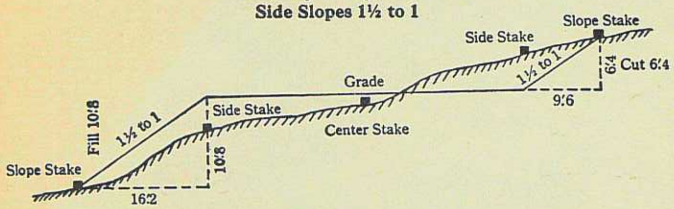
CR 351-(2) SLOPE STAKES

CR 351(2) - 1978

183+58 80

DISTANCES FROM SIDE STAKES FOR CROSS-SECTIONING

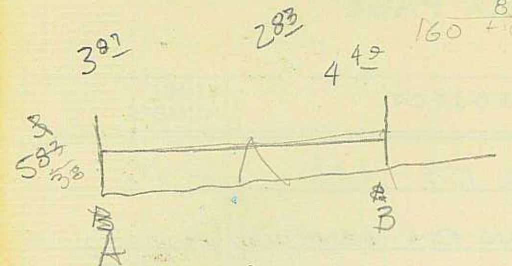
Roadway of any Width
Side Slopes 1½ to 1



In the figure above: Opposite 6 under "Cut or Fill" and under .4 read 9:6 the distance from the side stake to the slope stake at right. Opposite 10 under "Cut or Fill" and under .8 read 16:2, the distance from the side stake to the slope stake at the left.

Cut or Fill	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	Cut or Fill
	Distance out from Side or Shoulder Stake										
0	0.0	0.2	0.3	0.5	0.6	0.8	0.9	1.1	1.2	1.4	0
1	1.5	1.7	1.8	2.0	2.1	2.3	2.4	2.6	2.7	2.9	1
2	3.0	3.2	3.3	3.5	3.6	3.8	3.9	4.1	4.2	4.4	2
3	4.5	4.7	4.8	5.0	5.1	5.3	5.4	5.6	5.7	5.9	3
4	6.0	6.2	6.3	6.5	6.6	6.8	6.9	7.1	7.2	7.4	4
5	7.5	7.7	7.8	8.0	8.1	8.3	8.4	8.6	8.7	8.9	5
6	9.0	9.2	9.3	9.5	9.6	9.8	9.9	10.1	10.2	10.4	6
7	10.5	10.7	10.8	11.0	11.1	11.3	11.4	11.6	11.7	11.9	7
8	12.0	12.2	12.3	12.5	12.6	12.8	12.9	13.1	13.2	13.4	8
9	13.5	13.7	13.8	14.0	14.1	14.3	14.4	14.6	14.7	14.9	9
10	15.0	15.2	15.3	15.5	15.6	15.8	15.9	16.1	16.2	16.4	10
11	16.5	16.7	16.8	17.0	17.1	17.3	17.4	17.6	17.7	17.9	11
12	18.0	18.2	18.3	18.5	18.6	18.8	18.9	19.1	19.2	19.4	12
13	19.5	19.7	19.8	20.0	20.1	20.3	20.4	20.6	20.7	20.9	13
14	21.0	21.2	21.3	21.5	21.6	21.8	21.9	22.1	22.2	22.4	14
15	22.5	22.7	22.8	23.0	23.1	23.3	23.4	23.6	23.7	23.9	15
16	24.0	24.2	24.3	24.5	24.6	24.8	24.9	25.1	25.2	25.4	16
17	25.5	25.7	25.8	26.0	26.1	26.3	26.4	26.6	26.7	26.9	17
18	27.0	27.2	27.3	27.5	27.6	27.8	27.9	28.1	28.2	28.4	18
19	28.5	28.7	28.8	29.0	29.1	29.3	29.4	29.6	29.7	29.9	19
20	30.0	30.2	30.3	30.5	30.6	30.8	30.9	31.1	31.2	31.4	20
21	31.5	31.7	31.8	32.0	32.1	32.3	32.4	32.6	32.7	32.9	21
22	33.0	33.2	33.3	33.5	33.6	33.8	33.9	34.1	34.2	34.4	22
23	34.5	34.7	34.8	35.0	35.1	35.3	35.4	35.6	35.7	35.9	23
24	36.0	36.2	36.3	36.5	36.6	36.8	36.9	37.1	37.2	37.4	24
25	37.5	37.7	37.8	38.0	38.1	38.3	38.4	38.6	38.7	38.9	25
26	39.0	39.2	39.3	39.5	39.6	39.8	39.9	40.1	40.2	40.4	26
27	40.5	40.7	40.8	41.0	41.1	41.3	41.4	41.6	41.7	41.9	27
28	42.0	42.2	42.3	42.5	42.6	42.8	42.9	43.1	43.2	43.4	28
29	43.5	43.7	43.8	44.0	44.1	44.3	44.4	44.6	44.7	44.9	29
30	45.0	45.2	45.3	45.5	45.6	45.8	45.9	46.1	46.2	46.4	30
31	46.5	46.7	46.8	47.0	47.1	47.3	47.4	47.6	47.7	47.9	31
32	48.0	48.2	48.3	48.5	48.6	48.8	48.9	49.1	49.2	49.4	32
33	49.5	49.7	49.8	50.0	50.1	50.3	50.4	50.6	50.7	50.9	33
34	51.0	51.2	51.3	51.5	51.6	51.8	51.9	52.1	52.2	52.4	34
35	52.5	52.7	52.8	53.0	53.1	53.3	53.4	53.6	53.7	53.9	35
36	54.0	54.2	54.3	54.5	54.6	54.8	54.9	55.1	55.2	55.4	36
37	55.5	55.7	55.8	56.0	56.1	56.3	56.4	56.6	56.7	56.9	37
38	57.0	57.2	57.3	57.5	57.6	57.8	57.9	58.1	58.2	58.4	38
39	58.5	58.7	58.8	59.0	59.1	59.3	59.4	59.6	59.7	59.9	39
40	60.0	60.2	60.3	60.5	60.6	60.8	60.9	61.1	61.2	61.4	40

159 10.78 154.32
89.22
160+00.00 89.82
243.54



643.54
641.13
2.41

Property of ____________________

____

Address ____________________

____

Phone ____________________

This Field Book contains special paper which is impregnated with resin to make it substantially stronger as well as water resistant. Your field notes will come out sharp and clear even when the page is wet.

Made in U. S. A.

DISTA

Fill 10:8

Slope Stake

In the figure ab
stake to the slo

Cut or Fill	0
0	0.0
1	1.5
2	3.0
3	4.5
4	6.0
5	7.5
6	9.0
7	10.5
8	12.0
9	13.5
10	15.0
11	16.5
12	18.0
13	19.5
14	21.0
15	22.5
16	24.0
17	25.5
18	27.0
19	28.5
20	30.0
21	31.5
22	33.0
23	34.5
24	36.0
25	37.5
26	39.0
27	40.5
28	42.0
29	43.5
30	45.0
31	46.5
32	48.0
33	49.5
34	51.0
35	52.5
36	54.0
37	55.5
38	57.0
39	58.5
40	60.0

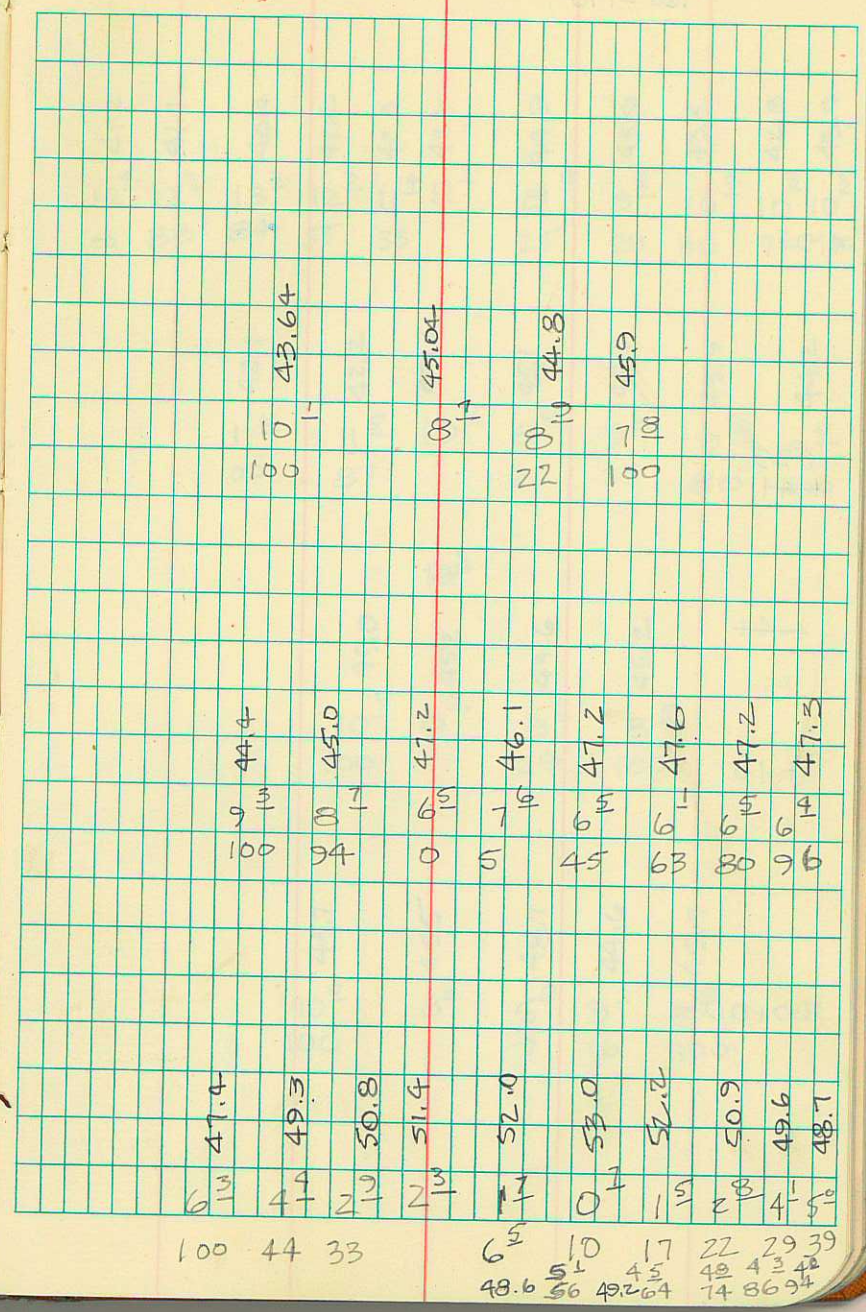
INDEX PAGE

9 MARCH 78 CROSS SECTIONS

HUDSON NOTES WARM, CLEAR

WARD - A

	+	HI	−	ELEV
BM *		4653.74	7.10	4646.64
+93			$8\frac{7}{-}$	4645.04
+53.5			$6\frac{5}{-}$	4647.24
~~+53.5~~				
159+10 PT			$2\frac{3}{-}$	



CR 351 (2)
CROSS SECTIONS
160 – 170

49

+25
+41

+41

25

+16

160+00

+86

41.2	41.6	37.4	38.0	39.0	40.4	42.1	41.4	42.3
12^{5}	12^{1}	~~14~~ 16^{2}	15^{1}	14^{1}	13^{3}	11^{16}	12^{13}	11^{14}
100	96	88	33	18		16	36	100

+77

40.6	40.4	38.4	38.8	40.0	41.0	42.1	42.8	42.0	43.4	42.1
13^{1}	13^{3}	15^{3}	14^{9}	13^{1}	12^{1}	11^{6}	10^{2}	11^{2}	10^{3}	11^{16}
100	93	88	34	18		34	41	46	53	58
						42.9	42.5			
						10^{18}	11^{2}			
						64	100			

+68

39.9	41.1	38.7	38.6	41.0	40.8	39.1	40.8	39.2	43.1	44.3	42.2	42.1	42.9	42.9
13^{18}	12^{6}	15^{10}	15^{1}	12^{4}	12^{2}	14^{6}	12^{9}	14^{5}	10^{6}	9^{14}	11^{15}	11^{6}	10^{18}	10^{18}
100	90	86	55	45	35	29	21	16		27	43	57	68	100

