

OFFICE OF COUNTY ENGINEER
RAMSEY COUNTY, MINN.

01D 8 Survey

Misc Notes

From I 694 To No. City Lim

Road Acc't. No. 77

Date Filed _____ F _____

RG
LPD
DS

April 12, 1976
Clear 50°

1

Alinement
of
Old Hwy 8
from
I694 to North

Sta	Pt.	ΔL	ΔR	Data
-----	-----	------------	------------	------

168 + 78.01	P.T.			$3^{\circ} 05' = \Delta$
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+50				
-----	--	--	--	--

				$2^{\circ} 48.2'$
--	--	--	--	-------------------

168				
-----	--	--	--	--

				$2^{\circ} 18.2' \Delta = 6^{\circ} 10' R$
--	--	--	--	--

+50				
-----	--	--	--	--

				$1^{\circ} 48.2' D = 2^{\circ}$
--	--	--	--	---------------------------------

+24.00				
--------	--	--	--	--

	P.I.			
--	------	--	--	--

				$T = 154.32'$
--	--	--	--	---------------

167				
-----	--	--	--	--

				$1^{\circ} 18.2' L = 308.33'$
--	--	--	--	-------------------------------

+50				
-----	--	--	--	--

				$0^{\circ} 48.2' R = 2864.79$
--	--	--	--	-------------------------------

166				
-----	--	--	--	--

				$0^{\circ} 18.2'$
--	--	--	--	-------------------

165 + 69.68				
-------------	--	--	--	--

	P.C.			
--	------	--	--	--

				$0^{\circ} 00'$
--	--	--	--	-----------------

165 + 48.30				
-------------	--	--	--	--

	P.O.T.			
--	--------	--	--	--

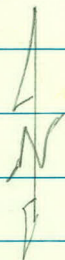
165 + 00				
----------	--	--	--	--

	P.O.T.			
--	--------	--	--	--

Apr. 12, 1976

2

2



cor. bridge rail post

37.90'

31.96'

cor bridge rail post

Edge concrete bridge
approach span.

PK nail

PK nail

Sta	Point	ΔL	ΔR
+94.6	PT		$13^{\circ} 13'$
+75.01	P.O.C.		$12^{\circ} 55' 22''$
+50			$12^{\circ} 32' 51''$
183			$11^{\circ} 47' 51''$
+50			$11^{\circ} 02' 51''$
182			$10^{\circ} 17' 51''$
+50			$9^{\circ} 32' 51''$
181			$8^{\circ} 47' 51''$
+50			$8^{\circ} 02' 51'' \Delta = 26^{\circ} 26' R.H.$
180			$7^{\circ} 17' 51'' D = 3^{\circ} 00'$
179+62.1			$T = 448.6'$
+50			$6^{\circ} 32' 51'' L = 881.1'$
179			$5^{\circ} 47' 51'' R = 1910.08'$
+50			$5^{\circ} 02' 51''$
178			$4^{\circ} 17' 51''$
+50			$3^{\circ} 32' 51''$
177			$2^{\circ} 47' 51''$
+50			$2^{\circ} 02' 51''$
176			$1^{\circ} 17' 51''$
+50			$0^{\circ} 32' 51''$
175+13.5	P.C.		$0^{\circ} 00'$

RG
LPO
DS
JA

1-5-B

Apr. 30, 1960
cldy 60°

3

PP

3N

85.36'
41.53'

50.17 on Tan

14.14 Th

PK nail

Top cor. stone cap

New Brighton Hdw.
2-5-Brick

76.85'

53.4'

P.K. nail

Top cor. stone cap

95.53'

34.43'

PP

3N

77.25'

PP

3N

73.86'

123.83' 3N PP

PK nail

Sta.	Point	ΔL	ΔR
31.34	+30.98 P.T.	$343^{\circ}32'25''$	
203		$344^{\circ}28'10.6''$	
+50		$345^{\circ}58'10.6''$	
202		$347^{\circ}28'10.6''$	$320^{\circ}04'50''$
+50		$348^{\circ}58'10.6''$	$\Delta = 32^{\circ}55'10''$
201		$350^{\circ}28'10.6''$	$D = 6^{\circ}00'$ Chord
200 + 64.58 P.I.			$T = 282.56'$
200 + 50		$351^{\circ}58'10.6''$	$L = 548.65555$ 549.44
200		$353^{\circ}28'10.6''$	$R = 955.37$ Chord
+50		$354^{\circ}58'10.6''$	
199		$356^{\circ}28'10.6''$	
+50		$357^{\circ}58'10.6''$	
198		$359^{\circ}28'10.6''$	
197 + 82.32 P.C.		$359^{\circ}60'00''$	

$1^{\circ}30'00''/50 \text{ ft}$

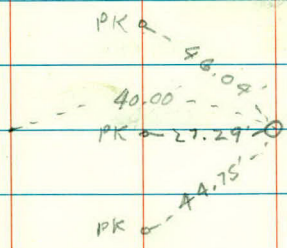
RG
LPD
DS
JA

FK
DS
RL
DW

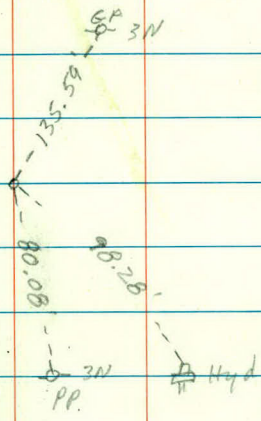
August 6, 1976
Clear 80°
Curve

May 5, 1976
Cldy, windy 50°
Ties 4

(203+37.4)



R/W
Iron
located by
FRK
5-4-76
7.5' below
Road



Iron

40'

P.K. Nail

R-W
Mon.

Sta Point

239+21.50 P.O.T.

(212+86.0)

212+78.79 P.I.

203+30.98 P.T.

FK
DS.
RL
DW

J.A.
L.P.
D.S.

August 6, 1976

5

Nov 29, 1976

5° P.C.

MEASURED Dist to P.I.

Front
Disc

55.10'

BRASS Plug

Hyd.

67.42'

113.34'

So. Pole
Front
Disc

111.92'

3N
PP

40.91'

Mon

T.H. No. 96

141.42'

116.68'

89° 55' 42"

3N
PP

P.K.



Sta

Pt

726+00.58 Pot

J.A.
DS
G.A.

2

DEC 3, 1976
SNOW 15"

6

COR. TOP PATIO LEDGE

KINGDOM HALL

OF JEHOVAHS

WITNESS

S.W. COR

1' ABOVE GROUND

103.02

72.77

P.K.

39.41

IRON

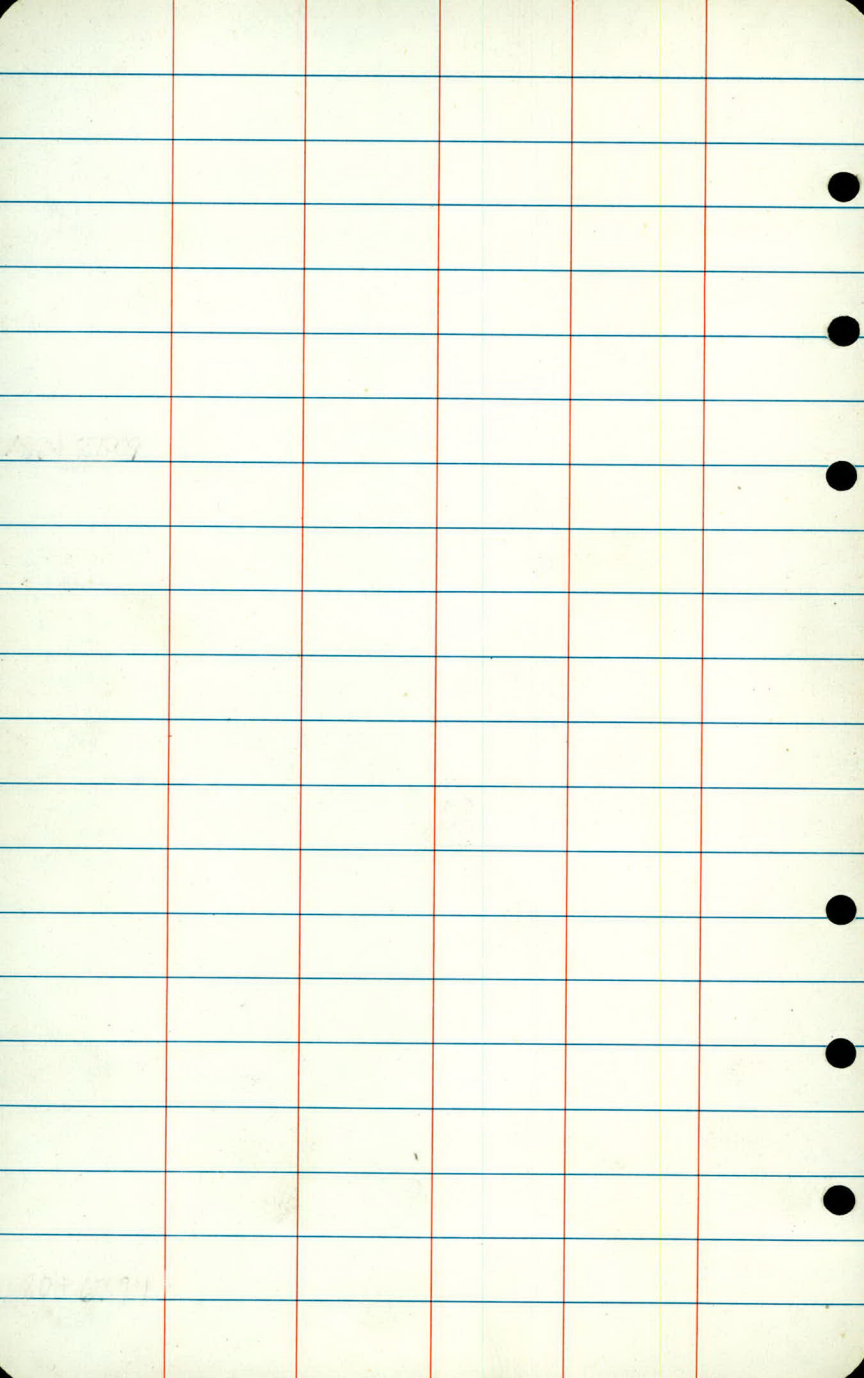
STA 226+00

89.32

HO #

1973

FO. S.W. COR



Old Hwy 8
694 to M.V.

PK

46.02

PK

27.29

Located

R.W. Mon.

5-4-1976

2 1/2

7.3 feet

Below Road

44.75

PK

3N
D GP

135.59

203+37

5-49

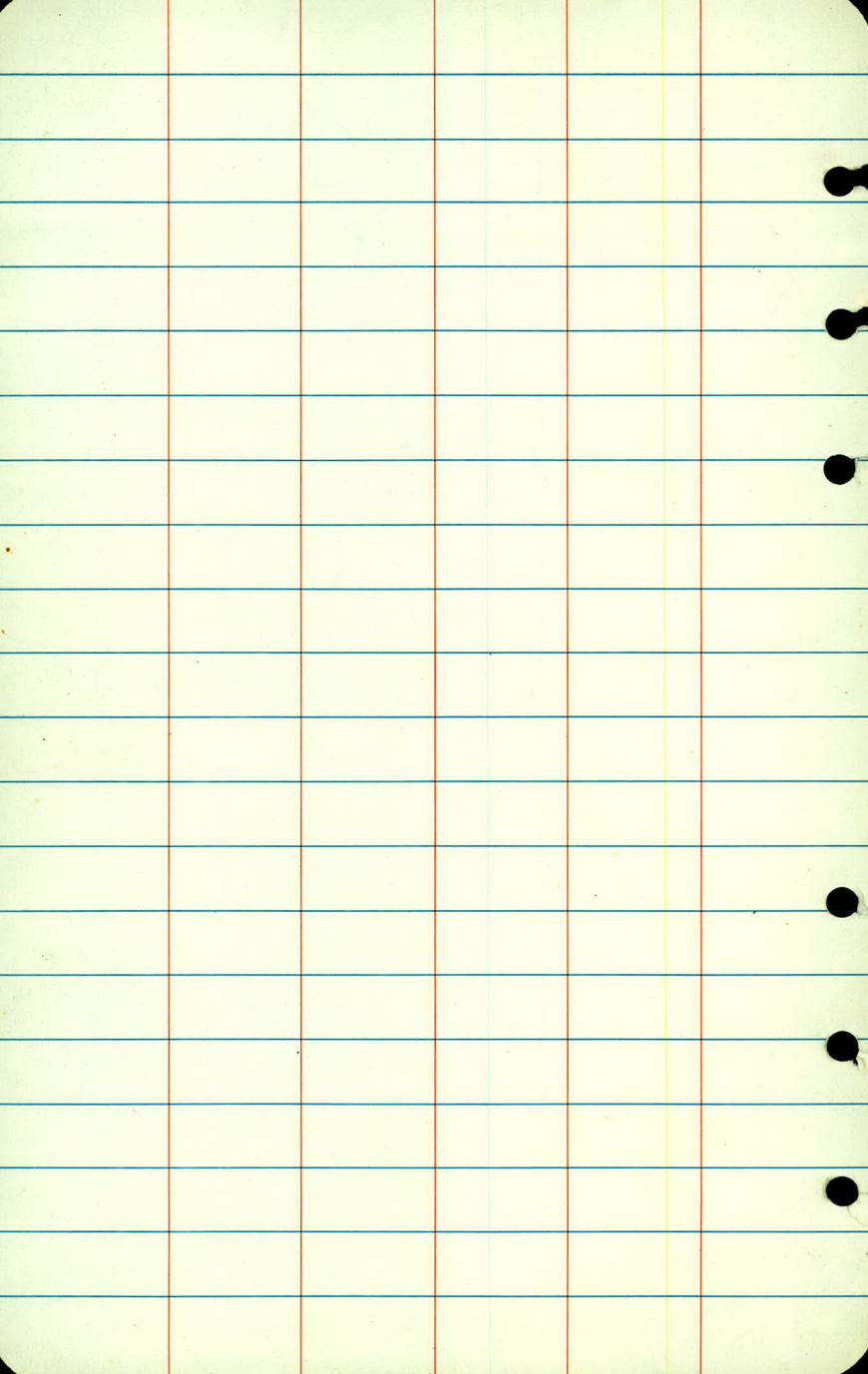
19788

80.08

98.28

3N
PP

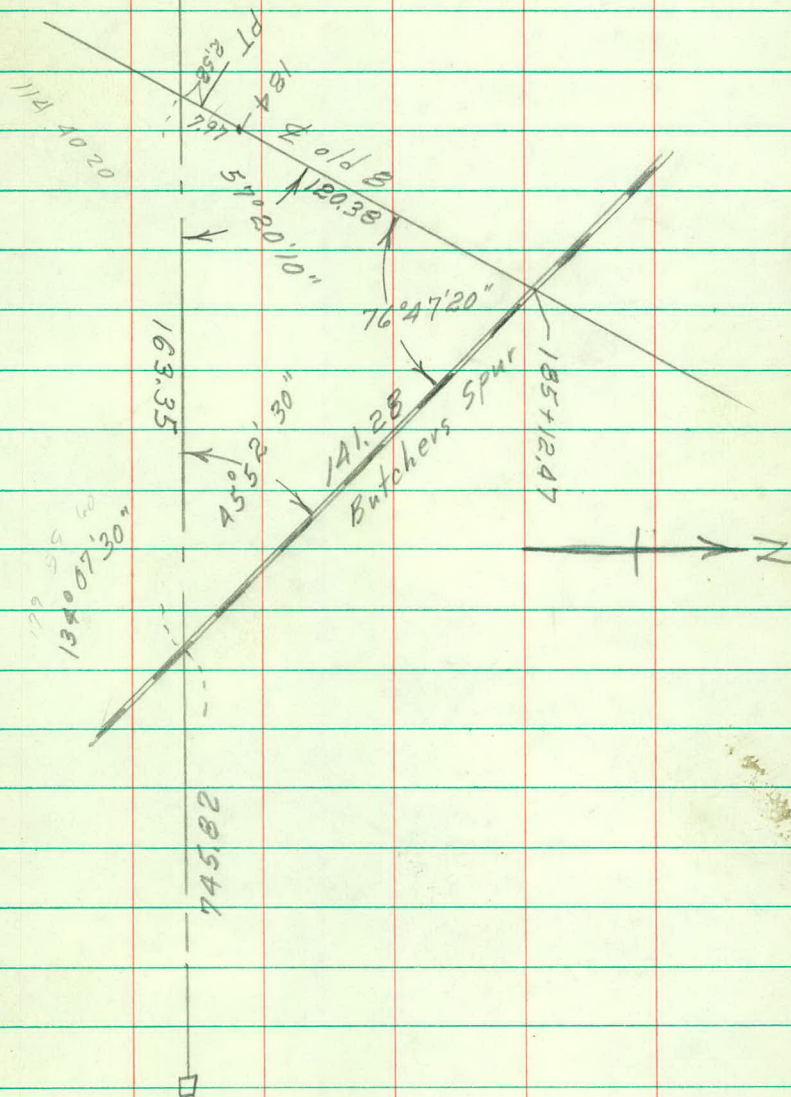
Hyd

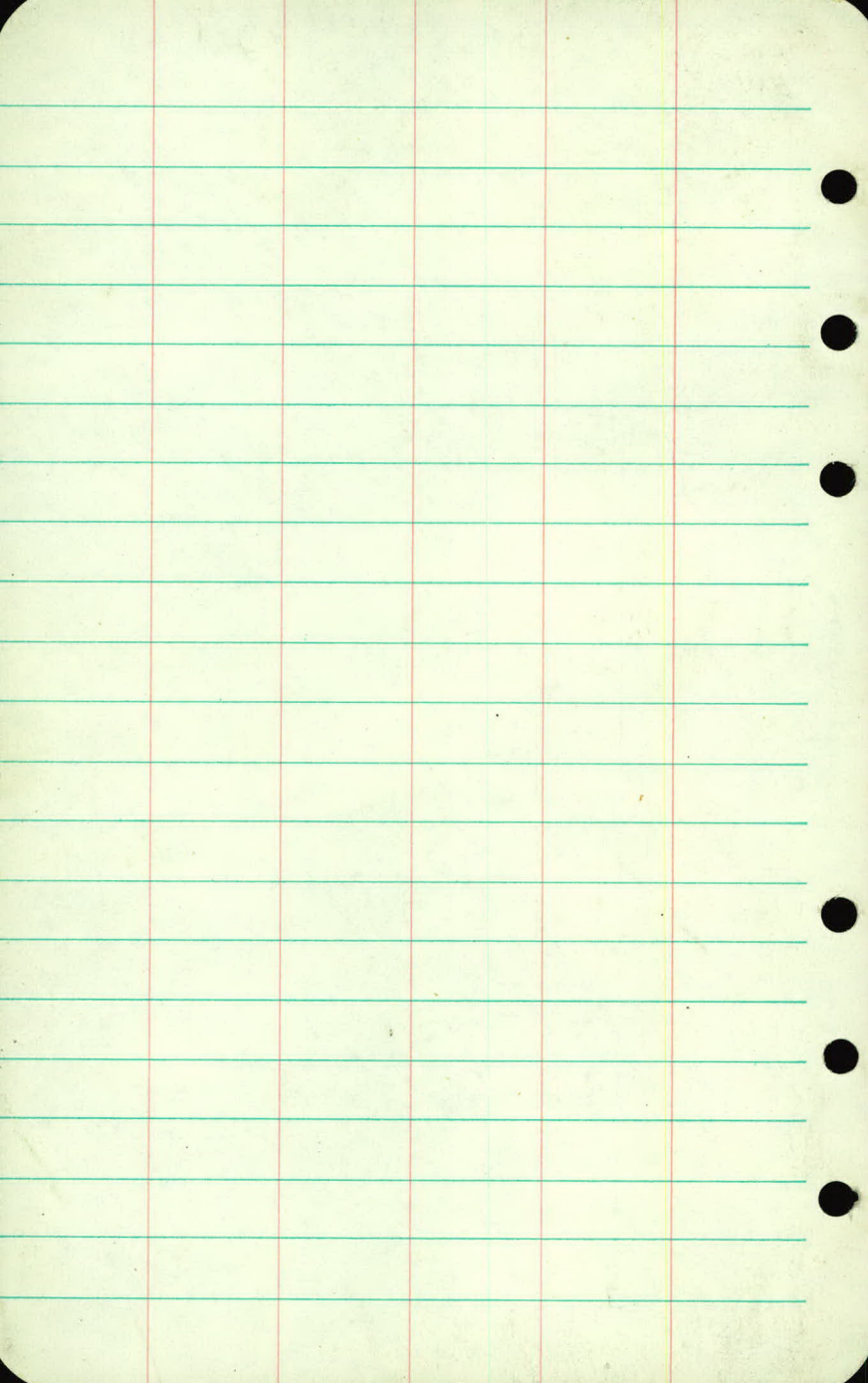


FK
RG
BW

April 6, 1977
Overcast 39°

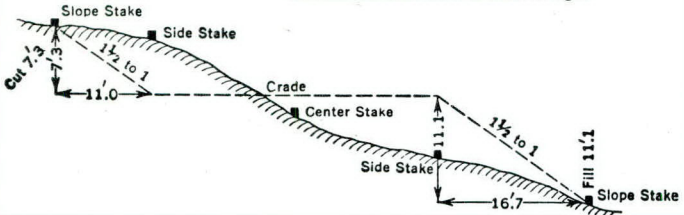
DIETZGEN NO. 384-5





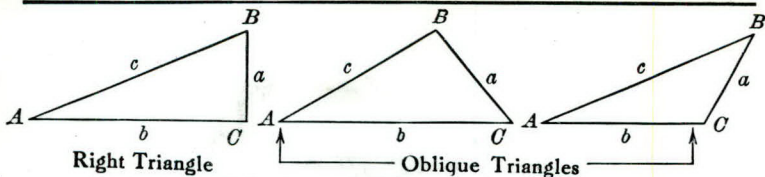
DISTANCES FROM SIDE STAKES FOR CROSS-SECTIONING **Roadway of any Width. Side Slopes 1½ to 1.**

In the figure below: opposite 7 under "Cut or Fill" and under .3 read 11.0, the distance out from the side stake at left. Also, opposite 11 under "Cut or Fill" and under .1 read 16.7, the distance out from the side stake at right.



