OFFICE OF
RAMSEY COUNTY ENGINEER

# FINAL CROSS-SECTIONS

AMOKA CUT-OFF

PROJ. 26-62-"C"

KEUFFEL & ESSER CO.
DRAWING MATERIALS
AND
SURVEYING INSTRUMENTS.
NEW YORK.
CHICAGO. ST. LOUIS. SAN FRANCISCO. MONTREAL.

# TABLES FOR EXCAVATIONS AND EMBANKMENTS.

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



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

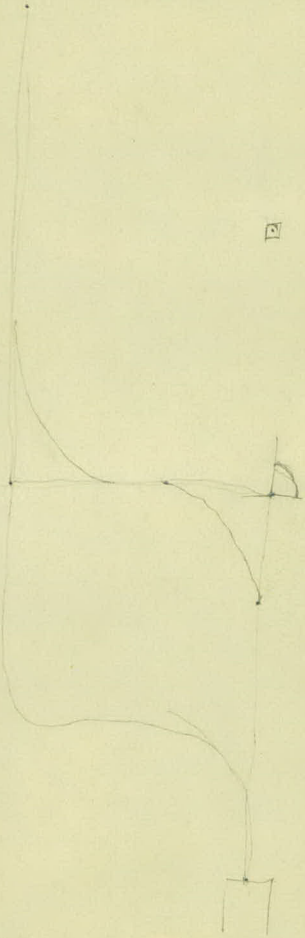
Calculated by Julien A. Hall, M. Am. Soc. C. E.

For Keith's Railroad Curve Tabels see end of book.


H. G. BOYESON CO.
INC.
STATIONERS AND PRINTERS
HGB
ADVERTISING SPECIALTIES
SAINT PAUL

562+00 Beg Dir C.

Δ 88°
D 15.



# INDEX.

| Sta | + | HI | - | Elev | |
|---|---|---|---|---|---|
| B.M | 1.76 | 903.69 ✓ | | 901.93 | |
| 647 | | | | 01.0 | 2.7 |
| 648 | | | | 900.0 | 3.7 |
| 649 | | | | 899.0 | 4.7 |
| +60 | | | | 98.5 | 5.2 |
| +77 | | | | 98.4 | 5.3 |
| +86 | | | | 98.3 | 5.4 |
| 650 | | | | 98.2 | 5.5 |
| +12 | | | | 98.2 | 5.5 |
| +30 | | | | 98.1 | 5.6 |
| 651 | | | | 97.7 | 6.0 |
| 652 | | | | 97.3 | 6.4 |

CWS
D.Sonnegum
T. Messinger
M. Galvin

2

Spike in 14" Cal 48' RT Stg 648+40

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 43/50 | 40/35 | 36/31 | 32/28 | 24/20 | 24 | 21/20 | 32/24 | 32/28 | 28/31 | 30/50 |

27

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 54/50 | 52/36 | 42/32 | 28/28 | 39/21 | 37 | 40/20 | 64/26 | 68/30 | 31/36 | 32/50 |

37

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 70/50 | 67/37 | 83/33 | 80/29 | 57/21 | 49 | 47/20 | 54/28 | 82/32 | 65/36 | 62/50 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 75/51 | 67/40 | 70/36 | 64/32 | 56/27 | 55/20 | 53 | 55/21 | 54/29 | 85/33 | 70/36 | 66/50 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 68/50 | 50/42 | 52/34 | 45/22 | 56 | 53/22 | 81/29 | 82/33 | 70/35 | 67/50 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 72/50 | 72/39 | 58/33 | 55/22 | 55 | 57/23 | 57/29 | 83/33 | 67/35 | 62/50 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 70/50 | 70/36 | 72/35 | 70/27 | 56/22 | 56 | 53/25 | 67/34 | 73/42 | 67/50 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 71/50 | 71/32 | 81/31 | 71/27 | 58/21 | 58 | 52/20 | 54/31 | 52/50 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 71/50 | 70/32 | 84/30 | 78/27 | 60/21 | 57 | 56/21 | 85/27 | 86/29 | 72/31 | 68/42 | 50/50 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 73/50 | 73/32 | 86/29 | 84/26 | 62/20 | 60 | 61/20 | 84/26 | 86/30 | 71/33 | 70/50 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 80/50 | 76/33 | 93/30 | 90/26 | 70/21 | 64 | 67/20 | 86/26 | 70/30 | 75/33 | 73/50 |

| 3+4 | + | H I | − | Flev | |
|---|---|---|---|---|---|
| | | 903.69 ✓ | | | |
| 653 | | | | 97.3 | 6.4 |
| +50 | | | | 97.3 | 6.4 |
| 654 | | | | 97.3 | 6.4 |
| T.P. | 4.11 | 901.92 ✓ | 5.88 | 897.81 ✓ | |
| 655 | | | | 97.4 | 4.5 |
| +50 | | | | 97.5 | 4.4 |
| 656 | | | | 97.5 | 4.4 |
| +50 | | | | 97.5 | 4.4 |
| 657 | | | | 97.4 | 4.5 |
| 658 | | | | 97.3 | 4.6 |
| 659 | | | | 97.0 | 4.9 |
| 660 | | | | 96.7 | 5.2 |
| 661 | | | | 96.4 | 5.5 |

84/50 80/31 92/27 86/24 70/20 65 67/21 88/26 87/30 77/33 75/50

80/30 77/31 70/28 85/25 64/20 65 66/20 87/26 90/30 78/33 70/50

74/50 76/32 90/28 85/24 68/20 65 67/20 87/25 88/30 76/33 70/50

54/50 61/32 68/29 64/25 48/20 47 48/20 71/26 71/30 60/34 54/50

58/50 53/32 66/28 68/24 48/20 46 45/20 62/26 64/31 50/36 40/50

52/50 53/33 68/29 64/25 48/20 47 48/20 64/25 67/27 32/36 30/50

52/50 50/34 52/33 70/29 67/25 46/20 47 47/20 66/24 66/29 36/35 31/37 36/50

48/50 47/34 70/29 70/25 44/20 47 48/20 64/25 63/30 34/36 30/39 28/50

44/50 42/37 45/34 74/29 71/25 49/20 48 48/20 68/25 70/29 38/35 32/38 33/50

47/50 46/35 54/33 75/29 73/25 50/20 50 49/20 72/26 71/29 52/34 50/36 51/50

68/50 56/32 60/35 76/31 74/25 53/20 52 52/20 70/26 70/31 51/35 48/38 46/50

58/50 53/36 80/30 72/25 57/20 54 54/20 76/25 74/30 50/35 43/39 40/50

| Jtg | + | HI | − | Flex | |
|---|---|---|---|---|---|
| | | 90192 ✓ | | | |
| 662 | | | | 96.1 | 5.8 |
| 663 | | | | 95.8 | 6.1 |
| 664 | | | | 95.5 | 6.4 |
| T.P | 3.53 | 89906 ✓ | 6.39 | 89553 ✓ | |
| +50 | | | | 95.1 | 3.7 |
| 665 | | | | 95.2 | 3.9 |
| 666 | | | | 94.9 | 4.2 |
| 667 | | | | 94.6 | 4.5 |
| +50 | | | | 94.5 | 4.6 |
| 668 | | | | 94.3 | 4.8 |
| +50 | | | | 94.2 | 4.9 |
| 669 | | | | 94.1 | 5.0 |
| +50 | | | | 94.1 | 5.0 |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 58 | 56 | 82 | 80 | 58 | 55 | | 54 | 28 | 78 | 50 | 44 | 46 | |
| 50 | 38 | 31 | 26 | 20 | | | 20 | 25 | 29 | 35 | 38 | 50 | |
| 66 | 67 | 64 | 88 | 88 | 61 | 59 | 60 | 77 | 80 | 52 | 48 | 48 | |
| 50 | 37 | 35 | 30 | 26 | 20 | | 20 | 25 | 30 | 35 | 39 | 50 | |
| 92 | 84 | 78 | 94 | 64 | 44 | | 64 | 87 | 88 | 67 | 62 | 62 | |
| 50 | 27 | 32 | 26 | 20 | | | 20 | 25 | 30 | 34 | 37 | 50 | |

End Ditch +28 Rt

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 73 | 72 | 76 | 72 | 66 | 38 | 38 | 35 | 62 | 60 | |
| 50 | 35 | 34 | 28 | 27 | 20 | | 20 | 28 | 50 | |

End Ditch +05 Rt

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 75 | 70 | 40 | | | 41 | 40 | 63 | 68 | |
| 50 | 26 | 20 | | | | 20 | 27 | 50 | |

Beg Ditch 61+37

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 80 | 72 | 40 | | 42 | 42 | 66 | 73 | 60 | 64 |
| | 50 | 27 | 20 | | | 20 | 28 | 35 | 38 | 50 |

Beg Ditch 66+50

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 72 | 68 | 76 | 76 | 46 | 45 | 44 | 70 | 71 | 55 | 52 |
| 50 | 33 | 30 | 27 | 20 | | 20 | 28 | 32 | 37 | 50 |

End D. +30 Rt

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 62 | 59 | 28 | 75 | 47 | 47 | 71 | 68 | |
| 50 | 33 | 30 | 27 | 20 | | 20 | 27 | 50 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 68 | 71 | 77 | 77 | 50 | 47 | 47 | 73 | 68 |
| 50 | 30 | 29 | 26 | 20 | | 20 | 26 | 50 |

End ditch +15

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | 84 | 83 | 50 | 49 | 48 | 76 | 76 |
| | 50 | 27 | 20 | | 20 | 26 | 50 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | 68 | 70 | 48 | 50 | 49 | 75 | 76 |
| | 50 | 25 | 20 | | 20 | 26 | 50 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 86 | 76 | 48 | 52 | 55 | 80 | 78 | 102 | 102 | 78 | 76 | |
| | 50 | 27 | 20 | | 20 | 26 | 30 | 32 | 35 | 40 | 50 | |

Beg Ditch +65

Beg D. +50

| Sta | + | HI | - | Elev | |
|---|---|---|---|---|---|
| | | 899.06 ✓ | | | |
| 670 | | | | 94.1 | 5.0 |
| +50 | | | | 94.1 | 5.0 |
| 671 | | | | 94.2 | 4.9 |
| +50 | | | | 94.3 | 4.8 |
| 672 | | | | 94.3 | 4.8 |
| +50 | | | | 94.4 | 4.7 |
| 673 | | | | 94.4 | 4.7 |
| 674 | | | | 94.5 | 4.6 |
| 675 | | | | 94.6 | 4.5 |
| BM | 1.27 | 899.33 ✓ | 1.01 | 898.05 ✓ | 898.06 ✓ |
| +50 | | | | 94.7 | 4.6 |
| 676 | | | | 94.7 | 4.6 |
| +50 | | | | 94.8 | 4.5 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 7.2 | 7.0 | 8.2 | 8.0 | 5.1 | 5.2 | 5.1 | 8.5 | 8.7 | 7.8 | 8.2 | |
| 50 | 31 | 28 | 26 | 20 | | 20 | 28 | 31 | 34 | 50 | |
| 6.2 | 5.6 | 7.5 | 7.6 | 5.2 | 5.2 | 5.3 | 7.8 | 7.8 | 5.8 | 5.6 | |
| 50 | 34 | 30 | 26 | 20 | | 20 | 26 | 29 | 33 | 50 | |
| 0.8 | 5.4 | 7.5 | 7.2 | 4.8 | 4.8 | 4.8 | 7.2 | 7.2 | 4.5 | 4.4 | |
| 50 | 33 | 29 | 25 | 20 | | 20 | 26 | 29 | 35 | 46 | |
| 4.6 | 4.0 | 2.5 | 2.5 | 4.7 | 4.7 | 4.7 | 6.6 | 6.7 | 3.5 | 3.3 | 3.2 |
| 50 | 37 | 29 | 27 | 20 | | 20 | 26 | 30 | 33 | 38 | 50 |
| 5.2 | 4.4 | 7.1 | 7.3 | 4.7 | 4.7 | 4.6 | 6.8 | 6.8 | 2.6 | 2.5 | 2.5 |
| 50 | 34 | 29 | 25 | 20 | | 20 | 27 | 31 | 38 | 40 | 50 |
| 5.0 | 5.0 | 7.2 | 7.1 | 5.0 | 4.8 | 4.6 | 6.7 | 6.9 | 2.5 | 2.0 | 2.0 |
| 50 | 34 | 31 | 27 | 20 | | 20 | 27 | 31 | 39 | 41 | 50 |
| 5.8 | 4.7 | 5.3 | 2.5 | 2.5 | 4.6 | 4.6 | 4.6 | 7.0 | 7.2 | 2.0 | 1.6 | 2.0 |
| 50 | 35 | 33 | 30 | 26 | 20 | | 20 | 26 | 30 | 39 | 40 | 50 |
| 6.0 | 5.4 | 5.1 | 7.0 | 7.0 | 4.6 | 4.6 | 4.6 | 7.2 | 7.0 | 4.2 | 4.0 | 3.4 |
| 50 | 34 | 33 | 30 | 26 | 20 | | 20 | 27 | 31 | 35 | 37 | 50 |
| 6.6 | 6.0 | 6.2 | 7.2 | 7.1 | 4.3 | 4.5 | 4.6 | 6.8 | 7.0 | 3.5 | 3.7 | 3.4 |
| 50 | 35 | 33 | 30 | 26 | 20 | | 20 | 26 | 29 | 36 | 37 | 50 |

Spike in 18" Ext. RT. 24 672 + 55

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 7.3 | 6.4 | 6.5 | 7.5 | 7.5 | 4.6 | 4.8 | 4.9 | 7.0 | 7.2 | 3.6 | 3.3 | 3.2 |
| 50 | 35 | 34 | 31 | 28 | 20 | | 20 | 26 | 30 | 36 | 38 | 50 |

+ 90 EM Ditch

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 7.4 | 6.8 | 7.0 | 4.5 | | | 4.8 | 5.0 | 7.0 | 7.2 | 3.6 | 3.3 | 3.1 |
| 50 | 33 | 30 | 20 | | | | 20 | 27 | 31 | 37 | 39 | 50 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 8.2 | 7.2 | 4.3 | | | 4.8 | 5.0 | 7.2 | 7.4 | 3.9 | 3.6 | 3.1 |
| 50 | 31 | 20 | | | | 20 | 26 | 30 | 36 | 37 | 50 |

| Sta | + | HI | - | Elev | |
|---|---|---|---|---|---|
| | | 899.33 ✓ | | | |
| 677 | | | | 94.8 | 4.5 |
| +50 | | | | 94.9 | 4.4 |
| 678 | | | | 94.8 | 4.5 |
| B.M. | | | 0.97 | 895.36 ✓ | 895.37 |
| +50 | | | | 94.7 | 4.6 |
| 679 | | | | 94.6 | 4.7 |
| +50 | | | | 94.4 | 4.9 |
| 680 | | | | 94.2 | 5.1 |
| +50 | | | | 93.9 | 5.4 |
| 681 | | | | 93.6 | 5.7 |
| T.P. | 2.71 | 895.95 ✓ | 6.09 | 893.24 ✓ | |
| +50 | | | | 93.2 | 2.8 |
| 682 ✓ | | | | 92.8 | 3.2 |
| 682 + 59.58 = 709 + 54.20 | | | | 92.4 | 3.6 |

995.98

6

+80 Begin Ditch

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 7.4 | 6.6 | 7.2 | 6.7 | 4.1 | 4.3 | 4.9 | 2.0 | 2.3 | 4.4 | 3.8 | |
| 50 | 31 | 30 | 27 | 20 | | 20 | 26 | 29 | 36 | 50 | |
| 6.3 | 6.2 | 6.7 | 6.7 | 4.5 | 4.9 | 5.0 | 6.9 | 7.1 | 5.8 | 5.4 | |
| 50 | 34 | 30 | 27 | 20 | | 20 | 27 | 31 | 35 | 50 | |
| 5.7 | 6.0 | 6.1 | 6.8 | 6.3 | 4.3 | 4.8 | 4.8 | 6.4 | 6.4 | 5.8 | 4.8 |
| 50 | 32 | 31 | 29 | 26 | 20 | | 20 | 25 | 29 | 32 | 50 |

Spoiling 12" Ork 100 Pt Sta 677+70

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 4.4 | 4.4 | 6.4 | 6.4 | 4.4 | 4.7 | 5.0 | 6.8 | 6.8 | 5.2 | 4.8 | 4.2 |
| 50 | 35 | 30 | 25 | 20 | | 20 | 26 | 30 | 33 | 36 | 50 |
| 3.3 | 3.5 | 6.6 | 7.0 | 4.4 | 4.9 | 5.0 | 6.3 | 7.0 | 3.7 | 3.6 | 3.2 |
| 50 | 39 | 30 | 26 | 20 | | 20 | 27 | 31 | 37 | 39 | 50 |
| 3.1 | 3.2 | 3.4 | 7.2 | 7.1 | 4.5 | 5.0 | 5.2 | 7.0 | 7.3 | 3.4 | 3.0 | 3.1 |
| 50 | 42 | 40 | 30 | 26 | 20 | | 20 | 26 | 30 | 38 | 40 | 50 |
| 3.4 | 3.3 | 3.6 | 7.4 | 7.5 | 4.6 | 5.1 | 5.5 | 7.3 | 7.8 | 3.5 | 3.3 | 3.0 |
| 50 | 42 | 40 | 32 | 28 | 20 | | 20 | 26 | 30 | 37 | 39 | 50 |
| 4.1 | 4.2 | 4.5 | 8.1 | 8.3 | 5.1 | 5.3 | 5.5 | 7.8 | 8.0 | 4.1 | 3.8 | 4.2 |
| 50 | 47 | 41 | 33 | 30 | 20 | | 20 | 27 | 30 | 38 | 39 | 50 |
| 4.8 | 4.7 | 5.0 | 8.6 | 8.7 | 5.4 | 5.6 | 6.1 | 8.4 | 8.6 | 5.7 | 5.4 | 5.8 |
| 50 | 44 | 41 | 33 | 29 | 20 | | 20 | 26 | 30 | 37 | 37 | 50 |
| | 4.1 | 2.4 | 6.1 | 6.2 | 2.5 | 2.7 | 3.0 | 5.2 | 5.2 | 4.2 | 4.6 | |
| | 50 | 45 | 35 | 31 | 20 | | 20 | 28 | 31 | 34 | 50 | |
| | | | | | | | | | | +80=00 Ditch | | |
| | 3.6 | 3.6 | 7.0 | 6.7 | 3.0 | 3.4 | 3.4 | 6.2 | 6.7 | | | |
| | 50 | 44 | 35 | 31 | 20 | | 20 | 27 | 50 | | | |
| End Ditch at E 964 | | 7.4 | 7.3 | 7.5 | 3.6 | 3.9 | 4.0 | 6.8 | 7.4 | | | |
| | | 50 | 39 | 30 | 20 | | 20 | 27 | 50 | | | |

| 3+4 | + | 1+I | − | E/eV | |
|---|---|---|---|---|---|
| | | 895.95 ✓ | | | |
| 710 | | | | 92.1 | 3.9 |
| 711 | | | | 91.7 | 4.3 |
| +46 | | | | 91.6 | 4.1 |
| 712 | | | | 91.4 | 4.6 |
| +50 | | | | 91.3 | 4.7 |
| 713 | | | | 91.1 | 4.9 |
| 714 | | | | 90.8 | 5.2 |
| +30 | | | | 90.7 | 5.3 |
| 715 | | | | 90.5 | 5.5 |
| +45 | | | | 90.4 | 5.6 |
| 716 | | | | 90.2 | 5.8 |
| 717 | | | | 89.9 | 6.1 |

72/50 71/28 4.9/20 4.2 4.0/20 7.1/28 7.1/50

6.4/50 6.2/35 7.5/28 4.5/20 4.5 4.5/20 7.1/28 7.4/50

7.7/50 7.7/41 8.1/36 8.1/33 7.7/29 7.6/20 4.8/20 4.7 4.8/20 8.2/30 8.2/35 7.4/26 7.3/50

Bog Ditch Wtr Rat Sta

7.7/50 7.8/27 4.7/20 4.8 4.9/20 8.0/29 8.0/33 6.2/39 5.5/50

5.2/50 5.2/37 7.7/31 7.4/27 4.8/20 4.9 5.0/20 7.7/31 8.0/36 5.0/45 4.7/50

4.3/50 4.4/40 8.2/31 7.8/27 5.0/20 5.0 5.1/20 7.9/26 7.6/31 8.2/34 8.0/35 4.7/44 4.5/50

End R. +43.

5.8/51 5.8/39 9.0/32 8.6/28 5.5/20 5.2 5.0/20 8.3/30 8.7/34 5.4/41 5.0/43 4.6/50

5.5/50 9.4/29 5.5/20 5.4 5.6/20 8.2/29 8.5/33 6.2/38 6.0/44 5.2/50

9.5/50 9.5/27 5.5/20 5.5 5.4/20 9.0/31 9.0/35 8.0/39 7.4/50

9.7/50 9.6/29 5.5/20 5.5 5.5/20 7.8/26 8.5/27 7.2/35 7.3/40 7.4/50

J 9.8/50 8.2/30 5.5/20 5.6 5.6/20 7.8/28 8.0/32 5.8/36 5.5/50

+20 = Bog Ditch

5.7/50 5.7/41 8.5/34 8.8/36 5.5/20 5.4 5.8/20 8.8/27 9.0/34 5.2/41 4.8/43 4.8/50

| | | | | | |
|---|---|---|---|---|---|
| 34+ | + | HI | − | Flev | |
| | | 895.95 ✓ | | | |
| 718 | | | | 89.6 | 6.4 |
| BM | 1.00 | 891.52 ✓ | 5.43 | 890.52 ✓ | |
| 719 | | | | 89.3 | 2.2 |
| +50 | | End | | | |
| BM | | | .52 | 890.00 ✓ | 890.01 |
| 715+20 | x Drain | | | | |
| 711+77 | Drive Culv Rt | | | | |
| 698+50 | Drive | | | | |
| 677+75 | Drive | | | | |
| 669+63 | x Drain | | | | |
| 659+80 | | | | | |
| 659+80 | | | | | |
| 650+12 | Rt | | | | |
| 649+70 | x Drain | | | | |

7-

8

6.5/50 7.0/37 9.6/32 9.3/27 6.2/20 6.2/— 6.3/20 9.0/29 9.3/35 6.8/40 6.8/42 6.3/50

Spike in 16" Oak 50' Rt Sta 718+50

2.5/50 2.6/40 2.7/38 5.2/33 5.2/27 2.0/20 18/— 2.0/20 4.6/28 5.0/34 2.0/40 1.7/50

2.3/50 2.4/37 2.2/20 2.4/— 2.4/20 2.7/26 2.8/36 3.2/50

Spike in 8" Oak 60' Lt Sta 721+25

24" x 54" P3

18" x 36.5 CM. Rt.

28' x 10' x 1.5' Lt 13 C.Y.

35' x 10' x 1.0 13 C.Y.

30' x 54" P3

15" x 24" CM 2 C.Y. Rt 2 C.Y

15' x 24" CM 2 C.Y Lt 2 C.Y

18" x 36.5 CM 2 C.Y Rt 2 C.Y

24" x 66" P3

Final x Sec. of Pri. X. Rd Lt. Sta. 827+18

0+00 = 20' Lt. Sta. 827+18

0+08

0+14

0+23

0+35

0+49

0+65 0.0 Section.

Final x Sec. of Pri. X Rd. Rt. Sta. 827+39.

0+00 = 20 Rt. Sta. 827+39.

0+05

0+12

0+22

0+44

0+64

Left Right 11-8-27

| | | | | | | |
|---|---|---|---|---|---|---|
| | | $\frac{7.7}{12}$ | 7.5 | $\frac{7.5}{11}$ | | |
| | $\frac{9.7}{12}$ | $\frac{7.8}{7}$ | 7.3 | $\frac{7.6}{10}$ | $\frac{9.4}{13}$ | |
| | $\frac{9.5}{13}$ | $\frac{7.3}{7}$ | 6.9 | $\frac{7.3}{9}$ | $\frac{8.6}{14}$ | |
| $\frac{2.2}{15}$ | $\frac{5.5}{9}$ | $\frac{6.3}{5}$ | 6.4 | $\frac{6.3}{8}$ | $\frac{7.3}{14}$ | |
| | $\frac{2.0}{11}$ | $\frac{5.4}{6}$ | 5.5 | $\frac{5.2}{6}$ | $\frac{3.9}{10}$ | $\frac{1.9}{14}$ |
| | $\frac{2.1}{11}$ | $\frac{3.6}{7}$ | 4.2 | $\frac{4.2}{4}$ | $\frac{3.4}{7}$ | $\frac{2.0}{10}$ |
| | | $\frac{2.2}{4}$ | 2.2 | $\frac{2.4}{6}$ | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | $\frac{8.2}{11}$ | 8.2 | $\frac{8.6}{12}$ | | |
| | $\frac{9.6}{12}$ | $\frac{8.4}{9}$ | 8.1 | $\frac{8.8}{10}$ | $\frac{9.6}{14}$ | |
| | $\frac{9.7}{11}$ | $\frac{8.2}{8}$ | 7.7 | $\frac{8.0}{10}$ | $\frac{10.0}{15}$ | |
| $\frac{2.1}{13}$ | $\frac{5.9}{7}$ | $\frac{7.3}{4}$ | 7.1 | $\frac{6.7}{7}$ | $\frac{5.5}{11}$ | $\frac{2.2}{15}$ |
| | $\frac{2.1}{11}$ | $\frac{5.5}{6}$ | 5.1 | $\frac{4.6}{5}$ | $\frac{4.1}{7}$ | $\frac{2.3}{10}$ |
| | | $\frac{2.6}{10}$ | 2.6 | $\frac{2.6}{6}$ | | |

For Uncl. Order # 6

| Sta | + | HI | - | Elev |
|---|---|---|---|---|
| B.M. | 2.71 | 853.78 | | 851.07 |
| 809+50 | | | | |
| +75 | | | | |
| 810+00 | | | | |
| +25 | | | | |
| +50 | | | | |
| 811+00 | | | | |
| +25 | | | | |
| +50 | | | | |
| +71 | | | | |
| +92 | | | | |
| 812+00 | | | | |

Left. Right.

$\frac{3.5}{50}$ $\frac{3.7}{32}$ $\frac{3.1}{22}$ $\frac{4.8}{20}$ 44 $\frac{4.4}{19}$ $\frac{6.5}{33}$ $\frac{5.4}{27}$ $\frac{2.4}{32}$ $\frac{7.8}{50}$

$\frac{4.9}{50}$ $\frac{4.1}{34}$ $\frac{6.7}{31}$ $\frac{6.4}{25}$ $\frac{4.8}{21}$ 44 $\frac{4.6}{19}$ $\frac{6.6}{24}$ $\frac{6.9}{29}$ $\frac{4.9}{34}$ $\frac{6.6}{42}$ $\frac{7.6}{50}$

$\frac{3.0}{50}$ $\frac{3.7}{37}$ $\frac{7.3}{33}$ $\frac{7.1}{25}$ $\frac{4.9}{21}$ 47 $\frac{4.7}{19}$ $\frac{7.6}{26}$ $\frac{7.6}{30}$ $\frac{5.1}{37}$ $\frac{5.8}{50}$

$\frac{3.8}{50}$ $\frac{3.7}{37}$ $\frac{7.3}{33}$ $\frac{7.1}{25}$ $\frac{4.9}{21}$ $\sqrt{50}$ $\frac{4.9}{19}$ $\frac{7.6}{26}$ $\frac{7.6}{30}$ $\frac{5.1}{37}$ $\frac{5.8}{50}$

$\frac{3.9}{50}$ $\frac{4.0}{38}$ $\frac{6.9}{50}$ $\frac{7.2}{26}$ $\frac{5.0}{22}$ 49 $\frac{4.9}{20}$ $\frac{7.3}{26}$ $\frac{7.1}{30}$ $\frac{5.4}{33}$ $\frac{6.1}{50}$

$\frac{1.0}{50}$ $\frac{6.9}{49}$ $\frac{6.9}{33}$ $\frac{2.0}{27}$ $\frac{5.2}{22}$ $\sqrt{50}$ $\frac{5.1}{20}$ $\frac{6.9}{24}$ $\frac{2.0}{29}$ $\frac{2\sqrt{}}{36}$ $\frac{2.9}{50}$

$\frac{1.2}{50}$ $\frac{+1.3}{44}$ $\frac{4.3}{38}$ $\frac{6.6}{33}$ $\frac{6.9}{26}$ $\frac{\sqrt{}}{21}$ $\sqrt{52}$ $\frac{5.3}{20}$ $\frac{7.1}{25}$ $\frac{7.1}{30}$ $\frac{0.8}{38}$ $\frac{0.1}{50}$

$\frac{0.1}{50}$ $\frac{+2.0}{46}$ $\frac{+2.0}{44}$ $\frac{6.2}{32}$ $\frac{6.9}{26}$ $\frac{\sqrt{}}{21}$ $\sqrt{54}$ $\frac{5.6}{20}$ $\frac{6.7}{24}$ $\frac{6.9}{30}$ $\frac{0.3}{39}$ $\frac{+0.5}{57}$

$\frac{1.6}{50}$ $\frac{+2.1}{48}$ $\frac{+2.5}{43}$ $\frac{3.6}{34}$ $\frac{6.2}{30}$ $\frac{6.4}{23}$ $\frac{5.3}{20}$ $\sqrt{56}$ $\frac{5.9}{20}$ $\frac{6.9}{25}$ $\frac{6.7}{30}$ $\frac{+1.3}{41}$ $\frac{+1.6}{50}$

$\frac{+8.8}{50}$ $\frac{+6.0}{38}$ $\frac{0.6}{28}$ $\frac{2.0}{19}$ $\frac{4.3}{11}$ 58 $\frac{5.6}{19}$ $\frac{6.7}{22}$ $\frac{6.1}{24}$ $\frac{+1.4}{44}$ $\frac{+1.1}{50}$

$\frac{+1.10}{50}$ $\frac{+2.3}{34}$ $\frac{0.0}{27}$ $\frac{1.1}{20}$ $\frac{3.3}{18}$ $\frac{4.0}{14}$ $\sqrt{71}$ $\frac{5.9}{19}$ $\frac{6.1}{22}$ $\frac{5.9}{34}$ $\frac{+1.0}{45}$ $\frac{+0.3}{50}$

| Sta | + | HI | − | Elev | |
|---|---|---|---|---|---|
| 801+00 | | | | | |

| Sta | + | H I | − | Elev | |
|---|---|---|---|---|---|
| | | | | | |

| Sta | + | HI | - | Elev | |
|---|---|---|---|---|---|

| Sta | + | H.I | - | Elev |
|---|---|---|---|---|
| B.M. | 4.75 | 918.15 ✓ | | 913.40 |
| 562+00 | | | | |
| 563+00 | | | | |
| 564+00 | | | | |
| 565+00 | | | | |
| +50 | | | | |
| 566+00 | | | | |
| 567+00 | | | | |
| +50 | | | | |
| 568+00 | | | | |
| T.P. | 3.54 | 917.88 ✓ | 3.81 | 914.34 ✓ |
| 569+00 | | | | |
| +63 | | | | |

CMO
D.S.
E.F.
H.M.

10/24/23

(47)

Optic in autumn 50 47 340 560 +68

24/50 28/40 30 25/26 32/20 50 42/20 27 33 60/32 35/40 42 31/50

(47)

30/50 32/39 34/31 24/27 28/20 50 31/20 28 29 42/37 44/50

(48)

45/50 47/33 31 29 26/20 50 48/20 28 31 45/33 49/50

(47)

40/50 41/32.5 33/31 34/28 48/20 47 48/20 28 32 46/20 47/50

(47)

24/50 35/38 31/30 28/28 50/20 48 51/20 29 31 39/39 38/50

(47)

32/50 39 38/30 27/20 50 50/20 26 27.5 40/33 43/50

(47)

28/50 39 30/30 27/28 31/20 50 50/20 27 30 37/31.5 39/50

(48)

35/50 39 33/30 27/28 31/20 48 31/20 27.5 29 39/38 40/50

(47)

31/50 37 30/31.5 32/28 31/20 51 33/20 28 30.5 38/38 39/50

(47)

106/50 33 100/205 48/27.5 47/20 48/27.5 42/50

(48)

110/50 34 103/21 48/47 50/20 33/31 35/50

| Sta | + | HI ✓ 917.88 | - | Elev |
|---|---|---|---|---|
| 570+00 | | | | |
| +50 | | | | |
| 571+00 | | | | |
| +50 | | | | |
| 572+00 | | | | |
| +50 | | | | |
| 573+00 | | | | |
| +50 | | | | |
| 574 | | | | |
| +40 | | | | |
| 575 | | | | |

10/24/27

(48)

| | | | | | | |
|---|---|---|---|---|---|---|
| 11.0 | 10.2 | 5.0 | 4.9 | 5.1 | 9.0 | 8.0 |
| 5.0 | 3.2 | 2.0 | | 2.0 | 3.1 | 5.0 |

(49)

| | | | | | | |
|---|---|---|---|---|---|---|
| 9.2 | 8.8 | 5.0 | 5.0 | 5.0 | 7.8 | 6.8 |
| 5.0 | 3.0 | 2.0 | | 2.0 | 2.9.5 | 5.0 |

+55 Beg Ditch 47 +17

(49)

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 6.0 | 5.3 | 2.7 | 2.5 | 5.0 | 5.0 | 8.0 | 8.0 | 5.0 | 4.8 |
| 5.0 | 3.5.5 | 3.0.5 | 2.7 | 2.0 | 2.0 | 2.7.5 | 3.0 | 3.6 | 5.0 |

(48)

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 3.4 | 3.5 | 2.5 | 2.5 | 4.9 | 5.0 | 5.1 | 8.0 | 7.8 | 3.7 | 3.7 |
| 5.0 | 3.9 | 3.1 | 2.7 | 2.0 | | 2.0 | 2.7 | 3.0.5 | 3.8 | 5.0 |

(48)

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 2.1 | 2.3 | 2.4 | 2.7 | 5.0 | 4.9 | 5.0 | 2.4 | 2.7 | 3.4 | 3.5 |
| 5.0 | 4.0 | 3.1 | 2.7.5 | 2.0 | | 2.0 | 2.9 | 3.1.5 | 3.8.5 | 5.0 |

(48)

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 2.2 | 2.3.5 | 2.1 | 2.5 | 5.1 | 4.8 | 4.8 | 7.3 | 2.5 | 3.4 | 3.7 |
| 5.0 | 4.0 | 3.2 | 2.8 | 2.0 | | 2.1 | 2.8.5 | 3.1 | 3.9 | 5.0 |

(47)

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 3.4 | 3.3 | 2.3 | 2.5 | 4.9 | 4.8 | 5.0 | 7.2 | 7.4 | 4.3 | 4.7 |
| 5.0 | 4.7.5 | 3.9.5 | 2.7.5 | 2.0 | | 2.0 | 2.5 | 3.0.5 | 3.6 | 5.0 |

(47)

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 5.2 | 5.8 | 6.5 | 6.5 | 5.2 | 4.6 | 4.7 | 6.8 | 6.8 | 6.4 | 6.4 |
| 5.0 | 3.3.8 | 3.2 | 3.0.5 | 2.5 | 2.0 | 2.0.5 | 2.7.5 | 3.1 | 3.2.5 | 5.0 |

+70 E Ditch 47 +50 E Ditch 81

(46)

| | | | | | | |
|---|---|---|---|---|---|---|
| 2.7 | 2.7 | 4.7 | 4.8 | 4.6 | 7.6 | 7.8 |
| 5.0 | 3.8 | 2.0 | | 2.0.5 | 2.8 | 5.0 |

(46)

| | | | | | | |
|---|---|---|---|---|---|---|
| 8.8 | 8.4 | 5.0 | 4.7 | 4.7 | 7.2 | 7.5 |
| 5.0 | 3.7 | 2.0.5 | | 2.0.5 | 2.9 | 5.0 |

(45)

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 8.0 | 7.2 | 4.6 | 4.4 | 5.2 | 7.0 | 7.9 | 6.6 | 7.0 |
| 5.0 | 3.6 | 2.0 | | 2.0 | 2.4 | 2.9 | 3.1 | 3.2 | 5.0 |

+60 Beg Ditch

| Sta | + | H I | − | Ele.v | |
|---|---|---|---|---|---|
| | | 917.88 | | | |
| 576 | | | | | |
| B.M. | 4.87 | 918.07 | 4.65 | 913.23 | 913.20 |
| 577 | | | | | |
| 578 | | | | | |
| +50 | | | | | |
| 579 | | | | | |
| B.M. | 4.96 | 918.16 | 4.87 | 913.20 | |
| 580+00 | | | | | |
| 581+00 | | | | | |
| +50 | | | | | |
| 582 | | | | | |
| +50 | | | | | |
| 583 | | | | | |

C.M.S.
D.J.
E.T.
A.P.

