INTRODUCTION

WASHINGTON PARK HISTORY AND SIGNIFICANCE

Portland first established its municipal water system in the 1890s. This was representative of other sizable municipalities across the country that sought to provide urban utility systems with an adequate supply of water for their growing cities. The supply was necessary not only to ensure safe water for domestic consumption, but also for fire fighting and manufacturing. The creation of the Portland water system involved significant effort and cost. The supply source, distribution network and reservoir system all needed to be assembled. Portland's leaders believed that the development of a dependable and safe water supply demonstrated the City's commitment to growth and the well-being of its citizens and future generations.

The effort to establish the municipal water system was the responsibility of Portland's Water Committee, a group created by the state legislature during special session in 1885. At that time there were issues relating to constant, adequate supply, and water purity facing the growing city that then depended on the local, privately owned water companies. Portland was growing, becoming industrialized, and was downstream from other developing towns that used the river for waste and sewer disposal. The city's residents were faced with the degradation of its river water like many other comparably sized cities in the country.

Water was needed for a wide variety of purposes, including domestic, agriculture, manufacturing, construction, and notably, fire fighting. The city's growth resulted in areas of densely populated, wooden structures, with essentially no fire protection. Although building practice was beginning to change from all wooden structures to a more substantial type with masonry exteriors and wood interior framing, nearly all remaining buildings from that era reveal fire scars on their interior framing, attesting to the day-to-day fire risks.

During this time, period health science was developing. New research discovered that certain epidemic diseases were water borne. Water purity increasingly became a concern for city leaders. Across the country, municipalities increasingly began to develop and control their own water supplies. Portland's Water Committee led the local effort to secure a clean, dependable source and supply of water at reasonable costs for its residents.

The new water system required a dependable source, the means to transmit the water, local storage facilities and the local distribution network. The Water Committee hired Colonel Isaac Smith as lead engineer for the project, and directed him to find a dependable water source replacement for the Willamette River. He recommended Bull Run Watershed and River,Lake, which the committee was able to secure, along with some surrounding watershed area. In addition, the Committee was able to secure federal protection for the greater watershed area (a current no trespass reserve).

Construction of Conduit No. 1 (pipeline) from the Bull Run Watershed to Portland was a considerable undertaking. The distance was great, the terrain difficult, and largely wilderness.

Construction required excavations, trestles and bridges to carry the gravity transmitted water from an initial elevation of 710 feet at the intake of the bull Run River to Mount Tabor, the chosen distribution site, at an elevation of 411 feet..

In Portland, Reservoir No. 1 was built at the Mount Tabor site. This reservoir fed and worked in conjunction with Reservoir No. 2 at the foot of Mount Tabor for east Portland service. The reservoirs at Mount Tabor supplied Reservoirs No. 3 and No. 4 at City Park (now Washington Park) through a conduit beneath the Willamette River for westside and downtown service. These four reservoirs provided a combined capacity of 66 million gallons of water, a 4-5 day supply for Portland.

In years following the 1905 Lewis and Clark Exposition, Portland grew significantly to a size nearly triple that of the initial system design. The water system came under pressure to enlarge its capacity to accommodate this new growth. A second supply line from Headworks, conduit No. 2, was added along with additional storage Reservoirs No. 5 and No. 6 at Mount Tabor in 1911. The reservoirs were interconnected by conduits in concrete tunnels between Reservoirs No. 1 and No. 5, (same elevation) and No. 6 on the lower west slope of Mt. Tabor. In 1923 a weir building (screen house) was added at Reservoir No. 1. In 1945, Conduit No. 3 (36" in size) and the accompanying 36 Weir House were added between Mount Tabor and Washington Park to provide additional supply for growth on the west side of Portland. Since that period, there have been other periodic enlargements and improvements to the Bull Run source supply, system conduits, and operations to keep pace with technology and growth. Yet, the system still utilizes the core design and most of the structures from the original period, a testament to its thoughtful long-term vision.

The construction of the first structures at Washington Park consisted of Reservoirs No. e and No. 4 and their associated gatehouses, dams, and reservoir basins. Reservoir design took engineering advantage of the natural terrain and also reflected the ideals of the City Beautiful Movement that was then becoming popular. These concepts sought to reinforce natural beauty within the built environment by creating a sense of order in the setting and harmony between structures and landscape. This was exemplified by the perimeter walkway and its decorative fencing around the reservoir, the paths, stairways, water fountains, and adjacent parkland and other public areas within a complex that provided municipal services. The Gatehouse used a Romanesque Revival design that was then popular in the country for engineering works, but was also a design reference to fortress gatehouses in England and the European Continent, where some similar structures also employed the use of water. The design conveyed a sense of strength and durability. It now also conveys a romantic setting.

Washington Park Reservoirs No. 3 and No. 4 dams, lining, perimeter walls, and gatehouses are constructed of poured in place concrete, the first large scale projects using the Ransome method that utilized twisted iron reinforcing bars. This was cutting edge technology at the time, as were the early concrete mix designs using Portland cement. The ability of liquid concrete to be formed and cast into a variety of shapes and surface textures added to its attractiveness. Popular styles could be constructed faster, stronger and more economically than previously. Work at the reservoirs later ancillary buildings continued the design style and type of construction using

current engineering and construction technology, but still with craft and attention to details. Much of the original piping, equipment, and mechanical construction still exists.

The Washington Park Reservoir structures and buildings are nationally significant as part of an early design of a city's water system. There are only a small number of major water districts still utilizing and operating their historic open reservoirs within an urban setting. The system is historically significant for its initial construction and additions involving monumental civic undertakings, for the exemplification of early concrete engineering construction technology, and for its architectural design.

PROJECT SCOPE & APPROACH

The purpose of this project is to develop a Reservoirs Historic Structures Report (RHSR) to provide an assessment of current conditions and recommendations for immediate and on-going maintenance, and for long-term preservation of the historic facilities and features within the Mount Tabor Park Reservoirs and Washington Park Reservoirs Historic Districts. The work items and procedures noted are generally not defined to a construction bid level in nature, although work items are noted sufficiently to define the project, uncover significant unknowns, and provide a basis for establishing a construction budget. This RHSR is based on the existing National Register Historic District nomination and includes review of existing historic research and documentation of the features, review of prior alterations, fieldwork for condition assessments, a tabular summary of results, and creation of an implementation plan. The tabular summary includes a prioritization list which identifies the immediate maintenance required to preserve the facilities against significant deterioration and the ongoing maintenance recommendations for items of lesser concern and significance.

The work is divided into two phases: Phase A – Mount Tabor Park, and Phase B – Washington Park. This RHSR pertains only to Phase B– Washington Park Reservoirs Historic Structures, and analyzes the condition of historic features as identified in the Washington Park Reservoirs Historic District (January 15, 2004). Buildings, structures, and objects included in this analysis are:

Reservoir 3	Gatehouse 3
	36 Weir Building
	Site (Reservoir Structure and Dam, Site Wall [Parapet Wall] Assembly, Stairway, Walkways)
Reservoir 4	Gatehouse 4
	Pump House 1
	Site (Reservoir Structure and Dam, Site Wall [Parapet Wall] Assembly, Walkways, Stairways, Valve Tunnels)

The Historic District boundary, including structures and other features, is shown in Figure 1, Site Plan.

