

DULZURA CONDUIT
EXTENSION SECTIONS 1,2,3.

INSTALLED UNDER
WATER CONSERVATION BOND FUND

1914

TRANSIT BOOK

No. 389 T

H. A. WHITNEY

HYDRAULIC ENGINEER

W59

MICROFILMED

JAN 6 1965

EUGENE DIETZGEN CO.

Drawing Materials and Surveying Instruments
 NEW YORK. CHICAGO. SAN FRANCISCO.

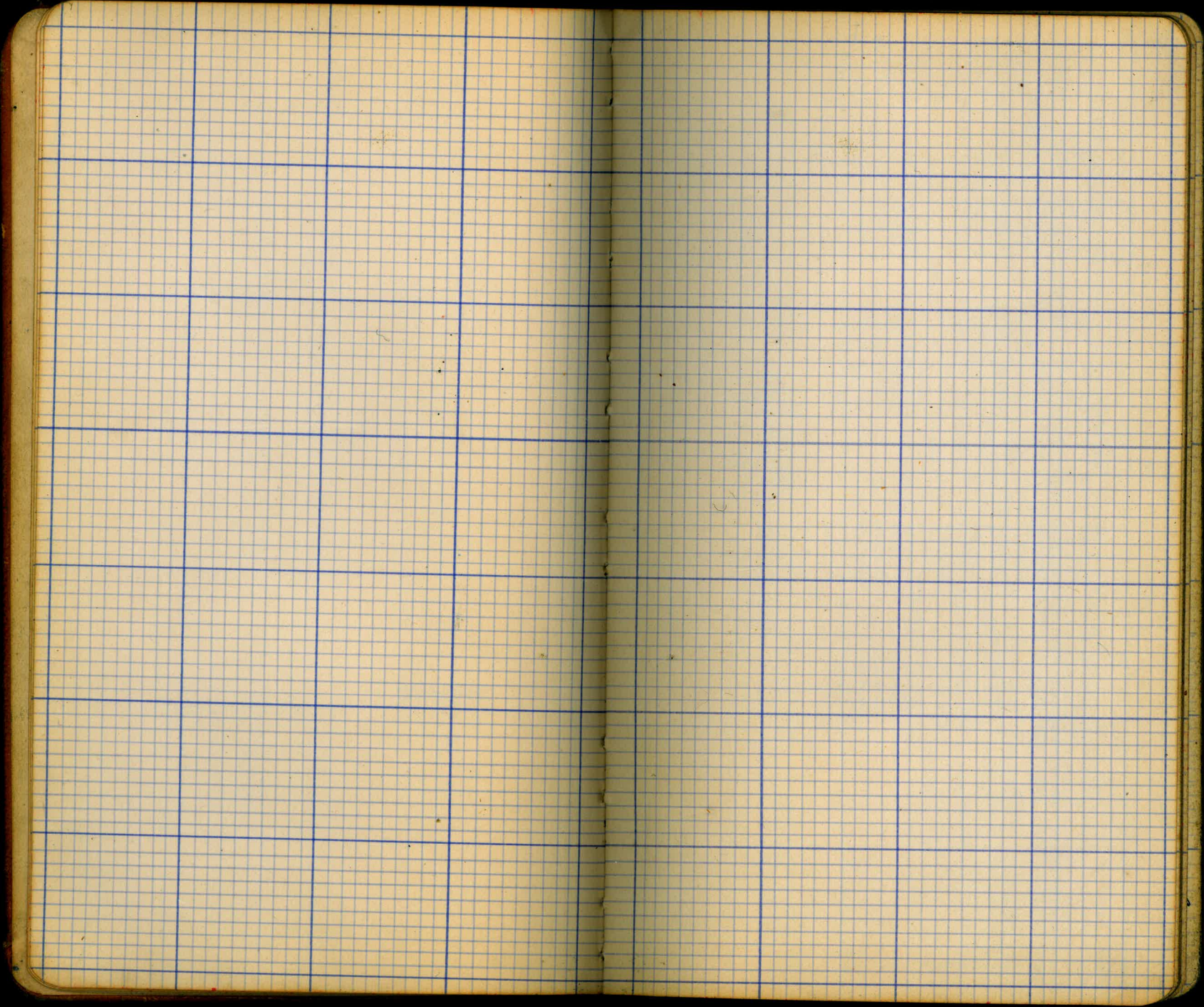
TABLES FOR EXCAVATIONS AND EMBANKMENTS
 DISTANCES FROM CENTER OF ROADWAY FOR CROSS-SECTIONING.
 ROADWAY 20 FEET WIDE. SIDE SLOPES 1 TO 1.
 FOR SINGLE TRACK EXCAVATION.

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	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	
0	10.0	10.1	10.2	10.3	10.4	10.5	10.6	10.7	10.8	10.9	0
1	11.0	11.1	11.2	11.3	11.4	11.5	11.6	11.7	11.8	11.9	1
2	12.0	12.1	12.2	12.3	12.4	12.5	12.6	12.7	12.8	12.9	2
3	13.0	13.1	13.2	13.3	13.4	13.5	13.6	13.7	13.8	13.9	3
4	14.0	14.1	14.2	14.3	14.4	14.5	14.6	14.7	14.8	14.9	4
5	15.0	15.1	15.2	15.3	15.4	15.5	15.6	15.7	15.8	15.9	5
6	16.0	16.1	16.2	16.3	16.4	16.5	16.6	16.7	16.8	16.9	6
7	17.0	17.1	17.2	17.3	17.4	17.5	17.6	17.7	17.8	17.9	7
8	18.0	18.1	18.2	18.3	18.4	18.5	18.6	18.7	18.8	18.9	8
9	19.0	19.1	19.2	19.3	19.4	19.5	19.6	19.7	19.8	19.9	9
10	20.0	20.1	20.2	20.3	20.4	20.5	20.6	20.7	20.8	20.9	10
11	21.0	21.1	21.2	21.3	21.4	21.5	21.6	21.7	21.8	21.9	11
12	22.0	22.1	22.2	22.3	22.4	22.5	22.6	22.7	22.8	22.9	12
13	23.0	23.1	23.2	23.3	23.4	23.5	23.6	23.7	23.8	23.9	13
14	24.0	24.1	24.2	24.3	24.4	24.5	24.6	24.7	24.8	24.9	14
15	25.0	25.1	25.2	25.3	25.4	25.5	25.6	25.7	25.8	25.9	15
16	26.0	26.1	26.2	26.3	26.4	26.5	26.6	26.7	26.8	26.9	16
17	27.0	27.1	27.2	27.3	27.4	27.5	27.6	27.7	27.8	27.9	17
18	28.0	28.1	28.2	28.3	28.4	28.5	28.6	28.7	28.8	28.9	18
19	29.0	29.1	29.2	29.3	29.4	29.5	29.6	29.7	29.8	29.9	19
20	30.0	30.1	30.2	30.3	30.4	30.5	30.6	30.7	30.8	30.9	20
21	31.0	31.1	31.2	31.3	31.4	31.5	31.6	31.7	31.8	31.9	21
22	32.0	32.1	32.2	32.3	32.4	32.5	32.6	32.7	32.8	32.9	22
23	33.0	33.1	33.2	33.3	33.4	33.5	33.6	33.7	33.8	33.9	23
24	34.0	34.1	34.2	34.3	34.4	34.5	34.6	34.7	34.8	34.9	24
25	35.0	35.1	35.2	35.3	35.4	35.5	35.6	35.7	35.8	35.9	25
26	36.0	36.1	36.2	36.3	36.4	36.5	36.6	36.7	36.8	36.9	26
27	37.0	37.1	37.2	37.3	37.4	37.5	37.6	37.7	37.8	37.9	27
28	38.0	38.1	38.2	38.3	38.4	38.5	38.6	38.7	38.8	38.9	28
29	39.0	39.1	39.2	39.3	39.4	39.5	39.6	39.7	39.8	39.9	29
30	40.0	40.1	40.2	40.3	40.4	40.5	40.6	40.7	40.8	40.9	30
31	41.0	41.1	41.2	41.3	41.4	41.5	41.6	41.7	41.8	41.9	31
32	42.0	42.1	42.2	42.3	42.4	42.5	42.6	42.7	42.8	42.9	32
33	43.0	43.1	43.2	43.3	43.4	43.5	43.6	43.7	43.8	43.9	33
34	44.0	44.1	44.2	44.3	44.4	44.5	44.6	44.7	44.8	44.9	34
35	45.0	45.1	45.2	45.3	45.4	45.5	45.6	45.7	45.8	45.9	35
36	46.0	46.1	46.2	46.3	46.4	46.5	46.6	46.7	46.8	46.9	36
37	47.0	47.1	47.2	47.3	47.4	47.5	47.6	47.7	47.8	47.9	37
38	48.0	48.1	48.2	48.3	48.4	48.5	48.6	48.7	48.8	48.9	38
39	49.0	49.1	49.2	49.3	49.4	49.5	49.6	49.7	49.8	49.9	39
40	50.0	50.1	50.2	50.3	50.4	50.5	50.6	50.7	50.8	50.9	40

Calculated by F. E. Paradis, C. E.

