

1032
MISSION VALLEY
PUMPING STATION
INSTALLED UNDER
WATER DEVELOPEMENT BOND FUND

1914

TRANSIT BOOK.

No. 369 T

H. A. WHITNEY
HYDRAULIC ENGINEER

1-3

17-18-19-21-22-23-24

28-30-33

MICROFILMED

DEC 17 1964

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.

Copyright, 1902. No. 39340.

	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
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2	12.0	12.1	12.2	12.3	12.4	12.5	12.6	12.7	12.8	12.9	2
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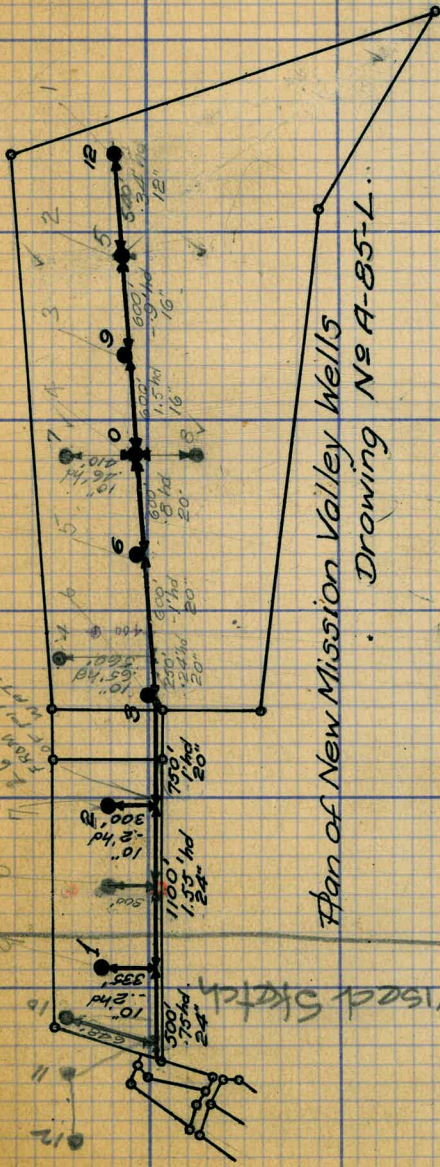
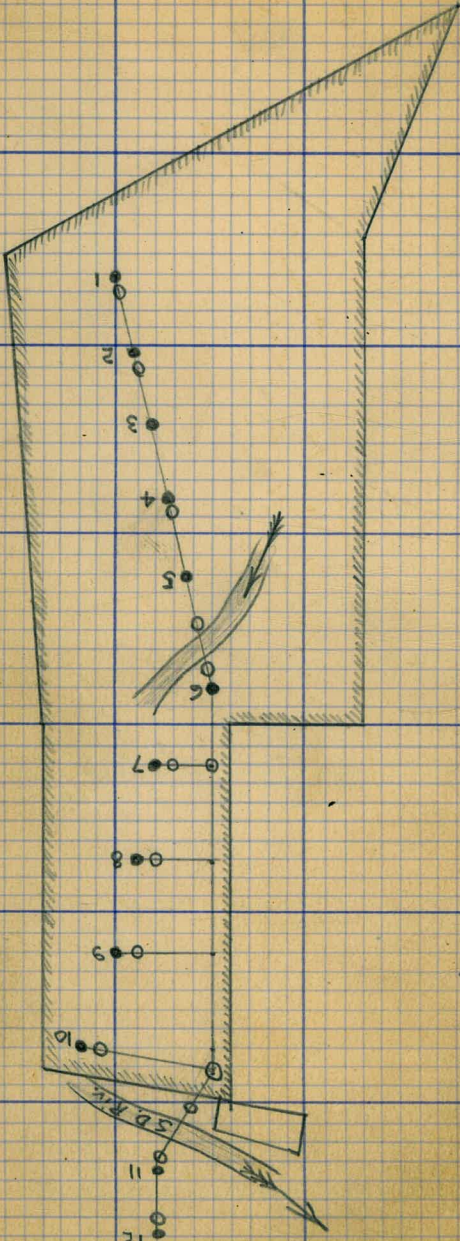
Calculated by F. E. Paradis, C. E.

INDEX

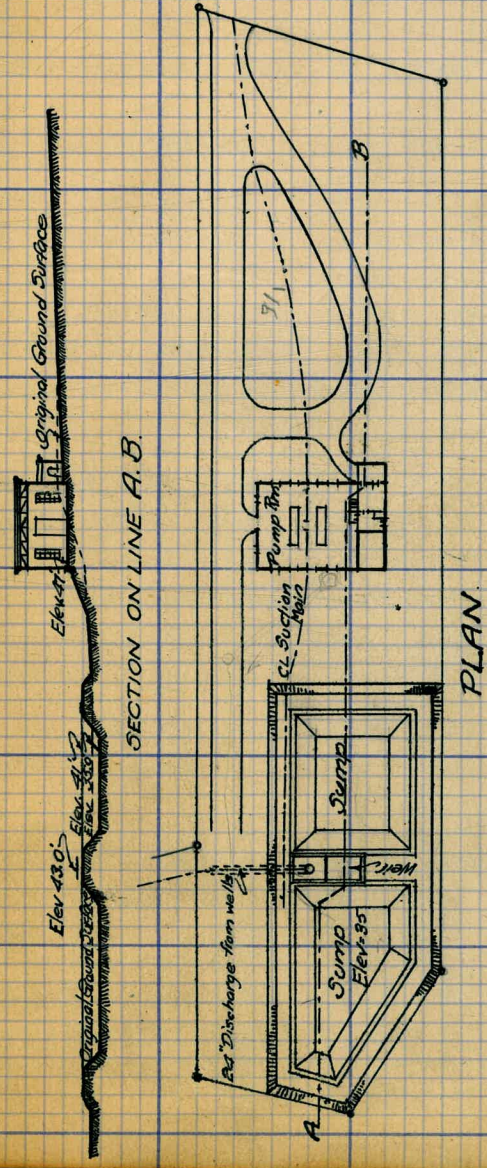
REVISED SKETCH OF MISSION VALLEY WELLS

Legend

- Well
- Sump
- Pipe lines
- ▨ Property



Plan of New Mission Valley Wells
Drawing No A-85-L.



General Plan and Arrangement of the
Proposed New Mission Valley Pumping Plant

Drawing No G-138-L

3

MISSION VALLEY WELL CONTRACT

Call for Bids May 25th 1914.

Let to - Mr. A.E. Hatherly.

Document No of Specifications 76453

Date Signed - May 11, 1914. ?

Bid of Mr. A.E. Hatherley for Drilling Wells.

(A) \$2.95 per foot up to 200 feet.

(B) \$2.95 per foot up to 200 feet.

(C) \$3.50 per foot up to 100 feet; \$4.00 per foot from 100 up to 200 feet.

(D) \$3.50 per foot up to 100 feet; \$4.00 per foot from 100 up to 200 feet.

Cleaning and Testing to be \$15.00 per day.

Contractor agrees to start work in ten days after contract has been awarded, and agrees to furnish each well up to one hundred feet in ten days, or two hundred feet in twenty days or less from date of starting of each well.

Document No of Bid 77096.

Date Signed May 25, 1914.

Recommendation of H.A. Whitney on bid of A.E. Hatherly for Drilling Wells.

Document No 77200

Date Signed. May 27, 1914.

Contract awarded to A.E. Hatherly

Date signed July 6th 1914.

Document No of Contract 78271.

ANALYSIS OF WATER
Mission Valley Well No 1

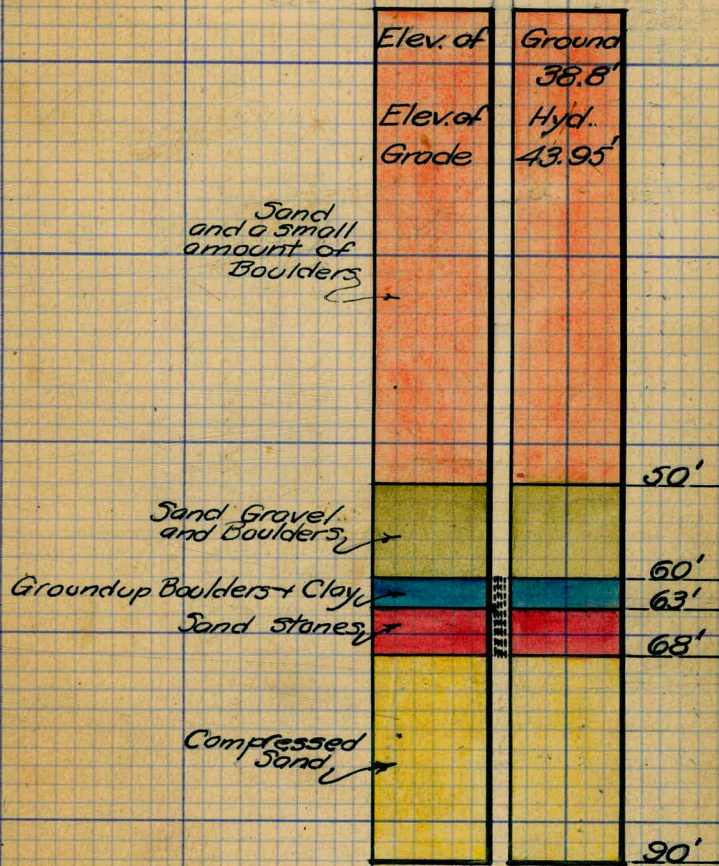
Laboratory No 10353

July 2, 1914

ANALYSIS OF SOLIDS	GRAINS PER U.S. GALLON	
	Filtered	Filtrated
Suspended Matter.....		
Silica (SiO ₂).....	.70	.70
Iron Oxide & Alumina (Fe ₂ O ₃)..	Trace	Trace
Lime (CaO).....	7.83	7.79
Magnesia (MgO).....	3.36	8.40
Soda (Na ₂ O).....	9.09	None
Sulphuric Anhydride (SO ₃).....	14.14	.77
Chlorine (Cl).....	7.02	None
Carbon Dioxide (Combined) (CO ₂)	4.33	17.66
Volatile & Organic Matter.....	8.77	
Total.....	55.24	
Excess Oxygen.....	1.59	1.24
Total Solids.....	53.65	8.92
		5.80
		11.57
Hydrogen Sulphide (H ₂ S).....	None	8.77
Carbon Dioxide (Uncombined) (CO ₂)		36.30
NON-INCORUSTING SOLIDS		
Sodium Carbonate.....		
Magnesium Sulphate †.....		
Sodium Sulphate.....		
Sodium Chloride.....		
Volatile & Organic Matter.....		
Total.....		

* Corrosive † Forms same scale in presence of Calcium Carbonate & Sodium Carbonate

LOG OF WELL No 1 9
MISSION VALLEY



Note: No 1 Well drilled to 90' Cased to 78' 6"

ANALYSIS OF WATER
Mission Valley Well No. 2

Laboratory 10490

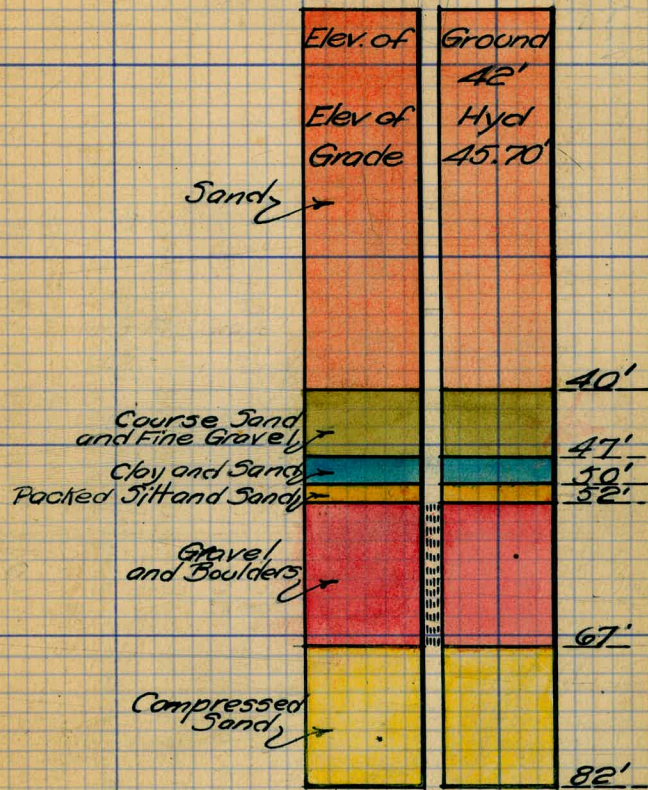
Aug. 3, 1914

ANALYSIS OF SOLIDS	Grains per U.S. Gallon	INCORUSTING SOLIDS	Grains per U.S. Gallon
Suspended Matter.....	Filtered	Suspended Matter.....	Filtered
Silica (SiO ₂).....	.59	Silica.....	.59
Iron Oxide & Alumina (Fe ₂ O ₃).....	Trace	Iron Oxide & Alumina.....	Trace
Lime (CaO).....	2.79	Calcium Carbonate.....	3.75
Magnesia (MgO).....	1.29	Calcium Sulphate.....	1.70
Soda (Na ₂ O).....	3.27	Calcium Chloride *.....	None
Sulphuric Anhydride (SO ₃).....	1.00	Magnesium Carbonate.....	1.78
Chlorine (Cl).....	3.92	Magnesium Chloride *.....	1.04
Carbon Dioxide (Combined) (CO ₂).....	2.92	Total.....	8.84
Volatiles & Organic Matter.....	5.26	NON-INCORUSTING SOLIDS	
Total.....	21.04	Sodium Carbonate.....	.87
Excess Oxygen.....	.89	Magnesium Sulphate.....	None
Total Solids.....	20.15	Sodium Sulphate.....	None
Hydrogen Sulphide (H ₂ S).....	None	Sodium Chloride.....	5.18
Carbon Dioxide (Combined) (CO ₂).....	None	Volatile & Organic Matter.....	5.26
		Total.....	11.31

