

9/09/09

CONTRACT: 6300016248 TIP PROJECT: R-2719A

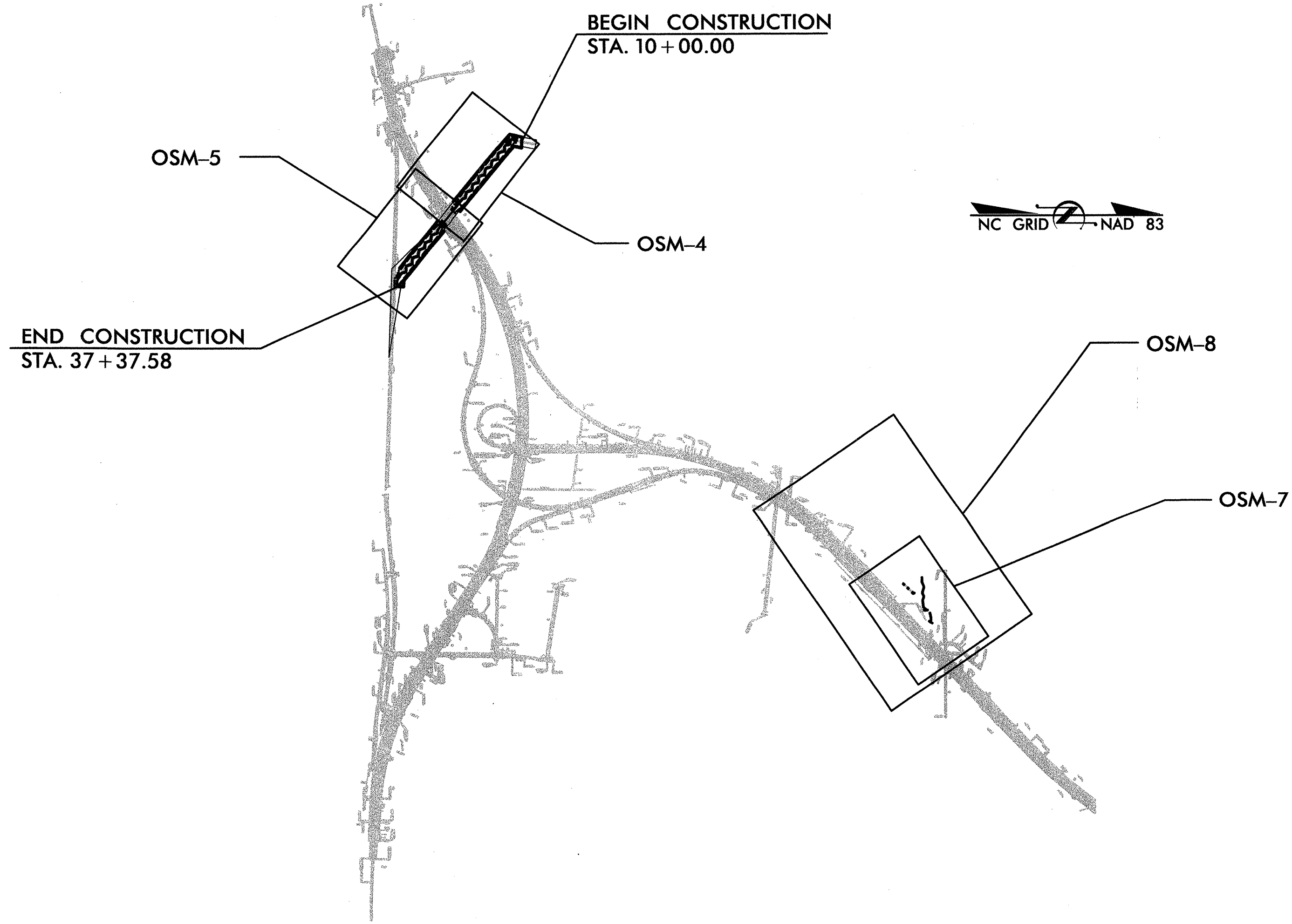
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

LENOIR COUNTY

LOCATION: UT TO FALLING CREEK AND WETLAND
AREA SOUTH OF BANKS SCHOOL RD.

TYPE OF WORK: ON-SITE MITIGATION

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2719A	OSM-1	17
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	



GRAPHIC SCALES

50 0 100
PLANS

2.5 0 5
PROFILE (HORIZONTAL)

0.5 0 1
PROFILE (VERTICAL)

PROJECT LENGTH

Prepared In the Office of:
Baker
Baker Engineering NY, Inc.
8000 Regency Parkway
Suite 200
Cary, NORTH CAROLINA 27518
Phone: 919.463.5488
Fax: 919.463.5490

2002 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: _____

LETTING DATE: _____

PROJECT ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: _____ P.E.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

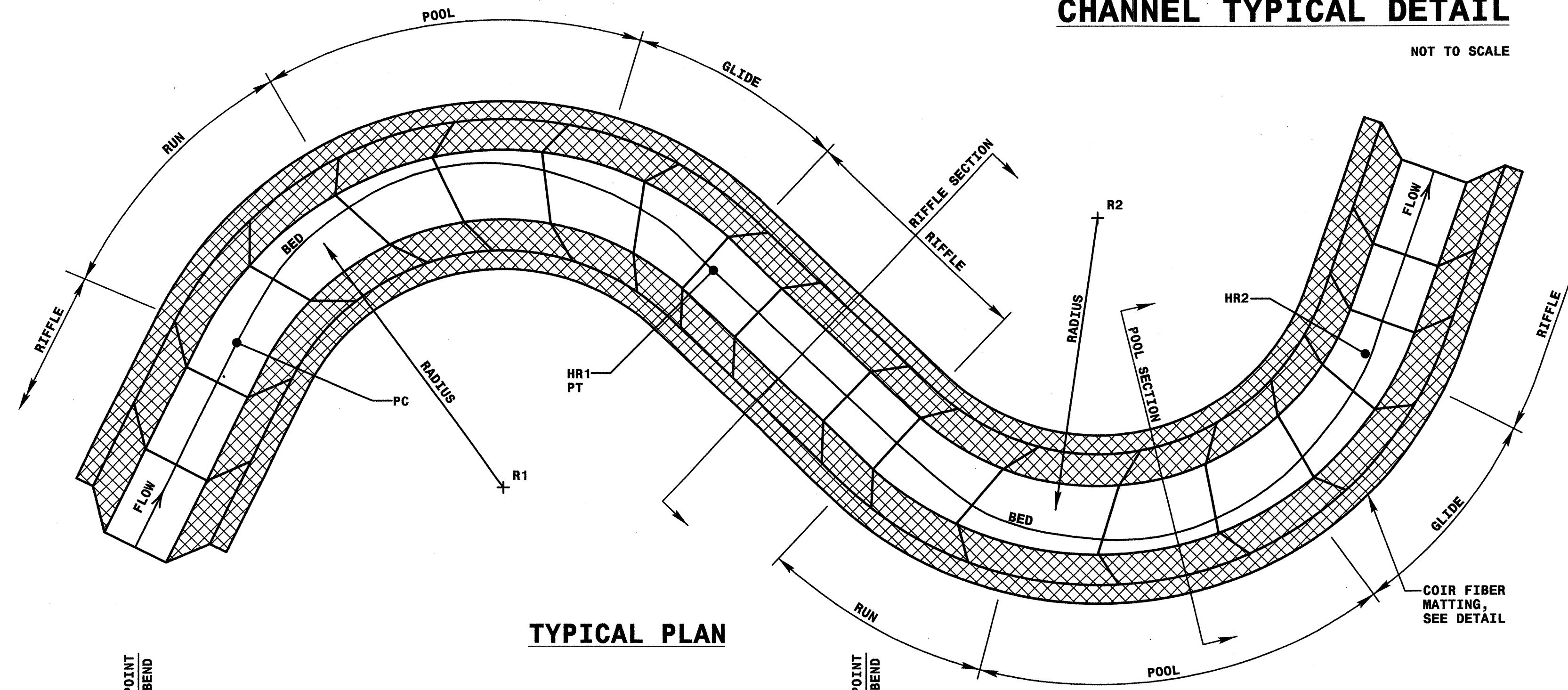
STATE DESIGN ENGINEER P.E.

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED _____
DIVISION ADMINISTRATOR DATE

CHANNEL TYPICAL DETAIL

NOT TO SCALE

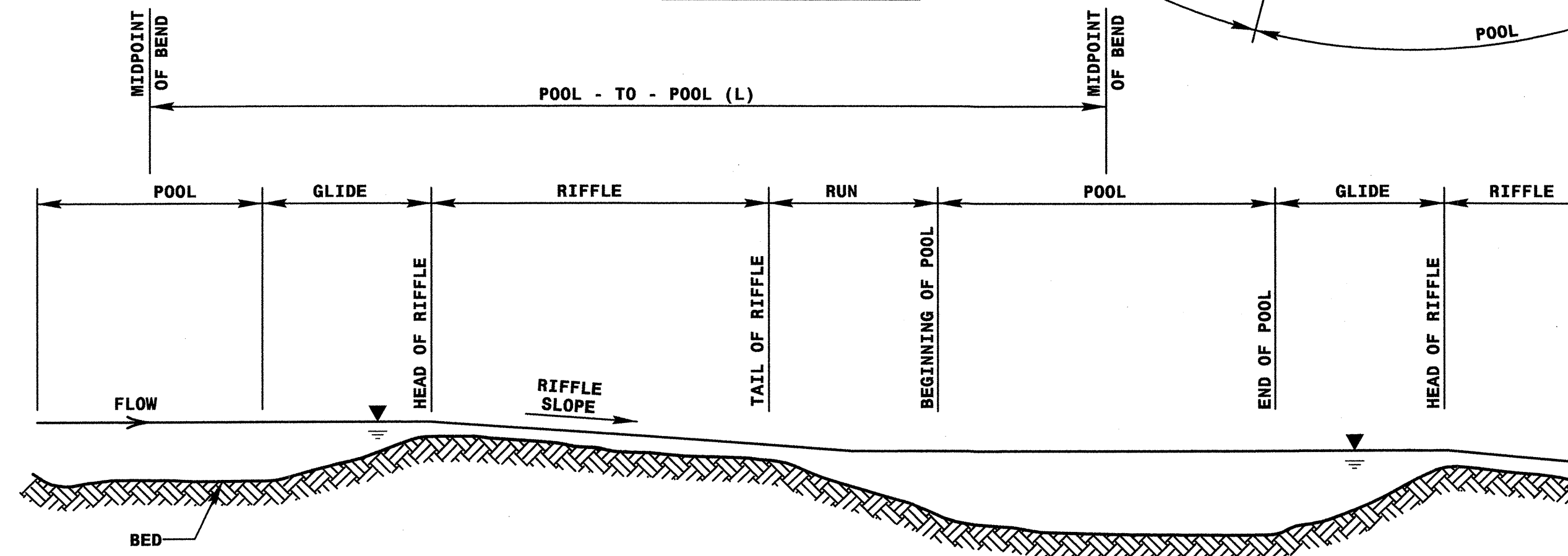


TYPICAL PLAN

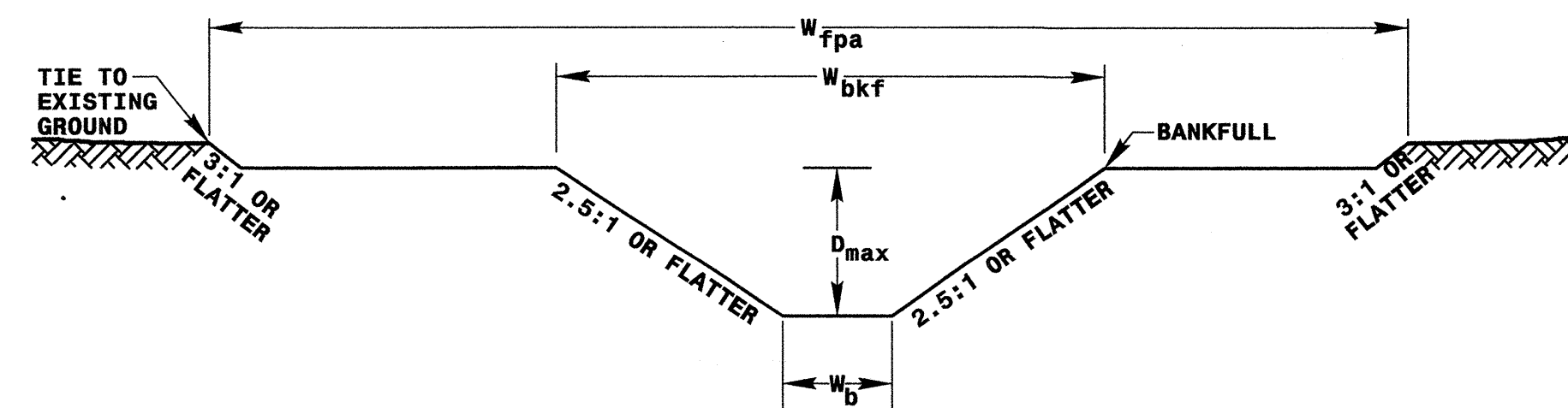
W_{bkf} = BANKFULL WIDTH
 D_{max} = MAXIMUM DEPTH
 W_b = BOTTOM WIDTH
 W_{fpa} = FLOOD PRONE AREA WIDTH

NOTES:
 1. THE COORDINATES FOR EACH CENTER OF RADIUS (EX. "R1", "R2") AND EACH HEAD OF RIFFLE (EX. "HR1", "HR2") ARE INDICATED ON THE PLAN SHEETS.

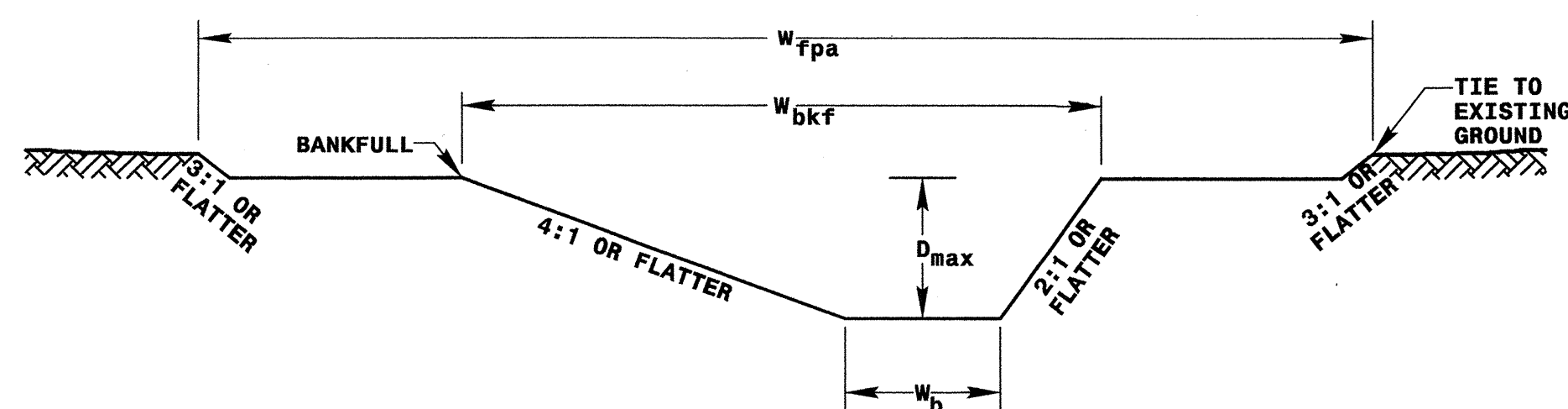
REACH	RIFFLE				POOL				Width/Depth Ratio
	W_{bkf}	D_{max}	W_b	W_{fpa}	W_{bkf}	D_{max}	W_b	W_{fpa}	
Sta. 10+00 - Sta. 22+31.85	9.4	1.3	3.0	80	13.0	2.0	2.0	80	11
Sta. 25+82 - Sta. 37+37.58	9.4	1.3	3.0	80	13.0	2.0	2.0	80	11



TYPICAL PROFILE



TYPICAL RIFFLE WITH BANKFULL BENCH



TYPICAL POOL WITH BANKFULL BENCH

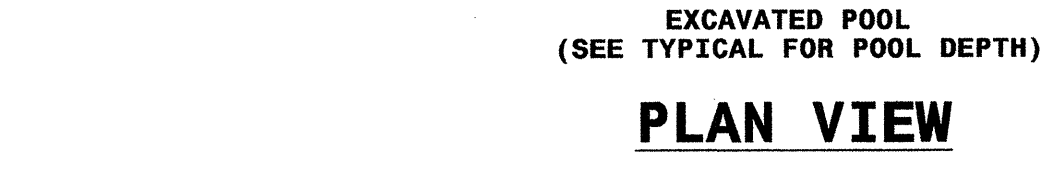
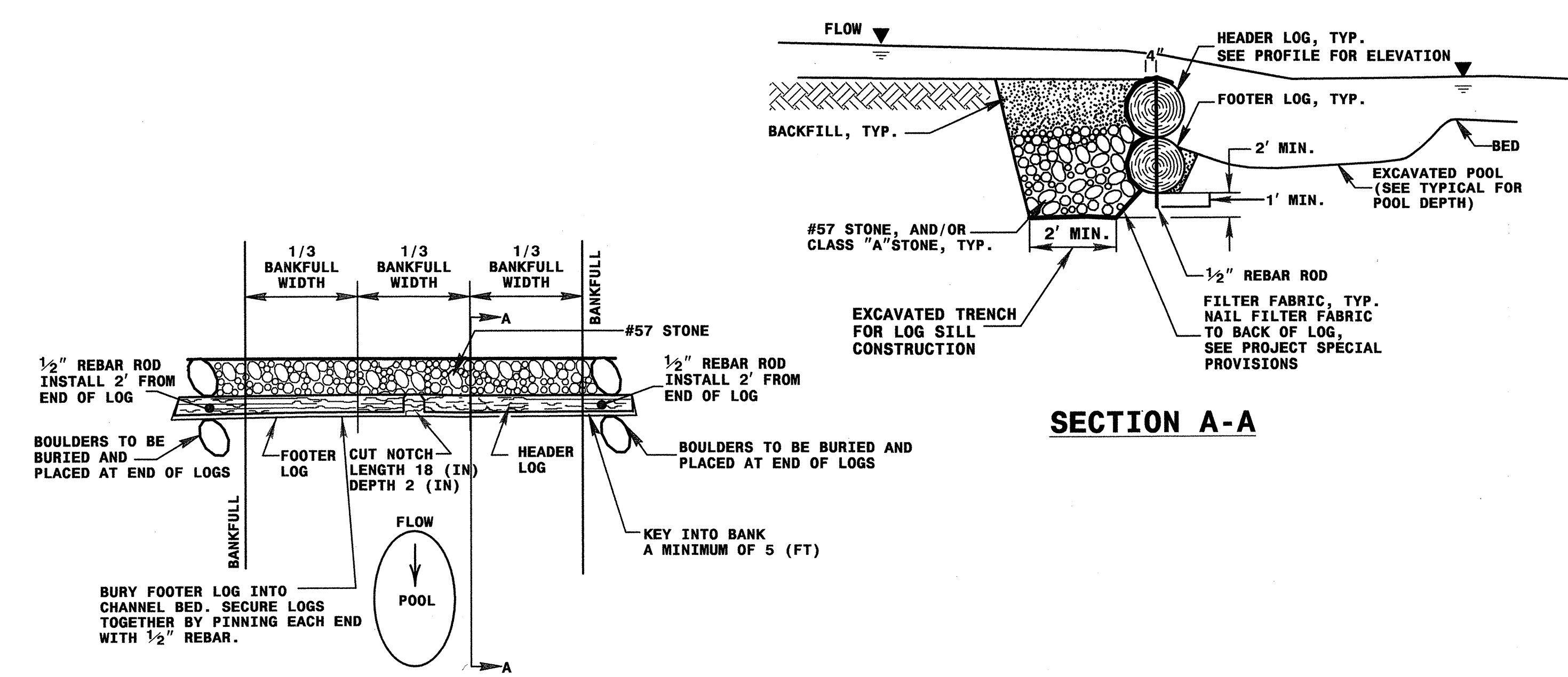
GEOMORPHOLOGICAL TABLE

Variables	Site 1 Proposed Condition	Site 1 Existing Condition	Beaverdam Swamp Reference Condition
stream type	E5	G5	E5/C5
drainage area (sq mi)	0.5	0.5	3.00
bankfull width (ft)	9.4	9.3 - 12.7	18.6
bankfull mean depth (ft)	0.9	0.6 - 0.8	1.4
width/depth ratio	11	11 - 20	14
bankfull cross-sectional area (sq ft)	8.0	7.9 - 8.1	25.3
bankfull mean velocity (ft/sec)	0.6	0.6	0.735
bankfull discharge (cu ft/sec)	5.0	5.0	18.6
bankfull max depth (ft)	1.3	1.5	2.3
width of floodprone area (ft)	80	15	>100
entrenchment ratio	8.5	1.3	>10
meander length (ft)	92 - 125	NA	92 - 125
radius of curvature (ft)	22 - 30	NA	30 - 40
ratio of radius of curvature to bankfull width	2.3 - 3.2	NA	1.8 - 2.4
belt width (ft)	50	NA	49 - 105
meander width ratio	5.3	NA	2.9 - 6.3
sinuosity (stream length/valley length)	1.2	1.1	1.66
valley slope	0.0006	0.0006	0.0007
average slope	0.0005	0.0005	0.0004
pool slope	0.00001	NA	0.00001
ratio of pool slope to average slope	0.02	NA	0.025
maximum pool depth (ft)	2.0	NA	3.3
ratio of pool depth to average bankfull depth	2.2	NA	2.4
pool width (ft)	13.0	NA	15.2
ratio of pool width to bankfull width	1.4	NA	0.8
pool to pool spacing (ft)	39 - 86	NA	100
ratio of pool to pool spacing to bankfull width	4.1 - 9.1	NA	5.4
ratio of lowest bank height to bankfull height	1.0	NA	1.0

8/17/99

REVISIONS

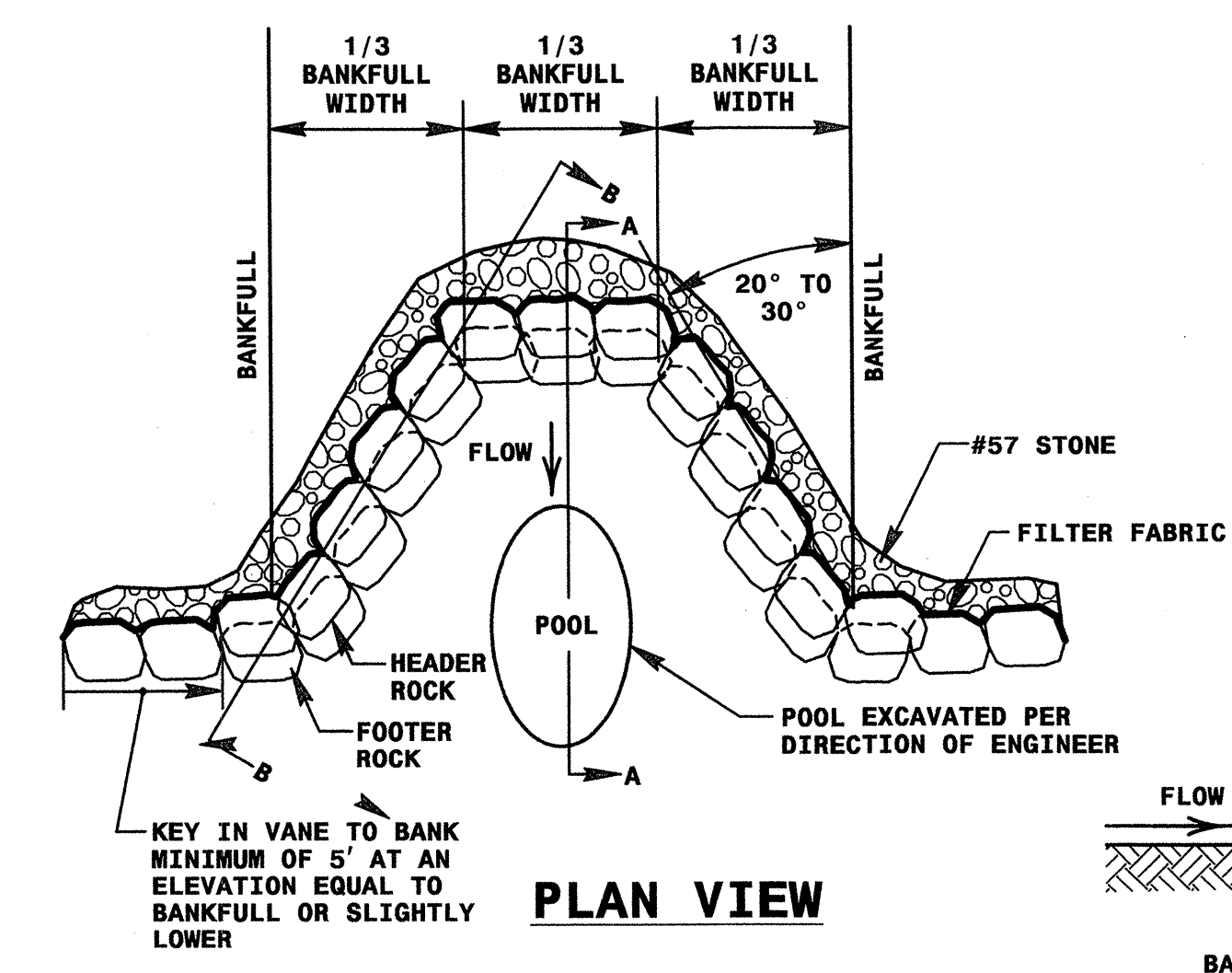
6/30/2008
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STATION	HEIGHT	LENGTH	WIDTH
10+06.75	2	3	2
17+22.19	2	3	2
20+91.49	2	3	2
26+94.98	2	3	2
31+76.71	2	3	2

- NOTES:
- DO NOT EXCAVATE POOL TOO CLOSE TO FOOTER LOG.
 - CLASS "A" STONE, AND/OR #57 STONE CAN BE USED TO REDUCE VOIDS BETWEEN HEADERS AND FOOTERS.
 - COMPACT BACKFILL TO EXTENT POSSIBLE OR AT THE DIRECTION OF THE ENGINEER.
 - POOL DEPTH SHOULD BE 2 TO 3 TIMES BANKFULL DEPTH.

