

ED & REFERENCE

WILLY DAY

MINING
TRANSIT BOOK

384

W133

1920-21-22

4- 19

6- 16

8- 19

9 - **MICROFILMED**

12- 31

14 - 42 **JAN 8 1985**

16- 45

18- 515

500
- 100
200

132

272

27
22
1872

1431

37648

9
211

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" <u>390</u> " "	21
" <u>385</u> " "	22
" <u>38150</u> " "	23
" <u>36180</u> " "	24
" <u>33170</u> " "	25
" <u>35880</u> " "	26
" <u>300</u> " "	27
" <u>29133</u> " "	28
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" <u>250</u> " "	29
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Elevations of Coordinate Reference Points.

Station Elev.	Station Elev.
455 ²⁹ = B Line	450 B Line East Tangent
12	
14	56 1550.34
16	58 1559.53
18 1557.81	60 1568.71
20 1545.11	62 1578.48
22 1534.73	64 1588.64
24 1525.20	66 1598.56
26 1503.85	68 1617.48
28 1488.45	70 1624.03
30 1472.35	72 1650.44
32	
34	1534.73 out
36	1649.80
38 1470.30	1537.22
40 1473.85	
42 1480.64	East Tangent
44 1476.44	325 Line
46 1502.68	60 1571.25 ✓
48 1512.78	62 1582.59 ✓
50 1522.57	64 1591.57 ✓
52-468 ¹¹ 1532.83	66 1602.58 ✓
54-468 ¹¹ 1542.20	68 1612.52 ✓
	70 1623.02 ✓
	72 1633.50 ✓

For Correct Elevation See Page 6-7

15' North
54
Lin Stump
with Witt.
about 6-7460
BM. 11' SE.
of 52-468¹¹

Elevations of Coordinate Reference Points.

Station Elev.	Station Elev.
300 Line	275 Line East
38 1474.66	70 1622.85 ✓
40 1480.30	72 1633.30 ✓
42 1488.29	
44 1496.84	
46 1507.33	
48 1516.37	250 Line
50 1524.46	
52 1536.39	38 1491.41 ✓
54 1540.42	40 1496.25 ✓
56 1551.46	42 1507.25 ✓
58 1560.46	44 1513.71 ✓
60 1571.50	46 1519.99 ✓
	48 1526.28 ✓
	50
	52
	54
East Tangent	56
275 Line	58
60 1567.79 ✓	60 1568.21 ✓
62 1579.68 ✓	
64 1588.49 ✓	
66 1600.42 ✓	
68 1614.82 ✓	

For Correct Elev. See Page 6-7-8

Elevations of Coordinate Reference Points

Miscellaneous Miscellaneous

	12-507 ²	1600.80	
00-	12-423 ³	1587.32	
00-330	12-315	1561.72	
00-429	12-437	1588.34	
00-	12-340 ¹³	1567.82	
2-	14-319	1557.84	
2-	14-350 ²	1557.70	
2-	14-475	1574.94	
2	14-495	1588.77	
4-	14-436 ²	1571.96	
4-350	14-309	1539.58	
4-455	14-470	1567.82 (??)	
4-	16-331 ²	1569.42	
6-	16-709		
6	16-464 ²		
6-480	16-303	1529.40	
6	18-412 ²	1561.05	
8	18-572		
8	18-478 ²	1554.09	Nail in Rock
8	18-312	1545.59	Nail in Rock
8-450	18-411 ¹⁹	1549.60	out
8	20-505	1549.60	
10	22-421 ²¹	1541.71	
10-315	22-409 ²⁴		
10-422	22-321 ²⁰	1511.09	out
447	22-497 ⁴⁰	1542.61	
1597.75	22-417 ⁴⁰		out

ALL ELEVATIONS West of Outlet Tower. See Page 6-7 & 8 For Carved Elevations

Elevations of Coordinate Reference Points

Miscellaneous Miscellaneous

	PI	Under Water
24-432	PI	
24-250	38-358.75	Nail in Concrete
24-321 ²	38-325	
24-505 ⁰⁰	38-295 ⁴	1509.45
24-800 -	38-423	1469.45
26	38-480 ⁴	1477.56
26-366	40-219 ¹⁰	1513.09
26-471 ⁹⁰	40-413 ⁵²	1482.94
26 + on Rock beyond	40-674	Ref point 76.69
500	42-217 ⁴	1514.56
28-481 ⁷⁷	42-420 ¹²	1487.07
28- + on Rock beyond	42-412 ⁶²	1486.04
28-	42-434 ⁰²	1491.70
28-3	42-624	1582.81 Ref Point + on Rock
	44-424	
	44-218 ⁹²	1517.70
	44-414 ⁴²	1491.53
	44-670	1500.82
	46-	
	46-414 ⁰²	1503.70
	46-432 ²²	1509.72
	46-338 ⁰	1481.42
	48-	
	48-416 ⁰⁵	
	48-	
	48	

Paint Mark on Rock for Line For Carved Elev Page 6-7-8

BM. Near B30 Nail in stump 1477.23 30-431²² 30-282.46 1463.59 37-430 1461.29 32 34-274.14 1467.05 34-118.66 out covered by Water.

Part on concrete

Miscellaneous

C-Line

Hvb.	Don't	10	1574.30	
50-4179	we for	12	1565.12	
50-56.41	ELW-	14	1552.99	
50-171.36		16	1546.14	out
50-307		18	1544.16	out
50-37129	Nail in Rock	52	1526.16	out
52-415.07		54	1534.24	out
52-314		56	1545.01	out
52-468 ⁴ 1532.83		58	1553.96	out
(Nail in Rock) 54-468 ⁴		60	1564.03	out
54-323		62	1573.16	out
56-427.35		64	1581.23	out
56-323		66	1591.73	out
58-427.18		68	1602.37	
58-325 ²		70	1613.50	
60-423 ⁵		72	1624.59	
60				
62-416				
Hvb.				
62-468		74	1635.07	
Hvb.		B.M. about		
64-429		7+60	1649.80	
64				
66				
66				
68				
68				

For Correct Elevations
See Page 6-7-8

Elevations of Co-ordinate Reference Points

"P" Line

Cableway Line - East -

{ 00-301 - 0+00 Pine	1618.65	{ 50-380.2 0+00	1524.51
0+32	1627.85	1+00	1561.51
0+89.08	1650.00	2+00	1618.81
2+00	1686.42	2+38.43	1649.52
{ 5' South 2+08	1694.61	3+00	1685.42
{ stump on line 1+85	1674.42	3+29.72	1704.52
2+33.60	1713.13	3+76.33	1739.82
Nail in 2x8 North side fence	150.77	4+25	1766.43
End of "P" Line above boundary Road	1751.67		
Cableway Line - West -			
{ 00-446 0+00	1631.70		
1+00	1675.60		
2+00	1715.89		
2+50	1739.25		
30' N. - 3+00 Nail in Beck	1764.33		
3+00	1760.48		

For Correct Elevations
See page 6-7-8



List of B.M.s

Harris B.M. Iron Pin Set in Top of Boulder
 U.S.G.S. (V) 60' S. of Old Blacksmith Shop. Barrett Datum 1626.33
 out ✓ Top of Wall - Canyon 1467.41
 ✓ Old Engine Base Westside Canyon 1461.38
 out ✓ Nail in Stump C-52-C54-15' North 1534.73
 ✓ Hub about C-7460 with Witness 1649.80
 ✓ Nail in 2" x 8" Northside Tunnel P-Line 1650.97
 ✓ Nail in Rock West Canyon 30' N-31' W 1764.33
 ✓ Nail in Stump about 16-468 1572.94
 ✓ Nail in Stump about 12-330 1570.96
 out ✓ On top Rock near Concrete Tower #1 ~~1546.24~~
 out ✓ Nail in Stump ~~1577.55~~
 out ✓ Nail in Rock about 24-932 ~~1570.75~~
 out ✓ Nail in Stump near B-30 ~~1441.75~~
 ✓ Nail in Stump SE. 11° of 468' (Sewer Line) 1537.77
 out ✓ Nail in concrete joint End steel pipe
 out ✓ Nail in Stump about 17-410 ~~1570.75~~
 ✓ End P-Line above Quarry Road 1751.67
 TP + on Rock 44-385 1474.77

B.M. Top of ^{Plumb} Rock. 7' East 4-34-329 1472.82
 out ✓ Top of Rock. 29-465 1491.92
 B (Nail) near front face of Dam
 for Outlet Tower 1506.46
 Fillet Top of Dam - (Nail) ~~1518.69~~
 B.M. East Centre Joint #3 Nail in Rock 1509.38

for correct Elevations
 see page 6

For Est Use These.

East Tangent
 52-314
 54-325 } mt. (P)
 56-325 } mt. (S)
 58-325

Cone Drill Hole

6 - 1503 - 59° 0 - 27' - SE. C 60
 7 - 1514 C 59
 8 - 1567 6+73 - 5' South.

~~1578.93~~
 C-28 - Nail in 1518 lift
 Nail in Lift # 4 near Contractin Joint 1530.45
 Nail in Rock Auxil from 5488 21 1512.86
 Top pipe outlet tower 1508.67
 Bm. SW Cor Tower 1524.18
 " NW Cor " 1524.30
 C6+35 191 N.W. Hole #1 1534.97
 { B.M. For Star Drill Holes lift #4 - 1847.77
 { Top of rock. " 100' N of Hole #1 " 1846.13
 4+375 \square To Lift # 4 - Quarry. 1847.20

50 - 295 95 1524.9
 52 - 300 1536.7
 54 - 295 13 1551.7
 56 - 298 21

58 - 256 - 6051
 56 - 250 6012
 60 - 319. 28 6406
 58 - 304 59 6391
 56 - 298 - 21 6361

Elevations of Coordinate Reference Points

Station Eler.

Station Eler-

Station	Elev.	Notes	Station	Elev.	Notes
6-470 ⁶⁵	1615.38	Hub.	18-470 ⁵⁷	1561.75	Nail in Rock
			18-488 ⁰	1561.11	Hub
8-450	1601.89	Hub.	18-502 ¹⁷	1564.95	Nail in Rock
Nail in stump	1617.93	Near Blacksmith Shop			
10-446 ⁵⁸	1597.77	End steel Pipe - Sewer Joint			
10-350	1576.97	Hub.	0+20.00	1541.11	Hub outlet & Tunnel
B.M.		Nail in stump	SW corner outlet		Nail in concrete center of fillet
12-330	1570.96	Stump	Top of fillet	1524.18	Nail in concrete
12-426 ³²	1567.35	Nail in rock	NW corner outlet		Nail in concrete
12-437 ⁰	1588.38	Nail in Rock	Top of Fillet	1524.30	
12-455 ⁷⁹	1587.34	Nail in Rock			
12-502 ⁰⁹	1600.83	Nail in Rock			
14-479 ²	1575.02	+ on rock	28-250		Nail
14-436 ²⁸	1574.94	+ on rock	28-290 ⁶³		Nail
14-455 ⁷⁹	1577.19	Hub			
14-495 ¹⁰	1588.91	Nail in Rock			
R.P. & out 1st tower	1581.45	Hub.			
16-446 ¹⁷	1567.82	Nail in Rock			
B.M.		Nail in stump			
16-468	1572.94	Nail in Rock			
16-490 ⁰⁹	1577.99	Hub			
18-411 ¹⁹	1548.30	Hub			
18-438 ⁰⁹	1554.12	Hub			

New Points

Use for Forms.
Lift #1
Lift #2
Lift #3
Nail curtain wall
Nail curtain wall
Nail curtain wall

Out

Nail in Stump 1617.93 Elevations of Coordinate + Reference Points.

Nail in Stump near Blacksmith Shop	1617.93
Harris B.M. Iron pin set in rock 40' south of conveyor #2 - BARRETT DAM - DATUM.	1626.33
Nail in rock 30' North of 3+00 (Cableway West)	1764.33
End of "P" Line above Quarry road	1751.67
See opposite Page for -	
Top of Nail 2 + 70	1548.85
1 + 99.43 - 353 ¹⁰ Nail in Lift D.S.F.	1555.04
1 + 85.62 353 ¹⁰ "R" Nail in Lift D.S.F.	1555.01
1 + 97.29 - 345.40 "R" Nail in Lift D.S.F.	1545.06
1 + 83.93 - 345.40 "R" Nail in Lift D.S.F.	1545.07
1 + 97.19 - 337 ⁷⁰ R Nail in Lift D.S.F.	1535.02
1 + 81.88 - 337 ⁷⁰ R Nail in Lift D.S.F.	1535.05
34 - 382 ³⁶ (Nail) 4 th Lift Curtain Wall	1529.79
34 - 369.58 " 2 nd Lift " " out	1498.59
34 - 363.51 " 1 st Lift " " out	1488.77
34 - 375.28 " 3 rd Lift " " out	1508.88
Nail Top of stringer supporting 2 nd Tower (outlet)	1477.56
Nail in Rock Right Abutt D.S.F. Dam (about 24-250)	1464.85
Top of Plumb rock - 2 nd Lift in Dam -	1472.91
34 - 274 ¹⁴ + on rock	1467.17
38 - 250 + in rock	1491.69
40 - 250 Hub	1496.43
42 - 250 Nail in rock	1507.27
44 - 250 Hub	1513.15
46 - 250 Hub	1520.08

"D" Line Coordinate Pts.
Reference Pts.

"D" 0+20 3+71.28	Nail in Post Landing Platform.	D-1+80 3+06.55	Nail in Rock.
"D" 0+20 425.73	Iron Pin under 1626.95 Blksmith Shop.	D 1+80 4+14.23	1547.57 Hub.
"D" 0+60 3+17.76	Hub. Nail -	D 1+20 4+03.67	1581.28
RP on Rock Bins.			
"D" 0+60 418.42	Hub.	D 1+10 4+14.23	1557.00
1608.14			
"D" 0+80	Nail in Rock.	D 1+20 3+35.70	1572.30
"D" 0+40	Hub.		
"D" 0+20	Hub.		
1+00.09			
D 1+00			
1+00.09			
D 1+00			
3+07.49	Hub.		
1+00.09	Note change in Nail Hub. Station.		
D 1+00			
4+09.75			1595.49
D-1+36.58			
D-1+36.58			
4+12.16			1573.21
D-1+36.58			
3+12.70			
R.P. on Rock.			

Nail in Stump near Blksmith Shop 1617.93

48-250	Hub.	1526.32
50-250	Hub.	1526.80
52-250	Hub.	1538.45
60-250	Hub.	1568.29
60-275	Hub.	1567.83
62-275	Hub.	1579.76
64-275	"	1588.57
66-275	"	1600.51
68-275	"	1614.90
70-275	"	1622.83
72-275	"	1633.37
60-300	"	1571.58
Note - see bottom of 325 for (56-58)		
60-325	"	
62-325	"	1582.64
64-325	"	1591.63
66-325	"	1602.66
68-325	"	1612.60
70-325	"	1623.05
72-325	"	1633.56
56-325		1558.55
58-325		1562.11
66-360		1598.55
68-360		1607.89

56-450	Hub	1550.30
58-450	Hub	1559.50
64-450		1588.48
66-450	Nail Top of rock	1603.39
68-450	Nail in rock	1617.52
70-450	Hub	1624.06
64-428 ⁹²	Hub	1586.06
66-429 ⁸⁶	Hub	1595.41
68-411 ⁹⁶	Hub	1600.00

B.M. Hub with witness. about C7+60 1649.86

B.M. 5+46 ± 2' from D.S.F. 1553.09

Nail at 2+05⁵⁵ - 1575 left - 377' R

B.M. Nail in stump near Blacksmith Shop 1617.93

B.M. Nail in Rock with witness - 1608.41

B.M. Nail " " " " 1599.59

4+37⁵ = 1847²⁰
 46
 47

3+24 □ 1741.63

48
 48
 □

□ nail 1720⁵⁴

3/29/2

Bub
Fisher
Mixer

Check Levels Left Abut.

BM	0.56	1650.42 ^s	1549.86
7435-		4.60 ^s	45.82
TP	6.36	45.49	11.29 39.13
TP	0.50	33.42	12.57 32.92
TP Hub	1.56	25.62	9.36 1624.06 ✓
TP	1.14	14.89	11.87 13.75
7+33.86			3.43 11.46 ✓
7+24			5.94 28.95 ✓
			10.21 09.68

BM Hub with witness - about C 7460

Nail in Top of Rock

Nail in Rock

Nail in Rock

Hub - 70-45.0

checked
at 0.01.

