

323

FIELD BOOK  
000002



1	MIKE ORTH	10-139-30
2	DICK HOWITY	22-139-30
4	DVANE ENGER	5-139-30
5	SANDY ZYLKA	3-1-141-26
7	PINE POINT RANDY COTE	32-143-30
8	CASS Co - SOD LINE RR. REMER	3-1-141-26
9	CORNELL BERG	8-139-32
10	GEORGE GAGOLA	2-30-144-29
11	GLENN WITHEM	30-140-30
13	REMER SOD - LINE	
14	KEN HELGESTAD	9-36-142-30
15	MAPLE LAND FILL	13-136-30
16	REMER	
17	RANDY COTE PINE PT	
19	GLENN WITHEM	30-140-30
20	REMER	
22	GARY ANDREWS	13-24-141-31
23	DAVE ANDERSON	4-138-30
24	MERLE BRANDANGER	20-29-136-29
25	GARY ANDREWS	
27	DICK MARINUCCI	9-141-29
28	USFS	28-149-25
29	BENSON	22-139-30
31	MARGRET PITTENGER	3-141-29
32	BIA MILLET LAC RESV.	



36	RANDY COTE	PINE PT	
40	GARY ANDREWS		
41	RANDY COTE	PINE PT	
42	GARY ANDREWS		
43	RANDY COTE	PINE PT	
45	MARGARET PITINGER		
48	DAVE DVORCHAK		32-142-30
49	CHRISTMAS PT	SHINGOBE TWP	
50	HARLAN BEAL	PINE RIVER	
51	EUGAT CASKY	WHITEFISH	
54	LEE ARMSTRONG		1-14-239-26
55	LONGVILLE LAND FILL		12-140-27
56	LESTER LIPPERT + ARLAND BENSON		6-19-142-27
58	KEN HELGESTAD		
59	ED MARQUARDT		9-139-32
60	MARGARET PITINGER		
62	HACK. POST OFFICE		
66	LIM JOHNSON		12-140-31
70	JACK CARLSON		12-140-28
72	DAVE CORBETT		9-139-29
73	HERMAN PETERSON		5-4-140-26
75	BILL CROMBIE		5-7-137-28
77	DAVE DVORCHAK		



MIKE ORTIZ

T @ 1 BS 2

0-0-56	180-41-46	89-55-20	174.14	174.139
180-0-48			59.174	
180-42-42			123.33	
3 0-42-34	180-41-46	94-56-44	68.075	222.504

T @ 3 BS 4

0-0-22	9-25-21	89-58-16	2396.18	2396.163
180-0-25			730.352	
9-25-43			2176.91	
5 180-25-40	9-25-15	90-6-55	663.523	2176.897
180-50-24	180-50-02			
3 0-50-25	180-50-00			

T @ 4 BS 3

0-0-24	88-56-47			
180-0-29				
88-57-16				
6 88-57-11	88-56-42			

T @ 6 BS 4

0-0-30	267-38-22	90-7-15	1717.04	1717.029
180-0-30			523.354	
267-38-52			447.42	
7 87-38-50	267-38-20	88-45-50	148.566	487.305

T @ 8 BS 7

0-1-23	240-39-31	89-33-50	2093.77	2093.70
180-1-25			634.181	
240-40-34			752.68	
9 60-40-56	240-39-31	89-1-30	229.421	752.574

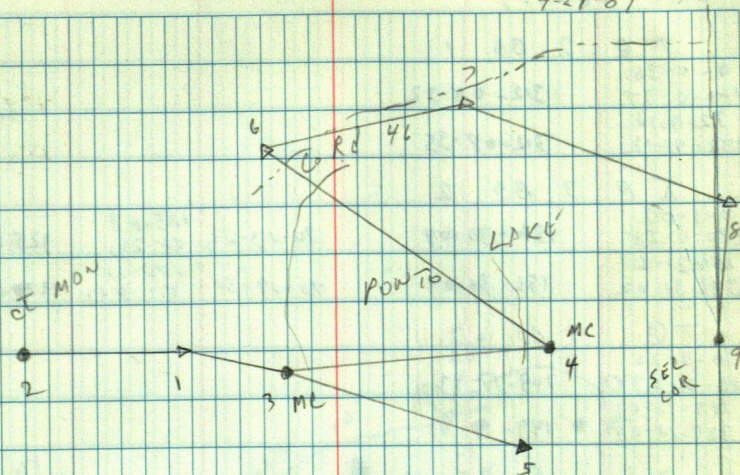
T @ 7 BS 8

0-0-28	148-10			
180-0-28				
148-10-28				
6 324-10-24	148-10-01			

55° CER

E. CURD  
L. VOLBY

4-24-89



SER SURVEY FOR ELLINGER

BK 287/

156/



## DICK HEWITT

T 0 2 BS 1

0-0-38  
 140-0-37 312-08-32  
 312-9-10  
 132-9-12 312-08-35

T 0 3 BS 2

0-1-02  
 180-0-58 156-30-04 90-13-25 125.63  
 156-31-6 38.29 125.627  
 4 336-31-02 156-30-04 90-19-50 170-11  
 51.852 170.119

T 0 4 BS 3

0-0-20  
 180-0-23 149-17-43  
 149-18-03  
 5 329-18-04 149-17-41

T 0 5 BS 4

0-0-52  
 180-1-05 172-06-58 90-9-20 216.89  
 172-7-50 66.109 216.86  
 6 352-7-53 172-6-48 90-33-03 125.91  
 38.372 125.903

T 0 6 BS 5

0-0-45  
 180-0-50 198-19-20  
 198-20-05  
 7 18-20-09 198-19-19

T 0 7 BS 6

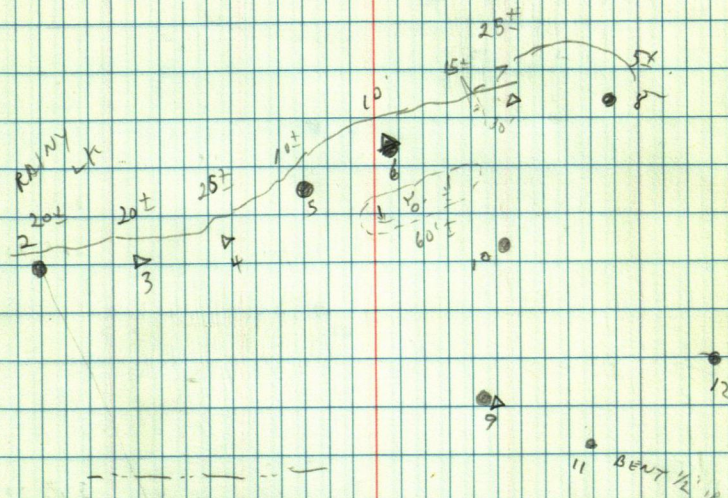
0-0-22  
 180-0-25 199-49-38 90-44-30 218.74  
 199-50- 66.671 218.719  
 8 19-49-56 199-49-31 97-4-30 44.88  
 286-21-38 286-21-16 13.679 44.527  
 9 106-21-46 286-21-21 87-19-07 238.21  
 72.605 237.746

T 0 9 BS 7

0-0-10  
 180-0-2 93-05  
 93-5-10  
 12 273-5-10 93-05-08 89-15-40 173.60  
 124-12-48 52.914 173.586  
 11 124-12-38 34.05  
 355-43-35 355-43-25 106.24  
 10 175-43-23 355-43-21 96-5-50 32.38 105.635

E. CURD  
L. VOL 61

2





K @ 12 B 5 9

0-0-43  
150-0-35  
91-51-06  
13 271-51-0

91-50-23

91-50-25

K @ 13 B 5 12

0-0-05  
140-0-23  
204-44-52  
17 24-45-10

204-44-47

86-09-16

95-2-40

133.17

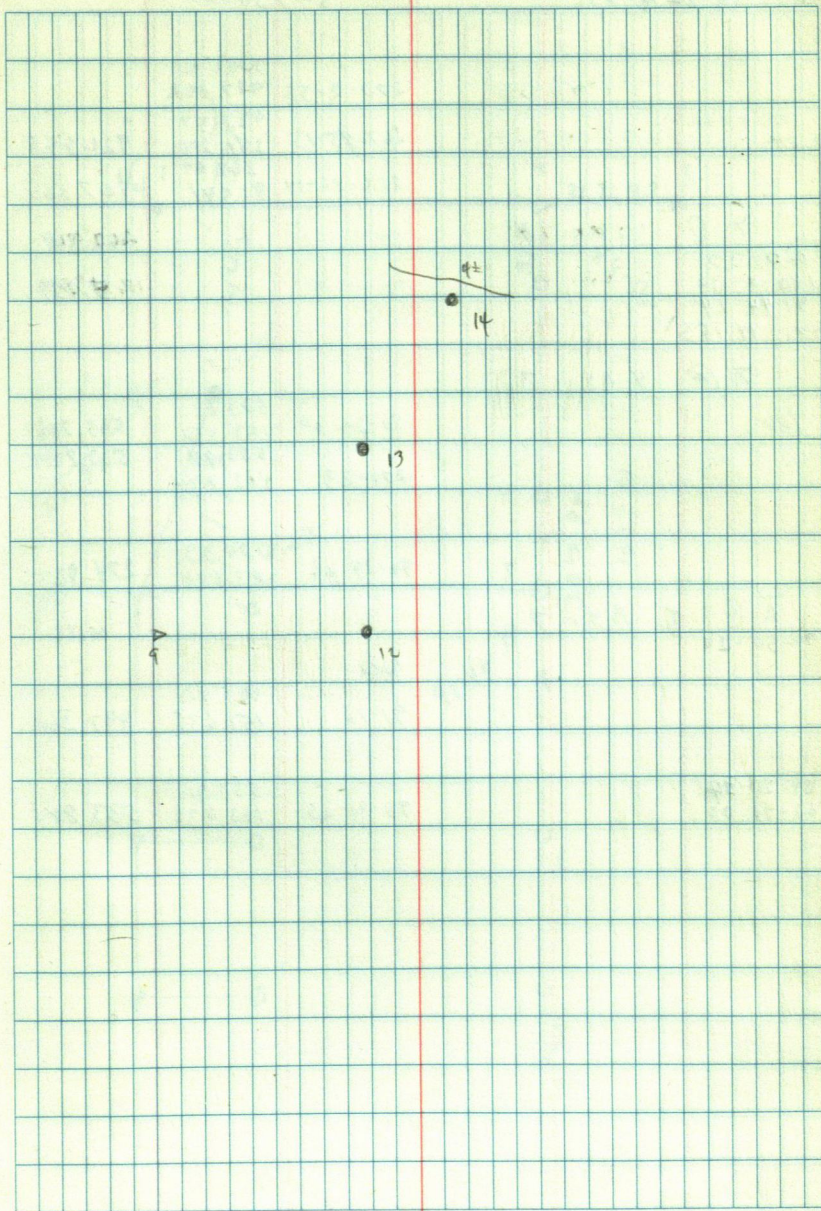
40.59

132.869

116.75

35.583

116.293





DUNE ENFER

5-139-30

	3041.63	
270-2-55	927.098	
	922.57	
267-45-13	181.200	926.858
	267.69	
268-16-14	81.591	267.565

262.368

5.197

T @ 3 AS 4

0-0-37

180-0-30

91-44-14

1271-44-15

T @ 4 AS 3

180

90-29-30	503.61	503.786
	157.559	
	533.88	533.724
271-23	162.738	

90-29-06	274.93	274.923
	83.601	

T @ 5 AS 7

91-50-20

944

91-16	497.49	
	151.635	497.366

90-31-25	533.91	533.841
	162.732	

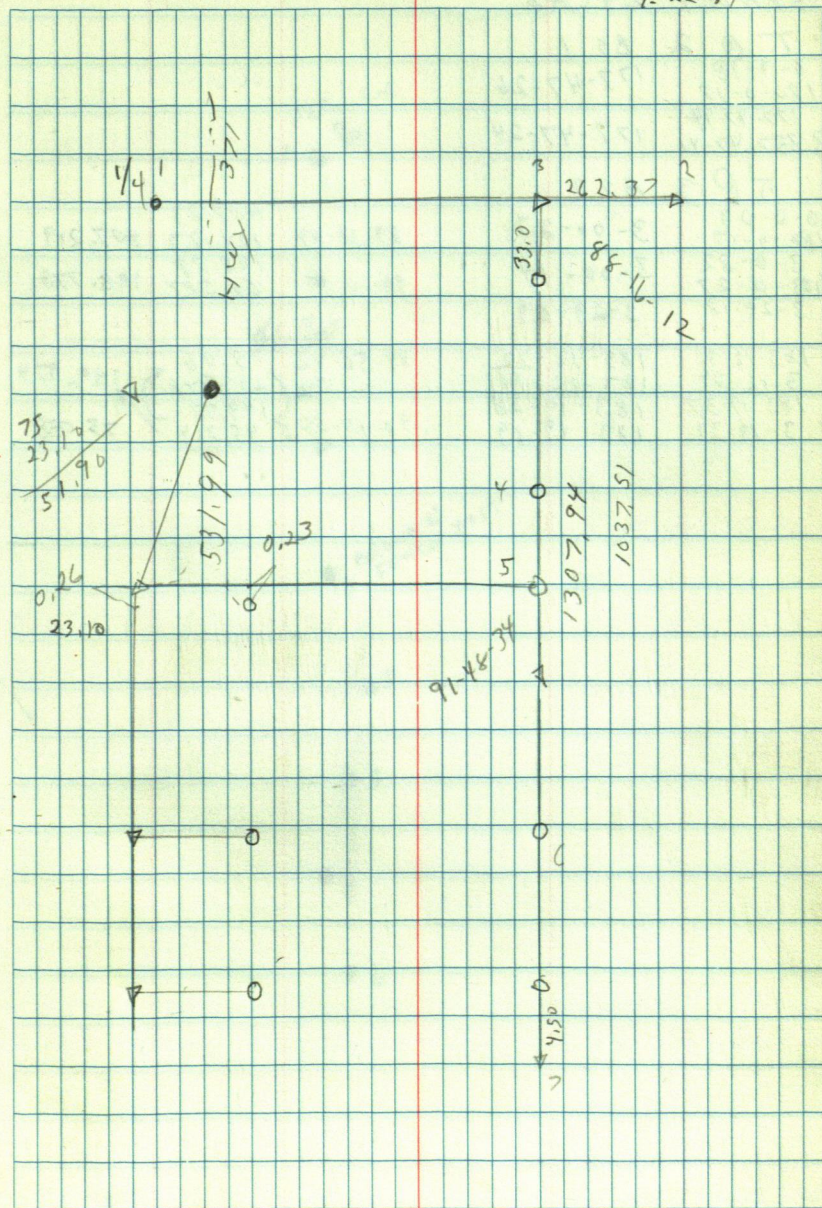
84-20-34  
168-40-00

70° WINDY

B. CARD  
L. VOLBY  
B. EOLIE

4

4.22-89





L. Volby  
E. Curo

SANDRA ZYLKA

π @ 2 BS 1

0-0-18 177-47-26  
180-0-17  
177-47-44  
3 357-47-41 177-47-24

π @ 3 BS 2

0-0-09	3-00-23	89-38-04	407.23	407.219
180-0-17			124.123	
3-0-32	3-00-14		198.78	198.778
418-0-27		90-10-05	60.588	
3-29-18	3-29-09			
5 183-12-31	183-12-22	89-56-42	75.06	149.974
6 3-12-24	183-12-11		22.878	
183-19-37	183-19-28		149.77	
7 3-19-32	183-19-19	90-15-55	45.714	75.058

5

sec cor  
1

1

2

BROKEN  
FENCE POST

5

3

7

6



SAUDRA ZYLKA

ECUAD  
L VOLBY

6

5-1-89

SEC CAR

32.78  
0  
9.75  
89-04-58

90-26.46

54.14  
0  
5.25



# PINE POINT

$\pi @ 1 \text{ B3 } 2$

0-0-07			425.43	
180-0-0	71-00-33	91-35-57	129.672	425.264
71-0-40			94.48	
251-0-35	71-00-35	87-8-13	28.795	94.362

Te 5 6 3

72-58-48

6145-57-54 72-58-57 39-35 F1

70 3 B5 5

0-0-6			760.63	
180-0-0	160-02-48	88-34-07	231.540	760.389
4 340-2-54	160-02-50	88-53-52	685.71	
339-56-30	339-56-24		209.005	685.707
1 159-56-25	339-56-25			

T @ 4 BS 3

0-0-20	
180-0-28	190-10-34
190-10-54	
8 10-11-02	190-10-34
0-0-12	
169-49-43	169-49-31

8 35 4

89-54-40	975.18	
	297.232	975.17

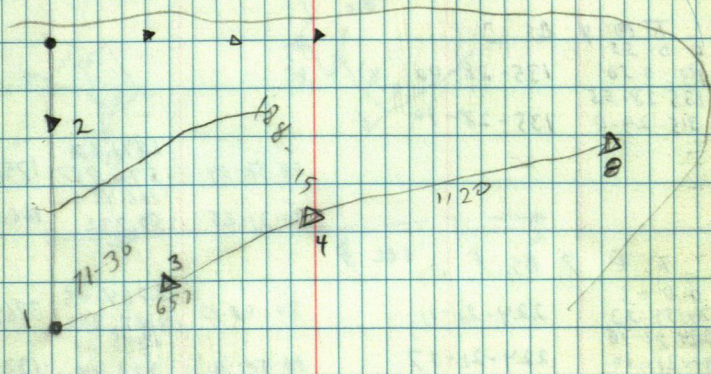
E. CURD  
L. VOLBY

5-5-89

7

$$\begin{array}{r} 94.4 \\ 685.7 \\ 975.2 \\ \hline 1755.3 \end{array}$$

LEECH LAKE



BIG LEECH  
RESORT



REMLA

$\pi$ @	1	BS	2			
0-0-12					1765.68	
180-0-15	6-09-41		90-6-25	538.181	1765.673	
0-9-53						
3180 9-57	0-09-42					

$\pi$ @	2	BS	1			
0-0-40						
180-0-50	138-51-38					
138-52-18						
7 318-52-25	138-51-35					

$\pi$ @	4	BS	3			
0-0-55						
180-0-50	135-28-00					
135-28-55						
6 315-29-0	135-28-10					

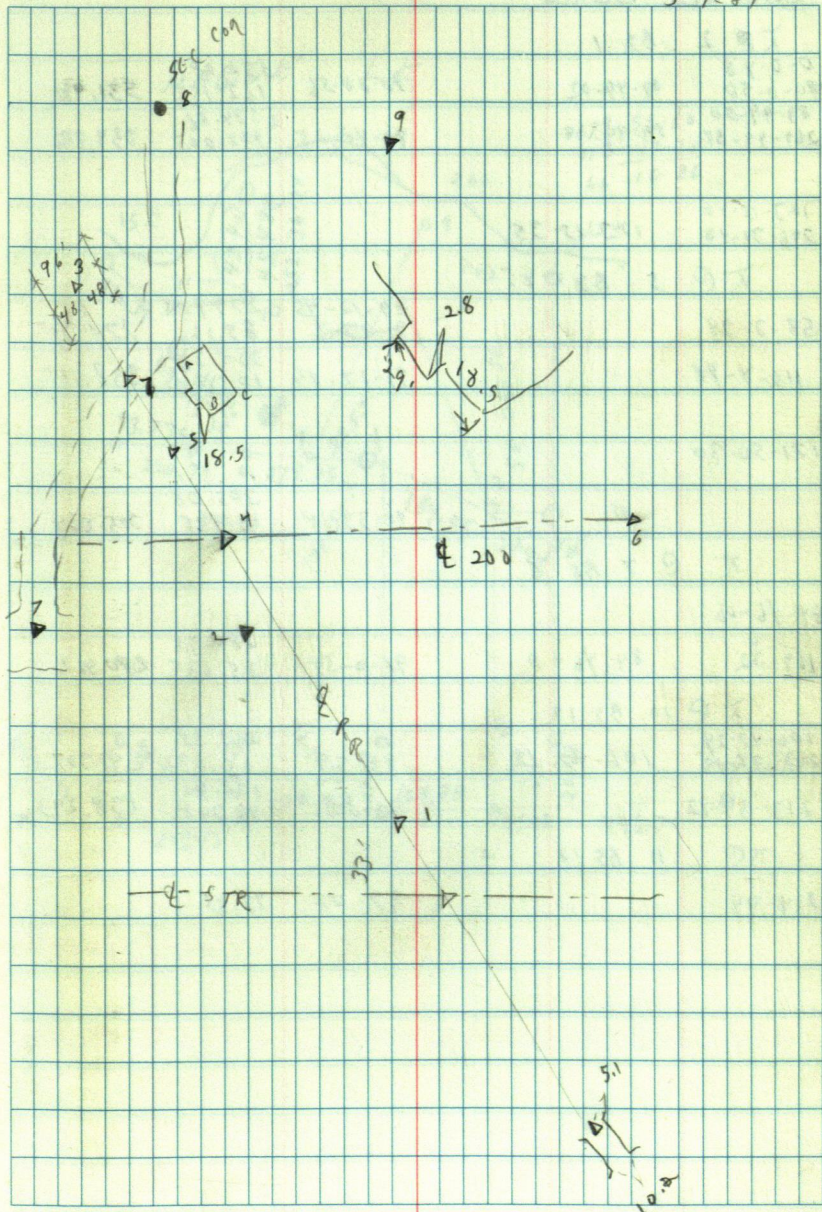
1			89-58-04	1791.62	546.087	1791.614
5			90-21-25	166.45	50.732	166.443

$\pi$ @	7	BS	1			
0-0-05					3764.05	
129-59-53	224-21-11		90-08-13	1147.289	3764.044	
224-21-16				1322.64		
8 44-21-10	224-21-17		89-58-46	403.14	1322.633	

$\pi$ @	5	BS	3			
A 8-59-12					114.50	
B 28-42-34					37.10	
C 52-25-50					53.20	

