Appendix A3
Center City Connector Cultural Resources Technical Report - Addendum
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1 INTRODUCTION

In March 2016, the City of Seattle and the Federal Transit Administration (FTA) completed an environmental assessment (EA) evaluating potential impacts of the Center City Connector in Seattle, Washington. The EA was published on May 9, 2016, and satisfies requirements of both the National Environmental Policy Act (NEPA) and the State Environmental Policy Act (SEPA). The 30-day public comment period closed on June 8, 2016.

The Seattle Center City Connector Environmental Assessment: Cultural Resources Technical Report was completed in 2015 to support the EA and to assist the FTA in meeting its requirements under Section 106 of the National Historic Preservation Act. The report was provided to the Washington Department of Archaeology and Historic Preservation (DAHP). DAHP concurred with the determination that the project would result in a finding of no adverse effect to historic properties on October 27, 2015, concluding Section 106 consultation.

Since the issuance of the EA, additional information has been obtained regarding potential historic properties along the alignment and possible effects on them:

1. Potential historic properties within 1st Avenue and 1st Avenue S in Pioneer Square and downtown Seattle that were not included in the May 2016 EA were identified:
   a. 1st Avenue and 1st Avenue S water lines
   b. 1st Avenue and 1st Avenue S fire hydrants

2. A number of improvements to support curb ramps were proposed that could affect historic areaway walls and ceilings along 1st Avenue and 1st Avenue S.

This addendum to the Seattle Center City Connector Environmental Assessment: Cultural Resources Technical Report updates the original report. It includes an evaluation of the 1st Avenue and 1st Avenue S water lines and hydrants for eligibility for listing in the National Register of Historic Places (NRHP), and an assessment of effects from relocation and replacement of the 1st Avenue and 1st Avenue S water lines, replacement of fire hydrants, and areaway strengthening as part of the Center City Connector Project.
2  PROJECT DESCRIPTION

2.1 1st Avenue and 1st Avenue S Water Lines, Fire Hydrant Replacement

As part of the proposed project, the 1st Avenue and 1st Avenue S water main between S Jackson Street and Stewart Street, which is a longitudinal line that runs more or less parallel to the proposed track alignment, would be relocated and replaced. The water main would be relocated so that there is 6 to 10 feet of separation between the pipe and the concrete slab that will contain the streetcar tracks. This will prevent potential damage to the water main from pavement removal activities during streetcar track slab construction, provide separation to reduce stray current corrosion, and make the pipes more accessible for future maintenance needs. The project also provides an opportunity to replace aging and/or vulnerable water service infrastructure. Along this segment, some perpendicular water mains that cross 1st Avenue and 1st Avenue S would be replaced, as would selected perpendicular service lines. No perpendicular service lines would be relocated. In addition, fourteen hydrants along 1st Avenue and 1st Avenue S would be replaced as part of the proposed project. Of these 14 hydrants, five were installed before 1966 and are evaluated for the NRHP as part of this addendum.

2.2 1st Avenue and 1st Avenue S Areaways

Areaways are belowground spaces within street rights-of-way, enclosed by the sidewalks above and by building foundations and street supports on either side. The project may include construction of American with Disabilities Act (ADA)-compliant curb ramps at some intersections, which could require the strengthening of walls or ceilings within historic areaways. Construction activities could include:

- Strengthening the areaway ceiling with reinforced concrete slabs supported by steel beams welded or bolted to existing steel I-beams or to the street wall, or anchored into the street wall and concrete arches, slab, or beams.
- Drilled shaft or micropile strengthening within areaways and attached to areaway walls, similar to that for contact-wire suspension poles. Some existing service piping penetrates historic areaway walls. No new wall penetrations are expected and the existing penetrations would be used for the replacement service lines.
3 AREA OF POTENTIAL EFFECTS

The area of potential effects (APE) remains the same as that described in the *Seattle Center City Connector Environmental Assessment: Cultural Resources Technical Report*. 
4 DESCRIPTIONS OF EVALUATED RESOURCES

The 1st Avenue and 1st Avenue S water main, including those segments of the perpendicular water mains and water service lines that cross it, and the 1st Avenue and 1st Avenue S fire hydrants are described in the sections below. Table 1 lists the mains and services evaluated, including brief descriptions and dates of construction. Table 2 lists the hydrants proposed for replacement, including years of installation. Only those hydrants that are more than 50 years old were evaluated for NRHP eligibility. Figure 1 shows the APE and Figure 2 shows the locations of the water lines and hydrants in relation to the APE. Representative historical photographs of water mains in Seattle and current photos of water service lines and fire hydrants on 1st Avenue and 1st Avenue S are included in Appendix A (Photos 1 – 10).

4.1 1st Avenue and 1st Avenue S Water Main

This addendum evaluates 4,662 linear feet of cast iron and ductile iron water main underneath the roadway of 1st Avenue and 1st Avenue S, between S Jackson Street and Stewart Street. No wood stave piping remains extant along this segment of water main. The segment is divided into four general sections according to the year recorded for installation: a 306-foot-long, 16-inch-diameter cast iron pipe between S Jackson Street and S Main Street that was installed in 1900; a 57-foot-long, 20-inch-diameter ductile iron pipe at S Main Street that is a replacement from 1990; a 1,214-foot-long, 20-inch-diameter cast iron pipe between S Main Street and Columbia Street that was installed in 1890; and a 3,085-foot-long, 20-inch-diameter cast iron pipe between Columbia Street and Stewart Street that was installed in 1891 and 1906. Since the initial phase of the Cedar River municipal water system was primarily completed between 1897 (when surveys occurred) and 1901 (when water began to flow), most of the 1st Avenue water main evaluated here predates the Cedar River system. Thus, it is likely that the 1890 and 1891 segments of the water main were originally part of the Spring Hill Water Company system or were constructed after the City of Seattle acquired Spring Hill in 1890. Based on the research materials currently available, it is assumed that the city installed new cast iron pipes upon acquisition of the Spring Hill system. The segment of the water main from 1900/1906 was constructed by the city as part of improvements to the water system that included new pipes and fire hydrants. In 1990, a 57-foot-long segment of the water main at S Main Street was replaced (Table 1).