+56

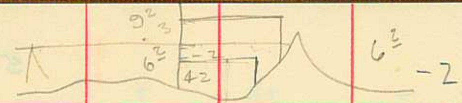
	40.9	40.0	40.9	48.9	40.5	40.9	42.7	43.4	44.8	42.7	42.7	43.3
12^{1}	12^{18}	13^{1}	12^{18}	4^{8}	13^{2}	12^{18}	11^{10}	10^{13}	8^{19}	11^{0}	11^{0}	10^{14}
100	92	86	59	43	28	15		16	37	43	63	100

	+	HI	-	ELEV
+27				
TP	3^{28}	4646.04	10^{98}	4642.76
161+00			12^{4}	
+92			12^{2}	

37.1	37.2	35.4	35.8	39.9	42.1	40.4	40.9
8^{19}	8^{18}	10^{11}	10^{12}	6^{1}	3^{9}	5^{16}	5^{1}
100	93	47	9		8	37	100

40.2	37.1	37.5	41.4	40.6	41.3	42.9	42.5	41.6	41.0	42.1
13^{5}	16^{6}	16^{2}	12^{13}	13^{1}	12^{14}	10^{18}	11^{12}	12^{1}	12^{7}	11^{6}
97	89	29	14	10		5	13	38	54	100

40.6	40.6	37.3	37.7	38.7	41.5	42.8	42.2	41.5	42.3
13^{1}	13^{-}	16^{7}	16^{0}	15^{0}	12^{2}	10^{9}	11^{15}	12^{4}	11^{4}
100	96	88	33	15		7	31	43	100



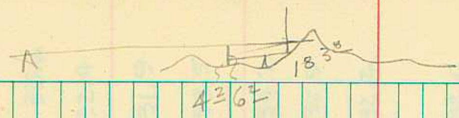
6^{3} −2

+12 11^{1}

162 11^{5}

+45 11^{5}

+35 10^{7}



33.0 10^{30} 100

34.9 11^{1}

35.4 10^{10} 20

37.0 9^{10} 25

35.7 10^{13} 31

37.2 8^{18} 75

38.4 7^{16} 78

6^{1} 5^{5}

33.1 12^{10} 100

34.5 11^{15}

35.0 11^{10} 11

40.0 6^{10} 21

36.7 9^{13} 27

39.7 6^{13} 33

40.2 $+9^{8}$ 41

36.3 4^{7} 48

42.2 3^{18} 65

37.1 8^{19} 80

40.3 5^{7} 100

34.6 11^{14} 100

34.5 11^{15}

45.5 0^{10} 16

26

40.1 5^{9} 32

40.1 5^{19} 100

46 35.4 10^{16} 97

35.3 10^{7}

43.1 2^{19} 14

42.7 3^{3} 20

40.2 5^{8} 25

40.5 5^{5} 64

40.8 5^{3} 100

+69

13 8/10

163+00

60

11 1/2

+27

11 1/2

7 3/10 5 2/10

36.7 33.6 32.4 31.9 33.5 34.7 32.9 32.2 32.0 33.7 32.4 31.4 45.8

9 12 4/10 13 6/10 14 1/10 12 5/10 11 3/10 13 1/10 11 3/10 14 1/10 12 1/10 13 5/10 14 1/10

60 48 41 22 18 9 5 21 24 26.9 63

42.7 3 3/10 44.5 41.0 35.3 70 TOP OF B

64 1 3/10 5 1/10 10 1/10

68 76 89 95

43.0 32.5 33.8 33.4 45.8

3 10/10 13 3/10 12 3/10 12 6/10 0 2/10

80 65 63 74 TOP OF BANK

39.0 34.8 34.2 45.5

13 10/10 11 4/10 11 10/10 6 5/10

100 39 61

32.9 34.9 35.5 38.8 30.0 36.7 44.4 40.5

13 1/10 11 1/10 10 5/10 7 2/10 10 1/10 9 3/10 1 6/10 5 5/10

100 35 42 49 59 76 88

96 4 3/100

+48			11.2	
164+00			10.2	
TP	10.66	4643.41	13.29	4632.75
+76			13.4	
+73			10.8	

33.7 31.9 31.6 31.7 30.5
9.1 11.5 11.8 11.1 12.9 BANK
94 89 59 80 93

33.2 32.0 32.6 33.3 31.8 32.5 30.9
10.2 11.4 10.38 10.1 11.16 10.9 12.5
76 70 65 52 45 76 83

33.3 32.1
10.1 11.13
88 97

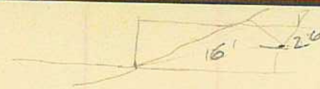
32.3 34.9 35.5 32.5 31.4 32.6 30.6
13.7 11.1 12.15 13.15 14.16 13.4 15.4 TOP OF BANK
69 55 52 48 39 68 76

13.4 10.5 10.16 11.15
68 74 79 100

35.5 36.3 34.4 31.9 31.6 35.2 32.9 31.3
12.5 9.7 11.16 14.1 14.4 10.18 13.1 14.7 TOP OF BANK
61 54 48 40 22 12 64 70

35.4 38.8 35.9 34.8
10.6 7.12 10.1 11.12
71 77 82 100

+ 25			7^{2}	
TP	0^{80}	4632.52	11^{69}	4631.72
165 +00			4^{0}	
+ 88 ^{64}				
+77			12^{2}	



℄ 12^{5} 0^{5} 2^{6} 6^{4} 6 9

30.8	31.4	35.5	33.4	32.0	25.3	25.3	29.4	41.9	42.9
1^{7}	$+1^{1}$	$+3^{0}$	$+0^{9}$	0^{5}	7^{2}	7^{2}	3^{1}	$+9^{4}$	$+10^{4}$
65	55	49	42	24		39	56	90	100

~~6.7~~ -0^{7} 31.8 74 -1^{0} 31.5

31.5	32.7	41.1	42.1	35.8	33.4	36.9	43.4
11^{0}	10^{1}	2^{3}	1^{3}	7^{6}	4^{0}	6^{5}	0^{0}
100	63	40	31	11		14	81

31.8	32.9	37.8	36.6	35.4	36.2	37.7	37.5	40.9
11^{6}	10^{5}	5^{0}	6^{0}	8^{0}	7^{2}	5^{1}	5^{0}	2^{5}
100	15	8		6	9	11	18	60

1^{0} 75 0^{2} 79

30.6	31.2	30.5	41.0	
12^{8}	12^{3}	12^{9}	2^{4}	TOP OF BANK
		49	64	

BM#4			9 57	4604.90		
TP	0 82	4614.47	14 50	4613.65		
TP	1 91	4628.15	6 28	4626.24		
166+05			7 3			
+56 +49			7 6		-1 2 18 93	-0 8 79

30.3 2 2 100

25.2 7 3

28.0 4 5 100

34.1 +1 6 68

33.9 +1 4 54

36.4 +3 2 45

31.8 0 7 37

25.8 6 1 24

24.9 7 6

26.5 6 0 64

30.8 1 7 84

REX SECTION — 164+56 – 165+00
3 MAY

	+	HI	–		
165+00			12 6		
~~16~~					
164+91			5 7	32.94	
TP 4	13 2	38.64			25.44
164+79		+4 ON EYE			
164+75					
164+65					
164+56 9		37 4 5	6 4		

REMAINDER OF P.16

26.0	27.1	31.3	30.3		11
12 9	11 5	7 3	8 3		
	4	14	32		
32.9	34 6	30 4	30.3		
5 7	4 1 0	8 2	0 3		
	16	21	33		
39 85	36 55	29 81	30 0		
+2 4	0 2	7 1	7 5		
	15	24	40		
33 9	35 56	29 81	30 0		
13 9	1 0	7 1	7 4		
	12	20	30		
33 5	36 5	30 0	30 0		
4 9	1 0	7 4	7 4		
31 05	5	18	39		
	30.4				
6 4	7 3				
	39				

10 MARCH 78

ELEVATIONS ON LAMPLIGHTER

	-	HI	+	ELEV
BM #8		4690.98	10 06	4680.92
FOUR FEET SOUTH OF UPPER CURB END	0 3			4690.68
SOUTH + 50 ON CMP LINE	5 0			4685.98
+100	11 6			4679.38
+130	13 9			4677.08
MANHOLE	9 6			4681.38
CURB	9 9			4681.08
END OF BIT. GUTTER TO SOUTH 80' SOUTH OF MANHOLE	16 7			4674.28

29 MAR 78 CROSS SECTIONS LAMPLIGHTER

	+	HI	−	ELEV
BM	12.02		℄	4680.92
UPPER END OF CURB ON CURB		4692.94	1.66	91.28
TOP OF EXIST. ~~B~~ GUTTER			1.72	91.22
~~+10~~			~~2.85~~	
+40				
+30				
+20				
+10				