E between.
Piers

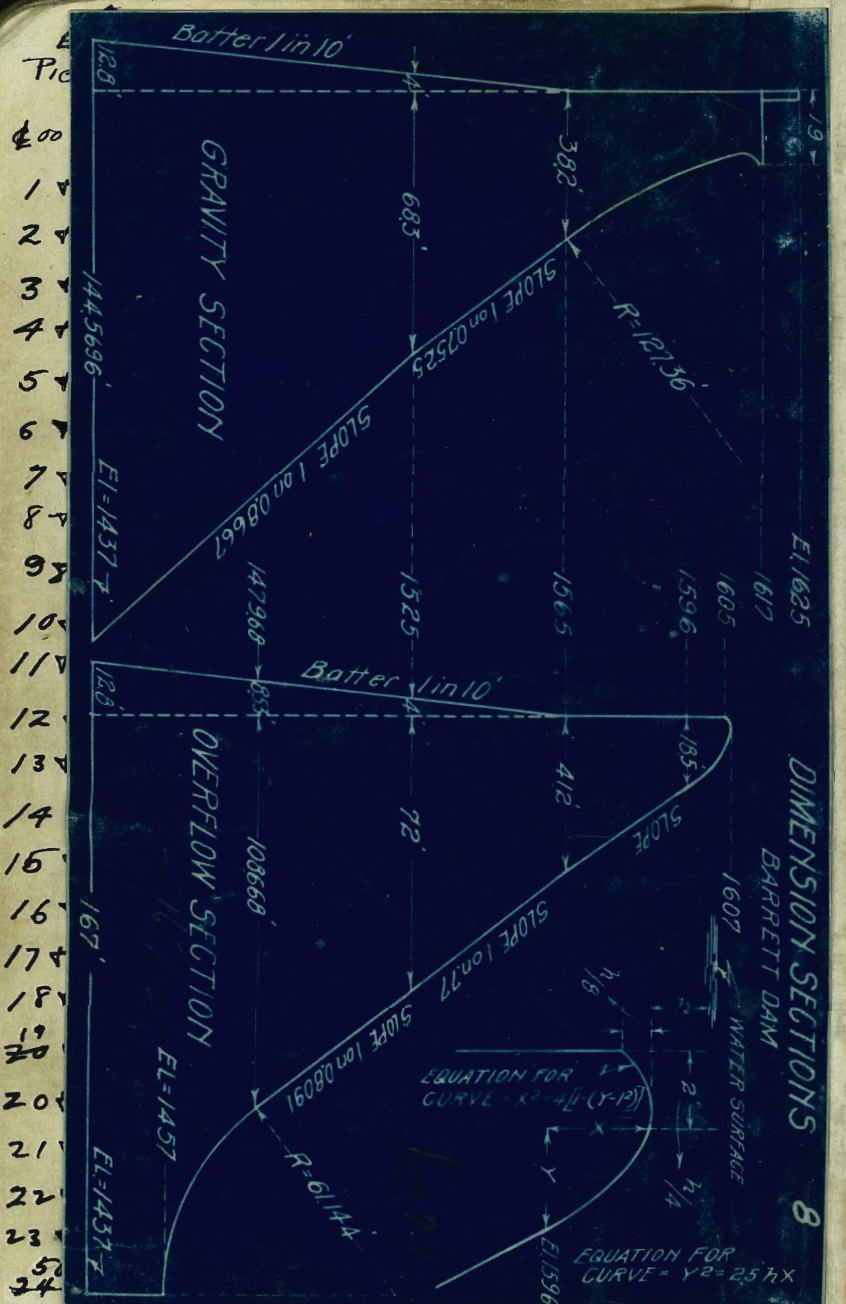
00 + 1	1607.03	Total	1617.05
1 + 2	1607.00		
2 + 3	1607.00		
3 + 4	1607.01		
4 + 5	1607.00		
5 + 6	1607.00		
6 + 7	1606.98		
7 + 8	1606.98		
8 + 9	1606.96		
9 + 10	1606.99		
10 + 11	1607.05		
11 + 12	1607.04		
12 + 13	1607.02		
13 + 14			
14 + 15			
15 + 16	1606.92		
16 + 17	1607.00		
17 + 18	1606.93		
18 + 19	1606.96		
19 + 20	1606.98		
20 + 21	1606.94		
21 + 22	1606.96		
22 + 23	1606.98		
23 + 24	1607.01		
50-397 24 + 25	1607.01		
25 + 26	1607.01		

Distance From 400 Radius To **UPSTREAM FACE** **BARRETT DAM**

Elev	0	1	2	3	4	5	6	7	8	9
1420	1450	1440	1430	1420	1410	1400	1390	1380	1370	1360
1430	1350	1340	1330	1320	1310	1300	1290	1280	1270	1260
1440	1250	1240	1230	1220	1210	1200	1190	1180	1170	1160
1450	1150	1140	1130	1120	1110	1100	1090	1080	1070	1060
1460	1050	1040	1030	1020	1010	1000	990	980	970	960
1470	950	940	930	920	910	900	890	880	870	860
1480	850	840	830	820	810	800	790	780	770	760
1490	750	740	730	720	710	700	690	680	670	660
1500	650	640	630	620	610	600	590	580	570	560
1510	550	540	530	520	510	500	490	480	470	460
1520	450	440	430	420	410	400	390	380	370	360
1530	350	340	330	320	310	300	290	280	270	260
1540	250	240	230	220	210	200	190	180	170	160
1550	150	140	130	120	110	100	090	080	070	060
1560	050	040	030	020	010	000				

Front Face Batter 1 in 10'

Computed by HRS
Checked by



200
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25 + 26

See page 42 for Divide

up

u.

128
 1445696
 EI-1437 7
 128
 167
 EI-1437 7
 100
 1
 2
 3
 4
 5
 6
 7
 8
 9
 10
 11
 12
 13
 14
 15
 16
 17
 18
 19
 20
 21
 22
 23
 24
 25 + 26

1607.01

See page 42 for Divide
 Wall D.S. Radlin Sta 1432.80
 above E1 1585

2569

9700
 6782
 2918

2616
 089
 4

9700
 7736
 1964
 3770

8203
 7736
 467

DIVIDE WALL

RADII TO DOWNSTREAM FACE BARRETT DAM

FIG	0	1	2	3	4	5	6	7	8	9
1510	316.58	317.35	318.12	318.89	319.66	320.43	321.20	321.97	322.74	323.51
1520	324.28	325.05	325.82	326.59	327.36	328.13	328.90	329.67	330.44	331.21
1530	331.98	332.75	333.52	334.29	335.06	335.83	336.60	337.37	338.14	338.91
1540	339.68	340.45	341.22	341.99	342.76	343.53	344.30	345.07	345.84	346.61
1550	347.38	348.15	348.92	349.69	350.46	351.23	352.00	352.77	353.54	354.31
1560	355.11									
1570	355.08	355.72	356.36	356.99	357.63	358.27	358.90	359.54	360.18	360.81
1580	361.45	362.09	362.72	363.36	364.00	364.63	365.27	365.91	366.54	367.18
1590	367.82	368.45	369.09	369.72	370.36	371.00	371.63	372.27	372.91	373.54
1600	374.18	374.82	375.45	376.09	376.73	377.36	378.00	378.64	379.27	379.91
1610	380.55	381.18	381.82	382.45	383.09	383.73	384.36	385.00		

1515 TO 157004 Slope 1 on 27
 157004 TO 1617 Slope 1 on 0.6365

Computed by HRS
 Checked by EM

70
 1
 2
 3
 4
 5
 6
 7
 8
 9
 10
 11
 12
 13
 14
 15
 16
 17
 18
 19
 20
 21
 22
 23
 24
 25 + 26

1607 or

RAIL TO DOWNSTREAM FACE										OVERFLOW SECTION										BARRETT DAM												
Elev	0	1	2	3	4	5	6	7	8	9	Elev	0	1	2	3	4	5	6	7	8	9	Elev	0	1	2	3	4	5	6	7	8	9
1450	26273	26556	26803	27022	27222	27405	27574	27732	27879	27992	28150	28274	28392	28504	28611	28713	28810	28905	28992	29078		29159	29240	29321	29402	29483	29563	29644	29725	29806	29887	
1460	28150	28274	28392	28504	28611	28713	28810	28905	28992	29078	29159	29240	29321	29402	29483	29563	29644	29725	29806	29887		29968	30049	30130	30211	30292	30373	30453	30534	30615	30696	
1470	29159	29240	29321	29402	29483	29563	29644	29725	29806	29887	29968	30049	30130	30211	30292	30373	30453	30534	30615	30696		30777	30858	30939	31020	31101	31182	31263	31343	31424	31505	
1480	29968	30049	30130	30211	30292	30373	30453	30534	30615	30696	30777	30858	30939	31020	31101	31182	31263	31343	31424	31505		31586	31667	31748	31829	31910	31991	32072	32153	32233	32314	
1490	30777	30858	30939	31020	31101	31182	31263	31343	31424	31505	31586	31667	31748	31829	31910	31991	32072	32153	32233	32314		32395	32476	32557	32638	32719	32800	32877	32954	33031	33108	
1500	31586	31667	31748	31829	31910	31991	32072	32153	32233	32314	32395	32476	32557	32638	32719	32800	32877	32954	33031	33108		33185	33262	33339	33416	33493	33570	33647	33724	33801	33878	
1510	32395	32476	32557	32638	32719	32800	32877	32954	33031	33108	33185	33262	33339	33416	33493	33570	33647	33724	33801	33878		33955	34032	34109	34186	34263	34340	34417	34494	34571	34648	
1520	33185	33262	33339	33416	33493	33570	33647	33724	33801	33878	33955	34032	34109	34186	34263	34340	34417	34494	34571	34648		34725	34802	34879	34956	35033	35110	35187	35264	35341	35418	
1530	33955	34032	34109	34186	34263	34340	34417	34494	34571	34648	34725	34802	34879	34956	35033	35110	35187	35264	35341	35418		35495	35572	35649	35726	35803	35880	35957	36034	36111	36188	
1540	34725	34802	34879	34956	35033	35110	35187	35264	35341	35418	35495	35572	35649	35726	35803	35880	35957	36034	36111	36188		36265	36342	36419	36496	36573	36650	36727	36804	36881	36958	
1550	35495	35572	35649	35726	35803	35880	35957	36034	36111	36188	36265	36342	36419	36496	36573	36650	36727	36804	36881	36958		37035	37112	37189	37266	37343	37420	37497	37574	37651	37728	
1560	36265	36342	36419	36496	36573	36650	36727	36804	36881	36958	37035	37112	37189	37266	37343	37420	37497	37574	37651	37728		37805	37882	37959	38036	38113	38190	38267	38344	38421	38498	
1570	37035	37112	37189	37266	37343	37420	37497	37574	37651	37728	37805	37882	37959	38036	38113	38190	38267	38344	38421	38498		38575	38652	38729	38806	38883	38960	39037	39114	39191	39268	
1580	37805	37882	37959	38036	38113	38190	38267	38344	38421	38498	38575	38652	38729	38806	38883	38960	39037	39114	39191	39268		39345	39422	39499	39576	39653	39730	39807	39884	39961	40038	
1590	38575	38652	38729	38806	38883	38960	39037	39114	39191	39268	39345	39422	39499	39576	39653	39730	39807	39884	39961	40038		40115	40192	40269	40346	40423	40500	40577	40654	40731	40808	
1590	40115	40192	40269	40346	40423	40500	40577	40654	40731	40808	40885	40962	41039	41116	41193	41270	41347	41424	41501	41578		41655	41732	41809	41886	41963	42040	42117	42194	42271	42348	

GRAVITY SECTION

BARRETT DAM

RAIL TO DOWNSTREAM FACE

Elev	0	1	2	3	4	5	6	7	8	9
1450	27536	27623	27710	27796	27883	27970	28056	28143	28230	28316
1460	28403	28490	28576	28663	28750	28837	28923	29010	29097	29183
1470	29270	29357	29443	29530	29617	29703	29790	29877	29963	30050
1480	30137	30223	30310	30397	30483	30570	30657	30743	30830	30917
1490	31003	31090	31177	31263	31350	31437	31523	31610	31697	31783
1500	31870	31957	32043	32130	32217	32303	32390	32477	32563	32650
1510	32737	32823	32910	32997	33083	33170	33256	33342	33428	33514
1520	33546	33622	33697	33772	33847	33923	33998	34073	34148	34224
1530	34299	34374	34449	34523	34600	34675	34750	34826	34901	34976
1540	35051	35127	35202	35277	35352	35428	35503	35578	35653	35729
1550	35804	35879	35954	36030	36105	36180	36254	36327	36399	36469
1560	36537	36605	36671	36735	36799	36861	36921	36981	37039	37096
1570	37152	37206	37260	37313	37364	37414	37463	37511	37558	37607
1580	37648	37692	37735	37777	37819	37857	37896	37934	37971	38007
1590	38042	38076	38109	38140	38172	38203	38232	38261	38289	38316
1610	38342	38367	38391	38415	38437	38459	38480	38500		

1457 To 1525 Slope = 1 on 0.8667
 1525 To 1565 " = 1 on 0.7525
 1565 To 1617 = Vertical Curve R=12736'

Checked by ZM
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 21
 22
 23
 24

25 + 26

1607 or

Checked by E.M.
70
100
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1607.01

17 19

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25 & 26

1607 01

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Computed by HRB
Checked by

ARC LENGTH	DEFLECTION ANGLE	CHORD LENGTH	CENTRAL ANGLE
1	0-4-17.95	1.0	0-0-83564
5	0-21-29.15	5.0	0-42-58.3
10	0-42-58.3	10.0	1-25-56.6
20	1-25-57	20.0	2-51-53
30	2-08-55	29.99	4-17-50
40	2-51-53	39.98	5-43-46
50	3-34-52	49.97	7-09-43
60	4-17-50	59.94	8-35-40
70	5-00-48	69.91	10-01-36
80	5-43-46	79.87	11-27-33
90	6-26-45	89.81	12-53-29
100	7-09-43	99.74	14-19-26
110	7-52-41	109.65	15-45-23
120	8-35-40	119.55	17-11-19
130	9-18-38	129.43	18-37-16
140	10-01-36	139.29	20-03-12
150	10-44-35	149.12	21-29-09
160	11-27-33	158.94	22-55-06
170	12-10-31	168.72	24-21-02
180	12-53-29	178.48	25-46-59
190	13-36-28	188.22	27-12-55
200	14-19-26	197.92	28-38-52
210	15-02-24	207.59	30-04-49
220	15-45-23	217.24	31-30-45
230	16-28-21	226.85	32-56-42
240	17-11-19	236.41	34-22-38
250	17-54-18	245.95	35-48-35
260	18-37-16	255.45	37-14-32
270	19-20-14	264.90	38-40-28
280	20-03-12	274.32	40-06-25
290	20-46-10	283.69	41-32-21
300	21-29-09	293.02	42-58-18
310	22-12-07	302.30	44-24-15
320	22-55-05	311.534	45-50-11.52

FUNCTIONS OF A 400' RADIUS CURVE 20' CHORDS BARRETT DAM 5

400' R ARC	ARC LENGTH	DEFLECTION ANGLE	CHORD LENGTH	CENTRAL ANGLE	
	1	0-3-46.27	1	0-07-32.54	
	5	0-18-51.36	5	0-37-42.72	
	10	0-37-42.71	10	1-15-25.42	
	20	22.79	1-25-57	22.787	2-51-53
	30	34.18	2-08-55	34.176	4-17-50
	40	45.58	2-51-53	45.560	5-43-46
	50	56.97	3-34-52	56.937	7-09-43
	60	68.37	4-17-50	68.304	8-35-40
	70	79.76	5-00-48	79.661	10-01-36
	80	91.16	5-43-46	91.006	11-27-33
	90	102.55	6-26-45	102.336	12-53-29
	100	113.95	7-09-43	113.651	14-19-26
	110	125.34	7-52-41	124.947	15-45-23
	120	136.74	8-35-40	136.226	17-11-19
	130	148.13	9-18-38	147.480	18-37-16
	140	159.53	10-01-36	158.713	20-03-12
	150	170.92	10-44-35	169.921	21-29-09
	160	182.32	11-27-33	181.103	22-55-06
	170	193.71	12-10-31	192.256	24-21-02
	180	205.11	12-53-29	203.378	25-46-59
	190	216.50	13-36-28	214.470	27-12-55
	200	227.90	14-19-26	225.528	28-38-52
	210	239.29	15-02-24	236.550	30-04-49
	220	250.68	15-45-23	247.532	31-30-45
	230	262.08	16-28-21	258.484	32-56-42
	240	273.47	17-11-19	269.390	34-22-38
	250	284.87	17-54-18	280.254	35-48-35
	260	296.26	18-37-16	291.074	37-14-32
	270	307.67	19-20-14	301.850	38-40-28
	280	319.05	20-03-12	312.578	40-06-25
	290	330.45	20-46-10	323.258	41-32-21
	300	341.84	21-29-09	333.886	42-58-18
	310	353.24	22-12-07	344.462	44-24-15
	320	364.632	22-55-05	354.984	45-50-11.52
	10	11.39	0-42-58.31	11.394	1-25-56.61

FUNCTIONS OF A 45529 RADIUS CURVE 11' 39415 CHORDS BARRETT DAM 22

397' Radius.
Tenths + Feet
4.3297

	Tenths		add minutes
	.1	00.433	
1	.2	00.866	
2	.3	01.299	1
3	.4	01.732	2
4	.5	02.165	2
5	.6	02.598	3
6	.7	03.031	3
7	.8	03.464	4
8	.9	03.897	4
	<u>Feet</u>		
9	1	04.3297	4
10	2	08.6594	9
11	3	12.9891	13
12	4	17.3188	17
13	5	21.6485	22
14	6	25.9782	26
15	7	30.3079	30
16	8	34.6376	35.0
17	9	38.9673	39.0
18	10	43.2970	43
19	8.35	36.1529	

