

284

W284

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Index

Otay Res. to San Diego 2nd Main Pipe line

Slope measurements of pipe 2-41

Pavement measurements at Bonita  
Road crossing 61

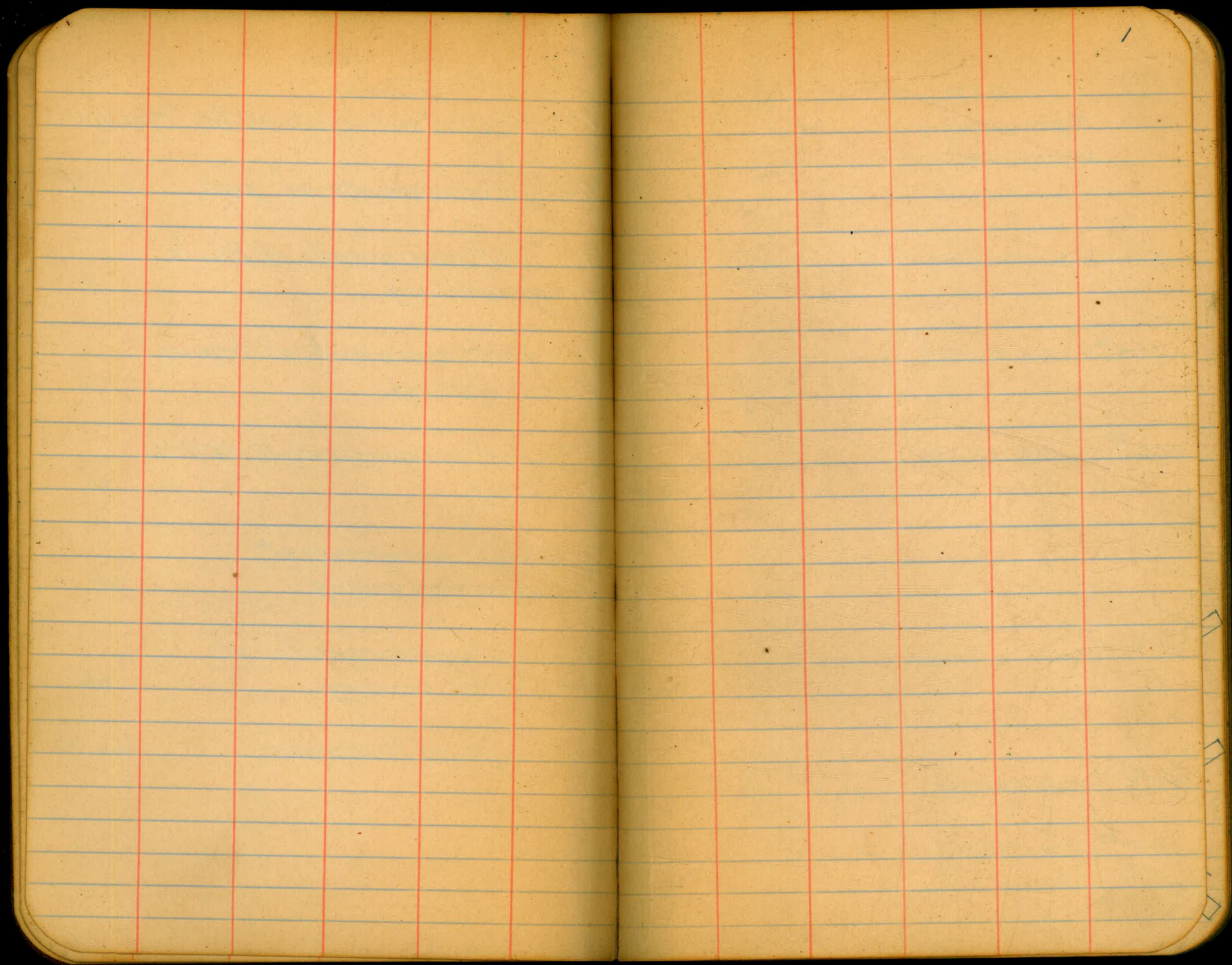
Pavement measurements at Ridgeway  
Road crossing 62

Pavement measurements at 65th St.  
Crossing 63

Pavement measurements at  
Imperial Ave. crossing 64

Pavement measurements at  
Bach Ave. crossing 65

Miscellaneous Structure Exc. 26-70



O.R.S.D. 2<sup>nd</sup> Main Pipe Line

Pipe measured in place in trench.

All measurements are on top of pipe.

0+00 = sta. 855+12<sup>65</sup> End of steel. lines



1+72<sup>65</sup> = sta. 853+73<sup>1±</sup> change thickness

1+72<sup>65</sup> = sta. 853+53<sup>±</sup>



5+29<sup>65</sup> = sta. 849+96<sup>±</sup>

9+10<sup>72</sup> = sta. 846+22<sup>±</sup> change thickness



Special A sta. 852+10<sup>±</sup>; Length = 27<sup>50</sup>

Special A sta. 849+95; Length = 34<sup>25</sup>

Special A sta. 848+68<sup>±</sup>; Length = 5<sup>90</sup>

3/16

3

1678<sup>82</sup> = sta. 838+80<sup>±</sup> change thickness

1714<sup>15</sup> = sta. 838+11<sup>5±</sup>

1921<sup>15</sup> = sta. 836+20<sup>9±</sup>

2100<sup>15</sup> = sta. 834+93<sup>±</sup>

2616<sup>15</sup> = sta. 829+29<sup>±</sup>

1/4

3440<sup>09</sup> = sta. 821+10<sup>50</sup>

3644<sup>22</sup> = sta. 819+10<sup>5±</sup> change thickness

3859<sup>71</sup> = sta. 816+93<sup>±</sup>

3/16

4129 <sup>31</sup> = sta 814 + 25<sup>±</sup> change thickness

3/16"



1/4"

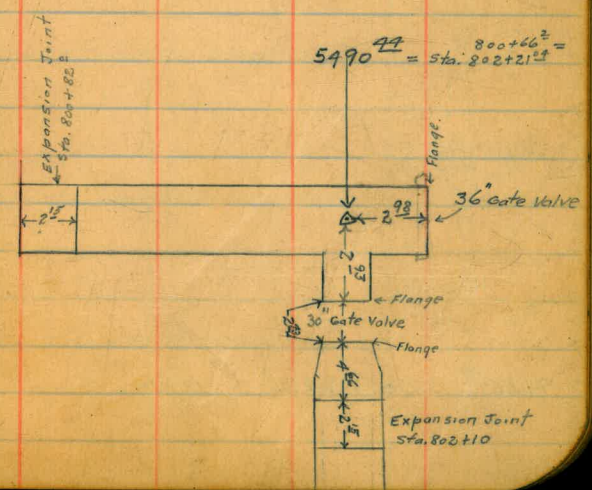


5138 <sup>44</sup> = sta. 804 + 17<sup>±</sup> change thickness

5429 <sup>94</sup> = sta. 801 + 30<sup>±</sup>

5490 <sup>44</sup> = sta. 800 + 66 <sup>20</sup> / 21<sup>±</sup> =

Note: All measurements on top of pipe are continuous, Gate valves, Expansion Joints, etc. not omitted.



3/16"

5524<sup>14</sup> = sta. 801+87<sup>7±</sup> (6/2/30)

Special sta. 801+27<sup>5</sup>



excav. = 2<sup>7</sup> x 4<sup>5</sup> x 5<sup>0</sup>

Special A sta. 792+81; length = 22<sup>85</sup>

3/16"

8009<sup>69</sup> = sta. 777+20<sup>±</sup> (6/2/30)

Special A sta. 769+50; length = 5<sup>22</sup>



Special A sta. 768+64; length = 18<sup>35</sup>



9456<sup>19</sup> = sta. 762+57<sup>±</sup> (6/5/30)

Special A sta. 767+75; length = 11<sup>62</sup>





3/16"



1/4"



3/16"

9815<sup>70</sup> = sta. 759+02<sup>±</sup> change Thickness

10,270<sup>90</sup> = sta. 754+52<sup>±</sup> (6/7/30)

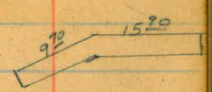
10815<sup>30</sup> = sta. 749+20<sup>±</sup> change Thickness

11,432<sup>80</sup> = sta. 743+10<sup>±</sup> (6/10/30)

Special A sta. 754+37<sup>67</sup>; Length = 20<sup>80</sup>



Special A sta. 748+54<sup>±</sup>; Length = 25<sup>60</sup>

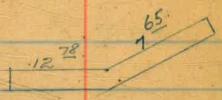


3/16"

.12,996<sup>10</sup> = sta. 727+54<sup>±</sup> (6/13/30)

13877<sup>86</sup> = sta. 718+79<sup>±</sup> (6/14/30) change thickness

Special A at sta. 718+95<sup>±</sup>



Total length = 20<sup>±</sup>

14,077<sup>80</sup> = sta. 716+83<sup>±</sup> 6/16/30

1/4"

14,381<sup>28</sup> = sta. 713+88<sup>±</sup> 6/19/30 change thickness

3/16"

15908<sup>28</sup> = sta. 698+70<sup>±</sup> 6/19/30

16,102<sup>88</sup> = sta. 696+78<sup>±</sup> change thickness

17,470<sup>18</sup> = sta. 683+18<sup>±</sup> (6/21/30)

17,590<sup>13</sup> = sta. 682+00<sup>±</sup> change thickness

3/16"

1/4"

5/16"

Special A sta. 691+00



Total length = 12<sup>12</sup>

Special A sta. 680+17<sup>5</sup>



total length = 30<sup>08</sup>

17,799<sup>38</sup> = Sta. 679+90<sup>±</sup> change Thickness



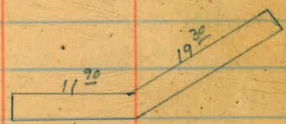
18,352<sup>38</sup> = Sta. 674+97<sup>±</sup> change Thickness (6/24/30)



19,418<sup>38</sup> = Sta. 663+90<sup>±</sup> (6/6/30)

