1049

DIETZGEN
TRADE MARK

1049

# ENGINEERS'
# FIELD BOOK
## No. 403

# EUGENE DIETZGEN CO.

DRAWING MATERIALS, MATHEMATICAL and
SURVEYING INSTRUMENTS

Chicago New York San Francisco New Orleans Pittsburg Toronto

## Distances from Center of Roadway for Cross-Sectioning Roadway 16 feet wide. Side Slopes 1 on 1. For Single Track Embankment.

| H | 0 | .1 | .2 | .3 | .4 | .5 | .6 | .7 | .8 | .9 | H |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 8.0 | 8.1 | 8.2 | 8.3 | 8.4 | 8.5 | 8.6 | 8.7 | 8.8 | 8.9 | 0 |
| 1 | 9.0 | 9.1 | 9.2 | 9.3 | 9.4 | 9.5 | 9.6 | 9.7 | 9.8 | 9.9 | 1 |
| 2 | 10.0 | 10.1 | 10.2 | 10.3 | 10.4 | 10.5 | 10.6 | 10.7 | 10.8 | 10.9 | 2 |
| 3 | 11.0 | 11.1 | 11.2 | 11.3 | 11.4 | 11.5 | 11.6 | 11.7 | 11.8 | 11.9 | 3 |
| 4 | 12.0 | 12.1 | 12.2 | 12.3 | 12.4 | 12.5 | 12.6 | 12.7 | 12.8 | 12.9 | 4 |
| 5 | 13.0 | 13.1 | 13.2 | 13.3 | 13.4 | 13.5 | 13.6 | 13.7 | 13.8 | 13.9 | 5 |
| 6 | 14.0 | 14.1 | 14.2 | 14.3 | 14.4 | 14.5 | 14.6 | 14.7 | 14.8 | 14.9 | 6 |
| 7 | 15.0 | 15.1 | 15.2 | 15.3 | 15.4 | 15.5 | 15.6 | 15.7 | 15.8 | 15.9 | 7 |
| 8 | 16.0 | 16.1 | 16.2 | 16.3 | 16.4 | 16.5 | 16.6 | 16.7 | 16.8 | 16.9 | 8 |
| 9 | 17.0 | 17.1 | 17.2 | 17.3 | 17.4 | 17.5 | 17.6 | 17.7 | 17.8 | 17.9 | 9 |
| 10 | 18.0 | 18.1 | 18.2 | 18.3 | 18.4 | 18.5 | 18.6 | 18.7 | 18.8 | 18.9 | 10 |
| 11 | 19.0 | 19.1 | 19.2 | 19.3 | 19.4 | 19.5 | 19.6 | 19.7 | 19.8 | 19.9 | 11 |
| 12 | 20.0 | 20.1 | 20.2 | 20.3 | 20.4 | 20.5 | 20.6 | 20.7 | 20.8 | 20.9 | 12 |
| 13 | 21.0 | 21.1 | 21.2 | 21.3 | 21.4 | 21.5 | 21.6 | 21.7 | 21.8 | 21.9 | 13 |
| 14 | 22.0 | 22.1 | 22.2 | 22.3 | 22.4 | 22.5 | 22.6 | 22.7 | 22.8 | 22.9 | 14 |
| 15 | 23.0 | 23.1 | 23.2 | 23.3 | 23.4 | 23.5 | 23.6 | 23.7 | 23.8 | 23.9 | 15 |
| 16 | 24.0 | 24.1 | 24.2 | 24.3 | 24.4 | 24.5 | 24.6 | 24.7 | 24.8 | 24.9 | 16 |
| 17 | 25.0 | 25.1 | 25.2 | 25.3 | 25.4 | 25.5 | 25.6 | 25.7 | 25.8 | 25.9 | 17 |
| 18 | 26.0 | 26.1 | 26.2 | 26.3 | 26.4 | 26.5 | 26.6 | 26.7 | 26.8 | 26.9 | 18 |
| 19 | 27.0 | 27.1 | 27.2 | 27.3 | 27.4 | 27.5 | 27.6 | 27.7 | 27.8 | 27.9 | 19 |
| 20 | 28.0 | 28.1 | 28.2 | 28.3 | 28.4 | 28.5 | 28.6 | 28.7 | 28.8 | 28.9 | 20 |
| 21 | 29.0 | 29.1 | 29.2 | 29.3 | 29.4 | 29.5 | 29.6 | 29.7 | 29.8 | 29.9 | 21 |
| 22 | 30.0 | 30.1 | 30.2 | 30.3 | 30.4 | 30.5 | 30.6 | 30.7 | 30.8 | 30.9 | 22 |
| 23 | 31.0 | 31.1 | 31.2 | 31.3 | 31.4 | 31.5 | 31.6 | 31.7 | 31.8 | 31.9 | 23 |
| 24 | 32.0 | 32.1 | 32.2 | 32.3 | 32.4 | 32.5 | 32.6 | 32.7 | 32.8 | 32.9 | 24 |
| 25 | 33.0 | 33.1 | 33.2 | 33.3 | 33.4 | 33.5 | 33.6 | 33.7 | 33.8 | 33.9 | 25 |
| 26 | 34.0 | 34.1 | 34.2 | 34.3 | 34.4 | 34.5 | 34.6 | 34.7 | 34.8 | 34.9 | 26 |
| 27 | 35.0 | 35.1 | 35.2 | 35.3 | 35.4 | 35.5 | 35.6 | 35.7 | 35.8 | 35.9 | 27 |
| 28 | 36.0 | 36.1 | 36.2 | 36.3 | 36.4 | 36.5 | 36.6 | 36.7 | 36.8 | 36.9 | 28 |
| 29 | 37.0 | 37.1 | 37.2 | 37.3 | 37.4 | 37.5 | 37.6 | 37.7 | 37.8 | 37.9 | 29 |
| 30 | 38.0 | 38.1 | 38.2 | 38.3 | 38.4 | 38.5 | 38.6 | 38.7 | 38.8 | 38.9 | 30 |
| 31 | 39.0 | 39.1 | 39.2 | 39.3 | 39.4 | 39.5 | 39.6 | 39.7 | 39.8 | 39.9 | 31 |
| 32 | 40.0 | 40.1 | 40.2 | 40.3 | 40.4 | 40.5 | 40.6 | 40.7 | 40.8 | 40.9 | 32 |
| 33 | 41.0 | 41.1 | 41.2 | 41.3 | 41.4 | 41.5 | 41.6 | 41.7 | 41.8 | 41.9 | 33 |
| 34 | 42.0 | 42.1 | 42.2 | 42.3 | 42.4 | 42.5 | 42.6 | 42.7 | 42.8 | 42.9 | 34 |
| 35 | 43.0 | 43.1 | 43.2 | 43.3 | 43.4 | 43.5 | 43.6 | 43.7 | 43.8 | 43.9 | 35 |
| 36 | 44.0 | 44.1 | 44.2 | 44.3 | 44.4 | 44.5 | 44.6 | 44.7 | 44.8 | 44.9 | 36 |
| 37 | 45.0 | 45.1 | 45.2 | 45.3 | 45.4 | 45.5 | 45.6 | 45.7 | 45.8 | 45.9 | 37 |
| 38 | 46.0 | 46.1 | 46.2 | 46.3 | 46.4 | 46.5 | 46.6 | 46.7 | 46.8 | 46.9 | 38 |
| 39 | 47.0 | 47.1 | 47.2 | 47.3 | 47.4 | 47.5 | 47.6 | 47.7 | 47.8 | 47.9 | 39 |
| 40 | 48.0 | 48.1 | 48.2 | 48.3 | 48.4 | 48.5 | 48.6 | 48.7 | 48.8 | 48.9 | 40 |

**Example**—If point is 22.6 ft. above grade, how far should it be from center line to be a slope stake point? Ans. from Table 30.6. For same slopes but other widths of roadbed, correct above figures by one-half difference in width of roadbed; thus in example above, for 20 ft. roadbed distance will be 30.6 + (20—16) ÷ 2 or 2 ft. added to 30.6 = 32.6. For slopes of 1 on 1½ see inside of back cover.

---

Magnolia NE hd spike whitepole 15.42
Bridge RR Pole E hd spk 10.92

Chic

H
0
1
2
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9
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12
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38
39
40

to b
of r
exa
30.6

## Index

12/27/18

CROSS SECTION OF
Rose Canon Rd.
(Distances given are on center Line)

| | | | | | |
|---|---|---|---|---|---|
| B.M. | 7.93 | 23.35 | | 15.42 | spk NE Magnolia & Grand |
| | | | 4.07 | 19.28 | 0565 BM = 25.0 |
| | | 0+00 = | S.L. P.L. | see book | 1048-1 |
| 15' L | | | 5.1 | | |
| C | | | 4.5 | | |
| 15' R | | | 4.7 | | |
| | | 0+50 | | | |
| 15' R | | | 5.6 | | |
| C | | | 5.0 | | |
| 15' L | | | 6.0 | | |
| | | 1+00 | | | |
| 15' L | | | 6.2 | | |
| C | | | 5.6 | | |
| 15' R | | | 6.5 | | |
| | | 1+50 | | | |
| 15' R | | | 7.2 | | |
| 7' R | | | 6.4 | | |
| C | | | 6.2 | | |
| 15' L | | | 7.1 | | |
| | | 2+00 | | | |
| 15' L | | | 7.8 | | |
| 12' L | | | 7.3 | | |
| C | | | 6.6 | | |
| 15' R | | | 7.3 | | |
| | | 2+50 | | | |
| 15' R | | | 7.6 | | |
| C | | | 6.9 | | |
| 10' L | | | 7.3 | | |
| 15' L | | | 8.3 | | |
| | | 3+00 | | | |
| 15' L | | | 8.3 | | |
| 12' L | | | 7.6 | | |
| C | | | 7.1 | | |
| 15' R | | | 7.9 | | |
| | | 3+50 | | | |
| 15' R | | | 8.2 | | |
| C | | | 7.3 | | |
| 10' L | | | 7.8 | | |
| 15' L | | | 8.6 | | |
| | | 4+00 | | | |
| 15' L | | | 9.0 | | |
| 10' L | | | 8.2 | | |
| C | | | 7.7 | | |
| 15' R | | | 8.4 | | |
| | | 4+50 | | | |
| 15' R | | | 8.8 | | |
| C | | | 8.2 | | |
| 12' L | | | 8.7 | | |
| 15' L | | | 9.4 | | |

2335

|  |  |  |  |  |  |
|---|---|---|---|---|---|
|  |  | 4+67.15' = P.C. |  |  |  |
| 15' L |  |  | 9.3 |  |  |
| 12' L |  |  | 8.7 |  |  |
| C |  |  | 8.4 |  |  |
| 15' R |  |  | 8.9 |  |  |
|  |  | 5+00 |  |  |  |
| 15' R |  |  | 9.7 |  |  |
| C |  |  | 9.1 |  |  |
| 15' L |  |  | 9.7 |  |  |
| T.P. | 4.15 | 17.08 | 10.42 | 12.93 | west 20' tie hub at 5+24.47 |
|  |  | 5+50 |  |  |  |
| 20' L |  |  | 5.8 |  |  |
| 12' L |  |  | 4.4 |  |  |
| C |  |  | 4.0 |  |  |
| 13' R |  |  | 4.2 |  |  |
| 15' R |  |  | 5.0 |  |  |
|  |  | 5+81.38 = EC. |  |  |  |
| 15' R |  |  | 5.2 |  |  |
| 12' R |  |  | 4.4 |  |  |
| C |  |  | 4.4 |  |  |
| 7.5 L |  |  | 4.3 |  |  |
| 20' L |  |  | 9.8 |  |  |
|  |  | 6+00 |  |  |  |
| 25' L |  |  | 12.7 |  | in creek |
| 15' L |  |  | 12.6 |  | in creek |
| 10' L |  |  | 11.2 |  |  |

|  |  |  |  |
|---|---|---|---|
| C |  | 4.5 |  |
| 15' R |  | 4.8 |  |
|  | 6+02.7 = | bridge floor |  |
| C |  | 4.6 |  |
|  | 6+7.0 |  |  |
| 25' R |  | 11.0 |  |
| 15' R |  | 10.7 |  |
| C |  | 12.6 | under bridge |
| 15' L |  | 12.8 |  |
| 25' L |  | 13.0 |  |
|  | 6+32 |  |  |
| 20' L |  | 11.0 |  |
| 15' L |  | 12.7 |  |
| C |  | 12.8 | under bridge |
| 15' R |  | 12.4 |  |
| 20' R |  | 12.3 |  |
|  | 6+46.6 |  |  |
| 20' R |  | 13.3 |  |
| 5' R |  | 12.6 |  |
| C |  | 4.7 | = floor of bridge |
| 11' L |  | 4.7 |  |
| 23' L |  | 8.9 |  |
|  | 6+63 |  |  |
| 20' L |  | 6.7 |  |
| 10' L |  | 5.0 |  |
| C |  | 4.9 |  |

| | | | |
|---|---|---|---|
| | | 1708 | |
| 9' R | | | 5.2 |
| 20' R | | | 11.7 |
| | | 7+0 | |
| 20'R | | | 6.1 |
| C | { | | 6.0 |
| 20' L | | | 5.5 |
| | | 7+22 | |
| 20'L | | | 8.0 |
| 13 L | | | 7.0 |
| C | | | 7.1 |
| 5"R | | | 7.2 |
| 8'R | | | 5.8 |
| 20'R | | | 5.6 |
| | | 7+45 | |
| 20'R | | | 8.2 |
| C | | | 7.8 |
| 15'L | | | 8.1 |
| 20'L | | | 9.3 |
| | | 7+70 | |
| 20'L | | | 9.3 |
| 9'L | | | 8.1 |
| C | | | 8.0 |
| 20'R. | | | 8.9 |
| | | 8+00 | |
| 20'R | | | 9.7 |
| 14'R | | | 9.6 |

| | | | | | |
|---|---|---|---|---|---|
| 9'R | | | | 7.7 | |
| C | | | | 7.6 | |
| 10'L | | | | 7.7 | |
| 20'L | | | | 8.2 | |
| | | | 8+44 | | |
| 20'L | | | | 7.0 | |
| C | | | | 6.7 | |
| 10'R | | | | 6.6 | |
| 15'R | | | | 6.2 | |
| | | | 8+50 | | |
| 15'R | | | | 3.8 | |
| 10'R | | | | 6.3 | |
| C | | | | 6.4 | |
| 20'L | | | | 6.8 | |
| T.P. | 7.93 | 21.92 | | 3.09 | 13.99 |
| | | | 9+00 | | |
| 15'L | | | | 9.1 | |
| C | | | | 8.3 | |
| 15'R. | | | | 8.5 | |
| | | | 9+15 | | |
| 15'R | | | | 9.7 | |
| 12'R | | | | 8.2 | |
| C | | | | 8.2 | |
| 10'L | | | | 8.3 | |
| 15'L | | | | 7.3 | |

|  |  |  |
|---|---|---|
|  | 2192 |  |
|  | 9+50 |  |
| 15'L |  | 6.7 |
| 13'L |  | 7.7 |
| C |  | 7.8 |
| 15'R. |  | 8.1 |
|  | 10+00 |  |
| 15'R |  | 7.4 |
| C |  | 7.4 |
| 12'L |  | 7.7 |
| 15'L |  | 6.3 |
|  | 10+50 |  |
| 15'L |  | 6.2 |
| 13'L |  | 7.2 |
| C |  | 6.8 |
| 15'R |  | 7.2 |
|  | 11+00 |  |
| 15'R. |  | 6.7 |
| C |  | 6.2 |
| 12'L |  | 6.7 |
| 15'L |  | 5.5 |
|  | 11+50 |  |
| 15'L |  | 4.7 |
| 11'L |  | 6.1 |
| C |  | 5.8 |
| 15'R |  | 6.1 |

|  |  |  |
|---|---|---|
|  | 12+00 |  |
| 15'R. |  | 5.7 |
| C |  | 5.2 |
| 11'L. |  | 5.6 |
| 15'L |  | 3.8 |
|  | 12+50 |  |
| 15'L. |  | 4.5 |
| C |  | 4.6 |
| 15'R |  | 4.9 |
|  | 13+00 |  |
| 15'R |  | 4.4 |
| C |  | 4.1 |
| 7'L |  | 4.4 |
| 11'L |  | 4.8 |
| 15'L |  | 4.2 |
|  | 13+50 |  |
| 15'L |  | 4.1 |
| 10'L |  | 4.6 |
| 4'L |  | 3.9 |
| C |  | 4.0 |
| 15'R. |  | 4.0 |
|  | 14+00 |  |
| 15'R |  | 3.8 |
| C |  | 3.5 |
| 4'L |  | 3.7 |
| 10'L |  | 4.2 |
| 15'L |  | 3.3 |

| | | | | |
|---|---|---|---|---|
| | | 21.92 | | |
| | | 14+50 | | |
| 15'L | | | 3.2 | |
| 12'L | | | 3.6 | |
| c | | | 3.0 | |
| 15'R | | | 3.2 | |
| | | 15+00 | | |
| 15'R | | | 2.8 | |
| C | | | 2.5 | |
| 12'L | | | 3.1 | |
| 15'L | | | 2.7 | |
| | | 15+50 | | |
| 15'L | | | 2.0 | |
| C | | | 1.9 | |
| 15'R | | | 1.9 | |
| | | 16+00 | | |
| 15'R | | | 1.0 | |
| c | | | 0.9 | |
| 15'L | | | 1.7 | |
| | | 16+50 | | |
| 15'L | | | 0.3 | |
| T.P. | 11.15 | 32.71 | 0.36 | 21.56 |
| c | | | 10.6 | |
| 15'R | | | 11.0 | |
| | | 17+00 | | |
| 15'R | | | 9.2 | |
| 7'R | | | 8.9 | |
| C | | | 8.9 | |
| 9'L | | | 9.6 | |

| | | |
|---|---|---|
| 12'L | | 7.9 |
| 15'L | | 7.8 |
| | 17+50 | |
| 15'L | | 5.8 |
| 11'L | | 8.1 |
| C | | 7.5 |
| 15'R | | 7.8 |
| | 18+00 | |
| 15'R | | 7.5 |
| C | | 6.7 |
| 13'L | | 7.3 |
| 15'L | | 5.6 |
| | 18+50 | |
| 15'L | | 5.5 |
| 12'L | | 6.7 |
| C | | 6.3 |
| 7'R | | 6.2 |
| 15'R | | 7.0 |
| | 19+00 | |
| 23'R | | 10.2 |
| 18'R | | 8.8 |
| 13'R | | 6.2 |
| C | | 5.6 |
| 9'L | | 5.9 |
| 13'L | | 2.6 |
| 15'L | | 2.1 |

|  |  |  |  |
|---|---|---|---|
|  | 32.71 |  |  |
|  | 19+18.35 = P.C. |  |  |
| 15'L |  | 0.3 |  |
| 13'L |  | 0.9 |  |
| 10'L |  | 4.4 |  |
| 5'L |  | 5.8 |  |
| C |  | 5.5 |  |
| 12'R |  | 5.6 |  |
| 20'R |  | 10.6 |  |
| 25'R |  | 11.0 |  |
|  | 19+50 |  |  |
| 28'R. |  | 12.0 |  |
| 20'R |  | 10.3 |  |
| 12'R |  | 5.0 |  |
| C |  | 5.1 |  |
| 10'L |  | 5.4 |  |
| 15'L |  | + 3.0 |  |
| 25'L |  | + 6.0 |  |
|  | 20+00 |  |  |
| 27.5'L |  | +17.4 |  |
| 17.5'L |  | +12.0 |  |
| 6'L |  | 4.4 | edge |
| C |  | 4.7 |  |
| 13'R |  | 5.2 | edge |
| 20'R |  | 10.0 |  |
| 30'R. |  | 11.8 |  |

|  |  |  |  |  |
|---|---|---|---|---|
|  | 20+50 |  |  |  |
| 30'R |  | 11.5 |  |  |
| 20'R. |  | 9.7 |  |  |
| 11'R. |  | 4.3 |  | edge |
| C |  | 4.4 |  |  |
| 7'L |  | 4.1 |  |  |
| 12'L |  | 0.0 |  |  |
| 13'L |  | +10.0 |  |  |
| 15'L |  | + 13.0 |  |  |
| 20'L |  | + 19.0 |  |  |
|  | 21+00 |  |  |  |
| 20'L |  | +16.5 |  |  |
| 14'L |  | +9.5<br>2.5 |  |  |
| 12'L |  | 4.1 |  |  |
| C |  | 4.2 |  |  |
| 8'R |  | 4.2 |  |  |
| 18'R |  | 10.2 |  |  |
| 26'R |  | 10.5 |  |  |
| TP. |  | 2.99 | 29.72 | 21\30<br>ctr hub 22+ |

