

I

296A

W296A

Faint, illegible text

Faint, illegible text

Our Leather Bound Engineers Note Books are carried in the following rulings:

- No. 380 LEVEL BOOK. Left and Right Hand Page the same as Left Hand Page of this Book.
- No. 382 FIELD BOOK. Left Hand Page as in this Book, Right Hand Page 4 x 4 to the inch, Center Line Red.
- No. 384 MINING TRANSIT BOOK. Left Hand Page as in this Book, Right Hand Page 8x8 to the inch, Center Line Red.
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THE FREDERICK POST CO.
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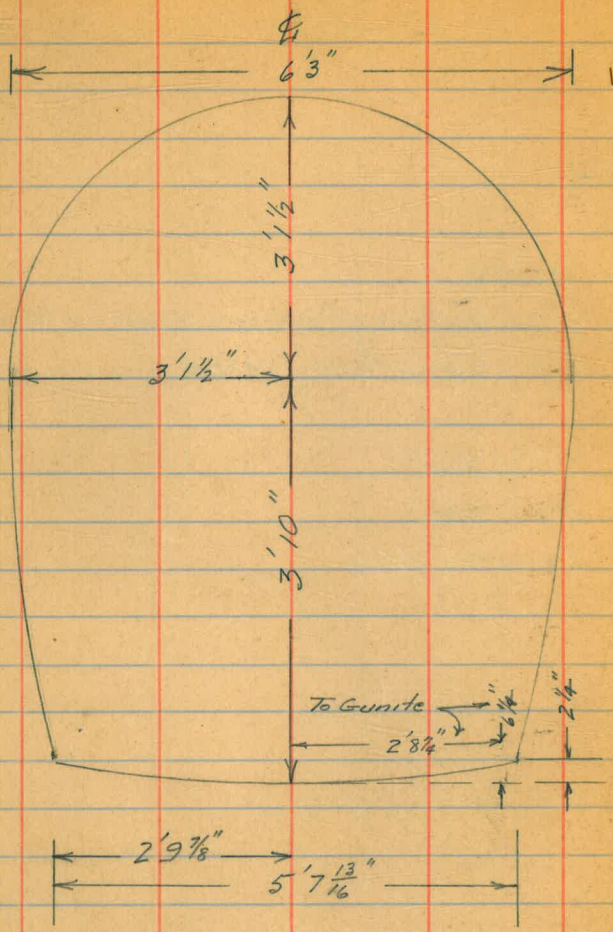
JAN 11 1965

Tunne / #1
Otay Res. to San Diego 2nd Main Pipe Line

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Neat Lines of tunnel bore

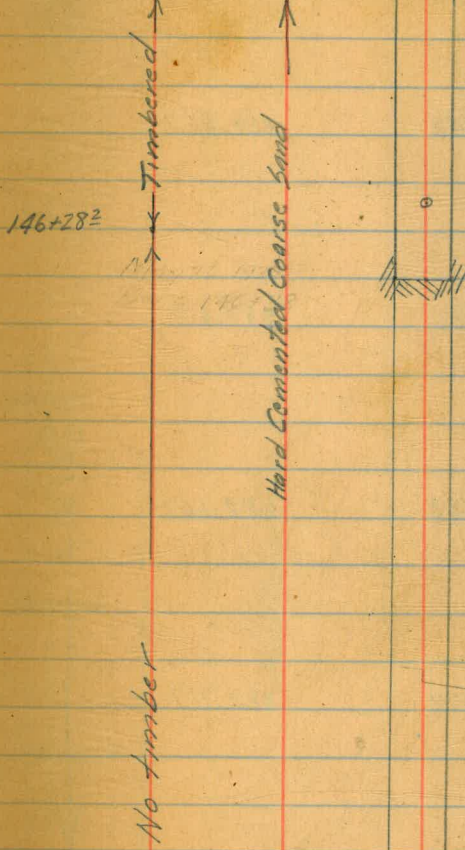
Tunnel #1 Length 2167'

| Entrance | Tunnel Grade | | Pipe Line Grade |
|---------------------|-----------------------|---------------|-----------------|
| | Bottom | Top | |
| 145+97 ⁶ | 387.177 | 394.135 | 388.260 |
| 146 | 387.184 28' 212 | 394.142 28 | 388.267 |
| +50 | 387.234 | 394.192 | 388.317 |
| 147 | 387.284 | 394.242 | 388.367 |
| +50 | 387.334 | 394.292 | 388.417 |
| 148 | 387.384 | 394.342 | 388.467 |

+0.1%

R.I. 145+47.87
B.M. Pin 390.78

Equation $145+93.51 = 145+86.2$
Entrance Portal



Bore started May 20, 1930

✓ June 18, 1930
Iron Pipe 146+09.71
B.M. Top pipe 386.87

May 26, 1930
Bore 146+38

| | Tunnel Bottom | Grade Top | Pipeline Grade |
|--------|------------------|--------------|-------------------|
| 148+50 | 387.434 | 394.392 | 388.517 |
| 149 | 387.489 | 394.442 | 388.567 |
| +50 | 387.534 | 394.492 | 388.617 |
| 150 | 387.589 | 394.542 | 388.667 |
| +50 | 387.634 | 394.592 | 388.717 |
| 151 | 387.684 | 394.642 | 388.767 |
| +50 | 387.734 | 394.692 | 388.817 |

+ 0.10%



149+735

150+175

150+663

150+993

No timber
 timbered
 No timber
 timbered
 No timber

Hard Cemented Coarse Sand

Set July 18
 B.M. Toppin El. 387.32
 148+61³² Pin

Set July 18
 B.M. Elev. 387.51
 Pipe 151+08⁶¹

| | Tunnel Grade Bottom | Pipe Line Top | Pipe Line Grade |
|-----|------------------------|------------------|--------------------|
| 152 | 387.784 | 394.742 | 388.867 |

| | | | |
|-----|---------|---------|---------|
| +50 | 387.834 | 394.792 | 388.917 |
|-----|---------|---------|---------|

| | | | |
|-----|---------|---------|---------|
| 153 | 387.884 | 394.842 | 388.967 |
|-----|---------|---------|---------|

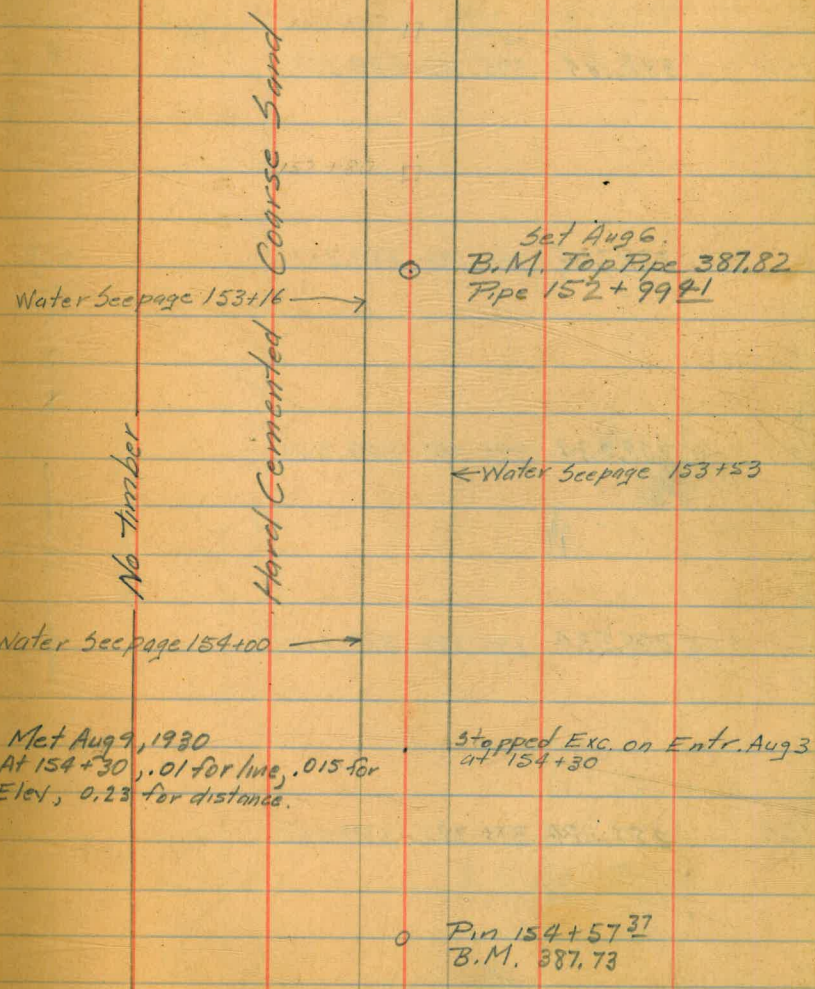
| | | | |
|-----|---------|---------|---------|
| +50 | 387.934 | 394.892 | 389.017 |
|-----|---------|---------|---------|

| | | | |
|-----|---------|---------|---------|
| 154 | 387.984 | 394.942 | 389.067 |
|-----|---------|---------|---------|

| | | | |
|-----|---------|---------|---------|
| +50 | 388.034 | 394.992 | 389.117 |
|-----|---------|---------|---------|

| | | | |
|-----|---------|---------|---------|
| 155 | 388.084 | 395.042 | 389.167 |
|-----|---------|---------|---------|

+ 0.10%
↓



Met Aug 9, 1930
At 154+30, .01 for line, .015 for
Elev, 0.23 for distance.

