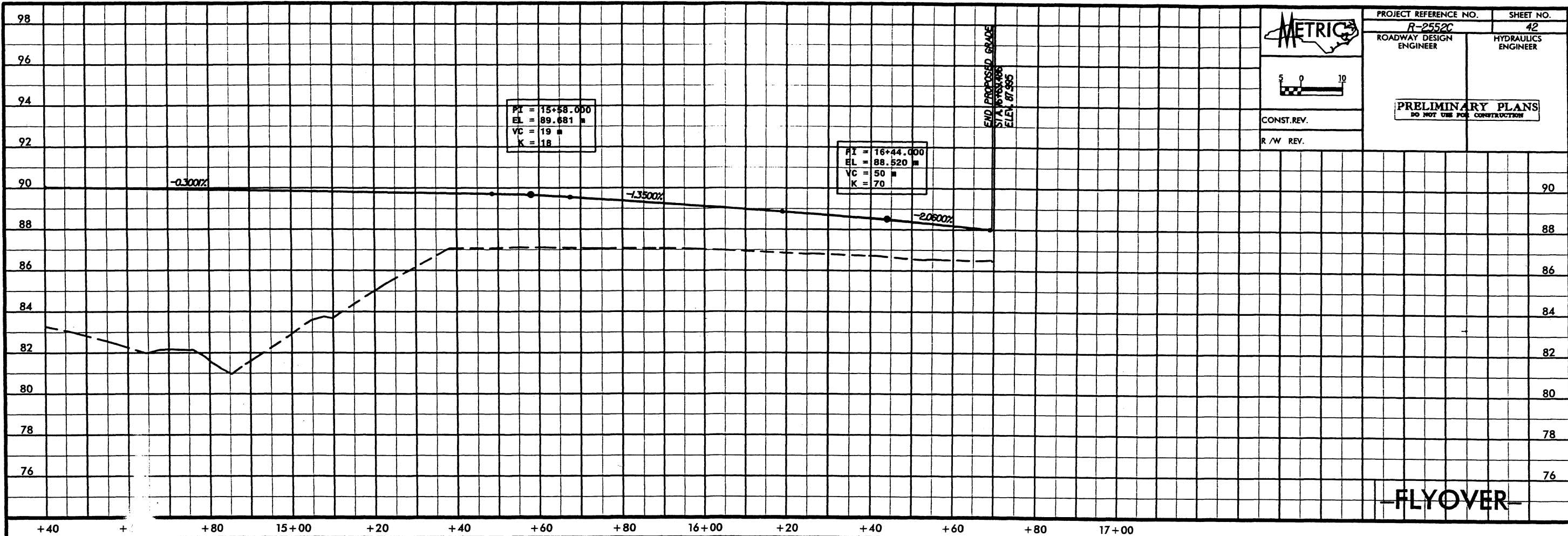


| PIPE HYDRAULIC DATA | |
|------------------------------|------------|
| DRAINAGE STRUCTURE NO. _____ | |
| DRAINAGE AREA | = 2.0 HA |
| DESIGN FREQUENCY | = 50 YRS |
| DESIGN DISCHARGE | = 0.68 CFS |
| DESIGN HW ELEVATION | = 78.77 M |
| 100 YEAR DISCHARGE | = 0.77 CFS |
| 100 YEAR HW ELEVATION | = 79.04 M |
| OVERTOPPING FREQUENCY | = 50+ YRS |
| OVERTOPPING DISCHARGE | = 0.71 CFS |
| OVERTOPPING ELEVATION | = 78.88 M |

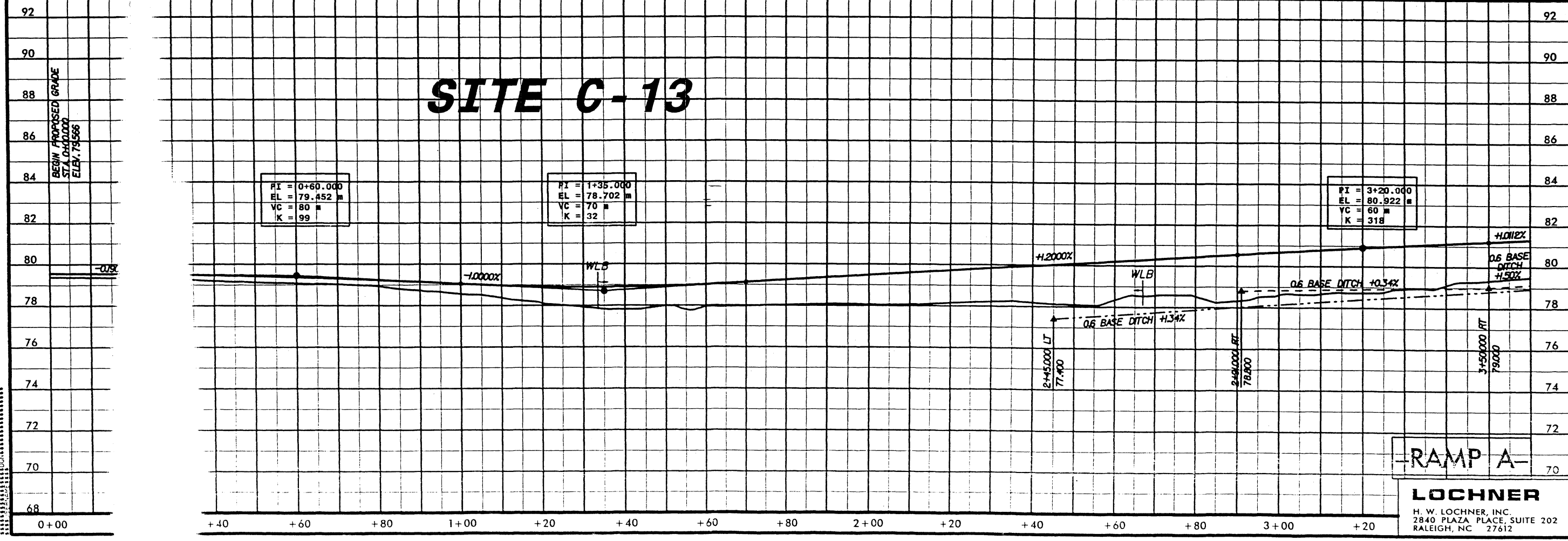
SITE C-12 RT SIDE



| | |
|---|---------------------|
| PROJECT REFERENCE NO. R-2552C | SHEET NO. 42 |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |
| PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION | |
| CONST. REV. | |
| R/W REV. | |



