Transit #1

Lower Otay Dam

FIELD BOOK

No. 403

W95

32 x 42"
5' to 1" reduced to 20 to 1'

INDEX

Index

7/3/17 Levels on Base Line

Sta	+	HI	-	Elc
00	4.655	204.655		200.0
+50			4.063	200.592
1+00	4.278	05.412	3.521	201.134
+50			4.167	01.245
2+00	4.222	05.634	4.000	01.412
+50			4.175	01.459
3+00	4.115	205.389	4.360	01.274
2+50			3.933	201.456
2+00			4.003	201.386
1+50			4.167	201.222
1+00			4.281	201.108
+50			4.509	200.880
0+00			5.393	199.996

3+6+ Level 7
Dilley - Pad
Weather - Fair

Diff to Elc Assumed Elc
0.592
0.542
0.141
0.167
0.047
0.185

7/5/17

Curve Data

325' Radius Curve

	Δ =	96°15'
	R =	325'
	D =	17°42'
	L =	543.785'
	C =	483.992'
	T =	362.536'
1' actual arc = 0°5'17.3"	Defl 1' =	0°531'
5' = 0°26'26.4"		
10' = 0°52'52.9"		
20' = 1°45'45.7"	Cor. 10' cord =	10.040'

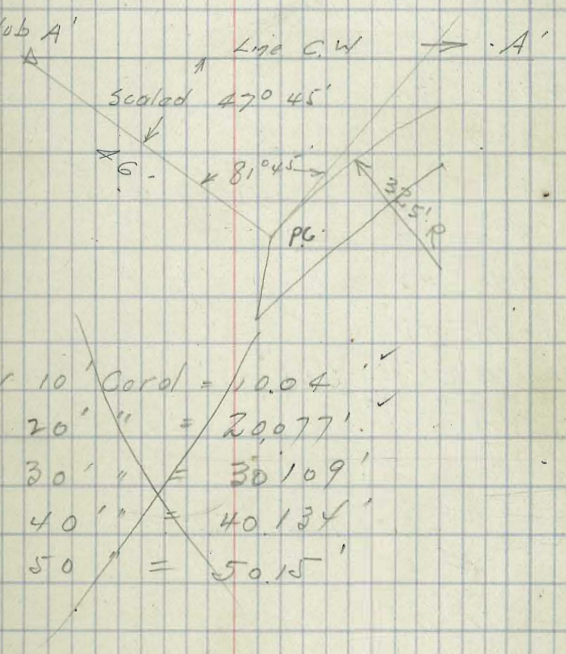
Curve Measured Using Actual Arc Lengths See Book 1 Page 15

0+00	P.C.	1+60	14°09.6'	3+20	28°19.2'
+10	0°53.1'	1+70	15°02.7'	+30	29°12.3'
+20	1°46.8'	+80	15°55.8'	+40	30°05.4'
+30	2°39.3'	+90	16°48.9'	+50	30°58.5'
+40	3°32.4'	2+00	17°42.0'	+60	31°51.6'
+50	4°25.5'	+10	18°35.1'	+70	32°44.7'
+60	5°18.6'	+12	18°45.7'	+80	33°37.8'
+70	6°11.7'	+20	19°28.2'	+90	34°30.9'
+80	7°04.8'	+30	20°21.3'	4+00	35°24.0'
+90	7°57.9'	+40	21°14.4'	+10	36°17.1'
1+00	8°51.0'	+50	22°07.5'	+20	37°10.2'
+10	9°44.1'	+60	23°00.6'	+30	38°03.3'
+20	10°37.2'	+70	23°53.7'	+40	38°56.4'
+30	11°30.3'	+80	24°46.8'	+50	39°49.5'
+40	12°23.4'	+90	25°39.9'	+60	40°42.6'
+50	13°16.5'	3+00	26°33.0'	+70	41°35.7'

HB - Instr
Dilley Rod.

2

4+80	42°28.8'	Tape on East
+90	43°24.9'	Outside 192'
5+00	44°21.0'	Center 195'
+10	45°08.1'	Inside 200'
+70	46°01.7'	
+30	46°54.3'	
+40	47°49.4'	
5+45.96	PT 48°7'30"	



Cor 10' Corol = 10.04'
" 20' " = 20.077'
" 30' " = 30.109'
" 40' " = 40.134'
" 50' " = 50.15'

See Tables.

OVERFLOW Section

Curve at Ele 367.2 down Stream

R = 222.27

D = 26°

7.8' = rate per foot

1° 18' rate " 10 ft

Cor. for 10' = 10.087

0+00 = Face Divide Wall Toward overflow Sect

+10 1° 18'

+20 2° 36'

+30 3° 54'

+40 5° 12'

+50 6° 30'

+60 7° 48'

+70 9° 06'

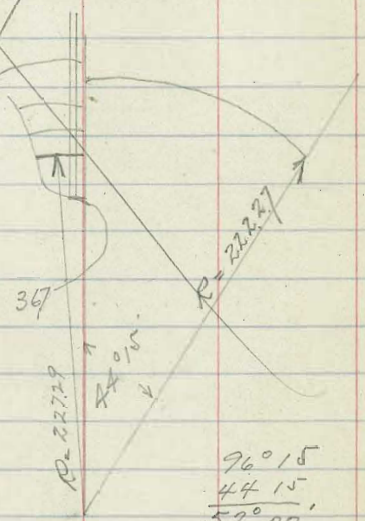
+80 10° 24'

+90 11° 42'

1+00 13° 00'

+10 14° 18'

+20. 15° 36'



96° 18'
44 15
52° 00'

Run to Contour 367.2

Hub 160.69 Point set in Concrete

Gravity Section

Curve at Ele 367.2 down Streams

R = 227.2

Run from Dividing wall to Cont 367.2

Scaled Length 24'

D = 25° 26'

= Rate per ft = 7.63'

" 10 ft = 76.3 = 1° 16' 30".

0+00 = face of wall Toward Overflow Sec

+10 = 1° 16' 30"

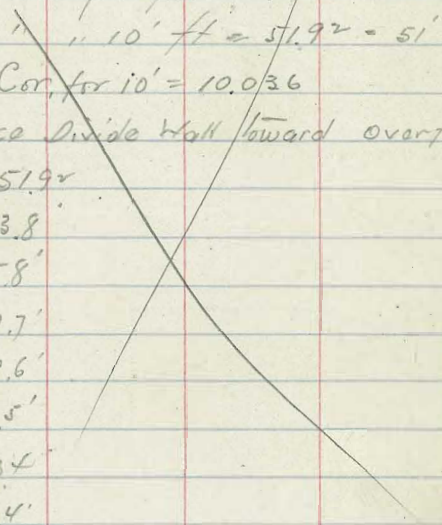
+20 = 2° 33' Cor on 10' = 10.11

+30 = 3° 49' 30"

+40 = 5° 06' 0"

Curve where up stream face cuts
Contour 367.5

R = 337.3
D = 17° 18' 24"
Rate per foot = 5.192
" " 10' ft = 51.92 = 51' 55"
Cor. for 10' = 10.036



0+00	= Face Divide Wall Toward overflow Sec
+10	0° 51.9'
+20	1° 43.8'
+30	2° 35.8'
+40	3° 27.7'
+50	4° 19.6'
+60	5° 11.5'
+70	6° 03.4'
+80	6° 55.4'
+90	7° 47.3'
1+00	8° 39.2
+10	9° 31.1
+20	10° 23.0'
+30	11° 15'
+40	12° 16.9'
+50	12° 58.8

Run to Cont. 3.77 both sides
about 11' to 377 on West

7/9/17

Sub-Dilley - 5

Measurements for Base Line

Temp approx 80°

	1	2	3	4	5	6	
0+00							
+50	50.008	49.995	50037	49.990	50.038	50072	about 85°
1+00	50.00	49998	50.037	49.987	50.038	50.076	about 85°
+50	50.005	50.000	50.040	49.996	50.040	50.074	about 85°
2+00	50.008	50.005	50.050	50.000	50.048	50.085	about 65°
+50	50.009	50.000	50.045	50.000	50.043	50.080	about 65°
3+00	50.010	50.002	50.048	49998	50.046	50.083	about 65°

See Comp Book Pg. 23

7/10/17

Radius of Curves at given Ele

Radius 334.3 at Ele 347.2 Upper End of Concrete
Degree
Rate per ft.

Radius 332.3 at Ele 367.2 Top present R. Bed
Degree
Rate per ft.

Radius 325 Face of Dam upstream
Degree
Rate per foot

Radius 317.5 ℄ Roadway
Degree
Rate per ft.

7/10/17

Radius of Curves at Given Ele's.

Radius 310 Inside Edge of Top
Degree
Rate per ft.

Radius 2838 at Ele 4402 Overflow Section
Degree.
Rate per foot.

Radius 2868 at Ele 4402 Gravity Section
Degree
Rate per ft.

Radius of Curves at diff Ele

Radius 253 at Ele 400.2 Overflow Section.
Degree
Rate per ft.

Radius 2567 at Ele 400.2 Gravity Section
Degree
Rate per ft.

Radius 22227 at Ele 367.2 Overflow Section.
Degree
Rate per ft.

Radius of Curves at diff Ele

Radius 227.2 at Ele 367.2 Gravity Section

Degree

Rate per ft.

Radius 184.1 at Ele 347.2 Overflow Section End of Concrete

Degree = 31°31' 05" Δ = 52°0

Rate per ft. 9.455' = 9' 27" Cor.10 = 10.126

+00		1+10	17° 20' 05.7"
+10	1° 34' 33.7"	1+20	18° 54' 38.4"
+20	3° 09' 06.4"	1+30	20° 29' 11.6"
+30	4° 43' 39.6"	1+40	22° 03' 44.8"
+40	6° 18' 12.8"	1+50	23° 38' 18.0"
+50	7° 52' 46.0"	1+60	25° 12' 51.2"
+60	9° 27' 19.2"		
+70	11° 01' 52.4"		
+80	12° 36' 25.6"		
0+90	14° 10' 58.8"		
1+00	15° 45' 32.0"		

Radius 201 at Ele 347.2 Gravity Section End of Concrete

Degree. = 28° 47' 35.6"

Rate per ft. = 8.638' = 8' 38" Cor 10' = 10.105

1+00		+10	10° 04' 41"	20' = 20.205'
+10	1° 26' 23"	+80	11° 31' 04"	30' = 30.290'
+20	2° 52' 46"	+90	12° 57' 27"	40 = 40.358
+30	4° 19° 09"	1+00	14° 23' 50"	50 = 50.40
+40	5° 45' 32"			60 = 60.41
+50	7° 11' 55"			
+60	8° 38' 18"			

7/11/13

HB Inst. 10

Triangulation for Dam Control

Occupy Hub A-1.

#5	33° 4' 30"
to	6/198° 26'
#4	33° 4' 20"

Hub A'

#4	17° 3' 30"
to	6/107° 30'
#6	17° 3' 20"

Hub A'

#5	5° 8'
to	6/300° 46'
#6	50° 7' 40"

At Hub A'

#6	26° 11' 30"
to	6/157° 8'
#7 Pot	26° 11' 20"

7/11/17

Triangulation for Dam Control

At Hub A'

#7 P.O.T.	42° 38'	
to	6/254° 45'	✓
#8 Point on Rad.	42° 27' 30"	

At Hub B'

#7 P.O.T.	47° 44' 5"	✓
to	6/286° 30'	
P.C.	47 45'	

At Hub A'

P.C.		
to	124° 4'	✓
#5		

At #8 Point on Radius

A'	127° 16' 30"	
to	6/763° 39	✓
#7 P.O.T. Axis old Dam	127° 16' 30"	

7/4/17

Triangulation for Dam Centre

	At #8 Point on Radius	
#7 P.O.T. Axis	49°	44' 30"
to	6/298°	25'
⊙ R.	49°	44' 10"
	At #8 Point on Radius	
#4	92°	24'
to	6/554°	24' 30" ✓
⊙ R	92°	24' 05"
	At #8 Point on Radius	
A'	177°	0 30
to	4/708°	3' ✓
⊙ R	177	0 45
	At #5	
#3	60°	47'
to	6/364°	47' ✓
#4	60°	47'

7/14/17

Triangulation for Dam Control

	At #5	
#4	24° 35'	✓
to	6/ 147° 32' 30"	
#6	24° 35' 25"	
	At #5	
#6	30° 59'	✓
to	6/ 185° 53	
#7 Pot Axis	30° 58' 50"	
	At #5	
#7 Pot Axis	66° 45' 30"	✓
to	6/ 400° 31'	
A'	66° 45' 10"	
	At #5	
#3	183° 06' 30"	✓
to		
A'		

KB lost

13

7/14/17

Triangulation for Dam Control

At #1

#2		67° 19' 30"
to	6/	403° 57'
#4		67° 19' 30"

At #1

#4		25° 57' 30"
to	6/	155° 45'
#3		25 57 30"

At #1

#2		93° 17"
to		
#3		

At #2.