Stopped Exc. on Entr. Aug 3
at 154+30

O Pin 154+57.37
B.M. 387.73

| | Tunnel Bottom | Grade Top | Pipe Line Grade |
|--------|------------------|--------------|--------------------|
| 155+50 | 388.134 | 395.092 | 389.217 |

| | | | |
|-----|---------|---------|---------|
| 156 | 388.184 | 395.142 | 389.267 |
|-----|---------|---------|---------|

| | | | |
|-----|---------|---------|---------|
| +50 | 388.234 | 395.192 | 389.317 |
|-----|---------|---------|---------|

| | | | |
|-----|---------|---------|---------|
| 157 | 388.284 | 395.242 | 389.367 |
|-----|---------|---------|---------|

| | | | |
|-----|---------|---------|---------|
| +50 | 388.334 | 395.292 | 389.417 |
|-----|---------|---------|---------|

| | | | |
|-----|---------------|---------|---------|
| 158 | 288.384 57 | 395.342 | 389.467 |
|-----|---------------|---------|---------|

| | | | |
|-----|---------|---------|---------|
| +50 | 288.434 | 395.392 | 389.517 |
|-----|---------|---------|---------|

Water Seepage 155+35 →

Pin 155+82.41
B.M. 388.02

+ 0.10%

No. timber

Hard Cemented Coarse Sand

B.M. Elev. 388.14
Ppe 158+07.61
Set July 22, 1930

| | Tunnel Grade Bottom | Pipe Line Top | Pipe Line Grade |
|--------|------------------------|------------------|--------------------|
| 159+00 | 288.484 | 395.442 | 389.567 |

| | | | |
|-----|---------|---------|---------|
| +50 | 288.534 | 395.492 | 389.617 |
|-----|---------|---------|---------|

| | | | |
|-----|---------|---------|---------|
| 160 | 288.584 | 395.542 | 389.667 |
|-----|---------|---------|---------|

| | | | |
|-----|---------|---------|---------|
| +50 | 288.634 | 395.592 | 389.717 |
|-----|---------|---------|---------|

| | | | |
|-----|---------|---------|---------|
| 161 | 288.684 | 395.642 | 389.767 |
|-----|---------|---------|---------|

| | | | |
|-----|---------|---------|---------|
| +50 | 288.734 | 395.692 | 389.817 |
|-----|---------|---------|---------|

| | | | |
|----|---------|---------|---------|
| 62 | 388.784 | 395.742 | 389.867 |
|----|---------|---------|---------|

+0.10%

Water Seepage
in Floor

159+45

No Timber

Coarse Cemented Sand

B.M. Elev. 388.37
Pipe 160+65.32
Set July 22, 1930

| | Tunnel Bottom | Grade Top | Pipe Line Grade |
|--------|---------------|-----------|-----------------|
| 162+50 | 388.834 | 395.792 | 389.917 |

| | | | |
|-----|---------|---------|---------|
| 163 | 388.884 | 395.842 | 389.967 |
|-----|---------|---------|---------|

| | | | |
|-----|---------|---------|---------|
| +50 | 388.934 | 395.892 | 390.017 |
|-----|---------|---------|---------|

| | | | |
|-----|---------|---------|---------|
| 164 | 388.984 | 395.942 | 390.067 |
|-----|---------|---------|---------|

| | | | |
|-----|---------|---------|---------|
| +50 | 389.034 | 395.992 | 390.117 |
|-----|---------|---------|---------|

| | | | |
|-----|---------|---------|---------|
| 165 | 389.084 | 396.042 | 390.167 |
|-----|---------|---------|---------|

| | | | |
|-----|---------|---------|---------|
| +50 | 389.134 | 396.092 | 390.217 |
|-----|---------|---------|---------|

+ 0.10%

No timber

163+355

Timbered

165+10
Coarse Cemented
Sand-Water Seepage

165+50

Fine Cemented Sand
(Air slots on exposure)

Coarse Cemented Sand



May 26, 3:PM.
Bore 163+79

7-22-30
(Set 6-6-1930)
Iron pipe 163+40.56
B.M. Top Pipe 388.62

April 30 1930
Bore 164+92

164

8

| | Tunnel Grade Bottom | Pipe Line Top | Pipe Line Grade |
|-----|------------------------|------------------|--------------------|
| 166 | 389.184 52 | 396.142 | 390.267 |

| | | | |
|-----|---------|---------|---------|
| +50 | 389.234 | 396.192 | 390.317 |
|-----|---------|---------|---------|

| | | | |
|-----|---------|---------|---------|
| 167 | 389.284 | 396.242 | 390.367 |
|-----|---------|---------|---------|

| | | | |
|-----|---------|---------|---------|
| +50 | 389.334 | 396.292 | 390.417 |
|-----|---------|---------|---------|

| Exit | | | |
|------|-------------------|---------|---------|
| 167 | +61 ⁹⁶ | 389.345 | 396.303 |
| | | | 390.428 |

+ 0.10%

✓ 6-6-1930
(Set April 28)
Iron Pipe 165+625'
B.M. Top pipe 388.90

Exit Portal

167+63⁶⁸ ✓ 7-22-30
B.M. Top of pin El. 389.08 1/2
Set April 22 1930
✓ 6-6-1930

B.M. Pin in E. bank Lt. 0
of 167+96 El. 393.71

Timbered

Fine Cemented Sand
(Ain slacks on exposure)

Bore started April 7, 1930

April 29 1930
 Cloudy, Cool
 Elliott, Simpson
 Bailey, Remmen

Otay Res. to San Diego
 Cross Sections of

| B.M. #34 | 2.94 | 398.98 | 396.54 | |
|--------------------------|-------|--------|--------|--------|
| | | | Elev. | Grade |
| 144 +00 | 1.4 | | 397.6 | 387.45 |
| +50 | 4.2 | | 394.8 | 387.68 |
| 145 +05 | 10.0 | | 389.0 | 387.93 |
| +25 | 9.6 | | 389.4 | 388.02 |
| +40 | 5.6 | | 393.4 | 388.09 |
| +47.87 | 5.0 | | 394.0 | 388.13 |
| +65 | 3.1 | | 395.9 | 388.19 |
| +73.66 | 7.2 | | 391.8 | 388.23 |
| +85 | 10.73 | | 388.25 | 388.25 |
| 145+93.51 = 145+86.11 | | | | |
| +90 | 10.72 | | 388.26 | 388.26 |
| 145 +94.06 Portal | 4.4 | | 394.6 | 388.26 |

2nd Main Pipe Line
 Partially Excavated Entrance Trench

10

Note: Section at 143+50 Same as in Final X Sect. Book

Lt. Rt.

| | | | | | |
|------|-------|-----|-----|-----|----|
| 10.0 | 6.10L | 84 | | | |
| 8.5 | 4 | 72 | | | |
| 7.6 | 7.1 | 80 | | | |
| 7.3 | 4 | 75 | | | |
| 6.8 | 1.1 | 12 | | | |
| 6.2 | 4 | 41 | | | |
| 5.0 | 1.9 | 22 | | | |
| 6.0 | 4 | 46 | | | |
| 8.6 | 5.3 | 52 | 82 | | |
| 7.8 | 4 | 30 | 76 | | |
| 7.2 | 5.2 | 6.8 | 106 | | |
| 7.1 | 4 | 5.0 | 88 | | |
| 13.0 | 8.2 | 7.2 | 7.6 | 94 | |
| 10.0 | 6.0 | 4 | 5.0 | 82 | |
| 10.4 | 6.0 | 3.6 | 3.6 | 7.0 | 88 |
| 8.2 | 5.0 | 4 | 2.0 | 4.0 | 79 |
| 7.4 | 0.8 | 0.0 | 0.0 | | |
| 7.3 | 3.0 | 4 | 3.5 | | |

Note:
 To pipe grade

| | | |
|-----|-----|-----|
| 1.6 | 0.0 | 1.3 |
| 4.3 | 4 | 4.1 |
| 6.3 | 6.3 | 6.3 |
| 4.0 | 4 | 4.0 |

Elliott notes
Simpson T
Barley
Remmen

April 8, 1930

11.

Exit Portal

| | | | |
|----------------------|------|--------|--------------------|
| B.M.# | | | 396.90 |
| | 3.30 | 400.20 | |
| T.P. | | | 9.99 390.21 |
| | 5.11 | 395.32 | |
| Set B.M. | | | 1.61 393.71 |
| | 1.88 | 395.59 | |
| 167+62 ⁰⁶ | | | 6.25 389.34 Bottom |

Nail in cap of 5 Portal old #2

Iron Pin in bank Rt of 167+90 ±

Set hub to grade

April 10 1930

Elliott notes
Simpson X
Bailey
Remmen

12

Exit

B.M.

393.71

1.51 395.22

167+62

- 5.89 389.33 Bottom

Check on hub of April 8

167+43

- 5.90 1/2 389.31 1/2 Bottom

Set hub to grade

"

+ 1.05 1/2 Top

April 12 1930

Same Party

Exit

B.M.

1.29 395.00

393.71

167+62

- 5.67 389.33 Bottom

Check on grade hub by portal

167+10

- 5.72 ⁶⁹ 389.28 "

Set hub to grade

"

+ 1.24 Top

Bore to 167+05+

April 15 1930

Elliott
Simpson
Bailey + Remmen

13

Exit

BM

0.79 394.50

393.71

5.15 389.35

167+60

+1.79 396.29

check on grade hub by portland

+51

+1.78 396.28

+40

+1.77 396.27

+30

+1.76 396.26

+20

+1.75 396.25

+10

+1.74 396.24

167+00

+1.73 396.23

166+90

+1.72 396.22

+80

+1.71 396.21

+70

^{6.96}
+1.70 396.20 Top

166+70

-5.26 389.24 Bottom

Bore to 166+62 ±

April 18 1930
Elliott
Simpson
Barley Remmen

Exit #1

14

| | | | |
|--------|-------|--------|--------|
| B.M. | | 393.71 | |
| | 0.85 | 394.56 | |
| 167+51 | +1.73 | 396.29 | Top |
| 166+60 | +1.64 | 396.20 | Top |
| +50 | +1.63 | 396.19 | Top |
| +40 | +1.62 | 396.18 | Top |
| +30 | +1.61 | 396.17 | Top |
| +30 | -5.35 | 389.21 | Bottom |

Check

Set Red Hd to line + grade

" " "

" " "

" " "

Hub. set to grade

April 21 1930

Elliott
Simpson
Barley
Remmen

Notes

| | | | |
|------|------|--------|--|
| B.M. | | 393.71 | |
| | 0.79 | 394.50 | |

| | | | |
|--------|-------|--------|--------|
| 167+51 | +1.77 | 396.29 | Top |
| 166+50 | +1.69 | 396.19 | Top |
| +40 | +1.68 | 396.18 | " |
| +30 | +1.67 | 396.17 | " |
| +20 | +1.66 | 396.16 | " |
| +10 | +1.65 | 396.15 | " |
| 166+00 | +1.64 | 396.14 | " |
| " | -5.32 | 389.18 | Bottom |

Check on previous work

Check

Check

Set Red Head to line + grade

"

"

Set Pin to grade (Bore 165+95#)

April 28 1930

Elliott Notes
Simpson &
Bailey
Remmen

15

| | Exit | | | | |
|------------|------|--------|--------|--------|---|
| B.M. | | | 389.09 | | Top Pin 167+63 ⁶⁸ 2 01 17 |
| (set B.M.) | 5.44 | 394.53 | | | |
| | | 5.65 | 388.88 | | Top of pin 165+62 ⁵¹ |
| T.P. | | 5.07 | 389.46 | | |
| | 9.66 | 394.12 | | | |
| 165+60 | | -4.99 | 389.13 | Bottom | Check on previous work |
| 165+30 | | +1.94 | 396.06 | Top | Set Rd. Hd. to line + grade |
| 165+17 | | +1.93 | 396.05 | " | " |
| 165+17 | | -5.03 | 389.09 | Bottom | Set spike to grade |
| 165+70 | | +1.99 | 396.11 | Top | Set Rd. Hd. to line + grade |
| 165+80 | | +2.00 | 396.12 | " | " |
| 165+90 | | +2.01 | 396.13 | " | " |
| 166+00 | | +2.02 | 396.14 | " | " |

May 2 1930

Rain

Elliott
Bailey
Chase

16

Exit

| | | | | | |
|--------|------|----------------------|--------|--------|-----------------------------|
| 165+60 | 2.27 | 398.37 | 396.10 | Top | Pickup |
| 165+50 | | +2.28 | 396.09 | " | Check |
| 165+10 | | +2.32 | 396.05 | " | Set Rd. Hd. to line + grade |
| 165+00 | | +2.33 ⁶⁷⁶ | 396.04 | " | " |
| 165+00 | | -4.63 | | Bottom | Not Set |
| 164+90 | | +2.34 | 396.03 | Top | Set line + grade |

May 2 1930

Rain

Elliott
Bailey
Chase

T.M.

