NPS Form 10-900a
(8-86)

OMB No. 1024-0018

United States Department of the Interior
National Park Service

NATIONAL REGISTER OF HISTORIC PLACES CONTINUATION SHEET

Section _____ Page ___

SUPPLEMENTARY LISTING RECORD

NRIS Reference Number: 03001446 Date Listed: 1/15/2004

Mount Tabor Park Reservoirs Historic District	Multnomah	OR
Property Name	County	State

N/A
Multiple Name

This property is listed in the National Register of Historic Places in accordance with the attached nomination documentation subject to the following exceptions, exclusions, or amendments, notwithstanding the National Park Service certification included in the nomination documentation.

Signature of the Keeper	Date of Action

Amended Items in Nomination:

Functions:

The Historic and Current Functions are amended to add: *Industry/Processing-Waterworks*

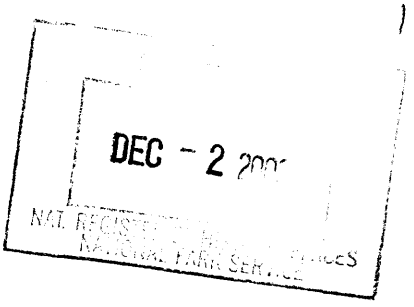
These clarifications were confirmed with the OR SHPO office.

DISTRIBUTION:
National Register property file
Nominating Authority (without nomination attachment)

1440

NPS Form 10-900
(Rev. 10-90)

OMB No. 1024-0018



United States Department of the Interior
National Park Service

NATIONAL REGISTER OF HISTORIC PLACES
REGISTRATION FORM

This form is for use in nominating or requesting determinations for individual properties and districts. See instructions in How to Complete the National Register of Historic Places Registration Form (National Register Bulletin 16A). Complete each item by marking "x" in the appropriate box or by entering the information requested. If any item does not apply to the property being documented, enter "N/A" for "not applicable." For functions, architectural classification, materials, and areas of significance, enter only categories and subcategories from the instructions. Place additional entries and narrative items on continuation sheets (NPS Form 10-900a). Use a typewriter, word processor, or computer, to complete all items.

1. Name of Property

name Mount Tabor Park Reservoirs Historic District
other names/site number Mount Tabor Park Reservoirs 1,5 and 6

2. Location

street & number 1 1900 SE Reservoir Loop
5 6445 SE Salmon St
6 1600 SE 60th Ave. not for publication ___
city or town Portland vicinity X
state Oregon code OR county Multnomah code 051
zip code 97215

3. State/Federal Agency Certification

As the designated authority under the National Historic Preservation Act of 1986, 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. I recommend that this property be considered significant ___ nationally ___ statewide X locally. (___ See continuation sheet for additional comments.)

James Hamrick 19 November 2003
Signature of certifying official / Deputy SHPO Date November 19, 2003

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 for additional comments.)

Signature of commenting or other official Date

State or Federal agency and bureau

4. National Park Service Certification

I, hereby certify that this property is:

✓ entered in the National Register 1/15/04
___ See continuation sheet.
____ 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 Keeper Date of Action

5. Classification

Ownership of Property (Check as many boxes as apply)
___ private
X public-local
___ public-State
___ public-Federal

Category of Property (Check only one box)
___ building(s)
X district
___ site
___structure
___ object

Number of Resources within Property

Contributing	Noncontributing	
7	2	buildings
____	___	sites
4	1	structures
1	__	objects
12	3	Total

Number of contributing resources previously listed in the National Register -0-

6. Function or Use

Historic Functions (Enter categories from instructions)
Cat: Government Sub: public works

Narrative Description

Reservoir 1, built in 1894, and Reservoirs 5 and 6, built in 1911, are located in 196-acre Mount Tabor Park in southeast Portland. The reservoirs, along with Reservoirs 3 and 4 in Washington Park located six miles due west across the Willamette River in Portland's west hills, provide storage and delivery of Portland's water in a gravity fed system from the Bull Run watershed in the Cascade Mountains east of the city. This system is little changed since its construction in the 1890s and still provides most of Portland with its water supply. Mount Tabor Reservoir 2, also built in 1894, was taken off line and sold in 1990 to a developer. Mitigation required retention of Gatehouse 2, sold to a private individual. An Historic American Engineering Record report was completed along with its acceptance to the National Register of Historic Places.

The Mount Tabor Reservoirs Historic District nomination consists of fifteen resources: seven contributing buildings (Gatehouse 1, Gatehouse 5, Inlet Gatehouse 6, Outlet Gatehouse 6, Weir Building 1, Weir Building 5, Covered Storage Tank Building), four contributing structures (three basins with their parapet walls, fences, lampposts and walkways, Covered Storage Tank), one contributing object (fountain at Reservoir 1), two non-contributing buildings (Out Building 5, Chlorination Building 6), and one non-contributing structure (Pump Station between Reservoirs 5 and 6).

Mount Tabor is one of numerous small volcanic buttes stretching between the foothills of the Cascades to the east and the northern Willamette Basin to the west. It is one of two volcanoes located within the limits of a city in the United States. (The other being in Bend, Oregon.) Mount Tabor is double-crested with an elevation of 640 feet. It was apparently not identified as volcanic by the white settlers until after the site was chosen for its elevation and location for the reservoirs in the 1880's. The Water Committee encouraged the taking of the land by the city of Portland. In 1909, when plans were made for a new pipeline from Bull Run, the land was obtained for the creation of Reservoirs 5 and 6 and land was also purchased for the park. Presently, Mount Tabor Park is a green island amidst a prime residential area in southeast Portland and is a major Portland landmark visible from all directions. Reservoirs 1, 5 and 6 are located on the south, higher west and lower west sides of the hill, respectively. Predominantly forested, the area around the basins of the reservoirs has been kept clear of trees with the use of grass and other groundcovers, so that the reservoirs and the deep water they hold afford vistas areas of the city framed with the surrounding towering evergreen and deciduous forest.

The Mount Tabor parkland provides tennis, picnicking, playgrounds, bicycling, a soapbox derby track, horseshoe pits but is most popular for walking and jogging. The original design of the park, as developed by Emanuel T. Mische, a former employee of the Olmsted firm who was retained as Portland's park superintendent from 1908 to 1915, included a series of curvilinear roadways and paths through a predominant forested parkland highlighting views of the city and the reservoirs. Since the 1970s, the Reservoir Loop Drive has been closed to public vehicular traffic making Mount Tabor Park a prime location for pedestrian and wheeled recreation, especially the walkways around the reservoirs, which are favorite areas for pedestrians, providing lighted access in early mornings and evenings. Grassy areas around the reservoirs provide informal picnic and lounging opportunities with good views to the north, south, and west. Each reservoir, with its deep, open water and individual design and location, provides a different feeling.

The Romanesque tower-styled Gatehouses, associated buildings, basins, and parapet walls of all of the reservoirs are of reinforced concrete. The Gatehouses and Weir Buildings were constructed of poured form concrete with the appearance of stone blocks made possible by wooden forms. The parapet walls are topped with decorative wrought iron fencing. Though harmonious, differences in style details exist between the 1894 and 1911 gatehouses and fences. All of the resources are in good to excellent condition with the primary alterations consisting of electrical conduits attached to the parapet walls and buildings and modern lighting that encircles the basins.

Originally water was delivered to Reservoir 1 by one main riveted steel conduit. Presently, water is delivered to Reservoir 1 via two main conduits. A third conduit can also feed Reservoir 1, but is commonly bypassed to go directly to Reservoir 5. Two pipes leave Reservoir 1 at the northwest corner of the basin through sluice gates traveling through a tunnel to emerge into the southeast section of Reservoir 5. Built at the same elevation as Reservoir 1, Reservoir 5 can work in tandem with Reservoir 1 via piping through the tunnel system. Two main conduits and two lines from Reservoir 1 feed directly into Reservoir 5 via the Reservoir 1 Gatehouse and the Reservoir 5 Weir Building. Reservoir 5 feeds Reservoir 6 through gravity piping in a tunnel extending to a buried pump house located halfway down the hill between Reservoir 5 and 6. This pump house supplies water to a covered storage tank, a smaller concrete cistern near the summit of Mount Tabor. Water leaves Reservoir 1 through the Gatehouse via pipeline to Southeast 68th Avenue and the Vernon area and pipeline to Reservoir 3 in Washington Park southwest Portland. Water leaves Reservoir 5 via three routes through the Gatehouse, a supply line to Vernon in N.E. Portland, a line to Reservoir 6, and a drain line. These lines serve the Southeast Hawthorne and Southeast Lincoln Street areas. Washdown piping is routed around the reservoirs and is discharged through a drain line in the gatehouses. Drainage for all the reservoirs is connected to the city sewer line.

Reservoir 1, is smallest and tucked into a ravine, provides an intimate experience with the deeply-hued water, forest, and romantic Gatehouse and Weir Building. Views south are possible from the top of the stairs descending the dam face. Reservoir 5, centrally located and with a variety of paths and service roads passing by, affords grand views across the water of the western cityscape, the expanse of the Forest Park's western hill line from the city stretching thirteen miles to the north, and a sweeping expanse of northwest, southeast and northeast Portland, including all of the city's most famous landmarks. Because of access by the main Salmon Street park entrance, Reservoir 5 is a key meeting place in Mount Tabor Park and the Gatehouse can be seen from across the Willamette River while traveling east up Hawthorne Boulevard. In darkness, the lights encircling the basin of Reservoir 5 are visible from across the city. Reservoir 6 is the lowest, largest, and most accessible reservoir in the system. The six tenths of a mile walkway around the reservoir is one of the most noted areas for jogging, walking, and stroller pushing and is used by a number of schools for athletic training. Reservoir 6 provides views from all directions of a large expanse of deep water with the reflected Gatehouses. Trails above Reservoir 6 and up the hundred stairs that climb between Reservoir 5 and 6, provide grand vistas of the city and the surrounding neighborhood. All of the lighted basins, with reflection in the deep water of the reservoirs, provide inspirational evening views for park users. Altogether, the reservoirs offer close to 20 acres of deep open water views.

RESERVOIR 1

Reservoir 1, built in 1894, predates Mount Tabor Park by fifteen years. The construction of this first reservoir coincided with construction of the Bull Run system and Reservoirs 2, 3 and 4. Reservoir 1, on the southern flank of Mount Tabor, sits in an excavated hillside, at an approximate elevation of 411.6 feet above the low water level of the Willamette River. The original site purchased was about 3.5 acres with the reservoir basin encompassing 1.63 acres. Access to the reservoir is gained by foot from the intersection of Reservoir Loop Drive with Water Bureau Road from the northwest or from the south on Southeast Lincoln Street up a flight of 50 stairs. The reservoir is comprised of a basin, dam, parapet wall with wrought iron fence, a concrete walkway, Gatehouse, Weir Building, inlet waterfall, spring fed fountain, and several small outbuildings. Plantings around Reservoir 1 include ivy and blackberries on the surrounding embankments, fir, cedar, and deciduous trees and some ornamental shrubbery on the dam in front of the Gatehouse, referred to as the Terrace Garden in the preliminary plan for the park published in 1911, and along the walkway to the Weir Building. Reservoir 1 has an intimate feel, being substantially smaller than the other reservoirs and tucked into a ravine. North of the basin is a mowed, grassy area with mature big leaf maples flanked by one of the main trails up to the top of the butte. This area provides a grand view of Reservoir 1 including the Gatehouse and Weir Building. Other views exist from the trail paralleling the Reservoir Loop Drive, from Water Bureau Road and Reservoir Loop Drive west of the basin, from the Gatehouse and Weir House areas, and from the walkway encircling the basin. The north and west accesses also provide views of Reservoir 5. A defining feature of the natural amphitheater that the Reservoir sits in is the water sounds that are afforded by the waterfall entering the southwest side of the basin adjacent to the Weir Building.

Contributing buildings, structures, and objects

Basin and Accompanying Features

The basin was formed by a natural ravine, excavated and built so that the sides could conform, with minor modifications, to the existing slopes with an approximate slope of 1:1. A 319-foot long dam, 20 feet thick at its base, 6 feet thick at its top and backed by earth and rock to a thickness of about 100 feet, forms the south face of the reservoir basin, and is topped by an outlet Gatehouse. At the west end of the dam, a concrete Weir house is constructed. The top of the dam retains the park-like features of a mature formal-style landscape composed of shrubs and walkways. Concrete stairs with an iron handrail climb the grassy dam face from the roadway below, arriving at the Gatehouse and landscaped area. Looking to the south from the top of the dam at the Gatehouse provides a view of southeast Portland. The basin is constructed of cast in place reinforced concrete using the Ransome system of twisted iron bars placed ten feet on center in each direction and anchored at 10 foot intervals by iron anchors driven to a depth of 3 to 20 feet into the slopes and embedded in concrete. The thimble shaped basin is 250 feet wide east and west at the southern end with a parabolic curve to the north. At its longest point, it is 350 feet north and south. It has a water storage capacity of 12-14 million gallons. Water depth is up to 33 feet, making it the third deepest reservoir in the system. The basin of Reservoir 1 appears to be original with spalling and cracking. It could benefit from resurfacing but is still functional and in satisfactory condition.

Surrounding the basin is a parapet wall with raised diamond motifs set in recessed panels along the front, south-facing side. A wrought iron fence encircling the basin atop the parapet wall is made up of 1-inch square uprights about 6 feet high, with tops hammered into spear shapes. Double-scrolls are screwed on to secure the uprights to cross bars. Every other bar is approximately 4 inches taller and on these bars are two 3-inch hammered leaves. These are forged opposite of each other from two sides of the metal bar. At approximately twelve-foot intervals are taller bars. These have ball decorations below spear-shaped tops and are braced against the parapet with curved iron bars on the waterside of the wall. The fences for Reservoirs 1, 3, and 4 were identical and were designed by prominent architects, Whidden and Lewis, who went on to design Portland City Hall. The wrought iron work was done by a celebrated local craftsman, Johan Trueck. Like the basin, the parapet wall has spalling and cracking, but is sound and in relatively good condition. The fence is sound but is in need of refinishing.

Around the basin is a concrete walkway designed to afford "a delightful promenade" for visitors. Modern brushed aluminum street lamps with conical shades have been installed surrounding the walk. They provide lighting for pedestrians and the security cameras. Adjacent to the path is a culvert with catch basin which provides for site drainage. The walkway needs some concrete repair but it, too, is in relatively good condition.

Fountain

At the north end of the reservoir is a small, apparently spring fed, concrete fountain. Set into the hillside on top of the short concrete retaining wall that encircles the reservoir, the basin about 1 foot in diameter and 8 inches deep sits in an arched niche facing the reservoir. The date "1894" is inscribed on the modestly decorated arch. A small wrought iron step to the fountain imbedded in the concrete, allowed a perch above the drainage culvert affording access to the water basin. Below the step, an small overflow pipe emerges. A small wrought iron hook, probably installed for holding a drinking cup, is found in the concrete on the top of the arch in the left corner. Surrounding plants include horsetail, *Equisetum sp.* and rushes *Juncus sp.*, both native plants indicative of water seepage. Although cracked in places and in need of concrete repair, the fountain is functional and in satisfactory condition.

Gatehouse

The Gatehouse is located in the middle of the dam at the south end of the basin facing south. Romanesque in style, the oval shaped building is faced in rusticated reinforced concrete with a flat slightly projecting roof. Although made from poured form concrete, the wall surface gives the impression of rock due to wooden formwork constructed to give the concrete outlines of stone blocks. The concrete surface was bush-hammered and tooled as if it were natural stone. On each side of the south facing door are two "blocks" giving patent numbers for the concrete construction: Ransome's Patent Construction 305229 and Ransome's Patent Concrete Finish 105800.

The Gatehouse has a pronounced water table and double hung wood-sash round arch windows, four over four, with rusticated concrete sill and surround. Metal screens were installed over the windows in the 1980s. The building has a double door on the south, accessed via a five-step concrete stairway. This door is similar in

design to the windows with a wood sash fanlight and rusticated concrete surround; the original wood paneled doors were replaced in 1987 with metal doors. To the west of the door there's a decorative wrought iron vent built into the south face of the building. Below its slightly projecting roof slab is a paneled frieze, and below that a corbelled band. On the north elevation of the gatehouse is a platform with original valves. The north elevation of the Gatehouse has an exterior steel access platform for the sluice gate operator.

The interior of the Gatehouse is in original condition. Original equipment includes; tanks, gauges, piping, cranks, valves, sluice gates, etc. Though not all of it is still functional, all of the equipment is original. Repair is needed in some places where bits of the reinforcing metal bars have been exposed. Some cracking on the outside of the building is visible but the Gatehouse is sound and in good condition.

Weir Building

At the southwest corner of the basin is a Weir Building (now referred to as the inlet chamber), built in 1923. Stylistically similar, the building blends into the setting. Rectangular in form, its concrete cornice and wall treatments are similar to those of the 1894 Gatehouse. Windows are square-headed, with six-over-six, double hung sash. Originally this building functioned as the inlet chamber or screening room to remove debris from water delivered from Powell Butte. The screens were dismantled and removed in the 1930s. Reservoir 1's Weir Building is in good condition with some repair needed where the reinforcing metal bars are exposed through the concrete.

Though little maintenance has been done on the Reservoir 1 site construction work is sound and maintenance reports from 2002 list the resource in good condition.

RESERVOIR 5

Located north and west of Reservoir 1, Reservoir 5 is comprised of a basin, dam, parapet wall with decorative wrought iron fence, a concrete walkway, Gatehouse, Weir Building (now the hypochlorite building), and inlet waterfall. A non-historic outbuilding is also associated with Reservoir 5. Built at the same elevation, a tunnel was constructed between Reservoir 5 and Reservoir 1 so that they could work as one reservoir since this elevation was considered the most useful for delivery by the gravity system. The Gatehouse is found at the center of the west end on top of the dam, with an access drive from the western foot of Mount Tabor via Southeast Salmon Street and Reservoir Loop Drive. This drive is open to the public for foot traffic and official city vehicular access. The loop roadway on the dam is a popular spot for park users who linger on the steps of the Gatehouse for views of the sunset and the city. The loop road travels along the west side of the reservoir encircling the hillside to the south of the site and then arrives above the east side. From the loop, the soapbox derby track that parallels the loop road and the trail that climbs to the top of the hill opposite Reservoir 5, picturesque views are afforded across the reservoir with the Gatehouse reflected in the water overlooking the city. The Reservoir Loop Drive was constructed to highlight vistas afforded across the deep water of the reservoirs. Water sounds are created by the inlet waterfall on the southwest side of the reservoir adjacent to the Weir Building. Plantings on the slopes to the north, east and south include large fir trees, flowering cherries, ground cover and several varieties of shrubbery arranged in naturalistic groupings. On the

grassy western aspect, many people congregate on the grassy walls above the basin to enjoy the views, the water sounds, and the sunshine. A bench has been recently constructed above the loop road to accommodate the grand vistas of the city skyline across the reservoir.