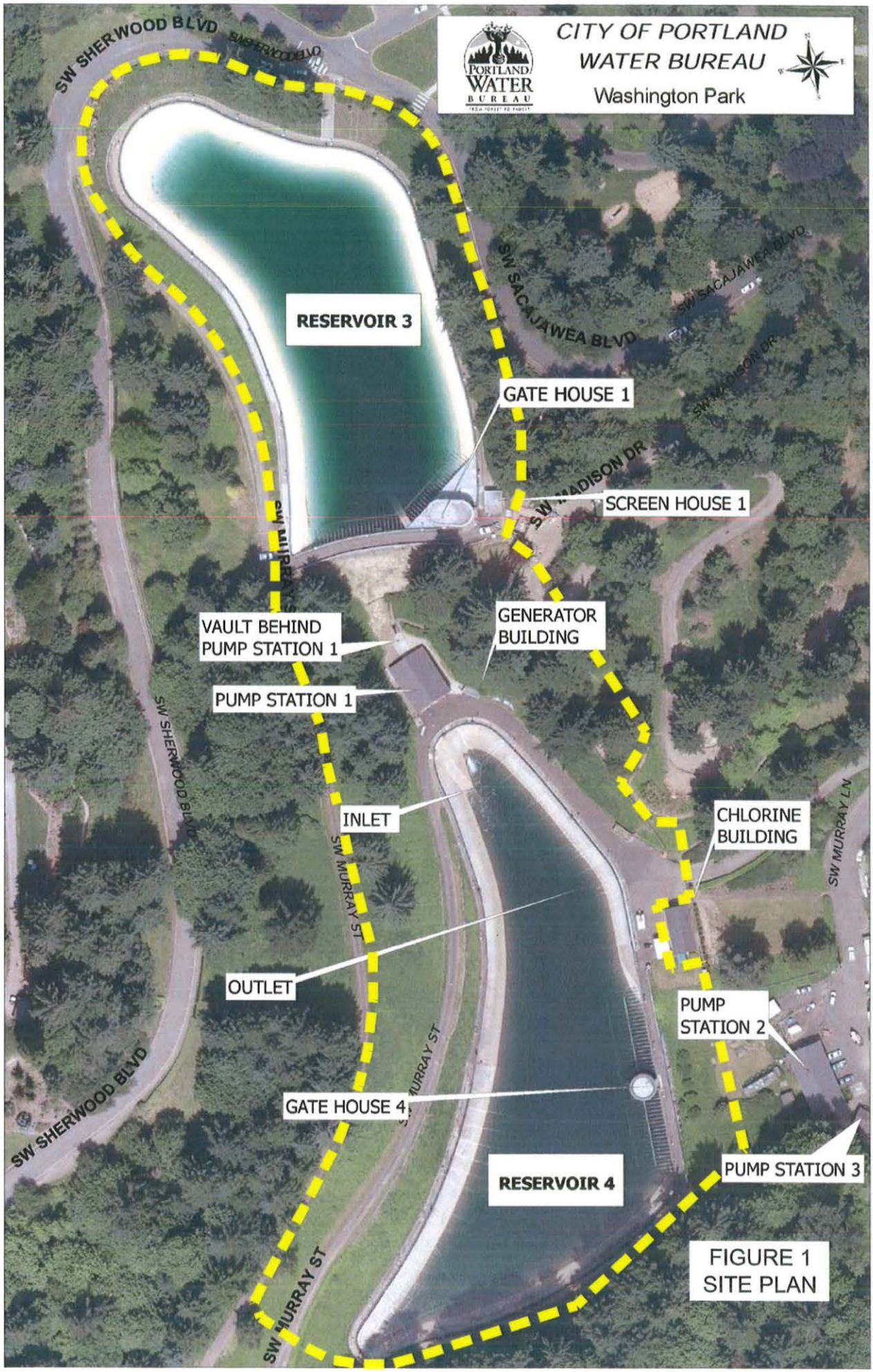


FIGURE 1
SITE PLAN

Phase B was divided into two parts. In Part 1 of Phase B, each of the historic contributing features of the above resources in the Washington Park Reservoirs Historic District were identified and reviewed, with a condition assessment developed for each. These were discussed with the Portland Water Bureau staff and the stakeholder groupo that included internal and external members. The results were documented in Technical Memorandum No. 1.

The consultant team visited each of the historic contributing resources over a three-week period during the field work portion. The visits were conducted by a team consisting of an architect to review the overall condition of the building or structure, a structural engineer to identify any pertinent structural deficiencies, and a civil engineer to review operational concerns. Each discipline then reviewed the findings in light of the building's or structure's historical significance. The reviews were visual and documented by digital photography. No testing or analysis was done in the course of the reviews.

Each of the contributing features was reviewed. A condition assessment for each of the features was developed, including a description of the facilities, discussion of the operations, photos, and an itemized list of apparent deficiencies.

Subsequently, in Part 2 of Phase B, alternative treatment means and methods to address deficiencies identified in the condition assessment were analyzed. Recommendations for improvements and a plan to implement the preferred alternatives were developed and discussed with the Portland Water Bureau staff and the stakeholder group that included internal and external members. The recommendations and implementation plan included a prioritization of major repairs and an ongoing maintenance plan. The results were incorporated into the final report. For some recommendations there may be alternative, but equally acceptable solutions. Those are labeled as sub-items, e.g. A.1 and A.2.

Final Report Format

The information from the technical memorandum have been integrated into this final RHSR. In the report, a separate, tabbed section is presented for each of the two Reservoirs (3 and 4). Within a particular section, each contributing resource is listed separately, such as Gatehouse 3, 36 Weir Building, etc. The building or structure is further broken down by contributing feature or component (such as balcony, windows, doors, etc), each of which includes a brief description, observations/conditions, treatment recommendations, alternative treatment options, and a priority (urgency, not significance) ranking. This information is summarized in the Executive Summary. Report appendices include a selected bibliography and relevant Department of Interior Historic Preservation Briefs. (These Briefs are typically not directed specifically toward the types of features and materials found at Washington Park, but they have some useful information and relevant methodology.) In addition, a Construction and Materials Reference Guide discussing the type of deterioration and typical remedial treatment for the different materials used in the district has been specifically developed and included.

METHODOLOGY FOR REPAIRS

Please Note: As work is completed on these facilities, appropriate documentation should be provided.

Treatment Guidelines

The recommendations and principles presented in this RHSR are in accordance with accepted good practice, and follow the Guidelines For Rehabilitating Historic Buildings as developed by the Secretary of the Interior in their "Standards for Rehabilitation". These recommendations for specific work on the buildings and structures follow those principles, guidelines, and methodology and are described below.

Fundamental Guideline for Treatment:
Work on historically significant buildings and structures seeks to

Identify, Retain and Preserve

those historic features and resources that distinguish their historic character.

Alternatives for Treatment

Once historic character defining features are identified and their conditions are assessed, recommendations can be made for their preservation. Those decisions need to consider both the nature of the feature and its anticipated use.

The following Secretary of the Interior guidelines define the possible alternatives for treatment, starting from the least invasive:

Protect and Maintain (Preserve): This method essentially seeks to slow deterioration. Often this is the recommended procedure, and always is the situation when there are adjacent projects that may damage the feature. This could be the recommendation when the feature can continue its intended use as is, or with minimal intervention, or when other repairs might threaten its integrity, or as an interim step until other treatment can occur. This work can also be considered as good maintenance.

