

← A4 →

← LETTER →

120

LEVEL BOOK

370 A



# KEUFFEL & ESSER CO.

## 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.

"Copyright, 1895, by Keuffel & Esser Co."

	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
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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.

120



B.M. Jones Bridge

1st Br. N of Br is 32' arch  
 2nd Br N of Br is 20' flat top

On Trip Line Guilford + Wash.

6' Rise skewed 30°  
 6' Rise " 20°

	South			±	North		
Sta	20	157	9		9	147	20
300'E	10540	10532	10385	10490	10275	10516	10520
Br. 4				H			
200'E	20	147	8.5		8.5	16	20
100'E	21	18	147	9	99.80	101.30	99.60
	18100	97.00	97.85	9810	99.10	98.20	98.90
20'E	20	147	9	5	3	9	16
	9720	9725	9660	9530	9530	9550	9815
±		100	30	10	16	60	
Stream	9300	9320	9450	9390	9425	9410	
10'W	20	14	9	4.5	2	9	167
	9690	9690	9670	9550	9570	9600	9640
100'W	20	147	9		9	167	20
	9900	9920	9890	9935	9960	9950	9850
200'W	20	147	9		9	167	20
	10100	10630	10370	10365	10360	10500	10650
300'W	20	147			9	167	
	10915	10915	10800	10970	10845	10935	10935

B.M.  
 El. 100.00  
 High Point  
 Large Granite  
 Rock N side  
 Road 100'E 16  
 Br.

Bn. at 90°

110.30

Cross Sec. 20' W ± is 2.6' higher than Sec 10' W except 3' center Reading  
 This reading 0.6 Higher



W.M.H. Hamilton Brown

old Budget Wooden

Skew New Br. 30°

150' N 99.41

100' N 98.91

50' N 97.83

20' N <sup>15</sup> 9560 <sup>9</sup> 9560 <sup>6</sup> 9768 97.70

6' N <sup>15</sup> 9470 <sup>10</sup> 9440 <sup>5</sup> 9760 97.95

<sup>4</sup> 01.00 <sup>E</sup> 7 Bed <sup>Δ</sup> 98.05

6'S <sup>20</sup> 9400 <sup>14</sup> 9500 <sup>6</sup> 9823 98.25

26'S <sup>15</sup> 9900 <sup>9</sup> 9960 99.50

50' N 101.10

68' N 102.50

Br. skinned home floor

8' span 14' wide

L.W.F. 10' span

Wings st Back

<sup>6</sup> 9780 <sup>10</sup> 9465 <sup>20</sup> 9400

<sup>7</sup> 9755 <sup>15</sup> 9230

<sup>W</sup> 7 Bed

91.12

<sup>6</sup> 9710 <sup>14</sup> 9190

<sup>7</sup> 9955 <sup>14</sup> 9555

60' New Channel  
Wide Road

Skew New Br 30°





56

Canary  
Finley Franklin

Bn No 2

Liberty

Pres. Str. Wooden Span

10' Rise

B.M. 100.00  
8" Round Con  
Post 15' NE  
E 2nd Br.

West

E

East

20' N

100' N

14' N

06 N

0+00

06 S

50' S

75' S

100' S

37' N

				10205			
	20	9		9850			
	93.80	93.20	97.40	9805	97.36	9460	9440
			10		9190		
			9134	9134			
	16	3			55	7	22
	9380	91.80	9790	9813	9810	9550	9460
	16	14	12		5	7	
	9750	93.70	9750	9820	9835	9610	9490
		20	28	8	10	20	25
	10200	100.20	10000	10105	10105	10510	11580
				10320			
		15		11000			
	9600	9570	9720	9775	9750	9710	

N. Abutment  
in stream

S Abutment

U. Pres Br Floor 9790 Bed 91.34

New Str. Cen. 6' S old Br. 10' Span Wings St. Back

Skew 15° L.W.F.



Canary Bl.

