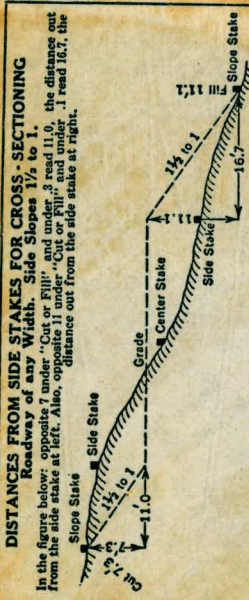


W  
%



Cut or Fill	Distance out from Side or Shoulder Stake									
	0	.1	.2	.3	.4	.5	.6	.7	.8	.9
0	0.0	0.2	0.3	0.5	0.6	0.8	0.9	1.1	1.2	1.4
1	1.5	1.7	1.8	2.0	2.1	2.3	2.4	2.6	2.7	2.9
2	3.0	3.2	3.3	3.5	3.6	3.8	3.9	4.1	4.2	4.4
3	4.5	4.7	4.8	5.0	5.1	5.3	5.4	5.6	5.7	5.9
4	6.0	6.2	6.3	6.5	6.6	6.8	6.9	7.1	7.2	7.4
5	7.5	7.7	7.8	8.0	8.1	8.3	8.4	8.6	8.7	8.9
6	9.0	9.2	9.3	9.5	9.6	9.8	9.9	10.1	10.2	10.4
7	10.5	10.7	10.8	11.0	11.1	11.3	11.4	11.6	11.7	11.9
8	12.0	12.2	12.3	12.5	12.6	12.8	12.9	13.1	13.2	13.4
9	13.5	13.7	13.8	14.0	14.1	14.3	14.4	14.6	14.7	14.9
10	15.0	15.2	15.3	15.5	15.6	15.8	15.9	16.1	16.2	16.4
11	16.5	16.7	16.8	17.0	17.1	17.3	17.4	17.6	17.7	17.9
12	18.0	18.2	18.3	18.5	18.6	18.8	18.9	19.1	19.2	19.4
13	19.5	19.7	19.8	20.0	20.1	20.3	20.4	20.6	20.7	20.9
14	21.0	21.2	21.3	21.5	21.6	21.8	21.9	22.1	22.2	22.4
15	22.5	22.7	22.8	23.0	23.1	23.3	23.4	23.6	23.7	23.9
16	24.0	24.2	24.3	24.5	24.6	24.8	24.9	25.1	25.2	25.4
17	25.5	25.7	25.8	26.0	26.1	26.3	26.4	26.6	26.7	26.9
18	27.0	27.2	27.3	27.5	27.6	27.8	27.9	28.1	28.2	28.4
19	28.5	28.7	28.8	29.0	29.1	29.3	29.4	29.6	29.7	29.9
20	30.0	30.2	30.3	30.5	30.6	30.8	30.9	31.1	31.2	31.4
21	31.5	31.7	31.8	32.0	32.1	32.3	32.4	32.6	32.7	32.9
22	33.0	33.2	33.3	33.5	33.6	33.8	33.9	34.1	34.2	34.4
23	34.5	34.7	34.8	35.0	35.1	35.3	35.4	35.6	35.7	35.9
24	36.0	36.2	36.3	36.5	36.6	36.8	36.9	37.1	37.2	37.4
25	37.5	37.7	37.8	38.0	38.1	38.3	38.4	38.6	38.7	38.9
26	39.0	39.2	39.3	39.5	39.6	39.8	39.9	40.1	40.2	40.4
27	40.5	40.7	40.8	41.0	41.1	41.3	41.4	41.6	41.7	41.9
28	42.0	42.2	42.3	42.5	42.6	42.8	42.9	43.1	43.2	43.4
29	43.5	43.7	43.8	44.0	44.1	44.3	44.4	44.6	44.7	44.9
30	45.0	45.2	45.3	45.5	45.6	45.8	45.9	46.1	46.2	46.4
31	46.5	46.7	46.8	47.0	47.1	47.3	47.4	47.6	47.7	47.9
32	48.0	48.2	48.3	48.5	48.6	48.8	48.9	49.1	49.2	49.4
33	49.5	49.7	49.8	50.0	50.1	50.3	50.4	50.6	50.7	50.9
34	51.0	51.2	51.3	51.5	51.6	51.8	51.9	52.1	52.2	52.4
35	52.5	52.7	52.8	53.0	53.1	53.3	53.4	53.6	53.7	53.9
36	54.0	54.2	54.3	54.5	54.6	54.8	54.9	55.1	55.2	55.4
37	55.5	55.7	55.8	56.0	56.1	56.3	56.4	56.6	56.7	56.9
38	57.0	57.2	57.3	57.5	57.6	57.8	57.9	58.1	58.2	58.4
39	58.5	58.7	58.8	59.0	59.1	59.3	59.4	59.6	59.7	59.9
40	60.0	60.2	60.3	60.5	60.6	60.8	60.9	61.1	61.2	61.4

*City of San Diego*

**MICROFILMED**

**JAN 13 1965**

The paper in this book No. F-370A

is made of 50% high grade rag stock with a WATER RESISTING surface sizing.

10,892-2. Y. cc. ys. c.M.

**KEUFFEL & ESSER CO., N. Y.**

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Progress X-Sections

Dec. 1941

Sta. 7+90 - 12+20 1-25

" 4+31 - 5+11 26-38

Cross-Section of

East Abutement 39-43

Sta. 8+00 - 10+00

Cross-Section of

West Abutement 44-46

Sta. 4+71 - 5+21

Note: These cross sections taken  
for Progress Report Jan 20<sup>th</sup>

Profile of Axis 51-52

Sta. 8+00 - 10+00

Profile of Axis 53-54

Sta. 4+71 to 5+88

(cont'd)

MICROFILMED

JUN 1 1962

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STA 10+00 - STA 8+00 (1/20/42) 51-52

PROFILE OF AXIS - Betw

STA 4+71 - STA 5+88 (1/20-42) 53-54

PROFILE OF LINE 50' south

of axis betw. 4+61 - 5+91 54-55

Cross-Sections on West

Slope - Monthly Estimate 56-75  
(Jan. 42)

12/23/41

Jackson  
Polak  
Leung

Cool-cloudy

Cross-Section of E. Keyway

for Monthly Estimate

56 + H.I. - I.S. Elev. 594.72

A-33  
B.M.

10.16 604.88

T.P.

0.60

604.28

904 613.32

12+20

30'N.

70.5 613.8

Loose rock

20'N.

25 610.8

Rock

10'N.

27 610.6

Axis

44 608.9

10'S.

33 610.0

20'S.

49 608.4

30'S.

46 608.7

36'S.

44 608.9

- toe of slope

12+10

20'N.