10/25/27

+50 Beg Ditch

| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 56 | 53 | 20 | 74 | 43 | 42 | 47 | 65 | 65 | 55 | 58 | 44 | | | | | | | | |
| 50 | 34 | 30.5 | 24.5 | 20 | | 21 | 27.5 | 30 | 32.5 | 50 | | | | | | | | | |

spike in 12" Oak 60' Lt of Sta 576+85

| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 45 | 43 | 72 | 73 | 49 | 46 | 47 | 58 | 72 | 72 | 60 | 70 | 48 | | | | | | | |
| 50 | 37 | 31 | 27 | 20 | | 20 | 24.8 | 29.5 | 29 | 32 | 50 | | | | | | | | |

| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 38 | 40 | 72 | 73 | 50 | 47 | 52 | 73 | 73 | 57 | 64 | 49 | | | | | | | | |
| 50 | 38 | 31 | 28 | 20 | | 23 | 28 | 29 | 32.5 | 50 | | | | | | | | | |

| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 34 | 32 | 67 | 72 | 48 | 47 | 49 | 68 | 68 | 78 | 53 | 50 | | | | | | | | |
| 50 | 39 | 32.5 | 29 | 20 | | 20 | 26 | 30 | 32 | 50 | | | | | | | | | |

| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 33 | 33 | 68 | 67 | 49 | 48 | 51 | 73 | 73 | 37 | 43 | 50 | | | | | | | | |
| 50 | 40 | 32.5 | 28.5 | 20 | | 20 | 27 | 30 | 35.5 | 50 | | | | | | | | | |

spike in 12" Oak 60' Lt of Sta 576+35

| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 42 | 40 | 75 | 71 | 55 | 52 | 53 | 78 | 77 | 38 | 47 | 50 | | | | | | | | |
| 50 | 36.5 | 29.5 | 27 | 20 | | 20 | 27.5 | 30 | 37 | 50 | | | | | | | | | |

| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 40 | 38 | 70 | 72 | 52 | 50 | 54 | 74 | 77 | 30 | 36 | 50 | | | | | | | | |
| 50 | 37 | 29.5 | 27 | 20 | | 20 | 25.5 | 28 | 38 | 50 | | | | | | | | | |

| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 55 | 52 | 78 | 78 | 55 | 55 | 55 | 78 | 78 | 30 | 30 | 50 | | | | | | | | |
| 50 | 34.5 | 29 | 25 | 20 | | 20 | 24.5 | 26 | 30.5 | 38 | 50 | | | | | | | | |

+95 End Ditch

| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X | 85 | 78 | 55 | 55 | 55 | 78 | 78 | 42 | 37 | 50 | | | | | | | | | |
| | 50 | 28 | 20 | | 20 | 28 | 31 | 40.5 | 50 | | | | | | | | | | |

| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 104 | 98 | 55 | 55 | 55 | 77 | 78 | 50 | 73 | 50 | | | | | | | | | | |
| 50 | 32.5 | 20 | | 20 | 26.5 | 31 | 36 | 50 | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 85 | 85 | 60 | 57 | 60 | 78 | 78 | 55 | 52 | 50 | | | | | | | | | | |
| 50 | 29.5 | 20 | | 20 | 28 | 31 | 36.5 | 50 | | | | | | | | | | | |

+00 Beg Ditch

| Sta | + | HI | − | Elev | |
|---|---|---|---|---|---|
| | | 915.96 | | | |
| 584 | | | | | |
| T.P. | 2.55 | 915.68 | 5.03 | 913.13 | |
| 585 | | | | | |
| 586 | | | | | |
| +50 | | | | | |
| 587 | | | | | |
| +44 | | | | | |
| 588 | | | | | |
| +50 | | | | | |
| 589 | | | | | |
| +50 | | | | | |
| B.M. | 4.81 | 915.70 | 4.81 | 910.87 = | 910.89 |
| 590 | | | | | |

10/25/17

(31)

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 63 | 64 | 78 | 78 | 61 | 60 | 58 | 58 | 54 | 50 | |
| 50 | 37 | 32.5 | 28.5 | 24 | 20 | 28.5 | 21 | 39 | 50 | |

(37)

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 39 | 38 | 61 | 61 | 47 | 41 | 64 | 64 | 51 | 30 | |
| 50 | 38 | 32 | 28.5 | 21 | 20 | 31.5 | 21 | 38 | 50 | |

(42)

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 44 | 38 | 64 | 64 | 45 | 43 | 44 | 64 | 65 | 36 | 38 |
| 50 | 38 | 32.5 | 28 | 22.5 | | 20 | 27 | 32.5 | 38 | 50 |

(45)

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 46 | 43 | 73 | 74 | 46 | 42 | 47 | 67 | 67 | 40 | 43 |
| 50 | 38 | 32 | 28.5 | 20 | | 20 | 27.5 | 31 | 37.5 | 50 |

(47)

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 45 | 45 | 78 | 78 | 52 | 49 | 48 | 70 | 72 | 50 | 47 |
| 50 | 38.5 | 33 | 28 | 24 | | 20 | 27 | 30 | 38.5 | 50 |

(40)

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 46 | 44 | 73 | 74 | 52 | 50 | 53 | 68 | 68 | 43 | 42 |
| 50 | 40 | 36 | 37.5 | 24 | | 22 | 30 | 32 | 38 | 50 |

(52)

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 42 | 44 | 72 | 75 | 57 | 54 | 56 | 76 | 77 | 40 | 36 |
| 50 | 41 | 36 | 31 | 24 | | 25 | 32 | 36 | 44 | 50 |

(55)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 43 | 46 | 77 | 77 | 63 | 56 | 57 | Cut off. |
| 50 | 40 | 34.5 | 28 | 22.5 | | 14 | |

(57)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 55 | 55 | 82 | 81 | 64 | 55 | 53 | |
| 50 | 40 | 35 | 29 | 22 | | 30 | |

(60)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | 82 | 80 | 92 | 90 | 68 | 56 | 50 |
| | 50 | 36.7 | 32 | 29 | 22 | | 30 |

+65 End of Sec. 10'

Spike in 18" Ash 100' N of 588+50

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 100 | 90 | 71 | 61 | 52 | 24 | 22 | |
| | 50 | 27.5 | 22 | | 18.5 | 18 | 20 | |

(62)

| Sta | + | HI | − | Elev | |
|---|---|---|---|---|---|
| | | 915.70 | | | |
| 590+50 | | | | | |
| 591 | | | | | |
| +50 | | | | | |
| T.P. | 4.21 | 913.74 | 6.17 | 909.53 | |
| 592 | | | | | |
| +50 | | | | | |
| 593 | | | | | |
| +50 | | | | | |
| 594 | | | | | |
| +50 | | | | | |
| 595 | | | | | |
| +4.7 | | | | | |
| +58 | | | | | |

10/25/27

(68)

| | | | | | | |
|---|---|---|---|---|---|---|
| 105 | 93 | 25 | 64 | 57 | 82 | 84 |
| 50 | 294 | 22.5 | | 20 | 28 | 50 |

(67)

| | | | | | | |
|---|---|---|---|---|---|---|
| 108 | 98 | 28 | 68 | 61 | 94 | 96 |
| 50 | 29 | 24.3 | | 20 | 29.5 | 50 |

(66)

| | | | | | | |
|---|---|---|---|---|---|---|
| 102 | 101 | 28 | 68 | 61 | 102 | 107 |
| 50 | 31 | 22.5 | | 21 | 30 | 50 |

+95 Beg Ditch Rt

(65)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 24 | 25 | 81 | 80 | 58 | 50 | 43 | 85 | 97 |
| 58 | 37 | 36 | 32 | 20.6 | | 20 | 30 | 50 |

(64)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 21 | 21 | 84 | 84 | 60 | 49 | 43 | 80 | 97 |
| 50 | 38.4 | 36.5 | 31.5 | 24 | | 20 | 30 | 50 |

(63)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 60 | 67 | 86 | 85 | 62 | 50 | 42 | 82 | 86 |
| 50 | 39 | 34.5 | 29.5 | 22.5 | | 20 | 31 | 50 |

(62)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 50 | 51 | 82 | 80 | 58 | 52 | 44 | 74 | 82 |
| 50 | 41 | 36 | 26.5 | 20.5 | | 20 | 29 | 50 |

(61)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 46 | 51 | 81 | 78 | 58 | 51 | 48 | 68 | 73 |
| 50 | 40 | 34.5 | 25 | 20 | | 20 | 28 | 50 |

+05 Beg Ditch Rt.

(60)

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 55 | 57 | 77 | 82 | 83 | 53 | 52 | 49 | 77 | 78 | 62 | 60 |
| 50 | 39 | 37 | 34 | 28 | 20 | | 20 | 27.5 | 30 | 34 | 50 |

(59)

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 46 | 49 | 83 | 87 | 82 | 51 | 52 | 48 | 66 | 75 | 74 | 56 | 58 |
| 50 | 40 | 33.5 | 30.5 | 26 | 20 | | 50 | 25 | 29.5 | 34.5 | 35.5 | 50 |

+41 End Ditch Rt.

(58)

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 49 | 48 | 82 | 85 | 80 | 50 | 49 | 49 | 82 | 67 | 50 |
| 50 | 39 | 32.5 | 29 | 26 | 20 | | 20 | 28.5 | 23 | 50 |

(57)

Pav

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 53 | 53 | 82 | 78 | 48 | 48 | | 47 | 46 |
| 50 | 34 | 33 | 26 | 20 | | | 20 | 50 |

| Sta. | + | HI | - | Elev |
|---|---|---|---|---|
| | | 913.74 | | |
| +64 | | | | |
| +80 | | | | |
| +95 | | | | |
| 596 | | | | |
| +15 | | | | |
| 1 +82 | | | | |
| 597 | | | | |
| +11 | | | | |
| +43 | | | | |
| +64 | | | | |
| 598 | | | | |
| +50 | | | | |
| T.P. | 8.16 | 917.62 ✓ | 4.28 | 909.46 ✓ |

CHMS
DB
EF
KP

10/25/23

(48) C. Pav Pav

51/50 58/37 78/33.5 82/26 48/22 48 48/15 45/20 45/50

+66 End Ditch Rt

(48) Pav Pav Pav

58/51 50/49 47/29 45 45/24 48/37 73/50

(48) Pav Pav

48/50 43/31.5 45 45/20 85/29 92/50

48

43/50 43/38.5 45/24 46 48/20 80/27 95/38 90/50

48

66/50 71/26 550/20 46 49/20 80/27 92/50

+50 Beg Ditch Rt.

(46)

46/50 52/34 72/30 72/26.5 49/20 50 48/20 70/24.5 71/29 64/31.5 68/50

+82 Beg Ditch Rt.

(46)

54/50 50/32.5 70/30.5 70/27 46/20.5 49 47/20 71/26 72/29.5 44/34 42/50

(46)

64/50 64/32 71/30.5 71/27 47/24.5 49 49/20 73/26 76/29.5 52/33 48/50

(45)

71/50 72/33 72/27 47/20.5 47 46/20 76/26 77/30 64/34 62/50

(44)

72/50 81/35 76/29.5 47/21 47 47/20 70/25.5 71/50

+75 Beg Ditch Rt. +95 Beg Ditch Rt

(0.4)

51/50 54/35 74/30.5 74/27 46/20 47 46/20 71/26 72/29.5 62/31.5 65/50

(0.4)

15/50 15/40.5 72/31 72/27.5 47/20 47 48/20 68/25 70/28 20/37 20/50

| Sta | + | HI | - | Elev | |
|---|---|---|---|---|---|
| BM. | 10.4 | 915.10 ✓ | 3.5✓ | 914.08 ✓ | = 914.06 |
| 599+00 | | | | | |
| +50 | | | | | |
| 600+00 | | | | | |
| +50 | | | | | |
| 601+00 | | | | | |
| +50 | | | | | |
| 602+00 | | | | | |
| +50 | | | | | |
| 603+00 | | | | | |
| +50 | | | | | |
| 604+00 | | | | | |
| +50 | | | | | |

10/26/37

Spike in 12" Oak 80' Rt at 599+40.

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 1.5 | 1.5 | 8.8 | 8.8 | 5.8 | 5.5 | 5.8 | 8.0 | 8.0 | 7.2 | 2.2 |
| 5.0 | 42.5 | 30 | 26.5 | 20 | | 20 | 25.5 | 29 | 39.5 | 5.0 |

(5.5)

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 2.0 | 2.0 | 8.2 | 8.4 | 5.7 | 5.5 | 5.7 | 8.0 | 8.0 | 1.3 | 2.6 |
| 5.0 | 41 | 29.5 | 26 | 20 | | 19.5 | 24 | 27.5 | 38.5 | 5.0 |

(5.3)

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 3.1 | 2.8 | 8.2 | 8.0 | 5.1 | 5.0 | 5.3 | 7.9 | 7.7 | 5.2 | 3.4 |
| 5.0 | 39 | 29 | 25.5 | 20 | | 19.5 | 25 | 30.5 | 37 | 5.0 |

(5.0)

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 5.0 | 4.7 | 6.8 | 7.0 | 4.8 | 4.8 | 5.7 | 7.3 | 7.8 | 8.1 | 5.7 |
| 5.0 | 34.5 | 30 | 26 | 20 | | 20 | 24 | 29.5 | 33 | 5.0 |

+85 End Pitch Rt

(4.9)

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 7.5 | 6.5 | 7.0 | 6.8 | 5.0 | 5.0 | 5.8 | 7.5 | | 8.7 | |
| 5.0 | 30.5 | 29 | 25 | 20 | | 19.5 | 29 | | 5.0 | |

Sta End Pitch Lt.

(4.7)

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 8.4 | 8.0 | 7.0 | 5.0 | 5.0 | 5.0 | 8.1 | 8.5 | 9.1 | 10.1 | |
| 5.0 | 31 | 25.5 | 20 | | 20 | 28 | 30 | 31.5 | 5.0 | |

(4.4)

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 8.4 | 7.2 | 5.0 | 5.0 | | 6.9 | 7.1 | | .5 | |
| | 5.0 | 28 | 20 | | | 19.5 | 26.5 | | 5.0 | |

+10 Beg Ret. Pft.

(4.8)

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 7.6 | 7.2 | 6.5 | 6.5 | 5.2 | 5.0 | 5.0 | 7.0 | 7.1 | 5.5 | 5.3 |
| 5.0 | 32 | 31.27 | 3.13 | | | 20.5 | 27.5 | 31 | 33.5 | 5.0 |

(4.9)

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 7.3 | 6.7 | 7.1 | 7.0 | 5.0 | 5.0 | 5.0 | 7.3 | 7.3 | 5.7 | 5.3 |
| 6.0 | 31 | 30 | 26.5 | 20 | | 20 | 27.5 | 30 | 33 | 5.0 |

Sta Beg Curb Rt

(5.1)

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 6.7 | 6.4 | 7.8 | 7.4 | 5.3 | 5.1 | 5.0 | 7.4 | 7.6 | 6.6 | 6.5 |
| 5.0 | 34 | 31.5 | 27 | 21 | | 20.5 | 28 | 30.5 | 32.5 | 5.0 |

(5.2)

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 4.9 | 4.8 | 7.4 | 7.2 | 5.2 | 5.2 | 5.2 | 7.3 | 7.4 | 6.9 | 9.9 |
| 5.0 | 38.5 | 30 | 26.5 | 20.5 | | 20 | 25 | 31 | 32.5 | 5.0 |

(5.3)

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 3.0 | 3.4 | 7.2 | 7.2 | 5.2 | 5.2 | 4.7 | 8.8 | 8.8 | 7.4 | 7.5 |
| 5.0 | 37 | 29.5 | 26 | 20.5 | | 20 | 27.5 | 31.5 | 33.5 | 5.0 |

| Sta | + | HI | − | Elev | |
|---|---|---|---|---|---|
| | | 915.10 | | | |
| 605+00 | | | | | |
| +46 | | | | | |
| 606 | | | | | |
| T.P. | 3.95 | 913.88 ✓ | 5.17 | 909.93 ✓ | |
| +50 | | | | | |
| 607 | | | | | |
| +50 | | | | | |
| 608 | | | | | |
| +50 | | | | | |
| 609 | | | | | |
| +50 | | | | | |
| 610+00 | | | | | |
| +50 | | | | | |
| BM | 3.55 | 913.86 ✓ | 3.55 | 910.83 ✓ | = 910.31 |
| 611+00 | | | | | |
| +47 | | | | | |

10/26/23

J.1

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 42 | 48 | 28 | 26 | 15.5 | 5.2 | 21 | 27 | 60 | 54 | 28 |
| 50 | 36 | 30.5 | 26.5 | 20 | | 20.5 | 28 | 31 | 33.5 | 43 | 50 |

J.6

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 21 | 8.0 | 5.4 | 5.4 | 15.8 | 8.4 | 8.5 | 66 | 28 |
| 50 | 21.5 | 20.5 | | 24 | 23.5 | 30.5 | 33.5 | 50 |

+46 ENDED AT

J.8

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 9.8 | 9.0 | 5.7 | 5.7 | 69 | 86 | 82 | 79 | 65 | 28 |
| 80 | 30 | 20.5 | | 20 | 25.5 | 34 | 34.5 | 43 | 50 |

606+40 IS a FOOTAGE

A.7

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 52 | 48 | 64 | 64 | 40 | 4.9 | 54 | 28 | 28 | 36 | 40 | 68 |
| 50 | 34 | 30 | 26 | 20 | | 21 | 26 | 29 | 31 | 32 | 50 |

A.8

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 30 | 24 | 68 | 64 | 42 | 4.6 | 58 | 82 | 82 | 24 | 60 |
| 50 | 36.5 | 28 | 24 | 20 | | 24 | 27.5 | 31 | 41 | 50 |

S.D

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 12 | 10 | 66 | 66 | 44 | 4.9 | 18 | 22 | 33 | 48 |
| 50 | 38 | 34 | 26 | 20 | | 24.5 | 28.5 | 43.5 | 45.5 | 50 |

S.2

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 15 | 10 | 67 | 66 | 44 | 5.2 | 66 | 80 | 88 | 24 | 42 | 52 |
| 50 | 38.5 | 30 | 26 | 20 | | 22 | 28 | 32 | 42 | 47 | 50 |

J.A

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 17 | 16 | 68 | 68 | 46 | 5.3 | 64 | 86 | 86 | 35 | 61 |
| 50 | 38.5 | 28 | 24 | 20 | | 24.5 | 28.5 | 32 | 42 | 50 |

J.5

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 20 | 20 | 72 | 23 | 47 | 9.5 | 20 | 9.2 | 9.2 | 40 | 66 |
| 50 | 38.5 | 29 | 24.5 | 19.5 | | 22 | 27.5 | 30.5 | 40 | 50 |

J.6

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 26 | 26 | 71 | 72 | 48 | 5.5 | 99 | 90 | 70 | 54 | 25 |
| 50 | 38 | 29.5 | 26.5 | 20.5 | | 24.5 | 28 | 32 | 39 | 50 |

J.7

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 47 | 42 | 28 | 68 | 48 | 5.8 | 21 | 94 | 94 | 62 | 78 |
| 50 | 35 | 28.5 | 26 | 20.5 | | 24 | 26 | 36.5 | 36.5 | 50 |

J.8

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 99 | 74 | 67 | 72 | 11 | 5.4 | 21 | 88 | 87 | 25 | 85 |
| 50 | 31 | 30 | 27 | 21 | | 24.5 | 27 | 31.5 | 39 | 50 |

+50 ENDED AT

spike in 6" oak 14' AT STA 610+00.

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 87 | 27 | 52 | 21 | 6.9 | 87 | 88 | 69 | 78 |
| 50 | 27.5 | 21 | | 22 | 24.5 | 32.5 | 36.5 | 50 |

S.8

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 38 | 27 | 54 | 20 | 96 | 98 | 88 | 80 | 83 | 27 |
| 50 | 27 | 20 | | 22 | 28 | 32 | 43 | 52 | 50 |

+60 ENDED AT

| Sta | + | HI | − | Elev | |
|---|---|---|---|---|---|
| | | 913.86 | | | |
| 612+00 | | | | | |
| 613+00 | | | | | |
| 614+00 | | | | | |
| 615+00 | | | | | |
| 616+00 | | | | | |
| T.P. | 5.67 | 914.37 ✓ | 5.16 | 908.70 ✓ | |
| 617+00 | | | | | |
| 618+00 | | | | | |
| 619+00 | | | | | |
| 620+00 | | | | | |
| B.M. | 3.75 | 916.26 ✓ | 1.85 | 912.52 ✓ | = 912.51 |
| 621+00 | | | | | |
| +50 | | | | | |
| 622+00 | | | | | |

10/26/27

58

| | | | | | | |
|---|---|---|---|---|---|---|
| 100/50 | 88/39 | 60/20.5 | 60 | 65/20 | 102/30.5 | 102/50 |

58

| | | | | | | |
|---|---|---|---|---|---|---|
| 100/50 | 103/39 | 120/38 | 110/34 | 62/20.5 | 62 | 65/20 | 108/32 | 109/50 |

6/13/00 Bay Ditch Rt.

58

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 102/50 | 102/38 | 108/37 | 103/34 | 100/33 | 61/20 | 61 | 61/20 | 83/28 | 85/31.5 | 103/35 | 102/37.5 | 95/39 | 91/50 |

58

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 100/50 | 100/38 | 104/37 | 102/33 | 92/32 | 87/30.5 | 60/20 | 58 | 58/19.5 | 76/26 | 83/32 | 100/34 | 100/38 | 90/39 | 86/50 |

58

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 85/50 | 86/39 | 96/38 | 90/33 | 82/31.5 | 76/25 | 61/20 | 60 | 60/20 | 74/26.5 | 78/32 | 100/36.5 | 100/38 | 90/39 | 90/50 |

63

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 92/50 | 92/39 | 102/38 | 100/33 | 88/31.5 | 82/25 | 66/20 | 64 | 65/21 | 78/27 | 82/31 | 102/36 | 106/37.5 | 92/39 | 88/50 |

62

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 97/50 | 91/38 | 100/37.5 | 97/33 | 88/32 | 85/27 | 63/20 | 63 | 63/20 | 73/25 | 75/31 | 94/36.5 | 97/37.5 | 81/39 | 80/50 |

60

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 53/50 | 53/34.5 | 81/34.5 | 80/26.5 | 60/20 | 61 | | 60/20 | | 80/27 | | 78/31.5 | 47/37 | 47/50 |

57

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 29/50 | 26/34.5 | 80/30 | 80/26 | 59/20 | 57 | | 59/20 | 78/26.5 | 78/30.5 | | 31/39 | 30/50 | |

Spike 10 6" 2nd 12 60' 84 3rd 13 6/20+05

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 53/50 | 53/37.5 | 95/29.5 | 83/25 | 74/20 | 72 | | 75/20 | 95/26.5 | 90/35 | 78/50 | | | |

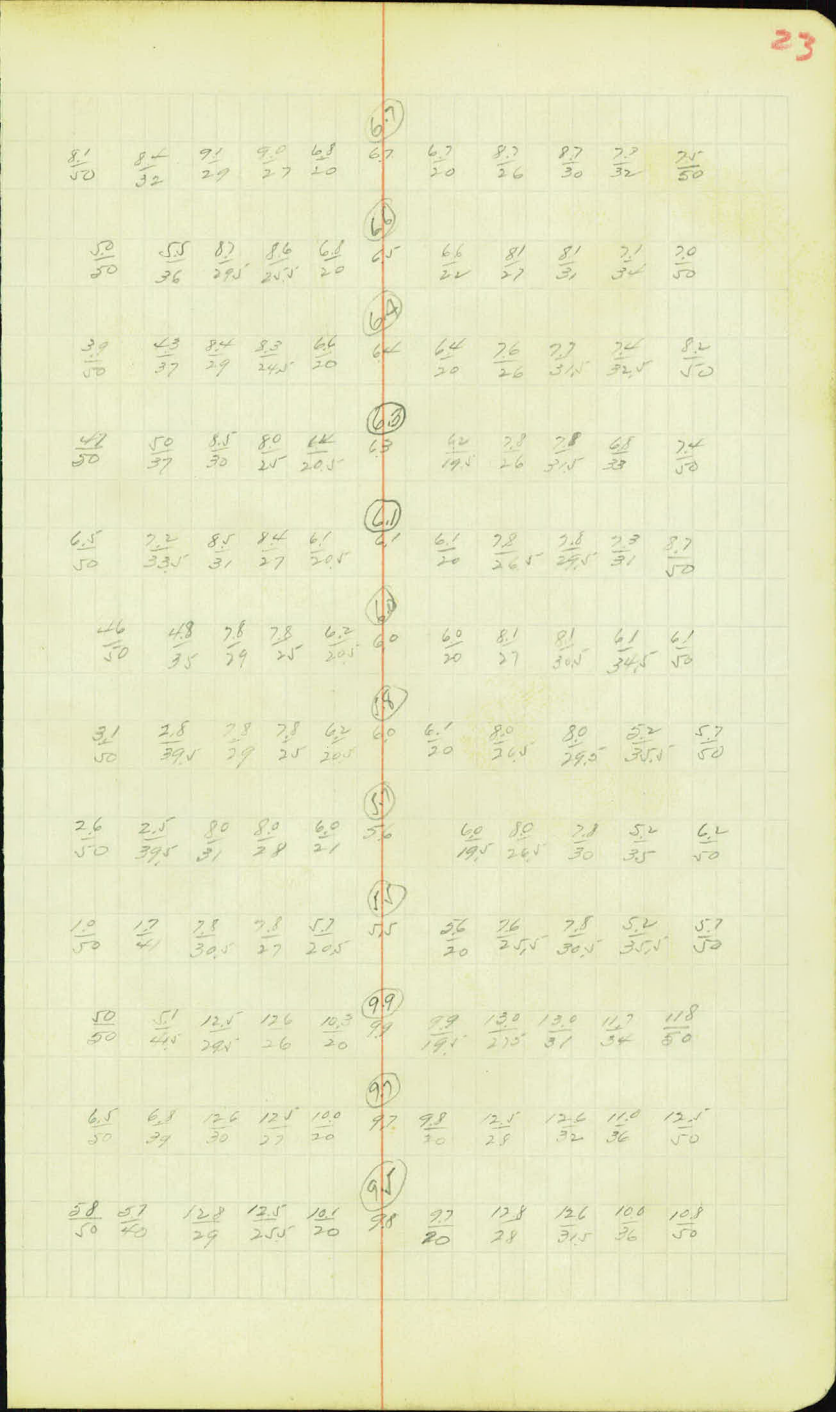
72

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 64/50 | 74/34.5 | 90/30 | 94/26 | 74/20 | 72 | | 74/20 | 94/28 | 96/32 | 90/36 | 95/50 | | |

70

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 73/50 | 84/31 | 90/30 | 90/26.5 | 72/20 | 71 | | 74/20 | 90/27 | 88/36.5 | 94/50 | | | |

| Sta | + | HI | - | Elev |
|---|---|---|---|---|
| | | 916.26 | | |
| 623+00 | | | | |
| +50 | | | | |
| 624+00 | | | | |
| +50 | | | | |
| 625+00 | | | | |
| +50 | | | | |
| 626+00 | | | | |
| +50 | | | | |
| 627 | | | | |
| T.P | 8.97 | 920.80 ✓ | 4.43 | 911.83 ✓ |
| +50 | | | | |
| 628 | | | | |
| +60 | | | | |



| | | | | | |
|---|---|---|---|---|---|
| | | 920 80 | | | |
| 629 | | | | | |
| +50 | | | | | |
| 630 | | | | | |
| BM. | 9.27 | 930.83 ✓ | 9.22 | 911.58 ✓ | = 911.61 |
| +40 | | | | | |
| 631 | | | | | |
| 632 | | | | | |
| +50 | | | | | |
| 633 | | | | | |
| T.P. | 3.06 | 914.48 ✓ | 9.41 | 911.42 ✓ | |
| +50 | | | | | |
| 634 | | | | | |
| +50 | | | | | |
| 635 | | | | | |

(9.4)

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 5.5 / 50 | 5.6 / 40.5 | 123 / 29.5 | 123 / 24.5 | 102 / 20.2 | 9.6 | 9.6 / 20 | 12.5 / 27.5 | 12.5 / 30 | 10.0 / 35 | 12.1 / 50 |

(9.3)

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 4.1 / 50 | 3.7 / 43 | 123 / 31 | 120 / 26 | 9.8 / 20 | 9.4 | 9.5 / 20 | 11.8 / 26 | 11.8 / 30.5 | 8.2 / 36.5 | 10.3 / 50 |

(9.3)

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 2.5 / 50 | 2.5 / 45 | 12.0 / 30 | 120 / 25 | 9.8 / 20.5 | 9.4 | 9.8 / 20 | 11.8 / 27 | 11.8 / 30 | 8.0 / 36 | 9.8 / 50 |

Split in 6" Oak 50 Rt Stg 6 30 + 40

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 2.7 / 50 | 2.0 / 44.5 | 12.4 / 24.5 | 12.0 / 25 | 10.0 / 20 | 9.3 | 9.6 / 20.5 | 12.1 / 27 | 12.1 / 30.5 | 9.5 / 35 | 10.2 / 50 |

(9.4)

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 7.7 / 50 | 9.2 / 36 | 126 / 30.5 | 126 / 26 | 9.9 / 20.5 | 9.6 | 9.6 / 20 | 12.0 / 26 | 12.1 / 29 | 9.9 / 33 | 10.0 / 50 |

(9.7)

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 5.8 / 50 | 7.0 / 37.5 | 12.4 / 28 | 12.4 / 24.5 | 10.1 / 20 | 9.7 | 9.7 / 20 | 12.1 / 28 | 12.1 / 31 | 9.0 / 35 | 9.0 / 50 |

(9.8)

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 5.3 / 50 | 7.0 / 38.5 | 123 / 29.5 | 12.4 / 26.5 | 10.0 / 20 | 10.0 | 10.0 / 20 | 12.0 / 27 | 12.0 / 30 | 11.0 / 33.5 | 11.5 / 50 |

+80 End Ditch Rt.

(10.0)

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 10.3 / 50 | 11.4 / 33 | 12.8 / 29.5 | 12.8 / 26.5 | 10.1 / 20.5 | 10.1 | 10.3 / 20 | | 15.3 / 37 | | 15.2 / 50 |

+15 End Ditch Rt

(3.8)

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 7.7 / 50 | 7.5 / 29 | 4.1 / 20 | 4.0 | 4.0 / 20 | 8.8 / 33 | 9.0 / 50 | | | |

+80 Beg. Ditch Rt

(4.0)

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 2.8 / 50 | 4.3 / 37 | 6.8 / 32 | 6.8 / 28 | 4.2 / 20 | 4.0 | 4.1 / 20 | 8.7 / 35 | 9.7 / 50 | | |

(4.1)

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 0.7 / 50 | 4.3 / 36 | 6.8 / 31 | 6.6 / 28 | 4.4 / 20 | 4.1 | 4.4 / 20 | 7.8 / 26.5 | 9.1 / 32.5 | 11.1 / 38 | 11.5 / 50 |

(4.2)

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 3.8 / 50 | 5.8 / 35 | 6.8 / 31 | 6.6 / 27 | 4.3 / 20 | 4.2 | 4.5 / 20 | 7.6 / 26.5 | 8.5 / 32 | 12.0 / 42 | 12.8 / 50 |

| | | | | |
|---|---|---|---|---|
| | | 914.48 | | |
| 635+50 | | | | |
| 636 | | | | |
| +50 | | | | |
| 637 | | | | |
| +50 | | | | |
| 638 | | | | |
| 639 | | | | |
| +50 | | | | |
| 640 | | | | |
| +50 | | | | |
| 641 | | | | |
| TP +63 | 0.11 | 908.25 ✓ | 6.34 | 908.14 ✓ |

4.4

35/50 45/37 20/32 6.8/27.5 44/20 4.3 47.5/20 9.3/33 10.1/50

4.6

44.6/50 55.1/36 7.3/31 7.2/27 44.7/20.5 4.5 44.8/20 7.5/29 7.7/50

+0.5 Beg Ditch Rt.

4.7

50=00 Ditch. 7.0/50 7.6/28 44.8/20 4.6 44.7/20 7.4/31 7.4/36 6.4/40 6.3/50

4.9

6.6/50 6.3/32.5 7.0/31 6.7/25.5 44.8/20.5 4.6 5.0/20 8.2/30 9.0/34 8.6/38 5.3/46.5 5.3/50

5.0

5.6/50 4.6/35 7.2/28.5 7.0/25 44.8/20 4.7 5.4/20.5 7.0/24 6.4/23 9.4/37 4.1/46.5 4.0/50

5.2

5.4/50 5.0/35.5 7.6/30.5 7.4/25.5 5.4/20 5.1 5.4/20 8.2/26.5 9.8/32.5 10.0/36.5 8.4/41 4.3/47.5 4.2/50

5.7

6.5/50 3.7/37 2.7/31 8.2/25 5.8/20 5.8 5.8/20 8.2/26 9.6/32 8.8/38.5 2.8/47.5 2.5/50

6.0

5.6/50 4.4/36 8.0/30 8.2/26 6.2/20 6.1 6.2/20.5 9.4/31 8.8/40 3.3/44 3.7/50

6.5

7.2/50 5.9/35 8.8/30 8.8/26 6.6/20 6.3 6.6/20 10.1/32 9.6/38 4.7/45.5 5.4/50

7.0

8.7/50 8.0/33 9.1/30 8.8/27.5 7.8/20.5 6.7 7.1/20 10.0/29.5 10.2/35 7.5/44 8.1/50

7.5

11.0/50 10.1/28 7.5/20 7.5 7.5/20 11.5/33 11.6/37 10.0/40 10.7/50

Sta. 64+00 End Ditch Rt.

+5.0 End Ditch Lft.

8.6/50 7.4/32.5 1.8/20 1.9 1.9/19.5 8.2/35 2.8/50

908.25

642

643

644

+50

645

+50

646+00

B17.

679 901.96 = 901.93

(23)

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 88 | 84 | 68 | 24 | 23 | 23 | 87 | 85 | |
| 50 | 34.5 | 30 | 20 | | 20 | 34 | 50 | |

(33)

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 84 | 83 | 33 | 31 | 34 | 48 | 86 | 83 | |
| 50 | 32 | 20 | | 20 | 26 | 34 | 50 | |

+75 Beg Ditch

(43)

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 61 | 59 | 67 | 65 | 45 | 44 | 43 | 65 | 67 | 56 | 66 |
| 50 | 32 | 29.5 | 27 | 20 | | 20.5 | 27 | 30 | 34 | 50 |

3+86 Line 100 Beg Ditch.