SITE C-13

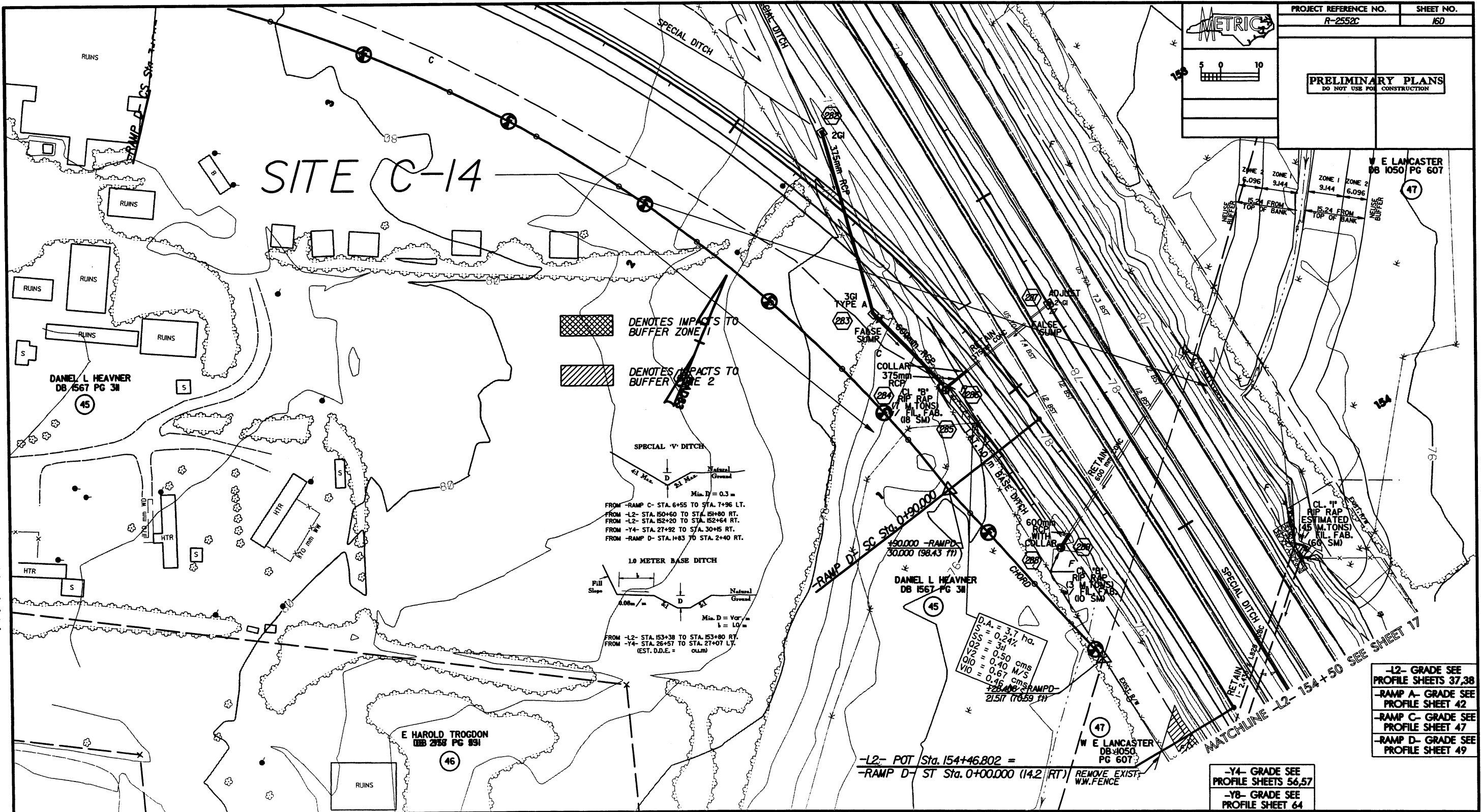


RAMP A

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

MATCH LINE 16 A-D

MATCH LINE 16 C-D



| | |
|---|------------------|
| PROJECT REFERENCE NO. R-2552C | SHEET NO. 16D |
| PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION | |

DENOTES IMPACTS TO BUFFER ZONE 1

DENOTES IMPACTS TO BUFFER ZONE 2

SPECIAL "V" DITCH

4:1 Max. D
Natural Ground

Min. D = 0.3 m

FROM -RAMP C- STA. 6+55 TO STA. 7+96 LT.
FROM -L2- STA. 150+60 TO STA. 151+80 RT.
FROM -Y4- STA. 27+92 TO STA. 30+15 RT.
FROM -RAMP D- STA. 1+83 TO STA. 2+40 RT.

1.0 METER BASE DITCH

Fill Slope
4:1 D
Natural Ground

Min. D = Var. =
1 = 1.0 m

FROM -L2- STA. 153+38 TO STA. 153+80 RT.
FROM -Y4- STA. 26+57 TO STA. 27+07 LT.
(EST. D.D.E. = 0.01m)

D.A. = 3.7 ha.
S₁ = 0.24%
Q₂ = 3l
V₂ = 0.50 cms
Q₁₀ = 0.40 M/S
V₁₀ = 0.67 cms
+28.006 RAMPD-
21.517 (78.59 FT)

-L2- POT Sta. 154+46.802 =
-RAMP D- ST Sta. 0+00.000 (14.2 RT) REMOVE EXIST. W.W.FENCE

-L2- GRADE SEE PROFILE SHEETS 37,38
-RAMP A- GRADE SEE PROFILE SHEET 42
-RAMP C- GRADE SEE PROFILE SHEET 47
-RAMP D- GRADE SEE PROFILE SHEET 49

-Y4- GRADE SEE PROFILE SHEETS 56,57
-Y8- GRADE SEE PROFILE SHEET 64

W E LANCASTER DB 1050 PG 607

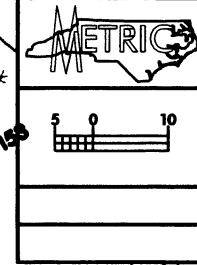
CL. 1" RIP RAP ESTIMATED 145 M.TONS (60 SM)

15.24 FROM TOP OF BANK

15.24 FROM TOP OF BANK

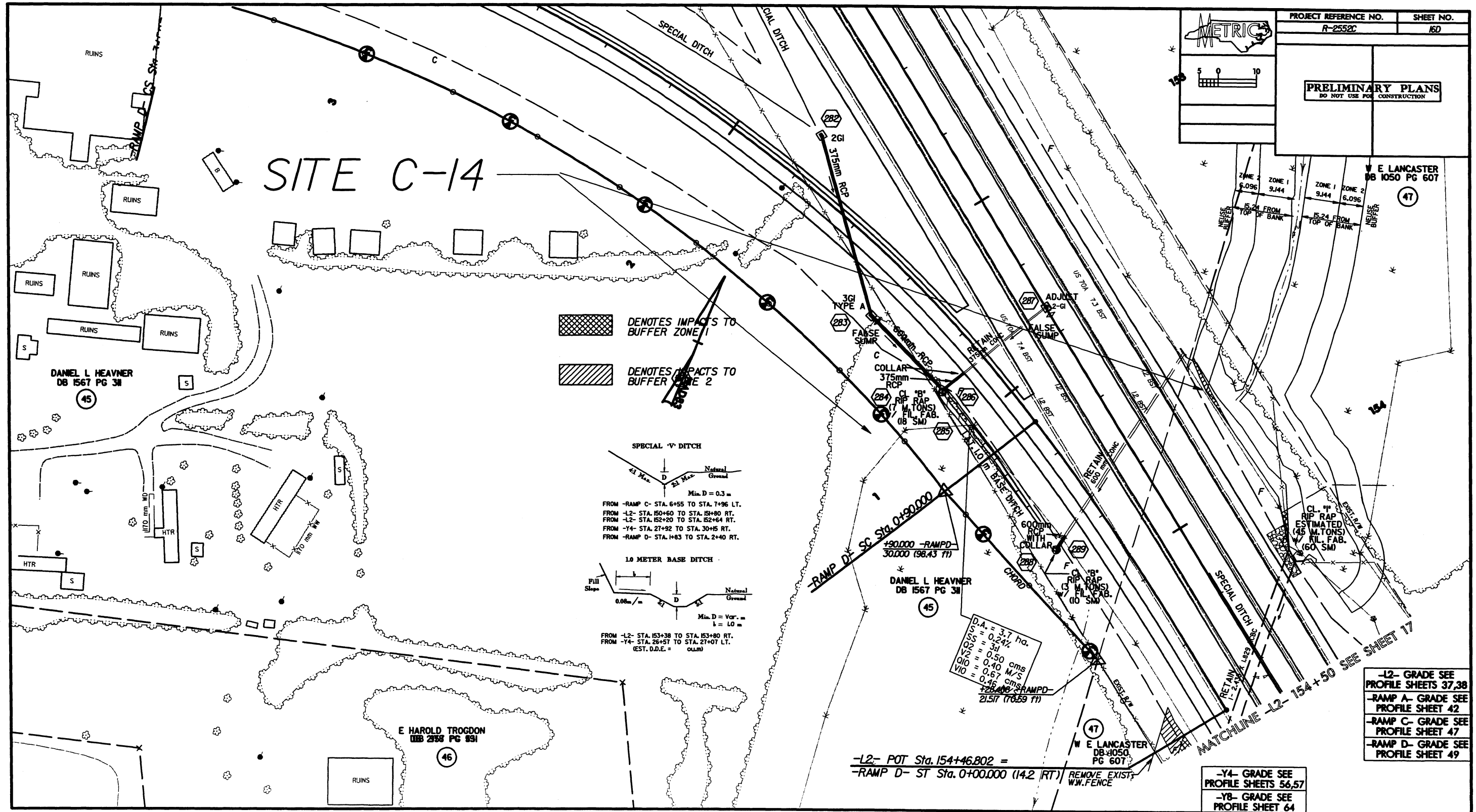
15.24 FROM TOP OF BANK

15.24 FROM TOP OF BANK



MATCH LINE 16 A-D

MATCH LINE 16 C-D



DENOTES IMPACTS TO BUFFER ZONE 1
 DENOTES IMPACTS TO BUFFER ZONE 2

SPECIAL V-DITCH

4:1 Max. 2:1 Max. Natural Ground

Min. D = 0.3 m

FROM -RAMP C- STA. 6+55 TO STA. 7+96 LT.
 FROM -L2- STA. 150+60 TO STA. 151+80 RT.
 FROM -L2- STA. 152+20 TO STA. 152+64 RT.
 FROM -Y4- STA. 27+92 TO STA. 30+15 RT.
 FROM -RAMP D- STA. 1+83 TO STA. 2+40 RT.