See page 53 for previous
Station on 397' Radius

— 397' Radius Curve — 19

1	0 - 04.3297
5	0 - 21.65
10	0 - 43.297
20	1 - 26.597
30	2 - 09.891
40	2 - 53.188
50	3 - 36.485
60	4 - 19.783
70	5 - 03.079
80	5 - 46.376
90	6 - 29.673
100	7 - 12.970
110	7 - 56.267
120	8 - 39.569
130	9 - 22.861
140	10 - 06.158
150	10 - 49.455
160	11 - 32.752
170	12 - 16.049
180	12 - 59.346
190	13 - 42.643
200	14 - 25.940
210	15 - 09.237
218 ³⁵	15 - 45.410

400 R ARC	ARC LENGTH	DEFLECTION ANGLE	CHORD LENGTH	LONG CHORD
	1	0-4-19.78	1	0-8-39.56
	5	0-21-38.89	5	0-43-17.78
	10	0-43-17.79	10	1-26-35.58
20	19.85	1-25-57	19.848	2-51-53
30	29.78	2-08-55	29.768	4-17-50
40	39.70	2-51-53	39.684	5-43-46
50	49.63	3-34-52	49.593	7-09-43
60	59.55	4-17-50	59.494	8-35-40
70	69.48	5-00-48	69.386	10-01-36
80	79.40	5-43-46	79.268	11-27-33
90	89.33	6-26-45	89.136	12-53-29
100	99.25	7-09-43	98.992	14-19-26
110	109.18	7-52-41		15-45-23
120	119.10	8-35-40		17-11-19
130	129.03	9-18-38		18-37-16
140	138.95	10-01-36		20-03-12
150	148.88	10-44-35		21-29-09
160	158.80	11-27-33		22-55-06
170	168.73	12-10-31		24-21-02
180	178.65	12-53-29		25-46-59
190	188.58	13-36-28		27-12-55
200	198.50	14-19-26		28-38-52
210	208.43	15-02-24		30-04-49
220	218.35	15-45-23		31-30-45
230	228.28	16-28-21		32-56-42
240	238.20	17-11-19		34-22-38
250	248.13	17-54-18		35-48-35
260	258.05	18-37-16		37-14-32
270	267.98	19-20-14		38-40-28
280	277.90	20-03-12		40-06-25
290	287.83	20-46-10		41-32-21
300	297.75	21-29-09		42-58-18
310	307.68	22-12-07		44-24-15
320	317.60	22-55-05.76	309.197	45-50-11.52
10	9.925	0-42-58.31	9.925	1-25-56.61

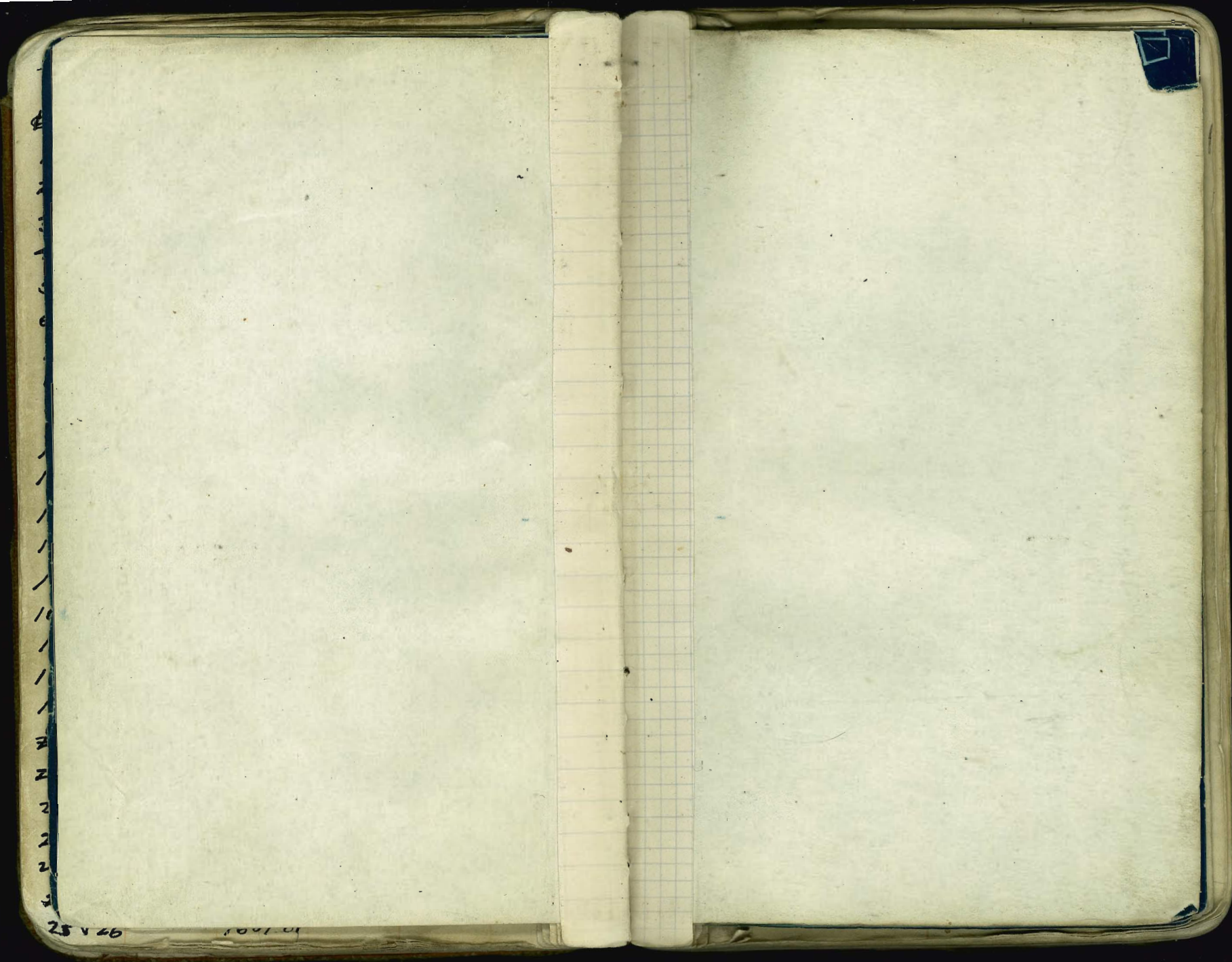
FUNCTIONS OF A 397 RADIUS CURVE 99.25 CHORDS BARRETT DAM 20

400 R ARC	ARC LENGTH	DEFLECTION ANGLE	CHORD LENGTH	CENTRAL ANGLE
	1	0-04-19.13	1	0-08-38.26
	5	0-21-35.63	5	0-43-11.26
	10	0-43-11.26	10	1-26-22.52
20	19.90	1-25-57	19.898	2-51-53
30	29.85	2-08-55	29.843	4-17-50
40	39.80	2-51-53	39.783	5-43-46
50	49.75	3-34-52	49.718	7-09-43
60	59.70	4-17-50	59.644	8-35-40
70	69.65	5-00-48	69.561	10-01-36
80	79.60	5-43-46	79.467	11-27-33
90	89.55	6-26-45	89.361	12-53-29
100	99.50	7-09-43	99.242	14-19-26
110	109.45	7-52-41		15-45-23
120	119.40	8-35-40		17-11-19
130	129.35	9-18-38		18-37-16
140	139.30	10-01-36		20-03-12
150	149.25	10-44-35		21-29-09
160	159.20	11-27-33		22-55-06
170	169.15	12-10-31		24-21-02
180	179.10	12-53-29		25-46-59
190	189.05	13-36-28		27-12-55
200	199.00	14-19-26		28-38-52
210	208.95	15-02-24		30-04-49
220	218.90	15-45-23		31-30-45
230	228.85	16-28-21		32-56-42
240	238.80	17-11-19		34-22-38
250	248.75	17-54-18		35-48-35
260	258.70	18-37-16		37-14-32
270	268.65	19-20-14		38-40-28
280	278.60	20-03-12		40-06-25
290	288.55	20-46-10		41-32-21
300	298.50	21-29-09		42-58-18
310	308.45	22-12-07		44-24-15
320	318.40	22-55-05.76	309.976	45-50-11.52
10	9.95	0-42-58.31	9.949	1-25-56.61

FUNCTIONS OF A 398 RADIUS CURVE 99.5 CHORDS BARRETT DAM 21

25826

10 1001



25 v 46

1001 01

400R ARC	ARC LENGTH	DEFLECTION ANGLE	CHORD LENGTH	LONG CHORD
	1	0-04-24.44	1	0-8-48.88
	5	0-22-22.08	5	0-44-44.16
	10	0-44-44.16	10	1-29-28.32
20	19.50	1-25-57	19.498	2-51-53
30	29.25	2-08-55	29.243	4-17-50
40	39.00	2-51-53	38.984	5-43-46
50	48.75	3-34-52	48.718	7-09-43
60	58.50	4-17-50	58.445	8-35-40
70	68.25	5-00-48	68.163	10-01-36
80	78.00	5-43-46	77.870	11-27-33
90	87.75	6-26-45	87.565	12-53-29
100	97.50	7-09-43	97.246	14-19-26
110	107.25	7-52-41		15-45-23
120	117.00	8-35-40		17-11-19
130	126.75	9-18-38		18-37-16
140	136.50	10-01-36		20-03-12
150	146.25	10-44-35		21-29-09
160	156.00	11-27-33		22-55-06
170	165.75	12-10-31		24-21-02
180	175.50	12-53-29		25-46-59
190	185.25	13-36-28		27-12-55
200	195.00	14-19-26		28-38-52
210	204.75	15-02-24		30-04-49
220	214.50	15-45-23		31-30-45
230	224.25	16-28-21		32-56-42
240	234.00	17-11-19		34-22-38
250	243.75	17-54-18		35-48-35
260	253.50	18-37-16		37-14-32
270	263.25	19-20-14		38-40-28
280	273.00	20-03-12		40-06-25
290	282.75	20-46-10		41-32-21
300	292.50	21-29-09		42-58-18
310	302.25	22-12-07		44-24-15
320	312.00	22-55-05.76	303.746	45-50-11.52
	975	0-42-58.31	975	1-25-56.61

FUNCTIONS OF A 390' RADIUS CURVE 925 CHORDS BARRETT DAM 19

400R ARC	ARC LENGTH	DEFLECTION ANGLE	CHORD LENGTH	CENTRAL ANGLE
	1	0-4-27.88	1	0-8-55.75
	5	0-22-19.30	5	0-44-38.76
	10	0-44-38.76	10	1-29-17.52
10	9.63	0-42-58.31	9.625	1-25-56.61
20	19.25	1-25-57	19.248	2-51-53
30	28.88	2-08-55	28.868	4-17-50
40	38.50	2-51-53	38.484	5-43-46
50	48.13	3-34-52	48.094	7-09-43
60	57.75	4-17-50	57.696	8-35-40
70	67.38	5-00-48	67.289	10-01-36
80	77.00	5-43-46	76.872	11-27-33
90	86.63	6-26-45	86.442	12-53-29
100	96.25	7-09-43	95.999	14-19-26
110	105.88	7-52-41		15-45-23
120	115.50	8-35-40		17-11-19
130	125.13	9-18-38		18-37-16
140	134.75	10-01-36		20-03-12
150	144.38	10-44-35		21-29-09
160	154.00	11-27-33		22-55-06
170	163.63	12-10-31		24-21-02
180	173.25	12-53-29		25-46-59
190	182.88	13-36-28		27-12-55
200	192.50	14-19-26		28-38-52
210	202.13	15-02-24		30-04-49
220	211.75	15-45-23		31-30-45
230	221.38	16-28-21		32-56-42
240	231.00	17-11-19		34-22-38
250	240.63	17-54-18		35-48-35
260	250.25	18-37-16		37-14-32
270	259.88	19-20-14		38-40-28
280	269.50	20-03-12		40-06-25
290	279.13	20-46-10		41-32-21
300	288.75	21-29-09		42-58-18
310	298.38	22-12-07		44-24-15
320	308.00	22-55-05.76	299.851	44-50-11.52

FUNCTIONS OF A 385' RADIUS CURVE 9625 CHORDS BARRETT DAM 18

400 R ARC	ARC LENGTH	DEFLECTION ANGLE	CHORD LENGTH	CENTRAL ANGLE
	1	0-4-30.33	1	0-9-0.67
	5	0-22-31.67	5	0-45-04.33
	10	0-45-3.33	10	1-30-6.67
10	9.54	0-42-58.31	9.537	1-25-56.61
20	19.08	1-25-57	19.073	2-51-53
30	28.61	2-08-55	28.606	4-17-50
40	38.15	2-51-53	38.134	5-43-46
50	47.69	3-34-52	47.656	7-09-43
60	57.23	4-17-50	57.171	8-35-40
70	66.76	5-00-48	66.677	10-01-36
80	76.30	5-43-46	76.173	11-27-33
90	85.84	6-26-45	85.656	12-53-29
100	95.38	7-09-43	95.127	14-19-26
110	104.91	7-52-41		15-45-23
120	114.45	8-35-40		17-11-19
130	123.99	9-18-38		18-37-16
140	133.53	10-01-36		20-03-12
150	143.06	10-44-35		21-29-00
160	152.60	11-27-33		22-55-06
170	162.14	12-10-31		24-21-02
180	171.68	12-53-29		25-46-59
190	181.21	13-36-28		27-12-55
200	190.75	14-19-26		28-38-52
210	200.29	15-02-24		30-04-49
220	209.83	15-45-23		31-30-45
230	219.36	16-28-21		32-56-42
240	228.90	17-11-19		34-22-38
250	238.44	17-54-18		35-48-35
260	247.98	18-37-16		37-14-32
270	257.51	19-20-14		38-40-28
280	267.05	20-03-12		40-06-25
290	276.59	20-46-10		41-32-21
300	286.13	21-29-09		42-58-18
310	295.66	22-12-07		44-24-15
320	305.20	22-55-05.76	297.125	45-50-11.52

FUNCTIONS OF A 38150 RADIUS CURVE 95375 CHORDS BARRETT DAM 17

400 R ARC	ARC LENGTH	DEFLECTION ANGLE	CHORD LENGTH	CENTRAL ANGLE
	1	0-4-45.05	1	0-09-30.11
	5	0-23-45.27	5	0-47-30.53
	10	0-47-30.53	10	1-35-1.06
20	18.09	1-25-57	18.088	2-51-53
30	27.14	2-08-55	27.129	4-17-50
40	36.18	2-51-53	36.165	5-43-46
50	45.23	3-34-52	45.196	7-09-43
60	54.27	4-17-50	54.219	8-35-40
70	63.33	5-00-48	63.234	10-01-36
80	72.36	5-43-46	72.239	11-27-33
90	81.42	6-26-45	81.234	12-53-29
100	90.45	7-09-43	90.215	14-19-26
110	99.50	7-52-41		15-45-23
120	108.54	8-35-40		17-11-19
130	117.59	9-18-38		18-37-16
140	126.63	10-01-36		20-03-12
150	135.68	10-44-35		21-29-09
160	144.72	11-27-33		22-55-06
170	153.77	12-10-31		24-21-02
180	162.81	12-53-29		25-46-59
190	171.86	13-36-28		27-12-55
200	180.90	14-19-26		28-38-52
210	189.95	15-02-24		30-04-49
220	198.99	15-45-23		31-30-45
230	208.04	16-28-21		32-56-42
240	217.08	17-11-19		34-22-38
250	226.13	17-54-18		35-48-35
260	235.17	18-37-16		37-14-32
270	244.22	19-20-14		38-40-28
280	253.26	20-03-12		40-06-25
290	262.31	20-46-10		41-32-21
300	271.35	21-29-09		42-58-18
310	280.40	22-12-07		44-24-15
320	289.44	22-55-05.76	281.782	45-50-11.52
	9045	0-42-58.31	9.045	1-25-56.61

FUNCTIONS OF A 36180 RADIUS CURVE 9045 CHORDS BARRETT DAM 16

400' R ARC	ARC LENGTH	DEFLECTION ANGLE	CHORD LENGTH	CENTRAL ANGLE
	1	0-5-1092	1.0	0-10-21.84
	5	0-25-54.60	5.0	0-51-49.20
	10	0-51-49.20	10.0	1-43-38.40
10	8.29	0-42-58.31	8.292	1-25-56.61
20	16.59	1-25-57	16.583	2-51-53
30	24.88	2-08-55	24.872	4-17-50
40	33.17	2-51-53	33.156	5-43-46
50	41.46	3-34-52	41.435	7-09-43
60	49.76	4-17-50	49.708	8-35-40
70	58.05	5-00-48	57.973	10-01-36
80	66.34	5-43-46	66.229	11-27-33
90	74.63	6-26-45	74.475	12-53-29
100	82.92	7-09-43	82.710	14-19-26
110	91.22	7-52-41	90.930	15-45-23
120	99.51	8-35-40	99.136	17-11-19
130	107.80	9-18-38		18-37-16
140	116.10	10-01-36		20-03-12
150	124.39	10-44-35		21-29-09
160	132.68	11-27-33		22-55-06
170	140.97	12-10-31		24-21-02
180	149.27	12-53-29		25-46-59
190	157.56	13-36-28		27-12-55
200	165.85	14-19-26		28-38-52
210	174.14	15-02-24		30-04-49
220	182.43	15-45-23		31-30-45
230	190.73	16-28-21		32-56-42
240	199.02	17-11-19		34-22-38
250	207.31	17-54-18		35-48-35
260	215.61	18-37-16		37-14-32
270	223.90	19-20-14		38-40-28
280	232.19	20-03-12		40-06-25
290	240.48	20-46-10		41-32-21
300	248.78	21-29-09		42-58-18
310	256.07	22-12-07		44-24-15
320	265.36	22-55-05.76	258.340	45-50-11.52

