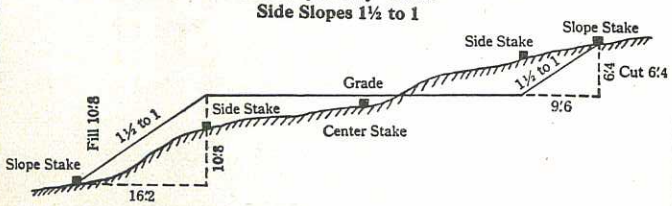
CE 351(2)

351 (2) 1977 LINE & X SECTIONS

713 43
83
81

1110.85

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

29°58

~~121331~~
121391
77
~~78~~
82

Property of CACHE COUNTY

Address RM 210 COUNTY COURT HOUSE

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.

INDEX PAGE

CR 351 (2) FINAL ℄ AND CROSS SEC.

START 27 JULY 77 WARM, CLOUDY

HUDSON NOTES

BOSHE φ

WARD ⊼

① SET ℄ 180' FROM REESTABLISHED SECTION LINE

STARTING PT STA 155+00 P.C. ON JOHNSON P.L. BY BIG TREE ON 10TH EAST.

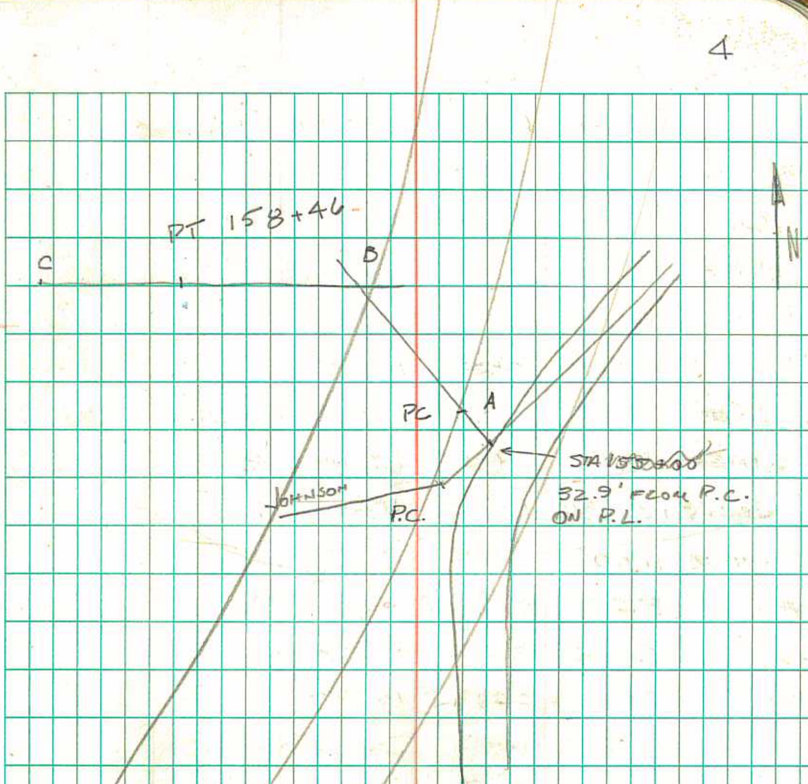
CURVE INFO

~~#1 PI STA 2+10~~
~~R = 250 Δ = 74°57'~~
~~T = 185 191.56~~
~~L = 319 327.03~~

~~#2 PI STA 18+25 (173+25)~~
~~R = 300~~
~~T = 79.6 Δ = 29°43'~~
~~L = 155.6~~

~~#3 PI STA 175+55~~
~~R = 300~~
~~T = 75.5 Δ = 28 36~~
~~L = 150.0~~

178+29.50



① SET UP ON SECTION CORNER AND SET ℄ MARK 180' FROM SOUTH OF SECTION CORNER.

151 23 150.92 - 180.0 = 29.08

288°15' .9497 = 29.9

℄ = 180.82 FROM SEC CORNER

SET ON MARK 180.8' FROM SEC LINE AND SET A PT ON ℄ WEST OF LINE

~~283.37 268°20' = 283.25~~

SET A PT ON ℄ EAST OF SEC LINE N-S

~~1086.74 ∇4 = 88°29 = 1086.36~~

1394.66 ∇4 = 91°37. = 1394.10

	H ∡	V ∡	SLOPE D.	HORIZ D.
A	~~271-06~~	271°06	210.88	210.64
B		271°52'	~~191.65~~	
P.C.		~~272.05~~	191.65	191.51
CURVE #1			STA	ΔC
$\frac{d}{2}$	C	~~STA~~	155+00	
		0+$\cancel{00}$ 19	155+19	
3°33'09"	30.89	0+50	155+50	30.89
9°16'57"	80.65	1+00	156+00	49.76
15°00'45"	129.51	1+50	156+50	48.86
20°44'33"	177.08	2+00	157+00	47.57
26°28'21"	222.88	2+50	157+50	45.80
32°12'09"	266.46	3+00	158+00	43.58
37°28'30"	304.21		158+46	37.75

191 0+19 50

LAY OUT OF CURVE #1 $\Delta = 74°57'$

$\frac{d}{2} = .3 L D$ $D = \frac{5729.58}{\cancel{22}\ 250}$

$= 22.92$

$\frac{d}{2} = .3(31)(22.92)$

MIN. 3° 33 09'

$\frac{D}{2} = \frac{22.92}{2} = 11.46 = 11°27'36"$ $\frac{D}{4} = 5°43'48"$

$C = 2 \times R \sin \frac{d}{2}$

327 = L $\frac{d}{2} = .3(46)(22.92)$

19

346

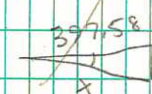
181.66 ∡

404.3 268°52 184.20 99°32

404.22 365.44 95°08

363.97

397.58 94° 19 30



33.09

$\cos ∡ = \frac{397.58}{x}$ $\frac{397.58}{\cos ∡}$

2 AUG 77 ℄ LAY OUT ON 351(2)

HUDSON - NOTES SUNNY, WARM

WARD ⊼ PPM 43

BOSHE ♀

BROUGHT UP STATIONING FROM 143+03.33 WHICH IS AT T INTESECTION OF ORCHARD HTS DRIVE AND RIVER HTS BLVD. PC STATION OF RIVER HTS BLVD CURVE IS 152+66.07.

CURVE PTS ARE AS FOLLOWS

153+00	2°	43' 50"	33.92	
153+50	6°	45' 16"	83.74	
154+00	10°	46' 42"	133.15	
154+50	14°	48' 08"	181.90	
155+00	18°	49' 34"	229.76	
155+49.9	22°	51' 00"	276.48	PT

℄ LEVELS AND CROSS SECTIONS

28 JULY 77 SUNNY ~~HOT~~

~~HUDSON NOTES~~

WARD ⊼

BOSNE ϕ

STA	+	HI	−	ELEV	L.L. DRIVE
BM #8	1.30	4682.16		4680.86	BM # 8
~~PI 10TH E~~	1.86	4671.57	12.45	4669.71	
PI 10TH E					
PI-100			10^{8}		
PI-150			12^{6}		
PI-200			13^{9}		

59.1	60.4	60.8	60.5	58.1
58.8	60.6/4660.4		60.1	57.7
12^{4}	11^{2}	10^{8}	11^{1}	13^{5}
32^{4} FEN	8^{6} EO		12 EO	33^{6} FEN

56.2	58.4	59.0	58.7	54.5
55.8	60.6	58.6	58.3	57.1
15^{4}	13^{2}	12^{6}	12^{9}	14^{1}
32 FEN	12^{6} EO		12 EO	35 FEN

55.4	57.1	57.7	57.4	56.5
55.0	56.7	57.3	57.0	56.1
16^{2}	14^{5}	13^{9}	14^{2}	15^{1}
29 FEN	13 E.O.		10 EO	35 FEN

E.O. - EDGE OF OIL

	+	HI	−	ELEV
PI+100			8.6	
TP	12.32	4681.~~43~~ 84	2.05	4669.~~11~~ 52
PI+50			2.0	
PI			5.1	
PI - 50			8.3	

76.5	72.5	73.0	4673.2	72.8	72.1	
5.3	9.3	8.8	8.6	9.0	9.1	
51	32.0	12.5 EO	·	10.5 EO	31.5 FEN	
	69.4	69.4	69.6	68.8	67.7	
	1.7	1.7	2.0	2.8	3.9	
	39.6	12 EO	·	12.5 EO	30.6 FEN	
66.9	65.7	65.4	66.4	65.2	64.1	
4.2	5.9	6.3	5.1	6.4	7.5	
43.4 FEN	38	14 EO	·	11.6 EO	25.4 FEN	
59.3	62.6	63.1	63.3	62.6	61.3	
12.3	9.2	8.5	8.3	9.0	10.3	
37.6	29	14		8	28	
	28 FEN	8 EO	·	14 EO	29	37.6 FEN

	+	HI	−	ELEV.

go to page 24

	+	HI	−	ELEV.
~~TP~~	~~9^{49}~~	~~4678.93~~	~~11^{22}~~	68.80 ~~4667.71~~
~~TP~~	~~2^{21}~~	80.79 ~~4669.98~~	~~11^{16}~~	78.58 ~~4667.X7~~
PI+246	LAMP LIGTHER DRIVE ℄			
PI +200				
TP	10^{01}	89.74 ~~4677.88~~	2^{11}	4679.73
PI +150				

87.4	85.2	86.1	87.0	86.3	84.1
2^{3}	4^{5}	3^{4}	2^{7}	3^{4}	5^{6}
34^{0}	27	11^{6} EO		22^{2} GUTTER	54^{6}
85.2	80.6	81.3	82.2	82.1	79.7
4^{5}	9^{1}	8^{4}	7^{5}	7^{6}	10^{0}
49	37^{5}	13^{2} EO		12^{3} EO	29^{6} GUTTER
80.2	76.6	76.8	4677.6	77.0	76.1
1^{6}	5^{2}	5^{0}	4^{2}	4^{8}	5^{7}
46	35^{0}	13 EO	.	14^{8} EO	32^{7} FEN

	+	HI	−	ELEV
	VOID			
TP	0.86	4667.62	$11^{\underline{12}}$	4666.76
TP	0.13	4657.53	$10^{\underline{24}}$	4657.40
155+50				
155+44$\underline{5}$				
155+19				
155+00				

VOID

$19^{\underline{2}}$	$15^{\underline{9}}$	$15^{\underline{0}}$	$12^{\underline{6}}$	$11^{\underline{5}}$	$16^{\underline{0}}$	$1^{\underline{6}}$	$1^{\underline{4}}$	$2^{\underline{8}}$	
100	75	50	25		21	54	76	100	
$17^{\underline{7}}$	$15^{\underline{0}}$	$11^{\underline{3}}$	$7^{\underline{6}}$	$4^{\underline{1}}$	$8^{\underline{6}}$	$2^{\underline{5}}$	$1\underline{2}$	$4^{\underline{6}}$	$3^{\underline{2}}$
100	80	42	11		15	25	49	$76^{\underline{3}}$	100
$13^{\underline{8}}$	$13^{\underline{1}}$	$12^{\underline{1}}$	$10^{\underline{9}}$	$6^{\underline{6}}$	$7^{\underline{9}}$	$6^{\underline{7}}$			
100	75	50	25		$17^{\underline{3}}$	50			
$11^{\underline{5}}$	$10^{\underline{5}}$	$9^{\underline{5}}$	$7^{\underline{9}}$	$7^{\underline{6}}$					
50	25		$31^{\underline{5}}$ EO	50					

116.46
68.18
184.64

VOID

155+74

VOID

8^{2} 8^{3} 6^{3} 4^{5} 5^{1} 5^{9} $+4^{6}$ $+14^{2}$ $+22^{6}$

100 75 50 25 25 50 75 88

$+22^{2}$

100

2 AUG 77 ℄ CR 351 (2) LAY OUT

HUDSON NOTES WARM (85°) SUNNY

WARD π PPM 43°

BOSHE ♀

START STATION 143+03.33 AT INTERSECTION OF RIVER HTS TO ORCHARD HTS. SET IN CURVE BELOW ON RIVER HTS ROAD.

Δ = 45°42'00" R = 237.31' LC = 184.30

T = 100.0' L = 189.28 D = 24°08'38"

46 47 30

143+03.33	0°	268°10'	1157.23	1156.64
POT				
	0°			56.1'
PI R.HTS				
PC	153+16.07			
	153+50.	4°	05'46"	33.90
	154+00	10°	07 55"	83.49
	154+50	16°	10'05	132.16
	155+00	22°	12' 14"	179.36
	155+05.35	22°	50' 59"	184.30

