PROJECT: WBS 34820.4.3

U-2524WM

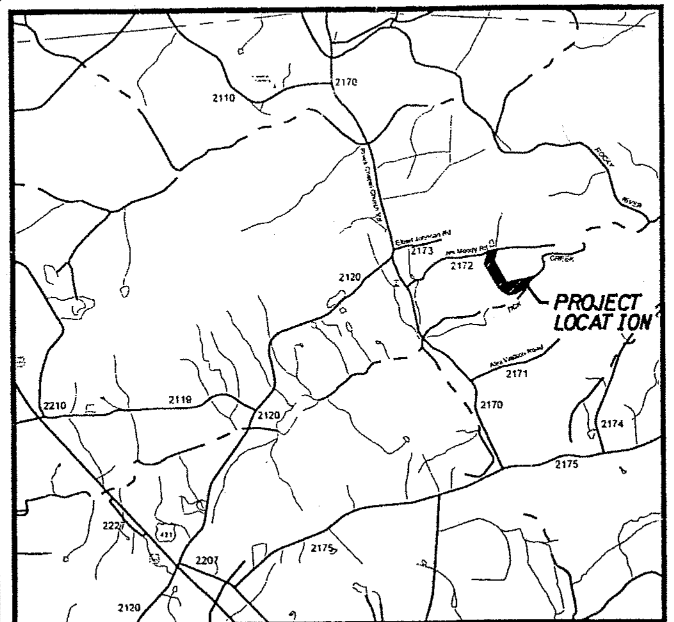
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CHATHAM COUNTY

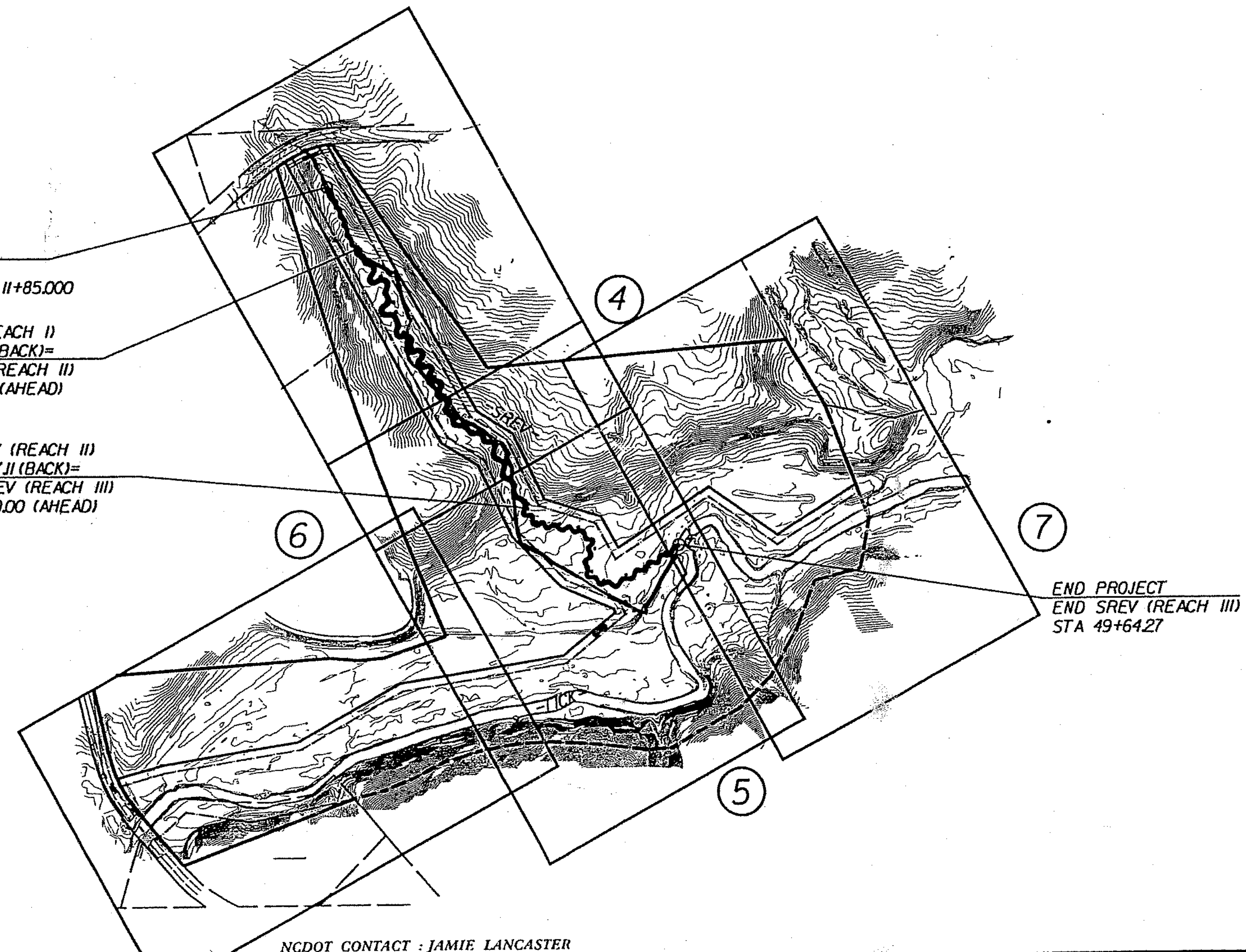
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-2524 WM	1	

STATE PROJ.NO.	F.A.PROJ.NO.	DESCRIPTION
34820.4.1	NHS-124-1 (8)	P.E.
34820.4.2	NHS-124 (10)	R/W
34820.4.3	NHS-124-1 (10)	Const.

LOCATION: UNNAMED TRIBUTARY TO TICK CREEK STREAM RESTORATION
TYPE OF WORK: CLEARING & GRUBBING, GRADING, STREAM RESTORATION, AND EROSION CONTROL



Vicinity Map
Not To Scale



NAD 83
NC GRID

100% PLANS
DATE: 07-07-2004

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

NCDOT CONTACT : JAMIE LANCASTER

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

CENTERLINE LENGTH (ft)	
REACH I	281.448
REACH II	1507.107
REACH III	945.599
TOTAL =	2734.154
APPROXIMATE THALWEG LENGTH (ft)	
REACH I	306.583
REACH II	1633.588
REACH III	1071.432
TOTAL =	3011.603

LETTING DATE:
AUGUST 18, 2004
2002 STANDARD SPECIFICATIONS

JANE M. ALMON
PROJECT BIOLOGIST

BENJAMIN T. GOETZ, P.E.
PROJECT ENGINEER

Prepared In the Office of:
EARTH TECH
A tyco INTERNATIONAL LTD. COMPANY
FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
701 Corporate Center Drive, Suite 475
Raleigh, NC 27607
(919) 854-6200 - (919) 854-6259(FAX)

PROJECT ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 028413 ENGINEER BENJAMIN T. GOETZ
7/28/04
SIGNATURE

rbarbour
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07/27/2004

...\Design\cadd\46433_tsh.dgn 07/27/2004 04:02:39 PM

PROJECT REFERENCE NO.	SHEET NO.
U-2524WM	1A

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 028413 ENGINEER BENJAMIN T. ODETT 7/24/04

Prepared in the Office of: EARTH TECH
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(919) 854-6200 - (919) 854-6259(FAX)

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

INDEX OF SHEETS

GENERAL NOTES

1. SURVEY INFORMATION PROVIDED BY NCDOT.
2. CONTRACTOR SHALL CONDUCT HIS/HER OWN UNDERGROUND UTILITIES INVESTIGATION BEFORE COMMENCEMENT OF CONSTRUCTION.
3. THE CONTRACTOR SHALL INSTALL AND MAINTAIN EROSION CONTROL DEVICES SUFFICIENT TO CONTAIN SEDIMENT AROUND ANY ERODIBLE MATERIAL STOCKPILE AREAS AS DIRECTED BY THE ENGINEER.
4. THE CONTRACTOR SHALL MINIMIZE REMOVAL OF VEGETATION ALONG STREAM BANKS AND WITHIN DISTURBED AREAS OF PROJECT LIMITS AS DIRECTED BY THE ENGINEER.

STANDARD DRAWING LIST

310.10	DRIVEWAY PIPE CONSTRUCTION
866.02	WOVEN WIRE FENCE - WITH TIMBER POST
866	GATE

PROJECT REFERENCE NO.	SHEET NO.
U-2524WM	2

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032813 ENGINEER BENJAMIN T. GOETZ 7/28/04

Prepared in the Office of:
EARTH TECH
701 Corporate Center Drive, Suite 475
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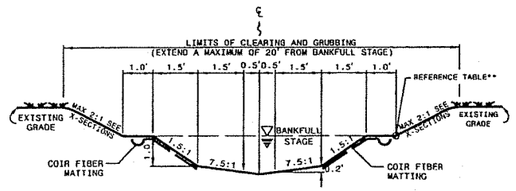
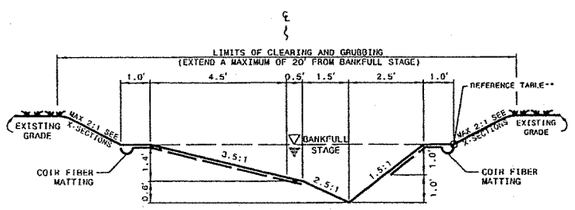
1/2 REACH I TYPICAL SECTION- - RIFFLE -



THALWEG (DEEPEST POINT IN CROSS SECTION) IS LOCATED IN CENTER OF CHANNEL IN A RIFFLE. THE CONTRACTOR IS TO PUSH SMALL DEPRESSION IN CENTER OF CHANNEL AFTER BUILDING RIFFLE.

SCALE: NTS

2/2 REACH I TYPICAL SECTION POOL RIGHT (REVERSE FOR POOL LEFT)

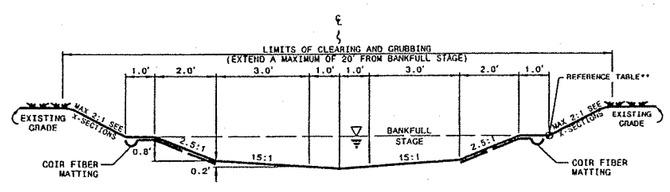


THALWEG (DEEPEST POINT IN CROSS SECTION) IS LOCATED IN THE OUTSIDE OF THE MEANDER BEND.
SCALE: NTS

NOTE:

TYPICALS FOR REACH I TO BE USED FOR STATIONS 10+00.000 - 14+66.448

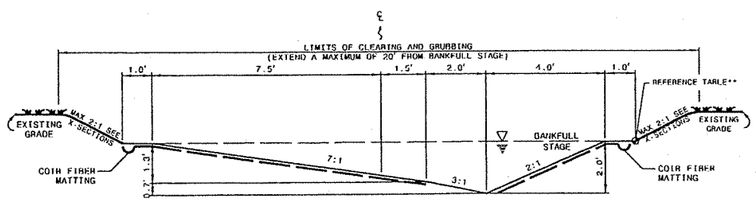
3/2 REACH II TYPICAL SECTION- - RIFFLE -



THALWEG (DEEPEST POINT IN CROSS SECTION) IS LOCATED IN CENTER OF CHANNEL IN A RIFFLE. THE CONTRACTOR IS TO PUSH SMALL DEPRESSION IN CENTER OF CHANNEL AFTER BUILDING RIFFLE.

SCALE: NTS

4/2 REACH II TYPICAL SECTION POOL RIGHT (REVERSE FOR POOL LEFT)

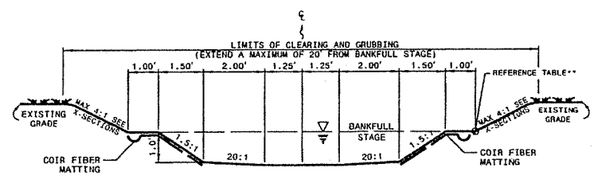


THALWEG (DEEPEST POINT IN CROSS SECTION) IS LOCATED IN THE OUTSIDE OF THE MEANDER BEND.
SCALE: NTS

NOTE:

TYPICALS FOR REACH II TO BE USED FOR STATIONS 20+00.000 - 35+07.107

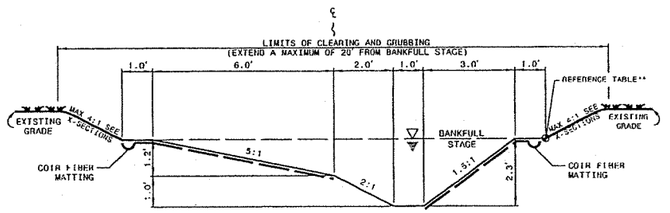
5/2 REACH III TYPICAL SECTION- - RIFFLE -



THALWEG (DEEPEST POINT IN CROSS SECTION) IS LOCATED IN CENTER OF CHANNEL IN A RIFFLE. THE CONTRACTOR IS TO PUSH SMALL DEPRESSION IN CENTER OF CHANNEL AFTER BUILDING RIFFLE.

SCALE: NTS

6/2 REACH III TYPICAL SECTION POOL RIGHT (REVERSE FOR POOL LEFT)



THALWEG (DEEPEST POINT IN CROSS SECTION) IS LOCATED IN THE OUTSIDE OF THE MEANDER BEND.
SCALE: NTS

NOTE:

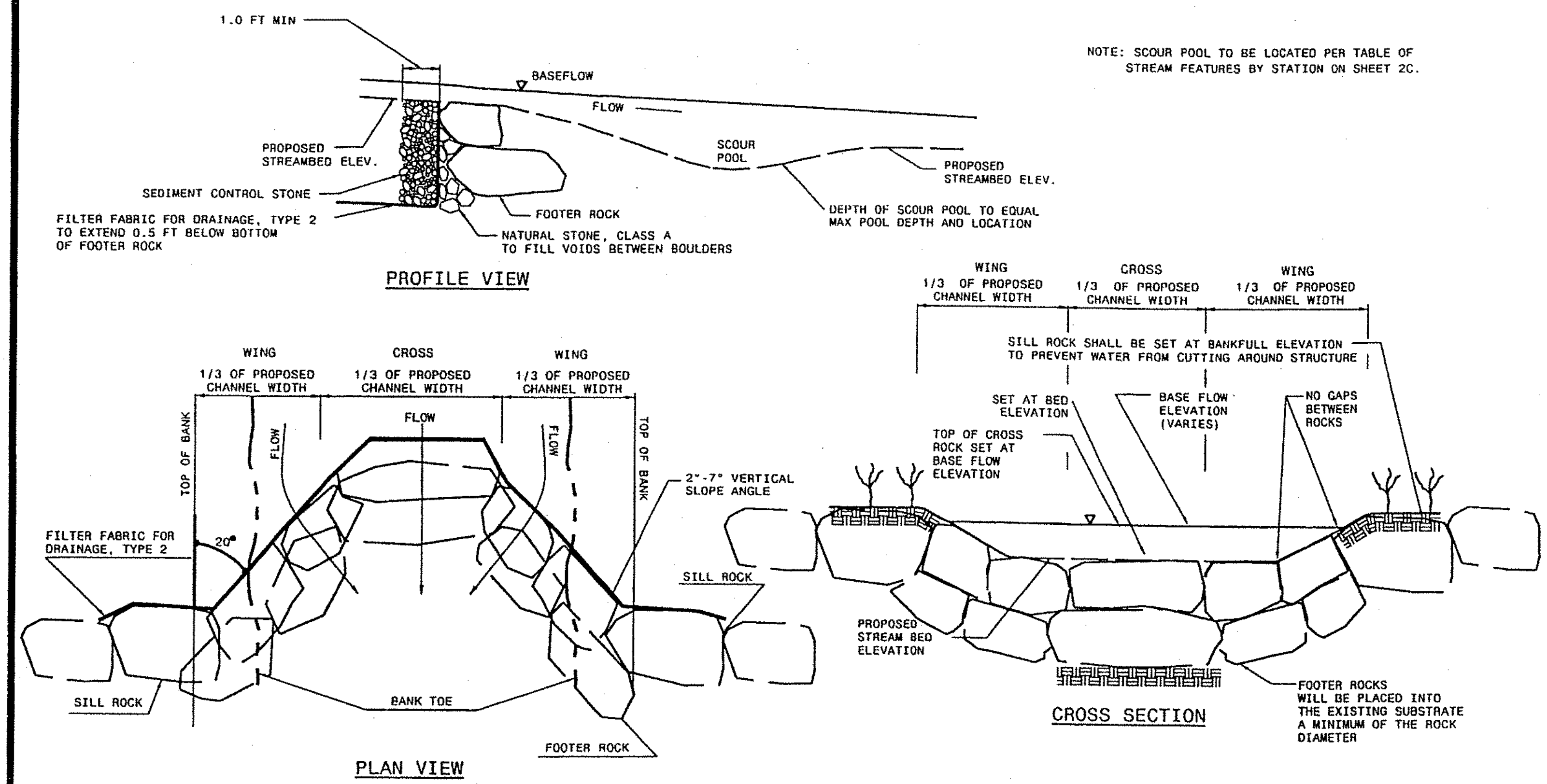
TYPICALS FOR REACH III TO BE USED FOR STATIONS 40+00.000 - 49+64.272

** NOTE: SEE PAGE 2C FOR REFERENCE TABLE.

PROJECT REFERENCE NO.	SHEET NO.
U-2524WM	2A
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

Prepared in the Office of: EARTH TECH
701 Corporate Center Drive, Suite 475
Raleigh, NC 27607
(919) 854-6200 - (919) 854-6259 (FAX)

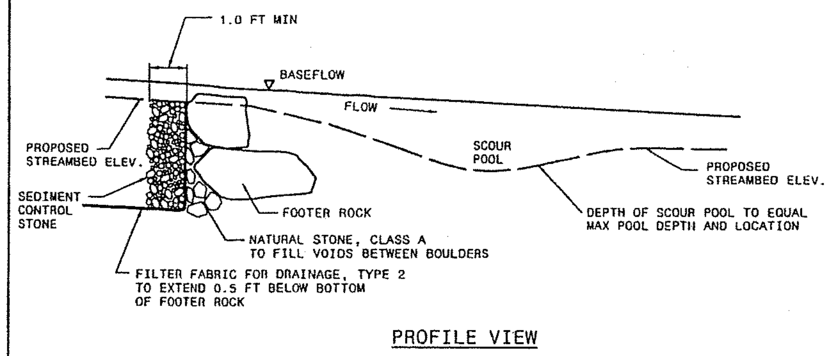
GRAPHIC SCALE 25' 0 25' 50'

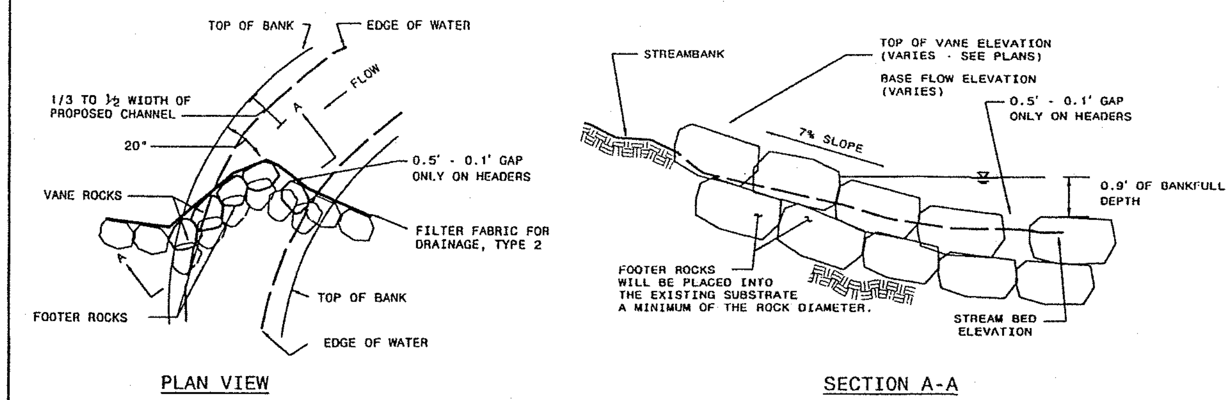


NOTE: SCOUR POOL TO BE LOCATED PER TABLE OF STREAM FEATURES BY STATION ON SHEET 2C.

NOTE: ALL STONES ARE TO BE BOULDERS.

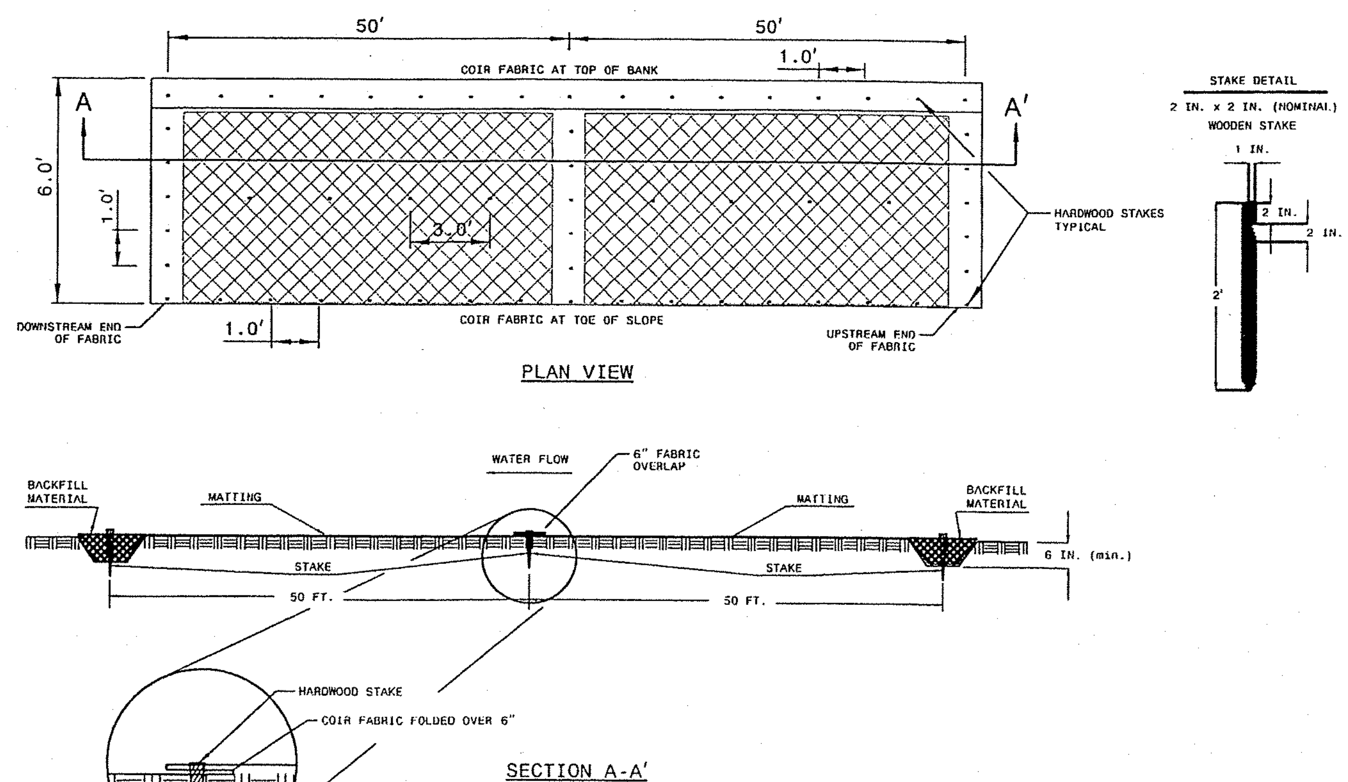
7/2A ROCK CROSS VANE
SCALE: NTS



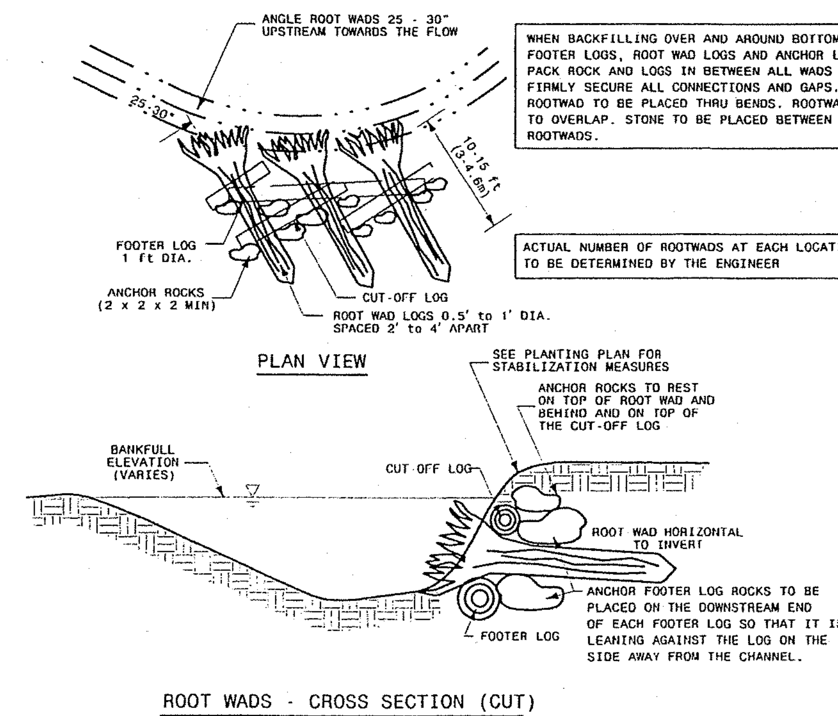


NOTE: ALL STONES ARE TO BE BOULDERS.

8/2A ROCK J-HOOK VANE
SCALE: NTS



9/2A COIR FIBER MATTING DETAIL
SCALE: NTS



WHEN BACKFILLING OVER AND AROUND BOTTOM FOOTER LOGS, ROOT WAD LOGS AND ANCHOR LOGS, PACK ROCK AND LOGS IN BETWEEN ALL WADS TO FIRMLY SECURE ALL CONNECTIONS AND GAPS. ROOTWAD TO BE PLACED THRU BENDS. ROOTWAD TO OVERLAP. STONE TO BE PLACED BETWEEN ROOTWADS.

ACTUAL NUMBER OF ROOTWADS AT EACH LOCATION TO BE DETERMINED BY THE ENGINEER

NOTE: IF ROOTWADS CAN BE DRIVEN IN PLACE, NO FOOTER LOGS, ANCHOR ROCKS, OR CUT-OFF LOGS ARE NECESSARY.

10/2A ROOT WAD
SCALE: NTS

rbarbour
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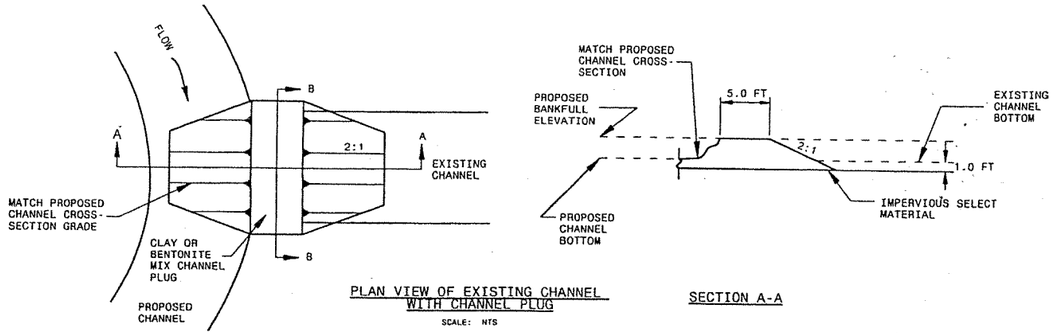
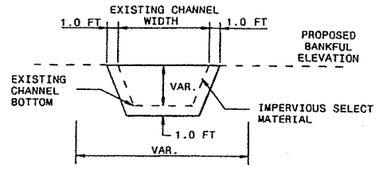


PLAN VIEW OF EXISTING CHANNEL WITH CHANNEL PLUG

SCALE: NTS

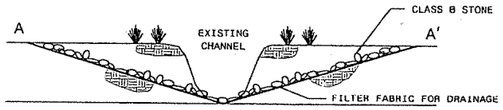
SECTION A-A



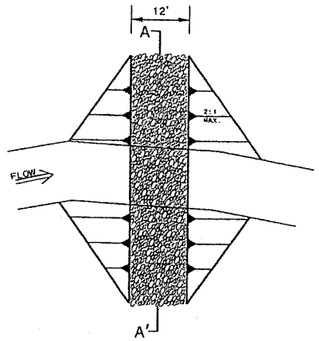
SECTION B-B

11/28 CLAY PLUG

SCALE: NTS



CROSS SECTION



PLAN VIEW

NOTE:

1. A STABILIZED PAD OF CLASS "B" STONE, 6 INCHES THICK, LINED WITH FILTER FABRIC FOR DRAINAGE SHALL BE LOCATED WHERE EQUIPMENT WILL BE ENTERING OR CROSSING THE EXISTING STREAM CHANNEL.
2. DIMENSIONS OF THE CROSSING SHALL BE SUFFICIENT TO ACCOMMODATE THE LARGEST VEHICLE ENTERING OR CROSSING THE EXISTING STREAM CHANNEL.
3. THE CROSSING MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND.
4. THE CONTRACTOR SHALL DETERMINE AN APPROPRIATE RAMP ANGLE FOR THE STREAM CROSSING ACCORDING TO THE EQUIPMENT UTILIZED.

