

JOB 2001-FA.PI42  
BRAINERD

MOTLEY  
CROSS-SECTION

FIELD BOOK

380



125

$A = 56^\circ 31' L$  (#2)  
 $D = 10^\circ L$

$$\begin{array}{r} 730535 \\ 730233 \\ \hline 302 \end{array} \quad \begin{array}{r} 730233 \\ 130 \\ \hline 729133 \end{array}$$

$T = R_0 = 2.758674$   
 $\tan 28-15 = 9.730383$

$338 L$   $12489057$   
 $\times 56.5167$   
 $\hline 34480.8 PI.$   
 $3408.4$   
 $31+72.4 BC.$   
 $565.2$   
 $\hline 37+37.6 EC$

$$\begin{array}{r} 376 \\ 2 \\ \hline 60112.8 \end{array} \quad \begin{array}{r} 26-22.19 \\ 152.8 \\ \hline 27756 \\ 28-15.6 \end{array} \quad \begin{array}{r} 28-15.5 \\ 2 \\ \hline 56-31 \\ 16 \end{array}$$

$$\begin{array}{r} 6679 \\ 60696 \\ 34044 \\ \hline 6679 \\ 60696 \\ 34044 \end{array} \quad \begin{array}{r} 88145 \\ 88145 \\ \hline 88145 \\ 88145 \end{array} \quad \begin{array}{r} 34480.8 \\ 29+72.4 \\ \hline 34480.8 \\ 29+72.4 \end{array}$$

$PI = 171+47.8$   
 $A = 17-17-30''$   
 $E = 78'$   
 $D = 2^\circ L$   
 $T = 435.6$

$4^\circ 20' - 15'$   
 $R_0 = 3.457115$   
 $9.181999$   
 $T = 435.6$   $12.639114$

$2125-55-30$   
 $115$   
 $12-057-15''$   
 $4^\circ 20' 15''$   
 $17-17-30''$   
 $\frac{1}{2} I = 8^\circ - 38' - 45''$

$496 = 100 \times 17.2917$   
 $864.6$   
 $37.8$   
 $\hline 113.4$   
 $226.8$   
 $160.8$   
 $\hline 38.76$

$171+47.8$   
 $9435.6$   
 $167+12.2 BC.$   
 $8+64.6$   
 $175+76.8 EC.$

$3000$   
 $2833$   
 $2167$   
 $084$   
 $2833$   
 $18241$   
 $18136$   
 $\hline 185121$   
 $639$   
 $111360$   
 $181999$

$217.2917$   $164.58$   
 $\frac{16}{1211}$

①  $\Delta = 90^\circ - 00'$   
 $D = 20^\circ$   
 $T = 287.94$

$PI = 28 + 30.9$   
 $287.9$

$T = R_{20} = 2.459300$   
 $\tan 45^\circ = 1$

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$2\frac{1}{2}C = 100 \frac{1}{2} = 50 \times \frac{90}{20} = 4500$

$2 \times 0.3 \times 20$

$BC = 25 + 43.0$   
 $450$   
 $29 + 93.0$

$57 \times 0.3 \times 20$   
 $46$   
 $60 \frac{342}{30} = 42$

$50 \frac{143}{6}$   
 $300 \frac{60}{225} \frac{8}{10} = 18$   
 $240 \frac{40}{40} = 42$   
 $18 \frac{44}{60}$

$287.94$   
 $50$   
 $450$



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$\Delta = 93^\circ - 18' L$   $46^\circ - 39'$   
 $PI = 89 + 46.1$

$R = 2.883371$   
 $\frac{1}{75} = 0.025027$

$EC = 2619.7$   
 $43$   
 $2520$   
 $782$

$D = 7^\circ - 30'$   
 $17^\circ - 23.3'$   
 $1^\circ - 52.5'$   
 $44^\circ - 38.3'$   
 $3^\circ - 00.67'$   
 $1^\circ - 52.5'$   
 $47^\circ - 38.98'$   
 $21^\circ - 08.3'$   
 $1^\circ - 52.5'$   
 $73^\circ - 00.8'$   
 $1^\circ - 52.5'$   
 $50^\circ - 53.3'$   
 $1^\circ - 52'$