Contributing buildings, structures, and objects at Reservoir 5

Basin and accompanying features

The basin of Reservoir 5 was formed by excavation of a natural shoulder on the western flank of Mount Tabor. The other sides were built to conform, with some modifications, to the existing slopes. The basin's dimensions were designed to use as much of the area as possible as this elevation was deemed to be the most useful for water delivery throughout the city. The kidney shaped reservoir basin is 460 feet east and west, and 750 feet north and south. The six-acre reservoir basin has a water storage capacity of 49 million gallons at a depth of 31 feet. A straight-line 362-foot long wall of reinforced concrete backed by earth and rock forms the west dam face of the basin. The earth was acquired from the excavation of the basin. It was estimated that over 210,000 cubic yards of earth were to be removed, but only 30,000 necessary for the dam. Park Superintendent, Emanuel T. Mische, agreed that some of the surplus material could possibly be used in the construction of the roads in the newly acquired park. Surplus earth was deposited on the slope of the hill between the sites of Reservoir 5 and 6, making it steep. Park plans included using the incline in a grand scheme of cascading waterfalls between the high and low service reservoirs to provide aeration of the water, hydroelectric generating power, and a park amenity. An open waterfall was never realized, however, at present a hydroelectric facility does generate power and a steep set of over one hundred stairs climbs the dam face dissecting the chain link fence that the Water Bureau erected in the mid-1990s. The dam is topped with the Reservoir Loop Drive, now closed to public vehicular traffic. At the north end, a locked gate limits vehicle access from the main Southeast Salmon Street entrance that becomes the Reservoir Loop Drive, that winds on up into the park. The Gatehouse sits in the middle of the dam facing west. The basin was constructed of cast-in-place concrete panels with caulked joints and "waterproofed concrete." This lining was prone to leaks and as early as 1914 its joints were overlaid with burlap and asphalt. In 1998 it was lined with a Hypalon membrane. Studies on the basin before the installation of the liner showed the original construction to be sound with leaking primarily at the joints between panels.

Surrounding the basin is a concrete parapet wall topped by a wrought iron fence made up of one-inch square uprights with tops hammered into spear shapes. Uprights are of alternating heights. Double scrolls secure the uprights to the crossbars. Newel posts are composed of one-inch square iron bars and connected by variously scrolled ironwork. The posts are now topped by large iron balls but originally served as pedestals for lampposts, identical to the ones on Reservoir 6. The wrought iron light posts and fixtures reportedly are stored in the Gatehouse. The fence is similar in design to the wrought iron fence encircling Reservoir 1 without the forged leaves on each upright. At the time of the liner installation in 1998, the fence was removed, sandblasted and refinished with epoxy and polyurethane. Lighting today is provided by contemporary rectangular lighting standards installed in 1987. Though not of the historic period, they do provide the light that was originally designed to make the reservoir accessible at dawn and evenings and their reflection in the deep water, with the city skyline as a backdrop, is a defining feature of Mount Tabor Park. The ring of lights,

halfway up the Mount Tabor butte is also visible from across the city and is a Portland landmark. Surrounding the basin is a concrete walkway designed for pedestrian access and to carry storm water away from the reservoir. The parapet wall is in good to excellent condition. The fence is in excellent condition though the wrought iron lampposts should be reinstated. The walkway is in good condition.

Gatehouse

The Romanesque tower-style Gatehouse is oval in shape, faced in rusticated reinforced concrete with a corbelled crenellated parapet. The wooden forms used were designed to mimic stone block construction as in all of the other gatehouses. Original plans show the finish was to be bush hammered to match the earlier reservoirs, but this was never carried out. It has a pronounced concrete water table. Windows are double hung wood-sash arched windows, four over four, with projecting concrete sill and surround. Metal screens were added to the windows in the 1970s. The building has a double door on the south, accessed via a five-step concrete stairway. This door is similar in design to the windows with a wood sash fanlight and concrete surround; the original wood paneled doors themselves however were replaced in 1987 with metal doors. Five concrete steps provide access to the building.

The interior of the Gatehouse is in nearly original condition. It holds original overflow piping, tanks, sluice gates, valves, drains piping, supply and distribution piping, and a weir. It also contains newer equipment, office and restroom. The Gatehouse is in good condition.

Weir Building

To the south of the Gatehouse on the southwest edge of the basin is the 1951 Weir Building (Hypochlorite Building.) It is sympathetic in design and materials, and similar if less elegant than the original Gatehouse. The rectangular building is constructed of poured concrete shaped to appear as stone with simulated stone quoins. The crenellated parapet contributes to the overall Romanesque style and it is nearly identical to the rectangular Gatehouses at Reservoir 6. Windows are four over four double-hung wood sash. Metal screens were added to the windows in the 1970s. Various kinds of mechanical equipment protrude from the roof parapet and the north elevation. In 1994, hypochlorite equipment for secondary disinfection was installed. The Weir Building now functions as a booster hypochlorite facility which can provide sodium hypochlorite to outlets and inlets of all three reservoirs. This facility also provides hypochlorite to Reservoir 3 in Washington Park. The interior of the building holds no known historic equipment. A generator is located in this building. The Weir Building is in good to excellent condition.

Non-contributing Buildings/Structures at Reservoir 5

Out Building

A small rectangular concrete non-historic building is located at the northwest end of the Reservoir 5 basin. It is set back into a concrete block retaining wall built into the south facing slope of the basin. There's a metal door on the south elevation and a vented window on the west elevation. There is a slight overhang to the flat roof.

RESERVOIR 6

Reservoir 6 is located in Mount Tabor Park on the west slope, approximately at an elevation of 305 feet above the low water level of the Willamette River. Completed in 1911, Reservoir 6 was built west of and with a 100 foot drop directly below Reservoir 5. Reservoir 6 is comprised of a basin with surrounding parapet wall, wrought iron fence, concrete walkway, two Gatehouses, and a small non-historic outbuilding. Access to Reservoir 6 is via paths off Southeast 60th Avenue, various trails within the Park, or a series of one hundred concrete steps between Reservoir 5 and 6, originally designed to be a hydroelectric generating waterfall. Surrounding landscape is primarily manicured lawn with mature Lombardy poplars, a mature hawthorn grove, and a towering sequoia on the east side. Private residences border the reservoir on the north and south sides. A row of mature conifers is planted on the western dam face above Southeast 60th Avenue. A tennis court, built in the northeast corner above the basin, overlooks the reservoir to the south. The north and south property adjoins the backyards of residential homes on Southeast Stephens Street and Southeast Main Street. The area encompassing Reservoir 6 is one of the most popular in Mount Tabor Park. Being the lowest reservoir site with adequate lighting and walkway, it attracts many park users of various ages and abilities. Because of the large expansive view of open water and the attractive Gatehouses, Reservoir 6 provides magnificent scenic vistas into and out of the park. The view looking west from Reservoir 5 above provides a unique view of the historic Mount Tabor neighborhood and the city of Portland skyline.

Basin and accompanying features

The basin is rectangular in shape, 600 feet east and west, and 875 feet north and south divided by a concrete wall into two 22-foot deep cells making it possible to use one side at a time. The twelve-acre reservoir has a capacity of 75 million gallons. Unlike Reservoirs 1, 3, 4 and 5, Reservoir 6 was not located in a natural ravine. Its site originally sloped fairly evenly from east to west. Earth excavated from the eastern portion and basin was used to create berms along the western side. The outer slopes were to be of a "moderate angle" so that they could be properly treated as part of the park landscape. The grassy slopes of the dam drop down to the sidewalk along Southeast 60th Avenue.

The basin is lined with concrete poured in place in 15 by 20 foot sections. Concrete beams were run underneath the joints between the sections. The basin is currently lined with asphalt. Water jets that can send a fountain of water up to 75 feet high were located in the center of each half of the basin originally intended for the aeration of the water and beauty. According to reports the north fountain was dismantled in 1997. Typically, only one of the two cells is in operation at a time, though water can be stored above the center wall giving the appearance of one entire reservoir. Reportedly the basin is good condition with some cracking. The original dividing wall also has some cracking but is in good condition.

Encircling the basin, the original concrete parapet wall is topped by an original ornamental wrought iron fence. The fence design is identical to that of Reservoir 5. Iron bars of alternating heights, with their tops hammered into spear shapes are attached to cross bars by double-scrolled iron bars. Newel posts are composed of one-inch square iron bars and connected by variously scrolled ironwork. Some newel posts are topped by iron balls. Others serve as pedestals for lampposts that encircled the reservoir. The lampposts are

also made up of scrolled bars. Arms for two glass globes extend from an iron ball at the top of this standard. There are presently no globes in place. Lighting is provided instead by contemporary lampposts installed to completely encircle the basin in 1987. As is true for Reservoir 5 and Reservoir 1, the modern lamps do not add to the period architectural features, but they do serve the original purpose of making the walkways accessible for dawn and evening visitors as well as providing lighting for the security cameras. They add an element of beauty with their light reflecting in the deep water of the reservoir. The parapet wall, fence and walkway are in good condition, though refurbishing is warranted.

Inlet and Outlet Gatehouses

At opposite ends of the wall running across the basin are two nearly identical poured form, reinforced concrete structures, an Inlet Gatehouse to the east and an Outlet Gatehouse on the west. The Inlet Gatehouse, painted white at some unknown time, was designed to accommodate a small hydroelectric turbine and is slightly larger than the Outlet Gatehouse. Electricty can be marketed from this facility and it can be used as backup power to the pump stationand other needs in case of a power-outage. Original plans show the finish was to be bush-hammered to match the earlier reservoirs, but this was never carried out. The upper portions of the wall are corbelled below the crenellated parapet. Windows are wood, square-headed, with four over four, double-hung sash. The original plank doors with wrought iron hinges are in place at the inlet Gatehouse on the east. Those on the west Gatehouse have been replaced with metal doors. The interior of the Gatehouses contains original valves, sluice gate, piping, flap valves, and overflow piping. Both Gatehouses have exterior steel access platforms for the sluice gate operators. Water enters the Inlet Gatehouse providing power to the small hydroelectric facility. Water is delivered directly to the distribution system via pipes on each side of the Reservoir. Hosebibs are located around the perimeter of the basin for washdown.

The Gatehouses are in good condition with some cracking and spalling of the concrete. Some metal features need repair.

Non-contributing Buildings/Structures at Reservoir 6

Chlorination House

A small concrete non-historic Chlorination House is located east of the Inlet Gatehouse at Reservoir 6. This rectangular building has a flat roof with a wide overhang on the west elevation and smaller overhangs on the other 3 elevations. A metal door accesses the north elevation. The north, west, and south elevations have long, linear rectangular windows with decorative metal grates. The west elevation has an access entry built like a window with double hung hinged doors.

Mount Tabor Pump Station

Located between Reservoirs 5 and 6 along the route of the hundred steps that climb between Reservoir 5 and 6 is the Mount Tabor Pump Station, a small metal unit on a concrete slab. Water from Reservoir 5 arrives at the pump station via gravity and the electric pump delivers water to a variety of locations in the system, including the covered storage tank on the north side of Mount Tabor.

Discontiguous Contributing Features

Included in the period of significance and associated with the Mount Tabor Reservoirs Historic District is another small "reservoir" and its associated building.[2] Constructed in 1912, conflicting information exists regarding the use of this tank and building. Discontiguous from the other resources, it is located near the peak of Mount Tabor on the northern slope at an elevation of about 590 feet. It is situated on the main east side path to the northwest of the steps to the summit of the butte.

Tank
The site includes a circular in-ground concrete tank with a concrete top. Another smaller circular concrete cap is attached to the large top on the north end of the structure giving the appearance of an "8" to the top of the structure. On the south end of the cap is a concrete rectangular structure.

Building
A small flat-topped, irregular-sided concrete building, painted green, is set into the north-facing hillside a few steps south of the tank. A romantic style is achieved with the round arched doorway and its matching wood plank door that provides access to the building on the north elevation. Other decorative features include the basalt block cornice. The side elevations have square wood framed vents. These are covered with iron grilles. This building reportedly contains irrigation equipment for the park.

Details regarding the covered storage tank are sketchy. In an accounting from a 1913 parks report an electric pump plant was being installed at the reservoir for delivering water to the attic tank in the residence on top of Mount Tabor, now demolished, which had been converted to a public comfort station. Water Bureau personnel currently report that there is no pump at the storage tank, as water is distributed by gravity. Some reports list its function as a tank for the park's irrigations system holding 200,000 gallons of water. A more recent accounting by Water Bureau personnel confirm construction in 1912 and suggest that this is a reservoir serving approximately 850 water customers at the highest elevation in the Mount Tabor neighborhood. According to this report, water is delivered to the storage tank through a 12-inch pipe from the pump station located at the base of Reservoir 5, east and above Reservoir 6. The water is pumped from the outlet line that comes from Reservoir 5. A 12-inch pipe heads east from the storage tank to Southeast 71st Avenue, and an 8-inch pipe heads north from the tank to Southeast Yamhill Street to feed the distribution system. The building and tank are in good condition with little apparent modification.

Associated Landscaping at Mount Tabor Reservoirs Historic District

Striking vistas of the city skyline and west hills over the large bodies of deep, sparkling water are the most defining landscape characteristic of Mount Tabor Reservoirs 5 and 6. Reservoir 1, located in a steeper basin, has a more intimate feel with the towering coniferous forest reflected in the deep water. After dark, pleasing views of reflected lights in the waters of the reservoirs are afforded. Generally, low maintenance landscape with some mowed lawn, ivy, blackberry, and other low shrubby plants growing on the steep sides of the basins predominate at the site Reservoirs 1 and 5. Reservoir 6, without the ravine setting, is surrounded by

mowed areas. Mature trees and shrubs requiring little care occupy areas away from the basins. The discontiguous covered storage tank is located along the concrete steps that ascend the summit through a mowed, forested area.

Reservoir 1 has remnants of a formal garden called the Terrace Garden on the 1912 map of Mount Tabor Park. Mature shrubs and trees, among them, *Rhododendron spp.*, witch hazel *Hamamelis virginiana, Cotoneasters.spp.*, cypress *Chamaecyparis spp.*, juniper *Juniperis media pfitzeriana* and red cedar *Thuja spp.*, run east and west across the dam face south of the Gatehouse. The steep basin walls are predominantly covered with English ivy *Hedera helix.* To the east and west of the basin native forest of Douglas fir *Pseudotsuga menzeisii* and big leaf maple *Acer macrophyllum* are most common. On the inside of the Water Bureau Road, on the west ridge above the basin, a row of California bay laurel, also called Oregon myrtle, *Umbellularia californica*, are planted amidst ivy. To the north is a groomed grassy hillside with a few mature big leaf maple trees. This area provides good southerly views overlooking the reservoir and the southeast portion of the city.

Encircling the basin at Reservoir 5, Himalayan blackberry *Rubus discolor* (syn. *Procerus*) and English ivy *Hedera helix* predominate. To the north of Reservoir 5, behind the unnamed building, star magnolias *Magnolia stellata*, mature hawthorns *Crataegus spp.*, and immature sequoias *Sequoiadendron giganteums* are planted. The eastern rim of the basin, below the soap box derby track, is an expanse of mowed lawn with a line of Japanese cherries *Prunus spp.*, equally spaced giving a formal look especially in the spring bloom time. The south basin is flanked by a tall, mature Douglas fir grove giving way to the naturalistic forest that predominates in the park. The west side of the reservoir area is composed of the dam topped with the Reservoir Loop Road. To the south of the Gatehouse mature cedar *Cedrus spp.* and California bay laurel grow. The dam face on either side of the steep stairway has been contained within a chain link fence since the mid-1990s. Most trees were removed and the area was left to naturalize with blackberry and other common weedy species predominating. There are some mature trees, a pear *Pyrus communi* (perhaps a remnant from the pear orchards that preceded the park in the Mount Tabor area during the 1800's when tons of fruit were shipped to the Bay Area during the California Gold Rush) and flowering crabapple *Malus spp.*

Above Reservoir 6, below the fence line, a footpath dissects the hillside from north to south through a mature hawthorn *Crataegus spp.* grove interspersed with other species such as native wild cherries *Prunus emarginata.* South of the hawthorn grove, is a grove of mature lombardy poplars *Populus **nigra Italica*** that give a striking golden display in autumn. A predominating feature below the trail overlooking Reservoir 6 is a massive sequoia tree, a native California species common to the Mount Tabor neighborhood. The flat north side of the reservoir sidewalk is lawn that gives way to the backyards of residential properties. The south side, built on fill, is primarily sidewalk with a steep drop down the dam face to residential backyards. The western sidewalk flanking the reservoir drops off into ivy and then onto a grassy shelf that is planted with a row of mature true cedars *Cedrus spp.* trees along Southeast 60th Avenue. Steps climbing up the dam face from the sidewalk adjacent to the Southeast 60th Avenue approach the Outlet Gatehouse.

The covered storage tank, on the north slope of Mount Tabor, is in a mowed clearing surrounded by a mature grove of Douglas firs *Pseudotsuga menziesii* and big leaf maples *Acer macrophyllum*. From this site, through the trees, is a view down the forested slope to the Reservoir Loop Road, the play ground, picnic shelter, and main parking lot of Mount Tabor Park.

Summary Statement of Integrity

The Mount Tabor Park Reservoirs remain today largely intact and in as-built condition. While the basins have been relined numerous times, the character-defining elements such as deep open water, parapet walls, iron fences, and gatehouses exist today without modification or inappropriate adjacent development. General deferred maintenance of the concrete and metal is needed on all of the resources. The Reservoir 1 site has been the most neglected with corrosion of the fence and spalling along the parapet walls and basins being most notable. The buildings at Reservoir 1 need some restoration in places where the reinforcing metal bars have been exposed. Although modern modifications such as full hollow-core metal doors have not been sensitive to the architecture, the Reservoirs significantly retain their Romanesque styling. The 1980s era aluminum light fixtures surrounding the basins do not match the period, yet their illumination and reflection in the water after dark provides a connection with the original design that included light fixtures. The period lampposts should be refurbished and used to provide lighting. Also, the interiors of the buildings are predominately intact including the mechanical equipment.

Though the Reservoirs are 109 and 94 years old, they continue to function as a primary water source for Portland. Protection of the watershed coupled with a well designed distribution system has given Portland high grade water since 1895 when it first flowed to the city's faucets. The following remarks are taken from recent reports on the district and offer a good overview of the resource:

No waterborne disease outbreak or water quality incident of public significance has ever been recorded in connection with Portland's open reservoirs...[1] *All features in good condition. ...a detailed maintenance program could extend the useful life of the open reservoirs to the year 2050.*[2]

[1] Montgomery Watson Harza. Open Reservoir Study: Phase I Summary Report. City of Portland, January, 2002.

[2] Montgomery Watson Harza. Open Reservoir Study, Draft TM 5.7 Facilities Evaluation, City of Portland. August, 2001.

Recreation	outdoor recreation

Current Functions (Enter categories from instructions)

Cat: Government Sub: public works
Recreation outdoor recreation

7. Description

Architectural Classification (Enter categories from instructions)
LATE VICTORIAN: Romanesque

Materials (Enter categories from instructions)

foundation	Concrete
basin	Asphalt
walls	Concrete
other	Iron, Earth, Water

Narrative Description (Describe the historic and current condition of the property on one or more continuation sheets.)

See Continuation Sheets-

8. Statement of Significance

Applicable National Register Criteria (Mark "x" in one or more boxes for the criteria qualifying the property for National Register listing)

_X_ A Property is associated with events that have made a significant contribution to the broad patterns of our history.

