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Cultural Resources Technical Report for the First Avenue Sewer Rehabilitation

Seattle Department of Transportation
January 2017
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1 INTRODUCTION

The Seattle Department of Transportation (SDOT) is currently planning construction of the Center City Connector project (Project) to expand the City’s streetcar network. The Project would connect the two existing modern streetcar lines through downtown Seattle. The Project’s 1.2-mile alignment begins at the southern terminus of the South Lake Union Streetcar line, at McGraw Square on Sixth Avenue and Westlake Avenue. The alignment continues west on Stewart Street and then south on First Avenue. The southern Project terminus connects to the First Hill Streetcar line terminus, where Occidental Park meets S Jackson Street.

The combined sewer system between S Jackson Street and Seneca Street was constructed between 1893 and 1963. Rehabilitation of the sewer line along First Avenue was identified by Seattle Public Utilities (SPU) during early design of the Center City Connector project as an opportunity to improve infrastructure, share project costs, reduce future risk and costs, minimize public disruption, and abate impacts from construction. SPU evaluated possible improvements and repairs to its sewer system along First Avenue and in downtown Seattle and identified repairs that could be coordinated with the streetcar’s design and construction packages.

Because the sewer rehabilitation work would not require federal funds, it does not require environmental review under the National Environmental Policy Act. The sewer project is, however, subject to Revised Code of Washington Chapter 27.53 and environmental review under the Washington State Environmental Policy Act, which triggers the need for a cultural resources evaluation. This technical report describes an evaluation of the historic-era sewer mains in downtown Seattle, below First Avenue and First Avenue S for eligibility for listing in the National Register of Historic Places (NRHP).
2 PROJECT LOCATION

Figures 1a, 1b, and 1c show the extent of the sewer main segments below First Avenue and First Avenue S along the Project alignment, as well as the year of installation and type of pipe.
Figure 1a (Page 1 of 3)
Locations of Sewer Mains

- Pike Place Market Historic District (local city district)
- Pike Place Public Market Historic District (NRHP district)

Year Installed: 1963

Location of Sewer Mains
- Reinforced Concrete

Figure 1a  Locations of Sewer Mains (Segment 1)
Figure 1b  Locations of Sewer Mains (Segments 1 – 4)
Figure 1c Locations of Sewer Mains (Segments 4 – 7)

Figure 1c (Page 3 of 3)
Locations of Sewer Mains

- Pioneer Square Historic District (local city district)
- Pioneer Square – Skid Road District (NRHP district)

Location of Sewer Mains
- Brick
3 PROJECT DESCRIPTION

The proposed action would reline portions of the existing sewer line and make spot masonry repairs to existing maintenance holes and to oviform and round brick sewers under First Avenue and First Avenue S. The work would be completed at the same time and in proximity to the Center City Connect Streetcar alignment.

- **Between S Jackson Street and Cherry Street.** Masonry repairs of the existing maintenance holes and of oviform and round brick sewers.
- **Between Cherry Street and Madison Street.** Cured in place pipe (CIPP) relining approximately 900 feet of the sewer mainline.
- **Between Spring Street and Seneca Street.** CIPP relining approximately 200 feet of mainline sewer.

CIPP lining is a method used to fix underground pipelines without excavating trenches to expose lengths of pipe. Work crews access the pipe through an existing maintenance hole or excavated access pit and insert a flexible liner into the pipe. The liner is then inflated with hot water or steam to cure it. As a result, the liner hardens to form a rigid, smooth surface that seals any cracks in the pipe. This extends the service life of the pipe, decreases ongoing maintenance costs, and reduces construction impacts.

In addition, the following repairs would be made where the connections between catch basins and the mainline sewer are broken or deteriorated. To facilitate relining or masonry repairs to the mainline sewer, the contractor may need to excavate the street at maintenance hole locations to provide access. Prior to doing this work, the contractor would install a temporary sewer bypass consisting of piping and pumps laid at street level to pump sewer flows around the work area.

At the conclusion of the relining or masonry repairs, the maintenance holes would be rebuilt and paving would be restored.