155

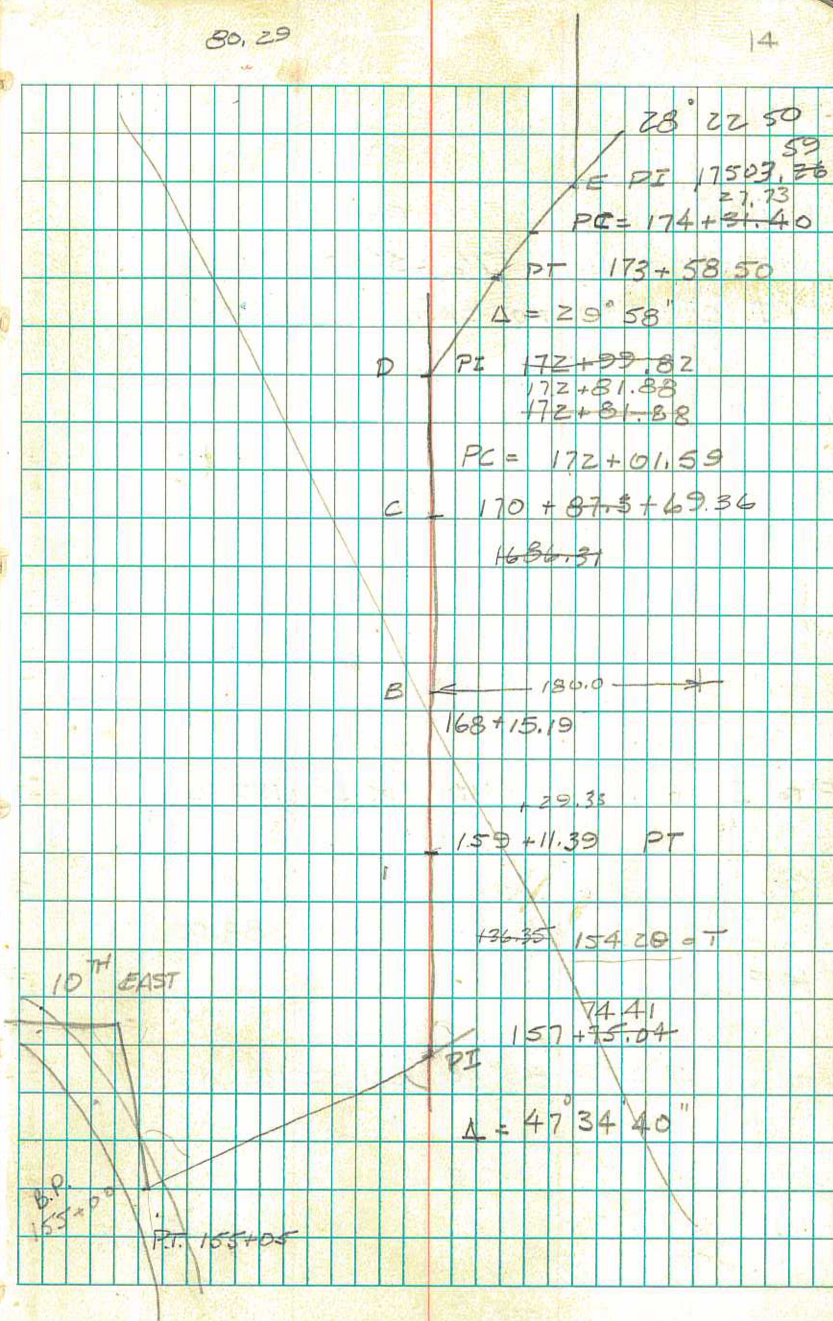
INTERSECTION PT STA. 155+00

~~89 33 384 06~~

BEARING ℄ 10 EAST : ~~N0° 52 E~~ N0°11'50"E

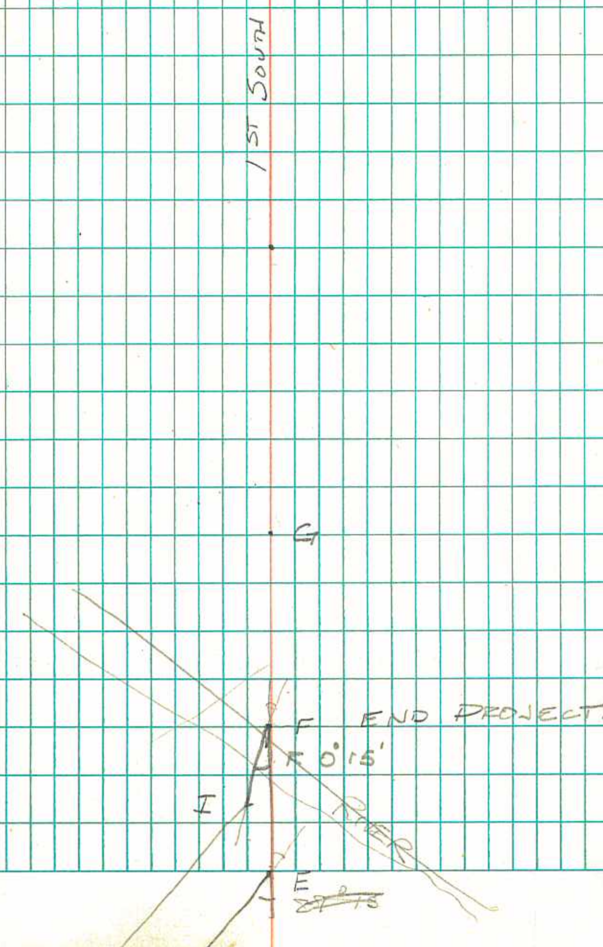
E

	29°58' R	78°50	229.73	225.38	
PTC TO PT D		279°03	215.20	212.52	
PT D IS PI					
PT B TO ~~PC~~ PTC	0° ℄	267°11'	272.44	272.11	168+15.19
PI TO PTC	0° ℄	270°59'	1312.45	1312.26	170+87.30
PT					159+11.39
PI	47°34'40 L	85°37'	221.24	220.59	157+75.00
PC					156+20.75
TP					
				54.45	
155+00					

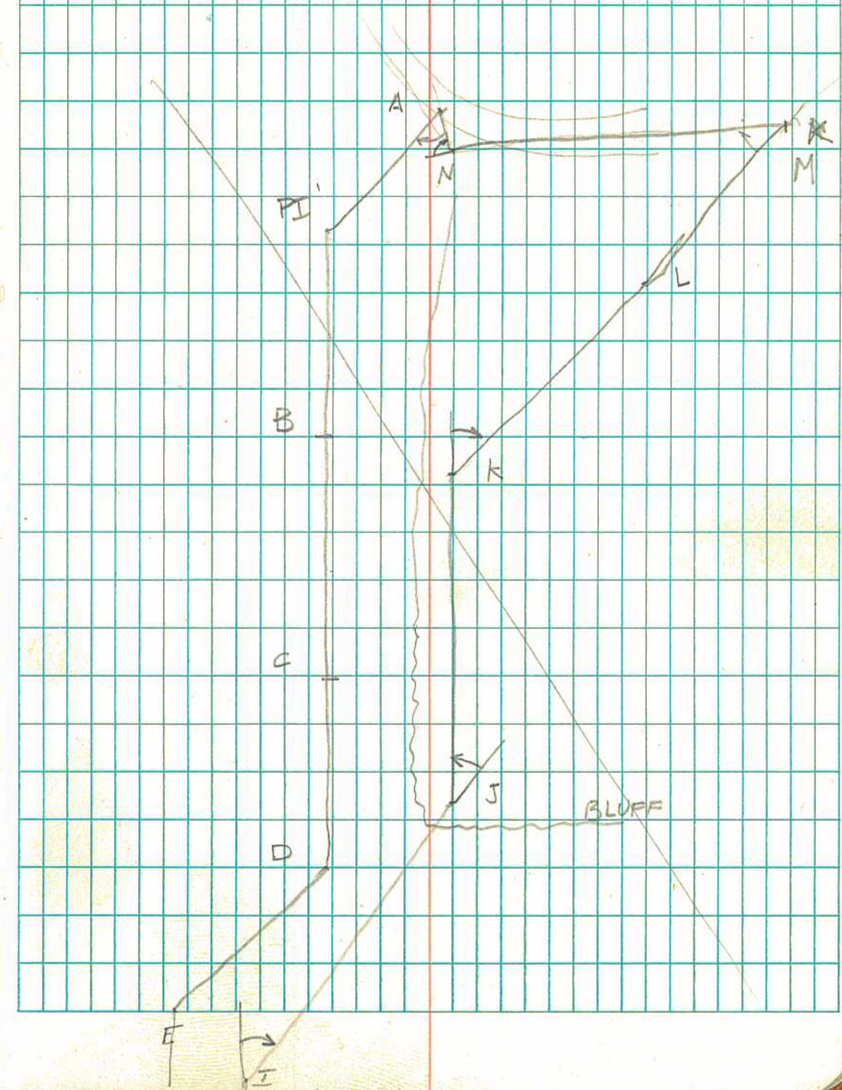


BRIDGE STATION : 177+04
PT STATION : 176+52.2 = 51.8
PI CURVE #3 TO BRIDGE = 127.10'

F TO I	0°15'R	89°30'	735.39	735.36
G				
	℄	89°33'	384.06	384.05
~~E~~ F				
E TO G	28°22 50	89°28'	1221.55	1221.45



Δ TO PI'	89 38 30 R			
N TO A	46°49' R			89.87
M to N	8°43'20"	268°10'	1157.23	1156.64
L TO M	34°56 R	92°37'	537.31	536.75
K TO L	35°40' R	91°23'	707.21	707.0
J TO K	37°03'30" L	90°03	1136.53	1136.53
I TO J	46°14'50" R	75°02'	403.01	389.34



4 AUG 77 TRAVERSE AROUND CR 351 (2) ℄

HUDSON NOTES — 85°, SUNNY

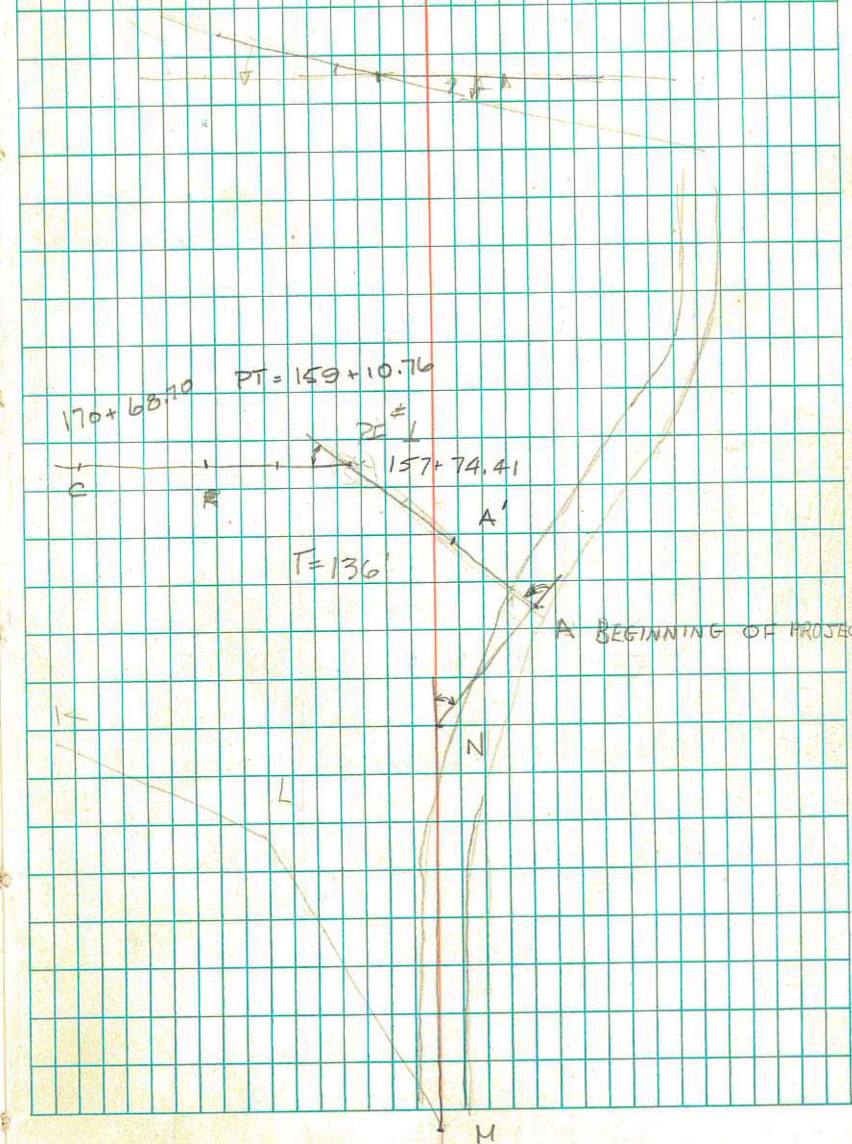
WARD ⊼ — PPM 443

BOSHR ⌽

STA	HORIZ ∠	VERT ∠	SLOPE D	HORIZ D	
D					172+82.09
	0°1'30" R	99°03'30"	216.08	213.39	~~170+68.70~~
C					170+68.78
	47°29'45" L	90°58'30"	1312.42	1312.23	56.48
PI #1					157+~~74.41~~
	0°14'15" L	94°32'30"	220.99	220.30	
A'					
	90°24'10" L			54.11	
A					
	46°56'50" ~~90~~ R			90.51	
N					

1312.42
42
41
43

221.02
1.00
~~89.24~~
159 10.76
~~157 74.74~~
100.00



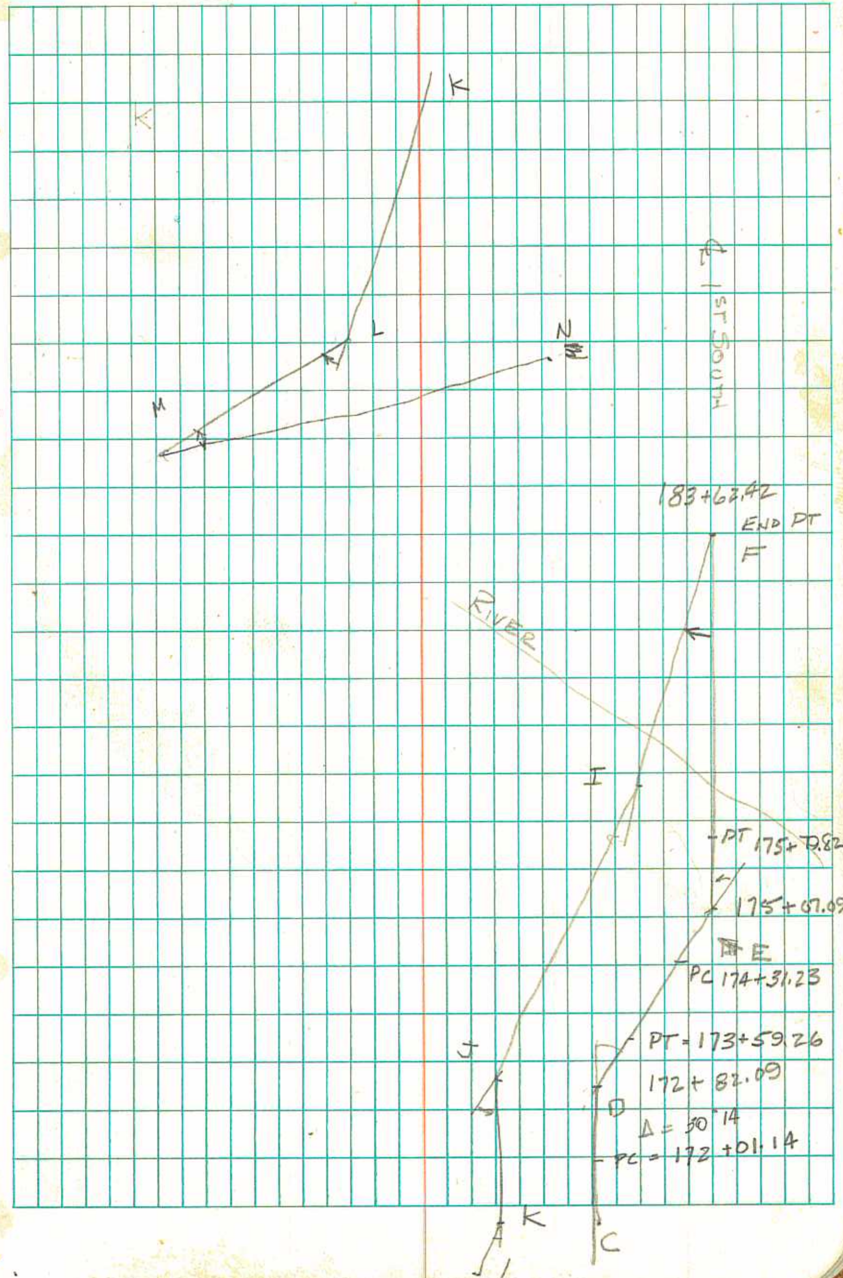
STATION	HORIZ ∡	VERT ∡	SLOPE DISTANCE	HORIZ DISTANCE
N				
	20°10'45" R	271°54'	1213.32	1212.65
M				
	23°41' R	267°20'	2494.20	493.66
L				
	37 12 05	91°05'15"	900.96	900.80
K		~~91 05 15~~	~~900.96~~	
	33 52 05 L	89°5'	902.77	902.65
J				
	40°45'25" R	284°11'	427.02	414.00
I				
	1°23'20" R	89°28'	713.83	713.80
F				
	28°22'10" L	90°36'	858.51	858.46
E				
	30°12'50" R	101°18'	229.45	225.00
D				