(53)

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 56 | 56 | 70 | 70 | 48 | 48 | 49 | 70 | 68 | 42 | 40 |
| 60 | 31.5 | 29 | 26.5 | 20 | | 21 | 28 | 31 | 36 | 50 |

(63)

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 60 | 63 | 73 | 73 | 53 | 50 | 52 | 78 | 76 | 40 | 34 |
| 50 | 32.5 | 31 | 27 | 20 | | 20 | 28 | 30 | 36 | 50 |

(73)

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 67 | 70 | 84 | 82 | 57 | 57 | 57 | 84 | 82 | 58 | 48 |
| 50 | 32 | 28.5 | 26 | 20 | | 20.5 | 29 | 32.5 | 35 | 50 |

(83)

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 76 | 76 | 87 | 87 | 62 | 62 | 64 | 88 | 88 | 70 | 66 |
| 50 | 32.5 | 31 | 27 | 20 | | 20 | 28 | 30 | 33 | 50 |

Spike in 8" Oak 4 8 FT at 64+40

| Sta | + | HI | - | Elev |
|---|---|---|---|---|
| BM 1 | 5.24 | 916.13 | | 910.89 |
| - | | | | |
| 588+50 | | | | |
| 589+00 | | | | |
| +50 | | | | |
| 590+00 | | | | |
| +50 | | | | |
| 591+00 | | | | |
| +50 | | | | |
| 592+00 | | | | |
| +50 | | | | |
| 593+00 | | | | |
| 64 | | | | |
| 594+00 | | | | |

Spike in 20" Oak. 10 Hits 598 to 0

59

| | | | | | |
|---|---|---|---|---|---|
| 60 | 64 | 84 | 85 | 43 | 40 |
| | 22 | 29 | 32 | 40 | 50 |

60

| | | | | | |
|---|---|---|---|---|---|
| 58 | 60 | 68 | 92 | 93 | 51 | 49 |
| 10 | | 21 | 29 | 32 | 39 | 50 |

60

| | | | | | | |
|---|---|---|---|---|---|---|
| 55 | 54 | 61 | 75 | 101 | 100 | 67 | 59 |
| 31 | 20 | | 22 | 28 | 32 | 38 | 50 |

60

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 84 | 72 | 54 | 60 | 73 | 97 | 100 | 69 | 70 |
| 50 | 27 | 21 | | 22 | 28 | 32 | 38 | 50 |

59

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 84 | 74 | 68 | 50 | 58 | 73 | 97 | 100 | 67 | 60 |
| 50 | 33 | 28 | 20 | | 22 | 27 | 31 | 38 | 50 |

59

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 79 | 72 | 49 | 57 | 75 | 93 | 97 | 53 | 52 |
| 50 | 27 | 20 | | 22 | 29 | 32 | 39 | 50 |

56

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 94 | 72 | 70 | 48 | 56 | 72 | 95 | 96 | 56 | 57 |
| 50 | 34 | 27 | 20 | | 22 | 29 | 32 | 38 | 50 |

54

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 96 | ? (80) | 45 | 52 | 69 | 92 | 93 | 54 | 53 |
| 50 | 23 | 20 | | 22 | 30 | 32 | 38 | 50 |
| | =30 | | | | | | | |

51

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 100 | 85 | 43 | 50 | 66 | 88 | 89 | 56 | 58 |
| 50 | 31 | 21 | | 22 | 29 | 32 | 38 | 50 |

48

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 98 | 87 | 41 | 47 | 69 | 82 | 87 | 59 | 59 |
| 50 | 35 | 20 | | 22 | 30 | 33 | 37 | 50 |

44

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 90 | 80 | 40 | 42 | 53 | 72 | 78 | 55 | 57 |
| 50 | 32 | 20 | | 21 | 29 | 32 | 37 | 50 |

42

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 85 | 69 | 39 | 41 | 49 | 70 | 72 | 49 | 54 |
| 50 | 30 | 20 | | 20 | 27 | 31 | 36 | 50 |

| Sta | + | H I | - | Elev. |
|---|---|---|---|---|
| | | 916.13 ✓ | | |
| 594+50 | | | | |
| 595+00 | | | | |
| +50 | | | | |
| T.P. | 5.57 | 918.53 ✓ | 3.17 | 912.96 ✓ |
| 596 | | | | |
| BM | 2.09 | 917.62 ✓ | 2.99 | 915.54 ✓ = 915.55 |
| +50 | | | | |
| 597 | | | | |
| +50 | | | | |
| 598+00 | | | | |
| 599+00 | | | | |
| 600+00 | | | | |
| +50 | | | | |

3.9

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 65 | 51 | 56 | 56 | 38 | 3.8 | 44 | 69 | 69 | 40 | 42 |
| 50 | 32 | 31 | 28 | 20 | | 20 | 28 | 30 | 36 | 50 |

3.6

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 48 | 50 | 55 | 54 | 38 | 3.4 | 39 | 55 | 58 | 33 | 30 |
| 50 | 33 | 30 | 27 | 20 | | 20 | 27 | 31 | 36 | 50 |

3.3

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 50 | 42 | 53 | 54 | 34 | 3.2 | 33 | 54 | 28 | 28 | |
| 50 | 33 | 31 | 27 | 20 | | 20 | 27 | 30 | 35 | 50 |

5.4

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 74 | 68 | 78 | 79 | 56 | 5.5 | 51 | 76 | 77 | 55 | 59 |
| 50 | 33 | 30 | 27 | 20 | | 20 | 28 | 31 | 36 | 60 |

Spirb in TP 25 15 + 5 4 60 4 + 20

4.2

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 68 | 60 | 65 | 67 | 40 | 4.3 | 47 | 70 | 70 | 45 | 50 |
| 50 | 33 | 30 | 27 | 20 | | 20 | 28 | 31 | 35 | 50 |

4.0

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 66 | 55 | 68 | 71 | 43 | 4.1 | 43 | 62 | 60 | 47 | 47 |
| 50 | 33 | 30 | 27 | 20 | | 20 | 28 | 31 | 35 | 50 |

3.9

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 56 | 44 | 66 | 69 | 41 | 4.0 | 43 | 66 | 66 | 40 | 42 |
| 50 | 34 | 30 | 27 | 20 | | 20 | 27 | 30 | 36 | 50 |

3.8

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 41 | 36 | 68 | 67 | 41 | 4.1 | 40 | 63 | 63 | 29 | 30 |
| 50 | 36 | 29 | 26 | 20 | | 20 | 26 | 29 | 36 | 50 |

3.8

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 32 | 27 | 60 | 61 | 40 | 4.1 | 41 | 62 | 62 | 26 | 33 |
| 50 | 36 | 30 | 26 | 20 | | 20 | 25 | 29 | 36 | 50 |

4.1

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 31 | 31 | 62 | 62 | 42 | 4.2 | 42 | 61 | 58 | 34 | 38 |
| 50 | 36 | 30 | 26 | 20 | | 20 | 26 | 31 | 36 | 50 |

4.3

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 62 | 48 | 46 | 65 | 68 | 46 | 44 | 45 | 63 | 64 | 49 | 52 |
| 50 | 48 | 45 | 34 | 30 | 27 | 20 | | 20 | 29 | 31 | 34 | 50 |

| Sta | + | HI | - | Elev | |
|---|---|---|---|---|---|
| | | 917.62 | | | |
| 601+00 | | 147 | | | |
| +50 | | | | | |
| 602+00 | | | | | |
| +47 | | | | | |
| +69 | | | | | |
| 603+00 | | | | | |
| +19 | | | | | |
| +80 | | | | | |
| 604+00 | | | | | |
| B.M. | | | | | 915.55 |

Pav.

| | | | | | | |
|---|---|---|---|---|---|---|
| 54 | 58 | 64 | 59 | 63 | 63 | 48 |
| 50 | 48 | 38 | 32 | 30 | 26 | 21 |

(45)

| | | | | | |
|---|---|---|---|---|---|
| 48 | 48 | 65 | 66 | 68 | 59 |
| | 20 | 28 | 31 | 36 | 50 |

Pav Pav

| | | |
|---|---|---|
| 54 | 52 | 51 |
| 50 | 37 | 20 |

(47)

| | | | | | |
|---|---|---|---|---|---|
| 50 | 52 | 68 | 68 | 59 | 60 |
| | 20 | 27 | 30 | 33 | 50 |

(49)

Pav.

| | | | | | |
|---|---|---|---|---|---|
| 50.4 | 49 | 51 | 53 | 54 | 54 | 46 | 48 |
| 26 | 20 | | 20 | 26 | 29 | 45 | 50 |

(50)

Pav.

| | | | | | | |
|---|---|---|---|---|---|---|
| 49 | 52 | 55 | 27 | 26 | 36 | 38 |
| 177 | | 20 | 27 | 30 | 38 | 50 |

Pav. (51)

| | | | | | | |
|---|---|---|---|---|---|---|
| 49 | 50 | 56 | 27 | 28 | 33 | 35 |
| 143 | | 20 | 26 | 30 | 37 | 50 |

Pav (52)

| | | | | | | |
|---|---|---|---|---|---|---|
| 48.4 | 50 | 55 | 25 | 25 | 31 | 33 |
| 96 | | 20 | 26 | 30 | 37 | 50 |

Pav. 48

| | | | | | | |
|---|---|---|---|---|---|---|
| 48.1 | 49 | 54 | 22 | 23 | 32 | 34 |
| 7 | | 20 | 25 | 29 | 36 | 50 |

47

Pav.

| | | | | | |
|---|---|---|---|---|---|
| 47.8 | 46 | 63 | 61 | 29 | 31 |
| | 20 | 25 | 31 | 37 | 50 |

47

| | | | | | |
|---|---|---|---|---|---|
| 47.4 | 47.3 | 43 | 37 | 26 | 24 |
| Pav | 14 | 20 | 29 | 34 | 50 |

spike in T.P. 25 RT 8+0 60+20

| Sta | + | HI | - | Elev | |
|---|---|---|---|---|---|
| B.M. | 2.90 | 892.91 | | 890.01 | |
| 720+01 | | | | | |
| 721 | | | | 88.7 | 4.2 |
| 722 | | | | 88.4 | 4.5 |
| 723 | | | | 88.2 | 4.7 |
| 724 | | | | 88.0 | 4.9 |
| 725 | | | | 87.8 | 5.1 |
| 726 | | | | 87.8 | 5.1 |
| 727 | | | | 87.7 | 5.2 |
| 728 | | | | 87.6 | 5.3 |
| 729 | | | | 87.5 | 5.4 |
| T.P. | 4.61 | 891.07 | 6.45 | 886.46 | |
| 730 | | | | 87.4 | 3.7 |
| 731 | | | | 87.4 | 3.7 |

C.M.A.
D.S.
E.F.
K.P.

30

10/30/27

spike in 8" Oak 60 Ht of 721+25

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 26 | 26 | 66 | 65 | 40 | | 40 | 57 | 64 | 55 | 38 | 42 |
| 50 | 42 | 31.5 | 38.5 | 21 | 38 | 20 | 24 | 28.5 | 34 | 37.6 | 50 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 35 | 42 | 22 | 24 | 44 | 42 | 43 | 68 | 68 | 33 | 30 |
| 50 | 21 | 25.5 | 30 | 20.7 | | 20 | 28.5 | 32.7 | 40 | 50 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 57 | 58 | 71 | 68 | 46 | 46 | 48 | 75 | 25 | 40 | 32 |
| 50 | 36.5 | 34 | 28.5 | 20 | | 21 | 27 | 35.5 | 40.5 | 50 |

+50 Ditch Ln.

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 74 | 73 | 51 | | 50 | 67 | 77 | 77 | 48 | 50 |
| 50 | 26 | 20 | | | 20 | 26.5 | 35 | 40.5 | 50 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 77 | 77 | 52 | 51 | 55 | 84 | 84 | 56 | 56 |
| | 50 | 26.5 | 21 | | 20 | 25.5 | 33 | 38 | 50 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 77 | 75 | 55 | 55 | 56 | 80 | 81 | 42 | 40 |
| | 50 | 25 | 20 | | 20.5 | 28 | 36 | 41 | 50 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 80 | 73 | 57 | 55 | 60 | 82 | 78 | 46 | 44 |
| | 50 | 26 | 20 | | 21 | 27 | 38 | 44.5 | 50 |

+10 Beg Ditch Ln.

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 81 | 81 | 88 | 88 | 85 | 22 | 61 | 61 | 61 | 78 | 80 | 44 | 44 |
| 50 | 36 | 35 | 51 | 30 | 25 | 20 | | 20 | 27.5 | 36 | 41.5 | 50 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 81 | 80 | 90 | 92 | 86 | 84 | 64 | 64 | 65 | 74 | 82 | 81 | 48 | 45 |
| 50 | 36 | 35 | 30 | 29.5 | 24.5 | 20 | | 20 | 23 | 29 | 35.5 | 41 | 50 |

H.D.

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 82 | 82 | 93 | 93 | 80 | 77 | 67 | 65 | 66 | 90 | 85 | 65 | 63 |
| 50 | 38 | 37 | 33 | 32 | 24.5 | 20 | | 20 | 28 | 37 | 40.5 | 50 |

Beg H.D.

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 64 | 77 | 76 | 76 | 77 | 66 | 46 | 46 | 46 | 64 | 72 | 72 | 55 | 60 |
| 80 | 38 | 37.5 | 38 | 32 | 26 | 20 | | 20 | 31 | 33 | 37.5 | 39.5 | 50 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 66 | 66 | 78 | 78 | 67 | 65 | 47 | 47 | 45 | 57 | 71 | 77 | 60 | 58 |
| 50 | 39 | 39 | 39 | 32 | 26 | 20 | | 21 | 31.5 | 33 | 38 | 39.5 | 50 |

| Sta | + | HI | − | Elev | |
|---|---|---|---|---|---|
| | | 891.07 | | | |
| 732 | | | | 87.4 | 3.7 |
| 733 | | | | 87.4 | 3.7 |
| 734 | | | | 87.4 | 3.7 |
| 735 | | | | 87.4 | 3.7 |
| 736 | | | | 87.4 | 3.7 |
| 737 | | | | 87.4 | 3.7 |
| 738 | | | | 87.4 | 3.7 |
| 739 | | | | 87.4 | 3.7 |
| 740 | | | | 87.4 | 3.7 |
| T.P. | 5.37. | 891.63 | 4.81 | 886.26 | |
| +36 | | | | 87.4 | 4.2 |
| +55 | | | | 87.4 | 4.2 |
| +70 | | | | 87.4 | 4.2 |

10/31/27

$\frac{7.0}{50}$ $\frac{6.7}{38.5}$ $\frac{8.0}{39.5}$ $\frac{8.0}{34}$ $\frac{6.6}{32}$ $\frac{6.4}{26}$ $\frac{4.6}{20}$ 4.7 $\frac{4.7}{20.5}$ $\frac{6.6}{23}$ $\frac{7.8}{33}$ $\frac{7.8}{37.5}$ $\frac{6.4}{39}$ $\frac{6.4}{50}$

$\frac{6.5}{50}$ $\frac{6.5}{39}$ $\frac{8.3}{37}$ $\frac{8.3}{33.5}$ $\frac{6.6}{32}$ $\frac{4.6}{20}$ 4.6 $\frac{4.6}{20}$ $\frac{6.1}{31}$ $\frac{7.8}{32.5}$ $\frac{8.0}{37}$ $\frac{6.5}{38.5}$ $\frac{6.2}{50}$

$\frac{7.4}{50}$ $\frac{7.2}{39}$ $\frac{8.4}{38}$ $\frac{8.2}{33}$ $\frac{7.1}{32}$ $\frac{6.7}{28}$ $\frac{4.9}{20}$ 4.7 $\frac{5.0}{20}$ $\frac{6.6}{31}$ $\frac{8.2}{32}$ $\frac{8.2}{36.5}$ $\frac{6.7}{38}$ $\frac{6.7}{50}$

$\frac{7.2}{50}$ $\frac{7.1}{39}$ $\frac{8.6}{37}$ $\frac{8.6}{32.5}$ $\frac{7.1}{31.5}$ $\frac{6.6}{27}$ $\frac{4.9}{20}$ 4.7 $\frac{4.6}{20}$ $\frac{6.0}{24.5}$ $\frac{6.4}{31}$ $\frac{8.2}{33}$ $\frac{8.3}{37}$ $\frac{6.9}{39}$ $\frac{6.8}{50}$

$\frac{7.3}{50}$ $\frac{7.4}{39}$ $\frac{8.8}{37.5}$ $\frac{9.0}{33.5}$ $\frac{7.3}{31}$ $\frac{4.7}{20}$ 4.7 $\frac{4.6}{20}$ $\frac{7.1}{31}$ $\frac{8.8}{32}$ $\frac{8.1}{38}$ $\frac{7.1}{39}$ $\frac{7.2}{50}$

$\frac{7.6}{50}$ $\frac{7.2}{39.5}$ $\frac{9.2}{37.5}$ $\frac{9.2}{33}$ $\frac{7.2}{32}$ $\frac{6.9}{28}$ $\frac{5.0}{20}$ 5.0 $\frac{4.8}{20}$ $\frac{6.8}{27}$ $\frac{7.2}{31}$ $\frac{9.0}{33}$ $\frac{9.0}{37}$ $\frac{7.3}{39}$ $\frac{6.8}{50}$

$\frac{8.0}{50}$ $\frac{7.5}{39}$ $\frac{9.2}{37}$ $\frac{9.2}{33.5}$ $\frac{7.7}{31}$ $\frac{7.0}{28}$ $\frac{4.8}{20}$ 4.7 $\frac{4.6}{20}$ $\frac{6.5}{28}$ $\frac{6.8}{30.5}$ $\frac{9.1}{32.5}$ $\frac{9.2}{37}$ $\frac{6.8}{40}$ $\frac{6.6}{50}$

$\frac{8.1}{50}$ $\frac{8.1}{39}$ $\frac{9.4}{38}$ $\frac{9.2}{34}$ $\frac{8.1}{32}$ $\frac{7.7}{29}$ $\frac{4.9}{20}$ 4.8 $\frac{4.7}{20}$ $\frac{7.1}{28.5}$ $\frac{7.3}{31}$ $\frac{9.4}{33.5}$ $\frac{9.8}{38}$ $\frac{7.3}{39}$ $\frac{7.5}{50}$

$\frac{8.4}{50}$ $\frac{8.4}{39.5}$ $\frac{10.0}{37}$ $\frac{9.6}{33}$ $\frac{8.2}{32}$ $\frac{7.8}{29}$ $\frac{6.8}{25}$ $\frac{5.0}{20.5}$ 4.9 $\frac{5.1}{20}$ $\frac{6.7}{23.5}$ $\frac{7.4}{29}$ $\frac{7.8}{31}$ $\frac{9.7}{33.5}$ $\frac{9.7}{37}$ $\frac{8.1}{39}$ $\frac{7.8}{50}$

$\frac{9.4}{50}$ $\frac{9.2}{38.5}$ $\frac{10.3}{37.5}$ $\frac{10.6}{34.5}$ $\frac{9.4}{32}$ $\frac{8.5}{27.5}$ $\frac{8.0}{25.5}$ $\frac{5.6}{20}$ 5.6 $\frac{5.8}{20.5}$ $\frac{9.6}{27}$ $\frac{10.0}{32.5}$ $\frac{10.6}{33}$ $\frac{11.0}{38}$ $\frac{9.8}{39}$ $\frac{10.0}{50}$

$\frac{9.7}{50}$ $\frac{9.7}{39}$ $\frac{11.0}{37}$ $\frac{10.7}{33.5}$ $\frac{9.6}{32.5}$ $\frac{8.5}{27}$ $\frac{5.5}{20}$ 5.8 $\frac{5.8}{21}$ $\frac{9.3}{26.5}$ $\frac{10.0}{32}$ $\frac{11.2}{38}$ $\frac{10.0}{40}$ $\frac{9.6}{50}$

$\frac{10.1}{50}$ $\frac{11.0}{37}$ $\frac{11.2}{29.5}$ $\frac{9.8}{28}$ $\frac{5.7}{20}$ 5.8 $\frac{5.8}{20}$ $\frac{8.8}{28}$ $\frac{9.5}{32}$ $\frac{11.0}{34}$ $\frac{11.4}{38.5}$ $\frac{9.4}{40}$ $\frac{9.6}{50}$

| Sta | + | HI | − | F/e | |
|---|---|---|---|---|---|
| | | 891.63 | | | |
| 741+00 | | | | 87.4 | 4.2 |
| 742+00 | | | | 87.4 | 4.2 |
| 743+00 | | | | 87.4 | 4.2 |
| 744+00 | | | | 87.4 | 4.2 |
| 745+60 | | | | 87.4 | 4.2 |
| +50 | | | | 87.4 | 4.2 |
| 746 | | | | 87.4 | 4.2 |
| +50 | | | | 87.4 | 4.2 |
| 747 | | | | 87.4 | 4.2 |
| +45 | | | | 87.4 | 4.2 |
| 748 | | | | 87.4 | 4.2 |
| T.P. | 8.43 | 895.83 | 4.23 | 887.40 | |
| +50 | | | | 87.4 | 8.4 |

10/31/27

$\frac{10.3}{50}$ $\frac{10.3}{39}$ $\frac{11.8}{38}$ $\frac{12.0}{33}$ $\frac{10.1}{31}$ $\frac{7.0}{22}$ $\frac{5.6}{20}$ 5.6 $\frac{5.6}{21}$ $\frac{9.0}{33}$ $\frac{11.7}{35.5}$ $\frac{11.7}{40}$ $\frac{8.8}{42}$ $\frac{8.2}{46}$ $\frac{8.8}{50}$

$\frac{9.1}{50}$ $\frac{9.0}{39}$ $\frac{10.3}{37.5}$ $\frac{10.3}{33}$ $\frac{8.8}{32.5}$ $\frac{8.7}{29}$ $\frac{7.5}{26}$ $\frac{7.0}{24}$ $\frac{5.4}{20}$ 5.4 $\frac{5.4}{20}$ $\frac{7.6}{32}$ $\frac{11.0}{34}$ $\frac{11.0}{39}$ $\frac{7.6}{41.5}$ $\frac{6.7}{46}$ $\frac{7.5}{50}$

$\frac{7.7}{50}$ $\frac{7.7}{39}$ $\frac{9.8}{38}$ $\frac{9.8}{32}$ $\frac{8.0}{31}$ $\frac{7.5}{28.5}$ $\frac{7.0}{25}$ $\frac{5.4}{20}$ 5.4 $\frac{5.4}{20}$ $\frac{7.1}{31}$ $\frac{10.1}{32.5}$ $\frac{10.0}{37.5}$ $\frac{7.2}{40}$ $\frac{6.5}{45}$ $\frac{7.3}{50}$

4.7

$\frac{8.7}{50}$ $\frac{8.6}{37.5}$ $\frac{9.4}{37}$ $\frac{9.2}{33}$ $\frac{8.4}{32}$ $\frac{7.4}{25}$ $\frac{5.2}{20}$ 5.0 $\frac{5.2}{20}$ $\frac{7.0}{26}$ $\frac{8.0}{31.5}$ $\frac{9.5}{32.5}$ $\frac{9.4}{37.5}$ $\frac{7.8}{39}$ $\frac{7.4}{45}$ $\frac{7.8}{50}$

4.7

$\frac{7.8}{50}$ $\frac{7.8}{39}$ $\frac{9.2}{38}$ $\frac{9.1}{33}$ $\frac{7.7}{32}$ $\frac{7.2}{27}$ $\frac{4.8}{20}$ 4.8 $\frac{5.3}{21}$ $\frac{6.0}{23}$ $\frac{6.4}{28}$ $\frac{7.2}{31}$ $\frac{9.0}{33}$ $\frac{9.0}{37.5}$ $\frac{7.2}{39}$ $\frac{6.7}{44.5}$ $\frac{7.3}{50}$

4.7

$\frac{8.5}{50}$ $\frac{8.3}{39}$ $\frac{9.0}{38}$ $\frac{9.0}{33.5}$ $\frac{8.3}{32.5}$ $\frac{8.0}{28}$ $\frac{6.8}{25}$ $\frac{4.8}{20}$ 4.7 $\frac{5.0}{20.5}$ $\frac{6.7}{23}$ $\frac{6.7}{27}$ $\frac{7.7}{31}$ $\frac{9.0}{32}$ $\frac{9.0}{38}$ $\frac{7.7}{38.5}$ $\frac{6.8}{46}$ $\frac{7.6}{49}$ $\frac{7.6}{50}$

4.7

$\frac{7.4}{50}$ $\frac{7.3}{39}$ $\frac{9.0}{37.5}$ $\frac{9.0}{33}$ $\frac{7.1}{31}$ $\frac{7.1}{28}$ $\frac{4.8}{20}$ 4.5 $\frac{4.8}{21}$ $\frac{8.8}{32}$ $\frac{8.3}{44}$ $\frac{5.0}{50}$

4.2

$\frac{8.2}{50}$ $\frac{7.8}{38.5}$ $\frac{9.0}{38}$ $\frac{9.0}{33}$ $\frac{7.7}{32.5}$ $\frac{7.5}{27}$ $\frac{4.6}{20}$ 4.4 $\frac{4.6}{21}$ $\frac{7.8}{28}$ $\frac{8.0}{44}$ $\frac{4.7}{49}$ $\frac{4.7}{50}$

+75 End H.D.

4.4

$\frac{6.9}{50}$ $\frac{7.1}{40}$ $\frac{10.0}{37}$ $\frac{9.6}{27}$ $\frac{4.8}{20}$ 4.6 $\frac{4.6}{20}$ $\frac{8.4}{30}$ $\frac{8.6}{42.5}$ $\frac{4.0}{50}$

4.2

$\frac{6.0}{50}$ $\frac{5.7}{47}$ $\frac{9.4}{41}$ $\frac{9.8}{31}$ $\frac{4.4}{20.5}$ 4.4 $\frac{4.5}{21}$ $\frac{8.4}{29}$ $\frac{8.4}{39.5}$ $\frac{2.8}{50}$

4.2

$\frac{3.6}{50}$ $\frac{9.6}{45}$ $\frac{9.2}{30}$ $\frac{4.2}{20}$ 4.2 $\frac{4.4}{21}$ $\frac{8.0}{29}$ $\frac{8.0}{38}$ $\frac{6.8}{42}$ $\frac{1.8}{50}$

8.4

$\frac{5.2}{50}$ $\frac{13.2}{39}$ $\frac{13.3}{30}$ $\frac{8.5}{20}$ 8.4 $\frac{8.6}{20.5}$ $\frac{12.2}{31}$ $\frac{12.2}{37}$ $\frac{9.8}{44}$ $\frac{5.3}{50}$

| Sta | + | H.I. | - | Elev | |
|---|---|---|---|---|---|
| | | 895.83 | | | |
| 749+00 | | | | 87.4 | 8.4 |
| +50 | | | | 87.4 | 8.4 |
| 750 | | | | 87.4 | 8.4 |
| +50 | | | | 87.4 | 8.4 |
| 751 | | | | 87.4 | 8.4 |
| +50 | | | | 87.4 | 8.4 |
| 752 | | | | 87.4 | 8.4 |
| | 4.17 | 892.23 | 7.77 | 888.06 | |
| 753 | | | | 87.4 | 4.8 |
| 754 | | | | 87.4 | 4.8 |
| 755 | | | | 87.4 | 4.8 |
| 756 | | | | 87.4 | 4.8 |
| 757 | | | | 87.4 | 4.8 |

10/31/27

(84)

3.9 / 50 | 13.0 / 38 | 13.5 / 30 | 8.5 / 20 | 8.5 | 8.8 / 20 | 12.8 / 32 | 12.6 / 33 | 9.7 / 43 | 4.7 / 50

(84)

4.2 / 50 | 13.1 / 37.5 | 13.5 / 29 | 8.6 / 21 | 8.5 | 8.5 / 20 | 12.4 / 30 | 12.3 / 33 | 9.1 / 42 | 2.8 / 50

(84)

5.3 / 50 | 13.8 / 40 | 13.9 / 30 | 8.6 / 20 | 8.9 | 8.8 / 20 | 12.3 / 29 | 12.2 / 32 | 10.0 / 38 | 4.8 / 48 | 2.3 / 50

(84)

6.4 / 50 | 12.8 / 39.5 | 12.2 / 29 | 9.1 / 20 | 8.6 | 8.9 / 21 | 12.3 / 29.5 | 12.2 / 32 | 11.3 / 33 | 9.0 / 40 | 1.8 / 50

(84)

7.0 / 50 | 13.0 / 40 | 12.5 / 28 | 9.0 / 20 | 8.9 | 9.0 / 20 | 11.7 / 30 | 11.7 / 35 | 0.2 / 50

(84)

7.7 / 50 | 12.8 / 40 | 12.5 / 29 | 8.8 / 20 | 8.8 | 8.8 / 20 | 11.2 / 26 | 11.2 / 37.5 | 0.7 / 50

(84)

7.5 / 50 | 12.8 / 39 | 12.8 / 28 | 8.8 / 20 | 8.9 | 8.8 / 20 | 11.8 / 29 | 11.5 / 39 | 3.4 / 52

+8' End Ditch Rt.

(48)

7.5 / 50 | 7.3 / 28 | 5.1 / 20 | 5.0 | 5.2 / 21 | 8.3 / 30 | 7.7 / 43 | 6.4 / 45.5 | 6.2 / 50

+10 End Ditch Rt.

(48)

8.2 / 50 | 7.7 / 27 | 5.2 / 20 | 5.0 | 5.2 / 20.5 | 7.8 / 29 | 8.0 / 50

(48)

8.2 / 50 | 8.0 / 28 | 4.7 / 20 | 4.8 | 4.7 / 21 | 7.7 / 30 | 7.7 / 50

(48)

8.0 / 50 | 8.0 / 28 | 5.1 / 20 | 4.8 | 4.8 / 21 | 7.7 / 28 | 7.8 / 50

(48)

7.7 / 50 | 7.5 / 27 | 5.0 / 20 | 4.6 | 4.7 / 20 | 6.8 / 25 | 7.0 / 50

+15 Beg Ditch Rt.

+30 Beg Ditch Rt

| Sta | + | HI | - | Elev | |
|---|---|---|---|---|---|
| | | 892.23 | | | |
| 758 | | | | | 4.8 |
| +50 | | | | | 4.8 |
| 759 | | | | | 4.8 |
| +50 | | | | | 4.8 |
| 760 | | | | | 4.9 |
| 761 | | | | | 5.0 |
| 762 | | | | | 5.2 |
| T.P. | 2.81 | 890.49 | 4.55 | 887.68 | |
| BM. | 4.09 | 890.75 | 3.88 | 886.61 | 886.66 |
| 763 | | | | | |
| +40 | | | | | |
| 764 | | | | | |
| +50 | | | | | |
| 765 | | | | | |

10/31/27 / 11/2/27 K.P.

48

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 51/50 | 72/47 | 77/27.5 | 48/20 | 48 | 50/20 | 75/26 | 76/46 | 57/50 |

48

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 51/50 | 74/47 | 71/28 | 50/21 | 50 | 50/20 | 83/27 | 80/44 | 41/50 |

48

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 61/50 | 77/49 | 75/27 | 50/20 | 50 | 51/20 | 80/27 | 81/44 | 46/50 |

48

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 72/50 | 84/47 | 84/30 | 51/20 | 51 | 54/21 | 84/27.5 | 84/46 | 60/50 |

49

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 66/50 | 87/47 | 87/27 | 52/20 | 51 | 51/20 | 92/30 | 92/44 | 84/46 | 55/50 |

50

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 60/50 | 94/44 | 91/27 | 51/20 | 51 | 53/20.5 | 87/28 | 78/44 | 26/51 |

52

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 48/50 | 88/43.5 | 86/27 | 55/20 | 53 | 55/20 | 90/28.5 | 88/39 | 07/50 |

spike in 24' O&S 75'-4" 3/4" 76 8/4 40

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 48/51 | 78/45 | 80/30 | 41/20 | 48 | 40/20 | 79/29 | 79/39 | 07/50 |
| 47/50 | 77/44 | 80/29 | 48/20 | 48 | 40/21 | 80/30 | 82/42 | 12/51 |

42

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 45/50 | 82/45 | 82/30 | 42/21 | 42 | 42/20 | 82/29.5 | 82/41 | 28/51 |

43

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 36/50 | 78/44 | 78/30 | 46/20 | 43 | 43/21 | 78/29.5 | 80/41.5 | 28/51 |

43

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 30/51 | 80/42 | 82/37 | 74/29 | 48/20 | 48 | 47/20 | 85/31 | 83/42 | 35/51 |

| Sta | + | HI | − | Elev |
|---|---|---|---|---|
| | | 893.75 | | |
| 766 | | | | |
| +30 | | | | |
| 767 | | | | |
| 768 | | | | |
| 769 | | | | |
| +16 | | | | |
| +25 | | | | |
| +50 | | | | |
| +68 | | | | |
| +83 | | | | |
| 770 | | | | |
| TP | 4.48 | 889.08 | 6.15 | 884.60 |
| +50 | | | | |

11/2/27

4.0

$\frac{4.2}{\sqrt{51}}$ $\frac{8.1}{44}$ $\frac{8.4}{31}$ $\frac{4.5}{20}$ 4.0 $\frac{4.6}{20}$ $\frac{8.3}{29}$ $\frac{8.6}{43}$ $\frac{4.8}{\sqrt{50}}$

4.1

$\frac{4.5}{\sqrt{51}}$ $\frac{8.4}{45}$ $\frac{8.4}{30}$ $\frac{4.6}{20}$ 4.1 $\frac{4.7}{20}$ $\frac{8.4}{29}$ $\frac{8.6}{44}$ $\frac{\sqrt{3}}{\sqrt{50}}$

4.2

$\frac{\sqrt{8}}{51}$ $\frac{8.8}{45}$ $\frac{8.4}{29}$ $\frac{4.3}{20}$ 4.6 $\frac{4.8}{20}$ $\frac{8.6}{28}$ $\frac{8.8}{44}$ $\frac{\sqrt{5}}{\sqrt{50}}$

5.0

$\frac{\sqrt{6}}{\sqrt{50}}$ $\frac{8.8}{43.5}$ $\frac{9.0}{29}$ $\frac{5.0}{21}$ 4.8 $\frac{5.0}{20}$ $\frac{9.0}{29}$ $\frac{1.8}{44}$ $\frac{\sqrt{1}}{\sqrt{50}}$

5.2

$\frac{\sqrt{7}}{\sqrt{51}}$ $\frac{8.8}{43}$ $\frac{9.2}{28}$ $\frac{5.2}{21}$ 5.0 $\frac{5.2}{20.5}$ $\frac{9.0}{28.5}$ $\frac{9.0}{44}$ $\frac{5.2}{50}$

5.3

$\frac{5.2}{\sqrt{51}}$ $\frac{9.0}{43}$ $\frac{9.2}{28}$ $\frac{5.2}{21.5}$ 5.2 $\frac{5.2}{28}$ $\frac{9.0}{34}$ $\frac{9.0}{38}$ $\frac{6.3}{44}$ $\frac{4.7}{48}$ $\frac{4.2}{50}$

+16 E.P.

