Attachment B
Environmental Checklist

Environmental Checklist / SEPA

chamlin 7/11/13

ENVIRONMENTAL CHECKLIST

BACKGROUND INFORMATION

Property owner: WR – SRI 120th LLC

Proponent: WRC

Contact person: Cindy Edens, Wright Runstad & Company

Address: 1201 3rd Avenue, Suite 2700, Seattle, WA 98101

Phone: (206) 447-9000

Proposal Title: The Spring District - Phase 1A

Proposal Location: BelRed Corridor, Bellevue, WA

Vicinity Map: See Vicinity Map (right) and attached ADR plan sheets

General description:

The proposal (The Spring District Phase 1A) is the first phase of a 36.01-acre transit-oriented mixed-use development. The proposal includes the demolition of two existing structures on a 14.75-acre portion of the site (Phase 1A) and construction of two buildings for office and retail use. The proposal also includes associated infrastructure, including streets and utilities for the buildings' operation, as well as park space and a temporary surface parking lot.

1. Acreage of site: 14.75 acres
2. Number of dwelling units/buildings to be demolished: 2
3. Number of dwelling units/buildings to be constructed: 2
4. Square footage of buildings to be demolished: 358,310 SF
5. Square footage of buildings to be constructed: ~~452,548~~ SF 525,140 GSF
6. Quantity of earth movement (in cubic yards): 145,000 CY
7. Proposed land use: Office and commercial/retail as allowed within zoning BR-OR-1 and BR-OR-2.
8. Design features, including building height, number of stories, and proposed exterior materials:

   This proposal includes the construction of two office buildings—Buildings 16 (on Parcel 16) and 24 (on Parcel 24)—each with ground-floor retail and underground parking. In accordance with the BelRed zoning, the maximum building height will not exceed 150-feet, plus 15-feet for HVAC. Infrastructure to be constructed to support this proposal includes roadways, utilities, parking, and park space in accordance with the recorded Development Agreement (2009).

   344,636 GSF total

   Building 16 will be an 11-story building and ~~300,962~~ SF. The exterior will be a horizontally faceted glass curtain wall system. This buiding will include ~~11,296~~ SF of retail space.

   12,426 GSF retail included

180,504 GSF total

Building 24 will have nine stories and ~~151,586~~ SF. The exterior will have a vertically faceted facade that provides shading and refraction of light upon its vertical surface to add visual interest and energy efficiency. This building will include ~~4,648~~ SF of retail space. 5349 GSF retail included

In adherence with the City of Bellevue Development Agreement (July 10, 2009) and Master Development Plan Approval with Conditions (May 3, 2012), this proposal includes the following features:

- A one-acre park and 30,000 contiguous square feet of activated or recreation space. This requirement is met with the park spaces being constructed on Tract C and Parcel 12 of the development.
- A traffic signal at 124th Avenue NE and NE 13th Street. Note that NE 13th Street is a temporary street name, the street will be renamed by the City of Bellevue at a later date. See Signal Plan sheet C2-031 of the Revised Conforming ADR plan set dated May 20, 2013.
- A multi-purpose path along 124th Avenue NE adjacent to the Phase 1A development will be constructed. See plan sheet set for illustrations of the path.

9. Other

None.

Estimated date of completion of the proposal or timing of phasing:

Building demolition and construction of the infrastructure (roadways and utilities) for this proposal could begin as early as July 2013. Completion of the two office buildings (16 and 24) is expected by 2015.

Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain.

Future development connected to this proposal includes the full build-out of the Spring District, in accordance with the Master Development Plan Approval with Conditions (approved May 3, 2012). As future phases of the Spring District are constructed, some elements of Phase 1A will be impacted, as follows:

appeal-approval affirmed on Oct. 8, 2012 by H. Examiner

- The temporary parking lot will be eliminated and a building will be constructed in its place
- The temporary park will be relocated to its final configuration

This proposal is the first phase of a multi-phase development to be constructed over the next 15 years. The Spring District phases are described generally next.

- Phase 1A - this proposal;
- Phase 1B includes the addition of more office development and ground-floor retail space; as well as residential buildings on the south side of the property;
- Phase 2 includes city roadway improvements, the arrival of the Sound Transit Light Rail Transit (LRT) station, and the permanent placement of the active and passive park spaces;
- Phase 3 includes additional office and retail space;
- Phase 4 adds a landmark hotel that will provide an additional entry to the LRT station;
- Phase 5 adds development north of NE 16th Street including residential and office/retail space; and
- Phase 6 adds the final office building and residential complex.

Each phase of development will go through the City of Bellevue's Administrative Design Review for adherence to both the approved Master Development Plan and applicable regulations and policies in effect at the time of application.

List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal.

An Final Environmental Impact Statement (FEIS) for the BelRed Corridor Project was issued by the City of Bellevue in July 2007. It designates a Preferred Alternative, identified by the BelRed Steering Committee in May 2007, which will increase density in the western half of the BelRed Corridor by including three closely spaced development nodes in the vicinity of Overlake Hospital Medical Center (OHMC), 122nd, and 130th Avenues NE.

There is a Category III wetland at the western edge of the proposal and is often referred to as the 120th Avenue NE wetland. The City has documented that it will mitigate this wetland for the 120th Avenue NE widening project. The wetland has been delineated and the mitigation plan documented in the City's NE 4th/120th Avenue NE Corridor Project Wetland and Stream Delineation Technical Report (April 2011).

While this wetland is not within this proposal boundary, the wetland buffer (60-feet per City of Bellevue Critical Areas Overlay District code) does lie partially within the proposal boundary. This buffer will be impacted in order to connect water and stormwater lines to existing facilities within 120th Avenue NE. Per City of Bellevue Critical Areas Overlay District LUC 20.25H.210, a critical areas report and buffer restoration plan will be required. The proposal proponent has hired a consultant to complete a critical areas report to further document the wetland, identify buffer impacts, and provide a buffer restoration plan associated with the proposal's construction.

Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain.

The City of Bellevue 120th Avenue NE widening project will eliminate the wetland at the corner of 120th Avenue NE / NE 12th Street.

List any government approvals or permits that will be needed for your proposal, if known. If permits have been applied for, list application date and file numbers, if known.

In addition to the ~~Administration~~ Design Review, this proposal requires local permits, including demolition, building, clearing and grading, critical areas, and utilities as well as coverage under Ecology's stormwater general NPDES permit.

Please provide one or more of the following exhibits, if applicable to your proposal. (Please check appropriate box(es) for exhibits submitted with your proposal):

- Land Use Reclassification (rezone) map of existing and proposed zoning
- Preliminary Plat or Planned Unit Development Preliminary plat map
- Clearing and Grading Permit
- Plan of existing and proposed grading *See accompanying ADR submittal documents
- Development Plans
- Building Permit (or Design Review)
- Site Plan *See accompanying ADR submittal documents
- Shoreline Management Permit

A. ENVIRONMENTAL ELEMENTS

1. Earth

a) General description of the site (circle one): Flat, rolling, hilly, steep slopes, mountainous, other….

b) What is the steepest slope on the site (approximate percent slope)?

The affected geographic area is generally flat, with the exception of a graded artificial slope located at the western edge of the site along 120th Avenue NE. The slope is up to 50-percent in places.

c) What general types of soils are found on the site (for example, clay, sand, gravel, peat, muck?) If you know the classification of agricultural soils, specify them and note any prime farmland.

Hart Crowser dated 4/6/12

The land has been developed since the 1960's and does not include any prime farmland. A geotechnical engineering report dated November 11, 2005 and updated in 2012 confirms significant fill exists on site consisting of medium dense sand to silty sand and medium stiff to hard sandy silt with varying amounts of gravel and organics. Soils beneath the fill are classified as lacustrine deposits underlain by glacial till consisting of dense to very dense silty sand. According to the geotechnical engineer of record, the slope is stable and capable of the proposed development.

d) Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe.
There are no known indications of or history of unstable soils in the immediate vicinity. The slope along 120th Ave NE is a man-made slope with no visible or known history of instability.

e) Describe the purpose, type, and approximate quantities of any filling or grading proposed. Indicate source of fill.
Proposed earthwork includes the excavation of approximately 145,000 CY of material for construction. It is anticipated 8,000 CY of soil will be used for fill on-site, if suitable. Fill trucked in from off-site will come from approved suppliers.

f) Could erosion occur as a result of clearing, construction, or use? If so, generally describe.
As with all construction activities, there is the possibility of erosion associated with the clearing and construction of the proposal site. The excavation and grading of the proposal area has the potential to cause erosion if construction stormwater is not properly managed.

g) About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)?
After construction, the Phase 1A project area will be covered in 69% impervious surface, as documented in the Impervious Coverage Memorandum. This is in compliance with City of Bellevue LUC 20.25D.080, which allows up to 75% impervious surface lot coverage in the Bel-Red Land Use Districts. Pervious surfaces will include planter strips, bioretention cells, park spaces, and an 8,400 SF green roof on Building 16.

h) Proposed measures to reduce or control erosion, or other impacts to the earth, if any:

As required by the Washington State Department of Ecology, the project proponent has prepared and will adhere to a construction stormwater pollution prevention plan (CSWPPP) as well as employ Best Management Practices (BMPs) to minimize peak stormwater flows, prevent soil erosion, capture water-borne sediment from exposed soils, and protect water quality from on-site pollutant sources. These BMPs include an erosion control plan prepared in accordance with City of Bellevue standards and the Stormwater Management Manual for Western Washington. The City of Bellevue Storm and Surface Water Engineering Standards provides guidance to prevent erosion downstream of construction sites. In accordance with the City's NPDES permit, a Certified

TESC per BCC 23.76 + CSWPPP
Erosion control

Erosion Control Lead (CERCL) will be on-site during construction.

Some measures that may be implemented during construction to manage source control and runoff conveyance and treatment include: road/parking area stabilization, wheel wash, dust control, concrete handling, construction timing, erosion control fencing, outlet protection, silt fencing, sediment traps, and construction stormwater chemical treatment. Additional devices and methods, including those recommended by the geotechnical engineer of record, may be employed to ensure the erosion potential is minimized.

In addition to measures during construction, the proposal's design will provide long-term erosion control by reducing the amount of impervious surfaces within the project boundary. This increase in pervious surfaces will allow more stormwater to infiltrate on-site and help reduce the risk of erosion.

2. Air

a) What types of emissions to the air would result from the proposal (i.e., dust, automobile, odors, industrial wood smoke) during construction and when the project is completed? If any, generally describe and give approximate quantities if known.
During construction, emissions to the air will be released by construction vehicles and heavy equipment. Following construction, emissions from vehicle traffic within the development will be released. Construction will temporarily increase dust and vehicle emissions near the construction area. Mitigation will include using BMPs to control dust, cover exposed soils, and require idling vehicles to be shut off.

The BelRed Corridor FEIS (2007) predicts that as a result of increased traffic in the study area (Bel-Red), carbon monoxide emissions would increase by about 40-percent over the No-Action Alternative, and emissions of particulates would increase by about 30-percent. It also states emissions are expected to remain within acceptable air quality standards. Washington State Department of Ecology (Ecology) has jurisdiction over air quality. This proposal does not trigger the need for a quantitative analysis, as the emissions are under the 25,000 MTCO2e threshold established by Ecology. However, a qualitative analysis, along with mitigation options, is included in the attached Greenhouse Gas Memorandum. See JMJ Team report dated 5/10/13 RE: greenhouse gas emissions

b) Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe.
There are no known off-site sources of emissions or odor that would affect this proposal.

c) Proposed measures to reduce or control emissions or other impacts to air, if any:
The City of Bellevue imposes standard practices as part of its Clearing and Grading permit (Bellevue City Code 23.76). Mitigation will include using BMPs to control dust and vehicle emissions near the construction area. Construction vehicles will be fitted with required, factory-installed emission control devices. To reduce the potential of dust, construction accesses will be covered with rock or aggregate. Dust emissions will also be reduced during construction through the use of spray water as necessary during dry weather conditions and planting disturbed areas with erosion control seed mix as soon as is practical. Material stockpiles will also be covered or watered as necessary to control dust.

The Bel-Red Corridor FEIS states that despite the predicted increase in traffic volumes and emissions, the Bel-Red Corridor redevelopment is not likely to result in any exceedance of the air quality standards. Maintaining traffic flow will reduce vehicles idling and, therefore, reduce pollutant emissions from vehicles.

As described in the Greenhouse Gas Emissions Memorandum, Buildings 16 and 24 will be constructed using adaptive building reuse, sustainably grown and regionally produced projects, and high-performance systems. By selecfting durable and less energy consuming building components, the applicant has a proven history of

BCC 23.76 dust suppresant measures

building sustainable, 100-year lifespan structures.

3. Water

1. Surface:

a) Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into.

The proposal area is approximately 400 feet northeast of Lake Bellevue. There is one Category III wetland (0.19-acre) located directly to the southwest of the proposal along 120th Avenue NE. This wetland is entirely within the City's 120th Avenue NE widening project and will be mitigated as part of the project by the City of Bellevue. The wetland is documented in the Bel-Red Corridor Study FEIS (City of Bellevue, 2007) and the Wetland and Stream Delineation Technical Report (2011) for the 120th Avenue NE widening project. The wetland flows to Lake Bellevue, which flows to Sturtevant Creek to the southwest. The proposal will require work within, and restoration of, the 60-foot wetland buffer.

Kelsey Creek is located approximatley 300 feet northeast of the proposal. The proposal will not affect Kelsey Creek.

b) Will the project require any work over, in, or adjacent to (within 200 feet) the described waters? If yes, please describe and attach available plans.

The proposal will connect water and stormwater lines to existing facilities within 120th Avenue NE. This will require work within 200 feet of the 120th Avenue NE wetland and will impact approximately 3,020 square feet of wetland buffer, as described in the proposal's Critical Areas Report (Shannon & Wilson, 2012). The City of Bellevue mitigation requirement for Category III wetland buffer impacts is 1:1. As required by the wetland buffer restoration plan per Bellevue LUC 20.25H.080, the impacted buffer will be revegetated to its previous condition, and per the Restoration Plan included in the Critical Areas Report.

See staff report Critical Areas Permit per LUC 20.30P

In addition, the ~~proposal is using buffer averaging to adjust the wetland's 60-foot wetland buffer in accordance with Bellevue LUC 20.25H.095~~. As required by code, the wetland's total buffer area will not be reduced; the buffer area will remain contiguous; the averaging will not impact slope stability; the buffer will maintain a width of at least 45-feet (75% of the 60-foot required buffer); and the ecological function of the wetland will not be impacted. The wetland has moderate habitat functions (14 points) as described by Shannon & Wilson in the 120th Avenue NE widening project Wetland and Stream Delineation Technical Report (2011).

During construction, the proposal will implement and maintain temporary erosion and sediment control and best management practices to minimize impacts to critical areas during construction. Disturbed areas will be restored to preconstruction grades and stabilized after construction.

c) Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the site that would be affected. Indicate the source of fill material.

Approximately 75 CY of material will be removed from the wetland buffer to place the water and stormwater conveyance lines. After installation, clean material from a WSDOT-approved source will be used to replace the dredged soil and restore the wetland buffer per the wetland buffer restoration plan.

d) Will the proposal require surface water withdrawals or diversions? Give general description, purpose, and approximate quantities if known.

The proposal will not require surface water withdrawals or diversions. Stormwater flows will not be

diverted away from the wetland.

e) Does the proposal lie within a 100-year floodplain? If so, note location on the site plan.

According to FEMA Flood Insurance Rate Maps, Community Panel numbers 53033C0368F and 53033C0656F (eff. May 16, 1995), the affected geographic area is not within the 100-year floodplain.

f) Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge.