858.51
.51
.50
.51

229.48
.45
.46

.43
.44

427.02
27.03 27.02
27.03 27.00



CURVE INFORMATION LOCATED LINE

#1

	CURVE INFO		LOCATED LINE	
#2	Δ = 30°12'		L = 158.12	
	R = 300'		LC = 155.65	
	T = 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+58.50	14° 59' 02"		155.13	8.50

CURVE #3

	Δ = 28 22' 50"		L = 148.59	
	R = 300'		L.C. = 147.09	
	T = 75.86		D = 19.10	
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+76.32	14° 11' 21"		147.08	26.31

	+	HI	−	EL.	
~~500~~ PI + ~~450~~					
1 450 PI + ~~400~~					
T.P.	12.50	4718.69	1.81	4706.19	
400 PI + ~~350~~					
350 PI + ~~300~~					
T.P	14.15	4708.00	1.01	4693.85	
PI + 296					
BM #8	14.00	4694.86			4680.86

NOTE:
H.I.S AND ELEVATIONS CHECKED BY R. BOSHE
8/11/77

18.2	13.8	14.0	4714.4	14.1	13.3
$0^{\underline{5}}$	$4^{\underline{9}}$	$4^{\underline{7}}$	$4^{\underline{3}}$	$4^{\underline{6}}$	$5^{\underline{4}}$
43.2	33.7	14.2		13.3 EP	35.4 P.L.
05.4	03.5	08.1	4708.9	08.7	08.1
$13^{\underline{8}}$	$15^{\underline{2}}$	$10^{\underline{6}}$	$9^{\underline{8}}$	$10^{\underline{2}}$	$10^{\underline{6}}$
35.8	26.2	12.3 E.P.		15.0 E.P.	36.0
94.9	4698.9	02.2	4703.5	03.5	04.4
$13^{\underline{1}}$	$9^{\underline{1}}$	$5^{\underline{8}}$	$4^{\underline{5}}$	$4^{\underline{5}}$	$3^{\underline{6}}$
40	26	11.9 E.P.		$13^{\underline{0}}$ E.P.	37.2

~~$3^{\underline{6}}$~~ $4^{\underline{5}}$ $4^{\underline{5}}$ $5^{\underline{8}}$ ~~$9^{\underline{1}}$~~ ~~$13^{\underline{1}}$~~
~~37.2~~ $13^{\underline{0}}$ E.P. ~~11.9~~ E.P. ~~26~~ ~~40~~

87.8	94.7	96.8	4697.7	98.0	97.6
$20^{\underline{2}}$	$13^{\underline{3}}$	$11^{\underline{2}}$	$10^{\underline{3}}$	$10^{\underline{2}}$	$10^{\underline{4}}$
43.0	30.7	11.0		16.7	37.5
83.4	90.0	4690.8	4691.9	91.3	89.9
$11^{\underline{5}}$	$4^{\underline{0}}$	$4^{\underline{}}$	$3^{\underline{0}}$	3.6	$5^{\underline{0}}$
36.6	26.0	11.4	~~30~~	21.5	43.0

EP - EDGE OF PAVEMENT

page chked
att

STA	+	H I	−	ELEV.
T.P.	6.87	4666.90	8.74	4660.~~10~~ 03
T P	1.56	4668.~~84~~ 77	14.71	4667.2~~8~~ 1
155+57.6				
155+54.2				
13.7				
155+39.5 (13.7 / 58.2)				
155+32.5				
155+00 ON ℄ RIVER HTS ROAD				
BM #8	1.06	4681.9~~8~~ 2		4680.~~92~~ 86

NOTE: ALL HI's AND ELEVATIONS CHECKED
8/11/77 R. Boshe

STA	+	H I	−	ELEV.
PI + ~~450~~ 550 ?				
TP	9.96	4726.75	1.90	4716.79

25

L+						℄				R+
66.6	67.0	68.0	73.8	74.2	69.8	69.9	~~67.2~~ 76.2	77.9	80.3	81.9
15^{3}	14^{9}	13^{9}	8^{1}	7^{1}	12^{1}	12^{0}	5^{7}	4^{1}	1^{6}	0^{10}
100	75	46	32.6	27.4	16.3		20.4	50	75	96
66.7	67.5	67.9	68.8	73.2	73.7	76.1	76.5	77.6	80.3	81.3
15^{2}	14^{4}	14^{0}	13^{1}	8^{7}	8^{2}	5^{10}	5^{4}	4^{3}	1^{6}	0^{6}
100	75	50	36.2	25	16.3		25	50	75	~~100~~ 87
67.4	67.2	69.2	72.2	73.3	75.7	74.3	75.1	76.1	76.8	79.9
14^{5}	14^{2}	12^{7}	9^{7}	8^{6}	6^{3}	7^{6}	6^{8}	5^{8}	5^{1}	2^{9}
100	75	46.2	39	25	9.4		25	50	75	100
T.B. 65.5	65.5	67.9	68.6	69.8		71.3	72.7	74.4	76.3	78.5
16^{4}	16^{4}	14^{0}	13^{3}	12^{1}		10^{6}	9^{2}	7^{5}	5^{6}	3^{4}
100 FL	90	75	50	25			25	50	75	100
	FL DITCH 65.0	TOP OF BANK 66.9	68.3	69.8		4671.4	73.2	75.2	77.4	79.6
	16^{2}	15^{0}	13^{6}	12^{1}		10^{5}	8^{7}	6^{7}	4^{5}	2^{3}
	100	75	50	25			25	50	75	100

T.B. = TOP OF BANK

20.8	19.1	19.3	4719.6	19.0	18.3
6^{9}	7^{7}	7^{5}	7^{3}	7^{8}	8^{5}
34.0	28.5	15.2 EP		11.9 EP	30.8

Page CHK A Hudson

STA	+	HI	-	ELEV.
157+75				
157+50				
157+25	TELEPHONE POLE @ ℄ + 47' L			
157+00				
156+75				
156+50	+10 HI of eye			
PC 156+20.75				
~~TP~~	~~13.4~~	~~4676.90~~	~~3.4~~	~~4663.50~~
		+4 on eye		
155+84.6				

50.4
16 5
92 5

51.8
15 1
69 1

49.6
17 3
100

Lt ℄ Rt

26

Station	Lt						℄					Rt	
157+75 elev.	49.2	50.7	52.5	54.0	55.5		57.2	58.6	61.2	62.0	59.0	59.6	60.2
rod	17 1	16 2	14 4	12 0	11 4		9 1	8 3	5 1	4 1	7 9	7 3	6 7
dist.	100	75	50	44.2	25			25	38	49.3	62.9	88	100
157+50 elev.	61.8	57.6	59.2	57.5	57.2		4658.1	59.6	60.1	62.8	62.4	62.8	
rod	5 1	9 3	7 7	9 4	9 7		8 10	7 3	6 2	4 1	4 5	4 1	
dist.	50.4	36.4	32.6	29.5	25			25	50	56.5	75	99	
157+25 elev.	51.8	58.5	65.8	60.9	59.9	59.4	4659.4	61.1	62.8	64.3	66.5	TOE OF FILL	
rod	15 1	8 4	1 1	6 0	7 0	7 5	7 10	5	4 1	2 1	0 4		
dist.	75 2	61.4	47 / 30.6	22 8	9 2			25	50	75	93		
157+00 elev.	44.4	49.2	52.7	57.7	56.2	60.7	60.4	62.3	65.8	66.3	64.5		
rod	17 3	14 2	9 2	10 7	6 7		6	4 6	1 1	-0 6	-2 4		
dist.	79	73	44	30	16			25	50	75	100		
156+75 elev.	49.4	49.5	52.8	53.7	54.6		4661.2	63.5	64.4	65.1	64.6	61.9	57.9
rod	17 5	17 4	14 1	13 2	12 3		5 7	3 4	2 5	-1 8	-2 3	-5 2	-9 0
dist.	100	76.9	65	40	15.6		5.5	21.4		34.9	65	85	100
156+50 elev.	49.5	50.5	53.2	53.3			4654.6	57.4	65.4	66.2	66.0	65.1	65.0 / 59.1
rod	17 4	16 4	13 2	13 6			12 3	9 3	1.5	-0 7	-0 2	-1 8	-1 9 / -7 8
dist.	100	66.4	50	25				6.5	25.0	31.3	50	75	86.7 / 100
PC 156+20.75 elev.	49.6	50.3	51.6	51.8			4653.2	53.4	56.3		58.0	62.1	66.7
rod	17 3	16 6	15 3	15 1			13 7	13 5	10 6		8 2	4 8	-0 3
dist.	100	75	50	25				8.8	22		36.3	41.1	55
											-1 8	-1 8	
											75	65.1	89.5
155+84.6 elev.	68.5	66.5	66.6	62.7	59.4	53.4	52.4	59.3	64.2		66.2	63.6	
rod	-1	-0 4	0 3	4 1	7 5	13 5	14	7 6	2 7		-0 7	+3	
dist.	100	78	61	32.8	25.0	9.0		25	50		75	100	

Page checked R. Wilson

STA	+	HI	−	ELEV.
159+11.38				
159+00				
158+75				
T.P.	0.62	4653.45 (~~4663.52~~)	14.07	4652.83 (~~4652.90~~)
158+50				
158+25				
158+00				

Lt — ℄ — Rt

STA	Cross-section (Lt to Rt): elevations, then cut/distance
159+11.38	48.85, 49.6, 46.5, 46.4, 48.5, 49.4, 49.8 (~~47.8~~), 51.5, 47.2, 48.1, 48.6, 49.2
	4.6/100, 3.9/91, 7.0/83, 7.1/75, 5.0/50, 4.1/29, 3.7, 2.0, 6.3/20, 5.4/50, 4.9/75, 4.3/100
159+00	46.6, 47.7, 48.3, 50.4 (~~47.1~~), 51.4, 52.4, 49.0, 48.8, 49.1, 49.6
	6.9/100, 5.8/75, 5.2/50, 3.0/25, 1.6, 1.1/27, 4.5/33, 4.7/50, 4.4/75, 3.0/100
158+75	47.8, 49.0, 49.8, 51.4, 4652.2, 52.8, 52.2, 50.4, 49.9, 49.4, 50.3
	5.7/100, 4.5/75, 3.7/50, 2.1/25, 1.3, 0.7/7.0, 1.3/25, 3.1/34, 3.6/50, 3.6/75, 3.2/100
158+50	47.3, 49.1, 50.4, 52.0, 4653.3, 54.6, 56.2, 52.2, 52.2, 53.5
	19.6/100, 17.8/75, 16.5/50, 14.9/25, 13.6, 12.3/25, 10.7/37.3, 14.2/48.6, 14.2/75, 13.4/100
158+25	48.1, 49.9, 52.1, 53.7, 55.1, 56.3, 57.4, 58.5, 53.8, 54.0
	18.8/100, 17.0/75, 14.0/50, 13.2/25, 11.0, 10.6/22, 9.5/24, 8.4/37.7, 13.1/45.9, 12.9/75
158+00	49.0, 50.8, 50.1, 53.5, 52.6, 54.6, 4656.0, 56.8, 57.9, 60.8, 56.4, 55.3, 57.4, 56.7
	17.9/100, 16.8 (~~16~~)/69.8, 19, 13.4/60.6, 14.3/54, 12.3/25, 10.9, 10.1/9.2, 9.0/10.3, 6.1/37, 10.5/49.1, 11.6/75, 10.2/100, 9.5/100

CHKED
[illegible]

STA. | | Lt | ℄ | Rt

161+15 (~~25~~)

Offset	100	50	20	5	℄	4	11	18	22	50	100
Rod	19 4	19 2	18 8	17 3	13 2	12 9	10 0	10 7	13 6	14 2	12 5
Elev.	34.1	34.3	34.7	36.2	40.3	40.6	43.5	42.8	40.5	39.3	

161+00

Offset	100	50	13	℄	6	32	42	50	100
Rod	17 9	18 6	17 9	13 2	10 6	11 0	13 2	13 3	12 1
Elev.	35.6	34.9	35.6	40.3	42.9	42.5	40.3	40.2	41.4

160+50

Offset	100	93	88	~~50~~	16	10	℄	35	45	75	100
Rod	13 6	12 4	15 2	15 8	13 9	12 0	11 2	9 6	12 5	12 1	10 7
Elev.	39.8	41.1	38.3	37.7	39.6	41.5	42.3	43.9	41.0	41.1	42.8

160+00

Offset	100	50	℄	27	34	50	100
Rod	11 3	10 6	9 4	8 0	11 3	11 0	8 7
Elev.	42.2	42.9	44.1	45.5	42.2	42.5	44.8

159+50

Offset	100	50	10	℄	50	100
Rod	9 3	7 4	6 5	8 6	7 6	6 0
Elev.	44.2	46.1	47.0	~~46~~ 44.9	45.9	47.5

