NPS Form 10-900
(Rev. 8-86)

OMB No. 1024-0018

United States Department of the Interior
National Park Service

National Register of Historic Places Registration Form

RECEIVED
MAY 02 1990
NATIONAL REGISTER

This form is for use in nominating or requesting determinations of eligibility for individual properties or districts. See instructions in *Guidelines for Completing National Register Forms* (National Register Bulletin 16). Complete each item by marking "x" in the appropriate box or by entering the requested information. If an item does not apply to the property being documented, enter "N/A" for "not applicable." For functions, styles, materials, and areas of significance, enter only the categories and subcategories listed in the instructions. For additional space use continuation sheets (Form 10-900a). Type all entries.

1. Name of Property

historic name: Gatehouse, Portland City Reservoir No. 2

other names/site number:

2. Location

street & number: 6007 SE Division Street — N/A [ ] not for publication

city, town: Portland — N/A [ ] vicinity

state: Oregon code: OR county: Multnomah code: 051 zip code: 97206

3. Classification

Ownership of Property	Category of Property	Number of Resources within Property	
		Contributing	Noncontributing
[X] private	[X] building(s)	1	buildings
[ ] public-local	[ ] district		sites
[ ] public-State	[ ] site		structures
[ ] public-Federal	[ ] structure		objects
	[ ] object	1	0 Total

Name of related multiple property listing: N/A

Number of contributing resources previously listed in the National Register: N/A

4. State/Federal Agency Certification

As the designated authority under the National Historic Preservation Act of 1966, as amended, I hereby certify that this [X] nomination [ ] request for determination of eligibility meets the documentation standards for registering properties in the National Register of Historic Places and meets the procedural and professional requirements set forth in 36 CFR Part 60. In my opinion, the property [X] meets [ ] does not meet the National Register criteria. [ ] See continuation sheet.

Signature of certifying official — Date: April 20, 1990

Oregon State Historic Preservation Office

State or Federal agency and bureau

In my opinion, the property [ ] meets [ ] does not meet the National Register criteria. [ ] See continuation sheet.

Signature of commenting or other official — Date

State or Federal agency and bureau

5. National Park Service Certification

I, hereby, certify that this property is:

Entered in the National Register

[X] entered in the National Register. [ ] See continuation sheet. — Helen Bryan — 6/1/90

[ ] determined eligible for the National Register. [ ] See continuation sheet.

[ ] determined not eligible for the National Register.

[ ] removed from the National Register.

[ ] other, (explain:) _____

Signature of the Keeper — Date of Action

6. Function or Use

Historic Functions (enter categories from instructions)	Current Functions (enter categories from instructions)
Waterworks	Vacant/not in use

7. Description

Architectural Classification (enter categories from instructions)	Materials (enter categories from instructions)
Romanesque	foundation concrete walls concrete roof concrete other windows: glass floor: concrete and glass

Describe present and historic physical appearance.

[X] See continuation sheet

The Gatehouse at Reservoir #2 is located at the southwest corner of the reservoir at the intersection of S.E. 60th Avenue and S.E. Division Street in Portland, Oregon. The building faces Division Street and is set 7 feet up and 35 feet back from the street. It is approached up a flight of concrete stairs from the intersection of the street, and is surrounded by a rusticated stone wall which is 5 feet high tapering to the ground on the west side of the site, and 4 feet high on the south side of the site. The reservoir is surrounded by a low brick wall 5 whythes deep and 3 to 5 whythes high ending at the entrance to the Gatehouse with two 3 1/2 foot high rectangular piers crowned with two whythe corbelled rectangular capitals. The brick wall was originally topped by a 3 1/2 foot fence made of iron rods spaced 5 inches apart. With the exception of the gate at the northeast corner of the site, this original fence has been replaced with chain link fencing. At the time it was built the reservoir was surrounded by forest, and a few farms and homes. Now, the surrounding area is light commercial to the south, east and west, and residential to the north.

The Gatehouse was constructed in 1894. It is cylindrical in shape, approximately 23 x 44 feet. There are two floors, one below reservoir level and one at grade. The ceiling height at ground level is approximately 15 feet, and at reservoir level 21 feet. The structure is of reinforced concrete with a rusticated cast stone facade which resembles rock faced coursed ashlar. The concrete walls are approximately 4' thick at the ground-floor level. The portion of the exterior which was designed to be below water level is plain concrete. The concrete roof is flat, with a one foot overhang. Just below the cornice is a corbelled band of smooth concrete cast to resemble a shallow arcade. There is a set of four panel double doors with a semicircular fan light above. The top two panels are divided into two over two glass inserts. There is a single door on the back of the structure facing the reservoir, which opens out to a small iron grate balcony. There are nine round arch four over four light sash windows spaced

evenly around the building. The front doors and windows are bordered with a round arch of cast stone voussoirs, the back door is bordered with rectangular stonework. The windows have concrete sills which are lighter in color than the cast stone of the body of the structure.

The interior floor plan of the Gatehouse is cylindrical in shape. One interior partition is constructed on the ground floor. It separates the eastern third of the space. The partition does not appear on the original plans for the structure, it is not known when it was constructed. The interior of the room contains two large metal winches, pipes, valves and two concrete pads six inches high approximately 8 feet long by 3 feet wide. These pads probably originally contained pumping equipment. The pump fed an underground water tank higher up on Mount Tabor. The pump, called a Pelton wheel, was water wheel driven. As water flowed from the reservoir on Mt. Tabor to Reservoir #2 it drove the pump which in turn fed the underground Reservoir #7. Since the entire water system was gravity driven, pumps were only needed for specific circumstances, when the water needed to be driven uphill. There was a similar pumping mechanism at the Washington Park reservoirs, which is now a hydroelectric system.

The interior walls and room of the structure are concrete which has been painted. The ceiling is concrete and reinforced concrete beams spaced about 24 inches on center are visible. There is also a metal bridge crane rail attached to the ceiling which could move and lift large and heavy equipment. Until dams were constructed on the Bull Run water system, water flowed to Portland directly from the mountain stream. Sticks, leaves and other debris were cleaned from the water supply through large screens on the incoming pipes. The overhead crane was used to lift, clean and replace these screens.

