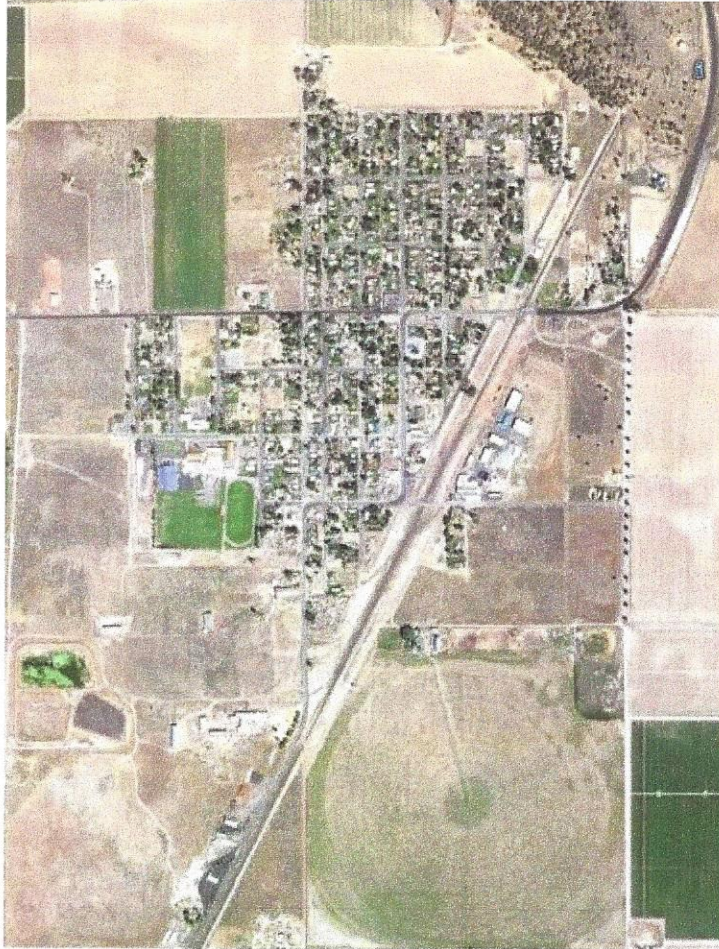


ENGINEER'S REPORT
FOR THE
CITY OF DORRIS WATER SYSTEM – WS # 4710001



Date: July, 2015

Prepared By:



Bray & Associates
Civil Engineering & Land Surveying
329 West Miner St.
Yreka, CA 96097

Prepared For:

City of Dorris
PO Box 768
Dorris, CA 96023

Funding by (DWSRF) Safe Drinking Water State Revolving Fund FAN- SRF13P121

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I. INTRODUCTION:

A) Project Description

The purpose of this planning project is to evaluate the City of Dorris water system as follows:

- Locate and evaluate the condition of all service laterals to determine if replacement is needed for meter installation and find customers with multiple service connections.
- Evaluate water mains to determine if replacement is needed for meter installation.
- Prepare Engineer Report and Draft Plans and Specifications for water meter installation construction project for review by State Division of Drinking Water.
- Prepare and process CEQA categorical exemption.
- Prepare Final Plans and Specifications for water meter installation construction project.

B) Project Funding

Funding for this project was provided by the State of California, Safe Drinking Water State Revolving Fund - Funding Agreement No. SRF12P121 Project Number 4710001-006P.

C) System Overview & History

The City of Dorris was incorporated in 1908 shortly after the arrival of the railroad. The water source for Dorris has always been well water. There have been many different wells drilled throughout the years and abandoned for differing reasons. The water distribution system developed as needed along with development in town.

Federal grant funding in the early 1980's allowed Dorris to construct a 750,000 gallon welded steel water reservoir on Dorris Hill, currently in use. This added storage drastically improved the system's fire protection capabilities.

