BASS LAKE DITCH

21

FIELD BOOK

1308

PLEASE RETURN TO
GEAUGA COUNTY ENGINEER
COURT HOUSE
CHARDON, O.
PHONE 250-X

Book 21

Return to County Surveyor
Chardon - Ohio.

BASS LAKE DITCH
Entire book

(21)

note mem. Top of page 47 - 96.40 = "low-water" mark.
E[illegible] 28-35
"High water" mark = Elev. [illegible]

INDEX

2

Bass Lake Ditch

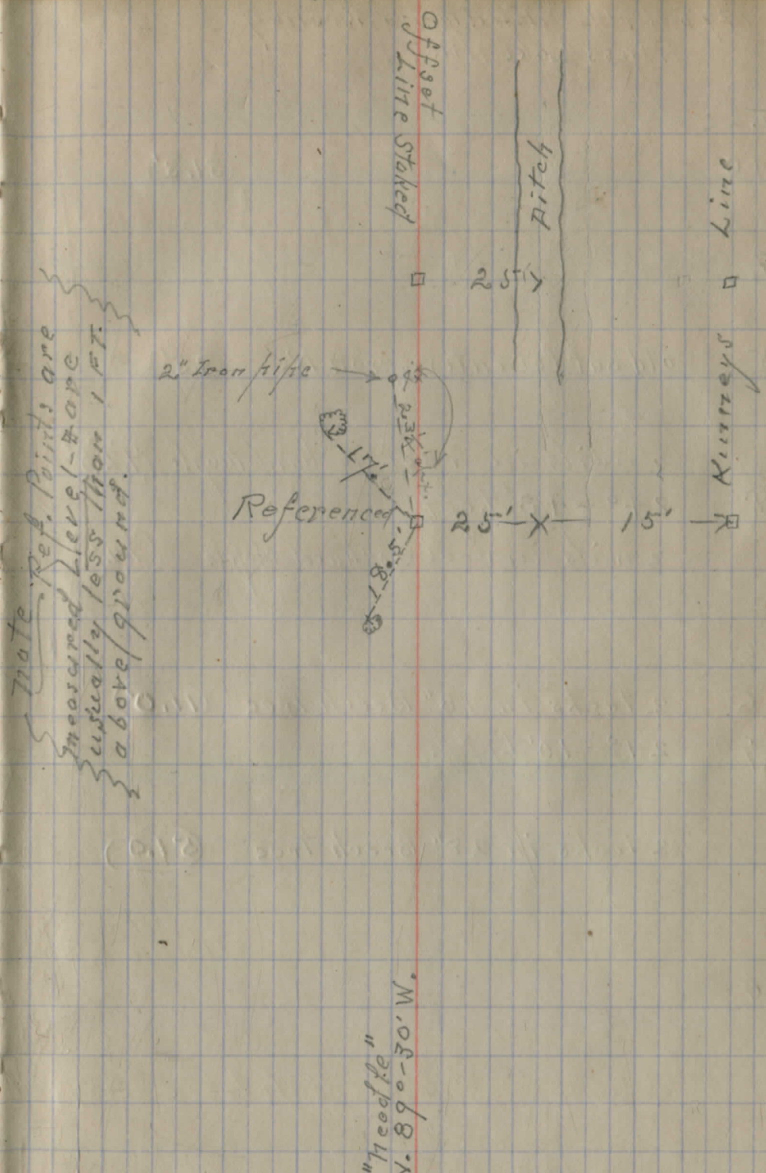
Transit Notes - Alignment 4 to 24

Measurements on ice - Reference Lines 28 & 30

1934 Elevations = back this book

4 December 8th E.A. Fiedler & Ernest Koeney
Bass Lake Ditch — 1916

STA.	
4	
(approx close) 3+23	Iron pipe on E.&W. prop. Line (4') to L.
3+12	2 tacks in 22" Black Ash Tree (17.0')
⊡ 3	Tangent
2+83	2 Tacks in 10" Black Ash Tree (18.5')
2	(no stake)
1	(no stake)
0	(no stake) out in Lake



6 12/8-1916 - Fiedler & Keeney
Bass Lake Hitch

Sta.

9+40 (31.3')

9

+35 old outlet enters from R. (35')

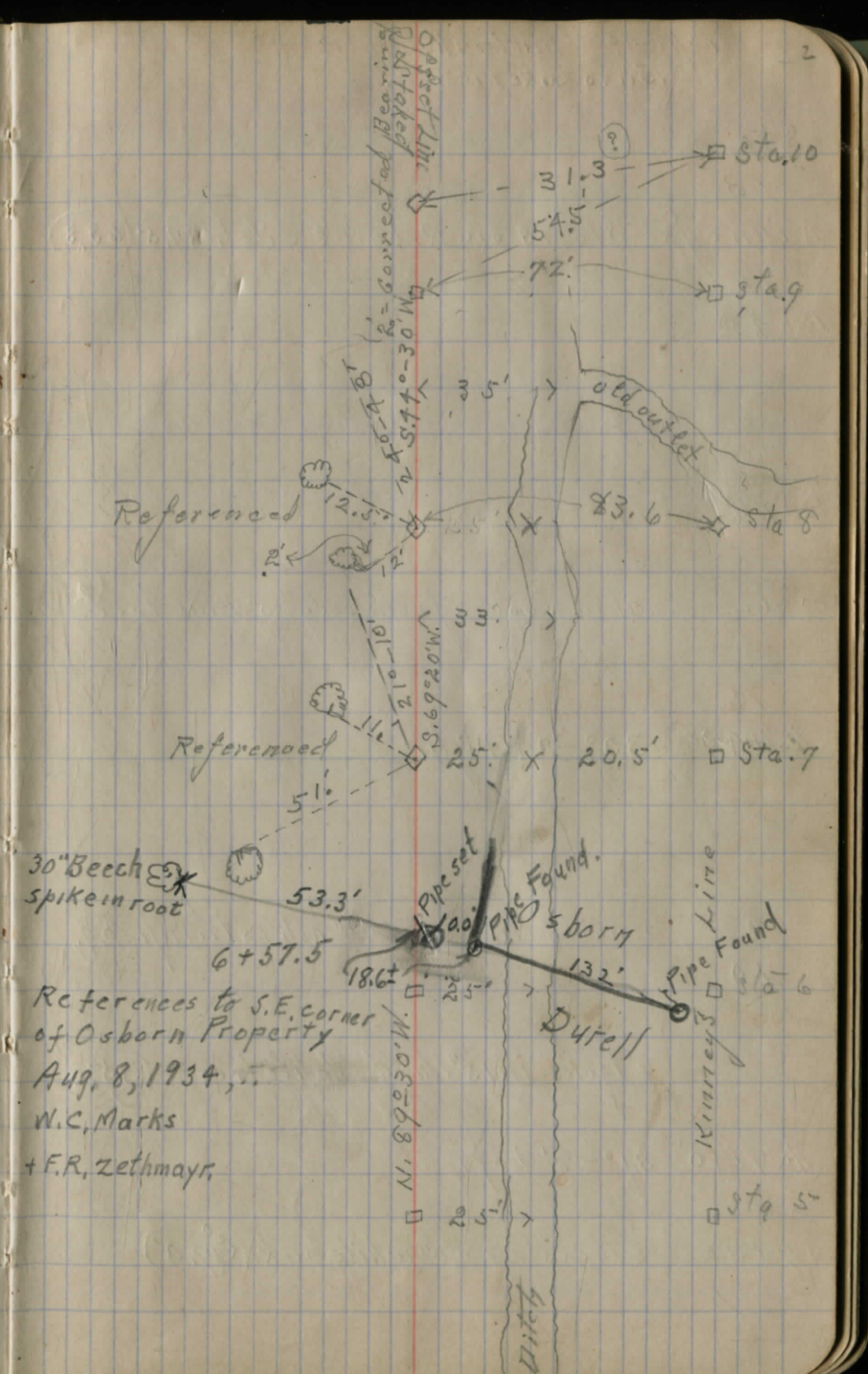
2 nails in root 16" hard Maple (12.5')
△ 8 24° - 48' Left
+91 2 nails in root 20" hard Maple (12.)
+50

+06 2 tacks in 18" Beech Tree (11.0')
△ 7 21° - 10' Left.

+73 2 tacks in 28" Beech Tree (51.0')

6

5



X 12/8-1916 Friedler & Keeney
Bass Lake Ditch

Sta.

13

Kinney's Sta. 13 on R. bank ditch (57.5) (63.3)

12

11

10+62 nail in root, 3' from body 30" Elm tree (24')

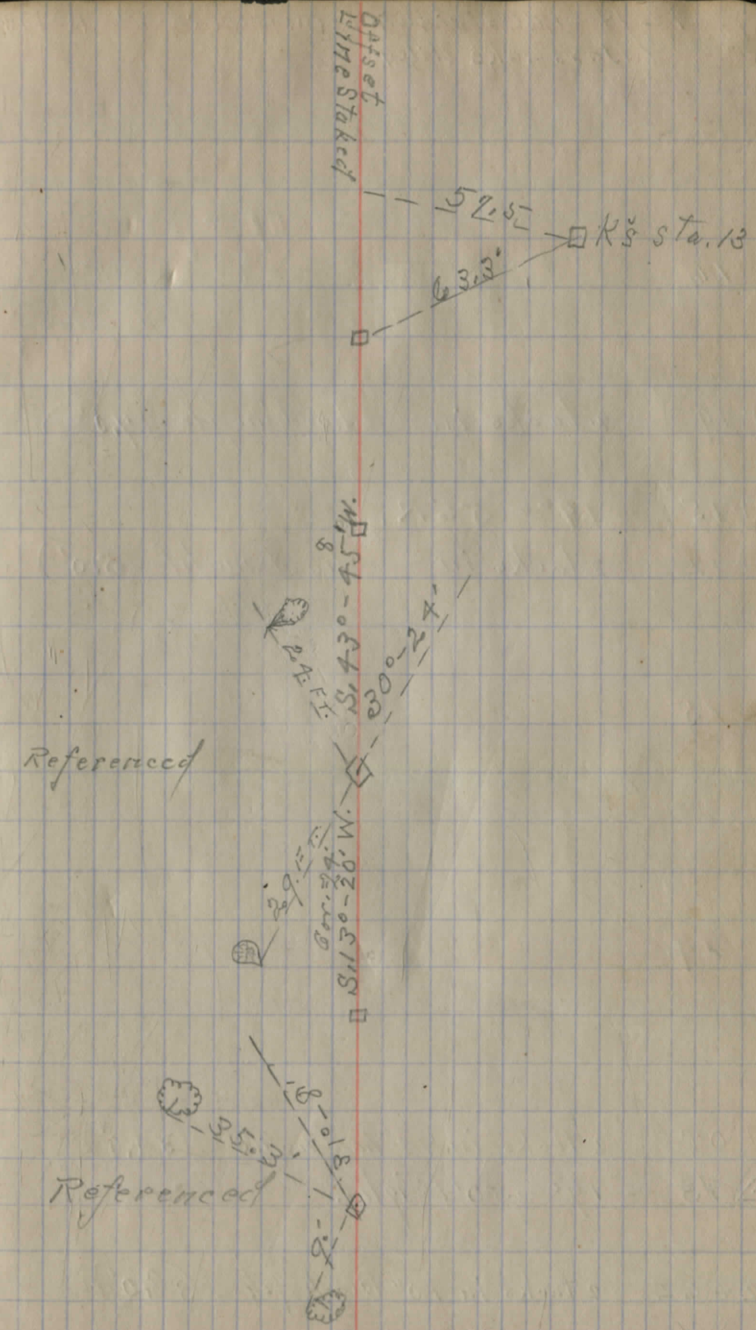
△+40 30° - 24' Right

+12 2 nails in root 22" ash stump (29.)
.10

2 tacks in 15" Hard Maple tree (35.3)

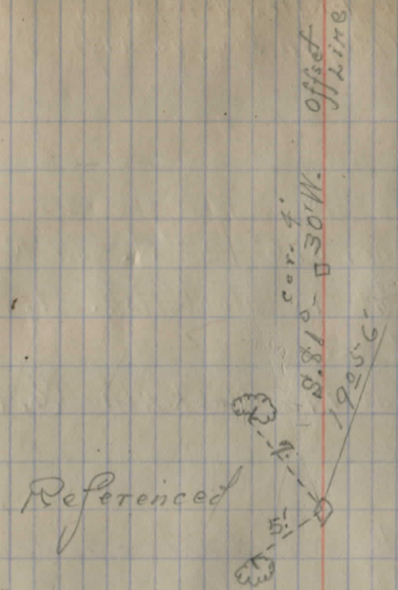
△ 9+40 31° - 8' Left

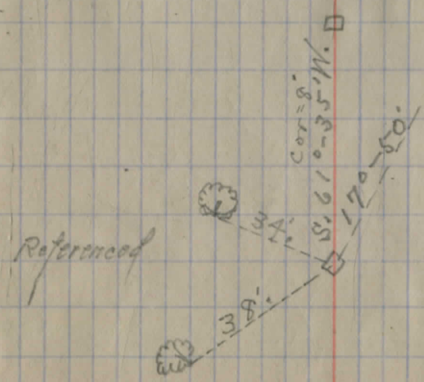
9+33 2 Tacks in 20" white oak tree (9.0)



.10 12/8-1916 — Tidler & Rooney (Quit at 15+15)
Bass Lake Ditch

16		
+19	2 tacks in hard maple	(7.0')
△+15	19°-56'R.	
+12	2 tacks in hard maple	(5.0')
15		
14		
+08	2 tacks in 14" hard maple	(34.0')
△ 13	17°-50' Right.	
12+62	2 tacks in 10" Black Ash	(38.0')





12 12/11-1916 Fiedler & Pomeroy

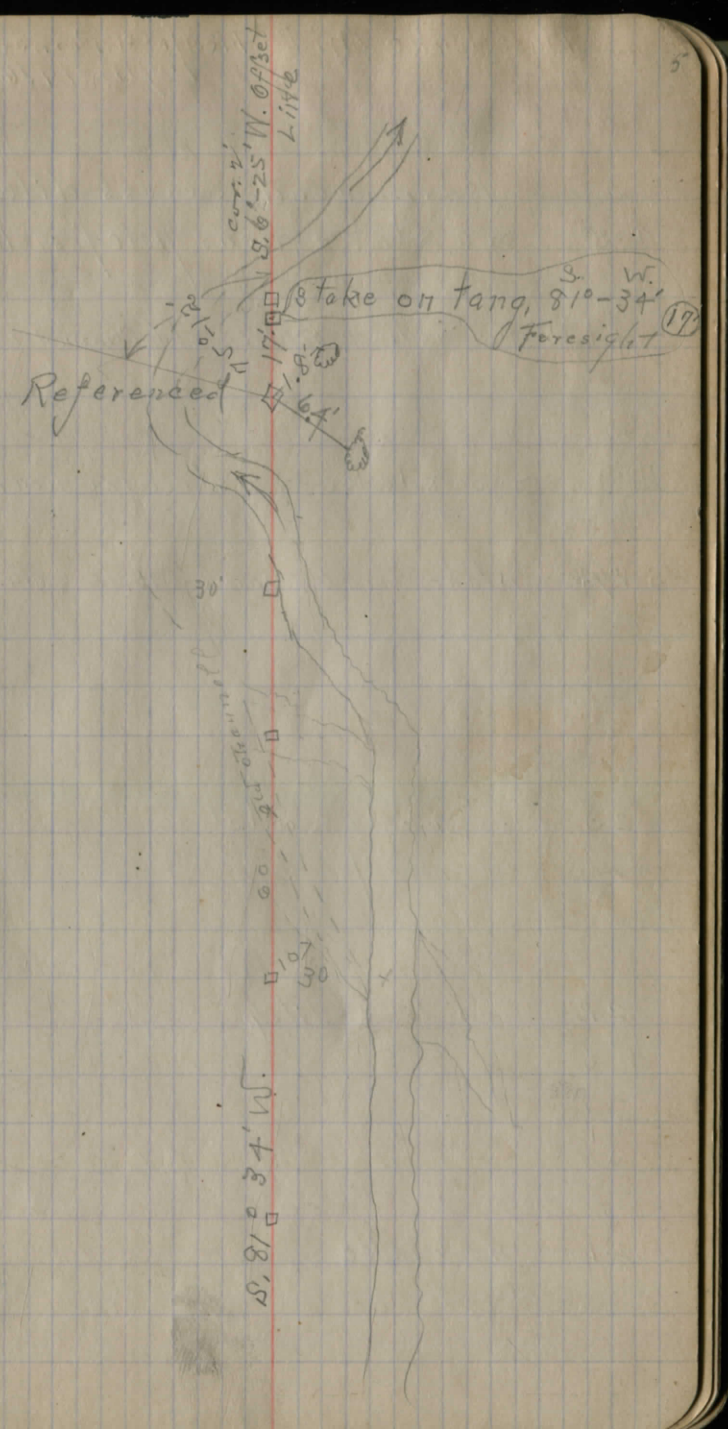
Bass Lake Ditch (Began Sta. 15 + 15)

Sta.	
+75	stake on tang. S. 6°-22' W. - on R. bank
	nail in root 10" black Ash. (1.80)
△ 20+28	75°-12' L.
+22	nail in root 14" Black Ash (6.4')
20.	no stake
+75	on L. bank

19

18

17



14 Bass Lake Ditch Fiedler & Pomeroy
12/11-1916 J

+30 Farm road across ditch
25 no stake (near pole foot bridge)

24+75 & ditch 12' to L. & old Channel 12' to R.

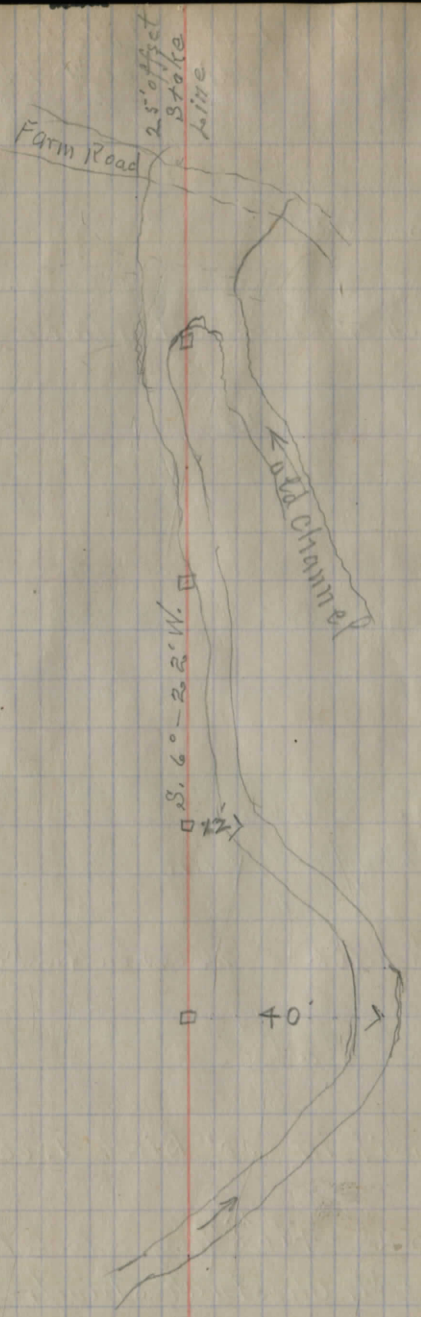
24 no stake - in stream near L. bank

23+75 stake in L. bank - 10' to & ditch to R.

23 22' to & ditch

22 40' to & ditch

21 no stake



16 Bass Lake Ditch 12/11-&12-1916
Friedler & Pomeroy

30	no stake
29+50	hub. 7' to L. on Random line
29	No Stake
28+50	
28	no stake
27+50	
27	no stake
65	~~Property fence~~
26+50	
	(Prop. line at 26+65 on random line)
26	no stake
+51	nail in 18" Birch Tree (12.0')
25+40	52° - 4' to 5' R. (Ang. calculated from Random Line)
25+36	2 ft. Chestnut stump - nail in root

1

50' offset Line

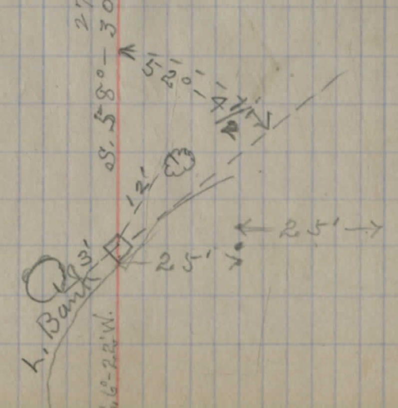
Ref. Mansfield

[Stakes set for fifty ft. offset line from 25+40 to 37+10]

Referenced (3')

Boulder +52

50'



(Random line angl 5°-28')

18 Fiedler & Bass Lake Ditch
Pomeroy 12/12-1916

35 in Ditch

+78.5 nail in root of 5" Elm {28.8'

34+57 nail in 8" Elm (9')

34+50 hub (12' lo. & old ditch on L.

" " " " on Random line also, 2' lo L.

34 no stake - in old ditch channel

33+50 no stake - in old ditch channel

33 no stake - in old ditch

32R+50 STAKE SET 4' to L. of Tangent Line

32

31+50 3+1/2 & ditch on R.

