

W

428

1911

1911

1911

1911

DISTANCES FROM CENTER OF ROADWAY FOR CROSS-SECTIONING.

Roadway 16 feet wide. Side Slopes 1 on 1.
For Single Track Embankment.

528

H	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	H
0	8.0	8.1	8.2	8.3	8.4	8.5	8.6	8.7	8.8	8.9	0
1	9.0	9.1	9.2	9.3	9.4	9.5	9.6	9.7	9.8	9.9	1
2	10.0	10.1	10.2	10.3	10.4	10.5	10.6	10.7	10.8	10.9	2
3	11.0	11.1	11.2	11.3	11.4	11.5	11.6	11.7	11.8	11.9	3
4	12.0	12.1	12.2	12.3	12.4	12.5	12.6	12.7	12.8	12.9	4
5	13.0	13.1	13.2	13.3	13.4	13.5	13.6	13.7	13.8	13.9	5
6	14.0	14.1	14.2	14.3	14.4	14.5	14.6	14.7	14.8	14.9	6
7	15.0	15.1	15.2	15.3	15.4	15.5	15.6	15.7	15.8	15.9	7
8	16.0	16.1	16.2	16.3	16.4	16.5	16.6	16.7	16.8	16.9	8
9	17.0	17.1	17.2	17.3	17.4	17.5	17.6	17.7	17.8	17.9	9
10	18.0	18.1	18.2	18.3	18.4	18.5	18.6	18.7	18.8	18.9	10
11	19.0	19.1	19.2	19.3	19.4	19.5	19.6	19.7	19.8	19.9	11
12	20.0	20.1	20.2	20.3	20.4	20.5	20.6	20.7	20.8	20.9	12
13	21.0	21.1	21.2	21.3	21.4	21.5	21.6	21.7	21.8	21.9	13
14	22.0	22.1	22.2	22.3	22.4	22.5	22.6	22.7	22.8	22.9	14
15	23.0	23.1	23.2	23.3	23.4	23.5	23.6	23.7	23.8	23.9	15
16	24.0	24.1	24.2	24.3	24.4	24.5	24.6	24.7	24.8	24.9	16
17	25.0	25.1	25.2	25.3	25.4	25.5	25.6	25.7	25.8	25.9	17
18	26.0	26.1	26.2	26.3	26.4	26.5	26.6	26.7	26.8	26.9	18
19	27.0	27.1	27.2	27.3	27.4	27.5	27.6	27.7	27.8	27.9	19
20	28.0	28.1	28.2	28.3	28.4	28.5	28.6	28.7	28.8	28.9	20
21	29.0	29.1	29.2	29.3	29.4	29.5	29.6	29.7	29.8	29.9	21
22	30.0	30.1	30.2	30.3	30.4	30.5	30.6	30.7	30.8	30.9	22
23	31.0	31.1	31.2	31.3	31.4	31.5	31.6	31.7	31.8	31.9	23
24	32.0	32.1	32.2	32.3	32.4	32.5	32.6	32.7	32.8	32.9	24
25	33.0	33.1	33.2	33.3	33.4	33.5	33.6	33.7	33.8	33.9	25
26	34.0	34.1	34.2	34.3	34.4	34.5	34.6	34.7	34.8	34.9	26
27	35.0	35.1	35.2	35.3	35.4	35.5	35.6	35.7	35.8	35.9	27
28	36.0	36.1	36.2	36.3	36.4	36.5	36.6	36.7	36.8	36.9	28
29	37.0	37.1	37.2	37.3	37.4	37.5	37.6	37.7	37.8	37.9	29
30	38.0	38.1	38.2	38.3	38.4	38.5	38.6	38.7	38.8	38.9	30
31	39.0	39.1	39.2	39.3	39.4	39.5	39.6	39.7	39.8	39.9	31
32	40.0	40.1	40.2	40.3	40.4	40.5	40.6	40.7	40.8	40.9	32
33	41.0	41.1	41.2	41.3	41.4	41.5	41.6	41.7	41.8	41.9	33
34	42.0	42.1	42.2	42.3	42.4	42.5	42.6	42.7	42.8	42.9	34
35	43.0	43.1	43.2	43.3	43.4	43.5	43.6	43.7	43.8	43.9	35
36	44.0	44.1	44.2	44.3	44.4	44.5	44.6	44.7	44.8	44.9	36
37	45.0	45.1	45.2	45.3	45.4	45.5	45.6	45.7	45.8	45.9	37
38	46.0	46.1	46.2	46.3	46.4	46.5	46.6	46.7	46.8	46.9	38
39	47.0	47.1	47.2	47.3	47.4	47.5	47.6	47.7	47.8	47.9	39
40	48.0	48.1	48.2	48.3	48.4	48.5	48.6	48.7	48.8	48.9	40

Example—If point is 22.6 ft. above grade, how far should it be from center line to be a slope stake point? Ans. from Table 30.6. For same slopes but other widths of roadbed, correct above figures by one-half difference in width of roadbed; thus in example above, for 20 ft. roadbed distance will be $30.6 + (20 - 16) \div 2$ or 2 ft. added to $30.6 = 32.6$. For slopes of 1 on $1\frac{1}{2}$ see inside of back cover.

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El Capitan Lakeside Pipe Line
Project- 5575-

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and Cu 7d @ Sta
103+54 to 427+07 1-52.

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Appurtenances to Blowoff and
Comb. PA 7+7 Valve installation, etc 70-72

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Excavation Structures

EL CAPITAN - LAKESIDE PIPE LINE
CITY SECTION - PWA 5575.

Trench 5.6' Wide Vertical sides
for 48" Steel Pipe to Sta 311+98.44

Sta.	+	HI	-	Elc. Grade	Cut.	Average Dist.	Cu yds
		536.82		Surface for Class 1 Ex.			Class 1 Exca.
T.P.	0.59	527.78	9.63	527.19			
				524 38			
				515 44			
103+54			5.8	522.0	514.62	7.4	75.85
						7.95	46' x 17.73
104+00	"		5.9	521.9	513.38	8.5	17.73
						8.55	10' x 17.73
+10	"		6.1	521.7	513.1	8.6	68.44
						8.25	40' x 68.44
+50	"		7.9	519.9	512.03	7.9	
BM # 14	"						
Rec. El. 525.11 correction	"		2.76	525.02			
on B.M.	2.76	527.87		525.11			
+75			8.7	519.2	511.37	7.8	40.70
						7.85	25' x 40.70
105+00			9.4	518.5	510.99	7.5	39.67
						7.65	25' x 39.67
+50	"		10.8	517.1	510.23	6.9	74.66
						7.20	50' x 74.66
106+00	"		12.0	515.9	509.47	6.4	68.97
						6.65	50' x 68.97
+40.44	"		12.7	515.2	508.85	6.3	53.26
						6.35	40.44 x 53.26
+50	"		12.9	515.0	508.71	6.3	12.49
						6.30	9.56 x 12.49
T.P.	1.72	516.98	12.61	515.26			
						6.45	50' x 66.89
107+00			2.5	514.5	507.94	6.6	66.89
							518.66

Nail in Oak 12' R+ Sta 102+95
7.85 x 25' x 40.70
7.65 x 25' x 39.67
7.20 x 50' x 74.66
6.65 x 50' x 68.97
6.35 x 40.44 x 53.26
6.30 x 9.56 x 12.49
6.45 x 50' x 66.89
518.66

Final Profile Levels

Trench 5.6' Wide Vert. sides

Sta	+	HI	-	Ele.	Grade	± Cut	Average cut	Distance	cu. yds	Page Total cu yds
		516.98								
				$\frac{524}{40}$	$\frac{FB 515}{46}$					
+50	$\frac{524}{40}$		2.6'	514.4	507.18	7.2	6.9	50	71.55	
108+00	"		3.8'	513.2	506.42	6.8	7.0	50	72.60	
+702 ⁰⁵	"			513.2	506.39	6.8	6.8	205		
+50	"		3.8'	513.2	506.25	7.0	6.9	47.95	71.51	
109+00	"		4.4'	512.6	506.10	6.5	6.75	50	70.00	
+50	"		5.0'	512.0	505.95	6.0	6.25	50	64.81	
110+00	"		5.0'	512.0	505.80	6.2	6.10	50	63.26	
+50	"		5.3'	511.7	505.65	6.0	6.10	50	63.26	
111+00	"		6.0'	511.0	505.50	5.5	5.75	50	59.63	
+50	"		6.2'	510.8	505.35	5.5	5.50	50	57.03	
112+00	"		6.3'	510.7	505.20	5.5	5.50	50	57.04	
+50	$\frac{524}{41}$		6.7'	510.3	505.05	5.2	5.35	50	55.48	
T.P.	2.57	512.88	6.67	510.31						
113+00	$\frac{524}{41}$		3.2'	509.7	504.90	4.8	5.00	50	51.85	
+50	"		3.6'	509.3	504.75	4.6	4.70	50	48.74	
114+00	"		3.8'	509.1	504.60	4.5	4.55	50	47.18	
+50	"		4.2'	508.7	504.45	4.2	4.35	50	45.11	

6mR 6mR 6mR 6mR 6mR 6mR 6mR
 899.05

Trench 5.6 wide Vert Sides (3)

Sta.	+ HI	- Ele.	Grade	to Cut.	Average Cut	Distance	Cu. yds.	Page Total
	512.88		504.30		4.15	50'	43.04	
115+00		4.5	508.4	4.1	4.15	50'	43.03	
+50		4.6	508.3	4.2	4.25	50'	44.07	
116+00		4.6	508.3	4.3	4.40	8.675'	7.92	
+08.675		4.4	508.5	4.5	4.95	41.325'	42.43	
+50		3.6	509.3	5.4	5.40	25'	28.00	
+75		3.6	509.3	5.4	5.45	19.28'	21.79	
+94.28	B.C.	3.6	509.3	5.5				
BM #16	511.35	2.93	514.28					
			511.35					
117+00		4.8	509.5	5.7	5.6	5.72'	6.64	
+25		4.8	509.5	5.7	5.7	25'	29.55	
+50		4.8	509.5	5.7	5.75	25'	29.82	
+75		5.3	509.0	5.8	5.55	25'	28.78	
118+00		4.6	509.7	5.3	5.70	25'	29.55	
+25		4.3	510.0	6.1	6.25	25'	32.41	
+50		4.3	510.0	6.4	6.45	25'	33.44	
				6.5				
							433.43	

6" extra board

See Inspected (Moran) Report of July-6-36 & letter 9/2/36
 Add 6" over depth bottom Trench = 5x5.6x125 118+00-116+75

Nail in Willow 25' L 116+50 12.96

6mR 6mR 6mR 6mR 6mR 6mR 6mR

Trench 5.6' wide, Vert Sides (A)

Sta	+	HI	-	Elev	Grade	Cut	Average Cut	Distance	Cuyds	Page Total
		514.28		514.43	515/50		6.50	25'	33.70	Co 745
118+75			4.3	510.0	503.45	6.5	6.55	25'	33.96	
119+00			4.3	510.0	503.40	6.6	6.65	25'	34.48	
+25			4.2	510.1	503.35	6.7	6.75	25.93'	36.30	
+50	93	E.C.	4.2	510.1	503.30	6.8				

From FB 508/51

#12				514.43						
BM 514.43	0.81	515.24		514.43						
120+00			4.8	510.4	503.20	7.2	7.20	50'	74.67	
+50			5.0	510.2	503.05	7.2	7.25	50'	75.18	
121+00			5.0	510.2	502.90	7.3	7.40	50'	76.74	
+50			5.0	510.2	502.75	7.5	7.40	50'	76.74	
122+00			5.3	509.9	502.60	7.3	7.35	50'	76.22	
+50			5.4	509.8	502.45	7.4	7.15	50'	74.15	
123+00			6.0	509.2	502.30	6.9				
T.P	3.94	512.94	6.24	509.00			6.85	50'	71.04	
+50			4.00	508.9	502.15	6.8	6.85	50'	71.03	
124+00			4.00	508.9	502.00	6.9				

Nail in Oak 1" R 720+05 (destroyed)

							7.00	49.07'	71.24	
							7.20	50'	74.67	
							7.25	50'	75.18	
							7.40	50'	76.74	
							7.40	50'	76.74	
							7.35	50'	76.22	
							7.15	50'	74.15	

6mR 6mR 6mR 6mR 6mR 6mR 805.45

Final Profile Levels

Trench 5.6' Wide, Vert. Sides

Sta.	+	HI	-	Ele.	Grade	± Cut	Average Cut.	Distance	Cu. yds.	Page Total Cu yds
		512.94			$\frac{515}{5}$		7.0	50	72.60	x
124+50	$\frac{508}{54}$		4.0	508.9	501.85	7.1	7.1	50	73.63	x
125+00	$\frac{508}{53}$		4.1	508.8	501.70	7.1	7.15	50	74.15	x
+50	"		4.2	508.7	501.55	7.2	7.20	50	74.66	x
126+00	"		4.3	508.6	501.39	7.2	6.85	50	71.03	x
+50	"		5.2	507.7	501.23	6.5	6.35	50	65.85	x
127+00	"		5.6	507.3	501.07	6.2	6.10	50	63.26	x
+50	"		6.0	506.9	500.85	6.0	5.65	50	58.59	x
128+00	"		7.0	505.9	500.60	5.3	5.70	50	59.11	x
+50	"		6.4	506.5	500.35	6.1	5.70	50	59.11	x
129+00	"		7.5	505.4	500.10	5.3	5.25	50	54.44	x
+50	$\frac{508}{54}$		7.8	505.1	499.85	5.2	4.85	50	50.30	x
130+00	"		8.8	504.1	499.60	4.5				
T.P.	4.96	510.95	6.95	505.99			4.60	50	47.70	x
+50	$\frac{508}{54}$		6.8	504.1	499.35	4.7	4.75	50	49.26	x
131+00	"		7.0	503.9	499.10	4.8	4.95	50	51.33	x
+50	"		6.9	504.0	498.85	5.1				

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925.02
emb

Trench 5.6 wide. Vert. Sides

(7)

Sta	+	HI	-	Elev.	Grade	to Cut.	Average Cut.	Distance	Cu yds	Pop. Total Cu yds
		508.51			$\frac{515}{57}$					
139+00	$\frac{506}{58}$		5.1	503.4	497.51	5.9	6.00	50'	62.22	
+50	"		5.3	503.2	497.36	5.8	5.85	50'	60.66	
140+00	$\frac{506}{59}$		5.6	502.9	497.21	5.7	5.75	50'	59.63	
+50	"		6.2	502.3	497.07	5.2	5.45	50'	56.52	
141+00	"		6.3	502.2	496.92	5.3	5.25	50'	54.44	
+50	"		6.5	502.0	496.77	5.2	5.25	50'	54.45	
T.P.	3.40	506.60	5.31	$\frac{503.20}{59}$		5.2	5.10	50'	52.89	
142+00	$\frac{506}{59}$		5.0	501.6	496.62	5.0	4.90	50'	50.81	
+50	"		5.3	501.3	496.47	4.8	5.00	50'	51.85	
143+00	"		5.1	501.5	496.32	5.2	5.30	50'	54.97	
+50	$\frac{506}{60}$		5.0	501.6	496.18	5.4	5.45	50'	56.52	
144+00	"		5.1	501.5	496.03	5.5				
							5.5	50'	57.03	
+50	"		5.1	501.5	495.95	5.5	5.6	50'	58.08	
145+00	"		5.0	501.6	495.90	5.7	5.8	50'	60.15	
+50	"		4.8	501.8	495.85	5.9	5.85	15'	18.20	
+65	See FB	$\frac{506}{60}$ 524.62	5.0	501.6	495.83	5.8				

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6mR 6mR 6mR

808.42
6mR

Sta.	HI	Ele.	Grade	± Cut	Average Cut	Distance	Cu Yds	Page Total
+70	Bench F.II allowed To 5.0 above invert grade	500.8	Theo. fill Bench 495.83	5.0 ^x	5.4 ^x	5.0 ^x	5.60 ^x	5.60 ^x
146+00		500.8	495.80 ^x	5.0 ^x	5.0 ^x	30 ^x	31.11 ^x	
+15	$\frac{524}{62}$ 506.93	6.2	500.7	495.78 ^x	4.9 ^x	4.95 ^x	15 ^x	15.40 ^x
+25	$\frac{506}{60}$ 506.60	3.3	503.3	495.77 ^x	7.5 ^x	6.2 ^x	10 ^x	12.86 ^x
+50	$\frac{506}{61}$	4.0	502.6	495.75 ^x	6.8 ^x	7.15 ^x	25 ^x	37.07 ^x
147+00	"	4.5	502.1	495.70 ^x	6.4 ^x	6.6 ^x	50 ^x	68.44 ^x
+50	"	4.8	501.8	495.65 ^x	6.1 ^x	6.25 ^x	50 ^x	64.81 ^x
148+00	"	5.0	501.6	495.60 ^x	6.0 ^x	6.05 ^x	50 ^x	62.74 ^x
+50	"	4.9	501.7	495.55 ^x	6.1 ^x	6.05 ^x	50 ^x	62.74 ^x
149+00	"	5.3	501.3	495.50 ^x	5.8 ^x	5.95 ^x	50 ^x	61.70 ^x
T.P.	3.73	505.82	4.51	502.09 ^x	5.90 ^x	5.90 ^x	50 ^x	61.19 ^x
+50	$\frac{506}{61}$	4.3	501.5	495.45 ^x	6.0 ^x	5.95 ^x	50 ^x	61.70 ^x
150+00	$\frac{506}{62}$	4.6	501.2	495.40 ^x	5.8 ^x	5.90 ^x	50 ^x	61.18 ^x
+50	"	4.6	501.2	495.34 ^x	5.9 ^x	5.85 ^x	50 ^x	60.66 ^x
151+00	"	4.9	500.9	495.28 ^x	5.6 ^x	5.75 ^x	50 ^x	59.63 ^x
+50	"	5.0	500.8	495.22 ^x	5.6 ^x	5.6 ^x	50 ^x	58.07 ^x
152+00	"	5.1	500.7	495.16 ^x	5.5 ^x	5.55 ^x	50 ^x	57.55 ^x

