FIRST REPORT

—OF THE—

SUPERINTENDENT AND SECRETARY

—OF THE—

Burlington Water-Works,

—TO THE—

BURLINGTON WATER COMPANY,

FROM ACCEPTANCE OF WORKS,

JUNE 1st, 1878, TO JANUARY 1st, 1880.

BURLINGTON, IOWA, JANUARY 1, 1880.

CHAS. I. BARKER, Steam Printer.

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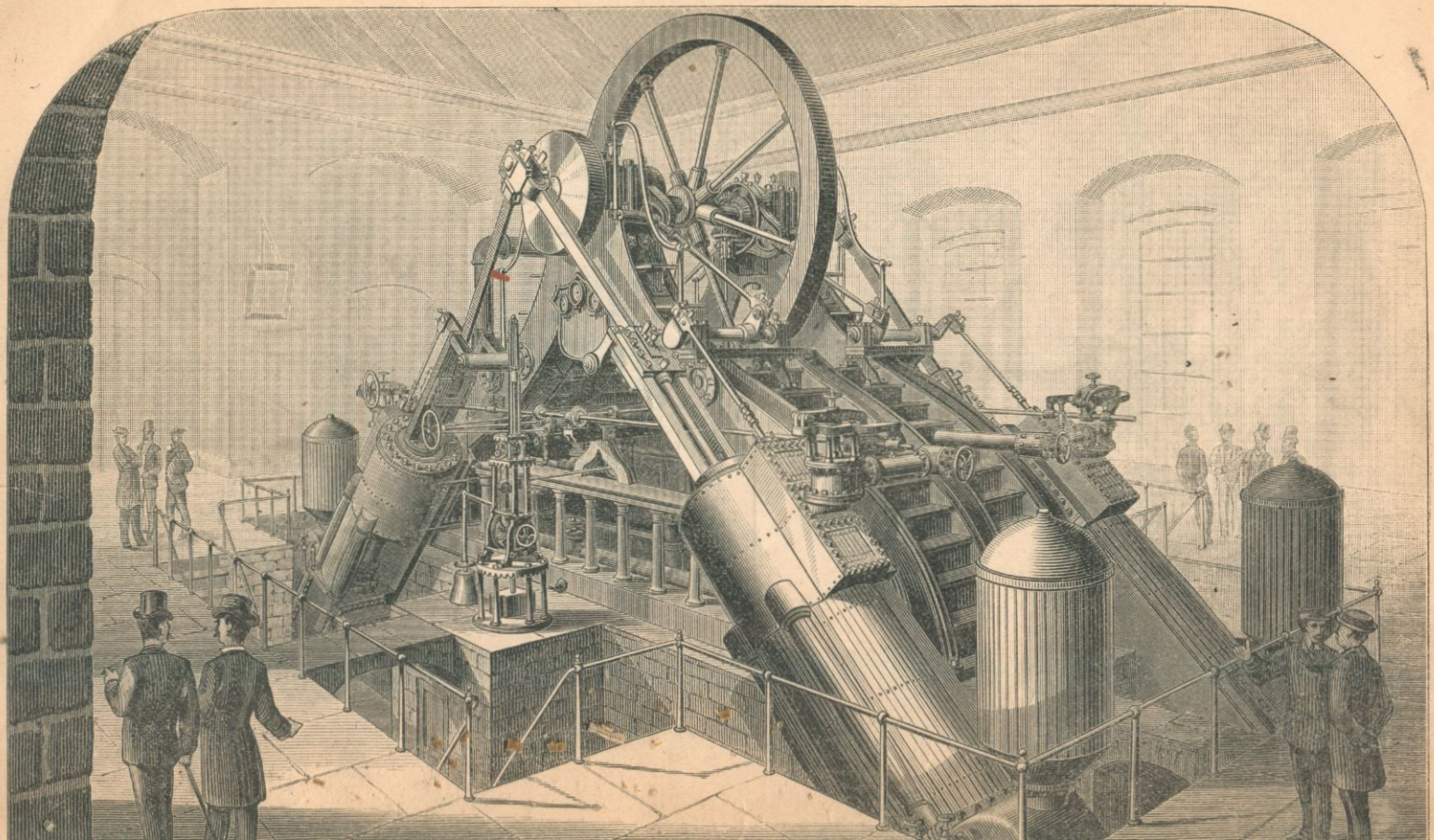

CHAS. I. BARKER,
STEAM BOOK AND JOB PRINTER,
BURLINGTON, IOWA.

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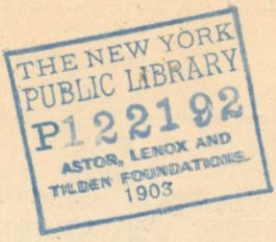

OFFICERS

—OF—

Burlington Water Company.

DIRECTORS.

HON. CHAS. MASON,

HON. JOHN PATTERSON, J. C. McKELL,
T. W. BARHYDT, W. W. NASSAU.

PRESIDENT—HON. CHARLES MASON.
VICE PRESIDENT—HON. JOHN PATTERSON.
TREASURER—J. C. McKELL.
SECRETARY—W. A. TORREY.
SUPERINTENDENT—IRA A. HOLLY.
ENGINEER—CHARLES HOOD.
ASSISTANT ENGINEERS—M. J. HADDIX,
—GEO. LEIPHART.
TAPPER AND PIPEMAN—ALECK GENTHER.

SUPERINTENDENT'S REPORT.

OFFICE OF SUPERINTENDENT OF WATER WORKS,
BURLINGTON, IOWA, January 1, 1880.

To the Honorable President and Board of Directors of the Burlington Water Company.

GENTLEMEN—I have the honor to submit herewith my report as Superintendent of your Water Works, of the condition and operation of the Water Works from their completion, June 1st, 1878, up to the present date, with such suggestions, recommendations and explanations as appear to me appropriate. I have endeavored to give you in detail and tabular form the amount and location of all cast and wrought iron mains, hydrants, valves, meters, and the total amount and cost of service pipes, which includes all furnished by the Holly Manufacturing Company, and since added by the Water Company.

The tables setting forth the duty performed, with all minute expenses, you will find quite complete. January 1st, this year, concludes the first nineteen months of the active and successful workings of the Water Works in this city, and has completely demonstrated the fact, that it is no longer an experimental system, but is a reliable and necessary institution, ready at all times to supply any demand made upon it; that it will also soon be a paying one, with a very respectable surplus of receipts over expenditures, and will, in time, be a source of revenue to the city.

The water mains, hydrants, valves, boilers and machinery at the Works, and all things connected with the water department, are in good condition, and there has been no accident to the Works except the break in the 12 inch main on Main Street, at the crossing of Valley Street sewer, April 10th, 1879.

I also submit to your honorable Board a complete inventory of the stock, tools, supplies, and miscellaneous articles owned by the Burlington Water Company.

There are 198 double nozzle fire hydrants and one single nozzle fire hydrant of the Holly patent, making a total of 199 fire hydrants. There are 90 valves and 17 miles 409 feet 10 inches of cast iron mains. There has been of wrought iron mains laid, from $\frac{3}{4}$ to $1\frac{1}{2}$ inches, 1 mile 4,246 feet, making a total of mains laid to date of 18

Size in In.	STREETS LAID ON	FROM	TO	FEET	INCHES	FEET	INCHES
6	Perkins Avenue	Louisa	Dill				
6	Maple	Seventh	Sixth	4,866		4,866	
6	Mount Pleasant Road	Chalfant	Bosch				
6	Osborn	North Oak	Morse				
6	Third	High	Franklin				
6	Clay	Main	First Alley East				
6	Agency Avenue	Moore	Curran				
6	Curran	Agency Avenue	200 feet East	5,291		5,291	
4	Third	Jefferson	High				
4	Fourth	Valley	Spring				
4	Spring	Fourth	Fifth				
4	Fifth	Valley	High				
4	Sixth	Columbia	Franklin	7,977	6	7,977	6
4	Valley	Fourth	Fifth				
4	Jefferson	Seventh	Ninth				
4	Alley bet. Ame'a & Ætna	Gunnison	Marshall				
4	Pond	Amelia	Spray	1,836		1,836	
4	Clay	1st Alley east of Main	118 feet East				
4	Mount Pleasand Road	Bosch	Moore				
4	Bosch	Mount Pleasant Road	Bosch's Brewery				
4	Market	Third	East of Alley				
4	Washington	Boundary	Murray Iron Works				
4	Fourteenth	Locust	60 feet South				
4	*From Main East to Rand's Lumber Yard* 111 *feet*			2,077		2,077	
4	*Mains to Hydrants* 2309 *feet*			2,309		2,309	
						90,169	10

Total Cast Iron Mains laid to date, January 1st, 1880, 90,169 feet and 10 inches, or 17 miles $\frac{409-10}{5280}$

	feet.	in.
Original Mains laid by Holly Manufacturing Company	66,610	10
Mains laid by Burlington Water Company	23,559	
	90,169	10

List, Location and Cost of Wrought Iron Mains laid to date, January 1st, 1880.

FEET.	SIZE.	LOCATION.	COST
195		On Arch east from Fourth	$48 75
100		On Angular west from Sterling's Grocery	20 00
145		On Sixth south from Maple	36 25
146		On Washington east from Fourth	29 25
175		On Valley east of Boundary	35 00
105		On Columbia east of O'Neill's Blacksmith shop	18 90
84		On Washington east of Unterkircher's residence	16 80
114		On Valley east of Alley between Main and Third	20 52
195		On Valley east of Front	43 50
113		On Columbia east of Main	28 25
126		On Summer South of Louisa	31 50
1498			$328 72

List, Location and Cost of Wrought Iron Mains laid to date, January 1st, 1880.