No waste materials will be discharged to surface waters. Stormwater from pollution-generating surfaces will be collected and treated before conveyance through approved systems and eventually discharge to Lake Bellevue.

b. Ground:

1) Will ground water be withdrawn, or will water be discharged to ground water? Give general description, purpose, and approximate quantities if known.

Geotechnical explorations have shown that the excavation for the underground parking garages will encounter perched groundwater. During construction, an engineered system of shoring and drainage will be in place to dewater, or isolate, the excavated area. The water removed from the excavation during dewatering will be treated as needed and discharged to the storm system, which ultimately discharges to Lake Bellevue. Once constructed, the building foundations will only locally displace groundwater and not prevent the groundwater from freely flowing around the structures.

2) Describe waste material that will be discharged into the ground from septic tanks or other sources, if any (for example: Domestic sewage; industrial, containing the following chemicals; agricultural; etc.). Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve.

The proposal does not include the discharge of waste materials into the ground from septic tanks or other sources. All buildings will be served by the City's public sewer system.

c. Water runoff (including stormwater):

1) Describe the source of runoff (including storm water) and method of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? If so, describe.

In compliance with the Washington Department of Ecology Stormwater Management Manual for Western Washington, the proposal is required to provide enhanced stormwater treatment of pollution-generating surfaces. Therefore, surface runoff from roadways and the surface parking lot will be collected and treated through bioretention cells (rain gardens) before entering the underdrain and leaving the site through a stormwater conveyance system. The system will connect to the existing storm drainage system at 120th Avenue NE where it is conveyed to Lake Bellevue.

Sidewalks, because they are non-pollution generating, will drain to planter strips and have the opportunity to infiltrate.

2) Could waste materials enter ground or surface waters? If so, generally describe.

It is not anticipated that waste materials will enter ground or surface waters associated with this proposal. As with all projects, there is a possibly of waste materials entering ground or surface waters during construction.

3) Proposed measures to reduce or control surface, ground, and runoff water impacts, if any:

The proposal will comply with all applicable requirements of the Drainage Design & Erosion Control Manual and applicable stormwater manual. During construction, contractors will be required to have a Spill Prevention Control and Countermeasure Plans and a Stormwater Pollution Prevention Plan (SWPPP) in place.

Stormwater systems will be designed and operated in accordance with relevant standards and requirements and will be treated prior to discharge into an approved system. In addition, the proposal is implementing enhanced stormwater treatment through the use of bioretention cells for treating stormwater runoff from the roadways and surface parking lot. The proposal is expected to decrease overall adverse impacts to the quality of surface water leaving the site as currently no stormwater treatment exists. In addition to stormwater treatment, design elements will have a positive impact on stormwater runoff. Examples include an 8,400 SF green roof on Building 16 to decrease impervious surfaces.

The proposal is within the Lake Bellevue Stormwater Sub-basin. As stormwater from several sites enters Lake Bellevue, sources of phosphorus levels in the lake were investigated and documented in the Lake Bellevue Water Quality Study and Management Recommendations Report (December 2006). A technical memorandum dated May 23, 2012 and included in the ADR submittal for Phase 1A includes details of this report. The report finds that sources of phosphorous in Lake Bellevue are mostly attributed to internal sources (76%). The Spring District accounts for 26% of the total stormwater runoff within the Lake Bellevue Sub-basin. While the proposal is not a major contributor of flow to Lake Bellevue, it is important to note that the proposal will not re-direct stormwater flows away from Lake Bellevue. The stormwater flow will maintain its historic pattern of entering the lake. The proposal's construction of low impact development techniques will reduce the peak stormwater flow rates to Lake Bellevue by slowing the rate it reaches the lake while not reducing overall flow volumes to the lake.

COB Utility Codes/Engineering Standards imposed through Developer Extension Agreement BCC 24.02, 24.04, 24.06

4. Plants

a. Check or circle types of vegetation found on the site:

X deciduous tree: alder, maple, aspen, other
X evergreen tree: fir, cedar, pine, other
_____ shrubs
_____ grass
_____ pasture
_____ crop or grain
_____ wet soil plants: cattail, buttercup, bullrush, skunk cabbage, other
_____ water plants: water lily, eelgrass, milfoil, other
_____ other types of vegetation

b. What kind and amount of vegetation will be removed or altered?

Various deciduous trees and shrubs, including a few cottonwood trees, will be removed.

New plants will be installed, including parks, street trees, rain gardens, green screen

c. List threatened or endangered species known to be on or near the site.

There are no threatened or endangered species known to occur on or near the site.

d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any:
There is limited vegetation currently on the site. While development of the site will require the removal of deciduous trees and shrubs, the proposed development includes significant landscaping, including mature street trees, open spaces, and parks for public use. In particular, the design of this phase includes the planting of 90 trees, two parks, and a park where 115 future street trees will be planted for future phases of development.

LandSC. per LUC 20.25D + Bel Red Corridor Plan ✓

5. Animals

a. Circle any birds and animals which have been observed on or near the site or are known to be on or near the site:

birds: hawk, heron, eagle, songbirds, other:
mammals: deer, bear, elk, beaver, other:
fish: bass, salmon, trout, herring, shellfish, other:

b. List any threatened or endangered species known to be on or near the site.
There are no threatened or endangered species known to occur on or near the site.

c. Is the site part of a migration route? If so, explain.
Yes, however, most of Western Washington is generally located in the Pacific Flyway for migratory waterfowl.

d. Proposed measures to preserve or enhance wildlife, if any:
As there is no known wildlife on the site, no preservation measures are needed. As the proposal site currently does not have any known wildlife, the increase in pervious surfaces, landscaping with native and ornamental plants, and creation of two parks will make habitat available for typical urban animals such as squirrels and birds.

Future landscaping will provide opportunities for small urban animals, such as squirrels, moles, and native birds.

6. Energy and natural resources

a. What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc.
The office buildings will require electricity and natural gas energy for heating/cooling associated with office and commercial retail needs.

b. Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe.
It is not likely the development will affect the potential use of solar energy by adjacent properties. The proposal will not shade adjacent properties.=

c. What kinds of energy conservation features are included in the plans of this proposal? List other proposed measures to reduce or control energy impacts, if any:
The buildings will be constructed to obtain Leadership in Energy and Environmental Design (LEED) certification. This certification ensures low impact design is used to minimize energy usage. A few examples of LEED features include LED lighting, sustainable or renewable materials, and purchasing local building materials to limit truck transit.

7. Environmental health

a. Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste that could occur as a result of this proposal? If so, describe.

Several underground storage sites were previously removed and no groundwater contamination was identified. The site received a No Further Action determination from Ecology in 2009. As with all sites, there may be a risk of spills during construction.

1) Describe special emergency services that might be required.

The need for special emergency services is not anticipated. The buildings are limited to office and commercial retail use. This proposal does not include facilities storing or processing toxic chemicals.

2) Proposed measures to reduce or control environmental health hazards, if any:

Spill Prevention and Control Plans will be utilized by contractors working on-site during construction.=

b. Noise

1) What types of noise exist in the area which may affect your project (for example: traffic, equipment, operation, other)?

Noise from nearby roadways exists, including freeways I-405 and SR-520 and ~~arterials~~ minor arterials 124th Avenue NE and NE 12th Street. Noise from these facilities and other surrounding uses is standard roadway noise and will not affect the proposal.

2) What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation, other)? Indicate what hours noise would come from the site.

During construction, the site will produce temporary construction noise. The BelRed Corridor FEIS states that long-term noise impacts from the BelRed Corridor would be similar to the No-Action Alternative (70 to 72 dBA) in areas proposed for residential development. Noise created by the proposal would be typical vehicle noise associated with office and commercial retail uses.

Noise Control per BCC 9.18

3) Proposed measures to reduce or control noise impacts, if any:

Bellevue City Code allows noise-related construction from 7AM to 6PM Monday through Friday and 9AM to 6PM on Saturday, except Federal holidays and as further defined by Bellevue City Code. The use of best available noise abatement technology consistent with feasibility is required during construction to mitigate construction noise impacts to surrounding uses. These standard requirements are imposed with the construction permits. An example of a requirement to be imposed includes properly fitting motorized construction equipment with mufflers to reduce engine noise associated with short-term construction noise.

For long-term noise control, the site could employ building and site design measures, including landscaped buffers and other sound-proofing techniques.

Noise Control per BCC 9.18

8. Land and shoreline use

a. What is the current use of the site and adjacent properties?

The development area currently contains a warehouse and an administration building. The uses on-site include warehouse, distribution, and accessory uses. Adjacent properties include warehouse, office, commercial and residential uses.

b. Has the site been used for agriculture? If so, describe.

In the 1950's, Safeway developed the site for light industrial uses. Prior to that time, the BelRed Corridor area was used for agricultural production. No agricultural land will be disturbed as a result of this proposal.

c. Describe any structures on the site.

There are currently two buildings within the Phase 1A project boundary. A 354,429 SF grocery warehouse and a 3,881 SF administration building.

d. Will any structures be demolished? If so, what?

The grocery warehouse and the administration building will be demolished as part of this phase of development. 358,310 SF to be demolished

e. What is the current zoning classification of the site?

In 2009, the BelRed Corridor FEIS evaluated alternatives for land use and density within the corridor. The proposal site is located within the transit station development node and was rezoned from light industrial to office/residential. (2 office bldgs) BR-OR-1 and (other work) BR-OR-2

f. What is the current comprehensive plan designation of the site?

The current comprehensive plan designation is mixed-use office/residential. Same

g. If applicable, what is the current shoreline master program designation of the site?

Not applicable.

h. Has any part of the site been classified as an "environmentally sensitive" area? If so, specify.

No, other than a ~~potentially~~ steep slope in the vicinity as described earlier in this checklist. west side of project area

i. Approximately how many people would reside or work in the completed project?

There are no residential units during this initial phase of development. When the two office buildings are complete, they will accommodate approximately 1,850 office and 32 retail employees.

j. Approximately how many people would the completed project displace?

The Proposal will not displace any residents as the current use of the site is industrial with no residences. The grocery warehouse and administration building currently employ approximately 179 employees that will be displaced as the buildings are demolished.

k. Proposed measures to avoid or reduce displacement impacts, if any:

The applicant is not proposing any measures to avoid displacement impacts. In the BelRed Corridor FEIS, the City considers potential mitigation for the displacement of industrial workers to include City assistance in finding relocation opportunities in the corridor or elsewhere in Bellevue.

l. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any:

This Proposal is in alignment with the approved Master Development Plan, Development Agreement, the City's existing comprehensive plan, and the FEIS for the BelRed Corridor. Alignment with these plans ensures compatibility with existing and projected land use plans. Any future development that may be proposed within the BelRed Corridor and/or the affected geographic area would be reviewed for compliance with existing regulations in place at the time of the application.

9. Housing

a. Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing.

No residential housing will be constructed during this phase of the proposal.

b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing.

This Proposal will not eliminate any existing housing units as none are currently on-site.

c. Proposed measures to reduce or control housing impacts, if any:

The Proposal will not have an impact on existing housing units, and therefore no housing impact reduction or control is necessary.

10. Aesthetics

a. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed?

Land use zoning within the project site allows buildings up to 150 feet tall. The proposal will follow existing Bellevue Land Use Code along with any future code amendments in effect at the time of permitting.

Building 16 will be an 11-story building and ~~300,962~~ 344,636 SF. The exterior will be horizontally faceted glass curtainwall. Building 24 will have nine stories and ~~151,586~~ 180,504 SF. The exterior will have a vertically faceted facade that provides interesting shading and refraction of light along the surface of the structure to add visual interest and energy efficiency.

b. What views in the immediate vicinity would be altered or obstructed?

The BelRed Corridor FEIS included a view/visual analysis component. The analysis found that taller buildings on the ridgetop location of The Spring District would be prominently visible from several public vantage points. From City Hall and the western terminus of the SR-520 Trail at NE 24th Street, these buildings would intersect the distant ridge lines but would not block significant views, such as of Mount Rainier. At the public vantage points on BelRed Road and on 124th Avenue NE, the buildings would be prominent but would not block significant views.

c. Proposed measures to reduce or control aesthetic impacts, if any:

Streetscapes, buildings, and accesses to and views of specific natural environments on the site have been carefully considered. The construction of Phase 1A includes usable park space, including planting space for maturing street trees to be installed during future phases of development. In

addition to these amenities, the roadways will include street trees, planters, and bioretention cells that will add aesthetic qualities to the proposal. The buildings are designed with screening to mask the mechanical equipment on the roof and the buildings' design reflect modern architecture details.

11. Light and glare

a. What type of light or glare will the proposal produce? What time of day would it mainly occur?

The new office buildings along with street lighting and traffic on the roadway network will increase light and glare at night.

b. Could light or glare from the finished project be a safety hazard or interfere with views?

It is not anticipated that light or glare from this project will be a safety hazard or interfere with views. The proposal is 400 feet away from the closest residences, therefore any light impacts will be on adjacent businesses that operate after dark and vehicle traffic along adjacent streets.

c. What existing off-site sources of light or glare may affect your proposal?

There are no known off-site sources of light or glare that would affect the proposal.

d. Proposed measures to reduce or control light and glare impacts, if any:

As required by City of Bellevue Land Use Code 20.20.522, exterior lighting will be designed to cast light downward and prevent light and glare spillover offsite. cut off shields per LUC 20.20.522

12. Recreation

a. What designated and informal recreational opportunities are in the immediate vicinity?

Wilburton Hill Park and Botanical Gardens and Kelsey Creek Park are located approximately ¾ miles to 1 mile from the proposal site.

b. Would the proposed project displace any existing recreational uses? If so, describe.

The development will not displace any existing recreational uses.

c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any:

The proposal will include park space in compliance with the Development Agreement and create one acre of park and 30,000 SF of contiguous active space. These amenities will be available for public use.

13. Historic and cultural preservation

a. Are there any places or objects listed on, or proposed for, national, state, or local preservation registers known to be on or next to the site? If so, generally describe.

The Washington State Department of Archaeology and Historic Preservation online GIS map tool does not indicate there are any places or objects listed on any registers within the immediate vicinity of the proposal site.

b. Generally describe any landmarks or evidence of historic, archaeological, scientific, or cultural importance known to be on or next to the site.

None known.

c. Proposed measures to reduce or control impacts, if any:

The proposal is not expected to have any impact on historical or cultural landmarks.

14. Transportation

a. Identify public streets and highways serving the site, and describe proposed access to the existing street system. Show on site plans, if any.

The project site is generally served by NE 12th Street, 124th Avenue NE, and 120th Avenue NE. Freeway access includes SR-520 located north of the site and I-405 to the west.

Primary site access will be from 124th Avenue NE to the new NE 13th Street. The Master Development Plan Approval with Conditions requires a traffic signal to be installed at this intersection to control movement into and out of the proposal.

Additional access to this proposal includes a minimum 20-foot fire/emergency access route that will be maintained and accessed from 120th Avenue NE. This route will provide emergency access to both new buildings.

b. Is site currently served by public transit? If not, what is the approximate distance to the nearest transit stop?

The proposal site is not served by public transit, but public transit, King County Metro, serves the vicinity with bus service, including:

- Route MT 226-O: - approximately 0.1 miles from the project site
- Route MT 249-O: approximately 0.3 miles from the project site
- Route MT 672-O, MT 889-O: approximately 0.3 miles from the project site
- King County Rapid Ride B-Line: approximately 0.3 miles from the project site

c. How many parking spaces would the completed project have? How many would the project eliminate? See Section III - Technical Table 4

Approximately 146 existing parking spaces and five 300-foot parking "lanes" will be eliminated. These parking spaces and lanes are associated with the existing warehouse that is to be demolished.