12/23/19
Gregory/
Miller
Shaw

CROSS SECTION OF TYRANT ST 24' wide
CONTINUED FROM BOOK 98 (Grade) Page 30

| | | | | | |
|---|---|---|---|---|---|
| | 5.39 | 210.14 | | 204.75 | on Hub |
| | 0+00 = P.C. | 50' No. of So. End of Curve N. of Brooklyn | | | |
| E | | | 5.4 | 204.7 | |
| C | | | 7.4 | 02.7 | |
| W | | | 9.1 | 1.0 | |
| +10 | | | 10.0 | 200.1 | |
| | | 100' N | | | |
| -10 | | | 8.7 | 1.4 | |
| W | | | 7.8 | 2.3 | |
| C | | | 6.3 | 3.8 | |
| E | | | 4.7 | 5.4 | |
| | | 150' N | | | |
| E | | | 3.8 | 6.3 | |
| C | | | 4.9 | 5.2 | |
| W | | | 6.1 | 4.0 | |
| +5 | | | 6.5 | 3.6 | |
| | | 200' N | | | |
| -5 | | | 5.7 | 4.4 | |
| W | | | 5.3 | 4.8 | |
| C | | | 4.2 | 5.9 | |
| E | | | 3.0 | 7.1 | |
| | | 237.22 = | E.C | | |
| E | | | 1.92 | 8.2 | on hub |
| C | | | 3.3 | 6.8 | |
| W | | | 5.2 | 4.9 | |
| +5 | | | 6.2 | 3.9 | |

| | | | | |
|---|---|---|---|---|
| | | 210.14 | | |
| | | 2+75 | | |
| -10 | | | 7.8 | 202.3 |
| W | | | 4.6 | 5.5 |
| C | | | 2.0 | 8.1 |
| E | | | 0.0 | 10.1 |
| | | 3+00 | | |
| E | | | 0.0 | 10.1 |
| C | | | 2.1 | 8.0 |
| W | | | 5.0 | 5.1 |
| +10 | | | 8.1 | 2.0 |
| | | 3+25 | | |
| -10 | | | 7.0 | 3.1 |
| W | | | 3.8 | 6.3 |
| C | | | 1.1 | 9.0 |
| T.P. | 7.56 | 216.83 | 0.87 | 209.27 |
| E | | | 6.3 | 10.5 |
| | | 3+54 | | |
| E | | | 5.9 | 10.9 |
| C | | | 7.8 | 9.0 |
| W | | | 10.0 | 6.8 |
| +10 | | | 13.5 | 203.3 |
| | | 3+67 | | |
| -35 | | | 21.8 | 195.0 |
| -10 | | | 24.9 | 191.9 |
| W | | | 20.6 | 196.2 |
| C | | | 13.3 | 203.5 |

| | | | |
|---|---|---|---|
| | 216.83 | | |
| +7 | | 8.1 | 208.7 |
| E | | 6.8 | 210.0 |
| | 3+80 | | |
| -5 | | 6.8 | 210.0 |
| E | | 10.9 | 205.9 |
| C | | 18.0 | 198.8 |
| +7 | | 22.8 | 94.0 |
| W | | 24.0 | 92.8 |
| +10 | | 21.5 | 95.3 |
| +35 | | 21.1 | 95.7 |
| | 3+90 | | |
| -35 | | 20.8 | 96.0 |
| -10 | | 20.8 | 96.0 |
| W | | 23.9 | 92.9 |
| +8 | | 21.7 | 95.1 |
| C | | 19.9 | 196.9 |
| E | | 12.0 | 204.8 |
| +10 | | 5.4 | 11.4 |
| | 4+05 | | |
| -5 | | 5.8 | 11.0 |
| E | | 8.5 | 8.3 |
| C | | 16.1 | 200.7 |
| W | | 22.0 | 194.8 |
| +10 | | 23.6 | 93.2 |
| +35 | | 20.6 | 96.2 |

| | | | |
|---|---|---|---|
| | 216.83 | TYRANT | 24' |
| | 4+20 | | |
| -35 | | 20.3 | 196.5 |
| -8 | | 18.8 | 198.0 |
| W | | 15.8 | 201.0 |
| C | | 9.8 | 7.0 |
| E | | 4.7 | 12.1 |
| | 4+35 | | |
| E | | 3.9 | 12.9 |
| C | | 6.0 | 10.8 |
| W | | 8.7 | 8.1 |
| +10 | | 12.2 | 4.6 |
| | 4+75 | | |
| W | | 5.5 | 11.3 |
| C | | 4.8 | 12.0 |
| E | | 3.3 | 13.5 |
| | 5+00 | | |
| E | | 2.0 | 14.8 |
| C | | 4.3 | 11.5 |
| W | | 5.6 | 11.2 |
| | 5+25 | | |
| W | | 4.5 | 12.3 |
| C | | 3.8 | 13.0 |
| E | | 2.7 | 14.1 |
| | 5+50 | ~~[illegible]~~ | |
| E | | 2.4 | 14.4 |
| C | | 3.7 | 13.1 |

| | | | | |
|---|---|---|---|---|
| | | 216.83 | | |
| W | | | 4.9 | 211.9 |
| | | 6+00 | | |
| W | | | 4.0 | 12.8 |
| C | | | 3.2 | 13.6 |
| E | | | 2.3 | 14.5 |
| | | 6+25 | | |
| E | | | 2.6 | 14.2 |
| C | | | 3.8 | 13.0 |
| W | | | 4.3 | 12.5 |
| | | 6+50 | | |
| W | | | 4.7 | 12.1 |
| C | | | 3.4 | 13.4 |
| E | | | 2.6 | 14.2 |
| | | 6+72.33 | = P.C. | = 0+00 |
| E | | | 3.1 | 13.7 |
| C | | | 4.1 | 12.7 |
| W | | | 5.2 | 11.6 |
| +10 | | | 6.9 | 9.9 |
| | 17' | 0+17 | | |
| -10 | | | 8.2 | 8.6 |
| W | | | 5.7 | 11.1 |
| C | | | 4.3 | 12.5 |
| E | | | 3.3 | 13.5 |
| | 17 | 0+34 | | |
| E | | | 3.8 | 13.0 |
| C | | | 6.3 | 10.5 |

216.83 TYRANT 24'

| | | | | |
|---|---|---|---|---|
| W | | | 9.6 | 207.2 |
| +20 | | | 12.2 | 4.6 |
| | 17 | 0+51 | | |
| -20 | | | 13.3 | 3.5 |
| W | | | 12.8 | 4.0 |
| C | | | 11.4 | 5.4 |
| E | | | 9.7 | 7.1 |
| +10 | | | 7.1 | 9.7 |
| | 85 | 0+60 | | |
| -15 | | | 8.6 | 8.2 |
| E | | | 11.4 | 5.4 |
| C | | | 13.2 | 3.6 |
| W | | | 12.2 | 4.6 |
| +20 | | | 11.7 | 5.1 |
| | 8.5 | 0+68 | | |
| -20 | | | 10.8 | 6.0 |
| W | | | 11.7 | 5.7 |
| C | | | 11.7 | 5.1 |
| E | | | 13.3 | 3.5 |
| +15 | | | 10.8 | 6.0 |
| | | 0+78.9 = P.R.C. | | |
| -20 | | | 11.8 | 5.0 |
| -15 | | | 12.9 | 3.9 |
| E | | | 11.1 | 5.7 |
| C | | | 10.1 | 6.7 |
| W | | | 9.4 | 7.4 |
| +15 | | | 9.0 | 7.8 |

| | | | | |
|---|---|---|---|---|
| | | 216.83 | | |
| | 215 | 1+00 | | |
| -15 | | | 4.1 | 212.7 |
| W | | | 4.7 | 12.1 |
| C | | | 5.5 | 11.3 |
| E | | | 6.8 | 10.0 |
| +20 | | | 9.1 | 7.7 |
| | 20 | 1+20 | | |
| -20 | | | 7.2 | 9.6 |
| E | | | 2.5 | 14.3 |
| C | | | 1.4 | 15.4 |
| W | | | 0.8 | 16.0 |
| +10 | | | 0.1 | 16.7 |
| T.P. | 12.07 | 228.81 | 0.09 | 216.74 |
| | 26 | 1+45 | | |
| -10 | | | 9.8 | 19.0 |
| W | | | 9.7 | 19.1 |
| C | | | 10.4 | 18.4 |
| E | | | 10.7 | 18.1 |
| +10 | | | 12.2 | 16.6 |
| | | 1+66.86 | = P.C.C. | |
| -10 | | | 9.9 | 18.9 |
| E | | | 8.8 | 20.0 |
| C | | | 7.6 | 21.2 |
| W | | | 6.7 | 22.1 |

TYRANT 24'

| | | | | |
|---|---|---|---|---|
| | | 228.81 | | |
| | 25 | 1+92.04 | | |
| W | | | 4.0 | 24.8 |
| C | | | 5.0 | 23.8 |
| E | | | 6.8 | 22.0 |
| | 25 | 2+17.22 | | |
| -5 | | | 6.2 | 22.6 |
| E | | | 5.5 | 23.3 |
| C | | | 3.5 | 25.3 |
| W | | | 2.0 | 26.8 |
| | 25 | 2+42.40 | | |
| W | | | 0.2 | 28.6 |
| C | | | 1.8 | 27.0 |
| E | | | 3.7 | 25.1 |
| +6 | | | 4.8 | 24.0 |
| | | 2+67.59 = | E.C. | |
| -5 | | | 3.0 | 25.8 |
| E | | | 2.4 | 26.4 |
| T.P. | 13.21 | 238.73 | 3.29 | 225.52 |
| C | | 238 | 9.9 | 28.8 |
| W | | | 8.2 | 30.5 |
| | 22 | 2+90 | | |
| W | | | 6.9 | 31.8 |
| C | | | 8.9 | 29.8 |
| E | | | 11.3 | 27.4 |
| +10 | | | 12.7 | 26.0 |

| | | | | |
|---|---|---|---|---|
| | | 238.73 | | |
| 10 | | 3+00 | | |
| -10 | | | 12.0 | 26.7 |
| E | | | 10.5 | 28.2 |
| C | | | 7.7 | 31.0 |
| W | | | 6.2 | 32.5 |
| 25 | | 3+25 | | |
| W | | | 4.7 | 34.0 |
| C | | | 6.6 | 32.1 |
| E | | | 8.9 | 29.8 |
| +10 | | | 10.4 | 28.3 |
| 25 | | 3+50 | | |
| -10 | | | 8.5 | 30.2 |
| E | | | 7.0 | 31.7 |
| C | | | 5.0 | 33.7 |
| W | | | 3.1 | 35.6 |
| 25 | | 3+75 | | |
| W | | | 1.8 | 36.9 |
| C | | | 3.8 | 34.9 |
| E | | | 5.7 | 33.0 |
| 25 | | 4+00 | | |
| E | | | 5.2 | 33.5 |
| C | | | 3.0 | 35.7 |
| W | | | 1.1 | 37.6 |
| T.P. | 8.04 | 244.25 | 2.52 | 236.21 |
| 25 | | 4+25 | | |
| W | | | 5.2 | 33.5 |

| | | | |
|---|---|---|---|
| | 243.5<br>244.25 | | |
| C | | 7.9 | 36.3 |
| E | | 10.4 | 33.8 |
| +10 | | 12.3 | 31.9 |
| 45 | 4+70 | | |
| -10 | | 12.1 | 32.1 |
| E | | 10.3 | 33.9 |
| C | | 8.1 | 36.1 |
| W | | 6.0 | 38.2 |
| 30 | 5+00 | | |
| W | | 7.3 | 36.9 |
| C | | 10.1 | 34.1 |
| E | | 12.3 | 31.9 |
| +10 | | 13.9 | 30.3 |
| 30 | 5+30 | | |
| -10 | | 13.5 | 30.7 |
| E or S | | 12.1 | 32.1 |
| C | | 10.3 | 33.9 |
| W or N. | | 8.0 | 36.2 |
| 34.6 | 5+64.6 = P.C. of 583.5' Radius | | |
| N | | 7.4 | 36.8 |
| C | | 9.2 | 35.0 |
| S | | 10.9 | 33.3 |
| +10 | | 12.2 | 32.0 |
| | 50.9' E of PC. | | |
| -10 | | 11.1 | 33.1 |
| S | | 9.1 | 35.1 |

244.25

| | | |
|---|---|---|
| C | 7.1 | 37.1 |
| N | 4.8 | 39.4 |

85.9 E. of PC

| | | |
|---|---|---|
| N | 4.6 | 39.6 |
| C | 7.0 | 37.2 |
| S | 9.2 | 35.0 |
| +10 | 11.1 | 33.1 |

101.83' E = EC

| | | |
|---|---|---|
| -10 | 11.2 | 33.0 |
| S | 9.1 | 35.1 |
| C | 6.4 | 37.8 |
| N | 4.4 | 39.8 |

35' E of EC

| | | |
|---|---|---|
| N | 3.3 | 40.9 |
| C | 6.2 | 38.0 |
| S | 8.0 | 36.2 |
| +10 | 10.8 | 34.4 |
| | 5.62 | 238.63 =<br>238.50 PI hub |

'E = W.L. 60th ST.

SEE BOOK 1059-15 for X SECTIONS

East on Radio Drive

TYRANT 24' 12

12/23/19
Gregory
Miller

CROSS SECTION OF 24' wide
New Alignment on Radio Drive
West of WINNETT ST
N & S in these notes = cbs in Book 1059

| | | | | | |
|---|---|---|---|---|---|
| | 3.08 | 298.11 | | 295.03 | Hub SW Winnet |
| This sta. corresponds to 310.21 E of Δpt on S Line of Radio. | 311.76 E. of Δpt Book 1059-34 = P.C. | | | | |
| N. | | | 3.7 | 94.4 | |
| C | | | 3.5 | 94.6 | |
| +9 | | | 7.0 | 91.1 | |
| S | | | 7.6 | 90.5 | |
| | 329.79 E of Δpt | | | | |
| S | | | 6.5 | 92.6 | |
| +5 | | | 5.7 | 92.4 | |
| C | | | 2.4 | 95.7 | |
| N | | | 2.9 | 95.2 | |
| | 3+35.80 | | | | |
| N | | | 2.6 | 95.5 | |
| C | | | 2.5 | 95.6 | |
| S | | | 9.1 | 89.0 | |
| +7 | | | 10.9 | 87.2 | |
| | 3+41.81 | | | | |
| S | | | 7.1 | 91.0 | |
| +5 | | | 5.2 | 92.9 | |
| C | | | 1.9 | 96.2 | |
| N | | | 2.2 | 95.9 | |
| | 3+47.83 = P.R.C. | | | 0 | |
| N | | | 2.1 | 96.0 | |
| C | | | 1.5 | 96.6 | |
| S | | | 7.4 | 90.7 | |

298.11

| | | | |
|---|---|---|---|
| | 3+83.90 | | |
| -13.5 | | 17.5 | 81.6 |
| S | | 9.7 | 88.4 |
| C | | 1.7 | 96.4 |
| N | | 1.2 | 96.9 |
| | 4+19.98 = P.R.C. | | |
| N | | 1.2 | 96.9 |
| +11 | | 1.6 | 96.5 |
| C | | 2.3 | 95.8 |
| S | | 9.8 | 88.3 |
| +10 | | 13.0 | 85.1 |
| | 4+56.05 = E.C. = 4+51.33 Book 1059-38 | | |
| S | | 6.2 | 92.9 |
| +5 | | 4.3 | 93.8 |
| C | | 1.3 | 96.8 |
| N | | 1.3 | 96.8 |

12/24/19 Gregory Re Cross-Section of Radio Dr
24' wide
from 2nd Angle pt So. of ORANGE ST North. ANGLE PT N
see Book 1059-71 for original notes

|  |  |  |  |  |  |
|---|---|---|---|---|---|
|  |  | ⊼ |  | Elev | Hub |
|  | 12.47 | 429.75 |  | 417.28 | Book 1059- |

All dis. = ℄ distances (4+28.13) See Book 1059-71

4+34.15 = New ANGLE PT

|  |  |  |  |  |
|---|---|---|---|---|
| -10 |  |  | 12.4 | 417.3 |
| S |  |  | 10.8 | 18.9 |
| C |  |  | 8.6 | 21.1 |
| +7 |  |  | 6.5 | 23.2 |
| N |  |  | 6.6 | 23.1 |
|  |  | 28.37 No. of △ PT. |  |  |
| N |  |  | 3.7 | 26.0 |
| +1 |  |  | 3.8 | 25.9 |
| +3 |  |  | 5.3 | 24.4 |
| C |  |  | 5.5 | 24.2 |
| +1 |  |  | 6.2 | 23.5 |
| S |  |  | 8.4 | 21.3 |
| +10 |  |  | 10.7 | 19.0 |
|  |  | 78.37 No. of ∠ pt. |  |  |
| -10 |  |  | 8.1 | 21.6 |
| S |  |  | 5.1 | 24.6 |
| +10 |  |  | 2.5 | 27.2 |
| C |  |  | 2.5 | 27.2 |
| +7 |  |  | 2.0 | 27.7 |
| T.P. | 11.46 | 441.02 | 0.19 | 429.56 |
| +9 |  |  | 12.0 | 29.0 |
| N |  |  | 11.4 | 29.6 |

14

441.02

|  |  |  |
|---|---|---|
|  | 108.37 No. |  |
| N | 9.2 | 31.8 |
| +5 | 11.1 | 29.9 |
| C | 11.6 | 29.4 |
| +3 | 11.6 | 29.4 |
| S | 143 | 26.7 |
| +10 | 17.9 | 23.1 |
|  | 143.37 N |  |
| -10 | 14.8 | 26.2 |
| S | 121 | 28.9 |
| +8 | 107 | 30.3 |
| C | 9.6 | 31.4 |
| +11 | 8.8 | 32.2 |
| N | 7.5 | 33.5 |
|  | 170.32 No. = ANGLE PT ⊙ |  |
| N | 7.6 | 33.4 |
| +8 | 88 | 32.2 |
| C | 9.3 | 31.7 |
| S | 121 | 28.9 |
| +6 | 134 | 27.6 |
| +16 | 17.6 | 23.4 |
|  | 27.60 No. of Angle |  |
| -15 | 15.6 | 25.4 |
| S | 94 | 31.6 |
| C | 6.3 | 34.7 |
| +10 | 5.8 | 35.2 |
| N | 4.3 | 36.7 |

Radio 24'

| | | | | | |
|---|---|---|---|---|---|
| | | 441.02 | | | |
| | | 62.6 N | | | |
| N | | | 2.9 | 38.1 | |
| +4 | | | 3.4 | 37.6 | |
| +5 | | | 4.3 | 36.7 | |
| C | | | 4.3 | 36.7 | |
| S | | | 6.3 | 34.7 | |
| +15 | | | 11.0 | 30.0 | |
| | | 87.6 N | | | |
| -11 | | | 8.2 | 32.8 | |
| S | | | 6.6 | 34.4 | |
| C | | | 3.3 | 37.7 | |
| +6 | | | 2.8 | 38.2 | |
| N | | | 1.5 | 39.5 | |
| T.P. | 12.41 | 452.32 | 1.11 | 439.91 | ✓ |
| | | 112.6' N | | | |
| N | | | 11.2 | 41.1 | |
| +5 | | | 11.5 | 40.8 | |
| +6 | | | 12.6 | 39.7 | |
| C | | | 12.6 | 39.7 | |
| +6 | | | 12.6 | 39.7 | |
| S | | | 14.6 | 37.7 | |
| ~~+5~~ +11 | | | 17.1 | 35.2 | |
| | | 127.6 | | | |
| -11 | | | 16.0 | 36.3 | |
| S | | | 14.2 | 38.1 | |
| +7 | | | 12.0 | 40.3 | |

| | | | |
|---|---|---|---|
| | 452.32 | | |
| C | | 11.7 | 40.6 |
| +5 | | 11.7 | 40.6 |
| +7 | | 10.6 | 41.7 |
| N | | 10.4 | 41.9 |
| | 152.6 N | | |
| N | | 7.8 | 44.5 |
| +6 | | 8.7 | 43.6 |
| +7 | | 10.1 | 42.2 |
| C | | 11.1 | 41.2 |
| +3 | | 10.4 | 41.9 |
| S | | 12.3 | 40.0 |
| +10 | | 12.8 | 39.5 |
| | 177.6 | | |
| -10 | | 10.2 | 42.1 |
| S | | 8.8 | 43.5 |
| +6 | | 8.2 | 44.1 |
| C | | 8.3 | 44.0 |
| +4 | | 8.1 | 44.2 |
| N | | 7.0 | 45.3 |
| | 197.6' | | |
| N | | 5.3 | 47.0 |
| +6 | | 5.7 | 47.6 |
| +9 | | 7.2 | 45.1 |
| C | | 6.7 | 45.6 |
| +6 | | 6.7 | 45.6 |
| +9 | | 7.9 | 44.4 |

|  |  |  |  |  |
|---|---|---|---|---|
|  |  | 452.32 |  |  |
| S |  |  | 8.0 | 44.3 |
| +5 |  |  | 8.1 | 44.2 |
|  |  | 227.6 |  |  |
| -5 |  |  | 5.7 | 46.6 |
| S |  |  | 5.5 | 46.8 |
| C |  |  | 4.8 | 47.5 |
| +2 |  |  | 5.2 | 47.1 |
| N |  |  | 3.9 | 49.4 |
|  |  | 252.6 |  |  |
| N |  |  | 2.0 | 50.3 |
| +3 |  |  | 2.3 | 50.0 |
| C |  |  | 3.6 | 48.7 |
| +1 |  |  | 3.0 | 49.3 |
| S |  |  | 3.5 | 48.8 |
| +5 |  |  | 3.5 | 48.8 |
|  |  | 287.6 |  |  |
| -5 |  |  | 1.3 | 51.0 |
| S |  |  | 1.3 | 51.0 |
| C |  |  | 1.9 | 50.4 |
| N |  |  | 0.8 | 51.5 |
| T.P. | 10.17 | 461.64 | 0.85 | 451.47 |

323.08 N = PC. = 0.0

|  |  |  |  |  |
|---|---|---|---|---|
| N |  |  | 7.2 | 54.4 |
| +9 |  |  | 7.5 | 54.1 |
| C |  |  | 8.5 | 53.1 |
| S |  |  | 8.5 | 53.1 |