Cut or Fill	Distance out from Side or Shoulder Stake										Cut or Fill
	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	
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

TRIGONOMETRIC FORMULÆ



Solution of Right Triangles

For Angle A . $\sin = \frac{a}{c}$, $\cos = \frac{b}{c}$, $\tan = \frac{a}{b}$, $\cot = \frac{b}{a}$, $\sec = \frac{c}{b}$, $\operatorname{cosec} = \frac{c}{a}$

Given a, b	Required A, B, c	$\tan A = \frac{a}{b} = \cot B, c = \sqrt{a^2 + b^2} = a \sqrt{1 + \frac{b^2}{a^2}}$
a, c	A, B, b	$\sin A = \frac{a}{c} = \cos B, b = \sqrt{(c+a)(c-a)} = c \sqrt{1 - \frac{a^2}{c^2}}$
A, a	B, b, c	$B = 90^\circ - A, b = a \cot A, c = \frac{a}{\sin A}$
A, b	B, a, c	$B = 90^\circ - A, a = b \tan A, c = \frac{b}{\cos A}$
A, c	B, a, b	$B = 90^\circ - A, a = c \sin A, b = c \cos A$

Solution of Oblique Triangles

Given A, B, a	Required b, c, C	$b = \frac{a \sin B}{\sin A}, C = 180^\circ - (A + B), c = \frac{a \sin C}{\sin A}$
A, a, b	B, c, C	$\sin B = \frac{b \sin A}{a}, C = 180^\circ - (A + B), c = \frac{a \sin C}{\sin A}$
a, b, C	A, B, c	$A + B = 180^\circ - C, \tan \frac{1}{2}(A - B) = \frac{(a - b) \tan \frac{1}{2}(A + B)}{a + b}$ $c = \frac{a \sin C}{\sin A}$
a, b, c	A, B, C	$s = \frac{a + b + c}{2}, \sin \frac{1}{2}A = \sqrt{\frac{(s - b)(s - c)}{bc}}$ $\sin \frac{1}{2}B = \sqrt{\frac{(s - a)(s - c)}{ac}}, C = 180^\circ - (A + B)$
a, b, c	Area	$s = \frac{a + b + c}{2}, \text{area} = \sqrt{s(s - a)(s - b)(s - c)}$
A, b, c	Area	$\text{area} = \frac{bc \sin A}{2}$
A, B, C, a	Area	$\text{area} = \frac{a^2 \sin B \sin C}{2 \sin A}$

REDUCTION TO HORIZONTAL



Horizontal distance = Slope distance multiplied by the cosine of the vertical angle. Thus: slope distance = 319.4 ft. Vert. angle = $5^\circ 10'$. From Table, Page IX. $\cos 5^\circ 10' = .9959$. Horizontal distance = $319.4 \times .9959 = 318.09$ ft. Horizontal distance also = Slope distance minus slope distance times (1 - cosine of vertical angle). With the same figures as in the preceding example, the following result is obtained. $\cos 5^\circ 10' = .9959$. $1 - .9959 = .0041$. $319.4 \times .0041 = 1.31$. $319.4 - 1.31 = 318.09$ ft.

When the rise is known, the horizontal distance is approximately:—the slope distance less the square of the rise divided by twice the slope distance. Thus: rise = 14 ft., slope distance = 302.6 ft. Horizontal distance = $302.6 - \frac{14 \times 14}{2 \times 302.6} = 302.6 - 0.32 = 302.28$ ft.

RG
LPD
DS
JA

Apr. 30, 1976
cldy 55°

T-1

Topography

Old Hwy 8

from

I 694 North to TH 96

LT
So. end, 15" CMP
+45 43

RT

167

166

165

T-2

2

12 nemp
L-1

A
N

8618 C 1/2 E 2

8618 C 1/2 E 2

W. B. L. →

SIDEWALK

Bridge

I 694

← W. B. L.

Lt

R

Rt

170

+23 £ 23' Bit Ent

+14 £ 39' Bit Ent.

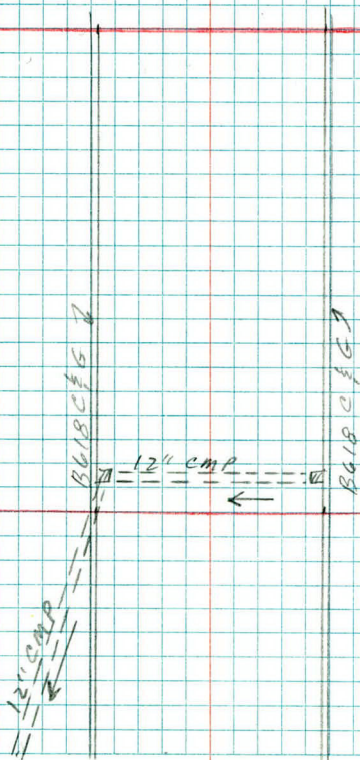
169

+07 $\overline{CB}$
24

+07 $\overline{CB}$
24

168

167+50



Lt

R

RL

+13 £ 25' Bit Ent.

172 +04 £ 43' Bit Ent

+18 £ 48' Gravel Ent.

171

+88 £ 50' Bit Ent

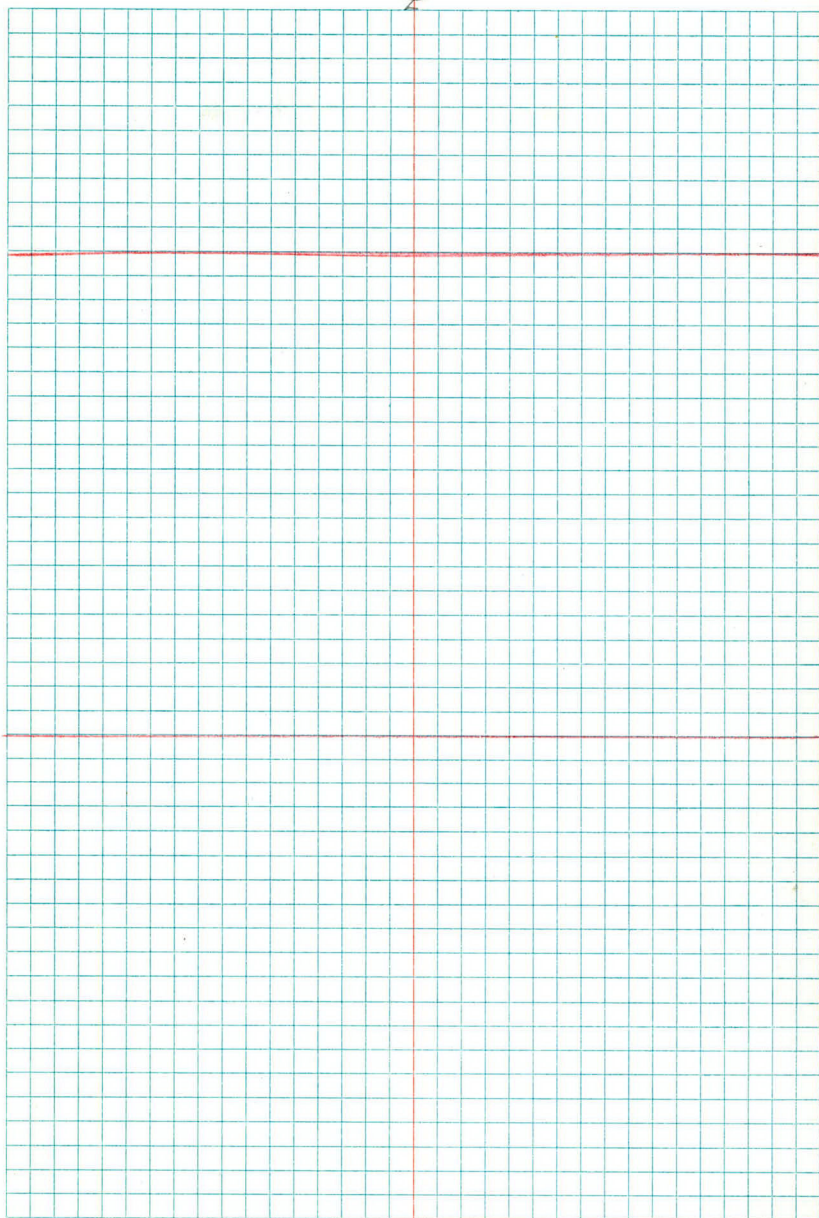
+52 £ 29' Bit Ent

+27 £ 45' Bit Ent

170

T-4

£



LT

E

RT

175

 $+14 \text{ E } 20' \text{ Bit Ent (RT} = +40)$

174

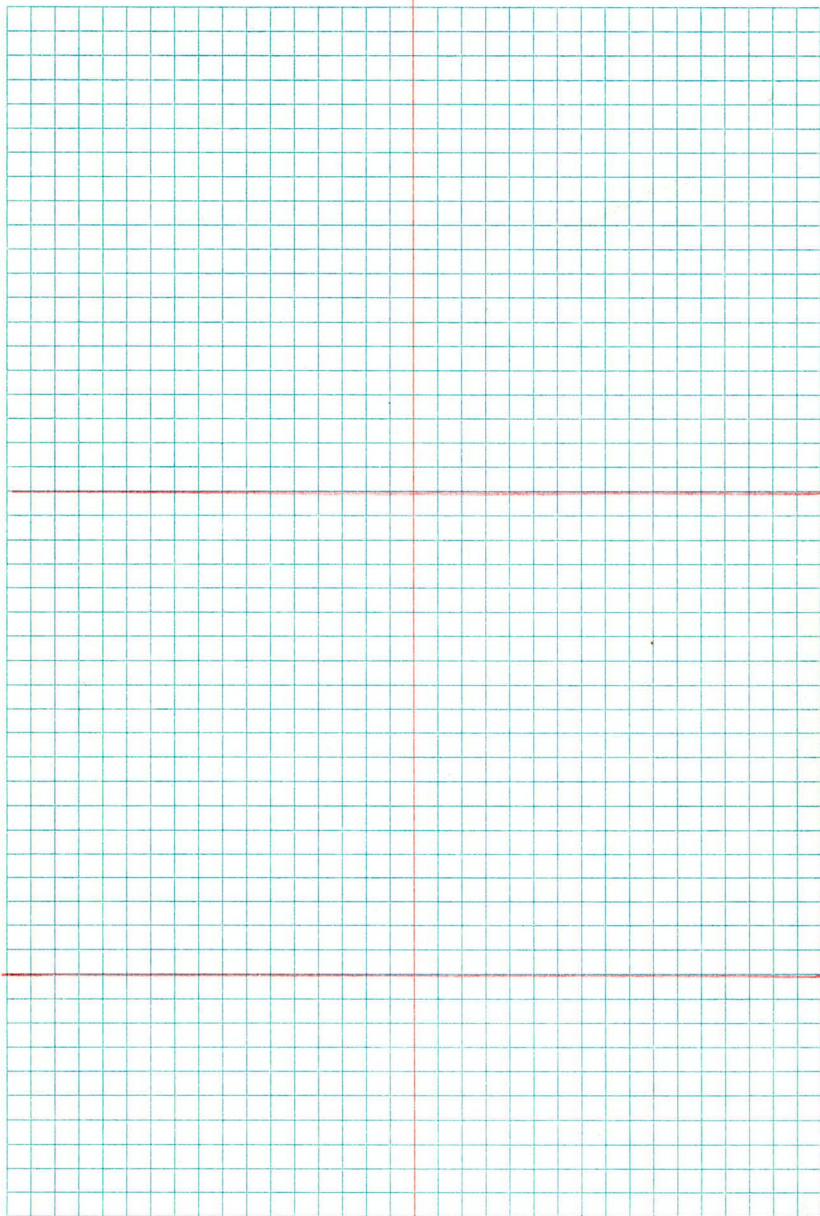
 $+52 \text{ E } 26' \text{ Bit. Ent.}$

173

172+50

T-5

2



Lt

E

Rt

177

100 E 24' Bit. Ent.

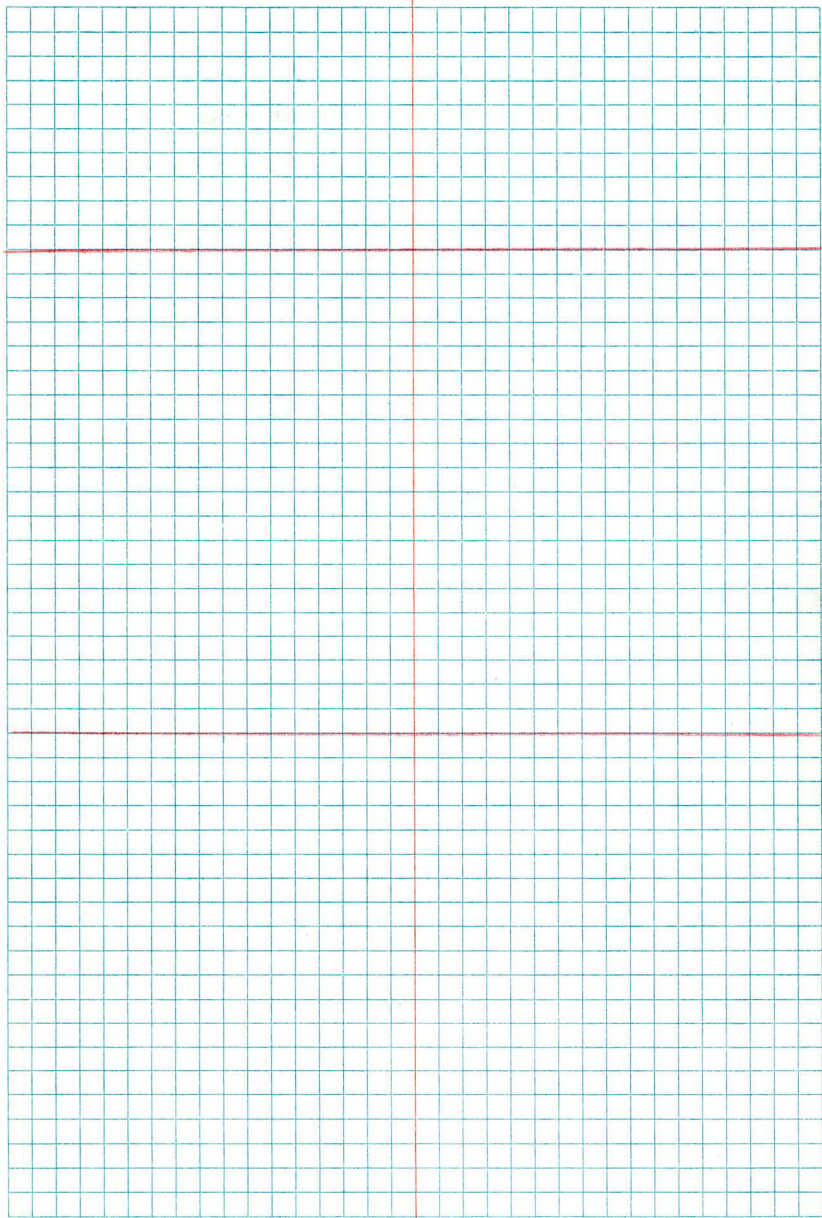
141 E 24' Bit. Ent.