5.8

607.5 Top of bank

Jackson  
Polak  
Landy

12/23/41  
Cool-Cloudy

Cross-Section of E. Keyway  
for Monthly Estimates

Sta	H.I.	I.S.	Elev	Notes
	613.32			
	12+00			
30'N	11+90	5.4	607.9	Top of bank.
30'N	11+80	5.6	607.7	
30'N	11+70	5.7	607.6	
30'N		11.3	602.0	
T.P.	12.75		600.57	
	0.17		600.74	
	11+60			
30'N		5.2	595.5	
30'N	11+50			
30'N		12.3	588.4	

12/23/41

3

Jackson  
Pollock  
LairdCool - Cloudy  
Laird

Sta	Ht	I.S	Elev
	600.74		
T.P	1297		587.77
	0.37	588.14	
	11440		
30'N		2.8	585.3
	11430		
30'N		4.0	584.1
	11420		
40'N		3.4	584.7
	11410		
40'N		5.3	582.8
	11400		
40'N		13.3	574.8
T.P	1302		575.12
	0.92	576.04	

Top of bank

Jackson  
Pollock  
Laird

12/24/41

Fair - Cool

Sto + H.I. - I.S. Elev.

57604

568.31

7.73

5.48 573.79

11+00

30'N.

3.1 570.7

Break

40'N.

5.3 568.5

Top of bank - Loose rock

50'N.

4.8 569.0

Loose rock

50'N.

10.5 563.3

Loose rock

40'N.

10.6 563.2

Top of bank - Loose rock

50'N.

11.7 562.1

Top of bank - Loose rock

T.P.

13.10

560.<sup>69</sup>~~89~~

0.84

53

561.73



12/24/41  
Fair-Cool

Jackson  
Polak  
Loring

5

Sta.	+ HI	- I.S.	Elev.
	✓ 561.73 10+60		
50'N	10+80	2.7	✓ 558.8
30'N	10+70	5.4	✓ 56.1
40'N	10+60	3.9	✓ 57.6
40'N	10+50	8.3	✓ 53.2
40'N		10.3	✓ 51.2
50'N	10+40	4.8	✓ 56.7
50'N		11.4	✓ 50.1
40'N		14.1	✓ 47.4

leave rock

12/24/41

Fair - Cool

Jackson  
Dolok  
Lainy

Sta.	H.I.	I.S.	Elev	Notes
	561.73			
	10+70			
30'N		89	552.6	Toe of bank - Loose rock
	10+60			
30'N		111	50.4	" "
	10+50			
30'N		125	490	" "
T.P.			548.97	
	12.76			
	52			
	0.75		549.72	
	10+40			
30'N		18	477	Loose rock
	10+30			
30'N		40	45.5	" "
40'N		32	46.3	" "
50'N		17	478	" "

Jackson  
Polak  
Lang12/24/41  
Fair - Cool

Sta.	+	HI	-	I.S.	Elev
		✓ 549.72			
		10+20			
50'N.			39	✓	545.6
40'N.			42	✓	45.3
30'N.			50	✓	44.5
		10+10			
30'N.			7.0	✓	42.5
40'N.			6.2	✓	43.3
50'N.			5.8	✓	43.7
		10+00			
50'N.			7.5	✓	42.0
40'N.			9.4	✓	40.1
30'N.			10.1	✓	39.4
		9+90			
40'N.			12.2	✓	37.3
50'N.			8.7	✓	40.8

Loose rock

" "

" "

Top of bank - Loose rock

Loose rock

" "

Top of bank - Loose rock

Loose rock

Top of bank - Loose rock

Jackson  
Pollock  
Zoning

12/24/41  
Fair - Cool

Sta	+	H.I.	-	I.S.	Elev
#1 T.B.M.		549.72 <sup>52</sup>	4.30		545.42 <sup>22</sup>
A-34 B.M.	11.54	556.96 <sup>76</sup>	3.18	553.58	553.58
#1 T.B.M.		556.74			545.22
	11.52	556.74	10+40		
20'N				96	547.1
10'N				106	46.1
Axis				85	48.2
10'S				48	51.9
			10+50		
10'S				18	54.9
Axis				79	46.8
10'N				10.2	46.5

Rock

12/24/41  
Fair-Cool

9

Sta	+	H.I.	-	IS	Elev
20'N		556.74	10450	74	549.3 ✓
20'N			10460	5.6	51.1 ✓
10'N				107	46.0 ✓
Axis				7.9	48.8 ✓
10'S				0.3	52.4 ✓
10'S			10470	2.4	54.3 ✓
Axis				6.7	50.0 ✓
10'N				106	46.1 ✓
20'N				5.5	51.2 ✓
20'N			10480	4.0	52.7 ✓

Loose rock

Rock

Loose rock

12/24/41  
Fair-Cool

Sta.	H.I.	I.S.	Elev
	556.74		
	10+80		
10'N		99	546.8
Axis		69	49.8
10'S		1.4	55.3
	10+90		
10'S		09	55.8
Axis		57	51.0
10'N		89	47.8
20'N		29	53.8
	11400		
10'N		72	49.5
Axis		46	52.1
10'S		28	53.9

Rock

"

"

"

"

"

Loose rock

Top of rock

rock

"

12/24/41  
Fair-Cool

Sta	Ht	IS	Elev.	
	556.74 ✓			
	11410			
10'S		0.0	556.7 ✓	Rock
Axis		3.7	53.0 ✓	" "
10'N		5.4	51.3 ✓	Toe of rock
	11420			
10'N		5.1	51.6 ✓	" "
Axis		3.1	53.6 ✓	Rock
10'S		0.9	55.8 ✓	" "
	11430			
Axis		1.3	55.4 ✓	" "
10'N		2.0	54.7 ✓	Toe of rock
T.P.		0.34	556.40 ✓	
	12.30	568.70 ✓		

12/24/41  
Fair - Cool

Jackson  
Polk  
King

12

Sta + H.I. - 15. Elev.

568.70

11440

10'N

11.6

557.1

Toe of rock

Axis

10.5

58.2

Rock

10'5

9.0

59.7

"

20'5

6.5

62.2

"

11450

20'5

2.8

65.9

"

10'5

6.8

61.9

"

Axis

6.5

62.2

"

10'N

9.3

59.4

Toe of rock

11460

10'N

4.8

63.9

"

Axis

4.7

64.0

Rock

10'5

2.2

66.5

"



Jackson  
Polare  
Ling

12/24/41  
Fair - Cool

Sta	H.I.	Elev
	568.70	
	11470	
570	1.5	
AXW	3.3	565.4
10'N	0.9	68.4
	11430	
30'S	0.7	68.0
20'S	7.7	61.0
	11420	
30'S	3.5	65.2
20'S	8.5	60.2
	11410	
30'S	3.1	65.6
20'S	9.4	59.3
	11400	
30'S	1.5	67.2
20'S	4.9	63.8

Rock  
Toe of rock

Rock

"  
"

"  
"