396.01

May 8 1930

Elliott
Bailey

17

Exit

| | | | | |
|----------|------|--------|--------|---------------|
| B.M. | | | 393.71 | |
| | 1.21 | 394.92 | | |
| B.M. TP. | | | 5.83 | 389.09 389.09 |
| | 5.83 | 394.92 | | |
| 167+50 | | + 1.37 | 396.29 | |
| 167+40 | | - 5.60 | 389.32 | |
| 167+30 | | - 5.61 | 389.31 | |
| 167+20 | | - 5.62 | 389.30 | |
| 167+10 | | - 5.63 | 389.29 | |
| 167+00 | | - 5.64 | 389.28 | |
| B.M. | | | 388.88 | |
| | 4.61 | 393.49 | | |
| 165+70 | | + 2.62 | 389.15 | |
| | | - 4.34 | 389.15 | |
| +80 | | - 4.33 | 389.16 | |
| +90 | | - 4.32 | 389.17 | |
| 166+00 | | - 4.31 | 389.18 | |
| +10 | | - 4.30 | 389.19 | |
| +20 | | - 4.29 | 389.20 | |
| +30 | | - 4.28 | 389.21 | |
| +40 | | - 4.27 | 389.22 | |
| +50 | | - 4.26 | 389.23 | |
| +60 | | - 4.25 | 389.24 | |

Check on previous work.

Pin set to line + grade in floor

"

"

"

"

"

"

"

"

"

"

"

"

"

"

May 9 1930

Elliott
Bailey

18

Exit

B.M. 1.32 395.03 393.71

167+50 1.26 396.29

167+40 1.25 396.28

Check

Set Rd. Hd. to line + grade

May 12 1930

Exit

Elliott
Bailey
Jacobson

B.M. 0.93 394.64 393.71

167+51 +1.65 396.29 Top

Check on previous work.

+43 +1.64 396.28 "

Set Rd. Hd. to line + grade

+33 +1.63 396.27 "

"

+25 +1.62 396.26 1/2 "

"

+16 +1.62 396.26 "

"

167+06 +1.61 396.25 "

"

166+97 +1.60 396.24 "

"

+88 +1.59 396.23 "

"

+79 +1.58 396.22 "

"

+70 +1.57 396.21 "

"

+15 5.39 1/2 Bottom

Set pin to grade

166+40 5.92

Check on previous work

May 13 1930

Elliott
Bailey
Jacobszon

Exit

B.M.

393.71

0.77 394.48

166+70

+ 1.73 396.21 Top

166+61

+ 1.72 396.20 "

166+52

+ 1.71 396.19 "

"

- 5.25 389.23 Bottom

166+40

- 5.26 "

B.M.

393.71

1.72½ 395.43½

Reset B.M.

6.35½ 389.08

396.21
394.48
78

19

Check on previous work

Rd. Hd. set to line + grade

"

Pin set to grade

Check on previous work

Top pipe 167+63⁶⁸

May 14 1930

Elliott
Barley
Jacobszon

20

Exit

| | | | |
|---------------------|------|--------|--------|
| B.M. | 0.88 | 394.59 | 393.71 |
| 166+52 | | + 1.60 | 396.19 |
| 166+43 | | + 1.59 | 396.18 |
| 166+34 | | + 1.58 | 396.17 |
| 166+24 ⁵ | | + 1.58 | 396.17 |
| " | | - 5.38 | 389.21 |
| 166+00 | | - 5.41 | 389.18 |

With level

| | | | |
|--------|------|--------------------|----------------------|
| B.M. | | | 393.71 |
| | 0.58 | 394.29 | |
| B.M. | | 5.20 $\frac{1}{2}$ | 389.08 $\frac{1}{2}$ |
| T.P. | | 5.11 | 389.18 |
| | 4.86 | 394.04 | |
| B.M. | | 5.15 | 388.89 |
| | 5.15 | 394.04 | |
| 166+00 | | - 4.86 | 389.18 |
| 165+80 | | - 4.88 | 389.16 |
| 170 | | - 4.89 | 389.15 |

Set Rd. Hd to line + grade

"

"

Pin in east bank at 167+96

Top of pipe: 167+63⁶⁸

Top of pipe 165+62⁵¹

Set pin to grade

"

"

May 15 1930

Elliott
Bailey
Jacobson

21

Exit

B.M

389.08½

5.15½ 394.24

166+295

+ 1.93 396.17

+ 15⁵

+ 1.92 396.16

+ 06⁵

+ 1.91 396.15

165+80

- 5.08 389.16

Check on previous pin

Set top line + grade + spring line

" " "

Check on previous pin

May 16

Exit

Elliott
Bailey
Jacobson

B.M.

388.89

5.13½ 394.02½

T.P. 4.87 394.08

4.81½ 389.21

166+295

+ 2.09 396.17 Top

166+155

+ 2.08 396.16 "

166+065

+ 2.07 396.15 "

165+975

+ 2.06 396.14 "

165+885

+ 2.05 396.13 "

165+79

+ 2.04 396.12 "

165+70

+ 2.03 396.11 "

165+90

- 4.96 389.12 Bottom

165+10

- 4.99 389.09 "

Not Set

May 19 1930

Elliott
Bailey
Jacobson

22

Entrance

| | | | | |
|----------|------|--------|----------|-------|
| B.M. #34 | 4.00 | 400.54 | 396.54 | |
| T.P. | | 6.20 | 394.34 | |
| | 0.19 | 394.53 | | |
| Portal | | 0.0 | 394.53 | Elev. |
| | | | 387.18 | Grade |
| | | | Cut 7.35 | |

Rd. Hd at Portal

Same Day Exit Same Party

| | | | | |
|----------|------|--------|--------|-------|
| B.M. | 5.22 | 394.11 | 388.89 | |
| 165 + 79 | | +2.01 | 396.12 | |
| 165 + 70 | | +2.00 | 396.11 | TOP |
| 165 + 61 | | +1.99 | 396.10 | " |
| 165 + 52 | | +1.98 | 396.09 | " |
| 165 + 43 | | +1.98 | 396.09 | " |
| 165 + 34 | | +1.97 | 396.08 | " |
| 165 + 25 | | +1.96 | 396.07 | " |
| 165 + 16 | | +1.95 | 396.06 | " |
| 165 + 07 | | +1.94 | 396.05 | " |
| 164 + 96 | | +1.93 | 396.04 | " |
| 169 + 85 | | -5.04 | 389.07 | FLOOR |
| | | 6.97 | | |

check on previous work

May 20 1930

Elliott
Bailey
Jacobszon

23

Exit

B.M. 5.33 394.22

388.89

| | | | | |
|--------|-------|--------|--------|-------|
| 165+07 | +1.83 | 396.05 | Top | Check |
| 164+96 | +1.82 | 396.04 | Top | Check |
| 164+85 | +1.81 | 396.03 | Top | |
| " | -5.15 | | Bottom | |
| 164+63 | -5.17 | 389.05 | " | |

May 22, 1930 Entrance

Elliott
Bailey
Jacobszon

~~Eq. 145+93⁵¹ = 145+86¹¹~~
~~P.L. 145+4787~~ ~~10.95~~

B.M. #34

396.54

1.14 397.68

Set B.M. T.P.

6.93 390.75

Top P.L. Hub

2.65 393.40

Portal

- 6.22 387.18

+ 2.32

Rd. Hd at Portal Cut 85⁴

~~6.96~~
1.58

4564 145+97⁰⁴ New Portal

May 22 1930

Exit

B.M. 388.89

5.26 394.15

164+85 +1.88 396.03 ✓

164+96 -1.87 396.04

+74 +1.87 396.02

+63 +1.86 396.01

+57 +1.85 396.00

+40 +5.13 389.02

Exit

May 23, 1930

Same Crew

B.M. 5.32 394.21 388.89

164+63 +1.80 396.01

+57 +1.79 396.00

+40 -5.19 389.02

+30 -5.20 389.01

29

Check

Check

Set Rod Hd to line + grade

"

"

Set Pin to grade

Bore 164+30±

Check on previous work

Check "

Check "

Set pin to grade

Bore 164+18

May 24, 1930 Entr.

| | | | | |
|------------|------|--------|--------|--------|
| B.M. 34 | | | 396.59 | |
| | 1.80 | | 398.39 | |
| Check B.M. | | 7.59 | 390.75 | 390.75 |
| | 1.86 | | 392.61 | |
| 145+97 | | - 5.43 | 387.18 | |
| 146+07 | | - 5.42 | 387.19 | |
| | | + 1.54 | | |

Set pin to grade
set line only

Bore 146+19±

May 26 1930 Entr.

Same Crew

| | | | | |
|--------|------|--------|--------|-------|
| B.M. | | | 390.75 | |
| | 2.16 | | 392.91 | |
| 145+97 | | - 5.73 | 387.18 | Floor |
| 146+10 | | - 5.72 | 387.19 | " |
| +20 | | + 1.25 | 394.16 | Top |
| +30 | | + 1.26 | 394.17 | Top |

Check on previous work
Set Pin to grade
Set pin to line + grade
" " " "

May 26 1930 Exit

Same Crew

| | | | | |
|--------|------|--------|--------|--|
| B.M. | | | 388.89 | |
| | 5.31 | | 394.20 | |
| 164+57 | | + 1.80 | 396.00 | |
| 164+46 | | + 1.79 | 395.99 | |
| 164+30 | | - 5.19 | 389.01 | |
| 164+10 | | - 5.21 | 388.99 | |
| 163+90 | | - 5.23 | 388.97 | |

Check
Set Rd. Hd to line + grade
Set Pin to grade
"
"

May 27, 1930

Entr.

Elliott
Jacobson
Bailey

26

B.M.