4.2 Perpendicular Mains

The perpendicular mains cross under 1st Avenue or 1st Avenue S at (or close to) a right angle. They are primarily located within street intersections and consist of late-nineteenth and early-twentieth century cast iron pipes as well as late-twentieth century replacement ductile iron pipes. The years of construction for two segments of the perpendicular mains, located at Columbia and Pike streets, are unknown. However, they are cast iron pipes and
are therefore assumed to be more than 50 years old. The perpendicular mains all date from after 1901, after the city activated the Cedar River water system (Table 1).

### 4.3 Perpendicular Service Lines

The water service lines transport water from the 1st Avenue and 1st Avenue S water main to individual buildings along the street. They intersect with the 1st Avenue and 1st Avenue S water main at (or close to) a right angle. More than a third of the perpendicular water service lines were constructed in 1905 or 1910. Just under a third of the lines were constructed between 1911 and 1930. The remaining service lines were constructed between 1941 and 1958. The date of construction for the service line at 1525-35 1st Avenue is unknown, but it is assumed to be more than 50 years old. All service lines identified in Table 1 are cast iron. The perpendicular service lines all date from after 1905, after the city activated the Cedar River water system. There are 10 pre-1966 service lines that penetrate historic areaways, highlighted grey in Table 1.

**Table 1. Water Lines Below 1st Avenue and 1st Avenue S**

*Between S Jackson Street and Stewart Street*

<table>
<thead>
<tr>
<th>Type of Pipe</th>
<th>Location</th>
<th>Description</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st Avenue S Water Main</td>
<td>S Jackson Street and S Main Street</td>
<td>306-foot-long, 16-inch-diameter, cast iron</td>
<td>1900</td>
</tr>
<tr>
<td>1st Avenue S Water Main – Modern Replacement</td>
<td>S Main Street</td>
<td>57-foot-long, 20-inch-diameter, ductile iron</td>
<td>1990</td>
</tr>
<tr>
<td>1st Avenue S Water Main</td>
<td>S Main Street and Columbia Street</td>
<td>1,214-foot-long, 20-inch-diameter, cast iron</td>
<td>1890</td>
</tr>
<tr>
<td>1st Avenue Water Main</td>
<td>Columbia Street and Stewart Street</td>
<td>3,085-foot-long, 20-inch-diameter, cast iron</td>
<td>1891/1906</td>
</tr>
<tr>
<td>Perpendicular Main</td>
<td>S Jackson Street at 1st Avenue S</td>
<td>12-inch-diameter, cast iron</td>
<td>1901/1906</td>
</tr>
<tr>
<td>Perpendicular Main</td>
<td>Columbia Street and 1st Avenue</td>
<td>8-inch-diameter, cast iron</td>
<td>Date Unknown – assumed more than 50 years old</td>
</tr>
<tr>
<td>Perpendicular Main</td>
<td>Madison Street and 1st Avenue</td>
<td>12-inch-diameter, cast iron</td>
<td>1907/1923</td>
</tr>
<tr>
<td>Perpendicular Main</td>
<td>Union Street and 1st Avenue</td>
<td>20/24-inch-diameter, cast iron</td>
<td>1906/1908</td>
</tr>
<tr>
<td>Perpendicular Main</td>
<td>Pike Street and 1st Avenue</td>
<td>12-inch-diameter, cast iron</td>
<td>Date Unknown – assumed more than 50 years old</td>
</tr>
<tr>
<td>Perpendicular Main</td>
<td>Pine Street and 1st Avenue</td>
<td>16-inch-diameter, cast iron</td>
<td>1904</td>
</tr>
<tr>
<td>Perpendicular Main – Modern Replacement</td>
<td>S Main Street and 1st Avenue S</td>
<td>8-inch-diameter, ductile iron</td>
<td>1990</td>
</tr>
<tr>
<td>Type of Pipe</td>
<td>Location</td>
<td>Description</td>
<td>Year</td>
</tr>
<tr>
<td>------------------------------------</td>
<td>-----------------------------------</td>
<td>--------------------------</td>
<td>------------</td>
</tr>
<tr>
<td>Perpendicular Main – Modern Replacement</td>
<td>S Washington Street and 1st Avenue S</td>
<td>8-inch-diameter, ductile iron</td>
<td>1997</td>
</tr>
<tr>
<td>Perpendicular Main – Modern Replacement</td>
<td>Yesler Way and 1st Avenue S</td>
<td>12-inch-diameter, ductile iron</td>
<td>1984</td>
</tr>
<tr>
<td>Perpendicular Service Line</td>
<td>1525-35 1st Avenue</td>
<td>0.75-inch-diameter, cast iron</td>
<td>Date Unknown – assumed more than 50 years old</td>
</tr>
<tr>
<td>Perpendicular Service Line</td>
<td>800-10 1st Avenue</td>
<td>8-inch-diameter, cast iron</td>
<td>1958</td>
</tr>
<tr>
<td>Perpendicular Service Line</td>
<td>714 1st Avenue</td>
<td>6-inch-diameter, cast iron</td>
<td>1958</td>
</tr>
<tr>
<td>Perpendicular Service Line</td>
<td>115 1st Avenue S</td>
<td>0.75-inch-diameter, cast iron</td>
<td>1953</td>
</tr>
<tr>
<td>Perpendicular Service Line</td>
<td>1012 1st Avenue</td>
<td>2-inch-diameter, cast iron</td>
<td>1952</td>
</tr>
<tr>
<td>Perpendicular Service Line</td>
<td>220 1st Avenue S</td>
<td>2-inch-diameter, cast iron</td>
<td>1946</td>
</tr>
<tr>
<td>Perpendicular Service Line</td>
<td>312-14 1st Avenue S</td>
<td>2-inch-diameter, cast iron</td>
<td>1942</td>
</tr>
<tr>
<td>Perpendicular Service Line</td>
<td>308 1st Avenue S</td>
<td>6-inch-diameter, cast iron</td>
<td>1941</td>
</tr>
<tr>
<td>Perpendicular Service Line</td>
<td>109 S Jackson Street</td>
<td>6-inch-diameter, cast iron</td>
<td>1927</td>
</tr>
<tr>
<td>Perpendicular Service Line</td>
<td>204 1st Avenue S</td>
<td>6-inch-diameter, cast iron</td>
<td>1925</td>
</tr>
<tr>
<td>Perpendicular Service Line</td>
<td>206 1st Avenue S</td>
<td>2-inch-diameter, cast iron</td>
<td>1925</td>
</tr>
<tr>
<td>Perpendicular Service Line</td>
<td>316 1st Avenue S</td>
<td>6-inch-diameter, cast iron</td>
<td>1923</td>
</tr>
<tr>
<td>Perpendicular Service Line</td>
<td>719 1st Avenue</td>
<td>6-inch-diameter, cast iron</td>
<td>1922</td>
</tr>
<tr>
<td>Perpendicular Service Line</td>
<td>616 1st Avenue</td>
<td>4-inch-diameter, cast iron</td>
<td>1913</td>
</tr>
<tr>
<td>Perpendicular Service Line</td>
<td>107 Pine Street</td>
<td>2-inch-diameter, cast iron</td>
<td>1911</td>
</tr>
<tr>
<td>Perpendicular Service Line</td>
<td>300-306 1st Avenue S</td>
<td>4-inch-diameter, cast iron</td>
<td>1910</td>
</tr>
<tr>
<td>Perpendicular Service Line</td>
<td>714 1st Avenue</td>
<td>1.5-inch-diameter, cast iron</td>
<td>1910</td>
</tr>
</tbody>
</table>
## 4.4 Fire Hydrants