Repair: When the physical condition of the historic character defining materials or features warrant, repairing is recommended. The general principle is to consider the least amount of repair necessary, then move to more extensive or invasive work where necessary. Repair may include limited replacement of heavily deteriorated materials. A project may, for example, include a basic level of repair work that satisfies most of the problem, and a smaller amount of more extensive repair. The existing condition should be well documented before any work commences.

Replace: The most invasive method of preservation is replacement. Generally this is only employed when the physical condition of the historic character defining materials or features is so deteriorated that suitable repairs are not feasible. The best replacement materials are those

that are in 'kind' or close to the original material in composition, performance and resultant expression (See Restore below). Replacement can also occur for other reasons, such as structural conditions, or greatly altered operational use. In these situations, the replacement required within the new design should be incorporated into the historic fabric as much as possible. The existing conditions should be well documented before any work commences.

Restore, Design For Missing Historic Features: When an entire feature or component is missing, it no longer plays a part in physically defining the historic character of the structure or building unless it can be accurately recovered. Salvage of the missing item is most preferable and should be the first objective. But salvage may not be feasible (or may occur later at an unknown time in the future). An alternative is to reproduce the feature. Typically, use of similar materials and the same design is necessary. For example, a new door or window, or lantern may be made using an original as the pattern and study guide. A second acceptable option is the replacement of the item with an alternative, historically compatible design. This design should not detract from the remaining historic feature attributes in its design, materials and finish. This alternative might be a necessary, but temporary solution for the continued protection of the structure (such as roofing or downspouts) that is then later removed when the original can be restored. The alternative design (second option, not first) should be sufficiently differentiated from the original historic feature so that it is not generally perceived as the original historic component.

Alterations/Additions: It is important that the historic building or structure be able to continue its use. Alterations or additions might be necessary to achieve this goal. They may be part of the overall preservation strategy, and may affect historic features directly or indirectly. Such work needs to be considerate of the character defining materials and features and should weigh alternative solutions or strategies. Work should be designed in such a manner that there is the least impact. This may include work on lesser or non-character defining features rather than on the primary ones. The work should not radically change, obscure or destroy character defining features. Reversibility of the proposed work should be considered (Can this be easily removed in the future? Could the original be restored?). Alterations can include removal of non-historic materials or elements. The existing conditions should be well documented before any work commences.

Prioritization

The highest priority is for the continued preservation of the most significant historic features, and for those that are most in danger of being lost. This is followed by those features having lesser deterioration, or having less imminent damage. The recommendations are grouped into Short-Term, ideally to be completed within 5 years, and Long-Term, from 5-10 years. No sub-definition should be used, since it is beneficial to allow preservation to occur as funding for other operational projects is obtained. In this way, lower priority items may be completed earlier than expected, but in concert with adjacent work, which improves construction and funding efficiency and does not require revisions of otherwise completed work. Other work may be best considered as maintenance and thus performed on a regular cycle using annual funding.

Preservation recommendations are primarily concerned with the continued retention, structural integrity, and 'well being' of the historic building and its features. A secondary aspect is the aesthetic quality of the resource and its environment or context. These attributes are those that can be reconciled over time without great concern for loss of historic material. Although secondary, they are important since they provide additional citizen support and pride.

Procedures

Work procedures on historic materials are very important. Inadequate knowledge, preparation, skill, or inappropriate materials can do more harm than good for particular items. However, the historic materials used on buildings and structures in the Washington Park Reservoirs Historic District are generally durable and heavily constructed. These materials, though worn, have a very long life span and can last much longer with appropriate maintenance.

While each specific material needs to be handled with regard to its specific properties, the general procedure for all repairs is as follows:

1. Inspect deteriorated conditions thoroughly to determine scope and degree of work. Document and photograph existing conditions.
2. Develop appropriate preservation and repair options; this often is a combination of strategies, not "one size fits all".
3. Fragile and very important historic features need closer guidance and review throughout the design and repair process.
4. Use test samples to determine the best remedial solution for the particular work; at highly visible features or where the outcome is not certain, first utilize separate test samples, then try field samples on the structure when reasonably assured of favorable results.
5. Use the gentlest means first, then step to more aggressive means if necessary; keep in mind that more aggressive repairs can also mean more loss of historic integrity, and potentially more rapid future deterioration.
6. If materials and products do not work satisfactorily, consider benefits of scaling back to a 'Preserve' strategy; future technology may provide a better result if the feature can last.
7. Since many repairs over time result in accumulated loss of original material, repair only what is necessary.
8. Replacements usually involve removal of original materials. Apply the test of reversibility to determine the best design; evaluate the ability to retain original materials in the replacement; document historic conditions; salvage materials in sound condition.
9. Review prior alterations and rehabilitation work to determine whether there is an adverse impact to the historic materials. If so, evaluate alternatives to design and installation.

Skill Level of Practitioners

The background and skill level of those involved in the repairs of historic features is an important aspect in the success of the repair and in the long term preservation of the resource. The formulation, design, specification and at times, the monitoring of most projects should be performed by individuals having adequate professional knowledge and historic expertise. The Tabular Summary assigns a construction skill level for each recommendation that is based on the combination of the feature or material's historic or unique nature, the current general availability of repair and replacement materials and the provider's skills.

Skill Level:

A: Use of a specialist historic preservation contractor is necessary; typically involves specialty products requiring prior experience on historic projects.

B: Use of a contractor with similar historic preservation experience; suggested: 5 similar firm projects, and primary workers to have experience on at least 3 similar projects.

C: Use of a qualified contractor or maintenance crew from PWB.

SUMMARY OF FINDINGS

From a historic perspective (not from an asset management perspective), the historic features in the district are in fair to good condition, are largely intact, and reflect their original construction. The buildings, structures and site are actively utilized and are maintained. None of the rehabilitation work necessary is of an immediate nature, i.e. the historic features are not in a position of needing urgent repairs to prevent their loss. There are, however, various projects that need to be completed in the short term (1-5 years) to prevent worsening conditions.

There are a large percentage of projects that can be remedied under a long-term time frame. These also include restoration-type projects that would enhance the district. Finally, there are various projects that can be incorporated as maintenance.

DOCUMENTATION

Historical structures may, in some cases, warrant certain procedures for documentation that complies with methods outlined in "Historic Architectural Building Survey" (HABS) in which the media (such as large format or digital photographs, drawings, etc. process) is used to record certain features. This is especially true for structures and components slated for demolition or extensive remodel. The facilities at Washington Park already bear historical designation and such documentation is not warranted at this time. If any large scale changes are planned, beyond the scope of this report, it is recommended that a Memorandum of Understanding be prepared that outlines any proposed changes and that the changes will be consistent with the State Historical Preservation Office.

IMPLEMENTATION PLAN

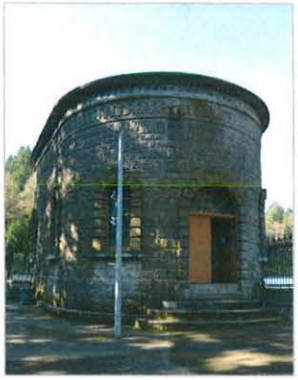
The Implementation Plan will be based on the Tabular Summary provided in this report. The Tabular Summary uses abbreviations to facilitate sorting according to Feature, Structure and Component and corresponds to the report narrative. The Feature or Structure (first column) is identified by its affiliated Reservoir, such as "GH3" for Gatehouse 3 at Reservoir 3 and "GB4" for Generating Building at Reservoir 4. The Component (second column) for each structure is further abbreviated by using letters from the component, such as "CONC" for concrete walls, floor and roof.