The City has struggled with funding for replacement of aging distribution lines for many years. Many of the lines still in use are original and were placed in service over 100 years ago. These original steel lines are in serious need of replacement. Each time these lines are exposed it is extremely difficult to get coupling fittings to seal around the rusted old pipes. There is also a shortage of line valves on the system which makes it very challenging to isolate certain sections of water pipe without discontinuing service to

many users. Each time the City depressurizes these old lines for repairs there is a large amount of rust and debris that is then distributed through the system. In many cases pressure reducing valves and plumbing fixtures are plugged when the system is depressurized.

II. EXISTING WATER SYSTEM

Supply

The water supply for the City of Dorris is provided by a single municipal well (Well # 6) inside the City Limits located at the corner of Second & Portland Streets. The well was drilled in 1971 and is at a depth of 1,236 feet. They currently use "Old Sandy" (Well # 4), which is located at the corner of Sage and Sly Streets, as a back up well. Use of "Old Sandy" was discontinued due to the excessive amount of sand that it produces. Well # 4 also has tested too high for current required levels of Arsenic.

Storage

The City of Dorris still has a tower elevated water storage tank in town that was placed out of service when the new 750,000 gallon welded steel tank was constructed on Dorris Hill in the early 1980's. The tower reservoir has been damaged by freezing conditions and is currently unusable without repairs. The level in the new Dorris Hill tank is maintained by pumping Well # 6 into the distribution system. The pumping causes pressure in the distribution system to fluctuate during pumping hours because the system uses a common supply/distribution line for filling the tank. Many of the water service connections in town have pressure reducing devices due to high pressures during pumping operations.

Distribution System

The water distribution system for the City is made up of many different sizes and types of pipe varying in age and condition. The original pipe was steel pipe installed around 1912 and there are still sections of this original pipe in service today. In general, the distribution system is very old and has many sections that require replacement of existing lines. The City has replaced some of the older lines throughout the years as monies were available; however there is a serious lack of funding available to keep up with the aging system. Additionally, the system was not constructed with an adequate number of gate valves, so it is difficult to isolate certain sections for repair and replacement.

Treatment

Treatment of the water supply is accomplished by adding chlorine at the well site.

Water Services

There are currently approximately 486 water services in the City of Dorris. Water connections in the City of Dorris are currently unmetered. City Code section 13.04.060 gives the City the right to place meters on the services at any time they deem necessary. Rate structures for metered and unmetered services are also contained in code section 13.04.070, however the rates are outdated and would have to be adjusted to current day costs.

Water Usage

The City consumption based on well metering for 2014 was approximately 142 million gallons for the year, which equates to an average of approximately 24,000 gallons per month per connection (based on 486 connections).

III. RECOMMENDATIONS

Meter Installation & New Rates

We recommend installation of meters to meet current California Code requirements and to help with the City's water conservation. The City is in the process of adopting a new metered water rate structure under the Proposition 218 guidelines. The installation of meters will affect user consumption, but it is difficult to determine exactly how much user consumption will reduce. In our preliminary estimates for rate structuring we are expecting a 30% reduction in water consumption. Following the installation of meters, water consumption should be tracked and the rates adjusted based on actual volumes used. A copy of the capital improvement plan, five year budget projection, and the new proposed rate structure are included in Appendix B for reference.

Service Lines

The majority of the service lines in Dorris are aging steel lines. The City staff often repairs and replaces these lines due to rust problems in the service lateral. We recommend replacement of service lines from the main line to the new meter box.

Distribution System Repairs

We have been involved with many water line replacement projects in Dorris through the years in which we were forced to connect to these old steel lines. The exterior of the steel lines are so rusted and expanded that it is sometimes difficult to tell the original main line size. When unearthed, the lines almost always begin to leak just from being

disturbed by a hand shovel. We have included some pictures of these lines for reference in this report, however we do not have photos of all of the existing 1912 steel lines. The good portion of what the City spends on maintenance is to repair these old rusted steel lines. We have tried to identify the worst of these lines and have included them in our Construction Drawings and Specifications for replacement under the meter installation project.

Construction Project Budget

Appendix C indicates the Engineer's Estimate for construction of the meter installation project. Item cost estimates are primarily based on bid values for similar work in Dorris from past projects. The older costs were adjusted for 4% inflation per annum. A 25% contingency was included for budgeting purposes to account for unforeseen items that arise during construction. Construction oversight of the project will likely be time consuming do to the extent of the work and fact that the City has never had meters in the past.