12/28 PERMANENT STREAM CROSSING

SCALE: NTS

PROJECT REFERENCE NO.	SHEET NO.
U-2524WM	2B

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 28413 ENGINEER BENJAMIN T. GREEN 7/23/04

Prepared in the Office of: EARTH TECH
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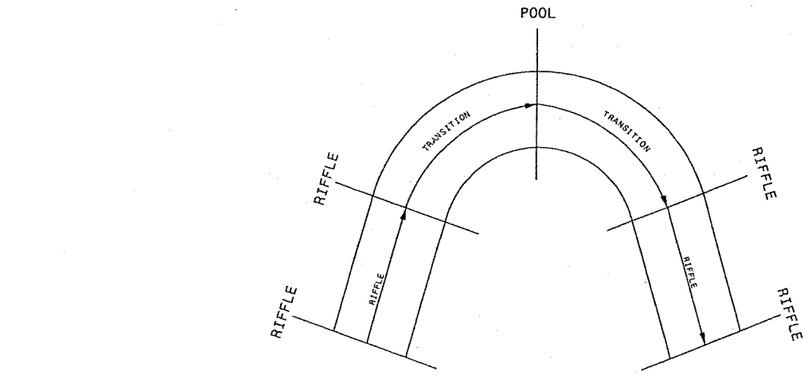
(919) 854-6200 - (919) 854-6259(FAX)

GRAPHIC SCALE 25' 0 25' 50'

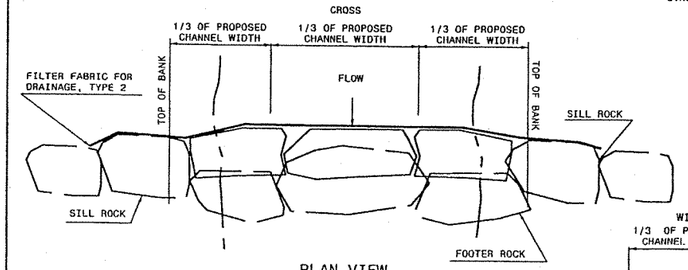


NOTE:

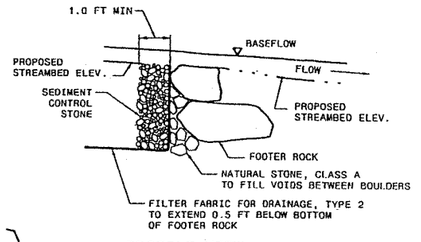
1. AREAS IN BETWEEN LABELED FEATURES ARE TRANSITION AREAS.
2. SEE TYPICALS AND STATIONING FOR MORE DETAIL.
3. THE AREA BETWEEN THE CONCURRENT RIFFLE CROSS-SECTIONS ARE CONSIDERED THE RIFFLE SECTION.
4. SEE REFERENCE TABLE ON SHEET 2C.

13/28 CROSS SECTION TRANSITION LOCATIONS

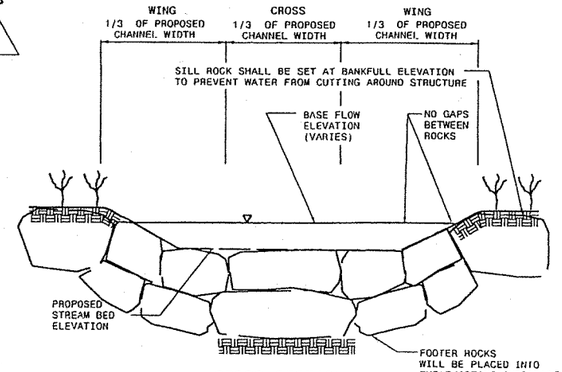
SCALE: NTS



PLAN VIEW



PROFILE VIEW



CROSS SECTION

14/28 STONE SILL

SCALE: NTS

REACH I		REACH II		REACH III	
STATION	CROSS ELEVATION	STATION	CROSS ELEVATION	STATION	CROSS ELEVATION
11+85	455.70	20+09	445.69	40+15	420.33
13+71	449.94	20+33	445.19	40+80	419.80
13+92	448.71	20+62	444.84	42+09	418.60
		21+06	442.28	*42+37	418.23
		22+90	440.88	42+69	417.48
		23+66	439.22	43+58	416.40
		25+13	437.12	*44+14	415.97
		25+83	436.55	44+50	415.77
		26+72	435.28	45+40	415.12
		27+25	434.15	45+36	414.46
		*27+70	433.53	46+73	414.04
		28+19	432.90	47+38	413.47
		28+61	432.27	48+03	412.89
		29+08	431.62	48+35	412.61
		29+50	430.84	48+63	411.92
		30+50	429.11	49+00	411.23
		*31+57	427.34	49+30	410.48
		31+97	426.88	49+46	409.87
		32+37	425.94		
		32+81	425.20		
		33+79	423.20		
		34+78	420.99		

	REACH I	REACH II	REACH III
ARM	8.0	14	11
CROSS	1.5	2.5	2.0
ANGLE	20%	20%	20%
SLOPE	2%-7%	2%-7%	2%-7%
RISE	0.6'	1.0'	0.8'

15/2C ROCK CROSS VANE DESIGN DATA

* Highlighted structures were shown on planview sheet, but not in table.

REACH I		REACH I	
STATION	SILL ELEVATION	STATION	SILL ELEVATION
~~10+26~~	~~460.99~~	14+06	447.85
~~10+47~~	~~460.19~~	14+14	447.43
11+97	458.45	~~14+25~~	~~447.20~~
12+05	458.03	14+34	446.72
12+20	454.72	14+45	446.45
12+28	454.40	14+55	445.92
~~12+40~~	~~454.15~~		
12+49	453.79		
~~12+61~~	~~453.55~~		
12+68	453.27		
~~12+82~~	~~452.96~~		
12+90	452.64		
~~13+00~~	~~452.50~~		
13+10	452.10		
~~13+24~~	~~451.73~~		
13+31	451.36		
~~13+45~~	~~451.04~~		
13+50	450.66		
~~13+63~~	~~450.36~~		
13+83	449.19		

* Structures at Sta. 10+26 & 10+47 were deleted due to bedrock

16/2C STONE SILL DESIGN DATA

* All other structures deleted due to small channel size and drop between structures.

REACH II		REACH III	
STATION	CROSS ELEVATION	STATION	CROSS ELEVATION
20+91	444.20	40+47	420.01
21+44	443.10	41+13	419.43
22+23	442.32	41+42	419.19
22+57	441.39	41+72	418.85
23+38	440.08	42+98	418.77
24+34	438.36	43+29	418.54
24+66	437.82	43+87	418.17
25+16	435.91	44+79	418.84
29+86	430.08	45+05	415.37
30+14	429.56	* 45+70	414.94
31+23	427.97	46+01	414.64
33+34	423.96	47+06	413.74
34+81	421.77	47+73	413.14

	REACH I	REACH II	REACH III
ARM	N/A	14	11
CROSS	N/A	3.0	3.0
ANGLE	N/A	20%	20%
SLOPE	N/A	7%	7%
RISE	N/A	1.0'	0.8'

17/2C ROCK J-HOOK VANE DESIGN DATA

* Highlighted structures were shown on planview sheet, but not in table.

PROJECT REFERENCE NO.	SHEET NO.
U-2524WM	2C

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 028413 ENGINEER BENJAMIN T. OBETZ

Prepared in the Office of:
EARTH TECH
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Raleigh, NC 27607
(919) 854-6200 - (919) 854-6259(FAX)

GRAPHIC SCALE
25' 0 25' 50'

REACH I

REACH I STATION	TYPE	BANKFULL ELEVATION	THALWEG ELEVATION	CENTERLINE ELEVATION
11+85.00	Riffle	457.05	455.85	455.85
11+91.00	Pool	456.98	455.08	456.13
11+96.00	Riffle	456.90	455.50	455.50
12+06.00	Riffle	456.37	454.97	454.97
12+12.00	Pool	456.29	454.39	455.44
12+18.00	Riffle	456.20	454.80	454.80
12+31.00	Riffle	455.58	454.28	454.28
12+38.00	Pool	455.52	453.72	454.77
12+40.00	Riffle	455.55	454.15	454.15
12+51.00	Riffle	455.11	453.71	453.71
12+58.00	Pool	455.05	453.15	454.20
12+60.00	Riffle	454.99	453.59	453.59
12+70.00	Riffle	454.59	453.19	453.19
12+75.00	Pool	454.51	452.81	453.86
12+80.00	Riffle	454.44	453.04	453.04
12+90.00	Riffle	454.04	452.64	452.64
12+98.00	Pool	453.97	452.07	453.12
13+00.00	Riffle	453.90	452.50	452.50
13+12.00	Riffle	453.42	452.02	452.02
13+17.00	Pool	453.36	451.46	452.51
13+21.00	Riffle	453.29	451.89	451.89
13+34.00	Riffle	452.60	451.20	451.20
13+38.00	Pool	452.54	450.84	451.89
13+42.00	Riffle	452.49	451.09	451.09
13+52.00	Riffle	451.96	450.56	450.56
13+57.00	Pool	451.89	449.99	451.04
13+62.00	Riffle	451.81	450.41	450.41
13+72.00	Riffle	451.28	449.88	449.88
13+72.10	STEP	450.78	449.38	449.38

REACH 1 STATION	TYPE	BANKFULL ELEVATION	THALWEG ELEVATION	CENTERLINE ELEVATION
13+77.00	Pool	450.71	448.61	449.66
13+82.00	Riffle	450.64	449.24	449.24
13+94.00	Riffle	450.01	448.61	448.61
13+94.10	STEP	449.51	448.11	448.11
13+98.00	Pool	449.43	447.53	448.58
14+04.00	Riffle	448.98	447.98	447.98
14+16.00	Riffle	448.73	447.33	447.33
14+21.00	Pool	448.66	446.76	447.81
14+25.00	Riffle	448.60	447.20	447.20
14+37.00	Riffle	447.96	446.56	446.56
14+41.00	Pool	447.90	446.00	447.05
14+45.00	Riffle	447.85	446.45	446.45
14+55.00	Riffle	447.32	445.92	445.92
14+61.00	Pool	447.24	445.34	446.39
14+66.00	Riffle	447.16	445.76	445.76

REACH II

REACH II STATION	TYPE	BANKFULL ELEVATION	THALWEG ELEVATION	CENTERLINE ELEVATION
20+00.00	Riffle	447.16	445.30	445.56
20+12.00	Riffle	446.80	445.80	445.80
20+17.00	Pool	446.76	445.06	445.61
20+22.00	Riffle	446.72	445.82	445.82
20+37.00	Riffle	446.27	445.07	445.07
20+41.00	Pool	446.24	444.54	445.29
20+44.00	Riffle	446.21	445.01	445.01
20+61.00	Riffle	445.70	444.50	444.50
20+67.00	Pool	445.66	443.96	444.71
20+72.00	Riffle	445.62	444.42	444.42
20+86.00	Riffle	445.20	444.00	444.00
21+03.00	Pool	445.06	443.36	444.11
21+19.00	Riffle	444.93	443.96	443.96
21+40.00	Riffle	444.30	443.10	443.10
21+58.00	Pool	444.16	442.46	443.21
21+78.00	Riffle	444.01	443.06	443.06
21+94.00	Riffle	443.47	442.27	442.27
22+19.00	Pool	443.27	441.57	442.32
22+44.00	Riffle	443.07	442.12	442.12
22+60.00	Riffle	442.59	441.39	441.39
22+87.00	Pool	442.54	440.84	441.59
22+73.00	Riffle	442.49	441.54	441.54
22+86.00	Riffle	442.04	440.84	440.84
23+00.00	Pool	441.94	440.24	440.99
23+12.00	Riffle	441.85	440.90	440.90
23+31.00	Riffle	441.28	440.08	440.08
23+51.00	Pool	441.12	439.42	440.17
23+70.00	Riffle	440.97	440.02	440.02
23+88.00	Riffle	440.43	439.23	439.23
23+99.00	Pool	440.34	438.64	439.39

REACH II STATION	TYPE	BANKFULL ELEVATION	THALWEG ELEVATION	CENTERLINE ELEVATION
24+10.00	Riffle	440.28	439.30	439.30
24+33.00	Riffle	439.56	438.36	438.36
24+39.00	Pool	439.52	437.82	438.87
24+44.00	Riffle	439.47	438.82	438.82
24+59.00	Riffle	439.02	437.82	437.82
24+77.00	Pool	438.88	437.18	437.93
24+95.00	Riffle	438.73	437.53	437.53
25+09.00	Riffle	438.31	437.11	437.11
25+32.00	Pool	438.13	436.43	437.18
25+54.00	Riffle	437.96	436.76	436.76
25+61.00	Riffle	437.74	436.54	436.54
25+90.00	Pool	437.59	435.89	436.64
25+99.00	Riffle	437.44	436.24	436.24
26+10.00	Riffle	437.11	436.91	436.91
26+34.00	Pool	436.92	435.22	436.97
26+57.00	Riffle	436.73	435.53	435.53
26+66.00	Riffle	436.46	435.26	435.26
26+66.10	STEP	435.96	434.76	434.76
26+89.00	Pool	435.78	434.08	434.83
27+12.00	Riffle	435.60	434.40	434.40
27+21.00	Riffle	435.33	434.13	434.13
27+36.00	Pool	435.19	433.49	434.24
27+54.00	Riffle	435.06	433.86	433.86
27+62.00	Riffle	434.82	433.62	433.62
27+80.00	Pool	434.68	432.98	433.73
27+97.00	Riffle	434.54	433.34	433.34
28+13.00	Riffle	434.06	432.86	432.86
28+29.00	Pool	433.94	432.24	432.99
28+44.00	Riffle	433.81	432.61	432.61
28+56.00	Riffle	433.46	432.25	432.25

REACH II STATION	TYPE	BANKFULL ELEVATION	THALWEG ELEVATION	CENTERLINE ELEVATION
28+75.00	Pool	433.30	431.60	432.35
28+94.00	Riffle	433.15	431.95	431.95
29+06.00	Riffle	432.73	431.53	431.53
29+20.00	Pool	432.63	430.93	431.68
29+32.00	Riffle	432.54	431.34	431.34
29+49.00	Riffle	432.03	430.83	430.83
29+59.00	Pool	431.95	430.25	431.00
29+68.00	Riffle	431.88	430.68	430.68
29+88.00	Riffle	431.25	430.08	430.08
29+94.00	Pool	431.23	429.53	430.28
30+00.00	Riffle	431.18	429.98	429.98
30+14.00	Riffle	430.76	429.56	429.56
30+24.00	Pool	430.66	428.96	429.73
30+34.00	Riffle	430.60	429.40	429.40
30+51.00	Riffle	430.50	429.10	429.10
30+61.00	Pool	430.28	428.58	429.31
30+71.00	Riffle	430.22	429.02	429.02
30+87.00	Riffle	429.74	428.54	428.54
30+97.00	Pool	429.66	427.96	428.71
31+06.00	Riffle	429.56	428.36	428.36
31+20.00	Riffle	429.17	427.97	427.97
31+31.00	Pool	429.08	427.38	428.13
31+42.00	Riffle	428.99	427.79	427.79
31+57.00	Riffle	428.54	427.34	427.34
31+66.00	Pool	428.47	426.77	427.52
31+74.00	Riffle	428.41	427.21	427.21
31+92.00	Riffle	427.87	426.67	426.67
32+03.00	Pool	427.78	426.08	426.83
32+14.00	Riffle	427.69	426.49	426.49
32+33.00	Riffle	427.12	425.92	425.92

REACH III

REACH III STATION	TYPE	BANKFULL ELEVATION	THALWEG ELEVATION	CENTERLINE ELEVATION
40+00.00	Riffle	421.91	420.71	420.71
40+18.00	Riffle	421.81	420.31	420.31
40+28.00	Pool	421.57	419.37	420.57
40+38.00	Riffle	421.52	420.22	420.22
40+48.00	Riffle	421.31	420.01	420.01
40+56.00	Pool	421.27	419.07	420.27
40+65.00	Riffle	421.23	419.93	419.93
40+75.00	Riffle	421.04	419.74	419.74
40+91.00	Pool	420.97	418.77	419.97
41+06.00	Riffle	420.90	419.60	419.60
41+16.00	Riffle	420.73	419.43	419.43
41+22.50	Pool	420.59	418.49	419.69
41+30.00	Riffle	420.66	419.36	419.36
41+39.00	Riffle	420.49	419.19	419.19
41+48.00	Pool	420.44	418.24	419.44
41+59.00	Riffle	420.39	419.09	419.09
41+72.00	Riffle	420.15	418.85	418.85
41+82.50	Pool	420.10	417.90	419.10
41+93.00	Riffle	420.05	418.75	418.75
42+05.00	Riffle	419.82	418.52	418.52
42+18.00	Pool	419.77	417.57	418.77
42+27.00	Riffle	419.72	418.42	418.42
42+37.00	Riffle	419.53	418.23	418.23
42+47.10	STEP	419.03	417.73	417.73
42+47.00	Pool	418.99	416.79	417.99
42+57.00	Riffle	418.94	417.64	417.64
42+68.00	Riffle	418.73	417.43	417.43
42+68.10	STEP	418.23	416.93	416.93
42+75.50	Pool	418.20	416.00	417.20
42+83.00	Riffle	418.17	416.87	416.87

REACH III STATION	TYPE	BANKFULL ELEVATION	THALWEG ELEVATION	CENTERLINE ELEVATION
42+93.00	Riffle	418.07	416.77	416.77
43+06.50	Pool	418.00	415.80	417.00
43+20.00	Riffle	417.94	416.64	416.64
43+30.00	Riffle	417.84	416.54	416.54
43+37.00	Pool	417.81	415.61	416.81
43+44.00	Riffle	417.78	416.48	416.48
43+54.00	Riffle	417.68	416.38	416.38
43+68.00	Pool	417.62	415.42	416.62
43+78.00	Riffle	417.57	416.27	416.27
43+88.00	Riffle	417.47	416.17	416.17
43+96.50	Pool	417.43	416.23	416.43
44+05.00	Riffle	417.39	416.09	416.09
44+17.00	Riffle	417.27	415.97	415.97
44+26.50	Pool	417.23	415.03	416.23
44+36.00	Riffle	417.18	415.88	415.88
44+49.00	Riffle	417.06	415.76	415.76
44+58.50	Pool	417.01	414.81	416.01
44+68.00	Riffle	416.97	415.67	415.67
44+81.00	Riffle	416.84	415.54	415.54
44+86.50	Pool	416.81	414.61	415.81
44+92.00	Riffle	416.79	415.49	415.49
45+04.00	Riffle	416.67	415.37	415.37
45+16.00	Pool	416.61	414.41	415.61
45+28.00	Riffle	416.56	415.26	415.26
45+41.00	Riffle	416.43	415.13	415.13
45+48.50	Pool	416.39	414.19	415.39
45+56.00	Riffle	416.36	415.06	415.06
45+68.00	Riffle	416.24	414.94	414.94
45+79.00	Riffle	416.19	413.99	415.19
45+90.00	Riffle	416.14	414.84	414.84

REACH II STATION	TYPE	BANKFULL ELEVATION	THALWEG ELEVATION	CENTERLINE ELEVATION
32+50.00	Pool	428.99	425.29	426.04
32+66.00	Riffle	428.86	425.66	425.66
32+86.00	Riffle	428.20	425.00	425.00
32+88.10	STEP	428.70	424.50	424.50
32+99.00	Pool	428.61	423.91	424.66
33+10.00	Riffle	428.52	424.32	424.32
33+34.00	Riffle	428.16	423.96	423.96
33+48.00	Pool	428.12	423.42	424.17
33+67.00	Riffle	428.07	423.87	423.87
33+82.00	Riffle	424.92	423.12	423.12
33+92.00	Pool	424.25	422.55	423.30
34+01.00	Riffle	424.17	422.97	422.97
34+41.00	Riffle	422.97	421.77	421.77
34+48.00	Pool	422.93	421.23	421.98
34+50.00	Riffle	422.90	421.70	421.70
34+74.00	Riffle	422.18	420.98	420.98
34+91.00	Pool	422.05	420.35	421.10
35+07.00	Riffle	421.91	420.71	420.71

REACH III STATION	TYPE	BANKFULL ELEVATION	THALWEG ELEVATION	CENTERLINE ELEVATION
45+03.00	Riffle	415.94	414.64	414.64
45+11.50	Pool	415.91	413.71	414.91
45+20.00	Riffle	415.87	414.57	414.57
45+31.00	Riffle	415.70	414.40	414.40
45+44.50	Pool	415.64	413.44	414.64
45+58.00	Riffle	415.58	414.28	414.28
45+73.00	Riffle	415.38	414.08	414.08
45+82.50	Pool	415.31	413.11	414.31
45+92.00	Riffle	415.27	413.97	413.97
47+07.00	Riffle	415.04	413.74	413.74
47+17.00	Pool	415.00	412.80	414.00
47+27.00	Riffle	414.95	413.65	413.65
47+41.00	Riffle	414.74	413.44	413.44
47+49.50	Pool	414.70	412.50	413.70
47+58.00	Riffle	414.66	413.36	413.36
47+73.00	Riffle	414.44	413.14	413.14
47+83.50	Pool	414.39	412.19	413.39
47+94.00	Riffle	414.34	413.04	413.04
48+06.00	Riffle	414.16	412.86	412.86
48+18.50	Pool	414.12	411.92	413.12
48+28.00	Riffle	414.06	412.76	412.76
48+37.00	Riffle	413.90	412.60	412.60
48+37.10	STEP	413.40	412.10	412.10
48+46.00	Pool	413.36	411.16	412.36
48+55.00	Riffle	413.31	412.01	412.01
48+66.00	Riffle	413.20	411.90	411.90
48+66.10	STEP	412.70	411.40	411.40
48+77.00	Pool	412.66	410.46	411.66
48+87.00	Riffle	412.61	411.31	411.31
48+98.00	Riffle	412.50	411.20	411.20

REACH III STATION	TYPE	BANKFULL ELEVATION	THALWEG ELEVATION	CENTERLINE ELEVATION
48+98.10	STEP	412.00	410.70	410.70
49+09.00	Pool	411.95	409.75	410.95
49+20.00	Riffle	411.90	410.60	410.60
49+34.00	Riffle	411.76	410.46	410.46
49+34.10	STEP	411.26	409.96	409.96
49+40.00	Pool	411.23	409.03	410.23
49+48.00	Riffle	411.20	409.90	409.90
49+58.00	Riffle	411.08	409.78	409.78
49+64.00	Riffle	411.02	409.72	409.72

18/2C STREAM FEATURES BY STATION

$$USER$$
$$DGN$$
$$DATE$$ $$TIME$$

PROJECT REFERENCE NO.	SHEET NO.
U-2524WM	2D

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 028413 ENGINEER BENJAMIN T. GOETZ 7/29/04

Prepared in the Office of:
EARTH TECH
701 Corporate Center Drive, Suite 475
Raleigh, NC 27607
(919) 854-6200 - (919) 854-6259 (FAX)

GRAPHIC SCALE
25' 0 25' 50'

Variables	Tributary REACH I	Tributary REACH II	Tributary REACH III	Tick Creek	Reference Reach Tributary to South Fork of Cane Creek	Reference Reach Spencer's Creek	Proposed Tributary REACH I	Proposed Tributary REACH II	Proposed Tributary REACH III
Stream Type (Rosgen)	E4b	E4-C4	E4	C4/E4	C4	E4	E4b	C4	E4
Drainage Area (sq. mi.)	0.15	0.15	0.15	20	0.41	0.5	0.15	0.15	0.15
Bankfull Width (Wbkf, ft)	7.3	7-8.6	5.6-7.9	36-41	13.0-13.1	8.7-12.3	6.9	12.0	9.5
MEAN	7.3	7.8	6.8	39	13.1	10.5			
Bankfull Mean Depth (dbkf, ft)	0.9	0.9-1.3	1.2-1.7	3.0-3.6	0.9	0.9-1.2	0.87	0.75	0.95
MEAN	0.9	1.2	1.50	3.20	0.9	1			
Width/depth Ratio (Wbkf/dbkf)	8.5	5.5-7.0	3.3	10.3-13.7	14.0-14.5	7.2-14.0	8	16	10
MEAN	8.5	6.3		12.7	14.3	13.3			
Bankfull Cross-sectional Area (Abkf sq. ft.)	6.3	7.9-9.7	9.3-9.5	120-129	11.6-12.2	10.6-10.8	6	9	9
MEAN	6.3	9	9.4	126	11.9	10.7			
Bankfull Maximum Depth (dmax ft)	1.5	1.5-1.9	1.9-2.1	3.4-5.3	1.4	1.8-1.9	1.4	1.2	1.5
MEAN	1.5	1.6	2	4.2	1.4	1.9			
Ratio Bankfull Maximum Depth to Mean Bankfull Depth (dmax/dbkf)	1.7	1.3	1.3	1.3	1.6	1.6-2.0	1.6	1.6	1.6
Lowest Bank Height to Bankfull Maximum Depth Ratio	2.0	2.6	2.7	1.5	1.0	1.0	1.0	1.0	1.0
Width of Flood Prone Area (Wfpa ft)	33	11-50	50	90-150	26-36	229	> 19	> 19	> 19
MEAN	33	31	50	116	31	229			
Entrenchment Ratio (Wfpa/Wbkf)	4.5	4.1	7.4	2.9	2.4	22.4	>2.8	> 1.6	>2.0
Meander Length (Lm ft)	0	25-31	-	251-418	32-58	54-196	17-39	29-68	23-54
MEAN	0	28	-	322	43	125	28	48.5	38.5
Ratio of Meander Length to Bankfull Width	0	3.2-4.0	-	7.0-10	2.4-4.4	15.9-30	2.4-5.7	2.4-5.7	2.4-5.7
MEAN	0	3.6	-	8.3	3.3	11.9	4.1	4.1	4.1
Radius of Curvature (Rc ft)	0	7-10	8-9	45-400	16-25	5.4-22.1	14-21	24-35	19-28
MEAN	0	8	9	144	22	12.9	17	29	24
Ratio of Radius of Curvature to Bankfull Width	0	0.9-1.3	1.2-1.3	1.3-9.8	1.2-1.9	1.8-3.0	2.0-3.0	2.0-3.0	2.0-3.0
MEAN	0	1.0	1.3	3.7	1.7	1.2	2.5	2.5	2.5
Belt Width (Wblt ft)	0	10-22	26	66-128	14-30	24-52	8.0-17.0	13-29	10.0-23.0
MEAN	0	16	26	91	19	38	12	22	17
Meander Width Ratio (Wblt/Wbkf)	0	1.3-2.8	3.8	1.8-3.1	1.1-2.3	4.2-13.3	1.1-2.4	1.1-2.4	1.1-2.4
MEAN	0	2.1	3.8	2.3	1.5	3.6	1.8	1.8	1.8
Sinuosity (Stream Length/Valley Length, k - ft/ft)	1.0	1.0	1.0	1.3	1.2	1.1	1.1	1.3	1.4
Valley Slope (Svalley) ft/ft	0.024	0.024	0.024	0.0016	0.0017	0.0139	0.038	0.020	0.014
Average Water Surface Slope (Savg)	0.039	0.022	0.0056	0.0012	0.0078	0.0130	0.034	0.015	0.010
Pool Slope (Spool)	0.000-0.014	0.000-0.0069	0.000-0.0031	0.000-.000952	0.000-0.0026	0.000-0.020	0.014	0.0073	0.0046
MEAN	0.0039	0.0028	0.0011	0.0004	0.001	0.0015	0.014	0.0073	0.0046
Ratio of Pool Slope to Average Slope (Spool/Savg)	0.1	0.18	0.2	0.36	0-0.33	0.00-1.52	0.41	0.49	0.46
Riffle Slope (Sriff ft/ft)	0.022-0.20	0.0072-0.078	0.0006-0.053	0.000-0.035	0.0043-0.041	.01-.067	.040-.053	.02-.029	.010-.019
MEAN	0.0287	0.0385	0.015	0.0092	0.021	0.03	0.05	0.028	0.013
Ratio of Riffle Slope to Average Slope (Sriff/Savg)	0.56-5.3	0.0024-0.051	0.11-9.5	0.000-29	0.55-5.3	0.76-5.1	1.2-1.6	1.3-1.9	1.0-1.9
MEAN	2.2	2.5	2.7	7.6	2.7	2.3	1.5	1.9	1.3
Maximum Pool Depth (dpool ft)	1.5	2.3	2.3	5.5	1.9	2.5	1.9	1.7	2.1
Ratio of pool depth to mean bankfull depth (dpool/dbkf)	1.7	1.9	1.5	1.7	2.1	2.4	2.2	2.2	2.2
Pool Width (Wpool ft)	—	8.6	7.9	35.7	12.5	8.4	9.0	16.0	12.0
Ratio of Pool Width to Bankfull Width (Wpool/Wbkf)	—	1.1	1.2	0.9	1.0	0.8	1.3	1.3	1.3
Pool to Pool Spacing (P-P ft)	8.5-68	11-72	18-50	111-390	37-81	13-47	13-22	36-61	19-38
MEAN	25	39	35	215	58	24	19	45	30
Ratio of P-P to Bankfull Width (P-P/Wbkf)	1.1-9.1	1.5-9.6	2.4-6.7	2.8-10	2.8-6.2	1.5-3.8	1.9-3.2	3.0-5.0	2.0-4.0
MEAN	3.4	5.1	4.6	5.5	4.4	2.3	2.8	3.8	3.2