* Corrosive + forms some scale in presence of Calcium Carbonate & Sodium Carbonate

LOG OF WELL No. 2 7
MISSION VALLEY

5



Note: 18' of perforations, 90 holes, 5/16" x 8" long
Well drilled 2' lower than casing.
Completed July 2, 1914
Total cost of Well No. 2. \$258.50

Laboratory 10491

ANALYSIS OF WATER
Mission Valley Well N^o 3

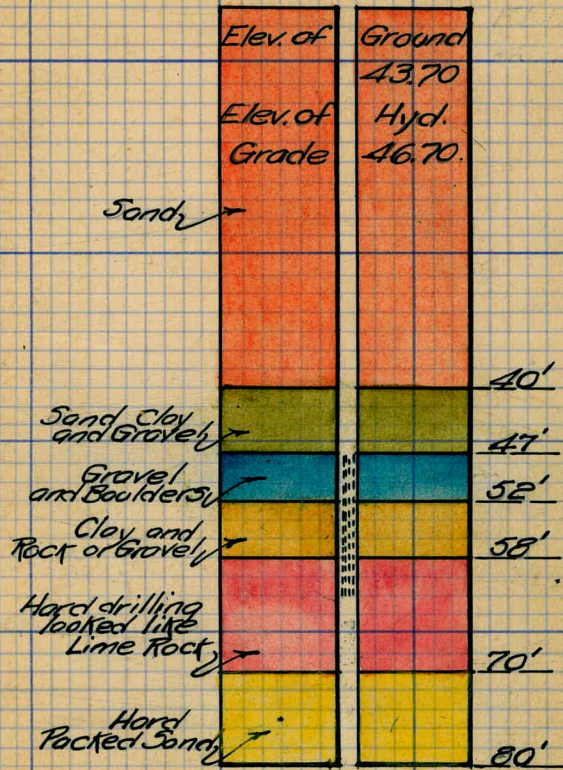
Aug. 3, 1914.

ANALYSIS OF SOLIDS	Grains Per U.S. Gallon	INCRUSTING SOLIDS	Grains Per U.S. Gallon
Suspended Matter.....	Filtered	Suspended Matter.....	Filtered
Silica (SiO ₂).....	.94	Silica.....	.94
Iron Oxide & Alumina (Fe O ₃).....	Trace	Iron Oxide & Alumina.....	Trace
Lime (CaO).....	3.86	Calcium Carbonate.....	4.80
Magnesium (MgO).....	1.69	Calcium Sulphate.....	2.84
Soda (Na ₂ O).....	4.47	Calcium Chloride *.....	None
Sulphuric Anhydride (SO ₃).....	2.00	Magnesium Carbonate.....	2.66
Chlorine (Cl).....	4.97	Magnesium Chloride *.....	.61
Carbon Dioxide (Combined) (CO ₂).....	3.85	Total.....	11.85
Volatile & Organic Matter.....	3.51	NON-INCRUSTING SOLIDS	
Total.....	25.29	Sodium Carbonate.....	.87
Excess Oxygen.....	1.13	Magnesium Sulphate †.....	.49
Total Solids.....	24.16	Sodium Sulphate.....	None
Hydrogen Sulphide (H ₂ S).....	None	Sodium Chloride.....	7.45
Carbon Dioxide (Uncombined) (CO ₂).....		Volatile & Organic Matter.....	3.51
		Total.....	12.32

* Corrosive † Forms some scale in presence of Calcium Carbonate & Sodium Carbonate

LOG OF WELL No. 3. 6

MISSION VALLEY.



Note: 15' of perforations
72 holes 5/16" x 8" long.
Completed July 13, 1914
Total Cost

LOG OF WELL No 4
MISSION VALLEY

7

MISSION VALLEY

LOG OF WELL No 5
MISSION VALLEY

8

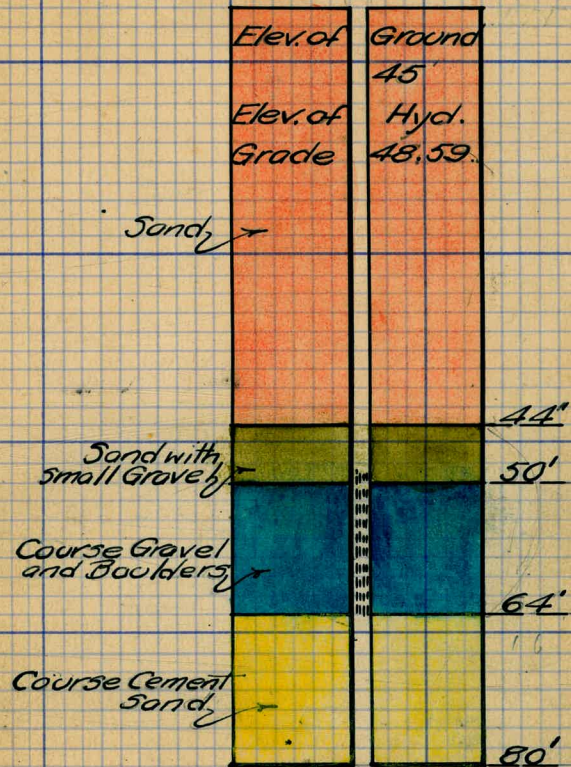
1880-1881

ANALYSIS OF WATER
Mission Valley Well No 6

ANALYSIS OF SOLIDS	Grains Per U.S. Gallon	INCRUSTING SOLIDS	Grains Per 0.5 Gallon
Suspended Matter		Suspended Matter	
Silica (SiO ₂)		Silica	
Iron Oxide & Alumina (FeO ₃)		Iron Oxide & Alumina	
Lime (CaO)		Calcium Carbonate	
Magnesia (MgO)		Calcium Sulphate	
Soda (Na ₂ O)		Calcium Chloride *	
Sulphuric Anhydride (SO ₃)		Magnesium Carbonate	
Chlorine (Cl)		Magnesium Chloride *	
Carbon Dioxide (Combined) (CO ₂)		Total	
Volatile & Organic Matter		NON-INCRUSTING SOLIDS	
Total		Sodium Carbonate	
Excess Oxygen		Magnesium Sulphate .t	
Total Solids		Sodium Sulphate	
		Sodium Chloride	
Hydrogen Sulphide (H ₂ S)		Volatile & Organic Matter	
Carbon Dioxide (Uncombined) (CO ₂)		Total	

LOG OF WELL No 6-5

MISSION VALLEY



Note: 12 ft. of perforations
60 holes 5/16" x 8" long.
Completed Aug. 27, 1914
Total Cost \$266.00.

ANALYSIS OF WATER
Mission Valley Well No 6

LOG OF WELL No 11.

MISSION VALLEY

10

Sand, *

28'

Clay & Gravel, *

34'

Gravel, *

39'

Sand Rock, *

44'

Compressed
Sand, *

75'

LOG OF WELL No 12.
MISSION VALLEY

Sandy

Hill Daube

28'

Hill Daube

38'

Boulders & Doube

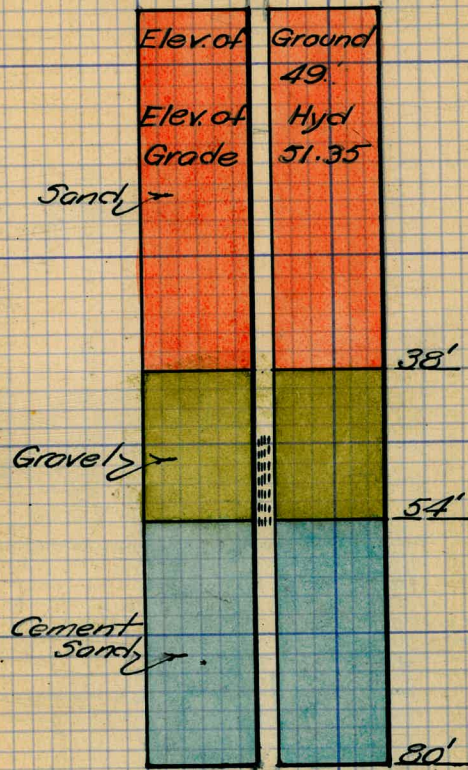
45'

ANALYSIS OF WATER
Mission Valley Well No 9

ANALYSIS OF SOLIDS	Grains per U.S. Gallons	INCORUSTING SOLIDS	Grains per U.S. Gallons
Suspended Matter		Suspended Matter	
Silica (SiO ₂)	40	Silica	40
Iron Oxide & Alumina (Fe ₂ O ₃)	Trace	Iron Oxide & Alumina	Trace
Lime (CaO)	5.38	Calcium Carbonate	8.19
Magnesia (MgO)	2.60	Calcium Sulphate	1.92
Soda (Na ₂ O)	7.02	Calcium Chloride *	None
Sulphuric Anhydride (SO ₃)	2.87	Magnesium Carbonate	2.57
Chlorine (Cl)	8.31	Magnesium Chloride *	1.16
Carbon Dioxide (Combined) (CO ₂)	5.30	Total	14.24
Volatile & Organic Matter	7.61		
Total	39.49	NON-INCORUSTING SOLIDS	
Excess Oxygen	1.89	Sodium Carbonate	87
Total Solids	37.60	Magnesium Sulphate †	2.62
		Sodium Sulphate	None
		Sodium Chloride	12.27
Hydrogen Sulphide (H ₂ S)	None	Volatile & Organic Matter	7.61
Carbon Dioxide (Uncombined) (CO ₂)	Trace	Total	23.37

*Corrosive † forms some scale in presence of Calcium Carbonate & Sodium Carbonate

LOG OF WELL No 9-3
MISSION VALLEY.



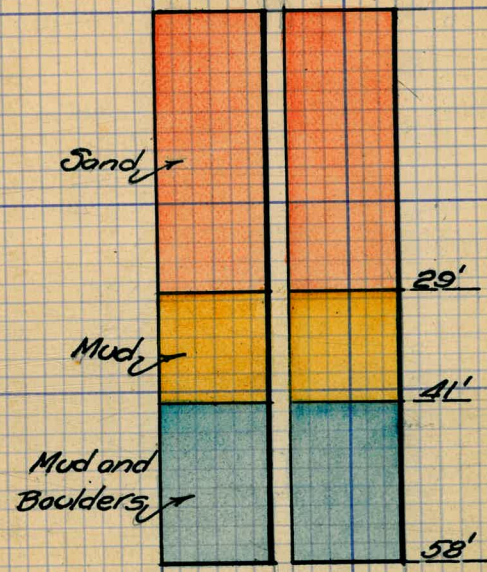
Note: 12' of perforations
60 holes 5/16" x 8" long.
Completed Aug. 27, 1914
Total Cost \$258.50

ANALYSIS OF WATER
Mission Valley Well No 10

ANALYSIS OF SOLIDS	Grains Per US Gallon	INCRUSTING SOLIDS	Grains per US Gallon
Suspended Matter		Suspended Matter	
Silica (SiO ₂)	.54	Silica	.54
Iron Oxide & Alumina (R ₂ O ₃)	Trace	Iron Oxide & Alumina	Trace
Lime (CaO)	5.38	Calcium Carbonate	9.01
Magnesia (MgO)	2.81	Calcium Sulphate	.80
Soda (Na ₂ O)	6.93	Calcium Chloride*	None
Sulphoric Anhydride (SO ₃)	3.13	Magnesium Carbonate	2.15
Chlorine (Cl)	8.13	Magnesium Chloride*	1.04
Carbon Dioxide (Combined) (CO ₂)	5.44	Total	13.54
Volatile & Organic Matter	7.84	NON-INCRUSTING SOLIDS	
Total	40.20	Sodium Carbonate	87
Excess Oxygen	1.85	Magnesium Sulphate	4.00
Total Solids	38.35	Sodium Sulphate	None
Hydrogen Sulphide (H ₂ S)	None	Sodium Chloride	12.12
Carbon Dioxide (Uncombined) (CO ₂)	Trace	Volatile & Organic Matter	7.84
		Total	24.83

*Corrosive + forms some scale in presence of Calcium Carbonate and Sodium Carbonate.