31

30+50

8

50' offset stake to Line

28.8'

9'

2'

Referenced hub on Random Line

50'

4'

50'

34'

S. 5-80-27 W.

20 Bass Lake Ditch

Fiedler & Pomeroy 12/13-1916

Δ

.41

40

39

38

▽ 37+10 1°-30'-L. (24.4 to Random. Hub L. & 25' to 50' offset hub)

▽ on 5-0' offset 37+10 Hub on 25' offset R. & hub on Random R 0.6'

37

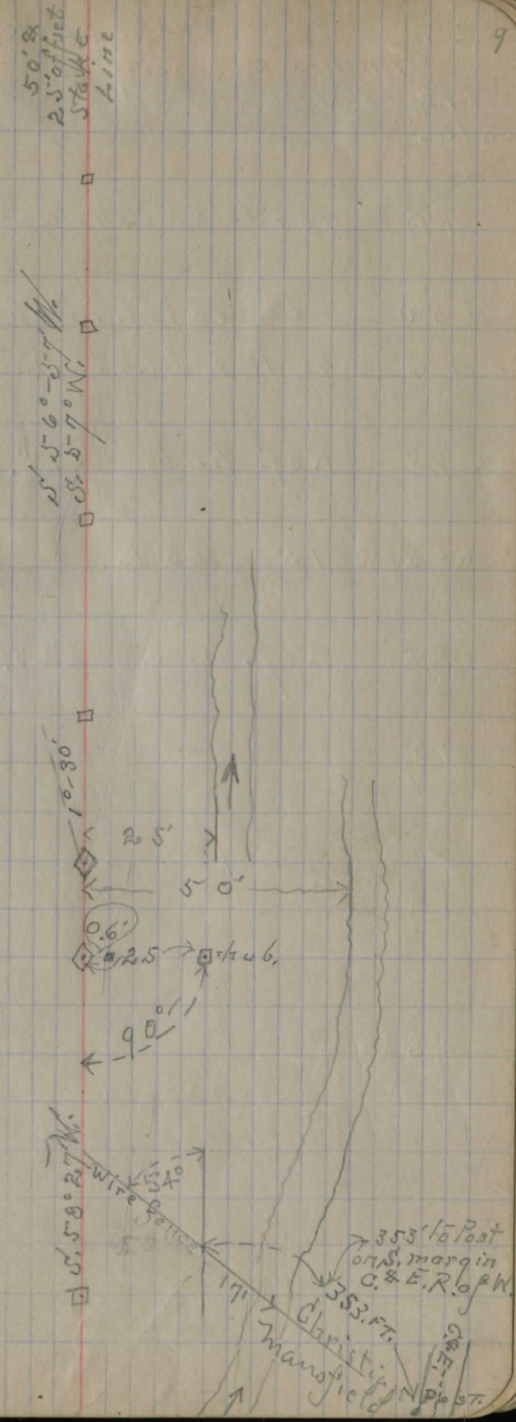
36+50

36

35+92 def. ang. to L. 54° = fence line

35+50

Referenced

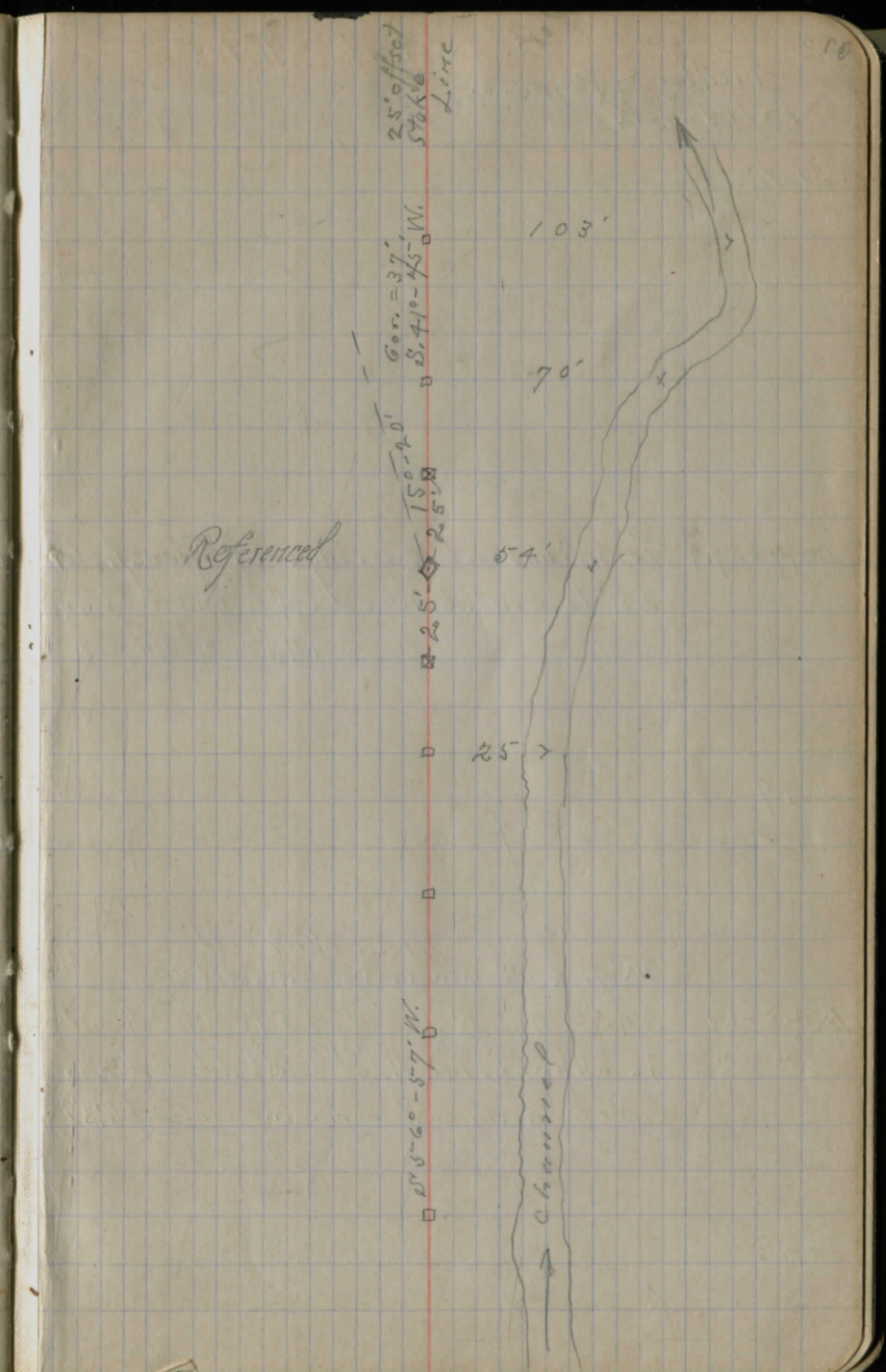


22 Beet Lake Ditch

Fiedler & Pomeroy

12/13-1916

Sta.	
47	103' to ℄ ditch channel
+50	curve to L. in old ditch
46	70' to ℄ ditch channel
+75	Ref. hub. (25') nail in top
△ 45+80	± to be 21' 15°-20' L. 54' to ℄ channel
+85	Ref. hub. (25') nail in top
45	
44	
43	
42	



Fiedler & Pomeroy

Bass Lake Ditch.

12/13-1916

Stations

△49+57.4 Terminal at ¢ Bridge at "Mansfield" Referenced
" " (25' to cent. bridge) 6.4' to end post on E. side railing
17.5' " " " W. " " & 1.5' from wing

49

Ref. ¢ 3rd iron post from north end of E. Rail. (89')
△48+65 34°-47' R. (73') to ditch channel
" " Is approx. 14' N. of ¢ Road to E. (& the ang. (included) 51°-47')
Ref. North east cor. wing wall (86.3')

48

28 Bass Lake Ditch Jan. 24th 1917.
Fiedler & P. Downey — P.M. only
[Measurements on Ice across the Lake]

margin road to B
(12.3') nail in S. side 10" apple tree on W.
22.88.5 = Base line from Sta. 3 of offset line

(2100' from Sta. 3 to W. margin weeds in ice — on Base)

2 nails in N. Root 3' soft maple (58.0')

0 — 300 stake in ice [Ang. L 81°-46 & 45°-21' / " R 92°-44']
0 no stake
1
1+50 E. margin where weeds show above ice

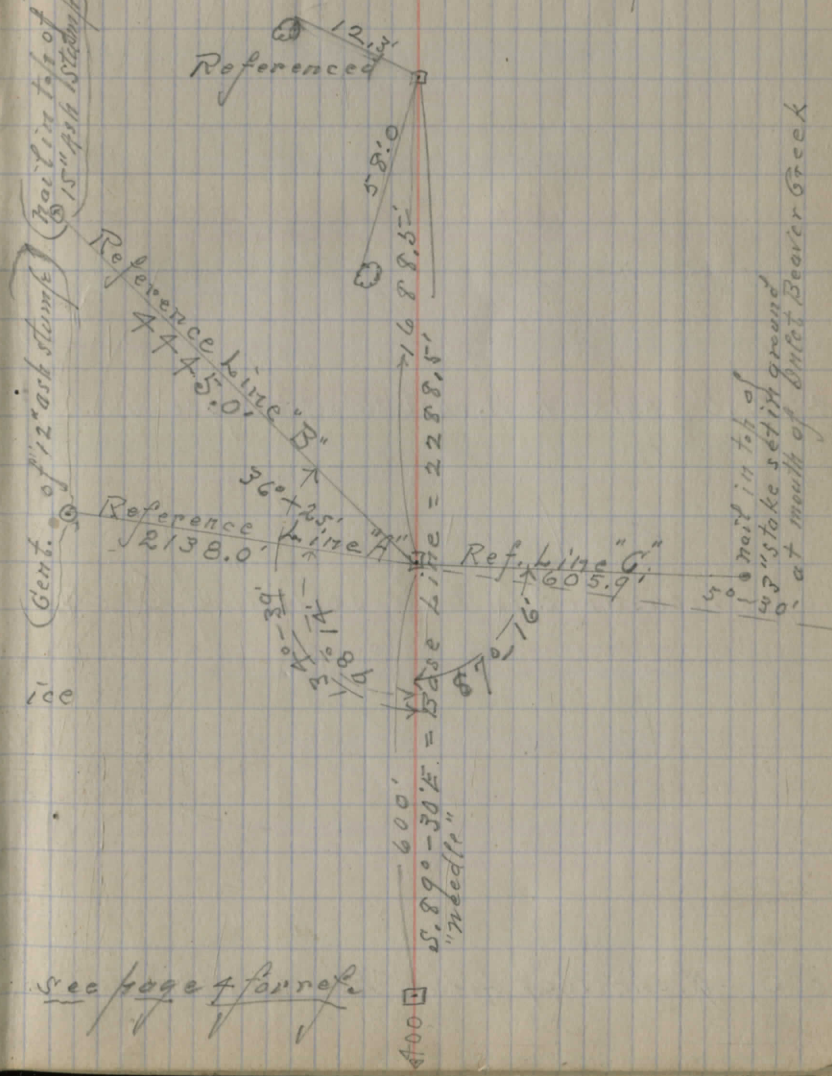
2 no stake

Sta. 3 of Ditch, on 25' offset Line.

Sta 4

5°-30'
36°-25'
198°-14'
4445'
2138'
605.9
2288.5
600.0

calculated from △3
Line A = S. 8°-44' W. 2138'
" B = N. 45°-9' E. 4445'
" C = S. 3°-14' W. 605.9'
" D = S. 30°-40' E. 1472'
Base line S. 89°-30' E. = 2688.5' to Sta. 7 on ditch Line



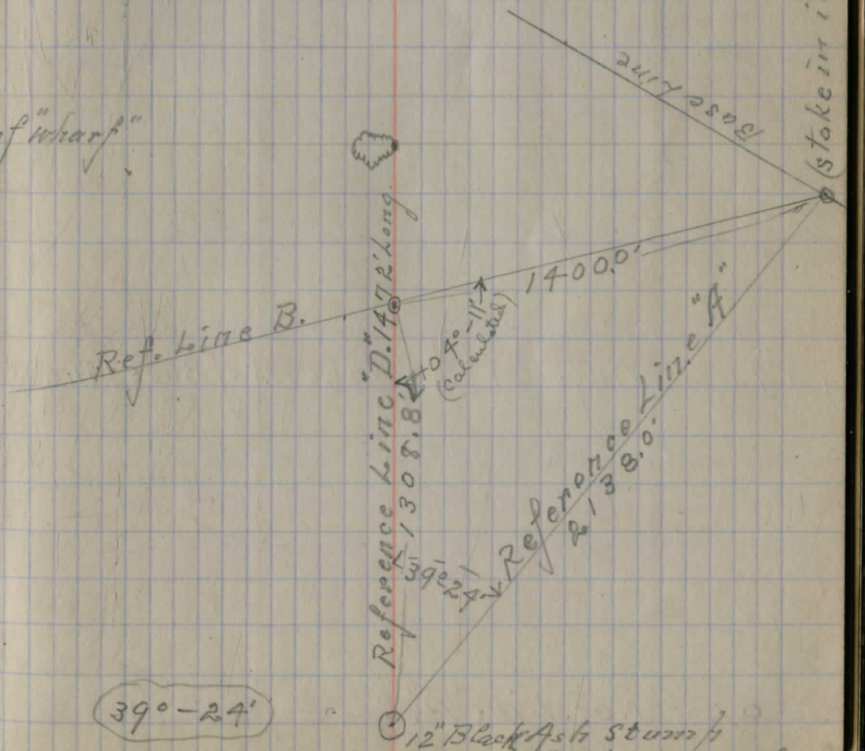
See page 4 for ref.

30 Bass Lake Ditch – Ref. measurements on ice
Jan. 25th 1917 Friedler & P. Delaney – A. M. only

1472.0' spike in W. root 16" soft maple back of "wharf"

1308.8' measured to Intersection of Line "B"

0 = N. end Ref Line "A" (2138.0' Long)



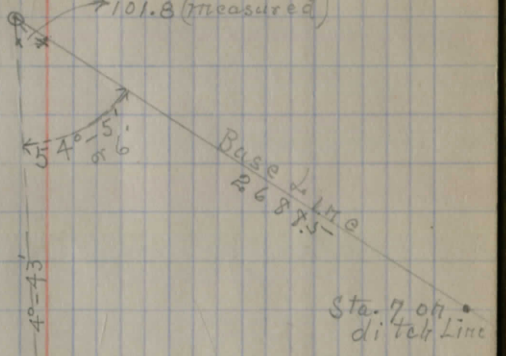
Fiedler & Kenney 4/17th 1917

Bass Lake Ditch

2688.5 of Base Line (stake) Ang. 54°-5 5½' or 6 min

14-7 R Ang. L 4°-43' to 2688.5 of Base Line

0 of Ref. Line "D".



spike in root of 16" Soft Maple

(12" Black Ash Stump)

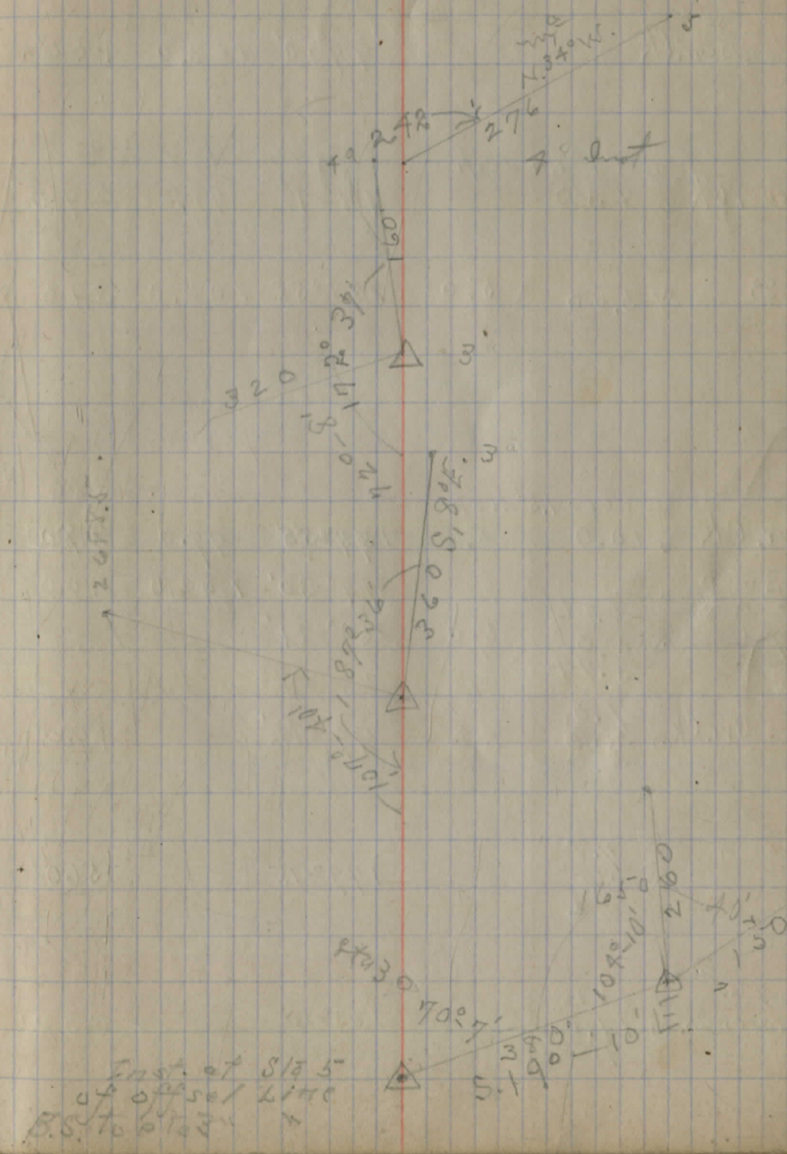
36 Bass Lake Ditch 4/19-1917

Turning R. from B.S. — Fiedler inst — Keeny Rod — Dorinsky "

Sta	Rod	H.I	Angles	Elevs	distances
7 5	△ 6.46 5.08 3.70	5.1	242°		276
	○ 5.45 5.0 4.55				90
5 4	△ 5.8 5.0 4.2	5.0	172°37'		160
Lake	○ 12.8 11.2 9.6	5.0	72°-8		320
4 3	△ 6.9 5.1 3.3	5.0	187°36		360
3 2	△ 5.6 4.85 4.1	4.8	170°8'		150
Prof. line	○ 5.20 4.80 4.40		165°40'		80
Lake	○ 12.7 11.4 10.1		104°10		260
2 #1	△ 5.35 3.45 1.55	3.5	70°-7'	102.	380

360
242
118

(setting 7)

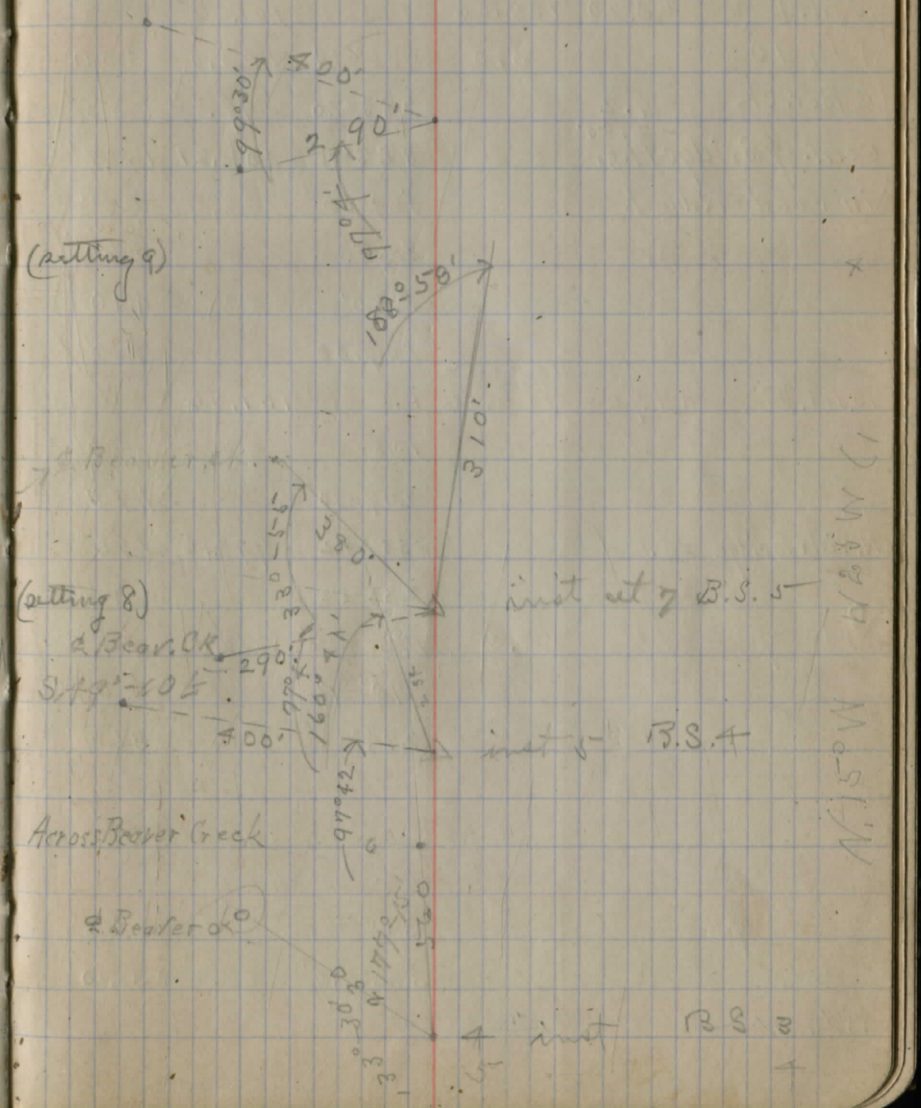


N 34° W

N 28°30'