#4		28° 0'
to	6/	168° 02'
#3		28° 0' 20"

At #2

#3		67° 03' 20"
to	6/	402° 20'
#1		67 3' 20"

7/14/17

Triangulation for Dam Control

At #2

#4	95° 3' 30"	✓
To	6/ 210° 57' 30"	
#1	95° 3' 45"	

At #4

#2	17° 37'-	
To	6/ 105° 40'	✓
#1.	17° 36' 40"	

At #4

#1	55° 15'-	
To	6/ 331° 27'	✓
#3	55° 14' 30"	

At #4

#3	44° 49'-	
To	6/ 268° 49° 30"	✓
#5	44° 48' 15"	

At #4

#5	90° 07'	
To	6/ 540° 47'	✓
#6	90° 07'	

7/15/17

Triangulation for Dam Control

At #4

#8 Point on Radius 17° 51'
To 6/ 107° 05'
⊙ R 17° 50' 50"

At #4

#2 207° 47'
To 6/ 124° 41'
#6 207° 46' 50"

At #6

#4 65° 17' 30"
To 6/ 391° 45' 30"
#5 65° 17' 35"

At #6

#5 32° 8' +
To 6/ 192° 51' +
A' 32° 8' 30"

At #6

A' 54° 1' —
To 6/ 324° 5' —
#7 POT Axis 54° 0' 50"

7/12/17

AE Instr.
17

Triangulation for Dom Control

At #6

#7 P.O.T. Axis	69° 52' 30"	✓
to	6/419° 13' 0"	
A N End old Dom Axis	69° 52' 10"	

At #6

#4	221° 30' -	
to	6/1337° 56'	✓
A N End Axis	221° 49' 20"	

At #6

#4	30° 18'	
to	6/1810° 48'	✓
#3	30 18'	

At #6

#3	35° 0' 00" -	
to	6/2090° 57'	✓
#5	34° 59' 30"	

7/12/07

AB lost

Triangulation for Dam Control

At A N End Axis old Dam

#7 Pot Axis	29° 55'	
to	6/179° 28' +	✓
#6	29° 54' 40"	

At #7 Pot

A N.E. Axis old Dam	80° 13' 30"	✓
to	6/ 48° 20'	
#6	80° 13' 20"	

At #7 Pot

#6	62° 52' 30"	
to	6/ 377° 12'	✓
#5	62° 52' 0"	

At #7 Pot

#5	~36° 56' ~	
to	6/ 321° 34'	✓
A' S. End Axis old Dam	36° 55' 40"	

7/12/17

Triangulation for Dam Control

At #7 P.O.T.

A1	10° 16' +	✓
to	6/ 61° 36' -	
#8	10° 16'	

At #7 P.O.T.

#8	190° 17'	✓
to	6/ 1141° 41'	
A N.E. Axis	190° 16' 50"	

At P.O.

#8	69° 45' +	
to	6/ 418° 34'	✓
#4	69° 45' 20"	

At #3

#1	190° 39' 30"	
to	6/ 117° 58'	✓
#2	190° 39' 40"	

7/12/17

Triangulation for Dam Control

	At #3	
#2	79° 8' 30"	
to	6/ 474° 51'	✓
#4	79° 8' 30"	
	At #3	
#4	33° 34' 30"	
to	6/ 201° 26' 30"	
#7	33° 34' 35"	
	At #3	
#4	14° 46' 30"	
to	6/ 88° 41'-	✓
#6	14° 46' 50"	
	At #3	
#6	59° 38' 30"	
to	6/ 357° 49'-	✓
#5	59° 38' 10"	
	At #3	
#1	173° 12' 30"	
to	6/ 1039° 17' "	✓
#5	173° 12' 50	

48 Inst 20

7/21/17

At No. 8 - P.C.T.

#7	130° 16' 45"
to	6/781° 37' 30"
P.C.	130° 16' 15"

At No 8

7	49° 44'
to	6/298° 24' 30"
OR	49° 44' 05"

At No 8.

7	26° 20'
to	6/158°
6	26° 20'

At No 8.

4	92° 23'
to	6/554° 21
OR.	92° 23' 30"

At P.C.

7	43° 06'
to	6/258 38
8	43 06 20

At #8

⊙	40° 05	30	40° 06
to	6/240°	35	30 6/240 35
P.O.R. #2	40°	5	55 40 6 20

At #8

⊙	37°	37'	
to	6/325°	44	325 45 30
P.O.R. #1	37° 37'	20"	37° 37 35

7/21/17

At P.C.

6 to 7: 26° 17' 30"

6 / 157° 45" ✓

7: 26° 17' 30"

At ⊙ R.

8 to 4: 69° 45' 30"

6 / 418° 34" ✓

4: 69° 45" 40"

At No. 4.

8 to 5: 34° 17'

205° 41" ✓

5: 34° 16' 50"

At No 4

8 to ⊙R: 17° 51'

6 / 107° 04" ✓

⊙R: 17° 50' 40"

At No 6.

7 to P.C.: 50° 16"

6 / 301° 38' ✓

P.C.: 50° 16' 20"

8/14/17

22

At Point on Curve & Dividing Wall

#3 to #6: 68° 40'

6 / 412° 1' 30"

#6: 68° 40' 15" Point Reset

At PoC East End of 100' Coord.

#3 to #6: 64° 11'

6 / 385° 7' Point Reset

#6: 64° 11' 10"

At #6

PoC 100' E: 87° 3' 30"

6 / 522° 21'

#3: 87° 3' 30"

At #6

PoC of Divide Wall

#3 to: 74° 47' 30"

6 / 448° 47'

74° 47' 50"

7/21/17

At 6

8	43° 36' 30"	
to	6/261° 39'	✓
7	43° 36' 30"	

At #7

6	103° 26'	✓
to	6/620° 36' 30"	
P.C.	103° 26' 05"	

At #7

6	110° 03' 30"	✓
to	660° 20'	
#8	110° 03' 20"	

At #9 Point on Tang

	20° 39' 30	
#6	6/123° 54' 30	
to	20° 39' 05	
#4		

At #6

#9	114° 07'	
To	6/684° 43'	
#4	114° 7' 10"	

At #4

#6	45° 14'	
to	6/271° 24	
#9	45 14'	

At #3 172° 35' 28° 45' 50"

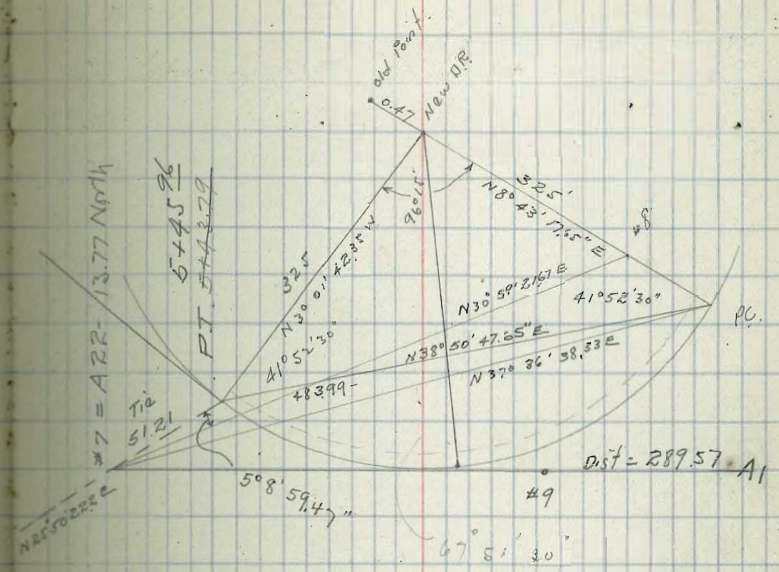
#6	28° 45' 30"	87 3 30
To	6/172° 35	64 11 10
P.C. 100'E	28° 45' 50"	180 00 30

At #3

	36° 31' 30"	36 31 55
#6	6/219 11 30	24 47 50
to	36 31 55	68 40 15
P.C. on Divide Work		180 00 00

7/21/17

Sub Instr. 24
Dilley - Rod



Dist #7 to A-1 = 563.77
Dist #9 to A-1 = 289.57
Dist #9 to #7 274.20
#7 = A22-13.77 North

8/21/17

At A

A-A #10	29° 54-30	
to	6/179 29	
#6	29 54 50	

At Pot A-A #10

A to	125° 08'	
#6	6/750° 49'	29 54 50
	125° 8' 10"	125 8 10
		24 57 05
		150 00 05

At #6

#10	24° 57	
to	6/149 42 30	
A	24 57 05	

10/2/17

At ⊙

PC	96°15'	96°16'
to	6/577 32	6/577 34
P.T	96° 15' 20"	96° 15 40

At ⊙

PC	52° 0
to	
160.60	

8/21/17 25

At Point on Radius #1

⊙	46° 06' +	46° 6
to	6/276° 38' 30"	6/276 39
#8		46 6 30
	46° 6' (25) -	
	20"	

At Point on Radius #2

⊙		
to	43° 37' 30" +	43°38'
#	6/361 45	6/361 38
8	43° 37' 30"	43 38

At Point on Radius #3

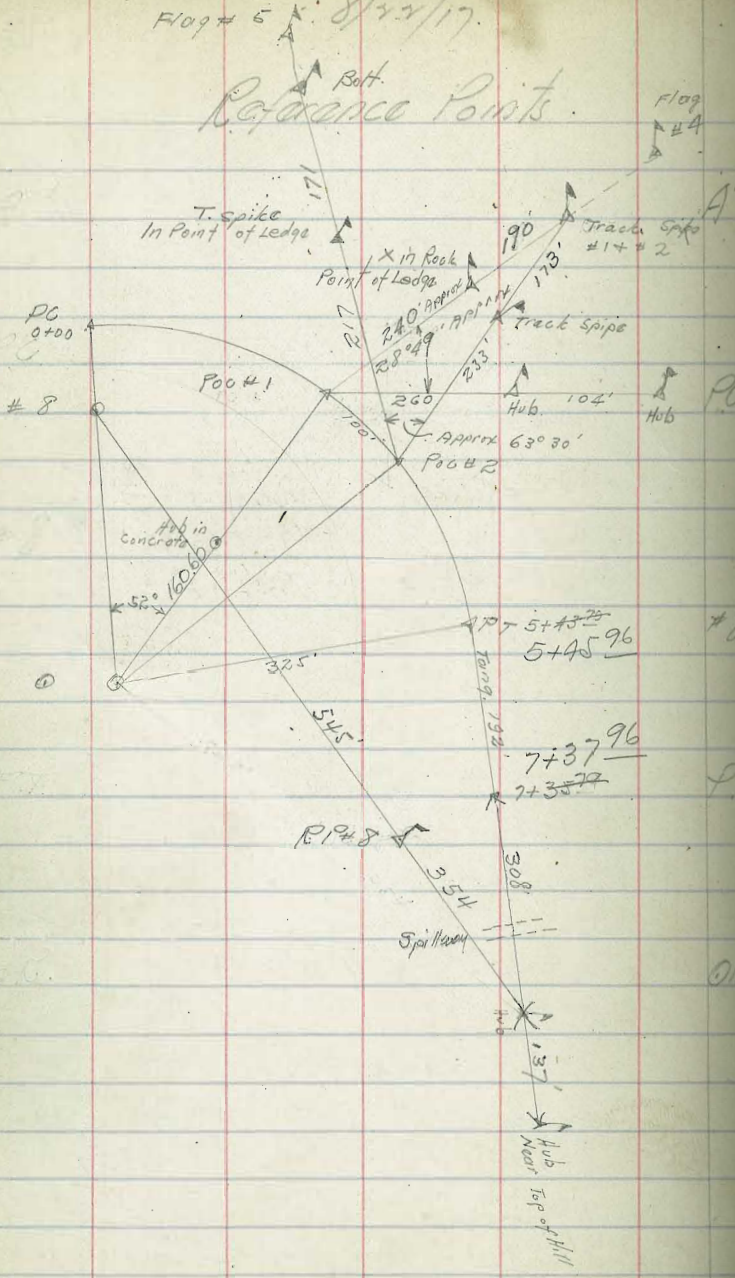
⊙	40° 24' 30"	40° 24' 30"
to	6/242 28	
#8	40 24 40'	

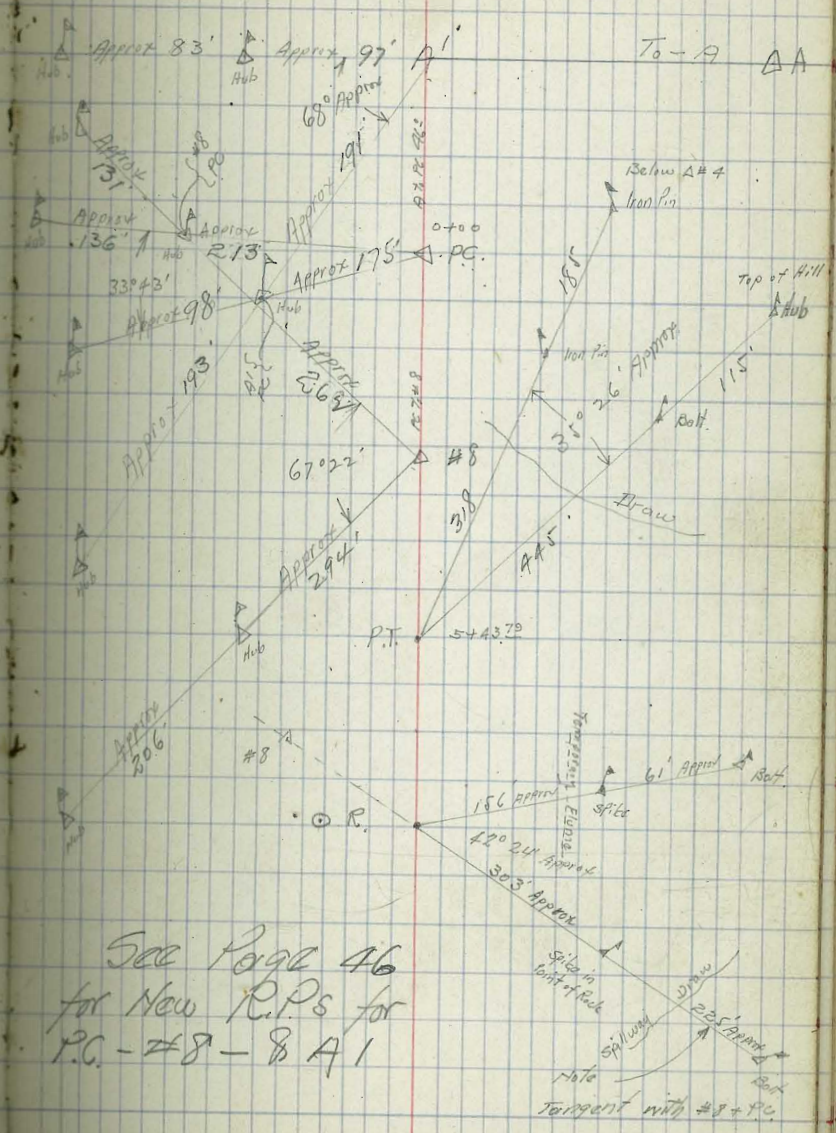
At #8

	43° 19'	See Page 21
⊙	6/259° 53'	6/259 55'
to 10	43° 18' 50"	43 19 10
P.O.T. #3		

Flag # 6 8-27-17.