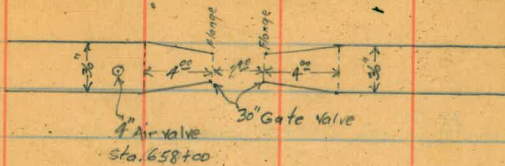
3/16

Special A Sta. 671+02<sup>±</sup>



Total length = 31<sup>20</sup>

Expansion Joint Sta. 658+37 = Total length = 2<sup>18</sup>

30" Gate Valve - sta. 657+93<sup>±</sup>Expansion Joint - sta. 657+20<sup>±</sup> = Length = 2<sup>±</sup>20,390<sup>18</sup> = Sta. 654+23<sup>±</sup> (6/28/30)20,629<sup>78</sup> = Sta. 652+10<sup>±</sup> 6/28/3020,884<sup>95</sup> = Sta. 649+78<sup>±</sup> 6/28/3022,117<sup>85</sup> = Sta. 636+96<sup>±</sup> (6/28/30)22,602<sup>35</sup> = Sta. 632+12<sup>±</sup> 6/30/30

3/16

23,103<sup>88</sup> = sta. 627+11<sup>f</sup> change thickness



Special A Sta. 610+16<sup>67</sup>



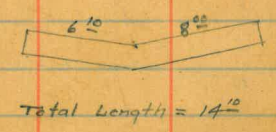
24,049<sup>38</sup> = sta. 617+73<sup>5</sup> = Change Thickness



Special A Sta. 616+25<sup>5</sup>



Special A Sta. 615+79<sup>4</sup>



24,865<sup>88</sup> = Sta. 609+75<sup>±</sup> (7/2/30)

1334<sup>82</sup>

Note: Distances From Here on,  
are individual Distances, not Total  
distance from Beginning as shown Before.

= Sta. 596+55<sup>±</sup> change thickness

658<sup>22</sup>

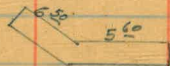
= Sta. 590+08<sup>+</sup> change thickness

3/16"

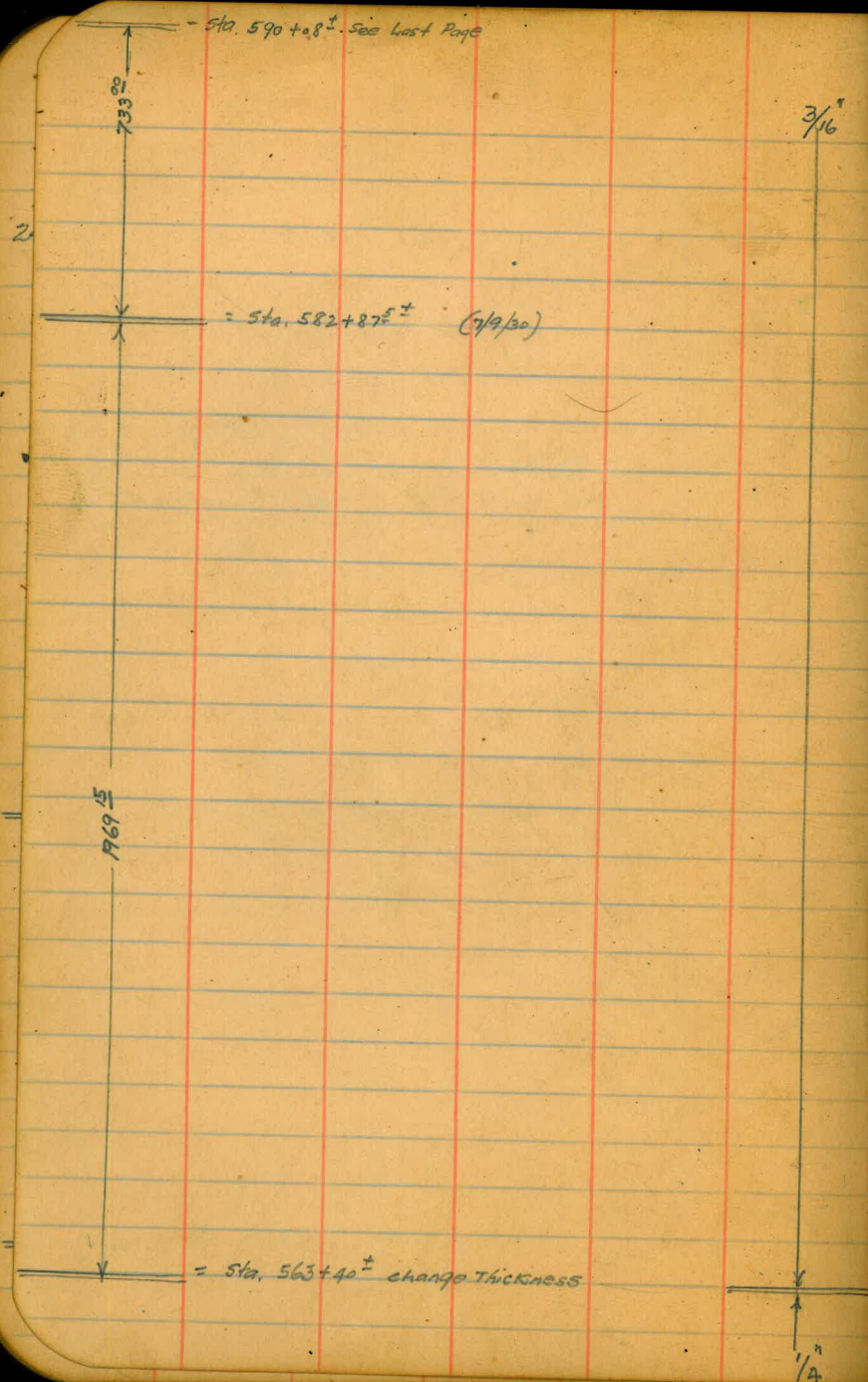
1/4"

3/16"

special A Sta. 608+10



Total Length = 12<sup>10</sup>



special A sta. 576 + 98<sup>86</sup>



Total Length = 22<sup>±</sup>

special A sta. 576 + 65<sup>91</sup>



Total Length = 27<sup>98</sup>



= sta. 563+40<sup>±</sup> see Last Page

459.35

$\frac{1}{4}$ "

14

= sta. 558+90<sup>±</sup> = change thickness

795.02

$\frac{3}{16}$ "

= sta. 551+11<sup>±</sup> = change thickness

1451.90

$\frac{1}{4}$ "

= sta. 536+65<sup>±</sup> = change thickness  
(7/19/30)

$\frac{3}{16}$ "

Sta. 536+65<sup>±</sup> see Last Page

149.22

Tar

Sta. 535+18<sup>±</sup> Change Thickness

571.19

Sta. 529+83<sup>±</sup> Change Thickness

705.67

Sta. 522+96<sup>±</sup> Change Thickness

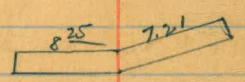
3/16"

1/4"

5/16"

1/4"

Special @ Sta. 523+50<sup>±</sup>



Total Length = 15'46"

Special @ Sta. 523+0<sup>±</sup>



Total Length = 12'63"

= sta. 522+96± see Last Page

276.40

1/4"

= sta. 520+10± change thickness

718.70

5/16"

= sta. 512+98± change thickness

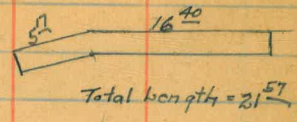
179.84

1/4"

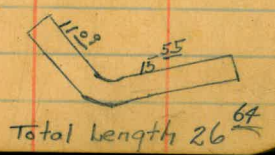
= sta. 511+18± change thickness

5/16"

special A sta. 522+34±



Special A sta. 508+93±



= Sta. 511 + 18<sup>±</sup> - See last Page

2049.60

5/16

= Sta. 490 + 90<sup>±</sup> (2/25/20)

59.80

= Sta 490 + 30<sup>±</sup> Change thickness

3/8

Special A Sta. 505 + 52<sup>±</sup>



Total length = 23<sup>16</sup>

Special A Sta 469 + 35<sup>±</sup> length 23<sup>30</sup>  
 " " " 469 + 95<sup>±</sup> " 10<sup>87</sup>

Sta 490+30<sup>±</sup>

See last page

2890<sup>97</sup>

$\frac{3}{8}$

Special Δ Sta = 469+95

Sta 461+62<sup>±</sup>

Change thickness

$\frac{5}{16}$

Special Δ Sta = 469+36

1148<sup>53</sup>

$\frac{5}{16}$

Sta 450+22<sup>±</sup> Change Thickness

$\frac{1}{4}$

1/4"

Sta. 450 + 22<sup>±</sup> see last Page

1036.79

36" pipe

Sta. 439 + 92<sup>±</sup> change thickness

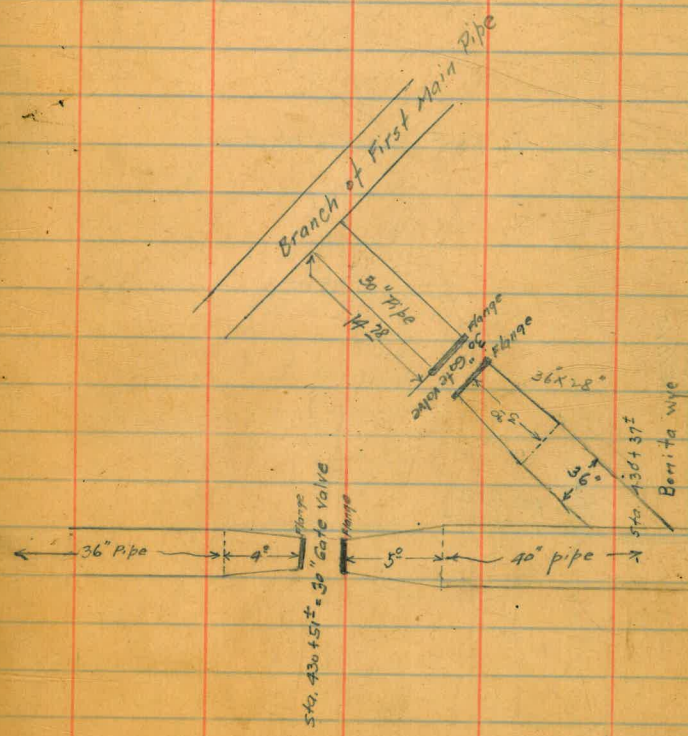
Note: Distances here are continuous on Main Pipe  
For distances on Bonita  
"Wye" Branch see sketch on opp. Page