RADIO 24'

|  |  |  |  |
|---|---|---|---|
|  | 461.64 |  |  |
|  | 25' from PC. |  |  |
| S |  | 6.5 | 55.1 |
| C |  | 7.2 | 54.4 |
| N |  | 6.6 | 55.0 |
|  | 50' E of PC. |  |  |
| N |  | 5.3 | 56.3 |
| C |  | 5.6 | 56.0 |
| +6 |  | 6.4 | 55.2 |
| S |  | 6.4 | 55.2 |
|  | 62.5' E |  |  |
| S |  | 5.6 | 56.0 |
| +5 |  | 6.0 | 55.6 |
| C |  | 5.3 | 56.3 |
| +6 |  | 5.2 | 56.4 |
| +7 |  | 4.1 | 57.5 |
| N |  | 3.7 | 57.9 |
|  | 75' E |  |  |
| N |  | 4.8 | 56.8 |
| C |  | 5.3 | 56.3 |
| S |  | 5.0 | 56.6 |
|  | 94' E |  |  |
| S |  | 5.0 | 56.6 |
| +10 |  | 4.6 | 57.0 |
| C |  | 3.7 | 57.9 |
| +6 |  | 2.9 | 58.7 |
| N |  | 3.4 | 58.2 |

|  |  |  |  |
|---|---|---|---|
|  | 461.64 |  |  |
|  | 104.39' E = E.C. |  |  |
| N |  | 4.6 | 57.0 |
| C |  | 4.4 | 57.2 |
| +3 |  | 4.9 | 56.7 |
| S |  | 4.8 | 56.8 |
|  | 11' E of E.C. |  |  |
| S |  | 3.9 | 57.7 |
| C |  | 4.2 | 57.4 |
| N |  | 4.8 | 56.8 |
|  | 35' E |  |  |
| N |  | 2.1 | 59.5 |
| +11 |  | 2.9 | 58.7 |
| C |  | 3.9 | 57.7 |
| +7 |  | 3.7 | 57.9 |
| S |  | 4.3 | 56.3 |
|  | 47.18' E = P.C. |  |  |
| S |  | 3.8 | 57.8 |
| C |  | 3.8 | 57.8 |
| N |  | 3.5 | 58.1 |
|  | 10' E of P.C. |  |  |
| N |  | 3.7 | 57.9 |
| C |  | 3.7 | 57.9 |
| S |  | 3.4 | 58.2 |
|  | 36' E |  |  |
| S |  | 1.7 | 59.9 |
| +9 |  | 1.7 | 59.9 |

|  |  |  |  |
|---|---|---|---|
|  | 461.64 |  |  |
| C |  | 0.1 | 61.5 |
| +5 |  | 0.2 | 61.4 |
| N |  | 0.9 | 60.7 |
|  | 63' E |  |  |
| N |  | 2.7 | 58.9 |
| C |  | 2.1 | 59.5 |
| S |  | 1.8 | 59.8 |

Book 1059-77

85.43' E = E.C. = 16.74 E of Sect. C

|  |  |  |  |
|---|---|---|---|
| S |  | 1.9 | 59.7 |
| +8 |  | 1.4 | 60.2 |
| C |  | 1.8 | 59.8 |
| N |  | 1.9 | 59.7 |
| chk |  | 6.58 | 455.06 on hub |

13.26 E. of last SECT = 30' E 1059-77

culv. Sta 103+49

| | | | | |
|---|---|---|---|---|
| | 1.01 | 17.28 | | 16.27 BM |
| 24' E of ℄ | | | 12.0 | flow line pipe |
| 24 " | | | 9.6 | top mud |
| 18 " | | | 7.9 | |
| 8 " | | | 9.2 | |
| 79 " | | | 12.1 | |
| ℄ | | | 11.6 | |
| 25' W | | | 12.0 | |
| 56 W | | | 11.8 | |
| 78 W | | | 12.6 | mud |
| 78 " | | | 15.0 | flow line |

Extension of readings at 150+15

| | | | | | |
|---|---|---|---|---|---|
| | 4.9 | 47.7 | | 42.8 | ℄ at 150+09 |
| 30' W of ℄ | | | 8.0 | 39.7 | |

Extension of readings at 151+70

| | | | | | |
|---|---|---|---|---|---|
| | 5.0 | 48.9 | | 43.9 | ℄ at 151+67 |
| 17.5' E of ℄ = Outlet of 12" vitrified pipe under road | | | 7.0 | 41.9 | flow line |
| 35' W. of ℄. | | | 11.6 | 37.3 | |

Extension of readings at 160

| | | | | | |
|---|---|---|---|---|---|
| | | HI<br>58.4 | | | |
| 29' W of ℄. | | | 12.7 | 45.7 | |
| 33' " " " | | | 14.2 | 44.2 | flow line outlet of old box. |
| 23.3' E of ℄ = Outlet 12" Vitrified pipe | | | 9.9 | | flow line |

Culv. at 159+60 (Why?)

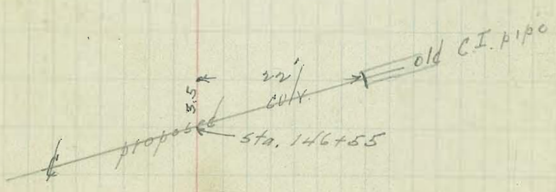
| | | |
|---|---|---|
| 32' E of ℄ | 4.2 | 54.2 |
| 26' " " " | 5.3 | 53.1 |
| 5' " " " | 5.6 | 52.8 |
| ℄ | 5.3 | 53.1 |
| 16' W. of ℄ | 5.0 | 53.4 |
| 20' " " " | 7.5 | 50.9 |
| 25' " " " | 11.0 | 47.4 |
| 34' " " " | 11.6 | 46.8 |

Culv. at 145+00

| | | | | | |
|---|---|---|---|---|---|
| | 4.8 | 45.2 | | 40.4 | ℄ at 145 |
| 32' E of ℄ | | | 2.4 | 42.8 | edge road |
| 29' " " " | | | 1.9 | 43.3 | |
| 19.5' " " " | | | 2.6 | 42.6 | |
| 14.5' " " " | | | 4.3 | 40.9 | |
| ℄ | | | 4.8 | 40.4 | |
| 16' W of ℄ | | | 5.2 | 40.0 | |
| 21' " " " | | | 7.8 | 37.4 | |
| 26.5' " " " | | | 11.6 | 33.6 | |
| 31' " " " | | | 12.3 | 32.9 | |

Culv. at 146+55 (Not on list but is apparently more necessary than 145+00

| | | |
|---|---|---|
| ℄ at 146 = 4.6 = | | |
| 22' E of ℄ = Outlet of C.I. pipe | 4.4 | = flow line of 6" C.I. pipe |
| 7' " " " | 4.9 | |
| ℄ | 5.3 | |
| 10' W of ℄ | 6.6 | |
| 20' " " " | 7.8 | |
| 30' " " " | 8.8 | |



Extension of readings at 150+15

| | | | | | |
|---|---|---|---|---|---|
| | 4.9 | 47.7 | | 42.8 | ℄ at 150+09 |
| 30' W of ℄ | | | 8.0 | 39.7 | |

Extension of readings at 151+70

| | | | | | |
|---|---|---|---|---|---|
| | 5.0 | 48.9 | | 43.9 | ℄ at 151+67 |
| 17.5' E of ℄ = Outlet of 12" vitrified pipe under road | | | 7.0 | 41.9 | flow line |
| 35' W. of ℄. | | | 11.6 | 37.3 | |

Extension of readings at 160

| | | | | | |
|---|---|---|---|---|---|
| | | HI<br>58.4 | | | |
| 29' W of ℄. | | | 12.7 | 45.7 | |
| 33' " " " | | | 14.2 | 44.2 | flow line outlet of old box |
| 23.3' E of ℄ = Outlet 12" Vitrified pipe | | | 9.9 | | flow line |

Culv. at 159+60 (Why?)

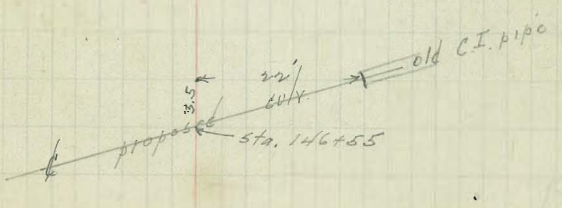
| | | | | | |
|---|---|---|---|---|---|
| 32' E of ℄ | | | 4.2 | 54.2 | |
| 26' " " " | | | 5.3 | 53.1 | |
| 5' " " " | | | 5.6 | 52.8 | |
| ℄ | | | 5.3 | 53.1 | |
| 16' W. of ℄ | | | 5.0 | 53.4 | |
| 20' " " " | | | 7.5 | 50.9 | |
| 25' " " " | | | 11.0 | 47.4 | |
| 34' " " " | | | 11.6 | 46.8 | |

Culv. at 145+00

| | | | | | |
|---|---|---|---|---|---|
| | 4.8 | 45.2 | | 40.4 | ℄ at 145 |
| 32' E of ℄ | | | 2.4 | 42.8 | edge road |
| 29' " " " | | | 1.9 | 43.3 | |
| 19.5' " " " | | | 2.6 | 42.6 | |
| 14.5' " " " | | | 4.3 | 40.9 | |
| ℄ | | | 4.8 | 40.4 | |
| 16' W of ℄ | | | 5.2 | 40.0 | |
| 21' " " " | | | 7.8 | 37.4 | |
| 26.5' " " " | | | 11.6 | 33.6 | |
| 31' " " " | | | 12.3 | 32.9 | |

℄ at 146 = 4.6 = Culv. at 146+55 (Not on list but is apparently more necessary than 145+00

| | | | | | |
|---|---|---|---|---|---|
| 22' E of ℄ = Outlet of C.I. pipe | | | 4.4 | | = flow line of 6" C.I. pipe |
| 7' " " " | | | 4.9 | | |
| ℄ | | | 5.3 | | |
| 10' W of ℄ | | | 6.6 | | |
| 20' " " " | | | 7.8 | | |
| 30' " " " | | | 8.8 | | |



## Culv. at 135+32.5

| | | | | | |
|---|---|---|---|---|---|
| | 5.0 | 51.2 | | 46.2 | ℄ at 135 |
| 22.5' E of ℄ and 2' No. | = Outlet 12" cement pipe | | 6.3 | 44.9 | = flow line |
| 17' " " " | | | 8.4 | 42.8 | |
| 15' " " " | | | 7.9 | 43.3 | = flow line of old box |
| 13' " " " | | | 5.6 | 45.6 | |
| 10' " " " | | | 4.6 | 46.6 | |
| 1' " " " | | | 4.8 | 46.4 | |
| ℄ | | | 5.6 | 45.6 | |
| 13' W. of ℄ | | | 5.9 | 45.3 | |
| 18' " " " | = Outlet old box | | 11.4 | 39.8 | = flow line |
| 18.1 " " " | = wash out below box | | 15.2 | 36.0 | |
| 29' " " " | | | 15.5 | 35.7 | |
| 30' " " " | | | 17.8 | 33.4 | |
| 40' " " " | | | 17.5 | 33.7 | |

## Culv. at 136+35

| | | |
|---|---|---|
| 26' E of ℄ | 3.9 | 47.3 |
| 21' E " " | 5.3 | 45.9 |
| 20' " " " | 8.2 | 43.0 |
| 10' " " " | 10.5 | 40.7 |
| 6' " " " | 8.0 | 43.2 |
| 5' " " " | 5.8 | 45.4 |
| 1' " " " | 9.5 | 41.7 |
| ℄ | 6.0 | 45.2 |
| 15' W of ℄ | 6.2 | 45.0 |
| 23' " " " | 11.2 | 40.0 |
| 35 " " " | 13.7 | 37.5 |

old box and outlet of cement pipe is covered.

## Culv. at 128+95 = old box.

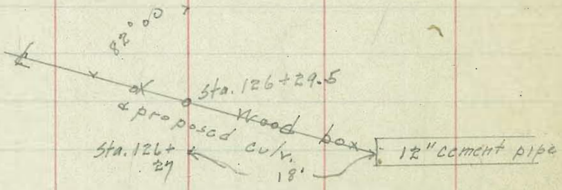
| | | | | | |
|---|---|---|---|---|---|
| | 5.2 | 54.2 | | 49.0 | ℄ at 129+ |
| 23' E of ℄ | | | 1.0 | 53.2 | |
| 18' " " ℄ | = approx end of 12" cement pipe under present road. | | 3.5 | 50.7 | |
| 3' " " " | | | 4.5 | 49.7 | |
| 2 " " " | | | 8.5 | 45.7 | = flow line of old box |
| ℄ | | | 6.4 | 47.8 | |
| 9' W of ℄ | | | 7.3 | 46.9 | |
| 14' " " " | | | 11.8 | 42.4 | |
| 14.1 " " " | | | 14.2 | 40.0 | |
| 20' " " " | | | 14.6 | 39.6 | |
| 35' " " " | | | 15.4 | 38.8 | |

## Culv. at 133+00 = opp 12" cement pipe across road

| | | | | | |
|---|---|---|---|---|---|
| | 4.7 | 52.44 | | 47.74 | hub at 132+85.12 |
| 19.7' E of ℄ | = end of cement pipe | | 2.9 | 49.5 | = flow line |
| 12' " " " | | | 2.9 | 49.5 | |
| ℄ | | | 4.5 | 47.9 | |
| 16' W. of ℄ | | | 6.3 | 46.1 | |
| 19' " " " | | | 10.0 | 42.4 | |
| 25 " " " | | | 12.1 | 40.3 | |
| 35' " " " | | | 13.6 | 38.8 | |

Colv. at Sta 126+29.5 = opp end of 12" cement pipe under present road.

| | | | | | |
|---|---|---|---|---|---|
| | 4.4 | 55.5 | | 51.1 | ℄ at Sta 126 |
| 18' E. of ℄ = W end of pipe | | | 4.6 | 50.9 | = flow line |
| 17.5 " " " | | | 6.6 | 48.9 | |
| 13.5 " " " = E. End of old wood box | | | 6.4 | 49.1 | = flow line of wood box |
| 11.5 " " " | | | 4.7 | 50.8 | |
| 5' " " " | | | 4.3 | 51.2 | |
| ℄ | | | 4.5 | 51.0 | |
| 9' W of ℄ | | | 5.0 | 50.5 | |
| 13.5 " " " | | | 6.0 | 49.5 | |
| 17.2' " " " = W end of old box | | | 10.1 | 45.4 | = flow line |
| 20.4 " " " | | | 10.4 | 45.1 | |



Colv. at Sta. 120+00

| | | | | | |
|---|---|---|---|---|---|
| | 8.4 | 49.8 | | 41.4 | ℄ at 120 |
| 27.5' E of ℄ | | | 1.7 | 48.1 | = edge road |
| 23 " " " | | | 21 | 47.7 | |
| 20' " " " | | | 35 | 46.3 | |
| 14' " " " | | | 4.3 | 45.5 | |
| 12' " " " | | | 53 | 44.5 | |
| 6' " " " | | | 6.1 | 43.7 | |
| 3' " " " | | | 7.9 | 41.9 | |
| ℄ | | | 8.4 | 41.4 | |
| 8' W of ℄ | | | 9.0 | 40.8 | |
| 16' " " " | | | 89 | 40.9 | |
| 19' " " " | | | 7.4 | 42.4 | |
| 27' " " " | | | 88 | 41.0 | |
| 34' " " " | | | 9.2 | 40.6 | |
| 50' " " " | | | 12.0 | 37.8 | drops 1-1½ |

Colv. at Sta 115+13
This sta. is opposite End of
12" cement pipe across present road.

| | | | | | |
|---|---|---|---|---|---|
| | 6.2 | 37.0 | | 30.8 | ℄ at 115+00 |
| 22.5 E of ℄ = end of cement pipe | | | 6.9 | 30.1 | = flow line |
| 13' ✓ ✓ ✓ | | | 5.4 | 31.6 | |
| ℄ | | | 6.1 | 30.9 | |
| 3' W. of ℄ | | | 5.3 | 31.7 | |
| 13' ✓ ✓ ✓ | | | 5.6 | 31.4 | |
| 18' ✓ ✓ ✓ | | | 6.8 | 30.2 | |
| 20' ✓ ✓ ✓ | | | 8.5 | 28.5 | |
| 24 ✓ ✓ ✓ | | | 11.2 | 25.8 | |

Colv. at Sta 116+00 (Can't see the necessity for this. See above

| | | | | | |
|---|---|---|---|---|---|
| | 6.3 | 39.0 | | 32.7 | ℄ at 116+00 |
| 29' E of ℄ | | | 3.7 | 35.3 | = edge road |
| 13' ✓ ✓ ✓ | | | 4.6 | 34.4 | |
| 9' ✓ ✓ ✓ | | | 6.4 | 32.6 | |
| ℄ | | | 6.3 | 32.7 | |
| 2' W of ℄ | | | 6.7 | 32.3 | |
| 16.5 ✓ ✓ ✓ | | | 6.8 | 32.2 | |
| 20' ✓ ✓ ✓ | | | 8.1 | 30.9 | |
| 24' ✓ ✓ ✓ | | | 10.9 | 28.1 | |

Colv at 94+45 = S curb of Kane

| | | | | | |
|---|---|---|---|---|---|
| | 5.0 | 13.0 | | 8.8 | ℄ at Sta 94.95 |
| 15' E of E.L. Blvd. | | | 4.5 | 8.5 | |
| E.L. | | | 4.8 | 8.2 | |
| +15 | | | 5.2 | 7.8 | |
| +25.48 = C | | | 5.3 | 7.7 | |
| +49 | | | 5.5 | 7.5 | |
| +53 | | | 6.1 | 6.9 | |
| +54 | | | 7.1 | 5.9 | |
| +63 | | | 7.5 | 5.5 | |
| +66 | | | 6.3 | 6.7 | |
| +97 | | | 6.8 | 6.2 | |
| 1+00 | | | 8.0 | 5.0 | |

Colv at 95+13 = N cb of Kane

| | | |
|---|---|---|
| 15' E of E Line | 3.7 | 7.3 |
| E L of Blvd | 4.2 | 8.8 |
| +20 | 5.1 | 7.9 |
| +25.48 = C | 5.0 | 8.0 |
| +50 | 5.3 | 7.7 |
| +57 | 6.5 | 6.5 |
| +98 | 7.0 | 6.0 |
| 1+00 | 7.6 | 5.4 |

Colv. at 90+65 = N.Cb. Lister ✓

| | | | | | |
|---|---|---|---|---|---|
| | 4.4 | 13.5 | | 9.1 | ℄ at 90+00 |
| 15' E of E. Line of Blvd. | | | 3.8 | 9.7 | |
| E Line of Blvd. | | | 3.9 | 9.6 | |
| +3 | | | 4.0 | 9.5 | |
| +4.5 | | | 4.5 | 9.0 | |
| +6.5 | | | 46 | 8.9 | |
| +10 | | | 3.2 | 10.3 | |
| +18 | | | 3.9 | 9.6 | |
| +20 | | | 4.8 | 8.7 | |
| +25.48 = ℄ 58 | | | 4.7 | 8.8 | |
| +47 | | | 5.0 | 8.5 | |
| +50 | | | 7.2 | 6.3 | |
| +79 | | | 7.4 | 6.1 | |
| +84 | | | 6.9 | 6.6 | |
| +87 | | | 7.8 | 5.7 | |
| +93 | | | 7.9 | 5.6 | |
| +97 | | | 6.9 | 6.6 | |
| 1+00 | | | 9.3 | 4.2 | |

Colv. at 90+13 = S.Cb. Lister ✓

| | | | | | |
|---|---|---|---|---|---|
| | 4.4 | 13.5 | | 9.1 | Sta 90+00 ℄ |
| 15' E of E Line of Blvd | | | 3.5 | 10 0 | 9.1 |
| E Line | | | 3.7 | 9 8 | |
| +4 | | | 4.8 | 8 7 | |
| +5 | | | 4.5 | 9 0 | |
| +7 | | | 4.5 | 9 0 | |
| +8 | | | 3.8 | 9 7 | |
| +17 | | | 3.7 | 9 8 | |
| +21 | | | 4.4 | 9 1 | |
| +25.48 = C | | | 4.5 | 9 0 | |
| +35 | | | 4.5 | 9 0 | |
| +47 | | | 5.5 | 8 0 | |
| +49 | | | 6.2 | 7 3 | |
| +65 | | | 6.9 | 6 6 | |
| +80 | | | 7.3 | 6 2 | |
| +97 | | | 7.3 | 6 2 | |
| 1+00 | | | 9.2 | 4 3 | |

1/26/49 Gregory

Alignment Notes of
Highway from No Side
of Old Town
To Balboa Ave.