FEET.	SIZE.	LOCATION.	COST.
120	1	On Fifth north from Iowa	$36 00
98	1	On Main north of Division	36 28
219	1	On Boundary north from Elm	65 70
123	1	On Maple east from Sixth	33 21
219	1	On Angular west from Boundary	59 13
58	1	On Washington east from Water	13 34
261	1	On Dill east of Perkins Avenue	65 25
205	1	On Washington west from Fifth	51 25
247	1	On Iowa east of Fifth	49 40
200	1	On Sixth south from Iowa	40 00
295	1	On Augusta south from Smith	59 00
260	1	On Columbia west from Seventh	52 00
(145	1	(On Augusta from Mrs. Etten's)	
(146	1	(To Valley on Valley from Augusta east 146 feet)	58 20
127	1	On Grand east of Alley, (to Glasgows)	12 67
2723			$631 43

List, Location and Cost of Wrought Iron Mains laid to date, January 1st, 1880.

FEET.	SIZE.	LOCATION.	COST.
167	1¼	On Valley east of Third	$53 60
253	1¼	On Marshall south of Alley	75 90
206	1¼	On Third north from Division	61 80
410	1¼	On Franklin east of Fifth	106 60
506	1¼	On Webb west of Summer	116 38
330	1¼	On Augusta north of Market (with 82 feet 1½)	94 76
306	1¼	On Ætna east of Leebrick	70 38
383	1¼	On Market west of Boundary	95 75
400	1¼	On Augusta south of Market	100 00
227	1¼	On Clay to Grand (for Glasgow)	30 65
3188			$805 82

List, Location and Cost of Wrought Iron Mains laid to date, January 1st, 1880.

FEET.	SIZE.	LOCATION.	COST.
198	1½	On Washington east of Third	$67 32
220	1½	On Market east from Marshall	74 80
242	1½	On Washington east from Main	72 60
110	1½	On Sixth north from Maple	33 00
82	1½	On Market east from McKell's attachment	
310	1½	On Gunnison north of Ætna	77 50
830	1½	On Valley, Gunnison and Jefferson	207 75
32	1½	From Pump House east to B., C. R. & N. R. R.	9 60
93	1½	On Valley from Main Street west	34 41
2117			$576 98

LOCATION OF VALVES (EDDY'S PATENT)

To Date, January 1st, 1880.

Size in In.	Number.	LOCATION.
24	1	In Filter bed.
24	3	In Well.
	—4	
16	1	Pump House.
16	2	On Main, corner High.
	—3	
12	1	North end Pump House.
12	2	On High, corner Main.
12	1	On Main, corner Jefferson.
12	1	On Jefferson, corner Main.
12	1	On Division, corner Main.
12	1	On Main, corner Angular.
12	1	On Jefferson, corner Fifth.
	—8	
10	1	On High, corner Fifth.
10	1	On Seventh, corner Franklin.
10	1	On Locust, corner Main.
10	2	On Locust, corner Seventh.
10	1	On Locust, corner Boundary.
10	2	On Boundary, corner Jefferson.
	—8	
8	1	On Franklin, corner Seventh.
8	1	On Seventh, corner Iowa
8	1	On Eighth, corner Linden.
8	1	On North Oak, corner Ninth.
8	1	On Osborn, corner North Oak.
8	1	On Osborn, corner Spring.
8	1	On Smith, corner Boundary.
8	2	On Smith, corner Marshall.
8	1	On Leebrick, corner Division.
8	1	On Leebrick, corner Spray.
8	1	On Foster, corner Green.
8	1	On Louisa, corner Perkins Avenue.
8	2	On Summer, corner Locust.
8	1	On Summer, corner Angular.
8	1	On Summer, corner Maple.
8	1	On Eighth, corner Division.
8	1	On Main, corner Locust.
8	1	On Main, corner South.
8	1	On Main, corner Clay.
8	1	On Mount Pleasant, corner Osborn.
8	1	On Agency Avenue, corner Osborn.
8	1	On Osborn, corner Agency Avenue.
8	1	On Agency Avenue, corner Moore.
	—25	

Size in In.	Number.	LOCATION.
6	1	On Columbia, corner Main.
6	2	On Columbia, corner Fourth.
6	1	On Columbia, corner Sixth.
6	1	On Seventh, corner High.
6	1	On High, corner Seventh.
6	1	On Boundary, corner Osborn.
6	1	On Fifth, corner High.
6	1	On Fifth, corner Franklin.
6	1	On Franklin, corner Seventh.
6	1	On Jefferson, corner Main.
6	1	On corner Main and Jefferson (3 in. stream)
6	1	On Valley, corner Main.
6	1	On Valley, corner Front.
6	1	On Third, corner Jefferson.
6	1	On Fifth, corner Division.
6	1	On Maple, corner Eighth.
6	1	On Washington, corner Boundary.
6	1	On Washington, cor. Murray Iron Works.
6	1	On Marshall, corner Valley.
6	1	On Marshall, corner Smith.
6	1	On Boundary, corner Maple.
6	1	On Amelia, corner Leebrick.
6	1	On Ninth, corner Locust.
6	1	On Perkins Avenue, corner Louisa.
6	1	On Mount Pleasant Road, corner Chalfant.
6	1	On Osborn, corner North Oak.
6	1	On Curran, corner Agency Avenue.
6	1	On Third, corner High.
6	1	In Pump House,
	-30	
4	1	On Third, corner Washington.
4	1	On Third, corner High.
4	1	On Fourth, corner Washington.
4	2	On Fourth, corner High.
4	1	On Fifth, corner High.
4	2	On Sixth, corner High.
4	1	On Sixth, corner Franklin.
4	1	On Bosch, corner Mount Pleasant Road.
4	1	On Third, corner Market.
4	1	On Main, 200 feet south of South Street, at bottom of creek.
	-12	

Total Valves, 90.

NUMBER, SIZE AND LOCATION OF STOP COCKS

ON WROUGHT IRON MAINS,

TO DATE, JANUARY 1, 1880.

No.	Size.	LOCATION.
1	¾	On Arch, S E corner Fourth.
2	¾	On Angular, N W corner Boundary.
3	¾	On Sixth, S W corner Maple.
4	¾	On Washington, S E corner Fourth.
5	¾	On Valley, N E corner Boundary.
6	¾	On Columbia, S E corner Main.
7	¾	On Valley, S E corner Third.
8	¾	On Valley, N W corner Front.
9	1	On Fifth, N E corner Iowa.
10	1	On west side of Main, north of Division.
11	1	On Boundary, N E corner Elm.
12	1	On Maple, N W corner Sixth.
13	1	On Dill, S E corner Perkins Avenue.
14	1	On Washington, S W corner Fifth.
15	1	On Iowa, S E corner Fifth.
16	1	On Sixth, S W corner Iowa.
17	1	On Sixth, S E corner Iowa.
18	1	On Augusta, S W corner Smith.
19	1	On Columbia, N W corner Seventh.
20	1¼	On Valley, S E corner Third.
21	1¼	On Marshall, S E cor. of alley, bet. Ætna & Amelia.
22	1¼	On Third, N E corner Division.
23	1¼	On Franklin, N E corner Fifth.
24	1¼	On Webb, N W corner Summer.
25	1¼	On Ætna, N E corner Leebrick.
26	1¼	On Market, N W corner Boundary.
27	1¼	On Clay, near Chas. Starker's Residence.
28	1½	On Washington, N E corner Third.
29	1½	On Market, S E corner Marshall.
30	1½	On Washington, N E corner Main.
31	1½	On Gunnison, N E corner Ætna.
32	1½	On Valley, N W corner Marshall.
33	1½	On Front, east of Pump House.
34	1½	On Valley, N W corner Main.

LOCATION OF HYDRANTS,

2½ Inch, Double Nozzle, Holly's Patent,

TO DATE, JANUARY 1, 1880.

NO.	LOCATION.	Height of Hydrant above low water mark.	
		Ft.	In
1	N W corner Front and Arch streets	34	..
2	N W corner Front and High streets	24	..
3	S E corner Main and Arch streets	56	4
4	N E corner Main and High streets	43	7
5	N E corner Main and Court streets	36	7
6	N E corner Main and Columbia streets	31	7
7	N E corner Main and Washington streets	28	..
8	N E corner Main and Jefferson streets	26	5
9	N E corner Main and Valley streets	26	..
10	N E corner Main and Market streets	24	8
11	S W corner Main and Division streets	21	6
12	S W corner Main and Elm streets	25	5
13	S W corner Main and Maple streets	29	3
14	S W corner Main and Vine streets	32	4
15	S W corner Main and Angular streets	34	8
16	S W corner Main and Spruce streets	37	4
17	S W corner Main and Cedar streets	39	..
18	N W corner Main and Locust streets	42	5
19	N W corner Main and Pine streets	45	
20	N W corner Main and Walnut streets	54	7
21	N W corner Main and South streets	66	8
22	Rand's lumber yard, 62 feet east of Main	47	..
23	S E corner Main and Clay streets	114	3
24	S E corner Clay and alley	147	2
25	S W corner Main and Grand streets	128	7
26	S W corner Main and opposite Hospital grounds	144	2
27	N W corner Main and Wade streets	158	.
28	S W corner Main and Denmark streets	169	..
29	S W corner Main and Sweny Avenue	180	8
30	N W corner Main and Grimes Avenue	176	5
31	N E corner Third and Franklin streets	152	9
32	S E corner Third and Spring streets	120	5
33	S E corner Third and Arch streets	90	5
34	S W corner Third and High streets	88	..
35	N E corner Third and Court streets	72	8
36	N E corner Third and Columbia streets	56	..
37	S E corner Third and Washington streets	42	3
38	S E corner Third and Jefferson streets	33	4
39	N E corner Third and Valley streets	29	5
40	S E corner Third and Market streets	21	2