Jackson  
Polate  
King

12/24/41  
Fair - Cool

Sta + H.I. - 1.5 Elev

56870

10+90

1 30'S

0.8

57.9

1 20'S

4.9

63.8

10+80

1 30'S

0.3

68.4

1 20'S

6.7

62.0

10+70

30'S

2.5

66.2

20'S

6.7

62.0

10+60

1 30'S

2.4

66.3

1 20'S

6.0

62.7

10+50

1 30'S

4.1

64.6

1 20'S

10.0

58.7



Jackson  
Pollock  
Kury

12/24/41  
Fair-Cool

Sta + H1 - 1.5 Elev

580.30

10+70

40'S

9.6 570.7 ✓

Rock

2100

50'S

6.9 73.4 ✓

"

2100

60'S

4.0 76.3 ✓

"

2100

10+80

60'S

1.8 78.5 ✓

"

2100

50'S

4.5 75.8 ✓

"

2100

40'S

8.2 72.1 ✓

"

2100

10+90

40'S

8.7 71.6 ✓

"

2100

50'S

6.0 74.3 ✓

"

2100

60'S

2.2 78.1 ✓

"

2100

11+00

70'S

0.2 80.1 ✓

Toe of rock

2100

12/24/40  
Fair-Cool

17

Sta	H.I.	-	15	Elev		
	580.30					202
	11400					202
60'S		3.6	576.7	✓	Rock	202
50'S		7.0	73.3	✓	"	202
40'S		8.7	71.6	✓	"	202
	11410					202
40'S		11.6	68.7	✓	"	202
50'S		7.3	73.0	✓	"	202
60'S		4.3	76.0	✓	"	202
	11420					202
60'S		2.9	77.4	✓	"	202
50'S		5.4	74.9	✓	"	202
40'S		11.0	69.3	✓	"	202
	11430					202
40'S		10.3	70.0	✓	"	202

12/24/41  
Fair - Cool

Sta.	H.I.	I.S.	Elev
	580.30		
	11+30		
50'S	11+40	6.1	574.2 ✓
			Rock
50'S		4.1	76.2 ✓
40'S		7.5	72.8 ✓
30'S		10.4	69.9 ✓
	11+50		
50'S		2.6	77.7 ✓
40'S		6.6	73.7 ✓
30'S		9.2	71.1 ✓
	11+60		
50'S		2.8	72.5 ✓
40'S		6.0	74.3 ✓
30'S		10.0	70.3 ✓
20'S		9.4	70.9 ✓

12/24/41  
Fair - Cool

Sta + Hl. - 15. Elev

12/24/41  
Fair Cog

Sta. + H.I. - I.S. Elev

58030

11470

10'S

8.4 571.9 ✓

Rock

20'S

3.3 77.0 ✓

"

30'S

4.8 75.5 ✓

"

40'S

6.0 74.3 ✓

"

50'S

1.1 79.2 ✓

Toe of rock

11480

40'S

2.9 77.4 ✓

Rock

30'S

0.7 79.6 ✓

"

20'S

2.4 77.9 ✓

"

10'S

5.2 75.1 ✓

"

Axis

6.2 74.1 ✓

"

10'N

7.1 73.2 ✓

" - toe



12/24/41  
Fair-Cool

Ecker  
Landing  
Cove

21

Sta + H1 - 1.5 Elev

580.30

11490

Axis

0.7 579.6

10'S

1.0 79.3

T.P.

0.95 579.95

1279 592.14

11490.

305

12.5 579.6

205

12.5 79.6

405

9.5 82.6

505

5.8 86.3

12400

505

00.0 92.1

12-24-91  
Fall & Cool

22

Sta + HI - Elev.

593.1  
12+00

40 S

6.9

✓ 585.7

Rock

30 S

6.7

✓ 85.4

"

11+90

8.8

✓ 83.3

"

11+50

5.2

✓ 86.9

70 S

0.6

✓ 91.5

Toe "

60 S

5.9

✓ 86.2

" "

70 S

3.3

✓ 88.8

" "

Toe

12-24-41  
Fair & Cool

Sta + HI - Elev

592.1  
11730

Rock

605

92

582.9

705

46

87.5

705

10.6

81.5

705

11710

705

116

80.5

705

11700

705

121

80.0

705

10790

705

119

80.2

12-29-91  
Falls & Cool

Sta + HI - IS EI

592.14

TP 0.33 580.33 ✓ 1214 580.00 ✓

TP 6.08 573.67 ✓ 1279 567.59 ✓

10+40

405 9.7 524.0 ✓

505 10.4 63.3 ✓

605 5.3 68.4 ✓

705 4.9 68.8 ✓

805 3.7 70.0 ✓

TP 4.29 565.58 ✓ 1238 561.29 ✓

ROCK

"

"

"

"

12-24-41  
Fair & Cool

25.

# Cross-Section for Monthly Estimator - F. Keyway

Sta + HI - I.S. Elev

565.58

TP

11.17 554.41

3.80 558.21

#1

T. BM

13.02 545.19

True elev. is 545.22 (error = .03)

12/29/41  
Cool: cloudy

Dickinson 26  
Jackson  
Polak  
Loring  
King  
Cote

Cross-Section for Monthly  
Estimates w Keyway

Sta + H.I. - 1.5 E/lev  
A-11  
BM 558.56

1083.56939

5+11

40'N	5.1	564.3	208
30'N	4.7	564.7	208
20'N	4.3	565.1	208
10'N	3.7	565.7	208
Axis	3.5	565.9	208
10'S	3.4	566.0	208
20'S	3.5	565.9	208
30'S	3.4	566.0	208
40'S	2.7	566.7	208
50'S	2.7	566.7	208
60'S	3.1	566.3	208
70'S	3.5	565.9	208

12/29/41

Cool - Cloudy

27

Sta	+ H.I.	- I.S.	E/ev
	569.39		
	5+11		
80'S		4.3	565.3
90'S		4.9	564.5
100'S		4.1	565.3
110'S		1.7	567.7 <del>567.7</del>
	5+01		
100'S		0.8	568.6
90'S		3.3	566.1
80'S		3.5	565.0
70'S		3.6	565.8
60'S		3.2	566.2
50'S		2.7	566.7
40'S		2.6	566.8
30'S		3.6	565.8

12/29/41

Cool - Cloudy

28

Sta	+ H.I.	- I.S.	Elev
	569.39		
	5401		
20'S		3.7	565.7 ✓
10'S		3.9	565.5 ✓
Axis		4.0	565.4 ✓
10'N		3.9	565.5 ✓
20'N		4.0	565.4 ✓
30'N		4.7	564.7 ✓
40'N		4.6	564.8 ✓
	4491		
40'N		3.7	565.7 ✓
30'N		3.3	566.1 ✓
20'N		3.1	566.3 ✓
10'N		4.5	564.9 ✓
Axis		4.8	564.6 ✓