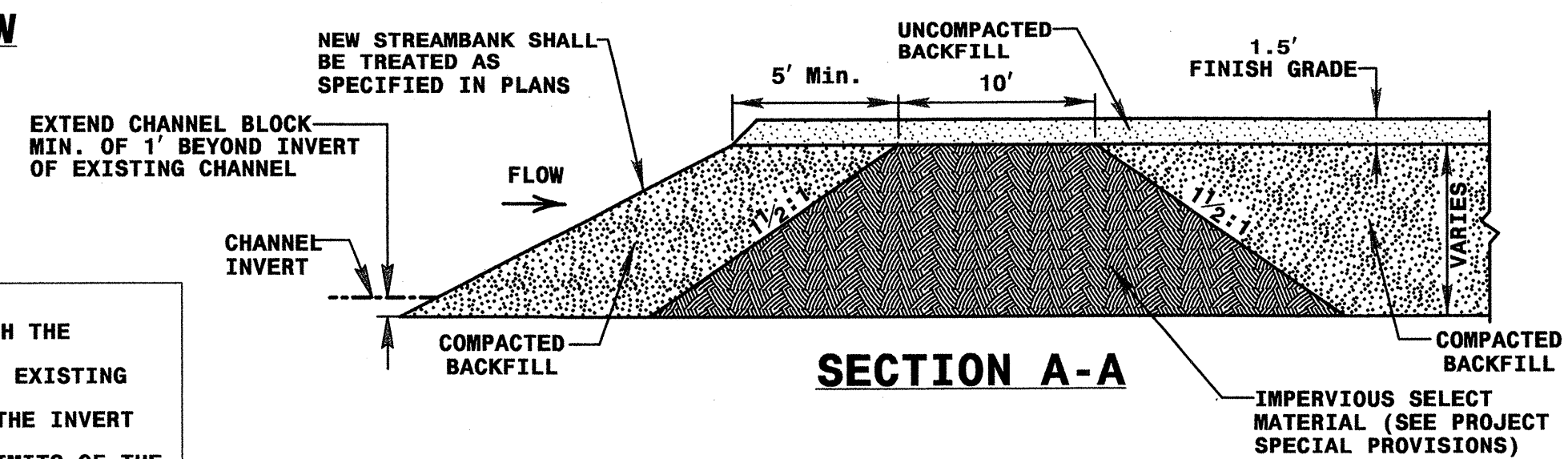
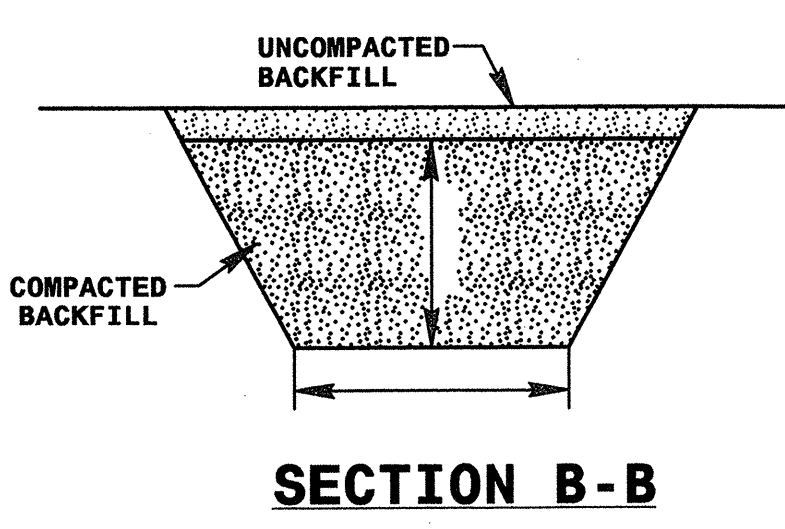
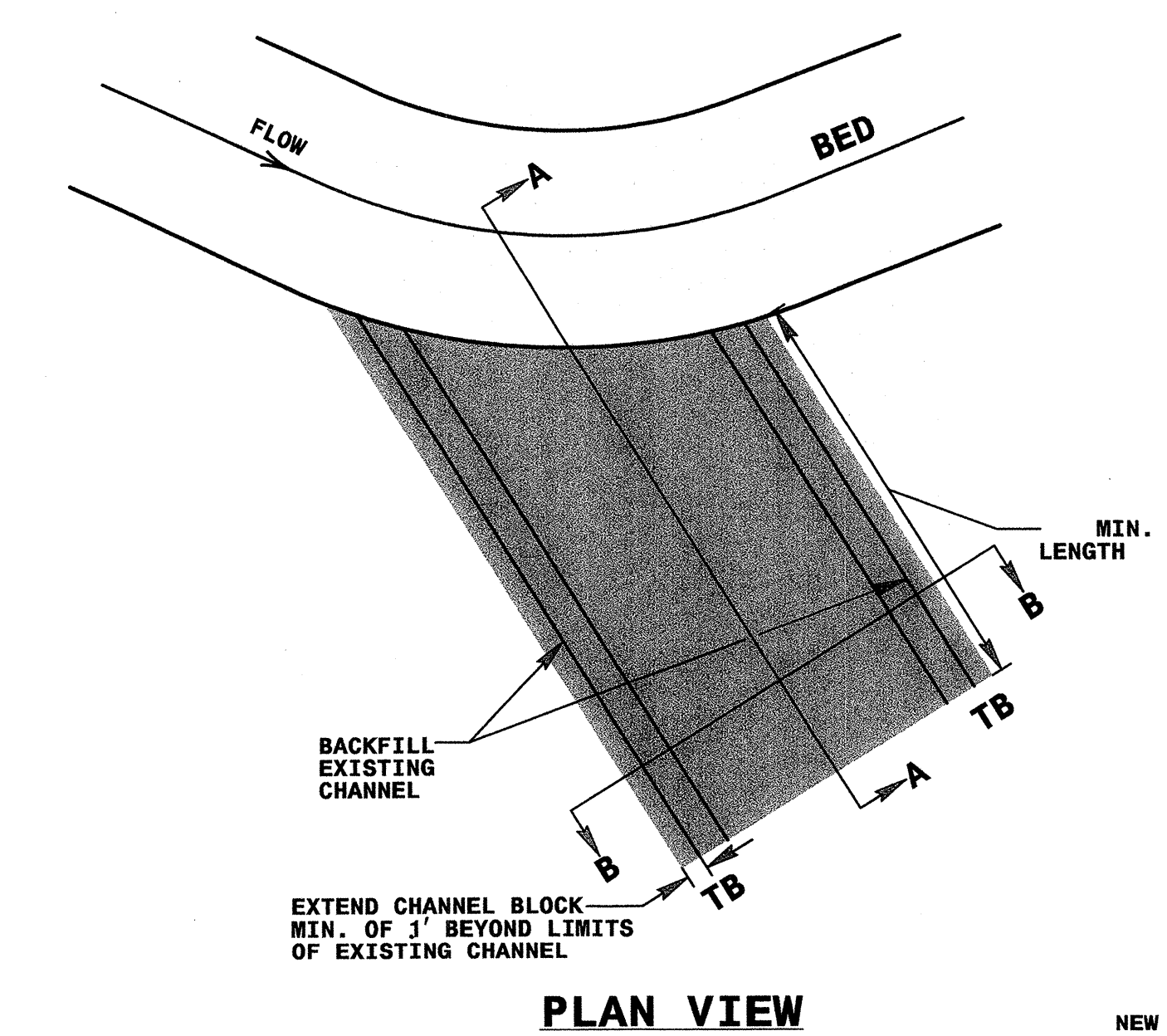
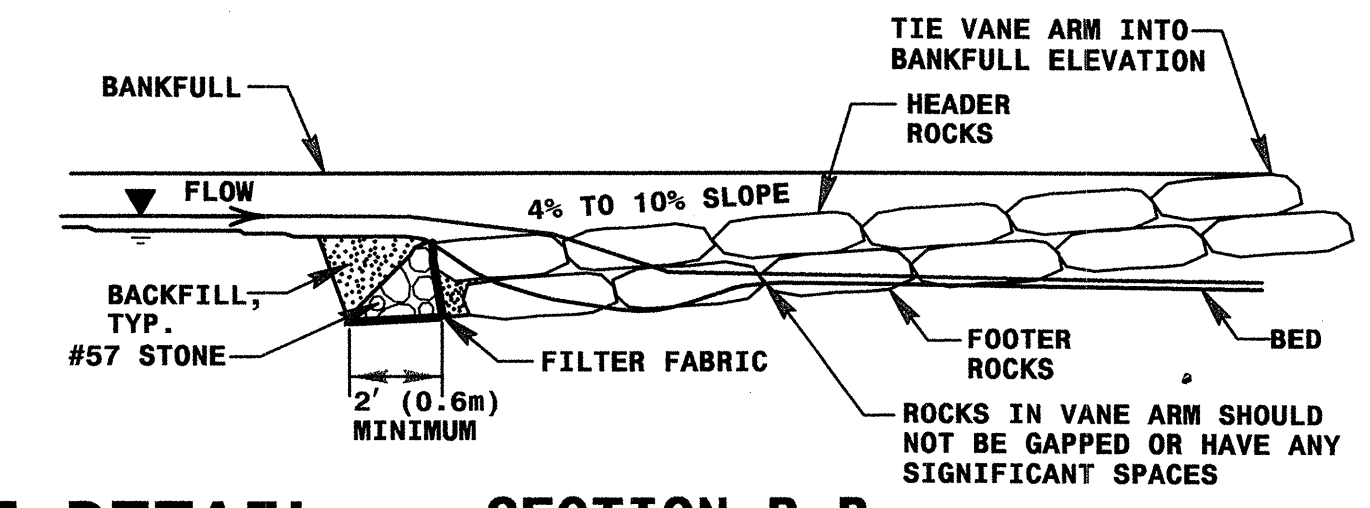
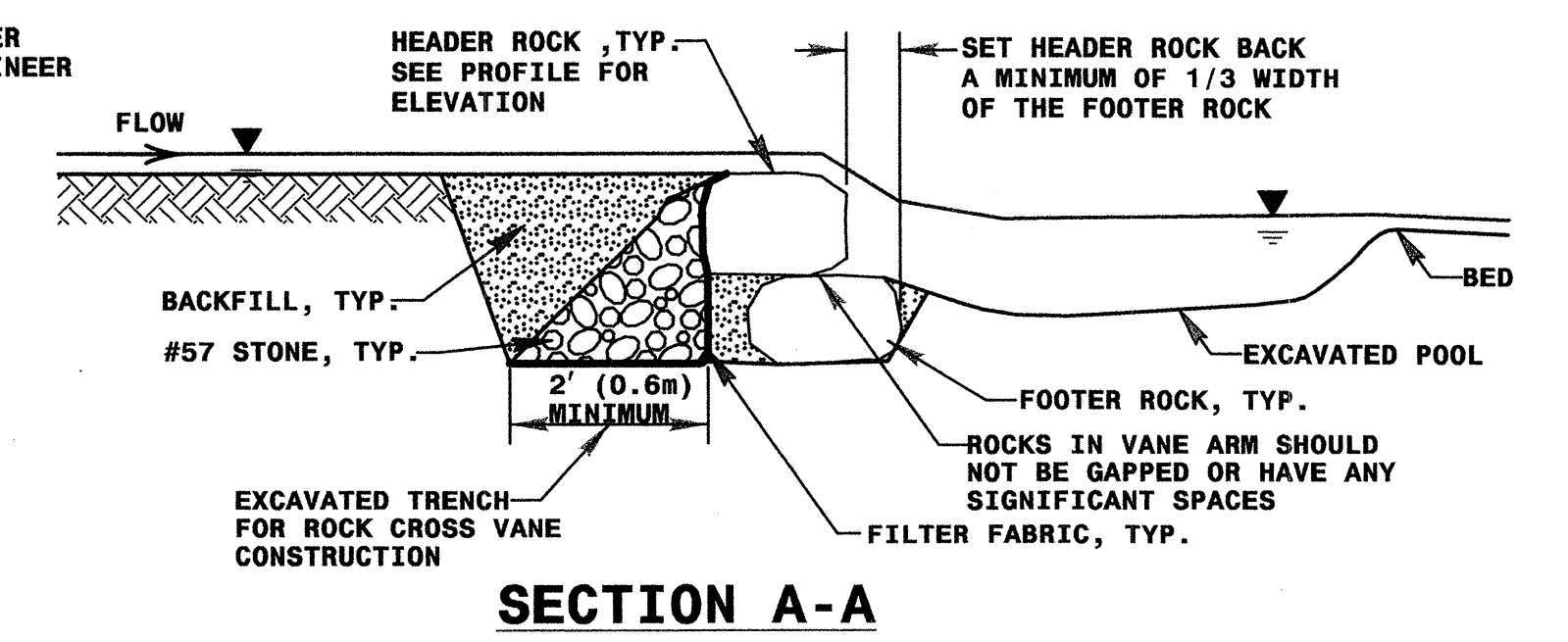
LOG SILL DETAIL
NOT TO SCALE



STATION	HEIGHT	LENGTH	WIDTH
36+76.88	2'	3'	2'

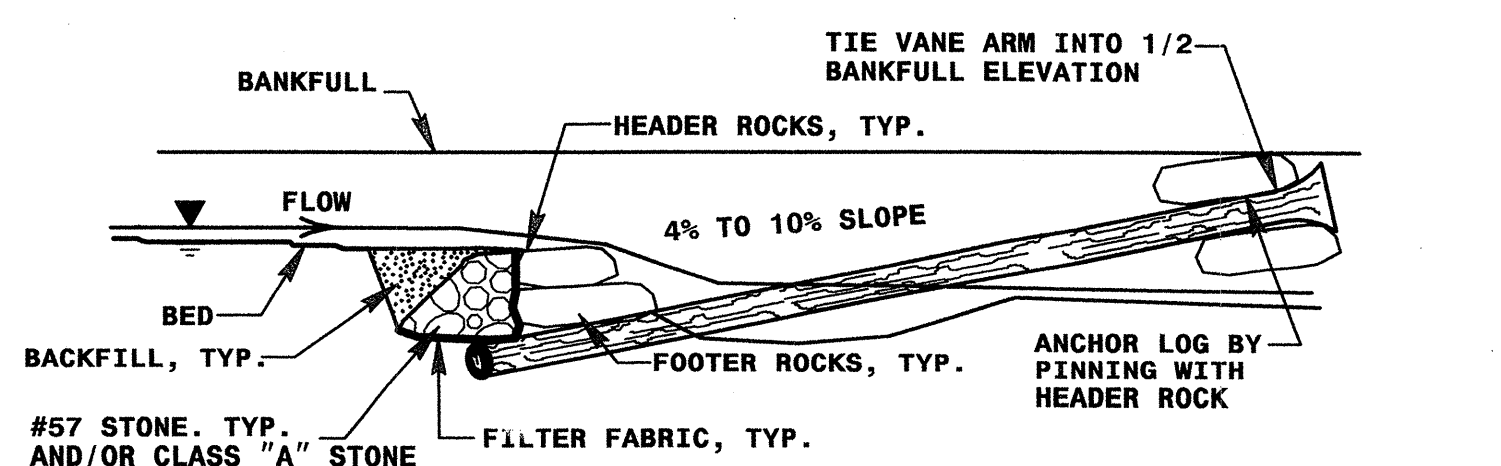
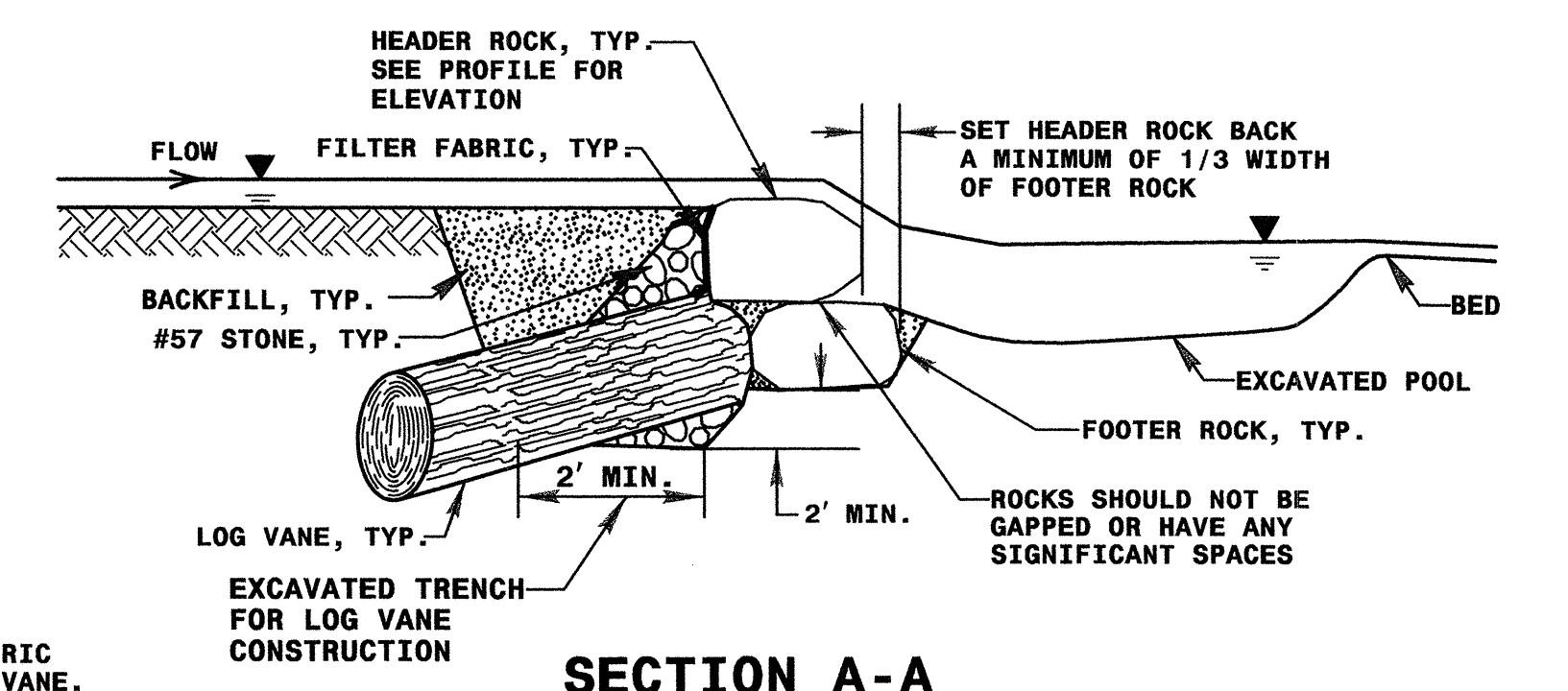
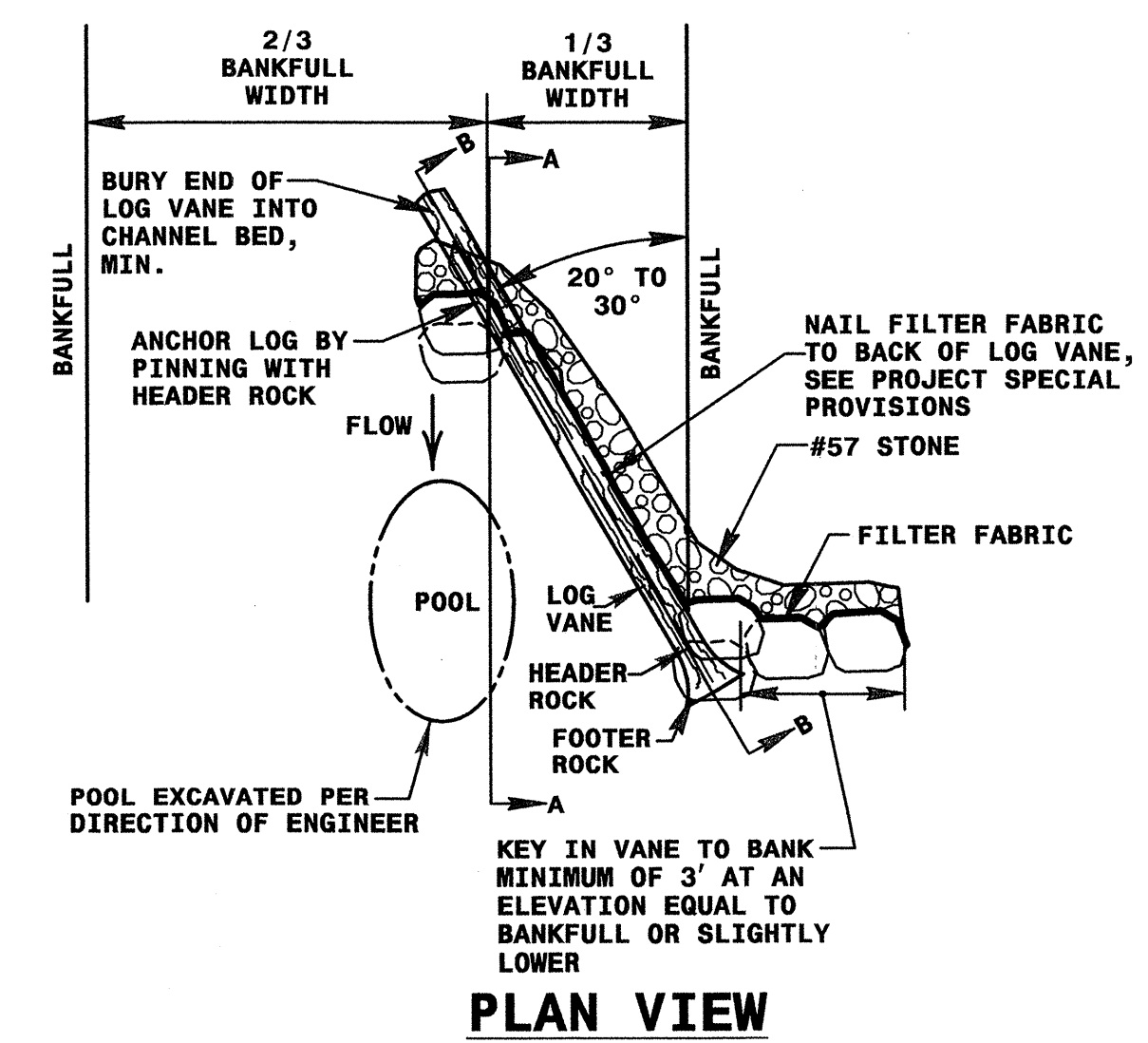
- NOTES:
- DEEPEST PART OF POOL TO BE IN LINE WITH WHERE VANE ARM TIES INTO BANKFULL.
 - DO NOT EXCAVATE POOL TOO CLOSE TO FOOTER BOULDERS.
 - CLASS "A" STONE CAN BE USED TO REDUCE VOIDS BETWEEN HEADERS AND FOOTERS.
 - COMPACT BACKFILL TO EXTENT POSSIBLE OR AT THE DIRECTION OF THE ENGINEER.
 - POOL DEPTH SHOULD BE 2 TO 3 TIMES BANKFULL DEPTH.