NO.	LOCATION.	Height of Hydrant above low water mark.	
		Ft.	In
41	N E corner Third and Division streets	25	2
42	N E corner Third and Locust streets	76	6
43	S E corner Fourth and Spring streets	136	..
44	S E corner Fourth and Arch streets	121	..
45	S E corner Fourth and High streets	122	3
46	N E corner Fourth and Court streets	108	5
47	N E corner Fourth and Columbia streets	86	5
48	N E corner Fourth and Washington streets	65	3
49	N E corner Fourth and Jefferson streets	42	6
50	N E corner Fourth and Valley streets	36	5
51	N E corner Fourth and Division streets	40	7
52	N W corner Fourth and Locust streets	112	..
53	S E corner Fifth and Iowa streets	166	7
54	S E corner Fifth and Franklin streets	151	5
55	S E corner Fifth and Spring streets	147	5
56	S E corner Fifth and Arch streets	142	..
57	S E corner Fifth and High streets	135	5
58	N E corner Fifth and Court streets	128	5
59	N E corner Fifth and Columbia streets	86	5
60	S E corner Fifth and Washington streets	70	..
61	S E corner Fifth and Jefferson streets	39	5
62	N E corner Fifth and Valley streets	30	3
63	N E corner Fifth and Division streets	70	..
64	N W corner Fifth and Locust streets	143	8
65	N E corner Sixth and Iowa streets	169	3
66	S E corner Sixth and Franklin streets	160	4
67	S E corner Sixth and Spring streets	153	..
68	S E corner Sixth and Arch streets	150	..
69	S E corner Sixth and High streets	146	7
70	N E corner Sixth and Court streets	140	8
71	N E corner Sixth and Columbia streets	132	..
72	S E corner Sixth and Jefferson streets	33	2
73	N W corner Sixth and Valley streets	32	...
74	S E corner Sixth and Market streets	50	..
75	N E corner Sixth and Division streets	97	7
76	N W corner Sixth and Maple streets	151	4
77	N W corner Sixth and Locust streets	159	..
78	N W corner Seventh and North streets	168	..
79	S E corner Seventh and Iowa streets	168	..
80	N E corner Seventh and Franklin streets	162	..
81	N E corner Seventh and Spring streets	146	..
82	N E corner Seventh and Arch streets	149	..
83	S E corner Seventh and High streets	141	..
84	N E corner Seventh and Court streets	136	..
85	N E corner Seventh and Columbia streets	132	..
86	S E corner Seventh and Jefferson streets	29	..
87	N E corner Seventh and Division streets	120	..
88	N W corner Seventh and Maple streets	168	..
89	N W corner Seventh and Locust streets	176	..
90	N W corner Eighth and North Oak streets	142	..
91	S W corner Eighth and Sycamore streets	142	..
92	N W corner Eighth and Linden streets	152	..

NO.	LOCATION.	Height of Hydrant above low water mark. Ft.	In
93	N W corner Eighth and North streets	162	..
94	S E corner Eighth and Franklin streets	158	..
95	S W corner Eighth and High streets	134	..
96	S W corner Eighth and Jefferson streets	30	..
97	N E corner Eighth and Division streets	142	..
98	N W corner Eighth and Maiden Lane	153	..
99	N W corner Eighth and Elm streets	165	..
100	N W corner Eighth and Maple streets	170	.
101	N W corner Eighth and Locust streets	178	..
102	N E corner Ninth and North Oak streets	138	..
103	On Franklin, near Garden street	144	...
104	S W corner Prospect and High streets	126	..
105	S W corner Ninth and Jefferson streets	32	..
106	N E corner Ninth and Maple streets	168	...
107	N W corner Ninth and Locust streets	187	...
108	N E corner Ninth and Pine streets	189	..
109	N E corner Ninth and Walnut streets	183	...
110	N E corner Tenth and Maple streets	170	...
111	N W corner Tenth and Locust streets	189	..
112	N E corner Boundary and North Oak	130	..
113	S E corner Boundary and Franklin streets	130	...
114	S E corner Boundary and High streets	119	..
115	N E corner Boundary and Court streets	74	...
116	N E corner Boundary and Columbia streets	43	...
117	N E corner Boundary and Washington streets	42	...
118	S E corner Boundary and Jefferson streets	64	...
119	S E corner Boundary and Valley streets	81	...
120	S E corner Boundary and Market streets	96	...
121	N E corner Boundary and Smith streets	105	..
122	N W corner Boundary and Elm streets	162	..
123	N E corner Boundary and Maple streets	174	..
124	N W corner Boundary and Vine streets	175	..
125	N W corner Boundary and Angular streets	178	..
126	N W corner Boundary and Locust streets	186	..
127	N W corner Twelfth and Locust streets	180	..
128	N W corner Thirteenth and Locust streets	173	..
129	S E corner Fourteenth and Locust streets	177	..
130	N W corner North Oak and Ashman streets	128	...
131	N E corner North Oak and Griswold streets	132	..
132	S W corner Osborn and Corse streets	137	
133	N E corner Osborn and North Oak streets	130	...
134	S E corner Osborn and Flora streets	126	..
135	S E corner Osborn and Linden streets	123	..
136	S W corner Osborn and Henrietta streets	111	..
137	N E corner Osborn and Ramge Avenue	84	...
138	N E corner Osborn and Spring streets	65	..
139	N E corner Osborn and Mount Pleasant streets	58	..
140	East side of Osborn, bet. Mount Pleasant and Agency Av.	48	..
141	East side of Osborn, near Agency Av	46	..
142	South side of Washington, bet. Boundary and Marshall	100	..
143	S E corner Washington and Marshall streets	113	..
144	S E corner Marshall and Jefferson streets	146	..

NO.	LOCATION.	Height of Hydrant above low water mark. Ft.	In
145	S E corner Marshall and Valley streets	160	..
146	S E corner Marshall and Market streets	164	..
147	N W corner Marshall and Smith streets	167	..
148	N W corner Gunnison and Smith streets	163	..
149	N W corner Gunnison and Ætna streets	167	..
150	S W corner Gunnison and Amelia streets	160	..
151	N W corner Pond and Smith streets	167	..
152	N E corner Pond and Amelia streets	172	..
153	N E corner Leebrick and Smith streets	174	..
154	N W corner Leebrick and Division streets	173	..
155	N W corner Leebrick and Ætna streets	173	..
156	N W corner Leebrick and Amelia streets	172	..
157	S W corner Foster and Spray streets	173	..
158	On Foster, between Spray and Potts streets	178	..
159	N W corner Foster and Potts streets	185	..
160	S W corner Foster and Green streets	190	..
161	S W corner Foster and Dill streets	192	..
162	N W corner Foster and Lydia streets	190	..
163	N E corner Louisa and Warren streets	190	..
164	N W corner Louisa and Perkins Avenue	189	..
165	N W corner Louisa and Summer streets	188	..
166	N W corner South, on Perkins Avenue	186	..
167	On Perkins Avenue, north side of Dill street	188	..
168	N W corner Summer and South streets	183	..
169	N W corner Summer and Pine streets	177	..
170	N E corner Summer and Locust streets	176	..
171	N W corner Summer and Chamberlain streets	182	..
172	S W corner Summer and Webb streets	180	..
173	S W corner Summer and Barnes streets	179	..
174	S W corner Summer and Angular streets	176	..
175	East side of Summer, between Angular and Vine	172	..
176	S E corner Summer and Vine streets	169	..
177	S E corner Summer and Maple streets	165	..
178	East side of Marshall, between Ætna and Amelia streets	156	..
179	N W corner Mount Pleasant and Chalfant streets	70	..
180	S E corner Mount Pleasant Road and Chalfant street	111	..
181	N E corner Mount Pleasant Road and Speigle	132	..
182	N E corner Mount Pleasant Road and Carolina street	143	..
183	N E corner Mount Pleasant Road and Bosch street	152	..
184	N E corner Mount Pleasant Road and Moore street	163	..
185	S E corner Bosch's Brewery	104	..
186	South side of Agency Road, 600 ft. west C., B. & Q. R. R.	48	..
187	South side of Agency Road, opposite Brewery	52	..
188	S E corner Agency Road and Gunnison street	88	..
189	S E corner Agency Road and Remick street	125	..
190	S E corner Agency Road and Cameron street	137	..
191	S E corner Agency Road and Fontanelle street	145	..
192	S E corner Agency Road and Moore street	160	..
193	S E corner First street, between Moore and Curran streets	168	..
194	S E corner Agency Road and Curran street	171	..
195	Murray Iron Works, (single nozzle)	41	..
196	N W corner Smith and Augusta streets	157	..

NO.	LOCATION.	Heights of Hydrant above low water mark. Ft.	In
197	N W corner Smith and Marietta streets	139	...
198	S E corner Market and Seventh streets	67	..
199	S E corner Market and Fifth streets	34	..

Extreme low water elevation seventy-six feet above city datum.

Size, Length, and Cost of Enameled Wrought Iron Service Pipes Laid from mains to curb stone, including Tap, Lead Connections, Tap Box, Stop Cock, and Stop Cock Boxes, to date, January 1st, 1880.