Tables & Designs



Summary of Bids on Cottonwood Conduit

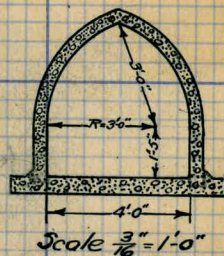
Item	Quantity	Doran & Reed		D. L. Bissell		Trownce & Debecker		Holland Const. Co.		Mesmer & Rice	
		Unit	Total	Unit	Total	Unit	Total	Unit	Total	Unit	Total
a	4000 cu. yd.	1.10	4400.00	1.22	4960.00	1.28	5120.00	1.35	5600.00	1.46	5840.00
b	6000 cu. yd.	.80	4800.00	.66	3960.00	.69	4140.00	.65	3900.00	.86	5160.00
c	4000 cu. yd.	.52	2080.00	.40	1600.00	.37	1540.00	.37	1480.00	.49	1960.00
d	10000 cu. yd.	1.00	10000.00	1.00	10000.00	1.00	10000.00	1.00	10000.00	1.00	10000.00
e	1500 cu. yd.	2.57	3855.00	3.80	5700.00	2.40	3600.00	3.25	4875.00	2.34	3510.00
f	500 cu. yd.	2.33	1165.00	4.70	6300.00	2.81	1405.00	3.60	4440.00	2.09	1045.00
g	4000 cu. yd.	1.00	4000.00	3.70	1480.00	2.69	1076.00	3.25	1300.00	1.71	684.00
h	2250 cu. yd.	18.50	4162.50	8.40	1890.00	18.00	4050.00	20.00	4500.00	20.00	4500.00
i	2250 cu. yd.	17.40	3915.00	8.10	1818.00	15.00	3375.00	17.50	3937.50	19.19	4310.00
j	2250 cu. yd.	17.75	3937.50	8.10	1818.00	15.00	3375.00	17.50	3937.50	19.19	4310.00
k	2250 cu. yd.	16.55	3701.25	8.10	1818.00	15.00	3375.00	17.50	3937.50	19.19	4310.00
l	2250 cu. yd.	17.75	3937.50	8.10	1818.00	15.00	3375.00	17.50	3937.50	19.19	4310.00
m	2250 cu. yd.	17.75	3937.50	8.10	1818.00	15.00	3375.00	17.50	3937.50	19.19	4310.00
n	3000 cu. yd.	.17	510.00	.05	150.00	.16	480.00	.20	600.00	.13	390.00
o	680 cu. yd.	14.15	9622.50	8.20	5760.00	14.45	10576.50	11.85	8038.50	19.05	12930.00
p	560 cu. yd.	11.75	6560.00	8.20	5760.00	9.65	9292.00	10.50	5700.00	19.90	11130.00
q	60 cu. yd.	16.50	990.00	8.00	480.00	12.50	775.00	12.00	720.00	31.70	1902.00
r	10 M.	72.00	720.00	40.00	400.00	50.00	500.00	60.00	600.00	31.70	317.00
s	1000	.60	600.00	.30	300.00	.70	700.00	.40	400.00	1.25	1250.00
t	1000	.60	600.00	.30	300.00	.70	700.00	.40	400.00	1.25	1250.00
u	126 cu. yd.	12.95	1631.70	8.00	1008.00	14.85	1790.10	13.00	1638.00	1.00	1000.00
v	1500 cu. yd.	.30	450.00	.15	225.00	.29	435.00	.25	375.00	2.00	300.00
Grand Total			57027.20		40978.50		50327.00		49789.75		64279.00
W	Time		150 Days		4 Months		6 Months		180 Wks. Days		6 Months

Summary of Bids on Cottonwood Conduit - Continued.

Item	Quantity	G. W. Calback		G. R. Doley		John Campbell		T. J. Sheo		Water Dept.	
		Unit	Total	Unit	Total	Unit	Total	Unit	Total	Unit	Total
a	4000 cu. yd.	1.50	6000.00	2.50	10000.00	1.80	7200.00	2.25	9000.00	1.90	7600.00
b	6000 cu. yd.	.90	5400.00	.35	1400.00	.90	3600.00	1.00	6000.00	.80	4800.00
c	4000 cu. yd.	.50	2000.00	.60	2400.00	.48	1920.00	.80	3200.00	.40	1600.00
d	10000 cu. yd.	1.00	10000.00	1.00	10000.00	1.00	10000.00	1.00	10000.00	1.00	10000.00
e	1500 cu. yd.	3.50	5250.00	2.08	3120.00	1.90	2850.00	3.00	4500.00	1.64	2460.00
f	500 cu. yd.	2.05	1025.00	2.52	1260.00	2.40	1200.00	3.30	4950.00	2.00	3000.00
g	4000 cu. yd.	2.50	10000.00	2.88	11520.00	1.80	7200.00	3.00	12000.00	1.47	5880.00
h	40 M. ft.	52.00	2080.00	45.00	1800.00	5.15	2077.50	3.00	1200.00	1.80	720.00
i	2250 cu. yd.	17.00	3825.00	13.68	3078.00	20.00	4400.00	20.00	4400.00	12.60	2808.00
j	2250 cu. yd.	16.25	3656.25	13.20	2970.00	23.60	5370.00	15.85	3566.25	12.60	2835.00
k	2250 cu. yd.	17.00	3825.00	13.68	3078.00	20.00	4400.00	20.00	4400.00	12.60	2808.00
l	2250 cu. yd.	16.25	3656.25	13.20	2970.00	23.60	5370.00	15.85	3566.25	12.60	2835.00
m	7000 cu. yd.	17.00	11900.00	12.48	8736.00	24.00	16800.00	16.00	11200.00	14.00	9800.00
n	3000 cu. yd.	.65	2025.00	.04	120.00	.22	660.00	.15	450.00	.03	90.00
o	680 cu. yd.	16.00	10880.00	11.40	7752.00	21.60	14688.00	14.60	9928.00	14.00	9800.00
p	560 cu. yd.	15.00	8400.00	11.40	6384.00	19.25	10787.50	13.00	7200.00	13.00	7200.00
q	60 cu. yd.	15.00	900.00	10.00	600.00	18.00	1080.00	15.00	900.00	10.00	600.00
r	10 M.	30.00	300.00	30.00	300.00	70.00	700.00	70.00	700.00	35.00	350.00
s	1000	.50	500.00	.25	250.00	1.25	1250.00	1.00	1000.00	1.50	1500.00
t	1000	.50	500.00	.25	250.00	1.25	1250.00	1.00	1000.00	1.50	1500.00
u	126 cu. yd.	17.00	2142.00	11.40	4860.00	22.00	2772.00	20.00	2520.00	15.00	1890.00
v	1500 cu. yd.	.40	600.00	.50	750.00	.25	375.00	.50	750.00	.30	450.00
Grand Total			49416.75		45994.50		71963.00		67649.25		53265.00
W	Time		6 Months		150 Days		12 Months		6 Months		6 Months

Table Showing Hydraulic Elements When Flowing To Second Feet

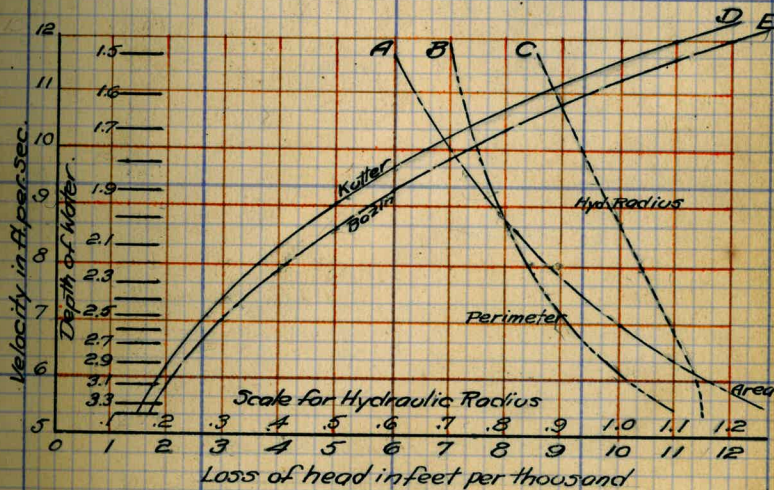
Depth in ft.	Area in sq. ft.	Wetted Perim. Radius	Hyd. Veloc.	Slope		C	
				Kutter	Bazin	Kutter	Bazin
1.5	6.00	7.00	0.857	11.67	0.010	125.5	120.0
1.6	6.40	7.20	0.883	10.92	0.009	125.1	120.4
1.7	6.80	7.40	0.910	10.30	0.008	124.8	121.0
1.8	7.20	7.60	0.936	9.72	0.007	124.5	121.5
1.9	7.60	7.80	0.963	9.22	0.006	124.2	122.0
2.0	8.00	8.00	0.991	8.77	0.005	123.9	122.5
2.1	8.40	8.20	1.021	8.36	0.004	123.7	122.9
2.2	8.80	8.40	1.052	8.00	0.003	123.4	123.2
2.3	9.20	8.60	1.085	7.66	0.002	123.2	123.6
2.4	9.60	8.80	1.120	7.36	0.001	123.0	123.9
2.5	10.00	9.00	1.157	7.09	0.000	122.8	124.2
2.6	10.40	9.20	1.196	6.84	0.000	122.6	124.4
2.7	10.80	9.40	1.237	6.60	0.000	122.5	124.6
2.8	11.20	9.60	1.280	6.40	0.000	122.4	124.7
2.9	11.60	9.80	1.325	6.21	0.000	122.3	124.8
3.0	12.00	10.00	1.372	6.04	0.000	122.2	124.9
3.1	12.40	10.20	1.421	5.89	0.000	122.1	125.0
3.2	12.80	10.40	1.471	5.75	0.000	122.0	125.0
3.3	13.20	10.60	1.523	5.62	0.000	121.9	125.0
3.4	13.60	10.80	1.576	5.50	0.000	121.8	125.0
3.5	14.00	11.00	1.631	5.39	0.000	121.7	125.0