4/19-1917 Bass Lake Track

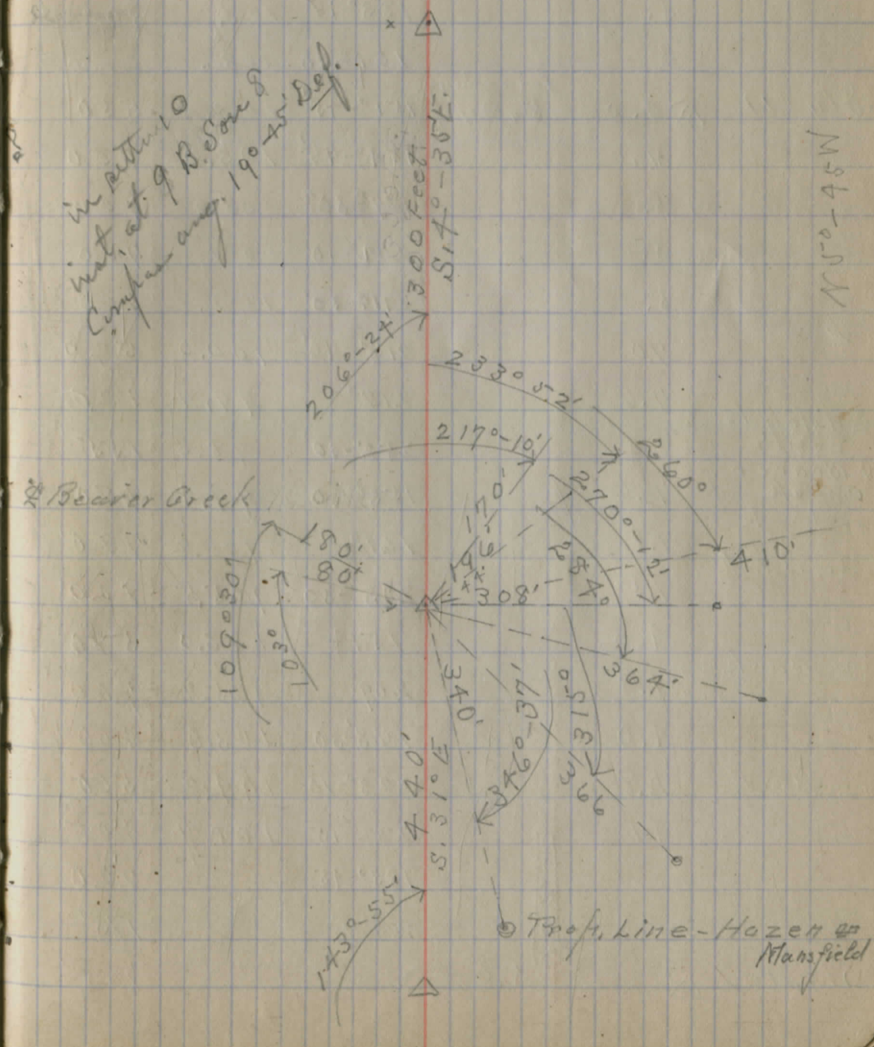
Sta	Rod	H.I.	Angles	Elevs	Dist
mst at 8	7.20				
9	▲ 5.0	4.5	143°-55'	102.0	440'
	2.80				
across Beav. Ck			99°30'	102.0	400'
	water 1.4 deep				
℄ Beav. Ck	○ 8.40		77°4'	98.6	290'
9 8	▽ 5.00	5.0	18-8°-58	102.0	310'
	water 1.5' deep				
℄ Brr. Ck	○ 10.0	5.	~~133°55'~~	97.0	~~380'~~
			99°-30'	102.0	400'
	4.26				
8 7	▲ 5.0	5.0	160°-41'		254
	3.74				
across Brr. Ck	7.0				
	○ 5.0		99°-52'		400'
	3.0				
mst at 6	7.8				
6	▲ 5.0	5.0	177°-15'		560'
	2.2				
	12.15				
℄ Beaver Ck.	○ 11.0		133°-30'		330'
	9.85				



4/20-1917 Fiedler Dourney Keeny

	Rod	H.I.	Angles	Elevs	Distance
			142°-		115'
a High water mark	-5.0		342°	102.86	70
Bev. ck ℄ ditch to S.	-9.30		311-25	97.76	130'
B.M. "E" (11B)	+5.20	107.06		101.86	
Sta 10		5.0	206°-24	102.0	300 ✓
℄ Bev. ck	-9.2		283-20	97.86	38' ✓
Cent. of Bridge floor	-2.85		317°-4'	104.21	154' ✓
in road - R. bank			329-30°		95' ✓
			238°-		360' ✓
			260°-		410' ✓
			109°30		180' ✓
B.M. "E"	+4.70	106.56		101.86	
			103°-		80' ✓
			217-10		170' ✓
N. side Bridge	-9.1		233-52	97.46	196' ✓
			233-52		44' ✓
10 sta ⊗		4.5	143°-55'	102.	440' ✓
			270°-12'		308'
			284°-		364'
			315°-		366'
			346°-37'		340'

9 Sta T



4/20 — 1917

	Rod	H.I.	Angle	Elevs	Distance
				101.6	
℄ Beaver Creek	6.4 Bottom				
	4. Bank		147°-20	104.0	5-4.0
	4.		157°-35	104.	460'
	4.0		163°-40	104.0	440
	5.		171°	103	400 ↙
	5.		183°-15	103.	300 ↓
	5.		151°-30	103.	220 ↙
Sta 11	4.0	for readings 6.0=102.	151°-45'	103.	550.↙
	4.0.		154°-45'	103.0	600 ↙
	5.		187°-30'	102.0	700 ↙
	5.		202°-10	102	700 ↙
	5.		211°-30'	102.	600 ↙
Elev	7.0		216°-40'	100.0	520'↙
Elev. gully & ditch to South	7.6		212°—	99.4	420'
	8.4		252°-30'	98.6	185'↙
℄ Beaver Creek on bank	7.6		158°-30	99.4	680 ↙
	1.8		161°—	105.2	730'
on Bank	1.5		203°-30	105.5	800
	4.0		151°—	103.0	5-80'
on Bank	1.3		209°—	105.7	760
	4.0		143°-30	103.0	400
on Bank	2.8		223°-10	104.2	560
	4.1		222-15	102.9	405
			133°-45		220
			25-7°		185'
Sta. 10		5.0			

△ #4

151° 45' → 5-5-0'

△ #10

△ B.S. #9

4/20—1917 Fiedler Rooney Reeny

			Angle	Elev	Distance
			313°-26'	to Sta. #9	
10° W. of Hazen-Morris line			229°-15'	102	360
			212°-10'	"	250'
			25°-2°	"	365'
			196°-10'	"	170'
			276°-45'	"	340'
			200°	"	80'
			230°-30'	102.	5-0'
BM "F" B.S.8	+3.38	5-00	191°	103.70	88'
Sta 12 △			74°-56'		5-13'

Sta 9 △

Sta 8 △

21

△ (B.S.) from 12 to 8

74°-56'

5-13'

740'

△ B.S.

4-20-1917 Fidler - D.&K.

	Rod	HI	Angles	Elev.	Distance
Bottom	7.3		351°-	99.3	150'
Bottom ditch	5.9		289°-	100.7	25'
			212°-30'		70'
			236°-30'		150
			253°-15		260'
			267°-30		360'
			290°—		350'
			308°—		320'
			324°-15		280'
			350°-45		190'
Sta 14 △ water 1.25		4.60	160°-17'	102	380'
Lake	10.6		123°-10	96.4	410'
			80°-5'		
water 1.25 Lake	10.6		85°-40'	96.4	390'
	7.0		85°-40'	100.	20'
Sta 13 △		(107.00) 5.0	129°-55'	102	540'
	7.0		35°-53 N-4°-15'E	100.	10'
Beaver Creek Outlet Property line Hazen Morris			35°-53'	96.4	827'
			130°-20	102.	223'
Sta 6 △		5.0		102	
Sta 4 △					

Use 96.4 for low water mark - Till Stinchcombs BM is located

open ditch flow North

open ditch - flow to N.

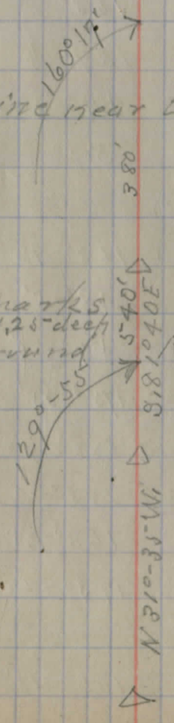
in meadow

N. end of Ref Line near landing on ash stump

high water marks water 1.25 deep

530 to hard ground

Ref. point S. end of line.



inst. 6 B.S. 4

BS

4-20-1917 to 4/21-1917

F. H. & K.

	Rod.	H.I.	Angles	Elevation	Distance
Sta 18.			191°-55'		320'
Lake			131°-40'		260'
Lake			102°-		300'
Sta. 17 △			124°-2'		445
			108°-10'		410'
			101°-20		400'
	4.8		159°-30'		350'
			138°-30'		325'
			124°-40'		253'
			110°-		180'
			168°-5'		155'
			129°-3'		
			49°-30'		
Lake			359°-		460'
B.M.	+3.25	4.80 (104.80)		103.55	
Sta. 16 △			163°-42	102.0	3-05'
			48°-5'		
Lake			57°-50'		295'
			175°-35'		435'
			188°-7		325'
			193°-10		180'
Sta 15 △		4.90	163°-25		65-0'
			173°-40		160'
			90°	100.00	30'
Sta 14 △			106°-13'		

= East end of Base line

water 1.25 on rod

— — —

191°-55' 320'

ditch as below

head of Ditch

184°-2' 445' N. 10°-30' W.

Prop. Pine N. side Morris

ditch N. side Morris farm

Ref Pt. E end Baseline

Ref. Pt. Beaver Creek

+16' S. of prop. Line - Morris 4. —

Bench on Hickory

quit work - night

Ref Pt. near Beaver Creek outlet

water 1.25 on rod

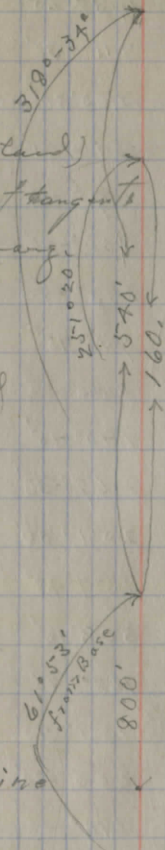
163°-42' 3-05'

163°-25' 65-0'

Ref. pt. on "45" stump" near Boat house

4/21–1917 F. H. & K.

	Rod	H.I.	Angles	Elevations	Distances	
Sta. 21			318°-34'		540'	(N.E. of base)
Sta 20'	△		251°-20'	102.00	160'	(on N.E. Side of Road)
"			341°-20'		490'	℄ Road - Int. of tangents
"			63°-15'		41'	℄ road small ang.
"			11°-45'		97'	℄ road
Lake N.			250°-	96.4	235'	1.25- water
Lake S.			90°-	96.4	270'	1.25- water on Road
			96°-15'		153'	
			251°-35'		156'	
			238°-45'		50'	
Sta. 19	△		61°-53'	102.0	800'	
			88°-		344	
			61°-50'		330'	
{Sta 18 B.S. on #1	⊙					= E. end of Base Line
Sta 1	×					
Lake			89°-5'		344	1.25- water on rod
			89°5'		18,5'	high water marks
	(N. 89°-30' W.)		89°-5'			Ref. sta 5 Base line (on 25' offset stake line of ditch)
			69°-39'			R. of Pt. Beaver Creek
Sta 18 (B.S. to 17)	△	5'3	338°-20		106.	Intersec. of tangents of Bass Lake Road



4/21-1917

Station		Rod	H.I.	Angles	Elevations	Distances	Remarks	
				193°-25'		440		
				211°-30'		290'		
				200°30'		366'		
				81°-21'			Ref pt-on "ash stump"	W. of Boat house
				9°-0'			E. end of Baseline	
Sta. 23	▷ B.S. 22		5.0	130°-40'	102.	450'		
				143°-50'		280'		
				93°-45'		221'	ditch	
				340°-15		190	Prop line Bidlake	
				140°-15'		250'		
Lake				67°-30'	96.54	345'	water 1.25 on Rod	8' W. of Prop line Bidlake
B.M.	B.S. 21	0.90	4.1	251°-30'		62'	B.M. Tree	
Sta. 22	▷			154°48'	102.0	530'		
				308°-15'			Ref pt. Beaver Creek	
				163°-40'		395'		
				193°-10'		520'		
				200°-30'		520'		
				190°-		430'		
				201°-30'		360'		
				199°		230'		
				289°-35'		515	N.W. cor. Barn	
				96°-15'		60'	S.W. cor. of Icehouse	
				175°-30'		195'		
Lake				65°-10'	46.4 approx	171'		
Sta. 21	▷ B.S. on 19			318°-34'	102.			B.S. on 19

swail outlet to NE

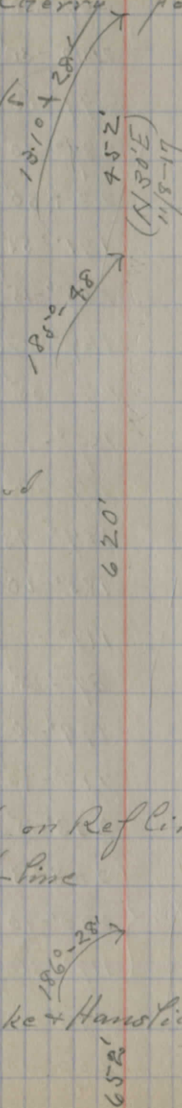
See record of Bidlake to Bass Lake 204.

130°40' 450'

154°48' 530'

4/21-1917

	Rod	HI	Angles	Elevation	Distances	Notes
	B.S. 25		293°–		210'	
			309°		110'	
Sta 26	△	5.0	131°-28'	102.	452'	on Edwards Cherry point
			131°-28'		415'	
	B.S. 24		85°-25'		540'	Prof. line Hanslik +
			134°-25		350'	Edwards
			137°-20'		185'	
Sta 25	△	5.0	185°48'	102.	620'	
			190°-15'		390'	
			187°-50'		265'	
			184°-45'		190'	
			159°-30'		65'	
Lake bottom		5.0	63°-35'	96.4	570'	1.25 water on rod
			192°-45'		195'	
			212°-40'		230'	
		swamp	236°-30'		100'	
			262°–		95'	
			215°-45'		63'	
			184°40'		150'	
	B.S. 23		62°-2'			To Oak Stump on Ref line
			344°35'		386'	Bidlake & Hanslik line
Sta. 24	△	5.0	186°-28'	102.	652'	
Lake	B.S. 22		106°–		370'	Prof. line Bidlake + Hanslick
Sta 23						



check this

4/21–1917

	Rod	HI	Angles	Elevs.	Dist.
S/a 29 "A"	○		208°-5'		280
S/a 29	△		174°-30'	102.00	595'
			269°-30		290'
			280°-30'		210'
			297°-15		150'
			287°-30'		90'
			224°30'		100'
			191°-55'		300'
			125°-15'		480'
S/a 28	△		169°-12'	102.00	345'
			166°-35'		280'
			169°-0		200'
			774°48'		
S/a 27	△		187°-43'	102.00	281'
			183°-20'		150'
			111°-		560'
			87°-25'		
			194°-10'		140'
			218°-40'		235'
			233°-15'		380'
		2' ditch	238°-30		220'
			220°-10'		55'
			119°-30		165'
			243°		350'
			269°-10'		310'

B.S. 27

B.S. 26

B.S. 25

S/a 26

(Located from 28 & B.S. 27) (to finish swamp)

1740-30'

5-95'

nail in creosote stump N. end Ref Line

1690-12'

345'

Ref. pt. on ash stump

check this

187°43'

281'

To Ref. pt ash stump

outlet of tile into ditch at 6

Monday 4/23-1917 Fiedler - Keerry & Downey

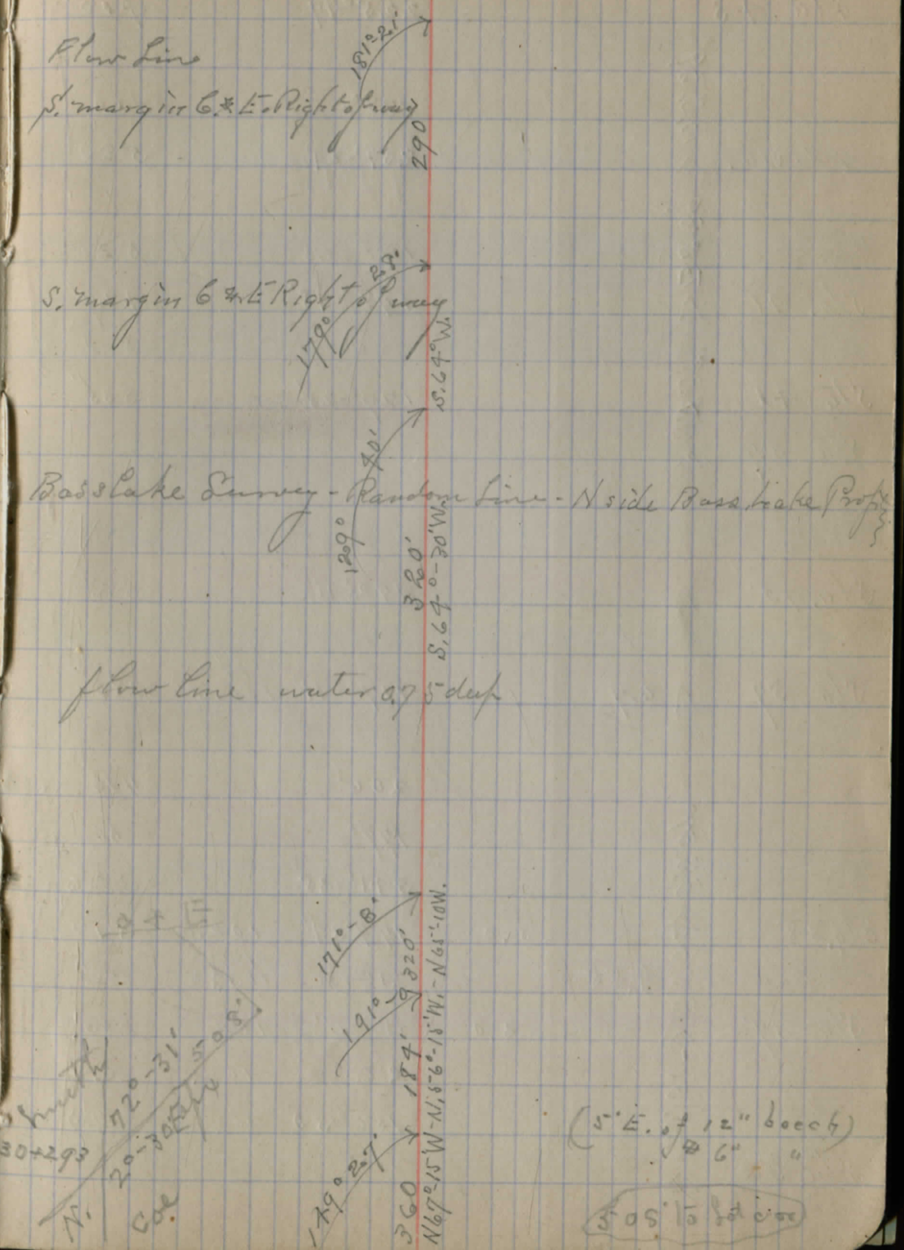
	Rod	H.I.	Angles	Elevs.	Distances	
B.S. 29			153°–		180'	
Sta. 30 △		4.9	151°-44'	102.0	580	across inlet ditch
			189°-50'		520'	across inlet ditch
			180°-50'		460'	across inlet ditch
			56°-20'		780'	ang. in ditch + near mouth of inlet
			65°-5'		620'	ang. in ditch
			158°-50'		292'	ang. in ditch
	9.0			98.0		water in inlet approx.
			229°-44'		645'	inlet ditch at an ang. pt. Brook from N.W. 30' above this pt.
			240°-50'		325'	
			234°-0'		390'	
			202°-50'		206	
			192°-50'		200'	
			159°-20'		120'	point of high ground S. of inlet ditch
Sta. 29 △ B.S. 28	6.15		51°-50'		460'	N end of Ref. line nail in stump
	5.3			101.7		water in swamp
			268°-30'		175'	
			229°-45'		320'	
			275°-30'		80'	outlet to swamp easterly side
			286°		94'	outlet to swamp – westerly side
			237°		390'	
			260°-40		350'	
	8.70			98.3		water at outlet swamp
Sta. 29"A" ○ B.S. on 28		5.0	122°50'	102.	391'	check on Sta. 29

151°-44'

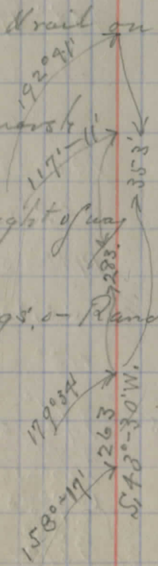
1-80'

4/23 – 1917 – F. K. & D.

	Rod	H. I.	Angles	Elevs.	Distances
Sta 36 △			181°-21'		290'
Culvert C. & E.	38		196°	103.00	140'
			252°		39'
			177°-		142'
B.S. 34			197°-		65'
Sta 35 △			179°-28'		212'
B.S. 33			265°		58'
			177°		110'
Sta. 34 △			129°-40'		320'
			100°		84'
nail in Ry Tie			283°40'		340'
			229°		95'
			250°		110'
		?	250°		125'
18" Ry Culvert	5.2			101.6	
		opening 3'6"	328°-		120'
			287°-0		62'
B.S. 32			2°		100'
Sta 33 △ B.S. 34		4.8	171°-8'	102.	320'
Sta. 32 B.S. 31			191°		184 5'
B.S. 30			163°-30'		100'
Sta 31 △			149°-27'		360'
B.S. 29			149°-30		298'
Sta 30 △					



Station	Rod	H.I.	Angles	Elevs.	Distances	Remarks
Sta 43			225°-17' (27, for corr. stake moved)		400'	Iron pipe set near Gravel + sand beach, S. of clump of Soft Maples
4/ B.S. 39			128°-		100'	shore line
42 Sta. △			251°-24'		580'	near shore line - Iron pipe set (S. 1° W.)
B.S. 39			198°-45'		520'	Shore line of Lake Outer fringe of bushes.
			198°-45'		427'	near shore line & across "Burnt area".
Sta 41 △ B.S. 38'			129°-25'		335'	
Sta 39 △						
Sta. 40 △			192°41'		353'	Tack in Tie 4" N. of N rail on Random Survey line
Sta 39 △	6.7		117°-11'	approx 100.3	283'	out in cranberry marsh
			206°-		130'	Margin of C&E Right of way
B.S. 37			177°-		60'	
			341°-25		326'	Int. of C&E Ry. Tangs. & Random of Survey
Sta. 38 △		5.0	179°34'	102.0	312'	quit on 38
B.S. 38	4.55		246°-30'	approx 103.45	72'	
Sta 37' △		5.0	158°-17'	103.	263'	
			260°-	102.	3.5'	
B.S. 36			156°-30'	102.	220'	
Sta 36 △						



4/24-1917 F.D.&R.