CHRED Akerlund

STA.	+	HI	−	ELEV.
163+00				
T P	8.52	4646.69 ~~4646.76~~	7.47	4638.17 (~~24~~)
162+50				
162+00				
161+50				
T P	4.79	4645.64 ~~4645.71~~	12.60	4640.85 ~~4640.92~~
161+25				

~~Shop 29~~

Lt ℄ Rt

163+00

						℄					
46.7	44.1	44.2	37.4	32.7	32.2	4631.9	32.1	32.7	36.4	45.9	45.9
0_{10}	2^{6}	2^{5}	9^{3}	14^{0}	14^{5}	14^{8}	14^{6}	14^{0}	10^{3}	0^{10}	0^{10}
86	80	77	74	65	25		25	60	67	70	100

162+50

					℄				
42.6	32.6	32.3	32.1	32.1	32.0	32.4	33.7	45.6	44.6
3^{0}	13^{9}	13^{11}	13^{5}	13^{5}	13^{6}	13^{2}	11^{9}	0^{10}	-1^{10}
100	89	75	50	25		25	65	75	100

162+00

		℄						
32.3	32.4	32.4	32.7	37.1	35.3	43.6	37.8	39.0
13^{3}	13^{2}	13^{2}	12^{9}	8^{5}	10^{3}	2^{0}	7^{8}	6^{6}
100	50		11	25	50	67	76	100

161+50

			℄					
32.7	33.3	33.3	4633.9	44.9	45.6	38.7	39.5	40.0
12^{9}	12^{3}	12^{3}	11^{7}	0^{7}	0^{0}	6^{9}	6^{1}	5^{6}
100	50	25		22	29	45	75	100

161+25

					℄				
34.1	34.2	34.3	38.3	37.1	41.0	46.5	39.5	38.9	39.9
19^{4}	19^{3}	19^{2}	15^{2}	16^{4}	12^{5}	7^{9}	14^{0}	14^{6}	13^{6}
100	50	23	14	5		10	27	50	100

CHKED aH

STA.	+	HI	−	ELEV.	
164+50					11 4 / 100
164+17					
					32.1 33.6 / 14 3 12 8
164+00					100 72
			NOTE:	LARGE CULVERTS LYING ON LINE HERE	32.4
163+94					14 0 / 100
		4646.40		4643.05	
T.P.	3.35	~~4646.40~~	3.64	~~4643.12~~	
163+79.5		8' ON EYE		+ 5 ON ...	
16361.5					
163+48				34.5	35.7 45.7
				12 2 / 100	11 0 / 83, 1 0 / 66

34.8 / 11 6 / 81	32.2 / 14 2 / 63	33.6 / 12 10 / 37	38.9 / 7 5 / 22	40.1 / 6 3	42.9 / 3 5 / 40	43.7 / 2 1 / 70	44.0 / 2 4 / 94	30			
32.1 / 14 3 / 100	33.5 / 12 10 / 70	35.4 / 11 9 / 49	37.1 / 9 3 / 42	40.3 / 6 1 / 10	42.1 / 4 3	44.1 / 2 3 / 34	44.6 / 1 8 / 83				
36.3 / 10 1 / 51	41.7 / 4 7 / 31	41.0 / 5 4 / 30	41.2 / 5 2 / 23	43.0 / 3 4 / 20	41.0 / 5 4 / 13	42.6 / 3 8	43.6 / 2 8 / 10	44.8 / 1 6 / 51	44.8 / 1 6 / 100		
34.3 / 12 1 / 70	36.9 / 9 5 / 52	42.4 / 4 0 / 36	41.1 / 5 3 / 34	41.6 / 4 8 / 12	42.9 / 3 15	43.4 / 2 5 / 13	43.5 / 2 9 / 16	44.9 / 1 5 / 45	44.5 / 1 0 / 69	44.8 / 1 6 / 100	
32.9 / 13 8 / 100	34.2 / 12 5 / 78	42.3 / 4 4 / 50	42.3 / 4 4 / 45	41.4 / 5 3 / 44	43.2 / 3 5 / 7	45.8 / 0 9	40.7 / 6 0 / 12	44.2 / -2 5 / 25	44.9 / -1 8 / 52	46.1 / ~~+0~~ -0 6 / 100	
33.9 / 12 8 / 100	35.0 / 11 7 / 82	41.3 / 5 4 / 61	42.1 / 4 6 / 33	43.7 / 3 0	44.8 / 1 9 / 33	45.7 / 1 0 / 70	44.7 / 2 0 / 100				
42.3 / 4 4 / 59	42.2 / 4 5 / 52	34.5 / 12 2 / 49	34.7 / 12 0 / 46	31.5 / 15 2 / 25	31.5 / 15 5	33.5 / 13 2 / 17	34.6 / 12 1 / 29	45.4 / 1 3 / 36	45.3 / 1 4 / 50	45.2 / 1 5 / 75	1 2 / 100

CHECKED 1/28-77 PBW

STA.	+	HI	−	ELEV.	
165+50					
16~~4~~5	+8		+15 on edge		
TP	0.04	~~4631.81~~ 4631.74 ~~4632.44~~	14.70	4631.70 ~~4632.40~~	
BM #5			2.09	4644.31	4644.45
16~~3~~4+80					$\frac{14^8}{100}$ 31.6 $\frac{14^7}{83}$ 31.7
16~~3~~4+71					
164+63					

Lt 31.4 31.0 28.6 26.7 25.0 24.7 ~~31.7~~ 23.8 24.2 Rt 24.0 ~~25.1~~ 26.9

0 3 0 7 3 1 5 9 6 1 7 0 7 3 7 5 7 7 4 8

100 83 57 27 20 29 56 81 ~~100~~ 95

31.7 34.6 36.5 26.1 4624.9 26.7 26.9 34.7 45.1 44.0

+0 0 −2 1 +4 10 5 0 6 8 5 1 4 8 +8 10 −13 4 +12 3

95 67 27 12 35 50 66 80 88

+12 42.7 100

NOTE: turned in to BM #5 - error of 0.14

32.0 32.6 35.7 35.8 38.0 39.8 39.2 39.0 44.5 39.9 39.5 38.2 46.0

13 6 13 3 10 7 10 6 8 4 6 6 7 2 7 4 1 2 6 5 6 2 8 2 0 4

75 59 49 35 7 2 8 19 28 36 41 62

43.7 2 7 72 44.1 2 3 100

31.4 31.9 32.9 36.7 36.2 38.5 39.5 45.5 45.6 42.3 44.6 42.6

15 2 14 5 13 5 9 7 10 7 3 6 10 0 2 0 10 4 1 1 8 3 8

100 88 52 39 35 45.3 44.0 17 45.5 21 43.7 25 44.3 34 38

31.6 32.5 32.8 37.3 38.1 4634.5 1 1 2 4 0 9 2 7 2 1

44 47 51 56 100

34.7 6 0 6 1 40.8 5 6 43.0 2 6 44.3 2 1

14 8 13 0 13 6 9 1 8 3 11 25 52 100

100 71 50 35 12

Ckd Att

STA	+	HI	-	ELEV.			
				28.3	28.9	34.2	31.9
167+67				-3^{0}	-2^{4}	$+2^{0}$	$+0^{6}$
				100	77	65	57
			28.4	24.6	30.3	35.6	
167+50			-2^{9}	-1^{7}	-1^{0}	$+4^{3}$	
			100	89	59	45	
BM #4	1.88	4631.31	25.55	4629.~~26~~ 19	4629.43		
167+00			5^{0}	6^{6}			
166+50				5^{0} on eye			
166+00				7^{0} on eye			

Lt — $15^{5} - 9 =$ ℄ 0 - Rod read — Rt 32

35.8	35.8	30.2	24.5	24.6	25.5	24.9	25.5	25.0	26.0	28.5				
$+4^{5}$	$+4^{5}$	-1^{1}	-6^{8}	-6^{7}	5^{8}	6^{4}	5^{8}	6^{3}	5^{3}	2^{8}				
46	39	36	25	11		39	55	77	85	94				
36.0	29.8	26.4	22.8	24.8	25.1	26.4								
$+4^{7}$	-1^{5}	4^{9}	8^{4}	6^{5}	6^{2}	4^{0}								
43	33	23	16		50	100								

NOTE: TURNED IN ON BM#4 - ERROR OF CLOSURE 0.24
CONTINUED ON WITH CORRECT BM EL.

30.2	30.1	31.4	23.0	24.2	25.2	24.4	26.0	27.0	27.2		
1^{5}	1^{6}	0^{3}	6^{7}	7^{5}	6^{5}	7^{3}	5^{7}	4^{7}	4^{5}		
100	90	58	45	42	36	32		50	100		
32.2	31.7	29.6	27.2	24.4	25.3	26.4	27.2	27.3			
$+0^{5}$	0^{10}	2^{1}	4^{5}	7^{3}	6^{4}	5^{3}	4^{5}	4^{4}			
100	74	70	58	45	28		50	100			
24.8	31.2	31.7	26.8	26.6	4624.8	24.4	27.2	24.6	22.8	23.8	26.4
$+1^{9}$	$+2^{5}$	0^{0}	4^{9}	5^{1}	6^{9}	6^{8}	4^{5}	7^{1}	8^{9}	7^{9}	4^{18}
100	74	67	60	29		12	17	24	39	72	79

4^{8}
100

checked

STA	+	HI.	-	ELEV
~~167~~ 170+00				
		4633.92		4625.29
TP	8.63	~~4633.92~~	6.02	~~4615.289~~
~~TP~~			~~6.02~~	
169+50				
169+00				edge of pile 148
168+82				137 edge of gravel
168+50				26.7 $\frac{-4^{6}}{159}$ 33.7 $\frac{+2^{4}}{100}$
168+00	8^{o} bench			27.9 $\frac{-3^{4}}{100}$
167+78				28.5 $\frac{-2^{8}}{100}$ 29.4 $\frac{-1^{9}}{71}$ 31.6 $\frac{+0^{3}}{58}$ 32.6 $\frac{+1^{3}}{50}$

23.4 26.1 27.4 28.1 28.2 26.2 25.0 30.3 32.4

$\frac{10^{15}}{100}$ $\frac{7^{8}}{50}$ $\frac{6^{15}}{27}$ $\frac{5^{8}}{0}$ $\frac{5^{1}}{16}$ $\frac{7^{7}}{24}$ $\frac{8^{0}}{43}$ $\frac{3^{6}}{52}$ -1^{5} 25.8 27.3 $+6^{2}$ 25.9 $+8^{0}$ $+9^{5}$ 77 92 100

23.5 $\frac{-7^{8}}{120}$ 24.3 $\frac{-7^{0}}{70}$ 31.4 $\frac{+0^{1}}{58}$ 31.3 $\frac{0^{1}}{40}$ 26.8 $\frac{4^{5}}{18}$ 25.4 5^{9} 27.3 $\frac{4^{0}}{52}$ 29.0 $\frac{2^{3}}{78}$ 31.3 $\frac{0^{0}}{89}$ 34.5 $\frac{+3^{4}}{100}$ 2

24.7 $\frac{6^{6}}{100}$ 41.3 $\frac{+10^{0}}{85}$ 31.3 $\frac{0^{2}}{47}$ 29.8 $\frac{1^{5}}{43}$ 26.4 $\frac{4^{9}}{23}$ 25.0 6^{3} 26.2 $\frac{5^{1}}{50}$ 28.0 $\frac{3^{5}}{61}$ 27.4 $\frac{3^{9}}{89}$ 28.4 $\frac{2^{9}}{100}$

38.3 $\frac{+8^{2}}{100}$ 42.0 $\frac{+10^{7}}{87}$ 28.4 $\frac{2^{9}}{35}$ 26.3 $\frac{5^{2}}{18}$ 26.1 27.0 $\frac{4^{3}}{14}$ 25.6 5^{7} 25.3 $\frac{6^{0}}{26}$ 26.6 $\frac{4^{7}}{51}$ 27.5 $\frac{3^{8}}{79}$ 29.1 $\frac{2^{2}}{100}$

Edge of gravel

39.4 $\frac{+8^{1}}{84}$ 40.8 $\frac{+9^{5}}{68}$ 32.4 $\frac{+1^{6}}{41}$ 30.5 $\frac{-0^{8}}{24}$ 32.0 $\frac{+0^{7}}{16}$ 27.0 $\frac{4^{3}}{6}$ 26.1 5^{3} 26.7 $\frac{4^{6}}{28}$ 26.9 $\frac{4^{4}}{59}$ 27.3 $\frac{4^{0}}{95}$

29.1 $\frac{-2^{2}}{78}$ 34.1 $\frac{+2^{3}}{33}$ 31.1 $\frac{0^{2}}{30}$ 27.2 $\frac{4^{1}}{25}$ 27.4 $\frac{3^{9}}{23}$ 23.3 $\frac{8^{0}}{15}$ 23.8 7^{5} 25.8 $\frac{5^{5}}{20}$ 26.3 $\frac{5^{2}}{32}$ 25.6 $\frac{5^{7}}{57}$ 26.2 $\frac{5^{1}}{100}$

37.3 $\frac{+6^{0}}{40}$ 35.1 $\frac{+3^{8}}{35}$ 29.7 $\frac{-1^{6}}{32}$ 26.1 $\frac{-5^{2}}{16}$ 27.4 $\frac{-3^{4}}{9}$ 4630.6 0^{7} 26.0 $\frac{5^{3}}{16}$ 26.0 $\frac{5^{3}}{27}$ 25.4 $\frac{5^{9}}{56}$ 25.1 $\frac{6^{2}}{76}$ 26.5 $\frac{4^{8}}{86}$ 24.1 $\frac{2^{2}}{91}$ $\frac{2^{6}}{100}$

STA	+	HI	−	ELEV.	
BM #3			7.34	4605.44	4605.54
TP	2.98	4612.78	12.67	4609.80	
TP	1.62	4622.47	12.93	4620.85	
170+89					
TP	4.18	4633.78	4.32	4629.60	
					16.0 17.9
170+73					17^9 16^0
					100 90
					17.3 18.1
170+61					16^6 15^8
					100 95
170+42					
170+20					

NOTE: TURNED IN ON BM#3 - ERROR of 0.10
CONTINUED WITH CORRECT (BM#3) ELEVATION.