948.83

Sta. 430 + 45<sup>±</sup> = Beginning of 40" pipe

3 1/4"

40" pipe



$\frac{3}{16}$ "

Sta. 430+45<sup>±</sup> see last Page

40"

45.00

1930.67

7/8"

Expansion Joint - Sta. 429+69<sup>±</sup>

Sta. 411+20<sup>±</sup> = change Thickness

$\frac{1}{4}$ "

621.82  
591.90

Sta. 405+33<sup>±</sup>  
= Sta. 405+04<sup>±</sup> = change Thickness

$\frac{5}{16}$ "

405+33<sup>±</sup>Sta 405+04<sup>±</sup> - change Thickness772.15  
772.15

5/16"

Special A 402+88<sup>±</sup>Sta 397+84<sup>±</sup> - change Thickness314.20  
314.20

1/4"

Special A 400+40<sup>±</sup>394+80<sup>±</sup>Sta 395+10<sup>±</sup> - change Thickness

3/16"

328.65  
328.65Sta 362+04<sup>±</sup> - change Thickness

1/4"



Sta 362+04 = change Thickness

137.65

1/4"

Special A Sta 361+59

Sta 360+68 = Change Thickness

↓

Special A Sta 361+16

824.50

3/16"

Sta 352+53 = change Thickness

↓

1/4"

Special A 350+85+

205.95

Sta 350+50 = Change Thickness

↓

Sta. 350+50 = Change Thickness

606.95

$\frac{3}{16}$ "

Sta. 344+53 = Change Thickness

228.75

$\frac{1}{4}$ "

Sta. 342+25 = Change Thickness

567.91

$\frac{3}{16}$ "

Sta. 330+74 = Change Thickness

$\frac{1}{4}$ "

Sta 330+74 = Change Thickness

257.95

1/4"

Special A Sta 329+29

Sta 328+22 = Change Thickness

974.05

3/16"

Sta 318+55 = Change Thickness

587.70

1/4"

Special A Sta 314+00

Sta 312+73 = Change Thickness

Sta 312+73 = Change Thickness

149.80

3/16"

Sta 311+24 = Change Thickness

226.40

1/4"

Special A 309+88

Sta 309+06 = Change Thickness

3/16"

8/14/30

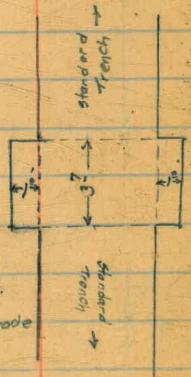
1094.12

3/16"

= 298+20 ± - change Thickness

Expansion Joint = 307+24 ±

6" Deep.  
2" Below Grade



extra excavation at Expansion Joint

= sta. 298+20<sup>±</sup>

1126<sup>73</sup>/<sub>4</sub>  
Thru Tunnel

= sta. 286+98<sup>±</sup> change thickness

275<sup>90</sup>/<sub>4</sub>

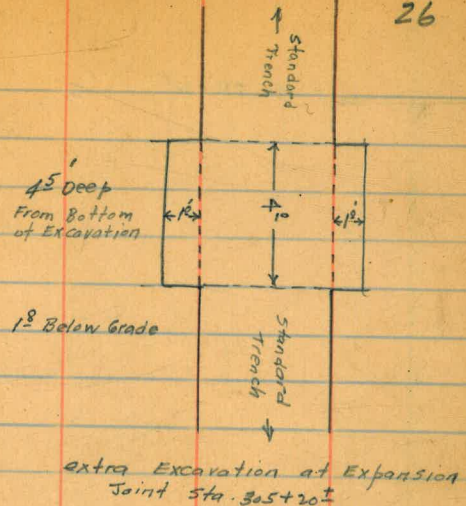
= sta. 284+22<sup>±</sup>

586<sup>79</sup>/<sub>4</sub>

= sta. 278+36<sup>±</sup>

1/4

3/16



Special D sta. 286+17<sup>56</sup>/<sub>4</sub>

= sta. 272+36<sup>±</sup>

2427.86

= sta. 254+40<sup>±</sup> (8/19/50)Special A sta. 275+80<sup>±</sup>Special A sta. 275+10<sup>±</sup>Special D sta. 270+80<sup>±</sup>Special D sta. 265+15<sup>±</sup>Special A sta. 269+85<sup>±</sup>Special D sta. 255+40<sup>±</sup>Special A sta. 255+10<sup>±</sup>

3/16"

28

sta. 254+40±

52  
2092

sta. 233+52± (8/22/30)

596  
30

sta. 227+56± (8/21/30)

Y

3/16"

= 227 + 56 ±

30"

= 227 + 26 ± (9-16-30)

313 70'

224 + 31 ±

change thickness

1916.75
147
1931.50

180
147.5
165.25

1931 50'  
Thru Tunnel #3

= sta 205 + 00 ±

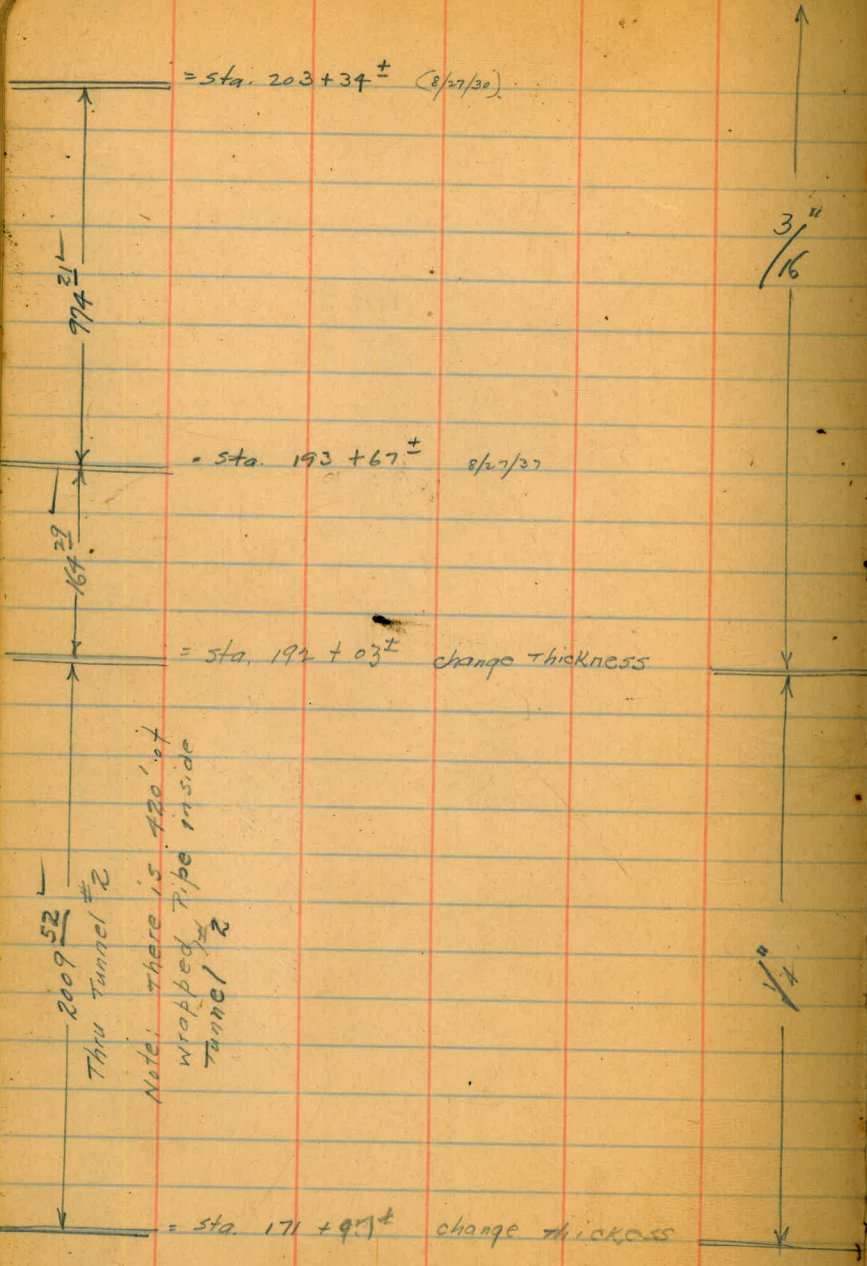
165 25'

= sta. 203 + 34 ± see next page

1/4"

3/16"





= sta. 171+97<sup>±</sup> see last Page

4 13/16"

3 1/16"

= sta. 167+84<sup>±</sup> see notes two  
Pages ahead



← Sta. 167+84<sup>±</sup> - change thickness

222 1/4  
Thru Tunnel #1

Note: There is 120' of  
wrapped pipe inside  
Tunnel #1

← Sta. 145+70<sup>±</sup> change thickness

59 8/2

← Sta. 145+11<sup>±</sup>

1/4

3/16

← Special a Sta. 145+48<sup>±</sup> Length = 17<sup>1/2</sup>

Sta. 145+11<sup>±</sup> (9/7/30)

1682<sup>±</sup>

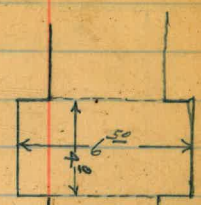
Sta. 128+35<sup>±</sup> 8/27/30

805<sup>±</sup>

Sta. 120+32<sup>±</sup> (8/7/30)

3"  
16

Extra Excavation at  
Expansion Joint Sta. 136+94<sup>±</sup>



4' Deep  
1.5 Below  
Grade

Extra Excavation at 6" valve for connection to  
Coronado Line, Sta. 135+88<sup>±</sup>; measures 2'x2'x1'

36' Gate Valve Sta. 135+81<sup>±</sup>

Extra excavation at Gate Valve = Left Side = 4' x 4' x 1.5'  
Rt. Side = 6' x 0' x 4'  
Bottom = 0' x 3' x 5'  
Total C.Y. = 2.7

Extra excavation at 6" valve for connection to Coronado line  
measures 1'x1'x1' Sta. 135+65

Extra excavation at expansion joint at  
Sta. 134+50 measures 1'x4'x6'