E. C. 200  
L. Volby 8

5-9-89





# CORNELL BERG

Σ 2 BS 1			
0-0-48			
180-0-50	89-49-02	90-28-56	532.00
89-49-50			162.155
3269-49-58	89-49-08	89-49-25	334.86
			102.065
			531.981
			334.856

127-15-10  
246-71-10 123-15-35

Σ 5 BS 4			
58-2-24		89-12-45	279.42
		89-12-45	89.166
6 116-4-48		91-27-49	338.23
			107.292
			338.117

171-50-30

90-33-18	305.08		
	92.988	305.064	

Σ 7 BS 6

84-46-06			
169-32	84-46-0	91-0-54	280.96
			85.635
			280.912

Σ 10 BS 12

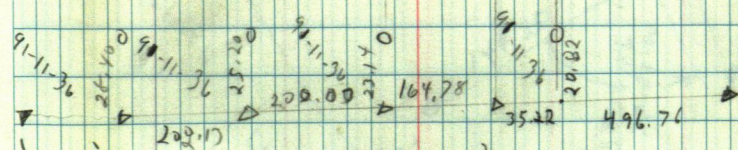
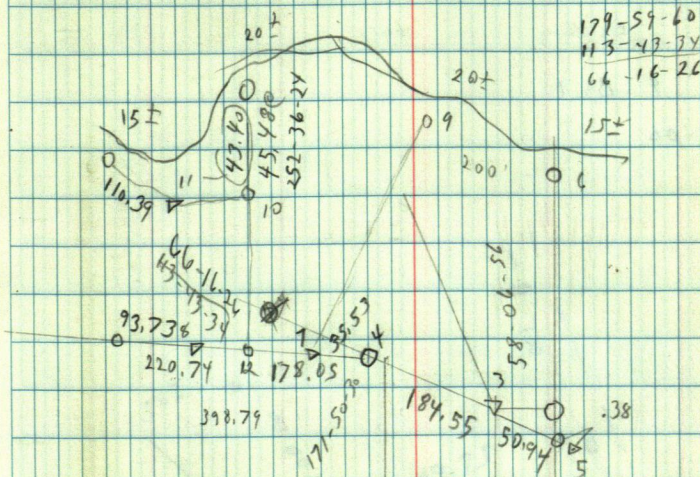
106-47-24			
106-47-12	88-59	88-59	214.34
			65.332
11 213-34-12	93-52	93-52	138.61
			42.248
			138.293

Σ 11 BS 10

214-04	97-07	97.85	
--------	-------	-------	--

9

## NAGLE LF





QED. QAGOLA

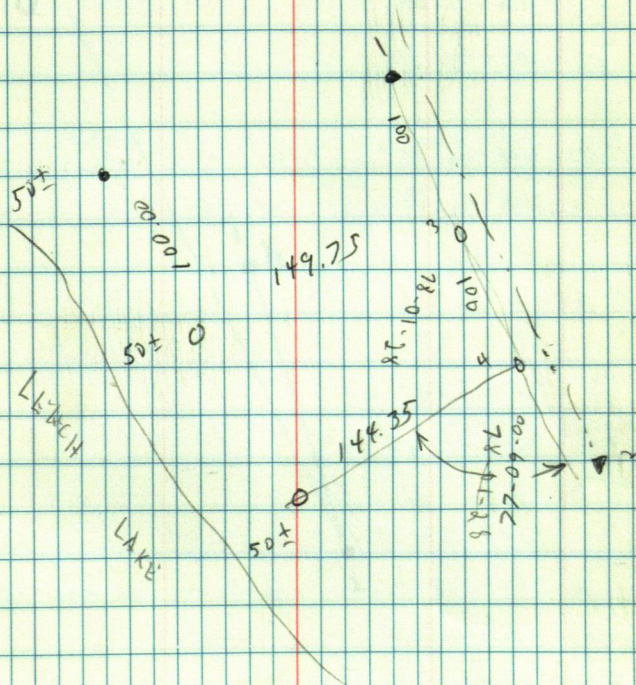
$\pi @ 133 \quad 2$

4-03-18

$\overline{A} \cap B$

77-09-00

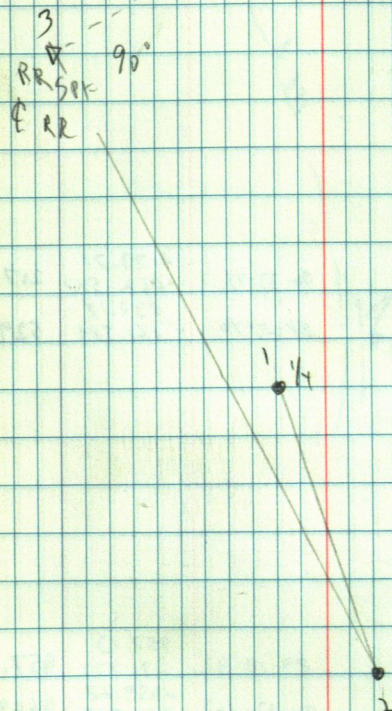
10





GLEN WITHEN

T	P	2	BS	3
0-0-27				
180-0-27	0-53-39	89-24-26	2377.78	2377.643
0-54-06			227.718	
10-54-10	0-53-43			





GLGN WIT/16m

π 2 BS 3				
0-0-2P			349.410	
181-0-27	263-48-55	89-35-10	1146.38	1146.334
263-49-23			138.25	
183-49-26	263-48-59	90-55-02	42.29	138.73
0-0-55				
96-11-55	96-10-58			

π 3 BS 2				
0-1-05	176-56-27			
180-1-05	<del>263-48-55</del>			
176-57-32				
+356-57-30	176-56-25			
0-0-24				
183-4-03	183-03-39			

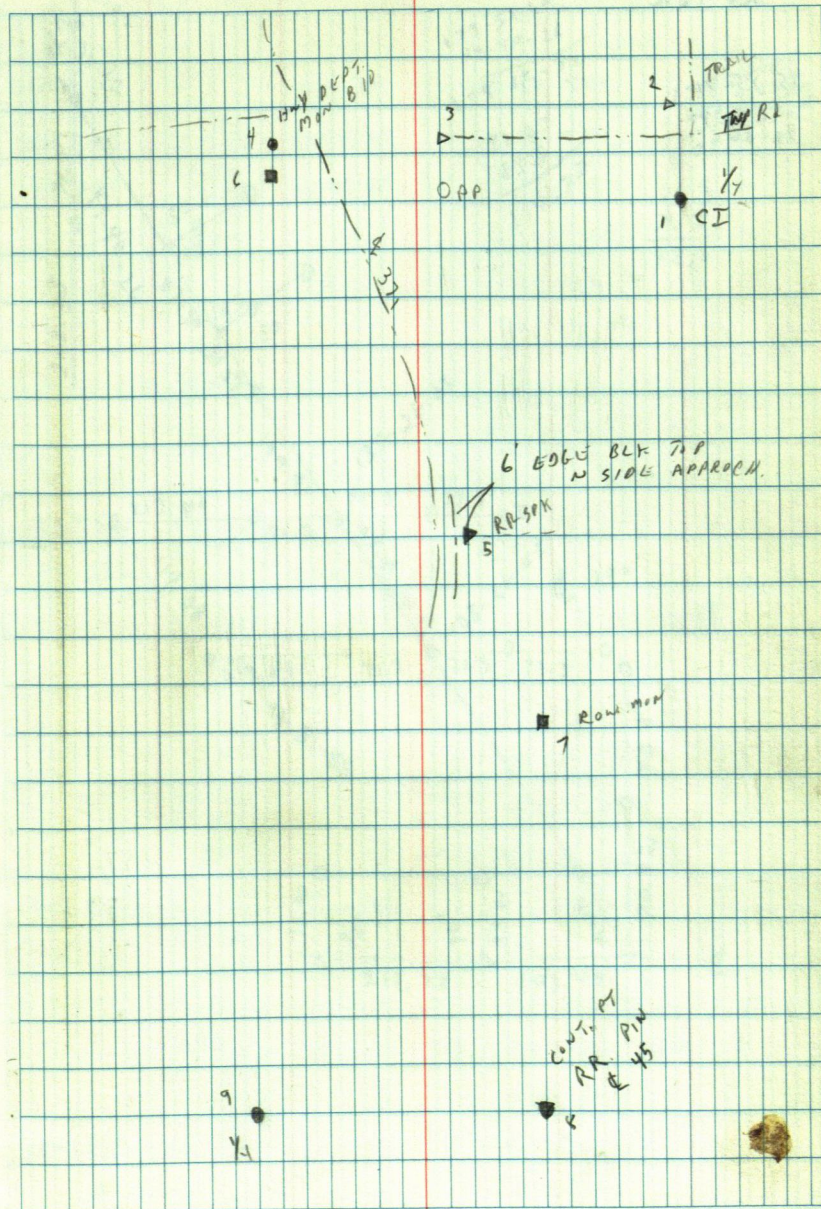
π 4 BS 5				
0-1-20			2173.71	
180-1-22	295-46-45	90-33-45	662.547	2173.596
295-48-05			530.14	
3 115-40-10	295-46-48	88-5-40	161.589	529.848
0-0-02				
64-13-14	64-13-12			

π 5 BS 6				
0-1-0	0-01-06			
180-1-0				
0-2-06				
+180-2-05	0-01-05			
179-41-26	179-40-26			
7 359-41-26	179-40-26			

π 7				
0-0-28			957.13	
180-0-30	205-28-37	89-19-42	291.733	957.06
205-29-05			2659.27	
8 25-29-19	205-28-42	90-13-16	810.544	2659.236
0-0-05				
154-31-28	154-31-23			

π 8 BS 7				
0-0-20				
180-0-28	276-47-53			
276-48-15			947.82	
9 96-48-18	276-47-50	92-14-13	106.015	347.553
0-0-10				
83-12-19	83-12-09			

12



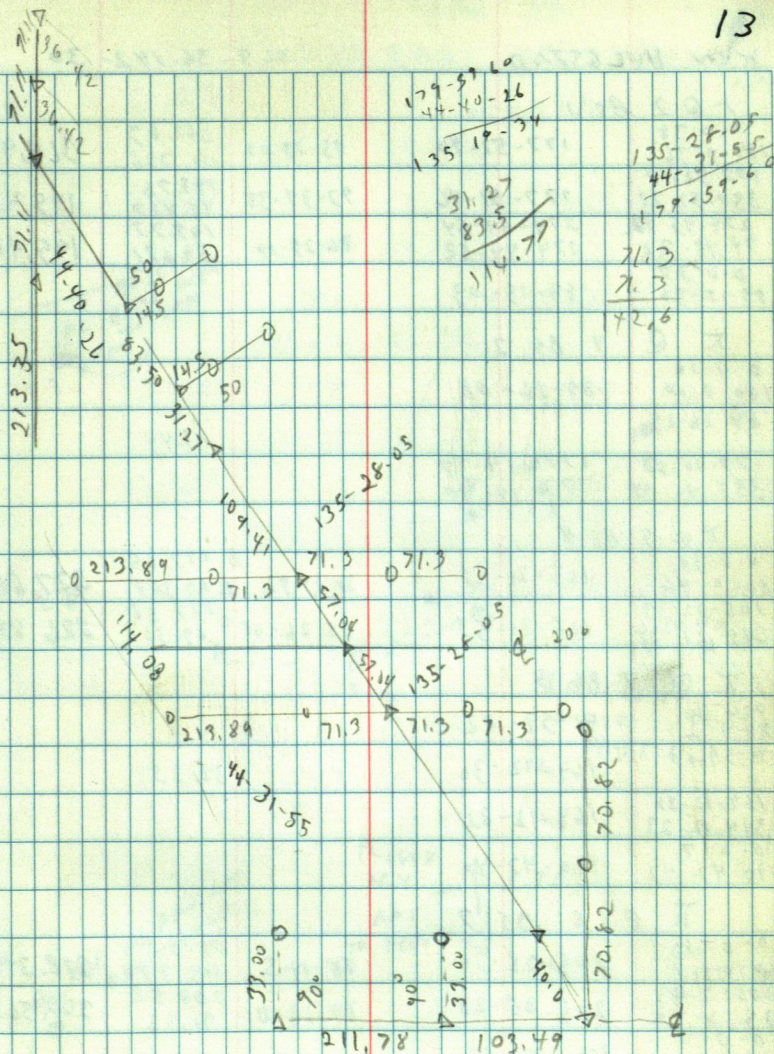


REMER

45-05-40

90-00-

13





## KEN HELGSTAD

GL9-36-142-30

K @ 2 BS 1			
0-0-38			367.83
180-0-36	177-51-40	85-59-05	112.226
177-52-18			145.76
3 357-52-22	177-51-46	93-39-35	44.427
274-45-38	274-44-54		195.77
4 94-45-28	274-44-52	86-29-10	59.671
0-0-27			
85-15-30	85-15-03		

K @ 4 BS 2			
0-0-16			
180-0-14	89-26-08		
89-26-24			
177-44-58	177-44-37		13.44
5 357-44-54	177-44-40		

K @ 5 BS 4			
0-0-38			227.65
180-0-46	165-21-55	90-1-42	69.388
165-22-33			227.56
7 345-22-39	165-21-53	85-26-08	69.36
			226.837

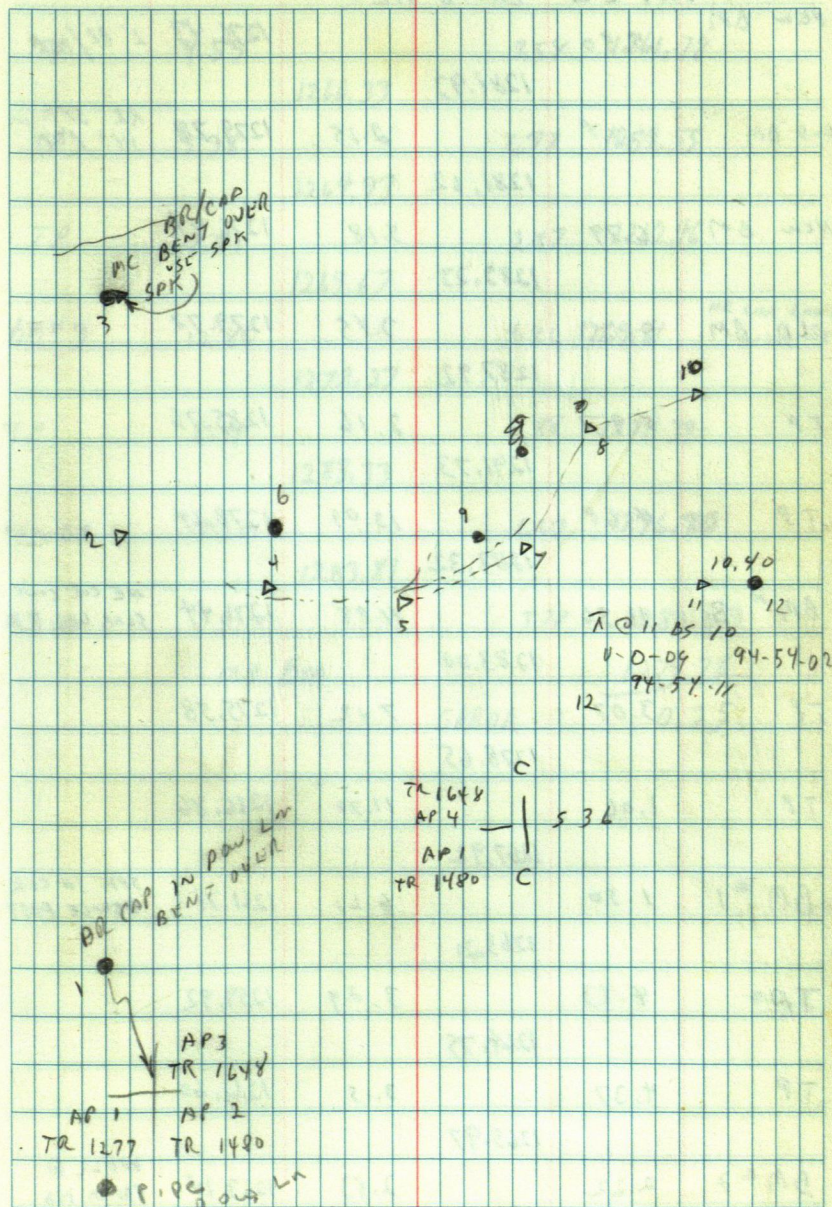
K @ 7 BS 5			
0-0-1			
180-0-2	41-59-02		
41-59-03	169-12-30		50.25
169-12-31	169-12-21		
8 349-12-23			
0-0-7			
190-47-47	190-47-40		

K @ 8 BS 7			
0-0-13			378.53
160-0-17	205-08-30	88-11-5	115.377
205-8-43			300.58
85-8-45	205-08-28	89-23-0	91.62
0-0-0			
154-51-15	154-51-15		

K @ 10 BS 8			
0-0-6			
180-0-7	266-37-51		
266-37-57			
86-38-1	266-37-54	89-28-21	855.75
0-0-5			260.848
93-22-8	93-22-03		

K @ 1  
89-17-55 164.99  
50.79 164.96

14





MAPLE LAND FILL

WELL @  
FARM H<sub>2</sub>

0.25



[illegible]



R. COTE

PINE POINT

π @ 2 BS 1

0-0-13	178-39-08
180-0-14	
178-39-21	178-39-04
3 358-39-18	
0-1-9	181-21-0
181-22-9	

π @ 3 BS 2

0-0-9	270-40-28	86-22-23	135.13	134,859
180-0-22			41.188	
270-40-37				
4 70-40-35	270-40-13	92-8-24	120.18	120,083
0-1-11			36.633	
89-20-51	89-19-40			

π @ 4 BS

0-0-24	184-36-39
180-0-23	
184-37-3	184-36-47
5 4-37-10	
0-5-7	175-23-19
175-28-26	

π @ 5 BS 4

0-5-40	186-44-0	90-43-6	228.56	228,541
180-5-44			69.665	
186-44-40	186-44-12	90-10-4	164.58	164,580
6 6-49-56			50.165	
179-25-23	173-15-52			

π @ 6 BS 5

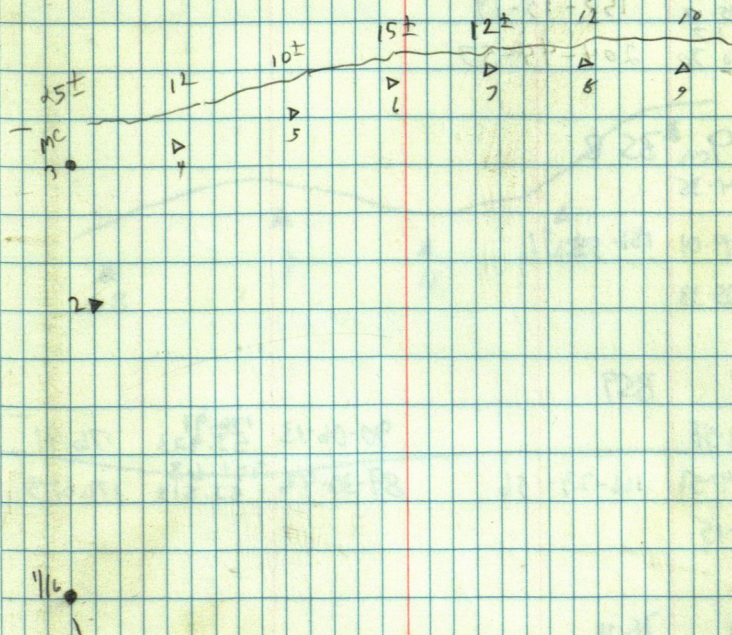
0-0-49	158-13-08
180-0-51	
158-13-57	158-13-17
7 338-13-8	
0-2-32	201-46-47
201-49-19	

π @ 7 BS 6

0-0-24	170-10-02	270-23-12	165.41	165,40
180-0-18			86.414	
170-10-26	170-09-47	270-32-0	131.84	131,839
8 350-10-5			40.189	
0-0-36	189-50-10			
189-50-46				

17

LEECH LAKE





$\pi @ 8 \text{ BS } 9$   
 0-0-15  
 180-0-22 155-15-30 90-24-45 200.41 61.087 200.407  
 155-15-45  
 7 335-15-41 155-15-19  
 0-5-57  
 204-50-30 204-44-53

$\pi @ 9 \text{ BS } 8$

181-54-35

11) 03-49-01 181-54-31

178-05-33

$\pi @ 11 \text{ BS } 9$

166-23-58

90-06-13 176.91 53.423 176.91

12) 332-47-51 166-23-56

89-30-42 171.63 52.313 171.623

193-36-15

$\pi @ 2 \text{ BS } 11$

176-39-18

10) 353-18-22 176-39-11

183-21-21

$\pi @ 10 \text{ BS } 12$

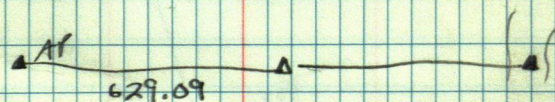
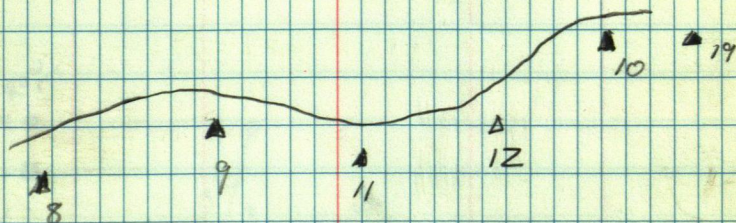
194-53-48