STREAM DESIGN DATA

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 028413 ENGINEER

Prepared in the Office of: EARTH TECH
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GRAPHIC SCALE 25' 0 25' 50'

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

ALIGNMENT DATA SHEET

REACH I

LINE	BEARING	LENGTH (FT)	CURVE
L-11	S 2°48' 25.1" W	3.65	C-11
L-12	S 62°19' 58.4" E	9.82	C-12
L-13	S 2°59' 45.3" E	12.61	C-13
L-14	S 55°35' 37.5" E	10.93	C-14
L-15	S 7°23' 32.9" W	10.08	C-15
L-16	S 52°35' 55.3" E	11.12	C-16
L-17	S 2°17' 03.2" W	12.94	C-17
L-18	S 49°57' 46.4" E	12.58	C-18
L-19	S 12°47' 14.4" W	9.50	C-19
L-20	S 43°33' 39.8" E	9.87	C-20
L-21	S 7°19' 43.9" W	12.00	C-21
L-22	S 50°56' 41.1" E	12.40	C-22
L-23	S 3°54' 15.2" E	11.25	C-23
L-24	S 62°03' 47.5" E	10.58	C-24

REACH II

LINE	BEARING	LENGTH (FT)	CURVE
L-25	S 4°25' 18.2" E	11.52	C-25
L-26	S 55°45' 22.1" E	14.72	C-26
L-27	S 28°00' 25.9" E	16.75	C-27
L-28	S 71°46' 29.4" E	12.73	C-28
L-29	S 32°27' 29.0" W	20.90	C-29
L-30	N 64°30' 26.0" E	18.65	C-30
L-31	S 21°16' 17.7" W	15.28	C-31
L-32	S 28°31' 01.1" E	15.63	C-32
L-33	S 50°20' 34.3" W	19.35	C-33
L-34	S 88°56' 35.6" E	18.07	C-34
L-35	S 22°48' 27.0" E	23.03	C-35
L-36	S 18°09' 09.4" W	14.28	C-36
L-37	N 84°24' 15.3" E	13.72	C-37
L-38	S 39°59' 01.3" W	7.81	C-38
L-39	N 65°26' 33.9" E	10.75	C-39
L-40	S 42°39' 05.2" W	9.73	C-40
L-41	N 70°10' 20.6" E	9.33	C-41
L-42	S 36°15' 35.7" W	8.14	C-42
L-43	S 80°22' 09.4" E	16.09	C-43
L-44	S 32°13' 18.0" W	11.99	C-44
L-45	S 82°08' 02.0" E	13.80	C-45
L-46	S 32°10' 07.6" W	16.82	C-46
L-47	S 49°32' 04.1" E	19.67	C-47
L-48	S 9°24' 10.7" E	13.75	C-48
L-49	S 86°26' 24.3" E	16.47	C-49
L-50	S 36°58' 03.5" E	16.72	C-50
L-51	N 82°34' 32.4" E	13.79	C-51
L-52	S 21°08' 02.3" E	13.91	C-52
L-53	S 83°27' 46.5" E	17.99	C-53
L-54	S 14°43' 52.1" W	19.60	C-54
L-55	S 65°38' 08.3" E	21.45	C-55
L-56	S 16°51' 27.9" W	23.14	C-56
L-57	S 59°59' 37.0" E	24.76	C-57
L-58	S 3°31' 00.8" E	30.36	C-58
L-59	S 62°39' 48.6" E	23.91	C-59

REACH III

LINE	BEARING	LENGTH (FT)	CURVE
L-60	S 21°01' 07.4" W	16.10	C-60
L-61	N 88°03' 47.4" E	10.09	C-61
L-62	S 1°51' 16.4" E	10.09	C-62
L-63	N 57°55' 59.0" E	8.67	C-63
L-64	S 26°13' 46.5" E	8.94	C-64
L-65	N 57°18' 04.8" E	12.49	C-65
L-66	S 40°08' 30.3" E	11.62	C-66
L-67	N 52°39' 36.5" E	9.64	C-67
L-68	S 36°25' 07.4" E	11.18	C-68
L-69	N 72°47' 55.2" E	9.48	C-69
L-70	S 10°42' 07.5" E	10.03	C-70
L-71	S 86°06' 24.9" E	9.73	C-71
L-72	S 49°33' 23.9" W	10.11	C-72
L-73	S 28°01' 00.5" E	11.66	C-73
L-74	S 56°44' 42.3" W	12.60	C-74
L-75	S 28°15' 29.5" E	12.71	C-75
L-76	S 14°04' 26.0" W	12.08	C-76
L-77	N 87°22' 00.0" E	12.68	C-77
L-78	S 24°25' 27.0" E	12.11	C-78
L-79	N 66°43' 04.1" E	13.14	C-79
L-80	S 48°25' 40.6" E	10.88	C-80
L-81	N 32°51' 48.4" E	14.72	C-81
L-82	S 86°07' 51.5" E	14.77	C-82
L-83	N 21°59' 33.2" E	13.88	C-83
L-84	S 84°19' 50.8" E	14.33	C-84
L-85	N 18°22' 41.0" E	12.17	C-85
L-86	S 78°37' 18.3" E	12.08	C-86
L-87	N 14°20' 16.7" E	10.50	C-87
L-88	S 80°22' 44.2" E	11.72	C-88
L-89	N 22°18' 06.9" E	14.26	C-89
L-90	N 63°04' 44.9" E	18.67	

REACH I

	SREV C-11	SREV C-12	SREV C-13	SREV C-14	SREV C-15	SREV C-16	SREV C-17	SREV C-18	SREV C-19	SREV C-20	SREV C-21	SREV C-22
PI Sta	11+92.80	12+12.70	12+35.84	12+55.91	12+75.08	12+95.36	13+17.13	13+38.58	13+57.32	13+77.38	13+99.62	14+21.18
PCSta.	11+88.65	12+05.86	12+30.90	12+51.01	12+69.88	12+90.43	13+12.47	13+33.70	13+51.96	13+71.67	13+94.33	14+16.39
PTSta.	11+96.04	12+18.29	12+40.08	12+59.81	12+79.30	12+99.53	13+21.13	13+42.47	13+61.80	13+82.33	14+03.99	14+25.42
Δ =	65°08' 24.7" (LT)	59°20' 13.1" (RT)	52°35' 52.3" (LT)	62°59' 16.6" (RT)	59°59' 28.2" (LT)	54°52' 56.2" (RT)	52°14' 49.5" (LT)	62°45' 05.4" (RT)	56°20' 58.0" (LT)	50°53' 23.7" (RT)	58°16' 23.0" (LT)	47°02' 25.9" (RT)
D =	881°28' 24.2"	477°27' 53.4"	572°57' 28.1"	716°11' 50.1"	636°37' 11.6"	603°06' 48.5"	603°06' 47.7"	716°11' 50.2"	572°57' 28.4"	477°27' 53.6"	603°06' 48.9"	520°52' 15.0"
L =	7.39'	12.43'	9.18'	8.79'	9.42'	9.10'	8.66'	8.76'	9.83'	10.66'	9.66'	9.03'
T =	4.15'	6.84'	4.94'	4.90'	5.20'	4.93'	4.66'	4.88'	5.36'	5.71'	5.30'	4.79'
R =	6.50'	12.00'	10.00'	8.00'	9.00'	9.50'	9.50'	8.00'	10.00'	12.00'	9.50'	11.00'

	SREV C-23	SREV C-24
PI Sta	14+41.13	14+61.43
PCSta.	14+36.88	14+55.38
PTSta.	14+44.80	14+66.45
Δ =	58°09' 30.8" (LT)	57°38' 29.5" (RT)
D =	716°11' 49.2"	520°52' 14.4"
L =	8.12'	11.07'
T =	4.45'	6.05'
R =	8.00'	11.00'

REACH II

	SREV C-25	SREV C-26	SREV C-27	SREV C-28	SREV C-29	SREV C-30	SREV C-31	SREV C-32	SREV C-33	SREV C-34	SREV C-35	SREV C-36
PI Sta	20+17.28	20+40.70	20+67.44	21+09.10	21+88.36	22+47.41	22+66.78	23+02.46	23+74.35	24+00.56	24+39.32	24+86.82
PCSta.	20+11.52	20+36.99	20+61.01	20+85.96	21+39.61	21+94.41	22+59.82	22+88.49	23+31.23	23+88.19	24+33.16	24+59.24
PTSta.	20+22.27	20+44.26	20+73.23	21+18.71	21+75.76	22+44.54	22+72.86	23+11.88	23+70.13	24+10.12	24+44.96	24+94.97
Δ =	51°20' 06.2" (LT)	27°44' 56.2" (RT)	43°46' 02.5" (LT)	104°13' 58.4" (RT)	147°57' 03.0" (LT)	136°45' 50.4" (RT)	49°47' 21.6" (LT)	78°51' 35.4" (RT)	139°17' 12.8" (LT)	66°08' 08.8" (RT)	40°59' 26.9" (RT)	113°44' 54.0" (LT)
D =	477°27' 53.3"	381°58' 18.7"	358°05' 54.8"	318°18' 35.6"	409°15' 20.0"	272°50' 13.4"	381°58' 18.8"	337°02' 02.4"	358°05' 55.0"	301°33' 24.2"	347°14' 49.7"	318°18' 35.6"
L =	10.75'	7.26'	12.22'	32.75'	36.15'	50.13'	13.03'	23.40'	38.90'	21.93'	11.80'	35.74'
T =	5.77'	3.71'	6.43'	23.14'	48.74'	52.99'	6.96'	13.98'	43.12'	12.37'	6.17'	27.58'
R =	12.00'	15.00'	16.00'	18.00'	14.00'	21.00'	15.00'	17.00'	16.00'	19.00'	16.50'	18.00'

	SREV C-37	SREV C-38	SREV C-39	SREV C-40	SREV C-41	SREV C-42	SREV C-43	SREV C-44	SREV C-45	SREV C-46	SREV C-47	SREV C-48
PI Sta	25+55.05	26+23.39	26+94.44	27+35.39	27+63.13	27+89.61	28+36.75	28+85.58	29+26.41	29+60.65	29+94.58	30+26.16
PCSta.	25+08.69	25+61.41	26+09.92	26+66.31	27+20.84	27+62.07	28+12.77	28+56.20	29+07.88	29+48.61	29+88.17	30+14.22
PTSta.	25+53.80	25+99.18	26+56.58	27+11.52	27+53.93	27+96.68	28+44.21	28+94.07	29+31.79	29+68.50	30+00.47	30+34.39
Δ =	135°25' 55.0" (RT)	154°32' 31.0" (LT)	157°15' 15.0" (RT)	152°20' 49.6" (LT)	145°49' 29.3" (RT)	116°37' 44.0" (LT)	112°35' 30.4" (RT)	114°12' 34.3" (LT)	114°09' 07.1" (RT)	81°24' 54.6" (LT)	40°16' 43.1" (RT)	77°03' 28.6" (LT)
D =	301°33' 24.2"	409°15' 20.0"	337°02' 02.4"	337°02' 02.4"	440°44' 12.4"	337°02' 02.4"	358°05' 55.0"	301°33' 24.2"	477°27' 53.5"	409°15' 20.0"	327°24' 16.0"	381°58' 18.7"
L =	44.91'	37.76'	46.66'	45.20'	33.09'	34.60'	31.44'	37.87'	23.91'	19.89'	12.30'	20.17'
T =	46.36'	61.98'	84.52'	69.07'	42.29'	27.54'	23.99'	29.37'	18.53'	12.05'	6.42'	11.94'
R =	19.00'	14.00'	17.00'	17.00'	13.00'	17.00'	16.00'	19.00'	12.00'	14.00'	17.50'	15.00'

	SREV C-49	SREV C-50	SREV C-51	SREV C-52	SREV C-53	SREV C-54	SREV C-55	SREV C-56	SREV C-57	SREV C-58	SREV C-59
PI Sta	30+61.43	30+97.91	31+33.53	31+66.13	32+07.02	32+53.23	33+01.55	33+47.58	33+92.14	34+41.23	34+94.11
PCSta.	30+50.86	30+87.40	31+20.21	31+56.71	31+91.52	32+33.81	32+87.52	33+33.70	33+81.93	34+31.02	34+73.51
PTSta.	30+70.68	31+06.42	31+42.80	31+73.53	32+14.21	32+66.07	33+10.56	33+57.17	34+00.66	34+49.60	35+07.11
Δ =	49°22' 47.5" (RT)	60°33' 10.3" (LT)	76°08' 37.2" (RT)	64°14' 38.9" (LT)	100°00' 59.7" (RT)	80°22' 00.9" (LT)	82°29' 34.3" (RT)	76°51' 02.1" (LT)	56°28' 36.2" (RT)	59°08' 50.4" (LT)	83°40' 56.0" (RT)
D =	249°06' 43.5"	318°18' 35.7"	337°02' 02.3"	381°58' 18.8"	440°44' 12.5"	249°06' 43.5"	358°05' 55.0"	327°24' 16.0"	301°33' 24.3"	318°18' 35.6"	249°06' 43.5"
L =	19.82'	19.02'	22.59'	16.82'	22.69'	32.26'	23.04'	23.47'	18.73'	18.58'	33.59'
T =	10.57'	10.51'	13.32'	9.42'	15.50'	19.43'	14.03'	13.88'	10.20'	10.21'	20.59'
R =	23.00'	18.00'	17.00'	15.00'	13.00'	23.00'	16.00'	17.50'	19.00'	18.00'	23.00'

REACH III

	SREV C-60	SREV C-61	SREV C-62	SREV C-63	SREV C-64	SREV C-65	SREV C-66	SREV C-67	SREV C-68	SREV C-69	SREV C-70	SREV C-71
PI Sta	40+31.20	40+57.93	41+00.95	41+24.97	41+52.43	41+84.85	42+18.72	42+49.84	42+76.97	43+10.67	43+38.23	43+78.47
PCSta.	40+16.10	40+45.91	40+74.86	41+15.00	41+38.99	41+71.68	42+04.92	42+36.63	42+68.44	42+92.75	43+29.73	43+53.93
PTSta.	40+35.82	40+64.78	41+06.33	41+30.05	41+59.19	41+93.29	42+26.98	42+57.26	42+83.27	43+19.69	43+44.20	43+77.61
Δ =	112°57' 25.1" (LT)	90°04' 59.5" (RT)	120°12' 44.7" (LT)	95°50' 12.1" (RT)	96°28' 12.3" (LT)	82°33' 27.8" (RT)	87°11' 51.9" (LT)	90°55' 14.0" (RT)	70°46' 57.4" (LT)	96°29' 57.3" (RT)	75°24' 14.5" (LT)	135°39' 44.2" (RT)
D =	572°57' 28.1"	477°27' 53.3"	381°58' 18.7"	636°37' 11.3"	477°27' 53.4"	381°58' 18.7"	395°08' 35.9"	440°44' 12.4"	477°27' 53.5"	358°05' 55.1"	520°52' 14.3"	572°57' 28.0"
L =	19.71'	18.87'	31.47'	15.05'	20.20'	21.61'	22.07'	20.63'	14.82'	26.95'	14.48'	23.68'
T =	15.10'	12.02'	26.09'	9.97'	13.44'	13.17'	13.81'	13.21'	8.53'	17.93'	8.50'	24.54'
R =	10.00'	11.00'	17.00'	8.00'	12.00'	15.00'	14.50'	13.00'	12.00'	16.00'	11.00'	10.00'

	SREV C-72	SREV C-73	SREV C-74	SREV C-75	SREV C-76	SREV C-77	SREV C-78	SREV C-79	SREV C-80	SREV C-81	SREV C-82	SREV C-83
PI Sta	43+98.16	44+28.85	44+60.73	44+86.62	45+21.46	45+49.34	45+81.59	46+12.25	46+49.21	46+83.47	47+18.40	47+51.24
PCSta.	43+87.72	44+16.98	44+48.82	44+80.82	45+03.98	45+40.88	45+67.87	46+02.72	46+30.58	46+72.86	47+06.80	47+40.75
PTSta.	44+05.32	44+36.22	44+68.11	44+91.90	45+28.19	45+55.76	45+89.58	46+19.70	46+58.14	46+92.03	47+26.87	47+58.76
Δ =	77°34' 24.4" (LT)	84°45' 38.8" (RT)	85°00' 11.8" (LT)	42°19' 55.7" (RT)	106°42' 26.0" (LT)	68°12' 30.4" (RT)	88°51' 24.4" (LT)	64°51' 16.6" (RT)	98°42' 33.9" (LT)	61°00' 22.2" (RT)	71°52' 35.2" (LT)	73°40' 35.9" (RT)
D =	440°44' 12.4"	440°44' 12.4"	440°44' 12.4"	381°58' 18.5"	440°44' 12.4"	458°21' 58.4"	409°15' 20.0"	381°58' 18.8"	358°05' 55.0"	318°18' 35.6"	358°05' 55.0"	409°15' 20.1"
L =	17.60'	19.23'	19.29'	11.08'	24.21'	14.88'	21.71'	16.98'	27.56'	19.17'	20.07'	18.00'
T =	10.45'	11.86'	11.91'	5.81'	17.47'	8.46'	13.72'	9.53'	18.64'	10.60'	11.60'	10.49'
R =	13.00'	13.00'	13.00'	15.00'	13.00'	12.50'	14.00'	15.00'	16.00'	18.00'	16.00'	14.00'

	SREV C-84	SREV C-85	SREV C-86	SREV C-87	SREV C-88	SREV C-89
PI Sta	47+85.48	48+17.67	48+48.47	48+78.70	49+11.16	49+40.16
PCSta.	47+73.09	48+06.17	48+37.08	48+65.81	48+98.36	49+34.21
PTSta.	47+94.00	48+25.00	48+55.30	48+86.65	49+19.95	49+45.60
Δ =	77°17' 30.6" (LT)	83°00' 04.4" (RT)	87°02' 24.1" (LT)	85°17' 03.1" (RT)	77°19' 08.9" (LT)	40°46' 40.8" (RT)
D =	369°39' 00.7"	440°44' 12.3"	477°27' 53.3"	409°15' 20.1"	358°05' 55.0"	358°05' 55.2"
L =	20.91'	18.83'	18.23'	20.84'	21.59'	11.39'
T =	12.39'	11.50'	11.40'	12.89'	12.80'	5.95'
R =	15.50'	13.00'	12.00'	14.00'	16.00'	16.00'

** Radius of SREV C-61, C-62, and C-63 Adusted to save mature Trees.

$$USER$$ $$DGN$$ $$DATE$$ $$TIME$$

PROJECT REFERENCE NO.	SHEET NO.
U-2524WM	3

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 028413 ENGINEER BENJAMIN T. GOETZ 7/29/04

Prepared in the Office of: EARTH TECH
701 Corporate Center Drive, Suite 475
Raleigh, NC 27607
(919) 854-6200 - (919) 854-6259(FAX)

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF QUANTITIES

SECTION	QUANTITY	UNIT	ITEM DESCRIPTION
200	1	LS	Mobilization
SP	1	LS	Construction Survey
266	1	LS	Grading
SP	2,700	CY	Impervious Select Material
1605	1,200	LF	Temporary Silt Fence
1056	1,900	SY	Filter Fabric for Drainage
1660	9.5	AC	Seeding and Mulching
1615	10	AC	Temporary Mulching
1620	350	LB	Seed for Temporary Seeding
1620	1.5	TON	Fertilizer for Temporary Seeding
1660	6	AC	Mowing
1661	100	LB	Seed for Repair Seeding
1665	0.25	TON	Fertilizer for Repair Seeding
1662	250	LB	Seed for Supplemental Seeding
1665	7	TON	Fertilizer Topdressing
1610	1,000	TON	Sediment Control Stone
1610	100	TON	Stone for Erosion Control, Class A
1610	90	TON	Stone for Erosion Control, Class B
SP	530	TON	Natural Stone, Class A
SP	3,000	TON	Natural Stone, Boulder
SP	69	EA	Root Wads
SP	2,600	SY	Coir Fiber Matting
SP	4	EA	Special Stilling Basin (Sediment Filter)
SP	1	LS	Diversion Pumping
866	328	LF	Woven Wire Fence 47" Fab
866	28	EA	Timber Posts 4"X8'
866	5	EA	Gate, SGL, 52"X14'X14'
904	36	EA	Erection, Type F Signs
904	288	LF	Supports, 3# Steel U-Channel Posts
SP	96	LF	18" RCP Culvert

EARTHWORK SUMMARY

LOCATION	UNCL. EXCAVATION (C.Y.)	UNDERCUT (C.Y.)	EMBANKMENT (C.Y.)	BORROW (C.Y.)	WASTE (C.Y.)
REACH I	690	0	185	0	505
REACH II	1022	0	1953	931	0
REACH III	761	0	193	0	568
SUB-TOTAL	2473	0	2331	931	1073
TOTAL	2473		2331	0	142

NOTE: EARTHWORK QUANTITIES FOR INFORMATION ONLY

rbarbour
k:\46433\design\cadd\46433_quantities.dgn
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PROJECT REFERENCE NO.	SHEET NO.
U-2524WM	4

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

Prepared in the Office of: EARTH TECH
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Raleigh, NC 27607
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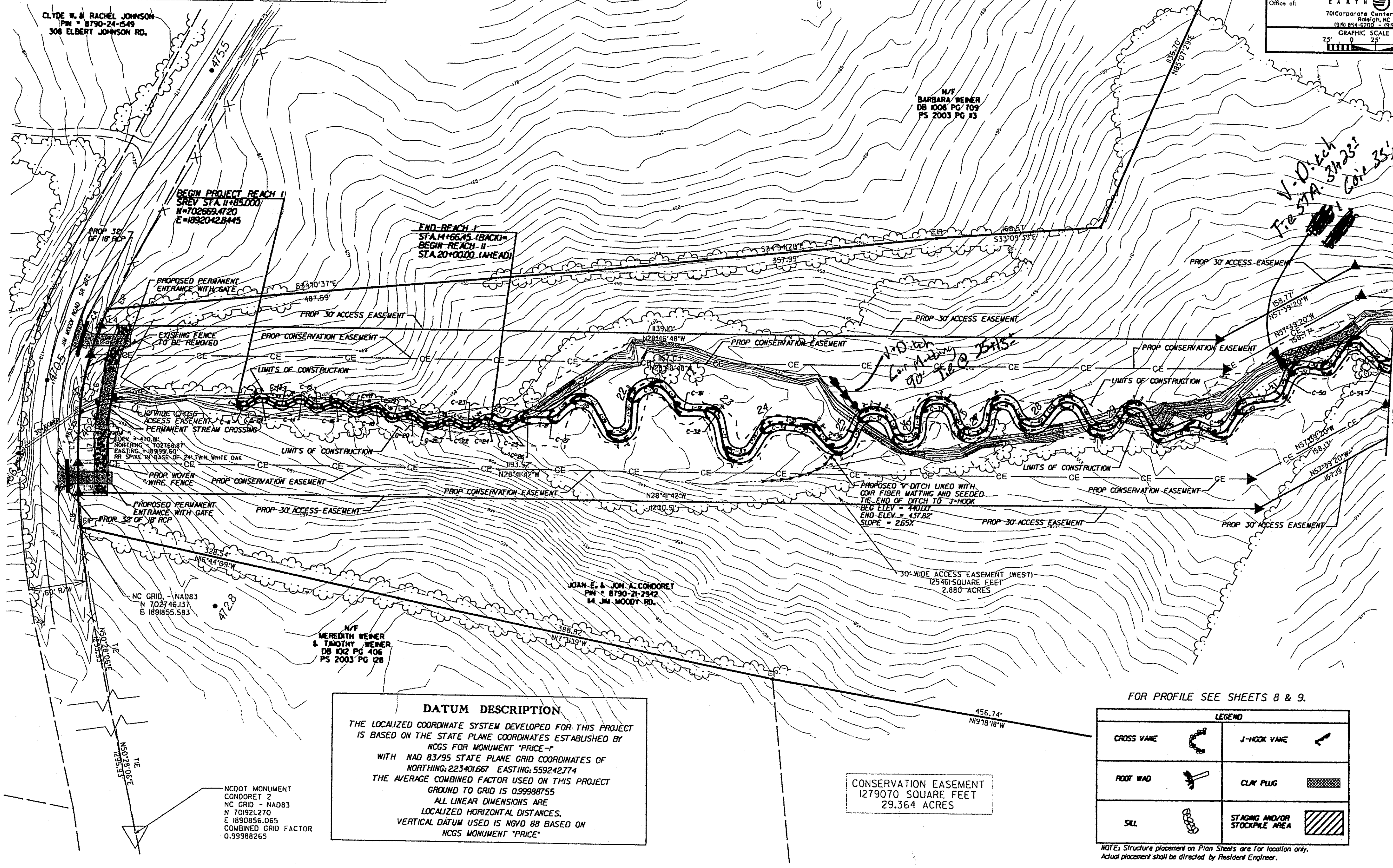
GRAPHIC SCALE 25' 0 25' 50'

CURVE TABLE				
CURVE	RADIUS	ARC	CHORD	BEARING
C1	488.72'	17.74'	17.73'	N35°38'05"W
C2	488.72'	166.67'	165.86'	N24°49'30"W
C3	289.36'	31.70'	31.69'	N80°00'38"E
C4	289.36'	18.13'	18.13'	N84°56'40"E
C5	289.36'	62.24'	62.12'	N70°42'36"E
C6	780.40'	30.01'	30.01'	N59°51'35"E
C7	780.40'	48.85'	48.85'	N62°45'18"E
C8	780.40'	35.15'	35.15'	N57°28'03"E
C9	500.00'	18.76'	18.76'	N13°58'49"W
C10	2000.00'	132.00'	131.97'	N38°33'54"W

LINE TABLE		
LINE	LENGTH	BEARING
L1	12.95'	N36°40'27"W
L2	9.40'	N36°40'27"W
L3	16.24'	N28°41'42"W
L4	17.18'	N28°46'48"W
L5	36.33'	S80°08'26"W
L6	61.29'	S70°14'57"W
L7	75.22'	S61°39'53"W
L8	74.22'	S61°39'53"W
L9	59.38'	S70°14'57"W
L10	39.40'	S80°08'26"W

DETAIL
'V' DITCH
(Not to Scale)
Natural Ground · 3:1 · D · 3:1 · Natural Ground
COIR FIBER MATTING
Min. D = 2 Ft.



DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCGS FOR MONUMENT "PRICE-1"
WITH NAD 83/95 STATE PLANE GRID COORDINATES OF NORTHING: 223401.667 EASTING: 559242.774
THE AVERAGE COMBINED FACTOR USED ON THIS PROJECT GROUND TO GRID IS 0.99988755
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES.
VERTICAL DATUM USED IS NGVD 88 BASED ON NCGS MONUMENT "PRICE"

CONSERVATION EASEMENT
1279070 SQUARE FEET
29.364 ACRES

FOR PROFILE SEE SHEETS 8 & 9.

LEGEND			
CROSS VANE		J-HOOK VANE	
ROOT WAD		CLAY PLUG	
SILL		STAGING AND/OR STOCKPILE AREA	

NOTE: Structure placement on Plan Sheets are for location only. Actual placement shall be directed by Resident Engineer.

rbarbour
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07/27/2004 03:38:54 PM

PROJECT REFERENCE NO.	SHEET NO.
U-2524WM	4

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 028413 BENJAMIN T. GOETZ

Prepared in the Office of: EARTH TECH
701 Corporate Center Drive, Suite 475
Raleigh, NC 27607
(919) 854-6200 - (919) 854-6259(FAX)

GRAPHIC SCALE 25' 0 25' 50'

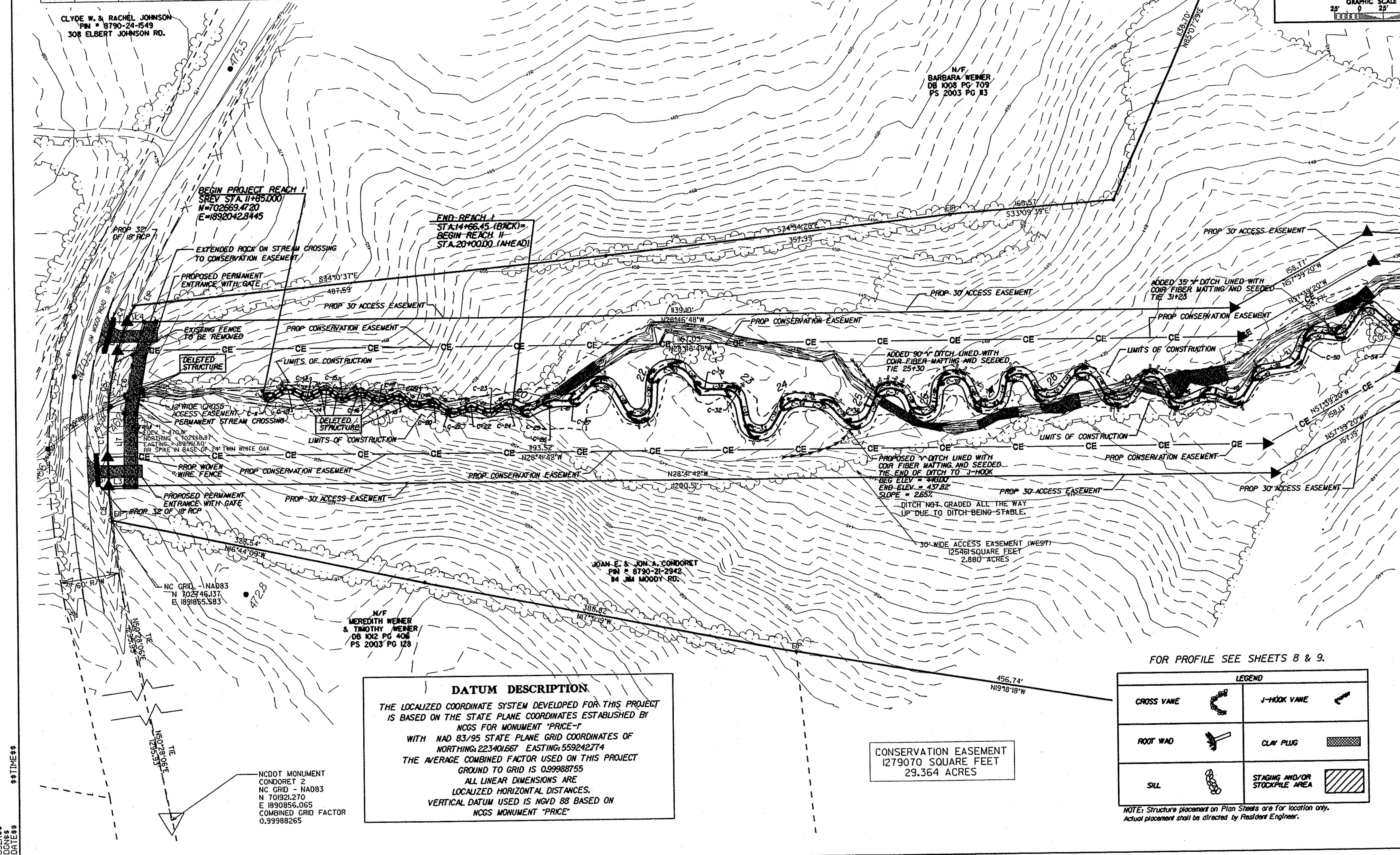
ALL ROCK CROSS VANES AND J-HOOK VANES FROM STA.25+00 TO THE END OF THE PROJECT CHANGED TO MODIFIED ROCK CROSS VANES. DUE TO DESIGN SIZE OF CHANNEL AND POTENTIAL INSTABILITY THAT THE J-HOOKS WOULD CREATE.

CURVE TABLE				
CURVE	RADIUS	ARC	CHORD	BEARING
C1	488.72'	17.74'	17.73'	N35°38'05"W
C2	488.72'	166.67'	165.86'	N24°49'30"W
C3	289.36'	31.70'	31.69'	N80°00'38"E
C4	289.36'	18.13'	18.13'	N84°56'40"E
C5	289.36'	62.24'	62.12'	N70°42'36"E
C6	780.40'	30.01'	30.01'	N59°51'35"E
C7	780.40'	48.85'	48.85'	N62°45'18"E
C8	780.40'	35.15'	35.15'	N57°28'03"E
C9	500.00'	18.76'	18.76'	N13°58'49"W
C10	2000.00'	132.00'	131.97'	N38°33'54"W

LINE TABLE		
LINE	LENGTH	BEARING
L1	12.95'	N36°40'27"W
L2	9.40'	N36°40'27"W
L3	16.24'	N28°41'42"W
L4	17.18'	N28°46'48"W
L5	36.33'	S80°08'26"W
L6	61.29'	S70°14'57"W
L7	75.22'	S61°39'53"W
L8	74.22'	S61°39'53"W
L9	59.38'	S70°14'57"W
L10	39.40'	S80°08'26"W

DETAIL
'V' DITCH
(Not to Scale)

Natural Ground — 3:1 — D — 3:1 — Natural Ground
COIR FIBER MATTING
Min. D = 2 Ft.



DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCGS FOR MONUMENT "PRICE-1"
WITH NAD 83/95 STATE PLANE GRID COORDINATES OF
NORTHING: 223401.667 EASTING: 559242.774
THE AVERAGE COMBINED FACTOR USED ON THIS PROJECT GROUND TO GRID IS 0.99988755
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES.
VERTICAL DATUM USED IS NGVD 88 BASED ON NCGS MONUMENT "PRICE"

CONSERVATION EASEMENT
1279070 SQUARE FEET
29.364 ACRES

FOR PROFILE SEE SHEETS 8 & 9.

LEGEND			
CROSS VANE		J-HOOK VANE	
ROOT WAD		CLAY PLUG	
SILL		STAGING AND/OR STOCKPILE AREA	

NOTE: Structure placement on Plan Sheets are for location only. Actual placement shall be directed by Resident Engineer.

$$USER$$ $$DGN$$ $$DATE$$ $$TIME$$

PROJECT REFERENCE NO.	SHEET NO.
U-2524WM	5

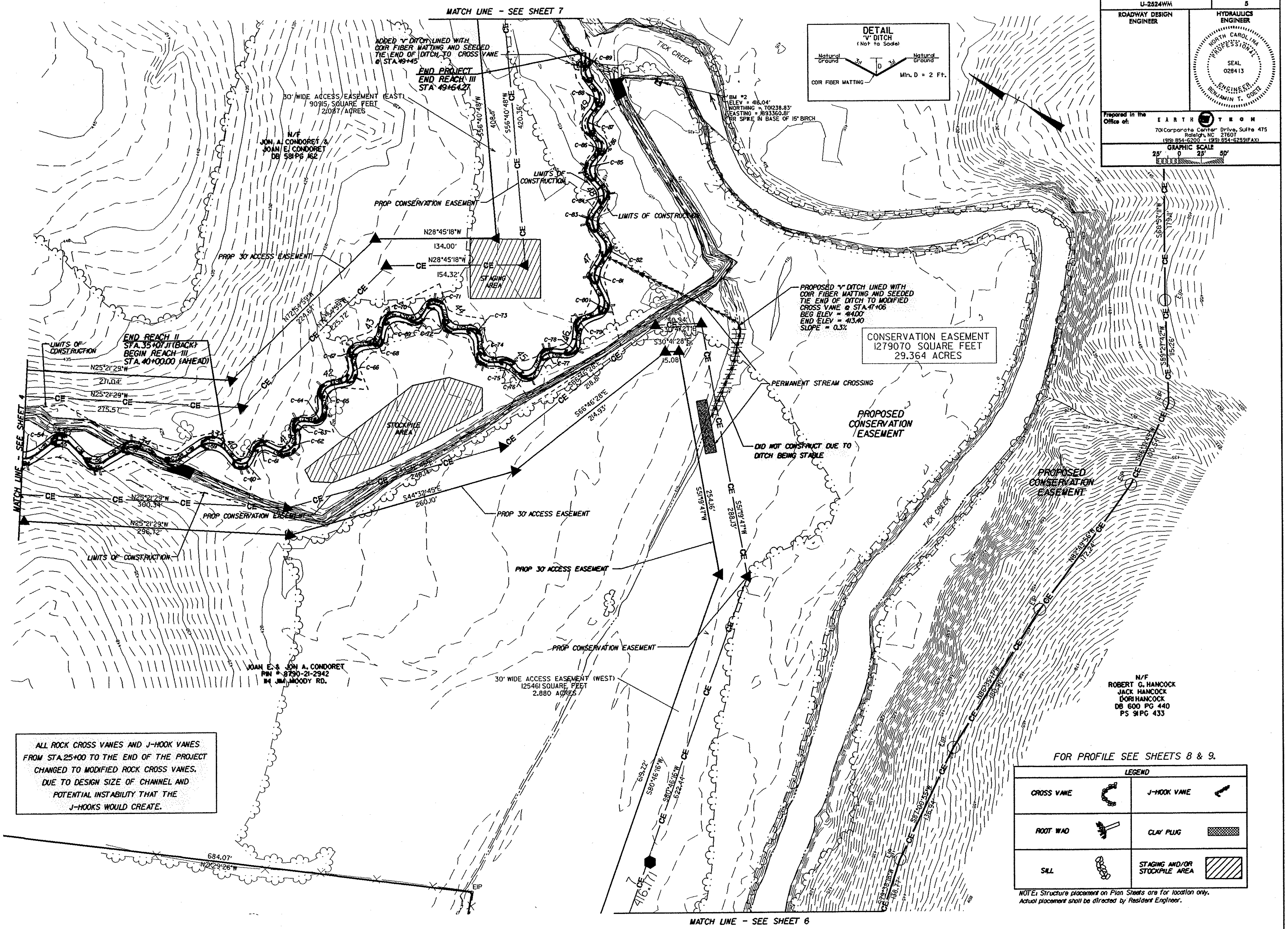
ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 028413 ENGINEER BENJAMIN T. GOETZ

Prepared in the Office of: EARTH TECH
701 Corporate Center Drive, Suite 475
Raleigh, NC 27607
(919) 854-6200 - (919) 854-6259(FAX)

GRAPHIC SCALE 25' 0 25' 50'



MATCH LINE - SEE SHEET 7
MATCH LINE - SEE SHEET 6
MATCH LINE - SEE SHEET 4
DETAIL 'V' DITCH (Not to Scale)
Natural Ground
COIR FIBER MATTING
Min. D = 2 Ft.
ADDED 'V' DITCH LINED WITH COIR FIBER MATTING AND SEEDED TIE END OF DITCH TO CROSS VANE @ STA.49+45
END PROJECT END REACH III STA 49+64.27
TICK CREEK
BM #2 ELEV = 416.04' NORTHING = 701238.83' EASTING = 1893360.81' RR SPIKE IN BASE OF 15" BIRCH
30' WIDE ACCESS EASEMENT (EAST) 90915 SQUARE FEET 2.087 ACRES
N/F JON A. CONDORET & JOAN E. CONDORET DB 581 PG 162
LIMITS OF CONSTRUCTION
PROP CONSERVATION EASEMENT
PROP 30' ACCESS EASEMENT
N28°45'18"W 134.00'
N28°45'18"W 154.32'
STAGING AREA
STOCKPILE AREA
PROPOSED 'V' DITCH LINED WITH COIR FIBER MATTING AND SEEDED TIE END OF DITCH TO MODIFIED CROSS VANE @ STA.47+06 BEG ELEV = 414.00' END ELEV = 413.40 SLOPE = 0.3%
CONSERVATION EASEMENT 1279070 SQUARE FEET 29.364 ACRES
END REACH II STA.35+07.11(BACK) BEGIN REACH III STA.40+00.00 (AHEAD)
N25°21'29"W 271.04'
N25°21'29"W 275.57'
N25°21'29"W 300.34'
N25°21'29"W 296.72'
S66°46'28"E 218.81'
S66°46'28"E 214.93'
S44°32'45"E 260.10'
S30°41'28"E
PERMANENT STREAM CROSSING
PROPOSED CONSERVATION EASEMENT
DID NOT CONSTRUCT DUE TO DITCH BEING STABLE
S51°19'47"W 254.16'
S51°19'47"W 288.13'
JOAN E. & JON A. CONDORET PIN # 8790-21-2942 114 JIM MOODY RD.
30' WIDE ACCESS EASEMENT (WEST) 125461 SQUARE FEET 2.880 ACRES
S80°46'16"W 619.22'
S80°46'16"W 622.44'
684.07' N2K29'26"W
EIP
N/F ROBERT G. HANCOCK JACK HANCOCK DORI HANCOCK DB 600 PG 440 PS 91 PG 433

ALL ROCK CROSS VANES AND J-HOOK VANES FROM STA.25+00 TO THE END OF THE PROJECT CHANGED TO MODIFIED ROCK CROSS VANES. DUE TO DESIGN SIZE OF CHANNEL AND POTENTIAL INSTABILITY THAT THE J-HOOKS WOULD CREATE.

FOR PROFILE SEE SHEETS 8 & 9.

LEGEND

CROSS VANE		J-HOOK VANE	
ROOT WAD		CLAY PLUG	
SILL		STAGING AND/OR STOCKPILE AREA	

NOTE: Structure placement on Plan Sheets are for location only. Actual placement shall be directed by Resident Engineer.

$$USER$$ $$DGN$$ $$DATE$$ $$TIME$$

PROJECT REFERENCE NO.	SHEET NO.
U-2524WM	6

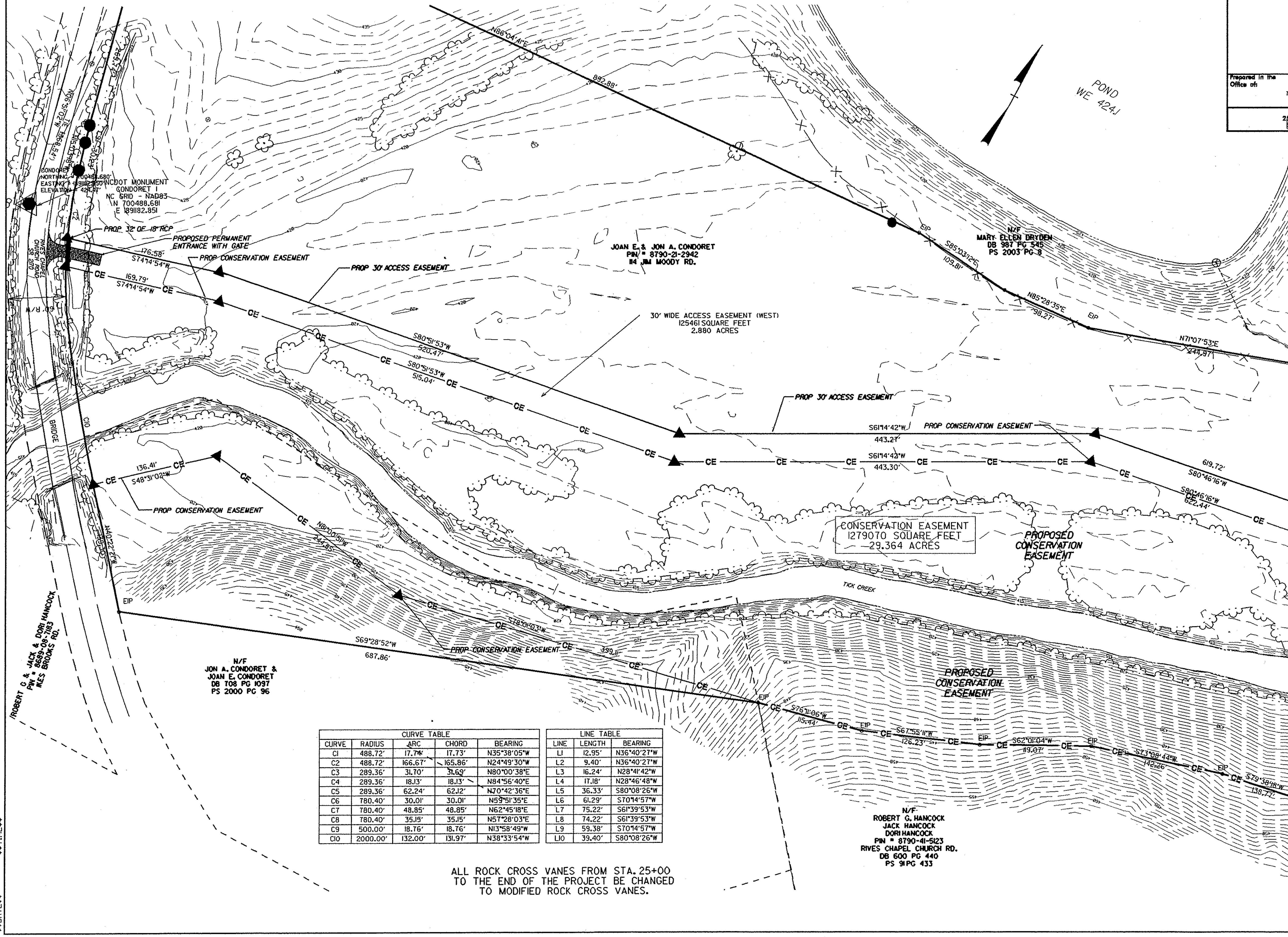
ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 028413 ENGINEER BENJAMIN T. GOETZ

Prepared in the Office of: EARTH TECH
701 Corporate Center Drive, Suite 475
Raleigh, NC 27607
(919) 854-6200 - (919) 854-6259(FAX)

GRAPHIC SCALE
25' 0 25' 50'



POND
WE 424J
N86°04'41"E
892.88'
NCDOT MONUMENT
CONDORET 1
NC GRID - NAD83
N 700488.681
E 1891182.851
PROP. 32' OF 18" RCP
PROPOSED PERMANENT ENTRANCE WITH GATE
PROP CONSERVATION EASEMENT
176.58'
S74°14'54"W
169.79'
S74°14'54"W
PROP 30' ACCESS EASEMENT
JOAN E. & JON A. CONDORET
PIN = 8790-21-2942
114 JIM MOODY RD.
N/F
MARY ELLEN DRYDEN
DB 987 PG 545
PS 2003 PG 8
S85°03'12"E
109.81'
N85°28'35"E
98.27'
N71°07'53"E
244.97'
EIP
30' WIDE ACCESS EASEMENT (WEST)
125461 SQUARE FEET
2.880 ACRES
S80°51'53"W
520.47'
S80°51'53"W
515.04'
PROP 30' ACCESS EASEMENT
S61°14'42"W
443.21'
S61°14'43"W
443.30'
619.72'
S80°46'16"W
S80°46'16"W
622.44'
BRIDGE
C10
136.41'
S48°31'02"W
PROP CONSERVATION EASEMENT
N80°01'51"W
244.85'
N40°22'41"W
CONSERVATION EASEMENT
1279070 SQUARE FEET
29.364 ACRES
PROPOSED CONSERVATION EASEMENT
TICK CREEK
MATCH LINE - SEE SHEET 5
S69°28'52"W
687.86'
PROP CONSERVATION EASEMENT
N/F
JON A. CONDORET &
JOAN E. CONDORET
DB 708 PG 1097
PS 2000 PG 96
ROBERT G. & JACK & DORI HANCOCK
PROPOSED CONSERVATION EASEMENT
S76°11'06"W
115.44'
S67°55'11"W
126.23'
S62°01'04"W
119.07'
S73°08'44"W
142.26'
S79°38'18"W
138.72'
N/F
ROBERT G. HANCOCK
JACK HANCOCK
DORI HANCOCK
PIN = 8790-41-5123
RIVES CHAPEL CHURCH RD.
DB 600 PG 440
PS 91 PG 433

CURVE TABLE				
CURVE	RADIUS	ARC	CHORD	BEARING
C1	488.72'	17.74'	17.73'	N35°38'05"W
C2	488.72'	166.67'	165.86'	N24°49'30"W
C3	289.36'	31.70'	31.69'	N80°00'38"E
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LINE TABLE		
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L8	74.22'	S61°39'53"W
L9	59.38'	S70°14'57"W
L10	39.40'	S80°08'26"W

ALL ROCK CROSS VANES FROM STA. 25+00 TO THE END OF THE PROJECT BE CHANGED TO MODIFIED ROCK CROSS VANES.

$$TIME$$

$$USER$$
$$DGN$$
$$DATE$$

PROJECT REFERENCE NO.	SHEET NO.
U-2524WM	7

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

BENJAMIN T. GOETZ
7/28/04

Prepared in the Office of:
EARTH TECH
701 Corporate Center Drive, Suite 475
Raleigh, NC 27607
(919) 854-6200 - (919) 854-6259(FAX)

GRAPHIC SCALE
25' 0 25' 50'

rbarbour
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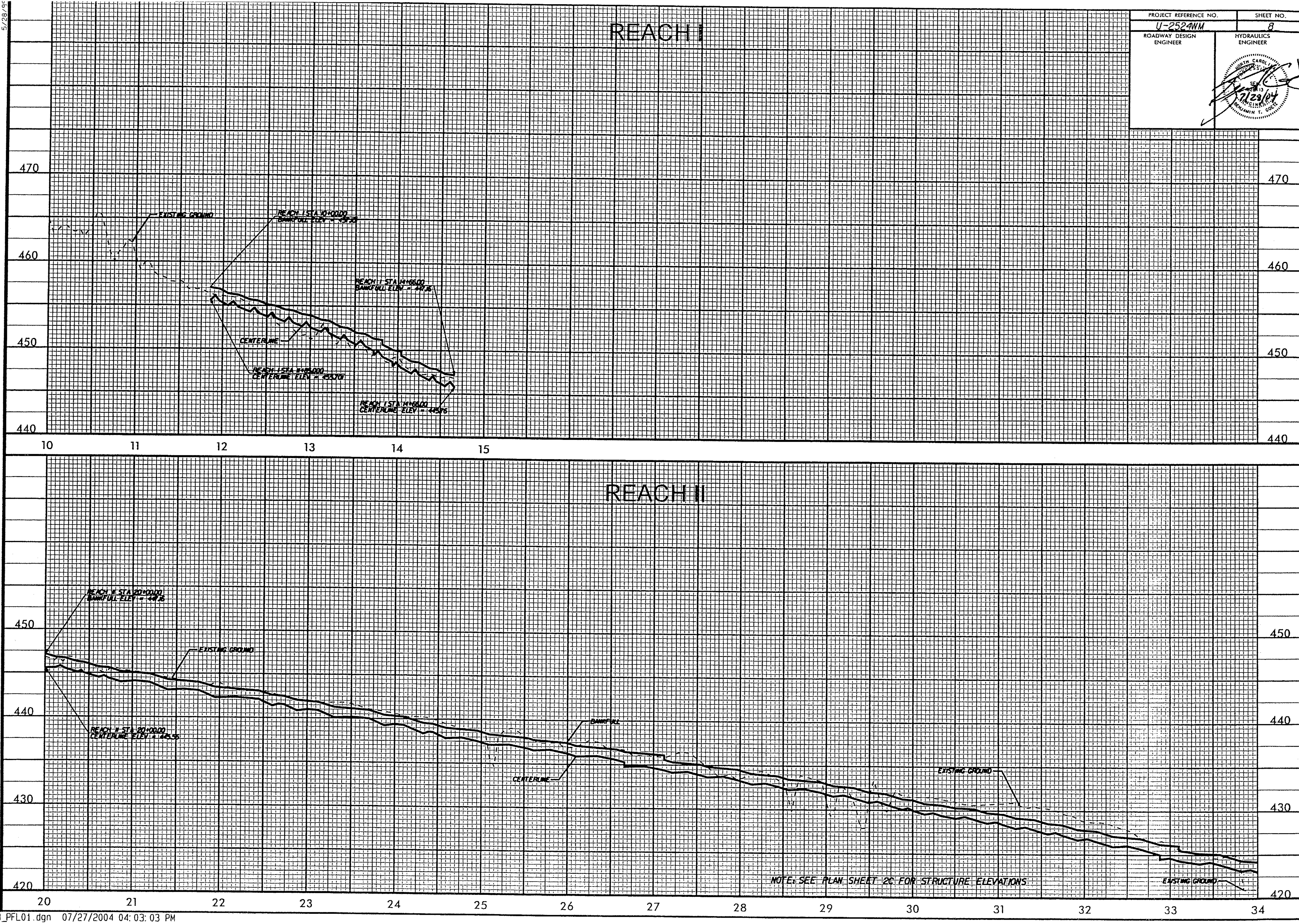
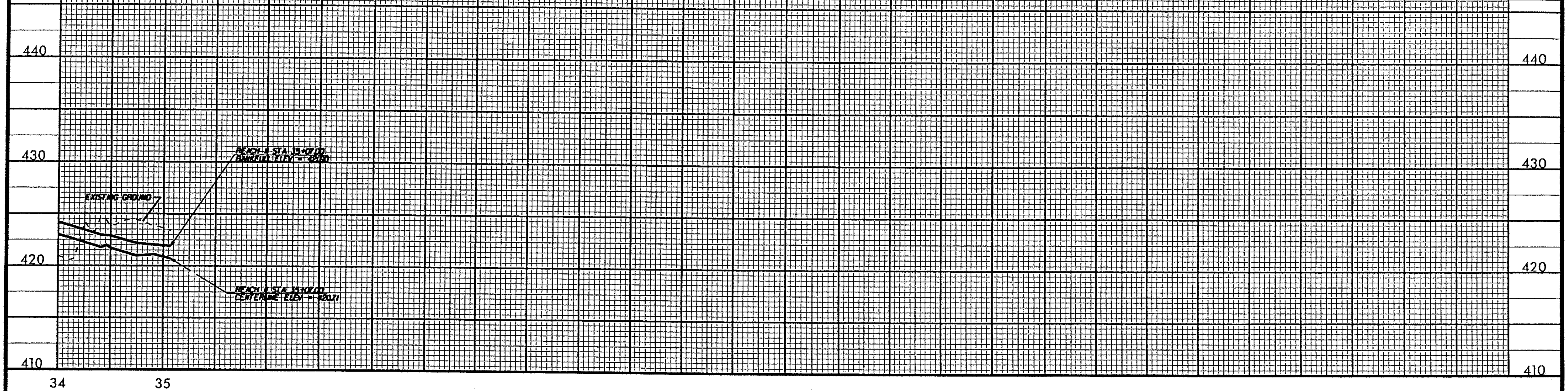