390.75

2.09 392.84

146+10 - 5.65 387.19 Bottom

146+30 + 1.33 394.17 Top

+40 + 1.34 394.18 Top

Check on previous work,
set Rd. Hd. to line + grade

May 29 1930

Exit

Same Crew

B.M. 5.18 394.07 388.89

164+96 + 1.92 395.99 Top

164+35 + 1.91 395.98 "

164+24 + 1.90 395.97 "

164+13 + 1.88¹/₂ 395.95¹/₂ "

164+02 + 1.87 395.94 "

163+90 - 5.10 388.97 Bottom

163+80 - 5.11 388.96 "

163+70 - 5.12 388.95 "

163+60 - 5.13 388.94 "

163+50 - 5.14 388.93 Top (Not Set)

+ 1.82

Check

Set Rd Hd. to line + grade

"

"

"

Set pin to grade

"

"

(Not Set)

Bore 163+48

May 30, 1930

Entr

Elliott
Jacobson
Bailey

27

| B.M. | | Entr | | 390.75 |
|---------|--|-------|------------------|--------|
| 146 +50 | | +1.64 | 394.19 | |
| +60 | | +1.65 | 394.20 | |
| +70 | | +1.66 | 394.21 | |
| +80 | | +1.67 | 394.22 | |
| +90 | | +1.68 | 394.23 (Not Set) | |

Check on previous work

Set Rd. Hd. to line + grade

"

"

Bore 146+94 (Line + grade marked on face.)

| Same Day | | Exit | | Same Crew |
|----------|------|--------|--------|-----------|
| B.M. | 5.13 | 394.02 | | 388.89 |
| 163 +93 | | +1.91 | 395.93 | Top |
| 163 +90 | | -5.05 | 388.97 | Floor |
| +80 | | -5.06 | | |
| 163 +70 | | -5.07 | 388.95 | " |
| +60 | | -5.08 | 388.94 | " |
| +50 | | -5.09 | 388.93 | " |
| +40 | | -5.10 | 388.92 | " |
| +25 | | +1.85 | 395.87 | Top |

Set Rd. Hd. to line + grade

Check

Set Pin to grade

"

"

"

Bore 163+25 +

| June 2, 1930 | Exit | Elliott Jacobszon Bailey |
|--------------|--------|--------------------------------|
| B.M. 4.91 | 393.80 | 388.89 |
| 163+91 | +2.13 | 395.93 |
| 163+80 | +2.12 | 395.92 |
| 163+69 | +2.11 | 395.91 |
| 163+40 | -4.88 | 388.92 |
| +30 | -4.89 | 388.91 |
| +20 | -4.90 | 388.90 |
| +10 | -4.91 | 388.89 |

| June 2 1930 | Entrance | Same Crew |
|-------------|----------|-----------|
| B.M. 1.14 | 391.89 | 390.75 |
| 146+80 | +2.33 | 394.22 |
| +95 | +2.34 | 394.23 |
| | +2.35 | 394.24 |
| 147+10 | +2.36 | 394.25 |

| | | |
|------------|--------|--------|
| B.M.* 1.60 | 398.14 | 396.54 |
| Set B.M. | 7.36 | 390.78 |
| | 2.03 | 392.81 |
| Set B.M. | 5.94 | 386.87 |
| | 5.60 | 392.47 |
| 146+95 | +1.77 | 394.24 |
| 147+10 | +1.78 | 394.25 |
| +20 | +1.79 | 394.26 |

62.55
106+09.71
146+72.26
27.77

28

Check on previous work
Set Rd Hd to line + grade
"
Check on previous work
Set pin to grade
"
"

Bore 163+00

Check
Set Rd. Hd. to line + grade
"
"

Bore 147+17

Top A.V.
Top Pl. pin
Top pipe at 146+09.71

Check
Reset

Bore 147+27 ±

June 5, 1930

Exit

Elliott
Jacobson
Bailey

29

| | | | | | |
|--------|------|--------|--------|-----|------------------------------|
| B.M | 5.39 | 394.28 | 388.89 | | |
| 163+80 | | + 1.64 | 395.92 | Top | Check on previous work |
| +69 | | + 1.63 | 395.91 | " | Set Red. Hd. to line + grade |
| +58 | | + 1.62 | 395.90 | " | " |
| 163+10 | | + 1.57 | 395.85 | " | " |
| 163+00 | | + 1.56 | 395.84 | " | " |
| 162+90 | | + 1.55 | 395.83 | " | " |
| +80 | | + 1.54 | 395.82 | " | " |
| +70 | | + 1.53 | 395.81 | " | Bore 162+64 ± |

Same Day

Entrance

Same Crew

| | | | | | |
|--------|------|--------|--------|-----|------------------------------|
| B.M. | 5.97 | 392.84 | 386.87 | | |
| 147+00 | | + 1.40 | 394.24 | Top | Check on prev |
| +10 | | + 1.41 | 394.25 | " | Reset |
| +20 | | + 1.42 | 394.26 | " | Set Red. Hd. to line + grade |
| +30 | | + 1.43 | 394.27 | " | " |
| +40 | | + 1.44 | 394.28 | " | " |
| | | | | | Bore 147+50 |

| June 6, 1930 | | Exit | Elliott Jacobszon Bailey |
|--------------|--------------------|--------------------|--------------------------------|
| B.M. | | | 393.71 |
| | 0.98 | 394.69 | |
| Check B.M. | | 5.60 $\frac{1}{2}$ | 389.08 $\frac{1}{2}$ |
| | 3.90 $\frac{1}{2}$ | 392.99 | |
| Check B.M. | | 4.09 | Use Previous 388.90 388.89 |
| | 4.14 | 393.04 | |
| Set B.M. | | 4.42 | 388.62 |

Top of pin Lt. of 167+96

Top of pipe 167+63⁶⁸Top of pipe 165+62⁵¹Top of pipe 163+40⁵⁶

| Same Day | | Exit | Same Crew |
|----------|------|--------|-----------|
| B.M. | 4.94 | 393.84 | 388.90 |
| 162+80 | | +1.98 | 395.82 |
| +70 | | +1.97 | 395.81 |
| +60 | | +1.96 | 395.80 |

Check on previous work

Set Rd. Hd. to line + grade

"

Bore 162+51

| Same Day | | Entr | Same Crew |
|----------|------|--------|-----------|
| B.M. | 5.97 | 392.84 | 386.87 |
| 147+40 | | +1.44 | 394.28 |
| +50 | | +1.45 | 394.29 |

Bore 147+61

| June 9, 1930 | | Entr | Same Crew |
|--------------|------|--------|-----------|
| B.M. | 5.88 | 392.75 | 386.87 |
| 147+50 | | +1.54 | 394.29 |
| +60 | | +1.55 | 394.30 |
| +70 | | +1.56 | 394.31 |
| +80 | | +1.57 | 394.32 |

Check on previous work

Set Rd. Hd. to line + grade

"

Bore 147+87

Elliott
Jacobszon
Bailey

June 9, 1930 Exit
 B.M. 5.06 393.96 388.90

163+58 +1.94 395.90 Top
 +46^s +1.93 395.89 "
 +35^s +1.92 395.88 "
 T.P. +4.99 393.82 -5.13 388.83
 162+60 +1.98 395.80 "
 +50 +1.97 395.79 "
 +40 +1.96 395.78 "

Check on previous work
 Set Rd. Hd. to line + grade
 "
 "
 "
 Check on previous work
 Set Rd. Hd. to line + grade
 "
 "
 Bore 162+27

June 12, 1930 Entr Same Crew
 B.M. 386.87

6.16 393.03
 197+70 +1.28 394.31 Top
 +80 +1.29 394.32 "
 +90 +1.30 394.33 "
 198+00 +1.31 394.34 "
 +10 +1.32 394.35 "
 145+97 -5.85 387.18
 196+01^s -5.85 387.18
 +06 -5.84 387.19
 +11^s -5.84 387.19
 +17 -5.83 387.20
 +22^s -5.83 387.20
 +28^s -5.82 387.21

Check on previous work
 Set Rd. Hd. to line + grade
 (Not set .8 low on roof)
 Set
 Set (.02 high)
 Bore 198+18
 O.K.
 O.K.
 O.K.
 3/4" low
 O.K.
 O.K.
 O.K.

June 12, 1930

Exit

Elliott
Jacobson
Bailey

B.M. 5.28 394.18

388.90

162+90

+1.60 395.78 Roof

Check on previous work

+30

+1.59 395.77 "

Set Rd. Hd. to line + grade

+20

+1.58 395.76 "

"

+10

+1.57 395.75 "

"

162+00

+1.56 395.74 "

"

Bore 161+95

June 16, 1930

Entr

Same Crew

B.M. 5.43 392.30

386.87

148+10

+2.05 394.35 Roof

Check on previous work

+20

+2.06 394.36 "

Set Rd. Hd. to line + grade

+30

+2.07 394.37 "

"

Bore 148+45

Same Day

Exit

Same Crew

B.M.

388.62

5.25 393.87

162+10

+1.88 395.75

Check on previous work

162+00

+1.87 395.74

Set Rd. Hd. to line + grade

161+85

+1.86 395.73

"

+70

+1.84 395.72

"

+70

+1.82 395.71

Bore 161+64

Elliott
Jacobszon
Bailey

June 18, 1930 Entr.

| | | | |
|--------|------|--------|--------|
| B.M. | 1.28 | 392.06 | 390.78 |
| 145+97 | | +2.07 | 394.13 |
| 146+06 | | +2.08 | 394.14 |
| 711E | | +2.09 | 394.15 |
| +20 | | +2.10 | 394.16 |

Set Rd. Hd. to line + grade in timbers
 " "
 " "
 Check on previous work

| | | | |
|--------|------|--------|--------|
| B.M. | 5.25 | 392.12 | 386.87 |
| 148+20 | | +2.25 | 394.37 |
| +40 | | +2.26 | 394.38 |
| +50 | | +2.27 | 394.39 |

" " " "
 (Not set Roof 0.7' Low)
 Set Rd. Hd. to line + grade
 Bore 148+61 =

Same Day Exit Same Crew

| | | | |
|--------|------|--------|--------|
| B.M. | 5.39 | 394.01 | 388.62 |
| 161+70 | | +1.70 | 395.71 |
| +60 | | +1.69 | 395.70 |
| +50 | | +1.68 | 395.69 |

Check on previous work
 Set pin to line + grade
 "
 Bore 161+47

June 20, 1930 Entr.

| | | | |
|--------|------|--------|--------|
| B.M. | 5.37 | 392.24 | 386.87 |
| 148+30 | | +2.13 | 394.38 |
| +50 | | +2.15 | 394.39 |
| +60 | | +2.16 | 394.40 |

Check on previous work
 "
 Set Rd. Hd. to line + grade
 Bore 148+73

June 20, 1930

Exit

Elliott
Jacobszon
Bailey

| | | | |
|--------|------|--------|--------|
| B.M. | 5.25 | 393.87 | 388.62 |
| 161+60 | | +1.83 | 395.70 |
| 161+50 | | +1.82 | 395.69 |
| +40 | | +1.81 | 395.68 |
| +30 | | +1.80 | 395.67 |

Check

Set

Set

Bore 161+30 (12 cut on face)

June 23, 1930

Entr.

Elliott Notes
Jacobszon
Bailey rod

| | | | |
|--------|------|--------|--------|
| B.M. | 5.51 | 392.38 | 386.87 |
| 148+60 | | +2.02 | 394.40 |
| +70 | | +2.03 | 394.41 |
| +80 | | +2.04 | 394.42 |
| +90 | | +2.05 | 394.43 |

Check

Set Rd. Hd. to line + grade

"

"

Bore 148+95 (Set 12 cut on face)

Same Day

Exit

Same Crew

| | | | |
|--------|------|--------|--------|
| B.M. | 5.35 | 393.97 | 388.62 |
| 161+90 | | +1.71 | 395.68 |
| +30 | | +1.70 | 395.67 |
| +20 | | +1.69 | 395.66 |
| +10 | | +1.68 | 395.65 |

Check

Set Rd. Hd. to line + grade

"

"

Bore 161+08 (Set 12 cut on face)

June 25, 1930

Entr.