Station	Rod	H.I.	Angles	Elevations	Distances	Notes
			42°-58'			To Beaver ck point end of Ref line
			216°-5'		204'	to Sta. 45
Inst. on ash stump						B.S. to Ref. line across Lake to pt. at Maple Tree
Sta 46 △			256°-7'		371'	across Track of C.&E. (256°-7')
B.S. on 44			97°-49'		294'	To Ref. pt. on Ash stump
Sta 45 △			162°-37'		664'	Bet. Boat House & Track E. of path
Sta 44 △ B.S. 43			238°-19'		280'	on knoll — See Page 70
				97.60		water Surface 4/24-1917
	1.6			104.5		highest pt on "knoll"
			146°-22'		546	N. cor. of boat house
			142°-		375	
			178°-53			Cor. Post of Lot Cor. back of Old Cottages (for checking)
			130°45	102.	260	
			116°-		174'	shore Line
Lake surface	9.6		71°	96.4 (1.2)	135'	shore line water 1.25 on rod
~~44 Sta~~ △ see above		106.05	~~238°-19~~ 2-16'	97.63	~~280'~~	~~on knoll~~ — See above
B.S. 42			142°-16'			Ref. Pt. on Island - Maple tree - nail in Root
			158°-5'			" " at Beaver Creek
shore line			213°		275'	
shore line			200°		195'	
shore line			161°		125'	
shore line			122°-0'		70	
Sta. 43 △			212°32			Ref. pt. ash stump

4/25-1917 – Fiedler Keeny & Downey

40		161°20'	645	to Sta no. 40 on G.&E.
		158°	475'	
		156°	430'	
		155°	330'	
		148°	215'	
		132° –	125'	
		90° –	60'	
		8°-30'	160'	
sta 45	B.S. 46	315°-50'	515'	Sta 45
46			280'	

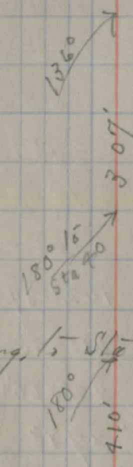
Inst. on Track G.&E. N. rail B.S. on 46 Ang to Sta 4.0 = 161°-20 distant 645 FT. (280' to 46)
(offset line - nail in tie G.&E. + Bass Lake Survey)
" ? check for above

153°-30	340'		
118°40'	485'		
156°-40'	230'		
154°-20'	260 215		
150°-30'	245' 135		
126° –	96		
154°	357'	at G.&E. Ry	
115° –	63	spring Brook	
67°-20'	370'		
64° –	180'		
18°-45'	75'		
304° –	95	Shore line & mouth of cold Spring Brook	

Ash. Stump ⊡ (B.S. to Maple tree point across Lake) N. end of Ref. line "A" as ash stump
End of Ref line D

4/25-1917-F.D.&K.

	Rod	H.I.	Angles	Elevs.	Distance	
			236°		240'	shore line
			175'		42	prop. line
			175°—		110'	shore line
			127°-30		160	shore line
Sta 50 △ (B.S. 49)			117°-30		302'	no. 50 near lake
Sta. 49 △ (B.S. 48)			136°		307'	(S. 3°-20'E)
			121°		270	
			110°		240'	
			83°		210	
Sta. 48 △			180°—		296'	on Ry
(B.S. 40)			138°—		230'	
Sta 47 △	8.70	10.70	180°—		410'	tack on Tie, Tang. to Sta 40
			150°	102.	110' (so as between)	
			~~180°~~—		~~410'~~	Tack in Tie on Tang. for #47
			173°—	.02	240'	2 stem? and near hwary in G&E right of way
			164°—	—	200'	
(B.S. to 40)			150°—	—	165'	Prop. line Bass Lake & Hazen
			131°—	—	155'	
	9.90	11.90	111°-12'	102.	165'	Elev. peg.



Inst. on Tack of offset line & G&E. in Tie & B.S. to N. Ealing G&E line

4/24-1917

	Rod	H.D.	Angles	Elev's	Distances	
Sta 45	△		162°-37'		65 ft	setting 45 - near path to Stop on Ry (S. 88° - W.)
			72°-20'			Ref pt. on island across Lake
			278°		70'	
			285°		100'	
			305°		138'	
			325°		125'	
			(0,0) 360°		135'	
	B.S. 43		350°		130'	
			335°		40'	Smith's "Island Knoll" (See Page 64)
Sta 44	△					

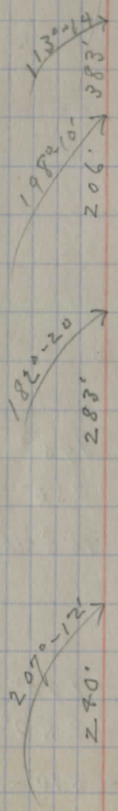
162°-37'

66 ft feet

			Road HD	Angles	Elevs	Distances	
S1/4. 1				198°-		260'	is S1/4. 5 of offset stake on ditch
				141°-		200'	
				300°-		140'	downstream
				146°-		100'	up stream
				✓ 195°-		26'	& old channel
				✓ 113°-14'		383'	24 cm for moving stake
S1/4 S-4	△	B.S.S-3					
		B.S.S-2					N. 22°-15' W.
S1/4, S-3	△			✓ 198°-10		206'	
				✓ 108°-		235'	
		B.S.S-1		✓ 110°-		195'	stream as below
				✓ 95°-		95'	
S1/4 S-2	△			182°-20		283'	
				✓ 165°-	102.	182'	
		7.50		✓ 159°-		215'	
		7.00		✓ 173°-		100'	
		6.70		209°-		91'	
		4.60	5:20	233°-	102.	65'	≠ stream
S1/4 S-1	△	B.S.49		207°-12'		240.	
				✓ 216°-		175'	
				✓ 251°-		100'	
				✓ 219°-		75'	
		6.1		86°-		125'	
		4.		342°-		140'	
S1/4.49	△	B.S.48	5:00		102.50		

N. 22°-15' W.

S. 44°30' E. - Rain



B.S. 55

		195°	150'
		250°	70'
Sta 56		158°-10'	310'
	B.S. Sta 155 (one on Base)		
		190°	180'
		250°	110'
Sta 55	Δ	310°-	380'
Sta. 1	Δ	262°-11 to Sta 54	

Finis

N. 19° E. aprox

158°-10'

310'

shore line — water line on road

to Shore line — — —

Beyond old Clamott

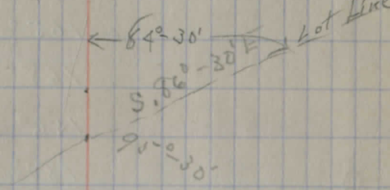
310° (B.S. as below)

B.S. on Sta. 3 of offset stake line for ditch

Fiedler & Gran. Nov. 6th 1917
Bass lake - Inlet Ditch etc.

(712)

Sta		Angle	Elev.	Distances
	B.S. on B.	incld. ang. of 95°-30'		
Sta "C"	△	101°-8'		729
		111°-15'		~~72~~
		64°-8'		
Sta "B"	△	215°-45'	102.0	622
	B.S. 29	172°-25'		587
		156°-10		287
Sta "a"	△ B.S. on 30	88°-30'	102.0	370'
Sta 29	△ N 36°-35' W			
	B.S. on 29	352°-30'		300'
30	△	0°-00'		300



Int. 1/2 ditch & Co. N. line — (stake on E Bank = 711') + 18' to int.

Int. G + E + Road

ang. in ditch #2

729' — N. 88° E — (S. 90° W / N 90° E)

ang in ditch #2

ang. in ditch about 30' N. of spring stream from N.

370' — N. 52° E

ang. in ditch S. bank

ditch south Bank ditch about 18' wide

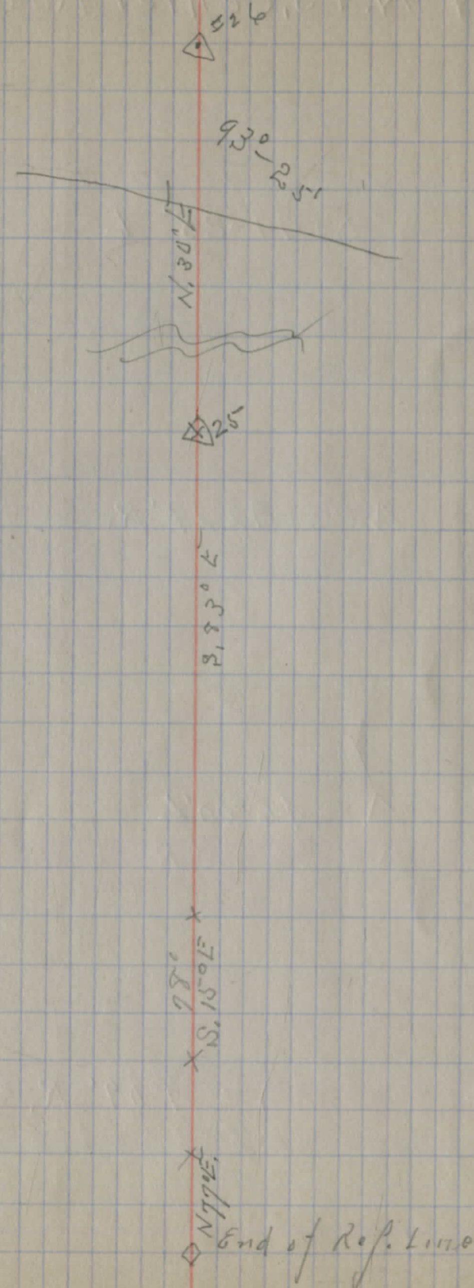
4/25 – 1917 –

Rad	H I	Angle	Elevs	Distances	
		159°		430'	
		152°		390'	
		148°		325'	
				210'	
		167°-45'		240'	cent. 20' knoll
		165°		260'	
		168°		280'	
		156°		250'	
0		180°		341'	to tack in Tie near W. prop line Bass Co. (Tangent)
		140°		270	
		149°		250'	
		152° –		220'	
		157° –		170'	
		150° –		185'	
		132°		220'	
		120°		195'	
		101°		115'	banks of brook
		68°-30'		145'	
		43° –		150'	
		20° –		220'	
		13°-30'		215'	S. of Track
		357°-45'		185'	
		346°-20		290'	
8.20	110.20	342°-12		400'	Int. on Track S. & E.

B.S. Boat House — B.S. on End of Ridge △ — B.S. on Ridge at Maple

		200°	105'	East
Sta W.	△			
		123°	78'	South
		140°	40'	South
Sta X.		245°	156'	West
		264°	84'	West
Sta W.		100°-25'	210'	East
	8.20			
Inst.	△ 4.20			

11/8-17



Bass Lake Ditch
W. of N. + S. Center Road

58+60.5 Δ = 44°-25' L

44-25
88-50

56+80.° Δ = 42°29' R.

42-29
84-58

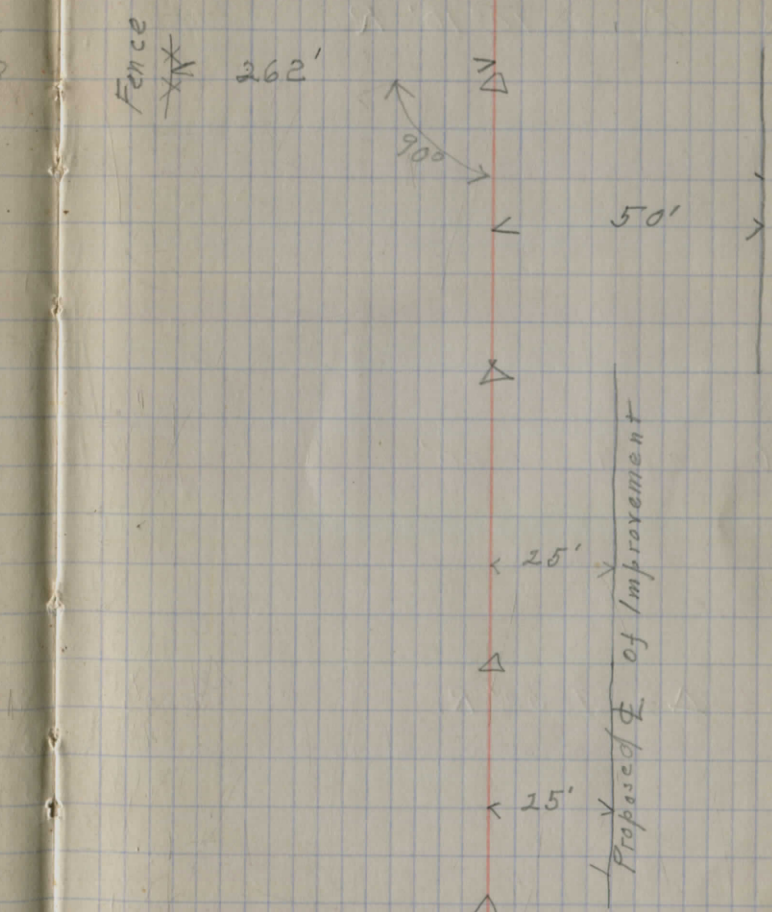
51+08.5 Δ = 46°00' L

46°00'
92°00'

49+57.4 Δ = 9°09' R.

9°09'
18°18'

Feb. 4, 1928 W.C. Marks
Thaw - Mist. Harvey Goodrich
Harry Klaus



84

72+15

68+18.3 $\Delta = 10°10'$ R

10°10'
10°21'

64+70.5

64+50.0 0°00'

62+31.2 $\Delta = 27°52'$ R.

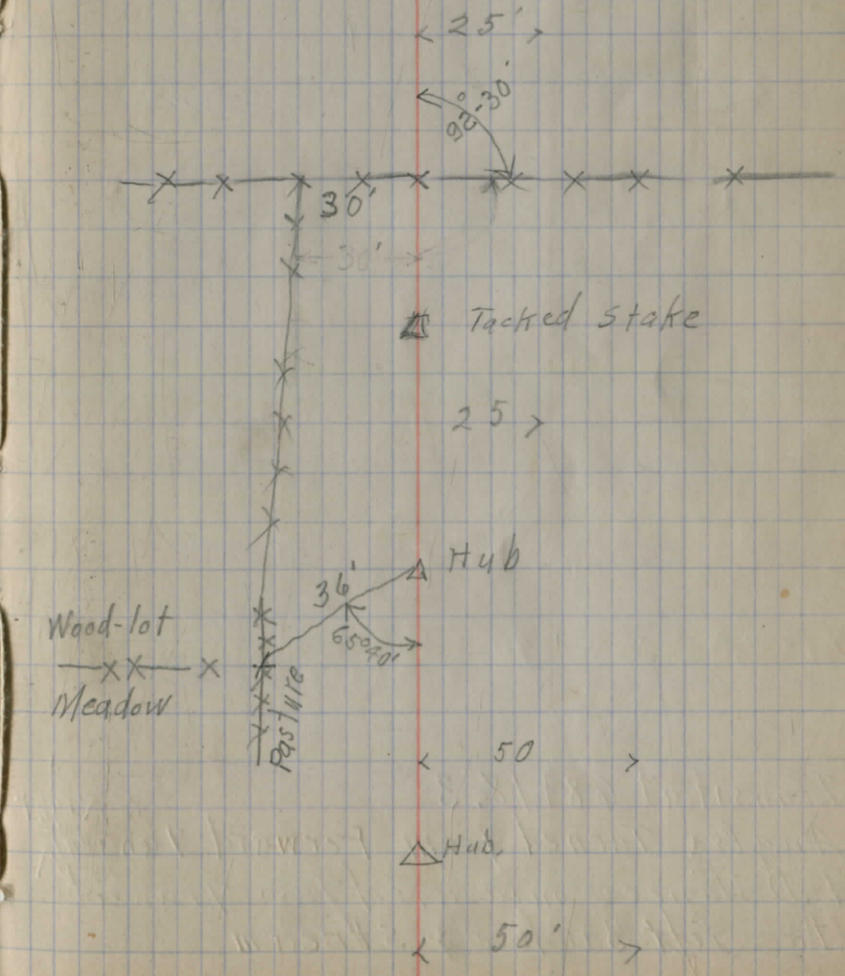
27-52
55-45

60+59.8 $\Delta = 27°-22'$ R

27-22
54-44

41

top of old Dam



Transit at 68+18.3

Angles Turned from Forward Tangent to Right

+ Distances measured from Transit

to Left Bank of stream

Angle	Dist.	Width of stream
24-30	102	25
49-00	100	15
90-00	103	25
98-55	127	26
106-45	139	20
111-05	125	30
104-25	110	20
98-35	93	20
96-45	55	20
104-00	45	25
128-35	44	20

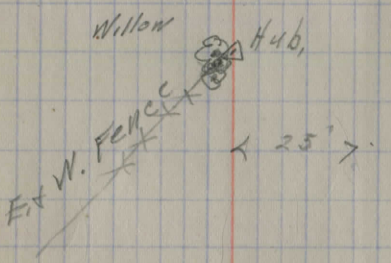
81+79.5

77+02.0 Δ = 40°58' Left
Stopped, Feb. 4, 1928

40°58'
81°55

74+00 Δ = 24°-43' L

2443
49-26



Δ Hub

< 25' >

6.80	1148.37		1141.57
		5.70	1142.67

1144.06

97.1
97.24

B.M. x W. Wall Bridge at Angle With Wing Wall – N. & S. Center Road

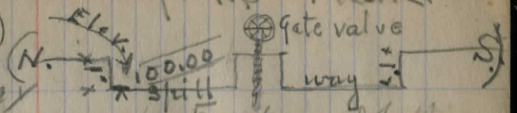
Stopped, account of Rain

Zethmayr's Elevation, run from U.C.H. 324, of B.M. on N.W. root of Elm at Outlet of Bass Lake, Assumed Elevation 100.00 of Ditch Survey

Low Water, Oct. 11, 1928
Water Oct. 22, 1928
33" Fluctuation during Fall of 1928 at Boat House

	+ R.	H. I.	− R.	Elev.
	7.69	107.69		100.00
			8.4	99.3
T. P.	6.90	114.59	0.00	107.69
T. P.			6.17	108.42
T. P.	4.41	112.83		
			16.4	96.4
			12.4	100.4
T. P.	3.85	112.27	4.41	108.42
T. P.	6.04	114.73	3.58	108.69
			6.3	108.4
			15.4	99.3
			11.4	103.3
			11.3	103.4
			9.1	105.6
			11.0	103.7
			14.0	100.7
			5.0	109.7
T. P.	7.70	121.52	0.91	113.82
			13.5	108.0
			16.5	105.0
			11.4	111.1
	6.65	125.15	3.02	118.50
			10.6	114.6
			14.15	111.00
			10.00	115.15
			17.7	107.45

Dec. 17, 1927 - W. C. Marks & Fiedler (Wm. Miller's Inspector)



spillway
Assumed El. 100 Damat Fowlers Mills
Water level of Pond (water running in race, + flume gate valve in down

Stream Bed, Jones-Russell West Line
Any Water Level.

Top of Dam " " Property
Stream Bed (dam) " "
Top of Water approx.
F. L. of Culv. across C. + E. - R. of W.
N. End of Rail of Foot-Bridge
Low Point in Cultivated Field N. of Stream
Stream Bed at Foot Bridge
Drive-way across C. + E. - Russell + Jones

Water Level Miller-Jones-Russell Line

Bed of Stream
" " " Ry. Culvert 50' E. (Russell)

" " " Rd. culvert W. of Mansfield
Water Surface, N. + S. Center Road
Top of Curb.
Stream Bed

	BS	HI	FS	Elev
B.M.				1141.57
B.M.	2.08	1186.38		1184.30
T.P.	0.32	1171.09	15.61	1170.77
T.P.	0.40	1155.25	16.24	1154.85
T.P.	3.14	1145.66	12.73	1142.52
B.M			4.23	1141.43
BM	4.23	1145.80		1141.57
T.P.	9.91	1146.69	9.02	1136.78
BM	5.21	1144.51	7.39	1139.30
TP	3.78	1138.62	9.67	1134.84
TP	3.04	1137.45	4.21	1134.41
BM	9.22	1140.28	6.39	1131.06
TP	7.80	1147.97	0.11	1140.17
TP	1.77	1148.87	0.87	1147.10
BM			7.29	1141.58

X on W. Wall of Bridge, S. End.