FUNCTIONS OF A 33120' RADIUS CURVE @ 2925' CHORDS BARRETT DAM 14

400' R ARC	ARC LENGTH	DEFLECTION ANGLE	CHORD LENGTH	CENTRAL ANGLE
	1	0-4-47.44	1	0-9-34.87
	5	0-23-57.18	5	0-47-54.36
	10	0-47-54.36	10	1-35-48.73
10	8.97	0-42-58.31	8.970	1-25-56.6
20	17.94	1-25-57	17.938	2-51-53
30	26.91	2-08-55	26.904	4-17-50
40	35.88	2-51-53	35.865	5-43-46
50	44.85	3-34-52	44.821	7-09-43
60	53.82	4-17-50	53.769	8-35-40
70	62.79	5-00-48	62.710	10-01-36
80	71.76	5-43-46	71.640	11-27-33
90	80.73	6-26-45	80.560	12-53-29
100	89.70	7-09-43	89.467	14-19-26
110	98.67	7-52-41	98.360	15-45-23
120	107.64	8-35-40		17-11-19
130	116.61	9-18-38		18-37-16
140	125.58	10-01-36		20-03-12
150	134.55	10-44-35		21-29-09
160	143.52	11-27-33		22-55-06
170	152.49	12-10-31		24-21-02
180	161.46	12-53-29		25-46-59
190	170.43	13-36-28		27-12-55
200	179.40	14-19-26		28-38-52
210	188.37	15-02-24		30-04-49
220	197.34	15-45-23		31-30-45
230	206.31	16-28-21		32-56-42
240	215.28	17-11-19		34-22-38
250	224.25	17-54-18		35-48-35
260	233.22	18-37-16		37-14-32
270	242.19	19-20-14		38-40-28
280	251.16	20-03-12		40-06-25
290	260.13	20-46-10		41-32-21
300	269.10	21-29-09		42-58-18
310	278.07	22-12-07		44-24-15
320	287.04	22-55-05.76	279.446	45-50-11.52

FUNCTIONS OF A 35820' RADIUS CURVE @ 97' CHORDS BARRETT DAM 15

400' R ARC	ARC LENGTH	DEFLECTION ANGLE	CHORD LENGTH	CENTRAL ANGLE
	1	0-5-43.77	1	0-11-27.55
	5	0-28-38.87	5	0-57-17.74
	10	0-57-17.74	10	1-54-35.48
20	15.00	1-25-57	14.998	2-51-53
30	22.50	2-08-55	22.495	4-17-50
40	30.00	2-51-53	29.987	5-43-46
50	37.50	3-34-52	37.476	7-09-43
60	45.00	4-17-50	44.958	8-35-40
70	52.50	5-00-48	52.433	10-01-36
80	60.00	5-43-46	59.900	11-27-33
90	67.50	6-26-45	67.358	12-53-29
100	75.00	7-09-43	74.804	14-19-26
110	82.50	7-52-41	82.240	15-45-23
120	90.00	8-35-40	89.663	17-11-19
130	97.50	9-18-38	97.072	18-37-16
140	105.00	10-01-36		20-03-12
150	112.50	10-44-35		21-29-09
160	120.00	11-27-33		22-55-06
170	127.50	12-10-31		24-21-02
180	135.00	12-53-29		25-46-59
190	142.50	13-36-28		27-12-55
200	150.00	14-19-26		28-38-52
210	157.50	15-02-24		30-04-49
220	165.00	15-45-23		31-30-45
230	172.50	16-28-21		32-56-42
240	180.00	17-11-19		34-22-38
250	187.50	17-54-18		35-48-35
260	195.00	18-37-16		37-14-32
270	202.50	19-20-14		38-40-28
280	210.00	20-03-12		40-06-25
290	217.50	20-46-10		41-32-21
300	225.00	21-29-09		42-58-18
310	232.50	22-12-07		44-24-15
320	240.00	22-55-05.76	233.651	45-50-11.52
	7.50	0-42-58.31	7.50	1-25-56.61

FUNCTIONS OF A 300' RADIUS CURVE 750' CHORDS BARRETT DAM

400' R ARC	ARC LENGTH	DEFLECTION ANGLE	CHORD LENGTH	CENTRAL ANGLE	
	1	0-5-54.00	1	0-11-48.00	
	5	0-29-30.02	5	0-59-0.04	
	10	0-59-0.05	10	1-58-0.09	
20	14.57	1-25-57	14.565	2-51-53	
30	21.85	2-08-55	21.845	4-17-50	
40	29.13	2-51-53	29.121	5-43-46	
50	36.42	3-34-52	36.390	7-09-43	
60	43.70	4-17-50	43.658	8-35-40	
70	50.98	5-00-48	50.918	10-01-36	
80	58.27	5-43-46	58.169	11-27-33	
90	65.55	6-26-45	65.411	12-53-29	
100	72.83	7-09-43	72.643	14-19-26	
110	80.12	7-52-41	79.863	15-45-23	
120	87.40	8-35-40	87.071	17-11-19	
130	94.68	9-18-38	94.266	18-37-16	
140	101.97	10-01-36		20-03-12	
150	109.25	10-44-35		21-29-09	
160	116.53	11-27-33		22-55-06	
170	123.82	12-10-31		24-21-02	
180	131.10	12-53-29		25-46-59	
190	138.38	13-36-28		27-12-55	
200	145.67	14-19-26		28-38-52	
210	152.95	15-02-24		30-04-49	
220	160.23	15-45-23		31-30-45	
230	167.51	16-28-21		32-56-42	
240	174.80	17-11-19		34-22-38	
250	182.08	17-54-18		35-48-35	
260	189.36	18-37-16		37-14-32	
270	196.65	19-20-14		38-40-28	
280	203.93	20-03-12		40-06-25	
290	211.21	20-46-10		41-32-21	
300	218.50	21-29-09		42-58-18	
310	225.78	22-12-07		44-24-15	
320	233.064	22-55-05.76	226.898	45-50-11.52	
	10	7.28	0-42-58.31	7.283	1-25-56.61

FUNCTIONS OF A 291.33' RADIUS CURVE 728.32' CHORD BARRETT DAM

29

400' R ARC	ARC LENGTH	DEFLECTION ANGLE	CHORD LENGTH	CENTRAL ANGLE
	1	0-6-18.11	1	0-12-36.22
	5	0-31-30.53	5	1-03-1.06
	10	1-3-1.06	10	2-6-2.12
20	13.638	1-25-57	13.637	2-51-53
30	20.46	2-08-55	20.452	4-17-50
40	27.28	2-51-53	27.265	5-43-46
50	34.10	3-34-52	34.073	7-09-43
60	40.91	4-17-50	40.876	8-35-40
70	47.73	5-00-48	47.672	10-01-36
80	54.55	5-43-46	54.461	11-27-33
90	61.37	6-26-45	61.242	12-53-29
100	68.19	7-09-43	68.012	14-19-26
110	75.01	7-52-41	74.773	15-45-23
120	81.83	8-35-40	81.521	17-11-19
130	88.65	9-18-38	88.257	18-37-16
140	95.47	10-01-36	94.978	20-03-12
150	102.29	10-44-35		21-29-09
160	109.10	11-27-33		22-55-06
170	115.92	12-10-31		24-21-02
180	122.74	12-53-29		25-46-59
190	129.56	13-36-28		27-12-55
200	136.38	14-19-26		28-38-52
210	143.20	15-02-24		30-04-49
220	150.02	15-45-23		31-30-45
230	156.84	16-28-21		32-56-42
240	163.66	17-11-19		34-22-38
250	170.48	17-54-18		35-48-35
260	177.29	18-37-16		37-14-32
270	184.11	19-20-14		38-40-28
280	190.93	20-03-12		40-06-25
290	197.75	20-46-10		41-32-21
300	204.57	21-29-09		42-58-18
310	211.39	22-12-07		44-24-15
320	218.208	22-55-05.76	212.435	45-50-11.52
10	6.819	0-42-58.31	6.819	1-25-56.61

FUNCTIONS OF A 272.76' RADIUS CURVE 6819' CHORDS BARRETT DAM

400' R ARC	ARC LENGTH	DEFLECTION ANGLE	CHORD LENGTH	CENTRAL ANGLE
	1	0-6-52.53	1	0-13-45.06
	5	0-34-22.64	5	1-08-45.29
	10	1-8-45.29	10	2-17-30.58
20	12.50	1-25-57	12.499	2-51-53
30	18.75	2-08-55	18.746	4-17-50
40	25.00	2-51-53	24.990	5-43-46
50	31.25	3-34-52	31.230	7-09-43
60	37.50	4-17-50	37.465	8-35-40
70	43.75	5-00-48	43.694	10-01-36
80	50.00	5-43-46	49.916	11-27-33
90	56.25	6-26-45	56.131	12-53-29
100	62.50	7-09-43	62.337	14-19-26
110	68.75	7-52-41	68.534	15-45-23
120	75.00	8-35-40	74.719	17-11-19
130	81.25	9-18-38	80.892	18-37-16
140	87.50	10-01-36	87.054	20-03-12
150	93.75	10-44-35	93.202	21-29-09
160	100.00	11-27-33	99.334	22-55-06
170	106.25	12-10-31		24-21-02
180	112.50	12-53-29		25-46-59
190	118.75	13-36-28		27-12-55
200	125.00	14-19-26		28-38-52
210	131.25	15-02-24		30-04-49
220	137.50	15-45-23		31-30-45
230	143.75	16-28-21		32-56-42
240	150.00	17-11-19		34-22-38
250	156.25	17-54-18		35-48-35
260	162.50	18-37-16		37-14-32
270	168.75	19-20-14		38-40-28
280	175.00	20-03-12		40-06-25
290	181.25	20-46-10		41-32-21
300	187.50	21-29-09		42-58-18
310	193.75	22-12-07		44-24-15
320	200.00	22-55-05.76	194.709	45-50-11.52
10	6.25	0-42-58.31	6.2498	1-25-56.61

FUNCTIONS OF A 250' RADIUS CURVE 625' CHORDS BARRETT DAM

400' R ARC	ARC LENGTH	DEFLECTION ANGLE	CHORD LENGTH	CENTRAL ANGLE
	1	0-07-3.02	1	0-14-6.04
	5	0-35-15.10	5	1-10-30.20
	10	1-10-30.19	10	2-21-0.39
20	12.19	1-25-57	12.189	2-51-53
30	18.29	2-08-55	18.281	4-17-50
40	24.38	2-51-53	24.370	5-43-46
50	30.48	3-34-52	30.455	7-09-43
60	36.57	4-17-50	36.536	8-35-40
70	42.67	5-00-48	42.610	10-01-36
80	48.76	5-43-46	48.679	11-27-33
90	54.86	6-26-45	54.739	12-53-29
100	60.95	7-09-43	60.791	14-19-26
110	67.05	7-52-41	66.834	15-45-23
120	73.14	8-35-40	72.866	17-11-19
130	79.24	9-18-38	78.887	18-37-16
140	85.33	10-01-36	84.895	20-03-12
150	91.43	10-44-35	90.890	21-29-09
160	97.52	11-27-33	96.870	22-55-06
170	103.62	12-10-31		24-21-02
180	109.71	12-53-29		25-46-59
190	115.81	13-36-28		27-12-55
200	121.90	14-19-26		28-38-52
210	128.00	15-02-24		30-04-49
220	134.09	15-45-23		31-30-45
230	140.19	16-28-21		32-56-42
240	146.28	17-11-19		34-22-38
250	152.38	17-54-18		35-48-35
260	158.47	18-37-16		37-14-32
270	164.57	19-20-14		38-40-28
280	170.66	20-03-12		40-06-25
290	176.76	20-46-10		41-32-21
300	182.85	21-29-09		42-58-18
310	188.95	22-12-07		44-24-15
320	195.04	22-55-05.76	189.880	45-50-11.52
10	6.095	0-42-58.31	6.095	1-25-56.61

FUNCTIONS OF A 24380' RADIUS CURVE 6.095' CHORDS BARRETT DAM 9

400' R ARC	392' R ARC	DEFLECTION ANGLE	CHORD LENGTH	CENTRAL ANGLE
	1	0-4-2309	1	0-8-46.19
	2	0-8-46.19	2	0-17-32.38
	3	0-13-09.28	3	0-26-18.56
	4	0-17-32.37	4	0-35-04.74
	5	0-21-55.47	5	0-43-50.84
10	9.8	0-42-58.32	9.8	1-25-56.63
	10.0	0-43-50.93	10.0	1-27-41.87
	13.313	0-58-22.56	13.313	1-56-45.12
	14.311	1-02-45.13	14.311	2-5-30.26
	16.0	1-10-09.50	16.0	2-20-19.00
20	19.6	1-25-56.63	19.6	2-51-53.26
	20.0	1-27-41.87	20.0	2-55-23.74
	26.626	1-56-45.12	26.62	3-53-30.24
	28.622	2-5-30.26	28.61	4-11-00.52
30	29.40	2-8-54.95	29.39	4-17-49.90
	30.0	2-11-32.80	29.99	4-23-05.60
	32.0	2-20-19.00	31.99	4-40-38.00
40	39.20	2-51-53.26	39.18	5-43-46.52
	39.939	2-55-07.68	39.92	5-50-15.36
	40.0	2-55-23.74	39.98	5-50-47.48
	42.933	3-08-15.39	42.91	6-16-30.78
	48.0	3-30-28.50	47.97	7-0-57.00
50	49.0	3-34-51.58	48.97	7-09-43.16
	50.0	3-39-14.67	49.97	7-18-29.34
	53.252	3-53-30.24		7-47-00.47
	57.244	4-11-05.2		8-22-10.4
60	58.80	4-17-49.89		8-35-39.78
	60.00	4-23-05.60		8-46-11.21
70	68.60	5-00-48.21		10-1-36.42
80	78.40	5-43-46.52		11-27-33.04
90	88.20	6-26-44.84		12-53-29.68
100	98.00	7-09-43.15		14-19-26.30
120	107.80	7-52-41.47		15-45-22.94
130	117.60	8-35-39.78		17-11-19.56
130	127.40	9-18-38.10		18-37-16.20
140	137.20	10-01-36.41		20-3-12.82
150	147.00	10-44-34.73		21-29-9.46
150	156.80	11-27-33		22-29-22

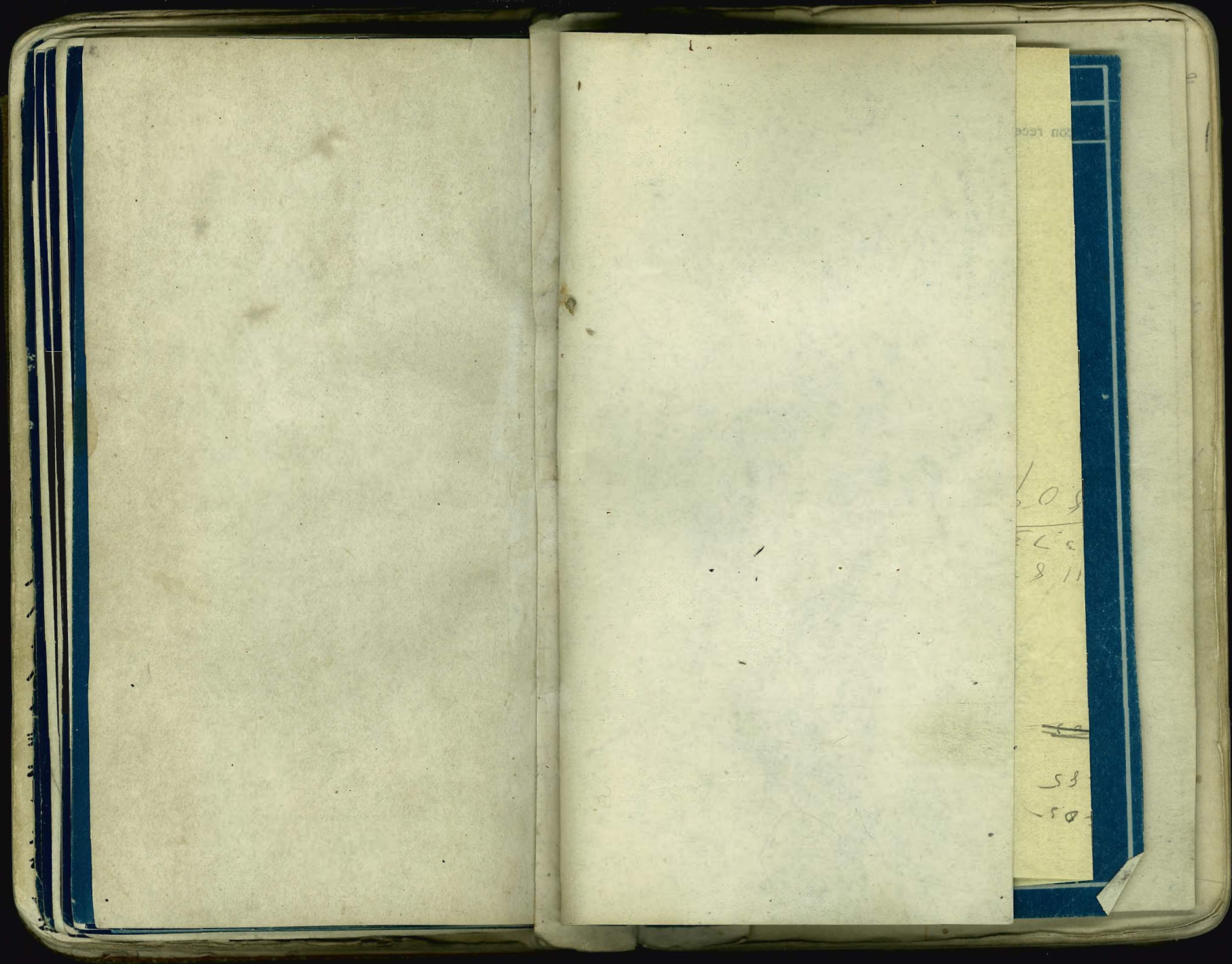
FUNCTIONS OF A 392' RADIUS CURVE 980' CHORDS BARRETT DAM 27