1.0 METER BASE DITCH

Fill Slope 0.08 m / m Natural Ground

Min. D = Var. m k = 1.0 m

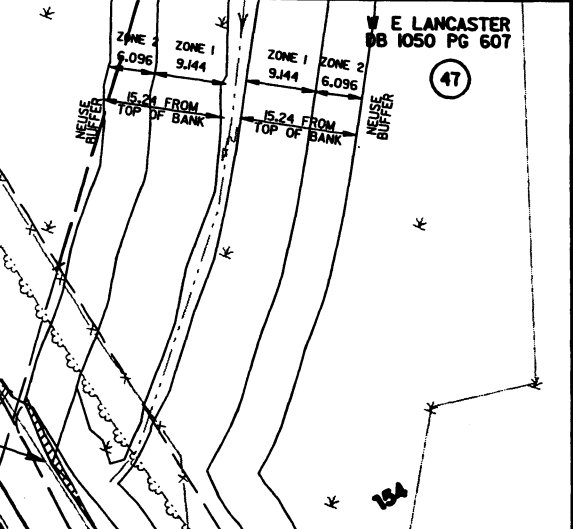
FROM -L2- STA. 153+38 TO STA. 153+80 RT.
 FROM -Y4- STA. 26+57 TO STA. 27+07 LT.
 (EST. D.D.E. = 0.2m)

D.A. = 3.7 ha
 S1 = 0.24%
 S2 = 3%
 V1 = 0.50 cms
 V2 = 0.40 M/S
 VIO = 0.67 cms
 228.409 RAMPD-21517 (76.55 FT)

-L2- GRADE SEE PROFILE SHEETS 37,38
 -RAMP A- GRADE SEE PROFILE SHEET 42
 -RAMP C- GRADE SEE PROFILE SHEET 47
 -RAMP D- GRADE SEE PROFILE SHEET 49
 -Y4- GRADE SEE PROFILE SHEETS 56,57
 -Y8- GRADE SEE PROFILE SHEET 64

-L2- POT Sta. 154+46.802 =
 -RAMP D- ST Sta. 0+00.000 (14.2 RT) REMOVE EXIST. WW.FENCE

PROJECT REFERENCE NO. R-2552C SHEET NO. 16D
METRIC
 5 0 10
PRELIMINARY PLANS
 DO NOT USE FOR CONSTRUCTION




DANIEL L HEAVNER
 DB 1567 PG 31
 45


E HAROLD TROGDON
 DB 2988 PG 931
 46


W E LANCASTER
 DB 1050 PG 607
 47

REVISIONS

SITE C-14

 DENOTES IMPACTS TO BUFFER ZONE 1

 DENOTES IMPACTS TO BUFFER ZONE 2



5 0 10

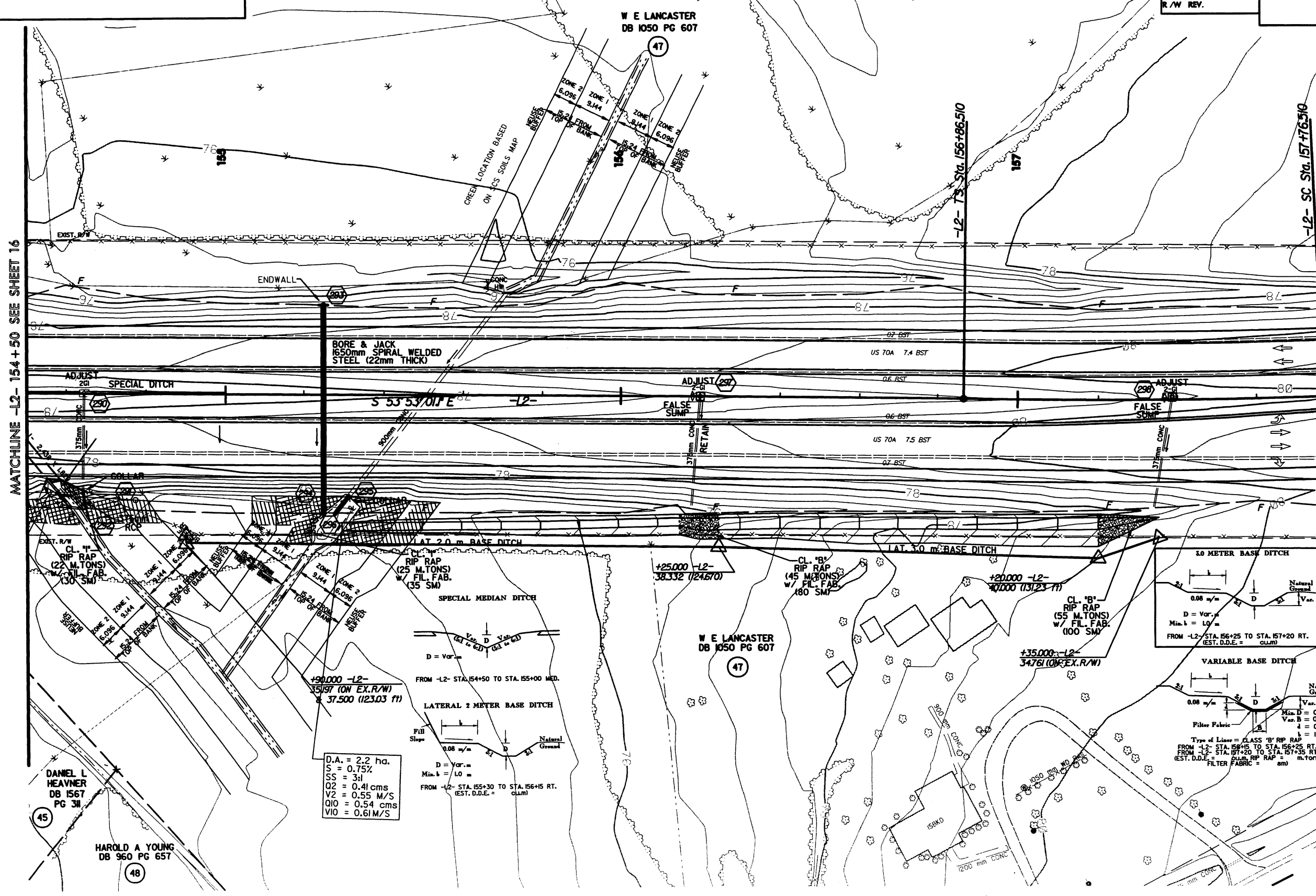
CONST. REV.