___ B Property is associated with the lives of persons significant in our past.

__X_ C Property embodies the distinctive characteristics of a type, period, or method of construction or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components lack individual distinction.

____ D Property has yielded, or is likely to yield information important in prehistory or history.

Criteria Considerations (Mark "X" in all the boxes that apply.)

____ A owned by religious institution or used for religious purposes.

____ B removed from its original location.

____ C a birthplace or a grave.

____ D a cemetery.

____ E a reconstructed building, object or structure.

____ F a commemorative property.

____ G less than 50 years of age or achieved significance within the past 50 years.

Areas of Significance (Enter categories from instructions)
Community Planning and Development
Engineering
Architecture
Entertainment/Recreation

Period of Significance 1894 – 1953

Significant Dates 1894,1911,1912,1923,1951

Significant Person (Complete if Criterion B is marked above)

_____

Cultural Affiliation _____

Architect/Builder Isaac Smith, Charles Oliver,
James D. Schuyler, D. D. Clarke

Narrative Statement of Significance (Explain the significance of the property on one or more continuation sheets.

See Continuation Sheets-

9. Major Bibliographical References

(Cite the books, articles, and other sources used in preparing this form on one or more continuation sheets.)

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

Mount Tabor Reservoirs Historic District
Name of Property

Multnomah County, Oregon
County, State

X_ Local government
___ University

_X_ Other
Name of repository: Multnomah County Library

10. Geographical Data

Acreage of Property 40.5
UTM References (Place additional UTM references on a continuation sheet)

	Zone	Easting	Northing		Zone	Easting	Northing
1	10	531740	5039770	3	10	531198	5039460
2	10	531985	5039245	4	10	531197	5039760

5 10 531845 5039900 (discontiguous element)

___ See continuation sheet.

Verbal Boundary Description (Describe the boundaries of the property on a continuation sheet.)
Boundary Justification (Explain why the boundaries were selected on a continuation sheet.)

11. Form Prepared By

name/title Friends of the Reservoirs

organization %Cascade Anderson Geller date February 28, 2003
street & number 1934 SE 56th Avenue telephone 503-232-0473

city or town Portland state OR zip code 97215

Additional Documentation

Submit the following items with the completed form:
Continuation Sheets

Maps A USGS map (7.5 or 15 minute series) indicating the property's location.
A sketch map for historic districts and properties having large acreage or numerous resources.

Photographs Representative black and white photographs of the property.

Additional items (Check with the SHPO or FPO for any additional items)

Property Owner

(Complete this item at the request of the SHPO or FPO.)
name City of Portland

street & number 1221 SW Fourth Avenue telephone 503-823-4151

city or town Portland state OR zip code 97204

Paperwork Reduction Act Statement: This information is being collected for applications to the National Register of Historic Places to nominate properties for listing or determine eligibility for listing, to list properties, and to amend existing listings. Response to this request is required to obtain a benefit in accordance with the National Historic Preservation Act, as amended (16 U.S.C. 470 et seq.).
Estimated Burden Statement: Public reporting burden for this form is estimated to average 18.1 hours per response including the time for reviewing instructions, gathering and maintaining data, and completing and reviewing the form. Direct comments regarding this burden estimate or any aspect of this form to the Chief, Administrative Services Division, National Park Service, P.0. Box 37127, Washington, DC 20013-7127; and the Office of Management and Budget, Paperwork Reductions Project (1024-0018), Washington, DC 20503.

STATEMENT OF SIGNIFICANCE

Overview

The Mount Tabor Park Reservoirs Historic District encompasses Reservoir 1 built in 1894 and Reservoirs 5 and 6 built in 1911. The resource is located on the west and south sides of Mount Tabor, a 640-foot volcanic butte parkland encompassing 196 acres located in a residential neighborhood in Southeast Portland, Multnomah County, Oregon. The reservoir undertaking was not only remarkable for its architecture and engineering but as a relatively early example of private-public partnership. The district meets Criterion A, for its association with significant historic events, in the areas of community planning and development, engineering, architecture/landscape architecture, and recreation. Along with Washington Park Reservoirs 3 and 4, located approximately 6 miles due west of Mount Tabor, Reservoirs 1, 5, and 6 serve as the main storage and distribution system for Portland's water supply. The layout of Portland's reservoirs, on the east and west side of the Willamette River, was one of the early connections to the two sides of Portland. The result of a government-business paradigm for public works, funding the creation of Portland's Bull Run water system, of which the reservoirs are an integral part, was a landmark process for Oregon's legislature that illustrated a commitment to public health and an adequate supply of high quality water using a cost effective delivery design. The reservoir construction embodied innovative engineering utilizing patented reinforced concrete and attractive finishing techniques that had not yet become widely accepted. The engineering involved the active channeling of water in a gravity-fed system to provide power for pumps (and eventually for the generation of electricity) making the system fiscally responsible. The breadth and depth of the water basins and the views afforded of the reservoirs and the surrounding landscape, harmonized with the site chosen for their construction. The Romanesque architectural style chosen for the gatehouses, weir buildings (screen houses), parapet walls and other features exhibited the quality of "beautility"[1] encompassing both highly attractive design with exceptional attention to detail and utilitarian function. This packaging of beauty with utility was a natural off shoot of the combined tenets of the Progressive Era and the City Beautiful movement. The turn of the century, when the reservoir districts were constructed, was a period of intense interest in improving growing urban areas, a reaction to the oppressive conditions found in American cities in the wake of the Industrial Revolution. Constructed in 1894, the same year as the National Municipal League was founded, and as the City Beautiful movement was rising throughout the country, the reservoirs' design reflects the mood of the period in which they were built. The lighted walkways and other amenities surrounding the deep open water provided a recreational destination and encouraged the remainder of the Mount Tabor butte to be developed as one of Portland's primary parks. The reservoirs provided a gift of more than tap water to the citizens for a very costly project for the time.

The district also meets Criterion C for its embodiment of distinctive characteristics of a type, period, or method of construction using masterful techniques, as an early example of concrete construction and romantic eclectic architectural and landscape design. Designed and constructed during the Progressive Era, and in the wake of the City Beautiful Movement, the reservoirs, with their careful attention to aesthetics and innovative engineering technology, serve as intact physical representation of this period in Portland's history. The concrete techniques were innovative, utilizing patented methods of Ernest Ransome, one of the earliest American pioneers in various aspects of concrete construction. The historic structures and buildings of Reservoir 1 are built of reinforced concrete, using the patented "Ransome System" and may be categorized as

Late Victorian – Romanesque Revival style of architecture. Collectively, the reservoir complex represents the largest, earliest application of the Ransome construction type in Portland, and one of the earliest in the country. The decorative wrought iron fence and lampposts were designed by prominent local architects Whidden and Lewis who went on to design Portland City Hall, now on the National Historic Register. The wrought iron work was manufactured by Old World trained and locally celebrated craftsman, Johan Tuerck. Although Reservoirs 5 and 6 were constructed at a time when reinforced concrete construction was more common, their design followed the "beautility" theme advanced by the earlier reservoirs. The engineering showed creative solutions to water delivery using natural elevation differences with minimum reliance on other sources of power. Because of the care in planning and construction, Reservoirs 1, 5 and 6 are important pieces of living history providing service and beauty as they first did 109 and 94 years ago.

Criterion A: Community Planning and Development
Reservoirs 1 and 2 on Mount Tabor and Reservoirs 3 and 4 in City Park (now Washington Park) were built simultaneously with the Bull Run water system in 1894. Reservoirs 5 and 6 were built when the Bull Run watershed delivery capacity was expanded and Mount Tabor Park was formalized in 1911. Reservoir 2 is now demolished and the property privately owned. The Reservoir 2 gatehouse was preserved as a private residence and is listed in the National Register of Historic Places and has been documented in the Historic American Engineering Record. Reservoirs 3 and 4 have been nominated to the National Register of Historic Places.

The reservoir district is eligible for listing in the National Register under Criterion A in the category of Community Planning and Development. The reservoir complex is noteworthy for its association with the city building activities of Portland's business community. The result of a government-business paradigm for public works, funding the creation of Portland's Bull Run water system was a landmark process for Oregon's legislature that illustrated a commitment to public health and an adequate supply of high quality water using a cost effective, publicly owned delivery design. The legislation to create Portland's Water Committee designated fifteen prominent businessmen to develop a municipal water system. While the bonds to build the system were guaranteed and paid for by Portland's general fund, it was not until 1913 that the Bull Run Water system came under the direct control of the city government. Prior to that time, the Water Committee was solely responsible for providing water to the citizens of Portland. That system – by design, by innovative construction, by emphasis on water quality, and by financing – far exceeded the water needs of the Portland community of the day. The Mount Tabor Park Reservoirs 1, 5, 6 featured aesthetic design, construction and detailing that transformed the water-holding utility of the reservoirs into a dramatic and defining community asset that would carry the city through a century of rapid growth.

The dedication of the Water Committee to create a private-public initiative to build a first-class water system for the city of Portland was successful. From this early initiative, these and other business leaders led a series of efforts that are highlighted by Whidden & Lewis's City Hall in 1895, the Portland Park Association of 1898, the 1905 Lewis & Clark Exposition, the Greater Portland Plan of Edward H. Bennett in 1912 (Bennett was the associate of Daniel Burnham of the "White City" fame) and the installation of handsome public drinking fountains known as the Benson Bubblers in 1912. The sum total of these city-building activities served as the catalyst that launched Portland's great growth spurts in the 1910s and 1920s and have contributed to the ongoing "livability" of the city of Portland.[2]

Trend toward Municipal Water Works in the Progressive Era

The Progressive Era, spurred on by the growing middle class and the suffrage movement, dominated the political landscape from approximately the late 1880's until the U.S.A. entered World War I in 1917. It was characterized by a call for reform in all aspects of American life – labor, politics, engineering, recreation, and public health. As a reaction to the domination of industrialization with laissez faire capitalism and ballooning populations, public interests moved toward civic organizations like The National Municipal League in 1894, formed the same year as the completion of Reservoirs 1,2,3 and 4 and the Bull Run system. Cholera and other epidemics had finally been directly associated with water. In 1909, when Reservoirs 5 and 6 were being designed, the General Federation of Women's Clubs formed national committees to review waterways, connoting pure water with the health of the individual and the community. Citizens' lack of trust in private companies to be able to guarantee safe and abundant water for a good price mobilized a move toward municipalizing water sources. In addition, as the density of buildings grew in neighborhoods so did the risk of fire. Municipal water works were a good investment for the safety and health of the infrastructure as well as the citizens of a city. The trend toward public ownership of utilities expanded so that in 1896 less than half of U.S. cities owned their water works but by 1915 two thirds did. Portland's commitment to a municipally owned water system, including the reservoirs, followed this national trend. Although the same arguments regarding public ownership of the water supply held true for other utilities, such as trolley, gas, electricity, telegraph or telephone systems, water remained the sole municipally owned utility in the city of Portland until mass transit was acquired in the mid-20th century.

Historian Martin Melosi, in The Sanitary City: Urban Infrastructure in America from Colonial Times to the Present helps to summarize the trend toward publicly owned water works in this statement:

By the late 19th century there was a strong feeling among municipal leaders that any respectable community needed a citywide waterworks. A healthy community was an essential ingredient in the process of growth. Many city leaders concluded that control of the sanitary quality of its water service would be difficult if the supply remained in private hands. The push for municipal ownership, therefore, had as much to do with the desire to influence the growth of the cities as to settle disputes with private companies over specific deficiencies.[3]

Situated on rivers, cities had easy access to water for drinking, transportation, industry, and sewage disposal and Portland, like most cities, paid the cost of a burgeoning population and industrial growth with the undermining of the quality of the water of the river and its tributaries. As settlements grew along the Willamette River, the water quality deteriorated until an early Portland water activist, P.F. Morey had this to say regarding drinking its water, "... the river Willamette is the sewer of nearly one-third of the state...Men should not drink such water, nor used it in their house either for culinary or 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." [4]

Governor Pennoyer considered the Willamette a sufficient source of drinking water, as did business leader Simeon Reed. The Willamette River flows north, dividing the city into an East and West side. It was a readily accessible water source. It would have been much less expensive to develop a water source right in the city

rather than to seek one over 50 miles to the East. Technology existed to filter impurities from water but no move was made by the Water Committee to institute filtration for the Willamette River water in the nine years it took to create the Bull Run system. The emphasis on a quality water source and the desire to find an alternative to the Willamette River was remarkably forward looking. Bull Run water is still a Portland hallmark and Portlanders and wholesale community customers continue to benefit from Bull Run's quality and inexpensive use of gravity as a delivery system even today.

The History and Development of Portland's Water System

Early Water: In the earliest days of settlement, Portland residents drew their water from wells located on or near their property. That pattern continued until the mid-1850s, when drainage from the growing population began to seep into the wells.

In 1856, Steven Coffin, Finice Caruthers and Jacob Cline founded the Portland Water Works and petitioned City Council to lay pipe. City Ordinance #54 granted the company a franchise for conducting water into the city. Their water supply was a creek on Caruther's Donation Land Claim in Marquam Gulch. It fed through a series of wood pipes to provide service from Southwest Fourth Street east to the Willamette River.

In 1859, Portland Water Works was sold to Robert Pentland. Pentland installed a steam pump at the foot of Southwest Mill Street to draw water from the Willamette River to supplement the Caruther Creek supply. He also hoped to pump water to supply water to the higher elevations from a reservoir at Southwest Fourth and Market Streets.

Three years later, faced with personal financial challenges, Pentland sold the water system to Herman C. Leonard and John Green for $5,400 (equivalent of $103,000 in 2001 dollars.)[5] Leonard and Green had already established themselves as utility entrepreneurs, starting the Portland Gas Light Company in 1859. The new enterprise was called the Portland Water Company. With a city population nearing 3,000, Leonard and Green began to upgrade the system immediately with cast iron pipes imported from the east coast and erecting a 300,000-gallon per day pumping station at the foot of Southwest Market Street. Leonard and Green also augmented the supply with water from Balch Creek northwest of town, piped to a reservoir at what are now Southwest 15th Avenue and Alder Street and providing gravity service to the higher elevations west of Fourth Street.

As Portland's population grew to 8,000 by 1870, so did the Portland Water Company's efforts to expand capacity. In 1868, it built an 800,000-gallon per day pumping station at the foot of Southwest Lincoln Street. Three years later, it installed a new steam powered pump to increase daily capacity from that location to 1.8 million gallons per day. The Portland Water Company also built a new reservoir at Southwest Sixth and Lincoln Street, and expanded the one at Fourth and Market Street.

Complaints of cost and quality prompted Mayor Philip Wasserman in 1871 to explore options for a new water service. He appointed a 5-member committee to consider the possibilities. The committee's report, issued in 1872, recommended municipally owned water service and identified the Willamette River or Stephens' Springs as possible sources. The projected cost for such a system was $1 million. Portland's Common

Council approved the report, but the city's charter did not empower the city to finance such an enterprise. That power was reserved to the state legislature. For its part, the legislature was fearful of taking on such a large debt on behalf of Portland. (Such fear was not unfounded; as late as 1909, when Portland was four times larger, surrounding Multnomah county still only had a total capital investment of $22 million.)

At the same time, the privately owned Portland Water Company continued to expand. New pumps were installed in a new "Round-House Station" at the Southwest Lincoln Street pumping station, increasing capacity there to 4 million gallons per day. Ten years later, demand continued to surge as Portland continued to grow. By 1880, the city's population was 18,000 and would grow to 46,000 by the end of the decade. This growth prompted the Portland Water Company to build the Palatine Hill Pumping Station four miles upstream from the city, with new capacity of 10 million gallons per day. At this time, the Portland Water Company abandoned the Caruthers Creek source as it fell victim to development. Completed in 1884, Palatine Hill was inadequate within 8 years as Portland's population continued to nearly double.

Relying on the Willamette River as the water source, the Portland Water Company also faced increasing challenges in water quality. Waste matter from upstream mills posed problems. Sewer disposals posed problems. And occasional tidal shifts affected the flow of the Willamette also posing problems. As Portland headed into the 20th Century, a new water source would need to be found.

The Portland Water Committee: As the Portland Water Company struggled to keep up with demand and its degrading water source, the city government once again picked up the question of a city-owned water works. Of the 3,000 public water systems built in the United States between 1860 and 1896, half were municipally owned.[6] In the 1885 state legislature's special session, Republican Joseph Simon orchestrated legislation to create the Portland Water Committee, passed on November 25, 1885. Simon's bill appointed fifteen of the city's most prominent business and civic leaders to serve as members: John Gates, C. H. Lewis, Henry Failing, Frank Dekum, L. Fleischner, H. W. Corbett, F. C. Smith, W. K. Smith, J. Loewenberg, S. G. Reed, R. B. Knapp, L. Therkelson, Thomas M. Richardson, A. H. Johnson, W. S. Ladd. The Committee was charged with the responsibility "to construct or purchase, keep, conduct and maintain water works . . . with an abundance of good, pure and wholesome water." The Committee was also authorized to issue up to $700,000 in tax-free bonds (equivalent to $13 million in 2001 dollars). Upon establishing a new water works, the Committee was to disband in favor of a permanent five-member Water Commission.[7]

The bonding authority in the legislation was significant in its size and in its structure – representing a sizable risk. Bonds were then, and remain, a common financial mechanism to fund government operations but particularly capital projects. They would be issued for a set period of time (typically 15-25 years) and paid back with interest from a city's general fund. At this time in Oregon, before a city could go into debt, it had to receive authorization from the state legislature. Typically, the legislature set a debt limit and authorized the governmental jurisdiction to issue bonds up to that limit. Portland's debt was limited to $100,000.[8] In this one piece of legislation creating the Water Committee, the state legislature established a debt limit seven times that of the state's largest city – and gave the authority not to the elected officials of the city required to pay back the bonds but to the fifteen member Water Committee created by the legislation.

This act was challenged almost immediately. The owners of private water works sued the Water Committee, challenging the constitutionality of the charter amendment. The decision was finally rendered by the Oregon Supreme Court. Justice William Thayer ruled, "It would be difficult we think, to find any class of cases in which the right of eminent domain is more justly or wisely exercised than in the provision to supply our crowded towns and cities with pure water . . ."[9]

At their first meeting on December 8, 1885, the Committee elected Henry Failing as President, a post he remained in for twelve years. Equally important was the influence of William S. Ladd until his death in 1893. The first step was the acquisition of the existing Portland Water Company. Following Thayer's decision, that sale was completed by the end of 1886 for $464,551. It subsequently also acquired the Crystal Springs Water Company for $150,000.

The second step was to locate a water source for the long-term. The committee initiated action in January, 1886, when it advertised to acquire water rights. One offer came from Charles Talbot and A. G. Cunningham who contacted the Water Committee regarding Bull Run. As early as 1883, Talbot, an engineer for the Northern Pacific Railroad, had conceived of supplying water from Bull Run Lake to Portland. He convinced Cunningham to join with him in acquiring land and riparian rights from the Oregon & California Railroad. Talbot and Cunningham offered the land and rights to the Water Committee for $130,000 ($2.5 million in 2001 dollars).