89-44-54 267.89 81.652 267.884

19) 291-47-15 194-53-38

165-06-36

18





81  
GLN WITHEN

π 0 5 95 Y

0-0-16

180-0-09

2-25-31

2-25-47

7 10 182-25-37

2-25-28

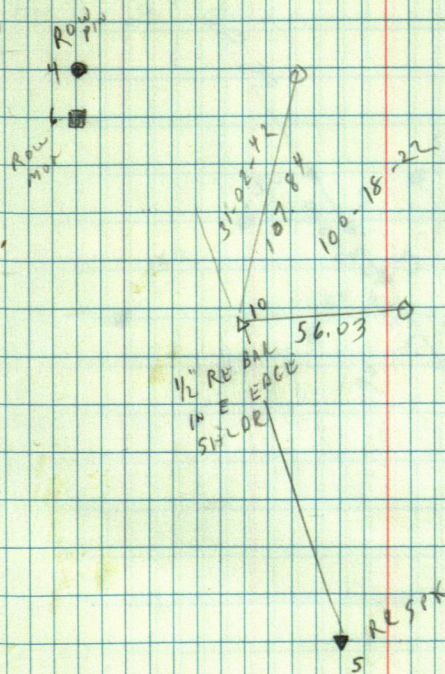
89.58-02

1577.40

480.791

1577.392

19





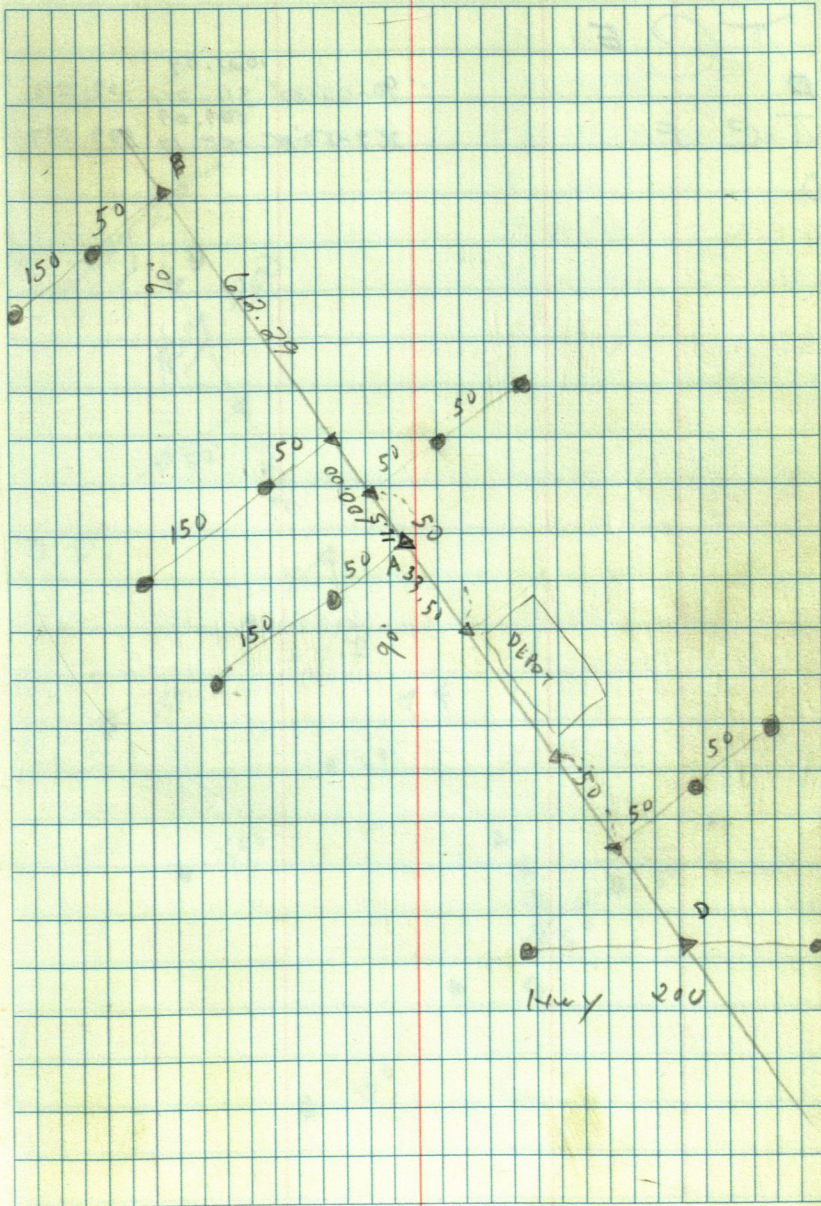
REMER

T @ L

B

90-05'-48" 612.29

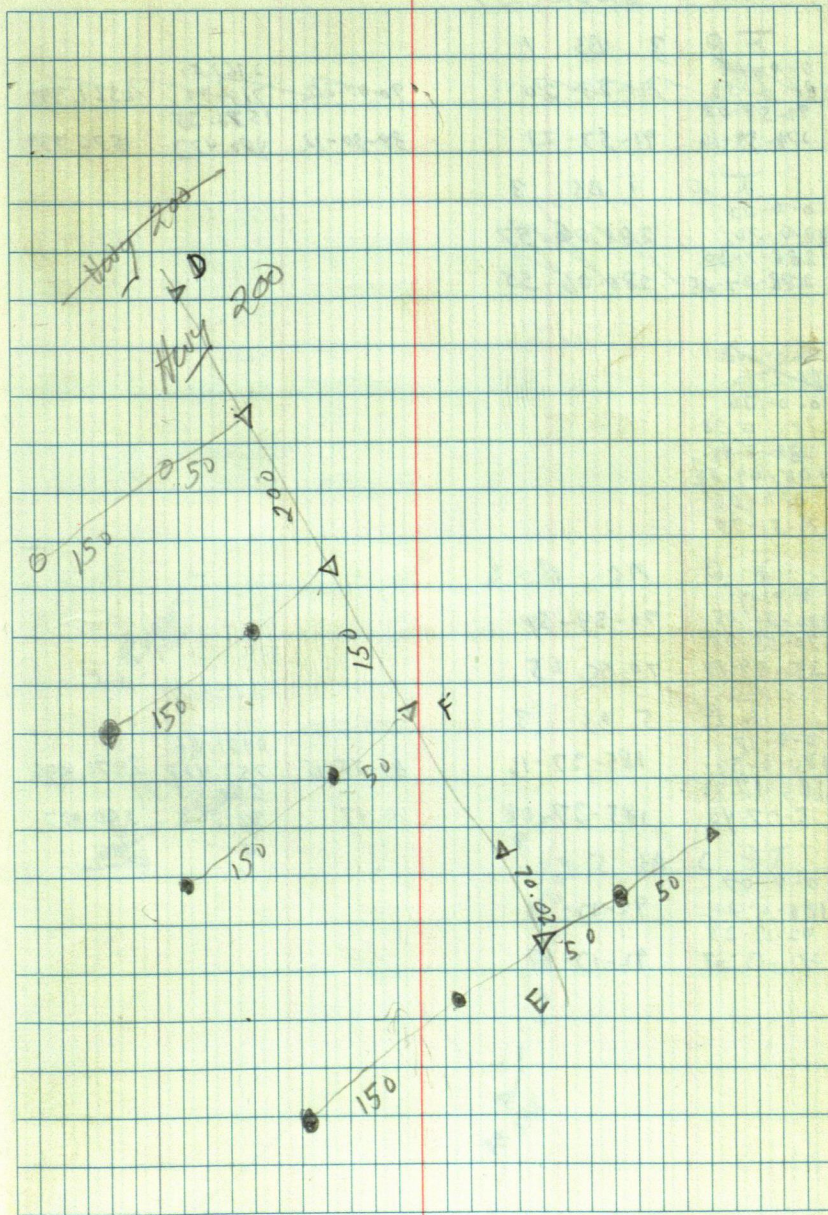
20





D

	1021.04	
90-02-37	311.212	1021.042
	509.09	
269-57-14	155.17	509.087





GARY ANDREWS

T	C	3	BS	1
0-0-48				
180-0-53		21-53-20		
91-54-08				
4 271-54-16		91-53-21		
		89-50-12		

T	C	1	BS	3
0-0-35				
180-0-30		288-06-57		
288-7-30				
2 288-07-25		288-06-55		

~~0-0-10~~  
~~288-17-0~~  
~~0-0-30~~  
~~180-0-38~~  
~~288-8-48~~  
~~108-09-02~~  
~~0-0-06~~  
~~71-51-37~~

T	C	MC	BS	2
0-0-14				
180-0-05		70-54-54		
70-55-02				
5 250-55-10		70-55-05		

T	C	5	BS	3
0-0-17				
180-0-32		185-37-16		
185-37-33				
1 5-27-40		185-37-08		

T	C	3	BS	5
0-0-07				
180-0-20		92-13-16		
92-13-23				
4 271-13-27		92-13-17		

~~0-0-10~~  
~~288-17-0~~  
~~0-0-30~~  
~~180-0-38~~  
~~288-8-48~~  
~~108-09-02~~  
~~0-0-06~~  
~~71-51-37~~

MC  
 1/2 MC  
 13-01  
 AS

MC  
 1/2 MC  
 13-01  
 AS  
 OLD RR  
 GND



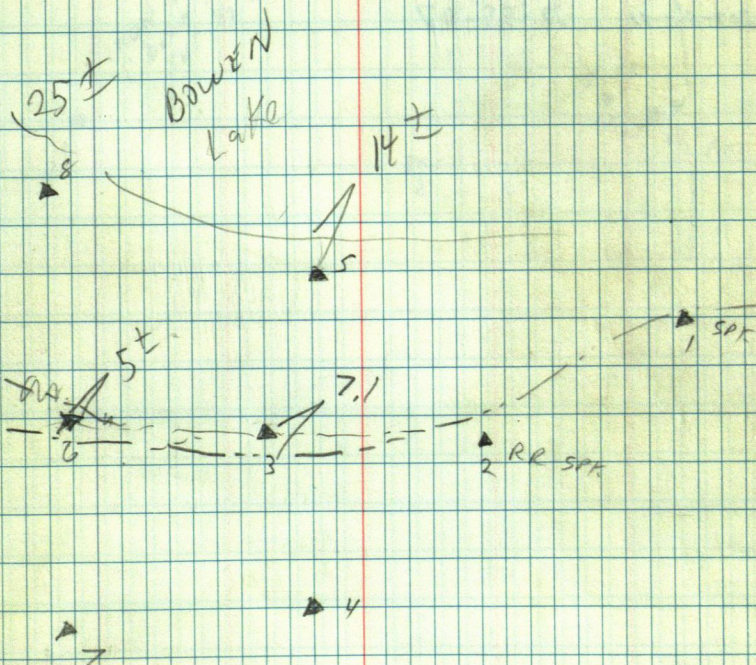
DAVE ANDERSON

0-0-30	2 BS 1			
180-0-42	199-10-18			
199-10-56				
3 19-11-00	199-10-20			
0-0-13	3 BS 2			
180-0-16	97-26-39	90-01-22	297.96 90.815	297.953
97-26-52			131.11	
4 277-26-58	97-26-43	271-11-39	39.89 7.1	131.076
	164-31-03			
164-31-16			191.04	
6 344-31-11	164-30-56	270-27-17	58.238	191.047
	284-33-04		14.5 82.49	
284-33-19				
5 104-33-16	284-33-01	265-13-55	25.144	82.206
00-00-34	124-30-54	90-58-51	191.00 52.215	190.968
180-00-41			103.93	
124-31-22	124-30-47	83-23-46	31.673 24.5	103.235
7 304-31-28				
	302-08-58			
302-09-32			168.74	
8 122-09-33	302-08-52	93-03-06	51.441 4.9	168.514

E. CURRO  
B. EDIE  
D. FARMER

23

6-18-89





# MORLE BRANDANGER

TP 2 BS 1

20-0-05	105-07-03	89-43-16	172.40	172.391
190-0-05			52.5-44	
105-7-74	105-07-01	98-24-32	88.19	88.12
3 285-7-6	184-18-31		26.888	
184-18-42	184-18-30	96-48-33	82.74	82.158
4 4-11-35			25.22	

TP 4 BS 2

20-0-04	27-55-06
190-0-04	
27-55-10	
5 207-55-11	27-55-07

E. CURD  
B. EDIE 24  
D. FARNUM  
6-19-89

1" IRON PIPE  
1" DOWN  
5' SET  
1" RE P.D.  
TOP

3 1/4" 48"  
0  
5 1/4"  
12.63  
1/2" P.M.C.

2



GARY ANDREWS

π @ 15 BS 1			
0-1-08	173-19-17	90-22-12	605.60
180-1-05			144.59
173-20-25			605.591
16 352-20-24	173-19-19	89-25-15	378.47
0-0-01			115,353
186-4-47	186-40-47		378.441

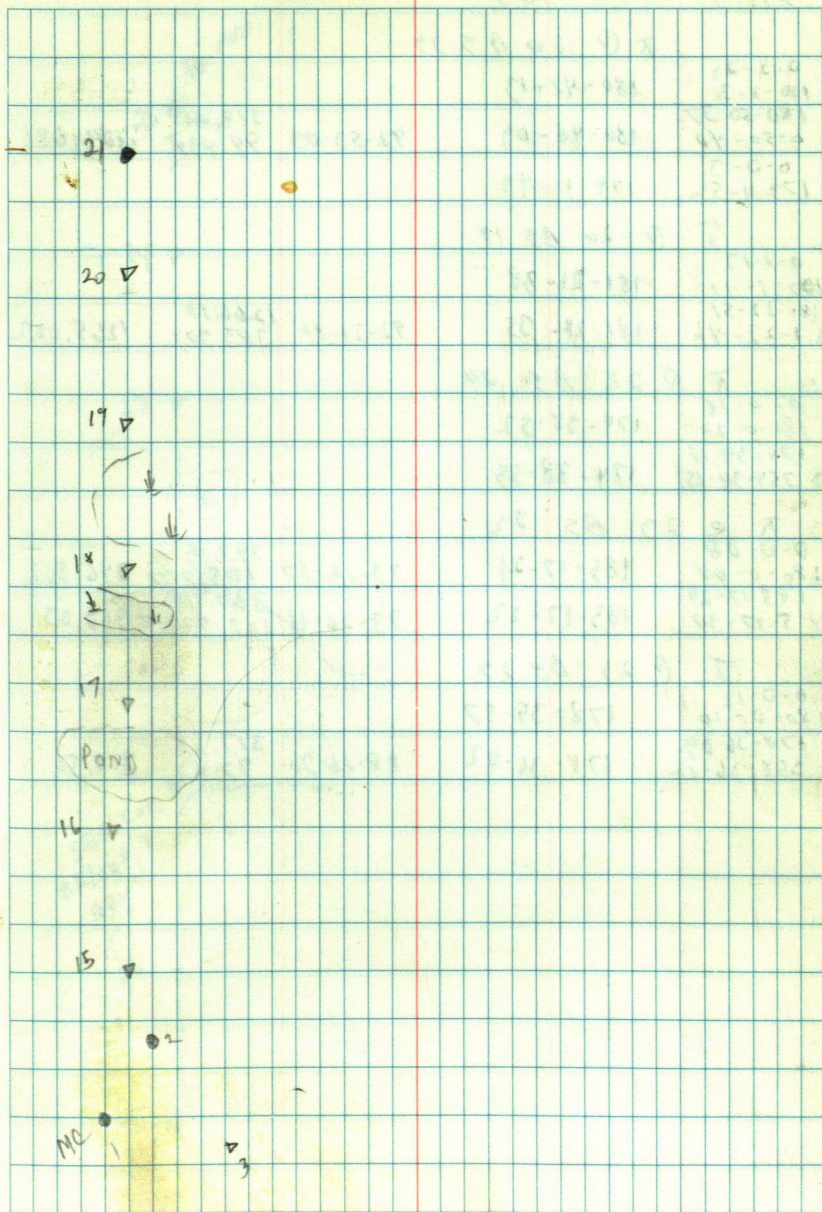
π @ 16 BS 1			
0-1-01	183-09-07		
180-1-20			
183-08-15	183-07-05	89-1-52	538.97
17 3-8-25			167.227
0-0-21			538.885
176-53-17	176-52-56		

π @ 1 BS 15			
0-0-10	74-20-07		
180-0-19			
74-20-17	74-20-04		
3 254-20-23			
0-0-05			
285-40-01	285-39-56		

π @ 17 BS 16			
0-0-05	186-52-50		
180-0-08			
186-52-55	186-52-47		
18 6-52-55			
0-1-54	173-07-16		
173-9-10			

π @ 18 BS 17			
0-0-15	170-54-25	90-10-24	713.45
180-0-24			126.016
170-54-40			642.20
19 350-54-50	170-54-26	89-36-50	195.744
0-2-08			642.185
189-7-36	189-05-28		

π @ 19 BS 18			
0-0-06	182-08-17		
174-59-57			
182-08-23	182-08-28	88-48-53	1114.77
20 2-08-25			339.60
0-0-22			1113.928
177-51-54	177-51-32		





GARY ANDREWS

T @ 20 AS 19

0-2-24				
180-2-31	180-48-13			
180-50-37			310.02	
21 0-50-40	180-48-09	92-53-03	94.494	309.626
0-0-3				
179-11-52	179-11-49			

T @ 20 AS 19

0-1-13				
180-1-11	181-21-38			
181-22-51			1266.10	
22 1-22-46	181-21-35	92-21-40	387.909	1265.022

T @ 22 AS 20

0-0-18				
180-0-20	174-38-52			
174-39-10				
23 354-39-15	174-38-55			

T @ 23 AS 22

0-0-08			347.13	
180-0-08	185-17-21	93-16-57	105.807	346.562
185-17-29			360.68	
24 5-17-30	185-17-22	93-26-26	107.936	360.03

T @ 24 AS 23

0-0-12				
180-0-10	178-35-57			
178-36-09			319.64	
25 354-36-12	178-36-02	88-16-30	97.43	319.50

26

25  
POND

24

23

22  
POND

21  
SEE COR  
BRIDGE  
DOWN

20

19



DICH MARINUCCI

$\pi$  @ 3 B 5 1

0-1-35			257.62	
186-1-43	186-90-08	90-9-10	78.553	257.668
186-31-43			197.96	
4 6-31-50	186-30-07	87-13-47	60.359	197.762

$\pi$  @ 4 B 5 3

0-1-31				
180-1-29	159-41-11			
159-42-42				
5 339-42-48	159-41-19			

$\pi$  @ 5 B 5 4

0-1-40				
180-1-33	198-32-34	92-52-20	144.60	144.408
198-34-14				
6 18-24-20	198-32-47	91-03	190.18	190.148

27

$\frac{1}{2}$

2 • 0.008/100

159.5  
250-06-30  
75  
4

5

4



DSRS

VERMILION LK

T @ 2 BS 3

0-01-13			2975.48	
180-1-26	179-26-44	91-56-51	906.983	2973.749
179-27-57			426.02	
1 359-27-58	179-26-32	91-16-26	129.85	425.911

T @ 2 BS 1

0-0-30				
180-0-28	180-33-23			
180-33-53				
3 000-33-49	180-33-21			

T @ 3 BS 2

0-1-0			2975.40	
180-1-10	179-50-04	88-05-48	906.904	2973.749
179-51-04			1857.08	
4 359-51-04	179-50-04	92-17-42	566.095	1855.577

T @ 3 BS 4

0-0-42				
180-0-32	180-09-50			
180-10-32				
2 0-10-25	180-09-53			

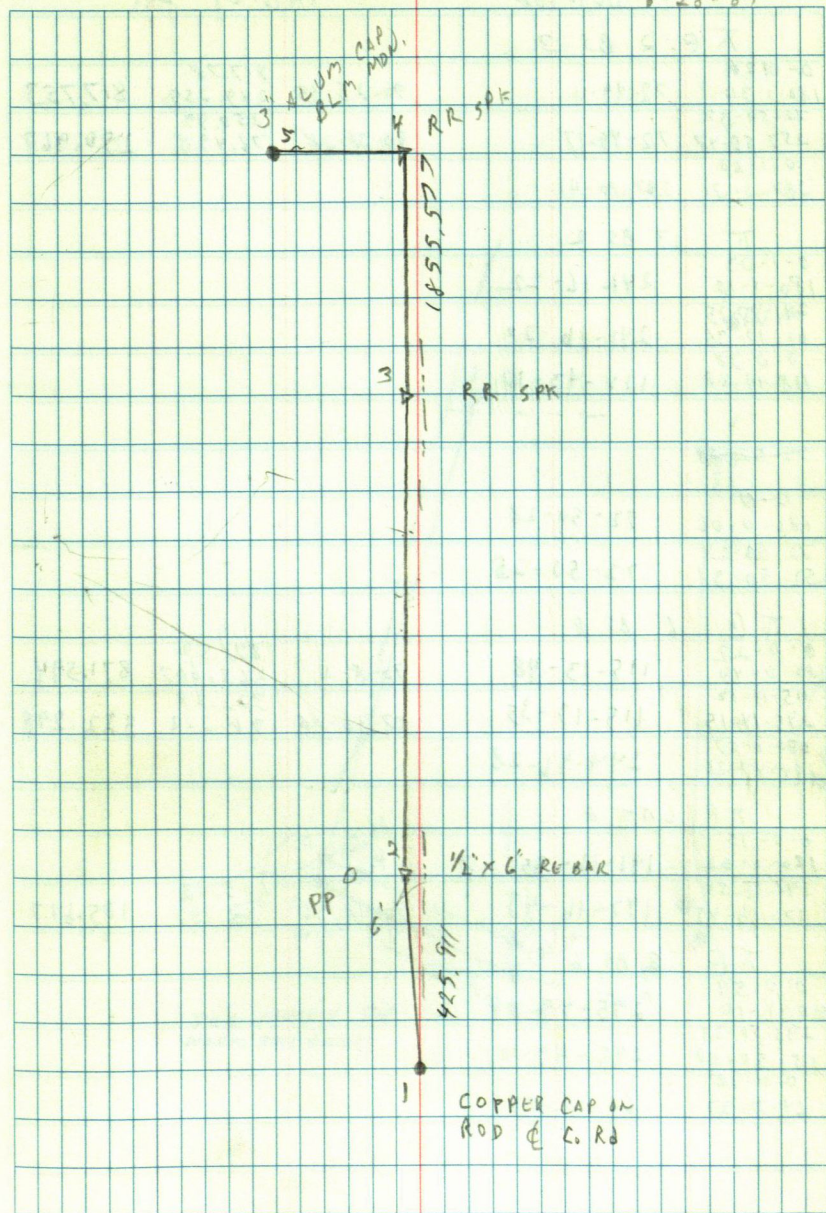
T @ 4 BS 3

0-0-52			1856.95	
180-1-04	97-13-12	87-44-54	566.00	1855.501
97-14-04			132.00	
5 277-14-04	97-12-58	91-0-20	40.235	131.988