905/1584 correct 452,548 Net SF

BelRed Land Use Code (20.25D120B.2) parking standards require a minimum of 2.0 and maximum of 3.5 stalls per 1,000 SF of general office use and retail development. The proposal includes ~~452,548~~ SF of office/retail building to be constructed, which equates to the need for ~~906 to 1,58~~6 stalls to meet code. The construction of this proposal will create 1,272 garage parking spaces and 241 surface parking spaces. The temporary surface parking lot will support higher parking demand rates that may be experienced prior to the opening of the light-rail station in future phases of development. This is a total of 1,513 parking spaces for Phase 1A, which is within the allowable range determined by the City. Meets LUC 20.25D.120

for both office + retail both buildings - NET square feet

d. Will the proposal require any new roads or streets, or improvements to existing roads or streets, not including driveways? If so, generally describe (indicate whether public or private).

New roads associated with this proposal include NE 13th Street (public); 121st Avenue NE from NE 13th Street and extending to the end of the Phase 1A boundary (public), 123rd Avenue NE extending from NE 13th Street to the Phase 1A boundary (public) and 123rd Avenue extending to the south of NE 13th Street to the southern proposal boundary (private).

See Section II - Technical Section for Transp. Dept. analysis

e. Will the project use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe.

The development does not use or occur in the immediate vicinity of current water, rail, or air transportation.

f. How many vehicular trips per day would be generated by the completed project? If known, indicate when peak volumes would occur.

See Section VI SEPA Transportation Analysis RE: pm peak hour trips

The proponent's traffic engineer has prepared a trip generation analysis for Phase 1A based on City of Bellevue trip generation rates. This analysis shows the two office buildings along with the residential development (permitted by others through a separate ADR) to be constructed in Phase 1A will generate approximately 841 new PM peak hour trips and 8,400 weekday trips. The long-term impacts of development by 2020 have been addressed in the City's Transportation Facilities Plan FEIS (March 5, 2009) and through the future payment of traffic impact fees. The proposal is within the assumptions of the Transportation Facilities Plan FEIS in addition to the Bel-Red Corridor FEIS, which also evaluated the long-term 2030 impacts within the proposal's mobilitiy management area.

g. Proposed measures to reduce or control transportation impacts, if any:

The City's Traffic Code (BCC 14.10) requires that development proposals generating 30 or more PM peak hour trips undergo a traffic impact analysis to determine if the concurrency requirements of the State Growth Management Act are maintained. Therefore, the proposal will include a traffic impact analysis and transportation concurrency prior to permitting.

This trip generation estimate includes trips generated by Buildings 16 and 24 as well as the residential parcels, which are within the boundaries of the Phase 1A impacted area. It is important to note that the residential parcels will be cleared and graded as part of this proposal, however, this SEPA checklist is not intended to disclose the potential environmental impacts from the residential parcels' development. These parcels will go through their own Administrative Design Review with SEPA prior to permitting.

Specific mitigation measures already determined include implementing a Transportation Management Program in accordance with City of Bellevue Code 14.60.070. In addition, this proposal includes the construction of a signalized intersection at 124th Avenue NE / NE 13th Street including left and right turn lanes from NE 13th Street onto 124th Avenue NE.

Roadway improvements adjacent to the proposal that will help reduce transportation impacts include the 120th Avenue NE widening project and the 124th Avenue NE widening project. These projects were identified in the Bel-Red Corridor FEIS as necessary roadway improvements to accommodate the redevelopment of the Bel-Red corridor with mixed-use, high density development. Both of these projects are on the City of Bellevue's Capital Improvement Program list.

Overviews of these projects include:

1. 120th Avenue NE project - currently in the design stage, this City of Bellevue project will widen the roadway along the west side of the proposal site. This widening project, identified in the City's BelRed Corridor FEIS, will accommodate increased density and vehicle trips associated with new development nodes in the corridor, including the proposal site.

2. 124th Avenue NE project - this City of Bellevue project includes improvements to 124th Ave NE by widening to a four-lane arterial with a two-way left-turn lane, sidewalks, and landscaping.

See Transportation Solutions, Inc. Traffic Impact Analysis dated May 20, 2013.

See Section V Transportation Department for technical analysis

See Section VI State Environmental Policy Act (SEPA) for discussion on Long-Term, → Mid-Range, + Short-Term transportation impacts and mitigation

15. Public services

a. Would the project result in an increased need for public services (for example: fire protection, police protection, health care, schools, other)? If so, generally describe.

There will be an increase in demand for fire and police protection services associated with two new office buildings. As there will be no residential development as part of this proposal, no additional students will be added to local schools.

b. Proposed measures to reduce or control direct impacts on public services, if any.

~~Increased tax base from the buildings will offset the financial impact of the additional public services needed.~~

16. Utilities

a. Circle utilities currently available at the site: electricity, natural gas, water, refuse service, telephone, sanitary sewer, septic system, other.

b. Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity which might be needed.

City sewer and water will be extended to serve the demands of the proposal. The sewer lines will connect to the city sewer line that runs along NE 12th Street. The water line will connect to the City's water line along 120th Avenue NE. Telephone service will be provided by a local communications provider and electricity and natural gas will be provided by Puget Sound Energy.

The BelRed Corridor FEIS predicts increases are not expected to result in the need for significant capacity increases by utility providers. See discussion under Utilities Department Section II Technical Review

c. Signature

The above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

Signature: Cindy Edens

Date Submitted: 5/20/13

Attachment C
Development Agreement
Signed on July 10, 2009 and Recorded on September 11, 2009

RECORDED AT THE REQUEST OF:
AND AFTER RECORDING RETURN TO:

FOSTER PEPPER PLLC
Attention: Tayloe J. Washburn
1111 Third Avenue, Suite 3400
Seattle, WA 98101-3299

200909110000269
FOSTER PEPPER AG 78.00
PAGE-001 OF 017
09/11/2009 09:41
KING COUNTY, WA

Unofficial Document

WASHINGTON STATE RECORDER'S Cover Sheet (RCW 65.04)

DOCUMENT TITLE(S) (or transactions contained therein):

Development Agreement

REFERENCE NUMBER(S) OF DOCUMENTS ASSIGNED OR RELEASED:

N/A

☐ Additional reference #s on page ___ of document(s)

GRANTOR(S) (Last name first, then first name and initials)

WR-SRI 120th LLC, a Delaware Limited Liability company

☐ Additional names on page ___ of document

GRANTEE(S) (Last name first, then first name and initials)

City of Bellevue, a municipal corporation

☐ Additional names on page ___ of document

LEGAL DESCRIPTION (abbreviated: i.e., lot, block, plat or section, township, range)

Lot 3, City of Bellevue Short Plat No. LF06-135856

☐ Additional legal is on Exhibit A of document

ASSESSOR'S PROPERTY TAX PARCEL/ACCOUNT NUMBER

1099100102

☐ Assessor Tax # not yet assigned

DEVELOPMENT AGREEMENT

THIS DEVELOPMENT AGREEMENT ("Agreement" or "Development Agreement") is entered into as of the effective date, by and between the **CITY OF BELLEVUE**, a Washington municipal corporation ("City") and **WR-SRI 120th LLC**, a Delaware limited liability company.

RECITALS

A. Intent. This Development Agreement is for the purposes of setting forth the applicable development standards and other provisions related to the development described herein, and is adopted pursuant to the authority provided in RCW 36.70B.170 *et seq.*

B. The City Council, in Ordinance 5858, adopted the Bel-Red Subarea Plan establishing a vision for conversion of the historic pattern of light-industrial land use to office, retail and residential development at densities supportive of high capacity transit. The Bel-Red Subarea Plan is implemented through a package of Land Use Code regulations, adopted in Ordinances 5874 and 5876, and an area-wide rezone of the Subarea, adopted in Ordinance 5875.

C. WR-SRI 120th LLC ("Owner"), owns a 36.01 acre parcel, King County Parcel No.1099100102 (the "Property") located in a Bel-Red Sub-Area office/residential development node zoned BR-OR-1 and BR-OR-2, as legally described on Exhibit A attached hereto and incorporated herein. This site is within one of the areas identified for concentrated development in a Bel-Red Subarea "node." The Owner proposes to develop what it has named "The Spring District" ("TSD") as a Catalyst Project under LUC 20.25D.035 of the City's Bel-Red Subarea provisions aimed at promoting urban revitalization through timely initial redevelopment. To be considered a Catalyst Project, TSD must be submitted as a phased master development plan ("MDP") for approval and permitting purposes by the later of 18 months after the Federal Transit Authority issues a Record of Decision on the Sound Transit East Link Project or December 31, 2011. A mixed-use urban community, The Spring District will include office, residential, and retail components. The Owner proposes to include in The Spring District other major public amenities, such as open spaces, and pedestrian plazas.

D. The Spring District proposal has the potential to embody many of the principles and vision for the corridor articulated by the Bel-Red Steering Committee in its September 2007 Bel-Red Corridor Project Final Report and the City Council in adopting the Bel- Red Subarea Plan and implementing Bel-Red development regulations. The City Comprehensive Plan puts an emphasis on dense nodal development in order to promote energy efficiency and reduce reliance on cars.

E. While the Owner believes that a market will come to exist in the next several years for both commercial and multifamily development at the Bel-Red project site, the transitional nature of the Bel-Red Corridor, coupled with the scope and duration of TSD, introduces significant additional risk and uncertainty. The Owner must make a large up-front capital investment in

project design and planning in order to prepare an MDP under LUC Part 20.30V and subsequent development applications. Over its full term, the Owner projects the development will cost well in excess of $1 Billion. Accordingly, and in order to proceed, the Owner needs to have a high level of certainty regarding regulatory approvals and project costs over an extended period of time, particularly given the lengthy approval and development process for Sound Transit's East Link Project.

F. The City has issued the Bel-Red Corridor EIS and Addenda (collectively referred to as "EIS"). The EIS analyzes at a programmatic level the impacts of substantial new office, residential, and retail development throughout the Bel-Red corridor. The EIS also assesses the impacts of significant office development in two development nodes within the corridor, including the area in and around the Property.

G. The City and the Owner acknowledge the importance of developing TSD as a mixed-use neighborhood with significant residential development. To that end, the City and the Owner recognize that the involvement of a residential developer may help in creating a successful project under this Development Agreement.

H. Development of TSD will meet key objectives of the City embodied in the Comprehensive Plan, the Bel-Red Subarea Plan, the Land Use Code, and other existing city regulations. Specifically, the development of TSD will provide many benefits to the City and the public including, but not limited to, 1) encouraging further redevelopment of the Bel-Red Subarea by providing a central neighborhood and absorbing the substantial risk of being a Catalyst developer in the Sub-Area; 2) enhancing public improvements and infrastructure in an underutilized and underdeveloped area of the city; 3) strengthening the city's economic base with a variety of long-term jobs and near- and long-term construction jobs; and 4) generating substantial City revenues in the form of fees, increased property tax base, and sales tax generation. The City Council therefore finds significant public benefit results from execution of this Development Agreement including, among other things: 1) providing certainty to encourage the required substantial private investment in the planning and development of TSD in years earlier than may otherwise occur; 2) securing orderly development and progressive fiscal benefits for public services, improvements, and facilities planning in the city; 3) ensuring development of certain public amenities in early phases of TSD; 4) providing greater certainty surrounding the timing and amount of residential development in TSD, recognizing that the viability of significant residential development relies on high capacity transit service through the area; and 5) fulfilling and implementing adopted City plans, goals, policies and objectives, including, among others, those embodied in the City's Bel-Red Subarea Plan.

I. The Development Agreement component of the Legislature's 1995 Regulatory Reform legislation provides a flexible tool with which the City can enter into agreements with property owners for a variety of purposes, broadly authorized in the statute. The legislative finding to this state law, RCW 36.70B. 170-200, emphasizes the challenges posed by lack of predictability in the permitting of development projects: "*The legislature finds that the lack of certainty in the approval of development projects can result in a waste of public and private resources, escalate housing costs for consumers and discourage the commitment to*

comprehensive planning which would make maximum use of resources at the least economic cost to the public....".

J. A Development Agreement can commit the City for the duration of the Development Agreement to vesting review procedures and standards for implementing decisions, phasing, mitigation measures, development conditions, permitted uses, residential and commercial intensities and "any other appropriate development requirement or procedure."

NOW, THEREFORE, in consideration of the mutual agreements contained herein, as well as other valuable consideration, the receipt and sufficiency of which are hereby mutually acknowledged, the City and WR-SRI 120th LLC hereby agree as follows:

AGREEMENT

A. Spring District Development Components.

1. **Must Meet Catalyst Project Criteria.** In order to be eligible for the modifications to the Land Use Code and other regulations described in this Agreement, Owner must submit an MDP within the time frame required for "catalyst projects" as set forth in the Land Use Code, and such MDP shall demonstrate that the development proposed meets the definition of catalyst project set forth in LUC Section 20.25D.035.

2. **Minimum Contents of MDP.** Owner agrees to include in its application for an MDP development across the Property with a minimum average FAR of 2.5, which shall include the Residentially-restricted Property (as defined in Section H.) In addition, the first phase of any MDP approved under this Agreement shall include development of a public mini-park a minimum of one acre in size (designated as project M3 in the Bel-Red Parks and Open Space Project List in the Comprehensive Plan) and an activated park or recreation space of at least 30,000 contiguous square feet.

B. Development Standards and Vesting Period.

1. **Master Development Plan Application.** As of the Effective Date of this Agreement, until issuance of the MDP approval consistent with the minimum requirements of Section A above, the provisions of this Agreement, and the Governing Regulations specified in Section C below, shall apply to and govern and vest the review and approval, including associated State Environmental Policy Act (SEPA) review, of the MDP application.

2. **Subsequent Land Use Review.** If the MDP application is approved, then such approval shall be vested for a period of fifteen (15) years from the date of the final decision (as defined in Section 20.35.045 of the LUC) on the MDP (the "Vesting Period"). During the Vesting Period and subject to Section T, the City shall not impose any modification of or new or additional Governing Regulations on the MDP or any Land Use Code approvals required for TSD consistent with this Agreement and the MDP. To the extent that neither this Agreement nor the Governing Regulations specified below address a certain subject, element or condition of the Project, then the Project shall be governed by the City's then-existing code.

3. **Approvals Eligible for Extended Vesting.** The Vesting Period shall only apply to Catalyst Projects on the Property, as defined in LUC 20.25D.035, and associated applications, decisions, and permits. Associated applications, decisions, and permits include those submitted with or during a Catalyst Project MDP application and those related applications submitted subsequent to Catalyst Project MDP approval. All other projects, development, and uses on the Property shall be governed without the benefit of this Development Agreement except as indicated in Section E, below.

C. Governing Regulations.

1. **Designation of Governing Regulations.** Except as specified otherwise herein, the existing city development regulations that govern development of the Property and shall be considered vested pursuant to the provisions of this Agreement, include and are limited to the following as they exist on the Effective Date of this Agreement (collectively, the "Governing Regulations"):

- Title 20 – Land Use Code (except process-related provisions, including Part 20.30 and Part 20.35)
- Title 21 – Comprehensive Plan to the extent applied to TSD through the provisions of the LUC

The Parties agree that SEPA applies to permits that will be issued during the Vesting Period. The City shall not exercise its substantive SEPA authority to impose conditions on Land Use Code approvals issued during the Vesting Period in a manner that is inconsistent with the Governing Regulations.

Subject to Section T, these Governing Regulations shall be applied to the Property and TSD during the Vesting Period, except as indicated below.

Except as otherwise specifically provided herein, Owners shall comply with all city ordinances, regulations, development standards and policies in effect at the time of application or issuance of an approval, as the case may be.