Fire hydrants located along 1st Avenue and 1st Avenue S, between S Jackson Street and Stewart Street, are standard aboveground dry-barrel type, made of cast iron, with three or four valves. Dry barrel-type hydrants have their main valve belowground “to resist or prevent freezing in the winter” (FireHydrant.org, 2003). Slight design variations exist between each hydrant, based on the manufacturer and year of installation; however, the hydrants have the same general appearance. Located approximately 1 foot from the edge of the sidewalk, each hydrant has a rounded-barrel post and stands approximately 2 feet above ground level. Bolts secure the base of the hydrant to the sidewalk. Most of the hydrants along 1st Avenue and 1st Avenue S are stamped with their manufacturer and year of installation. In some cases layers of paint have obscured the year of installation. Where the year of installation was not visible, Seattle Public Utilities records were referenced. According to available information, the fire hydrants proposed for replacement were installed between 1895 and 2000 (Table 2). There are five hydrants (of the 14 proposed for replacement) that were installed before 1966 and that are more than 50 years old. Three of the pre-1966 hydrants are associated with historic areaways; these are highlighted grey in Table 2. In addition, there are three modern fire hydrants (1969, 1985, and 2000) that are associated with historic areaways and that are proposed for replacement.
Table 2. Fire Hydrants Along 1st Avenue and 1st Avenue S Proposed for Replacement*

* Shaded rows indicate there are associated historic areaways.

** Modern hydrant replacement that is less than 50 years old; not evaluated for NRHP eligibility as part of this project.

<table>
<thead>
<tr>
<th>Location</th>
<th>Installation Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>1412 1st Avenue</td>
<td>1895</td>
</tr>
<tr>
<td>1313 1st Avenue</td>
<td>1968 **</td>
</tr>
<tr>
<td>101 S Jackson Street</td>
<td>1949</td>
</tr>
<tr>
<td>707 1st Avenue</td>
<td>1969 **</td>
</tr>
<tr>
<td>999 1st Avenue</td>
<td>1974 **</td>
</tr>
<tr>
<td>1401 1st Avenue</td>
<td>1994 **</td>
</tr>
<tr>
<td>1317 1st Avenue</td>
<td>1972 **</td>
</tr>
<tr>
<td>100 Stewart Street</td>
<td>1972 **</td>
</tr>
<tr>
<td>1119 1st Avenue</td>
<td>2000 **</td>
</tr>
<tr>
<td>1501 1st Avenue</td>
<td>1895</td>
</tr>
<tr>
<td>300 1st Avenue S</td>
<td>1903</td>
</tr>
<tr>
<td>99 S Washington Street</td>
<td>1985 **</td>
</tr>
<tr>
<td>1009 1st Avenue</td>
<td>1969 **</td>
</tr>
<tr>
<td>801 1st Avenue</td>
<td>1895</td>
</tr>
</tbody>
</table>
Figure 1  Project Vicinity U.S Geological Survey Map
Figure 2a  Location of 1st Avenue Water Lines and Hydrants
Figure 2b  Location of 1st Avenue Water Lines and Hydrants
Figure 2c  Location of 1st Avenue Water Lines and Hydrants
5 RESEARCH METHODOLOGY