0-0-06				
179-59-50	262-46-50			
262-46-56				
82-46-42	262-46-52			

75°-05' CLOUDY WINDY  
WILD T2  
K-E AUTO ANGLE

H. CURD  
TIM WATSKY 28  
6-28-89





# BENSON

# RAINEY LK

TP 2 BS 3

0-0128			817.78	
180-1-30	72-49-11	90-25-35	249.259	817.753
72-50-37			250.99	
5 252-50-47	72-49-17	90-38-28	76.498	250.967
0-1-50				
287-12-31	287-10-41			

TP 3 BS 2

0-1-03				
180-1-15	241-16-22			
241-17-25				
6 61-17-36	241-16-20			
0-0-38				
118-44-08	118-47-30			

72-52-28

0-0				
180-0-06	72-50-28			
72-50-28				
252-50-31	72-50-25			

TP 6 BS 8

0-0-22			871.59	
180-0-40	115-13-48	90-8-6	265.667	871.594
115-14-10			322.58	
3 295-14-15	115-13-35	87-36-45	98.322	322.298
000-0-57				
244-47-25	244-46-28			

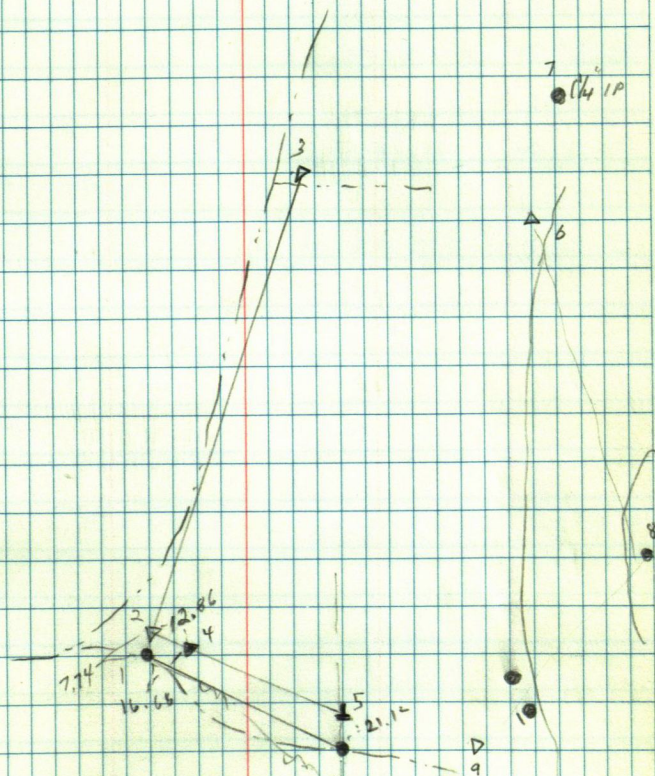
TP 6 BS 8

0-0-15				
180-0-02	191-16-35			
197-16-50			105.62	
7 12-16-45	197-16-43	90-12-46	32.192	105.617

TP 8 BS 6

0-0-59				
180-1-10	295-49-04			
295-50-03				
9 115-50-10	295-49-0			
0-0-18				
64-11-20	64-11-05			

29



SEE SURVEY AND  
NORMAL EXPLANATION



0-0-17	182-43-42	91-21-06	578.38	578.228
180-0-27			176.297	
182-43-59	182-43-32	89-1-38	263.67	263.597
5 2-43-59			80.354	
0-0-22	177-16-26			
177-16-48				



PITTINGER

X @ 2 05 1

73-22-42

~~90-15-24~~

3 146-45-12 73-22-36 90-15-24 180.39 54.98 180.384

X @ 3 05 2

12-39-06

4 25-17-38 12-38-49

16-18-24

5 32-36-20 16-18-10

195-43-30

6 31-24 195-42-0

31

← 99.60 3 47.76 110.10 ← 5

2 RD SPR

Rd EAST MOUNT

HABLE WOOD  
500' E



BIA

ROADSIDE MILL LAC LA

T@ 2 BS 1

180-0-0

87-06-23

1311.69

399.80 1311.52

3

91-27-55

1309.57

399.153 1309.11

T@ 2 BS 4

0-0-42

180-13-03

90-44-54

90-49-54

2641.73

805.179 2641.674

3

90-45-36

270-46-0

90-32-57

0-0-14

269-27-17

269-27-03

T@ 5

BS 2

0-0-24

181-35-30

88-59-45

1647.06

502.022 1646.797

6

181-35-58

0-1-32

180-1-36

302-19-17

302-20-49

9

122-21-02

302-19-26

90-04-25

1522.76

464.137 1522.752

0-3-38

180-3-37

316-13-30

316-17-08

8

136-17-11

316-13-33

89-20-19

1751.14

533.743 1751.001

0-3-53

180-3-53

152-19-40

152-23-33

7

332-23-36

152-19-43

90-6-33

2744.98

836.674 2744.97

T@ 7 BS 5

0-0-37

180-0-50

118-33-57

118-34-34

11

298-34-34

118-33-44

90-17-56

1381.89

427.196 1381.858

T@ 7 BS 5

0-0-12

179-59-57

189-20-35

119-20-47

12

299-20-40

119-20-43

T@ 12 BS 7

0-0-17

180-0-34

183-34-65

90-1-43

2021.92

616.278 2021.906

183-34-22

13

3-34-35

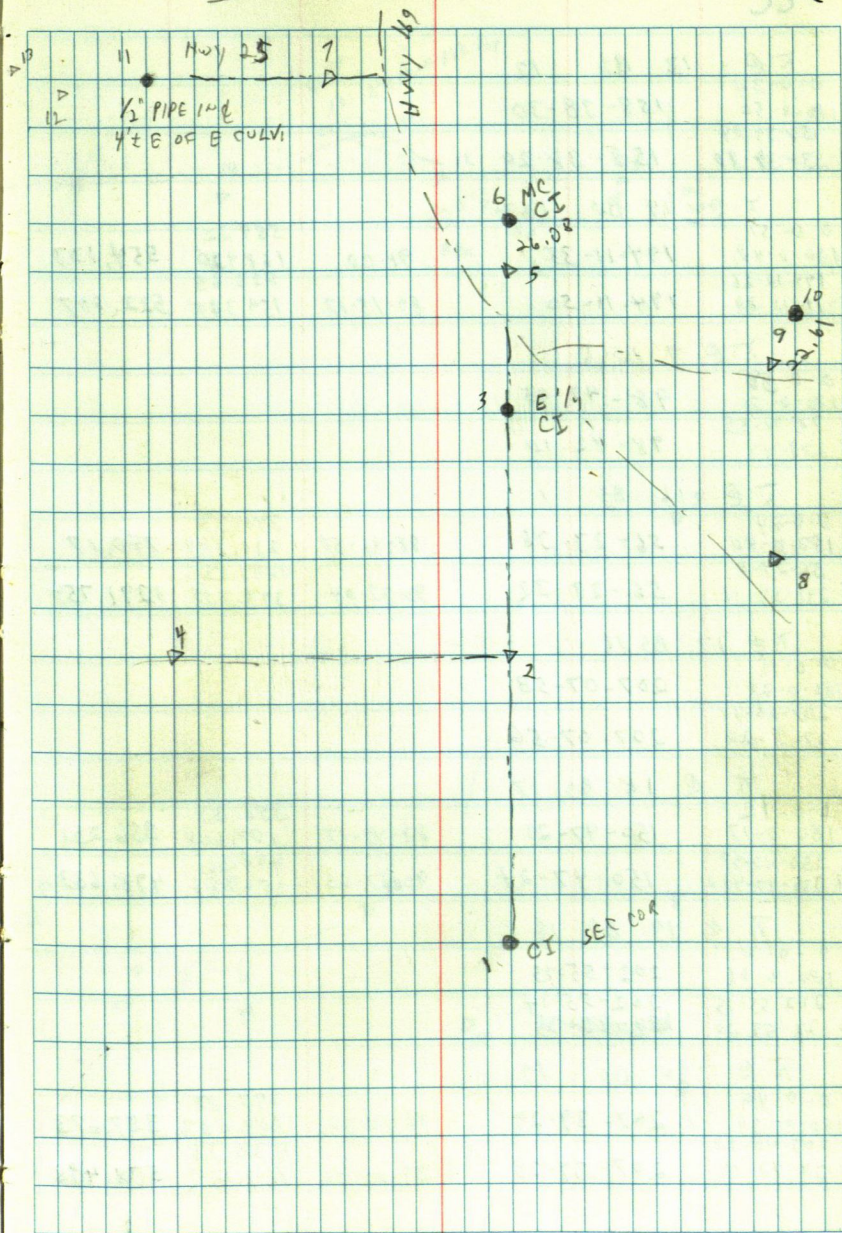
183-34-01

90-0-40

1364.93

416.039 1364.938

32





0-0-34	13	B5	12			
180-0-50		158-38-30				
158-39-04						
14 338-39-90		158-38-20				
0-0-51	14	B5	13			
180-0-48		194-11-35		91-00	554.22	554.133
194-12-26					168.926	522.69
15 14-12-30		194-11-50		89-15-17	159.348	522.647

0.0-50	98-42-05
180-0-50	
98-42-55	
10 228-42	98-42-10

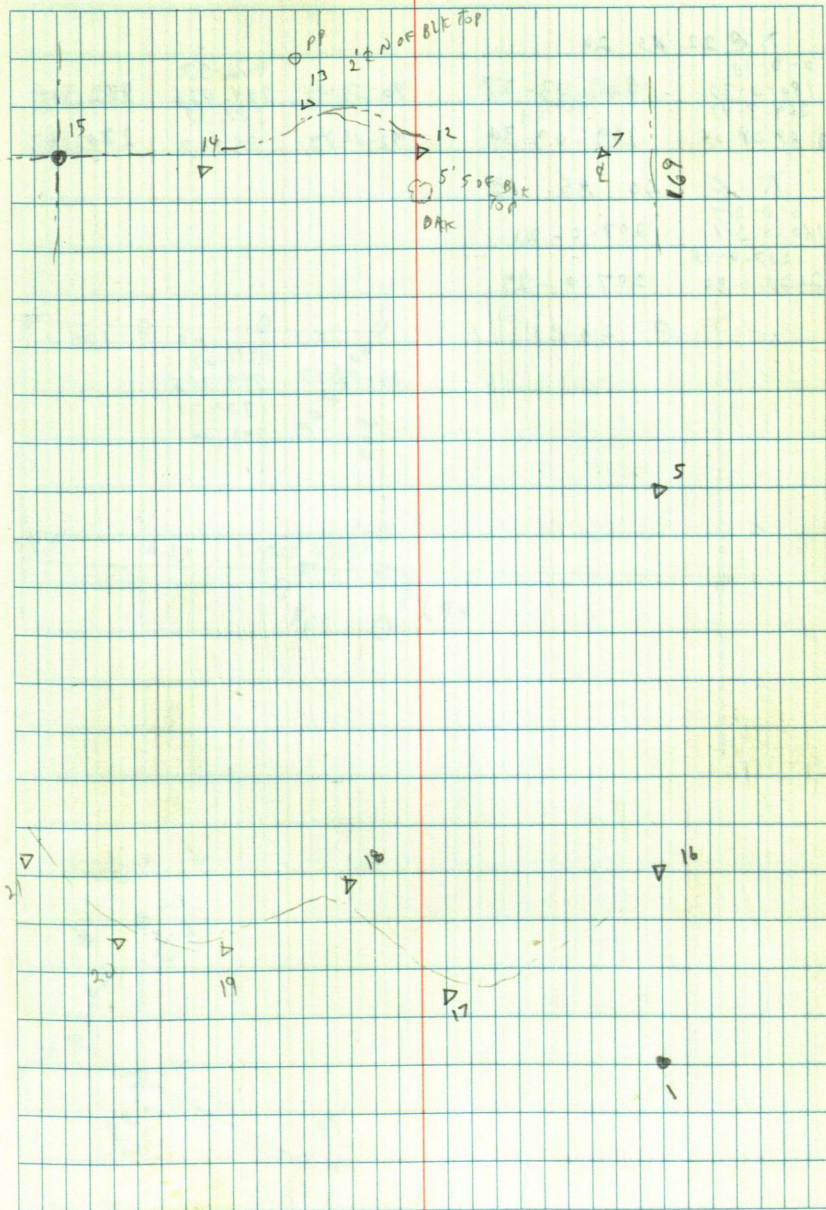
	T	Q	16	B5	1			
	0-0-24						740.33	
	182-0-40		56-23-36			88-46-58	225.65	740.17
	56-24-0						1291.85	
17	211-24-12		56-23-32			90-32-04	393.755	1291.754

17	207-07-58
18	207-07-56

0-0-12	150-47-21	88-49-17	356.33	
180-0-17			108.608	356.251
150-47-33			498.66	
19 238-47-41	150-47-24	90-27-05	151.986	498.633

$\pi \in 14 \text{ BS } 18$   
 $0-0-0$   
 $180-0-06$        $202-55-15$   
 $202-55-15$        $202-55-14$   
 $20 \ 22-55-20$        $189-47-35$

$\lambda$	$\theta$	20	05	19			
0-0-49						357.97	
180-0-50		207-39-29		88-14-40		109.062	357.673
207-40-18						538.56	
21 27-40-18		207-39-28		89-09-32		164.152	538.498





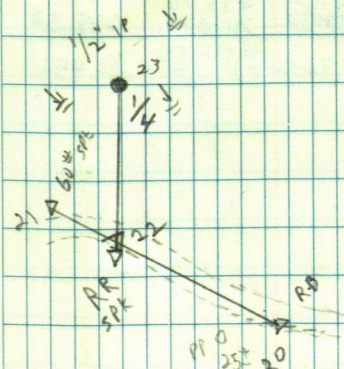
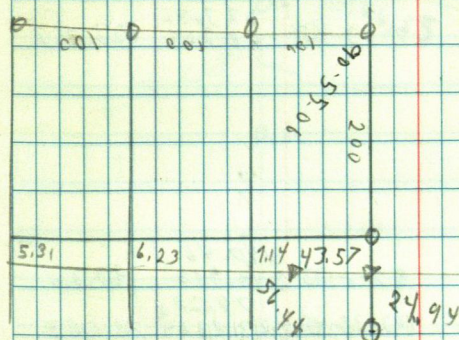
0-0-18	269-03-27	90-54-04	472.57	
180-0-30			144.036	472.504
269-3-15			280.37	
23 89-04-04	269-03-34	92-11-13	85.457	280.163

$\Delta C$	20 85 19
$0.0-27$	
$180.0-27$	207-0-21
$207.0-48$	
$22-27.0-50$	207-0-29

$\overline{A} @ 2AB5 \quad 1$

89-08-47	1311.64
	399.785
	1309.71
	399.20

3





61A

TC 1 BS A

172-46.6

TC 2 BS 1

2 50-57-32

TC 3 BS 2

0-0-37			95.69	
180-0-40	178-20-13	92-57-08	29.163	95.563
178-20-50			223.82	
4 358-21-6	178-20-20	91-23-45	68.223	223.757

TC 4 BS 7

0-0-22		
180-0-23	180-19-15	
180-19-37		
5 0-19-40	180-19-17	

TC 5 BS 4

0-0-10			147.46	
180-0-16	188-51-50	87-1-35	44.946	147.26
188-51-0			78.20	
6 8-52-02	188-51-46	103-25-45	27.836	76.063

89-54-36	336.72	
	102.643	336.74

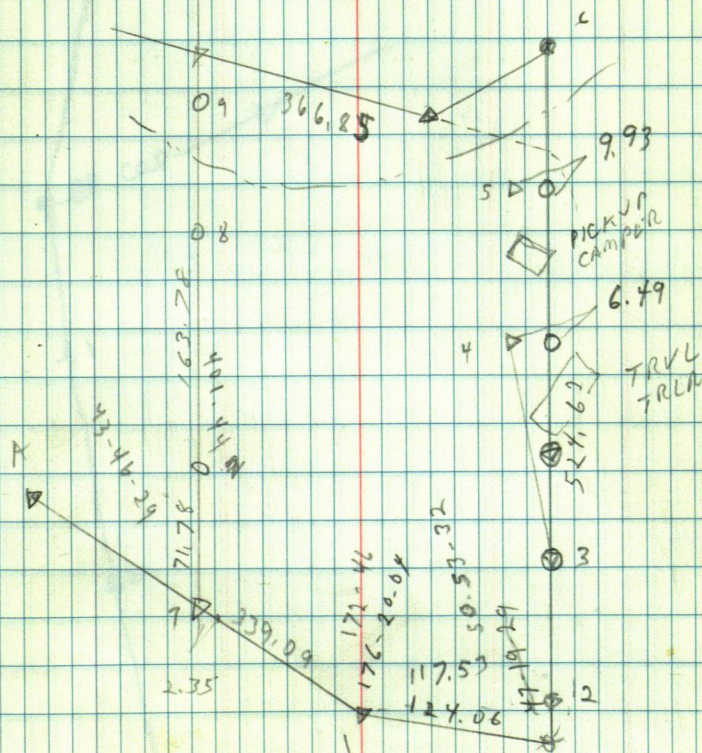
TC 8 BS 9

87-58-30	235.73	
	71.84	235.50
100-36-50	25.259	
	82.87	81.452

9

35

MILL LACS





TC 185 BPCap

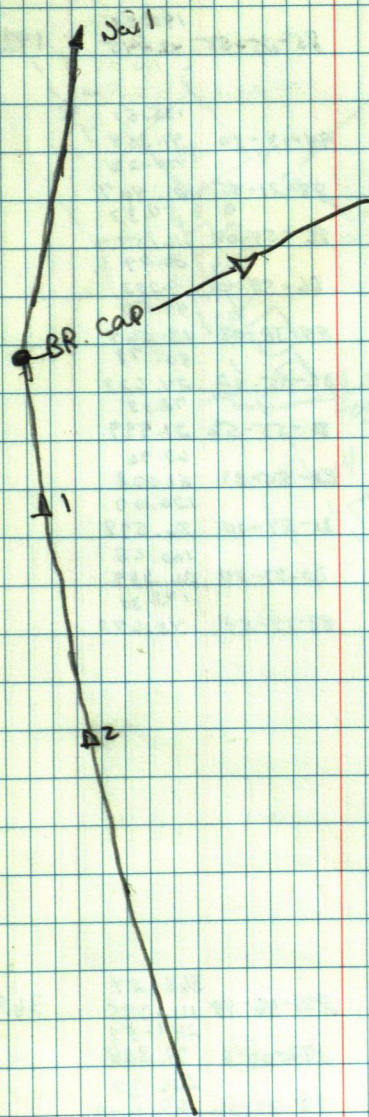
	119.70	
95-17-38	86.482	119.184
	205.55	
269-95-11	62.651	205.546

Pine Point

B. Edie 7/12/89

36

J. WATSHKE





B. Edie 7/13/89  
J. Watcher  
Clear Lt. wind

37

TC1

2 85-25-53 142.53 142.08

TC3BS1

0-0-0	135.51
279-03-29	41.304
198-06-47	70.23
259-48-21	88-21-45 21.407
	54.33
251-24-58	86-54-08 16.559
	30.29
220-38-30	86-59-46 9.223
	44.50
218-53-27	84-36-08 13.564
	80.78
211-14-54	84-45-42 24.623
	72.18
202-12-54	83-55-52 21.999
	68.72
176-44-35	83-55-31 21.008
	120.07
162-05-13	81-54-18 36.598
	102.65
154-25-53	80-37-30 31.289
	143.30
	83-19-54 43.678