176

175

£

T-6



LT

£

Rt

180

R Tie
+67 E.S. Bldg

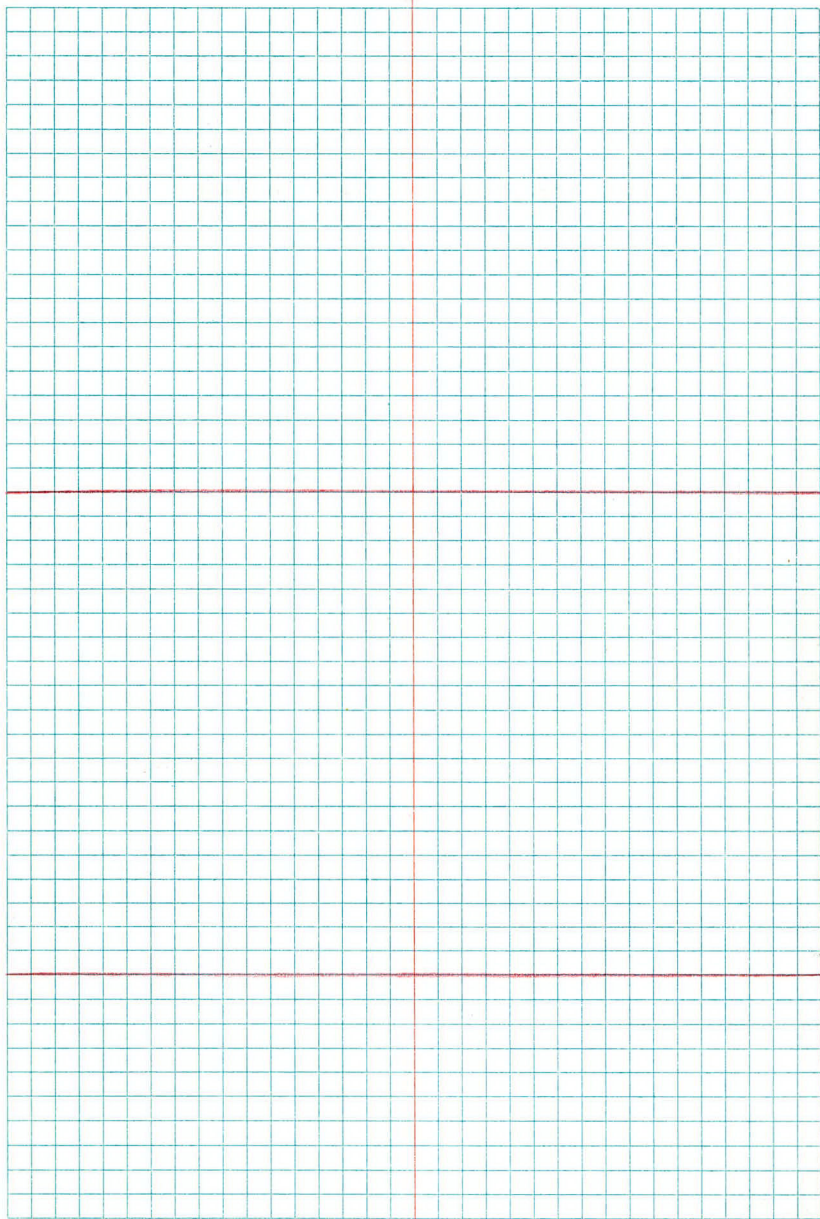
179

178

177+50

£

T-7



+50

Lt

R

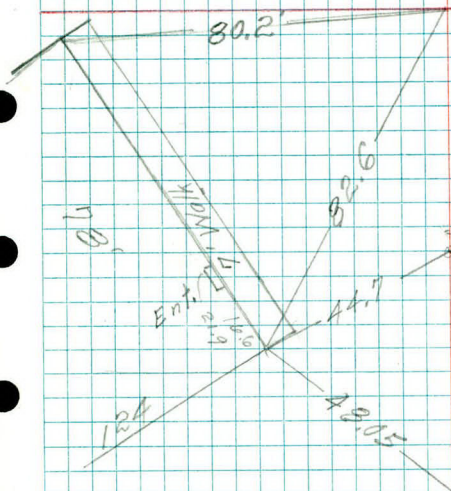
Rt

182

181

R. Tie
+54 s. side Bldg

180



Lt

R

Rt

185

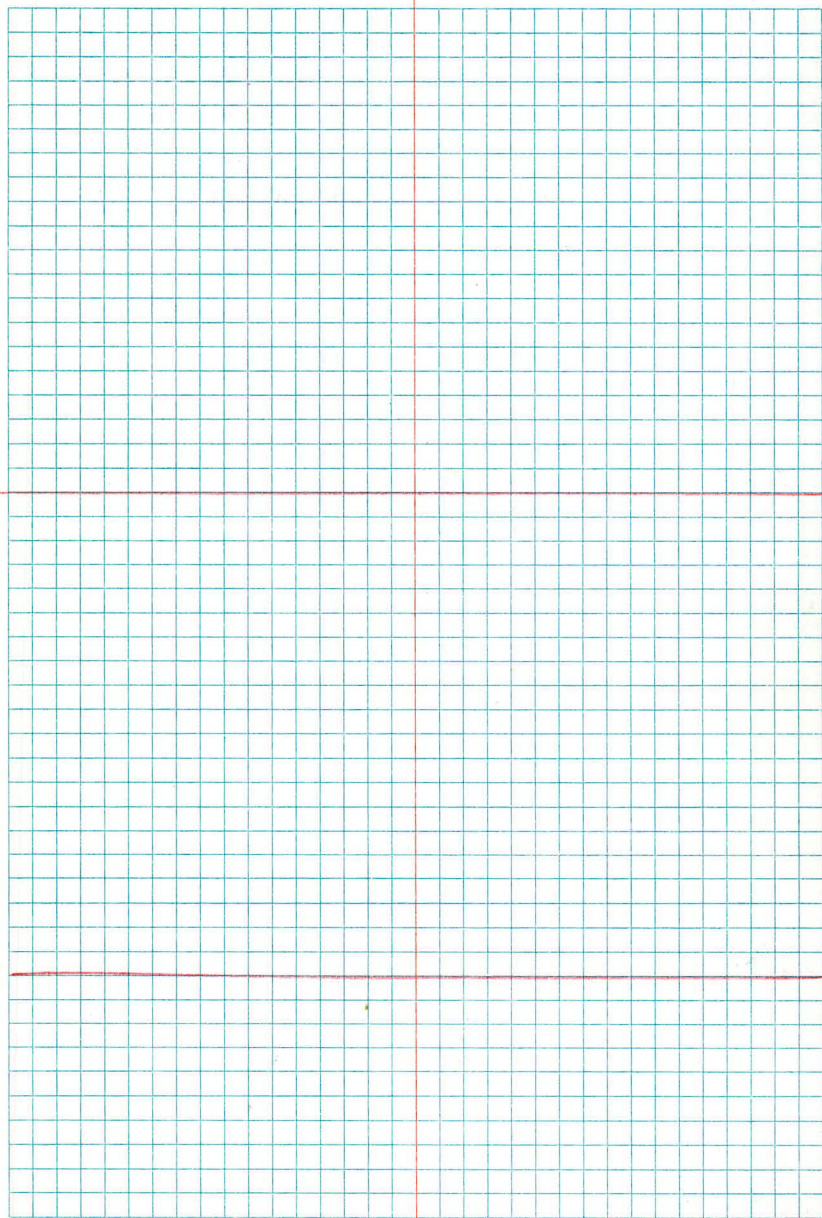
184

183

182+50

2

T-9



+50

Lt

E

Rt

187

25

186

+52 GATE Post
43

+52 Bit Ent
62

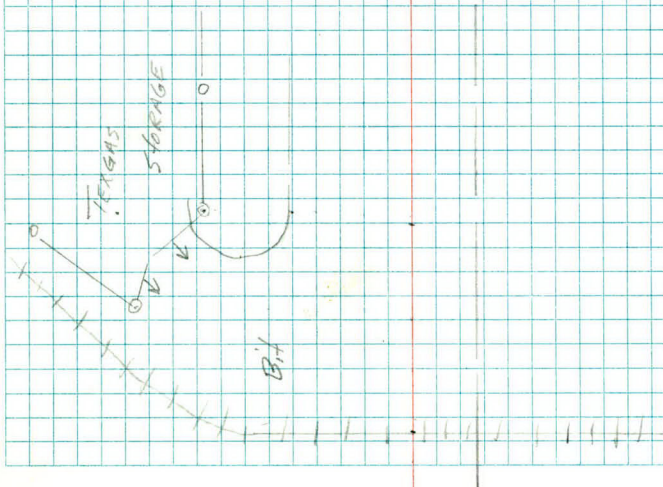
+32 GATE Post
57

+52 Road
25

+07 E RR TRACKS

185

L

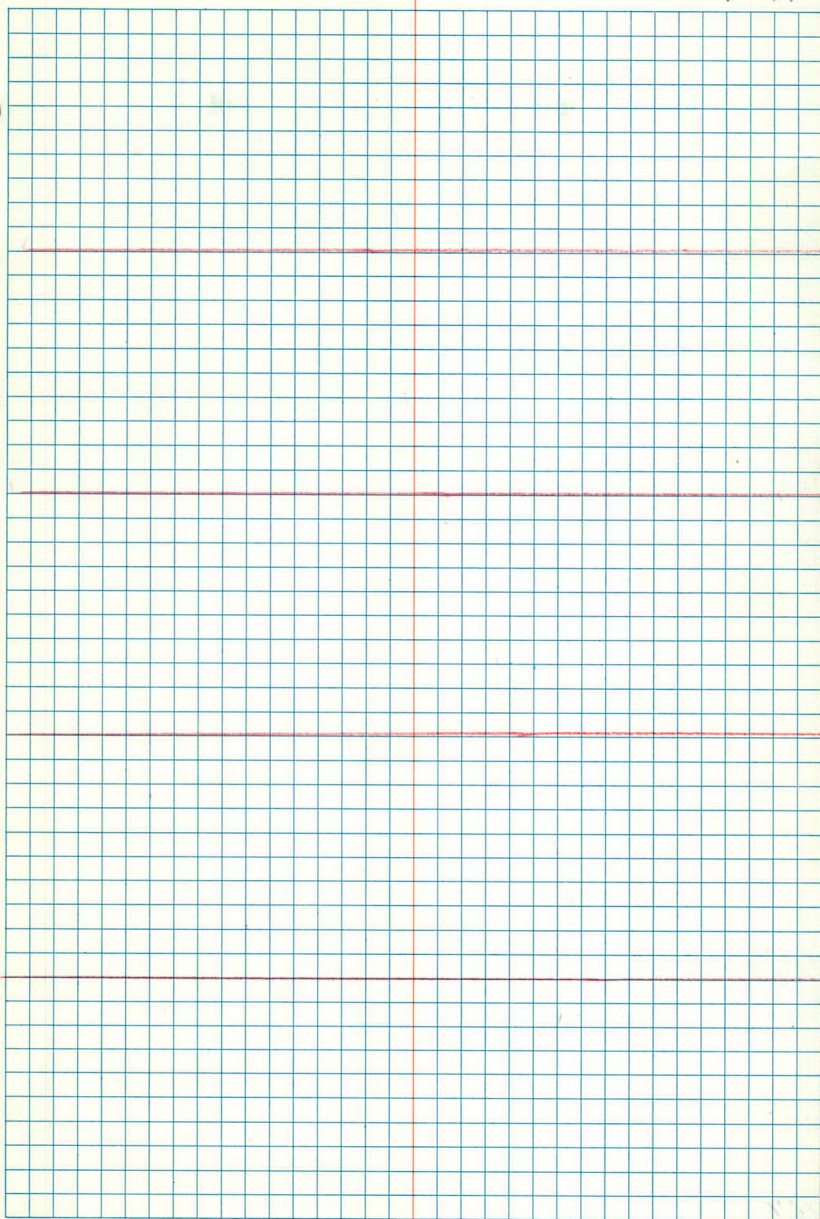


190

189

188

187+50

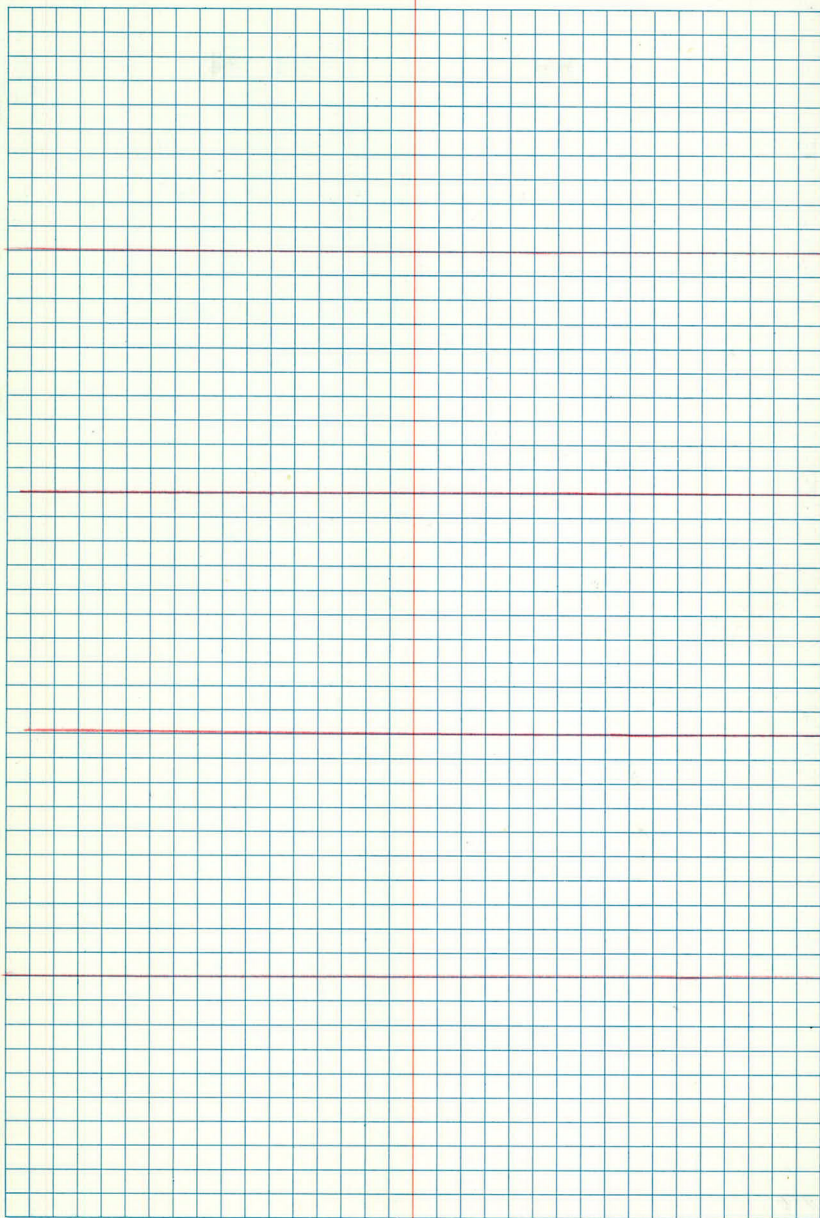


192

191

190

T-12



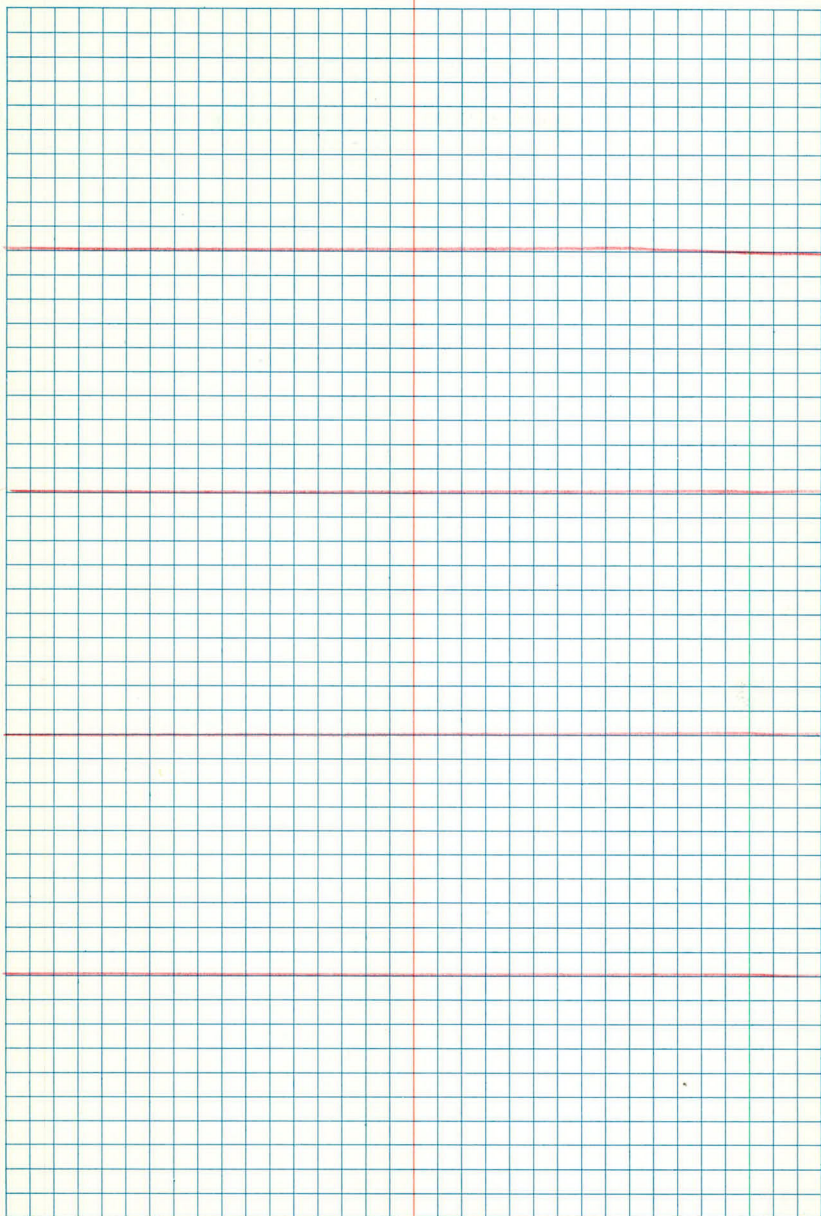
195

194

193

192+50

T-13

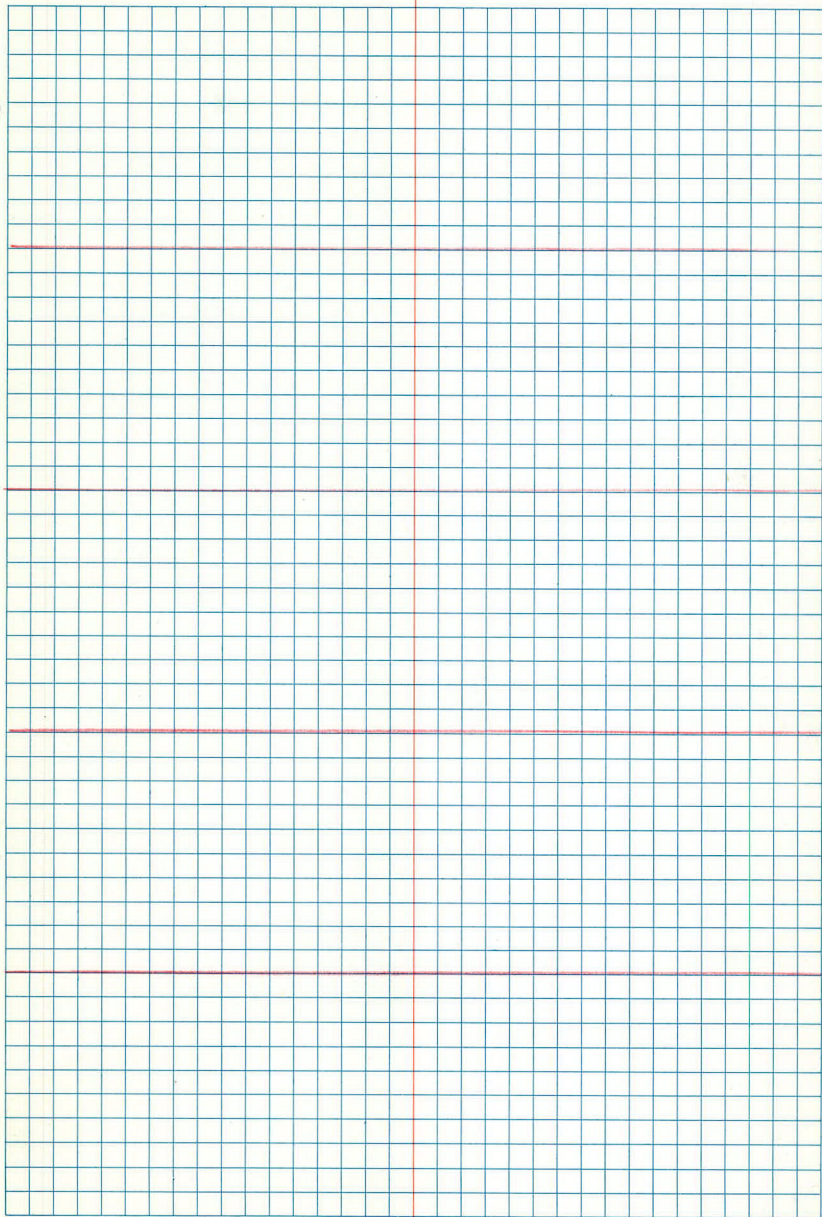


197

196

195

T-14



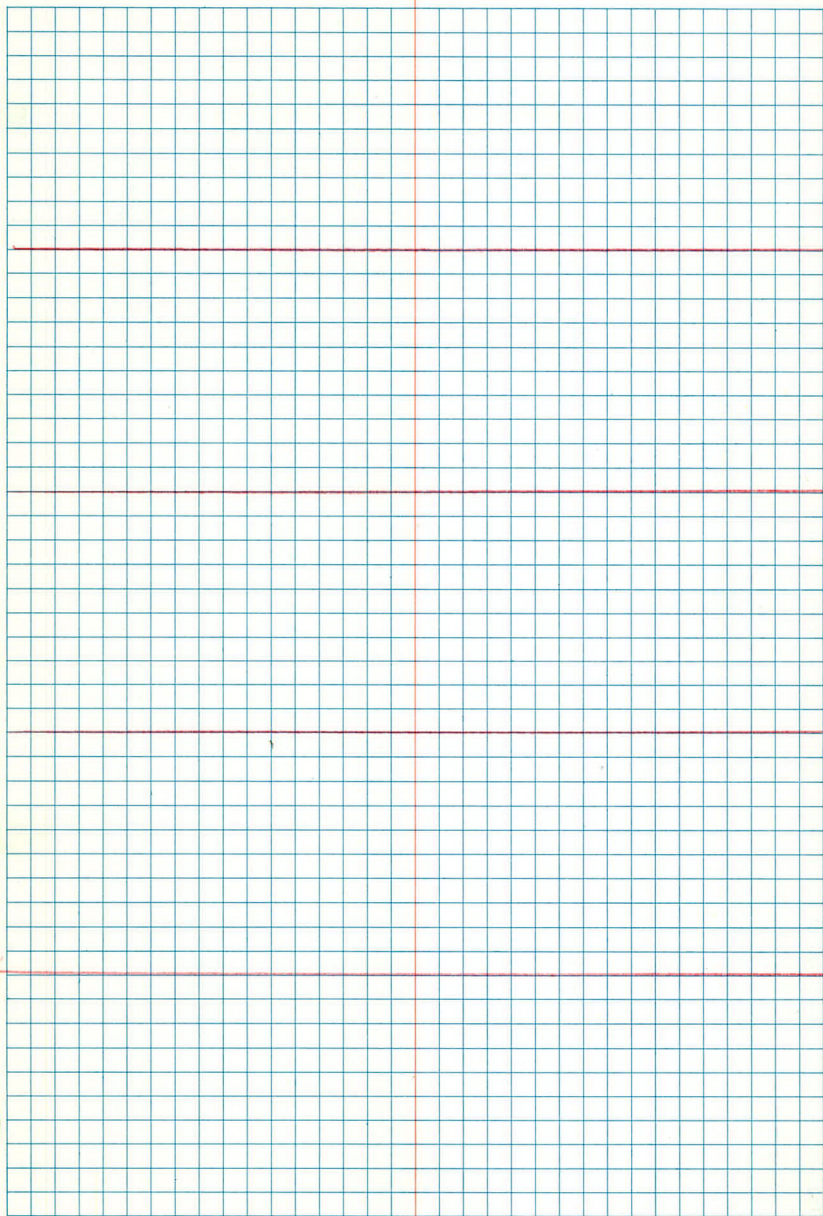
200

199

198

197+50

T-15



202

201

+77 $\frac{8' \times 30" \text{ Vit.}}{70}$

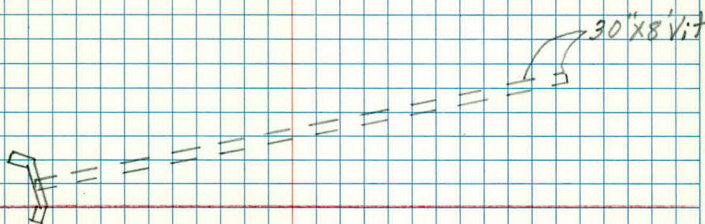
+55 $\frac{\text{WE 21' SCP}}{53 \text{ W-Headwall}}$

