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LEVEL BOOK
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W121

KEUFFEL & ESSER CO.

DRAWING MATERIALS
AND
SURVEYING INSTRUMENTS.
NEW YORK.
CHICAGO. SAN FRANCISCO. ST. LOUIS.

TABLES FOR EXCAVATIONS AND EMBANKMENTS.

DISTANCES FROM CENTER OF ROADWAY FOR CROSS-SECTIONING.
ROADWAY 18 FEET WIDE. SIDE SLOPES 1 TO 1.
FOR SINGLE TRACK EXCAVATION.

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

Calculated by Julien A. Hall, M. Am. Soc. C. E.

Legality of uncovered pipe
Stop band reclamation
Stop newbun grading.

Index

9-3-19 Kneeshaw
Carrell

Sta H.I.	Az	Dist	Vert ∠	Diff.Elv	Elv	
⊡ 0	Elev		H.I. 5.00			S.end of Axis of Dam N42°30'W Bear. of Axis
⊡ 1	N29°E 29°01'	195.2 193	~~-1°32'~~	~~-5.1~~		
⊡ 2	E 89°52'	93.2	~~+5°15'~~	~~+8.5~~		
⊡ 3	S82°E 98°12'	413 411	~~-1°15'~~	~~-8.8~~		
⊡ 4	S45°30'E 134°47°	250 248	~~+1°20'~~	~~+6.8~~		

Elev. on ⊡ by levels from BM
at S end of Dam see page 19

⊡ 4 Elev 159.48 H.I 5.15

Sta	Az	Dist	Vert ∠	Diff.Elv	Elv	
⊡ 3	314°47'	247	-1°18°			
⊡ 5	S40°35'E 140°10'	554.2 552	-0°10°			
W side Rd	199°11'	21	0°00'		159.5	W side Lower rd
W side Rd	238°37'	76	+4°10'	+5.5	165.0	W side upper rd
W side Rd	193°28'	148	+3°15'	+8.4	167.9	W side upper rd
	181°02'	72	-1°50'	-2.4	157.1	NE end Barracks
	177°42'	113	-0°40'	-1.3	158.2	S E Cor "
	176°35'	121	-0°40'	-1.4	158.1	N E cor Cook House
	171°39'	150	-0°35'	-1.5	158.0	S E cor "
	168°36'	165	-0°30'	-1.4	158.1	℄ Large boulder 20' dia 12' high
	162°02'	258	-0°46'	-3.5	156.0	Intsec roads
	165°00°	265	0°00'		159.5	Toilet SE cor 4'x6'

Sta	Az	Dist	Vert∠	Dif. Elv	Elv	
⊡ 5	Elev 155.73		H.I. 5.1			E edge rd nr cement hse
⊡ 4	✓ 320°10'	550	+ 0° 10'			
⊡ 6	✓ S 33°30'E 145°43'	(202.2) 200	- 0° 15'	[illegible]		W edge rd
	202° 00'	32	+ 0° 45'	+ 0.4	156.1	NE cor Cement hse
	161° 27'	91	+ 0° 35'	+ 0.9	156.6	SE " " "
	152° 35'	109	+ 0° 30'	+ 1.0	156.7	NE " Blk shop 8x16
⊡ 6	Elev 154.68		H.I 5.1			
⊡ 5	✓ 325°45'	200	+ 0°25'		[illegible]	E edge rd
⊡ 7	✓ S 23°45'E 156°16'	(276.9) 275	+ 1°25'	[illegible]	[illegible]	
⊡ 7	Elev 160.96		H.I 5.1			E edge rd
⊡ 6	✓ 336°16'	275	- 1°20'	[illegible]	[illegible]	E edge rd
⊡ 8	✓ S 10° E 169°28'	(171.9) 170	+ 2°35'	[illegible]	[illegible]	

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Sta	Az	Dist	Vert ∠	Dif Elev	Elev	
⊡	8 Elev168.37		H.I 5.2			Wedgerd
⊡ 7	✓349°28'	171	-2°27°	-7.6		
⊡ 9	S 65°45'E ✓114°13'	(254.5) 253	+3°00°	+13.5		
CP	✓260°20'	62	+20°00°	+19.9	188.3	
CP	✓223°20	67	+16°15°	+18.0	186.4	
CP	✓200°36'	73	+16°15°	+19.7	188.0	
CP	✓196°38'	137	+21°15°	+46.30	214.7	Tree 24" dia
CP	✓185°53'	134	+21°28'	+45.3	214.7	Rock 8x10x6
CP	✓171°24'	72	+18°00'	+21.7	190.1	
	✓165°37'	75	+18°00'	+22.6	191.0	Toilet NE cor 4x6
	✓181°04'	61	+16°20'	+17.0	185.4	Boul 10x12x12 Tree 18"
	✓168°30'	52	+12°30'	+11.2	179.6	" 8x15x12
CP	✓147°20'	94	+11°50'	+19.3	187.7	
	✓131°30	122	+7°15'	+15.5	183.9	℄ N End Tmhse
	✓126°20'	150	+5°40'	+14.9	183.3	SE cor Tmhse 12x30'
	✓115°00'	120	+4°00'	+8.5	176.9	℄ rd
	✓109°00'	108	+3°45'	+7.2	175.6	Tree 36' dia
	✓91°37'	135	-0°10'	-0.4	168.0	30" "
	✓75°07'	118	-2°42'	-5.6	162.8	Boul 6x8x6

⊡ 8 cont. Elev HI 3.2

Sta	Az	Dist '	Vert ∠	Dif Elev	Elev	
CP	✓ 47°00	116	-11°45'	-23.5	144.9	
CP	✓ 23°25'	103	-8°30'	-15.3	153.1	
CP	✓ 340°55'	94	-1°15'	-2.1	166.3	
	⊡ 9	Elev	181.53	HI. 5.00		E edge rd above Tin hse
⊡ 8	✓ 294°13'	252	-2°50'	-		
	S46°45'E	(342)				
⊡ 10	✓ 132°47'	340	+1°28'	+8.7		
	✓ 55°30'	101	-13°20'	-23.1	158.4	℄ crk
	✓ 24°38'	64	-12°15'	-13.7	167.8	ctr upside Boul 15x22x16
CP	✓ 348°05'	97	-12°45'	-21.3	160.2	Tree 14"
	✓ 317°36'	101	-7°22'	-13.1	168.4	Tree 20"
CP	✓ 328°33'	43	-5°30'	-4.1	177.4	
	✓ 293°32'	55	-1°50'	-1.8	179.7	℄ rd
	✓ 276°19'	106	+1°00	+1.9	183.4	SE cor Tin hse
	✓ 271°35'	97	+1°45'	+3.0	184.5	Tree 12"
	✓ 264°12'	114	+3°30'	+7.1	188.6	SE cor Tent 12x14
CP	✓ 254°07'	126	+5°00'	+11.1	192.6	
	✓ 242°55'	140	+7°55'	+19.4	200.9	SE cor Tent 12x14
CP	✓ 239°35'	175	+9°45'	+29.5	211.0	Tree 14"