TC2BS1

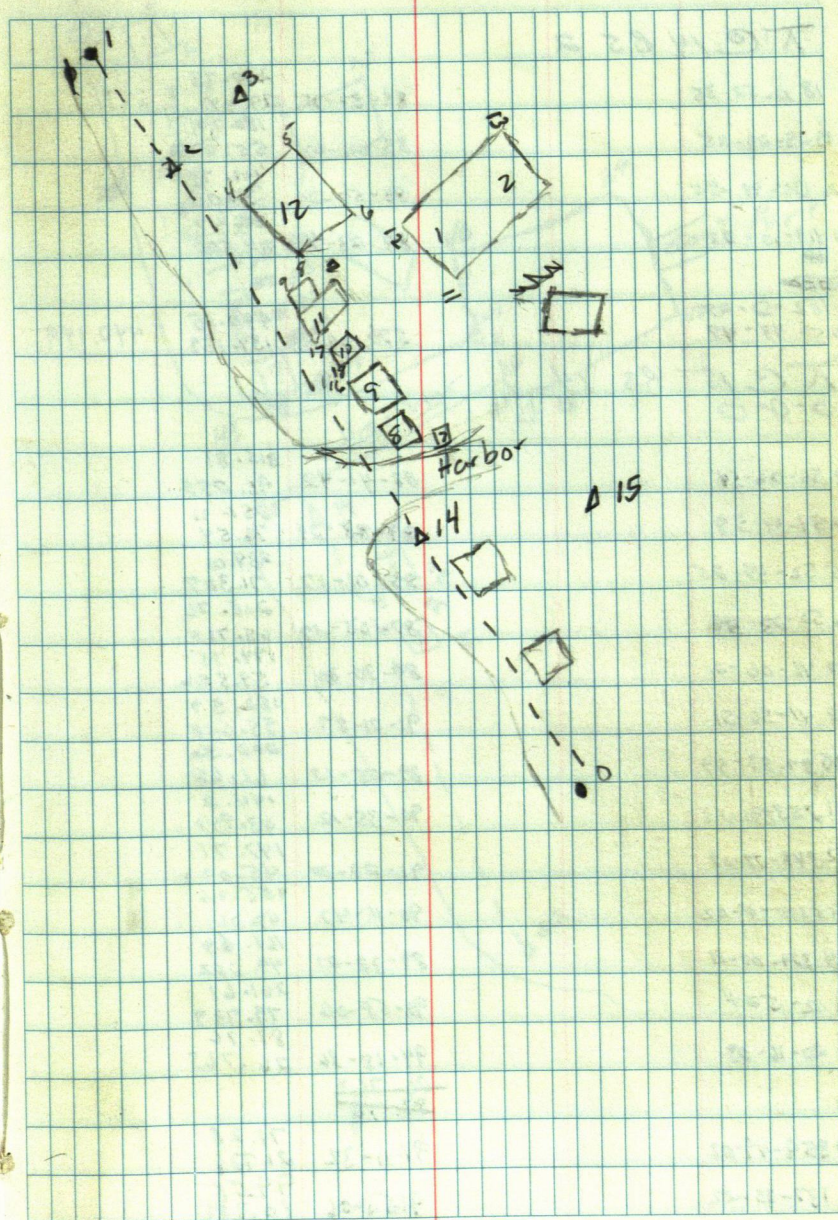
0-0-0  
69-5-1-06  
139-40-13

TC2BS1

0-0-0  
176-31-29  
1353-02-53

TC14BS2

0-0-0	365.24	365.062
93-54-25	271-46-49 111.325	
187-48-47	240.59	
	272-08-11 73.328	
20-44-82	226.38	
	95-25-36 69.600	
	279.00	
11-28-47	96-02-55 84.721	





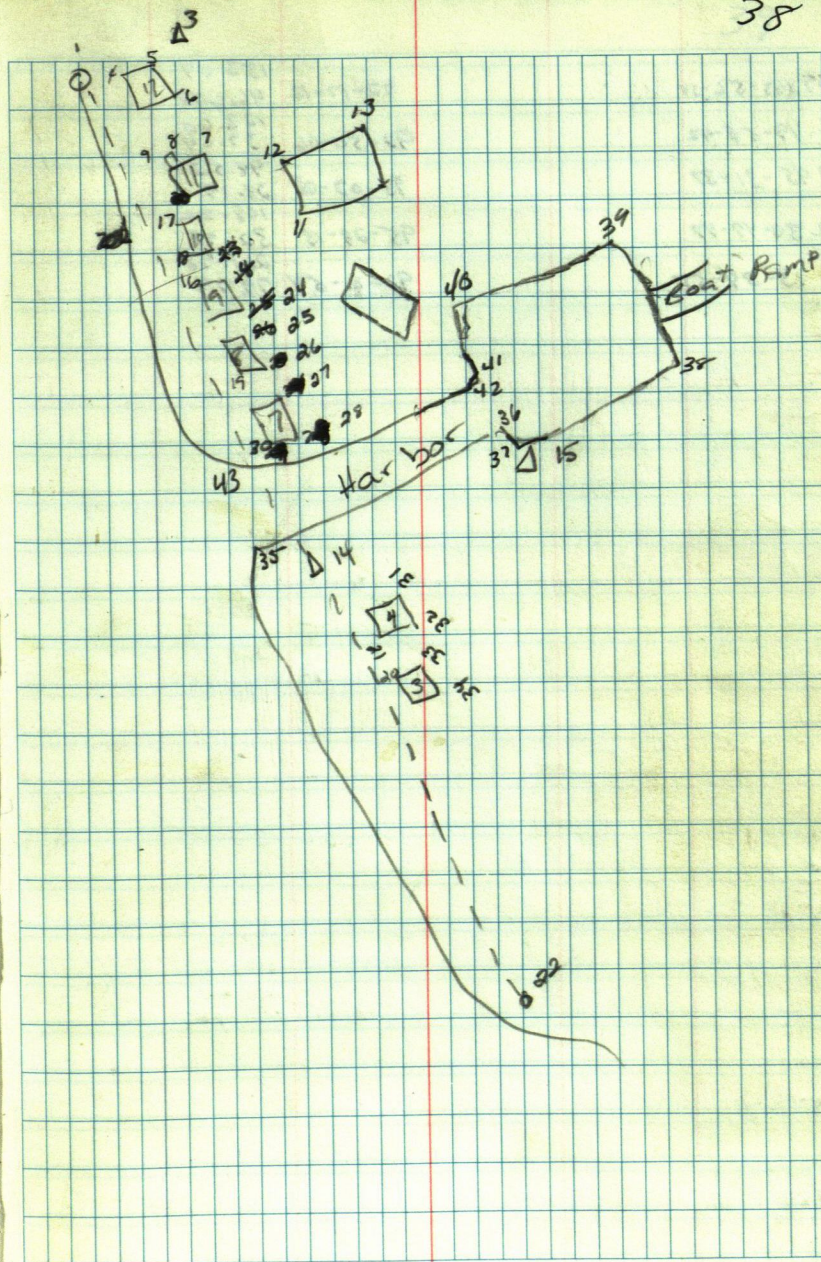
TC 14852

18 12-52-35	85-37-11	260.73	
		79.471	
		180.70	
19 25-29-25	85-04-02	55.076	
		101.74	
20 135-98-55	83-50-30	31.011	
		80.47	
21 119-10-38	84-23-43	24.528	
182-50-05		440.15	
25-44-48	270-09-05	134.159	440.149

TC 158514  
0-0-0

23 56-06-54	88-41-42	315.81	
		96.259	
		251.11	
24 54-04-58	89-38-24	76.54	
		234.01	
25 52-49-25	88-01-17	71.327	
		215.76	
26 50-23-36	87-05-17	65.764	
		194.75	
27 46-06-21	89-30-20	59.556	
		182.59	
28 41-56-51	91-21-37	55.648	
		202.36	
30 37-33-49	89-05-13	61.68	
		144.2	
31 353-30-25	90-35-12	43.949	
		147.71	
32 346-27-08	91-28-20	45.022	
		155.06	
33 335-09-02	90-11-47	42.261	
		161.69	
34 329-00-21	89-38-21	79.282	
		261.61	
35 02-50-11	91-58-06	79.739	
		87.76	
36 20-16-23	94-18-36	26.763	
		26.763	
		87.76	
37 354-49-02	91-11-32	71.28	
		21.728	
		99.88	
38 137-33-22	91-55-06	30.351	

38





39 103-56-58

40 49-58-42

41 45-31-37

42 30-47-47

43 13-34-55

92-17-12

92-50-06

95-02-08

95-28-13

92-01-54

153.04

46.644

123.60

37.64

94.53

28.79

108.22

32.78

261.78

79.79



GARY ANDREWS

I@2 BS1

VERT.

270-02-00  
3 180-44-01

I@3 BS2

2

92-08-35 492.37 1521.208 498.632

4

270-49-23 907.75 276.681 907.658

I@5 BS4

269-02-12  
6 269-02-12 269-09-07 269-09-04

I@5 BS4

4 269-02-08 271-37-05 428.85 130.711 428.673  
269-02-08 961.10  
6 178-04-12 269-02-06 267-37-24 272.947 960.275

I@6 BS5

190-29-21  
7 190-29-21 190-29-20  
20-58-39

I@7 BS6

167-58-19 89-57-43 2154.14 656.588 2154.155  
167-58-19 390.56  
335-56-32 167-58-16 276-08-31 119.043 390.56

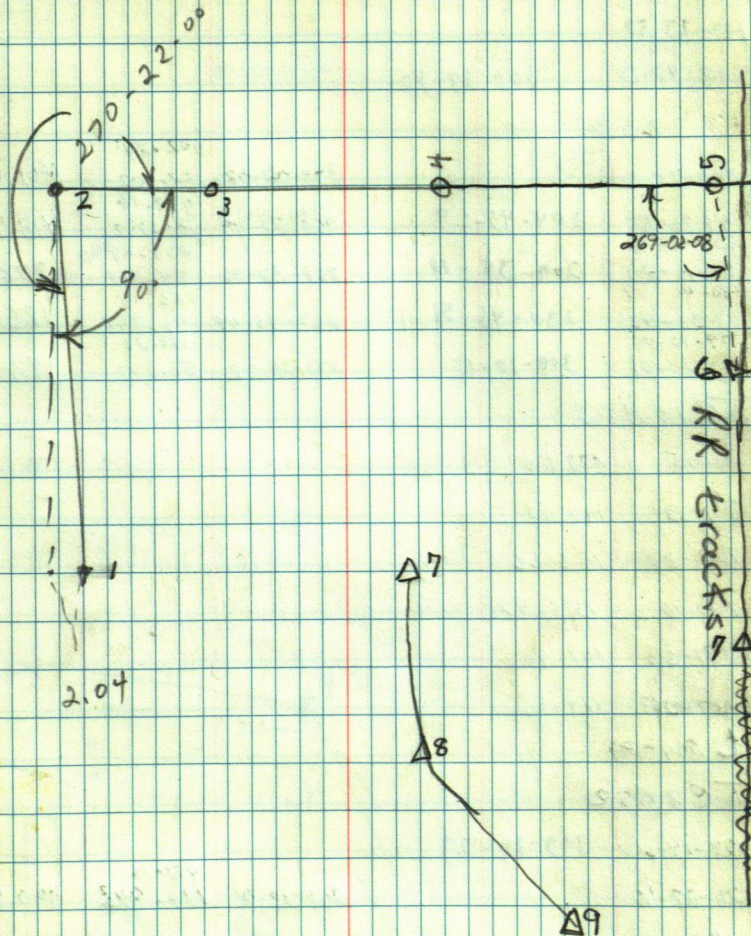
I@8 BS7

171-37-45  
9 171-37-45 171-31-42  
343-15-23

7/19/89  
D. FARNAM - B. EIDE

Plenty HOT, SUNNY - DEER FLIES

40





PINE PT

109-27-53 TC 2 BS 1

109-27-52

3 218-47-24 109-27-42

TC 3 BS 2

204-45-30

273-02-08

402.24

122.602

401.673

5 49-30-53

204-45-29

268-22-49

419.16

127.762

418.987

6 59-16-20

209-38-10

268-32-06

278.28

84.818

278.185

7 101-35-42

230-46-51

267-46-48

156.18

56.746

186.178

8 309-10-09

309-10-11

270-28-32

183.32

55.877

183.314

9 258-20-21

TC 12 BS 3

8 94-05

173.67

9 95-32

147.63

10 107-30

156.66

11 109-10

158.47

13 131-50

101.40

14 137-25

114.66

TC 204-29

TC 3 BS 2

193-14-20

193-14-23

4 26-28-46

268-13-18

441-10

134.442

440.877

5 309-28-48

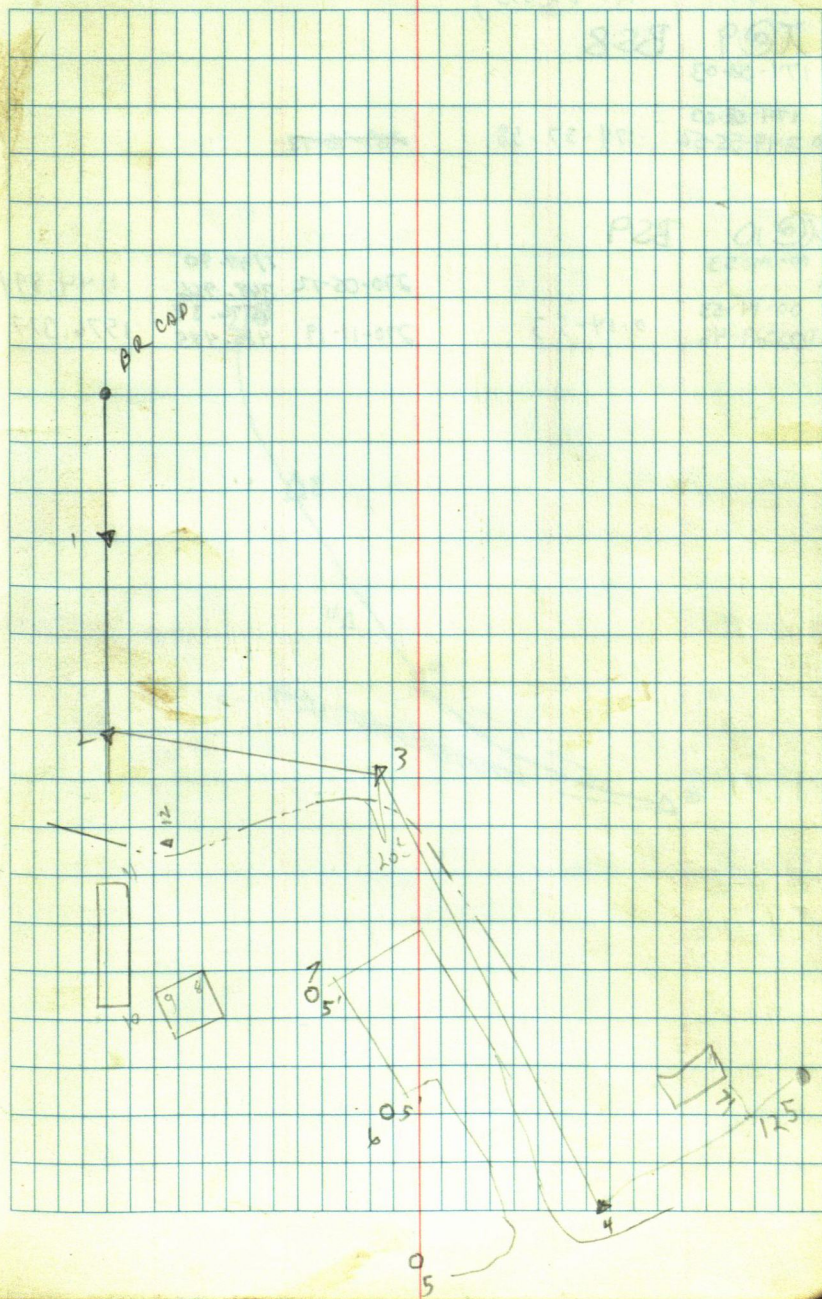
TC 4 BS

9 96-45-34

15 193-30-58

96-45-30

41





ARMY ANDREWS

$\pi @ 9$  BS8

174-58-03

174-58-03

10 349-55-56 .174-57-58

~~267-48-48~~

$\pi @ 10$  BS9

9 00-14-53

270-05-12

1144.90

1144,894

00-14-53

348.966

1576.39

1576,377

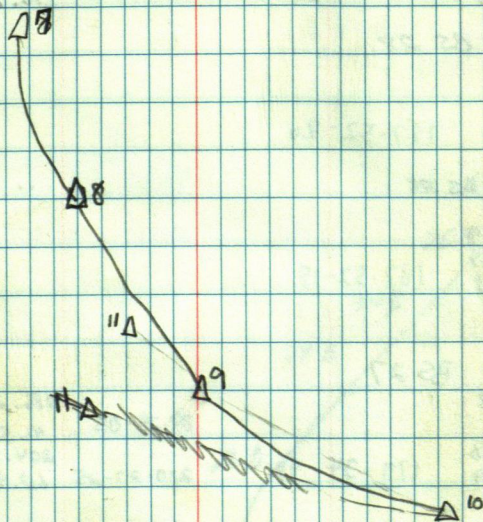
1100-29-46

0-14-53

270-11-19

480.485

42





# PINE POINT

VERT.

TC29 BS30

197-28-14  
197-28-14

28 34-56-14 197-28-07

TC28 BS29

177-08-24

90-18-07

173.91

173.904

177-08-24

177-08-24

269-44-03

53.006

230.30

70.195

230.296

27 354-16-48

TC27 BS28

187-52-35

187-52-35

26 15-44-37

187-52-20

TC27 BS28

187-52-19

187-52-19

2 15-44-29

187-52-15

TC26 BS27

179-34-48

89-28-05

136.27

136.275

25 179-34-48

25 359-09-19

179-34-40

270-27-25

41.536

204.81

62.428

204.806

TC25 BS26

179-58-33

24 179-58-33

24 359-57-06

179-58-33

JULY 20, 1989

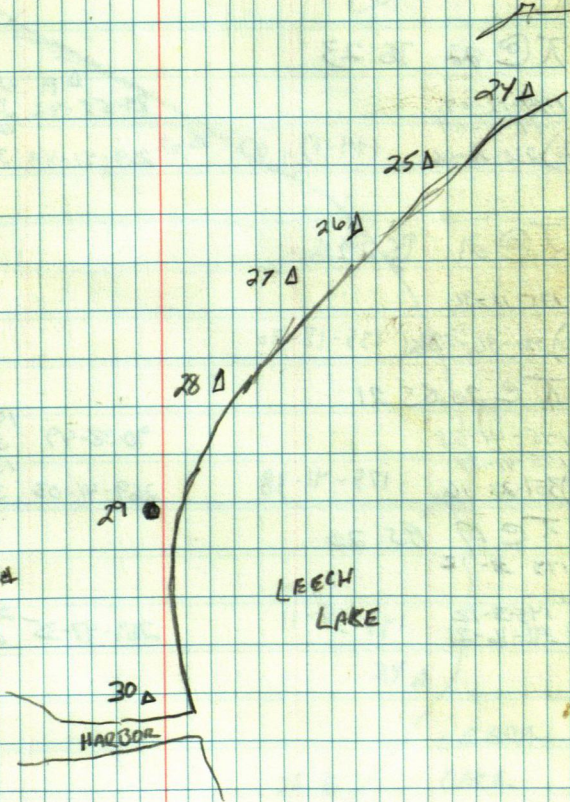
D. FARNAM - B. EDIE

SUNNY - HOT

93

BIG LEECH  
RESORT

LEECH  
LAKE





# PINE POINT

TC 24 BS 25

162-40-24	89-39-37	202.69	202.682
162-40-24		61.228	
23) 325-20-98	269-50-38	134.45	134.448
162-40-24		40.980	

TC 23 BS 24

169-04-24	169-04-22
169-04-24	
22) 338-08-43	

TC 22 BS 23

144-13-07	89-58-42	130.95	130.945
144-13-07		39.911	
21) 288-26-06	269-41-49	123.59	123.591
144-13-07		37.672	

TC 21 BS 22

135-12-31	135-18-30
20) 220-36-59	

TC 20 BS 21

175-41-38	90-38-49	105.29	105.284
175-41-38		32.093	
19) 351-23-16	269-41-03	130.56	130.558
175-41-38		39.795	

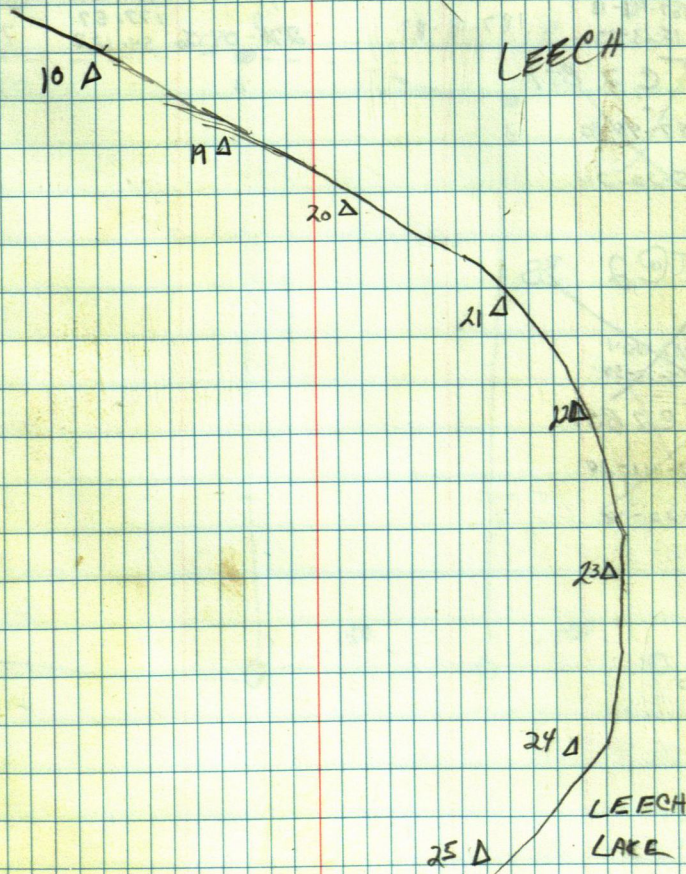
TC 19 BS 20

145-38-12	145-38-11	269-47-35	215.584
145-38-12		215.57	
10) 211-16-21		65.710	

JULY 20th 1989  
D. FARNAM - B. EDIE

SUNNY - HOT - LOTS OF DEERFLIES

44





PITTMAN

~~TC 2 BS 1~~

~~187-41-24~~

~~3 15-22-18~~

TC 2 BS 1

1) 187-

187-41-13

3) 15-23-25

187-41-13

92-30-12	150.04	149.907
	45.739	
	177.57	
276-04-06	54.123	176.552

~~TC 2 BS 1~~

~~187-41-30~~

~~15-22-24~~

TC 2 BS 1

1)