ALVERSONS FORMULAR

$$V = R \times 2 \times \text{FALL IN FT PER MILE} \times 5280$$

$$V = 10560 R S \quad S = \text{FALL IN FT PER MI.}$$



HYDRAULIC ELEMENTS

For Design of Cement Conduit

$$Q = 70 \text{ cu. ft. per sec.}$$

Curve "A" shows the conduit Areas for various depths.
 " " " " " Wetted Perimeter " " "
 " " " " " Hydraulic Radius " " "
 " " " " " what the velocity of flow will be for the various slopes in feet per thousand as calculated by Kutter's Formula ($n = .012$, $C = 125 - 130$)
 Curve "E" shows what the velocity of flow will be for the various slopes in feet per thousand as calculated by Bazin's Formula ($C = 120 - 124$).

$$V = 122 \sqrt{R S}$$

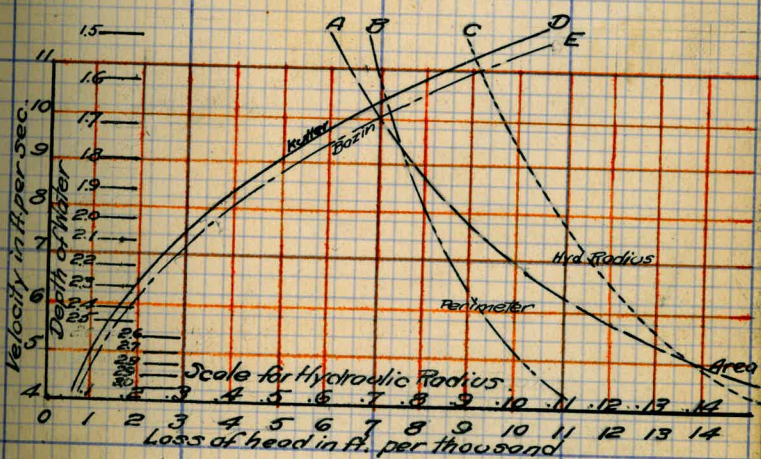
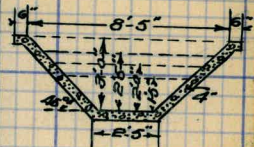
V =

$V = C \sqrt{R S}$
 $10560 = C \sqrt{R S}$
 $10560 / \sqrt{R S} = C$

$V = 122 \sqrt{R S}$
 $122 \sqrt{R S} = C \sqrt{R S}$
 $122 = C$

Table Showing Hydraulic Elements when Flowing to Sec. Feet

K	C	Depth in ft.	Area	Hyd. Radius	Wetted Perimeter	Hyd. Rad.	Slope	
							Kutter	Bozin
125.2	120.5	1.2	6.00	0.500	11.67	0.0079	0.1032	6.124
126.1	121.0	1.6	6.36	0.397	10.47	0.0074	0.0839	7.097
127.0	121.7	1.7	7.14	0.376	9.80	0.0069	0.0664	7.37
128.1	122.3	1.8	7.74	0.360	9.04	0.0064	0.0536	7.80
129.2	123.3	2.0	9.00	0.300	8.37	0.0059	0.0427	7.87
129.8	123.9	2.1	9.66	0.286	7.85	0.0054	0.0361	8.16
130.6	124.5	2.2	10.32	0.273	7.35	0.0049	0.0299	8.24
131.1	125.0	2.3	11.04	0.262	6.72	0.0047	0.0210	8.00
132.1	125.5	2.5	12.76	0.226	5.95	0.0039	0.0177	8.20
133.1	126.0	2.5	13.10	0.220	5.60	0.0036	0.0151	8.57
134.1	126.5	2.6	13.56	0.214	5.33	0.0033	0.0130	8.87
135.1	127.0	2.7	14.04	0.209	5.09	0.0030	0.0114	9.17
136.1	127.5	2.8	14.54	0.204	4.77	0.0028	0.0097	9.47
137.1	128.0	2.9	15.06	0.200	4.47	0.0026	0.0082	9.70
138.1	128.5	3.0	15.60	0.196	4.24	0.0024	0.0073	9.99



HYDRAULIC ELEMENTS.

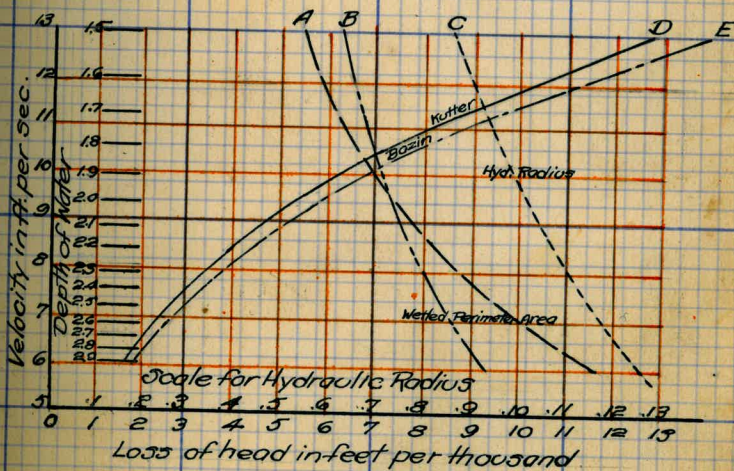
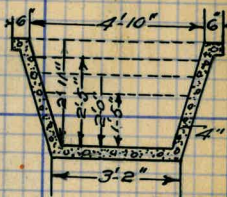
For Design of Cement Conduit

Q = 70 Sec. Feet.

"A" shows the conduit Areas for various depths.
 "B" " " "Wetted Perimeter"
 "C" " " "Hydraulic Radius"
 "D" " " what the velocity of flow will be for
 the various slopes in feet per thousand as calculated
 by Kutter's Formula (n = 0.12). C = 125-135
 Curve "E" shows what the velocity of flow will be for the
 various slopes in feet per thousand as calculated by
 Bozin's Formula (C = 120-128).

Table Showing Hydraulic Elements When Flowing To Second Feet

Depth in ft.	Area in sq. ft.	Wetted Perim. Radius	Hyd. Radius	Veloc.	Slope		K	B
					Kutter	Basin		
1.0	3.14	6.28	0.500	12.99	0.0229	0.134	124.0	124.0
1.2	3.52	6.70	0.521	12.07	0.0239	0.132	125.3	120.4
1.4	3.82	6.70	0.521	11.27	0.0246	0.131	126.2	120.9
1.5	4.21	6.70	0.521	10.46	0.0250	0.130	127.0	121.4
1.7	4.63	6.91	0.510	9.65	0.0250	0.130	127.4	121.9
1.9	4.95	7.15	0.500	8.85	0.0251	0.129	127.5	122.3
2.0	5.28	7.32	0.500	8.06	0.0251	0.129	127.5	122.7
2.1	5.61	7.52	0.490	7.27	0.0250	0.129	127.4	122.7
2.2	5.95	7.75	0.480	6.48	0.0250	0.129	127.3	122.7
2.3	6.30	7.99	0.470	5.69	0.0250	0.129	127.2	122.7
2.4	6.65	8.17	0.460	4.90	0.0250	0.129	127.1	122.7
2.5	7.00	8.37	0.450	4.11	0.0250	0.129	127.0	122.7
2.6	7.35	8.58	0.440	3.32	0.0250	0.129	126.9	122.7
2.7	7.70	8.79	0.430	2.53	0.0250	0.129	126.8	122.7
2.8	8.05	9.00	0.420	1.74	0.0250	0.129	126.7	122.7
2.9	8.40	9.21	0.410	0.95	0.0250	0.129	126.6	122.7