Sta	As	Dist	Vert ∠			
CP	✓ 226°10'	133	+10°10'	+23.4	204.9	
CP	✓ 228°14'	64	+9°25'	+10.6	192.1	Tree 16"
	✓ 192°26'	59	+10°30'	+10.9	192.4	SE cor Tent 12×14
CP	✓ 186°47'	112	+12°43'	+24.5	206.0	Tree 14"
CP	✓ 181°30'	160	+11°30'	+31.6	213.1	
CP	✓ 169°10'	121	+8°45'	+18.5	200.0	
CP	✓ 160°15'	96	+7°50'	+13.3	194.8	
	✓ 141°10'	84	+2°00	+3.0	184.5	℄ rd
	✓ 122°15'	91	-3°45'	-6.1	175.4	℄ Lower rd
	✓ 117°18'	113	-5°30'	-11.0	170.5	℄ crk
□ 9½	✓ 132°47'	252 ✓ 250	+1°00	+4.3	182.4	
	□ 9½	Elev 185.51	HI 5.3			℄ rd
□ 9	312°47'	250 250	-1°00'	-4.3	182.1	
	✓ 49°32'	37	-7°00'	-4.7	180.8	℄ crk
	✓ 354°08'	78	-6°30'	-9.0	174.5	℄ crk
	✓ 323°45'	67	-6°30'	-7.6	177.9	Tree 20"
	✓ 309°20'	49	-1°00'	-0.9	184.6	Intsec. Rd.
	✓ 281°10'	46	+6°00'	+5.0	190.5	Tree 24"

Sta	Az.	Dist	Vert. ∠			
C.P.	✓ 270° 35'	82	+10° 13'	+14.7	200.2	
C.P.	✓ 270° 40'	172	+12° 15'	+36.0	221.5	
C.P.	✓ 253° 25'	140	+11° 25'	+27.5	213.0	Tree 24"
C.P.	✓ 243° 10'	210	+9° 20'	+33.9	219.4	℄ Draw
C.P.	✓ 237° 10'	169	+8° 05'	+23.8	209.3	℄ Draw
	✓ 235° 05'	193	+9° 30'	+31.7	217.2	Tr 15"
	✓ 217° 40'	190	+9° 00'	+29.7	215.2	Tr 15"
C.P.	✓ 219° 30'	155	+9° 17'	+25.0	210.5	Tr 20" ~~Rocks~~
C.P.	✓ 229° 40'	130	+8° 00'	+18.2	203.7	℄ Draw
	✓ 223°-00'	131	+8° 00'	+15.3	203.8	Tr 24"
C.P.	✓ 216°-40'	116	+7° 43'	+15.7	201.2	Rocks
	✓ 217° 10'	95	+7° 50'	+13.1	198.6	Rocks
	✓ 223° 13'	86	+7° 30'	+11.4	196.9	℄ Draw ~~Tr 24"~~
	✓ 194° 45'	93	+9° 10'	+14.9	200.4	Edge Rd. Tr 24"
	✓ 176° 10'	106	+9° 30'	+17.6	203.1	℄ Rd.
C.P.	✓ 177° 47'	154	+9° 50'	+27.3	212.8	
C.P.	✓ 154° 10'	133	+7° 20'	+17.1	202.6	
	✓ 154° 10'	57	+8° 35'	+8.7	194.2	Tr. 30"
	✓ 195° 30'	58	+10° 23'	+10.7	196.2	Tr. 24"

Sta.	Az.	Dist.	Vert. ∠			Tr. 2
	✓ 160° 40'	18	+7° 10'	+2.5	188.0	Tr. 24"
	☐ 10	Elev 189.66		HI 4.9		E edge rd
☐ 9	✓ 312° 47'	342 340	-1° 30'	-8.6		
☐ 11	S 27° 30' E ✓ 153° 46'	242.6 242	+4° 41'	+19.6		
	✓ 151° 40'	84	+5° 45'	+8.6	198.3	℄ rd
	✓ 125° 45'	76	+2° 45'	+1.8	191.5	℄ crk
	✓ 170° 10'	23	+6° 30'	+2.8	192.5	Tree 18"
	☐ 11	Elev 208.20		HI 5.2		
☐ 10	✓ 333° 46'	243 241	-4° 30'	-19.4		
☐ 12	S 7° 45' W ✓ 188° 10'	159.9 160	+6° 52'	+19.0		
☐ 13	W ✓ 271° 00'	225.0 224	+4° 15'	+16.6		
	✓ 70° 12'	35	-11° 00'	-6.9	201.3	℄ Crk
	✓ 11° 10'	26	-7° 30'	+3.6	204.6	Tr 18"
	✓ 350° 40'	35	-5° 40'	+3.6	204.6	Tr 18"
	✓ 357° 20'	58	-6° 40'	-6.9	201.3	Rk 6x6x1.5
	✓ 353° 30'	82	-5° 50'	+8.5	199.7	Tr 18"
	✓ 354° 20'	125	-5° 40'	-12.5	195.7	℄ Crk

Sta.	Az.	Dist.	Vert. ∠			
	✓ 341°35'	120	-4° 35'	-9.4	198.8	Tr. 24"
	✓ 331° 50'	147	-3° 00'	-7.8	200.4	Tr. 24"
C.P.	✓ 318° 10'	179	-1° 20'	-4.2	204.0	
	✓ 296° 45'	155	+1° 15'	+3.4	211.6	Tr. 30"
	✓ 298° 00'	215	+1° 45'	+6.6	214.8	RK. 6x6x4
	✓ 328° 30'	110	-3° - 00'	-5.8	202.4	¢ Gate
	✓ 306° 10'	119	-0° 50'	-1.7	206.5	Tr. 12"
	✓ 285° 10'	105	+0° 40'	+1.2	209.4	Edge Rd.
C.P.	✓ 285° 20'	175	+3° 05'	+9.5	217.7	
	✓ 268° 50'	189	+4° 00'	+13.3	221.5	Edge Rd.
	✓ 258° 15'	164	+5° 00'	+14.4	222.6	Tr. 18"
	✓ 278° 40'	135	+3° 20'	+7.9	216.1	Tr. 18"
	✓ 266° 15'	127	+3° 15'	+7.3	215.5	RK. 12x12x8
	✓ 257° 25'	112	+3° 10'	+6.3	214.5	Edge Rd
	✓ 238° 55'	98	+6° 00'	+10.4	218.6	Tr. 48"
	✓ 242° 50'	60	+4° 15'	+4.6	212.8	Tr. 18"
	✓ 247° 10'	43	+3° 45'	+2.9	211.1	Tr. 12"
	✓ 259° 15'	34	+2° 40'	+1.7	209.9	¢ Rd.
	✓ 216° 45'	138	+8° 35'	+20.7	228.9	Edge Brsh

Sta	Az.	Dist.	Yert. ∠			
	✓ 192°15'	99	+7°15'	+12.6	220.8	₵ Rd.
	✓ 176°00'	91	+7°45'	+12.3	220.5	Tr. 24"
	✓ 156°50'	96	+1°15'	+2.1	210.3	₵ Crk.
	□13	Elev	223.77 HI	5.1		
□11	✓ 91°	⓶⓶⓺ 226 224	-4°10'	-16.6		
□14	N 59° W ✓ 301°53'	(244.0) 243	+3°55'	+16.8		
	✓ 70°-00'	24	-3°25'	-1.5	222.3	RK. 12x12x8
	✓ 26°30'	22	-3°50'	-1.6	222.2	Tr. 30"
	✓ 18°45'	54	-6°45'	-6.5	217.3	W Edge Rd.
	✓ 21°45'	127	-5°30'	-12.3	211.5	Tr. 18"
	✓ 13°12'	150	-5°45'	-15.1	208.7	Tr. 14"
	✓ 358°50'	141	-5°45'	-14.2	209.6	Tr. 26"
C.P.	✓ 351°15'	130	-7°-00'	-16.0	207.8	
	✓ 336°30'	150	-4°30'	-11.9	211.9	Tr. 24"
C.P.	✓ 323°35'	155	-0°10'	-0.5	223.3	Edge Brush
C.P.	✓ 315°10'	162	+2°50'	+8.1	231.9	Brush
C.P.	✓ 313°15'	123	+2°20'	+5.1	228.9	RK. 6x6x6
C.P.	✓ 318°15'	116	-1°00'	-2.1	221.7	