187-41-24

3) 15-22-30

~~TC 2 BS 1~~

~~187-41-24~~

~~3 15-22-18~~

B. Edie  
D. Farnam

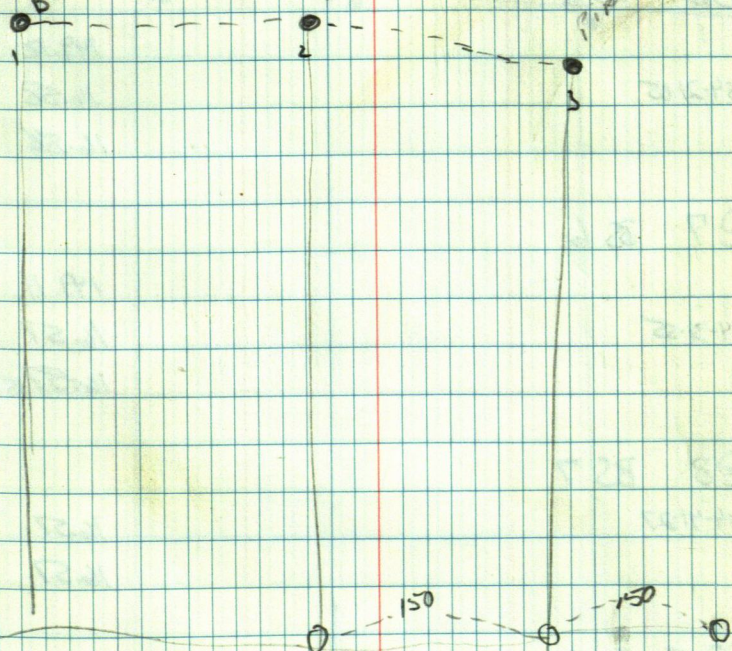
45

Lecur

Be Cao

PIPE

PIPE





PITTINGER

I@3 BS1

4) 110-36-30

7.73'

5)

37.41

6)

196.41

I@6 BS3

7)

149.12

14) 84-21-05

16.58

13)

16.58

I@7 BS6

8)

149.11

12) 84-31-55

16.57

11)

16.57 15.47

I@8 BS7

10) 84-41-27

16.57

9)

16.57

I@5 BS6

10) 85-53-10

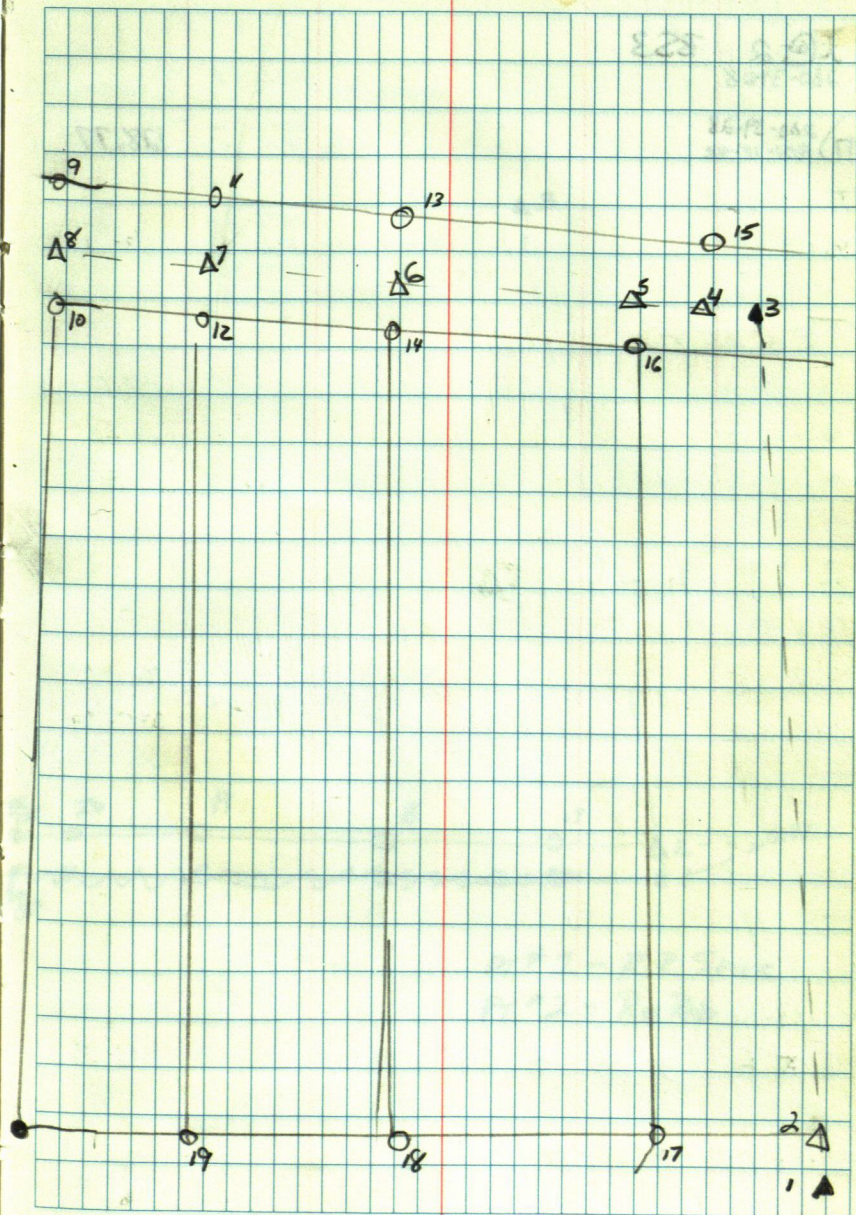
16.54

I@4 BS6

15) 90-00-00

16.50

46





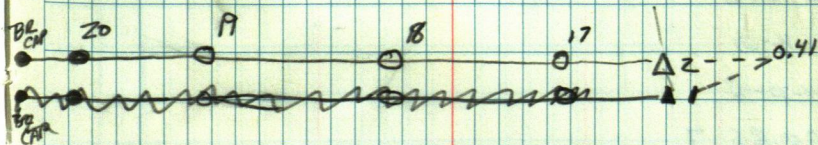
IC 2 BS3

280-3928

17) 280-39-28  
201-18-92

128.77

47



PT #1 - R.R. SPIKE

PT #2 - RE ROD



D. D. VORCHER

TC2 BS 1

179-54-25

90-18-52

1656.58

504.926

1656.548

3) 357-48-48

269-56-31

3016.36

919.385

3016.347

TC4 BS 3

90-37-44

270-24-04

1694.26

516.411

1694.212

5) 181-15-42

268-58-55

383.92

117.018

387.856

TC5 BS 4

219-86-03

6) 79-52-12

TC5 BS 4

219-56-06

219-56-06

7) 79-52-17

219-56-09

TC6 BS 5

171-31-38

89-40-12

211.97

64.607

211.963

7) 343-02-00

91-42-46

358.52

109.278

358.39

TC7 BS 6

152-16-21

8) 304-32-48

TC8 BS 7

180-46-29

89-02-00

216.26

65.916

216.228

9) 1-33-00

269-20-59

137.10

42.397

139.089

TC 3 BS 4

0-33-22

70-27-42

1694.16

516.377

4) 1-6-28

0-33-14

ON 160M

RD

A3

A4 A5 A6  
TRAILER

A2

A8

A9

TURTLE LAKE TOWN HALL

CONCRETE # 1378



XMAS PT. RD (CUMVERTS)

	BS	FS
Bm#4	2.28	
TP	1.51	8.42
TP	0.545	14.03
TP	1.4	9.69
INVERT	9.88	11.06
INVERT	14.125	14.065
TP	9.85	4.12
Bm#5		2.335

JULY 26<sup>th</sup>, 1989

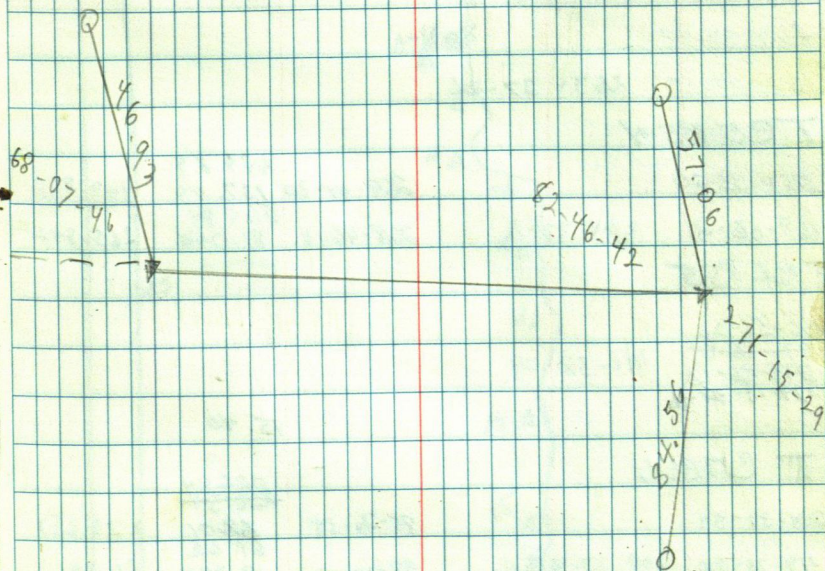
SUNNY-HOT-88°  
D. FARNAM-B. EDE 49



WILSON BEAL

PN RIVER

50





WHITE FISH LAKE

TC2B51

89-50-46

3 179-41-22

89-50-41

TC3B52

177-47-28

4 355-35-00

TC4B53

263-37-27

167-14-57 263-37-26

TC5B54

264-33-20

6 169-06-21 264-33-11

TC6B55

146-58-02

7 274-18-04  
293-56-18  
129-19-50

146-58-09

15.40

TC7B56

204-37-54

9 49-15-35 204-37-48

8 148-27-50

95-20-54

98-10-12

226.44  
206.34

69.01

61.62

18.785

51.58

225.657

61.00

TC9B57

7)

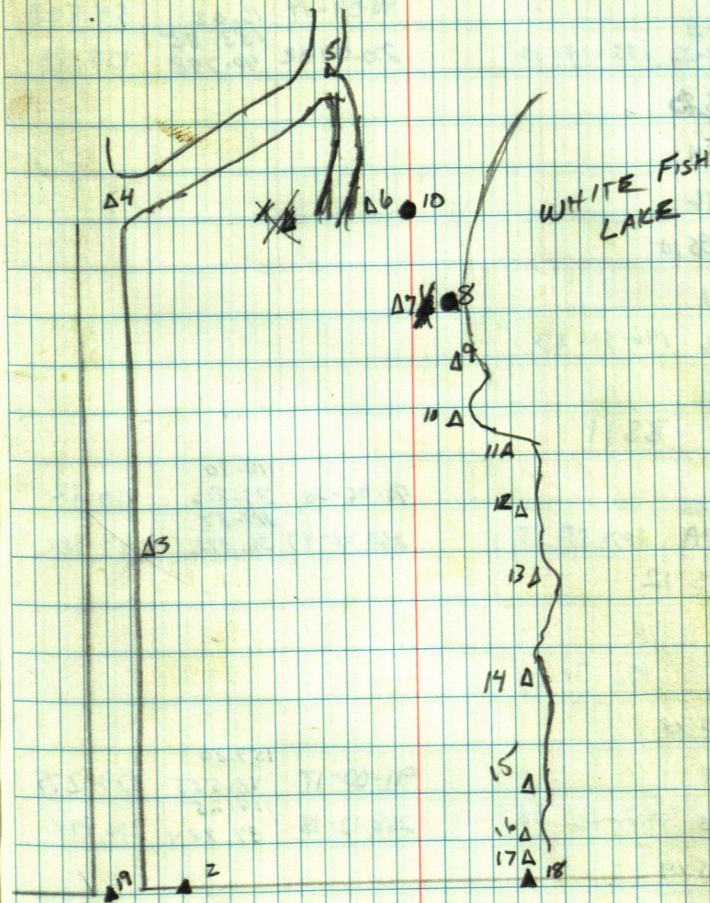
265-48-24

10) 171-36-20 265-48-16

JULY 28, 1989

D. FARNAM - B. EDE - JIM WATSCHE

51





# WHITEFISH LAKE

TC 10 BS 9

9) 132-19-13

90-04-14 54.53 16.62 54.528

11) 132-19-13 264-38-26 192-19-13

270-09-02 133.85 40.798 133.85

~~TC 11 BS 10~~

~~146-30-54~~

~~273-09-16~~

TC 11 BS 10

1) 146-31-31

12) 283-02-46 146-31-23

TC 12 BS 11

11) 207-55-58

90-06-20 110.90 33.816 110.92

13) 55-51-49 207-55-55

269-48-47 36.892 119.381

TC 13 BS 12

191-31-23

14) 23-02-50 191-31-25

TC 14 BS 13

147-46-49

91-00-17 159.20 48.555 159.275

15) 294-33-35 147-16-48

268-12-18 114.25 34.884 114.194

TC 15 BS 14

229-31-12 229-31-12

16) 99-02-24

TC 17 BS 16

16) 126-42-12

91-16-38

10) 253-24-26 126-42-13

274-20-35

125.43 38.320 125.54  
200.24 61.032 199.662

JULY 28, 1989

52

D. FARNHAM - B. EDIE - J. WATSON



White fish Lake

Te 188517

285-36-42  
19 211-12-59

285-36-30

271-11-03

618.88

188.637

618.747

July 28, 1989

53



LEG ARMSTRONG

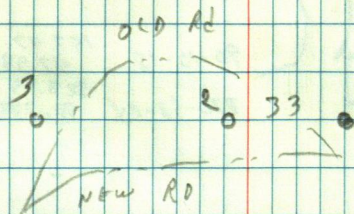
TA 2 BS 3

00-00-34  
180-00-35 269-51-26  
269-52-00  
1 89-51-57 269-51-22

92-10-03 252.17  
76.859 251.984

July 28, 1989

54



1 33



Longville Landfill

TC 2 BS 1

1) 183-51-29

268-59-15 1434.04  
437.095

3) 07-42-38

270-17-12 ~~1434.04~~ 643.46  
437.095 196.128

TP 3 BS 2

283-22-06

206-04-11  
4) ~~283-22-06~~

TP 4 BS 3

146-54-36

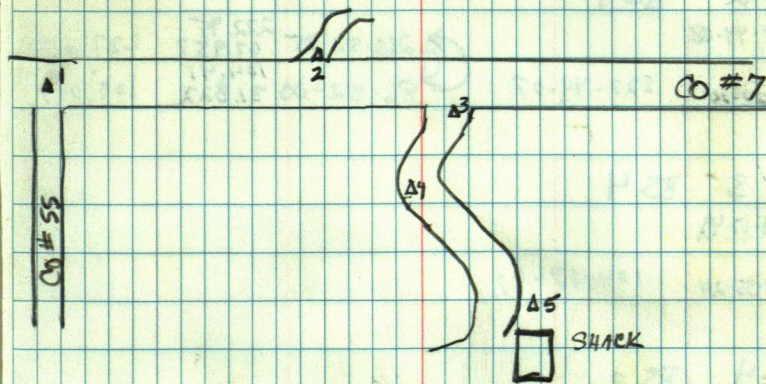
90-10-18 157.47  
47.997

5) 293-49-06

270-58-24 323.95  
98.739

July 28 1989 Dale Farnham, Bill E., Jim Warschke

55





# BOY LAKE

TC 2 BS 1

1) 227-44-08

2) 95-28-14 227-44-07

260-52-35 222.95  
67.957 222.619  
86-52-00 104.41  
31.822 109.085

TC 3 BS 4

4) 104-17-49

2) 208-35-24 104-17-42

TC 4 BS 3

202-18-25

90-07-50

176.11  
53.680 176.112

5) 44-36-38 202-18-19

89-31-38

205.08  
62.507 205.07

TC 5 BS 4

1) 181-55-49

2) 3-51-20 181-55-46

TC 6 BS 5

5) 158-07-21

268-43-44

191.22  
58.279 191.164

7) 316-14-40 158-07-20

268-39-39

266.84  
81.332 266.764

TC 7 BS 6

TC 8 BS 7

1) 165-06-26

8) 336-12-38 165-06-19

TC 8 BS 7

190-51-17

90-55-20

847.86  
75.547 247.829

9) 21-42-25 190.51-13

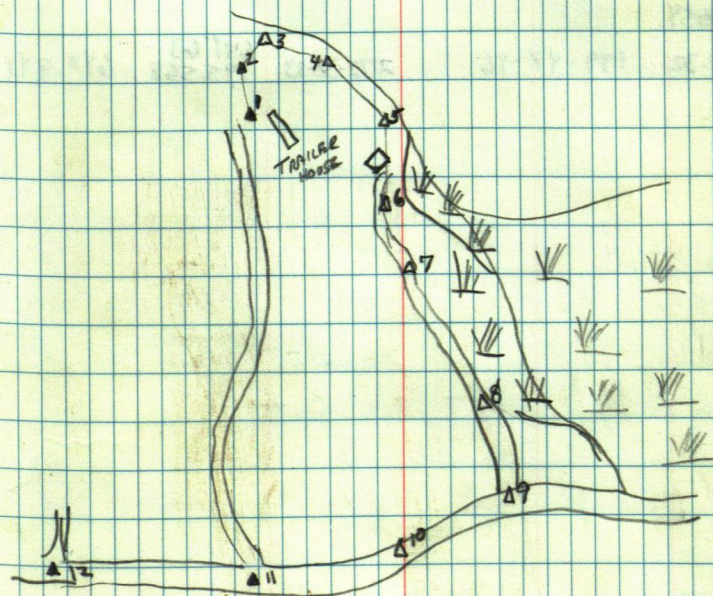
208-54-30

160.85  
47.025 160.817

July 31, 1989

B. EDIE - J. WATSON - J. FARNHAM

56





## BOY LAKE

I@9 BS8

8) 312-41-51

10 265-23-34 312-41-47

I@10 BS9

9) 161-49-38

266-50-03 <sup>260.03</sup>  
79.258 259.637

11) 323-39-12 161-49-36

270-24-44 <sup>538.27</sup>  
164.064 598.253

I@11 BS10

10) 199-48-54

12) 39-37-32 199-48-46

272-38-33 <sup>641.63</sup>  
195.562 640.944

July 31, 1989

57

B. EDIE - J. WATSCHE - D. FARNAM



SMOKY POINT

IC 1	BS 16
------	-------

271-16-12

2 182-32-12

7C2B51

1)	89-52-00	267.08	81.408	267.0814
----	----------	--------	--------	----------

3)	271-51-00	30.265	99.2451
----	-----------	--------	---------

104853

3)			88-29-03	326.99 99.662	326.8667
----	--	--	----------	------------------	----------

5) 271-49-36 250.69 76.408 250.5577

TAPED from BR. CAP to P<sub>T</sub> #1 10.39 FEET

XC5B54

4)	<del>268.05-10</del>	362.79	
6)	268.05-10	110.574	362.578

TC 6 B55

5) 269-13-411

8)	178-27-21	270-06-55	162.28 49.464	162.28
----	-----------	-----------	------------------	--------

Tapped from 6 to 7 3.43 feet

TIES FOR #7 Br. CAP MONUMENT

6" OAK N 45° W 32.12

12" MAPLE N 42° E 34.32

8" POPPER N 80° E 29.83

Aug. 1, 1989

58

B. EDIE - D. FARNAM

$\pi^0$  17 BS 1 10-24-89 80° CLR

0-0-19  
180-0-19

274-28-56	274-28-01
94-28-19	

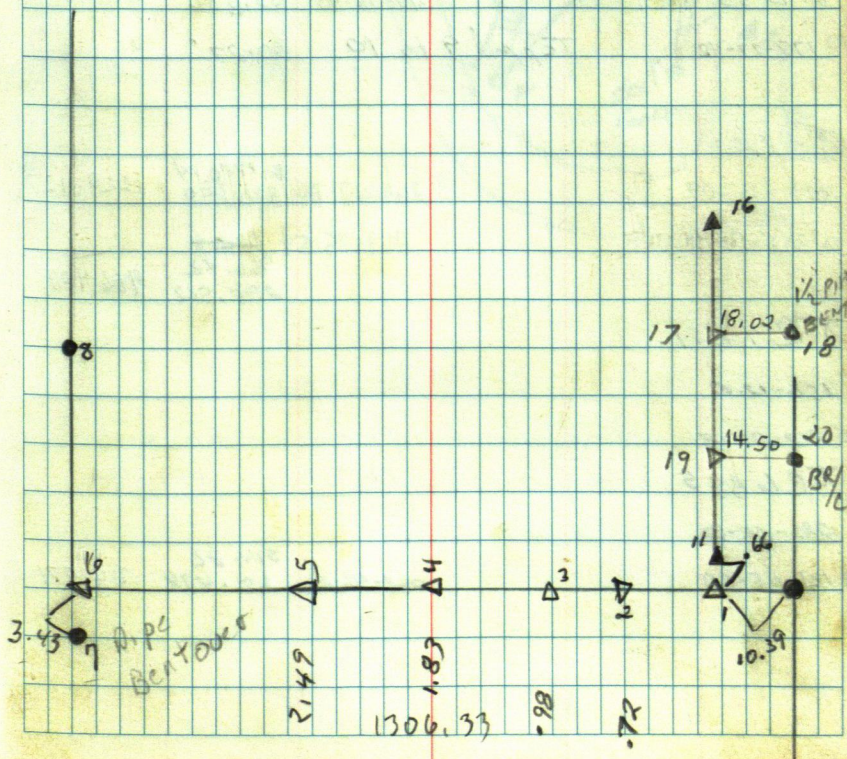
94-28-19 274-28-01 SET 2'x2'x36 PIP

T @ 19 BS 16

0-0-31  
180-1-04 92-15-38

20	92-16-9	92-15-14	(17)	89-59-16	330.55	100.753	330.551
----	---------	----------	------	----------	--------	---------	---------

1	①	88-04-56	331.17 100.943	330.487
---	---	----------	-------------------	---------





ED MAR QURDY

Aug 4, 1989

T@1 B53

50-00-18

5369.2

2) 100-00-35

269-54-07

1636.469

5369.06

24-21-38

1018.73

1018.71

4) 48-43-16

269-40-36

310.509

T@5 B54

274-16-35

269-47-00

351.40

107.106

351.394

6) 188-33-08

262-40-31

265.25

80.849

263.086

7 tapped 140' From 8

T@9 B54

89-13-55

90-18-43

114.00

53.036

173.998

10) 178-27-42

Tapped 9 to 10

20.27'