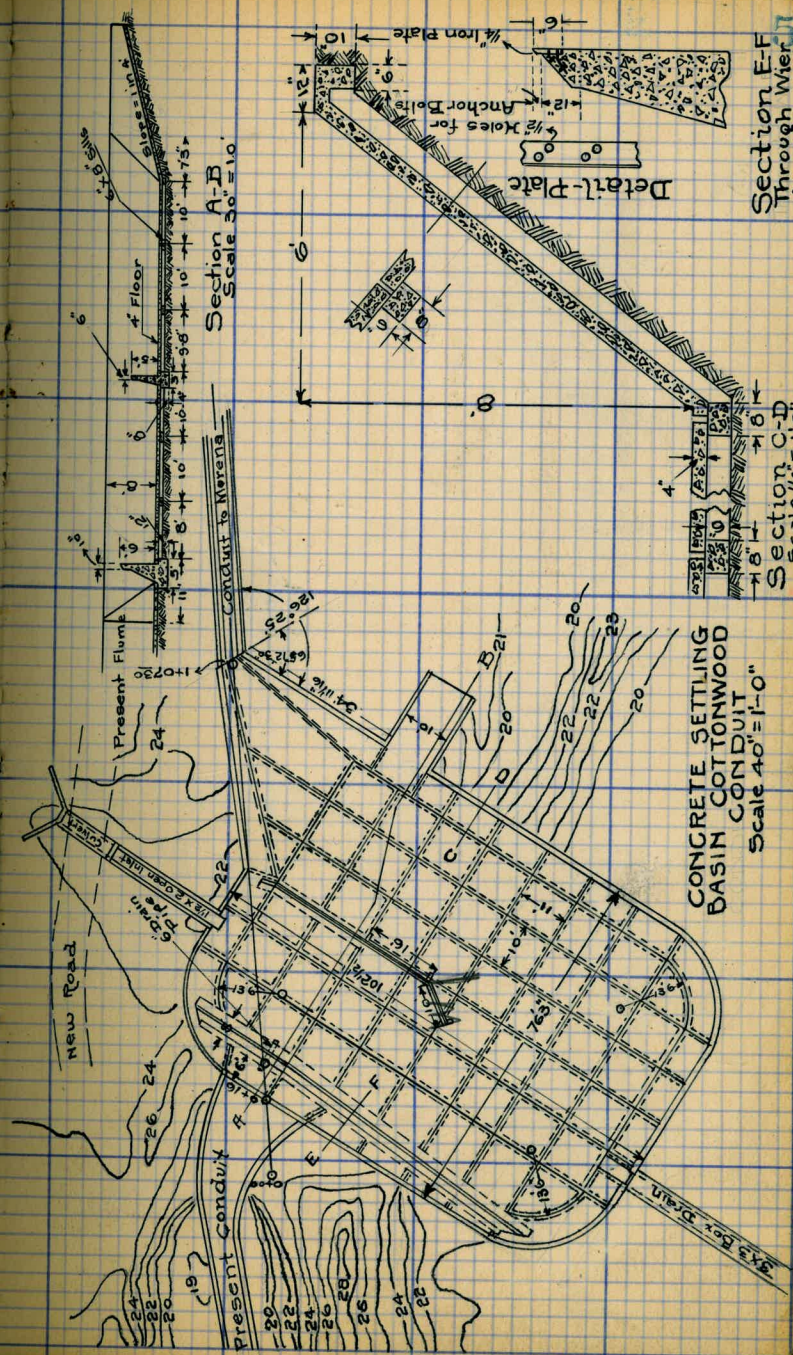


HYDRAULIC ELEMENTS

For Design of Cement Conduit

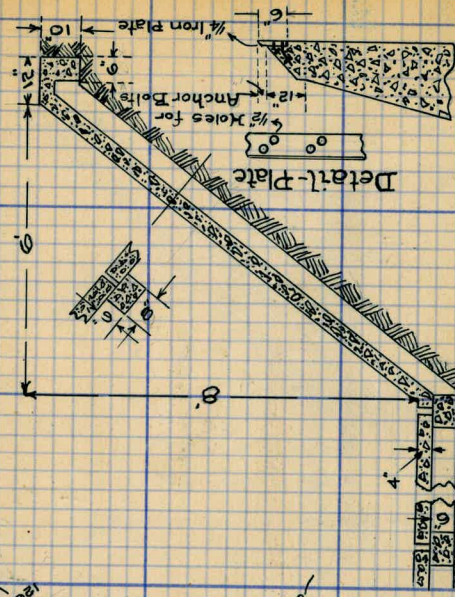
$Q = 70$ Sec. Feet.

Curve "A" shows the conduit Areas for various depths.
 "B" " " " Wetted Perimeter " " "
 "C" " " " Hydraulic Radius " " "
 "D" " " what the velocity of flow will be for the
 various slopes in feet per thousand as calculated by
 Kutter's Formula ($n=0.12$), $C=124.5-132$.
 Curve "E" shows what the velocity of flow will be for
 the various slopes in feet per thousand as calculated
 by Basin's Formula ($C=120-126$).



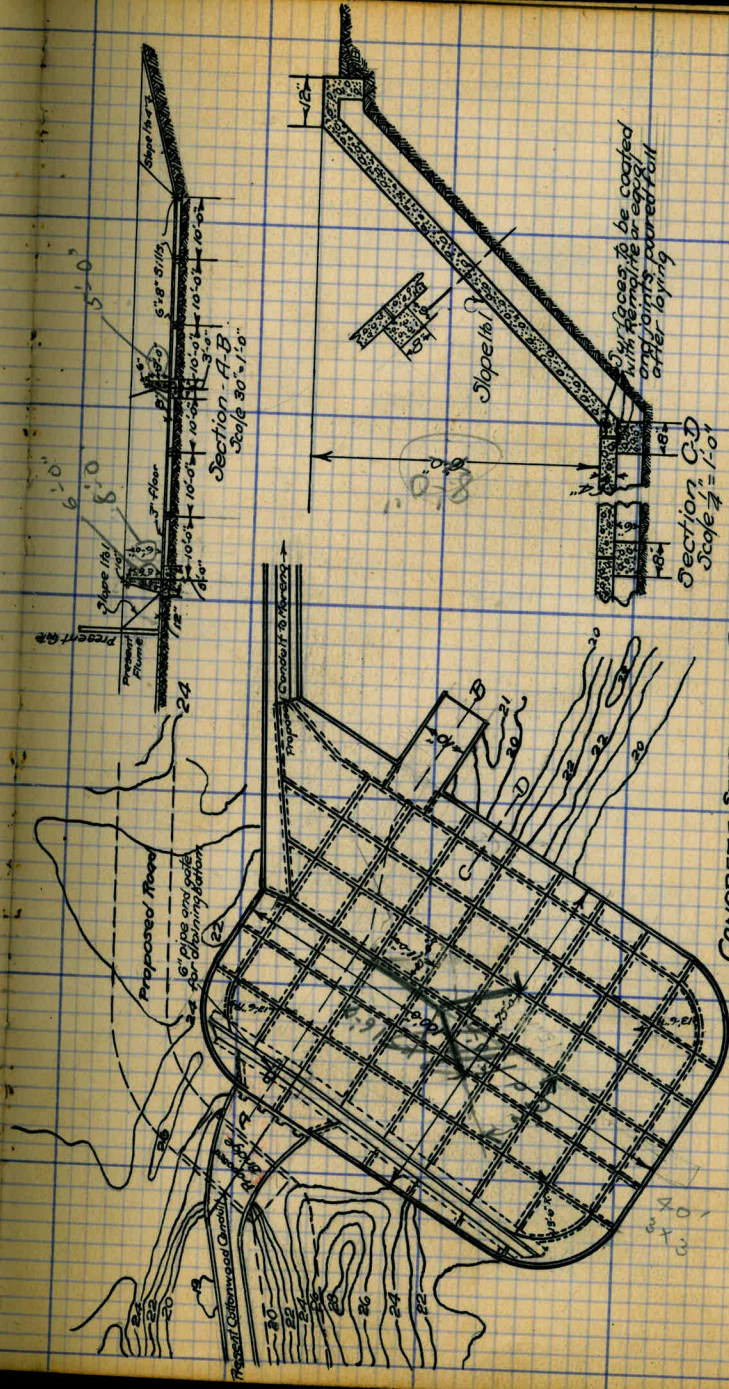
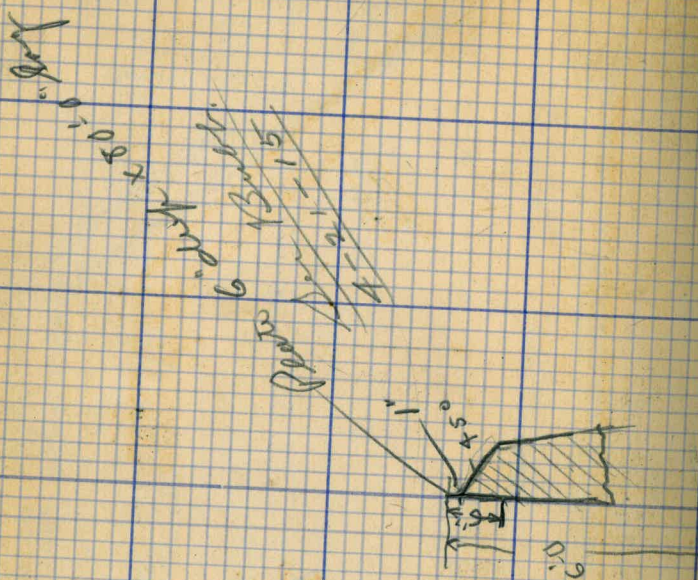
CONCRETE SETTLING
BASIN COTTONWOOD
CONDUIT
Scale 40' = 1'-0"

Section A-B
Scale 30" = 1'-0"



Section E-F
Through Wier

Section C-D
Scale 1/4" = 1'-0"



CONCRETE SETTLING BASIN
FOR COTTONWOOD CONDUIT
Scale 40" = 1' 0"

Drawing # B205 L

Take From Page 5

PRICE LIST

WESTERN STEEL FLUME

Prices on flume to City erected, purchaser to haul from San Diego to Job.