A Secretary of the Interior-qualified architectural historian with CH2M checked the Washington Information System for Architectural and Archaeological Records Data (WISAARD) online database in July 2016. This search showed that the water main, and its associated perpendicular lines, under 1st Avenue and 1st Avenue S between S Jackson Street and Stewart Street has not been previously inventoried in WISAARD and has not been evaluated for NRHP eligibility. Similarly, the fire hydrants along 1st Avenue and 1st Avenue S between S Jackson Street and Stewart Street had not been inventoried in WISAARD and had not been evaluated for NRHP eligibility. Additional research was conducted to prepare a historical context for the 1st Avenue and 1st Avenue S water lines and hydrants. Research included a review of published materials, online resources, and maps, as well as as-built drawings, photographs, and maintenance records provided by Seattle Public Utilities. A pedestrian survey was conducted on August 29, 2016, to photograph the hydrants proposed for replacement and verify their years of installation. Inventory forms were completed for the 1st Avenue and 1st Avenue S water lines and hydrants and were submitted through WISAARD on October 25, 2016.
Throughout the nineteenth century, Seattle’s infrastructure slowly developed as its population grew. Seattle’s economy was heavily dependent on the steam-powered lumber mill owned and operated by Henry Yesler, located on Mill Street (now Yesler Way) within Pioneer Square. The mill, constructed in 1853, produced lumber that was used locally and shipped to San Francisco as well as other smaller communities in the Pacific Northwest. Much of the city and its associated infrastructure was related to timber construction as a result of the abundant lumber supply (Morgan, 1982). Streets remained unpaved throughout the nineteenth century and “Seattle relied on a haphazard assortment of sewers and cesspools that, at best, drained into surrounding lakes and salt water” (Seattle Post-Intelligencer, 1906; Seattle Municipal Archives, 2016a). Most residents relied on local springs and Lake Union for their fresh water supply. The city’s earliest organized water systems, constructed by Yesler and other settlers, used available timber materials, “open wooden flumes, and later pipes consisting of hand-bored logs, to carry water from springs in the slopes above downtown to the small settlement on Elliot Bay” (Oldham, 2010).

During the 1880s, some advances were made with the water system as a result of a few small, private companies that pumped water from Lake Washington and Lake Union into storage tanks and reservoirs (Oldham, 2010). One of these companies was the Spring Hill Water Company, which eventually established a pump at Lake Washington, “divert[ing] spring water into a dozen or so wooden tanks along the ridge between 1st and Beacon hills” (Dorpat, 2010). Additionally, the company had “laid some sizable water mains beneath the business district’s principle streets” (Dorpat, 2010). However, several residents recognized the need for a larger, more cohesive and efficient water system, particularly as the population continued to rise. City engineer F.H. Whitworth, “advised the city council that the Cedar River was the best potential source for an abundant supply of pure community water” (Dorpat, 2010). In 1888, the city’s mayor, Robert Moran, proposed a “gravity supply system” to access the Cedar River resources (Oldham, 2010). At the time, Seattle’s city council did not act on these recommendations, instead only maintaining the supply from the Spring Hill Water Company and approving the proposal of city engineer John G. Scurry to access water from Rock Creek, a tributary to Cedar River (Dorpat, 2010; Stein and Tate, 2000). It would require a terrible disaster to set the Cedar River plan into action.

Before the invention of the hydrant in the early nineteenth century, firefighting primarily involved buckets and hand-operated pumps to combat conflagrations. As water systems evolved within urban centers, holes were often dug through the ground and into the wooden water mains to allow access to the primary water system during fires. Since these holes would require plugging after the fire was put out, they became known as fire plugs (Bocciolone Antincendio, 2016). Over time, aboveground valve systems replaced the fire plugs and became the concept behind the common fire hydrant. Frederick Graff Sr., who was the chief engineer of the Philadelphia Water Works, is acknowledged for designing the common post hydrant circa 1801. His first design was essentially a faucet surrounded by a wood barrel. Cast iron hydrants started to be manufactured circa 1802 and in 1803 Graff “introduced an improved version of the fire hydrant with the valve in the lower
portion. These were inserted into wooden mains with a tapering joint” (FireHydrant.org, 2003). By the mid-nineteenth century, the cast iron model, very similar to what is still used today, had become the norm (FireHydrant.org, 2003).

A devastating fire, known as the Great Fire, destroyed most of Seattle on June 6, 1889, consuming nearly the entire, timber-constructed downtown (Corley, 1970). During the fire, the existing private water systems, most prominently Spring Hill Water Company, “failed to supply adequate water for firefighting” (Oldham, 2010). Major structural (and aesthetic) improvements were initiated during the rebuilding process that followed the fire, including the widening and regrading of streets, new water works and wharf facilities, and well-designed, urban buildings (Seattle Municipal Archives, 2016b). Stone, iron, and brick were the primary building materials used to reconstruct the city. In addition, the major downtown thoroughfares, including 1st Avenue, were elevated between 6.5 and 19 feet above the old city, in some cases with new buildings and streets constructed directly on top of older structures, which led to the creation of areaways (City of Seattle, 2000; Corley, 1970). Seattle had installed fire hydrants prior to 1889; however, at the time of the fire, hydrants were located only on every other street and many of the timber pipes burned during the conflagration (University of Washington, n.d.). The Great Fire in Seattle “motivated the city to replace the all-volunteer fire department with paid professional firefighters” and increase the number of hydrants (Blair, 2014).

On July 8, 1889, one month after experiencing the harsh consequences of the existing failed water systems, “citizens voted to fund the creation of a municipally-owned water system” (Seattle Municipal Archives, 2016a). The vote was tremendously in favor of Mayor Moran’s proposed Cedar River system, with 1,875 votes for, and only 51 votes against (Oldham, 2010; Seattle Public Utilities, 2016). A new, full-time fire department was established on October 17, 1889, and Gardener Kellogg was named chief of the Seattle Fire Department. Efforts were made to modernize the fire equipment, including fire hydrants. “The number of fire hydrants doubled, with one on every block. This signaled to residents and outsiders alike of Seattle’s commitment to protecting the new city” (Blair, 2014). Just a few months later, the city acquired the Spring Hill Water Company in 1890 for $352,265.67 (Dorpat, 2010). At the time, Spring Hill served 12,000 people, leaving 42,000 residents who accessed water from personal wells or from smaller private water companies. The acquisition of the Spring Hill Water Company, and the eventual acquisition of the other smaller private water companies, marks the beginning of the Seattle Water Department (Dorpat, 2010). The new system would increase the size of water pipes and the number of fire hydrants, while also decreasing the use of wood for water piping (University of Washington, n.d.).