The Water Committee hired Colonel Isaac Smith as staff engineer to investigate possible sources. The Committee directed Smith that the Willamette River needed to be replaced as the source and that pumping was prohibitively expensive. With that direction, Smith focused on possible gravity supplies. As Smith explored options that included Oswego Lake, Eagle Creek and Clackamas River, he increasingly was attracted to the Bull Run Lake, River, and its tributaries in the forested mountains east of the city and west of Mount Hood.

The investigation of the Bull Run vicinity, with its steep hillsides was challenging. The watershed was "a rugged wilderness impassible for a horse and difficult for a man to penetrate."[10] Upon reaching Bull Run Lake, at an elevation of 3174 feet above sea level and approximately 50 miles east of Portland, Smith deemed the water as pure and clear as any they had ever seen. Although in the shadow of the western face of Mount Hood, the Bull Run Lake, River and the watershed were separate from the glacial waters of the 11,237-foot mountain. Delivering this water to the city of Portland, however, posed a formidable task. Smith faced several false starts in attempting to define a specific course, however, in 1886, after five months in the wilderness, Smith and his party reported to the Committee on Bull Run that a pipeline could and should be built.

The Water Committee then set about securing riparian rights and rights-of-way for the pipeline. They sent Smith back towards Bull Run to secure pipeline rights-of-way and riparian rights from individual settlers. Typically, given the imposing landscape, owners were selling their water rights for $1-5 ($18-$90 in 2001 dollars). The Committee also began negotiations with Talbot and Cunningham regarding their claims to water rights, eventually securing those rights for one sixth of Talbot and Cunningham's original asking price, or $21,000.

As much of watershed remained unsettled and subject to the Donation Land Act, the Water Committee also set about courting the federal government. Early in 1892, the state's congressional delegation urged President Benjamin Harrison to exclude Bull Run lands from future settlement or sale. The President had received authority for such set-asides the year earlier with the "Act to Repeal Timber Culture Laws". On June 17, Harrison signed a proclamation declaring Bull Run as the nation's fifth national forest reserve.

The Committee also continued to grapple with the existing supply. Demand was increasing by an average of 25 percent per year. Even though a new source had been located, the Committee realized that capacity from the old Portland Water Company would need to be expanded until Bull Run could be brought online. The pumps were running 24 hours a day and yet the reservoir levels continued to drop, forcing the Water Committee to shut off the water flow during some peak periods.

With $600,000 of the initial $700,000 in bond revenues already spent as early as 1887, the Committee sought legislative authority to issue another $500,000 in tax-free bonds. Though passed by the legislature, Democratic and populist governor Sylvester Pennoyer vetoed the authorization, objecting to the bond's tax-free provisions benefiting the wealthy and banking interests. In the following legislative session in 1889, the Water Committee sought $1.5 million in tax-free bonding capacity to pay for expanding existing capacity and for the Bull Run system. Again, it passed the legislature but was vetoed by Governor Pennoyer – ostensibly now because the water originated from Mount Hood glacier run-off and "would cause goiter to the fair sex of Portland."[11]

Given the challenges of getting authority through the Governor and Portland's population growth, the Water Committee reassessed their vision for the Bull Run system. The proposed system was projected to provide 15 million gallons per day at a construction cost of $1.4 million. The committee reassessed demand projections and re-engineered the Bull Run system to produce 24 million gallons per day. This enlarged system would cost $2 million. The Committee then went to the 1891 state legislature for bonding authority of $2.5 million. To undermine Pennoyer's possible veto, they demonstrated that the water source was not from glacier run-off and stipulated that the bonds would not be tax-free. The legislature passed the authority and Pennoyer approved the bill but an inadvertent discrepancy in the legislation's bonding authority and limits delayed the project another two years. In 1893, the discrepancy was corrected and the Bull Run challenge now transformed from money and politics to engineering.

The Bull Run System: While the Water Committee worked on securing the money, Isaac Smith worked on the engineering and eventually would oversee its construction. Smith was born in Fredericksburg, 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 state of Washington. Settling in the Pacific Northwest, he built lighthouses at Shoalwater Bay and platted the gas and water works in Tacoma, Washington. As engineer for the Northern Pacific Railroad, he located the line from Portland to Kalama, Washington and from Kalama to Tacoma, Washington, as well as the line across the Cascade Mountains from Tacoma to the Yakima and Columbia Rivers. Smith also built the system of steamboat locks around Willamette Falls in Oregon City, Oregon.

Smith had been appointed Chief Engineer by the Water Committee on December 22, 1885. In 1886, after surveying a line from Bull Run, Smith presented to the Water Committee "Specifications of Works for the Water Supply of the City of Portland." In that document, he outlined the requirements for headworks, pipelines and reservoirs. He refined his design and in 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."[12] The high service reservoir was at a higher elevation and served customers whose home or business were at a greater elevation than those served by the low service basin. As design work progressed, he solicited bids for materials and construction costs, including the construction of roads along the pipeline. All this preliminary work would result in speedy construction.

Smith's overall gravity based design was both simple and sophisticated. He established a headworks 710 feet above the Willamette River on the Bull Run River and ran pipeline west 24 miles to Mount. Tabor. With a daily capacity of 24 million gallons, the 33-42" riveted steel pipes ran initially parallel to the Bull Run River to avoid rockslide areas. From roughly the confluence of the Sandy and Bull Run Rivers, the pipeline then ran in a westerly direction through Gresham. With standpipes at Lusted and Grant's Butte, the end point was Mount Tabor Reservoir Number 1 at 402 feet above the Willamette.[13]

Once at Reservoir 1, the system began to distribute the water. From Mount Tabor, 1 million gallons per day would flow directly to East Portland for "high" service; four million gallons per day would flow nearby to southeast to Reservoir 2 at 220 feet above the Willamette with distribution to East Portland; and nineteen million gallons per day cross under the Willamette and would flow west 6 miles to Reservoir 3 at City Park (now Washington Park) 290 feet above the Willamette River. At Reservoir 3, four million gallons per day would go to "high" service in West Portland and fifteen million gallons would go to nearby Reservoir 4, 70 feet below Reservoir 3 and 220 feet above the Willamette River. Thirteen point five million gallons of this would provide low service to Portland and 1.5 million gallons would be pumped hydraulically west to "extra high" service (this original hydraulic pump, known as Thumper, is housed in Pump House 1 and still operates.)[14]

Building the first pipeline from Bull Run in the pre-automobile steam and muscle era of the 1890s was a difficult and heroic physical feat. In 1891, Smith convinced Multnomah County to construct four miles of roads and bridges west from the Sandy River through a landscape "covered with dense growth of brush and small timbers."[15] The road six miles east from the Sandy River to the Bull Run headwaters was to be the work of the Water Committee, completed largely by Italian immigrants in 1893-94. The land was cleared by hand because the forest was too thick for horses. Specifications called for all trees, logs and brush to be cleared along 33' right of way with trees being cut to a maximum height of twelve feet. The entire conduit required the excavation and refilling of 270,000 cubic yards of dirt, moving 10,000 cubic yards of loose rock, and cutting through 2,000 cubic yards of solid rock. The pipeline itself was the work of Hoffman & Bates Construction Co., which used six-horse wagon teams to haul 17' five-ton pipe sections along dirt roads to be riveted in place; of particular challenge was laying 2,000 feet of pipe along the bed of the Willamette River.

Construction on the Reservoirs 1, 2, 3 and 4 and ancillary buildings occurred simultaneously with the pipeline. The goal was to complete the reservoirs by January, 1895 when the first Bull Run Water was to flow to Portland. Excavation began in 1893 and was completed in 1894. Laborers were readily available due to the "depression," and with good planning, the work moved along at a rapid pace.

The engineering team of Charles Oliver and James Dix Schuyler worked under Chief Engineer Isaac W. Smith in the construction of the reservoirs. Oliver was born in Iowa in 1856 and came to Oregon in 1864. He was educated in Portland primary and secondary schools, but apparently acquired 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. Following 1895 he continued to work for the Water Department, primarily at the Bull Run headworks. James Dix Schuyler of Los Angeles, California was hired as a consulting engineer. His brother Phillip, was the first secretary of the Portland Water Committee. Schuyler designed and constructed the Sweetwater Dam near San Diego and engineered the Hemst Dam in Riverside County, California.

Of the construction, Oliver observed: "I was superintendent 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 that 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 payrolls for the four reservoirs."[16] In total, the reservoir system had 66 million gallons combined capacity, enough to supply the city for 4-5 days. The conduit and distribution system took nearly two years and $2.4 million to build. As the project neared completion, the Water Committee issued a report on its operations in October, 1894:

Millions of dollars have been spent, a great public work carried to completion; no scandal exists; no charges of mal-administration are made; not even a hint of speculation is suggestion . . . The work of the Committee is practically done. It must be judged by its works. The City of Portland will have a supply of water which for purity is probably unexcelled anywhere in the world.[17]

An in-depth Oregonian article featuring details of the Bull Run system and the reservoirs published on January 1, 1895 stated, *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 ...These walks afford a delightful promenade for visitors who are separated from the basin itself by a concrete wall surmounted by a neat 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."*[18]

Meeting their construction deadline, on January 2, 1895, Bull Run water flowed into the city for the first time. In an ironic twist, it was Governor Pennoyer, perhaps with a palette accustomed to the more complicated constituents of Willamette River water, who took the ceremonial first drink and announced its inferior quality: "No Body!"[19]

Despite the enormous expense and controversy, the Water Committee had been determined to provide quality water and plenty of it. The first investment at $700,000 in bonds, was seven times the city's debt limit and an approximate investment of $15 per capita. By the end, the Water Committee had spent $5,400,000 in bond revenue (the equivalent of $100 million today) costing approximately $31 per capita. At the time, water rates were roughly $12 per household. The bond obligation of property tax revenues to pay for the water system far exceeded anything the city had contemplated before. As late as 1907, the city had only seven outstanding bonds totaling just less than $9 million. Of these, the water system made up two-thirds. The next closest bond was bridges at $1.1 million.[20]

Mount Tabor Reservoir 1: The Water Committee purchased less than a 10-acre area on Mount Tabor to build Reservoir 1, also referred to as the Mount Tabor "high service" reservoir. The basin itself is 1.63 acres. It was designed to be the primary site to store and deliver water to the other reservoirs, including Reservoir 2, the "low service" reservoir to the immediate southwest at the base of the butte, as well as to Reservoirs 3 and 4 six miles to the west across the Willamette River. Situated on the south side of Mount Tabor at an elevation of 411.6 feet, the site was determined by geography and availability of land. Excavation of the hillside allowed for the east, north and west sides to use the natural embankment. Reservoir 1's elevation was considered optimal for storage since the elevation and site allowed for easy distribution using gravity to the growing population of the east and west sides of Portland. Because of the optimum elevation for Portland's water needs, seventeen years later Reservoir 5 was constructed on the west side of Mount Tabor at the same elevation as Reservoir 1 and the two were tied together via a tunnel so that they could work as one reservoir.

Reservoirs 1, 2, 3, and 4 shared basic design and construction techniques. All were both creatively engineered and aesthetically attractive. The Gatehouses were round or oval in shape complementing the rounded features of the basins. The method of reinforced concrete construction adopted for the water system was quite innovative at the time. Although unreinforced concrete was nothing new at the time, reinforcing methods were in the early experimental stages. The method of concrete construction used for the reservoirs had a patent, known as the "concrete and twisted iron patent." The concrete finish on the buildings was also patented, as were the circular lights cast in the concrete of the gatehouse floors and pump house roof, and even the concrete mixer itself. All these patents were held by Ernest Leslie Ransome, considered by historians as the leader in early reinforced concrete technology in the United States.[21]

The concrete work for the Gatehouse at Reservoir 1 is notable, not only because it was technically innovative, but also because of its aesthetic qualities. Wooden formwork was constructed to give the poured concrete the general outlines of stone blocks. Elaborate scaffolding allowed workers to climb up the outside of the structures after each pour of concrete. When the beveled formwork was removed, the concrete was hand tooled and bush hammered to simulate rusticated stone blocks. This construction technique differs from the more common "cast stone" block construction that was often used in residential construction at the time. The concrete itself was notable. Josson brand, imported through Antwerp, Belgium, was used until shipments were delayed in the middle of the project. Instead of holding up the project, North brand cement, available locally, was substituted.

Original contracts for all the basins seem to indicate that they were originally to be lined with brick and then coated for water proofing instead of being constructed with concrete panels. As the bricks were not available when construction began, concrete was utilized, with the exception of Reservoir 2. (Reservoir 2 was an afterthought whose construction was encouraged by the consultant to the project, James D. Schuyler. Because construction was begun later than the other 3 reservoirs, brick was utilized in the basin of Reservoir 2.) Reportedly all of the reservoir basins, with the exception of Reservoir 2, now demolished, were "lined with concrete strengthened with twisted iron placed at intervals of 10 feet in each direction, and anchored at intervals of 10 feet by means of anchors driven to a depth of from 3 to 20 feet into the slopes forming the sides of the reservoirs and imbedded in concrete."[22] The concrete basins were lined with asphalt, imported from a California firm, Alcatraz Asphalt refinery. "The asphalt used in the reservoirs is pure natural bitumen...."[23]

Contracts for the design of the ornamental wrought iron fence (and lamp posts of Resevoir 3 and 4) encircling the basins of the 1894 reservoirs were awarded to Whidden and Lewis, who also designed Portland City Hall built in 1895. On September 20, 1894, the Water Committee contracted with Johann H. Tuerck to manufacture the fences and lampposts from wrought iron. 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. The Oregon Chapter of the American Institute of Architects presented Tuerck with their premier award in June, 1928, in honor of his "exceptional ability."[24] He is credited with the work for major banks, clubhouses, churches and residences built in Portland from the 1890s. Some of his projects included the main entrance door of the Julius Meier home, the conservatory entrance of the Harry A. Green home, as well as work for the Congress Hotel and the Temple Beth Israel. The ornamental wrought iron fences and lampposts on the Reservoirs are prime examples of his work.

Completing the Bull Run System: In 1903, the city of Portland reorganized its government and the 15-member Water Committee was replaced by a 5-member Water Board. The shift in oversight did not appreciably change the operations or policies. One of the first actions of the Water Board was to endeavor to restrict public access to the approximately 120 square mile Bull Run watershed. In December, 1903, the Water Board officially requested limited entry, placing the site off limits to the public. President Theodore Roosevelt agreed that with the unique character of the land and on April 28, 1904 signed Public Law #206, popularly known as the Bull Run Trespass Act. Currently this watershed is still jointly managed by the city of Portland and the U.S. Forest Service. Public access is restricted.

While the Water Committee aggressively sought to create a long-term water system with capacity for 24,000,000 gallons per day, Portland's population continued to grow exponentially. Following the 1905 Lewis & Clark Exposition, Portland boasted 172,000 residents; nearly three times the number when construction on the Bull Run system began in 1893. Shortly after the Exposition, the Water Board decided to build Conduit #2, a $3 million project that included two additional reservoirs and additional capacity of 50 million gallons per day and storage capacity of 125 gallons. While this project would be funded by bonds, the process was considerably less rigorous than the first time. In 1902, Oregon voters had approved the Initiative and Referendum Amendment to the state constitution. This change allowed voters to create laws by direct ballot. In 1906, the voters approved an initiative that gave Oregon cities the right to amend their own charters. This change eliminated the need to go to the state legislature to raise debt. The City Council then referred the Water

Board's request to the voters, who narrowly approved the measure. After some public debate, it was decided to build two additional reservoirs on Mount Tabor and, at the same time that land was being acquired for the reservoirs, to purchase additional land for creation of a public park. Both reservoirs were completed in 1911. Since that time no new open reservoirs have been constructed in Portland and the original reservoirs continue to supply water to Portland. By 1911, the physical structure of the Bull Run system was in place with headquarters, two conduits and six reservoirs.

Reservoirs 5 and 6

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 5 and 6. Isaac Smith, Chief Engineer of the Water Committee who had designed the Bull Run System, including the 1894 reservoirs, died in 1897 and was succeeded by David Dexter Clarke who had worked for the Water Committee since 1893. Clarke was responsible for the design of Reservoirs 5 and 6. Born in New England, Clarke moved to Portland in 1864. He and Smith had worked together, Clarke as Smith's principal assistant, on the construction of the Tacoma Water Works in the state of Washington. After 24 years of service, Clarke resigned his position of Chief Engineer of the Water Committee in 1917.

The long-term affiliation of Smith and Clarke probably helped to create the harmonious relationship between the 1894 site and the 1911 reservoirs. Though the designs of the buildings and other features differ, they are compatible. The Gatehouses at Reservoirs 5 and 6 are constructed of high quality reinforced poured in place concrete and in the years between 1894 and 1911, reinforced concrete had become more commonplace. The surface treatment of the concrete at Reservoirs 5 and 6 was made to look like blocks, and though specified to be bush hammered like Reservoir 1, it was left smooth. The wrought iron fences and lampposts of Reservoirs 5 and 6 have a similar design as those of the 1894 reservoirs, but are less detailed. Conspicuously missing are the forged hammered leaves and the intricate detailing of the lamppost scrolls. The 1911 ironwork, especially the lampposts are more hefty, less delicate than that of the 1894 work.

Additional Contributing Buildings and structures at Mount Tabor Reservoir Historic District

In 1923 a small rectangular Weir House (Screen House) was constructed to the west of the Gatehouse at Reservoir 1. It is constructed of poured concrete with essentially the same finish and detailing, though darker in color, than the Gatehouse.

In 1951 a poured concrete Weir Building (now known as the Hypochlorite Building) was constructed to the southeast of the Gatehouse at Reservoir 5. The construction style essentially matches the Reservoir 5 Gatehouse, except, like the Gatehouses at Reservoir 6, it is rectangular. This 1951 addition is the last time that the construction of buildings at any of the reservoir sites attempted to match the original romantic Romanesque designs.

A small circular concrete covered tank with a water holding capacity of 200,000 gallons was constructed on Mount Tabor at an elevation of 590 feet. Though Water Bureau sources have offered differing construction dates, in an accounting from a 1913 Department of Public Affairs report, an electric pump plant was being installed at this tank for delivering water to the attic tank in the residence on top of Mount Tabor, now demolished, which had been converted to a public comfort station for the park. The most recent accounting by

Water Bureau personnel confirm construction in 1912 and suggest that this is a "reservoir" serving approximately 850 water customers at the highest elevation in the Mount Tabor neighborhood.

Associated with the utilitarian concrete covered tank is an original building that continues the romantic style theme of the other reservoir gatehouses with the arched doorway, original matching wood plank door, and the cut basalt block cornice.

Post-1911 Additions to the Bull Run Water System

In 1913, the city charter was revised and the Water Board transformed into a city bureau under the supervision of a city commissioner. With the Bull Run system in place, the Bureau continued to concentrate on expanding capacity and distribution to meet the growth of the city. Though changes were made to the delivery system and the headwaters, the Water Bureau made no significant modifications to the aesthetic design of the reservoir system. In 1952, the Bureau completed a fourth conduit, with capacity of 100 million gallons per day. In 1981, an underground reservoir at Powell Butte was added with capacity of 50 million gallons. In addition, the system has 69 smaller tanks and standpipes with a capacity of 68.2 million gallons located throughout the city.