EMR EMR EMR EMR EMR EMR
780 75^x

Trench 5.6 wide + Vert Sides (8)

Trench 5.6 wide + Vert Sides (9)

Sta.	+	HI	-	Ele.	Grade	± Cut	Average Cut Distance	Cu Yds	Page Total C. 743
		505.82			$\frac{515}{6}$				
152	+50	$\frac{506}{6}$		500.5	495.10	5.4	5.45 x 50'	56.52	
153	+00	"		500.7	495.04	5.7	5.55 x 50'	57.55	
	+50	"		500.7	494.98	5.7	5.7 x 50'	59.11	
154	+00	"		500.6	494.92	5.7	5.7 x 50'	59.12	
	+50	$\frac{506}{6}$		500.9	494.86	6.0	5.85 x 50'	60.67	
155	+00	"		501.1	494.89	6.2	6.10 x 50'	63.26	
	+50	"		501.2	495.32	5.9	6.05 x 50'	60.74 62.74	
	+60	"		500.3	495.40	4.9	5.4 x 10'	11.20	
156	+00	"		500.1	495.74	4.4	4.65 x 40'	38.58	
	+37	"		499.8	496.06	3.7	4.05 x 37'	31.08	
	+45	"		501.8	496.12	5.7	4.70 x 8'	7.80	
	T.P.	4.61	509.34	504.73		5.45	5.45 x 5'	5.65	
	+50	$\frac{506}{6}$		501.4	496.16	5.2	5.2 x 17'	18.33	
	+67	$\frac{506}{6}$		501.5	496.31	5.2	6.70 x 11'	15.29	
	+78	"		504.6	496.40	8.2	8.55 x 22'	39.01	
157	+00	"		505.5	496.59	8.9		585.91 585.91	
				6mR	6mR	6mR			

Sta.	+	HI	-	Ele	Grade
		509.34			
157+50	(506/64)		4.6	504.7	497.01
+62	See X Sec. 7		4.8	504.5	497.11
+75	Bottoms Class 2.			507.0	497.22
158+00	"			507.0	497.43
+50	"			507.0	497.86
+57	Natural Ground			507.0	497.92
+80	Top Bench fill.			503.1	498.11
159+00	"			503.2	498.28
+25	"			503.5	498.49
+35	(506/65)	509.34	3.9	505.4	498.57
+54.35 = 159+62.16			2.5	506.8	498.74
+75	(508/62)	513.70		506.6	498.85
+96.95				505.6	499.03
159+99	(529/43)			505.6	499.06
160+08	See X Sec. 7			505.6	499.07
+50	Bottoms Class 2.			505.9	498.90
161+00	"			505.7	498.59
+50	"			505.5	498.49
162+00	"			505.3	498.28
+40	"			505.1	498.12
+50	(508/65)	513.81	8.9	504.9	498.08

Trench 5.6' wide Vert Sides (10)

±	Average Cut	Distance	Cu yds	Page Total
	8.30	50'	86.07	2.34
7.7	7.55	12'	18.79	
7.4	8.60	13'	23.19	
9.8	9.70	2.5'	50.30	
9.6	9.35	50'	96.97	
9.1	9.10	7'	13.21	
5.0	7.05	23'	33.63	
4.9	4.95	20'	20.53	
5.0	4.95	2.5'	25.67	
6.8	5.90	10'	12.24	
	7.45	19.35'	29.90	
8.1	7.95	12.24'	20.18	
7.8	7.2	24.45'	36.51	
6.6				
6.5				
7.0	6.75	41.89'	58.65	
7.1	7.00	50'	73.11	
7.0	7.00	50'	73.11	
7.0	7.00	50'	72.59	
7.0	7.00	40'	58.08	
7.0	6.90	10'	14.31	
6.8				

Anchor Valve Chamber Structure, Etc. See 528/55

817.04

515
66

Trench 5.6 wide Vert Sides

(11)

Sta	+	HI	-	Ele.	Grade
163+00	(508/63)	513.81	10.0	503.8	497.87
163+25	"	interpolate		503.1	497.77
163+50	"	Top Bench 5.0 above grade		502.7	497.67
164+00	"	"	"	502.5	497.46
+50	(508/64)	513.81	11.4	502.6	497.25
165+00	"	"	11.0	502.8	497.05
+50	"	"	11.0	502.8	496.84
166+00	"	"	11.5	502.3	496.64
+15	"	Bottom Class 2 See Sec.		503.7	496.5
+50	"	See x Sec. Bottom Cl. 2. Ex.		503.7	496.11
167+00	"	"		503.5	495.52
+55	"	"		503.3	494.88
+65	(508/65)	506.40	5.4	501.0	494.76
168+00	"	"	5.5	500.9	494.35
+50	"	"	7.8	498.6	493.76
169.	"	"	7.5	498.9	493.17

EMR EMR2 EMR

¢	Average Cut	Distance	Cu Yds.	Page Total
5.9	6.35	50'	65.85	cu yds.
5.3	5.60	25'	29.04	
5.0	5.15	25'	26.70	
5.0	5.0	50'	51.85	
5.0	5.15	50'	53.41	
5.3	5.50	50'	57.04	
5.7	5.85	50'	60.67	
6.0	5.85	50'	60.66	
5.7	6.45	15'	20.07	
7.2	7.40	35'	53.72	
7.6	7.80	50'	80.89	
8.0	8.20	55'	93.54	
8.4	7.30	10'	15.14	
6.2	6.35	35'	46.10	
6.5	5.65	50'	58.60	
4.8	5.25	50'	54.44	
5.7	5.19	50'	5.19	

EMR EMR2 EMR3

overdepth 6" Sta 166+25 to 166+75
 5.19 cu yds
 5.6' x 5.5' x 50' = 8.52 cu yds

overdepth Sta 166+25 to 166+75
 5' x 5.0' x 5.6' → 5.19

832.91
EMR

Trench 5-6' wide Vert Sides (12)

515
69

Sta	+	HI	-	Elev.	Grade	± Cut	Average Cut	Dist	Cu yds	Page Total Cu yds
		506.40								
169	+50	(508/65)	7.4	499.0	492.59	6.4	6.05	50'	62.74	
170	+00		7.9	498.5	492.04	6.5	6.45	50'	66.89	
	+50		8.6	497.8	491.98	5.8	6.15	50'	63.78	
171	+00		7.9	498.5	491.91	6.6	6.20	50'	64.30	
	+50		8.0	498.4	491.84	6.6	6.60	50'	68.45	
	+75	Top Bench 5' above Gr.		496.8	491.81	5.0	5.80	25'	30.08	
	+90			496.8	491.79	5.0	5.00	15'	15.55	
172	+20	(524/50)	10.5	494.8	491.75	3.0	4.00	30'	24.89	
	+50	" (524/50)	10.5	494.8	491.71	3.1	3.05	30'	18.98	
173	+00	"	9.5	495.8	491.64	4.2	3.65	50'	37.85	
	+50	"	9.6	495.7	491.58	4.1	4.15	50'	43.03	
TP		7.94	504.04	9.21	496.10					
174	+00	(524/50)	8.3	495.7	491.51	4.2	4.15	50'	43.04	
	+50		9.0	495.0	491.44	3.6	3.90	50'	40.44	
175	+00	"	9.0	495.0	491.38	3.6	3.60	50'	37.34	
	+50	"	8.9	495.1	491.31	3.8	3.70	50'	38.37	
	+65	Top of Bench fill 5' above Grade		496.3	491.29	5.0	4.40	15'	13.69	
						emr	emr	emr		669.42

669.42
emr

Trench 5.6' wide Vert Sides

(13)

Sta	+ HI -	Ele.	Grade	ft Cut	Average cut	Distance	Cu Yds	Cu Yds
			(515) 491					
176+10	Top Bench authorized 5.0 above Grade Bottom Class 2 Est.	496.2	491.23	5.0	5.00	45'	46.66	
+25	See Sections	501.1	491.20	9.9	7.45	15'	23.18	
+50	"	501.1	491.18	9.9	9.90	25'	51.33	
177+00	"	501.1	491.11	10.0	9.95	50'	103.18	
+50	"	501.1	491.04	10.1	10.05	50'	104.22	
178+00	"	501.0	490.97	10.0	10.05	50'	104.22	
+50	"	500.3	490.31	10.0	10.00	50'	103.70	
179+00	"	500.2	489.62	10.6	10.30	50'	106.81	
graph +25		499.6	489.28	10.3	10.45	25'	54.18	
+50	(508) (68) 508.20 11.0 Top Bench Fill.	497.0	488.94	8.1	9.20	25'	47.70	
180+00	As Authorized 5' above Pipe in rest + grade	493.2	488.25	4.9	6.50	50'	67.41	
+50	"	492.6	487.56	(5.0)	4.95	50'	51.33	
181+00	"	491.9	486.88	5.0	5.00	50'	51.85	
+50	"	491.2	486.19	5.0	5.00	50'	51.85	
182+00	"	490.5	485.55	4.9	4.95	50'	51.33	
		6MR	6MR	6MR	6MR	6MR	1018.95	6MR

Trench 5.6' wide Vert Sides.

(14)

Sta	+	HI	-	Elev	Grade	± Cut	Average Cut	Distance	Cu. Yds.	Page Total Cu Yds
182+50				490.0	485.09	4.9	4.90	50'	50.81	
183+00				489.6	484.63	5.0	4.95	50'	51.33	
+50		498.90	10.0	488.9	484.18	4.7	4.85	50'	50.30	
184+00	"		9.6	489.3	483.72	5.6	5.15	50'	53.41	
+50	"		10.2	488.7	483.26	5.4	5.50	50'	57.04	
185+00	"		9.6	489.3	482.90	6.4	5.90	50'	61.18	
+50			9.6	489.3	482.88	6.4	6.40	50'	66.37	
186+00	"		10.0	488.9	482.85	6.0	6.20	50'	64.30	
+50	"		11.5	487.4	482.82	4.6	5.30	50'	54.96	
187+00	"		11.3	487.6	482.80	4.8	4.70	50'	48.74	
TP	5.68	494.02	10.56	488.34						
+50			7.1	486.9	482.77	4.1	4.45	50'	46.15	
188+00	"		7.4	486.6	482.75	3.8	3.95	50'	40.97	
+50	"		6.0	488.0	482.72	5.3	4.55	50'	47.18	
189+00	"		4.9	489.1	482.70	6.4	5.85	50'	60.66	
				EMR	EMR	EMR	EMR	EMR	EMR	EMR
									753.40	EMR

Trench 5.6' wide Vert Sides. (15)

Sta.	+ HI -	Elev.	Grade	± Cut	Average Cut.	Distance	Cu Yds	Page Total Cu Yds
	(508-74) 494.02		(515/76)					
189+50	"	4.8 ✓	489.2 ✓	482.67 ✓	6.5 ✓	6.45 ✓	50' ✓	66.89 ✓
190+00	"	5.3 ✓	488.7 ✓	482.64 ✓	6.1 ✓	6.30 ✓	50' ✓	65.33 ✓
+50	"	4.1 ✓	489.9 ✓	482.62 ✓	7.3 ✓	6.70 ✓	50' ✓	69.48 ✓
191+00	"	5.1 ✓	488.9 ✓	482.59 ✓	6.3 ✓	6.80 ✓	50' ✓	70.52 ✓
+50	"	5.0 ✓	489.0 ✓	482.57 ✓	6.4 ✓	6.35 ✓	50' ✓	65.85 ✓
192+00	"	4.3 ✓	489.7 ✓	482.54 ✓	7.2 ✓	6.80 ✓	50' ✓	70.52 ✓
+50	"	3.5 ✓	490.5 ✓	482.51 ✓	8.0 ✓	7.60 ✓	50' ✓	78.81 ✓
TP	6.22 ✓	497.20 ✓	3.04 ✓	490.98 ✓				
193+00	"	6.1 ✓	491.1 ✓	482.49 ✓	8.6 ✓	8.30 ✓	50' ✓	86.07 ✓
+50	(508/74)	5.5 ✓	491.7 ✓	482.46 ✓	9.2 ✓	8.90 ✓	50' ✓	92.30 ✓
194+00	"	5.2 ✓	492.0 ✓	482.44 ✓	9.6 ✓	9.40 ✓	50' ✓	97.48 ✓
+50	"	5.1 ✓	492.1 ✓	482.41 ✓	9.7 ✓	9.65 ✓	50' ✓	100.07 ✓
195+00	"	5.4 ✓	491.8 ✓	482.39 ✓	9.4 ✓	9.55 ✓	50' ✓	99.04 ✓
+50	"	5.7 ✓	491.5 ✓	482.20 ✓	9.3 ✓	9.35 ✓	50' ✓	96.97 ✓
196+00	"	6.1 ✓	491.1 ✓	482.00 ✓	9.1 ✓	9.20 ✓	50' ✓	95.41 ✓
+50	"	6.0 ✓	491.2 ✓	481.80 ✓	9.4 ✓	9.25 ✓	50' ✓	95.93 ✓

EMR EMR EMR EMR EMR EMR

1250.67
EMR

Trench 5.6' wide Vert Sides

Sta.	+ HI -	Ele. Grade	± Cut	Average Cut	Distance	Cu. Yds.	Page Totals Cu Yds.
	(508/72) 497.20	(515/78)		9.25	50'	95.93	
197+00	"	6.5 490.7 481.60	9.1	8.90	50'	92.30	
+50	"	7.1 490.1 481.40	8.7	8.50	50'	88.15	
198+00	(508/73)	7.7 489.5 481.21	8.3				
T.P.	1.15 491.18	7.17 490.03		8.00	50'	82.97	
+50	(508/73)	2.5 488.7 481.01	7.7	7.40	50'	76.74	
199+00	"	3.3 487.9 480.81	7.1	6.90	50'	71.55	
+50	"	3.9 487.3 480.61	6.7	6.45	50'	66.89	
200+00	"	4.6 486.6 480.41	6.2	6.10	50'	63.26	
+50	"	4.9 486.3 480.25	6.0	6.15	50'	63.78	
201+00	"	4.8 486.4 480.10	6.3	6.25	50'	64.81	
+50	"	5.0 486.2 479.95	6.2	6.55	50'	67.93	
202+00	(508/74)	4.5 486.7 479.80	6.9	7.25	50'	75.18	
+50	"	3.9 487.3 479.65	7.6	7.70	50'	79.85	
203+00	"	3.9 487.3 479.50	7.8	7.55	50'	78.30	
+50	"	4.5 486.7 479.35	7.3	7.10	50'	73.63	
204+00	"	5.1 486.1 479.20	6.9				

EMR EMR EMR

EMR EMR EMR

1141.27
EMR

Trench 5.6 wide Vert Sides

(17)

Sta.	+ HI -	Ele.	Grade	± cut	Average cut	Distance	Cu Yds Page Total
	$\frac{508}{74}$ 491.18						
TP	4.59 ^W 490.68	5.09 ^W 486.09	$\frac{516}{1}$				
204+50	$\frac{508}{74}$	5.2 ^W 485.5	479.05	6.4 ^W	6.65 ^W 50'	68.97 ^W	
205+00	"	5.5 ^W 485.2	478.90	6.3 ^W	6.35 ^W 50'	65.85 ^W	
+50	"	5.2 ^W 485.5	478.75	6.7 ^W	6.50 ^W 50'	67.41 ^W	
206+00	$\frac{508}{75}$	5.1 ^W 485.6	478.60	7.0 ^W	6.85 ^W 50'	71.04 ^W	
+50	$\frac{508-75}{75}$	5.1 ^W 485.6	478.45	7.1 ^W	7.05 ^W 50'	73.11 ^W	
# 25							
BM+ck	3.75 ^W 491.33	3.10 ^W 487.58		Nail No P173426	On Pole South of road		
207+00	$\frac{509}{75}$	5.9 ^W 485.4	478.30	7.1 ^W	7.10 ^W 50'	73.63 ^W	
+50	"	6.8 ^W 484.5	478.15	6.3 ^W	6.70 ^W 50'	69.48 ^W	
208+00	"	7.9 ^W 483.4	477.98	5.4 ^W	5.85 ^W 50'	60.67 ^W	
+50	"	8.3 ^W 483.0	477.73	5.3 ^W	5.35 ^W 50'	55.48 ^W	
209+00	"	9.4 ^W 481.9	477.49	4.4 ^W	4.85 ^W 50'	50.30 ^W	
+50	"	9.5 ^W 481.8	477.24	4.6 ^W	4.50 ^W 50'	46.66 ^W	
+85	"	9.8 ^W 481.5	477.08	4.4 ^W	4.50 ^W 35'	32.67 ^W	
210+00	"	7.8 ^W 483.5	476.99	6.5 ^W	5.45 ^W 15'	16.96 ^W	
+50	"	5.7 ^W 485.6	476.66	8.9 ^W	7.7 ^W 50'	79.85 ^W	
		EMR	EMR	EMR	EMR	EMR	EMR
							83 2.08 ^W EMR