ROCK CROSS VANE DETAIL
NOT TO SCALE



- NOTES:
- CHANNEL BLOCK SHALL BE INSTALLED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS.
 - BLOCK SHOULD BE INSTALLED AT THE INTERFACE BETWEEN EXISTING CHANNEL AND PROPOSED CHANNEL.
 - BOTTOM OF BLOCK SHOULD BE A MINIMUM OF 0.5' BELOW THE INVERT OF THE EXISTING CHANNEL.
 - BLOCK SHOULD EXTEND A MINIMUM OF 1.0' BEYOND THE LIMITS OF THE EXISTING STREAM CHANNEL.
 - INSTALL EROSION CONTROL MATTING AND SEED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS IMMEDIATELY AFTER GRADING.
 - COMPACT BACKFILL TO EXTENT POSSIBLE OR AT THE DIRECTION OF THE ENGINEER.

STREAM PLUG
NOT TO SCALE



STATION	HEIGHT	LENGTH	WIDTH
10+82.86	2	3	2
12+16.94	2	3	2
17+32.04	2	3	2
21+73.46	2	3	2
22+18.86	2	3	2
27+43.22	2	3	2
31+84.96	2	3	2
35+41.78	2	3	2

- NOTES:
- DEEPEST PART OF POOL TO BE IN LINE WITH WHERE VANE ARM TIES INTO BANKFULL.
 - DO NOT EXCAVATE POOL TOO CLOSE TO FOOTER BOULDERS.
 - CLASS "A" STONE AND/OR #57 STONE CAN BE USED TO REDUCE VOIDS BETWEEN HEADERS AND FOOTERS.
 - COMPACT BACKFILL TO EXTENT POSSIBLE OR AT THE DIRECTION OF THE ENGINEER.
 - POOL DEPTH SHOULD BE 2 TO 3 TIMES BANKFULL DEPTH.

LOG VANE DETAIL
NOT TO SCALE

REVISIONS

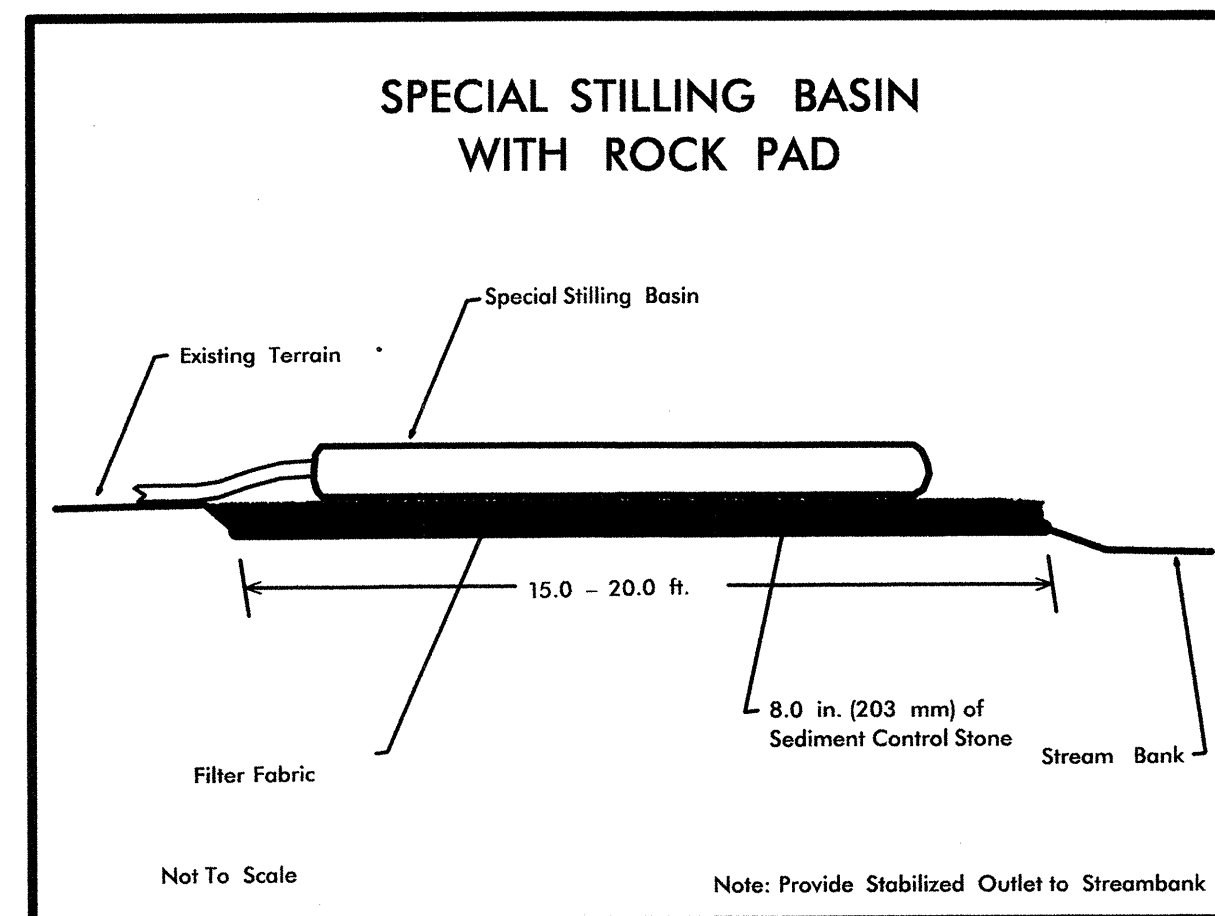
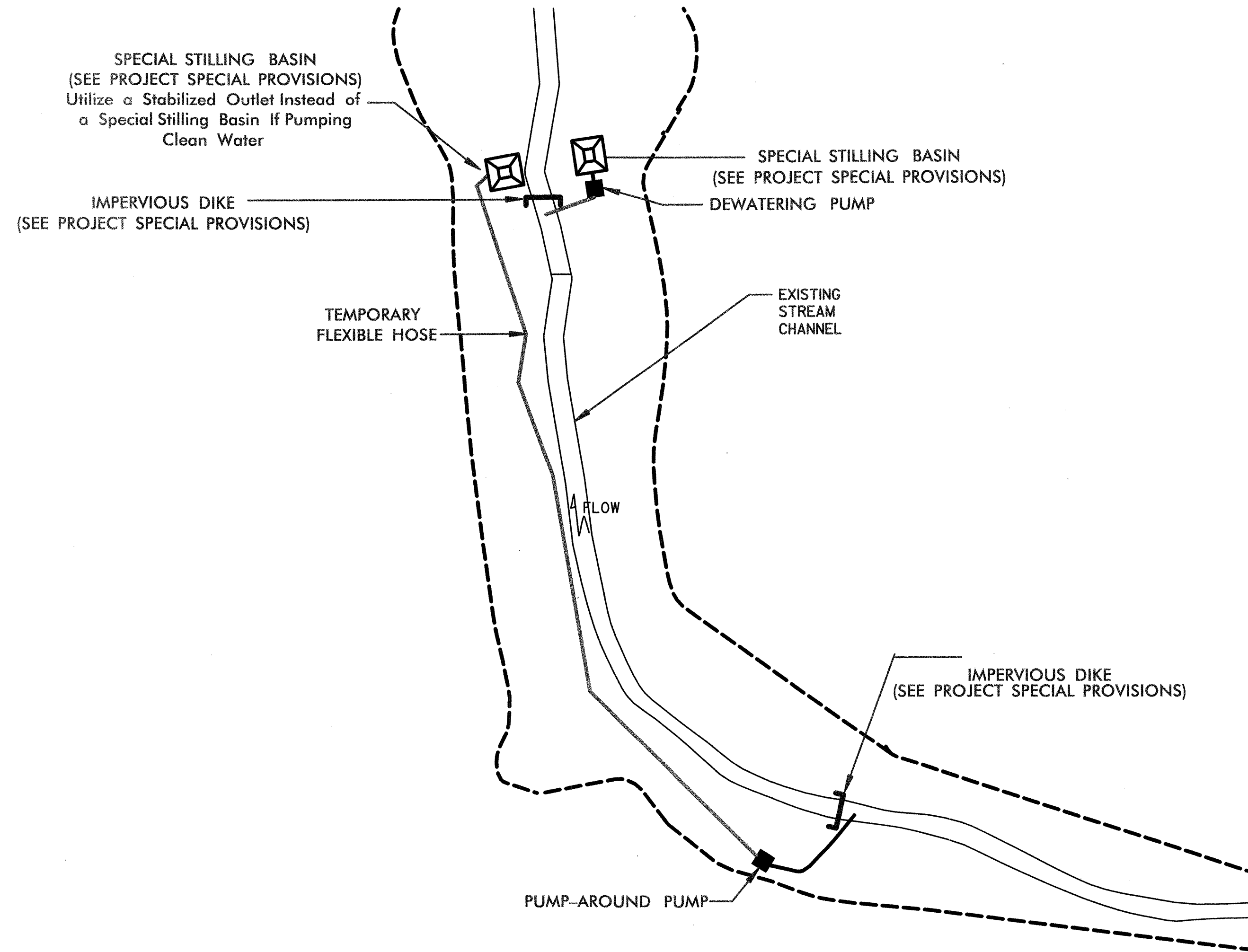
6/30/08 Design Plans 111929_DOT_DTL.S.dgn

2/26/03

REVISIONS

6/30/2008
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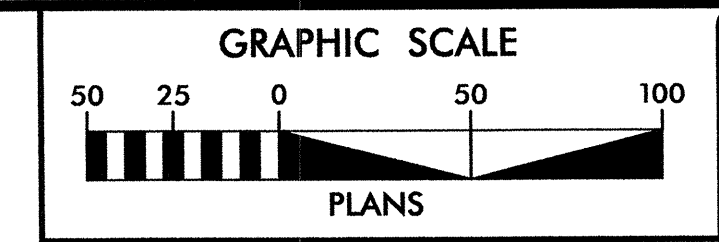
EXAMPLE OF PUMP-AROUND OPERATION



- 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 sufficient size to dewater the work area.

- 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.

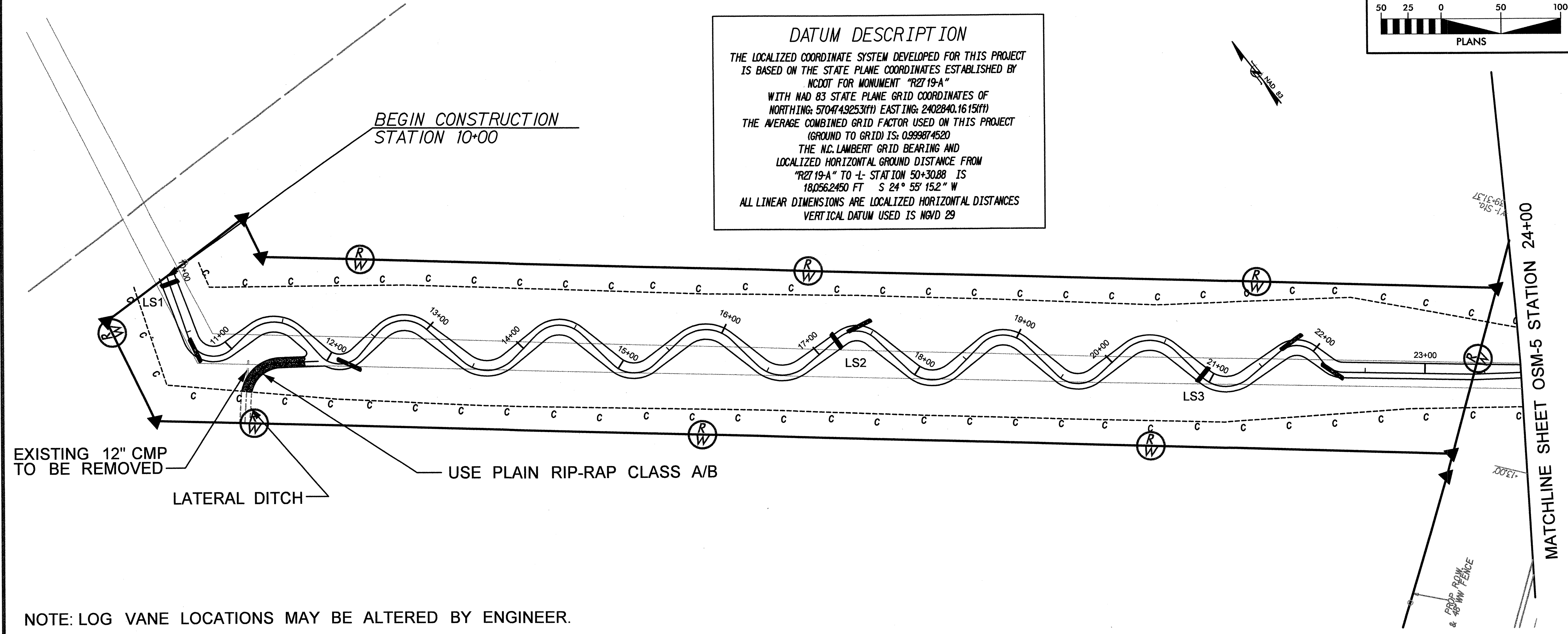
PROJECT REFERENCE NO. R-2719A	SHEET NO. OSM-3
PROJECT ENGINEER	
Baker	
<small>Baker Engineering NY, Inc. 8000 Ridgely Parkway Suite 200 Cary, NORTH CAROLINA 27511 Phone: 919.483.5488 Fax: 919.483.5490</small>	



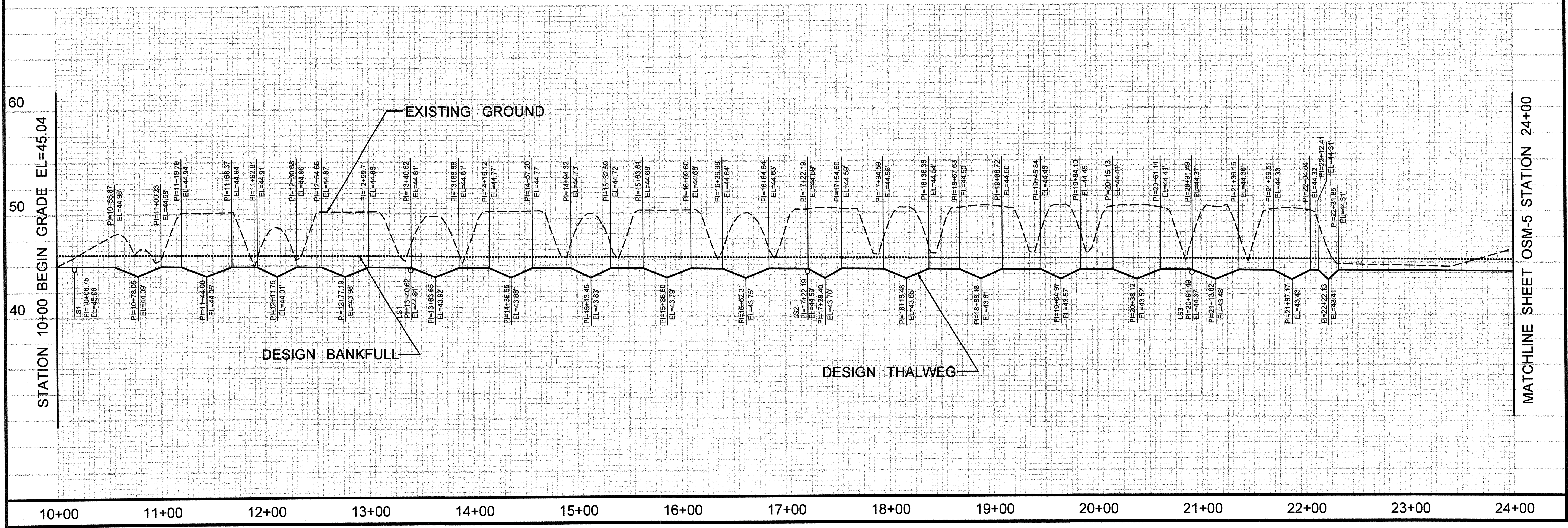
PROJECT REFERENCE NO. R-2719A	SHEET NO. OSM-4
PROJECT ENGINEER	

DATUM DESCRIPTION

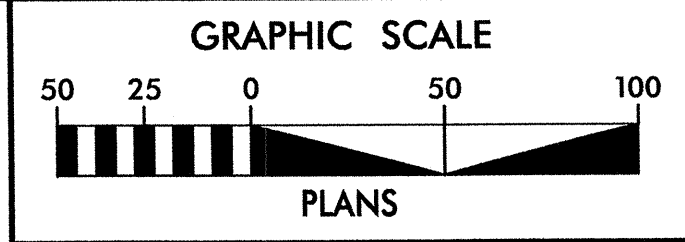
THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "R2719-A" WITH NAD 83 STATE PLANE GRID COORDINATES OF NORTHING: 5704743253(ft) EASTING: 2402840.1615(ft) THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999874520 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "R2719-A" TO ± STATION 50+30.88 IS 18,056.2450 FT S 24° 55' 15.2" W ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES VERTICAL DATUM USED IS NGVD 29



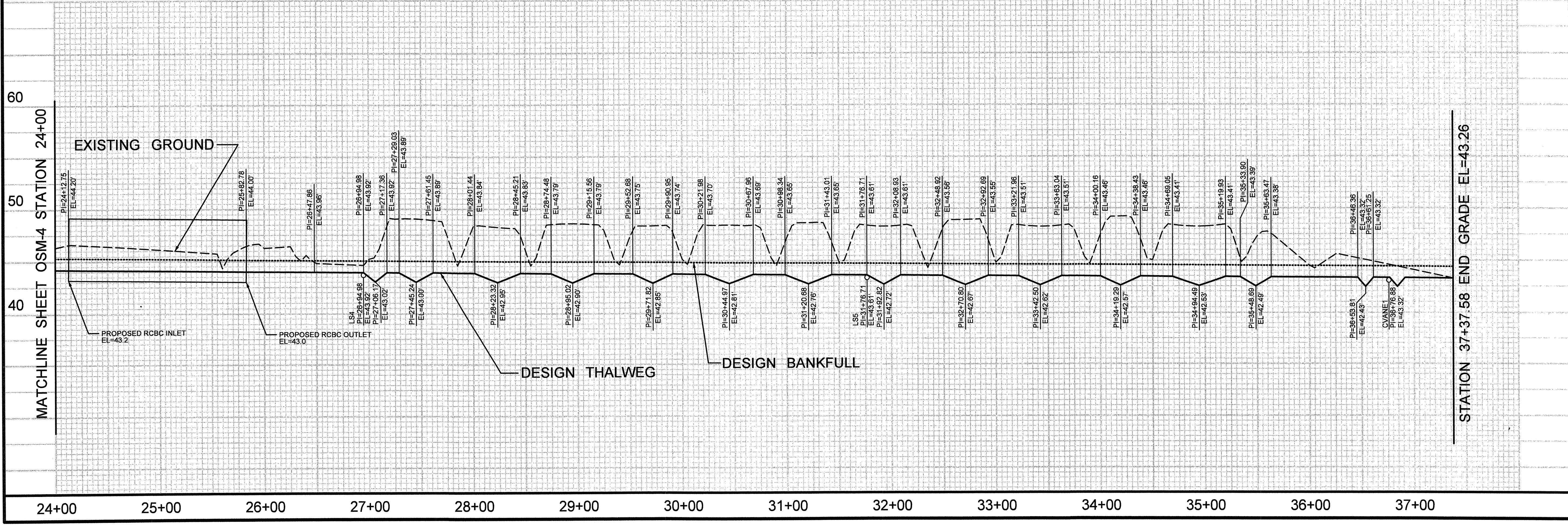
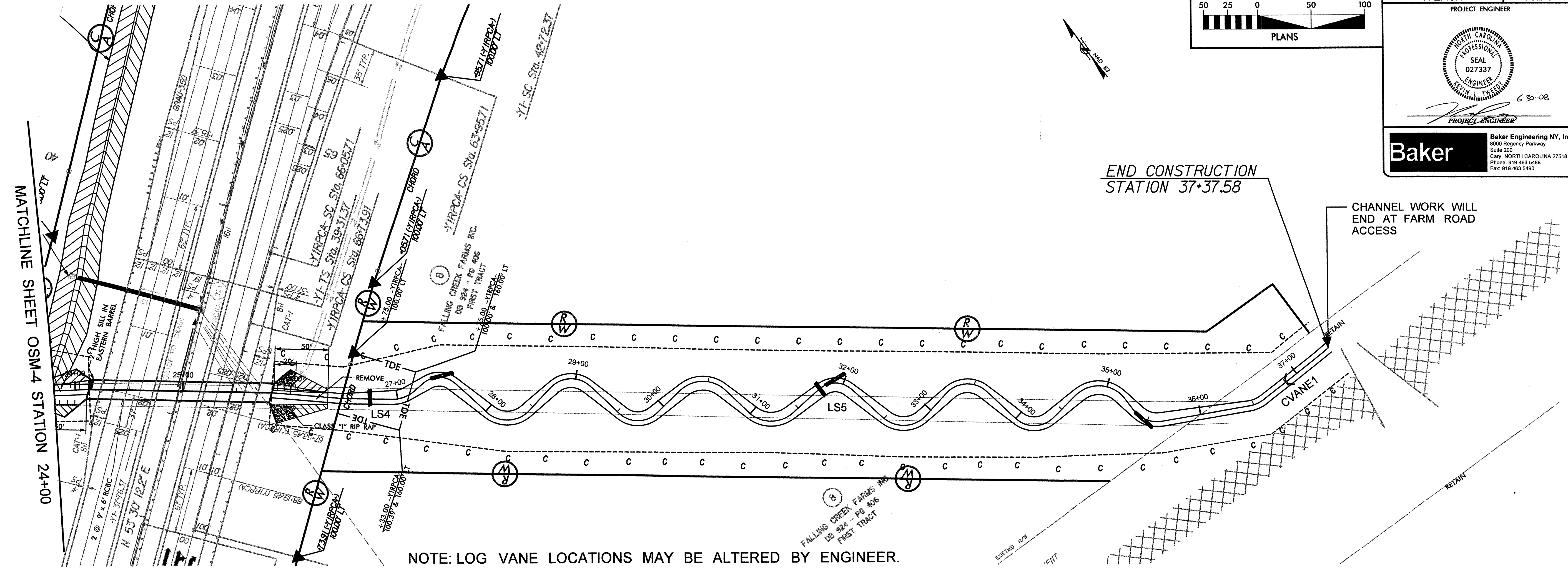
NOTE: LOG VANE LOCATIONS MAY BE ALTERED BY ENGINEER.