Shortly after the 1889 fire, Mayor Moran hired Benezette Williams, a water systems engineer, “to devise a plan for increasing the city’s water supply” (Dorpat, 2010). Williams could see that Lake Washington was becoming polluted and, therefore, was not a feasible source of water for the city in the future. However, the city continued to expand its pumping system at Lake Washington despite the warnings of Williams.

In 1892, R.H. Thomson was named city engineer (Dorpat, 2010). After acquiring his new role, Thomson promptly “forbade expansion of the Lake Washington plant and put his formidable will to the task of bringing Cedar River water to the city” in order to increase supply for the ever-rising demand (Dorpat, 2010). Thomson proposed a buried pipeline
instead of Williams’ above-ground flume design for reasons of both safety and sanitation. Construction started on the Landsburg Diversion Dam, but progress was soon halted by the national financial Panic of 1893. However, in 1895, citing a state Supreme Court precedent set in Spokane, Washington, the city was able to use revenue bonds to fund construction of the Cedar River system. Permissions to use revenue bonds, however, required a local vote, which occurred in December 1895 and was described at the time as “waged with a fury scarcely equaled in any other campaign that the city has experienced” (Dorpat, 2010). Opponents of the public system “denounced [it] as Populist, Socialist, and otherwise dangerous” (McWilliams, 1955). Despite a bitter battle, the results of the vote named Thomson and the public system victorious (Dorpat, 2010).

The boom from the Klondike gold rush in the late 1890s, which brought tens of thousands of new settlers to the Seattle area on their way to Alaska and the Yukon, Canada, increased the need for an improved water system. This population growth added further pressure to complete the water system. In 1897, the survey for the Cedar River watershed was completed, and, after passing a series of tests, the much anticipated Cedar River water system was finally made active on January 10, 1901 (Dorpat, 2010).

Seattle’s population continued to grow rapidly, from 80,000 residents in 1900 to almost 240,000 residents in 1910. Over the next few decades, new reservoirs, transmission mains, and distribution mains were constructed as demand required the system to expand. The gradual switch from the old water systems to the new Cedar River system required sequencing of construction activities in order to limit disruption to residents. Additionally, street improvement projects during the twentieth century also required the distribution of water main construction, since installation of piping was often coordinated with streetcar construction and paving projects. Construction of new buildings or alterations to buildings also required the installation of new service lines, which would run perpendicular to the water main lines, providing water to individual buildings. Thus, water mains and service lines were routinely added to the city’s infrastructure throughout the twentieth century as the city expanded and developed. Similarly, cast iron fire hydrants were replaced and added as needed. In 1997, Seattle Public Utilities was created, absorbing the functions of the Seattle Water Department (Ness, 2011). Currently, Seattle Public Utilities serves 1.4 million people, with an average of 140 million gallons of water each day (Seattle Public Utilities, 2016).
7 DETERMINATIONS OF ELIGIBILITY

7.1 Previously Evaluated Resources

Areaways located in an NRHP-listed historic district or attached to an NRHP-listed building are considered historic properties, even though they are actually part of the right-of-way. All areaways that retain integrity and are connected to a historic property or within a historic district are assumed to be historic for the purposes of this project. Representative photographs of service lines within historic areaways are included in Appendix A (Photos 10 – 11).

7.2 Water Lines

The segment of the 1st Avenue and 1st Avenue S water main, the associated perpendicular mains and service lines, and the hydrants between S Jackson Street and Stewart Street are located within the boundaries of two historic districts that are listed in the NRHP: the Pioneer Square-Skid Road Historic District and the Pike Place Public Market Historic District. However, the segment of water main, its associated perpendicular lines, and the hydrants are not listed as contributing elements to either historic district.

The segment of water main located along 1st Avenue and 1st Avenue S in downtown Seattle, between S Jackson Street and Stewart Street, including perpendicular mains and service lines, is not eligible for the NRHP. The property is not eligible for the NRHP under Criterion A, which applies to resources that are associated with events that have made a significant contribution to the broad patterns of history, as no significant events are directly associated with this linear structure. The segment of the 1st Avenue and 1st Avenue S water main between S Jackson Street and Stewart Street contains pipes that were installed in 1890, 1891, 1900, 1906, and a short replacement segment from 1990 (57 feet where 1st Avenue and Main intersect). Most of the evaluated segment, from Main Street to Stewart Avenue, was installed in 1890-91, just after the Great Fire of 1889 and after the city acquired the Spring Hill Water Company in 1890. The remainder of the water main, a portion of the section from Columbia Street to Stewart Street, was added in 1906, likely as part of ongoing improvements to the downtown area. The perpendicular mains were installed and replaced as necessary between 1901 and 1997, and the perpendicular service lines were installed and replaced as necessary between 1905 and 1958. The segment of water main along 1st Avenue and 1st Avenue S and most of the perpendicular mains and service lines are early examples of water pipes in Seattle and are typical of water pipes installed around the city and all over the country in the early twentieth century. In Seattle, they comprised but one aspect of the massive rebuilding efforts after the Great Fire.