Computed by H.P.B.
Checked by

400' R ARC	392' R ARC	DEFLECTION ANGLE	CHORD LENGTH	CENTRAL ANGLE
	170	12-10-31.36		24-21-02.76
	180	12-53-29.67		25-46-59.34
	190	13-36-27.99		27-12-55.98
	200	14-19-26.30		28-38-52.60
	210	15-02-24.62		30-4-49.24
	220	15-45-22.93		31-30-45.86
	230	16-28-21.25		32-56-42.50
	240	17-11-19.56		34-22-39.12
	250	17-54-17.88		35-48-35.76
	260	18-37-16.19		37-14-32.38
	270	19-20-14.51		38-40-29.02
	280	20-03-12.82		40-6-25.64
	290	20-46-11.14		41-32-22.28
	300	21-29-09.45		42-58-18.90
	310	22-12-07.77		44-24-15.54
	320	22-55-05.76	305.304	45-50-11.52

FUNCTIONS OF A 392' RADIUS CURVE 980' CHORDS BARRETT DAM 28

Computed by H.P.B.
Checked by



108

57

811

58

50

N. B. You receipt of material ordered by you as noted on this copy.
 At once, carefully checking all items for

$$\frac{303.73}{301.73}$$

(4)

$$\frac{16.15}{29.85}$$

$$\frac{17.00}{31.182}$$

$$\frac{809}{303.73}$$

 1182

~~5000~~
 75-85
 95-05

OVERFLOW SECTION

Elev	RADI TO DOWNSTREAM FACE									Elev		
	0	1	2	3	4	5	6	7	8		9	
145967	24380	27344	27344	27344	27344	28713	28713	28713	28713	28713	145967	27344
1460	27344	27344	28713	28713	28713	29563	29563	29563	29563	29563	146467	27344
1470	28713	28713	29563	29563	29563	30373	30373	30373	30373	30373	1475	29563
1480	29563	29563	30373	30373	30373	31182	31182	31182	31182	31182	1485	31182
1490	30373	30373	31182	31182	31182	31991	31991	31991	31991	31991	1505	31991
1500	31182	31182	31991	31991	31991	32800	32800	32800	32800	32800	1525	32800
1510	31991	31991	32800	32800	32800	33570	33570	33570	33570	33570	1535	34340
1520	32800	32800	33570	33570	33570	34340	34340	34340	34340	34340	1545	35110
1530	33570	33570	34340	34340	34340	35110	35110	35110	35110	35110	1555	35880
1540	34340	34340	35110	35110	35110	35880	35880	35880	35880	35880	1565	36612
1550	35110	35110	35880	35880	35880	36612	36612	36612	36612	36612	1575	37344
1560	35880	35880	36612	36612	36612	37344	37344	37344	37344	37344	1585	37344
1560	36612	36612	36612	36612	36612	37418	37418	37564	37637	37637	1596	38150
1570	37344	37344	37344	37344	37344	38150	38150	38227	38308	38393	1603.5	38869
1580	37344	37344	37344	37344	37344	38150	38150	38227	38308	38393	1604.5	39013
1590	37211	37284	37857	37930	38004	38077	38150	38227	38308	38393	1605.5	39191
1590	38424	38481	38688	38805	38938	39096	39303	39800			1606.5	39448

BARRETT DAM

Computed by HHS
 checked by

400' Radius		397' Radius	
ARC LENGTH	DEFLECTION ANGLE	ARC LENGTH	DEFLECTION ANGLE
0.1	0°-0'-25.783	0.1	0-0-25.978
0.2	0°-0'-51.566	0.2	0-0-51.956
0.3	0°-1'-17.349	0.3	0-1-17.934
0.4	0°-1'-43.132	0.4	0-1-43.912
0.5	0°-2'-08.915	0.5	0-2-09.890
0.6	0°-2'-34.698	0.6	0-2-35.868
0.7	0°-3'-00.481	0.7	0-3-01.846
0.8	0°-3'-26.264	0.8	0-3-27.824
0.9	0°-3'-52.047	0.9	0-3-53.802
1.0	0°-4'-17.830	1.0	0-4-19.780
2.0	0°-8'-35.660	2.0	0-8-39.552
3.0	0°-12'-53.490	3.0	0-12-59.328
4.0	0°-17'-11.320	4.0	0-17-19.104
5.0	0°-21'-29.150	5.0	0-21-38.890
6.0	0°-25'-46.980	6.0	0-25-58.670
7.0	0°-29'-64.810	7.0	0-30-18.450
8.0	0°-34'-22.640	8.0	0-34-38.230
9.0	0°-38'-40.470	9.0	0-38-58.010
10.0	0°-42'-58.300	10.0	0-43-17.790

RADI TO DOWNSTREAM FACE
OVERFLOW SECTION
BARRETT DAM

Sta	0	1	2	3	4	5	6	7	8	9	Sta	
145967	24380										145967	27344
1460	27344	27344	27344	27344	27344	28713	28713	28713	28713	28713	146467	27344
1470	28713	28713	28713	28713	28713	29563	29563	29563	29563	29563	1475	29563
1480	29563	29563	29563	29563	29563	30373	30373	30373	30373	30373	1485	30373
1490	30373	30373	30373	30373	30373	31182	31182	31182	31182	31182	1495	31182
1500	31182	31182	31182	31182	31182	31991	31991	31991	31991	31991	1505	31991
1510	31991	31991	31991	31991	31991	32800	32800	32800	32800	32800	1515	32800
1520	32800	32800	32800	32800	32800	33570	33570	33570	33570	33570	1525	33570
1530	33570	33570	33570	33570	33570	34340	34340	34340	34340	34340	1535	34340
1540	34340	34340	34340	34340	34340	35110	35110	35110	35110	35110	1545	35110
1550	35110	35110	35110	35110	35110	35880	35880	35880	35880	35880	1555	35880
1560	35880	35880	35880	35880	35880	36612	36612	36612	36612	36612	1565	36612
1570	36612	36612	36612	36612	36612	37344	37344	37344	37344	37344	1575	37344
1580	37344	37344	37344	37344	37344	37344	37344	37344	37344	37344	1585	37344
1590	37344	37344	37344	37344	37344	38077	38077	38077	38077	38077	1596	38077
1590	37211	37284	37857	37930	38004	38077	38150	38227	38308	38393	1603.5	38869
1600	38184	38281	38388	38405	38438	38496	38550	38627	38708	38793	1604.5	39013
											1606.5	39448

Computed by HRS

Deflection for 1' any Radius Curve
in Minutes = $\frac{1718.87}{R}$ 390.51

Solution

$2\pi =$ Cir. of any Circle with $R=1$

$2\pi = 6.2832'$

$\frac{360^\circ}{6.2832R} = 57.2958^\circ = \phi$ at center of 1' Arc

$\frac{57.2958}{2} = 28.6479^\circ = \text{defl } \phi \text{ for 1' Arc}$

$28.6479^\circ \times 60' = 1718.87 \text{ minutes} = \text{defl.}$

459
8342
1.17

9700
95 - 37857
16.43

9700
7857
18.43

9700
8342

9700
38042
16.58

9700
7414
22.82

9700
35042
16.58

9700
8203
14.97

9700
8459
12.41

9700
7648
26.52

9700
4557
21.43

21.43

GRAVITY SECTION												
RADI TO DOWNSTREAM FACE					BARRETT DAM							
Elev	0	1	2	3	4	5	6	7	8	9	Elev	Radius
1500	32303	32303	32303	32303	32303	32303	32303	32303	32303	32303	1505	32303
1510	33170	33170	33170	33170	33170	33170	33170	33170	33170	33170	1515	33170
1520	33923	33923	33923	33923	33923	33923	33923	33923	33923	33923	1525	33923
1530	34675	34675	34675	34675	34675	34675	34675	34675	34675	34675	1535	34675
1540	35428	35428	35428	35428	35428	35428	35428	35428	35428	35428	1545	35428
1550	36180	36180	36180	36180	36180	36180	36180	36180	36180	36180	1555	36180
1560	36861	36861	36861	36861	36861	36861	36861	36861	36861	36861	1565	36861
1570	37414	37414	37414	37414	37414	37414	37414	37414	37414	37414	1575	37414
1580	37648	37692	37735	37777	37817	37857	37896	37934	37971	38007		
1590	38042	38076	38109	38140	38172	38203	38232	38261	38289	38316		
1610	38342	38367	38391	38415	38437	38459	38480	38500				

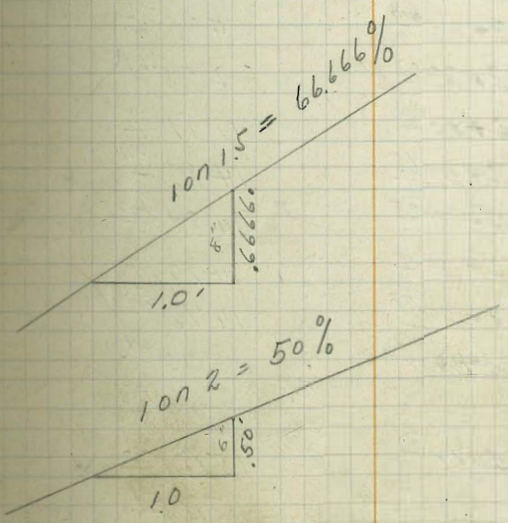
Stations & Grades
Inspection Gallery

Sta. 392	390	400R	Grades on 392	Grades 390
1+65 ⁶⁹	1+65 ⁶⁹	1+65 ⁶⁹		1547.41
P.C. 1+80 ⁰⁰	P.C. 1+80 ⁰⁰	P.C. 1+80 ⁰⁰	2.00% 50%	1540.250
1+85 ⁰⁷	1+85 ⁰⁴	1+85 ¹⁷	X	<u>1537.73</u> X
1+98 ³⁸	1+98 ²⁹	1+98 ⁷⁶		1528.90
1+99 ⁶⁰	1+99 ⁵⁰	2+00		1528.09
2+11 ⁶⁹	2+11 ⁵³	2+12 ³⁴ 1/4		1520.07
2+19 ²⁰	2+19 ⁰⁰	2+20 ⁰⁰		1515.09
2+25 ⁰¹	2+24 ⁷⁸	2+25 ⁹³ 10/		1511.24
2+38 ³²	2+38 ⁰²	2+39 ⁵⁷ 10/25		1502.41
2+38 ⁸⁰	2+38 ⁵⁰	2+40 ⁰⁰	66.328%	1502.09
2+51 ⁶³	2+51 ²⁷	2+53 ¹⁰		1493.58
2+58 ⁴⁰	2+58 ⁰⁰	2+60 ⁰⁰		1489.09
2+64 ⁹⁴	2+64 ⁵¹	2+66 ⁶⁸		1484.75
2+78 ⁰⁰	2+77 ⁵⁰	2+80 ⁰⁰		1476.09
2+78 ²⁶	2+77 ⁷⁶	2+80 ²⁷		1475.92
2+91 ⁵⁷	2+91 ⁰⁰	2+93 ⁸⁵	X	1467.09 X
E Outlet 2+97 ⁶⁰	E Outlet 2+97 ⁰⁰	E Outlet 3+00	-14.922%	1467.00 X
3+13 ⁶⁰	3+12 ⁹²	3+16 ³³	+14.922%	1467.24 +15%

(See Book 19 Page 2)

Equivalent Grades on 392 and 390

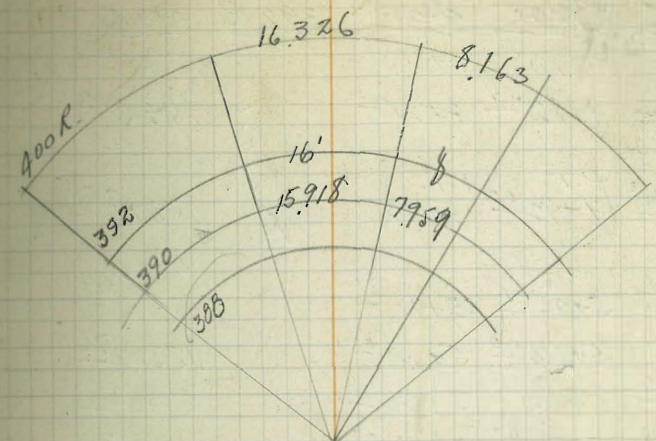
Stations		392	390	392	390	392	390
392R	390R	107.2 49.745%	107.2 50%	107.15 66.328%	107.15 66.666%	107.666 1.5%	107.666 14.922%
19.60	19.50	9.75	9.75	13.00	13.00		
16.00	15.918					2387	2387
8.00	7.959					11938	11938
13.313	13.244			8.83	8.83		
6.03	6.02					.09	.09
14.311	14.238	7.119	7.119				
	14.311		7.1555				



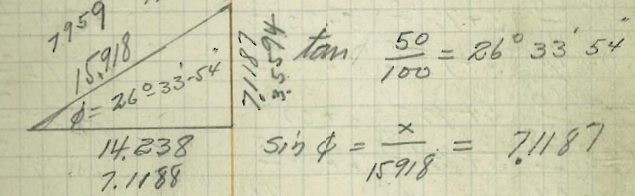
Steps in Inspection
Gallery

Sta + Grades
Inspection Gallery

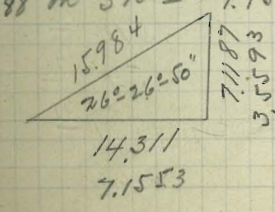
Sta 392R	390R	400R	Grades 392R	Grades 390R
3+17 ²⁰	3+16 ⁵⁰	3+20 ⁰⁰		1467 ²⁹
3+29 ²⁰	3+28 ⁸⁴	3+32 ⁶⁵		1467 ⁴⁸
3+36 ⁸⁰	3+36 ⁰⁰	3+40 ⁰⁰		1467 ⁵⁹
3+45 ⁶⁰	3+44 ⁷⁵	3+48 ⁹⁸		1467 ⁷²
3+56 ⁴⁰	3+55 ⁵⁰	3+60 ⁰⁰		1467 ⁸⁸
3+61 ⁶⁰	3+60 ⁶⁷	3+65 ³⁰	8-31 119220 222674	1467 ⁹⁶
3+69 ⁶⁰	3+68 ⁶³	3+73 ⁴⁷	X	1468 ⁰⁷⁴
See Page 45				
3+76 ⁰⁰	3+75 ⁰⁰	3+80 ⁰⁰	1/20	1471 ²⁶
3+83 ⁹¹	3+82 ⁸⁷	3+88 ⁰⁷	1/20	1475 ¹⁹³
3+95 ⁶⁰	3+94 ⁵⁰	4+00		1481 ⁰¹
3+98 ²²	3+97 ¹¹	4+02 ⁶⁷	11/26	1482 ³¹
4+12 ⁵³	4+11 ³⁵	4+17 ²⁸	X	1489 ⁴³
4+15 ²⁰	4+14 ⁰⁰	4+20 ⁰⁰		1490 ⁷⁶
4+26 ⁸⁴	4+25 ⁵⁸	4+31 ⁸⁸	X	1496 ⁵⁵
4+34 ⁸⁰	4+33 ⁵⁰	4+40 ⁰⁰		1500 ⁵¹
4+41 ¹⁶	4+39 ⁸²	4+46 ⁴⁸		1503 ⁶⁷
4+54 ⁴⁰	4+53 ⁰⁰	4+60 ⁰⁰	49.743%	1510 ²⁶
4+55 ⁴⁷	4+54 ⁰⁶	4+61 ⁰⁹		1510 ⁷⁹
4+69 ⁷⁸	4+68 ³⁰	4+75 ⁶⁹		1517 ⁹¹



