CULTURAL RESOURCES REPORT COVER SHEET

Author: Sarah Amell and Jennifer Chambers

Title of Report: Cultural Resource Assessment for the Views on 5th Development Project Olympia, Thurston County, Washington

Date of Report: September 29, 2017

County(ies): Pierce Section: 14 Township: 18N Range: 2W

Quad: Tumwater, WA Acres: 1.06

PDF of report submitted (REQUIRED) ☒ Yes

Historic Property Inventory Forms to be Approved Online? ☒ Yes ☐ No

Archaeological Site(s)/Isolate(s) Found or Amended? ☐ Yes ☒ No

TCP(s) found? ☐ Yes ☒ No

Replace a draft? ☐ Yes ☒ No

Satisfy a DAHP Archaeological Excavation Permit requirement? ☐ Yes # ☒ No

Were Human Remains Found? ☐ Yes DAHP Case # ☒ No

DAHP Archaeological Site #:

_____
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_____

- Submission of PDFs is required.
- Please be sure that any PDF submitted to DAHP has its cover sheet, figures, graphics, appendices, attachments, correspondence, etc., compiled into one single PDF file.
- Please check that the PDF displays correctly when opened.

Cultural Resource Assessment
for the
Views on 5th Development Project
Olympia, Thurston County, Washington

Prepared for:

Ken E. Brogan
Brogan Companies

Prepared by:

Sarah J. Amell, Principal Investigator
Jennifer Chambers, Senior Archaeologist

Aqua Terra Cultural Resource Consultants
8525 Stoney Creek Lane SW
Olympia, WA 98512
www.AquaTerraCRC.com

Report # TH-02-17
DAHP Project Tracking Code: 2017-07-05018

September 29, 2017

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for the
Views on 5th Development Project
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Executive Summary

Aqua Terra Cultural Resource Consultants (ATCRC) was contracted by Ken Brogan of Civil Investments, LLC (CI) to conduct a cultural resources assessment for the Views on 5th Development Project (the project) to be located at two parcels (#91005301000 and #91005502000) in the 400 block of 5th Avenue in Olympia, Thurston County, Washington (the project area).

CI is proposing a project that would redevelop the project area with a mixed-use, multi-family residential and commercial complex. The project is permitted by the City of Olympia and as such is subject to the State Environmental Policy Act (SEPA). SEPA requires that impacts to cultural resources be considered during the public environmental review process. During the public review process, the Washington State Department of Historic Preservation (DAHP) responded (August 10, 2017) and expressed concern with potential impacts to the effects on view sheds, cultural landscapes and the economy of the historic downtown. Specifically, DAHP requested completion of the following cultural resource review activities:

- A study of the impacts to the historic view shed.
- A socioeconomic assessment of the proposals effects to the National Register listed Downtown Olympia Historic District.
- Preparation of an overview for the project area that utilizes archival resources including historical maps.
- Cultural resource monitoring of geotechnical borings and boring substrate analysis by a Professional Archaeologist.
- Cultural resource recommendations based on the completion of the aforementioned items, that may include additional work requiring mechanical trenching, cultural resource monitoring during construction, and the preparation of an Inadvertent Discovery Plan.

This report was prepared to address the August 10, 2017 DAHP comments. Thomas Architecture Studios prepared a study of the impacts to the historic view shed. ATCRC prepared the overview for the project area that utilizes archival resources. ATCRC also implemented a cultural resource assessment that included background research, field survey, and preparation of this report.

Two historic-aged properties were identified in the project area. In the northwest corner of the project area, the building at 411 4th Avenue W (Parcel# 91005301000) was reportedly constructed in 1950. The building has not been previously inventoried. Accordingly, ATCRC prepared a HPI form and submitted to the DAHP. A copy of the HPI is provided in Appendix A. Also located in the project area is the Capitol Center Building, which was reportedly constructed

in 1965/1966. This building has been previously inventoried and determined eligible for listing on the NRHP. As the Capitol Center Building was most recently inventoried in 2012/2013 ATCRC did not update the HPI form as the DAHP requires inventories to be updated if older than 10 years.

Field investigations consisted of pedestrian survey and archaeological screening of geotechnical bores; no cultural resources were encountered. As such, ATCRC has determined it unlikely that any cultural materials or features will be impacted during project construction and no further archaeological review is recommended. ATCRC recommends that an Inadvertent Discovery Plan (IDP) be adopted prior to further ground disturbing activities in the event that archaeological resources or human remains are discovered during site development. ATCRC also recommends the project proceed with consultation with DAHP to ensure that the proposed remodel and development of the National Register Eligible Capitol Center Building will not compromise the integrity or character defining features of the structure.

Regulatory Compliance

This project was conducted, in part, to satisfy regulatory requirements of the State Environmental Policy Act (SEPA). SEPA requires that impacts to cultural resources be considered during the public environmental review process. Under SEPA, the Washington State Department of Archaeology and Historic Preservation (DAHP) is the sole agency with technical expertise in regard to cultural resources and provides formal opinions to local governments and other state agencies on a site's significance and the impact of proposed projects upon such sites.

In addition, the State of Washington requires compliance with the cultural resources management laws and regulations under the Revised Code of Washington (RCW) 27.53 Archaeological Sites and Resources, RCW 27.44 Indian Graves and Records, and RCW 68.50.645 Skeletal Human Remains—Duty to Notify. The latter regulation provides a strict process for notification of law enforcement and other interested parties in the event of the discovery of any human remains, regardless of inferred cultural affiliation.

Consultation

As part of the SEPA process, affiliated tribes will be contacted by the City of Olympia. During the public review process, the Washington State Department of Historic Preservation (DAHP) responded (August 10, 2017) and expressed concern with potential impacts to the effects on view sheds, cultural landscapes and the economy of the historic downtown. Specifically, DAHP requested completion of the following cultural resource review activities:

- A study of the impacts to the historic view shed.
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- Cultural resource recommendations based on the completion of the aforementioned items, that may include additional work requiring mechanical trenching, cultural resource monitoring during construction, and the preparation of an Inadvertent Discovery Plan.

Project Area and Description

The project area consists of two parcels (#91005301000 and #91005502000) located at the 400 block of 5th Avenue in Olympia, Thurston County, Washington in Section 14 of Township18 North, Range 2 West, Willamette Meridian (Figure 1 and Figure 2). Both parcels are currently developed. Parcel #91005301000, located on the corner of Simmons and 4th Avenue is developed entirely with a single story building that was reportedly constructed in 1950 (Thurston GeoData Center). Parcel #91005502000, located along 5th Avenue between Simmons Street SW and Sylvester Street SW, is developed with a paved parking lot on the western 1/3 of the parcel and a 9-story building (called the Capitol Center Building) that was constructed in 1965 on the eastern 2/3 of the parcel (Thurston GeoData Center). Parcel #91005301000 is 0.40 acres and Parcel# 91005502000 is 0.66 acres totaling 1.06 acres for the overall project area.

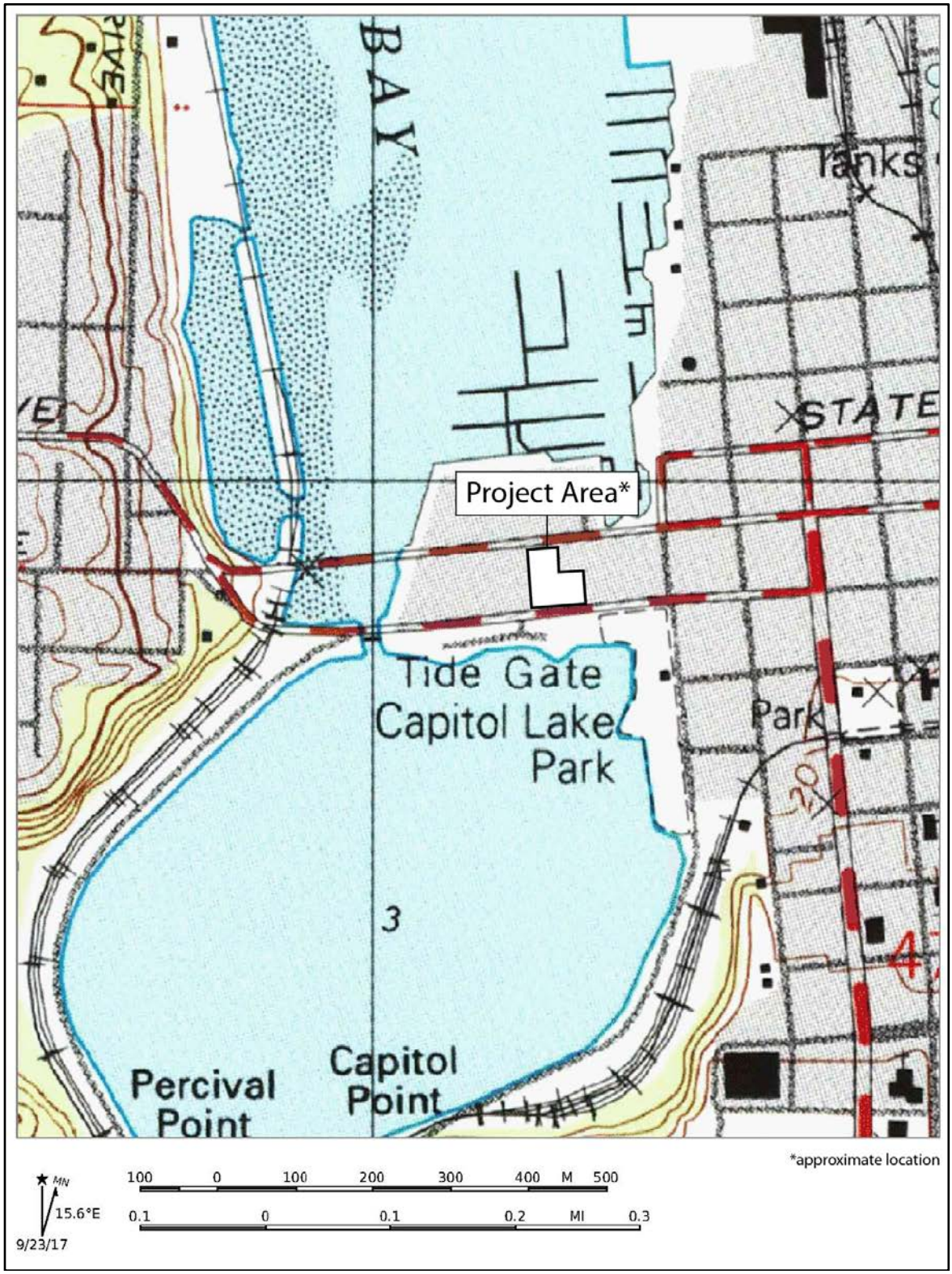

Figure 1. Portion of the USGS (1994) Tumwater, WA topographic map detailing the approximate location of the project area.

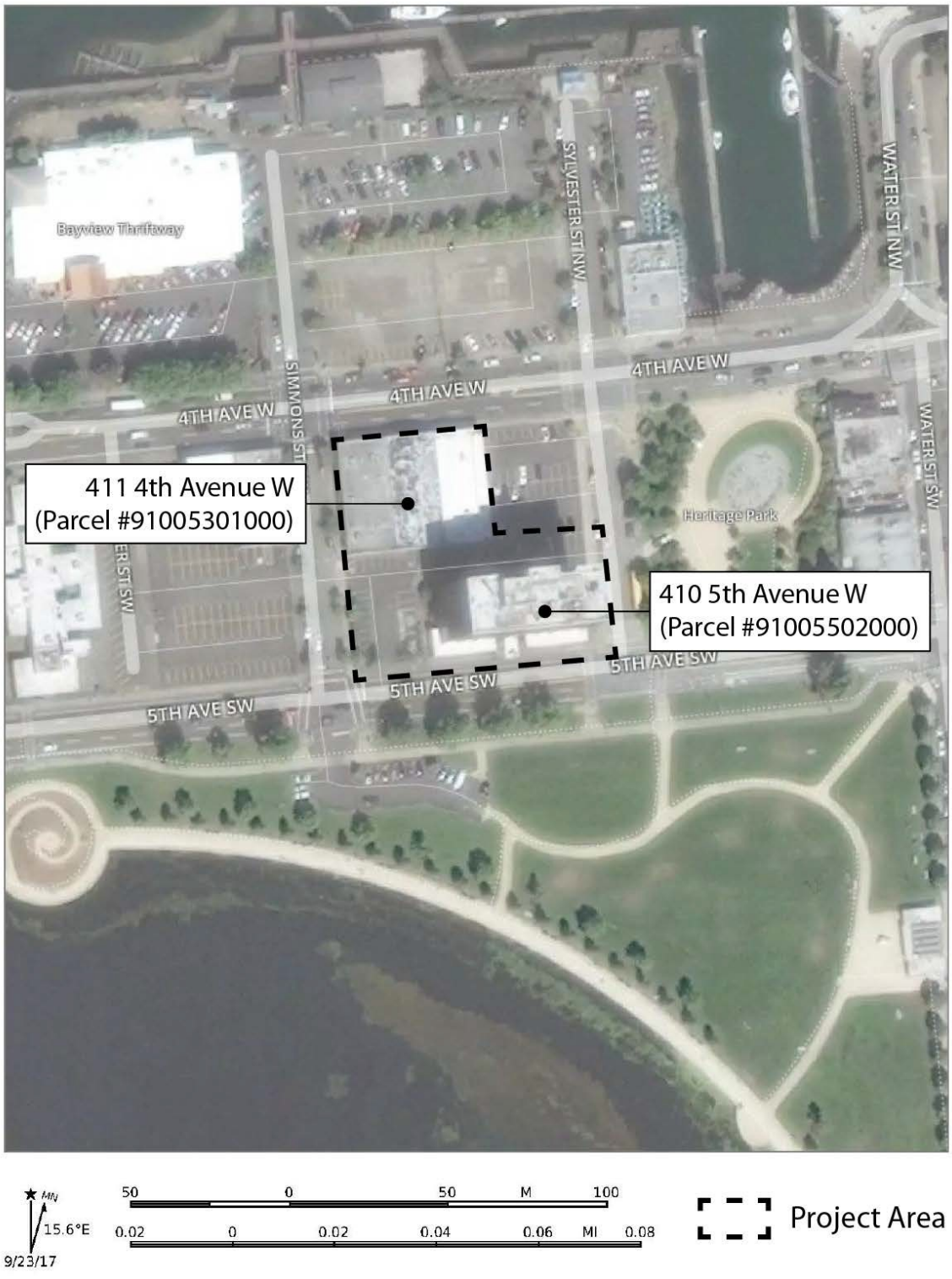

Figure 2. Aerial detailing the location of the project area and 411 4th Avenue W and 410 5th Avenue W.

The project proposes to redevelop the project area with a mixed-use, multi-family residential and commercial complex (Figure 2). The project will consist of 140 residential units, with live/work units and retail space located on the ground floor.

The overall project includes both demolition and renovation. For Parcel #91005301000, the existing vacant and blighted single-story building (411 4th Avenue W) will be demolished and replaced with a three-story building consisting of an automated parking garage, gym, retail space, and a total of 36 residential units with 11 of those provided as ground level live/work units.

For Parcel #91005502000 the existing parking lot will be demolished and replaced with a three-story building consisting of a total of 16 residential units. And the building (410 5th Avenue W) will be renovated. The exterior of the building will be upgraded with architectural features including new energy efficient window and glazing systems, and community oriented art wall features. A restaurant and bar with prominent outdoor seating opportunities, retail space, and a residential lobby with associated accessory spaces will be on the street level while the upper floors will be converted to residential space for a total of 90 residential units.

A public pedestrian walk-through feature will also be added between the new buildings in order to allow public access through the new development. New street trees and landscaping features will also be added consistent with city design standards.

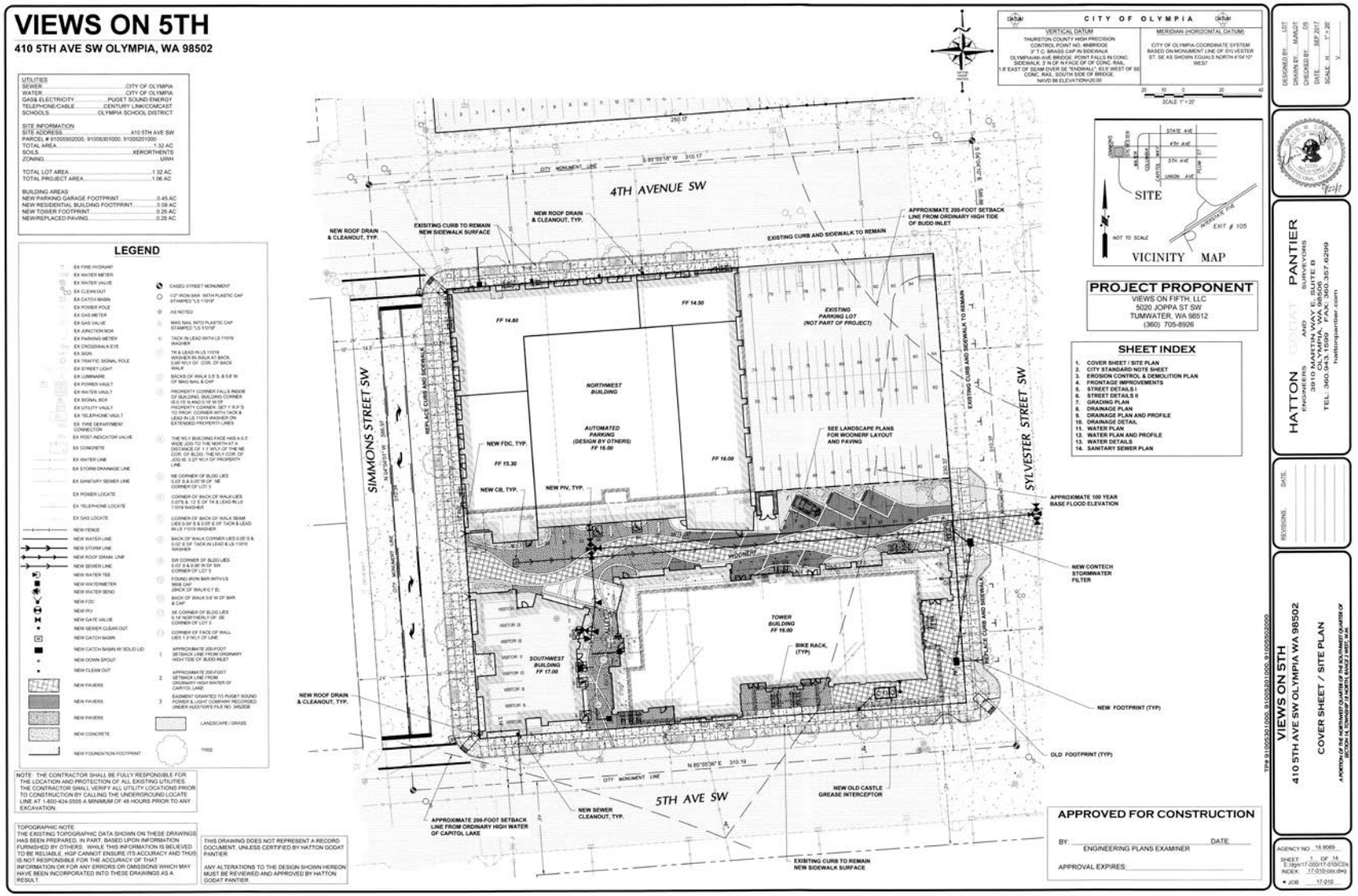

Figure 3. Proposed site development (as provided by client).

The probability for cultural resources to be located within the project area is based on review of environmental and cultural settings, and local cultural resource studies and sites. ATCRC's background research included review of project files, local geologic data, and cultural resources records available on DAHP's Washington Information System for Architectural and Archaeological Records Data (WISAARD) database.

Environmental Setting

The project area lies within the Puget Trough physiographic province (Fenneman 1931), a valley system that runs from Puget Sound south through the Willamette River valley, separating the Coast and Cascade mountain ranges. The landscape consists of low, gently rolling hills cut by numerous streams. In the Puget Sound watershed, rivers and streams drain into small coves and inlets of tidewater, as well as into larger bays such as Budd Bay.

The southern Puget Sound region is composed of inlets that begin in the northwestern portion of the state approximately 80 kilometers inland from the Pacific Ocean, and flow southward, forming a large inland sea in the northwestern quarter of the State. This inland sea is flanked on its western side by the Olympic Mountain range and on its eastern side by the Cascade Mountain range. The extensive inland waterways of the Puget Sound's interior lowlands were created by momentous geologic events in ancient history, from huge glacial processes and massive earthquakes, to gradual and abrupt changes in sea and land levels.