The interior floor is reinforced concrete, with the words "Ransome Construction" impressed into the cement. The floor is interspersed with sections of round glass inserts 2 1/2 inches in diameter, set 2 inches apart. At the southwest corner of the room is a broad iron curved stairway which descends to the lower level. This level contains the huge iron holding tank connected to the water supply with incoming and outgoing pipes. The tank covers approximately 80% of the floor space of the west half of the lower level. The rest of the lower floor is accessible only through a manhole entrance on the main floor; it is a low space which was used for maintenance of the pipes which ran through the structure. The function of the Gatehouse was to act as a valve. Through it water could be allowed into the reservoir, or continue on past the reservoir and flow to the city. The tank inside of the Gatehouse acted as a water storage reservoir if the large outside reservoir was out of service. Water flowed through the tank to the reservoir.

The Portland Water Bureau stopped using the reservoir in 1976 because of traffic caused pollutants. The reservoir is currently empty, and is slated to be filled and the land developed. The Gatehouse is currently boarded up and not in use.

The Gatehouse at Reservoir #2 was built in 1894 as part of an ambitious engineering undertaking by the City of Portland to bring water from Bull Run Lake to the City. With the exception of one pumping station which provides water to the West Hills, the system was and is totally operated by gravity. Conduit pipe was laid over the rugged wilderness from Bull Run "impassable for a horse and difficult for a man to penetrate." Construction of the pipeline began in 1893. Twenty-four miles of riveted steel pipe between 33 and 44 inches in diameter were laid. Clearing, excavation and refilling was done by hand; pipe and equipment were moved by horse team. The first water from Bull Run flowed through it to the City of Portland in 1895. Two more reservoirs were added in the 1920's.

The history of the Gatehouse begins on October 24, 1882, when the City of Portland passed a charter amendment allowing the city to construct and maintain water works. Based on that amendment, the Water Committee was formed. The chairman of the Committee was Henry Failing; other members included Henry Corbett, Frank Dekum, and William S. Ladd. The Committee hired Colonel Isaac W. Smith as staff engineer. Colonel Smith was from Virginia, graduated from Virginia Military Institute, served in the Confederate Army Engineer Corps in the Civil War, after which he moved to the northwest. He built railroad lines in Oregon, Washington and British Columbia, constructed the steamboat locks by Willamette Falls in Oregon City, and platted the gas and water works for the City of Tacoma. At the time Smith was hired, Portland's water was pumped from the Willamette River; it was expensive and of dubious quality. The goal of the Committee was to provide the city with cleaner water, and with a system operated by gravity that did not require pumping and would therefore be less expensive.

Charles Talbot, a civil engineer for Northern Pacific Railroad in Tacoma did a preliminary survey of the Bull Run watershed in 1883. He advocated the use of a gravity system to bring water from the western slopes of the Cascade Mountains to Portland. He and a partner A.G. Cunningham, speculatively purchased the land and water rights to the acreage bordering the Bull Run River, and offered those rights to the Water Committee for $130,000. The Committee had Engineer Smith complete a survey of the property. After a five month study, he concluded that the use of Bull Run water would be feasible.

The Committee began to buy water rights from landowners along Bull Run, and began negotiations with Cunningham. He finally accepted $21,181.89 for the land and water rights in February of 1888. The Committee then began the work of bringing the water from Bull Run to Portland.

Reservoir #2, or the Low Service Reservoir at Mt. Tabor as it was called, was first mentioned in the Minutes of the Water Committee September 19, 1893. Prior to that date, only one reservoir (Reservoir #1) was planned for Mt. Tabor. In June of 1893, the Committee had hired James D. Schuyler as consulting engineer. He recommended a low service reservoir at Mt. Tabor. On November 11, 1893 ten acres owned by Levi White was selected by the Construction Sub-committee for the site, and it was purchased on December 18, 1893.

Because the decision to construct Reservoir #2 was made later than the decision to build the other three reservoirs, it was not included in the original estimates and contract bidding for the work. At this time, Portland was suffering from a major economic depression; many people were out of work. This prompted the Mayor, W. S. Mason, to send a letter to the Water Committee dated January 15, 1894. He wrote "that since the low service reservoir near Mt. Tabor was not under contract (that) the work be given to the unemployed by the day." Based on his request, the Committee

voted to prepare the plans and specifications for the reservoir as soon as possible and to "advertise proposals and thereby give some of the unemployed of the city an opportunity to obtain work" and to "gladly make every effort to have the (excavation) contractor give work to the unemployed."

On March 20, 1894 the Committee resolved, based on Mr. Schuyler's recommendations, "first that all the dams for the reservoirs be constructed of concrete, second that (they) be built by expert men paid by the day and third that the cement be mixed by machine." The plans for the Gatehouse and Reservoir #2 were drawn up in 1894 and were signed by consulting engineer Schuyler. The reinforcing material used in construction of the Gatehouse was twisted iron bars; the contract for same was awarded to "N.E. Ayer Company of Portland, Rolling Mills" according the minutes of May 1, 1894; the contract for the cast and wrought iron work was awarded to Risdon Iron and Locomotive Works in San Francisco. The award of such a large contract to an out of state company during such hard economic times prompted 692 citizens of Portland to sign a petition directed to the Committee asking them to award the contract to a Portland Company and "keep the money at home and enable them to better support their families and pay their debts." The Committee was unable to get out of their contract with Risdon, but they sent a letter on May 15, 1894 saying that the contract for iron pipes would be awarded to City of Portland firms, and that they would make every effort to hire local workers by the day. Because of the depression, Italian immigrants and unemployed doctors, lawyers and other professionals worked side by side as day laborers excavating Reservoir #2.

On July 19, 1894 Engineer Smith reported to the Committee that the supply of cement was being used more rapidly than anticipated, and the "supply of Josson brand

(would be) exhausted by July 25th." Two ships with the cement had left Antwerp, Belgium on April 8th and May 5th respectively, but waiting for their arrival would make "completion of the reservoir this year doubtful." The committee authorized the acquisition of North brand cement, which Smith determined to be the second best choice, and which was available locally. The plans for the reservoirs called for a lining of brick. Because of delays in delivery Reservoir #1 was lined with cement instead, but by the time. construction of Reservoir #2 began the brick was used because it was available.

The reinforced concrete construction for the Gatehouse was innovative at the time. The technology of reinforced concrete was just being developed in Europe and America in the late 1890's. Ernest Leslie Ransome held a patent for a the "concrete and twisted iron" method of reinforcement which was used in the Gatehouse. He was born in England, and emmigrated to the United States to manufacture and sell a patented concrete stone invented by his father. He experimented with concrete reinforcement, and in 1884 discovered that using twisted square bars for reinforcement instead of round bars established a stronger bond with the surrounding concrete. These twisted iron bars, or "Ransome bars" were used for reinforcing the concrete construction of the Gatehouse. The impression in the floor of the Gatehouse reads "Ransome Construction", acknowledging the use of his system.