BALANCE ON P20

DOWN

13

87.13 86.33 ~~87.15~~ 87.92 88.14

5.81 6.61 5.79 5.92 4.80

22.5 22 8 23

CURB GUTTER

87.73 87.15 88.09 88.14 88.09

5.21 5.79 4.85 4.20 3.85

6.5 16 8 23

TOP CURB GUTTER ℄

88.75 88.99 89.59 89.63

4.19 3.95 3.34 3.31

11 8 23

CURB ℄

89.8 90.09 90.81 90.80

3.14 2.85 2.13 2.14

7 8 22

CURB ℄

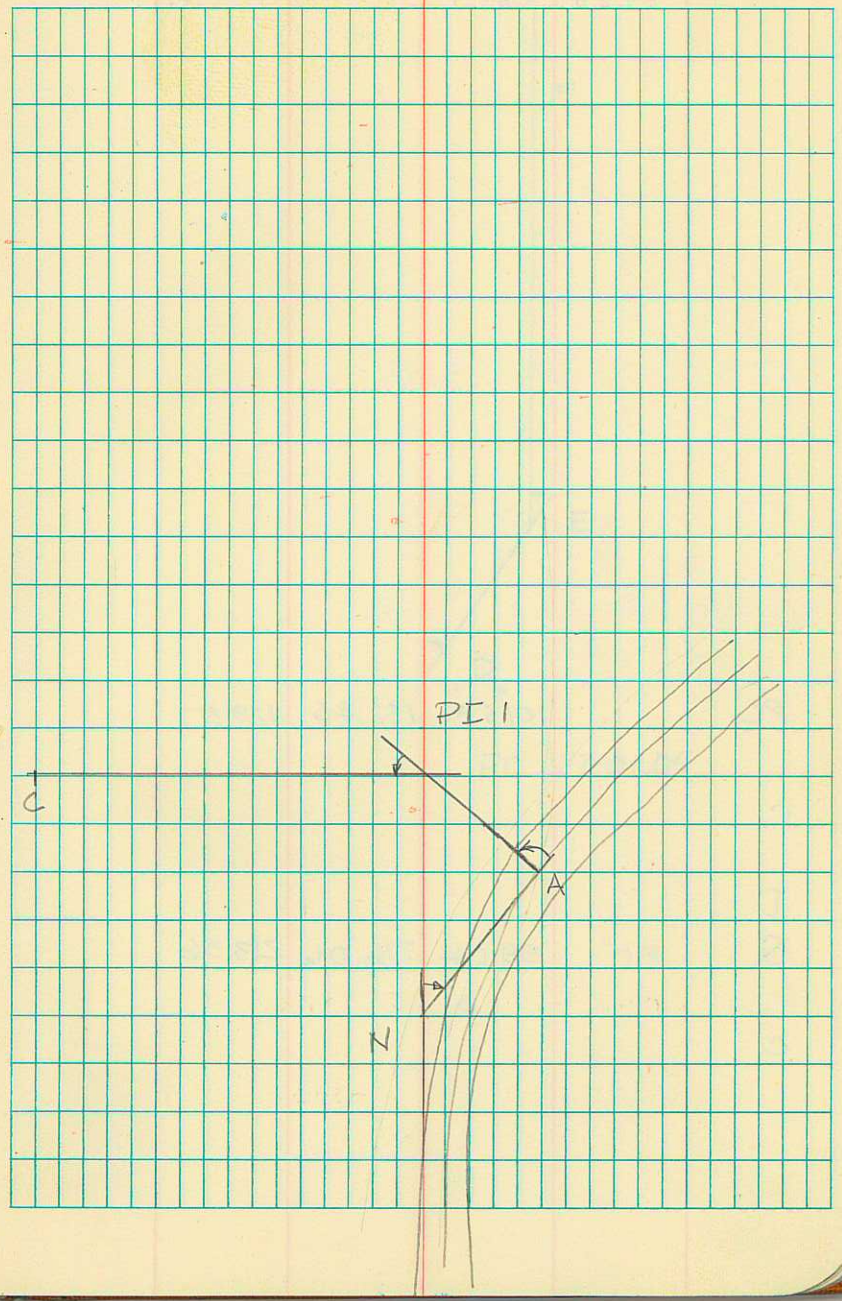
29 MAR 78 FINAL ℄

HUDSON NOTES WARM, SUNNY

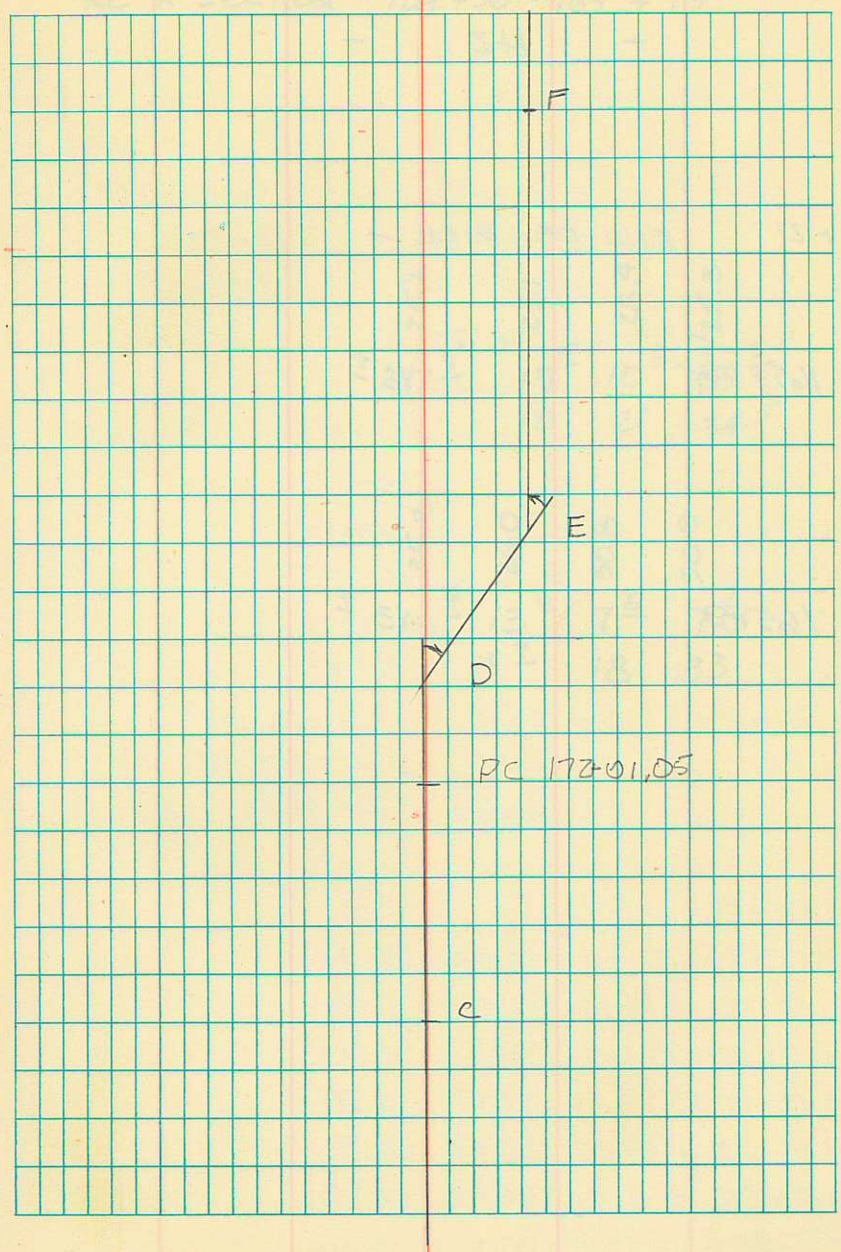
WARD ⊼

SIBEMORE ⊦

C				~~68.78~~ 120+~~86.71~~
	47°35'10"L	1312.61	1312.~~62~~ 42	170+~~70.03~~
PI				157+~~56.48~~
	90°24'10"L	54.11 TAPE		
A				
	~~90°24'10~~ "L	~~54.11 TAPED~~		
N				



	Horiz ∠	Vert ∠	Slope	Horiz. D.
PC		10°59'	132.46	129.57
C				
D				
~~D~~	180°	99.04	216.06	213.36
C				

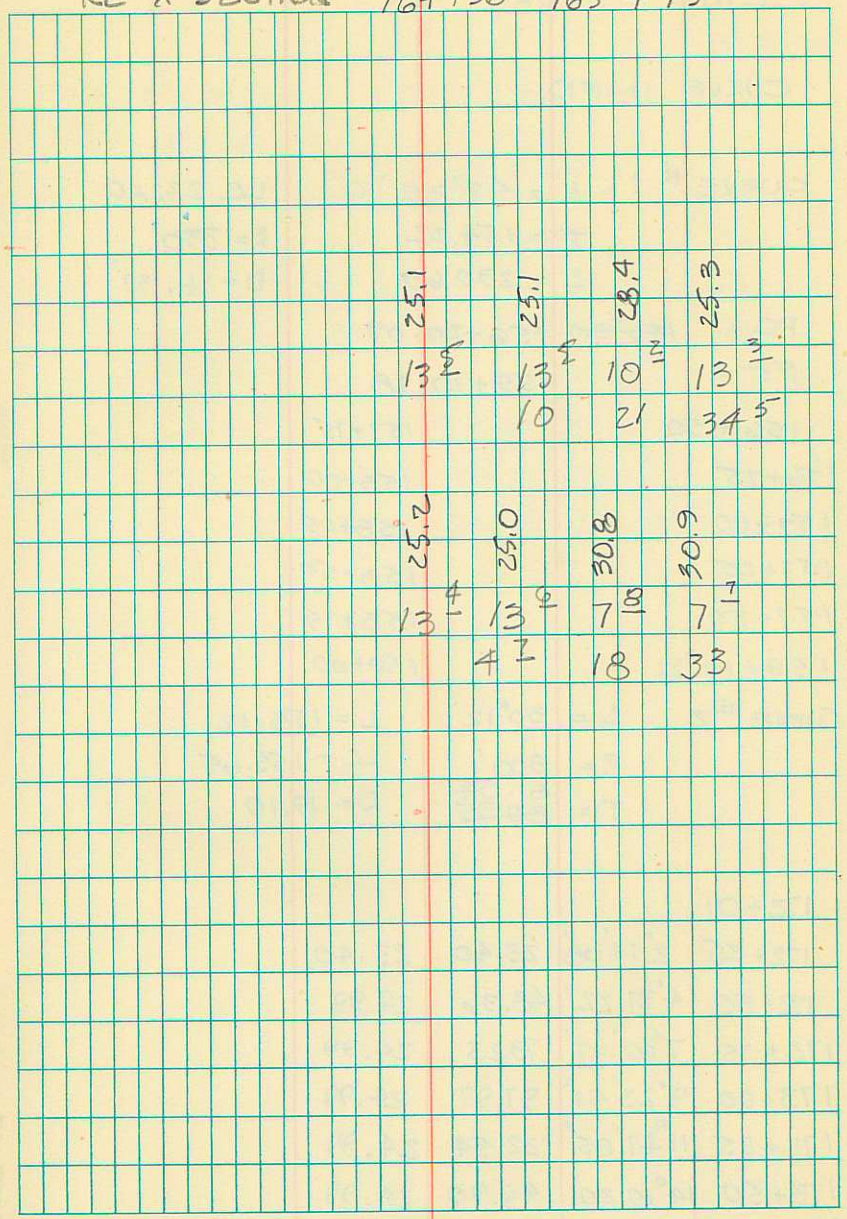


	+	HI	−
+21	END OF PILE		
165+18			13.5
165+09			13.4

(CONT.) FROM P 11

16

RE X SECTION 164+56 - 165+15



LINE – FINAL ℄

CURVE INFO

CURVE # 1	Δ = 47°35'10"		L.C. 282.40
	T = 154.32		R = 350'
	L = 290.69		D = 16.37°
PC =	~~156°20~~	156+20.09	
PT =		159+10.78	
156+50			157+75
156+75			158+00
157+00			158+25
157+25			158+50
157+50			158+75
159+10.78			159+00
CURVE #2	Δ =	30°12'	L = 158.12
	R =	300'	LC = 155.65
	T =	81.04 ~~80.95~~	D = 19.10
172+01			
172+25	2°14'08"	23.40	23.40
172+50	4°37'22"	48.36	24.99
172+75	7°00'37"	73.23	24.99
173+00	9°23'51"	97.97	24.99
173+25	11°47'05"	122.54	24.99
173+50	14°10'20"	146.90	24.99
173+58.5	14°59'02"	155.13	8.50

CURVE # 3

$\Delta = 28^\circ 22' 50''$ L = 148.53

R = 300'

T = ~~76~~ 75.87 ~~75.86~~

LC = 147.09

D = 19.10°

174+27.49			
174+50	2°07'36"	22.26	22.26
174+75	4°30'50"	47.22	25.0
175+00	6°54'05"	72.10	25.0
175+25	9°17'19"	96.84	25.0
175+50	11°40'33"	121.43	25.0
175+76.02	14°11'21"	147.08	26.31