LOG OF WELL No 10
MISSION VALLEY



Completed Aug. 30, 1914
Total Cost \$128.49

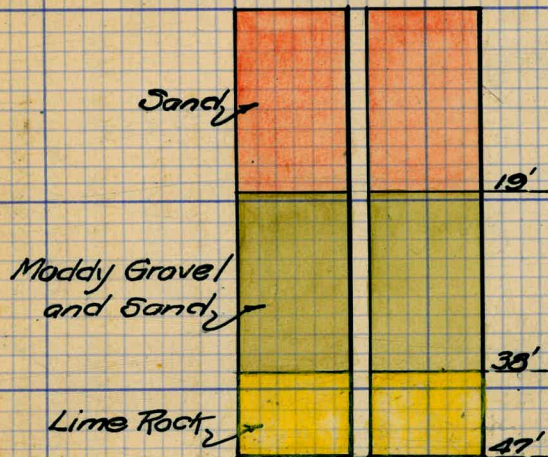
Drilling 58' sand, mud and boulders @ \$2.95 - \$171.10
 Two days pulling casing @ \$15.00 30.00
 201.10
 By pulling starter \$36.72
 By pulling 37' casing @ \$.97 35.89 -72.61
 128.49

ANALYSIS OF WATER
Mission Valley Well No 10.

ANALYSIS OF SOLIDS	Grains Per U.S. Gallon	INCRUSTING SOLIDS	Grains Per U.S. Gallon
Suspended Matter		Suspended Matter	
Silica (SiO ₂)		Silica	
Iron Oxide & Alumina (Fe ₂ O ₃)		Iron Oxide & Alumina	
Lime (CaO)		Calcium Carbonate	
Magnesia (MgO)		Calcium Sulphate	
Soda (Na ₂ O)		Calcium Chloride *	
Sulphuric Anhydride (SO ₃)		Magnesium Carbonate	
Chlorine (Cl)		Magnesium Chloride *	
Carbon Dioxide (Combined) (CO ₂)		Total	
Volatile & Organic Matter Total		NON-INCRUSTING SOLIDS	
Excess Oxygen		Sodium Carbonate	
Total Solids		Magnesium Sulphate †	
		Sodium Sulphate	
		Sodium Chloride	
		Volatile & Organic Matter	
		Total	
Hydrogen Sulphide (H ₂ S)			
Carbon Dioxide (Uncombined) (CO ₂)			

* Corrosive † forms some scale in presence of Calcium Carbonate & Sodium Carbonate

LOG OF WELL No 11
MISSION VALLEY.



Completed Sept 29, 1914.
Total Cost \$148.38.

Drilling 38' sand, mud, gravel and lime rock
@ \$2.95 - \$112.10
Drilling 9' lime rock 31.50
Two days pulling casing @ \$15.00 30.00
173.60
Pulling casing 26' @ \$.97 - 25.22
148.38

ANALYSIS OF WATER
Mission Valley Well No 12.

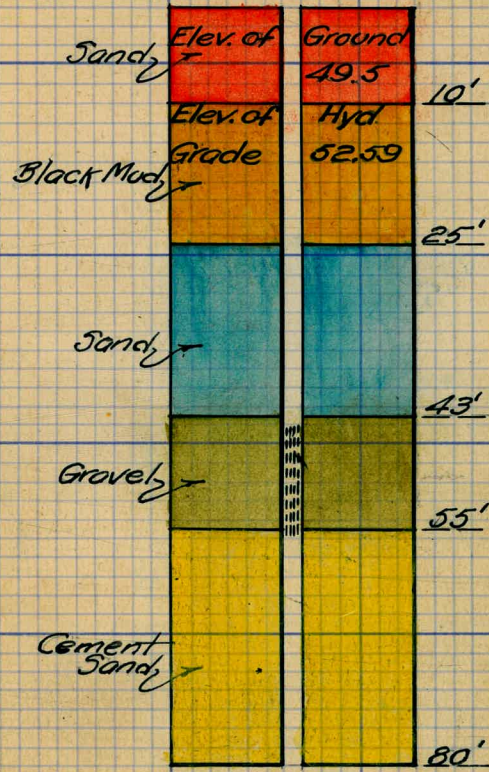
Laboratory No 10761

Sept. 22, 1914

ANALYSIS OF SOLIDS	Grains per U.S. Gallons	INCRUSTING SOLIDS	Grains per U.S. Gallons
Suspended Matter.		Suspended Matter.	
Silica (SiO ₂)	.70	Silica	.70
Iron Oxide & Alumina (Fe ₂ O ₃)	.19	Iron Oxide & Alumina	.90
Lime (CaO)	5.38	Calcium Carbonate	8.42
Magnesia (MgO)	2.92	Calcium Sulphate	1.60
Soda (Na ₂ O)	7.66	Calcium Chloride *	None
Sulphuric Anhydride (SO ₃)	2.71	Magnesium Carbonate	3.09
Chlorine (Cl)	9.48	Magnesium Chloride *	1.30
Carbon Dioxide (Combined) (CO ₂)	5.51	Total	15.30
Volatile & Organic Matter.	7.66	NON-INCRUSTING SOLIDS	
Total.	42.21	Sodium Carbonate	.50
Excess Oxygen	2.15	Magnesium Sulphate †	2.66
Total Solids.	40.06	Sodium Sulphate	None
		Sodium Chloride	13.87
Hydrogen Sulphide (H ₂ S)	None	Volatile & Organic Matter.	7.66
Carbon Dioxide (Uncombined) (CO ₂)		Total	24.69

* Corrosive † Forms some scale in presence of Calcium Carbonate & Sodium Carbonate

LOG OF WELL No 12. 1 See p. 1
MISSION VALLEY

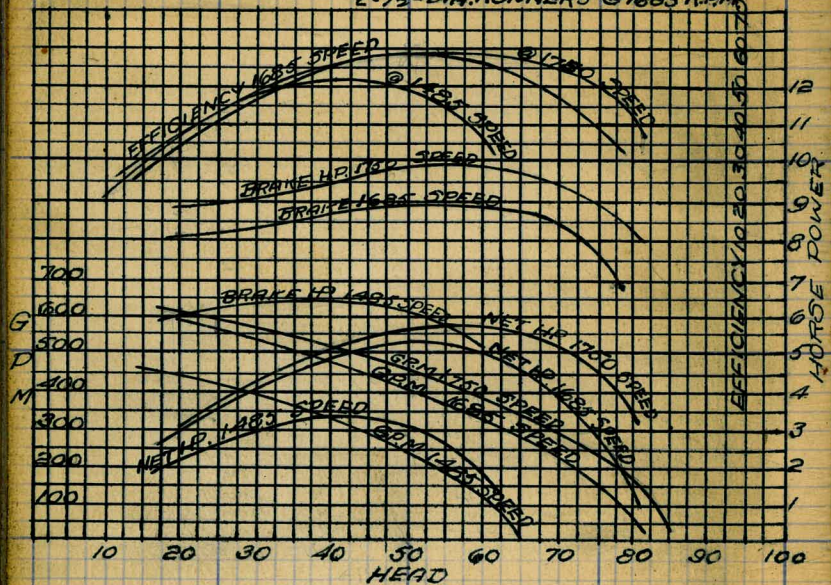


Note: 8' of perforations
40 holes, 5/16 x 8" long.
Completed Aug. 5, 1914.
Total Cost \$266.00.

LOG OF WELL No 13.
MISSION VALLEY

TEST OF 4" BORE HOLE PUMP

2-7 1/2" DIA. RUNNERS @ 1685 RPM



DEEP WELL PUMPS and AIR LIFT PUMPS

Document No Specifications 79120

Date Signed July 20th 1914

Report of H.A. Whitney Hyd. Eng. on Bids to
Furnish and Install Deep Well and Air Lift Pumps

Document No of Bids 80164.

Date Signed Aug. 17th 1914.

Contract Awarded to Standard Iron Works

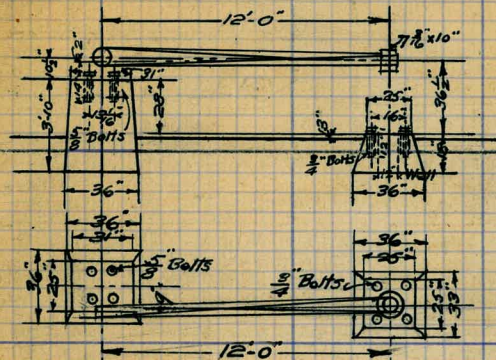
Date of Contract Aug. 26th 1914.

Document No 80336.

Bid of Standard Iron Works

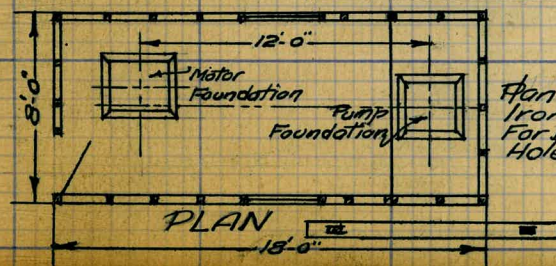
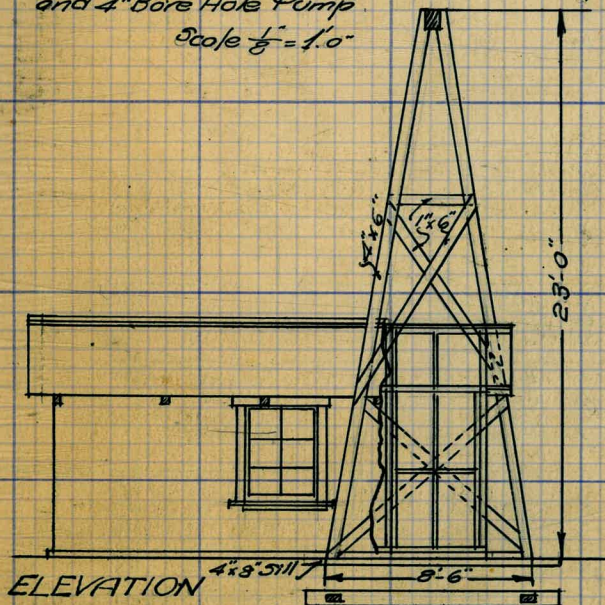
Document No 80128

Date Signed Aug. 17th 1914.



Foundation for 10HP
1800 Speed G.E. Motor
and 4" Bore Hole Pump.

Scale 1/8" = 1'-0"



Plan of Corrugated
Iron Pump House
For Belt Driven Bore
Hole Pump.

Scale 1/8" = 1'-0"

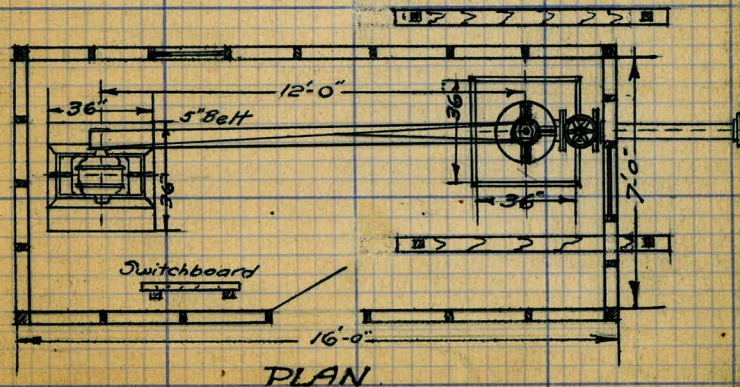
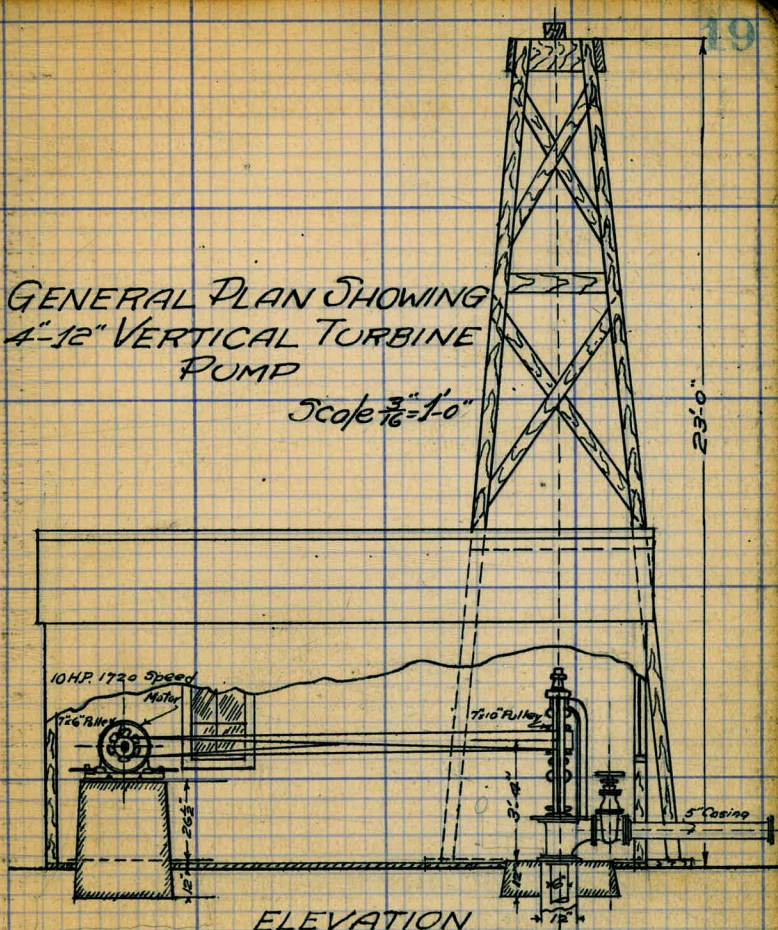
PRICE LIST