The concrete work of the Gatehouse has unique aesthetic qualities as well as technical ones. The formwork for the concrete was constructed to give the general appearance of stone blocks, with beveled edges and recessed, beaded connections which look like mortar joints. After the formwork was removed, the concrete was chiseled and bush hammered so that it had the appearance of natural stone.

The formwork for the reservoir and Gatehouse was constructed of wood. As the individual pours were completed, the next level of formwork was constructed. Wood scaffolding was built around the outside of the completed cement work so that workers would have access to each pour level as the height of the structure increased. Early photographs show the elaborate wood scaffolding surrounding

completed pours, and the twisted reinforcing bars of iron in place in preparation for the construction of the formwork for the next pour.

The Committee had contracted with the Portland architectural firm of Whidden and Lewis for the design of the wrought iron fences and electric light posts for the reservoirs. The plans were drawn, and bids were accepted for Reservoirs #1, #3 and #4. Because the bidding for Reservoir #2 was begun later than the other reservoirs, it was not included in the contract. The Committee originally recommended a tight board fence for Reservoir #2, but on November 20, 1894 agreed upon an iron fence of pointed posts, which shows in early photographs. This matches the remnants of original fence which exist at the site today.

On January 2, 1895 Bull Run Water flowed through the system and to the City of Portland for the first time. The property was in service as a functioning waterworks until 1976, when it was removed from the system because of the contamination of the water with lead caused by bus and vehicle traffic on the nearby streets. The City owned and maintained the property until 1989 when it sold a 4000 square foot parcel containing the Gatehouse to Robert F. Phillips, Jr. dba Renovation Properties for restoration and conversion into a dwelling, and the rest of the reservoir site to a developer who plans to build senior residences.

8. Statement of Significance

Certifying official has considered the significance of this property in relation to other properties:
☐ nationally ☐ statewide ☒ locally

Applicable National Register Criteria ☒ A ☐ B ☒ C ☐ D

Criteria Considerations (Exceptions) ☐ A ☐ B ☐ C ☐ D ☐ E ☐ F ☐ G

Areas of Significance (enter categories from instructions)	Period of Significance	Significant Dates
Architecture/Engineering	1893-1894	1894
Community Planning and Development	1893-1894	1894

Cultural Affiliation: N/A

Significant Person: N/A

Architect/Builder: Isaac W. Smith, City Engineer and James D. Schuyler, consulting engineer

State significance of property, and justify criteria, criteria considerations, and areas and periods of significance noted above.

INTRODUCTION

The gatehouse of Portland City Reservoir No. 2, a Portland Historical Landmark, is one of four nearly identical valvehouses built in 1894 as part of the City of Portland waterworks development carried out under supervision of City engineer Isaac W. Smith and consulting engineer James D. Schuyler.

The feature occupies a site above street grade at the southwest corner of the historic reservoir parcel of just under ten acres on SE Division at 60th, near Mount Tabor in southeast Portland, Oregon. It is nominated, however, as a separate area measuring 52 x 80 feet because the abandoned reservoir has been rezoned and is the object of a multi-unit housing development proposal. The reservoir basin was drained and taken out of service in 1976 owing to high levels of airborne contaminents and persistent leaks.

Specifically, what is included in the small nominated area is the concrete gatehouse, the southwest corner section of a low retaining wall of random ashlar (basalt) with stone coping that lines the street frontages of the reservoir, diagonally placed, concrete steps giving access to the site at the street corner, the above-grade lawn area, and a low brick wall with chain-link fencing which surrounds the gatehouse on south and west sides. Originally, the wall was topped with iron fencing.

The gatehouse is an elongated cylindrical volume of reinforced concrete measuring 22 x 44 feet in ground plan. Its long axis and primary facade parallel Division street. Below the waterline, however, the base of the feature tapers outward to meet the battered interior wall of the reservoir, and it was through the flared base that the cast iron supply mains fed the holding tank. The exterior of the poured concrete gatehouse was form-finished as rock-cut masonry, then bush-hammered and tooled as if it were natural stone. It was detailed in the Romanesque manner with tall round-arched windows having rusticated block surrounds. The main portal facing Division Street is a wide arched opening fitted with fanlight over a double-leaf door with wood and glass panels--probably a replacement door. The building is capped by corbelled frieze of cast

☒ See continuation sheet

9. Major Bibliographical References

Minutes of the Water Committee, Clerk Frank Dodge, pages 142-385, 1889-1894, City of Portland Archives.

Short, Casey. Water, Portland's Precious Heritage, City of Portland, 1983.

Interview with Dick Vrooman, City of Portland Water Bureau Engineering, October 2-3, 1989.
Interview with Todd Humphrey, City of Partland Water Bureau Engineering, December 1, 1989.

Ferriday, Virginia Guest, National Register of Historic Places Inventory Nomination Form, Portland Reservoirs Nos. 1, 2, 3, 4, 5 and 6, prepared September, 1985.

Multnomah County Deed Records Book 206, Page 204.

☐ See continuation sheet

Previous documentation on file (NPS):

- ☐ preliminary determination of individual listing (36 CFR 67) has been requested
- ☐ previously listed in the National Register
- ☐ previously determined eligible by the National Register
- ☐ designated a National Historic Landmark
- ☐ recorded by Historic American Buildings Survey # _____
- ☐ recorded by Historic American Engineering Record # _____

Primary location of additional data:

- ☐ State historic preservation office
- ☐ Other State agency
- ☐ Federal agency
- ☒ Local government
- ☐ University
- ☐ Other

Specify repository: _____

10. Geographical Data

Acreage of property 0.092 acres Mount Tabor, Oregon-Washington 1:24000

UTM References

	Zone	Easting	Northing		Zone	Easting	Northing
A	10	531240	5038090	B			
C				D			

☐ See continuation sheet

Verbal Boundary Description

The gatehouse of Portland City Reservoir No. 2 is located in the SE¼ SE¼ Section 6, Township 1S, Range 2E, Willamette Meridian, in Portland, Multnomah County, Oregon. The nominated area measuring 52 x 80 feet, more or less, is confined to the gatehouse and its immediate setting, exclusive of the abandoned reservoir that is scheduled for redevelopment. The area is particularly described as follows:

☒ See continuation sheet

Boundary Justification

☒ See continuation sheet

11. Form Prepared By

name/title Georganne Dunn, with context statement and bibliography by Virginia G. Ferriday
organization N/A date November 28, 1989
street & number 1829 NW Lovejoy #212 telephone (503) 294-9789
city or town Portland state Oregon zip code 97209

stone and a thin, flat roof slab projecting beyond the wall plane. The gatehouse, or valvehouse interior is finished concrete and is replete with its filter screens, overhead crane and iron stairway and iron holding tank. The concrete floor of the gatehouse is inset with glazed apertures which provide a view of the holding tank beneath.