XSECTIONS ON LAMPLIGHTER INTERSECTION

+80

+70

+625 DIDE - WATER

+60 ≈ ℄ OF LAMPLIGHTER

+50

81.93
11 5.3
45
GUTTER

81.34
11 6.0
30
GUTTER

81.25
11 6.9
20

87.83
10 11
13

83.55
9 5.9

84.11
8 8.3

84.44
8 5.8
25
℄ 10 E

82.61
10 3.3
45

83.27
9 7.9
32

83.89
9 9.5
20

84.60
8 3.4

85.02
7 9.2
9

85.44
7 5.0
23
℄ 10 WEST

83.35
9 10
46

84.07
8 8.7
35

84.58
8 3.6
25

85.24
7 7.0
14

85.74
7 2.7

86.13
6 8.1
7.5

86.50
6 4.4
22

86.19
6 7.5

85.16
7 7.8
33

85.43
7 5.1
25

85.93
7 0.1
14

86.45
6 4.0

86.99
5 9.5
7

87.34
5 6.0
23

CURB

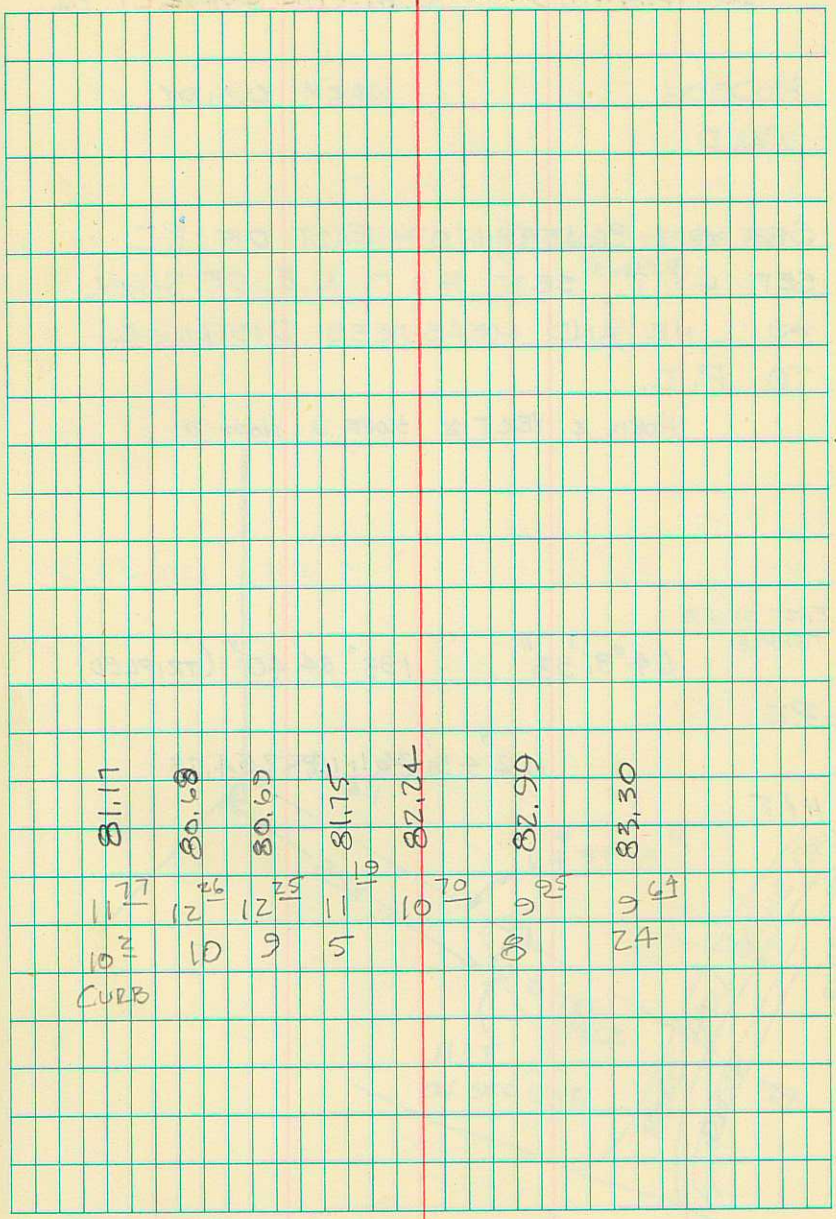
XSECTIONS ON LAMPLIGHTER

12 03 — 4680.91

BH *

+90

↓ DOWN

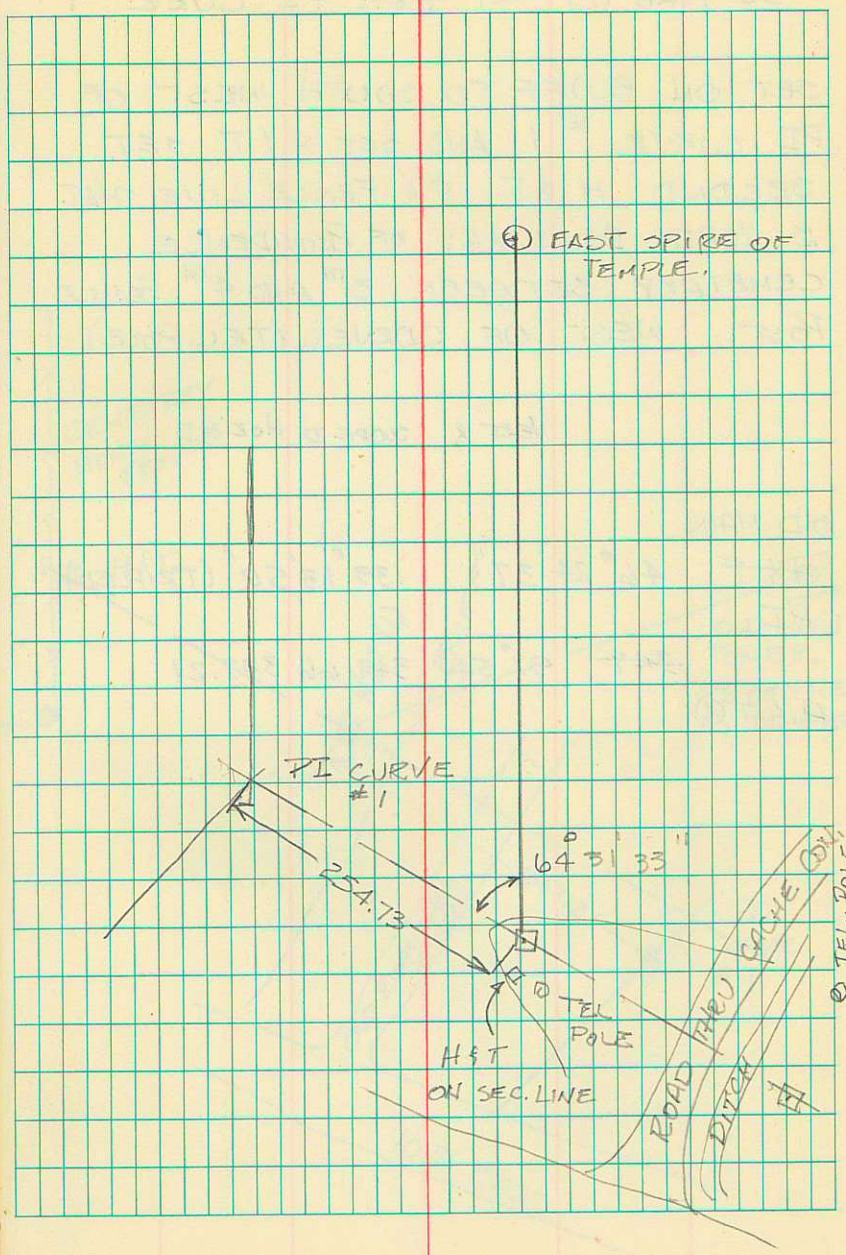


30 MAR 78 R.P. FOR CURVE # 1 P.I.

HUDSON WARD — WARM, CLOUDY

SET ON BLUFF, NOTH EAST OF P.I.
SET H & T, SET H & T N.E OF THIER
AS LINE AND MEASURED DISTANCE
TO P.I.

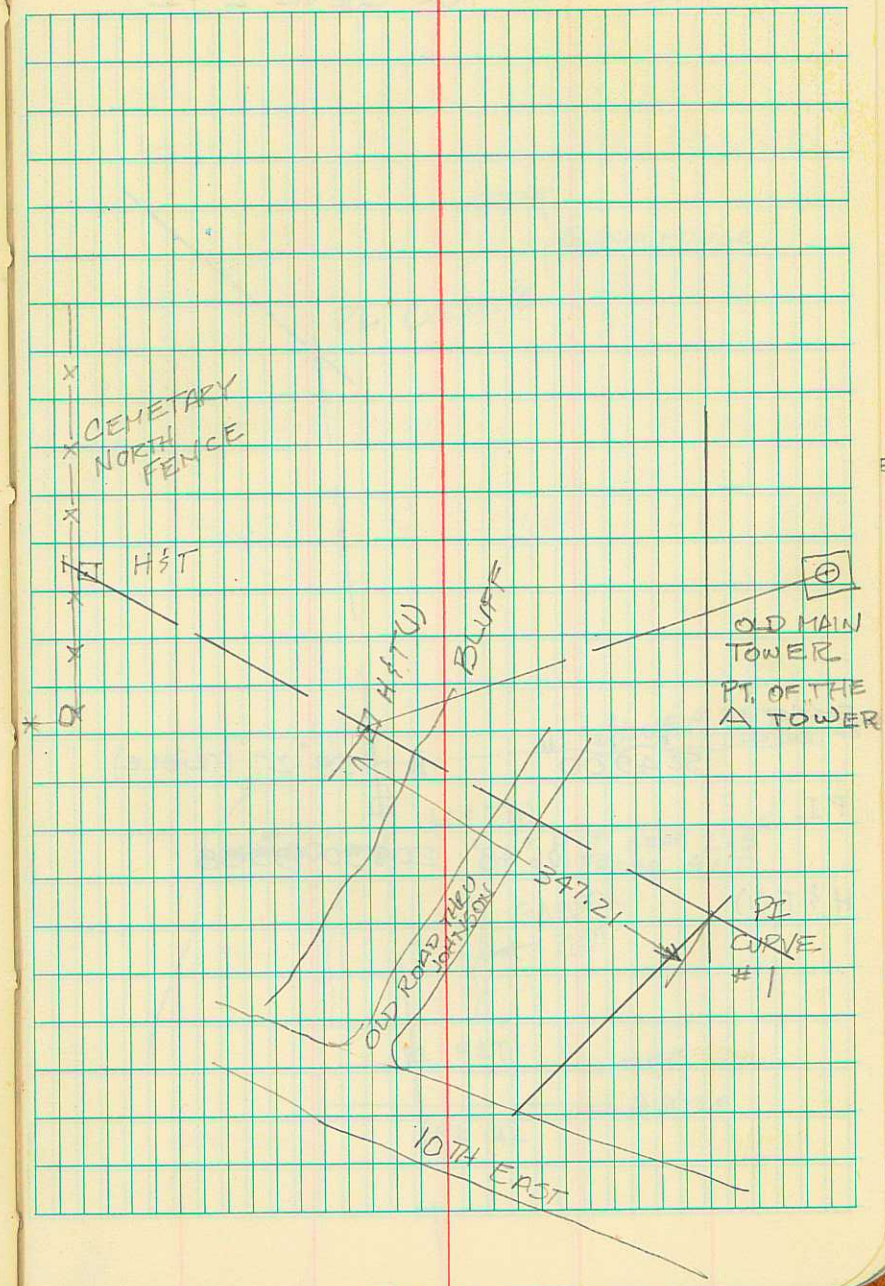
	Horiz ∠	Vert ∠	Slope D	Horiz D
EAST SPIRE TEMPLE	64°31'33"	193°34'40" (TRIPLED)		
PI	102°43'	261.14	254.73	
H & T				



30 MAR 78 RP FOR PI CURE # 1

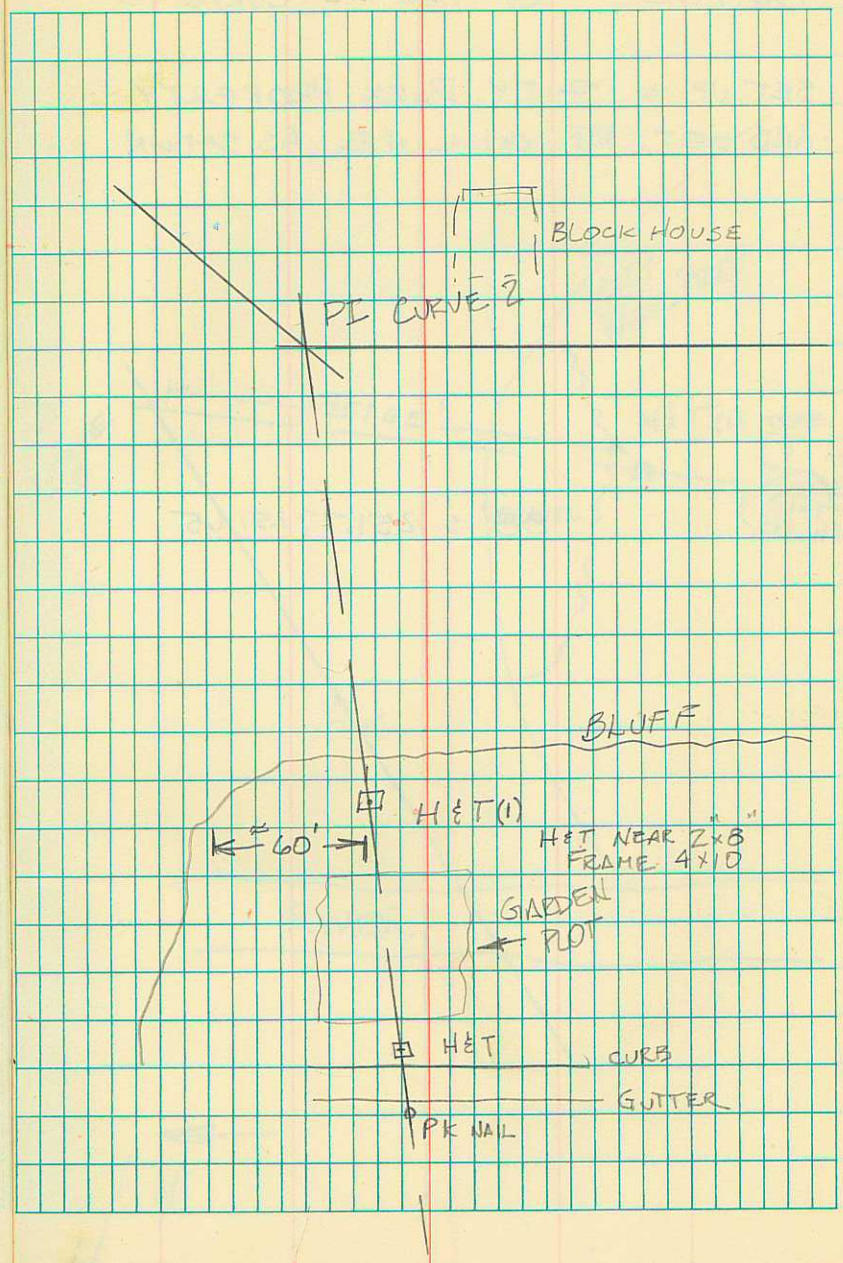
SET ON BLUFF TO SOUTH WEST OF PI CURVE # 1 AND SET H & T. SET SECOND H & T ON FENCE LINE THAT IS NORTH BOUNDARY OF PROVIDENCE CEMETARY BETWEEN 3TH AND 4TH FENCE POST WEST OF CORNER (TEL. POLE)