Development of a city water system, while necessary for a city to prosper, was no longer a significant event by the end of the nineteenth century. Several east coast cities, including Philadelphia, New York, and Boston had established urban water systems prior to 1850. These three systems are described in the cultural resources survey report for the Jersey City Water Works Pipeline as the “most important urban water supply systems of
the first half of the 19th century” (Howson, 2001). Technical and design innovations from these water systems influenced other systems regionally, in places like Jersey City, New Jersey, where the water works were completed in 1854 (Howson, 2001). In addition, cities around the country used these early examples as models for new local systems. The Jersey City Water Works Pipeline report notes that as cities grew during the nineteenth century, a consistent water supply became a common necessity nationally for both health and safety reasons: “As in other American cities, with rapid population growth the need for a reliable supply of fresh water became acute. In addition to the lack of water for domestic use, fires in the increasingly dense urban core could not be brought under control with the supplies at hand” (Howson, 2001). As such, the development of Seattle’s downtown water system was the result of common nineteenth century urban dilemmas. The City of Seattle was able to use the engineering innovations and technologies that had been established decades earlier for other urban water systems to design a locally appropriate system.

Water systems are components of any city’s infrastructure; this segment of water main, and its associated perpendicular mains and service lines, is not significant within the historical context of Seattle’s water system, the Cedar River water system, or the regional or national development of water systems. Therefore, the segment of water main, including its associated perpendicular mains and service lines along 1st Avenue and 1st Avenue S, is not eligible for the NRHP under Criterion A.

To be eligible for the NRHP under Criterion B, a property must be directly associated with a person considered significant within a historical context whose specific contribution to history has been both identified and documented. While significant people were involved in the development of Seattle’s water system, including R.H. Thomson, no such person who meets that definition is directly associated with this segment of water main or the associated perpendicular mains and lines.

The linear structure, including its associated perpendicular mains and service lines, is not eligible for the NRHP under Criterion C because it is a segment of an unremarkable water main primarily constructed of cast iron with no unusual qualities and no noticeable differences from other common cast iron water pipes; therefore, it does not embody distinctive characteristics of a type, period, or method of construction; it is not the work of a master and does not possess high artistic value. A small segment of the water main has been replaced with ductile iron, which is a typical, modern replacement material. The water main displays the same designs, materials, and construction techniques used for water systems around the country. Currently, Seattle Public Utilities includes 1,339 miles of cast iron water mains, 45.7 miles of which are 20-inch cast iron pipes, identical to a majority of the 1st Avenue water main evaluated in this form. A third of the perpendicular mains included on this form that intersect with the 1st Avenue and 1st Avenue S water main were installed after 1984 and are ductile iron replacement pipes. The remaining perpendicular mains, and most of the evaluated service lines, are early to mid-twentieth century cast iron pipes that were installed over several decades and are unremarkable examples. Thus, the network of extant water pipes in Seattle includes many hundreds of miles of cast iron water pipes, and this segment and its associated perpendicular lines is not distinguishable from other cast iron pipes in Seattle or the rest of the country. Therefore, the segment of water main, including the associated
perpendicular mains and service lines along 1st Avenue and 1st Avenue S between S Jackson Street and Stewart Street, is not eligible for listing in the NRHP because it does not meet any of the eligibility criteria.

Since the late nineteenth century, the water main along 1st Avenue and 1st Avenue S, and the perpendicular mains and services lines, have been regularly maintained, which mostly involves repairs associated with service leaks and leaks at the pipe joints. As a utilitarian structure, continued use is a priority and regular maintenance is to be expected. The evaluated segment of water main includes a total of 4,662 linear feet of pipe. Within that segment, there are 4,605 feet of cast iron pipe from the late nineteenth and early twentieth centuries and 57 feet of replacement ductile iron pipe from 1990. Overall, the segment of water main along 1st Avenue retains good integrity of materials, design, workmanship, feeling, association, setting, and location. A third of the perpendicular mains evaluated for this report are replacement ductile iron pipes that were installed after 1984. Therefore, the perpendicular mains lack some integrity of material and workmanship, but retain integrity of design, feeling, association, setting, and location. Approximately two-thirds of the perpendicular service lines evaluated for this report were constructed prior to 1930. The remaining lines were constructed between 1941 and 1958. Therefore, the service lines retain integrity of materials, workmanship, design, feeling, association, setting, and location.

7.3 Fire Hydrants

There are 14 hydrants that would be replaced along 1st Avenue and 1st Avenue S. Only five of these hydrants were identified as more than 50 years old and were evaluated for NRHP eligibility for this project.

The fire hydrants located along 1st Avenue and 1st Avenue S, between S Jackson Street and Stewart Street, are not eligible for the NRHP. The structures are not eligible for the NRHP under Criterion A, because no significant events are directly associated with these structures. The hydrants have been installed and replaced as necessary through the late nineteenth and twentieth centuries. The five pre-1966 hydrants proposed for replacement were installed between 1895 and 1949 as infrastructure developed in the downtown area. The hydrants are typical of hydrants installed around the city and all over the country in the late nineteenth and early twentieth century. Their installation was part of a number of preventative safety measures taken by the city to avoid another devastating fire. These hydrants are not significant within the historical context of Seattle’s fire department, or the regional or national development of fire prevention systems. Therefore, the five evaluated hydrants within this segment of 1st Avenue and 1st Avenue S are not eligible for the NRHP under Criterion A.

To be eligible for the NRHP under Criterion B, a property must be directly associated with a person considered significant within a historical context whose specific contribution to history has been both identified and documented. No such person who meets that definition is associated with these fire hydrants.