Portland Water Bureau (PWB) will use the Tabular Summary as a starting point to develop a detailed Implementation Plan. A PWB stakeholder group will be established consisting of the appropriate representatives and will use the Tabular Summary to facilitate sorting work projects by priority, cost or skill level and update as necessary to reflect personnel availability and financial conditions.

RESERVOIR 3

Contributing historic features at Reservoir 3 include the basin, its perimeter wall system and dam, gutter and walkway, the gatehouse on the southeast side, and the 36 Weir Building (screen house) adjacent to the gatehouse near the southeast corner.

GATEHOUSE 3



Reservoir 3 - Gatehouse 3

Concrete Walls, Floor and Roof

The building is a poured in place reinforced concrete structure, oval in plan, measuring 47 feet east-west and 26 feet north-south, and is symmetrically composed and located on the south side of the reservoir toward the inlet chamber on the east. It was constructed using Ransome construction and finish patents that were the latest technological achievement at the time of its 1894 construction. The exterior was formed with a rusticated block pattern that was bush hammered to provide a heavy rock finish, while the interior is smooth and painted. There is a low projecting parapet with a frieze using repetitive chamfered square recesses, horizontal molding lines and a projecting cornice with a dentil course below aligning with the frieze pattern. Door and window openings are round arch headed and have projecting surrounds with a prominent sill projection. There is a molded water table base. The lower water facing exterior below the water table line (floor line projection) is unpatterned and coated with cement plaster and waterproofing. The concrete floor deck is finished with a smooth troweled concrete and is without other finishes. The floor has imbedded glass relights installed under the Ransome's patent method. The concrete roof deck, 19½ feet above the floor, is supported on concrete beams. Roof drainage is internal by means of two cast iron pipes embedded in the exterior wall, one at the northeast and one at the southwest, that are routed under walkways to daylight into surface drainage facilities. The exterior was rehabilitated in 1988-89 with work that included patching injection crack filling, an exterior cementitious coating at the window sills, cornice and on the below waterline walls. The coping and roof deck were coated with an elastomeric deck coating. There are several unflashed steel brackets.

Condition/Observations: The exterior wall is in fair to good condition. There are some new cracks and spalled areas, some where reinforcement is exposed. There are some horizontal hairline cracks at the concrete cold joints, although none run through the wall to the interior. There is some soiling and moss accumulation on the exterior water table projection, sills and other horizontal projections. The roof coating is over 20 years old and well worn. Moisture was noticed at the top of the interior wall on the southwest, south and east sides; this appears to be due to roof and rain drain leaks at these locations. There is also some leakage in the center of the roof. The interior is reported to typically have significant condensation. Below the deck level at the waterline the wall is eroded. The roof drain design is prone to clogging.

Treatment Recommendations: The patterned concrete above the waterline requires protection to minimize future deterioration. Damaged and spalled areas should be patched. The original concrete finish should be expected to be difficult to match.

Option A.1: Preserve and Repair – Gently clean the concrete exterior; test for water absorption, perform patch tests; install cementitious patching to rebuild severely deteriorated horizontal projections and apply a breathable sealer to the above waterline, articulated concrete finish; retain lower below waterline wall as is.

Priority: Short-term

Option A.2: Repair, Replace – Check both drainlines for integrity. Install new interior drainlines if existing leak; provide overflow to one of these lines.

Priority: Short-term

Option A.3a: Replace – Provide a new membrane roof. This will require revision or removal of protruding brackets.

Priority: Short-term

Option A.3b: Repair – Provide new elastomeric coating over the existing roof deck and interior side of parapet.

Priority: Short-term

Option A.4a: Repair Replace – Provide new elastomeric coating over the existing roof coping.

Priority: Short-term

Option A.4b: Repair Replace – Provide new standing seam coping at parapet and its interior side similar to Gatehouse 4.

Priority: Long-term

Option A.5: Preserve – Preserve existing Ransome floor lights.

Priority: Maintenance

Metal Decking, Balcony

There is a wide reservoir side deck that was installed as part of Water Bureau Project Number 3367, Washington Park Open Reservoirs 3 and 4 Improvements, completed in 2003-2004. It is constructed of stainless steel and utilizes a hatch door to allow access to the reservoir stairway below. The valve operating platform is located on the dam – this is described in the Site section.

Condition/Observations: The non-historic stainless steel decking and related metal work is in good condition.

Treatment Recommendations: The metal decking and framing although in good condition is not historic and may be removed if no longer needed for operations.

Option A.1: Maintain – Maintain the deck until such time as it needs major repair or is no longer necessary, then consider revisions or removal.

Priority: Maintenance.

Doors

The single entry has inswinging doors topped with a fan light and is located at the top of five concrete steps on the east side of the building. The minimal top landing is covered with the original cast iron sill. The doors are flush steel (1980's) mounted on a hollow steel frame that are replacements for the original wood units. The arched transom and fan light has an outer plexi-glass glazed protection window. There is no reservoir side door or opening.

Condition/Observations: The non-original paired hollow metal entry doors and frame are in fair condition.

Treatment Recommendations:

Option A.1: Preserve and Repair – Maintain the existing metal door assembly as is. Preserve the existing cast iron sill.

Priority: Maintenance.

Option A.2: Repair and Replace – Replace the doors and frame with historically appropriate wood doors. Preserve the existing cast iron sill.

Priority: Long-term.

Windows

There are nine windows symmetrically located around the building. Windows are arch topped, wood double hung, 4/4 with rope suspension; all but two windows have missing ropes. Some have latch locks, and none have lift hardware. Glass is intact, but most of it appears to have been replaced over time. It is not historic, and one pane is cracked. The non-roped windows are unused. Windows have recently been fitted with interior security grilles fabricated of expanded galvanized metal. the new interior grills replaced similar ones previously on the exterior.

Condition/Observations: The windows and sills are generally in good condition but minor repairs and painting are needed.

Treatment Recommendations:

Option A.1: Preserve and Repair – Preserve the wood windows. Provide needed minor repairs including caulking, patching and painting. Replace rope suspension on windows designated to be operable; Suspension improvements are not needed on inoperable units.

Priority: Long-term

Interior Space

The interior retains much original wheeled valve and mechanical equipment, operable but no longer used since valves are operated remotely. Overhead trolley and curved track are intact, but the lifting cranes have been removed. There are multiple (Ransome) glass floor lights, and iron lids that are intact. There is an historic wood storage cabinet on the north wall. A curved iron stairway descends clockwise to the lower level starting at the west end. The treads have been overlaid with expanded metal for better traction, but otherwise the assembly is in historic condition. The metal stairway to the lower level is similar to the design shown on Mount Tabor Gatehouse 1 drawings dated 1917 that apparently replaced the original stair and matched the 1911 stair at Mount Tabor Gatehouse 5. The interior lighting is by modern floodlights surface-mounted overhead around the perimeter.

Condition/Observations: The metal stair has some surface rusting, but appears structurally well maintained.

Treatment Recommendations:

Option A.1: Preserve – Maintain metal stairway and railing to the extent possible, wood cabinet, and existing historic mechanical equipment intact; New equipment modifications added as needed with minimal removal or replacement of historic materials.