During the last Ice Age (the Pleistocene Epoch) the Puget Sound was covered by the thick Cordilleran ice sheet. In the last interval, known as the Fraser Glaciation, the Puget Lobe covered Puget Sound with up to 1,250 meters of ice (Thorson 1980). The Puget Lobe blocked north-flowing streams and created a system of proglacial lakes that were fed by ice-marginal and sub-glacial meltwater systems. About 15,000 years ago, the Puget Lobe started to retreat northward toward Port Townsend, later retreating from what is now the Strait of Juan de Fuca. Remains of the glacial outwash plain, glacial moraines, kettle ponds, and old river terraces are still visible today and represent ground surfaces as old as 11,000 to 15,000 years.

The API is located in the *Tsuga heterophylla* (Western Hemlock) vegetation zone, which is the most extensive zone in western Washington. This zone has a wet, mild, maritime climate where the primary species include Douglas fir (*Pseudotsuga menziesii*), western hemlock (*Tsuga heterophylla*), and western red cedar *(Thuja plicata)* (Franklin and Dyrness 1973:72). Hardwood tree species, including western red alder (*Alnus rubra*) and big leaf maple (*Acer macrophyllum),* are almost always subordinate and are commonly found near water courses, riparian habitats, and disturbed sites. The understory in this vegetation zone includes sword fern (*Polystichum muritum),* bracken fern (*Pteridium aquilinum),* Oregon grape *Mahonia aquifolium),* and vine maple *(Acer cicinatum).*

In 2016, a geotechnical engineering report was prepared by The Riley Group, Inc. in association with the subject project (The Riley Group, LLC 2016). The geotechnical study reported that "soil in the project vicinity was mapped as artificial fill [consisting of] clay, silt, sand, gravel, organic

matters, shells, and construction debris" (*Geologic Folio of the Olympia - Lacey - Tumwater Urban Area, Washington – Liquefaction Susceptibility Map* by Steven P, Palmer and etc. [1999] as cited in The Riley Group [2016:2]). The Riley Group (2016:2) report continued:

> … soils encountered during field exploration include[d] up to 15 feet of fill over native soil. The fill consists of very loose to loose silty sand with gravel trace of wood, organics, and shell fragments. The native soil is very loose to medium dense silty sand with interbedded silt layer over medium dense to very dense sandy gravel to gravely sand at about 55 feet.

Cultural Setting

Human occupation in the Northwest Coast is believed to have begun following the retreat of glacial ice across the landscape in the Late Pleistocene. To date, the oldest indication of human occupation in Washington State appears at the Manis Mastodon Site in Manis, which dates to approximately 13,800 years before present (BP) (Gustafson and Manis 1984). Here, a bone point was identified *embedded* in the bone of a mastodon, which provided evidence of hunting and butchering by early human (Gustafson et al 1979). Other early archeological sites identified in Washington State include the Clovis / Richey-Roberts Site, located in Wenatchee. Here, several large Clovis points were encountered in-situ. Silica encrusted on the points was dated to 13,000 years old (Kirk and Daugherty 2007:15). Overall, these archaeological sites have led to the indication that early culture in Washington State was highly mobile and relied heavily upon large game.

Between 12,000 to 7,000 years ago, socio-economies appear to have changed to a foraging strategy that included smaller inland game, aquatic animals, and a variety of plants. Sites from this period are typically encountered on high marine and river terraces (current and abandoned), subalpine meadows, and saltwater shores (Kirk and Daugherty 2007:84). The artifact assemblage from this period is generally represented by large leaf-shaped and stemmed points, scrapers, flake tools and blade cores (Carlson 1990). Hearths, structures, and/or plant and animal remains have not been found associated with these sites from this period.

After 5000 BP, populations appear to become larger and more complex as groups utilized a wider range of resources, including salmon and shellfish, land mammals, and plant resources such as berries, roots, and bulbs. Ground stone tools, microblades and cores appear at this time as well as bone and antler tools, ground shell, harpoons. Shell middens are also prevalent in this time period and continued into the ethnohistoric period (Ames and Maschner 1999:89).

The project area is located in the ceded traditional territory of the Squaxin Island Indian Tribe (Smith 1940). The Squaxin are one of seven autonomous groups who once occupied the seven-inlet region of the southern Puget Sound inlets and surrounding watersheds of Lower Puget Sound, including North Bay of Case Inlet. Other local native groups included the *Sa-He-Wa-Mish* of Hammersley Inlet, the *Noo-She-Chatl* of Henderson Inlet, the *Squi-Aitl* of Eld Inlet, the *Sawamish/T'Peeksin* of Totten Inlet, and the *S'Hotl=Ma-Mish* of Carr Inlet. Following the Medicine Creek Treaty of 1854, these groups were combined and collectively referred to as the Squaxin Island Tribe.

Pre-contact Squaxin settlements, like other Coast Salish groups, were often located along major waterways and at heads of bays or inlets, where abundant resources of coastal and estuarine environments supported a relatively rich, diverse, and reliable subsistence base (Kopperl 2005). During the winter months, these groups lived in large villages of cedar plank houses at permanent settlements. During the spring and summer, they lived in seasonal encampments often constructed of reed mats while fishing, hunting, and plant and berry collecting.

Spanish explorers first visited the Puget Sound area in the early 1600s, and the area was later explored in part by Captain James Cook in the 1700s. European discovery of the far inland portions of the southern Puget Sound occurred in 1792 by Captain George Vancouver who explored Admiralty Inlet Hood Canal and other areas throughout the Puget Sound (Schilling 2005). Not long after discovery, England established fur trading posts through the Hudson Bay Company, capitalizing on the high demand for beaver pelts and enlisting the services of local Native American trappers. Nisqually Delta hosted two Hudson Bay Company forts and one associated village. Fort Nisqually was a pastoral and agricultural branch of the Puget Sound Agricultural Company (a subsidiary of the Hudson Bay Company), and shipped supplies to England and other fort establishments (Stilson 2003).

The first non-native settlers to arrive in Olympia were Edmund Sylvester and Levi Lathrop Smith, platting the town site of Olympia in 1850. Olympia was named the capitol of the Washington Territory in 1853, and the local economy relied on timber, maritime trade and agriculture.

By 1854, the Squaxin were forced to sign the Medicine Creek Treaty ceding their traditional territory to the United States Government in exchange for reservation lands. The Squaxin were assigned a reservation on Squaxin Island, a small island four and a half miles long and one-half mile wide that was devoid of drinking water. Due, in part, to the inhospitable conditions of the island only about 50 people resided there; others lived moved elsewhere to work in logging camps and in the hop and berry fields (Wilma 2006). During the Indian War of 1856-57, Squaxin Island was used to confine hundreds of Indians suspect of warlike activities; however, the Squaxin did not participate in the war (Wilma 2006).

By the early 20th century the advent of the automobile drastically changed the development of Olympia. Following the Highway Act and Interstate Freeway system, Olympia became the hub of two major roadways: the Pacific and Olympic State Highways. These main state north-south and east-west main corridors met in downtown Olympia at Fourth and Main (now Capitol Way). As dependency on the automobile grew, many businesses along 4th Avenue were rebuilt into auto-related operations until 1958 when the Old Highway 99 corridor was rerouted away and, in turn, many of the street corner gas stations disappeared (:33).

By the 1970s Olympia underwent substantial growth and change. New modern buildings were constructed for commercial institutions. Improvements to infrastructure as dependency on the automobile grew. One of the largest buildings constructed in Olympia was the Capitol Center Building, built in 1966 by Stacey Bennet and Robert Olson, a 9 story office tower. This is the best example of the Miesian style which was heavily influenced by architect Mies Van der Rohe (:19).

Historic Maps and Aerials

Historic maps indicate that much of the project area had been developed, in part, since at least 1924.

The 1888, 1891, 1896, and 1908 Sanborn maps do not include the project area as much of the area was tide flats at that time. By 1924, the Sanborn indicates that four structures were located on Parcel #91005301000 (Figure 4). Two buildings were labeled "dwelling," one labeled "carpenter," and another was divided into two offices. Parcel #91005502000 was not included in the mapping. The 1924 Sanborn also names Sylvester Street as "Tilton." The parking lot adjacent to the project area (currently a parking lot): details several structures labeled "carpenter and tool store," "autos," and another unidentifiable.

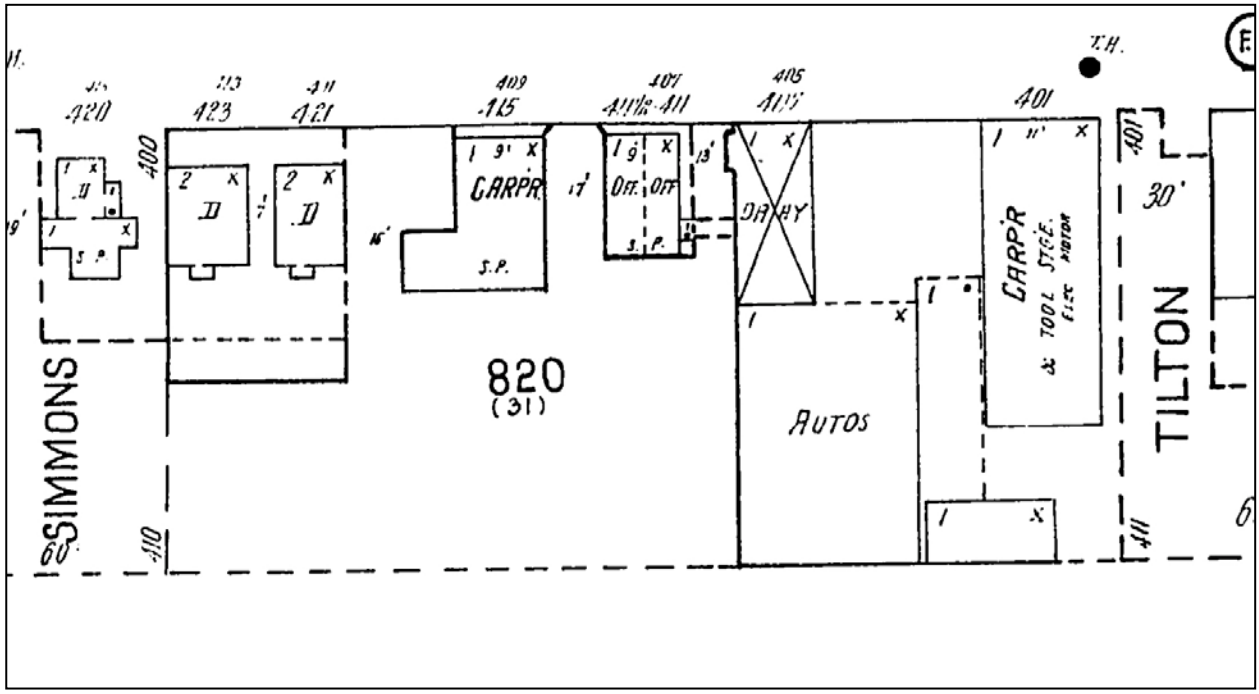

Figure 4. Portion of the Sanborn (1924) detailing the northern half of the project area.

On the 1928-1940 aerial, it appears that the building at 411 4th Avenue on Parcel #91005301000 had been constructed (Photo 1). At this time is appears the building consisted of two bays. A small detached structure also appears to the east of the building. Two small buildings are also present on the eastern half of Parcel #91005502000 at this time.

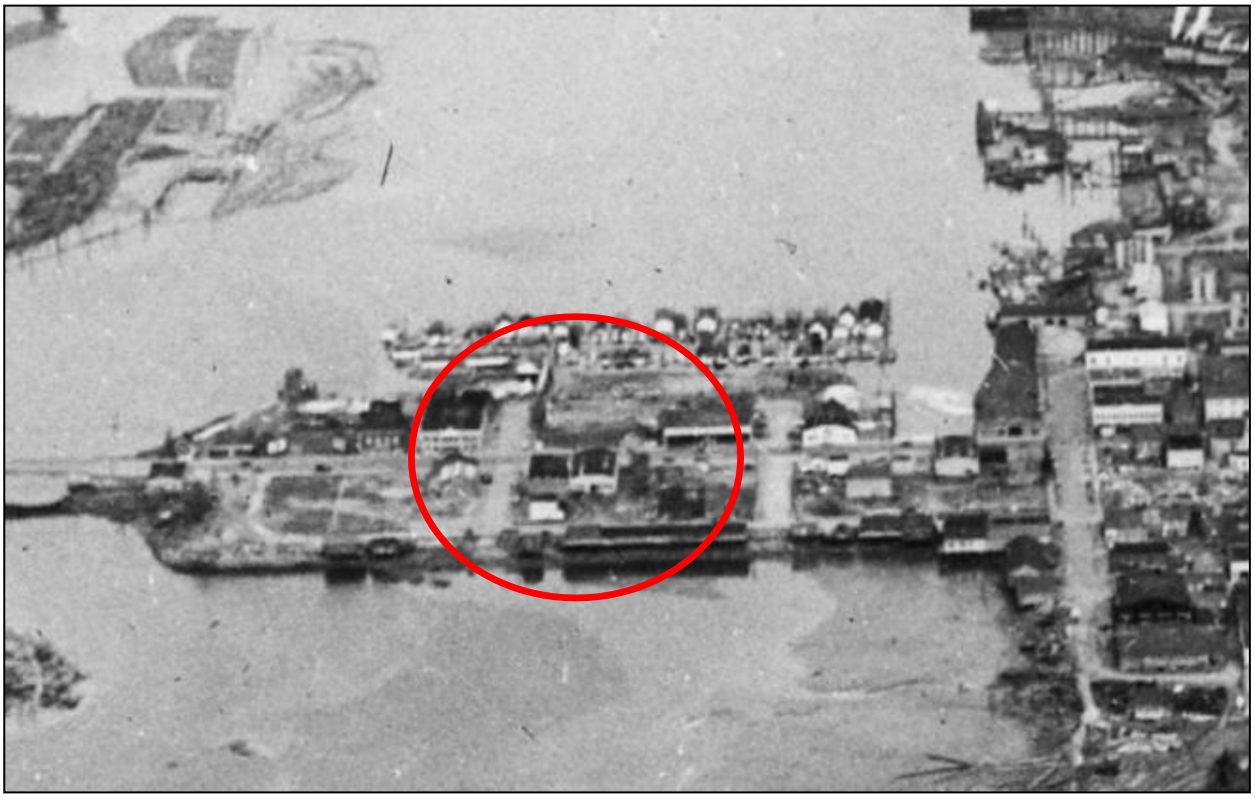

Photo 1. 1928-1940 aerial. Photograph by Ellis courtesy of the Washington State Archives – Digital Archives. Electronic resource, https://www.digitalarchives.wa.gov/do/2569562442D76E09AAECE88004823AE4.jpg, accessed September 2017.

The 1910-1930 and 1940-1948 aerials indicate that the building at 411 4th Avenue W (Parcel #91005301000) has been expanded.

The two-story building with gable roof on the western half of Parcel #91005502000 the appears the same as in the 1928-1940 aerial. (Photo 2 and Photo 3). On the east half of Parcel #91005502000 it appears the building from the 1928-1940 aerial has been replaced with a building with shed roofs and an extension off the north. The 1946 aerial details the project area from the north side (viewing south) (Photo 4); no discernable changes are indicated.

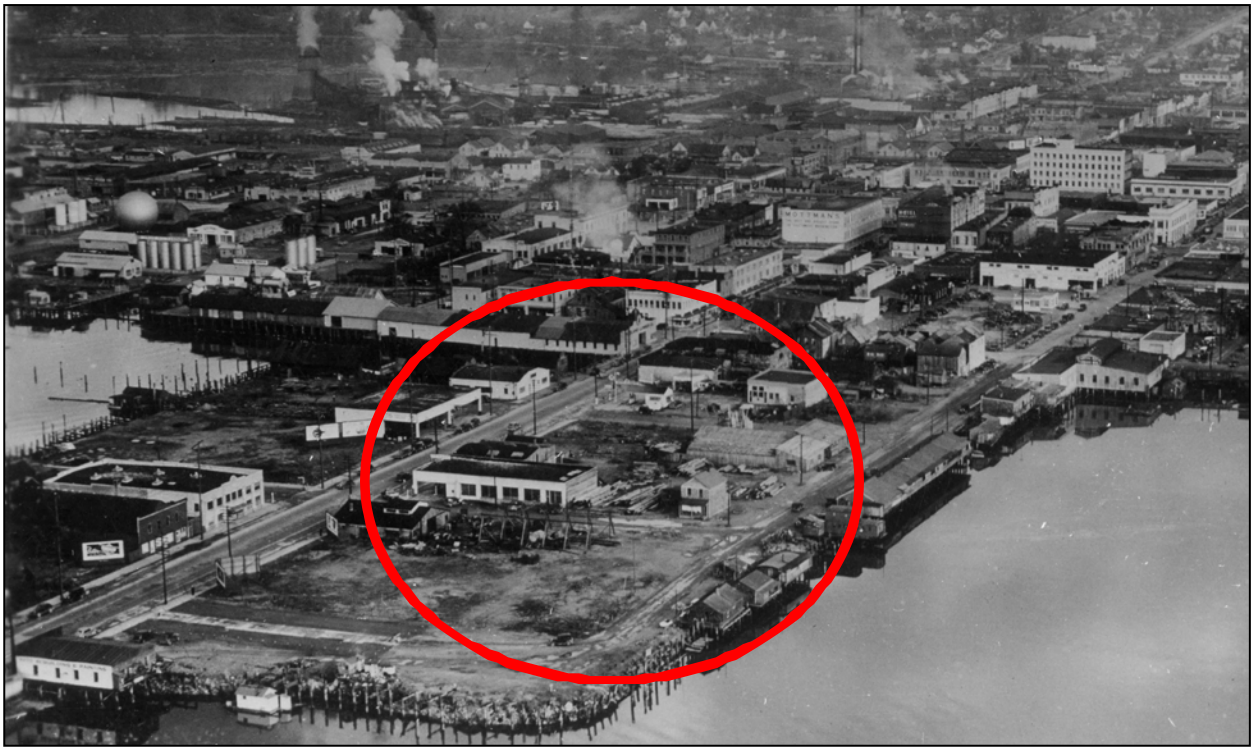

Photo 2. 1910-1930 aerial. Unknown photographer courtesy of the Washington State Archives – Digital Archives. Electronic resource, https://www.digitalarchives.wa.gov/Record/View/6FCE82E9835569205B0196A474880394, accessed September 2017.

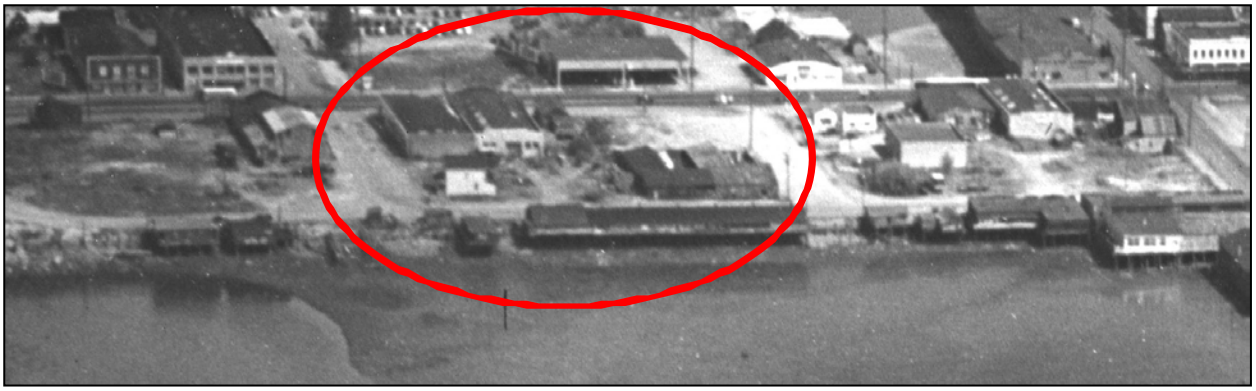

Photo 3. 1940-1948 aerial. Unknown photographer courtesy of the Washington State Archives – Digital Archives. Electronic resource, https://www.digitalarchives.wa.gov/Record/View/158CD18047862B8E66A7058682267CE1, accessed September 2017.