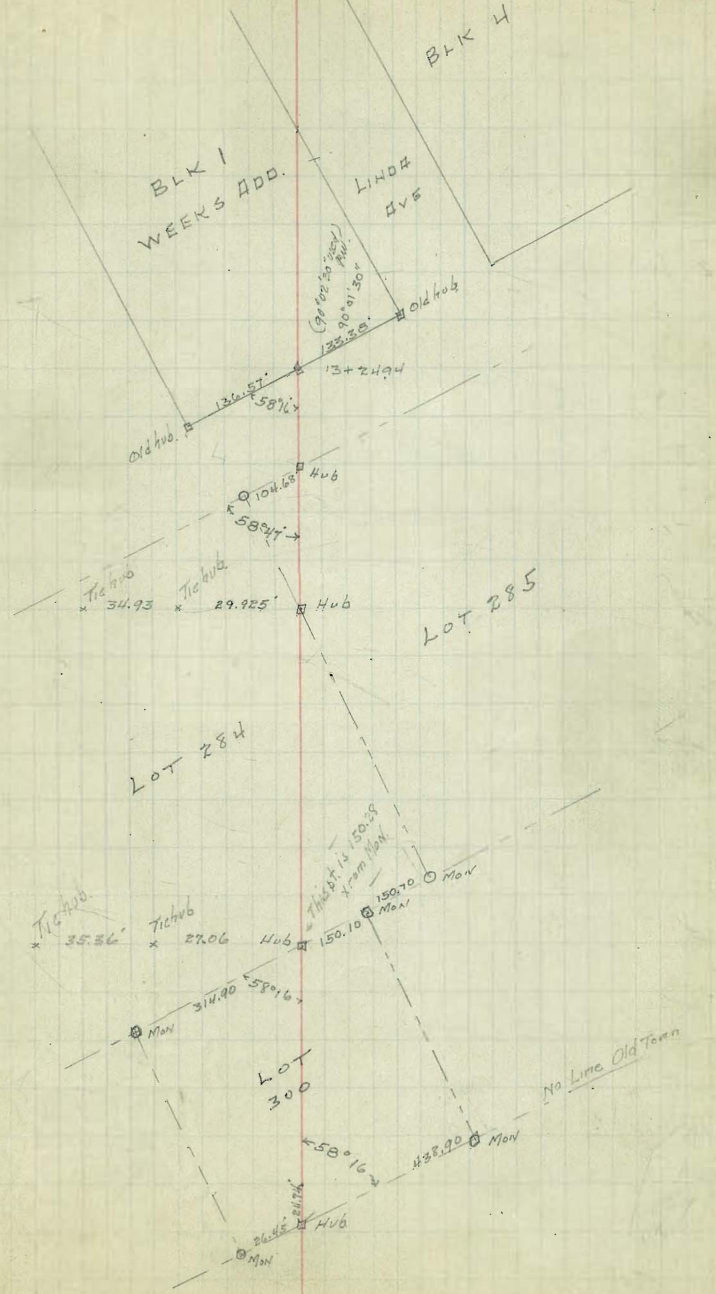
13+24.94

12+95.05 ⊙

10+95.98 ⊙

5+23.73 ⊙

0+00

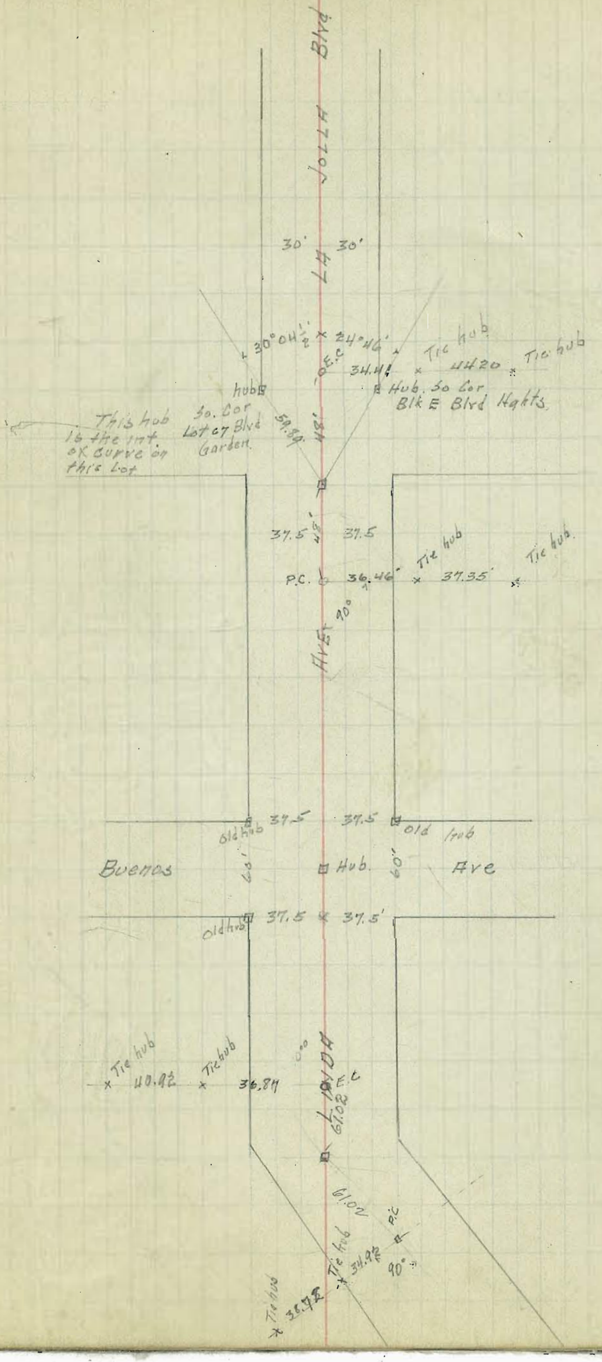


22+79.77 Δ 42°01' Right

18+23.22

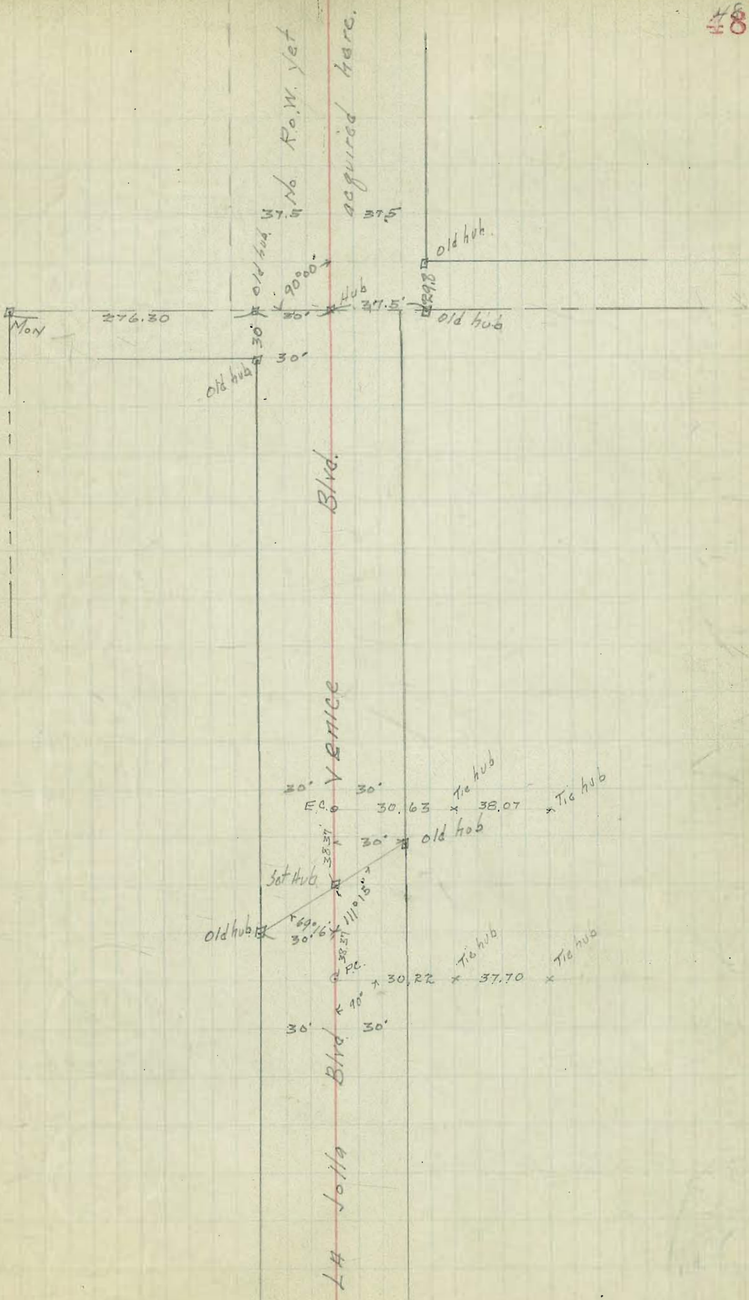
16+50.11 Δ 37°41'30" Left.

See 1057-2



38+39.09 ⊙ P.O.T.

31+96.15 △ 41°59' L.



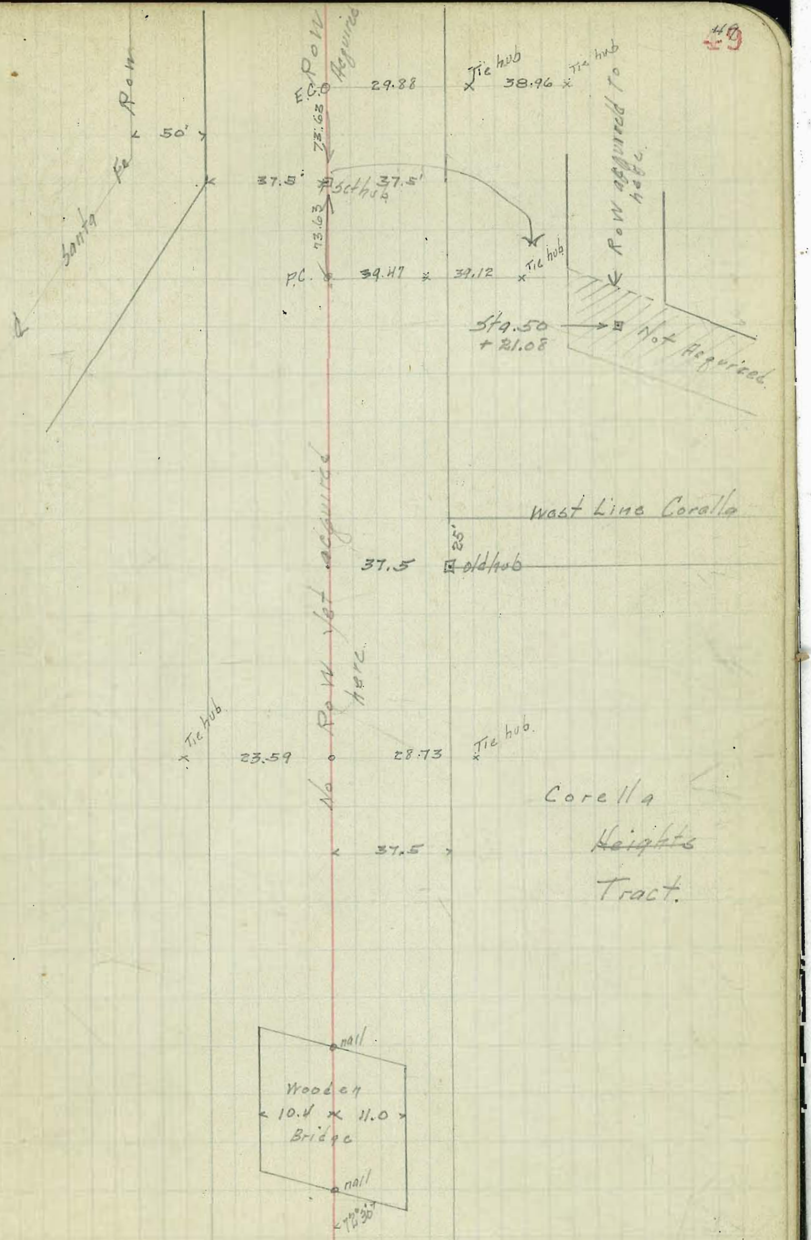
50+21.08 Δ 36°14½' Right

46+88.89

44+00 P.O.T.

41+71.91 = No. End Bridge

41+51.35 = So. End Bridge



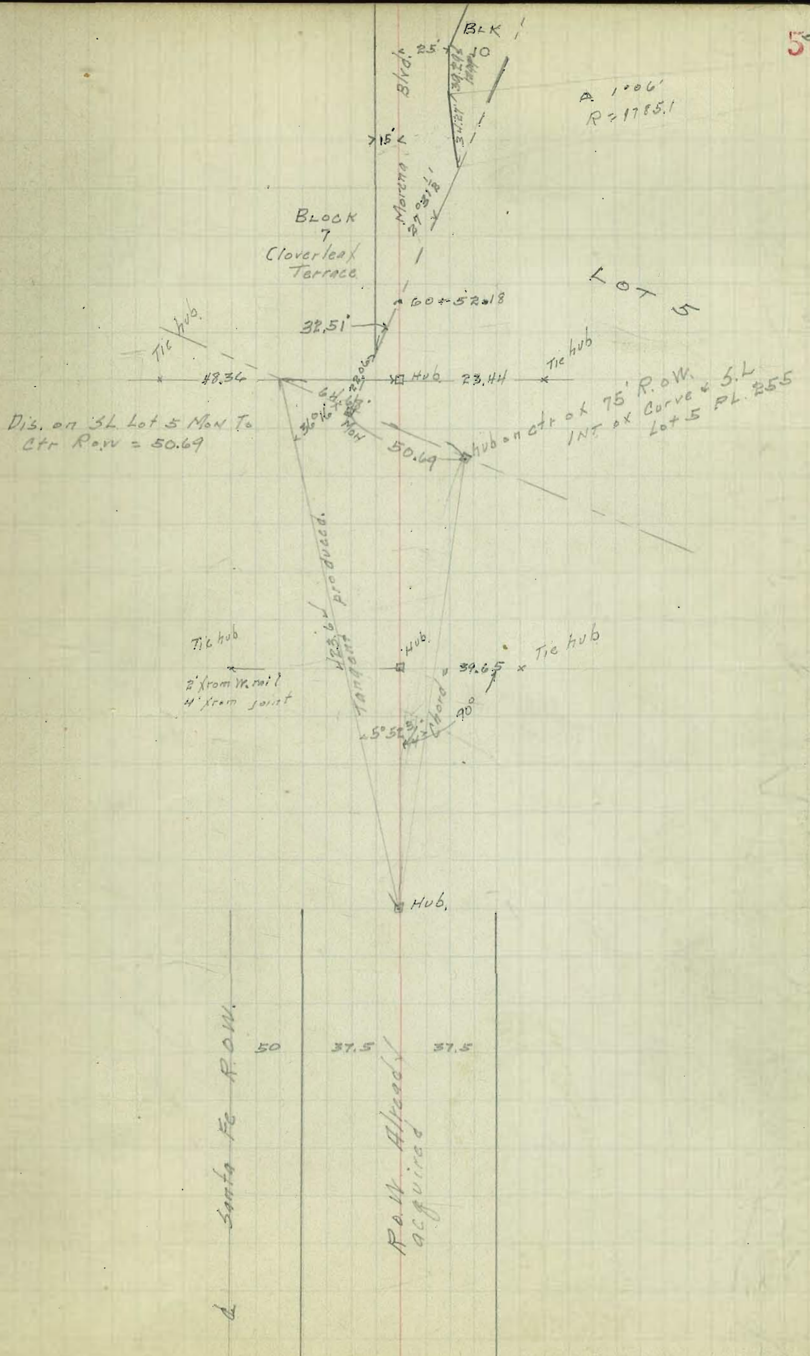
60+49.31 E.C.

R = 500
St = 115.85

59+37.47 Δ 26°05½' R.

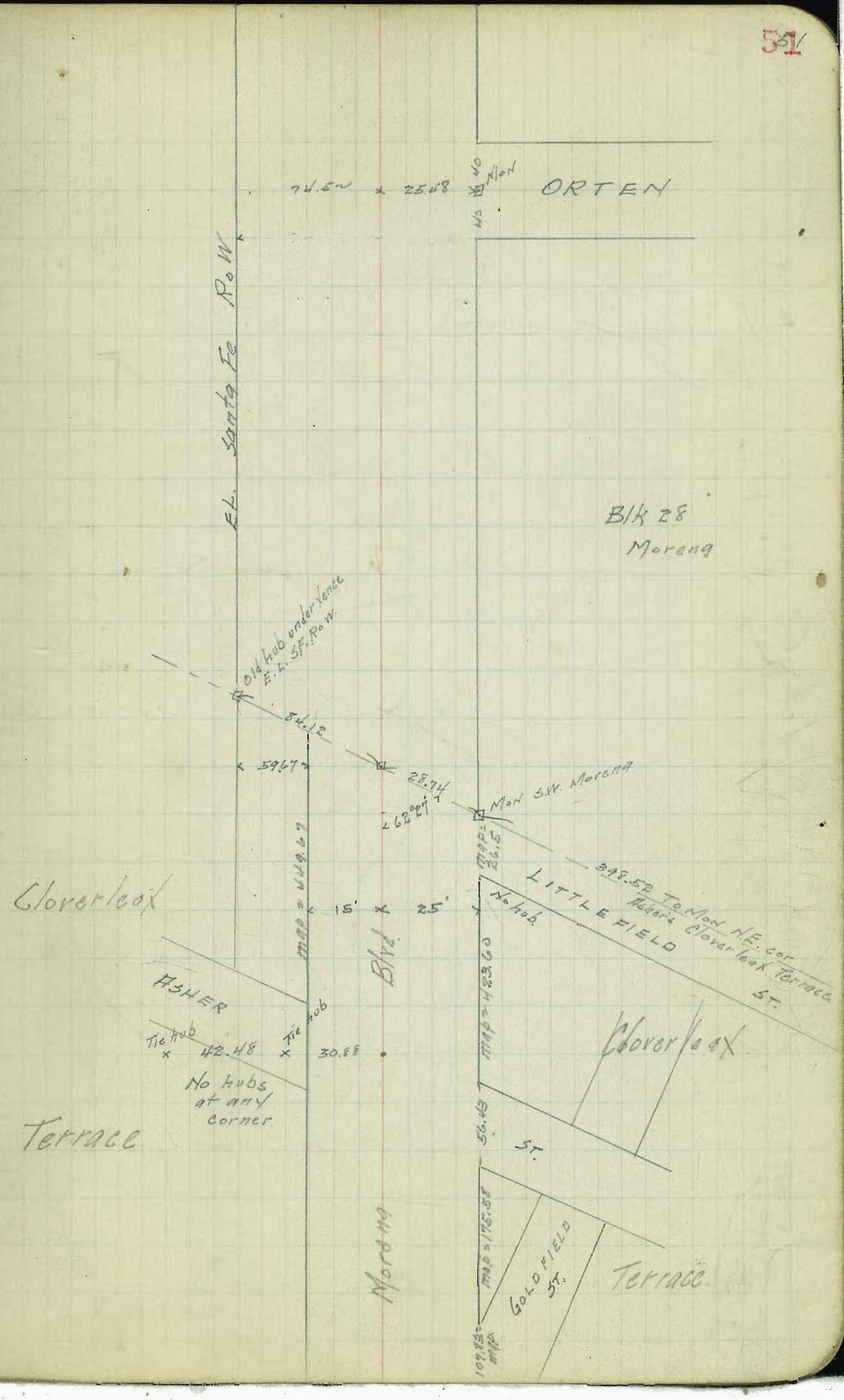
58+21.62, P.C.

55+99.37 ⊙ P.O.T. = P.C. 3° R of Santa Fe.

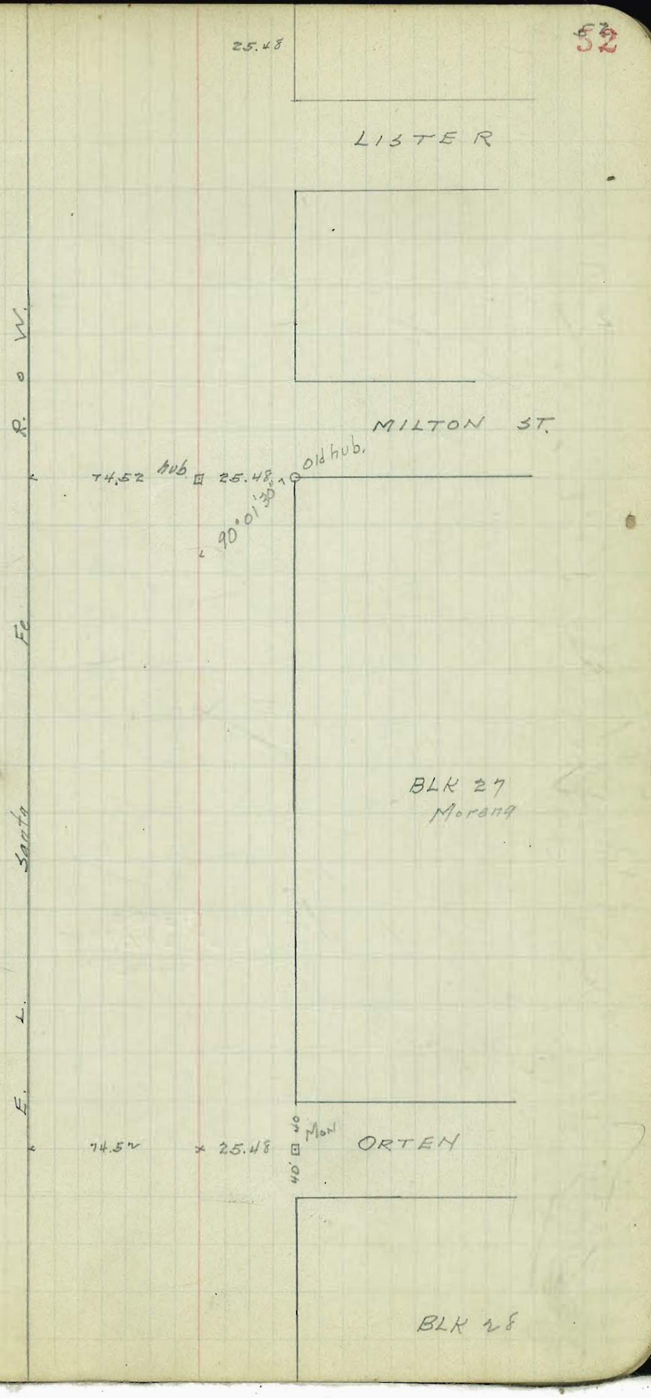


69+76.47 ⊙ P.O.T.

65+50 ⊙ P.O.T.



85+69.01 ⊙ P.O.T.