Liberty

849

South

North

200' W		105.50
150' W		10370
20' W		9990
0 + 00	15'S	9545
30' E in Bl pres. stream.		9830
100' E		9660
100' E		10065
100' E		11510
200' E		

12'	25'	100'	150'	120'
9915	10150	10245	9830	9960

BM 100.00  
high Rock  
at fence S.  
side of bank  
near stream

New  
channel  
on N.  
side

New Bridge 18' span Wings.  
Bl at 90°

St Back. rise r.



10

## Garrison Bridge Clay

11

Pres Br. Wooden floor Cms Abutments Span 17 Rise 6'

Bm 100.  
110 cm NW  
wing pres

200' W	S.			±	N.			
170' W				10495				
				10210				
24' W	20	15	8	10150	65	11	15	20
	9900	9990	10140	10150	10125	9910	9870	9870
09' W	20	14	9	10165	65	11	15	20
	9710	9710	9820	10095	10120	9643	9660	9660
0+00				9560	10145	9470		
09' E	20	11	6.5	10172	65	11	15	20
	9650	9655	10105	10172	10115	9890	9860	9860
29' E	20	14	11	10112	65	11	15	20
	9950	9970	9935	10112	10135	9930	9945	10000
100' E				10185				
200' E				10480				

Br. at 90°

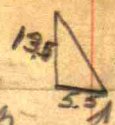


12

Frank Gardner and Br.

Brown

Pres. Br. Iron Span 22' Rounding 13.5 - skew RW 7  
Rise 55'



13

BW 100.00  
8" Round  
Post 20' N  
of Ward Br

Sta	N.	E.	S
31'E		96.76	
100'E	15 9600	12 9310	9 9605
11'E		14 9085	7 9580
0+00		13 8920	8 9597
11'W	16 9420	11 9305	7 9610
31'W	21 9560	13 9500	7 9600
190'W			9625
			9660

at 45°

at 45°

Skew New Br 45° R.W.7

20' Span

New Sta 5'-00" Rise  
Bed El. 88.76  
Wings 10'-6"



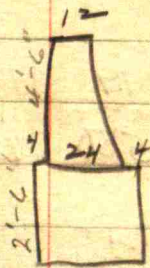
13  
94

Ira O. Dale  
2 45' 36" B.P. Culvert  
Cen Rd 1.0' above Top Culvert.

14  
15

Middle  
Skewed 45° LWF  
Should Have Bot Culvert.

Header 16' long  
4.5 High





<sup>15</sup>  
16

Henderson Bridge

Cur. old str. Iron on  
Span 12 Rise 6.00"

<sup>14</sup>  
State Rd 200' W end  
Bad condition  
Roadway 15'

	N			E			S		
200									
140									
27	<sup>227</sup> 9790	<sup>12</sup> 9725	<sup>5</sup> 9970				<sup>5</sup> 9940	<sup>12</sup> 9815	<sup>187</sup> 9790
7' E	<sup>227</sup> 9580	<sup>11</sup> 9620	<sup>7.5</sup> 9980				<sup>7.5</sup> 9935	" 97.60	<sup>187</sup> 9520
0			<sup>32</sup> 9386				<sup>32</sup> 94.70		
7' W	<sup>217</sup> 9530	<sup>11</sup> 9750	<sup>7.5</sup> 9990				<sup>7.5</sup> 9990	<sup>11</sup> 9800	<sup>187</sup> 9815
27	<sup>22</sup> 9730	<sup>13</sup> 9790	<sup>9</sup> 9960				<sup>9</sup> 9970	<sup>12</sup> 9850	<sup>187</sup> 9820
100									
200									