Special A Sta. 119+95 - Length = 18<sup>±</sup>

3/16

35

= Sta 120+32<sup>±</sup>



114/50



= Sta 109+03<sup>±</sup> (9/5/30)

202/40



= Sta 106+08<sup>±</sup> change thickness

280/35

= Sta 103+83<sup>±</sup> change thickness

1/4

Special A = Sta 119+50 = Length = 11<sup>90</sup>

Special A = Sta 110+14<sup>86</sup> = Length = 26<sup>85</sup>

Special A = Sta 105+40 = Length = 28<sup>50</sup>

Special A = Sta 104+62<sup>±</sup> = Length = 29<sup>40</sup>

= Sta. 103+83<sup>±</sup> see Last Page

96  
1046

= Sta. 93+58<sup>±</sup>

82  
15

= Sta. 92+75<sup>±</sup>

31  
116

Special A = Sta. 98+75<sup>±</sup> Length = 33<sup>30</sup>

Special B = Sta. 98+75<sup>±</sup> Length = 22<sup>90</sup>

Special C = Sta. 93+58<sup>±</sup> Length = 10<sup>40</sup>

Special D = Sta. 92+80 Length = 8<sup>92</sup>

= sta. 72+75<sup>±</sup>

1088

= sta. 82+04<sup>±</sup> 9/9/30

1013 73

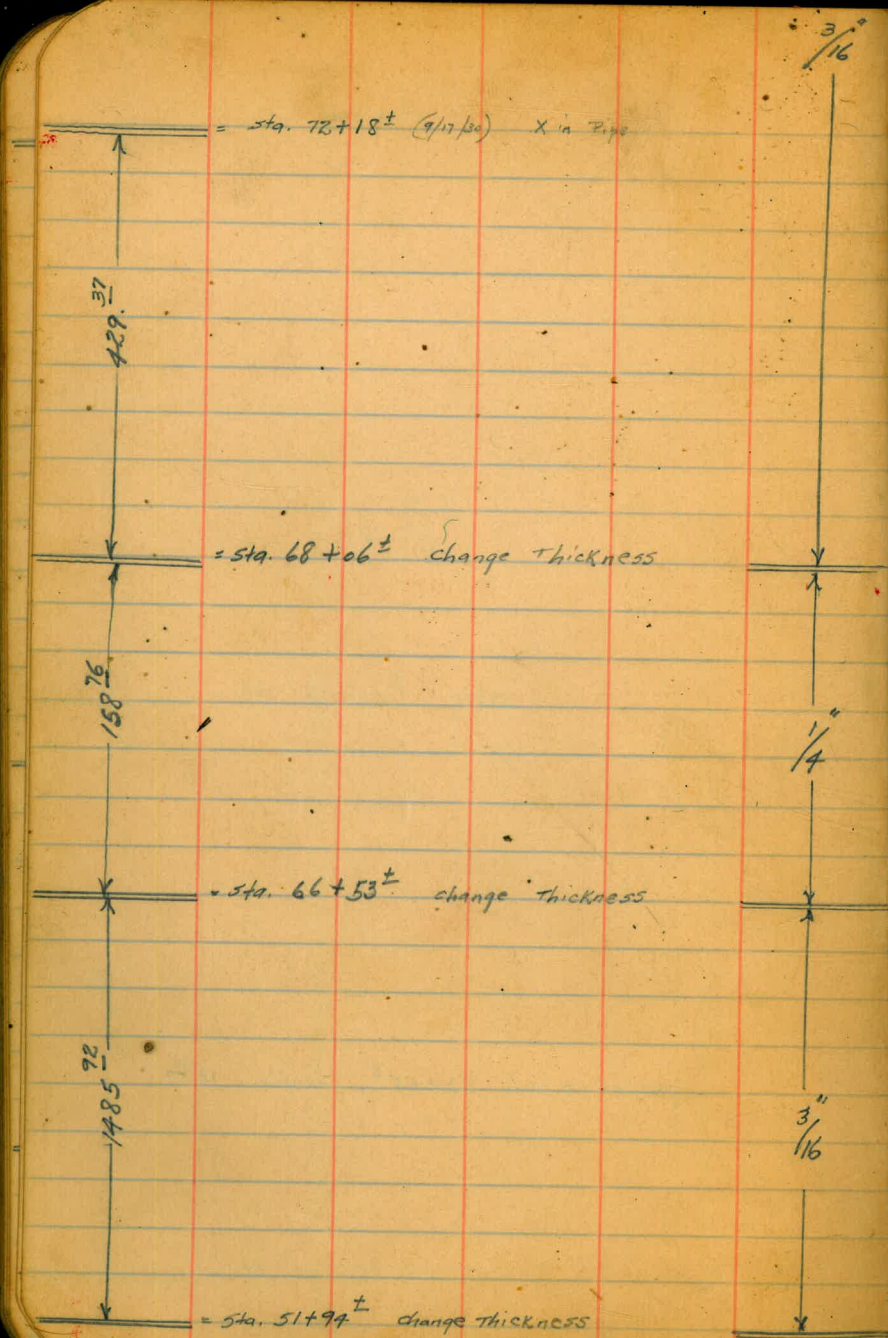
= sta. 72+18<sup>±</sup> (9/25/30)

3  
16

7.75  
38  
108.77

special 0 sta. 72+55<sup>±</sup>, length = 18<sup>33</sup>





special @ sta. 71+80<sup>±</sup> Length = 15<sup>75</sup>

special @ sta. 71+00<sup>±</sup> Length = 18<sup>00</sup>

special @ sta. 70+67<sup>±</sup> " = 16<sup>50</sup>

special @ sta. 69+53<sup>±</sup> Length = 12<sup>00</sup>

special @ sta. 67+70<sup>±</sup> Length = 21<sup>00</sup>

" " " 66+86 " = 17<sup>90</sup>

special @ sta. 60+78<sup>±</sup> Length = 20<sup>60</sup>

" " " 60+15<sup>±</sup> " = 17<sup>30</sup>

" " " 59+50<sup>±</sup> " = 17<sup>97</sup>

Sta. 51+94<sup>±</sup> see last page

87  
130.5

Sta. 39+05<sup>±</sup> change thickness

1063<sup>50</sup>

Sta. 28+62<sup>±</sup> (9/22/30)

691<sup>70</sup>

Sta. 21+86<sup>±</sup> change thickness

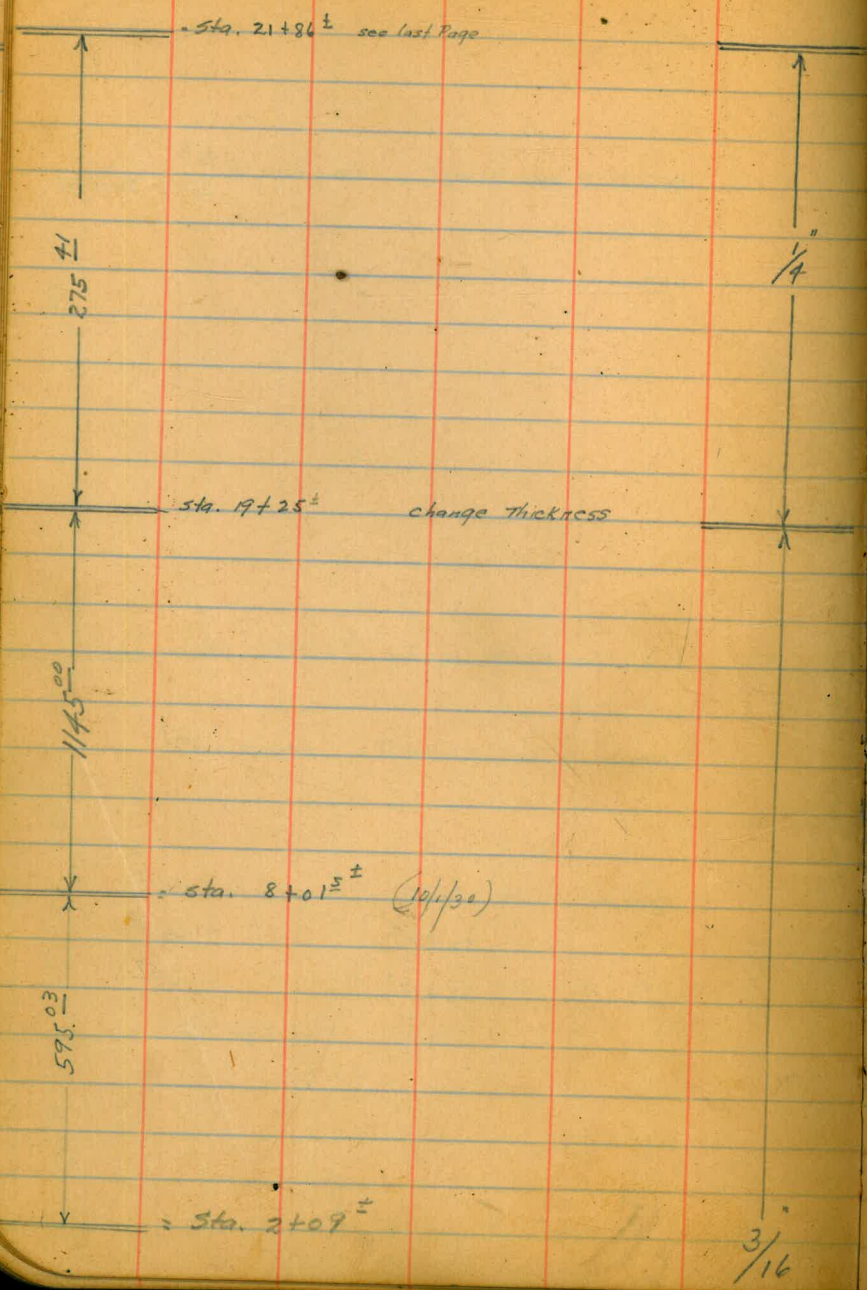
1/4

3/16

special D sta 41+85 length = 16<sup>30<sup>±</sup></sup>  
Joints Bonded

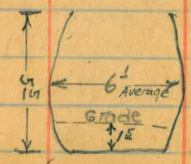
Special D sta 37+47<sup>50</sup> length = 18<sup>50</sup>

Special D sta. 33+50 length = 26<sup>10</sup>  
" " " 32+90<sup>±</sup> " = 26<sup>35</sup>  
" " " 32+17<sup>±</sup> " = 4<sup>57</sup>