8/17/99



PROJECT REFERENCE NO. R-2719A	SHEET NO. OSM-5
PROJECT ENGINEER	
Baker Engineering NY, Inc. 8000 Regency Parkway Suite 200 Cary, NORTH CAROLINA 27518 Phone: 919.463.5498 Fax: 919.463.5490	



CURVE DATA

CV1
 P.I. Station 10+90.76 N 554,098.4727 E 2,391,376.5143
 Delta = 115° 31' 46.45" (LT)
 Degree = 260° 26' 07.30"
 Tangent = 34.8878
 Length = 44.3602
 Radius = 22.0000
 External = 19.2451
 Long Chord = 37.2181
 Mid. Ord. = 10.2653
 P.C. Station 10+55.87 N 554,131.3507 E 2,391,388.1846
 P.T. Station 11+00.23 N 554,102.1114 E 2,391,411.2118
 C.C. N 554,123.9914 E 2,391,408.9173

CV2
 P.I. Station 11+51.28 N 554,107.4360 E 2,391,461.9853
 Delta = 92° 46' 53.46" (RT)
 Degree = 190° 59' 09.35"
 Tangent = 31.4929
 Length = 48.5803
 Radius = 30.0000
 External = 13.4949
 Long Chord = 43.4436
 Mid. Ord. = 9.3079
 P.C. Station 11+19.79 N 554,104.1514 E 2,391,430.6641
 P.T. Station 11+68.37 N 554,075.9924 E 2,391,463.7461
 C.C. N 554,074.3150 E 2,391,433.7930

CV3
 P.I. Station 12+18.39 N 554,026.0457 E 2,391,466.5431
 Delta = 98° 36' 58.58" (LT)
 Degree = 260° 26' 07.30"
 Tangent = 25.5847
 Length = 37.8659
 Radius = 22.0000
 External = 11.7428
 Long Chord = 33.3620
 Mid. Ord. = 7.6562
 P.C. Station 11+92.81 N 554,051.5904 E 2,391,465.1126
 P.T. Station 12+30.68 N 554,031.2871 E 2,391,491.5852
 C.C. N 554,052.8205 E 2,391,487.0782

CV4
 P.I. Station 12+83.75 N 554,042.1601 E 2,391,543.5339
 Delta = 92° 11' 36.00" (RT)
 Degree = 204° 37' 40.02"
 Tangent = 29.0929
 Length = 45.0542
 Radius = 28.0000
 External = 12.3782
 Long Chord = 40.3486
 Mid. Ord. = 8.5836
 P.C. Station 12+54.66 N 554,036.2000 E 2,391,515.0581
 P.T. Station 12+99.71 N 554,013.4770 E 2,391,548.3998

CV5
 P.I. Station 13+69.57 N 553,944.6052 E 2,391,560.0834
 Delta = 87° 57' 59.35" (LT)
 Degree = 190° 59' 09.35"
 Tangent = 28.9537
 Length = 48.0591
 Radius = 30.0000
 External = 11.6931
 Long Chord = 41.6669
 Mid. Ord. = 8.4137
 P.C. Station 13+40.61 N 553,973.1510 E 2,391,555.2408
 P.T. Station 13+86.67 N 553,948.4318 E 2,391,588.7832

CV6
 P.I. Station 14+42.36 N 553,955.7915 E 2,391,643.9805
 Delta = 90° 31' 55.35" (RT)
 Degree = 220° 22' 06.18"
 Tangent = 26.2426
 Length = 41.0821
 Radius = 26.0000
 External = 10.9415
 Long Chord = 36.9399
 Mid. Ord. = 7.7008
 P.C. Station 14+16.12 N 553,952.3231 E 2,391,617.9682
 P.T. Station 14+57.20 N 553,929.7480 E 2,391,647.2071

CV7
 P.I. Station 15+18.33 N 553,869.0768 E 2,391,654.7239
 Delta = 87° 42' 03.74" (LT)
 Degree = 229° 10' 59.22"
 Tangent = 24.0165
 Length = 38.2668
 Radius = 25.0000
 External = 9.6669
 Long Chord = 34.6390
 Mid. Ord. = 6.9713
 P.C. Station 14+94.32 N 553,892.9111 E 2,391,651.7710
 P.T. Station 15+32.58 N 553,871.0713 E 2,391,678.6575

CV8
 P.I. Station 15+92.49 N 553,876.0462 E 2,391,738.3572
 Delta = 87° 49' 21.57" (RT)
 Degree = 190° 59' 09.35"
 Tangent = 28.8811
 Length = 45.9838
 Radius = 30.0000
 External = 11.6427
 Long Chord = 41.6127
 Mid. Ord. = 8.3876
 P.C. Station 15+63.61 N 553,873.6478 E 2,391,709.5759
 P.T. Station 16+09.59 N 553,847.3768 E 2,391,741.8474

CV9
 P.I. Station 16+67.61 N 553,789.7897 E 2,391,748.8580
 Delta = 85° 17' 29.65" (LT)
 Degree = 190° 59' 09.35"
 Tangent = 27.6307
 Length = 44.6586
 Radius = 30.0000
 External = 10.7855
 Long Chord = 40.6478
 Mid. Ord. = 7.9333
 P.C. Station 16+39.97 N 553,817.2179 E 2,391,745.5189
 P.T. Station 16+84.63 N 553,790.8661 E 2,391,776.4677

CV10
 P.I. Station 17+42.14 N 553,793.1064 E 2,391,833.9324
 Delta = 84° 25' 42.44" (RT)
 Degree = 260° 26' 07.30"
 Tangent = 19.9583
 Length = 32.4182
 Radius = 22.0000
 External = 7.7041
 Long Chord = 29.5638
 Mid. Ord. = 5.7060
 P.C. Station 17+22.18 N 553,792.3289 E 2,391,813.9892
 P.T. Station 17+54.80 N 553,773.3329 E 2,391,836.6425

CV11
 P.I. Station 18+22.37 N 553,706.1873 E 2,391,845.8452
 Delta = 89° 33' 19.17" (LT)
 Degree = 204° 37' 40.02"
 Tangent = 27.7835
 Length = 43.7650
 Radius = 28.0000
 External = 11.4452
 Long Chord = 39.4440
 Mid. Ord. = 8.1243
 P.C. Station 17+94.59 N 553,733.7135 E 2,391,842.0726
 P.T. Station 18+38.36 N 553,709.7462 E 2,391,873.3998

CV12
 P.I. Station 18+93.87 N 553,716.8577 E 2,391,928.4605
 Delta = 90° 31' 55.35" (RT)
 Degree = 220° 22' 06.18"
 Tangent = 26.2426
 Length = 41.0821
 Radius = 26.0000
 External = 10.9415
 Long Chord = 36.9399
 Mid. Ord. = 7.7008
 P.C. Station 18+67.63 N 553,713.4962 E 2,391,902.4342
 P.T. Station 19+08.71 N 553,690.8012 E 2,391,931.5802

CV13
 P.I. Station 19+69.85 N 553,630.0996 E 2,391,938.8479
 Delta = 87° 42' 03.74" (LT)
 Degree = 229° 10' 59.22"
 Tangent = 24.0165
 Length = 38.2668
 Radius = 25.0000
 External = 9.6669
 Long Chord = 34.6390
 Mid. Ord. = 6.9713
 P.C. Station 19+45.83 N 553,653.9458 E 2,391,935.9928
 P.T. Station 19+84.10 N 553,631.9958 E 2,391,962.7894

CV14
 P.I. Station 20+44.01 N 553,636.7257 E 2,392,022.5091
 Delta = 87° 49' 21.57" (RT)
 Degree = 190° 59' 09.35"
 Tangent = 28.8811
 Length = 45.9838
 Radius = 30.0000
 External = 11.6427
 Long Chord = 41.6127
 Mid. Ord. = 8.3876
 P.C. Station 20+15.12 N 553,634.4454 E 2,391,993.7181
 P.T. Station 20+61.11 N 553,608.0422 E 2,392,025.8815

CV15
 P.I. Station 21+19.12 N 553,550.4268 E 2,392,032.6556
 Delta = 85° 17' 29.65" (LT)
 Degree = 190° 59' 09.35"
 Tangent = 27.6307
 Length = 44.6586
 Radius = 30.0000
 External = 10.7855
 Long Chord = 40.6478
 Mid. Ord. = 7.9333
 P.C. Station 20+91.49 N 553,577.8684 E 2,392,029.4292
 P.T. Station 21+36.15 N 553,551.3898 E 2,392,060.2695

CV16
 P.I. Station 21+92.29 N 553,553.3464 E 2,392,116.3757
 Delta = 91° 59' 50.40" (RT)
 Degree = 260° 26' 07.30"
 Tangent = 22.7806
 Length = 35.3244
 Radius = 22.0000
 External = 9.6695
 Long Chord = 31.6502
 Mid. Ord. = 6.7171
 P.C. Station 21+69.51 N 553,552.5525 E 2,392,093.6089
 P.T. Station 22+04.83 N 553,530.9658 E 2,392,116.3757

CV17
 P.I. Station 22+22.82 N 553,512.5831 E 2,392,116.3757
 Delta = 50° 36' 37.38" (LT)
 Degree = 260° 26' 07.30"
 Tangent = 10.4018
 Length = 19.4330
 Radius = 22.0000
 External = 2.3351
 Long Chord = 18.8074
 Mid. Ord. = 2.1110
 P.C. Station 22+12.41 N 553,522.9848 E 2,392,116.3757
 P.T. Station 22+31.85 N 553,505.9822 E 2,392,124.4147

CV18
 P.I. Station 27+06.72 N 553,203.2661 E 2,392,489.9923
 Delta = 42° 44' 39.34" (LT)
 Degree = 190° 59' 09.35"
 Tangent = 11.7400
 Length = 22.3808
 Radius = 30.0000
 External = 2.2153
 Long Chord = 21.8654
 Mid. Ord. = 2.0630
 P.C. Station 26+94.98 N 553,210.7173 E 2,392,480.9198
 P.T. Station 27+17.36 N 553,203.9518 E 2,392,501.7123

CV19
 P.I. Station 27+48.99 N 553,205.7990 E 2,392,533.2889
 Delta = 84° 25' 42.44" (RT)
 Degree = 260° 26' 07.30"
 Tangent = 19.9583
 Length = 32.4182
 Radius = 22.0000
 External = 7.7041
 Long Chord = 29.5638
 Mid. Ord. = 5.7060
 P.C. Station 27+29.03 N 553,204.6334 E 2,392,513.3647
 P.T. Station 27+61.45 N 553,186.0821 E 2,392,536.3835

CV20
 P.I. Station 28+29.23 N 553,119.1283 E 2,392,546.8916
 Delta = 89° 33' 19.17" (LT)
 Degree = 204° 37' 40.02"
 Tangent = 27.7835
 Length = 43.7650
 Radius = 28.0000
 External = 11.4452
 Long Chord = 39.4440
 Mid. Ord. = 8.1243
 P.C. Station 28+01.44 N 553,146.5759 E 2,392,542.5838
 P.T. Station 28+45.21 N 553,123.2230 E 2,392,574.3717

CV21
 P.I. Station 29+00.73 N 553,131.4050 E 2,392,629.2835
 Delta = 90° 31' 55.35" (RT)
 Degree = 220° 22' 06.18"
 Tangent = 26.2426
 Length = 41.0821
 Radius = 26.0000
 External = 10.9415
 Long Chord = 36.9399
 Mid. Ord. = 7.7008
 P.C. Station 28+74.48 N 553,127.5375 E 2,392,603.3275
 P.T. Station 29+15.56 N 553,105.4142 E 2,392,632.9099

CV22
 P.I. Station 29+76.70 N 553,044.8657 E 2,392,641.3579
 Delta = 87° 42' 03.74" (LT)
 Degree = 229° 10' 59.22"
 Tangent = 24.0165
 Length = 38.2668
 Radius = 25.0000
 External = 9.6669
 Long Chord = 34.6390
 Mid. Ord. = 6.9713
 P.C. Station 29+52.68 N 553,068.6517 E 2,392,638.0392
 P.T. Station 29+90.95 N 553,047.2276 E 2,392,665.2580

CV23
 P.I. Station 30+50.86 N 553,053.1191 E 2,392,724.8742
 Delta = 87° 49' 21.57" (RT)
 Degree = 190° 59' 09.35"
 Tangent = 28.8811
 Length = 45.9838
 Radius = 30.0000
 External = 11.6427
 Long Chord = 41.6127
 Mid. Ord. = 8.3876
 P.C. Station 30+21.98 N 553,050.2788 E 2,392,696.1332
 P.T. Station 30+67.96 N 553,024.5067 E 2,392,728.8045

CV24
 P.I. Station 31+25.98 N 552,967.0222 E 2,392,736.7006
 Delta = 85° 18' 59.44" (LT)
 Degree = 190° 59' 09.35"
 Tangent = 27.6428
 Length = 44.6716
 Radius = 30.0000
 External = 10.7937
 Long Chord = 40.6574
 Mid. Ord. = 7.9377
 P.C. Station 30+98.34 N 552,994.4078 E 2,392,732.9389
 P.T. Station 31+43.01 N 552,968.5353 E 2,392,764.3019

CV25
 P.I. Station 31+96.49 N 552,971.4624 E 2,392,817.6985
 Delta = 83° 54' 24.65" (RT)
 Degree = 260° 26' 07.30"
 Tangent = 19.7765
 Length = 32.2179
 Radius = 22.0000
 External = 7.5823
 Long Chord = 29.4152
 Mid. Ord. = 5.6389
 P.C. Station 31+76.71 N 552,970.3799 E 2,392,797.9516
 P.T. Station 32+08.93 N 552,951.9420 E 2,392,820.8709

CV26
 P.I. Station 32+76.70 N 552,885.0464 E 2,392,831.7427
 Delta = 89° 33' 19.17" (LT)
 Degree = 204° 37' 40.02"
 Tangent = 27.7835
 Length = 43.7650
 Radius = 28.0000
 External = 11.4452
 Long Chord = 39.4440
 Mid. Ord. = 8.1243
 P.C. Station 32+48.92 N 552,912.4701 E 2,392,827.2858
 P.T. Station 32+92.69 N 552,889.2903 E 2,392,859.2002

CV27
 P.I. Station 33+48.20 N 552,897.7706 E 2,392,914.0667
 Delta = 90° 31' 55.35" (RT)
 Degree = 220° 22' 06.18"
 Tangent = 26.2426
 Length = 41.0821
 Radius = 26.0000
 External = 10.9415
 Long Chord = 36.9399
 Mid. Ord. = 7.7008
 P.C. Station 33+21.96 N 552,893.7621 E 2,392,888.1321
 P.T. Station 33+63.04 N 552,871.7999 E 2,392,917.8343

CV28
 P.I. Station 34+24.18 N 552,811.2981 E 2,392,926.6111
 Delta = 87° 42' 03.74" (LT)
 Degree = 229° 10' 59.22"
 Tangent = 24.0165
 Length = 38.2668
 Radius = 25.0000
 External = 9.6669
 Long Chord = 34.6390
 Mid. Ord. = 6.9713
 P.C. Station 34+00.16 N 552,835.0658 E 2,392,923.1632
 P.T. Station 34+38.43 N 552,813.7898 E 2,392,950.4980

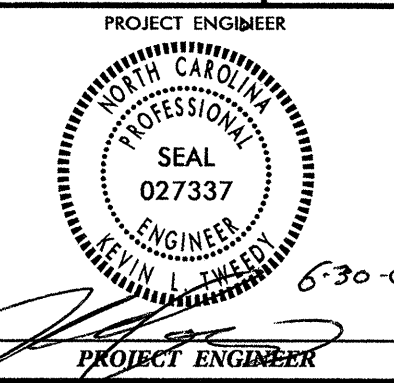
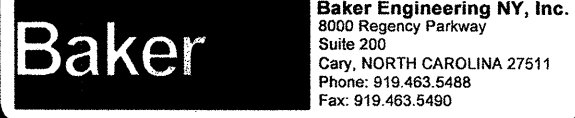
CV29
 P.I. Station 35+03.06 N 552,820.4953 E 2,393,014.7782
 Delta = 97° 09' 39.97" (RT)
 Degree = 190° 59' 09.35"
 Tangent = 34.0050
 Length = 50.8734
 Radius = 30.0000
 External = 15.3469
 Long Chord = 44.9932
 Mid. Ord. = 10.1530
 P.C. Station 34+69.05 N 552,816.9672 E 2,392,980.9576
 P.T. Station 35+19.93 N 552,786.4978 E 2,393,014.0635

CV30
 P.I. Station 35+50.37 N 552,756.0626 E 2,393,013.4229
 Delta = 62° 45' 16.57" (LT)
 Degree = 212° 12' 23.73"
 Tangent = 16.4662
 Length = 29.5724
 Radius = 27.0000
 External = 4.6249
 Long Chord = 28.1163
 Mid. Ord. = 3.9486
 P.C. Station 35+33.90 N 552,772.5252 E 2,393,013.7694
 P.T. Station 35+63.48 N 552,748.2180 E 2,393,027.9003

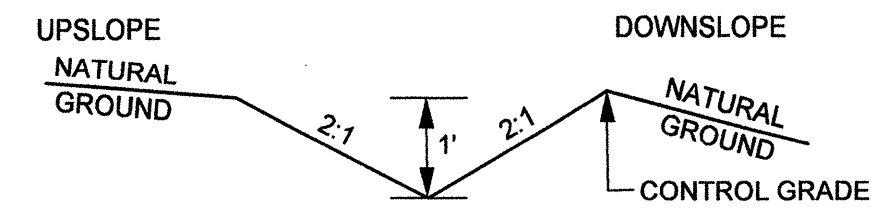
CV31
 P.I. Station 36+53.97 N 552,705.1062 E 2,393,107.4637
 Delta = 28° 26' 07.55" (LT)
 Degree = 190° 59' 09.35"
 Tangent = 7.6010
 Length = 14.8888
 Radius = 30.0000
 External = 0.9480
 Long Chord = 14.7364
 Mid. Ord. = 0.9189
 P.C. Station 36+46.37 N 552,708.7274 E 2,393,100.7807
 P.T. Station 36+61.26 N 552,705.1041 E 2,393,115.0647

REVISIONS

6/30/2008
 P:\11125\Design\PI\ans\111929_DOT-DTL.dgn

PROJECT REFERENCE NO. R-2719A SHEET NO. OSM-6
 PROJECT ENGINEER

 PROJECT ENGINEER

 Baker Engineering NY, Inc.
 8000 Regency Parkway
 Suite 200
 Cary, North Carolina 27511
 Phone: 919.463.5488
 Fax: 919.463.5490

V-DITCH

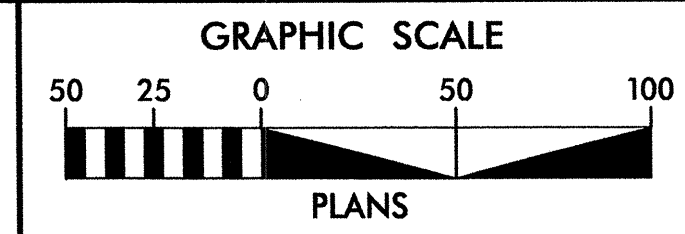


STANDARD 'V' DITCH (TYPE B)

	CONTROL GRADE
V-DITCH 1	70
V-DITCH 2	69

NOTES:

1. BANKS OF DITCHES PROTECTED WITH EXCELSIOR MATTING (SEE SPECIFICATIONS)
2. DITCHES TO BE CONSTRUCTED WITH A MAXIMUM SLOPE OF 0.0005
3. SPOIL FROM DITCHES MAY BE USED IN BACKFILLING OLD DITCHES.

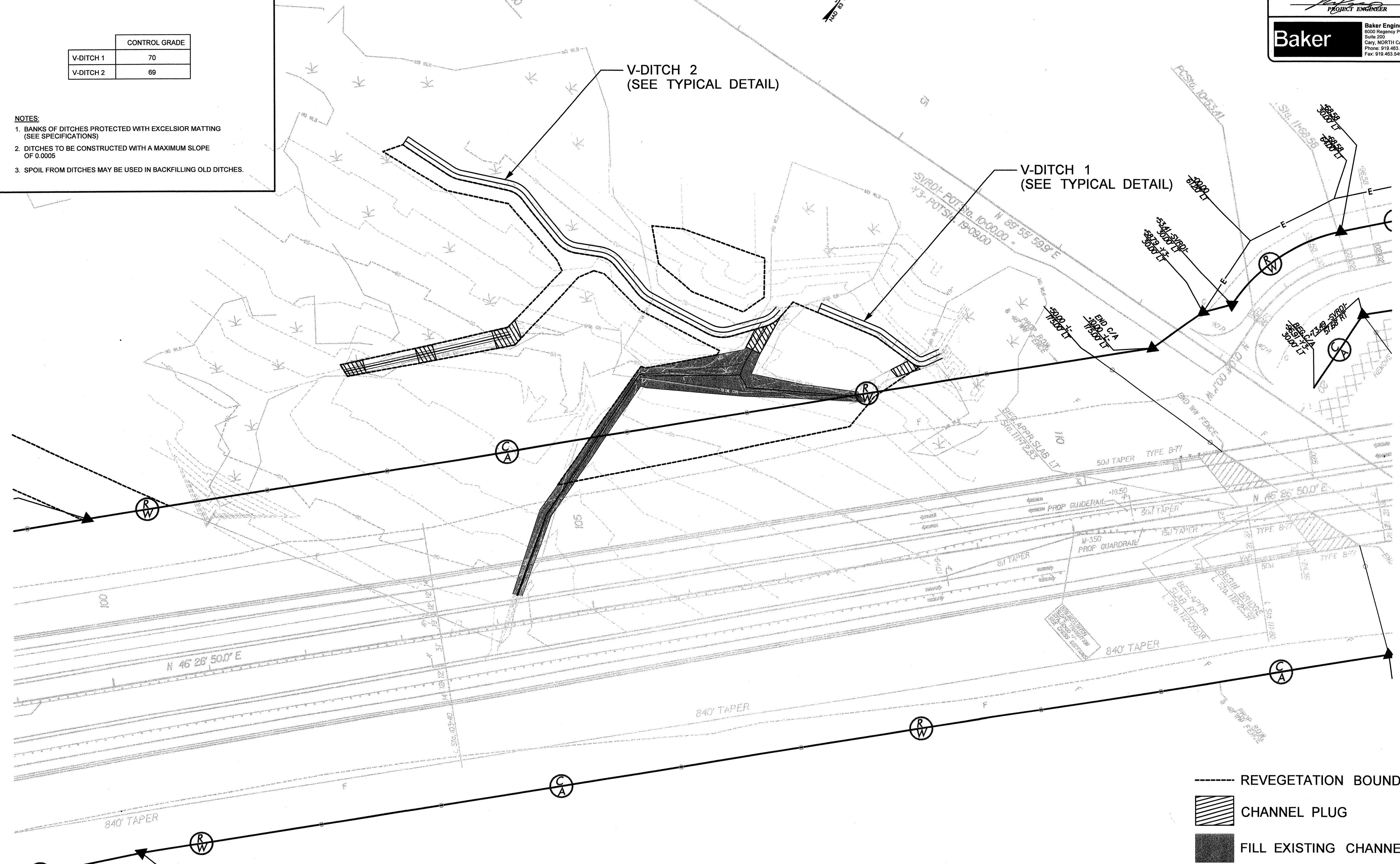


PROJECT REFERENCE NO. **R-2719A** SHEET NO. **OSM-7**

PROJECT ENGINEER

Baker Baker Engineering NY, Inc.
8000 Regency Parkway
Suite 200
Cary, NORTH CAROLINA 27518
Phone: 919.483.8488
Fax: 919.483.8490