S. E. Root of Hickory opposite Miller's House

1141.57 Rec. X on West Wall of Bridge at Angle with S.W. Wing-Wall

top Stake 54+00
N root 18" Elm Sta 62+70 and 75' L of travers line

top Hub Sta. 68+18.3
N root 30" maple Sta 74+70 and 45' L traverse line

Sta	BS	HI	FS	Elev
BM	0.88	1142.45		1141.57
Sta 50				
Sta. 51				
Sta 52				
Sta 53				
TP Top Stake 54	5.12	1141.90	5.67	1136.78
Sta 54				
Sta 55				
Sta 56				
Sta 57				
TP Hub (top) 56+46	7.44	1144.99	4.35	1137.55
Sta 58				
Sta 58+60		Section at ½ (Bisecting Angle)		
TP tap Hub 58+60	2.70	1146.17	1.52	1143.47
Sta 59				

X on W wall bridge S End

1137.8	1137.3	1134.9	1133.8	1135.3	1136.7	1136.7
4.7	5.2	7.6	8.6	7.2	5.8	5.8
0+00	3.00	9.0	20	32	39	50
1137.0	1137.1	1135.8	1134.7	1134.2	1134.3	1135.8	1137.7	1137.6
5.5	5.4	6.7	7.8	8.4	8.2	6.7	4.8	4.9
0	14	18	18	25	32	34	38	50 Fence
1136.3	1136.4	1133.9	1134.2	1136.1	1136.9	1136.8	1137.7
6.2	6.1	8.6	7.3	6.4	5.6	5.7	4.8
0	18	20	19	33	42	58	81
1136.7	1136.1	1134.1	1134.0	1135.3	1135.8	1136.7	1138.0
5.8	6.4	8.4	8.5	7.2	6.7	5.8	4.5
0	36	23	32	34	49	70	89
1136.0	1136.0	1135.7	1135.1	1135.1	1133.8	1134.1	1136.2	1136.3	1136.3
5.9	5.9	6.2	6.8	6.8	8.1	7.8	5.7	5.6	5.6
0	14	24	25	31	32	33	42	66	100
1136.3	1136.3	1135.0	1134.0	1133.4	1133.4	1135.6	1136.1	1136.3
5.6	5.6	6.9	7.9	8.5	8.5	6.3	5.8	5.6
0	10	15	17	20	35	29	45	59-150
1136.6	1135.6	1133.4	1133.4	1135.3	1135.5	1136.2
5.3	6.3	8.5	8.5	6.6	6.4	5.7
0	11	13	25	29	33	43-206
1137.1	1136.5	1133.6	1133.7	1133.6	1134.6	1135.2	1135.4	1136.0
4.8	5.4	8.3	8.2	8.3	7.3	6.7	6.5	5.9
0	10	13	21	23	27	39	57	69-206
1142.4	1140.6	1137.8	1135.7	1134.7	1133.6	1135.9
2.6	4.4	7.2	9.3	10.3	11.4	9.1
0	13	19	39	43	46-56	67-206
1143.2	1142.0	1137.6	1136.2	1135.8	1133.5	1134.5	1135.5
1.8	3.	7.4	8.8	9.2	11.5	10.5	9.5
0 0	9	17	26	45	51-60	62	70-Level
1143.8	1142.8	1137.9	1135.3	1134.4	1133.7	1133.4	1134.4	1135.6
2.4	3.4	8.3	10.9	11.8	12.5	12.8	11.8	10.6
0	8	14	34	40	43-49	54	62	70

	BS	HI	FS	Elev.
		1146.17		
TP	1.98		2.70	1143.47
60.				
T.P.	0.80	1144.27		1143.47
60+59.8				
61+00				
61+75				
62-00				
BM	2.67	1141.96	4.98	1139.29
62+31.2				
63+00				
63+25				
64+00				
64+50				
tip	4.01	1139.63	6.34	1135.62

1143.5 / 2.7 / 0.0 — 1142.7 / 3.5 / 19 — 1135.3 / 10.9 / 32 — 1135.3 / 10.9 / 41 — 1133.9 / 12.3 / 53 — 1135.7 / 10.5 / 68 - 2.06

Feb. 13, 1928 Clear, 22° Marks-Goodrich Clause-Rand

Top of Hub. 58+60

1140.5 / 3.8 / 00 — 1141.1 / 3.2 / 26 — 1136.7 / 5.6 / 32 — 1134.3 / 8.0 / 34 — 1133.1 / 11.2 / 40 — 1132.6 / 11.7 / 44 — 1132.7 / 11.6 / 49 — 1134.2 / 10.1 / 54 — 1134.6 / 9.7 / 65

1140.1 / 4.2 / 00 — 1141.1 / 3.2 / 21 — 1138.9 / 5.4 / 28 — 1133.1 / 11.2 / 38 — 1133.1 / 11.2 / 43 — 1138.7 / 10.6 / 48 — 1134.2 / 10.1 / 61 — 1134.6 / 9.8 / 80

1137.6 / 6.7 / 06 — 1138.5 / 5.8 / 12 — 1139.4 / 4.9 / 17 — 1139.6 / 4.7 / 24 — 1134.3 / 10.0 / 32 — 1133.3 / 11.0 / 36 — 1132.7 / 11.6 / 39 — 1132.5 / 11.8 / 52 — 1132.6 / 11.7 / 61 — 1134.3 / 10.0 / 64 — 1134.6 / 9.7 / 80

1136.1 / 8.2 / 00 — 1134.6 / 9.8 / 34 — 1132.7 / 11.6 / 36 — 1132.5 / 11.8 / 49 — 1132.7 / 11.6 / 54 — 1134.4 / 9.9 / 65

1139.30 rec. N. Root. 18" Elm 75' L. of 62+70

1138.7 / 3.3 / 06 — 1138.4 / 3.6 / 12 — 1134.5 / 7.5 / 21 — 1133.7 / 8.3 / 29 — 1132.7 / 9.3 / 33 — 1132.6 / 9.4 / 43 — 1133.6 / 9.0 / 47 — 1135.2 / 7.5 / 56

1137.7 / 5.3 / 10 — 1133.3 / 8.7 / 5 — 1132.9 / 9.1 / 00 — 1132.8 / 9.2 / 8 — 1133.3 / 8.7 / 16 — 1133.2 / 8.8 / 36 — 1135.7 / 6.3 / 53-80

Small stream enters from left

1140.1 / 1.4 / 7 — 1135.8 / 6.2 / 20 — 1132.8 / 9.2 / 7 — 1132.6 / 9.4 / 16 — 1132.8 / 9.2 / 24 — 1133.7 / 8.3 / 27 — 1134.6 / 7.4 / 37 — 1135.2 / 6.8 / 70

1139.6 / 2.4 / 00 — 1138.9 / 3.1 / 7 — 1132.3 / 9.7 / 12 — 1132.3 / 9.7 / 17 — 1132.9 / 9.1 / 37 — 1134.6 / 7.4 / 42 — 1134.9 / 7.1 / 80

Sta	BS.	H.I	FS	Elev
Sta 65+00		1139.63		
Sta 66+00				
TP	4.58	1139.33	4.88	1134.75
67+00				
67+65				
68+00				
68+25				
69+00				
?				
70+00				
TP	5.00	1136.21	8.12	1131.21
71+00				
72+00				
72+15				
72+90				

57

1134.8 1134.5 1134.8 1131.7 1132.4 1133.1 1133.8 1134.6
4.8 5.1 7.8 7.9 7.2 6.8 5.8 5.0
00 8 13 20 25 29 39 50

1134.9 1134.0 1131.2 1131.1 1131.3 1133.5 1133.5
4.7 5.6 8.4 8.5 8.3 6.1 6.1
00 10 20 28 33 45 80

1134.0 1133.4 1132.3 1131.1 1132.7 1133.0 1134.0
5.3 5.9 7.0 8.2 6.6 6.3 5.3
00 15 19 33 41 44 80

1132.8 1133.1 1130.3 1130.3 1131.5 1132.6 1131.5
6.5 6.2 9.0 9.0 7.8 6.7 7.8
00 20 25 35 39 45-80 80

1134.5 1134.0 1130
4.8 5.3 9.3
00 34 38-80

1134.2 1133.3
5.1 6.0
00 80

1131.9 1131.9 1128.9 1129.3 1131.1 1133.6
7.4 7.4 10.5 10.0 8.2 5.7
00 43 49 60 66 80

1130.6 1129.0 1130.0 1129.1 1133.4 1132.8 1131.8
8.7 10.3 9.3 10.2 5.9 6.5 7.5
00-8 12 29 52 80 115

1131.1 1131.8 1128.8 1128.4 1130.9 1131.6
5.1 4.9 7.4 7.8 5.8 4.6
00 12 30 33 36 65-80

1132.7 1130.2 1127.1 1127.9 1128.6 1130.0
3.5 6.0 9.1 8.3 7.6 6.2
80 57 61 74 79 86

1134.5 1130.2 1129.3 1127.2 1127.2 1127.9 1128.9 1129.2
1.7 6.0 6.9 9.0 9.0 8.3 7.3 7.0
00-8 41 68 73 80 86 94 100

1133.4 1132.1 1133.9 1127.7 1128.1 1129.2
2.8 4.1 2.8 8.5 8.1 7.0
00 50 76 96 128 140

Sta	BS	HI	FS	Elev
72+50		1136.21		
72+80				
72+80				
73+00				
73+40				
BM			5.05	1131.16
	4.10	1135.16		1131.06
74+00				
75+00				
76+00				
77+00				
77+50				
77+75				
79+00				

1133.4 2.8 00 | 1133.5 3.7 11 | 1129.2 7.0 12 | 1127.3 8.9 38 | 1128.5 7.7 60 | 1135.4 0.8 76 | 1135.0 1.2 89 | 1133.1 4.1 100 | 1129.7 6.5 118 | 1128.0 8.2 146 | 1127.8 8.9 173

1133.7 2.5 00 | 1128.6 7.6 8 | 1127.6 8.6 13 | 1128.2 8.0 21 | 1128.8 7.4 69 | 1130.6 5.6 113 | 1131.8 4.4 124 | 1128.9 7.3 129 | 1127.1 9.1 138

1129.9 8.3 154 | 1128.0 9.2 163 | 1131.8 5.2 173

1133.8 2.9 00 | 1132.8 3.4 10 | 1128.2 8.0 21 | 1127.1 9.1 29 | 1128.5 7.7 43 | 1130.0 6.2 100 | 1129.9 6.8 130 | 1126.6 9.2 147 | 1127.4 8.8 158

1129.1 6.8 | 1130.0 6.2 174

6.0 00-7 | 1130.2 13.2 8 | 1123.0 10.2 50-80 | 1126.0 9.2 100 | 1127.2

1131.06 rec. N. root 30" Maple 45' Sta. 74+70

1130.2 5.0 00 | 1129.8 5.4 6 | 1127.2 8.0 9 | 1126.4 8.8 13 | 1128.1 7.1 23 | 1128.5 6.7 25 | 1129.7 5.5 80

1124.8 (6.4 left 5-) | 1127.7 7.5 40 | 1128.1 7.1 32 | 1125.8 9.4 40 | 1125.7 9.5 51 | 1126.7 8.5 56 | 1127.9 7.3 61 | 1129.8 5.4 67 | 1128.6 6.6 85

1130.6 (4.6 left 23-) | 1126.8 8.9 17 | 1127.7 7.5 00 | 1129.8 10.4 6 | 1125.3 9.9 15 | 1125.0 10.2 17 | 1126.7 8.5 20 | 1127.8 7.4 48 | 1128.8 6.4 55 | 1128.3 6.9 80

1130.5 4.7 00 | 1127.9 7.3 6 | 1128.0 7.2 26 | 1124.9 10.3 21 | 1124.9 10.3 41 | 1127.5 7.7 46 | 1126.5 8.7 78

1130.0 5.2 00 | 1129.7 5.5 14 | 1126.6 8.6 21 | 1127.9 7.3 34 | 1127.3 7.9 57 | 1124.6 10.6 93-110 | 1128.0 7.2 115

1127.7 7.5 00 | 1127.7 8.1 69 | 1129.5 10.7 73 | 1125.3 9.9 89-100

1126.6 8.6 00 | 1127.4 7.8 6 | 1124.6 10.6 11 | 1124.9 10.3 31 | 1125.6 9.6 34 | 1126.8 8.4 36 | 1127.7 7.5 48 | 1126.2 9.0 65 | 1127.7 7.5 70

Sta	BS	HI	FS	Elev
TP	4.54	1132.64	7.06	1128.10
79+75				
80+00	Brook enters from left			
80+50				
81+00				
81+89.5				

1126.9 1126.2 1123.9 1124.1 1125.8 1126.9 1126.5 1127.5
5.7 6.4 8.7 8.5 6.8 5.7 6.1 5.1
00 14 17 27 30 37 48 57-80

1126.0 1125.6 1125.0 1124.9 1125.8 1127.5
6.6 7.0 7.6 7.7 6.8 5.1
00 21 27 39 45 52-80

1128.0 1127.6 1126.0 1126.1 1123.8 1124.5 1126.6 1127.5
4.6 5.0 6.6 6.5 8.8 8.1 6.0 5.1
00 19 22 19 36 40 65 70-80

1127.7 1127.9 1126.1 1127.2 1126.4 1127.2
4.9 4.7 6.5 5.4 6.2 5.4
00 16 27 47 69 75

175-195 banks

1126.2 1124.1 1123.6 1123.4 1124.7 1125.4 1126.4
6.4 8.5 9.0 9.2 7.9 7.2 6.2
00 7 12 42 48 51 52-80

Area of High Water.

Angles Turned to Right from Forward Tangent

	Angle	Distance
⊼ 8+00	90°	100'
	90°	12'
⊼ 9+00	90°	15'
	90°	175'
⊼ 10+40	270°	20'
	90°	125'
⊼ 13+00	38-30	190
	86-30	75
	126-15	140
	187-45	150
	329	60
	332	140
	354	110
⊼ 16+00	90	125
	270	8
⊼ 17+00	90	100
	270	10
⊼ 18+00	90	125
	270	5
⊼ 19+00	90	80
	270	25
	326	140
	320	255

π 19+00 continued

Point A turned from 5th 17-19 extended as above readings

π Point A

Angle		Distance
298		340
294		440
311		420
339		320
356		230
39		165
66		360
72		255
89		300
70		360
310-55		430
323	N. Side	125
357	" "	175
12		275
20		440

Area of High Water
Angles Turned to right
From foward Tangent

π 35+00	
π 36+50	
π 41	
π 42	
π 43	
π 44	
* 95+00	

Angle		Distance
		N. bank of outlet
90		
131		380
131	S. Side	60
110		225
83		260
61		302
61	S. Side	55
40		330
23		370
17		440
17	S. Side	150
02	S. Side	216
356	"	290
357	"	326
01	"	400
90	S. Side	15
90	S. Side	15
90	" "	05
90	" "	00
158		340
158	S. Side	25
148		230
103		100
77		155
35		200
00	S. Side	100

45+00 Continued

49+57.4

51+08.5

58+60.5

Angle		Distance
343	S 5.00	165
340	S 5.40	335
265		35
90		75
209-30		145
196-30		135
97		70
20		180
23		250
15		320
07		390
05		510
223		130
190		25
328		140
352		340
358		540
154		430
143		460
132		416
102		260
75		220
75		280
49		210

58+60,5 continued

64+50

Middle of culvert S. Side

Middle of creek + Gullet

Spring enters

Creek enters

Angle	Distance
236	180
239	140
209	100
189	90
132	255
124	400
114	460
113	600
99	580
100	430
95	480
96	375
100	320
163	100
126	65
21	200
172	250
176	240
175	270
181	150
215	120
189	120
04	30
04-30	250
00	340

68+18.3	Creek	Angle	Distance
		218	320
		218	340
		246	220
		246	235
		308	75
		06	130
		306	140
		335	140
		01	195
72+00		73	130
		89	220
	Middle of culvert	83-30	148
		76	210
		71	150
		52	210
		55	225
		50	240
		45	225
		28	170
		08	210
		23	110
		35	105
		25	65
		6	90
		15	115

75+00

78+00

Angle	Distance
146	75
197	95
116	70
18	80
28	95
26	150
22	215
19	245
90	90
4	8
350	90
356	140
5	200
156	45
270	65
320	75
333	145
333	180
351	200
115	130
73	165
59	150
92	200
41	260
47	280

81+00

In creek.

Angle	Distance
194	70
228	70
195	60
117	30
18	15
355	90
103	255
85	215
68	160

Cont. from pg 16 (over) in Back this book.

	B.S.	H.I.	Depth of Water	Bed of Stream	Elev.
60+00			0.7	7.1	1132.8
61			9.5	7.6	32.3
62			0.6	8.2	31.7
63			0.8	8.7	31.2
64			1.0	9.4	30.5
TP Noon	3.71	1137.72		5.90	1134.01
65+00			1.7	9.4	28.3
66			1.7	9.6	28.1
67			0.5	9.0	28.7
68			1.1	10.2	27.5
69			3.0	12.5	25.2
70			3.8	14.1	23.6
BM.	3.35	1134.41		6.65	1131.06 1131.07
↑ Nail N. root 30" maple Sta 71+26 Lt 22'					
71+00			0.7	8.4	1126.0
72+00			1.0	9.3	1125.1
73+00			1.4	9.9	1124.5
74			0.5	9.1	25.3
75+00			1.1	9.7	24.7
T.P.	5.09	1139.03		0.47	1133.94
78+00			2.9	16.3	1122.7
TP	5.50	1140.76		3.77	1135.26
82+00 (Stream = 30' wide)			1.6	16.6	24.2
83+00			2.3	17.4	23.4
T.P.	0.46	1134.30		6.92	1133.84

	B.S.	H.I.	Depth of Water	Bed of Stream	Elev.
		1134.30			
B.M. (Spike E. root 30" Oak)				5.42	1128.88
B.M. (Top dam)	5.32	1132.57		7.05	1127.25
Downstream side Conc. dam				13.5	1119.1
Mouth of Mill Race			3.0	9.8	1122.8
100' from mouth of Mill Race			2.8	9.7	1122.9
Top Lake at dam				6.9	1125.7

Chardon O. Nov. 6th 1917
Recd of E. A. Tiedke 10¢ car fare Chardon
Bass Lake 2 passengers
P. R. Haines C. & E. Cond.
Bass Lake to Chardon 10¢, 2 fares
as above P. R. Haines

IMPROVED TABLES
AND
INFORMATION

INDEX

Line and Topo. Pages 2-12
Levels " 15-19

Bass Lake Outlet Ditch
Munson Twp.
Geauga Co
1934

12-3-34
Cody - Cold

Davidson
Sperry
Rossback
Hill.

9+00

8+00

7+00

6+00

5+00

(80 25)
1+19 75

△ 45°-08' Lt.

2+00

0+00

2

15

12 5

7+41

20 5

43

5 +65

24

4+47 3 Ditch

23 5 Stake

28 5

Ditch

37 5 Tack in Stump

17+00

(97 27)
16+02 73 Δ = 39°-28' Lt.

16+00

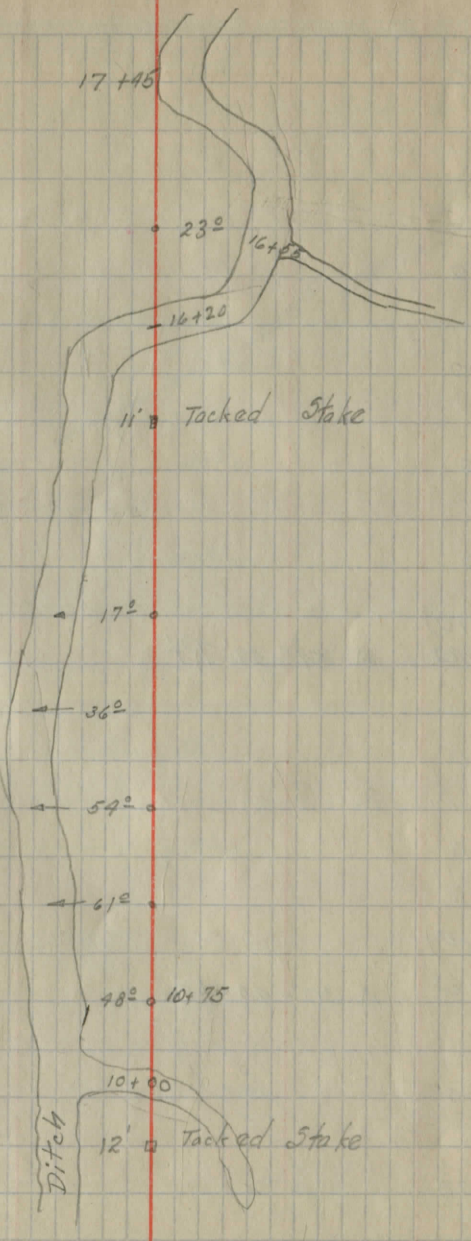
15+00

14+00

13+00

12+00

(26 55)
9+73 15 Δ 30°-55' Rt.



27+00

26+00

25+00

24+00

23+00

22+00

(49°23')
21+50.23 Δ 54°-54' Rt

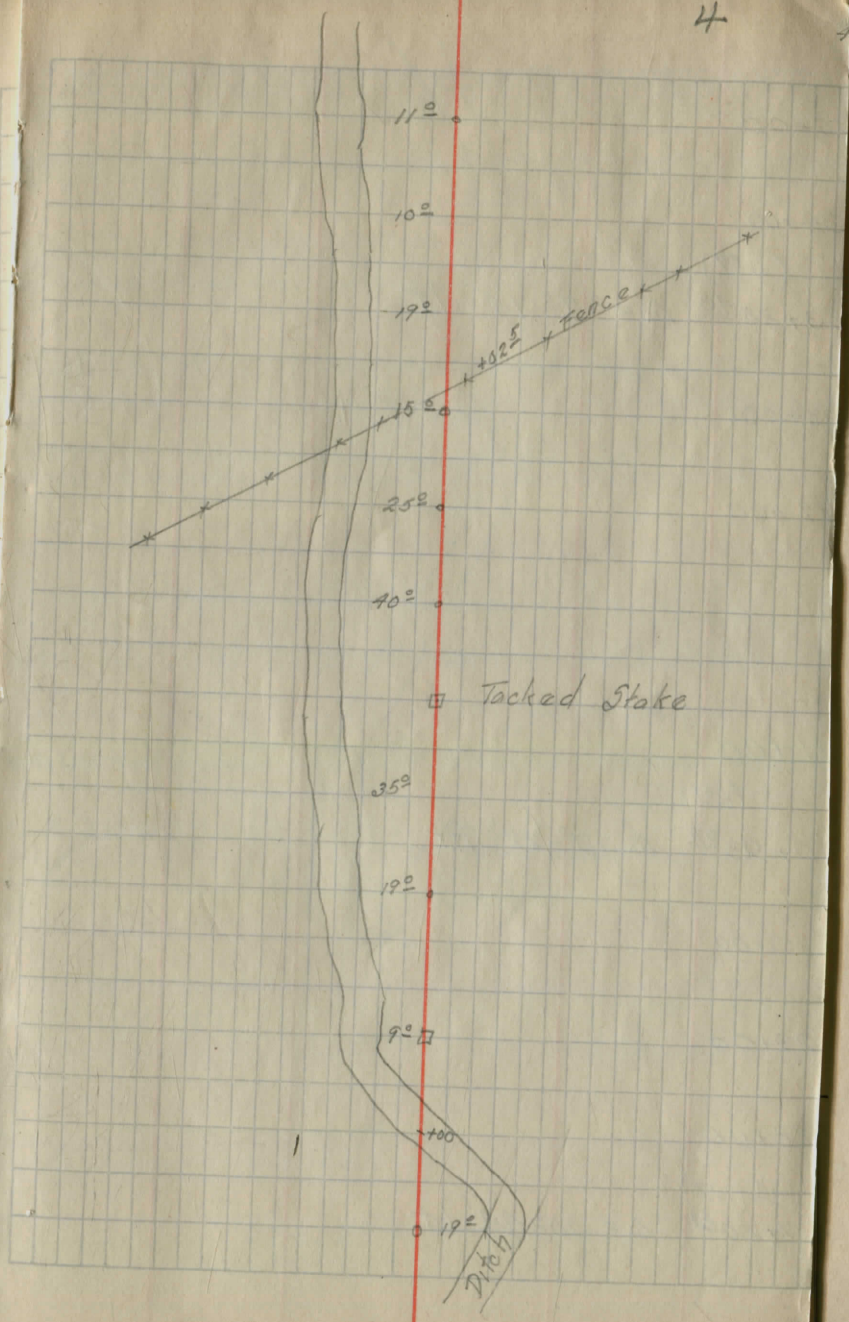
21+00

20+00

(25°37')
19+14.63 Δ 30°-45' Lt

19+00

18+00



35+00

34+00

(11.57)

33+88.43 Δ = 7°-14' Lt.