Special A Sta. 22+98 ± Length = 17 <sup>30</sup>/<sub>16</sub>  
 special A Sta. 20+80 ± Length = 21 <sup>32</sup>/<sub>16</sub>  
 " " " 20+23 Length = 29 <sup>11</sup>/<sub>16</sub>

Dressler Coupling Sta. 6+22 ±  
 Excavation = Sta. 6+20 to Sta. 6+24 ±



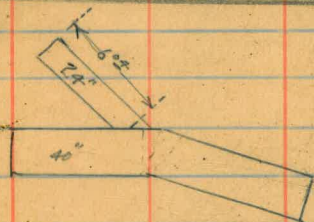
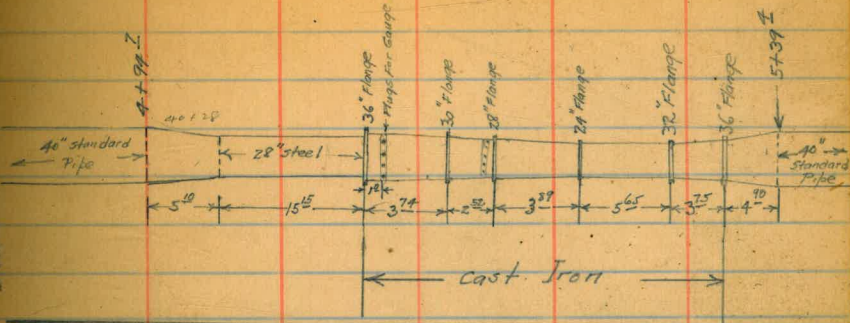
Sta. 2+09<sup>±</sup> see last Page

93<sup>18</sup>

Sta. 1+17<sup>±</sup> - End of Special Wre

# Location And Measurements of Venturi Meter

41



Total length = 17<sup>9/16</sup>

Special A Sta. 1+26<sup>±</sup>  
with Wre 1+08<sup>±</sup>























52





54



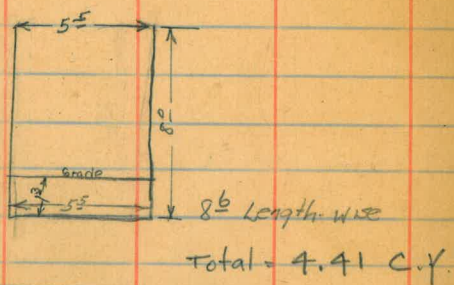




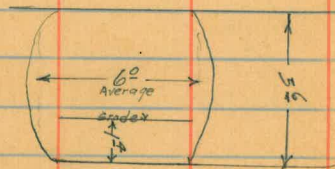


10/6/30

Structure excavation at Anchor  
 10' west of P.I. Sta.  $\frac{802+21.05}{800+66.20} =$



Structure excavation at Anchor  
 Sta. 802+10.



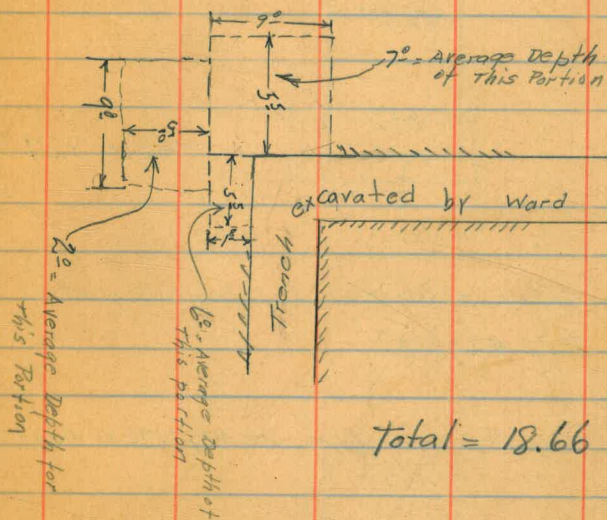
6' length wise  
 this also includes excava.  
 for Expan Joint.

total = 3.27 C.Y.

59

Structure excavation at Gate valve

Sta.  $\frac{802+21.05}{800+66.20} =$



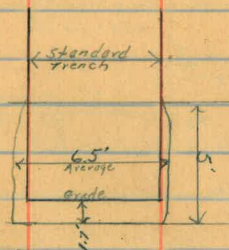
total = 18.66 C.Y.

8-11-30

Bliss  
Jacobzoon

Extra excavation Expansion Joint  
at Sta 430+88"

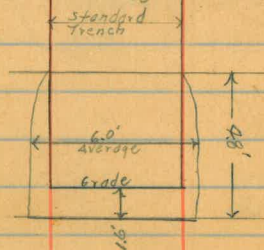
Extra excavation from 430+84 to 430+90



total = <sup>3.55</sup> 3.57 C.Y.

Extra excavation at expansion joint  
Sta 429+69"

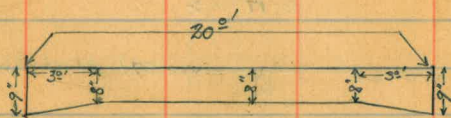
Extra excavation from Sta 429+67.2 to 429+71.2



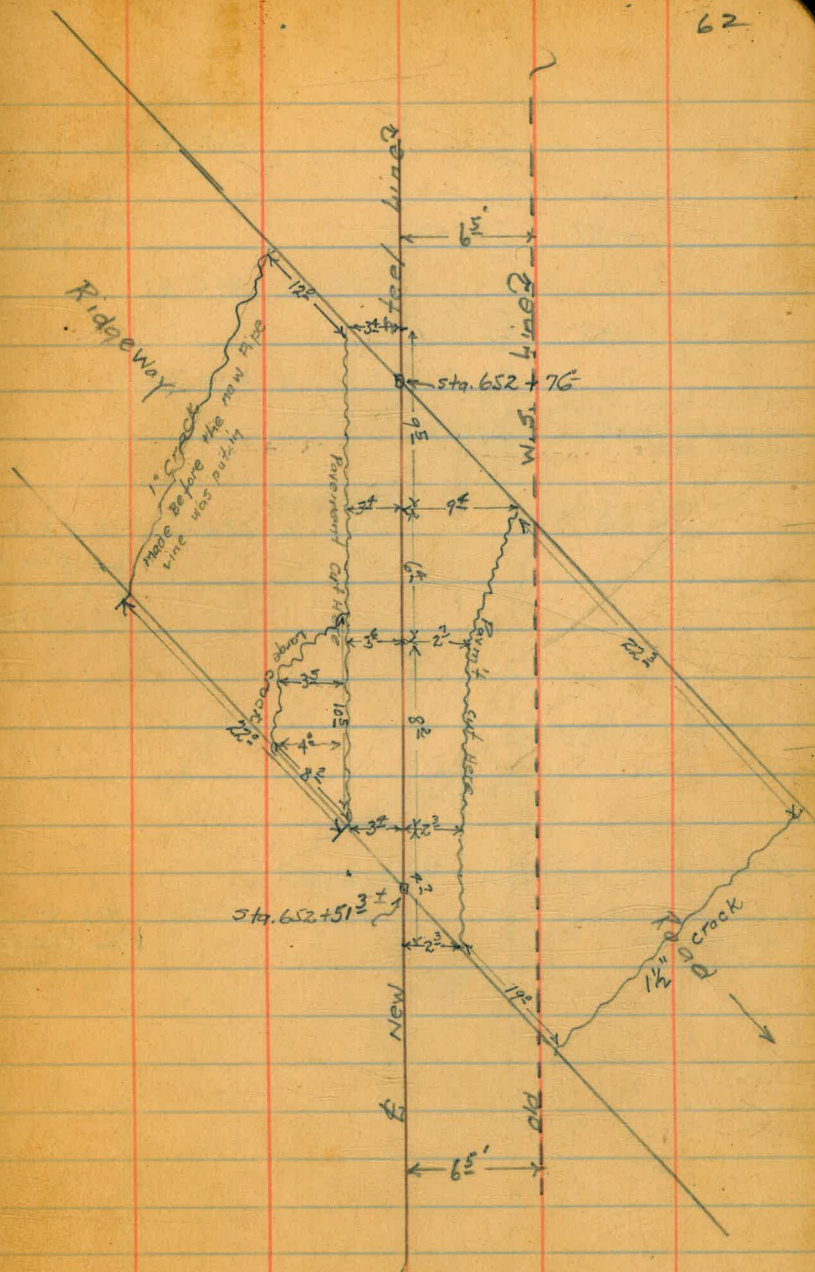
Total 2.09 C.Y.