Reservoir No. 2 gatehouse meets National Register Criterion C as a well-preserved and handsomely designed and finished architectural feature of the municipal water system developed by the City of Portland at the end of the last century. It employed the advanced patented poured concrete construction method with twisted iron reinforcement originated by Ernest L. Ransome. This small component of the waterworks, associated at least geographically with its historic functional setting, is significant also under Criterion A relating to community development and public works. The significance of the gravity-operated system supplied from Bull Run Lake in the foothills of the Cascade Range was that it eliminated expensive pumping of impure water from the industrialized Willamette River and provided the growing city its first professionally engineered modern, economical water supply system. Bull Run Lake remains the City's main water supply source. The nominated parcel of 4,100 square feet was transferred to private ownership in 1989.

Sites for Reservoirs Nos. 1 and 2 at the base of Mt. Tabor were purchased by the Water Committee specifically for the reservoirs and were limited to less than ten acres in size each. The additional area now comprising Mt. Tabor Park was acquired by the City in connection with construction of Reservoirs Nos. 5 and 6 in 1911. Mt. Tabor Park is now 176.23 acres in extent. Reservoir No. 2, measuring 250 x 700 feet, occupies a finger of the park, with residential and commercial development to the north, west and south. When it was active, its capacity was 20,500,000 gallons. Unlike the other three reservoirs of 1894, of which Nos. 3 and 4 were located in Washington Park, Reservoir No. 2 was excavated, rather than built in a natural ravine. It required no dam, therefore. Its original basin lining consisted of a double layer of brick heavily coated with asphalt.

HISTORICAL CONTEXT

The following context statement concerning Portland's historic waterworks was prepared in 1985 by Virginia Guest Ferriday under auspices of the City of Portland with grant assistance from the State Historic Preservation Office.

Portland's reservoirs are significant, not only as functioning components of the municipal water system, but also as symbols of the importance of that system to the development of the city from a small town to a large metropolis. The reinforced concrete construction of the reservoirs is notable. Of particular importance in this respect are the four 1894 reservoirs, conctructed using systems patented by Ernest L. Ransome, nationally recognized pioneer in the field of reinforced concrete. With their picturesque structures and decorative wrought-iron fences and lamp posts, the reservoirs are vital landscape elements for the two major city parks in which they are located.

All six reservoirs included in this thematic nomination were constructed as part of the City of Portland's Bull Run water supply system. Reservoirs Nos. 1 and 2 in Mt. Tabor and 3 and 4 in Washington Park were completed in 1894, the same year as the original Bull Run headworks and pipeline. Reservoirs Nos. 5 and 6 in Mt. Tabor were built in 1911 to provide the additional storage capacity required by construction of a second pipeline from Bull Run.

Portland's Bull Run supply system was named for its source of water, the Bull Run River, which flows southwest through the Cascade Mountains from its head at Bull Run Lake, about ten miles from Mt. Hood, to its confluence with the Sandy River east of Portland. The original headworks for the water system was located on the Bull Run River approxiamtely 22 miles downstream from Bull Run Lake at an elevation of 716 feet above the low water mark of the Willamette River. From there the pipeline was run 24 miles to Reservoir No. 1 on Mt. Tabor in East Portland. From Reservoir No. 1 water flowed to Reservoir No. 2 on Mt. Tabor and to Reservoirs Nos. 3 and 4 in Washington Park on the west side of the Willamette River, six miles from Mt. Tabor.

Because of the greater elevation of the Bull Run headworks, water for all but the highest areas of the city could be supplied by gravity. On each side of the Willamette River two service districts were established: a high service district and a low service district. Reservoirs Nos. 1 and 3, located at elevations 411.6 and 299.5 respectively, supplied the high service districts, and Reservoirs Nos. 2 and 4, located at elevations 229.2 and 229.5 respectively, supplied the low service districts. Water for higher areas was pumped from the reservoirs to tanks on the hilltops above these areas. After 1911 there were three service districts on the east side, with Reservoirs Nos. 1 and 5 serving the high service district, Reservoir No. 6 the intermediate district and Reservoir No.2 the low district. Although there have been other additions and alterations over the years, the system operates today essentially as it did originally.

Prior to completion of the Bull Run supply system, water for Portland residents was obtained primarily from the Willamette River. Early settlers had often commented on the purity of Willamette River water. Its quality had, however, deteriorated over the years of continuing settlement of the Willamette Valley. P.F. Morey, an early agitator for construction of the Bull Run system, summed up the situation in 1884 as follows: "....the river Willamette is the sewer of nearly one-third of the state.... Men should not drink such water, nor use it in their house either for culinary of lavatory purposes. They have been doing so in defiance of every sanitary principle; and as the state grows older and becomes more settled up, the [contamination] will only increase, and the danger of a greater epidemic overhang this entire community."

At the time Morey wrote this piece, water was supplied by privately owned water companies. Undertaking a project of the scope of the Bull Run system would require some form of public financing and public ownership. In 1885 the state legislature established the Portland Water Committee and empowered it to issue bonds not to exceed $3,200,000. Apppointed to the Committee were Henry Failing (Chairman), L. Fleischner, J. Loewenberg, L. Therkelsen, F.C. Smith, W.S. Ladd, H.W. Corbett, S.G. Reed, T.M. Richardson, C.H. Lewis, F. DeKum, W.K. Smith, R.B. Knapp and A.H. Johnson. The Committee purchased the privately owned Portland Water Company and began extending its distribution system. Early in 1886 the Committee began making plans to construct a pipe

line from Bull Run. However, they were soon stymied in their efforts by opposition from Governor Sylvester Pennoyer. Pennoyer, said by one of his contemporaries to have an "impracticable, cranky nature," vetoed the bill authorizing the additional bonds needed to carry out the project. Opposition to tax free bonds was one of Pennoyer's prime campaign issues. He also voiced doubts as to the desirability of Bull Run water, claiming that it came from melting glaciers and would cause goitre in the fair sex of Portland. (During these difficult times, an engineer for the Water Committee tramped to the source at Bull Run Lake, where he camped out for several days taking pictures to prove that the water was not fed by glaciers.) Finally in 1891 the bond issue was submitted without the tax exempt clause and it passed and was signed by Pennoyer.