Final Profile Levels

Trench - 5.6' Wide - Vertical Sides

Sta.	+	HI	-	Ele.	Grade	Cut	Average Cut	Distance	Cu. Yds	Page Total
		491.33			$\frac{516}{4}$					
211+00	509		5.3	486.0	476.33	9.7	9.3	50	96.44	
+50	"		5.2	486.1	476.00	10.1	9.9	50	102.66	
212+00	"		6.1	485.2	475.66	9.5	9.8	50	101.63	
+50	"		7.2	484.1	475.33	8.8	9.15	50	94.89	
213+00	"		8.1	483.2	475.00	8.3	8.5	50	88.15	
+50	"		8.5	482.8	474.66	8.1	8.15	50	84.52	
214+00	"		8.9	482.4	474.33	8.1	8.1	50	84.00	
TP	5.00	487.82	8.51	482.82						
+50	509		5.7	482.1	474.03	8.1	8.1	50	84.00	
215+00	"		6.0	481.8	473.94	7.9	8.0	50	82.97	
+50	"		5.5	482.3	473.85	8.5	8.2	50	85.03	
216+00	"		5.3	482.5	473.76	8.7	8.60	50	89.18	
+50	"		5.0	482.8	473.66	9.1	8.90	50	92.30	
217+00	"		5.7	482.1	473.57	8.5	8.8	50	91.26	
+50	"		5.8	482.0	473.48	8.5	8.5	50	88.15	
218+00	"		6.0	481.8	473.39	8.4	8.45	50	87.63	
										1352.81

EMR EMR EMR

EMR EMR EMR

EMR

Final profile levels

Sta.	+	HI	-	Ele.	Grade
		487.82			516/6
218+50	(509/4)		6.5	481.3	473.23
B.M.	2.62	486.20		483.58	
219+00	<524-22>		5.7	480.5	473.06
+25	(524/22)		6.1	480.1	473.97
+50	"		6.6	479.6	472.88
+75	"		6.9	479.3	472.80
220+00	"		7.1	479.1	472.71
+25	"		7.6	478.6	472.63
+50	(524/23)		7.1	479.1	472.54
+75	"		7.3	478.9	472.46
221+00	"		7.5	478.7	472.37
+25	"		7.9	478.3	472.29
+50	"		7.7	478.5	472.20
+75	"		8.0	478.2	472.11
222+00	"		7.7	478.5	472.02
T.P.	7.86	486.12	9.56	478.26	

509/3

EMR EMR EMR

Trench 5.6' wide - Vertical sides (19)

Out. Average Distance Cu. Yds Page Total

8.1	8.25	50	85.56
7.4	7.75	50	80.37
7.1	7.25	25	37.60
6.7	6.90	25	35.78
6.5	6.60	25	34.22
6.4	6.45	25	33.44
6.0	6.20	25	32.15
6.6	6.30	25	32.67
6.4	6.50	25	33.70
6.3	6.35	25	32.92
6.0	6.15	25	31.89
6.3	6.15	25	31.89
6.1	6.20	25	32.15
6.5	6.30	25	32.67

567.01
EMR

EMR EMR EMR

Sta.	+	HI -	Ele.	Grade	Cut	Average cut	Distance	Cu. Yds	Page Total
		486.12		516/9					
+50						6.70	50'	69.48	
223+00	509-4		7.4	478.7	476.77	6.9	50'	76.74	
+50			6.7	479.4	471.53	7.9	50'	86.07	
BM #27	7.73	487.96		480.23		8.7	50'		
223+	524		7.6	480.4	476.19	9.2	20.34	37.76	
70.34 B.C.	54		7.4	480.6	471.05	9.5	29.66	57.52	
224+00			7.6	480.4	470.93	9.5	25	49.26	
+25			7.2	480.8	470.81	10.0	25	50.55	
+50			7.3	480.7	470.70	10.0	25	51.85	
+75			2	480.5	470.57	9.9	25	51.59	
225+00	See Sections Bottom allowed	Class 2	2	480.0	470.45	9.5	25	50.29	
+25			2	480.0	470.45	9.5	25	47.18	
+50	524/54		9.0	479.0	470.33	8.7	25	44.59	
+75			9.3	478.7	470.21	8.5	25	41.48	
226+00	509/5	486.12	8.5	477.6	470.08	7.5	25	37.85	
+25		Interpolate		477.3	470.16	7.1	25	36.04	
+50			9.0	477.1	470.33	6.8	25	20.74	

Overdepth 20.74
 5.6' x 5' x 200' = 208 Cu Yds
 To Sta. 226+00
 Overdepth Sta. 224+00
 20.74 Cu Yds
 808.99

Trench 5.6' wide Vert Sides

(21)

Sta.	+	HI.	-	Ele.	Grade	Cut	Average Cut	Distance	Cu. Yds	Page Total
					51.6/9		5.85	25.1	30.33	
		Authorized Top of Bench Fill.								
+75	"	"	"	475.4	470.49	4.9	5.50	25.19		
227+00	"	"	"	475.6	470.66	4.9	4.90	25	25.41	
+50	"	"	"	475.9	471.00	4.9	4.90	50	50.81	
228+00	"	"	"	476.9	471.90	5.0	4.95	50	51.33	
+35	"	"	"	477.6	472.63	5.0	5.00	35	36.30	
+50	"	524/55	484.62	6.9	477.7	472.93	4.8	4.90	15	15.24
229+00	"	"	"	6.6	478.0	474.42	3.6	4.20	50	43.55
+50	"	"	"	4.1	480.5	475.91	4.6	4.10	50	42.52
+75	"	509/7	"	481.6	476.63	5.0	4.80	25	24.89	
230+00	"	509/7	"	486.4	477.42	9.0	7.00	25	36.30	
+25	"	Bottom of Allowed Sections	6.8	488.3	478.29	10.0	9.50	25	49.26	
+50	"	"	5.7	489.1	479.16	9.9	9.95	25	51.59	
+75	"	"	4.4	490.4	480.03	10.4	10.15	25	52.63	
231+00	"	"	3.8	490.9	480.68	10.2	10.30	25	53.41	
+50	"	"	3.0	491.8	481.66	10.1	10.15	50	105.26	
				6mR	6mR	6mR	6mR	6mR		

668.83
6mR

Trench 5.6' wide, Vert Sides. (22)

Sta	+	HI	-	Ele. Grade	Cut	Average Cut	Distance	Cu Yds	Page Total
		494.83							
232+00		Bottom of Allowed Class 2 Ex ca See Sections.		492.7	482.64	10.1	50	104.74	
+50				493.6	483.36	10.2	50	105.26	
233+00				493.7	483.44	10.3	50	106.30	
+50				493.8	483.52	10.3	50	106.81	
234+00				492.9	483.60	10.3	50	106.82	
+50				492.6	482.78	9.8	50	104.22	
235+00				491.3	481.58	9.7	50	101.11	
+25				491.2	480.98	9.95	25	51.59	
+34	0.45	491.98		491.53	480.77	9.75	9	18.20	
+50	509/9	Interpolate		490.1	480.77	9.3	16	30.20	
236+00				487.6	478.68	8.9	50	80.89	
T.P.	0.84	479.79	13.1	478.9	472.20	6.7	50	64.81	
+50	509/9			478.95	465.72	6.25	50	64.81	
				8.3	471.5	5.8			

tmt tmt tmt tmt tmt

980.95
tmt

Sta.	+	H.I.	-	Ele.	Grade	CUT	Average cut	Distance	Cu. Yds	Page Total
		479.79			516 12					
236+55	(509/9)		9.2	470.6	465.07	5.5	5.65	5.	5.86	
		Interpolate Ground El.		470.1	462.70	7.4	6.45	18.24	24.40	
Anchor				470.0	462.23	7.8				
				469.9	462.2	7.7	7.65	1.15	1.82	cut
				469.8	462.19	7.6				
237+00	(509/9)		10.5	469.3	462.06	7.2	7.40	18.21	27.95	
+50	(509/10)		11.6	468.2	461.69	6.5	6.85	50	71.03	
238+00	"		12.0	467.8	461.32	6.5	6.50	50	67.41	
+50	"		12.4	467.4	460.95	6.4	6.45	50	66.89	
239+00	(509/10)		12.7	467.1	460.58	6.5	6.45	50	66.89	
+50	"		12.9	466.9	460.22	6.7	6.60	50	68.44	
T.P.	3.22	470.15	12.86	466.93			6.80	50	70.52	
240+00	(509/10)		3.4	466.8	459.85	6.9	7.00	50	72.60	
+50	"		3.6	466.6	459.47	7.1	7.10	50	73.63	
241+00	"		4.0	466.2	459.09	7.1	7.25	50	75.18	
+50	"		4.1	466.1	458.72	7.4	7.40	50	76.74	
242+00	"		4.5	465.7	458.34	7.4	7.45	50	77.26	
+50	"		4.7	465.5	457.96	7.5				
				6mR	6mR	6mR	6mR	6mR	6mR	6mR
									846.62	6mR

Struct Ex FB
Anchor Seen 528 Page 56

Trench 5.6' wide, Vert Sides.

516
13

Sta	+	HI	-	Elev.	Grade	Cut	Average	Cut	Distance	Cu yds	Page Total
242+64		470.15	5.1	465.1	457.85	7.2	7.35	7.35	14.7	21.34	
BM #29	5.5	467.38		461.86			6.05	6.05	10.0	12.55	
+74				462.7	457.79	4.9	4.9	4.9	26.0	26.42	
243+00				462.5	457.58	4.9	4.95	4.95	50.0	51.33	
+50			5.2	462.2	457.20	5.0	5.0	5.0	50.0	51.85	
244+00				461.8	456.82	5.0	4.95	4.95	50.0	51.33	
+50				461.4	456.45	4.9	4.9	4.9	50.0	50.82	
245+00				461.0	456.07	4.9	4.95	4.95	50.0	51.33	
+50				460.7	455.69	5.0					
T.P.	1.57	462.59	6.36	461.02							
246+00				460.3	455.31	5.0	5.0	5.0	50.0	51.85	
+50				459.9	454.93	5.0	5.0	5.0	50.0	51.85	
247+00				459.6	454.55	5.0	5.0	5.0	50.0	51.85	
+50			3.4	459.2	454.18	5.0	5.0	5.0	50.0	51.85	
248+00			3.8	458.8	453.82	5.0	5.0	5.0	50.0	51.85	
+50			4.7	457.9	453.51	4.4	4.7	4.7	50.0	48.74	
249+00			4.4	458.2	453.21	5.0	4.7	4.7	50.0	48.74	
										673.70	

Theo. Top of Staked Bench Shows in 5/12 when Fill on Elev. is below this Elev. app.

EMR EMR EMR EMR EMR EMR EMR

Trench 5.6' wide, Vert Sides. (25)

Sta	+	HI	=	Ele.	Grade	Cut	Average Cut	Distance	Cu yds	Page Total
		(462.59)			(516/15)					
249	+50		4.7	457.9	452.91	5.0	5.00	50	51.85	
250	+00		5	457.6	452.61	5.0	5.00	50	51.85	
	+50		5.4	457.2	452.30	4.9	4.95	50	51.33	
251	+00		5.6	457.0	452.00	5.0	4.95	50	51.34	
	+50		6.0	456.6	451.70	4.9	4.95	50	51.33	
252	+00		6.2	456.4	451.39	5.0	4.95	50	51.34	
T.P.	2.47	(458.87)	6.19	(456.40)						
	+50		5	456.1	451.09	5.0	5.00	50	51.85	
253	+00		3.5	455.4	450.79	4.6	4.80	50	49.78	
	+50		3.6	455.3	450.48	4.8	4.70	50	48.74	
254	+00		4.2	454.7	450.18	4.5	4.65	50	48.22	
	+50		4.2	454.7	449.89	4.8	4.65	50	48.22	
255	+00		4.8	454.1	449.57	4.5	4.65	50	48.22	

Staked Bench Filler to in 5/14 when below

Theo Top of Bler. as shown in Bler. 503/69

EMR EMR EMR EMR EMR EMR

604.07

Trench 5.6' wide, Vert Sides.

Average

Sta	HI	Elev.	Grade	Cut	Cut	Distance	Cu. Yds	Page	Total
B.M. 30	10.32	464.43	454.11	516/16					
255+50	10.5	453.9	449.01	4.9	4.70	50	48.74		
256+00	10.6	453.8	448.43	5.4	5.15	50	53.41		
+50	11.3	453.1	447.84	5.3	5.35	50	55.48		
257+00	11.4	453.0	447.25	5.7	5.60	50	57.04		
+50	12.0	452.4	446.67	5.7	5.70	50	59.11		
258+00	11.8	452.6	446.08	6.5	6.10	50	63.26		
+41	12.4	452.0	446.68	5.3	5.90	41	50.17		
+51	509/15	452.0	446.82	5.2	5.25	19	10.89		
+65	503/70	464.43	458.9	447.07	11.8	8.50	14	24.68	
259+00	5.5	458.9	447.64	11.3	11.55	35	83.85		
+50	"	458.9	448.46	10.4	10.85	50	112.52		
260+00	"	458.7	449.28	9.4	9.90	50	102.66		
+50	5.5	458.9	449.94	9.0	9.20	58	95.41		
261+00	"	458.2	449.73	8.5	8.75	50	90.74		
+50	"	457.9	449.53	8.4	8.45	50	87.63		
262+00	"	457.7	449.32	8.4	8.40	50	87.11		

See Letter of Authorization dated 9/29/36.

Depth below invert grade on account of rock 516 x 26 ft 200 x 0.5 x 516 = 20.74 Cu Yds.

EMR EMR EMR EMR EMR EMR

1103.44
EMR

Trench 5.6' wide, Vert Sides. (27)
Average

Sta	+	HI	-	Ele.	Grade	Cut	Cut	Distance	Cu. Yds	Page Total
					(516) 18					
262+50		Bottom Class	See Sec	(503) 52	457.5	449.12	8.4	50	87.11	
263+00		"	"		457.2	448.91	8.3	50	86.60	
T.P.	(509) 18	7.73	465.19	26	457.46					
+50	(509) 16				9.0	456.3	448.71	7.6	50	82.44
264+00		"			13.0	452.3	448.50	3.8	50	59.11
+50		"			14.6	450.7	448.38	2.3	50	31.63
265+00	(509) 19				10.8	454.5	448.25	6.2	50	44.07
+28		"			7.8	457.5	448.18	9.3	28	45.01
T.P.	2.53	460.14	7.65		457.61					
+50	(509) 17				2.6	457.5	448.12	9.4	22	42.66
266+00		"			2.5	457.6	448.00	9.6	50	98.52
+50		"			2.4	457.7	447.87	9.8	50	100.60
267+00		"			2.6	457.5	447.75	9.7	50	101.11
+50		"			3.1	457.0	447.62	9.4	50	99.04
268+00		"			4.0	456.1	447.50	8.6	50	93.33
+50	(509) 18				4.4	455.7	447.37	8.3	50	87.63
									18.15	1077.01

See letter of 9/19/36
0.5 Depth below invert grade on account of Rock Sta 265+50 to 267+25 = 18.15 Cu. Yds.

EMR EMR EMR EMR EMR EMR

Trench 5.6' wide Vert. Sides. (28)

Average
 Sta. + HI - Ele. Grade Cut Cut. Distance Cu Yds Page Total

Sta.	+	HI	-	Ele.	Grade	Cut	Cut.	Distance	Cu Yds	Page Total	
	(509/18)	460.14			(516-19)						
269+00	"	5.0	✓	455.1	✓	447.25	✓	7.8	8.05	50	83.48
+50	"	5.6	✓	454.5	✓	447.12	✓	7.4	7.60	50	78.81
270+00	"	6.0	✓	454.1	✓	446.98	✓	7.1	7.25	50	75.18
+50	"	6.3	✓	453.8	✓	446.62	✓	7.2	7.15	50	74.15
+70	"	6.8	✓	453.3	✓	446.48	✓	6.8	7.00	20	29.04
271+00	"	11.1	✓	449.0	✓	446.26	✓	2.7	4.75	30	29.56
+50	"	11.6	✓	448.5	✓	445.89	✓	2.6	2.65	50	27.48
272+00	"	12.4	✓	447.7	✓	445.53	✓	2.2	2.40	50	24.89
+50	(509/19)	10.4	✓	449.7	✓	445.37	✓	4.3	3.25	50	33.70
+60		12.7	✓	447.4	✓	445.34	✓	2.1	3.20	10	6.64
T.P.	6.30	458.08	✓	8.36	✓	451.78			2.10	40	17.42
273+00	(509/19)	10.8	✓	447.3	✓	445.24	✓	2.1	2.20	50	22.81
+50	"	10.7	✓	447.4	✓	445.12	✓	2.3	2.15	37	16.50
+87	"	11.1	✓	447.0	✓	445.02	✓	2.0	3.30	13	8.90
274+00	"	8.5	✓	449.6	✓	444.99	✓	4.6	5.95	6	7.40
+06	"	5.8	✓	452.3	✓	444.98	✓	7.3	7.40	44	67.53
+50	"	5.7	✓	452.4	✓	444.86	✓	7.5			44.07

See letter 9/29/36
 0.5 Depth below invert grade on account
 of rock at Sta 270+25 to 274+50
 $4.25 \times .5 \times 5.6 \times 27 = 44.07$ Cu Yds

EMR EMR EMR EMR EMR EMR 647.56

Trench 5.6' wide, Vert Sides. (29)

Sta	+	HI	-	Ele.	Grade	Cut	Average Cut	Distance	Cu Yds	Page Total
	(509-20)	458.08			(516) 21					
275+00	"		6.0	452.1	444.73	7.4	7.45	50	77.26	
+50	"		5.6	452.5	444.60	7.9	7.65	50	79.33	
276+00	"		4.9	453.2	444.48	8.7	8.30	50	86.07	
+18	"		4.7	453.4	444.43	9.0	8.85	18	33.04	
+50	"		4.3	453.8	444.35	9.4	9.20	32	61.06	
277+00	"		4.2	453.9	444.22	9.7	9.55	50	99.04	
+50	"		4.2	453.9	444.09	9.8	9.75	50	101.11	
278+00	"		4.3	453.8	443.97	9.8	9.80	50	101.63	
+50	"		4.6	453.5	443.84	9.7	9.75	50	101.11	
279+00	"		4.5	453.6	443.71	9.9	9.80	50	101.63	
+40	"		3.6	454.5	443.61	10.9	10.40	40	86.28	
+50	(509) 21		3.6	454.5	443.58	10.9	10.90	10	22.61	
+70	"		3.0	455.1	443.52	11.6	11.25	20	46.67	
T.P.	4.95	460.11	2.92	455.16	-	-	-	-	-	
+95	(509) 21		4.8	455.3	443.47	11.8	11.70	25	60.67	
280+00	"		6.2	453.9	443.46	10.4	11.10	5	11.51	
+50	"		14.1	446.0	443.33	2.7	6.55	50	67.92	
									57.04	1193.98

0.5' Depth below invert grade on account of rock. $\frac{5}{16}$ 27450 to 280+00 See letter 9/19/36
 $550 \times .5 \times 5.6 \div 27 = 57.04$ cu yds.