2. **Revised Governing Regulations After Sound Transit Operational.** On or after the date Sound Transit's East Link Project or other high-capacity transit operating within a dedicated transit-only right-of-way begins regularly scheduled passenger-carrying service to a transit station within the Property, any application for design review or other required Process II permit under the LUC on the Property shall be subject to the following code provisions (or substitute code sections specifically designated as such by city ordinance) as they exist on the date of issuance of the design review or other Process II decision: LUC 20.25D.030.C (Design Review), LUC 20.25D.110 (Landscape Development), LUC 20.25D.120 (Parking/Circulation), LUC 20.25D.130 (Bel-Red Development Standards), LUC 20.25D.140 (Bel-Red Street Development Standards), LUC 20.25D.150 (Design Guidelines) (collectively referred to as the "Revised Governing Regulations").

3. **Revisions to the Master Development Plan.** Owner acknowledges that it may be required to modify the MDP in order to remain consistent with the Revised Governing

Regulations. Review of such modification shall be based on the Governing Regulations and Revised Governing Regulations. Notwithstanding the provisions of Land Use Code Section 20.30V.160, any other modification, revision or amendment proposed to the MDP during the Vesting Period shall be reviewed against the Governing Regulations and Revised Governing Regulations, so long as the proposed modification, revision or amendment is consistent with the general scope, purpose and intent of this Agreement and the original MDP.

Approval of any modification or revision to the MDP shall not extend the expiration date of the Vesting Period.

D. No Approval of Project-related Actions

The Owner has not made any development proposal relating to The Spring District, and plans to do so consistent with the Catalyst Project provisions of Chapter 20.25D and other applicable provisions of the Bellevue Land Use Code. The execution of this Development Agreement does not, in and of itself, permit any development at this time.

Nothing in this Agreement shall be interpreted to limit the exercise by City of its regulatory powers with respect to any development proposal on the Property, including The Spring District MDP or other regulatory matters in accordance with applicable law. Nor shall this Agreement be interpreted as: a) a determination as to the consistency of The Spring District MDP with applicable plans, codes and ordinances, b) an agreement or commitment to approve any or all development on the Property, nor c) any commitment whatsoever by City with respect to any future City discretionary decisions that may be required for development of the Property. A permit or approval issued by the City after the execution of this Development Agreement shall be consistent with this Development Agreement.

E. Proportional Compliance.

Any proportional compliance requirements in LUC 20.25D.060.G that would otherwise apply to the Property as a result of application of the Existing Development provisions of LUC 20.25D.060.G shall be deferred from the period of the Effective Date of this Agreement through a final decision on the MDP, so long as the MDP is applied for within the timeframe established for catalyst projects in LUC Section 20.25D.035.A. Any deferred proportional compliance obligation shall be waived if the MDP is approved by the City. If Owner fails to apply for the MDP within the required timeframe under this Agreement, or if the MDP is denied, then the proportional compliance obligations deferred under this Section D shall become immediately due and Owner shall apply for any necessary permits or approvals to perform such proportional compliance with 60 days of expiration of the timeframe or issuance of the denial. Notwithstanding any provision in the associated permits to the contrary, work to complete the proportional compliance obligation shall be completed within 180 days of issuance of the required permits or approvals, unless extended by the City to accommodate any conditions or restrictions on timing of the work.

F. FAR Amenity Bonus System.

1. **Adjustment of Tier 1 Fee-in-lieu Rate.** For a Catalyst Project on the Property, the Owner may choose to comply with the LUC 20.25D.090 requirements for Tier 1 amenities

by paying a fee-in-lieu at a rate of $3.75 for each square foot of floor area for the first 750,000 square feet of development under the MDP, and by paying a fee-in-lieu rate of $4.00 for each square foot of floor area above 750,000 square feet. In the alternative, this Development Agreement provision shall not bar the Owner, at its choice, from utilizing the LUC 20.25D.090 standards as of the Effective Date to provide required amenities.

2. **Amenity Rate for Certain Required Open Space.** Owner may receive credit towards required amenities for the mini-park and activated park or recreation space required to be included in Phase 1 of the MDP under Section A above as provided in this Section F.

a) Mini-Park: Owner shall receive credit towards required amenities for dedication of the M-3 mini-park at the bonus rate set forth in 20.25D.090.C.7 Tier 1b.2 (Park Dedication) and/or Tier 1b.3 (Park Improvements).

b) Other Activated Park or Recreation Space: Owner may receive credit towards required amenities for the activated green space as follows:

- at the Tier 2 bonus rate so long as it is developed according to the design criteria set forth in 20.25D.090.C.7 Tier 2.12 (Active Recreation Area); or
- at the Tier 1b bonus rate set forth in 20.25D.090.C.7 Tier 1b.2 (Park Dedication) if the entire area is dedicated to the City, and it meets the design criteria 2 through 4 in that section; and/or
- at the Tier 1b bonus rate set forth in 20.25D.090.C.7 Tier 1b.3 (Park Improvements) if improvements are made according to the design criteria 1 through 5 set forth in such section.

Unless the activated park or recreation space meets one of the provisions above, it shall not receive credit towards required amenities.

3. **Eligibility for Other City Credits, Bonuses or Offsets**. Notwithstanding any provision of city code to the contrary, any public infrastructure required as a condition of approving the MDP that meets the criteria of LUC 20.25D.035.A.3.a through c shall not be eligible for and shall not earn any of the credits, bonuses, or offsets described in LUC 20.25D.035.A.3.d through f.

G. Concurrency.

The Bellevue Traffic Standards Code, Chapter 14.10 BCC, allows a development agreement to adjust the timing of traffic concurrency analysis and the expiration date of concurrency approval. The City and the Owner agree to the amended analysis time and concurrency expiration date specified below.

1. **Timing of Concurrency Analysis and Determination.** For purposes of approving the MDP, the concurrency analysis pursuant to Chapter 14.10 BCC (the Traffic Standards Code or TSC) shall not be required at the time of the master development plan application. Owner acknowledges that approval of the MDP is not a guarantee, assurance,

acknowledgement or statement of any kind about whether all or any part of the development included in the MDP would satisfy the requirements of Chapter 14.10 BCC, with or without mitigation. Owner acknowledges that approval of the MDP does not limit the City's ability to require compliance with Chapter 14.10 BCC, as modified in this Agreement, which compliance may include denial or conditioning of phases of the MDP. For purposes of compliance with the TSC, the required concurrency analysis and determination shall be conducted on each phase of the MDP, which analysis and determination shall be made at the time of application for the first design review or other required Process II approval for development within such phase.

2. **Vesting of Concurrency Approval.** The concurrency approval issued for each phase shall expire five years from the date of issuance of the Land Use Code approval with which it was issued, provided that such five year period shall be extended consistent with the provisions of BCC 14.10.040.F.1; and further provided that in no event may development consisting of more than 1,000,000 square feet of commercial development be vested at any given time. For purposes of this Paragraph, hotels shall not be considered commercial development.

H. Catalyst Project Residential Requirements and Delay Penalty.

1. **Designation of Residentially-restricted Property.** The master development plan must designate at least 5.8 acres within the MDP for residential use and associated required ground floor commercial or retail uses, exempt ground floor retail and exempt childcare or nonprofit space (as described in LUC Section 20.25D.090). Such area shall be designated as the "Residentially-restricted Property." The MDP shall further establish a requirement that a minimum of 784,000 square feet of residential development, exclusive of the associated uses described above, be developed within the Residentially-restricted Property. A covenant restricting use shall be recorded against the property and run with the land.

2. **Required Timing of Development.** The Residentially-restricted Property shall be developed with residential uses in an amount proportional to the amount of project limit area developed with commercial uses on the Property by no later than the date that Sound Transit's East Link Project or other high-capacity transit operating within a dedicated transit-only right-of-way begins regularly scheduled passenger-carrying service to a transit station within the Property. For purposes of determining compliance with this Section H, "developed with" residential or commercial use means that such development shall be constructed or underway with an issued building permit.

3. **Sale of Residentially-restricted Property.** It is acknowledged that Owner intends to sell the Residentially-restricted Property to a third party. In order to avoid the penalty described in Paragraph 4 below, any sale of Residentially-restricted Property must be to an unrelated third party, and must be closed at least three years prior to Sound Transit's East Link Project or other high-capacity transit operating within a dedicated transit-only right-of-way beginning regularly scheduled passenger-carrying service to a transit station within the Property. Owner acknowledges that additional approvals, including subdivision or binding site plan approvals, may be required in order to create a parcel or parcels of residentially-restricted property for sale to third parties.

4. **Penalty for Failure to Develop Residentially-restricted Property.** A penalty for delay in developing the Residentially-restricted Property by the time set forth in Paragraph 2 above shall be imposed at the time of any application for any approval of further commercial development on the Property if both of the following conditions are satisfied on or after the date that Sound Transit's East Link Project or other high-capacity transit operating within a dedicated transit-only right-of-way begins regularly scheduled passenger-carrying service to a transit station within the Property:

a) WR-SRI 120th LLC is the fee owner of any portion of the Residentially-restricted Property. For purposes of this Development Agreement, WR-SRI 120th LLC will be considered the fee owner of the Property if the fee owner of the Property is an entity related to Shorenstein Properties LLC or Wright Runstad & Company or subsidiaries or affiliates; or if WR-SRI 120th LLC is not the fee owner, the sale of the Residentially-restricted Property was not closed at least three years prior to Sound Transit's East Link Project or other high-capacity transit operating within a dedicated transit-only right-of-way beginning regularly scheduled passenger-carrying service to a transit station within the Property.

b) That portion of the Residentially-restricted Property that is proportional to the amount of project limit area developed with commercial uses is not developed with a residential use.

Penalty to be applied if both of the two above conditions are met: The next application for design review on the Property must include a proposal to develop that portion of Residentially-restricted Property necessary to be proportional to the total of: a) the amount of commercial development developed on the Property; and b) the amount of commercial development proposed in any active building permit on the Property.

I. Term, Amendment, and Termination

This Development Agreement shall go into effect on the date it is executed by the Owner and the City ("Effective Date"). This Development Agreement shall be effective until the later of 18 months after the Federal Transit Authority issues a Record of Decision on the Sound Transit East Link Project or December 31, 2011; provided that the term shall automatically be extended for an additional two years (or such different period agreed to by the parties as a negotiated permit review timeline) so long as an MDP consistent with this Agreement is filed prior to expiration and is diligently pursued by Owner; and further provided that the term of the Development Agreement shall be automatically extended for the effective life of any MDP approved consistent with this Agreement. Upon expiration of such period, as may be extended above, this Development Agreement shall automatically terminate.

Other than as set forth in Section T, no amendment to this Development Agreement shall be effective unless approved by both parties in writing.

J. Binding Effect; Assignability.

This Development Agreement shall bind and inure to the benefit of the Parties hereto and their respective successors, heirs, legatees, representatives, receivers, trustees, successors, transferees

and assigns. Prior to submittal of an MDP consistent with this Agreement, Owner may not assign its interest or obligations under this Agreement without the City's prior written consent, which shall not be unreasonably withheld. If an MDP consistent with this Development Agreement is submitted, Owner may assign its interest and obligations under this Agreement without the City's consent. Notwithstanding the foregoing, Owner may assign its interest and obligations hereunder to an affiliate or related entity owned, controlled by or under common control with Owner without necessity of City's consent but only following delivery of written notice of such assignment, together with such documents as are reasonably necessary to confirm the relationship between Owner and such affiliated entity.

K. Representations and Warranties.

Each signatory to this Development Agreement represents and warrants that he or she has full power and authority to execute and deliver this Development Agreement on behalf of the Party for which he or she is signing, and that he or she will defend and hold harmless the other Parties and signatories from any claim that he or she was not fully authorized to execute this Development Agreement on behalf of the person or entity for whom he or she signed. Upon proper execution and delivery, this Development Agreement will have been duly entered into by the Parties, will constitute as against each Party a valid, legal and binding obligation that shall run with the land, and will be enforceable against each Party in accordance with the terms herein.

L. Specific Performance and Enforcement.

The Parties specifically agree that damages are not an adequate remedy for breach of this Development Agreement and that the Parties are entitled to compel specific performance of all material terms of this Development Agreement by any Party in default hereof. All terms and provisions of this Development Agreement are material. Nothing in this Agreement modifies the City's ability to pursue its otherwise applicable enforcement provisions for violations of any permits issued for TSD.

M. Governing Law and Venue.

This Development Agreement shall be governed by and construed in accordance with the laws of the State of Washington. Jurisdiction over and venue for any action arising out of or relating to this Development Agreement shall be exclusively in the state and federal courts of King County, Washington. In the event of any apparent conflicts between the provisions of the city code or ordinances and this Development Agreement, this Development Agreement shall prevail.

N. Full Understanding.

The Parties each acknowledge, represent and agree that they have read this Development Agreement; that they fully understand the terms thereof; that they have had the opportunity to be fully advised by their legal counsel and any other advisors with respect thereto; and that they are executing this Development Agreement after sufficient review and understanding of its contents.

O. Counterparts; Facsimile Signatures.

This Agreement may be executed in more than one counterpart, each of which shall be deemed an original, and all of which shall constitute one and the same instrument. Facsimile signatures on this Agreement shall constitute original signatures of the Parties.

P. Attorneys' Fees.

Should it be necessary for any Party to this Development Agreement to initiate legal proceedings to adjudicate any issues arising hereunder, the Party or Parties to such legal proceedings who substantially prevail shall be entitled to reimbursement of their attorneys' fees, costs, expenses, and disbursements (including the fees and expenses of expert and fact witnesses) reasonably incurred or made by the substantially prevailing Parties in preparing to participate in mediation or arbitration, to bring suit, during suit, on appeal, on petition for review, and in enforcing any judgment or award, from the other Party or Parties.

Q. Waiver.

The waiver by a party of a breach of any provision of this Development Agreement by the other party shall not operate or be construed as a waiver of any subsequent breach by that party. No waiver shall be valid unless in writing and signed by the party against whom enforcement of the waiver is sought.

R. Severability.

This Development Agreement is expressly made and entered into under the authority of RCW 36.70B.170 *et seq.* This Development Agreement does not violate any federal or state statute, rule, regulation or common law known; but any provision which is found to be invalid or in violation of any statute, rule, regulation or common law shall be considered null and void, with the remaining provisions remaining in full force and effect.

S. Equal Opportunity to Participate in Drafting.

The Parties have participated and had an equal opportunity to participate in the drafting of this Development Agreement. No ambiguity shall be construed against any Party based upon a claim that the Party drafted the ambiguous language.

T. Reservation of City Authority.

As required by RCW 36.70B.170(4) and notwithstanding any other term of this Development Agreement, the City reserves the right to establish and impose new or different additional regulations to the extent required to address a serious threat to public health and safety.

U. Notice.

All correspondence and any notice required in this Development Agreement shall be delivered to the following parties:

City of Bellevue

Attention: Ms. Carol Helland
Land Use Director
450 110th Avenue NE
PO Box 90012
Bellevue, WA 98009
Email: chelland@bellevuewa.gov

with a copy to:
Lori Riordan, City Attorney
450 110th Avenue NE
PO Box 90012
Bellevue, WA 98009
Email: LRiordan@bellevuewa.gov

WR-SRI 120th LLC
c/o Shorenstein Realty Services
Attention: Mr. Todd Sklar
235 Montgomery Street, 16th Floor
San Francisco, CA 94104
Email: tsklar@shorenstein.com

c/o Wright Runstad & Company
Attention: Mr. Greg Johnson
1201 Third Avenue
Suite 2700
Seattle, WA 98101
Email: gjohnson@wrightrunstad.com

with a copy to:
Mr. Tayloe Washburn
Foster Pepper PLLC
1111 Third Avenue, Suite 3400
Seattle, WA 98101
Email: washt@foster.com

V. Final and Complete Agreement.

This Development Agreement constitutes the final and complete expression of the Parties on the development standards governing the Owner's development of the Property. This Development Agreement may not be modified, interpreted, amended, waived or revoked orally, but only by a writing signed by all Parties. This Development Agreement supersedes and replaces all prior agreements, discussions and representations on all subjects discussed herein, without limitation. No Party is entering into this Development Agreement in reliance on any oral or written promises, inducements, representations, understandings, interpretations or agreements other than those contained in this Development Agreement.