12/29/41

Cool - cloudy

29

Sta	Ht	Elev
	569.39	
	4+91	
10'S	3.7	565.7
20'S	4.1	565.3
30'S	3.4	566.0
40'S	3.4	566.0
50'S	2.8	566.6
60'S	3.2	66.2
70'S	3.8	65.6
80'S	3.3	66.1
	4+81	
70'S	1.0	68.4
60'S	1.9	67.5
50'S	2.8	66.6
40'S	2.9	66.5

12/29/41

Cool-Cloudy

Sta	+	H.I.	-	IS	Elev	
		560.39				
		4+81				
30'S				35	565.9	
20'S				41	553	
10'S				38	556	
AxN				45	549	
10'N				17	577	
T.P.				0.36	569.03	
		642			575.45	
		5+01				
110'S				48	570.7	
		4+91				
90'S				25	573.0	
100'S				66	589	

12/29/41

Cool - Cloudy

Sta.	H.I.	IS	Elev
	57545		
	4+81		
20'N		5.3	570.2
30'N		3.3	72.2
40'N		2.3	73.2
	4+71		
10'N		7.1	68.4
Axw.		9.7	65.8
10'S		8.1	67.4
20'S		8.5	67.0
30'S		9.2	66.3
40'S		9.7	65.8
50'S		9.6	65.9
60'S		7.6	67.9
70'S		6.2	69.3

12/29/41  
Cool - Cloudy

Sta + HI - 15 Elev

575.45

4+61

60'S	3.7	571.8
50'S	5.1	70.4
40'S	6.8	48.7
30'S	5.4	70.1
20'S	5.0	70.5
10'S	8.6	66.9
Axis	7.0	68.5
10'N	2.3	73.2
		4+51
10'N	2.6	72.9
Axis	5.1	70.4
10'S	4.9	70.1
20'S	5.3	70.2

12/29/41

Cool-cloudy

Sta + H.I. - 15 Elev

575.45

4+51

30'S

3.6

571.9

40'S

1.7

573.8

T.P.

1.64

573.81

1113

584.94

4+41

10'N

5.0

579.9

Ax 15

6.1

578.8

10'S

5.9

579.0

20'S

7.1

577.8

30'S

5.1

579.8

40'S

2.1

582.8

4+51

50'S

6.2

578.7

60'S

4.3

580.6

12/29/41

Cool-Cloudy

Sta	H.I.	I.S.	Elev
	58494	0.52	58442
T.P.	12.76	59718	
	4+41		
50'S		10.4	586.8
	4+31		
10'N		10.6	586.6
Axis		11.3	585.9
10'S		10.9	587.2
20'S		10.0	587.2
30'S		10.2	587.0
40'S		6.7	590.5
50'S		0.0	597.2
	4+41		
60'S		5.0	592.2

12/29/41

Cool-Cloudy

Sta	H.I.	-	I.S.	Elev
	597.18	✓		
	4+71			
30'N			130	584.2
40'N			108	586.4
30'N	4+61		116	585.6
20'N	4+51		45	592.7
40'N	4+61		102	587.0
40'N	4+51		46	
30'N			46	592.6
T.P			0.66	596.52

12.85 609.37

12/29/41

36

Cool-Cloudy

Sta	H1	H2	Elev
	609.37	1.5	
	4+51		
40'N	4+41	10.2	599.2 ✓
40'N		7.8	601.6 ✓
30'N		8.9	600.5 ✓
20'N		9.0	600.4 ✓
	4+31		
20'N		6.2	603.2 ✓
30'N		6.5	602.9 ✓
40'N		6.0	603.4 ✓
60'S		1.3	608.1 ✓
70'S		+1.3	610.7 ✓
	4+41		
70'S		1.2	608.2 ✓



Dickinson  
Jackson  
Potato  
Loring  
K. 70  
Cote

12/29/41  
Cool-Cloudy

Cross-Section for Monthly  
Estimator - W. Keyway

Sta	+	H1	-	15	Elev
		609.37			
		4+41			
80's			04		609.0 ✓
		4+51			
80's			14		608.0 ✓
70's			116		597.8 ✓
		4+61			
80's			116		597.8 ✓
T.P			1191		597.46 ✓
		155	59901		
		4+61			
90's			42		594.8 ✓
		4+71			
80's			105		588.5 ✓
90's			124		586.6 ✓

12/29/41

Cool - cloudy

Cross-Section for Monthly  
Estimate - W. Keyway

Sta	H.I.	-	1.5 Elev	
	5990.1			✓
T.P.		1300		586.01
	2.76	588.77		✓
		4+81		
80'S			7.9	580.9
90'S			8.8	580.0
20'N			7.0	581.8
20'N			7.7	581.1
T.P.		0.48		588.29
	9.28	597.57		✓
C-2				596.48
T.B.M.		1.09		596.48

Error = 0.00

Dickinson 39  
 Jackson  
 Polak  
 Loring  
 King  
 Cole

1/20/42  
 Fair-Warm

Note These cross sections taken  
 for Progress Report Jan 20<sup>th</sup>

Cross-Section of East  
 Abutment - 50' Intervals

Sta + H.I. - I.S. Elev.

T.B.M. 511.52

0.73 512.25

9+50	2.4	509.8	40' North of Axis
9+50	3.3	508.9	38' " "
9+50	10.8	501.4	20' " "
9+50'	15.2	497.0	16' " "
9+50	14.1	498.1	1' " "
9+50	10.3	501.9	Axis
9+50	7.3	504.9	10' South of Axis
9+50	8.4	503.8	30' " "
9+50	12.7	499.5	50' " "
9+50	12.4	499.8	70' " "
9+50	11.9	500.3	90' " "
9+50	13.0	499.2	110' " "
9+50	13.8	498.4	130' " "

1/20/42 Dickinson 40  
 Fair - Warm  
 Polak  
 Loring  
 King  
 Cole

NOTE! These cross sections  
 taken for progress report Jan 20<sup>th</sup>

Cross-Section of East  
 Abutement - 50' Intervals

Sta	+ H.I.	- I.S.	Elev
9+50	512.25	13.9	498.3
9+50		7.6	504.6
9+50		7.4	504.8
T.B.M.		0.73	511.52
T.B.M.			529.03
	3.00		532.03
10+00		0.3	531.7
10+00		3.0	529.1
10+00		9.5	522.5
10+00		7.0	525.0
10+00		2.6	529.4
10+00		0.4	531.6
T.R.		0.38	531.65

12.97 544.62

150' South of Axis  
 " " "  
 " " "  
 " " "  
 22' North of Axis  
 " " "  
 " " "  
 " " "  
 " " "  
 Axis  
 10' South " "

11/20/42  
Fair - Warm  
Dickinson 41  
Jackson  
Dolok  
Loring  
King  
Cote

NOTE! - These cross sections  
taken for Progress Report Jan 20<sup>th</sup>

Cross-Section of East  
Abutement - 50' Intervals

Sta	+ H.I.	-	IS	Elev
10+00	544.62		8.9	535.7
10+00			11.0	532.6
10+00			11.2	532.4
10+00			8.7	535.9
10+00			11.8	532.8
10+00			12.4	532.2
10+00			11.6	533.0
10+00			5.5	539.1
10+00			4.4	540.2
10+00			1.1	543.5
10+00			10.9	545.5
10+00			5.1	539.5
10+00			4.6	540.0