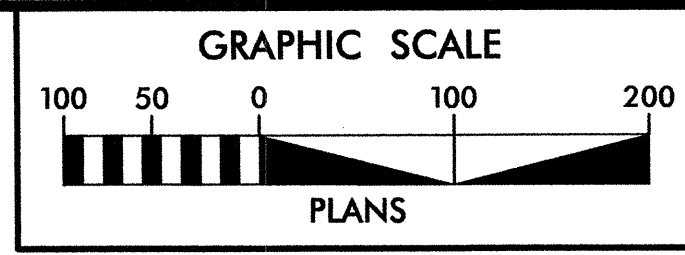
REVISIONS



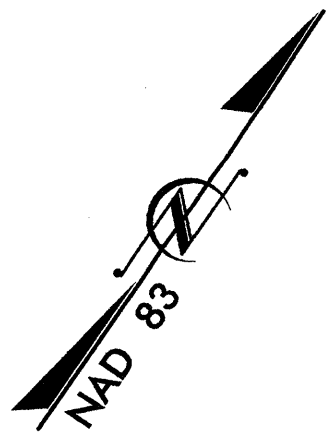
- REVEGETATION BOUNDARY
- CHANNEL PLUG
- FILL EXISTING CHANNEL

NOTE: PLUG LOCATIONS ARE APPROXIMATE AND MAY BE ALTERED BY ENGINEER

7/2/2008 Design\Plans\R-2719a_rdy_psh_OSM7.dwg

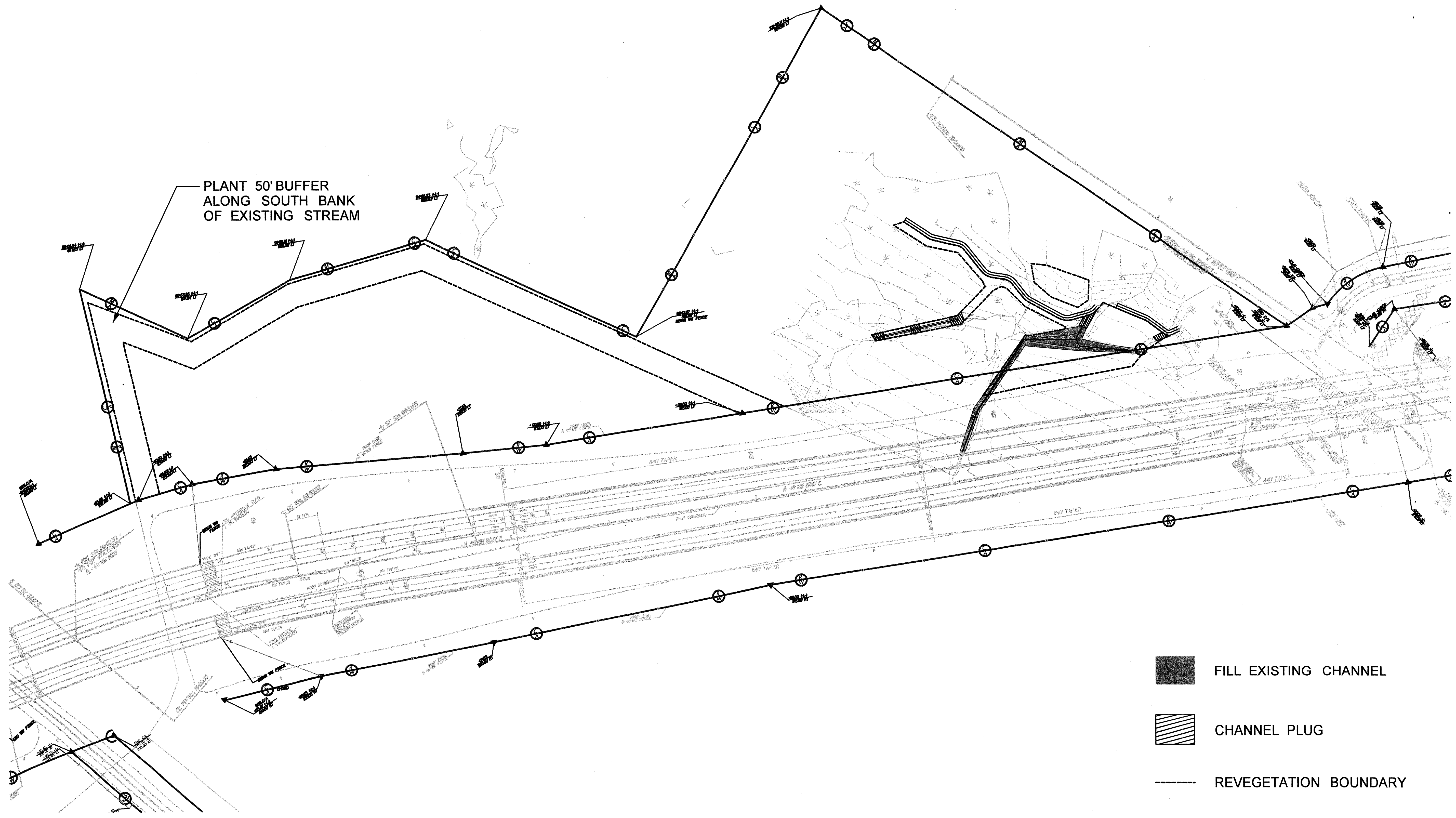


PROJECT REFERENCE NO. R-2719A	SHEET NO. OSM-8
PROJECT ENGINEER	
Baker	
<small>Baker Engineering NY, Inc. 8000 Regency Parkway Suite 200 Cary, NORTH CAROLINA 27518 Phone: 919.463.5488 Fax: 919.463.5490</small>	



REVISIONS

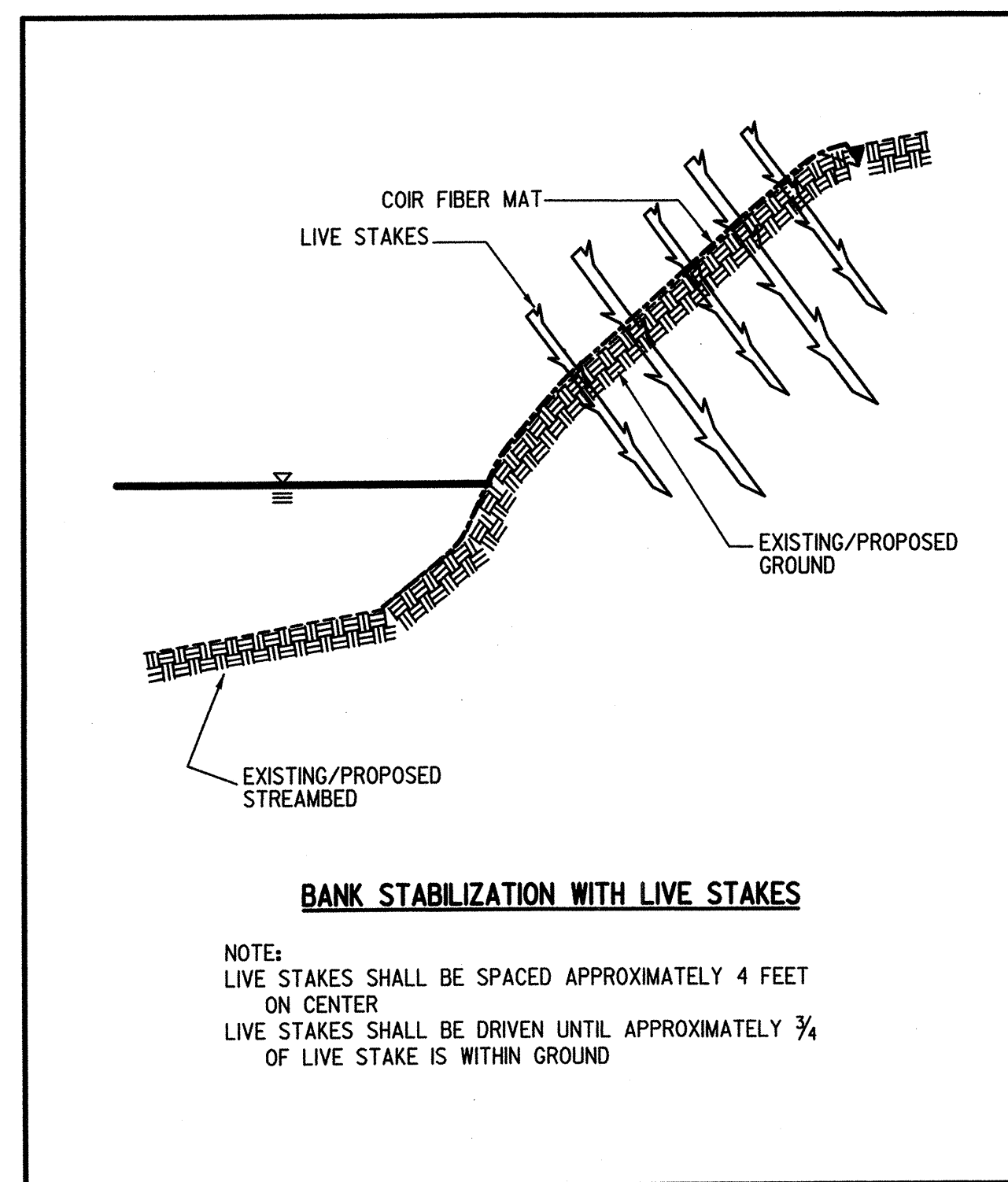
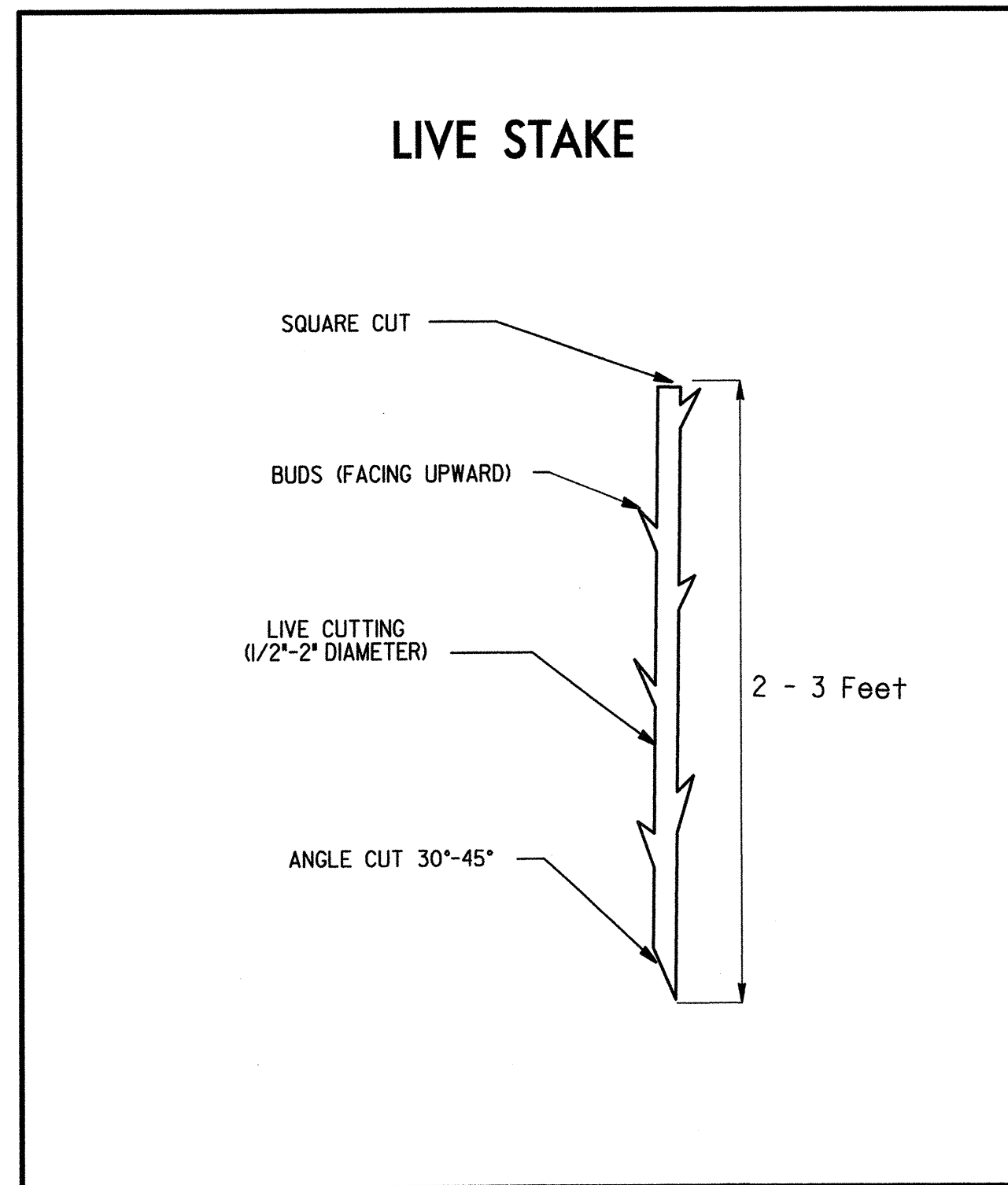
PLANT 50' BUFFER
 ALONG SOUTH BANK
 OF EXISTING STREAM



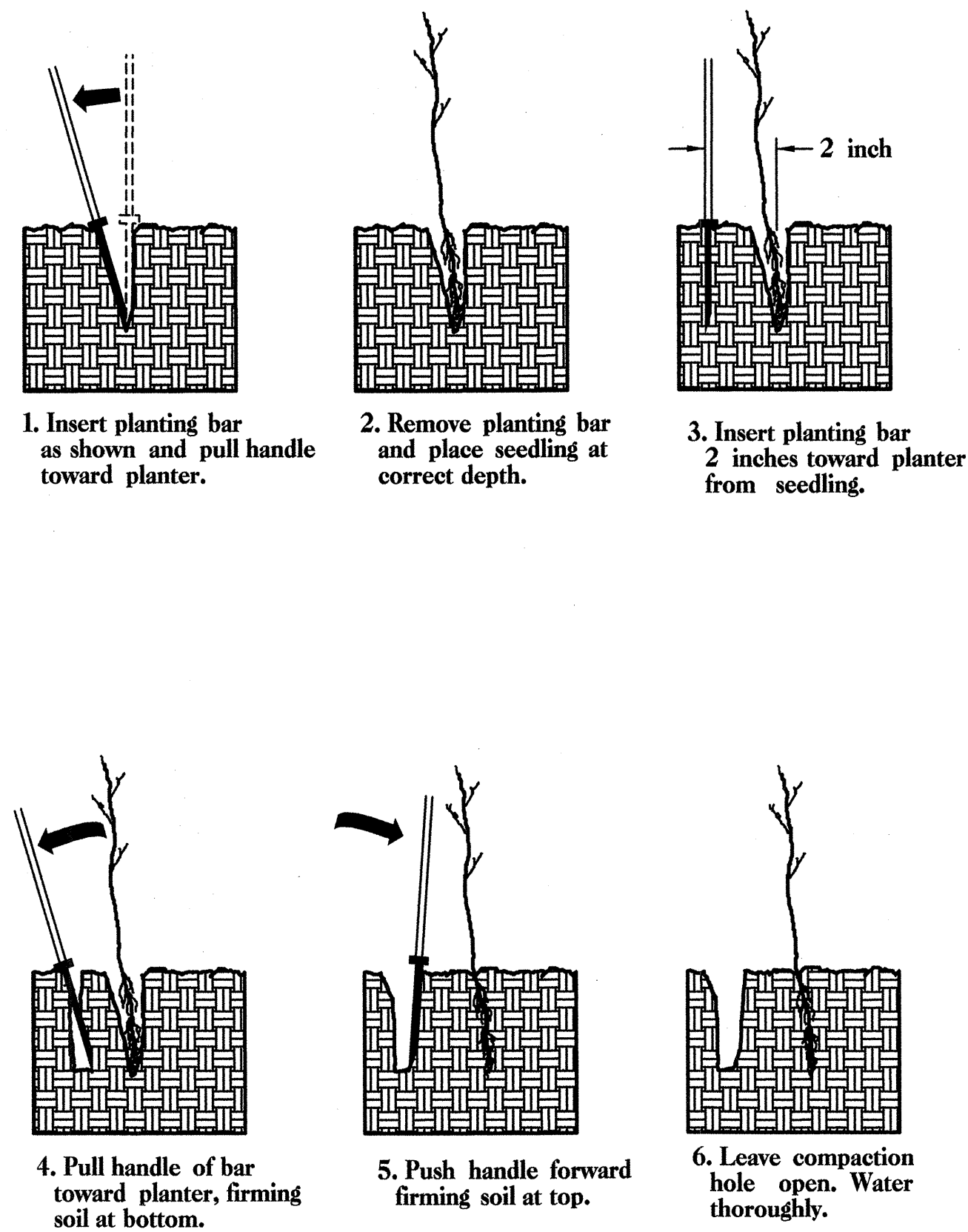
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 eapniko

PLANTING DETAILS

LIVE STAKES PLANTING DETAIL



BAREROOT PLANTING DETAIL DIBBLE PLANTING METHOD USING THE KBC PLANTING BAR



PLANTING NOTES:

PLANTING BAG
 During planting, seedlings shall be kept in a moist canvas bag or similar container to prevent the root systems from drying.



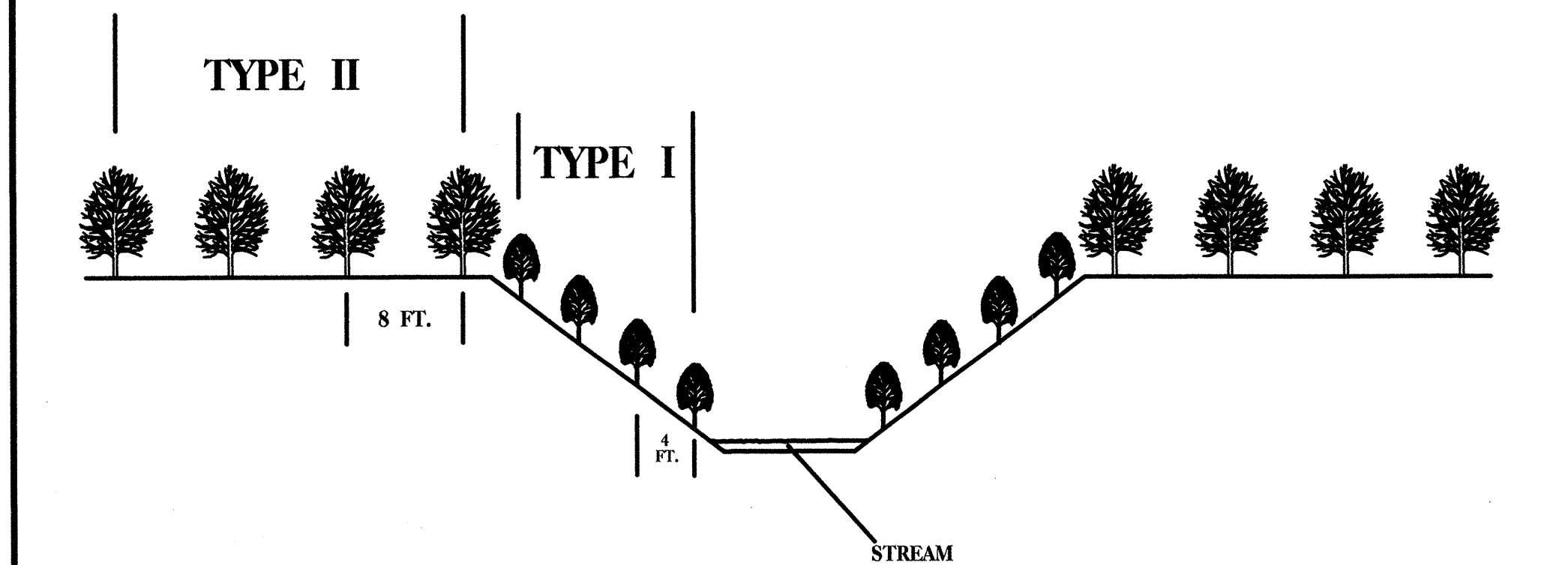
KBC PLANTING BAR
 Planting bar shall have a blade with a triangular cross section, and shall be 12 inches long, 4 inches wide and 1 inch thick at center.



ROOT PRUNING
 All seedlings shall be root pruned, if necessary, so that no roots extend more than 10 inches below the root collar.

- TYPE 1 STREAMBANK REFORESTATION SHALL BE PLANTED 3 FT. TO 5 FT. ON CENTER, RANDOM SPACING, AVERAGING 4 FT. ON CENTER, APPROXIMATELY 2724 PLANTS PER ACRE.
- TYPE 2 STREAMBANK REFORESTATION SHALL BE PLANTED 6 FT. TO 10 FT. ON CENTER, RANDOM SPACING, AVERAGING 8 FT. ON CENTER, APPROXIMATELY 680 PLANTS PER ACRE.
- NOTE: TYPE 1 AND TYPE 2 STREAMBANK REFORESTATION SHALL BE PAID FOR AS "STREAMBANK REFORESTATION"

STREAMBANK REFORESTATION TYPICAL



STREAMBANK REFORESTATION

MIXTURE, TYPE, SIZE, AND FURNISH SHALL CONFORM TO THE FOLLOWING:

TYPE 1

- 50% CORNUS AMOMUM SILKY DOGWOOD 2 ft - 3 ft LIVE STAKES
- 50% SAMBUCUS CANADENSIS ELDERBERRY 2 ft - 3 ft LIVE STAKES

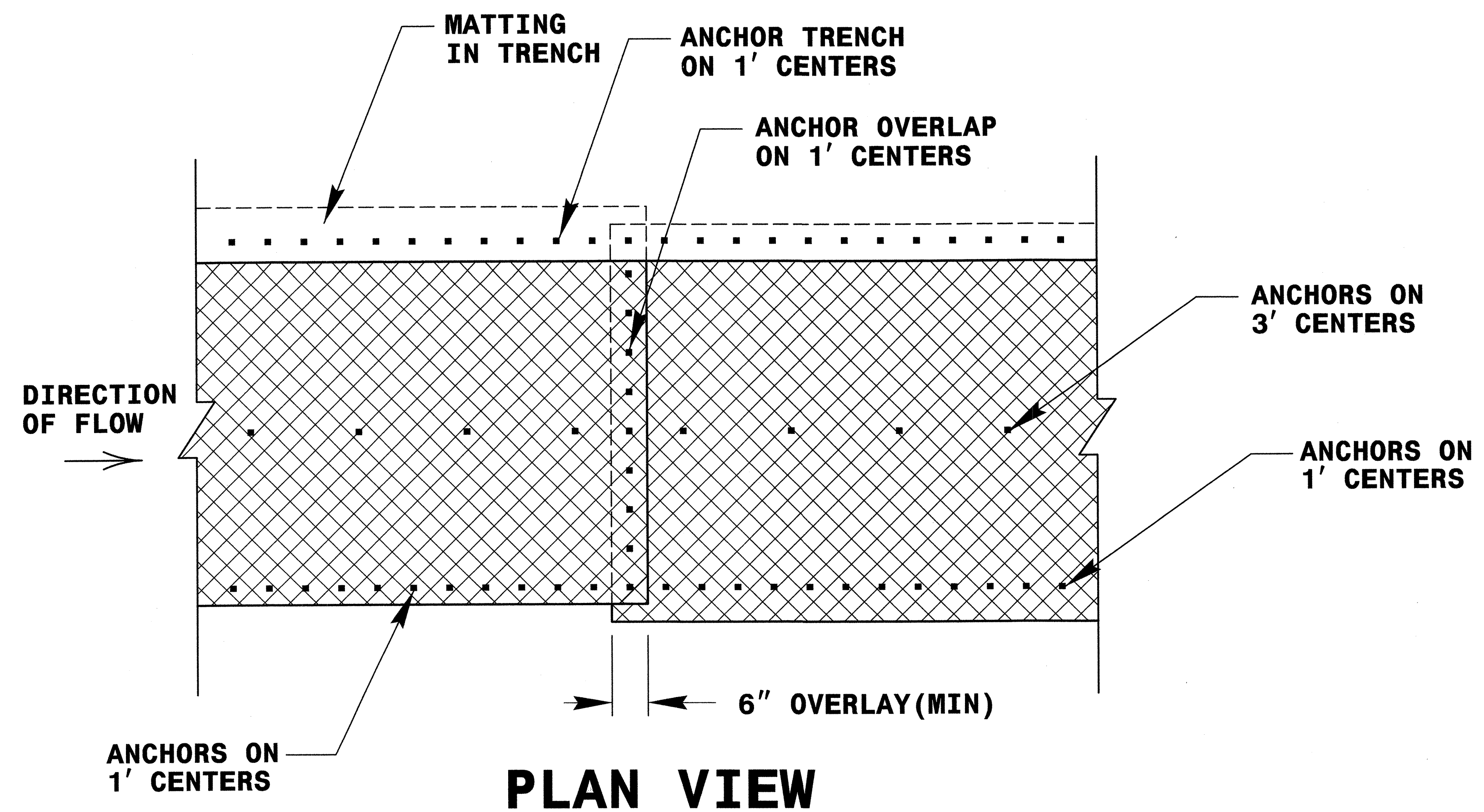
TYPE 2

- 30% BETULA NIGRA RIVER BIRCH 12 in - 18 in BR
- 30% FRAXINUS PENNSYLVANICA GREEN ASH 12 in - 18 in BR
- 20% QUERCUS LYRATA OVERCUP OAK 12 in - 18 in BR
- 20% QUERCUS MICHAUXII SWAMP CHESTNUT OAK 12 in - 18 in BR