	VERT &	SLOPED	HOR'L D.
OLD MAIN			
~~H & T~~	46° 24' 37"	139° 13' 50" (TRIPLED)	
PI			
	~~347~~	92° 54'	347.66 347.21
H & T (1)			



30 MAR RP FOR CURVE #2 PI

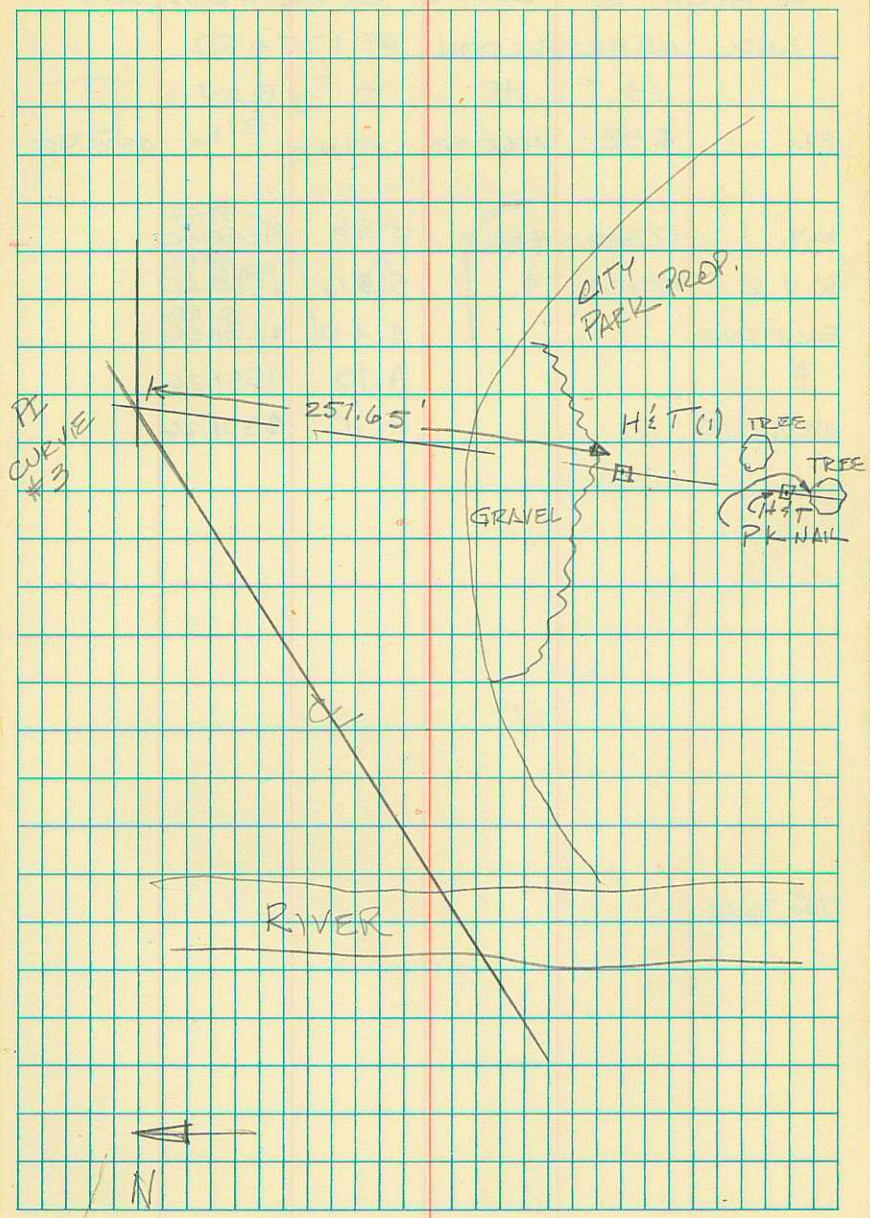
EAST SPIRE OF TEMPLE	52°49'00"	& 158°27' (TRIBLE)	
PI			
	106°48'	204.30	195.58
H & T (1)			



30 MAR RP FOR PI CURVE # 3

SET UP IN CITY PARK PROPERTY
AND SET RP ON LINE AS SHOWN

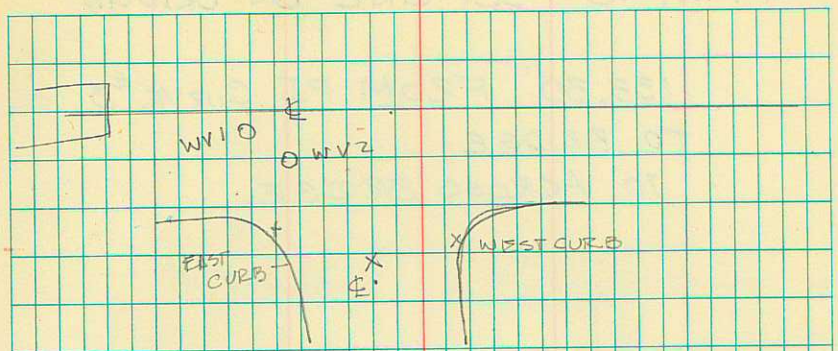
88°15 251.77 251.65



4 APRIL 78 LEVELS ON WATER VALVES AND INTERSECTION AT 177+50.

	+	HI	−	ELEV	
BM.	4.92	4560.88			4555.96
W.V. 1	177+14	3 L ℄	5.66	4550~~.30~~ 55.22	
W.V 2	177+18	℄	5.56	4550~~.40~~ 55.32	
EAST CURB			4.40	45~~51.56~~ 54.48	
℄			4.70	4551.26	
WEST CURB			4.70	~~4~~551.26	

176+76.02



4 MAY 78 SET LINE ON BRIDGE

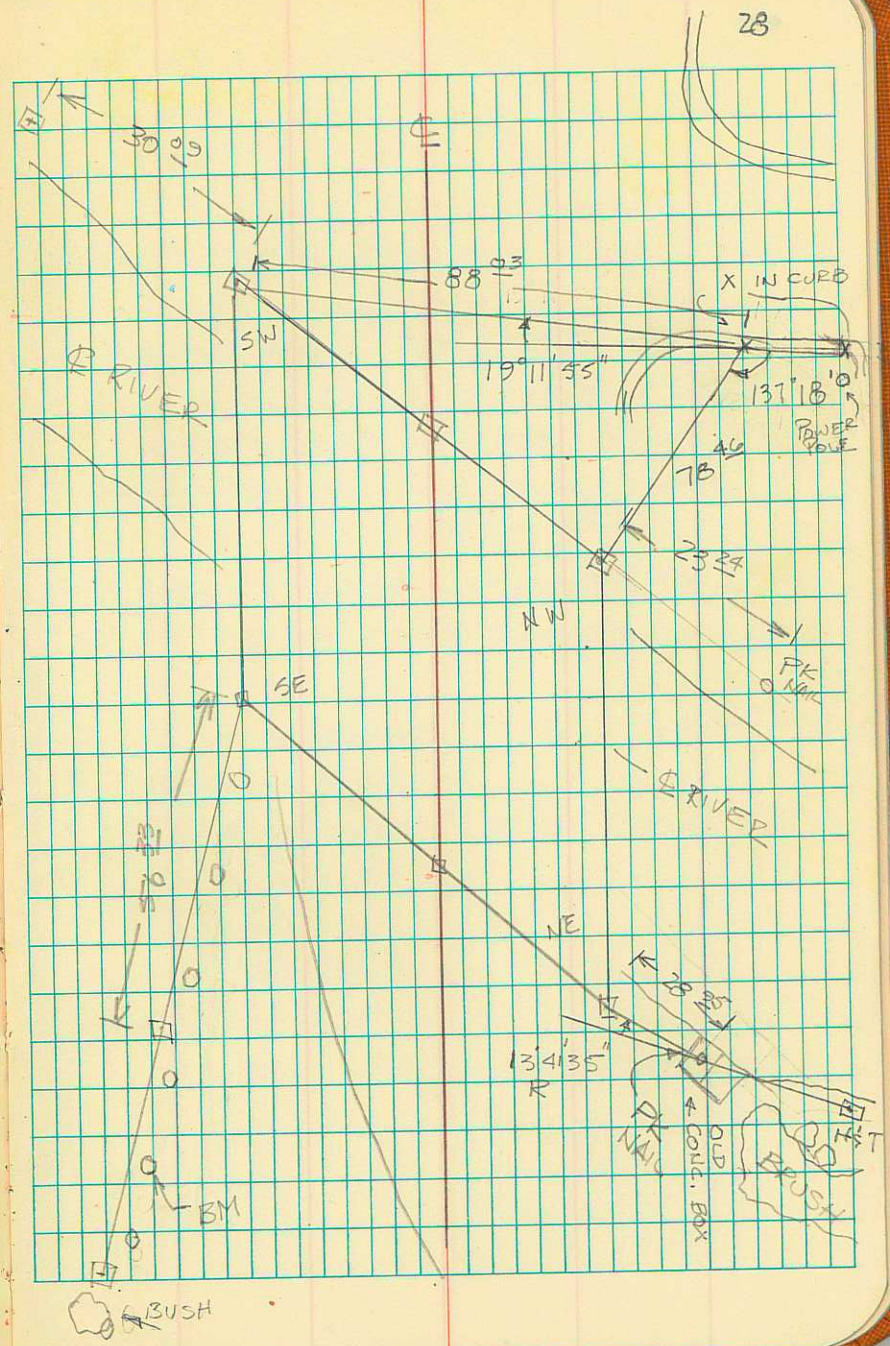
133.30' FROM PI CURVE #3
TO BRIDGE
70' ACROSS BRIDGE.

SET RP FOR BRIDGE 10 MAY

DOUBLED ∠

∠

L FOR NW CORN.	274°36'	137°18"
∠ DEFL. FOR SW CORN	38°23'50"	R
∠ DEFL FOR NE CORN	27°23'10" / 13°41'35"	R



FLUME LINE & RP's 11 MAY 78
WARM, WINDY. HUDSON
WARD

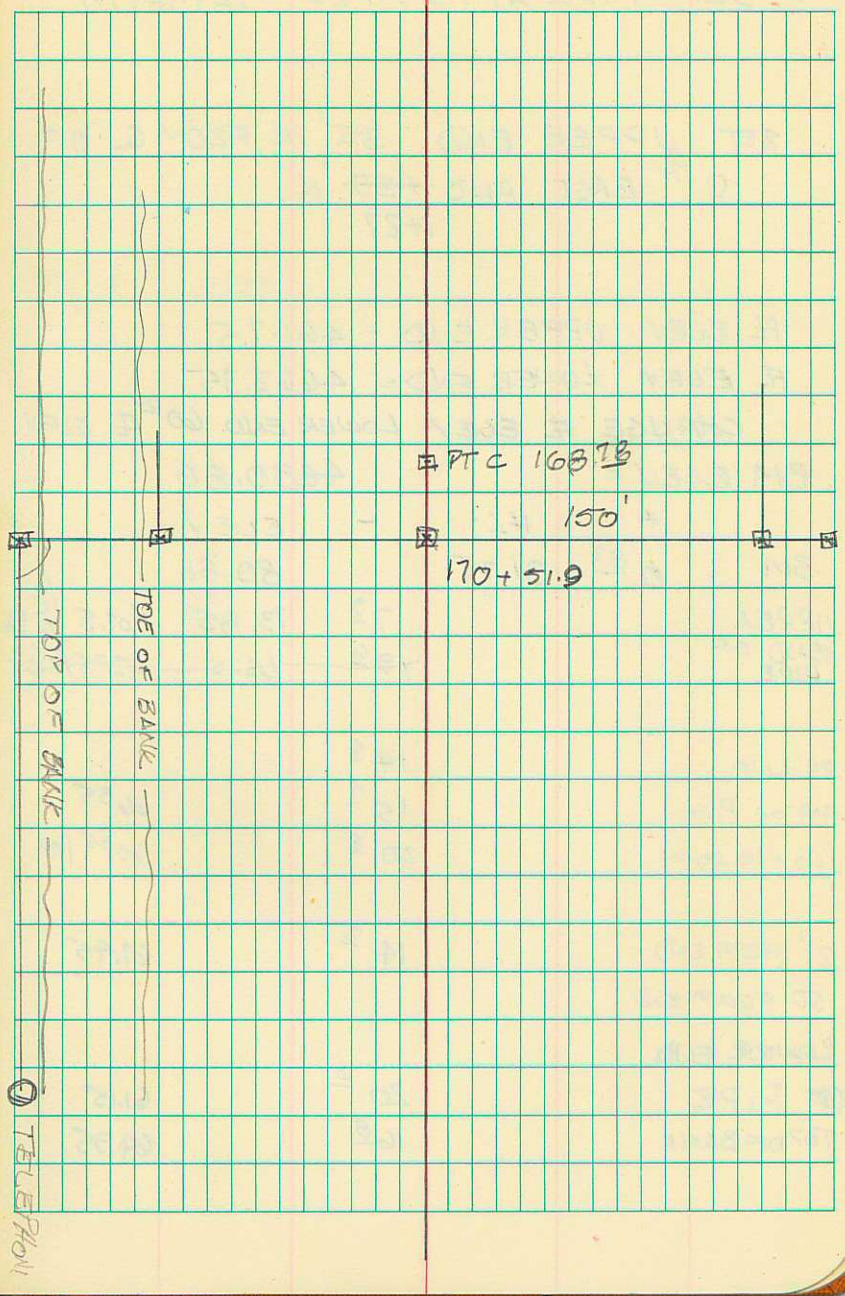
FLUME LINE CROSSES AT ℄ 170+51.9

MEASURED FROM P.O.T. "C" ON UNIVERSITY
RIDE HILL STA 170+86.70 BACK
34.81' TO STA 170+51.9, SET ON
℄ AND TURNED 90° AND SET POINTS.