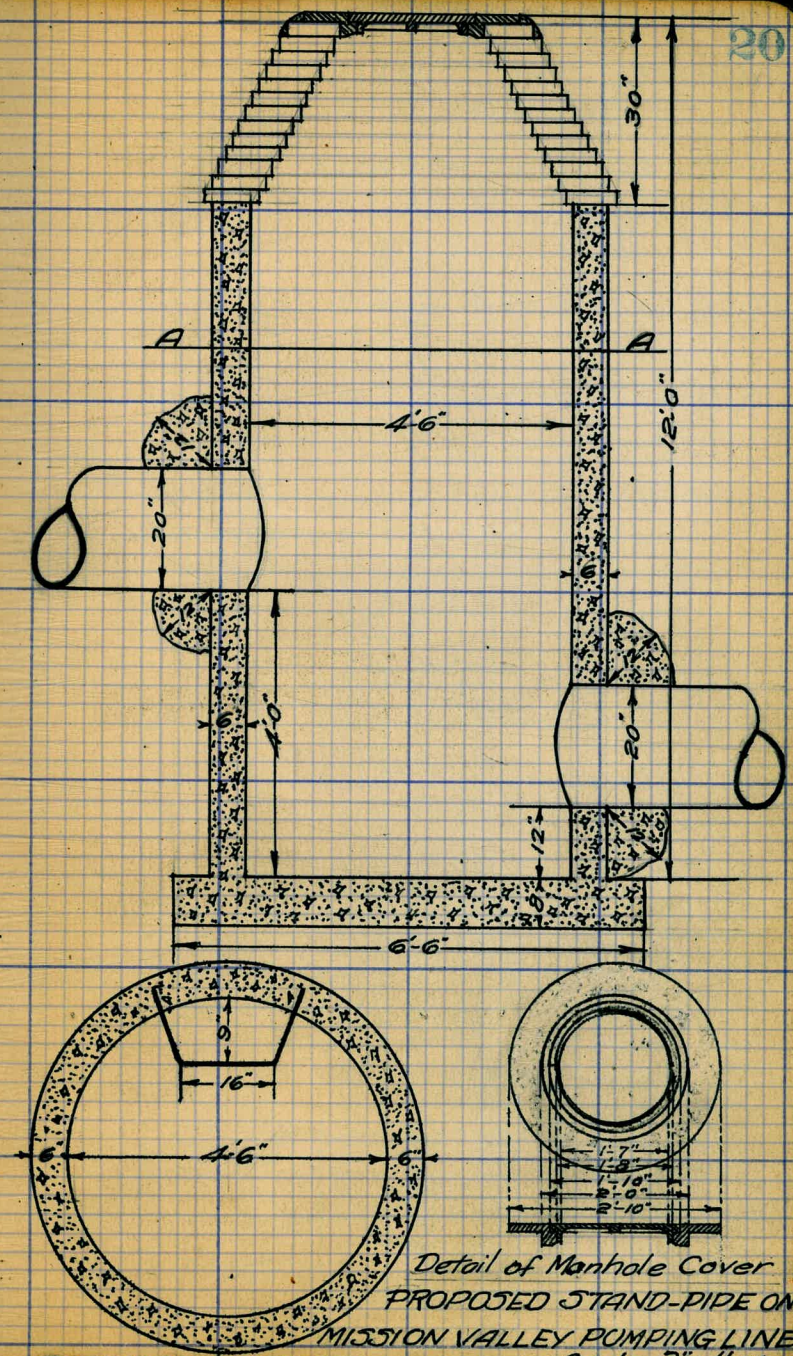
Repair Parts for 4"-7½" Belt Driven Bore Hole Pumps
 UNITED IRON WORKS - OAKLAND.

No		WEIGHT EACH	PRICE EACH
1	Discharge Head		\$20.00
1	Discharge Head Cover		15.00
1	Discharge Head Gland		2.00
1	Pulley Frame		30.00
1	Pulley Frame Broce		7.50
1	Base Plate		10.00
2	Oil Bowls		2.50
1	Grip Coupling		3.00
1	Thrust Collar		2.50
1	Pulley		4.50
1	Ball Bearing Thrust 5" O.D.		10.00
1	1 7/16" Cold Rolled Shaft.		4.00
6	1 3/16" Special Lignum Vitae Bearings		5.00
1	Discharge Connection		5.00
2	Spiders		20.00
2	Runners Brass		22.50
1	Suction Connection Brass		15.00
2	Separators 1/16" Sheet Brass		4.00
1	Pump Casing 10" O.D. Casing 25 1/4"		12.50
1	Shaft 1 3/16" x 37" with Brass Nut		10.00
1	Brass Separator 1 5/16" O.D. x 8 1/4"		2.00

GENERAL PLAN SHOWING
 4"-12" VERTICAL TURBINE
 PUMP

Scale 3/16" = 1'-0"





DRAWING N° B220L

Detail of Manhole Cover
PROPOSED STAND-PIPE ON
MISSION VALLEY PUMPING LINE
Scale - 3/8" = 1'-0"

**DIRECT CONNECTED FOUR STAGE
CENTRIFUGAL TYPE OF PUMP**

Call for Bids July 27th 1914.

Document N^o of Specifications 78388

Date Signed - June 29th, 1914.

Bid of Southwestern Foundries Company

	Rate	Time
The furnishing of one foundation complete as per Specifications, approximately 24 cu. yds.	60.00	5 days

The furnishing of two foundations complete as per Specifications, approximately 84 cu. yds.	108.00	5 days
---	--------	--------

The furnishing of one Onyx Switch-board complete	245.00	
--	--------	--

The furnishing of two Onyx Switchboards complete	495.00	
--	--------	--

The furnishing of one Slate Switchboard complete	200.00	
--	--------	--

The furnishing of two Slate Switchboards complete	400.00	
---	--------	--

	Cost	Time
The furnishing of one complete pump and 200 H.P. motor, installed as specified, upon foundation together with all necessary wiring, valves, fittings and piping, with his guaranties.	3449.00	75 days

The furnishing of two complete pumps and 200 H.P. Motors, installed as specified, upon foundation together with all necessary wiring, valves, fittings, and piping with his guaranties	6776.00	80 days
--	---------	---------

The furnishing of one complete pump and 250 H.P. Motor, installed as specified, upon foundation together with all necessary wiring, valves, fittings, and piping, with his guaranties	3709.00	Same as 1-200 H.P.
---	---------	--------------------

The furnishing of two complete pumps and 250 H.P. Motors, installed as specified, upon foundation together with all necessary wiring, valves, fittings and piping, with his guaranties	7313.00	Same as 2-200 H.P.
--	---------	--------------------

Document N^o of Bids 79436

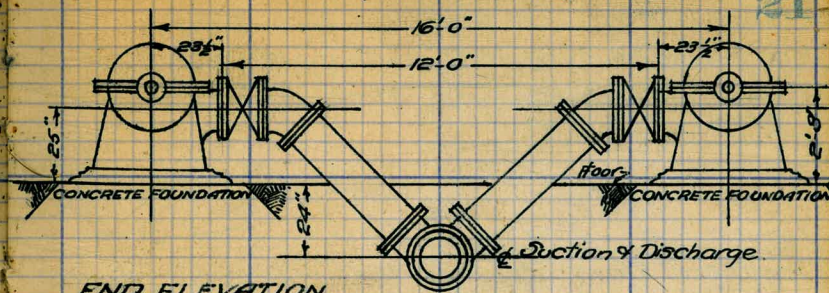
Date Signed July 27th 1914.

Contract awarded to

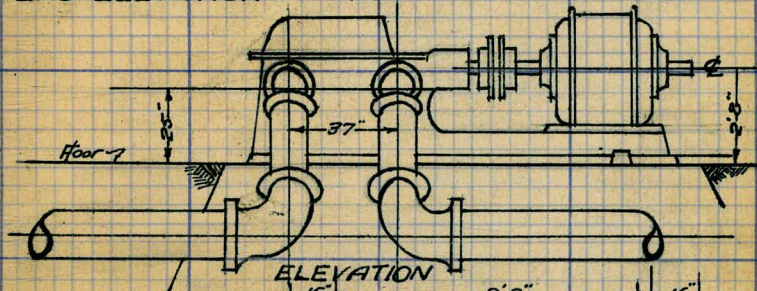
Southwestern Foundries Company.

Date of Contract Aug. 12, 1914.

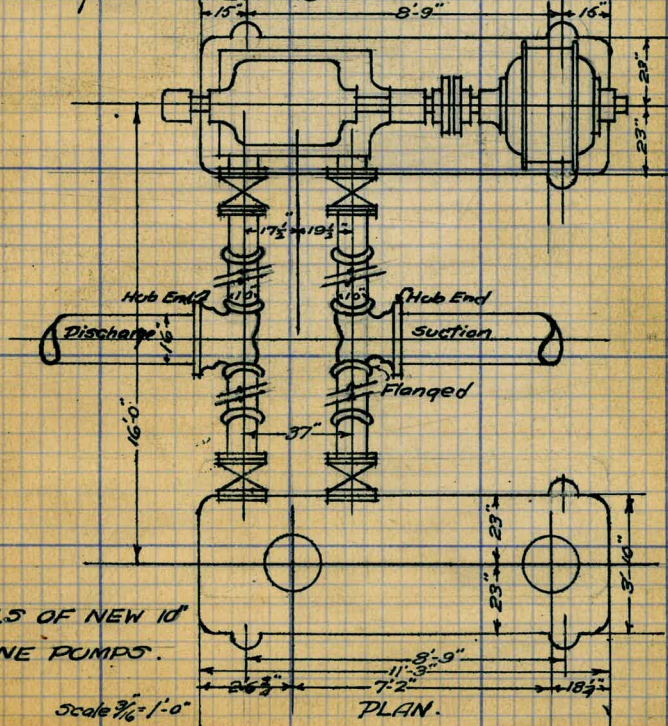
Document N^o 79988.



END ELEVATION



ELEVATION



DETAILS OF NEW 10"
TURBINE PUMPS.

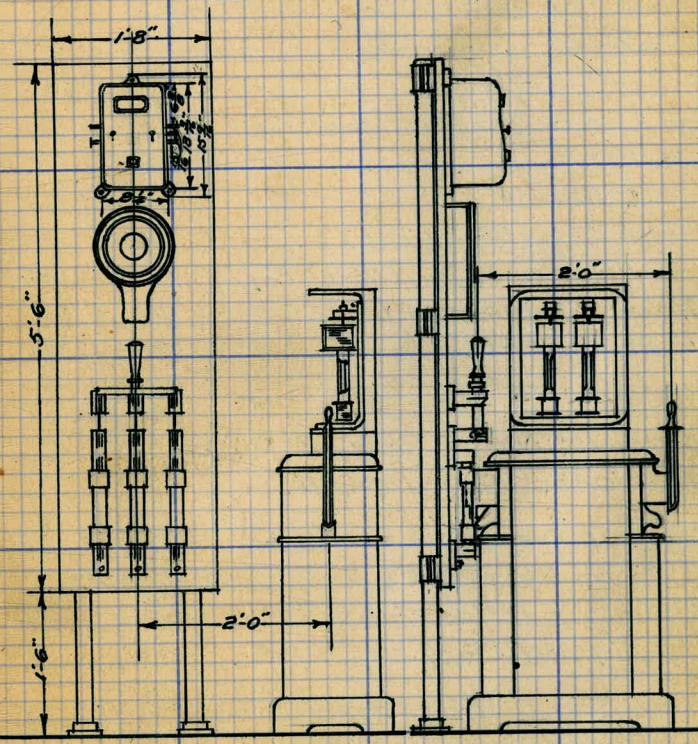
Scale $\frac{3}{16}$ " = 1'-0"

PLAN.

Report of H.A. Whitney Hyd. Eng.
Of Bids on Direct Connected 4 Stage
Centrifugal Pumps, Motors, and install
ation thereof.

Name	Cost	Time Delivery
Lawrence C. Foy	\$10830.00	85 days.
Southern Electric Co	10100.00	115 "
H.H. Howell	8944.00	95 "
Pacific Hardware & Steel Co	9519.00	89 "
United Iron Works	9200.00	75 "
Southwestern Foundries Co	7821.00	80 "

Document No 79508
Dated July 29th 1914



ELEVATION - SWITCHBOARD. ELEVATION - COMPENSATOR

ELECTRICAL SWITCHBOARD.
Mission Valley Pumping Plant
Scale 1/2" = 1'-0"

SUMP and WEIR.