Sta.	Az:	Dist	Vert. L	Dif elev	Elev	
C.P.	✓ 307°15'	96	+2° 15'	+3.8	227.6	
C.P.	✓ 323°40'	90	-3° 45'	-6.0	217.8	
C.P.	✓ 337° 10'	88	-5° 50'	-9.1	214.7	~~Tr. 2~~
	✓ 352° 10'	100	-5° 00'	-8.7	215.1	Tr. 24"
	✓ 318° 45'	61	-2° 10'	-2.4	221.4	6x8 Post
	✓ 277° 50'	46	+2° 10'	+1.8	225.6	Tr 30"
	✓ 300° 10'	132	+4° 10'	+9.7	233.5	E Edge Rd.
	✓ 289°05'	90	+3° 40'	+5.7	229.5	℄ Rd.
	✓ 266° 40'	114	+5° 00'	+10.1	233.9	Rks. Eg. Brush.
	✓ 229° 30'	93	+6° 45'	+11.1	234.9	" " "
	✓ 231° 12'	48	+4° 10'	+ 3.6	227.4	W Edge Rd. Rk 12x12x5
	✓ 202° 20'	61	+7° 00'	+ 7.6	230.4	Edge Brush
	✓ 173° 25'	66	+7° 10'	+ 8.4	232.2	" " Tr 24"
	✓ 135° 05'	58	-1° 10'	-1.2	222.6	Tr. 24"
	✓ 145° 25'	114	+3° 50'	+7.7	231.5	Edge Brush
	✓ 129° 05'	121	-0' 40'	-1.4	222.4	Toilet
	142° 45'	26	-0' 40'	-0.3	223.5	℄ Rd.

9-6-19

Sta	Az	Dist	Vert L	Dif Elev	Elev	
	☐ 14	Elev 244.45	H.I	5.0		Edge rd + Edge o Flat
☐ 13	✓ 121°53'	(244) 242	-3°45'			
☐ 15	N 46°45' W ✓ 313°36'	(304.9) 303	+1°41'	8.8		
C.P.	✓ 44°25'	35	-13°15'	-8.2	236.3	
C.P.	✓ 32° 10'	76	-11°00'	-13.6	230.9	
C.P.	✓ 29°55'	125	-5°20'	-11.7	232.8	
	✓ 7°30'	93	-2°30'	-4.1	239.4	Tr. 15"
	✓ 355°50'	57	-3°10'	-3.3	241.2	RK 5x10x4
	✓ 351°30'	86	-1°15'	-1.9	242.6	RK 6x6x6
	✓ 355°15'	105	-2°10'	-4.0	240.5	Tr. 24"
	✓ 347°00'	104	-0°50'	-1.5	243.0	Rk. 6x10x4
	✓ 343°15'	126	-1°00'	-2.2	242.3	RK. 12x15x9 Tr. 24"
	✓ 340°50'	115	+0°10'	+0.3	244.8	Tr. 18"
	✓ 336°40'	101	+0°20'	+0.6	245.1	Tr. 18"
	✓ 325°20'	120	+1°12'	+1.5	246.0	Rk. 8x14x5
	✓ 323°45'	164	+0°40'	+1.8	246.3	Tr. 30"
	✓ 320°20'	144	+1°25'	+3.6	248.1	Rk. 5x7x3
	✓ 314°40'	160	+1°50'	+5.1	249.6	Tr. 30"
	✓ 316°10'	200	+1°20'	+4.7	249.2	Tr. 24"

Sta.	Az.	Dist.	Vert. L			
	✓ 315°00'	213	+1°00'	+3.7	248.2	Tr. 26"
	✓ 306°40'	230	+2°45'	+11.1	255.6	Tr. 15"
	✓ 308°20'	178	+2°20'	+7.3	251.8	Rk. 6X6X3
	✓ 303°50'	142	+3°15'	+8.1	252.6	Tr. 20"
	✓ 292°00'	155	+4°40'	+12.7	257.2	Tr. 42"
	✓ 294°40'	190	+4°20'	+14.6	259.1	Tr. 30"
	✓ 296°50'	235	+4°15'	+17.5	262.0	Tr. 30"
	✓ 302°20'	252	+3°10'	+14.0	258.5	SE Cor. Keepers Hse
	✓ 295°50'	280	+4°45'	+13.3	257.8	NE Cor. Tent
	✓ 291°10'	288	+5°30'	+17.7	262.2	Rk. 15X24X16
	✓ 287°10'	292	+6°40'	+33.9	274.4	Edge Brush Rk. 6X10X4
	✓ 285°25'	195	+5°45'	+19.6	264.1	Tr. 30" 8' S of Edge Rd
	✓ 279°00'	119	+5°00'	+10.5	255.0	Tr. 48"
	✓ 268°20'	142	+6°20'	+15.8	260.3	Rk. 6X6X5
	✓ 268°40'	167	+7°00'	+20.0	264.5	Rk 12X12X8
	✓ 246°40'	163	+9°35'	+27.1	271.6	Tr. 24" Rk. 25X25X25
	✓ 257°20'	135	+7°07'	+16.8	261.3	Tr. 30"
	✓ 274°40'	75	+7°10'	+9.5	254.0	Tr. 30"
	✓ 289°35'	54	+5°40'	+5.5	250.0	Tr. 24"

Sta.	Az.	Dist.	Vert. L			
	✓ 262°15'	26	+6°00'	+2.9	247.4	Tr. 30"
	✓ 252°20'	42	+6°30'	+5.0	249.5	Tr. 18"
	✓ 222°50'	20	+7°50'	+3.0	247.5	Tr. 30"
	✓ 177°50'	18	+4°10'	+1.5	246.0	Tr. 18"
	✓ 211°10'	42	+8°30'	+6.4	250.9	Rk. 6X6X4
	✓ 214°50'	60	+8°00'	+8.5	253.0	Rk. 5X5X4
	✓ 229°40'	83	+7°45'	+11.4	255.9	Dble. Tr. 12"
	✓ 233°00'	102	+7°25'	+12.7	257.2	Tr. 30"
	✓ 229°50'	127	+5°35'	+12.5	257.0	Tr. 24"
C.P.	✓ 214°50'	132	+8°45'	+20.1	264.6	Edge Brush.
	✓ 191°10'	98	+7°30'	+12.9	257.4	Toilet
C.P.	✓ 180°45'	118	+6°50'	+14.2	258.7	Edge Brush
C.P.	✓ 161°45'	65	+7°50'	+9.0	253.5	" "
	✓ 125°15'	55	+1°50'	+1.8	246.3	℄ Rd.
	✓ 103°30"	52	-1°10'	-1.1	243.4	Rk. 25X25X20

Sta	Az	Dist	Vert ∠	Dif Elev	Elev	
⊡ 15	Elev	247.61	HI 4.9			
⊡ 14	✓ 133° 36'	(303) 301	-1° 40'			
	✓ 190° 50'	62	+5° 40'	+6.3	253.9	20X30 8X8 Wart S.W. Cor. Hse
	✓ 169° 20'	35	+5° 05'	+3.3	250.9	N.W. " "
	✓ 125° 15'	43	-6° 15'	-4.9	242.7	Tr.+Rk.10x10x10
	✓ 92° 00'	58	-12° 35'	-12.8	234.9	Toilet
	✓ 108° 05'	91	-10° 05'	-16.0	231.6	Tr. + Rk 10X15X12
C.P.	✓ 101° 50'	160	-8° 10'	-22.8	224.8	
C.P.	✓ 85° 50'	159	-14° 00'	-37.8	209.9	
C.P.	✓ 77° 10'	145	-17° 05'	-41.3	206.3	
C.P.	✓ 62° 25'	100	-18° 00'	-30.0	217.6	
C.P.	✓ 7° 10'	39	-14° 50'	-10.1	237.5	
	✓ 300° 10'	56	-7° 20'	-7.3	240.6	℄ Trail + Draw
	✓ 256° 00'	75	+1° 50'	+2.5	250.1	End of Draw
C.P.	✓ 216° 30'	72	+7° 30'	+9.6	257.2	
	✓ 216° 30'	87	+9° 30'	+14.5	262.1	℄ Rd.
	✓ 211° 00'	52	+6° 47'	+6.3	253.9	Tr. 30"