Elliott Notes
Jacobszon
Bailey

| | | | |
|--------|------|--------|--------|
| B.M. | 5.85 | 392.72 | 386.87 |
| 148+90 | | +1.71 | 394.43 |
| 149+00 | | +1.72 | 394.44 |
| +10 | | +1.73 | 394.45 |

Check on previous work

Bore 149+14

Elliott
Jacobson
Bailey

| | | | |
|---------------|-------|--------|--------|
| June 26, 1930 | Exit | | |
| B.M. 5.21 | | 393.83 | 388.62 |
| 161+20 | +1.83 | | 395.66 |
| +10 | +1.82 | | 395.65 |
| 161+00 | +1.81 | | 395.64 |
| 160+90 | +1.80 | | 395.63 |

Check on previous work
 Set Rd. Hd. to line + grade
 "
 "
 Bore 160+81⁵

| | | | |
|---------------|-------|--------|--------|
| June 27, 1930 | Entr | | |
| B.M. 5.93 | | 392.80 | 386.87 |
| 148+90 | +1.63 | | 394.43 |
| 149+00 | +1.64 | | 394.44 |
| +10 | +1.65 | | 394.45 |
| +20 | +1.66 | | 394.46 |
| +30 | +1.67 | | 394.47 |

Check on previous work
 Set Rd. Hd. to line + grade
 "
 "
 "
 Bore 149+36 (Set 12 cut on face)

| | | | |
|---------|------|--|-----------|
| June 28 | Exit | | Same Crew |
| 161+20 | | | +1.89 |
| 161+00 | | | +1.87 |
| +70 | | | +1.84 |
| +60 | | | +1.83 |

Pick up
 Set.
 160+58^{1/2}

| July 1, 1930 | | Entr | Elliott Bailey Soper |
|--------------|------|--------|----------------------------|
| B.M. | 5.94 | 392.81 | 386.87 |
| 149+20 | | +1.65 | 394.46 |
| +30 | | +1.66 | 394.47 |
| +40 | | +1.67 | 394.48 |
| +50 | | +1.68 | 394.49 |
| +60 | | +1.69 | 394.50 |
| +70 | | +1.70 | 394.51 |

Check

Check

Hub 149

0.5

| June 30, 1930 | | Exit | Same Crew |
|---------------|------|--------|-----------|
| B.M. | 5.43 | 399.05 | 388.62 |
| 160+90 | | +1.58 | 395.63 |
| +75 | | +1.57 | 395.62 |
| +65 | | +1.55 | 395.60 |
| +50 | | +1.54 | 395.59 |
| +40 | | +1.53 | 395.58 |

Bore 149+76

Hub 162+00

Check

Set Rd. Hd. to line + gr.

Check

Set Rd. Hd. to line + gr.

Set Rd. Hd. to line + gr.

Bore 160+29 ±

| July 3, 1930 | | Exit | |
|--------------|------|--------|--------|
| B.M. | 5.36 | 393.98 | 388.62 |
| 160+40 | | +1.60 | 395.58 |
| +30 | | +1.59 | 395.57 |
| +20 | | +1.58 | 395.56 |
| +10 | | +1.57 | 395.55 |
| 160+00 | | +1.56 | 395.54 |
| 159+92 | | +1.55 | 395.53 |

163+40

Check on previous work

Set Rd. Hd. to line + grade

"

"

"

Bore (set 15' cut on face)

Elliott
Bailey
Jacobson

37

July 3 1930

Entr.

B.M. 5.80 392.67 386.87

149+60 +1.83 394.50

+70 +1.84 394.51

+80 +1.85 394.52

+90 +1.86 394.53

Check on previous work

Set Rd. Hd. to line + grade

||

||

Bore 149+97

July 7 1930

Exit

Same Crew

B.M. 4.91 393.53 388.62

160+00 +2.01 395.54

159+90 +2.00 395.53 1.81

+80 +1.99 395.52 1.80

+70 +1.98 395.51 1.79

+60 +1.97 395.50 1.78

+50 +1.96 395.49 1.77

Check on previous work

Set Rd. Hd. to line + grade

||

||

||

(Not Set) ||

Bore 159+98

Same Day

Entr.

Same Crew

B.M. 5.81 392.68 386.87

149+70 +1.83 394.51

+80 +1.84 394.52

+90 +1.85 394.53

150+00 +1.86 394.54

+15 +1.87 394.55

+20 +1.88 394.56

Check on previous work

Set Rd. Hd. to line + grade

||

Not Set.

Set Rd. Hd. to line + grade

Bore 150+21

| July 10 1930 | | EXIT | Elliott Bailey Super |
|--------------|------|--------|----------------------------|
| B.M. | 5.24 | 393.86 | 388.62 |
| 159+60 | | +1.64 | 395.50 |
| +50 | | +1.63 | 395.49 |
| +40 | | +1.62 | 395.48 |
| +30 | | +1.61 | 395.47 |
| +20 | | +1.60 | 395.46 |
| +10 | | +1.59 | 395.45 |

Check on previous work
 09 low Not set
 10 low Not set
 12 low Not set
 (10 low) Set Rd. Hd. to line + grade
 02 low Not set

Bore 159+00

| July 11, 1930 | | Entr | Same Crew |
|---------------|------|--------|-------------|
| B.M. | 5.97 | 392.84 | 386.87 |
| 150+15 | | +1.72 | 394.56 Roof |
| +30 | | +1.73 | 394.57 " |
| +40 | | +1.74 | 394.58 " |
| +50 | | +1.75 | 394.59 " |
| +60 | | +1.76 | 394.60 " |

Check on previous work
 Set Rd. Hd. to line + grade

"

"

Bore 150+60 + (Marked 12 up on face)

July 11, 1930
 B.M. 5.21 393.83
 159+60 +1.67 395.50 Roof
 +50 +1.66 395.49 "
 +40 -5.31 288.52 Floor
 +30 -5.32 288.51 Floor
 +20 +1.62 395.45 Roof
 +10 -5.34 288.49 Floor
 159+00 +1.61 395.44 Roof

Elliott
 Bailey
 Soper

Exit

Check
 Set Rd. Hd. to line + grade
 Set floor grade, line + spring line +0.96
 "
 +0.53
 5.32
 -5.85
 Set pinto line + grade
 Set floor grade, line + spring line +0.76
 5.39
 -6.10
 Set Rd. Hd. to line + grade
 Bore 158+87

July 16, 1930
 B.M. 6.17 393.04
 150+50 +1.55 394.59
 151+10 +1.61 394.65

Entr

Same Crew

149
 Check
 Set Rd. Hd. to line + grade

Same Day
 159+00 -1.82 393.62
 158+60 +1.78 395.40
 158+40 +1.76
 158+20 +1.74 395.36

Exit

Same Crew

161+00
 Check
 set
 set

Elliott
Soper
Bailey

July 17, 1930 Ent.

| | | | | |
|----------|----------|------------|--|--------|
| B.M. | 5.40 1/2 | 392.20 1/2 | | 386.87 |
| Set B.M. | | 4.95 1/2 | | 387.32 |
| | 5.39 | 392.71 | | |
| Set B.M. | | 5.20 | | 387.51 |
| B.M. | 5.40 | 392.72 | | 387.32 |
| 151+10 | | +1.93 | | 394.65 |
| 151+40 | | +1.96 | | 394.68 |

Same Day Exit Same Crew

| | | | | |
|--------|------|--------|------|--------|
| B.M. | 5.15 | 393.77 | | 388.62 |
| T.F. | 4.34 | 393.18 | 4.93 | 388.84 |
| 158+20 | | +2.18 | | 395.36 |
| 157+90 | | +2.15 | | 395.33 |

July 21 Entr

| | | | | |
|--------|--|--|--|--|
| 151+90 | | | | |
|--------|--|--|--|--|

40

Top pipe 146+09 7'

Top pin 148+61 29'

Top pin 151+08 6'

Check on previous work

Set Rd. Hd. to line + grade

Bore 151+46

Check on previous work

Set Rd. Hd. to line + grade

Bore 157+80 ± (Marked 12' up on face)

Set Rd. Hd. to line + grade

Elliott
Bailey
Soper.

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July 22, 1930 Exit

B.M. 4.64 393.26 388.62

Set B.M. 4.89 388.37

4.64 1/2 393.01 1/2

Set B.M. 4.87 1/2 388.14

5.05 393.19

158+20 +2.17 395.36

157+50 +2.10 395.29

July 23, 1930 Entr Same Crew

B.M. 4.90 392.41 387.51

151+90 +2.32 394.73

152+20 +2.35 394.76

July 29, 1930 Exit

157+90 -1.88 393.45 395.33

157+50 +1.83 395.29

157+20 +1.81 395.26 178

July 25, 1930 Entr

B.M. 5.24 392.75 387.51

152+20 +2.01 394.76

152+55 +2.05 394.80

Pipe 163 +40 ⁵⁶₇₅

Pipe 160 +65 32 162 +0.0

159+40

Pipe 158 +07 ⁶¹

Check on previous

Set Rd. Hd. to line + grade

Bore 157+90 ±

Check on previous work

Set Rd. Hd. to line + grade

Bore 152+34

Pickup

Check

Set Rd. Hd. to line + grade

Bore 157+11

Check on previous work

Bore 152+64

Elliott
Soper
Bailey

July 25, 1930 Exit

| | | |
|--------------|--------|--------|
| 157+50 -1.71 | 393.58 | 395.29 |
| 157+20 | +1.68 | 395.26 |
| 157+03 | +1.66 | 395.29 |

Check
set Rd. Hd. to line + grade
Bore 156+98

July 28 Entr Same Crew

| | | |
|-----------|--------|--------|
| B.M. 5.47 | 392.98 | 387.51 |
| 152+55 | +1.82 | 394.80 |
| 153+05 | +1.87 | 394.85 |
| " | +1.88 | 394.86 |

151+08
Check on previous work
Set
Bore 153+21

Exit

| | | |
|-----------|--------|----------------------|
| B.M. 4.84 | 392.98 | 388.14 |
| 157+00 | +2.26 | 395.24 |
| 156+50 | +2.21 | 395.19 ₅₀ |

Check on previous work.
(Set wh. Hd. and stake marked "up 6" to grade")
Bore 156+44

July 30, 1930 Entr

| | | |
|-----------|--------|--------|
| B.M. 4.97 | 392.98 | 387.51 |
| 153+05 | +2.37 | 394.85 |
| 153+50 | +2.41 | 394.89 |