Document No of Specifications 79147

Date Signed - July 20th, 1914.

Call for bids Aug. 10th, 1914.

Report of H.A. Whitney Hyd. Eng.

On bids for Concrete Reservoirs

Name	\$ Cost.
San Diego Glazed Pipe Co.	1382.62
G. R. Daily	1483.18
J. W. Calback	1557.94
Isbell Construction Co.	1638.45
Winter & Nicholson (Did not comply with Specifications)	
Holland Construction Co.	2013.90
Doran & Reed	2501.50
Ben Hawkins	1784.00

Document No of Report 79981.

Date Signed Aug. 12, 1914.

Contract awarded to

San Diego Glazed Cement and Pipe Co.

Document No of Contract 81203.

Date Signed Sept. 24th, 1914.

Bid of San Diego Glazed Cement & Pipe Co.
on Concrete Settling Reservoir Mission Valley

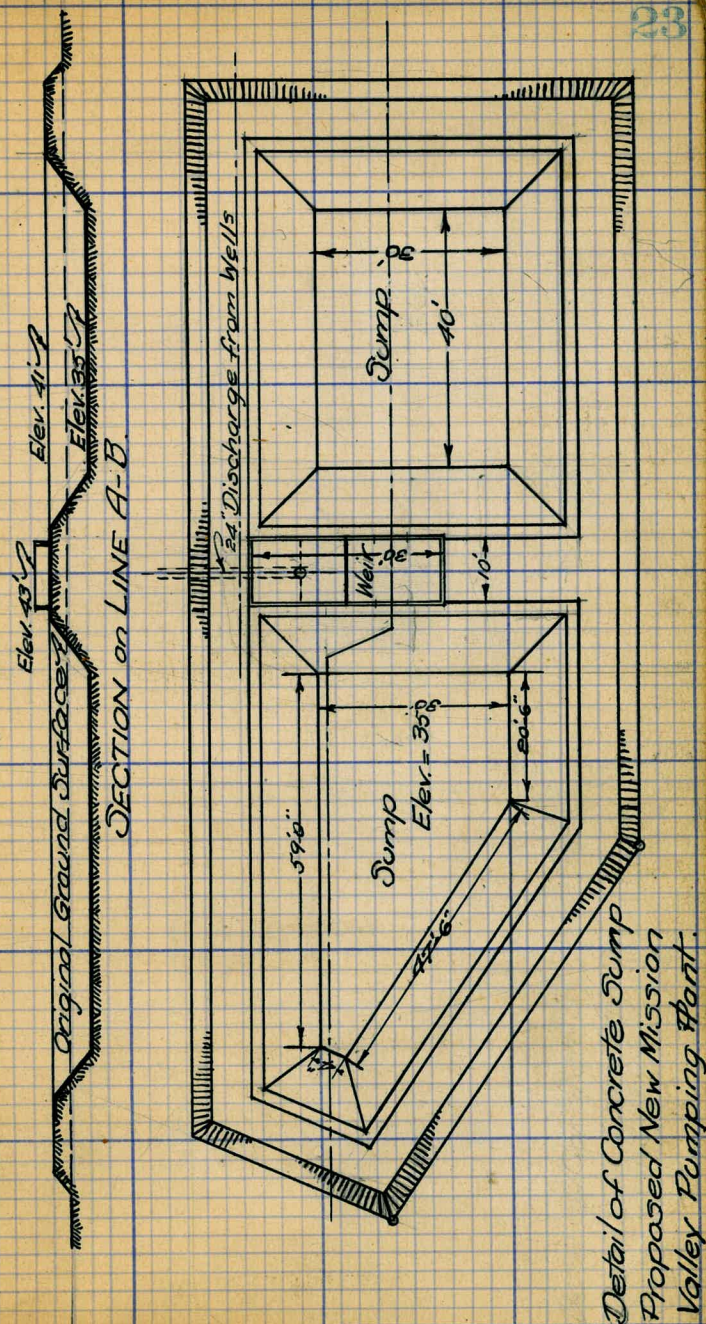
Unit Prices:

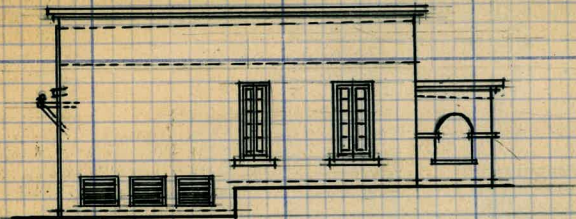
Excavation @ 25 cents per cu. yd.

Concrete @ \$11.00 per cu. yd.

Painting with Romalite or equal compound.

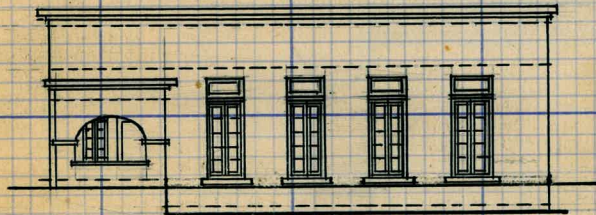
3/4 of one cent per cu. ft.





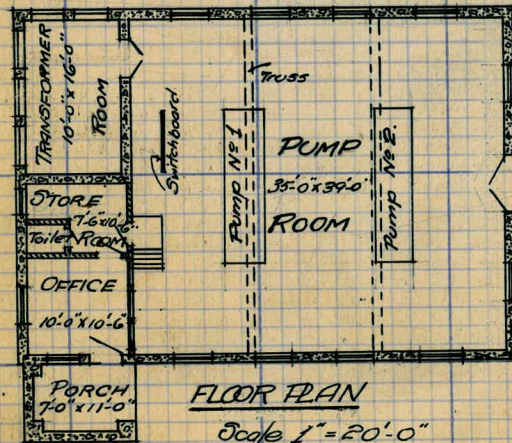
LEFT SIDE ELEVATION

Scale 1"=20'-0"



FRONT ELEVATION

Scale 1"=20'-0"



FLOOR PLAN

Scale 1"=20'-0"

SKETCH OF
NEW MISSION VALLEY PUMPING STATION

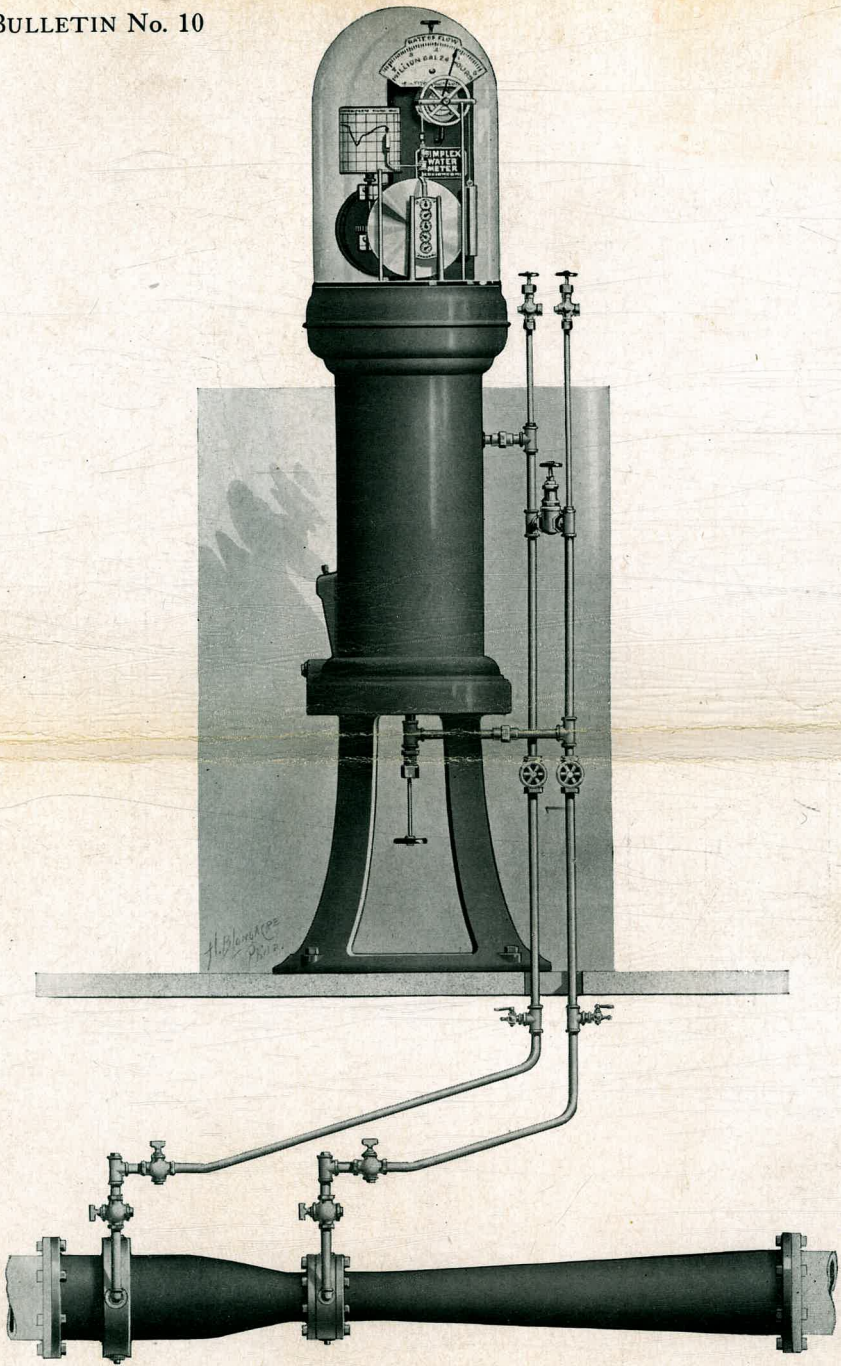
VENTURI METER ~~16"~~

16" CAST IRON WATER PIPE

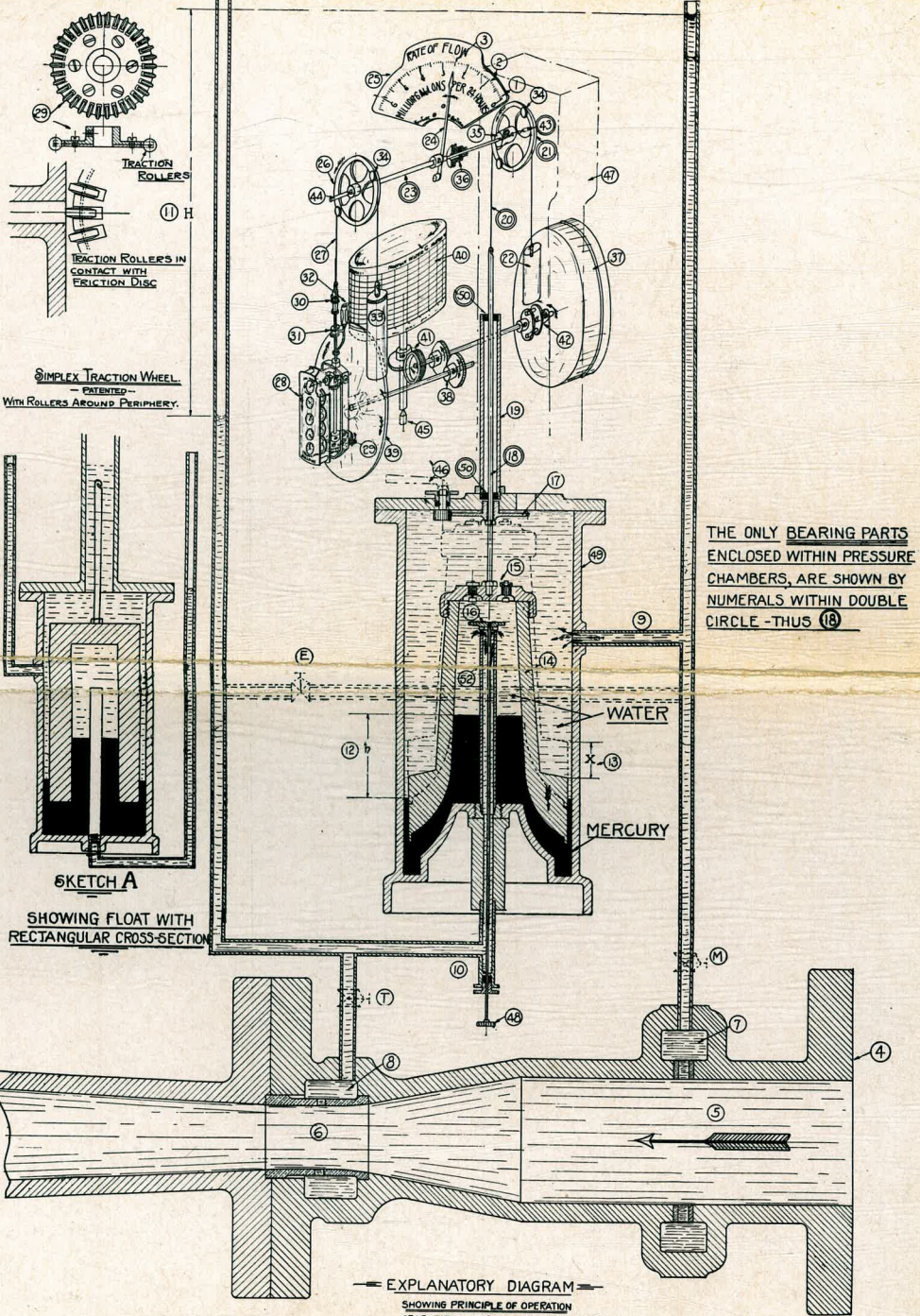
Document No of Specifications 80300

Date Signed Aug. 24th, 1914.