Sta	Az	Dist	Vert∠	Dif Elev	Elev	
	☐ 12	Elev	226.54 Ht.	∠ 5.1		W edge rd
☐ 11	✓ 8°10'	(161)	-6°50		[illegible]	
☐ 16	S 25°30'E ✓ 155°55'	(186.2) 186	+5°57'	19.0	[illegible]	
CP	262°40'	51	+8°10'	+ 7.5	234.0	edge brush
CP	66°53'	96	-8°10'	- 13.8	212.7	℄ crk
	☐ 16	Elev	245.29 Ht.	∠ 5.1		E edge rd
☐ 12	✓ 335°56'	(188) 186	-5°55'			
CP	✓ 270°10'	56	+ 9°10'	+9.1	254.5	edge brush
CP	✓ 218°25'	122	+ 8°00'	+17.1	262.4	" " ℄ draw
CP	✓ 184°46'	54	+10°16'	+ 9.8	255.1	" "
	✓ 137°40'	59	+ 2°41'	+ 2.8	248.1	℄ rd
	✓ 47°52'	101	- 8°00	-14.2	231.1	℄ crk
	✓ 144°08'	300	+3°07'	+ 16.4	261.7	℄ rd
	✓ 137°43'	326	+ 2°10'	+ 12.4	257.7	℄ crk
☐ 17	S 39°15'E ✓ 141°20'	(579.9) 580	+3°36'	36.3	[illegible]	

9-7-19

Sta	Az	Dist	Vert∠	Dif Elev	Elev		16
	☐ 17	Elev	279.52	H.I. 4.8		Edge rd. above bridge	
☐ 16	✓ 321°19'	578	-3°35'				
☐ 18	S 44° 00' E ✓ 136°45'	619.1 618	+2°24'	+25.8	[illegible]		
	✓ 8°15'	37	-6°50'	-4.6	274.9	℄ Crk.	
	✓ 9°50'	455	+1°40'	+13.3	292.8	℄ Rd.	
	✓ 8°50'	387	+0°50'	+5.6	285.1	℄ Rd.	
	✓ 0°12'	206	-1°30'	-5.4	274.1	℄ Rd.	
	✓ 328°12'	163	-4°17'	-12.3	267.2	℄ Rd. ℄ Bridge	
	✓ 319°40'	165	-4°30'	-13.1	266.4	Int. Rd.	
	✓ 306°50'	342	-0°40'	-5.5	274.0	Edge Brush	
C.P.	✓ 295°20'	334	+2°40'	+15.6	295.1		
C.P.	✓ 272°20'	162	+3°25'	+9.8	289.3		
C.P.	✓ 212°30'	195	+6°50'	+23.3	302.8		
	✓ 182°15'	132	+7°10'	+16.6	296.1	W. Edge Crk. 6' Deep	
	✓ 159°40'	109	+5°00'	+7.6	287.1	E. " "	
	✓ 151°00'	168	+5°50'	+17.2	296.7	10' Wide 5' Deep E. Crk.	
	✓ 117°20'	189	+4°20'	+14.4	293.9	8 X 12 Stone House	
	✓ 131°45'	61	+4°10'	+4.1	284.1	14 X 20 X 6 Spring	
	✓ 110°40'	91	+4°25'	+7.1	286.6	"	

Sta.	Az.	Dist.	Vert. L			
C.P.	87°40'	87	+12°30'	+18.8	298.3	
	⊡18	Elev 303.85	HI	5.0		
⊡17	✓ 316°44'	620	-2°20'			
	✓ 321°37'	128	-1°40'	-3.8	300.0	Eedgecrk wedgerd
	✓ 40° 10'	92	+3°45'	+6.2	310.0	Fence
	✓ 83°40'	100	+4°10'	+7.3	311.1	Barn 16x16
	✓ 90° 15'	87	+4° 25'	+6.8	310.6	"
	✓ 114°50'	66	+2° 35'	+3.1	306.9	Cor. Corral
	✓ 130° 40'	227	+2° 35'	+10.3	314.1	" "
	✓ 171°20'	661	+2° 00'	+23.1	326.9	Cor. Fence

Levels on ⊡ at Morena 9-7-19

Sta.	+	H.I.	−	Elev
B.M.	4.80	160.00		155.20
T.P.	6.82	166.00	0.82	159.18
P. ⊡3	9.28	163.60	11.68	154.32
⊡4			4.12	159.48
P.	3.36	160.52	6.44	157.16
⊡5			4.79	155.73
P ⊡6	10.22	164.90	5.84	154.68
⊡6			10.25	154.65
⊡7			3.94	160.96
P.	11.64	176.25	0.29	164.61
⊡8			7.88	168.37
P.	12.96	188.80	0.41	175.84
⊡9			7.27	181.53
⊡9½			3.29	185.51
P.	13.13	200.31	1.62	187.18
⊡10			10.65	189.66

Kneeshaw,
carrall

Send Dam

Sta	+	HI	-	Elev
		200.31		
P.	12.89	212.70	0.50	199.81
⊡ 11			4.50	208.20
P	9.68	220.95	1.43	211.27
P.	13.05	233.47	0.53	220.42
⊡ 13			9.60	223.77
P	12.39	244.88	0.98	232.49
⊡ 14			5.43	244.45
P	5.31	249.83	0.36	244.52
⊡ 15			2.22	247.61
P	9.87	221.14		211.27
P	12.18	231.67	1.65	219.49
⊡ 12			5.13	226.54
P	12.35	243.91	0.11	231.56
P	9.85	253.16	0.60	243.31
⊡ 16			7.87	245.29
P	13.05	266.20	0.01	253.15
P	12.47	278.27	0.40	265.80
P	11.46	289.34	0.39	277.88

9-8-19

Sta	+	HI	-	Elev	
⊡ 17		289.34	9.82	279.52	
			5.70	283.64	Concrete wall NW cor spring
P	13.13	301.16	1.31	288.03	
P	7.85	308.56	0.45	300.71	
⊡ 18			4.71	303.85	
B.M.			0.50	308.06	Top of rock 3x3x6 80' N of Barn