16' on 392R taken as basis for Calculations
 16' on 392R = 15.918 on 390R in Gallery
 Slope of 20% or 50% on R gives 14.238 Horizontal
 measurement for hypotenuse of 15.918



14.238 on 390 = 14.311 on 392 = 14.603 on 400R
 7.1188 on 390 = 7.1553 on 392 = 7.301 on 400R



26° 26' 50" = 49.743%

Sta and Grades
Inspection Gallery

Sta on	Sta on	Sta on	Grades	Grades
<u>392R</u>	<u>390R</u>	<u>400R</u>	<u>392R</u>	<u>390R</u>
4+74 ⁰⁰	4+72 ⁵⁰	4+80 ⁰⁰	1520 ⁰¹	
4+84 ⁰⁹	4+82 ⁵⁴	4+90 ²⁹	1525 ⁰²⁶	
P.T.	P.T.	P.T.	49.745%	
4+93 ⁶⁰	4+92 ⁰⁰	5+00	X	1529 ⁷⁵⁹
5+07 ⁹¹	5+06 ³¹	5+14 ³¹		1536 ⁹¹
5+13 ⁶⁰	5+12 ⁰⁰	5+20 ⁰⁰		1539 ⁷⁶
5+22 ²²	5+20 ⁶²	5+28 ⁶²		1544 ⁰⁷
5+33 ⁶⁰	5+32 ⁰⁰	5+40 ⁰⁰		1549 ⁷⁶
5+36 ⁵³	5+34 ⁹³	5+42 ⁹³		1551 ²³
5+50 ⁸⁴	5+49 ²⁴	5+57 ²⁴	200% / 50%	1558 ³⁸
5+53 ⁶⁰	5+52 ⁰⁰	5+60 ⁰⁰		1559 ⁷⁶
5+65 ¹⁶	5+63 ⁵⁶	5+71 ⁵⁶		1565 ⁵⁴
5+73 ⁶⁰	5+72 ⁰⁰	5+80 ⁰⁰		1569 ⁷⁶
5+79 ⁴⁷	5+77 ⁸⁷	5+85 ⁸⁷		1572 ⁶⁹
5+93 ⁶⁰	5+92 ⁰⁰	6+00 ⁰⁰		1579 ⁷⁶
5+93 ⁷⁸	5+92 ¹⁸	6+00 ¹⁸		1579 ⁸⁵
6+08 ⁰⁹	6+06 ⁴⁹	6+14 ⁴⁹		1587 ⁰⁰
6+13 ⁶⁰	6+12 ⁰⁰	6+20 ⁰⁰		1589 ⁷⁶
6+22 ⁴⁰	6+20 ⁸⁰	6+28 ⁸⁰		1594 ¹⁶
6+33 ⁶⁰	6+32 ⁰⁰	6+40 ⁰⁰		1599 ⁷⁶
6+36 ⁷¹	6+35 ¹¹	6+43 ¹¹		1601 ³¹

200% / 50% Slope

5+3653

5+1360
07.91
569

2862
1431
1431

6- 2880
1449
1431

Sta and Grades

Inspecting Gallery

Station	Station	Station	Grade	Grade	
392R	390R	400R	392R	390R	
6+51 ⁰²	6+49 ⁴²	6+57 ⁴²		1608	4695
6+53 ⁶⁰	6+52 ⁰⁰	6+60 ⁰⁰	90% 2001 50%	1609	759

2001
50%
↓

Curtain Wall

Deflections for 360' R. Curve

1	0°	4.77'
2	0°	9.55'
3	0°	14.32'
4	0°	19.10'
5	0°	23.87'
10	0°	47.74'
20	1°	35.49'
30	2°	23.24'
40	3°	10.99'
50	3°	58.74'

Deflections for 373' Radius

1	0°	4.61'
2	0°	9.22'
3	0°	13.82'
4	0°	18.43'
5	0°	23.04'
10	0°	46.08'
20	1°	32.17'
30	2°	18.25'
40	3°	04.33'
50	3°	50.42'
70	5°	23.55'
90	6°	55.55'

Deflections for 379.5' Radius

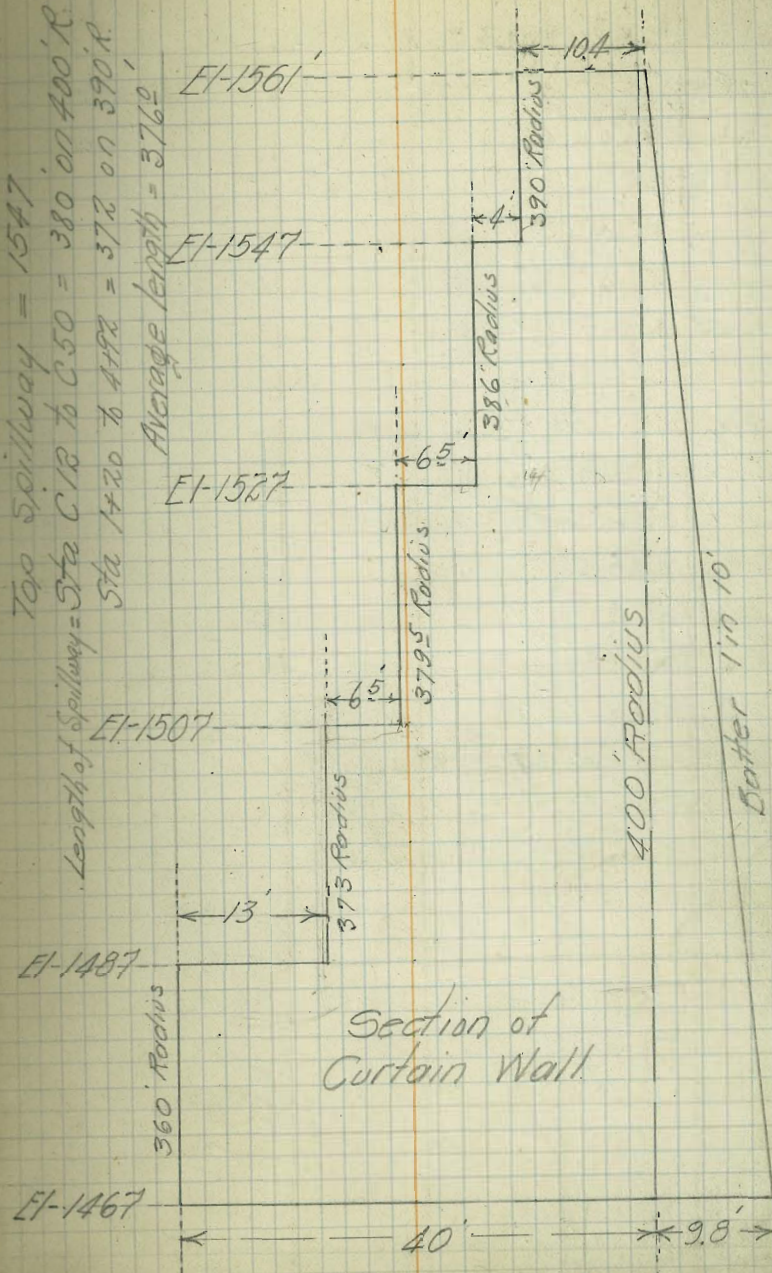
1		
2		
3		
4		
5		
10		
20		
30		
40		
50		

Deflections for 386' R. Curve

1		
2		
3		
4		
5		
10		
20		
30		
40		
50		

Deflections for 390' R. Curve

1		
2		
3		
4		
5		
10		
20		
30		
40		
50		



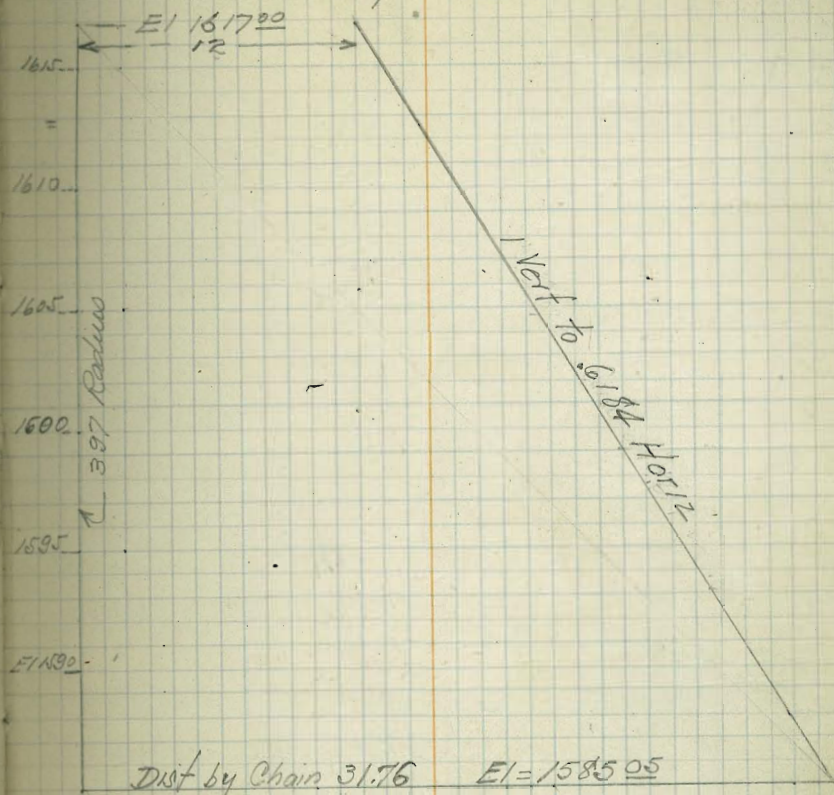
Radius	EI
385.00 -	1617
19.76	
365.24	1585.05
365.84	1586
366.46	1587
367.07	1588
367.69	1589
368.31	1590
368.93	1591
369.55	1592
370.17	1593
370.78	1594
371.40	1595
372.02	1596
372.64	1597
373.26	1598
373.88	1599
374.50	1600
375.11	1601
375.73	1602
376.35	1603
376.97	1604
377.59	1605
378.21	1606
378.82	1607
379.44	1608
380.06	1609
380.68	1610
381.30	1611
381.92	1612
382.54	1613

Radius	EI
383.15	1614
383.77	1615
384.39	1616
385.00 -	1617

Divide Wall Sta 1+32.80

42

New Slope above EI 1585.05



$$\begin{array}{r}
 1617.00 \\
 1585.05 \\
 \hline
 31.95 \text{ diff in EI in 1976 Horizontal}
 \end{array}
 \qquad
 \begin{array}{r}
 31.76 \\
 12.00 \\
 \hline
 19.76
 \end{array}$$

31.95 | 19.760 | 1.6184 = rate Hor. to 1 $\frac{1}{2}$ Vert.

$$\begin{array}{r}
 19170 \\
 5900 \\
 \hline
 33195 \\
 27050 \\
 35560 \\
 \hline
 114900
 \end{array}$$

Oct. 21 1920

Outlet Tower & Tunnel

Station	Top Concrete Grade
£ Tower 0+00	1505.00
+10	1504.95
+20	1504.90
+30	1504.85
+40	1504.80
+50	1504.75
+60	1504.70
+70	1504.65
+80	1504.60
+90	1504.55
1+00	1504.50
+10	1504.45
+20	1504.40
+30	1504.35
+40	1504.30
+50	1504.25
+60	1504.20
+70	1504.15

Saucervalue #1
El. Top Brass 1596.70
El £ Tee 1594.51
Saucervalue #2
El. Top Brass 1567.28
El £ Tee 1565.09
Saucervalue #3
El Top Brass 1537.86
El-£ Tee 1535.67

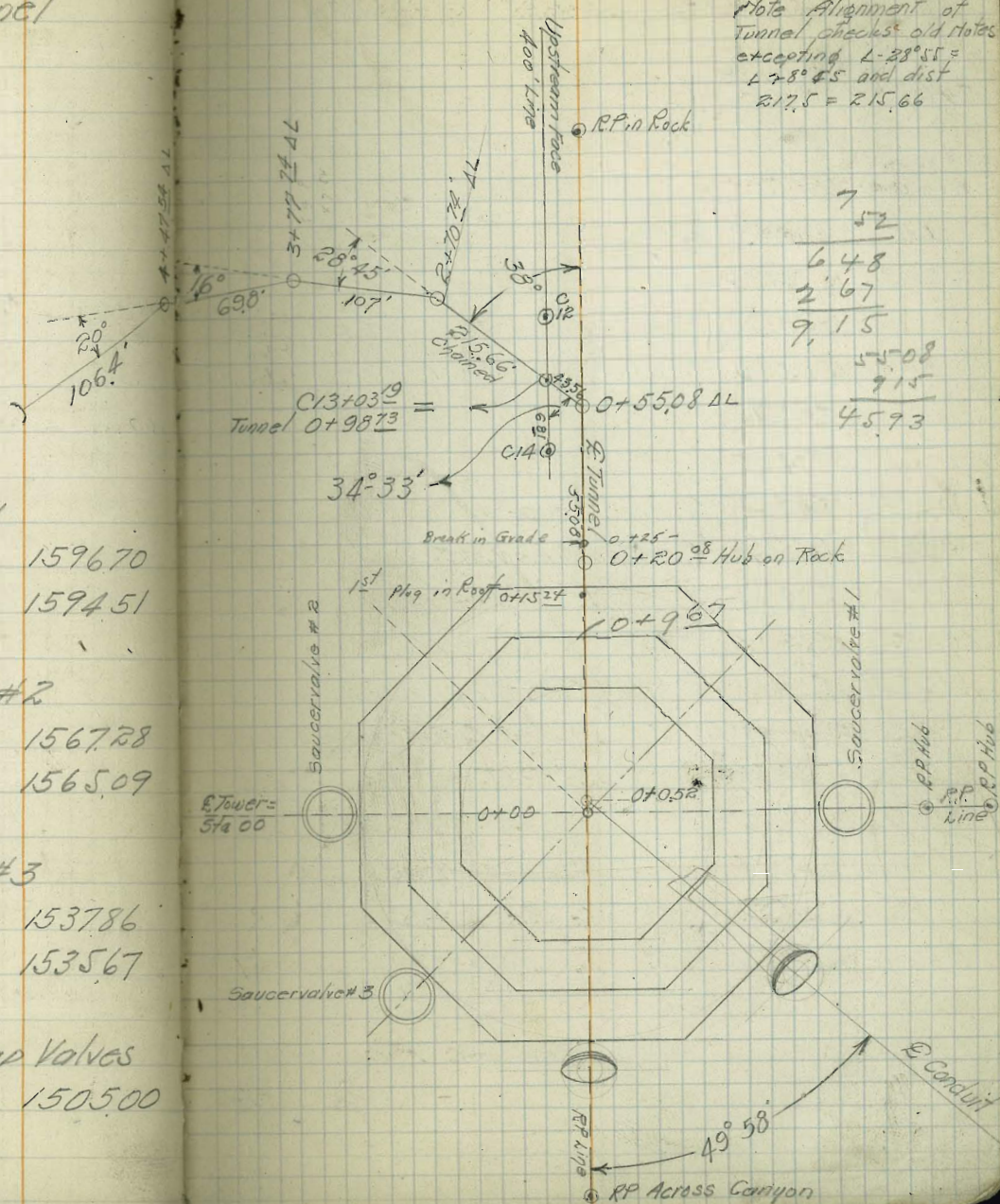
Flowline Flap Valves
= 1505.00

28° 55' - 217.5'

© R.P. Hub above Road

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Note Alignment of Tunnel check old notes excepting L-28°55' = L-28°55' and dist 217.5 = 215.66