33+00

32+00

31+00

(6.07)

30+93.93 Δ 19°-22' Rt

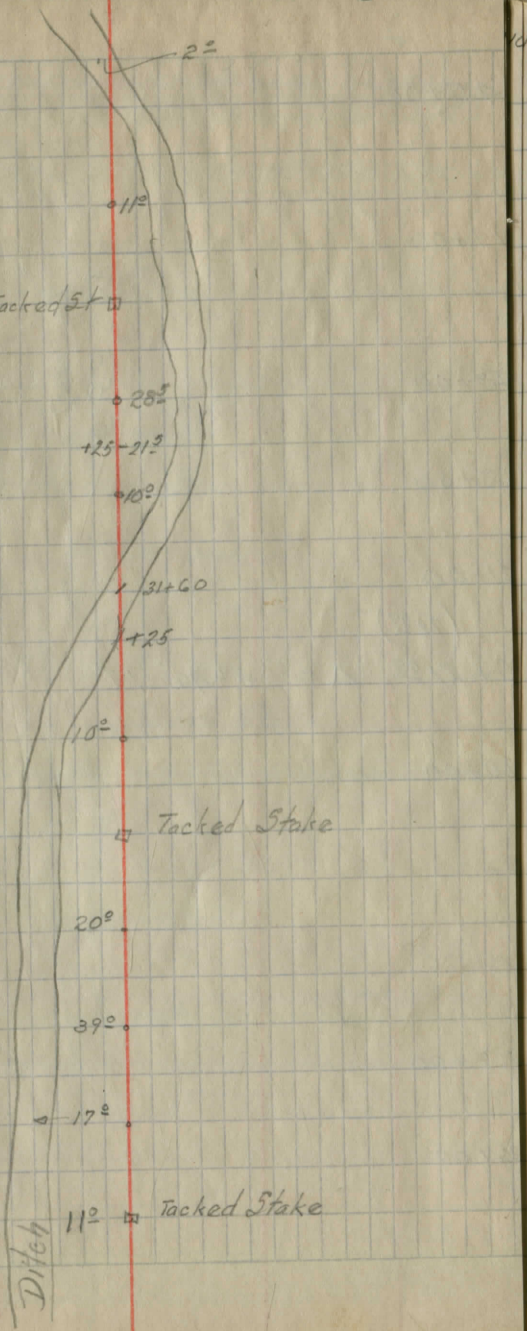
30+00

29+00

28+00

Noon (79.72)

27+00.53 Δ = 10°-44' Lt.



45+00

44+00

43+00

42+00

41+00

(78.97)

40+21.03 $\Delta = 4°46'$ Lt

40+00

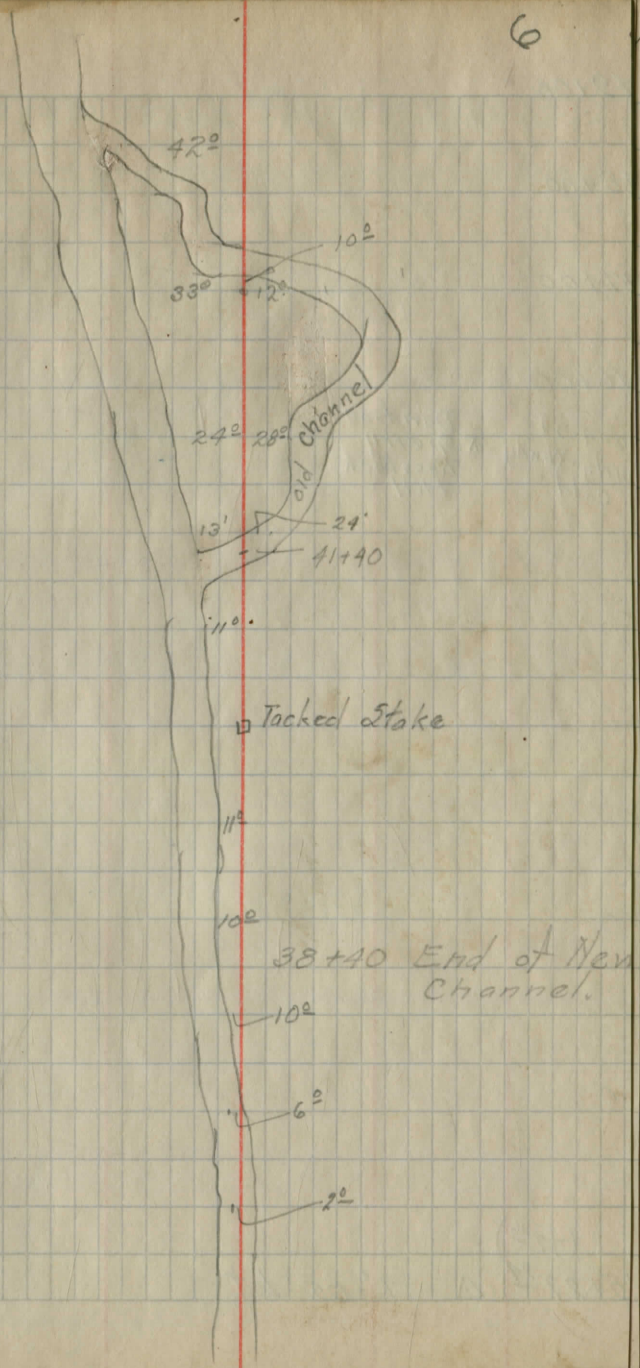
39+00

38+00

37+00

36+00

S 55° W (Nearly)



49+00

48+00

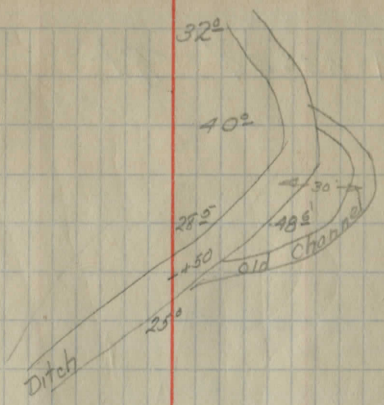
47+00

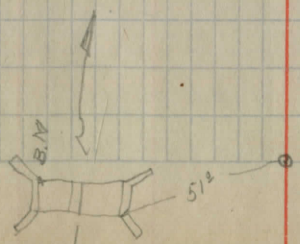
46+00

2-4-34
Cloudy-Windy
Cold

Davidson
Sperry
Rossback
Hill

(72°04')
45+27.99 △ 7°-05' Lt.





(22 21)

8 + 77 59 Δ 54°-44' Rt.

58+00

57+00

56+00

55+00

(62 20)

54+37 10 Δ = 41°-30' Lt.

54+00

53+00 End New Channel

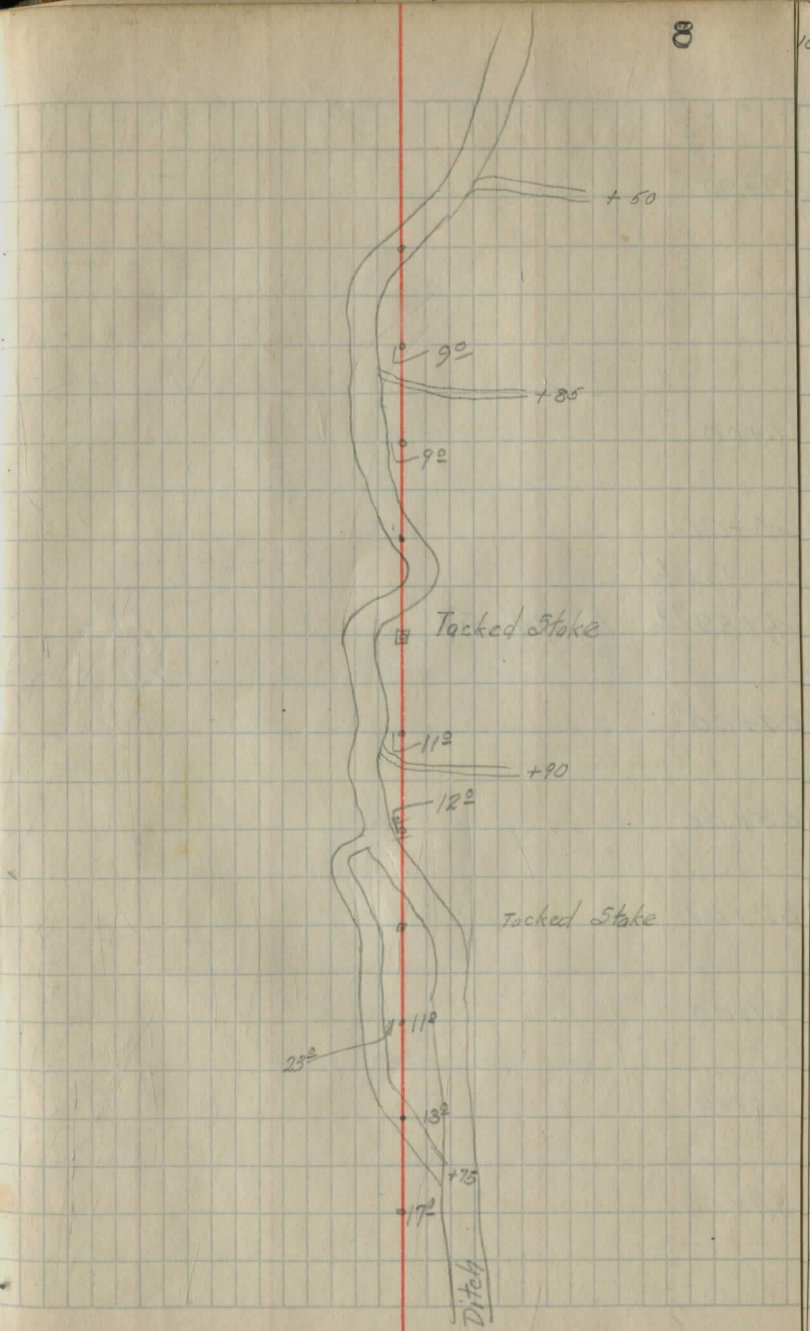
(60 57)

52+39 13 Δ 34°-17' Rt.

52+00

51+00

50+00



67+00

66+00

65+00

(10°4)

64+89.99 0°-44' Rt.

64+00

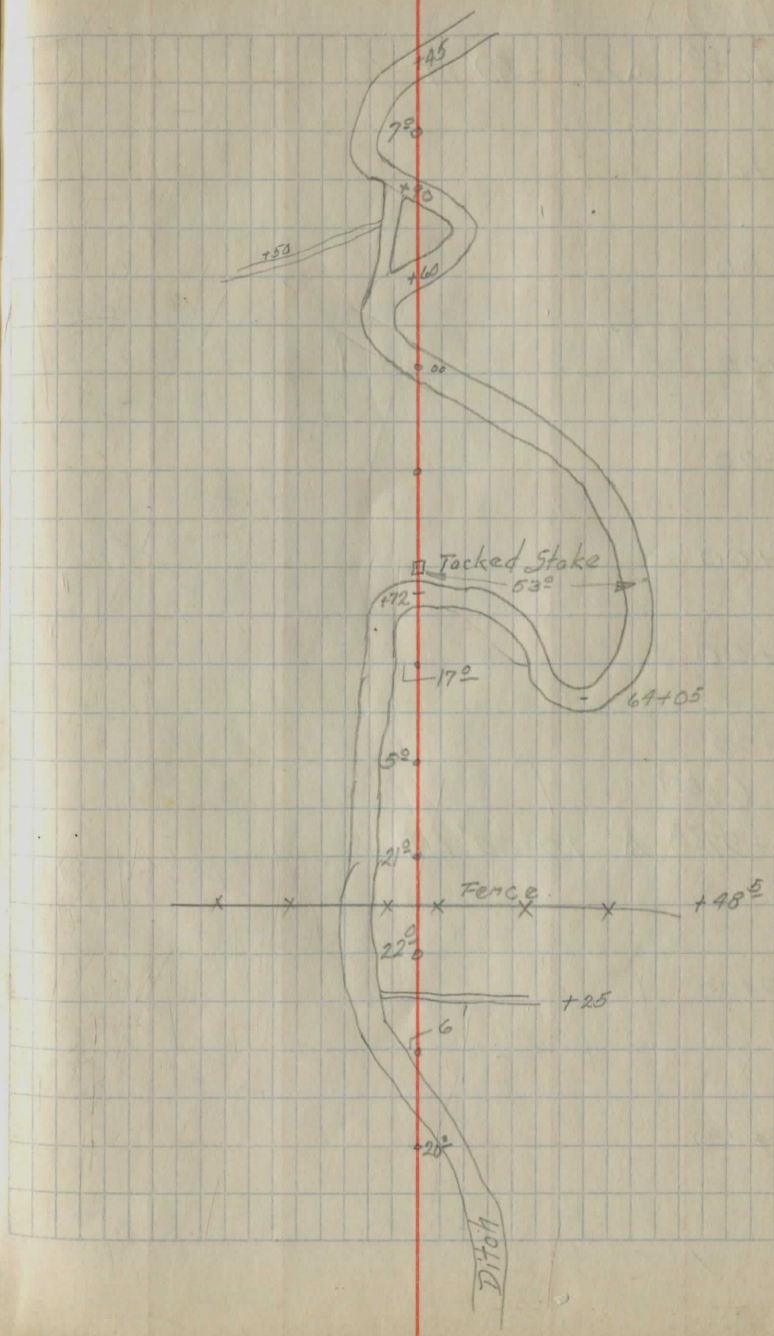
63+00

62+00

61+00

60+00

59+00



(51°)

+48 90 Δ 25° - 59 Lt

76+00

75+00

74+00

73+00

72+00

71+00

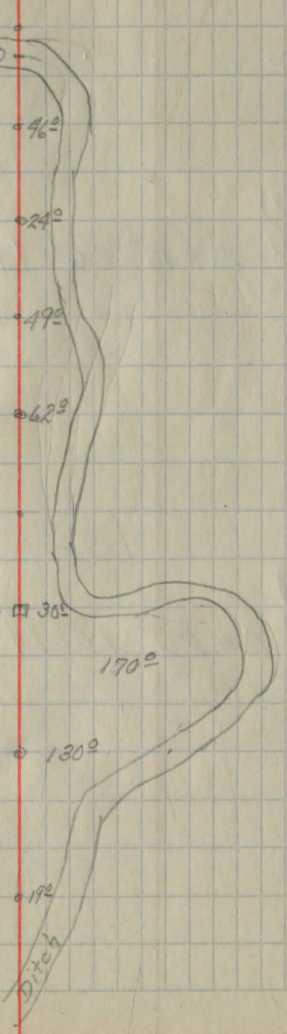
70+00

(2 30)

69+97 72 Δ 10°34' Lt.

69+00

68+00



92+00.99

Stadia Reading 6.35 to Dam
Vert Angle 0°-30' = 6.35

85+65.05 Δ 52°-01' Lt.

85+00

84+00

S 120° W (Needle)

83+00

(62.99)

2+37.21 Δ = 16°-26' Lt

82+00

81+00

80+00

(99.92)

79+00.92 Δ = 29°-15' Lt

78+00

77+00

□ B.M. on Dam. 11 11

□ Tacked Stake

250'

42½°

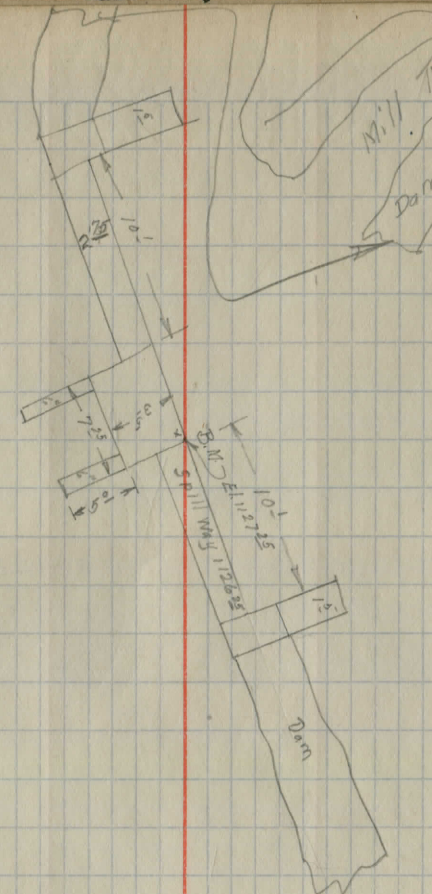
□ Tacked Stake

59°

□ Tacked Stake

84½°

Ditch


Mill Race
Dam
10'
B.M. El. 1127.25
Spill way 1126.25
10'
7.25
5.0
1.5'
1.5'
Dam

14

12-5-34 Cloudy - Cold

Davidson & Sperry

LEVELS

	(+) Rossback Hill	(H.I)	(Depths of H_2O)	(−) (Bed of Stream)	(Elev)	
B.M.	5.36	1149.42			1144.06	Spike in NW Root of Elm at Outlet of Bass Lake Sta 0+56 Lt 60'
0+00			1.0	8.8	1140.6	
1+00			2.0	9.9	1139.5	Stream 15' Wide
2+00			1.5	9.5	1139.9	
3+00			0.8	8.8	1140.6	
4+00			1.2	9.6	1139.8	
5+00			1.0	9.6	1139.8	
T.P.	4.21	1148.08		5.55	1143.87	
6+00			1.0	8.3	1139.8	
7+00			1.4	8.7	1139.4	
8+00			1.9	9.9	1138.2	
9+00			1.8	9.1	1139.0	
10+00			2.0	9.4	1138.7	Stream 15' Wide
T.P.	5.95	1148.90		5.13	1142.95	
11+00			1.6	9.9	1139.0	
12+00			1.7	10.0	1138.9	
13+00			1.4	9.7	1139.2	
14+00			1.8	10.1	1138.8	
15+00			1.8	10.2	1138.7	
16+00			2.4	10.8	1138.1	
B.M.				6.92	1141.98	Nail & Washer S. Root 30" Maple Sta 15+25 Rt. 55
17+00			1.5	10.2	1138.7	
T.P.	3.48	1146.36		6.08	1142.88	

Station	B.S	H.I	Depth of H_2O	F.S	Elev.
		1146.36			
18+00			1.3	7.6	1138.8
19+00			1.5	7.9	1138.5
20+00			1.9	8.5	1137.9
21+00			2.0	8.6	1137.8
22+00			1.3	8.1	1138.3
23+00			1.9	8.7	1137.7
24+00			1.5	8.4	1138.0
25+00			1.1	8.0	1138.4
26+00			1.4	8.8	1137.6
T.P.	3.77	1146.30		3.83	1142.53
27+00			1.1	8.2	1138.1
28+00			0.8	8.0	1138.3
29+00			0.8	8.0	1138.3
30+00			1.7	9.0	1137.3
31+00			1.8	9.1	1137.2
32+00			1.9	9.2	1137.1
33+00			0.8	8.3	1138.0
B.M				4.64	1141.66
T.P.	2.30	1144.58		4.02	1142.28
34+00			0.5	6.8	1137.8
35+00			0.5	7.4	1137.2
36+00			1.2	8.2	1136.4

Nail in S.E. Root 12" Elm Sta 30+55 Rt 22'

inches
6
0
6
0
6
0
6
0
6
0
6
0
6
0
6
0
6
0
6
0

inches
12
04
96
88
80
72
64
56
48
40
32
24
16
08
00
92
84

			Depth of Water	Bed of Stream	
		1144.58			
37+00			1.0	8.1	1136.5
38+00	Stream=11' wide		1.1	8.6	1136.0
39+00			0.5	8.8	1135.8
40+00			0.9	9.4	1135.2
41+00	Strm=16'		2.0	11.1	1133.5
T.P.	5.15	1143.04		6.69	1137.89
42+00	(Old channel=1135.3)		1.0	8.7	1134.3
43+00	" " = 35.0		2.3	10.0	1133.0
44+00	" " = 34.7		2.4	10.1	1132.9
45+00			1.6	9.3	1133.7
B.M.	0.57	1142.14			1141.57
46+00	(X in W. wall of bridge at angle with Wing Wall Sta 46+00)		1.9	9.1	1133.0
47+00			0.8	8.2	1133.9
48+00			1.6	8.9	1133.2
49+00			2.2	9.5	1132.6
50+00			1.8	9.1	1133.0
51+00			0.7	8.1	1134.0
52+00			2.3	9.7	1132.4
53+00			0.7	8.1	1134.0
T.P.	4.50	1140.67		5.97	1136.17
54+00			0.6	6.9	33.8
55+00			1.5	8.0	32.7
56			1.0	7.5	33.2
57			0.9	7.5	33.2
58+00			1.1	7.8	32.9
T.P.	4.44	1139.91		5.20	1135.47
59+00	(Cont. Pg 64)		1.3	7.4	1132.5