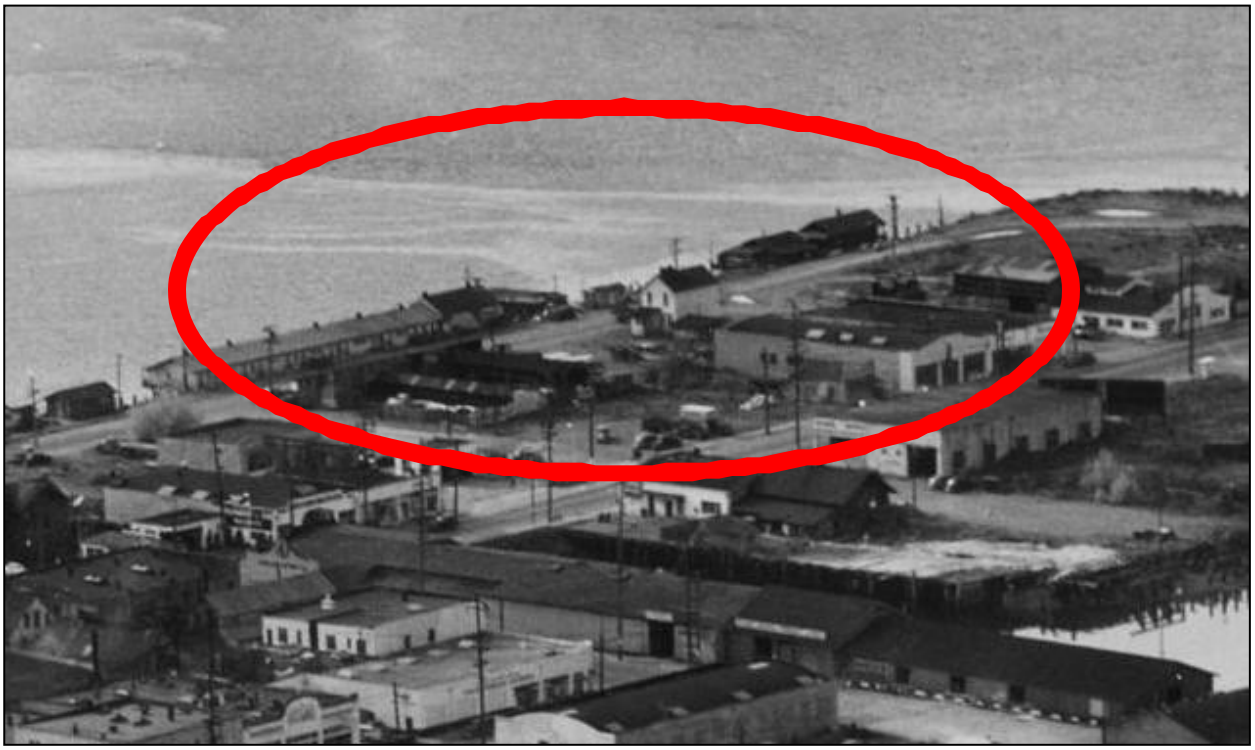

Photo 4. 1946 aerial. Photographed by Leonard Delano courtesy Washington State Archives – Digital Archives. Electronic resource, https://www.digitalarchives.wa.gov/Record/View/D33225A6CFF0FE10A047B426A8A02952, accessed September 2017.

Sanborn maps indicate that, in 1947, the building at 411 4th Avenue W (Parcel #91005301000) (which consisted of two bays at that time) housed two businesses: the western bay had "gas and oil" up front and the back side of the shop served as auto wrecking and repair; the middle bay operated as an electrical repair and supply shop (Figure 5). The detached structure east of the building is not identified. The 1947 Sanborn also indicates that the building located on the eastern half of Parcel #91005301000 operated as a lumber shed and "used lumber and carpentry shop" (Figure 5). The building on the west half of Parcel #91005301000 is not identified.

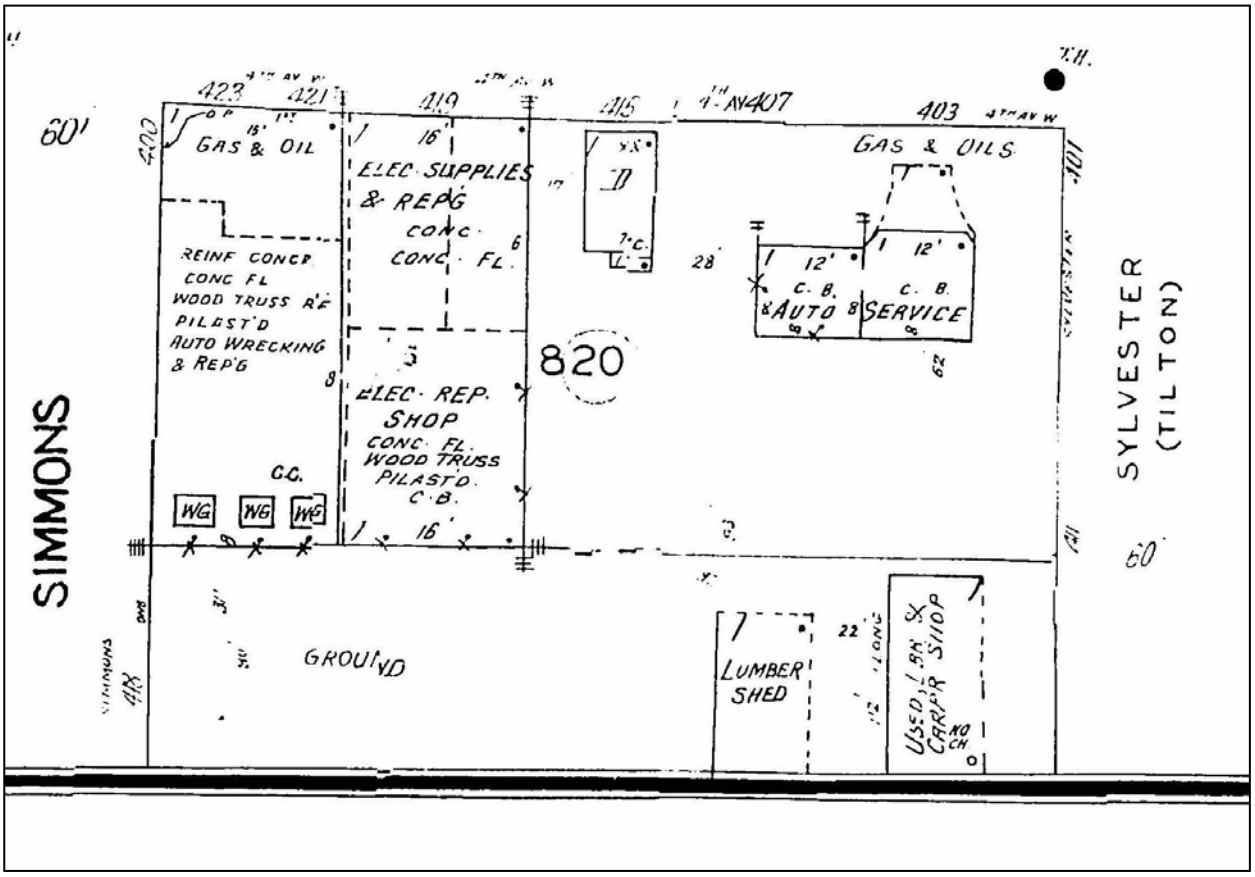

Figure 5. Portion of the 1947 updated Sanborn map.

The 1955 aerial details the back (south) side of the project area (Photo 5). The building on Parcel #91005301000 has been expanded to three bays (Photo 5). On Parcel #91005502000 the building on the western half remains and on the eastern half much of the building appears to have been removed.

Photo 5. 1955 aerial. Photographed by Merle Junk courtesy Washington State Archives – Digital Archives. Electronic resource, https://www.digitalarchives.wa.gov/Record/View/05088B5B732EF867D464BD23B53A8395, accessed September 2017.

In the 1961 aerial, taken from above, the building at 411 4th Avenue W remains and all of the buildings on Parcel #91005502000 have been removed (Photo 6). By 1965, the Capitol Center Building located at 410 5th Avenue W was constructed on Parcel #91005502000.

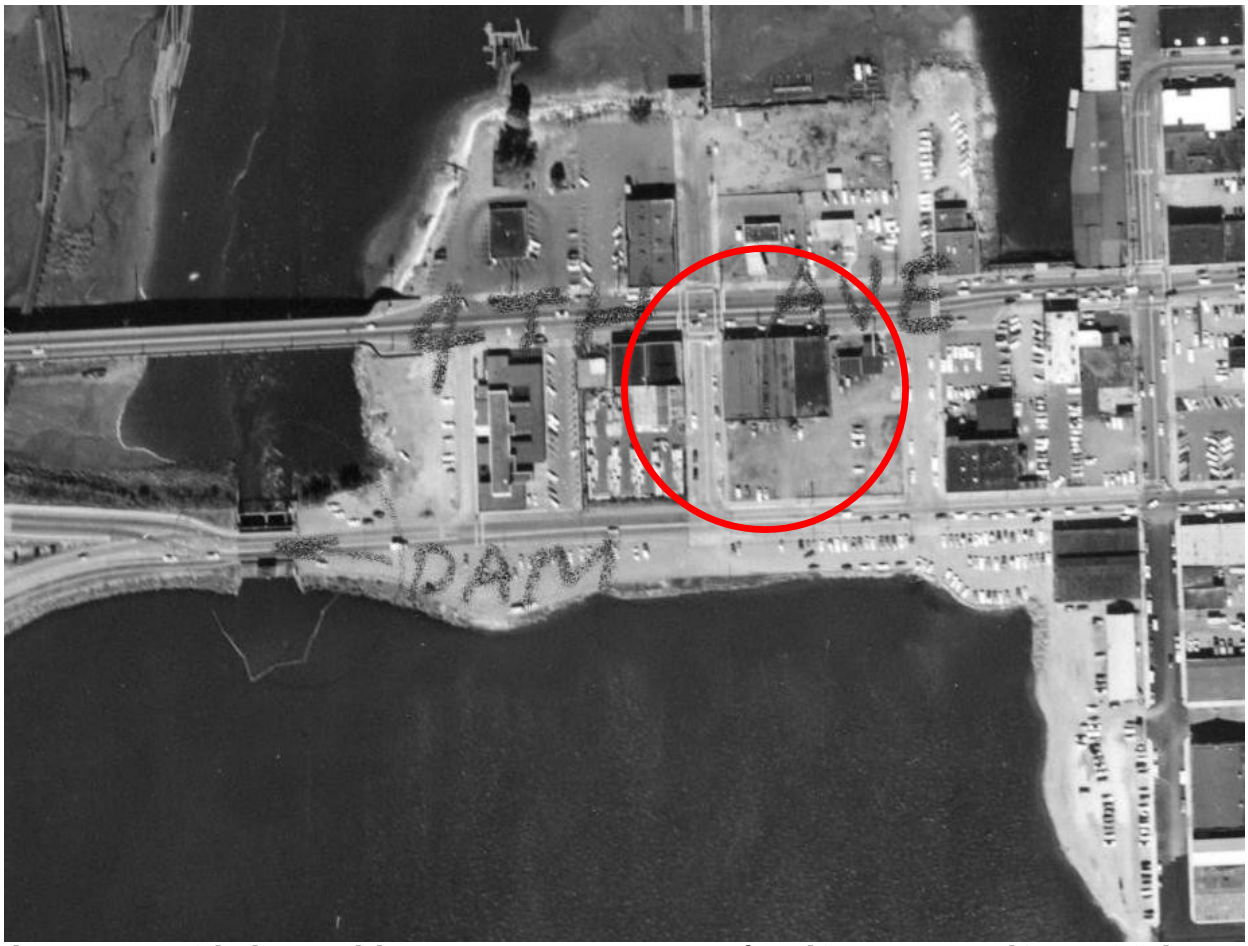

Photo 6. 1961 aerial. Photograph by Western Way, Inc courtesy of Washington State Archives – Digital Archives. Electronic resource, https://www.digitalarchives.wa.gov/Record/View/5CE6806C0ABF9FE9810AE80B1E6702F5, accessed September 2017.

By 1974, the small building to the east of Parcel #91005301000 had been removed and the lot turned into a parking lot (Photo 7). Sometime after 1974 the building at 411 4th Avenue W was remodeled which consisted of closing in the open garage bay and windows.

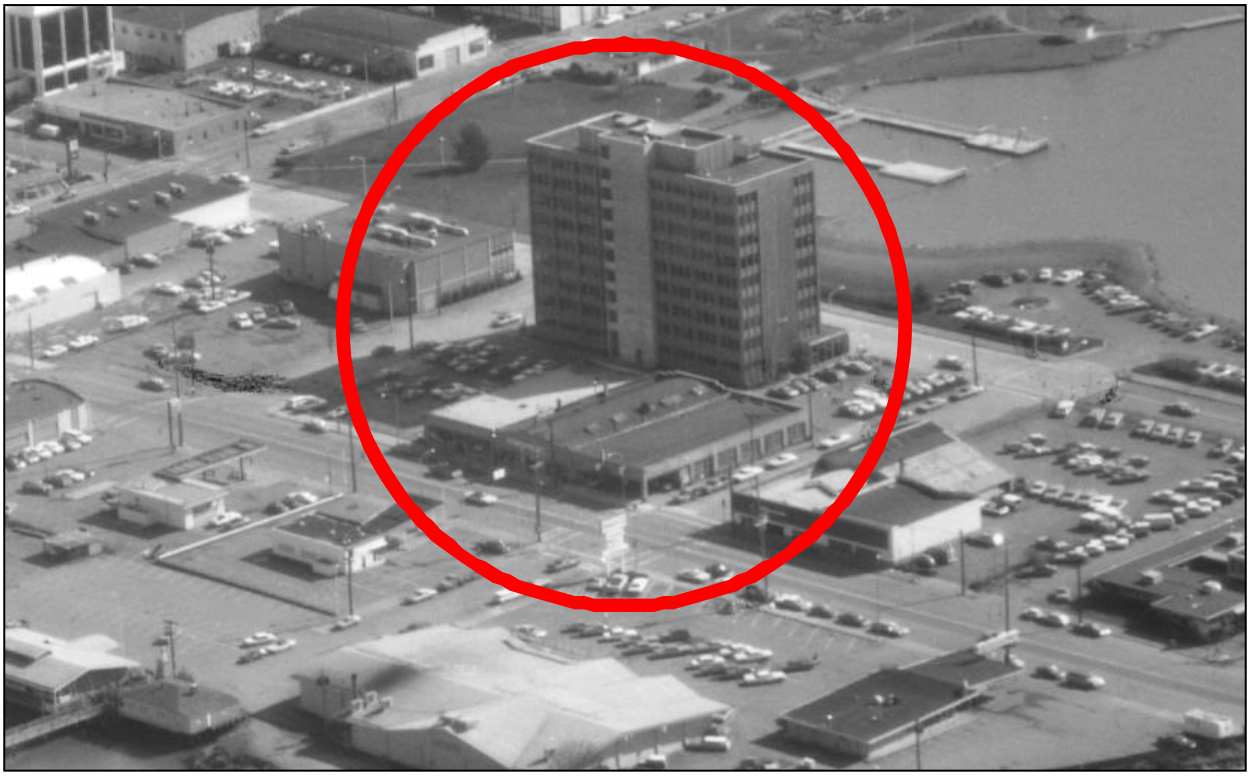

Photo 7. 1974 aerial. Photograph by Western Way, Inc courtesy of Washington State Archives – Digital Archives. Electronic resource, https://www.digitalarchives.wa.gov/Record/View/4795B95A4F02718117CD14738A26AA8F, accessed September 2017.

The Capitol Center Building at 410 5th Avenue W (Parcel #91005502000) was last occupied by the state Department of Corrections in 2006 and hasn't been occupied since (Boone 2015). In 2016, Ken Brogan purchased the project area and began the process to improve the property (Hobbs 2016).

Previously Recorded Cultural Resources Studies and Sites

The DAHP WISAARD database was accessed (September 2017) to determine if the project area had been previously surveyed and if any archaeological sites, historic register sites, historic properties, or cemeteries/burials have been previously recorded in, or in the vicinity of, the project area.

Cultural Survey

The project area has been previously surveyed for cultural resources. In 2012 a cultural resources survey was conducted prior to the installation of cellular towers atop the Capitol Center Building (Pinyard 2012). The area of potential effect was defined as a 0.5 mile radius circle [around the Capitol Center Building](Pinyerd 2012). The assessment consisted of pedestrian survey to determine if historic properties might be adversely affected by the project. Six historic properties were identified, from WISAARD, as located in the APE. The assessment did not identify or assess resources that were not already listed on WISAARD – including the building at 411 4th

Avenue W, which is located immediately adjacent to the Capitol Center Building. Results of the survey determined the proposed project would not have a direct or indirect adverse effect on any NRHP listed or potentially-eligible historic resource (Pinyerd 2012:2).

Archaeology

No archaeological sites have been previously recorded in the project area. The nearest previously recorded archaeological site is 45TN238, is remains of former wooden structure located 350 meters (0.22 miles) west of the project area.

Register Sites

No register sites have been previously recorded in the project area. The nearest previously recorded register site is Sand Man Tug Boat (45TN299) located 176 meters (0.11 mile) northeast of the project area at Percival Landing. The project area is also located approximately156 meters (0.10 mile) east of the Olympia Downtown Historic District (DT192) which covers approximately 26.74 acres roughly located between State Avenue on the north, Franklin Street on the east, 7th Avenue on the south and Columbia and Water Streets on the west and consists of 51contributing properties and 16 non-contributing properties.

Historic Property Inventories

A historic property inventory (HPI) form has been completed for the building located in the northwest corner of the project area at 411 4th Avenue W. The HPI was completed as part of a legacy project and provides assessor information (Artifacts Inc 2011). The building is reported to have been constructed in 1950 is a one-story commercial/professional building with stucco cladding. The building was not evaluated for listing on the NRHP as part of the legacy project.

A HPI has also been completed for the Capitol Center Building located in the project area at 410 5th Avenue W (Pinyerd 2012, Artifacts Consulting, Inc. 2011, Houser 2002). The building was constructed in 1965 and is detailed in Houser (2002):

> Located on the flat tidewater between Olympia's downtown and west side, the Capitol Center Building is an imposing 9-story structure. At 287 feet tall, the building is the tallest structure in the city. The steel frame building has a glass curtain wall of windows highlighted by bronze colored spandrels and gold tone exterior framing. The building is divided into nine bays. The first floor has a one story projection, which abuts the sidewalk on 5th Avenue. The Meisian style building has a flat roof with simple cornice. The main entry is highlighted by a large flat overhanging roof, which appears to float between two steel columns. The foundation, made of poured concrete, is reportedly over 11 feet thick. Inside the building has been heavily remodeled.
>
> The 2 million dollar Capitol Center Building was designed by the local architectural firm of Bennett & Olson. The firm set the architectural tone in Olympia during the 1950s and 1960s. This building is their largest project. Each floor contained 8,130 sq. ft. of space which was leased to a variety of businesses. The first three floors were occupied by State Agencies, among them the

> Department of Motor Vehicles and the Division of Vocational Rehabilitation of the Department of Public Instruction. Frank Baker, an Olympia Attorney, was the developer for the project. The building is the best example in the city of the Mesian style, which developed from the work of Mies Van de Rohe and the project was the first mid-rise building to be constructed in the city.

The Capitol Center Building was recommended eligible for the NRHP by SHPO in 2013 (Kim Gant, personal communication 2017).

Cemetery/Burials

No cemeteries or burials have been previously recorded in the project area.

Cultural Resources Expectations

Based on the project scope, environmental and cultural settings, and previously recorded cultural resources, the project area is considered to be located in an area of high probability for cultural resources to be present. If cultural resources were to be present in the project area they would be expected to be representative of historic-era cultural resources rather than precontact-era cultural resources considering that the project area was largely unstable tidal flats prior to the 1924 and zero precontact sites have been previously identified in the project area. If, however, precontact sites were encountered in the project area types of precontact era archaeology may include diffuse remains of shell midden, lithic scatters or similar features representing a range of domestic, subsistence activities. Any precontact era cultural resources in the project area would be expected to be deeply buried beneath fill. Types of historic era archaeology that may be encountered in the project area might include objects such as structural foundations or refuse piles.

Field Investigations

Field investigations were conducted on September 18 and 25, 2017 by Principal Investigator Sarah Amell during mild weather conditions. Field investigation included pedestrian survey and archaeological screening of two geotechnical bore samples that were previously excavated and stored at the project site. The API is located in an urban development. The entirety of the API has been disturbed by previous commercial development. The entire API was visually inspected to indicate the presence/absence of cultural materials and/or features. Surface visibility is generally very poor, varying from 0-15% as most of the site is covered with pavement or asphalt. No cultural materials were observed during the pedestrian survey.

In 2016, two geotechnical borings were excavated to a maximum depth of 76.5 feet below existing grade. A geotechnical engineering report (Appendix B) was prepared by The Riley Group, Inc. in association with the subject project (The Riley Group, LLC 2016). The Riley Group (2016:2) report continued:

> … soils encountered during field exploration include[d] up to 15 feet of fill over native soil. The fill consists of very loose to loose silty sand with gravel trace of wood, organics, and shell fragments. The native soil is very loose to medium

dense silty sand with interbedded silt layer over medium dense to very dense sandy gravel to gravely sand at about 55 feet.

Small soil samples were removed from bores for reference and then the bore cuttings were stored at the project site in two barrels. Bore cuttings were transported to ATCRC in September 2017. The waterlogged geotechnical bore sediments were water screened through ¼-inch mesh at the ATCRC lab on September 26, 2017. Cultural resources screening resulted in the identification of trace amounts of wood, organics, shell fragments and modern refuse (plastic sheeting fragments). None of the material observed was diagnostic of cultural activities, and no cultural resource material was identified.