New Br 14' Span Rise at 90° Wings St Back

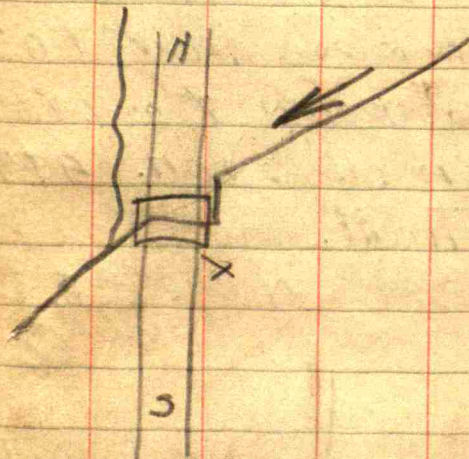


17  
18

old stn Peary Culvert  
Clean Rise 4.5' Span 10'  
Top Pres Rdway is 5.9' above bed  
Floor can be raised 1.0'  
Skew New Bz 45° LW 7' and  
Center New Bz 11' 11" of  
Cen old STN

Rise 4.0'  
Span 10'  
Rdway 20'  
Wings parallel to Rd.  
and 9' long  
Skew 45°  
Flows 6" thick with  
Toe at outlet + inlet.

18  
19





19  
20

Maxwell Guttered

Old Str. 11.6 span

# Pulments + Wings

Wooden Floor in very bad

cut 1.0' below top old

New Br 14' span. at 90°

S. abutment. Remove Willows

above Br. Wings St. Bac

⊕

200' N

0.45

100' N

3.40

Bed N Br 7' floor  
1252 4.71Bed E  
1211

100' S

3.62

200' S

0.00

Tp

16.5 R down Concrete

One wing broken off  
condition. Stream has  
footings.

with Rd. Centered at

K Flow E20  
21



22

Monton Foster

Old Stn 3x3 Box 12.5'

6' Broken off <sup>Wind</sup> Wind.

of Floor. New Stn



16'

20 II -

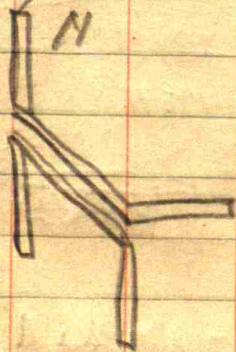
9

Br

1049 Skew 10° RW7

Beds 3' below Top

18' Rd way Skew 45° RW7



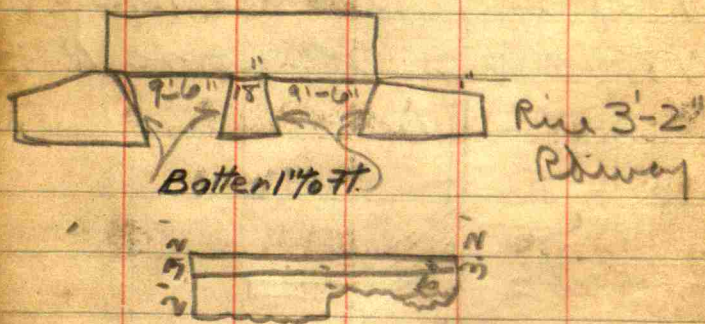
23

LETTER



24

## Bunten Bridge



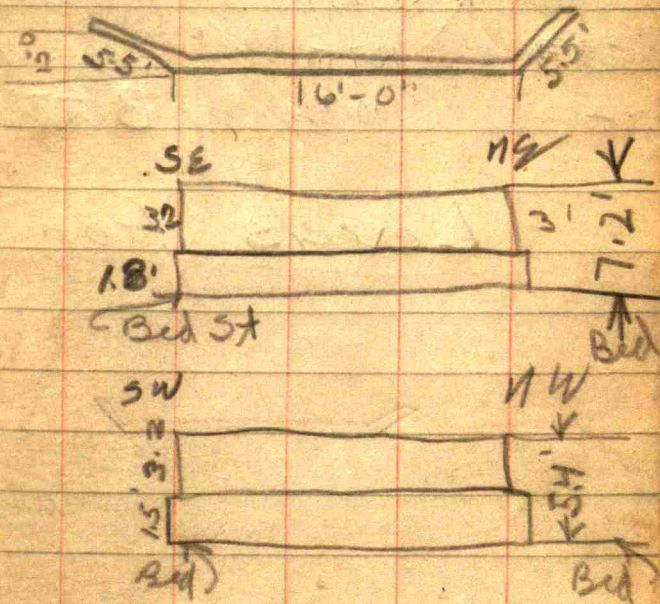
Bed at Wide N end pier  
is 4' below top footings  
Bed at E end N end pier  
is 3.2' below top footings

Water line is 4.5' below  
bottom of slab and stands at  
top of 1 1/2" tile N of Bridge.  
Clean out channel under

25

## Repair Marion Tp.

Bot. slab to Top Footings  
14.5'



Bt.