EMR EMR EMR EMR EMR EMR EMR

Sta	+	HI	-	Ele.	Grade	Cut	Cut	Distance	Cu Yds	Page Total
		$\frac{509}{20}$ 460.11			$\frac{516}{23}$					
281+00	"		13.5	446.6	443.20	3.4	3.05	50	31.63	
+50	"		12.6	447.5	443.03	4.5	3.95	50	40.97	
282+00	"		13.4	446.7	442.85	3.8	4.15	50	43.03	
+50	$\frac{509}{20}$		14.2	445.9	442.68	3.2	3.50	50	36.30	
283+00	"		14.6	445.5	442.50	3.0	3.10	50	32.15	
+50	"		14.7	445.4	442.33	3.1	3.05	50	31.63	
284+00	"		12.8	447.3	442.15	5.1	4.10	50	42.52	
+50	"		13.2	446.9	441.98	4.9	5.00	50	51.85	
+60	"		12.8	447.3	441.94	5.4	5.15	10	10.68	
285+00	"		8.6	451.5	441.80	9.7	7.55	40	62.64	
+50	"		9.3	450.8	441.63	9.2	9.45	50	98.00	
286+00	"		10.4	449.7	441.45	8.2	8.70	50	90.22	
TP	$\frac{509}{20}$ 3.07	452.32	10.86	449.25						
+50	$\frac{509}{20}$		3.5	448.8	441.28	7.5	7.85	50	81.41	
287+00	"		4.0	448.3	441.10	7.2	7.35	50	76.22	
+50	"		4.2	448.1	440.83	7.3	7.25	50	75.19	
			EmR	EmR	EmR	EmR	EmR	EmR	EmR	EmR
									804.44	EmR

Trench 5.6' wide, Vert Sides, Average 30

Sta	+	HI	-	Elev	Grade
	509/23	452.32			(516/24)
288+00	"		4.0	448.3	440.56
+50	"		4.7	447.6	440.28
289+00	"		5.1	447.2	440.01
+50	"		4.8	447.5	439.80
290+00	"		4.3	448.0	439.60
+50	(509/24)		4.2	448.1	439.40
291+00	"		4.6	447.7	439.20
+50	"		5.5	446.8	439.01
292+00	"		6.4	445.9	438.96
TP	1.68	449.53	4.47	447.85	-
+50	(509/25)		4.2	445.3	438.92
293+00	"		2.6	446.9	438.87
+50	"		2.7	446.8	438.82
294+00	"		2.6	446.9	438.66
+50	(509/25)		3.2	446.3	438.49
295+00	"		3.5	446.0	438.31

6mR 6mR 6mR

Trench 5.6' wide Next Sides. (31)

Cut	Average Cut	Distance	Cu Yds	Page Total
7.7	7.50	50	77.78	
7.3	7.50	50	77.78	
7.2	7.25	50	75.18	
7.7	7.45	50	77.26	
8.4	8.05	50	83.48	
8.7	8.55	50	88.67	
8.5	8.60	50	89.19	
7.8	8.15	50	84.52	
6.9	7.35	50	76.22	
6.4	6.65	50	68.97	
8.0	7.20	50	74.67	
8.0	8.00	50	82.96	
8.2	8.10	50	84.00	
7.8	8.00	50	82.97	
7.7	7.75	50	80.37	

6mR 6mR 6mR

1204.02
6mR

Trench 5.6' wide, Vert. Sides. (32)
Average.

Sta	+ HI	-	Ele.	Grade	Cut	Cut	Distance	Cu Yds	Page Total
	509.25	449.53		516/26					
295+50	"	3.7	445.8	438.13	7.7	7.70	50	79.85	
296+00	"	4.0	445.5	437.95	7.5	7.60	50	78.81	
+50	"	4.7	444.8	437.78	7.0	7.25	50	75.19	
297+00	"	4.7	444.8	437.60	7.2	7.10	50	73.63	
+10	"	4.6	444.9	437.56	7.3	7.25	10	15.04	
+40	"	6.0	443.5	437.46	6.0	6.65	30	41.38	
+50	"	5.8	443.7	437.42	6.3	6.15	10	12.76	
298+00	509/26	6.6	442.9	437.24	5.7	6.00	50	62.22	
+50	"	7.2	442.3	437.07	5.2	5.45	50	56.52	
299+00	"	6.6	442.9	436.89	6.0	5.60	50	58.07	
+50	"	7.0	442.5	436.71	5.8	5.90	50	61.19	
300+00	"	7.1	442.4	436.53	5.9	5.85	50	60.66	
+50	"	6.7	442.8	436.36	6.4	6.15	50	63.78	
T.P	4.19	446.99	6.73	442.80	-	-	-	-	
301+00	509/26	4.2	442.8	436.19	6.6	6.50	50	67.41	
+50	"	4.1	442.9	436.02	6.9	6.75	50	70.00	
			<i>Emr</i>	<i>Emr</i>	<i>Emr</i>	<i>Emr</i>	<i>Emr</i>	<i>Emr</i>	

876.51
Emr

Trench 5.6' wide Yett Sides (33)
Average

Sta	+ (509.27)	HI - 446.99	Ele	Grade (516.27)	Cut	Cut	Distance	Cu. Yds	Page Total
302+00	"		4.3 ✓	442.7 ✓	435.84 ✓	6.9 ✓	6.90 ✓	50 ✓	71.55 ✓
+50	"		4.4 ✓	442.6 ✓	435.67 ✓	6.9 ✓	6.90 ✓	50 ✓	71.56 ✓
303+00	"		4.6 ✓	442.4 ✓	435.50 ✓	6.9 ✓	6.90 ✓	50 ✓	71.55 ✓
+50	"		5.0 ✓	442.0 ✓	435.33 ✓	6.7 ✓	6.80 ✓	50 ✓	70.52 ✓
304+00	"		6.0 ✓	441.0 ✓	435.16 ✓	5.8 ✓	6.25 ✓	50 ✓	64.82 ✓
+50	"		7.2 ✓	439.8 ✓	434.99 ✓	4.8 ✓	5.30 ✓	50 ✓	54.97 ✓
+90	"	Ground Ele. Interl		438.9 ✓	434.85 ✓	4.0 ✓	4.40 ✓	40 ✓	36.50 ✓
305+00	"		8.3 ✓	438.7 ✓	434.76 ✓	3.9 ✓	3.95 ✓	10 ✓	8.19 ✓
+50	"		8.7 ✓	438.3 ✓	434.32 ✓	4.0 ✓	3.95 ✓	50 ✓	40.96 ✓
306+00	"		8.3 ✓	438.7 ✓	433.88 ✓	4.8 ✓	4.40 ✓	50 ✓	45.63 ✓
+25	"	509.28	7.4 ✓	439.6 ✓	433.66 ✓	5.9 ✓	5.35 ✓	25 ✓	27.74 ✓
+50	"		7.5 ✓	439.5 ✓	433.44 ✓	6.1 ✓	6.00 ✓	25 ✓	31.11 ✓
307+00	"		7.9 ✓	439.1 ✓	433.00 ✓	6.1 ✓	6.10 ✓	50 ✓	63.26 ✓
+50	"		8.2 ✓	438.8 ✓	432.90 ✓	5.9 ✓	6.00 ✓	50 ✓	62.22 ✓
308+00	"		8.1 ✓	438.9 ✓	432.80 ✓	6.1 ✓	6.00 ✓	50 ✓	62.22 ✓
T.P.	5.24	445.11	7.12 ✓	439.87 ✓					

782.80 ✓
bmr

Trench 5.6' wide + Vert Sides
 to 311+98.44
 Average

Sta	HI	Rod	Elev	Grade	Cut	Cut	Distance	Cu Yds	Page Total
	445.11			516/29					
308+50	509/28	6.0	439.1	432.70	6.4	6.25	50	64.82	
309+00	509/28	5.8	439.3	432.60	6.7	6.55	50	67.93	
BM	509/75	5.89	444.82	438.93					
+3309	509/75	5.2	439.6	432.54	7.1	6.90	33.09	47.95	
+50	"	5.2	439.6	432.50	7.1	7.10	16.91	24.90	
+95	"	4.6	440.2	432.41	7.8	7.45	45	69.53	
310+00	"	4.8	440.0	432.40	7.6	7.70	5	7.98	
+50	"	5.3	439.5	432.30	7.2	7.40	50	76.74	
311+00	"	8.0	436.8	432.20	4.6	5.90	50	61.18	
+50	509/75	8.2	436.6	432.10	4.5	4.55	50	47.19	

BM #35	524/69	3.51	442.44	438.93	530/65				
+98.44	524/69	6.1	436.3	432.00	4.3	4.40	48.44	44.21	
312+05.5	"	6.1	436.3	432.24	4.1	29.67	7.06	209.47	7.76
+10.03	"	4.5	437.9	432.48	5.4	46.25	4.53	209.51	7.76
+14.82	"	3.1	439.3	432.47	6.8	64.66	4.79	309.70	11.47
+17.32	"		439.2						

{ +14.82 E edge of Anchor Structure Ex.
 { +17.32 E side Valve Chamber

(Structure Ex. Anchor + Valve Chamber)
 See Page 56

538.82

Width of Trench 4.6' per d.w.w. 9/29/36
 35

rec at elev 530/65

Sta	HI	Ele.	Grade	Cut	Average Cut	Distance	Cu. Yds	Page Total
See 528 for Stru Excavation. See City 2nd MD 562								
+25.49	530/65	442.44	5.8	436.6	432.74	3.9	4.05	2.31
+27.8	524/69	5.4	437.0	432.77	4.2	4.8	22.2	18.16
+50	"	43	438.1	432.69	5.4	5.20	50.0	44.30
313+00	524/64	442.97	5.5	437.5	432.52	5.0		64.05
End Item 1. Total 28,820.54								Sta 104-313

Begin Item 2. Class 1 Excavation

Width of Trench 4.6' per d.w.w. 9/29/36

Sta	HI	Ele.	Grade	Cut	Average Cut	Distance	Cu. Yds	Page Total
313+00	524/64	442.97	5.5	437.5	432.5	5.0	0.43	
313+00.50	Venturi Meter			437.5	432.5	5.0	0.50	
313+21.5				437.1	432.5	4.6	21.0	3.41
313+25.76	524/64			437.0	432.18	4.8	4.26	19.41
313+50	524/64	16.4	436.6	432.05	4.6	4.70	24.24	4.51
313+55.76	"		436.6	432.02	4.6	4.60	5.76	1.81
313+58.77	530/30	E. side valve Cham.	436.6	432.14	4.2	4.40	2.41	
313+67.84	26	W. side valve Cham.	436.6	432.14	4.2	4.5	2.42	1.86
313+70.26	Begin 36" Pipe		436.8	432.00	4.8	5.15	35.08	30.98
314+05.34	524/64	15.9	437.1	431.59	5.5	5.45	10.89	10.11
314+16.23		16.0	437.0	431.57	5.4	5.40	33.77	31.07
314+50	524/64	16.1	436.9	431.50	5.4	5.50	50.0	46.85
315+00	"	16.0	437.0	431.39	5.6	5.6	50.0	47.70
+50	"	16.1	436.9	431.29	5.6	5.65	50.0	48.13
J.P.	3.93	441.43	509/30	437.50				
316+00		4.5	436.9	431.17	5.7	5.65	55.36	53.29
316+11.77	Subst. = equation							
316+06.41	ahead. See Dwg. 2652-1							
316+50	509/30	4.7	436.7	431.09	5.6	5.5	50.0	46.85
317+00	"	5.0	436.4	430.99	5.4	5.0	50.0	346.21
Total From Sta 313+00								346.21

CLASS I EXCAVATION FOR 36" STEEL PIPE. WIDTH OF TRENCH 4.6'
 See Dwg. No 536. (36)
 File No 2510-2-D-2.

Sta.	HI	Ele.	Grade	Cut	Average Cut.	Distance	Cu Yds	Page Total
	441.43		516/31					
317+50	5.0 ✓	436.4 ✓	430.89 ✓	5.5 ✓	5.45 ✓	50 ✓	46.42 ✓	
318+00	5.2 ✓	436.2 ✓	430.79 ✓	5.4 ✓	5.45 ✓	50 ✓	46.43 ✓	
+50	5.3 ✓	436.1 ✓	430.69 ✓	5.4 ✓	5.40 ✓	50 ✓	46.00 ✓	
319+00	5.4 ✓	436.0 ✓	430.59 ✓	5.4 ✓	5.40 ✓	50 ✓	46.00 ✓	
+50	5.3 ✓	436.1 ✓	430.49 ✓	5.6 ✓	5.50 ✓	50 ✓	46.85 ✓	
320+00	5.6 ✓	435.8 ✓	430.40 ✓	5.4 ✓	5.50 ✓	50 ✓	46.85 ✓	
#36 BM	3.70 ✓	444.76 ✓	441.06 ✓					
+50	9.0 ✓	435.8 ✓	430.30 ✓	5.5 ✓	5.45 ✓	50 ✓	46.42 ✓	
321+00	8.8 ✓	436.0 ✓	430.20 ✓	5.8 ✓	5.65 ✓	50 ✓	48.13 ✓	
+50	9.1 ✓	435.7 ✓	430.10 ✓	5.6 ✓	5.70 ✓	50 ✓	48.55 ✓	
322+00	8.6 ✓	436.2 ✓	430.03 ✓	6.2 ✓	5.90 ✓	50 ✓	50.26 ✓	
+50	8.5 ✓	436.3 ✓	430.07 ✓	6.2 ✓	6.20 ✓	50 ✓	52.81 ✓	
323+00	8.1 ✓	436.7 ✓	430.11 ✓	6.6 ✓	6.40 ✓	50 ✓	54.52 ✓	
+50	8.0 ✓	436.8 ✓	430.15 ✓	6.6 ✓	6.60 ✓	50 ✓	56.22 ✓	
324+00	7.8 ✓	437.0 ✓	430.18 ✓	6.8 ✓	6.70 ✓	50 ✓	57.08 ✓	
							692.54 ✓	

EMR EMR EMR EMR EMR EMR

Sta	+	HI	-	Elev	Grade	Cut	Average Cut	Distance	Cu. Yds	Page Total
		444.76			<u>516</u> <u>33</u>					
324	+50	<u>524</u> <u>58</u>	7.4	437.4	430.22	7.2	7.00	50	59.63	
325	+00	"	6.8	438.0	430.26	7.7	7.45	50	63.47	
	+50	"	6.3	438.5	430.33	8.2	7.95	50	67.72	
326	+00	"	5.6	439.2	430.79	8.4	8.30	50	70.70	
	+50	"	5.3	439.5	431.26	8.2	8.30	50	70.71	
327	+00	"	4.8	440.0	431.72	8.3	8.25	50	70.28	
	+50	"	4.4	440.4	432.18	8.2	8.25	50	70.28	
328	+00	<u>524</u> <u>59</u>	4.2	440.6	432.64	8.0	8.10	50	69.00	
	+50	"	3.9	440.9	433.11	7.8	7.90	50	67.30	
329	+00	"	3.9	440.9	433.57	7.3	7.55	50	64.31	
	+50	"	3.2	441.6	434.03	7.6	7.45	50	63.47	
330	+00	"	2.2	442.6	434.46	8.1	7.85	50	66.87	
	+50	"	1.8	443.0	434.60	8.4	8.25	50	70.28	
TP	12.64	454.91	2.49	<u>442.27</u>						
331	+00	<u>524</u> <u>59</u>	11.7	443.2	434.74	8.5	8.45	50	71.98	
	+50	"	11.4	443.5	434.88	8.6	8.55	50	72.83	
				EMR	EMR	EMR				
				EMR	EMR	EMR				
				EMR	EMR	EMR				
										1018.83