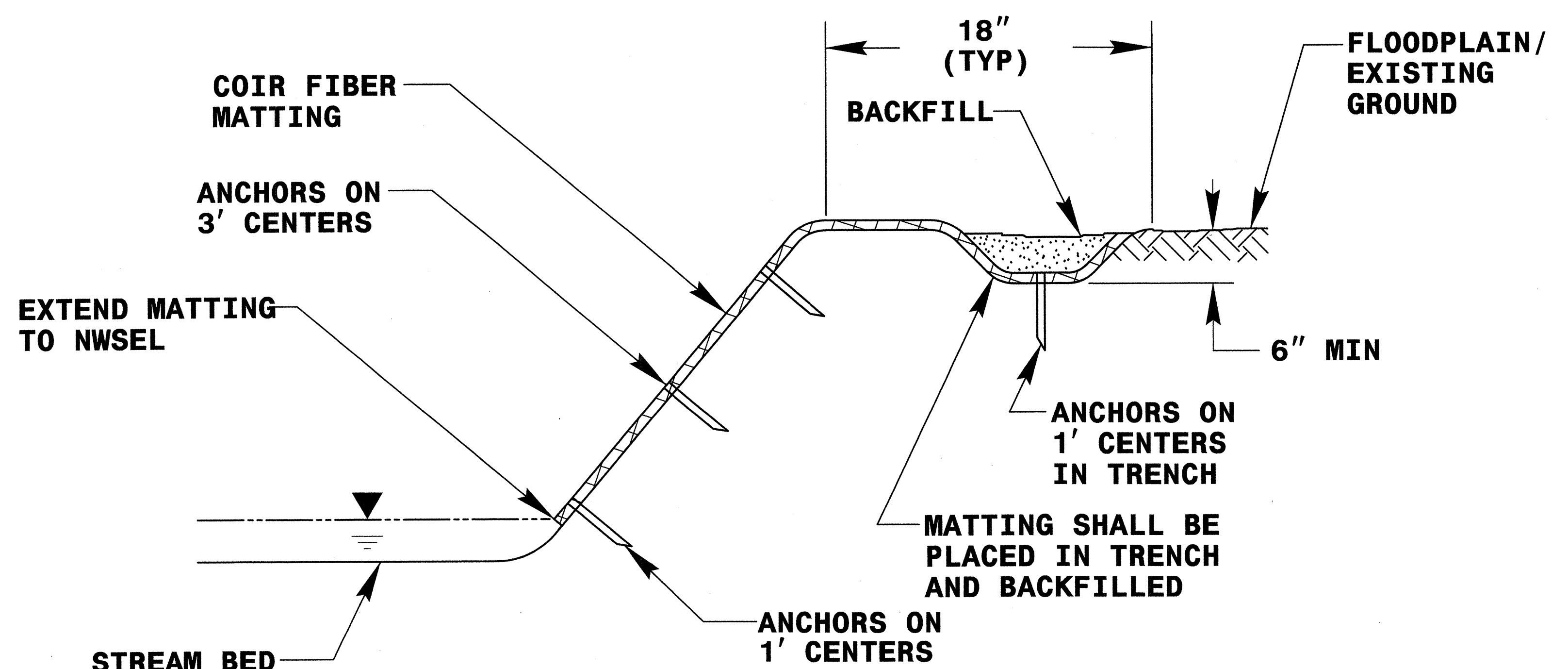
SEE PLAN SHEETS FOR AREAS TO BE PLANTED

STREAMBANK REFORESTATION

DETAIL SHEET 1 OF 2



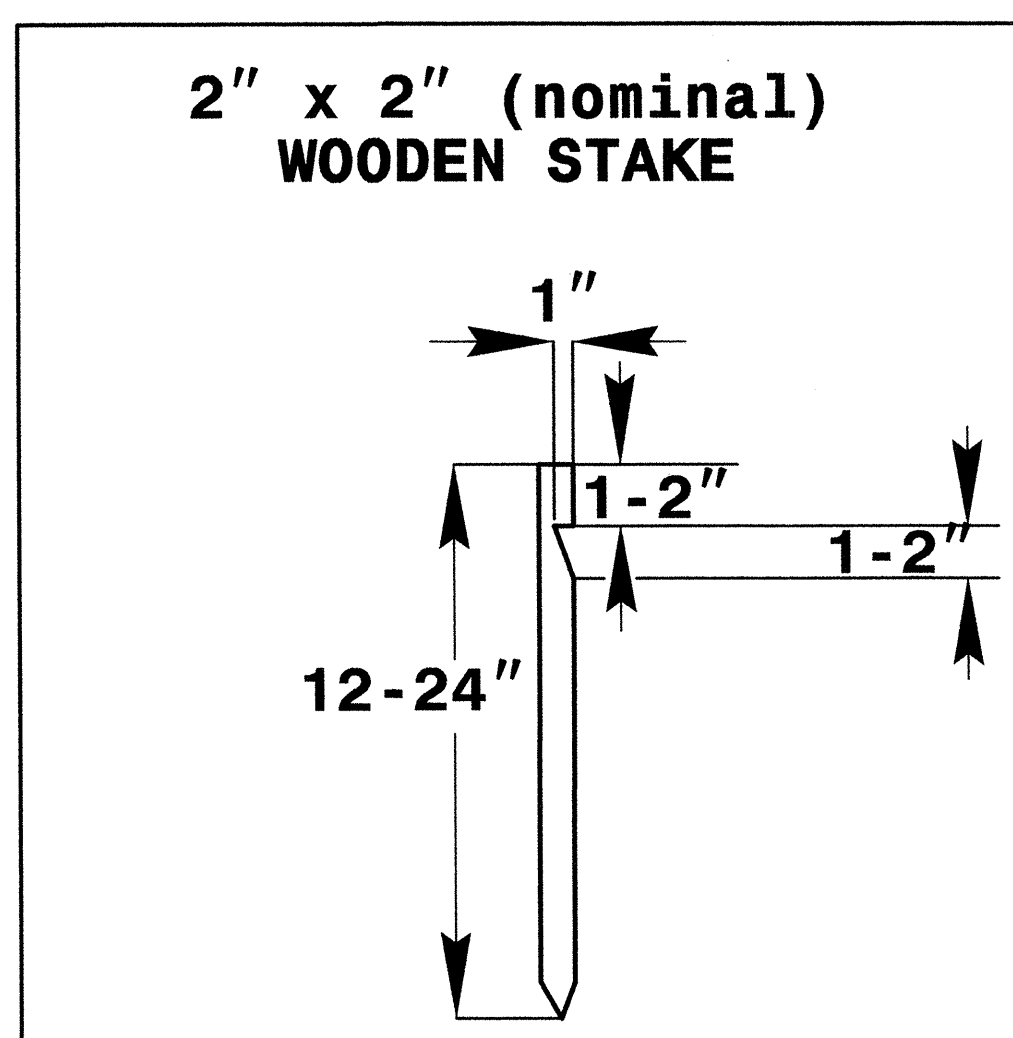
PLAN VIEW



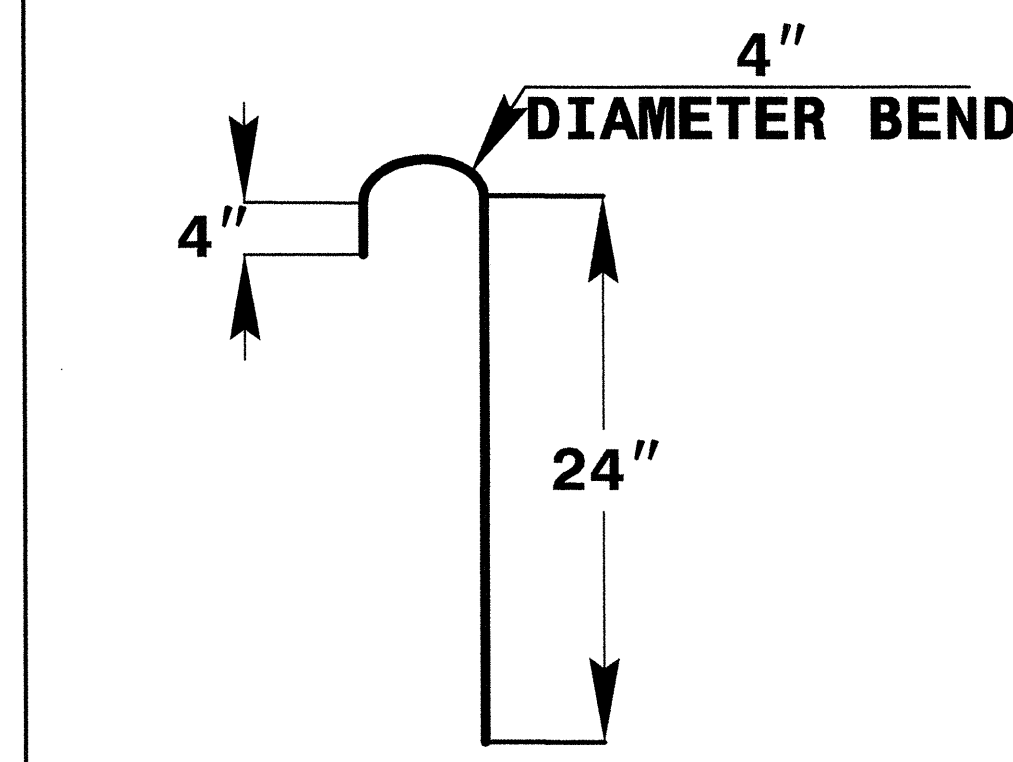
TYPICAL CROSS SECTION

COIR FIBER MATTING DETAIL

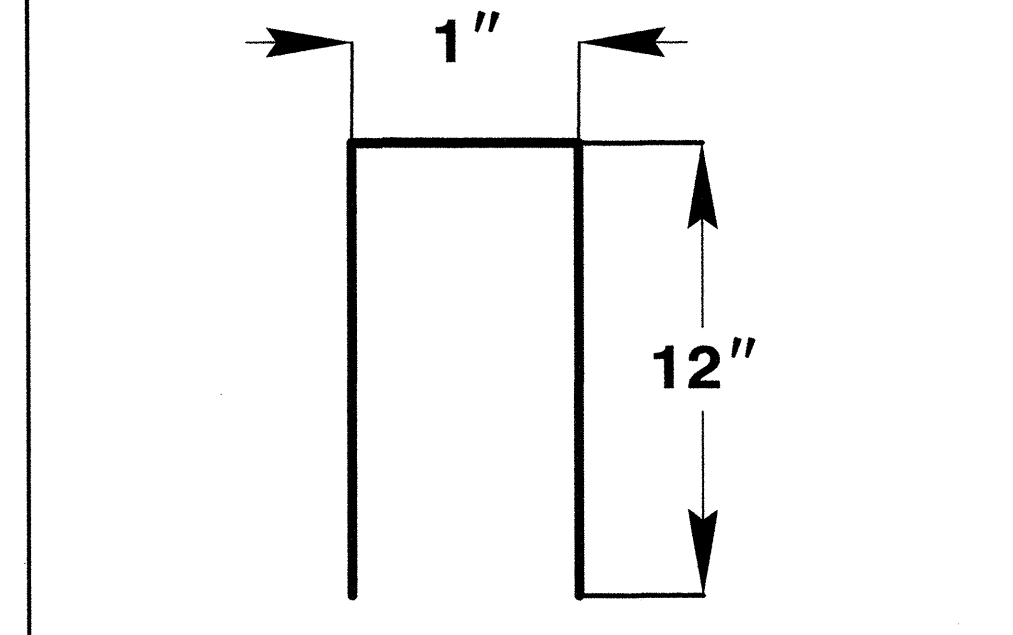
NOT TO SCALE



2" x 2" (nominal) WOODEN STAKE



#10 STEEL REINFORCEMENT BAR



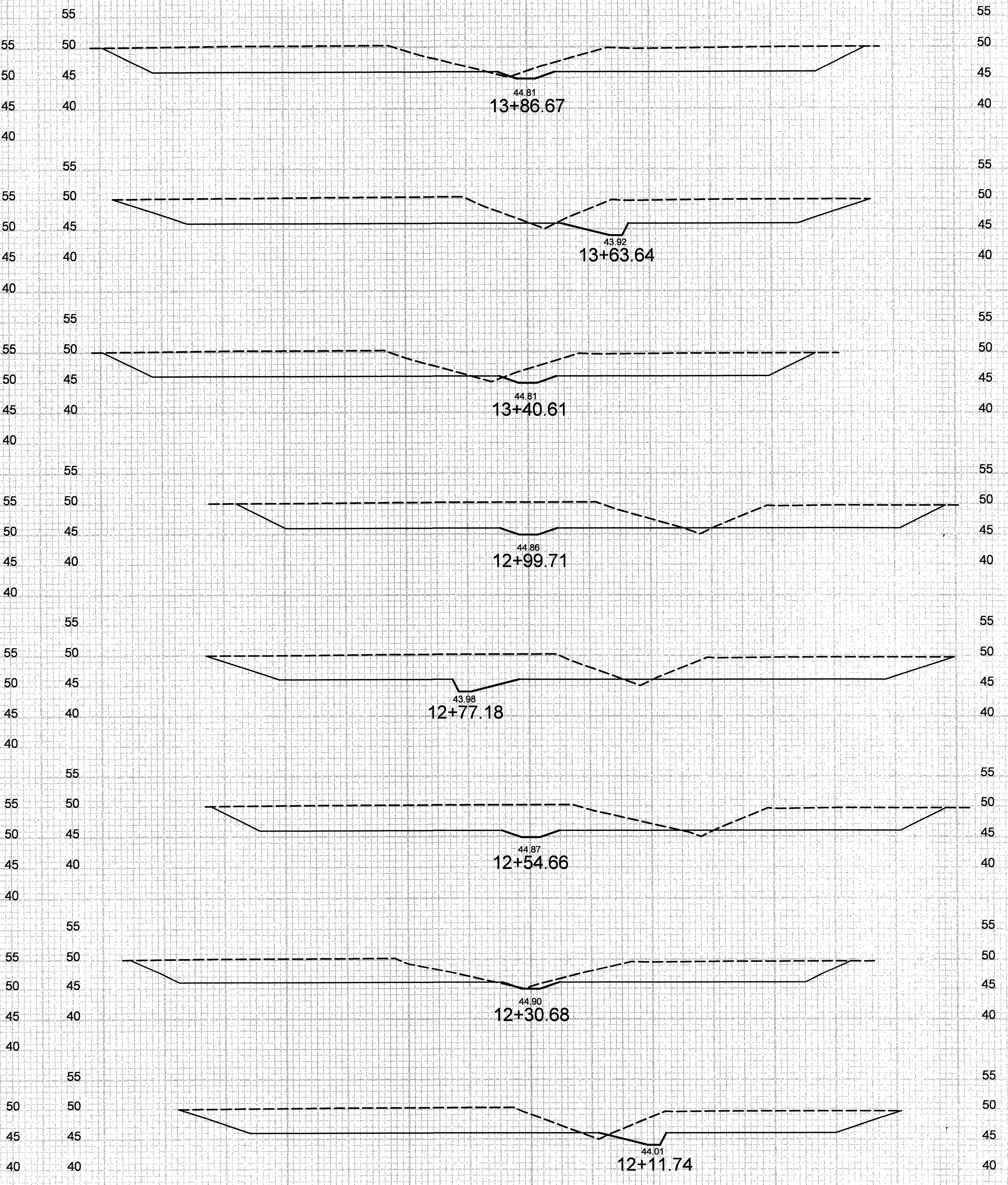
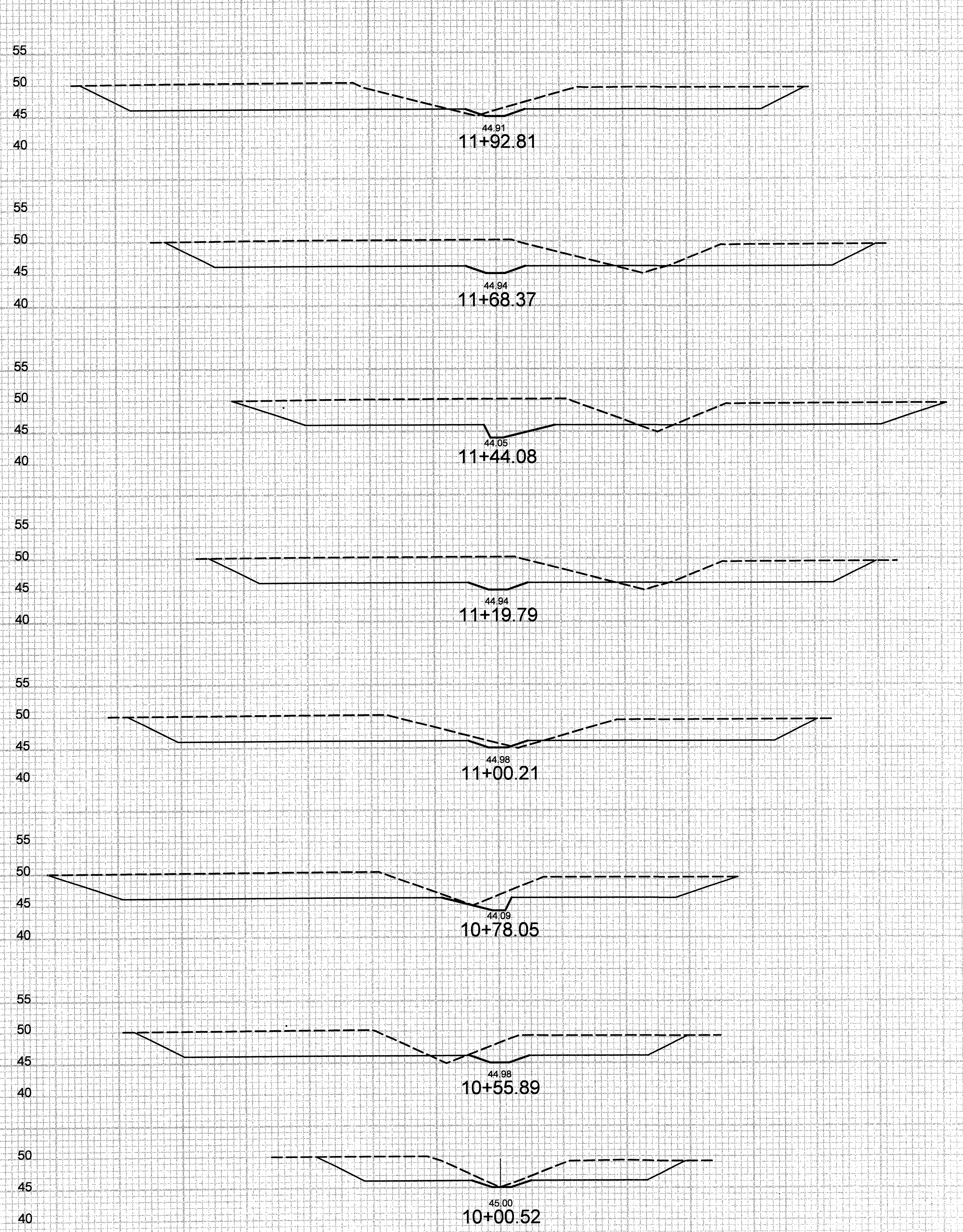
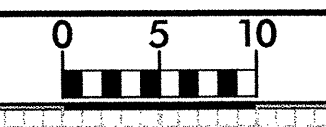
1" (nominal) STAPLE