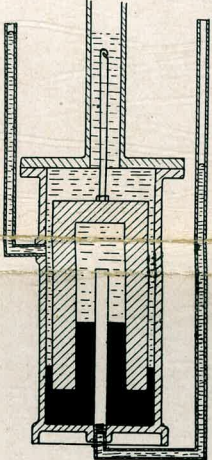
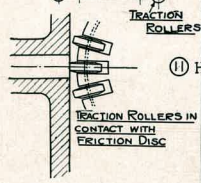
25



PRINCIPLE OF OPERATION AND DESCRIPTION OF
SIMPLEX METER REGISTER
AS USED WITH THE VENTURI TUBE



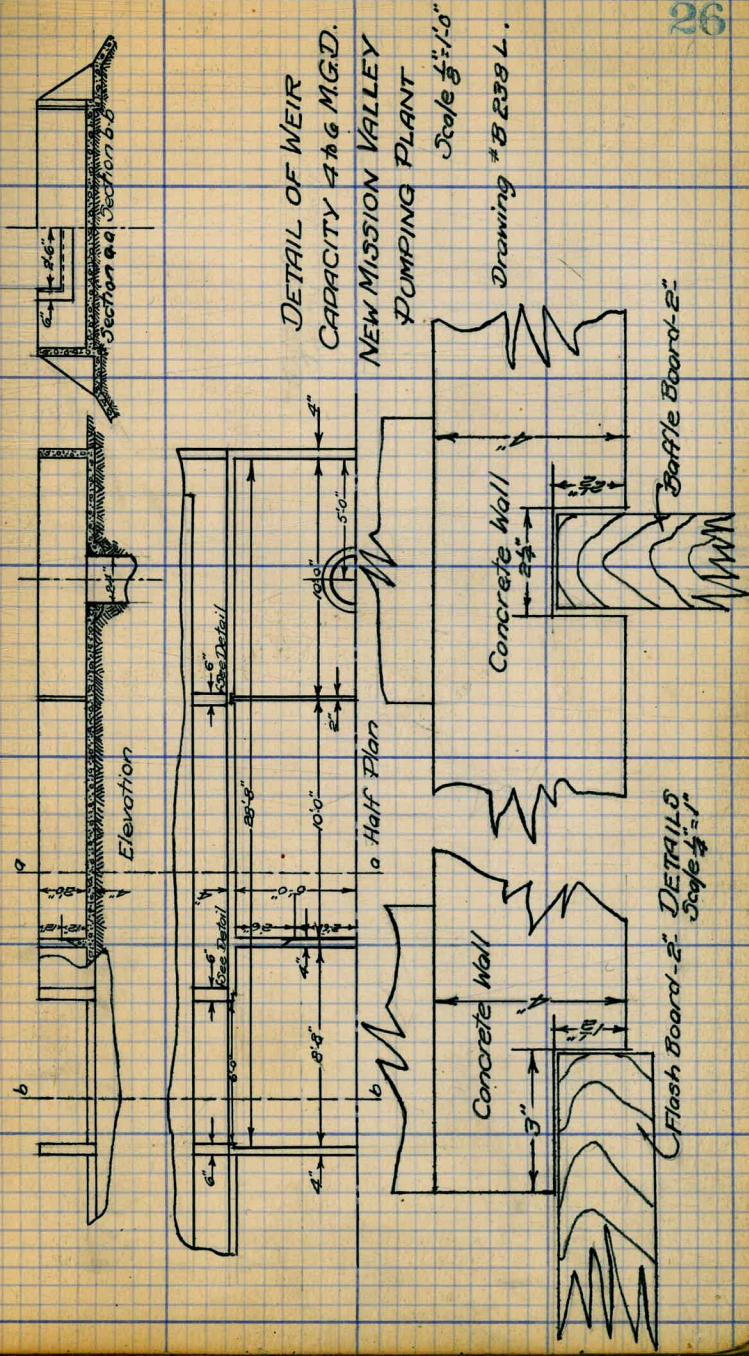
SIMPLEX TRACTION WHEEL
 PATENTED
 WITH ROLLERS AROUND PERIPHERY.



SKETCH A
 SHOWING FLOAT WITH
 RECTANGULAR CROSS-SECTION

THE ONLY BEARING PARTS
 ENCLOSED WITHIN PRESSURE
 CHAMBERS, ARE SHOWN BY
 NUMERALS WITHIN DOUBLE
 CIRCLE - THUS (18)

EXPLANATORY DIAGRAM
 SHOWING PRINCIPLE OF OPERATION
 OF VENTURI TUBE & SIMPLEX METER REGISTER



DETAIL OF WEIR
 CAPACITY 4 to 6 M.G.D.
 NEW MISSION VALLEY
 PUMPING PLANT
 Scale $\frac{1}{2}'' = 1'$
 Drawing # B 239 L.

Flash Board - 2"
 DETAILS
 Scale $\frac{1}{2}'' = 1'$

Baffle Board - 2"

27

MISSION VALLEY

Record of Official Test for

Efficiency of Main Pumps as

Bids Called - July 27, 1914 - Contract Signed -

Date of Test - Jan 4, 1914 - Time of Starting -

CITY OFFICIALS - H.A. Whitney Hyd. Eng. - W.L.

CONTRACTORS OFFICERS - Robt. Baker Contr. -

Pumps Mfd. Platt Iron Wks. - Dayton Ohio 4 Stage #10-1400

Motors - Crocker Wheeler D.C. - 250 HP - 100R - 60 Cycle - 440 Volts -

Recording Watt Meter - Bristol #364 Type - Registering Watt Met

PUMP STATION N^o 6

28

cial Test for

Specified on Document 78388.

July 29, 1914 - By South Western Foundrys Co.

10 A.M. Length of Test 24 Hours.

Wiseman Foreman of Operation - Ed. Jewell Ch. Plant Eng.

A.J. Huddleson Mfrs. Rep. - Schultz Mfrs. Agent.

G.P.M. 416 Hd. - Shop N^o Pump N^o 1 80577 - Shop N^o Pump N^o 2 80516

1170 R.P.M. - 3^d - 285 Amps. Motor #1 - 198317 - Motor #2 - 198319.

er Thompson #2823651 - 2823650 Simplex Water Meter 16x8 - 16x30-271-GD.

TIME	READING WIER	VACUUM IN INCHES	PRESSURE IN POUNDS	REC. WATT METER	REC. WATT METER	WATT HR. METER	WATT HR. METER
10:02	6 3/8 4000,000	26 1/2	26	158	163	180	175
11:15	6 3/8 4,000,000	26 1/2	25 1/2	159	163	180	175
12:00	6 3/8 4000,000	26	25 1/2	159	163	178	178
1:00	6 3/8 4000,000	26	25 1/2	158	164	178	178
2:00	6 3/8 4095600	26	25 1/2	158	164	178	178
3:00	6 3/8 3852000	26	25 1/2	158	164	180	175
4:00	7 4694400	26	25 1/2	158	164	180	180
5:00	6 3/8 4095360	26 1/2	25 1/2	158	164	180	180
6:00	6 3/8 4095360	26 1/2	25 1/2	158	164	170	195
7:00	7 4694400	26 1/2	25 1/2	158	164	170	195
8:00	6 3/8 4579200	26 1/2	25 1/2	158	164	180	194
9:00	6 3/8 4095360	26 1/2	25 1/2	158	164	180	190
10:00	6 3/8 4095360	26 1/2	25 1/2	158	164	180	180
11:00	6 3/8 4095360	26 1/2	25 1/2	158	164	180	180
12M.	6 3/8 4095360	26 1/2	25 1/2	158	164	184	178
Dec. 5 1:40 AM	7 4694400	26 1/2	25 1/2	158	164	180	184
2:00	6 3/8 4095360	26 1/2	25 1/2	158	164	182	178
3:00	6 3/8 4095360	26 1/2	25 1/2	158	164	180	178
4:00	7 4694400	26 1/2	25 1/2	158	164	180	178
5:00	6 3/8 4095360	26 1/2	25 1/2	158	164	180	180
6:00	6 3/8 4095360	26 1/2	25 1/2	158	164	180	180
7:00	7 4694400	26 1/2	25 1/2	158	164	180	182
8:00	6 3/8 4453460	26 1/2	25 1/2	158	164	180	180

SIMPLEX METER DIAL	G.P.M. HR. READ	N ^o OF WELLS IN COMMISSION	SPEED ON PUMPS #1	SPEED ON PUMPS #2	REMARKS
11804000	4	3-4-5-6-7-8	1165	1165	
12012000	4	3-4-5-6-7-8	1178	1173	
12124000	4	3-4-5-6-7-8	1171	1172	
12274000	4,030,000	3-4-5-6-7-8	1170	1169	
12432000	4,023,000	2-3-5-6-7-8-9	1176	1167	
12593000	4,030,000	2-3-5-6-7-8-9	1168	1165	#9 out Belt Broke #10 on at 3:15
12759000	4,050,000	2-3-5-6-7-9-10	1167	1166	
12920000	4,050,000	2-3-5-6-7-10	1167	1168	#9 off at 4:55
13094000	4,025,000	2-3-5-6-7-10	1167	1168	
13252000	4,025,000	2-3-5-6-7-9-10	1169	1168	#9 - on at 6:45
13408000	4,050,000	2-3-5-6-7-9-10	1171	1170	#9 - off at 8:15
13575000	4,050,000	2-3-5-6-7-10	1175	1176	
13736000	4,050,000	2-3-5-6-7-9-10	1171	1171	#9 - on at 9:25
13902000	4,050,000	2-3-5-6-7-10	1170	1170	#9 off at 10:40
14065000	4,040,000	2-3-5-6-7-10	1173	1172	
14229000	4,040,000	2-3-5-6-7-9-10	1174	1173	#9 on at 12:15
14392000	4,050,000	2-3-5-6-7-10	1174	1174	#9 off at 1:40
14558000	4,050,000	2-3-5-6-7-10	1174	1175	
14721000	4,050,000	2-3-5-6-7-9-10	1177	1171	#9 on at 3:10
14885000	4,050,000	2-3-5-6-7-10	1178	1177	#9 off at 4:20
15049000	4,030,000	2-3-5-6-7-10	1177	1171	
15212000	4,050,000	2-3-5-6-7-9-10	1174	1171	#9 on at 6:05
15381000	4,050,000	1-2-3-5-6-7-10	1176	1171	#9 off at 7:15 #1 on at 7:40

MISSION VALLEY

Record of Official

PUMP STATION N^o 6

Test (Continued)

Jan. 6, 1915

29

TIME	WIER READING	VACUUM IN INCHES		PRESSURE IN POUNDS		REC. WATT METER	REC. WATT METER	WATT HR METER	WATT HR METER
		#1	#2	#1	#2	#1	#2	#1	#2
9.00		26	25 $\frac{1}{2}$	158	164	182	180	.0220	.3985
10.00	6 $\frac{3}{4}$	26 $\frac{1}{2}$	25 $\frac{1}{2}$	158	164	180	181	.0223	.3988
11.00		25	23 $\frac{1}{2}$	161	166	200	197	.0226	.3992
11.15		12	12 $\frac{1}{2}$	166	172	224	209	.0236	.3992

SIMPLEX METER DIAL	METER 24 HR.	N ^o OF WELLS IN COMMISSION	SPEED OF PUMPS		REMARKS
			#1	#2	
15,544,000	4,050,000		1167	1168	
15,726,000	4,050,000		1171	1172	
15,831,000	4,500,000		1162	1165	
	5,150,000		1164	1165	

TEST
#10-4 Stage
MISSION VALLEY

Jan. 5, 1915 - Test on Pump No 1

K.W. CORRECT	R.P.M.	VOLTS	AMPS.	K.W. AS READ	B.H.P.	P.#	V."
226.5	1168			239	279	153	11.5
223.5	1168			236	273	162.5	11.5
205.	1169			216	252.5	182	10.5
199.	1159			210	245	185	10.25
191	1170			202	235	192	10.25
171.5	1177			180	211	200	9.75
178	1165			188		150	25.5
197	1177			208		151	24.