Reference Points.





See Page 46 for New R.P.s for P.C. - #8 - 8 A 1

7/26/17

H.I. 4.6 Topog for Excavation

At I 11 Sight I 10 for O 92 Rt

66.34

4.8 70.94 66.14 H.I.

7/27/17

H.I. = 84.00 At M 10

74	246°	12
74	231°	11
74	190°	9.5
74	140°	11
74	134°	16.5
74	118° 30'	26.
76	114	25
76	133	16
76	138° 30'	10.5
76	196	6.5
76	238	11
76	283	14.5
78	282	12
78	268° 30'	10'
78	112 30	6
78	125	13
78	112	18
78	108	24.5

Bob Instr
Willcomb - Topog
D. Way - Rod

27

Plotted 7/27/17

Reference Points 10/12/17

Poc in Bottom #1 32.5' Rt Lt Leg

Dist.	cor Dist	∠ Angle
440	427	9°20'
240	238	5°33'

Rt Leg ∠ A = 28°49'

265	260	7.45
385	364	13.5

Poc #2 Rt Leg

420	408	9°35'
240	233	9°

Lt Leg ∠ = 63°30'

220	217	5°40'
400	388	9°30'

Spliced in Topog Book #6 Page 65

7/27/17

Hi = 47 - 70.9

66	At N 11	
66	187 30	14
66	127 30	18.5
70	319	15
70	350	14.5
70	36°	17.3
70	48	18.0
70	55°	18.0
70	66	24
68	74°	27.5
68	71°	15.5
68	64	12.3
68	50	14
68	54 30	15.5
68	44 30	17.5
68	24°	15.3
68	350 30	13.5
68	336 30	10
68	327 30	11
68	327 30	13
68	317	15
89.5 = Hi 50	At N 10	
88	292° 30	39'
88	287° 30	32.3
88	294°	32
88	300°	24

66.24

Sighted Bk. to Pg. 66

54.5

Plotted 7/27/17

At P.T. L.P. L.P. Rt Leg

445 +1°30 ✓

560 +1°30 ✓ ✓

Lt Leg Hog A = 35°26'

505 503 -4°30 ✓

325 318 -8° 8' ✓

At 7+35.79 End Dam

Tang RP ⊥ 1 310' 308' +3°45' ✓

" RP ⊥ ⊥ 450 445 +6°40' ✓

At A Lt Leg

210 191 ✓ +15° 0" ✓

400 384 ✓ +16° 8' ✓

Hor. ∠ - 68°

Rt Let A Line Produced

105' 97 ✓ +16° 18' ✓

At RP on Tang 85' 83 ✓ +10° 30' ✓

7/27/17

At N 10

88		29 L 30	22
88		289	21.5
88		291 30	18.5
88		316 30	14
88		329°	10.5
88		2°	9.5
88		18°	5'
88		59° 30	4.2
88		80° 30	7.0
86		95° 30	6.5
86		81 30	3
86		17°	4
86		308 30	9.5
86		289	15
86		283	20
86		280 30	23
86		286	25
86		286	29
86		286	36.5
88	Boulder	287	24
88	"	286 30	28.5
88	"	293 30	24.0
84		274	26
84		271	18
84		273	16

Crossed Lt Cape 66 Lt 6

Plotted

7/27/17

	At PC	Rt Leg	
	240	238 ✓	+19° 10'
At PP #1 - Rt Leg	145	136	+13° 30'

Lt Leg

300	278 ✓	+17° 20'	Hor ∠ 33° 43'
195	175 ✓	+20° 0'	

At #8 Rt Leg = Sec. #8 P.C.

At PP #1 Rt Leg	135	131	+9° 42' ✓
At #8 -	285	265	+16° 0' ✓

Lt Leg Hor ∠ 67° 32'

320	294	+16° 33' ✓
540	500	+16° 15'

H.I.=89.5	H.A.	N°	84.5
84	271	12	
84	283 30	3	
84	179	3	
84	133	2	
84	139 30	5	
84	137	10.5	
82	163	11	
82	209 30	4.5	
82	254 30	15	
82	272	22	
82	274	28	
49 H.I.=71.2	49 N		
7/28/17 70	336 30	11	✓
72	336.30	12	✓
70	1°	9.0	✓
72	1°	10.0	✓
70	21 30	6.5	✓
72	31 30	9.5	✓
70	33° 30	7.5	✓
72	33°30	9.5	✓
70	73 30	6.0	✓
72	73 30	9.0	✓
72	94	8.5	✓
70	107	12.5	✓
72	94	13	✓

Copied in BK-6 pg 66

66.5

Plotted 7/27/17

7/28/17

H.I. = 71"

At N 11

72	99°	15	✓
70	99°	22	✓
72	99°	24	✓
70	105 30	19.5	✓
72	105 30	22	✓
70	115°	22	✓
72	112 30	24.5	✓
70	115 30	24	✓
70	115 30	28	✓
70	119°	27	✓
70	129 30	31	✓
68	132°	34	✓
66	133°	34	✓
68	129 30	29	✓
66	129 30	28	✓
66	131	25.5	✓
66	121	24.5	✓
68	147°	26.5	✓
68	147 30	22	✓
66	126	20	✓
66	115	16	✓
66	172	16	✓
66	130 30	12.5	✓
66	166	9	✓
66	235 30	7.5	✓

Copied to Bk 6 Page 66

At N 11

H.I. 7.2				
66		268°	15	✓
66		219 30	12.3	✓
68		103°	17	✓
68	Point	118°	12	✓
68		18°	3.5	✓
68		99°	5.5	✓
68		111°	3.5	✓
68	Boulder	142	5	✓
68		63-30	3	✓
68		18-30	5.5	✓
68		318 30	8	✓
H.I. 8.1 5.95 5.5		At 0"		
74	Point of Pic	153	18	✓
74	" "	159 30	17.5	✓
74	" "	159 30	15.3	✓
74	" "	167 30	15.3	✓
74	" "	171	14	✓
74	" "	174	21	✓
74	" "	166	13.5	✓
76	" "	166 30	17.5	✓
72	" "	152	16	✓
74	" "	181	13	✓
74	" "	184	15.5	✓

Copied in BK 67 pg 766

Ring Cont
" "
" "
" "
" "
" "
" "
Touches Top.
" "
" "
" "

H.I. = 816	At 0"		766
72	178	20.3	✓
72	164	24	✓
72	152 30	20.5	✓
72	134 30	10.0	✓
72	156°	8.5	✓
72	149° 30'	5.5	✓
72	128°	9.5	✓
72	105	17	✓
72	89 30	20.5	✓
72	79	21.5	✓
72	68°	28	✓
72	54 30°	34	✓
70	74 30	34	✓
70	87	22.5	✓
70	97 30	26.5	✓
70	110 30	18	✓
70	143	17	✓
70	141 30	19	✓
70	153 30	22	✓
70	161 30	23.5	✓
70	178	22	✓
74	198	26	✓
74	206	18	✓
74	277 30	12	✓
74	255 30	9.5	✓

Copied page 67 in BC #6

Ring Conf.
" "
" "
" "

Connect with topog from N"

Cliff

H.I. = 81.6	At 0"			76.6
74	197 30	3.	✓	
74	109	9.5	✓	
74	79°	19	✓	
74	71	22	✓	
74	61 30	21.5	✓	
74	63°	25'	✓	
74	73°	36'	✓	
76	71°	32	✓	
76	55	21	✓	
76	81 30	13	✓	
76	163°	2	✓	
76	254	5.5	✓	
76	259	10.	✓	
76	277	11	✓	
76	311	17	✓	
76	299	28.5	✓	
78	304	28	✓	
80	304	28	✓	
78	305	27	✓	
80	305	27	✓	
78	311	17.3	✓	
80	311	17.3	✓	
78	311 30	9.5	✓	
80	311 30	9.5	✓	
78	323	4.	✓	

Copied in Bk 6 p 67

Cliff
Edge cliff
"

816 — At 011 — 76.6

80	337	5	✓
78	72 30	7	✓
80	6 ✓	7.5	✓
78	39 30	15	✓
80	50 30	15.5	✓
78	48	19	✓
80	44	17.5	✓

Carried to Bk 6 page 68

465
H1

At P11

8/21/17

Top lip Spillway West Side

At #10 Sight A' for 0 Az Rt.

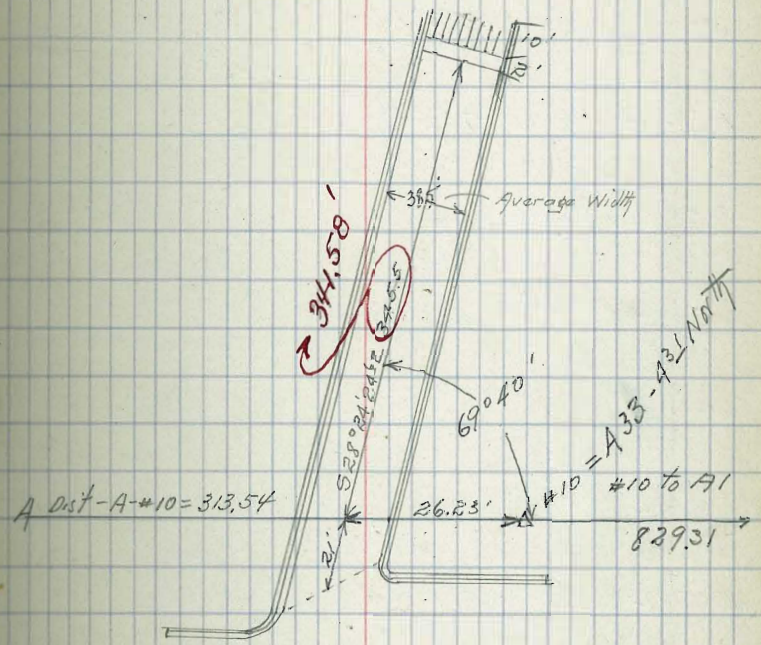
SW Cor Spill	24'	45°06'
P.C.	17.2'	81°12'
P.T.	9.2'	134°30'

East Side

NE Cor.	80'	163°14'
P.C.	70.5'	157°22'
P.T.	61.8'	157°10'

2' batter

1' across top - thickness Concrete



8/29/17 "A" Alignment

Road Survey

	Δ Lt	Δ Rt.
7+04 $\frac{01}{}$	Δ Rt	21°28'
6+51 $\frac{61}{}$	Δ Rt	5°08'
6+01 $\frac{53}{}$	Δ Rt.	7°50'
5+51 $\frac{33}{}$	Δ Lt	10°07'
5+01 $\frac{33}{}$	Δ Lt	7°25'
4+51 $\frac{0}{}$	Δ Lt	6°39'
4+01	Δ Lt	13°40'
3+01 $\frac{48}{}$	Δ Lt	6°04'
2+00 $\frac{72}{}$	Δ Rt	7°06
1+00 $\frac{3}{}$	Δ Lt	29°0'
0+00		
360 / 37		41°32'

Road Survey

Sta	Δ Lt	Δ Rt
12+53 $\frac{17}{}$	Δ Lt 6°19'	
12+03 $\frac{34}{}$	Δ Rt	4°21
11+53 $\frac{39}{}$	Δ Lt 1°12'	
11+03 $\frac{44}{}$	Δ Lt 7°47'	
10+43	Wash.	
10+33 $\frac{16}{}$	Δ Rt	68°44'
10+22	Wash	
10+02 $\frac{68}{}$	Δ Rt	85°06'
9+52 $\frac{5}{}$	Δ Lt 1°44'	
9+02 $\frac{20}{}$	Δ Rt	1°43'
8+41 $\frac{85}{}$	Δ Lt 22°30'	
8+02	Δ Lt 53°50'	
7+52	P.O.T. 96°22'	159°54'