Check on previous work
set Rd. Hd. to line + grade

Same Day Exit

set spring line 159+50

Elliott
Bailey
Soper

43

July 31, 1930

| | | | | |
|---------|----------|-----------|------------|------------|
| B.M. | 4.30 1/2 | 393.39 | 389.08 1/2 | |
| 167 +61 | | +2.91 | 396.30 | Roof |
| +61 | | -3.52 | 389.87 | Em. Floor. |
| +51 | | -3.53 | 389.86 | " |
| +43 | | -3.54 | 389.85 | " |
| +34 | | -3.55 | 389.84 | " |
| +25 | | -3.56 | 389.83 | " |
| +16 | | -3.57 | 389.82 | " |
| 167 +07 | | -3.58 | 389.81 | " |
| 166 +97 | | -3.59 | 389.80 | " |
| +88 | | -3.60 | 389.79 | " |
| +79 | | -3.60 1/2 | 389.78 1/2 | " |
| +70 | | -3.61 | 389.78 | " |
| +61 | | -3.62 | 389.77 | " |
| +52 | | -3.63 | 389.76 | " |
| +43 | | -3.64 | 389.75 | " |
| +34 | | -3.65 | 389.74 | " |
| +25 | | -3.66 | 389.73 | " |
| +16 | | -3.67 | 389.72 | " |
| 166 +07 | | -3.68 | 389.71 | " |
| 165 +98 | | -3.69 | 389.70 | " |
| +89 | | -3.70 | 389.69 | " |
| +80 | | -3.71 | 389.68 | " |
| 165 +80 | | +2.73 | 396.12 | Roof |

Check on previous work
set grade each side

389.35
52
389.87

389.28
52
389.80

389.18
52
389.70

Check on previous work

July 31, 1930

| | | | | |
|--------|------|-------------------------|--------|---|
| B.M. | 3.79 | ^{96 08} 392.69 | 388.90 | |
| 163+36 | | | + 3.17 | 395.88 Roof |
| +36 | | | -3.25 | 389.44 Fin. Flr. Set Floor grade both sides |
| +47 | | | -3.24 | 389.45 |
| +58 | | | -3.23 | 389.46 |
| +69 | | | -3.22 | 389.47 |
| +80 | | | -3.20½ | 389.48½ |
| 163+91 | | | -3.19 | 389.50 |
| 164+02 | | | -3.18 | 389.51 |
| +13 | | | -3.17 | 389.52 |
| +24 | | | -3.16 | 389.53 |
| +29 | | | -3.15 | 389.54 |
| +40 | | | -3.14 | 389.55 |
| +51 | | | -3.13 | 389.56 |
| +63 | | | -3.12 | 389.57 |
| +74 | | | -3.11 | 389.58 |
| +85 | | | -3.10 | 389.59 |
| 164+96 | | | -3.09 | 389.60 |
| 165+07 | | | -3.08 | 389.61 |
| +16 | | | -3.07 | 389.62 |
| +25 | | | -3.06 | 389.63 |
| +34 | | | -3.05 | 389.64 |
| +43 | | | -3.04 | 389.65 |
| +52 | | | -3.03 | 389.66 |

388.99
 52
 389.51

389.14
 52
 389.66

| | | | |
|--------|--------|---------------------|----------------------|
| | 392.69 | | |
| 165+61 | | -3.02 | 389.67 |
| 170 | | -3.01 | 389.68 |
| 179 | | -3.00 | 389.69 |
| +88 | | -3.00 $\frac{1}{2}$ | 389.68 $\frac{1}{2}$ |
| +98 | | -2.99 | 389.70 |
| | | | Fm. Fl. |
| | | | 396.14 |
| | | | Roof |

Check

Check

| | | | |
|--------|-------|--------|--------|
| 156+30 | -2.55 | 392.62 | 395.17 |
| +50 | | +2.08 | 394.70 |
| 155+90 | | +2.51 | 395.13 |

| | | | |
|-------------|--------|-------|--------|
| Aug 1, 1930 | Entr. | | |
| B.M., 5.19 | 392.70 | | 387.51 |
| 153+50 | | +2.19 | 394.89 |
| 153+80 | | +2.22 | 394.92 |
| | | +2.24 | 394.94 |

Check on previous work

Set Rd. Hd. to line + gr. (Floor 0.6 Low)

Bore 153+94

| | | | |
|------------|--------|-------|--------|
| Same Day | Exit | | |
| B.M., 4.55 | 392.69 | | 388.14 |
| 156+30 | | +2.48 | 395.17 |
| 155+88 | | +2.43 | 395.12 |

Ch.

Check on previous

Set Rd. Hd. to line + gr. (Floor 0.2 Low)

Bore 155+70

| | | | |
|--------|-------|-------|--|
| Aug 2 | Entr. | | |
| 153+80 | -2.29 | | |
| 154+05 | | +2.31 | |

Set Rd. Hd. to line + gr.

Aug 4, 1930

Exit

| | | | | |
|--------|------|--------|--------------------------|--------|
| B.M. | 4.98 | 392.62 | | 388.14 |
| 155+82 | | | + 2.51 | 395.13 |
| 155+35 | | | (+ 2.01) ^{Read} | 395.08 |
| | | | + 2.44 | 395.06 |

Check

(Set white Hd. + stake marked up 5" to gr.)
Bore 155+15

Aug 5, 1930

Entr.

| | | | | |
|--------|------|--------|--------|--------|
| B.M. | 1.15 | 391.93 | | 390.78 |
| 146+12 | | | + 2.22 | 394.15 |
| 146+28 | | | + 2.24 | 394.17 |

Set

| |
|--------|
| 394.14 |
| 91.13 |
| 3.01 |

| | | | | |
|--------|------|--------|--------|------------------|
| B.M. | 4.26 | 391.13 | | 386.87 |
| 145+97 | | | 3.43 | 387.70 Fin. Flr. |
| 146+06 | | | 3.42 | 387.71 " |
| +17 | | | 3.41 | 387.72 " |
| +28 | | | 3.40 | 387.73 " |
| 146+40 | | | 3.39 | 387.74 " |
| +60 | | | 3.37 | 387.76 " |
| +80 | | | 3.35 | 387.78 " |
| 147+00 | | | 3.33 | 387.80 " |
| | | | + 3.11 | 394.24 |

Set Rd. Hd. to grade

| |
|--------|
| 387.18 |
| 52 |
| 387.70 |

Set Pinta grade

| |
|--------|
| 387.21 |
| 52 |
| .73 |

| |
|--------|
| 387.28 |
| 52 |
| 387.80 |

Aug 6
B.M. 4.67
155+35
155+00

Exit

| | | |
|--------|--------|---------------------|
| 392.81 | | 388.14 |
| | + 1.85 | 394.66 (Set 5" low) |
| | + 2.23 | 395.04 |
| Read | 1.85 | |
| | .38 | |

Check

Set Wh. Hd. & stake Marked "up 4 1/2" to grade"

| Aug 6 | | Entr. | | | |
|-------------------|-------|---------|--------|----------|------------------|
| B.M. | 4.68 | 391.55 | 386.87 | | |
| 146+60 | | 3.79 | 387.76 | Fin. Fl. | Check on prev |
| 147+20 | | 3.73 | 387.82 | " | Set Pin to grade |
| +40 | | 3.71 | 387.84 | " | " |
| +60 | | 3.69 | 387.86 | " | " |
| Aug 7, 1930 | | | | | |
| B.M. | 3.75½ | 391.46½ | 387.51 | | |
| Set B.M. | | 3.64½ | 387.82 | | |
| Top pipe 151+08 | | | | | |
| Top pipe 152+9941 | | | | | |
| | | | | | |
| B.M. | 3.83 | 391.15 | 387.32 | | |
| 147+60 | | 3.29 | 387.86 | | Check |
| +80 | | 3.27 | 387.88 | | Set Pin to grade |
| 148+00 | | 3.25 | 387.90 | " | " |
| +20 | | 3.23 | 387.92 | " | " |
| +40 | | 3.21 | 387.94 | " | " |
| +60 | | 3.19 | 387.96 | " | " |
| +80 | | 3.17 | 387.98 | " | " |
| 149+00 | | 3.15 | 388.00 | " | " |
| | | | | | |
| B.M. | 3.89 | 391.21 | 387.32 | | |
| 149+20 | | 3.19 | 388.02 | " | " |
| +40 | | 3.17 | 388.04 | " | " |
| +60 | | 3.15 | 388.06 | | |

387.30
52
387.82

387.38
52
387.90

387.98
52
388.00

387.54
52
388.06

Elliott
Super
Bailey

Aug 7, 1930
Entr.
B.M. 4.55 392.37 387.82

| | | | |
|--------|-------|--------|------|
| 151+10 | +2.28 | 394.65 | Roof |
| 151+00 | -4.69 | 387.68 | Flr. |
| +27 | +2.30 | 394.67 | Roof |
| +90 | +2.31 | 394.68 | " |
| +68 | +2.34 | 394.71 | " |
| 151+90 | +2.36 | 394.73 | " |
| 152+00 | +2.39 | 394.76 | " |

Aug 8, 1930
Exit
B.M. 4.21 392.35 388.14

| | | | |
|--------|---------------------------|--------|--|
| 155+05 | +2.32 | 394.67 | |
| 154+57 | +2.65 Read +2.06 59 | 395.00 | |

Aug 8, 1930
Entr.
B.M. 4.17 391.49 387.32

| | | | |
|--------|------|--------|-----------|
| 149+40 | 3.45 | 388.04 | Fin. Flr. |
| +60 | 3.43 | 388.06 | |
| +73 | 3.41 | 388.08 | |
| +85 | 3.40 | 388.09 | |
| 149+95 | 3.39 | 388.10 | |
| 150+06 | 3.38 | 388.11 | |
| +17 | 3.37 | 388.12 | |

Check
Set Pin in Floor
Set Rd. Hd. to line + gr.
Check
Check
Check

Set W.h. Hd. to line (Marked up 7" to grade)
Bore 154+52

Check
Set Pin to grade
"
Set Rd. Hd. to grade each side
"
"
"
Set Top line + gr

395.02
38
394.67
387.52
52
388.04
387.56
52
388.08
388.60
52
388.12

| Aug 8 | | | | | | |
|--------|------|--------|--------------------|----------------------|-----------|--|
| B.M. | 4.01 | 391.52 | 387.51 | | | |
| 150+30 | | | 3.39 | 388.13 | Fin. Flr. | Set Pin to grade |
| +50 | | | 3.37 | 388.15 | " | " |
| +66 | | | 3.36 | 388.16 | " | Set Rd. Hd to grade each side also Top L. & G. |
| +77 | | | 3.35 | 388.17 | " | " |
| +88 | | | 3.33 $\frac{1}{2}$ | 388.18 $\frac{1}{2}$ | " | " |
| 150+99 | | | 3.32 | 388.20 | " | " |
| | | | 3.12 | | | |

387.63
52
388.15

"

"