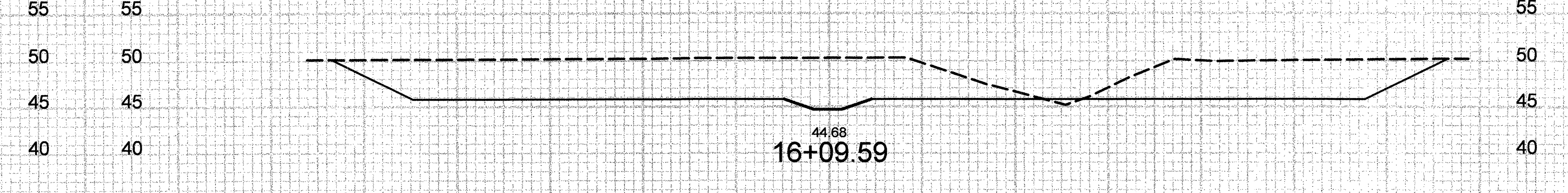
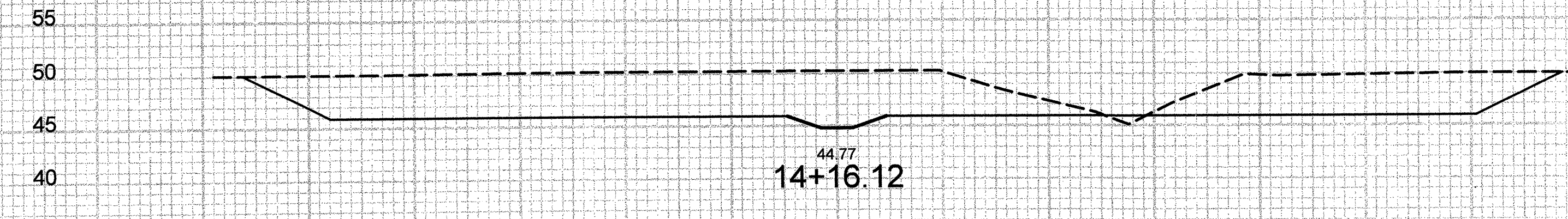
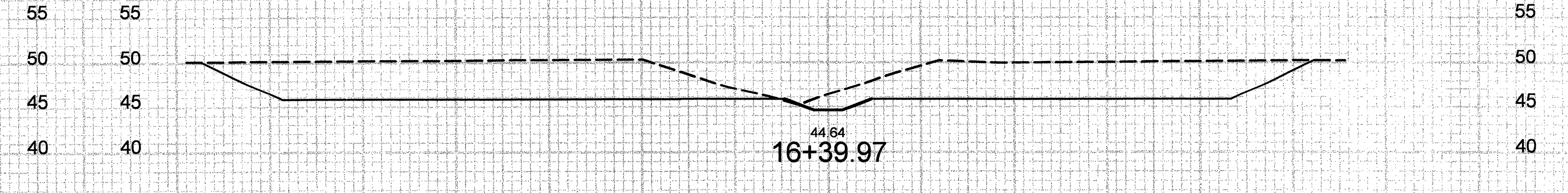
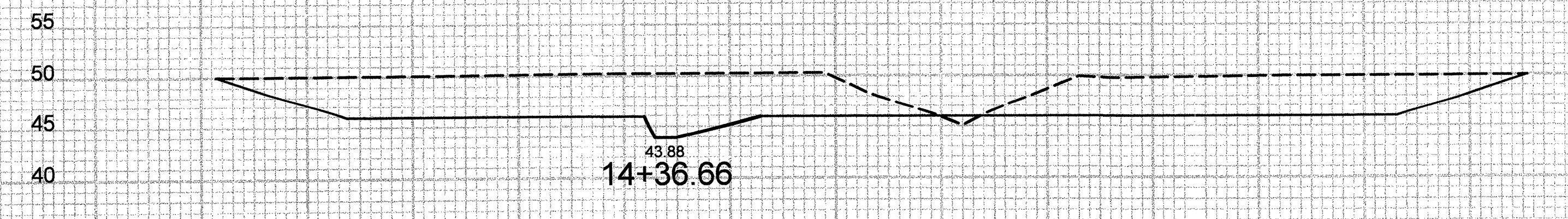
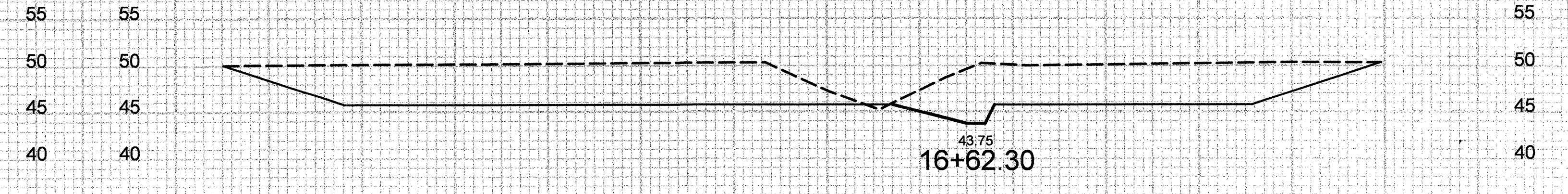
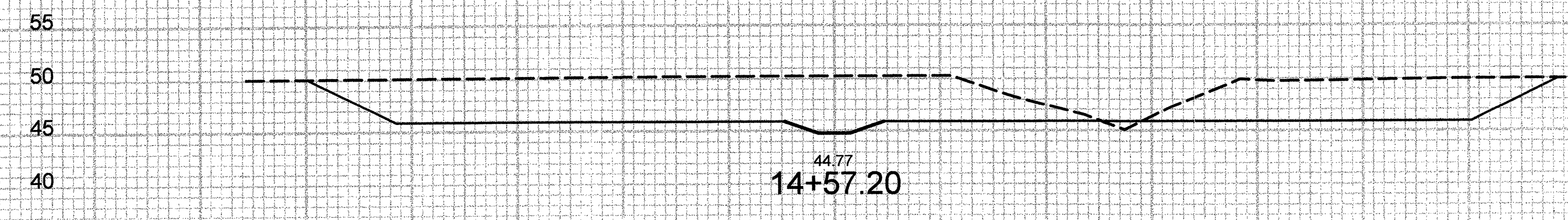
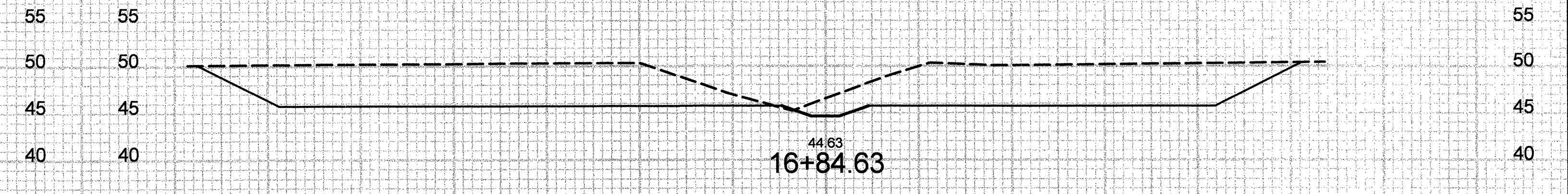
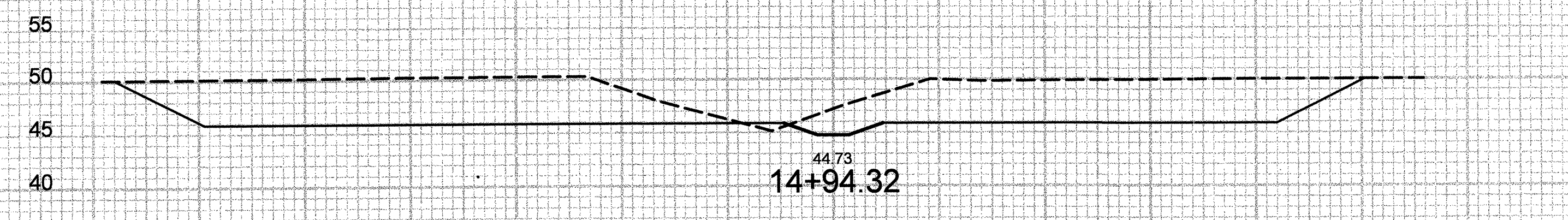
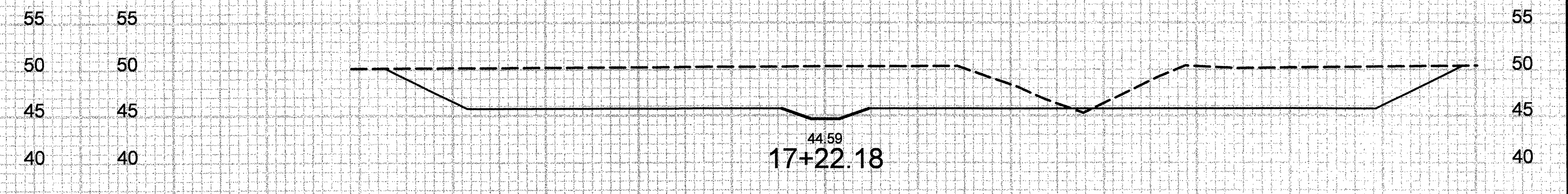
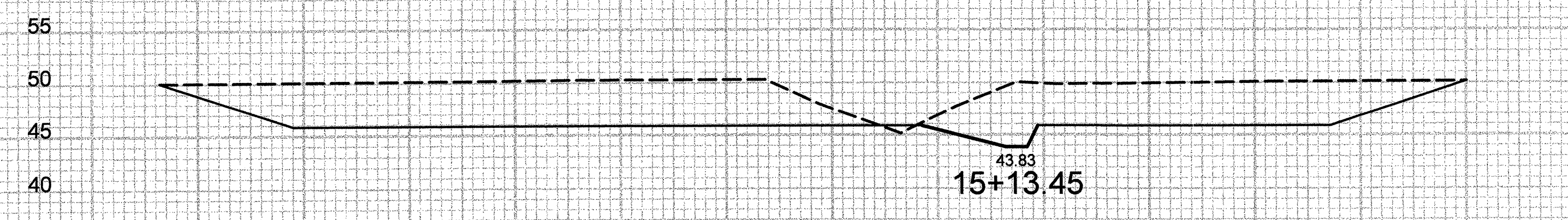
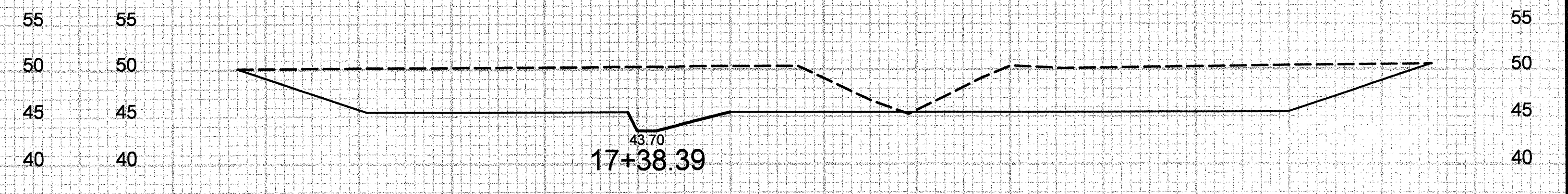
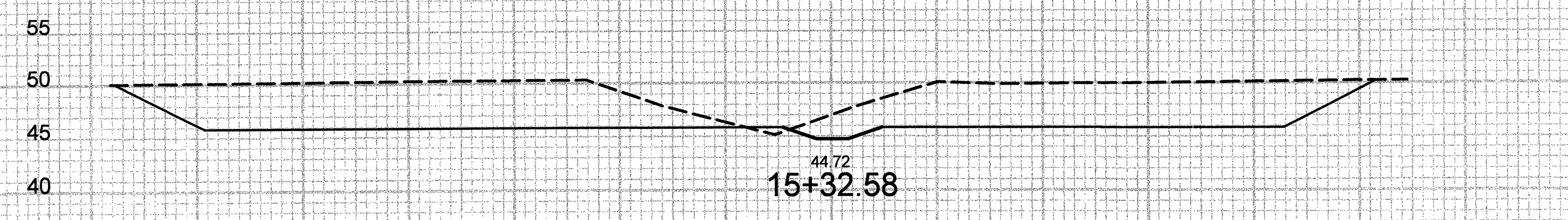
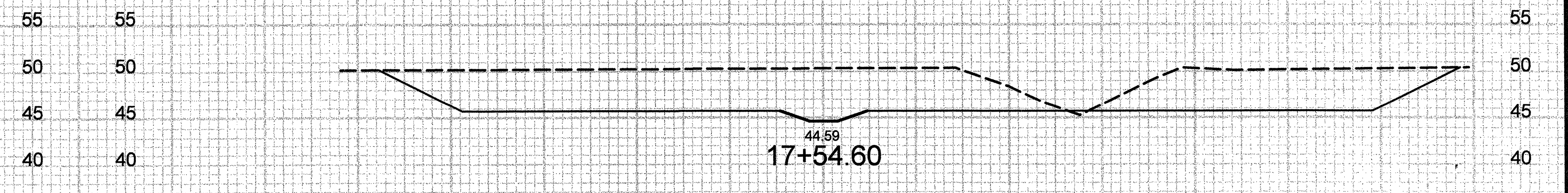
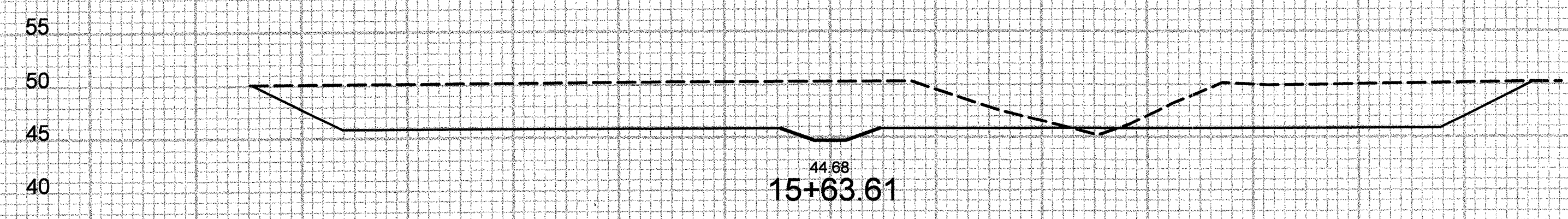
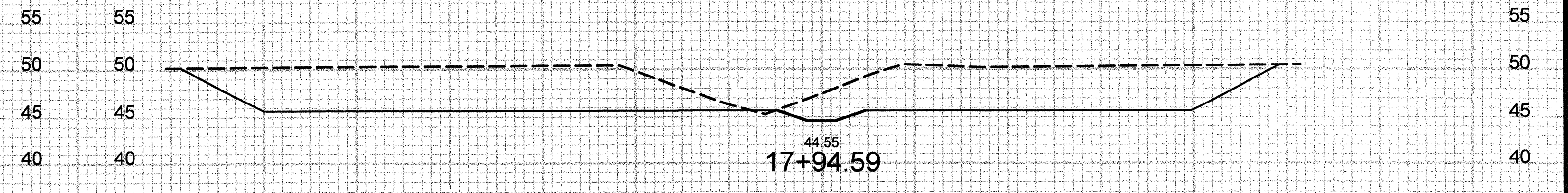
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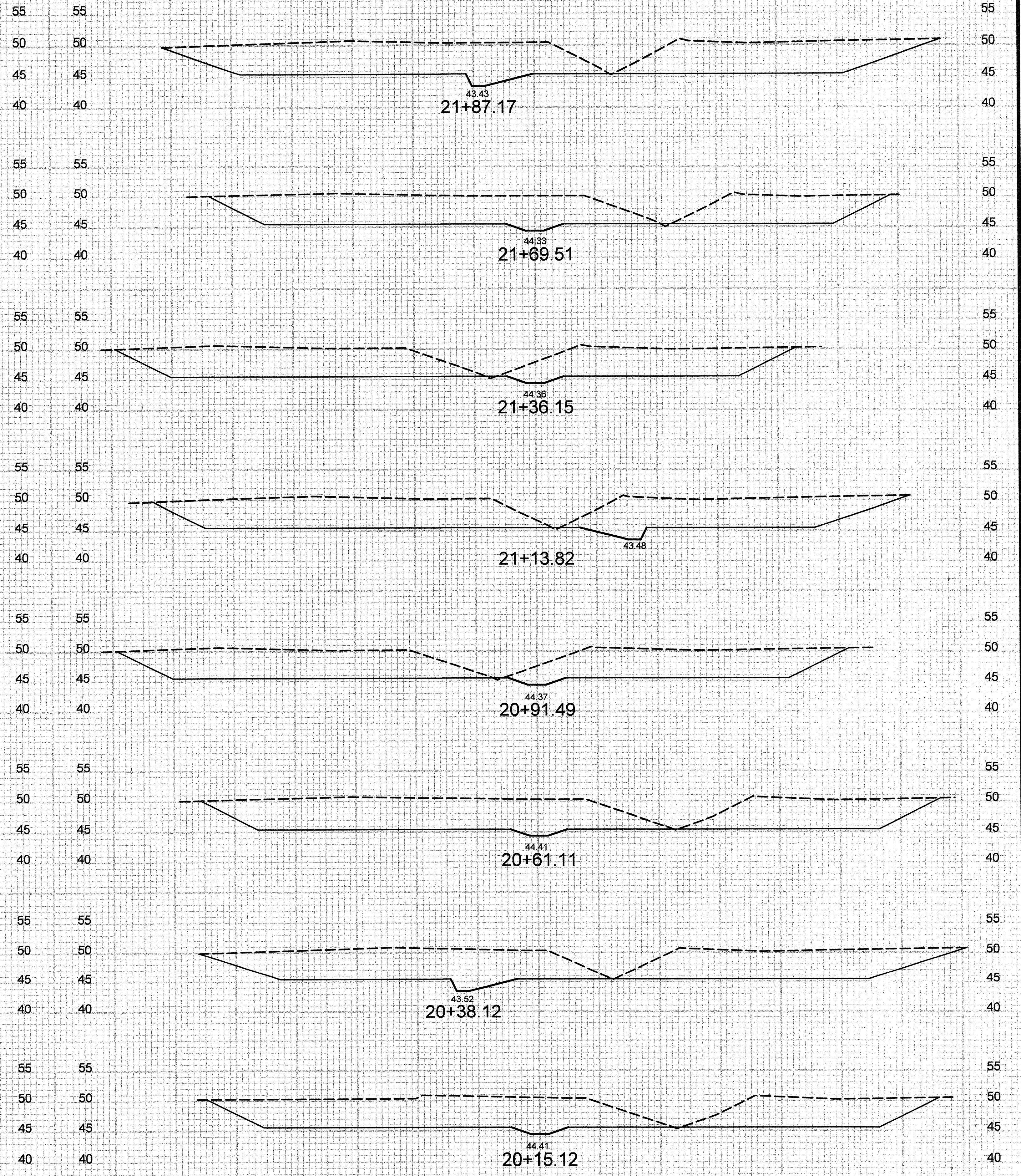
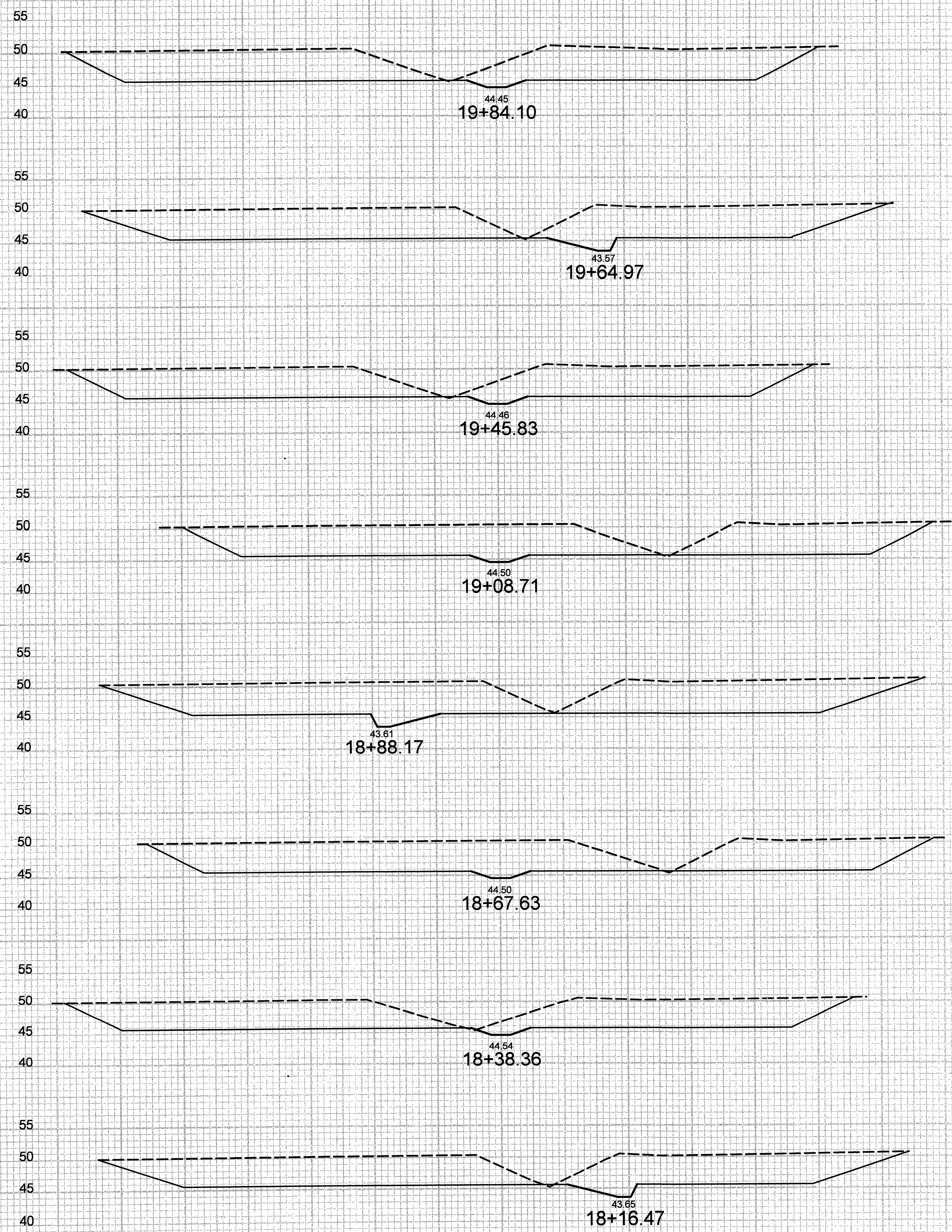
STREAMBANK REFORESTATION