$T = 809.8 = 2.908398$

$2\frac{1}{2}C = 100 \frac{93.30}{75} = 1244.0$

$89 + 46.1 PI$   
 $8 + 09.8 T$   
 $8^\circ - 00.8'$   
 $1^\circ - 52.5'$   
 $9^\circ - 53.3'$   
 $1^\circ - 52.5'$   
 $11^\circ - 45.8'$   
 $1^\circ - 52.5'$   
 $13^\circ - 38.3'$   
 $1^\circ - 52.5'$   
 $15^\circ - 30.8'$   
 $1^\circ - 52.5'$

$100.0$   
 $36.3$   
 $63.7$   
 $12.44$   
 $75 \frac{93.30}{75}$   
 $183$   
 $150$   
 $330$   
 $300$   
 $300$

$C \times 0.3 \times 7.5$   
 $62$   
 $637$   
 $619.1$   
 $75$   
 $19555$   
 $13377$   
 $61143.325$   
 $120$   
 $23.3$   
 $50$   
 $150$   
 $7.5$   
 $7.5$   
 $2^\circ - 10.5'$   
 $112.5$   
 $60$   
 $52.5$   
 $4^\circ - 15.8'$   
 $1^\circ - 52.5'$   
 $6^\circ - 08.3'$   
 $1^\circ - 52.5'$   
 $8^\circ - 00.8'$

$26^\circ - 05.3'$   $80.3$   
 $23$   
 $240.7$   
 $2$   
 $120.65$   
 $168.63$   
 $1180.675$   $(3^\circ - 00.68)$   $17^\circ - 23.3'$



$E_{30}$   
 $\Delta = 124^\circ - 37'R$   
 $D = 4^\circ C R$   
 $T = 312.6$   
 $PI = 105 + 33.1$

$339183$   
 $338527$   
 $0606$   
 $307$   
 $338527$   
 $303$   
 $338830$

$3 \sqrt{1330 \dots}$   
 $130 \dots$   
 $18.5$

$R_f = 3.156151$   
 $\tan 12^\circ - 16.5 = 9.338830$

$312.6 \dots$   
 $25 \dots$   
 $24.6167$   
 $115.4$   
 $29.5$   
 $8.85$   
 $35.4$

$32.494981 - 10$   
 $6.1541$   
 $24.6167$   
 $24 \dots$   
 $18.5$   
 $10.77$   
 $43.08$   
 $11 - 35.4$   
 $12 - 18.48$

$A = 4^\circ - 49'R$   
 $D = 1^\circ C R$   
 $T = 241$   
 $Lg C_{100} = 100 \cdot 4.8167$   
 $481.67$

$20 - 29.4$   
 $15.4$   
 $6.5534$   
 $622343$   
 $13007$   
 $1524$   
 $622363$   
 $1304$   
 $623647$

$R = 3.758128$   
 $8.623847$   
 $25.2 - 12.381975$

$PI = 137 + 93.0$   
 $2 + 41.2$   
 $135 + 52.0 BC$   
 $4 + 81.7$   
 $140 + 33.7 EC$

$50$   
 $15.0$   
 $12.4$   
 $29.2$   
 $15$   
 $44$   
 $15$   
 $59$   
 $15$   
 $74$

$28$   
 $14.4$   
 $12$   
 $33.1$   
 $10.1$   
 $55.4$   
 $14.4$   
 $69.5$

$1.53!$   
 $15$   
 $27.0!$

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$4^{\circ}20'15''$   
 $2555 \div 10$   
 $12^{\circ}54'15''$   
 $117017507$   
 $803875.95$   
 $460/4500$   
 $PI. 171447.8$   
 $I = 17^{\circ}17'30''$   
 $E = 28'26/66$   
 $D = 2^{\circ}1$   
 $3457115$   
 $9181997$   
 $12639114$   
 $T = 435.6$   
 $L = 864.6$   
 $171 + 47.8$   
 $4 + 35.6$   
 $167 + 122 BC$   
 $3000$   
 $2830$   
 $167 + 122$   
 $175 + 76.8 EC$   
 $172917/86458$