Repair of the catch basin to mainline sewer connections (laterals) would occur at most intersections and in at least one or more locations per intersection. The laterals are located roughly perpendicular to the long access of the street and at intersections or mid-block. This work would involve trenching 10 to 15 feet below street grade to repair or replace the broken or deteriorated pipes.
This report evaluates seven longitudinal segments of sewer main that run below First Avenue and First Avenue S in downtown Seattle. Combined, the segments include 3,545 linear feet of pipes and tunnels made of vitrified clay, reinforced concrete, and brick. According to SPU records, the segment below First Avenue between Union and Seneca streets was constructed in 1963, while the six segments below First Avenue and First Avenue S south of Seneca Street were installed in 1893. Maintenance holes are located at most intersections. A closed-circuit television (CCTV) inspection of the sewers below First Avenue and First Avenue S occurred in 2013 to determine their current conditions.

The seven sewer segments are described below. Representative photographs of the sewer mains below First Avenue and First Avenue S are included in Appendix A (Photos 1 – 7).

### Table 1. Evaluated Sewer Mains

*Below First Avenue and First Avenue S in downtown Seattle*

<table>
<thead>
<tr>
<th>Segment #</th>
<th>Location</th>
<th>Description</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Below First Avenue: from Union to Seneca streets</td>
<td>850 linear feet; 24-inch-diameter; reinforced concrete</td>
<td>1963</td>
</tr>
<tr>
<td>2</td>
<td>Below First Avenue: from Seneca to Spring streets</td>
<td>195 linear feet; 18-inch-diameter; vitrified clay pipe</td>
<td>1893</td>
</tr>
<tr>
<td>3</td>
<td>Below First Avenue: from Spring to Madison streets</td>
<td>320 linear feet; 18-inch-diameter; vitrified clay pipe</td>
<td>1893; relined with CIPP in 2006</td>
</tr>
<tr>
<td>4</td>
<td>Below First Avenue: from Madison to Cherry streets</td>
<td>970 linear feet; 22-inch-wide by 33-inch-high egg-shaped tunnel; brick</td>
<td>1893</td>
</tr>
<tr>
<td>5</td>
<td>Below First Avenue: from Cherry Street to Yesler Way</td>
<td>270 linear feet; 28-inch-wide by 42-inch-high egg-shaped tunnel; brick</td>
<td>1893</td>
</tr>
<tr>
<td>6</td>
<td>Below First Avenue S: from Yesler Way to S Main Street</td>
<td>600 linear feet; 32-inch-wide by 48-inch-high egg-shaped tunnel; brick</td>
<td>1893</td>
</tr>
<tr>
<td>7</td>
<td>Below First Avenue S: from S Main to S Jackson streets</td>
<td>340 linear feet; 48-inch-diameter; brick</td>
<td>1893</td>
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No as-builds were provided for Segment 1. The CCTV inspections indicated that sections of the reinforced concrete pipe sewers had exposed aggregate, which was installed in 1963. Segment 2, which is located below First Avenue between Seneca and Spring streets, and Segment 3, which is located below First Avenue between Spring and Madison streets, are both composed of vitrified clay pipe with an 18-inch diameter and were installed in 1893 (Thomson, 1893a). Photographs from the CCTV inspection of Segment 3 showed the CIPP re-line that was done in 2006 (SPU, 2013).

Segments 4 to 6, which are located below First Avenue and First Avenue S between Madison Street and S Main Street, are composed of egg-shaped brick tunnels of various sizes. All three
segments are composed of two layers of brick, the interior layer of which is described in the 1893 as-builts as “Selected Extra Hard Burned Brick” (Thomson, 1893b; 1893c). During the CCTV inspection, Segment 4 was recorded as being in poor condition (SPU, 2015). Structural deficiencies were visible during the CCTV inspection along Segment 5, located between Cherry Street and Yesler Way (SPU, 2015). The CCTV inspection indicated that Segment 6 is structurally deficient and in failure (SPU, 2015).