26

0+00		
0+17	100.12	Bot tile
0+30.8	103.60	Curb
0+43	104.61	Lower step
0+54	106.93	Stake
0+80	106.79	pt <sup>on</sup> WK
<del>0+80</del>	107.50	Side WP
0+93	100.82	Bot tile

Levels for

27

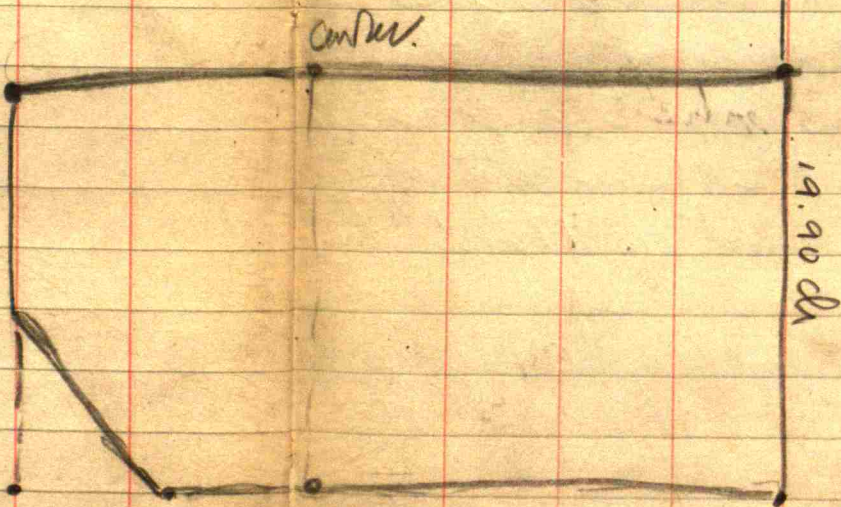


82

$$\begin{array}{r} 64.25 \\ 170.5 \\ \hline 321.25 \\ 385.50 \\ \hline 64.25 \\ \hline 1060.125 \end{array}$$

$$\begin{array}{r} 66 \\ .32 \\ \hline 132 \\ 198 \\ \hline 21.12 \end{array}$$

$$\begin{array}{r} 30 \\ 50 \\ \hline 150 \\ 198 \end{array}$$

 cen N5W<sup>4</sup>


6<sup>2</sup> Mi stno - 16x12x6  
 20 Buck N52<sup>1</sup>/<sub>2</sub>W 32<sup>1</sup>/<sub>4</sub> l  
 16 Angus N89<sup>1</sup>/<sub>2</sub>W 30 l  
 N17.31<sup>1</sup>/<sub>2</sub> dnd

Sunny for Everett Newlin  
 Sec 14 - T14N-R1E

33

17.33

6<sup>2</sup> Mi.

19.90 d

5



34  $\frac{1}{2}$  Mi Stone to SE cor  
Stone found from old  
 $\frac{1}{2}$  Mi Stone to NE cor Farm

W on N line from NE cor is  
W on N line from NE cor to  
ON S line from SE cor W  
ON S line from SE cor W  
Def R  $67^{\circ}29'$  - a dist of  
R  $2^{\circ}$  - a dist of  $772.2'$  to

35  
Farm is  $1309'$   
Witness trees still standing  
is  $1151'$  —  
 $2295'$  to Gen Morewell Rd.  
Iron pipe at S is  
to Gen Rd  $1904'$   
to SW cor  $3438'$   $3433.5'$   
 $240.24'$  - Thence def  
a stone.