T@1 B53

321-13-07

269-47-24

3 1220.14

371.899

1220.127

20) 282-26-01

269-45-54

~~966.42~~

966.42

294.562

966.403

T@4 B51

156-12-07

5) 812-24-13

T@6 B55

280-52-30

8) 101-45-00

268-46-20

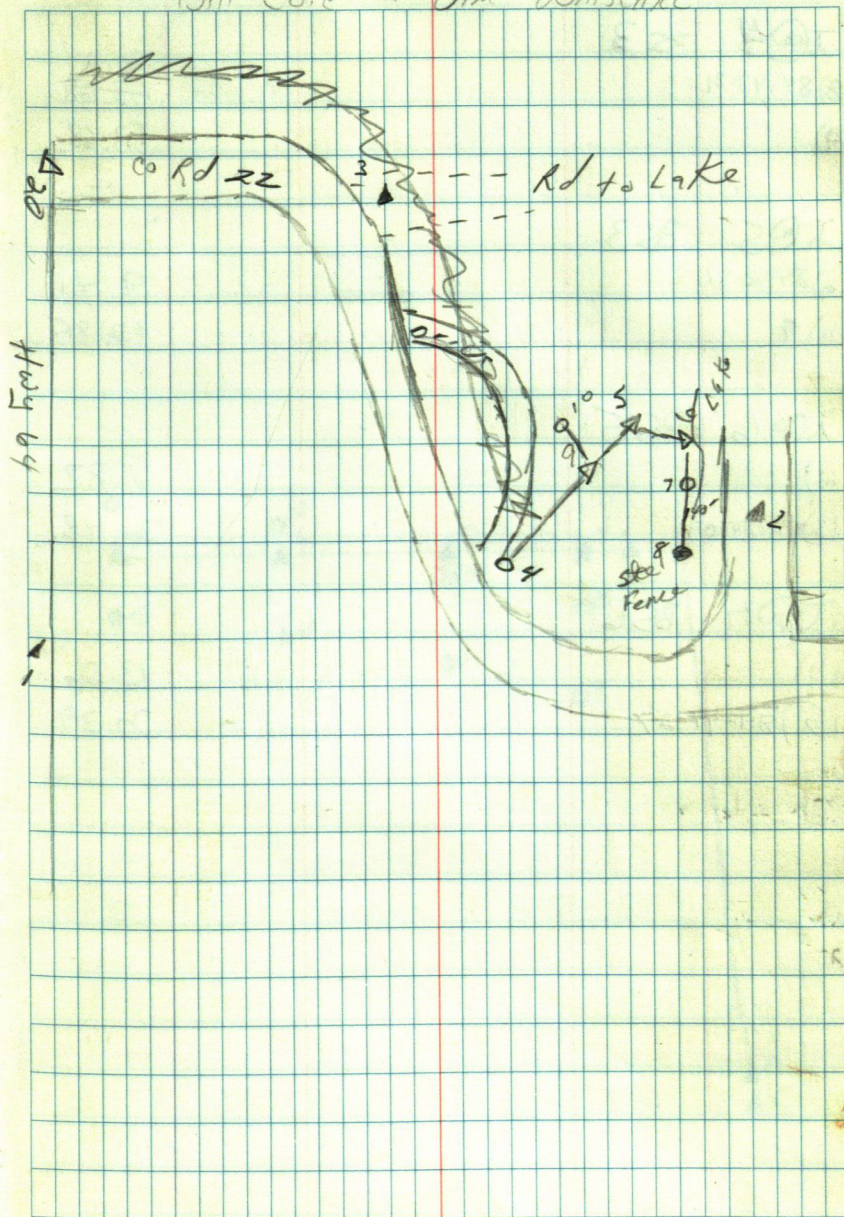
214.82

65.478

214.771

Partly cloudy + warm

Bill Edie + Jim WATSCHKE 59





MARGARET PITTENGER

I@4 BS3

8) 84-47-31

9)

1141.23

20.24

342.68

53.68

53.68

I@5 BS3

6) 84-48-41

10)

9.71

42.85

I@6 BS5

12)

13) 86-24-09

1.82

31.48

I@7 BS6

14)

15) 84-41-27

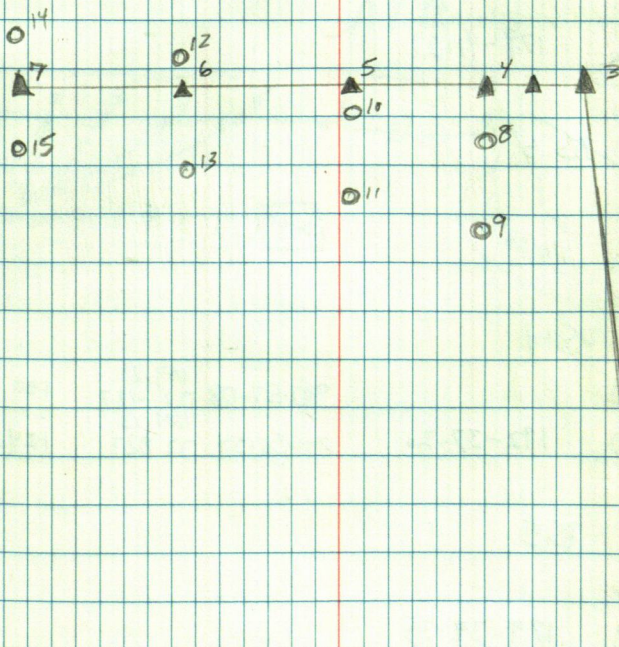
13.06

20.39

AUG, 7, 1989

D. FARNAM - B. EDIE

60





MARGARET PITRANGER

I@2 BS 1

1) 178-53-26

3) 357-46-51 178-53-26

I@3 BS 2

2) 180-25-39

4) 00-51-04 180-25-32

<del>20.475</del> 90-45-27 <del>20.475</del>	99.99 30.475 100.01	99,978
93-27-22	30.483	99,827

I@4 BS 3

3) 179-41-31

5) 359-22-42 179-41-21

~~I@5 BS 4~~

~~4) 172-37-15~~

~~6) 25-14-16~~

I@5 BS 4

2) 192-37-30

6) 25-14-40 192-37-20

90-57-08	109.89 33.487 124.13	109,862
271-52-54	37.837	124,066

I@6 BS 5

5) 179-39-36

7) 359-11-09 179-39-35

I@7 BS 6

6) 172-15-54

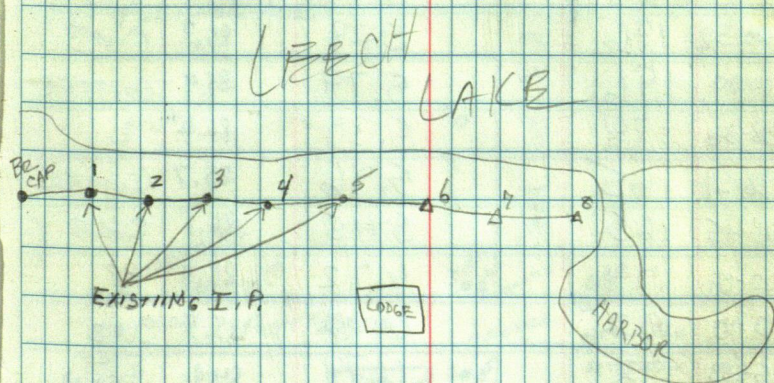
8) 344-31-44 172-15-51

841-26-14	121.10 36.908 128.11	120,557
264-32-44	39.047	127,528

AUG 8, 1989

61

D. FARNHAM - B. FIDIE





# POST OFFICE TOPO

HACKENSACK

H12 1398.69

ELEV.

ELEV

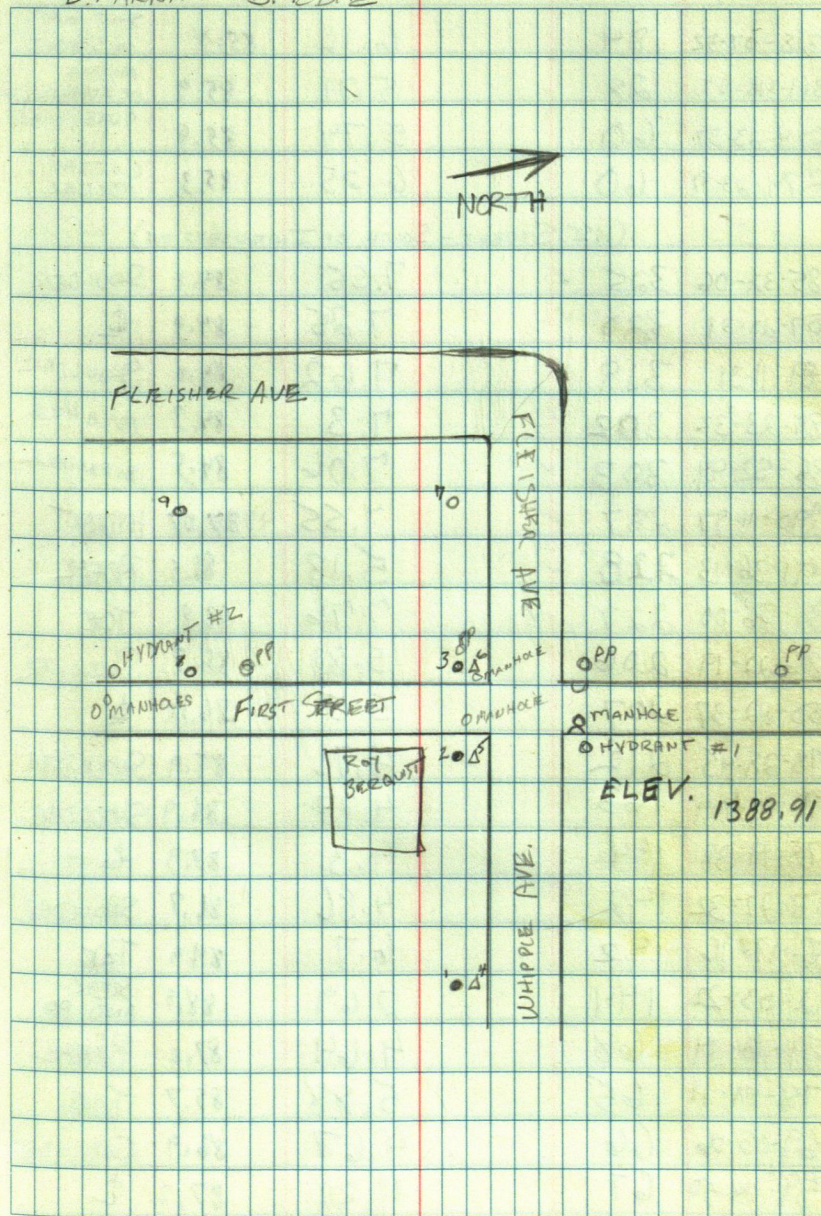
DESCRIPTION

ANGLE	DISTANCE	(1ST STREET - NORTH OF INTERSECTION)			
103	BS 2				
1 269-42-15	206	3.02	88.6	PP	
2 273-31-48	207	4.01	87.6	CURB	
3 273-41-52	206	4.55	87.1	GUTTER	
4 279-31-32	212	3.09	88.5	CL	
5 287-19-36	228	5.38	86.2	GUTTER	
6 287-25-56	229	4.91	86.7	CURB	
7 290-20-52	196	5.28	86.3	CURB	
8 290-11-00	196	5.74	85.9	GUTTER	
9 281-38-36	174	5.39	86.2	CL	
11 274-38-59	165	5.96	85.7	GUTTER	
12 274-21-45	165	5.45	86.1	CURB	
13 269-00-59	74	4.72	86.9	PP	
14 277-43-10	92	6.12	85.5	CURB	
15 276-15-33	92	6.74	84.9	STORM DRAIN	
16 291-05-54	100	6.10	85.5	CL	
17 299-35-15	102	6.24	85.4	MANHOLE	
18 306-59-34	112	6.76	84.9	STORM DRAIN	
19 307-13-26	113	6.12	85.5	CURB	
BM 309-25-31	112	2.71	1388.91	HYDRANT #1	
20 309-08-12	112	5.93	85.7	CURB CCK	
21 307-15-06	102	6.54	85.1	SHUT-OFF IN STREET	
22 300-14-06	142	5.72	85.9	CURB CCK	
23 314-37-05	104	6.53	85.1	CURB CORNER	

AUG 10, 1989

D. FARNAM - B. EDIE

62









47	52-31-22	74	4.61	87.06	SHOULDER
48	94-58-15	50	5.01	86.6	CURB POCK
49	352-91-14	61	5.92	85.6	CURB CORNER
50	345-16-32	63	6.09	85.6	MANHOLE
51	312-05-06	25	5.84	85.8	CURB CORNER
52	312-05-06	25	6.45	85.1	GUTTER CORNER
53	299-40-09	20.5	5.27	86.3	MANHOLE
54	257-59-08	7.5	4.6	1387	PP

(LOT CORNERS)

1@3 BS 2

7) ON LINE

100'

8) 90-00-00

150'

(LOT CORNER)

1@7 BS 2

9) 90-00-00

150'

1@3 BS 2

5.94

343-07-21 238

5.91

ALLEY  
CURB

350-30-09 231

5.49

MANHOLE

350-55-03 231

5.52

C

355-14-38 232

5.92

GUTTER

356-28-35 231

5.94

CURB

354-12-17 148

5.81

CURB

354-01-32 148

6.3

GUTTER

345-16-50 147

5.82

C



332-40-06	152	6.31	GUTTER
332-29-20	152	5.84	CURB
322-57-48	116	6.69	STORM DRAIN
341-02-40	97	6.19	MANHOLE
350-27-43	92	6.73	STORM DRAIN

I@3	BS 2		
198-44-23	165	6.44	TOE SHOULDER
197-21-51	162	6.31	<del>TOE SHOULDER</del>
195-17-45	152	6.19	<del>E</del>
191-42-54	142	6.51	SHOULDER
187-41-26	86	5.43	BREAK
192-35-52	86	6.67	TOE
198-54-52	86	6.28	SHOULDER
209-14-40	87	6.02	<del>E</del>
215-27-40	94	6.21	SHOULDER
218-24-38	102	6.78	TOE
223-30-01	109	5.15	BREAK

-(FLEISHER AVE. - NORTH-SOUTH SECTION)

I@7	BS 2	HI =	1392.32	
55 92-46-09	227	6.46	85.9	BREAK
56 100-01-20	233	10.88	81.4	TOE
57 106-26-51	242	9.58	82.7	SHOULDER
58 108-50-46	244	9.08	83.2	<del>E</del>
59 111-30-37	245	9.02	83.3	SHOULDER



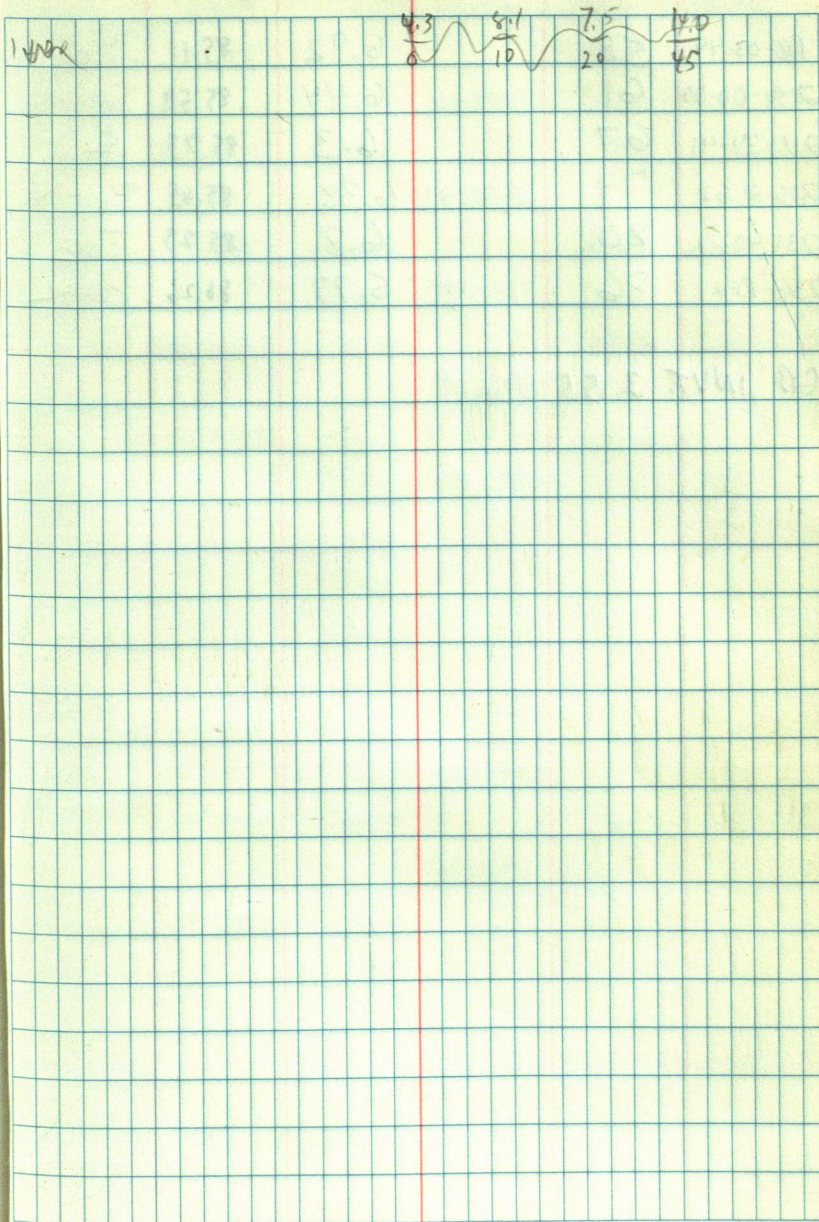
60	122-16-21	165	7.88	84.4	SHOULDER
61	119-30-46	157	7.98	84.3	☐
62	116-32-46	149	8.57	83.7	SHOULDER
63	111-24-58	138	8.83	83.5	TOE
64	96-29-18	120	5.97	86.4	BRAK
65	114-10-50	38	5.48	86.8	TRAK
66	136-45-36	47	7.75	84.6	TOE
67	153-07-22	71	7.69	86.6	SHOULDER
68	153-46-46	82	7.29	85.0	☐
69	157-13-18	91	7.35	85.0	SHOULDER
70	193-35-35	43	7.5	84.8	SHOULDER CORNER
71	Bm <sup>333-15-43</sup>	191	3.41	1786.91	HYDANT #1

(LOT TOPO)

72	86-14-32	210	5.86	86.4	
73	77-24-12	219	6.18	86.1	
74	69-57-45	228	5.3	87.0	
75	63-45-12	183	4.54	87.8	
76	71-55-48	167	5.2	87.1	
77	86-03-09	153	5.03	87.3	
78	54-24-16	106	5.11	87.2	
79	63-24-36	112	5.52	86.8	
80	49-35-03	124	5.0	87.3	
81	27-52-24	91	5.69	86.6	
82	40-06-14	63	5.91	86.4	
83	71-16-07	39	5.27	87.0	



60	84	H-26-24	9	5.33	87.0	
61	85	02-55-12	44	5.78	86.5	
62	86	00-56-09	87	5.96	86.3	
63		(WHIPPLE AVENUE)				
64		ICE3	BS 2	HI=	1392.03	
65	87	242-03-12	240	6.0	86.03	ALLEY
66	88	350-26-41	231	5.82	86.21	MANHOLE
67	89	350-53-22	231	5.87	86.16	⊕
68	90	355-14-25	232	6.26	85.77	MANHOLE
69	91	356-32-03	230	6.25	85.78	DRIVEWAY
70	92	353-16-43	127	6.69	85.34	DRIVEWAY
71	93	343-19-18	130	6.27	85.79	⊕
72	94	329-45-36	138	6.73	85.30	GUTTER
73	95	329-31-21	139	6.23	85.83	CURB
74	96	322-47-27	116	7.05	84.98	STORM DRAIN
75	97	341-30-27	95	6.56	85.47	MANHOLE
76	98	350-19-45	92	7.07	84.96	STORM DRAIN
77		BM 309-24-54	111	3.12	1388.91	HYDRANT #1
78		(FLEISHER AVE - EAST-WEST SECTION)				
79	99	197-19-39	163	6.72	85.31	SHOULDER
80	100	194-37-19	154	6.54	85.49	⊕
81	1	191-21-28	143	6.87	85.16	SHOULDER
82	2	187-50-29	137	7.21	84.82	TOE
83	3	183-06-45	131	6.48	85.55	BREAK
	4	190-05-23	60	<del>5.82</del> 5.78	86.85	BREAK





5	198-03-44	58	6.92	85.11	TOE
6	209-00-00	61	6.44	85.59	SHOULDER
7	218-37-41	67	6.3	85.73	E
8	226-31-52	74	6.38	85.65	SHOULDER
9	231-40-22	80	6.8	85.23	TOE
10	236-10-21	86	5.77	86.26	BREAK

CB INVT. 3.55



BS	HI	FS	ELEV	
US POST. OFF.	LEVELS			SPOT N ENT AM. LEG. OLD
BM	3.14		1391.92	
	1395.06			
Top Hyd	.09	2.71	1392.35	POST OFF
	1392.44			
BM	2.34	3.53		OLD GAMBLE
TOP HYD	<del>2.13</del>	<del>0.29</del>	1388.91	ST. COR
	1391.95			
TOY HYD	2.50	2.70	1388.55	E CLINIC COR
	1391.05			
NE COR SW				BUDRO'S
BM	3.59	3.42	1387.62	PLANTER
	1391.21			
TOP		4.76		TOP CURB
		4.4		
		4.05		
TOP HYD	3.91	2.30	1388.91	TOP HYD @ GAMBLE ST
	1392.82			
TOY HYD	3.01	0.46	1392.36	E OLD P.D.
	1395.37			
BM		3.45	1391.92	M LEG OLD