20' South of Axis  
30' " "  
44' " "  
54' " "  
70' " "  
80' " "  
85' " "  
90' " "  
100' " "  
110' " "  
120' " "  
33' North  
40' " "

0.21

Elev of T.B.M. = 544.42

Dickinson 42  
 Jackson  
 Potok  
 Long  
 King  
 Core

1/20/42  
 Fair-Warm

Note! - These cross sections  
 taken for Progress Report JAN 20

Cross-Section of East  
 Abutement - 50' Intervals

Sta	+ HI	- I.S.	Elev
T.P.	1.32		482.64
9+00		38	480.1
9+00		20	481.9
9+00		82	475.7
9+00		9.1	474.6
9+00		11.6	472.3
9+00		12.3	471.6
9+00		12.2	471.7
9+00		10.5	473.4
9+00		6.8	477.1
9+00		3.1	480.8
9+00		+8.9	492.8
T.P.		12.29	471.67

0.83 472.50

40' South of Axis - Muck Pile

50'	"	"
70'	"	"
100'	"	"
120'	"	"
140'	"	"
160'	"	"
180'	"	"
20' North	"	"
30'	"	"

Dickinson  
 Jackson  
 Polak  
 Laing  
 King  
 Cole

1/20/42  
 Fair-Warm

Cross-Section of Fast

Abutement - 50' Intervals

Sta.	Ht.	I.S. Elev	Interval	Direction
8+00	472.50	471.0	1.5	40' North of Axis
8+00		465.2	7.3	Axis
8+00		462.9	9.6	20' South "
8+00		461.7	10.8	40' "
8+00		460.9	11.6	60' "
8+00		459.9	12.6	80' "
8+00		459.8	12.7	100' "
8+00		458.8	12.7	120' "
8+00		459.8	12.7	160' "
8+00		460.5	12.0	180' "
8+00		465.8	6.7	188' "
8+00		472.4	0.1	238' "
T.P.		470.54	1.96	

3.29 473.83

A-9  
 B.M.

464.28

Elev of B.M. = 464.29 ± 100

Dickinson 44  
 JACKSON  
 Polak  
 Laing  
 King  
 Cole

1/20/42  
 Fair: Warm

NOTE! These cross sections taken  
 for Progress Report Jan 20<sup>th</sup>

Cross-Section of West  
 Abutment - 50' Intervals

Sta + H.I. - 15. E/lev.

T.B.M 56342

6.46 56988

4+71 10.4 5594 Axis

4+71 10.0 559.8 9' North of Axis

4+71 7.7 562.1 14' "

4+71 +9.0 578.8 17' "

4+71 10.9 558.9 20' South " "

4+71 11.4 558.4 40' " "

4+71 8.6 561.2 60' " "

4+71 4.5 565.3 70' " "

4+71 +2.0 571.8 72' " "

4+71 +10.0 579.8 89' " "

4+71 +14.0 583.8 90' " "

4+71 +15.0 584.8 98' " "

T.P. 12.63 557.25

0.97 558.22



Dickinson  
Jackson  
Polak  
Laird  
King  
Cafe

1/20/42  
Fair-Warm

Cross-Section of West

Abutement - 50' Intervals

Sta	+ H.I.	- I.S.	Elev.
T.P	558.22	12.34	545.88
5+21	0.72	1.0	545.6
5+21		+5.0	551.6
5+21		+15.0	561.6
5+21		+19.0	565.6
T.P	9.43	12.50	534.10
5+21		+1.7	545.2
5+21		6.2	537.3
5+21		9.8	533.7
T.P	1.28	12.84	530.69
5+21		3.0	529.0

14' North of Axis

22' " " "

100' South " " "

120' " " "

97' " " "

80' " " "

60' " " "

40' " " "

Dickinson  
Jackson  
Delak  
Lairg  
King  
Cole

1/20/42  
Fair - Warm

NOTE! - These cross sections  
taken for Progress Report Jan 20<sup>th</sup>

Cross-Section of West  
Abutement - 50' Intervals

Sta.	+ H.I.	-	15' Elev.
5+21	531.97	3.8	528.1
5+21		1.9	530.0
5+21		1.6	530.6
T.P.		6.08	525.80
T.B.M.	9.51	535.40	
		8.18	527.22

EI of T.B.M. = 527.25

20' South of Axis

Axis

12' North "

Dickinson.  
Jackson  
Polart  
Lairng  
King  
Cote

47

Sta + HI - U.S. E/ev

Dickinson  
Jackson  
Polak  
Loing  
King  
Cafe

Sta + H.I. = 15. E/ev

Dickinson  
Jackson  
Polak  
Loring  
King  
Cote

Sta + Hl - 15. Elev

Dickinson 50  
Jackson.  
Dolan  
Loring  
Cole

Sta + H.I. - 1.5 Elev

11/20/42  
Fair-Weather

Dickinson  
Jackson  
Polak  
Loring  
King  
Cate

51

Profile of Axis (bet Sta  
10+00 and 8+00)

Sta	+ H.I	-	15. Elev
	1.54	530.57	529.03
10+00		1.1	529.5
9+95		3.5	527.1
9+90		9.0	521.6
T.P.		12.95	517.62
	0.24	517.86	
9+70		6.0	511.9
9+60		11.4	506.5
T.P.		12.70	505.16
	1.82	506.98	
9+50		5.5	501.5
T.P.		12.30	494.68
	0.56	495.24	
9+27		9.8	485.4
T.P.		12.60	482.64
	1.32	483.96	

Dickinson  
Jackson  
Bojak  
King  
Cole

1/20/42  
Fair-Weirm

Profile of Axis (bet Sta  
10+00 and 8+00

Sta.	+ H.I.	- I.S.	Elev
	483.96		
8+80		6.6	477.4
T.P.	12.29		471.67
	0.83		472.50
8+45		8.9	463.6
8+00		7.2	465.3
7+89		6.3	466.2
7+75		1.3	476.8
T.P.	1.96		470.54
	3.29		473.83
A-9			
B.M.	9.55		464.28

Elev of B.M. = 464.29



Dickinson  
 Jackson  
 Polak  
 Laing  
 King  
 Cole

1/20/42  
 Fair-Worm

53

Profile of Axis (bet

Sta	4+71 to 5+88				
Sta	+ H.I.	-	1.5	Elev	
T.B.M.	6.46	56988		56342	
4+71			10.4	559.5	
T.P.		1263		557.25	
	0.97	558.22			
4+80			1.9	556.3	
4+86			10.2	548.0	
4+91			10.3	547.9	
T.P.		1234		546.98	
	0.72	546.60			
4+99			3.2	543.4	
5+06			6.2	540.4	
T.P.		1250		534.10	
	9.43	543.53			
T.P.		1284		530.69	
	1.28	531.97			