A handwritten signature in blue ink, appearing to read "M. D. Eastlick", written over a horizontal line.

Morgan D. Eastlick, City Engineer

7-2-15
Date

Appendix A

Distribution System Pictures

Corner of 2nd + S. Pine





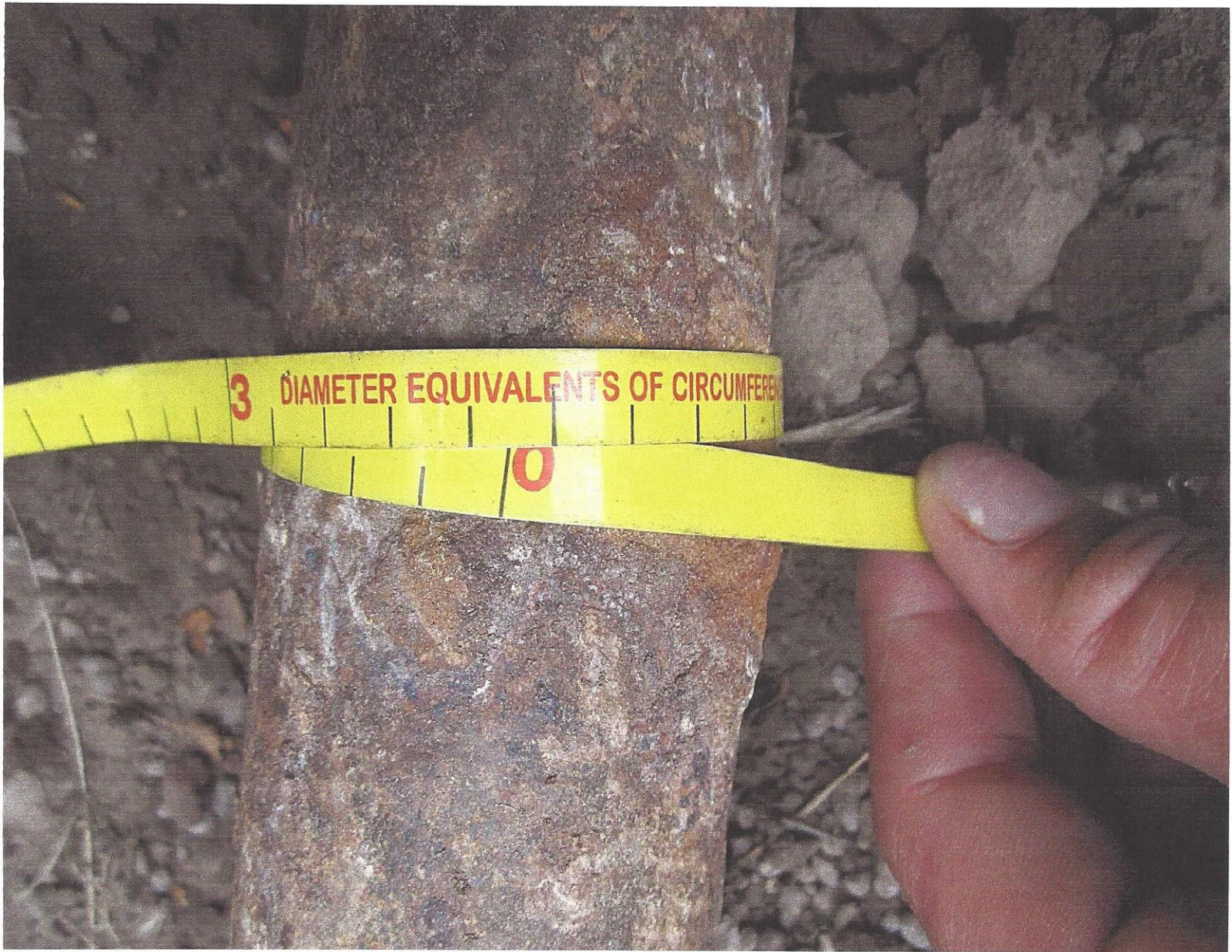
200 N. Oregon
Block











Appendix B

Proposed Meter Rate Structure

FIVE YEAR BUDGET PROJECTION

System Name:
City of Dorris

System ID Number:
4710006

% Inflation:
2.40

Date:
30-Apr-15

LINE	EXPENSES AND SOURCE OF FUNDS	2015	2016	2017	2018	2019
OPERATIONS & MAINTENANCE (O&M) EXPENSES						
1	Salaries and Benefits	\$ 58,691.00	\$ 60,099.58	\$ 61,541.97	\$ 63,018.98	\$ 64,531.44
2	Travel & Training	\$ 500.00	\$ 512.00	\$ 524.29	\$ 536.87	\$ 549.76
3	Power and Other Utilities	\$ 24,800.00	\$ 25,395.20	\$ 26,004.68	\$ 26,628.80	\$ 27,267.89
4	Fees Regulatory	\$ 3,910.00	\$ 4,003.84	\$ 4,099.93	\$ 4,198.33	\$ 4,299.09
5	Treatment Chemicals	\$ 1,856.00	\$ 1,900.54	\$ 1,946.16	\$ 1,992.86	\$ 2,040.69
6	Laboratory Tests	\$ 1,315.00	\$ 1,346.56	\$ 1,378.88	\$ 1,411.97	\$ 1,445.86
7	Postal Expenses	\$ 1,690.00	\$ 1,730.56	\$ 1,772.09	\$ 1,814.62	\$ 1,858.17
8	Transportation	\$ 5,100.00	\$ 5,222.40	\$ 5,347.74	\$ 5,476.08	\$ 5,607.51
9	Maintenance & Supplies	\$ 24,926.00	\$ 25,524.22	\$ 26,136.81	\$ 26,764.09	\$ 27,406.43
10	Miscellaneous	\$ -	\$ -	\$ -	\$ -	\$ -