Isaac W. Smith had been appointed Chief Engineer by the Water Committee on December 22, 1885. In 1886 Smith was directed by the Committee to make a survey of the line from Bull Run and that same year he presented to the Water Committee "Specifications of Works for the Water Supply of the City of Portland," in which he outlined the requirements for headworks, pipelines and reservoirs. On Sept. 6, 1891, Smith presented another report to the Committee in which he stated: "A high and low service reservoir are needed for the economical operation of the works, and to compensate for the varying consumption of water at different portions of the day." Smith remained in the position of Chief Engineer until 1897. During that period he was responsible for the design and construction of the headworks at Bull Run, the pipeline to Portland, and the reservoir system.

Isaac W. Smith was born in Fredricksberg, Virginia. A graduate of Virginia Military Institute, he devoted his entire career to civil engineering. He was a captain in the Engineer Corps of the Confederate Army, afterwards engaging in public land surveys of Washington state. He built lighthouses at Sholawater Bay and at New Dungeness Smith's Island and Tatoosh on the Straits of Fuca. He platted the gas and water works for the Tacoma Light and Water Company. As engineer for the Northern Pacific, he located the lines from Portland to Kalama and Kalama to Tacoma, as well as the line across the Cascade Mountains from Tacoma to the Yakima and Columbia Rivers. He also built the system of steamboat locks around Willamette Falls.

James Dix Schuyler of Los Angeles, was hired as Consulting Engineer by the Water Committee and given specific responsibility for the reservoirs, including their dams, pipe connections and pumping station. Schuyler was born and educated in New York, but practiced his profession in the Western states and territories. After working on railroad construction, he began specializing in hydraulics. For several years Schuyler was in charge of irrigation investigation for the state of California. In that position he designed and constructed the Sweetwater Dam near San Diego, California. He was also engineer for the Hemst Dam in Riverside County, California. The Water Committee evidently learned of Schuyler through his brother, Phillip, who was its first secretary.

A third engineer, Charles E. Oliver, was responsible for surveys for the pipeline from Bull Run, for acquiring sites for the headworks and reservoirs and for acquiring rights of way for the pipeline. Oliver was born in Iowa in 1856 and came to Oregon in 1864. He was educated in Portland primary and secondary schoools, but aparently accquired his engineering skills on the job rather than in the classroom. Prior to his employment by Smith, Oliver had worked in the City Engineer's office as chainman and roadman. He worked on the Bull Run pipeline and reservoirs from 1886 to early 1887, from 1889 to 1890, and from 1893 until 1895. Following 1895 he continued to work for the Water Department, primarily at the Bull Run headworks.

Excavation for Reservoirs Nos. 1,2,3 and 4 began in 1893 and was completed in 1894. Concrete work on the dams, basin linings, and gatehouses was in progress while grading was still underway. The goal was to complete the reservoirs by January 1895 when the first Bull Run Water was to flow to Portland.

C.E. Oliver wrote as follows of work on the reservoirs: "I was superintnedent of construction on Reservoirs Nos. 1,2,3 and 4 during the great depression of 1893 and 1894. They did not call it a depression then, but used the more expressive term, "hard times." The Water Committee built all of the reservoirs by day labor, except the excavation which was let by contract. Lawyers, doctors, dentists, accountants, and all classes of men were employed on the work as day laborers at $1.50 per day for common labor, and they were glad to get it. Men with families were employed almost exclusively. At times we had as many as 1500 men on the pay rolls for the four reservoirs."

The method of reinforced concrete construction adopted for the dams, gatehouses and retaining walls is unusual and was quite innovative at the time. Although unreinforced concrete was nothing new at the time, reinforcing methods were in the early experimental stages both in the United States and in Europe. The method of concrete construction used for the reservoirs had a patent, known as the "concrete and twisted iron patent." The concrete finish was also patented, as were the circular lights cast in the concrete of the gate house floors and pump house roof, and even the concrete mixer itself. All of these patents were held by Ernest Leslie Ransome, considered by historians as the leader in early reinforced concrete technology in the United States.

Ernest Leslie Ransome (1844-1917) was born in Epswich, England. His family had engaged in the manufacture of agricultural machinery since the late eighteenth century and some of Ernest's ancestors had been inventors as well. Between 1844 and 1867 his father developed and manufactured a patented concrete stone. Following an apprenticeship in the family business Ernest came to the United States to exploit his father's patent. He settled in San Francisco where he established a business to manufacture concrete blocks. His first notable innovation came in 1884 when he used twisted square bars as reinforcement. The round bars previously used had not established a good connection with the surrounding concrete. These twisted bars, which came to be known as "Ransome bars," were used as reinforcment for Portland's reservoirs. Ransome achieved the full concrete frame around 1900, and began experimenting further in unit construction. By about 1910, however, many others were entering the field of reinforced concrete construction and Ransome lost his position as frontrunner.

The concrete work for the reservoirs in notable, not only because it was technically innovative, but also because of its aesthetic qualities. Formwork was constructed to give the general outlines of stone blocks, with beveled edges and recessed, beaded "mortar joints." After the formwork was removed the concrete was tooled and bush hammered in a variety of textures as if it were natural stone. The level of detail given to its finishes would be unusual even for a non-utilitarian structure.

Contracts for the ornamental iron fences and lamp posts around the 1894 reservoirs were awarded on September 20,

1894, to Johann H. Tuerck. Tuerck, born in Germany in 1863, was trained in Bayreuth, Munich and Nuremberg before he came to America in 1888. Eighteen months after arriving in Portland in 1890 he established Portland Art Metal Works. He is credited with the wrought-iron work for major banks, clubhouses, churches and residences built in Portland during the 1890s, 1900s, and 1910s. The ornamental iron fences and lamp posts on Reservoirs Nos. 1,2,3 and 4 are prime examples of his work.