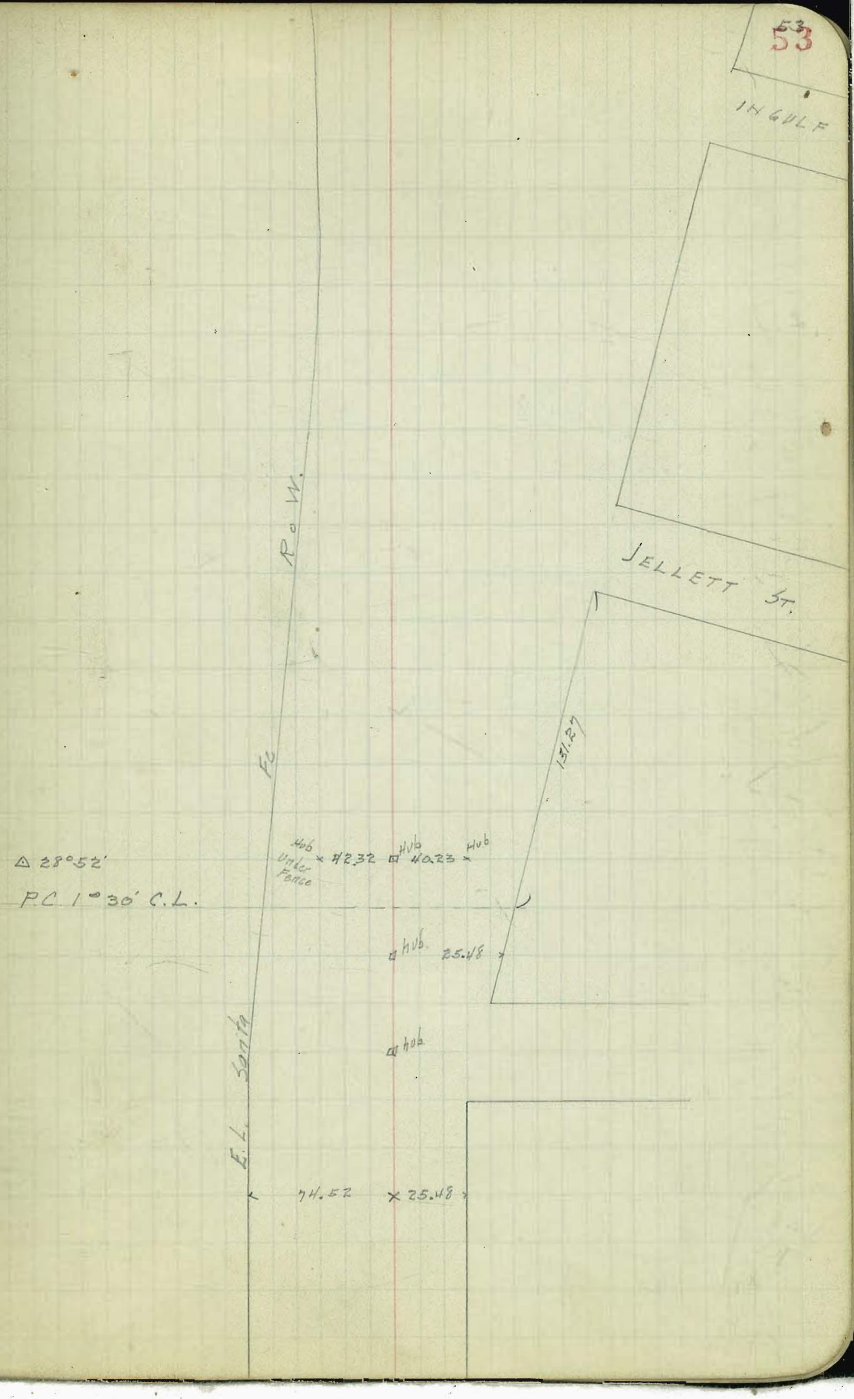

25.48
LISTER
MILTON ST.
E. L. Santa Fe R. o W.
74.52
hub
25.48
old hub.
90°01'30"
BLK 27
Morena
74.52
25.48
Mon
40'
40'
ORTEN
BLK 28

99+80.57 = E.C.

97+33.90 △ 9°26'37" L

R = 3000'
st = 247.80
lc = 494.47

94+96.10 = Equation
94+86.10 P.C.



117+04.46 E.C.

Δ 19°25'23" L

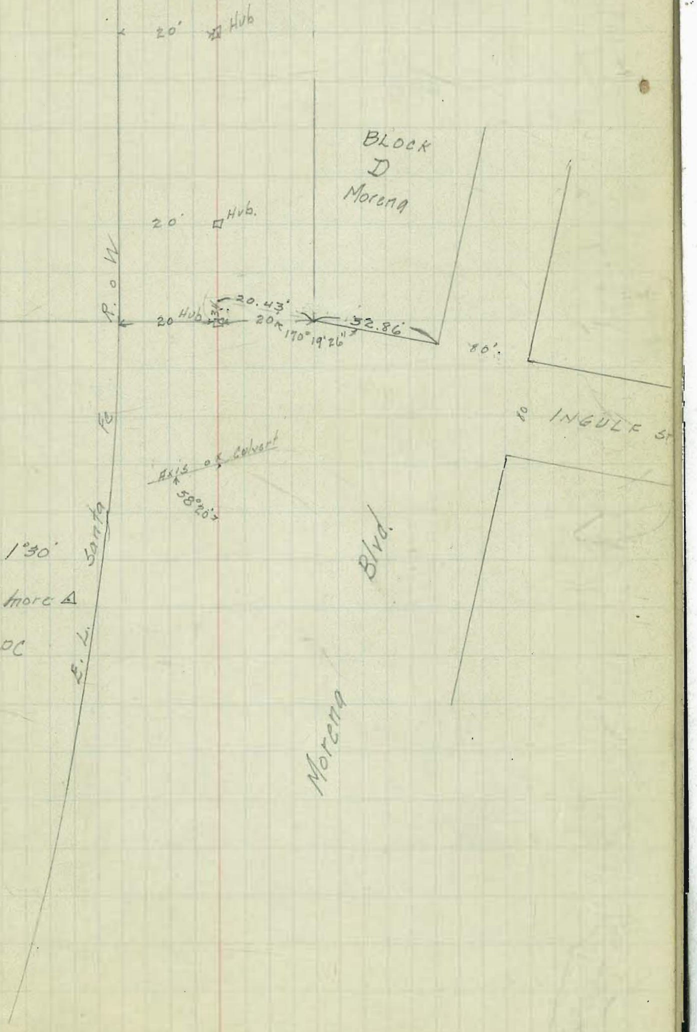
R = 3889.83
St = 665.71
Lc = 1318.64

107+24.49 P.O.C.

Δ 4°59'23"

103+85.82 P.C.

103+49 = center of necessary culvert.



Santa Fe Curve 1°30'
consumes 9°26'37" more Δ
angle So. of Above PC

138+82.83 ⊙ P.O.T.

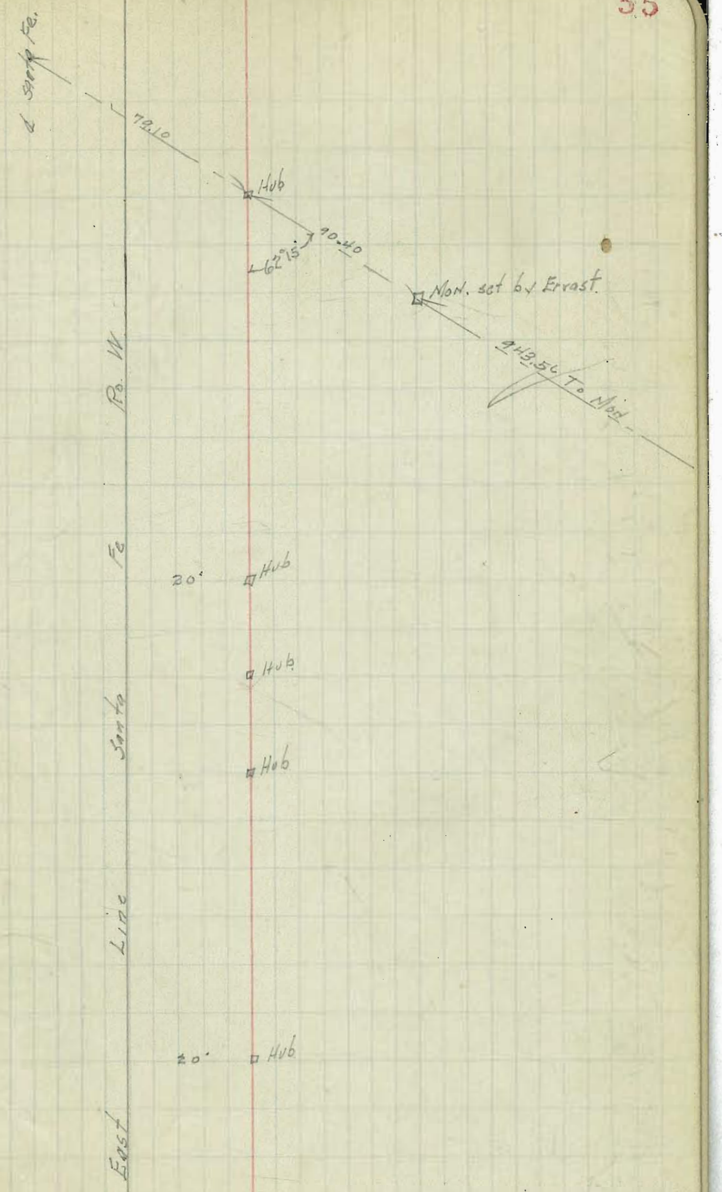
132+85.12 E.C

R = 5799.65
St = 356.79
Lc = 712.78

129+29.13 △ 7°02'30" Left

125+72.34 P.C.

124+00 ⊙ P.O.T.



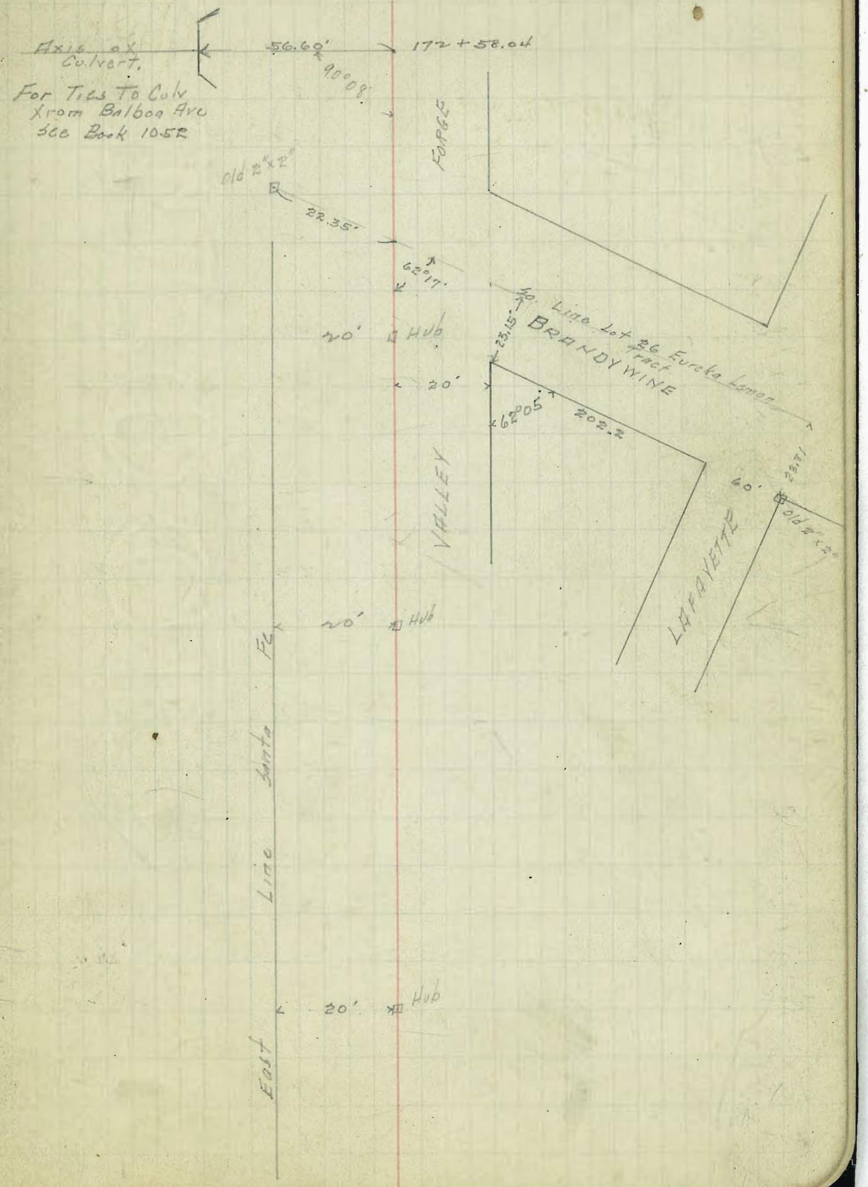
172+ 58.04

168+74.0

165+45.0 ⊙ POT

159+00 ⊙ POT.

148+00 ⊙ P.OT.



47.56

CROSS SECTIONS OF MORENA BLVD
CONTINUED FROM Book 1048

| | | | | | |
|---|---|---|---|---|---|
| | ✓ 149+83 | | | | |
| -5 | | 0.2 | 47 | 4 | |
| E | | 2.6 | 45 | 0 | |
| +3 | | 3.4 | 44 | 2 | |
| +15 | | 4.8 | 42 | 8 | |
| +30=W | | 5.3 | 42 | 3 | |
| +5 | ✓ | 1.8 | 45 | 8 | |
| | 149+90 | | | | |
| -5 | | 4.7 | 42 | 9 | |
| W | | 5.2 | 42 | 4 | |
| +15 | | 4.9 | 42 | 7 | |
| +20 | | 4.0 | 43 | 6 | |
| +30=E | | 3.4 | 44 | 2 | |
| +5 | ✓ | 2.3 | 45 | 3 | |
| | 150+09.0 | | | | |
| -5 | | 1.6 | 46 | 0 | |
| E | | 3.1 | 44 | 5 | |
| +12 | | 4.0 | 43 | 6 | |
| +15 | | 4.8 | 42 | 8 | |
| +30=W | | 5.2 | 42 | 4 | |
| +5 | ✓ | 3.8 | 43 | 8 | |
| | 150+12 = So. edge of 2.6' x 6' double box | | | | |
| -4.5 | | 7.8 | 39.8 | | = Flow line Outlet |
| W | | 7.8 | 39.8 | | |
| +15 | | 7.8 | 39.8 | | |
| +17 | | 7.6 | 40.0 | | Flow line Inlet |

18 47.5 75

47.56

| | | | | | |
|---|---|---|---|---|---|
| +30=E | | 6.5 | 41 | 1 | |
| +5 | | 4.6 | 43 | 0 | |
| | ✓ 150+18 = No. Edge Culvert opp. Highway Culv. | | | | |
| -5 | | 6.7 | 40 | 9 | |
| E | | 7.0 | 40 | 6 | |
| +15 | | 7.8 | 39 | 8 | |
| +30=W | | 6.8 | 40 | 8 | |
| +5 | | 6.9 | 40 | 7 | |
| | ✓ 150+21 | | | | |
| -5 | | 7.0 | 40 | 6 | |
| W | | 5.0 | 42 | 6 | |
| +15 | | 4.8 | 42 | 8 | |
| +17 | | 3.5 | 44 | 1 | |
| +30=E | | 3.9 | 43 | 7 | |
| +5 | ✓ | 3.8 | 43 | 6 | |
| | 150+33 | | | | |
| -5 | | 1.3 | 46 | 3 | |
| E | | 1.9 | 45 | 7 | |
| +3 | | 3.1 | 44 | 5 | |
| +15 | | 4.9 | 42 | 7 | |
| +30=W | | 4.6 | 43 | 0 | |
| +3 | | 3.2 | 44 | 4 | |
| +5 | ✓ | 3.4 | 43 | 2 | |
| | 150+60 | | | | |
| -5 | | 5.6 | 42 | 0 | |
| W | | 4.4 | 43 | 2 | |

4756

| | | | | | |
|---|---|---|---|---|---|
| +15 | | | 4.3 | 43 | 3 |
| +30=E | | | 2.9 | 44 | 7 |
| +5 | | | 0.9 | 46 | 7 |
| | | 151+00 | | | |
| -5 | | | 2.9 | 44 | 7 |
| E | | | 3.9 | 43 | 7 |
| +15 | | | 3.9 | 43 | 7 |
| +27 | | | 4.2 | 43 | 4 |
| +30=W | | | 4.9 | 42 | 7 |
| +5 | | ✓ | 8.0 | 39 | 6 |
| | | 151+67 | | | |
| -5 | | | 6.5 | 41 | 1 |
| W | | | 3.6 | 44 | 0 |
| +15 | | | 3.7 | 43 | 9 |
| +30=E | | | 4.2 | 43 | 4 |
| +5 | | ✓ | 4.5 | 43 | 1 |
| | | 151+71.7 = ¢ of 1'×2' box opp. highway culvert. | | | |
| -5 | | | 4.8 | 42 | 8 |
| -2 | | | 8.8 | 38 | 8 |
| E | | | 10.8 | 36 | 8 |
| +12.5 | do not use for yardage.<br>water does not go thru culv. | | 7.5 | 40.1 | Flowline Inlet |
| +15 | | | 9.5 | 38 | 1 |
| +18 | | | 3.7 | 43 | 9 |
| +29.9 | | | 4.0 | 43 | 6 |
| +30=W | | | 11.1 | 36 | 5 |
| +5 | do not use for yardage. | | 9.4 | 38.2 | Flowline outlet |
| +5 | | | 11.2 | 36 | 4 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | ✓<br>151+76 | | | |
| -5 | | | | 6.8 | 40 | 8 |
| W | | | | 3.5 | 44 | 1 |
| +12 | | | | 3.3 | 44 | 3 |
| +15 | | | | 4.1 | 43 | 5 |
| +30=E | | | | 3.6 | 44 | 0 |
| +5 | | | | 4.2 | 43 | 4 |
| | | | ✓<br>152+00 | | | |
| -5 | | | | 2.6 | 45 | 0 |
| E | | | | 3.0 | 44 | 6 |
| +15 | | | | 3.1 | 44 | 5 |
| +18 | | | | 2.9 | 44 | 7 |
| +30=W | | | | 3.0 | 44 | 6 |
| +5 | | | | 5.5 | 42 | 1 |
| | | | 152+50 | | | |
| -5 | | | | 2.2 | 45 | 4 |
| W | | | | 2.1 | 45 | 5 |
| +15 | | | | 2.1 | 45 | 5 |
| +21 | | | | 1.3 | 46 | 4 |
| T.P. | 12.86 | ✓<br>58.56 | | 1.86 | 45 | 70 ✓ |
| +30=E | | | | 10.0 | 48 | 6 |
| +5 | | | | 10.3 | 48 | 3 |
| | | | ✓<br>153+00 | | | |
| -5 | | | | 10.5 | 48 | 1 |
| E | | | | 10.9 | 47 | 7 |
| +15 | | | | 12.2 | 46 | 4 |

Moreno

| | | | |
|---|---|---|---|
| | 58.56 | | |
| +30 = W | | 12.5 | 46 1 |
| +1 | | 12.3 | 46 3 |
| +2 | | 11.2 | 46 4 |
| +5 | ✓ | 11.1 | 47 5 |
| | 153+25 | | |
| -5 | | 11.1 | 47 5 |
| -3 | | 11.1 | 47 5 |
| -1 | | 12.1 | 46 5 |
| W | | 12.1 | 46 5 |
| +8 | | 12.1 | 46 5 |
| +15 | | 11.6 | 47 0 |
| +19 | | 11.2 | 47 4 |
| +30 = E | | 8.3 | 50 3 |
| +5 | | 7.7 | 50 9 |
| | 153+50 | | |
| -5 | | 7.3 | 51 3 |
| E | | 7.8 | 50 8 |
| +10 | | 9.8 | 48 8 |
| +12 | | 11.0 | 47 6 |
| +15 | | 11.3 | 47 3 |
| +30 = W | | 12.1 | 46 5 |
| +1 | | 11.9 | 46 7 |
| +3 | | 10.8 | 47 8 |
| +5 | | 10.5 | 48 1 |
| | 154+00 | | |
| -5 | | 10.0 | 48 6 |

| | | | |
|---|---|---|---|
| | 58.56 | | |
| -3 | | 10.2 | 48 4 |
| -2 | | 11.4 | 47 2 |
| W | | 11.6 | 47 0 |
| +15 | | 10.8 | 47 8 |
| +17 | | 10.7 | 47 9 |
| +18 | | 9.7 | 46 9 |
| +27 | | 6.8 | 51 8 |
| +30 = E | | 6.4 | 52 2 |
| +5 | | 5.9 | 51 7 |
| | 154+50 | | |
| -5 | | 4.3 | 54 3 |
| E | | 5.0 | 53 6 |
| +6 | | 6.3 | 52 3 |
| +10 | | 7.9 | 50 7 |
| +12.5 | | 9.9 | 48 7 |
| +15 | | 10.1 | 48 5 |
| +25 | | 10.9 | 47 7 |
| +30 = W | | 10.9 | 47 7 |
| +1 | | 10.7 | 47 9 |
| +2 | | 9.5 | 49 1 |
| +5 | | 9.2 | 49 4 |
| | 155+00 | | |
| -5 | | 8.2 | 50 4 |
| -2 | | 8.3 | 50 3 |
| -1 | | 10.0 | 48 6 |
| W | | 10.4 | 48 2 |
| +15 | | 9.5 | 49 1 |

58.56

| | | | |
|---|---|---|---|
| +17 | | 9.3 | 49 3 |
| +19 | | 7.1 | 51 5 |
| +30 = E | | 3.6 | 54 8 |
| +5 | | 3.1 | 55 5 |
| | 155+50 | | |
| -5 | | 1.3 | 57 3 |
| -2 | | 1.2 | 57 5 |
| E | | 1.7 | 56 9 |
| +6 | | 4.5 | 54 1 |
| +9 | | 5.2 | 54 4 |
| +12 | | 8.1 | 50 5 |
| +15 | | 8.5 | 50 4 |
| +25 | | 9.3 | 49 3 |
| +30 = W | | 9.3 | 49 3 |
| +1 | | 9.0 | 49 6 |
| +3 | | 6.7 | 51 9 |
| +5 | | 6.6 | 52 0 |
| | 156+00 | | |
| -5 | | 4.4 | 54 2 |
| -3 | | 4.4 | 54 2 |
| W | | 8.2 | 50 4 |
| +4 | | 8.8 | 49 8 |
| +15 | | 7.9 | 50 7 |
| +18 | | 7.5 | 51 1 |
| +22 | | 3.1 | 55 5 |
| +28 | | 1.2 | 57 5 |