387.68
52

388.20

| Aug 12, 1930 | | | | | | |
|--------------|------|--------|--------|--------|------------|------------------|
| B.M. | 4.15 | 391.88 | 387.73 | Roof | | |
| 154+25 | | | 3.09 | 388.53 | Fin. Floor | Check |
| 154+00 | | | -3.38 | 388.50 | " | Set Pin to grade |
| 153+80 | | | -3.40 | 388.48 | " | " |
| +60 | | | -3.42 | 388.46 | " | " |
| +40 | | | -3.44 | 388.44 | " | " |
| +20 | | | -3.46 | 388.42 | " | " |
| 153+00 | | | -3.48 | 388.40 | " | " |
| B.M. | 4.07 | 391.89 | 4.04 | 387.84 | 387.82 | |
| 152+80 | | | -3.51 | 388.38 | " | Screed .12 low |
| +60 | | | -3.53 | 388.36 | " | .06 low |
| +40 | | | -3.55 | 388.34 | " | " |
| 152+20 | | | -3.57 | 388.32 | | |
| 152+00 | | | -3.59 | 388.30 | | |

387.98
52
388.50

387.78
52
388.30

Aug 12, 1930

391.89

| | | |
|--------|-------|--------|
| 151+80 | -3.61 | 388.28 |
| +60 | -3.63 | 388.26 |
| +40 | -3.65 | 388.29 |
| +20 | -3.67 | 388.22 |
| 151+00 | -3.69 | 388.20 |

Aug 9, 1930

| | | | |
|------------|----------|------------|-----------|
| B.M. 4.00 | 392.14 | 388.14 | |
| Set B.M. | 4.12 | 388.02 | |
| 4.01 | 392.03 | | |
| Set B.M. | 4.30 | 387.73 | |
| 4.04 | 391.77 | | |
| Check B.M. | 3.93 1/2 | 387.83 1/2 | 387.82 |
| | | From Exit | From Exit |
| 154+30 | +3.20 | 394.97 | |

Pipe 158+07.61

Pin 155+82.41

Pin. 154+57.37

| |
|----------------|
| Pipe 152+99.41 |
| 152+99.23 |
| <hr/> |
| 0.18 |

.08 low on Lt. RT. OK

05 low Lt. 04. RT.

OK Lt. .03 low RT

OK Lt. OK RT

382.68

52

388.20

158+07.61

- 5+08.38

152 99.23

Aug 13

B.M. 4.58 392.31 387.73

| | | | | | |
|--------|--------|--------|-----------|-------------------------------|---|
| 154+57 | + 2.67 | 395.00 | Roof | Set Rd. Hgt. to line + grade | |
| 154+86 | + 2.72 | 395.03 | " | " | |
| 155+05 | + 2.74 | 395.05 | " | " | |
| 154+40 | - 3.77 | 388.54 | Fin. Flr. | Set pin to grade on 2' offset | ^{388.02} each side _{388.54} |
| +60 | - 3.75 | 388.56 | " | " | |
| +80 | - 3.73 | 388.58 | " | " | |
| 155+20 | - 2.75 | 395.06 | | | <u>388.06</u> 52 388.58 |

Aug 18, 1930

B.M. 4.22 392.59 388.37

| | | | | | |
|--------|--------|--------|-------------|------------------|---------------------------------------|
| 161+60 | - 3.33 | 389.26 | Finish Flr. | Set pin to grade | |
| +40 | - 3.35 | 389.24 | " | " | OK |
| +20 | - 3.37 | 389.22 | " | " | OK |
| 161+00 | - 3.39 | 289.20 | " | " | OK <u>288.68</u> 52 |
| 160+80 | - 3.41 | 389.18 | " | " | OK Lt. 289.20 (.05 low .01 low) |
| +60 | - 3.43 | 389.16 | " | " | (.07 low .07 low) |
| +40 | - 3.45 | 389.14 | " | " | (.02 low Not set) |
| +20 | - 3.47 | 389.12 | " | " | (.00 Not set) |
| 160+00 | - 3.49 | 289.10 | " | " | <u>288.58</u> 52 |
| 159+80 | - 3.51 | 389.08 | " | " | 289.10 |
| 159+60 | - 3.53 | 389.06 | " | " | Not set |
| 159+40 | - 3.55 | 389.04 | " | " | |
| | 2.89 | | | | |

Aug 18, 1930

| | | | |
|--------|-------|--------|--------|
| B.M. | 4.08 | 392.10 | 388.02 |
| 155+20 | | | 395.06 |
| 155+60 | +3.00 | 395.10 | |
| 155+82 | +3.02 | 395.12 | |
| 156+00 | +3.04 | 395.14 | |
| +20 | +3.06 | 395.16 | |
| +30 | +3.07 | 395.17 | |
| +50 | +3.09 | 395.19 | |

Check
 Set Rd. Hd. to line + grade
 Check
 Set Rd. Hd. to line + grade
 "
 Check
 "

(0.2)

| | | | |
|--------|-------|--------|--------|
| B.M. | 4.20 | 392.82 | 388.62 |
| 163+35 | -3.38 | 389.44 | 389.44 |
| +20 | -3.40 | 389.42 | |
| 163+00 | -3.42 | 389.40 | |
| 162+80 | -3.44 | 389.38 | |
| +60 | -3.46 | 389.36 | |
| +40 | -3.48 | 389.34 | |
| +20 | -3.50 | 389.32 | |
| 162+00 | -3.52 | 389.30 | |
| 161+80 | -3.54 | 389.28 | |
| +60 | -3.56 | 389.26 | |

Finish Fl.

Set pin to grade
 "
 "
 "
 "
 "
 "
 "
 "
 "
 "

| Screeds | |
|----------|----------|
| Rt | Lt |
| O.K. | O.K. |
| .02 Low | .03 Low |
| .03 High | .05 High |
| .04 Low | O.K. |
| O.K. | .02 High |
| .09 High | .05 High |
| O.K. | .04 High |
| O.K. | .06 High |
| .03 High | .05 High |

388.88
 52
 389.40

388.78
 52
 389.30

Aug 18, 1930

| | | | | |
|--------|------|--------|--------|--------------------|
| B.M. | 4.21 | 392.58 | 388.37 | |
| 159+40 | | | -3.54 | 389.04 Finish Flr. |
| +20 | | | -3.56 | 389.02 " |
| 159+00 | | | -3.58 | 389.00 " |
| 158+80 | | | -3.60 | 388.98 " |
| +60 | | | -3.62 | 388.96 " |
| +40 | | | -3.64 | 388.94 " |
| +20 | | | -3.66 | 388.92 " |
| 158+00 | | | -3.68 | 388.90 " |
| B.M. | 4.44 | 388.14 | 388.14 | |

Check

set pin to grade.

Aug 19, 1930

| | | | | |
|--------|------|--------|--------|--------------------|
| B.M. | 4.25 | 392.39 | 388.14 | |
| 158+00 | | | -3.49 | 388.90 Finish Flr. |
| 157+80 | | | -3.51 | 388.88 " |
| +60 | | | -3.53 | 388.86 " |
| +40 | | | -3.55 | 388.84 " |
| +20 | | | -3.57 | 388.82 " |
| 157+00 | | | -3.59 | 388.80 " |
| 156+80 | | | -3.61 | 388.78 " |
| +70 | | | -3.62 | 388.77 " |
| +50 | | | -3.64 | 388.75 " |
| +40 | | | -3.65 | 388.74 " |
| +20 | | | -3.67 | 388.72 " |
| 156+00 | | | -3.69 | 388.70 " |
| B.M. | 4.37 | 388.02 | 388.02 | |

158+076

Check on previous work

Set Pin to grade.

$$\begin{array}{r} 388.38 \\ .52 \\ \hline 388.90 \end{array}$$

Screed

RT

Lft

.05 low .07 low

.06 low .05 low

.01 .04 low

.15 low

.21 low

$$\begin{array}{r} 388.18 \\ .52 \\ \hline 388.70 \end{array}$$

Aug 19, 1930

B.M. 4.55 392.57

388.02

pipe 155+82⁴

155+80 - 3.89 388.68 Finish Hr.

Set Pintograde

Screeds

+60 - 3.91 388.66 "

"

Rt Lt

+40 - 3.93 388.64 "

"

+20 - 3.95 388.62 "

"

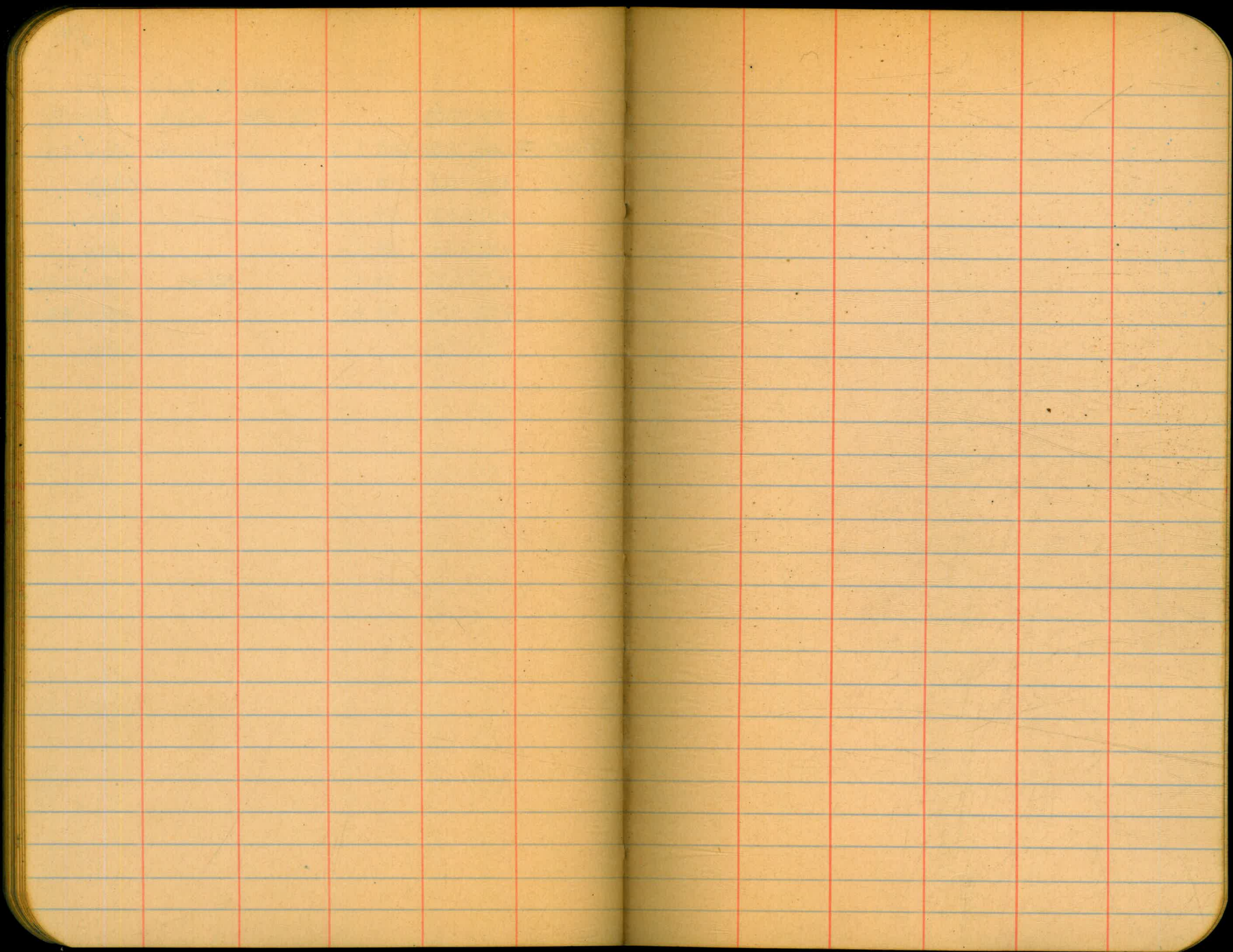
155+00 - 3.97 388.60 "