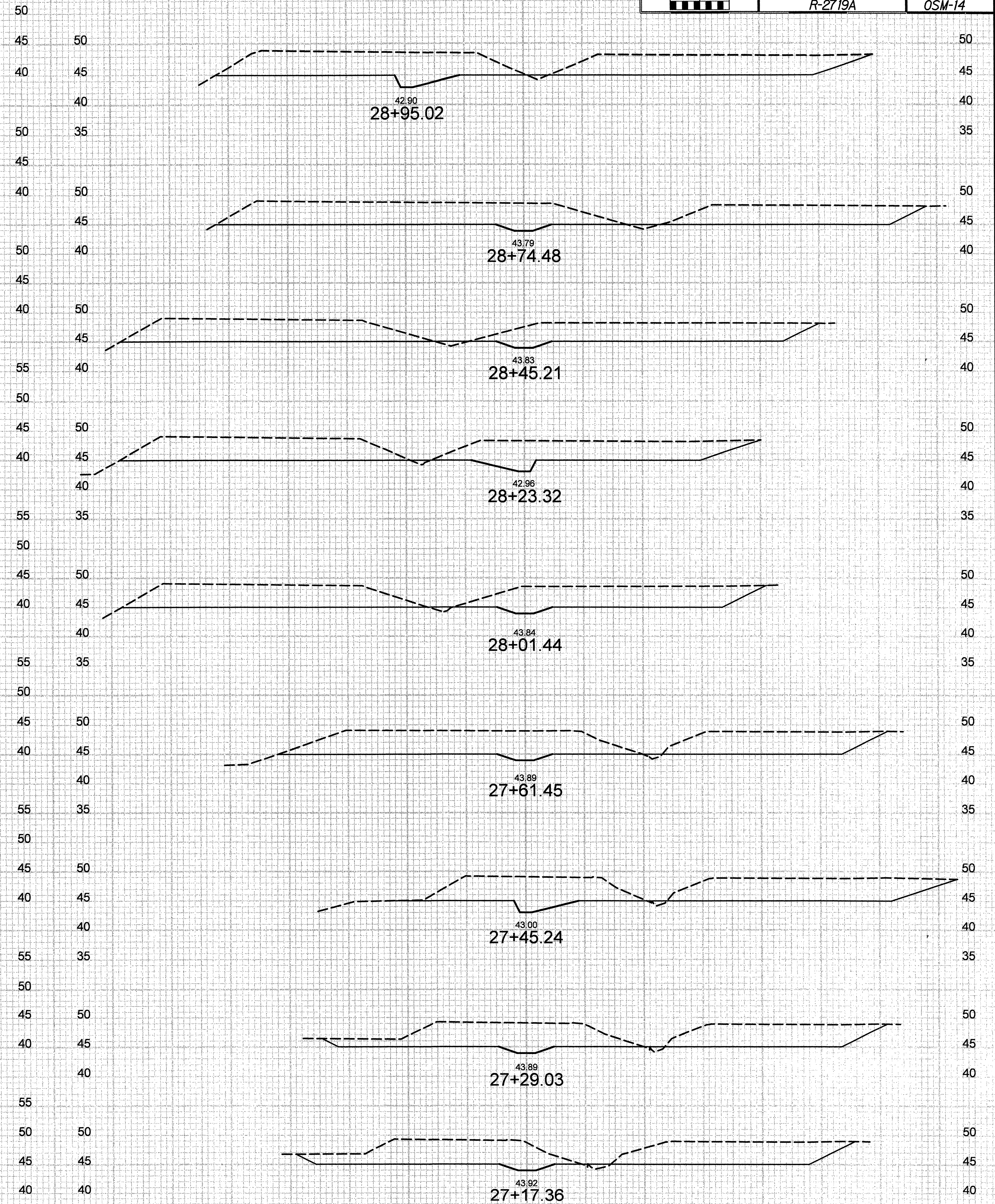
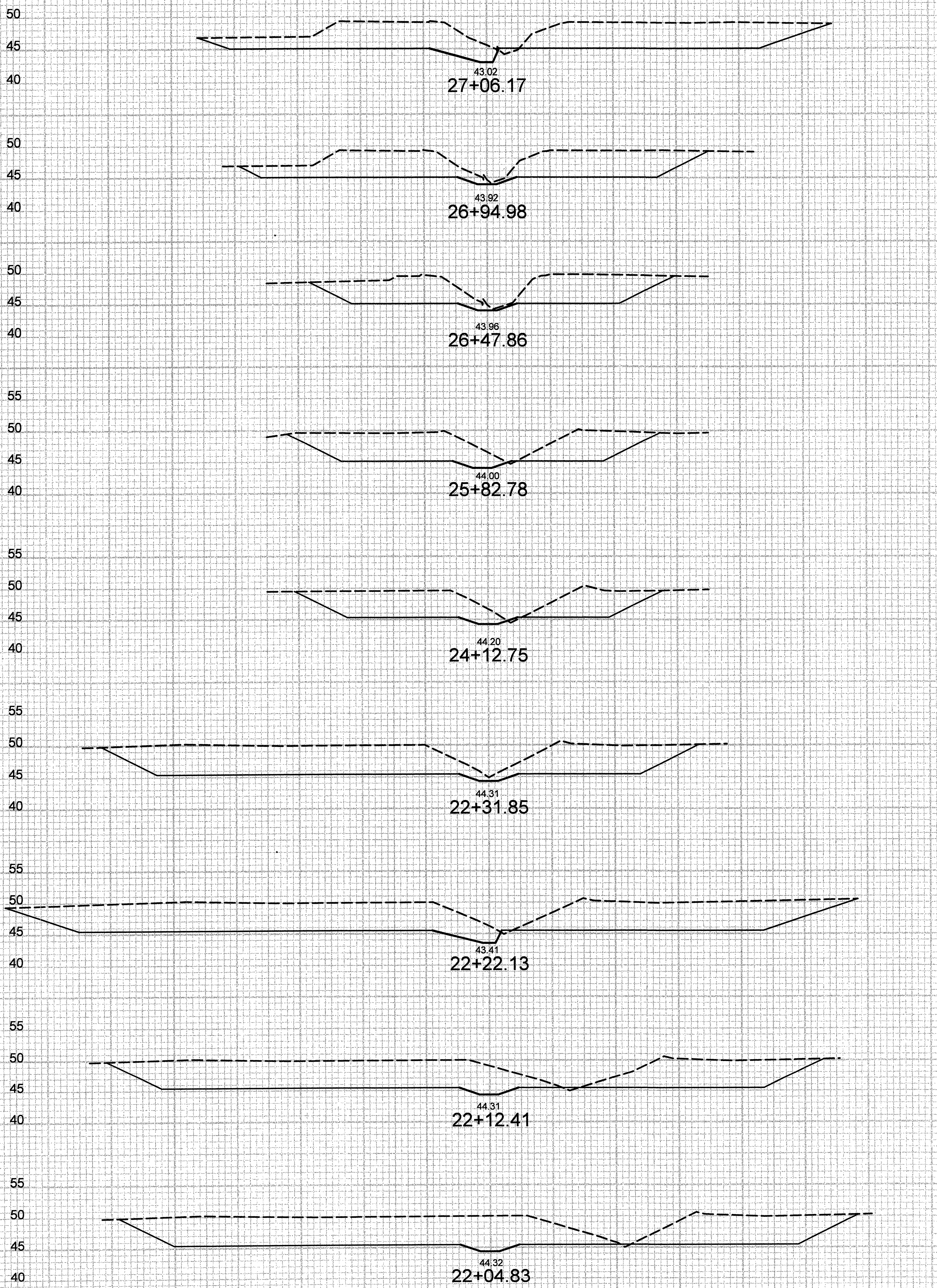
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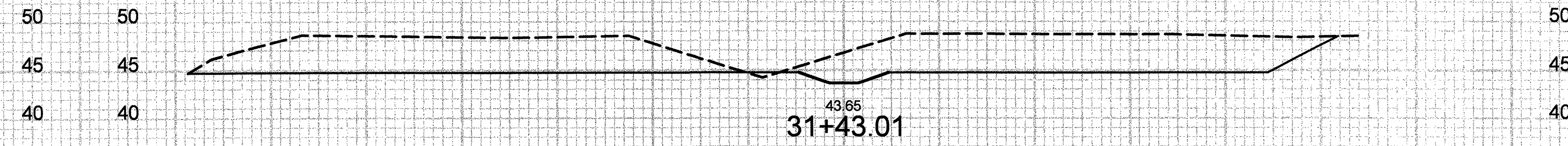
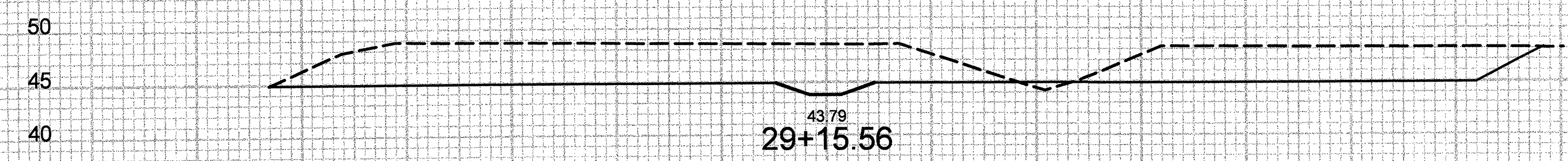
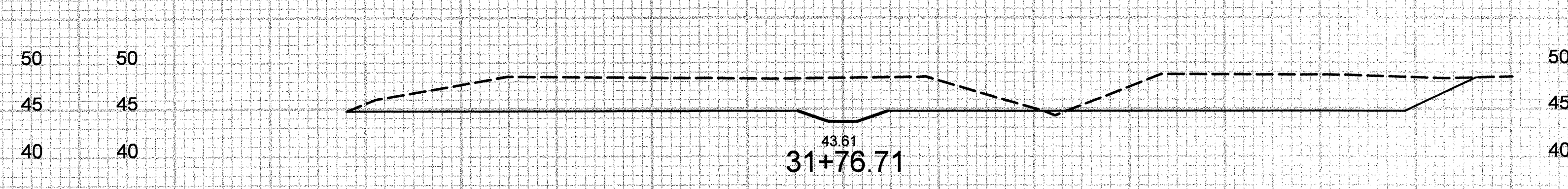
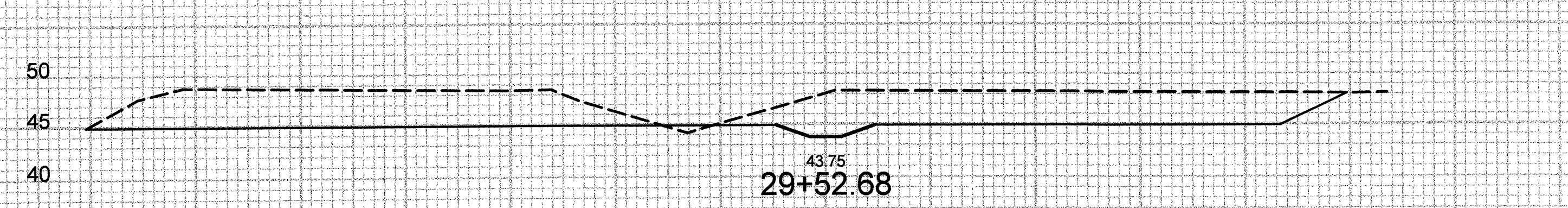
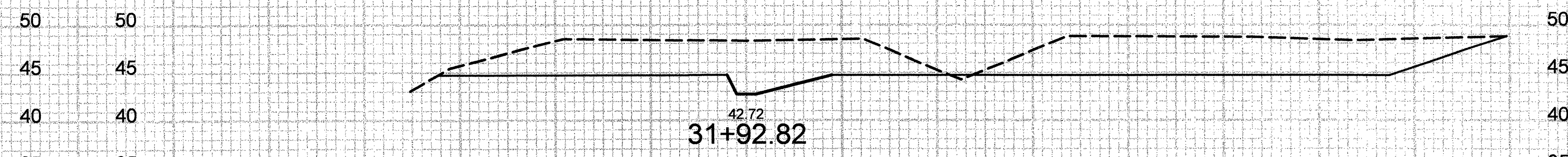
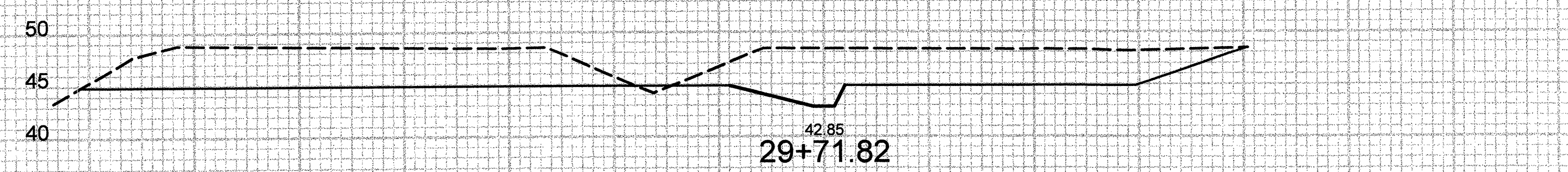
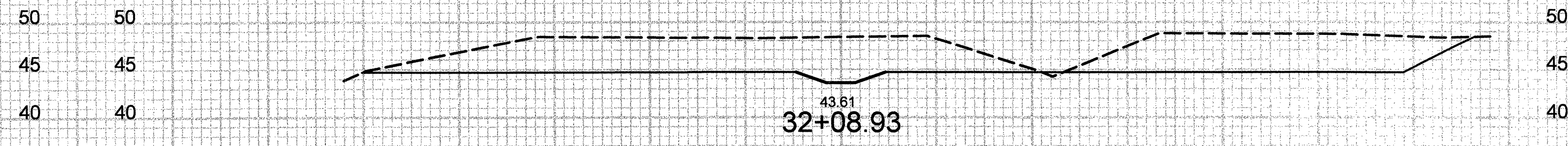
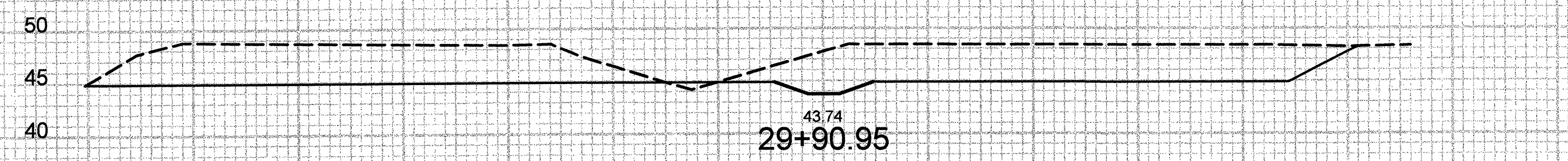
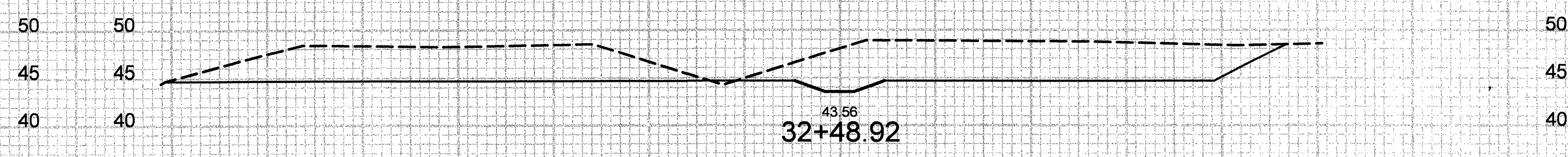
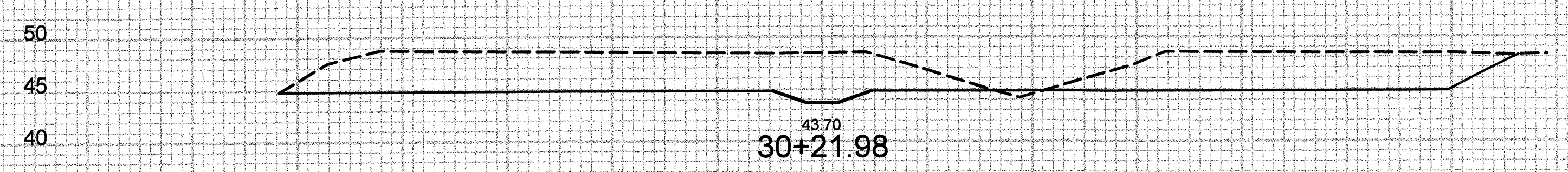
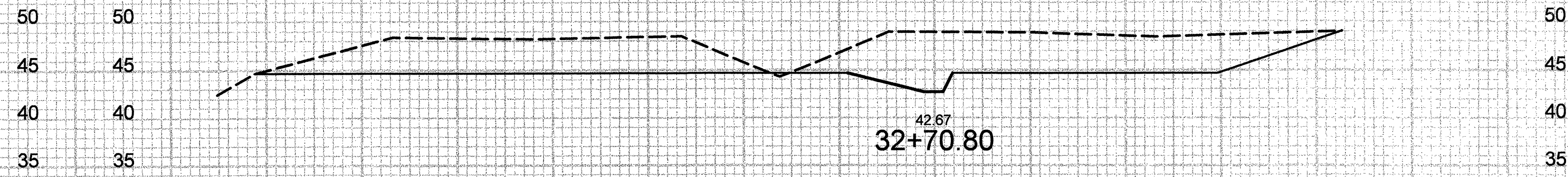
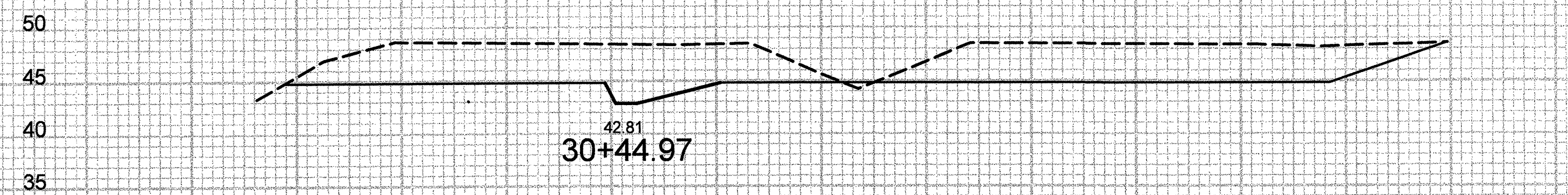
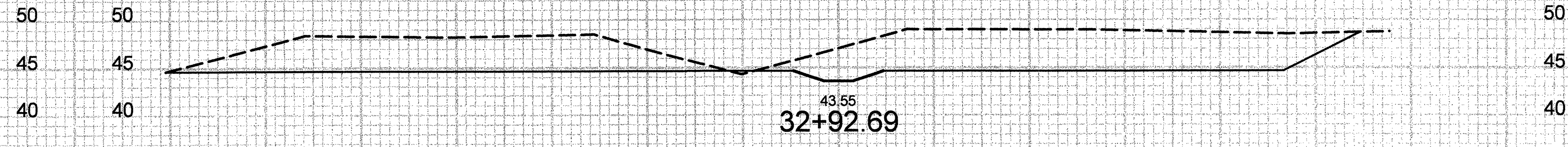
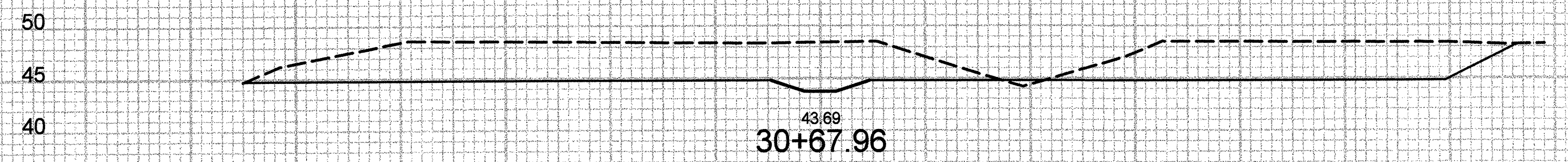
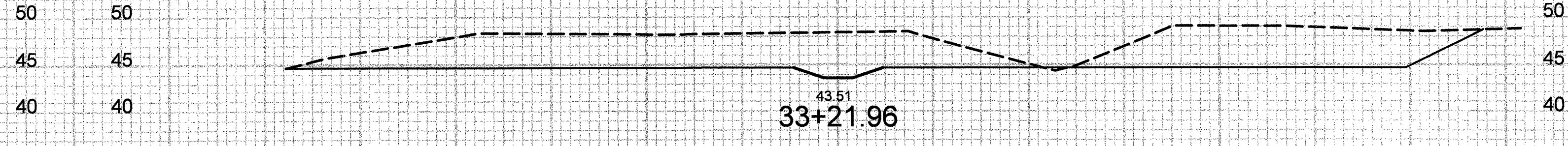
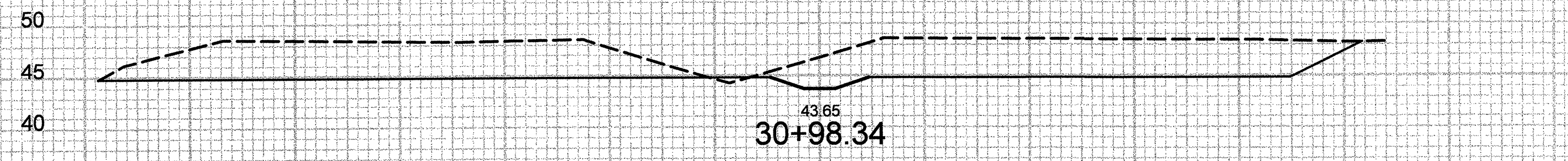
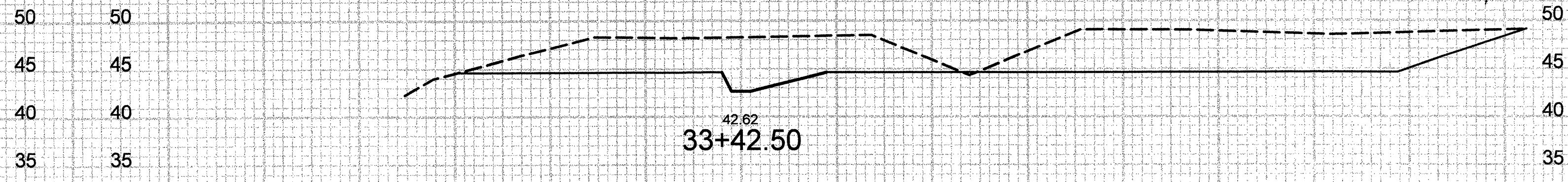
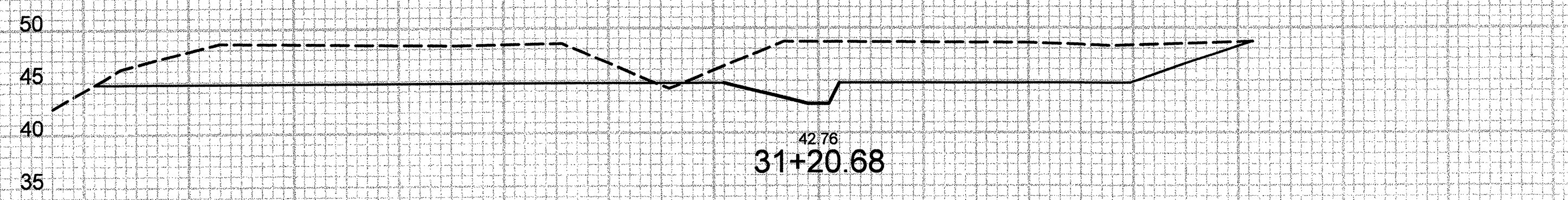
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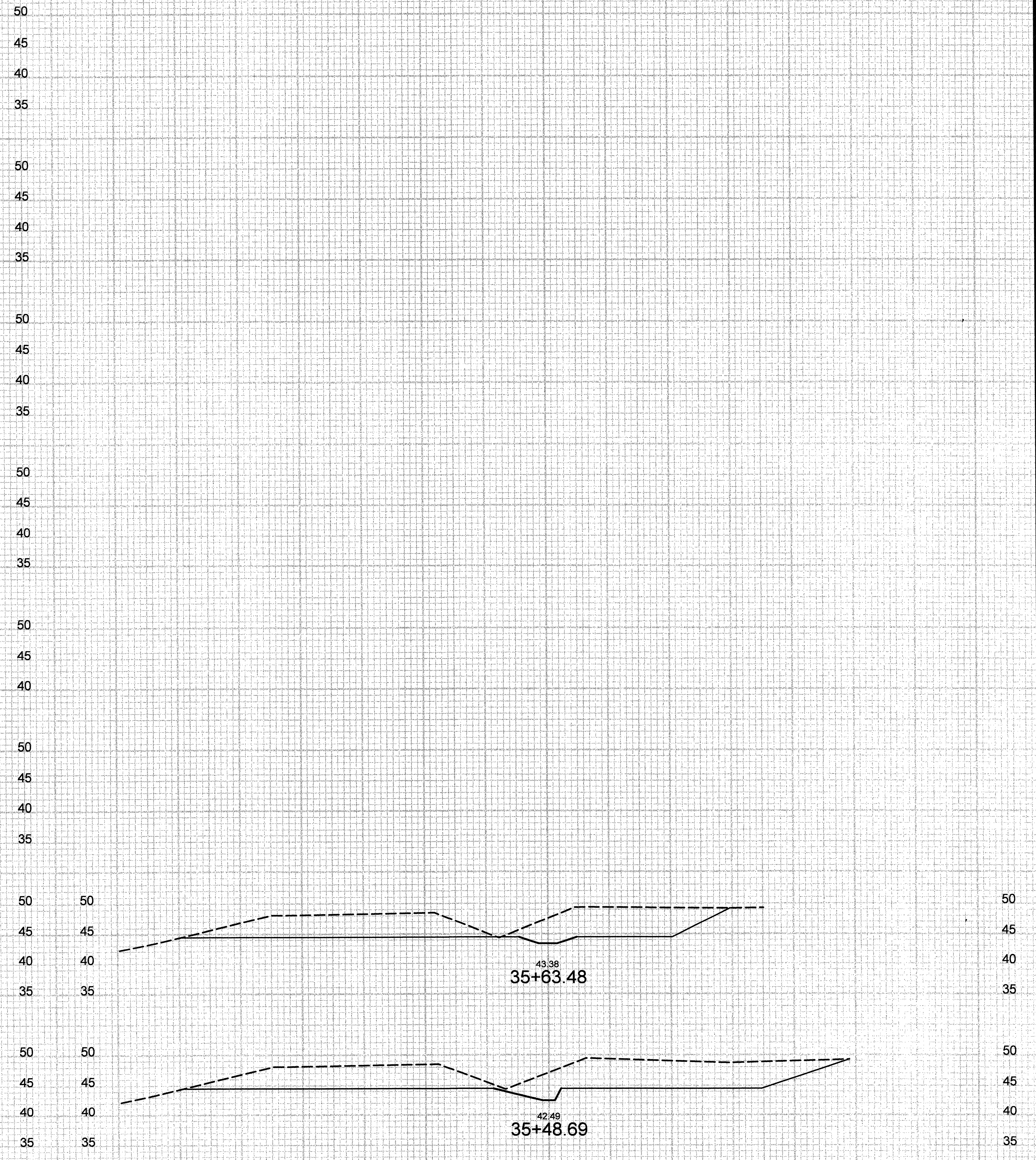
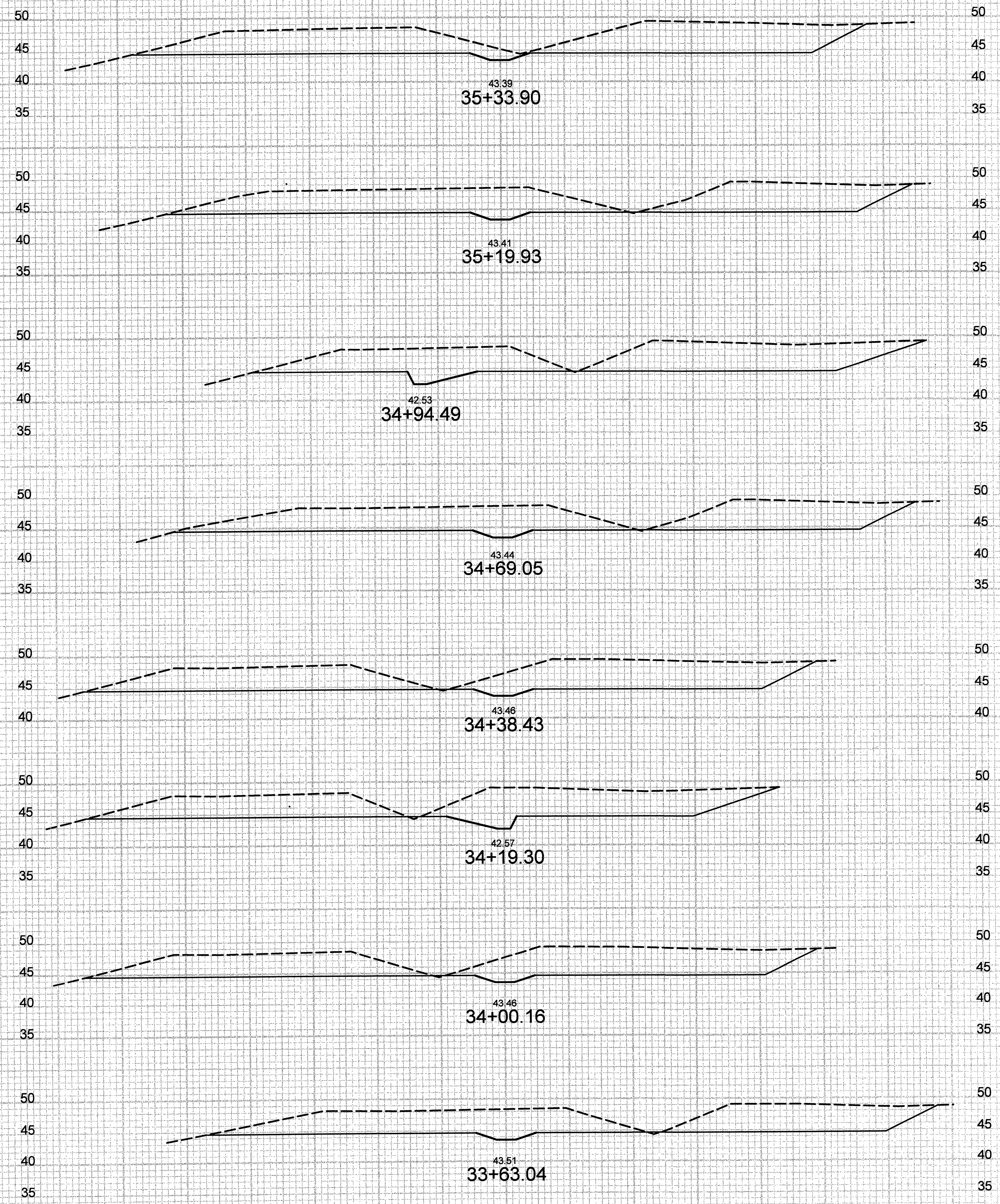




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PROJ. REFERENCE NO.	SHEET NO.
R-2719A	OSM-16



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