Portland's East Side Development and Demand for Park Land

The Mount Tabor reservoirs also meet Criterion A as they helped to develop and bind Portland's east side with the central urban core area dominated by the west side and the property along the north-south axis of the Willamette River. After considering a variety of water sources, the Water Committee looked to the high mountains to the east of Portland and sited Reservoirs 1 and 2 on the south side of Mount Tabor in what was then, a rural area east of the city proper. The butte was a convenient high point along the route planned for the gravity water distribution system. The name Mount Tabor refers to the volcanic butte, the city park and the neighborhood that at one time was a much larger area of east Portland than makes up the "official" neighborhood presently. Mount Tabor Park is 3 miles east of the Willamette River. Downtown Portland is on the west side of the Willamette River. At the time Reservoir 1 was built, the neighborhood of Mount Tabor was not incorporated into the city of Portland. The reservoir construction project brought employment to the area during the depression of 1893 and 1894 when the area was still predominantly farms. New bridges constructed over the Willamette River beginning in the late 1880's and rail service in the 1890's, afforded easier accessibility and consequently the farmland in the Mount Tabor area was subdivided and the population of the area burgeoned and was incorporated into the city of Portland in 1905 adding more land to the earlier East Portland incorporation of 1901.

The 1911 reservoirs, like those of 1894, brought welcome employment during a national economic downturn. Interest in building two more reservoirs to enlarge Bull Run water storage, also aided the movement already established to turn the Mount Tabor butte into an official city park. Residents were in the habit of using the land for recreation prior to its purchase by the city for park and Water Board land in 1909. In 1903, John Charles Olmsted was hired to visit Portland in preparation for the 1905 Lewis and Clark Exposition. For three weeks Olmsted toured existing and potential parklands. In his report, issued on December 31, 1903, he wrote, "There seems to be every reason why a portion, at least, of Mount Tabor should be taken as a public park. It is the only important landscape feature for miles around, and the population in its vicinity is destined to be fairly dense. It is already a good deal resorted to by people for their Sunday and holiday outings, and it will be better

known to and more visited by the citizens as time goes on."[25] Reference is made to Mount Tabor Park in Park Board reports earlier than 1909. According to an Oregonian article in November, 1908, a "committee from the United East Side Push Clubs ... was appointed mainly to have some action taken on the park question, for it has seemed to many citizens that little or no progress is being made toward securing a park at Mount Tabor, or anywhere else...It is said on good authority that the water committee contemplates locating two reservoirs on the west side of Mount Tabor for the second Bull Run pipeline, one for the low and one for the high service system and in that case the full 169 acres and perhaps more will be needed."[26]

Property prices soared with the population increase after the Exposition in 1905, and despite the recommendations of the esteemed Olmsted and public sentiment, the city did not act on purchasing land, other than that already controlled for Reservoirs 1 and 2 until 1909. As residential subdivisions burgeoned, pressure mounted to acquire parkland, and in 1907 a one million dollar bond issue passed narrowly but was then held up with legal entanglements. The Park Board went ahead and retained the Olmsted firm to prepare a land acquisition plan and they hired a former employee of the Olmsted's to prioritize and acquire parklands. In 1908, Emanuel T. Mische, a highly trained horticulturist in the employment of the Olmsted's Massachussets firm for eight years, was hired as superintendent of Portland parks. By 1909 four east side park lands were purchased including Mount Tabor, the most costly acquisition. Mount Tabor lands were acquired by the Water Board at the same time for the construction of Reservoirs 5 and 6 as reported by the Oregonian in March, 1909, "The property to be used for park purposes is some of the choicest in the city...From it may be had a magnificent view of the city and surrounding country and that it will become one of the principle attraction(s) in Portland is the belief of those who have studied it carefully. That portion which is to be purchased by the Water Board is to be used for a system of huge reservoirs, to be used in connection with the new pipe line..."[27] The area around Mount Tabor Park and its reservoirs helped to create a neighborhood which included some grand historic houses and two private colleges.

Criterion C: Architecture, Landscape and Engineering in the Progressive Era

"... beauty has always paid better than any other commodity and always will." Daniel Burnham, Designer of Chicago's "White City."[28]

The City Beautiful movement arose out of the Progressive Era. Some contend that the City Beautiful ideals were launched at the 1893 World's Columbian Exposition in Chicago. Designers such as architect Daniel Burnham and landscape architect Frederick Law Olmsted, of New York's Central Park fame, created the "White City" to illustrate how beautiful the built environment could be in a well-planned city. European styled-classical beauty coexisted with the most modern technological inventions. Moving sidewalks and modern lighting paired with buildings designed in a neoclassical style. Carefully implemented street plans included landscapes, outdoor sculpture, and grand water features.

The Exposition brought city planning to the forefront. Many architects and landscape designers were influenced by this Exposition and they brought their excitement back to their respective communities. Professional publications and promotional literature reached across the country. Completed in 1894, the

reservoirs were designed and constructed at the start of the excitement about the Exposition. H.W. Corbett, business leader on the original Portland Water Committee when the first reservoirs were designed and built, went on to chair the 1905 Lewis and Clark Exposition commission in Portland.

The Columbian Exposition of 1893 show-cased water as a primary aesthetic feature in city planning. The exploitation of the waterfront as a space for beauty and public recreation was a major innovation. Before 1893 water frontage was primarily commercially exploited. Though the Olmsted firm preferred naturalistic water features, they appreciated the aesthetic character that open water brought to a landscape, even with the sterile banks and contrived shapes that water storage reservoirs usually exhibited. In The Relation of Reservoirs to Parks, written in 1899, Frederick Law Olmsted, Jr. discusses the virtues of reservoirs in parks and sums up his views as follows:

All reservoirs, have, in addition to their essential quality of storing water, an element of landscape effect; namely, that of an expanse of clear, sparkling water. This same element forms the chief feature of many landscapes in public parks, where it is created at large cost, and it is clearly a thing of great value to the public when it can be made available. In itself, regardless of its outline or setting, a body of water is beautiful and refreshing, and its value to the public is so well recognized that provision is very often made for giving the public access to the enclosure about a reservoir, whence it surface may be seen.[29]

Reservoir 1 clearly, both in the design of the gravity fed water system, still integral to water delivery in the city today, and in the architecture that graced the landscape. Although formal, the oval shape of the gatehouse enhanced the romantic character of the setting, complete with the planned Terrace Garden, it conjured images of "Old Europe." This romanticism was typical of the period.

Although Reservoir 1 predates the creation of Mount Tabor Park, like Reservoirs 3 and 4 in City Park (now Washington Park in the west hills) the reservoir benefited from thoughtful planning and was constructed with elegance befitting the striking location it occupied. Classical architectural style was adapted to utilitarian structures that featured innovative technology and inviting walkways and landscaping, including the Terrace Garden across the top of the dam in front of the Gatehouse. The design provided a destination for inspiration and rejuvenation and encouraged the development of the surrounding land into a public park.

Reservoirs 5 and 6 were planned in conjunction with the park in 1909 and continued the theme of "beautility." All of the reservoirs elevated the storage and distribution of water by enhancing water's highly prized characteristics in a recreational landscape . With their completion, the reservoirs provided fountains spouting from the center of the basins, aerating the water and entertaining at the same time. Walkways spanned the dams and encircled the basins and the use of gas lamps (to be replaced with electric lights powered by the generation of electricity from the fall between the two reservoirs) ensured evening use of the park. The light reflecting in the deep water created a romantic feeling. This character is preserved even today, though modern lights have replaced the period lamps. Reservoirs 5 and 6 were to be "formal features" in an otherwise primarily natural park setting. Instead of overflow water being routed to the sewer system, Emanuel T. Mische, former Olmsted associate and park superintendent from 1908 through 1915, saw "its high potential value in an ornamental scheme is the basis of the cascade feature. The water is to fall over a series of dams so

contrived as to agitate and increase its seeming volume, be caught in a series of pools and supply several spray jets."[30] Reservoirs 1, 5 and 6 were a monument to the importance of water as a life-giving substance and as a beautiful visual resource for the benefit of the community.

Early Reinforced Concrete Work and the Patents of Ransome

Concrete was only beginning to be considered a serious building material when the reservoirs were constructed. Collectively, the Bull Run system as built in 1894 is perhaps the earliest large application of reinforced concrete in the state and one of the earliest major reinforced concrete projects in the country. The headwaters, now demolished, and reservoirs with associated buildings were all constructed using a reinforced concrete system call "the Ransome System," created in a series of patents by Ernest L. Ransome. 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 gatehouse floors and pump house roof, and even the concrete mixer itself.

Reinforced concrete first developed as a construction technique in the 1850s. The earliest accepted use of reinforcing in concrete was by Frenchman Jean-Louis Lambot in the early 1850s. He reinforced his concrete boats with iron bars and wire mesh. He also had some plans for using this material in building construction because he applied for patents in France and Belgium in 1856. About the same time, in 1854, William Wilkinson of Newcastle-on-Tyne erected a small two-story servant's cottage reinforcing the concrete floor and roof with iron bars and wire rope. Wilkinson took out a patent on his technique and is generally credited with constructing the first reinforced concrete building. In the United States, the first building in reinforced concrete was by American mechanical engineer, William E. Ward, in Port Chester, New York, completed in 1875. Over the next quarter century, Ernest L. Ransome pioneered the development of reinforced concrete in the United States, while Europeans G. A. Wayss of Germany and Francois Hennebique of France paralleled Ransome's innovations on the continent. Architectural critic Ada Louise Huxtable has described Ransome as the "Father of reinforced concrete" "As engineering and design, Ernest Ransome's work deserves a prominent place in the story of American architectural advance."[31]

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 Ransome's ancestors had been inventors as well. Between 1844 and 1867 his father, Frederick Ransome, 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, employing the technique in building the Arctic Oil Works completed that year. The round bars previously used had not established a good connection with the surrounding concrete. These twisted square bars, which came to be known as "Ransome bars," were used as reinforcement for Portland's reservoirs.

"Up to about 1888 my work in reinforced concrete was largely confined to what we now term small and unimportant structures," wrote Ernest Ransome in a contribution to the history of reinforced concrete.[32] His first major work was the 3-story Bourn & Wise wine cellar at St. Helena, California and the Academy of Sciences Building in San Francisco, both in 1888. The following year saw construction of the Alvord Lake

Bridge in Golden Gate Park, the first reinforced concrete bridge in the United States. Besides the 1894 Portland Reservoirs, major works known using the Ransome system included the 1894 Stanford Museum in California and industrial buildings such as the 1897 Pacific Coast Borax Building in Bayonne, New Jersey, the 1903-04 Kelly and Jones Machine Shop in Greensburg, Pennsylvania. One of the largest projects using the Ransome system was the United Shoe Machinery complex in Beverly, Massachusetts, begun in 1902; that site was 74 acres and 3,340 linear feet. In 1904, the 16-story Ingalls Building (Cincinnati, Ohio) was the first reinforced concrete skyscraper. It remained the tallest reinforced concrete building until 1923 when the Medical Arts Building was constructed in Dallas, Texas. Other concrete achievements utilizing the Ransome system in the era include construction of the first concrete street in Bellefontaine, Ohio in 1891, and the construction of the reinforced concrete Harvard Stadium in Cambridge, Massachusetts in 1904.

Later Concrete Construction

By the time of the second phase of construction in 1911, reinforced concrete was a common method of construction. Reservoirs 5 and 6 were constructed to match Reservoir 1 stylistically, but were apparently not part of the Ransome patent. Cost cutting measures were undertaken with the finishing of the gatehouses at Reservoirs 5 and 6 as the original plans call for a hand chiseled finish. This work was never done. When the concrete Screen House was added to Reservoir 1 in 1923, it was again designed to match the 1894 gatehouse, and the Ransome finish was used. In 1951 a poured concrete Weir Building of a Romanesque style was added to Reservoir 5. Like the Gatehouses of Reservoir 5 and 6, it had the look of blocks but the finish was smooth. The 1951 building was the last construction in the district that contributed to the aesthetics. Utilitarian design alone was used with the other two small non-descript, non-contributing concrete buildings added at Reservoir 5 (Outbuilding) and at Reservoir 6 (Hypochlorite Building.) Due to their modest style and size they do not detract from the earlier buildings.

Summary of Significance

Of the more than 5,000 properties included in the last Portland Historic Resource Inventory only 52 were considered Rank 1 and of the 52, the reservoirs of Mount Tabor and Washington Park accounted for 6 of them. Quotes from the city's recent evaluation of the reservoirs offer a good summary of this resource:

The great amount of historical documentation available on these properties indicates their historical importance to the City. The reservoirs are historically significant as examples of early engineering, and serve as monuments to the social history of the City's growth and development. They provide an early example of a planned landscape, including the views and vistas into and out of the landscape."[33]

Footnotes

[1] Lutino, Cielo. Merker, B., Green, R. "The City Beautiful Movement and Civic Planning in Portland, Oregon 1897 – 1921 National Register of Historic Places Multiple Property Nomination." 2001.
[2] Abbott, Carl. The Great Extravaganza: Portland and the Lewis and Clark Exposition (Portland, OR: Oregon Historical Society 1981); City of Portland, Proposed City Beautiful Multiple Property Submission, 2000.
[3] Melois, Martin V. The Sanitary City: Urban Infrastructure in America from Colonial Times to the Present. (Baltimore: Johns Hopkins University Press, 2000).
[4] Proposed Amendment to Section 227 of the Charter of the City of Portland, November 19, 1908, p. liv-lv.
[5] Consumer Price Index, 2001 (All inflation estimates based on this reference).
[6] Melois, Martin V. The Sanitary City: Urban Infrastructure in America from Colonial Times to the Present. (Baltimore: Johns Hopkins University Press, 2000).
[7] "Waterworks for the City of Portland, Oregon" (Portland, OR: R. H. Schwab & Bro., 1886).
[8] Ibid.
[9] John B. David, David P. Thompson and Jacob Kamm v. The City of Portland, et al, October 28, 1886.
[10] City of Portland, Oregon. Water: Portland's Precious Heritage. (Portland, OR: City of Portland, 1983).
[11] Ibid.
[12] Ibid.
[13] Ibid.
[14] Montgomery Watson Harza. Open Reservoir Study, Draft TM 5.7 Facilities Evaluation, City of Portland. August, 2001.
[15] City of Portland, Oregon. Water: Portland's Precious Heritage. (Portland, OR: City of Portland, 1983).
[16] Ibid.
[17] Ibid.
[18] Oregonian, January 1, 1895, p. 16-17.
[19] City of Portland, Oregon. Water: Portland's Precious Heritage. (Portland, OR: City of Portland, 1983).
[20] Proposed Amendment to Section 227 of the Charter of the City of Portland, November 19, 1908, p. liv-lv.
[21] Ferriday, Virginia Guest. Portland Reservoirs Nos. 1, 2, 3, 4, 5, and 6 (Thematic National Register Nomination), 1984.
[22] Oregonian, January 1, 1895, p. 16-17.
[23] Ibid.
[24] Newspaper, unnamed. "Honor Paid Craftsman," June, 1928.
[25] City of Portland, Report of the Park Board, Appendix, Olmsted Brothers Landscape Architects, 1903.
[26] Oregonian, "Want Park at Mount Tabor: East siders think ground should be bought now." Novermber 5, 1908, p. 14.
[27] Oregonian, "Parks to be bought. Mount Tabor property..." March 30, 1909, p. 16.
[28] Kallus, Melvin. Frederick Law Olmsted: The Passion of a Public Artist. (NY: NY University Press: 1990).
[29] Olmsted, Jr., Frederick Law. The Relation of Reservoirs to Parks. (Boston: Rockwell and Churchill Press, 1899).
[30] City of Portland, Report of the Park Board, Mount Tabor Park suggestions by E. T. Mische. 1912.
[31] Quoted in www.cummings.com/arc.html.
[32] Ransome, Ernest L. "Reinforced Concrete Buildings." From A Selection of Historic American Papers on Concrete 1876 – 1926.. American Concrete Institute: Detroit, Michigan, 1976.
[33] Montgomery Watson Harza. Open Reservoir Study, Draft TM 5.7 Facilities Evaluation, City of Portland. August, 2001.

Published

Abbott, Carl. Portland. Planning, Politics and Growth in a Twentieth Century City. (Lincoln: University of Nebraska, 1983).

Abbott, Carl. The Great Extravaganza: Portland and the Lewis and Clark Exposition (Portland, OR: Oregon Historical Society 1981).

Bluemenson, John J. G. Identifying American Architecture. (Nashville, TN: American Association for State and Local History, 1977).

City of Portland, Water: Portland's Precious Heritage (Portland, OR: City of Portland, 1983).

Corning, Howard McKinley, Dictionary of Oregon History (Portland, OR: Binford & Morts, 1956).

Cowan, Henry J., Design of Reinforced Concrete Structures (Englewood, Cliffs, NJ: Prentice Hall, Inc., 1982)

Davis New Commercial Encyclopedia: Washington, Oregon and Idaho (Seattle, WA: Ellis A. Davis, 1909)

Ferriday, Virginia Guest, et. al. Historic Resources Inventory of Portland. (Portland, OR: City of Portland, 1984).

Gayle, M.,., Waite, J, Look, D. Metals in America's Historic Building: Uses and Preservation Treatments. Wash. D.C.: Preservation Press, National Trust for Historic Preservation, 1976.

Kallus, Melvin. Frederick Law Olmsted: The Passion of a Public Artist. (NY: NY University Press: 1990.)

MacColl, E. Kimbark. Merchants, Money, & Power: The Portland Establishment 1843-1913. (Portland: The Georgian Press, 1988).

MacColl, E. Kimbark. The Growth of a City: Power and Politics in Portland, Oregon 1915-1950. (Portland: The Georgian Press, 1979).

MacColl, E. Kimbark. The Shaping of the City: Business and Politics in Portland, Oregon 1885 to 1915 (Portland: The Georgian Press, 1976).

Melosi, Martin V. The Sanitary City: Urban Infrastructure in America from Colonial Times to the Present. (Baltimore: Johns Hopkins University Press, 2000).

Oliver, Charles E., "The Portland Water Supply," Pacific Engineer (April, 1930).

Olmsted, Frederick Law Jr., The Relation of Reservoirs to Parks. (Boston: Rockwell and Churchill Press, 1899).

Ransome, Ernest L. "Reinforced Concrete Buildings." From A Selection of Historic American Papers on Concrete 1876 – 1926.. (American Concrete Institute: Detroit, Michigan, 1976.)

Roth, Leland M. A Concise History of American Architecture. (NY: Harper & Row, 1979.)

Roth, Leland M. McKim, Mead & White Architects. (NY: Harper & Row, 1983.)

Tishler, William H. American Landscape Architecture: Designers and Places. (Wash. DC: The Preservation Press, 1989.)

Turneaure, F. E. and Russell, H. L., Public Water Supplies (New York: John Wiley & Sons, 1901)

Vaughn, Thomas and Ferriday, Virginia Guest. Space, Style and Structure: Building in Northwest America. (Portland: Oregon Historical Society, 1974.)

Other Sources

Auburn University web site (**www.auburn.edu**)

Bennet, Edward H. "The Greater Portland Plan." Portland, Oregon 1912.

Clarke, D.D. "Letter from Engineer's Office, Water Department to the Portland Water Board Re: Reservoirs 5 & 6." September 1, 1909.

City of Portland Archives.

City of Portland, Department of Public Affairs: Parks and Playgrounds, 1913.