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$A 520-08 \frac{1}{2} R$   
 $P.I. 189+02.2$   
 $D 8^{\circ}CR$   
 $T = 350.7$   
 $LC = 651.8$   
 $26-04-15'' E=70$   
 $1300$   
 $1333$   
 $1167$   
 $84$   
 $1333$   
 $1417$   
 $T = 2.8553850$   
 $9.6895431$   
 $12.594928$   
 $35069$   
 $189+02.2$   
 $350.7$   
 $185+51.5 BC$   
 $651.8$   
 $192+03.3 EC$   
 $26-04-3$   
 $70/650$   
 $63$   
 $90$   
 $311$   
 $9/2802$   
 $27$   
 $10$   
 $6.5177$   
 $100 \times \frac{52.1417}{28}$   
 $53.3$   
 $41$   
 $15.98$   
 $127 \times 92$   
 $36$   
 $57$   
 $20.7.9$   
 $23564$

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164.51  
24.30  

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9.04  
197.85

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DRAWING MATERIALS

AND

SURVEYING INSTRUMENTS.

NEW YORK.

CHICAGO. ST. LOUIS. SAN FRANCISCO. MONTREAL.

## Tables for Excavations and Embankments.

DISTANCES FROM CENTER OF ROADWAY FOR CROSS-SECTIONING.  
ROADWAY 18 FEET WIDE. SIDE SLOPES 1 TO 1.  
FOR SINGLE TRACK EXCAVATION.

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	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	
0	9.0	9.1	9.2	9.3	9.4	9.5	9.6	9.7	9.8	9.9	0
1	10.0	10.1	10.2	10.3	10.4	10.5	10.6	10.7	10.8	10.9	1
2	11.0	11.1	11.2	11.3	11.4	11.5	11.6	11.7	11.8	11.9	2
3	12.0	12.1	12.2	12.3	12.4	12.5	12.6	12.7	12.8	12.9	3
4	13.0	13.1	13.2	13.3	13.4	13.5	13.6	13.7	13.8	13.9	4
5	14.0	14.1	14.2	14.3	14.4	14.5	14.6	14.7	14.8	14.9	5
6	15.0	15.1	15.2	15.3	15.4	15.5	15.6	15.7	15.8	15.9	6
7	16.0	16.1	16.2	16.3	16.4	16.5	16.6	16.7	16.8	16.9	7
8	17.0	17.1	17.2	17.3	17.4	17.5	17.6	17.7	17.8	17.9	8
9	18.0	18.1	18.2	18.3	18.4	18.5	18.6	18.7	18.8	18.9	9
10	19.0	19.1	19.2	19.3	19.4	19.5	19.6	19.7	19.8	19.9	10
11	20.0	20.1	20.2	20.3	20.4	20.5	20.6	20.7	20.8	20.9	11
12	21.0	21.1	21.2	21.3	21.4	21.5	21.6	21.7	21.8	21.9	12
13	22.0	22.1	22.2	22.3	22.4	22.5	22.6	22.7	22.8	22.9	13
14	23.0	23.1	23.2	23.3	23.4	23.5	23.6	23.7	23.8	23.9	14
15	24.0	24.1	24.2	24.3	24.4	24.5	24.6	24.7	24.8	24.9	15
16	25.0	25.1	25.2	25.3	25.4	25.5	25.6	25.7	25.8	25.9	16
17	26.0	26.1	26.2	26.3	26.4	26.5	26.6	26.7	26.8	26.9	17
18	27.0	27.1	27.2	27.3	27.4	27.5	27.6	27.7	27.8	27.9	18
19	28.0	28.1	28.2	28.3	28.4	28.5	28.6	28.7	28.8	28.9	19
20	29.0	29.1	29.2	29.3	29.4	29.5	29.6	29.7	29.8	29.9	20
21	30.0	30.1	30.2	30.3	30.4	30.5	30.6	30.7	30.8	30.9	21
22	31.0	31.1	31.2	31.3	31.4	31.5	31.6	31.7	31.8	31.9	22
23	32.0	32.1	32.2	32.3	32.4	32.5	32.6	32.7	32.8	32.9	23
24	33.0	33.1	33.2	33.3	33.4	33.5	33.6	33.7	33.8	33.9	24
25	34.0	34.1	34.2	34.3	34.4	34.5	34.6	34.7	34.8	34.9	25
26	35.0	35.1	35.2	35.3	35.4	35.5	35.6	35.7	35.8	35.9	26
27	36.0	36.1	36.2	36.3	36.4	36.5	36.6	36.7	36.8	36.9	27
28	37.0	37.1	37.2	37.3	37.4	37.5	37.6	37.7	37.8	37.9	28
29	38.0	38.1	38.2	38.3	38.4	38.5	38.6	38.7	38.8	38.9	29
30	39.0	39.1	39.2	39.3	39.4	39.5	39.6	39.7	39.8	39.9	30
31	40.0	40.1	40.2	40.3	40.4	40.5	40.6	40.7	40.8	40.9	31
32	41.0	41.1	41.2	41.3	41.4	41.5	41.6	41.7	41.8	41.9	32
33	42.0	42.1	42.2	42.3	42.4	42.5	42.6	42.7	42.8	42.9	33
34	43.0	43.1	43.2	43.3	43.4	43.5	43.6	43.7	43.8	43.9	34
35	44.0	44.1	44.2	44.3	44.4	44.5	44.6	44.7	44.8	44.9	35
36	45.0	45.1	45.2	45.3	45.4	45.5	45.6	45.7	45.8	45.9	36