Priority: Maintenance

Option A.2 – Provide for limited interpretive tours, develop portable signage and graphics depicting operations.

Priority: Long-term

Option A.3 – Provide additional documentation, inventory and photographs of existing historic mechanical equipment

Priority: Long-term

Entry Steps

There are five concrete steps including the upper step flush with the entry doors that ascend from the walkway. The top step is straight and has a cast iron threshold at the entry doors. The lower three steps have radiused returns in a Romanesque style that extend past the door to the building wall. The step nosing is square and without a projection; the steps appear to have been rebuilt in the past to match the originals except for the nosing. There are no handrails. A section of the original walkway, approximately ¼ circle, exists on the south side; it has 20" square tooling pattern that radiates from the building. It appears that more of the remaining walk is overlaid with asphalt.

Condition/Observations: There is some spalling on the lower steps on the south end.

Treatment Recommendations:

Option A.1: Preserve and Repair – Preserve, patch and repair the entry steps with matching material; Clean concrete surfaces, remove loose and deteriorated material; patch tests; patch spalled areas.

Priority: Long-term

Option A.2: Preserve and Repair – Preserve the remains of the original plaza and sidewalk and restore missing portions or those overlaid with new construction. Coordinate work with adjacent site paving.

Priority: Long-term

36 WEIR BUILDING

Reservoir 3 – 36 Weir Building

Constructed in 1945, the 36 Weir or Inlet Building is located a short distance to the east of Gatehouse 3. It was originally built when the additional westside 36" diameter Conduit #3 was constructed. The screening function was replaced by facilities at Powell Butte, and currently the building is utilized for security and storage.

Concrete Walls, Floor and Roof

The rectangular single story reinforced concrete building measures approximately 10 feet by 16 feet and is approximately 3 feet above the adjacent grade. The small structure is built into the hillside on the east. The exterior wall surface is smooth with a short regressed parapet. The building has a flat concrete roof deck, and has a steel I-beam for screen hoisting.

The roof has a modified bitumen membrane covering that terminates at the outside edge of the parapet coping with a sheet metal flashing. The roof drain [currently a 2" sleeve] is routed through the low coping at the northeast corner. The drain connects to a 4" cast iron downspout that in turn drains into the adjacent walkway catchbasin at the end of the open walkway gutter.

The front, or south side, adjoins a large raised concrete water vault lid of more recent construction. Some of the concrete walls have been refinished and display plywood form and gridding marks.

Condition/Observations: The exterior walls are in good condition. The roofing appears to be in good condition. The small roof drain is prone to clogging.

Treatment Recommendations:

Option A.1: Preserve– Gently clean the concrete exterior; test for water absorption, and apply a breathable sealer if needed.

Priority: Maintenance.

Option A.2: Preserve and Repair – Consider a cementitious or concrete finish coating to allow a uniform and protective finish.

Priority: Long-term

Option A.3 Preserve and Repair – Revise the existing roof drain; Provide a free standing roof drain connected to the existing pipe and an open overflow, or revise the drain to be an open scupper style.

Priority: Short-term

Door

There is a single entry with an inswinging door on the east side. It is a flush metal door with metal frame. Over the entry door there is a contemporary surface mounted light fixture.

Condition/Observations: The non-original hollow metal entry door and frame are in fair condition, and only need repainting. The opening is not scheduled for revision under recent Water Bureau Project numbers 3366 and 1086, Washington Park Interim Security and Deferred Maintenance. The exterior light fixture is intact, but slightly rusty.

Treatment Recommendations:

Option A.1: Preserve– Maintain the existing non original door.

Priority: Maintenance.

Option A.2 Preserve and Repair– Replace the current door when worn out with a door similar to the original construction.

Priority: Long-term.

Option A.3 Preserve and Repair– Replace the current light fixture when worn out with a fixture similar to the original construction.

Priority: Long-term.

Window

There is a single window on the south side. The current window, which is a late 1990's replacement, is a paired painted metal casement with single pane wire glazing. The sash is divided horizontally.

Condition/Observations: The non-historic window is in good condition.

Treatment Recommendations:

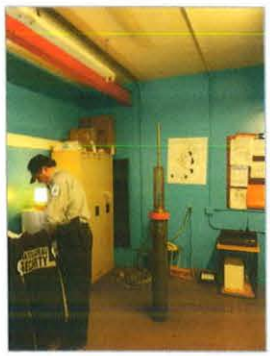
Option A.1: Preserve– Maintain the existing non original window.

Priority: Maintenance.

Option A.2 Preserve and Repair– Replace the current window when worn out with a window similar to the original construction.

Priority: Long-term.

Interior Space



The interior is a single room with smooth painted concrete walls and ceiling. The wood floor structure is covered with vinyl composition tile. Lighting is by pendent mounted contemporary florescent fixtures. The screen lid, water gauge, and hoisting I-beam are intact historic materials. New security equipment has been installed in the room.

Condition/Observations: The finishes are in good condition.

Treatment Recommendations:

Option A.1 Preserve– Preserve the existing historic equipment in place. If required to relocate, record equipment and installation, store or reinstall at safe location.

Priority: Long-term.

Option A.2 Preserve and Repair– Update the interior finishes as necessary in a manner that is historically appropriate.

Priority: Long-term.

Entry Steps

A concrete stairway and landing provides access from the south walkway along the edge of the raised vault. The five steps are simply detailed with sloped risers. There is a painted pipe handrail on the open side. This stairway appears to have been rebuilt, but the handrailing appears to be original.

Condition/Observations: The steps are in good condition.

Treatment Recommendations:

Option A.1: Preserve–. Maintain the existing non original stair and paint the handrailing.

Priority: Maintenance.

SITE

Reservoir 3 – Site

Reservoir Structure and Dam

Reservoir 3 was formed by damming the drainage on the south. The resulting basin utilized a concrete lining that tied into a site wall (parapet wall) around the perimeter of the basin. A concrete stairway descends into the basin from the southeast corner by the gatehouse.

At a hydraulic grade line of 299 feet, the reservoir serves by gravity the upper portions of downtown Portland and northwest neighborhoods to approximately NW 23rd Avenue. The basin is Portland's deepest at 49 feet and is roughly 180 feet wide by 500 feet long. The construction included retrofitting of the drain tunnels. PWB is unaware of any tunnels under the reservoir, but they do know that tunnels are located on slopes adjacent to the reservoir. These systems are still in operation. The reservoir has had various waterproofing systems over time to resolve leak issues. The current flexible hypalon membrane was installed in 2003.

A stainless steel pipe framework descending from the dam and gatehouse walls into the reservoir is intact. The structure was installed in 2003 to allow a previously proposed reservoir cover to be pulled back for basin maintenance.

The gently radiused, 175 foot long dam has a base of approximately 40 feet that narrows at the top to provide a 10 foot wide vehicle lane, with narrow walks and guard walls on each side (discussion of these walls is included under Basin Wall Assembly). The earthen dam is concrete faced on both sides. On the dry side, the design employs a rusticated block pattern from the base upward. The top section uses the design of a blind arcade of embossed stone pattern to give the appearance of a classic viaduct. This is achieved by forming the arched structure portion (arches at 10 foot centers) and roadway walls vertically, while the lower wall continues up and into the arches maintaining its slope. The roadway asphalt is overlaid on portions of the original 4-foot wide sidewalks. A portion of the walks are visible at the east end near the gate house.