SET RP CLOSE TO PROPERTY LINE..
SET POINT 150' NORTH OF ℄

SET POINT 144.-' SOUTH OF ℄
1½ SLOPE ON BANK
SET POINT 210 ±19 SOUTH OF ℄

101° 01' 30" ALONG BANK —
RP ON TELEPHONE BOX
~~201~~ 202 14 30 DOUBLED



SET PIPE AT 155+29 12 MAY 78

SET UPPER END 35' IN FROM ℄ OF 10TH EAST AND ~~1+29~~ 1+27 'N.

℄ ELEV UPPER END = 4667.5

℄ ELEV LOWER END = 4662.75

CHANGE ℄ ELEV LOWER END 60.00 ℄ ELEV

BM ELEV = 4680.86

	+	HI	−	ELEV	
BM	0 89	81.75		80.86	
UPPER END OF PIPE			7 2	73.85	67.5 / C 6 35
			~~9 6~~	~~63+5~~	~~61.75 F 0 6~~
ON LINE			14 6		
END OF PIPE			15 4		66.35
140+10 DOWN			20 8		60.95 / 80
21' FROM END			14 3		67.45
50' FROM END					
LOWER END OF PIPE			20 6		61.15
TOP OF BANK			16 8		64.95

CURVE ON 10TH EAST

Δ = 46°47'30"
T = 100'
R = 231.1
D = 24.79°

		Δ =	L	
PC =	153+16.07	~~4.21°~~		
	153+50	4.21°	33.92	4°12'36"
	154+00	10.41°	83.48	10°24'36"
	154+50	16.61°	132.07	16°36'36"
	155+00	22.81°	179.11	22°48'36"
	155+05.35	23.40°	183.45	23°23'45"

SETTING BM'S — 15 MAY 78

HUDSON NOTES — WARM, CLEAR

WARD ⊼

	+	HI	-	ELEV	
BM	2.25	48.89		4646.64	
TP #1	2.05	42.73	8.21	40.68	
TP 2	9.15	46.08	5.80	36.93	
BM 161+00		46.08	3.18	~~42.90~~ 42.90	42.80
TP 2	3.01	46.08 ~~46.08~~	9.15	36.93	
	~~3.01~~				
TP 3	4.50	39.94	8.38	31.56	
BM 164+00		36.06 ~~39.94~~	3.67	32.39 (4.50)	
TP 4	2.21	30.93	7.34	28.72	
BM 168+00		30.93	5.59	25.34	
TP 5	2.55	29.14	4.34	26.59	
BM			4.78	23.36	
TP 6	0.60	22.79	6.95	22.81 19	
	1.50	16.99	7.30	15.49	
		16.99	11.67	05.32	05.54
	10.98	27.78	0.19	16.80	
	5.88	32.76	0.90	26.88	
	11.73	44.37	0.12	32.64	
	6.81	49.93	1.25	43.12	
			3.39	46.54	

BM IS 1.5' OUTSIDE RT SLOPE STAKE

BM IS 1.4 INSIDE OF LT REF HUB

BM 3/4" PIPE 1.3 INSIDE REF HUB ON RT SLOPE HUB

BM LT OF ℄ AT ≈ 170+25 UNDER TREE ON TOE OF BANK

BM EST. AT 172+25 BOLT W DBL NUT ON TOE OF SLOPE

BM LEVEL CHECK

	+	HI	−	ELEV
BM	2 08	48 72		46.64
TP 2	3 08	39 88	11 92	36 80
BM 164+00		39 88	7 47	32 41
TP 3	4 27	35 77	8 38	31 ~~60~~ 50
TP 4	1 56	30 23	7 10	28 ~~67~~ 56
BM 164	2 49	30 23	5 01	25 22
TP 5	~~3 76~~	28 96	3 76	26 47
BM 170		28 96	4 73	24 23
TP	0 64	17 79	11 81	17 15
			12 60	5 19

BM LEVEL CHK — N°4 LEVEL

BM	1 67	48.31		46.64	
TP 2	2 60	39 46	11 45	36 86	
BM 164	2 19	34 66	6 99	32 47	
TP 4	1 52	30 38	5 80	28 86	
BM 168	7 03	32 45	4 96	25 42	
TP 5	2 48	29 32	5 61	26 84	
BM 170+25	~~5 84~~	~~34 47~~	4 69	24 63	
TP 6	0 02	19 50	9 84	19 48	
TP 7	5 94	13 28	12 16	07 34	
~~TP 8~~			7 62	05 66	05 54
	13 20	25 76	0 72	12 56	
	8 53	33 46	1 23	24 53	

STA	+	HI	−	ELEV
		33 46		
	7 66	37 49	3 63	29 83
	11 85	47 83	14 47	36 02
	5 86	50 144	2 29	45 58
			4 71	46 73

46 64

	5 85	52 49		46 64
TP 1	11 87	62 83	1 44	51 03
	5 35	67 21	0 97	61 86

BM SET IN POWER POLE 67 21

		49 06		46 64
BM 2	42	66 88		64 46
	8 71	45 54	12 23	44 65
			2 74	42 80

BM 161 ELEV

BM	1 66	48 39		46 64
TP 3			11 41	34 6 59
	1 62	48 26		
TP 2	2 36	32 19	11 43	36 83
BM 164			6 76	32 43

BM LEVEL CK

BM	1 02	48.26		46.64	
TP_2	2 36	39.19	11 43	36.83	
BM_{164}	2 72	35.15	6 76	32.43	
TP_4	2 97	31 78	6 34	28.81	
BM_{168}	6 13	31.43	6 48	25.30	
TP_5	2 99	29 67	4 75	26 68	
BM_{170+25}	1		5 21	24 46	
TP_6	1 42	20.70	10 39	19.28	
	0 87	13.23	8 34	12. 36	
			7 75	5 48	5 54 0 06

SlOPE STAKES

155+00		84.54	4^{22}	$80.^{32}$	
154+50		84.54	7^{4}	77^{14}	
154+~~00~~ 12		84.54	9^{54}	85^{00}	84^{67}
153+50		71.71	9^{4}	62^{3}	62^{0}

4^{22} 8'86 5.08 10^{2}

54 .32 .9

~~36~~ 39

4^{3} 4^{3} 4^{7} FLAT FO^{3} DOWN 2% 5^{1} 6^{6} 5^{4}

GRADE CO^{4} $F1^{5}$ $C1^{2}$

10^{2} 22^{4} 23^{5} 7^{6}

FO^{1} $F2^{0}$

16^{2} 16^{2}

7^{2} 7^{1} 7^{1} UP 1% FO^{3} DOWN 3.5% 8^{5} 9^{6} . 9^{2}

FO^{1} CO^{6} $F1^{1}$ CO^{4}

12^{4} 22^{4} CO^{1} 16^{2} 23^{1} FO^{6} 5^{3} 16

9^{7} 9^{7} 9^{5} UP 3% FO^{3} DOWN 5% 10^{8} 10^{2} 11^{4}

GRADE FO^{2} CO^{6} $F1^{2}$

9^{8} 22^{2} 22^{6} ~~E~~3^{1}

FO^{7} CO^{1}

16^{2} 16^{7}

12^{5} 10^{0} 9^{7} FO^{3} 10^{4} 10^{2} 10^{3}

$FO2^{5}$ FO^{3} CO^{7} FO^{31}

9 22^{7} 22^{2} 11

UP 1%

7.1 DITCH DOWN 3%

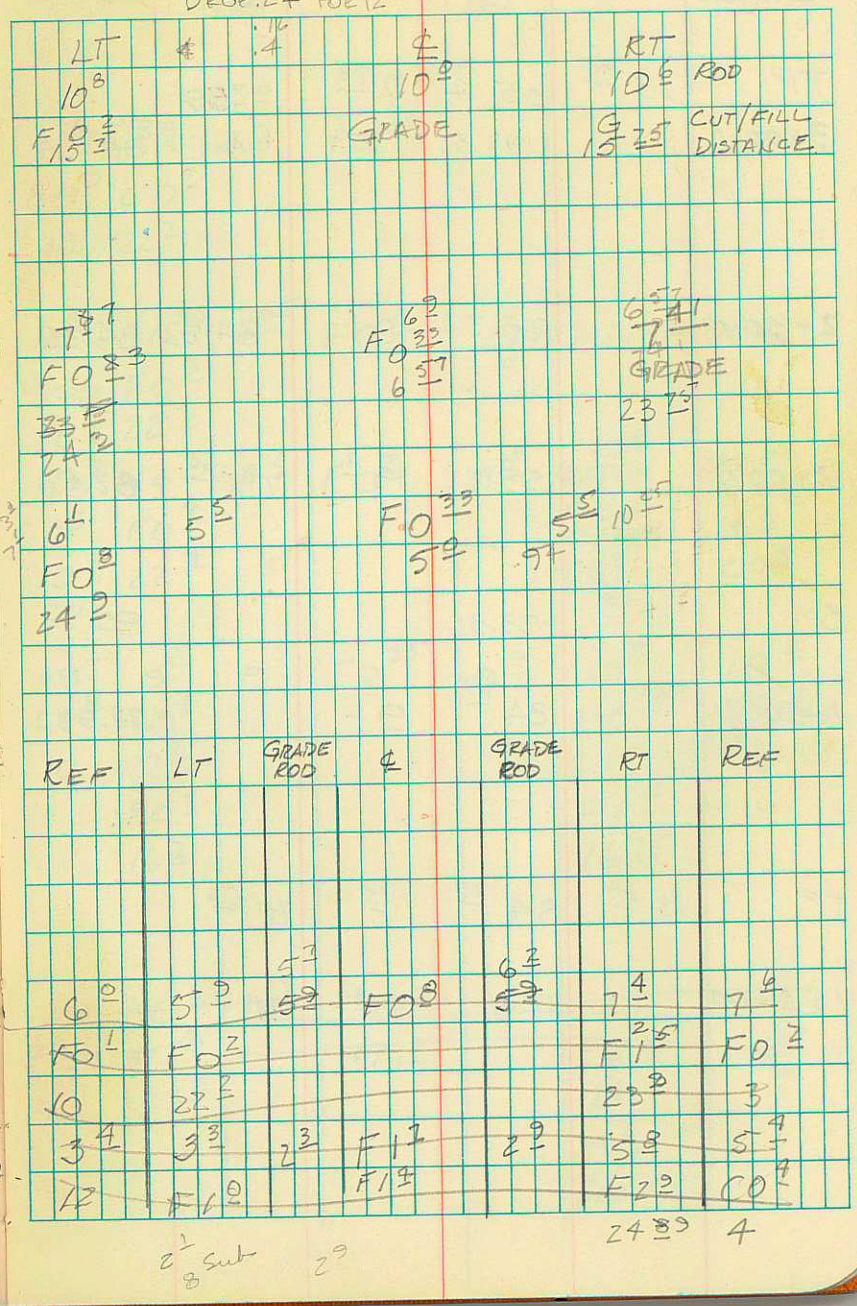
SLOPE STAKES

½ ROAD TO DITCH 15 24' SEE BACK COVER

STATION	+	HI	−	GROUND ELEV	PROFILE ELEV.
	0 78	4681.70		4680.92 BM	
	0 66	4667.82	14.54	4667.16	
152+16.07			10 0	4657.82	57.82
153+16.07			6 3	60.9	61.23
+50			5 3	62.5	62.17
	4 78	4671.94		4667.16	
+50			9 5	61.94	
BM	4 62	4684.54			4680.92
~~STA~~ TP	21.42	14.62	12 34	72.20	
154+00		4671.71			66.73
154+50		71.71	5 7	66 01	67.23 ~~69.93~~
154+50		71 71	3 5	68 21	69.93