JIM JOHNSON

X C A B B

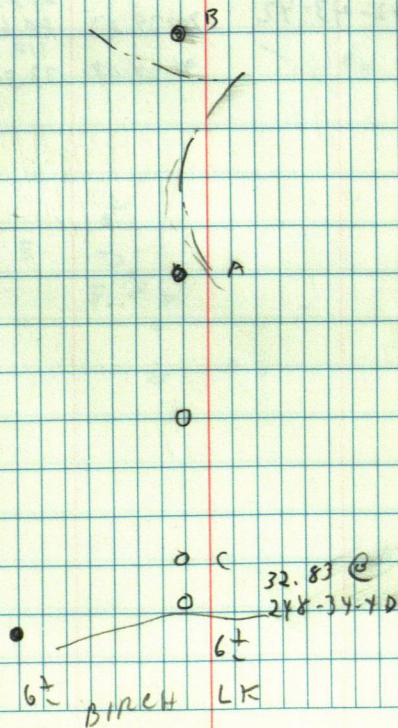
88.22.35 206.80  
63.025

91.49.30

X C C B S A

0-1-07 227.19  
180-1-05 69.745  
246-29-18 110.23  
D 66-29-20 95.52.27 33.598

70





97

JACK COLLSON

T @ 2 BS 1

0-0-07	175-38-13	90-51-30	115.54	115.535
180-0-27			35.217	
175-38-20	175-38-08	90-23-40	131.52	131.52
3 355-38-35			40.092	
			27.98	

T @ 4 BS 6

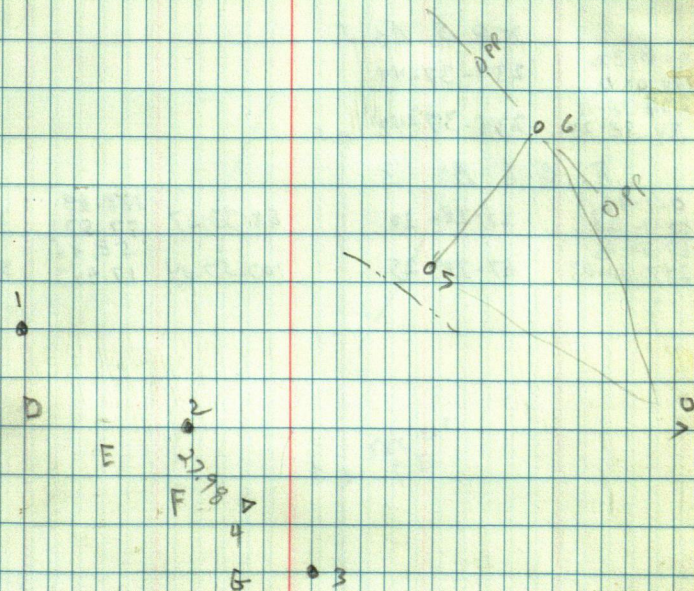
0-0-01	103-11-39
180-0-04	
103-11-40	103-11-36
3 287-11-40	

5 - 0-0-0

A @ 6 BS 7

0-0-50	82-43-40	87-39-25	284.57	289.333
180-0-58			88.215	
82-44-30	82-43-42	90-39-23	294.23	294.209
4 262-44-40			89.681	
			110.10	
5		91-24-08	33.569	110.083

71

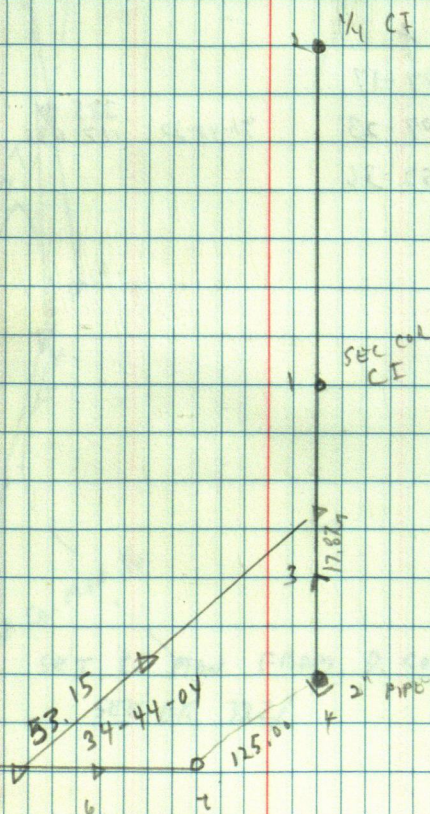




DAVE COBBETT

$\pi @$	1 BS	2		
0-0-10				
181-0-30	182-55-03			
182-55-13				
3 2-55-25	182-54-55			
$\pi @$	3 BS	1-5		
0-0-14			268.99	
180-0-32	180-05-07	90-04-40	81.992	268.994
180-5-21			59.59	
4 0-5-21	180-04-49	111-08-0	18.159	55.576
$\pi @$	5 BS	1		
0-0-32				
180-0-42	234-37-44			
234-38-16				
6 54-38-24	234-37-42			
$\pi @$	6 BS	5		
0-1-46			188.89	
180-1-38	67-28-20	88-33-27	57.522	188.828
67-30-06			58.86	
7 247-30-03	67-28-25	107-57-04	17.943	55.998

72





# HERMAN PETERSON

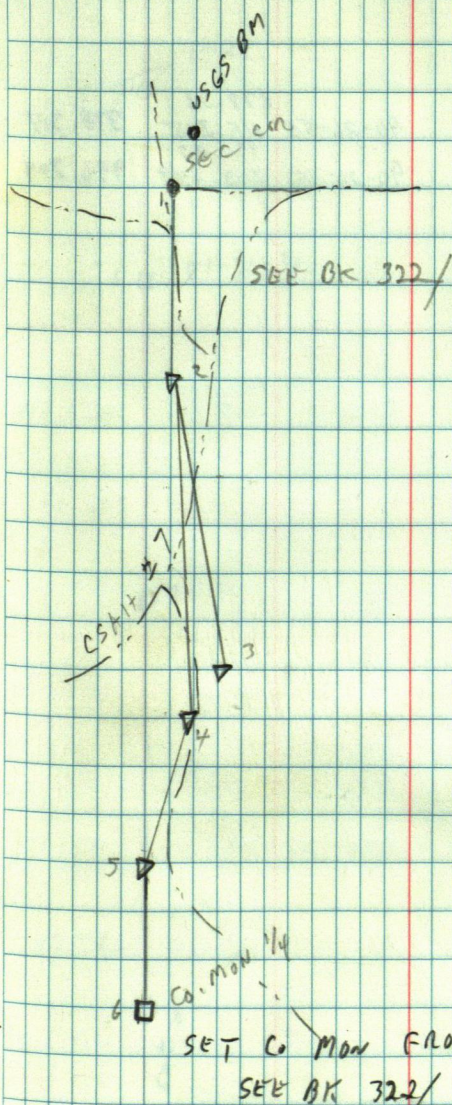
KP 2 BS 3  
 0-0-45  
 180-0-57 0-54-19  
 0-55-04  
 4 180-55-05 0-54-08  
 0-4-12  
 359-10-04 359-05-52

KP 4 BS 2  
 0-0-16  
 180-0-20 180-53-0 90-14-54 1232.07 1232.07  
 180-53-16 325.548  
 5 0-53-23 180-53-03 92-38-23 315.37 314.982  
 0-1-14 96.093  
 129-8-20 179-07-06

KP 5 BS 4  
 0-0-21  
 180-0-22 178-07-17  
 178-7-38  
 6 358-7-45 178-07-23 91-40-20 385.94 385.776  
 0-0-30 112.636  
 181-53-06 181-52-36

6 COR  
 T. WATSLAKE 73

8-27-89





Herman Peterson

TC 6 B5 5

181-31-30

7

378.33  
90-26-55 115.315 378.317

8

496.23  
90-20-35 303.649 996.204

E. CUNO  
B. EIDE  
Z. WATSCHE 74

5 10/27

6 181-31-30

07

08

60x

THUNDER

LAKE



BILL CROMETT

5-7-137-28

$\pi$ 0	2 BS 1			
0-0-13			2684.74	
180-0-17	90-37-15	90-02-07	818.310	2684.73
90-37-28			260.55	
3 270-37-40	90-37-23	270-1-10	79.411	260.541

$\pi$ 0	4 BS 1			
15-1-03				
180-1-05	155-19-51			
155-21-04				
5 335-21-10	155-19-55			
0-0-17				
204-40-23	204-40-06			

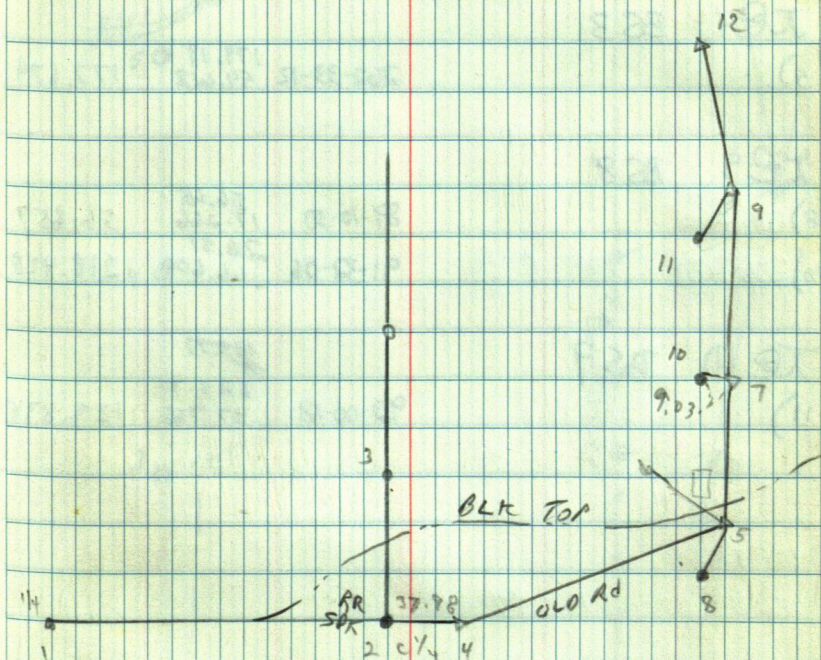
$\pi$ 0	5 BS 4			
0-0-23			1429.58	
180-0-38	70-53-57	89-55-0	173.737	1429.574
70-54-20				
114-45-10	114-44-47		216.61	
7 244-45-26	114-44-48	90-12-52	66.025	216.61
320-59-50	320-59-27		25.28	

$\pi$ 0	7 BS 5			
0-0-29				
180-0-34	92-36-36			
10 92-37-05			9.03	
186-35-08	186-34-39			
9 6-35-15	186-34-41			

$\pi$ 0	9 BS 7			
0-0-16			242.93	
180-0-15	2642.	90-51-30	74.043	242.898
11 36-43-0	36-42-44		51.26	
170-47-10	170-46-54		258.01	
12 350-47-15	170-47-00	94-19-10	78.632	257.261

E. CURD  
L. WATTSCHKE

8-29-89 TS





WHITE FISH LAKE

Te 3 BS 2

2)			88-42-09	<del>286.26</del> 87.252	286.185
4)			90-57-27	173.50 52.878	173.467

$\pi @ 4$  BS 3

5) 262-33-12 179,19  
54,618 177,679

LE 9 BS 8

8)	89-10-30	$\frac{56.48}{17.266}$	56.657
10)	91-32-06	$\frac{218.51}{46.600}$	218.428

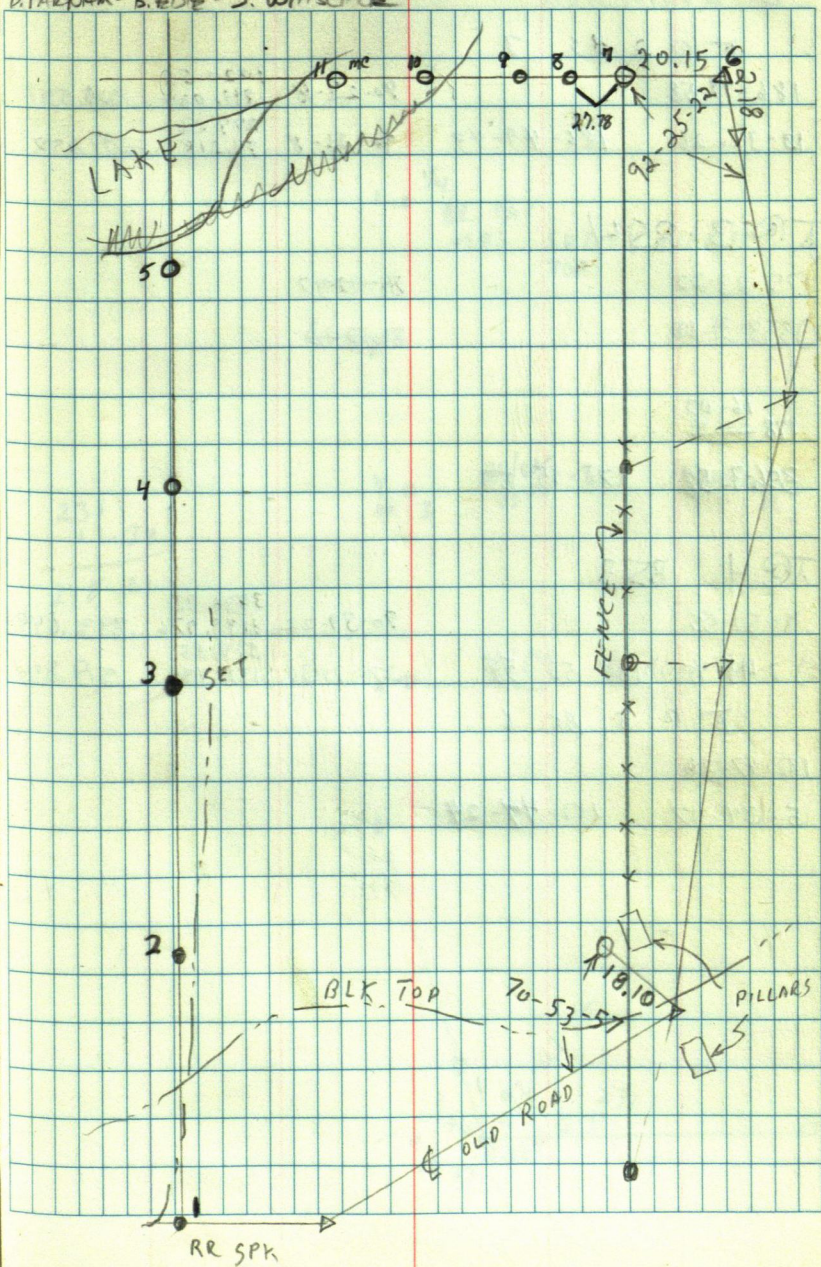
10 10 BS9

11)	92-00-18	37.768	123.834
-----	----------	--------	---------

AUG. 30, 1989

D. FARHAM - B. EDIE - J. WATSON

76





D. DVORCHUK

π @ 2 BS 3

186-49-58

90-22-18

1020.59

311.068

1020.551

1 13-39-26

186-49-43

90-22-8

299.26

91.218

299.258

π @ 3 BS 4

175-23-22

89-42-47

2) 353-39-00

89-22-23

16-03

178-23-38

356-31-58

178-15-59

16 118

π @ 4 BS 3

181-52-55

90-39-22

3936.92

1199.976

3936.649

5) 3-43-45

181-52-59

270-24-30

519.85

158.450

519.834

π @ 5 BS 6

182-47-36

4 5-34-47

182-47-24

77

1 • 1/4  
BR. CAP  
USFS SET 3/4" PIN IN  
TOP

2

1/16 • 3  
BR/CAP  
USFS

231  
12.34

218.61

4 • 3/4" PIN  
BLK TOP

5

3 104  
12 39  
6 92  
02 45  
231  
231  
12 39



Published by KLUFFCA &amp; SATECA CO.

## HOW TO USE CURVE TABLES

69.3  
35  
104.3

[illegible]

Want a Curve with an Exp. of about 12% Angle

9

95,

40

159-14

A.

104.30



# CURVE TABLES

Published by KEUFFEL & ESSER CO.

## HOW TO USE CURVE TABLES

Table I. contains Tangents and Externals to a  $1^\circ$  curve. Tan. and Ext. to any other radius may be found nearly enough, by dividing the Tan. or Ext. opposite the given Central Angle by the given degree of curve.

To find Deg. of Curve, having the Central Angle and Tangent: Divide Tan. opposite the given Central Angle by the given Tangent.

To find Deg. of Curve, having the Central Angle and External: Divide Ext. opposite the given Central Angle by the given External.

To find Nat. Tan. and Nat. Ex. Sec. for any angle by Table I.: Tan. or Ext. of twice the given angle divided by the radius of a  $1^\circ$  curve will be the Nat. Tan. or Nat. Ex. Sec.

### EXAMPLE

Wanted a Curve with an Ext. of about 12 ft. Angle of Intersection or I. P. =  $23^\circ 20'$  to the R. at Station 542+72.

Ext. in Tab. I opposite  $23^\circ 20' = 120.87$   
 $120.87 \div 12 = 10.07$ . Say a  $10^\circ$  Curve.

Tan. in Tab. I opp.  $23^\circ 20' = 1183.1$   
 $1183.1 \div 10 = 118.31$ .

Correction for A.  $23^\circ 20'$  for a  $10^\circ$  Cur. = 0.16  
 $118.31 + 0.16 = 118.47 = \text{corrected Tangent}$ .

(If corrected Ext. is required find in same way)  
 Ang.  $23^\circ 20' = 23.33^\circ \div 10 = 2.3333 = \text{L. C.}$

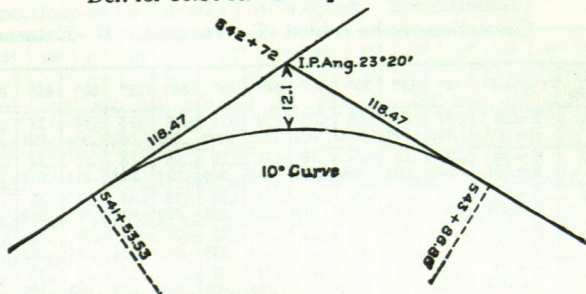
$2^\circ 19\frac{1}{2}' = \text{def. for sta.}$	542	I. P. = sta.	542+72
$4^\circ 49\frac{1}{2}' = \text{" " "}$	+50	Tan. =	1 18.47
$7^\circ 19\frac{1}{2}' = \text{" " "}$	543	B. C. = sta.	541+53.53
$9^\circ 49\frac{1}{2}' = \text{" " "}$	+50	L. C. =	2 33.33
$11^\circ 40' = \text{" " "}$	543+	E. C. = Sta.	543+86.86
	86.86		

$100 - 53.53 = 46.47 \times 3' (\text{def. for 1 ft. of } 10^\circ \text{ Cur.}) = 139.41' =$

$2^\circ 19\frac{1}{2}' = \text{def. for sta. 542.}$

Def. for 50 ft. =  $2^\circ 30'$  for a  $10^\circ$  Curve.

Def. for 36.86 ft. =  $1^\circ 50\frac{1}{2}'$  for a  $10^\circ$  Curve.





$$\begin{array}{r} 789.34 \\ 503 \\ \hline 1292 \end{array}$$

$$\begin{array}{r} 62 \\ 17 \\ \hline 45 \end{array} \quad 269.02 - 12$$

$$\begin{array}{r} 269 \\ 538 \\ 360 \\ \hline 178 \end{array}$$

$$0.24 \div \frac{1}{17}$$

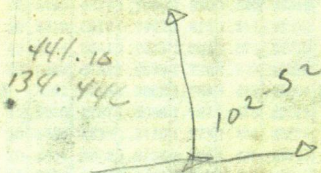
$$269-13-18$$

$$193-14-20$$

$$26-28-46$$

$$\begin{array}{r} 197 \\ 394 \\ 360 \\ \hline 34 \end{array}$$

$$10-29.14$$



$$\begin{array}{r} 80 \\ 60 \\ \hline 22 \end{array}$$

$$56 \frac{28}{14}$$

$$\begin{array}{r} 87 \\ 374 \\ 360 \\ \hline 14 \end{array}$$

$$187-11-20$$

$$15-22-48$$

$$15-16-17-13$$

$$15-24-26$$

$$44$$

$$27.84$$

$$56.68$$

$$218.31$$

$$123.91$$

$$15-23-00$$

$$\begin{array}{r} 54 \\ 54 \\ \hline 108 \\ 40 \\ \hline 48 \end{array}$$

$$629.09$$

$$614.92$$

$$\hline 14.17$$

$$36.98$$

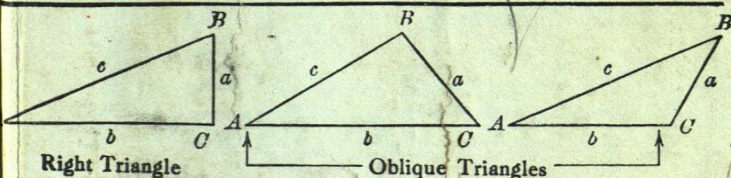
$$49-10$$

$$356-47 = 16$$

$$\begin{array}{r} 181 \\ 181 \\ \hline 362 \end{array}$$



# TRIGONOMETRIC FORMULÆ



1037.51  
274.93  
1312.44

## Solution of Right Triangles

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

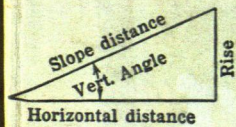
1312.44  
1907.94  
4.50

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

## Solution of Oblique Triangles

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