Segment 7, located below First Avenue S between S Main Street and S Jackson Street, is a round brick pipe. Based on the CCTV inspection, the segment is structurally sound, but sections of the segment have been repaired with grout or mortar surface coatings (SPU, 2015). As-builts from 1893 of the segment show that it is composed of two layers of brick and the interior layer is labeled as “Selected Extra Hard Burned Brick” (Thomson, 1893c). South of S Jackson Street, the 1893 as-built indicates that the round brick pipe is connected with a wooden conduit, from where it likely discharged onto the tide flats (Thomson, 1893c).
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 downtown sewer mains have not been previously inventoried in WISAARD and have not been evaluated for NRHP eligibility. Additional research was conducted to prepare a historical context for the sewer system in downtown Seattle. Research included a review of published materials, online resources, and maps, as well as as-built drawings, photographs, and maintenance records provided by SPU. An inventory form was completed for the seven sewer mains evaluated in this technical report and was submitted through WISAARD on January 23, 2017.
6 HISTORICAL CONTEXT

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 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” (Seattle Post-Intelligencer, 1906; Seattle Municipal Archives, 2016a). A mix of private and public systems had been established to dispose of sewage and “approximately 65 per cent of the city’s area drained naturally into fresh water lakes, with the remainder draining into Elliott Bay” (Sheridan, 2012a). The fresh water sources were also used for drinking water and as a result of sewage contamination, the city suffered from typhoid and diphtheria epidemics. The city’s “main commercial district (Pioneer Square) was particularly foul, since it sat in a low-lying area near the waterfront” (Sheridan, 2012a).

Construction of Seattle’s first sewer system was directed by City Engineer Reginald H. Thomson. Thomson is remembered for his long and active career during which time he “leveled hills, straightened and dredged waterways, reclaimed tideflats, built sewers, sidewalks, tunnels, and bridges, and paved roads” (Stein, 2000). As a result, “virtually all of Seattle’s infrastructure can be attributed to R.H. Thomson” (Stein, 2000). In 1881, Thomson arrived in Seattle, which at the time had a population of approximately 3,500 people. Upon arrival, “Thomson took note of the crowd, but couldn’t help also noting the rudimentary state of city development” (Stein, 2000). His first official role with the city was as the assistant to the city and county surveyor, F.H. Whitworth. Thomson became the city surveyor in 1884 and it was “in this role that he built Seattle’s first sewers” (Stein, 2000). These early systems were a few short sewer lines that were constructed using wood and ironstone. Within the downtown area, some of the lines “discharged waste across the primary commercial street, Front Street (now First Avenue)” (Sheridan, 2012a).

The city of Seattle hired Colonel George E. Waring in 1888 to design a comprehensive sewer system for the community. Waring, who was a well-known sanitary engineer, “proposed a system of small, tightly sealed, pipes to remove waste rapidly from houses. The pipes were to carry only household waste, not storm water, which would be handled by a system of gutters and other surface drainage” (Sheridan, 2012a). Waring argued that smaller pipes that did not accommodate storm water drainage would be cheaper for the city to construct. However, the city rejected Waring’s plan because the “City Surveyor, John Scurry, disagreed with the location of the pipes and considered them too small to meet the city’s needs” (Sheridan, 2012a).

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). The fire “provided an opportunity to rebuild the streets at a higher level to improve drainage” (Sheridan, 2012a). 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 First 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).

In October 1889, after the Great Fire, the city of Seattle hired Benezette Williams to replace Waring and design a city-wide sewer system. Williams “proposed larger pipes capable of handling both household waste and the runoff from most storms” (Sheridan, 2012a). The plan would divide the city into three distinct districts: Lake Union, Central, and Intermediate. Two future districts were also established: Renton Hill and Queen Anne. As part of the plan, a complete system including sewer mains, tunnels, and outfalls to Elliott Bay would be constructed for each individual district; “This plan was adopted and guided the city’s sewer construction for decades” (Sheridan, 2012a).

Voters in Seattle authorized sewer bonds in June 1890 “to construct the first phase of the new sewer system, the Lake Union Tunnel” (Sheridan, 2012a). Construction on the system was stopped in 1892 when workers dug into an underground lake and progress on the sewer system was not moving fast enough to keep up with Seattle’s growing population. Seattle’s mayor, James T. Ronald, turned to R.H. Thomson for advice on how to proceed with construction (Sheridan, 2012a). Thomson had taken a brief hiatus from his work in Seattle, during which time he was employed with the Seattle, Lake Shore & Eastern railroad. At Ronald’s request, Thomson returned to Seattle and became a consulting engineer for the city and in 1892 assumed the position of city engineer, which would remain his title for most of the next 20 years. As city engineer, he designed 4.5 miles of sewer lines, “much of it through formations that had stymied earlier engineers” (Stein, 2000). Thomson primarily followed Williams’ design by constructing “two sewer trunk lines that began carrying wastewater in 1894. One, on the north side of downtown, carried sewage to Elliott Bay, at the base of Denny Hill (before it was regraded)” (Ott, 2015). This was the Lake Union Sewer Tunnel. The second trunk line, “on the south end of downtown, discharged onto the tide flats south of King Street until they were filled and the outfall pipe was extended to the Duwamish River in 1910” (Ott, 2015). This line incorporates parts of the First Avenue and First Avenue S sewer lines that are evaluated in this technical report.