Test on Pump No 2

R.P.M.	G.P.M. Correct	K.W. Correct	K.W.	B.H.P.	P#	V"
1162	2030	227	220	279	157	10 3/4
1166	1938	224	217	276	166	10 1/4
1166	1875	220	213	270	170	10 1/4
1165	1805	215	208	265	177	10
1164	1680	207	200	255	184	9 3/4
1164	1590	199.5	193	245	188	9.5
1165	1458	186	180	229	197 1/2	9 1/4
1166	1264	175.5	170	216	202	9
1164	1110	162.	157	200	206	8 3/4

Test on Pump No 1

R.P.M.	G.P.M. Correct	K.W. Correct	K.W.	B.H.P.	P#	V"
1160	1975	216.5	228	266	153	11 1/2
1162	1890	218.	230	268 1/2	160	10 1/2
1163	1785	217	229	267	110	10 1/4
1163	1710	206.5	218	254	178	10
1164	1545	197	208	242	185	10
1162	1420	197	208	242	190	9 1/2
1163	1188	184	194	227	196	9
1164	1485	185.5	196	228 1/2	186	9 3/4
1164	1610	195.5	206	240	180	10
1159	1675	199	210	244	175	10
1162	1780	215.	227	264	167 1/2	10 1/2

B. FORMULA $\frac{C \times 20 \times 60 \times 3600}{60} - K.W. \text{ HRS } C = 2.5$

A. 20 REV OF METER DISC = 60 SEC = 190

RECORD
Turbine Pumps.
PUMPING STATION

30

Platt Iron Works

HEAD	G.P.M.	HYD.-H.P.	EFF. %	HEAD	G.P.M.	H'	H"
372	2,820,000	188	68.5		2030		
392 1/2	2,710,000	185.5	68.		1938		
401 1/2	2,400,000	183.5	72.7		1875		
418 1/2	2,220,000	172.5	71		1805		
434	2,020,000	162.8	68.5		1680		
443	1,640,000	137.	65.		1590		
464 1/2	2,090,000				1458		
474	2,390,000				1264		

Jan. 4, 1915

HEAD	G.P.M.	HYD.-H.P.	EFF. %
372	2,920-	191	68.5
392 1/2	2,790-	192	69.7
401 1/2	2,700-	190.5	70.7
418 1/2	2,600-	191	72
434	2,420-	184.5	72.5
443	2,290-	178	72.8
464 1/2	2,100-	171	74
474	1,820-	151.3	70.2
483	1,600-	135.5	67.8

2nd Run

HEAD	G.P.M.	HYD.-H.P.	EFF. %
368	2,840	184	69
384	2,720	183.2	68.5
406 1/2	2,570	183.4	69
424 1/2	2,460	183.	72
441 1/2	2,220	173	71.5
452	2,040	162.5	67.5
465	1,710	139.5	61.5
443	2,140	166.2	72.8
428 1/2	2,310	175	73
418	2,410	176.8	72.5
401	2,560	186.5	58.5

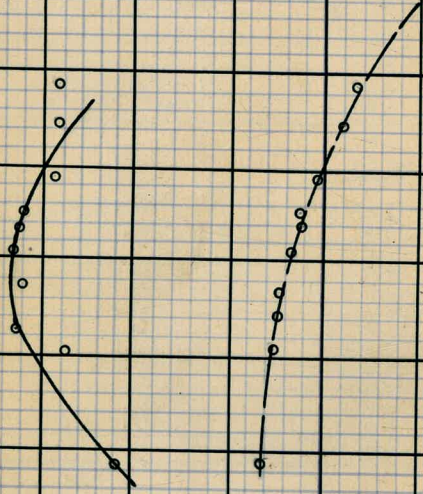
$(2.5 \times 20 \times 3600 \times 20) \div 60 = 180 \text{ K.W.}$

WATTS ON RECORDING WATT MET

100 200 300 400 500 F.Hd.
 10 20 30 40 50 60 70%

200 400 600 800 1000 1200 1400 1600 1800 2000 2200 2400 G.P.M.

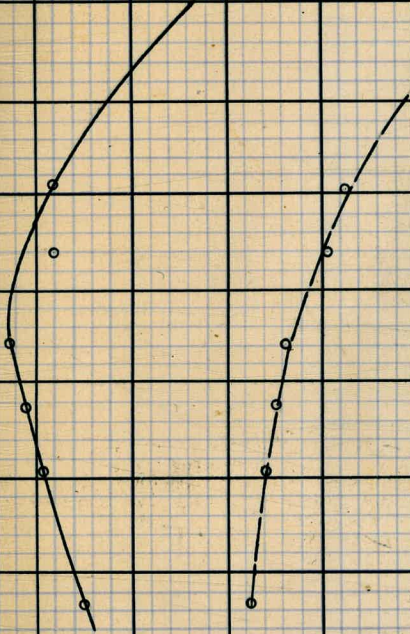
Curves from Test Log
 Pump N^o 1
 2nd Run.



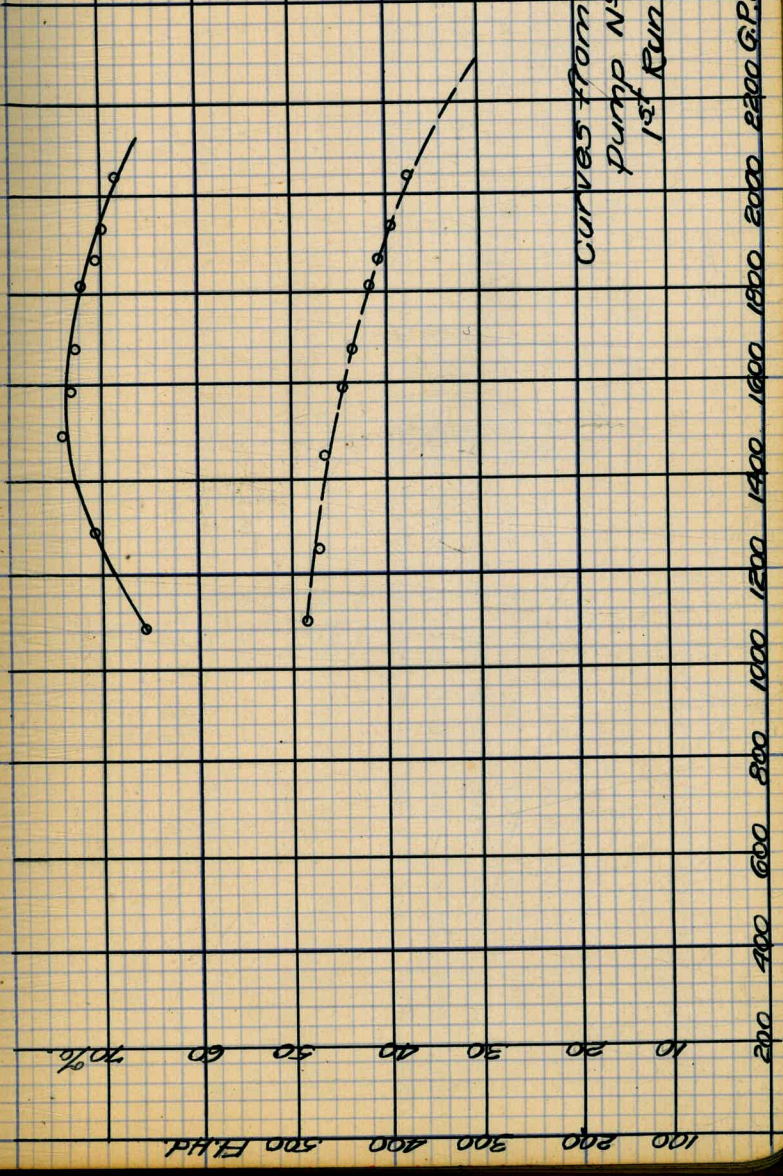
100 200 300 400 500 F.Hd.
 10 20 30 40 50 60 70%

200 400 600 800 1000 1200 1400 1600 1800 2000 2200 G.P.M.

Curves from Test Log
 Pump N^o 1
 1st Run.



Curves from Test Log
Pump N^o 2
1st Run



FACTORY TEST RECORD

*10-4 Stage Turbine Pump

The Platt Iron Works Co.

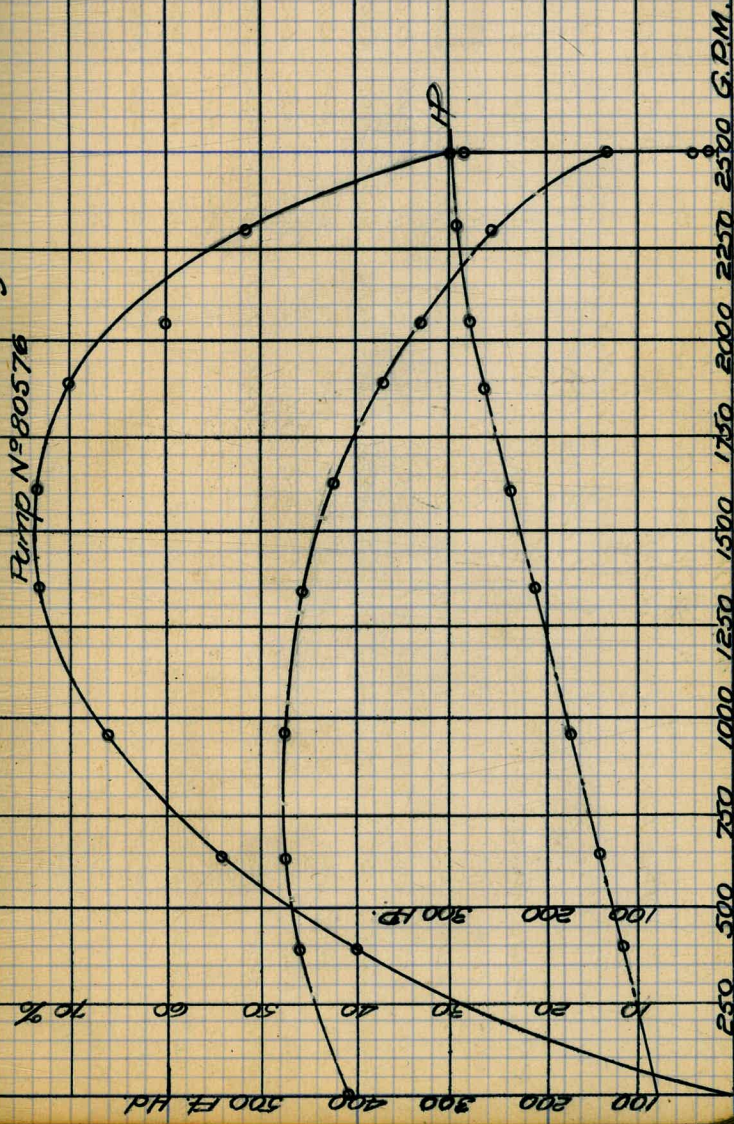
Oct. 2-1914.

Pump No 80576

Log of Test.

R.P.M.	VOLTS	AMPS	K.W.	B.H.P.	P.	V.	HEAD	G.P.M.	HYD. H.P.	EFF.	HEAD.	G.P.M.	H'	H''
1010	220	925	203	210	2	8	146	2400	885	42%	19	2500	1535	1360
1000	220	885	195	203	40	7.5	102	2260	58.1	28.5	134	2500	1500	1325
1010	223	835	186	195	81	7	196	2015	100	51.5	255	2300	1440	1265
1000	224	785	176	186	103	6.5	246.5	1785	111	60	325	2050	1380	1205
1000	224	735	164.5	175	124	6	294	1640	123	70	387	1880	1340	1165
1010	223	680	151.5	162	140	6	331	1420	119	73.3	429	1620	1275	1100
1020	224	610	136.5	146.5	151	5.5	356	1180	106.3	72.8	453	1330	1200	1025
1020	225	495	111.8	120	138	5	370.5	845	79	66	470	954	1065	890
1020	225	405	92.2	98	138	5	370.5	565	53	54	470	638	930	755
1020	226	335	75.7	80	135	4.5	363	350	32.1	40	460	395	800	625
1010	225	240	54	55	132	4.5	311.				403			

Curves from Test Log.