PROJECT REFERENCE NO.
U-2524WM
SHEET NO.
8
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
NORTH CAROLINA
SEAL
7/29/04
ENGINEER
BENJAMIN T. GOETZ
REACH I
EXISTING GROUND
REACH I STA 10+00.00
REACH I STA 14+66.00
BANKFULL ELEV = 447.36
CENTERLINE
REACH I STA 14+66.00
CENTERLINE ELEV = 445.76
REACH II
REACH II STA 20+00.00
BANKFULL ELEV = 447.36
EXISTING GROUND
REACH II STA 20+00.00
CENTERLINE ELEV = 445.55
BANKFULL
CENTERLINE
EXISTING GROUND
NOTE: SEE PLAN SHEET 2C FOR STRUCTURE ELEVATIONS
EXISTING GROUND
470
460
450
440
430
420
10
11
12
13
14
15
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34

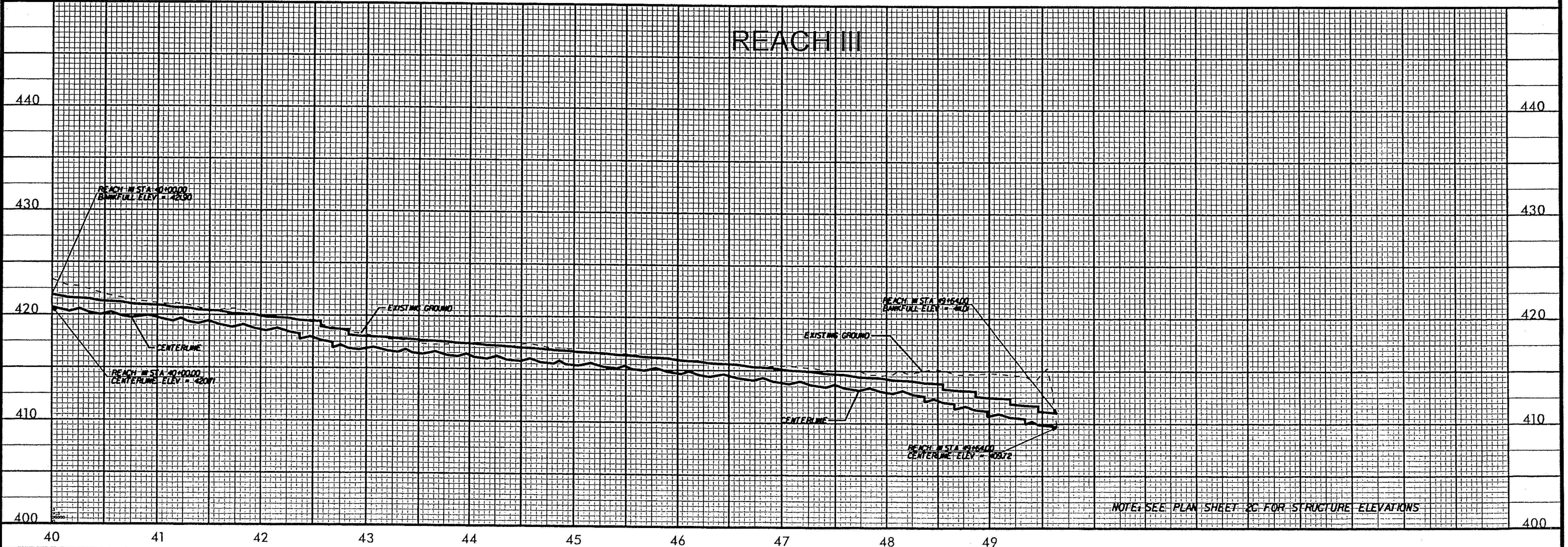
PROJECT REFERENCE NO.	SHEET NO.
U-2524WM	9

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 023413 BENJAMIN T. GOETZ 7/28/04



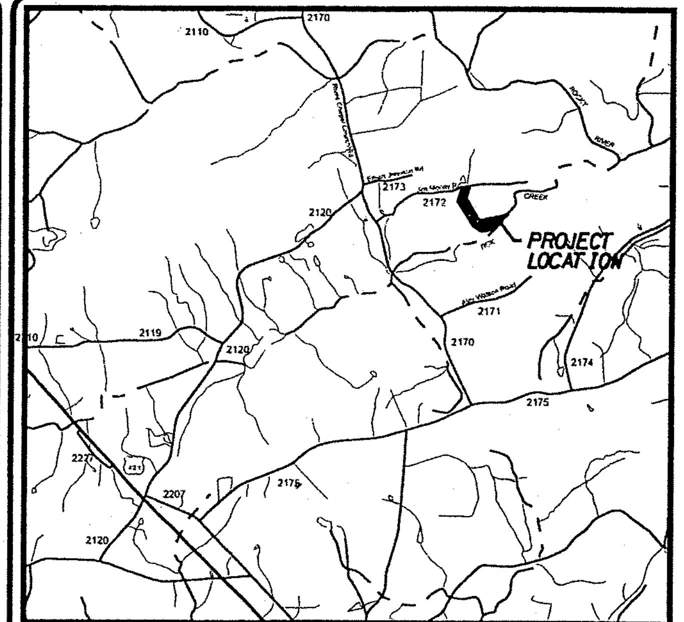


U-2524WM

PROJECT: 8.U492111

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-2524 WM	EC-1	

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
34820.4.1	NHS-124-1 (8)	P.E.
34820.4.2	NHS-124 (10)	R/W
34820.4.3	NHS-124-1 (10)	Const.

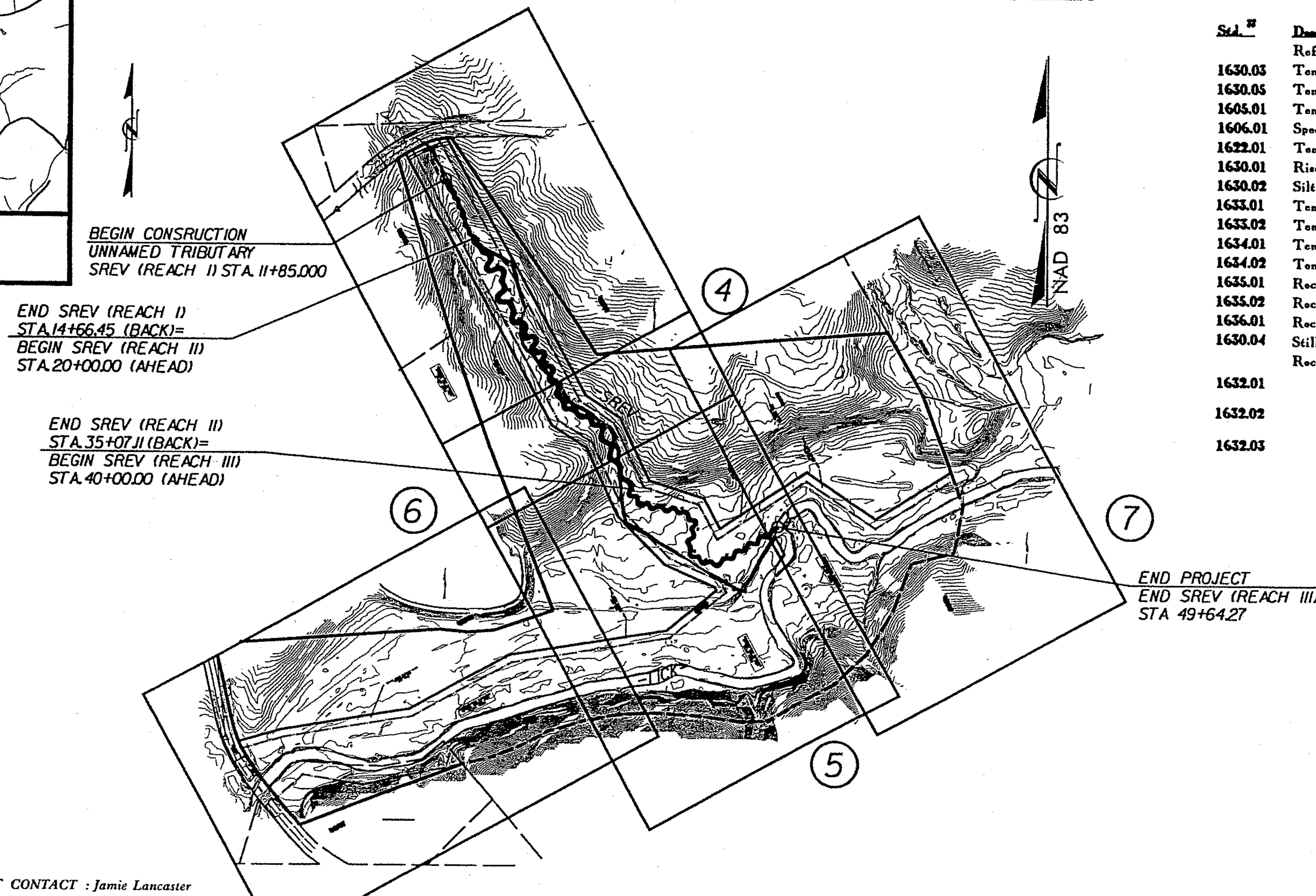


Vicinity Map
Not To Scale

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

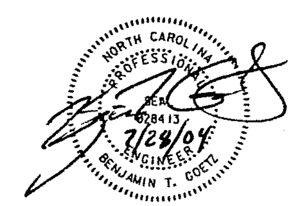
PLAN FOR PROPOSED STREAM RESTORATION EROSION CONTROL

LOCATION: CHATHAM COUNTY, UNNAMED TRIBUTARY TO TICK CREEK



EROSION AND SEDIMENT CONTROL MEASURES

Std. #	Description	Symbol
	Reforestation	
1630.03	Temporary Silt Ditch	
1630.05	Temporary Diversion	
1605.01	Temporary Silt Fence	
1606.01	Special Sediment Control Fence	
1622.01	Temporary Berms and Slope Drains	
1630.01	Riser Basin	
1630.02	Silt Basin Type B	
1633.01	Temporary Rock Silt Check Type-A	
1633.02	Temporary Rock Silt Check Type-B	
1634.01	Temporary Rock Sediment Dam Type-A	
1634.02	Temporary Rock Sediment Dam Type-B	
1635.01	Rock Pipe Inlet Sediment Trap Type-A	
1635.02	Rock Pipe Inlet Sediment Trap Type-B	
1636.01	Rock Silt Screen	
1630.04	Stilling Basin	
	Rock Inlet Sediment Trap:	
1632.01	Type A	A OR A)
1632.02	Type B	B OR B)
1632.03	Type C	C OR C)



INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NCDOT CONTACT : Jamie Lancaster

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

ROADSIDE ENVIRONMENTAL UNIT
DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

P.E.
ROADSIDE ENVIRONMENTAL ENGINEER

Prepared In the Office of:

EARTH TECH

A tyco INTERNATIONAL LTD. COMPANY

FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

701 Corporate Center Drive, Suite 475
Raleigh, NC 27607
(919) 854-6200 - (919) 854-6259(FAX)

Roadway Standard Drawings

The following roadway english standards as appear in "Roadway Standard Drawings"- Roadway Design Unit - N. C. Department of Transportation - Raleigh, N. C., dated January 20, 2002 and the latest revison thereto are applicable to this project and by reference hereby are considered a part of these plans.

1605.01	Temporary Silt Fence	1632.01	Rock Inlet Sediment Trap Type A
1606.01	Special Sediment Control Fence	1632.03	Rock Inlet Sediment Trap Type C
1622.01	Temporary Berms and Slope Drains	1633.01	Temporary Rock Silt Check Type A
1630.01	Riser Basin	1633.02	Temporary Rock Silt Check Type B
1630.02	Silt Basin Type B	1634.01	Temporary Rock Sediment Dam Type A
1630.03	Temporary Silt Ditch	1634.02	Temporary Rock Sediment Dam Type B
1630.04	Stilling Basin	1635.01	Rock Pipe Inlet Sediment Trap Type A
1630.05	Temporary Diversion	1636.01	Rock Silt Screen

PROJECT REFERENCE NO.	SHEET NO.
U-2524WM	EC-2

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

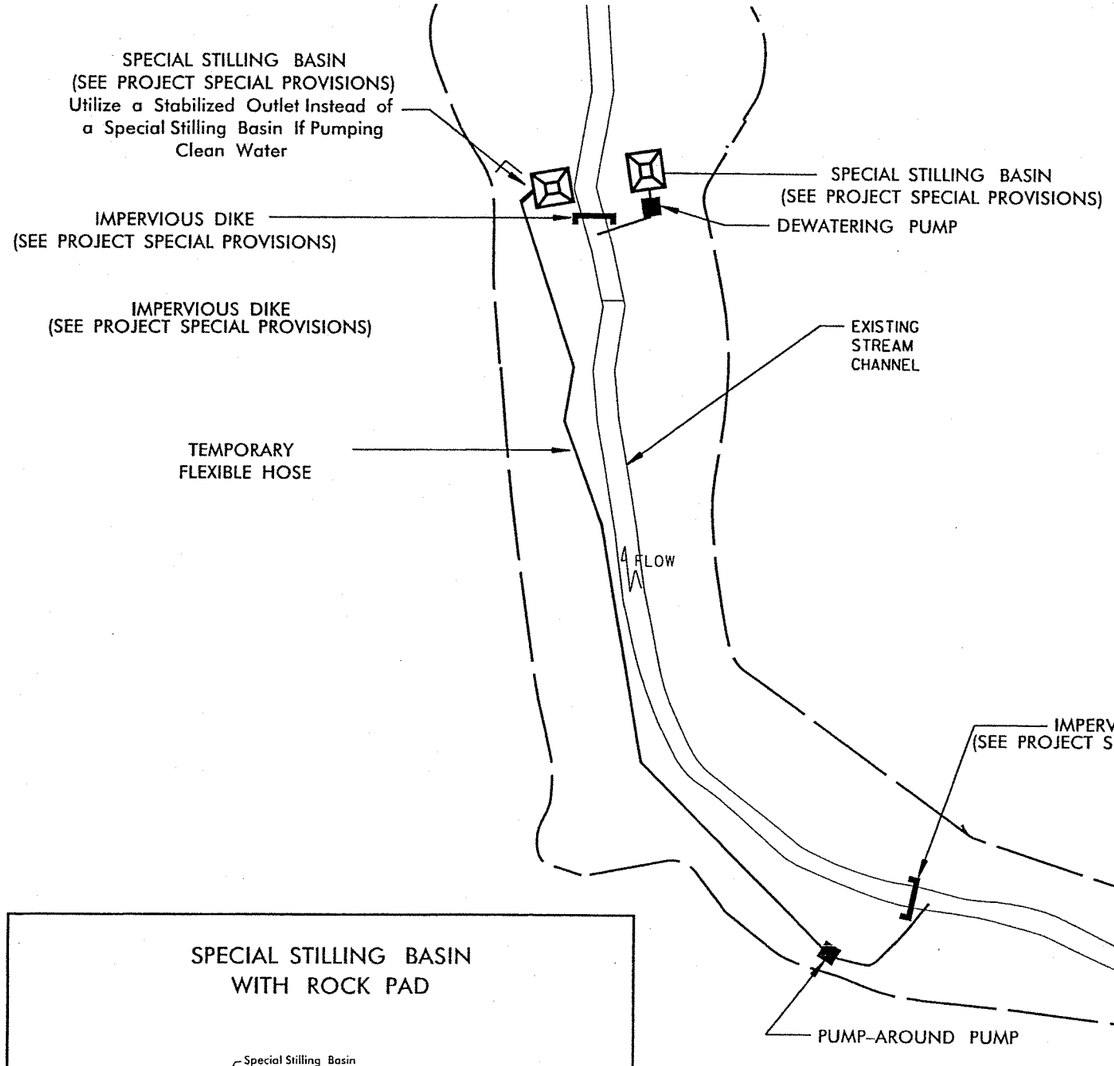
NORTH CAROLINA PROFESSIONAL SEAL 028413 ENGINEER BENJAMIN T. GOETZ 7/29/07

Prepared in the Office of: EARTH TECH
701 Corporate Center Drive, Suite 475
Raleigh, NC 27607
(919) 854-6200 - (919) 854-6259 (FAX)

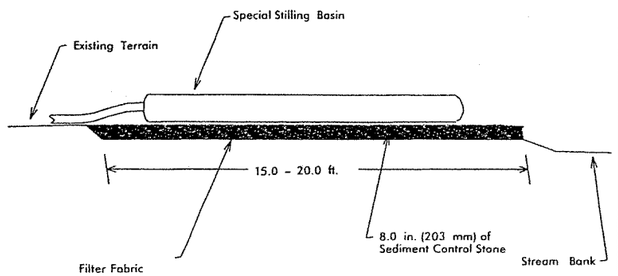
GRAPHIC SCALE
25' 0 25' 50'

16 EC-2 PUMP AROUND OPERATION
SCALE: NTS

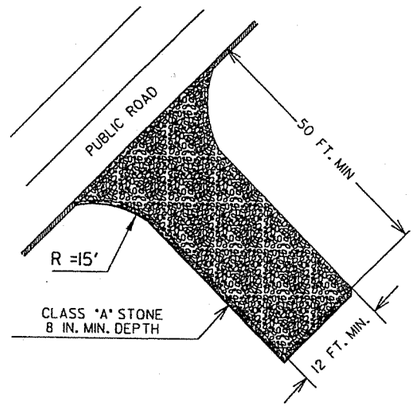
EXAMPLE OF PUMP-AROUND OPERATION



SPECIAL STILLING BASIN WITH ROCK PAD



NOTES:
1) All excavation shall be performed in only dry or isolated sections of channel.
2) Impervious dikes are to be used to isolate work from stream flow when necessary.
3) All graded areas shall be stabilized within 24 hours.
4) Maintenance of stream flow operations shall be incidental to the work. This includes polyethylene sheeting, diversion pipes, pumps and hoses.
5) Pumps and hoses shall be of sufficicient size to dewater the work area.



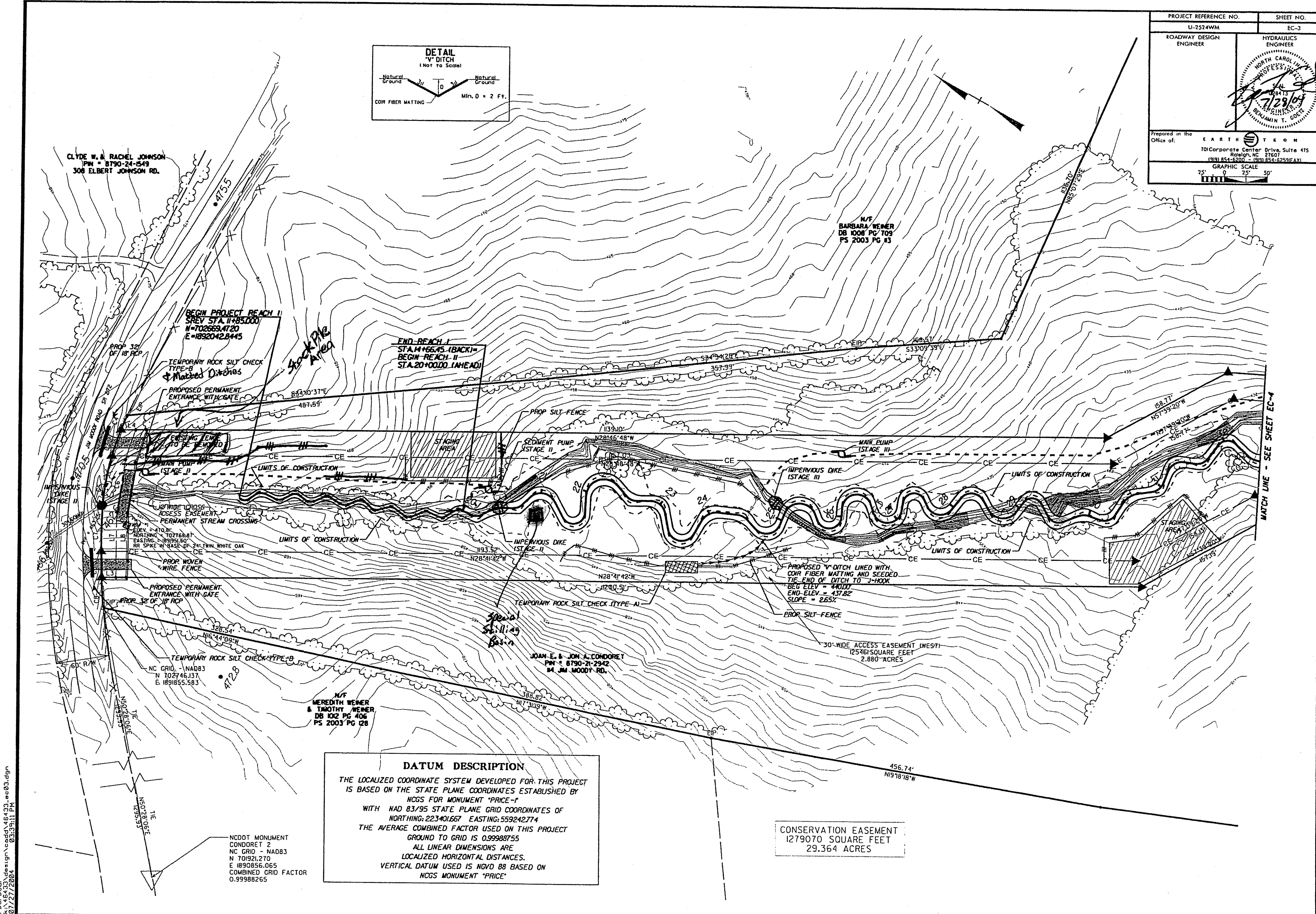
NOTES:
1. TURNING RADIUS SUFFICIENT TO ACCOMODATE LARGE TRUCKS SHALL BE PROVIDED.
2. ENTRANCE(S) SHOULD BE LOCATED TO PROVIDE FOR UTILIZATION BY ALL CONSTRUCTION VEHICLES.
3. MUST BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR DIRECT FLOW OF MUD ONTO STREETS. PERIODIC TOPDRESSING WITH STONE WILL BE NECESSARY.
4. ANY MATERIAL TRACKED ONTO THE ROADWAY MUST BE CLEANED UP IMMEDIATELY.
5. GRAVEL CONSTRUCTION ENTRANCE SHALL BE LOCATED AT ALL POINTS OF INGRESS AND EGRESS UNTIL SITE IS STABILIZED. FREQUENT CHECKS OF THE DEVICE AND TIMELY MAINTENANCE MUST BE PROVIDED.
6. NUMBER AND LOCATION OF CONSTRUCTION ENTRANCES TO BE DETERMINED BY THE ENGINEER

NOTE: FILTER FABRIC TO BE PLACED BENEATH STONE

17 EC-2 PERMANENT GRAVEL CONSTRUCTION ENTRANCE
SCALE: NTS

SEQUENCE OF CONSTRUCTION FOR TYPICAL WORK AREA

1. INSTALL SPECIAL STILLING BASIN(S)..
2. INSTALL UPSTREAM PUMP AND TEMPORARY FLEXIBLE HOSE.
3. PLACE UPSTREAM IMPERVIOUS DIKE AND BEGIN PUMPING OPERATIONS FOR STREAM DIVERSION.
4. PLACE DOWNSTREAM IMPERVIOUS DIKE AND PUMPING APPARATUS. DEWATER ENTRAPPED AREA. AREA TO BE DEWATERED SHALL BE EQUAL TO ONE DAY'S WORK.
5. PERFORM STREAM RESTORATION WORK IN ACCORDANCE WITH THE PLANS.
6. EXCAVATE ANY ACCUMULATED SILT AND DEWATER BEFORE REMOVAL OF IMPERVIOUS DIKES. REMOVE IMPERVIOUS DIKES, PUMPS, AND TEMPORARY FLEXIBLE HOSE. (DOWNSTREAM IMPERVIOUS DIKES FIRST).
7. ALL GRADING AND STABILIZATION MUST BE COMPLETED IN ONE DAY WITHIN THE PUMP AROUND AREAS BETWEEN THE IMPERVIOUS DIKES. THE IMPERVIOUS DIKE LOCATIONS AS SHOWN ON THIS SHEET ONLY SHOW THE UPPER AND LOWER EXTENT OF WORK FOR EACH STREAM SEGMENT. THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE LOCATION OF THE IMPERVIOUS DIKE(S) FOR EACH DAY'S WORK.
8. REMOVE SPECIAL STILLING BASIN(S) AND BACKFILL. STABILIZE DISTURBED AREA WITH SEED AND MULCH.