36

stone

1849

ⓑ Beg at stone W line NW<sup>4</sup> 72  
Then N 1479' <sup>(22.110)</sup> to sec corner  
Stone in Cen of Road ⓓ

Thence Def R 88° 21' -  
in Cen Road wit by.

Then Def L 7° 29' a dist  
Cen of Road on A line of Farm.

Thence Def. R 99° 12' a  
Tract to Stone at Beg. B 1859.

B 36" Soun Oak N 05° E 12'

24" Poplar S 15° W 43'

E 12" Hackberry N 40° W. 41'

17" " S 30° E. 20.5'

ⓓ Send Cement Brace for cen

37

Rods N of Cen W Sec 14 ⓐ

Thence E 1703' to  
Wit by (25.80C) ↗

a dist of 728' to a stone<sup>E</sup>  
(11.03C)

of 759' (11.50C)  
wit by 30" Sugar S 10° E 77'

dist. of along S line of  
5' (28.18C)

part ⓐ on line 12.5'



40

Claud Johnson Br.  
 Pres Str 23.5' x 48" B.P.  
 Skew New Br. 10° L.W.F. 2  
 NE wing ⊥ & Rd NW = & Rd  
 SE + SW at 30° with & Rd. Cen  
 Half way between stones.

Rhea.

20' x 6' B.P. - NW + NE wings  
 at 30° & Rd. SE at back  
 SW at 45° & Rd.

41

7"  
 4 3x6'



42

Hollingsworth Br.

160' Clear Span

165' Overall L

20' Rise Approx.

Stone Abut - wings

Monse Ry. Co. 1886

Youngs Ohio.

State Farm Br.

Two 75' spans.

15' Rise approx.

1905 - Hackensack Cons. Co.

Ind.

TH 1+6

35'-40'-42'-40'-35'

Rise 15'

43

Nat. Rd Br.

50-55-50

15' Rise

F.M. Hawthorn

Div. Eng

PCL+StL RR

Terra Haute Ind.



44

Sheets Br. Marion Not Daughantys

45



Bridge Repair listed 1922

46

Two Bridges N. of Chas. Robbins Near Gov. Walton

Call Bensot Trustee Lincoln Tp.

One West of Amo on Coatsville Road

One S. of Geo. McHattie

" S of " " Stringer

" W. of Coates Bridge

" N. of Jacktown

" S " "

W. Cooper Bridge Franklin

One W. and S. of New Winchester on Coatsville Road

47



50

Taylor Hadley

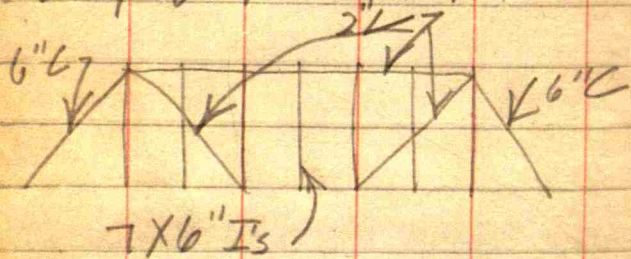
Bed to Top Floor 9.50'

Bed to Bot. 9" I's 8.25'

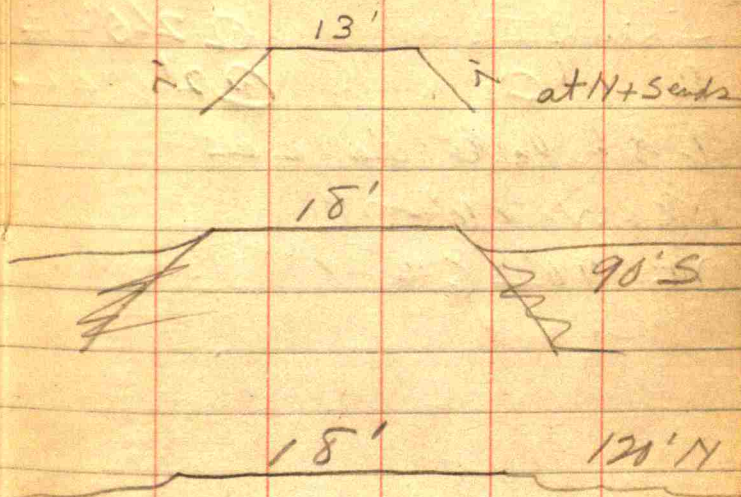
7x9" I's spaced 2.25'