City of Portland, Historic Resources Inventory. May, 1984.

City of Portland, Mayors Message and Municipal Reports, 1905.

City of Portland. Mount Tabor Park Master Plan Report, January 2000.

City of Portland, Water Bureau communication via email.

City of Portland Water Bureau files.

City of Portland Web Site (www.ci.portland.or.us)

Columbia University web site (http://caho.columbia.edu/main/topics/APUSH-22-B-2/index.html).

Curran, Christine. "Laurelhurst Park National Register of Historic Places." 1999.

Ferriday, Virginia Guest, "Portland Reservoirs Nos. 1, 2, 3, 4, 5, and 6, Thematic National Register Nomination". (not formally submitted)

Guzowski, Kenneth James, "Portland's Olmsted Vision (1897-1915): A Study of the Public Landscapes Designed by Emanuel T. Mische in Portland, Oregon." Thesis, University of Oregon, June, 1990.

Heritage Consulting Group historic Portland research files.

Heritage Investment Corporation, "Portland Reservoir No. 2: Courtyard Plaza: Historic American Engineering Record". 1990.

Howe, Kathleen. "Jerome Park Reservoir National Register Nomination". 2000.

Jenkins, Candace. "Water Supply System of Metropolitan Boston Thematic Multiple Properties Submission". 1989.

Lutino, Cielo. Merker, B., Green, R. "The City Beautiful Movement and Civic Planning in Portland, Oregon 1897 – 1921 National Register of Historic Places Multiple Property Nomination." 2001.

Montgomery Watson Harza, *City of Portland Water Bureau Open Reservoir Study, Facilities Evaluation*, August 2001.

Montgomery Watson Harza, *City of Portland Water Bureau Open Reservoir Study, Phase I Summary Report*, January 2002.

Multnomah County Tax Assessor Records

Nelson, Grant. "The Early Years at Mount Tabor (1845-1895) From Forests to Farms to Families." Paper, 1977.

Newspaper, unnamed. "Honor Paid Craftsman," June, 1928.

VERBAL BOUNDARY DESCRIPTION

A. The Mount Tabor Reservoirs Historic District is located on the south and west slope of Mount Tabor in the southeast part of the city of Portland, Multnomah County, Oregon. They are contained within the city park called Mount Tabor Park. The boundaries proposed for the National Register nomination include: beginning at the point at the foot of the south dam at Reservoir 6 where it meets the sidewalk paralleling Southeast 60th Avenue at the southwest corner of the reservoir, continuing north along the west side of the reservoir following the sidewalk that parallels Southeast 60th Avenue at the foot of the west side dam to the northwest corner of the reservoir and turning east along the north edge of the sidewalk paralleling the north side of the reservoir past the tennis courts to the northeast corner of the reservoir continuing south on the dirt path on the dam face of Reservoir 5 to a point due west down slope of the locked gate at Reservoir Loop Road at the northwest corner of Reservoir 5 turning east to follow roughly in a straight line up the dam face (coincides with the chain link fence line) to the locked gate at the Reservoir Loop Road and continuing east curving along the outside of the path that encircles the Reservoir 5 basin to the southeast side valve turning southeast continuing in a straight line paralleling the tunnel that connects Reservoir 1 and Reservoir 5 bisecting the Reservoir Loop Drive and down into the northwest portion of the natural basin encircling Reservoir 1 and continuing to encircle the north rim of Reservoir 1 turning south along the east perimeter of the rim of the natural basin continuing across the gravel service road that traverses the south side of the top of the dam at Reservoir 1 turning west at the southeast corner of the dam face of Reservoir 1 following the southern edge of the service road to the locked gate at the southwest corner of Reservoir 1 turning north following the curb line of Water Bureau Road to the intersection with Reservoir Loop Drive turning northwest across Reservoir Loop Drive following a straight line northwest paralleling the tunnel back to the trail encircling Reservoir 5 turning west to bisect the Reservoir Loop Drive and the lower unpaved service road down the dam face of Reservoir 5 bisecting the paved service road to the south dam of Reservoir 6 continuing along the bottom of the dam to the sidewalk paralleling S.E. 60th Avenue at the point of origin. A small, discontiguous element, a concrete covered storage tank and associated building, exists separate from the three main resources in the district on the north slope of the butte, within the boundaries of Mount Tabor Park. The area between the tank and the contiguous boundary of the remaining resource lacks significance to the district. The proposed boundary of this element is depicted on the enclosed map.

B. The boundaries proposed for the National Register nomination are as depicted by the solid line drawn on the accompanying map.

BOUNDARY JUSTIFICATION

The boundary includes the basins, walkways, fences, lampposts, gatehouses, buildings, structures, and objects, and the primary viewpoints from the reservoirs significant to the Mount Tabor Reservoirs Historic District. The boundary generally follows the natural perimeter of the basin sites and roughly corresponds to the Water Bureau property boundary within Mount Tabor Park.

Photo List for:
Mount Tabor Park Reservoirs Historic District
City of Portland
Multnomah County, Oregon

All negatives stored at:
1934 S.E. 56th Avenue
Portland, Oregon 97215
Date of photographs: February, 2003

Resource: Mount Tabor Park Reservoir 1
Photographer: Jeff Lee
View: looking southeast
Photo Number: **1**

Resource: Mount Tabor Park Reservoir 1
Photographer: Jeff Lee
View: looking west at Gatehouse and Weir Building, east elevations
Photo Number: **2**

Resource: Mount Tabor Park Reservoir 1
Photographer: Jeff Lee
View: looking north at Gatehouse, south elevation
Photo Number: **3**

Resource: Mount Tabor Park Reservoir 1
Photographer: Jeff Lee
View: Gatehouse, Ransome's Patent stamp
Photo Number: **4**

Resource: Mount Tabor Park Reservoir 1
Photographer: Jeff Lee
View: Wrought Iron Fence, detail
Photo Number: **5**

Resource: Mount Tabor Park Reservoir 1
Photographer: Cascade Anderson Geller
View: looking southwest at Weir House, east elevation
Photo Number: **6**

Resource: Mount Tabor Park Reservoir 1
Photographer: Jeff Lee
View: north end of Reservoir 1, Water Fountain
Photo Number: **7**

Resource: Mount Tabor Park Reservoir 1
Photographer: Kim Lakin
View: looking north at walkway, and south elevation of Weir House
Photo Number: **8**

Resource: Mount Tabor Park Reservoir 5
Photographer: Jeff Lee
View: looking northwest
Photo Number: **9**

Resource: Mount Tabor Park Reservoir 5
Photographer: Kim Lakin
View: looking northwest, Gatehouse 5, southeast elevation
Photo Number: **10**

Resource: Mount Tabor Park Reservoir 5
Photographer: Jeff Lee
View: looking southeast, Gatehouse 5, northwest elevation
Photo Number: **11**

Resource: Mount Tabor Park Reservoir 5
Photographer: Jeff Lee
View: Wrought Iron Fence cornerpost detail
Photo Number: **12**

Resource: Mount Tabor Park Reservoir 5
Photographer: Jeff Lee
View: looking southwest, Weir Building, north & east elevations
Photo Number: **13**

Resource: Mount Tabor Park Reservoir 5
Photographer: Jeff Lee
View: looking southeast, Weir Building, north & west elevation
Photo Number: **14**

Resource: Mount Tabor Park Reservoir 5
Photographer: Kim Lakin
View: looking east, Outbuilding, west elevation
Photo Number: **15**

Resource: Mount Tabor Park Reservoir 5
Photographer: Jeff Lee
View: looking southwest, dam face, stairway
Photo Number: **16**

Resource: Mount Tabor Park Reservoir 6
Photographer: Jeff Lee
View: looking west, Reservoir 6, Inlet Gatehouse, east elevation
Photo Number: **17**

Resource: Mount Tabor Park Reservoir 6
Photographer: Jeff Lee
View: looking southeast, Inlet & Outlet Gatehouses
Photo Number: **18**

Resource: Mount Tabor Park Reservoir 6
Photographer: Kim Lakin
View: looking south, Inlet Gatehouse 6, north elevation
Photo Number: **19**

Resource: Mount Tabor Park Reservoir 6
Photographer: Jeff Lee
View: looking southeast, Outlet Gatehouse 6, north and west elevation
Photo Number: **20**

Resource: Mount Tabor Park Reservoir 6
Photographer: Kim Lakin
View: looking south, Chlorination House, north elevation
Photo Number: **21**

Resource: Mount Tabor Park Reservoir 6
Photographer: Jeff Lee
View: Wrought Iron Lamppost detail
Photo Number: **22**

Resource: Mount Tabor Park Discontiguous Feature
Photographer: Jeff Lee
View: looking southeast, Tank and Building
Photo Number: **23**

Resource: Mount Tabor Park Discontiguous Feature
Photographer: Jeff Lee
View: looking southeast, Building, north elevation
Photo Number: **24**

PORTLAND CITY WATER WORKS.

GENERAL PLANS & DETAILS OF RESERVOIRS.

SHEET No. 8a

SCALE, 3/4 IN. = 1 FT.

APPROVED: [signature] CITY ENGINEER

APPROVED: [signature] CONSULTING ENGINEER

Plan thro' Post

Plan of Lamp post at A - A

Concrete Balustrade

Concrete Balustrade

Side Elevation of Posts

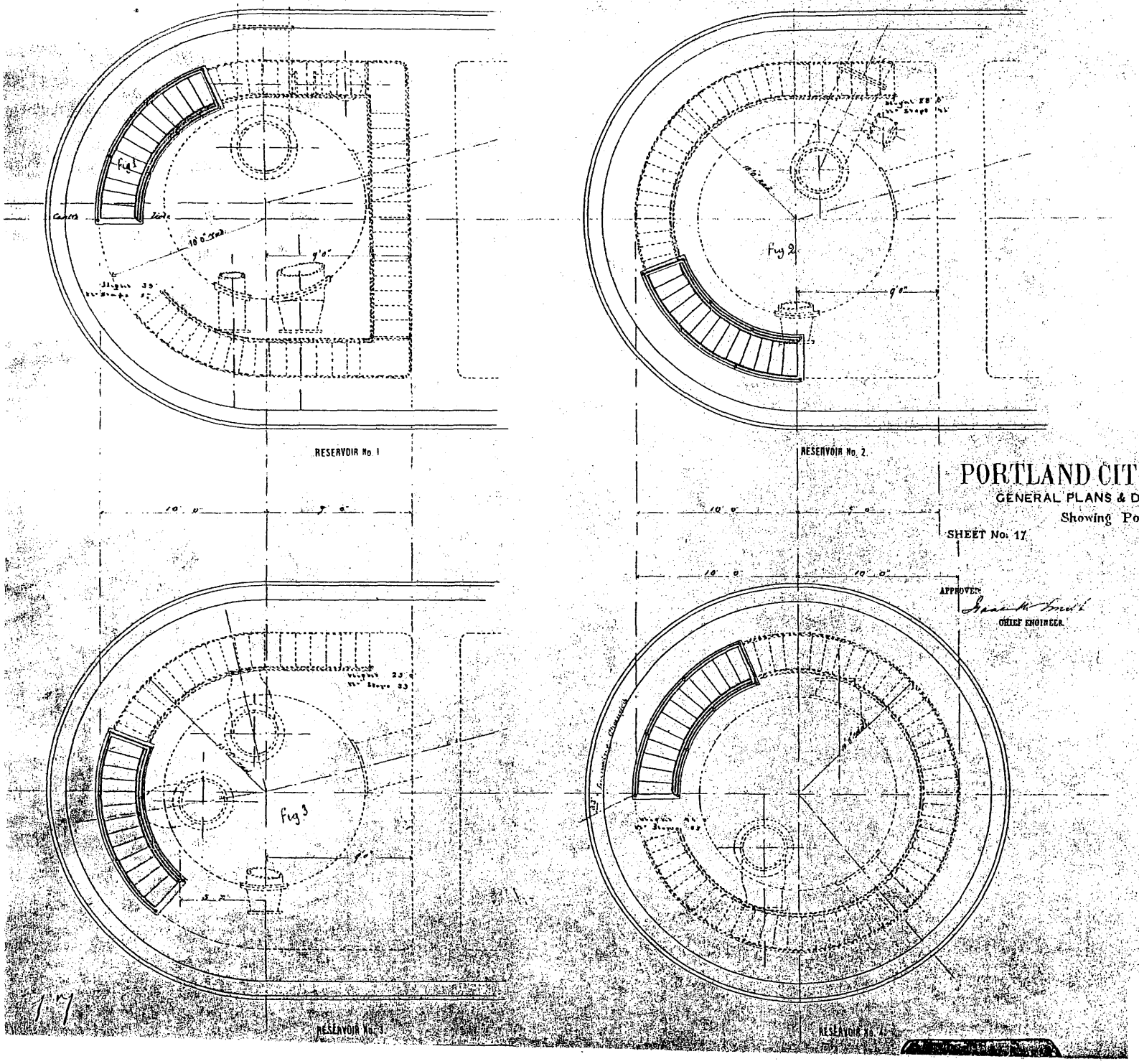
Elevation of Fence and Posts for City Park Reservoirs Nos 3+4. Section of Fence showing intermediate Posts with Bolts

Elevation of Fence for Reservoir No. 1

Elevation of Lamp Posts on Dams, 4 like this.

Side Elevation

MOUNT TABOR PARK RESERVOIRS
HISTORIC DISTRICT
MULTNOMAH COUNTY OREGON



PORTLAND CITY WATER WORKS.

GENERAL PLANS & DETAILS OF RESERVOIRS.

Showing Position of Stairs

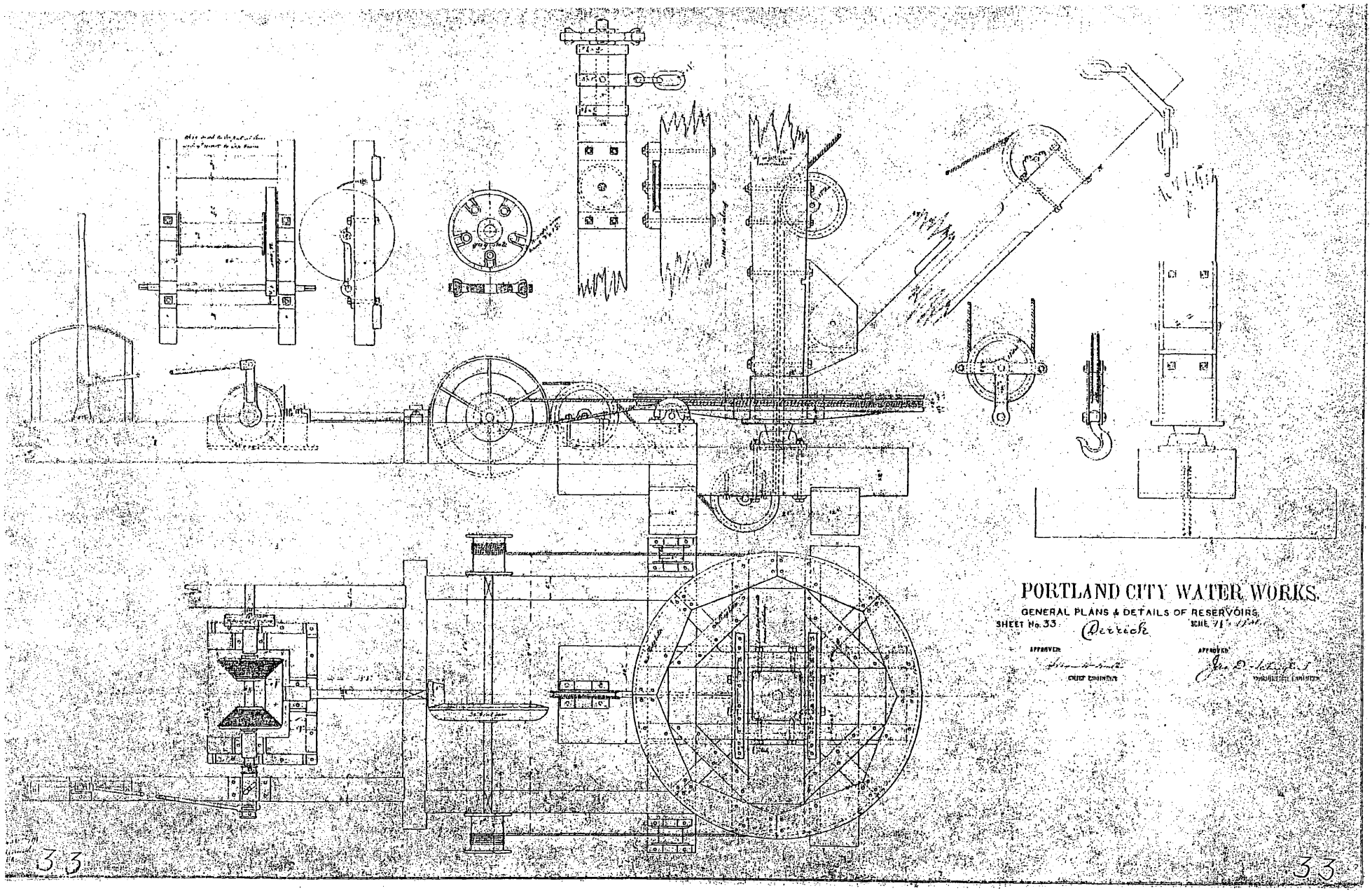
SHEET No. 17

SCALE, ¼"=1 Ft

APPROVED:
CHIEF ENGINEER.

APPROVED:
CONSULTING ENGINEER.

MOUNT TABOR PARK RESERVOIRS
HISTORIC DISTRICT
MULTNOMAH COUNTY OREGON



MOUNT TABOR PARK RESERVOIRS
HISTORIC DISTRICT
MULTNOMAH COUNTY OREGON

PORTLAND CITY WATER WORKS.

GENERAL PLANS & DETAILS OF RESERVOIRS.