The massive construction project of the headworks, pipeline and reservoirs was not entirely finished before the Water Committe was faced with a severe problem. As Reservoir No. 3 was being filled on December 14, 1894, cracks were observed in the bottom. It was emptied on December 20th. Reservoir No. 4 was partially filled from December, 1894, to the following September, when cracking forced engineers to empty it also. Repairs were made and the basins partially filled. During 1896, as the cracks increased in number and size, the basins were only partially filled or kept empty. It soon became obvious that the hillside above the two reservoirs was sliding.

At the time that the reservoirs were constructed, the tract of land to the west of Reservoirs Nos. 3 and 4 was owned by the King Real Estate Corporation, which had platted it for a development of single-family residences and named it Melinda Heights. In 1892, to promote lot sales, a cable car line had been run up the hill from Jefferson Street, across the future site of Reservoir No. 4, to what is now Kingston Avenue. Faced with relocation due to construction of the reservoir, the owners of the cable car line had opted to abandon it. Most segments of the line, however, remained in place.

In 1897 the King Real Estate Investment Corporation filed suit against the City, claiming that construction of the reservoirs had undermined Melinda Heights and that 71 of the building lots were sliding downhill. The suit came to trial in 1899. By presenting detailed documentation of the geology of the hillside, of rainfall patterns and of movements of the cable car tracks prior to excavation for the reservoirs, the City was able to persuade the jury that the movement resulted from natural causes, that the slide was an ancient one, that the hillside had been moving two years prior to the excavation, and that the movement was caused by excess water in the soil. The City did, however, subsequently purchase Melinda Heights from the King Real Estate Investment Corporation, eventually adding it to the adjacent City Park.

Even with the favorable outcome of the trial the Water Committee still had to contend with damages caused by what was for many years referred to in Water Department records simply as "the Sliding Land." The slide was quite extensive: 29.27 acres in area, 3,400,000 cubic yards in volume and weighing approximately 4,600,000 tons. To solve the drainage problem, believed by the engineers to be the cause of the slide, the Water Department constructed a system of drainage tunnels. Elevators lowered workmen 115 feet below grade, where they excavated and shored up the six-foot high tunnels. The tunnel system was finally completed in 1905. The tunnels are still in place, though apparently filled with gravel.

With the hillside stabilized, the reservoirs could also be repaired and put back into service. By 1904 Reservoir No. 4 had evidently been completely empty for sometime, as the Oregonian reported that there were "..shrubs growing luxuriantly in the bottom .. subsisting on soil which has washed through the broken walls. Squirrels live in the bushes ..." Repairs were completed and the reservoirs were back in service in 1905. The work was done under the supervision of engineer D.D. Clarke, who was responsible for the design of the 1911 Reservoirs, Nos. 5 and 6.

Fortunately for Portland's west side, the water system had been designed so that Bull Run water flowing to reservoirs could bypass the reservoir basins and be routed through the gatehouses directly to consumers. It was, therefore, possible to maintain uninterrupted service during the years 1895 to 1905 when Nos. 3 and 4 were in and out of service.

By 1906 plans were underway to construct a second pipeline from the Bull Run headworks. A second pipeline would also necessitate additional reservoir storage. After some public debate, it was decided to build two new reservoirs on Mt. Tabor and, at the same time that land was being acquired for the reservoirs, to purchase additional land for creation of a public park. Early in 1909 sites for the reservoirs were secured and in October of that same year contracts were awarded to Robert Wakefield & Company for construction of Reservoirs Nos. 5 and 6.

David Dexter Clarke, who succeeded Isaac Smith as Chief Engineer of the Water Committee upon Smith's death in 1897, was responsible for the design of Reservoirs Nos. 5 and 6. Clarke was born in New England and moved to Portland in 1864. During the following 26 years he worked in Portland, Olympia and Tacoma, primarily as a surveyor. While employed by the Northern Pacific Railroad Company as assistant engineer, he was in charge of terminal improvements at Tacoma. In 1884-1885 he was principal assistant to Isaac W. Smith during construction of the Tacoma Water Works. He began work for the Portland Water Committee in 1893. He remained in the position of Chief Engineer from 1897 until his resignation in 1917.

Reservoir No. 5 was constructed with the same water elevation as Reservoir No. 1 and connected with it by a tunnel. This enabled the two to function as one. Reservoir No. 6, with a water elevation of 305 feet, served an intermediate district, between the east side high and low service districts. Both reservoirs were completed in 1911. Since that time no new reservoirs have been constructed in Portland.

Gatehouses for Reservoirs Nos. 5 and 6 were, like the earlier reservoir structures, built of reinforced concrete. In the intervening 17 years reinforced concrete technolgy had, however, come of age. So, although the concrete work on the 1911 reservoirs is very fine, it was not as innovative as the 1894 work. Plans for the 1911 structures specified that the concrete would be bush hammered, like the 1894 work, but it was, in fact, left smooth. In 1923 a small one-story concrete inlet gatehouse was built adjacent to Reservoirs No. 1 and in 1951 an inlet gatehouse adjacent to Reservoir No. 5. These are similar in style and detailing to the 1911 gatehouses. Iron fences on the 1911 reservoirs are similar to those on the 1894 reservoirs, but without the leaf decorations. The 1911 lamp posts are similar, but much stockier than those of 1894.

All six reservoirs are important landscape features. That they were intended for pleasure as well as for utility is evident from an Oregonian article of January 1, 1895, which states, "When this work is completed the brilliantly lighted walks surrounding the reservoirs will be the most popular promenades in the city during the evenings of the warmer months of the year," and, "These walks afford a delightful promenade for visitors who are separated from the basin itself by a concrete wall surmounted by a neat iron fence. All the reservoirs have been constructed in the most substantial manner and the effect of harmony it was possible to obtain by a little attention to the adornment of the finished work has not been overlooked by the engineers in charge." In spite of certain subsequent lapses in "attention to the adornment of the finished work," the reservoirs continue to attract and delight the many visitors who come to the parks each year.

Major Bibliographical References

Bureau of Water Works, Portland, Oregon, "Map and Statistical Data, April 15, 1930," Collection Multnomah County Library.

City of Portland Archives and Records Center, Photographs, Vertical Files.

City of Portland Bureau of Water Works, Annual Reports, 1909 - 1971.

City of Portland Water Bureau, Maps, Engineering and Architectural Drawings.