Span 24' clear Rhr 13'6"

Wings at 45° 7' Fall



51





52

N. Salem Floor.

5 lines<sup>6</sup> T's in place @ 2'-6" c/c2 " " <sup>6</sup> C's " " @ 2'-6" c/c

6 panels @ 15'-0" c/c

Max W. 10'-0"

O.L. 90'-6"

53



54

Davis B.

2 panels 13'-0"

1 " 14'-0"

Total Card to Comb 40'-0"

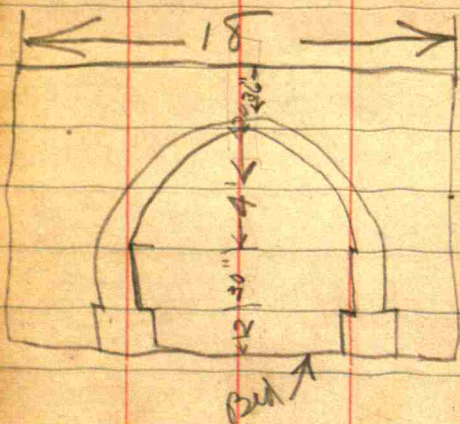
M.U. 13'-9"

4-1 $\frac{3}{8}$ " x 1 $\frac{3}{8}$ " -  $\angle$  - 13'-0" - 14 Rivetsto  $\angle$  - paint.

55



56



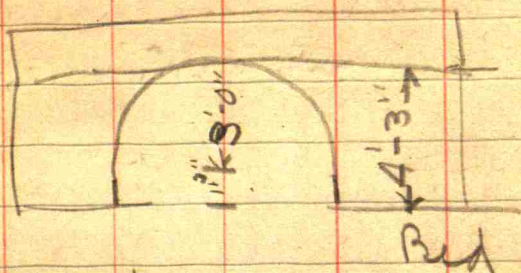
Rdway 20'  
 Crown Rd is 10.5 above Bed  
 Top Railcare 11.5 above Bed

57



58

Hogon-



From Rd is 6.5' above Bed  
 8' Span - Skew 20° R.W.F.

$$\begin{array}{r}
 6'-8'' \\
 1'-2'' \\
 \hline
 6'-6''
 \end{array}$$

LETTER

59

Wagon

12' x 4' Flat Top  
 Munge St. B.A.

Old Bridge Red to from  
 Rd 5'-5''



60

Miller Bridge

3' x 6' Flat Top,

Wings ~~at 5°~~24' Rock Straight  
Wings

Wooden Bridge

61

B.W. Coakettle

3' Circle —

Bed to crown rd. 4.3' —

3' x 6'

Wings straight  
back 8 ft. Rail  
Wings 6' Back~~Flat~~ Top 2 1/2 feet,  
with floor

20' Clear Rock

shields.

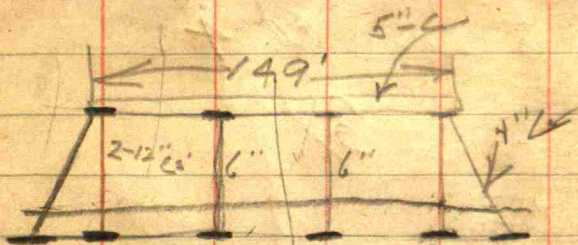
4-1



62

Carter Br

60' Spruce Bed Stud



12'-3" Bed to Top I

33

$$\begin{array}{r} 3 \overline{) 149} \\ \underline{9} \\ 59 \\ \underline{51} \\ 8 \end{array}$$

5'0"

4'

1st Br. N. Coltonville <sup>63</sup>

3' Grade —

7' from Bed to Crown Rd.