58.56

| | | | |
|---|---|---|---|
| +30) = E | | 0.3 | 58 3 |
| +5 | | 0.1 | 58 5 |
| | 156+50 | | |
| -5 | | +0.1 | 58 7 |
| E | | 1.4 | 57 2 |
| +8 | | 3.0 | 55 6 |
| +11 | | 6.5 | 52 1 |
| +15 | | 7.0 | 51 6 |
| +26 | | 7.9 | 50 7 |
| +30 = W | | 7.5 | 51 1 |
| +3 | | 2.9 | 55 7 |
| +5 | | 2.9 | 55 7 |
| | 157+00 | | |
| -5 | | 2.0 | 56 6 |
| -3 | | 1.9 | 56 7 |
| W | | 7.2 | 51 4 |
| +5 | | 7.7 | 50 9 |
| +15 | | 7.0 | 51 6 |
| +18 | | 6.8 | 51 8 |
| +22 | | 2.8 | 55 8 |
| +30 = E | | 0.7 | 57 9 |
| +5 | | 0.4 | 58 2 |
| | 157+50 | | |
| -5 | | 1.6 | 57 0 |
| E | | 1.2 | 57 4 |
| +5 | | 2.0 | 57 6 |

|  |  |  |  |  |
|---|---|---|---|---|
|  | 58.56 |  |  |  |
| +10 |  | 4.0 | 54 | 6 |
| +13 |  | 6.4 | 52 | 2 |
| +15 |  | 6.6 | 52 | 0 |
| +28 |  | 7.3 | 51 | 3 |
| +30 = W |  | 6.9 | 51 | 7 |
| +3 |  | 2 2 | 56 | 4 |
| +5 | ✓ | 2 3 | 56 | 3 |
|  | 158+00 |  |  |  |
| -5 |  | 2 3 | 56 | 3 |
| -3 |  | 2 3 | 56 | 3 |
| -1 |  | 6.6 | 52 | 0 |
| W |  | 6.8 | 51 | 8 |
| +3 |  | 6.9 | 51 | 7 |
| +15 |  | 6.1 | 52 | 5 |
| +18 |  | 5.7 | 52 | 9 |
| +20 |  | 3.7 | 54 | 9 |
| +25 |  | 1.9 | 56 | 7 |
| +30 = E |  | 1.2 | 57 | 4 |
| +5 | ✓ | 0.9 | 57 | 7 |
|  | 158+20 |  |  |  |
| -5 |  | 1.2 | 57 | 4 |
| E |  | 1.2 | 57 | 4 |
| +5 |  | 1.7 | 56 | 9 |
| +9 |  | 3.3 | 54 | 3 |
| +11 |  | 5.5 | 53 | 1 |
| +15 |  | 5.9 | 52 | 7 |

Moreno

|  |  |  |  |  |
|---|---|---|---|---|
| +27 |  | 6.7 | 51 | 9 |
| W |  | 6.4 | 52 | 2 |
| +1 |  | 6.1 | 52 | 5 |
| +3 |  | 2 1 | 56 | 5 |
| +5 | ✓ | 2 2 | 56 | 4 |
|  | 158+32 |  |  |  |
| -5 |  | 6.4 | 52 | 2 |
| W |  | 6.6 | 52 | 0 |
| +15 |  | 5.9 | 52 | 7 |
| +17 |  | 5.8 | 52 | 8 |
| +19 |  | 3.9 | 54 | 7 |
| +25 |  | 2 4 | 56 | 2 |
| +30 = E |  | 1.7 | 56 | 9 |
| +5 | ✓ | 1.6 | 57 | 0 |
|  | 158+70 |  |  |  |
| -5 |  | 3.5 | 55 | 1 |
| E |  | 3.5 | 55 | 1 |
| +6 |  | 3.3 | 55 | 3 |
| +12 |  | 4.9 | 53 | 7 |
| +15 |  | 5.6 | 53 | 0 |
| +30 = W |  | 6.4 | 52 | 2 |
| +2 |  | 6.6 | 52 | 0 |
| +5 |  | 8.5 | 50 | 1 |
|  | 159+00 |  |  |  |
| -5 |  | 8.1 | 50 | 5 |
| -W |  | 6.3 | 52 | 3 |

|  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|
|  |  | 58.56 |  |  |  |  |
| W |  |  | 5.9 | 52 | 7 |  |
| +15 |  |  | 5.0 | 53 | 6 |  |
| +30 = E |  |  | 3.9 | 54 | 7 |  |
| +5 |  |  | 3.5 | 55 | 1 |  |
| BM. | 8.24 | ✓ 61.81 | 4.99 | ✓ 53.57 |  | hub 5+9 159+00 |
|  |  | ✓ 159+37 |  |  |  |  |
| -5 |  |  | 6.5 | 55 | 3 |  |
| E |  |  | 7.4 | 54 | 4 |  |
| +10 |  |  | 8.8 | 53 | 0 |  |
| +15 |  |  | 8.9 | 52 | 9 |  |
| +17 |  |  | 8.5 | 53 | 3 |  |
| +30 = W |  |  | 8.8 | 53 | 0 |  |
| +2 |  |  | 9.1 | 52 | 7 |  |
| +5 |  |  | 11.4 | 50 | 4 |  |
|  |  | ✓ 159+60 |  |  |  |  |
| -5 |  |  | 10.9 | 50 | 9 |  |
| -2 |  |  | 8.6 | 53 | 2 |  |
| W |  |  | 8.5 | 53 | 3 |  |
| +8 |  |  | 8.4 | 53 | 4 |  |
| +15 |  |  | 9.0 | 52 | 8 |  |
| +18 |  |  | 9.2 | 52 | 6 |  |
| +30 = E |  |  | 9.0 | 52 | 8 |  |
| +5 |  | ✓ |  9.1 | 52 | 7 |  |
|  |  | 159+90 |  |  |  |  |
| -5 |  |  | 12.6 | 49 | 2 |  |
| E |  |  | 12.5 | 49 | 3 |  |

Moreno

|  |  |  |  |  |  |
|---|---|---|---|---|---|
|  | 61.81 |  |  |  |  |
| +3 |  | 10.3 | 51 | 5 |  |
| +15 |  | 8.6 | 53 | 2 |  |
| +18 |  | 8.2 | 53 | 6 |  |
| +30 = W |  | 8.7 | 53 | 1 |  |
| +5 |  | 11.1 | 50 | 7 |  |
|  | ✓ 160+00 = ℄ of | 1.6' × 2.4 |  |  | box |
| -18.0 |  | 17.6 = | 44 | 2 | flow line outlet |
| -5 |  | 10.5 | 51 | 3 |  |
| -2 |  | 9.1 | 52 | 7 |  |
| W |  | 8.8 | 53 | 0 |  |
| +15 |  | 8.2 | 53 | 6 |  |
| +19 |  | 9.1 | 52 | 7 |  |
| +26 |  | 15.8 | 46 | 0 | flow line inlet. |
| +30 = E |  | 14.6 | 47 | 2 |  |
| +5 |  | 13.2 | 48 | 6 |  |
|  | ✓ 160+10 |  |  |  |  |
| -5. |  | 12.2 | 49 | 6 |  |
| -3 |  | 12.4 | 49 | 4 |  |
| -2 |  | 11.5 | 50 | 3 |  |
| E |  | 10.8 | 51 | 0 |  |
| +5 |  | 9.7 | 52 | 1 |  |
| +10 |  | 7.9 | 53 | 9 |  |
| +15 |  | 7.9 | 53 | 9 |  |
| +30 = ~~E~~W |  | 8.7 | 53 | 1 |  |
| +2 |  | 8.9 | 52 | 9 |  |
| +5 |  | 10.9 | 50 | 9 |  |

|  |  |  |  |  |
|---|---|---|---|---|
|  | 61.81 |  |  |  |
|  | ✓<br>160+35 |  |  |  |
| -5 |  | 10.8 | 51 | 0 |
| W |  | 8.2 | 53 | 6 |
| +5 |  | 7.6 | 54 | 2 |
| +15 |  | 7.6 | 54 | 2 |
| +28 |  | 7.9 | 53 | 9 |
| +30 = E |  | 9.7 | 52 | 1 |
| +4 |  | 11.4 | 50 | 4 |
| +5 |  | 11.5 | 50 | 3 |
|  | ✓<br>160+55 |  |  |  |
| -5 |  | 10.9 | 50 | 9 |
| -3 |  | 10.4 | 51 | 4 |
| E |  | 8.4 | 53 | 4 |
| +2 |  | 7.3 | 54 | 5 |
| +15 |  | 7.3 | 54 | 5 |
| +30 = W |  | 7.4 | 54 | 4 |
| +5 |  | 9.3 | 52 | 5 |
|  | ✓<br>160+56 |  |  |  |
| -5 |  | 15.0 | 46 | 8 |
| -1 |  | 13.0 | 48 | 8 |
| W |  | 7.2 | 54 | 6 |
| +15 |  | 7.2 | 54 | 6 |
| +29 |  | 7.4 | 54 | 4 |
| +30 = E |  | 8.4 | 53 | 4 |
| +3 |  | 10.4 | 51 | 4 |
| +5 |  | 10.8 | 51 | 0 |

|  |  |  |  |  |
|---|---|---|---|---|
|  | 61.81 |  |  |  |
|  | ✓<br>160 + 71 |  |  |  |
| -5 |  | 10.1 | 51 | 7 |
| -2 |  | 9.8 | 52 | 0 |
| E |  | 8.1 | 53 | 7 |
| +2 |  | 7.2 | 54 | 6 |
| +15 |  | 7.0 | 54 | 8 |
| +26.9 |  | 7.0 | 54 | 8 |
| +27 |  | 13.4 | 48 | 4 |
| +30 = W |  | 14.2 | 47 | 6 |
| +5 |  | 11.5 | 50 | 3 |
|  | ✓<br>160+89 |  |  |  |
| -5 |  | 12.5 | 49 | 3 |
| W |  | 12.0 | 49 | 8 |
| +2 |  | 10.2 | 51 | 6 |
| +2.1 |  | 7.0 | 54 | 8 |
| +1.5 |  | 6.8 | 55 | 0 |
| +29 |  | 7.0 | 54 | 8 |
| +30 = E |  | 7.4 | 54 | 4 |
| +2 |  | 8.3 | 53 | 5 |
| +5 |  | 8.3 | 53 | 5 |
|  | ✓<br>160+90 |  |  |  |
| -5 |  | 8.2 | 53 | 6 |
| -1 |  | 8.1 | 53 | 7 |
| E |  | 7.6 | 54 | 2 |
| +1 |  | 6.8 | 55 | 0 |
| +15 |  | 6.8 | 55 | 0 |

| | | 61.81 | | | |
|---|---|---|---|---|---|
| +30 = W | | | 7.0 | 54 | 8 |
| +5 | | ✓ | 7.5 | 54 | 3 |
| | | 161+05.0 | | | |
| -5 | | | 68 | 55 | 0 |
| W | | | 6.8 | 55 | 0 |
| +15 | | | 6.5 | 55 | 3 |
| +30 = E | | | 6.3 | 55 | 5 |
| +5 | | ✓ | 6.7 | 55 | 1 |
| | | 161+43.0 | = ctr of traveled Road to West | | |
| -5 | | | 51 | 56 | 7 |
| E | | | 5.5 | 56 | 3 |
| +15 | | | 6.0 | 55 | 8 |
| +30 = W | | | 6.4 | 55 | 4 |
| +5 | | | 6.5 | 55 | 3 |
| | | 162+00 | | | |
| -5 | | | 4.1 | 57 | 7 |
| W | | | 4.9 | 56 | 9 |
| +12 | | | 5.0 | 56 | 8 |
| +15 | | | 4.8 | 57 | 0 |
| +18 | | | 4.5 | 57 | 3 |
| +22 | | | 5.0 | 56 | 8 |
| +30 = E | | | 4.9 | 56 | 9 |
| +5 | | ✓ | 4.6 | 57 | 2 |
| | | 162+42 | | | |
| -5 | | | 1.2 | 60 | 6 |
| E | | | 1.7 | 60 | 1 |

| | | 61.81 | | Moreng | |
|---|---|---|---|---|---|
| +10 | | | 1.7 | 60 | 1 |
| +12 | | | 3.3 | 58 | 5 |
| +15 | | | 4.0 | 57 | 8 |
| +18 | | | 4.3 | 57 | 5 |
| +26 | | | 3.6 | 58 | 2 |
| +30 = W | | | 2.8 | 59 | 0 |
| +5 | | ✓ | 2.4 | 59 | 4 |
| | | 162+80 | | | |
| -5 | | | 0.6 | 61 | 2 |
| W | | | 0.9 | 60 | 9 |
| +2 | | | 1.7 | 60 | 1 |
| +10 | | | 2.2 | 59 | 6 |
| +13 | | | 3.3 | 58 | 5 |
| +15 | | | 2.1 | 59 | 7 |
| +18 | | | 1.4 | 59 | 4 |
| T.P. | 13.13 | 73.78 ✓ | 1.16 | 60. | 65 ✓ |
| +23 | | | 11.5 | 62 | 3 |
| +30 = E | | | 11.4 | 62 | 4 |
| +5 | | ✓ | 9.9 | 63 | 9 |
| | | 163+05.0 | | | |
| -5 | | | 11.1 | 62 | 7 |
| E | | | 11.1 | 62 | 7 |
| +7 | | | 11.8 | 62 | 0 |
| +9 | | | 12.9 | 60 | 9 |
| +15 | | | 13.2 | 60 | 6 |
| +23 | | | 14.2 | 59 | 6 |

|  |  |  |  |  |
|---|---|---|---|---|
|  | 73.78 |  |  |  |
| +24 |  | 13.8 | 60 | 0 |
| + 30 = W |  | 12.9 | 60 | 9. |
| +5 |  | 13.0 | 60 | 8 |
|  | 163+50 |  |  |  |
| -5 |  | 14.1 | 59 | 7 |
| W |  | 13.8 | 60 | 0 |
| +15 |  | 13.3 | 60 | 5 |
| +18 |  | 13.1 | 60 | 7 |
| +21 |  | 11.8 | 62 | 0 |
| +30 = E |  | 10.7 | 63 | 1 |
| +5 |  | 9.7 | 64 | 1 |
|  | 164+00 |  |  |  |
| -5 |  | 9.0 | 64 | 8 |
| E |  | 9.3 | 64 | 5 |
| +4 |  | 11.4 | 62 | 4 |
| +15 |  | 11.8 | 62 | 0 |
| +30 = W |  | 13.4 | 60 | 4 |
| +5 | ✓ | 14.0 | 59 | 8 |
|  | 164+55 |  |  |  |
| -5 |  | 13.9 | 59 | 9 |
| W |  | 13.1 | 60 | 7 |
| +2 |  | 12.9 | 60 | 9 |
| +15 |  | 12.4 | 61 | 4 |
| +18 |  | 12.2 | 61 | 6 |
| +30 = E |  | 10.5 | 63 | 3 |
| +5 |  | 9.5 | 64 | 3 |

Morena

|  |  |  |  |  |  |
|---|---|---|---|---|---|
|  | 73.78 |  |  |  |  |
|  | ✓<br>164+73 |  |  |  |  |
| -5 |  | 7.9 | 65 | 9 |  |
| E |  | 8.8 | 65 | 0 |  |
| +10 |  | 10.5 | 63 | 8 |  |
| +12 |  | 11.8 | 62 | 0 |  |
| +15 |  | 12.0 | 61 | 8 |  |
| +30 = W |  | 12.2 | 61 | 6 |  |
| +1 |  | 12.3 | 61 | 5 |  |
| +5 |  | 13.4 | 60 | 4 |  |
|  | ✓<br>165+11 |  |  |  |  |
| -5 |  | 9.3 | 64 | 5 |  |
| W |  | 9.8 | 64 | 0 |  |
| +15 |  | 9.0 | 64 | 8 |  |
| +19 |  | 5.7 | 68 | 1 |  |
| +30 = E |  | 4.0 | 69 | 8 |  |
| +5 |  | 3.0 | 70 | 8 |  |
|  | ✓<br>165+25 |  |  |  |  |
| -5 |  | 2.0 | 71 | 8 |  |
| E |  | 3.2 | 70 | 6 |  |
| +11 |  | 5.4 | 68 | 4 |  |
| +14 |  | 8.2 | 65 | 6 |  |
| +15 |  | 8.5 | 65 | 3 |  |
| +30 = W |  | 9.4 | 64 | 4 |  |
| +5 |  | 9.3 | 64 | 5 |  |
| B.M |  | 8.84 | 64 | 94 | on hub<br>165+45 |

| | | | | | |
|---|---|---|---|---|---|
| | | 73.78 | | | |
| | | ✓ 165+50 | | | |
| -5 | | | 95 | 64 | 3 |
| W | | | 9.9 | 63 | 9 |
| +15 | | | 89 | 64 | 9 |
| +17 | | | 8.7 | 65 | 1 |
| +20 | | | 6.6 | 67 | 2 |
| +30 = E | | | 4.7 | 69 | 1 |
| +5 | | | 3.7 | 70 | 1 |
| | | ✓ 165+68 | | | |
| -5 | | | 3.4 | 70 | 4 |
| E | | | 4.5 | 69 | 3 |
| +10 | | | 7.0 | 66 | 8 |
| +12 | | | 93 | 64 | 5 |
| +15 | | | 10.3 | 63 | 5 |
| +20 | | | 10.1 | 63 | 7 |
| +30 = W | | | 10.8 | 63 | 0 |
| +5 | | | 10.8 | 63 | 0 |
| | | ✓ 165+87 | | | |
| -5 | | | 12.3 | 61 | 5 |
| W | | | 11.5 | 62 | 3 |
| +15 | | | 10.3 | 63 | 5 |
| +19 | | | 8.9 | 64 | 9 |
| +30 = E | | | 7.8 | 66 | 0 |
| +5 | | | 5.9 | 67 | 9 |

Morena

| | | | | | |
|---|---|---|---|---|---|
| | | 73.78 | | | |
| | | ✓ 166+20 | | | |
| -5 | | | 7.0 | 66 | 8 |
| E | | | 6.8 | 67 | 0 |
| +5 | | | 83 | 65 | 5 |
| +11 | | | 10.9 | 62 | 9 |
| +15 | | | 11.4 | 62 | 4 |
| +30 = W | | | 12.3 | 61 | 5 |
| +5 | | | 13.8 | 60 | 0 |
| | | ✓ 166+60 | | | |
| -5 | | | 12.7 | 61 | 1 |
| W | | | 12.1 | 61 | 7 |
| +15 | | | 11.3 | 62 | 5 |
| +18 | | | 10.8 | 63 | 0 |
| +20 | | | 9.5 | 64 | 3 |
| +27 | | | 6.5 | 67 | 3 |
| +30 = E | | | 6.3 | 67 | 5 |
| +5 | | | 6.1 | 67 | 7 |
| | | ✓ 167+12 | | | |
| -5 | | | 4.4 | 69 | 4 |
| E | | | 53 | 68 | 5 |
| +10 | | | 6.8 | 67 | 0 |
| +13 | | | 9.3 | 64 | 5 |
| +15 | | | 9.7 | 64 | 1 |
| +30 = W | | | 10.7 | 63 | 1 |
| +5 | | | 10.7 | 63 | 1 |
| T.P. | 6.47 | ✓ 69.75 | 10.50 | 63. | 28 |

| | | | |
|---|---|---|---|
| | 69.75 | | |
| | ✗ | | |
| | 167+50 | | |
| -5 | | 7.4 | 62 4 |
| W | | 7.3 | 62 5 |
| +15 | | 6.8 | 63 0 |
| +16 | | 6.8 | 63 0 |
| +20 | | 4.4 | 65 4 |
| +30=E | | 2.9 | 66 9 |
| +5 | | 2.1 | 67 7 |
| | 168+00 | | |
| -5 | | 3.7 | 66 1 |
| E | | 4.1 | 65 7 |
| +10 | | 4.4 | 65 4 |
| +13 | | 6.8 | 63 0 |
| +15 | | 7.0 | 62 8 |
| +21 | | 7.4 | 62 4 |
| +30=W | | 7.3 | 62 5 |
| +5 | ✓ | 7.0 | 62 8 |
| | 168+21 | | |
| -5 | | 7.4 | 62 4 |
| W | | 7.6 | 62 2 |
| +9 | | 7.6 | 62 2 |
| +15 | | 7.1 | 62 7 |
| +16 | | 6.9 | 62 9 |
| +21 | | 4.5 | 65 3 |
| +30=E | | 3.9 | 65 9 |
| +5 | | 3.7 | 66 1 |

Morena

| | | | |
|---|---|---|---|
| | 69.75 | | |
| | ✓ | | |
| | 168+57 | | |
| -5 | | 6.8 | 63 0 |
| E | | 6.9 | 62 9 |
| +15 | | 7.7 | 62 1 |
| +26 | | 7.8 | 62 0 |
| +30=W | | 7.6 | 62 2 |
| +5 | ✓ | 8.1 | 61 7 |
| | 168+70 | | |
| -5 | | 9.6 | 60 2 |
| W | | 7.7 | 62 1 |
| +2 | | 8.8 | 61 0 |
| +15 | | 8.2 | 61 6 |
| +30=E | | 7.6 | 62 2 |
| +5 | | 7.2 | 62 6 |
| | 169+00 | | |
| -45 | | 5.5 | 64 3 |
| -42 | | 6.0 | 63 8 |
| -17 | | 5.9 | 63 9 |
| -14 | | 7.0 | 62 8 |
| -5 | | 7.8 | 62 0 |
| E | | 8.3 | 61 5 |
| +10 | | 8.8 | 61 0 |
| +15 | | 8.7 | 61 1 |
| +16 | | 8.3 | 61 5 |
| +27 | | 8.5 | 61 3 |
| +30=W | | 7.8 | 62 0 |
| +5 | | 9.3 | 60 5 |