159°54'
96 22
63 32

328°37'
63 32
32 09

Wash

Road Survey

Sta	Ls Lt	Ls Rt
19+03.59	LH. 5°23'	
18+53.67	ΔLt 12°05	
18+03.67	ΔRt	5°39'
17+03.24	ΔLt 4°48'	
16+02.89	ΔRt	8°05'
15+52.27	ΔRt	48°39'
15+02.29	ΔLt 67°46	
14+52.29	ΔRt	5°23'
14+02.99	ΔLt 16°52'	
13+53.08	ΔRt.	13°09'
13+03.23	ΔLt 6°18'	80°55'

113 17
80 55
32°02'17

36° 32 09
32 17
389.52'

Road Survey

Sta	Ls Lt	Ls Rt
28+06 19	ΔRt.	31° 30'
27+56 12	ΔRt.	10° 16'
27+06 30	ΔRt.	5° 20'
26+56 30	Δ Lt	11° 41
26+06 36	Lt	30 17'
25+56 53		7° 16'
25+26 06	Lt	0° 41'
24+65 86	Lt	7° 50'
24+05 87	Lt	6° 01'
23+05 05	Lt	1° 31'
22+04 97	Lt.	7° 27'
21+04 48	Lt	19° 38
20+04 07	Lt	4° 20

19° 18'

98 21
19 18
79° 03

35 99 52
79 03
88 55

25+19 F. Xxing

23+81 F. Xing

23+71 F. Xing

23+56 Road Xing

23+15 F Xing

8/29/17 41

Road Survey

Sta	Δ's Lt	Δ's Rt.	
35+57	-	Δ Rt.	25° 05'
35+07	08	Δ Rt	11° 47'
34+57	13	Δ Rt.	0° 51'
34+07	22	Δ Lt	1° 28'
33+57	27	Δ Rt.	4° 54'
33+07	30	Δ Rt.	2° 37'
32+06	72	Δ Lt	7° 16'
31+56	62	Δ Lt.	2° 28'
31+06	27	Δ Lt	4° 45'
30+06	12	Δ Lt	3° 26'
29+06	08	Δ Rt	5° 56'
28+56	16	Δ Rt.	15° 51'

19°20

66° 56'
19 20
47 36
78 56

M 31

N 87-30 W

N 58° 30 W

N 57° 30 W

Road Survey

8/29/17 42

Sta	Ls Lt	Ls Rt	
	Cont. Rg US		S 50° W
57+81 9 +45		Lt 15°56'	
47+40 Fence Xing			
40+56 23	Lt 25°57'		
40+06 30	Lt. 19°22'		
39+56 30	Lt 20°40'		
39+06 40	Lt 18°37'		
38+56 40	Lt 18°22'		
38+06 20		Lt. 5°02'	
37+56 63	Lt 0°45'		
37+06 92	Lt 0°23'		
36+56 90	Lt 6°28'		
36+07 10		Lt. 11°01'	

84.37 / 16.03 / 68.34

16.03

126.31 / 68.34 / 57.97

59+84 3 Lt Rt Old Road

40+56 23

S 60° W

40+06 30 Lt.

2°30'

S 38° 30' W

S 6°02' W

2+00 75

Mag Course S 76° 00' E

0+00

Road Survey

13" Line

	Sta	Ls Lt	Ls Rt
5	21+04 48		7°45'
	S 7° W.		
A	21+99 86	42°59'	
A	22+99 79		13°21'
	S 22°30' E		
4	24+18 17		60° 50
3	25+49 8		44°22'
	S 82° W		
3	26+50		16°14'
3	27+00	36°21'	
	S 61° W		
3	27+50 3	15°55'	
3	28+00 4		9°13'
	S 53°30' W.		
3	28+50	20°20'	
3	29+49 7 48		23°12'
	21+04 = 48 A =		
	21+04 = 48 B		

Mag Course.

"B" Line.

Sta.		Ls Lt.	Ls Rt.
29+49.1	S 55°30' W.		
30+00			13°30'
30+50			17°26'
	S 87° W.		
31+50			9°38'
	N 82°30' W.		
33+50		5°26'	
34+00		3°49'	
	S 88°30' W.		
34+50		3°10'	
36+00		5°21'	
	S. 79° W.		
37+00		3.5°AC'	
	S 66° W.		
39+50	Bottom Grade		

"A" Line

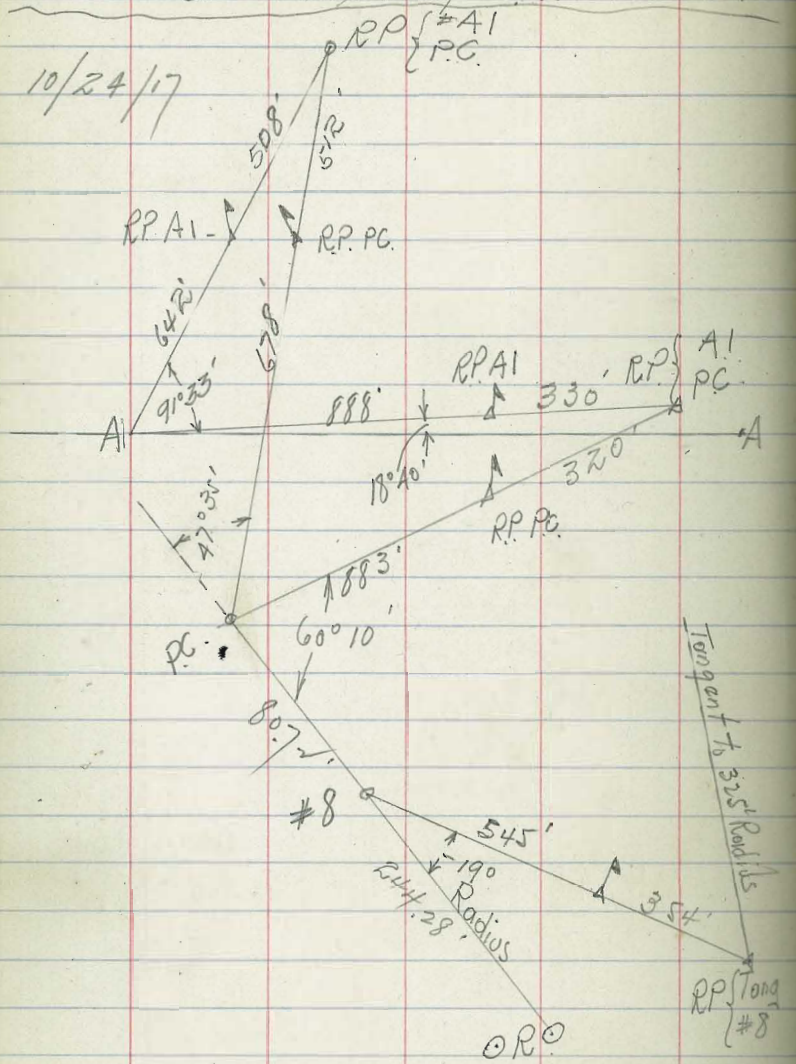
Alignment Road Survey

Sta.	Ls Lt.	Ls Rt.
59+84	Lt	40° 0'
		5°56°W
58+81.8	Lt	5°38'

10/22/17

Sat Temporary R.P. Poc # 182

10/24/17



10/30/17 Excavation Estimate

Sub-Level Datum Point -100

Sta	+	H.I.	-	Elev
12'N F12	3.98	375.28		371.30 B.M.
00 cut across				

F line

F12		10.0	65.3
6' N. F12		11.0	64.3
F13		10.7	64.6
F 14		10.4	64.9
F 15		10.0	65.3
F15-10'N		8.7	67.2

E line

E12-9'N		10.3	65.0
E12-15'N		11.0	64.3
E 13		11.2	64.1
E 14		11.0	64.3
E 15		11.1	64.2
E15-18'N		9.3	66.0
E15-20'N		10.7	64.6
E 16		11.0	64.3
E16-2'N		8.5	66.8

D line

D12		10.2	65.1
D12-6'N		10.4	64.9
D13		11.3	64.0
D14		11.4	63.9

See Estimate Book 1, Page 44

Plotted & Computed 10/30/17 HHB

X Sections

Elc. Estimate Oct 30 1917

Sta	+	+/-	−	Elc
		375.28		
	D line Cont.			
D 15			11.1	64.2
D.15-20N			9.8	65.5
D16			11.0	64.3
D16-6N			11.0	64.3
	C line			
C 1N			10.2	64.9
C 13			8.2	65.1
C 13-15N			10.3	65.0
C 14			11.0	64.3
C 15			10.9	64.4
C 15-17N			9.0	66.3
	B line			
B 1N			10.3	65.0
B 13			10.3	65.0
B 14			10.6	64.7
B 15			9.9	65.4
B 15-5N			8.9	66.4
	A line			
A 1N			10.5	64.8
A 13			11.0	64.3
A 14			10.7	64.6
A 15		✓	9.6	65.7

See Book # 9 Pages 1-2

Plotted + Computed 10/30/17 HRB

Yardage

	End Area	Cu Yds
F12-12W	00	
		23.6
F line	106	
		136.6
E "	189	
		181.9
D "	204	
		147.2
C "	114	
		75.0
B "	48	
		51.9
A "	64	
		66.2
M "	79	
		59.7
N "	50	
		23.1
O "	00	
Total Yds.		765.2
		.34

Constructional - Stable fill Sand

Checked by end.

Note See X sections - Sections plotted + Areas taken by planimeter. HRB.

Exc. Est. Oct. 30 1917.
Cont.

Sta	+	H.I.	−	Elev
		375.28		
		N. Line		
N 15			8.8	66.5
N 14-20 N			9.2	66.1
N 14-10 N.			11.3	64.0
N 14			11.3	64.0
N 13			10.8	64.5
N 12			10.2	65.1
		W Line		
N 12			10.6	64.7
N 13			10.9	64.4
N 14			10.7	64.6
N 14-15 N			9.1	66.2

Plotted. Tied
Plot Comp 11/7
& 10/30 11/7

10/5/17 Hand level Bob Paddock

Profile for test holes

1.2
~~56~~ 71.77 70.57 A15-8'N.

00				
0+7				
0+19				
0+24 5				
0+33 5				
1+15 5	15 1+15 Crosses "12" 4' West of "B"	10.6	5.6 / 5.0 / 10.0 D	66.2 / 61.2
1+19 5		9.9	7.4 / 2.5 D	64.4 / 61.9
1+24		16.2	4.2 / 12.0 D	67.6 / 55.6
1+28 5		16.6	3.6 / 13.0 D	68.2 / 55.2
1+33 0		15.4	5.4 / 10.0 D	65.4 / 55.4
1+37		17.0	7.5 / 9.5 D	64.3 / 54.8
1+42		15.6	7.0 / 8.6 D	64.8 / 56.2
1+46		16.6	6.7 / 9.9 D	65.1 / 55.2
1+47 5		16.1	6.5 / 9.6 D	65.3 / 55.7
		13.3	5.8 / 7.5 D	66.0 / 58.5
		9.8	5.8 / 4.0 D	65.0 / 62.0
		6.5	5.5 / 1.0 D	66.3 / 65.3
		5.0	5.0 / 0.0 D	66.8 / 66.8
		2.5	2.0 / 0	69.8 / 90

A12 65.08 / 7.2 / 72.28 = A1

A15-5'N 70.57 / 1.2 / 71.77

50

A12 7.2

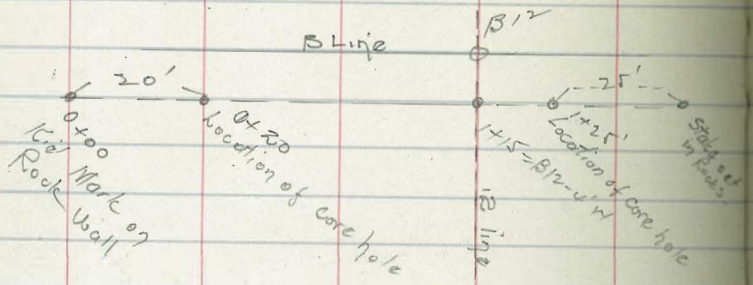
A15-8'N 1.2

30'

Plotted, Nov 5 1917

11/9/17

R. Points for Location of Core holes set by Bub + Willcomb



11/12/17

Levels To Top Shaft

B.M.	9.47	504.36		499.89
	9.74	517.28	180	502.56
	11.66	520.13	381	508.47
	0.27	516.26	414	515.99
			879	507.97

Rock Concrete Basin -
Rock
Rock

Center Manhole Cover over Shaft.
at Coagulating House.