Thomson appointed a miner, Edward T. Morgan, to oversee the difficult construction work and decided that the interior of the piping would be lined with brick instead of concrete. During the early stages of construction, “there had been doubt that local brick makers could produce brick of high enough quality to serve as sewer lining” (Sheridan, 2012a). Thomson was certain, however, that with meticulous manufacturing processes and high standards for quality, local brick would be sufficient for use. In 1892, Seattle residents voted to approve an additional $350,000 in sewer bonds. Despite the public approval, construction on the sewer system was once again delayed by the financial crisis of 1893, and the bonds were not sold until December 1893. The financial crisis had caused considerable unemployment in the region and this “led politicians to see sewer construction primarily as an employment program, with less regard for the quality of the work than for the number of men employed” (Sheridan, 2012a). Thomson disagreed with this approach, emphasizing instead the need for a workforce comprised of skilled laborers. Thomson’s opinion put him at odds with the Board of Public Works which wanted to control the project’s hiring process. The rift led the Board to terminate Thomson as city engineer in January 1894; however, Thomson was re-hired in February of the same year “after it became clear that money was being wasted and progress on the sewers had halted” (Sheridan, 2012a). With Thomson reinstated as city engineer, the Lake Union Sewer Tunnel was completed in 1894. At
the same time, Thomson was also constructing the downtown sewer, some of which remains below First Avenue and First Avenue S. As-builts for the downtown sewer segments are dated December 1893.

For the first years of its operation, sewage passed through the system untreated. Since the system limited the amount of waste that was deposited into the city’s freshwater sources, “the city saw a marked decrease in illnesses and deaths attributed to polluted water” (Ott, 2015). However, the sewer system could not handle the amount of wastewater and drainage when heavy rainstorms occurred. Overflow outlets located on the lakes, the Duwamish River, and the Puget Sound expelled the overflow during heavy storms (Ott, 2015). During the late 1910s, “the City undertook a succession of steps…to remove solids, begin primary sewage treatment, and eventually separate storm water from raw sewage” (City of Seattle, 2016). Water-treatment facilities were in operation by the 1920s, which diminished the amount of pollution released into the nearby bodies of water. However, “storm-related overflows continued to release millions of gallons of untreated wastewater into waterways each year” (Ott, 2015). It was not until the 1960s and 1970s that the sewer and storm drainage systems were separated within the older parts of the city (Ott, 2015). In more recent years, the city has continued “making changes to limit combined sewer overflows, the ones that come from parts of the city that still carry sewage and stormwater in the same pipes, to one overflow per outfall per year, by building inline storage tanks that hold excess water until the [collection system and] treatment plants can handle the volume” (Ott, 2015).

In 2012, the Lake Union Sewer Tunnel was evaluated as part of the Alaskan Way Viaduct, Central Waterfront, Deep-Bore Tunnel/Replacement Project. It was determined eligible for the NRHP and received concurrence from the State Historic Preservation Officer on August 15. The evaluation included the sewer segments along Republican Street from Westlake Avenue to Sixth Avenue S, then west on Denny Way to Elliott Bay (Sheridan, 2012b). The Lake Union Sewer Tunnel is eligible under Criterion A “for its association with the development of the city of Seattle and its early infrastructure, and under Criterion C as a good example of a nineteenth-century brick-lined sewer tunnel with original materials, design and workmanship” (Sheridan, 2012a).
7 DETERMINATIONS OF ELIGIBILITY

A total of 3,545 linear feet of sewer located below First Avenue and First Avenue S in downtown Seattle is evaluated in this technical report. The evaluated sewers are divided into seven segments that were constructed in 1893 and 1963.