Size in In.	LENGTH IN FT.	COST.
3	55	$57 75
2½	46 (private)	
2	57	25 00
1½	108	57 15
1¼	332½	251 85
1	730	308 83
¾	7,747	3020 79
½	4,024	1498 69
⅝	257	94 20
	13,357½	$5314 26

Description of the Burlington Water Works.

The construction of Water Works was a question which was agitated by the citizens of Burlington at various times during the last eight or ten years. The city could not build them on its own account, because its indebtedness exceeded the limit fixed by the constitution of the State, and different schemes were proposed by companies of residents or non-residents, one after another, until it appeared as if a satisfactory conclusion was well nigh hopeless. But some of the leading and most enterprising citizens determined upon a final effort, and the present Water Works is the result.

The conditions of the ordinance and contract are favorable to the city; in that, instead of a fixed yearly rental for fire hydrant service, as usual in such cases, the amount to be raised by direct taxation, and paid by the city for this service, will be diminished in proportion, as the revenues from private consumers are increased. They are favorable to the bondholders, because the first money to be paid out of the water fund, (into which the entire tax and gross income from private consumers are paid,) goes directly to the payment of coupons, and next, to create a sinking fund for the payment of the principal of the bonds. They are favorable to the stockholders of the Water Company only when there is a surplus, after paying the above and current expenses; after which they may receive not over twelve per cent. per annum dividends upon the money actually paid in on their stock.

It was under such fair and reasonable considerations as these, that the Water Company undertook the construction of the Works, and without unnecessary delay advertised for plans and proposals, many of which were submitted, but none being wholly satisfactory, they were all rejected. Private negotiations were then begun, which resulted in a contract with the Holly Manufacturing Company, of Lockport, New York, in the sum of $190,000.00, for the erection of complete works on the Holly system of Water Supply and Fire Protection. The contract was executed October 6th, 1877, and active operations were begun as soon as working forces could be organized, and material delivered upon the ground. The fall and winter seasons being exceedingly favorable, work was carried on (except in pipe laying) with only occasional interruptions of a day or two at a time until the entire contract was completed. It was finished

and test made for acceptance on May 31st, 1878, two months in advance of the stipulated date.

The Holly system of Water Works has been adopted, and is in use in more than eighty towns and cities in the United States. This number does not include some twenty or more works built on the same or similar plan by other parties than the Holly Company. The chief advantages of this system over the older systems are: 1, Secures by variable pressure a more reliable supply of water for all purposes. 2, Less cost for construction. 3, Less cost for maintainance. 4, Less cost for daily supply. 5, Affords the best fire protection in the world. 6, Largely reduces insurance risks and premiums. 7, dispenses with fire engines in whole or in part. 8, Reduces fire department expenses.

The Burlington Water Works conform in every particular to the requirements of the ordinance. Following is a brief description of the Works:

The river work consists of an inlet crib constructed of sound pine timbers, firmly bolted together, filled with broken stone, placed on the bed of the Mississippi river, in 19 feet of water at low water mark, and distant from the shore about 250 feet. A 24-inch iron pipe extends along the river bed from the crib to a filter on the shore. The filter is of stone masonry, 120 feet long, 20 feet wide, and provided with suitable filtering materials, which may be renewed or cleansed at any time. An independent inlet pipe is provided to convey water directly from the crib inlet to the pumps, should the demand at any time (as for fire protection) exceed the capacity of the filter.

The engine, boiler and coal house are located 150 feet from the river. The Burlington, Cedar Rapids and Northern, and the Burlington and Northwestern railways run between the river and buildings, making the delivery of coal convenient and inexpensive. The filter extends from the crib inlet under these railway tracks, to a pump well in the engine house. The buildings are of brick and stone, have iron roofs, are substantial and fire proof, and of dimensions suitable for a duplicate of the machinery first introduced. The smoke stack is of brick, and is 128 feet high.

The pumping machinery is of the latest design of the Holly Manufacturing Company, and embraces all recent valuable improvements. It is especially adapted to the service required, and in finish and workmanship cannot be excelled. The engine is of the compound type, and guaranteed to perform a duty equal to raising sixty million pounds of water one foot, with one hundred pounds of coal, and to supply the quantity of water—3,000,000 gallons daily, and throw the fire streams as required. It has four steam cylinders, each nineteen inches diameter, twenty-seven inch stroke, with four corresponding reciprocating pumps, each ten inches diameter and

twenty-seven inch stroke, attached by direct connections, and erected on a heavy arched double frame of iron, set at an angle of 90 degrees, one steam cylinder and its pump being placed at each of the four corners. The frame supports at its top a shaft with an overhanging crank on either end, to which the four engines are connected by ordinary connecting rods. The cylinders and pumps are detachable at pleasure, and may be run singly, in pairs, or all together, according to the demands for water supply from time to time. The engine is provided with the usual air pump and jet, or surface condenser, and by a peculiar arrangement of pipes and valves, may be run on either the high, low or compound steam pressure principles, and may be changed from one to the other at any moment by the engineer. This arrangement is necessary to secure economical daily pumping for domestic supply, which is done by compounding steam and prompt increase of power for efficient fire protection, which is amply secured by converting the machine into a high pressure engine. When compounding, the steam is taken directly from the boilers into one of the cylinders, and exhausted into the remaining three, and when running high pressure, steam is taken directly into all of the cylinders, the latter operation increasing the power of the whole four to eight times. To supply this increase, reserve boilers are provided, there being three in all, either of which alone will be sufficient to meet the ordinary demand.

The Completion and final Tests of the Water Works.

The following account of the completion and tests of the Water Works is taken from the Burlington Hawkeye of June 1st, 1878:

"Yesterday was a gala day in Burlington. It was the crowning triumph of an effort to obtain a water supply for the city, that dates back nearly a decade of years. The problem was not an easy one to solve. It is true water in lavish abundance flows past the city. The supply is not only inexhaustible, but the quality is superior to that furnished many American cities. From the water level to the elevated plateau that marks the beginning of the fertile stretch of prairie lands towards the west is an elevation of about two hundred feet. To force water to that height, and then distribute it with sufficient head to meet the requirement of every householder, was a difficult problem, and one which troubled not a little every thoughtful citizen. At first glance, it appeared simple enough, for surely, where there are hills there can be built great reservoirs, into which water may be pumped, and left to distribute itself to consumers by the volition of its own gravity. But as a matter of fact, *there are no hills in Burlington*. A hill, says Noah Webster L. L. D., is a natural elevation of land, or a mass of earth rising above the common level of the surrounding land. No such condition of things exists at Burlington. As the prairie land approaches the west bank of the Mississippi streams of water, in past ages, have cut deep channels in the land in their descent to the river, and the numerous ravines thus formed are still affected by the washing away of the soil in each storm that continues the labors of the centuries past. But as the city grew, and nearly all the best residence property, and not a little of the business property, is to be found on the upper elevations, it is obvious that the reservoir system grew every year more impracticable. There was, therefore, no other practical solution of the problem, but a system of direct pressure which would furnish all the water required for domestic and general consumption, and which would also afford the very best fire protection wherever the street mains extended. The tests that were made yesterday we think fully justify the wisdom of the Burlington Water Company in adopting what is known as the Holly system of Water Works.

THE DUTY TEST.

"On Wednesday, May 29th, at 10:30 A. M. was begun a 'duty test' of the works, to ascertain whether the Holly machinery would

fulfill certain economic requirements of the ordinance. The engines are required to raise sixty million pounds of water one foot with each one hundred pounds of coal while pumping at the rate of three million gallons of water in twenty-four hours. The machinery was worked twenty-four hours without stopping. It had not been used in the previous twelve hours, and the coal was of an inferior quality. The following official figures shows the result, which was entirely satisfactory throughout:

Number of steam cylinders	4
Number of Pumps	4
Diameter of Steam Cylinders in inches	19
Diameter of Pump Pistons in inches	10 1-32
Length of stroke in inches	27
Discharge of four pumps each revolution in gallons	72⅛
Duration of test	24 h. 17 m.
Number of revolutions	45,812
Average pressure on water gauge in lbs	86 2-10
Average height from water in well to gauge in feet	27
Total head of water, equal to feet	226
Coal burned, in pounds	8,730
Duty in pounds raised 1 foot per 100 pounds coal	71,514,000

"The contract required 60,000,000 foot pounds duty, which was exceeded by nearly twenty per cent.

"The quantity of water pumped during the run was 3,204.240 gallons, which was at the rate of 3,166,704 gallons for twenty-four hours, or five per cent. in excess of contract guarantee.

THE FINAL TEST—A FULL DAY'S PROGRAMME COMPLETELY CARRIED OUT.

"The sun went down in a clear sky, Thursday evening, and the stars scintillated hopeful promises of pleasant weather for the coming gala day (May 31.) But there's nothing certain except death and taxes. The day dawned without the 'dawn.' On Friday morning the sun hid his smiles behind the angry clouds. Heavy thunder heralded the approach of day, and the rain poured down in torrents. But promptly at the hour advertised, nine A. M., the tests were begun on West Hill. Six streams were thrown with entire success. As the solid streams shot heavenward, colliding with the heavy rainfall at the height of one hundred and thirty feet, and then in water evolutions, mingled with the cousinly spray from the clouds the picture was one worthy the occasion. The average height of these hydrants was one hundred and thirty feet above the pumps. The streams were thrown to the heighth of one hundred and five to one hundred and thirty-two feet above the hydrants.