R/W REV.

| | |
|---|---------------------|
| PROJECT REFERENCE NO. | SHEET NO. |
| R-2552C | 17 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |
| PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION | |
| CONST. REV. | |
| R/W REV. | |

MATCHLINE -L2- 154+50 SEE SHEET 16

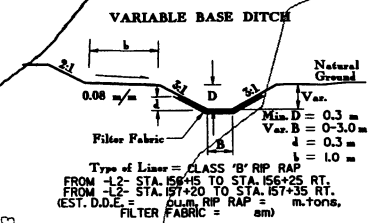
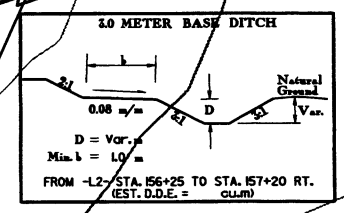
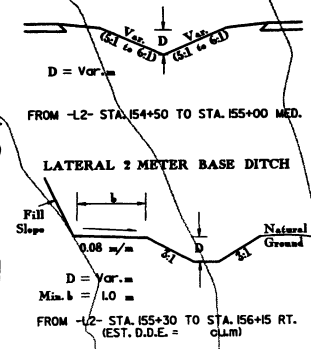
MATCHLINE -L2- 157+80 SEE SHEET 18



DANIEL L HEAVNER
DB 1567
PG 31

HAROLD A YOUNG
DB 960 PG 657


D.A. = 2.2 ha.
S = 0.75%
SS = 3s
Q2 = 0.41 cms
V2 = 0.55 M/S
Q10 = 0.54 cms
V10 = 0.61 M/S




-L2- GRADE SEE PROFILE SHEET 38

REVISIONS

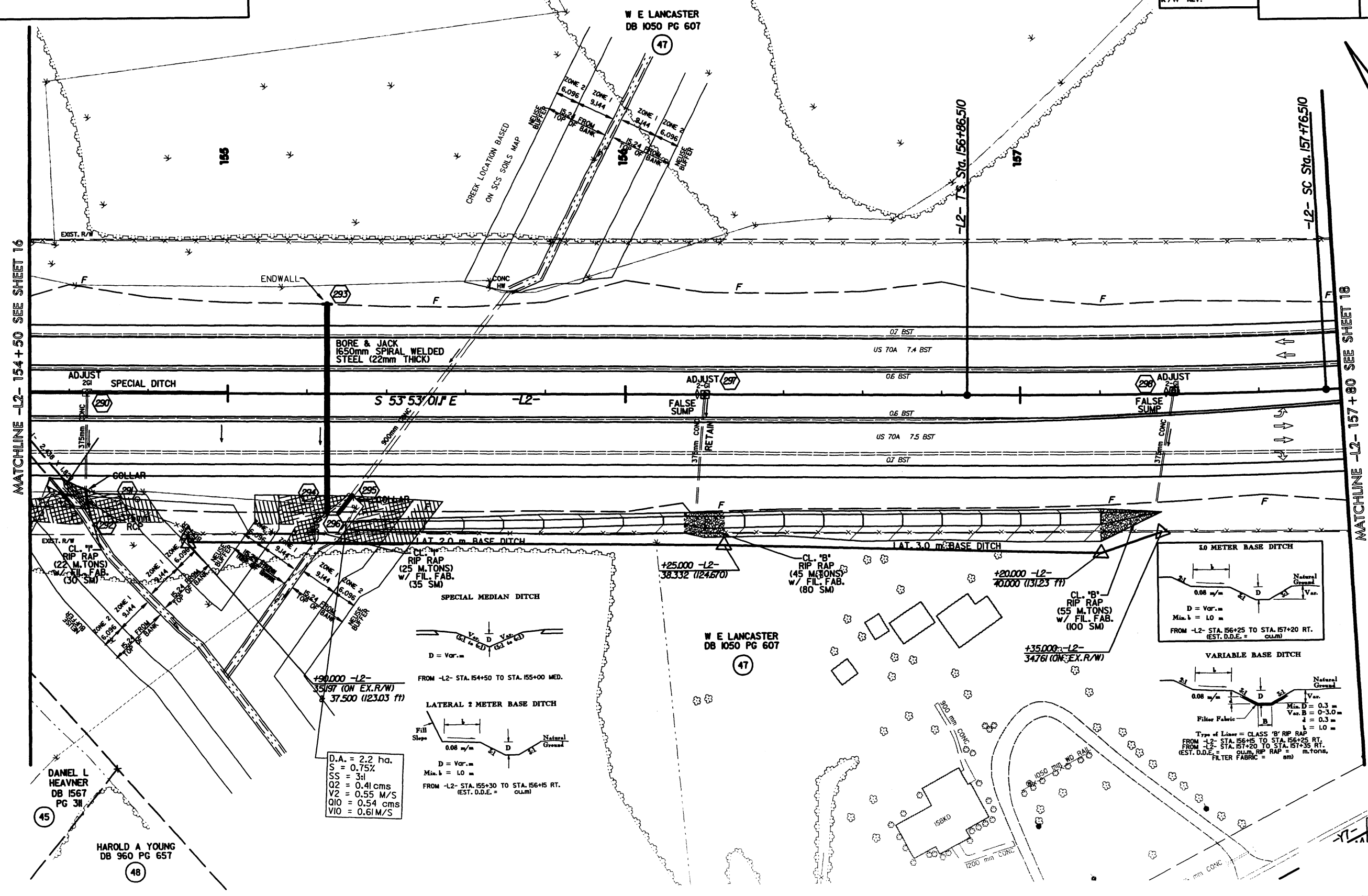
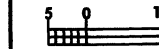
SITE C-14

 DENOTES IMPACTS TO BUFFER ZONE 1

 DENOTES IMPACTS TO BUFFER ZONE 2



| | |
|---|---------------------|
| PROJECT REFERENCE NO. R-2552C | SHEET NO. 11 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |
| PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION | |
| CONST. REV. | |
| R/W REV. | |



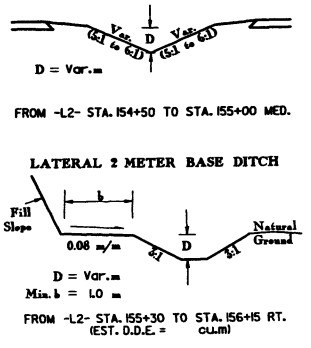
MATCHLINE -L2- 154+50 SEE SHEET 16

MATCHLINE -L2- 157+80 SEE SHEET 18

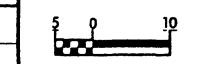
DANIEL L HEAVNER
DB 1567
PG 31 (45)

HAROLD A YOUNG
DB 960 PG 657 (48)

D.A. = 2.2 ha.
S = 0.75%
SS = 3h
Q2 = 0.4l cms
V2 = 0.55 M/S
Q10 = 0.54 cms
V10 = 0.61 M/S



-L2- GRADE SEE PROFILE SHEET 38



PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

SITE C-14

CONST. REV.

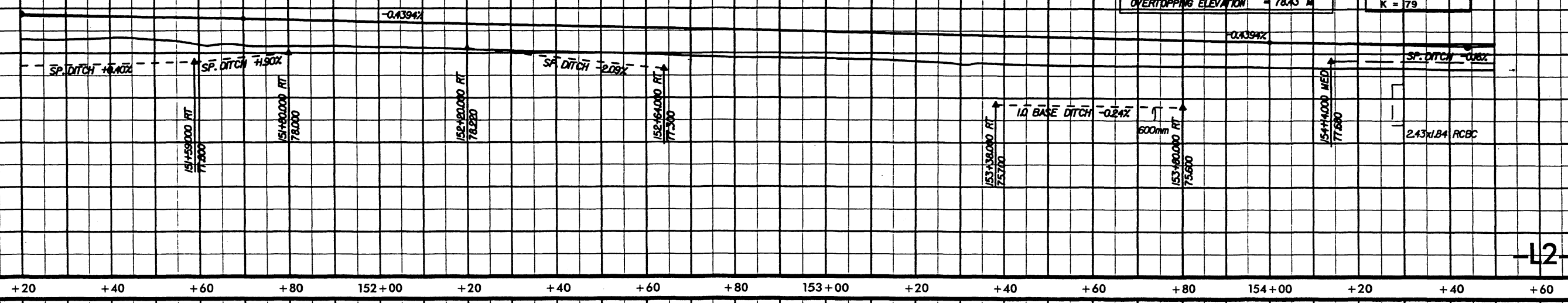
R / W REV.