The sewer segments are not eligible for the NRHP. They are 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 the linear structures. The six sewer segments between Seneca Street and S Jackson Street (totaling 2,695 linear feet) were installed in 1893, just a few years after the Great Fire. In response to this catastrophic event, the city undertook a major overhaul of its infrastructure, including the regrading of streets, reconstruction of buildings downtown, and a new water system, among others. The sewer segment north of Seneca Street (totaling 850 linear feet) was subsequently added in 1963, as the sewer system was upgraded and expanded.

Although the sewer segments between Seneca Street and S Jackson Street are associated with the rebuilding efforts after the Great Fire, this association is not significant. The Lake Union Sewer Tunnel, which was determined eligible for the NRHP in 2012, was the “first phase of the new sewer system” and, therefore, is a better representation of this early period of infrastructure development. The downtown line appears to have been constructed as part of the second phase of development that ultimately was finished around the same time as the Lake Union Sewer Tunnel due to delays in construction. Thomson designed approximately 4.5 miles of sewer, and the Lake Union and downtown segments composed only part of that. Currently, there are 90,337.85 linear feet of brick sewers still present in Seattle, 87,924.93 linear feet of which are owned by SPU (Herrera, 2016). This evaluation includes 2,180 linear feet of brick sewers, which represents just over 2 percent of all brick sewers within the city. The vitrified clay pipes and the brick sewer tunnels located within downtown Seattle are examples of early sewers in Seattle, but they were just one component of a larger rebuilding program and are not considered individually significant.

Other combined-sewer systems had been constructed elsewhere in the United States during the mid-nineteenth century: “The first comprehensively planned [combined-sewer systems] in the United States were constructed in Chicago and Brooklyn in the late 1850s” (Burian et al., 2000). By the end of the nineteenth century, when Seattle started construction of its city-wide system, “the basic techniques of urban wastewater collection were established, the sewer technologies were mostly developed, and the necessary construction materials and equipment were available. By that time, most major U.S. cities had also constructed some form of a sewer system” (Burian et al., 2000). Such a development was in large part to avoid outbreaks of diseases that had plagued urban areas during the first half of the nineteenth century. The lessons learned from controlling various outbreaks, including a cholera outbreak after the Civil War, “indicated that the effective management of human wastes was an important component in protecting public health . . . [which] invariably encouraged the construction of water-carriage sewer systems” (Burian et al., 2000). As a result, construction of Seattle’s sewer system was one component of many infrastructure improvements initiated after the Great Fire in response to a series of health and public safety crises that had affected the whole country. In this way, construction of the downtown sewer lines is not a specific event that marks an important moment in history, but is rather a small component of a much larger historical trend. The 5,400-linear-foot Lake Union
Sewer Tunnel, which has a diameter of 6 feet and is “largely intact,” was recorded as a significant example of its type due to its association with the development of the city of Seattle and its early infrastructure under Criterion A. As the first of its kind in Seattle, the Lake Union Sewer Tunnel is a good representation of the historical moment, and its significance has been documented through accepted means of historical research. The downtown sewer lines were part of the subsequent expansion of the system and their specific association with the early development of the city’s infrastructure is not particularly significant; therefore, the downtown sewer segments evaluated in this report are not considered eligible 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 sewer system, including R.H. Thomson and Colonel George E. Waring, no such person who meets that definition is directly associated with these downtown sewer segments. As a result of the massive rebuilding projects that occurred after the Great Fire, most infrastructure constructed during the end of the nineteenth century and into the twentieth century is associated with R.H. Thomson. The city engineer’s association with the downtown sewer lines below First Avenue and First Avenue S is not significant.

The downtown sewer mains are not eligible for the NRHP under Criterion C. They include multiple sections that are characterized by various materials, shapes, and sizes. While the sewer mains are examples of late nineteenth and early twentieth century sewers, the segments 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. Two of the three sewer segments north of Madison Street date from 1893 and were constructed using vitrified clay pipe. The section of vitrified clay pipe between Spring and Madison streets was relined with CIPP in 2006. The segment of reinforced concrete pipe between Union and Seneca streets was installed in 1963 and likely replaced an earlier vitrified clay segment. Approximately 2,180 linear feet of brick lined sewer remain extant below First Avenue and First Avenue S between Madison Street and S Jackson Street; however, parts of the brick sewer between S Main Street and S Jackson Street have been repaired at several locations with grout or mortar surface coatings. The other sections are generally in poor condition or structurally deficient. Therefore, these sewer lines have lost some integrity of materials, design, and workmanship and are not distinguishable from other similar late nineteenth or early twentieth century sewers. The Lake Union Sewer Tunnel is a better example of a nineteenth-century brick-lined sewer tunnel in that it retains integrity and is recorded as the first example in Seattle of its type (Sheridan, 2012a). The sewer mains under First Avenue and First Avenue S are not eligible for the NRHP under Criterion C.