RESERVOIR No 1 MT TABOR. HIGH SERVICE

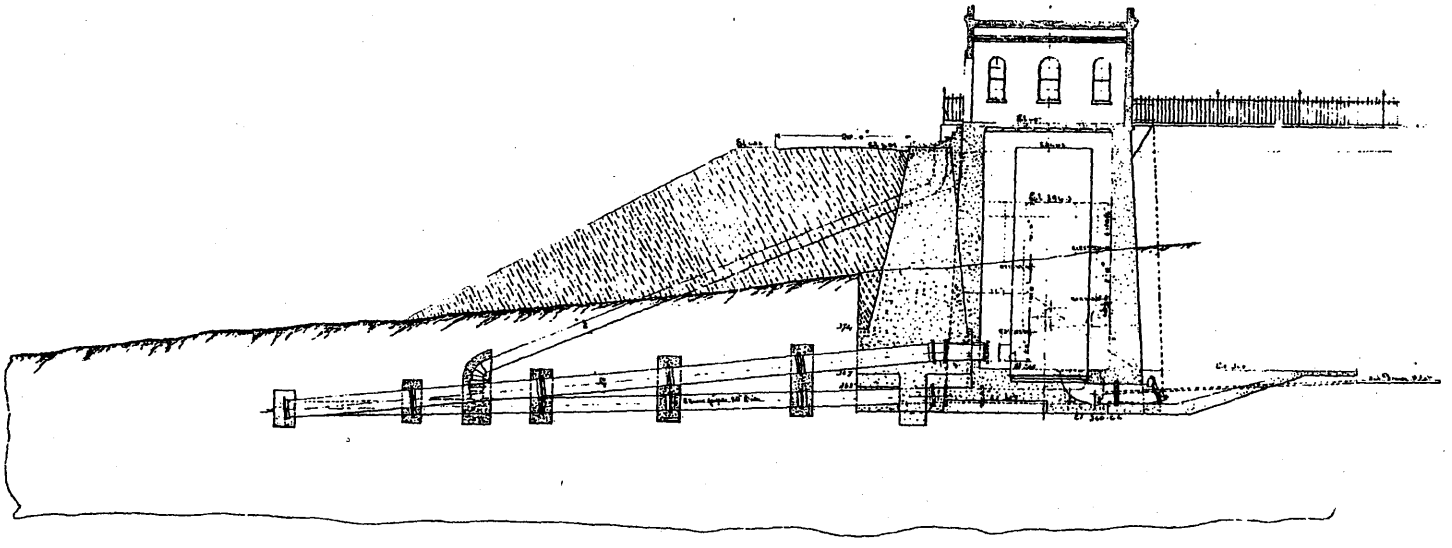
SHEET No: 50

SCALE 1" = 1'-0"

APPROVED
CHIEF ENGINEER

APPROVED
CONSULTING ENGINEER

1-0-2
Res 1



1-0-8

G-2 PRELIMINARY PLAN

Drawing 1

MOUNT TABOR RESERVOIRS
HISTORIC DISTRICT RESERVOIR 1
MULTNOMAH COUNTY OREGON
CITY OF PORTLAND
STANLEY PARR ARCHIVES & RECORD CENTER

PORTLAND CITY WATER WORKS.

GENERAL PLANS & DETAILS OF RESERVOIRS.

RESERVOIR No. 1 MT. TABOR. HIGH SERVICE.

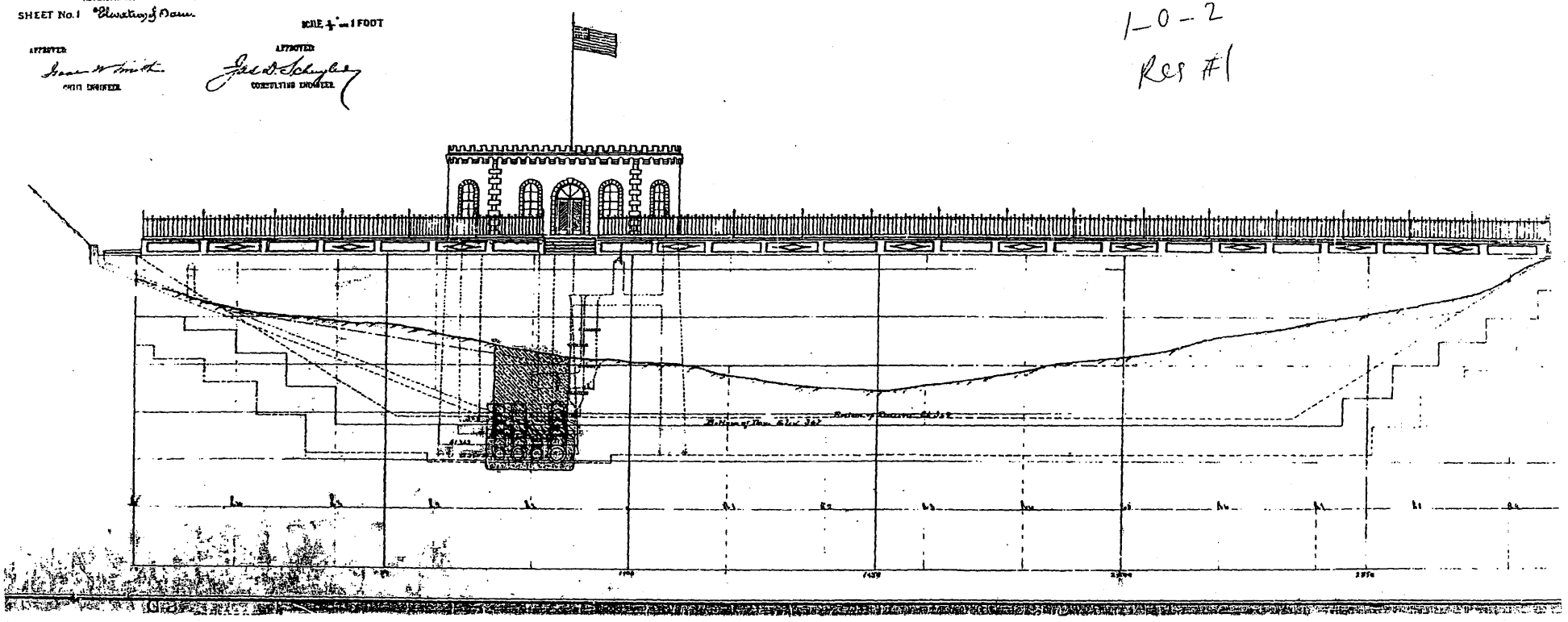
SHEET No. 1 Elevation of Dam.

SCALE 1/4" = 1 FOOT

APPROVED: [signature] CHIEF ENGINEER.

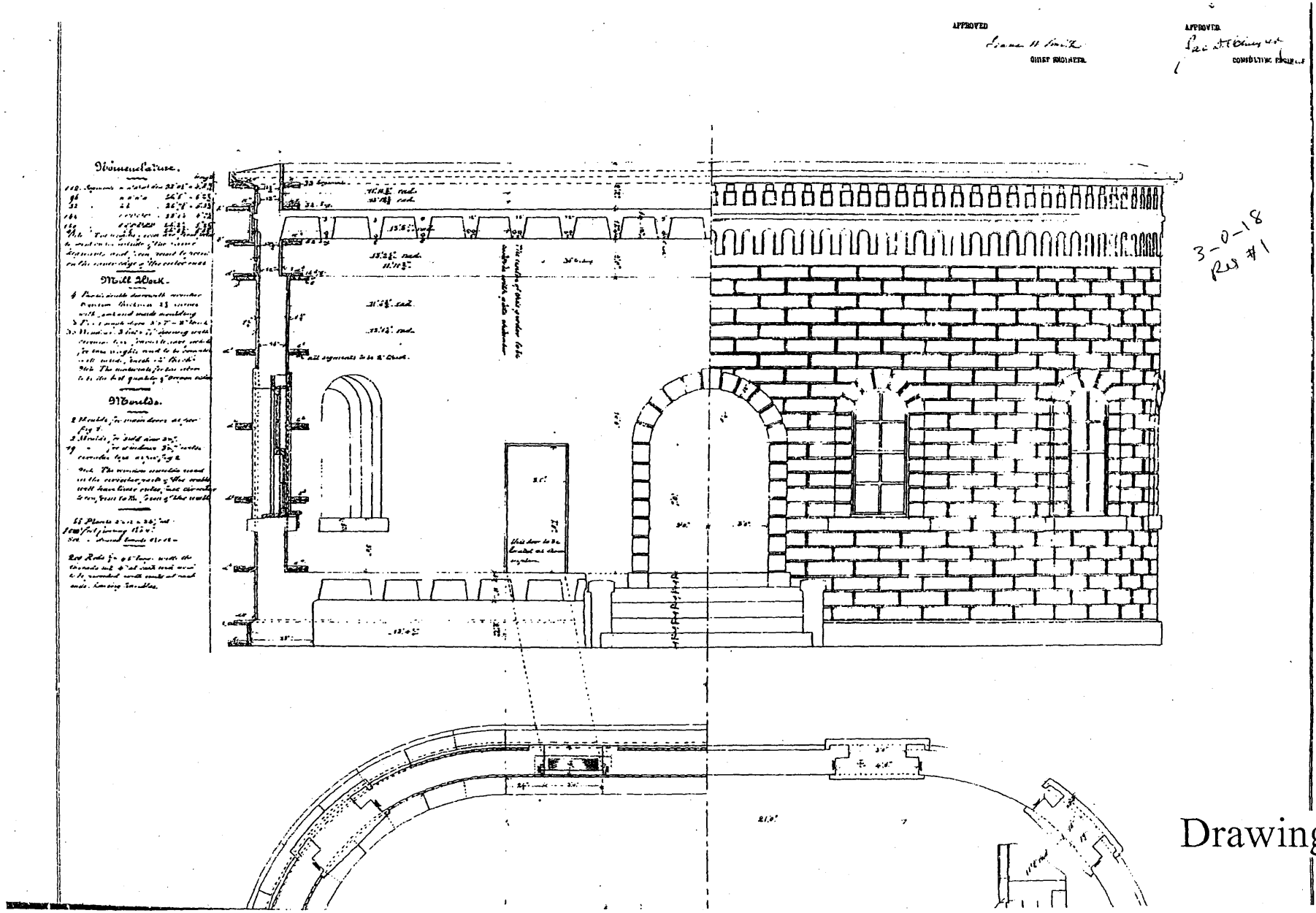
APPROVED: [signature] CONSULTING ENGINEER.

1-0-2
Res #1



Drawing 2

MOUNT TABOR RESERVOIRS
HISTORIC DISTRICT RESERVOIR 1
MULTNOMAH COUNTY OREGON
CITY OF PORTLAND
STANLEY PARR ARCHIVES & RECORD CENTER



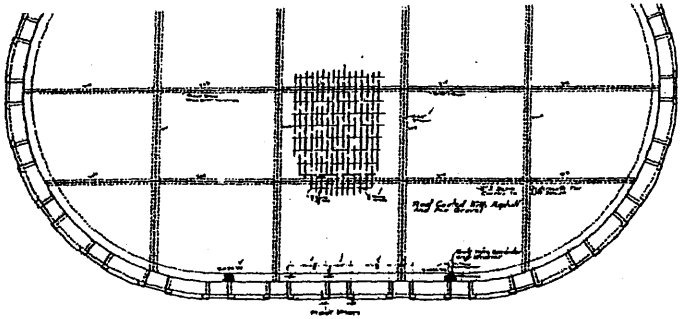
Drawing 3

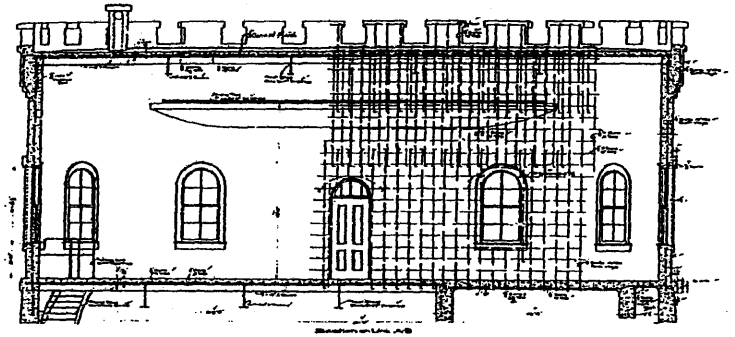
MOUNT TABOR RESERVOIRS
HISTORIC DISTRICT RESERVOIR 1
MULTNOMAH COUNTY OREGON
CITY OF PORTLAND
STANLEY PARR ARCHIVES & RECORD CENTER

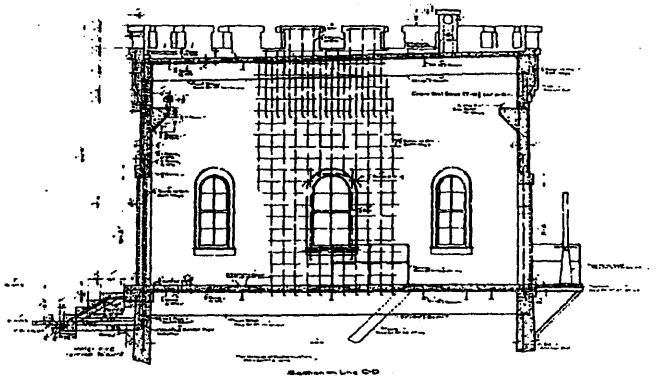
K

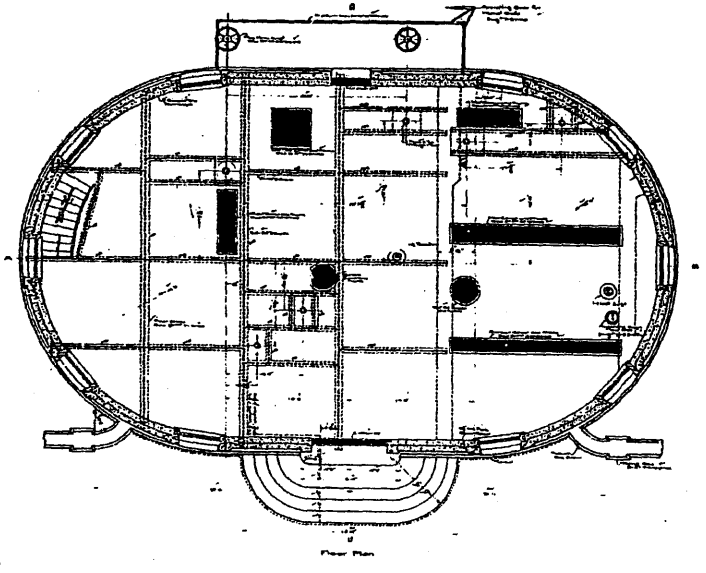
3-K-18

Res # 5

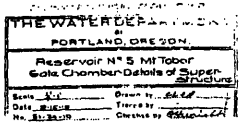








Drawing 4



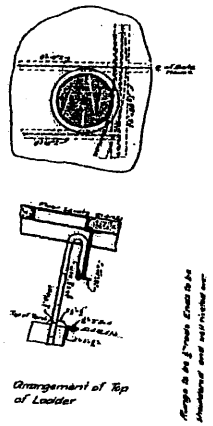
MOUNT TABOR RESERVOIRS
HISTORIC DISTRICT RESERVOIR 5
MULTNOMAH COUNTY OREGON
CITY OF PORTLAND
STANLEY PARR ARCHIVES & RECORD CENTER

JANUARY, 1974

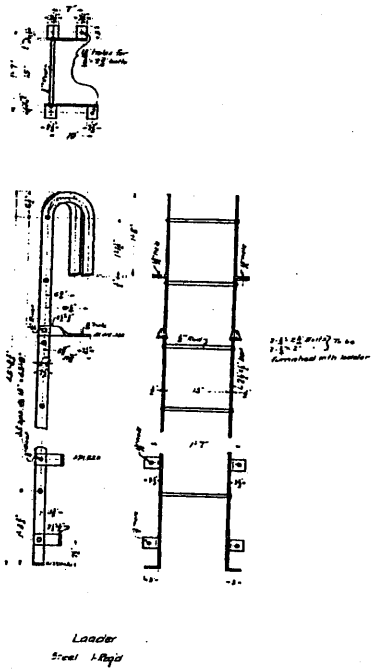
1-MA 2

Rest 5

1-MA-3 3

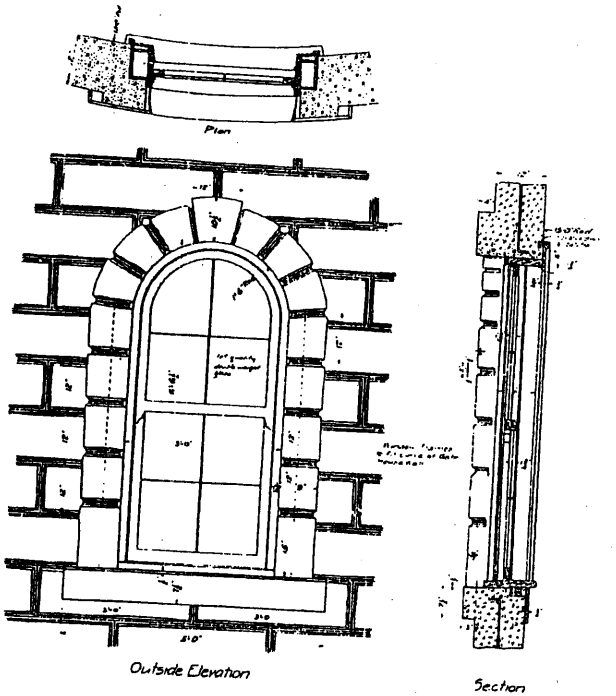


Arrangement of Top of Ladder



Ladder
Steel Rigid

THE WATER DEPARTMENT
OF
PORTLAND, OREGON.
Gate House Res°5 Mt Tabor
Detail of Steel Ladder in Tank
Scale 1"=1'-0" Drawn by GHKnight
Date 12-11-1931 Traced by
No. 117-5-02 Checked by
1-M-A2 Approved



Plan
Outside Elevation
Section
Detail of Window

Drawing 5

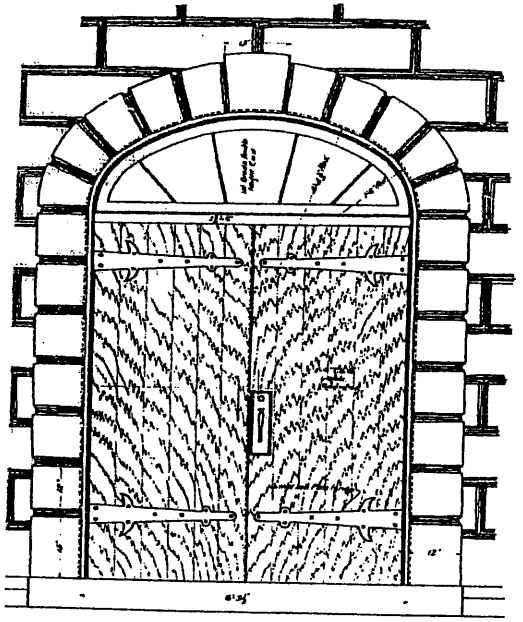
THE WATER DEPARTMENT
OF
PORTLAND, OREGON.
Reservoir °5 Mt Tabor
Detail of Gate House Window
Scale 1-1-0 Drawn by GHKnight
Date 5-11-1932 Traced by
No. 51-2-04 Checked by
1-M-A3

MOUNT TABOR RESERVOIRS
HISTORIC DISTRICT RESERVOIR 5
MULTNOMAH COUNTY OREGON
CITY OF PORTLAND
STANLEY PARR ARCHIVES & RECORD CENTER

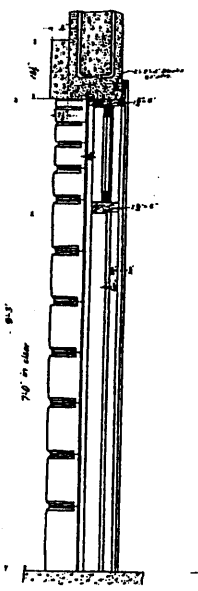
JANUARY, 1974

1-MA 11

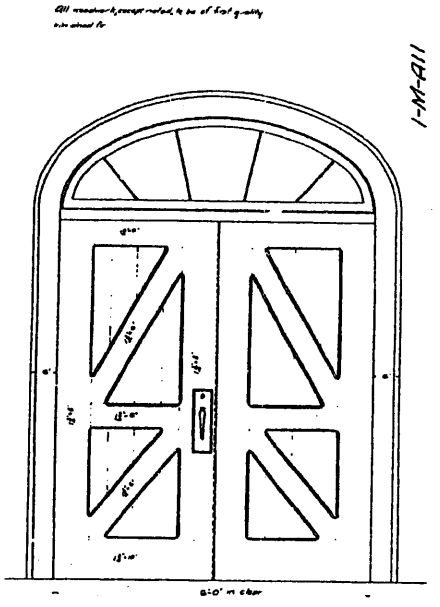
Res #5



Front Elevation



Section



1-M-A11

Rear Elevation

1-Door and Frame required as shown.