Ele Top Harvey Diverting Dam 559.0

Ele Spillway Crest Upper Otay 549.56
" Outlet 20" Dia. " " 521.69
Ele Spillway Lower Otay 484.7
Ele Indep " " " 487.2
Ele Top Shaft. Depth Roughly 113' 507.97

Ele Bottom Tunnel Outlet 392.9
" & Pipe Outlet 393.9

Ele Bottom Tunnel Inlet 396±

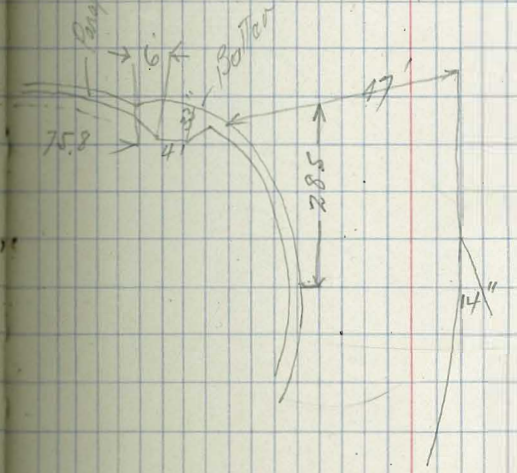
11/14/17 Elevations Upper Otay. Level 13rb

Sta.	+	H.I.	−	Elv.	
	49.2	559.66		554.74	Top of old Dam
			2.72	56.94	Top Raised Parapet.
			10.12	49.54	Rt Side Top Concrete Spillway End upstream
			9.90	49.76	Center " " " "
			9.90	49.76	Lt. Side " " " "
			2.40	57.26	Top Parapet at Break on Rt.
			4.92	54.74	Top Dam at Center
			2.40	57.26	Top Parapet at Break on Lt.
			2.40	57.26	" " at West. END of Dam

8" / 18"

1 K 27½ ☐ 1 ☐ K 1 35' K

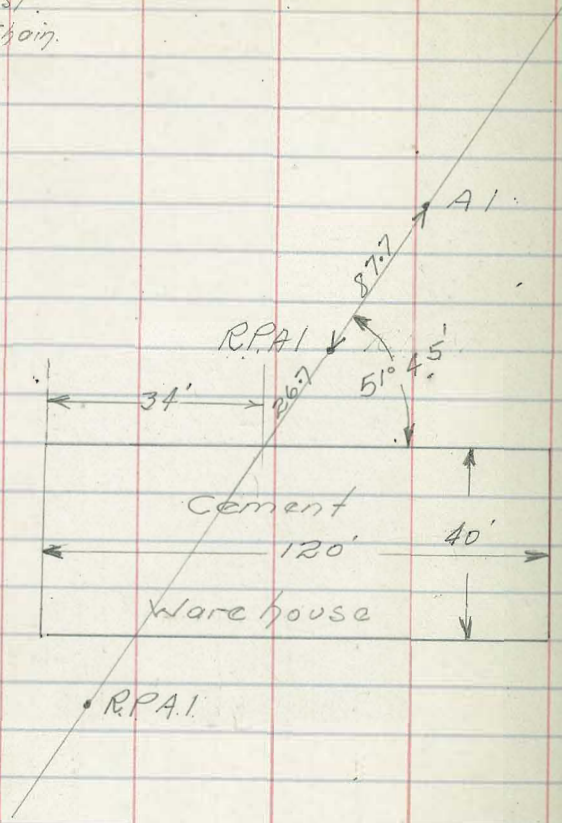
End of Parapet. 1st Park West Side 1st Park East Side



11/15/17

Location of Cement Store House

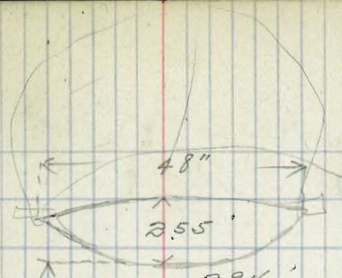
Bub Inst.
V.W. - Chain.



11/16/17 Tunnel Data.

1+34 26		
1+35 80	1.54	
1+77 27	41.47	Hub.
2+17 27	40.00	Stake.
2+47 27	30.00	"
2+82 27	35.00	"
3+07 27	25.00	"
3+37 27	30.00	Hub.
3+68 27	31.00	Stake.
3+97 27	29.00	Stake
4+22 27	25.00	"
4+42 27	20.00	"
4+59 27	17.00	"
4+82 27	23.00	"
5+27 27	45.00	"
5+55 27	28.00	"
5+84 27	29.00	"
6+27 27	43.00	"
6+30 21	2.94	
6+32 26	2.55	
1+34 26	498.50 ✓	Center Present Tower

To South Side Shaft.



46.2
89.0
42.0
177.2

Total dist Center Shaft to South Side Stand Pipe = 494.44
9.65 = Cir of Pipe
Dist from North side 5.10 to Face Concrete = 1.7

11/16/17

Stationing on line connecting Old Tower + Tunnel Shaft.

6+32 76 South Side Shaft.

6+30 21 North Side Shaft (6+29 97 = Measurement inside tunnel)

6+27 27 Cross on Conc.

5+13 81 P.O.T.

3+37 27 P.O.T.

1+77 27 P.O.T.

1+42 31 End Conc. Apron

1+34 26 ℄ Tower.

1+32 82 End of Pipe.

1+32 22 North Side Tower

1+31 06 Face of Wall

1+26 31 End Con Apron

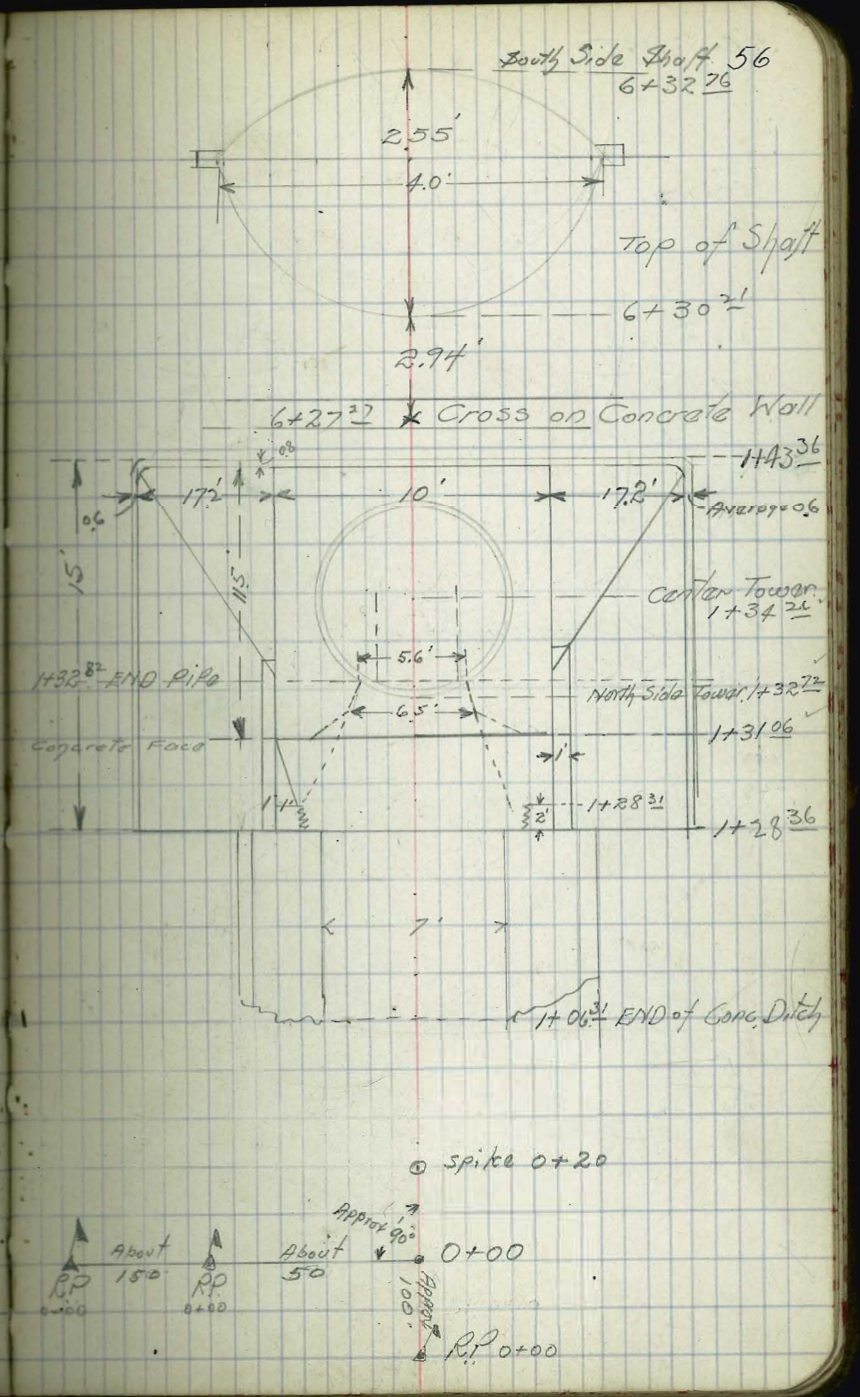
1+06 31 End Con Ditch

0+00

12.5
1.7
1.5
15.7

1+34.7
1.5
32
18.5
1+18.06 Center tower
℄ New tower

1+18.06
12.5
56
1+05
25
56
1+30



Dec 6/1917

Measurements on Road from P.C. of Dam 325' R. to S.E. Cor. Sand Bin = Distance = 3025.0'

Distance from Sta 7 projected from line to S.E. Cor. Sand Bin = 1525.
Horizontal dist from Sta 1+84.7 to Sta 7 = 502 add 1525. = 2027 from A Line to Sand Bin

See page 58 Book #2

Sub Instr.

Check on Triangle Points

P.T. - ⊙ - #8.

At # 3

# 4	56° 43' 30" ✓
To	6/340 21
#11	56° 43' 30"

At # 3

#4	37° 06' -
To	6/22 34 30 ✓
P.T.	37° 05' 45"

At # 3

P.T.	19° 38' -
To	6/117 46 30 ✓
#11	19° 37' 45"

At # 4

# 3	73° 39' +
To	6/441° 57' ✓
#11	73° 39' 30"

At # 4

#11	39° 11' 30" ✓
To	6/235° 09'
P.T.	39° 11' 30"

At # 4

# 3	112° 51' ✓
To	6/677° 06'
#P.T.	112° 51'

At # 4

#8	33° 45' 30" ✓
To	6/202° 34 30"
P.T.	33° 45' 45"

At P.T.

⊙	34° 37'
To	6/207° 42' 30" ✓
#8	34° 37' 05"

At P.T.

#8	102° 57' 30"
To	6/617° 46' 30" ✓
#4	102° 57' 45"

At P.T.

#11	63° -
To	6/377° 57' 30"
#4	62° 59' 35" ✓

	At PT
⊙	74° 35' 30"
to	6|447° 31' 30"
#11	74° 35' 15"
	At P.T.
#11	32° 56'
to	6|497° 38' —
#3	32° 56' 30"
	At P.T.
#3	30° 3' +
to	6|180° 19' 30"
#4	30° 3' 15"

12/20/17

	At #8
⊙	49° 6' 30"
to	6|294° 39' 30"
P.T.	49° 6' 35"
	At #8
P.T.	43° 16' 30"
to	6|259° 39'
#4	43° 16' 30"
	At #8
#4	92° 23'
to	6|554° 18'
⊙	92° 23'

12/20/17

	At #11
⊙	50° 55' 30"
to	6|305° 33'
P.T.	50° 55' 30"
	At #11
P.T.	77° 49'
to	6|466° 53' 30"
#4	77° 48' 55"
	At #11
#4	49° 37'
to	6|297° 41' —
#3	49° 37' 0"
	At #11
#3	178° 21' 30"
to	6|1070° 09'
⊙	178° 21' 30"

At O

#8	96° 16' 30"
To	8 | 270° 11' 30"
PT	96° 16' 22.5" ✓

At O

#11	54° 29'
To	6 | 326° 55' 30" +
PT	54° 29' 15" ✓

At PT

O	137° 34' 30"
To	6 | 825° 28' 30" ✓
#4	137° 34' 45"

12/22/17

At Point on Radius

#11	38° 59' 30"
To	6 | 233° 57'
#4	38° 59' 30"

At Point POG #1 as Reset 12/22/17

#11	69° 45' 30"
To	6 | 418° 33'
#4	69° 45' 30"

At #11

#4	97° 57' 30"
To	6 | 587° 42'
POG #1	97° 57'

At #11

#4	122° 07' 12"
To Point on Radius on Divide Wall	6 | 732° 42' 30" 122° 7' 45"

At #4

#11	18° 53'
To	6 | 1130° 18'
#17 ✓	18° 53'

At #4

#11	17° 18'
To	6 | 730° 46' 30"
POG #1	17° 17' 45"

1/2/48 R. P's

		Dist	Dist
		330	155
Rt Leg		380	158
Lt Leg	Bldg #4		248

At Poc 2+85.88 315' R.

⊙	111°	0'
to	6)666°	4
RP Rt Leg	111°	0 40"
285.88 Poc		

At Poc 5+85.88 315' R.