TABLE VII
RODS IN FEET AND INCHES

Rods	Feet Inches	Rods	Feet Inches	Rods	Feet Inches	Rods	Feet Inches	Rods	Feet Inches
1	16—6	21	346—6	41	676—6	61	1006—6	81	1336—6
2	33—0	22	363—0	42	693—0	62	1023—0	82	1353—0
3	49—6	23	379—6	43	709—6	63	1039—6	83	1369—6
4	66—0	24	396—0	44	726—0	64	1056—0	84	1386—0
5	82—6	25	412—6	45	742—6	65	1072—6	85	1402—6
6	99—0	26	429—0	46	759—0	66	1089—0	86	1419—0
7	115—6	27	445—6	47	775—6	67	1105—6	87	1435—6
8	132—0	28	462—0	48	792—0	68	1122—0	88	1452—0
9	148—6	29	478—6	49	808—6	69	1138—6	89	1468—6
10	165—0	30	495—0	50	825—0	70	1155—0	90	1485—0
11	181—6	31	511—6	51	841—6	71	1171—6	91	1501—6
12	198—0	32	528—0	52	858—0	72	1188—0	92	1518—0
13	214—6	33	544—6	53	874—6	73	1204—6	93	1534—6
14	231—0	34	561—0	54	891—0	74	1221—0	94	1551—0
15	247—6	35	577—6	55	907—6	75	1237—6	95	1567—6
16	264—0	36	594—0	56	924—0	76	1254—0	96	1584—0
17	280—6	37	610—6	57	940—6	77	1270—6	97	1600—6
18	297—0	38	627—0	58	957—0	78	1287—0	98	1617—0
19	313—6	39	643—6	59	973—6	79	1303—6	99	1633—6
20	330—0	40	660—0	60	990—0	80	1320—0	100	1650—0

TABLE VIII
LINKS IN FEET AND INCHES

Links	Feet Inches	Links	Feet Inches	Links	Feet Inches	Links	Feet Inches	Links	Feet Inches	Links	Feet Inches
1	0- 7.92	18	11-10.56	35	23- 1.20	52	34- 3.84	69	45- 6.48	86	56- 9.12
2	1- 3.84	19	12- 6.48	36	23- 9.12	53	34-11.76	70	46- 2.40	87	57- 5.04
3	1-11.76	20	13- 2.40	37	24- 5.04	54	35- 7.68	71	46-10.32	88	58- 0.96
4	2- 7.68	21	13-10.32	38	25- 0.96	55	36- 3.60	72	47- 6.24	89	58- 8.88
5	3- 3.60	22	14- 6.24	39	25- 8.88	56	36-11.52	73	48- 2.16	90	59- 4.80
6	3-11.52	23	15- 2.16	40	26- 4.80	57	37- 7.44	74	48-10.08	91	60- 0.72
7	4- 7.44	24	15-10.08	41	27- 0.72	58	38- 3.36	75	49- 6.00	92	60- 8.64
8	5- 3.36	25	16- 6.00	42	27- 8.64	59	38-11.28	76	50- 1.92	93	61- 4.56
9	5-11.28	26	17- 1.92	43	28- 4.56	60	39- 7.20	77	50- 9.84	94	62- 0.48
10	6- 7.20	27	17- 9.84	44	29- 0.48	61	40- 3.12	78	51- 5.76	95	62- 8.40
11	7- 3.12	28	18- 5.76	45	29- 8.40	62	40-11.04	79	52- 1.68	96	63- 4.32
12	7-11.04	29	19- 1.68	46	30- 4.32	63	41- 6.96	80	52- 9.60	97	64- 0.24
13	8- 6.96	30	19- 9.60	47	31- 0.24	64	42- 2.88	81	53- 5.52	98	64- 8.16
14	9- 2.88	31	20- 5.52	48	31- 8.16	65	42-10.80	82	54- 1.44	99	65- 4.08
15	9-10.80	32	21- 1.44	49	32- 4.08	66	43- 6.72	83	54- 9.36	100	66- .000
16	10- 6.72	33	21- 9.36	50	33- 0.00	67	44- 2.64	84	55- 5.28	101	66 -7.92
17	11- 2.64	34	22- 5.28	51	33- 7.92	68	44-10.56	85	56- 1.20	102	67- 3.84

TABLE IX. TANGENTS AND EXTERNALS TO A 1° CURVE

I	T	E	I=10°	I	T	E	I=20°	I	T	E	I=30°
1°	50.00	.218	+	11°	551.70	26.500	+	21°	1061.9	97.577	+
10′	58.34	.297	5° C.	10′	560.11	27.313	5° C	10′	1070.6	99.155	5° C
20′	66.67	.388	T	20′	568.53	28.137	T	20′	1079.2	100.75	T
30′	75.01	.491	.03	30′	576.95	28.974	.06	30′	1087.8	102.35	.10
40′	83.34	.606	E	40′	585.36	29.824	E	40′	1096.4	103.97	E
50′	91.68	.733		50′	593.79	30.686		50′	1105.1	105.60	
2°	100.01	.873	.001	12°	602.21	31.561	.006	22°	1113.7	107.24	.013
10′	108.35	1.024		10′	610.64	32.447		10′	1122.4	108.90	
20′	116.68	1.188		20′	619.07	33.347		20′	1131.0	110.57	
30′	125.02	1.364		30′	627.50	34.259		30′	1139.7	112.25	
40′	133.36	1.552		40′	635.93	35.183		40′	1148.4	113.95	
50′	141.70	1.752		50′	644.37	36.120		50′	1157.0	115.66	
3°	150.04	1.964	10° C.	13°	652.81	37.070	10° C.	23°	1165.7	117.38	10° C.
10′	158.38	2.188	T	10′	661.25	38.031	T	10′	1174.4	119.12	T
20′	166.72	2.425	.06	20′	669.70	39.006	.13	20′	1183.1	120.87	.19
30′	175.06	2.674	E	30′	678.15	39.993	E	30′	1191.8	122.63	E
40′	183.40	2.934	.003	40′	686.60	40.992	.011	40′	1200.5	124.41	.025
50′	191.74	3.207		50′	695.06	42.004		50′	1209.2	126.20	
4°	200.08	3.492		14°	703.51	43.029		24°	1217.9	128.00	
10′	208.43	3.790		10′	711.97	44.066		10′	1226.6	129.82	
20′	216.77	4.099		20′	720.44	45.116		20′	1235.3	131.65	
30′	225.12	4.421		30′	728.90	46.178		30′	1244.0	133.50	
40′	233.47	4.755		40′	737.37	47.253		40′	1252.8	135.35	
50′	241.81	5.100	15° C.	50′	745.85	48.341	15° C.	50′	1261.5	137.23	15° C.
5°	250.16	5.459	T	15°	754.32	49.441	T	25°	1270.2	139.11	T
10′	258.51	5.829	.09	10′	762.80	50.554	.19	10′	1279.0	141.01	.29
20′	266.86	6.211	E	20′	771.29	51.679	E	20′	1287.7	142.93	E
30′	275.21	6.606	.004	30′	779.77	52.818	.017	30′	1296.5	144.85	.038
40′	283.57	7.013		40′	788.26	53.969		40′	1305.3	146.79	
50′	291.92	7.432		50′	796.75	55.132		50′	1314.0	148.75	
6°	300.28	7.863		16°	805.25	56.309		26°	1322.8	150.71	
10′	308.64	8.307		10′	813.75	57.498		10′	1331.6	152.69	
20′	316.99	8.762		20′	822.25	58.699		20′	1340.4	154.69	
30′	325.35	9.230		30′	830.76	59.914		30′	1349.2	156.70	
40′	333.71	9.710	20° C.	40′	839.27	61.141	20° C.	40′	1358.0	158.72	20° C.
50′	342.08	10.202	T	50′	847.78	62.381	T	50′	1366.8	160.76	T
7°	350.44	10.707	.13	17°	856.30	63.634	.26	27°	1375.6	162.81	.39
10′	358.81	11.224	E	10′	864.82	64.900	E	10′	1384.4	164.86	E
20′	367.17	11.753	.006	20′	873.35	66.178	.022	20′	1393.2	166.95	.051
30′	375.54	12.294		30′	881.88	67.470		30′	1402.0	169.04	
40′	383.91	12.847		40′	890.41	68.774		40′	1410.9	171.15	
50′	392.28	13.413		50′	898.95	70.091		50′	1419.7	173.27	
8°	400.66	13.991		18°	907.49	71.421		28°	1428.6	175.41	
10′	409.03	14.582		10′	916.03	72.764		10′	1437.4	177.55	
20′	417.41	15.184	25° C.	20′	924.58	74.119	25° C.	20′	1446.3	179.72	25° C.
30′	425.79	15.799	T	30′	933.13	75.488	T	30′	1455.1	181.89	T
40′	434.17	16.426	.16	40′	941.69	76.869	.32	40′	1464.0	184.08	.49
50′	442.55	17.065	E	50′	950.25	78.264	E	50′	1472.9	186.29	E
9°	450.93	17.717	.007	19°	958.81	79.671	.028	29°	1481.8	188.51	.065
10′	459.32	18.381		10′	967.38	81.092		10′	1490.7	190.74	
20′	467.71	19.058		20′	975.96	82.525		20′	1499.6	192.99	
30′	476.10	19.746		30′	984.53	83.972		30′	1508.5	195.25	
40′	484.49	20.447		40′	993.12	85.431		40′	1517.4	197.53	
50′	492.88	21.161		50′	1001.7	86.904		50′	1526.3	199.82	
10°	501.28	21.887	30° C.	20°	1010.3	88.389	30° C.	30°	1535.3	202.12	30° C.
10′	509.68	22.624	T	10′	1018.9	89.888	T	10′	1544.2	204.44	T
20′	518.08	23.375	.19	20′	1027.5	91.399	.39	20′	1553.1	206.77	.59
30′	526.48	24.138	E	30′	1036.1	92.924	E	30′	1562.1	209.12	E
40′	534.89	24.913	.008	40′	1044.7	94.462	.034	40′	1571.0	211.48	.078
50′	543.29	25.700		50′	1053.3	96.013		50′	1580.0	213.86	

T = R tan ½ I E = R exsec ½ I

TABLE IX. TANGENTS AND EXTERNALS TO A 1° CURVE

I	T	E	I=40°	I	T	E	I=50°	I	T	E	I=60°
31°	1589.0	216.3	+	41°	2142.2	387.4	+	51°	2732.9	618.4	+
10′	1598.0	218.7	5° C.	10′	2151.7	390.7	5° C.	10′	2743.1	622.8	5° C.
20′	1606.9	221.1	T	20′	2161.2	394.1	T	20′	2753.4	627.2	T
30′	1615.9	223.5	.13	30′	2170.8	397.4	.17	30′	2763.7	631.7	.21
40′	1624.9	226.0	E	40′	2180.3	400.8	E	40′	2773.9	636.2	E
50′	1633.9	228.4		50′	2189.9	404.2		50′	2784.2	340.7	
32°	1643.0	230.9	.023	42°	2199.4	407.6	.037	52°	2794.5	645.2	.056
10′	1652.0	233.4		10′	2209.0	411.1		10′	2804.9	649.7	
20	1661.0	235.9		20′	2218.6	414.5		20′	2815.2	654.3	
30′	1670.0	238.4		30′	2228.1	418.0		30′	2825.6	658.8	
40′	1679.1	241.0		40′	2237.7	421.4		40′	2835.9	663.4	
50′	1688.1	243.5		50′	2247.3	425.0		50′	2846.3	668.0	
33°	1697.2	246.1	10° C.	43°	2257.0	428.5	10° C.	53°	2856.7	672.7	10° C.
10′	1706.3	248.7	T	10′	2266.6	432.0	T	10′	2867.1	677.3	T
20′	1715.3	251.3	.26	20′	2276.2	435.6	.34	20′	2877.5	682.0	.42
30′	1724.4	253.9	E	30′	2285.9	439.2	E	30′	2888.0	686.7	E
40′	1733.5	256.5	.046	40′	2295.6	442.8	.075	40′	2898.4	691.4	.112
50′	1742.6	259.1		50	2305.2	446.4		50′	2908.9	696.1	
34°	1751.7	261.8		44°	2314.9	450.0		54°	2919.4	700.9	
10′	1760.8	264.5		10′	2324.6	453.6		10′	2929.9	705.7	
20′	1770.0	267.2		20′	2334.3	457.3		20′	2940.4	710.5	
30′	1779.1	269.9		30′	2344.1	461.0		30′	2951.0	715.3	
40′	1788.2	272.6		40′	2353.8	464.6		40′	2961.5	720.1	
50′	1797.4	275.3	15° C.	50′	2363.5	468.4	15° C.	50′	2972.1	725.0	15° C.
35°	1806.6	278.1	T	45°	2373.3	472.1	T	55°	2982.7	729.9	T
10′	1815.7	280.8	.40	10′	2383.1	475.8	.51	10′	2993.3	734.8	.63
20′	1824.9	283.6	E	20′	2392.8	479.6	E	20′	3003.9	739.7	E
30′	1834.1	286.4	.070	30′	2402.6	483.4	.116	30′	3014.5	744.6	.168
40′	1843.3	289.2		40′	2412.4	487.2		40′	3025.2	749.6	
50′	1852.5	292.0		50′	2422.3	491.0		50′	3035.8	754.6	
36°	1861.7	294.9		46°	2432.1	494.8		56°	3046.5	759.6	
10′	1870.9	297.7		10′	2441.9	498.7		10′	3057.2	764.6	
20′	1880.1	300.6		20′	2451.8	502.5		20′	3067.9	769.7	
30′	1889.4	303.5		30′	2461.7	506.4		30′	3078.7	774.7	
40′	1898.6	306.4	20° C.	40′	2471.5	510.3	20° C.	40′	3089.4	779.8	20° C.
50′	1907.9	309.3	T	50′	2481.4	514.3	T	50′	3100.2	784.9	T
37°	1917.1	312.2	.53	47°	2491.3	518.2	.68	57°	3110.9	790.1	.84
10′	1926.4	315.2	E	10′	2501.2	522.2	E	10′	3121.7	795.2	E
20′	1935.7	318.1	.093	20′	2511.2	526.1	.151	20′	3132.6	800.4	.225
30′	1945.0	321.1		30′	2521.1	530.1		30′	3143.4	805.6	
40′	1954.3	324.1		40′	2531.1	534.2		40′	3154.2	810.9	
50′	1963.6	327.1		50′	2541.0	538.2		50′	3165.1	816.1	
38°	1972.9	330.2		48°	2551.0	542.2		58°	3176.0	821.4	
10′	1982.2	333.2		10′	2561.0	546.3		10′	3186.9	826.7	
20′	1991.5	336.3	25° C.	20′	2571.0	550.4	25° C.	20′	3197.8	832.0	25° C.
30′	2000.9	339.3	T	30′	2581.0	554.5	T	30′	3208.8	837.3	T
40′	2010.2	342.4	.67	40′	2591.0	558.6	.85	40′	3219.7	842.7	1.05
50′	2019.6	345.5	E	50′	2601.1	562.8	E	50′	3230.7	848.1	E
39°	2029.0	348.6	.117	49°	2611.2	566.9	.189	59°	3241.7	853.5	.283
10′	2038.4	351.8		10′	2621.2	571.1		10′	3252.7	858.9	
20′	2047.8	354.9		20′	2631.3	575.3		20′	3263.7	864.3	
30′	2057.2	358.1		30′	2641.4	579.5		30′	3274.8	869.8	
40′	2066.6	361.3		40′	2651.5	583.8		40′	3285.8	875.3	
50′	2076.0	364.5		50′	2661.6	588.0		50′	3296.9	880.8	
40°	2085.4	367.7	30° C.	50°	2671.8	592.3	30° C.	60°	3308.0	886.4	30° C.
10′	2094.9	371.0	T	10′	2681.9	596.6	T	10′	3319.1	892.0	T
20′	2104.3	374.2	.80	20′	2692.1	600.9	1.02	20′	3330.3	897.5	1.27
30′	2113.8	377.5	E	30′	2702.3	605.3	E	30′	3341.4	903.2	E
40′	2123.3	380.8	.141	40′	2712.5	609.6	.227	40′	3352.6	908.8	.340
50′	2132.7	384.1		50′	2722.7	614.0		50′	3363.8	914.5	

T = R tan ½ I E = R exsec ½ I

TABLE IX. TANGENTS AND EXTERNALS TO A 1° CURVE

I	T	E	I=70°	I	T	E	I=80°	I	T	E	I=90°
61°	3375.0	920.2		71°	4086.9	1308.2		81°	4893.6	1805.3	
10′	3386.3	925.9	+	10′	4099.5	1315.6	+	10′	4908.0	1814.7	+
20′	3397.5	931.6	5° C.	20′	4112.1	1322.9	5° C.	20′	4922.5	1824.1	5° C.
30′	3408.8	937.3	T	30′	4124.8	1330.3	T	30′	4937.0	1833.6	T
40′	3420.1	943.1	.25	40′	4137.4	1337.7	.30	40′	4951.5	1843.1	.36
50′	3431.4	948.9	E	50′	4150.1	1345.1	E	50′	4966.1	1852.6	E
62°	3442.7	954.8	.080	72°	4162.8	1352.6	.110	82°	4980.7	1862.2	.149
10′	3454.1	960.6		10′	4175.6	1360.1		10′	4995.4	1871.8	
20′	3465.4	966.5		20′	4188.5	1367.6		20′	5010.0	1881.5	
30′	3476.8	972.4		30′	4201.2	1375.2		30′	5024.8	1891.2	
40′	3488.3	978.3		40′	4214.0	1382.8		40′	5039.5	1900.9	
50′	3499.7	984.3		50′	4226.8	1390.4		50′	5054.3	1910.7	
63°	3511.1	990.2	10° C.	73°	4239.7	1398.0	10° C.	83°	5069.2	1920.5	10° C.
10′	3522.6	996.2	T	10′	4252.6	1405.7	T	10′	5084.0	1930.4	T
20′	3534.1	1002.3	.51	20′	4265.6	1413.5	.61	20′	5099.0	1940.3	.72
30′	3545.6	1008.3	E	30′	4278.5	1421.2	E	30′	5113.9	1950.3	E
40′	3557.2	1014.4	.159	40′	4291.5	1429.0	.220	40′	5128.9	1960.2	.299
50′	3568.7	1020.5		50′	4304.6	1436.8		50′	5143.9	1970.3	
64°	3580.3	1026.6		74°	4317.6	1444.6		84°	5159.0	1980.4	
10′	3591.9	1032.8		10′	4330.7	1452.5		10′	5174.1	1990.5	
20′	3603.5	1039.0		20′	4343.8	1460.4		20′	5189.3	2000.6	
30′	3615.1	1045.2		30′	4356.9	1468.4		30′	5204.4	2010.8	
40′	3626.8	1051.4		40′	4370.1	1476.4		40′	5219.7	2021.1	
50′	3638.5	1057.7	15° C.	50′	4383.3	1484.4	15° C.	50′	5234.9	2031.4	15° C.
65°	3650.2	1063.9	T	75°	4396.5	1492.4	T	85°	5250.3	2041.7	T
10′	3661.9	1070.2	.76	10′	4409.8	1500.5	.91	10′	5265.6	2052.1	1.09
20′	3673.7	1076.6	E	20′	4423.1	1508.6	E	20′	5281.0	2062.5	E
30′	3685.4	1082.9	.240	30′	4436.4	1516.7	.332	30′	5296.4	2073.0	.450
40′	3697.2	1089.3		40′	4449.7	1524.9		40′	5311.9	2083.5	
50′	3709.0	1095.7		50′	4463.1	1533.1		50′	5327.4	2094.1	
66°	3720.9	1102.2		76°	4476.5	1541.4		86°	5343.0	2104.7	
10′	3732.7	1108.6		10′	4489.9	1549.7		10′	5358.6	2115.3	
20′	3744.6	1115.1		20′	4503.4	1558.0		20′	5374.2	2126.0	
30′	3756.5	1121.7		30′	4516.9	1566.3		30′	5389.9	2136.7	
40′	3768.5	1128.2	20° C.	40′	4530.4	1574.7	20° C.	40′	5405.6	2147.5	20° C.
50′	3780.4	1134.8	T	50′	4544.0	1583.1	T	50′	5421.4	2158.4	T
67°	3792.4	1141.4	1.02	77°	4557.6	1591.6	1.22	87°	5437.2	2169.2	1.45
10′	3804.4	1148.0	E	10′	4571.2	1600.1	E	10′	5453.1	2180.2	E
20′	3816.4	1154.7	.321	20′	4584.8	1608.6	.445	20′	5469.0	2191.1	.603
30′	3828.4	1161.3		30′	4598.5	1617.1		30′	5484.9	2202.2	
40′	3840.5	1168.1		40′	4612.2	1625.7		40′	5500.9	2213.2	
50′	3852.6	1174.8		50′	4626.0	1634.4		50′	5517.0	2224.3	
68°	3864.7	1181.6		78°	4639.8	1643.0		88°	5533.1	2235.5	
10′	3876.8	1188.4		10	4653.6	1651.7		10′	5549.2	2246.7	
20′	3889.0	1195.2	25° C.	20′	4667.4	1660.5	25° C.	20′	5565.4	2258.0	25° C.
30	3901.2	1202.0	T	30′	4681.3	1669.2	T	30′	5581.6	2269.3	T
40′	3913.4	1208.9	1.28	40′	4695.2	1678.1	1.53	40′	5597.8	2280.6	1.83
50′	3925.6	1215.8	E	50′	4709.2	1686.9	E	50′	5614.2	2292.0	E
69°	3937.9	1222.7	.403	79°	4723.2	1695.8	.558	89°	5630.5	2303.5	.756
10′	3950.2	1229.7		10′	4737.2	1704.7		10′	5646.9	2315.0	
20′	3962.5	1236.7		20′	4751.2	1713.7		20′	5663.4	2326.6	
30′	3974.8	1243.7		30′	4765.3	1722.7		30′	5679.9	2338.2	
40′	3987.2	1250.8		40′	4779.4	1731.7		40′	5696.4	2349.8	
50′	3999.5	1257.9		50′	4793.6	1740.8		50′	5713.0	2361.5	
70°	4011.9	1265.0	30° C.	80°	4807.7	1749.9	30° C.	90°	5729.7	2373.3	30° C.
10′	4024.4	1272.1	T	10′	4822.0	1759.0	T	10′	5746.3	2385.1	T
20′	4036.8	1279.3	1.54	20′	4836.2	1768.2	1.84	20′	5763.1	2397.0	2.20
30′	4049.3	1286.5	E	30′	4850.5	1777.4	E	30′	5779.9	2408.9	E
40′	4061.8	1293.6	.485	40′	4864.8	1786.7	.671	40′	5796.7	2420.9	.910
50′	4074.4	1300.9		50′	4879.2	1796.0		50′	5813.6	2432.9	