City of Portland Bureau of Planning, Historic Resource Inventory, May, 1984.

Clarke, D.D., "A Phenomenal Land Slide," Reprinted from Transactions (American Society of Civil Engineers) Vol LIII (1904) p 322.

Clarke, D.D., "Supplemental Report to the Water Board, January 10th, 1908," Collection City of Portland Water Bureau.

Ferriday, Virginia Guest, Last of the Handmade Buildings; Glazed Terra Cotta in Downtown Portland, Portland, 1984.

Giedion, Sigfried, Space, Time and Architecture, Cambridge, 1954.

Hofmann, Jane R. "The Neighborhood in the Park; A History of Arlington Heights" (Photocopied Typescript) Portland, 1978.

Kaiser, Lawrence, S., "The Municipal Water System of Portland, Oregon; Historical, Descriptive, Statistical" (Mimeograph Copy of Typescript) Collection Multnomah County Library.

MacColl, E. Kimbark, The Growth of A City; Power and Politics in Portland, Oregon, 1915 to 1950, Portland, 1979.

MacColl, E. Kimbark, The Shaping of a City; Business and Politics in Portland, Oregon, 1885 to 1915, Portland, 1976.

Morey, P.F., Facts and Figures About Water Supply in Portland, Oregon, For the Consideration of Tax Payers and Consumers, Portland, 1885.

Oliver, Charles E., "History of the Water Bureau" (Undated Typescript - 1930s?) Collection City of Portland Water Bureau.

Oliver, Charles E., "The Portland Water Supply," Pacific Engineer, Vol IX, No 4 (April, 1930) p 3-6.

Oregon Historical Society, Photographs.

Oregonian (Portland) May 10, 1890, p 6; Sept. 20, 1894, p 10; Sept. 25, 1894, p 12; Jan. 1, 1895, p 16-19; July 31, 1904, p 12; March 18, 1906 ,p 15; July 13, 1906, p 11; July 22, 1906, p 10; Oct. 2, 1906, p 10; Oct. 8, 1906, p 12.

Peaslee Bros., Portland Illustrated Annual, 1894.

Placzek, Adolf K. Macmillan Encyclopedia of Architects, New York, 1982.

"Report of a Joint Committee of Councilmen and Citizens on Different Methods of Supplying the City of Portland with Water Presented to the Common Council Sept. 14th, 1872."

Report on the Water Committee of the City of Portland by the Committee on Other Commissions to the Committee of One Hundred, 1894.

Short, Casey, Water; Portland's Precious Heritage, Portland, 1983.

Smith, Isaac W., Specifications of Works for the Water Supply of the City of Portland, Oregon, Portland, 1886.

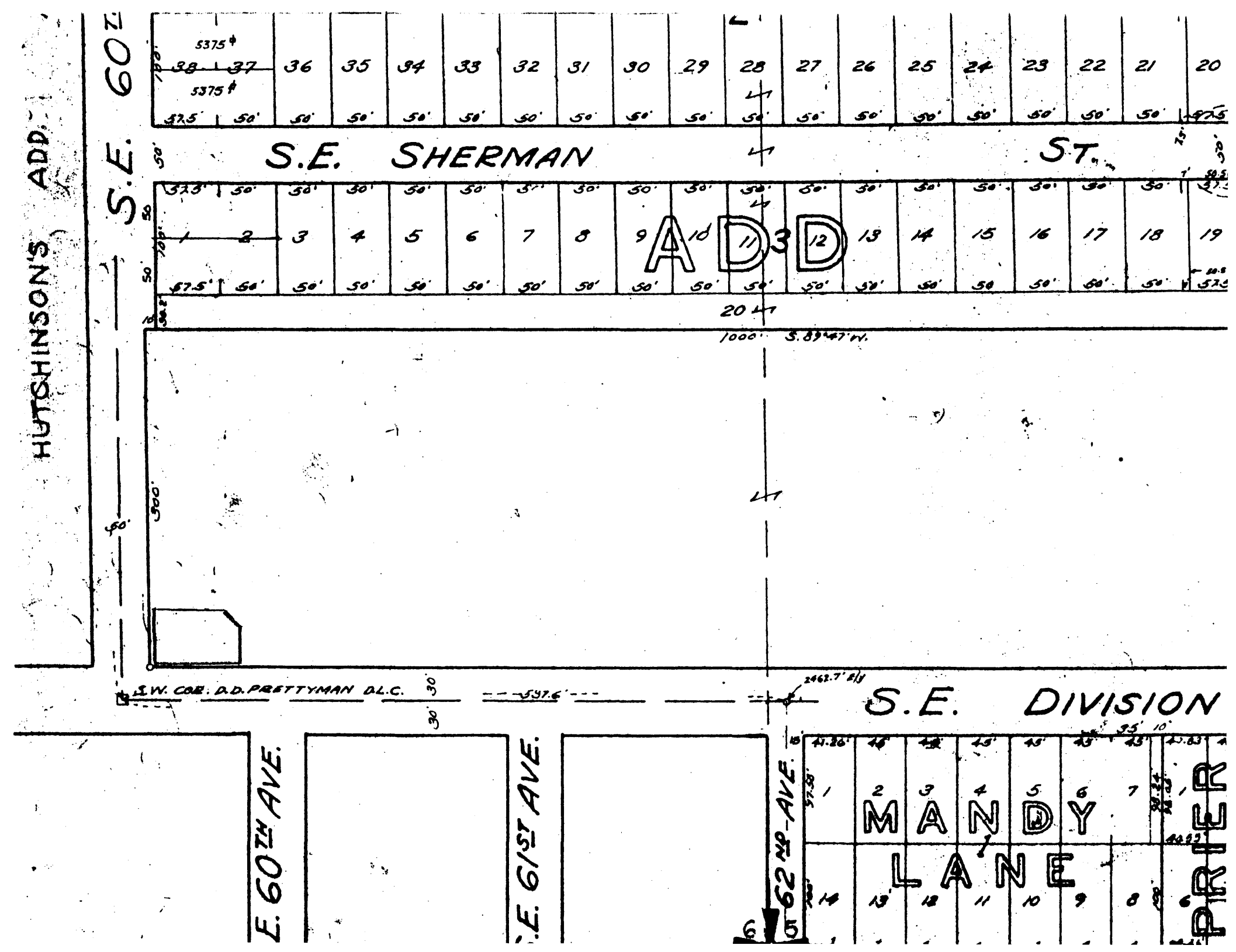
Water Board of the City of Portland, Oregon, "Water Department, Portland, Oregon; Notice to Contractors; Proposal and Specification for Reservoirs Nos. 5 and 6, Mt. Tabor; Portland, Oregon, 1909."