Unofficial Document

W. Recording Required.

This Agreement shall be recorded with King County at Owner's expense.

X. Execution and Effective Date.

The Effective Date of this Agreement is the date on which it is fully executed by the City and Owner representatives. The following representatives of the Parties are authorized to, and do hereby, execute on behalf of the party so indicated.

OWNER:
WR-SRI 120TH LLC, a Delaware limited liability company
By: SRI EIGHT 120th LLC,
A Delaware limited liability company,
Its Managing Member

By: _____
Its: Vice President
Date: 9 July 07

By: WRC BEL-RED LLC,
A Washington limited liability company
By: Wright Runstad Associates Limited Partnership, a Washington limited partnership, its Manager
By: Wright Runstad & Company, a Washington Corporation, its general partner
By: _____
Its: President

Unofficial Document

CITY OF BELLEVUE:

Steven R. Sarkozy, City Manager
Date: 7/10/2009

APPROVED AS TO FORM:
Lori M. Riordan, City Attorney

Mary Kate Berens, Deputy City Attorney

Unofficial Document

STATE OF WASHINGTON)
) ss.
COUNTY OF KING)

I certify that I know or have satisfactory evidence that Todd Sklar is the person who appeared before me and said person acknowledged that he/she signed this instrument, on oath stated that he/she was authorized to execute the instrument and acknowledged it as the Vice President of SRI EIGHT 120th LLC, Managing Member of WR-SRI 120th LLC to be the free and voluntary act of such party for the uses and purposes mentioned in the instrument.

DATED: July 9, 2009.

Notary Seal

JUDITH K. HOYLE NOTARY PUBLIC STATE OF WASHINGTON COMMISSION EXPIRES 11-06-11

Judith K Hoyle
JUDITH K HOYLE (Print Name)
Notary Public Residing at Chimacum WA
My appointment expires: 11-6-11

STATE OF WASHINGTON)
) ss.
COUNTY OF KING)

I certify that I know or have satisfactory evidence that Gregory K Johnson is the person who appeared before me and said person acknowledged that he/she signed this instrument, on oath stated that he/she was authorized to execute the instrument and acknowledged it as the President of Wright Runstad & Company, general partner of Wright Runstad Associates Limited Partnership, Manager of WRC BEL-RED LLC, to be the free and voluntary act of such party for the uses and purposes mentioned in the instrument.

DATED: July 9, 2009.

Notary Seal

JUDITH K. HOYLE NOTARY PUBLIC STATE OF WASHINGTON COMMISSION EXPIRES 11-06-11

Judith K Hoyle
JUDITH K HOYLE (Print Name)
Notary Public Residing at Chimacum WA
My appointment expires: 11-6-11

Unofficial Document

STATE OF WASHINGTON)
) ss.
COUNTY OF KING)

I certify that I know or have satisfactory evidence that Steven R. Sarkozy is the person who appeared before me and said person acknowledged that he/she signed this instrument, on oath stated that he/she was authorized to execute the instrument and acknowledged it as the City Manager of the CITY OF BELLEVUE to be the free and voluntary act of such party for the uses and purposes mentioned in the instrument.

DATED: July 10, 2009

Notary Seal

JANNA DEE STEEDMAN COMMISSION EXPIRES NOTARY PUBLIC 12-20-12 STATE OF WASHINGTON

Janna Dee Steedman
JANNA DEE STEEDMAN (Print Name)
Notary Public
Residing at Sammamish WA
My appointment expires: 12/20/12

Unofficial Document

Exhibit A
Legal Description of Property

Lot 3 of City of Bellevue Short Plat No. LF-06-135856, Recorded under King County Recording No. 20070319900012

Unofficial Document

Attachment D
Greenhouse Gas Emissions – Phase 1A Update
Technical Memo by JMJ Team dated May 10, 2013

Greenhouse Gas Emissions – Technical Memorandum

Project:	The Spring District – Phase 1A	From:	Joleen Fuson Justin Jones, PE
Reviewer:	City of Bellevue	Date:	May 20, 2013

GREENHOUSE GAS EMISSIONS – PHASE 1A UPDATE

A technical memorandum dated March 28, 2012 both qualitatively and quantitatively described the new greenhouse gas (GHG) emissions associated with The Spring District Master Development Plan. As an update to that memo, The Spring District is submitting this GHG emissions memo for Phase 1A of development.

Phase 1A of The Spring District development includes the construction of two office buildings totaling 452,548 SF, park space, and associated roadways, utilities, and landscaping.

Need for Qualitative or Quantitative Disclosure

Washington Department of Ecology (Ecology) has jurisdiction over air quality in Washington State. Ecology provides thresholds based on building type and square footage to estimate the annual CO2e from the buildings and associated traffic. These thresholds are used to determine the need for either a qualitative or quantitative analysis of CO2e for a project. We have used Ecology's screening table, below, to determine the need for a qualitative or quantitative analysis.

Ecology GHG Screening Table – Phase 1A

Phase 1A		Ecology Threshold Determination	
Building Types	**Units or SF**	**Qualitative Analysis (10,000 MTCO2e Annually)**	**Quantitative Analysis (25,000 MTCO2e Annually)**
Office Space (Buildings 16, 24)	452,548 SF	> 399,000 SF	> 998,000 SF

Ecology's Guidance for including Greenhouse Gas Emissions in SEPA states that for projects that are expected to annually produce an average estimate of at least 10,000 but less than 25,000 metric tons CO2e, proponents should at least qualitatively disclose the GHG emissions caused by the project. A qualitative disclosure should include a general description of the project's expected source(s) of the emissions, as well as any proposed GHG mitigation measures incorporated or designed into the project.

The Spring District meets the 10,000 MTCO2e threshold to warrant a qualitative analysis for the office buildings. This qualitative analysis, including mitigation options, is described next. The project does not, however, meet the 998,000 SF threshold to warrant a quantitative analysis for Phase 1A.

Qualitative Analysis

Sources of Emissions

The expected sources of emissions for Phase 1A include embodied emissions created through the manufacturing, transportation, construction, and disposal of building materials as well as emissions created through landscape disturbance. Emissions associated with the operation of the project include building energy usage and maintenance as well as vehicle trips accessing the site.

Mitigation Options

The Spring District is committed to providing environmentally responsible, low impact development techniques as a standard practice. Mitigation measures described in the Master Development Plan Greenhouse Gas Emissions Memo (3/28/12) apply to the entire Spring District site, including Phase 1A.

Mitigation measures proposed for The Spring District development include transit-oriented development (light rail station, walkable community, multi-use path with regional connection, and mixed-use development), low impact development techniques, which may include: rain gardens, bioretention, porous concrete, and LEED® certified buildings.

Mitigation #1: Transit-Oriented Development

The Spring District will be a transit-oriented developed with a future light rail station, bus lines, a walkable community layout and mixed use development. The estimated MTCO2 reduction associated with the reduction of vehicle dependency in a transit-oriented development is 25%*. The elements of a transit-oriented development that result in reductions of CO2 emissions include the following:

- High employment concentrations
- Mixed-use development (retail, office, residential)
- Significant public transportation accessibility

A 25% MTCO2 reduction for transit-oriented development equates to approximately 9,000 MTCO2e annually. This equates to a CO2e reduction of approximately 11% annually for the project.

** Source: The Transportation Research Board, Special Report 298: Driving and the Built Environment – The Effects of Compact Development on Motorized Travel, Energy Use, and CO2 Emissions, 2009*

Mitigation #2: Building Lifespan

While the GHG Calculator used in this evaluation has lifespan estimates for buildings based on use, the developer (Wright Runstad & Company) has a large portfolio of built work that shows their commitment to ecological construction, green building management and a practice of energy conservation. By employing adaptive building reuse, sustainably grown and regionally produced products and high-performance systems, Wright Runstad & Company promotes waste reduction as well as reuse and recycling in all of their new and existing projects. By selecting durable and less energy consuming building components, they have a proven history of sustainable 100-year buildings.

Using the King County GHG Calculator with the 100-year lifespan for the new office buildings, this mitigation is able to reduce the greenhouse gas emissions associated with the project. Annual emissions can be reduced by an additional 26,800 MTCO2e per year, or 31%, with the building lifespan mitigation.

Other Mitigation Measures

While it is difficult to quantify the MTCO2e reductions of many low impact development techniques, these features will certainly provide additional emissions reductions. The Spring District is considering the following measures for this project:

Bike and Pedestrian Facilities – bike and pedestrian facilities throughout the Spring District will encourage non-motorized transportation that will further reduce the number of vehicle miles trips.

LEED®-ND Building Design – buildings and site design will be designed to LEED-ND standards resulting in energy efficiencies and possible water reuse. During construction, materials will be recycled where possible. This mitigation reduces stationary combustion emission sources.

Low Impact Development (LID) – the site will include several low impact development techniques to reduce land use change impacts. These techniques include:

- Bioretention cells to treat pollution-generating surfaces
- An 8,400 SF green roof on Building 16

Attachment E
Critical Areas Report
by Shannon & Wilson, Inc. dated June 4, 2013

Critical Areas Report
Spring District Development – Phase 1A
Bellevue, Washington

June 4, 2013

SHANNON & WILSON, INC.

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

Excellence. Innovation. Service. Value.

Since 1954.

Submitted To:
JMJ Team
811 First Avenue, Suite 615
Seattle, Washington 98104

By:
Shannon & Wilson, Inc.
400 N 34th Street, Suite 100
Seattle, Washington 98103

21-1-12396-002

TABLE OF CONTENTS

Page

1.0 INTRODUCTION 1

2.0 SCOPE OF SERVICES 1

3.0 SITE DESCRIPTION 2

4.0 IMPACTS TO CRITICAL AREAS 3

5.0 BUFFER RESTORATION PLAN
AND VEGETATION MANAGEMENT PLAN 3
- 5.1 Planting Plan 4
- 5.2 Restoration Sequence 4
- 5.3 Maintenance 5
- 5.4 Performance Monitoring 5
- 5.5 Goals and Objectives 6

6.0 CLOSURE 7

TABLE

1 Planting Plan 4

FIGURES

1 Vicinity Map
2 Proposed Temporary Impacts to Wetland Buffer
3 Conceptual Buffer Restoration

APPENDIX

Wetland Rating Form
Important Information About Your Wetland Delineation/Mitigation and/or Stream Classification Report

CRITICAL AREAS REPORT
SPRING DISTRICT DEVELOPMENT – PHASE 1A
BELLEVUE, WASHINGTON

1.0 INTRODUCTION

Wright Runstad & Company is proposing to develop Phase 1A of the Spring District Development, a transit-oriented development on an existing warehouse site, hereafter referred to as "the project." The project site is located on King County Parcel No. 067100-0000, north of NE 12th Street and between 120th Avenue NE to the west and 124th Avenue NE to the east, within the Bel-Red neighborhood in Bellevue, Washington (Figure 1).

Shannon & Wilson, Inc. was contracted by the JMJ Team on behalf of Wright Runstad & Company to complete a critical areas report for the project. We understand temporary impacts to critical areas, as defined under Section 20.25H (Critical Areas Overlay District) of the Bellevue Land Use Code (LUC), are unavoidable as a result of the project. The purpose of this critical areas report is to describe proposed temporary buffer impacts provide a conceptual wetland buffer restoration plan.

2.0 SCOPE OF SERVICES

Our scope of services for this project consisted of performing the following tasks:

- Work with the JMJ Team design team to define the impacts to critical areas, as described within LUC 20.25H. Our understanding of the potential impact to wetland buffer consist of construction of underground utilities on the western edge of the project site.
- We assume that the proposed critical area impacts are either explicitly allowable under LUC 20.25H or may be approved by the City of Bellevue (the City) provided appropriate mitigation occurs in compliance with the LUC. We also assume that there will be no direct impacts to wetlands or streams, as defined by the City, state, or United States and permits from state or federal agencies will, therefore, not be required.
- Shannon & Wilson will prepare a draft critical areas report, consistent with LUC 20.25H.230-20.25H.250, to be provided to JMJ Team. Following the JMJ Team review, Shannon & Wilson will review comments and prepare a final Critical Areas Report to JMJ Team for their use and submittal to the City.

3.0 SITE DESCRIPTION

The site parcel is approximately 36 acres and was previously developed for use as a grocery distribution center with several warehouses and industrial buildings. The site is paved, except for a landscaping strip along the eastern edge of the site, facing 124th Avenue NE, and a vegetated slope along the western edge of the site, facing 120th Avenue NE. The vegetated slope along the western edge of the site is dominated by black cottonwood (*Populus balsamifera*), red alder (*Alnus rubra*), Himalayan blackberry (*Rubus armeniacus*), English ivy (*Hedera helix*), and western swordfern (*Polystichum munitum*).

One wetland (Wetland A) has been delineated just offsite at the toe of the vegetated slope along the site's western boundary along 120th Avenue NE. Wetland A was delineated by Shannon & Wilson, Inc. for the City of Bellevue's Northeast 4th Street/120th Avenue Northeast Corridor Project. A description of Wetland A was provided in the *Northeast 4th Street/120th Avenue Northeast Corridor Project Wetland and Stream Delineation Technical Report* prepared for the City and dated March 16, 2011. This report gives the following description of Wetland A:

> **"***Wetland A (8,260 square feet) is located northeast of the intersection of 120th Avenue NE and NE 12th Street and is entirely within the project corridor. The Cowardin classification (Cowardin, 1979) for Wetland A is PEM/SS and its hydrogeomorphic classification (Brinson, 1993) is "depressional outflow."*
>
> *Dominant vegetation within Wetland A includes Pacific willow (Salix lasiandra, FACW), Douglas spirea (Spirea douglasii, FACW) with an emergent strata of bentgrass (Agrostis sp., FAC).*
>
> *Soils observed included a surface layer of black (10YR 2/1) muck above a layer of dark gray (2.5Y 4/1) clay loam exhibiting dark grayish-brown (10YR 4/2) redoximorphic concentrations. While the site is mapped as urban land (Ur), Tukwila muck (Tu) is mapped immediately west of Wetland A.*
>
> *There appear to be three primary hydrologic sources for Wetland A: (1) a high groundwater table, (2) stormwater sheetflow off of 120th Avenue NE, and (3) discharge of surface flow out of a large, black plastic outfall structure in the middle of the wetland. We presume the black plastic outfall releases stormwater from the development upslope to the east of Wetland A. A roadside ditch is located within Wetland A, which originates from the black outfall structure, runs parallel to 120th Avenue NE, and terminates at a concrete culvert. Surface flow within Wetland A exits through this concrete culvert and is presumably conveyed through a series of underground pipes to Lake Bellevue.*
>
> *Wetland A was classified as a Category III wetland using Ecology's Wetland Rating System (Appendix C). The rationale for this rating was the wetland's:*

- *High water quality functions score (24 points) due to its organic soils, persistent vegetation, unconstructed surface outlet, and opportunity to remove pollutants;*
- *Low hydrologic functions score (8 points) due to the high dead storage during wet periods, the moderate ratio of the wetland's area to its basin, but lack of opportunity to reduce flooding downstream as the wetland drains to Lake Bellevue; and*
- *Moderate habitat functions score (14 points) due to its low diversity of vegetation, moderate interspersion of hydroperiods, and the presence of other nearby wetlands in the developed landscape. Additionally, a standing snag was observed in the southern end of Wetland A with evidence that it has been used by pileated woodpeckers for foraging.*

The City has adopted Ecology's Wetland Rating System into the BCC, which requires Category III wetlands with habitat scores less than 20 points to maintain a 60-foot standard buffer."