PROJECT REFERENCE NO. U-2524WM
SHEET NO. EC-3
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
Prepared in the Office of: EARTH TECH
701 Corporate Center Drive, Suite 475 Raleigh, NC 27607
(919) 854-6200 - (919) 854-6259(FAX)
GRAPHIC SCALE
25' 0 25' 50'
DETAIL 'V' DITCH (Not to Scale)
Natural Ground
Natural Ground
COIR FIBER MATTING
Min. D = 2 Ft.
CLYDE W. & RACHEL JOHNSON
PIN = 8790-24-1549
308 ELBERT JOHNSON RD.
N/F
BARBARA WEINER
DB 1008 PG 709
PS 2003 PG 83
BEGIN PROJECT REACH II
SREV STA. 11+85.000
N=702669.4720
E=1892042.8445
END REACH I
STA.14+66.45 (BACK)=
BEGIN REACH II
STA.20+00.00 (AHEAD)
TEMPORARY ROCK SILT CHECK TYPE-B
PROPOSED PERMANENT ENTRANCE WITH GATE
PROP SILT FENCE
STAGING AREA
SEDIMENT PUMP (STAGE II)
MAIN PUMP (STAGE II)
MAIN PUMP (STAGE III)
IMPERVIOUS DIKE (STAGE II)
IMPERVIOUS DIKE (STAGE III)
LIMITS OF CONSTRUCTION
PERMANENT STREAM CROSSING
PROP WOVEN WIRE FENCE
PROPOSED PERMANENT ENTRANCE WITH GATE
PROP. 32' OF 18" RCP
TEMPORARY ROCK SILT CHECK (TYPE A)
PROPOSED 'V' DITCH LINED WITH COIR FIBER MATTING AND SEEDED. TIE END OF DITCH TO J-HOOK
BEG ELEV = 440.00
END ELEV = 437.82
SLOPE = 2.65%
PROP SILT FENCE
30' WIDE ACCESS EASEMENT (WEST)
125461 SQUARE FEET
2.880 ACRES
JOAN E. & JON A. CONDORET
PIN = 8790-21-2942
84 JIM MOODY RD.
N/F
MEREDITH WEINER
& TIMOTHY WEINER
DB 1012 PG 406
PS 2003 PG 128
TEMPORARY ROCK SILT CHECK TYPE-B
NC GRID - NAD83
N 702746.137
E 1891855.583
MATCH LINE - SEE SHEET EC-4
NCDOT MONUMENT
CONDORET 2
NC GRID - NAD83
N 701921.270
E 1890856.065
COMBINED GRID FACTOR
0.99988265
DATUM DESCRIPTION
THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCGS FOR MONUMENT "PRICE-1"
WITH NAD 83/95 STATE PLANE GRID COORDINATES OF NORTHING: 223401.667 EASTING: 559242.774
THE AVERAGE COMBINED FACTOR USED ON THIS PROJECT GROUND TO GRID IS 0.99988755
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES.
VERTICAL DATUM USED IS NGVD 88 BASED ON NCGS MONUMENT "PRICE"
CONSERVATION EASEMENT
1279070 SQUARE FEET
29.364 ACRES
07/27/2004

PROJECT REFERENCE NO.	SHEET NO.
U-2524WM	EC-4

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 029164 ENGINEER BENJAMIN T. OGLE

Prepared in the Office of: EARTH TECH
701 Corporate Center Drive, Suite 475
Raleigh, NC 27607
(919) 854-6200 - (919) 854-6259 (FAX)

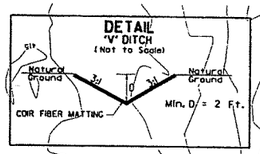
GRAPHIC SCALE
25' 0 25' 50'

MATCH LINE - SEE SHEET EC-6

MATCH LINE - SEE SHEET EC-3

MATCH LINE - SEE SHEET EC-5

DETAIL
"V" DITCH
(Not to Scale)



PROP SILT FENCE

END PROJECT
END REACH III
STA 49+64.27

ROCK INLET SCREEN

TICK CREEK

BM #2
ELEV = 416.04'
NORTHING = 701238.83'
EASTING = 1893360.81'
RR SPIKE IN BASE OF 15" BIRCH

30' WIDE ACCESS EASEMENT (EAST)
90915 SQUARE FEET
2.087 ACRES

N/F
JON A. CONDORET &
JOAN E. CONDORET
DB 581 PG 162

N56°40'48"W 408.11'

S56°40'48"W 420.36'

PROP SILT FENCE

TEMPORARY ROCK SILT CHECK (TYPE A)

UNITS OF CONSTRUCTION

PROP CONSERVATION EASEMENT

LIMITS OF CONSTRUCTION

N28°45'18"W 134.00'

N28°45'18"W 154.32'

STAGING AREA

PROP 30' ACCESS EASEMENT

N72°54'55"W 224.61'

N72°54'55"W 225.72'

PROP SILT FENCE

PROPOSED "V" DITCH LINED WITH COIR FIBER MATTING AND SEEDED
TIE END OF DITCH TO CROSS VANE
BEG ELEV = 414.03'
END ELEV = 412.90'
SLOPE = 0.3%

CONSERVATION EASEMENT
1279070 SQUARE FEET
29.364 ACRES

END REACH II
STA 35+07.11 (BACK)
BEGIN REACH III
STA 40+00.00 (AHEAD)

UNITS OF CONSTRUCTION

N25°21'29"W 271.04'

N25°21'29"W 275.57'

IMPERVIOUS DIKE (STAGE II)

PROP SILT FENCE

S65°44'28"E 218.81'

S66°46'28"E 214.93'

S30°41'28"E 15.08'

PERMANENT STREAM CROSSING

STOCKPILE AREA

PROPOSED CONSERVATION EASEMENT

SEDIMENT PUMP (STAGE II)

N25°21'29"W 300.34'

PROP CONSERVATION EASEMENT

S44°32'45"E 260.10'

PROP SILT FENCE

PROP 30' ACCESS EASEMENT

N25°21'29"W 296.72'

TEMPORARY ROCK SILT CHECK (TYPE A)

LIMITS OF CONSTRUCTION

S55°19'47"W 254.16'

S55°19'47"W 288.13'

PROP 30' ACCESS EASEMENT

PROP CONSERVATION EASEMENT

JOAN E. & JON A. CONDORET
PIN # 8790-21-2942
84 JIM MOODY RD.

30' WIDE ACCESS EASEMENT (WEST)
125461 SQUARE FEET
2.880 ACRES

S80°46'16"W 619.72'

S80°46'16"W 622.44'

N29°29'26"W 684.07'

EIP

N16°49'53"W 172.24'

N16°49'53"W 180.90'

S73°38'08"W 108.71'

S87°00'55"W 136.34'

S99°27'47"W 116.26'

S60°57'41"W 179.11'

N/F
ROBERT G. HANCOCK
JACK HANCOCK
DORI HANCOCK
DB 600 PG 440
PS 91 PG 433

rbarbour
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PROJECT REFERENCE NO.	SHEET NO.
U-2524WM	EC-5

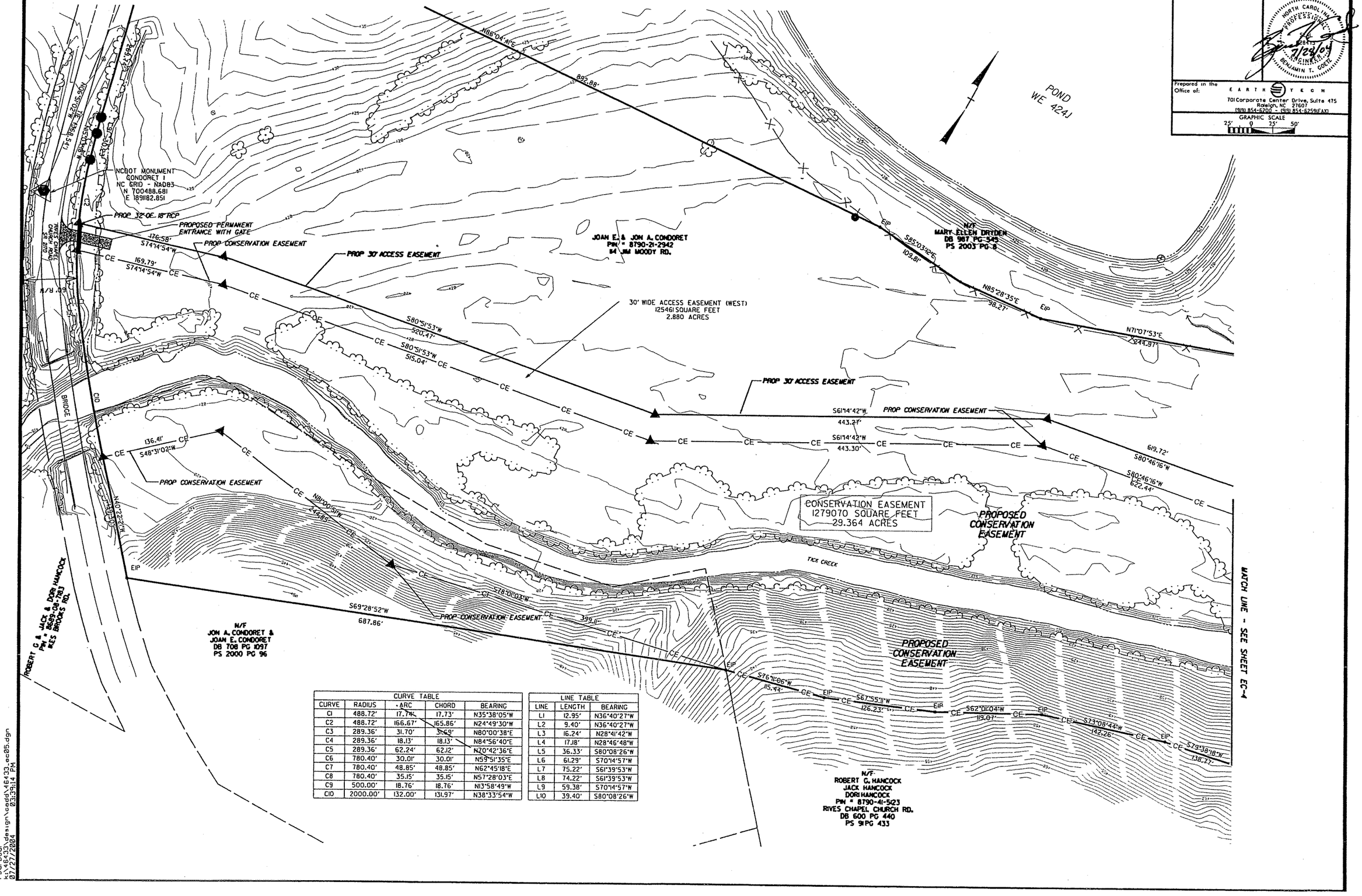
ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 028413 ENGINEER BENJAMIN T. GOETZ 7/28/04

Prepared in the Office of: EARTH TECH
701 Corporate Center Drive, Suite 475
Raleigh, NC 27607
(919) 854-6200 - (919) 854-6259 (FAX)

GRAPHIC SCALE
25' 0 25' 50'



CURVE TABLE				
CURVE	RADIUS	ARC	CHORD	BEARING
C1	488.72'	17.74'	17.73'	N35°38'05"W
C2	488.72'	166.67'	165.86'	N24°49'30"W
C3	289.36'	31.70'	31.69'	N80°00'38"E
C4	289.36'	18.13'	18.13'	N84°56'40"E
C5	289.36'	62.24'	62.12'	N70°42'36"E
C6	780.40'	30.01'	30.01'	N59°51'35"E
C7	780.40'	48.85'	48.85'	N62°45'18"E
C8	780.40'	35.15'	35.15'	N57°28'03"E
C9	500.00'	18.76'	18.76'	N13°58'49"W
C10	2000.00'	132.00'	131.97'	N38°33'54"W

LINE TABLE		
LINE	LENGTH	BEARING
L1	12.95'	N36°40'27"W
L2	9.40'	N36°40'27"W
L3	16.24'	N28°41'42"W
L4	17.18'	N28°46'48"W
L5	36.33'	S80°08'26"W
L6	61.29'	S70°14'57"W
L7	75.22'	S61°39'53"W
L8	74.22'	S61°39'53"W
L9	59.38'	S70°14'57"W
L10	39.40'	S80°08'26"W

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PROJECT REFERENCE NO.	SHEET NO.
U-2524WM	EC-6

ROADWAY DESIGN ENGINEER

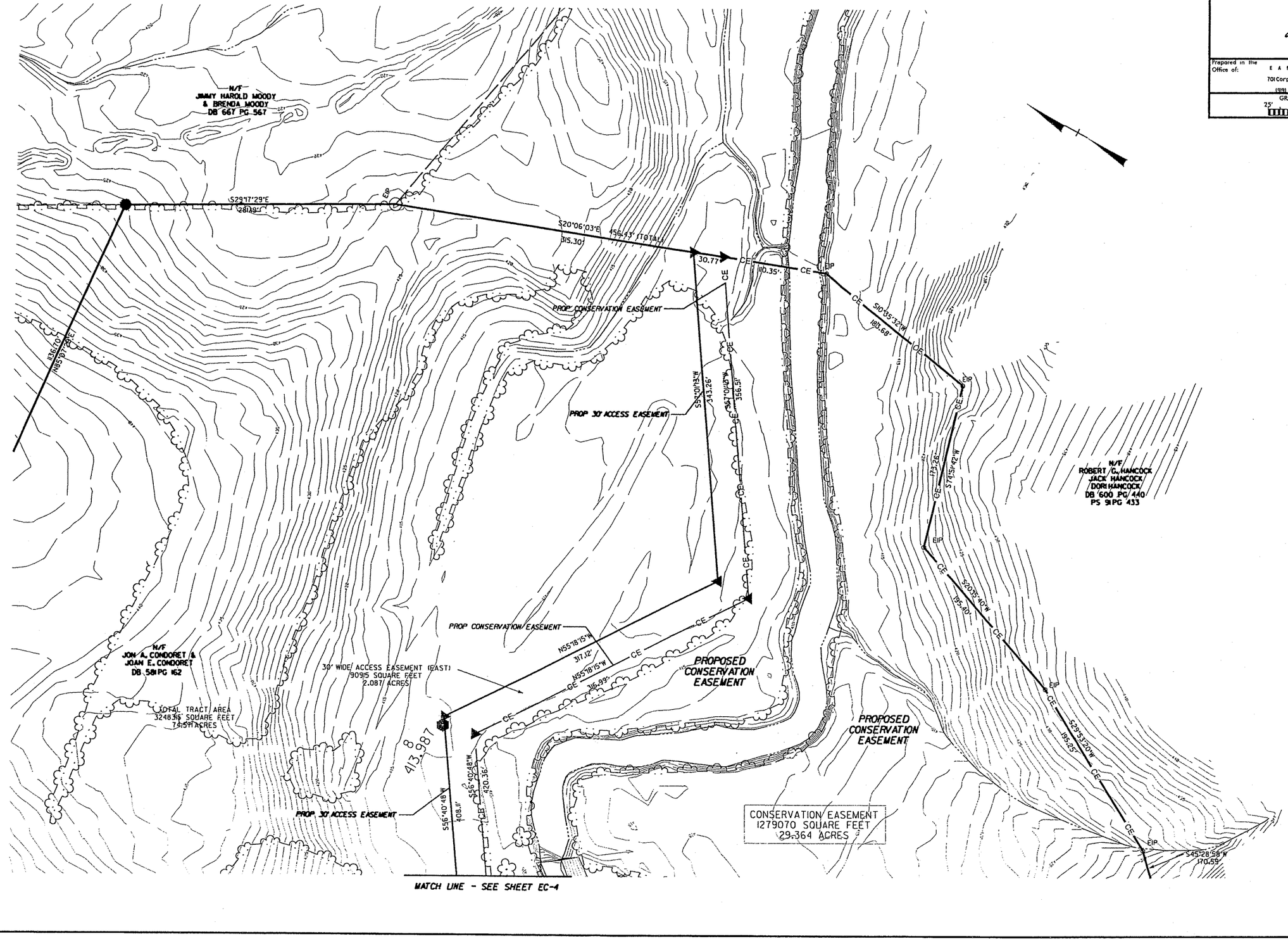
HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 026413 ENGINEER BENJAMIN T. GOETZ

7/28/04

Prepared in the Office of:
EARTH TECH
701 Corporate Center Drive, Suite 475
Raleigh, NC 27607
(919) 854-6200 - (919) 854-6259 (FAX)

GRAPHIC SCALE
25' 0 25' 50'



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PROJECT REFERENCE NO.	SHEET NO.
U-2524WM	X-01

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 026437 ENGINEER BENJAMIN T. GOETZ 7/23/04

Prepared in the Office of:
EARTH TECH
701 Corporate Center Drive, Suite 475
Raleigh, NC 27607
(919) 854-6200 - (919) 854-6259 (FAX)

INDEX TO CROSS SECTIONS

REACH I	X-02 THRU X-06
REACH II	X-07 THRU X-15
REACH III	X-16 THRU X-24

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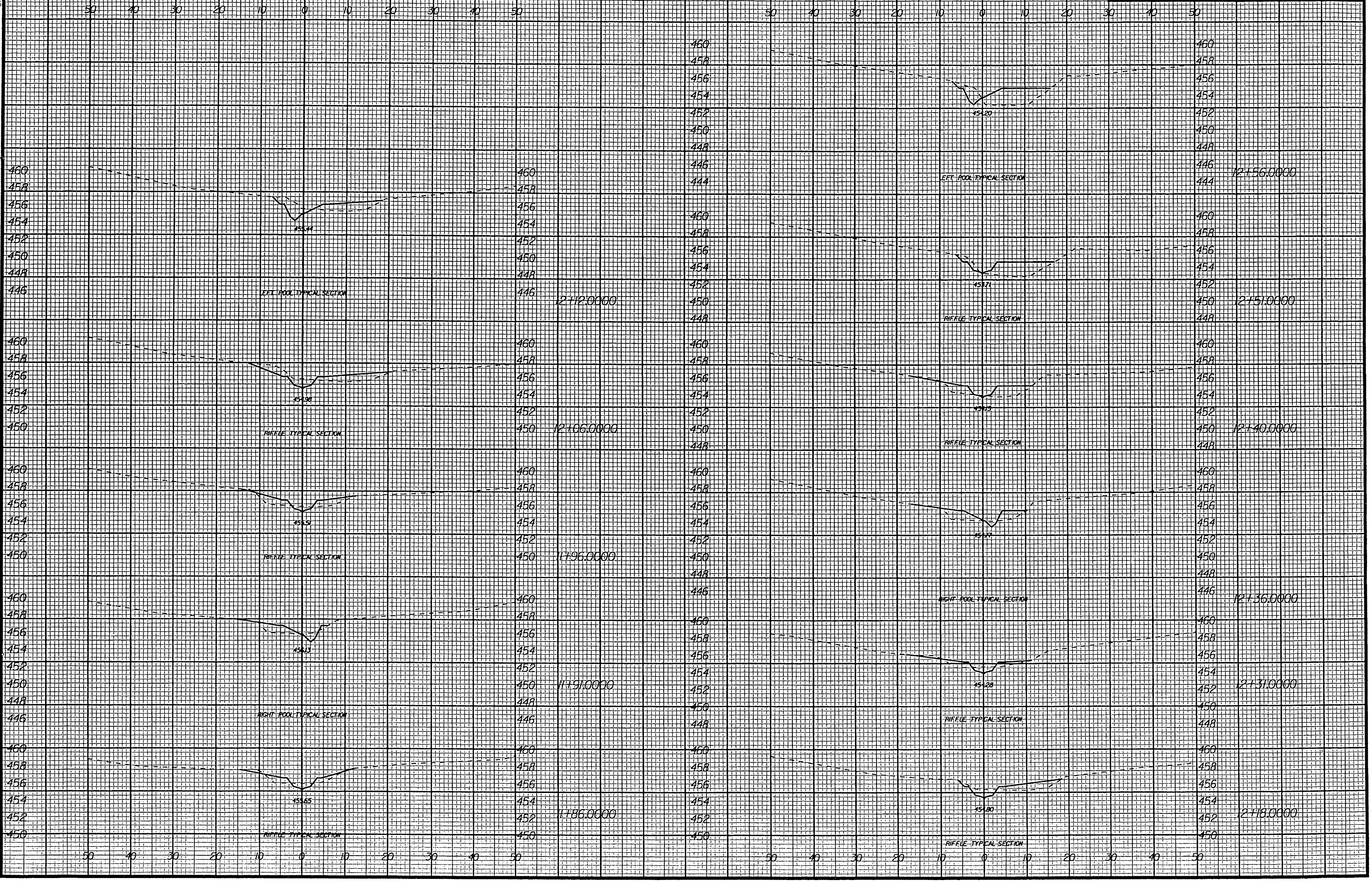
PROJ. REFERENCE NO.	SHEET NO.
U-2524 WM	X-2



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0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-2524 WM	X-3

RIFFLE TYPICAL SECTION

45.04

RIFFLE TYPICAL SECTION

45.04

RIFFLE TYPICAL SECTION

45.66

RIGHT POOL TYPICAL SECTION

45.79

RIFFLE TYPICAL SECTION

45.59

RIFFLE TYPICAL SECTION

12+90.0000

12+80.0000

12+75.0000

12+70.0000

12+60.0000

RIGHT POOL TYPICAL SECTION

45.88

RIFFLE TYPICAL SECTION

45.50

RIGHT POOL TYPICAL SECTION

45.02

RIFFLE TYPICAL SECTION

45.58

RIFFLE TYPICAL SECTION

45.16

LEFT POOL TYPICAL SECTION

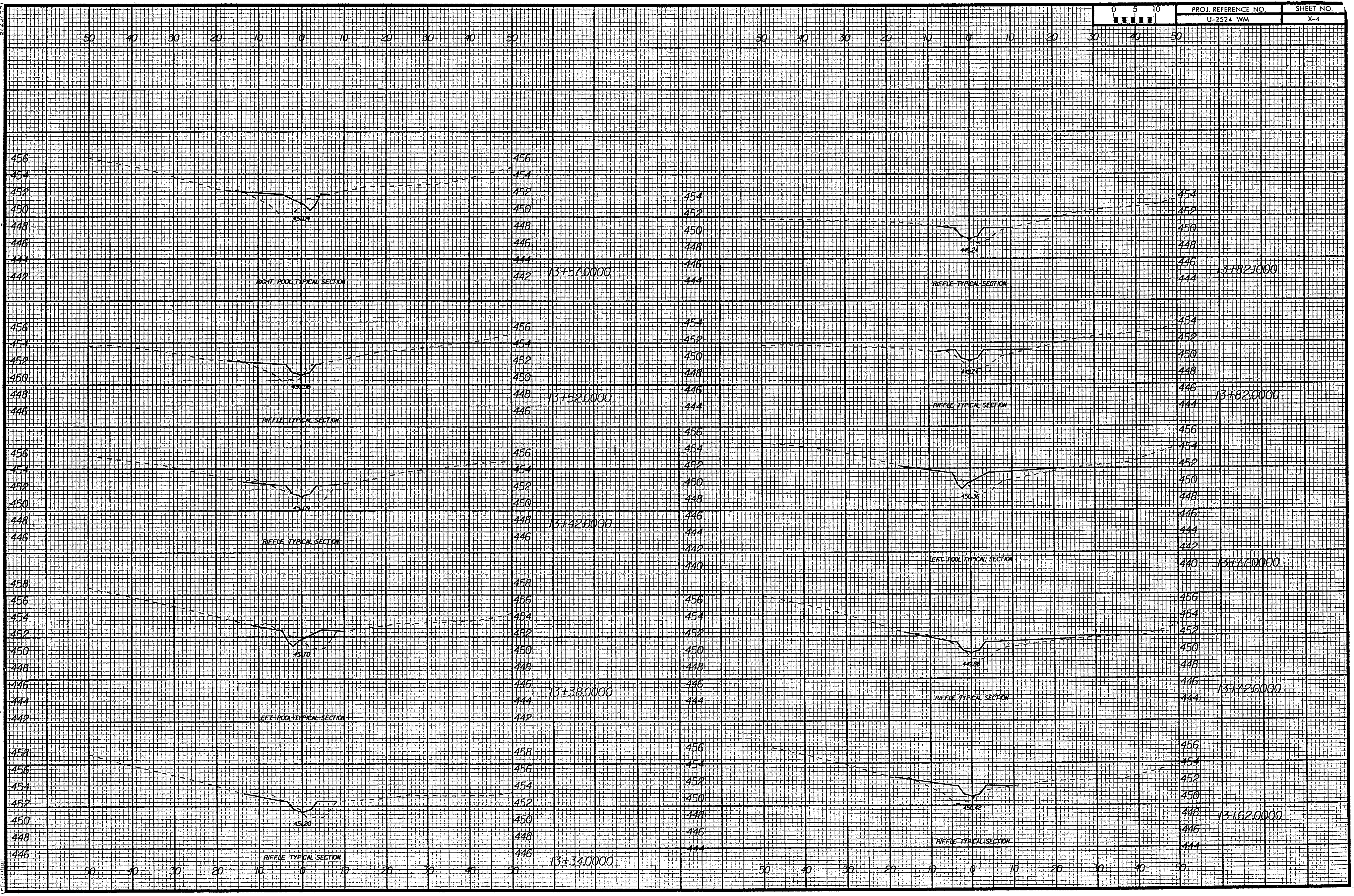
13+21.0000

13+11.0000

13+12.0000

13+00.0000

12+95.0000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U-2524 WM
SHEET NO.
X-4
0 5 10
8/23/99
13+57.0000
RIGHT POOL TYPICAL SECTION
13+52.0000
RIFFLE TYPICAL SECTION
13+42.0000
RIFFLE TYPICAL SECTION
13+38.0000
LEFT POOL TYPICAL SECTION
13+34.0000
RIFFLE TYPICAL SECTION
13+82.1000
RIFFLE TYPICAL SECTION
13+82.0000
RIFFLE TYPICAL SECTION
13+77.0000
LEFT POOL TYPICAL SECTION
13+72.0000
RIFFLE TYPICAL SECTION
13+62.0000
RIFFLE TYPICAL SECTION

PROJ. REFERENCE NO.	SHEET NO.
U-2524 WM	X-5

0 5 10

8/27/99

14+16.0000

RIFFLE TYPICAL SECTION

14+45.0000

RIFFLE TYPICAL SECTION

14+04.1000

RIFFLE TYPICAL SECTION

14+41.0000

RIGHT POOL TYPICAL SECTION

14+04.0000

RIFFLE TYPICAL SECTION

14+37.0000

RIFFLE TYPICAL SECTION

13+98.0000

RIGHT POOL TYPICAL SECTION

14+25.0000

RIFFLE TYPICAL SECTION

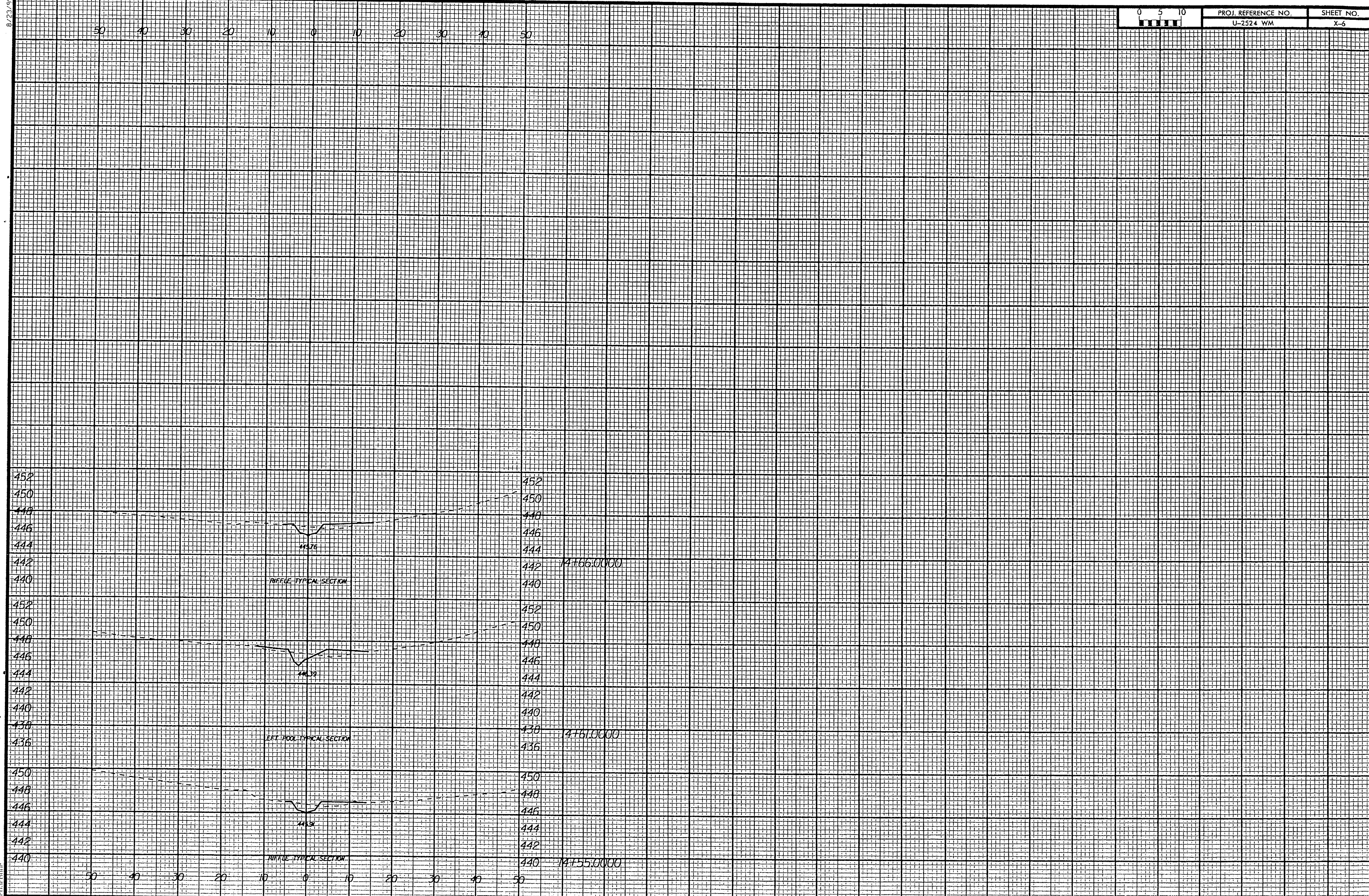
13+94.0000

RIFFLE TYPICAL SECTION

14+21.0000

LEFT POOL TYPICAL SECTION

	PROJ. REFERENCE NO.	SHEET NO.
0 5 10	U-2524 WM	X-6



PROJ. REFERENCE NO.	SHEET NO.
U-2524 WM	X-7

0 5 10

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448 446 444 442 440 438 452 450