A historic viewshed analysis was completed by Thomas Architect Studios (Appendix C). Analysis was completed providing photo visualizations from each of the National Register eligible or listed resources/districts within the viewshed of the Capitol Center building including the Capitol Lake Bathhouse, American Legion Hall, Olympia Downtown Historic District, the Sand Man Tugboat, Capitol Historic District and General Administration Building. This analysis determined that the existing view is unchanged with the project. In addition, the new curtain wall facade proposed on the tower structure includes a glazing system to help reflect the natural settings and further blend the existing tower with the water and sky.

Results and Recommendations

The building located on the corner of Simons St and 4th Avenue (91005301000) meets the age threshold for inventory and a completed Historic Property Inventory was prepared and is attached in Appendix A.

The Capitol Center Building (DAHP Property #1671) has been previously determined eligible for listing on the National Register of Historic Places (January 2013). The building is visible from the National Register listed Washington State Capitol Historic District and the Olympia Downtown Historic District, as well as multiple other register listed properties. A historic viewshed analysis was completed and determined that the existing view is unchanged with the project.

There are at least nine recorded archaeological sites within a one-mile radius of the project area. The project area also lies within a “Very High Risk: Survey Highly Advised” zone area as indicated by the DAHP statewide Archaeological Predictive Model.

Field investigations consisted of pedestrian survey and archaeological screening of geotechnical bores; no cultural resources were encountered. As such, ATCRC has determined it unlikely that any cultural materials or features will be impacted during project construction and no further archaeological review is recommended. ATCRC recommends that an Inadvertent Discovery Plan (IDP) be adopted prior to further ground disturbing activities in the event that archaeological resources or human remains are discovered during site development. ATCRC also recommends the project proceed with consultation with DAHP to ensure that the proposed remodel and development of the National Register Eligible Capitol Center Building will not compromise the integrity or character defining features of the structure.

No cultural resources study can wholly eliminate uncertainty regarding the potential for prehistoric sites, historic properties or TCPs associated with a project. The information presented in this report is based on professional opinions derived from our analysis and interpretation of available documents, records, literature and information identified in this report, and on our reconnaissance-level field investigation and observations as described herein. Conclusions and recommendations presented apply to project conditions existing at the time of our study and those reasonably foreseeable. The data, conclusions and interpretations in this report should not be construed as a warranty of subsurface conditions described in this report. They cannot necessarily apply to site changes of which ATCRC is not aware and has not had the opportunity to evaluate.

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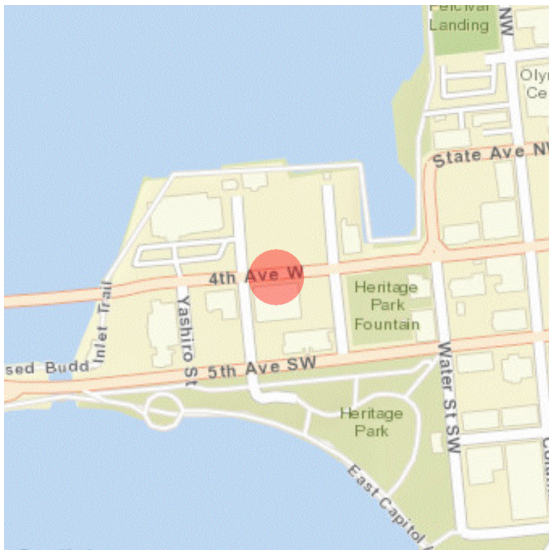
Appendix A: Copy of HPI for 411 4th Avenue W, Olympia, WA

Historic Property Report

Resource Name: Capitol Center Annex Office Building Property ID: 713068

Location



Address: 411 4th Ave W, Olympia, WA, 98501, USA

Geographic Areas: Olympia Certified Local Government, Thurston Certified Local Government, Thurston County, T18R02W46, OLYMPIA Quadrangle

Information

Number of stories: 1.00

Construction Dates:

Construction Type	Year	Circa
Built Date	1928	☑
Remodel	1950	☑

Historic Use:

Category	Subcategory
Commerce/Trade	Commerce/Trade - Business
Transportation	Transportation - Road-Related (vehicular)
Commerce/Trade	Commerce/Trade - Business
Transportation	Transportation - Road-Related (vehicular)

Historic Context:

Category
Transportation

Architect/Engineer:

Category	Name or Company

Historic Property Report

Resource Name: Capitol Center Annex Office Building Property ID: 713068

Thematics:

Local Registers and Districts

Name	Date Listed	Notes

Project History

Project Number, Organization, Project Name	Resource Inventory	SHPO Determination	SHPO Determined By, Determined Date
2017-07-05018, , Notice of Land Use Application and Public Meetings for the project known as Views on 5th located at 410 5th Avenue SE	9/30/2017		

Photos

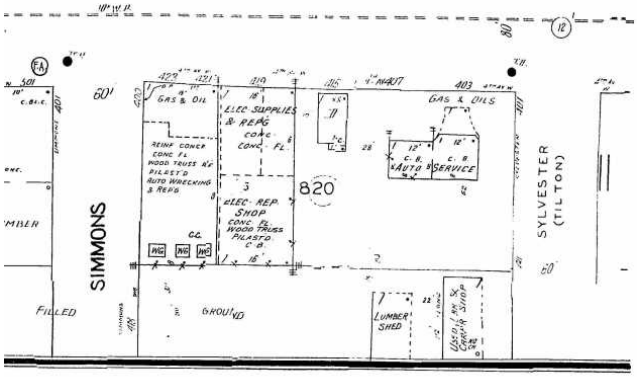
Front (north) façade of building at 411 4th Avenue W.

1974 aerial.

1961 aerial.

1955 aerial.

1951 photograph of easternmost side of building.



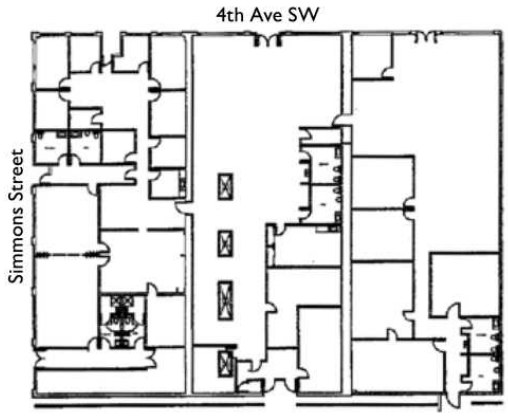
Portion of the 1947 updated Sanborn map.

1946 aerial.

1940-1948 aerial.

1910-1930 aerial.

1928-1940 aerial.



Plan detailing interior layout of building.

Side (west) façade to building at 411 4th Avenue W.

Back (south) façade to building at 411 4th Avenue W.

Side (east) façade of building at 411 4th Avenue W.

Front (north) façade of building at 411 4th Avenue W.

Historic Property Report

Resource Name: Capitol Center Annex Office Building Property ID: 713068

Inventory Details - 9/30/2017

Common name: Capitol Center Annex Office Building

Date recorded: 9/30/2017

Field Recorder: Jennifer Chambers

Field Site number:

SHPO Determination

Detail Information

Characteristics:

Category	Item
Foundation	Concrete - Poured
Form Type	Gas Station
Roof Type	Dome
Roof Material	Asphalt/Composition
Cladding	Stucco
Structural System	Masonry - Brick
Plan	Rectangle

Surveyor Opinion

Physical description:

The building at 411 4th Avenue W is located on the corner of 4th Avenue and Simmons Street in downtown Olympia. Known locally as the Capitol Center Annex Office Building the building most recently served as additional office space for the neighboring Capitol Center Building. Currently, the building is unoccupied and in poor condition.

The 17,016 square feet single-story building is clad in stucco and sits atop a concrete slab foundation. The building is comprised of three “bays." The west and east bays have flat roofs and the center “bay” has a barrel roof. The bays are joined by a corrugated metal parapet. The windows and doors are of similar make and are aluminum. The building reportedly has an unreinforced masonry structural system (Artifacts Consulting, Inc. 2011).

The building is scheduled for demolition at the time this inventory was prepared. According to DAHP records this building was previously inventoried as part of a legacy project that documented available assessor information (Artifacts Consulting, Inc. 2011). No additional inventory has been recorded at this time.

Thurston County GeoData (n.d.) reports this building was constructed in 1950. This date likely stems from the most recent addition of the east bay as historic aerials and maps indicate the western and center bays were constructed as early as 1928.

On the 1928-1940 aerial the western and center bays were already constructed. In this aerial, it appears both bays are similar length and a door, flanked by two windows, can been seen on the back of the center bay. A small detached structure appears to the east

of the building.

The 1910-1930 aerial indicates that the western bay has been extended longer than the center bay. The western bay appears to have been constructed in the "box-type station" design (U.S. Department of the Interior, National Park Service [NPS] n.d). This design combined the gas station with other revenue streams such as repair and service bays; large display windows and glazed service bay doors highlighted these products and services (U.S. Department of the Interior, National Park Service n.d). The westernmost bay had an open bay at the front (north) with five double hung windows on the western façade. Behind the western bay are stacks of lumber. Cars are parked near the building along Simmons Street and 4th Street. A sign above the western bay appears to read: "Texaco." The small structure is still present east of the building.

The 1940-1948 aerial indicates that center bay was extended to match the western bay.

The 1946 aerial details the front of the building, which at that time still consisted of two bays; a detached structure was located to the east. The front of the center bay had a door flanked by two large windows and parapet above. The western bay shows the open front and indistinguishable signs on the building and street.

Sanborn maps from 1947 indicate the western bay had "gas and oil" up front and the back served as auto wrecking and repair. The middle bay operated as an electrical repair and supply shop. The detached structure east of the building is not identified.

A 1951 photograph indicates that by then the eastern bay had been constructed. The eastern bay is appears to have been designed in the art deco style. The front of the eastern bay is has several large picture windows trimmed with a triple border. No signs are visible at that time however according to an unsourced graphic the eastern bay at one time served as a paint store (The Riley Group 2016: Figure 2). The eastern neighboring lot (not in project area) appears to be an auto shop and a sign "RPM Lubrication" is identifiable above the garage door.

The 1955 aerial details the back (south) side of the building with all three bays. The door in the center bay is open and appears to have a large sign above it. Stacks of what are possibly tires are located around the door.

In the 1961 aerial, taken from above, the buildings and structures located south of the subject building have been removed. By 1965, the Capitol Center Building was constructed on the southern half of the lot behind the subject building.

By 1974, the small neighboring (east) building had been removed and the lot turned into a parking lot. Sometime after 1974 the open front of the western side of the building was closed in and all of the larger window frames will filled with smaller windows as the building appears today.

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Appendix B: Geotechnical Engineering Report

GEOTECHNICAL ENGINEERING REPORT

PREPARED BY:

THE RILEY GROUP, INC.
17522 BOTHELL WAY NORTHEAST
BOTHELL, WASHINGTON 98011

PREPARED FOR:

BROGAN COMPANIES
5020 JOPPA STREET SOUTHWEST
TUMWATER, WASHINGTON 98512

RGI PROJECT NO. 2016-189A

CAPITOL CENTER DEVELOPMENT
411 4TH AVENUE WEST
OLYMPIA, WASHINGTON 98501

DECEMBER 23, 2016

Corporate Office
17522 Bothell Way Northeast
Bothell, Washington 98011
Phone 425.415.0551 Fax 425.415.0311

www.riley-group.com

RILEYGROUP

December 23, 2016

Mr. Ken Brogan
Brogan Companies
5020 Joppa Street Southwest
Tumwater, Washington 98512

Subject: **Geotechnical Engineering Report**
Capitol Center Development
411 4th Avenue West
Olympia, Washington 98501
RGI Project No. 2016-189A

Dear Mr. Brogan:

As requested, The Riley Group, Inc. (RGI) has performed a Geotechnical Engineering Report (GER) for the above-referenced subject site. Our services were completed in accordance with our proposal PRP2016-302B dated October 28, 2016 and authorized by you November 9, 2016. The information in this GER is based on our understanding of the proposed construction, and the soil and groundwater conditions encountered in the borings completed by RGI at the site on December 8, 2016.

RGI recommends that you submit the project plans and specifications to RGI for a general review so that we may confirm that the recommendations in this report are interpreted and implemented properly in the construction documents. RGI also recommends that a representative of our firm be present on site during portions of the project construction to confirm that the soil and groundwater conditions are consistent with those that form the basis for the engineering recommendations in this report.

If you have any questions or require additional information, please contact us.

Sincerely yours,

THE RILEY GROUP, INC.

RICKY RUNQI WANG
STATE OF WASHINGTON
35013
REGISTERED
PROFESSIONAL ENGINEER

12/23/2016

Ricky R. Wang, PhD, PE
Principal Engineer

RW/KW

Corporate Office
17522 Bothell Way Northeast
Bothell, Washington 98011
Phone 425.415.0551 Fax 425.415.0311

www.riley-group.com

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LIST OF FIGURES AND APPENDICES

Executive Summary

This Executive Summary should be used in conjunction with the entire Geotechnical Engineering Report (GER) for design and/or construction purposes. It should be recognized that specific details were not included or fully developed in this section, and the report must be read in its entirety for a comprehensive understanding of the items contained herein. Section 7.0 should be read for an understanding of limitations.

RGI's geotechnical scope of work included the advancement of two test borings to a maximum depth of 76.5 feet below ground surface (bgs).

Based on the information obtained from our subsurface exploration, the site is suitable for development of the proposed project. The following geotechnical considerations were identified:

Soil Conditions: The soils encountered during field exploration include up to 15 feet of fill over native soil. The fill consists of very loose to loose silty sand with gravel trace of wood, organics, and shell fragments. The native soil is very loose to medium dense silty sand with interbedded silt layers over medium dense to very dense sandy gravel to gravely sand at about 55 feet.

Groundwater: Groundwater seepage was encountered at depths of 11 to 15 feet during our subsurface exploration.

Foundations: The building foundation should be supported on piles extending to the suitable dense soils encountered at least 55 feet below the ground surface.

Slab-on-grade: Concrete slab floors should be supported on the grade beam system supported on the piles.

Pavements: The following pavement sections are recommended:

- **For general parking**: 2 inches of asphalt concrete (AC) over 6 inches of crushed rock base (CRB) over 12 inches of structural fill over woven geotextile fabric
- **For driveway and heavy traffic area**: 3 inches of AC over 8 inches of CRB over 12 inches of structural fill over woven geotextile fabric

1.0 Introduction

This Geotechnical Engineering Report (GER) presents the results of the geotechnical engineering services provided for the Capitol Center Development located at 411 4th Avenue West in Olympia, Washington. The approximate location of the site is shown on Figure 1.

The recommendations in the following sections of this GER are based upon our current understanding of the proposed site development as outlined below. If actual features vary or changes are made, we should review them in order to modify our recommendations as required. In addition, RGI requests to review the site grading plan, final design drawings and specifications when available to verify that our project understanding is correct and that our recommendations have been properly interpreted and incorporated into the project design and construction.

2.0 Project description

The project site is located at 411 4th Avenue West in Olympia, Washington. The approximate location of the site is shown on Figure 1.

The site consists of three parcels of land with a total area about 1.32 acres in size. We understand it is proposed to demolish the existing single-story Capitol Center Annex office building and construct a three-story apartment building with half-level of parking on the northwestern portion of the site and renovate the existing nine-story Capitol Center office building on the southern portion of the site. Our understanding of the project is based on a conceptual plan prepared by Nardi Associates LLP forwarded to us on October 28, 2016.

At the time of preparing this report, detailed project plans were not available for our review. Based on our experience with similar construction, RGI anticipates that the proposed building will be supported on perimeter walls with bearing loads of 3 to 6 kips per linear foot, and a series of columns with a maximum load up to 250 kips. Slab-on-grade floor loading of 250 pounds per square foot (psf) are expected. Based on the topography, RGI expects that the site grading will require shallow cuts to achieve finish grade elevations.

3.0 Field Exploration and Laboratory Testing

3.1 Field Exploration

On December 8, 2016, RGI observed the drilling of two test borings to depths up to 76.5 feet bgs. The approximate exploration locations are shown on Figure 2.

Field logs of each exploration were prepared by the geologist that continuously observed the drilling. These logs included visual classifications of the materials encountered during drilling as well as our interpretation of the subsurface conditions between samples. The boring logs included in Appendix A represent an interpretation of the field logs and include modifications based on laboratory observation and analysis of the samples.

3.2 LABORATORY TESTING

During the field investigation, a representative portion of each recovered sample was sealed in containers and transported to our laboratory for further visual and laboratory examination. Selected samples retrieved from the borings were tested for moisture content and grain-size analysis to aid in soil classification and provide input for the recommendations provided in this GER. The results and descriptions of the laboratory tests are enclosed in Appendix A.

4.0 Site Conditions

4.1 SURFACE

The subject site is a rectangular-shaped area located at 411 4th Avenue West in Olympia, Washington. The site is bordered to the north and south by residential properties, to the east by 4th Avenue Northwest, and to the west by 5th Avenue Northwest.

The site is occupied by a single-story Capitol Center Annex office building on the northwestern portion of the site and a nine-story Capitol Center office building on the southern portion of the site. The remainder of the site is paved parking lot.

4.2 GEOLOGY

Review of the *Geologic Folio of the Olympia-Lacey-Tumwater Urban Area, Washington – Liquefaction Susceptibility Map* by Steven P, Palmer and etc. (1999) indicates that the soil in the project vicinity is mapped as artificial fill (Map Unit af), which is clay, silt, sand, gravel, organic matters, shells, and construction debris. These descriptions are generally similar to the upper fill encountered during our field explorations.

4.3 SOILS

The soils encountered during field exploration include up to 15 feet of fill over native soil. The fill consists of very loose to loose silty sand with gravel trace of wood, organics, and shell fragments. The native soil is very loose to medium dense silty sand with interbedded silt layer over medium dense to very dense sandy gravel to gravely sand at about 55 feet.

More detailed descriptions of the subsurface conditions encountered are included in Appendix A. Sieve analysis was performed on seven selected soil samples. Grain size distribution curves are included in Appendix A.

4.4 GROUNDWATER

Groundwater seepage was encountered at depths of 11 to 15 feet during our subsurface exploration. The seepage appears to be static groundwater in the area.

It should be recognized that fluctuations of the groundwater table will occur due to seasonal variations in the amount of rainfall, runoff, and other factors not evident at the time the explorations were performed. In addition, perched water can develop within seams and layers contained in fill soils or higher permeability soils overlying less permeable soils following periods of heavy or prolonged precipitation. Therefore, groundwater levels during construction or at other times in the future may be higher or lower than the levels indicated on the logs. Groundwater level fluctuations should be considered when developing the design and construction plans for the project

4.5 SEISMIC CONSIDERATIONS

Based on the 2012 International Building Code (IBC), RGI recommends the follow seismic parameters in Table 1 be used for design.

Table 1 IBC Seismic Parameters

2012 IBC Parameter	Value
Site Soil Class[1]	E[2]
Site Latitude	47.044299 N
Site Longitude	122.90626 W
Maximum considered earthquake spectral response acceleration parameters (g)	S_s =1.331, S_1 =0.547
Spectral response acceleration parameters adjusted for site class (g)	S_{ms} =1.197, S_{m1} =1.312
Design spectral response acceleration parameters (g)	S_{ds} =0.798, S_{d1} =0.875

1 Note: In general accordance with the USGS *2012 International Building Code*. IBC Site Class is based on the average characteristics of the upper 100 feet of the subsurface profile.

2 Note: The *2012 International Building Code* requires a site soil profile determination extending to a depth of 100 feet for seismic site classification. The current scope of our services does not include the required 100 foot soil profile determination. Test borings extended to a maximum depth of 51.5 feet, and this seismic site class definition considers that similar soil continues below the maximum depth of the subsurface exploration.

Liquefaction is a phenomenon where there is a reduction or complete loss of soil strength due to an increase in water pressure induced by vibrations from a seismic event. Liquefaction mainly affects geologically recent deposits of fine-grained sands that are below the groundwater table. Soils of this nature derive their strength from intergranular

friction. The generated water pressure or pore pressure essentially separates the soil grains and eliminates this intergranular friction, thus reducing or eliminating the soil's strength.

For liquefaction analysis, soil information obtained from the test borings B-1 and B-2 was used. Analysis indicates the native soil below the groundwater table may liquefy under severe earthquake ground motions (Magnitude 7 and horizontal acceleration 0.25g to 0.4g) or moderate ground shaking of significant duration. However, the soil above groundwater level will not likely be liquefied during an earthquake event.

Total ground settlement from 14 to 21 inches in the eastern portion of the site and 18 to 23 inches in the western portion of the site is possible upon dissipation of excess pore pressures generated during a seismic event. The resulting differential settlement will be approximately 5 to 7 inches along the building length from west to east. The analysis is attached in Appendix B.

4.6 GEOLOGIC HAZARD AREAS

Regulated geologically hazardous areas include erosion, landslide, earthquake, or other geological hazards. Based on the City of Olympia Critical Areas Ordinance (Chapter 18.32.660), the project site is classified as a seismic hazard area.