⊙		151°	14' 30"
to	6)907		39
Lt Leg RP	151°	14'	50"
285.88 Poc			

Grades Bottom Spillway

				70.47	
B.M.		5.17	75.59		
~~B.M.~~		~~4.85~~		4.8	70.77
Sta	Sub grade				
1	~~470.27~~				
+40	468.				
+80	466.				
2	465.				
+40	463.				
+80	461.				
3	460.				
+40	458.				
+80	456.				
4	455.				
+25	453.95				

Wilcomb 1951
Bub - Coo

T 31 Coord Point

Q 3 70.76

Grade Rod	Rod
5.39	4.39
7.39	4.39
9.39	4.39
10.39	4.39
12.39	4.39
14.39	4.39
15.39	4.39
17.39	4.39
19.39	4.39
20.39	5.39
21.64	

Copied from Book # 9 Estimates
See Book Page 23 and 24

Upstream Toe of Curtain Wall

	+	H.I.	−	El.
T.B.M.				362.13
	5.07	367.20		
2+85.88			3.3	363.9
2+95.88			10.6	356.6
A			12.30	354.90
	0.30	355.20		
3+05.88			2.3	352.9
3+15.88			6.1	349.1
3+25.88			10.3	344.9
3+35.88			9.8	345.4
3+45.88			7.1 6.2	348.1
3+55.88			+ 2	357.
T.B.M.			12.52	~~342.68~~ 413

At Intersection with Surface of Rock

Top of Rock about 3' E B13 -15'W -15'N

7.6 +10' from 315'R. Baseline Batter 1 on 10 from El 490

8.4 +10'

8.7 +10' out

9.1 +10' "

9.5 +10' "

9.5 +10' "

9.2 +10' "

8.3 +10 "

Copied in Topog 1800 ft #10 Page 15

Pt. on Face of Old Concrete on top of 2" Sk. lagging

SAND ESTIMATE

Jan 10 18

	L	℄	R	END AREA	Cu Yds.	
	1.0 / 6.3	1.0 / 0+00	1.0 / 5	68.0		
	1.5 / 17	2.0 / 1+00	1.0 / 15	573	773	
	1.0 / 35	2.0 / 2+00	1.5 / 16	88.0	760	
	2.0 / 36	2.0 / 3+00	1.0 / 24	108.0	367	
	3.0 / 42	3.0 / 4+00	2.5 / 26	197.5	366	
	3.0 / 45	3.5 / 5+00	3.0 / 25	277.5	787	
	3.5 / 26	4.0 / 6+00	3.0 / 20	165.7	778	
	3.0 / 20	3.5 / 7+00	2.5 / 23	134.0	555	
	2.5 / 32	3.5 / 8+00	3.0 / 32	184.0	389	
			Total Cu Yds		3671	

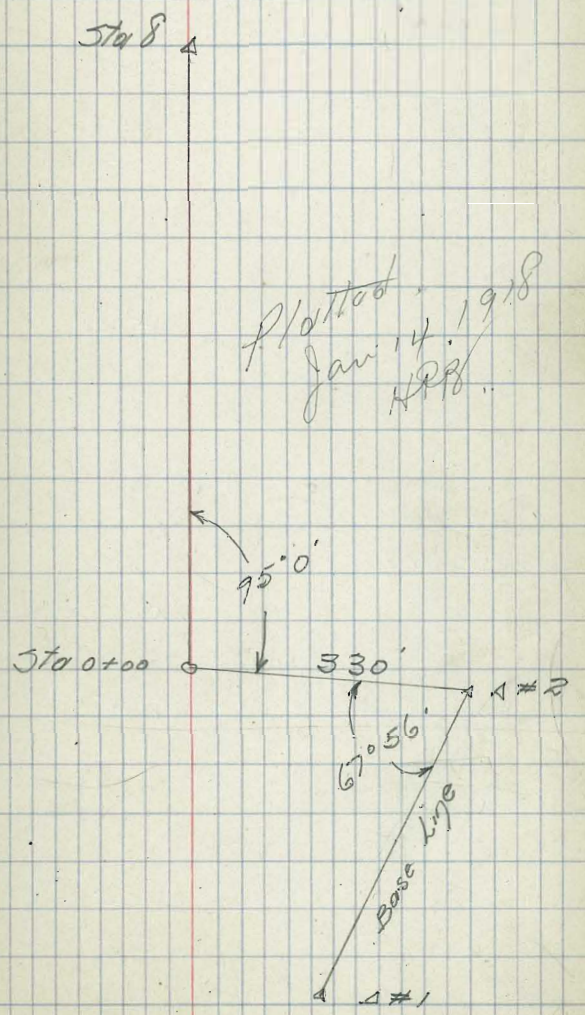
1/7/18

	Lt	℄	Rt
7+00	1.5 / 42.0	3.0	2.7 / 22.0
10+00	2.5 / 63.0	3.0	2.3 / 21.0

1/10/18 64

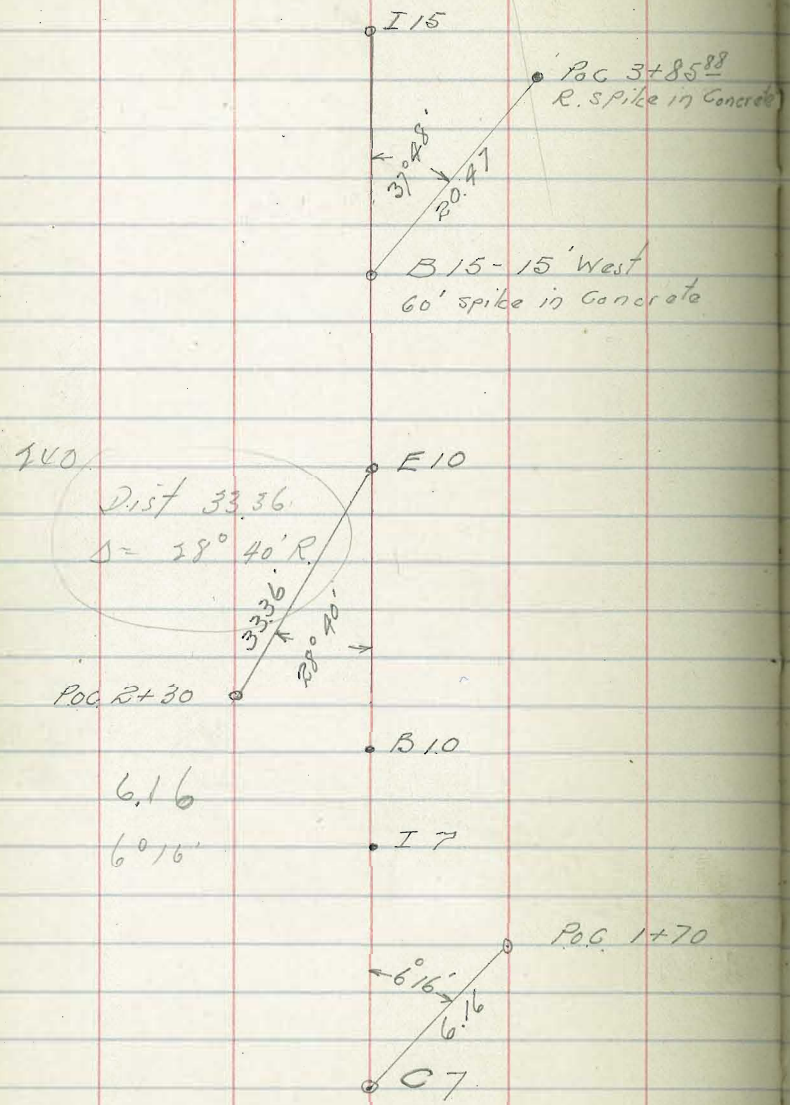
Wilcomb – last
Bob – Rod

Tie from Base Line to Sections for Sand Estimate



Ties 25' Coord Points to 315-R-Base Line

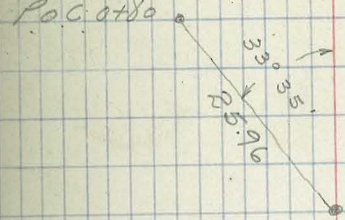
Jan 31 1918



Bk 5 Pat

65

A End of Axis North



Copied in Book 7 P 21

2/1/18

Levels for BMs

	0.725	372.025		371.30	B.M. Bolt in Ledge. 50' E of S. End Diversion Dam (D)
			9.890	362.135	B.M. Point Mark on Rock 3' East B 14 15 North 15 West
					Checked (D)
	12.30	383.60		371.30	
T.P.	12.0 ±	95.48	0.14	383.46	Rock
P.	11.97	406.39	1.06	94.4 ±	Rock
P.	11.79	417.65	0.53	405.86	Rock
Check			7.49	410.16	I 7
P.	17.66	430 ± 2	0.09	417.56	Rock
Check			9.9 ±	420.30	I 6 - 420.3 ±
T.P.	10.78	437.14	3.86	426.36	F-7 Checks (D) 426.36
A	5.44	441.38	1.20	35.94	Rock
B.M.			2.27	439.11	Plug in Concrete. Reference Point P.G. 1+20.
check			3.97	37.41	Hub C #7
Check			6.38	435.00	Nail ± 6
	0.72	362.85		362.13	B.M. 3' E. B14 (15 N 15 W
P.	-0 ±	50.74	12.09	50.76	Rock
P.	8.16	48.33	1.057	40.17	Rock
B.M.			11.10	337.23	R.R. Spike in Wood Plug in Concrete of old Masonry upstream Face

To be checked

Bub Instr
Rod - Rod

2/8/18

Sections on Curves for Progress Feb 8 1918

Sta 00 of 383' R taken on Radius through P.C 3+85.88 Deflect. 315' Radius.

Central Δ 1° = 8.976'

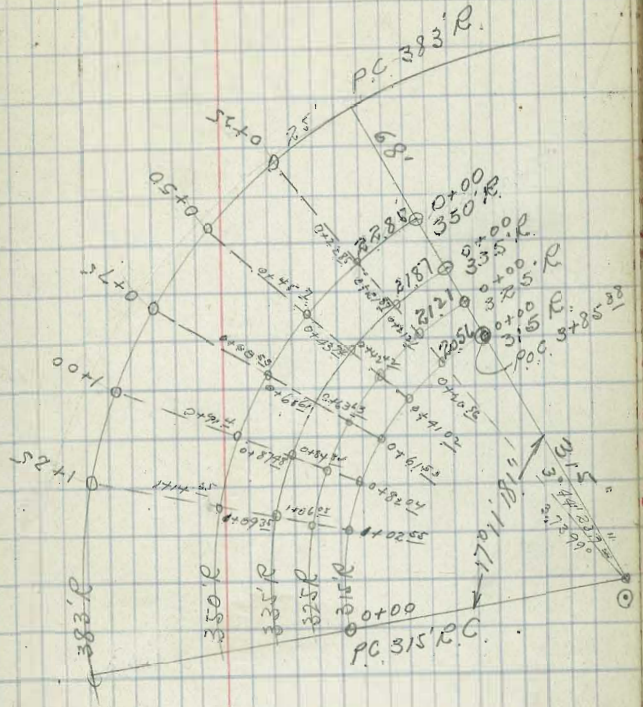
Defl. for 1° = 4.488'

Diff. 383' R Curve

0+00	
+25	1° 52' 12"
+50	3° 44' 24"
+75	5° 36' 36"
1+00	7° 48' 48"
1+25	9° 41' 00"
1+50	11° 13' 12"
1+75	13° 05' 24"

Radius	Dist.
305	78
305	68
325	58
335	48
350	33

D.b
Pat.
K.W.
Bill



Lay-out of Section

See next page for Elevations

2/8/18

Sections taken on 350- 335- 325- 315 Radius Curves.

Stations		+	H.I.	−	Elev
		1.66	363.79		362.13
315 R	Sta 1+25	Computed Station 1+02.6	✓	1.15	62.64
2.5	"	1+04.6	✓	.00	63.8
325 R	"	1+06	✓	.30	63.5
335 1'N.	"	1+08.4	✓	1.6	62.2
335 R	"	1+09.4	✓	13.1	66.9
3'N.		1+06.4	✓	2.8	61.0
4'N.		1+05.4	✓	6.0	57.8
8.3 N.		1+01.1	✓	7.6	56.2
9.2 N.		1+00.2	✓	9.4	54.4
9.9 N		0+99.5	✓	11.7	52.1
350 R	"	1+14.3	✓	.00	63.8
8'N		1+06.3	✓	0.30	63.5
12' N		1+07.3	✓	3.0	60.8
15'N		0+96.3	✓	3.7	60.1
350'R	Sta 100	0+91.4	✓	6.0	57.8
7'N		0+84.4	✓	8.0	55.8
13'N		0+78.4	✓	8.6	55.2
16.5 N.		0+74.9	✓	12.8	51.0
350 R	Sta 75	0+68.6	✓	16.4	48.4
14'N		0+54.6	✓	17.7	46.1
350 R	Sta 50	0+48.7	✓	16.5	49.3
6'N.		0+39.7	✓	16.2	47.6
6'N		0+39.7	✓	17.2	46.6
11 N		0+34.7	✓	16.7	47.1

Paddock Test Rod

Stations		H.I. 0+31.2	−	Elev
14'N	Sta 50	63.79 ✓	15.0	48.8
14 N.		0+31.2 ✓	13.0	50.8
17 N		0+28.7 ✓	12.8	51.0
20'N.		0+25.7 ✓	14.3	49.5
350 R	Sta 25	0+22.9 ✓	13.8	50.0
15'N		0+07.9 ✓	10.2	53.6
350 R	Sta 00	0+00 ✓	0.0	63.8
335 R	Sta 00	0+00 ✓	7.1	56.7
1'N.		0+00−1 ✓	6.4	57.4
1'N.		0+00−1 ✓	4.3	59.5
5.5 N		0+00−5.5 ✓	0.6	63.2
3.5		0+3 ✓	8.3	55.5
4.5		0+4 ✓	8.0	55.8
7'5		0+7 ✓	9.1	54.7
325' R	Sta 00	0+00 ✓	8.3	55.5
15'N		0+00−15 ✓	4.3	59.5
7'N		0+0−7 ✓	3.1	60.7
12'N		0+0−12 ✓	.00	63.8
5'5		0+5 ✓	10.5	53.3
11.5		0+11 ✓	13.0	50.8
325 R 0.5 N	Sta 1+25	1+05.5 ✓	6.0	57.8
315 R 2.0 N	Sta 1+25	1+00.6 ✓	8.0	55.8