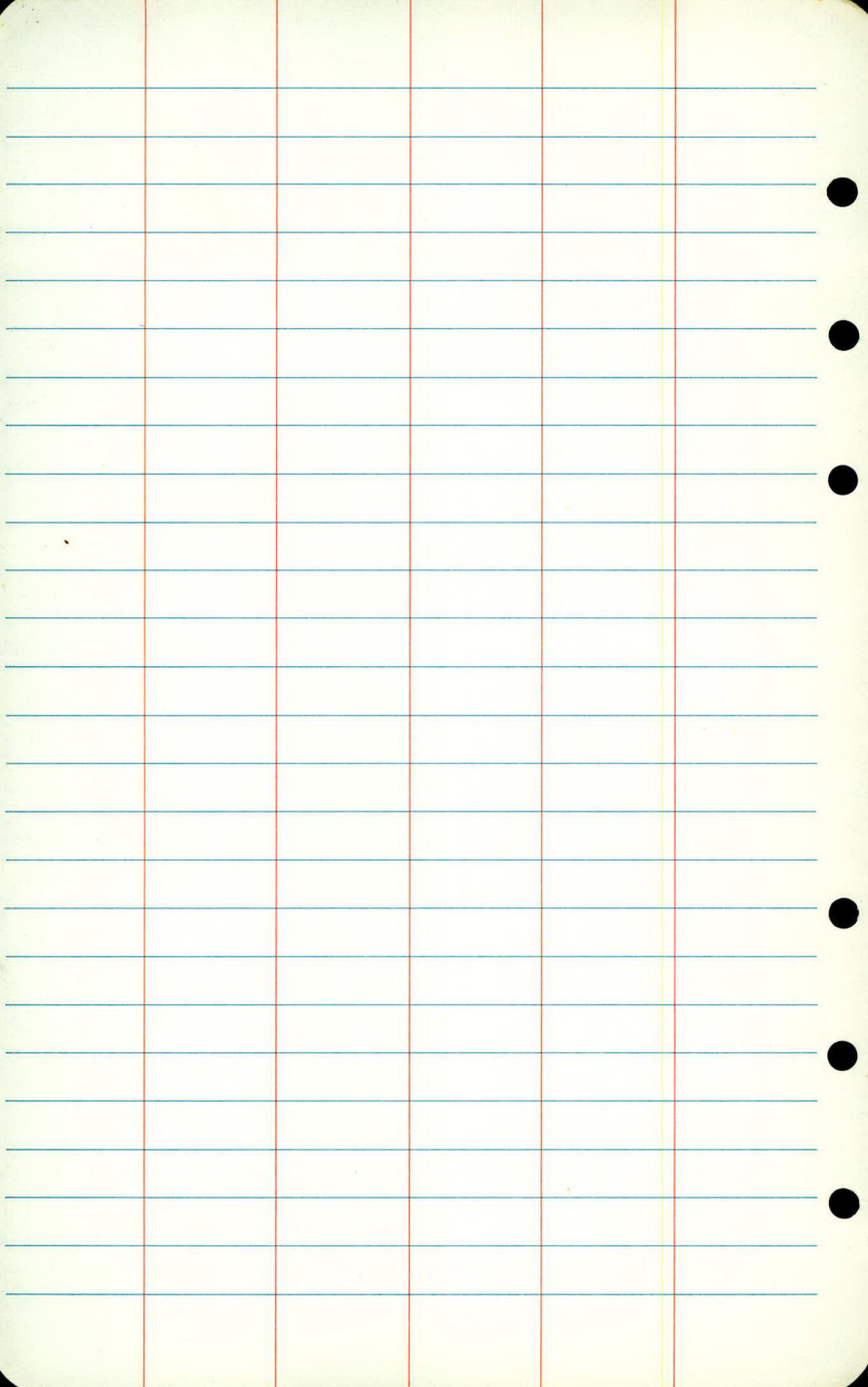
200

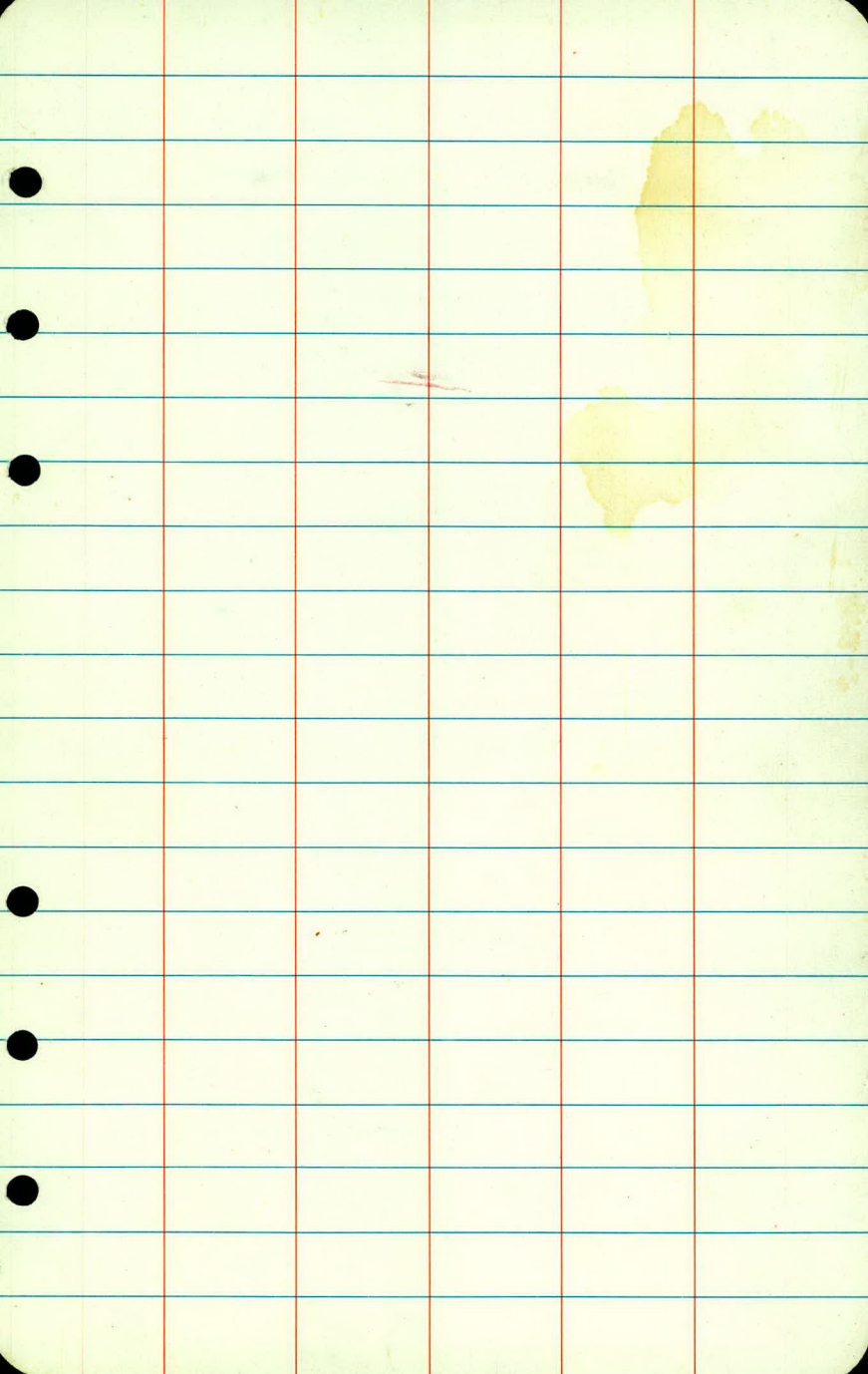
FK
LPD
DS

June 3, 1977

T-16







RG
LPD
DS
JA

Apr. 30, 1976
P.C. 55°

Top Hyd Lt 168+05

Inv. CB Rt 168+07

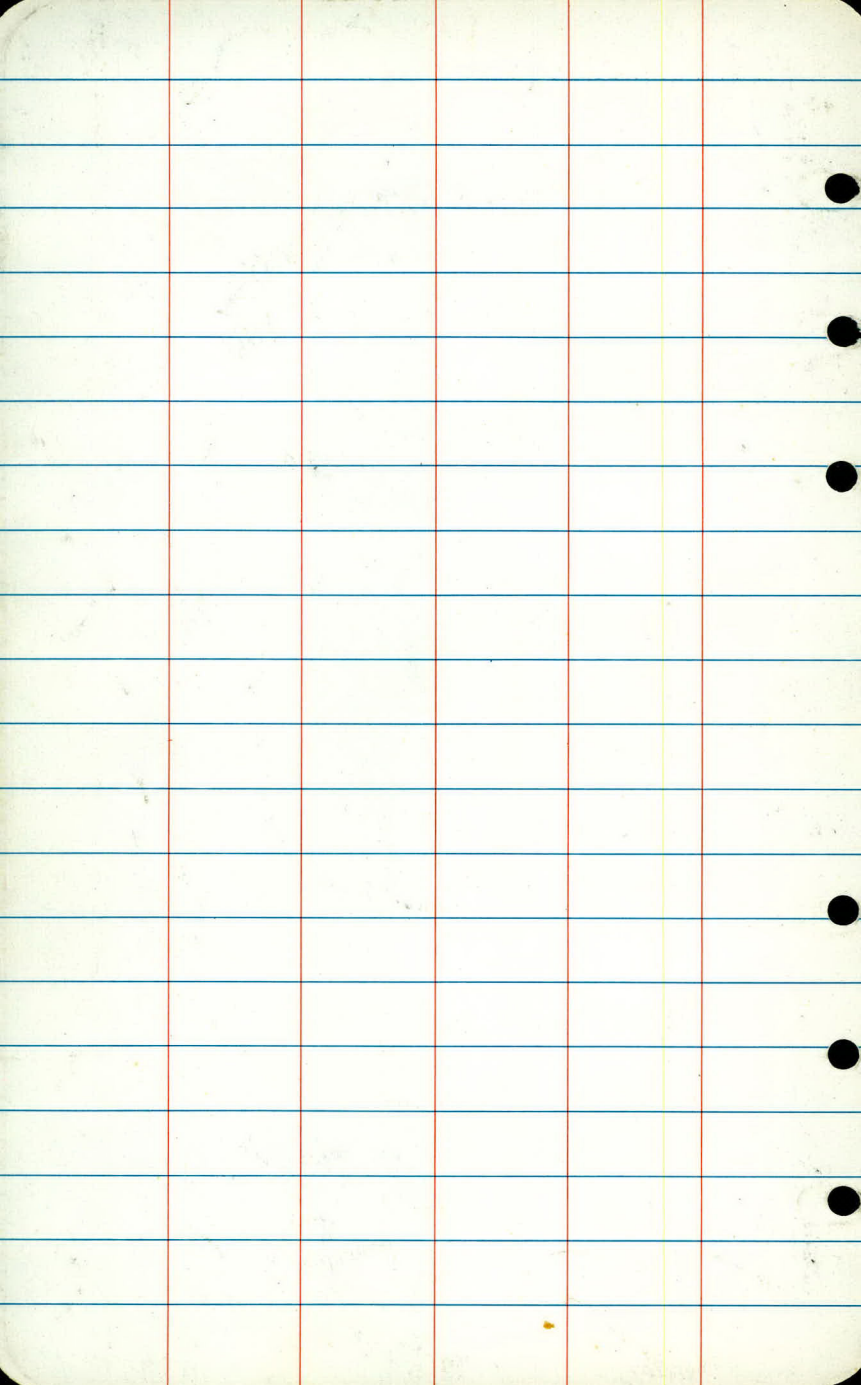
Inv CB Lt 168+07

Inv 12" CMP 43' Lt 167+45

E 168

JK

May 9, 1977
O.K. 70°



RG
LPD
DS
JA

May 3, 1976
PC 45°

14th St. N.W.

Plan Survey
for
Proposed Storm Sewer

Alinement

Sta	Point	ALT	ABT	Defl
-----	-------	-----	-----	------

4+00.00	P.O.T.			
---------	--------	--	--	--

2+36.30	P.I.		73°52'20"	
---------	------	--	-----------	--

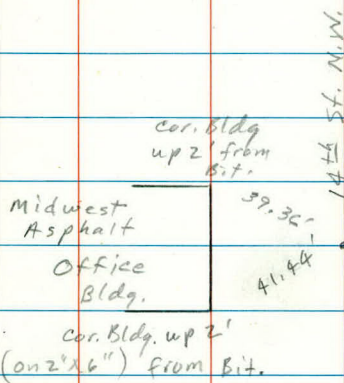
0+00	P.I.	72°52'35"		
------	------	-----------	--	--

May 3, 1976

£

2

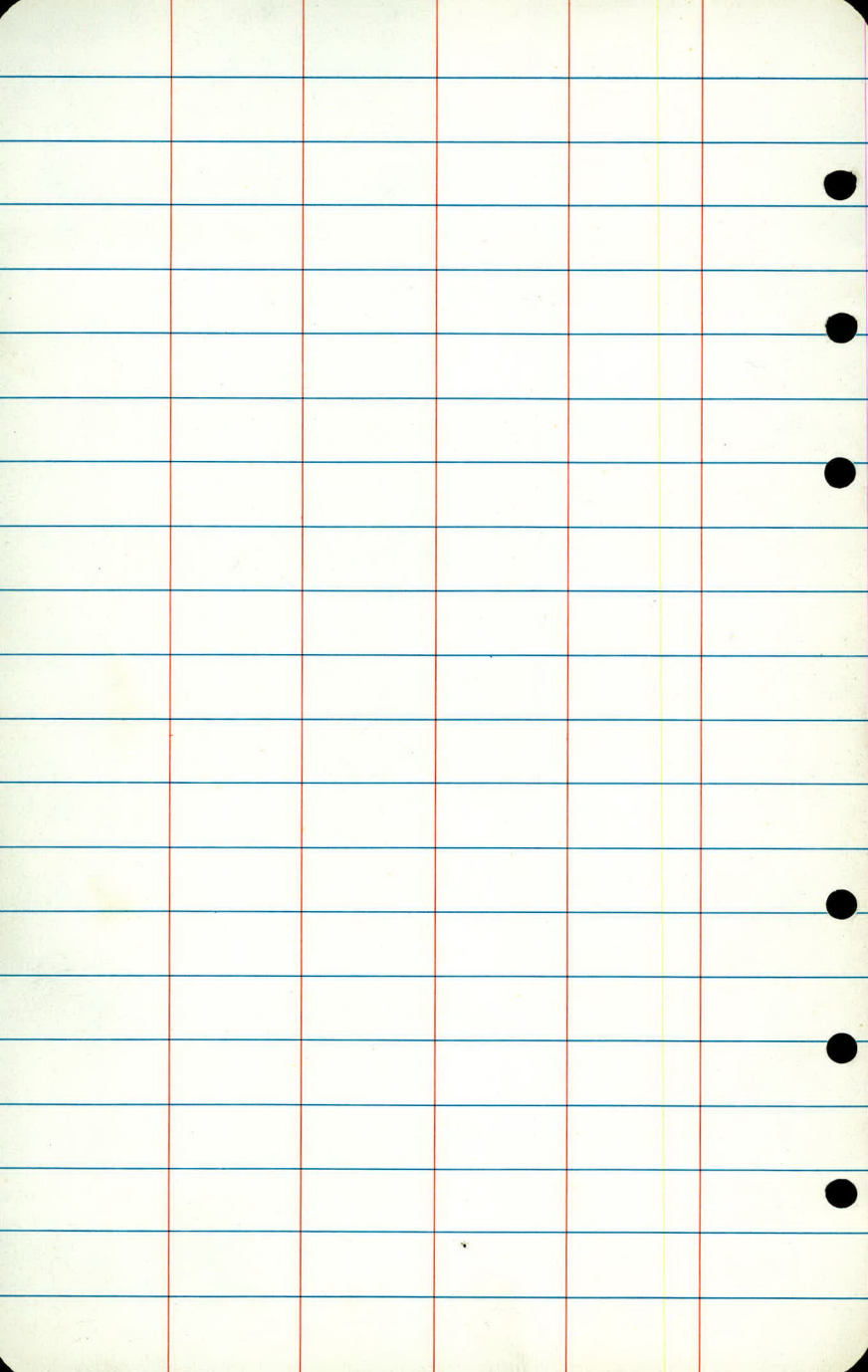
spike



PK nail

PK nail

Sta. 183 + 75.01
old Hwy 8



RG
LPD
DS
JA

May 3, 1976
PC 45°

3

Topography
for
Storm Sewer

14th St. N.W.