Dickinson  
Jackson  
Polak  
Lainig  
King  
Cote

11/20/42

Fair-Warm

Profile of Axw (bet.  
Sta 4+71 and 5+88)

Sta	+	H.I.	-	15	Elev
4	5+38			8.8	5231
4	5+88			11.1	5205
4	T.P.		6.08		5258
4		9.51	535.40		
4	T.B.M.		8.18		527.25

Elev of T.B.M. = 527.25

Dickinson  
Jackson  
Polak  
Loring  
King  
Cole

11/22/42

Cool - Cloudy

Profile of 50' South Line  
(bet. Sta. 4+61 and 5+91)

Sta.	+ H.I.	- I.S. Elev.
T.B.M.	2.95	56637
4+61	+2.2	5686
4+62	1.3	5651
4+77	9.3	5571
4+90	11.3	5551
T.P.	12.94	5534
5+04	0.35	55378
5+12	10.7	5431
T.B.M.	12.0	5411
5+19	11.71	5420
5+30	0.21	54228
T.P.	11.0	5315
	13.2	5291
	11.97	5303
	1.94	53225

Dickinson  
Jackson  
Boyd  
Loring  
Coff

11/22/42  
Cool - Cloudy

Profile of 50' South Line  
(bet. Sta. 4+61 - 5+91)

Sta.	+ H.I.	- I.S	Elev
5+50	532.25	9.7	522.5
5+91		11.2	521.1
T.P.		901	523.24
A-10	0.25	523.49	
B.M.		8.63	514.86

EI of BM = 514.88

Dickinson  
Jackson  
Polak  
Laird  
King  
Cole

11/26/42  
Cool - Cloudy

Cross-Section on West Slope  
for Monthly Estimate

Sta.	+ H.L.	-	15. Elev.
T.B.M.			596.40
	0.48	596.96	
	4+71		
40'N.		10.9	586.1
30'N.		12.5	584.5
100'S		10.3	586.7
90'S		12.1	584.9
T.P.		12.77	584.9
	0.40	584.59	
	4+81		
100'S		3.7	580.9
90'S		5.2	
	(?)		
	4+91		
100'S		11.0	573.6
90'S		11.6	573.0

Dickinson 57  
 Jackson  
 DeLox  
 Laing  
 King  
 Cole

11/26/42  
 Fair-Warning

Cross-section of West Slope  
 for Monthly Estimate

Sta	+ H.I.	-	1.5	Elev
	584.59			
	4+71			
80'S		4+81	8.6	576.0
40'N			7.1	577.5
30'N			10.8	573.8
20'N			8.3	576.3
		4+71		
20'N			3.9	580.7
T.P.			12.60	571.09
	0.35	572.34		
		4+71		
70'S			3.9	568.4
60'S			10.9	561.4
50'S			11.0	561.3

Dickinson  
Jackson  
Potok  
Lainig  
King  
Cote

1/26/42  
Cool-Cloudy

Cross-Section on West Slope  
for Monthly E

Sta	+ H.I.	-	15	Elev.
	572.34			
	4+71			
40'N		13.5		558.8
30'N		13.2		559.1
20'N		12.9		559.4
10'N		12.8		559.5
	4+91			
20'N		4.8		567.5
30'N		5.4		566.9
40'N		6.2		566.1
	5+01			
40'N		9.4		562.9
30'N		10.9		561.4
20'N		11.2		561.1
	4+81			
70'S		8.6		563.7

Cross-Section on West Slope  
for Monthly Estimate

Sta.	H.I.	-	I.S. Elev
	57234		
	4+81		
80'S	5+01	47	5676
90'S	4+91	10.1	5622
90'S	5+01	80	5643
100'S	5+11	27	5696
100'S	5+21	67	5656
100'S	4+91	96	5627
80'S		117	5607

See page 56





Dickinson 61  
 Jackson  
 Doleak  
 Laing  
 King  
 Cole

1/26/42  
 Cool-Cloudy

Cross-Section on West Slope  
 for Monthly Estimate

Sta	+ H1	- I.S.	Elev
	559.51		
	4+91		
70'S		2.7	556.8
60'S		3.2	556.3
50'S		6.9	552.6
40'S		7.4	552.1
30'S		10.5	549.0
20'S		11.6	547.9
10'S		12.5	547.0
Axis		11.9	547.6
10'N		10.0	549.5
	5+01		
80'S		8.6	550.9
70'S		8.7	550.8
60'S		11.6	547.9

Dickinson  
 Jackman  
 Polak  
 Laing  
 King  
 Corp

11/26/42  
 Cool - Cloudy

Crack - Section on West Slope  
 for Monthly Estimate

Sta.	H.I.	I.S.	Elev
	550.51		
	571.1		
20'N		7.2	552.3
30'N		5.9	553.6
40'N		5.2	554.3
90'S		9.3	550.2
T.P.	13.08		546.43
	7.30	553.73	
	570.1		
50'S		8.4	545.3
40'S		9.4	544.3
30'S		9.6	544.1
20'S		9.0	544.7
10'S		8.5	545.2
Axis		11.3	542.4
10'N		9.4	544.3

Dickinson 63  
Tac Kison  
Polak  
Zaing  
King  
Cote

1/27/42  
Partly Cloudy

Cross-Section on West Slope  
for Monthly Estimate

Sta.	H.I.	LS	F/ev.
	553.73		
	5+21		
20'N		2.8	5509
30'N		1.7	5520
40'N		1.8	5519
	5+31		
40'N		1.6	5521
30'N		1.4	5523
20'N		4.9	5488
	5+41		
30'N		10.0	5437
T.R.	1277		54096
	1.00	541.96	
	5+11		
10'N		61	535.9
Axis		60	536.0

Dickinson 64  
 Jackson  
 Polak  
 King  
 Cole

1/27/42

Partly Cloudy

Cross Section on West Slope  
 for Monthly Estimate

Sta.	H.I.	I.S.	Elev
	541.96		
	541.1		
10'S	49	537.1	
20'S	3.8	538.2	
30'S	5.0	537.0	
40'S	4.2	537.8	
50'S	1.1	540.9	
60'S	1.3	540.7	
70'S	2.2	539.8	
80'S	+1.6	543.6	
	5+21		
10'N	12.3	529.7	
Axis	14.6	527.4	
10'S	14.7	527.3	
20'S	13.7	528.3	
30'S	14.0	528.0	

Dickinson 65  
 JACKSON  
 Polak  
 Laing  
 King  
 Cole

1/27/42  
 Partly Cloudy

Cross-Section on West Slope  
 for Monthly Estimate

Sta + H.I.	-	I.S.	Elev
541.96			
5+41			
40'N	3.5	538.5	
36'N	10.2	531.8	
40'N	10.4	531.6	
5+21			
40'S	13.3	528.7	
50'S	11.4	530.6	
60'S	9.6	532.4	
70'S	7.4	534.6	
80'S	5.7	536.3	
90'S	1.2	540.8	

+0.13 542.09 E.I. of TBM = 542.08

Dickinson  
Jackson  
Palak  
Lairg  
King  
Cole

11/28/42

Cool - Cloudy

Cross-Section on West Slope  
for Monthly Estimate

Sta + H.I. - I.S. Elev

A-11 B.M. 558.56

13.03 571.59

5+11

130' 1.1 570.5

120' 1.0 570.6

110' 3.2 588.4

5+21

130' 5.6 566.0

120' 5.6 566.0

110' 7.2 564.4

120' 9.0 562.6

T.P. 1291 558.68

0.11 558.79

*[Faint handwritten notes and bleed-through from the reverse side of the page]*

1/28/42

Cool-Cloudy

S. Elev

H.I.