✓

2/8/18 Section 07 315 325 335 350 Radius Curves

Stations	+	✓	−	Ele
	13.17 computed Sta 100	350 .40		337.23
325-R Sta 100	0+84.8			
16'S	1+01 3	✓	38	46.6
16.5S	1+01 3	✓	+32	53.6
13'S	0+97 8	✓	5.5	44.9
7'S	0+91 8	✓	9.6	40.8
325-R Sta 100	0+84 8	✓	11.3	39.1
2'N	0+82 8	✓	12.4	38.0
L'N	0+78 8	✓	13.5	36.9
13'N	0+71 8	✓	16.6	33.8
325-R Sta 75	0+63 6	✓	18.3	32.1
6'N	0+57 6	✓	17.2	33.2
10'N	0+53 6	✓	19.2	31.2
325-R Sta 50	0+42 4	✓	17.6	32.8
9'N	0+33 4	✓	17.0	33.4
11 N	0+31 4	✓	14.3	36.1
16'N	0+26 4	✓	12.1	38.3
325-R Sta 25	0+21 2	✓	8.0	42.4
3'N	0+18 2	✓	7.6	42.8
325- 11'S Sta 00	0+11 0	/	+0.20	50.6
335-R Sta 00	0+00.	✓		
11'S	0+11 0	/	0.80	49.6
14'S	0+14 0	/	1.6	48.8
16.5	0+16 0	✓	4.6	45.8

Sta − Sta	+	✓	− Ele	
335-R Sta 25	350.4 computed Sta 0+21.9			
00	0+21.9	/	5.3	45.1
7'S	0+28 9	/	8.7	41.7
10'S	0+31 9	✓	12.8	37.6
L'N 335-R Sta 50	0+37 7	✓	12.3	38.1
335-R Sta 50	0+43 7	✓	14.3	36.1
4'S	0+47 7	✓	12.8	37.6
9'S	0+52 7	✓	15.6	34.8
13'S	0+66 7	✓	20.0	30.4
16'S Sta	0+58 7	✓	17.7	32.7
335- Sta 75	0+65 6	✓	12.6	37.8
7'S	0+72 6	✓	10.6	39.8
10'S	0+75 6	✓	11.8	38.6
335-R Sta 100	0+87 5	✓	7.5	42.9
315-R Sta 100	0+82 0	✓	11.9	38.5
16'S	0+58 0	✓	.9	49.5
17'S	0+99 0	✓	+5.1	55.5
14'S	0+96 0	✓	5.7	44.7
6'S	0+88 0	✓	10.2	40.2
14'N	0+68 0	✓	16.6	33.8
315-R Sta 75	0+61 5	✓	17.0	33.4
5'N	0+56 5	✓	17.8	34.6
315-R Sta 50	0+41 0	✓	16.4	34.0
6'S Sta	0+47 0	✓	18.8	31.6
3'N	0+38 0	✓	17.	33.4

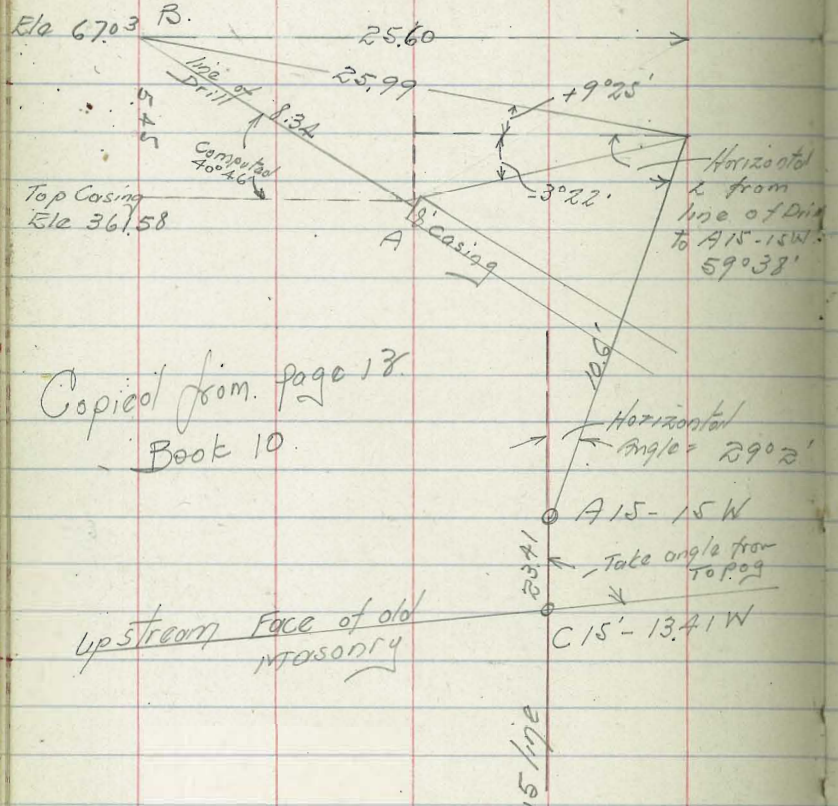
2/8/18 Sections on 315 325 335 350 } Radii Curves.

Stations			34	–	E/e
315-R	Sta 5-0	0+41 ±	350.40		
9'N		0+32 ±		15-5-	34.9
14.N		0+27 ±		9.4	41.0
24'N		0+17 ±		+9.6	60.00

✓

1/17/1918 Willcomb Bub

Tie core Drill hole To A15-15'W

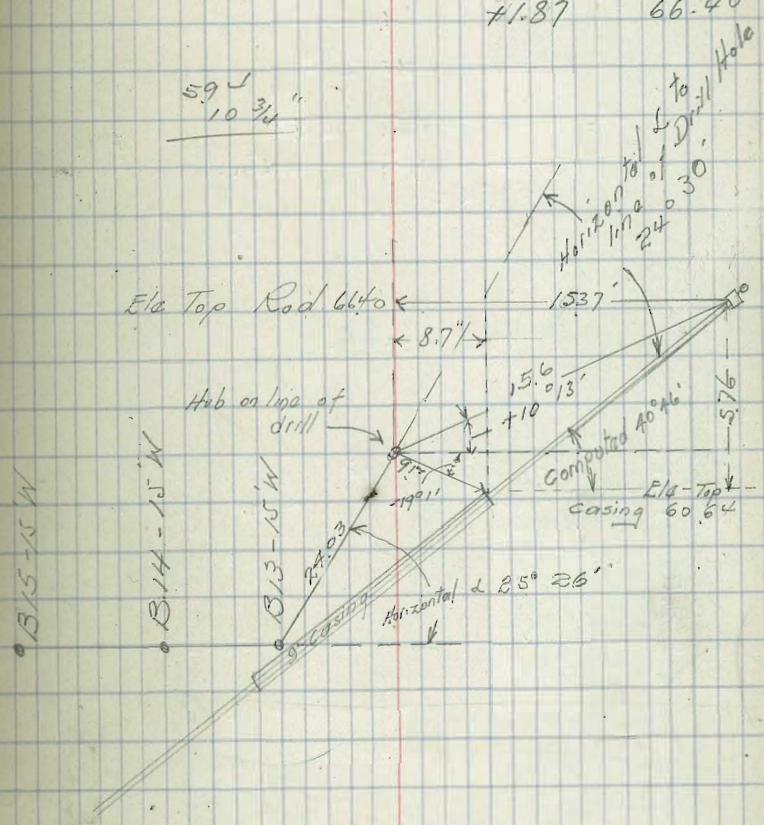


		+	H.I	-	Ela
B.M. 3'E B13 15'N		109	63.22		362.13
Top Casing		A.		1.64	361.58
Top Rod.		B.		+3.81	67.03

Feb 15/1918 Paddock Bub 71

	+	H.I.	-	Ela
B.M.	240	364.53		362.13
Top Casing			389	360.64
Ela Point on Floor.			497	59.56
			+1.87	66.40

59° 10 3/4"



Plotted. 2/15/18 RRR.

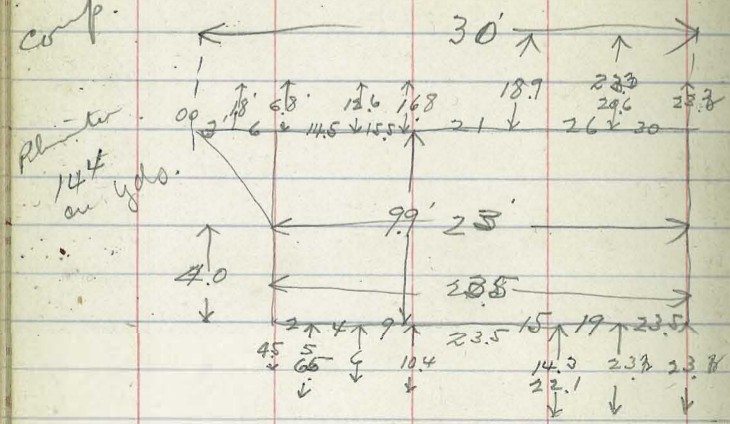
add 7.1 to all

7/20/18

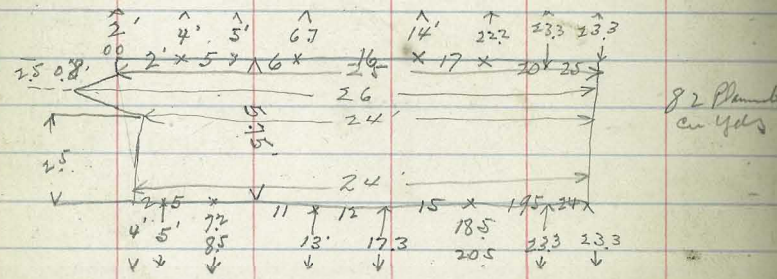
147.

Bin #1

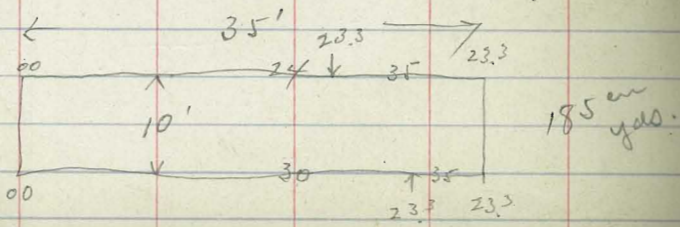
comp.



Bin #2



Sand Pit

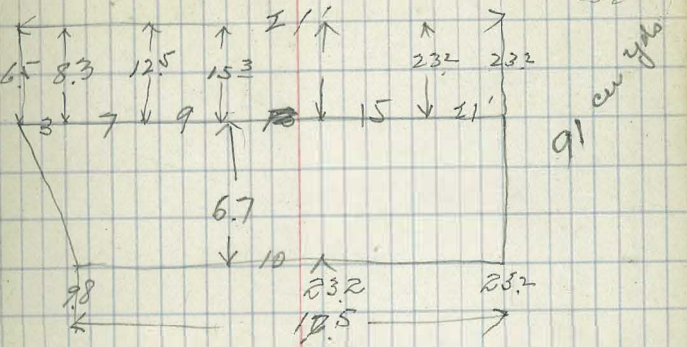


Add 1.3 to all Vertical Measurements To Top of Bin

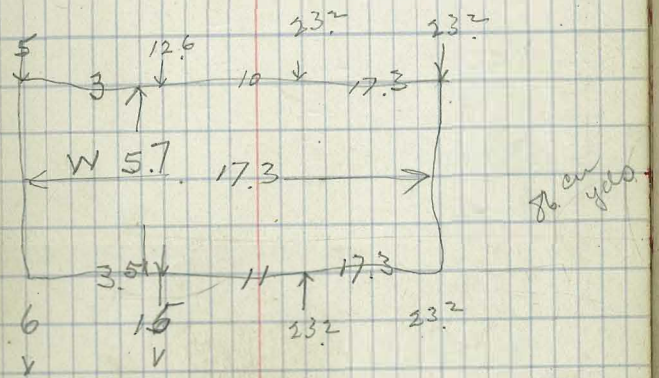
72

Bin # 3

add 7.1



Bin #4



3/14/18 Levels to Estimate Flood Discharge over Cofferdam

Bub Instr. Rod
Williamson

	+	H.I.	−	Elev
B.M.	6.27	377.57		371.30
H. Water on 12"			6.25	371.32
½" Higher				
Water S at 11-10				
on 11".			6.77	370.80
H. End Weir 0+00			7.25	370.32
+25 R. S opening at 10-10			7.6	370.0
+33 " " " " 10-20			7.9	369.7
+48 " " " " 10-45			7.4	370.2
+58 " " " 11-10			7.45	370.12
+88 Low Point			9.7	367.9
1+11			6.8	370.8
1+32			6.6	371.0
1+46 L Side of opening		± 4.	6.6	371.0

3/20/18 Flood of 3/19/18

	5.0	376.3		371.30
9-30 P.M. - Water 6" lower.				
High water			7.8	368.5
7:30 AM H.W.			9.6"	366.7
low Point in Weir.			11.2	365.1

Natural Level

Tower Base Outlet.
Slopes 1 to 1. Base 12.5'

Hand Level

	13.7	13.7		0.0
	9.7	21.9	1.5	12.2
	6.7	25.3	3.3	18.6 TP
	7.7	26.3		18.6 TP

	H		Ht
+00	5.4 16.5 29.0		6.5 19.8 32.7
+25 Concrete Face	4.4 20.9 33.4		4.2 32.1 35.6 SW Corner