16.5' Clear Pathway

5' Box

F1

3-0

0-9

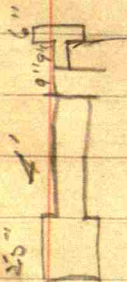


64  
Shurtie

4' Circle.

4.5' from Bed to Crown Rd.

can raise crown 1'



4x5

1st Br. S. Reno.

65-

3' Circle - New Box

11' of old culvert skewed 45°

LWF

5' crown rod to bed

3x5 wing at back

Martens



66

Pritchett No 2  
36" B.P. Replace  
with 3x12x20

Pritchett No 1 on N+S  
Road — Wooden Culvert  
Replace with 3x10x20

Bunter —

67

4 pakebs — 14.85'  
OL 60'-0"  
5 liner I and 2 liner  
C's in place —  
MW 14'-0" W.L. 60'6"



68

Hunt No 1 N+ S Rd

30" Arched

Replace with  $4\frac{1}{2} \times 8$

Wings st. Blk

---

Hunt No 2

14 Rdwy

McCard

15.5' cl span

16' O.A.L

7 lines of 6" I's 16' long

uprights 4" I's

Bed to Avn 7'-0"

Wings st Blk.



← A4 →

← LETTER →

$$\begin{array}{r} 69.25 \\ \underline{16.5} \\ 346.25 \\ 4155.0 \\ \underline{6925} \\ 1142.625 \end{array}$$



$$\frac{20.75 \times 66}{100}$$

$$\begin{array}{r} 20.75 \\ 66 \\ \hline 12450 \\ 1240 \\ \hline 136950 \\ 19.5 \\ 66 \\ \hline 1170 \\ 117 \\ \hline 11.8701 \end{array}$$



$$\begin{array}{r} 11.7 \\ 66 \\ \hline 702 \\ 702 \\ \hline 772.2 \\ 77 \end{array}$$

$$\begin{array}{r} 3,64 \\ 66 \\ \hline 2184 \\ 2184 \\ \hline 24024 \end{array}$$



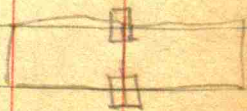
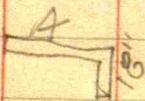
Kelleher	W. F.	Riappetoe	G14	J. Jones	P. F.	H. T.
Kink	Fromlin			Enoch Leathin's	Hovell	Holt,
	J. O.	Harvey	C. E. W.	Compbell	C. A. S.	Dorley
	Tinder		Huff	Ther.	M.	St. P. S.
			Emma	Isaac	Tinder	
			Huff	Robt.		



$$\begin{array}{r}
 66 \\
 71 \\
 \hline
 66 \\
 462 \\
 \hline
 4686
 \end{array}$$



$$50 \overline{) 800} 16$$



10

~~$$\begin{array}{r}
 1 \\
 3.3 \\
 \hline
 2 \times 16.5 \\
 5
 \end{array}$$~~

1320

66

4313.4

1060.62

2461

2373.52

88

2461.



1000  
 37  
 3  
 ---  
 11.1

66 | 1479  
 132  
 ---  
 22.4

66 | 459  
 132  
 ---  
 270

66 | 1850  
 132  
 ---  
 530  
 528  
 ---  
 22

28  
 22.5

10.4  
 66  
 ---  
 24  
 686.4

DISTANCES FROM CENTER OF ROADWAY FOR CROSS-SECTIONING.  
 ROADWAY 14 FEET WIDE. SIDE SLOPES 1½ TO 1.  
 FOR SINGLE TRACK EMBANKMENT.