EMR

Sta	+	HI	-	Ele.	Grade	Cut	Average Cut	Distance	Cu Yds	Page Total
		454.91			$\frac{516}{35}$					
332+00	$\frac{524}{59}$			11.1 ✓	443.8 ✓	435.02 ✓	8.70 ✓	50 ✓	74.11 ✓	
+50	"			10.6 ✓	444.3 ✓	435.16 ✓	8.8 ✓	50 ✓	76.24 ✓	
+62	"			10.6 ✓	444.3 ✓	435.19 ✓	9.1 ✓	12 ✓	18.60 ✓	
333+00	"			9.7 ✓	445.2 ✓	436.67 ✓	9.1 ✓	38 ✓	56.97 ✓	
+50	"			9.1 ✓	445.8 ✓	438.63 ✓	8.5 ✓	50 ✓	66.87 ✓	
334+00	"			7.8 ✓	447.1 ✓	440.59 ✓	7.2 ✓	50 ✓	58.35 ✓	
+50	"			6.0 ✓	448.9 ✓	442.56 ✓	6.8 ✓	50 ✓	54.52 ✓	
335+00	$\frac{524}{60}$			4.1 ✓	450.8 ✓	444.56 ✓	6.4 ✓	50 ✓	53.24 ✓	
+50	"			2.0 ✓	452.9 ✓	446.74 ✓	6.3 ✓	50 ✓	52.81 ✓	
T.P.	12.73	467.26	0.38	454.53						
336+00	$\frac{524}{60}$			12.1 ✓	455.2 ✓	448.95 ✓	6.2 ✓	50 ✓	52.82 ✓	
+50	"			9.8 ✓	457.5 ✓	451.18 ✓	6.25 ✓	50 ✓	53.24 ✓	
337+00	"			7.8 ✓	459.5 ✓	453.40 ✓	6.2 ✓	50 ✓	52.81 ✓	
+50	"			5.6 ✓	461.7 ✓	455.62 ✓	6.1 ✓	50 ✓	51.97 ✓	
338+00	"			3.4 ✓	463.9 ✓	457.85 ✓	6.1 ✓	50 ✓	51.53 ✓	
+50	"			0.9 ✓	466.4 ✓	460.07 ✓	6.0 ✓	50 ✓	52.39 ✓	
T.P.	12.55	479.72	0.09	467.17						
				bmr		bmr	bmr	bmr		
									826.47 ✓	
									bmr	

Sta.	+	HI	-	Ele	Grade	Cut	Average	Distance	Cu. Yds	Page Total
		476.97			516/38					
346+00	(509/59)		11.1	465.9	460.91	5.0	4.95	50	42.16	
T.P.	0.93	466.75	11.15	465.82			4.85	50	41.32	
+50	(509/59)		2.3	464.4	459.68	4.7	4.90	50	41.74	
347+00	"		2.5	464.2	459.05	5.1	5.30	50	45.15	
+50	(509.59)		2.8	463.9	458.41	5.5				
BM #38	(524-65)	0.13	476.44	476.31						
T.P.	0.57	465.42	11.59	464.85			5.45	50	46.42	
348+00			2.2	463.2	457.78	5.4	5.50	50	46.85	
+50			2.7	462.7	457.14	5.6	5.40	50	46.00	
349+00			3.7	461.7	456.50	5.2	4.85	50	41.31	
+50			5.0	460.4	455.87	4.5	4.55	50	38.76	
350+00			5.6	459.8	455.23	4.6	4.70	50	40.04	
+50			6.0	459.4	454.60	4.8	5.00	50	42.59	
351+00			6.2	459.2	453.96	5.2				

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47 2.34
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Sta	+	HI	Ele	Grade	Gut	Average	Cut	Distance	Cu. Yds	Page Total
356+	19.53	469.26		$\frac{5.6}{41}$ 455.96	6.6	6.6	19.53		21.96	
+25	"		462.6	455.92	6.6	6.7	5.47		6.24	
+50	"		462.6	455.59	6.8	6.9	25		29.39	
+75	"		462.1	455.27	7.0	6.9	25		29.39	
357+00	"		461.7	454.94	6.8	6.8	25		28.96	
+25	"		461.6	454.61	7.0	6.9	25		29.39	
+50	"		461.4	454.29	7.1	7.0	25		30.03	
+75	"		460.9	453.96	6.9	7.0	25		29.81	
358+00	"		460.3	453.61	6.7	6.8	25		28.96	

(509-61)

T.P.	0.69	464.64	463.95							
+50	$\frac{5.09}{61}$		459.3	452.98	6.3	6.5	50		55.37	
359+00	"		458.5	452.33	6.2	6.2	50		53.24	
+50	"		457.7	451.67	6.0	6.1	50		51.96	
360+00	"		456.9	451.02	5.9	5.9	50		50.69	
+50	"		456.0	450.93	5.5	5.7	50		48.56	

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~~emb emb emb~~

~~493.95~~
HALL

Average

Sta.	+	HI	-	Elev.	Grade	Cut	Average Cut	Distance	Cu. Yds	Page Total
361+00	(509/61)	464.64	9.4	455.2	450.00 (516/43)	5.2	5.35	50	45.57	
+50	"		10.2	454.4	449.50	4.9	5.05	50	43.02	
362+00	"		11.0	453.6	448.99	4.6	4.75	50	40.47	
T.P.	0.80	454.45	10.99	453.65						
+50	(509/61)		1.5	453.0	448.49	4.5	4.55	50	38.76	
363+00	(509/62)		2.2	452.3	447.99	4.3	4.40	50	37.48	
+50	"		2.8	451.7	447.49	4.2	4.25	50	36.20	
364+00	"		3.4	451.1	446.99	4.1	4.15	50	35.35	
+50	"		4.0	450.5	446.49	4.0	4.05	50	34.50	
365+00	"		4.4	450.1	445.99	4.1	4.05	50	34.50	
+50	"		4.8	449.7	445.49	4.2	4.15	50	35.35	
366+00	"		5.0	449.5	444.99	4.5	4.35	50	37.05	
+50	"		5.4	449.1	444.48	4.6	4.55	50	38.76	

BM #40 7.81 460.83 (453.02)

T.P. 2.33 453.82 9.34 (451.49)

emb emb emb emb emb emb emb emb emb emb

457.01
emb

Sta.	+ $\frac{524}{67}$	HI -	Ele.	Grade $\frac{516}{44}$	Cut	Average Cut	Distance	Cu. Yds	Page Total
		453.82							
367+00	"	3.9 ✓	449.9 ✓	443.98 ✓	5.9 ✓	5.25 ✓	50 ✓	44.72 ✓	
+50	"	4.1 ✓	449.7 ✓	443.48 ✓	6.2 ✓	6.05 ✓	50 ✓	51.53 ✓	
368+00	"	5.1 ✓	448.7 ✓	442.94 ✓	5.8 ✓	6.00 ✓	50 ✓	51.11 ✓	
+50	"	6.5 ✓	447.3 ✓	441.21 ✓	6.1 ✓	5.95 ✓	50 ✓	50.69 ✓	
369+00	"	7.7 ✓	446.1 ✓	439.47 ✓	6.6 ✓	6.35 ✓	50 ✓	54.09 ✓	
+50	"	10.0 ✓	443.8 ✓	437.74 ✓	6.1 ✓	6.35 ✓	50 ✓	54.09 ✓	
370+00	"	13.3 ✓	440.5 ✓	436.09 ✓	4.4 ✓	5.25 ✓	50 ✓	44.72 ✓	
T.P.	0.85 ✓	441.79 ✓	12.88 ✓	440.94 ✓					
+50	$\frac{524}{67}$	2.9 ✓	438.9 ✓	434.92 ✓	4.0 ✓	4.20 ✓	50 ✓	35.77 ✓	
371+00	"	3.8 ✓	438.0 ✓	433.75 ✓	4.2 ✓	4.10 ✓	50 ✓	34.92 ✓	
+50	"	4.0 ✓	437.8 ✓	432.58 ✓	5.2 ✓	4.70 ✓	50 ✓	40.04 ✓	
372+00	$\frac{524}{68}$	5.1 ✓	436.7 ✓	431.42 ✓	5.3 ✓	5.25 ✓	50 ✓	44.72 ✓	
+50	"	6.3 ✓	435.5 ✓	430.25 ✓	5.2 ✓	5.25 ✓	50 ✓	44.72 ✓	
373+00	"	8.0 ✓	433.8 ✓	429.08 ✓	4.7 ✓	4.95 ✓	50 ✓	42.16 ✓	
+50	"	9.8 ✓	432.0 ✓	427.46 ✓	4.5 ✓	4.60 ✓	50 ✓	39.19 ✓	
374+00	"	11.8 ✓	430.0 ✓	425.53 ✓	4.5 ✓	4.50 ✓	50 ✓	38.33 ✓	
			<i>EmL</i>	<i>EmL</i>	<i>EmL</i>	<i>EmL</i>	<i>EmL</i>	<i>EmL</i>	<i>EmL</i>

67 0.80
EmL

Sta	+	HI	Ele.	Grade	Cut	Average cut	Distance	Cu. Yds	Page Total
		441.79		516 26					
374	+50	524 68	13.4	428.4	423.60	4.8	4.65	50	39.61
B.M.	#41	524-70 0.90	432.13	10.55	431.23				
375	+00	524 70	4.8	427.3	421.67	5.6	5.20	50	44.30
	+50	"	6.0	426.1	419.71	6.4	6.00	50	51.11
376	+00	"	9.0	423.1	417.81	5.3	5.85	50	49.83
	+50	"	11.8	420.3	415.88	4.4	4.85	50	41.32
T.P.	"	0.91	420.02	13.02	419.11		4.45	50	37.90
377		524 70	1.5	418.5	413.95	4.5	4.55	50	38.76
	+50	"	3.1	416.9	412.31	4.6	4.15	50	35.35
378		"	4.6	415.4	411.67	3.7	3.70	50	31.52
	+50	"	5.3	414.7	411.03	3.7	3.60	50	30.66
379		"	6.1	413.9	410.38	3.5	3.50	50	29.82
	+50	"	6.8	413.2	409.74	3.5	3.50	50	29.82
380		"	7.4	412.6	409.10	3.5	3.40	50	28.96
	+50	524 71	8.2	411.8	408.46	3.3	3.30	50	28.11
381		"	8.9	411.1	407.81	3.3			

EMR EMR EMR EMR EMR EMR

51 7.07
EMR

					Cut	Av. Cut	Distance	Cu. Yds.
		420.02 ✓		$\frac{516}{48}$				
381+50	$\frac{524}{71}$		9.5 ✓	410.5 ✓	407.17 ✓	3.3 ✓	3.30 ✓ 50 ✓	28.11 ✓
382	"		10.4 ✓	409.6 ✓	406.53 ✓	3.1 ✓	3.20 ✓ 50 ✓	27.26 ✓
+50	"		10.9 ✓	409.1 ✓	405.89 ✓	3.2 ✓	3.15 ✓ 50 ✓	26.84 ✓
383	"		11.1 ✓	408.9 ✓	405.24 ✓	3.7 ✓	3.45 ✓ 50 ✓	29.39 ✓
T.P.	1.90 ✓	410.85 ✓	11.07 ✓	408.95 ✓			3.85 ✓ 50 ✓	32.80 ✓
+50	$\frac{524}{71}$		2.2 ✓	408.6 ✓	404.60 ✓	4.0 ✓	4.20 ✓ 50 ✓	35.77 ✓
384	"		2.4 ✓	408.4 ✓	403.96 ✓	4.4 ✓	4.85 ✓ 50 ✓	41.32 ✓
+50	"		2.3 ✓	408.6 ✓	403.32 ✓	5.3 ✓	5.60 ✓ 50 ✓	47.71 ✓
385	"		2.3 ✓	408.6 ✓	402.67 ✓	5.9 ✓	5.55 ✓ 50 ✓	47.28 ✓
+50	"		3.6 ✓	407.2 ✓	402.03 ✓	5.2 ✓	4.70 ✓ 50 ✓	40.04 ✓
386	"		5.2 ✓	405.6 ✓	401.39 ✓	4.2 ✓	4.00 ✓ 50 ✓	34.07 ✓
+50	"		6.3 ✓	404.6 ✓	400.75 ✓	3.8 ✓	3.85 ✓ 50 ✓	32.80 ✓
387	"		6.9 ✓	404.0 ✓	400.10 ✓	3.9 ✓	4.10 ✓ 50 ✓	34.92 ✓
+50	"		7.0 ✓	403.8 ✓	399.46 ✓	4.3 ✓	4.65 ✓ 50 ✓	39.61 ✓
388	$\frac{524}{71}$		7.1 ✓	403.8 ✓	398.81 ✓	5.0 ✓	4.45 ✓ 50 ✓	37.90 ✓
+50	"		7.5 ✓	403.4 ✓	399.51 ✓	3.9 ✓	3.70 ✓ 50 ✓	31.52 ✓
389	"		6.6 ✓	404.2 ✓	400.72 ✓	3.5 ✓		
BM #4			6.43 ✓	404.4 ✓				

~~567.34~~
BML

	$\frac{509}{65}$		$\frac{516}{50}$	
T.P. & B.M. 36 12.81	416.66	$\langle 403.85 \rangle$		
389 + 50	$\frac{509}{65}$	10.7	406.0	402.34
390	"	7.4	409.3	404.74
+ 50	"	4.0	412.7	407.15
391	"	1.0	415.7	409.42
T.P.	11.33	427.70	$\langle 416.37 \rangle$	
+ 50	$\frac{509}{66}$	9.8	417.9	411.40
392	"	8.0	419.7	413.20
+ 50	"	6.2	421.5	414.82
393	"	5.0	422.7	416.12
+ 50	"	4.0	423.7	417.42
394	"	2.7	425.0	418.72
+ 50	"	1.1	426.6	420.03
T.P.	9.17	$\langle 436.39 \rangle$	$\langle 427.22 \rangle$	
395	$\frac{509}{66}$	8.4	428.0	421.33
+ 50	"	7.5	428.9	422.64
		EMR	EMR	EMR

Out	Ar. Out	Dist	
3.7	3.60	50.	30.66
4.6	4.15	50.	35.35
5.5	5.05	50.	43.02
6.3	5.90	50.	50.26
	6.40	50.	54.52
6.5	6.50	50.	55.37
6.5			
	6.60	50.	56.22
6.7	6.65	50.	56.65
6.6	6.45	50.	54.94
6.3	6.30	50.	53.67
6.3	6.45	50.	54.94
6.6	6.65	50.	56.65
6.7	6.50	50.	55.37
6.3			
			657.62
			EMR

		436.39 ✓		$\frac{516}{52}$							
396 +00	$\frac{509}{66}$		6.9 ✓	429.5 ✓	423.30 ✓	6.2 ✓	6.25 ✓	50. ✓	53.24 ✓		
+50	"		6.2 ✓	430.2 ✓	423.80 ✓	6.4 ✓	6.30 ✓	50. ✓	53.67 ✓		
397	"		5.5 ✓	430.9 ✓	424.30 ✓	6.6 ✓	6.50 ✓	50. ✓	55.37 ✓		
+50	"		5.0 ✓	431.4 ✓	424.73 ✓	6.7 ✓	6.65 ✓	50. ✓	56.65 ✓		
398	$\frac{509}{67}$		4.5 ✓	431.9 ✓	424.91 ✓	7.0 ✓	6.85 ✓	50. ✓	58.35 ✓		
+50	"		4.3 ✓	432.1 ✓	425.08 ✓	7.0 ✓	7.00 ✓	50. ✓	59.63 ✓		
399	"		4.2 ✓	432.2 ✓	425.16 ✓	7.0 ✓	7.00 ✓	50. ✓	60.05 ✓		
+50	"		3.9 ✓	432.5 ✓	425.44 ✓	7.1 ✓	7.05 ✓	50. ✓	60.65 ✓		
400	"		4.6 ✓	431.8 ✓	425.61 ✓	6.2 ✓	6.65 ✓	50. ✓	56.65 ✓		
+50	"		5.5 ✓	430.9 ✓	424.84 ✓	6.1 ✓	6.15 ✓	50. ✓	52.39 ✓		
401	"		6.4 ✓	430.0 ✓	423.88 ✓	6.1 ✓	6.10 ✓	50. ✓	51.96 ✓		
+50	"		7.3 ✓	429.1 ✓	422.92 ✓	6.2 ✓	6.15 ✓	50. ✓	52.39 ✓		
402	"		8.1 ✓	428.3 ✓	421.96 ✓	6.3 ✓	6.25 ✓	50. ✓	53.24 ✓		
T.P.	0.59 ✓	427.93 ✓	9.05 ✓	427.34 ✓	-	-	6.20 ✓	50. ✓	52.81 ✓		
+50	$\frac{509}{67}$		0.8 ✓	427.1 ✓	420.97 ✓	6.1 ✓	6.10 ✓	50. ✓	51.96 ✓		
403	"		2.3 ✓	425.6 ✓	419.45 ✓	6.1 ✓	6.00 ✓	50. ✓	51.11 ✓		
+50	"		4.1 ✓	423.8 ✓	417.92 ✓	5.9 ✓					
			EMR	EMR	EMR	EMR	EMR	EMR	EMR		
										879.10 ✓	
										EMR	

404	$\frac{509}{67}$	427.93	5.7	422.2	$\frac{516}{53}$ 416.40
+50	"		7.3	420.6	414.88
405	"		8.5	419.4	413.36
+50	"		9.6	418.3	411.83
+75	$\frac{509}{68}$			417.9	411.06
406	$\frac{509}{68}$		10.4	417.5	411.03
+50	"		10.9	417.0	410.97
T.P.	7.27	424.11	11.09	416.84	-
407	$\frac{509}{68}$		7.3	416.8	410.91
+50	"		7.3	416.8	410.85
408	"		7.2	416.9	410.79
+50	"		6.4	417.7	410.73
409	"		4.8	419.3	410.67
B.M. 44	$\frac{516}{65}$	6.20 (Ans. 26)	3.0	417.06	$\frac{516}{55}$ 410.63
+34.12			2.9	420.4	410.61
+50			2.8	420.5	410.58
+75			3.0	420.3	410.55
410			4.0	419.3	410.41
+50			5.7	418.3	409.61
+75				417.6	409.0
+92.80					

EMR EMR

EMR

EMR EMR EMR

Out	Ar. Out	Dist	avg.
5.8	5.85	50.	49.83
5.7	5.75	50.	48.98
5.7	5.85	50.	49.84
6.0	6.25	50.	53.24
6.5	6.65	25.	28.32
6.8	6.65	25.	28.33
6.5	6.25	50.	53.24
6.0	.	.	.
5.95	5.95	50.	50.68
5.9	5.90	50.	50.26
5.9	6.00	50.	51.11
6.1	6.55	50.	55.80
7.0	7.80	50.	66.44
8.6	9.15	34.14	53.22
9.7	9.75	15.86	26.34
9.8	9.85	25.00	41.93
9.9	9.85	25.	41.96
9.8	9.35	50.	79.65
8.9	8.8	25.	37.48
8.7	8.65	17.8	26.23
8.6			
			892.90

49

EMR

BM. 44 1.49 \leftarrow 418.55 \leftarrow 417.06 \leftarrow 408.69 \leftarrow 408.69

411+00 $\left(\frac{516}{69}\right)$ 1.1 417.4 408.69

+50 4.9 413.6 406.85

411+74.21 } Anchor.
 411+77.21 }
 411+80.21 } $\left(\frac{516}{56}\right)$
 411+80.65 } Back = 411+81.01 Ahead.
 equation.