60

section of Permit



62





0.39 269.73

0.28 257.09

1.05 245.38

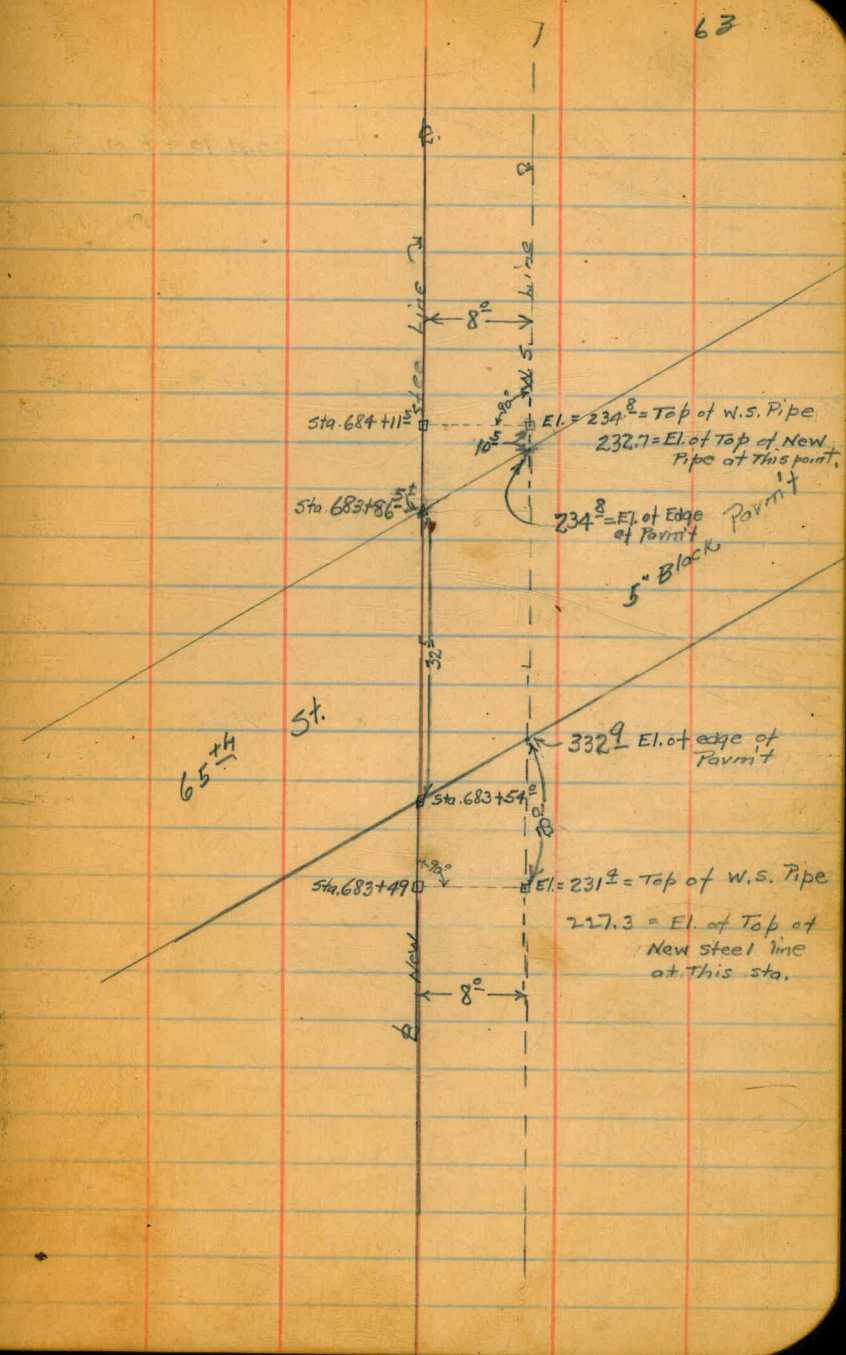
13.12 256.81

12.76 244.33

10.6 234.8 = Top of W.S. Pipe 25' North of north edge of Pavmt

14.0 231.9 = Top of W.S. Pipe 5' South of south edge of Pavmt

269.54 = B.M. # 110  
Top A.V.  
Sta. 688 + 63



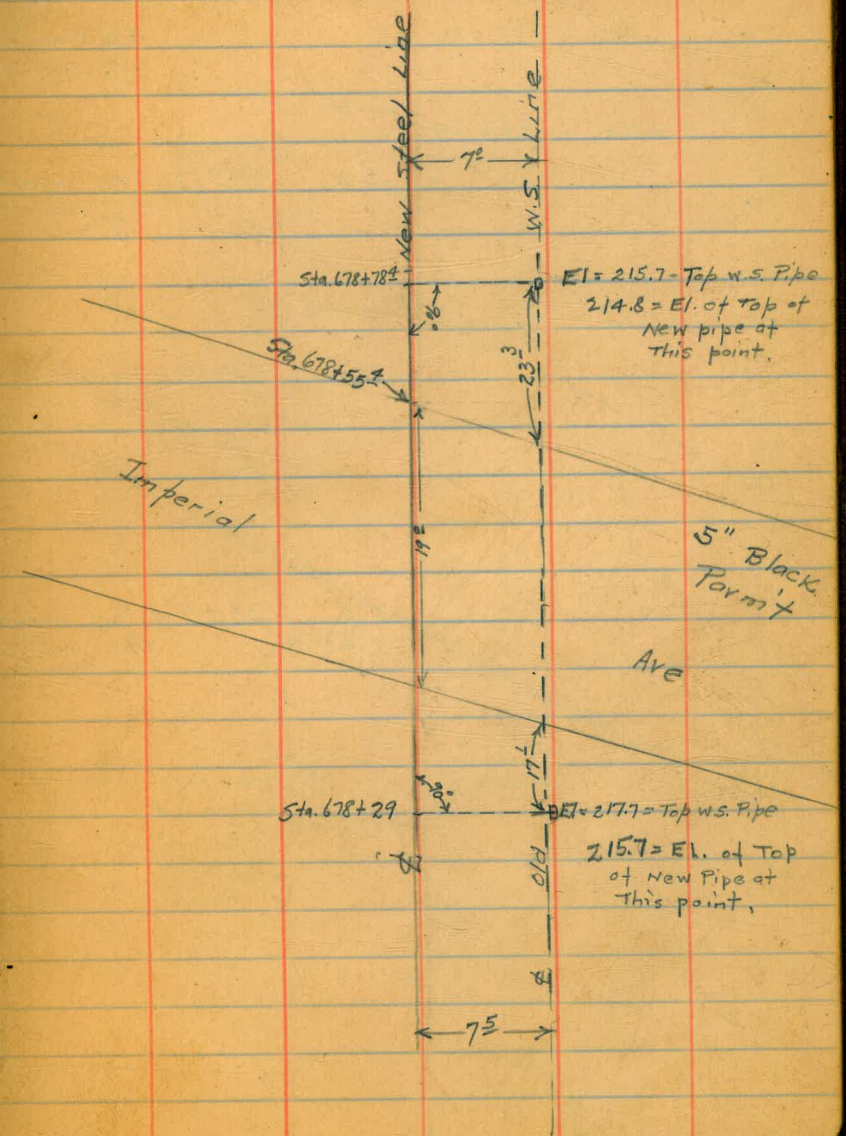
6794 15 6  
60  
678 55

2.43 224.53

222.10 = B.M. Nail  
in Pepper  
Tree Sta.  
678+25

6.8 217.7 = Top w.s.  
Pipe 7' south  
of south  
edge Pavmt

8.8 215.7 = Top of w.s.  
Pipe 23' North  
of North edge  
of Pavmt



334.43 = B.M. #112

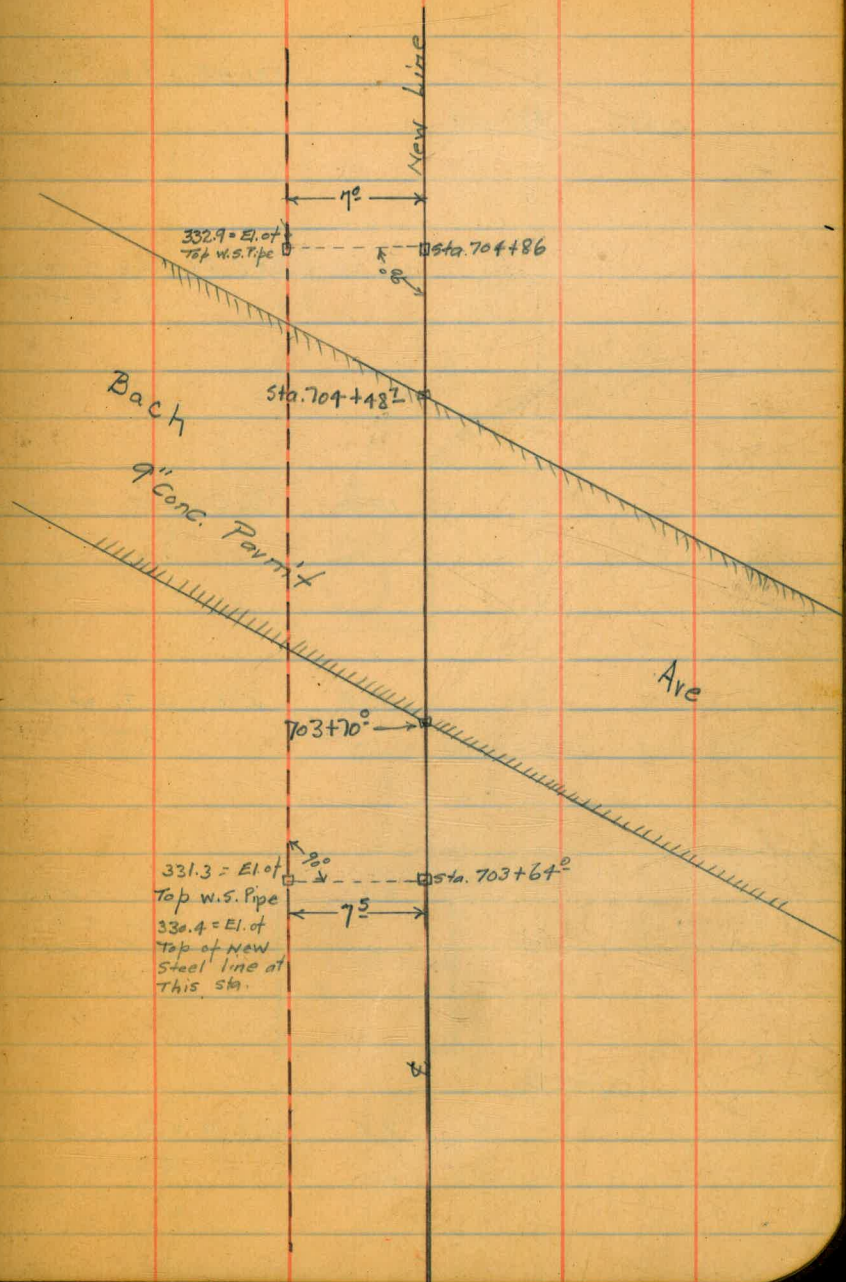
Top Fire Plug  
63<sup>rd</sup> + Bach ave