Ext +62 $\frac{AP}{14}$

+50

LT

R

RT

+33 $\frac{Cor Scale}{33}$

+31 $\frac{Bay Bitank}{16}$

+36 $\frac{Bit}{14}$

+26 $\frac{Bldg}{42}$ Rt = +22 +36 $\frac{Cor Scale}{23}$

+36 $\frac{curb}{14}$ +25 $\frac{Pol}{17}$ +25 $\frac{drive}{17-36}$

+21 $\frac{MH}{10.5}$

+44 $\frac{MH}{17}$

2+00 tow $\frac{drive}{12-26}$ Bit. 12 20

Bay trees

+94 $\frac{(15" cotts)}{34}$

+55 $\frac{Rd}{14}$

Edge

+76 $\frac{Ent}{41}$

End

+80 $\frac{Ent + cone black wall}{54}$

Bit

+50 $\frac{19}{19}$

Edge

+42 $\frac{Ent}{20}$

Edge

+63 $\frac{Ent}{24}$

Bldg

+43 $\frac{34}{34}$

Bldg Cor

+56 $\frac{31}{31}$

End Fe

+17 $\frac{27}{27}$

PP

+18 $\frac{16}{16}$

Bldg

+34 $\frac{37}{37}$

PP

+37 $\frac{29}{29}$

1+00

Fe 100 $\frac{23}{23}$

Bit. 10 22

SE Cor

+86 $\frac{Bldg}{45}$ Rt = +73

ER

+76 $\frac{25}{25}$

BR

+54 $\frac{44}{44}$

POR

+66 $\frac{32}{32}$

+37 $\frac{10}{10}$

Edge Old 8

+25 $\frac{46}{46}$

+54 $\frac{MH}{18}$

PP

+31 $\frac{16}{16}$

+16 $\frac{Bldg}{24}$

+22 $\frac{MH (TCA)}{8}$

Bay Fe

+57 $\frac{22}{22}$

ER

+45 $\frac{5}{5}$

+25

+25

+25

Rd

+50 $\frac{5}{5}$

Vent Pipe

+47 $\frac{18}{18}$

Vent Pipe

+20

POR $\frac{9}{9}$

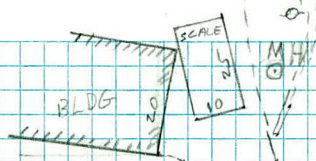
edge Old 8

+14 $\frac{6}{6}$

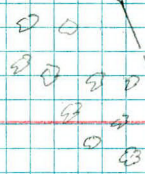
0+00

May 3, 1976

LOAMH



+ 436 = Angle Pt.



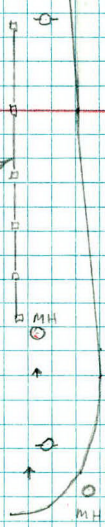
conc. block retaining wall (1' 2")

ENT

1-5-Block

wooden guard rail posts & one 1" pipe rail.

wood posts 1" pipe



MH

MH



2+

2

 R_+

450 $\frac{80}{14}$ 2 fuel pipes $\frac{13}{13}$

4+00

18" Caff

Fuel loading + 86 23

+69 $\frac{20}{20}$ platform (x5) +74 $\frac{53}{53}$ 12" pipe
 cor conc cor conc +65 $\frac{52}{52}$ 2 tracks
 35 $\frac{21}{21}$ slab +33 $\frac{6}{6}$ slab +55 $\frac{2}{2}$ 2 tracks
 End conc slab End +47 $\frac{52}{52}$ 2 tracks
 Beg conc wall +33 $\frac{50}{50}$ +38 $\frac{2}{2}$ 2 RR tracks
 +29 $\frac{39}{39}$ 12" pipe +24 $\frac{24}{24}$ cor conc slab
 29 $\frac{58}{58}$ Tw 10" corr +21 $\frac{35}{35}$ cor conc slab
 +21 $\frac{35}{35}$ +22 $\frac{8}{8}$

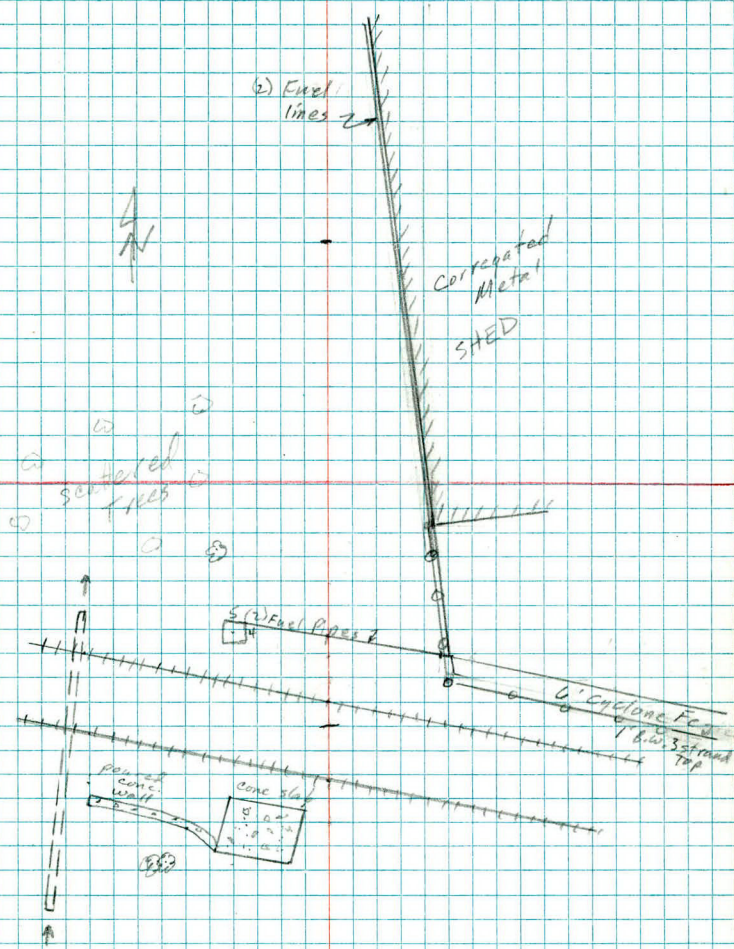
3400

 $2+50$
$$\begin{array}{r} 17 \\ + 56 \\ \hline 73 \end{array}$$

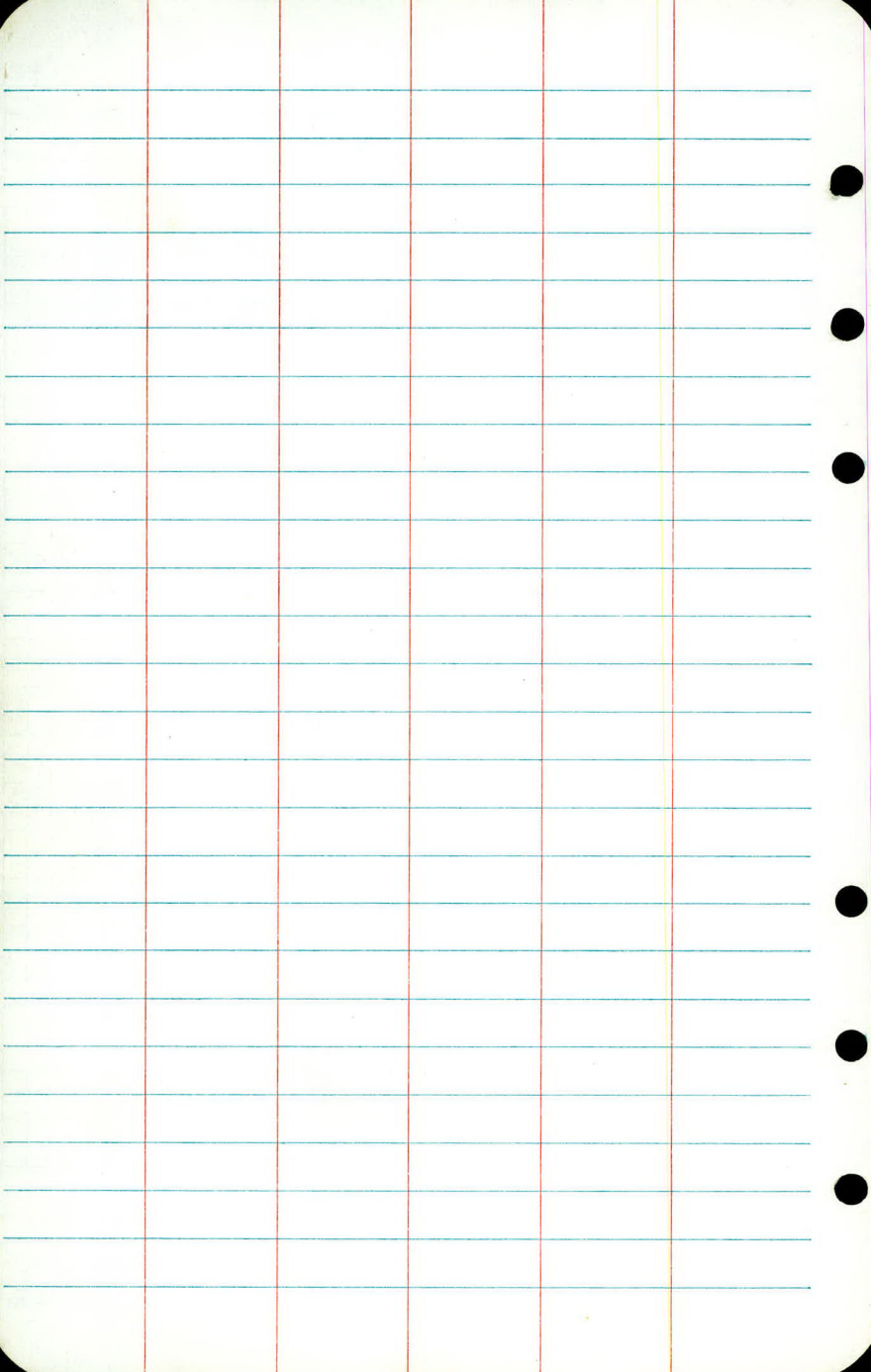
May 3, 1976

L

5



Edge Bit J



RG
LPD
DS
JA

May 3, 1976
Clear, 50°

6

Storm Sewer Survey
14th St. N.W.
½ Old Hwy 8

X-Sections

Sta	+	Δ	-	Elev.	
BM	0.68	889.54		888.86	
0+00					E Hwy 8
0+22			3.63	885.91	
0+38			4.10	885.44	
0+50					
1+00					
+50					
2+00					

May 3, 1976

Lt

L

Rt

7

Top Hyd. East Co Rd 77 @ CO-OP Ser. Sta.

6.7	6.2	5.9	5.6	5.2	5.0	4.8	4.7	3.2	5.1
2.8	3.3	3.6	3.9	4.3	4.5	4.7	4.8	Ditch	6.3
100	50	25		24	50	75	81	86	95

5.1
4.4
100

MH Rt

MH Lt

5.3	5.4	4.75	5.3	5.2	5.1	4.9
		MH				
4.2	4.1	4.79	4.2	4.3	4.4	4.6
50	23	17	9		25	50

3.4	3.5	3.2	3.5	3.2	4.1	4.6
6.1	6.0	6.3	6.0	6.3	5.4	5.0
35	16	11		22	26	42
		Bit		Bit		Bldg

88.9	2.2	2.4	2.3	2.8	4.1	4.6
7.6	7.3	7.1	7.2	6.7	5.4	4.9
50	14		21	21	27	32
Ent	Bit		Bit	top		Bldg
			Well			

1.6	2.0	2.1	2.2	1.9	1.9	1.5	1.4
2.9	7.5	7.4	7.3	7.6	7.6	8.0	8.1
50	32	27	13	11		19	24
		Ent	Ent	Bit		Bit	Ent

Sta	+	π	-	Elev.
-----	---	-------	---	-------

		889.54		
--	--	--------	--	--

TP	3.92	885.83	7.63	881.91
----	------	--------	------	--------

2+36				
------	--	--	--	--

				L Point
--	--	--	--	---------

+56				
-----	--	--	--	--

				Edge Bit
--	--	--	--	----------

3+00				
------	--	--	--	--

+22				
-----	--	--	--	--

✓				
---	--	--	--	--

May 3, 1976

Lt

F

RT

8

F Sta 2+00

2.7	2.8	2.3	2.1	1.5	1.4	1.3	1.2	1.4
3.1	3.0	3.5	3.7	4.3	4.4	4.5	4.6	4.4
39	19	18	14	14		18	39	50
Bldg	Ent to scale		T.C.B.C.			Bit.		

81.0	81.0	81.0	81.1	81.4	81.6
4.8	4.8	4.8	4.7	4.4	4.2
190	50	24		27	50
Bit.	Bit	Bit		Bit	Bit

X-section Lt+Rt
Not at Rt. L⁵
but along edge
of Bit.

81.0	80.7	80.7	80.9	81.6	82.4	82.8
4.8	5.1	5.1	4.9	4.2	3.4	3.0
100	50	19		21	38	50

80.5	81.0	82.64	82.63	83.0	83.7	84.1
5.3	4.8	3.19	3.20	2.8	2.1	1.7
50	26	25	8		31	50
		Cone.	Cone			

80.03	81.1
5.80	4.7
58	100
F.L.	

Sta	+	π	-	Elev.	
		885.83			
3 +35			2.27	83.56	
+40			2.30	83.53	
+53			2.02	83.81	
+57			2.15	83.68	
+44					
TP	3.60	887.33	2.10	883.73	
+70					Top Bank
+83					Bot, bank
✓					

May 3, 1976

Lt

E

Rt

9

So. rail

No rail

So. rail

No rail

82.23

83.11

83.0

83.0

83.1

83.5

83.6

3.6

2.72

2.8

2.8

2.7

2.3

2.2

100

75

50

37

29

50

TOP
N. raillet
So. tracks

SE cor pile of loading Platform Lt 3+65

81.4

81.5

81.9

82.7

82.2

85.7

82.0

82.7

5.9

5.8

5.4

4.6

5.1

1.6

5.3

4.6

100

79

50

24

E

13

24

TOP
pipes

FC
cor

819.01

75.0

76.3

76.8

78.8

80.5

81.3

82.0

8.32

12.3

11.0

10.5

8.5

6.8

6.0

5.3

50
FL
12"

50

31

8

11

14

21
Fe

72.4

73.8

14.9

13.5

79

100

Sta

+

π

-

Elev

887.33

4+00

✓

TP

4.63

889.29

2.17

885.16

BM

0.91

888.88

888.86

May 3, 1976

Lt

E

Rt

10

73.0

74.7

74.7

76.2

78.2

79.4

82.0

82.9

14.3

12.6

12.6

11.1

9.1

7.9

5.3

4.4

78

50

39

15

5

10

19

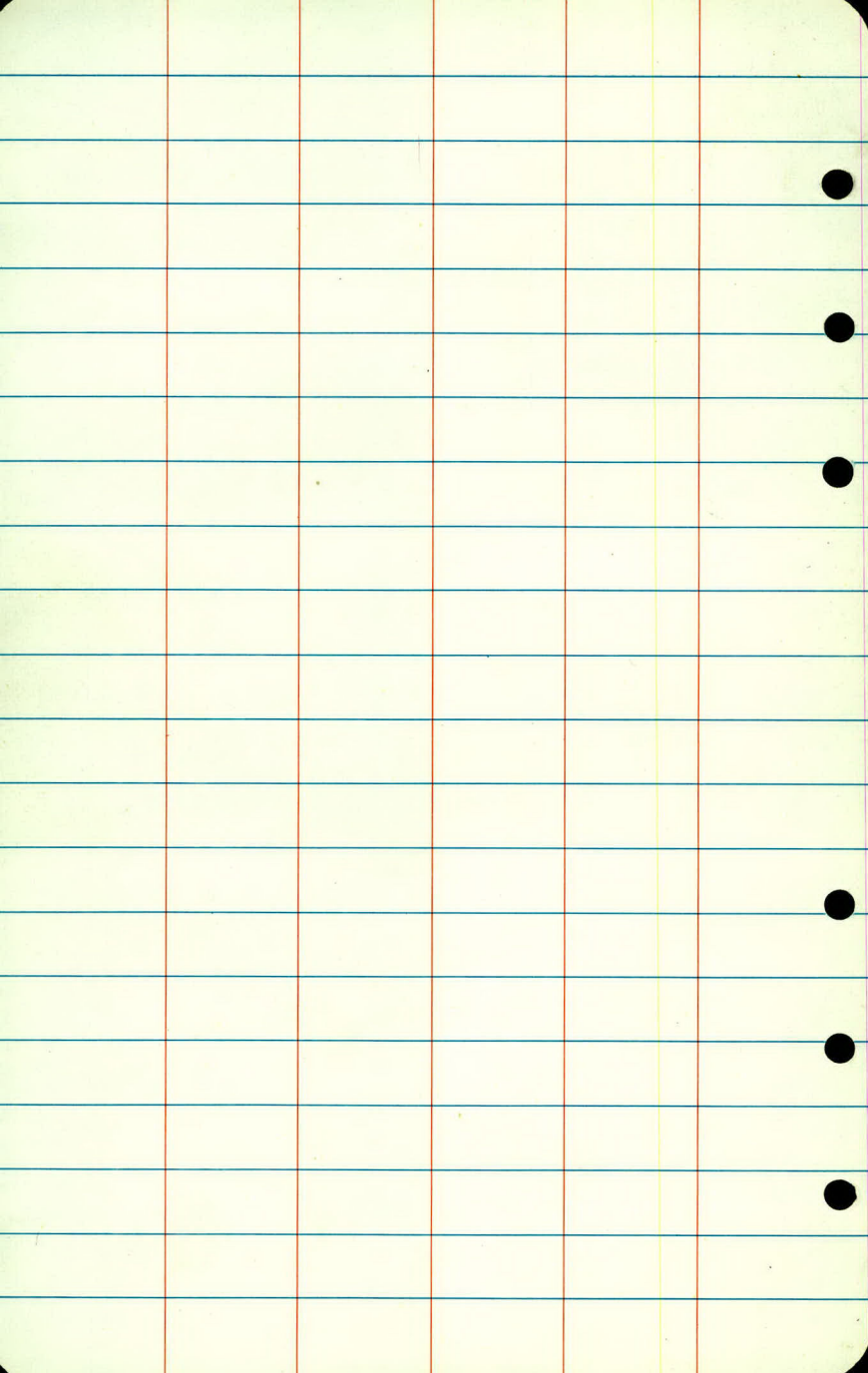
Bldg

72.7

14.6

100

Top Hyd. @ Co-op Sta.