The evaluated sewer main segments are located within the boundaries of the NRHP-listed Pioneer Square-Skid Road Historic District. However, the sewer mains are not listed as contributing elements to the historic district and are generally not visible to the public.
This technical report finds that the seven segments of sewer mains below First Avenue and First Avenue S are not eligible for the NRHP. However, the sewer lines below First Avenue and First Avenue S that would be affected by the proposed rehabilitation project are located partially within the Pioneer Square-Skid Road Historic District, which is listed in the NRHP. Rehabilitation of the First Avenue and First Avenue S sewer mains could result in minimal, temporary impacts to the NRHP-listed historic district.

CIPP relining would not require any digging to expose sewer tunnels or piping. Where necessary, the street would be accessed via maintenance hole locations to facilitate relining or masonry repairs. Trenching may be required at intersections in order to repair catch basin to mainline sewer connections. Construction activities would result in temporary lane closures and detour routes. During construction, a temporary sewer bypass would be set up to allow for continued sewer service. The bypass consists of piping and pumps that would be laid on the surface to pump sewer flows around the construction/work area. Once construction is complete areas would be rebuilt and restored.

The rehabilitation of the sewer mains would not have an adverse effect on the NRHP-listed Pioneer Square-Skid Road Historic District through which they pass. Construction impacts on the historic district and its contributing buildings could include visual effects, noise, vibration, and dust and debris of construction activities. These effects are limited to the duration of construction. Best practices would be followed for dust control, maintaining access, noise reduction, and vibration. Construction would be limited to existing right-of-way, and buildings or structures that contribute to the NRHP-listed district would incur minor impacts from the passing and use of heavy equipment and dust. All construction staging areas would occur within the roadway right-of-way. The historic districts and their contributing resources along First Avenue and First Avenue S would experience temporary visual impacts from the construction activities; however, these impacts would be minor. After construction, operation of the sewer lines below First Avenue and First Avenue S would result in no adverse effects to the historic districts. The longitudinal sewer mains are located below the roadways and would not be visible or noticeable from the NRHP-listed historic districts.

Although the Pioneer Square-Skid Road Historic District and its respective contributing resources would experience impacts from construction in the adjacent right-of-way, these impacts would be temporary and would not be significant. Seattle standard specifications and best management practices would be followed to minimize construction impacts. The rehabilitation of the sewer mains could have a beneficial impact on the historic district by improving the overall infrastructure within the district. Relining or repairing of aging or vulnerable infrastructure would help ensure a more stable future for the NRHP-listed historic district and its contributing resources. No adverse effects on historic properties are anticipated from project construction.
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APPENDIX A
Representative Photographs
Photo 1. Egg-shaped brick sewer First Avenue S south of Washington Street (Segment 6). Installed 1893.  
(Seattle Public Utilities, 2013)
Photo 2. Round brick sewer, south of S Main Street below First Avenue S (Segment 7). Installed 1893.  
(Seattle Public Utilities, 2013)
Photo 3. Looking up a brick maintenance hole at First Avenue and Cherry Street (between Segments 4 and 5).  
(Seattle Public Utilities, 2013)
Photo 4. Egg-shaped brick sewer below First Avenue south of Cherry Street (Segment 5). Installed 1893.

(Seattle Public Utilities, 2013)
Photo 5. Egg-shaped brick sewer below First Avenue south of Columbia (Segment 4). Installed 1893. (Seattle Public Utilities, 2013)
Photo 6. Vitrified clay pipe below First Avenue at Spring Street (Segment 3). CIPP reline done in 2006.  
(Seattle Public Utilities, 2013)
Photo 7. Reinforced concrete pipe below First Avenue north of University Street (Segment 1). Installed in 1963.

(Seattle Public Utilities, 2013)