Cuts for

Sta	+	HI	-	T.P.	Ground	Elev	Grade	Cut	Fill
0+00	9.55	9.55		0.00			0.00		
+14					7.14	2.41	0112 0.0112	2.40	
+39					5.18	4.37	0.0312	4.34 ✓	
+64					5.01	4.54	0.0512	4.49 ✓	
+89					4.575	4.975	0.0712	4.90 ✓	
1+14					4.79	4.76	0.0912	4.67 ✓	
+39					5.60	3.95	0.1112	3.84 ✓	
+64					9.33	0.22	0.1312	0.09 ✓	
+89					9.80	-0.25	0.1512		0.40 ✓
2+14					8.37	1.18	0.1712	1.01 ✓	
+39					4.70	4.85	0.1912	4.66 ✓	

c
993
955
38
19
57

Levels Over Tunnel #4, Otay-San Diego Pipeline

April 14th, 1920

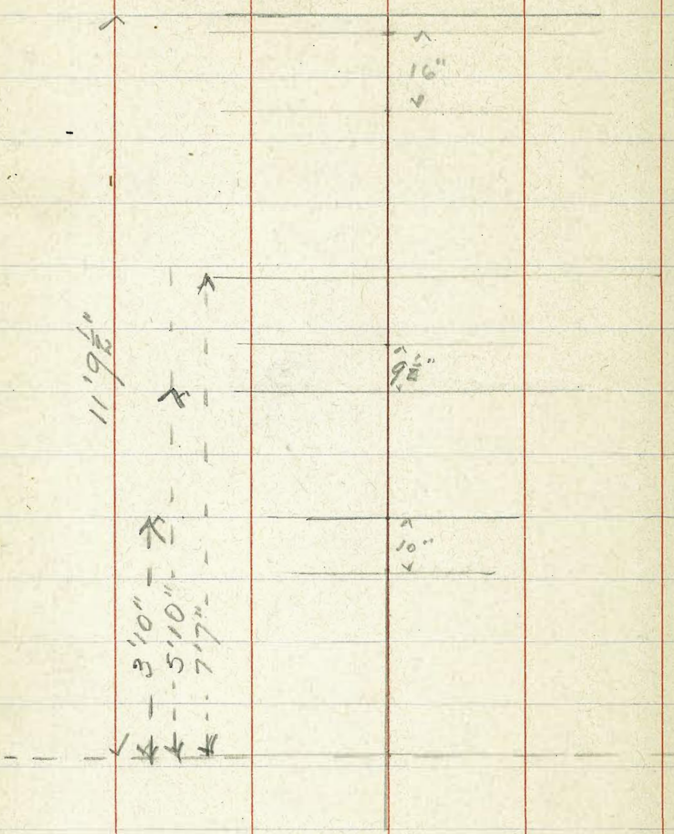
Wueste
Klatt
Witte

Sta.	+	HI	−	Elev.	
	10.64	110.64		100.00	= Assumed elev. top 3-pc sill 5 ft. N of Tunnel Portal
⊙	12.37	122.56½	0.44½	110.19½	
⊙	12.24	133.67½	1.13	121.43½	
⊙	12.10½	144.55	1.23	132.44½	
⊙	12.84	156.08	1.31	143.24	
⊙	12.56	168.10	0.54	155.54	
⊙	12.01	179.38	0.73	167.37	
⊙	12.07	190.83½	0.61½	178.76½	
⊙	12.89	203.19	0.53½	190.30	
⊙	7.50	209.97½	0.71½	202.47½	
⊙	0.27	199.54½	10.70	199.27½	
⊙	0.53	187.29½	12.78	186.76½	
⊙	0.33	174.64½	12.98	174.31½	
⊙	1.31	163.23	12.72½	161.92	
⊙	0.57½	151.99	11.81½	151.41½	
⊙	0.78½	140.31½	12.46	139.53	
⊙	0.32	128.66½	11.97	128.34½	
⊙	1.44½	117.69	12.42	116.24½	
⊙	3.68	110.10½	11.26½	106.42½	
	126.47✓		9.63 ~~125.99½~~✓	100.47½	= Relative elev top 3-pc sill at S Portal of Tunnel

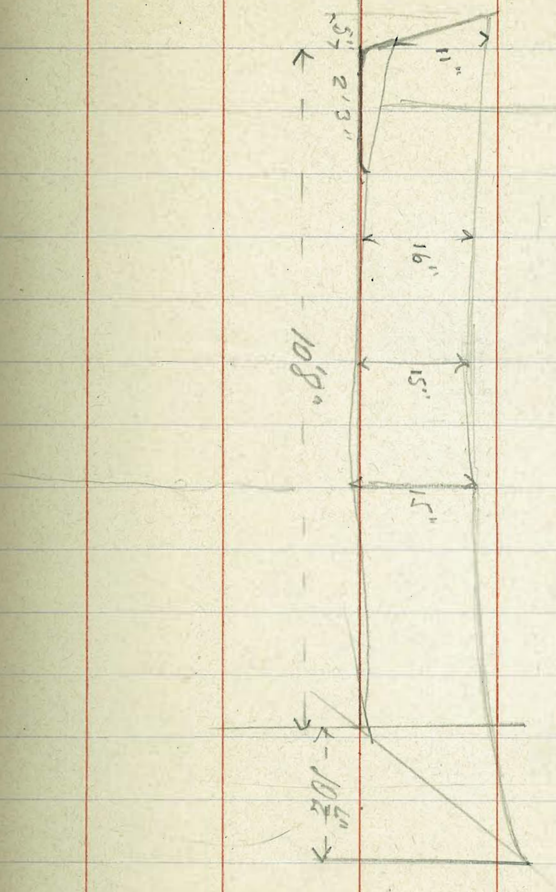
see rear fly-leaf for grade

Measurements Boot #7

Morena Dam



Top Width
3'8"
4'3½"
4'2½"
3'4"



Bot Width
2'7½"
2'4"
2'8½"
2'9½"
2'3"

Preliminary Levels
Open-cut and Tunnel - L.O. Saddle

May 15, 1920
Wueste - Root.

	0.71	508.68			507.97	= Bob BM - top manhole cover.
⊙	0.73	497.41	12.00	496.68	31.62 476.35	
⊙	0.71	486.12	12.00	485.41		
			9.77		476.35	
	2.15 ✓		33.77 ✓			

Levels
Open-cut and Tunnel. L.O. Saddle

May 18, 1920
Wueste-Voneida

	10.28	511.63			501.35	= Invert present 24" W.S. Pipe.			
⊙	1.36	509.08	3.91	507.72		= B.M. top shaft - bolt-head. near Sta 0+00			
Sta 0+25						3.14	505.94	476.31	+ 29.63
0+50						7.86	501.22	476.27	+ 24.95
0+75						11.73	497.35	476.23	+ 21.12
⊙	0.66	498.01	11.73	497.35					
1+00						3.42	494.59	476.19	+ 18.40
+25						8.06	489.95	476.15	+ 13.80
⊙	1.58	487.16 11 20 759 3	12.43	485.58					
+65						10.67	476.49	476.09	+ 0.40
+75						10.85	476.31	476.07	+ 0.24
R.P.=+87						11.05	476.11	476.05	+ 0.06
	13.88		28.07 13.88 14.19 ✓						

Grades in Open-cut at L.O

5-25-20
Woeste-Symms

0.82 490.77 489.95 = El of hub at Sta 1+25
1.66 480.34 12.09 478.68

as starting point
Note: This grade taken

Sta 1+75 4.27 476.07
1+50 4.19 476.75
1+30 4.925 476.215
3.075
1.050

+0.32%

2.48

12.09
2.48
9.61

0.032
20
.0640

Grades tunnel at L.o

6-1-20
Wuesto
Cornell

0.13 490.08 489.95 = Elev. of hub at Sta 1+25
2.02 480.30 11.80 478.28

sta 0+75 3.91 476.39

+0.32%

2.15

11.80

6-12-20
Wueste

Notes for Detail

30" saddle, 16" bell outlet

O.D. 30" C.I. Pipe = 8'4½"

Notes for Determination of
Upper and L.O. open ended Water Column

	+	HI	-	Elev.
	1.26	101.26		
○	12.94	113.79	0.41	100.85
○	12.44	126.12	0.11	113.68
○	12.44	137.20	1.36	124.76
○	11.91	148.44	0.67	136.53
○	12.33	159.58 ✓	1.19	147.25
	63.32 3.74 59.58		3.74	
			0.73	158.85
	1.26	101.26		100.00
○			0.41	
○				

1512 8.4
1535 6.1
1558 3.8

Wooste-Conrell
6-28-20

100.00 = Assumed elev ctr. gage, teststand
L.O. Filtration Plant.