PIPE HYDRAULIC DATA

| | | |
|-----------------------|---------|------|
| DRAINAGE AREA | = 25 | SQKM |
| DESIGN FREQUENCY | = 50 | YRS |
| DESIGN DISCHARGE | = 29 | CMS |
| DESIGN HW ELEVATION | = 78.02 | M |
| 100 YEAR DISCHARGE | = 33 | CMS |
| 100 YEAR HW ELEVATION | = 78.39 | M |
| OVERTOPPING FREQUENCY | = 100 | YRS |
| OVERTOPPING DISCHARGE | = 33.7 | CMS |
| OVERTOPPING ELEVATION | = 78.43 | M |

PI = 151+20.000
EL = 79.750
VC = 100
K = 187

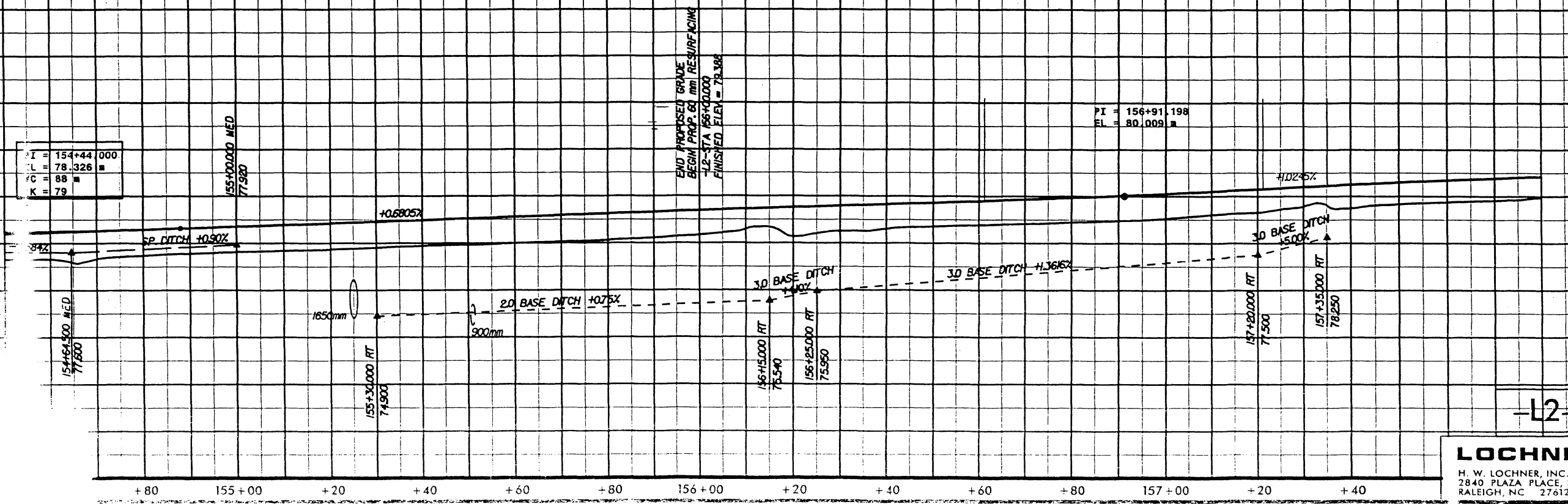
PI = 154+44.000
EL = 78.326
VC = 88
K = 79