5.2

$\frac{4.8}{51}$ $\frac{9.0}{44}$ $\frac{9.0}{30}$ $\frac{5.2}{22.5}$ 5.3 $\frac{5.3}{50}$ $\frac{6.0}{32}$ $\frac{7.0}{36}$ $\frac{\sqrt{1}}{43}$ $\frac{4.0}{50}$

5.3

$\frac{5.2}{\sqrt{50}}$ $\frac{\sqrt{51}}{30}$ 5.3 $\frac{4.8}{28}$ $\frac{4.4}{\sqrt{50}}$

5.3

$\frac{5.5}{\sqrt{50}}$ $\frac{5.3}{25}$ 5.3 $\frac{5.3}{26}$ $\frac{7.2}{32}$ $\frac{7.2}{44}$ $\frac{3.6}{50}$

5.3

$\frac{4.8}{\sqrt{50}}$ $\frac{8.5}{42}$ $\frac{9.2}{32}$ $\frac{8.8}{31}$ $\frac{\sqrt{6}}{22}$ 5.1 $\frac{5.4}{20}$ $\frac{8.2}{27}$ $\frac{9.4}{36}$ $\frac{8.8}{43}$ $\frac{3.2}{\sqrt{50}}$

5.4

$\frac{\sqrt{0}}{\sqrt{50}}$ $\frac{9.0}{41}$ $\frac{9.3}{29}$ $\frac{5.5}{19}$ $\sqrt{5}$ $\frac{\sqrt{5}}{20}$ $\frac{9.4}{30}$ $\frac{9.4}{42}$ $\frac{3.1}{\sqrt{51}}$

5.8

$\frac{3.3}{\sqrt{51}}$ $\frac{7.8}{43}$ $\frac{7.8}{29}$ $\frac{4.0}{20}$ 4.0 $\frac{3.8}{21}$ $\frac{7.6}{30}$ $\frac{7.7}{44}$ $\frac{2.6}{51}$

| Sta | + | HI | - | Elev. |
|---|---|---|---|---|
| | | 889.08 | | |
| 771 | | | | |
| +38 | | | | |
| 772 | | | | |
| 773 | | | | |
| 774 | | | | |
| 775 | | | | |
| 776 | | | | |
| 777 | | | | |
| 778 | | | | |
| T.P | 2.19 | 885.00 | 6.27 | 882.81 |
| 779 | | | | |
| 780 | | | | |
| B.M. | 3.84 | 884.89 | 3.95 | 881.05 |
| 781 | | | | |

11/2/27

3.9

$\frac{3.8}{50}$ $\frac{7.8}{43}$ $\frac{8.2}{30}$ $\frac{4.0}{20}$ 4.0 $\frac{4.1}{21}$ $\frac{8.0}{30}$ $\frac{8.0}{44}$ $\frac{4.7}{50}$

+20 Beg H.P

4.0

$\frac{5.0}{50}$ $\frac{8.2}{45}$ $\frac{8.2}{28}$ $\frac{4.2}{20}$ 4.1 $\frac{4.3}{21}$ $\frac{6.4}{28}$ $\frac{7.0}{32}$ $\frac{8.2}{33}$ $\frac{8.2}{375}$ $\frac{7.0}{39}$ $\frac{7.0}{50}$

+60 Beg H.P

4.1

$\frac{7.3}{50}$ $\frac{7.3}{39}$ $\frac{8.6}{37.5}$ $\frac{8.6}{33.5}$ $\frac{6.8}{31.5}$ $\frac{6.8}{26.5}$ $\frac{4.2}{21}$ 4.1 $\frac{4.2}{21.5}$ $\frac{6.6}{28}$ $\frac{7.3}{31.5}$ $\frac{8.8}{33}$ $\frac{8.8}{38}$ $\frac{7.2}{39}$ $\frac{7.2}{50}$

4.3

$\frac{7.2}{50}$ $\frac{7.5}{39}$ $\frac{9.3}{38}$ $\frac{9.2}{33}$ $\frac{7.8}{32}$ $\frac{7.1}{28}$ $\frac{4.6}{22}$ 4.5 $\frac{4.4}{22}$ $\frac{7.3}{28}$ $\frac{7.6}{32}$ $\frac{9.0}{33}$ $\frac{9.2}{37.5}$ $\frac{7.5}{39}$ $\frac{7.5}{50}$

4.6

$\frac{8.3}{50}$ $\frac{9.0}{39}$ $\frac{9.8}{38}$ $\frac{9.8}{33}$ $\frac{8.0}{32}$ $\frac{7.5}{29}$ $\frac{4.8}{22}$ 4.8 $\frac{5.0}{23}$ $\frac{7.7}{29}$ $\frac{7.8}{31}$ $\frac{9.5}{32}$ $\frac{9.5}{37}$ $\frac{7.8}{39}$ $\frac{7.8}{50}$

5.1

$\frac{8.6}{50}$ $\frac{8.6}{39}$ $\frac{10.0}{38}$ $\frac{10.1}{33}$ $\frac{8.5}{31.5}$ $\frac{8.0}{28}$ $\frac{5.3}{22}$ 5.2 $\frac{5.3}{23}$ $\frac{7.8}{28}$ $\frac{8.6}{31}$ $\frac{10.0}{32.5}$ $\frac{10.0}{38}$ $\frac{8.4}{39}$ $\frac{8.4}{50}$

5.7

$\frac{8.8}{50}$ $\frac{9.0}{40}$ $\frac{10.5}{38}$ $\frac{10.4}{33}$ $\frac{9.0}{32}$ $\frac{8.2}{28}$ $\frac{5.7}{22}$ 5.6 $\frac{5.6}{22}$ $\frac{8.4}{29}$ $\frac{8.7}{31}$ $\frac{11.0}{32.5}$ $\frac{10.8}{37}$ $\frac{9.0}{39}$ $\frac{8.8}{50}$

6.3

$\frac{9.6}{50}$ $\frac{9.4}{40}$ $\frac{11.2}{38}$ $\frac{11.4}{34}$ $\frac{9.5}{32}$ $\frac{8.8}{29}$ $\frac{6.1}{22}$ 6.2 $\frac{6.2}{23}$ $\frac{9.0}{30}$ $\frac{11.4}{32}$ $\frac{11.4}{38}$ $\frac{9.1}{39}$ $\frac{9.0}{50}$

6.9

$\frac{10.0}{50}$ $\frac{10.0}{40}$ $\frac{12.0}{38.5}$ $\frac{11.8}{33}$ $\frac{10.0}{31}$ $\frac{9.1}{28}$ $\frac{7.2}{22.5}$ 7.1 $\frac{7.1}{22.5}$ $\frac{9.0}{28.5}$ $\frac{9.5}{30}$ $\frac{12.0}{32}$ $\frac{11.8}{38}$ $\frac{9.0}{40}$ $\frac{9.0}{50}$

3.4

$\frac{7.0}{50}$ $\frac{6.6}{40}$ $\frac{8.5}{38.5}$ $\frac{8.5}{33}$ $\frac{6.3}{31}$ $\frac{6.1}{29}$ $\frac{3.8}{33}$ 3.6 $\frac{3.8}{22}$ $\frac{5.8}{29}$ $\frac{6.8}{31}$ $\frac{8.4}{33}$ $\frac{8.4}{37}$ $\frac{6.7}{39}$ $\frac{6.6}{50}$

4.0

$\frac{7.5}{50}$ $\frac{7.5}{39}$ $\frac{8.7}{38}$ $\frac{8.8}{34}$ $\frac{7.8}{33}$ $\frac{7.5}{28.5}$ $\frac{4.3}{21}$ 4.4 $\frac{4.5}{21.5}$ $\frac{7.0}{28}$ $\frac{7.0}{31}$ $\frac{8.7}{33}$ $\frac{8.7}{37}$ $\frac{7.3}{38.5}$ $\frac{7.3}{50}$

2 Nails in 6" Birch 45' ht 3+9 778+75

$\frac{8.2}{50}$ $\frac{8.0}{38}$ $\frac{9.2}{37}$ $\frac{9.2}{33}$ $\frac{8.2}{32}$ $\frac{7.8}{26}$ $\frac{5.1}{20.5}$ 4.9 $\frac{5.2}{20.5}$ $\frac{7.0}{25}$ $\frac{8.1}{32}$ $\frac{9.5}{33}$ $\frac{9.6}{37.5}$ $\frac{8.0}{38.5}$ $\frac{8.0}{50}$

4.5

| Sta | + | HI | − | Elev | |
|---|---|---|---|---|---|
| | | 884.89 ✓ | | | |
| 782 | | | | | |
| 783 | | | | | |
| 784 | | | | | |
| 785 | | | | | |
| 786 | | | | | |
| T.P. | 1.62 | 878.15 ✓ | 8.36 | 876.53 ✓ | |
| BM1. | 4.60 | 879.25 | 3.60 | 874.53 ✓ | 874.65 |
| 787+00 | | | | | |
| 788 | | | | | |
| 789 | | | | | |
| 790 | | | | | |
| +30 | | | | | |
| 791 | | | | | |
| +50 | | | | | |

C.W.S.
D.S.
E.F.
K.P.

1/3/27

5.1

90/50 90/38 100/37 98/33 90/32 88/26 61/20 50/ 59/21 85/26 83/32 101/33 101/38 90/34 88/50

5.7

92/50 90/38 104/37 106/33 90/32 90/27 64/20 62/ 64/20 88/26 91/32 107/33 107/38 90/34 92/50

6.3

97/50 92/40 112/38 112/34 93/31 92/28 70/20 68/ 68/20 88/26 90/31 112/33 114/37 90/34 90/50

6.9

10.0/50 10.0/40 12.1/38 12.1/33 98/31 98/28 78/21 74/ 25/20 88/26 88/30 118/33 117/37 88/34 87/50

7.5

11.7/50 10.7/40 13.8/37 12.8/34 110/31 103/27 86/20 82/ 86/20 10.1/25 10.4/30 12.7/33 127/37 10.5/34 10.2/50

Spike in shown.

5.8/50 5.8/39 7.7/37.5 7.5/33 5.7/31 5.5/27 3.8/20 3.8/ 4.0/21 5.4/27 5.6/31 7.2/32 7.1/38 5.6/40 5.3/50

6.6/50 6.8/38 7.8/37 7.8/32 6.8/31 6.6/26 5.1/20 5.1/ 5.1/20 6.2/24 6.6/31 7.5/32 7.5/38 6.3/40 6.3/50

7.6/50 7.6/38 8.6/37.5 9.0/33.5 7.4/32 7.4/24.5 5.9/20 5.9/ 6.0/20 6.2/21.5 6.2/28.5 8.6/31 8.8/37 6.0/34.5 6.0/50

+25 End H.D.

8.3/50 8.0/37 9.1/36 9.2/31 8.2/29 8.2/27 6.7/20 6.7/ 6.7/20 9.7/30 10.2/41 7.0/45 6.2/50

+30 End H.D.

8.3/50 7.8/36 9.2/34 9.5/30 8.3/28 7.0/21 7.0/ 7.0/20 10.5/29 10.5/38 7.0/44 6.6/50

8.7/50 7.7/36 10.5/33 10.0/29 10.2/27 8.0/21 7.8/ 8.9/20 10.7/28 11.2/38 7.7/45 7.2/50

9.4/50 8.1/36 11.0/33 11.0/28.5 10.1/27.5 8.4/21 8.4/ 8.4/21 11.4/30 11.2/41 8.2/47 7.7/50

| Sta | + | HI | − | Elev |
|---|---|---|---|---|
| | | 529.25 | | |
| 792 | | | | |
| +50 | | | | |
| T.P. | 1.57 | 872.82 | 8.00 | 871.25 |
| 793 | | | | |
| 794 | | | | |
| 795 | | | | |
| 796 | | | | |
| +50 | | | | |
| +77 | | | | |
| T.P. | 5.99 | 866.84 | 11.97 | 860.85 |
| 797 | | | | |
| +50 | | | | |
| 798 | | | | |
| 799 | | | | |

11/3/27

400 Boy HD

8.1

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 10.6 | 10.2 | 11.7 | 11.6 | 9.5 | 9.8 | 8.8 | 9.0 | 11.8 | 12.0 | 8.7 | 8.7 |
| 50 | 36 | 34 | 28.5 | 24.5 | 21 | | 21 | 27 | 42 | 48 | 50 |

8.9

450 Boy H.D.

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 11.3 | 11.2 | 12.2 | 12.4 | 11.8 | 12.7 | 9.5 | 9.2 | 9.2 | 10.4 | 12.4 | 12.4 | 9.5 | 9.1 |
| 50 | 36 | 31 | 30 | 28 | 25 | 21 | | 21 | 26 | 30 | 34 | 38 | 50 |

2.9

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5.3 | 5.2 | 6.6 | 6.6 | 5.4 | 4.8 | 3.7 | 3.0 | 3.8 | 5.0 | 5.1 | 6.1 | 6.2 | 5.0 | 4.6 |
| 50 | 36 | 34 | 30 | 27 | 24 | 20.5 | | 21.5 | 25 | 27 | 29 | 34 | 36 | 50 |

4.2

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6.1 | 5.8 | 7.6 | 7.9 | 6.0 | 5.7 | 4.7 | 4.7 | 5.1 | 5.7 | 7.5 | 7.5 | 5.8 | 5.1 |
| 50 | 37 | 33 | 30 | 26 | 24 | 20 | | 21 | 24 | 25 | 29 | 33 | 38 | 50 |

450 Boy Dutch

5.5

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8.0 | 9.3 | 8.7 | 9.1 | 9.0 | 7.4 | 7.2 | 5.4 | 5.0 | 5.7 | 7.0 | 7.3 | 9.7 | 7.5 | 7.4 | 7.5 |
| 48 | 46 | 42 | 33 | 28 | 26 | 25 | 20 | | 21 | 24 | 25 | 29.5 | 32 | 36 | 50 |

450 B Dutch

6.7

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8.0 | 8.6 | 12.1 | 13.3 | 13.3 | 10.5 | 10.3 | 9.3 | 6.6 | 6.6 | 8.3 | 8.6 | 12.2 | 12.2 | 8.6 | 8.7 |
| 38 | 44 | 42 | 44 | 35 | 30 | 28 | 27 | 20 | | 21 | 24 | 29 | 33 | 36 | 40 | 50 |

7.2

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9.0 | 12.2 | 13.6 | 13.6 | 12 | 11 | | 12 | 9.2 | 9.5 | 13.3 | 13.3 | 9.4 | 9.0 |
| 50 | 42 | 41 | 36 | 31 | 27 | | 21 | 26 | 29 | 30 | 38 | 40 | 50 |

7.4

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8.5 | 14.0 | 14.0 | 13.7 | 9.4 | 7.2 | 7.6 | 10.3 | 10.7 | 13.7 | 13.7 | 10.1 | 9.7 |
| 50 | 42 | 37 | 33 | 20 | | 21 | 26 | 29 | 31 | 35 | 39 | 50 |

16

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2.4 | 3.4 | 8.3 | 8.4 | 1.5 | 1.5 | 1.8 | 5.0 | 5.2 | 7.4 | 8.0 | 5.0 | 4.3 |
| 57 | 48 | 41 | 34 | 20 | | 21.5 | 27 | 30 | 31 | 35.5 | 38 | 50 |

2.0

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4.7 | 7.2 | 8.8 | 9.0 | 6.8 | 2.1 | 2.0 | 2.2 | 5.2 | 5.5 | 8.8 | 8.0 | 5.7 | 5.7 |
| 54 | 44 | 43.5 | 36 | 35 | 20 | | 21.5 | 29 | 31 | 33.5 | 37 | 39 | 50 |

2.4

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9.7 | 9.5 | 8.8 | 9.7 | 9.4 | 9.4 | 9.3 | 3.0 | 3.8 | 3.1 | 6.6 | 7.2 | 8.7 | 8.7 | 7.5 | 6.5 |
| 50 | 45 | 43 | 42 | 37 | 36 | 33 | 20.5 | | 21 | 28 | 32 | 34 | 36 | 38 | 50 |

400 Boy Dutch

3.3

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 11.0 | 9.8 | 4.0 | 3.7 | 3.7 | 7.5 | 8.2 | 8.4 | 8.4 | 8.4 | 7.7 | 8.8 |
| 50 | 33 | 20 | | 21 | 28 | 32 | 33 | 34 | 37 | 38 | 50 |

| Sta | + | HI | - | Elev | |
|---|---|---|---|---|---|
| | | 866.84 ✓ | | | |
| 44+ | | | | | |
| 800+00 | | | | | |
| T.P. BM. | 6.45 | 867.00 ✓ | 5.99 | 860.85 ✓ | |
| 801 | | | | | |
| 802 | | | | | |
| 803 | | | | | |
| 62+ | | | | | |
| 804 | | | | | |
| 60+ | | | | | |
| 805 | | | | | |
| T.P. | 9.23 | 858.08 ✓ | 9.45 | 857.85 ✓ | |
| 806 | | | | | |
| 50+ | | | | | |
| B.M. | | | | | 851.07 |
| 807 | | | | | |

10/1-12-27

+50 Beg H.D.

3.6

100/50 96/40 110/39 98/36 93/35 94/33 44/21 47 38/20 26/28 78/32 84/33 84/36 70/37 66/50

1

4.0

73/50 64/40 28/36 88/35 90/32 77/31 78/26 57/20 50 47/20 63/27 60/30 74/32 73/36 58/37 55/50

+50 End H.D.

North End Cul de sac #777490.

72/36 88/35 85/37 71/32.5 61 47/23 60/30 81/32 54/35 49/50

5.3

6.1

63/37 96/31 94/27 78/22 64 56/20 84/30 84/30 60/38

6.9

63/39 108/32 102/26 86/22 70 60/20 90/27 90/32 43/20.5

7.6

63/50 85/39 106/32 112/28 92/22 78 62/21 88/27 88/31 50/44 26/50

8.1

98/50 91/36 114/32 114/27 98/22 82 70/21 92/25 94/32 34/41 26/50

9.3

126/50 122/34 130/33 128/27 110/23 96 84/20 104/28 104/32 54/40 44/50

10.1

137/50 130/33 135/32 133/27 117/22 102 90/20 110/24.5 110/30 70/39 50/50

5.3

+100 806 Beg H.D.

77/50 63/33 72/31 70/29 50/22 36 24/20 50/27 61/28 61/30 50/30.5 32/33.5 22/50

+50 End Ditch Lo.

4.5

100/50 90/30 62/22 51 37/20 74/29 77/32 68/34 50/35 41/50

5.7

130/50 125/36 75/24 62 48/20 86/28 90/31 97/32 100/36 78/38 65/50

| Sta | + | HI | − | Elev | |
|---|---|---|---|---|---|
| | | 858.08 ✓ | | | |
| 807+17 | | | | | |
| +50 | | | | | |
| 808 | | | | | |
| +44 | | | | | |
| +66 | | | | | |
| B.M. | 3.46 | 854.53 ✓ | 7.03 | 851.05 ✓ | = 851.07 |
| +98 | | | | | |
| 809 | | | | | |
| +06 | | | | | |
| +14 | | | | | |
| T.P. | 6.83 | 857.47 ✓ | 3.89 | 850.64 ✓ | |
| +42 | | | | | |
| +55 | | | | | |
| 810 | | | | | |

10/4/27

6.1

12.4/50 | 13.0/38 | 7.8/25 | 6.6 | 15.5/20 | 10.0/29 | 10.1/32 | 11.4/33 | 10.8/37 | 9.3/38 | 7.8/50

7.1

6.1/20

14.8/50 | 14.0/34 | 8.7/25 | 7.4 | 10.0/27 | 10.5/29 | 11.4/31 | 11.7/34 | 13.7/35 | 13.2/39 | 10.8/41 | 10.3/50

7.6

14.5/50 | 13.8/34 | 8.8/25 | 8.0 | 6.7/21 | 10.0/28 | 13.3/36 | 14.8/38 | 14.7/41 | 12.6/43 | 12.2/50

7.9

13.0/50 | 12.4/40 | 10.8/33 | 8.8/24 | 8.4 | 8.0/20 | 12.0/26 | 15.0/32 | 16.0/50

8.0

8.7/50 | 8.5/21 | 8.5 | 8.1/20 | 10.0/35 | 9.6/32

To p Slab 3W Cor 18+ Sta 80.9 + 42

1.7/19 | 4.7/15 | 5.0 | 5.0/15 | 2.5/19

+12.2

1.7/19 | 4.6/15 | 5.1 | 5.1/15 | 2.6/19

+12.6

1.6/19 | 4.5/15 | 5.2 | 5.0/15 | 2.5/19

+12.9

1.5/19 | 4.6/15 | 5.2 | 5.1/15 | 2.6/19 | +12.2

8.2

5.0/50 | 5.6/24 | 8.9/18 | 9.0 | 8.3/20 | 7.3/26 | 5.3/31 | 5.8/34 | 7.7/44 | 7.7/50

8.3

+5.5 Beg Ditch

8.5/50 | 8.5/35 | 8.0/25 | 8.5/23 | 8.2 | 8.4/19 | 9.8/24 | 9.5/24 | 7.6/32 | 10.7/40 | 14.2/50

+5.9 Beg Ditch

8.6

9.7/50 | 8.0/40 | 11.2/37 | 11.4/29 | 8.4/20 | 8.4 | 8.4/19 | 11.8/28 | 11.8/31 | 9.3/36 | 11.6/46 | 13.3/15

| Sta | + | HI | − | Elev. | |
|---|---|---|---|---|---|
| | | 857.47 ✓ | | | |
| +80 | | | | | |
| 811+00 | | | | | |
| +37 | | | | | |
| +58 | | | | | |
| +70 | | | | | |
| T.P. | 11.69 | 862.78 ✓ | 6.38 | 851.09 ✓ | |
| T.P. | 5.88 | 868.47 ✓ | 0.19 | 862.59 ✓ | |
| 808+98 | | | | | |
| 809+00 | | | | | |
| +06 | | | | | |
| +14 | | | | | |
| T.P. | 0.43 | 863.02 ✓ | 5.88 | 862.59 ✓ | |
| B.M. | | | 11.93 | 851.09 ✓ | 851.09 |

8.9

64/50 65/41 107/32 107/26 87/23 88 88/20 117/24 106/29 75/25 86/50

9.0

47/50 47/41 108/33 110/26 98/20 88 89/20 108/24 107/29 61/36 66/50

9.1

23/50 18/43 107/31 106/25 92/20 92 91/20 108/25 106/30 78/38 41/47 40/50

9.3

27/50 20/41 100/29 102/22 91/19 91 93/20 107/24 105/32 33/41 26/50

9.4

23/50 17/40 98/29 102/22 90/19 91 95/21 106/25 106/31 27/42 22/50

100

18/50 17/319 94/319 (1.5) 100/316 20/316 21/50

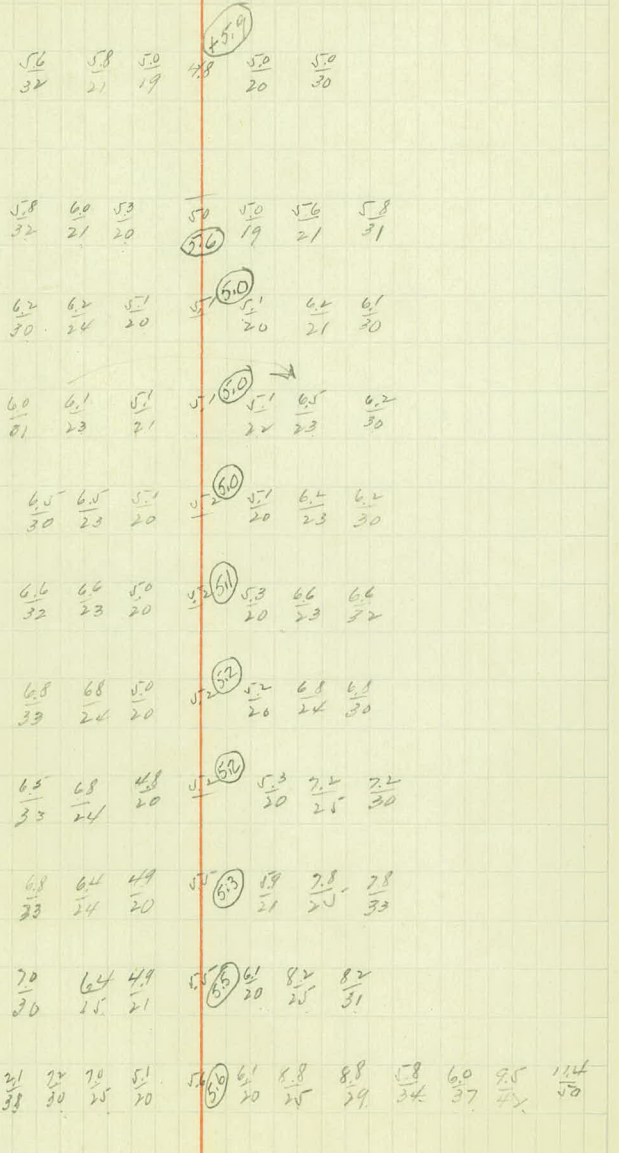
09/50 08/319 95/319 (1.7) 101/316 15/316 12/50

05/50 12/319 96/319 (1.1) 101/316 18/316 13/100

18/50 17/319 97/319 (1.8) 102/316 15/316 21/50

Cor stab

| Sta | + | HI | − | Elev |
|---|---|---|---|---|
| B.M. | 5.18 | 852.62 | | 847.44 |
| 813+00 | | | | |
| +22 | | | | |
| +36 | | | | |
| +63 | | | | |
| 814 | | | | |
| +41 | | | | |
| 815 | | | | |
| +50 | | | | |
| 816 | | | | |
| 817 | | | | |
| +50 | | | | |
| 818 | | | | |



| Sta | + | H I | − | Elev |
|---|---|---|---|---|
| | | 852.62 | | |
| T. P. | 12.43 | 862.47 | 2.58 | 850.04 |
| +22 | | | | |
| +36 | | | | |
| +63 | | | | |
| 814 | | | | |
| +41 | | | | |
| 815 | | | | |
| +50 | | | | |
| 816 | | | | |
| 817 | | | | |
| +50 | | | | |
| T. P. | 1.50 | 851.54 | 12.43 | 850.04 |
| 818 +00 | | | | |

| | | |
|---|---|---|
| 8.1/51 | (14.0) | 12/42 10/48 20/50 |
| 21/51 | (14.8) | 5.2/43 4.8/50 |
| 12/51 | (14.9) | 2.7/48 3.0/50 |
| 2.3/51 | (14.9) | 3.9/49 2.4/50 |
| 4.2/52 | (14.9) | 6.1/47 5.7/50 |
| 6.6/50 | (15.0) | 6.3/46 5.8/50 |
| 5.6/50 | (15.1) | 6.6/42 6.2/50 |
| 2.3/50 7.3/47 | (15.1) | 5.4/44 5.0/50 |
| 9.2/50 9.4/42 | (15.2) | 100/43 9.8/50 |
| 8.5/50 9.4/40 | (15.4) | 11.3/40 11.3/50 |
| 36/50 48/47 48/45 | (15.5) | |

| Sta | + | H I | − | Elev. | |
|---|---|---|---|---|---|
| | | 51.5 | | | |
| +37 | | | | | |
| +51 | | | | | |
| +68 | | | | | |
| +74 | | | | | |
| +94 | | | | | |
| 819+00 | | | | | |
| 13 M. | 3.83 | 851.27 | 4.11 | 847.43 | 847.44 |
| 820+00 | | | | | |
| +16 | | | | | |
| +44 | | | | | |
| +75 | | | | | |
| 821+00 | | | | | |
| +65 | | | | | |

Left

Right

4.6

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5.4 | 6.1 | 6.5 | 4.7 | 4.9 | 7.2 | 6.0 | 16.8 | | | | |
| 50 | 44 | 29 | 20 | 20 | 26 | 29 | 50 | | | | |

4.3

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7.8 | 6.7 | 4.7 | 7.5 | 7.4 | 4.3 | 4.8 | 4.3 | 6.6 | 5.4 | 6.0 | 11.0 | 21.7 | |
| 50 | 48 | 35 | 30 | 27 | 21 | 20 | 23 | 26 | 29 | 44 | 50 | 73 | |

4.3

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 13.5 | 10.0 | 8.0 | 8.0 | 4.7 | 4.8 | 6.1 | 6.1 | 5.6 | 7.5 | 8.7 | 22.3 | | |
| 50 | 45 | 37 | 28 | 21 | 20 | 23 | 27 | 29 | 50 | 61 | 84 | | |

4.3

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 14.5 | 9.6 | 8.5 | 4.7 | 4.8 | 5.8 | 5.8 | 5.5 | 7.5 | 8.9 | 21.5 | 22.0 | | |
| 50 | 38 | 30 | 22 | 19 | 22 | 27 | 30 | 50 | 65 | 85 | 90 | | |

4.8

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 17.2 | 14.0 | 13.0 | 4.4 | 4.5 | 4.5 | 4.6 | 7.1 | | | 8.2 | 22.3 | | |
| 42 | 40 | 37 | 22 | | | 18 | 50 | | | 60 | 81 | | |

4.3

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 20.0 | 14.3 | 7.2 | 6.7 | 3.9 | 4.6 | 4.7 | 7.0 | 5.5 | 7.1 | 7.2 | 18.3 | 21.9 | 22.8 |
| 50 | 42 | 26 | 20 | 17 | 19 | 20 | 20 | 27 | 50 | 53 | 64 | 78 | 86 |

11-5-27
Crane

4.9

| | | | | |
|---|---|---|---|---|
| 4.9 | 3.9 | 4.9 | 4.2 | 6.4 |
| 26 | 20 | 4.4 | 20 | 25 |

5.0

| | | | | |
|---|---|---|---|---|
| 5.6 | 4.2 | 5.0 | 5.0 | 6.5 |
| 31 | 20 | 4.6 | 19 | 27 |

5.1

| | | | | | | |
|---|---|---|---|---|---|---|
| 7.7 | 5.7 | 4.6 | 5.1 | 5.5 | 6.7 | 7.7 |
| 39 | 27 | 22 | 5.0 | 20 | 24 | 37 |

5.2

| | | | | | | |
|---|---|---|---|---|---|---|
| 7.1 | 5.5 | 4.6 | 5.2 | 5.6 | 6.7 | 8.1 |
| 38 | 23 | 20 | 5.1 | 21 | 26 | 42 |

5.2

| | | | | | | |
|---|---|---|---|---|---|---|
| 7.2 | 6.1 | 4.7 | 5.2 | 5.5 | 6.6 | 8.5 |
| 41 | 25 | 21 | 5.3 | 24 | 26 | 43 |

5.3

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 7.4 | 6.1 | 5.0 | 5.3 | 6.2 | 6.7 | 7.0 | 8.3 | 9.1 |
| 35 | 23 | 20 | 5.7 | 21 | 24 | 31 | 36 | 43 |

| Stg. | + | H. I. | − | Elev. |
|---|---|---|---|---|
| | | 851.27 | | |
| 822+00 | | | | |
| +25 | | | | |
| +73 | | | | |
| 823+00 | | | | |
| +44 | | | | |
| +54 | | | | |
| +65 | | | | |
| +76 | | | | |
| 824+00 | | | | |
| T.P. | 1.71 | 840.33 | 12.65 | 838.62 |
| 820+00 | | | | |
| 820+16 | | | | |
| 820+64 | | | | |

Left. Right. 11-5-27

| | | | | | | |
|---|---|---|---|---|---|---|
| 7.9 | 6.8 | 4.8 | (5.4) | 6.1 | 6.9 | 8.3 |
| 36 | 27 | 20 | 5.7 | 21 | 25 | 40 |
| 7.4 | 6.2 | 5.0 | (5.4) | 6.0 | 7.1 | 7.7 |
| 37 | 27 | 20 | 5.8 | 20 | 24 | 36 |
| 6.7 | 5.8 | 4.7 | (5.4) | 5.7 | 7.1 | |
| 32 | 23 | 20 | 5.5 | 20 | 27 | |
| | | | (5.3) | | | |
| 6.5 | 5.5 | 4.6 | | 5.5 | 6.3 | |
| 30 | 22 | 19 | 5.4 | 20 | 24 | |
| | | | (5.2) | | | |
| | 9.5 | 4.6 | | 5.3 | 13.4 | 15.8 |
| | 32 | 19 | 5.1 | 21 | 38 | 50 |
| | | | (5.2) | | | |
| 7.6 | 9.2 | 10.3 | 4.6 | 5.3 | 13.2 | 15.6 |
| 50 | 39 | 32 | 19 | 5.1 | 21 | 38 | 50 |
| | | | (5.2) | | | |
| 13.7 | 11.9 | 4.4 | | 6.4 | 12.2 | 10.7 | 8.6 |
| 50 | 36 | 20 | 5.0 | 20 | 34 | 41 | 50 |
| 13.5 | 13.0 | 4.4 | | 5.4 | 10.6 | 10.4 | 8.8 |
| 50 | 38 | 20 | 5.1 | 20 | 31 | 34 | 50 |
| | | | (5.0) | | | |
| 12.2 | 12.2 | 4.2 | | 5.4 | 13.2 | 15.9 |
| 50 | 38 | 20 | 5.0 | 20 | 35 | 50 |
| | | | (4.1) | 4.2 | 5.2 | 5.6 |
| | | | | 42 | 50 | 60 |
| | | | (4.0) | 5.6 | 6.3 | |
| | | | | 46 | 50 | |
| | | | (3.9) | 5.4 | 6.1 | 6.7 |
| | | | | 51 | 54 | 59 |

| Stg. | + | H. I. | − | E/cv. | |
|---|---|---|---|---|---|
| | | 840.33 | | | |
| 820+75 | | | | | |
| 821+00 | | | | | |
| | 5.26 | 840.86 | 4.73 | 835.60 | |
| 821+65 | | | | | |
| 822+00 | | | | | |
| 822+25 | | | | | |
| 822+73 | | | | | |
| 823+00 | | | | | |
| T.P. | 11.56 | 848.69 | 3.73 | 837.13 | |
| B.M. | 1.25 | 848.69 | 1.25 | 847.44 | |
| T.P. | 1.27 | 837.64 | 12.32 | 836.37 | |
| 820+00 | | | | | |
| 820+16 | | | | | |
| 820+64 | | | | | |
| 820+75 | | | | | |

Left. Right 11-5-27

+5.8 — 6.0/55 6.6/60

+5.8 — 6.7/58 9.5/64 9.6/64

+5.1 — 10.4/60 13.4/70 14.0/80

+5.0 — 9.3/58 9.3/60 8.4/61 6.6/65

+5.0 — 5.5/48 5.7/53 5.0/60

+5.0 — 5.0/40 4.8/50

−5.1 — 5.0/40 5.9/46 6.0/50

11-7-27

7.5/58 5.5/49 3.9/44 — +8.8

6.6/53 5.1/48 — +8.5

7.5/60 6.8/55 2.7/50 — +8.6

9.7/65 8.7/64 7.4/59 1.3/50 — +8.5

| Sta. | + | H.I. | − | Elev. |
|---|---|---|---|---|
| | | 837.64 | | |
| 821+00 | | | | |
| T.P. | 5.69 | 839.69 | 3.64 | 834.00 |
| 821+65 | | | | |
| 822+00 | | | | |
| 822+25 | | | | |
| 822+73 | | | | |
| 823+00 | | | | |
| 823+44 | | | | |
| T.P. | 12.32 | 851.30 | 0.71 | 838.98 |
| B.M. | 3.81 | 851.25 | 3.86 | 847.44 |
| 824+38 | | | | |
| 824+83 | | | | |
| 825+00 | | | | |
| 825+33 | | | | |

Left Right. 11-7-27

8.8/63 7.8/60 5.3/57 (+6.5)

10.4/60 9.4/53 7.1/50 (+6.3)

9.2/58 8.8/53 6.6/50 (+6.2)

8.9/58 8.3/53 6.3/50 (+6.2)

10.1/55 8.4/50 5.7/45 (+6.2)

7.7/50 6.8/47 (-6.3)

0.0/50 2.3/43 1.6/39 (-6.4)

(4.8)

4.0/50 10.9/37 10.6/31 4.0/20 5.2/4.8 9.9/20 13.2/31 16.0/42 /50

(4.4)

5.5/35 7.5/32 7.5/29 4.0/21 4.9/4.7 10.6/19 16.3/33 17.8/44 /50

(4.4)

3.0/39 6.9/31 6.5/26 4.0/20.5 4.7/4.5 8.9/19 15.6/28 17.6/39 /50

(4.0)

4.6/36 6.3/30 5.7/26 3.6/20 4.5/4.1 7.8/19 11.8/33 13.0/36 /50

| Sta. | + | H.I. | − | Elev. |
|---|---|---|---|---|
| | | 851.25 | | |
| 825+65 | | | | |
| 826+00 | | | | |
| T.P. | 8.69 | 856.81 | 3.13 | 848.12 |
| 824+83 | | | | |
| 825+00 | | | | |
| 825+33 | | | | |
| 825+65 | | | | |
| 826+00 | | | | |
| 827+00 | | | | |
| 827+40 | | | | |
| 828+00 | | | | |
| 829+00 | | | | |
| 829+50 | | | | |