51.2
43)22.00
215
50
43
70

53.5
43)23.00
215
150
129
210

55.8
43)24.00
215
250
215
350

= BM on rk SW cor chlorine house

Wash Water Waste – L.O. F.I.

Notes on Discharge over 36" Rect. Sharp-crested Weir.

Wueste
7-1-20
Cornell

Note: measurements taken from R.P. downward to W.S.

R.P. = Top weir which was 11⅛" above crest and 22" to right of rt end contraction.

Time PM	Reading	Head	Converted Head	Rate	Q
3:51:30	10 3/4"	3/8"			
			0.03	0.0510	11.4
3:52:00	10 3/4"	3/8"			
			0.045	0.0960	21.5
3:52:30	10 3/8"	3/4"			
			0.085	0.2463	55.3
3:53:00	9 3/4"	1 3/8"			
			0.12	0.4162	93.4
3:53:30	9 1/2"	1 5/8"			
			0.14	0.5046	113.2
3:54:00	9 3/8"	1 3/4"			
			0.12	0.4162	93.4
3:54:30	9 3/4"	1 3/8"			
			0.10	0.3135	70.3
3:55:00	10 1/8"	1"			41.3
			0.07	0.1839	2.2277

Time	Reading	Head	Converted Head	Rate	Q
3:55:30	10 3/8"	3/4"			2.2277
			0.055	0.1288	29.0
3:56:00	10 1/2"	5/8"			
			0.10	0.3135	70.3
3:56:30	9 1/4"	1 7/8"			
			0.27	1.3730	308.1
3:57:00	6 1/2"	4 5/8"			
			0.425	2.7890	625.9
3:57:30	5 5/8"	5 1/2"			
			0.475	3.1680	710.9
3:58:00	5 1/4"	5 7/8"			
			0.495	3.3665	755.5
3:58:30	5 1/8"	6"			
			0.50	3.4185	757.0
3:59:00	5 1/8"	6"			757.0
			0.50	3.4185	17.9758
					20.2035

Time	Reading	Head	Converted Head		
3:59:30	5 1/8"	6"			20.2035
			0.465	3.0685	689.5
4:00:00	6"	5 1/8"			
			0.355	2.0033	450.0
4:00:30	7 5/8"	3 1/2"			
			0.205	0.9114	205.5
4:01:00	8 1/2"	2 5/8"			
			0.19	0.8186	184.1
4:01:30	9"	2 1/8"			
			0.165	0.6619	149.5
4:02:00	9 1/8"	2"			
			0.145	0.5391	118.5
4:02:30	9 1/2"	1 5/8"			
			0.115	0.3866	86.9
4:03:00	9 7/8"	1 1/4"			
			0.085	0.2463	55.3
4:03:30	10 1/4"	7/8"			
			0.065	0.1653	35.2
4:04:00	10 3/8"	3/4"			110. 9.2860
			0.135	0.4850	29.4895
4:04:30	9 1/2"	1 5/8"			29.4895
			0.25	1.2279	275.2
4:05:00	6 3/4"	4 3/8"			
			0.40	2.4600	553.5
4:05:30	5 3/4"	5 3/8"			
			0.455	2.9738	612.5
4:06:00	5 3/8"	5 1/2"			
			0.475	3.1680	710.1
4:06:30	5 1/4"	5 7/8"			
			0.505	3.4656	758.2
4:07:00	5 1/8"	6"			
			0.50	3.4185	756.9
4:07:30	5 1/8"	6"			
			0.50	3.4185	756.9
4:08:00	5 1/8"	6"			
			0.425	2.7890	625.1
4:08:30	7"	4 1/8"			
			0.275	1.4119	312.6
4:09:00	8 3/8	2 1/2"			214.5 25.2788
			0.21	0.9256	54.7683

Time	Reading	Head	Converted Head	Rate	Q
4:09:30	9 3/8"	1 3/4"			54.7683
			0.115	0.3866	86.7
4:10:00	10"	1 1/8"			
			0.075	0.2042	45.5
4:10:30	10 3/8"	3/4"			
			0.055	0.1288	28.5
4:11:00	10 1/2"	5/8"			
			0.045	0.0960	21.5
4:11:30	10 5/8"	1/2"			
			0.035	0.0660	14.8
4:12:00	10 3/4"	3/8"		19.1	0.8816
					55.6499

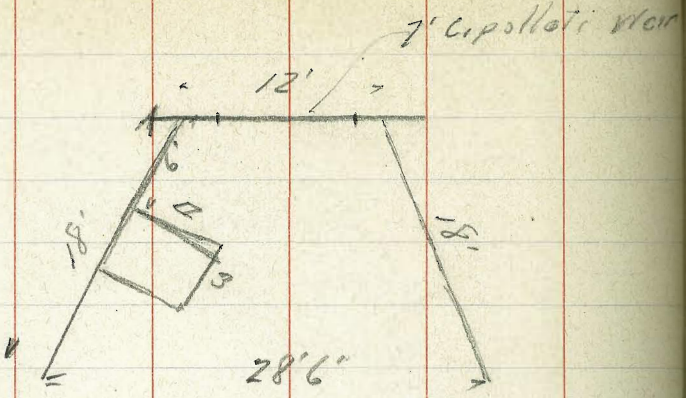
55.6499 × 30 × 7.4805 = 12,489 gals.

20 minits = 10 × 12489 = 124,890 gals.

W-est corner
8-13-20

Grades for Collecting Basin - Low Otay Filtration Plant

11.31	111.31		100.00			= assumed grade top drain pipe
		0.00	111.31			
3.61	114.92					
				1.92	113.00	= grade top reservoir walls.
10.49	122.43	2.98	111.94			
25.41 2.98 22.43		2.98		9.43	113.00	
				5.59	116.84	+3.84
				4.28	118.15	+5.15
				2.21	120.22	+7.22
				1.83	120.60	+7.60
				0.00	122.43	+9.43
				4.44	117.99	+4.99
				6.86	115.57	+2.57
				9.25	113.18	



notes on Arizona canal

12-10-20

weir no 1

open cut #65

remove forms slab 6 N.

FB 26" Sta 544   28"-531   22"-527

Replace sta nos.

Shovel out sand, grass plant rock

clean outside - inside screen 22 t 6 N

Fl 22 leaking seals OK 20" FB

Bbls OK gate stems need grease

FB 512-29"   496-32"

F21 no leakage Bench OK Bbl OK

470+75 minor lining failing

Fl/020 needs 7×16-22 stringer on RH side

some leakage Bbl OK Bench OK needs

2×6 Flume sill, 8×8-16 stringer 6×6 cap.

458+75

F19 1 new flume set 4 new flume sill

Bbls OK some leakage bench OK Bbl OK
gate Stems need grease

Flu 18 OK except for leakage at N[illegible]

F B 432-32" 431+50 [illegible] for

concrete [illegible] from [illegible]

clean fallen rock from timber [illegible]

open cut T 5½

Flume 17 needs several new 4x6 sills

OK otherwise a good place to try

concrete flume then earth

Flu 16 needs a little bending leaking

at ends otherwise OK do do an concrete

flume

Flu 17 2 bbls brush only fair

F.B. 343-32"

303+25 needs reinforcement [illegible] 20 ft

304+70 do do 20 ft

306 do do 20 ft

FB 265-26"

Remove forms under slab 255+50

20 ft slab near T4N

FB 250-27"

FB 224-33" bet 2-3

3-4 Sec need brushing

3 trail do

FB 197-38" 154-36"

F11 OK for this season

gate screws need oil gates leak

gate forks should be changed

F12 OK slight leakage

FB 129-32" = near T15

FB 115-43" near T1N

FB 105-42"

FB 100-34"

Fl 10 needs bending [illegible] new leaking

needs fine [illegible] work

FB 65-35"

Fl 3 sag on left side due to [illegible]

water

P.C. Intake

settling Basin

Syphon with rail brace

meter flumes, coating, 2 doz bad joints

footings [illegible] basin, gates at [illegible] from

siding [illegible] break

Sta A.