"After an intermission of thirty minutes, the different parties repaired to North Hill, where the first test was reported, that of

throwing six one-inch streams. This in one of the highest points in the city, and the streams were to be thrown seventy-five feet high. A strong wind was blowing at the time, that prevented the streams being thrown as high as could otherwise have been done. The average height of the hydrants was one hundred and fifty feet above the pumps, and the exact measurement of the height of each stream as taken was from eighty-four to one hundred and fifteen feet.

"The third test on the programme commenced at 11:15 A. M., and was a display of three streams on each North, West and South Hills. (In all nine streams.) This trial was not one of the contract tests, but was merely given to show that the Holly engines could exceed their rated capacity. The average height of these hydrants above the pumps was one hundred and forty feet. But three streams were measured, the average height being over ninety feet.

"The fourth test consisted of one one-inch stream thrown through five hundred feet of hose for fifteen minutes. This trial took place at the hydrant at the corner of Summer and Louisa streets, which is one hundred and fifty-five feet above the level of the pumps. The water was thrown to a height of eighty-five feet. This was considered, by the Holly company's officials, the most gratifying trial of the forenoon exhibition.

"At two o'clock the fifth test occurred, which was one of the contract tests, and consisted of eight one-inch streams thrown at one time on the low ground of the city. By this time the clouds had nearly all passed away, and the streets and sidewalks were crowded with spectators. The contract required that these eight streams should be thrown one hundred feet high. The average hight reached was one hundred and forty-one feet and nine inches.

"The sixth test was a display of twelve one-inch streams from eight hydrants on Main street, and four on Jefferson street. This trial lasted twenty minutes, and was stated by the engineer at the works to be the most severe trial during the day. From the corner of Main and Jefferson streets the whole number of streams could be seen. But three of these streams could be measured, the average height of which was one hundred and twenty-six feet. This is about equal to the other streams thrown at the same time.

"Test number seven at 4:20, one of the grandest displays of the day, occurred at the Congregational church tower. This was a stream thrown through a one and three-fourth inch nozzle. The water was taken from three hydrants, and combined with one stream through a Siamese coupling. The church tower is one hundred and twenty-six feet high, and as the water rose in a solid stream to a level with the top of the tower, the immense crowd burst forth with loud cheers. But the water kept on higher and higher, until it went over sixty feet above the top of the tower, and as measured

showed that the solid stream was one hundred and ninety feet high. The spray was carried much higher.

"The next was a display lasting ten minutes, of a stream thrown through *one thousand feet of hose*. This was a severe test of the efficiency of the works, and the water pressure at the pumps during the trial was one hundred and fifty pounds. The height of the stream could not be measured accurately, but was over one hundred and twenty feet.

"The ninth and last trial was a most magnificent display. A valve at the corner of Main and Jefferson streets was arranged to throw a three inch stream. The display commenced at 5:10 P. M., and the column of water shot up immediately to the height of one hundred and seventy feet. The stream stopped at this height for a few moments, but in a short time the pressure was increased, and the water went higher and higher, until it far exceeded anything ever anticipated by any person, except those who had seen previous performances of the Holly pumps. When the full pressure was reached, the column was measured, and found to be two hundred and eighty-three feet high, and was continued for twenty minutes. The wind was blowing just strong enough to let the water fall on the roofs of the houses on the west side of Main street, and the gutters on the roofs were not large enough to carry off the water, which poured from the eaves in volumes. This last test was a grand sight, and a close to the proceedings of the day, and satisfied every one as to the power of the Holly engines and pumps.

" At the works all moved as smoothly as a drawing room reception. The engines and pumps worked steadily, the steam gauges showed an even pressure, and the moderate fires and leisurely movements of the fireman showed there was no 'forcing' boilers or machinery. One boiler was not used at all. The following cold-glittering facts will tell the 'expert' reader better than descriptive language the work done by the machinery:

Boiler pressure during day from	60 to 70 pounds
Water pressure test No. 1	150 pounds
Water pressure test No. 2	140 pounds
Water pressure display No. 3	130 pounds
Water pressure display No. 4	145 pounds
Water pressure test No. 5	115 pounds
Water pressure display No. 6	120 pounds
Water pressure 1¾ in. stream cong. church	130 pounds
Water pressure 1 in. stream 1000 ft hose	150 pounds
Water pressure 3-in. stream	145 pounds
Number gallons test No 1	1,200 gallons per minute
Number gallons test No. 2	1,200 gallons per minute
Number gallons test No. 3	1,800 gallons per minute
Number gallons display No. 4	226 gallons per minute

Number gallons test No. 5.....1,728 gallons per minute
Number gallons display No. 6.....3,000 gallons per minute
No. gal. 1¾ in. stream cong. church 850 gallons per minute
No. gal. 1 in. stream 1,000 ft hose.... 216 gallons per minute
Number gallons 3 in. stream .....2,808 gallons per minute
Number gallons per day.....3,000,000 to 5,000,000 gal.

CONGRATULATIONS.

"At the close of the day it was hard to find any person who had any objections to find against the Holly system of water works. The works have exceeded the contract so much in every particular, that a general expression of satisfaction was heard, that our city was extremely fortunate in securing the best system of water works in the west. The people of Burlington are gratified at the completion of the works, and at the possession of one of the surest possible protections from fire. They are also gratified at the prospect of the future of our city, which will increase in manufactories, etc., through the convenience afforded by water works, and from no one who has the best interest of the city at heart, can be heard a word of grumbling or discontent at the cost this will place upon our city. For Burlington we predict a steady progress toward prosperity. We have now all the essentials of a first class city. The future looks brighter, and to the enterprising men who have labored long and earnestly to give us this latest need, the Hawkeye joins in wishing them the fullest realizations of their most sanguine expectations."

BURLINGTON WATER WORKS.

Monthly and Aggregate results of Engines, Pumps, Service, and Duty, from acceptance of Works, June 1, 1878, to January 1st, 1880.

1878 and 1879. MONTHS.	Amount of Water Pumped, in Gallons.	Average Daily Consumption, in Gallons.	Average Duty lbs. raised one foot high with 100 lbs. of Coal.	Average Daily Consumption of Fuel.	Fuel consumed in the Month of	Cost of Fuel for each Million Gallon.	Total Cost for each Million Gallon.	Steam Pressure.	Vacuum	Average Revolutions per Minute of Engine.	Height of Column of Water, in Feet.	Height of Water Gauge above supply, in Feet.	Ashes and Clinkers removed, in pounds.	Number of Fires.	Hours run at Fires. H	Hours run at Fires. M	Average Fire Pressure.	Pounds of Water Evaporated per each pound of Fuel consumed.	REMARKS.
								Domestic Water Pressure											
JUNE	6,374,538	253,815	20,413,079	2218 9-10	55,348	$10 63	$	90	60	27	9 6-10	231	24	9,740	3	4	02	133		Works accepted June 1, com'ced pumping June 6.
JULY	7,950,420	256,465	20,418,709	2336 5	69,334	10 90		90	60	27	9 4	231	24	11,967	1		23	150		
AUGUST	7,046,064	227,292	20,896,590	1992 9	61,780	11 33		90	60	27	8 5	231	24	12,459	2	1	48	131	5 91-100	Meter attached to feed water.
SEPTEMBER	7,014,726	233,824	19,326,979	2372 9	71,189	12 68		90	60	27½	8 8	231	24	12,039	6	5	03	135	5 48	Joy's Estate fire, Jefferson street, 6 streams.
OCTOBER	6,589,458	212,563	20,033,632	2058 1	63,802	12 10		90	60	28	7 7	231	24	10,180	4	1	27	125	5 15	Tobacco Factory fire, 8 streams.
NOVEMBER	4,859,550	161,985	16,717,644	1912 7	57,381	13 28		90	60	28	6	231	24	10,950	8	11	05	115	4 93	
DECEMBER	5,330,574	171,954	18,125,572	1952 3	60,524	14 19		90	60	28	6 2	231	24	10,424	9	2	41	122	6 07	Furniture Factory fire, 5 streams.
JANUARY	5,912,898	190,736	18,598,823	2013	62,418	14 22		90	60	28	6 6	231	24	9,099	9	5	34	127	5 68	
FEBRUARY	4,924,368	175,870	16,738,555	2056 7	57,588	14 61		90	60	28½	6 5	231	24	10,137	3	5	02	129	4 93	Lawrence House fire 7 streams.
MARCH	6,715,260	216,621	18,479,924	2294 2	71,121	11 91		90	60	28	8 1	231	24	10,678	3	1	14	124	5 79	Trial for Omaha Com.
APRIL	7,993,638	266,454	21,658,674	2397 5	71,925	8 99		90	60	28½	8 6	231	24	13,192	9	4	40	120	6 58	Trial for St. Joe Com.
MAY	12,452,526	401,694	25,133,346	3187 7	98,819	8 09		90	60	28½	9 2	231	24	10,932	3	6		140	5 18	Orchard City Mill fire, 9 streams.
JUNE	11,965,050	398,835	24,932,564	3090 5	92,716	8 32		90	60	28	11	231	44	14,337	5	4	25	144	6 18	
JULY	12,404,808	400,155	23,893,526	3277 8	101,612	8 78		90	60	28	10 4	231	24	10,675	3	2	40	131	5 05	Throwed a 3 in. stream for Gen. Grant, 304 1-2 feet high.
AUGUST	10,625,256	342,750	24,750,542	2722	84,382	8 53		90	60	27½	11 5	231	24	13,527	3	5	28	130	4 85	
SEPTEMBER	10,774,908	359,163	22,501,394	3150 8	94,526	9 86		90	60	28	9 7	231	24	11,123	1		15	150	5 07	Corn Cobs substituted for coal and coal reduced to cobs in price.
OCTOBER	8,501,868	274,253	20,384,085	2678 4	83,033	10 98		90	60	28½	8 6	231	24	9,035	5	2	11	132	5 91	
NOVEMBER	9,480,294	316,009	25,334,859	2462 2	73,867	9 73		90	60	28½	9 1	231	24	1,538	6	2	27	119	11 54	Oil used, three barrels.
DECEMBER	8,788,428	283,498	49,373,581	1143	35,436	5 28					8 1	231	24							Waste, 475 pounds.
TOTAL	155,704,572	271,262	22,104,838	2381 1-10	1366,801	$10 71	$59 94	90	60	28	8 56-100	231	24	203,345	88	68	24	130	5 03,100	

No coal deducted for heating Engine and Boiler Room or blowing out flues.
The Engines have been run compound for domestic, all fires, and all other purposes.
No deduction has been made for ashes or cinders.