3.60 338.02

6.7 331.3 = Top of W.S.  
Pipe 5' south  
of Permit

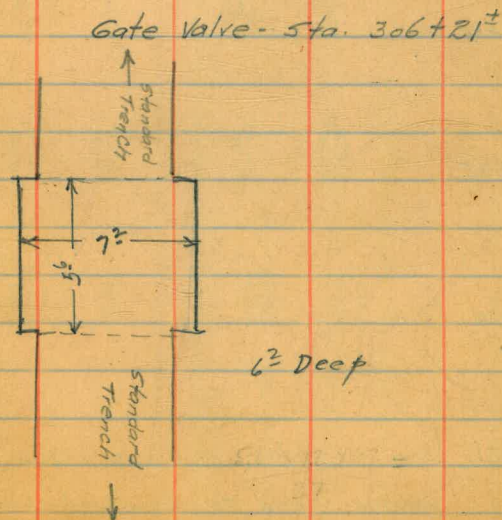
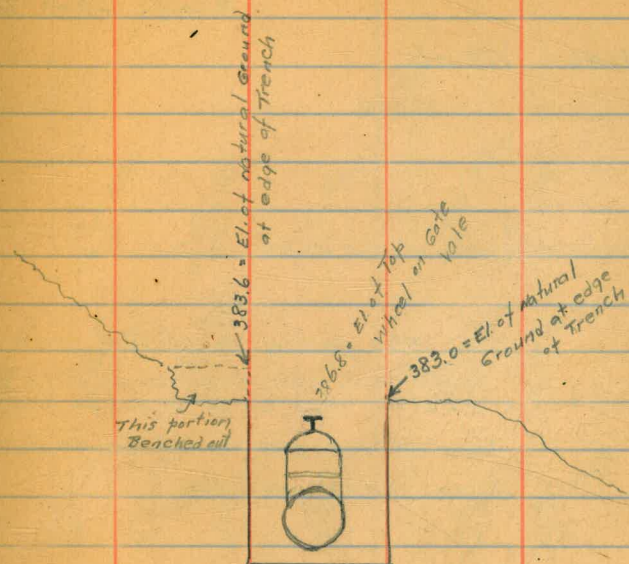
7.6 330.4 = Top of New  
Steel Line  
South of Permit

5.1 332.9 = Top of W.S.  
Pipe North  
of Permit



0.61 392.09

391.98 = B.M. #56

5.28 386.81 = Top of wheel  
of Gate Valve15.4 376.7 = El. of Bottom  
of excavation  
underneath  
Gate Valve14.0 378.1 = El. of Grade  
3' west of Gate  
Valve8.5 383.6 = El. of Natural  
Ground on  
left edge of  
Trench9.1 383.0 = El. of Natural  
Ground on  
Right edge  
of Trench.

X-Sections of extra Portion  
 To be Back-filled thru cut  
 sta. 741+39 to sta. 742+31

8/8/30  
 S. Simpson  
 Jacobszoon  
 Lecky  
 Remmen

374.60 = B.M. #116

4.46 379.06

741+39 standard trench at this point

741+42

Note: This portion backfilled over  
 old 36" w.s. pipe, exposed by City  
 forces on account of Break in w.s. pipe  
 Area of w.s. pipe should be deducted  
 from total yardage

741+65

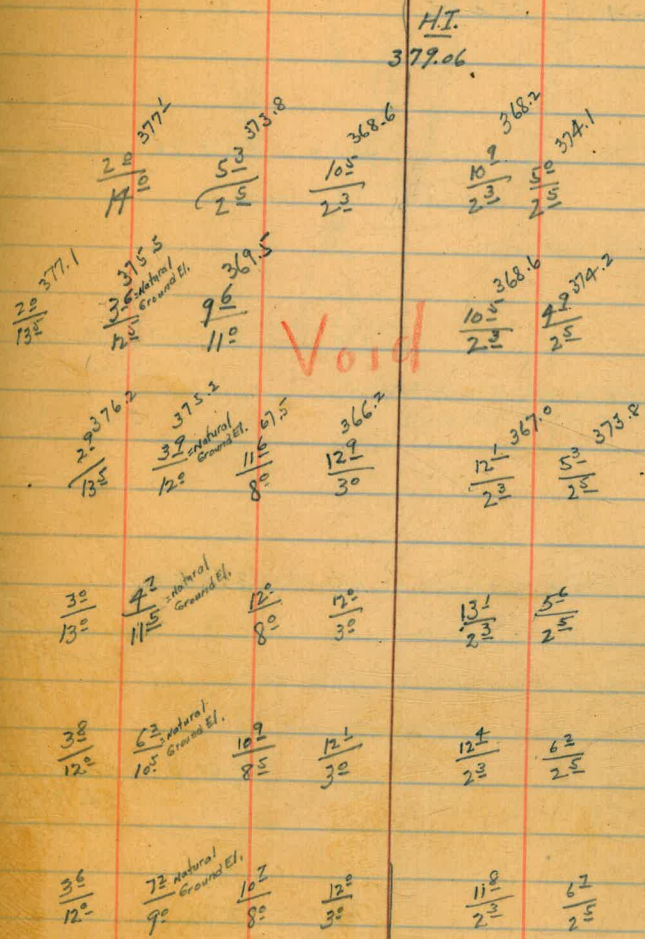
Void

741+80

741+95

742+10

742+31 End of Portion that was cored off on South Side  
 comes back to standard trench at this point.



Elevations and special excavation  
at Gate valve sta. 657+93

8/8/30  
Simpson  
Jacobszoon  
Lecky  
Remmon

68

0.70 354.90

354.20 = B.M. # 105

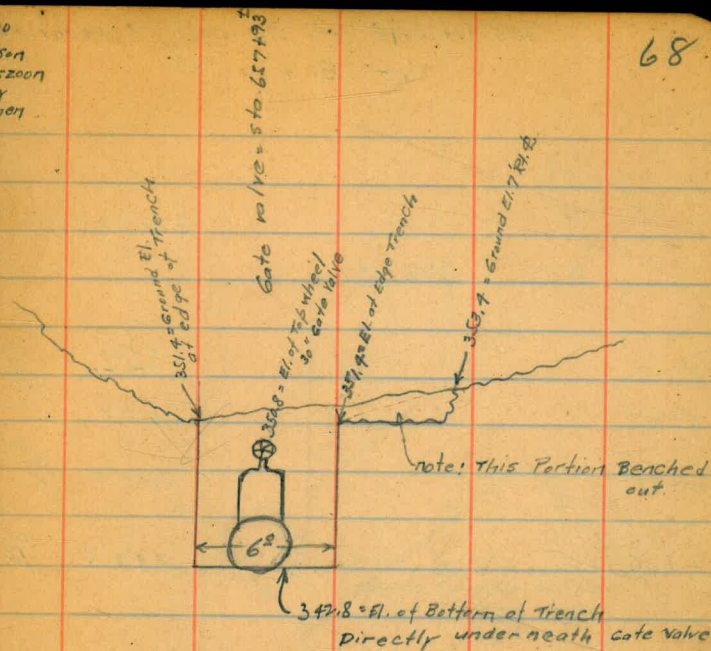
4.10 350.80 = Top of  
Wheel of 30"  
Gate Valve

3.5 351.4 = Natural  
Ground El.  
on left  
Side of Trench

1.5 353.4 = Natural  
Ground El. 7'  
Rt. of  $\frac{1}{2}$  of  
Trench

3.5 351.4 = Ground El.  
2  $\frac{1}{2}$  Rt. of  $\frac{1}{2}$   
Trench

12.1 342.8 = Bottom of  
Trench directly  
underneath  
The Gate Valve



Note: The Trench is excavated 6' wide at the Gate valve and along the  $\frac{1}{2}$  9.5 Ft. This special excavation is only excavated 2' Above the Bottom of the Trench

X sections of special excavation  
at Bonita Wre

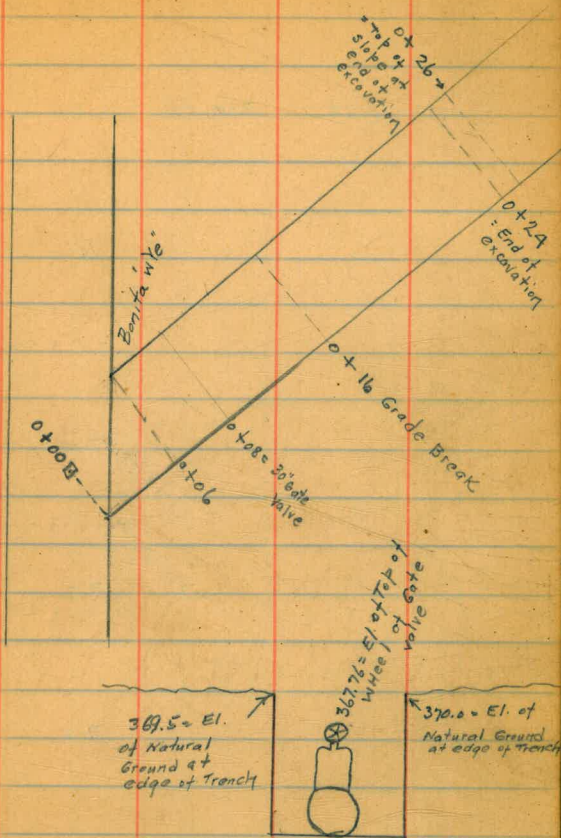
8/8/30  
Simpson  
Jacobszoon  
Weeky  
Remmon

69

373.93 = B.M. # 71

0.26 374.19

Station	Description	Elev.	Notes
0+00		359.9	
0+07.5		360.0	
0+06	Bottom of Beginning of extra excavation for Gate Valve	358.5	
0+10	End of extra excavation for Gate Valve on Side Parizealy	358.7	underneath Gate Valve
0+11		358.7	
0+13		358.8	underneath Gate Valve
0+14		360.0	
0+21		362.5	
0+24		364.9	
0+25		369.0	Top of Natural Ground at End of excavation



Extra excavation at Gate Valve  
Sta. 430+51<sup>2</sup>

70

373.93 = B.M. # 71

0.26 374.19

16.0 358.2 = Ground El.  
Bottom of  
Extra excavation  
underneath Gate  
valve.

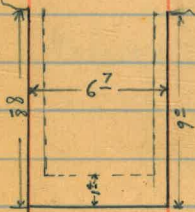
7.0 367.2 = Top of Wheel  
of Gate valve

7.2 367.0 = Top of edge  
of Trench on  
Rt side

7.0 367.2 = Top of edge  
of Trench on  
Left side

14.6 359.6 = El. of original  
Grade under the  
valve

Excavation at Bottom  
measures 5<sup>5</sup> X 6<sup>7</sup>





List of Special A in Pipe.