DROP .54' IN 3.75' .02 .16 5/16'

DROP .24 FOR 12



STATION	+	HI	−	GROUND ELEV	GRADE ELEV
	88 + 5 = 93				
TP	13 40	105.99	0 73	92.59	
3+00 N		93.32	3 7	90.1	89.8 98
2+50 N		93.32 8 1/6	8 7	84.82	84.30
2+00 N		93.32 13 2	13 7	79 6	82.53
BM	12 32	93.32			80.92 12.4 32
1+50 N		84 19	9 1		77.93
TP	13 63	84 19	1 15	70 56	
1 55+00		71.71	0 4	71 31	
					73.53

REF	LT	GRADE ROD	℄	GRADE ROD	RT	REF 41
4 1	3 3	4 0	FO 33			
FO 8	CO 7					
10	22 1					
10 4	10 4	9 45	FO 3		LAMPLIGHTER	
GRADE	FO 9					
10	22 9					
13 6	14 3	14 5	FO 3	14 5	15 4 GUTTER 15 SUB GRADE 25° ℄	SET RP 35° ℄ 14 4 CO 8
CO 7	FO 4					
10	22 4					
9 1	9 7	9 2	FO 33	9 9	10 4	10 2
CO 9	CO 2				FO 45	CO 2
10	22 2				22 5	10
	FO 3				F1 0	
	16 2				16 25	
Q 6	10 5	+0 7	FZ 2	+0 7	1 4	1 7
FO 1	F1 2		371 9		FZ 1	6
9 15	23 2				24 1	
					24 4	
					FROM ℄	

STATION	+	HI	−	ELEV GROUND	GRADE ELEV
155+32.5	0^{95}	81.87		4680.92	
			10^{5}	71.37	73.04
5+50 N		120.40	2^{9} 3^{4}	117. 5	
TP	4^{59}	120.40	0^{16}	115^{81} 4^{59} 40	
5+00 N		115^{97}	3^{7}	112^{27}	
4+50 N		115^{97}	9^{2} 9^{16}	106^{81}	106^{48}
TP	12^{73}	115^{27}	2^{75}	103^{24}	
4+00 N		105^{99}	4^{8}	101^{2}	
3+50 N		105.99	10^{4}	95^{59}	95^{29}

GRADE 10^{3}

LT ℄ RT

24 1^{5} 9^{2} 10^{2} ROD

12^{4} F 3^{8} 10^{2} 9^{2} ~~C~~ 1^{01} C/F

F2^{1} 1^{67} C1^{1} ~~22~~ DIST

28^{3} 25^{1} 25^{1} 8^{3}

3^{4} 3^{4} 3^{7} F0^{3} 3^{7} 4^{2} 4^{5}

GRADE C0^{3} F0^{5} F0^{3}

10 18^{1} 18^{3} 10

4^{7} 4^{4} 4^{5} F0^{3} 4^{5} 4^{1} 4^{8}

F0^{3} C0^{1} C0^{4} F0^{7}

10 17^{9} 18^{2} 10

F0^{4}

12

11^{6} 9^{8} 10^{0} F0^{3} 10^{0} 9^{2} 9^{6}

F1^{8} C0^{2} C0^{8} F0^{4}/10

10 18^{0} F0^{3}/12 18^{6} C0^{5}/12

8^{3} 5^{4} 5^{6} F0^{3} 5^{6} 4^{4} 5^{0}

F2^{9} C0^{2} C1^{2} F0^{6}

10 18^{0} 19^{0} 10^{0}

F0^{3} C0^{7}

12 12^{0}

13^{0} 11^{3} 11^{2} F0^{3} 11^{2} 10^{8} 9^{8}

F1^{2} F0^{1} C0^{4} <18^{2} C1^{0}

10 ~~2~~ 17^{8} F0^{1} 7

F0^{6} ~~16~~ 12^{0}

12^{0} SHLDR

	+	HI	−	GROUND ELEV	GRADE ELEV
157+50		66.31	8^{0}	58.3	63.20
157+00		66.31	5.7	60.6	66.47
T P	8.54	66.31		57.77	
156+75			7^{3}	61.35	67.8
156+20		68.65	15^{2}	53.45	70.6
T.P.	10.88	68.65	24.10	57.77	~~70.6~~
155+~~32.5~~ 54.11	~~0^{25}~~	81.87 ~~81.87~~ 76.5	5^{3}	76.5	72.70

15 15

REF	LT	℄	GRADE ROD	RT	REF
9^{7} GRADE 10	9^{7} F 5^{1} 34^{2}	F 4^{9}	4^{6}	6^{1} F 1^{8} 27^{6}	5^{6} C 0^{8} 10
13^{5} F 0^{3} 10	13^{2} F 11^{3} 47^{8}	F 5.9 5.7 10.6 12.1	1.3	3^{5} F 2^{2} 28^{4}	2^{3} C 1^{3} 10
18^{6} F 1^{1} 10	17^{5} F 15^{1} 54^{3}	F 6^{45} 7^{3}	2^{4}	3^{0} F 0^{6} 25^{2}	C 2^{9} 10
16^{8} F 0^{2} 10	16^{6} F 17^{1} 58^{2}	15^{3} F 17^{15} $.2^{8}$	~~2~~ +0^{5}	~~7~~6^{6} 7^{1} 36^{6}	0^{9} C 5^{7} 10
13^{6} F 1^{1} 10	12^{5} F 1^{9} 27^{8}	C 3^{8} 9.1	10^{6}	5^{3} C 5^{3} 29^{3}	5^{1} C 0^{2} 10

STATION	+	HI	−	ELEV GROUND	ELEV GRADE
160+00		56^{97}	13^{8}	43^{17}	46.79 43.2 .6
159+50		56^{97}	11^{7}	$45.^{27}$	50.07
BM		56^{97}	10^{35}	46^{62}	46.64✓
159+~~00~~ 10.73		56.97	6^{7}	50.27	~~51.79~~ ~~52.6~~ 52.14
Redo ✓ 15~~8~~+50		56.97	3^{5}	53.47	~~53.30~~ 56.63
T P 158 LT REF HUB	3.45	56.97	12.79 66.3	53.52	
158+00		66.30	10^{2}	56.1	59.91

-0656

REF	LT	GRADE ROD	℄	GRADE ROD	RT	REF
13^{8} F0^{1} 10	13^{7} F2^{0} 28^{0}	11^{7}	F3^{6}	11^{7}	11^{6} C0^{1} 24^{1}	~~F~~ 12^{7} F1^{1} 10
11^{0} F0^{3} 10	10^{7} F2^{3} 28^{6}	8^{4}	F4^{8}	8^{4}	10^{7} F2^{3} 28^{6}	10^{4} C0^{3} 10
~~F~~ 8^{2} F0^{5} 10	7^{1} F1^{2} 27^{8}	5^{8}	F 2^{4}	5^{8}	9^{4} F3^{6} 31^{2}	9^{3} C0^{1} 10
7^{5} F0^{4} ~~F5^{0}~~ ~~F0^{1}~~ 10	7^{1} F3^{1} 30^{2} ~~4^{2}~~ ~~C0^{3}~~ ~~24^{3}~~	4^{0} ~~5^{3}~~	F3^{1} ℄ ~~0^{2}~~	4^{0} ~~5^{2}~~	3^{1} 3^{2} C0^{5} ~~1^{5}~~ 24^{3} ~~C3^{1}~~ ~~27^{1}~~	2^{0} C1^{1} 2^{0} 10 ~~F0^{6}~~ ~~10~~
12^{8} F0^{6} 10	12^{2} F4^{3} 32^{6}	7^{9}	F 3^{8}	7^{9}	8^{2} F0^{2} 24^{6}	8^{0} C0^{2} 10

STATION	+	HI	−	GROUND ELEV	GRADE ELEV
			12.66		
162+50		47.16	$12\frac{8}{9}$	34.36	31.49
162+00		~~47.16~~ ~~50.01~~	$12\frac{4}{-}$	34.76	33.95
BM	3.41				
16	6				
TP					
161+24	$12\frac{66}{-}$	~~47.16~~ ~~50.01~~	(12.66) $15\frac{50}{-}$	~~44.23~~ ~~34.50~~ ~~34.69~~	38.67
B.M	$3\frac{41}{-}$	50.01	$3\frac{41}{-}$	46.60	
	$6\frac{65}{-}$	50.01	$0\frac{87}{-}$	43.36	
TP	$7\frac{10}{-}$	44.23	10.06	37.13	
161+00		$47\frac{13}{-}$	$7\frac{6}{-}$	39.59	40.23
TP	$10\frac{05}{-}$	$47\frac{19}{-}$	$19\frac{83}{-}$	$37\frac{14}{-}$	
160+50		$56\frac{97}{-}$	$15\frac{2}{-}$	$41\frac{77}{-}$	43.51

REF	LEFT	GRADE ROD	℄	GRADE ROD	RIGHT	REF
$13\frac{3}{-}$	$13\frac{3}{-}$	$17\frac{2}{-}$	$C2\frac{9}{-}$	$17\frac{2}{-}$	$13\frac{3}{-}$	$13\frac{3}{-}$
GRADE	$C4\frac{0}{-}$				$C4\frac{0}{-}$	$F0\frac{4}{-}$
10'	$28\frac{0}{-}$				$28\frac{0}{-}$	10
$13\frac{0}{-}$	$13\frac{0}{-}$	$14\frac{7}{-}$	$C0\frac{8}{-}$	$14\frac{7}{-}$	$11\frac{9}{-}$	$11\frac{7}{-}$
GRADE	$C1\frac{7}{-}$				$C2\frac{6}{-}$	$C0\frac{2}{-}$
10	$25\frac{7}{-}$				$26\frac{3}{-}$	10'
$12\frac{7}{-}$	$12\frac{8}{-}$	$10\frac{2}{-}$	$F3\frac{98}{-}$	$10\frac{2}{-}$	$6\frac{5}{-}$	~~7~~ $\frac{4}{-}$
$C0\frac{1}{-}$	$F2\frac{6}{-}$				$C3\frac{7}{-}$	$F0\frac{9}{-}$
10	$29\frac{2}{-}$				$27\frac{2}{-}$	10
$11\frac{4}{-}$	$11\frac{6}{-}$	$8\frac{5}{-}$	$F0\frac{6}{-}$	$8\frac{3}{-}$	$4\frac{4}{-}$	$5\frac{3}{-}$
$C0\frac{5}{-}$	$F3\frac{1}{-}$				$C4\frac{1}{-}$	$F1\frac{1}{-}$
10	$30\frac{2}{-}$				$28\frac{1}{-}$	10
$18\frac{3}{-}$	$16\frac{1}{-}$	$13\frac{5}{-}$	$F17$	$13\frac{5}{-}$	$13\frac{7}{-}$	$13\frac{1}{-}$
$F2\frac{3}{-}$	$F1\frac{1}{-}$				$C1\frac{3}{-}$	$C0\frac{6}{-}$
10	$26\frac{2}{-}$				$25\frac{3}{-}$	10

STATION	+	HI	−	GROUND ELEV	GRADE ELEV
165+00		32.10	6.0	26.10	24.98
TP4	6.66	32.10	10.03	25.44	
TP3	3.80	35.47	21.88	31.67	.47 DIFF
BM	6.91	53.55		46.64	
TP3		37.45	6.25	31.20	
164+50					
		37.45	6.4	31.05	26.06
164+00		37.45	5.1	32.35	27.15
163+50		37.45	3.4	34.05	28.23
163+00		37.45	4.2	32.55	29.58
TP	4.14	37.45	13.85	33.31	