Total No. of revolutions made by Engine, 7,083,576.
" " " Pump revolutions, 8,650,254.
Most water pumped in any one day, May 21, 1879, 726,858 gallons.
Least " " " " " " Dec. 1st, 1878, 103,950 "

WATER METERS.

No.	NAME.	KIND.	STREET.	BUSINESS.	SIZE.					
					5/8	3/4	1	1¼	1½	2
1	Burlington Water Co.	Union	Front	Feed Water to Boilers				1		
2	Gorham House	Rotary.	Main	Hotel		1				
3	Geo. Bosch & Co	"	Main	Brewery			1			
4	Geo. Boeck	"	Fifth	Butcher		1				
5	Sweney & Bell	"	Third	Hotel						1
6	Chris. Geyer	"	Main	Hotel		1				
7	Tom. Sowden	"	Main	Machine Shop	1					
8	—— Krafts*	"	Valley	Dye House	1					
9	Chas. Wagner	"	Valley	Boarding House	1					
10	D. C. Griffin*	"	Valley	Shirt Factory	1					
11	John Burg	"	Osborn	Wagon Factory			1			
12	Buffington & Forney	"	Osborn	Wheel Factory			1			
13	W. B. Lawrence*	"	Jefferson	Hotel	1					
14	J. L. Plum	"	Third	Laundry	1					
15	Smith, Cook & Co	"	Valley	Tobacco Factory		1				
16	J. L. Hertz	"	Jefferson	Cigar Box Factory	1					
17	Simpson, Wilkinson & Co.	"	Main	Enamel Paint Works	1					
18	E. F. Terrill	"	Main	Laundry	1					
19	W. F. Hayden	"	Division	Residence	1					
20	Orchard City School Desk Company*	"	Locust	School Furniture		1				
21	John Waldhoff*	"	Mt. Pleasant Road	Slaughter House			1			
22	Wortmueller & Ende	"	Mt. Pleasant	Brewery					1	
23	P. Rothenberger	"	Agency Avenue	Brewery				1		
24	Sanford Gunnell	"	Third	Barber Shop	1					
25	Bosch Bro.	"	Bosch	Brewery					1	
26	Olmstead & Cameron*	"	Valley	Flouring Mill		1				
27	Casper Heil	"	Jefferson	Brewery				1		
					11	6	4	3	2	1

Meters Removed.

During the past 19 months 6 meters have been removed, leaving now in use 21 meters.

I would most respectfully recommend to your honorable body the necessity of putting on water meters, on all water takers, such as slaughter houses, meat markets, steam engines, hotels, boarding houses, railroads and manufacturing establishments of all kinds.

I would respectfully recommend to your honorable body the urgent necessity of more filtering capacity. Our filter bed was originally built to filter about four hundred thousand gallons per twenty-four hours at an ordinary stage of water; but when the water is low in the river, it will not filter to exceed three hundred thousand gallons per twenty-four hours. During the summer months, between 6 and 8 a. m. and 5 and 8 o'clock p. m., while people are sprinkling lawns, our works are run at a capacity of at least seven hundred and fifty thousand gallons per twenty-four hours, which requires the opening of the direct pipe to the river, therefore causing muddy or roily water to be pumped into the mains. I would recommend the building of a filter bed to be connected on the north-east corner of the present filter, and extending north up the river two hundred and sixty feet, by twenty-five feet wide. This would give us eight thousand six hundred and sixty cubic feet of filtering surface, against two thousand one hundred and sixty cubic

feet in our present filter, thereby increasing the capacity four times, which in very low water would give us a capacity of one million two hundred and fifty thousand gallons per twenty-four hours, or at an ordinary stage of water, would give us a capacity of two million gallons per twenty-four hours. This would give us clearer and better water, as the filter would not have to be forced as our small one is at the present time.

I would further recommend the necessity of digging out the west end of your water works lot to the line of Main street, and building thereon a suitable building or coal house to hold at least five hundred tons of coal. By so doing, we could take advantage of the price of coal, and buy when it is cheap, and store one year's supply, thereby saving at least seventy-five cents per ton. During the past month I have substituted corn cobs for coal, and have made a saving on fuel alone of nearly fifty per cent, at the price of coal at the present date, which is $2,62½ per ton.

Since the Water Works were accepted by the water company, I have laid 23,559 feet, or four miles—2,439 feet of cast iron mains four, six, eight and twelve inches in diameter, with 44 double hydrants.

Our engines have performed their work splendidly, never having failed to respond within two minutes to any demand made upon them for fire or any other service. The duty or foot pounds raised one foot high, with one hundred pounds of fuel, has been 22,104,838, and this duty has been made while our engines have been running at only about one-twelfth of their capacity. To get the best results or duty of an engine, we should run them somewhere near their maxim capacity. Same with our cost per million gallons pumped. We have the same expense per day to pump two hundred and fifty thousand gallons as we do to pump two million gallons, with the exception of a very small increase in fuel, which would not amount to over 20 per cent. more per day. Our expenses for the first nineteen months have been very large, but it is like starting up a manufacturing establishment. We have every thing to buy the first year. We have now everything in good running order, and feel assured that our actual running expenses will be much less this year than the past.

In conclusion, I wish to thank each and all of your honorable Board, also your Secretary, and all the employes connected with the Works, for the many courtesies shown me since I have been Superintendent of your Water Works.

For a full and detailed statement upon financial matters, you are respectfully referred to the accompanying report of your Secretary.

Very respectfully submitted,

IRA A. HOLLY,
Supt. Burlington Water Works.

STOCK ON HAND.

It is always safe and prudent to keep constantly on hand a greater or less supply of the different sizes of iron pipes, which have been and are now used in the construction of our Works. It is impossible to say at what time or season some of them may be suddenly required for an immediate repair. The necessity is equally imperative that a duplicate at least, of every special should be always in reserve for any emergency. With these precautions, a long delay, and perhaps a serious inconvenience may be avoided.

INVENTORY

Of Stock, Tools, and Engine Supplies, up to date, January 1, 1880.

NO. OF FULL LENGTHS OF CAST IRON PIPES IN PIPE YARD.

NO.	SIZE.	LENGTH IN FEET.	TOTAL LENGTH.
1	20	6	6 feet
5	16	12	60 "
3	12	12	36 "
2	10	12	24 "
5	8	12	60 "
2	6	12	24 "
6	4	12	72 " —282 feet.

NO. OF PIECES OF CAST IRON PIPE IN PIPE YARD.

1	16		4 feet
7	12		53 " 8 inches
6	10		39 "
5	8		19 " 4 "
2	6		8 "
3	4		12 " 8 "
1	16	Curves	6 " 3 "
1	12	"	6 " 4 "
4	10	" 8 ft.	32 "
3	8	" 6ft. 4 in.	19 " —482 ft. 3 in.

SPECIAL CASTINGS.

1 Cross 12x12x12x12.
1 do 12x12x4x4.
1 do 8x8x8x8.
5 do 8x8x6x6.
1 do 6x6x6x6.
1 T, 12x12x12.
3 T, 12x12x6.
3 T, 6x6x6.
1 16 inch sleeve.
1 10 inch sleeve.
1 12 inch plug.
3 10 inch plugs.
5 8 inch plugs.
15 6 inch plugs.
5 4 inch plugs.
1 6 inch Eddy valve.
2 valve lids.
1 double nozzle, Holly hydrant.

3 hydrant plates.
1 hydrant top.
2 hydrant caps.
1 hydrant frost jacket.
4 hydrant nozzle caps.
1 hydrant top (whole).
42 stop cock box covers.
36 street washer covers.
81 grate bars.

230 fire brick.
105 pounds pig lead.
45 pounds rope gasking.
1 1 inch Union water meter, (rotary).
4 $\frac{5}{8}$ inch Union water meter. (rotary).
1 charcoal furnace.
1 soldering iron.

INVENTORY OF STORE-HOUSE.

2 pieces of 2 inch pipe, 6 feet.
2 " " $1\frac{1}{2}$ " " 13 "
1 " " $1\frac{1}{4}$ " " 5 ft. 6 in.
1 " " 1 " " 15 feet.
18 short p'ces of 1 in. pipe, 48 ft.
10 " " $\frac{1}{2}$ " " 24 "
5 " " $\frac{3}{8}$ " " 12 "
7 2 inch couplings.
3 $1\frac{1}{2}$ " " 123-6
4 $1\frac{1}{4}$ " "
1 1 " "
4 $\frac{3}{4}$ " "
6 1 " Ts.
2 $1\frac{1}{2}$ " Ls.
1 $1\frac{1}{4}$ " "
2 1 " "
1 $\frac{3}{4}$ " "
1 $1\frac{1}{2}$ " unions.
4 1 " "
1 $\frac{3}{4}$ " "
1 $\frac{1}{2}$ " "
2 2 " nipples.
2 $1\frac{1}{2}$ " "
9 $1\frac{1}{4}$ " "
9 1 " "
2 $\frac{3}{4}$ " "
6 $\frac{1}{2}$ " "
12 $\frac{3}{8}$ " "
3 $\frac{1}{4}$ " "
2 2 " plugs.
1 $\frac{3}{4}$ " "
2 2 " bushings.