In addition to a 60-foot (ft) standard buffer width (as described above), a 15-ft structure setback from the wetland buffer is required under LUC.

4.0 IMPACTS TO CRITICAL AREAS

We understand that the project will generally convert a warehouse site to a mixed use development for commercial and residential uses. The project has been designed to avoid and minimize impacts to critical areas. However, the installation of new utilities serving the site will result in clearing and ground disturbance in wetland buffer. Based on the standard buffer width of 60 feet, disturbance from utility installation activities will temporarily impact approximately 4,300 square feet (sf) of wetland buffer. The project will implement and maintain temporary erosion and sediment control and best management practices to minimize impacts to critical areas during construction. Disturbed areas will be restored to preconstruction grades and stabilized after construction. Vegetation will be re-established in the wetland buffer in accordance with the buffer restoration plan and vegetation management plan (see Section 5.0).

5.0 BUFFER RESTORATION PLAN AND VEGETATION MANAGEMENT PLAN

The project proposes to mitigate for unavoidable temporary impacts by revegetating the disturbed wetland buffer. This conceptual buffer restoration plan was designed based on our understanding that 4,300 sf of wetland buffer will be temporarily impacted during construction (Figure 2).

5.1 Planting Plan

The planting plan is designed to establish native, non-invasive plant species in the temporarily disturbed wetland buffer area. Temporarily disturbed areas will be revegetated with a native woody plant community comprised of shrubs and trees (Table 1).

TABLE 1
PLANTING PLAN

Common Name	Scientific Name	Condition	Spacing[1]	Quantity
Snowberry	*Symphoricarpos albus*	1-gallon	4 ft O.C.	89
Indian plum	*Oemleria cerasiformis*			89
Pacific ninebark	*Physocarpus capitatus*			90
Black cottonwood	*Populus balsamifera*	2-gallon	10 ft O.C.	21
Douglas fir	*Pseudotsuga menziesii*			22

Notes:
[1] Spacing indicates the cumulative on center (O.C.) spacing per stratum.
ft = feet

The plant species selected for these areas are native to the project area and have displayed a high degree of success in similar restoration projects. Planting should be done by hand in natural, randomized clusters. All vegetation should be installed the same day the plants are obtained. Plants that cannot be planted within one day after arrival should be “heeled in” for protection against drying. For best results, planting should occur during the fall or winter seasons (October to February) when plants are most dormant and have the greatest potential for survival.

The site is largely protected from high winds. Therefore, shrubs and trees are not anticipated to require staking. If the plant can stand alone without staking in a moderate wind, tree stakes should not be used. If the plant needs support, then webbing should be used as low as possible on the trunk to loosely brace the tree with two stakes. All stakes and webbing must be removed within two years of installation. Stakes and webbing can be removed sooner if the plant no longer requires support.

5.2 Restoration Sequence

The planting sequence should occur generally as follows:

1. Complete grading to restore slope topography. This includes decompacting soil in areas that have been compacted by heavy machinery to the extent possible and mixing 6 inches of compost (Cedar Grove or equivalent) into the soil to a depth of 12 inches.
2. Apply 3 inches of mulch throughout planting area.
3. Procure plants specified in Table 1 from a registered nursery or through a licensed landscaper. Note: Procured tree and shrub plant materials shall be stored and handled during installation to prevent them from becoming desiccated at all times.
4. Place plants within the disturbed wetland buffer area in natural, random clusters, as shown in Figure 3. Dig holes for plants, twice the size of the container, and score edges of planting hole with shovel (so roots can travel outside hole). Loosen plant roots slightly and place in center of hole, upright and level with ground surface. Backfill planting holes with native soils and replace the wood mulch around the base of each plant.
5. Water plants thoroughly to avoid capillary stress. Typically, planted areas should be watered with approximately 1 inch of water after planting.

5.3 Maintenance

The following maintenance activities should be performed to optimize the success of the restoration:

1. Supplemental irrigation shall be provided for the first two years (minimum) after plant installation.
2. Replace *all* plant mortalities during the fall or winter of the first year following plant installation as a component in the contract provisions for landscape establishment.
3. Remove *all* Class A, B, and C Noxious Weeds as defined by the Washington State Noxious Weed Control Board's most current Noxious Weed List (http://www.nwcb.wa.gov/) throughout the restored wetland buffer area. All weed removal should be completed by hand and occur during the monitoring program to increase the success of the installed vegetation.

   In the event that the buffer restoration area becomes reestablished by noxious weed species following one year of hand removal, targeted herbicide application should occur in accordance with state and federally approved methodology.

5.4 Performance Monitoring

The primary purpose of the monitoring plan is to assess the completed restoration and provide a basis for determining whether the plants are surviving and the goals of the restoration plan are

being achieved. A biologist shall observe plant condition at time of delivery and observe plant layout prior to installation. After construction of the buffer restoration is completed, an as-built drawing shall be provided to the City. Performance monitoring will be conducted annually for three years. The monitoring period may be extended if determined necessary by the City to establish that performance standards have been met.

Reports should consist of the following:

1. A comprehensive plant count will occur during the Year 1 monitoring event. Total plant survival, percent volunteer recruitment, and confirmation that all plant mortalities have been replaced shall be reported.
2. Percent of plant survival and percent areal cover of installed shrub and tree species will be calculated during Years 2 and 3 through vegetation transects or other appropriate vegetation monitoring protocols.
3. Plant vigor and growth will be visually estimated during each year to assess the growing conditions.
4. Percent invasive cover will be reported during each year.
5. Maintenance concerns (e.g., plants that need replacing, noxious weed removal, etc.) will be identified.
6. Direct or indirect wildlife observations of the buffer restoration area will be recorded.
7. Photographs of the buffer restoration area shall be taken from locations which can be repeated during future site visits to qualitatively assess the success of the planted area.

5.5 Goals and Objectives

The objective for the wetland buffer restoration plan is to restore a forested upland with native shrub and tree species that, once established, will provide equivalent or greater habitat functions and values.

- *Year 1 Goal*
  - No more than 25 percent plant mortality will occur in Year 1. Following the comprehensive stem count in Year 1, all plant mortalities shall be replaced in accordance with the landscaper's one-year plant guarantee.
- *Year 2 Goal*
  - Plant survival will exceed 85 percent *or* areal cover of native woody vegetation will exceed 20 percent.

- *Year 3 Goal*
  - Plant survival will exceed 80 percent *or* areal cover of native woody vegetation will exceed 40 percent.

If any monitoring report shows that mitigation is not meeting these goals, the applicant will work with the City to perform corrective actions appropriate to the mitigation (e.g., failing plants will be replaced, other plant species will be substituted, and noxious/nuisance weeds will be removed by hand or with approved herbicides provided all local, state, and federal permits are obtained).

6.0 CLOSURE

The findings and conclusions documented in this report have been prepared for specific application to this project and have been developed in a manner consistent with that level of care and skill normally exercised by members of the environmental science profession currently practicing under similar conditions in the area, and in accordance with the terms and conditions set forth in our agreement. The conclusions and recommendations presented in this report are professional opinions based on interpretation of information currently available to us and are made within the operational scope, budget, and schedule constraints of this project. No warranty, express or implied, is made.

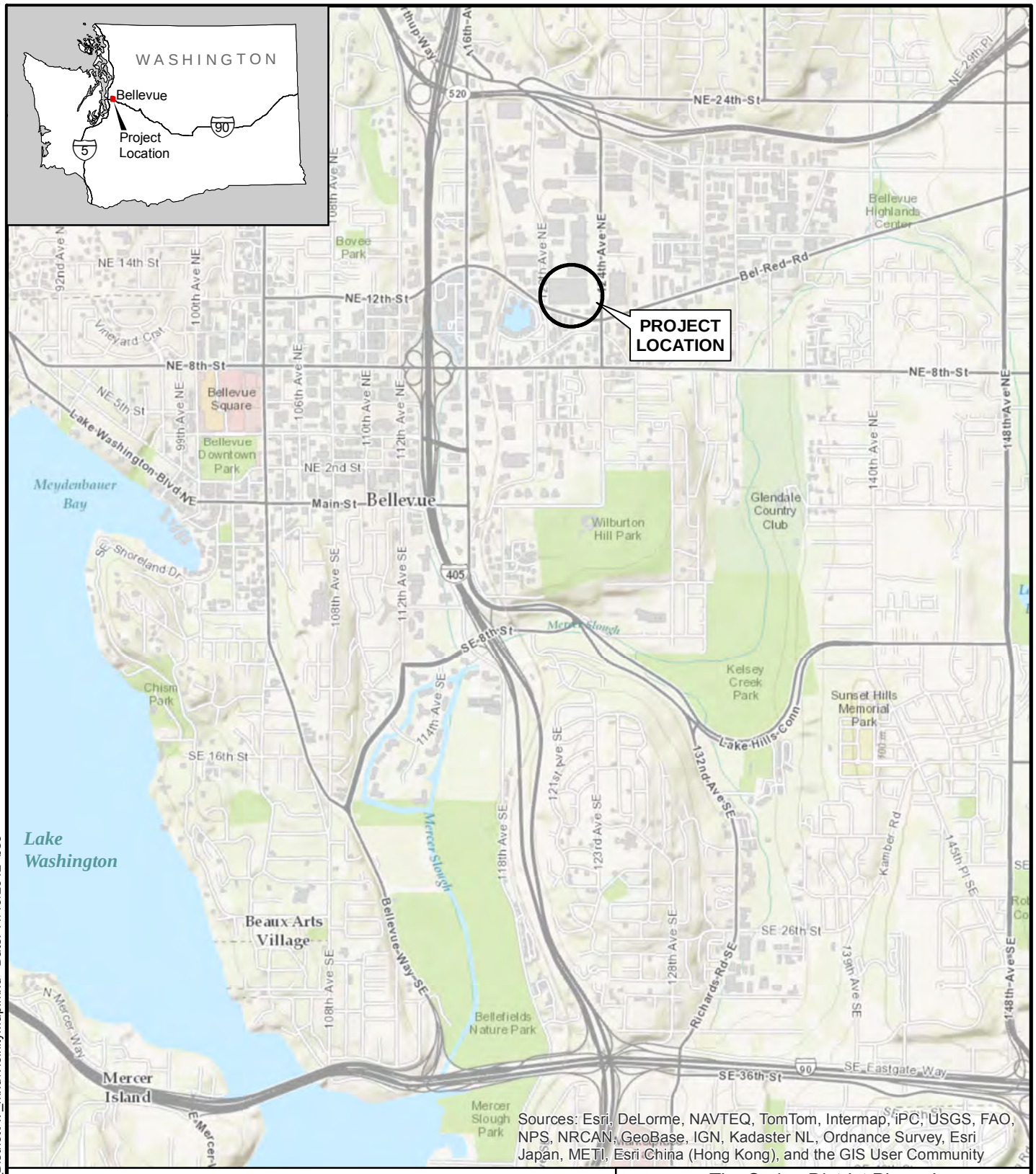
Shannon & Wilson, Inc. has prepared an appendix, "Important Information About Your Wetland Delineation/Mitigation and/or Stream Classification Report," to assist you and others in understanding the use and limitations of our reports.

SHANNON & WILSON, INC.

Brooke O'Neill
Biologist

Per Johnson, P.W.S.
Biologist

BEO:PCJ:KLW/beo



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The Spring District Phase I
Critical Areas Report
Bellevue, Washington

VICINITY MAP

June 2013 21-1-12396-002

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

FIG. 1

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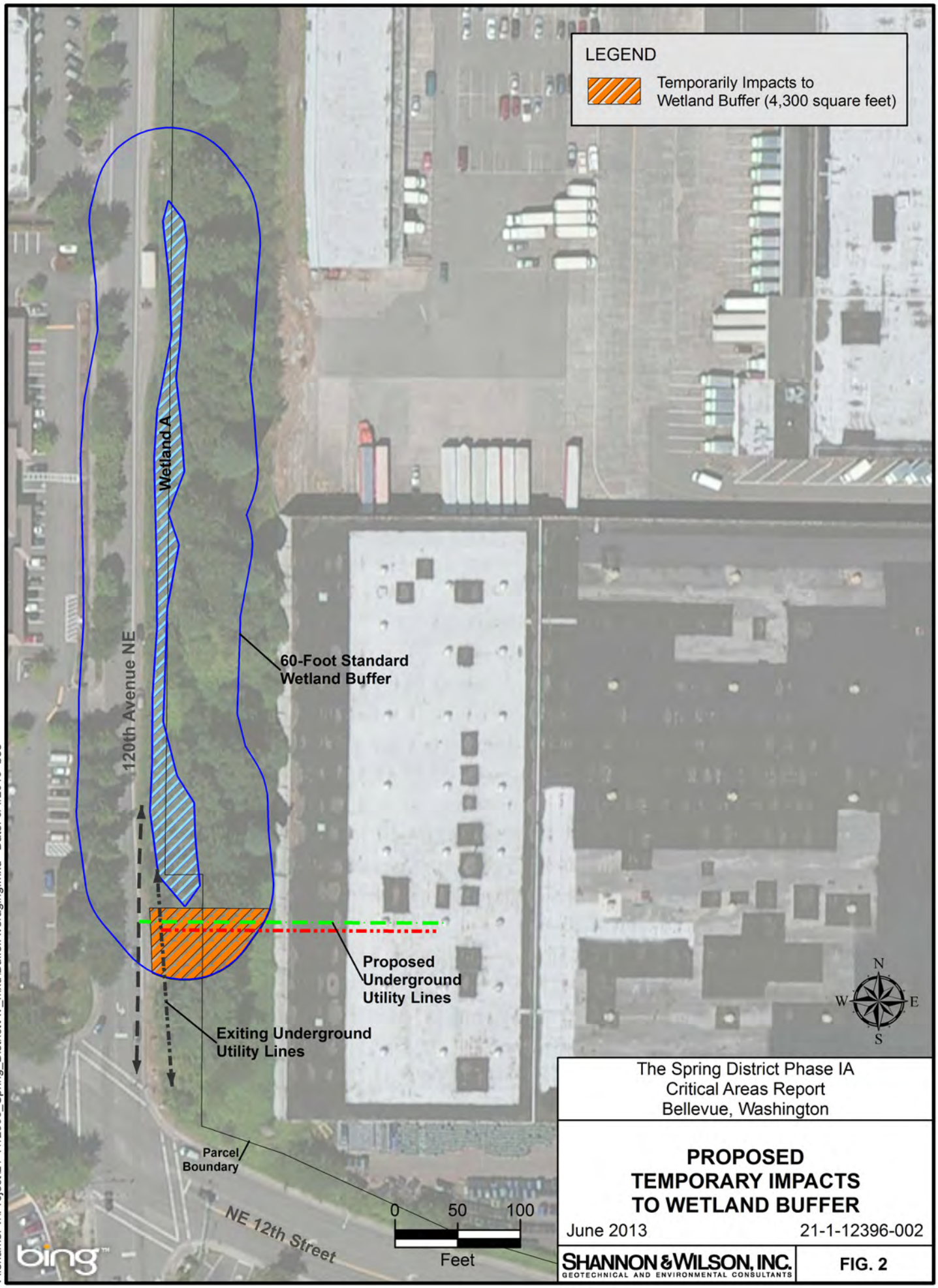