$852+10 \Delta \checkmark$

$620+16^{67} \Delta$

$849+95 \Delta \checkmark$

$616+25^{59} \Delta$

$848+68 \Delta \checkmark$

$608+10^{\circ} \Delta$

$792+81^{\circ} \Delta \checkmark$

$576+98^{86} \Delta$

$769+50^{\circ} \Delta \checkmark$

$576+65^{91} \Delta$

$754+37^{67} \Delta \checkmark$

$748+54^{65} \Delta \checkmark$

$718+45^{03} \Delta \checkmark$

$691+00^{00} \Delta \checkmark$

$680+17^{50} \Delta \checkmark$

$679+52^{31} \Delta$  No special Here

$671+02^{\text{E}} \Delta \checkmark$

List of stations where change  
in thickness in pipe.

814+25 ✓ 1/4	596+95 3/16
804+17 ✓ 3/16	590+12 1/4
758+95 ✓ 1/4	563+70 3/16
749+25 ✓ 3/16	558+92 1/4
718+80 ✓ 1/4	551+50 ✓ 3/16
714+20 ✓ 3/16	536+35 1/4
696+85 ✓ 1/4	535+25 3/16
681+70 ✓ 5/16	529+85 1/4
679+75 ✓ 1/4	522+82 5/16
674+58 ✓ 3/16	
626+58 627+00 1/4	
618+82 618+00	

72

Ent. #1	145+97 <sup>06</sup>	
Exit #1	167+61 <sup>06</sup>	389 7 2723
Ent. #2	172+09 <sup>50</sup>	
Exit #2	192+17 <sup>50</sup>	
Ent. #3	205+29 <sup>66</sup>	
Exit #3	229+16 <sup>66</sup>	

DIRECTIONS FOR USE OF TABLES

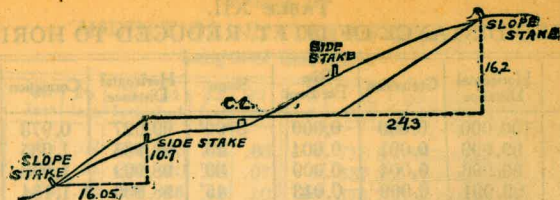
TABLE No. 1.

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

IMPROVED TABLES  
AND  
INFORMATION

TABLE No. 2.

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



DISTANCES FROM SIDE STAKES FOR CROSS-SECTIONING.

SLOPE 1 1/2 TO 1. ROADWAY OF ANY WIDTH.

	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	
0	0 00	0 15	0 30	0 45	0 60	0 75	0 90	1 05	1 20	1 35	0
1	1 50	1 65	1 80	1 95	2 10	2 25	2 40	2 55	2 70	2 85	1
2	3 00	3 15	3 30	3 45	3 60	3 75	3 90	4 05	4 20	4 35	2
3	4 50	4 65	4 80	4 95	5 10	5 25	5 40	5 55	5 70	5 85	3
4	6 00	6 15	6 30	6 45	6 60	6 75	6 90	7 05	7 20	7 35	4
5	7 50	7 65	7 80	7 95	8 10	8 25	8 40	8 55	8 70	8 85	5
6	9 00	9 15	9 30	9 45	9 60	9 75	9 90	10 05	10 20	10 35	6
7	10 50	10 65	10 80	10 95	11 10	11 25	11 40	11 55	11 70	11 85	7
8	12 00	12 15	12 30	12 45	12 60	12 75	12 90	13 05	13 20	13 35	8
9	13 50	13 65	13 80	13 95	14 10	14 25	14 40	14 55	14 70	14 85	9
10	15 00	15 15	15 30	15 45	15 60	15 75	15 90	16 05	16 20	16 35	10
11	16 50	16 65	16 80	16 95	17 10	17 25	17 40	17 55	17 70	17 85	11
12	18 00	18 15	18 30	18 45	18 60	18 75	18 90	19 05	19 20	19 35	12
13	19 50	19 65	19 80	19 95	20 10	20 25	20 40	20 55	20 70	20 85	13
14	21 00	21 15	21 30	21 45	21 60	21 75	21 90	22 05	22 20	22 35	14
15	22 50	22 65	22 80	22 95	23 10	23 25	23 40	23 55	23 70	23 85	15
16	24 00	24 15	24 30	24 45	24 60	24 75	24 90	25 05	25 20	25 35	16
17	25 50	25 65	25 80	25 95	26 10	26 25	26 40	26 55	26 70	26 85	17
18	27 00	27 15	27 30	27 45	27 60	27 75	27 90	28 05	28 20	28 35	18
19	28 50	28 65	28 80	28 95	29 10	29 25	29 40	29 55	29 70	29 85	19
20	30 00	30 15	30 30	30 45	30 60	30 75	30 90	31 05	31 20	31 35	20
21	31 50	31 65	31 80	31 95	32 10	32 25	32 40	32 55	32 70	32 85	21
22	33 00	33 15	33 30	33 45	33 60	33 75	33 90	34 05	34 20	34 35	22
23	34 50	34 65	34 80	34 95	35 10	35 25	35 40	35 55	35 70	35 85	23
24	36 00	36 15	36 30	36 45	36 60	36 75	36 90	37 05	37 20	37 35	24
25	37 50	37 65	37 80	37 95	38 10	38 25	38 40	38 55	38 70	38 85	25
26	39 00	39 15	39 30	39 45	39 60	39 75	39 90	40 05	40 20	40 35	26
27	40 50	40 65	40 80	40 95	41 10	41 25	41 40	41 55	41 70	41 85	27
28	42 00	42 15	42 30	42 45	42 60	42 75	42 90	43 05	43 20	43 35	28
29	43 50	43 65	43 80	43 95	44 10	44 25	44 40	44 55	44 70	44 85	29
30	45 00	45 15	45 30	45 45	45 60	45 75	45 90	46 05	46 20	46 35	30
31	46 50	46 65	46 80	46 95	47 10	47 25	47 40	47 55	47 70	47 85	31
32	48 00	48 15	48 30	48 45	48 60	48 75	48 90	49 05	49 20	49 35	32
33	49 50	49 65	49 80	49 95	50 10	50 25	50 40	50 55	50 70	50 85	33
34	51 00	51 15	51 30	51 45	51 60	51 75	51 90	52 05	52 20	52 35	34
35	52 50	52 65	52 80	52 95	53 10	53 25	53 40	53 55	53 70	53 85	35
36	54 00	54 15	54 30	54 45	54 60	54 75	54 90	55 05	55 20	55 35	36
37	55 50	55 65	55 80	55 95	56 10	56 25	56 40	56 55	56 70	56 85	37
38	57 00	57 15	57 30	57 45	57 60	57 75	57 90	58 05	58 20	58 35	38
39	58 50	58 65	58 80	58 95	59 10	59 25	59 40	59 55	59 70	59 85	39
40	60 00	60 15	60 30	60 45	60 60	60 75	60 90	61 05	61 20	61 35	40
41	61 50	61 65	61 80	61 95	62 10	62 25	62 40	62 55	62 70	62 85	41
42	63 00	63 15	63 30	63 45	63 60	63 75	63 90	64 05	64 20	64 35	42
43	64 50	64 65	64 80	64 95	65 10	65 25	65 40	65 55	65 70	65 85	43
44	66 00	66 15	66 30	66 45	66 60	66 75	66 90	67 05	67 20	67 35	44
45	67 50	67 65	67 80	67 95	68 10	68 25	68 40	68 55	68 70	68 85	45
46	69 00	69 15	69 30	69 45	69 60	69 75	69 90	70 05	70 20	70 35	46
47	70 50	70 65	70 80	70 95	71 10	71 25	71 40	71 55	71 70	71 85	47
48	72 00	72 15	72 30	72 45	72 60	72 75	72 90	73 05	73 20	73 35	48
49	73 50	73 65	73 80	73 95	74 10	74 25	74 40	74 55	74 70	74 85	49
50	75 00	75 15	75 30	75 45	75 60	75 75	75 90	76 05	76 20	76 35	50

Computed by L. Leland Locke.

802 + 02 <sup>42</sup> ✓  
 801 + 87 <sup>94</sup> ✓  
 801 + 73 <sup>46</sup> ✓  
 " + 58 <sup>98</sup> ✓  
 " + 99 <sup>50</sup> - 48  
 " + 30 <sup>021</sup>

23.46  
 23.74  
 14.48  
 19.66  
 802 + 0966  
 8794  
 21.72  
 31.90

801 + 00 <sup>50</sup> ✓  
 800 + 91 <sup>91</sup> ✓  
 " + 67 <sup>83</sup> ✓  
 " + 43 <sup>75</sup> ✓  
 " + 19 <sup>67</sup>

24.08

2710.44  
 529.65  
 3440.09

14.48  
 79.75  
 67.83  
 11.92  
 12.02

44.50  
 32.78  
 21.72  
 21.97  
 44  
 29.52  
 21.97  
 77.75  
 12.16

8.59  
 24.08  
 24.27

317.39 - 13.41 on sill of Truss

9.71 327.10  
4.81  
257

on concrete Footing Pier #2 - 13.9 - 313.2

" " " " #3 - 12.1 - 315.0

38.50  
+89.87  
528.37  
76  
599.37

135 + 65  
135 + 88

136 + 41  
135 + 88  
53  
23

48  
91  
48  
192  
1968  
13  
9840  
1968 1985.55  
29520 1446.50  
3932.05

29.52  
20.80  
22.50  
27 282  
54  
188  
189  
5291.16  
474.76  
544.40

3732.05  
359.21  
4291.26

802 + 41  
801 + 87.7  
33.3  
63.8  
97.1

802 + 21.04  
800 + 66  
1.55

748 + 23.97  
84.14

749.48, 11

26.  
8  
208

753 + 71.00  
751 + 17.95  
2.5605

751 + 18.21  
2.92  
37426

801 + 58.98  
73.16  
14.48

14.68

754 + 52  
10101.76

856 + 2.8  
1.55  
857.83  
16.55

856, 28859.73

751 + 17.95  
749 + 17.82  
200.13

749 + 18.21  
200.13  
749 + 18.28 10273.8

804 + 17  
802 + 21.04  
1.96  
1922

801 + 30  
800 + 66  
638

857 + 8  
55.17  
27.10

15.50  
30  
200  
5371  
359.21

25  
9  
225  
455.50  
4291.26  
4746.76

4746.76  
4900.29  
529.65