1 1 inch angle valve.
2 1 " globe valves.
1 $\frac{3}{4}$ " angle valve.
1 $\frac{1}{2}$ " globe valve.
1 $\frac{1}{2}$ " angle valve.
1 1 " check valve.
40 pounds miscellaneous bolts.
3 pieces bar iron $1\frac{1}{2}$ in. square.
2 scaffold bolts.
$\frac{1}{2}$ barrel Asbestos cement.
1 keg Utica cement.
1 Ratchet drill clamp.
1 bar iron 3x$\frac{5}{8}$, 5 feet long.
1 jack screw.
1 barrel Asbestos roof paint.
1 barrel of salt.
$\frac{1}{2}$ keg 10s nails.
3 pounds of 20s spikes.
1 cant hook.
4 6 inch iron clamp screws.
1 iron fence post.
1 box machinery bolts.
1 box pipe bolts.
20 pounds scrap brass.
1 ton scrap iron.
1 pitch fork.
2 bushel of oats.
1 bale of hay.
1 gin pole and clevis.
150 feet of lumber.
4 empty oil barrels.

LIST OF TAPPERS TOOLS.

1 Mueller tapping machine complete.
1 8 inch screw wrench.
1 hand oil can.
1 machinist hammer.
1 cold chisel.
1 pair tongues.
3 large valve wrenches.
1 stop cock key.

CAULKER'S TOOLS.

1 wrought iron lead kettle on [wheels.
1 tool box.
7 shovels.
1 spade.
1 pick.
1 sledge.
2 hand ladles.
2 tape lines.
1 chalk line.
6 caulking sets.
2 gasking tools.
6 cold chisels.
2 caulking hammers.
1 derrick (large) with gearing.
1 set pulley blocks with rope.
60 feet of 1 inch rope.
4 pipe chains.
1 chain, hook and ring.
2 wheelbarrows.
2 steel wedges.
2 iron wedges.
1 cutting tool.
1 axe.
6 buckets.
3 red lanterns.
2 white lanterns.
1 road scraper.
1 tap wrench.

INVENTORY OF ENGINE ROOM.

1 clock.
5 jars battery.
3 telephones.
1 fire alarm gong.
1 steam pump, 12x12x7x12.
1 steam engine indicator.
1 56 1-inch tube radiator.
1 12 inch water gauge.
1 platform steps.
1 step ladder.
2 chairs.
4 screw wrenches.
4 packing wrenches.
2 socket wrenches.
2 screw drivers.
3 packing hooks.
1 air pump wrench.
1 cut-off wrench.
2 set-screw wrenches.
1 pair plyers.
2 metallic pump piston followers.
1 soft hammer.
1 hard hammer.
1 brass play pipe.
3 brass nozzles.
1 water meter.
3 galvanized iron drip pans.
3 brass drip pans.
1 mercury suction gauge.
1 cylinder oiler.
3 hand oil cans.
1 three way play pipe, 1¾ inch nozzle.
1 6 in. play pipe, 3 in. nozzle.
1 spittoon (poor).
1 inkstand.
1 bottle ink.
1 writing desk.
1 draughting table.
1 engine record book.
1 meter book.
1 coal book.
3 time books.
3 day books.
500 envelops.
200 letter heads.
1 permit book.
50 applications.
150 engine record sheets.
1 letter press.
2 pipe line maps.
1 duster.
1 bath tub.
8 paper hooks.
1 6 inch steam gauge.
1 four light chandelier.
1 city directory.

INVENTORY OF BOILER ROOM.

1 portable forge.
1 anvil.
1 pair of blacksmith tongues.
5 anvil swedges.
15 hammer swedges.
1 flatter.
1 fuller.
2 bolt headers.
3 drifts.
1 sledge hammer.

10 joints stove pipe.
1 elbow stove pipe.
1 grind stone and frame.
2 56 1-inch tube radiators.
1 vice bench.
1 machinists' vice.
1 tool rack.
1 set gas pipe dies from ⅛ to 2 in.
1 " " " taps " " "
2 pair of gas pipe stocks.
2 gas pipe cutters.
3 pair gas pipe tongs.
1 ratchet drill stock.
15 " "
1 breast "
3 twist "
2 hand tool stamps.
5 files (good).
8 files (poor).
3 indicator bolts.
6 cold chisels.
1 24 inch screw wrench, with pipe cutter attached.
6 S wrenches.
3 socket wrenches.
3 hydrant wrenches.
2 stop cock box wrenches.
1 box assorted bolts.
1 hand saw.
1 key hole saw.
1 extension bit.
5 short steel bars.
3 pipe plates 10, 12, and 14 in.
1 set universal chain pulley blocks.
1 wrought iron bar.
1 collar (for main shaft).
3 boiler hooks and hoe.
1 scoop shovel (good).
2 scoop shovels (poor).
1 iron wheelbarrow.
1 wheelbarrow for ashes.
1 coal pick.
1 set platform scales, 5x6 feet.
1 set large platform scales.
2 pieces steam hose, 24 feet.
2 pieces 1 inch hose, 100 feet.
2 sections 2½ in. White Anchor Akron hose.
1 box assorted bolts and screws
1 lead weight.
1 hydrant gauge cap.
1 wash sink.
1 water closet.
1 dark lantern.
1 pair hand shears.
1 hose spanner.
1 engine rail wrench.
1 screw driver.
1 step ladder.
2 trestles.
1 platform for trestles.
1 16 inch valve wrench.
1 10 gallon can.
1 sprinkler.
2 60 gallon oil pump tanks.
1 ice saw.
2 pint measures.
2 quart measures.
1 gallon measure.
4 funnels.
1 benzine can.
1 French fluid polish can.
1 coal oil can.
1 1 gallon can.
1 2 gallon lard oil can.
1 2 gallon jug.
1 ½ gallon jug.
1 alcohol can.
1 10 gallon can.
2 brooms (old).
1 pair rubber boots.
2 scrub brushes.
2 mop sticks.
1 soap barrel.
1 ice cooler.
1 wash dish.
1 dipper.
1 towel rack.
1 lantern globe.
3 paint brushes.
1 map of city.
1 ½ inch nozzle.
2 slates.
1 16 foot ladder.

ENGINE AND BOILER SUPPLIES

On hand to date, January 1st, 1880.

41 pounds concentrated lye.
46 pounds bar soap.
25 pounds cotton waste.
1 roll packing paper.
1 barrel boiler compound.
125 pounds extract logwood.
12 pounds white lead.
1 quart lard oil.

35 gallons cylinder oil.
40 gallons machine oil.
1 gallon coal oil.
½ gallon benzine.
½ gallon fluid polish.
1 gallon aspheltam varnish.
2 gallons linseed oil.
3½ sheets Asbestos board pack'g
25 pounds American packing.
2 pounds tallow packing.
167 sheets emery & crocus cloth.
5 pounds flour of emery.
3 pounds oxalic acid.
5 pounds tripoli.

¼ pound glue.
6 pounds mica packing.
1 pound Asbestos packing.
25 lbs. square rubber pump pac'g
8 brooms.
23 balls candle wick.
½ pound copper wire.
1 pound sheet brass.
6 pounds sheet rubber.
5 pounds sheet lead.
1 water glass.
2 tons coal.
8 tons corn cobs.
4 cords wood.

SECRETARY'S REPORT.

OFFICE OF THE BURLINGTON WATER COMPANY,
BURLINGTON, IOWA, January 20, 1880.

TO THE OFFICERS, DIRECTORS AND STOCKHOLDERS OF THE BURLINGTON WATER COMPANY.

Gentlemen;

A settlement between this company and the city of Burlington to June 30th, 1878, and a report in full made to the city council to that time, we submit that report herewith, as the basis from which the present report is made. The report to the city council is as follows, viz:

BURLINGTON, IOWA, AUG. 4, 1879.

To the Honorable Mayor and City Council, Burlington, Iowa:

GENTLEMEN—Below is original balance sheet, statement of profit and loss, and final balance sheet, of the Burlington Water company, to June 30th, 1879, in accordance with requirements of water ordinance, and in compliance with recommendations of judiciary committee of your honorable body.

Very respectfully,
WM. A. TORREY, Secretary.

Original balance sheet, Burlington Water Company, to June 30, 1879:

Capital stock		$27,133 50
Bonds		190,000 00
Construction	$ 207,017 83	
Russell & Alexander		60 04
Bond interest	8,042 61	
Salary	3,175 58	
Office furniture	16 50	
Water fund		5,340 05
Expense	461 38	
Engine supplies	1,811 87	
Interest	100 00	
Taxes	88 81	
Orders		6,333 29
J. C. McKell, treasurer	8,002 30	
Discount	150 00	
	$228,866 88	$228,866 88

Statement of profit and loss account, Burlington Water company to June 30, 1879:

Bond interest	$ 8,042 61	
Salary	3,175 58	
Expense	461 38	
Engine supply	1,811 87	
Interest	100 00	
Taxes	88 81	
Discount	150 00	
Water fund		5,340 05
Balance to construction fund		8,490 20
	$13,830 25	$13,830 25

Final balance sheet, Burlington Water company, to June 30, 1879:

Capital stock		$27,133 50
Bonds		190,000 00
Russell & Alexander		60 04
Orders		6,333 29
Construction	$ 215,508 03	
J. C. McKell, treasurer	8,002 30	
Office furniture	16 50	
	223,526 83	223,526 83
Amount of dividends due stockholders to June 30th, 1879, estimated		$2,999 80

The profit and loss account given above, was made in accordance with recommendations made by city council.