14.7 19.3 21.4 27.2 24.4 29.8 29.6 30.4 30.6 27.6 29.1 28.3 33.8
19^1 14^5 12^4 6^6 9^4 4^5 4^2 2^9 3^2 6^2 4^7 5^5 0^{10}
100 80 57 45 34 19 8 23 51 72 75 87
$+2^5$ 8^0 100

19.9 23.3 27.5 26.9 25.9 27.7 29.5 37.7 37.7 29.4 29.2 27.3 32.6 31.1
14^0 10^6 6^4 7^9 8^0 6^2 4^4 $+3^8$ $+3^8$ -4^0 -4^7 -6^6 -1^3 -2^8
77 66 47 45 40 34 15 18 30 46 51 62 66
37.9 $+4^0$ 89 42.7 $+8^0$ 100

19.3 24.5 26.6 26.8 27.5 37.6 37.6 37.8 29.8 30.1 27.1 33.1 31.4
14^6 9^4 6^3 7^1 6^4 $+3^2$ $+3^7$ $+3^9$ -4^1 -3^8 -6^8 -0^8 -2^5
83 71 58 50 23 6 10 26 38 49 58 62
31.0 37.1 $+3^1$ 73 37.5 $+3^6$ 85 39.9 $+6^0$ 100

20.9 21.4 24.4 22.6 23.4 28.6 27.8 20.1 28.4 29.7 33.9 37.9
13^0 12^5 9^5 11^3 5^2 5^3 6^1 4^8 2^9 5^5 4^2 0^2 $+4^0$
100 79 71 63 47 35 24 29 36 45 64 100

22.2 23.4 26.5 27.8 26.2 25.0 32.0 35.6 37.0 39.8
11^7 10^5 7^4 6^1 7^1 8^9 1^2 $+1^2$ $+3^1$ $+5^9$
100 75 38 29 35 51 62 71 75
$+5^2$ 100 28.7

CHKED

STA	+	HI	-	ELEV.	
171+70					
TP	4.11	4620.09 ~~4617.08~~	13.33	461~~2~~5.98	08.7
					20 6
171+45					100
171+43					
171+20					
171+00					
TP	11.37	462~~7~~8.30	1.33	461~~7~~4.93	
BM F 3	13.73	461~~6~~9.27	~~13.73~~		4605.54

09.8	08.1	11.0	09.6	13.9	12.6	14.8	14.3	17.3	15.5	17.2	22.3	28.1	28.3
10 3	12 9	9 1	10 5	6 7	7 5	5 3	5 8	2 10	4 6	2 9	+2 1	+8 0	+8 2
98	54	45	40	33	25	5		19	30	38	54	72	89

08.6	12.8	11.2	17.5	15.9	19.3	20.6	24.7	26.2	27.9	27.8	28.9	28.1
20 7	16 5	18 1	11 8	13 4	10 0	8 1	4 9	3 1	1 4	-1 5	-0 1	-1 2
61	46	38	25	18	8		10	19	28	51	69	85

36.7 +7 4 100

10.1	10.9	12.5	17.3	23.6	28.3	28.3	34.0	34.3	24.2	37.8
19 2	18 4	16 8	12 0	5 1	1 0	-1 0	+4 7	+5 0	-0 1	+8 10
100	65	12	3		13	43	58	65	77	100

12.8	12.0	12.9	13.2	17.5	19.6	26.6	29.0	28.9	30.0	38.5	38.4
16 5	+4 3	16 4	16 1	11 8	9 2	2 2	0 3	-0 4	+0 1	+9 2	+9 1
100	74	40	9	2		3	40	59	73	86	100

15.2	13.7	12.9	14.4	18.7	~~30.7~~ 20.2	4628.2	27.9	28.7	18.4
14 1	15 6	16 4	14 9	10 6	1 1	1 1	1 4	0 6	-10 9
110	98	85	45	21	10	7	28	78	98

CHKED Cut

STA	+	HI	-	ELEV.	
BM# 3			7.24	4605.55	4605.54
172+63					
172+55					
172+50					
BM# 3			7.25	4605.54	4605.54
172+25		BUILDING UP 9'			
TP	3.37	~~4609.78~~ 4612.79	10.67	~~4606.41~~ 4609.42	
172+10					
172+00					

06.8 04.4 04.8 05.0 08.9 12.4 18.6 18.7 10.1

6 9/100 0 4/88 8 0/45 7 8 3 10/31 0 4/43 +5 8/52 +5 9/66 -2 7/100

04.0 04.0 04.8 05.5 06.4 08.7 09.4 17.8 16.2 19.2

8 8/100 8 10/62 8 10/23 7 3 5 10/10 4 1/14 2 9/24 +5 0/42 +3 4/48 +6 4/66

20.2 +7 4/70 +7 4/78 -3 3/100

04.6 04.7 05.8 06.7 07.9 08.1 09.5 14.9 16.1 20.6 20.2 14.2

7 8/100 7 9/77 7 0/35 6 1/11 4 9/8 4 7 3 3/16 +2 1/32 +3 3/55 +7 7/70 +7 4/80 +1 4/86

-1 1/97

NOTE: CHECKED IN ON BM# 3
closure of 0.00

05.7 06.3 06.1 08.1 08.1 09.8 16.2 15.9 21.4 21.0 14.4

6 1/100 6 5/75 6 7/34 4 7/30 3 7 3 11/11 +3 4/55 +3 1/63 +8 6/68 +8 12/70 +2 1/76

BUILDING EDGE EDGE BUILDING 11.0 -1 9/99 -3 1/101

07.4 06.2 08.7 11.9 07.7 14.8 15.6 16.4 25.2 20.6 21.4

12 7/100 13 9/59 11 4/26 8 2/16 12 4 5 3/17 4 5/24 -3 7/60 +5 1/65 +0 5/73 +1 3/83

Block house other side Block house +6 6/100

08.1 06.7 10.8 13.1 10.4 4608.3 08.9 11.2 14.5 16.3

12 9/100 13 4/50 9 13/24 7 0/11 9 1 11 8/7 11 2/17 8 9/28 5 6/38 -3 3/61

24.5 +4 4/83 +4 4/94 24.5 5

CHked att

STA	+	HI	−	ELEV.
TP	3.42	4606.46	7.64	4603.04
173+14				
	−1 one eye			
173+09				
173+00				
172+86	✓			
172+75			13 on eye	
BM#3	5.14 ~~5.02~~	4610.68		4605.54

00.2 02.2 02.8 04.1 03.6 4598.3 02.3 02.1 4600.8 4594.1 4588.3 4584.7

−10^5 −8^5 7^0 6^6 7^1 12^4 8^4 8^6 9^2 11^6 22^4 −26^0

100 85 61 42 38 35 29 14 11 65 100

08.2 02.5 06.1 03.6 03.7 02.9 4601.3 4598.5 4592.1 4598.5 4589.3 4585.7

−12 −8^2 −4^6 −7^1 7^0 7^8 9^4 12^2 −18^6 −21^4 −25 10

100 93 83 66 34 18 40 69 100

04.9 04.1 03.4 00.3 03.0 02.2 04.0 04.5 00.6

5^8 6^6 7^3 10^4 7^7 8^5 6^7 6^2 4^4

98 89 56 7 33 65 83 100

05.4 07.9 04.6 02.7 03.3 03.7 05.3 04.6 04.7 3.98 ~~05.0~~ 05.3 06.3

4^8 2^8 6^1 8^0 7^4 7^0 5^4 6^1 6^0 −6^7 −5^4 −4^4

100 94 88 36 30 10 15 39 61 75 90

−4^6

100

07.6 04.5 03.4 01.6 4604.7 05.9 08.4 07.5 14.3 13.5 09.0

3^1 6^2 7^2 6^1 6^0 4^8 2^3 3^2 +3^6 +2^8 −1^3

110 91 48 21 23 32 35 47 72 82

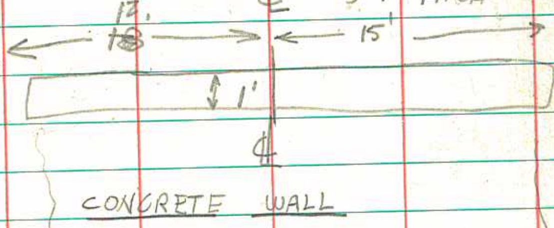
6.88 −3^8 −2^1 −4^1

88 94 100

7.98 7.98 6.58

CHKED OK

STA	+	HI	-	ELEV
173+68 ✓				
			℄ .97'	HIGH
REF. NOTE:				
173+60				



STA	+	HI	-	ELEV
173+53^50				
TP	6.02	76.42 ~~4572.30~~	11.67	70.40 ~~4566.28~~
TP	0.44	82.07 ~~4577.95~~	12.88	81.63 ~~4599.51~~
TP	1.93	4594.51	13.88	4592.58
173+25				
173+17				

173+53^50 (cross-section, elevation / rod / distance): 74.9 1.5 100; 73.1 3.3 88; 70.4 5.2 72 (Far edge of culvert); 79.1 +2.1 63 (Edge of concrete); 76.4 0.0 54; 69.4 7.0 35; 70.6 5.8 29; 4568.4 8.0 20; 4569.2 7.2 13; 4568.1 8.3; 67.4 9.0 9; 68.1 8.3 23; 67.9 8.5 29; 69.3 7.1 47; 73.8 2.6 69; 82.0 +5.6 91; 80.6 +4.2 95

173+60 (cross-section): 72.7 3.7 92; 72.1 4.3 83; 73.6 2.8 77; 71.1 5.3 64; 71.8 4.6 58; 66.4 10 35 (edge of building 63); 4563.4 13.0; 63.5 12.9 12; 62.5 13.9 17; 63.7 12.7 57; 67.1 9.3 65; 70.6 5.8 78; 75.92 0.5 90; 77.42 +1.0 91; 76.52 +0.1 100

173+25 (cross-section): 91.1 -15.4 98; 95.4 -11.1 87; 96.2 -10.3 81; 93.7 -12.8 74; 96.3 -10.2 64; 95.3 11.2 60; 90.8 15.7 44; 92.3 14.2 38; 91.0 15.5 32; 4591.6 14.9 27; 4591.7 14.10; 91.0 15.5 10; 90.4 16.1 25; 90.1 -16.4 61; 84.5 -22.0 81; 82.1 -24.4 100

173+17 (cross-section): 4596.9 -9.6 100; 4597.3 -9.2 91; 4599.1 -7.4 86; 4600.9 -5.6 82; 4599.7 -6.8 79; 4600.9 5.6 63; 4601.4 5.1 40; 4596.6 9.9 32; 4597.4 9.1 29; 4600.3 6.2 24; 4599.4 6.7 15; 4600.1 6.4; 4596.6 9.10 19; 4593.7 12.8 28; 4588.7 17.8 60; 4583.8 22.7 100

NO DATA

STA	+ $\frac{127.73}{-48}$ 79.73	HI	-	ELEV.	
175+00					
174+75	? Check this				
					58.3 57.8
					7^{8} 8^{3}
174+72					100 82
		174+61 ⊥ CHORD TO CONC.			
174+50		56^{5} L ℄ LINE OF CONC SUPPORTS			
BM# 2	10.05	4566.05	7.11	~~4556.00~~ 4558.94	4555.96
TP	0.63	63.11 ~~4558.99~~	13.94	62.48 ~~4558.36~~	

REFERENCE NOTE:

173+79.7	41' LEFT ℄ WING WALL	
174+27.73	57^{5} L ℄ LINE OF CONC. SUPPORTS	

57.4	57.9	60.1	60.3	60.1	59.5	59.2	63.3	57.6	39	
8 7	8 2	6 0	5 8	6 0	6 6	6 2	2 8	8 5		
100	73	42	19		13	22	32	55		

57.8	59.8	61.1	61.2	62.4	69.2	67.4	60.0	59.1	
8 3	6 3	5 0	4 9	3 7	+3 1	+1 3	6 1	7 0	
100	49	30		34	47	55	41 61	46 76	

57.2	57.3	58.6	59.1	60.5	61.5	61.4	63.3	64.9	65.5	68.6	69.2	60.3
8 9	8 8	7 5	7 0	5 6	4 6	4 7	2 10	1 3	0 6	+2 5	+3 1	5 8
80	73	70	52	31	23		35	42	54	67	75	88

57.6	57.4	59.6	60.4	62.7	63.6	66.1	67.1	59.9	
0 5	8 1	6 5	5 7	3 4	2 5	0 10	+1 0	6 3	
100	85	44	26		17 road	52 road	76	100	

58.2	59.0	58.2	58.7	61.7	4562.2	64.4	67.4	69.7	71.3
18 2	17 4	18 2	17 7	14 2	14 2	12 0	9 0	6 7	5 1
100	73	68	60	51		46	59 road	81 road	91

CHKD OK

STA	+	HI	-	ELEV.
				~~4558.99~~ 4555.99
BM # 2			10.06	~~10.06~~
176 + 44	EDGE OF BRIDGE			

REF. NOTE : no X-section done

STA	+	HI	-	ELEV.
176 + 19				
176 + 00				
175 + 76				
175 + 50				
175 + 25				

-4°
-7°

57.4	57.9	57.3	57.5	57.1	52.6	45.5
8^{1}	8^{2}	8^{10}	8^{16}	9^{0}	13^{9}	20^{6}
37	30	24	10 ROAD		13	26 RIVER

56.5	57.8	58.1	56.2	45.5
9^{6}	8^{3}	8^{0}	9^{3}	20^{6}
65 FENCE LINE	20		22 TOP OF	44 FLOW LINE

56.3	57.6	58.0	57.8	56.6	54.8	56.0	48.7
9^{8}	8^{5}	8^{1}	8^{3}	9^{5}	11^{3}	10^{1}	17^{4}
93	61	26		25	30	35	50 RIVER BOTTOM

56.9	58.5	58.3	57.6	57.4	56.5	59.2
9^{2}	7^{6}	7^{1}	8^{5}	8^{7}	9^{6}	-6^{2}
87	58	32	29		38	47 RIVER BOTTOM

56.9	58.3	59.2	58.1	58.7	57.9	59.1	56.6	53.5	53.3
9^{2}	7^{8}	6^{9}	9^{0}	7^{4}	8^{2}	7^{0}	-9^{5}	-12^{6}	12^{8}
99	66	31	25		25	46	62	72	80

53.15
-12^{9}
95

STA.	+	HI	-	ELEV.
177+42 (~~34~~)				
177+34 (~~26~~)				
SEWER FL	14.80			4546.58
177+26.5				

REFERENCE NOTE: H_2O MAIN

STA.	+	HI	-	ELEV.
177+8"	5 Rt	TOP OF VALVE	8.80	4552.58
		TOP OF CAP	6.13	4555.25
177+00				
TP	4.58	4561.38	9.25	4556.80

Lt CL RT 41

		56.7	56.1	57.4	57.9	58.7	56.2 56.0	55.6		
		4.2 / 33 FENCE LINE	5.3 / 18	4.0 / 4	3.5	2.7 / 7	5.4 / 8	5.00 / 32 P.L.		
			53.3	56.7	59.7	55.7	56.1	55.4		
			8.1 / 37 BANK	4.7 / 9	1.7	5.7 / 10	5.3 / 29	6.0 / 34		
			51.5	56.5	56.8	56.2	55.7	~~55.6~~ 55.58	~~46.6~~ 46.58	
			9.9 / 34 BANK	4.9 / 18	4.6	5.2 / 10	5.7 / 33	5.80 / 47 SEWER	14.80 SEWER FL	
45.2	43.2	47.2	53.0	55.3	4555.7	55.8	54.2 53.7	53.5 54.2	53.7	
16.2 / 22 RIVER	14.2 / 20		8.4 / 13	6.1 / 5	5.7	5.6 / 27 ROAD	7.2 / 42	7.9 / 46	7.2 / 50 FENCE LINE	

CHKD

STA	+	HI	-	ELEV
179+00				
T.P.	2.73	4558.23	5.88	4555.50
+50				
178+00				
177+~~56~~ 64				
177+~~50~~ 58				
177+~~42~~ 49				

55.5 55.7 52.9 53.9 55.2 54.7 54.7

2 1 2 5 5 3 4 3 3 0 3 5 3 5

30 25 20 19 14 ~~35~~ 33 CORNER BLDG.