Copied Estimate Book 1, Page 21

Tower Base East Side

	717	93.74	AR. 569	U.S.G.S.
0+25 A			4.7	89.0
00 A			4.9	88.8
0+00 B			0.1	93.6
0+25 B			0.7	93.0
0+50 B			2.7	91.0
0+50 A			6.7	87.0
0+56 A			9.6	84.1
0+67 A			9.2	84.5
0+75 A			11.6	82.1
1+00 A			15.2	78.5
1+00 B			7.1	86.6
0+90 B			4.8	88.9
0+75 B			5.7	88.0
0+70 B			3.8	89.9
0+50 B			1.5	92.2
P.	1311	406.70	0.15	93.59
00 C			10.6	96.1
0+25 C			9.9	96.8
0+50 C			10.7	96.0
0+75 C			11.2	95.5
1+00 C			13.7	94.0
1+00 D			6.1	100.6
0+75 D			6.0	100.7

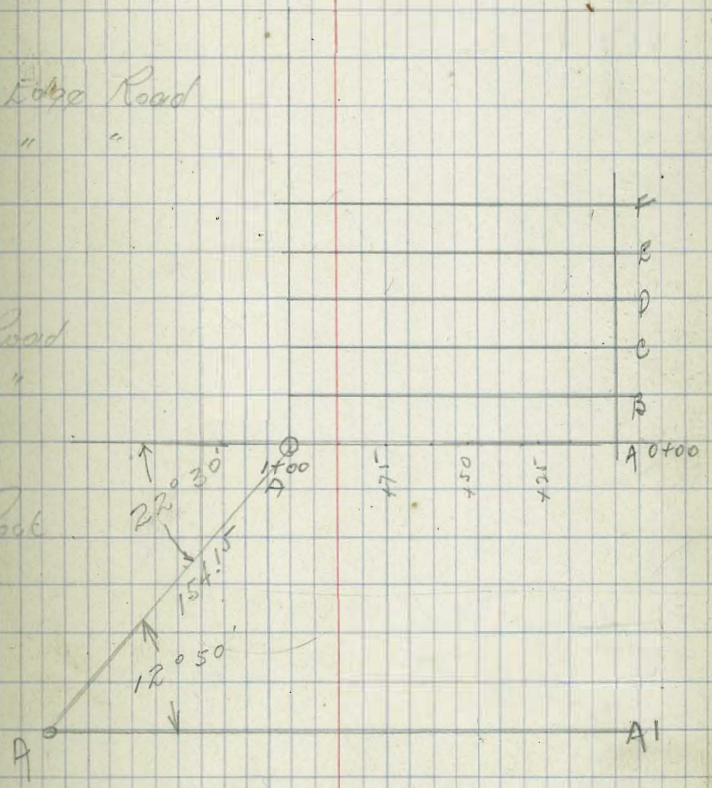
Edna Road

"

Road

"

Road



East Side Tower Base

406.70

0+50 D	6.✓	400.5
0+25 D	6.7	400.0
0+00 D	7.9	98.8
0+00 E	5.8	400.9
0+25 E	4.✓	402.3
0+50 E	2.✓	404.3
0+75 E	2.5	04.2
1+00 E	0.9	05.8
1+00 F	+1.9	408.6
0+75 F	+0.9	407.6
0+50 F	1.3	05.✓
0+25 F	3.0	03.7
0+00 F	4.5	402.2

July 16. 1917 Levels. Flume.

Bub-Instr
Dilley-Rod

Sta		+	H.I.	−	Ele.
		0.52	371.82		371.30
0+00				4.65	367.17
0+00				5.82 / 6.30	366.00 / 365.50
1+00				4.70	367.12
1+00				6.50	365.30
2+00	Δ R.			5.00	366.82
2+00				6.60	365.22
+20				5.10	366.72
+25				2.20	369.62
+30				4.90	366.92
+50				4.90	366.92
+75				4.80	367.02
+90	Δ R.			5.6	366.22
+90	Ele of Concrete		?	7.3 W.L.	364.52
3+03				4.7	367.12
T.P.		2.21	369.89	4.12	367.68
3+41	Δ L.			3.6	366.3
3+93				3.2	366.69
4+22	Δ R			3.7	366.0
4+22				5.1 W.L.	364.79
+55				3.9	365.99
5+05	Δ L.			4.7	365.19
5+05				5.3 W.L.	364.59
T.P.				3.88	366.01
5+35				4.3	365.59
6+00				5.0	364.89

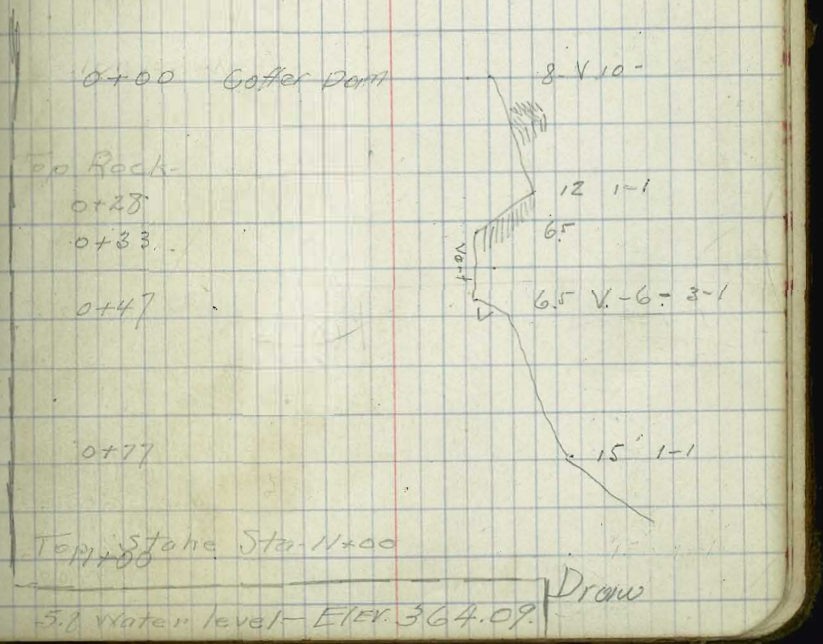
B.M. Bolt in Ledge of Rock

Water level - backed up water in dam.
Water Level in Creek Sta 0+00

Water Level in Creek.

do do do

Plotted July 16 1917



1+00

Plotted 2/16/17

Drawn

1+65

1+85

2+06

2+08

2+10

2+25

2+30

2+40

2+50

(2+68)

2+75

2+87

2+90

2+96

3+03

3+08

3+20

3+20

(325R)

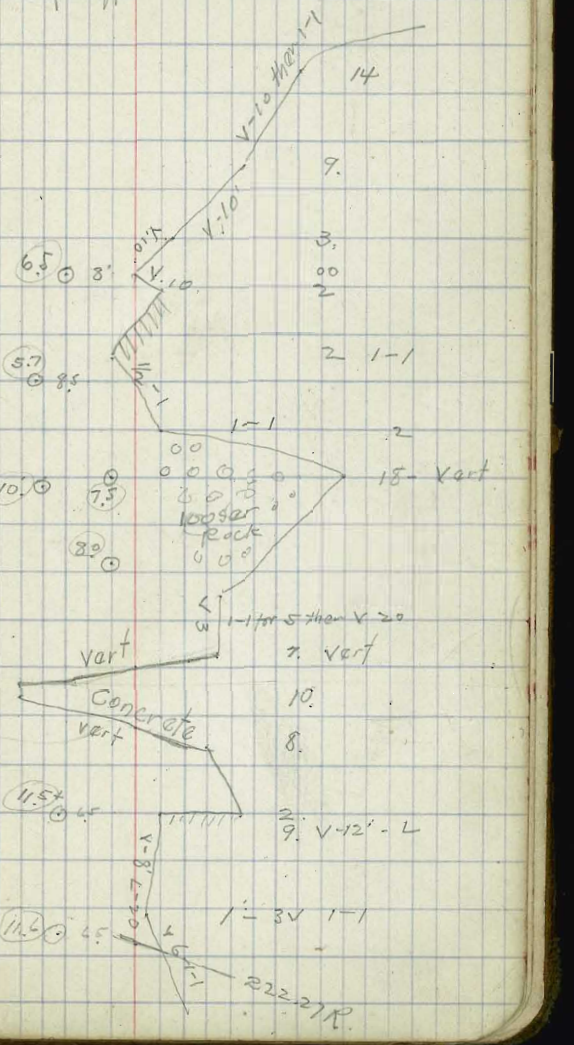
3+37 = 4+13

3+41 Δ

3+45

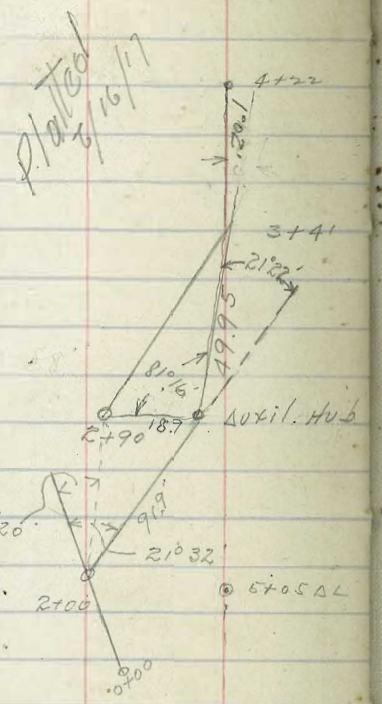
3+47 =

1+09 Curve

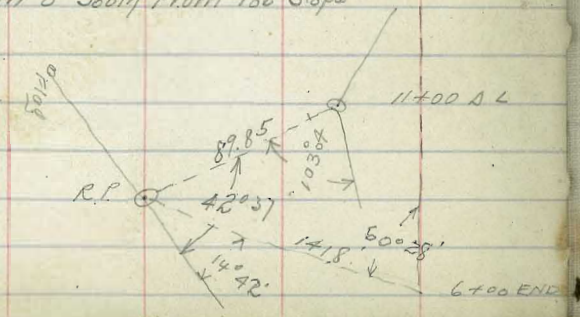


July 16 1917 Alignment Data for Flume

Sta	Ls L	Ls Rt
6+00 END.		
5+05 ΔL	4°51'	
4+22 ΔR	8°58'	
3+41 ΔL		
3+41 ΔL	22°31	
2+90 ΔR	11°19'	
2+00 ΔR	10°20'	

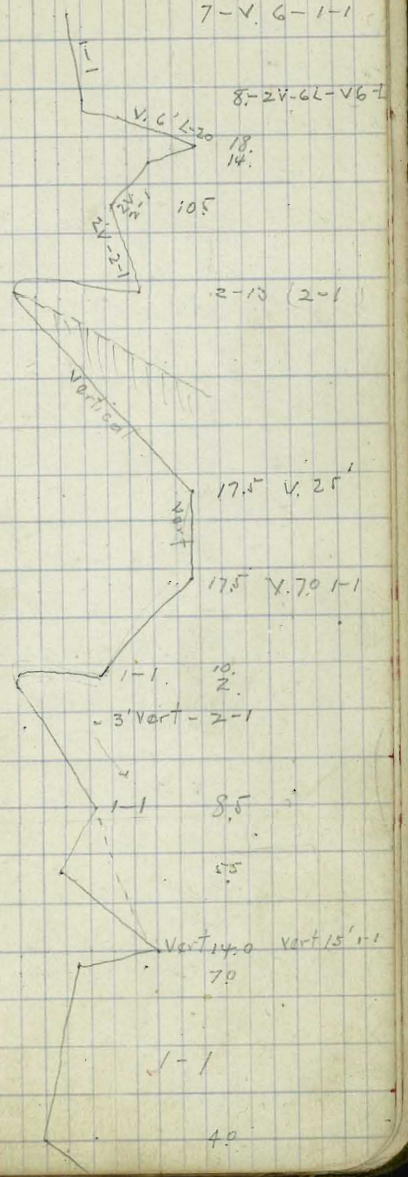


0+00 - Coffer Dam 8' South From Toe Slope



Bub-Instr 78
Dilley-Road

3+50
3+65
3+68
111.5+
3+82
3+93
3+94
4+00
4+05
4+22 ΔR.
4+65
4+78
5+03
5+05
5+30
5+45
5+60
5+63
6+00 END



List of BMs

USGS + in Brass Cap in Boulder E. End Dam	486.569
#1 Nail in Boulder ½ way down Slope below W. Spillway	440.24
#2 Nail in Ledge 20' above Bottom Draw W. Side below #1	401.22
#3 Bolt in Rock Ledge W. Side canyon 21' W. Core Wall	371.30
#4 Bolt in Flat Ledge W. Side Canyon 50' below old Diversion Dam	377.59
#5 Bolt in Power Pole to Rt. of Road below Tool House	440.72
#6 Rock West end Basin below Tool House	491.89
#7 Point Mark on Rock 3' E of B14 { 15 West / 15 North	362.13
Plug in Concrete R.R. P.C. 1+70 near Shaft	439.11
R.R. Spike in Wood Plug Upstream Face old Masonry	337.23

8067 to Hubbard

2.00 of a 6 of

2000 hits old Rd

2000 ft of a 7

90

17 4"

52° 18'

4 / 3 B4

81

90°

53'

89 07