RIFFLE TYPICAL SECTION
441.01
20+37.0000

RIFFLE TYPICAL SECTION
441.52
20+22.0000

RIGHT POOL TYPICAL SECTION
441.81
20+17.0000

RIGHT POOL TYPICAL SECTION
441.80
20+12.0000

RIFFLE TYPICAL SECTION
441.56
20+00.0000

RIFFLE TYPICAL SECTION
441.44
20+72.0000

RIGHT POOL TYPICAL SECTION
441.87
20+67.0000

RIFFLE TYPICAL SECTION
441.51
20+61.0000

RIFFLE TYPICAL SECTION
441.01
20+44.0000

LEFT POOL TYPICAL SECTION
441.29
20+41.0000

50 40 30 20 10 0 10 20 30 40 50

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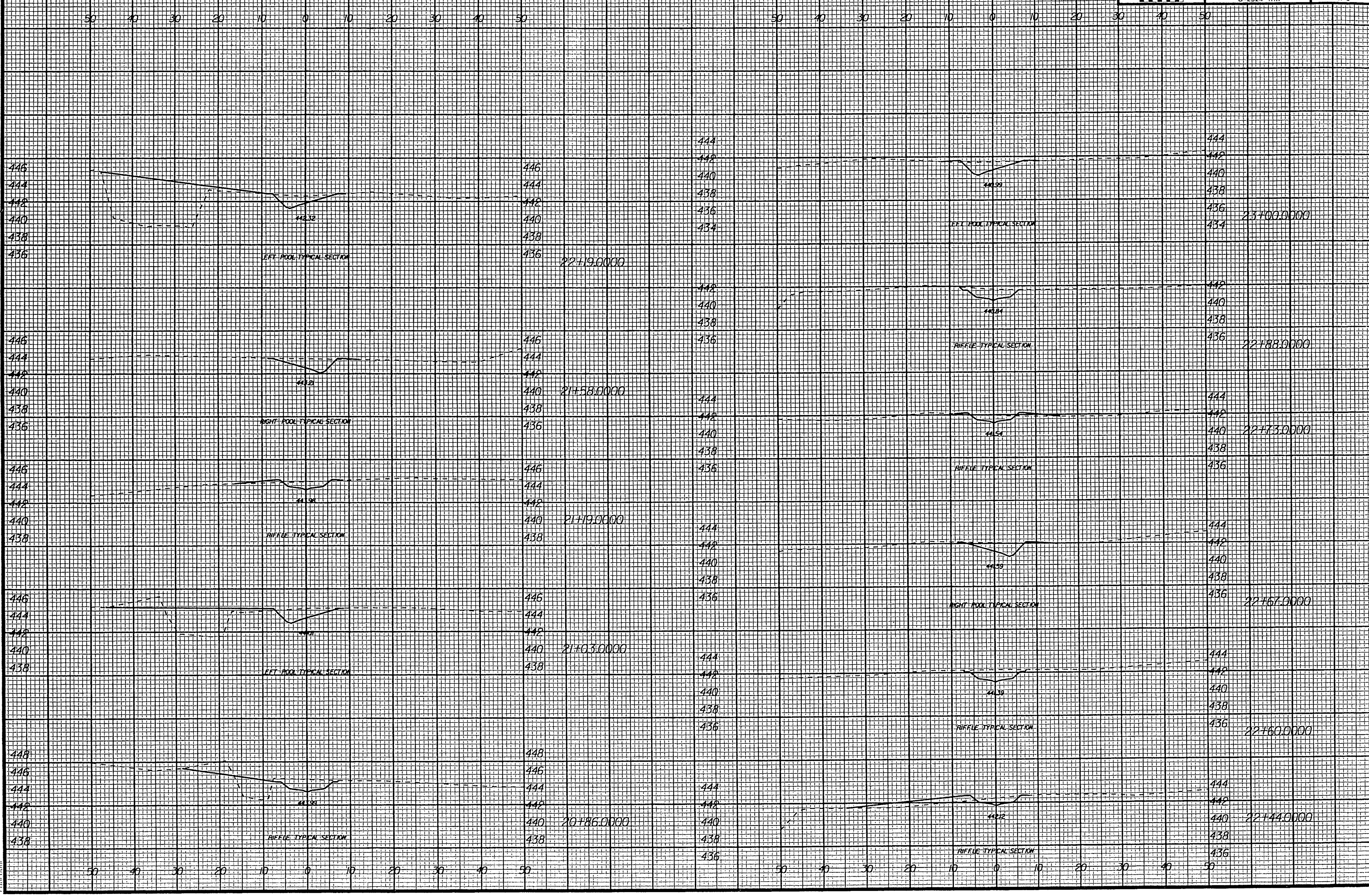
kimdaugh

PROJ. REFERENCE NO.	SHEET NO.
U-2524 WM	X-8



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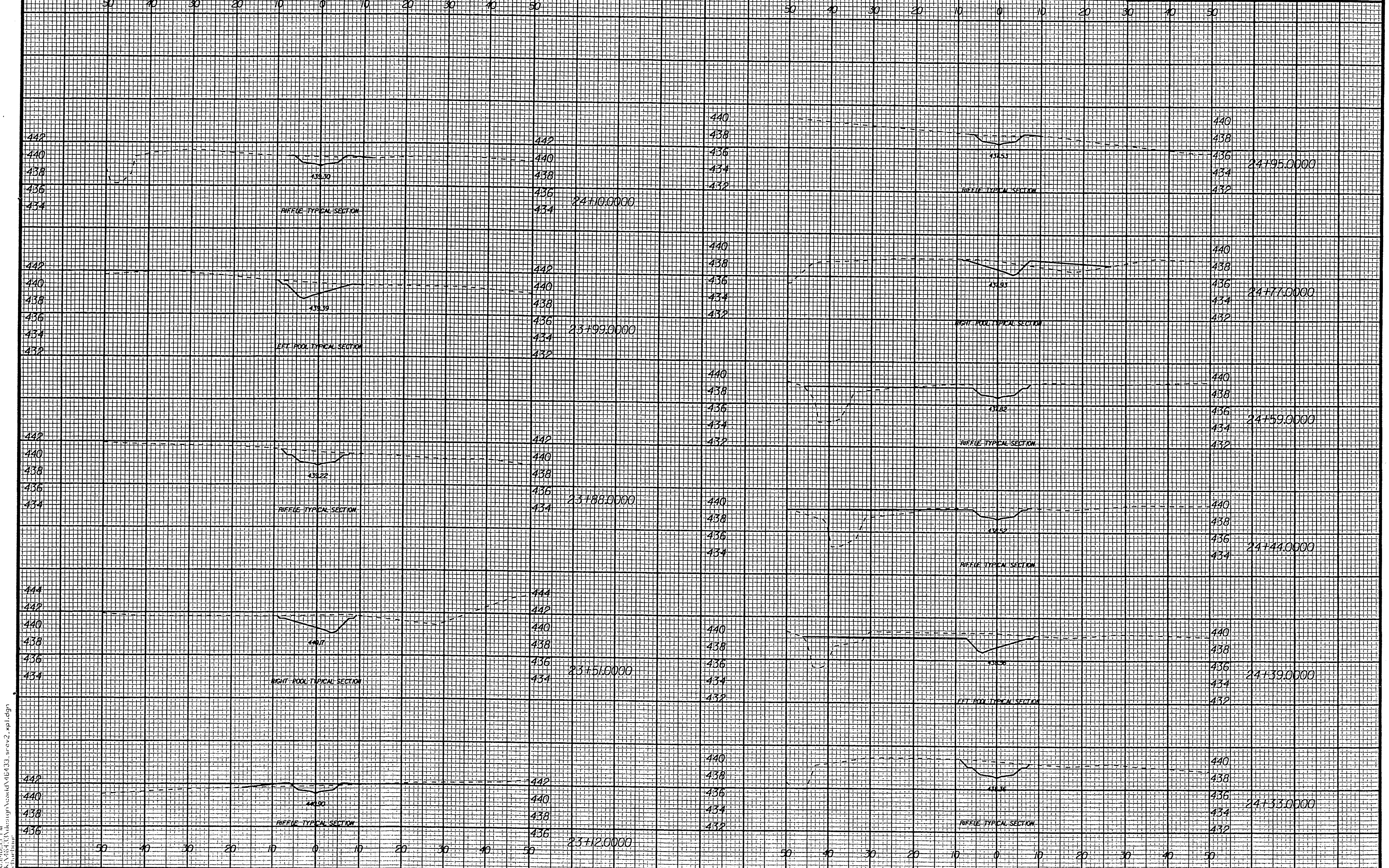
U-2524 WM	X-9



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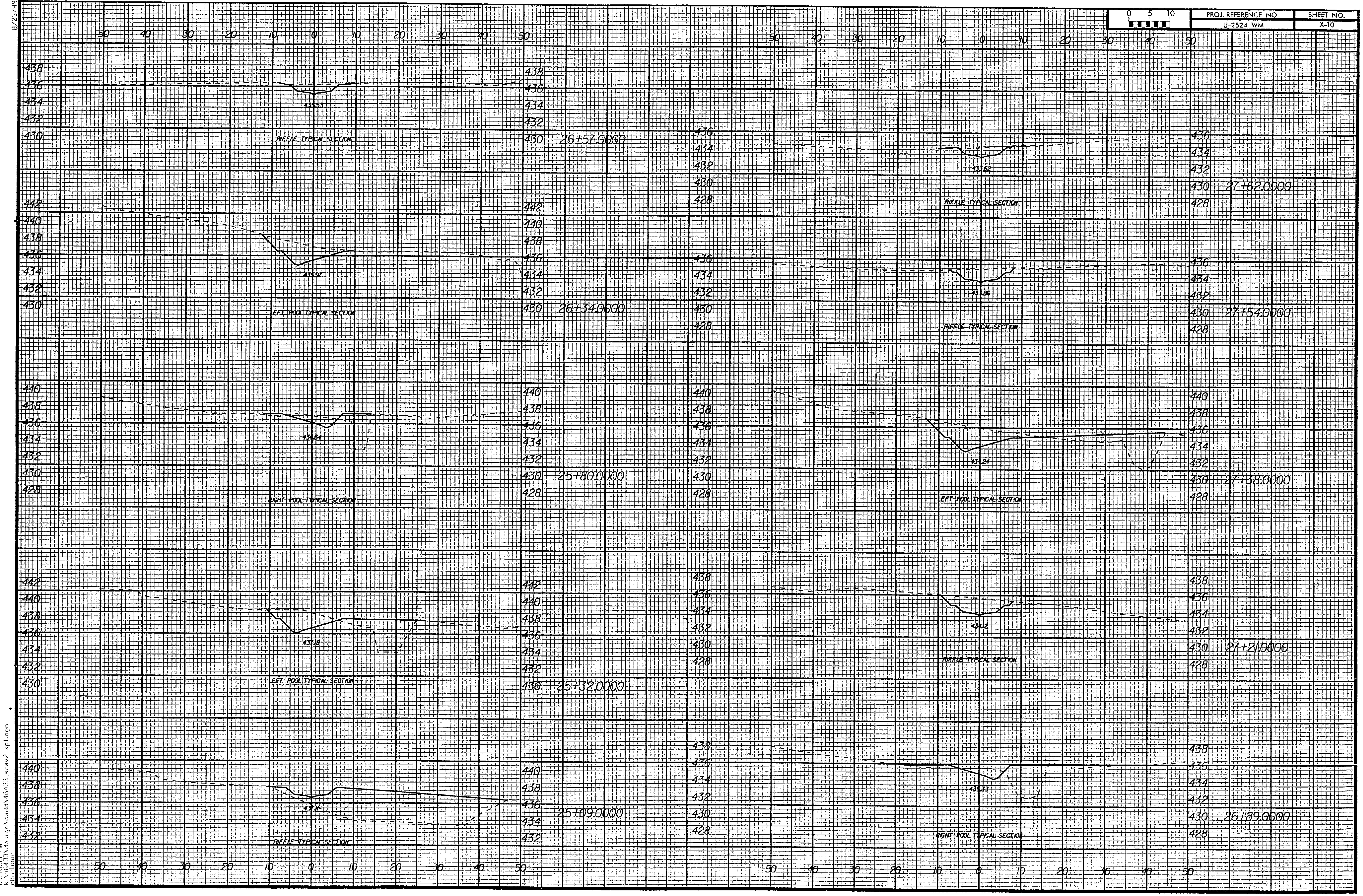

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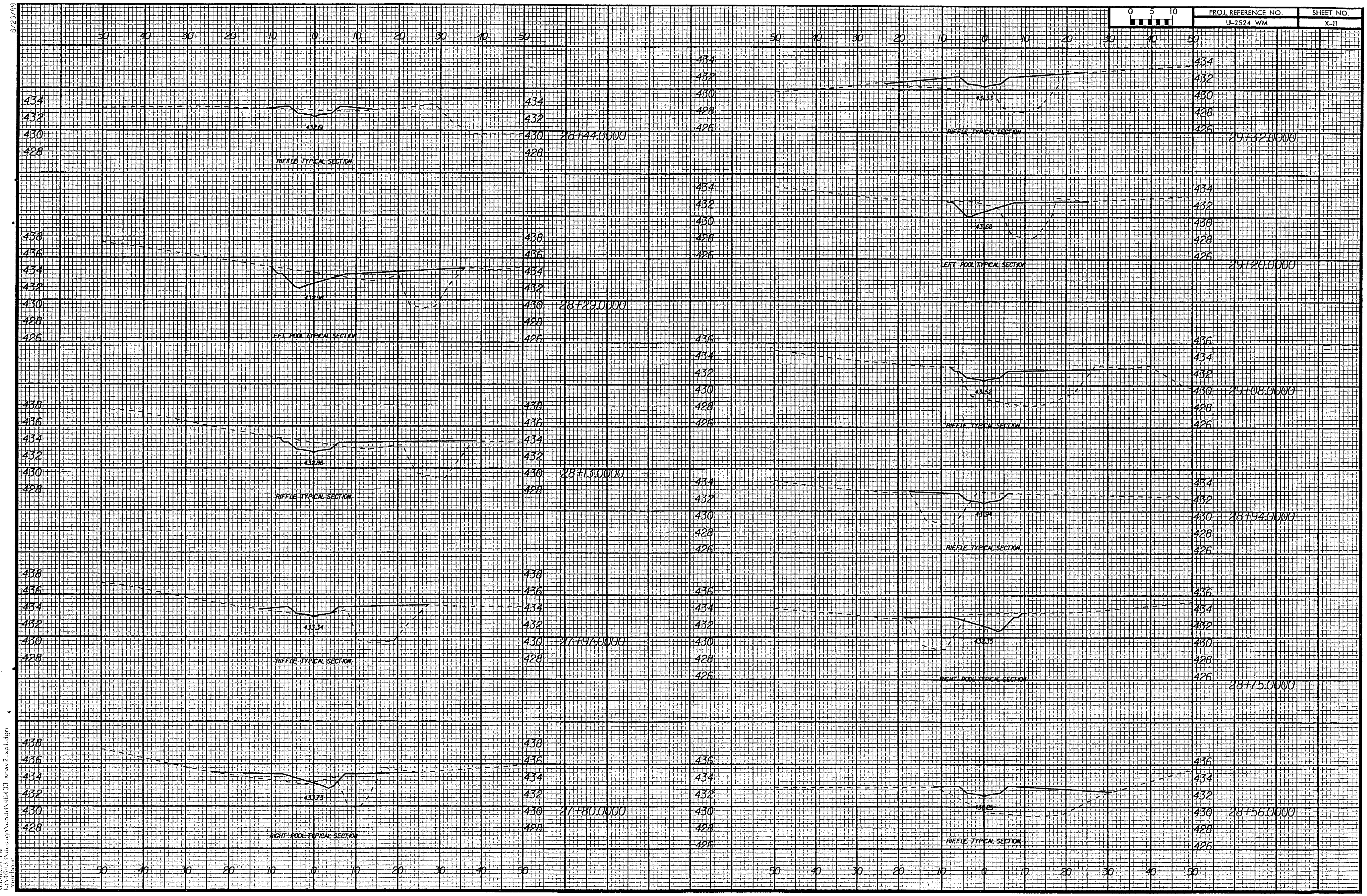
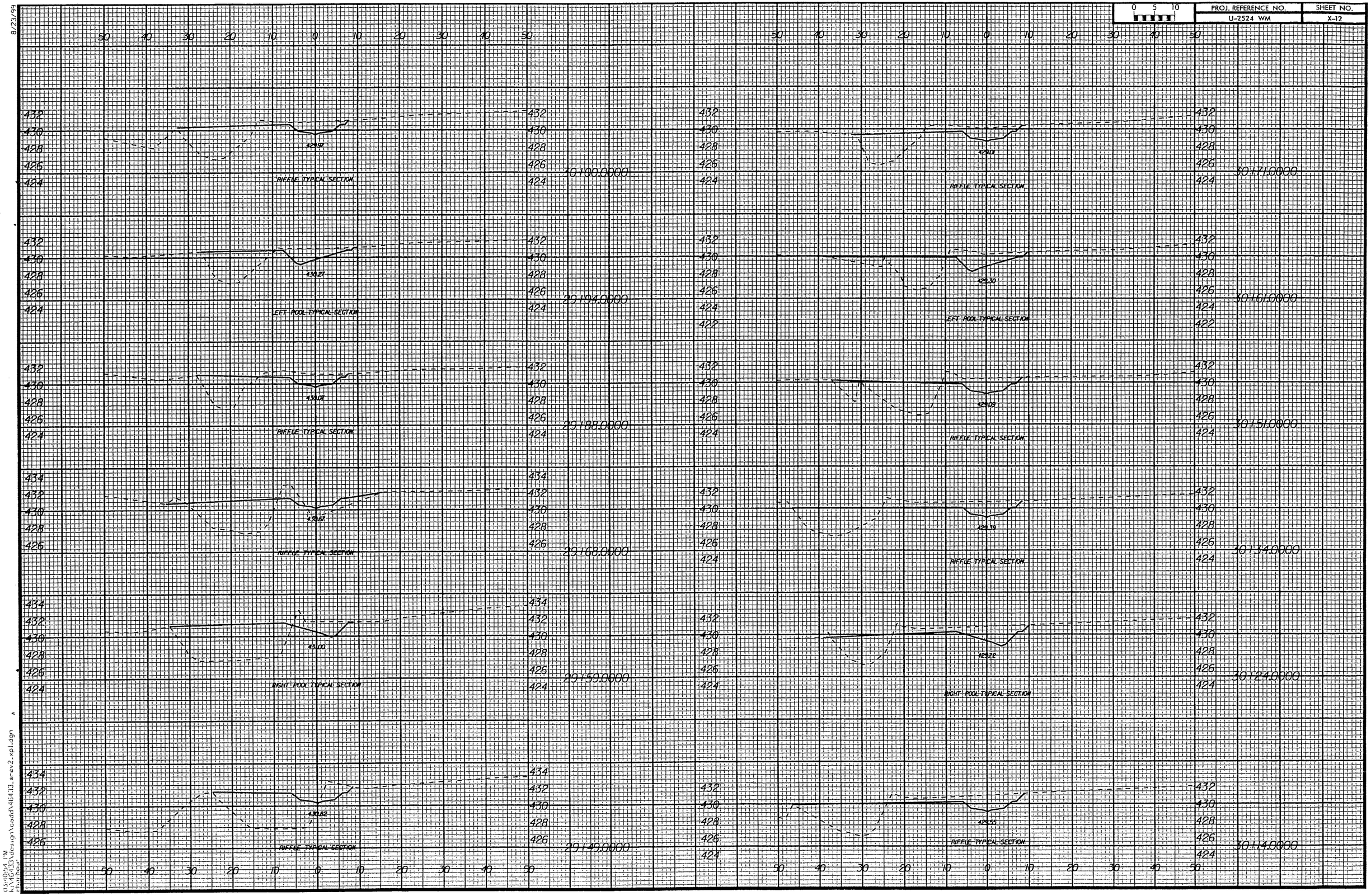

PROJ. REFERENCE NO.
U-2524 WM
SHEET NO.
X-11
28+44.0000
RIFFLE TYPICAL SECTION
28+29.0000
LEFT POOL TYPICAL SECTION
28+13.0000
RIFFLE TYPICAL SECTION
27+97.0000
RIFFLE TYPICAL SECTION
27+80.0000
RIGHT POOL TYPICAL SECTION
29+32.0000
RIFFLE TYPICAL SECTION
29+20.0000
LEFT POOL TYPICAL SECTION
29+08.0000
RIFFLE TYPICAL SECTION
28+94.0000
RIFFLE TYPICAL SECTION
28+75.0000
RIGHT POOL TYPICAL SECTION
28+56.0000
RIFFLE TYPICAL SECTION
8/23/99

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-2524 WM	X-12



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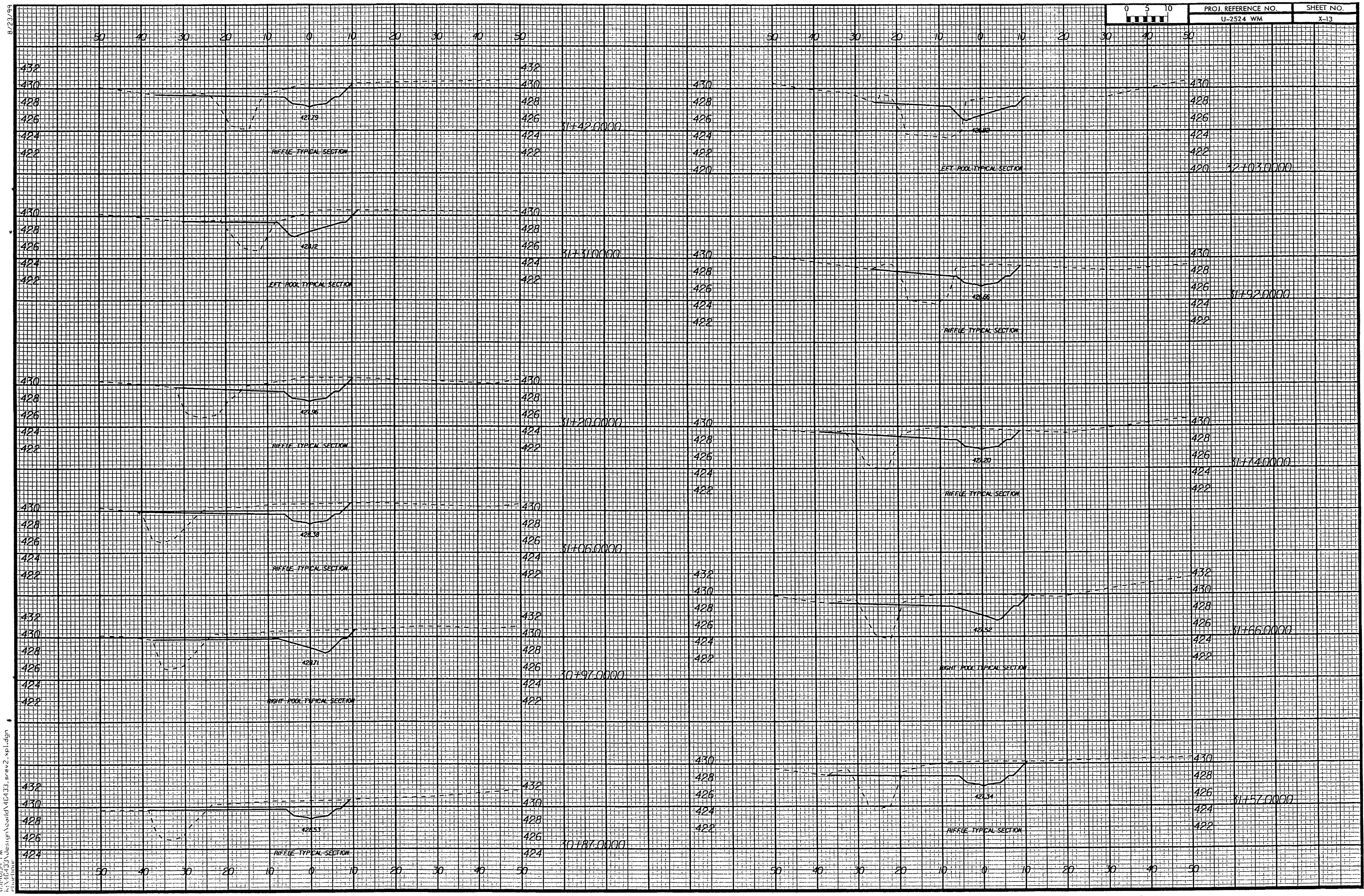
rhinehour

8/23/99



PROJ. REFERENCE NO.
U-2524 WM
SHEET NO.
X-13
0 5 10
31+42.0000
RIFFLE TYPICAL SECTION
427.79
31+31.0000
LEFT POOL TYPICAL SECTION
31+20.0000
RIFFLE TYPICAL SECTION
427.96
31+06.0000
RIFFLE TYPICAL SECTION
428.38
30+97.0000
RIGHT POOL TYPICAL SECTION
427.71
30+87.0000
RIFFLE TYPICAL SECTION
428.53
32+03.0000
LEFT POOL TYPICAL SECTION
31+92.0000
RIFFLE TYPICAL SECTION
426.66
31+74.0000
RIFFLE TYPICAL SECTION
427.20
31+66.0000
RIGHT POOL TYPICAL SECTION
427.52
31+57.0000
RIFFLE TYPICAL SECTION
427.34