5.0 Discussion and Recommendations

5.1 GEOTECHNICAL CONSIDERATIONS

Based on the explorations and our analysis, the site is challenging for the proposed development. If the building foundation is supported on shallow footings bearing on existing fill or native soil, it will experience a significant amount of settlements. The settlements include consolidation settlement and earthquake induced liquefaction settlement. The potential differential settlement will be excessive to building structure. To avoid the settlements, the typical solution is to support the building foundation on a deep foundation system bearing on competent native soil.

Slab-on-grade floors for the proposed building can be similarly supported on the grade beam system bearing on piles. Pavements can be supported on at least 12 inches of structural fill with a woven geotextile fabric over existing fill soil.

Detailed recommendations regarding the above issues and other geotechnical design considerations are provided in the following sections. These recommendations should be incorporated into the final design drawings and construction specifications.

5.1.1 EROSION AND SEDIMENT CONTROL

Potential sources or causes of erosion and sedimentation depend on construction methods, slope length and gradient, amount of soil exposed and/or disturbed, soil type, construction sequencing and weather. The impacts on erosion-prone areas can be

reduced by implementing an erosion and sedimentation control plan. The plan should be designed in accordance with applicable city and/or county standards.

RGI recommends the following erosion control Best Management Practices (BMPs):

- Scheduling site preparation and grading for the drier summer and early fall months and undertaking activities that expose soil during periods of little or no rainfall
- Retaining existing vegetation whenever feasible
- Establishing a quarry spall construction entrance
- Installing siltation control fencing or anchored straw or coir wattles on the downhill side of work areas
- Covering soil stockpiles with anchored plastic sheeting
- Revegetating or mulching exposed soils with a minimum 3-inch thickness of straw if surfaces will be left undisturbed for more than 1 day during wet weather or 1 week in dry weather
- Directing runoff away from exposed soils and slopes
- Minimizing the length and steepness of slopes with exposed soils and cover excavation surfaces with anchored plastic sheeting (Graded and disturbed slopes should be tracked in place with the equipment running perpendicular to the slope contours so that the track marks provide a texture to help resist erosion and channeling. Some sloughing and raveling of slopes with exposed or disturbed soil should be expected.)
- Decreasing runoff velocities with check dams, straw bales or coir wattles
- Confining sediment to the project site
- Inspecting and maintaining erosion and sediment control measures frequently (The contractor should be aware that inspection and maintenance of erosion control BMPs is critical toward their satisfactory performance. Repair and/or replacement of dysfunctional erosion control elements should be anticipated.)

Permanent erosion protection should be provided by reestablishing vegetation using hydroseeding and/or landscape planting. Until the permanent erosion protection is established, site monitoring should be performed by qualified personnel to evaluate the effectiveness of the erosion control measures. Provisions for modifications to the erosion control system based on monitoring observations should be included in the erosion and sedimentation control plan.

5.1.2 STRIPPING

Stripping efforts should include removal of pavements, vegetation, organic materials, and deleterious debris from areas slated for building, pavement, and utility construction. Based on the thickness of the pavement at the boring locations, we anticipate stripping depths of about 8 inches across the site.

5.1.3 EXCAVATIONS

All temporary cut slopes associated with the site and utility excavations should be adequately inclined to prevent sloughing and collapse. Based on OSHA regulations, the native soil classifies as a Group C soil.

Accordingly, for excavations more than 4 feet but less than 20 feet in depth, the temporary side slopes should be laid back with a minimum slope inclination of 1.5H:1V (Horizontal:Vertical) in native soil. If there is insufficient room to complete the excavations in this manner, or excavations greater than 20 feet in depth are planned, using temporary shoring to support the excavations should be considered. For open cuts at the site, RGI recommends:

- No traffic, construction equipment, stockpiles or building supplies are allowed at the top of cut slopes within a distance of at least 5 feet from the top of the cut.
- Exposed soil along the slope is protected from surface erosion using waterproof tarps and/or plastic sheeting.
- Construction activities are scheduled so that the length of time the temporary cut is left open is minimized.
- Surface water is diverted away from the excavation.
- The general condition of slopes should be observed periodically by a geotechnical engineer to confirm adequate stability and erosion control measures.

In all cases, however, appropriate inclinations will depend on the actual soil and groundwater conditions encountered during earthwork. Ultimately, the site contractor must be responsible for maintaining safe excavation slopes that comply with applicable OSHA or WISHA guidelines.

5.2 EARTHWORK

Based on the site grades, RGI anticipates the earthwork will include cuts up to 10 feet to reach subgrade elevations for the building grades, installing underground utilities and excavating and backfilling the building foundations.

5.2.1 SITE PREPARATION

RGI anticipates that some areas of loose or soft soil will be exposed upon completion of stripping and grubbing. Subgrade verification should be considered an essential step in site preparation. After stripping, grubbing, and prior to placement of structural fill for the pavement areas, RGI recommends proofrolling the subgrades. The existing fill or native soils in these areas should moisture conditioned and compacted to a firm and unyielding condition in order to achieve a minimum compaction level of 95 percent of the modified proctor maximum dry density as determined by the American Society of Testing and

Materials D1557-09 Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (ASTM D1557).

Proofrolling and adequate subgrade compaction can only be achieved when the soils are within approximately ± 2 percent moisture content of the optimum moisture content. Soils which appear firm after stripping and grubbing may be proofrolled with a heavy compactor, loaded double-axle dump truck, or other heavy equipment under the observation of an RGI representative. This observer will assess the subgrade conditions prior to placement of the geotextile fabric and structural fill for the pavement section.

Subgrade soils that become disturbed due to elevated moisture conditions should be overexcavated to reveal firm, non-yielding, non-organic soils and backfilled with compacted structural fill. To limit overexcavations, RGI recommends that the earthwork portion of this project be completed during extended periods of warm and dry weather if possible. If earthwork is completed during the wet season (typically November through May) it will be necessary to take extra precautionary measures to protect subgrade soils. Wet season earthwork will require additional mitigative measures beyond what would be expected during the drier summer and fall months.

5.2.2 STRUCTURAL FILL

RGI recommends fill below the foundation and floor slab, behind retaining walls, and below pavement and hardscape surfaces be placed in accordance with the following recommendations for structural fill. The structural fill in should be placed after completion of site preparation procedures as described above.

RGI recommends placing structural fill in lifts not exceeding 12 inches in loose thickness and thoroughly compacted as specified in Table 3. The suitability of soils for compacted structural fill use will depend on the gradation and moisture content of the soil when it is placed. As the amount of fines (that portion passing the US. No. 200 sieve) increases, soil becomes increasingly sensitive to small changes in moisture content and adequate compaction becomes more difficult or impossible to achieve. Soils containing more than about 5 percent fines cannot be consistently compacted to a dense, non-yielding condition when the moisture content is more than 2 percent above or below optimum. Optimum moisture content is that moisture which results in the greatest compacted dry density with a specified compactive effort.

The native soil and existing fill encountered is not suitable for re-use as structural fill in its present condition. RGI recommends import structural fill be used for all grading and backfill. The import material should meet the grading requirements listed in Table 2 in order to be used as structural fill.

Table 2 Structural Fill Gradation

U.S. Sieve Size	Percent Passing
3 inches	100
No. 4 sieve	75 percent
No. 200 sieve	5 percent *

*Based on minus 3/4 inch fraction.

Prior to use, an RGI representative should observe and test all materials imported to the site for use as structural fill. Structural fill materials should be placed in uniform loose layers not exceeding 12 inches and compacted as specified in Table 3. The soil's maximum density and optimum moisture should be determined by ASTM D1557.

Table 3 Structural Fill Compaction ASTM D1557

Location	Material Type	Minimum Compaction Percentage	Moisture Content Range	
Foundations	On-site granular or approved imported fill soils:	95	+2	-2
Retaining Wall Backfill	On-site granular or approved imported fill soils:	92	+2	-2
Slab-on-grade	On-site granular or approved imported fill soils:	95	+2	-2
General Fill (non-structural areas)	On-site granular or approved imported fill soils:	90	+3	-2
Pavement – Subgrade and Base Course	On-site granular or approved imported fill soils:	95	+2	-2

Placement and compaction of structural fill should be observed by RGI. A representative number of in-place density tests should be performed as the fill is being placed to confirm that the recommended level of compaction is achieved.

5.2.3 CUT AND FILL SLOPES

All permanent cut and fill slopes should be graded with a finished inclination no greater than 2H:1V. Upon completion of construction, the slope face should be trackwalked, compacted and vegetated, or provided with other physical means to guard against erosion. All fill placed for slope construction should meet the structural fill requirements as described in Section 5.2.2.

Final grades at the top of the slopes must promote surface drainage away from the slope crest. Water must not be allowed to flow in an uncontrolled fashion over the slope face. If

it is necessary to direct surface runoff towards the slope, it should be controlled at the top of the slope, piped in a closed conduit installed on the slope face, and taken to an appropriate point of discharge beyond the toe of the slope.

5.2.4 WET WEATHER CONSTRUCTION CONSIDERATIONS

RGI recommends that preparation for site grading and construction include procedures intended to drain ponded water, control surface water runoff, and to collect shallow subsurface seepage zones in excavations where encountered. It will not be possible to successfully compact the subgrade or utilize on-site soils as structural fill if accumulated water is not drained prior to grading or if drainage is not controlled during construction. Attempting to grade the site without adequate drainage control measures will reduce the amount of on-site soil effectively available for use, increase the amount of select import fill materials required, and ultimately increase the cost of the earthwork phases of the project. Free water should not be allowed to pond on the subgrade soils. RGI anticipates that the use of berms and shallow drainage ditches, with sumps and pumps in utility trenches, will be required for surface water control during wet weather and/or wet site conditions.

5.3 FOUNDATIONS

As discussed, the major geotechnical concern with this project is that the site will be subject to both static settlement and liquefaction induced settlement during a seismic event. If the foundations are directly supported on the existing fill or native soil, the building will experience unacceptable settlement that will likely damage the building structure. RGI suggests that the proposed building be supported on deep foundation bearing in firm native soil.

RGI recommends that steel pipe piles be used. If this option is selected, RGI recommends that two test piles (one at end of the building) be installed before construction. The test piles will provide the necessary information for pile capacity and pile depth.

RGI expects 6- to 8- inch-diameter steel pipe piles may be used for supporting the proposed building foundation. The piles should be driven to refusal in the competent native soil (dense sandy gravel) below the loose soils.

Based on our experience with similar projects, the pile capacities listed in Table 4 can be used for project planning and preliminary structural design. Based on the soil information, RGI expects that the pile termination depth will be from 55 to 60 feet in the eastern portion of the building to over 75 feet in the western portion of the building. The actual pile depth will be determined in the field based on actual driving condition.

Table 4 Driven Pile Capacities (kips)

Pile Type	Pile Diameter (inches)	Compression	Uplift	Lateral*
Steel Pipe	8	45	20	5
Steel Pipe	6	30	14	3

*Lateral load assumes 1" top deflection and uplift can only be achieved by welding the pile couplers.

5.4 RETAINING WALLS

If retaining walls are needed in the building area, RGI recommends cast-in-place concrete walls be used. The magnitude of earth pressure development on retaining walls will partly depend on the quality of the wall backfill. RGI recommends that the basement wall be supported on the piles designed in accordance with the above table to avoid settlement.

For retaining walls outside building area that are able to tolerate some settlement, it can be supported on two feet of structural fill. RGI recommends placing and compacting wall backfill as structural fill. Wall drainage will be needed behind the wall face. A typical retaining wall drainage detail is shown in Figure 3.

With wall backfill placed and compacted as recommended, and drainage properly installed, RGI recommends using the values in the following table for design of retaining walls. The bearing capacity may only be used for retaining walls not associated with the building and that are able to tolerate settlement. Retaining walls supported on structural fill may not be functional after an earthquake that induces the liquefaction settlements.

Table 5 Retaining Wall Design

Design Parameter	Value
Allowable Bearing Capacity - Structural Fill	2,500 psf[1]*
Active Earth Pressure (unrestrained walls)	35 pcf
At-rest Earth Pressure (restrained walls)	50 pcf
Friction Coefficient	0.30
Passive pressure (equivalent fluid pressure)	250 pcf[2]

*For basement wall supported on pile, use pile capacities listed in Table 4.
1. psf = pounds per square foot
2. pcf = pounds per cubic foot

For seismic design, an additional uniform load of 7 times the wall height (H) for unrestrained walls and 14H for restrained walls should be applied to the wall surface.

Friction at the base of foundations and passive earth pressure will provide resistance to these lateral loads. The allowable bearing pressures apply to dead loads plus design live load conditions. For short-term loads, such as wind and seismic, a 1/3 increase in this allowable capacity may be used. At perimeter locations, RGI recommends not including the upper 12 inches of soil in the computation of passive pressures because they can be affected by weather or disturbed by future grading activity. The passive pressure value assumes the foundation will be constructed neat against competent soil or backfilled with structural fill as described in Section 5.2.2. The recommended base friction and passive resistance value includes a safety factor of about 1.5.

5.5 SLAB-ON-GRADE CONSTRUCTION

As described above, the slab-on-grade supported on existing fill will be subject to a significant amount of settlement. RGI recommends that the floor slab be supported on grade beams and piles.

Immediately below the floor slab, RGI recommends placing a 4-inch-thick capillary break layer of clean, free-draining pea gravel, washed rock, or crushed rock that has less than 5 percent passing the U.S. No. 200 sieve. This material will reduce the potential for upward capillary movement of water through the underlying soil and subsequent wetting of the floor slab. Where moisture by vapor transmission is undesirable, an 8- to 10-millimeter thick plastic membrane should be placed on the 4-inch-thick layer of clean gravel or rock.

5.6 DRAINAGE

5.6.1 SURFACE DRAINAGE

Final exterior grades should promote free and positive drainage away from the building area. Water must not be allowed to pond or collect adjacent to foundations or within the immediate building area. For non-pavement locations, RGI recommends providing a minimum drainage gradient of 3 percent for a minimum distance of 10 feet from the building perimeter. In paved locations, a minimum gradient of 1 percent should be provided unless provisions are included for collection and disposal of surface water adjacent to the structure.

5.6.2 SUBSURFACE DRAINAGE

RGI recommends installing perimeter foundation drains. A typical footing drain detail is shown on Figure 4. The foundation drains and roof downspouts should be tightlined separately to an approved discharge facility. Subsurface drains must be laid with a gradient sufficient to promote positive flow to a controlled point of approved discharge. The footing drain may be eliminated if the area sounding the building will be covered with sidewalk and pavement.

5.7 UTILITIES

Utility pipes should be bedded and backfilled in accordance with American Public Works Association (APWA) specifications. For site utilities located within the right-of-ways, bedding and backfill should be completed in accordance with City of Olympia specifications. At a minimum, trench backfill should be placed as structural fill, as described in Section 5.2.2 and compacted to at least 95 percent of the maximum dry density per ASTM D1557. Where utilities occur below unimproved areas, the degree of compaction can be reduced to a minimum of 90 percent of the soil's maximum density as determined by ASTM D1557.

As noted, soils excavated on site will not be suitable for use as backfill material in their present condition. Imported structural fill meeting the gradation provided in Table 2 should be used for trench backfill. Since the site will subject to liquefaction induced settlements, all utilities pipes should use flexible joints for connections to structures.

5.8 PAVEMENTS

Pavement subgrades should be prepared as described in the Section 5.2 and as discussed below. The subgrade should consist of 12 inches of structural fill over native soil. RGI recommends that a geotextile fabric such as Propex Geotex 200ST or equivalent be placed on the subgrade. Regardless of the relative compaction achieved, the subgrade must be firm and relatively unyielding before paving. This condition should be verified by proofrolling with heavy construction equipment.

With the pavement subgrade prepared as described above, RGI recommends the following pavement sections for parking and drive areas paved with flexible asphalt concrete surfacing.

- **For heavy truck traffic areas**: 3 inches of hot mix asphalt (HMA) over 8 inches of crushed rock base (CRB) over 12 inches of structural fill over woven geotextile fabric
- **For general parking areas**: 2 inches of HMA over 6 inches of CRB over 12 inches of structural fill over woven geotextile fabric

The asphalt paving materials used should conform to the Washington State Department of Transportation (WSDOT) specifications for Hot Mix Asphalt Class 1/2 inch and CRB surfacing.

Long-term pavement performance will depend on surface drainage. A poorly-drained pavement section will be subject to premature failure as a result of surface water infiltrating into the subgrade soils and reducing their supporting capability.

For optimum pavement performance, surface drainage gradients of no less than 2 percent are recommended. Also, some degree of longitudinal and transverse cracking of

the pavement surface should be expected over time. Regular maintenance should be planned to seal cracks when they occur.

6.0 Additional Services

RGI is available to provide further geotechnical consultation throughout the design phase of the project. RGI should review the final design and specifications in order to verify that earthwork and foundation recommendations have been properly interpreted and incorporated into project design and construction.

RGI is also available to provide geotechnical engineering and construction monitoring services during construction. The integrity of the earthwork and construction depends on proper site preparation and procedures. In addition, engineering decisions may arise in the field in the event that variations in subsurface conditions become apparent. Construction monitoring services are not part of this scope of work. If these services are desired, please let us know and we will prepare a cost proposal.

Li itation

This report is the property of RGI, Brogan Companies, and their designated agents. Within the limits of the scope and budget, this report was prepared in accordance with generally accepted geotechnical engineering practices in the area at the time this report was issued. This report is intended for specific application to Capitol Center Development in Olympia, Washington, and for the exclusive use of Brogan Companies, and their authorized representatives. No other warranty, expressed or implied, is made. Site safety, excavation support, and dewatering requirements are the responsibility of others.

The scope of services for this project does not include either specifically or by implication any environmental or biological (for example, mold, fungi, bacteria) assessment of the site or identification or prevention of pollutants, hazardous materials or conditions.

The analyses and recommendations presented in this report are based upon data obtained from the test exploration performed on-site. Variations in soil conditions can occur, the nature and extent of which may not become evident until construction. If variations appear evident, RGI should be requested to reevaluate the recommendations in this report prior to proceeding with construction.

It is the client's responsibility to see that all parties to the project, including the designers, contractors, subcontractors, are made aware of this report in its entirety. The use of information contained in this report for bidding purposes should be done at the contractor's option and risk.