Left. Right. 11-7-27

(3.9)

2.0/37 5.9/32 5.3/26 3.4/20 4.5/41 6.5/19 7.5/26 4.4/31 9.1/40 /50

(3.7)

2.0/36 6.3/33 5.7/26 2.0/20 4.5/38 6.3/20 6.5/25 4.2/30 /34

(1.9)

1.7/60 1.6/54

(1.9)

1.7/60 1.5/53

(2.6)

2.0/50 2.2/47

(2.2)

2.1/50 2.4/44

(2.2)

2.1/50 2.1/44 1.9/45 1.8/50

(8.5)

2.6/50 2.6/43 10.3/33 10.2/29 8.2/22 8.7/20 9.2/26 10.9/32 11.0/43 2.7/50 2.8/50

(8.2)

2.5/60 2.6/50 8.6/43 10.1/35 10.2/28 7.8/21 8.7/20 10.4/24 10.4/31 2.7/41 2.7/50

(7.9)

2.7/60 3.8/46 8.5/38 9.8/31 9.4/26 7.3/21 8.6/20 9.8/22 9.8/25 4.9/29 3.5/39 3.3/45 3.3/50

(6.8)

5.3/50 4.7/36 8.8/30 8.8/25 6.6/21 7.8/21 9.0/24 9.0/32 3.6/40 3.8/50

4.7/50 5.1/37 7.7/32 7.7/27 5.9/21 6.3/21 7.0/25 8.4/31 8.3/37 3.9/50 3.8/50

| Sta. | − | H.I. | − | Elev. |
|---|---|---|---|---|
| | | 856.81 | | |
| 830+00 | | | | |
| T.P. | 6.11 | 857.83 | 5.09 | 851.72 |
| 830+21 | | | | |
| 830+43 | | | | |
| 830+71 | | | | |
| 831+00 | | | | |
| 831+47 | | | | |
| 832+00 | | | | |
| 832+23 | | | | |
| 833+00 | | | | |
| 834+00 | | | | |
| T.P. | 8.49 | 863.33 | 2.99 | 854.84 |
| 835+00 | | | | |
| 836+00 | | | | |

Left. Right. 11-7-27

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2.9 | 2.0 | 5.2 | 5.7 | 5.1 | | 6.5 | 7.8 | 7.9 | 4.0 | 4.0 | |
| 93 | 42 | 32 | 26 | 23 | 5.8 | 20 | 24 | 29 | 34 | 50 | |
| 4.6 | 4.4 | 4.8 | 5.1 | 5.9 | | 7.8 | 8.4 | 8.6 | 4.8 | 4.7 | |
| 64 | 50 | 38 | 32 | 22 | 6.3 | 21 | 25 | 31 | 35 | 50 | |
| 4.8 | 4.6 | 5.2 | 5.5 | | | 7.0 | 8.4 | 8.5 | 4.5 | 4.5 | |
| 61 | 48 | 32 | 23 | 6.3 | | 20 | 25 | 30 | 36 | 50 | |
| 4.8 | 4.8 | 5.4 | | | | 6.9 | 8.1 | 8.3 | 4.6 | 4.6 | |
| 55 | 42 | 20 | 6.1 | | | 21 | 25 | 30 | 37 | 50 | |
| 5.0 | 4.7 | 5.2 | | | | 6.3 | 7.8 | 8.0 | 4.8 | 4.7 | |
| 50 | 34 | 21 | 5.9 | | | 20 | 24 | 31 | 35 | 50 | |
| 3.9 | 5.1 | 5.4 | 4.6 | 4.6 | | 5.9 | 7.4 | 7.5 | 4.4 | 4.3 | |
| 53 | 30 | 47 | 43 | 23 | 5.6 | 20 | 25 | 31 | 35 | 50 | |
| 3.2 | 3.3 | 7.4 | 6.7 | 4.6 | 4.4 | 5.2 | 6.5 | 6.8 | 3.9 | 3.8 | |
| 50 | 44 | 40 | 34 | 29 | 11 | 4.8 | 21 | 25 | 30 | 37 | 50 |
| 3.9 | 2.9 | 3.0 | 6.7 | 6.7 | 4.9 | 4.4 | 4.6 | 5.8 | 5.8 | 3.4 | 3.4 |
| 50 | 48 | 41 | 36 | 32 | 27 | 9 | 4.6 | 20 | 26 | 31 | 37 | 50 |
| 2.9 | 4.7 | 2.7 | 5.9 | 6.1 | 4.0 | | 4.0 | 5.1 | 4.8 | 2.5 | 2.3 | |
| 30 | 46 | 39 | 32 | 26 | 20 | 3.9 | 20 | 30 | 32 | 37 | 50 | |
| 03 | 2.3 | 3.0 | 5.1 | 5.4 | 5.1 | | 3.0 | 4.0 | 4.3 | 1.4 | 2.2 | |
| 50 | 46 | 40 | 35 | 26 | 20 | 3.0 | 20 | 25 | 31 | 37 | 50 | |
| 5.0 | 5.5 | 8.2 | 8.8 | 9.7 | 9.5 | 7.6 | 7.4 | 9.0 | 9.3 | 8.1 | 8.7 | |
| 50 | 46 | 38 | 32 | 30 | 25 | 20 | 7.3 | 20 | 25 | 28 | 31 | 50 |
| 4.8 | 5.3 | 7.4 | 10.0 | 9.3 | 9.1 | 6.8 | 6.4 | 8.4 | 8.4 | 8.5 | 8.1 | |
| 50 | 46 | 39 | 36 | 32 | 26 | 21 | 6.4 | 22 | 27 | 30 | 42 | 50 |

| Sta. | + | H. I. | − | Elev. |
|---|---|---|---|---|
| | | 863.33 | | |
| 837+00 | | | | |
| 837+84 | | | | |
| B.M. | 4.49 | 862.52 | 5.30 | 858.03 |
| T.P. | 2.16 | 857.26 | 7.42 | 855.10 |
| T.P. | 2.48 | 850.59 | 9.15 | 848.11 |
| B.M. | | | 3.15 | 847.44 |

Left Right. 11-7-27

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 4.4 | 5.6 | 8.4 | 6.4 | 8.7 | 8.7 | 5.5 | | 5.7 | 7.6 | 8.0 | |
| 0 | 42 | 37 | 33 | 30 | 26 | 21 | 5.2 | 21 | 28 | 50 | |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3.7 | 3.5 | 5.1 | 3.7 | 3.4 | 7.5 | 7.8 | 4.5 | | 4.4 | 7.4 | 7.2 | 5.9 | 4.7 | 5.8 |
| 50 | 43 | 40 | 37 | 33 | 29 | 25 | 19 | 4.1 | 50 | 27 | 30 | 34 | 44 | 50 |

Spk in 24" O & K 80 Rt. Sta. 838 + 00.

On Bridge.

Final X Sec. of Channel Change
Right at Sta. 819+40.

| Sta. | + | H.I. | − | Elev. |
|---|---|---|---|---|
| B.M. | 1.42 | 848.86 ✓ | | 847.44 ✓ |
| T.P. | 2.69 | 841.30 ✓ | 10.25 | 838.61 ✓ |
| 0+00 | | | | |
| 0+22 | | | | |
| 0+46 | | | | |
| 0+54 | | | | |
| 0+64 | | | | |
| 0+78 | | | | |
| 1+00 | | | | |
| 1+29 | | | | |
| T.P. | 2.91 | 836.71 ✓ | 7.50 | 833.80 ✓ |
| 1+75 | | | | |
| 2+00 | | | | |
| 2+22 | | | | |
| 2+40 | | | | |

Left. Right. 11-7-27

16.2

| Left | | | | | Right | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 16.7 | | | | | 16.7 | | | | |
| 15 | | | | | 15 | | | | |

16.1

| Left | | | | | Right | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 11.5 | 9.7 | 13.2 | 14.7 | | 14.7 | 11.2 | | | |
| 21 | 16 | 14 | 9 | | 16.7 | 10 | 15 | | |

16.0

| Left | | | | | Right | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 6.3 | 6.4 | 9.3 | 14.7 | 16.1 | 16.5 | 14.7 | 12.2 | 5.8 | |
| 33 | 24 | 16 | 10 | 8 | 16.5 | 4 | 9 | 13 | 20 |

16.0

| Left | | | | | Right | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 4.1 | 3.9 | 14.7 | 16.3 | | 16.3 | 14.7 | 12.4 | 1.6 | 1.7 |
| 33 | 22 | 10 | 6 | 16.7 | 5 | 9 | 13 | 24 | 26 |

15.9

| Left | | | | | Right | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 3.8 | 3.0 | 12.3 | 14.7 | 16.5 | 16.7 | 14.7 | 9.6 | 4.2 | 3.2 | 7.6 | |
| 33 | 24 | 14 | 10 | 7 | 16.7 | 6 | 9 | 15 | 21 | 23 | 28 |

15.9

| Left | | | | | | Right | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4.0 | 2.8 | 2.8 | 11.5 | 14.7 | 16.4 | 16.4 | 14.7 | 8.1 | 8.1 | 11.6 | | |
| 33 | 26 | 24 | 13 | 10 | 6 | 16.7 | 7 | 10 | 17 | 18 | 26 | |

15.8

| Left | | | | | | | Right | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4.9 | 3.3 | 3.3 | 10.1 | 14.7 | 15.7 | | 16.2 | 11.7 | 12.0 | 9.0 | 7.7 | 14.1 | 15.1 | |
| 33 | 25 | 23 | 16 | 12 | 10 | 16.2 | 7 | 11 | 15 | 18 | 21 | 30 | 36 | |

15.7

| Left | | | | | | | | Right | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5.5 | 5.0 | 7.0 | 5.9 | 8.4 | 9.5 | 14.7 | 16.7 | | 16.2 | 14.7 | 10.2 | 9.3 | | | |
| 33 | 30 | 25 | 22 | 19 | 17 | 12 | 7 | 16.2 | 9 | 11 | 14 | 33 | | | |

10.9

| Left | | | | | | | Right | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2.0 | 4.5 | 5.1 | 10.0 | 11.3 | | | 11.4 | 10.0 | 11.9 | 5.2 | 6.2 | 9.8 | 9.8 | |
| 33 | 28 | 16 | 10 | 7 | 11.3 | | 9 | 11 | 14 | 20 | 23 | 31 | 33 | |

10.8

| Left | | | | | | | Right | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3.3 | 4.5 | 4.9 | 8.3 | 10.0 | 11.3 | | 11.5 | 9.7 | 7.9 | 5.3 | 5.3 | 7.9 | 7.0 | |
| 33 | 26 | 17 | 13 | 11 | 8 | 11.2 | 8 | 11 | 15 | 18 | 22 | 27 | 33 | |

10.7

| Left | | | | | | | Right | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3.2 | 3.2 | 3.4 | 6.8 | 10.0 | 11.3 | | 10.9 | 10.0 | 8.8 | 7.1 | 5.4 | |
| 33 | 24 | 20 | 16 | 12 | 8 | 11.3 | 9 | 10 | 11 | 13 | 33 | |

10.6

| Left | | | | | | | Right | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2.8 | 2.9 | 5.3 | 10.0 | 11.1 | | | 10.8 | 8.1 | 5.1 | 5.1 | |
| 33 | 22 | 17 | 12 | 8 | 11.3 | | 10 | 12 | 14 | 33 | |

| Sta. | + | H. I. | − | Elev. | |
|---|---|---|---|---|---|
| | | 836.71 | | | |
| 2+55 | | | | | |
| 3+00 | | | | | |
| 3+58 | | | | | |
| 3+70 | | | | | |
| 3+76 | | | | | |
| T.P. | 5.64 | 839.44 | 2.91 | 836.80 | |
| B.M. | | | 7.33 | 832.11 | 832.13 |

Final x Sec. of Channel
Change Left Sta. 819+40.

| | | | | | |
|---|---|---|---|---|---|
| B.M. | 3.31 | 835.44 | | 832.13 | |
| 0+13 | | | | | |
| 0+31 | | | | | |
| 0+40 | | | | | |
| 0+50 | | | | | |
| 0+80 | | | | | |
| 1+00 | | | | | |
| 1+28 | | | | | |
| 1+42 | Same as Original | | x Sec. | | |
| B.M. | | | 3.31 | 832.13 | |

Left. Right 11-9-27

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | (10.6) | 11.0 | 10.0 | 7.8 | 4.4 | 5.2 | |
| 3.5 | 3.0 | 3.6 | 8.5 | 10.0 | 11.0 | | 7 | 10 | 12 | 15 | 33 | |
| 33 | 21 | 18 | 14 | 12 | 9 | 11.2 | | | | | | |
| | 4.8 | 5.1 | 9.2 | 10.0 | 11.4 | (10.4) | 10.8 | 10.0 | 7.6 | 5.8 | 5.2 | |
| | 33 | 16 | 12 | 12 | 10 | 11.4 | 8 | 12 | 14 | 15 | 33 | |
| 9.3 | 9.9 | 6.8 | 6.2 | 8.4 | 10.0 | 11.2 | (10.2) | 10.8 | 9.7 | 8.4 | 4.7 | 4.1 | 4.4 |
| 33 | 24 | 22 | 17 | 16 | 13 | 10 | 10.8 | 6 | 11 | 14 | 16 | 22 | 33 |
| | | | 9.6 | 9.9 | 10.1 | 10.9 | (10.1) | 10.5 | 9.6 | 7.1 | 4.1 | 4.2 | 4.4 |
| | | | 37 | 33 | 25 | 17 | 11.0 | 8 | 6 | 11 | 12 | 22 | 33 |
| | | | 9.0 | 9.9 | 10.1 | 10.7 | (10.8) | 10.3 | 9.6 | 4.4 | 4.3 | | |
| | | | 36 | 33 | 18 | 14 | 11.2 | 5 | 8 | 13 | 33 | | |

11-8-27

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 11.2 | 9.6 | 9.2 | (10.3) | 10.7 | 9.7 | | | | |
| | | | 15 | 10 | 5 | 10.1 | 8 | 15 | | | | |
| | | 4.5 | 7.7 | 8.8 | 9.8 | (10.4) | 10.4 | 9.8 | 7.2 | 6.4 | | |
| | | 18 | 15 | 11 | 9 | 10.1 | 8 | 11 | 14 | 20 | | |
| | 4.9 | 5.6 | 6.0 | 8.0 | 8.7 | (10.5) | 9.9 | 7.9 | 7.4 | 6.5 | | |
| | 22 | 17 | 15 | 13 | 9 | 5 | 10.4 | 12 | 13 | 20 | 27 | |
| | | 4.9 | 5.5 | 6.5 | 7.6 | 9.2 | (10.5) | 10.7 | 10.7 | 9.0 | 7.7 | 6.7 |
| | | 25 | 16 | 14 | 12 | 11 | 10.2 | 5 | 13 | 18 | 20 | 28 |
| | 4.6 | 4.7 | 7.1 | 7.0 | 7.8 | 8.7 | 10.4 | (10.6) | 11.7 | 11.9 | 11.3 | 7.0 | 6.5 | 5.7 |
| | 33 | 29 | 27 | 23 | 17 | 14 | 11 | 11.1 | 5 | 7 | 11 | 13 | 20 | 33 |
| 5.9 | 8.0 | 9.0 | 10.5 | 11.2 | 12.0 | 10.1 | (10.1) | 6.7 | 6.1 | 6.1 | | | | |
| 52 | 30 | 26 | 20 | 14 | 8 | 2 | 6.6 | 13 | 28 | 33 | | | | |
| 6.5 | 8.0 | 10.8 | 11.0 | 11.3 | 9.7 | 8.5 | 7.3 | 6.2 | 6.6 | 8.3 | | | | |
| 33 | 31 | 30 | 28 | 20 | 9 | 8 | 4 | 6.8 | 6 | 20 | 33 | | | |

839

838

+84 End of Div. C.

837

836

835

834

11-8-27

+84± Beg of 27' pavement

+38 Rd to Brick Yard

+77 T.P. 37

+01 T.P. 26

+54 T.P. 28

834

833

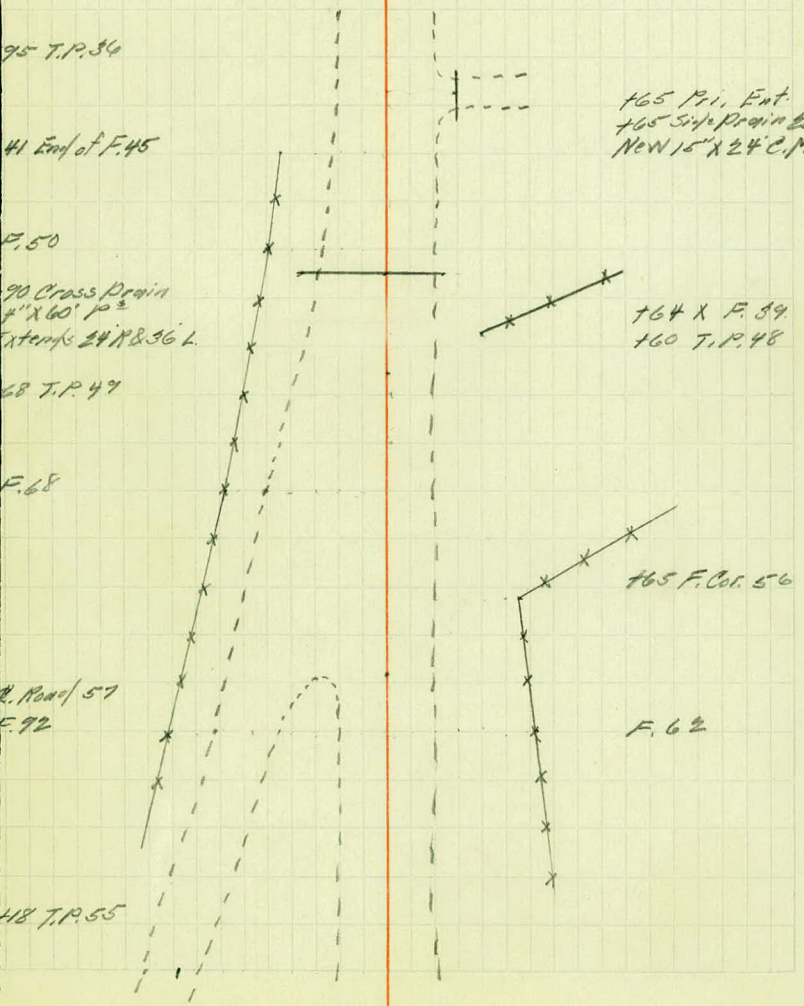
832

831

830

829

11-8-27


95 T.P. 36
41 End of F. 45
F. 50
90 Cross Drain
#"X60' Ips
Extends 24 R & 36 L.
68 T.P. 47
F. 68
R. Road 57
F. 72
48 T.P. 55
+65 Pi, Ent.
+65 Side Drain 58
New 15"X24' C.M.
+64 X F. 59.
+60 T.P. 48
+65 F. Cor. 56
F. 62

829

828

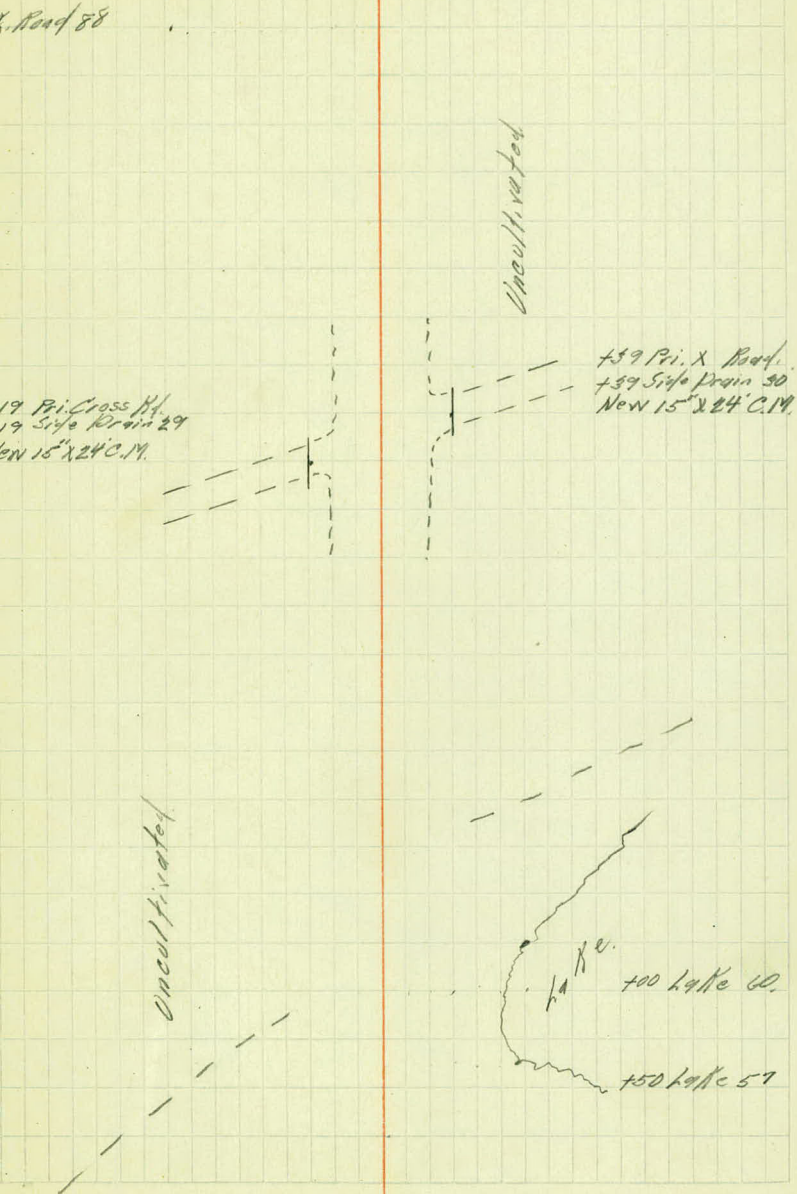
827

826

825

824

11-8-27


Road 88
Creek Valley
+39 Pri. X Road
+39 Side Drain 30
New 15" X 24" C.M.
19 Pri. Cross Rd.
19 Side Drain 29
New 15" X 24" C.M.
Creek Valley
+00 Lake 60
+50 Lake 57

824

823

822

821

820

819

818

817

816

815

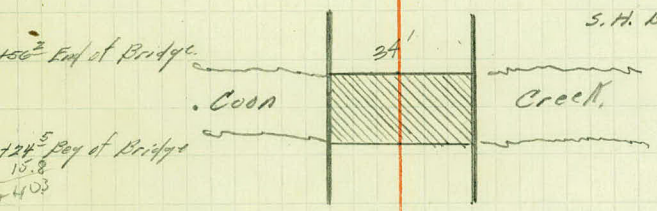
814

11-8-27

Woods & Brush

Woods & Brush

S.H. Bridge #4575.




Woods & Brush.

Woods & Brush.

814

813

812

811

+69 & Drive Lt 15" X 24 CM.

+56 & Drive Rt 15" X 24 CM.

810.

+97 X Drain 24X 48 Rs

+05 under Pass G N

809

+30 Cattle Pass 6'x 10' x 48'

+03 & Drive Rt 18 X 30 CM.

808

807

+57 Bcg Cal 30

+44 Bcg Cal 32'

11 13' | 8' +15. 13' 11
+95

+82 1

+82 Bcg Cal HI

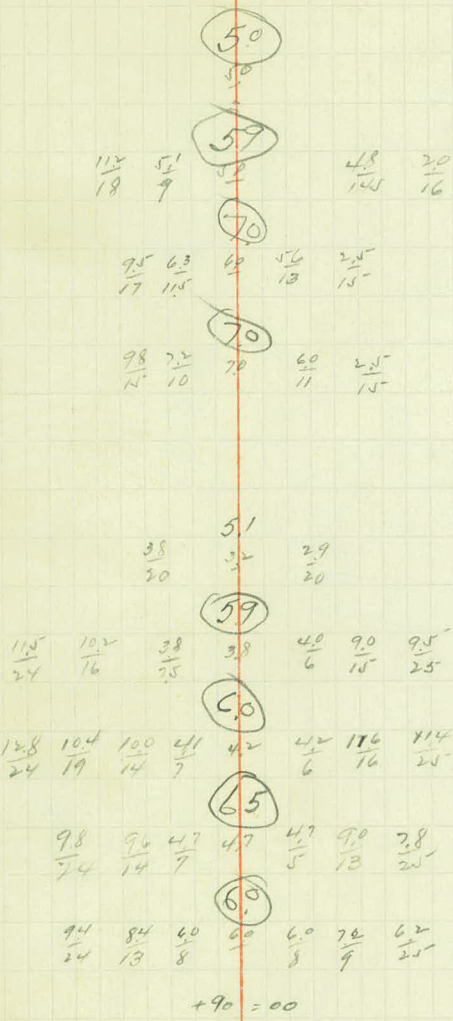
Lt Sta 808+56 Lt  Drive Ways.

| Sta | + | HI | + | Elev |
|---|---|---|---|---|
| B.M. | 3.61 | 857.67 | | 851.07 |
| +20 | | | | 47.7 |
| +37 | | | | 47.7 |
| +57 | | | | |
| +83 | | | | |

Rt Sta 808+03

| | |
|---|---|
| +20 | |
| +37 | |
| +41 | |
| +47 | |
| +75 | |

Final X Sec.



807

806

805

804

803

802

801

800

799

798

+90 X Drain 30"X66" FS 34 Ft. 32 Lt

797

796

795

794

793

792

+85 R Drive Lt "2" 15"X24" CMP

791

790

Cont From Page 59

+73 Beg Double Col 8x'

| Sta | + | HI | - | Elev. |
|---|---|---|---|---|
| BM | 5.45 | 880.10 | | 874.65 |
| 789+00 | | | | |
| +50 | | | | |
| 790+00 | | | Sta = 00 | |
| +50 | | | | |
| +75 | | | | |
| 791+00 | | | | |
| +50 | | | | |
| 792+00 | | | | |
| +25 | | | | |
| +50 | | | | |

Spike in stump 22' Rt of 392+00

Same Original

Same Original.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | 39/50 | 72/66 | 48/70 | 41/100 | | | |
| 6.9 | x 76/50 | 73/75 | 73/100 | 76/119 | 70/137 | 72/152 | |
| 7.2 | x 73/50 | x 71/73 | 72/100 | 75/134 | 68/150 | 70/159 | 72/167 |
| 7.6 | x 81/50 | x 76/69 | x 73/95 | 74/100 | 72/144 | 70/153 | 71/160 |
| 4.2 | x 85/50 | x 77/60 | x 77/100 | x 71/135 | x 61/139 | 47/143 | 47/150 |
| 8.9 | x 94/50 | x 94/66 | x 84/74 | x 85/86 | x 88/100 | x 80/123 | x 63/130 | x 73/140 |
| 9.2 | x 98/50 | x 96/62 | x 96/93 | x 95/100 | x 93/100 | x 70/111 | x 78/117 | x 82/124 |

+37 End Cut

| | | |
|---|---|---|
| 96/51 | 75/76 | 95/100 |

Cont. Page 59

789

788

787

786

785

+17 & Drive Lt (") (B) 15" x 24

784

783

782

781

780

779

778

777

776

775

774

773

+00 End Brg Timber.

+00 End Brush.

+10 Beg Brush

+00 Beg Brush

+05 Double Cul 36'

+80 End Timber Rt 4 Ft.

+00 Timber Rt 4 Ft

+22 X F 50' Δ 775+81

+45 X F 4 Δ + 81

772

771

770

+ 50' Foley Rd

30" x 42 13 RT
30" x 42 Fo Wt

769

768

767

766

765

764

763

762

761

760

759

758

757

756

755

Lowland Timber

+60 E Timber

+30 End Timber

Lowland Timber

+34 Bog Cul 34

+23 + Bog Cul 35

Cultivated.

Cultivated.

+ two Bog Cultivation
+ 20 End Timber

+ 85 Bog Cultivation.
+ 85 End Timber.

Timber

Timber

754

753

753 +00 ℄ Drive Lt.

752

751

750

749

748

747

746

745

744

743

742

741

741+00

+90 Cattle Pass 4'x6' x 50'

740

lowkey

Timber.

Low key.

F 62

+81 F 56

54

54

53

53

52

F 52

F 52

F 52

F 52

F 51

F 50

F 50

F 50

+08 F Cor 50 @ 45°

739

738

737

736

735

4HO & Drive Pt. 15" x 24

734

733

732

731

730

729

728

726

725

724

723

722

721

720

28 Bag Cut 35"

+00 End Timber

+20 End Timber.

+20 Bag Timber.

Lowland

+70 End Timber.

Timber

Timber

708 E Drive Rt

604

603

602

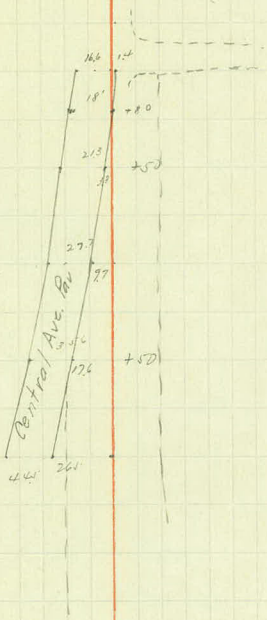
601

600

599

598

597




+.65 T.P 42'

+19 M B37'

+15 T.P 36'

+49 T.P 44'

Cultivated

Cultivated

596

595

594

593.

+95 X Drain 24" X 54' 30.5 LT. 23.5 RT.

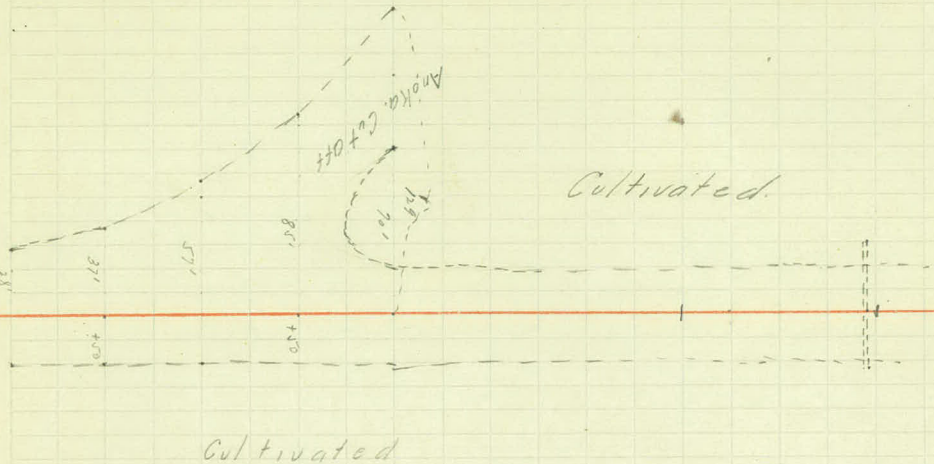
592

591

590+00

589+00

588+00


Anoka Cut off
Cultivated.
Cultivated

649

646

F 35'

F 33'

Timber



Timber

645

644

643

+50 X Drain 24"x 60' RC 30' Lt
31 Rt

642

641

+78 ± Drive Lt 15"x 24 C.M.

640

639

638

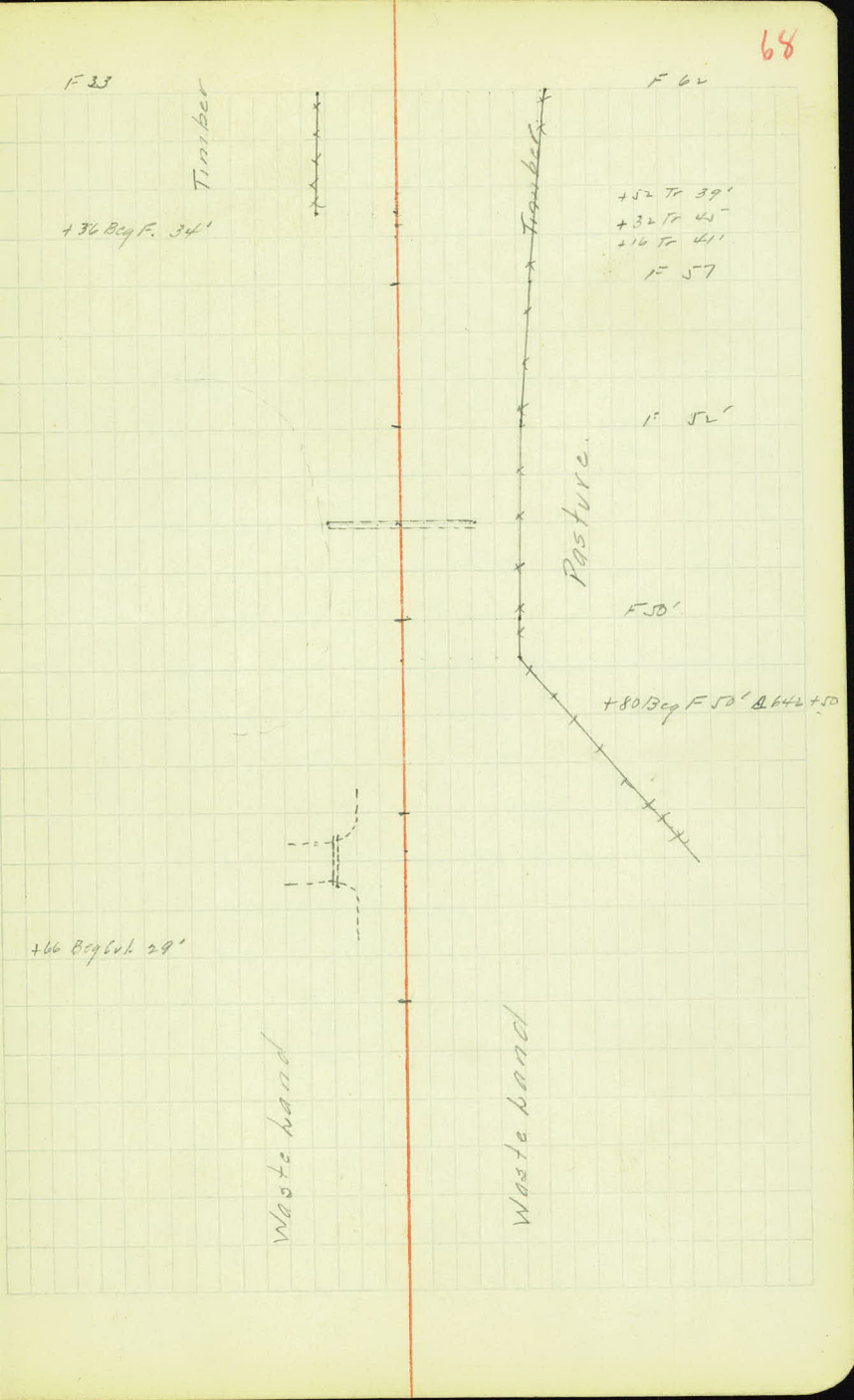
637

636

635

634

Cont. From Page 71.


F 33
Timber
+36 Beg F. 34'
F 62
Timber
+52 Tr 39'
+32 Tr 42'
+16 Tr 41'
F 57
F 52'
Pasture.
F 50'
+80 Beg F 50' A 642 +50
+66 Beg Cut 29'
Waste land
Waste land

| Sta | + | H.I | − | Elev | |
|---|---|---|---|---|---|
| B.M. | 12.90 | 845.03 ✓ | | | 832.13 |
| TP | 9.43 | 852.06 ✓ | 2.40 | 842.63 ✓ | |
| T.P. | 8.96 | 857.62 ✓ | 3.40 | 848.66 ✓ | |
| 829+50 | | | | | |
| 830 | | | | | |
| +20 | | | | | |
| +43 | | | | | |
| +71 | | | | | |
| 831 | | | | | |
| +47 | | | | | |
| 832 | | | | | |
| +23 | | | | | |
| 833 | | | | | |

(Copied by M.W.C. 5/23/27)

CWS
DS
HB
T.M.