10217

REF	LT	GRADE ROD	℄	GRADE ROD	RT	REF
	3.0					
C 2.5	C 10.2	8.9	C 1.1	8.2	2.1	5.0 - 5.2
10	34.9	13.9		13	C 6.8	C 0.2
					30.8	10
5.3	5.3	12.2	C 5.2	12.2	7.0	7.3
C 0.1	C 7.4				C 5.2	F 0.3
10	31.6				29.2	10
4.5.4	4.7	11.8	C 5.20	11.80	5.7	6.0
F 0.7	C 7.1				C 6.1	F 0.3
10	X 31.1				30.1	10
5.8	5.2	10.7	C 5.8	10.7	5.2	5.6
C 0.1	4.8				C 5.25	F 0.4
10	28.8				29.5	10
4.2	4.3	9.4	C 3.2	9.4	4.7	4.2
F 0.6	C 5.1				C 4.7	F 0.2
10	29.1				28.7	10

STATION	+	HI	−	GROUND ELEV	GRADE ELEV
TP 5	7 26	33 40	5 96	26.14	
			15		
168+00		32 10	7 5	24.60	18.13
TP5	13 61	39.72	6.11	26.11	
TP4	6.78	32.22		25.44	
167+50		32 10	7 0	25.10	19.52
167+00		32 10	6 0	26.10	20.64
166+50					
		32 10	5 6	26.50	21.72
166+00			6 4	25 70	22.81
165+50		32 10	6 5	25.60	
					23.89

REF	LT	GRADE ROD	℄	GRADE ROD	RT	REF
7 5	6 3	23 1	C 6 5	23 1	13 5	14 3
F1 2	C16 8				C 9 6	FO 8
10	40 8				33 6	10
4 7 9	1 4	12 7	C 5 6	12 7	5 6	5 2
F3 2	C18 3	7	11 2 5		C 7 1	CO 4
10	42 3	19 7	1 12		31 1	10
7 4	7 0		C 5 5			
FO 4	C 7 8	14 8	5 3	14 8	5 5	5 0
10	31 8		13 3 1 5		C 9 3	CO 5
			14 8		33 3	10
7 52	6 5	12 2	C 4 8	12 2	5 1	5 3
FO 7	C 5 7	6 5	10 7 5 2		C 7 1	FO 2
10	29 7		1 1		31 1	10
4 7	4 7	10 3	C 3 0	10 3	4 7	4 3
GRADE	C 5 6		5 3		C 5 6	CO 5
10	29 6		8 3 1 5		29 6	10
			10 3			
3 9	4 4		C 1 7		5 6	4 6
CO 5	C 4 6	9 0	5 8 7 5	9 0	C 3 4	C 1 9
10	28 9		1 5 9 0		27 4	10

STATION	+	HI	−	GROUND ELEV	GRADE ELEV
171+00		32.82	4 6	28.22	4599.65
		4 6 .22		28 57	
TP 6	3.05	39.72	9 95	29.77	
				3.05 32.82	
170+50 47		33 40	5 4	28.00	~~03.76~~ ~~03.19~~
			11 6		
170+00		33 40	5 3	28.10	06.73
			11 6		06.73
169+50		33 40	7 8	25.60	10.27
			14 2		
169+00		33 40	8 1	25.30	13.50
			14 3		
168+50		33 40	7 1	26.30	16.12
		39.72	13 4		

REF	LT	GRADE ROD	℄	GRADE ROD	RT	REF
			C 28 6			
17 5	18 9	34 7	4 8	34 7	4 4	4 1
C0 6	C15 8		33 1 5	4 9 30	C30 3	C0 3
10	39 8		34 7		54 3	10
15 4	11 3	37 3	C24 2	37 3	8 0	5 7
F4 0	C26 0		1 6	78	C29 3	C2 3
10	50 9		35 8 1 5	2	53 3	10
14 7	13 8	34 5	C21 4	34 5	13 7	9 7
F0 9	C20 7		11 9		C20 8	C4 8
10	44 7		33 2		44 8	10
7 6	7 3	31 2	C15 3	31 0	13 2	12 6
F0 3	C23 7		14 5		C17 8	C0 8 6
10	47 7		29 5		41 8	10
			32 7			
7 1	10 3	27 6	C11 8	27 6	14 4	13 8
C3 2	C17 3				C13 2	C0 6
	41 3				27 2	10
3 9	6 8	25 1	C10 2	25 1	13 0	13 2
C2 8	C18 3				C12 1	F0 2
10	42 5				36 1	10

STATION	+	HI	-	GROUND ELEV	GRADE ELEV
					87.29
172+75		13.62	9.1	4.52	87.26
172+50		13.62	5.4	8.22	89.03
	8.08				
BM		13.54	8.08	05.43	05.43
172+25		13.51	4.5	9.10	90.80
	1.77	13.51			
TP 7	18	32.82	21.08	11.74	
172+00		32.8	22.1	10.1	92.57
171+50		32.82	10.6	22.22	96.11
		32.82			
		10.6			
		22.22			

9.8	9.7	27.9	C17.3	27.9	9.6	5.5 - 5.8	
F0.1	C19.2		9.1		C18.3	F0.3	
10	43.2		26.4		47.3	10	
			1.5				
			27.9				
9.3	9.1						
F0.2	C18.9	27.1	C20.2				
10	42.9	3.1	5.4	27.1	4.2	4.1	
			25.6	+10 EVE	32.9	C0.1	
			1.5	37.1	56.9	10	
			24.1				
8.1	7.7	24.3	C18.3	24.3			
F0.4	C16.6		4.5	7.8			
10	40.6		22.8	16.5			
			1.5	16.6			
			24.3				
9.5.3	24.5	41.6	C17.4	41.6	18.1	17.3	
F1.2	C17.1		22.2	1	C23.5	C0.2	
10	41.1		1.5		47.3	10	
			41.6				
					2.8		
21.3			C26.1		4.3	5.1	
F0.1	2.2	38.2	10.5	38.2	C35.4	F2.3	
10	C17.9		36.2	21.3	50.1	15	
	41.7		1.5	16.9			
			38.2				

STATION	+	HI	−	GROUND ELEV	GRADE ELEV
174+00			13 3/4	62.66	74.87
177+00		75.96	13 7/8	62.26	78.41
176+50		75.96	7 5/8	68.46	81.29 / 81.95
BM 175+96.3	19 59/100	75.96			4556.37
176+00		12.85	12 6/8	00.25	85.49
172+50		12.85	4 6/8	08.25	89.03
BM STA 172+25	7.31	4612.85		4605.54	

REF	LT	GRADE ROD	℄	GRADE ROD	RT	REF
5 8/8 - 5 5/8	17 4/8	-0 4/8	F 12 7/8	+0 4/8	10 8/8	9 6/8
F0 3/8	F16 8/8				F 10 4/8	C1 8/8 Z
16	57 6/8				44 8/8	10
15 0/8	17 9/8	+0 9/8	F16 1/8	+0 9/8	12 4/8	11 3/8
C2 9/8	F17 9/8				F13 3/8	C 1 1/8
10	59 8/8				50 6/8	10
3 7/8 - 8 5/8	4 5/8	+3 8/8	F 12 8/8	+3 8/8	8 4/8	6 5/8
C4 8/8	F8 3/8			3 5/8	F12 2/8	C1 9/8
10	40 5/8			10 3/8	48 4/8	10
9 5/8	10 9/8	28 9/8	C 14 8/8	28 3/8	17 9/8	17 9/8
C0 5/8	C18 9/8				11 9/8	F0 9/8
10	44 9/8				35 3/8	10
8 5/8	8 6/8	25 3/8	C 19 2/8	25 3/8	4 3/8	5 5/8 - 5 3/8
F0 5/8	C17 3/8			11/36 3/8	C 32 1/8	C0 2/8
10	41 3/8				56 1/8	10

176+33.50			5'		62.74
176+00		62.95	5 1/2	57.85	64.61
175+50		62.95	5 1/2	57.25	67.80
175+00		62.95	3 3/4	59.65	71.33
BM 175+96.3	6.58	62.95			56.37

REF	LT	GRADE ROD	℄	GRADE ROD	RT	REF
			BRIDGE			
6 3/4	5 4/4	+0 1/2	F6 3/8	+0 3/4		
F0 1/2	F5 1/2					
20	35 1/2					
4 1/2	4 1/2	+3 3/4	F10 5/8	+3 3/4	5 5/8	6 1/2
F0 3/4	F7 1/2				F8 3/8	F1 1/4
20	39 3/8				41 1/2	10
3 3/4	3 1/2	+6 1/2	F11 1/4	+6 1/2	3 3/4	5 1/2 - 2 1/2
F0 3/4	F9 5/8				F10 1/2	F2 1/4
10	43 3/8				44 1/4	17

STATION	+	HI	-	GROUND ELEV	GRADE ELEV
178+40			5 3/8		56.13
178+00			5 3/8		56.75
177+50		60.62	4 8/8	55.82	57.98
177+525					
BM	4 6/8	60.62		4555.96	

REF	LT	GRADE ROD	℄	GRADE ROD	RT	REF
5 9/8 22.8						5 7/8 22.8
5 6/8 22.6						4 8/8 22.6
4 9/8 18			FZ 7/8			@TEE 4 6/8

REF LT GRADE ROD ℄ GRADE ROD RT REF

REF LT GRADE ℄ GRADE RT REF

NEW TAPE CALIBRATION

TEMP 65° CLOUDY

100'

SET MICRORANGER

	VERT ∠	SLOPE D	HORIZ D
	90° 44'	100.02	100.01

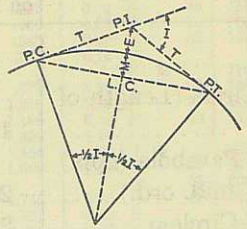
3 27 .99 2 23

4 64 ~~3 65~~ .99 3 65

A B

CURVE AND REDUCTION TABLES

Published by Eugene Dietzgen Co.



CURVE FORMULAS

1. Radius : $R = \frac{50}{\sin D/2}$
2. Degree of Curve: $D = 100\frac{I}{L}$. Also, $\sin D/2 = \frac{50}{R}$
3. Tangent : $T = R \tan \frac{1}{2} I$. Also, $T = \frac{T \text{ for } 1° \text{ curve}}{D} + C.$
4. Length of Curve: $L = 100\frac{I}{D}$
5. Long Chord : $L.C. = 2R \sin \frac{1}{2} I.$
6. Middle Ordinate: $M = R(1 - \cos \frac{1}{2} I)$
7. External : $E = \frac{R}{\cos \frac{1}{2} I} - R.$ Also, $E = T \tan \frac{1}{4} I.$

EXPLANATION AND USE OF TABLES

Given P.I. Sta. 83+40.7, I = 45° 20′ and D = 6°30′ find:

Stations—P. C. = P. I. − T. $T = \frac{T \text{ for } 1° \text{ Curve}}{D} +$ C. From Tables V and VI $T = \frac{2392.8}{6.5} + .197 = 368.32 = 3 + 68.32$. Sta. P. C. = 83+40.7 − (3+68.32) = 79+72.38. P. T. = P. C. + L, and $L = 100\frac{I}{D} = 100\frac{45.33}{6.5} = 697.38$ Therefore, P. T. = (79+72.38) + (6+97.38) = 86+69.76.

Offsets—Tangent offsets vary (approximately) directly with D and with the square of the distance. From Table III Tangent Offset for 100 feet = 5.669 feet. Distance = 80 − Sta. P. C. = 27.62. Hence offset $= 5.66 \times \left(\frac{27.62}{100}\right)^2 = .432$ ft. Also, square of any distance, divided by twice the radius equals (approximately) the distance from tangent to curve. Thus $(27.62)^2 \div (2 \times 881.95) = .432$ ft.

Deflections—Deflection angle = ½ D for 100 ft., ¼ D for 50 ft., etc. For "X" ft., Deflection Angle (in minutes) = .3 × X × D. For Sta. 80 of above curve Deflection Angle = .3 × 27.62 × 6.5 = 53.86′. Also Deflection Angle = dfl. for 1 ft. from Table III × X = 1.95 × 27.62 = 53.86′. For Sta. 181 Deflection Angle = $53.86' + \frac{6° 30'}{2} = 4° 8.86'$.

Externals—From Table V for 1° curve, with central angle of 45° 20′, E = 479.6. Therefore, for 6° 30′ curve, $E = \frac{479.6}{6.5} +$ Correction from Table VI = 7.378 + .039 = 7.417.

46 47 30

231,10
2
462,20

170+51.9
ELEV-
4603.06

2R x SIN Δ/2