412+00 8.5 410.0 405.02

+50 10.6 408.0 403.40

413 11.2 407.4 403.20

T.P 5.30 412.55 11.30 407.25

413+50 4.8 407.8 403.00

414 4.2 408.4 402.80

+50 4.1 408.4 402.60

415 4.4 408.2 402.40

+50 4.7 407.8 402.20

416 5.0 407.6 402.00

+50 $\left(\frac{516}{70}\right)$ 5.3 407.2 401.80

417 6.1 406.4 401.60

+50 7.0 405.6 401.40

418 5.7 406.8 401.30

EMR EMR EMR EMR EMR EMR

Ar. Dist Cu yds. (50)

Cut Ar. Dist Cu yds.

8.65 7.20 10.61

8.7 7.70 50.0 65.59

6.7 6.20 24.21 25.57

5.71 5.6 Excavation Anchor. -

5.3 5.30 0.44 40

5.3 5.15 18.93 16.61

5.0 4.80 50. 40.89

4.6 4.40 50. 37.48

4.2 4.50 50. 38.33

4.8 5.20 50. 44.30

5.6 5.70 50. 48.55

5.8 5.80 50. 49.41

5.8 5.70 50. 48.55

5.6 5.60 50. 47.70

5.6 5.50 50. 46.85

5.4 5.10 50. 43.45

4.8 4.50 50. 38.33

4.2 4.85 50. 41.32

5.5 4.85 50. 41.32

643.94

(516/70) <412.55>

(516/59)

T.P. 5.56 <411.63> 6.42 <406.13>

418+10 5.2 406.4 401.34

+34 3.2 408.4 401.31

+50 3.1 408.5 401.29

419 3.4 408.2 401.24

New Bl #45 4.46 <412.42> 3.67 <407.96>

+10.44 bc. 4.2 408.2 401.23

+25 4.3 408.1 401.21

+50 4.5 407.9 401.19

+66.77 EC. 4.7 407.7 401.17

420 5.0 407.4 401.14

+48.93 5.1 407.3 401.09

+50 5.1 407.3 401.09

+75 5.0 407.4 401.06

421 5.0 407.4 401.03

+25 4.9 407.5 401.01

+50 4.8 407.6 400.98

~~cut cut cut~~

cut Ar. cut Dist feet. Cu yds.

5.3 10. 9.03

5.1 6.1 24. 24.94

7.1 7.15 16. 19.49

7.2 7.10 50. 60.48

7.0 7.00 10.44 12.45

7.0 6.95 14.56 17.24

6.9 6.80 25. 28.96

6.7 6.60 16.77 18.86

6.5 6.40 33.23 36.23

6.3 6.25 48.93 52.10

6.2 6.20 1.07 1.13

6.2 6.25 25. 26.62

6.3 6.35 25. 27.04

6.4 6.45 25. 27.47

6.5 6.55 25. 27.90

6.6 389.94

~~cut cut cut~~

389.94

(51)

421+75	412.42	4.6	407.8	400.96
422		4.2	408.1	400.93
422+21.0 ² Back	}	3.8	408.6	400.91
422+36.68 Ahead				
422+80		2.3	410.1	400.87
423+10		2.4	410.0	400.84
+16.78	} Struct Ex Class 3		409.7	400.82
+22.78			409.5	400.82
TP. 3.27		2.81	409.6	
423+25.15 Back = 423+27.28 ahead			409.5	400.82
423+50		3.9	409.0	400.79
+62.5			408.6	400.78
424		5.4	407.5	400.74
+22			406.6	399.94
+50		7.5	405.4	399.11
425		8.2	404.7	397.60
+41.7			402.8	396.34
+50		10.5	402.4	396.28
426		10.9	402.0	395.87
+32.1	} Struct Ex Class 3		401.9	395.6
+34.6			401.9	395.6
+42.8			401.8	395.5
+50.0			401.8	395.5
427		11.1	401.8	395.45
TP + 0.7		11.4	401.5	395.0
ok on County B.M.		5.38	406.65	400.32

516/60

516/71

528/58

516/71

Cut	Ar. Cut	Dist feet	Cu yds.
6.70		25.0	28.54
6.8			
7.05		25.0	30.03
7.3			
7.5		21.0	26.86
7.7			
8.45		43.3	62.36
9.2			
9.2		30.0	47.02
9.2			
9.05		6.78	10.45
8.9			
8.7			
8.7		2.37	3.51
8.2		22.7	32.71
7.8		12.0	16.36
7.3		38.0	48.88
6.7		22.0	26.24
6.3		28.0	31.01
6.1			
6.1		50.0	57.07
6.5		41.7	48.31
6.1		8.3	8.91
6.1			
6.1		50.0	51.97
6.3		32.1	33.91
6.3			
6.35		7.2	7.79
6.4			
6.45		55.3	62.64
6.5			
6.5		57.0	63.45

Struct Ex Class 3 528/57

Struct Ex Class 3 528/58

Total Item Class 1 Ex yds

11343.34

CLASS - 3 - EXCAVATION.

EL CAPITAN - LAKESIDE PIPE LINE
CITY SECTION STA 103+54 1/2 LAKESIDE

55

Cu Yds.

STRUCTURE EXCAVATION.

includes Back fill. CLASS 3. ITEM 43.

PUMPOUT BOX FOR BLOW OFF (531/29)

STA. See (530/19) FB. Elev. Grade
134+47 10' to R of Trench 502.7 495.3

outside Size of Box
Cut 7.2 x 5 x 4
Cuft 144.0
Cu Yds. 5.33 *emb*

(530/28) PUMPOUT BOX FOR BLOW OFF

154+75 10' to R of Trench 500.8 492.5

8.3 x 5 x 4
166.0
6.15 *emb*

(531/36)

Anchor Sta. 159+96.95 to 159+99.45

Sta.	Seedling No. 564	Distance	Ground	Bottom of Pipe
159+96.95		1.25	505.6	497.9
159+98.20			(529/73)	497.9
159+99.45		1.25	505.6	496.85

width	Depth	Cu Yds.
7.7 x 4.0	30.80	50.53
7.7 x 6.5	50.05	
8.8 x 9.0	79.20	85.25
8.8 x 9.0	57.20	
		5.0 <i>emb</i>

VALVE CHAMBER.

Sta.	Location	Ground El.	Grade Bottom of Concrete
159+99.45	4.83 Left of C	505.6	496.85
"	9.83 Right " "	505.7	496.75
160+08.11	4.83 Left of C	505.5	496.95
"	9.83 Right " "	505.7	496.90

8.75 } 8.85 x 14.66 = 129.74
8.95 }
8.55 } 8.675 x 14.66 = 127.18
8.80 }

$\frac{129.74 + 127.18}{2} \times 8.66 = 1112.46$
Cuft x *emb*
41.20

Page Total

57.68 *emb*

CLASS 3 - STRUCT. EXCAVATION

Sta	Anchor	Ground Elev.	Grade 1'-below	Cut	Area Sq ft	Av Area Sq ft	Dist Between Sections	Cu ft	Cu yds
236+73.24	Width Trench Top 3.5 Bottom 3.00 3.20 Ar 509 Max Gr. 516	470.1	461.7	8.4	57.28	58.26	3.70	215.54	
236+76.94	3.5 4.0 3.00 3.30	470.0	461.2	8.8	59.22		3.70	220.54	
236+80.60	3.45 4.06 3.00 3.40 1.0 above pipe (+ to top cut) 1.0 below top	469.9	461.2	8.7	60.47	59.85	3.70	226.44 221.44	emr
Total								466.46 437.00	16.55 16.18

PUMP OUT BOX FOR BLOWOFF

Sta	Description	El. Ground	Grade	Cut	Area Sq ft	Av Area Sq ft	Distance	Cu ft	Cu yds
258+00	10.2 to R of Trench	451.1	443.3	7.8	58.4		156.0	5.78	emr

ANCHOR

Sta	Ground El.	Ground	Ground	Grade	Cut	Area Sq ft	Av Area Sq ft	Distance	Cu ft	Cu yds
312+14.82	439.3	439.0	439.0	431.2	7.8	71.55	82.81	1.25	103.51	
312+16.07	439.3	439.0	438.9	431.2	7.8	94.07			9.09	emr
312+16.07	439.2	439.2	438.9	430.5	8.5	101.77				
312+17.32	439.2	438.9	438.7	430.5	8.4	125.29	113.53	1.25	141.91	

VALVE CHAMBER

Sta	Ground El.	Ground	Ground	Grade	Cut	Area Sq ft	Av Area Sq ft	Distance	Cu ft	Cu yds
312+17.32	438.7	439.2	438.0	430.35	8.15	106.43	8.77	76.5	180.98	
312+25.49	438.8	436.6	436.2	430.45	8.15	89.44	6.07	5.75	53.66	

80.15
80.08
emr

CLASS 3 STRUC. EXCAVATION.

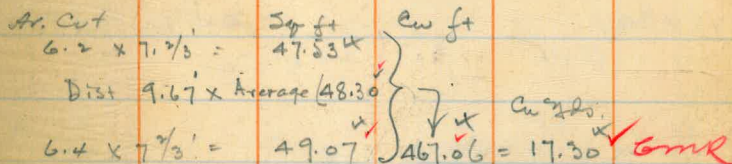
PUMP OUT BOX FOR BLOWOFF

312+12.0	531 49	Ground 437.1	Bottom Box 429.3
0.3	excavated		



VALVE CHAMBER - PRESS. REGULATOR

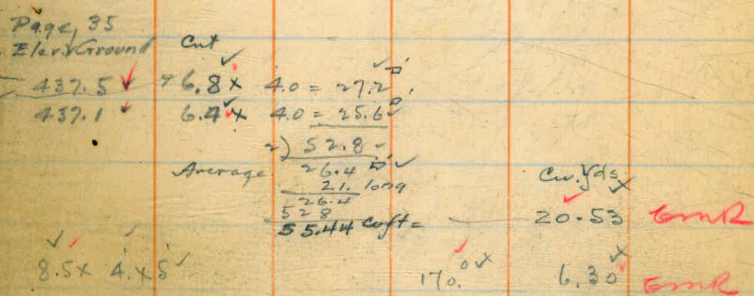
313+58.17	530 55	6.5' cut 36.8 EI	36.4	3.83 R.	430.35
313+67.84		6.5' cut 36.8 EI	36.4	3.83 R.	430.25



* See Page 59

MANIFOLD FOR VENTURI METER TUBE

Sta 313+00.5 to 313+21.5	4.14' (493.07)	438.93 B.M.
top 6" Conc. Slab each end	11.90	431.17
bottom 6" " " "	" " "	430.67



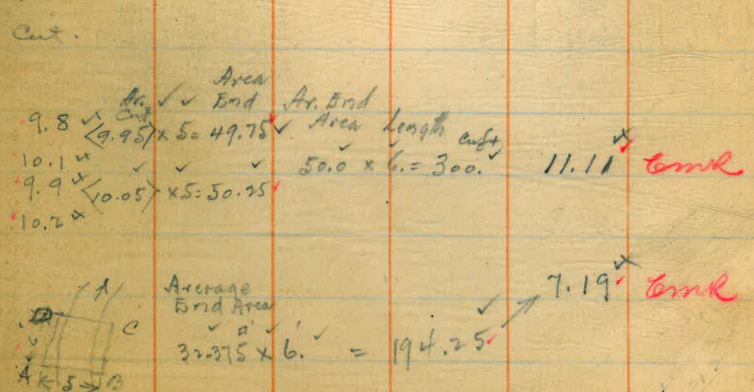
PUMP OUT BOX FOR BLOWOFF

322+00	531 52	Ground 435.7	Bottom Box 427.2	8.5' cut
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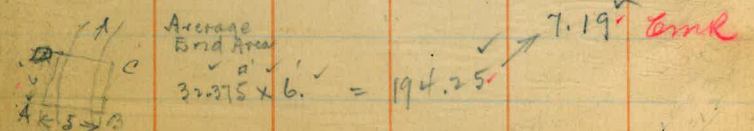


ANCHOR

423+19.78	531 64	315.3	414.9
A	5.4	409.6	399.7
B	5.1	409.5	399.7
C	5.3	409.8	399.7
D	5.0	409.6	399.7
	5.0	409.9	399.7



411+77	531 64	Ground 404.2	Bottom Box 404.7	6.5' cut
A	411.2	404.2	404.7	6.5
B	411.3	404.7	404.5	6.6
C	411.0	404.5	404.5	6.5
D	410.8	404.5	404.5	6.3



PUMP OUT BOX FOR BLOWOFF ⁵³¹/₅₇

	Ground	392.9
426+14 (To Ref Line)	402.0	392.9
ANCHOR. ⁵³¹ / ₆₆		
426+32.1	401.9	392.9
426+34.6	401.9	"

Cut Size Ch.

9.1	x 4 x 5 =
9.0	x 5.28 = 47.52
9.0	x 10.0 = 90.00
<u>137.52 x 2.5 =</u>	

Cu ft Cu 720.

182.0	6.74
171.90	6.37

Valve Chamber.

Original Ground ⁵³¹/₃₂

	407.2	401.9	401.7	402.5	402.3
426+34.6					
El.	402.0	401.9	401.7	402.5	402.3
Rob	5.2	5.3	5.5	4.7	4.9
Dist.	5.3	0	3.0	5.0	9.1
Gr.	392.9			392.8	
Cut	9.1	9.0	8.9	9.7	9.5

Area Sq ft

9.05 x 5.3 =	47.97
8.95 x 3.0 =	26.85
9.30 x 2.0 =	18.60
9.65 x 4.1 =	39.36
<u>132.78</u>	

Average Area Sq ft

Dist. Cu ft

132.78	
130.40	
<u>263.18</u>	
131.59	8.2
1079.04	

Ground

	401.9	401.8	401.6	402.5	402.3
426+42.8					
El.	401.9	401.8	401.6	402.5	402.3
Rob	5.3	5.4	5.6	4.7	4.9
Dist.	5.3	0	3.0	5.0	9.1
Gr.	392.0			392.9	
Cut	8.9	8.8	8.7	9.6	9.4

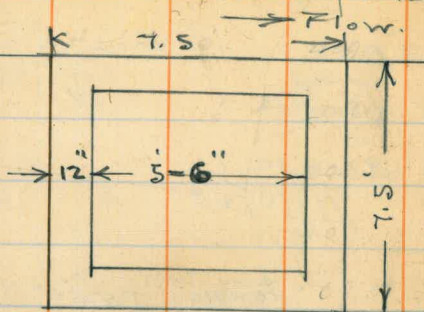
8.85 x 5.3 =	46.90
8.75 x 3.0 =	26.25
9.15 x 2.0 =	18.30
9.5 x 4.1 =	38.95
<u>130.40</u>	

Cu 720.
39.96
6mR

5301

CLASS 3 STRUC EXCAVATION

✓ 531
53
Flex. of Floor Recording Sta



Class 3 Ex.

- 7.5 ✓
- 7.5 ✓
- 5.5 ✓
- 5.5 ✓

$$26.0' \times 1' \times .35 = 9.1 \quad Cw \text{ sta.} = 0.34 \quad \text{6MP}$$

CLASS 4 EXCAVATION INCLUDES BACKFILL.