6/14/27

Spt in 8" oak 55' Lt. sta 822+10

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 4.4/50 | 5.7/37 | 9.9/31 | 8.8/27 | 6.7/20 | 7.2 | 7.8/20 | 9.7/27 | 9.6/31 | 4.7/37 | 4.5/50 |
| 3.4/50 | 4.0/39 | 6.5/29 | 6.7/26 | 6.1/25 | 6.0/20 | 6.6 | 7.2/20 | 9.0/25 | 9.2/29 | 4.7/34 | 4.7/50 |
| 5.2/24 | 4.2/71 | 4.8/68 | 4.1/50 | 4.3/40 | 5.9/20 | 6.1 | 6.9/20 | 9.0/26 | 8.9/30 | 4.6/34 | 4.5/50 |
| 4.2/64 | 4.4/50 | 4.8/37 | 5.4/20 | 5.9 | 6.8/20 | 9.4/26 | 9.0/30 | 4.3/36 | 4.3/50 | | |
| 4.6/56 | 4.5/42 | 4.8/32 | 5.2/20 | 6.0 | 6.4/20 | 8.6/26 | 8.6/29 | 4.6/36 | 4.3/50 | | |
| 4.4/56 | 4.4/34 | 4.8/24 | 4.8/20 | 5.7 | 6.1/20 | 8.6/26 | 8.5/30 | 4.7/36 | 4.5/50 | | |
| 3.6/50 | 3.5/47 | 4.5/44 | 4.5/42 | 4.4/28 | 4.4/20 | 5.3 | 5.7/20 | 7.8/25 | 8.0/29 | 4.2/35 | 4.2/50 |
| 3.0/50 | 3.0/41 | 5.0/38 | 5.0/34 | 4.6/32 | 4.2/20 | 4.6 | 5.2/20 | 6.9/27 | 6.9/31 | 3.8/36 | 3.5/50 |
| 2.7/50 | 2.7/39 | 6.0/34 | 6.1/31 | 4.6/28 | 4.3 | 4.4/20 | 6.5/26 | 6.6/30 | 3.0/36 | 3.1/50 | |
| 3.0/50 | 4.4/48 | 4.0/44 | 2.5/39 | 5.1/34 | 5.3/24 | 3.8/20 | 3.7 | 3.7/20 | 3.7/22 | 5.7/27 | 5.7/30 | 3.2/37 | 2.1/50 |

| Sta | + | H.I. | − | Elev. | |
|---|---|---|---|---|---|
| | | 857.62 ✓ | | | |
| 834 | | | | | |
| T.P. | 7.27 | 862.16 ✓ | 2.73 | 854.89 ✓ | |
| 835 | | | | | |
| 836 | | | | | |
| 837 | | | | | |
| +84 | | | | | |
| B.M. | | | 5.20 | | 856.96 ✓ |
| T.P. | 2.24 | 857.13 ✓ | 7.27 | 854.89 ✓ | |
| T.P. | 3.16 | 850.94 ✓ | 9.35 | 847.78 ✓ | |
| T.P. | 2.51 | 845.15 ✓ | 8.30 | 842.64 ✓ | |
| B.M. | | | 13.01 | 832.14 | ✓ 832.13 |

0.0/50 2.0/46 2.8/39 4.9/35 4.9/25 2.8/20 2.8 2.6/20 5.4/26 5.3/28 2.0/35 2.0/50

4.0/50 4.7/45 5.1/44 8.0/32 8.5/30 8.5/25 6.5/20 5.6 6.1/20 8.6/26 8.6/29 7.0/32 7.4/50

4.4/45 5.0/44 6.2/39 9.0/37 8.0/32 8.0/26 5.5/20 4.8 5.2/22 7.2/27 7.3/30 7.1/31 6.9/50

3.0/50 3.6/43 7.2/37 5.2/32 8.0/28 8.0/26 4.4/20 4.0 4.3/20 6.4/27 6.7/50

2.5/45 2.5/43 4.0/40 2.3/37 2.2/33 6.0/28 6.0/25 3.4/19 2.9 3.1/20 6.2/28 6.2/30 4.7/33 4.6/20

2.5/50 2.6/46

Spk. in 8" oak 55' Lt. sta 822+10

634 Topography. Cont. Page 68'

+49 x Drain 24" X 54" $P_3$ 27Lt 28Rt

633+

632+00

631+00

630+00

629+00

628+00

627+00

626

625

624

623

622

621

620

619

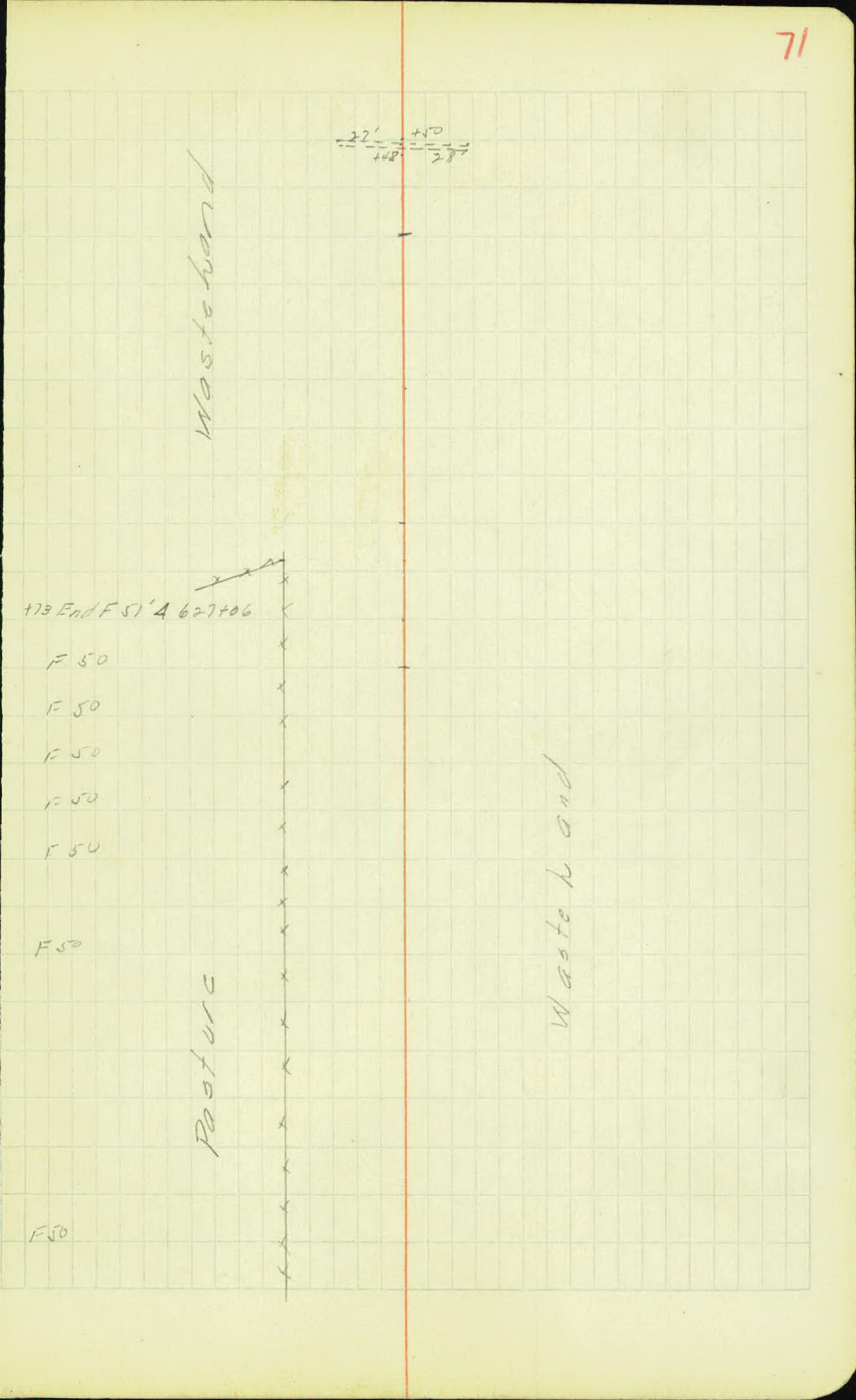
618

617

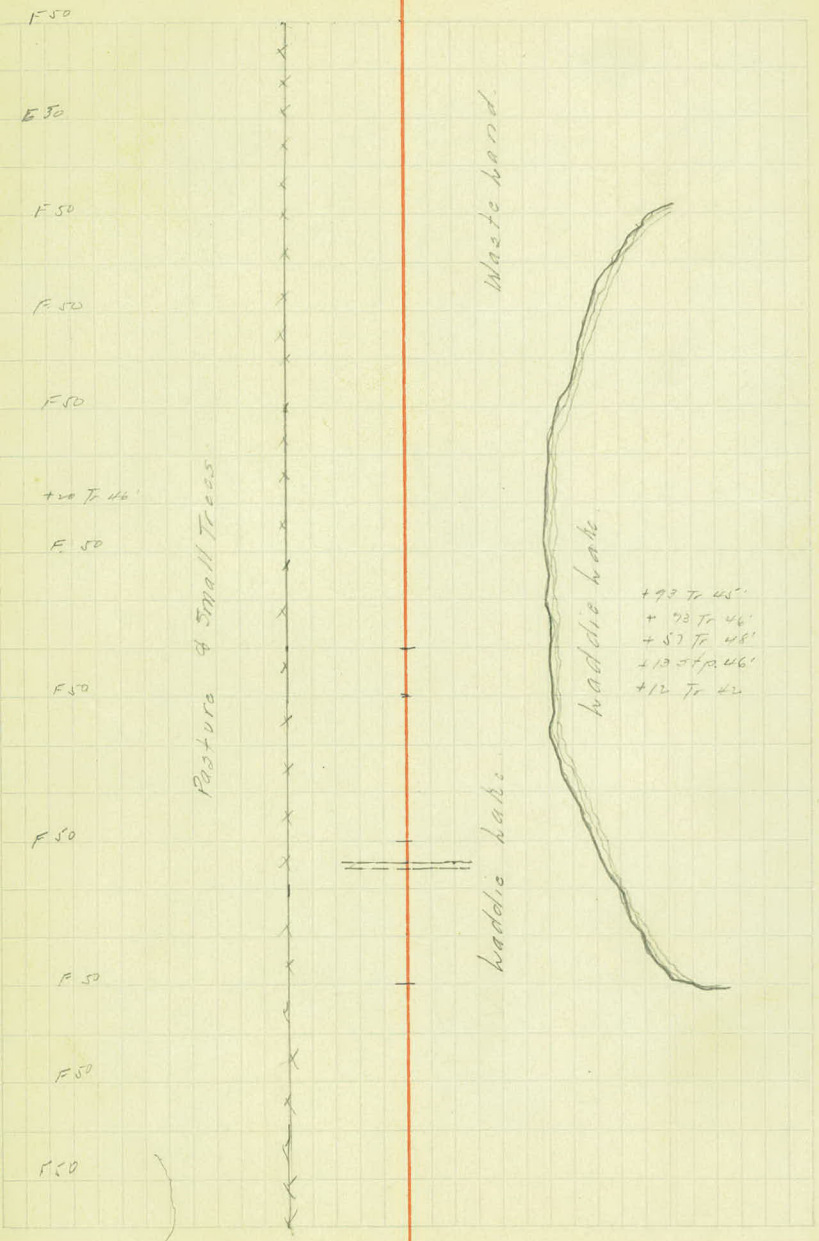
616

615

614


22' +50
148 38
Woodland
+73 End F 51' 4 627+06
F 50
F 50
F 50
F 50
F 50
F 50
Pasture
F 50
Wasteland

| | | | | |
|---|---|---|---|---|
| 613+00 | Sta | X Drain | 24" X 54" R3 | 27 Lt 28 Rt. |
| 612 | | | | |
| 611 | | | | |
| 610 | | | | |
| 609 | | | | |
| 608 | | | | |
| 607 | | | | |
| 606 | | | | |
| +80 | | X Drain | 24" X 54' R3 | 28 Lt 29 Rt. |
| 605 | | | | |
| 604 | | | | |
| 603 | | | | |


F 50
E 50
F 50
F 50
F 50
+ 48 Tr 46'
F 50
F 50
F 50
F 50
F 50
F 50
Pasture & Small Trees
Waste land
Saddle Lake
Saddle Lake
+ 93 Tr 45'
+ 93 Tr 46'
+ 87 Tr 48'
+ 13 Tr 46'
+ 12 Tr 42

602

601

600

599

598

597

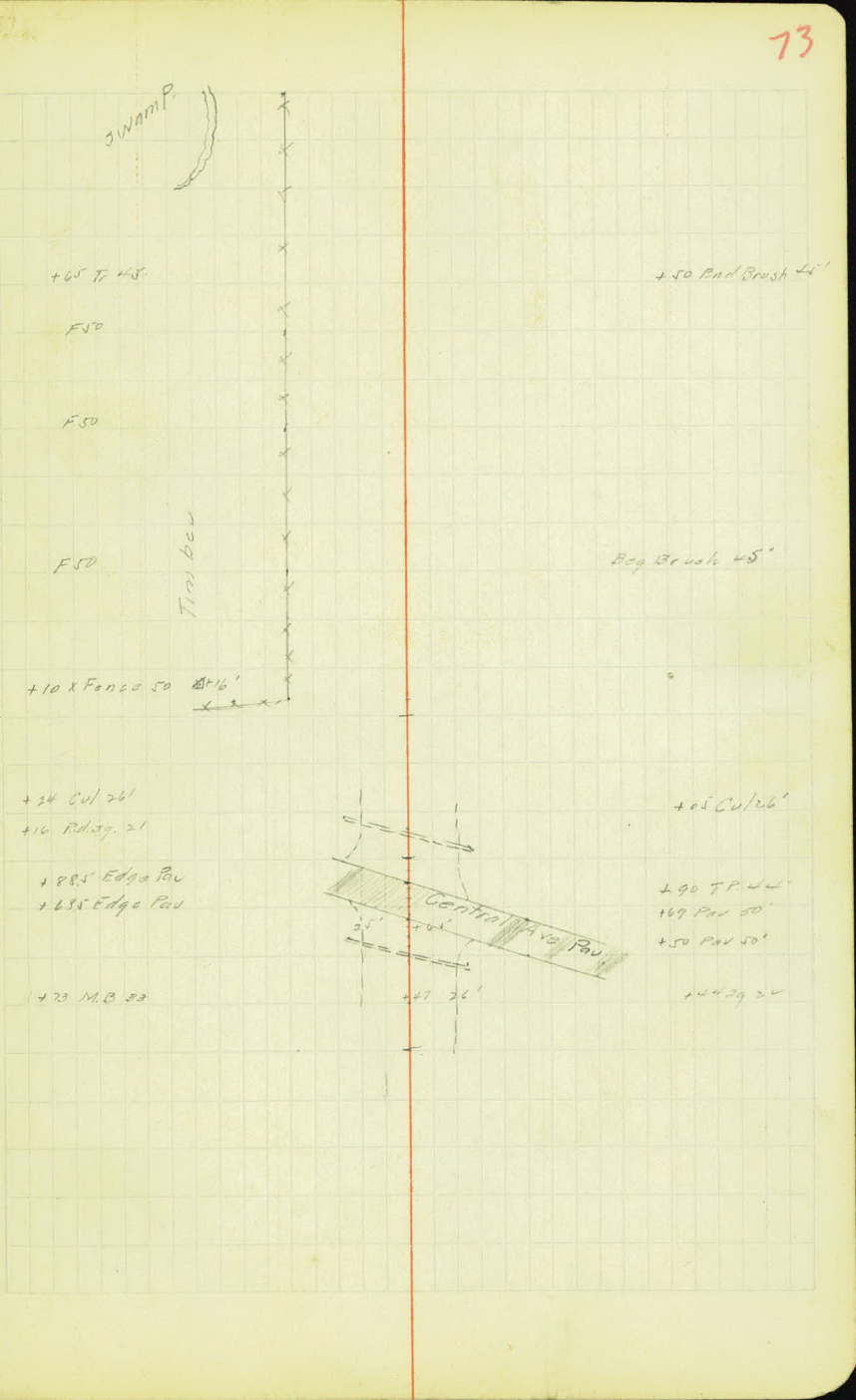
+15 X Drain 24" x 54" P3

596+00

+56 X Drain 24" 54 P3 28 LT. 26 RT.

595

594


Swamp
+65 Tr 45'
F50
F50
F50
Timber
+10 X Fence 50
+16'
+50 Brd Brush 45'
Brg Brush 45'
+24 Cul 26'
+16 Rd Jg. 21
+885 Edge Pav
+685 Edge Pav
+73 M.B 33
Center Line Pav
+0'
25'
+41 26'
+05 Cul 26'
+90 TP 44'
+69 Pav 50'
+50 Pav 50'
+44 Jg 24

593

592

591

590

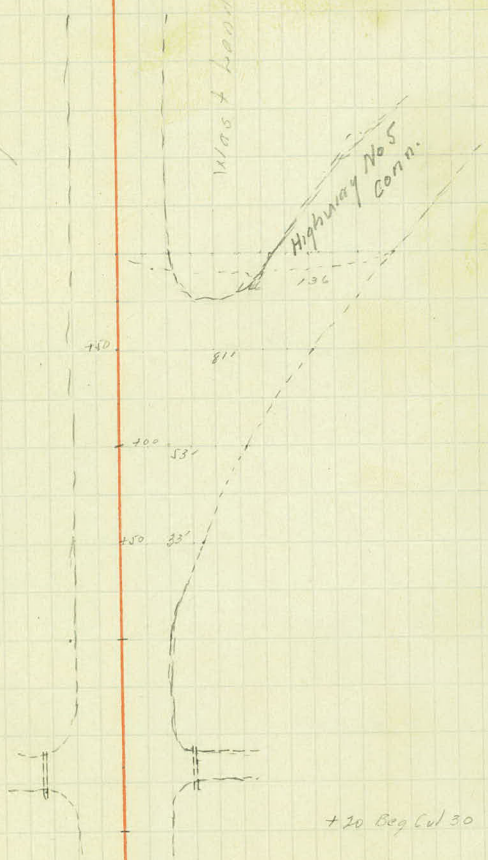
589

588

+30 R Drive Lt. 15" X 24 CM

+32 R Drive RH 15" x 24 CM.

587


Hayward
Wash Brook
Highway No 5 Conn.
136
750
811
700
53'
650
33'
+18 Beg Cul 23'
+20 Beg Cul 30

584

583

582

583

582

581

580

+58 & Drive Rt.

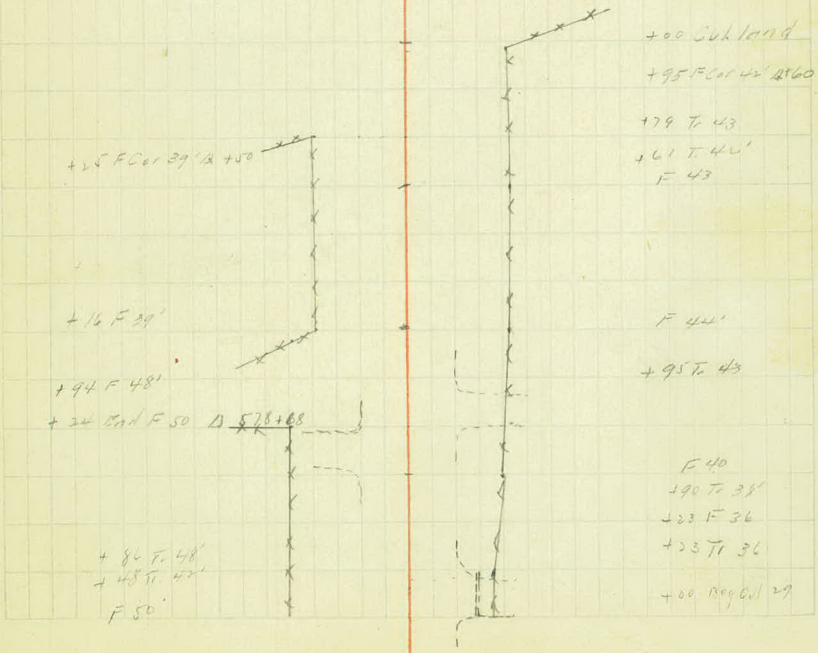
+14 & Drive Lt

579

+12 Drive Rt. 15x24CM.

578

Hoy Land


+25 F Cor 39' Lt +50
+16 F 39'
+94 F 48'
+24 End F 50 D 578+68
+86 F. 48'
+48 Tr. 42'
F 50'
+00 Cul land
+95 F Cor 42' Lt 60
+79 Tr. 43
+61 Tr. 44'
F 43
F 44'
+95 Tr. 43
F 40
+90 Tr. 38'
+23 F 36
+23 Tr 36
+00 Beg Cul 29

577

576

575

574

573

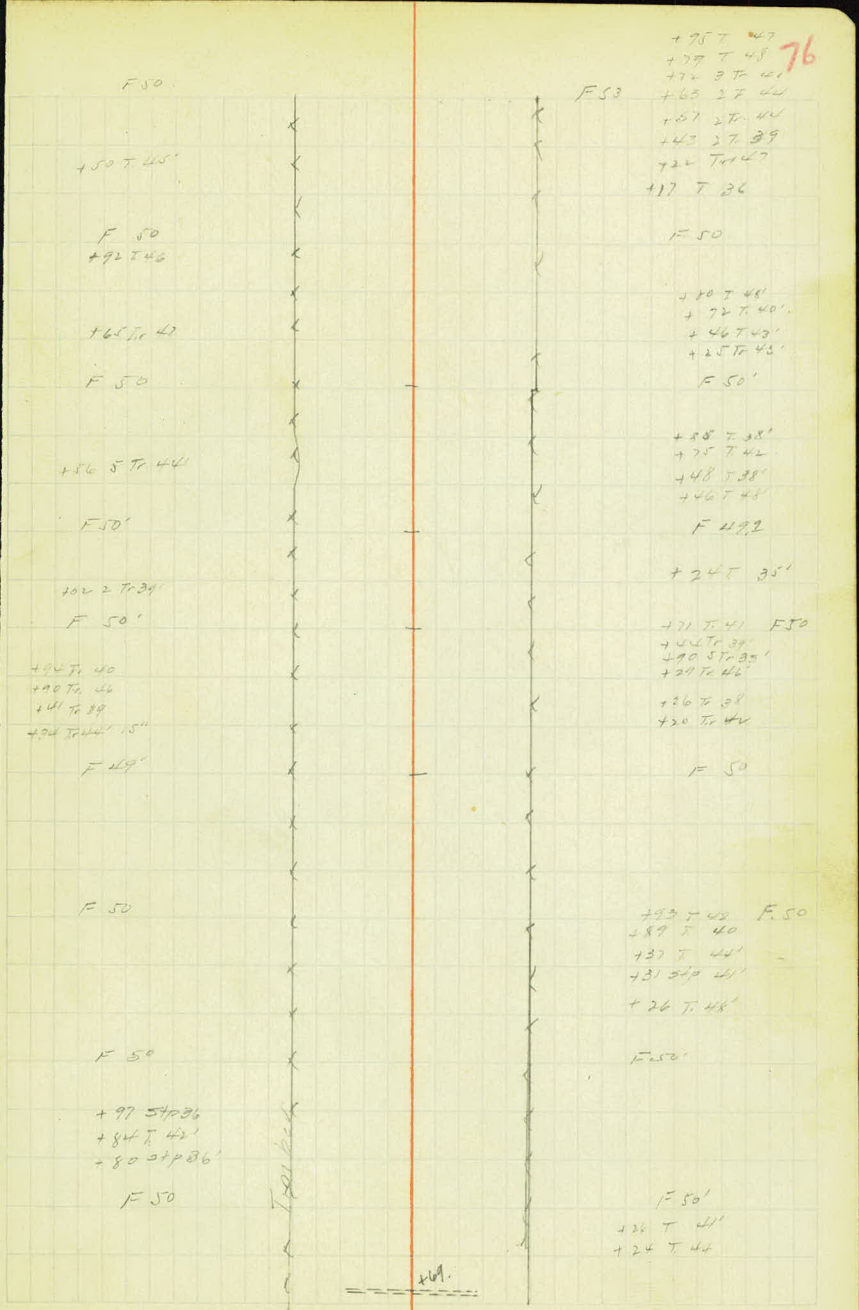
572

571

570

+69 X Drain

Rt 29'
Lt 31' 24" X 60' Rs.


F 50
+50 T 45'
F 50
+92 T 46
+65 T 47
F 50
+86 5 Tr 44'
F 50'
+62 2 Tr 39'
F 50'
+94 T 40
+90 Tr 40
+41 Tr 39
+94 Tr 44' 15"
F 49'
F 50
F 50
+97 5Tr 36
+84 T 42'
+80 3Tr 36'
F 50
+69.
F 53
+95 T 47
+77 T 48
+72 3 Tr 40
+65 2 T 44
+57 2 Tr 44
+43 2 T 39
+22 T 44?
+17 T 36
F 50
+40 T 48'
+ 72 T 40'
+ 46 T 43'
+ 25 Tr 43'
F 50'
+88 T 38'
+75 T 42'
+48 T 38'
+46 T 48'
F 49?
+ 24 T 35'
+71 T 41 F 50
+44 Tr 39'
+40 5 Tr 39'
+29 Tr 46'
+26 T 38'
+20 T 44'
F 50
+83 T 42 F 50
+89 T 40
+37 T 44'
+31 3Tr 41'
+ 26 T 48'
F 50'
F 50'
+24 T 41'
+24 T 44

569

568

567

566

565

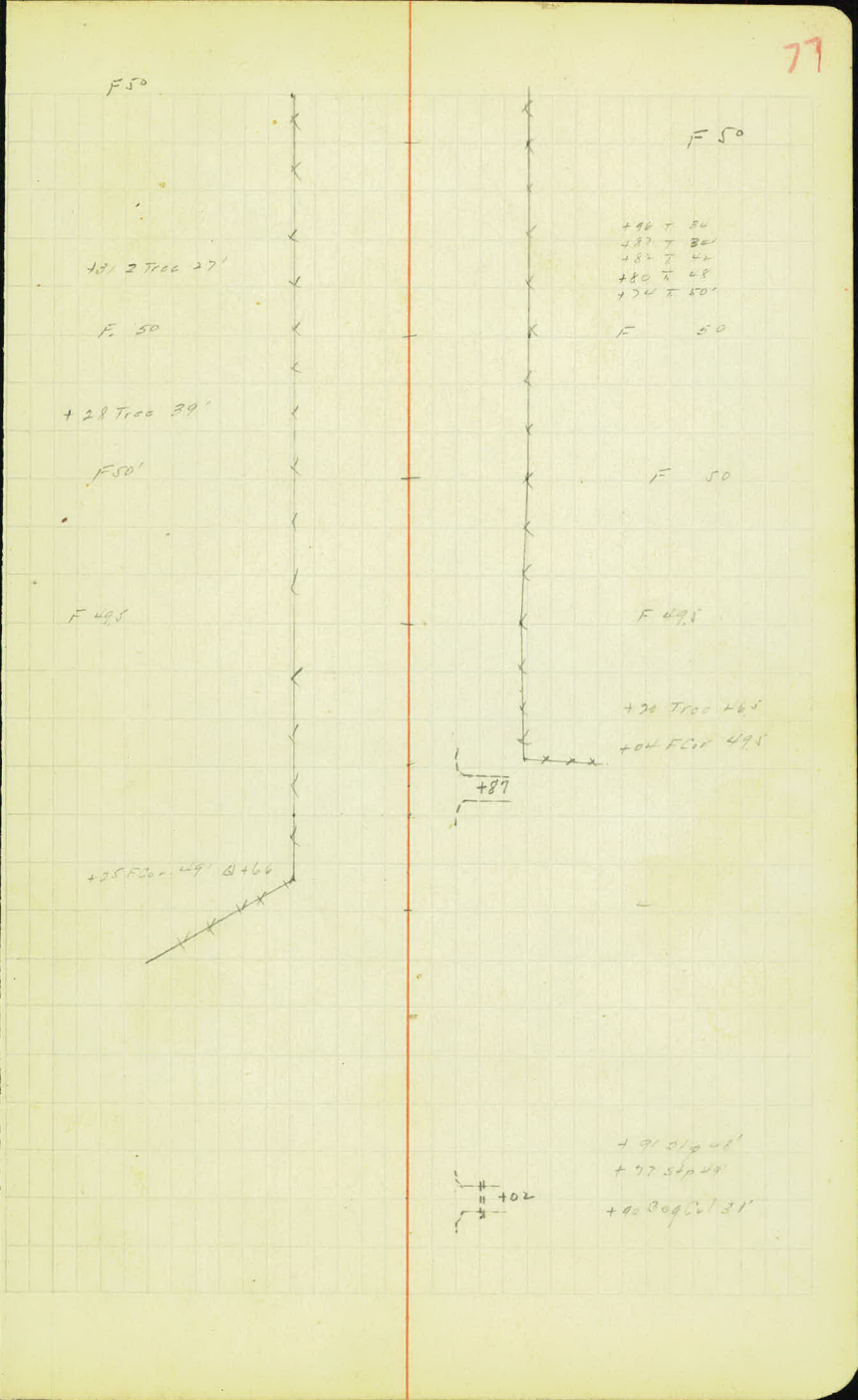
+87 @ Drive Rt.

564

563

+62 @ Drive Rt 15" x 24" CM.

562


F 50
+48 2 Trac 27'
F. 50
+28 Trac 39'
F 50'
F 49.8
+35 Fcor 49' @ +66
+87
+96 T 86
+87 T 86
+82 T 42
+80 T 48
+54 T 50'
F 50
F 50
F 49.8
+30 Trac 46.5
+04 Fcor 49.5
+02
+91 Sup 48'
+77 Sup 48'
+40 Beg Cv 31'

| | | | | | |
|---|---|---|---|---|---|
| BM | 1.52 | 891.53 | | 890.01 | |
| T.P. | 0.10 | 890.00 | 2.23 | 889.30 | |
| 729 | | | | | |
| 730 | | | | | |
| 731 | | | | | |
| 732 | | | | | |
| BM | | | W13 | 885.87 | |
| BM. new | | | 4.09 | 885.21 | = 885.90 |
| 733 | | | | | |
| 734 | | | | | |
| 735 | | | | | |
| 736 | | | | | |
| T.P. | 5.17 | 889.41 | 5.76 | 884.24 | |
| 737 | | | | | |
| 738 | | | | | |
| 739 | | | | | |
| 740 | | | | | |
| 741 | | | | | |
| BM. | | | | 882.61 | = 882.77 |
| 740+86 | | | | | |
| +55 | | | | | |
| +90 | | | | | |

CWS
D.S.
T.M
M.G.

74

Spike in 5" Black Oak 50R+32+73+25

44

47

52

54

Spike in 6" Maple 50R+32+73+50

Check center in Tree 50R+32+732+00

52

67

58

62

57

58

60

63

60

68 / 38 | 84 / 36 | 84 / 33 | 71 / 32

76

74 / 32 | 86 / 34 | 82 / 38 | 74 / 39

80 / 39 | 91 / 38 | 91 / 34 | 74 / 32

74

77 / 30 | 93 / 32 | 72 / 34 | 77 / 37

88 / 31 | 93 / 37 | 96 / 36 | 86 / 32

70

70 / 31 | 72 / 33 | 94 / 37 | 70 / 40

| | | | | | |
|---|---|---|---|---|---|
| 274 | | | | | |
| | | 889.41 | | | |
| 742 | | | | | |
| 743 | | | | | |
| 744 | | | | | |
| 745 | | | | | |
| 746 | | | | | |
| 747 | | | | | |
| T.P | 9.88 | 898.29 | 0.91 | 888.50 | |
| 748 | | | | | |
| 749 | | | | | |
| | | | 4.38 | 874.01 | ± 894.20 |
| T.P. | 4.35 | 892.41 | 10.33 | 888.06 | |
| T.P | 4.09 | 890.88 | 5.62 | 886.79 | |
| | | | 4.19 | 886.69 | ± 886.66 |

59

52

60

50

57

45

84

53

Nail in 18" Oak 70' Rt of St 748+60

Spike in 24" Oak 95' Lt of St 769+40

Drive Ways:

| Sta. | Rt Fill | Rt Exc. | Rt Fill | Rt Exc. | |
|---|---|---|---|---|---|
| 640+78 | 20x25x1 | | | | 19 |
| 562+02 | | | 9x15x1.5 | | 8 |
| 564+87 | | | 18x12x1.5 | | 12 |
| 678+12 | | | 8x20x1 | | 6 |
| 679+14 | 49x10x2 | | | | 34 |
| 679+58 | | | 16x8x1 | | 5 |
| 587+32 | 18x8x1 | | 20x10x1 | | 13 |
| 734+40 | | | 10x18x2 | | 13 |
| 753+00 | 15x10x1 | | | | 5 |
| 785+17 | 20x5x1.5 | | | | 5 |
| 791+85 | 6 Cu Yd. | | | | 6 |
| 810+56 | | | 9x20x1.5 | | 10 |
| 810+69 | 10x22x2 | | | | 15 |

# KEITH'S RAILROAD CURVE TABLES.

Published by KEUFFEL & ESSER CO., New York.



## HOW TO USE KEITH'S TABLES.

### EXAMPLE.

Wanted a Curve with an Ext. of about 12 ft. Angle of Intersection or I. P.=23° 20′ to the R. at Station 542+72.

Ext. in Tab. IV opposite 23° 20′=120.87
120.87÷12=10.07. Say a 10° Curve.

Tan. in Tab. IV opp. 23° 20′=1183.1
1183.1÷10=118.31.

Tab. V. correction for A. 23° 20′ for a 10° Cur.=0.16
118.31+0.16=118.47=corrected Tangent.

(If corrected Ext. is required find in same way)
Ang. 23° 20′=23.33°÷10=2.3333=L. C.

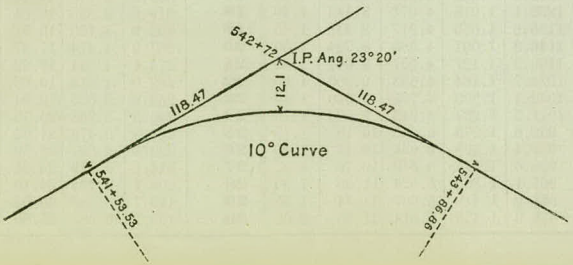
| | | | |
|---|---|---|---|
| 2° 19½′=def. for sta. | 542 | I. P.=sta. | 542+72 |
| 4° 49½′= " " " | +50 | Tan.= | 1.18.47 |
| 7° 19½′= " " " | 543 | B. C.=sta. | 541+53.53 |
| 9° 49½′= " " " | +50 | L. C.= | 2.33.33 |
| 11° 40′= " " " | 543+ | E. C.=sta. | 543+86.86 |
| | 86.86 | | |

100—53.53=46.47×3′(def. for 1 ft. of 10° Cur.)=139.41′=
2° 19½″=def. for sta. 542.

Def. for 50 ft.=2° 30′ for a 10° Curve.

Def. for 36.86 ft.=1° 50½′ for a 10° Curve

(These tables are published in Field Books of KEUFFEL & ESSER Co., New York, N. Y.)