	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	
0	7.0	7.2	7.3	7.5	7.6	7.8	7.9	8.1	8.2	8.4	0
1	8.5	8.7	8.8	9.0	9.1	9.3	9.4	9.6	9.7	9.9	1
2	10.0	10.2	10.3	10.5	10.6	10.8	10.9	11.1	11.2	11.4	2
3	11.5	11.7	11.8	12.0	12.1	12.3	12.4	12.6	12.7	12.9	3
4	13.0	13.2	13.3	13.5	13.6	13.8	13.9	14.1	14.2	14.4	4
5	14.5	14.7	14.8	15.0	15.1	15.3	15.4	15.6	15.7	15.9	5
6	16.0	16.2	16.3	16.5	16.6	16.8	16.9	17.1	17.2	17.4	6
7	17.5	17.7	17.8	18.0	18.1	18.3	18.4	18.6	18.7	18.9	7
8	19.0	19.2	19.3	19.5	19.6	19.8	19.9	20.1	20.2	20.4	8
9	20.5	20.7	20.8	21.0	21.1	21.3	21.4	21.6	21.7	21.9	9
10	22.0	22.2	22.3	22.5	22.6	22.8	22.9	23.1	23.2	23.4	10
11	23.5	23.7	23.8	24.0	24.1	24.3	24.4	24.6	24.7	24.9	11
12	25.0	25.2	25.3	25.5	25.6	25.8	25.9	26.1	26.2	26.4	12
13	26.5	26.7	26.8	27.0	27.1	27.3	27.4	27.6	27.7	27.9	13
14	28.0	28.2	28.3	28.5	28.6	28.8	28.9	29.1	29.2	29.4	14
15	29.5	29.7	29.8	30.0	30.1	30.3	30.4	30.6	30.7	30.9	15
16	31.0	31.2	31.3	31.5	31.6	31.8	31.9	32.1	32.2	32.4	16
17	32.5	32.7	32.8	33.0	33.1	33.3	33.4	33.6	33.7	33.9	17
18	34.0	34.2	34.3	34.5	34.6	34.8	34.9	35.1	35.2	35.4	18
19	35.5	35.7	35.8	36.0	36.1	36.3	36.4	36.6	36.7	36.9	19
20	37.0	37.2	37.3	37.5	37.6	37.8	37.9	38.1	38.2	38.4	20
21	38.5	38.7	38.8	39.0	39.1	39.3	39.4	39.6	39.7	39.9	21
22	40.0	40.2	40.3	40.5	40.6	40.8	40.9	41.1	41.2	41.4	22
23	41.5	41.7	41.8	42.0	42.1	42.3	42.4	42.6	42.7	42.9	23
24	43.0	43.2	43.3	43.5	43.6	43.8	43.9	44.1	44.2	44.4	24
25	44.5	44.7	44.8	45.0	45.1	45.3	45.4	45.6	45.7	45.9	25
26	46.0	46.2	46.3	46.5	46.6	46.8	46.9	47.1	47.2	47.4	26
27	47.5	47.7	47.8	48.0	48.1	48.3	48.4	48.6	48.7	48.9	27
28	49.0	49.2	49.3	49.5	49.6	49.8	49.9	50.1	50.2	50.4	28
29	50.5	50.7	50.8	51.0	51.1	51.3	51.4	51.6	51.7	51.9	29
30	52.0	52.2	52.3	52.5	52.6	52.8	52.9	53.1	53.2	53.4	30
31	53.5	53.7	53.8	54.0	54.1	54.3	54.4	54.6	54.7	54.9	31
32	55.0	55.2	55.3	55.5	55.6	55.8	55.9	56.1	56.2	56.4	32
33	56.5	56.7	56.8	57.0	57.1	57.3	57.4	57.6	57.7	57.9	33
34	58.0	58.2	58.3	58.5	58.6	58.8	58.9	59.1	59.2	59.4	34
35	59.5	59.7	59.8	60.0	60.1	60.3	60.4	60.6	60.7	60.9	35
36	61.0	61.2	61.3	61.5	61.6	61.8	61.9	62.1	62.2	62.4	36

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