S29°37'W 130° 23'	70	+2°30'	cor hse
69°54' 110° 06'	104	+1°25'	" "
62°50' 117°10°	37	0	Mulberry tree
46°15' 133°45°	53	+2°30'	pomgranite "
10°27' 169°33°	58	+2°40'	oak "
71°56' 108°04'	71	+1°35'	cherry "
S75°34'W 104°26'	89	+1°16'	" "
N65°04W	126'	+0°10'	Pear "
39°43'	169	-0°45'	L in road
14°10'	113	0°0'	wht oak
14°10'	124	0°0'	" "
14°10'	137	0°	rd "
N2°17'E 357°43'	102	+25'	" "
22°15' 337°45'	100	+2°0'	" "
26°05' 333°55'	170	+3°40'	" "
64°18' 295°42'	190	+2°10'	" "
86°08' 273°52'	187	+30'	" "
S70 59E 250°59'	205	+57'	" "

	✓ S 68°04'E 248°04'	200	+ 1°06'	cor wagon shed
	✓ 60° 20' 240°20'	187	+ 43'	" " " 28' deep
	✓ 50° 40' 230°40'	123	+ 1°42'	wht oak Tree
	✓ 32° 13' 212° 13'	163	+ 7° 30'	" " "
	✓ 41 08 221°08'	160	+ 5°40'	rd " "
	✓ 49° 56' 229°56'	190	+ 3° 40'	" " "
	✓ 55° 14' 235° 14'	204	+ 2°10'	wht " "
Sta B.	✓ 78° 42' 258° 42'	274	+ 0°55'	
	Sta B.			
	✓ S 12° 38'W 167°22'	49	+ 0°10'	ctr 80" corral
	✓ 30° 52' 149°08'	90	+ 2°0'	wt oak
	✓ 61° 28' 118° 42'	16	0°0'	rd "
	✓ 32° 43' 147°17'	135	+ 7°30'	" "
	✓ 19° 30' 160° 30'	138	+ 7°10'	wht "
	✓ S 3° 58'E 183° 58'	160	+ 7°10'	rd "
	✓ 25° 33' 205° 33'	93	+ 2°10'	sw cor barn
	✓ 53° 13' 233° 13'	71	+ 1° 42'	NW " "
	✓ 59° 10' 239°10'	112	+ 1° 15'	NE " "
	✓ N. W. 38° 55'	92	- 35'	L in road

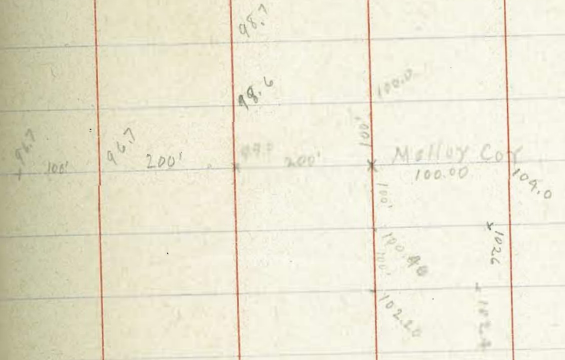
	✓ N.W. 5°07	160	+4°40'	red oak tree
	✓ N 48° 20'E 311°40'	129	+4°45'	" " "
	✓ 51°42' 308°18'	45	+10'	L in road
Sta C	✓ S 60° E 239°58'	232	+1°17'	
	Sta C			
	✓ S 41° 20 E 221°20'	76	+2°30'	L in road
	✓ N 33° 17'E 326°43'	49	-4°57'	Datum Dam Site
	✓ 29°43' 330°17'	92	+1°0'	rd oak
	✓ 29°26' 330°34'	150	+2°38'	C.P. axis Dam
	✓ 26°10' 333°50'	184	+7°10'	crst dam
	✓ N.W. 12°57'	48	-4°24'	rd oak
	✓ 22°46'	61	-3°50'	" "
	✓ 31°40'	72	-2°50'	" "
	✓ S 17° 50'W 162°10'	64	+7°45'	CP xis dam
	✓ 14°11' 165°49'	100	+13°10	crst dam

A To D	N 54° 30' W 54° 41'	400	-0° 11'	
	N 85° 43' E 265° 43'	220	+10'	big sycamore
	N 33 07 E 326° 53'	158	+10'	wht oak
C.P.	N 3° 23 E 356° 37'	332	+20'	
C.P.	23° 33'	365	-25'	
	38° 21'	350	-53'	rd oak
C.P.	70° 22'	390	-1° 20'	
	53°	253	-1° 40'	-4' C.P. in gully
	69° 44'	154	-1° 57'	" " "
	148° 54'	74	-1° 58'	
Sta. E.	S 85° 20' W 94° 40'	400	-35'	

St E

CP	S 13° W	120	+10	on fence line
CP	N 28° 30' W	172	-50'	2 oaks gully 5' lower
CP	N 40° 30' W	230	-1° 45'	in gully
CP	N 13° 30' W	240	00	
CP	N 67° W.	320	-1° 40	" "
Sta F	S 71° 45' W	403	+13'	

	Sta F.			
	S 34°30'W	85	+ 1°40'	sycamore edge rd
sta G	N 74°30'W	600	- 40'	C.P. fence edge rd phone pole.
	Sta G.			
Sta H	N 5° E	215	-1°20'	
	Sta H			
Sta I	N 33°30'W	233	-1°18'	
	Sta. I			
	S 48°30'W	27	-12°10'	water hole
	N 24° E	85	00	oak
St. J	N 20° E	138	+ 40'	
	Sta J			
Sta 106	S 76° E	220	+ 3°30	Transmission line
Sta K	S 61°30'E	400	+ 1°35'	on old road
	Sta K			
	N 35° E	22	-40	oak
Sta L	S 71°30'E	340	+ 1°	on d road
	Sta L			
Sta F	S 4° E	410	+ 15'	


98.7
98.6
96.7
100'
96.7
200'
99.?
200'
100.0
100'
Malloy Cor
100.00
104.0
100'
100.90
100'
102.20
102.6
102.4

Levels	S.B. to top	L.O. saddle		5-8-21 correct water = at step SB
7.61	7.61		0.0	
12.12	18.12	1.61	6.00	
12.62	30.49	0.25	17.87	
11.24	41.52	0.21	30.28	
12.03	53.20	0.35	41.17	
9.65	62.32	0.53	51.67	
12.20	74.20	0.32	62.00	
10.43	84.30	0.33	73.87	
12.32	95.79	0.83	83.47	
11.99	106.87	0.91	94.88	
12.25	118.24	0.88	105.99	
8.07	125.85	0.46	117.78	
132.53 10.73 121.80		4.05	121.80	= top 2" pipe on 24" W.S. line thru saddle
	✓	10.73	✓	

6.28 top 2" pipe to top 8" pipe on saddle

121.80
6.63
115.17

#5 Type D.S. Kronogh
Westinghouse
Style 271815

77

Temporary Pumping Outfit

5-8-21

10 K.W. hrs per 18 min = 33.3 K.W. hrs per hr.
= 44½ H.P.

Total lift 120' 400 g.p.m.
= 12.1 H.P. theoretical
= 28% efficiency.