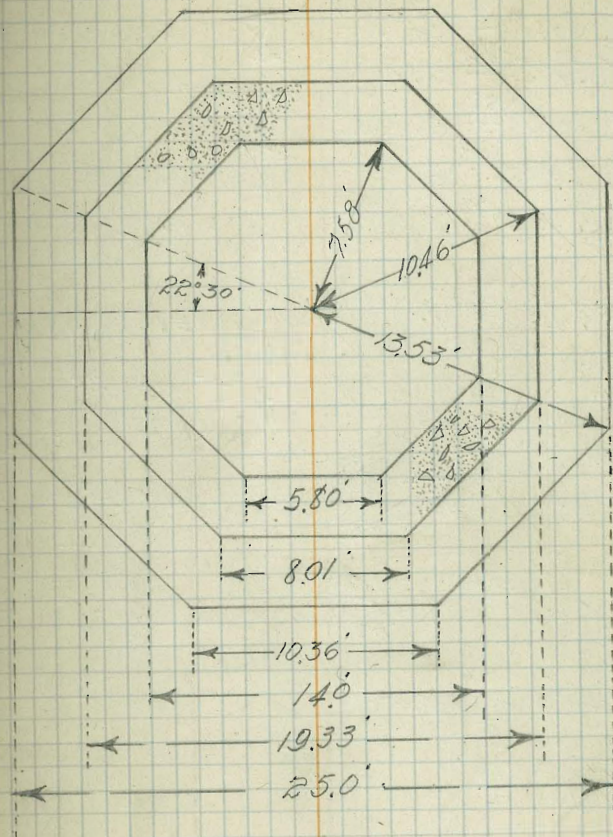


7.52
6.48
2.67
9.15
54.08
9.15
45.93

Oct. 21 1920

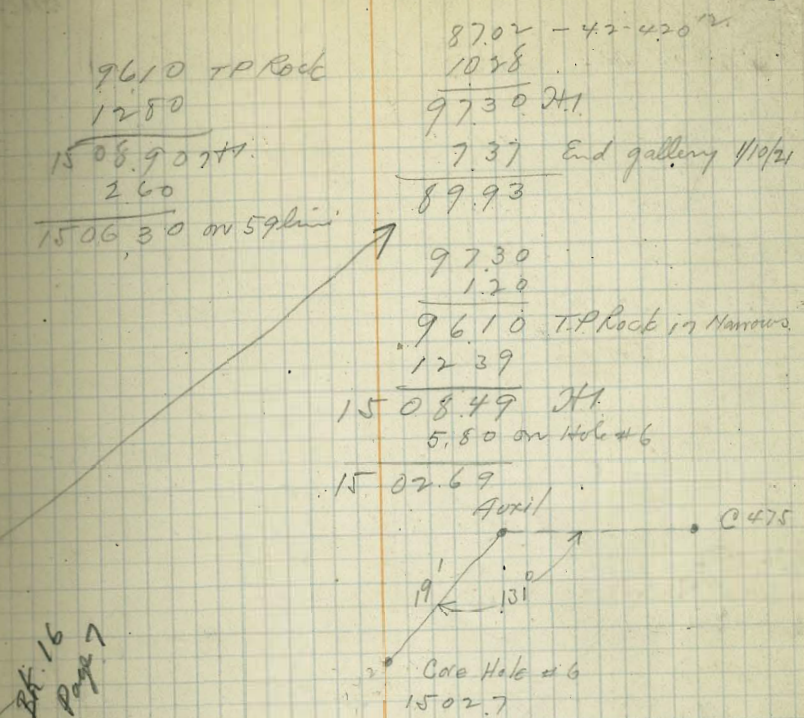
44

Outlet Tower & Base

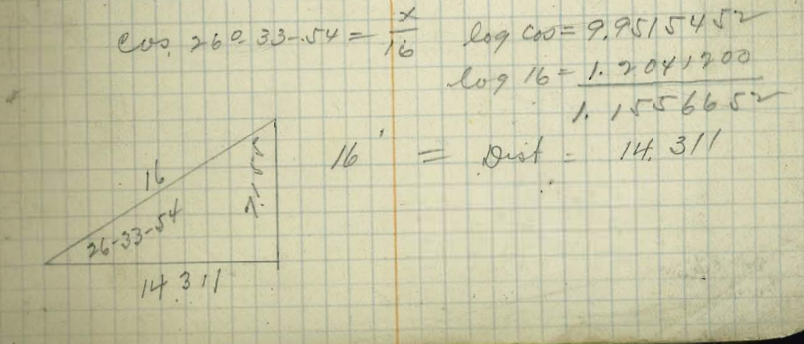


Sta + grades Inspection Gallery

Sta 394	Sta 390R	400R	Grades 392R	Grades 390R
3+69 ⁶⁰	3+68 ⁶³	3+73 ⁴⁷		1468.074
3+76 ⁷⁵⁵	3+75 ⁷⁴⁹	3+80 ⁷⁷¹		1471.633
3+83 ⁹¹	3+82 ⁸⁷	3+88 ⁰⁷		1475.193
3+95 ⁶⁰	3+94 ⁵⁰	4+00		1481.01
3+98 ²²	3+97 ¹¹⁰	4+02 ⁶⁷⁰		1482.31
				1481.98 as set
4+14 ²²	4+13 ⁰²⁸	4+18 ⁹⁹⁶		1482.549
4+30 ²²	4+28 ⁹⁴⁶	4+35 ³²²		1482.457
				(1482.788)
4+44 ⁴⁵	4+43 ¹⁰⁸	4+49 ⁸⁴⁴		1489.576
4+44 ⁵³	4+43 ¹⁸⁴	4+49 ⁹³⁵		1489.93
				7.155
4+58 ⁷⁶	4+57 ³⁴¹	4+64 ⁴⁴⁵		1497.085
				7.155
4+73 ⁰⁷	4+71 ⁵⁷⁹	4+79 ⁰⁴⁸		1504.249
				7.155
4+87 ⁴⁶	4+85 ⁹¹⁴	4+03 ⁶⁵⁷		1511.391
				7.155
5+01 ⁷⁷	5+00 ²²⁴	5+17 ⁹⁶⁷		1518.550
5+16 ⁰⁸	5+14 ⁵³⁴	5+32 ²⁷⁷		1525.705
5+30 ³⁹	5+28 ⁸¹⁴	5+46 ⁵⁸⁷		1532.860
5+37 ⁵⁵	5+35 ⁹⁹⁹	5+53 ⁷⁴⁷		1536.438
5+44 ⁷⁰	5+43 ¹⁵⁴	5+60 ⁸⁹⁷		1540.016
5+59 ⁰¹	5+57 ⁴⁶⁴	5+75 ²⁰⁷		1547.171



tan $\frac{50}{100} = 50\%$ Slope = $26^\circ 33' 54''$
 $\sin 26^\circ 33' 54'' = \frac{x}{16}$ $\log \sin = 9.6505142$
 $\log 16 = 1.2041200$
 0.8546342
 $\text{El} - 7.1554$



$$\sin 69^\circ = \frac{x}{144} \quad \log \sin 69^\circ = 9.9701517$$

$$\log 144 = 1.1583625$$

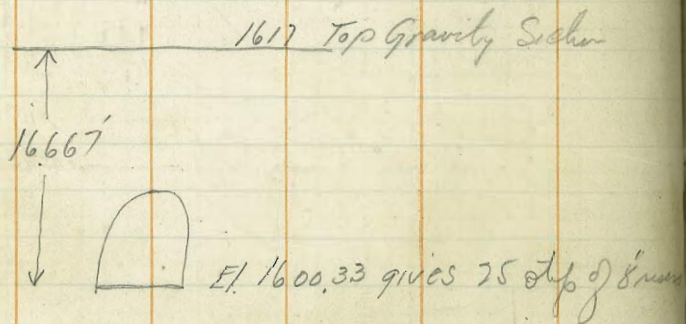
$$\frac{1.1285142}{1.1583625} = 13.443$$

$$\cos 69^\circ = \frac{x}{144} \quad \log \cos 69^\circ = 9.5543292$$

$$\log 144 = 1.1583625$$

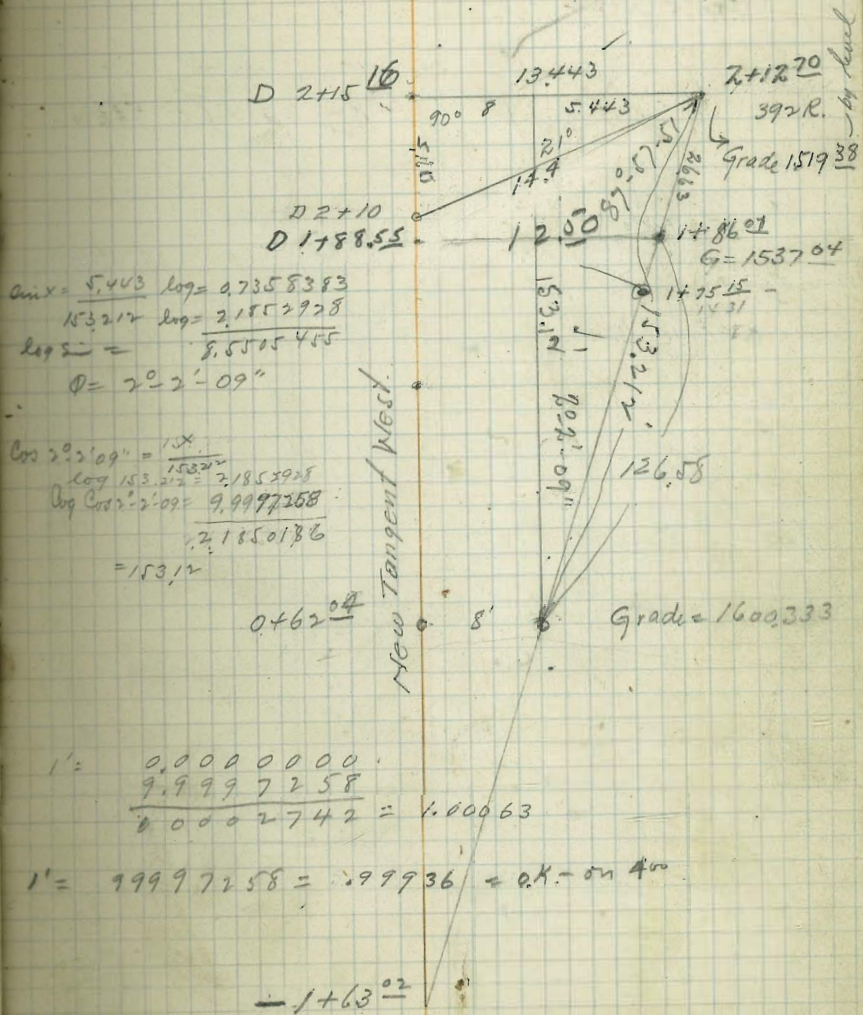
$$\frac{0.7126917}{1.1583625} = 5.1605$$

2+10
516
2+15.16 = 86 on 400' line at Right angle to
break in gallery alignment



Gallery tie to New Tangent.

Tie from 2+10 - to end of gallery at beginning of
new tangent gives 69° and Offset of 144.4 to point on 392R



$$\sin x = \frac{5.443}{153.212} \quad \log = 0.7358383$$

$$\log 153.212 = 2.1852928$$

$$\log s = \frac{8.5505455}{2.1852928}$$

$$s = 2^\circ - 2' - 09"$$

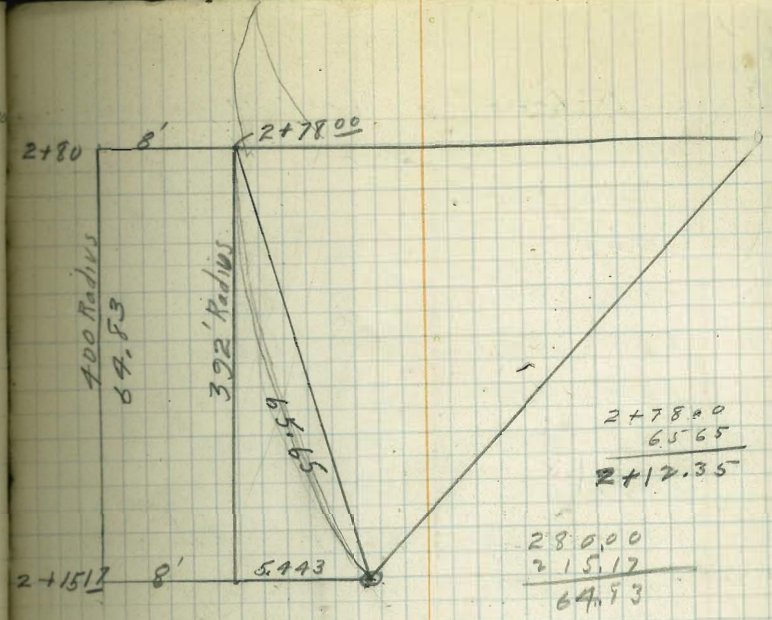
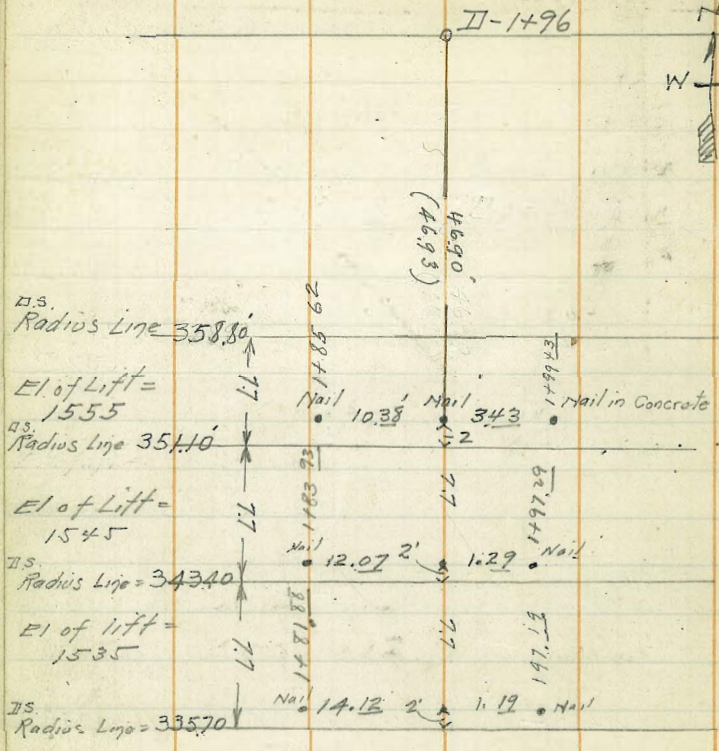
$$\cos 2^\circ - 2' - 09" = \frac{153}{153.212} = 2.1852928$$

$$\log \cos 2^\circ - 2' - 09" = 9.9997258$$

$$\frac{2.1850186}{9.9997258} = 153.12$$

4/27/21
 Dub
 Fisher
 mistec

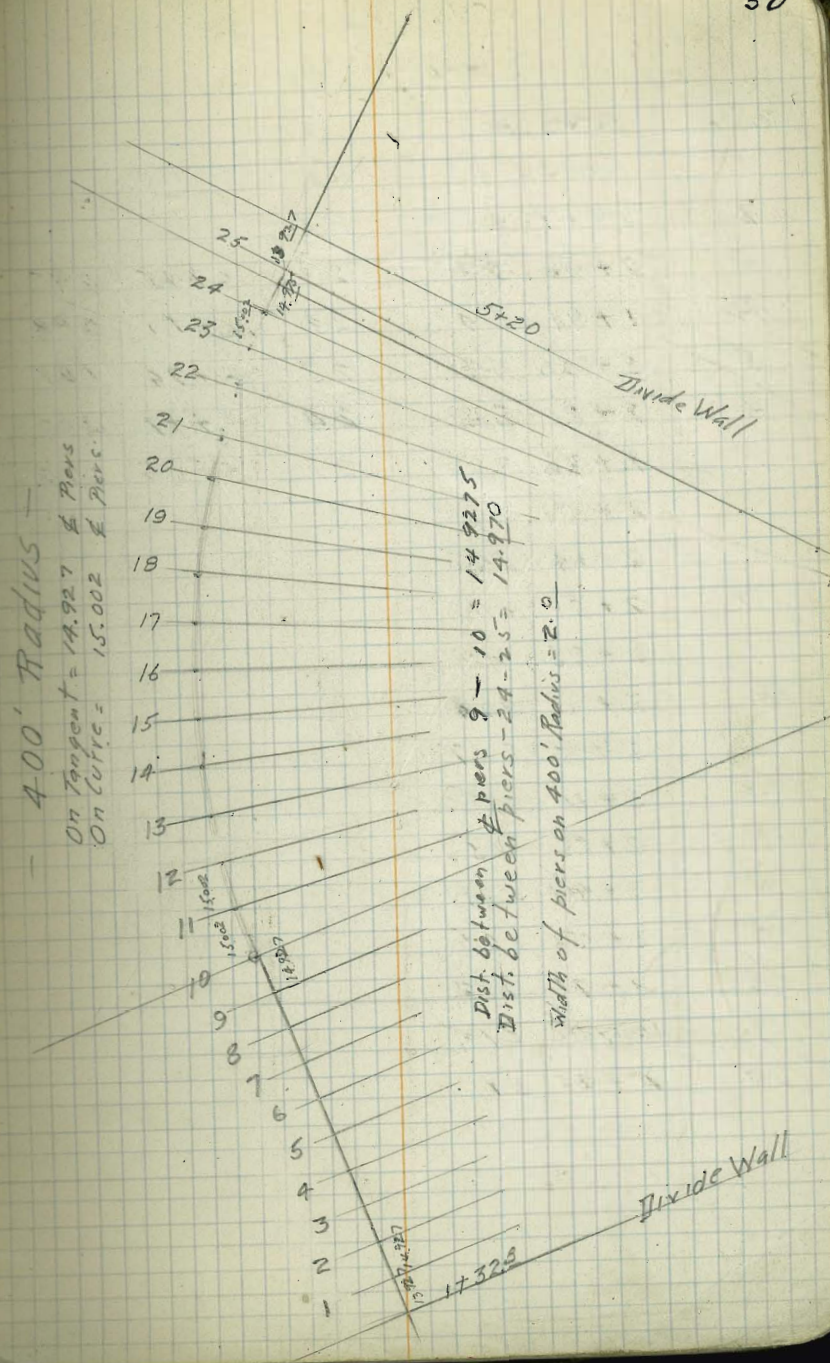
Reference Points Downstream



$\tan X = \frac{5.443}{64.83} = 0.7358383$
 $\log \tan = \frac{1.8117760}{8.9240623} = 4^{\circ}47'53''$
 $4^{\circ}47'53'' = 4.798^{\circ}$
 $\log \text{Defl angle} = 4.798^{\circ} = 0.6810602$
 $\log \text{ " " for lift} = \frac{8.8637985}{1.8172617} = 65.654$