BANK F.L. BANK

54.6 55.8 53.0 55.3 55.8 55.8 58.0

6 8 5 6 8 4 6 1 5 6 5 6 3 4

30 23 19 17 17 31 P.L.

F.L. BANK ℄ BANK

54.3 55.8 56.3

7 1 5 6 5 1

~~30~~ 30 32 P.L.

54.2 54.6 55.8 56.0

7 2 6 8 5 6 5 4

28 12 35

54.5 55.7 54.7 56.1 55.8

6 9 5 2 1 7 5 3 5 5

28 6 7 36 P.L.

54.7 57.3 4554.6 57.8 56.1 56.1 56.1

6 7 4 1 1 8 3 6 5 3 5 3

30 8 5 14 34 P.L.

CHKED OUT

STA	+	HI	−	ELEV.
182+00				
SEWER	COVER 181+57		4.74	4551.63
181+50				
T.P.	4.77	4556.37	6.63	4551.60
181+00				
180 +50				
180 +00				
179 +50				

51.2 51.3 49.7 51.5 51.2 51.2
5 2 5 1 6 7 4 19 5 1 6 2
31 23 21 18 30
FENCE LINE ℄ BANK

51.3 51.7 50.1 51.4 51.6 51.6
5 1 4 3 6 3 4 5 4 4 8
32 26 21 19 32 33
Fence ℄

51.7 52.1 50.6 51.9 52.5 52.2 52.3
6 5 6 7 6 6 3 5 7 6 5
33 27 22 20 18 30
℄
Fence

51.9 52.5 51.0 52.1 52.4 52.5 52.7
6 3 5 7 2 6 1 5 3 5 7 5 5
30 23 19 17 16 33
F.L. BANK ℄ BANK

52.4 52.9 52.0 53.0 53.6 53.1 53.2
5 8 5 3 6 2 5 2 4 6 5 1 5 0
F.L. 24 21 15 16 33
31 ℄ BANK

53.8 54.7 52.4 53.5 4554.2 4553.9 51.3
4 4 5 8 4 7 4 0 4 3 3 2
30 26 ℄ 21 BANK 19 14 34

CHKED [illegible]

STA	+	HI	-	ELEV

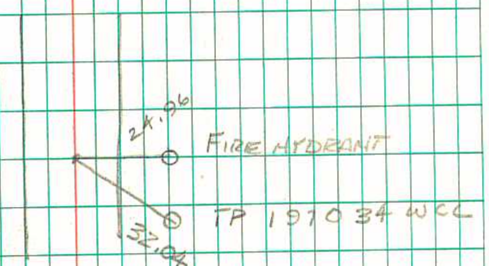
END PROJECT REFERENCE PTS

END OF PROJECT
+(62.42)

183+59.2

183+00

182+50



49.6 48.3 50.0 50.0 49.60 48.85 49.58

6 8 | 8 1 | 6 4 | 6 4 | 6 77 | 7 52 | 6 79

22 19.5 15 16.6 20 21

GUTTER CURB

50.1 48.5 50.5 50.6 50.1

6 13 | 7 9 | 5 19 | 5 100 | 6 3

23 20 16 33

℄

50.7 50.49 49.30 50.44 50.7 49.55 50.9 50.5

5 1 | 5 88 | 7 08 | 5 88 | 5 7 | 5 1 | 5 19

30 21 19 19 17 15 31

FACE BANK CONC ℄ CONC BANK

CHKED OAD

CURVE PT REFERENCE PTS

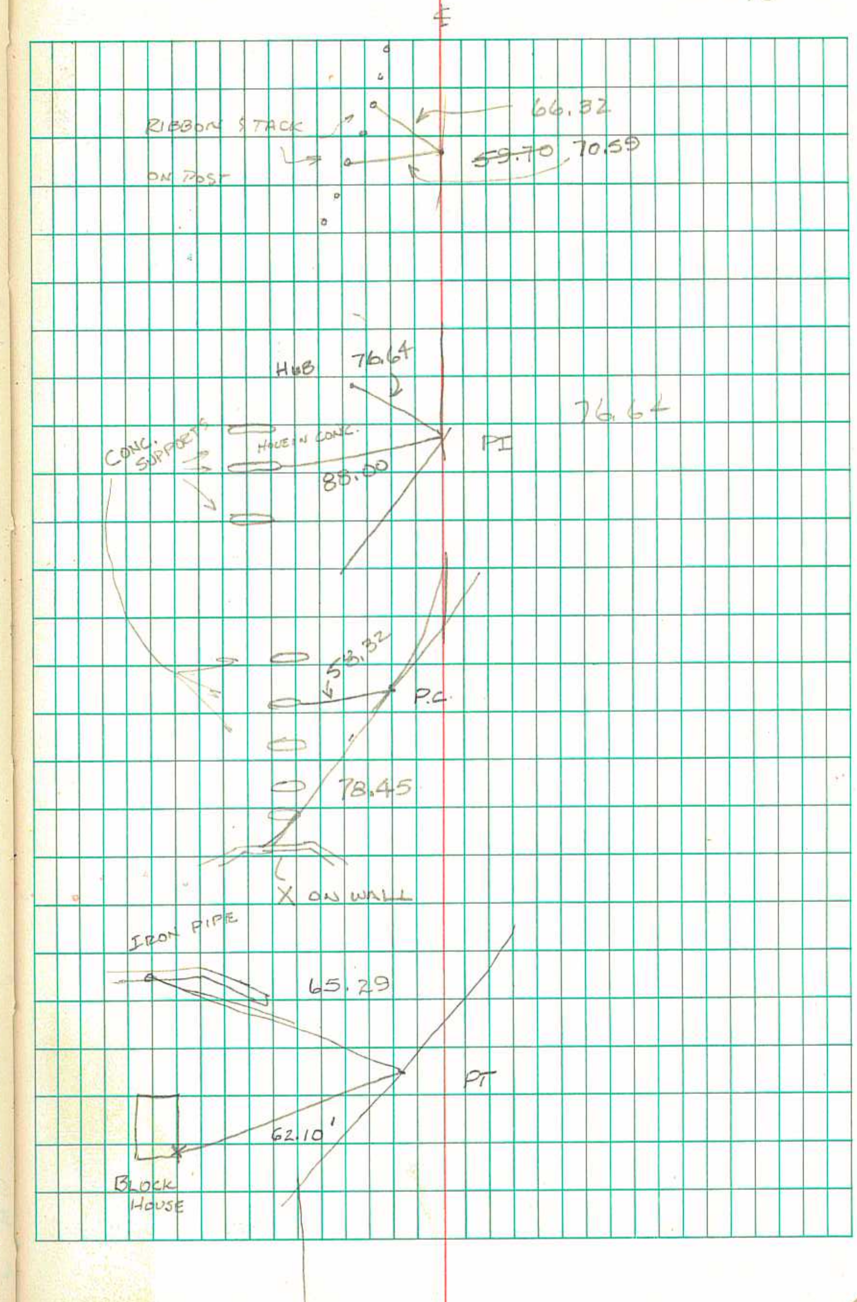
PI OF CURVE # 3

PI #3 CURVE

PC CURVE # 3

PT CURVE # 2

PT, PC CURVE # 2 ON PAGE 48.



69
36
32

47 58

275' FROM SEC LINE TO FLUME ℄

	+	HI	−	ELEV	
BM #2	5.73	4561.69			4555.96
SEWER MANHOLE	12' L ℄ STA		5.52	4556.17	
177+~~6~~71	12' L ℄				
178+32.2	CULVERT FROM		33' R ℄ TO 15' L ℄		
	49' LONG 18" CONC				
	TOP PIPE OUTLET		7.65	4554.04	
	F.L. OUTLET		9.05	4552.64	
	INLET PIPE TOP		7.17	4554.52	
	F.L. INLET		8.80	4552.89	
181+70	GAS TANKS		~~26'~~ 5' ~~±~~R ℄		
	12' LONG - 181+82				
~~181+93~~ ~~182+00~~	TELEPHONE POLE		22.2 R ℄		
	TRANSFORMERS				
182.01.6	BACK EDGE OF POLES.				
	GUY POLE IS 45.6' L OF 181.93 POLE				
	G				
181+53	SEWER LID)		9.89	4551.80	1' L ℄
TP	4.76	4556.56	9.89	4551.80	
182+59	LEADING EDGE DRIVEWAY		5.46	4551.10	16' L ℄
182+70	TRAILING CORNER D.W.		5.39	4551.17	

182+83	WALKWAY		5.91	17.5' L ℄ LEADING	
				4.7' WIDE	
183+18.1	T.P. GUY WIRE		23.0 R	℄	
183+35.3	TEL. POLE		22.3 R	℄	
183+59.2					
~~BM # 1~~					
TP	7.41	4559.70	4.27	4552.29	
BM # 1			6.17	4553.53	
BM # 2			4.03	4555.67	

180+91.3 GAS LINE 90° ∡ TO ℄ APPROX. 18" DEEP
6' NORTH OF THE SOUTH RIGHT-OF-WAY
FENCE GAS LINE

LAMPLIGHTER TELEPHONE LINE IS ON EAST SIDE
OF ROAD 6' WEST OF R OF W FENCE
GAS LINE 20' WEST OF ℄ AT LAMPLIGHTER DR.
CROSSES 135' N OF PT LOWER CURVE

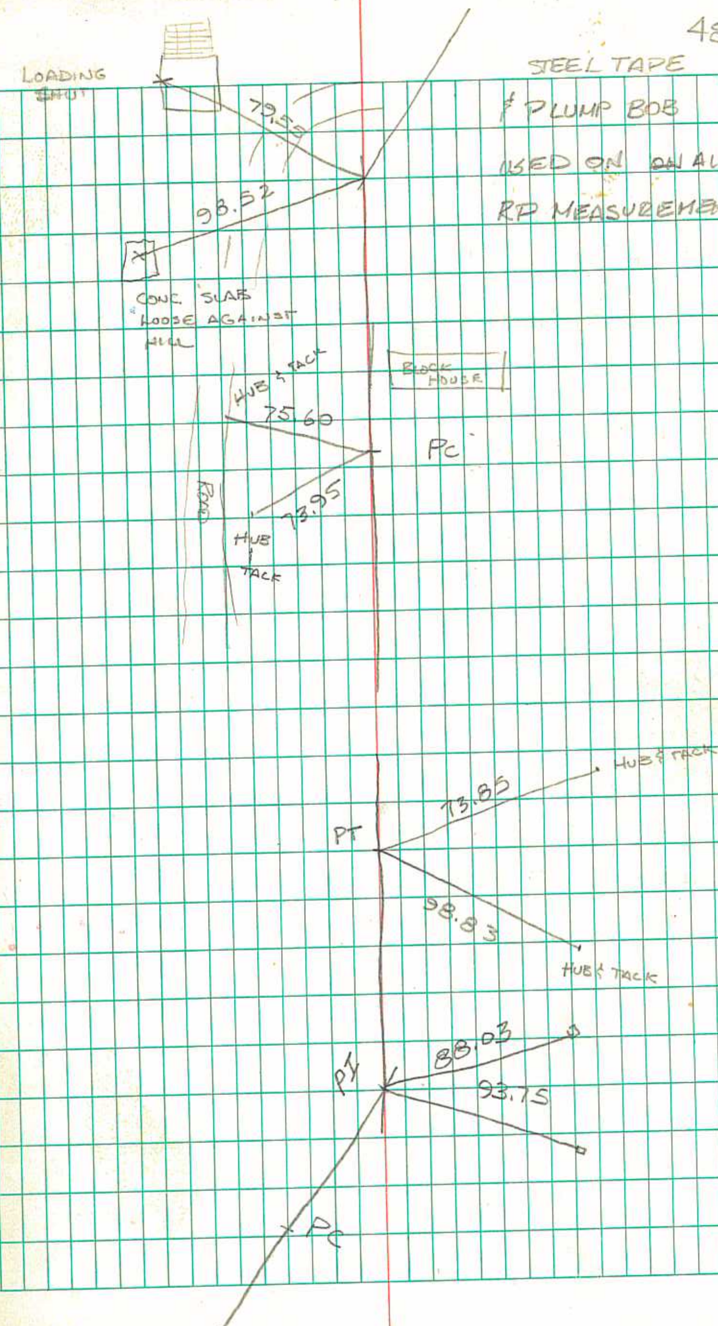
PI CURVE #2

PC CURVE #2

159+11.38 PT CURVE #1

PC CURVE #1

STEEL TAPE
& PLUMB BOB
USED ON ~~ON~~ ALL
RP MEASUREMENTS



82.48

PT OF BEGINNING

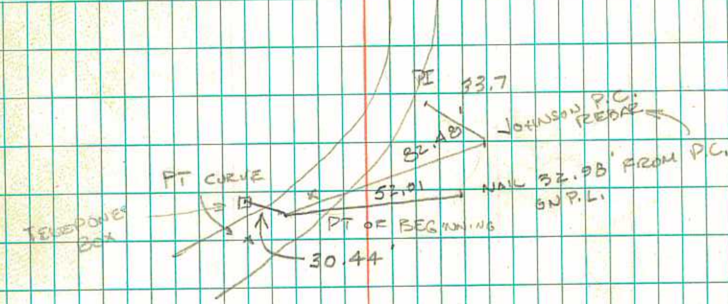
BM	4.29	4685.15	13.90	4671.25	4680.86

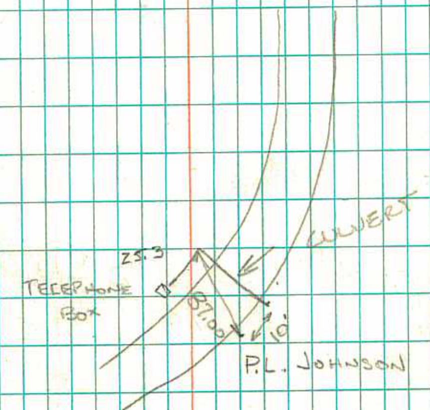
CULVERT ON RIVER HTS

90.070 = LENGTH

TP	6.21	4677.46	13.90	4671.25
FL INLET			12.01	4665.45
FL OUTLET			12.22	65.24
BM# 7			9.26	68.20
LID SEWER			10.46	67.00
			4.29 ~~2.66~~	
BM	4.29			
TOP OF WATER PIPE LAMP LIGHTER			0.90	