11	Loan Payment Principal & Interest	\$ -	\$ -	\$ -	\$ -	\$ -
12	Miscellaneous	\$ -	\$ -	\$ -	\$ -	\$ -
13	Total O & M Expenses:	\$ 122,788.00	\$ 125,734.91	\$ 128,752.55	\$ 131,842.61	\$ 135,006.83
GENERAL & ADMINISTRATIVE EXPENSES						
14	Engineering & Professional Services	\$ 69,270.00	\$ 70,932.48	\$ 72,634.86	\$ 74,378.10	\$ 76,163.17
15	Insurance	\$ 11,040.00	\$ 11,304.96	\$ 11,576.28	\$ 11,854.11	\$ 12,138.61
16	Existing CIP Contribution	\$ 7,000.00	\$ 7,168.00	\$ 7,340.03	\$ 7,516.19	\$ 7,696.58
17	Miscellaneous	\$ -	\$ -	\$ -	\$ -	\$ -
18	Additional Contribution to CIP	\$ 123,428.00	\$ 126,390.27	\$ 129,423.64	\$ 132,529.81	\$ 135,710.52
19	Total General & Administrative Expenses:	\$ 210,738.00	\$ 215,795.71	\$ 220,974.81	\$ 226,278.20	\$ 231,708.88
20	Total Water System Expenses:	\$ 333,526.00	\$ 341,530.62	\$ 349,727.36	\$ 358,120.82	\$ 366,715.72
REVENUES RECEIVED						
21	Interest Earnings & Loan Assessments	\$ 233.00	\$ 233.00	\$ 233.00	\$ 233.00	\$ 233.00
22	Penalties & Delinquent Fees	\$ 3,685.00	\$ 3,685.00	\$ 3,685.00	\$ 3,685.00	\$ 3,685.00
23	Water Sales	\$ 215,070.00	\$ 215,070.00	\$ 215,070.00	\$ 215,070.00	\$ 215,070.00
24	Total Revenues:	\$ 218,988.00	\$ 218,988.00	\$ 218,988.00	\$ 218,988.00	\$ 218,988.00
25	NET GAIN OR LOSS	\$ (114,538.00)	\$ (122,542.62)	\$ (130,739.36)	\$ (139,132.82)	\$ (147,727.72)