There is a painted steel valve platform located west of the gatehouse on the reservoir side of the dam. It is a non-historic fabrication that has replaced the original at this location.

Condition/Observations: The basin has had a long history of drainage and geologic problems. Measures have been taken to stabilize the condition, but with the underlying geologic condition, these problems presumably will continue. At this time, there is a buckling or heave zone at the most problematic section on the west side of the reservoir, that is evident beneath the liner and that extends across the walkway and hillside retaining wall. Reservoir 3 construction undercut the toe of an ancient landslide. Landslide continues to move or creep.

The dam has numerous cracks on the south or downstream side. Crack monitors have been installed at various times in the past, some as much as 20 years ago, according to Water Bureau staff. A review of available reports and literature indicates that larger scale geological movements have been an ongoing concern for the Washington Park reservoirs and dams. The open guard rail at the west end of the dam has several significant cracks.

The recently constructed valve platform at the reservoir side of the dam is in good condition except for its paint which is peeling. The paint did not properly bond to the galvanized coated steel.

Treatment Recommendations:

Option A.1: Preserve and Repair – Gently clean the concrete dam face and walls; test for water absorption, perform patch tests; install cementitious patching to rebuild severely deteriorated areas; apply a breathable sealer to the wall caps.

Priority: Long-term

Option A.2: Preserve– Provide regularly scheduled cleaning of the dam face to reduce biological and environmental damage and the subsequent need for stronger cleaners.

Priority: Maintenance.

Option A.3: Preserve and Repair – Continue to monitor dam stability and geologic/hydraulic affects on the existing basin.

Priority: Maintenance, Long-term

Option A.4: Preserve and Repair – Properly prep and paint the valve platform.

Priority: Maintenance.

Option A.5: Preserve and Repair – Remove stainless steel pipe framework that was installed for the reservoir cover maintenance.

Priority: Long-term.

Option A.6: Preserve and Repair – Restore original paving located beneath the asphalt overlay.

Priority: Long-term.

Site Wall (Parapet Wall) Assembly

Along the dam portion on the east side there is a 42" high guard wall on the free side that is designed as a massive square sectioned balustrade. The wall terminates at massive concrete post bases on each end. These supported decorative lamposts with triple light fixtures, the center post portion of which survives. On the reservoir side, the guard wall is solid, 38" high, with a raised diamond pattern set within recessed panels. The pattern on this side is mostly obscured by multiple (7) electrical service conduits. The wall features a projecting crowned and chamfered cap, an apron beneath and a projecting base. The wall on the reservoir side has ornamental iron fencing mounted to its cap. Beyond the dam, it becomes heavily battered with smooth finished concrete and without pattern or base design. The cap and fencing design continues.

On top of the concrete reservoir wall there is a six foot high, ornamental wrought iron fence. This historic fence consists of decorated upper and lower rails, and vertical bars alternating in height all with a spear design. The end posts of the fence segments are set into the concrete cap and have a curved brace on the reservoir side. The wrought iron is fabricated with solid square and flat bars. There are a total of five four-sided ornamental fence columns serving as light poles. At these locations the concrete wall widens to receive the metal post. These posts still retain the wrought iron top that once held gas lamps that provided walkway lighting. At the gatehouse the wall returns to join the gatehouse wall. Original lighting was by a single gas lamp. Each end of the dam's open railing is punctuated by a large ornamental lamp post composed of square shaped concrete base that is 3-1/2 feet wide and 6 feet high that supports a wrought iron light standard, originally with three gas lights. Current lighting is from free standing tapered aluminum posts with globe and top reflector type fixtures that are located next to the rail wall.

Condition/Observations: The low concrete wall has many areas that are deteriorated, including the cap, projecting diamond patterns, and joint edges. There have been some prior patching repairs, but many other defects now are evident. The iron fencing is in fair condition needing minor repairs and repainting. Security monitoring cables have recently been attached to the metal work. Lighting on the fencing was discontinued long ago and the actual fixtures are missing, however most of the posts are in place. Electrical conduit feeds for the current light poles are surface mounted on the walkway side of the low wall and junction down to the base of each metal lamp post (50-foot spacing). The installation nearly covers the wall making it difficult to perform repairs. Additional security measures include cameras are mounted on these and newer posts.

Treatment Recommendations:

Option A.1: Preserve and Repair – Gently clean the concrete basin walls and urns; perform patch tests to develop best match; install cementitious patching to rebuild severely deteriorated areas.

Priority: Short-term

Option A.2: Preserve and Repair – Preserve metal fencing and light fixture posts; make repairs and repaint. Lead abatement is possibly required.

Priority: Short-term

Option A.3: Preserve and Repair – Test the basin walls for water absorption; Seal the guard railing wall cap and urns with a breathable sealer if appropriate; Due to the large area involved select only most needed elements for treatment.

Priority: Long-term

Option A.4: Preserve and Repair – Rehabilitate historic light fixtures and posts; provide new lighting for ambiance.

Priority: Long-term

Option A.5: Replace – Replace existing modern poles and light fixtures with units that are historically appropriate.

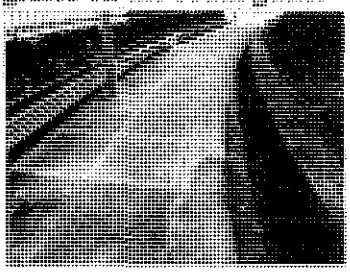
Priority: Long-term

Option A.6: Repair - Replace – Remove-consolidate electrical and data conduits that obscures the wall pattern.

Priority: Long-term

Walkways and Walls

The basin guard wall with iron fencing is surrounded by a continuous five-foot wide concrete walkway. The walk is scored in 30-inch squares and has a light broom finish. The lengths along the hillsides have an integral concrete gutter to capture and direct surface runoff. There is a free standing concrete urn adjacent to the walkway at the southwest corner of the basin. It is similar to those at the ends of dam rail walls. There are historic cast iron bar grates on the south gutter corners. In addition, there are several cast iron lids around the perimeter of the reservoir. Non-historic poles with lighting and security cameras (50-foot spacing) are located adjacent to the low wall around the basin and dam. The outer gutter perimeter changes from a low curb wall to a tall retaining wall as the hillside requires. These retaining walls are constructed as a battered (leaning back) wall with a rock faced block finish pattern. The wall cap has a smooth finish similar to the cap on the reservoir guard wall. There is a single large concrete urn at the south end of the wall on the west side. It is similar to ones at the grand north stair. The reservoir wash down piping and associated equipment is located just outside of the perimeter gutter curb and wall. The system includes valves and risers for hose connections. A hillside landscape irrigation system is located beyond the wash down piping.



Condition/Observations: The walkway has some damaged areas, including broken slabs, corners, spalls, and roughened surfaces, but is generally in good condition. Portions of the paving have been replaced as part of electrical and security improvements. At the northwest side approximately 200 linear feet of walkway and accompanying gutter have been replaced [this coincides with the earth movement zone]. The pavement tooling pattern at this section does not match the original and the gutter has a "V" shaped profile instead of the broad "U" shape. The gutter is in worse condition than the walkway having many deteriorated sections. The outer retaining walls are heavily soiled and mossy, and there are some areas of surface damage to the original block pattern. The free standing urn at the southwest corner of the basin has developed a lean, and is slightly deteriorated and soiled.