gas & WATER 4' BELOW ASPHALT
WATER BELOW EDGE OF PAVEMENT





PROPOSED FLUME LINE ℄

	+	HI	—	ELEV
#3 MANHOLE	9.0	4607.0		4598.0
1+33 ℄ DITCH LINE		~~461~~		~~4602.0~~
1+~~34~~ ⊥ WITH SEC LINE	15.1	4617.1	5.0	4602.0
TP 1+34	15.0		1.0 ~~15~~	4616.1
1+32 24			11.7	4619.4
+ ~~60~~				
TP	13.6	4644	0.7	4630.40
1+56.5 34			11.9	4632.10
TP	14.6	4656.2	2.4	4641.60
1+90	10.0 ~~4.9~~	4661.3	4.9	4651.30
+102.5			3.4	4657.9
2+32.5			10.5	4650.8
2+48.5			11.3	4650.0

	+	HI	−		
2x+62.5	4.6	4661.90	4 0	4657.3	
2+68.5 13			2 6	4659.3	
2+81.5 23			6 7	4655.2	
3+04.5 21			3 4	4658.5	
3+19.5			13 7	4648.2	
TP	0.8	4649.0	13 7	4648.2	
3+25.5			3.4	4645.6	
47.5 13			7.2	4641.80	
3+60.5 18	6 1	4644.6	10 5	4638.5	
3+78.5 29.5			11 2	4633.4	
4 08 10 33.			16.7	4627.9	
4+11.5 50			14.9	4629.7	
4+28.5 61			14.2	4630.4	
4+39.5			6.3	4638.3	

TURN 90° = TO NS SECTION LINE

178.5 +82	+	HI	−		
4+60.5			6.4	4638.2	
17 63					
4+77.5			~~14.4~~ 15.4	4629.2	
TP	$2^{\underline{8}}$	4632.4	$15^{\underline{0}}$	4629.60	
5+23.5			$7^{\underline{2}}$	4625.2	
5+42.5	$6.^{\underline{2}}$	4625.30	13.3	4619.10	
5+97.5	$0^{\underline{98}}$	4621.38	$4^{\underline{2}}$	4620.40	
~~BM~~ TP	6.14	4613.52	14.05	4607.38	
BM #2			7.25 D	4606.27	4605.54
7+97.5			9.4	4604.12	
8+25.0 45			5.4	4608.12	
8+70.0			15.4	~~℄~~ MH #1 4598.12	
TP	~~4.49~~ 4.49	4609.44	8.57	4604.95	
℄ #3			10.76	4598.68	4598.0

[illegible]

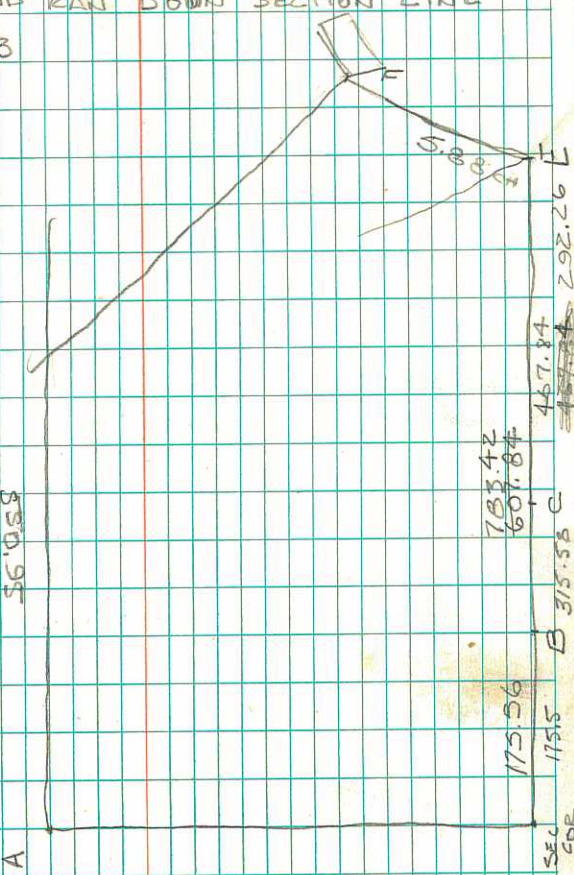
Man hole #1.

JOHNSON PROP SURVEY SEC. 3

29 JULY 77

STA	HORIZ ∡	VERT ∡	SLOPE D	HORIZ D	
SEC COR					
	0°	89°34'	364.50	364.49	
A					
		85 0			
B SEC COR					
	90	85°0'	178.20	175.5	
B					
	0°	85°47'	317.19	315.58	
C					
		97°58	708.03	701.19	467.82
D				~~467.82~~	
		92°21'	266.33	261.34 ~~233.37~~	233.36
E					
	43°11'55"	86°03	109.57		
F					

SET SEC. CORNER 801.8' FROM CEMETARY FENCE ~~SET~~ ON N-S LINE. SET UP ON SEC. COR. D TURNED 90° AND RAN DOWN SECTION LINE 175.56' TO PT B



10 AUG 77 SET W. MARKER FOR SEC COR IN GRAVEL PIT

HUDSON – NOTES HOT (92°) SUNNY

BOSHE –

WARD – DPM 43

SET UP ON W.M AND SHOT AND DOUBLED ∡ FROM LOGAN TEMPLE EAST SPIRE TO THE SECTION CORNER

120° 45' 40" DOUBLED = 60° 22' 50"

DOUBLED ∡ FROM 5^{TH} AND 18^{TH} WARD CHURCH TO SECTION CORNER

68° 2~~0~~3' 40" DOUBLED = 34° 11' 50"

VERT ∡

DISTANCE FROM WITNESS MARKER TO SEC. COR.

94° 08' 407.69 406.63

STAMPED 406.63 → ON WITNESS CORNER

AMALGA ROAD TIE-IN

29 JULY 77

HUDSON NOTES

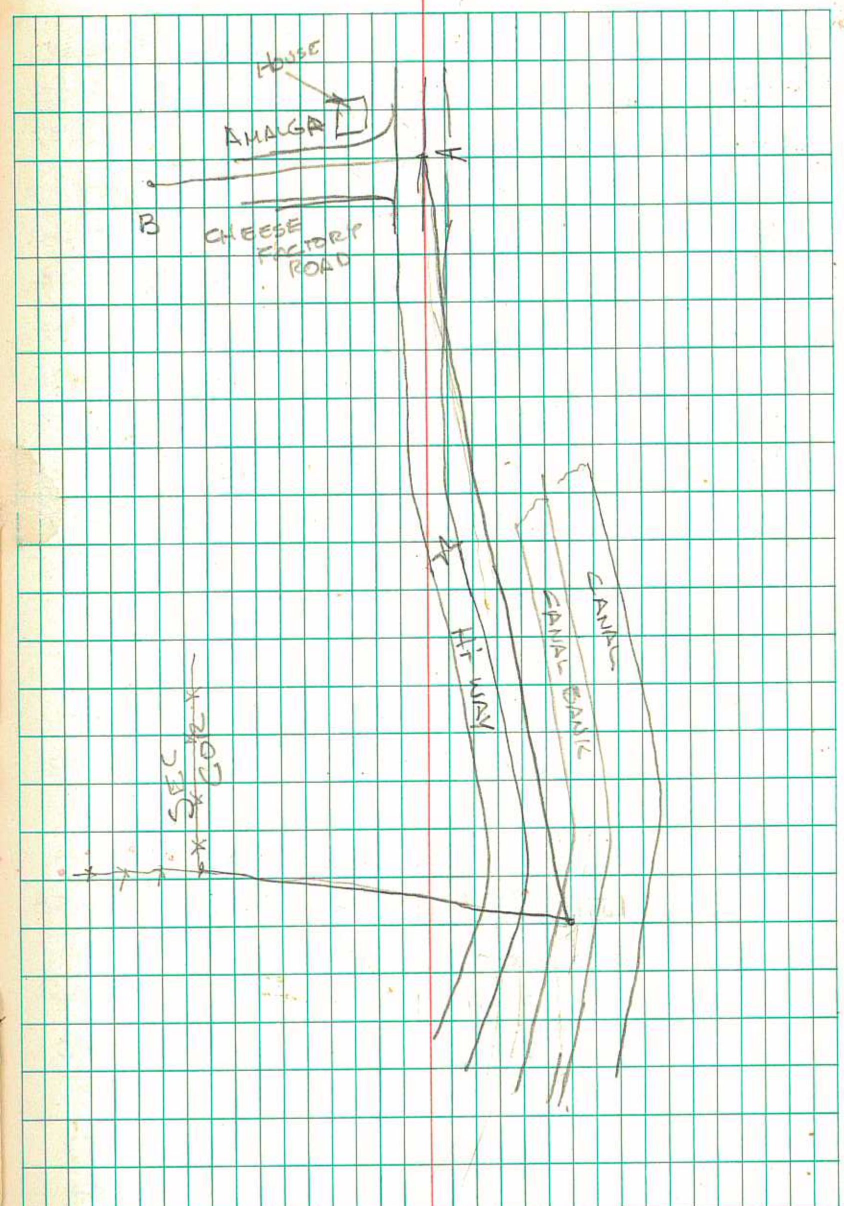
WARD

BOSHE

A				
		90°	3688.24	3688.24
B'				
	44°42'20" L	91°58'	884.72	884.20
SEC COR				
B'				
	100°46' R			
A				

SET UP ON B' (ON CANAL BANK, H & F)
TURNED ANGLE TO LEFT TO SECTION CORNER. THEN SET UP ON PT A AND TURNED ∡ FROM B' TO B. B BEING PT ON AMALGA RD TRAVERSE (PC OF FIRST CURVE)

COPIED INTO MISC. SURVEY BOOK
8 JULY 77



SET ℄ GRADE SHEET

STA	ELEV	GRADE	STA	ELEV	GRADE
155+00	71.4	4671.4	161+25	41.0	48.05
+32.5	71.3	4671.4	+50	33.9	46.92
+39.5	74.3	71.4	162+00	32.4	44.66
+54.2	76.1	71.4	162+50	32.0	42.40
+57.6	69.9	71.4	163+00	31.9	40.14
+84.6	52.4	4671.4	+48	31.5	37.97
156+20.75	53.2		+61.5	43.7	37.36
+50	54.6		+79.5	45.8	36.54
+58.41			+94	42.9	35.89
156+75	61.2	68.39	164+00	42.6	35.07
157+00	60.4	67.26	164+17	42.1	34.85
157+25	59.2	66.13	+50	40.1	33.36
157+50	58.1	65.00	+63	39.5	32.77
+75	57.2	63.87	+71	38.5	32.41
158+00	56.0	62.74	+80	39.3	32.00
+25	55.1	61.61	165+00	21.9	31.10
+50	53.3	60.48	+50	25.0	28.84
75	52.2	59.35	166+00	24.8	4626.58
159+00	51.9	58.22	+50	26.4	24.32
159+11.38	49.8	57.71	167+00	26.0	22.06
+50	44.1	55.96	+50	24.8	19.80
160+00	44.1	53.70	+67	25.5	19.03
160+50	42.3	51.44	+78	30.6	18.53
161+00	40.3	49.18	168+00	23.8	17.54
161+15	40.3	48.50	168+50	26.1	15.28

STATION	ELEV	GRADE	STATION	ELEV	GRADE
168+82	25.6	4613.82	173+1~~4~~7		~~4586.53~~ 84.31
169+00	25.0	13.02	+25		83.74
169+50	25.4	10.76	+53.5		4581.73
170+00		4606.66	173+68	4563.4	4580.70
170+20		04.95	174+27.73	4562.2	76.48
+42		03.76	+50	62.7	74.90
+61		02.43	+72	61.4	75.35
+73		01.59	+75	61.2	73.14
+89		00.43	175+00	60.1	71.37
171+00		4599.65	+25	58.7	69.66
+20		98.23	+50	57.4	67.80
+43		96.61	+76	57.8	66.07
+46.5		96.47	176+00	58.1	64.5
+70		94.70	+19	57.1	63.49
172+00		92.58	177+00	55.7	4559.6
+10		91.87	177+26.5	56.8	58.68
+25		90.81	177+34	59.7	58.38
+50		8~~8~~9.04	177+42	57.9	58.15
+55		88.69	+49	59.6	57.94
+63		88.12	+58	59.7	57.65
+75		87.28	+64	54.6	57.46
+86		86.50	178+00	55.8	56.7
173+00		85.51	178+50	55.8	56.0
173+09		84.87	179+00	54.7	55.42
173+14		84.52	179+50	~~55.8~~ 53.9	4554.83

181+00	52.2	4553.08
+50	51.6	52.49
182+00	51.62	51.91
+50	50.9	51.32
183+00	50.6	50.74
183+62.42	4550.0	4550.0

174+75

BM TIE IN

175+96.3 72' L ℄ FENCE POST #3

176+53 10' L ℄ BRIDGE #2

179+64 39.5 L ℄ #1

$11^{\underline{7}}$ $10^{\underline{9}}$ $4^{\underline{4}}$ $3^{\underline{6}}$ $8^{\underline{4}}$