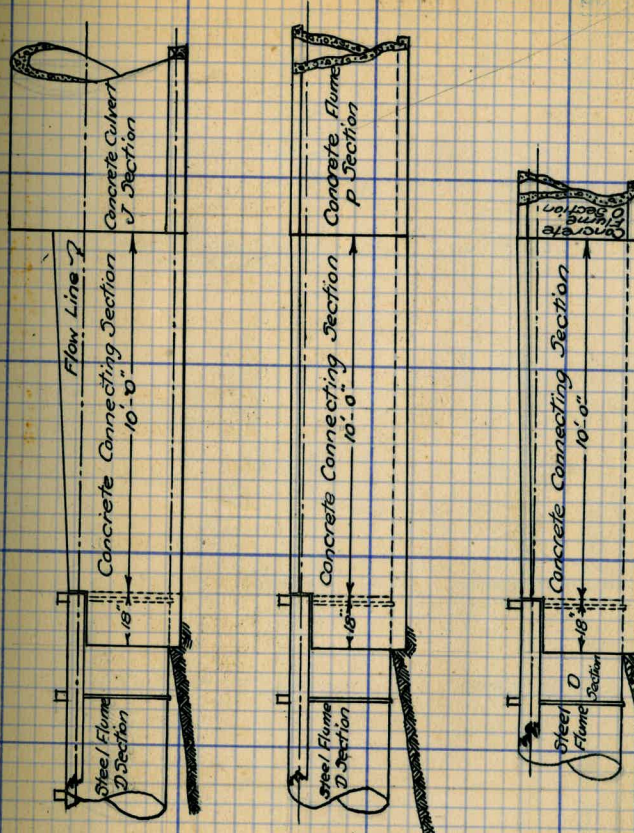
Number	Diameter	Price per Lin. Foot		
		16 Gauge	16 Gauge	14 Gauge
2	1'-3 1/4"	.50	.55	.60
3	1'-11"	.65	.70	.80
4	2'-6 1/2"	.85	.90	1.00
5	3'-2 1/4"	1.00	1.15	1.25
6	3'-10"	1.15	1.30	1.45
7	4'-6"	1.30	1.45	1.60
8	5'-1"		1.65	1.85
9	5'-9"		2.10	2.35
10	6'-4"		2.35	2.60
11	7'-0"		2.50	2.75
12	7'-8"		2.80	3.10
13	8'-4"		3.65	4.00
14	8'-11"		3.85	4.20
15	9'-6"		4.35	4.75
16	10'-2"		4.85	5.25

10% off list using Western Metal

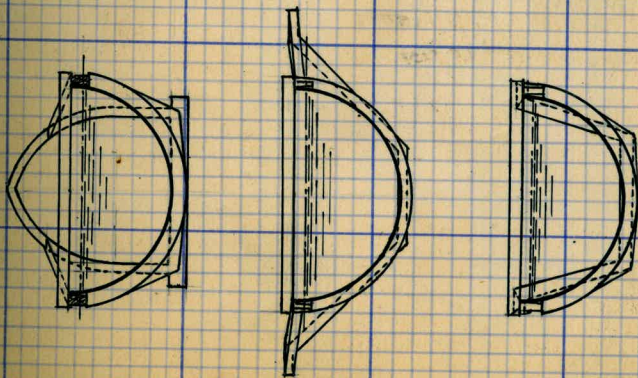
Using so called Pure Iron--

*18-10%*16 list

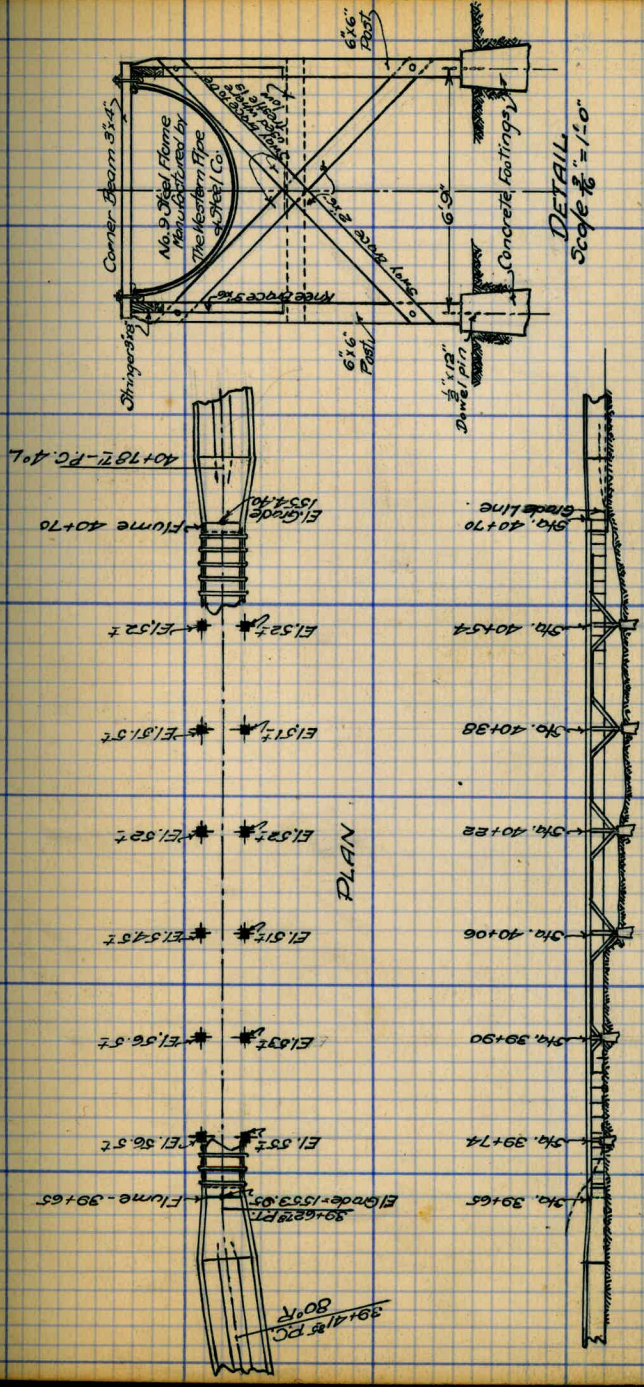
*16-10%*14 list.



Typical Connections between Sections
Dulzura Conduit Extension
Scale 3/8" = 1'-0"