Treatment Recommendations:

Option A.1: Preserve and Repair – Clean and preserve existing paving and gutter.

Priority: Maintenance

Option A.2: Preserve and Repair – Clean soiled walls, patch spalls and cracks to match original design, texture and color; monitor hillside irrigation to prevent excessive moisture from damaging retaining walls.

Priority: Maintenance

Option A.3: Repair - Replace – Clean, plumb, repair the free standing urn at the southwest corner of the basin.

Priority: Sbort-term

Option A.4: Repair - Replace – Replace, patch damaged walkway slab; match original paving pattern and texture.

Priority: Long-term

Option A.5: Repair - Replace– Replace, patch damaged gutter sections with new to match original pattern.

Priority: Long-term

Option A.6: Preserve and Repair – Preserve historic grates, and assorted historic metal lids.

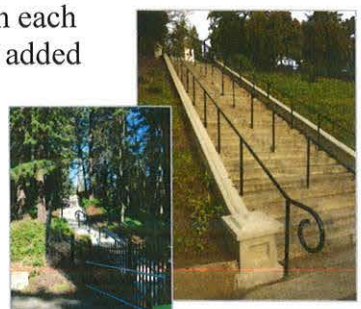
Priority: Maintenance

Option A.7: Replace – When worn, replace walkway and gutter sections not matching original design with new to match original

Priority: Long Term

Stairways

There are two stairways in addition to the vehicle roadways that provide access to the reservoir and its perimeter walkway. The stairway at the north was designed as a grand approach from the upper level circle drive. The concrete stair, which was built with the original reservoir construction, descends with two short stair runs rounding a planting bed that then join with a straight run that follows the hillside slope down to the reservoir walk. The main portion of the stairway is 11 feet wide and has low smooth concrete cheek walls with molded caps. These walls terminate at large concrete urns on each side and on each end. Recent (2008) painted metal handrails have been added inside each wall and at the centerline.



The second stairway is smaller in width (seven feet) and length and is located along hillside fencing on the southeast side of the reservoir, also connecting the circle drive to the reservoir near the gatehouse. This stair replaced a similar stair in 2008 that was heavily deteriorated.

Condition/Observations: The main and secondary stairs are in good condition following the recent rehabilitation work. The patches on the main stairway are very noticeable due to their color difference. The urns and associated walls at the top entry of this stairway are in good condition.

Treatment Recommendations:

Option A.1: Preserve and Repair – Maintain and preserve the stairs, their railings, walls and urns.

Priority: Maintenance

Option A.2: Preserve and Repair –Patch spalls and cracks to match original in design, texture and color.

Priority: Maintenance

Other Features

Much of the perimeter of the site is controlled by a six foot high painted steel picket fence installed in 2008. The fencing includes a powered operated vehicle gate and a pedestrian gate located just east of the 36 Weir Building. Pedestrian gates are also located at the top of the main stair. The fence is constructed with pickets and posts of tubing and horizontal channel supports (the original basin fencing is constructed of solid wrought iron members). The remainder of the less visible perimeter is controlled with a previously utilized chain link fence.

Condition/Observations: The fencing and its gates are in good condition.

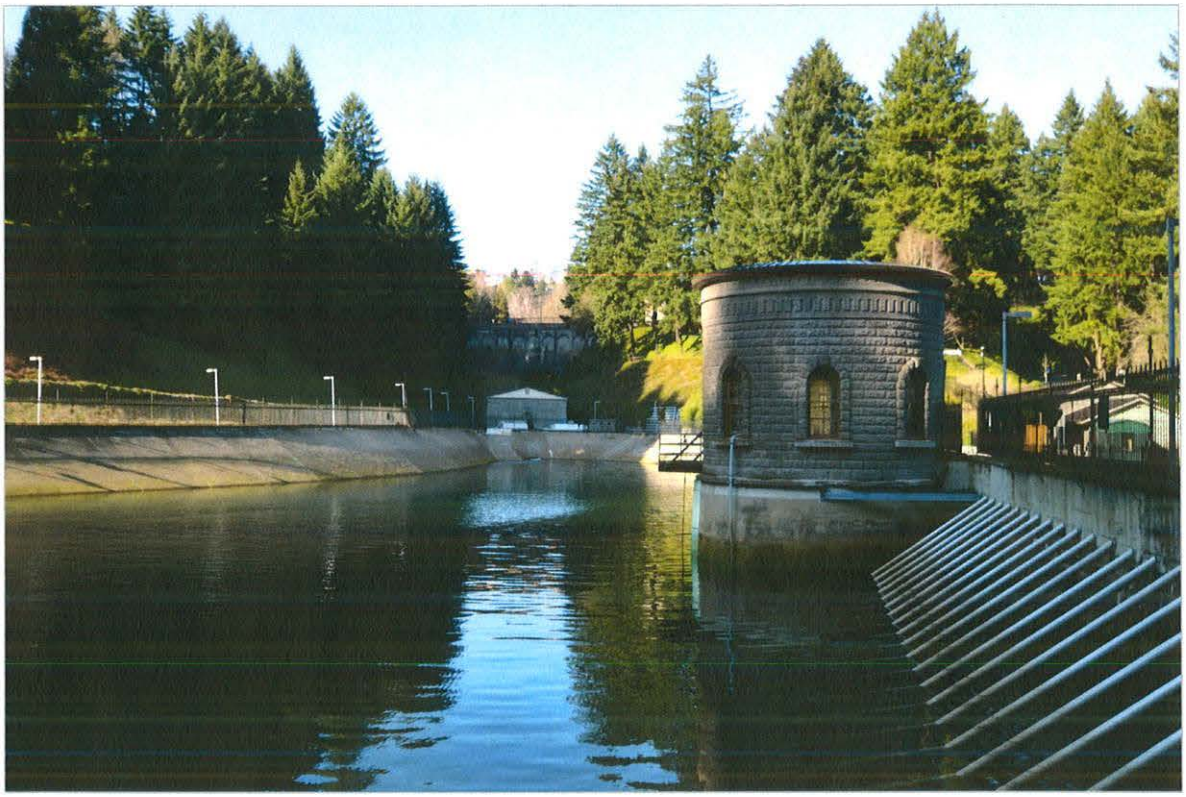
Treatment Recommendations:

Option A.1: Preserve– Preserve the non historic, but historically compatible fencing and its gates.

Priority: Maintenance

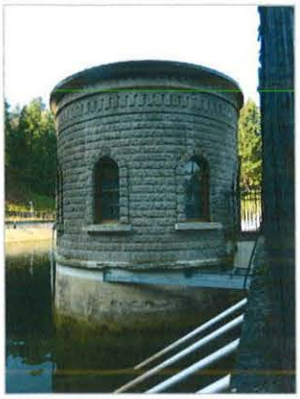
RESERVOIR 4

Contributing historic features at Reservoir 4 include the large two (or double) ended basin, its perimeter and site (parapet) walls, walkway and gutter system, related walks and gate stairs and two fountains, Gatehouse 4 in the center of the straight dam portion on the east side, Pump House 1 on the north end, and the small generator building on the northeast corner. The dam has a controlled access roadway that runs across the dam and up the hillside to the dam at Reservoir 3. There are also assorted cast and wrought iron grates and lids of historic interest.