"

.02low

154+80 - 3.99 388.58 "

"



72

Aug 20, 1930

Elliott X Notes

Soper

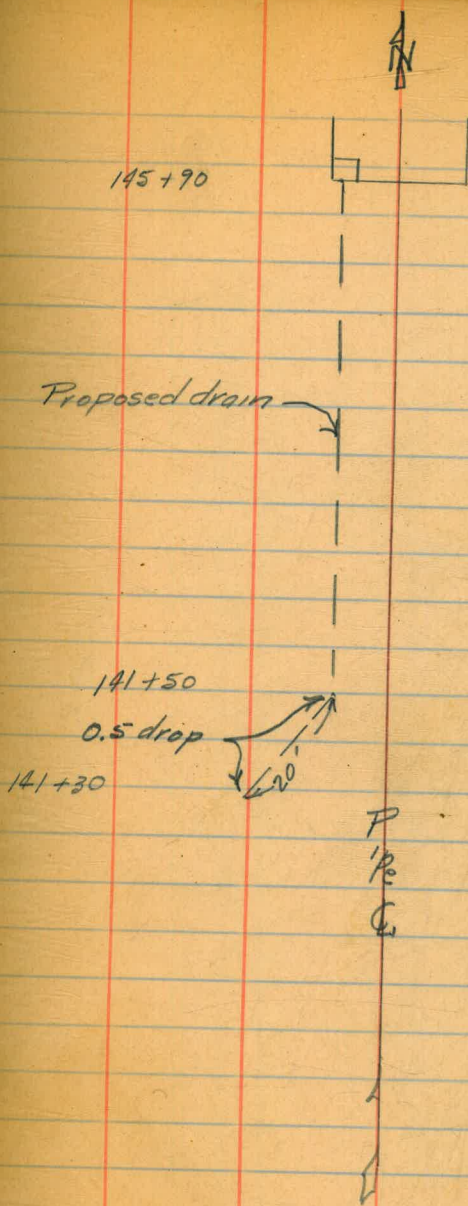
Bailey

Drain tile ditch

Void

Grade Stake at 141+50 = Cut 15 for drain pipe
 141+50 on bank Cut 7.3
 141+42 Cut 8.2
 141+30 Cut 0.0

76



77

13.5

12.9

13.2

5.1

Aug 20, 1930

Exit Well

B.M. 5.83 394.92 389.09

Tunnel Floor 389.35

Well subgrade at Portal 4.73 390.19 389.19 Cut 1.0

Well subgrade Lt. 3.92 391.00 389.20 Cut 1.80 ^{1'9 1/2"}

" Rt. 4.36 390.56 389.20 Cut 1.36 ^{1'4 1/4"}

Well subgrade Lt. 4.02 390.90 389.21 Cut 1.69 ^{1'8 1/2"}

" " Rt. 4.45 390.47 389.21 Cut 1.26 ^{1'3 1/4"}

Elliott
Soper
Bailey

78

167+61.06 (Portal) Rd. Cut 1.0

Rd. Hd. Cut 1.0

167+63.68

167+66.06

Cut 1.36 2°

2° C. 1.80

167+75.06

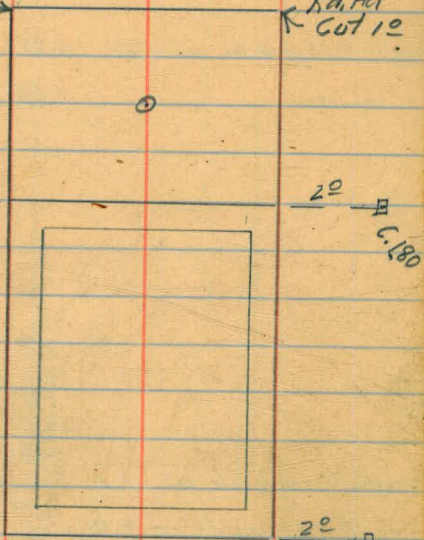
Cut 1.26 2°

2° Cut 1.69

167+63.68
+61.06
2.62

+66.06
167+63.68
2.38

+75.06
167+63.68
11.38



Aug 9, 1930
Entr. Well.

B.M. 7.06 393.93 386.87
Tunnel Floor at Portal 387.18
Well Subgrade at Portal 387.02

Well Subgrade at Wall 0.31 393.62 387.01 Cut $6' 7\frac{1}{4}"$
1.45 392.48 387.01 Cut $5' 5\frac{3}{4}"$

Well Subgrade at S.E. Cor. ^{4.68} 389.25 386.99 Cut $2' 5\frac{1}{4}"$
Well Subgrade at S.W. Cor. (Sump Cor.) ^{2.05} ^{391.88} 386.93 Cut $4' 11\frac{1}{2}"$

B.M. 4.64 391.51 386.87
Well subgrade at Portal 3.49 388.02 387.02 Cut 12

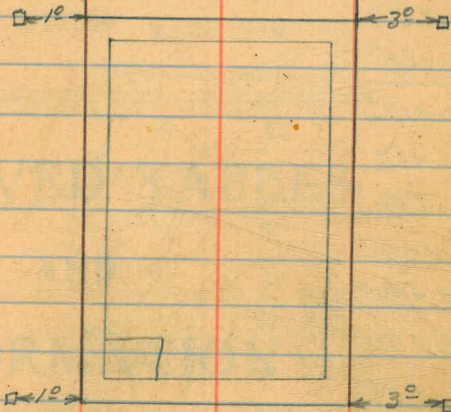
Elliott
Bailey
Coper

79

145+97⁰⁶ Portal

Rd. Hd.
Cut 12

Rel. Hd. Cut 12



145+92⁰⁶

145+83⁰⁶

146+09⁷¹
145+97⁰⁶
12.65
5.
17.65
7

| Sta. | 2x10 | 2x12 |
|---------------------|--------|------|
| 150+99 ³ | 3 | 11 |
| +93 ² | 3 | 6 |
| +88 ⁴ | 3 | 6 |
| +82 ⁸ | 3 | 6 |
| +77 ³ | 3 | 6 |
| +71 ⁸ | 3 | 6 |
| 150+66 ³ | 3 | 6 |
| 150+17 ⁵ | 3 | 6 |
| +12 | 3 | 11 |
| +06 ⁴ | 3 | 6 |
| 150+00 ² | 3 | 6 |
| 149+95 ⁵ | 3 | 6 |
| 149+90 | 3 | 6 |
| +84 ⁶ | 3 | 6 |
| +79 ³ | 3 | 6 |
| 149+73 ⁵ | 3 | 6 |
| 146+28 ² | 3 | 6 |
| +22 ⁵ | 3 | 6 |
| +17 | 3 | 6 |
| +11 ⁵ | 3 | 16 |
| +05 ⁹ | 3 | 16 |
| 146+01 ⁴ | 3 | 16 |
| 145+96 ⁹ | Portal | |

DIRECTIONS FOR USE OF TABLES

TABLE No. 1.

Distance of slope stake from side or shoulder
 stake for any width roadway, slope 1 1/2 to 1.
 If ground is nearly level, the cut or fill at side
 stake is located by the double entry method in
 left column and top row. The number in body

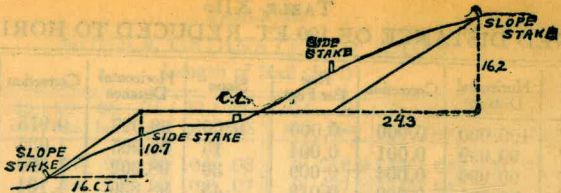
IMPROVED TABLES

AND

INFORMATION

TABLE No. 2.

To find Tangent and External for curve of
 any other degree, divide by degree of curve and
 add correction found in column of corrections.
 Degree of curve with a given L may be found
 by dividing tangent (or external), opposite L by
 given tangent (or external).
 The distance from a point on the tangent to
 the curve is very nearly the square of the tangent
 length divided by twice the radius.



DISTANCES FROM SIDE STAKES FOR CROSS-SECTIONING

SLOPE 1 1/2 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 05 | 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.

156+44 2.1
 +36 2.2
 134 2.9
 +30 1.9
 +25 2.3
 +20 2.4
 +18 1.9
 113 2.1
 155+00 2.4
 +07 2.0
 +97.5 2.3
 156+03 2.3
 156+00 2.0
 155+94 2.0
 +86 2.2
 +80 1.8
 +75 1.7
 +67 1.8
 +70 2.3
 +67 2.4
 +62 2.5
 +63 2.0
 +53 1.7
 +43 2.3
 +57 2.2
 +50 2.7
 +45 2.6
 +42 2.3

158+35 2.7
 +27 2.5
 +23 2.7
 +15.5 3.0
 +13 3.0
 +11 2.7
 +09 2.6

$163 + 40.56$
 $5 + 32.95$
 $158 + 07.61$
 $- 2 + 25.20$
 $\hline 155 + 82.41$

63.48

2.60
 2.55
 $.49$
 $\hline 2.09$
 $.49$

2.58

2.56

$167 + 63.68$
 $2 + 01.15$
 $165 + 62.53$
 $165 + 62.51$
 $2 + 21.95$
 $\hline 163 + 40.56$

386.87
 $5.40\frac{1}{2}$
 $392.27\frac{1}{2}$
 $4.95\frac{1}{2}$
 $\hline 387.320$

276.79
 16340.56
 275.24
 $\hline 160 + 65.32$

$158 + 07.61$
 $3 + 50.24$
 $\hline 154 + 57.37$

$167 + 42 - 167 + 46.5$ ✓
 $167 + 46.5 - 167 + 51$ ✓ 2×10 2×12
 $165 + 61 - 165 + 57$ ✓ 1 1
 $164 + 57 - 164 + 62$ ✓
 $164 + 51.2 - 164 + 57$ ✓ $167 + 62$
 $\hline 3$ 11
 $164 + 46.2 - 164 + 51.2$ ✓ $4 - 10$

$164 + 40.9 - 164 + 46.2$ ✓ $3 - 6$
 $(164 + 34.2 - 164 + 40.9)$ ✓ $3 - 6$
 Not in

$165 + 02.3 - 164 + 96.7$ ✓ 5
 $164 + 96.2 - 164 + 91.2$ ✓ 10
 $164 + 85.6 - 164 + 91.2$ ✓ 5

$151 + 08.61 - 146.09.71$
 $1 + 90.80 - 498.90$
 $\hline 152 + 99.41 - 151 + 08.61$ 2.11
 4.99
 6.60

$146 + 09.71$
 $2 + 51.58$
 $\hline 148 + 61.29$ 4.49
 6.25