Lyons Valley 5-6-19
Wueste - Kneeshaw

			S		℄ 150/3208			N
10				5 3205	3205	208 3220	90 3225	
9				15 3200	3202	208 3210	208 3228	20 3232
8				10 3193	3194	208 3205	208 3224	135 3234
7				75 3188	3191	208 3205	208 3220	130 3229
6				130 3185	℄ 3190	208 3210	208 3212	140 3226
5			100 3189	208 3190	3200	208 3209	185 3212	
4	100 crk. Junc. 3171	135 Bank 3185	208 3188	208 3194	3204	208 3220	208 3229	135 3237
3			55 3196	208 3200	3210	208 3221	208 3227	145 3240
2				208 3203	3206	2+250 Brush 175 Brush 208 3233 Knob 3245	125 Brush 208 3245	104 3250
1			15 crk	208 3205	3220	150 Brush 208 3236 Brush 0+270	40 Brush 208 3240	30 3245

			S		℄		
0	L intsect Mellor Fence at Toe slope		208	208 3210	3220	208 3231	95 0240
+1			75 3205	208 3213	3220	185 3234	
+1+190'					3227		

Mellor cor. = 3214

Mellor cor S to rd 375'

Mellor cor E to rd 540' 3233

-10

208

-9

16" C.I. Pipe

7-7

12-5

12-5

12-5

12-5

12-5 ~~×5 ×6 ×8 ×16 ×4~~

~~×2 = 24~~

12-6 ~~×2~~ ×8 ×4 36

1 8-9

1 7-7 70

40 12-5

4 12-6

208
-8
208
-7
208
-6
208
-5
208
-4
208
-3
208
-2
208
-1 N6527W
208
0 700 N2855W
208
+1

Frame Hercules
westinghouse induction motor
Type C.S 25 H.P. 220V 60 cycles 3 phase
297 amperes per terminal 1755 RPM
at full load
Style no 1608157 Serial no 190822

3-stub ✓ Ins
𝍷𝍷𝍷𝍷 𝍷𝍷𝍷

Reset
𝍷𝍷 ✓

New Poles ✓ Insolators Resets
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westinghouse induction
motor. Type C.S
25 H.P. 220 V. 60 cycles
3 phase 59 amp 1800 RPM
Serial no 2484337
Style no 271815

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no 5 Type D.S. Krogh
Pump Mfg co shop no 18592

1012
18
1028

1009
5
1010

360
30150
5807

.00046840
1000) .4750
4056
6940
6084
8560
8112
4480
4056
4240

5.09
+ 1
508
- 8
5.16 = 5'2"
52½"
4'4½"
0'9½"

5.09
+ 2
507
8
515
= 5'1⅞
50⅝"
4'2⅝"
0'11¼"

25 37

.00047
25
235
94
.01175

145
58
67

10.50
7.30
3.20

175
3.50

.39
3.1
3.5

.00047
37
329
141
.01739

16½

175
117
58

95
12
1.6
28

10.80
1.40
9.40

L.O. Camp
82710
1052613
11 every 4th pm
6 days

~~4~~ 6
5
1.6
2'1

8) 1380
1.72
150
322

606
234
840
430

DISTANCES FROM CENTER OF ROADWAY FOR CROSS-SECTIONING.

ROADWAY 14 FEET WIDE. SIDE SLOPES 1½ TO 1.

FOR SINGLE TRACK EMBANKMENT.

	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	
0	7.0	7.2	7.3	7.5	7.6	7.8	7.9	8.1	8.2	8.4	0
1	8.5	8.7	8.8	9.0	9.1	9.3	9.4	9.6	9.7	9.9	1
2	10.0	10.2	10.3	10.5	10.6	10.8	10.9	11.1	11.2	11.4	2
3	11.5	11.7	11.8	12.0	12.1	12.3	12.4	12.6	12.7	12.9	3
4	13.0	13.2	13.3	13.5	13.6	13.8	13.9	14.1	14.2	14.4	4
5	14.5	14.7	14.8	15.0	15.1	15.3	15.4	15.6	15.7	15.9	5
6	16.0	16.2	16.3	16.5	16.6	16.8	16.9	17.1	17.2	17.4	6
7	17.5	17.7	17.8	18.0	18.1	18.3	18.4	18.6	18.7	18.9	7
8	19.0	19.2	19.3	19.5	19.6	19.8	19.9	20.1	20.2	20.4	8
9	20.5	20.7	20.8	21.0	21.1	21.3	21.4	21.6	21.7	21.9	9
10	22.0	22.2	22.3	22.5	22.6	22.8	22.9	23.1	23.2	23.4	10
11	23.5	23.7	23.8	24.0	24.1	24.3	24.4	24.6	24.7	24.9	11
12	25.0	25.2	25.3	25.5	25.6	25.8	25.9	26.1	26.2	26.4	12
13	26.5	26.7	26.8	27.0	27.1	27.3	27.4	27.6	27.7	27.9	13
14	28.0	28.2	28.3	28.5	28.6	28.8	28.9	29.1	29.2	29.4	14
15	29.5	29.7	29.8	30.0	30.1	30.3	30.4	30.6	30.7	30.9	15
16	31.0	31.2	31.3	31.5	31.6	31.8	31.9	32.1	32.2	32.4	16
17	32.5	32.7	32.8	33.0	33.1	33.3	33.4	33.6	33.7	33.9	17
18	34.0	34.2	34.3	34.5	34.6	34.8	34.9	35.1	35.2	35.4	18
19	35.5	35.7	35.8	36.0	36.1	36.3	36.4	36.6	36.7	36.9	19
20	37.0	37.2	37.3	37.5	37.6	37.8	37.9	38.1	38.2	38.4	20
21	38.5	38.7	38.8	39.0	39.1	39.3	39.4	39.6	39.7	39.9	21
22	40.0	40.2	40.3	40.5	40.6	40.8	40.9	41.1	41.2	41.4	22
23	41.5	41.7	41.8	42.0	42.1	42.3	42.4	42.6	42.7	42.9	23
24	43.0	43.2	43.3	43.5	43.6	43.8	43.9	44.1	44.2	44.4	24
25	44.5	44.7	44.8	45.0	45.1	45.3	45.4	45.6	45.7	45.9	25
26	46.0	46.2	46.3	46.5	46.6	46.8	46.9	47.1	47.2	47.4	26
27	47.5	47.7	47.8	48.0	48.1	48.3	48.4	48.6	48.7	48.9	27
28	49.0	49.2	49.3	49.5	49.6	49.8	49.9	50.1	50.2	50.4	28
29	50.5	50.7	50.8	51.0	51.1	51.3	51.4	51.6	51.7	51.9	29
30	52.0	52.2	52.3	52.5	52.6	52.8	52.9	53.1	53.2	53.4	30
31	53.5	53.7	53.8	54.0	54.1	54.3	54.4	54.6	54.7	54.9	31
32	55.0	55.2	55.3	55.5	55.6	55.8	55.9	56.1	56.2	56.4	32
33	56.5	56.7	56.8	57.0	57.1	57.3	57.4	57.6	57.7	57.9	33
34	58.0	58.2	58.3	58.5	58.6	58.8	58.9	59.1	59.2	59.4	34
35	59.5	59.7	59.8	60.0	60.1	60.3	60.4	60.6	60.7	60.9	35
36	61.0	61.2	61.3	61.5	61.6	61.8	61.9	62.1	62.2	62.4	36

Calculated by Julien A. Hall, M. Am. Soc. C. E.

MADE IN GERMANY.