T = R tan ½ I E = R exsec ½ I

TABLE IX. TANGENTS AND EXTERNALS TO A 1° CURVE

I	T	E	I=100°	I	T	E	I=110°	I	T	E	I=120°
91°	5830.5	2444.9		101°	6950.6	3278.1		111°	8336.7	4386.1	
10′	5847.5	2457.1	+	10′	6971.3	3294.1	+	10′	8362.7	4407.6	+
20′	5864.6	2469.3	5° C.	20′	6992.0	3310.1	5° C.	20′	8388.9	4429.2	5° C.
30′	5881.7	2481.5	T	30′	7012.7	3326.1	T	30′	8415.1	4450.9	T
40′	5898.8	2493.8	.43	40′	7033.6	3342.3	.51	40′	8441.5	4472.7	.62
50′	5916.0	2506.1	E	50′	7054.5	3358.5	E	50′	8468.0	4494.6	E
92°	5933.2	2518.5	.200	102°	7075.5	3374.9	.268	112°	8494.6	4516.6	.360
10′	5950.5	2531.0		10′	7096.6	3391.2		10′	8521.3	4538.8	
20′	5967.9	2543.5		20′	7117.8	3407.7		20′	8548.1	4561.1	
30′	5985.3	2556.0		30′	7139.0	3424.3		30′	8575.0	4583.4	
40′	6002.7	2568.6		40′	7160.3	3440.9		40′	8602.1	4606.0	
50′	6020.2	2581.3		50′	7181.7	3457.6		50′	8629.3	4628.6	
93°	6037.8	2594.0	10° C.	103°	7203.2	3474.4	10° C.	113°	8656.6	4651.3	10° C.
10′	6055.4	2606.8	T	10′	7224.7	3491.3	T	10′	8684.0	4674.2	T
20′	6073.1	2619.7	.86	20′	7246.3	3508.2	.103	20′	8711.5	4697.2	1.25
30′	6090.8	2632.6	E	30′	7268.0	3525.2	E	30′	8739.2	4720.3	E
40′	6108.6	2645.5	.401	40′	7289.8	3542.4	.536	40′	8767.0	4743.6	.721
50′	6126.4	2658.5		50′	7311.7	3559.6		50′	8794.9	4766.9	
94°	6144.3	2671.6		104°	7333.6	3576.8		114°	8822.9	4790.4	
10′	6162.2	2684.7		10′	7355.6	3594.2		10′	8851.0	4814.1	
20′	6180.2	2697.9		20′	7377.8	3611.7		20′	8879.3	4837.8	
30′	6198.3	2711.2		30′	7399.9	3629.2		30′	8907.7	4861.7	
40′	6216.4	2724.5		40′	7422.2	3646.8		40′	8936.3	4885.7	
50′	6234.6	2737.9	15° C.	50′	7444.6	3664.5	15° C.	50′	8965.0	4909.9	15° C.
95°	6252.8	2751.3	T	105°	7467.0	3682.3	T	115°	8993.8	4934.1	T
10′	6271.1	2764.8	1.30	10′	7489.6	3700.2	1.56	10′	9022.7	4958.6	1.93
20′	6289.4	2778.3	E	20′	7512.2	3718.2	E	20′	9051.7	4983.1	E
30′	6307.9	2792.0	.604	30′	7534.9	3736.2	.806	30′	9080.9	5007.8	1.09
40′	6326.3	2805.6		40′	7557.7	3754.4		40′	9110.3	5032.6	
50′	6344.8	2819.4		50′	7580.5	3772.6		50′	9139.8	5057.6	
96°	6363.4	2833.2		106°	7603.5	3791.0		116°	9169.4	5082.7	
10′	6382.1	2847.0		10′	7626.6	3809.4		10′	9199.1	5107.9	
20′	6400.8	2861.0		20′	7649.7	3827.9		20′	9229.0	5133.3	
30′	6419.5	2875.0		30′	7672.9	3846.5		30′	9259.0	5158.8	
40′	6438.4	2889.0	20° C.	40′	7696.3	3865.2	20° C.	40′	9289.2	5184.5	20° C.
50′	6457.3	2903.1	T	50′	7719.7	3884.0	T	50′	9319.5	5210.3	T
97°	6476.2	2917.3	1.74	107°	7743.2	3902.9	2.08	117°	9349.9	5236.2	2.52
10′	6495.2	2931.6	E	10′	7766.8	3921.9	E	10′	9380.5	5262.3	E
20′	6514.3	2945.9	.809	20′	7790.5	3940.9	1.08	20′	9411.3	5288.6	1.46
30′	6533.4	2960.3		30′	7814.3	3960.1		30′	9442.2	5315.0	
40′	6552.6	2974.7		40′	7838.1	3979.4		40′	9473.2	5341.5	
50′	6571.9	2989.2		50′	7862.1	3998.7		50′	9504.4	5368.2	
98°	6591.2	3003.8		108°	7886.2	4018.2		118°	9535.7	5395.1	
10′	6610.6	3018.4		10′	7910.4	4037.8		10′	9567.2	5422.1	
20′	6630.1	3033.1	25° C.	20′	7934.6	4057.4	25° C.	20′	9598.9	5449.2	25° C.
30′	6649.6	3047.9	T	30′	7959.0	4077.2	T	30′	9630.7	5476.5	T
40′	6669.2	3062.8	2.18	40′	7983.5	4097.1	2.61	40′	9662.6	5504.0	3.16
50′	6688.8	3077.7	E	50′	8008.0	4117.0	E	50′	9694.7	5531.7	E
99°	6708.6	3092.7	1.02	109°	8032.7	4137.1	1.36	119°	9727.0	5559.4	1.83
10′	6728.4	3107.7		10′	8057.4	4157.3		10′	9759.4	5587.4	
20′	6748.2	3122.9		20′	8082.3	4177.5		20′	9792.0	5615.5	
30′	6768.1	3138.1		30′	8107.3	4197.9		30′	9824.8	5643.8	
40′	6788.1	3153.3		40′	8132.3	4218.4		40′	9857.7	5672.3	
50′	6808.2	3168.7		50′	8157.5	4239.0		50′	9890.8	5700.9	
100°	6828.3	3184.1	30° C.	110°	8182.8	4259.7	30° C.	120°	9924.0	5729.7	30° C.
10′	6848.5	3199.6	T	10′	8208.2	4280.5	T	10′	9957.5	5758.6	T
20′	6868.8	3215.1	2.62	20′	8233.7	4301.4	3.14	20′	9991.0	5787.7	3.81
30′	6889.2	3230.8	E	30′	8259.3	4322.4	E	30′	10025.0	5817.0	E
40′	6909.6	3246.5	.922	40′	8285.0	4343.6	1.63	40′	10059.0	5846.5	2.20
50′	6930.1	3262.3		50′	8310.8	4364.8		50′	10093.0	5876.1	

T = R tan ½ I E = R exsec ½ I

Table X.

MIDDLE ORDINATES OF RAILS

Length of Rail (feet)

C ° ′	R Feet	30 Inch	28 Inch	26 Inch	24 Inch	22 Inch	20 Inch	C °	R Feet	30 Inch	28 Inch	26 Inch	24 Inch	22 Inch	20 Inch
0–20	17189	.08	.07	.06	.05	.04	.03	8	716.8	1.88	1.64	1.42	1.20	1.01	.84
0–40	8594	.16	.14	.12	.10	.08	.07	9	637.3	2.12	1.84	1.60	1.35	1.14	.94
1–0	5730	.24	.20	.18	.15	.13	.10	10	573.7	2.36	2.05	1.78	1.50	1.27	1.04
1–20	4297	.31	.27	.23	.20	.17	.13	11	521.7	2.59	2.26	1.95	1.65	1.39	1.15
1–40	3438	.39	.34	.29	.25	.21	.17	12	478.3	3.83	2.47	2.15	1.81	1.54	1.26
2–0	2865	.47	.41	.35	.30	.25	.20	13	441 7	3.05	2.66	2.30	1.96	1.66	1.36
2–20	2456	.55	.48	.41	.35	.29	.23	14	410.3	3.30	2.87	2.48	2.10	1.78	1.46
2–40	2149	.63	.55	.47	.40	.33	.27	15	383.1	3.54	3.08	2.68	2.26	1.91	1.57
3–0	1910	.71	.62	.53	.45	.38	.31	16	359.3	3.76	3.28	2.83	2.40	2.04	1.67
3–20	1719	.78	.68	.59	.50	.42	.35	17	338.3	4.00	3.48	3.02	2.57	2.16	1.78
3–40	1563	.86	.75	.65	.55	.46	.38	18	319.6	4.21	3.67	3.18	2.70	2.28	1.87
4–0	1433	.94	.82	.71	.60	.50	.42	19	302.9	4.45	3.89	3.36	2.86	2.41	1.98
4–20	1323	1.02	.89	.77	.65	.55	.45	20	287.9	4.70	4.09	3.55	3.00	2.54	2.09
4–40	1228	1.10	.96	.83	.70	.59	.48	22	262.0	5.16	4.44	3.84	3.30	2.80	2.29
5	1146	1.18	1.03	.89	.75	.63	.52	24	240.5	5.64	4.92	4.20	3.59	3.04	2.50
6	955.3	1.41	1.23	1.06	.90	.76	.62	26	222.3	6.07	5.29	4.58	3.88	3.29	2.70
7	819.0	1.65	1.44	1.24	1.05	.89	.73								

Table XI.

SHORT RADIUS CURVES

Radius Feet	Chord Feet	Central Angle	Deflection Angle	Deflection for 1 Foot
35	10	16-26	8-13	49.3
45	10	12-46	6-23	38.3
50	15	17-16	8-38	34.5
60	15	14-22	7-11	28.8
75	15	11-30	5-45	23.0
100	20	11-30	5-45	17.3
120	20	9-34	4-47	14.3
150	20	7-39	3-49	11.5
190	25	7-32	3-46	9.15
200	25	7-10	3-35	8.6
225	25	6-25	3-12	7.7
240	25	5-58	2-59	7.2
250	25	5-44	2-52	6.9
275	25	5-12	2-36	6.2
288	50	9-58	4-59	6.0
300	50	9-32	4-46	5.7
350	50	8-12	4-06	4.9
376	50	7-40	3-50	4.6
400	50	7-10	3-35	4.3
410	50	7-00	3-30	4.2

To find length of curve divide angle from P. C. to P. T. by central angle of chord, and multiply by length of chord.

Table XII.

INCLINED DISTANCE OF 100 FT. REDUCED TO HORIZONTAL

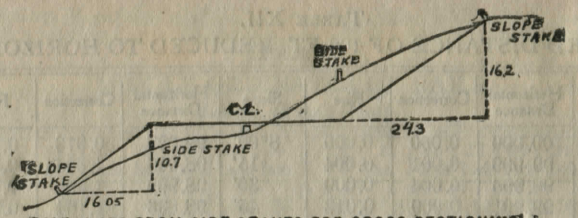
Slope	Horizontal Distance	Correction	Rise	Slope	Horizontal Distance	Correction	Rise
0°00′	100.000	0.000	0.000	8°00′	99.027	0.973	0.139
15′	99.999	0.001	0.004	15′	98.965	1.035	0.143
30′	99.996	0.004	0.009	30′	98.902	1.098	0.148
45′	99.991	0.009	0.013	45′	98.836	1.164	0.152
1 00	99.985	0.015	0.017	9 00	98.769	1.231	0.156
15	99.976	0.024	0.022	15	98.700	1.300	0.161
30	99.966	0.034	0.026	30	98.629	1.371	0.165
45	99.953	0.047	0.031	45	98.556	1.444	0.169
2 00	99.939	0.061	0.035	10 00	98.481	1.519	0.174
15	99.923	0.077	0.039	15	98.404	1.596	0.178
30	99.905	0.095	0.044	30	98.325	1.675	0.182
45	99.885	0.115	0.048	45	98.245	1.755	0.187
3 00	99.863	0.137	0.052	11 00	98.163	1.837	0.191
15	99.839	0.161	0.057	15	98.079	1.921	0.195
30	99.813	0.187	0.061	30	97.992	2.008	0.199
45	99.786	0.214	0.065	45	97.905	2.095	0.204
4 00	99.756	0.244	0.070	12 00	97.815	2.185	0.208
15	99.725	0.275	0.074	15	97.723	2.277	0.212
30	99.692	0.308	0.078	30	97.630	2.370	0.216
45	99.657	0.343	0.083	45	97.534	2.466	0.221
5 00	99.619	0.381	0.087	13 00	97.437	2.563	0.225
15	99.580	0.420	0.092	15	97.338	2.662	0.229
30	99.540	0.460	0.096	30	97.237	2.763	0.233
45	99.497	0.503	0.100	45	97.134	2.866	0.238
6 00	99.452	0.548	0.105	14 00	97.030	2.970	0.242
15	99.406	0.594	0.109	15	96.923	3.077	0.246
30	99.357	0.643	0.113	30	96.815	3.185	0.250
45	99.307	0.693	0.118	45	96.705	3.295	0.255
7 00	99.255	0.745	0.122	15 00	96.593	3.407	0.259
15	99.200	0.800	0.126	15	96.479	3.521	0.263
30	99.144	0.856	0.131	30	96.363	3.637	0.267
45	99.087	0.913	0.135	45	96.246	3.754	0.271

For each foot take one one-hundredth of each reading.

Table XIII.

MINUTES IN DECIMALS OF A DEGREE.

0 30″	.00833	10′ 30″	.17500	20′ 30″	.34167	30′ 10″	.50833	40′ 30″	.67500	50′ 10″	.84167
1 00	.01667	11 00	.18333	21 00	.35000	31 00	.51667	41 00	.68333	51 00	.85000
30	.02500	30	.19167	30	.35833	30	.52500	30	.69167	30	.85833
2 00	.03333	12 00	.20000	22 00	.36667	32 00	.53333	42 00	.70000	52 00	.86667
30	.04167	30	.20833	30	.37500	30	.54167	30	.70833	30	.87500
3 00	.05000	13 00	.21667	23 00	.38333	33 00	.55000	43 00	.71667	53 00	.88333
30	.05833	30	.22500	30	.39167	30	.55833	30	.72500	30	.89167
4 00	.06667	14 00	.23333	24 00	.40000	34 00	.56667	44 00	.73333	54 00	.90000
30	.07500	30	.24167	30	.40833	30	.57500	30	.74167	30	.90833
5 00	.08333	15 00	.25000	25 00	.41667	35 00	.58333	45 00	.75000	55 00	.91667
30	.09167	30	.25833	30	.42500	30	.59167	30	.75833	30	.92500
6 00	.10000	16 00	.26667	26 00	.43333	36 00	.60000	46 00	.76667	56 00	.93333
30	.10833	30	.27500	30	.44167	30	.60833	30	.77500	30	.94167
7 00	.11667	17 00	.28333	27 00	.45000	37 00	.61667	47 00	.78333	57 00	.95000
30	.12500	30	.29167	30	.45833	30	.62500	30	.79167	30	.95833
8 00	.13333	18 00	.30000	28 00	.46667	38 00	.63333	48 00	.80000	58 00	.96667
30	.14167	30	.30833	30	.47500	30	.64167	30	.80833	30	.97500
9 00	.15000	19 00	.31667	29 00	.48333	39 00	.65000	49 00	.81667	59 00	.98333
30	.15833	30	.32500	30	.49167	30	.65833	30	.82500	30	.99167
10 00	.16667	20 00	.33333	30 00	.50000	40 00	.66667	50 00	.83333	60 00	1.00000



DISTANCES FROM SIDE STAKES FOR CROSS-SECTIONING.

SLOPE 1½ TO 1. ROADWAY OF ANY WIDTH.

	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	
0	0 00	0 15	0.30	0.45	0.60	0.75	0.90	1.05	1.20	1.35	0
1	1.50	1 65	1 80	1.95	2.10	2.25	2.40	2.55	2.70	2.85	1
2	3.00	3.15	3.30	3 45	3.60	3 75	3.90	4.05	4.20	4 35	2
3	4.50	4 65	4.80	4.95	5 10	5 25	5 40	5.55	5.70	5.85	3
4	6.00	6 15	6.30	6.45	6.60	6.75	6.90	7.05	7.20	7.35	4
5	7 50	7.65	7.80	7.95	8.10	8.25	8.40	8.55	8.70	8.85	5
6	9 00	9 15	9.30	9.45	9.60	9.75	9.90	10.05	10.20	10.35	6
7	10.50	10 65	10.80	10.95	11.10	11.25	11.40	11.55	11 70	11.85	7
8	12.00	12 15	12.30	12.45	12.60	12.75	12.90	13.05	13.20	13.35	8
9	13 50	13 65	13 80	13 95	14.10	14.25	14.40	14 55	14.70	14.85	9
10	15.00	15 15	15 30	15 45	15.60	15.75	15.90	16.05	16.20	16 35	10
11	16 50	16 65	16 80	16.95	17 10	17.25	17.40	17.55	17.70	17.85	11
12	18 00	18 15	18.30	18 45	18.60	18 75	18.90	19.05	19.20	19 35	12
13	19 50	19 65	19.80	19.95	20.10	20.25	20 40	20.55	20.70	20.85	13
14	21.00	21 15	21.30	21.45	21 60	21.75	21.90	22 05	22 20	22 35	14
15	22 50	22 65	22 80	22 95	23.10	23.25	23.40	23.55	23.70	23.85	15
16	24.00	24 15	24 30	24 45	24 60	24.75	24 90	25 05	25.20	25.35	16
17	25.50	25 65	25.80	25 95	26.10	26 25	26 40	26.55	26.70	26.85	17
18	27.00	27 15	27.30	27 45	27.60	27.75	27.90	28.05	28 20	28.35	18
19	28 50	28 65	28 80	28.95	29.10	29.25	29.40	29.55	29.70	29.85	19
20	30 00	30 15	30.30	30.45	30.60	30.75	30.90	31.05	31.20	31.35	20
21	31 50	31 65	31.80	31.95	32 10	32 25	32.40	32.55	32 70	32 85	21
22	33 00	33 15	33 30	33 45	33.60	33 75	33.90	34.05	34.20	34.35	22
23	34 50	34 65	34.80	34.95	35.10	35 25	35 40	35.55	35.70	35 85	23
24	36.00	36 15	36.30	36 45	36.60	36.75	36.90	37.05	37.20	37.35	24
25	37.50	37.65	37 80	37.95	38.10	38.25	38.40	38.55	38.70	38.85	25
26	39 00	39 15	39.30	39 45	39 60	39.75	39.90	40.05	40.20	40.35	26
27	40 50	40 65	40 80	40.95	41.10	41.25	41 40	41.55	41.70	41.85	27
28	42 00	42 15	42.30	42.45	42.60	42 75	42.90	43.05	43.20	43.35	28
29	43 50	43 65	43.80	43 95	44.10	44 25	44 40	44.55	44.70	44 85	29
30	45 00	45 15	45.30	45 45	45.60	45.75	45.90	46.05	46 20	46.35	30
31	46.50	46.65	46.80	46 95	47.10	47.25	47.40	47.55	47.70	47.85	31
32	48 00	48.15	48.30	48 45	48.60	48 75	48.90	49.05	49 20	49.35	32
33	49.50	49 65	49.80	49.95	50.10	50.25	50.40	50.55	50.70	50.85	33
34	51 00	51.15	51.30	51.45	51.60	51.75	51.90	52.05	52.20	52.35	34
35	52 50	52.65	52.80	52.95	53.10	53.25	53.40	53.55	53.70	53.85	35
36	54 00	54.15	54.30	54 45	54.60	54.75	54.90	55.05	55.20	55.35	36
37	55 50	55 65	55.80	55.95	56.10	56.25	56.40	56.55	56.70	56.85	37
38	57.00	57.15	57.30	57 45	57.60	57 75	57.90	58.05	58.20	58 35	38
39	58 50	58.65	58 80	58.95	59.10	59 25	59.40	59 55	59.70	59.85	39
40	60 00	60 15	60 30	60 45	60 60	60.75	60 90	61.05	61 20	61.35	40
41	61.50	61 65	61.80	61 95	62 10	62 25	62.40	62 55	62 70	62.85	41
42	63 00	63.15	63 30	63 45	63 60	63 75	63 90	64 05	64 20	64.35	42
43	64.50	64 65	64 80	64.95	65.10	65 25	65 40	65.55	65.70	65.85	43
44	66 00	66 15	66.30	66.45	66.60	66.75	66.90	67.05	67.20	67.35	44
45	67 50	67 65	67 80	67.95	68.10	68.25	68.40	68.55	68.70	68.85	45
46	69 00	69 15	69 30	69.45	69.60	69.75	69.90	70.05	70.20	70.35	46
47	70 50	70 65	70 80	70 95	71.10	71.25	71 40	71.55	71.70	71.85	47
48	72.00	72 15	72.30	72.45	72.60	72.75	72.90	73 05	73.20	73 35	48
49	73 50	73 65	73.80	73.95	74.10	74.25	74.40	74.55	74.70	74.85	49
50	75.00	75.15	75.30	75.45	75.60	75.75	75.90	76.05	76.20	76.35	50

Computed by L. Leland Locke.

4445 to nail in 16" black oak stump

Stump A

9.8° - 17° 8

2050 - swamp

2080

2138

36°

1600

6059

50 1/2

Inlet Bear

N. 365 on Col S north line to swamp

N 35° W

PLEASE RETURN TO
GEAUGA COUNTY ENGINEER
COURT HOUSE
CHARDON, O.
PHONE 250- X

360
6330
29670

2830
2.1
27-30

2830
34
6220

242
55

180
2830
130

13
16
78
13
208

12.5
16
750
125
2000

459 on C & E - Hog

555 to ¢ road

190 on a - Sol line to Bridge

650 " " Pine W " "

390 BM to ¢ Beaver ck

675 " " Sl 8"

465 across 10 A Buss Bridge

413 Bidlake cor to Int township

Hambletts S. line N. 84° E.

" N " N 88° E