Stations of
Piers for Roadway
400 Radius
Pier

Pier	Station	Pier	Station
Washwall	1+32.80		
1	1+46.727	21	4+46.097
2	1+61.654	22	4+61.099
3	1+76.581	23	4+76.101
4	1+91.508	24	4+91.103
5	2+06.435	25	5+06.073
6	2+21.362	Wash Wall	5+20.000
7	2+36.289		
8	2+51.216		
9	2+66.143		
10	2+81.070		
11	2+96.077		
12	3+11.079		
13	3+26.081		
14	3+41.083		
15	3+56.085		
16	3+71.087		
17	3+86.089		
18	4+01.091		
19	4+16.093		
20	4+31.095		

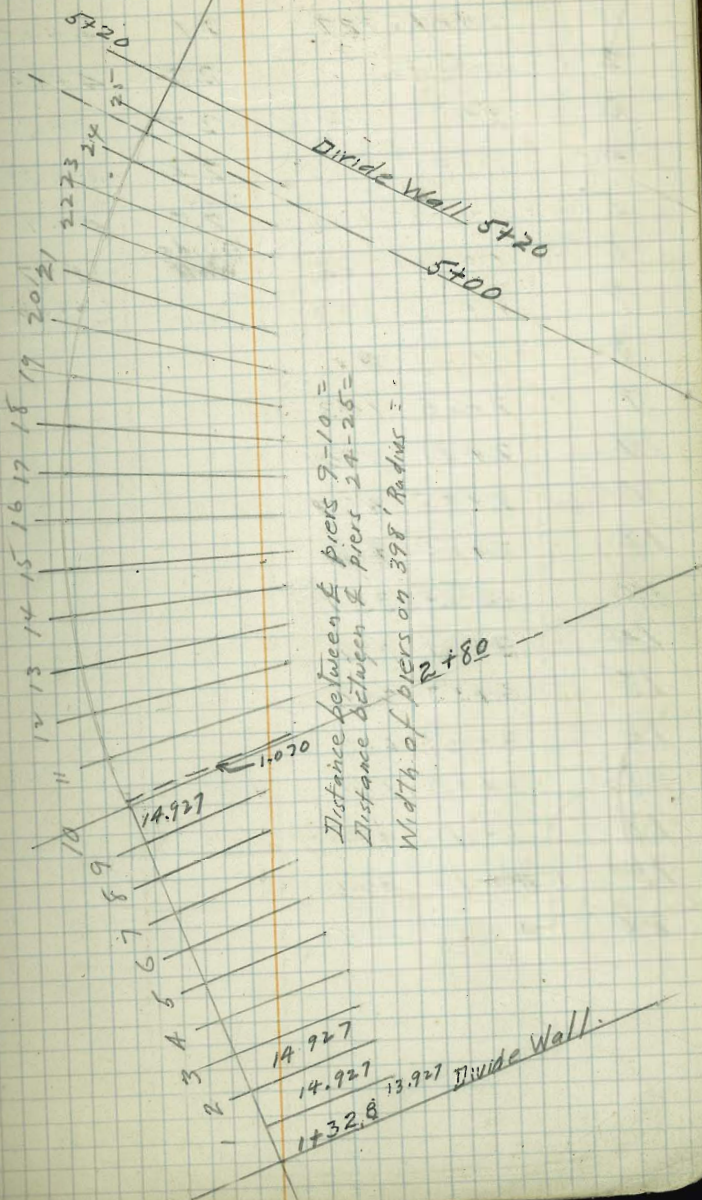


Stations of
Piers for Roadway

398' Radius

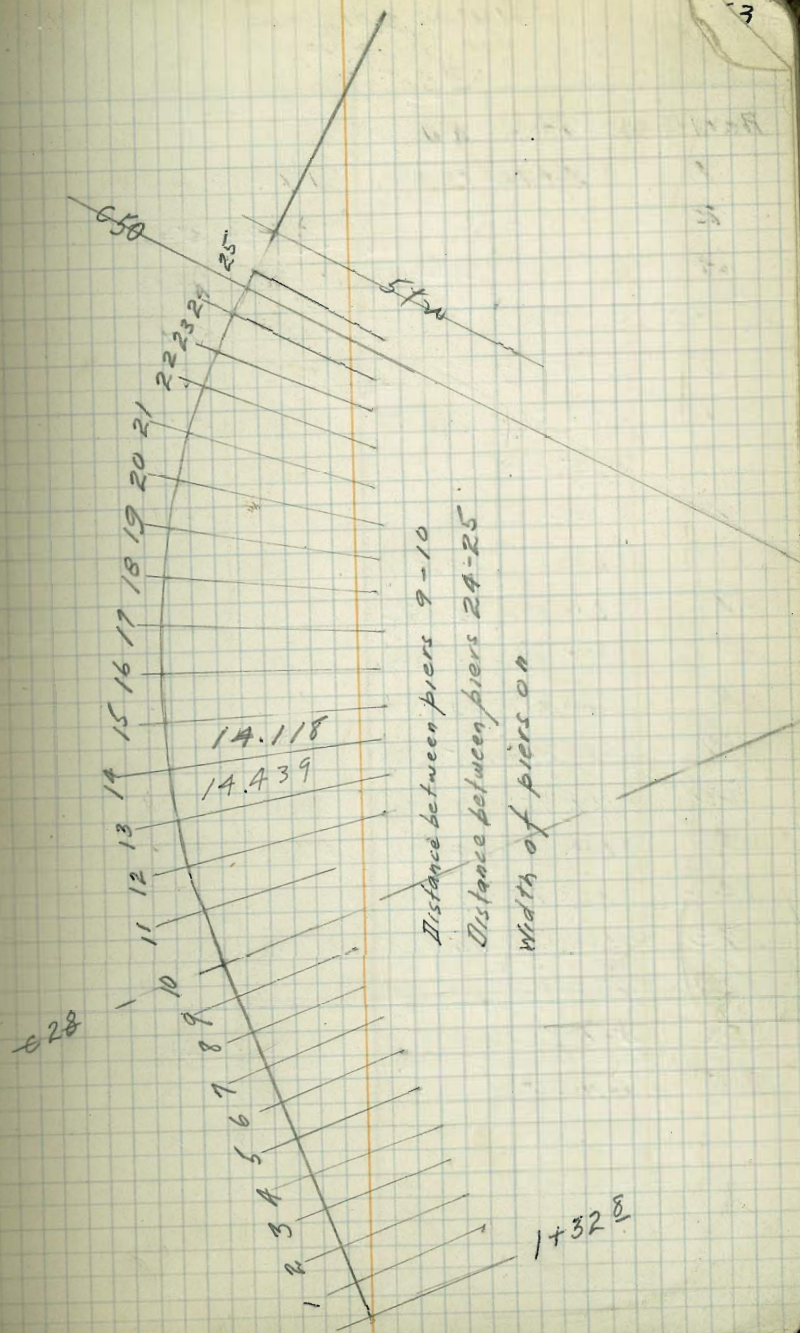
Divide Wall				
	1+32.80			
1	1+46.727	21	4+45	269
2	1+61.654	22	4+60	194
3	1+76.581	23	4+75	121
4	1+91.508	24	4+90	048
5	2+06.435	^{CSU} 25	4+98	902
6	2+21.362	Divide Wall	5+04	975
7	2+36.289		{ 5+20	60
8	2+51.216		{ 5+18	902
9	2+66.143			
10	2+81.070			
11	2+95.997			
12	3+10.924			
13	3+25.851			
14	3+40.778			
15	3+55.705			
16	3+70.632			
17	3+85.559			
18	4+00.486			
19	4+15.413			
20	4+30.346			

— 398' Radius —



Station for Piers
for Roadway
385' Radius

Divide Wall	1+32.80			
1	1+46.727	21	4+39	864
2		22	4+84	303
3		23	4+68	742
4		24	4+83	181
5		Pt.	4+91	744
6		25	4+97	817
7		Divide Wall	{ 5+11	744
8			{ 5+20	
9	2+66			143
10	2+81			035
11	2+95			474
12	3+09			913
13	3+24			352
14	3+38			791
15	3+53			230
16	3+67			669
17	3+82			108
18	3+96			547
19	4+10			986
20	4+25			425

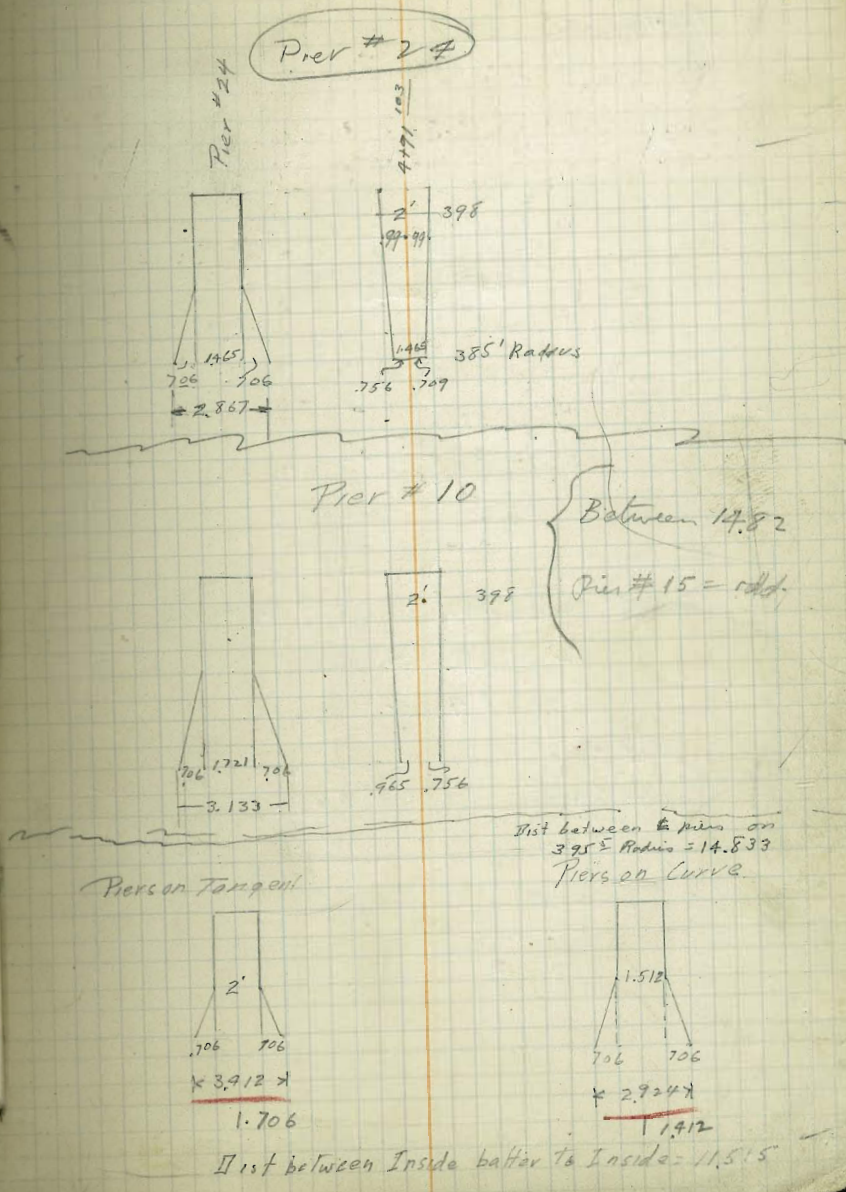


Station + Deflection Angles 397 Radius
Piers for Roadway

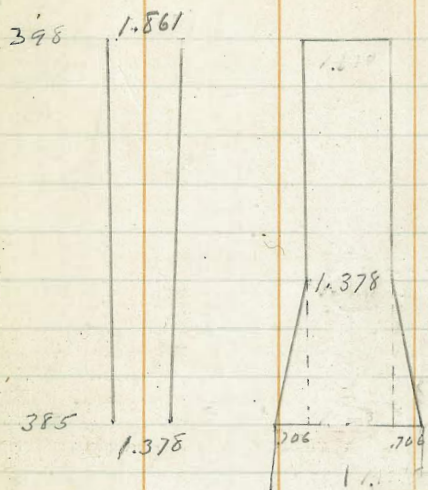
Pier #	Station	ARC Length	Deflection Angle
9	2+66.143	—	—
P.C.	2+80.70	1'	0-04.3297
		14.889	1-04.465
10	2+81.068	1.068	0-04.624
11	2+95.957	15.957	1-09.089
12	3+10.846	30.846	2-13.554
13	3+25.735	45.735	3-18.019
14	3+40.624	60.624	4-22.484
15	3+55.513	75.513	5-26.949
16	3+70.402	90.402	6-31.414
17	3+85.291	105.291	7-35.879
18	4+00.180	120.180	8-40.344
19	4+15.069	135.069	9-44.809
20	4+29.958	149.958	10-49.274
21	4+44.847	164.847	11-53.739
22	4+59.736	179.736	12-58.204
23	4+74.625	194.625	14-02.669
24	4+89.514	209.514	15-07.134
E.C.	4+98.346	218.346	15-45.374
* 1	1+46.727		# 7 } 2+36.289
* 2	1+61.654		# 8 } 2+51.216
# 3	1+76.581		# 9 } 2+66.143
# 4	1+91.508		25 5+04.419
* 5	2+06.435	Wishwall	5+18.346

↑
29.64
↓

Piers = Tangent = 14.927



Pier # 15



$$\begin{array}{r} 689 \\ 706 \\ \hline 1395 \end{array}$$

Dist between piers #14 + 16

$$2 \overline{) 29.64}$$

14.82

14.889

14.820

$$\hline .069$$



3/11/14

upstream Points

241

61 47.2

9.5

154111

15327

16.5

15307

2.8

15424

2.7 out.

3.5 out.

2.2 out.

1565.0
1537.7
27.3

15150
1531
3.4

1565
42.4
22.6

Contraction Joints

Sta on 400R.

Bottom
Elevation

0+93	
1+42 ⁹ = El. 1555	1555
1+43 \square	
1+94 ² at El 1555	1555.0
1+93 \square	1538.5
2+06 ⁴ \square	- 1500.0
2+18 ⁴ C	1518.30
2+72 ⁵ \square 3+72 ⁵⁰ on 3+340R.	1518.00
3+27 ⁰⁰ C	1467 ⁰⁰
3+81 ⁵⁰ C = 3+67 ¹⁴ on 3+340R. No joint above 1553-	1512 ⁴⁰
4+36 ⁰⁰ C = 4+393 on 3+340R.	1478.80
4+86 ⁵ C	1517.0
5+50 ⁸ C 5+48 ² No joint above 1565	- 1515.0
6+05 ⁸ C	1502.6
6+55	1517.0
	1575

Note 5+48 joint Reset Feb 7

Bottom El -

Average Elev from CW =

Average El. from CW South = 1535.0

Average El. from C.W. South = 1534.3

Average El. from Curtain Wall South = 1534.2

D.S.F.

1545 - D.S.F. elev -

1535 D.S.F. elev

12-1-21

175' Contour Barrett Reservoir

20 miles — 6600 post spaced 16' + 400 = 7000 ^{Pa}

R 171887

DIRECTIONS FOR USE OF TABLES

TABLE No. 1.

Distance of slope stake from side or shoulder stake for any width roadway, slope $1\frac{1}{2}$ to 1. If ground is nearly level, the cut or fill at side stake is located by the double entry method in

IMPROVED TABLES

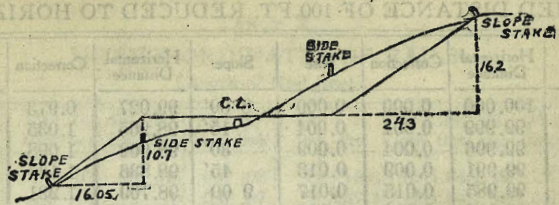
AND

INFORMATION

TABLE No. 2.

To find Tangent and External for curve of any other 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.

out let June Bus

11/4/20

2518
560
3378
325.00
358.75

37300
358.78
301079

40 = 2052
30

1.14.27
1.72
12.50

025
28

282
3022

172
150

400
21
373' R

235

043297
12
086394
43297
519564

50
553



589
175
884

1310.42
782

2518
 260
 3378
 325.00
 358.75

40 = 2052
 30
 282
 3022

114.22
 1.72
 12.50

122 400
 150 21
 373

025
 25

235
 043297
 12
 86394
 43297
 519564

50
 553



589
 545
 138

113.84
 787
 1510.42

043297

37300 303079

358.78

City

Resolution No.

TO PURCHASE

RESOLUTION OF THE BOARD OF SUPERVISORS OF THE COUNTY OF ALTA

2

5.23
 8427
 9022

Requisition No. 1802

9700
38342
1358

BELL DAM

DEPARTMENT OF

Ordinance No. 2021, Chapter

SING DEPARTMENT

BY

PURCHASING DEPARTMENT
Approved

Contract No.

Resolution No.

9000
5477
5,23