Calculated by Julien A. Hall, M. Am. Soc. C. E.

FOR KEITH'S RAILROAD CURVE TABLES SEE END OF BOOK.

KEUFFEL & ESSER CO.

Construction

Book

Job 2001 & F.A.P. 142

Cross Section

Notes

R.E. Krueger  
Engr. 1910

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①

AREA'S		Cubic Yds.		Remarks
EXCAVATION		Embankment	Excav. Embank.	
	Offtake Ditch R-		769-	3
	Side Ditch R		763-769	3
	" " L		" "	4
X	Sections	704	- 723	5-6
"	"	698	- 703	7
"	"	723	- 725+	8
"	"	672	- 698-	9-11
	Channel Change	682+		12
X	Sections	885	- 891	13
"	"	891	- 884	14-15
"	"	644	- 671	16-18
	Side Ditch L	649	- 662	19
X	Sections	862	- 870	20
"	"	892	- 901	21
"	"	628	- 643	22-23
	Side Ditch R	649	- 662	24
X	Sections	903	- 924	25-27
	Side Ditch R&L	917	- 924	28
	Offtake Ditch	917	R	28
	Side Ditch	662	- 682	29
X	Sections	518	- 537	30-32



SECTION.

SECTION

STA.	ELEVA.	GRADE	CUT OR FILL.		AREA'S		Cubic Yds.		Remarks
			LEFT	C. RIGHT	EXCAVATION	Embankment	Excav.	Embank.	
X sections	925 - 972			<del>37</del> - 38					
Side Ditches	568 - 580			39 - 40	✓				
" "	568 - 580			39 & 41	✓				
Re-measurement Ditch	667 - 655			42	✓				
X Sections	608 - 627			43 - 46	✓				
Side Ditches	608 - 616			44					
X Sections	512 - 517			47					
Approach	973 + 75 L			47					
Offtake	611 + 40			48	✓				
X sections	972 - 980			49 - 50					
Side Ditch L	661 - 663			51					
X Sections	500 - 511			52 - 53					
" "	591 - 607			54 - 56					
" "	985 - 1032			57 - 61					
" "	981 - 984			64 - 65					
" "	537 - 545			66					
" "	789 - 861			67 - 75					
" "	Spur to Pillager.			76					
" "	1033 - 1080			77 - <sup>END,</sup>					