Sta.

558.79

5+31

130'S

1.4 557.4

110'S

5.3 553.5

5+41

110'S

7.7 551.1

120'S

3.2 ~~558.6~~  
55.6

130'S

4.9 553.9

5+51

130'S

13.0 545.8

120'S

12.8 546.0

T.P.

12.9 ~~545.82~~  
?

0.32 546.14

5+51

110'S

6.0 540.1

5+61

110'S

13.4 532.7



1/28/42

Cool-Cloudy

Sta + Ht - I.S. Elev

546.4

5+61

120'S

8.7 537.4

130'S

9.2 536.9

T.P.

12.69 533.45

0.60 534.05

5+61

40'N

9.1 525.0

30'N

10.4 523.7

110'S

11.6 522.5

120'S

5.2 528.9

130'S

4.9 529.2

40'N

13.2 520.9

5+81

130'S

11.7 522.4

T.P.

12.69 521.36

1.30 522.66

1/28/42

Cool-Cloudy

IS Elev

HI

Sta

52266

5+71

30 IN

11.0

5117

5+81

120 S

2.5

5202

110 S

2.8

5799

5+91

110 S

11.0

5117

120 S

9.4

573.3

130 S

6.9

575.8

A-10

778

51488

B.M.

Elev of B.M. = 514.88

Sta	+ H.I.	- I.S.	Elev	1/30/42	70
T.B.M.	0.69	542.77	542.08	Cool-Cloudy	Jackson Polak Lainy King Cole
	5+31				
100'S		7.1	735.7		
T.P.	1265		530.12		
	0.99	531.11			
	5+31				
90'S		2.7	528.4		
80'S		4.1	527.0		
70'S		4.1	527.0		
60'S		8.7	522.4		
50'S		12.3	518.8		
40'S		13.2	517.9		
	5+41				
100'S		4.9	526.2		
90'S		9.9	521.2		
80'S		12.0	519.1		

1/30/42  
Cool, Cloudy

Sta.	H.I.	I.S.	Elev.
T.P.	531.11	1272	518.39
	0.86	519.25	
	5+41		
70'S		2.8	516.4
60'S		6.0	513.2
50'S		7.2	512.0
40'S		9.0	510.2
30'S		9.8	509.4
20'S		9.0	510.2
10'S		6.1	513.1
Axis		6.8	512.4
10'N		7.2	512.0
	5+31		
10'N		0.6	518.6
Axis		0.9	518.3
10'S		1.8	517.4

1/30/42

Cool - Cloudy

IS. Elev

H.I.

Sta

51925

5+31

20'S

2.9 516.3

30'S

2.0 517.2

100'S

0.0 519.2

90'S

2.4 516.8

80'S

8.2 511.0

70'S

10.5 508.7

60'S

11.3 507.9

50'S

12.5 506.7

40'S

12.8 506.4

5+61

70'S

13.3 505.9

80'S

11.5 507.7

90'S

6.2 513.0

100'S

5.0 514.2

11/30/42

Cool-Cloudy

Elev

15

H.I.

Stn

51925

5+71

110'S

516.3

2.9

100'S

509.8

9.4

90'S

510.3

8.9

80'S

506.8

12.4

T.P

506.50

12.75

1.05

507.55

5+51

30'S

504.8

2.7

20'S

504.9

2.6

10'S

504.0

3.5

AXN

504.2

3.3

10'N

503.7

3.8

5+61

10'N

499.5

8.0

AXN

500.3

7.2

See page 68

1/30/42

Cool - Cloudy

Sta	+	H1	-	IS	Elev
		507.55			
		5+61			
10'S				7.6	499.9
20'S				7.2	500.3
30'S				5.2	502.3
40'S				6.1	501.4
50'S				3.7	503.8
60'S				3.2	504.3
		5+71			
60'S				7.2	500.3
50'S				10.0	497.5
40'S				9.0	498.5
30				10.6	496.9
20'S				12.3	495.2
10'S				10.2	497.3
Axii				9.4	498.1
16'N				10.4	497.1
20'N				8.6	498.9

Dickinson 75  
 Jackson  
 Potok  
 Laing  
 King  
 Cole

1/30/42  
 Partly Cloudy

Sta.	+	H.I.	-	IS.	Elev.
TR		507.55	<del>TR</del>		<del>495.31</del>
		5+81			
100W				2.8	504.8
90W				3.8	503.8
80W				4.9	502.7
70W				10.6	497.0
30N				7.7	499.9
40N				+1.0	508.6
		5+91			
40N				+0.4	508.0
30N				9.6	498.0
100W				11.0	496.6
110W				6.0	501.6
90W				11.5	496.1
80W				11.9	495.7
70W				12.8	494.8
TR			12.24		495.31

see pg 69

cont in F.B.#615-pg.62



30

N

N

♀

10

20

30

40

50

60

70

80

90

100

110

120

130

140

150

9+50

9+00

8+70

4+70

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4+81

4+71

5+01

5+11

4 BIK #6

5+96

1525

3525

12505

TRIGONOMETRIC FORMULÆ



**Right Triangle**

For Angle A.  $\sin \frac{a}{c}, \cos \frac{b}{c}, \tan \frac{a}{b}, \cot \frac{b}{a}, \sec \frac{c}{b}, \operatorname{cosec} \frac{c}{a}$

Required  $A, B, c$

$a, b$   $\tan A = \frac{a}{b} = \cot B, c = \sqrt{a^2 + b^2} = a \sqrt{1 + \frac{b^2}{a^2}}$

$a, c$   $\sin A = \frac{a}{c} = \cos B, b = \sqrt{c^2 - a^2} = c \sqrt{1 - \frac{a^2}{c^2}}$