Report Prepared By: Morgan D. Eastlick, City Engineer

Morgan D. Eastlick

Date: 7-2-15

	2015	2016	2017	2018	2019
Number of Customers:	486	486	486	486	486
Average Monthly Revenue Needed per Customer:	\$ 57.19	\$ 58.56	\$ 59.97	\$ 61.41	\$ 62.88

Capital Improvement Plan

City of Dorris

Date: 30-Apr-15

System ID Number: 4710006

Number Service Connections: 486

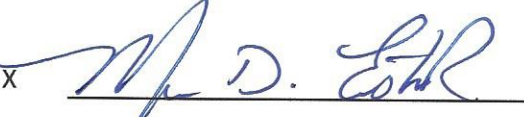
Quantity	Units	Component	Unit Cost	Installed Cost	Ave. Life	Annual Reserve	Monthly Reserve	Monthly Reserve / Conn.
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Existing Facilities

4970	LF	2" & Smaller Steel Pipe	\$35.00	\$173,950.00	15	\$11,596.67	\$966.39	\$1.99
1590	LF	4" PVC Pipe	\$50.00	\$79,500.00	40	\$1,987.50	\$165.63	\$0.34
7050	LF	4" Steel Pipe	\$50.00	\$352,500.00	15	\$23,500.00	\$1,958.33	\$4.03
2500	LF	6" Steel Pipe	\$60.00	\$150,000.00	15	\$10,000.00	\$833.33	\$1.71
370	LF	6" AC Pipe	\$60.00	\$22,200.00	40	\$555.00	\$46.25	\$0.10
1670	LF	6" PVC Pipe	\$60.00	\$100,200.00	40	\$2,505.00	\$208.75	\$0.43
1675	LF	8" PVC Pipe	\$75.00	\$125,625.00	40	\$3,140.63	\$261.72	\$0.54
478	LF	10" AC Pipe	\$95.00	\$45,410.00	40	\$1,135.25	\$94.60	\$0.19
248	LF	10" PVC Pipe	\$95.00	\$23,560.00	40	\$589.00	\$49.08	\$0.10
1532	LF	10" Steel Pipe	\$95.00	\$145,540.00	25	\$5,821.60	\$485.13	\$1.00
2230	LF	12" AC Pipe	\$115.00	\$256,450.00	40	\$6,411.25	\$534.27	\$1.10
25	Each	4" Gate Valve	\$800.00	\$20,000.00	40	\$500.00	\$41.67	\$0.09
18	Each	6" Gate Valve	\$2,000.00	\$36,000.00	40	\$900.00	\$75.00	\$0.15
3	Each	8" Gate Valve	\$3,000.00	\$9,000.00	40	\$225.00	\$18.75	\$0.04
4	Each	10" Gate Valve	\$5,000.00	\$20,000.00	40	\$500.00	\$41.67	\$0.09
3	Each	12" Gate Valve	\$6,000.00	\$18,000.00	40	\$450.00	\$37.50	\$0.08
22	Each	Fire Hydrant	\$3,500.00	\$77,000.00	40	\$1,925.00	\$160.42	\$0.33
486	Each	Water Service no meter	\$500.00	\$243,000.00	15	\$16,200.00	\$1,350.00	\$2.78
1	Each	Storage Reservoir 750,000 gallons	\$550,000.00	\$550,000.00	35	\$15,714.29	\$1,309.52	\$2.69
1	Each	Various Maintenance Equipment	\$15,000.00	\$15,000.00	10	\$1,500.00	\$125.00	\$0.26
1	Each	Chlorination Building	\$15,000.00	\$15,000.00	30	\$500.00	\$41.67	\$0.09
1	Each	Well & Pump	\$325,000.00	\$325,000.00	55	\$5,909.09	\$492.42	\$1.01
Subtotal Existing CIP Costs				\$2,802,935.00		\$111,565.27	\$9,297.11	\$19.13