GATEHOUSE 4

Reservoir 4 - Gatehouse 4



Concrete Wall, Floor and Roof

Constructed in 1894, the building is a symmetrically composed, poured in place concrete structure, circular in plan, measuring close to 25 feet in diameter. The exterior design and finish of the building are similar to the gatehouse of Reservoir 3. The exterior was formed with a rusticated block pattern with projecting water table, top banding and simplified cornice detailing. The parapet has a metal covered coping that slopes gently to the exterior (6" slope over 28"). The interior finish which shows its 6-inch board form pattern is smooth and painted. Door and window openings are round arched and have projecting quoined surrounds. The lower water facing exterior below the water table line (floor line projection) is unpatterned and coated with cement plaster. The concrete floor deck is finished with a smooth troweled topping slab and is without other finishes. There are multiple Ransome floor lights and their patent marks.

The exterior was rehabilitated in 1988-89 under Water bureau Project Number 3750, Washington park Concrete Demolition and Restoration, with work that included patching, injection crack filling, and exterior cementitious coating at the window sills, cornice band, and on the below waterline walls. The concrete roof deck and 5-inch high coping has an elastomeric deck coating, the outer 18 inches of which has been sealed with a bituminous product. The roof is drained by a single in-wall drain through the coping on the north side of the entry. The drain extends below the entry walk and daylights to the gutter system.

Condition/Observations: The exterior wall has some new areas of spalling and deterioration, but overall it is in fair to good condition following rehabilitation work in the late 1980's. Horizontal cold joints from the original construction are visible (inside and out) at roughly 2-foot spacing; the joint lines do not line up with the exterior block pattern. The interior concrete topping slab has some spider cracking. The roof drain is prone to clogging, and the inlet and/or the drain line are leaking, or the roof flashing is problematic as evidenced by continual dripping from the roof edge and moisture on the exterior wall.

Treatment Recommendations: The articulated above water concrete requires protection to minimize future deterioration. Damaged and spalled areas should be patched. The original concrete finish will likely be difficult to match.

Option A.1: Preserve and Repair – Gently clean the concrete exterior; test for water absorption, perform patch tests; install cementitious patching to rebuild deteriorated areas and spalls; apply a breathable sealer to the above waterline, articulated concrete finish portion; retain lower below waterline wall as is.

Priority: Short-term

Option A.2: Repair, Replace – Check drainline for integrity. Install new interior drainline if existing leaks; provide overflow to the line. Check coping cap and flashings for integrity to locate and correct source of dripping.

Priority: Short-term

Option A.3a: Replace – Provide a new membrane roof. This will require revision or removal of protruding brackets.

Priority: Short-term

Option A.3b: Repair – Provide new elastomeric coating over the existing at roof deck and interior side of parapet.

Priority: Short-term

Option A.4: Preserve – Preserve existing Ransome floor lights.

Priority: Maintenance

Metal Balcony

A painted steel platform and guard railing, and stainless steel valve assembly has replaced the original.

Condition/Observations: The steel is in good condition. The paint coating is failing.

Treatment Recommendations:

Option A.1: Preserve and Repair – Properly prep and paint the valve platform.

Priority: Maintenance.

Doors

There is a single entry with inswinging paired doors at the top of three exterior concrete steps on the east side. The doors are flush steel 1987 replacements with a hollow steel frame. The original wood jambs have been cut off at the transom line. The arched transom and fan light remain as does the cast iron sill. Similar to Gatehouse 3, the transom has an exterior plexiglass storm window. The reservoir side door is a single wood 4 panel stile and rail painted door (historic, but not original) with original wood frame and no transom. It has black finished mortise latch, replacement hinges, and the original cast iron threshold.

Condition/Observations: The non-original paired hollow metal entry doors and frame are in good condition. The reservoir side door is in good condition.

Treatment Recommendations:

Option A.1: Preserve and Repair – Maintain the existing metal entry door assembly as is. Preserve wood door frame and cast iron threshold; paint threshold.

Priority: Maintenance.

Option A.2: Preserve and Repair – Maintain existing wood door, frame, and mortise latch and cast iron threshold at reservoir side; replace hinges with balltip type; paint threshold.

Priority: Maintenance.

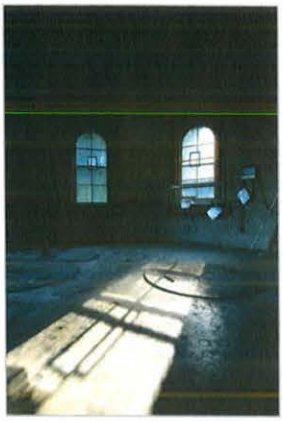
Option A.3: Repair and Replace – Replace the metal entry doors and frame with historically appropriate wood doors. Preserve the existing cast iron sill.

Priority: Long-term.

Option A.4: Repair and Replace – Replace wood door at reservoir side when deteriorated with one similar to the historic style, retain mortise latch, replace hinges with balltip type.

Priority: Long-term.

Windows



There are five windows that together with the reservoir side door are evenly spaced around the circumference. Windows are arch topped, wood double hung, divided 4/4. Two of the windows have suspension ropes and are operable. The suspension ropes on the others are missing. Glass is intact but most of it appears to have been replaced over time and is not historic. Windows have been fitted with interior security grilles.

Condition/Observations: The windows are generally in good condition. Two of the windows are operable, the other three are left sealed.

Treatment Recommendations:

Option A.1: Preserve and Repair – Preserve the wood windows. Provide needed minor repairs including caulking, patching and painting. Renew rope suspension on windows designated to be operable; Suspension improvements are not needed on inoperable units.

Priority: Long-term

Interior Space

The interior retains most of the original wheeled valves, water level measurement and mechanical equipment that is intact and operable, though mostly no longer used due to replacement equipment. In addition, there is new security equipment. The overhead trolley is intact. An iron stairway descends clockwise along the west curved wall to the lower level. The treads have been overlaid with expanded metal or straight bars for better traction, but otherwise the assembly is in original condition. It is enclosed with an iron pipe railing. The stairway is similar to the stairway at Gatehouse 3.

Condition/Observations: The metal stair has minor rusting, but appears to be structurally sound. Existing valve operators appear to be in good condition and are well-maintained.

Treatment Recommendations:

Option A.1: Preserve – Maintain metal stairway, wood cabinet, and existing historic mechanical equipment intact; New equipment modifications added as needed with minimal removal or replacement of historic materials.

Priority: Maintenance

Option A.2: Provide for limited interpretive tours, develop portable signage and graphics depicting operations.

Priority: Long-term

Option A.3: Provide additional documentation, inventory and photographs of existing historic mechanical equipment

Priority: Long-term

Entry Steps

Including the shallow upper landing, there are three curved concrete steps that ascend from the walkway to the entry doors. The upper step retains its curved cast iron threshold.

Condition/Observations: There is some staining and spalling at the steps. The entry receives moisture dripping off of the coping, and there is some ponding at the downspout terminus.

Treatment Recommendations: Repair of the steps should be coordinated with rain drain and adjacent sidewalk paving repairs.

Option A.1: Preserve and Repair – Preserve, patch and repair the entry steps with matching material; Clean concrete surfaces, remove loose and deteriorated material; perform patch tests; patch spalled areas.

Priority: Long-term

Option A.2: Preserve and Repair – Preserve the remains of the original sidewalk and restore missing portions or those overlaid with new construction. Coordinate work with adjacent site paving.

Priority: Long-term