-L2-

PI = 154+44.000
EL = 78.326
VC = 88
K = 79

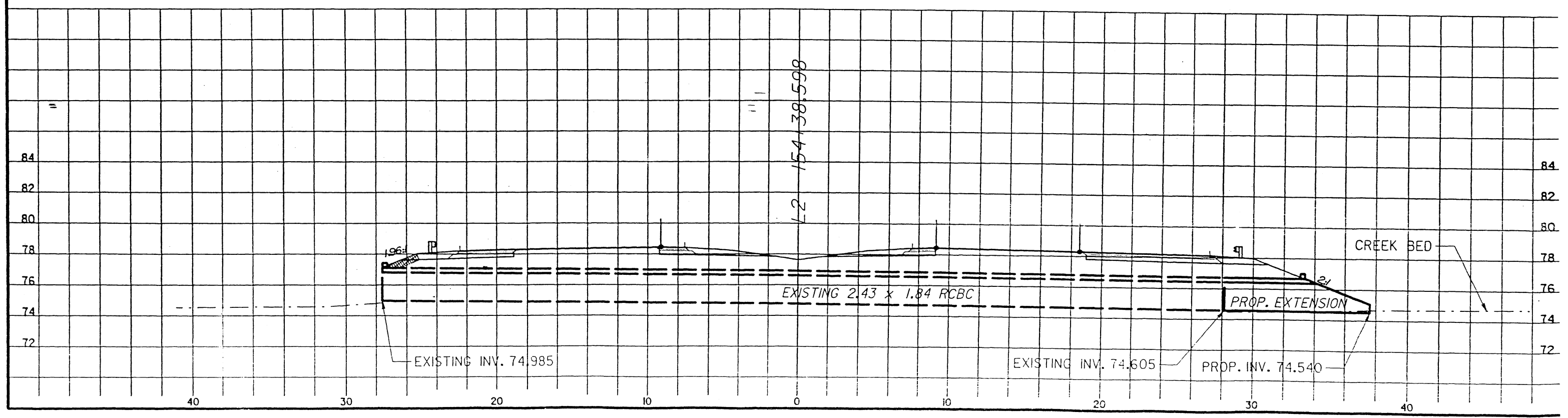
PI = 156+91.198
EL = 80.009

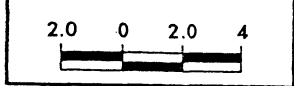


-L2-

SITE C-14

PROFILE OF 2.43 x 1.84 RCBC
 -L2- STA. 154+38.598
 PLAN SHEETS 16 & 17

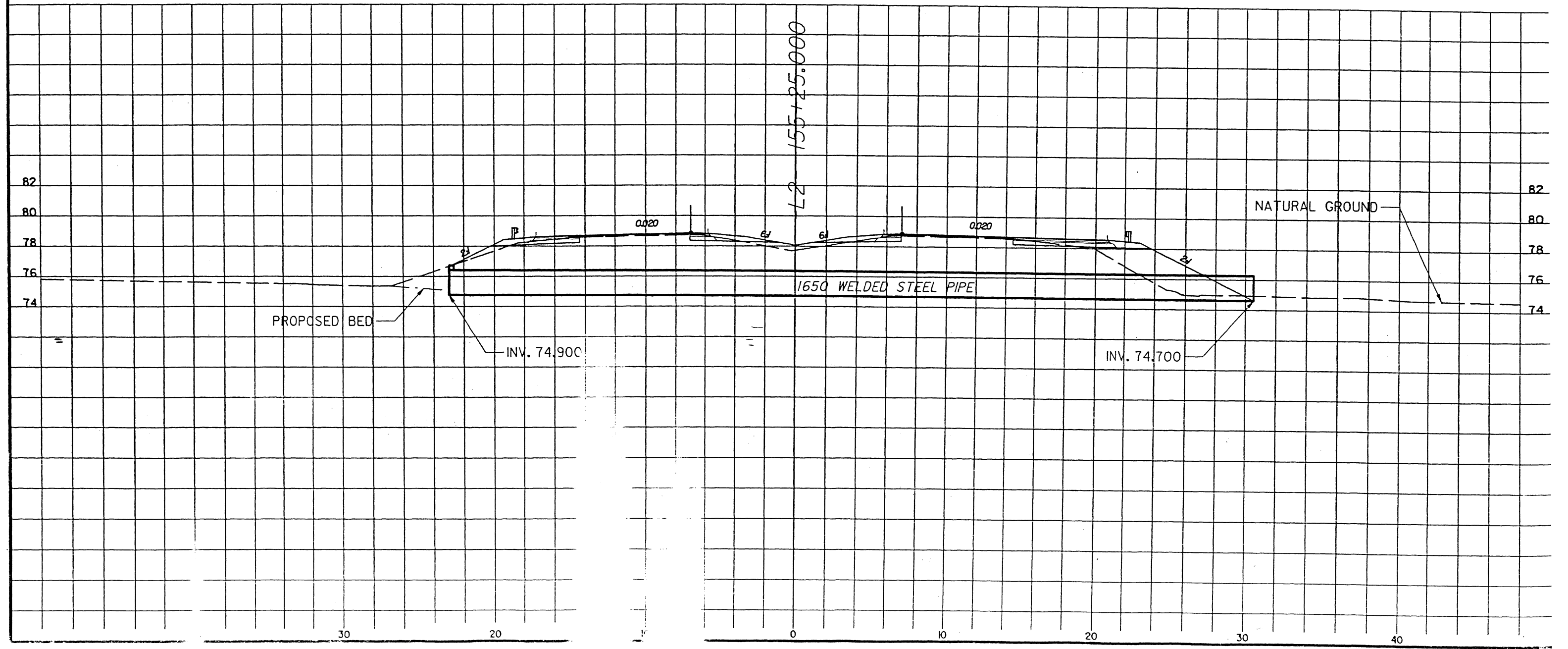




| PROJECT REFERENCE NO. | SHEET NO. |
|-----------------------|-----------|
| R-2552C | PP-4 |

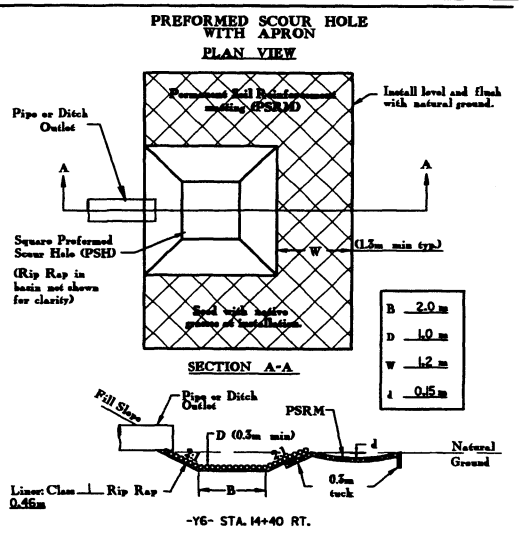
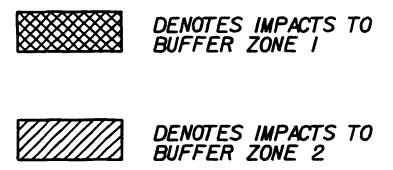
SITE C-14

PROFILE OF 1650 WELDED STEEL PIPE
-L2- STA. 155+25.000
PLAN SHEET 17

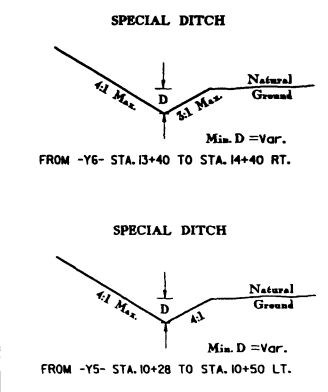
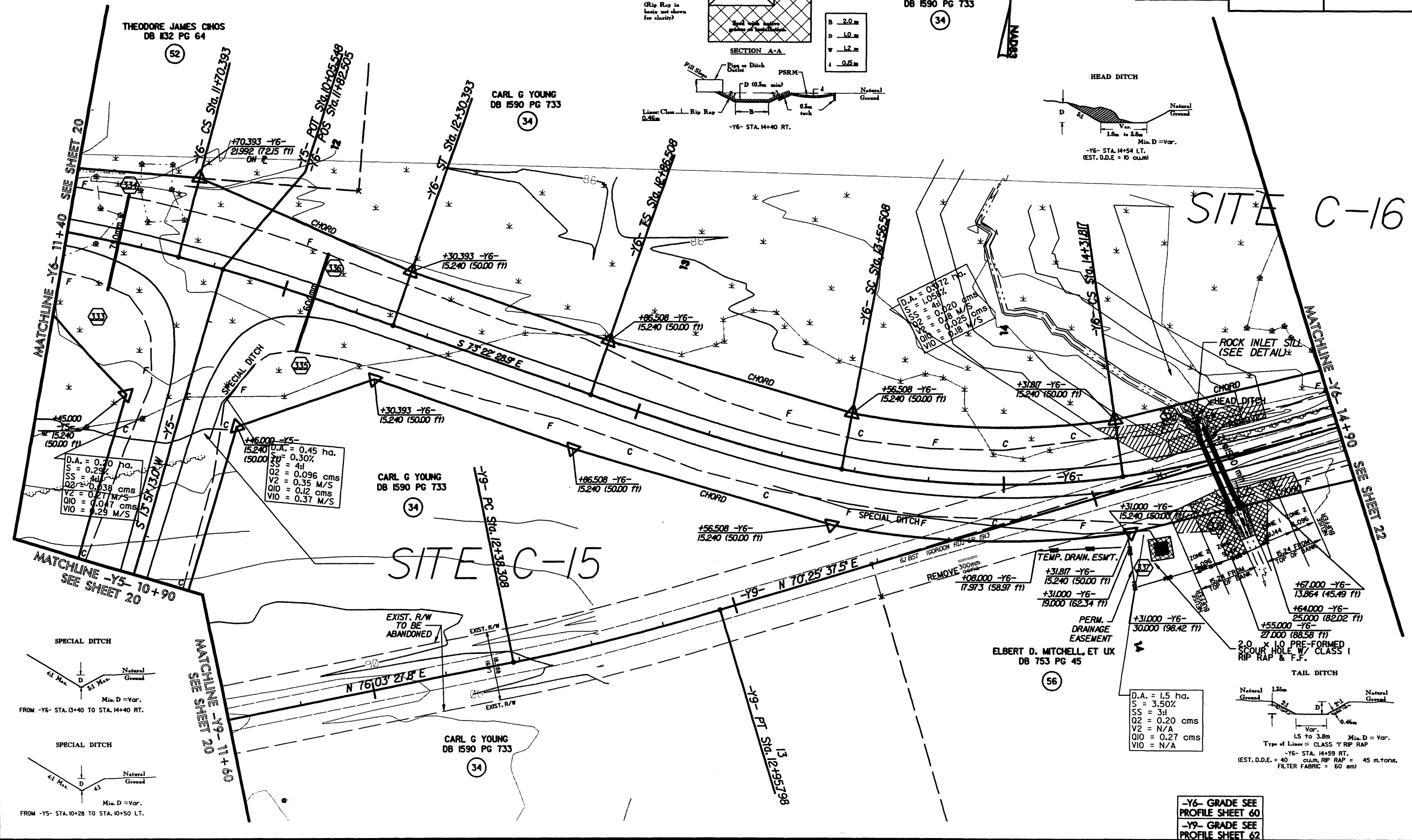


REVISIONS

| | | | |
|-----------------------------|--|---------------------|--|
| PROJECT REFERENCE NO. | | SHEET NO. | |
| R-2552C | | 21 | |
| R/W SHEET NO. | | | |
| ROADWAY DESIGN ENGINEER | | HYDRAULICS ENGINEER | |
| | | | |
| PRELIMINARY PLANS | | | |
| DO NOT USE FOR CONSTRUCTION | | | |
| CONST. REV. | | | |
| R/W REV. | | | |



CARL G YOUNG
DB 1590 PG 733
(34)



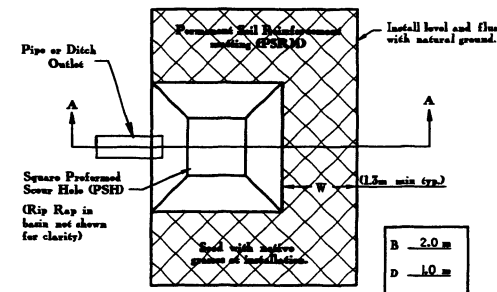
-Y6- GRADE SEE
PROFILE SHEET 60
-Y9- GRADE SEE
PROFILE SHEET 62