THE WATER DEPARTMENT
OF
PORTLAND, OREGON.

Reservoir #5 Mt. Tabor
Detail of Front Door Gate House

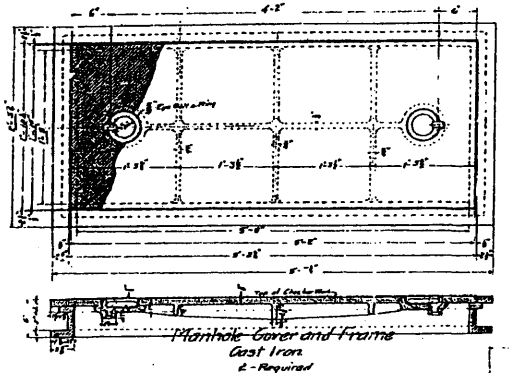
Scale 1"=1'0" Drawn by
Date Sept 27/1910 Traced by
No. Checked by

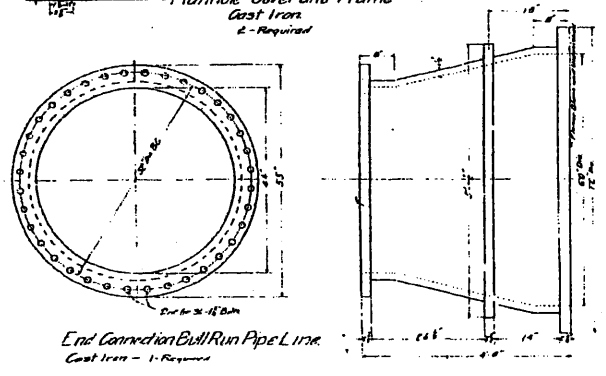
Approved
Engineer.

Drawing 6

MOUNT TABOR RESERVOIRS
HISTORIC DISTRICT RESERVOIR 5
MULTNOMAH COUNTY OREGON
CITY OF PORTLAND
STANLEY PARR ARCHIVES & RECORD CENTER

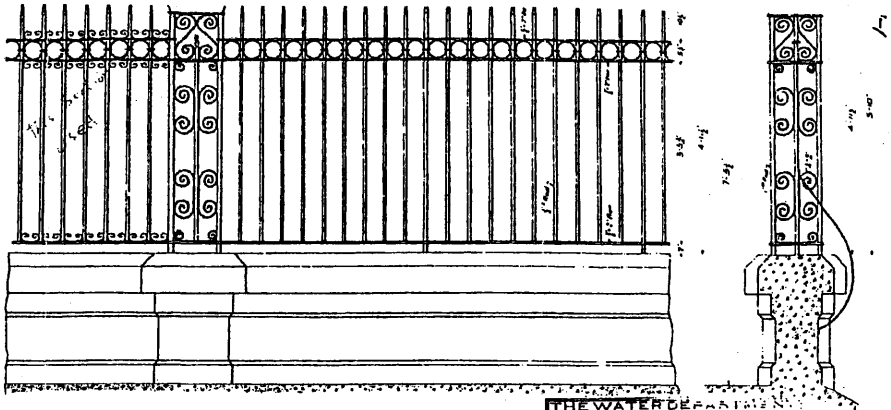
6





THE WATER DEPARTMENT
OF
PORTLAND, OREGON.
Reservoir "5
End Connection Bull Run Pipe Line and Manhole Cover + Frame for Tunnel Gate Chamber
Scale 1½"-1'-0" Drawn by
Date 5-23-16 Traced by
No. 12-8182 Checked by
Approved
Engineer.

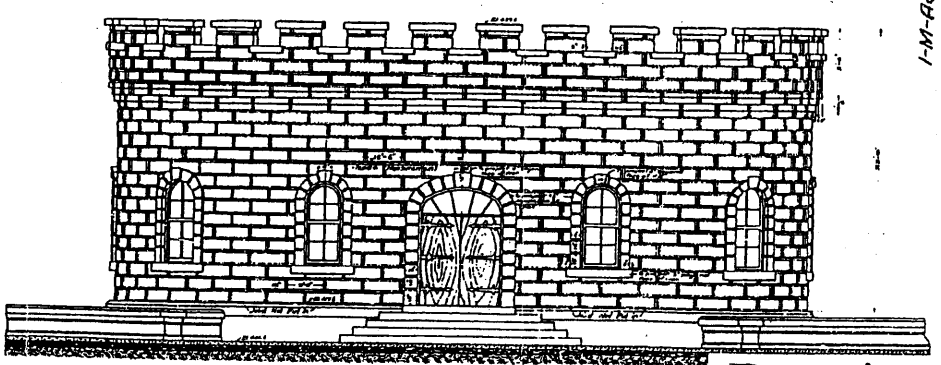
1-M-A6



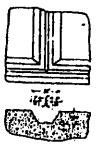
Pickets and rails to be made of steel, sandblasted, of wrought

THE WATER DEPARTMENT
OF
PORTLAND, OREGON.
Reservoir "5 Mt. Tabor
Proposed Fence on Parapet Wall
Scale 1½"
Date June 8-1910
No.
Engineer.

8



FRONT ELEVATION



See Dwg "81-24-D

Outside Surface to be finished as per directions of Engineer.

THE WATER DEPARTMENT
OF
PORTLAND, OREGON.
Reservoir "5 Mt. Tabor
Front Elevation of Gate House
Scale 1½"-1'-0" Drawn by G.H.W.
Date June 12-'11 Traced by G.E.P.

1-M-A8

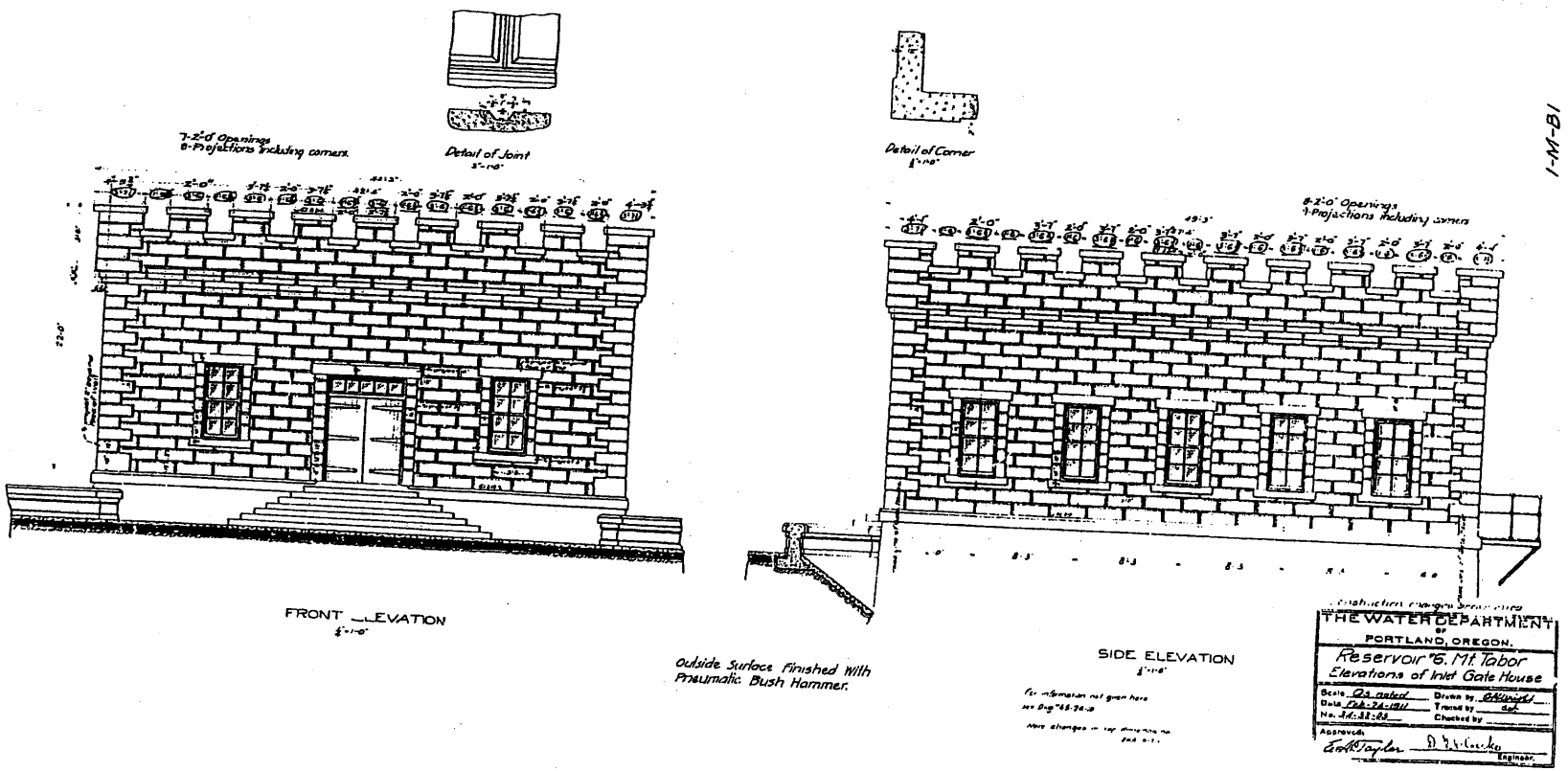
Reg #5

Drawing 7

MOUNT TABOR RESERVOIRS
HISTORIC DISTRICT RESERVOIR 5
MULTNOMAH COUNTY OREGON
CITY OF PORTLAND
STANLEY PARR ARCHIVES & RECORD CENTER

1-MB-1

Res #6



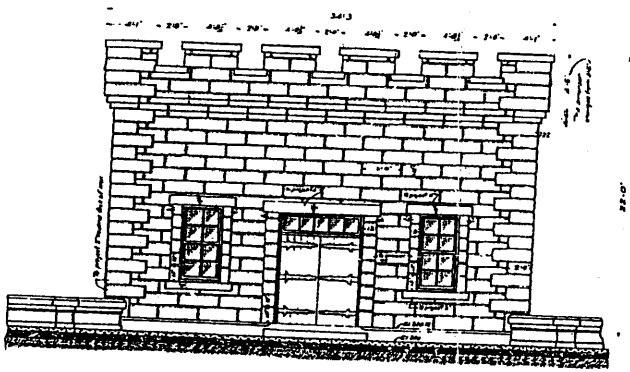
1-MB-1

Drawing 8

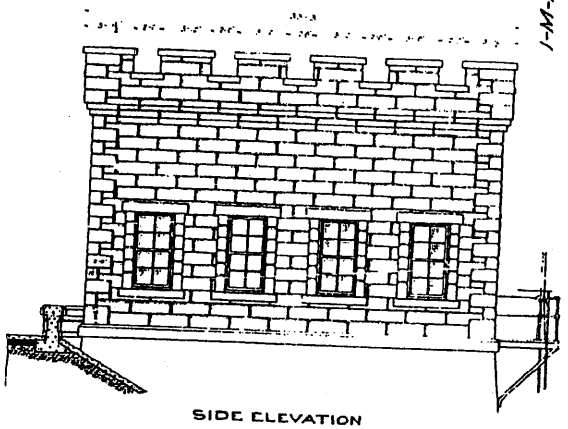
MOUNT TABOR RESERVOIRS
HISTORIC DISTRICT RESERVOIR 6
MULTNOMAH COUNTY OREGON
CITY OF PORTLAND
STANLEY PARR ARCHIVES & RECORD CENTER

1-MB-5

Res #6

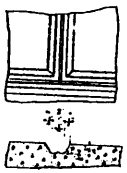


FRONT ELEVATION



SIDE ELEVATION

1-M-B5



DETAIL OF JOINT

Outside Surface Finished With Pneumatic Bush Hammer

THE WATER DEPARTMENT OF PORTLAND, OREGON.

Reservoir 6, Mt. Tabor
Elevations of Outlet Gate House

Scale 1/8"=1'-0" Drawn by
Date Oct. 9, 1928 Traced by
No. 78-23-05 Checked by

Approved:

Engineer.

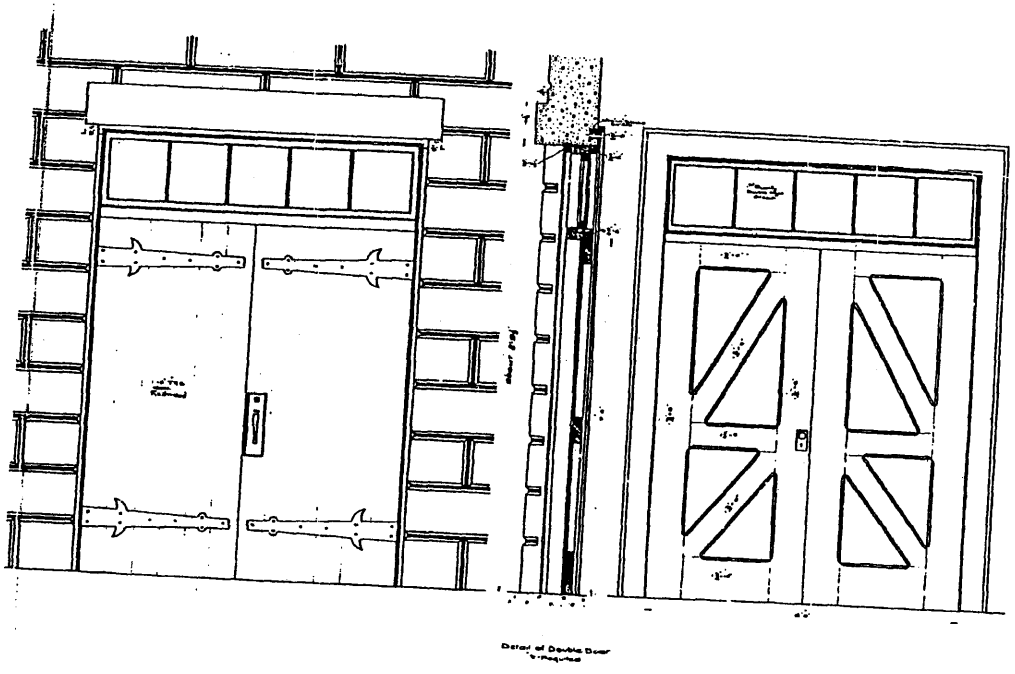
Drawing 9

MOUNT TABOR RESERVOIRS
HISTORIC DISTRICT RESERVOIR 6
MULTNOMAH COUNTY OREGON
CITY OF PORTLAND
STANLEY PARR ARCHIVES & RECORD CENTER

I-MB-6

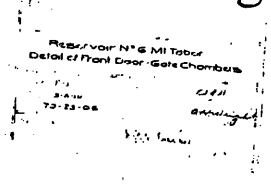
I-MB-6

Res#6

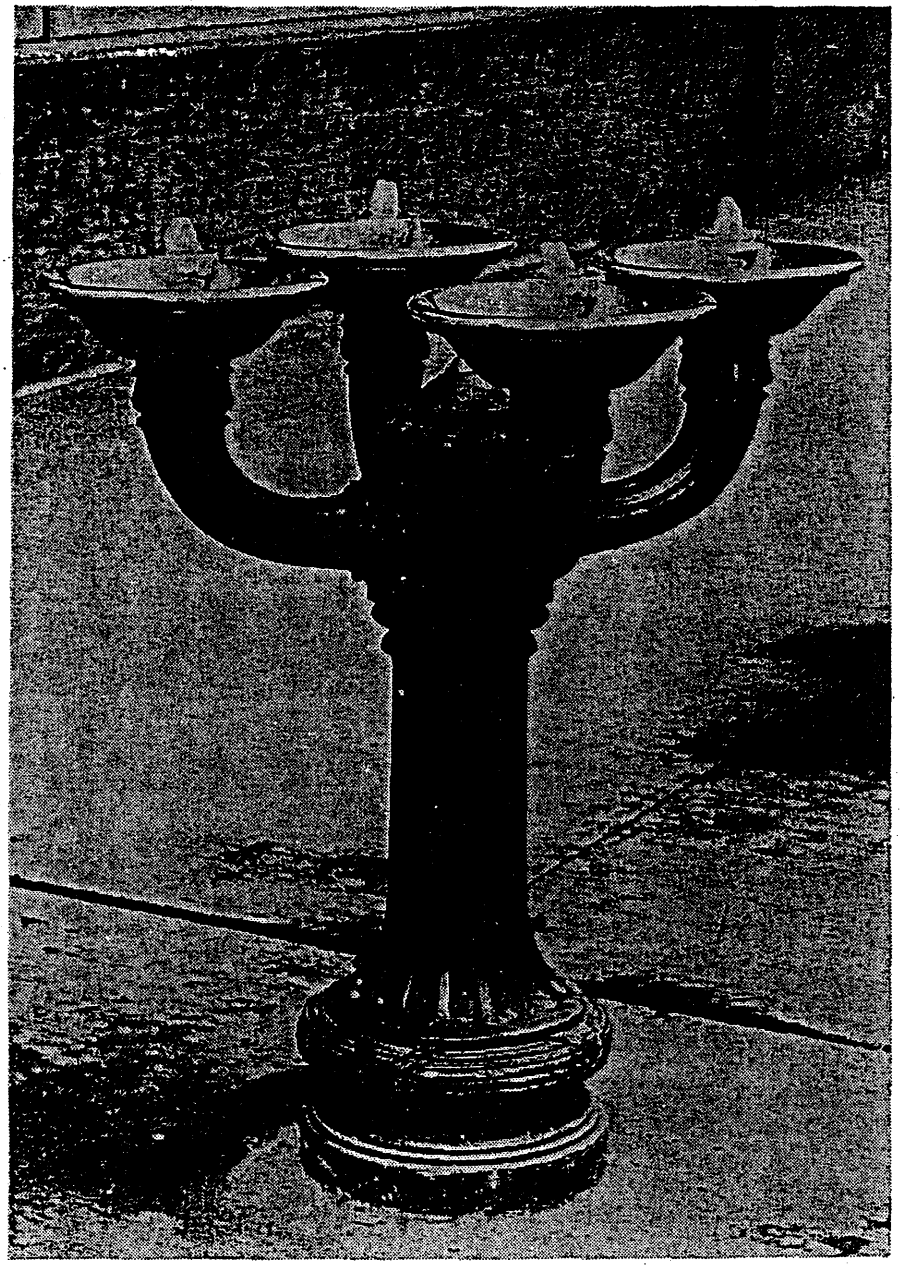


I-M-86

Drawing 10



MOUNT TABOR RESERVOIRS
HISTORIC DISTRICT RESERVOIR 6
MULTNOMAH COUNTY OREGON
CITY OF PORTLAND
STANLEY PARR ARCHIVES & RECORD CENTER



One of twenty bubbling drinking fountains donated by Simon Benson, 1912 (9010-06)