34 45 53 63

172+25 117 L ℄ #4

158+69 181 L ℄ #6

PI+203 42 R ℄ LAMPLIGHTER

13 SEPT 77

POLARIS SHOT 12 SEPT

Δ∡ BETWEEN 6 ~~PTS~~ SHOTS = 2 MIN

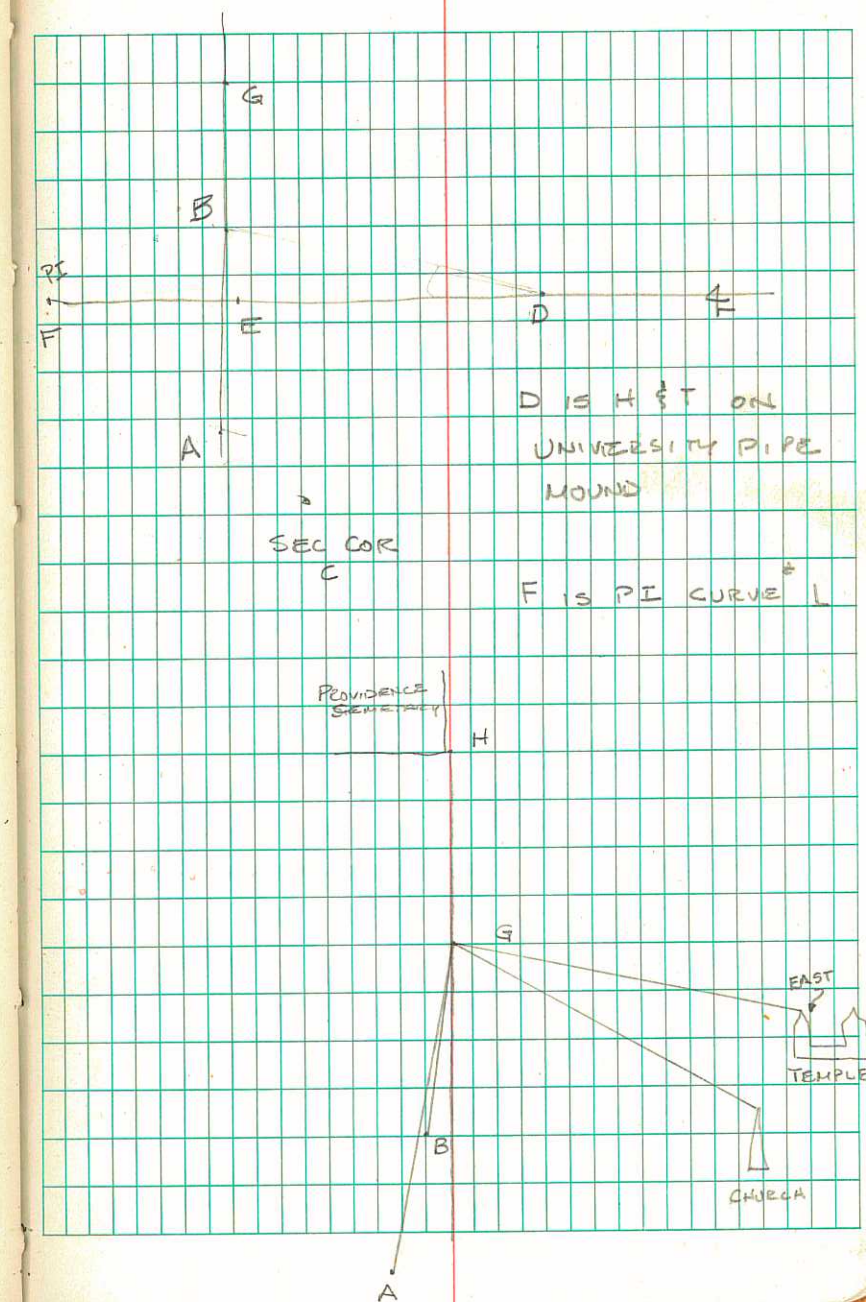
SET UP ON B AND SHOT POLARIS. TURNED DOWN AND SET POINT A DIRECTLY BELOW POLARIS TOOK 3 SHOTS UPRIGHT, PLUNGED FOR THREE AND PLUNGED AGAIN FOR CHK.

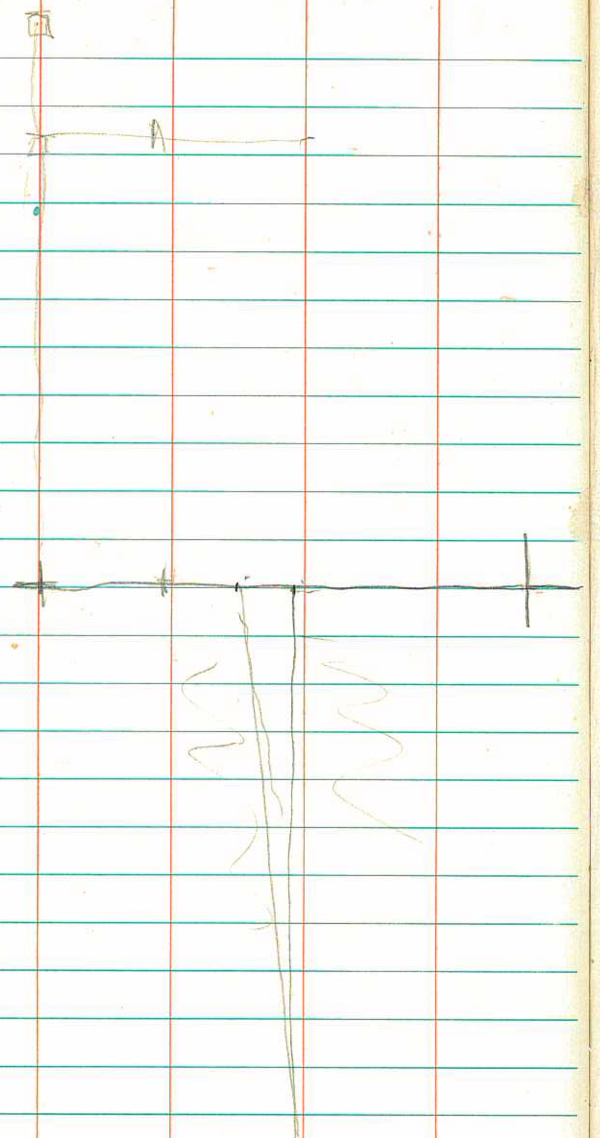
SET UP ON 13 SEPT ON B SHOT A TOOK AVE OF Δ∡ 2 MIN AND SHOT FOLLOWING ∡

∡ABC	1°33'10"
∡ABD	83°50'50"
∡BDF	7°40'
∡BDA	31°52'

SET ON SET WITNESS CORNER ON BLUFF SIGHTED ON B, A, CHURCH, TEMPLE EAST SPIRE AND PT H - SUBD. BOUNDARY REBAR BY NORTH CORNER OF PROVIDENCE CEMETARY.

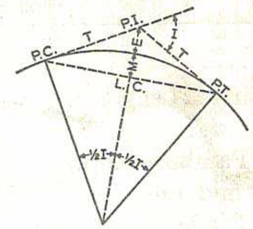
AGB	0°07'10" R
BG CHURCH	34°35'02" LT
BG TEMPLE	61°04'10" LT
BGH	181°46'40" LT





CURVE AND REDUCTION TABLES

Published by Eugene Dietzgen Co.



CURVE FORMULAS

1. Radius : $R=\dfrac{50}{\sin D/2}$
2. Degree of Curve: $D=100\dfrac{I}{L}$. Also, $\sin D/2=\dfrac{50}{R}$
3. Tangent : $T=R\tan \frac{1}{2} I$. Also, $T=\dfrac{T \text{ for } 1^\circ \text{ curve}}{D}+C$.
4. Length of Curve: $L=100\dfrac{I}{D}$

$D = \dfrac{5729.58}{R}$

5. Long Chord : $L.\,C.=2R\sin \frac{1}{2} I$.
6. Middle Ordinate: $M=R\,(1-\cos \frac{1}{2} I)$
7. External : $E=\dfrac{R}{\cos \frac{1}{2} I}-R$. 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. $T=\dfrac{T \text{ for } 1^\circ \text{ Curve}}{D}+$ C. From Tables V and VI $T=\dfrac{2392.8}{6.5}+.197=368.32=3+68.32$. Sta. P. C. = 83+40.7 − (3+68.32) = 79+72.38.

P. T. = P. C.+L, and $L=100\,\dfrac{I}{D}=100\,\dfrac{45.33}{6.5}=697.38$ 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 $=5.66\times\left(\dfrac{27.62}{100}\right)^2=.432$ ft. Also, square of any distance, divided by twice the radius equals (approximately) the distance from tangent to curve. Thus $(27.62)^2\div(2\times881.95)=.432$ ft.

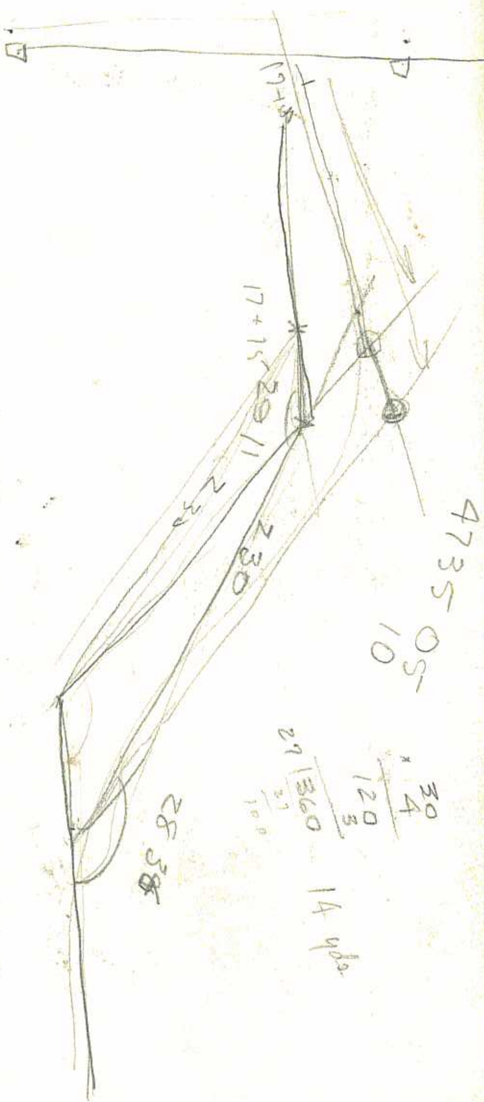
Deflections—Deflection angle = ½ D for 100 ft., ¼ D for 50 ft., etc. For "X" ft., Deflection Angle (in minutes) = .3 × X × D. For Sta. 80 of above curve Deflection Angle = .3 × 27.62 × 6.5 = 53.86′. Also Deflection Angle = dfl. for 1 ft. from Table III × X = 1.95 × 27.62 = 53.86′. For Sta. 181 Deflection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

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

102.55

8.7'

156+20.7
36.1
155 84.6
36.1
120.7

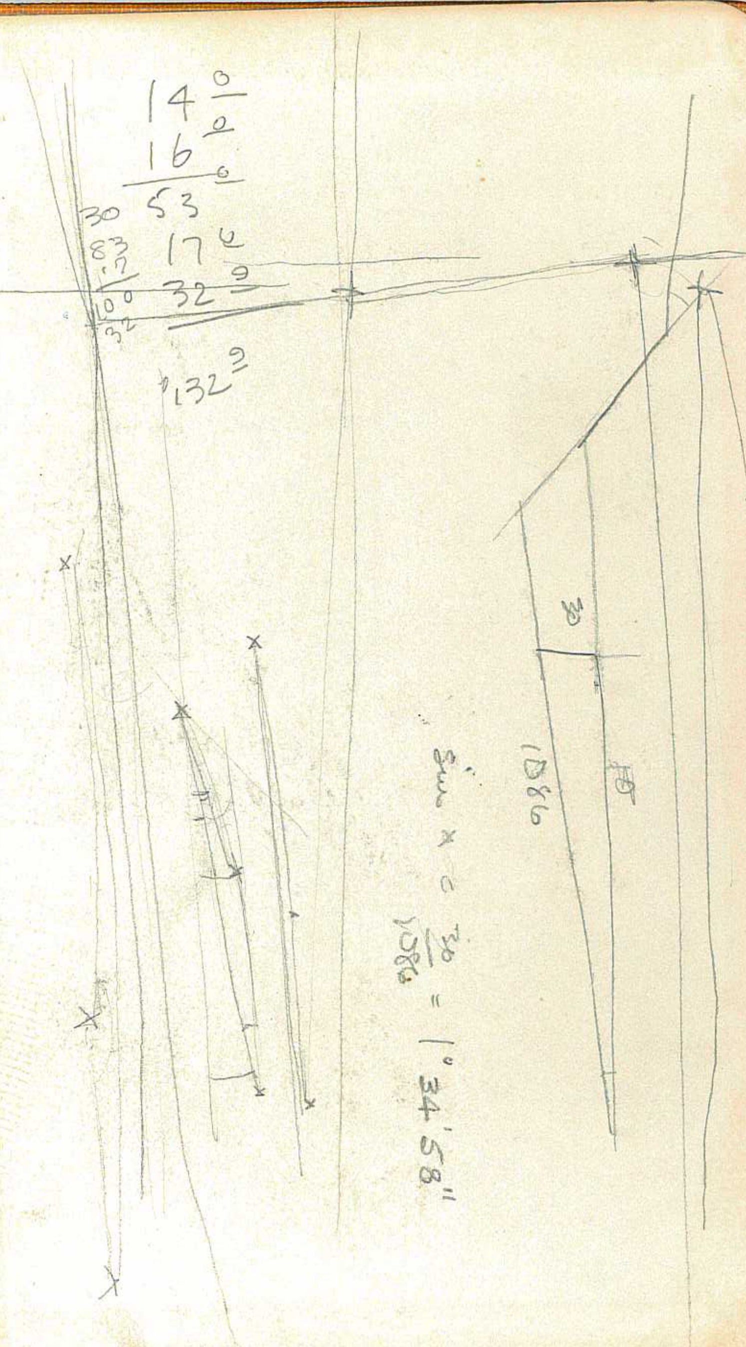


45 42

22 30.
21

100.06
92 32 50

14°
16°
53
17°
32°
132°



sin x = 30/1086 = 1°34'58"