FACTORY TEST RECORD

#10-4 Stage Turbine Pump

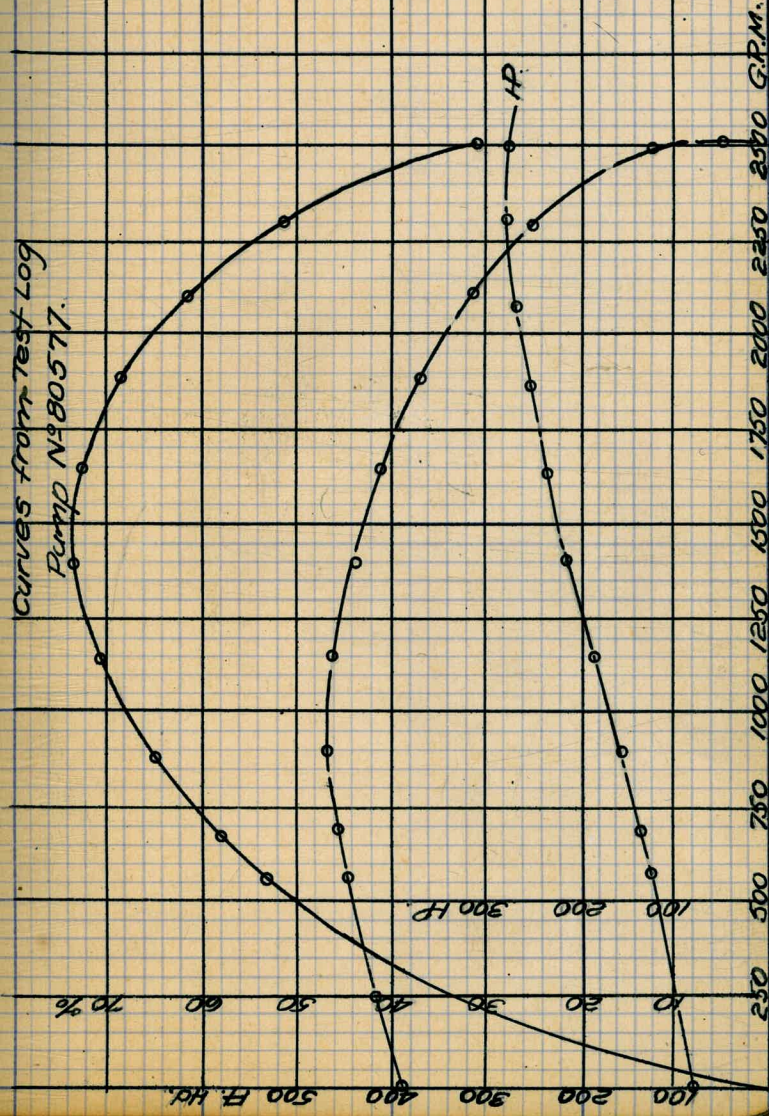
The Platt Iron Works

Oct-2-1914

Pump - No 80577

Log of Test.

R.P.M.	VOLTS	AMPS.	K.W.	B.H.P.	P.	V.	HEAD	G.P.M.	HYD.H.P.	EFF.	HEAD	G.P.M.	H'	H''
1015	224	895	200	208	2	8	14.6	2410	8.9	4.3%	19	2500	1.535	1.360
1015	226	875	198	206	41	7.5	104	2325	6.12	31	133	2500	1.575	1.340
1020	226	825	186.5	196.5	81	7	125.5	2025	100	51	248	2285	1.445	1.270
1025	228	790	180	189.5	103	6.5	245.5	1860	115.5	61	310	2090	1.400	1.225
1025	228	745	170	180	122	6	259	1670	122	68	364	1875	1.350	1.175
1025	228	695	158.5	169	140	5.5	330	1465	122.1	72.5	415	1645	1.290	1.115
1030	228	630	143.5	153.5	150	5	352.5	1250	111.1	72.6	439	1595	1.225	1.050
1035	229	555	127	136.5	158	5	371.5	1025	96	70.6	460	1140	1.135	.960
1045	230	415	95.5	102.5	161	4.5	377	625	59.5	58	456	689	965	790
1035	230	475	109.2	117.3	160	4.5	375	800	75.8	65	462	890	1.045	.870
1045	228	370	84.5	90	158	4.5	370	518	48.4	53.7	448	570	905	730
1030	230	245	56.3	58	130	4	306				382			



Camp Kearny Booster Pump Test May 11 - 1918 Geo. Cromwell.
 Pump No. 2 Allis-Chalmers single stage double suction
 (1260 g.p.h. 204' head. 1750 r.p.m. 1st ed.)

[Motor direct con. 100 HP 440 V. 60 c. 3 ph. Serial No. 26C10749.1
 Full Load Speed = 1750 r.p.m. 117 Amps. Temp. full load 40°C
 25° overload 2 hrs. 55°C.]

Test No. 1.

Time	Speed	Motor Elect	Suct. Press	Disch. Press	Crust Meter	Water Pumped
9-45 AM.	1758	837485	-6 ins	80 lbs	295982.10	2523 Cu. Ft.
10-00 "	1762	837520	-4 "	81 "	296007.33	2559 "
10-15 "		837580	-4 "	81 "	296032.92	2579 "
10-30 "	1762	837620	-4 "	81 "	296058.71	2561 "
10-45 "	1760	837670	-4 "	81 "	296084.52	10222 "

Total 1 Hr. - Disch. 1274.4 g.p.m. + Contractors use on Camp Kearny Road Const. (?)

Reservoir W.L. 9-45 15-11 1/4"
 10-00 15-10 5/8"
 10-15 15-9 1/2"
 10-30 15-8 5/8"
 10-45 15-8 "

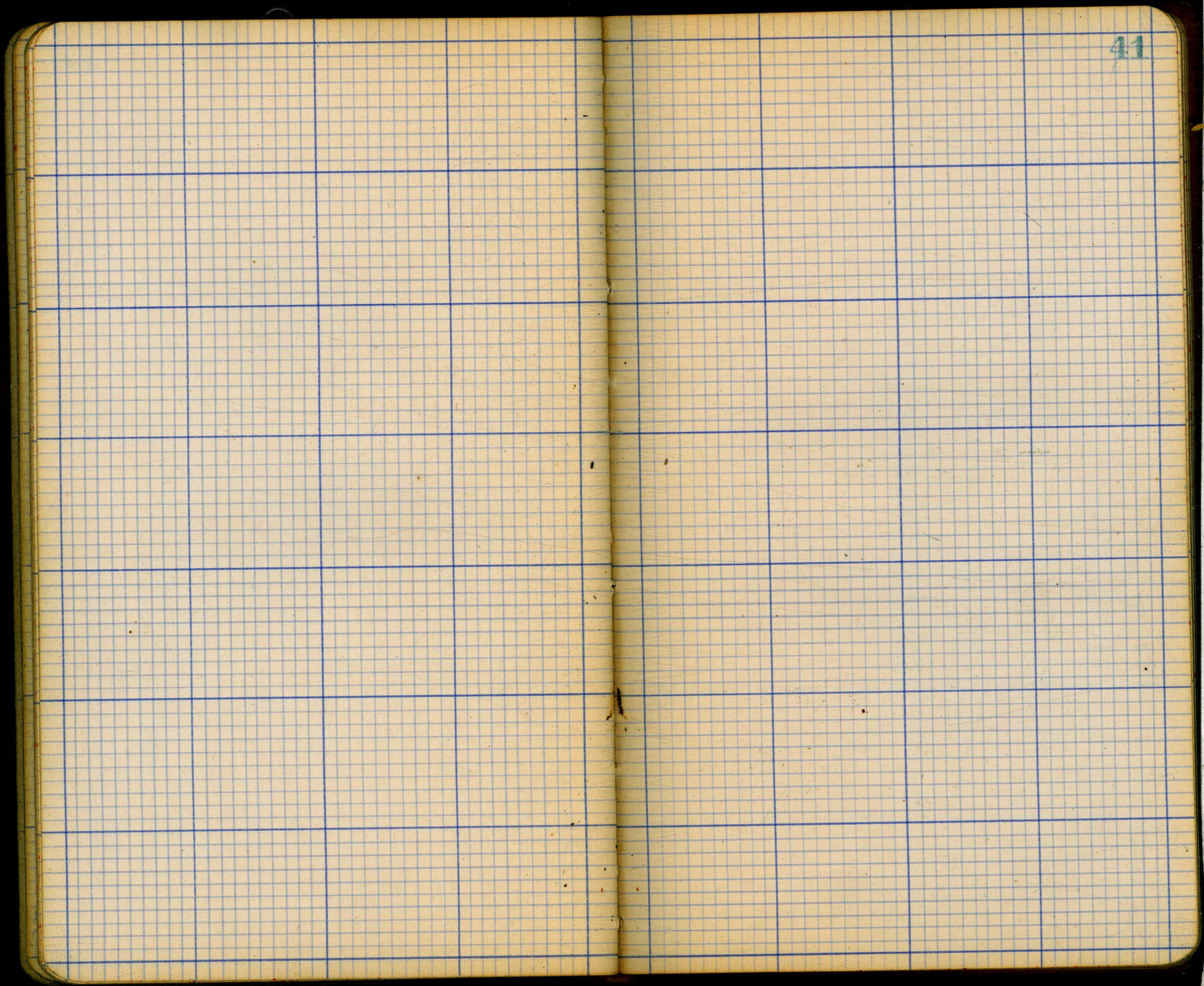
Actual Work performed = $187.1 \text{ Ft. Head} \times 170.37 \text{ cu. Ft. per min.} \times 62.5$
 $= 33000$
 $= 61.6 \text{ HP.}$
 (60.4)

Note - This is not exact because it was impossible to determine the amt. of water used bet. the pump and the meter.

The pump delivered 1274.4 g.p.m. against a working press of 81' = 187.1 ft. head. Water Surf. in Conc. Dist. Res. = 16' approx.

Velocity = 3.61 Ft. per sec. $Q = 170.37 \text{ cu. Ft. per sec.} = 1274.4 \text{ g.p.m.}$
 Total Friction Loss = 93.92 ft. = 3.57 ft. per 1000 ft. in. $\left[\begin{array}{l} 25000.5 \text{ ft. of } 12 \text{ " N.P.P.} \\ 1143.5 \text{ " " " R.S.P.} \\ 80.0 \text{ " " " 16 \text{ " C.I.P.} \end{array} \right]$

Motor Guaranteed Eff. F.L. 91% P.F. = 92%
 " " 1400 g.p.m. 197' Head 69%
 " " 1260 " " 204' " 68%



63

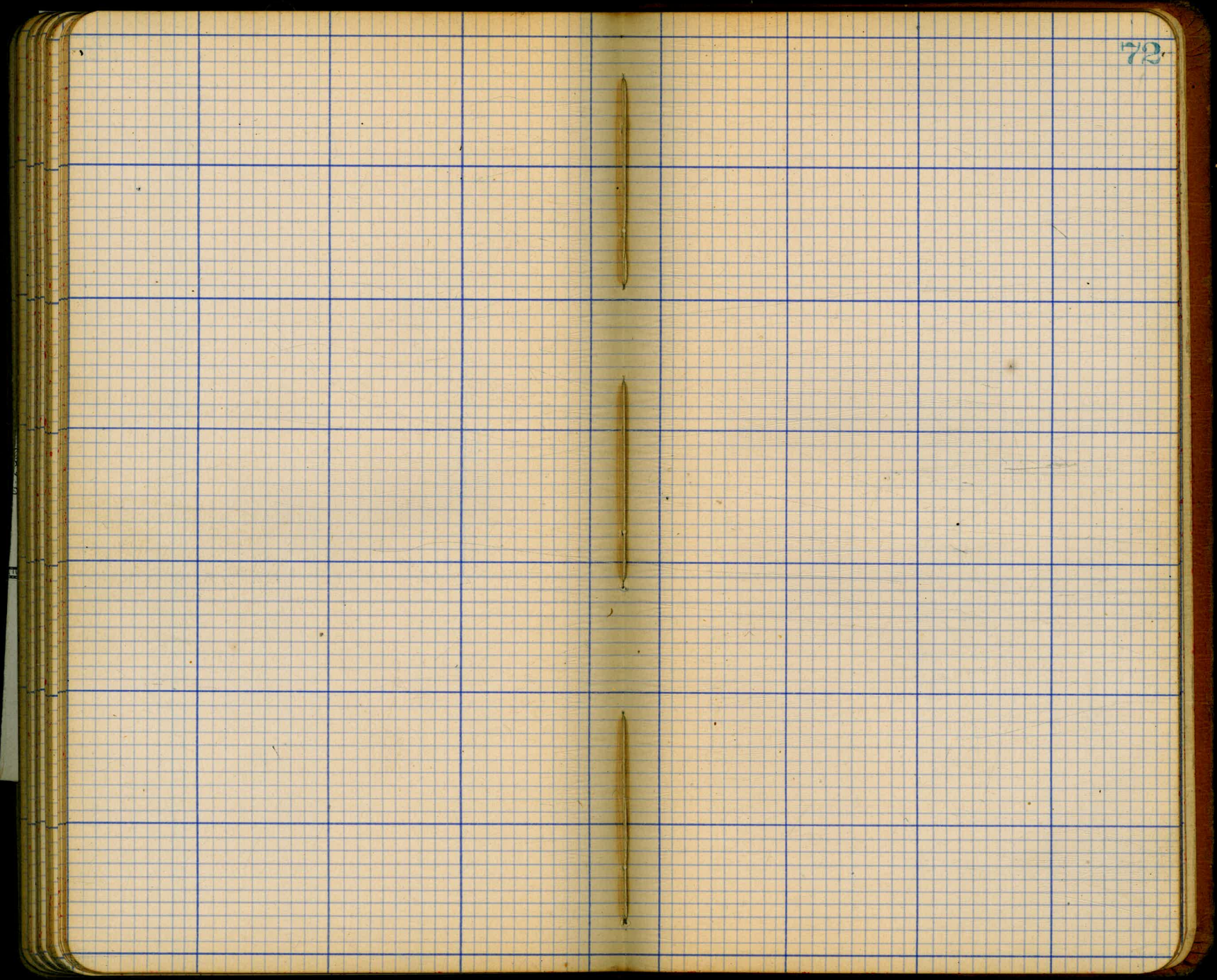
65

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68

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76



77

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.

434/ 810 / 184
434
3660
2472
1880

67
90
6230

33000

184
1300.
55200
184
739200
813
79733
1913600
H.P.
33/1993.333 / 604
198
133
132