$A, a$   $B = 90^\circ - A, b = a \cot A, c = \frac{a}{\sin A}$

$A, b$   $B = 90^\circ - A, a = b \tan A, c = \frac{b}{\cos A}$

$A, c$   $B = 90^\circ - A, a = c \sin A, b = c \cos A$

**Solution of Oblique Triangles**

Required  $A, B, a, b, c, C$

$A, a, b$   $B = 180^\circ - (A + B), c = \frac{a \sin C}{\sin A}$

$A, b, c$   $B = 180^\circ - (A + B), c = \frac{a \sin C}{\sin A}$

$a, b, c$   $A + B = 180^\circ - C, \tan \frac{1}{2}(A - B) = \frac{(a - b) \tan \frac{1}{2}(A + B)}{c}$

$a, b, c$   $A, B, C$   $s = \frac{a + b + c}{2}, \sin \frac{1}{2}A = \sqrt{\frac{(s - b)(s - c)}{bc}}$

$a, b, c$   $A, B, C$   $\sin \frac{1}{2}D = \sqrt{\frac{(s - a)(s - c)}{ac}}, C = 180^\circ - (A + B)$

$a, b, c$   $A, B, C$   $s = \frac{a + b + c}{2}, \text{area} = \sqrt{s(s - a)(s - b)(s - c)}$

$a, b, c$   $A, B, C$   $\text{area} = \frac{bc \sin A}{2}$

$A, B, C, a$   $\text{area} = \frac{a^2 \sin B \sin C}{2 \sin A}$

**Oblique Triangles**

For Angle A.  $\sin \frac{a}{c}, \cos \frac{b}{c}, \tan \frac{a}{b}, \cot \frac{b}{a}, \sec \frac{c}{b}, \operatorname{cosec} \frac{c}{a}$

Required  $A, B, c$

$a, b$   $\tan A = \frac{a}{b} = \cot B, c = \sqrt{a^2 + b^2} = a \sqrt{1 + \frac{b^2}{a^2}}$

$a, c$   $\sin A = \frac{a}{c} = \cos B, b = \sqrt{c^2 - a^2} = c \sqrt{1 - \frac{a^2}{c^2}}$

$A, a$   $B = 90^\circ - A, b = a \cot A, c = \frac{a}{\sin A}$

$A, b$   $B = 90^\circ - A, a = b \tan A, c = \frac{b}{\cos A}$

$A, c$   $B = 90^\circ - A, a = c \sin A, b = c \cos A$

**Solution of Oblique Triangles**

Required  $A, B, a, b, c, C$

$A, a, b$   $B = 180^\circ - (A + B), c = \frac{a \sin C}{\sin A}$

$A, b, c$   $B = 180^\circ - (A + B), c = \frac{a \sin C}{\sin A}$

$a, b, c$   $A + B = 180^\circ - C, \tan \frac{1}{2}(A - B) = \frac{(a - b) \tan \frac{1}{2}(A + B)}{c}$

$a, b, c$   $A, B, C$   $s = \frac{a + b + c}{2}, \sin \frac{1}{2}A = \sqrt{\frac{(s - b)(s - c)}{bc}}$

$a, b, c$   $A, B, C$   $\sin \frac{1}{2}D = \sqrt{\frac{(s - a)(s - c)}{ac}}, C = 180^\circ - (A + B)$

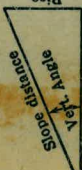
$a, b, c$   $A, B, C$   $s = \frac{a + b + c}{2}, \text{area} = \sqrt{s(s - a)(s - b)(s - c)}$

$a, b, c$   $A, B, C$   $\text{area} = \frac{bc \sin A}{2}$

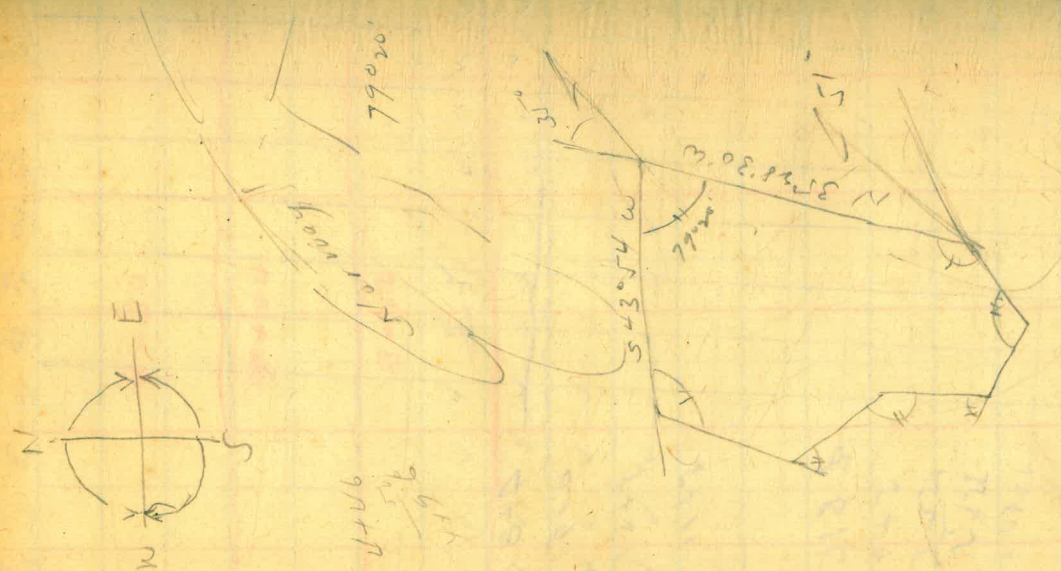
$A, B, C, a$   $\text{area} = \frac{a^2 \sin B \sin C}{2 \sin A}$

**REDUCTION TO HORIZONTAL**

Horizontal distance = Slope distance multiplied by the cosine of the angle of slope. Example: Slope distance = 319.4 ft. Vertical angle = 5° 10'. Horizontal distance = 319.4 × .9969 = 318.06 ft. Vertical distance = 319.4 × .1736 = 55.14 ft. Horizontal distance also = Slope distance minus slope distance times (1 - cosine of vertical angle). With the same figures as in the preceding example, the following figures are obtained. Cosine of 5° 10' = .9969. 319.4 × .0031 = .9969. 1 - .9969 = .0031. Horizontal distance = 319.4 - .9969 = 318.4031 ft. When the rise is known, the horizontal distance is approximately the slope distance less the square of the rise divided by twice the slope distance. Thus: rise = 14 ft. slope distance = 302.6 ft. Horizontal distance = 302.6 -  $\frac{14 \times 14}{2 \times 302.6}$  = 302.35 ft.



MADE IN U. S. A.



City of San Diego, California  
**WATER DEPARTMENT**  
 Daily Automobile and Truck Time Report

No. .... Type.....  
 Station .....  
 Date..... Driver.....  
 Daily Rate..... Hourly.....

HOURS	AMOUNT	CHARGE ACCOUNT OR DESCRIPTION OF WORK
	524.5	
	511.9	
	586.4	
	-4.2	
	582.2	
	611.0	
	14.1	
	4+61	

SPEEDOMETER:

A. M. P. M.

DEAD TIME

TOTAL TIME

Foreman.....

Form 717 10M 10-41

5227 5341 507.6