The Spring District Phase IA
Critical Areas Report
Bellevue, Washington

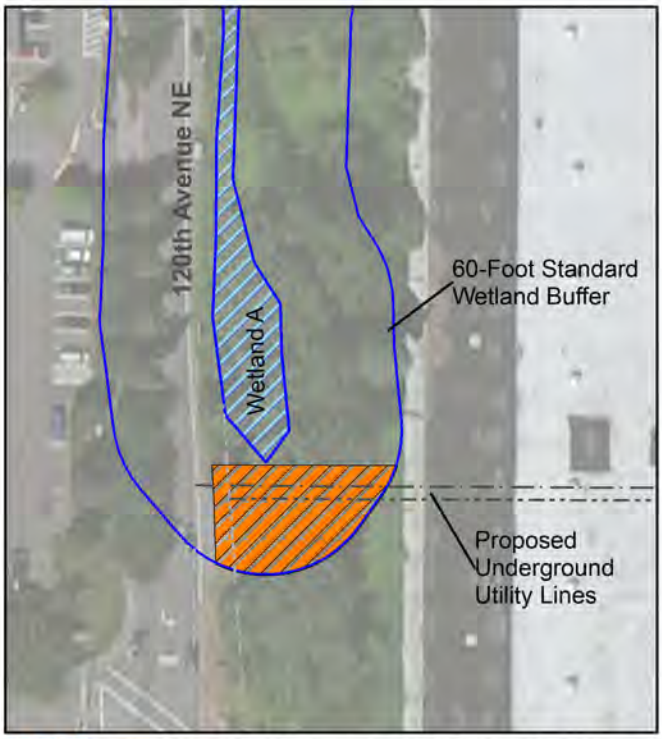
PROPOSED TEMPORARY IMPACTS TO WETLAND BUFFER

June 2013 | 21-1-12396-002

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

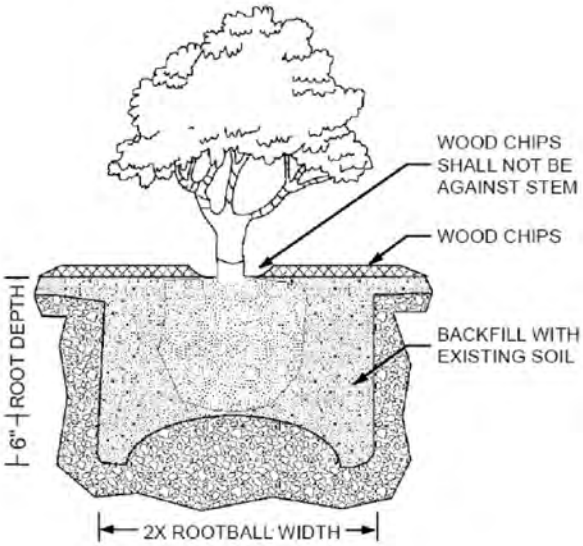
FIG. 2

Filename: T:\Project\21-1\12396_Spring_District\AV_mxd\BufferAveraging.mxd Date: 6/4/2013 beo



Temporary Buffer Impacts/Restoration Area
4,300 Square Feet

PLANTING DETAIL

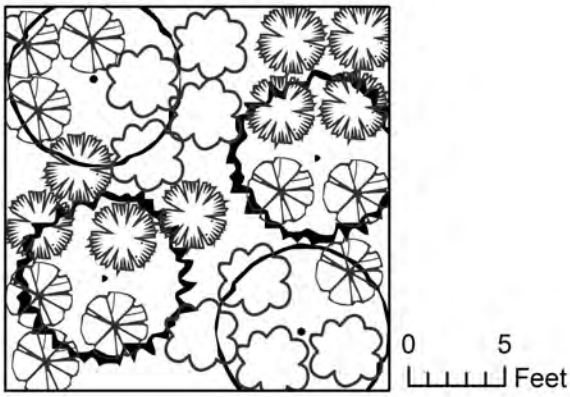


PLANTING SCHEDULE

Symbol	Common Name	Scientific Name	Condition	Spacing[1]	Quantity
	snowberry	*Symphoricarpos albus*	1-gallon	4 ft O.C.	89
	Indian plum	*Oemleria cerasiformis*			89
	Pacific ninebark	*Physocarpus capitatus*			90
	black cottonwood	*Populus balsamifera*	2-gallon	10 ft O.C.	21
	Douglas fir	*Pseudotsuga menziesii*			22

Notes:
[1] Spacing indicates the cumulative on center (O.C.) spacing per strata.
ft = feet

PLANTING TYPICAL



The Spring District Phase IA
Critical Areas Report
Bellevue, Washington

WETLAND BUFFER RESTORATION

June 2013 | 21-1-12396-002

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

FIG. 3

Filename: T:\Project\21-1\12396_Spring_District\AV_mxd\Restoration.mxd Date: 6/4/2013 beo

APPENDIX A

WETLAND RATING FORM

Wetland name or number ~~D~~ A

WETLAND RATING FORM – WESTERN WASHINGTON

Version 2 - Updated July 2006 to increase accuracy and reproducibility among users
Updated Oct 2008 with the new WDFW definitions for priority habitats

Name of wetland (if known): WETLAND ~~D~~ A Date of site visit: 7·29·10

Rated by PER JOHNSON Trained by Ecology? Yes ✓ No___ Date of training___

SEC: 28 TWNSHP: 25N RNGE: 5E Is S/T/R in Appendix D? Yes___ No ✓

Map of wetland unit: Figure ___ Estimated size 1-acre

SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland

I___ II___ III X IV___

Category I = Score >=70
Category II = Score 51-69
Category III = Score 30-50
Category IV = Score < 30

Score for Water Quality Functions	24
Score for Hydrologic Functions	8
Score for Habitat Functions	14
TOTAL score for Functions	46

Category based on SPECIAL CHARACTERISTICS of wetland

I___ II___ **Does not Apply** X

Final Category (choose the "highest" category from above) III

Summary of basic information about the wetland unit

Wetland Unit has Special Characteristics		Wetland HGM Class used for Rating	
Estuarine		Depressional	X
Natural Heritage Wetland		Riverine	
Bog		Lake-fringe	
Mature Forest		Slope	
Old Growth Forest		Flats	
Coastal Lagoon		Freshwater Tidal	
Interdunal			
None of the above	X	Check if unit has multiple HGM classes present	

Wetland name or number ~~D~~A

Does the wetland unit being rated meet any of the criteria below?

If you answer YES to any of the questions below you will need to protect the wetland according to the regulations regarding the special characteristics found in the wetland.

Check List for Wetlands That May Need Additional Protection (in addition to the protection recommended for its category)	YES	NO
SP1. *Has the wetland unit been documented as a habitat for any Federally listed Threatened or Endangered* ***animal or plant*** *species (T/E species)?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state or federal database.		✓
SP2. *Has the wetland unit been documented as habitat for any State listed Threatened or Endangered* ***animal*** *species?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state database. Note: Wetlands with State listed plant species are categorized as Category I Natural Heritage Wetlands (see p. 19 of data form).		✓
SP3. *Does the wetland unit contain individuals of Priority species listed by the WDFW for the state?*		✓
SP4. *Does the wetland unit have a local significance in addition to its functions?* For example, the wetland has been identified in the Shoreline Master Program, the Critical Areas Ordinance, or in a local management plan as having special significance.		✓

To complete the next part of the data sheet you will need to determine the Hydrogeomorphic Class of the wetland being rated.

The hydrogeomorphic classification groups wetlands into those that function in similar ways. This simplifies the questions needed to answer how well the wetland functions. The Hydrogeomorphic Class of a wetland can be determined using the key below. See p. 24 for more detailed instructions on classifying wetlands.

Wetland name or number A

Classification of Wetland Units in Western Washington

If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in questions 1-7 apply, and go to Question 8.

1. Are the water levels in the entire unit usually controlled by tides (i.e. except during floods)?
✓ NO – go to 2 YES – the wetland class is **Tidal Fringe**

   If yes, is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)? **YES – Freshwater Tidal Fringe** **NO – Saltwater Tidal Fringe (Estuarine)**

   If your wetland can be classified as a Freshwater Tidal Fringe use the forms for ***Riverine*** *wetlands. If it is Saltwater Tidal Fringe it is rated as an* ***Estuarine*** *wetland.* Wetlands that were called estuarine in the first and second editions of the rating system are called Salt Water Tidal Fringe in the Hydrogeomorphic Classification. Estuarine wetlands were categorized separately in the earlier editions, and this separation is being kept in this revision. To maintain consistency between editions, the term "Estuarine" wetland is kept. Please note, however, that the characteristics that define Category I and II estuarine wetlands have changed (see p.).

2. The entire wetland unit is flat and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.
✓ NO – go to 3 YES – The wetland class is **Flats**

   If your wetland can be classified as a "Flats" wetland, use the form for **Depressional** wetlands.

3. Does the entire wetland unit **meet both** of the following criteria?
   ___The vegetated part of the wetland is on the shores of a body of permanent open water (without any vegetation on the surface) at least 20 acres (8 ha) in size;
   ___At least 30% of the open water area is deeper than 6.6 ft (2 m)?
✓ NO – go to 4 YES – The wetland class is **Lake-fringe (Lacustrine Fringe)**

4. Does the entire wetland unit **meet all** of the following criteria?
   ____The wetland is on a slope (*slope can be very gradual*),
   ____The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks.
   ____The water leaves the wetland **without being impounded**?
   NOTE: *Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3ft diameter and less than 1 foot deep).*
✓ NO - go to 5 YES – The wetland class is **Slope**

Wetland name or number ~~D~~A

5. Does the entire wetland unit **meet all** of the following criteria?

____ The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river

____ The overbank flooding occurs at least once every two years.

NOTE: The riverine unit can contain depressions that are filled with water when the river is not flooding.

✓ NO - go to 6 **YES** – The wetland class is **Riverine**

6. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time during the year. *This means that any outlet, if present, is higher than the interior of the wetland.*

NO – go to 7 ✓ **YES** – The wetland class is **Depressional**

7. Is the entire wetland unit located in a very flat area with no obvious depression and no overbank flooding. The unit does not pond surface water more than a few inches. The unit seems to be maintained by high groundwater in the area. The wetland may be ditched, but has no obvious natural outlet.

✓ NO – go to 8 **YES** – The wetland class is **Depressional**

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM clases. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within your wetland. NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the class listed in column 2 is less than 10% of the unit; classify the wetland using the class that represents more than 90% of the total area.

HGM Classes within the wetland unit being rated	*HGM Class to Use in Rating*
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake-fringe	Lake-fringe
Depressional + Riverine along stream within boundary	Depressional
Depressional + Lake-fringe	Depressional
Salt Water Tidal Fringe and any other class of freshwater wetland	Treat as ESTUARINE under wetlands with special characteristics

If you are unable still to determine which of the above criteria apply to your wetland, or if you have more than 2 HGM classes within a wetland boundary, classify the wetland as **Depressional** for the rating.

Wetland name or number ~~D~~ A

D	**Depressional and Flats Wetlands** **WATER QUALITY FUNCTIONS** - Indicators that the wetland unit functions to improve water quality	**Points** (only 1 score per box)
D	**D 1. Does the wetland unit have the potential to improve water quality?**	*(see p.38)*
D	D 1.1 Characteristics of surface water flows out of the wetland: Unit is a depression with no surface water leaving it (no outlet) points = 3 Unit has an intermittently flowing, OR highly constricted permanently flowing outlet points = 2 ✓ Unit has an unconstricted, or slightly constricted, surface outlet (*permanently flowing*) points = 1 Unit is a "flat" depression (Q. 7 on key), or in the Flats class, with permanent surface outflow **and no obvious natural outlet** and/or outlet is a man-made ditch points = 1 (*If ditch is not permanently flowing treat unit as "intermittently flowing"*) Provide photo or drawing	Figure ___ 1
D	S 1.2 The soil 2 inches below the surface (or duff layer) is clay or organic *(use NRCS definitions)* ✓ YES – Tukwila muck mapped nearby. points = 4 NO points = 0	4
D	D 1.3 Characteristics of persistent vegetation (emergent, shrub, and/or forest Cowardin class) ✓ Wetland has persistent, ungrazed, vegetation > = 95% of area points = 5 Wetland has persistent, ungrazed, vegetation > = 1/2 of area points = 3 Wetland has persistent, ungrazed vegetation > = 1/10 of area points = 1 Wetland has persistent, ungrazed vegetation <1/10 of area points = 0 Map of Cowardin vegetation classes	Figure ___ 5
D	D1.4 Characteristics of seasonal ponding or inundation. *This is the area of the wetland unit that is ponded for at least 2 months, but dries out sometime during the year. Do not count the area that is permanently ponded. Estimate area as the average condition 5 out of 10 yrs.* Area seasonally ponded is > ½ total area of wetland points = 4 ✓ Area seasonally ponded is > ¼ total area of wetland points = 2 Area seasonally ponded is < ¼ total area of wetland points = 0 Map of Hydroperiods	Figure ___ 2
D	**Total for D 1** *Add the points in the boxes above*	12
D	**D 2. Does the wetland unit have the opportunity to improve water quality?** Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland. *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity.* — Grazing in the wetland or within 150 ft ✓ Untreated stormwater discharges to wetland — Tilled fields or orchards within 150 ft of wetland ✓ A stream or culvert discharges into wetland that drains developed areas, residential areas, farmed fields, roads, or clear-cut logging — Residential, urban areas, golf courses are within 150 ft of wetland — Wetland is fed by groundwater high in phosphorus or nitrogen — Other_____ ✓ **YES** multiplier is 2 **NO** multiplier is **1**	*(see p. 44)* multiplier 2
D	**TOTAL - Water Quality Functions** Multiply the score from D1 by D2 ***Add score to table on p. 1***	24

Wetland name or number ~~D~~A

D	**Depressional and Flats Wetlands** HYDROLOGIC FUNCTIONS - Indicators that the wetland unit functions to reduce flooding and stream degradation	**Points** (only 1 score per box)
	D 3. Does the wetland unit have the potential to reduce flooding and erosion?	*(see p.46)*
D	D 3.1 Characteristics of surface water flows out of the wetland unit Unit is a depression with no surface water leaving it (no outlet) points = 4 Unit has an intermittently flowing, OR highly constricted permanently flowing outlet points = 2 Unit is a "flat" depression (Q. 7 on key), or in the Flats class, with permanent surface outflow **and no obvious natural outlet** and/or outlet is a man-made ditch points = 1 *(If ditch is not permanently flowing treat unit as "intermittently flowing")* ✓ Unit has an unconstricted, or slightly constricted, surface outlet (*permanently flowing*) points = 0	0
D	D 3.2 Depth of storage during wet periods *Estimate the height of ponding above the bottom of the outlet. For units with no outlet measure from the surface of permanent water or deepest part (if dry).* Marks of ponding are 3 ft or more above the surface or bottom of outlet points = 7 The wetland is a "headwater" wetland" points = 5 ✓ Marks of ponding between 2 ft to < 3 ft from surface or bottom of outlet points = 5 Marks are at least 0.5 ft to < 2 ft from surface or bottom of outlet points = 3 Unit is flat (yes to Q. 2 or Q. 7 on key) but has small depressions on the surface that trap water points = 1 Marks of ponding less than 0.5 ft points = 0	5
D	D 3.3 Contribution of wetland unit to storage in the watershed *Estimate the ratio of the area of upstream basin contributing surface water to the wetland to the area of the wetland unit itself.* The area of the basin is less than 10 times the area of unit points = 5 ✓ The area of the basin is 10 to 100 times the area of the unit points = 3 The area of the basin is more than 100 times the area of the unit points = 0 Entire unit is in the FLATS class points = 5	3
D	**Total for D 3** *Add the points in the boxes above*	8
D	**D 4. Does the wetland unit have the opportunity to reduce flooding and erosion?** Answer YES if the unit is in a location in the watershed where the flood storage, or reduction in water velocity, it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows. Answer NO if the water coming into the wetland is controlled by a structure such as flood gate, tide gate, flap valve, reservoir etc. OR you estimate that more than 90% of the water in the wetland is from groundwater in areas where damaging groundwater flooding does not occur. *Note which of the following indicators of opportunity apply.* — Wetland is in a headwater of a river or stream that has flooding problems — Wetland drains to a river or stream that has flooding problems — Wetland has no outlet and impounds surface runoff water that might otherwise flow into a river or stream that has flooding problems — Other_____ **YES** multiplier is **2** ✓ **NO** multiplier is **1**	*(see p. 49)* multiplier 1*
D	**TOTAL - Hydrologic Functions** Multiply the score from D 3 by D 4 ***Add score to table on p. 1***	6

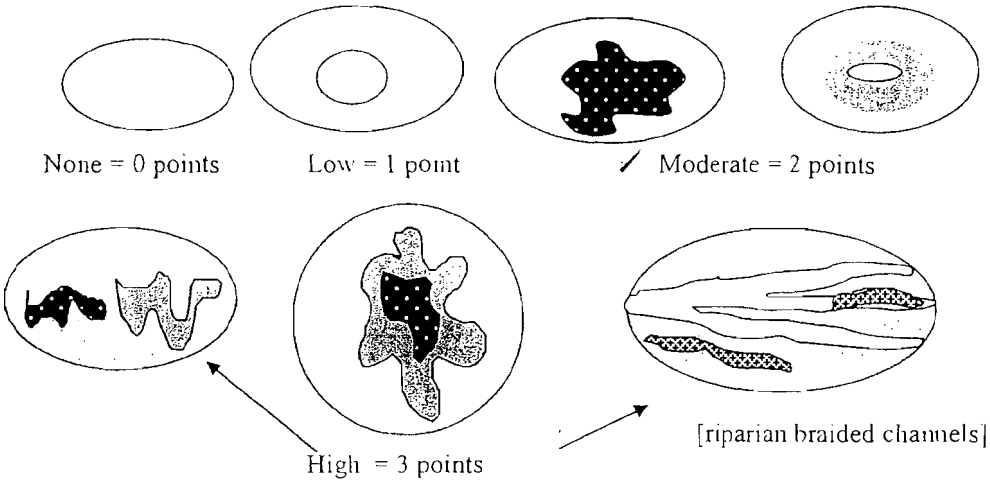
* Presume flow enters Lake Bellevue.