REVISIONS

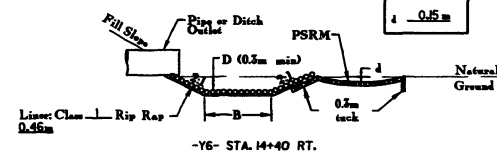
DENOTES IMPACTS TO BUFFER ZONE 1

DENOTES IMPACTS TO BUFFER ZONE 2

PREFORMED SCOUR HOLE WITH APRON
PLAN VIEW



SECTION A-A



CARL G YOUNG
DB 1590 PG 733

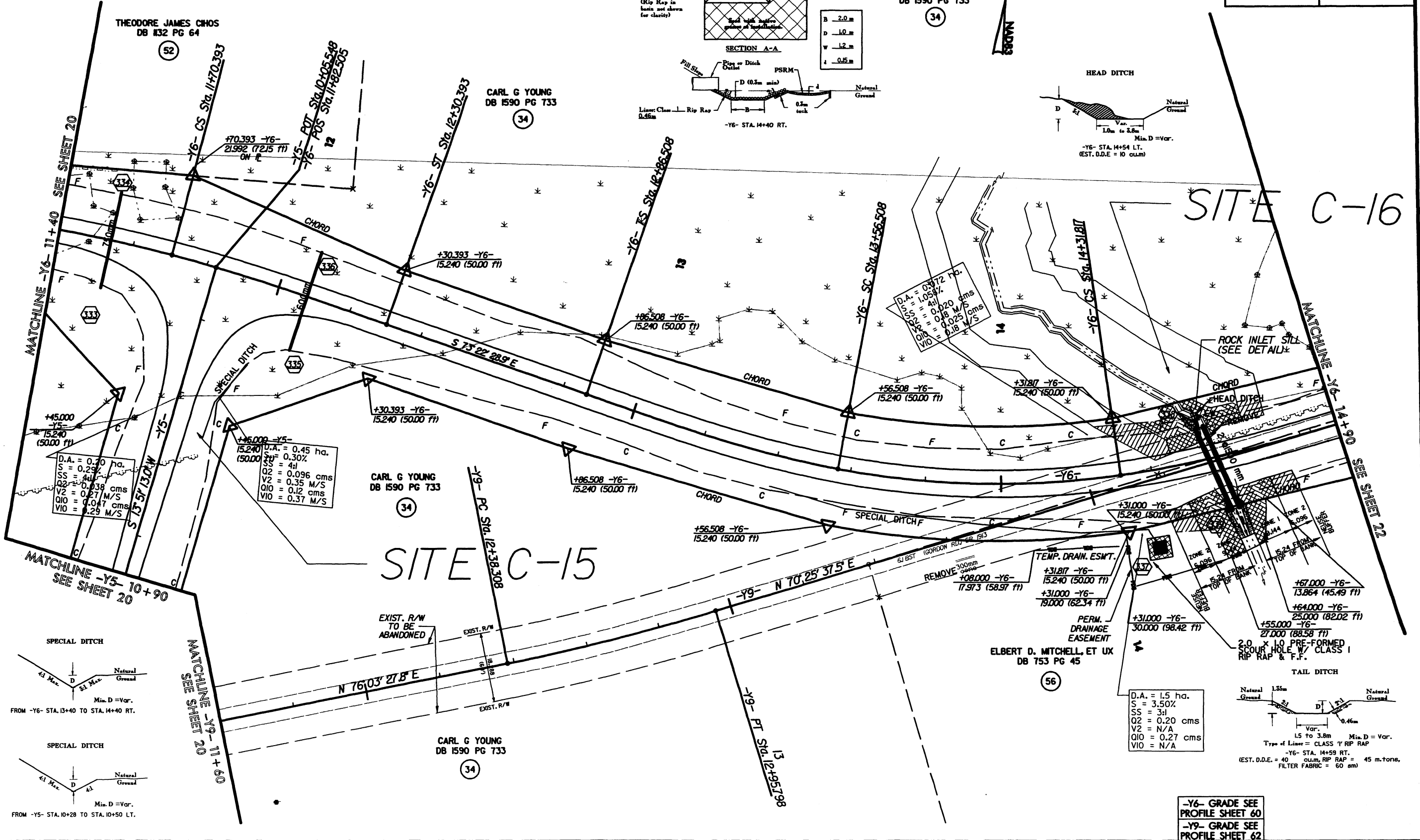
METRIC

5 0 10

CONST. REV. _____

R/W REV. _____

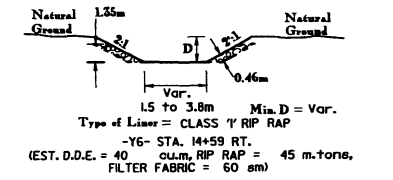
| | |
|---|---------------------|
| PROJECT REFERENCE NO. R-2552C | SHEET NO. 21 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |
| PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION | |



D.A. = 0.40 ha.
S = 0.23%
SS = 4#
Q2 = 0.038 cms
V2 = 0.27 M/S
Q10 = 0.047 cms
V10 = 0.29 M/S

D.A. = 0.45 ha.
S = 0.30%
SS = 4#
Q2 = 0.096 cms
V2 = 0.35 M/S
Q10 = 0.12 cms
V10 = 0.37 M/S

D.A. = 1.5 ha.
S = 3.50%
SS = 3#
Q2 = 0.20 cms
V2 = N/A
Q10 = 0.27 cms
V10 = N/A



-Y6- GRADE SEE PROFILE SHEET 60
-Y9- GRADE SEE PROFILE SHEET 62

SYSTEMS ENGINEERING
 DESIGN
 CONSTRUCTION
 MANAGEMENT
 SERVICES

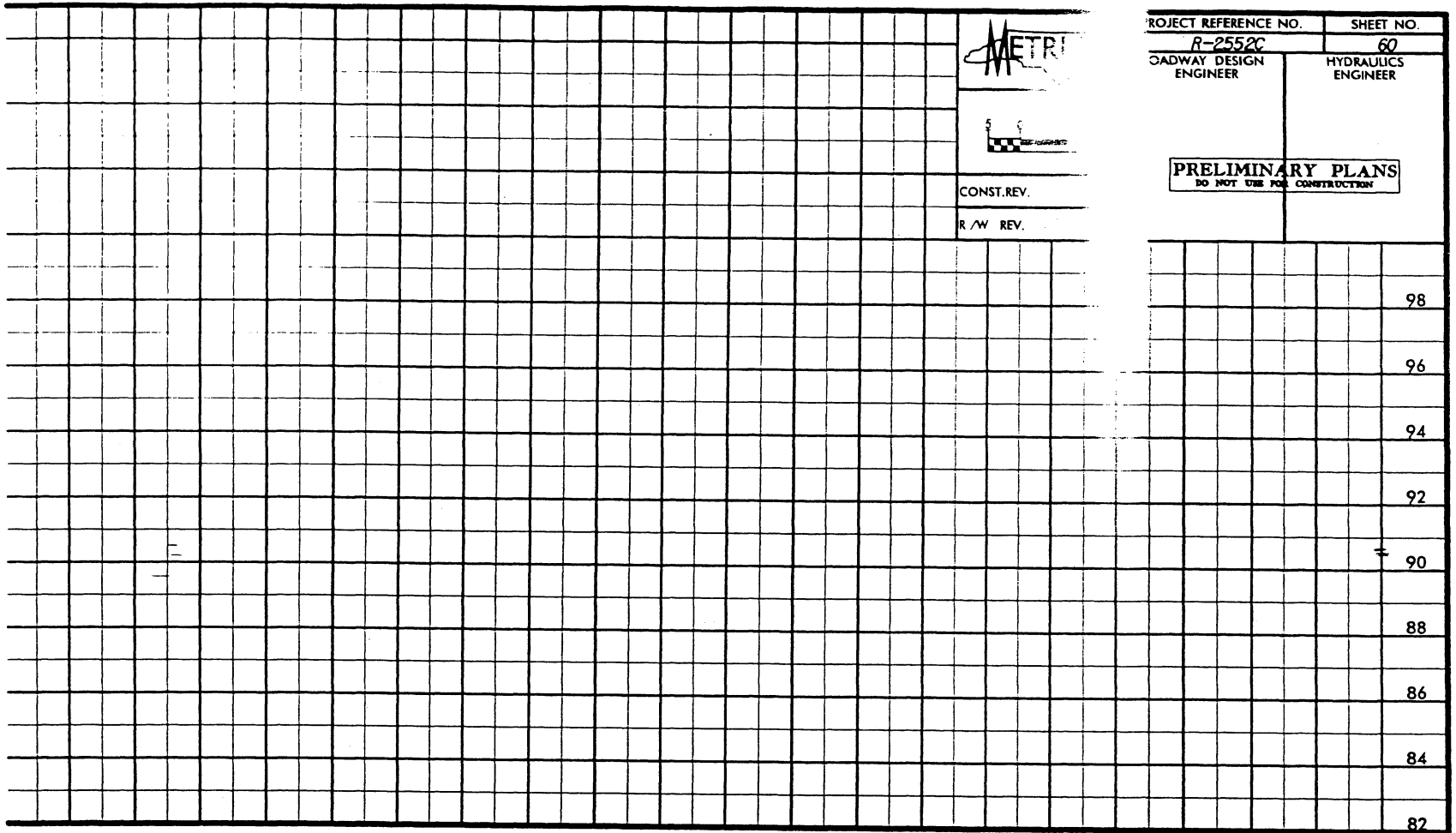


| | |
|-------------------------|---------------------|
| PROJECT REFERENCE NO. | SHEET NO. |
| R-2552C | 60 |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