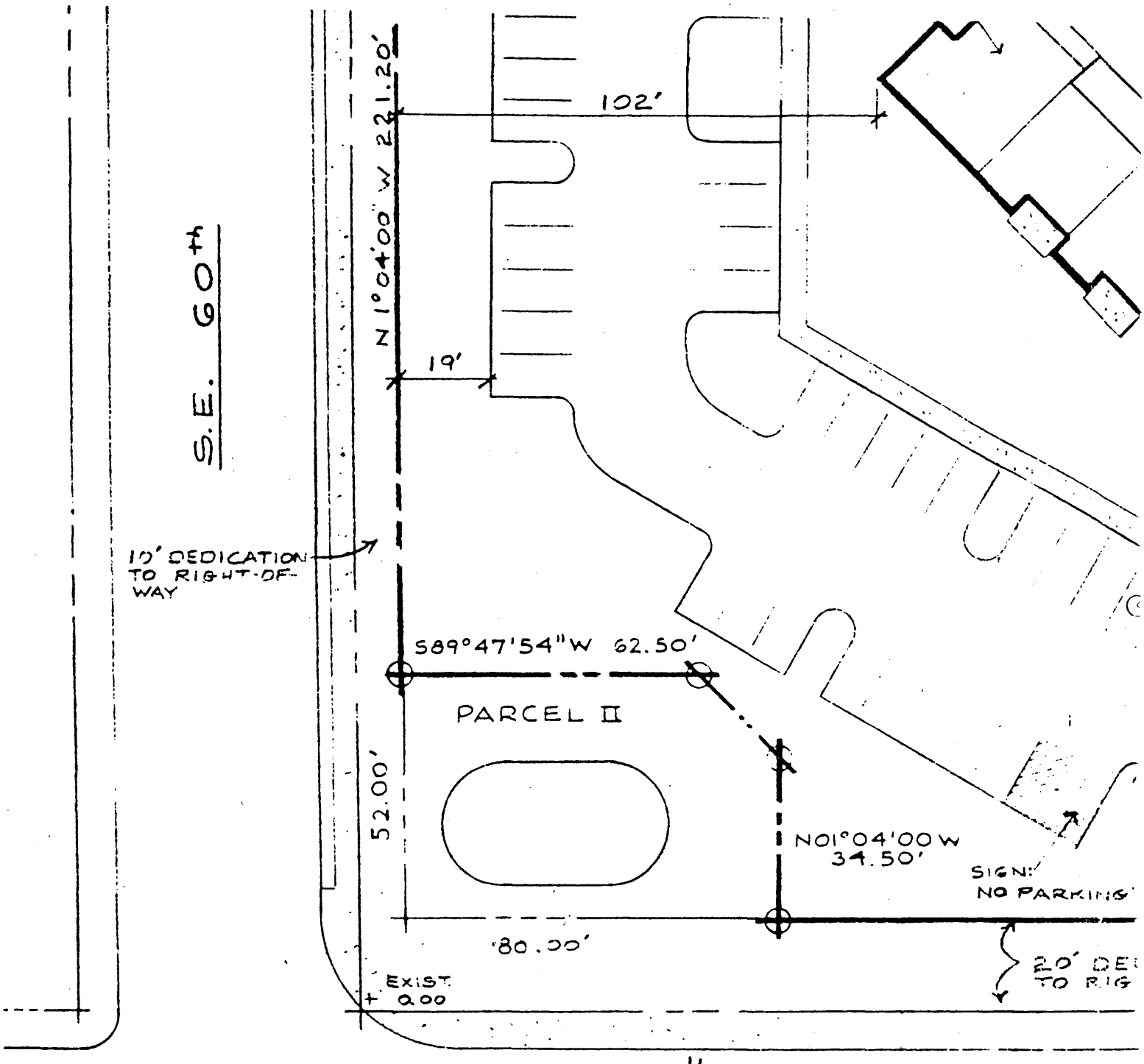
Willard, W.C., "Corporate History of Portland Water System," (Exerpts from Portland Water Works Bureau Report - no date) Collection Multnomah County Library.

A parcel of land within the Southeast Quarter of Section 6, Township 1 South, Range 2 East, Willamette Meridian, Multnomah County, Oregon:
Commencing at the southwest corner of the D.D. Prettyman Donation Land Claim (D.L.C.); thence North 01.04'00" West 102.00 feet along the west line of the D.D. Prettyman D.L.C.; thence North 89.47'54" East 35.00 feet to the true Point of Beginning.
From said Point of Beginning North 89.47'54" East 62.50 feet; thence South 45.38'03" East 24.94 feet; thence South 01.04'00" East 34.5 feet to the north right-of-way line of S.E. Division Street South 89.47'54" West 80.00 feet to the east right-of-way line of S.E. 60th Avenue; thence North 01.04'00" West 52.00 feet to the Point of Beginning.
The basis of bearings for the above legal description being the bearing of the west line of the D.D. Prettyman D.L.C. as shown on the recorded plat of MITTLEMAN ADDITION, Multnomah County, Oregon, and on survey number 50476 filed June 6, 1988 in the Multnomah County Survey Records.
The parcel described above contains 4,006 square feet (0.092 acres), more or less.

The nominated area consists of the Gatehouse, the stairs leading up to it from the sidewalk at S.E. 60th and Division, the portion of the rusticated stone wall which surrounds the south and west side of the site and the portion of the surrounding brick wall with chain link fencing contained on the south and west side of the site.

The Gatehouse addresses the intersection of S.E. 60th and Division Street. The view of the front of the structure, up above the street, would be maintained with this site boundary. The Gatehouse, the small lawn in front, the brick piers and iron fencing, and the rusticated stone wall would be viewed from the street as they were in the late 1890's.


HUTCHINSON'S ADD.
S.E. 60TH
S.E. SHERMAN ST.
ADD
1000' S.89°47'W.
SW. COR. D.D. PRETTYMAN D.L.C.
597.6
2462.7' S/y
S.E. DIVISION
E. 60TH AVE.
S.E. 61ST AVE.
62ND AVE.
MANDY LANE
PRICE



Scale = 1" = 30'

S.E. DIVISION ST.