The utilitarian hydrant structures are not eligible for the NRHP under Criterion C because they are unremarkable cast iron fire hydrants that are found around Seattle and throughout the country. The hydrants are a standard type of late nineteenth and early
twentieth century hydrants that had grown common in other cities during the early and mid-nineteenth century. By 1811, Philadelphia had 185 cast iron fire hydrants and “by 1865, Philadelphia had installed cast iron hydrants that were very similar to today’s models” (FireHydrant.org, 2003). The hydrants are not distinguishable from other hydrants within Seattle and around the country. They do not embody distinctive characteristics of a type, period, or method of construction; they are not the work of a master and do not possess high artistic value. Therefore, the five fire hydrants along 1st Avenue and 1st Avenue S between S Jackson Street and Stewart Street are not eligible for listing in the NRHP because they do not meet any of the eligibility criteria.

The five hydrants installed between 1895 and 1949 show signs of wear as a result of their age and continued use. In some cases, layers of paint and rust obscure the manufacturers’ stamps and installation years. However, overall, the five fire hydrants remain very similar to their original appearance when they were first installed; they retain integrity of materials, design, workmanship, location, setting, association, and feeling.
8 ASSESSMENT OF EFFECTS

This addendum finds that the 1st Avenue and 1st Avenue S water lines and hydrants are not eligible for the NRHP. General impacts from construction activities on the Pioneer Square-Skid Road Historic District and Pike Place Public Market Historic District were discussed in the Seattle Center City Connector Environmental Assessment: Cultural Resources Technical Report. Any additional potential effects on historic properties as a result of the 1st Avenue and 1st Avenue S water line replacements, hydrant replacements, or areaway strengthening activities are described below.

8.1 Construction Effects

No physical impacts on historic areaways would result from the relocation and replacement of the 1st Avenue and 1st Avenue S water main or replacement of the perpendicular mains, which are all located within the roadway. Replacement of perpendicular service lines and hydrants are not anticipated to result in physical impacts on historic areaways because placement of new pipes would occur in locations where pipes already exist, and replacement of hydrants would occur in locations where hydrants already exist. Replacement pipes would have the same diameter as existing pipes and would be placed in the same locations. Replacement hydrants would have the same barrel size and would also be placed in the same locations. See Table 3 for a list of historic areaways that could be impacted by water line replacements.

Strengthening of the areaways could require the placement of concrete slabs and installation of vertical steel beams or micropiles within historic areaways that would result in physical impacts on areaway walls and ceilings. However, areaways are utilitarian spaces that provide necessary locations for electrical conduits, utility pipes, meters, alarm systems, water service lines, and general storage. Areaways are routinely maintained and altered in order to sustain their functionality as support structures for the sidewalks and structures aboveground; as a result, areaways in downtown Seattle have been altered and reinforced as needed over the course of their history. Areaway strengthening could occur at 16 historic areaways; four of these are already significantly altered and one has minor alterations. See Table 3 for a list of historic areaways that could be impacted by strengthening improvements. The strengthening associated with the installation of ADA curb ramps is a continuation of these utilitarian, structural improvements. Structural strengthening of areaways would not impact the defining characteristics of the historic areaways. The open spaces within areaways would be maintained. Although installation of steel beams or micropiles would result in a loss of some integrity of design and materials, this loss would be concentrated in only the areas where structural elements need to be attached to areaway walls or ceilings. The significant features of areaways that convey their unique historical associations would largely be retained, including their open spaces below-ground, extant vaulted ceilings, and building walls.

If construction could affect a historic areaway, the Seattle Department of Transportation would survey the areaway before construction is initiated to verify the existing condition of the structure and determine if a Certificate of Approval from the Pioneer Square...
Preservation Board or the Pike Place Market Historical Commission is necessary. Any required changes made to areaways as a result of construction activities would follow the guidelines presented in the *Secretary of the Interior’s Standards for the Treatment of Historic Properties*. No adverse effects to the areaways are anticipated from the replacement of perpendicular service lines or hydrants or from the strengthening of areaways associated with ADA curb ramp improvements. Therefore, no adverse effects on historic properties are anticipated from project construction.