RG
LPD
GA
15

May 11, 1976
clear 70°

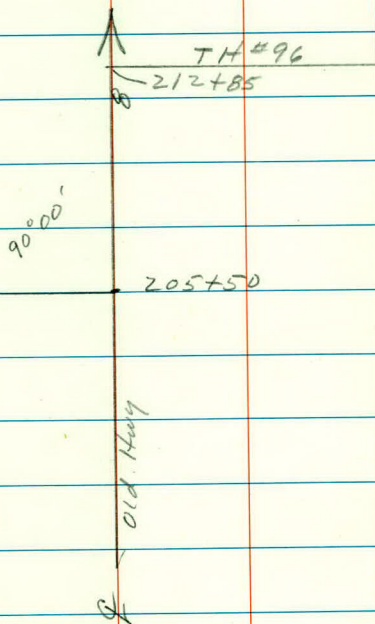
11

Old Hwy 8

Storm Sewer Survey

Alinement

RUSH LAKE



Sta	Point	ΔL_t	ΔR_t
-----	-------	--------------	--------------

1+73	End
------	-----

1464.45 POT

0455	POT
------	-----

$$0 + 00$$

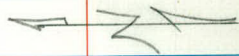
May 11, 1976

12

RUSH LAKE



spike



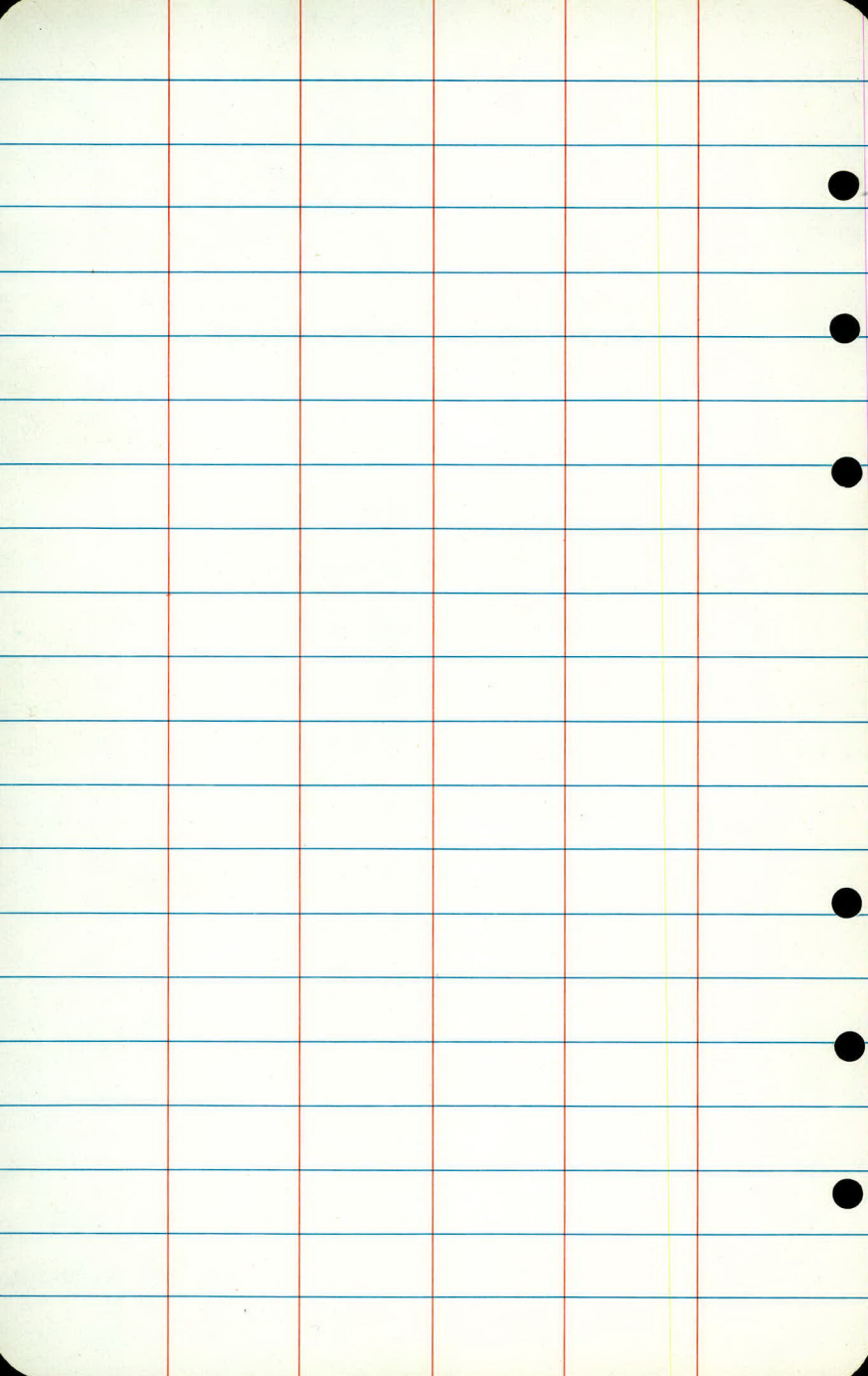
up 1'
1.4'

24" oak

spike

Z

Sta 205+50
Old Hwy 8



RG
LPD
DS
GA

May 11, 1976
clear 70°

13

Topography

LT

E

RT

2+00

+73 Lake
E

+65 14" oak
41
+59 tw. 8" oak
21

+55 Twin Oak
(1) 4" + (1) 12" oak
24" oak 10
+56 40
+59 (3) 4" oak
11

+50 6" oak
21
+47 22" oak
12
+51 10" oak
42 tw.
+48 20" oak
14

+08 22" oak
26
+13 (3) 3" oaks
+ (5) 1" oaks
35
+14 12" oak
44

1+00

+96 (4) 5" oak
41
+80 M.H. (San)
85

+55 18" oak
62

+55 24" oak
2
+50 5" oak
22

+46 tw. 6"
18" oak
69
+46 16" oak
74

+34 PP
41

+34 sewer
clean
out
87

+17 CB
20

0+00

+13 E
PP
(conc.)

May 11, 1976

Lt

L

Rt

14

RUSH LAKE



From Notes
From ETOS



9" cast. Inv.
No rings 9.0

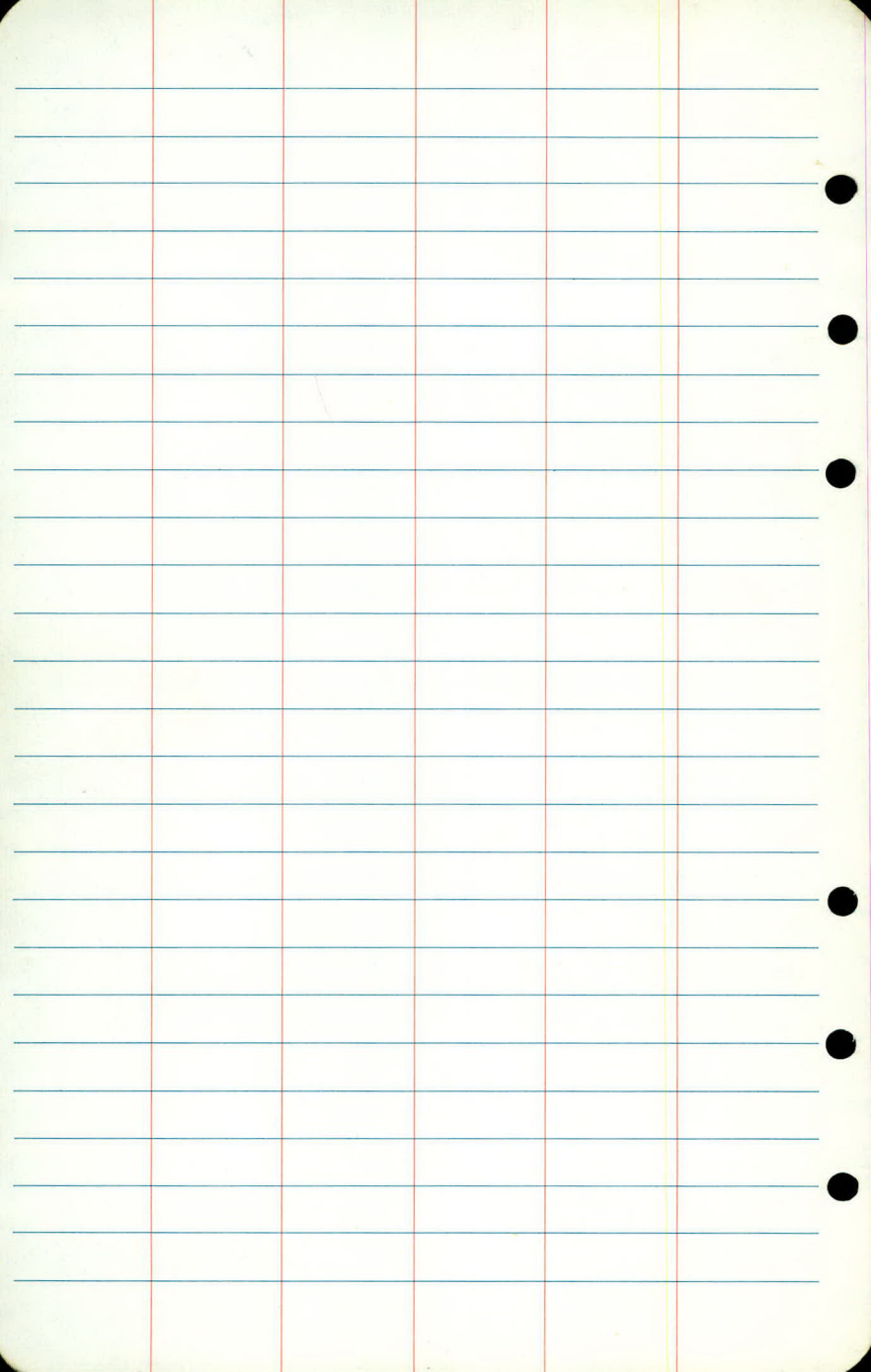


12" pipe 7.8
Inv. 4.1



OLD HWY 8

From Road &
Machinery
Supplies Co.



RG
LPD
DS

May 11, 1976
Clear 75° 15

X-Sections

Sta	+	π	-	Elv
BM	10.60	907.42		896.82
TP	5.14	909.89	2.67	904.75

0+00 $\neq$ OLD T.H.

+13

+17

5.16 904.73

+25

+44

TP 0.82 897.53 13.18 896.71

GA
LPO
DS
RT

May 12, 1976
cloudy 55°
16

LT

R

RT

Top Hyd Lt Old Hwy 8 Sta 204+

SPIKE IN PP STA 205+09 LT

3.9	4.3	4.8	5.2	5.6	6.0	6.4	6.8	7.2
6.0	5.6	5.1	4.7	4.3	3.9	3.5	3.1	2.7
100	75	50	25		25	50	75	100

5.1	4.2	4.6	5.1	5.5	5.9	6.3	6.7	7.0
6.2	5.7	5.3	4.8	4.4	4.0	3.6	3.2	2.9
100	75	50	25		25	50	75	100

TOP CB FL LT 20'

5.2	5.5	4.1	5.0	5.1	6.0	6.3	6.5	6.8
6.7	6.4	5.8	4.9	4.2	3.9	3.6	3.4	3.1
100	76	49	30		32	61	79	100

897.5	7.5	8.5	6.6	8.9	9.6	9.6	9.6	901.6	900.7
12.4	12.4	11.4	13.3	11.0	10.3	10.3	10.3	8.3	9.2
100	64	36	32	24		20	52	78	100

TOP POINTED ROCK 0+59 RT 10'

STA

+

π

—

ELEV

897.53

0+68

0+80

7.64

889.89

0+90

TP

0.59

884.76

13.36

884.17

1+23

1+64.45

GA
LPO
DS
RT

LT

2

RT

5-12-76
CLOY 55'

17

92.33	91.7	88.9	89.1	90.5	92.1	93.4	93.7	92.4	92.4	90.0	90.43
5.2	6.2	8.6	8.4	7.0	5.4	4.1	3.8	5.1	5.1	7.5	7.1
100	44	42	34	32	19		22	58	83	85	86

MH RT 85'

92.6

4.9
100

87.1	87.0	85.8	85.1	85.6	86.0	86.7	86.8	88.2
10.4	10.5	11.7	14.4	11.9	11.5	10.8	10.7	9.3
100	70	43	39	31		33	68	100

BENT SPIKE IN OAK TREE 1+00 LT 26'

78.4	77.5	77.5	76.8	78.0	77.4	80.3
6.4	7.3	7.3	8.0	6.8	5.4	4.5
100	67	30		35	66	100

70.0	70.1	70.1	70.6	69.6	72.0	71.2	71.6
14.8	14.7	14.7	14.2	15.2	12.8	13.6	13.2
100	64	30		30	57	76	100

STA

+

π

-

ELEV

884.76

~~897.53~~

15.3

869.46

TP

12.49

894.49

~~907.26~~

2.76

882.00

~~894.77~~

TP

12.89

902.81

~~915.58~~

4.57

889.92

~~902.69~~

TP

12.05

913.56

~~926.33~~

1.30

901.51

~~914.28~~

BM

1.65

911.91

~~924.68~~

912.77

GA
LPO
DS
RS

LT

E

RT

5-12-76
CLOY 55°
118

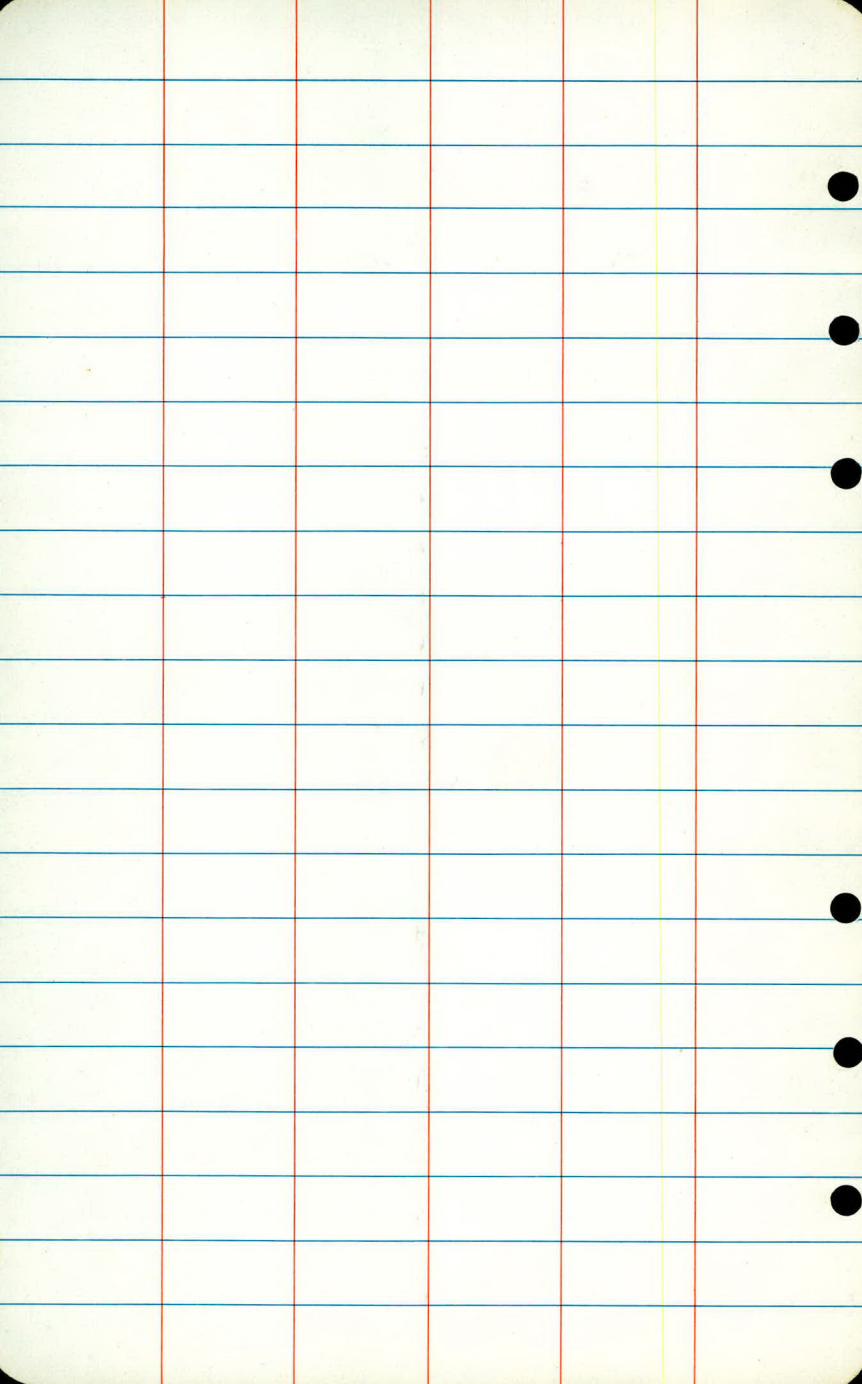
WATER LEVEL

PLUMB BOB STUCK IN GROUND

TOP RIM MH 0+80 RT 85'

PLUMB BOB STUCK IN SIDE OF HILL

SPIKE IN PP LT OF NO. ENT. TO LPV INC.



J.A.
D.S.
K.G.
B.W.

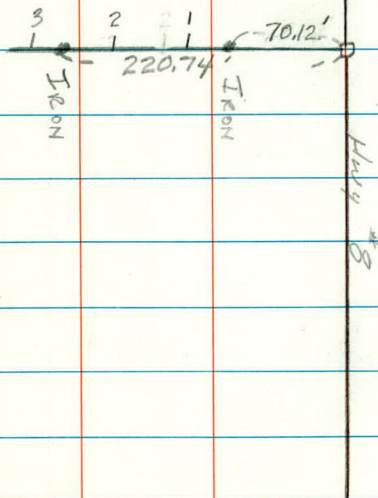
FEB 1, 1977
CLR 150

19

STORM SEWER SURVEY

TH #96 & Old Hwy 8

ALINEMENT



PAGES

+50

1 +00

150

0 +00

J.A.
D.S.
K.G.
B.W.

FEB 2 1977
CLdy 200

20

X-SECTIONS

STORM SEWER SURVEY

At Hwy #96 to RUSH LAKE

LENKER Rod

Sta

+

A

-

CLEV

B.M.

911.86

~~912.77~~

0+14

+27

+36

+50

T.P.

910.89 ✓

~~911.80~~

J.A.
D.S.
KG
B.W.

£

FEB 2, 1977
Cldy 20° 21

SPike P.P. NW. of North ENT to LPW Inc.

13.8	14.1	14.3	14.5	14.6	14.8	14.9	15.1	15.2
14.7	15.0	15.2	15.4	15.5	15.7	15.8	16.0	16.1
100	75	53	25		28	50	75	100

13.3	13.6	13.9	14.2	14.6	14.6	14.7	15.1	14.7
14.2	14.7	14.8	15.1	15.7	15.5	15.6	16.0	15.6
100	75	50	25		25	45	72	100

11.4	11.8	12.3	12.8	13.1	13.3	12.8	14.6	14.7	14.4
12.3	12.7	13.2	13.7	14.0	14.2	13.7	15.5	15.6	15.3
100	75	48	25		25	51	59	78	89
									13.9
									14.8
									100

08.7	09.5	10.4	10.7	11.8	11.9	11.9	11.0	11.54
9.6	10.4	11.3	11.6	12.7	12.8	12.8	11.9	12.45
100	75	54	30		25	44	56	61

14.8	15.0	12.2
100	70	63

Top Chunk of Cone.

ELEV.

0+82

+92

906.39 ✓

~~907.30~~

882.84 = Inv. S

1+00

906.46

~~906.39~~

907.30

~~910.96~~

T.P.

- 4.56

+50

~~887.06~~

887.95

~~891.61~~

T.P.

+69

2+00

-0.9
01.5

J.A.
D.S.
12.6
B.W.

Feb 3, 1977
Cldy 200 22
08.5 10.2 11.7
004 11.1 12.6

02.0 04.6 06.5 07.4 08.6
024 039 05.5 07.4 08.3 005
100 78 52 23 23 45 65 71

16.50' top to inv N = Elev 889.89
Top M.H. Left 23.55' to F.L.

01.6 03.7 04.7 06.0 05.4 06.8 06.2 08.7 10.9
025 042 056 079 06.3 07.7 07.1 096 11.8
100 78 50 24 30 36 45 53

TOP M.H.

910.96
907.30
3.66

85.4 86.7 91.8 97.8 94.8 96.2 96.9 98.4 900.9 905.7 907.3
90.0 91.3 96.4 98.4 994 08 01.5 03.0 05.5 10.3 11.9 x
100 80 53 30 16 10 16 36 47 49

Spike in ground

~~82.4~~ ~~84.2~~ ~~86.9~~ ~~88.4~~ ~~89.7~~ ~~88.7~~ ~~89.1~~ ~~93.5~~ ~~96.2~~
~~77.6~~ ~~79.4~~ ~~82.1~~ ~~83.6~~ ~~84.9~~ ~~84.9~~ ~~86.7~~ ~~88.7~~ ~~91.4~~
100 82 52 36 9 10 19 36

70' 100'

~~76.1~~ ~~79.5~~ ~~82.4~~ ~~84.4~~ ~~86.1~~ ~~89.9~~ ~~93.9~~
~~70.6~~ ~~74.0~~ ~~76.9~~ ~~78.9~~ ~~80.6~~ ~~84.4~~ ~~88.4~~
100 47 21 13 33 54

ELEV.

482.34

~~872.24~~~~876.86~~

-4.42

T.P.

2+50

3+00

+69

872.44

~~883.20~~~~886.86~~~~876.86~~

482.34

872.36

T.P.

897.36

~~901.78~~~~891.78~~

897.30

T.P.

909.53

~~913.95~~~~903.95~~

T.P.

916.56

916.51

~~920.98~~~~916.49~~

B.M.

T.P.

~~910.95~~

906.49

~~910.96~~

B.m.

916.30

912.77

J.A.
D.S.
K.G.
B.W.