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rthurbour

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-2524 WM	X-14

RIFFLE TYPICAL SECTION

42499

32+88.0000

RIGHT POOL TYPICAL SECTION

42496

33+46.0000

RIFFLE TYPICAL SECTION

42495

32+66.0000

RIGHT POOL TYPICAL SECTION

42495

33+34.0000

RIGHT POOL TYPICAL SECTION

42503

32+50.0000

RIFFLE TYPICAL SECTION

42499

33+10.0000

RIFFLE TYPICAL SECTION

42498

32+33.0000

RIFFLE TYPICAL SECTION

42491

33+10.0000

RIFFLE TYPICAL SECTION

42498

32+14.0000

RIFFLE TYPICAL SECTION

42495

32+99.0000

LEFT POOL TYPICAL SECTION

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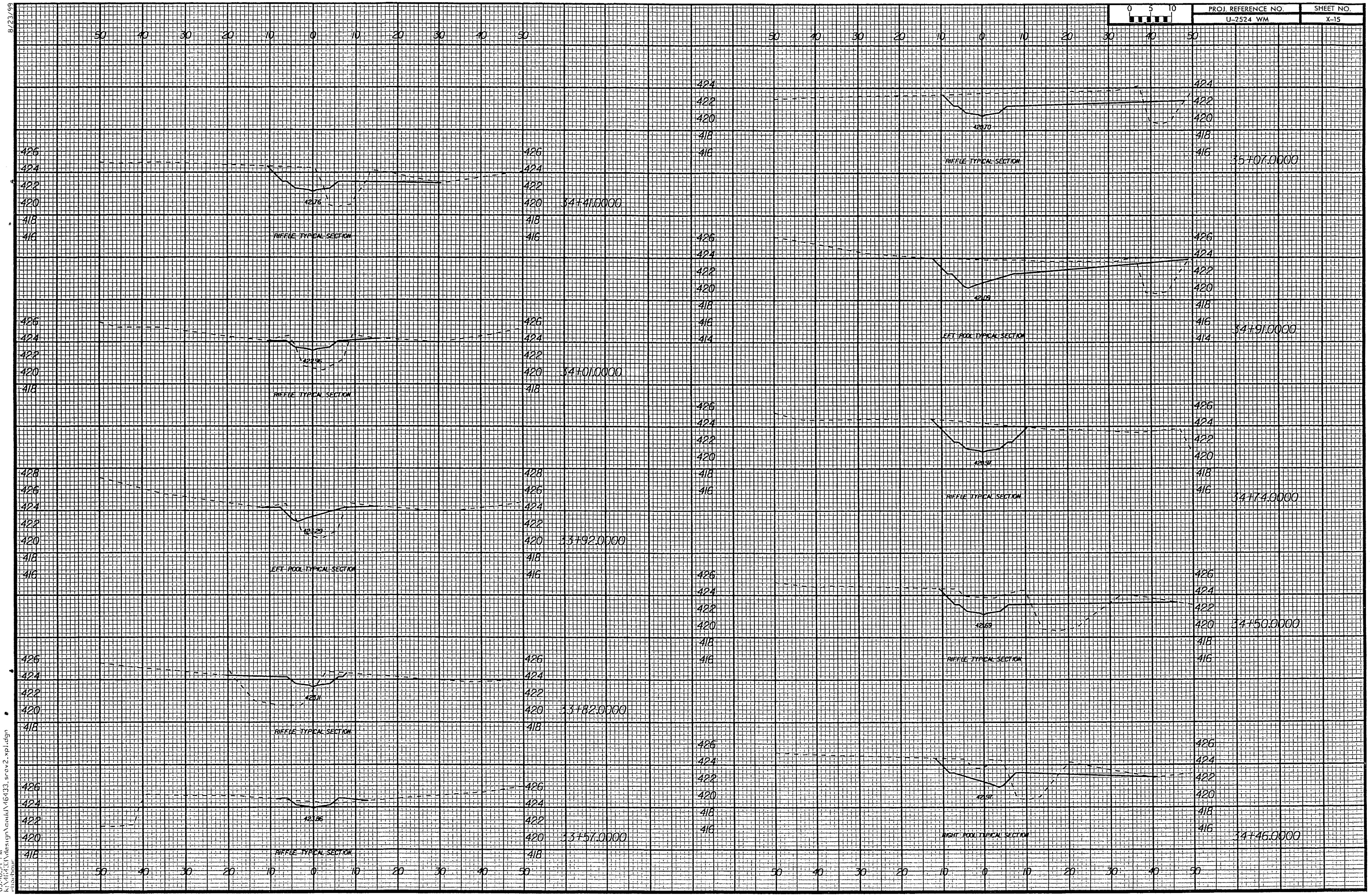
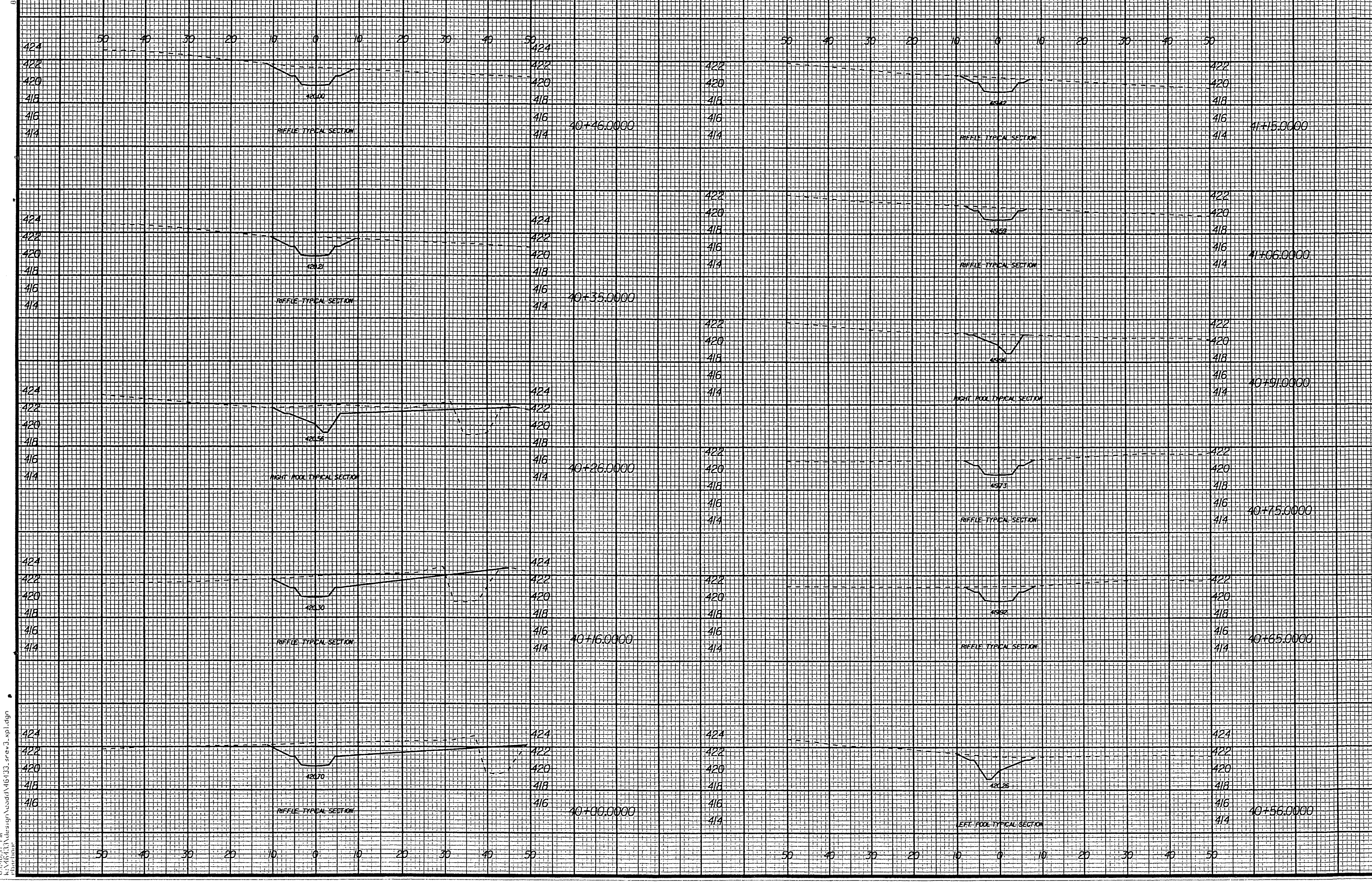
rhartman

PROJ. REFERENCE NO.	SHEET NO.
U-2524 WM	X-15


35+07.0000
RIFFLE TYPICAL SECTION
420.70
34+91.0000
LEFT POOL TYPICAL SECTION
421.09
34+74.0000
RIFFLE TYPICAL SECTION
420.91
34+50.0000
RIFFLE TYPICAL SECTION
421.69
34+46.0000
RIGHT POOL TYPICAL SECTION
421.91
34+41.0000
RIFFLE TYPICAL SECTION
421.76
34+01.0000
RIFFLE TYPICAL SECTION
422.96
33+92.0000
LEFT POOL TYPICAL SECTION
422.29
33+82.0000
RIFFLE TYPICAL SECTION
423.11
33+57.0000
RIFFLE TYPICAL SECTION
423.86

8/23/99

PROJ. REFERENCE NO.	SHEET NO.
U-2524 WM	X-16



0 5 10
40+46.0000
RIFFLE TYPICAL SECTION
420.00
40+35.0000
RIFFLE TYPICAL SECTION
420.21
40+26.0000
RIGHT POOL TYPICAL SECTION
420.56
40+16.0000
RIFFLE TYPICAL SECTION
420.30
40+00.0000
RIFFLE TYPICAL SECTION
420.70
41+15.0000
RIFFLE TYPICAL SECTION
41+06.0000
RIFFLE TYPICAL SECTION
40+91.0000
RIGHT POOL TYPICAL SECTION
40+75.0000
RIFFLE TYPICAL SECTION
40+65.0000
RIFFLE TYPICAL SECTION
40+56.0000
LEFT POOL TYPICAL SECTION
420.26

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-2524 WM	X-17

11/21/95

50 40 30 20 10 0 10 20 30 40 50

422 420 418 416 414

41+72.0000

41.84

RIFFLE TYPICAL SECTION

41+59.0000

41.93

RIFFLE TYPICAL SECTION

41+49.0000

41.94

MOIST POOL TYPICAL SECTION

41+39.0000

41.98

RIFFLE TYPICAL SECTION

41+30.0000

41.95

RIFFLE TYPICAL SECTION

424 422 420 418 416 414

41+22.5000

41.98

LEFT POOL TYPICAL SECTION

50 40 30 20 10 0 10 20 30 40 50

422 420 418 416 414 412

42+37.0000

41.82

RIFFLE TYPICAL SECTION

42+27.0000

41.81

RIFFLE TYPICAL SECTION

42+16.0000

41.76

MOIST POOL TYPICAL SECTION

42+05.0000

41.83

RIFFLE TYPICAL SECTION

41+93.0000

41.87

RIFFLE TYPICAL SECTION

422 420 418 416 414 412

41+82.5000

41.93

LEFT POOL TYPICAL SECTION

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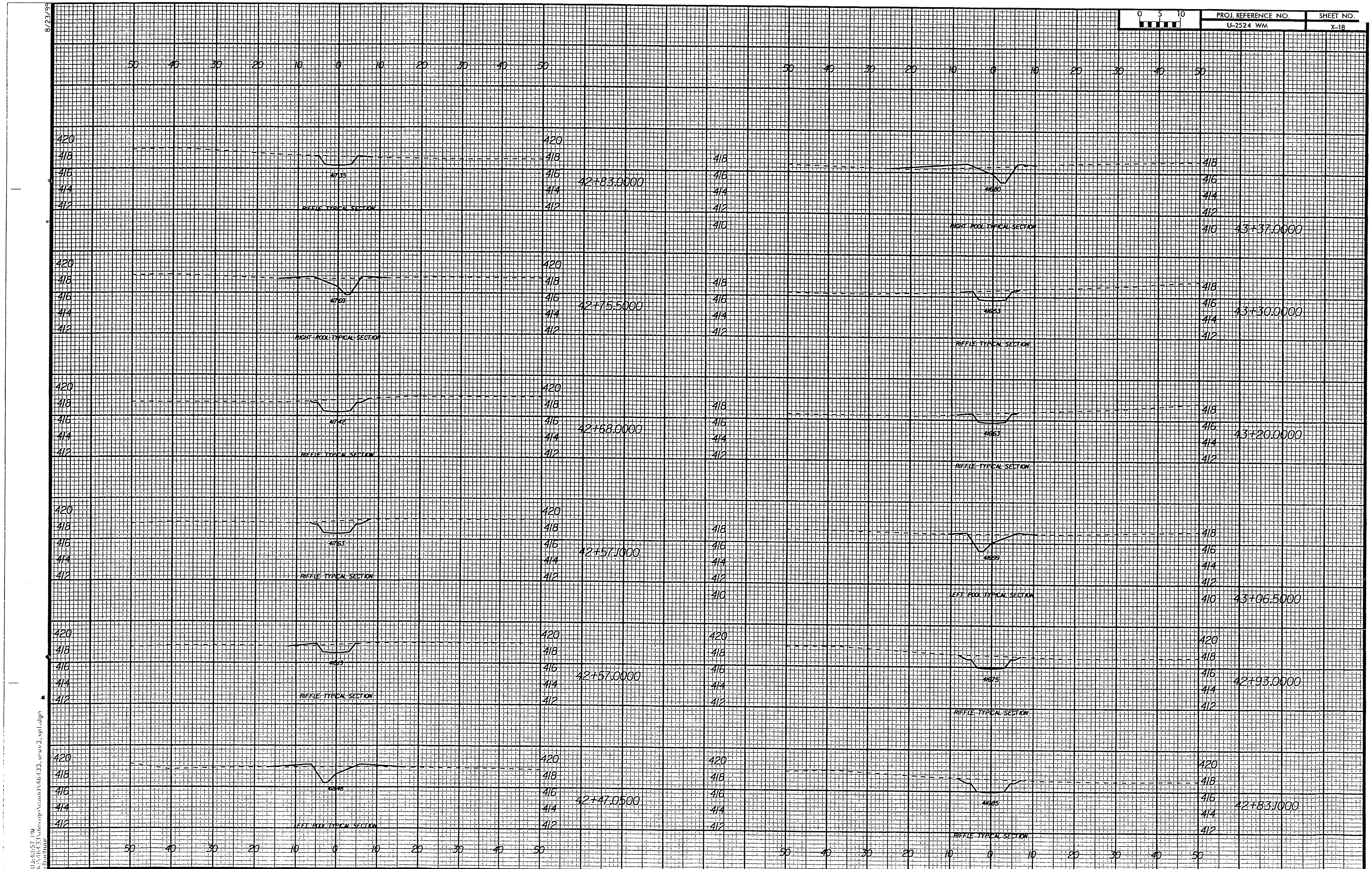
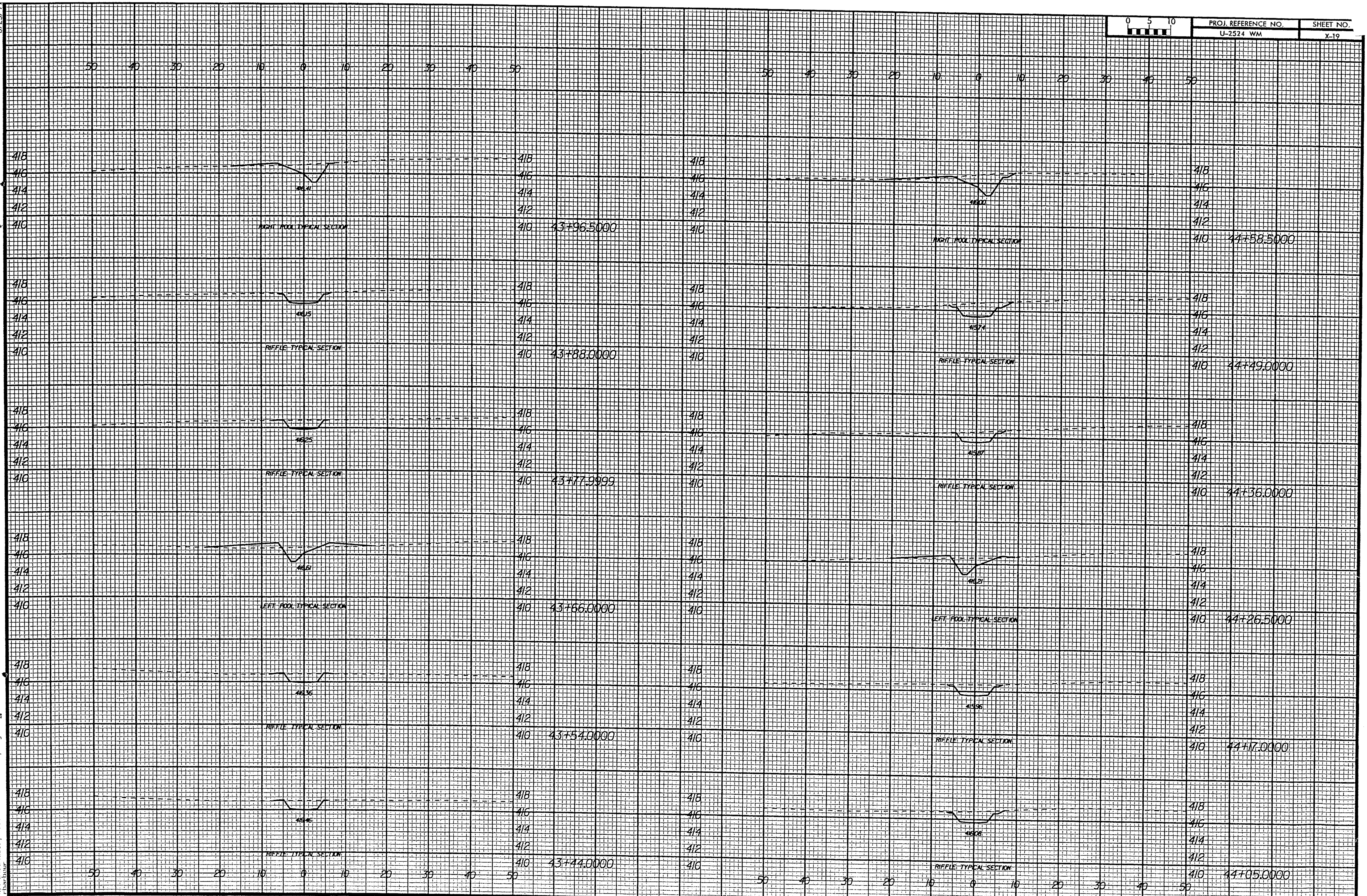


PROJ. REFERENCE NO.
U-2524 WM
SHEET NO.
X-18
0 5 10
8/23/99
42+83.0000
RIFFLE TYPICAL SECTION
42+75.5000
RIGHT POOL TYPICAL SECTION
42+68.0000
RIFFLE TYPICAL SECTION
42+57.1000
RIFFLE TYPICAL SECTION
42+57.0000
RIFFLE TYPICAL SECTION
42+47.0500
LEFT POOL TYPICAL SECTION
43+37.0000
RIGHT POOL TYPICAL SECTION
43+30.0000
RIFFLE TYPICAL SECTION
43+20.0000
RIFFLE TYPICAL SECTION
43+06.5000
LEFT POOL TYPICAL SECTION
42+93.0000
RIFFLE TYPICAL SECTION
42+83.1000
RIFFLE TYPICAL SECTION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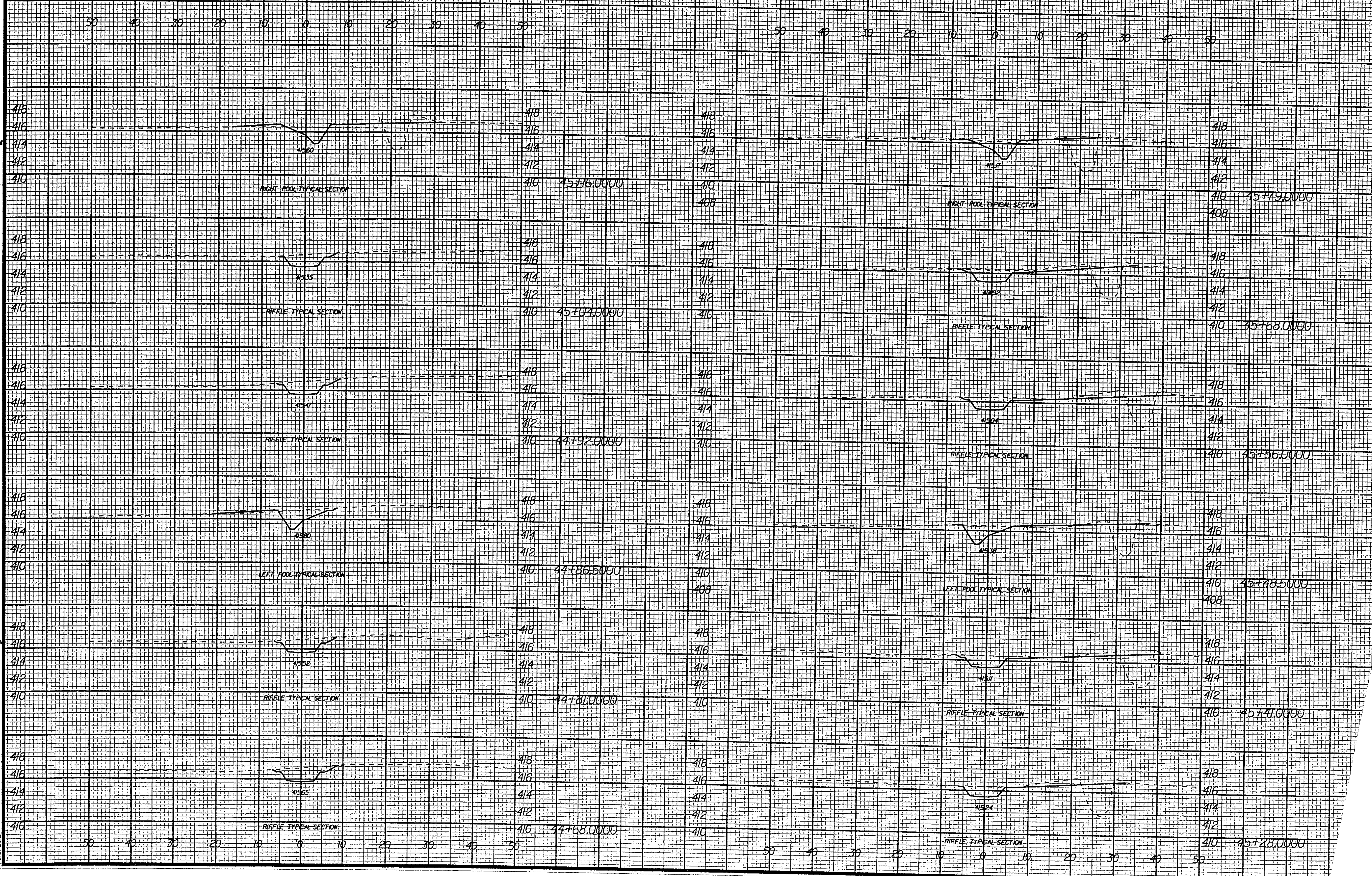
PROJ. REFERENCE NO.
U-2524 WM
SHEET NO.
X-19
RIGHT POOL TYPICAL SECTION
43+96.5000
RIFFLE TYPICAL SECTION
43+88.0000
RIFFLE TYPICAL SECTION
43+77.9999
LEFT POOL TYPICAL SECTION
43+66.0000
RIFFLE TYPICAL SECTION
43+54.0000
RIFFLE TYPICAL SECTION
43+44.0000
RIGHT POOL TYPICAL SECTION
44+58.5000
RIFFLE TYPICAL SECTION
44+49.0000
RIFFLE TYPICAL SECTION
44+36.0000
LEFT POOL TYPICAL SECTION
44+26.5000
RIFFLE TYPICAL SECTION
44+17.0000
RIFFLE TYPICAL SECTION
44+05.0000

PROJ. REFERENCE NO.	SHEET NO.
U-2524 WM	X-20



45+16.0000
RIGHT POOL TYPICAL SECTION
415.60
45+19.0000
RIGHT POOL TYPICAL SECTION
415.17
45+04.0000
RIFFLE TYPICAL SECTION
415.35
45+68.0000
RIFFLE TYPICAL SECTION
414.92
44+92.0000
RIFFLE TYPICAL SECTION
415.47
45+56.0000
RIFFLE TYPICAL SECTION
415.04
44+86.5000
LEFT POOL TYPICAL SECTION
415.80
45+48.5000
LEFT POOL TYPICAL SECTION
415.38
44+81.0000
RIFFLE TYPICAL SECTION
415.52
45+41.0000
RIFFLE TYPICAL SECTION
415.11
44+68.0000
RIFFLE TYPICAL SECTION
415.65
45+28.0000
RIFFLE TYPICAL SECTION
415.24

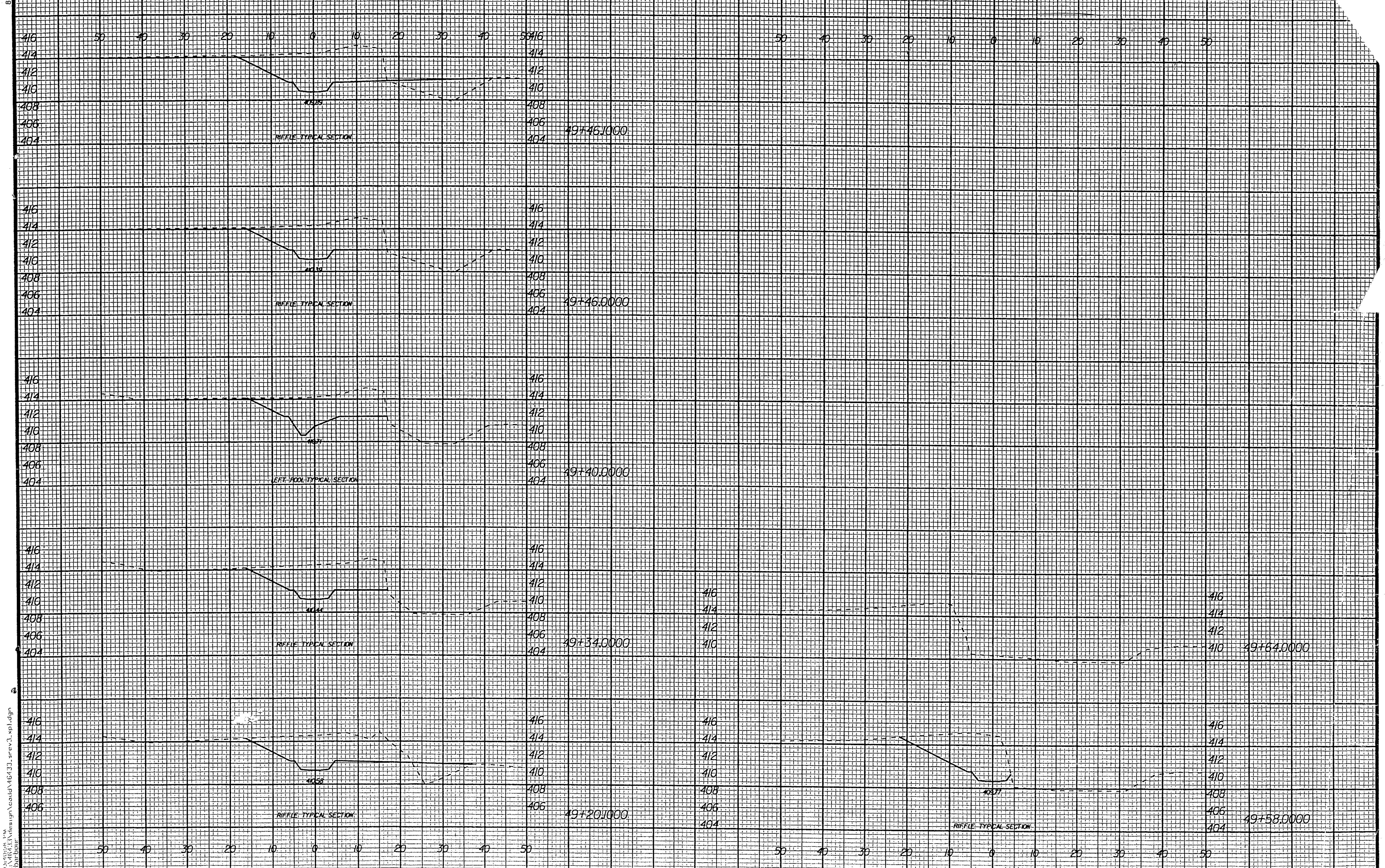
SHEET NO	PROJ. REFERENCE NO.	0 5 10
X-21	U-2524 WM	

8/23/99

RIFFLE TYPICAL SECTION
RIGHT POOL TYPICAL SECTION
LEFT POOL TYPICAL SECTION
48+82.0000
48+87.0000
48+92.0000
48+98.0000
49+04.0000
49+09.0500
48+46.0500
48+55.0000
48+55.1000
48+66.0000
48+76.5500
48+82.0000
48+87.0000
48+92.0000
48+98.0000
49+04.0000
49+09.0500
406
408
410
412
414
416
0
10
20
30
40
50
0 5 10
PROJ. REFERENCE NO.
U-2524 WM
SHEET NO.
X-23
8/23/99

0 5 10	PROJ. REFERENCE NO.
	U-2524 WM

8/23/99



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rbarbour