## TABLE I. — Minutes in Decimals of a Degree.

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1′ | .0167 | 11′ | .1833 | 21′ | .3500 | 31′ | .5167 | 41′ | .6833 | 51′ | .8500 |
| 2 | .0333 | 12 | .2000 | 22 | .3667 | 32 | .5333 | 42 | .7000 | 52 | .8667 |
| 3 | .0500 | 13 | .2167 | 23 | .3833 | 33 | .5500 | 43 | .7167 | 53 | .8833 |
| 4 | .0667 | 14 | .2333 | 24 | .4000 | 34 | .5667 | 44 | .7333 | 54 | .9000 |
| 5 | .0833 | 15 | .2500 | 25 | .4167 | 35 | .5833 | 45 | .7500 | 55 | .9167 |
| 6 | .1000 | 16 | .2667 | 26 | .4333 | 36 | .6000 | 46 | .7667 | 56 | .9333 |
| 7 | .1167 | 17 | .2833 | 27 | .4500 | 37 | .6167 | 47 | .7833 | 57 | .9500 |
| 8 | .1333 | 18 | .3000 | 28 | .4667 | 38 | .6333 | 48 | .8000 | 58 | .9667 |
| 9 | .1500 | 19 | .3167 | 29 | .4833 | 39 | .6500 | 49 | .8167 | 59 | .9833 |
| 10 | .1667 | 20 | .3333 | 30 | .5000 | 40 | .6667 | 50 | .8333 | 60 | 1.0000 |

## TABLE II. — Inches in Decimals of a Foot.

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 1-16 | 3-32 | 1/8 | 3-16 | 1/4 | 5-16 | 3/8 | 1/2 | 5/8 | 3/4 | 7/8 |
| .0052 | .0078 | .0104 | .0156 | .0208 | .0260 | .0313 | .0417 | .0521 | .0625 | .0729 |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| .0833 | .1667 | .2500 | .3333 | .4167 | .5000 | .5833 | .6667 | .7500 | .8333 | .9167 |

## TABLE III. — Radii, Ordinates and Deflections.

| Deg. | Radius | Mid. Ord. | Tan. Def. | Chd. Def. | Def. for 1 Foot | Deg. | Radius | Mid. Ord. | Tan. Def. | Chd. Def. | Def. for 1 Foot |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° 10′ | 34377. | .036 | .145 | .291 | 0.05′ | 7° | 819.0 | 1.528 | 6.105 | 12.21 | 2.10′ |
| 20 | 17189. | .073 | .291 | .582 | 0.10 | 20′ | 781.8 | 1.600 | 6.395 | 12.79 | 2.20 |
| 30 | 11459. | .109 | .436 | .873 | 0.15 | 30 | 764.5 | 1.637 | 6.540 | 13.08 | 2.25 |
| 40 | 8594.4 | .145 | .582 | 1.164 | 0.20 | 40 | 747.9 | 1.673 | 6.685 | 13.37 | 2.30 |
| 50 | 6875.5 | .182 | .727 | 1.454 | 0.25 | 8 | 716.8 | 1.746 | 6.976 | 13.95 | 2.40 |
| 1 | 5729.6 | .218 | .873 | 1.745 | 0.30 | 20 | 688.2 | 1.819 | 7.266 | 14.53 | 2.50 |
| 10 | 4911.2 | .255 | 1.018 | 2.036 | 0.35 | 30 | 674.7 | 1.855 | 7.411 | 14.82 | 2.55 |
| 20 | 4297.3 | .291 | 1.164 | 2.327 | 0.40 | 40 | 661.7 | 1.892 | 7.556 | 15.11 | 2.60 |
| 30 | 3819.8 | .327 | 1.309 | 2.618 | 0.45 | 9 | 637.3 | 1.965 | 7.846 | 15.69 | 2.70 |
| 40 | 3437.9 | .364 | 1.454 | 2.909 | 0.50 | 20 | 614.6 | 2.037 | 8.136 | 16.27 | 2.80 |
| 50 | 3125.4 | .400 | 1.600 | 3.200 | 0.55 | 30 | 603.8 | 2.074 | 8.281 | 16.56 | 2.85 |
| 2 | 2864.9 | .436 | 1.745 | 3.490 | 0.60 | 40 | 593.4 | 2.110 | 8.426 | 16.85 | 2.90 |
| 10 | 2644.6 | .473 | 1.891 | 3.781 | 0.65 | 10 | 573.7 | 2.183 | 8.716 | 17.43 | 3.00 |
| 20 | 2455.7 | .509 | 2.036 | 4.072 | 0.70 | 30 | 546.4 | 2.292 | 9.150 | 18.30 | 3.15 |
| 30 | 2292.0 | .545 | 2.181 | 4.363 | 0.75 | 11 | 521.7 | 2.402 | 9.585 | 19.16 | 3.30 |
| 40 | 2148.8 | .582 | 2.327 | 4.654 | 0.80 | 30 | 499.1 | 2.511 | 10.02 | 20.04 | 3.45 |
| 50 | 2022.4 | .618 | 2.472 | 4.945 | 0.85 | 12 | 478.3 | 2.620 | 10.45 | 20.91 | 3.60 |
| 3 | 1910.1 | .655 | 2.618 | 5.235 | 0.90 | 30 | 459.3 | 2.730 | 10.89 | 21.77 | 3.75 |
| 10 | 1809.6 | .691 | 2.763 | 5.526 | 0.95 | 13 | 441.7 | 2.839 | 11.32 | 22.64 | 3.90 |
| 20 | 1719.1 | .727 | 2.908 | 5.817 | 1.00 | 30 | 425.4 | 2.949 | 11.75 | 23.51 | 4.05 |
| 30 | 1637.3 | .764 | 3.054 | 6.108 | 1.05 | 14 | 410.3 | 3.058 | 12.18 | 24.37 | 4.20 |
| 40 | 1562.9 | .800 | 3.199 | 6.398 | 1.10 | 30 | 396.2 | 3.168 | 12.62 | 25.24 | 4.35 |
| 50 | 1495.0 | .836 | 3.345 | 6.689 | 1.15 | 15 | 383.1 | 3.277 | 13.05 | 26.11 | 4.50 |
| 4 | 1432.7 | .873 | 3.490 | 6.980 | 1.20 | 30 | 370.8 | 3.387 | 13.49 | 26.97 | 4.65 |
| 10 | 1375.4 | .909 | 3.635 | 7.271 | 1.25 | 16 | 359.3 | 3.496 | 13.92 | 27.84 | 4.80 |
| 20 | 1322.5 | .945 | 3.718 | 7.561 | 1.30 | 30 | 348.5 | 3.606 | 14.35 | 28.70 | 4.95 |
| 30 | 1273.6 | .982 | 3.926 | 7.852 | 1.35 | 17 | 338.3 | 3.716 | 14.78 | 29.56 | 5.10 |
| 40 | 1228.1 | 1.018 | 4.071 | 8.143 | 1.40 | 18 | 319.6 | 3.935 | 15.64 | 31.29 | 5.40 |
| 50 | 1185.8 | 1.055 | 4.217 | 8.433 | 1.45 | 19 | 302.9 | 4.155 | 16.51 | 33.01 | 5.70 |
| 5 | 1146.3 | 1.091 | 4.362 | 8.724 | 1.50 | 20 | 287.9 | 4.374 | 17.37 | 34.73 | 6.00 |
| 10 | 1109.3 | 1.127 | 4.507 | 9.014 | 1.55 | 21 | 274.4 | 4.594 | 18.22 | 36.44 | 6.30 |
| 20 | 1074.7 | 1.164 | 4.653 | 9.305 | 1.60 | 22 | 262.0 | 4.814 | 19.08 | 38.16 | 6.60 |
| 30 | 1042.1 | 1.200 | 4.798 | 9.596 | 1.65 | 23 | 250.8 | 5.035 | 19.94 | 39.87 | 6.90 |
| 40 | 1011.5 | 1.237 | 4.943 | 9.886 | 1.70 | 24 | 240.5 | 5.255 | 20.79 | 41.58 | 7.20 |
| 50 | 982.6 | 1.273 | 5.088 | 10.18 | 1.75 | 25 | 231.0 | 5.476 | 21.64 | 43.28 | 7.50 |
| 6 | 955.4 | 1.309 | 5.234 | 10.47 | 1.80 | 26 | 222.3 | 5.697 | 22.50 | 44.99 | 7.80 |
| 10 | 929.6 | 1.346 | 5.379 | 10.76 | 1.85 | 27 | 214.2 | 5.918 | 23.35 | 46.69 | 8.10 |
| 20 | 905.1 | 1.382 | 5.524 | 11.05 | 1.90 | 28 | 206.7 | 6.139 | 24.19 | 48.38 | 8.40 |
| 30 | 881.9 | 1.418 | 5.669 | 11.34 | 1.95 | 29 | 199.7 | 6.360 | 25.04 | 50.07 | 8.70 |
| 40 | 859.9 | 1.455 | 5.814 | 11.63 | 2.00 | 30 | 193.2 | 6.583 | 25.88 | 51.76 | 9.00 |

TABLE IV. — Tangents and Externals to a 1° Curve.

| Angle | Tangent | External | Angle | Tangent | External | Angle | Tangent | External |
|---|---|---|---|---|---|---|---|---|
| **1°** | 50.00 | .22 | **11°** | 551.70 | 26.50 | **21°** | 1061.9 | 97.57 |
| 10′ | 58.34 | .30 | 10′ | 560.11 | 27.31 | 10′ | 1070.6 | 99.16 |
| 20 | 66.67 | .39 | 20 | 568.53 | 28.14 | 20 | 1079.2 | 100.75 |
| 30 | 75.01 | .49 | 30 | 576.95 | 28.97 | 30 | 1087.8 | 102.35 |
| 40 | 83.34 | .61 | 40 | 585.36 | 29.82 | 40 | 1096.4 | 103.97 |
| 50 | 91.68 | .73 | 50 | 593.79 | 30.68 | 50 | 1105.1 | 105.60 |
| **2** | 100.01 | .87 | **12** | 602.21 | 31.56 | **22** | 1113.7 | 107.24 |
| 10 | 108.35 | 1.02 | 10 | 610.64 | 32.45 | 10 | 1122.4 | 108.90 |
| 20 | 116.68 | 1.19 | 20 | 619.07 | 33.35 | 20 | 1131.0 | 110.57 |
| 30 | 125.02 | 1.36 | 30 | 627.50 | 34.26 | 30 | 1139.7 | 112.25 |
| 40 | 133.36 | 1.55 | 40 | 635.93 | 35.18 | 40 | 1148.4 | 113.95 |
| 50 | 141.70 | 1.75 | 50 | 644.37 | 36.12 | 50 | 1157.0 | 115.66 |
| **3** | 150.04 | 1.96 | **13** | 652.81 | 37.07 | **23** | 1165.7 | 117.38 |
| 10 | 158.38 | 2.19 | 10 | 661.25 | 38.03 | 10 | 1174.4 | 119.12 |
| 20 | 166.72 | 2.43 | 20 | 669.70 | 39.01 | 20 | 1183.1 | 120.87 |
| 30 | 175.06 | 2.67 | 30 | 678.15 | 39.99 | 30 | 1191.8 | 122.63 |
| 40 | 183.40 | 2.93 | 40 | 686.60 | 40.99 | 40 | 1200.5 | 124.41 |
| 50 | 191.74 | 3.21 | 50 | 695.06 | 42.00 | 50 | 1209.2 | 126.20 |
| **4** | 200.08 | 3.49 | **14** | 703.51 | 43.03 | **24** | 1217.9 | 128.00 |
| 10 | 208.43 | 3.79 | 10 | 711.97 | 44.07 | 10 | 1226.6 | 129.82 |
| 20 | 216.77 | 4.10 | 20 | 720.44 | 45.12 | 20 | 1235.3 | 131.65 |
| 30 | 225.12 | 4.42 | 30 | 728.90 | 46.18 | 30 | 1244.0 | 133.50 |
| 40 | 233.47 | 4.76 | 40 | 737.37 | 47.25 | 40 | 1252.8 | 135.35 |
| 50 | 241.81 | 5.10 | 50 | 745.85 | 48.34 | 50 | 1261.5 | 137.23 |
| **5** | 250.16 | 5.46 | **15** | 754.32 | 49.44 | **25** | 1270.2 | 139.11 |
| 10 | 258.51 | 5.83 | 10 | 762.80 | 50.55 | 10 | 1279.0 | 141.01 |
| 20 | 266.86 | 6.21 | 20 | 771.29 | 51.68 | 20 | 1287.7 | 142.93 |
| 30 | 275.21 | 6.61 | 30 | 779.77 | 52.89 | 30 | 1296.5 | 144.85 |
| 40 | 283.57 | 7.01 | 40 | 788.26 | 53.97 | 40 | 1305.3 | 146.79 |
| 50 | 291.92 | 7.43 | 50 | 796.75 | 55.13 | 50 | 1314.0 | 148.75 |
| **6** | 300.28 | 7.86 | **16** | 805.25 | 56.31 | **26** | 1322.8 | 150.71 |
| 10 | 308.64 | 8.31 | 10 | 813.75 | 57.50 | 10 | 1331.6 | 152.69 |
| 20 | 316.99 | 8.76 | 20 | 822.25 | 58.70 | 20 | 1340.4 | 154.69 |
| 30 | 325.35 | 9.23 | 30 | 830.76 | 59.91 | 30 | 1349.2 | 156.70 |
| 40 | 333.71 | 9.71 | 40 | 839.27 | 61.14 | 40 | 1358.0 | 158.72 |
| 50 | 342.08 | 10.20 | 50 | 847.78 | 62.38 | 50 | 1366.8 | 160.76 |
| **7** | 350.44 | 10.71 | **17** | 856.30 | 63.63 | **27** | 1375.6 | 162.81 |
| 10 | 358.81 | 11.22 | 10 | 864.82 | 64.90 | 10 | 1384.4 | 164.86 |
| 20 | 367.17 | 11.75 | 20 | 873.35 | 66.18 | 20 | 1393.2 | 166.95 |
| 30 | 375.54 | 12.29 | 30 | 881.88 | 67.47 | 30 | 1402.0 | 169.04 |
| 40 | 383.91 | 12.85 | 40 | 890.41 | 68.77 | 40 | 1410.9 | 171.15 |
| 50 | 392.28 | 13.41 | 50 | 898.95 | 70.09 | 50 | 1419.7 | 173.27 |
| **8** | 400.66 | 13.99 | **18** | 907.49 | 71.42 | **28** | 1428.6 | 175.41 |
| 10 | 409.03 | 14.58 | 10 | 916.03 | 72.76 | 10 | 1437.4 | 177.55 |
| 20 | 417.41 | 15.18 | 20 | 924.58 | 74.12 | 20 | 1446.3 | 179.72 |
| 30 | 425.79 | 15.80 | 30 | 933.13 | 75.49 | 30 | 1455.1 | 181.89 |
| 40 | 434.17 | 16.43 | 40 | 941.69 | 76.86 | 40 | 1464.0 | 184.08 |
| 50 | 442.55 | 17.07 | 50 | 950.25 | 78.26 | 50 | 1472.9 | 186.29 |
| **9** | 450.93 | 17.72 | **19** | 958.81 | 79.67 | **29** | 1481.8 | 188.51 |
| 10 | 459.32 | 18.38 | 10 | 967.38 | 81.09 | 10 | 1490.7 | 190.74 |
| 20 | 467.71 | 19.06 | 20 | 975.96 | 82.53 | 20 | 1499.6 | 192.99 |
| 30 | 476.10 | 19.75 | 30 | 984.53 | 83.97 | 30 | 1508.5 | 195.25 |
| 40 | 484.49 | 20.45 | 40 | 993.12 | 85.43 | 40 | 1517.4 | 197.53 |
| 50 | 492.88 | 21.16 | 50 | 1001.7 | 86.90 | 50 | 1526.3 | 199.82 |
| **10** | 501.28 | 21.89 | **20** | 1010.3 | 88.39 | **30** | 1535.3 | 202.12 |
| 10 | 509.68 | 22.62 | 10 | 1018.9 | 89.89 | 10 | 1544.2 | 204.44 |
| 20 | 518.08 | 23.38 | 20 | 1027.5 | 91.40 | 20 | 1553.1 | 206.77 |
| 30 | 526.48 | 24.14 | 30 | 1036.1 | 92.92 | 30 | 1562.1 | 209.12 |
| 40 | 534.89 | 24.91 | 40 | 1044.7 | 94.46 | 40 | 1571.0 | 211.48 |
| 50 | 543.29 | 25.70 | 50 | 1053.3 | 96.01 | 50 | 1580.0 | 213.86 |

## TABLE IV. — Tangents and Externals to a 1° Curve.

| Angle | Tangent | External | Angle | Tangent | External | Angle | Tangent | External |
|---|---|---|---|---|---|---|---|---|
| **31°** | 1589.0 | 216.3 | **41°** | 2142.2 | 387.4 | **51°** | 2782.9 | 618.4 |
| 10′ | 1598.0 | 218.7 | 10′ | 2151.7 | 390.7 | 10′ | 2743.1 | 622.8 |
| 20 | 1606.9 | 221.1 | 20 | 2161.2 | 394.1 | 20 | 2753.4 | 627.2 |
| 30 | 1615.9 | 223.5 | 30 | 2170.8 | 397.4 | 30 | 2763.7 | 631.7 |
| 40 | 1624.9 | 226.0 | 40 | 2180.3 | 400.8 | 40 | 2773.9 | 636.2 |
| 50 | 1633.9 | 228.4 | 50 | 2189.9 | 404.2 | 50 | 2784.2 | 640.7 |
| **32** | 1643.0 | 230.9 | **42** | 2199.4 | 407.6 | **52** | 2794.5 | 645.2 |
| 10 | 1652.0 | 233.4 | 10 | 2209.0 | 411.1 | 10 | 2804.9 | 649.7 |
| 20 | 1661.0 | 235.9 | 20 | 2218.6 | 414.5 | 20 | 2815.2 | 654.3 |
| 30 | 1670.0 | 238.4 | 30 | 2228.1 | 418.0 | 30 | 2825.6 | 658.8 |
| 40 | 1679.1 | 241.0 | 40 | 2237.7 | 421.4 | 40 | 2835.9 | 663.4 |
| 50 | 1688.1 | 243.5 | 50 | 2247.3 | 425.0 | 50 | 2846.3 | 668.0 |
| **33** | 1697.2 | 246.1 | **43** | 2257.0 | 428.5 | **53** | 2856.7 | 672.7 |
| 10 | 1706.3 | 248.7 | 10 | 2266.6 | 432.0 | 10 | 2867.1 | 677.3 |
| 20 | 1715.3 | 251.3 | 20 | 2276 2 | 435.6 | 20 | 2877.5 | 682.0 |
| 30 | 1724.4 | 253.9 | 30 | 2285.9 | 439.2 | 30 | 2888.0 | 686.7 |
| 40 | 1733.5 | 256.5 | 40 | 2295.6 | 442.8 | 40 | 2898.4 | 691.4 |
| 50 | 1742.6 | 259.1 | 50 | 2305.2 | 446.4 | 50 | 2908.9 | 696.1 |
| **34** | 1751.7 | 261.8 | **44** | 2314.9 | 450.0 | **54** | 2919.4 | 700.9 |
| 10 | 1760.8 | 264.5 | 10 | 2324.6 | 453.6 | 10 | 2929.9 | 705.7 |
| 20 | 1770.0 | 267.2 | 20 | 2334.3 | 457.3 | 20 | 2940.4 | 710.5 |
| 30 | 1779.1 | 269.9 | 30 | 2344.1 | 461.0 | 30 | 2951.0 | 715.3 |
| 40 | 1788.2 | 272.6 | 40 | 2353.8 | 464.6 | 40 | 2961.5 | 720.1 |
| 50 | 1797.4 | 275.3 | 50 | 2363.5 | 468.4 | 50 | 2972.1 | 725.0 |
| **35** | 1806.6 | 278.1 | **45** | 2373.3 | 472.1 | **55** | 2982.7 | 729.9 |
| 10 | 1815.7 | 280.8 | 10 | 2383.1 | 475.8 | 10 | 2993.3 | 734.8 |
| 20 | 1824.9 | 283.6 | 20 | 2392.8 | 479.6 | 20 | 3003.9 | 739.7 |
| 30 | 1834.1 | 286.4 | 30 | 2402.6 | 483.8 | 30 | 3014.5 | 744.6 |
| 40 | 1843.3 | 289.2 | 40 | 2412.4 | 487.2 | 40 | 3025.2 | 749.6 |
| 50 | 1852.5 | 292.0 | 50 | 2422.3 | 491.0 | 50 | 3035.8 | 754.6 |
| **36** | 1861.7 | 294.9 | **46** | 2432.1 | 494.8 | **56** | 3046.5 | 759.6 |
| 10 | 1870.9 | 297.7 | 10 | 2441.9 | 498.7 | 10 | 3057.2 | 764.6 |
| 20 | 1880.1 | 300.6 | 20 | 2451.8 | 502.5 | 20 | 3067.9 | 769.7 |
| 30 | 1889.4 | 303.5 | 30 | 2461.7 | 506.4 | 30 | 3078.7 | 774.7 |
| 40 | 1898.6 | 306.4 | 40 | 2471.5 | 510.3 | 40 | 3089.4 | 779.8 |
| 50 | 1907.9 | 309.3 | 50 | 2481.4 | 514.3 | 50 | 3100.2 | 784.9 |
| **37** | 1917.1 | 312.2 | **47** | 2491.3 | 518.2 | **57** | 3110.9 | 790.1 |
| 10 | 1926.4 | 315.2 | 10 | 2501.2 | 522.2 | 10 | 3121.7 | 795.2 |
| 20 | 1935.7 | 318.1 | 20 | 2511.2 | 526.1 | 20 | 3132.6 | 800.4 |
| 30 | 1945.0 | 321.1 | 30 | 2521.1 | 530.1 | 30 | 3143.4 | 805.6 |
| 40 | 1954.3 | 324.1 | 40 | 2531.1 | 534.2 | 40 | 3154.2 | 810.9 |
| 50 | 1963.6 | 327.1 | 50 | 2541.0 | 538.2 | 50 | 3165.1 | 816.1 |
| **38** | 1972.9 | 330.2 | **48** | 2551.0 | 542.2 | **58** | 3176.0 | 821.4 |
| 10 | 1982.2 | 333.2 | 10 | 2561.0 | 546.3 | 10 | 3186.9 | 826.7 |
| 20 | 1991.5 | 336.3 | 20 | 2571.0 | 550.4 | 20 | 3197.8 | 832.0 |
| 30 | 2000.9 | 339.3 | 30 | 2581.0 | 554.5 | 30 | 3208.8 | 837.3 |
| 40 | 2010.2 | 342.4 | 40 | 2591.0 | 558.6 | 40 | 3219.7 | 842.7 |
| 50 | 2019.6 | 345.5 | 50 | 2601.1 | 562.8 | 50 | 3230.7 | 848.1 |
| **39** | 2029.0 | 348.6 | **49** | 2611.2 | 566.9 | **59** | 3241.7 | 853.5 |
| 10 | 2038.4 | 351.8 | 10 | 2621.2 | 571.1 | 10 | 3252.7 | 858.9 |
| 20 | 2047.8 | 354.9 | 20 | 2631.3 | 575.3 | 20 | 3263.7 | 864.3 |
| 30 | 2057.2 | 358.1 | 30 | 2641.4 | 579.5 | 30 | 3274.8 | 869.8 |
| 40 | 2066.6 | 361.3 | 40 | 2651.5 | 583.8 | 40 | 3285.8 | 875.3 |
| 50 | 2076.0 | 364.5 | 50 | 2661.6 | 588.0 | 50 | 3296.9 | 880.8 |
| **40** | 2085.4 | 367.7 | **50** | 2671.8 | 592.3 | **60** | 3308.0 | 886.4 |
| 10 | 2094.9 | 371.0 | 10 | 2681.9 | 596.6 | 10 | 3319.1 | 892.0 |
| 20 | 2104.3 | 374.2 | 20 | 2692.1 | 600.9 | 20 | 3330.3 | 897.5 |
| 30 | 2113.8 | 377.5 | 30 | 2702.3 | 605.3 | 30 | 3341.4 | 903.2 |
| 40 | 2123.3 | 380.8 | 40 | 2712.5 | 609.6 | 40 | 3352.6 | 908.8 |
| 50 | 2132 7 | 384.1 | 50 | 2722.7 | 614.0 | 50 | 3363.8 | 914.5 |

TABLE IV Tangents and Externals to a 1° Curve.

| Angle | Tangent | External | Angle | Tangent | External | Angle | Tangent | External |
|---|---|---|---|---|---|---|---|---|
| **61°** | 3375.0 | 920.2 | **71°** | 4086.9 | 1308.2 | **81°** | 4893.6 | 1805.3 |
| 10′ | 3386.3 | 925.9 | 10′ | 4099.5 | 1315.6 | 10′ | 4908.0 | 1814.7 |
| 20 | 3397.5 | 931.6 | 20 | 4112.1 | 1322.9 | 20 | 4922.5 | 1824.1 |
| 30 | 3408.8 | 937.3 | 30 | 4124.8 | 1330.3 | 30 | 4937.0 | 1833.6 |
| 40 | 3420.1 | 943.1 | 40 | 4137.4 | 1337.7 | 40 | 4951.5 | 1843.1 |
| 50 | 3431.4 | 948.9 | 50 | 4150.1 | 1345.1 | 50 | 4966.1 | 1852.6 |
| **62** | 3442.7 | 954.8 | **72** | 4162.8 | 1352.6 | **82** | 4980.7 | 1862.2 |
| 10 | 3454.1 | 960.6 | 10 | 4175.6 | 1360.1 | 10 | 4995.4 | 1871.8 |
| 20 | 3465.4 | 966.5 | 20 | 4188.5 | 1367.6 | 20 | 5010.0 | 1881.5 |
| 30 | 3476.8 | 972.4 | 30 | 4201.2 | 1375.2 | 30 | 5024.8 | 1891.2 |
| 40 | 3488.3 | 978.3 | 40 | 4214.0 | 1382.8 | 40 | 5039.5 | 1900.9 |
| 50 | 3499.7 | 984.3 | 50 | 4226.8 | 1390.4 | 50 | 5054.3 | 1910.7 |
| **63** | 3511.1 | 990.2 | **73** | 4239.7 | 1398.0 | **83** | 5069.2 | 1920.5 |
| 10 | 3522.6 | 996.2 | 10 | 4252.6 | 1405.7 | 10 | 5084.0 | 1930.4 |
| 20 | 3534.1 | 1002.3 | 20 | 4265.6 | 1413.5 | 20 | 5099.0 | 1940.3 |
| 30 | 3545.6 | 1008.3 | 30 | 4278.5 | 1421.2 | 30 | 5113.9 | 1950.3 |
| 40 | 3557.2 | 1014.4 | 40 | 4291.5 | 1429.0 | 40 | 5128.9 | 1960.2 |
| 50 | 3568.7 | 1020.5 | 50 | 4304.6 | 1436.8 | 50 | 5143.9 | 1970.3 |
| **64** | 3580.3 | 1026.6 | **74** | 4317.6 | 1444.6 | **84** | 5159.0 | 1980.4 |
| 10 | 3591.9 | 1032.8 | 10 | 4330.7 | 1452.5 | 10 | 5174.1 | 1990.5 |
| 20 | 3603.5 | 1039.0 | 20 | 4343.8 | 1460.4 | 20 | 5189.3 | 2000.6 |
| 30 | 3615.1 | 1045.2 | 30 | 4356.9 | 1468.4 | 30 | 5204.4 | 2010.8 |
| 40 | 3626.8 | 1051.4 | 40 | 4370.1 | 1476.4 | 40 | 5219.7 | 2021.1 |
| 50 | 3638.5 | 1057.7 | 50 | 4383.3 | 1484.4 | 50 | 5234.9 | 2031.4 |
| **65** | 3650.2 | 1063.9 | **75** | 4396.5 | 1492.4 | **85** | 5250.3 | 2041.7 |
| 10 | 3661.9 | 1070.2 | 10 | 4409.8 | 1500.5 | 10 | 5265.6 | 2052.1 |
| 20 | 3673.7 | 1076.6 | 20 | 4423.1 | 1508.6 | 20 | 5281.0 | 2062.5 |
| 30 | 3685.4 | 1082.9 | 30 | 4436.4 | 1516.7 | 30 | 5296 4 | 2073.0 |
| 40 | 3697.2 | 1089.3 | 40 | 4449.7 | 1524.9 | 40 | 5311.9 | 2083.5 |
| 50 | 3709.0 | 1095.7 | 50 | 4463.1 | 1533.1 | 50 | 5327.4 | 2094.1 |
| **66** | 3720.9 | 1102.2 | **76** | 4476.5 | 1541.4 | **86** | 5343.0 | 2104.7 |
| 10 | 3732.7 | 1108.6 | 10 | 4489.9 | 1549.7 | 10 | 5358.6 | 2115.3 |
| 20 | 3744.6 | 1115.1 | 20 | 4503.4 | 1558.0 | 20 | 5374.2 | 2126.0 |
| 30 | 3756.5 | 1121.7 | 30 | 4516.9 | 1566.3 | 30 | 5389.9 | 2136.7 |
| 40 | 3768.5 | 1128.2 | 40 | 4530.4 | 1574.7 | 40 | 5405.6 | 2147.5 |
| 50 | 3780.4 | 1134.8 | 50 | 4544.0 | 1583.1 | 50 | 5421.4 | 2158.4 |
| **67** | 3792.4 | 1141.4 | **77** | 4557.6 | 1591.6 | **87** | 5437.2 | 2169.2 |
| 10 | 3804.4 | 1148.0 | 10 | 4571.2 | 1600.1 | 10 | 5453.1 | 2180.2 |
| 20 | 3816.4 | 1154.7 | 20 | 4584.8 | 1608.6 | 20 | 5469.0 | 2191.1 |
| 30 | 3828.4 | 1161.3 | 30 | 4598.5 | 1617.1 | 30 | 5484.9 | 2202.2 |
| 40 | 3840.5 | 1168.1 | 40 | 4612.2 | 1625.7 | 40 | 5500.9 | 2213.2 |
| 50 | 3852.6 | 1174.8 | 50 | 4626.0 | 1634.4 | 50 | 5517.0 | 2224.3 |
| **68** | 3864.7 | 1181.6 | **78** | 4639.8 | 1643.0 | **88** | 5533.1 | 2235.5 |
| 10 | 3876.8 | 1188.4 | 10 | 4653.6 | 1651.7 | 10 | 5549.2 | 2246.7 |
| 20 | 3889.0 | 1195.2 | 20 | 4667.4 | 1660.5 | 20 | 5565.4 | 2258.0 |
| 30 | 3901.2 | 1202.0 | 30 | 4681.3 | 1669.2 | 30 | 5581.6 | 2269.3 |
| 40 | 3913.4 | 1208.9 | 40 | 4695.2 | 1678.1 | 40 | 5597.8 | 2280.6 |
| 50 | 3925.6 | 1215.8 | 50 | 4709.2 | 1686.9 | 50 | 5614.2 | 2292.0 |
| **69** | 3937.9 | 1222.7 | **79** | 4723.2 | 1695.8 | **89** | 5630.5 | 2303.5 |
| 10 | 3950.2 | 1229.7 | 10 | 4737.2 | 1704.7 | 10 | 5646.9 | 2315.0 |
| 20 | 3962.5 | 1236.7 | 20 | 4751.2 | 1713.7 | 20 | 5663.4 | 2326.6 |
| 30 | 3974.8 | 1243.7 | 30 | 4765.3 | 1722.7 | 30 | 5679.9 | 2338.2 |
| 40 | 3987.2 | 1250.8 | 40 | 4779.4 | 1731.7 | 40 | 5696.4 | 2349.8 |
| 50 | 3999.5 | 1257.9 | 50 | 4793.6 | 1740.8 | 50 | 5713.0 | 2361.5 |
| **70** | 4011.9 | 1265.0 | **80** | 4807.7 | 1749.9 | **90** | 5729.7 | 2373.3 |
| 10 | 4024.4 | 1272.1 | 10 | 4822.0 | 1759.0 | 10 | 5746.3 | 2385.1 |
| 20 | 4036.8 | 1279.3 | 20 | 4836.2 | 1768.2 | 20 | 5763.1 | 2397.0 |
| 30 | 4049.3 | 1286.5 | 30 | 4850.5 | 1777.4 | 30 | 5779.9 | 2408.9 |
| 40 | 4061.8 | 1293.6 | 40 | 4864.8 | 1786.7 | 40 | 5796.7 | 2420.9 |
| 50 | 4074.4 | 1300.9 | 50 | 4879.2 | 1796.0 | 50 | 5813.6 | 2432.9 |