The receipts and expenditures for the six months ending December 31st, 1879, are as follows:

WATER FUND.

RECEIPTS.

From City of Burlington		5,000 00	
" Water Rates	3 637 90		
" Extra Water	386 45		
" Meter Rents	46 40	4,070 75	
" Engine supply for oil sold		5 05	9,075 80

EXPENDITURES.

Water Fund for Cr. of engine supply	5 05	
Salaries	2,762 48	
Expense	156 93	
Engine Supply	88 49	
Gas	155 10	
Fuel	563 48	
Oil	67 55	
Dividend	4,729 42	
Repair Street Mains and Hydrants	22 70	
Telephone	6 33	
Balance	518 27	9,075 80

GENERAL FUND.

In hands of treasurer July 1, 1879	$8,002 30	
Less orders previously issued	6,333 29	1,669 01
Bonds sold since July 1, 1879		10,000 00
Bills Payable		1,000 00
Capital stock		2,878 50
Construction		141 79
Balance, Dec. 31, 1879		758 73
		$16,448 03

EXPENDITURES.

Construction	891 49	
Russell & Alexander on account	10 00	
Discount	200 00	
Hydrants	894 63	
Lead	634 20	
Valves	361 08	
Meters	108 68	
Iron pipe	7,994 45	
Service pipe	1,413 89	
Labor	1,627 61	
Organization and Superintending construction	2,300 00	
Capital Stock	12 00	$16,448 03
General Fund in arrears	758 73	
Water Fund Balance	518 27	
	240 46	

J. C. McKELL, Treasurer.

Cash on hand July 1, 1879	$ 8,092 30	
Capital stock (from stockholders)	2,878 50	
Water Fund " sec'y	9,070 75	
Bonds " sales	9,800 00	
Bills payable " sec'y	1,000 00	
Construction " "	141 79	
Engine supply " "	5 05	
Receipts to Dec. 31, 1879	30,898 39	

ORDERS.

Outstanding July 1, 1879	6,333 29	
Issued on Water Fund since July 1, 1879	8,557 53	
Issued on General Fund since July 1, 1879	16,248 03	31,138 85
Orders issued in excess of all funds	240 46	

Water Receipts by items for the six months ending Dec. 31, 1879.

	Meter Rents.	Extra Water.	Water Rates.	Total.
July 1879	6 80	34 35	662 90	704 05
Aug. "	6 80	48 70	546 75	602 25
Sept. "	7 60	58 55	562 50	628 65
Oct. "	8 40	37 80	527 95	574 15
Nov. "	8 00	131 85	492 85	632 70
Dec. "	8 80	75 20	844 95	928 95
	46 40	386 45	3,637 90	4,070 75

Balance Sheet, December 31, 1879.

Capital stock		$ 30,000 00
Bonds		200,000 00
Russell & Alexander		50 04
Water Fund		518 27
Bills payable		1,000 00
Orders		31,138 85
Construction	231,792 27	
Office furniture	16 50	
J. C. McKell, Treasurer	30,898 39	
	$ 262,707 16	$262,707 16

All of which is respectfully submitted.

WM. A. TORREY, Secretary.

RULES AND RATES

OF THE

BURLINGTON WATER CO.

Water rents amounting to more than twelve dollars per annum must be paid quarterly in advance.

When the amount does not exceed twelve dollars per annum the same shall be paid semi-annually in advance.

Rents for the season, such as fountains, sprinkling, etc., shall be paid for in advance by the season.

Applications for water must be made in writing by the owner or occupant of the property, stating all purposes for which water is to be used.

No different or additional use will be allowed except upon written application to the superintendent of Water Co.

No consumer shall supply water to other persons or families nor suffer it to be taken off from their premises.

When two parties or more are supplied from the same pipe, they shall be jointly liable for the water rent; a failure of either to pay such rent or comply with the rules of the water company shall justify the company in shutting off the supply.

No person except a plumber licensed by the Burlington Water Company is allowed to do any work on pipes or attachments connected with the works of the company.

The water company will not be responsible for pipes and fixtures beyond the sidewalk curbstone from which point all renters must keep their pipes and apparatus in good order and well protected from frost at their own expense.

Supplying fountains, sprinkling, washing vehicles, etc., with hose are not allowed unless mentioned in the application or by special permit therefor.

Nozzles for washing vehicles, windows, etc must not be over one-eighth of an inch opening. Nozzles for sprinkling purposes must not be over one-quarter of an inch. The water at wash basins, water closets, urinals, baths, hose, and other fixtures must not be kept running when not in actual use, nor allowed to run to prevent freezing. If detected, one quarter additional rent will be charged. All willful waste of water must be prevented.

The superintendent of water works or any employee under his directions shall at all reasonable times have free access to enter premises or buildings to examine the pipes, fixtures and the manner of using water.

For any violation of the rules of the water company and a non-payment of rent the company reserve the right to turn off the water without notice, or forfeiting any payments made or water rents due, whenever the water has been shut off on account of non-payment of water rents, the same will not again be turned on until all back rents are paid, together with the expense of turning off and on such water.

It is expressly understood that the water company reserves the right at any time to shut off the water in their main pipe for the purpose of making connections, extensions, repairs, and cleaning the same, and also reserve the right to alter and amend these rules and regulations as may be necessary for the protection and preservation of their works.

WATER RATES OF THE BURLINGTON WATER COMPANY.

Payable quarterly in advance unless otherwise stated. Special rates in all cases not herein included.

	PER QUARTER.
Aquariums. (special rate.)	
Banks	$2 50
Bakeries. For average daily use for each bbl. of flour	75
But in no case less than	2 50
Bath Tubs. In bath houses and hotels, public, first tub	2 50
" " Each additional tub	1 50
" " Hotel sleeping rooms, each tub	75
" " Boarding houses, first tub	2 00
" " Each additional tub	1 00
" " Private residences, first tub	1 00
" " Each additional tub	75
Barber shops, first chair	1 00
" " Each additional chair	75
Blacksmith shops, one fire	1 25
" " each additional fire	50
Brewers and Distillers. (special rate.)	
Building purposes. Stone work, per perch	05
" " Brick work, per M	05
" " Wetting bricks, per M	05
" " Plastering, per hundred yards	25
Butcher shops. (steam extra.)	2 50
Cigar manufacturers, 6 hands or less	1 25
" " Each additional hand	10
Dwellings, 4 rooms or less	1 00
" Each additional room	25
" Each additional family in same house	1 00

Hose for street sprinkling, ¼ in. nozzle, 2 hours per day, front of business houses for every 20 ft. front per season..	4 00
Hose for street sprinkling business houses on corner lots, extra per season	2 00
Hose for street sprinkling, residence property for 60 ft. front 1¼ hours per day, per season	5 00
per 100 ft. front 1¼ hours per day, per season	8 00
Over 100 ft. (special rate.)	
No nozzle larger than ¼ in. will be allowed without special rate	
Laundries (special rate.)	
Liquor rectifiers or mixers (special rate)	
Manufactories (special rate)	
Mechanic shops, 10 hands or less	2 50
" " Each additional hand	15
Offices and sleeping rooms	75
Printing offices, 10 hands or less (engine extra)	3 00
" " Each additional hand	15
" " Each power press, large	1 00
" " " " " quarto and half medium	75
Photograph rooms	2 50 to 3 75
Railroads (special rate)	
Restaurants	2 50 to 5 00
Saloons	2 50 to 5 00
Saloons and restaurants	3 75 to 7 50
Schools, boarding, each room	25
Schools, not boarding, 25 pupils or less	1 00
" Each additional pupil	02
Stores of all classes, from	1 00 to 2 50
" tenements over business houses, four rooms or less	1 00
Fountains 1-16 jet 6 hours per day in season, per season	12 00
" ⅛ jet 6 hours per day in season, per season	40 00
" ¼ jet (special rate)	
Hotels and boarding houses (special rate)	
Stables, livery or boarding, 6 horses or less, including carriage washing	3 00
" Each additional horse	40
" Private, 1 horse and carriage washing	1 00
" " Each additional horse or cow	25
Steam engines from 1 to 10 horse power, per horse power	1 00
" " " 10 to 20 " " " " "	90
" " " 20 to 30 " " " " "	80
" " " 30 to 40 " " " " "	70
" " " 40 to 100 " " " " "	60
" " " over 100 " " " " "	50
Urinals, public, per basin	1 25
" private, banks, stores, offices, etc	1 00
Water closets, hotels, boarding houses, saloons, etc., each seat	1 25
Water closets, shops, manufactories	1 00
" " private.	75
Watering troughs in front of business houses (special rate)	
Water rates by meter 1000 gallons. For first M gallons daily..	40
" " gallons daily, from 1000 to 5000, per M gallons daily	30
" " from 5000 gallons and upwards, per M gall	20
Water motors, (special rate.)	
Water elevators (special rate)	

The Burlington Water Company reserve the right to establish meters or to change rates, if these are found insufficient.