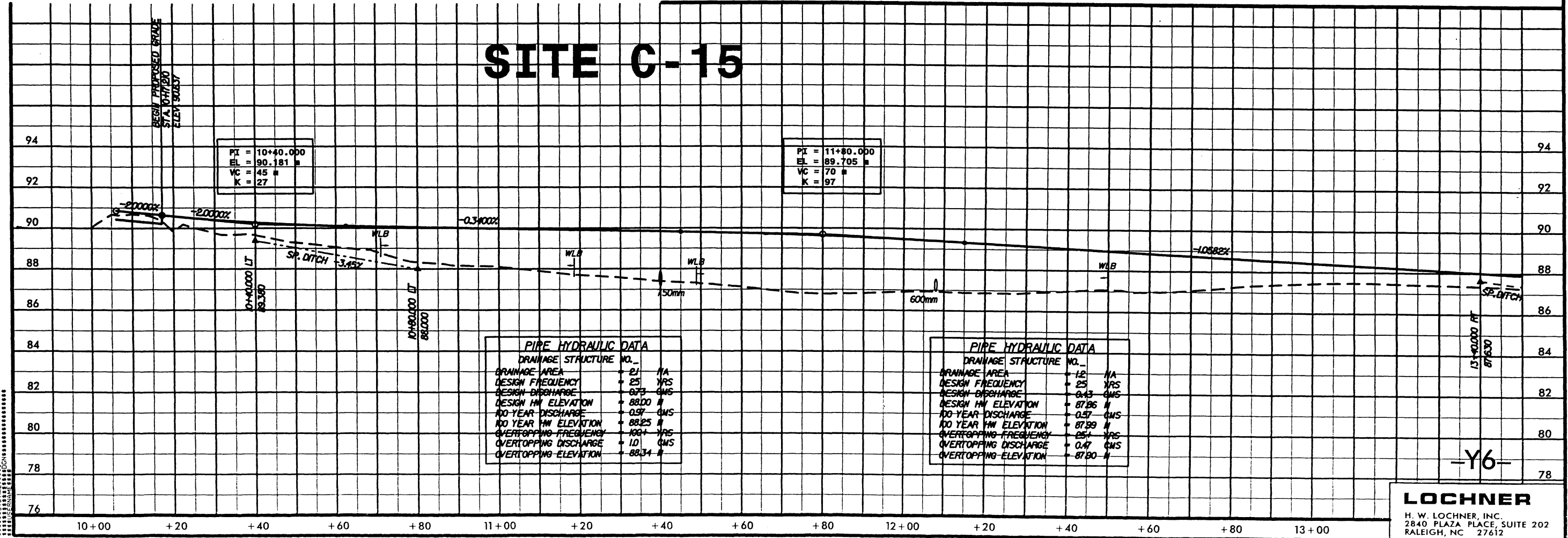


CONST. REV.
R/W REV.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



SITE C-15



LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

-Y6-

SITE C-16



PROJECT REFERENCE NO. R-2552C SHEET NO. 61

ROADWAY DESIGN ENGINEER HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

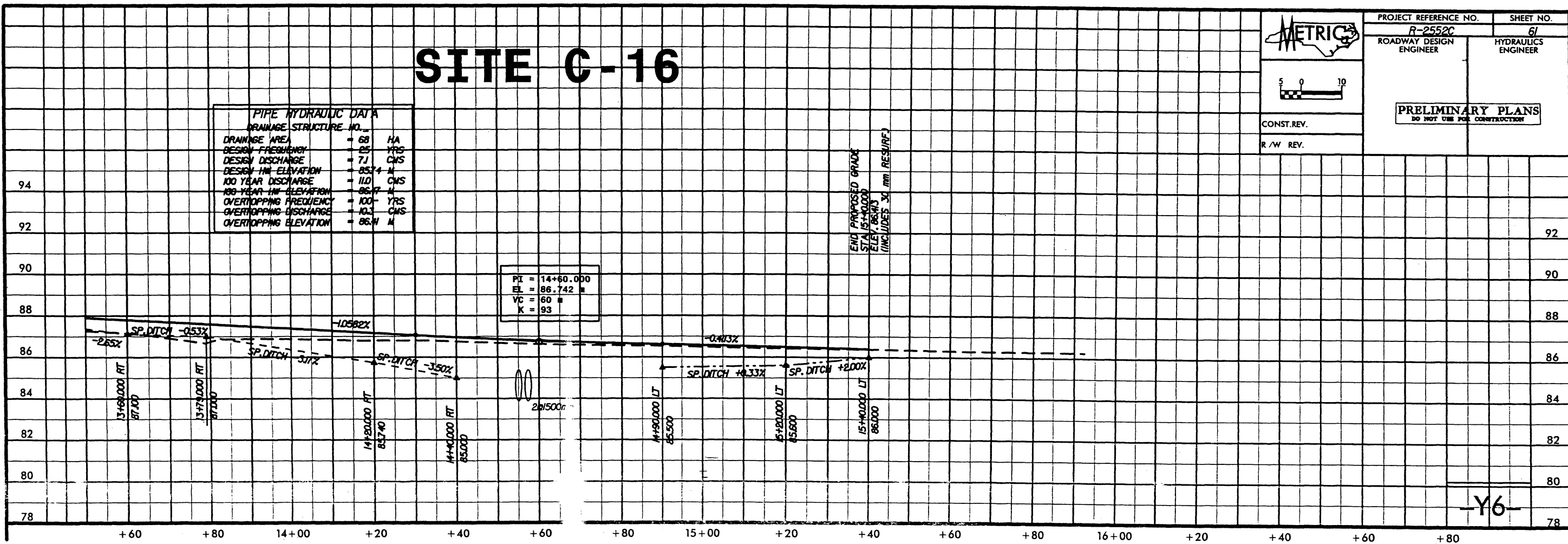
CONST. REV.

R/W REV.

| PIPE HYDRAULIC DATA | | |
|------------------------|---------|-----|
| DRAINAGE STRUCTURE NO. | | |
| DRAINAGE AREA | = 68 | HA |
| DESIGN FREQUENCY | = 25 | YRS |
| DESIGN DISCHARGE | = 7.1 | CMS |
| DESIGN HW ELEVATION | = 85.74 | M |
| 100 YEAR DISCHARGE | = 11.0 | CMS |
| 100-YEAR HW ELEVATION | = 86.17 | M |
| OVERTOPPING FREQUENCY | = 100 | YRS |
| OVERTOPPING DISCHARGE | = 10.3 | CMS |
| OVERTOPPING ELEVATION | = 86.11 | M |

PI = 14+60.000
EL = 86.742 m
VC = 60 m
K = 93

END PROPOSED GRADE
STA 15+00.000
ELEV. 86.000
(INCLUDES 30 mm RESURF.)



-Y6-

SITE C-16

PROFILE OF DOUBLE 1500 RCP
 -Y6- STA. 14+56.200
 PLAN SHEET 21