USGS, 2014, Tumwater, Washington
7.5-Minute Quadrangle

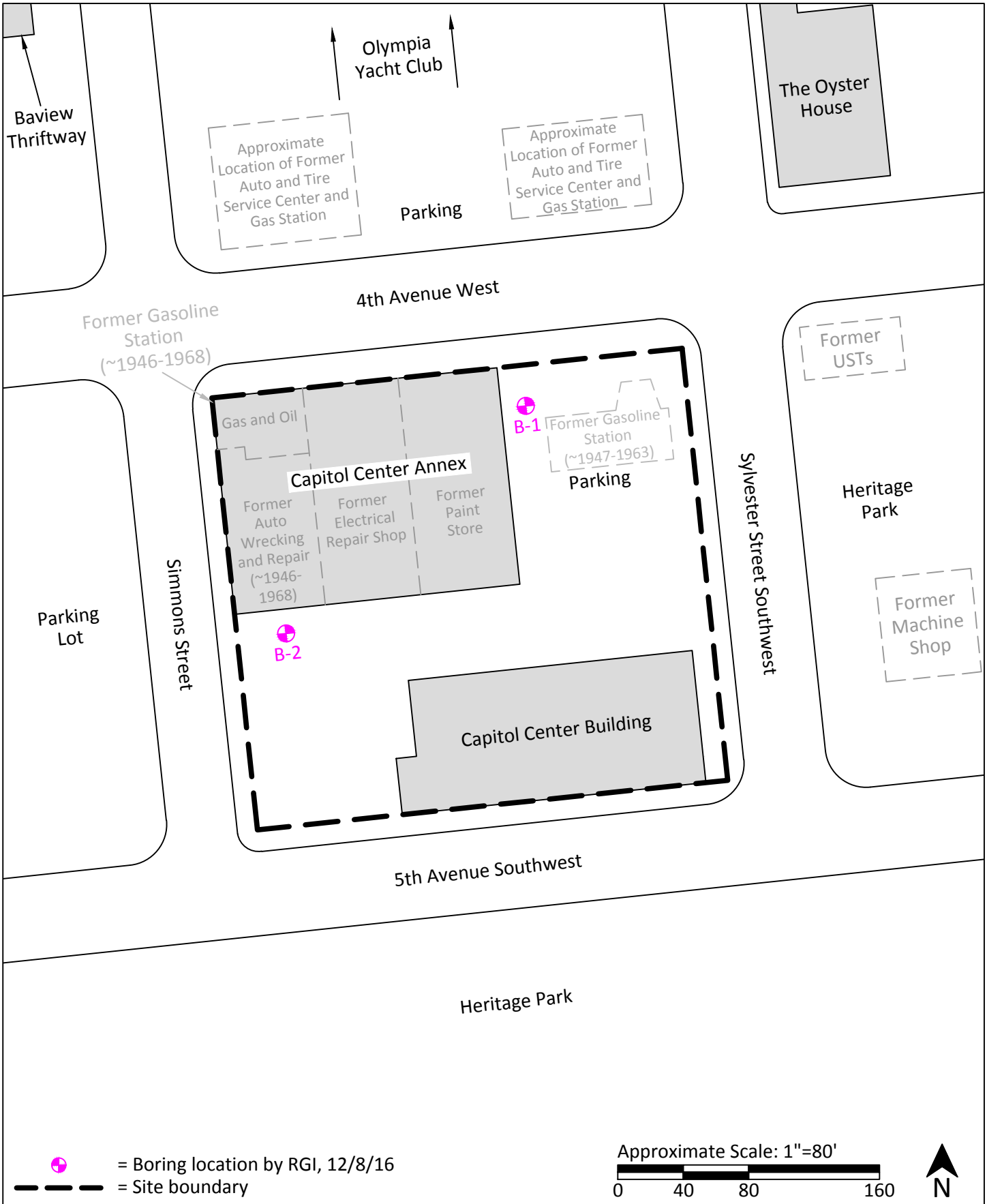
Approximate Scale: 1"=1000'

0 500 1000 2000

N

RILEYGROUP
Corporate Office
17522 Bothell Way Northeast
Bothell, Washington 98011
Phone: 425.415.0551
Fax: 425.415.0311

Capitol Center Building		Figure 1
RGI Project Number 2016-189A	Site Vicinity Map	Date Drawn: 12/2016
Address: 410 5th Avenue Southwest & 411 4th Avenue West, Olympia, Washington 98501		



= Boring location by RGI, 12/8/16

= Site boundary

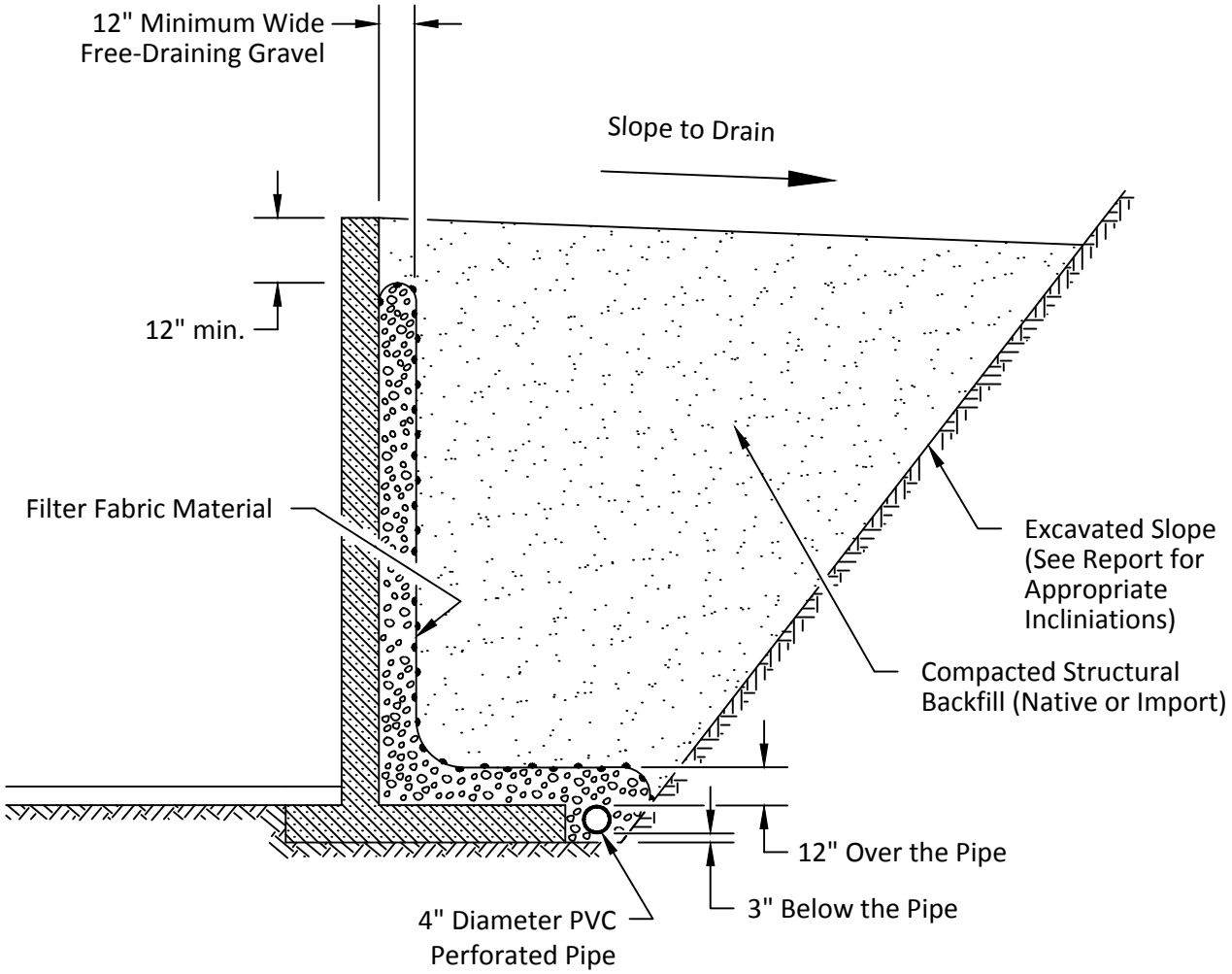
Approximate Scale: 1"=80'

0 40 80 160

N

Corporate Office
17522 Bothell Way Northeast
Bothell, Washington 98011
Phone: 425.415.0551
Fax: 425.415.0311

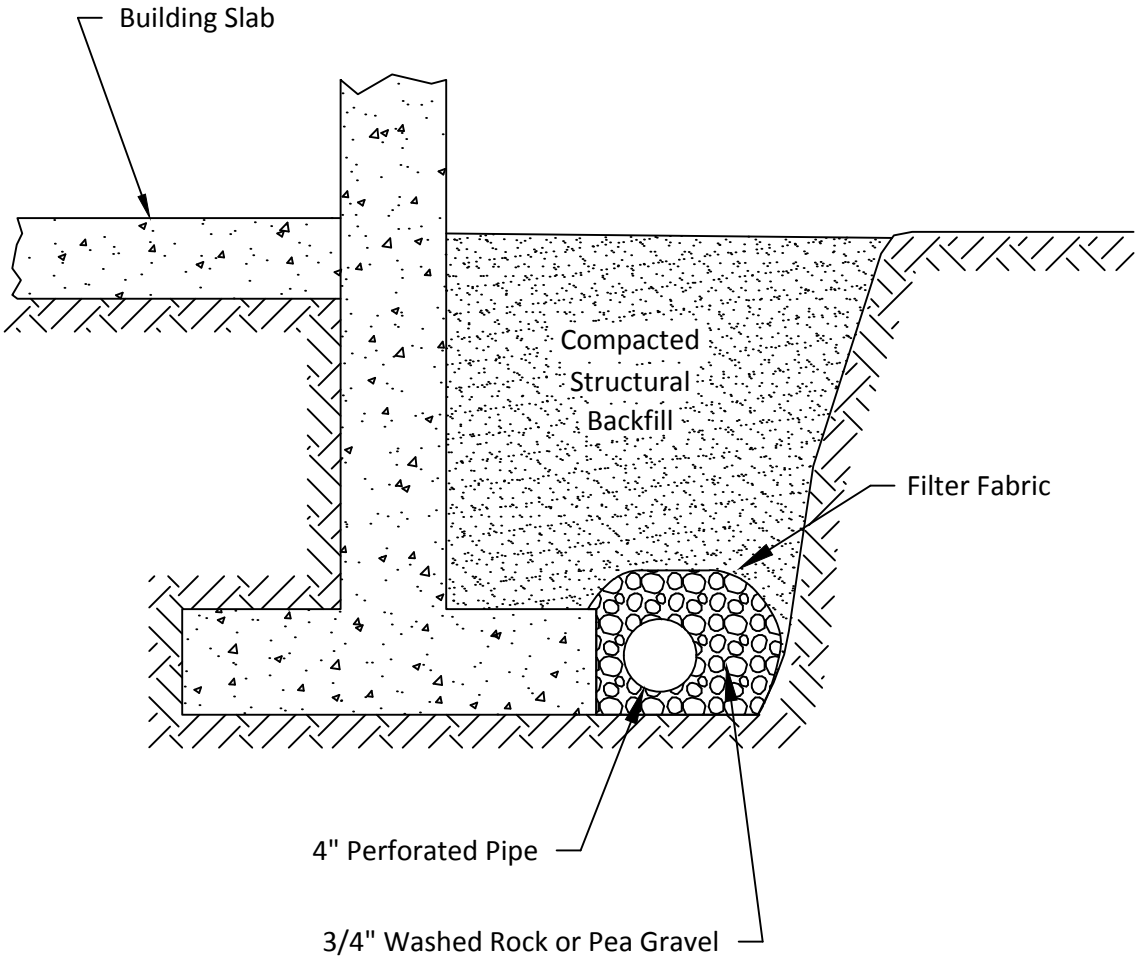
Capitol Center Building		Figure 2
RGI Project Number 2016-189A	Geotechnical Exploration Plan	Date Drawn: 12/2016
Address: 410 5th Avenue Southwest & 411 4th Avenue West, Olympia, Washington 98501		



Not to Scale

RILEYGROUP
Corporate Office
17522 Bothell Way Northeast
Bothell, Washington 98011
Phone: 425.415.0551
Fax: 425.415.0311

Capitol Center Building		Figure 3
RGI Project Number 2016-189A	Retaining Wall Drainage Detail	Date Drawn: 12/2016
Address: 410 5th Avenue Southwest & 411 4th Avenue West, Olympia, Washington 98501		



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RILEYGROUP
Corporate Office
17522 Bothell Way Northeast
Bothell, Washington 98011
Phone: 425.415.0551
Fax: 425.415.0311

Capitol Center Building		Figure 4
RGI Project Number 2016-189A	Typical Footing Drain Detail	Date Drawn: 12/2016
Address: 410 5th Avenue Southwest & 411 4th Avenue West, Olympia, Washington 98501		

APPENDIX A
FIELD EXPLORATION AND LABORATORY TESTING

On December 8, 2016, RGI explored the subsurface soil conditions at the site by observing the drilling of two borings to a maximum depth of 76.5 feet below existing grade. The borings locations are shown on Figure 2. The boring locations were approximately determined by measurements from existing property lines and paved roads.

A geologist from our office conducted the field exploration and classified the soil conditions encountered, maintained a log of each exploration, obtained representative soil samples, and observed pertinent site features. All soil samples were visually classified in accordance with the Unified Soil Classification System (USCS) described in Appendix A.

Representative soil samples obtained from the explorations were placed in closed containers and taken to our laboratory for further examination and testing. As a part of the laboratory testing program, the soil samples were classified in our in house laboratory based on visual observation, texture, and the limited laboratory testing described below.

Moisture Content Determinations

Moisture content determinations were performed in accordance with the American Society of Testing and Materials D2216-10 Standard Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass (ASTM D2216) on representative samples obtained from the exploration in order to aid in identification and correlation of soil types. The moisture content of typical sample was measured and is reported on the test boring logs.

Grain Size Analysis

A grain size analysis indicates the range in diameter of soil particles included in a particular sample. Grain size analyses for the greater than 75 micrometer portion of the samples were performed in accordance with American Society of Testing and Materials D422 Standard Test Method for Particle-Size Analysis of Soils (ASTM D422) on seven of the samples, the results of which are attached in Appendix A.

THE RILEY GROUP, INC.
17522 Bothell Way NE
Bothell, WA 98011

PHONE: (425) 415-0551
FAX: (425) 415-0311

GRAIN SIZE ANALYSIS
ASTM D421, D422, D1140, D2487, D6913

PROJECT TITLE	Capitol Center Development	SAMPLE ID/TYPE	B-1
PROJECT NO.	2016-189A	SAMPLE DEPTH	10'
TECH/TEST DATE	EW 12/12/2016	DATE RECEIVED	12/9/2016

WATER CONTENT (Delivered Moisture)

Wt Wet Soil & Tare (gm)	(w1)	306.7
Wt Dry Soil & Tare (gm)	(w2)	177.3
Weight of Tare (gm)	(w3)	16.0
Weight of Water (gm)	(w4=w1-w2)	129.4
Weight of Dry Soil (gm)	(w5=w2-w3)	161.3
Moisture Content (%)	(w4/w5)*100	80

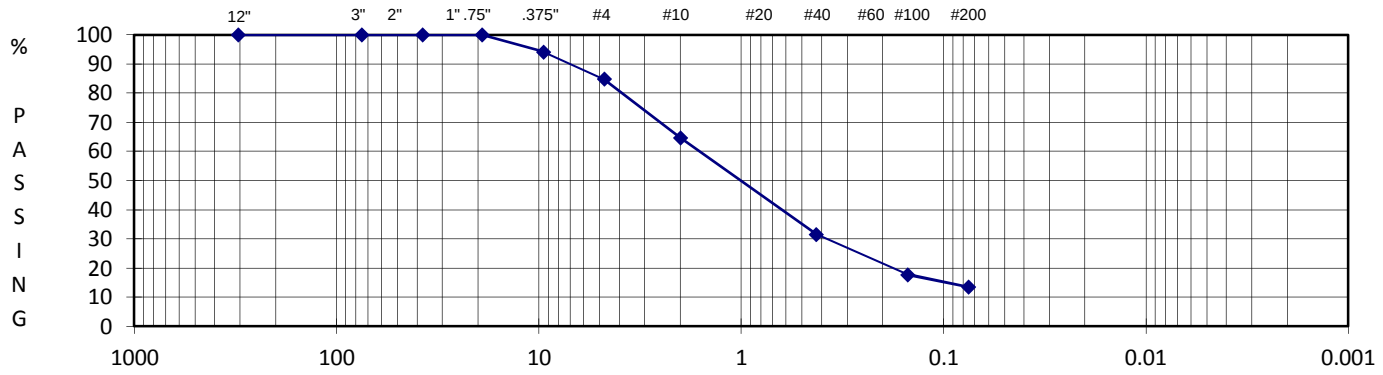
Total Weight Of Sample Used For Sieve Corrected For Hygroscopic Moisture

Weight Of Sample (gm)		177.3
Tare Weight (gm)		16.0
Total Dry Weight (gm)	(W6)	161.3

% COBBLES	0.0
% C GRAVEL	0.0
% F GRAVEL	15.3
% C SAND	20.0
% M SAND	33.1
% F SAND	18.2
% FINES	13.4
% TOTAL	100.0
D10 (mm)	
D30 (mm)	
D60 (mm)	
Cu	
Cc	

SIEVE ANALYSIS

	Wt Ret +Tare	(Wt-Tare)	Cumulative (%Retained) {(wt ret/w6)*100}	% PASS (100-%ret)	
12.0"	16.0	0.00	0.00	100.00	cobbles
3.0"	16.0	0.00	0.00	100.00	coarse gravel
2.5"					coarse gravel
2.0"					coarse gravel
1.5"	16.0	0.00	0.00	100.00	coarse gravel
1.0"					coarse gravel
0.75"	16.0	0.00	0.00	100.00	fine gravel
0.50"					fine gravel
0.375"	25.5	9.50	5.89	94.11	fine gravel
#4	40.7	24.70	15.31	84.69	coarse sand
#10	73.0	57.00	35.34	64.66	medium sand
#20					medium sand
#40	126.4	110.40	68.44	31.56	fine sand
#60					fine sand
#100	148.8	132.80	82.33	17.67	fine sand
#200	155.7	139.70	86.61	13.39	fines
PAN	177.3				silt/clay



DESCRIPTION Silty SAND with some gravel

USCS SM

Prepared For: Brogan Companies

Reviewed By: KMW

RILEYGROUP

THE RILEY GROUP, INC.
17522 Bothell Way NE
Bothell, WA 98011

PHONE: (425) 415-0551
FAX: (425) 415-0311

GRAIN SIZE ANALYSIS
ASTM D421, D422, D1140, D2487, D6913

PROJECT TITLE	Capitol Center Development	SAMPLE ID/TYPE	B-1
PROJECT NO.	2016-189A	SAMPLE DEPTH	20'
TECH/TEST DATE	EW 12/12/2016	DATE RECEIVED	12/9/2016

WATER CONTENT (Delivered Moisture)

Wt Wet Soil & Tare (gm)	(w1)	372.9
Wt Dry Soil & Tare (gm)	(w2)	282.0
Weight of Tare (gm)	(w3)	16.0
Weight of Water (gm)	(w4=w1-w2)	90.9
Weight of Dry Soil (gm)	(w5=w2-w3)	266.0
Moisture Content (%)	(w4/w5)*100	34

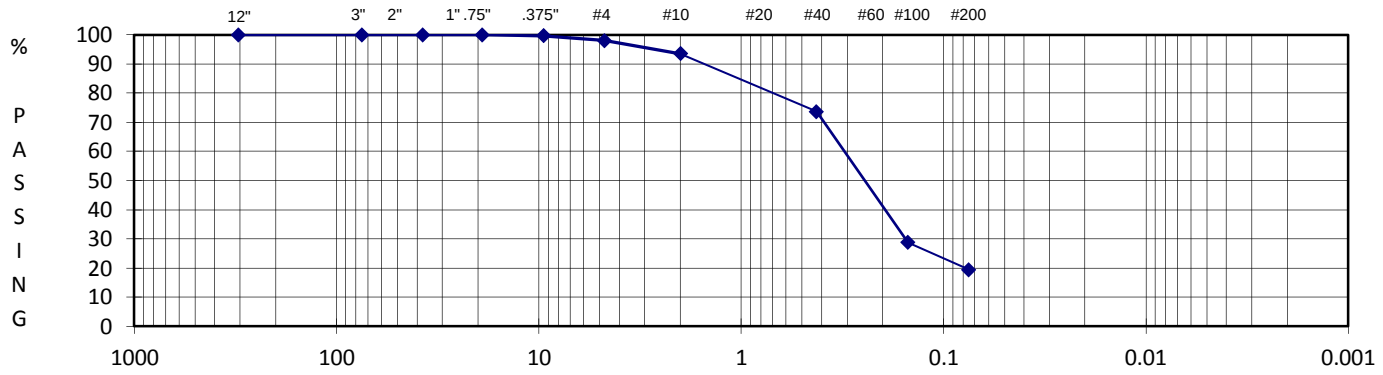
Total Weight Of Sample Used For Sieve Corrected For Hygroscopic Moisture

Weight Of Sample (gm)		282.0
Tare Weight (gm)		16.0
(W6) Total Dry Weight (gm)		266.0

% COBBLES	0.0
% C GRAVEL	0.0
% F GRAVEL	2.0
% C SAND	4.4
% M SAND	19.9
% F SAND	54.1
% FINES	19.5
% TOTAL	100.0
D10 (mm)	
D30 (mm)	
D60 (mm)	
Cu	
Cc	

SIEVE ANALYSIS

	Wt Ret +Tare	(Wt-Tare)	Cumulative (%Retained) {(wt ret/w6)*100}	% PASS (100-%ret)	
12.0"	16.0	0.00	0.00	100.00	cobbles
3.0"	16.0	0.00	0.00	100.00	coarse gravel
2.5"					coarse gravel
2.0"					coarse gravel
1.5"	16.0	0.00	0.00	100.00	coarse gravel
1.0"					coarse gravel
0.75"	16.0	0.00	0.00	100.00	fine gravel
0.50"					fine gravel
0.375"	17.0	1.00	0.38	99.62	fine gravel
#4	21.4	5.40	2.03	97.97	coarse sand
#10	33.2	17.20	6.47	93.53	medium sand
#20					medium sand
#40	86.2	70.20	26.39	73.61	fine sand
#60					fine sand
#100	205.5	189.50	71.24	28.76	fine sand
#200	230.2	214.20	80.53	19.47	fines
PAN	282.0				silt/clay



DESCRIPTION Silty SAND

USCS SM

Prepared For: Brogan Companies

Reviewed By: KMW

RILEYGROUP

THE RILEY GROUP, INC.
17522 Bothell Way NE
Bothell, WA 98011

PHONE: (425) 415-0551
FAX: (425) 415-0311

GRAIN SIZE ANALYSIS
ASTM D421, D422, D1140, D2487, D6913

PROJECT TITLE	Capitol Center Development	SAMPLE ID/TYPE	B-1
PROJECT NO.	2016-189A	SAMPLE DEPTH	30'
TECH/TEST DATE	EW 12/12/2016	DATE RECEIVED	12/9/2016

WATER CONTENT (Delivered Moisture)

Wt Wet Soil & Tare (gm)	(w1)	457.1
Wt Dry Soil & Tare (gm)	(w2)	380.2
Weight of Tare (gm)	(w3)	15.9
Weight of Water (gm)	(w4=w1-w2)	76.9
Weight of Dry Soil (gm)	(w5=w2-w3)	364.3
Moisture Content (%)	(w4/w5)*100	21