## TABLE IV. — Tangents and Externals to a 1° Curve.

| Angle | Tangent | External | Angle | Tangent | External | Angle | Tangent | External |
|---|---|---|---|---|---|---|---|---|
| **91°** | 5830.5 | 2444.9 | **101°** | 6950.6 | 3278.1 | **111°** | 8336.7 | 4386.1 |
| 10′ | 5847.5 | 2457.1 | 10′ | 6971.3 | 3294.1 | 10′ | 8362.7 | 4407.6 |
| 20 | 5864.6 | 2469.3 | 20 | 6992.0 | 3310.1 | 20 | 8388.9 | 4429.2 |
| 30 | 5881.7 | 2481.5 | 30 | 7012.7 | 3326.1 | 30 | 8415.1 | 4450.9 |
| 40 | 5898.8 | 2493.8 | 40 | 7033.6 | 3342.3 | 40 | 8441.5 | 4472.7 |
| 50 | 5916.0 | 2506.1 | 50 | 7054.5 | 3358.5 | 50 | 8468.0 | 4494.6 |
| **92** | 5933.2 | 2518.5 | **102** | 7075.5 | 3374.9 | **112** | 8494.6 | 4516.6 |
| 10 | 5950.5 | 2531.0 | 10 | 7096.6 | 3391.2 | 10 | 8521.3 | 4538.8 |
| 20 | 5967.9 | 2543.5 | 20 | 7117.8 | 3407.7 | 20 | 8548.1 | 4561.1 |
| 30 | 5985.3 | 2556.0 | 30 | 7139.0 | 3424.3 | 30 | 8575.0 | 4583.4 |
| 40 | 6002.7 | 2568.6 | 40 | 7160.3 | 3440.9 | 40 | 8602.1 | 4606.0 |
| 50 | 6020.2 | 2581.3 | 50 | 7181.7 | 3457.6 | 50 | 8629.3 | 4628.6 |
| **93** | 6037.8 | 2594.0 | **103** | 7203.2 | 3474.4 | **113** | 8656.6 | 4651.3 |
| 10 | 6055.4 | 2606.8 | 10 | 7224.7 | 3491.3 | 10 | 8684.0 | 4674.2 |
| 20 | 6073.1 | 2619.7 | 20 | 7246.3 | 3508.2 | 20 | 8711.5 | 4697.2 |
| 30 | 6090.8 | 2632.6 | 30 | 7268.0 | 3525.2 | 30 | 8739.2 | 4720.3 |
| 40 | 6108.6 | 2645.5 | 40 | 7289.8 | 3542.4 | 40 | 8767.0 | 4743.6 |
| 50 | 6126.4 | 2658.5 | 50 | 7311.7 | 3559.6 | 50 | 8794.9 | 4766.9 |
| **94** | 6144.3 | 2671.6 | **104** | 7333.6 | 3576.8 | **114** | 8822.9 | 4790.4 |
| 10 | 6162.6 | 2684.7 | 10 | 7355.6 | 3594.2 | 10 | 8851.0 | 4814.1 |
| 20 | 6180.2 | 2697.9 | 20 | 7377.8 | 3611.7 | 20 | 8879.3 | 4837.8 |
| 30 | 6198.3 | 2711.2 | 30 | 7399.9 | 3629.2 | 30 | 8907.7 | 4861.7 |
| 40 | 6216.4 | 2724.5 | 40 | 7422.2 | 3646.8 | 40 | 8936.3 | 4885.7 |
| 50 | 6234.6 | 2737.9 | 50 | 7444.6 | 3664.5 | 50 | 8965.0 | 4909.9 |
| **95** | 6252.8 | 2751.3 | **105** | 7467.0 | 3682.3 | **115** | 8993.8 | 4934.1 |
| 10 | 6271.1 | 2764.8 | 10 | 7489.6 | 3700.2 | 10 | 9022.7 | 4958.6 |
| 20 | 6289.4 | 2778.3 | 20 | 7512.2 | 3718.2 | 20 | 9051.7 | 4983.1 |
| 30 | 6307.9 | 2792.0 | 30 | 7534.9 | 3736.2 | 30 | 9080.9 | 5007.8 |
| 40 | 6326.3 | 2805.6 | 40 | 7557.7 | 3754.4 | 40 | 9110.3 | 5032.6 |
| 50 | 6344.8 | 2819.4 | 50 | 7580.5 | 3772.6 | 50 | 9139.8 | 5057.6 |
| **96** | 6363.4 | 2833.2 | **106** | 7603.5 | 3791.0 | **116** | 9169.4 | 5082.7 |
| 10 | 6382.1 | 2847.0 | 10 | 7626.6 | 3809.4 | 10 | 9199.1 | 5107.9 |
| 20 | 6400.8 | 2861.0 | 20 | 7649.7 | 3827.9 | 20 | 9229.0 | 5133.3 |
| 30 | 6419.5 | 2875.0 | 30 | 7672.9 | 3846.5 | 30 | 9259.0 | 5158.8 |
| 40 | 6438.4 | 2889.0 | 40 | 7696.3 | 3865.2 | 40 | 9289.2 | 5184.5 |
| 50 | 6457.3 | 2903.1 | 50 | 7719.7 | 3884.0 | 50 | 9319.5 | 5210.3 |
| **97** | 6476.2 | 2917.3 | **107** | 7743.2 | 3902.9 | **117** | 9349.9 | 5236.2 |
| 10 | 6495.2 | 2931.6 | 10 | 7766.8 | 3921.9 | 10 | 9380.5 | 5262.3 |
| 20 | 6514.3 | 2945.9 | 20 | 7790.5 | 3940.9 | 20 | 9411.3 | 5288.6 |
| 30 | 6533.4 | 2960.3 | 30 | 7814.3 | 3960.1 | 30 | 9442.2 | 5315.0 |
| 40 | 6552.6 | 2974.7 | 40 | 7838.1 | 3979.4 | 40 | 9473.2 | 5341.5 |
| 50 | 6571.9 | 2989.2 | 50 | 7862.1 | 3998.7 | 50 | 9504.4 | 5368.2 |
| **98** | 6591.2 | 3003.8 | **108** | 7886.2 | 4018.2 | **118** | 9535.7 | 5395.1 |
| 10 | 6610.6 | 3018.4 | 10 | 7910.4 | 4037.8 | 10 | 9567.2 | 5422.1 |
| 20 | 6630.1 | 3033.1 | 20 | 7934.6 | 4057.4 | 20 | 9598.9 | 5449.2 |
| 30 | 6649.6 | 3047.9 | 30 | 7959.0 | 4077.2 | 30 | 9630.7 | 5476.5 |
| 40 | 6669.2 | 3062.8 | 40 | 7983.5 | 4097.1 | 40 | 9662.6 | 5504.0 |
| 50 | 6688.8 | 3077.7 | 50 | 8008.0 | 4117.0 | 50 | 9694.7 | 5531.7 |
| **99** | 6708.6 | 3092.7 | **109** | 8032.7 | 4137.1 | **119** | 9727.0 | 5559.4 |
| 10 | 6728.4 | 3107.7 | 10 | 8057.4 | 4157.3 | 10 | 9759.4 | 5587.4 |
| 20 | 6748.2 | 3122.9 | 20 | 8082.3 | 4177.5 | 20 | 9792.0 | 5615.5 |
| 30 | 6768.1 | 3138.1 | 30 | 8107.3 | 4197.9 | 30 | 9824.8 | 5643.8 |
| 40 | 6788.1 | 3153.3 | 40 | 8132.3 | 4218.4 | 40 | 9857.7 | 5672.3 |
| 50 | 6808.2 | 3168.7 | 50 | 8157.5 | 4239.0 | 50 | 9890.8 | 5700.9 |
| **100** | 6828.3 | 3184.1 | **110** | 8182.8 | 4259.7 | **120** | 9924.0 | 5729.7 |
| 10 | 6848.5 | 3199.6 | 10 | 8208.2 | 4280.5 | 10 | 9957.5 | 5758.6 |
| 20 | 6868.8 | 3215.1 | 20 | 8233.7 | 4301.4 | 20 | 9991.0 | 5787.7 |
| 30 | 6889.2 | 3230.8 | 30 | 8259.3 | 4322.4 | 30 | 10025.0 | 5817.0 |
| 40 | 6909.6 | 3246.5 | 40 | 8285.0 | 4343.6 | 40 | 10059.0 | 5846.5 |
| 50 | 6930.1 | 3262.3 | 50 | 8310.8 | 4364.8 | 50 | 10093.0 | 5876.1 |

# Table V. Corrections for use with table IV,



## For Tangents Add

| Δ ANGLE / CURVE | 5° | 10° | 15° | 20° | 25° | 30° | 35° | 40° | 45° | 50° | 55° | 60° | 65° | 70° |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10° | .03 | .06 | .09 | .13 | .16 | .10 | .22 | .25 | .28 | .31 | .34 | .38 | .42 | .46 |
| 15° | .04 | .10 | .14 | .19 | .24 | .29 | .34 | .39 | .45 | .51 | .53 | .58 | .63 | .68 |
| 20° | .06 | .13 | .19 | .26 | .32 | .39 | .45 | .51 | .58 | .65 | .72 | .79 | .84 | .90 |
| 25° | .08 | .16 | .24 | .33 | .40 | .49 | .58 | .67 | .75 | .83 | .90 | .99 | 1.06 | 1.14 |
| 30° | .10 | .19 | .29 | .39 | .49 | .59 | .69 | .79 | .89 | .99 | 1.09 | 1.20 | 1.29 | 1 39 |
| 35° | .11 | .22 | .34 | .47 | .58 | .69 | .70 | .81 | .92 | 1.04 | 1.29 | 1.42 | 1 54 | 1 66 |
| 40° | .13 | .26 | .40 | .53 | .67 | .80 | .93 | 1.06 | 1.20 | 1.34 | 1.49 | 1.64 | 1.79 | 1 94 |
| 45° | .15 | .30 | .44 | .60 | .76 | .91 | 1.06 | 1.21 | 1.37 | 1.52 | 1.70 | 1.87 | 2.04 | 2.21 |
| 50° | .17 | .34 | .51 | .68 | .85 | 1.02 | 1.19 | 1.36 | 1.54 | 1.72 | 1.91 | 2.10 | 2.29 | 2.48 |
| 55° | .19 | .38 | .57 | .76 | .95 | 1.14 | 1.32 | 1.52 | 1.72 | 1.92 | 2.14 | 2.35 | 2.56 | 2.77 |
| 60° | .21 | .42 | .63 | .84 | 1.05 | 1.27 | 1.49 | 1.71 | 1.94 | 2.17 | 2.38 | 2.60 | 2.83 | 3.07 |
| 65° | .23 | .46 | .69 | .93 | 1.16 | 1.40 | 1.64 | 1.88 | 2.13 | 2.38 | 2.63 | 2.88 | 3.13 | 3.39 |
| 70° | .25 | .51 | .76 | 1.02 | 1.28 | 1.54 | 1.80 | 2.06 | 2.33 | 2.60 | 2.88 | 3.16 | 3.44 | 3.72 |
| 75° | .27 | .56 | .83 | 1.12 | 1.40 | 1.69 | 1.98 | 2.27 | 2.57 | 2.87 | 3.16 | 3.47 | 3.78 | 4.09 |
| 80° | .30 | .61 | .91 | 1.22 | 1.53 | 1.84 | 2.15 | 2.46 | 2.78 | 3.10 | 3.44 | 3.78 | 4.12 | 4.46 |
| 85° | .33 | .66 | 1.00 | 1.33 | 1.68 | 2.02 | 2.36 | 2.70 | 3.05 | 3.40 | 3.77 | 4.14 | 4.55 | 4.89 |
| 90° | .36 | .72 | 1.09 | 1.45 | 1.83 | 2.20 | 2.57 | 2.94 | 3.32 | 3.70 | 4.10 | 4.50 | 4.91 | 5.32 |
| 95° | .39 | .79 | 1.19 | 1.55 | 2.00 | 2.40 | 2.80 | 3.20 | 3.61 | 4.02 | 4.40 | 4.98 | 5.38 | 5.83 |
| 100° | .43 | .86 | 1.30 | 1.74 | 2.18 | 2.62 | 3.06 | 3 50 | 3.95 | 4.40 | 4.88 | 5.37 | 5.85 | 6.34 |

## For Externals Add

| ANGLE / CURVE | 5° | 10° | 15° | 20° | 25° | 30° | 35° | 40° | 45° | 50° | 55° | 60° | 65° | 70° |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10° | .001 | .003 | .004 | .006 | .007 | .008 | .009 | .011 | .012 | .014 | .015 | .017 | .018 | .020 |
| 15° | .003 | .007 | .010 | .014 | .018 | .023 | .027 | .029 | .032 | .035 | .039 | .043 | .047 | .051 |
| 20° | .006 | .011 | .017 | .022 | .028 | .034 | 038 | .045 | .051 | .057 | .063 | .070 | .076 | .083 |
| 25° | .009 | .018 | .027 | .036 | .046 | .056 | .065 | .074 | .083 | .093 | .106 | .120 | .127 | .135 |
| 30° | .013 | .025 | .038 | .051 | .065 | .078 | .090 | .103 | .116 | .129 | .149 | .170 | .179 | .188 |
| 35° | .018 | .035 | .054 | .072 | .086 | .109 | .131 | .153 | .175 | .197 | .213 | .230 | .247 | .264 |
| 40° | .023 | .046 | .070 | .093 | .117 | .141 | .172 | .203 | .234 | .265 | .277 | .290 | .315 | .341 |
| 45° | .030 | .060 | .093 | .119 | .153 | .184 | .216 | .254 | .289 | .325 | .351 | .378 | .411 | .445 |
| 50° | .037 | .075 | .116 | .151 | .189 | .227 | .266 | .305 | .345 | .384 | .425 | .467 | .508 | .550 |
| 55° | .046 | .093 | .142 | 188 | .236 | .283 | .332 | .381 | 420 | .479 | .530 | .582 | .641 | .700 |
| 60° | .056 | .112 | .168 | .225 | .283 | .340 | .398 | .457 | 516 | .575 | .636 | .697 | .774 | .851 |
| 65° | .067 | .135 | .204 | .273 | .343 | .412 | .483 | .554 | .625 | .697 | .711 | .845 | .922 | 1.01 |
| 70° | .080 | .159 | .240 | .321 | .403 | .485 | .568 | .652 | .735 | .819 | .906 | .994 | 1.08 | 1.17 |
| 75° | .095 | .182 | .286 | .383 | .480 | .578 | .678 | 777 | .877 | 977 | 1.07 | 1.18 | 1.29 | 1.39 |
| 80° | .110 | .220 | 332 | .445 | .558 | 671 | .787 | .903 | 1.02 | 1.13 | 1.25 | 1.38 | 1.50 | 1.62 |
| 85° | .128 | .259 | .391 | .524 | .657 | .790 | .926 | 1.06 | 1.20 | 1.34 | 1.47 | 1.62 | 1.76 | 1.91 |
| 90° | .149 | .299 | .450 | .603 | .756 | .910 | 1.07 | 1.22 | 1.38 | 1.54 | 1.70 | 1.87 | 2.03 | 2.20 |
| 95° | .174 | .350 | .522 | .706 | .985 | 1.06 | 1.25 | 1.43 | 1.62 | 1.80 | 1.99 | 2.18 | 2.38 | 2.58 |
| 100° | .200 | .401 | .604 | .809 | 1.01 | 1.22 | 1.43 | 1.64 | 1.85 | 2.06 | 2.28 | 2.50 | 2.73 | 2.96 |

## Table VI. Deflections for Sub Chords for Short Radius Curves.

| Degree of Curve | Radius 50 / sin. def. ang. | ½ sub chord / R = sin of def. angle | | | | Length of arc for 100 ft. |
|---|---|---|---|---|---|---|
| | | 12.5 Ft. | 15 Ft. | 20 Ft | 25 Ft. | |
| 30° | 193.18 | 1° 51′ | 2° 17′ | 2° 58′ | 3° 43′ | 101.15 |
| 32° | 181.39 | 1° 59′ | 2° 25′ | 3° 10′ | 3° 58′ | 101.33 |
| 34° | 171.01 | 2° 06′ | 2° 33′ | 3° 21′ | 4° 12′ | 101.48 |
| 36° | 161.80 | 2° 13′ | 2° 41′ | 3° 33′ | 4° 26′ | 101.66 |
| 38° | 153.58 | 2° 20′ | 2° 49′ | 3° 44′ | 4° 40′ | 101.85 |
| 40° | 146.19 | 2° 27′ | 2° 57′ | 3° 55′ | 4° 54′ | 102.06 |
| 42° | 139.52 | 2° 34′ | 3° 05′ | 4° 07′ | 5° 08′ | 102.29 |
| 44° | 133.47 | 2° 41′ | 3° 13′ | 4° 18′ | 5° 22′ | 102.53 |
| 46° | 127.97 | 2° 48′ | 3° 21′ | 4° 29′ | 5° 36′ | 102.76 |
| 48° | 122.92 | 2° 55′ | 3° 29′ | 4° 40′ | 5° 50′ | 103.00 |
| 50° | 118.31 | 3° 02′ | 3° 38′ | 4° 51′ | 6° 04′ | 103.24 |
| 52° | 114.06 | 3° 09′ | 3° 46′ | 5° 02′ | 6° 17′ | 103.54 |
| 54° | 110.11 | 3° 16′ | 3° 54′ | 5° 13′ | 6° 31′ | 103.84 |
| 56° | 106.50 | 3° 22′ | 4° 02′ | 5° 23′ | 6° 44′ | 104.14 |
| 58° | 103.14 | 3° 29′ | 4° 10′ | 5° 34′ | 6° 57′ | 104.43 |
| 60° | 100.00 | 3° 35′ | 4° 18′ | 5° 44′ | 7° 11′ | 104.72 |

## CURVE FORMULAS.

$T = R \tan \frac{1}{2} I$

$T = 50 \tan. \frac{1}{2} I$

$\text{Sin. } D = \frac{50}{R}$

$\text{Sin. } D = \frac{50 \tan. \frac{1}{2} I}{T}$

$R = T \cot. \frac{1}{2} I$

$R = \frac{50}{\text{Sin. } D}$

$E = R \text{ ex. sec. } \frac{1}{2} I$

$E = T \tan \frac{1}{4} I$

$\text{Chord def.} = \frac{\text{chord}^2}{R}$

$\text{No. chords} = \frac{\frac{1}{2} I}{D}$

Tan. def. = ½ chord def.

The square of any distance, divided by twice the radius, will equal the distance from tangent to curve, very nearly.

Table IV. contains Tangents and Externals to a 1° curve. Tan. and Ext. to any other radius may be found, nearly enough, by dividing the Tan. or Ext. opposite the given Central Angle by the given degree of curve.

To find Deg. of Curve, having the Central Angle and Tangent: Divide Tan. opposite the given Central Angle by the given Tangent.

To find Deg. of Curve, having the Central Angle and Tangent: Divide Ext. opposite the given Central Angle by the given External.

To find. Nat. Tan. and Nat. Ex. Sec. for any angle by Table IV.: Tan. or Ext. of twice the given angle divided by the radius of a 1° curve will be the Nat. Tan. or Nat. Ex. Sec.

To find angle for a given distance and deflection.

Rule 1. Multiply the given distance by .01745 (def. for 1° for 1 ft.), and divide given deflection by the product.

Rule 2. Multiply given deflection by 57.3, and divide the product by the given distance.

To find deflection for a given angle and distance: Multiply the angle by .01745, and the product by the distance.

Right Angle Triangles.— Square the altitude, divide by twice the base. Add quotient to base for hypotenuse.

Given Base 100, Alt 10. $10^2 \div 200 = .5$. $100 + .5 = 100.5$ hyp.

Given Hyp. 100, Alt. 25. $25^2 \div 200 = 3.125$. $100 - 3.125 = 96.875 =$ Base.

Error in first example, .002; in last, .045.

To find Tons of Rail in one mile of track: multiply weight per yard by 11, and divide by 7.

## Natural Sines

| DEG. | 0′ | 10′ | 20′ | 30′ | 40′ | 50′ | DEG. | DEG. | 0′ | 10′ | 20′ | 30′ | 40′ | 50′ | DEG. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0000 | 0029 | 0058 | 0087 | 0116 | 0145 | 89 | 40 | 6428 | 6450 | 6472 | 6494 | 6517 | 6539 | 49 |
| 1 | 0175 | 0204 | 0233 | 0262 | 0291 | 0320 | 88 | 41 | 6561 | 6583 | 6604 | 6626 | 6648 | 6670 | 48 |
| 2 | 0349 | 0378 | 0407 | 0436 | 0465 | 0494 | 87 | 42 | 6691 | 6713 | 6734 | 6756 | 6777 | 6799 | 47 |
| 3 | 0523 | 0552 | 0581 | 0610 | 0640 | 0669 | 86 | 43 | 6820 | 5841 | 6862 | 6884 | 6905 | 6926 | 46 |
| 4 | 0698 | 0727 | 0756 | 0785 | 0814 | 0843 | 85 | 44 | 6947 | 6967 | 6988 | 7009 | 7030 | 7050 | 45 |
| 5 | 0872 | 0901 | 0929 | 0958 | 0987 | 1016 | 84 | 45 | 7071 | 7092 | 7112 | 7133 | 7153 | 7173 | 44 |
| 6 | 1045 | 1074 | 1103 | 1132 | 1161 | 1190 | 83 | 46 | 7193 | 7214 | 7234 | 7254 | 7274 | 7294 | 43 |
| 7 | 1219 | 1248 | 1279 | 1305 | 1334 | 1363 | 82 | 47 | 7314 | 7333 | 7353 | 7373 | 7392 | 7412 | 42 |
| 8 | 1392 | 1421 | 1449 | 1478 | 1507 | 1536 | 81 | 48 | 7431 | 7451 | 7470 | 7490 | 7509 | 7528 | 41 |
| 9 | 1564 | 1593 | 1622 | 1650 | 1679 | 1708 | 80 | 49 | 7547 | 7566 | 7585 | 7604 | 7623 | 7642 | 40 |
| 10 | 1736 | 1765 | 1794 | 1822 | 1851 | 1880 | 79 | 50 | 7660 | 7679 | 7698 | 7716 | 7735 | 7753 | 39 |
| 11 | 1908 | 1937 | 1965 | 1994 | 2022 | 2051 | 78 | 51 | 7771 | 7790 | 7808 | 7826 | 7844 | 7862 | 38 |
| 12 | 2079 | 2108 | 2136 | 2164 | 2193 | 2221 | 77 | 52 | 7880 | 7898 | 7916 | 7934 | 7951 | 7969 | 37 |
| 13 | 2250 | 2278 | 2306 | 2334 | 2363 | 2391 | 76 | 53 | 7986 | 8004 | 8021 | 8039 | 8056 | 8073 | 36 |
| 14 | 2419 | 2447 | 2476 | 2504 | 2532 | 2560 | 75 | 54 | 8090 | 8107 | 8124 | 8141 | 8158 | 8175 | 35 |
| 15 | 2588 | 2616 | 2644 | 2672 | 2700 | 2728 | 74 | 55 | 8192 | 8208 | 8225 | 8241 | 8258 | 8274 | 34 |
| 16 | 2756 | 2784 | 2812 | 2840 | 2868 | 2896 | 73 | 56 | 8290 | 8307 | 8323 | 8339 | 8355 | 8371 | 33 |
| 17 | 2924 | 2952 | 2979 | 3007 | 3035 | 3062 | 72 | 57 | 8387 | 8403 | 8418 | 8434 | 8450 | 8465 | 32 |
| 18 | 3090 | 3118 | 3145 | 3173 | 3201 | 3228 | 71 | 58 | 8480 | 8496 | 8511 | 8526 | 8542 | 8557 | 31 |
| 19 | 3256 | 3283 | 3311 | 3338 | 3365 | 3393 | 70 | 59 | 8572 | 8587 | 8601 | 8616 | 8631 | 8646 | 30 |
| 20 | 3420 | 3448 | 3475 | 3502 | 3529 | 3557 | 69 | 60 | 8660 | 8675 | 8689 | 8704 | 8718 | 8732 | 29 |
| 21 | 3584 | 3611 | 3638 | 3665 | 3692 | 3719 | 68 | 61 | 8746 | 8760 | 8774 | 8788 | 8802 | 8816 | 28 |
| 22 | 3746 | 3773 | 3800 | 3827 | 3854 | 3881 | 67 | 62 | 8829 | 8843 | 8857 | 8870 | 8884 | 8897 | 27 |
| 23 | 3907 | 3934 | 3961 | 3987 | 4014 | 4041 | 66 | 63 | 8910 | 8923 | 8936 | 8949 | 8962 | 8975 | 26 |
| 24 | 4067 | 4094 | 4120 | 4147 | 4173 | 4200 | 65 | 64 | 8988 | 9001 | 9013 | 9026 | 9038 | 9051 | 25 |
| 25 | 4226 | 4253 | 4279 | 4305 | 4331 | 4358 | 64 | 65 | 9063 | 9075 | 9088 | 9100 | 9112 | 9124 | 24 |
| 26 | 4384 | 4410 | 4436 | 4462 | 4488 | 4514 | 63 | 66 | 9135 | 9147 | 9159 | 9171 | 9182 | 9194 | 23 |
| 27 | 4540 | 4566 | 4592 | 4617 | 4643 | 4669 | 62 | 67 | 9205 | 9216 | 9228 | 9239 | 9250 | 9261 | 22 |
| 28 | 4695 | 4720 | 4746 | 4772 | 4797 | 4823 | 61 | 68 | 9272 | 9283 | 9293 | 9304 | 9315 | 9325 | 21 |
| 29 | 4848 | 4874 | 4899 | 4924 | 4950 | 4975 | 60 | 69 | 9336 | 9346 | 9356 | 9367 | 9377 | 9387 | 20 |
| 30 | 5000 | 5025 | 5050 | 5075 | 5100 | 5125 | 59 | 70 | 9397 | 9407 | 9417 | 9426 | 9436 | 9446 | 19 |
| 31 | 5150 | 5175 | 5200 | 5225 | 5250 | 5275 | 58 | 71 | 9455 | 9465 | 9474 | 9483 | 9492 | 9502 | 18 |
| 32 | 5299 | 5324 | 5348 | 5373 | 5398 | 5422 | 57 | 72 | 9511 | 9520 | 9528 | 9537 | 9546 | 9555 | 17 |
| 33 | 5446 | 5471 | 5495 | 5519 | 5544 | 5568 | 56 | 73 | 9563 | 9572 | 9580 | 9588 | 9596 | 9605 | 16 |
| 34 | 5592 | 5616 | 5640 | 5664 | 5688 | 5712 | 55 | 74 | 9613 | 9621 | 9628 | 9636 | 9644 | 9652 | 15 |
| 35 | 5736 | 5760 | 5783 | 5807 | 5831 | 5854 | 54 | 75 | 9659 | 9667 | 9674 | 9681 | 9689 | 9696 | 14 |
| 36 | 5878 | 5901 | 5925 | 5948 | 5972 | 5995 | 53 | 76 | 9703 | 9710 | 9717 | 9724 | 9730 | 9737 | 13 |
| 37 | 6018 | 6041 | 6065 | 6088 | 6111 | 6134 | 52 | 77 | 9744 | 9750 | 9757 | 9763 | 9769 | 9775 | 12 |
| 38 | 6157 | 6180 | 6202 | 6225 | 6248 | 6271 | 51 | 78 | 9781 | 9787 | 9793 | 9799 | 9805 | 9811 | 11 |
| 39 | 6293 | 6316 | 6338 | 6361 | 6383 | 6406 | 50 | 79 | 9816 | 9822 | 9827 | 9833 | 9838 | 9843 | 10 |
| DEG. | 60′ | 50′ | 40′ | 30′ | 20′ | 10′ | DEG. | DEG. | 60′ | 50′ | 40′ | 30′ | 20′ | 10′ | DEG. |

| DEG. | 0′ | 10′ | 20′ | 30′ | 40′ | 50′ | DEG. |
|---|---|---|---|---|---|---|---|
| 80 | 9848 | 9853 | 9858 | 9863 | 9868 | 9872 | 9 |
| 81 | 9877 | 9881 | 9886 | 9890 | 9894 | 9899 | 8 |
| 82 | 9903 | 9907 | 9911 | 9914 | 9918 | 9922 | 7 |
| 83 | 9925 | 9929 | 9932 | 9936 | 9939 | 9942 | 6 |
| 84 | 9945 | 9948 | 9951 | 9954 | 9957 | 9959 | 5 |
| 85 | 9962 | 9964 | 9967 | 9969 | 9971 | 9974 | 4 |
| 86 | 9976 | 9978 | 9980 | 9981 | 9983 | 9985 | 3 |
| 87 | 9986 | 9988 | 9989 | 9990 | 9992 | 9993 | 2 |
| 88 | 9994 | 9995 | 9996 | 9997 | 9997 | 9998 | 1 |
| 89 | 9998 | 9999 | 9999 | 9999 | 1.0000 | 1.0000 | 0 |
| DEG. | 60′ | 50′ | 40′ | 30′ | 20′ | 10′ | DEG. |

## Natural Cosines

## Natural Tangents

| deg. | 0′ | 10′ | 20′ | 30′ | 40′ | 50′ | deg. | deg. | 0′ | 10′ | 20′ | 30′ | 40′ | 50′ | deg. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0000 | 0029 | 0058 | 0087 | 0116 | 0145 | 89 | 40 | 8391 | 8441 | 8491 | 8541 | 8591 | 8642 | 49 |
| 1 | 0175 | 0204 | 0233 | 0262 | 0291 | 0320 | 88 | 41 | 8693 | 8744 | 8796 | 8847 | 8899 | 8952 | 48 |
| 2 | 0349 | 0378 | 0407 | 0437 | 0466 | 0495 | 87 | 42 | 9004 | 9057 | 9110 | 9163 | 9217 | 9271 | 47 |
| 3 | 0524 | 0553 | 0582 | 0612 | 0641 | 0670 | 86 | 43 | 9325 | 9380 | 9435 | 9490 | 9545 | 9601 | 46 |
| 4 | 0699 | 0729 | 0758 | 0787 | 0816 | 0846 | 85 | 44 | 9657 | 9713 | 9770 | 9827 | 9884 | 9942 | 45 |
| 5 | 0875 | 0904 | 0934 | 0963 | 0992 | 1022 | 84 | 45 | 1.0000 | 1.0058 | 1.0117 | 1.0176 | 1.0235 | 1.0295 | 44 |
| 6 | 1051 | 1080 | 1110 | 1139 | 1169 | 1198 | 83 | 46 | 1.0355 | 1.0416 | 1.0477 | 1.0533 | 1.0599 | 1.0661 | 43 |
| 7 | 1228 | 1257 | 1287 | 1317 | 1346 | 1376 | 82 | 47 | 1.0724 | 1.0786 | 1.0850 | 1.0913 | 1.0977 | 1 1041 | 42 |
| 8 | 1405 | 1435 | 1465 | 1495 | 1524 | 1554 | 81 | 48 | 1.1106 | 1.1171 | 1.1237 | 1.1303 | 1.1369 | 1.1436 | 41 |
| 9 | 1584 | 1614 | 1644 | 1673 | 1703 | 1733 | 80 | 49 | 1.1504 | 1.1571 | 1.1640 | 1.1708 | 1.1778 | 1.1847 | 40 |
| 10 | 1763 | 1793 | 1823 | 1853 | 1883 | 1914 | 79 | 50 | 1.1918 | 1 1988 | 1.2059 | 1.2131 | 1.2203 | 1.2276 | 39 |
| 11 | 1944 | 1974 | 2004 | 2035 | 2065 | 2095 | 78 | 51 | 1.2349 | 1.2423 | 1.2497 | 1.2572 | 1.2647 | 1.2723 | 38 |
| 12 | 2126 | 2156 | 2186 | 2217 | 2247 | 2278 | 77 | 52 | 1.2799 | 1.2876 | 1.2954 | 1.3032 | 1.3111 | 1.3190 | 37 |
| 13 | 2309 | 2339 | 2370 | 2401 | 2432 | 2462 | 76 | 53 | 1.3270 | 1.3351 | 1.3452 | 1.3514 | 1.3597 | 1 3680 | 36 |
| 14 | 2493 | 2524 | 2555 | 2586 | 2617 | 2648 | 75 | 54 | 1.3764 | 1.3848 | 1.3934 | 1.4019 | 1.4106 | 1.4193 | 35 |
| 15 | 2679 | 2711 | 2742 | 2773 | 2805 | 2836 | 74 | 55 | 1.4281 | 1.4370 | 1.4460 | 1.4550 | 1.4641 | 1.4733 | 34 |
| 16 | 2867 | 2899 | 2931 | 2962 | 2994 | 3026 | 73 | 56 | 1.4826 | 1.4919 | 1.5013 | 1.5108 | 1.5204 | 1.5301 | 33 |
| 17 | 3057 | 3089 | 3121 | 3153 | 3185 | 3217 | 72 | 57 | 1 5399 | 1.5497 | 1.5597 | 1 5697 | 1 5798 | 1.5900 | 32 |
| 18 | 3249 | 3281 | 3314 | 3346 | 3378 | 3411 | 71 | 58 | 1.6003 | 1.6107 | 1.6212 | 1.6319 | 1.6426 | 1.6534 | 31 |
| 19 | 3443 | 3476 | 3508 | 3541 | 3574 | 3607 | 70 | 59 | 1.6643 | 1 6753 | 1.6864 | 1.6977 | 1.7090 | 1 7205 | 30 |
| 20 | 3640 | 3673 | 3706 | 3739 | 3772 | 3805 | 69 | 60 | 1.7321 | 1.7437 | 1.7556 | 1.7675 | 1.7797 | 1.7917 | 29 |
| 21 | 3839 | 3872 | 3906 | 3939 | 3973 | 4006 | 68 | 61 | 1.8040 | 1.8165 | 1.8291 | 1.8418 | 1.8546 | 1.8676 | 28 |
| 22 | 4040 | 4074 | 4108 | 4142 | 4176 | 4210 | 67 | 62 | 1.8807 | 1.8940 | 1.9074 | 1.9210 | 1.9347 | 1.9486 | 27 |
| 23 | 4245 | 4279 | 4314 | 4348 | 4383 | 4417 | 66 | 63 | 1.9626 | 1.9768 | 1.9912 | 2.0057 | 2.0204 | 2.0353 | 26 |
| 24 | 4452 | 4487 | 4522 | 4557 | 4592 | 4628 | 65 | 64 | 2.0503 | 2.0655 | 2.0809 | 2.0965 | 2.1123 | 2.1283 | 25 |
| 25 | 4663 | 4699 | 4734 | 4770 | 4806 | 4841 | 64 | 65 | 2.1445 | 2.1609 | 2.1775 | 2 1943 | 2.2113 | 2.2286 | 24 |
| 26 | 4877 | 4913 | 4950 | 4986 | 5022 | 5059 | 63 | 66 | 2.2460 | 2.2637 | 2.2817 | 2.2998 | 2.3183 | 2.3369 | 23 |
| 27 | 5095 | 5132 | 5169 | 5206 | 5243 | 5280 | 62 | 67 | 2.3559 | 2.3750 | 2 3945 | 2.4142 | 2.4342 | 2.4545 | 22 |
| 28 | 5317 | 5354 | 5392 | 5430 | 5467 | 5505 | 61 | 68 | 2.4751 | 2.4960 | 2.5172 | 2.5386 | 2.5605 | 2.5826 | 21 |
| 29 | 5543 | 5581 | 5619 | 5658 | 5696 | 5735 | 60 | 69 | 2.6051 | 2 6279 | 2.6511 | 2.6746 | 2.6985 | 2.7228 | 20 |
| 30 | 5774 | 5812 | 5851 | 5890 | 5930 | 5969 | 59 | 70 | 2.7475 | 2.7725 | 2 7980 | 2.8239 | 2.8502 | 2.8770 | 19 |
| 31 | 6009 | 6048 | 6088 | 6128 | 6168 | 6208 | 58 | 71 | 2.9042 | 2.9319 | 2 9600 | 2.9887 | 3.0178 | 3.0475 | 18 |
| 32 | 6249 | 6289 | 6330 | 6371 | 6412 | 6453 | 57 | 72 | 3.0777 | 3 1084 | 3.1397 | 3.1716 | 3.2041 | 3.2371 | 17 |
| 33 | 6494 | 6536 | 6577 | 6619 | 6661 | 6703 | 56 | 73 | 3.2709 | 3.3052 | 3.3402 | 3.3759 | 3.4124 | 3.4495 | 16 |
| 34 | 6745 | 6787 | 6830 | 6873 | 6916 | 6959 | 55 | 74 | 3.4874 | 3.5261 | 3 5656 | 3.6059 | 3.6470 | 3.6891 | 15 |
| 35 | 7002 | 7046 | 7089 | 7133 | 7177 | 7221 | 54 | 75 | 3.7321 | 3.7760 | 3.8208 | 3.8657 | 3.9136 | 3.9617 | 14 |
| 36 | 7265 | 7310 | 7355 | 7400 | 7445 | 7490 | 53 | 76 | 4.0108 | 4.0611 | 4.1126 | 4.1653 | 4.2193 | 4.2747 | 13 |
| 37 | 7536 | 7581 | 7627 | 7673 | 7720 | 7766 | 52 | 77 | 4.3315 | 4.3897 | 4.4494 | 4.5107 | 4.5736 | 4.6382 | 12 |
| 38 | 7813 | 7860 | 7907 | 7954 | 8002 | 8050 | 51 | 78 | 4.7046 | 4.7729 | 4.8430 | 4.9152 | 4.9894 | 5.0658 | 11 |
| 39 | 8098 | 8146 | 8195 | 8243 | 8292 | 8342 | 50 | 79 | 5.1446 | 5.2257 | 5,3093 | 5.3955 | 5.4845 | 5.5764 | 10 |
| deg. | 60′ | 50′ | 40′ | 30 | 20′ | 10′ | deg. | deg. | 60′ | 50′ | 40′ | 30′ | 20′ | 10′ | deg. |

| deg. | 0′ | 10′ | 20′ | 30′ | 40′ | 50′ | deg. |
|---|---|---|---|---|---|---|---|
| 80 | 5.6713 | 5 7694 | 5.8708 | 5 9758 | 6.0844 | 6.1970 | 9 |
| 81 | 6.3138 | 6.4348 | 6.5606 | 6.6912 | 6.8269 | 6.9682 | 8 |
| 82 | 7.1154 | 7.2687 | 7.4287 | 7.5958 | 7.7704 | 7.9530 | 7 |
| 83 | 8.1443 | 8 3450 | 8.5555 | 8.7769 | 9.0098 | 9.2553 | 6 |
| 84 | 9.5144 | 9.7882 | 10.078 | 10.385 | 10.711 | 11.059 | 5 |
| 85 | 11.430 | 11.826 | 12.250 | 12.706 | 13.197 | 13.727 | 4 |
| 86 | 14.300 | 14.924 | 15.605 | 16.350 | 17.169 | 18.075 | 3 |
| 87 | 19.081 | 20.206 | 21.470 | 22.903 | 24.542 | 26.432 | 2 |
| 88 | 28.636 | 31.242 | 34.368 | 38.189 | 42.964 | 49.104 | 1 |
| 89 | 57.290 | 68 750 | 85.940 | 114.588 | 171 885 | 343.77 | 0 |
| deg. | 60′ | 50′ | 40′ | 30′ | 20′ | 10′ | deg. |

## Natural Cotangents

886.66
3.23
889.89
5.47
884.42
2.16
886.58
10.07
876.51
2.71
879.22
3.83
875.39

886.58
1.48
885.10

886.58
9.99
876.59

879.22
4.07
875.15

+36.
+51
+68
+74
+94

819+00

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

ROADWAY 14 FEET WIDE. SIDE SLOPES $1^1/_2$ TO 1.

FOR SINGLE TRACK EMBANKMENT.

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

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