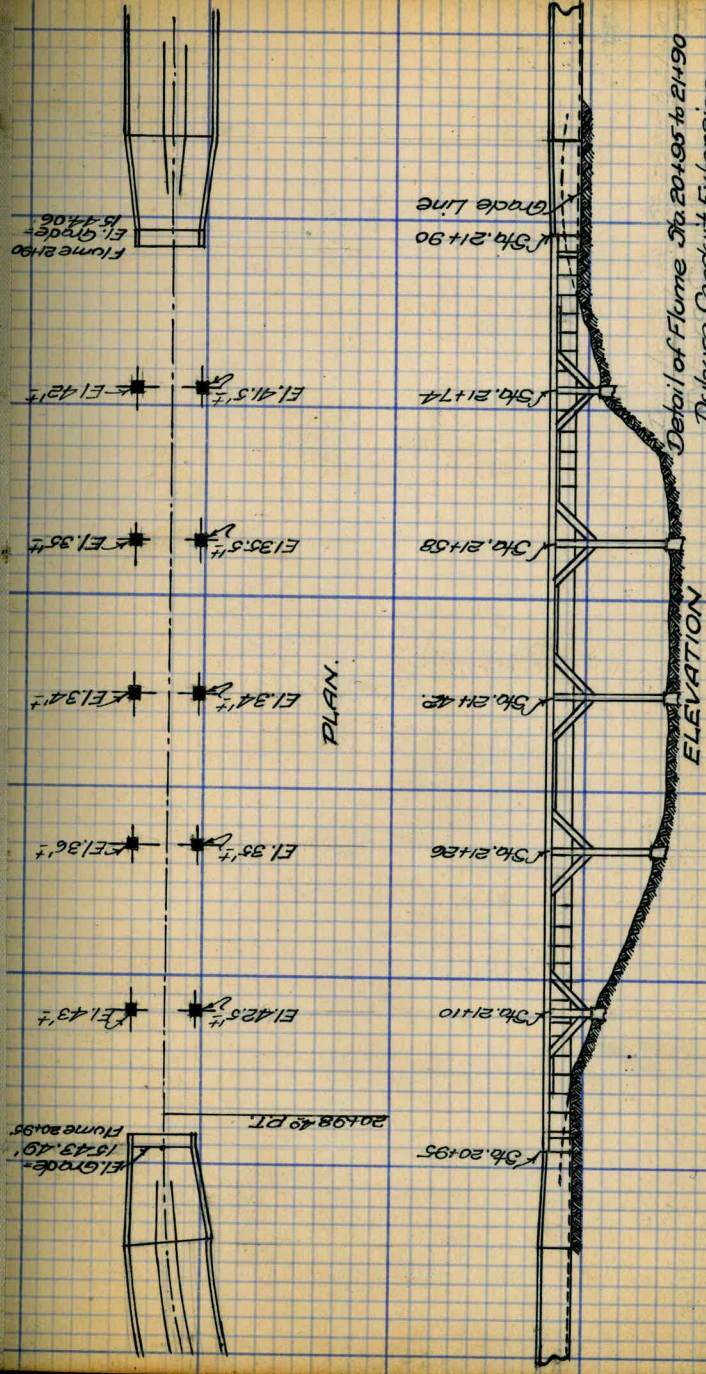


Drawing # BE43L



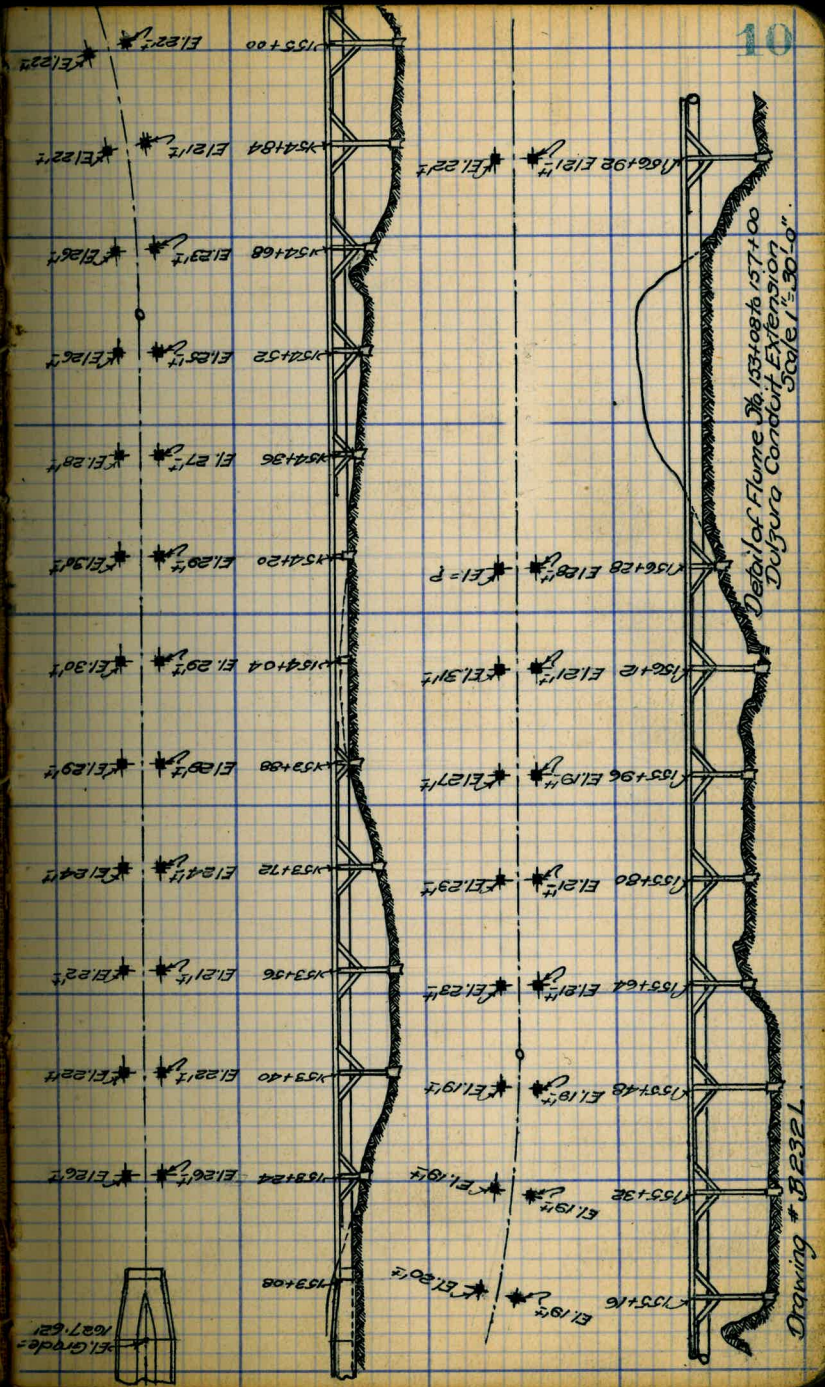
Detail of Flume Sta. 39+65 to 40+70
Durgara Conduit Extension
Scale 1" = 30'-0"

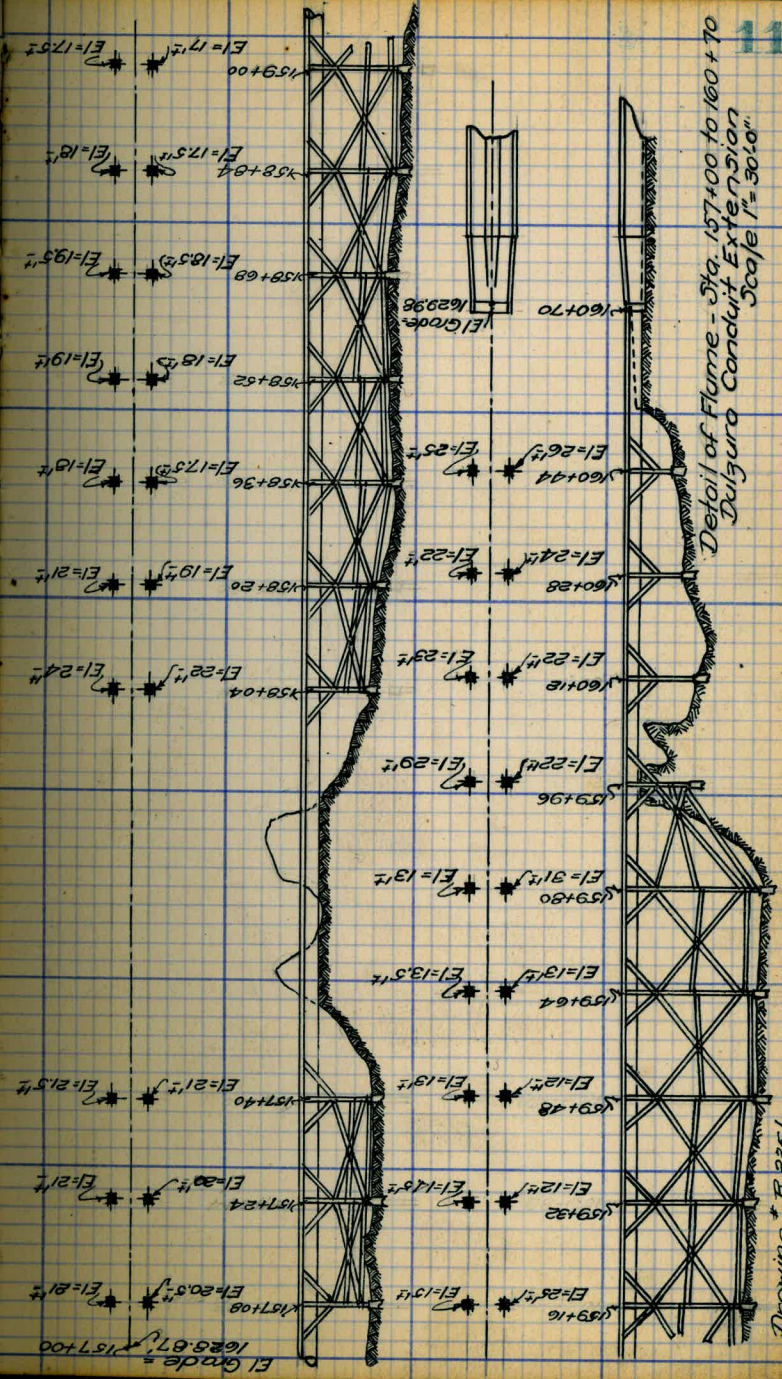
Drawing # B222 L.

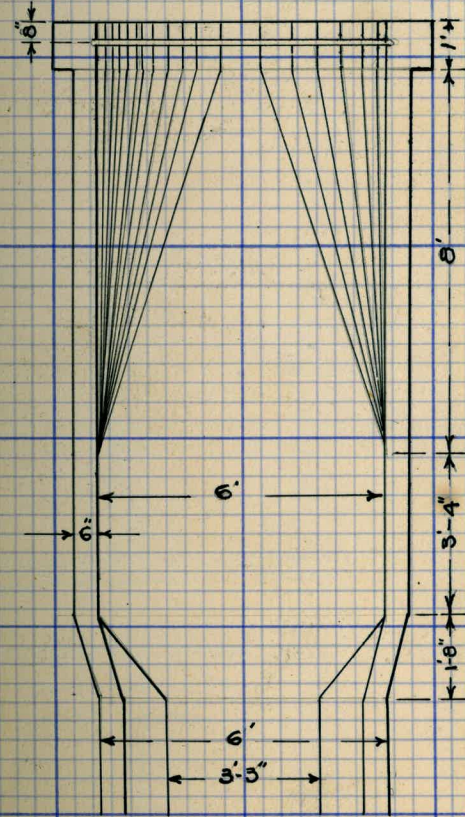
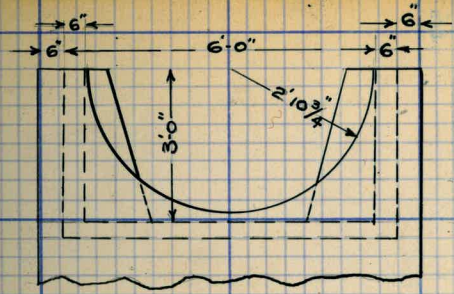