EXCAVATION FOR APPURTENANCES AND SMALL PIPE

EXCAVATION

STATION	Length Trench	Elev. Ground	Grade
134+47	10.2	502.7	497.95

Cut	Shape Trench	Cu. Yds.
4.7	20" Vert Sides 10.2 x 4.7 x 1 1/3' = 79.90 + Under Pipe etc 3x3x1 = 9.00	88.90 = 3.29 emb

STATION	Length Trench	Elev. Ground	Grade
154+75	10.2	500.8	494.35

Cut	Shape Trench	Cu. Yds.
6.5	Bottom 6' Vert Sides + above 6' 1/2:1 Slope. 10.2 x 6 x 1 1/3' = 102.0 " x 5 x 1 1/3' = 9.75 Ex under pipe etc 3 x 1 1/3' x 7 = 3.50	115.25 = 4.27 emb

6" BLOW OFF TRENCH

STATION	Trench	Ground	Grade
227+20	0+0	476.5	469.6
	0+19	476.6	469.5
	0+25.2	469.5	469.5

Cut	Shape Trench	Cu. Yds.
6.9	Bottom 6' - 20" wide Vert Sides + above 6' = 1/2:1 Slopes. 1.67 + 2.12 x 9 = 1.70 x 11.7 = 19.89 6 x 1 1/3' = 10.00 2.14 x 11.1 = 23.75 6 x 1 1/3' = 10.00	63.64
7.1		14.14
0.0	4.0' x 19.0' = 76.00 6.07' x 6' = 36.42	112.04
	Excavate under pipe etc 3' x 3' x 1' = 9.00	121.04

4" BLOW OFF TRENCH

STATION	Trench	Ground	Bottom Ev
258+00	0	451.1	445.2
	0+10.2	451.1	445.2

Cut	Shape Trench	Cu. Yds.
5.9	10.2 x 5.9 x 1 1/3' = 100.30	100.30
5.9	+ under pipe etc 7 x 3 x 1 1/3' = 3.50	103.80 = 3.84 emb

STATION	Trench	Ground	Bottom Ev
312+14	0+0.3 from & Pipe	437.3	431.7
	0+03	437.3	431.7

Cut	Shape Trench	Cu. Yds.
5.6	3.0 x 5.6 x 1 1/3' = 28.0	28.0
5.6	+ under pipe 3 x 3 x 1 = 9.0	37.0 = 1.37 emb

2288

CLASS 4 EXCAVATION.

20" Trench
Slopes above 6' cut

4" Blowoff Trench

322+01 (531/52)

0+00 = 2.3' from 8" Pipe
8.9'

Ground	Grade
435.8	429.0
435.7	428.9

Cut	Cu ft
6.8	$6 \times 8.9 \times 1\frac{2}{3} = 89.0$
6.8	$.8 \times 8.9 \times (\frac{1.67 + 2.07}{2}) = 13.31$
+ under Pipe	
$3 \times 1\frac{2}{3} \times .7$	3.50
	$105.81 = 3.92$

6" Blowoff Trench

388+27 (531/55)

0+00 = 2.3' from 8" Pipe
0+16
0+20
0+24.4
0+24.4
0+27.9

space to turn
grade of 18" blowoff
allow 1/2" grade

Ground	Grade
403.2	397.7
403.0	397.2
400.7	397.1
400.7	397.0
400.7	396.5
400.7	396.5

Area Sq ft	Cu ft
5.5	$9.17 \times 9.42 \times 1.6 = 150.72$
5.8	$9.67 \times 7.83 \times 4 = 31.32$
3.6	$6.00 \times 6.08 \times 4.4 = 26.75$
3.7	$6.16 \times 12.6 \times 3.5 = 44.10$
3x 4.2	
3x 4.2	
+ under Pipe etc 3x3x1	9.00

261.89 x 9.70 = 2540.0

4" Blowoff Trench

351+75 (531/36)

0+00
0+10.7
0+10.7
0+14.0

Ground	Grade
456.5	451.7
454.8	451.4
454.8	450.1
454.6	450.1

Sq ft	Cu ft
4.8	$8.00 \times 6.83 \times 1.07 = 73.08$
3.4	$5.67 \times 13.8 \times 3.3 = 45.54$
3x 4.7	
3x 4.5	
+ under Pipe etc 3x1 2/3 x .7	3.50

122.12 = 4.52 = 1814

CLASS A EXCAVATION

4" Pipe off Trench Sta 426+14 ⁵³¹/₅₇

Sta	Rot.	Ground	Grate
0+00	5.3	402.6	395.0
0+11	5.9	402.0	395.0

Cut. End Area → Cu ft Cu yds

6x1.75 = 10.5
 1.6x(1.75+2.47) = 3.31
 13.31

7.6
 7.0

20" $\frac{1}{2}$ Slope

Average End Area $\frac{10.5 + 10.0}{2} = 10.25$
 $12.61 \times 11 = 138.71$

6x1.75 = 10.5
 1.6x(1.75+2.17) = 1.9
 11.9

Under Pipe etc 3x173x.7 = 3.52

142.27 = 5.27 ⁶ emr

Drain from Valve Cham Sta 160+

0+00 = 22 Side Valve "

Top Cham	2.30	509.0	506.70
0+00	4.3	504.7	496.4
0+21	4.3	504.7	496.2
0+42	10.7	498.3	496.0

Cut $\frac{1}{2}$ Slopes

20" $\frac{1}{2}$ Slopes

Cut	Area	Average	Dist	Cu ft
8.3	15.17	15.46	21' = 324.66	
8.5	15.75	9.80	21' = 205.80	
2.3	3.84			

530.46 ^{Cu ft} = 19.65 ^{emr}

total 42.50

CONCRETE STRUCTURES.

Sta. PUMP OUT Chamber Cwft Cu Yds.

134+47 Floor 4x5x5 = 10.0
 2 Sides 2(5x7.9x5) = 39.5
 2 Ends 2(3x7.65x5) = 22.95
 Rebar 2(.5x25x5) = 2.5
 Total = 75.0

531
 Top floor to top conc 8.4

PUMP OUT Chamber Dwg No. D 572.

154+75 Floor = 4x5x5 = 10.0
 2 Sides 2(5x8.5x5) = 42.5
 2 ends 2(3x8.25x5) = 24.75
 2 Sides recesses 2(2.5x25x5) = 6.25
 Total = 83.5

531
 Top floor to top of conc. 9.0

159+96.95 to 159+99.45 Anchor Dwg No. D 564

E Side of Valve Chamber Section Cwft Cuft
 159+96.95 4.0 x 5.0 = 20.0
 (Average 4.9 x 2.5) = 117.25
 159+99.45 9.0 x 8.0 = 72.0
 At bottom 2 Steps 4 lengths = 8.94
 3.88 Dia. Length, cwt = 126.19
 Pipe 2.5 x 11.3 = 28.25
 Total 97.94

C
 3.63
 cmt

159+99.45 to 160+08.11 Valve Chamber

See Page 68.

159+99.45 } Valve Chamber 1

160+08.11 } See See Sheet. See Pg 68

531
 65 Elev Top Conc 506.7

*
 d
 18.68

Anchor width 6.0
 236+78 6.2 7.44 40.94
 236+78 6.3 7.16 40.38
 236+80 6.4 7.51 41.73
 Less Vol of Pipe 13.1 x 7 = 91.70
 194.27

531
 65 Pump Out Chamber
 Floor 4x5x5 = 10.0
 Walls (5+5+3+3)x5x8 = 64.0
 5x25x5 = 6.25
 Total 80.25

312+12 Pump Out Chamber
 Floor 4x5x5 = 10.0
 Walls (5+5+3)x5x5.4 = 35.10
 5x25x5 = 6.25
 Total 51.35

Anchor 312+14.8 to 312+17.32
 312+14.8 = 11 1/3 x 5.4 - 2.37 Pipe 5.85
 = 61.2 - 14.94 = 46.26

312+17.32 = 17.5 x 7.75 - 2.9 Pipe 5.85
 = 134.16 - 9.90 = 124.26
 Vol = 46.26 + 124.26 x 2.5 = 350.85

2.76
 cmt

9
 1.69
 cmt

7.89
 cmt

Concrete Class 1

$\Delta 10.5$ $B.C. 3.5$ 10.8 K
 $A = 438.98$ $C = 439.07$
 $B = 438.97$ $D = 438.95$

312+21 Valve Chamber

Floor $21\frac{1}{3} \times 8\frac{1}{6} \times .75 = 132.7$ cuft

+ Sump Box $8' \text{ long} \times 1.0' \times .5' = 4.0$ cuft

- " Floor $2.1 \times 1.0 \times .25 = -.525$

+ Difference = 136.20

Pier under 30" Valve Bottom

2.03 long at Bottom

1.55 " " Top

$2 \times \frac{3.58}{1.79} \text{ Ar.} \times 1\frac{1}{2} \text{ high} \times \frac{2}{3} \text{ wide} = 1.99$ cuft

Pier under 30" Valve

4.27 long

1.6 Ar. ht.

1.7 width

11.61

Pier under 20" Valve

2.77 long

1.00 wide

1.85 Ar. ht.

5.12

18.72

Side Wall to bottom Roof Slab

$(10'-4" + 10'-4" + 6'-6") \times \frac{5}{8} \times 6'-9\frac{1}{2}" = 153.1$

$(11'-4" + 11'-4" + 6'-6") \times \frac{5}{8} \times 7'-1\frac{1}{2}" = 173.1$

326.91

Roof Slabs

$10\frac{1}{3} \times 8\frac{1}{6} \times \frac{5}{8} = 70.32$

$11\frac{1}{3} \times 8\frac{1}{6} \times \frac{5}{8} = 61.70$

132.02

Beams $5/6 \times 5/6 \times 6.5 = 4.51$

$1 \times 7.5 \times 6.5 = 4.88$

9.39

Less Opening for Manhole

$\pi \times \frac{10}{2} \times \frac{2}{3} = 1.45$

Less Vol. Pipe in Walls + Opening for Pipe

$1 \times 2.71 \text{ diam} = 5.73$

$2 \times 2.3' = 8.31$

$1 \times 3' = 7.07$

+ 623.24

Total $604.20 = 22.38$

Concrete Class 1

Elev. Top Conc. 437.85

313+63 Valve Chamber

Floor $7\frac{2}{3} \times 9\frac{2}{3} \times .75 = 55.58$ cuft

+ Sump $6 \text{ lin ft} \times 1' \times .5' = 3.00$ cuft

- " open floor $1 \times 1 \times .25 = -.25$

58.33

Side Walls

$(8+8+7\frac{2}{3}+7\frac{2}{3}) \times 6' \times \frac{10}{12} = 156.67$

Roof Top of Walls Same level

$7\frac{2}{3} \times 9\frac{2}{3} \times \frac{10}{12} = 61.76$

Piers under Valve

$2 \times (1.2 + .7) \times 1.3 \times 3' = 7.41$

Less $20"$ opening for Manhole

$\pi \times \frac{10}{2} \times \frac{10}{12} = 1.82$ cuft

Less Vol. Pipe in Walls

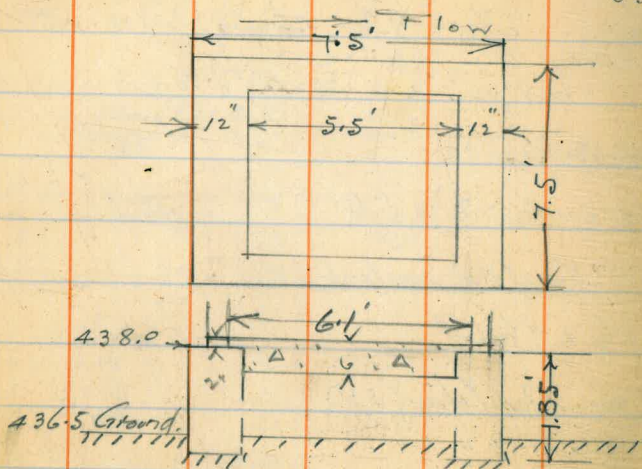
$2 \times (\pi \times \frac{5}{2}) \times \frac{5}{6} = 5.24$

- 7.06 + 284.17

Total + 277.11 10.26

Concrete Class 1.

Recording Sta $\frac{531}{53}$



Concrete Wall

7.5 ✓
7.5 ✓
5.5 ✓
5.5 ✓

$$26.0 \times 1. \times 1.85 = 48.1 \text{ cuft} = 1.78 \text{ cu yd}$$

Floor $5.5 \times 5.5 \times .5 = 15.12 \text{ cu yd} = .56 \text{ cu yd}$

$3 \times 16' \times 23.2 = 1.11 \text{ cu yd} = .04 \text{ cu yd}$

2.38 ✓
5 bmr

Concrete Class 1.

(65)

Yerstoni Meter Tube $\frac{531}{61}$

Mat - Sta 313+00.50 to 313+21.50

long wide thick cuft
 $21 \times 4. \times .5 = 42 \text{ cu yd}$

cu yd
 $\times 1.56 \text{ ✓}$
bmr

Pier Sta 313+03.86

3' long \times 1.0' wide \times 1.6' high
 $3 \times 1. \times 1.6 = 4.8 \text{ cuft}$

Pier Sta 313+09.36

3' long \times 1' wide \times 2.0' high
 $3 \times 1. \times 2. = 6.0 \text{ cuft}$

Pier Sta 313+15.66

3' long \times 1' wide \times 1.7' high
 $3 \times 1. \times 1.7 = 5.1 \text{ cuft}$

$15.9 \text{ cu yd} = \text{cu yd} = 1.59 \text{ ✓}$
bmr

CONCRETE CLASS 1.

PUMPOUT CHAMBER.

Sta 322 to 1 Floor 4x5x.5 = 10.0^{cuft} ✓

Side Walls (5+5+3+3)x.5x8.1 = 64.8^{cuft} ✓
Top " " 5x5x.25 = 6.25^{cuft} ✓

75.425 = 2.79^m ✓ *only*

PUMPOUT CHAMBER.

426+14 ^{cuft.}

Floor 4x5x.5 = 10.0^{cuft} ✓

Roof 4x5x.5 = 10.0^{cuft} ✓

Side Walls (5+5+3+3)x.5x7.62 = 60.96^{cuft} ✓

80.96^{cuft} = 3.00^m ✓ *only*
P

CONCRETE CLASS 1.

66

ANCHOR ON LINE.

(531/64) (528/57)

Sta 411+74.2 to 411+80.2

5x5x6' = 150.00^{cuft} ✓

- 6x37" Diarr Pipe

incl plate wrapping

7.47 cuft 6' x 6' = 44.82^{cuft} ✓

105.18 = 3.90^m ✓ *only*

ANCHOR ON LINE.

Sta 423+16.78 to 423+22.78

(531/31) (528/57)

5x5x6' = 150.00^{cuft} ✓

- 6x37" Diarr Pipe

incl plate wrapping

7.47 cuft 6' x 6' = 44.82^{cuft} ✓

105.18 = 3.90^m ✓ *only*

CONCRETE CLASS 1.

ANCHOR STA 426+32.1 to 426+34.6

(531/66) Dwg. No 571 (531/32) $\frac{2.1}{2.1}$
426+32.1 to 6" above top Pipe = 398.7

(531/32) Bottom Concrete 392.9
5.8 high

(531/66) Width $5.28 \times 5.8 = 30.62$

426+34.6 to Top Valve Chamber = 401.50

(531/32) Bottom Concrete 392.90

8.6

(531/66) Width Concrete 10.0

8.6 x 10.0 = 86.00

Average end Area

$\frac{30.62 + 86.00}{2} = 58.31$

Volume Cu ft $58.31 \times 2.5 = 145.77$

Less Vol. Pipe + wrapping thru Anchor.

- 37" diam = $7.47 \times 22 = 164.34$

Total $145.77 - 164.34 = -18.57$

6mm

CONCRETE CLASS 1.

67

Valve Chamber Sta 426+34.6 to 426+42.8

See Drawing No D 571 File 2714-A-23.

" Field Book. (531/32) (531/69) (531/67)

Floor: $8\frac{1}{6} \times 14\frac{5}{16} \times \frac{3}{4} = 88.30$

+ For Sump (2+2+1) $5 \times 1 = 3.0$
- Diff Floor = 2.75

Side Walls

$(14\frac{5}{16} + 14\frac{5}{16} + 6\frac{1}{2} + 6\frac{1}{2}) \times \frac{5}{6} \times 7.0 = 244.03$

Beam $1 \times 5\frac{1}{6} \times 6\frac{1}{2} = 5.42$

Roof $8\frac{1}{6} \times 14\frac{5}{16} \times \frac{5}{6} = 98.03$

Piers (531/72) $\frac{4.15 + 4.55}{2} \times 1.2 \times 1.7 = 8.87$

$\frac{2 + 1.5}{2} \times 2.36 \times .67 = 2.77$

Less Opening on top - 1.82

" Pipe in Walls: $2 \times \frac{10 \times 10}{4} = 10.5$

$\frac{12.60}{2} = 6.30$

Total $88.30 + 3.0 - 1.82 - 10.5 - 6.30 = 62.78$

437.85

16.22

6mm

* Concrete Class.
Valve Chamber.

Sta 159+99.45 to 160+08.11

Reference Drawing No. D 564-2714-2 D3

FB. 529 530
73 6-56 C. ft C. yds.