Q

FEB 3, 1977
CLDY 200

23

Top of Wood Stake

69.7 69.7 64.1	74.3 74.3 68.7	75.7 75.7 70.1	77.0 77.0 71.4	78.6 78.6 73.2	81.2 81.2 75.6	83.3 83.3 77.7
65	17		11	23	33	51

Lake

69.7 69.7 64.1	872.76 872.76 67.2	73.7 73.7 68.1	74.1 74.1 68.5	75.4 75.4 70.0	77.2 77.2 71.6
19		20	39	59	74

? swp

? Lake ~~62.9~~ 868.5
swp 858.5

Top of Wood Stake

Spike in ground

Iron

Top Hyd

920.98
916.49
4.49

MH Top

Spike PP

916.30
912.77
-5.53

B.M.	- B.S.	LENNER Rod		ELEV	
		THEORETICAL H.I.	+ F.S.		
B.M.	2.73	913.76			916.49
TP			7.14	910.90	
			5.71	909.47	
TP	1.95	904.54	2.73	906.49	
1+00	£	895.18	1.01	895.55	897.30
TP	2.12	885.18	2.76	887.30	
TP 2+00	0.38	874.03	9.23	874.41	
			8.33	872.36	
3			8.75	862.78	

Feb. 3, 1977
Cldy 10°

24

FK
JA
DS
KG
BW

Top Hyd

conc

Iron

MH

spike

stake

£

B.M.	+	Σ	-	ELEV	
B.M.	0.80	917.29			916.49
T.P	0.91	906.46	11.74	905.55	
T.P.	0.08	897.38	9.16	897.30	
			7.7	889.7	
T.P.	2.52	886.93	12.97	884.41	
			4.59	882.34	
T.P.	1.47	882.02	6.38	880.55	
			13.52	868.50	
			9.26	872.76	
T.P.	12.88	893.44	1.46	880.56	
T.P.	12.10	902.05	3.49	889.95	
			5.96	896.09	
T.P	11.49	912.40	1.14	900.91	
			5.94	906.46	
B.M.			0.54	911.86	911.86

J.A.
K.G.
D.S.

DESCRIPTION

FEB 14, 1977
CLR 150

25

Top Hyd

Top SPIKE 1+00

Top SPIKE

1+69 2

Top SPIKE 2+00

Top Wood STAKE Iron MARKER

Iron

ICE

SPIKE 3+00

Iron

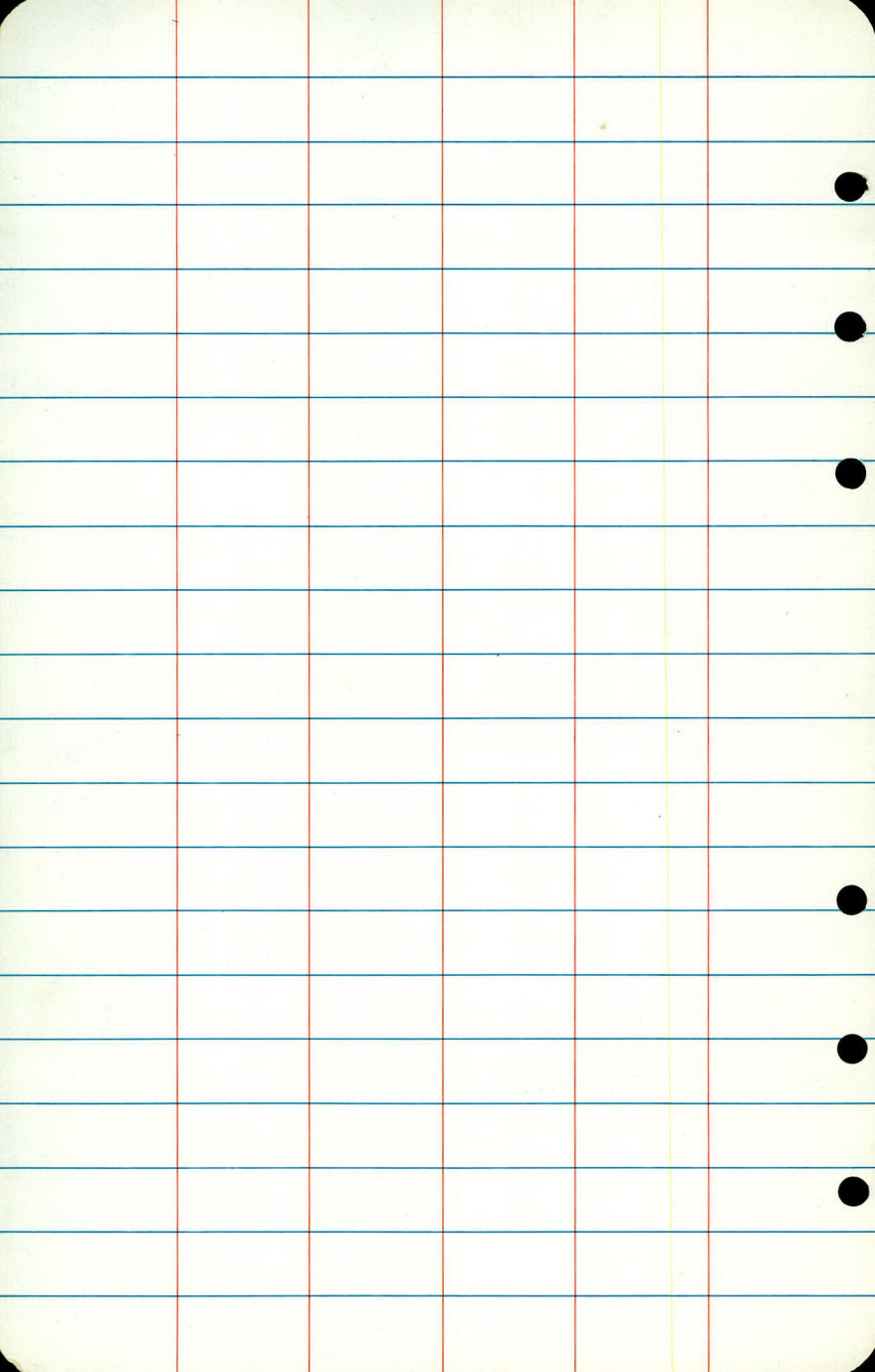
STUMP

1+50± 2

SPIKE

MH 1+2'

SPIKE PP N.W. of No Ent to LPW Inc



Торькартх

+50					
+48 46	+37 50	+28 80			
+48 41	+27 68	+23 70	+35 45		
+46 51	+23 63	+16 9	+27 33		
+42 36	+11 5	+04 38	+21 IRON	+18 47	
2+00		+93 15	+04 59		
	+84 26	+81 51			
	+81 45	+61 75	+86 44		
+61 91	+61 66	+57 57	+66 53	+77 54	+68 73
	+54 97	+46 44	+61 70	+64 85	+63 85
+50	+44 29	+46 91	+48 64-85	+65 70	
	+52 61	+41 76	+38 38	+50 62-66	
		+36 52	+28 54	+40 64-73	+47 64-86
			+24 63	+24 65	
		+18 18	+16 36	+19 35	
1+00					
		+91 MH			
		+57 13	+88 45	+93 68-73	+93 75
	+67 31	+69 35	+70 IRON		
	+65 58	+65 65	+64 34		
+50	+58 8	+63 65	+57 Hyd	+52 38	
		+56 87	+51 42	+53 45	
		+54 61	+49 62	+49 16-Ent	
			+33 69		
			+33 24		
0+00			+14 Rd		

J. A.
D.S.
K.G.
B.W.

FEB 1, 1977
CLR

27

Q

Iron

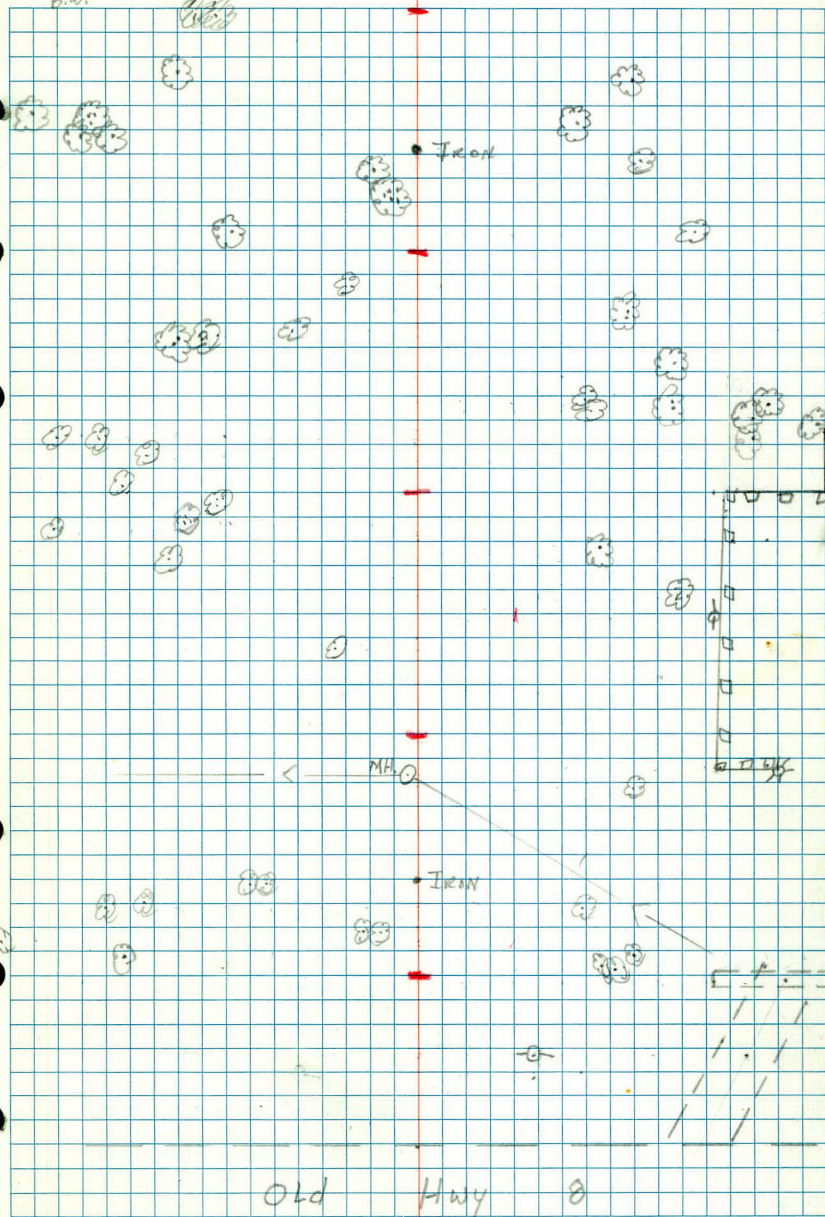
MA

IRON

Old

Hwy

8



£

4 +00

+50

3 +00

+16 SWAMP

Swamp

19

+74 $\frac{10'' \text{Oak}}{12}$

+85 $\frac{14'' \text{Oak}}{7}$

+96 $\frac{15'' \text{Oak}}{22}$

+69 $\frac{30'' \text{Oak}}{5}$

+74 $\frac{20'' \text{Oak}}{75}$

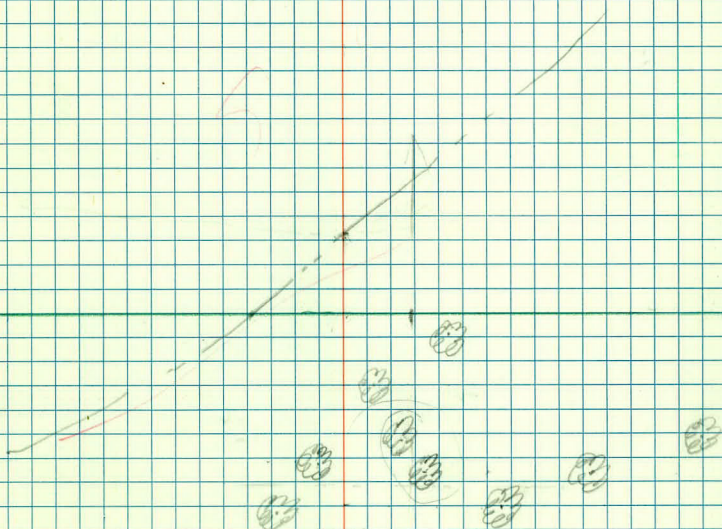
+67 $\frac{7'' \text{Oak}}{17}$

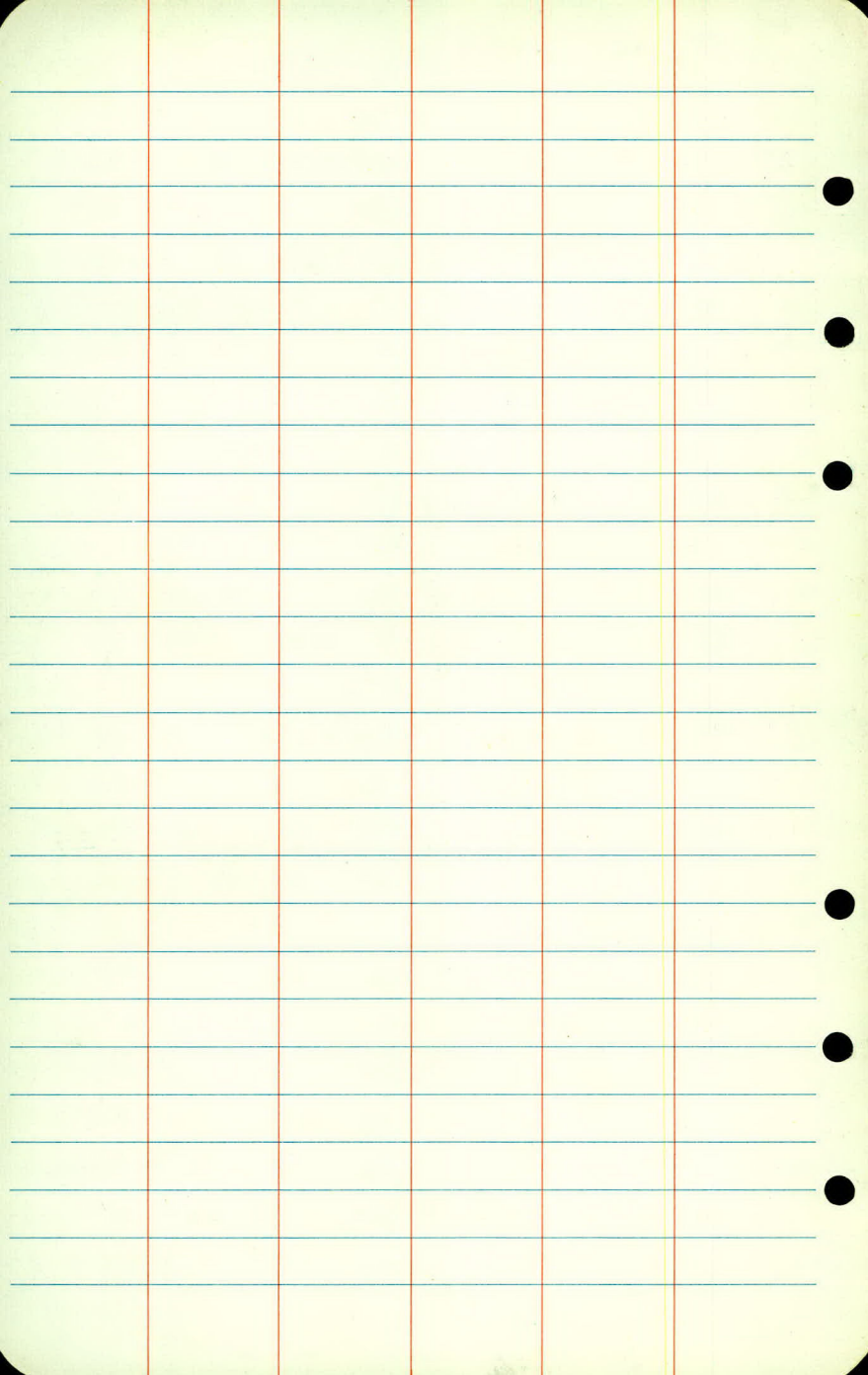
+58 $\frac{15'' \text{Oak}}{13}$

+66 $\frac{20'' \text{Oak}}{52}$

+60 $\frac{20'' \text{Oak}}{35}$

2 +50



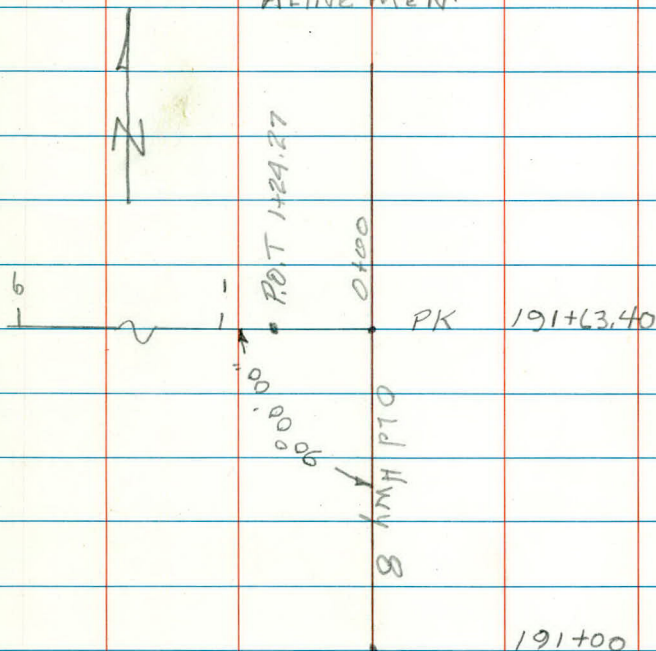


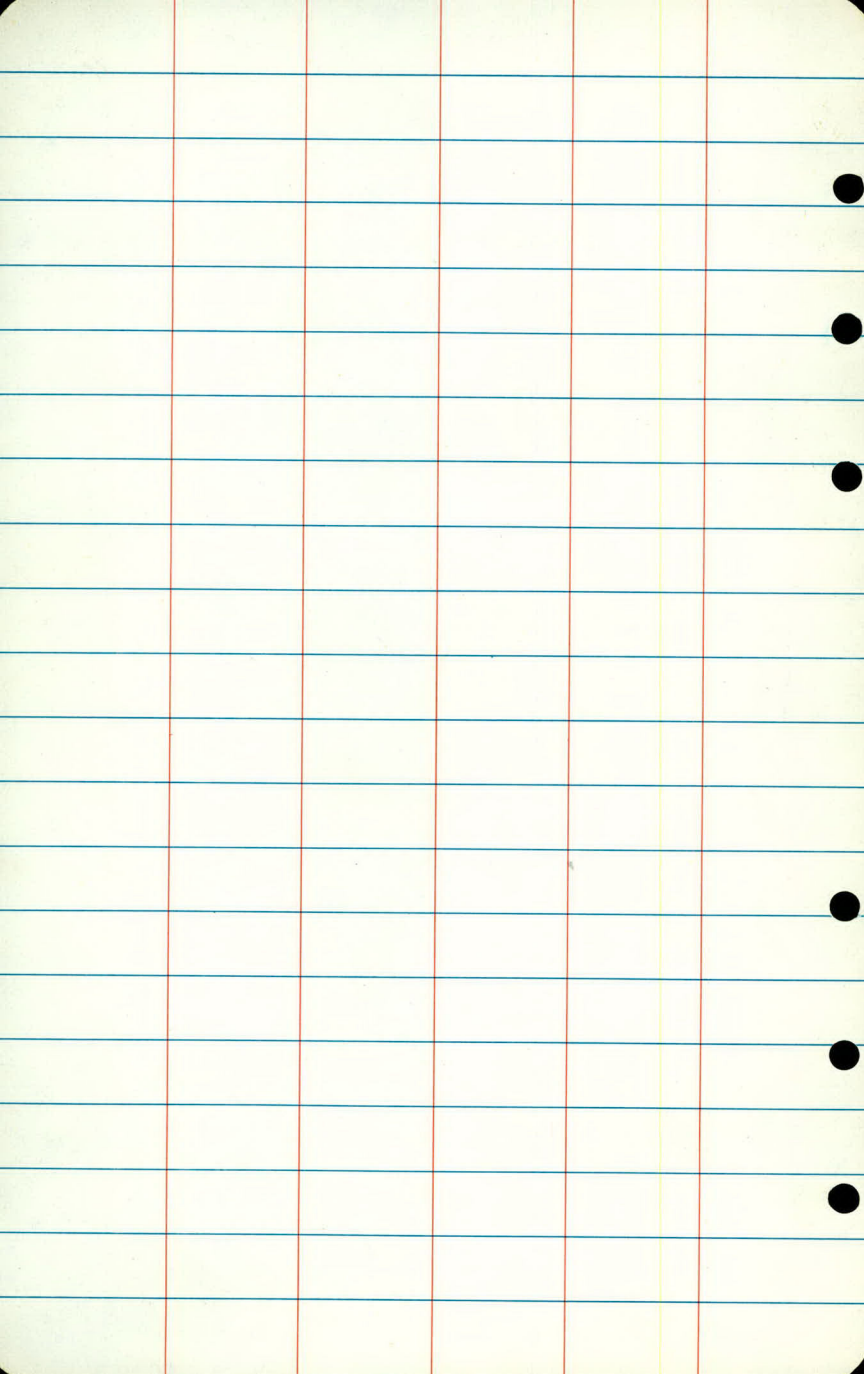
J.A.
D.S.
K.G.
B.W.