69.75

| | | | | | |
|---|---|---|---|---|---|
| | 169+50 | | | | |
| -5 | | 9.1 | 60 | 7 | |
| W | | 7.5 | 62 | 3 | |
| +3 | | 8.2 | 61 | 6 | |
| +12 | | 8.1 | 61 | 7 | |
| +13 | | 7.7 | 62 | 1 | |
| +15 | | 8.7 | 61 | 1 | |
| +17 | | 9.1 | 60 | 7 | |
| +30 = E | | 8.7 | 61 | 1 | |
| +14 | | 8.8 | 61 | 0 | |
| +17 | | 7.8 | 62 | 0 | |
| +27 | | 7.0 | 62 | 8 | |
| +36 | | 7.3 | 62 | 5 | |
| +45 | | 6.5 | 63 | 3 | |
| | 169+69.4 = ℄ of 1'×1.5' box | | | | |
| -45 | | 7.1 | 62 | 7 | |
| -30 | | 7.6 | 62 | 2 | |
| -15 | | 8.5 | 61 | 3 | |
| E | | 9.0 | 60 | 8 | |
| +13 | | 9.8 | 60 | 0 | |
| +13 | do not use for yardage. | 10.56 | 59.29 | | flow line Inlet. |
| +15 | | 8.8 | 61 | 0 | |
| +18 | | 7.6 | 62 | 2 | |
| +29 | | 7.7 | 62 | 1 | |
| +30 = W | | 7.3 | 62 | 5 | |
| +4 | | 7.9 | 61 | 9 | |
| +5 | | 8.7 | 61 | 1 | |

69.75

| | | | | | |
|---|---|---|---|---|---|
| +11 | | 12.2 | 57 | 6 | = flow line outlet. |
| | 170+00 | | | | |
| -5 | | 8.6 | 61 | 2 | |
| W | | 6.9 | 62 | 9 | |
| +1 | | 7.2 | 62 | 6 | |
| +13 | | 6.9 | 62 | 9 | |
| +15 | | 8.4 | 61 | 4 | |
| +23 | | 9.3 | 60 | 5 | |
| +30 = E | | 9.1 | 60 | 7 | |
| +15 | | 8.6 | 61 | 2 | |
| +22 | | 7.7 | 62 | 1 | |
| +40 | | 7.4 | 62 | 4 | |
| +45 | | 6.7 | 63 | 2 | |
| | 170+40 | | | | |
| -45 | | 7.1 | 62 | 7 | |
| E | | 8.0 | 61 | 8 | |
| +5 | | 8.0 | 61 | 8 | |
| +15 | | 6.9 | 62 | 9 | |
| +19 | | 5.9 | 63 | 9 | |
| +30 = W | | 6.1 | 63 | 7 | |
| +5 | | 6.4 | 63 | 4 | |
| | 171+00 | | | | |
| -5 | | 4.8 | 65 | 0 | |
| W | | 5.1 | 64 | 7 | |
| +12 | | 5.2 | 64 | 6 | |
| +15 | | 6.5 | 64 | 3 | |

68

| | | | | | |
|---|---|---|---|---|---|
| | | 69.75 | | | |
| +17 | | | 8.0 | 61 | 8 |
| +30=E | | | 7.3 | 62 | 5 |
| +10 | | | 6.4 | 63 | 4 |
| +13 | | | 6.9 | 62 | 9 |
| +18 | | | 9.8 | 60 | 0 |
| +23 | | | 8.7 | 61 | 1 |
| +39 | | | 8.4 | 61 | 4 |
| +45 | | | 9.0 | 60 | 8 |
| | | 171+25 | | | |
| -45 | | | 9.8 | 60 | 0 |
| -42 | | | 10.3 | 59 | 5 |
| -40 | | | 9.3 | 60 | 5 |
| -25 | | | 9.7 | 60 | 1 |
| -18 | | | 11.1 | 58 | 7 |
| -15 | | | 6.8 | 63 | 0 |
| -12 | | | 6.3 | 63 | 5 |
| E | | | 7.0 | 62 | 8 |
| +12 | | | 8.1 | 61 | 7 |
| +15 | | | 5.5 | 63 | 3 |
| +17 | | | 4.9 | 64 | 9 |
| +30=W | | | 5.0 | 64 | 8 |
| +5 | | | 5.5 | 64 | 3 |
| | | 171+56 | | | |
| -5 | | | 6.1 | 63 | 7 |
| W | | | 5.0 | 64 | 8 |
| +10 | | | 4.9 | 64 | 9 |

Moreno

69

| | | | | | |
|---|---|---|---|---|---|
| | | | 69.75 | | |
| +15 | | | 5.8 | 64 | 0 |
| +22 | | | 10.3 | 59 | 5 |
| +30=E | | | 9.5 | 60 | 3 |
| +13 | | | 8.4 | 61 | 4 |
| +18 | | | 13.0 | 56 | 8 |
| +24 | | | 11.6 | 58 | 2 |
| +40 | | | 11.4 | 58 | 4 |
| +45 | | | 12.0 | 57 | 8 |
| | | 171+76 | | | |
| -45 | | | 13.5 | 56 | 3 |
| -20 | | | 13.8 | 56 | 0 |
| -5 | | | 14.6 | 55 | 2 |
| E | | | 14.0 | 55 | 8 |
| +7 | | | 12.9 | 56 | 9 |
| +15 | | | 7.6 | 62 | 2 |
| +18 | | | 5.5 | 64 | 3 |
| +30=W | | | 5.8 | 64 | 0 |
| +5 | | | 8.6 | 61 | 2 |
| | | 171+85 | | | |
| -5 | | | 10.7 | 59 | 1 |
| -3 | | | 10.2 | 59 | 6 |
| W | | | 7.8 | 62 | 0 |
| +7 | | | 6.7 | 63 | 1 |
| +14 | | | 6.9 | 62 | 9 |
| +15 | | | 7.8 | 62 | 0 |
| TP | 1.42 | 5834 ✓ | 12.83 | 56 | 92 ✓ |

| | | | | | |
|---|---|---|---|---|---|
| | | 58.34 | | | |
| +25 | | | 3.5 | 54 | 8 |
| +30 = E | | | 4.1 | 54 | 2 |
| +24 | | | 3.0 | 55 | 3 |
| +40 | | | 2.7 | 55 | 6 |
| +45 | | | 3.0 | 55 | 3 |
| | | 172+07.0 | | | |
| -45 | | | 6.9 | 51 | 4 |
| -43 | | | 5.2 | 53 | 1 |
| -28 | | | 4.6 | 53 | 7 |
| -5 | | | 5.9 | 52 | 4 |
| E | | | 5.9 | 52 | 4 |
| +5 | | | 5.6 | 52 | 7 |
| +15 | | | 4.5 | 53 | 8 |
| +26 | | | 4.7 | 53 | 6 |
| +30 = W | | | 5.9 | 52 | 4 |
| +3 | | | 7.3 | 51 | 0 |
| +15 | | | 8.3 | 50 | 0 |
| +30 = Toe of Santa Fe | | | 6.9 | 51 | 4 |
| | | 172+30 | | | |
| -30 = Toe of Santa Fe | | | 7.6 | 50 | 7 |
| -25 | | | 8.6 | 49 | 7 |
| -9 | | | 8.8 | 49 | 5 |
| W | | | 8.2 | 50 | 1 |
| +15 | | | 7.2 | 51 | 1 |
| +30 = E | | | 7.0 | 51 | 3 |
| +20 | | | 6.7 | 51 | 6 |

70

| | | | | | | |
|---|---|---|---|---|---|---|
| | | 58.34 | | Morena | | |
| +34 | | | 6.9 | 51 | 4 | |
| +45 | | | 7.6 | 50 | 7 | |
| | | 172+50 | | | | |
| -45 | | | 8.5 | 49 | 8 | |
| -35 | | | 8.3 | 50 | 0 | |
| E | | | 8.7 | 49 | 6 | |
| +7 | | | 7.9 | 50 | 4 | |
| +15 | | | 8.1 | 50 | 2 | |
| +30 = W | | | 9.3 | 49 | 0 | |
| +15 | | | 10.1 | 48 | 1 | |
| +22 | | | 11.2 | 47 | 1 | |
| +30 | | | 11.1 | 47 | 2 | |
| +41.6 = face of culv. | | | 11.5 | 46 | 8 | = floor of culv |
| T.P. | 3.95 | 50.78 ✓ | 11.51 | 46 | 83 ✓ | |
| | | | 2.39 | 48 | 39 ✓ | pole 50' N. of Balboa<br>W side<br>Santa Fe |

9/5/19 Gregory Moore Miller

CROSS SECTION OF
Goose Neck Curve
at Santa Fe Xing
on Morena Blvd

| | | | | |
|---|---|---|---|---|
| | 2.22 | 67.16 | 64.94 | Hub at 165+ |
| Sta 168+ | 68.14 | | Book 1059 | |
| -5 | | 7.5 | 59.7 | |
| W | | 5.3 | 61.9 | |
| +5 | | 6.1 | 61.1 | |
| +15 | | 5.7 | 61.5 | |
| +25 | | 5.1 | 62.1 | |
| +30 = E | | 4.7 | 62.5 | |
| +5 | | 4.4 | 62.8 | |
| 169+00 | | | | |
| -5 | | 5.7 | 61.5 | |
| E | | 5.9 | 61.3 | |
| +5 | | 6.1 | 61.1 | |
| +14 | | 6.2 | 61.0 | |
| +15 | | 5.7 | 61.5 | |
| +25 | | 5.9 | 61.3 | |
| +28 | | 5.9 | 61.3 | |
| +30 = W | | 5.2 | 62.0 | |
| +5 | | 6.9 | 60.3 | |
| 169+50 | | | | |
| -5 | | 7.0 | 60.2 | |
| -2 | | 5.1 | 62.1 | |
| W | | 4.8 | 62.4 | |
| +2 | | 5.5 | 61.7 | |
| +5 | | 5.4 | 61.8 | |
| +10 | | 5.3 | 61.9 | |

67.16

| | | | |
|---|---|---|---|
| +13 | 4.9 | 62.3 | |
| +15 | 6.4 | 60.8 | |
| +25 | 6.4 | 60.8 | |
| +30 = E | 6.4 | 60.8 | |
| +5 | 6.3 | 60.9 | |
| 169+75 | | | |
| -5 | 6.2 | 61.0 | |
| E | 6.5 | 60.7 | |
| +5 | 6.9 | 60.3 | |
| +15 | 6.2 | 61.0 | |
| +17 | 4.9 | 62.3 | |
| +25 | 5.2 | 62.0 | |
| +29 | 5.2 | 62.0 | |
| +30 = W | 4.5 | 62.7 | |
| +3 | 4.6 | 62.6 | |
| +5 | 5.8 | 61.4 | |
| 170+14.69 = P.C. R on ℄ | | | see book 1057-11 |
| -5 | 5.5 | 61.7 | |
| W | 3.7 | 63.5 | |
| +5 | 3.8 | 63.4 | |
| +12 | 3.9 | 63.3 | |
| +15 | 5.3 | 61.9 | |
| +25 | 6.0 | 61.2 | |
| +30 = E | 5.9 | 61.3 | |
| +5 | 5.8 | 61.4 | |
| B.M. | 5.20 | 61.96 | Nearest hub E of PC |

| | | | |
|---|---|---|---|
| | 67.16 | | |
| | 170+35.36 | | |
| -5 | | 5.4 | 61.8 |
| E | | 5.4 | 61.8 |
| +5 | | 5.4 | 61.8 |
| +15 | | 4.5 | 62.7 |
| +20 | | 3.3 | 63.9 |
| +26.12 = edge paving | | 3.3 | 63.9 |
| +31.12 = W | | 3.5 | 63.7 |
| +5 | | 3.4 | 63.8 |
| | 170+56.04 | | |
| -5 | | 2.9 | 64.3 |
| W | | 3.1 | 64.1 |
| +5 | | 3.0 | 64.2 |
| +12 | | 3.5 | 63.7 |
| +14 | | 5.0 | 62.2 |
| +17.25 = C | | 5.3 | 61.9 |
| +27.25 | | 5.7 | 61.5 |
| +32.25 = E | | 5.6 | 61.6 |
| +5 | | 5.4 | 61.8 |
| | 170+76.71 | | |
| E | | 4.9 | 62.3 |
| +5 = edge paving | | 5.1 | 62.1 |
| +15 = C | | 5.4 | 61.8 |
| +24 | | 5.2 | 62.0 |
| +27 | | 2.8 | 64.4 |
| +28.37 = edge paving | | 2.8 | 64.4 |

3337
95
2387

| | | | |
|---|---|---|---|
| +33.37 = W | 67.16 | 2.8 | 64.4 |
| | 170+97.39 = P.R.C. | | |
| W | | 3.3 | 63.9 |
| +3 | | 5.6 | 61.6 |
| +5 = edge paving | | 5.7 | 61.4 |
| +19.49 = C | | 4.3 | 62.9 |
| +29.49 = edge | | 4.0 | 63.2 |
| +32 | | 4.5 | 62.7 |
| +34.49 = E | | 6.6 | 60.6 |
| +5 | | 6.0 | 61.2 |
| | 171+19.21 | | |
| -5 | | 6.4 | 60.8 |
| E | | 6.5 | 60.7 |
| +4 | | 6.8 | 60.4 |
| +5 = edge pav. | | 8.0 | 59.2 |
| +7.5 | | 8.0 | 59.2 |
| +10 | | 4.2 | 63.0 |
| +15 | | 3.8 | 63.4 |
| +29.49 = edge | | 4.9 | 62.3 |
| +34.49 = W | | 5.5 | 61.7 |
| | 171+39.28 | | |
| W | | 5.9 | 61.3 |
| +5 = edge par | | 5.2 | 62.0 |
| +19.49 = C | | 4.8 | 62.4 |
| +22 | | 7.7 | 59.5 |
| +28 | | 9.7 | 57.5 |

| | | | | |
|---|---|---|---|---|
| | | 67.16 | | |
| +29.94 = edge paving | | | 8.0 | 59.2 |
| + 34.94 = E | | | 8.4 | 58.8 |
| + 1 | | | 7.6 | 59.6 |
| + 5 | | | 7.5 | 59.7 |
| | | 171 + 59.35 | | |
| -5 | | | 9.8 | 57.4 |
| E | | | 9.9 | 57.3 |
| +5 = edge pav | | | 9.6 | 57.5 |
| +8 | | | 9.6 | 57.5 |
| +9 | | | 11.1 | 56.1 |
| + 15.9 = c | | | 7.6 | 59.6 |
| + 21 | | | 7.6 | 59.6 |
| + 30.39 = edge | | | 7.6 | 59.6 |
| +31.4 | | | 8.6 | 58.6 |
| + 35.39 = W | | | 7.7 | 59.5 |
| | | 171+79.42 | | |
| W | | | 8.9 | 58.3 |
| +5 = edge pav. | | | 11.2 | 56.0 |
| +10 | | | 12.4 | 54.8 |
| + 19.49 = c | | | 12.5 | 54.7 |
| T.P. | 2.39 | ✓ 57.00 | 12.55 | 54.61 |
| + 28 | | | 1.7 | 55.3 |
| + 30.84 = edge pav. | | | 2.2 | 54.8 |
| + 35.84 = E | | | 1.7 | 55.3 |
| | | 171 + 99.49 | | |
| E | | | 3.8 | 53.2 |
| +5 = edge paving | | | 3.9 | 53.1 |

| | | | |
|---|---|---|---|
| | 57.00 | | |
| +10 | | 4.3 | 52.7 |
| +16.8 = c | | 3.9 | 53.1 |
| +21.8 | | 3.4 | 53.6 |
| + 28 | | 1.5 | 55.5 |
| +31.3 = edge pav | | +0.8 | 57.8 |
| +36.3 = W | | +3.5 | 60.5 |
| | 172 + 19.56 | | |
| W. | | 3.8 | 53.2 |
| +5 = edge pav. | | 4.4 | 52.6 |
| +8 | | 4.0 | 53.6 |
| +19.49 = c | | 5.0 | 52.0 |
| +31.7 = edge pav | | 5.3 | 51.7 |
| +36.7 = | | 5.1 | 51.9 |
| +5 | | 5.9 | 51.1 |
| | 172 + 39.63 | | |
| -5 | | 6.5 | 50.5 |
| E | | 6.1 | 50.9 |
| +5 = edge pav | | 6.0 | 51.0 |
| +17.7 = c | | 6.4 | 50.6 |
| + 32.2 = edge pav | | 6.1 | 50.9 |
| + 37.2 = W | | 6.6 | 50.4 |
| +5 | | 6.5 | 50.5 |
| | end 172 + 57.36 on ℄ = E.L. Santa Fe RoW | | |
| -5 | | 7.0 | 50.0 |
| W | | 7.2 | 49.8 |
| +5 = edge paving | | 8.4 | 48.6 |

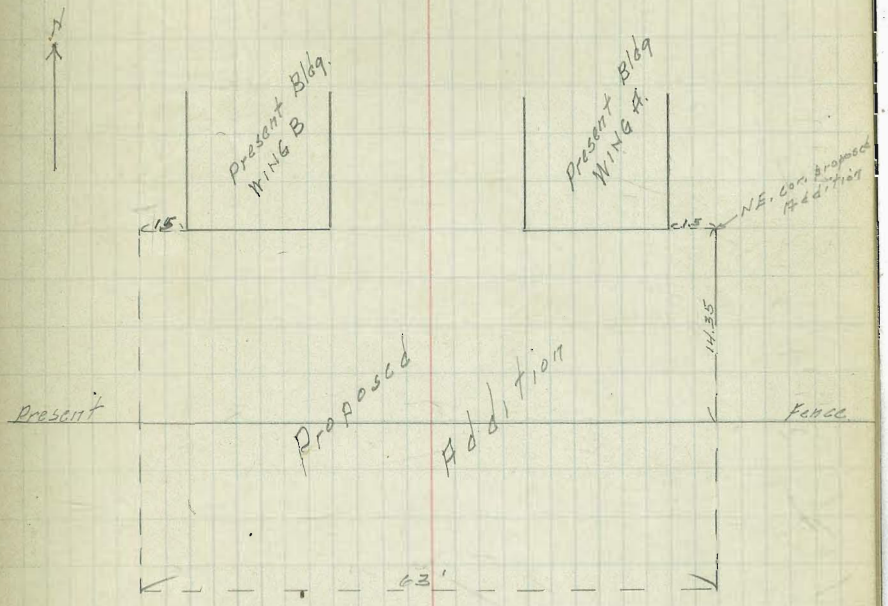
| | | | | |
|---|---|---|---|---|
| | | 57.00 | | |
| +11 | | | 7.4 | 49.6 |
| +19.49 = C | | | 8.0 | 49.0 |
| +31 | | | 7.6 | 49.4 |
| +32.6 = edge pav | | | 8.2 | 48.8 |
| +36 | | | 8.0 | 49.0 |
| +37.6 = E | | | 6.6 | 50.4 |
| +5 | | | 6.4 | 50.6 |
| T.P. | 2.99 | 51.55 | 8.44 | 48.56 |
| on B.M. W side RoW. | | | 3.05 | 48.39 = OK<br>48.50 |

172+96.66 = end of culvert.