**Table 3. Historic Areaways Along 1st Avenue and 1st Avenue S Affected by Proposed Alterations**

<table>
<thead>
<tr>
<th>Building Address</th>
<th>Building Name</th>
<th>Historic District</th>
<th>Proposed Alterations</th>
</tr>
</thead>
<tbody>
<tr>
<td>322 1st Ave S</td>
<td>Jackson Building</td>
<td>Pioneer Square-Skid Road Historic District</td>
<td>Areaway strengthening Replace water service line</td>
</tr>
<tr>
<td>80 S Jackson (321 1st Ave S)</td>
<td>Smith Building/ Squires Building</td>
<td>Pioneer Square-Skid Road Historic District</td>
<td>Areaway strengthening</td>
</tr>
<tr>
<td>310 1st Ave S (107 S Main St)</td>
<td>Globe Building</td>
<td>Pioneer Square-Skid Road Historic District</td>
<td>Areaway strengthening Replace fire hydrant Replace water service line</td>
</tr>
<tr>
<td>301 1st Ave S</td>
<td>Bread of Life Mission</td>
<td>Pioneer Square-Skid Road Historic District</td>
<td>Areaway strengthening</td>
</tr>
<tr>
<td>219 1st Ave S</td>
<td>New England Hotel</td>
<td>Pioneer Square-Skid Road Historic District</td>
<td>Areaway strengthening</td>
</tr>
<tr>
<td>202-204 1st Ave S</td>
<td>Butnick Building</td>
<td>Pioneer Square-Skid Road Historic District</td>
<td>Areaway strengthening Replace water service line</td>
</tr>
<tr>
<td>216-220 1st Ave S</td>
<td>Grand Central Hotel</td>
<td>Pioneer Square-Skid Road Historic District</td>
<td>Areaway strengthening Replace water service line</td>
</tr>
<tr>
<td>201 1st Ave S</td>
<td>J &amp; M Building</td>
<td>Pioneer Square-Skid Road Historic District</td>
<td>Areaway strengthening Replace fire hydrant</td>
</tr>
<tr>
<td>119 1st Ave S</td>
<td>Maynard Building</td>
<td>Pioneer Square-Skid Road Historic District</td>
<td>Areaway strengthening Replace water service line</td>
</tr>
<tr>
<td>108 S Washington</td>
<td>Terry Kittinger Building</td>
<td>Pioneer Square-Skid Road Historic District</td>
<td>Areaway strengthening Replace water service line</td>
</tr>
<tr>
<td>100 1st Ave S</td>
<td>Olympic Building</td>
<td>Pioneer Square-Skid Road Historic District</td>
<td>Areaway strengthening</td>
</tr>
<tr>
<td>95 Yesler Way</td>
<td>Yesler Building</td>
<td>Pioneer Square-Skid Road Historic District</td>
<td>Areaway strengthening</td>
</tr>
<tr>
<td>312-314 1st Ave S</td>
<td>Nord Hotel and Condo</td>
<td>Pioneer Square-Skid Road Historic District</td>
<td>Replace water service line</td>
</tr>
<tr>
<td>316-320 1st Ave S</td>
<td>Seattle Quilt Building</td>
<td>Pioneer Square-Skid Road Historic District</td>
<td>Replace water service line</td>
</tr>
</tbody>
</table>
### Building Address | Building Name | Historic District | Proposed Alterations
--- | --- | --- | ---
323 1st Ave S | Maud Building | Pioneer Square-Skid Road Historic District | Replace water service line
605 1st Ave | Mutual Life Building | Pioneer Square-Skid Road Historic District | Areaway strengthening
NE Corner 1st Ave/Yesler | Pioneer Place Park | Pioneer Square-Skid Road Historic District | Replace water service line
801 1st Ave | Coleman Building | Individually Listed | Areaway strengthening
821 2nd Ave | Exchange Building | Individually Listed | Replace water service line
1000-1003 1st Ave | Alexis Hotel | Individually Listed | Areaway strengthening
1119 1st Ave | Colonial Hotel/Grand Pacific Condo | Individually Listed | Replace fire hydrant
1505 1st Ave | Corner Market | Pike Place Public Market Historic District | Areaway strengthening
1531 1st Ave | Market House Condo | Pike Place Public Market Historic District | Replace water service line

### 8.2 Operation Effects

Operation of the water lines below 1st Avenue and 1st Avenue S and the fire hydrants would result in no adverse effects to historic properties. The longitudinal and perpendicular water mains are located below the roadways and would not be visible. New fire hydrants would replace existing fire hydrants; they would be standard hydrants that are similar in appearance to the original structures and would serve the same utilitarian purpose.

Replacement service lines and the support beams and micropiles associated with the areaway strengthening activities could result in minor visual effects that would only be apparent from within historic areaways; however, these effects would not diminish the characteristics of the areaways that make them eligible as historic properties. Visual impacts on historic areaways from operation of replacement 1st Avenue and 1st Avenue S service lines or new supports would be minor and would not significantly alter the areaways’ integrity of materials, design, workmanship, feeling, setting, association, or location.

The relocation and replacement of the 1st Avenue and 1st Avenue S water main and the associated perpendicular mains and service lines could have a beneficial impact on the historic districts by improving the overall infrastructure within each district. The project will maintain existing water service levels in the project alignment, reduce risk of water main and service
failures, and enhance the seismic reliability of the distribution system. Cast iron water mains and service pipes are more vulnerable to leaks than those made of ductile iron. In addition, cast iron water mains are also more vulnerable to pipe breaks, which can cause significant property damage to historic buildings. Replacement of aging or vulnerable infrastructure will help ensure a more stable future for the NRHP-listed historic districts and their contributing resources, including historic areaways.
REFERENCES


Seattle Post-Intelligencer. 1906. Prosperous Washington; A Series of Articles Descriptive of the Evergreen State, Its Magnificent Resources, and Its Present and Probable Development. https://books.google.com/books?id=Y68-AAAAYAAJ&pg=PA136&lpg=PA136&dq=when+were+Seattle%27s+streets+first+paved?&source=bl&ots=IkNzC5JH8M&sig=pNV1aB7ZTrXsa3rS09juyHtdMLk&hl=en&sa=X&ei=CD7JVLr3FYGKgwS2pYD4CA&ved=0CFkQ6AEwCQ#v=onepage&q=when%20were%20Seattle's%20streets%20first%20paved%3F&f=false. Accessed August 10, 2016.


APPENDIX A

Representative Photographs
Photo 1. Representative historic photo of a 20-inch cast iron water main in Seattle at Spokane Street and Eighth Avenue

Seattle Public Utilities, 1941
Photo 2. Representative historic photo of a cast iron water main in Seattle at Renton Avenue S and S Henderson Street

*Seattle Public Utilities, 1959*
Photo 3. 1st Avenue fire hydrant, 801 1st Avenue (near Marion Street), installed 1895

CH2M, 2016
Photo 4. Close-up of manufacturer’s mark and year of installation stamp on hydrant at 801 1st Avenue

CH2M, 2016
Photo 5. Hydrant at 101 S Jackson Street, installed 1949
CH2M, 2016
Photo 6. Close-up of top of hydrant at 1501 1st Avenue (corner of Pike Street), installed 1895

CH2M, 2016
Photo 7. Hydrant at 300 1st Avenue S (corner of Main Street), installed 1903

CH2M, 2016
Photo 8. Hydrant at 1412 1st Avenue (between Union and Pike streets), installed 1895

CH2M, 2016
Photo 9. Service line where it penetrates an areaway wall

Photograph provided by City of Seattle Department of Transportation.
Photo 10. Service line valve (indicated by red arrow) within the historic areaway associated with the Maynard Building (119-121 1st Avenue)

Photograph provided by City of Seattle Department of Transportation.