FEB 3, 1977
CLdy 200

29

ROAD SURVEY FOR OPEN
SPACE PROPERTY SO. OF RUSH LAKE
NEW BRIGHTON, MINN
ALIGNMENT





J.A.
D.S.
K.G.
B.W.

FEB 3, 1977
CLDY 200

30

Topography

for Open Space Ent.

NEW Brighton, MINN

F₂
110

+50

+37 $\frac{MH}{100}$	+20 $\frac{24" \text{Apron}}{110}$	+45 $\frac{15" \text{OAK}}{54}$	+52 $\frac{12" \text{OAK}}{76}$	+53 $\frac{12" \text{OAK}}{78}$	
+39 $\frac{22" \text{OAK}}{64}$	+40 $\frac{7" \text{OAK}}{16}$	+27 $\frac{4" \text{OAK}}{21}$	+46 $\frac{8" \text{OAK}}{5}$	+47 $\frac{20" \text{OAK}}{32}$	+52 $\frac{12" \text{OAK}}{75}$
+22 $\frac{3-8" \text{OAK}}{14}$	+24 $\frac{COK \text{ FECL}}{110}$	+11 $\frac{15" \text{OAK}}{61}$	+45 $\frac{12" \text{OAK}}{74}$	+47 $\frac{12" \text{OAK}}{77}$	+50 $\frac{12" \text{OAK}}{77}$
+12 $\frac{2-6" \text{OAK}}{3.7}$	+11 $\frac{8" \text{OAK}}{35}$	+10 $\frac{8" \text{OAK}}{34}$	+35 $\frac{7" \text{OAK}}{13}$	+35 $\frac{7" \text{OAK}}{15}$	
2+00	+09 $\frac{8" \text{OAK}}{37}$	+07 $\frac{2-6" \text{OAK}}{36}$	+08 $\frac{3-12" \text{OAK}}{17}$	+08 $\frac{4-10" \text{OAK}}{68}$	+11 $\frac{18" \text{OAK}}{3}$

+50 $\frac{20" \text{WILLOW}}{76}$	+66 $\frac{10" \text{WILLOW}}{26}$	
+53 $\frac{12" \text{WILLOW}}{37}$	+50 $\frac{30" \text{WILLOW}}{7.3}$	
+50	+50 $\frac{10" \text{WILLOW}}{34}$	
	+47 $\frac{8" \text{WILLOW}}{30}$	

2-15" OAK
+89 $\frac{29}{29}$

✓
+41 $\frac{18" \text{OAK}}{60}$ ✓
+38 $\frac{12" \text{OAK}}{44}$

✓
+14 $\frac{15" \text{OAK}}{87}$

+100

+50

+43 $\frac{COK 6" \text{CLFE}}{106}$

+1

0+00

+13 $\frac{\text{Edge Bit}}{L}$

+35 $\frac{PP}{9}$

J.A.
D.S.
K.G.
B.W.

Feb 3, 1977
Cldy 200

31

Old Hwy 8

5+00

Uncultivated
0-100

Uncultivated
0-100

+50

4+00

+100 Uncultivated
0-100

+87 ^{Swamp} 75

+78 ^{Swamp} 76

+85 ^{Swamp} 2

+73 ^{4" Ash} 10

+85 ^{Swamp} 0-100

+70 ^{4" Ash} 3

+63 ^{10" Ash} 42

+8" Ash 48

+50

3+00

+69 ^{12" OAK} 55

+67 ^{12" OAK} 53

+66 ^{5" OAK} 47

+60 ^{8" OAK} 35

+59 ^{2-5" OAK} 19

+64 ^{10" OAK} 49

+85 ^{Swamp} 0-100

+59 ^{2-8" OAK} 61

+59 ^{5" OAK} 53

+61 ^{4" OAK} 43

+73 ^{14" OAK} 16

+73 ^{10" OAK} 60

+58 ^{6" OAK} 11

+60 ^{12" OAK} 90

+54 ^{6" OAK} 23

+65 ^{18" OAK} 17

+67 ^{7" OAK} 7

+70 ^{15" OAK} 21

2+50

+53 ^{2" OAK} 19

+53 ^{12" OAK} 3

+51 ^{9" OAK} 11

+56 ^{11" OAK} 42

+62 ^{4-8" OAK} 41

+78 ^{Swamp} 59

+70 ^{22" OAK} 2

+85 ^{Swamp} 0-59

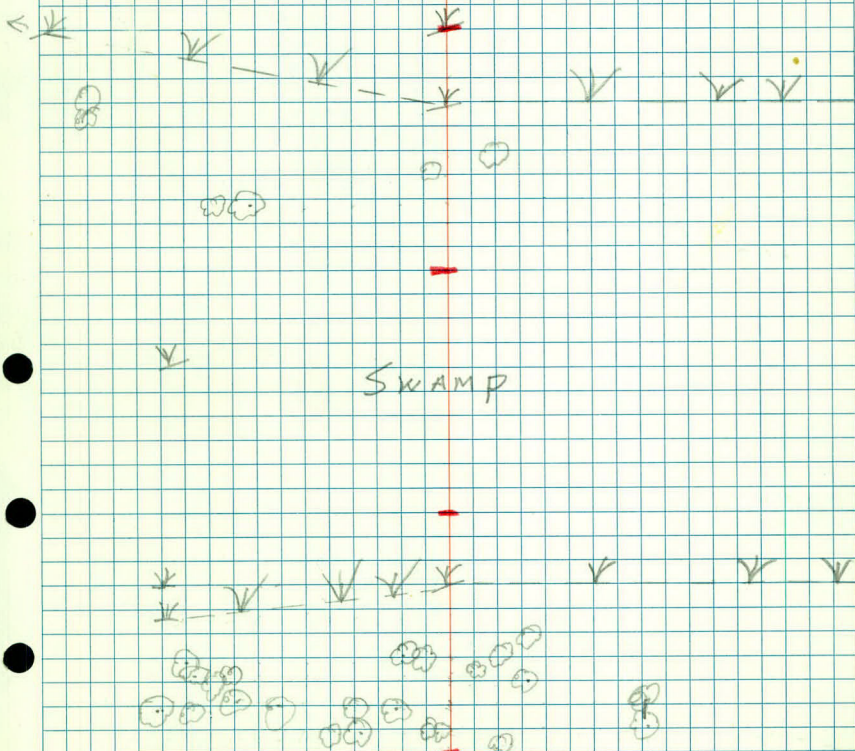
+71 ^{8" OAK} 6

J.A.
D.S.
K.G.
B.W.

Feb 4, 1977
CLR 15°

32

Q
V



6 + 00

Uncultivated
0-100

Uncultivated
0-100

+50

5 + 00

Uncultivated
0-100

Uncultivated
0-100

J. A.
D. S.
K. G.
B. W.

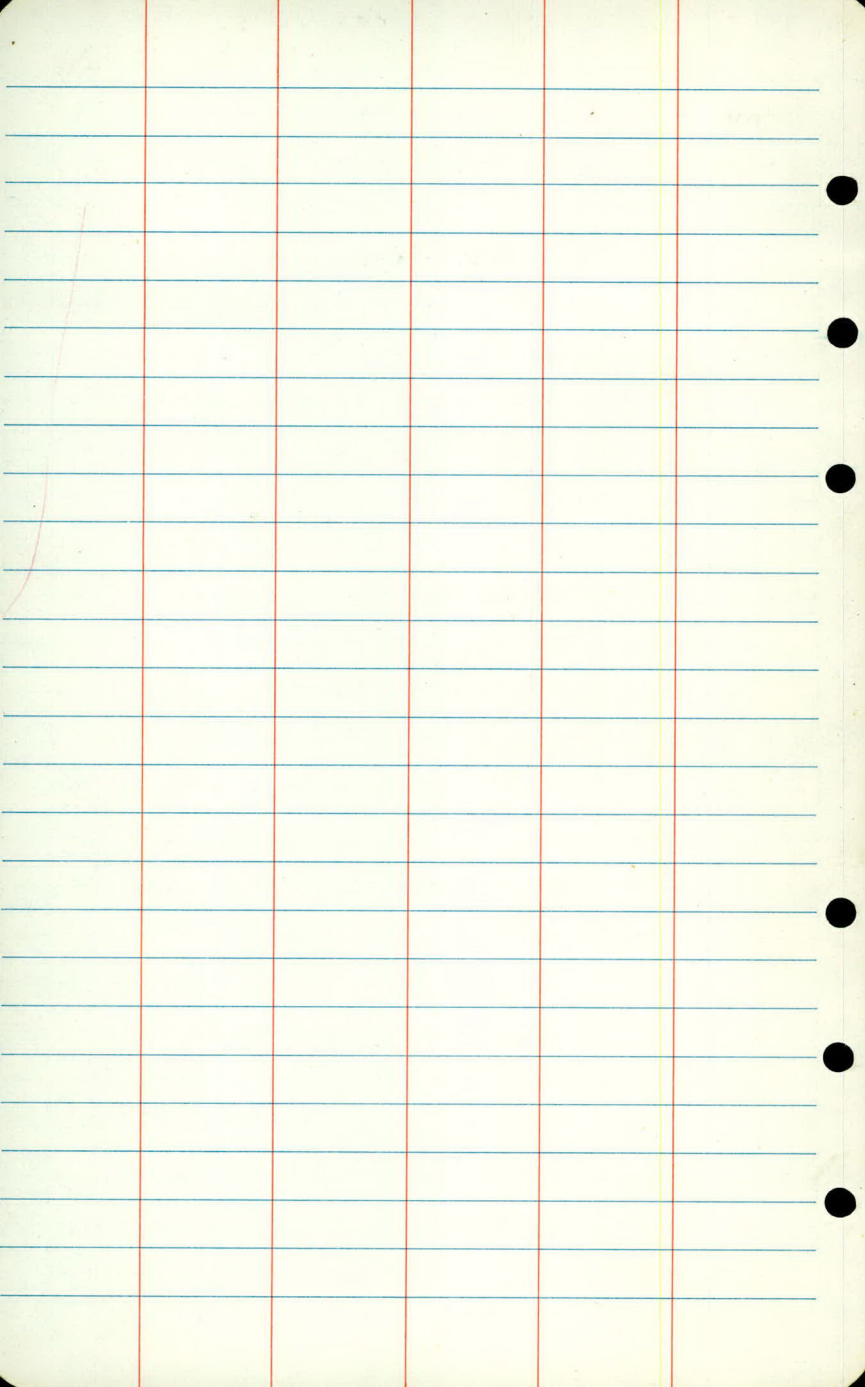
C

Feb 4, 1977
CLR 150

33

Uncultivated

Uncultivated



J.A.
D.S.
K.G.
B.W.

FEB 4, 1977
CLR 150

34

X - SECTION 3

OPEN SPACE ENTRANCE

to RUSH LAKE

LENKER Rod

Sta

ELEV

B.M.

898.87

898.87

0+14

Edge Bit Road

0+25

0+44

1 Ditch

0+57

1+00

1+25

T.P

888.90

B.M.

881.53

1+60

J.A.
D.S.
K.G.
B.W.

Q

FEB 4, 1977
CLR 15°

35

Top Hyd BETWEEN Co-op & Paron Motors

96.5	97.0	97.3	97.6	97.9	98.2	98.4	98.6	98.6
100	75	50	25		28	52	75	100

96.6	96.9	97.1	97.4	97.7	97.8	98.0
75	50	25		25	50	75

95.8	95.8	96.1	96.4	96.8	96.8	96.8
75	50	25		23	45	75

96.0	96.5	97.1	97.4	97.8	98.0	98.4
75	50	25		25	50	75

94.9	98.0	98.0	98.0	98.2	98.3	97.5
75	50	25		25	50	75

91.2	95.7	96.6	97.0	96.9	96.2	90.2
75	59	26		24	47	75

Spikebury 8th FENCE Post (CL) FROM East

Top Conc Fo. N.W. COR Fe. Post to TEX GAS STORAGE YARD

84.5	83.8	83.5	85.2	84.4	85.6	85.7	83.0
75	48	28		29	39	51	75

LENKER Road

S+A

ELEV

T.P.

888.88

B.M.

848.88

898.87

B.M.

881.53 881.53

2+00

+50

T.P.

874.64

+71

EDGE OF SWAMP EAST

3+00

+50

4+00

J.A.
O.G.
K.G.
B.W.

Q

FEB 4, 1977
CLR 15°

36

SPike 8th FE Post.

Top Hyd BETWEEN Camp & PARCH Motor

Top Conc Fd N.W. Cor FE Post TEXAGAS YARD

83.0	82.8	82.5	82.9	82.3	80.9	79.8	78.6
75	50	26		23	35	56	75

75.4	75.2	75.5	75.8	75.3	75.0	72.3
75	41	17		25	43	75

Top Hot WATER HEATER

71.6	71.4	71.4	71.8	71.4	71.2	70.6
75	50	25		28	50	75

71.0	70.9	71.0	71.7	70.9	70.6	70.5
75	50	25		25	50	75

70.7	71.1	71.3	71.1	71.1	70.9	70.1
75	50	25		25	50	75

71.7	71.5	71.9	71.6	71.3	70.3	70.8
75	50	25		25	50	75

STA

ELEV

4+50

T.P.

878.22

5+00

B.M.

881.50 881.53

2+37

879.38

J.H.
D.S.
M.G.
B.W.

9
L

FEB 4, 1977
CLC 150

33

73.8	74.7	75.3	74.6	75.4	75.8	76.4
75	50	25		25	50	75

Top 24" Arkora 876.11 F.L. 2+20 119' Lt

78.7	79.0	79.0	79.7	80.2	80.1	80.2
75	50	25		25	50	75

Top Conc

MH Top 2+37 100' Lt

916.49

KP
LPD
RJ.

28 Feb 1977
Sunny 30°

38

STH 96

OLD STH 8 TO STH 10

TOPOGRAPHY



0+00 SWCOR. SEC 16-T30-R23

+50

LT

RD
26 20

RT

+36 PP
70

2+00

RD
23 20

+68 RD
20

+50

RD
20 20

+14 9" Ash
86

1+00

RD
20 20

+93 PP
71

+64 ER
20

+64 ER
20

+50

+26 POR
39

+20 BR
64

+28 POR
44

+14 BR
81

+13.5 Conc

0+00

SWC

MONT

KP
LPD
RJ

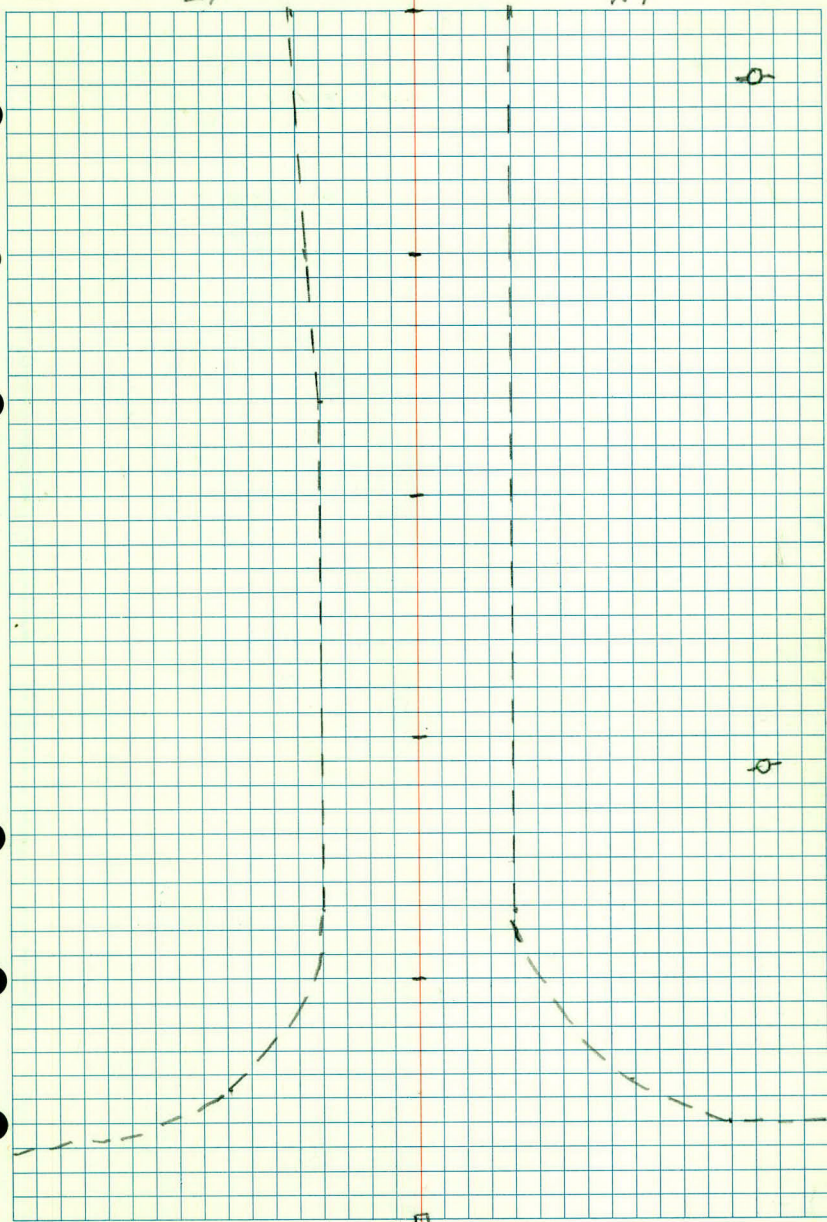
28 Feb 1977

39.

LT

$\frac{1}{2}$

RT



5+00 BR
35

LT

Med RD
0-4 34 17

RT

GP
20

+179 BR Med
0-4

+52 BR GP
27

+150

+48 ER
20

+31 ER
36

+36 BR GP
45
+18 ER Conc
32

+41 LITE
28

+14 POR
52

+13 BR
86

+30 ER Conc
20

+23 POR
38

+22 BR
66

4+00

Conc
34

Conc
20

+93 ER Conc
86

+92 RT RAMP

+99 ER Conc
71

+73 POR Conc
47

+95 RT RAMP

+86 POR Conc
31

+65 BR Conc
19

+58 POR

+58 BR Conc
32

+57 POR
23

+50

RD

+49 PP
70

+30 FE
75

+33 BR
20

+39 BR
32

+04 FE
75

+07 RT FE

3+00

RD
29 20

+93 RT FE

+89 STD
77

2+50

RD
26 20

KP
LPD
RJ

LT

28 Feb 1977
RT

8.
40

Steam
beam
barrier

Steel barrier
beam