Floor $14\frac{2}{3} \times 8\frac{2}{3} \times .75 = 95.33$

Walls $(13+13+8\frac{2}{3}+8\frac{2}{3}) \times 8 \times \frac{10}{12} = 297.92$

Roof, including Top of Sidewalls

$14\frac{2}{3} \times 8\frac{2}{3} \times \frac{10}{12} = 105.93$

Beam $1 \times .75 \times 7 = 5.25$

Extra at Sump. - Floor left out $1 \times 1 \times .75$

+ " $2 \times 2 \times .5 = 2.00$
+ Sidewalls $(2+2+1+1) \times .5 \times .5 = 1.5$
 $+ 3.5 - .75 = 2.75$

Valve Support

Bottom Sec: $5 \times 1.75 = 8.75$ Area ht
Top " $3.75 \times 1.33 = 5.00$ $6.875 \times 1.5/6 = 12.60$

Bonnet Support $2+1.5 \times 2\frac{1}{4} = 3.94$

$3.94 \times \frac{7\frac{1}{2}}{12} = 2.46$

Less Volume of Pipe. 16.035 522.24

$2 \left[\left(\frac{3.1416 \times 3.5^2}{6} \right) \frac{5.7}{6} \right] = 17.85$

Less 20" Manhole Opening 1.82 17.85 504.39 18.68

included on Page 63 total

Concrete Excavation State Highway

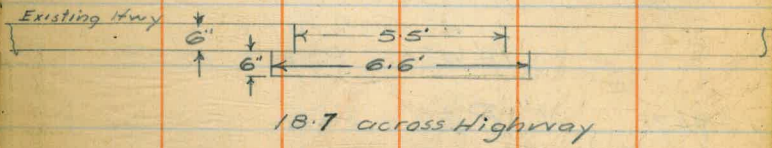
18.7 x 5.5' wide x .5' = 51.42^{cu ft}

18.7 x 6.6 " x .5' = 61.71^{cu ft}

Total 113.13

(531 / 60)

Reference Truss Report ^{Emly} 11/6/36



Appurtenances -

Sta
 134+47⁵⁰ 6" Blowoff
 1-6" Street ell.
 1-6" Gate Valve
 1-6" W.I. Pipe x 12'-6"

154+78 4" Blowoff
 1-4" Street ell.
 1-4" Gate Valve
 1-4" W.I. Pipe x 12'-8" ✓

159+92 4" P.A.Y. + Y.
 2-4" x 6" Nipples. ✓
 1-1/2" Coupling
 1-1/2" Brass Pet Cock
 1-4" Gate Valve
 1-4" Comb P.A.Y. + Y. Valve

227+20 6" Blowoff
 1-6" Street ell.
 1-6" Gate Valve
 1-6" W.I. Pipe x 25'-0"

234+00^{01.7} 4" P.A.Y. + Y. Valve
 1-4" x 12" Nipple
 1-4" x 6" "
 1-1/2" Coupling
 1-1/2" Brass Pet Cock
 1-4" Gate Valve
 1-4" Comb P.A.Y. + Y. Valve

234+00^{04.7} 4" P.A.Y. + Y. Valve

1-4" x 12" Nipple.
 1-4" x 6" "
 1-1/2" Coupling
 1-1/2" Brass Pet Cock
 1-4" Gate Valve
 1-4" P.A.Y. + Y. Valve

160+12 4" P.A.Y. + Y. Valve

1-4" x 12" Nipple ✓
 1-4" x 6" "
 1-1/2" Coupling
 1-1/2" Brass Pet Cock
 1-4" Gate Valve
 1-4" P.A.Y. + Y. Valve

258+00 4" Blowoff

1-4" Street ell.
 1-4" Gate Valve
 1-4" Black W.I. Pipe x 13'-0"

260+67 4" P.A.Y. + Y. }
 280+97 4" " " }
 2-6" x "
 2-12" x "
 2-1/2" Coupling
 2-1/2" Brass Pet Cock
 2-4" Gate Y.
 2-4" P.A.Y. + Y.

312+13 6" Blowoff
 1-6" Street ell.
 1-6" Pipe x 6'-5 1/2"
 1-6" Gate Valve

177+96^{6 Super.} 4" P.A.Y. + Y. Y

1-12" Nipple.
 1-6" Valve
 1-4" Valve
 1/2" Coupling 1/2" Brass Pet Cock.

Super.
 11/9/56

4" P.A.Y.
 313+51 - 2 1/2" Nipples.
 1 1/2" Coupling
 1 1/2" Brass Pet Cock

341+79 }
 +82.5 } 1-12" Nipple } each
 1-6" " }
 1-1/2" Coupling }
 1-1/2" Brass Pet Cock }

4" P.A.Y. + T. Valve.
 356+94 - Same as 341+78

4" P.A.Y. + T. Valve.
 367+92 - " " "

4" Blowoff
 322+01 - 1-4" St. Ell.
 13'-6" - 4" W.I. Pipe.
 4" Blowoff Gate Valve.

4" Blowoff
 351+75 - 1-4" Street Ell.
 13'-6" - 4" W.I. Pipe.
 4" Gate Valve.

388+28 - 6" Blowoff in 20" Steel Pipe
 28'-6" W.I. Pipe.
 1-6" Gate Valve
 1-6" Street Ell.

399+99.
 400+00 - 4" Comb P.A.Y. + T. Valve.
 1-12" Nipple
 1-6" "
 1-4" Gate Valve.
 1-1/2" Coupling
 1-1/2" Brass Pet Cock

8.2
 411+08 - 4" Comb P.A.Y. + T. Valve.
 1-12" Nipple.
 1-6" "
 1-4" Gate Valve.
 1-1/2" Coupling
 1-1/2" Brass Pet Cock.

426+14 - 4" Blowoff in Con Pump Out
 4" Street Ell. | Chamber.
 13'-11" 4" Pipe.
 1-4" Gate Valve

426+50. - 4" Comb P.A.Y. + T. Valve.
 1-12" Nipple
 1-6" "
 1-4" Gate Valve.
 1-1/2" Coupling.
 1-1/2" Brass Pet Cock.

313+01 ✓ 2- pcs ✓ 5' x 12" pipe
 351+75 ✓ 5' x 20" pipe
 388+28 - 5' x " " "
 2 27+05 3' x " " "
 " 7/36
 checked by Lopez 11/18/36

Eye Bolts in removable
 Covers
 160+00F - Valve Box 5 Bolts ✓
 312+20F " " 8 ✓
 313+63 " " 4 ✓
 426+38 " " 5 ✓
 22 "

Comb P A & Y. Valves each have
 1- 30" Pipe Vertically over
 Valve and Perforated CI
 Cover. (To be set in Concrete
 when road is To Grade.)

@ 4.17[#]/in foot
 @ 6.75[#] 137.5[#]

2 Bluff Med Covers. One of these
 1-9" Dia x 1/2" Thick. at Sta 388+44 one
 2 x 2.4[#] x 10.2[#] on 98-18 Project ✓
 49.0

74

(75)

(76)

(77)

98

CALCULATION OF EARTHWORK.

Width	HEIGHT														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	.02	.04	.06	.07	.09	.11	.13	.15	.17	.18	.20	.22	.24	.26	.28
2	.04	.07	.11	.15	.18	.22	.26	.30	.33	.37	.41	.44	.48	.52	.56
3	.06	.11	.17	.22	.28	.33	.39	.44	.50	.56	.61	.67	.72	.78	.83
4	.07	.15	.22	.30	.37	.44	.52	.59	.67	.74	.81	.89	.96	1.04	1.11
5	.09	.19	.28	.37	.46	.56	.65	.74	.83	.93	1.02	1.11	1.20	1.30	1.39
6	.11	.22	.33	.44	.56	.67	.78	.89	1.00	1.11	1.22	1.33	1.44	1.55	1.67
7	.13	.26	.39	.52	.65	.78	.91	1.04	1.16	1.30	1.42	1.55	1.68	1.81	1.94
8	.15	.30	.44	.59	.74	.89	1.04	1.19	1.33	1.48	1.63	1.78	1.92	2.08	2.22
9	.17	.33	.50	.67	.83	1.00	1.17	1.33	1.50	1.67	1.83	2.00	2.17	2.33	2.50
10	.18	.37	.56	.74	.93	1.11	1.30	1.48	1.67	1.85	2.04	2.22	2.41	2.59	2.78
11	.20	.41	.61	.82	1.02	1.22	1.43	1.63	1.83	2.04	2.24	2.44	2.65	2.85	3.06
12	.22	.44	.67	.89	1.11	1.33	1.55	1.78	2.00	2.22	2.44	2.67	2.89	3.11	3.33
13	.24	.48	.72	.96	1.20	1.44	1.68	1.92	2.16	2.41	2.65	2.89	3.13	3.37	3.61
14	.26	.52	.78	1.04	1.30	1.55	1.81	2.08	2.33	2.59	2.85	3.11	3.37	3.63	3.89
15	.28	.56	.83	1.11	1.39	1.67	1.94	2.22	2.50	2.78	3.06	3.33	3.61	3.89	4.17
16	.30	.59	.89	1.18	1.48	1.78	2.07	2.37	2.67	2.96	3.26	3.56	3.85	4.15	4.44
17	.31	.63	.94	1.26	1.57	1.89	2.20	2.52	2.83	3.15	3.46	3.78	4.09	4.41	4.72
18	.33	.67	1.00	1.33	1.67	2.00	2.33	2.67	3.00	3.33	3.67	4.00	4.33	4.67	5.00
19	.35	.70	1.06	1.41	1.76	2.11	2.46	2.82	3.17	3.52	3.87	4.22	4.57	4.92	5.28
20	.37	.74	1.11	1.48	1.85	2.22	2.59	2.96	3.33	3.70	4.07	4.44	4.81	5.18	5.56
21	.39	.78	1.17	1.55	1.94	2.33	2.72	3.11	3.50	3.89	4.28	4.67	5.06	5.44	5.83
22	.41	.81	1.22	1.63	2.04	2.44	2.85	3.26	3.67	4.07	4.48	4.89	5.30	5.70	6.11
23	.43	.85	1.28	1.70	2.13	2.56	2.98	3.41	3.83	4.26	4.68	5.11	5.54	5.96	6.39
24	.44	.89	1.33	1.78	2.22	2.67	3.11	3.56	4.00	4.44	4.89	5.33	5.78	6.22	6.67
25	.46	.92	1.39	1.85	2.31	2.78	3.24	3.70	4.17	4.63	5.09	5.56	6.02	6.48	6.94
26	.48	.96	1.44	1.92	2.41	2.89	3.37	3.85	4.33	4.82	5.30	5.78	6.26	6.74	7.24
27	.50	1.00	1.50	2.00	2.50	3.00	3.50	4.00	4.50	5.00	5.50	6.00	6.50	7.00	7.50
28	.52	1.04	1.55	2.07	2.59	3.11	3.63	4.15	4.67	5.18	5.70	6.22	6.74	7.26	7.78
29	.54	1.07	1.61	2.15	2.68	3.22	3.76	4.30	4.83	5.37	5.91	6.44	6.98	7.52	8.06
30	.56	1.11	1.67	2.22	2.78	3.33	3.89	4.44	5.00	5.55	6.11	6.67	7.22	7.78	8.33
31	.57	1.15	1.72	2.30	2.87	3.44	4.02	4.59	5.17	5.74	6.32	6.89	7.46	8.04	8.61
32	.59	1.18	1.78	2.37	2.96	3.56	4.15	4.74	5.33	5.92	6.52	7.11	7.70	8.30	8.89
33	.61	1.22	1.83	2.44	3.05	3.67	4.28	4.89	5.50	6.11	6.72	7.33	7.94	8.55	9.17
34	.63	1.26	1.89	2.52	3.15	3.78	4.40	5.04	5.67	6.29	6.93	7.56	8.18	8.81	9.44
35	.65	1.30	1.94	2.59	3.24	3.89	4.53	5.18	5.83	6.48	7.13	7.78	8.42	9.08	9.72
36	.67	1.33	2.00	2.67	3.33	4.00	4.66	5.33	6.00	6.67	7.33	8.00	8.67	9.33	10.00
37	.68	1.37	2.06	2.74	3.42	4.11	4.79	5.48	6.17	6.85	7.54	8.22	8.91	9.59	10.28
38	.70	1.41	2.11	2.82	3.52	4.22	4.92	5.63	6.33	7.03	7.74	8.44	9.15	9.85	10.56
39	.72	1.44	2.17	2.89	3.61	4.33	5.05	5.78	6.50	7.22	7.95	8.67	9.39	10.11	10.83
40	.74	1.48	2.22	2.96	3.70	4.44	5.18	5.92	6.67	7.41	8.15	8.89	9.63	10.37	11.11

Table gives cu. yds. in 1 ft. of a triangle of given width and height. Corrections for tenths of width are one tenth the values found under each height considering the widths from 1 to 9 as tenths and similarly the corrections for tenths of height are one tenth the figures opposite width considering the heights from 1 to 9 as tenths. Thus if $w = 16.2$ and $h = 5.3$, cu. yds. $= 1.48 + .028 + .039 = 1.597$ cu. yds. or practically 160 cu. yds. per 100 ft. If w exceeds 40 ft., use one half and multiply result by 2, if both w and h are large use one half of each and multiply result by 4. Any cross-section may be divided into triangles by the following rule. To the triangle of the sum of the outside cuts (or fills) $= h$, and $\frac{1}{2}$ the roadbed $= w$, add the triangles formed by taking the distance out to each break in turn ($= w'$) by the difference between the cuts (or fills) on each side of it ($= h'$) always subtracting the outer from the inner.

DISTANCES FROM CENTER OF ROADWAY FOR CROSS-SECTIONING.
Roadway 16 feet wide. Side Slopes 1 on 1½
For Single Track Embankment.

H	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	H
0	8.0	8.2	8.3	8.5	8.6	8.8	8.9	9.1	9.2	9.4	0
1	9.5	9.7	9.8	10.0	10.1	10.3	10.4	10.6	10.7	10.9	1
2	11.0	11.2	11.3	11.5	11.6	11.8	11.9	12.1	12.2	12.4	2
3	12.5	12.7	12.8	13.0	13.1	13.3	13.4	13.6	13.7	13.9	3
4	14.0	14.2	14.3	14.5	14.6	14.8	14.9	15.1	15.2	15.4	4
5	15.5	15.7	15.8	16.0	16.1	16.3	16.4	16.6	16.7	16.9	5
6	17.0	17.2	17.3	17.5	17.6	17.8	17.9	18.1	18.2	18.4	6
7	18.5	18.7	18.8	19.0	19.1	19.3	19.4	19.6	19.7	19.9	7
8	20.0	20.2	20.3	20.5	20.6	20.8	20.9	21.1	21.2	21.4	8
9	21.5	21.7	21.8	22.0	22.1	22.3	22.4	22.6	22.7	22.9	9
10	23.0	23.2	23.3	23.5	23.6	23.8	23.9	24.1	24.2	24.4	10
11	24.5	24.7	24.8	25.0	25.1	25.3	25.4	25.6	25.7	25.9	11
12	26.0	26.2	26.3	26.5	26.6	26.8	26.9	27.1	27.2	27.4	12
13	27.5	27.7	27.8	28.0	28.1	28.3	28.4	28.6	28.7	28.9	13
14	29.0	29.2	29.3	29.5	29.6	29.8	29.9	30.1	30.2	30.4	14
15	30.5	30.7	30.8	31.0	31.1	31.3	31.4	31.6	31.7	31.9	15
16	32.0	32.2	32.3	32.5	32.6	32.8	32.9	33.1	33.2	33.4	16
17	33.5	33.7	33.8	34.0	34.1	34.3	34.4	34.6	34.7	34.9	17
18	35.0	35.2	35.3	35.5	35.6	35.8	35.9	36.1	36.2	36.4	18
19	36.5	36.7	36.8	37.0	37.1	37.3	37.4	37.6	37.7	37.9	19
20	38.0	38.2	38.3	38.5	38.6	38.8	38.9	39.1	39.2	39.4	20
21	39.5	39.7	39.8	40.0	40.1	40.3	40.4	40.6	40.7	40.9	21
22	41.0	41.2	41.3	41.5	41.6	41.8	41.9	42.1	42.2	42.4	22
23	42.5	42.7	42.8	43.0	43.1	43.3	43.4	43.6	43.7	43.9	23
24	44.0	44.2	44.3	44.5	44.6	44.8	44.9	45.1	45.2	45.4	24
25	45.5	45.7	45.8	46.0	46.1	46.3	46.4	46.6	46.7	46.9	25
26	47.0	47.2	47.3	47.5	47.6	47.8	47.9	48.1	48.2	48.4	26
27	48.5	48.7	48.8	49.0	49.1	49.3	49.4	49.6	49.7	49.9	27
28	50.0	50.2	50.3	50.5	50.6	50.8	50.9	51.1	51.2	51.4	28
29	51.5	51.7	51.8	52.0	52.1	52.3	52.4	52.6	52.7	52.9	29
30	53.0	53.2	53.3	53.5	53.6	53.8	53.9	54.1	54.2	54.4	30
31	54.5	54.7	54.8	55.0	55.1	55.3	55.4	55.6	55.7	55.9	31
32	56.0	56.2	56.3	56.5	56.6	56.8	56.9	57.1	57.2	57.4	32
33	57.5	57.7	57.8	58.0	58.1	58.3	58.4	58.6	58.7	58.9	33
34	59.0	59.2	59.3	59.5	59.6	59.8	59.9	60.1	60.2	60.4	34
35	60.5	60.7	60.8	61.0	61.1	61.3	61.4	61.6	61.7	61.9	35
36	62.0	62.2	62.3	62.5	62.6	62.8	62.9	63.1	63.2	63.4	36
37	63.5	63.7	63.8	64.0	64.1	64.3	64.4	64.6	64.7	64.9	37
38	65.0	65.2	65.3	65.5	65.6	65.8	65.9	66.1	66.2	66.4	38
39	66.5	66.7	66.8	67.0	67.1	67.3	67.4	67.6	67.7	67.9	39
40	68.0	68.2	68.3	68.5	68.6	68.8	68.9	69.1	69.2	69.4	40

Example—If point is 22.6 ft. above grade, how far should it be from center line to be a slope stake point? Ans. from Table 41.9. For same slopes but other widths of roadbed correct above figures by one-half difference in width of roadbed; thus in example above for 20 ft. roadbed distance will be $41.9 + (20 - 16) \times 2$ or 2 ft. added to 41.9 = 43.9. For slopes of 1 on 1 see inside of front cover.