Drawing # B223L

Detail of Fume Sta. 20+95 to 21+90
Dalgura Conduit Extension
Scale 1"=20' 0"







"0" Section

TYPICAL CONNECTION
FLUME & CONDUIT
Scale 1/4" = 1'-0"

r = area
wet Perim
C = velac
V x S

Table showing Hydraulic Elements of Section 0.3% Grade Sta 37+00 to 38+33

Depth	Area	Wetted Hyd	Veloc	Slope	C	V	Q
m ft	sq ft	Perim	Radius				
1.5	6.00	7.00	0.857	0.3	124.4	0.12	37.85
1.6	6.40	7.20	0.889	0.3	124.6	0.12	41.41
1.7	6.80	7.40	0.919	0.3	124.7	0.12	45.02
1.8	7.20	7.60	0.946	0.3	124.8	0.12	48.70
1.9	7.59	7.80	0.973	0.3	124.9	0.12	52.45
2.0	7.99	8.00	0.999	0.3	125.0	0.12	56.27
2.1	8.38	8.20	1.024	0.3	125.1	0.12	60.16
2.2	8.77	8.41	1.049	0.3	125.2	0.12	64.12
2.3	9.14	8.54	1.072	0.3	125.3	0.12	68.15
2.4	9.51	8.67	1.095	0.3	125.4	0.12	72.25
2.5	9.87	8.80	1.117	0.3	125.5	0.12	76.42
2.6	10.22	8.93	1.139	0.3	125.6	0.12	80.66
2.7	10.57	9.06	1.161	0.3	125.7	0.12	84.97
2.8	10.91	9.19	1.182	0.3	125.8	0.12	89.35
2.9	11.25	9.32	1.203	0.3	125.9	0.12	93.79
3.0	11.58	9.45	1.224	0.3	126.0	0.12	98.29
3.1	11.91	9.58	1.244	0.3	126.1	0.12	102.85
3.2	12.23	9.71	1.264	0.3	126.2	0.12	107.47
3.3	12.55	9.84	1.284	0.3	126.3	0.12	112.15
3.4	12.87	9.97	1.303	0.3	126.4	0.12	116.89
3.5	13.18	10.10	1.322	0.3	126.5	0.12	121.69

Table showing Hydraulic Elements of Section 0.06% Slope Sta 11+00 to 20+76.77

Depth	Area	Wetted Hyd	Veloc	Slope	C	V	Q
m ft	sq ft	Perim	Radius				
1.5	6.00	7.00	0.857	0.06	124.7	0.12	55.64
1.6	6.40	7.20	0.889	0.06	124.8	0.12	59.62
1.7	6.80	7.40	0.919	0.06	124.9	0.12	63.65
1.8	7.20	7.60	0.946	0.06	125.0	0.12	67.73
1.9	7.59	7.80	0.973	0.06	125.1	0.12	71.86
2.0	7.99	8.00	0.999	0.06	125.2	0.12	76.04
2.1	8.38	8.20	1.024	0.06	125.3	0.12	80.27
2.2	8.77	8.41	1.049	0.06	125.4	0.12	84.55
2.3	9.14	8.54	1.072	0.06	125.5	0.12	88.88
2.4	9.51	8.67	1.095	0.06	125.6	0.12	93.26
2.5	9.87	8.80	1.117	0.06	125.7	0.12	97.69
2.6	10.22	8.93	1.139	0.06	125.8	0.12	102.17
2.7	10.57	9.06	1.161	0.06	125.9	0.12	106.70
2.8	10.91	9.19	1.182	0.06	126.0	0.12	111.28
2.9	11.25	9.32	1.203	0.06	126.1	0.12	115.91
3.0	11.58	9.45	1.224	0.06	126.2	0.12	120.59
3.1	11.91	9.58	1.244	0.06	126.3	0.12	125.32
3.2	12.23	9.71	1.264	0.06	126.4	0.12	130.10
3.3	12.55	9.84	1.284	0.06	126.5	0.12	134.93
3.4	12.87	9.97	1.303	0.06	126.6	0.12	139.81
3.5	13.18	10.10	1.322	0.06	126.7	0.12	144.74

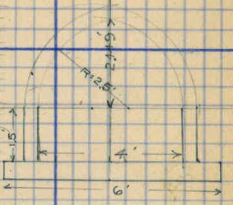


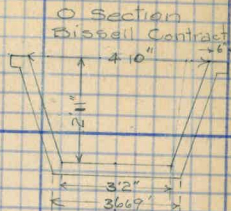
Table showing Hydraulic Elements of Section 0.23% Grade Sta 39+31.5 to 39+79.5

Depth	Area	Wetted Hyd	Veloc	Slope	C	V	Q
m ft	sq ft	Perim	Radius				
1.5	6.00	7.00	0.857	0.23	124.4	0.12	44.44
1.6	6.40	7.20	0.889	0.23	125.5	0.12	49.15
1.7	6.80	7.40	0.919	0.23	126.0	0.12	53.88
1.8	7.20	7.60	0.946	0.23	126.6	0.12	58.67
1.9	7.59	7.80	0.973	0.23	127.3	0.12	63.51
2.0	7.99	8.00	0.999	0.23	128.0	0.12	68.41
2.1	8.38	8.20	1.024	0.23	128.6	0.12	73.37
2.2	8.77	8.41	1.049	0.23	129.3	0.12	78.39
2.3	9.14	8.54	1.072	0.23	129.8	0.12	83.47
2.4	9.51	8.67	1.095	0.23	130.5	0.12	88.61
2.5	9.87	8.80	1.117	0.23	131.2	0.12	93.81
2.6	10.22	8.93	1.139	0.23	131.9	0.12	99.07
2.7	10.57	9.06	1.161	0.23	132.6	0.12	104.39
2.8	10.91	9.19	1.182	0.23	133.3	0.12	109.77
2.9	11.25	9.32	1.203	0.23	134.0	0.12	115.21
3.0	11.58	9.45	1.224	0.23	134.7	0.12	120.71
3.1	11.91	9.58	1.244	0.23	135.4	0.12	126.27
3.2	12.23	9.71	1.264	0.23	136.1	0.12	131.89
3.3	12.55	9.84	1.284	0.23	136.8	0.12	137.57
3.4	12.87	9.97	1.303	0.23	137.5	0.12	143.31
3.5	13.18	10.10	1.322	0.23	138.2	0.12	149.11

Hydraulic Elements 0' section
 Bissell Contract 0.3% Grade
 Depth Area Wet Hydr C
 in ft Sq ft Perim Radius Veloc Slope Kutter M Q

Table showing Hydraulic Elements
 0' Sect Bissell Contract 0.6% Grade
 Depth Area Wet Hydr C
 in ft Sq ft Perim Radius Veloc Slope Kutter M Q

14



Hydraulic Elements 0' section
 Bissell Contract 0.5% Grade
 Depth Area Wet Hydr C
 in ft Sq ft Perim Radius Veloc Slope Kutter M Q

Hydraulic Elements 0' Sect
 Bissell Contract 0.544% Grade
 Depth Area Wet Hydr C
 in ft Sq ft Perim Radius Veloc Slope Kutter M Q

Hydraulic Elements 0' Sect
 Bissell Contract 0.7% Grade
 Depth Area Wet Hydr C
 in ft Sq ft Perim Radius Veloc Slope Kutter M Q

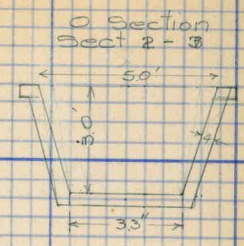
Hydraulic Elements 0' Section
 Bissell Contract 0.423% Grade
 Depth Area Wet Hydr C
 in ft Sq ft Perim Radius Veloc Slope Kutter M Q

Hydraulic Elements "0" Section
Bissell Contract 032% Grade
Depth Area Wet Hyd. C
in ft. Sa ft Perim Radius Veloc Slope Kutter n Q

Hydraulic Elements "0" Section
Bissell Contract 1233% Grade
Depth Area Wet Hyd. C
in ft. Sa ft Perim Radius Veloc Slope Kutter n Q