Total Weight Of Sample Used For Sieve Corrected For Hygroscopic Moisture

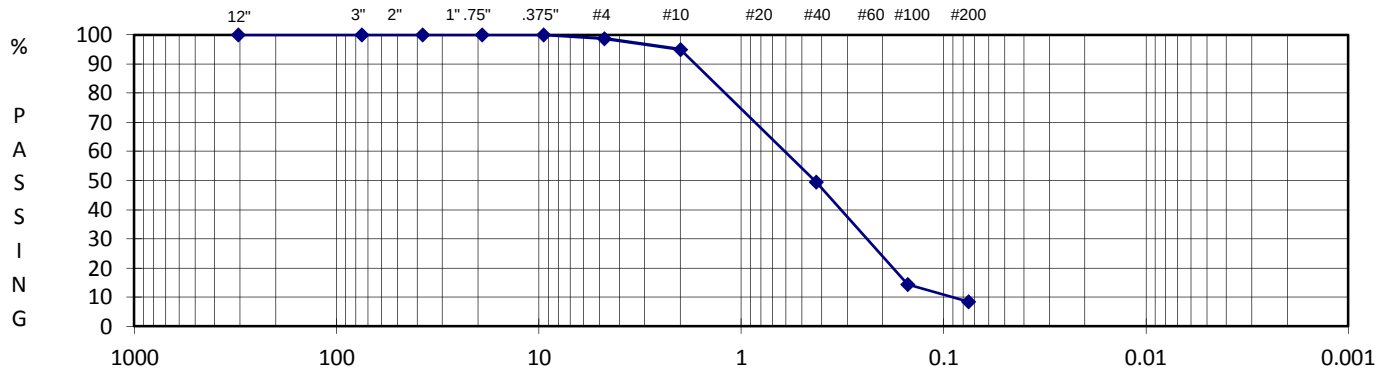
Weight Of Sample (gm)		380.2
Tare Weight (gm)		15.9
(W6) Total Dry Weight (gm)		364.3

% COBBLES	0.0
% C GRAVEL	0.0
% F GRAVEL	1.3
% C SAND	3.7
% M SAND	45.6
% F SAND	40.9
% FINES	8.5
% TOTAL	100.0

D10 (mm)	0.09
D30 (mm)	0.24
D60 (mm)	0.6
Cu	6.7
Cc	1.1

SIEVE ANALYSIS

	Wt Ret +Tare	(Wt-Tare)	Cumulative (%Retained) {(wt ret/w6)*100}	% PASS (100-%ret)	
12.0"	15.9	0.00	0.00	100.00	cobbles
3.0"	15.9	0.00	0.00	100.00	coarse gravel
2.5"					coarse gravel
2.0"					coarse gravel
1.5"	15.9	0.00	0.00	100.00	coarse gravel
1.0"					coarse gravel
0.75"	15.9	0.00	0.00	100.00	fine gravel
0.50"					fine gravel
0.375"	15.9	0.00	0.00	100.00	fine gravel
#4	20.6	4.70	1.29	98.71	coarse sand
#10	34.2	18.30	5.02	94.98	medium sand
#20					medium sand
#40	200.3	184.40	50.62	49.38	fine sand
#60					fine sand
#100	328.1	312.20	85.70	14.30	fine sand
#200	349.4	333.50	91.55	8.45	fines
PAN	380.2				silt/clay



DESCRIPTION SAND with some silt

USCS SW-SM

Prepared For: Brogan Companies

Reviewed By: KMW

RILEYGROUP

THE RILEY GROUP, INC.
17522 Bothell Way NE
Bothell, WA 98011

PHONE: (425) 415-0551
FAX: (425) 415-0311

GRAIN SIZE ANALYSIS
ASTM D421, D422, D1140, D2487, D6913

PROJECT TITLE	Capitol Center Development	SAMPLE ID/TYPE	B-1
PROJECT NO.	2016-189A	SAMPLE DEPTH	40'
TECH/TEST DATE	EW 12/12/2016	DATE RECEIVED	12/9/2016

WATER CONTENT (Delivered Moisture)

Wt Wet Soil & Tare (gm)	(w1)	314.5
Wt Dry Soil & Tare (gm)	(w2)	252.8
Weight of Tare (gm)	(w3)	15.9
Weight of Water (gm)	(w4=w1-w2)	61.7
Weight of Dry Soil (gm)	(w5=w2-w3)	236.9
Moisture Content (%)	(w4/w5)*100	26

Total Weight Of Sample Used For Sieve Corrected For Hygroscopic Moisture

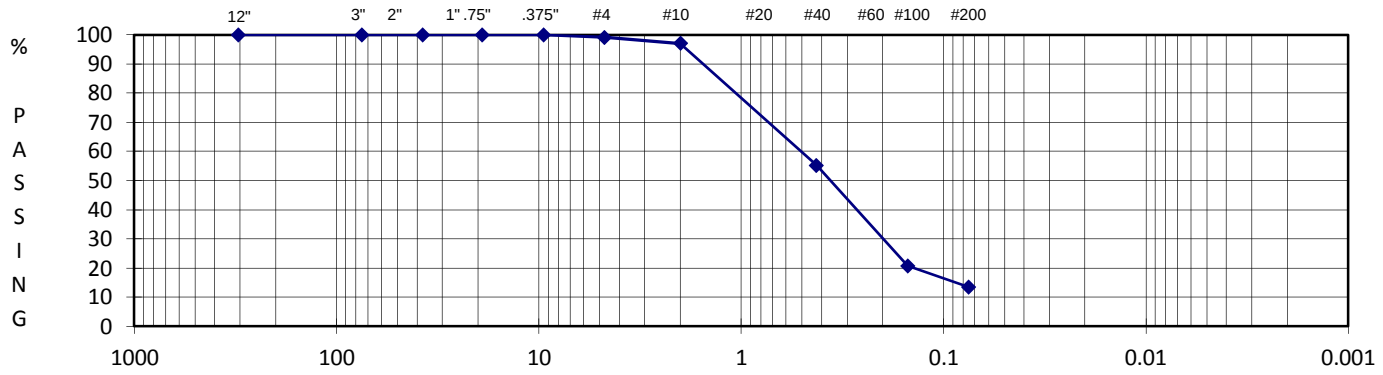
Weight Of Sample (gm)		252.8
Tare Weight (gm)		15.9
(W6) Total Dry Weight (gm)		236.9

% COBBLES	0.0
% C GRAVEL	0.0
% F GRAVEL	0.9
% C SAND	2.1
% M SAND	41.9
% F SAND	41.8
% FINES	13.4
% TOTAL	100.0

D10 (mm)	
D30 (mm)	
D60 (mm)	
Cu	
Cc	

SIEVE ANALYSIS

	Wt Ret +Tare	(Wt-Tare)	Cumulative (%Retained) {(wt ret/w6)*100}	% PASS (100-%ret)	
12.0"	15.9	0.00	0.00	100.00	cobbles
3.0"	15.9	0.00	0.00	100.00	coarse gravel
2.5"					coarse gravel
2.0"					coarse gravel
1.5"	15.9	0.00	0.00	100.00	coarse gravel
1.0"					coarse gravel
0.75"	15.9	0.00	0.00	100.00	fine gravel
0.50"					fine gravel
0.375"	15.9	0.00	0.00	100.00	fine gravel
#4	18.0	2.10	0.89	99.11	coarse sand
#10	22.9	7.00	2.95	97.05	medium sand
#20					medium sand
#40	122.1	106.20	44.83	55.17	fine sand
#60					fine sand
#100	204.0	188.10	79.40	20.60	fine sand
#200	221.1	205.20	86.62	13.38	fines
PAN	252.8				silt/clay



DESCRIPTION	Silty SAND
USCS	SM

Prepared For: Brogan Companies

Reviewed By: KMW

RILEYGROUP

THE RILEY GROUP, INC.
17522 Bothell Way NE
Bothell, WA 98011

PHONE: (425) 415-0551
FAX: (425) 415-0311

GRAIN SIZE ANALYSIS
ASTM D421, D422, D1140, D2487, D6913

PROJECT TITLE	Capitol Center Development	**SAMPLE ID/TYPE**	B-1
PROJECT NO.	2016-189A	**SAMPLE DEPTH**	50'
TECH/TEST DATE	EW 12/12/2016	**DATE RECEIVED**	12/9/2016

WATER CONTENT (Delivered Moisture)

Wt Wet Soil & Tare (gm)	(w1)	317.0
Wt Dry Soil & Tare (gm)	(w2)	238.4
Weight of Tare (gm)	(w3)	16.0
Weight of Water (gm)	(w4=w1-w2)	78.6
Weight of Dry Soil (gm)	(w5=w2-w3)	222.4
Moisture Content (%)	(w4/w5)*100	35

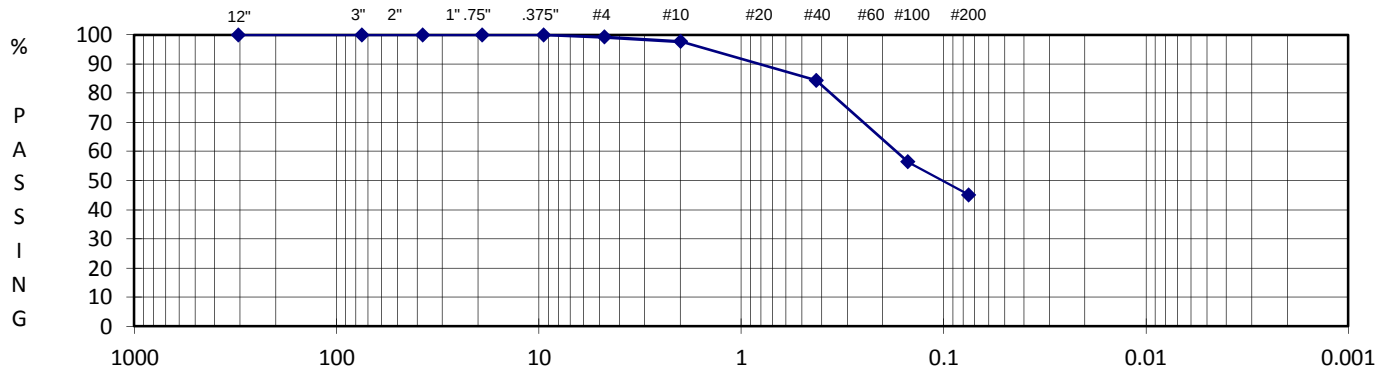
Total Weight Of Sample Used For Sieve Corrected For Hygroscopic Moisture

Weight Of Sample (gm)		238.4
Tare Weight (gm)		16.0
(W6) Total Dry Weight (gm)		222.4

% COBBLES	**0.0**
% C GRAVEL	**0.0**
% F GRAVEL	**0.8**
% C SAND	**1.6**
% M SAND	**13.4**
% F SAND	**39.2**
% FINES	**45.1**
% TOTAL	**100.0**
D10 (mm)	
D30 (mm)	
D60 (mm)	
Cu	
Cc	

SIEVE ANALYSIS

	Wt Ret +Tare	(Wt-Tare)	Cumulative (%Retained) {(wt ret/w6)*100}	% PASS (100-%ret)	
12.0"	16.0	0.00	0.00	100.00	cobbles
3.0"	16.0	0.00	0.00	100.00	coarse gravel
2.5"					coarse gravel
2.0"					coarse gravel
1.5"	16.0	0.00	0.00	100.00	coarse gravel
1.0"					coarse gravel
0.75"	16.0	0.00	0.00	100.00	fine gravel
0.50"					fine gravel
0.375"	16.0	0.00	0.00	100.00	fine gravel
#4	17.7	1.70	0.76	99.24	coarse sand
#10	21.2	5.20	2.34	97.66	medium sand
#20					medium sand
#40	50.9	34.90	15.69	84.31	fine sand
#60					fine sand
#100	112.9	96.90	43.57	56.43	fine sand
#200	138.0	122.00	54.86	45.14	fines
PAN	238.4				silt/clay



DESCRIPTION Silty SAND

USCS SM

Prepared For: Brogan Companies

Reviewed By: KMW

RILEYGROUP

THE RILEY GROUP, INC.
17522 Bothell Way NE
Bothell, WA 98011

PHONE: (425) 415-0551
FAX: (425) 415-0311

GRAIN SIZE ANALYSIS
ASTM D421, D422, D1140, D2487, D6913

PROJECT TITLE	Capitol Center Development	SAMPLE ID/TYPE	B-1
PROJECT NO.	2016-189A	SAMPLE DEPTH	60'
TECH/TEST DATE	EW 12/12/2016	DATE RECEIVED	12/9/2016

WATER CONTENT (Delivered Moisture)

Wt Wet Soil & Tare (gm)	(w1)	427.5
Wt Dry Soil & Tare (gm)	(w2)	377.5
Weight of Tare (gm)	(w3)	16.4
Weight of Water (gm)	(w4=w1-w2)	50.0
Weight of Dry Soil (gm)	(w5=w2-w3)	361.1
Moisture Content (%)	(w4/w5)*100	14

Total Weight Of Sample Used For Sieve Corrected For Hygroscopic Moisture

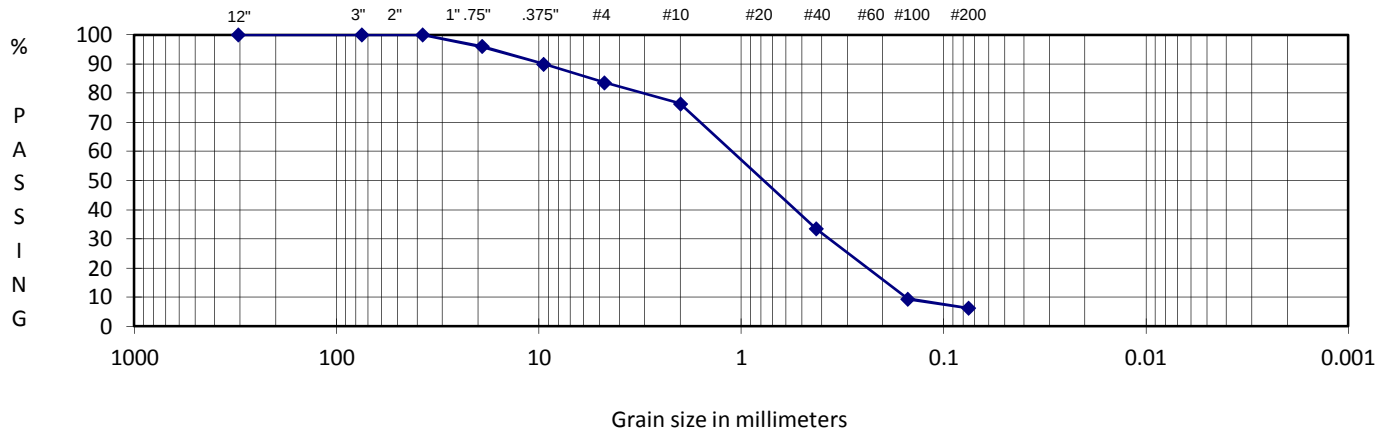
Weight Of Sample (gm)		377.5
Tare Weight (gm)		16.4
(W6) Total Dry Weight (gm)		361.1

% COBBLES	0.0
% C GRAVEL	4.1
% F GRAVEL	12.4
% C SAND	7.3
% M SAND	42.8
% F SAND	27.2
% FINES	6.2
% TOTAL	100.0

D10 (mm)	0.17
D30 (mm)	0.38
D60 (mm)	1.1
Cu	6.5
Cc	0.8

SIEVE ANALYSIS

	Wt Ret +Tare	(Wt-Tare)	Cumulative (%Retained) {(wt ret/w6)*100}	% PASS (100-%ret)	
12.0"	16.4	0.00	0.00	100.00	cobbles
3.0"	16.4	0.00	0.00	100.00	coarse gravel
2.5"					coarse gravel
2.0"					coarse gravel
1.5"	16.4	0.00	0.00	100.00	coarse gravel
1.0"					coarse gravel
0.75"	31.1	14.70	4.07	95.93	fine gravel
0.50"					fine gravel
0.375"	52.9	36.50	10.11	89.89	fine gravel
#4	75.8	59.40	16.45	83.55	coarse sand
#10	102.2	85.80	23.76	76.24	medium sand
#20					medium sand
#40	256.9	240.50	66.60	33.40	fine sand
#60					fine sand
#100	344.0	327.60	90.72	9.28	fine sand
#200	355.0	338.60	93.77	6.23	fines
PAN	377.5				silt/clay



DESCRIPTION	SAND with some silt and gravel
USCS	SP-SM

Prepared For: Brogan Companies

Reviewed By: KMW

RILEYGROUP

THE RILEY GROUP, INC.
17522 Bothell Way NE
Bothell, WA 98011

PHONE: (425) 415-0551
FAX: (425) 415-0311

GRAIN SIZE ANALYSIS
ASTM D421, D422, D1140, D2487, D6913

PROJECT TITLE	Capitol Center Development	SAMPLE ID/TYPE	B-2
PROJECT NO.	2016-189A	SAMPLE DEPTH	70'
TECH/TEST DATE	EW 12/12/2016	DATE RECEIVED	12/9/2016

WATER CONTENT (Delivered Moisture)

Wt Wet Soil & Tare (gm)	(w1)	246.9
Wt Dry Soil & Tare (gm)	(w2)	186.2
Weight of Tare (gm)	(w3)	15.9
Weight of Water (gm)	(w4=w1-w2)	60.7
Weight of Dry Soil (gm)	(w5=w2-w3)	170.3
Moisture Content (%)	(w4/w5)*100	36

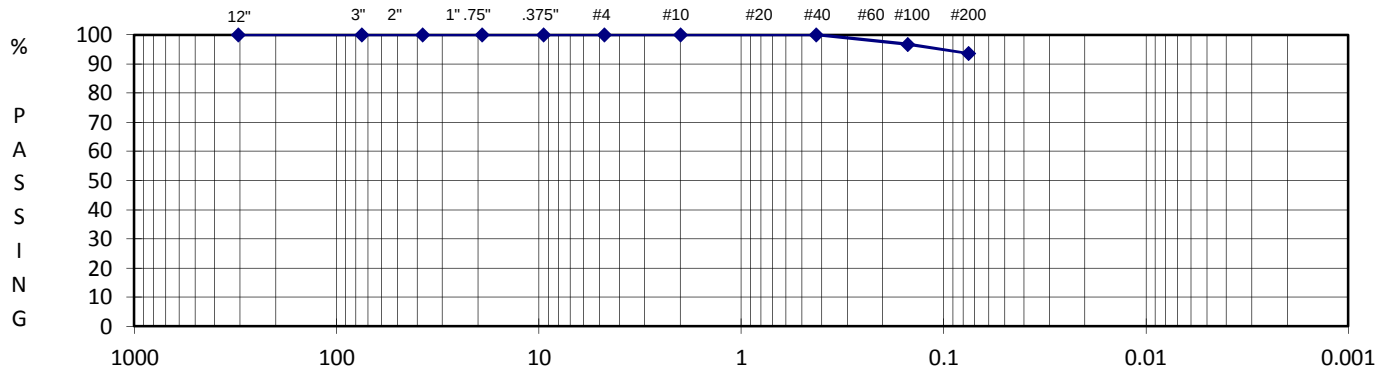
Total Weight Of Sample Used For Sieve Corrected For Hygroscopic Moisture

Weight Of Sample (gm)		186.2
Tare Weight (gm)		15.9
(W6) Total Dry Weight (gm)		170.3

% COBBLES	0.0
% C GRAVEL	0.0
% F GRAVEL	0.0
% C SAND	0.0
% M SAND	0.1
% F SAND	6.3
% FINES	93.6
% TOTAL	100.0
D10 (mm)	
D30 (mm)	
D60 (mm)	
Cu	
Cc	

SIEVE ANALYSIS

	Wt Ret +Tare	(Wt-Tare)	Cumulative (%Retained) {(wt ret/w6)*100}	% PASS (100-%ret)	
12.0"	15.9	0.00	0.00	100.00	cobbles
3.0"	15.9	0.00	0.00	100.00	coarse gravel
2.5"					coarse gravel
2.0"					coarse gravel
1.5"	15.9	0.00	0.00	100.00	coarse gravel
1.0"					coarse gravel
0.75"	15.9	0.00	0.00	100.00	fine gravel
0.50"					fine gravel
0.375"	15.9	0.00	0.00	100.00	fine gravel
#4	15.9	0.00	0.00	100.00	coarse sand
#10	15.9	0.00	0.00	100.00	medium sand
#20					medium sand
#40	16.0	0.10	0.06	99.94	fine sand
#60					fine sand
#100	21.6	5.70	3.35	96.65	fine sand
#200	26.8	10.90	6.40	93.60	fines
PAN	186.2				silt/clay