9/6/19 Gregory
Miller
Shaw

## Levels for Proposed Addition To MAGDALEN HOSPITAL

| | | | | | |
|---|---|---|---|---|---|
| | 5.32 | 105.32 | | 100.00 | Assumed elev on Floor of Wing A. |
| East Line of Prop. Addn. | | | | | |
| on Grd. SE cor Wing A | | | 7.05 | 98.3 | |
| 〃 〃 NE. 〃 proposed Addn | | | 7.30 | 98.0 | |
| 〃 〃 14.4 So. of NE. cor 〃 〃 = fence | | | 6.1 | 99.2 | |
| 〃 〃 25' 〃 〃 〃 〃 〃 〃 〃 〃 | | | 6.0 | 99.3 | |
| 〃 〃 29' 〃 〃 〃 〃 〃 〃 〃 = S.E. cor. | | | 5.7 | 99.6 | |
| T.P. | 4.71 | 104.00 | 6.03 | 99.29 | |
| N. L. proposed Add. | | | | | |
| N.W. cor proposed Addn. | | | 5.3 | 98.7 | |
| 1.5 E of N.W. cor prop. 〃 = SW cor Wing B | | | 5.1 | 98.9 | |
| Floor of Wing B. | | | 4.07 | 99.93 | |
| 19.7 E of N.W. cor Prop Add = SE Wing B | | | 4.9 | 99.1 | |
| 29 〃 〃 〃 〃 〃 〃 〃 | | | 4.7 | 99.3 | |
| 43.6 〃 〃 〃 〃 〃 〃 〃 〃 = SW Wing A | | | 4.9 | 99.1 | |
| 61.5 〃 〃 〃 〃 〃 〃 〃 = SE 〃 A. | | | 5.7 | 98.3 | |
| W.L. prop. Addn. | | | | | |
| T.P. | 5.73 | 105.02 | 4.71 | 99.29 | |
| 14.35 S. of N.W. cor prop Add = fence | | | 5.7 | 99.3 | |
| 29' 〃 〃 〃 〃 〃 〃 〃 = SW cor. | | | 5.6 | 99.4 | |
| S.L. prop. Addn. | | | | | |
| SW. cor prop. Addn | | | 5.6 | 99.4 | |
| 25' E of SW cor. | | | 5.8 | 99.2 | |
| 50' 〃 〃 〃 〃 〃 | | | 5.9 | 99.1 | |
| 63' 〃 〃 〃 〃 〃 = S.E. cor | | | 5.4 | 99.6 | |



### Fence Line

| | | |
|---|---|---|
| W.L. of Prop Add. | 5.7 | 99.3 |
| 25' E of W.L | 5.5 | 99.5 |
| 50' 〃 〃 〃 〃 | 5.6 | 99.4 |
| 63' 〃 〃 〃 〃 = E.L. Addn. | 5.8 | 99.2 |

## Table VI.—Corrections for Sub-Chords and Long Chords.

| FOR SUB-CHORDS ADD | | | | | | | | | | Excess of arc per 100 ft. | LONG CHORDS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| D | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | | D | 200 | 300 | 400 | 500 |
| **4°** | .00 | .00 | .01 | .01 | .01 | .01 | .01 | .01 | .00 | .02 | **1** | 199.99 | 299.97 | 399.92 | 499.85 |
| **6** | .00 | .01 | .01 | .02 | .02 | .02 | .02 | .01 | 01 | .05 | **2** | 199.97 | 299.88 | 399.70 | 499.39 |
| **8** | .01 | .02 | .02 | .03 | .03 | .03 | .03 | .02 | .01 | .08 | **3** | 199.93 | 299.73 | 399.32 | 498.63 |
| **10** | .01 | .02 | .03 | .04 | .05 | .05 | .05 | .04 | .02 | .13 | **4** | 199.88 | 299.51 | 398.78 | 497.57 |
| **12** | .02 | .04 | .05 | .06 | .07 | .07 | .07 | .05 | .03 | .18 | **5** | 199.81 | 299.24 | 398.10 | 496.20 |
| **14** | .02 | .05 | .07 | .08 | .09 | .10 | .09 | .07 | .04 | .25 | **6** | 199.73 | 298.90 | 397.26 | 494.53 |
| **16** | .03 | .06 | .09 | .11 | .12 | .12 | .12 | .09 | .05 | .33 | **7** | 199.63 | 298.51 | 396.28 | 492.57 |
| **18** | .04 | .08 | .11 | .14 | .15 | .16 | .15 | .12 | .07 | .41 | **8** | 199.51 | 298.05 | 395.14 | 490.31 |
| **20** | .05 | .10 | .14 | .17 | .19 | .20 | .18 | .15 | .09 | .51 | **9** | 199.38 | 297.54 | 393.86 | 487.75 |
| **22** | .06 | .12 | .17 | .21 | .23 | .24 | .22 | .18 | .10 | .62 | **10** | 199.24 | 296.96 | 392.42 | 484.90 |
| **24** | .07 | .14 | .20 | .25 | .28 | .28 | .26 | .21 | .12 | .74 | **12** | 198.90 | 295.63 | 389.12 | 478.34 |
| **26** | .09 | .17 | .24 | .29 | .32 | .33 | .31 | .25 | .15 | .86 | **14** | 198.51 | 294.06 | 385.22 | 470.65 |
| **28** | .10 | .19 | .27 | .34 | .37 | .38 | .36 | .29 | .17 | 1.00 | **16** | 198.05 | 292.25 | 380.76 | 461.86 |
| **30** | .11 | .22 | .31 | .39 | .43 | .44 | .41 | .33 | .19 | 1.15 | **18** | 197.54 | 290.21 | 375.74 | 452.02 |
| **32** | .13 | .25 | .36 | .44 | .49 | .50 | .47 | .38 | .22 | 1.31 | **20** | 196.96 | 287.94 | 370.17 | 441.15 |
| **34** | .15 | .28 | .40 | .50 | .55 | .57 | .53 | .43 | .25 | 1.48 | **22** | 196.32 | 285.44 | 364.06 | 429.30 |
| **36** | .17 | .32 | .45 | .56 | .62 | .64 | .59 | .48 | .28 | 1.66 | **24** | 195.63 | 282.71 | 357.43 | 416.53 |
| **38** | .18 | .36 | .51 | .62 | .70 | .71 | .66 | .53 | .31 | 1.86 | **26** | 194.87 | 279.76 | 350.30 | 402.89 |
| **40** | .21 | .40 | .56 | .69 | .77 | .79 | .73 | .59 | .35 | 2.06 | **28** | 194.06 | 276.59 | 342.69 | 388.43 |
| **42** | .23 | .44 | .62 | .76 | .85 | .87 | .81 | .65 | .38 | 2.28 | **30** | 193.18 | 273.20 | 334.61 | 373.20 |
| **44** | .25 | .48 | .68 | .84 | .94 | .96 | .89 | .72 | .42 | 2.50 | **32** | 192.25 | 269.61 | 326.08 | 357.28 |
| **46** | .27 | .52 | .75 | .92 | 1.02 | 1.05 | .98 | .78 | .46 | 2.74 | **34** | 191.26 | 265.81 | 317.12 | 340.73 |
| **48** | .30 | .57 | .81 | 1.00 | 1.12 | 1.14 | 1.06 | .86 | .50 | 2.99 | **36** | 190.21 | 261.80 | 307.77 | 323.61 |
| **50** | .32 | .62 | .89 | 1.09 | 1.21 | 1.24 | 1.15 | .93 | .55 | 3.24 | **38** | 189.10 | 257.60 | 298.03 | 305.99 |
| **52** | .35 | .67 | .96 | 1.18 | 1.31 | 1.35 | 1.25 | 1.01 | .59 | 3.52 | **40** | 187.94 | 253.21 | 287.94 | 287.94 |
| **54** | .38 | .73 | 1.04 | 1.28 | 1.42 | 1.46 | 1.35 | 1.09 | .64 | 3.80 | **42** | 186.72 | 248.63 | 277.51 | 269.54 |
| **56** | .41 | .78 | 1.12 | 1.38 | 1.53 | 1.57 | 1.46 | 1.17 | .69 | 4.09 | **44** | 185.44 | 243.87 | 266.78 | 250.85 |
| **58** | .44 | .84 | 1.20 | 1.48 | 1.65 | 1.69 | 1.57 | 1.26 | .74 | 4.40 | **46** | 184.10 | 239.93 | 255.78 | 231.95 |
| **60** | .47 | .91 | 1.29 | 1.59 | 1.76 | 1.81 | 1.68 | 1.35 | .80 | 4.72 | **48** | 182.71 | 233.83 | 244.51 | 212.92 |

Note.—When a chord of less than 100 ft. is used the corrections given in the above table should be added to the nominal length of chord to get the length which should be used in order that the 100 ft. points will check with those obtained by using the standard 100 ft. chord. Thus in locating a 14° curve by 25 ft. chords measure 25′.06 for each chord. Long chords are useful in passing obstacles.

## Table VII.—Middle Ordinates for Rails in Feet.

| Deg. of Curve | LENGTH OF RAILS | | | | | | | Deg. of Curve | LENGTH OF RAILS. | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 32 | 30 | 28 | 26 | 24 | 22 | 20 | | 32 | 30 | 28 | 26 | 24 | 22 | 20 |
| **1°** | .022 | .020 | .016 | .013 | .011 | .009 | .008 | **16°** | .356 | .313 | .273 | .236 | .200 | .170 | .139 |
| **2** | .045 | .038 | .034 | .029 | .025 | .021 | .017 | **17** | .378 | .333 | .290 | .252 | .213 | .180 | .148 |
| **3** | .037 | .058 | .051 | .044 | .037 | .031 | .026 | **18** | .400 | .351 | .306 | .265 | .225 | .190 | .156 |
| **4** | .089 | .079 | .069 | .060 | .050 | .042 | .035 | **19** | .423 | .371 | .324 | .280 | .238 | .201 | .165 |
| **5** | .112 | .099 | .086 | .074 | .063 | .053 | .044 | **20** | .445 | .392 | .341 | .296 | .250 | .212 | .174 |
| **6** | .134 | .117 | .102 | .088 | .076 | .064 | .052 | **21** | .466 | .410 | .357 | .309 | .262 | .222 | .182 |
| **7** | .156 | .137 | .120 | .104 | .088 | .074 | .061 | **22** | .487 | .430 | .375 | .325 | .275 | .233 | .191 |
| **8** | .179 | .158 | .137 | .119 | .100 | .085 | .070 | **23** | .509 | .450 | .390 | .338 | .287 | .243 | .199 |
| **9** | .201 | .175 | .153 | .133 | .112 | .095 | .078 | **24** | .531 | .469 | .408 | .354 | .299 | .253 | .208 |
| **10** | .223 | .196 | .171 | .148 | .125 | .106 | .087 | **25** | .552 | .486 | .424 | .367 | .311 | .263 | .216 |
| **11** | .245 | .216 | .188 | .163 | .139 | .117 | .096 | **26** | .573 | .506 | .441 | .382 | .323 | .274 | .225 |
| **12** | .268 | .236 | .206 | .179 | .151 | .128 | .105 | **27** | .594 | .524 | .457 | .396 | .335 | .284 | .233 |
| **13** | .290 | .254 | .222 | .192 | .163 | .138 | .113 | **28** | .618 | .545 | .475 | .411 | .348 | .294 | .242 |
| **14** | .312 | .275 | .239 | .207 | .175 | .148 | .122 | **29** | .638 | .564 | .491 | .424 | .361 | .303 | .250 |
| **15** | .334 | .295 | .257 | .223 | .188 | .159 | .131 | **30** | .660 | .583 | .508 | .438 | .374 | .313 | .259 |

170 1469
20675
170 35365

## SLOPE REDUCTIONS.

When distances are measured on a slope they may be reduced to the equivalent horizontal distance by the following approximate rule:—subtract from the slope distance the square of the rise divided by twice the slope distance. Thus for a slope distance of 250.3 ft. and a rise of 15 ft. correction$=15^2 \div 2 \times 250.3=.45$ (by slide rule) or horizontal distance$=250.3-.45=249.85$. When vertical angle=V. A. is measured horizontal distance=slope distance—slope distance (1—Cos. V. A.). Thus for slope distance of 248.7 ft. and V. A. of 4° 20′ from Table VIII Cos=.99714 and correction$=1-.99714=.00286$ per foot or total of $.286 \times 2\frac{1}{2}$ (near enough)=.57 and horizontal distance$=248.7-.57=248.13$ ft.

170 35365
20675
170 56040
170 767.15
170 97390

## TRIGONOMETRICAL FORMULAS.

See fig. (a).

sin. $A=\frac{a}{c}$

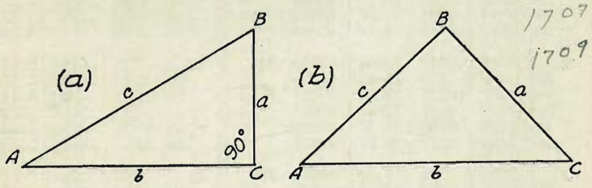
cos. $A=\frac{b}{c}$

tan. $A=\frac{a}{b}$

cot. $A=\frac{b}{a}$

sec. $A=\frac{c}{b}$

cosec. $A=\frac{c}{a}$



170 1469
8270
170 9739

### Formula for Solving Triangles.

| Given | Sought. | Right triangles. See fig. (a). |
|---|---|---|
| $a, c$ | $A, B, b$ | sin. $A=\frac{a}{c}$, cos. $B=\frac{a}{c}$, $b=\sqrt{(c+a)(c-a)}$ |
| $a, b$ | $A, B, c$ | tan. $A=\frac{a}{b}$, cot. $B=\frac{a}{b}$, $c=\sqrt{a^2+b^2}$. |
| $A, a$ | $B, b, c$ | $B=90°-A$, $b=a$ cot. $A$, $c=\frac{a}{\sin. A}$. |
| $A, b$ | $B, a, c$ | $B=90°-A$, $a=b$ tan. $A$, $c=\frac{b}{\cos. A}$. |
| $A, c$ | $B, a, b$ | $B=90°-A$, $a=c$ sin. $A$, $c=c$ cos. $A$ |
| **Given** | **Sought.** | **Oblique triangles. See fig. (b).** |
| $A, B, a$ | $b$ | $b=\frac{a \sin. B}{\sin. A}$ |
| $A, a, b$ | $B$ | sin. $B=\frac{b \sin. A}{a}$ |
| $a, b, C$ | $A - B$ | tan. $\frac{1}{2}(A-B)=\frac{(a-b)\tan. \frac{1}{2}(A+B)}{a+b}$ |
| $a, b, c$ | $A$ | If $s=\frac{1}{2}(a+b+c)$, sin. $\frac{1}{2}A=\sqrt{\frac{(s-b)(s-c)}{bc}}$<br>cos. $\frac{1}{2}A=\sqrt{\frac{s(s-a)}{bc}}$, tan. $\frac{1}{2}A=\sqrt{\frac{(s-b)(s-c)}{s(s-a)}}$,<br>sin. $A=\frac{2\sqrt{(s-a)(s-b)(s-c)}}{bc}$ |
| $A, B, C, a$ | area | area$=\frac{a^2 \sin. B \sin. C}{2 \sin. A}$ |
| $A, b, c$ | area | area$=\frac{1}{2}bc \sin. A$ |
| $a, b, c$ | area | $s=\frac{1}{2}(a+b+c)$, area$=\sqrt{s(s-a)(s-b)(s-c)}$ |

25
45
30 ✓
30 ✓
346 = P.C

646

78.37
108.37
25

313
67
~~193~~
2191
1678
20.97

433
67
3031
2598
2.90

16.74 E

72+79.77
42.00
77+31.77
91.67
73+23.44

69+7
69 7

20.40
9.34
29.74

50.57
29.74
20.83

10.92
61

.000075 .00000
4.05 0.000
4.00

4.0
415

71.91
10.92
60.99
61.00

380 390
3+67 3+75 3+86
367
-35 21.1
-35 20.8
-10 21.5 -10 20.5
W 24.0 W 23.9
+7 22.8 +8 21.7
C 18.0 C 19.9

C 16.1
W 22.0
+10 23.6
+35 20.6

+8 18.8
-35 20.3

1.8 | 22.5
1.74

210
209.13
7.56
216.69

58 21.6
15.86
58.05.76

168+74
5.86
161+68.14

11.03
7.46
3.69

74
401.40
47.6

P.C. 171+66.23

x 32.49 x 38.63 x
90°

117 98.6
21.6
117.70

122
117.77
4.23

E.C. 11
35

122
120

---

163
16
947
163
2608

117 6446
586
9860

4813
253

11286
2874
84.12
112.86

170 9739
2182
171 1921

208.6
86
220
22

37
210

113
16
678
113
1308

## DISTANCES FROM CENTER OF ROADWAY FOR CROSS-SECTIONING.

Roadway 16 feet wide. Side Slopes 1 on 1½.

For Single Track Embankment.

| H | 0 | .1 | .2 | .3 | .4 | .5 | .6 | .7 | .8 | .9 | H |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 8.0 | 8.2 | 8.3 | 8.5 | 8.6 | 8.8 | 8.9 | 9.1 | 9.2 | 9.4 | 0 |
| 1 | 9.5 | 9.7 | 9.8 | 10.0 | 10.1 | 10.3 | 10.4 | 10.6 | 10.7 | 10.9 | 1 |
| 2 | 11.0 | 11.2 | 11.3 | 11.5 | 11.6 | 11.8 | 11.9 | 12.1 | 12.2 | 12.4 | 2 |
| 3 | 12.5 | 12.7 | 12.8 | 13.0 | 13.1 | 13.3 | 13.4 | 13.6 | 13.7 | 13.9 | 3 |
| 4 | 14.0 | 14.2 | 14.3 | 14.5 | 14.6 | 14.8 | 14.9 | 15.1 | 15.2 | 15.4 | 4 |
| 5 | 15.5 | 15.7 | 15.8 | 16.0 | 16.1 | 16.3 | 16.4 | 16.6 | 16.7 | 16.9 | 5 |
| 6 | 17.0 | 17.2 | 17.3 | 17.5 | 17.6 | 17.8 | 17.9 | 18.1 | 18.2 | 18.4 | 6 |
| 7 | 18.5 | 18.7 | 18.8 | 19.0 | 19.1 | 19.3 | 19.4 | 19.6 | 19.7 | 19.9 | 7 |
| 8 | 20.0 | 20.2 | 20.3 | 20.5 | 20.6 | 20.8 | 20.9 | 21.1 | 21.2 | 21.4 | 8 |
| 9 | 21.5 | 21.7 | 21.8 | 22.0 | 22.1 | 22.3 | 22.4 | 22.6 | 22.7 | 22.9 | 9 |
| 10 | 23.0 | 23.2 | 23.3 | 23.5 | 23.6 | 23.8 | 23.9 | 24.1 | 24.2 | 24.4 | 10 |
| 11 | 24.5 | 24.7 | 24.8 | 25.0 | 25.1 | 25.3 | 25.4 | 25.6 | 25.7 | 25.9 | 11 |
| 12 | 26.0 | 25.2 | 26.3 | 26.5 | 26.6 | 26.8 | 26.9 | 27.1 | 27.2 | 27.4 | 12 |
| 13 | 27.5 | 27.7 | 27.8 | 28.0 | 28.1 | 28.3 | 28.4 | 28.6 | 28.7 | 28.9 | 13 |
| 14 | 29.0 | 29.2 | 29.3 | 29.5 | 29.6 | 29.8 | 29.9 | 30.1 | 30.2 | 30.4 | 14 |
| 15 | 30.5 | 30.7 | 30.8 | 31.0 | 31.1 | 31.3 | 31.4 | 31.6 | 31.7 | 31.9 | 15 |
| 16 | 32.0 | 32.2 | 32.3 | 32.5 | 32.6 | 32.8 | 32.9 | 33.1 | 33.2 | 33.4 | 16 |
| 17 | 33.5 | 33.7 | 33.8 | 34.0 | 34.1 | 34.3 | 34.4 | 34.6 | 34.7 | 34.9 | 17 |
| 18 | 35.0 | 35.2 | 35.3 | 35.5 | 35.6 | 35.8 | 35.9 | 36.1 | 36.2 | 36.4 | 18 |
| 19 | 36.5 | 36.7 | 36.8 | 37.0 | 37.1 | 37.3 | 37.4 | 37.6 | 37.7 | 37.9 | 19 |
| 20 | 38.0 | 38.2 | 38.3 | 38.5 | 38.6 | 38.8 | 38.9 | 39.1 | 39.2 | 39.4 | 20 |
| 21 | 39.5 | 39.7 | 39.8 | 40.0 | 40.1 | 40.3 | 40.4 | 40.6 | 40.7 | 40.9 | 21 |
| 22 | 41.0 | 41.2 | 41.3 | 41.5 | 41.6 | 41.8 | 41.9 | 42.1 | 42.2 | 42.4 | 22 |
| 23 | 42.5 | 42.7 | 42.8 | 43.0 | 43.1 | 43.3 | 43.4 | 43.6 | 43.7 | 43.9 | 23 |
| 24 | 44.0 | 44.2 | 44.3 | 44.5 | 44.6 | 44.8 | 44.9 | 45.1 | 45.2 | 45.4 | 24 |
| 25 | 45.5 | 45.7 | 45.8 | 46.0 | 46.1 | 46.3 | 46.4 | 46.6 | 46.7 | 46.9 | 25 |
| 26 | 47.0 | 47.2 | 47.3 | 47.5 | 47.6 | 47.8 | 47.9 | 48.1 | 48.2 | 48.4 | 26 |
| 27 | 48.5 | 48.7 | 48.8 | 49.0 | 49.1 | 49.3 | 49.4 | 49.6 | 49.7 | 49.9 | 27 |
| 28 | 50.0 | 50.2 | 50.3 | 50.5 | 50.6 | 50.8 | 50.9 | 51.1 | 51.2 | 51.4 | 28 |
| 29 | 51.5 | 51.7 | 51.8 | 52.0 | 52.1 | 52.3 | 52.4 | 52.6 | 52.7 | 52.9 | 29 |
| 30 | 53.0 | 53.2 | 53.3 | 53.5 | 53.6 | 53.8 | 53.9 | 54.1 | 54.2 | 54.4 | 30 |
| 31 | 54.5 | 54.7 | 54.8 | 55.0 | 55.1 | 55.3 | 55.4 | 55.6 | 55.7 | 55.9 | 31 |
| 32 | 56.0 | 56.2 | 56.3 | 56.5 | 56.6 | 56.8 | 56.9 | 57.1 | 57.2 | 57.4 | 32 |
| 33 | 57.5 | 57.7 | 57.8 | 58.0 | 58.1 | 58.3 | 58.4 | 58.6 | 58.7 | 58.9 | 33 |
| 34 | 59.0 | 59.2 | 59.3 | 59.5 | 59.6 | 59.8 | 59.9 | 60.1 | 60.2 | 60.4 | 34 |
| 35 | 60.5 | 60.7 | 60.8 | 61.0 | 61.1 | 61.3 | 61.4 | 61.6 | 61.7 | 61.9 | 35 |
| 36 | 62.0 | 62.2 | 62.3 | 62.5 | 62.6 | 62.8 | 62.9 | 63.1 | 63.2 | 63.4 | 36 |
| 37 | 63.5 | 63.7 | 63.8 | 64.0 | 64.1 | 64.3 | 64.4 | 64.6 | 64.7 | 64.9 | 37 |
| 38 | 65.0 | 65.2 | 65.3 | 65.5 | 65.6 | 65.8 | 65.9 | 66.1 | 66.2 | 66.4 | 38 |
| 39 | 66.5 | 66.7 | 66.8 | 67.0 | 67.1 | 67.3 | 67.4 | 67.6 | 67.7 | 67.9 | 39 |
| 40 | 68.0 | 68.2 | 68.3 | 68.5 | 68.6 | 68.8 | 68.9 | 69.1 | 69.2 | 69.4 | 40 |

205
46
72

2637
2372
25.8

**Example**—If point is 22.6 ft. above grade, how far should it be from center line to be a slope stake point? Ans. from Table 41.9. For same slopes but other widths of roadbed correct above figures by one-half difference in width of roadbed; thus in example above for 20 ft. roadbed distance will be 41.9+(20—16)÷2 or 2 ft. added to 41.9 =43.9. For slopes of 1 on 1 see inside of front cover.