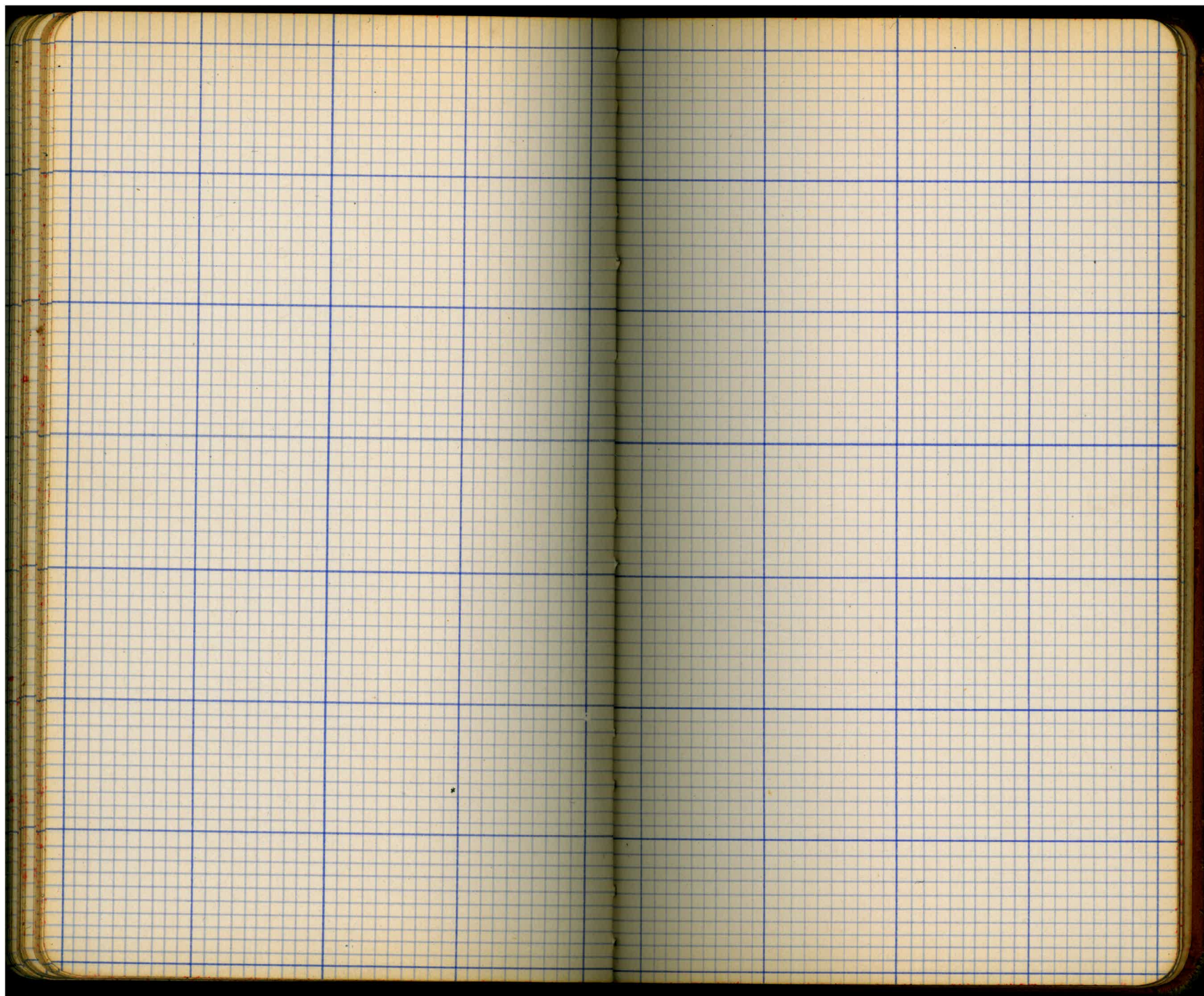
Hydraulic Elements 0 Section
 Sections 27.3 0.3% Grade
 Depth Area Wet Hydr. C
 in ft. sq. ft. Perim. Radius Veloc. Slope Kutter n Q

Hydraulic Elements 0 Section
 Sections 27.3 0.6% Grade
 Depth Area Wet Hydr. C
 in ft. sq. ft. Perim. Radius Veloc. Slope Kutter n Q



Hydraulic Elements 0 Section
 Sections 29.3 0.25% Grade
 Depth Area Wet Hydr. C
 in ft. sq. ft. Perim. Radius Veloc. Slope Kutter n Q

3



CAMP-3 - COTTONWOOD CREEK

ANALYSIS OF GRAVEL ON SECTION #1

AMOUNT No of SCREEN	RETAINED WEIGHT OF AGGREGATE OUNCES	PERCENT OF TOTAL		
#4	55.5	29.2	29.2	100.
#10	58.5	30.8	60.	70.8
#20	43.5	22.9	82.9	40
#30	12.	6.3	89.2	17.10
40	8.	4.2	93.42	10.78
60	6.5	3.42	96.84	658
80	4.	2.1	98.94	316
100	1.	.53	99.47	106
200	1.	.53	100.	53
	190.0	100.00		

DISTANCES FROM CENTER OF ROADWAY FOR CROSS-SECTIONING.

ROADWAY 14 FEET WIDE. SIDE SLOPES 1 1/2 TO 1.

FOR SINGLE TRACK EMBANKMENT.

	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	
0	7.00	7.15	7.30	7.45	7.60	7.75	7.90	8.05	8.20	8.35	0
1	8.50	8.65	8.80	8.95	9.10	9.25	9.40	9.55	9.70	9.85	1
2	10.00	10.15	10.30	10.45	10.60	10.75	10.90	11.05	11.20	11.35	2
3	11.50	11.65	11.80	11.95	12.10	12.25	12.40	12.55	12.70	12.85	3
4	13.00	13.15	13.30	13.45	13.60	13.75	13.90	14.05	14.20	14.35	4
5	14.50	14.65	14.80	14.95	15.10	15.25	15.40	15.55	15.70	15.85	5
6	16.00	16.15	16.30	16.45	16.60	16.75	16.90	17.05	17.20	17.35	6
7	17.50	17.65	17.80	17.95	18.10	18.25	18.40	18.55	18.70	18.85	7
8	19.00	19.15	19.30	19.45	19.60	19.75	19.90	20.05	20.20	20.35	8
9	20.50	20.65	20.80	20.95	21.10	21.25	21.40	21.55	21.70	21.85	9
10	22.00	22.15	22.30	22.45	22.60	22.75	22.90	23.05	23.20	23.35	10
11	23.50	23.65	23.80	23.95	24.10	24.25	24.40	24.55	24.70	24.85	11
12	25.00	25.15	25.30	25.45	25.60	25.75	25.90	26.05	26.20	26.35	12
13	26.50	26.65	26.80	26.95	27.10	27.25	27.40	27.55	27.70	27.85	13
14	28.00	28.15	28.30	28.45	28.60	28.75	28.90	29.05	29.20	29.35	14
15	29.50	29.65	29.80	29.95	30.10	30.25	30.40	30.55	30.70	30.85	15
16	31.00	31.15	31.30	31.45	31.60	31.75	31.90	32.05	32.20	32.35	16
17	32.50	32.65	32.80	32.95	33.10	33.25	33.40	33.55	33.70	33.85	17
18	34.00	34.15	34.30	34.45	34.60	34.75	34.90	35.05	35.20	35.35	18
19	35.50	35.65	35.80	35.95	36.10	36.25	36.40	36.55	36.70	36.85	19
20	37.00	37.15	37.30	37.45	37.60	37.75	37.90	38.05	38.20	38.35	20
21	38.50	38.65	38.80	38.95	39.10	39.25	39.40	39.55	39.70	39.85	21
22	40.00	40.15	40.30	40.45	40.60	40.75	40.90	41.05	41.20	41.35	22
23	41.50	41.65	41.80	41.95	42.10	42.25	42.40	42.55	42.70	42.85	23
24	43.00	43.15	43.30	43.45	43.60	43.75	43.90	44.05	44.20	44.35	24
25	44.50	44.65	44.80	44.95	45.10	45.25	45.40	45.55	45.70	45.85	25
26	46.00	46.15	46.30	46.45	46.60	46.75	46.90	47.05	47.20	47.35	26
27	47.50	47.65	47.80	47.95	48.10	48.25	48.40	48.55	48.70	48.85	27
28	49.00	49.15	49.30	49.45	49.60	49.75	49.90	50.05	50.20	50.35	28
29	50.50	50.65	50.80	50.95	51.10	51.25	51.40	51.55	51.70	51.85	29
30	52.00	52.15	52.30	52.45	52.60	52.75	52.90	53.05	53.20	53.35	30
31	53.50	53.65	53.80	53.95	54.10	54.25	54.40	54.55	54.70	54.85	31
32	55.00	55.15	55.30	55.45	55.60	55.75	55.90	56.05	56.20	56.35	32
33	56.50	56.65	56.80	56.95	57.10	57.25	57.40	57.55	57.70	57.85	33
34	58.00	58.15	58.30	58.45	58.60	58.75	58.90	59.05	59.20	59.35	34
35	59.50	59.65	59.80	59.95	60.10	60.25	60.40	60.55	60.70	60.85	35
36	61.00	61.15	61.30	61.45	61.60	61.75	61.90	62.05	62.20	62.35	36
37	62.50	62.65	62.80	62.95	63.10	63.25	63.40	63.55	63.70	63.85	37
38	64.00	64.15	64.30	64.45	64.60	64.75	64.90	65.05	65.20	65.35	38
39	65.50	65.65	65.80	65.95	66.10	66.25	66.40	66.55	66.70	66.85	39
40	67.00	67.15	67.30	67.45	67.60	67.75	67.90	68.05	68.20	68.35	40

Calculated by F. E. Paradis, C. E.

DISTANCES FROM CENTER OF ROADWAY FOR CROSS-SECTIONING.

ROADWAY 16 FEET WIDE. SIDE SLOPES 1½ TO 1.

FOR SINGLE TRACK EMBANKMENT.

	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	
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

Calculated by F. E. Paradis, C. E.