DESCRIPTION	SILT with trace sand
USCS	ML

Prepared For: Brogan Companies

Reviewed By: KMW

RILEYGROUP

APPENDIX B
LIQUEFACTION ANALYSIS

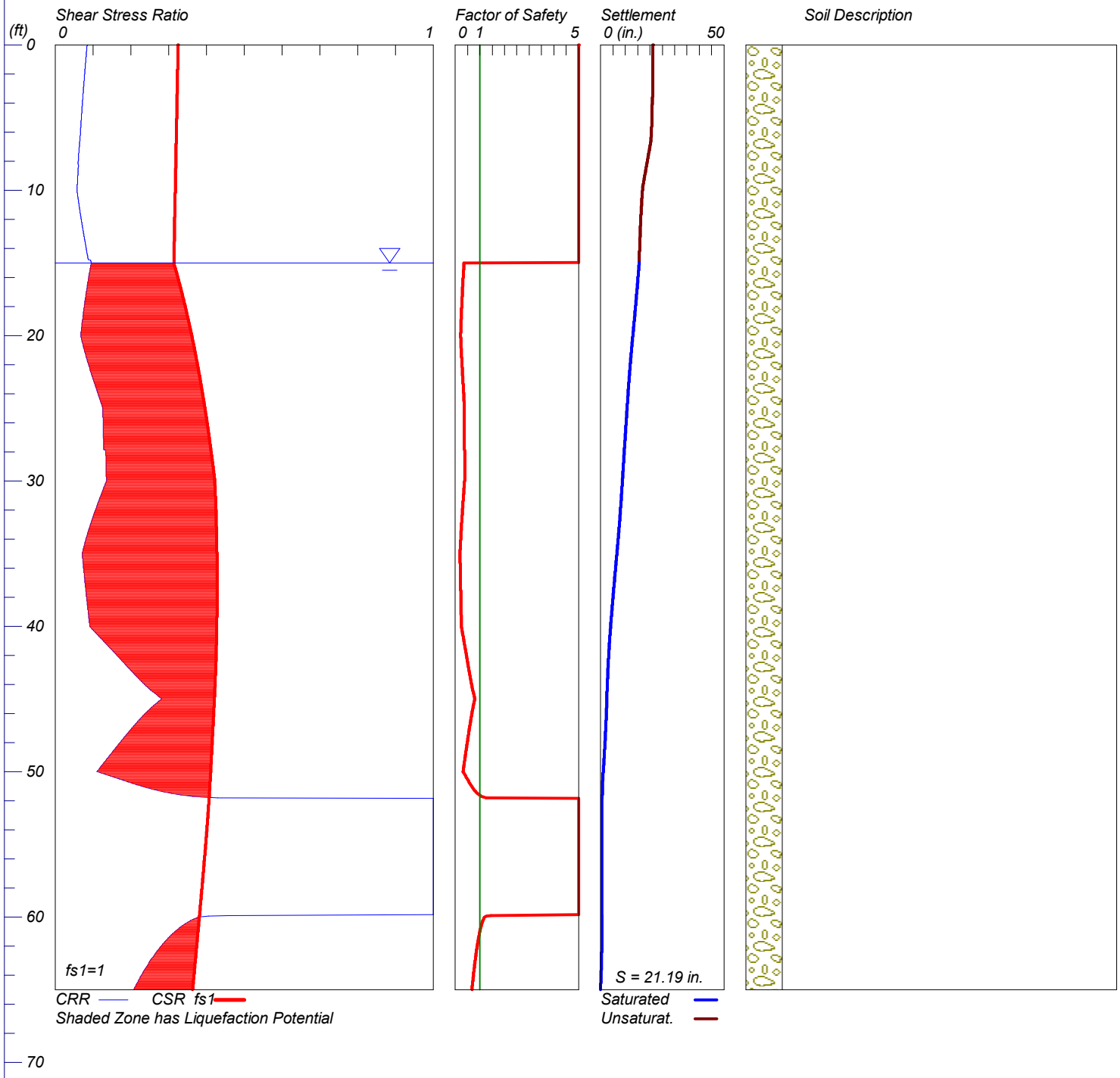
Liquefaction analysis was completed using the LiquefyPro software from CivilTech Software USA. Soil and groundwater conditions from borings B-1 and B-2 were used and the printout is attached.

LIQUEFACTION ANALYSIS

Capitol Center

Hole No.=B-1 Water Depth=15 ft

Magnitude=7
Acceleration=0.5g

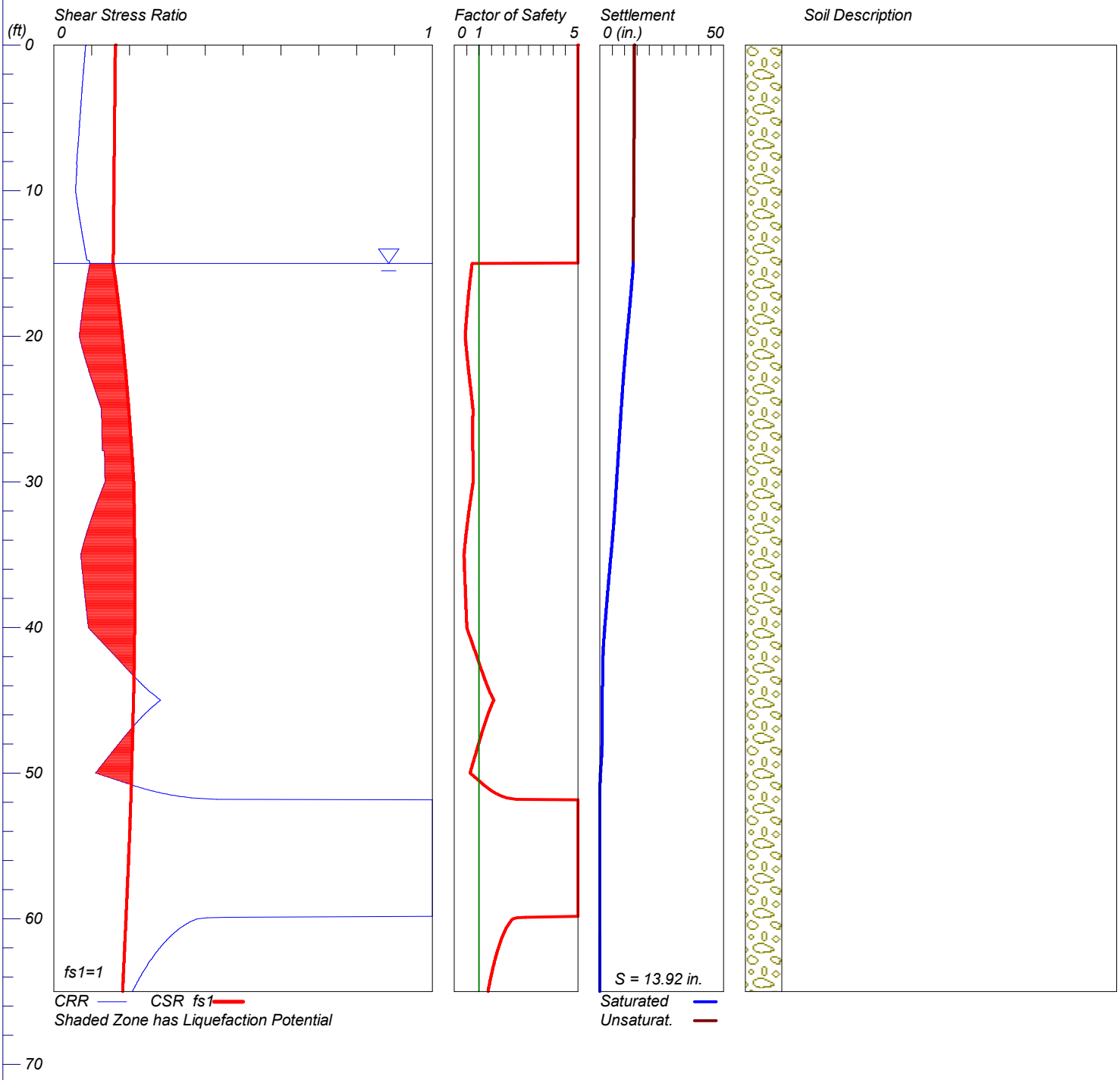


LIQUEFACTION ANALYSIS

Capitol Center

Hole No.=B-1 Water Depth=15 ft

Magnitude=7
Acceleration=0.25g

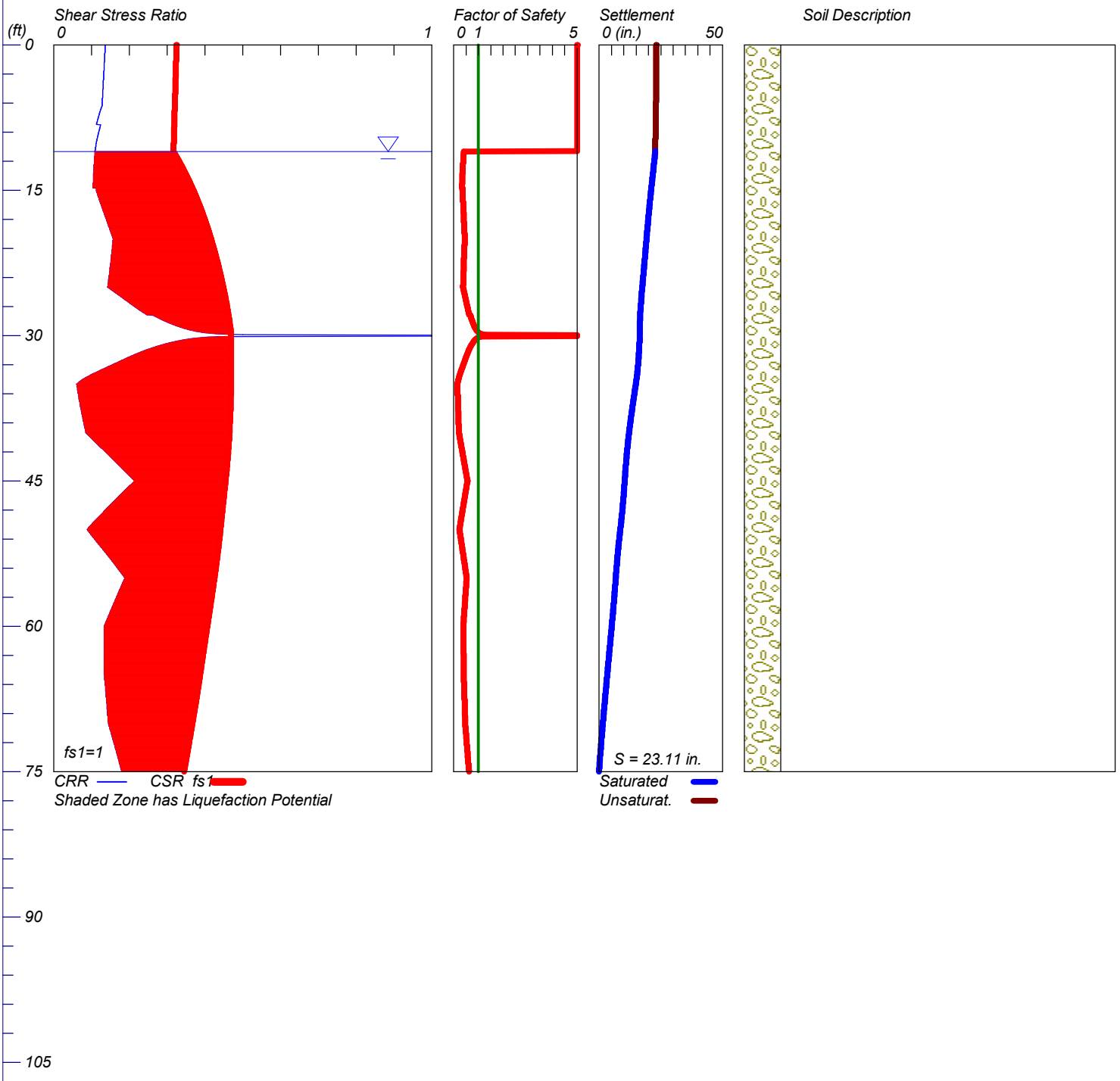


LIQUEFACTION ANALYSIS

Capitol Center

Hole No.=B-2 Water Depth=11 ft

Magnitude=7
Acceleration=0.5g

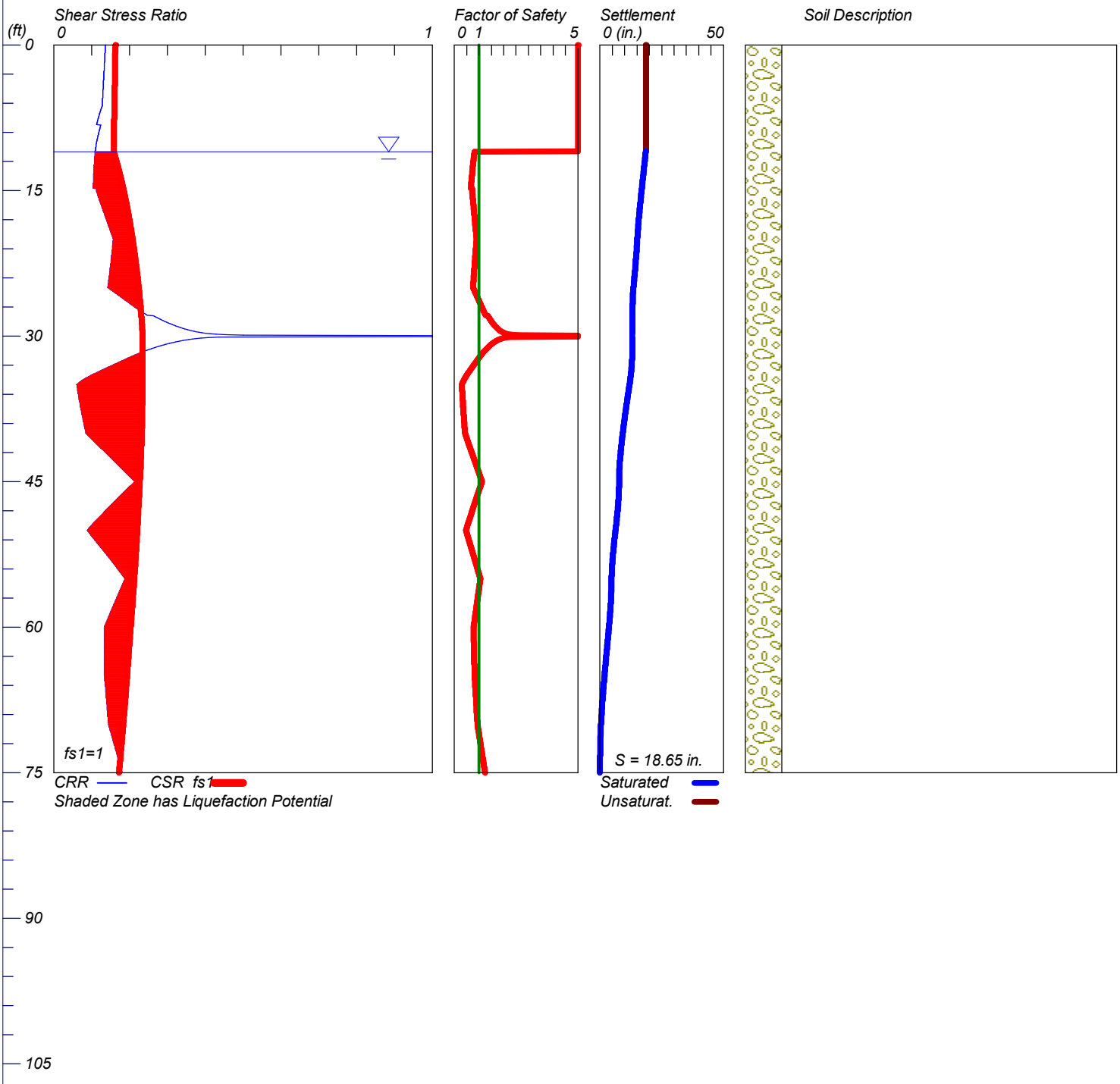


LIQUEFACTION ANALYSIS

Capitol Center

Hole No.=B-2 Water Depth=11 ft

Magnitude=7
Acceleration=0.25g



Appendix C: Historic Viewshed Analysis

THOMAS
architecture studios

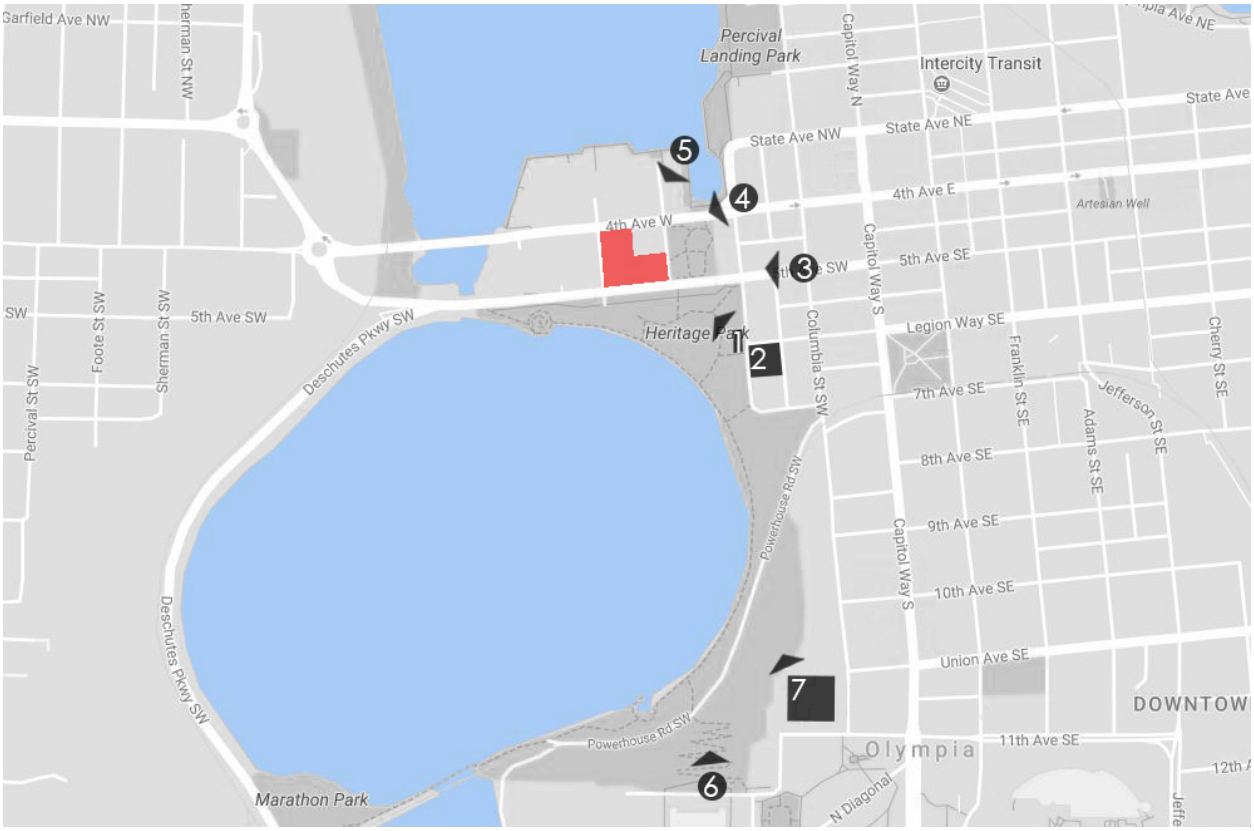
VIEWS ON FIFTH

PEDESTRIAN VIEW ANALYSIS **SEPTEMBER 19, 2017**

PROJECT APPROACH:

The Views on Fifth project intends to protect existing historic scenic views and improve upon the ones currently available to the public as outlined in the photo documentation provided herein. The following map shows points of historic interest and their views of this project. The numbers correspond to our photo examples on the following pages.

VIEWS FROM HISTORICAL LANDMARKS:



VIEW 1: View from Capitol Lake Bath House.

Figure 1 Existing view

Figure 2 View with project

The existing view impact on the skyline is reduced with the removal of a large portion of the existing mechanical room on the roof.

VIEW 2: View from the American Legion Hall.

Figure 3 Existing view

Figure 4 View with project

The existing view impact on the skyline is reduced with the removal of a large portion of the existing mechanical room on the roof.

VIEW 3: View looking west from 5th Avenue.

Figure 5 Existing view

Figure 6 View with project

The existing view is relatively unchanged with the project.

VIEW 4: View looking west from 4th Avenue.

Figure 7 Existing view

Figure 8 View with project

The existing view is unchanged with the project.

VIEW 5: View from the Sandman tugboat.

Figure 9 Existing view

Figure 10 View with project

The existing view is unchanged with the project.

VIEW 6: View from the Capitol Hill.

Figure 11 Existing view

Figure 12 View with project

The existing view is unchanged with the project. The new curtain wall façade on the tower structure will include a glazing system to help reflect the natural settings and further blend the existing tower with the water and sky.

VIEW 7: View from the General Administration Building (image taken from top floor).

Figure 13 Existing view

Figure 14 View with project

The existing view is unchanged with the project.