Future Projects

495	Each	New Water Meters	\$1,500.00	\$742,500.00	40	\$18,562.50	\$1,546.88	\$3.18
Total Existing and New CIP Projects				\$3,545,435.00		\$130,127.77	\$10,843.98	\$22.31
Existing Water Improvement Fund Account Balance				\$150,000.00				
Existing Deficiency for Future Replacement of System Facilities				\$3,395,435.00				

X 

Date:

7-2-15

Report Prepared By: Morgan D. Eastlick, City Engineer

PROPOSED RATES

System:								System ID Number:		Date:	
City of Dorris								4710006		30-Apr-15	
Capital Recovery Value 2015	(Based on estimated system replacement costs for 2015)							\$ 130,428.00	Annually		
2015 Water Production	(Based on annual water system statistics for the City of Dorris for 2014 reduced by 30%)							99,214,870	Gallons		
Flat Rate per connection	(Flat Rate is calculated using O & M, General Admin. Expenses 2014 - 486 connections)								\$30.25 / conn.		
Rate/Gallon	(Rate/Gallon is calculated using estimated Capital Replacement, Power & Treatment Costs)								\$1.56 / 1000 gallons		
	Note: City of Dorris usage reduced by 30% due to rate increase)										
2015	1							Flat Rate w/ 2.4% Inflation	\$30.25	\$1.56 / 1000 gallons	
2016	2							Flat Rate w/ 2.4% Inflation	\$30.98	\$1.60 / 1000 gallons	
2017	3							Flat Rate w/ 2.4% Inflation	\$31.72	\$1.64 / 1000 gallons	
2018	4							Flat Rate w/ 2.4% Inflation	\$32.48	\$1.68 / 1000 gallons	
2019	5							Flat Rate w/ 2.4% Inflation	\$33.26	\$1.72 / 1000 gallons	

Flat Rate Proposed Rate Increase - 2.4% Inflation Index for 5 years

Rate/1,000 Gallons Proposed Rate Increase - 2.4% Inflation Index for 5 years

Note:

- All user connections would be charged flat rate and usage would be charged per gallon used each month.
- Annual transfer to Capital Replacement Account bringing Water Fund Account to \$50,000 balance for operating water system.

Appendix C

Construction Project Engineer's Estimate



Bray Associates
Civil Engineers Land Surveyors
brayengineer.com

329 West Miner Street
Yreka, CA 96097
530-842-6813
530-842-6645(Fax)
brayengr@sbcglobal.net

ENGINEER'S ESTIMATE

DORRIS WATER METER INSTALLATION PROJECT

Date: July 2, 2015

Item No.	Description	Estimated Quantity	Unit	Unit Price	Total Item Amount
1	Mobilization	1	Lump Sum	\$60,000.00	\$60,000.00
2	Connect Existing Fire Hydrant	9	Each	\$2,000.00	\$18,000.00
3	Single Meter Installation	466	Each	\$1,800.00	\$838,800.00
4	Double Meter Installation	8	Each	\$2,700.00	\$21,600.00
5	1" iPERL Meter Installation	6	Each	\$1,869.00	\$11,214.00
6	2" OMNI C2 Meter Installation	1	Each	\$2,700.00	\$2,700.00
7	4" OMI C2 Meter Installation	1	Each	\$6,000.00	\$6,000.00
8	6" OMNI C2 Meter Installation	2	Each	\$9,132.00	\$18,264.00
9	Backflow Prevention Devices	1	Each	\$3,000.00	\$3,000.00
10	6" C-900 Water Pipe	5,380	LF	\$68.00	\$365,840.00
11	6" Water Gate Valves	25	Each	\$1,600.00	\$40,000.00
12	Connect 6" C-900 To Existing Water Main	12	Each	\$3,000.00	\$36,000.00
13	Locate Missing Water Services	15	Each	\$4,500.00	\$67,500.00
14	Construction Surveying	1	Lump Sum	\$15,000.00	\$15,000.00

Construction Subtotal **\$1,503,918.00**

15% Public Bid Process, Construction Oversight & Testing **\$225,587.70**
25 % Contingencies **\$375,979.50**

Total Construction Budget **\$2,105,485.20**