Wetland name or number ~~B~~A

These questions apply to wetlands of all HGM classes. HABITAT FUNCTIONS - Indicators that unit functions to provide important habitat	**Points** (only 1 score per box)
H 1. Does the wetland unit have the potential to provide habitat for many species?	
H 1.1 Vegetation structure *(see p. 72)* *Check the types of vegetation classes present (as defined by Cowardin)- Size threshold for each class is ¼ acre or more than 10% of the area if unit is smaller than 2.5 acres.* ____Aquatic bed __✓__Emergent plants __✓__Scrub/shrub (areas where shrubs have >30% cover) ____Forested (areas where trees have >30% cover) *If the unit has a forested class check if:* ____The forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the forested polygon *Add the number of vegetation structures that qualify. If you have:* 4 structures or more — points = 4 3 structures — points = 2 ✓ 2 structures — points = 1 1 structure — points = 0 Map of Cowardin vegetation classes	Figure ___ 1
H 1.2. Hydroperiods *(see p. 73)* *Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ acre to count. (see text for descriptions of hydroperiods)* ____Permanently flooded or inundated __✓__Seasonally flooded or inundated ____Occasionally flooded or inundated __✓__Saturated only ____ Permanently flowing stream or river in, or adjacent to, the wetland __✓__ Seasonally flowing stream in, or adjacent to, the wetland ____ ***Lake-fringe wetland*** **= 2 points** ____***Freshwater tidal wetland*** **= 2 points** 4 or more types present — points = 3 ✓ 3 types present — points = 2 2 types present — point = 1 1 type present — points = 0 Map of hydroperiods	Figure ___ 2
H 1.3. Richness of Plant Species *(see p. 75)* Count the number of plant species in the wetland that cover at least 10 ft^2. *(different patches of the same species can be combined to meet the size threshold)* *You do not have to name the species.* *Do not include Eurasian Milfoil, reed canarygrass, purple loosestrife, Canadian Thistle* If you counted: > 19 species — points = 2 ✓ 5 - 19 species — points = 1 < 5 species — points = 0 *List species below if you want to:*	1

Total for page 4

Wetland name or number ~~B~~ A

	Figure ___
H 1.4. Interspersion of habitats *(see p. 76)* Decide from the diagrams below whether interspersion between Cowardin vegetation classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, medium, low, or none.  None = 0 points Low = 1 point ✓ Moderate = 2 points High = 3 points [riparian braided channels] NOTE: If you have four or more classes or three vegetation classes and open water the rating is always "high". Use map of Cowardin vegetation classes	2
H 1.5. Special Habitat Features: *(see p. 77)* *Check the habitat features that are present in the wetland. The number of checks is the number of points you put into the next column.* ✓ Large, downed, woody debris within the wetland (>4in. diameter and 6 ft long). ___ Standing snags (diameter at the bottom > 4 inches) in the wetland ___ Undercut banks are present for at least 6.6 ft (2m) and/or overhanging vegetation extends at least 3.3 ft (1m) over a stream (or ditch) in, or contiguous with the unit, for at least 33 ft (10m) ___ Stable steep banks of fine material that might be used by beaver or muskrat for denning (>30degree slope) OR signs of recent beaver activity are present *(cut shrubs or trees that have not yet turned grey/brown)* ___ At least ¼ acre of thin-stemmed persistent vegetation or woody branches are present in areas that are permanently or seasonally inundated.*(structures for egg-laying by amphibians)* ___ Invasive plants cover less than 25% of the wetland area in each stratum of plants *NOTE: The 20% stated in early printings of the manual on page 78 is an error.*	1
H 1. TOTAL Score - potential for providing habitat *Add the scores from H1.1, H1.2, H1.3, H1.4, H1.5*	7

Comments

Wetland name or number DA

H 2. Does the wetland unit have the opportunity to provide habitat for many species?	
H 2.1 Buffers *(see p. 80)* *Choose the description that best represents condition of buffer of wetland unit. The highest scoring criterion that applies to the wetland is to be used in the rating. See text for definition of "undisturbed."* — 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% of circumference. No structures are within the undisturbed part of buffer. (relatively undisturbed also means no-grazing, no landscaping, no daily human use) **Points = 5** — 100 m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 50% circumference. **Points = 4** — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% circumference. **Points = 4** — 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 25% circumference, . **Points = 3** — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water for > 50% circumference. **Points = 3** **If buffer does not meet any of the criteria above** — No paved areas (except paved trails) or buildings within 25 m (80ft) of wetland > 95% circumference. Light to moderate grazing, or lawns are OK. **Points = 2** — No paved areas or buildings within 50m of wetland for >50% circumference. Light to moderate grazing, or lawns are OK. **Points = 2** — Heavy grazing in buffer. **Points = 1** — Vegetated buffers are <2m wide (6.6ft) for more than 95% of the circumference (e.g. tilled fields, paving, basalt bedrock extend to edge of wetland **Points = 0.** ✓ Buffer does not meet any of the criteria above. **Points = 1** Aerial photo showing buffers	Figure ___ 1
H 2.2 Corridors and Connections *(see p. 81)* H 2.2.1 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 150 ft wide, has at least 30% cover of shrubs, forest or native undisturbed prairie, that connects to estuaries, other wetlands or undisturbed uplands that are at least 250 acres in size? (*dams in riparian corridors, heavily used gravel roads, paved roads, are considered breaks in the corridor*). YES = **4 points** (*go to H 2.3*) ✓ NO = go to H 2.2.2 H 2.2.2 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 50ft wide, has at least 30% cover of shrubs or forest, and connects to estuaries, other wetlands or undisturbed uplands that are at least 25 acres in size? **OR** a **Lake-fringe** wetland, if it does not have an undisturbed corridor as in the question above? YES = **2 points** (*go to H 2.3*) ✓ NO = H 2.2.3 H 2.2.3 Is the wetland: within 5 mi (8km) of a brackish or salt water estuary OR within 3 mi of a large field or pasture (>40 acres) OR within 1 mi of a lake greater than 20 acres? YES = **1 point** ✓ NO = **0 points**	0

Total for page 1

H 2.3 Near or adjacent to other priority habitats listed by WDFW *(see new and complete descriptions of WDFW priority habitats, and the counties in which they can be found, in the PHS report http://wdfw.wa.gov/hab/phslist.htm)* Which of the following priority habitats are within 330ft (100m) of the wetland unit? *NOTE: the connections do not have to be relatively undisturbed.* ____**Aspen Stands:** Pure or mixed stands of aspen greater than 0.4 ha (1 acre). ✓ **Biodiversity Areas and Corridors**: Areas of habitat that are relatively important to various species of native fish and wildlife (*full descriptions in WDFW PHS report p. 152*). ____**Herbaceous Balds:** Variable size patches of grass and forbs on shallow soils over bedrock. ____**Old-growth/Mature forests:** (Old-growth west of Cascade crest) Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 20 trees/ha (8 trees/acre) > 81 cm (32 in) dbh or > 200 years of age. (Mature forests) Stands with average diameters exceeding 53 cm (21 in) dbh; crown cover may be less that 100%; crown cover may be less that 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80 - 200 years old west of the Cascade crest. ____**Oregon white Oak:** Woodlands Stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important (*full descriptions in WDFW PHS report p. 158*). ____**Riparian**: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other. ____**Westside Prairies:** Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie (*full descriptions in WDFW PHS report p. 161*). ____**Instream:** The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources. ____**Nearshore**: Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore. (*full descriptions of habitats and the definition of relatively undisturbed are in WDFW report: pp. 167-169 and glossary in Appendix A).* ____**Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human. ____**Cliffs:** Greater than 7.6 m (25 ft) high and occurring below 5000 ft. ____**Talus:** Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs. ✓ **Snags and Logs:** Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 51 cm (20 in) in western Washington and are > 2 m (6.5 ft) in height. Priority logs are > 30 cm (12 in) in diameter at the largest end, and > 6 m (20 ft) long. If wetland has **3 or more** priority habitats = **4 points** ✓ If wetland has **2** priority habitats = **3 points** If wetland has **1** priority habitat = **1 point** No habitats = 0 points *Note: All vegetated wetlands are by definition a priority habitat but are not included in this list. Nearby wetlands are addressed in question H 2.4)*	3

Wetland name or number ~~D~~ A

H 2.4 Wetland Landscape *(choose the **one** description of the landscape around the wetland that best fits)* ***(see p. 84)*** There are at least 3 other wetlands within ½ mile, and the connections between them are relatively undisturbed (light grazing between wetlands OK, as is lake shore with some boating, but connections should NOT be bisected by paved roads, fill, fields, or other development. points = 5 The wetland is Lake-fringe on a lake with little disturbance and there are 3 other lake-fringe wetlands within ½ mile points = 5 ✓ There are at least 3 other wetlands within ½ mile, BUT the connections between them are disturbed points = 3 The wetland is Lake-fringe on a lake **with** disturbance and there are 3 other lake-fringe wetland within ½ mile points = 3 There is at least 1 wetland within ½ mile. points = 2 There are no wetlands within ½ mile. points = 0	3
H 2. TOTAL Score - opportunity for providing habitat *Add the scores from H2.1,H2.2, H2.3, H2.4*	7
TOTAL for H 1 from page 14	7
Total Score for Habitat Functions – add the points for H 1, H 2 and record the result on p. 1	14

Wetland name or number ~~B~~ A

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Please determine if the wetland meets the attributes described below and circle the appropriate answers and Category.

Wetland Type *Check off any criteria that apply to the wetland. Circle the Category when the appropriate criteria are met.*	**Category**
SC 1.0 Estuarine wetlands *(see p. 86)* Does the wetland unit meet the following criteria for Estuarine wetlands? — The dominant water regime is tidal, — Vegetated, and — With a salinity greater than 0.5 ppt. YES = Go to SC 1.1 NO ✓	
SC 1.1 Is the wetland unit within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? YES = Category I NO go to SC 1.2	**Cat. I**
SC 1.2 Is the wetland unit at least 1 acre in size and meets at least two of the following three conditions? YES = Category I NO = Category II — The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. If the non-native *Spartina* spp. are the only species that cover more than 10% of the wetland, then the wetland should be given a dual rating (I/II). The area of Spartina would be rated a Category II while the relatively undisturbed upper marsh with native species would be a Category I. Do not, however, exclude the area of Spartina in determining the size threshold of 1 acre. — At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. — The wetland has at least 2 of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands.	**Cat. I** **Cat. II** **Dual rating I/II**

Wetland name or number 5A

SC 2.0 Natural Heritage Wetlands *(see p. 87)* Natural Heritage wetlands have been identified by the Washington Natural Heritage Program/DNR as either high quality undisturbed wetlands or wetlands that support state Threatened, Endangered, or Sensitive plant species. SC 2.1 Is the wetland unit being rated in a Section/Township/Range that contains a Natural Heritage wetland? *(this question is used to screen out most sites before you need to contact WNHP/DNR)* S/T/R information from Appendix D ✓ or accessed from WNHP/DNR web site ___ YES____ – contact WNHP/DNR (see p. 79) and go to SC 2.2 NO X SC 2.2 Has DNR identified the wetland as a high quality undisturbed wetland or as or as a site with state threatened or endangered plant species? YES = Category I NO ____not a Heritage Wetland	**Cat. I**
SC 3.0 Bogs *(see p. 87)* Does the wetland unit (**or any part of the unit**) meet both the criteria for soils and vegetation in bogs? *Use the key below to identify if the wetland is a bog.* ***If you answer yes you will still need to rate the wetland based on its functions.*** 1. Does the unit have organic soil horizons (i.e. layers of organic soil), either peats or mucks, that compose 16 inches or more of the first 32 inches of the soil profile? (See Appendix B for a field key to identify organic soils)? Yes - go to Q. 3 ✓ No - go to Q. 2 2. Does the unit have organic soils, either peats or mucks that are less than 16 inches deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on a lake or pond? Yes - go to Q. 3 ✓ No - Is not a bog for purpose of rating 3. Does the unit have more than 70% cover of mosses at ground level, AND other plants, if present, consist of the "bog" species listed in Table 3 as a significant component of the vegetation (more than 30% of the total shrub and herbaceous cover consists of species in Table 3)? Yes – Is a bog for purpose of rating No - go to Q. 4 NOTE: If you are uncertain about the extent of mosses in the understory you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16" deep. If the pH is less than 5.0 and the "bog" plant species in Table 3 are present, the wetland is a bog. *1.* Is the unit forested (> 30% cover) with sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Englemann's spruce, or western white pine, WITH any of the species (or combination of species) on the bog species plant list in Table 3 as a significant component of the ground cover *(> 30% coverage of the total shrub/herbaceous cover)?* 2. YES = Category I No___ Is not a bog for purpose of rating	**Cat. I**

SC 4.0 Forested Wetlands *(see p. 90)* Does the wetland unit have at least 1 acre of forest that meet one of these criteria for the Department of Fish and Wildlife's forests as priority habitats? *If you answer yes you will still need to rate the wetland based on its functions.* — **Old-growth forests**: (west of Cascade crest) Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/acre (20 trees/hectare) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 inches (81 cm) or more. NOTE: The criterion for dbh is based on measurements for upland forests. Two-hundred year old trees in wetlands will often have a smaller dbh because their growth rates are often slower. The DFW criterion is and "OR" so old-growth forests do not necessarily have to have trees of this diameter. — **Mature forests**: (west of the Cascade Crest) Stands where the largest trees are 80 – 200 years old OR have average diameters (dbh) exceeding 21 inches (53cm); crown cover may be less that 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth. YES = Category I NO ✓ not a forested wetland with special characteristics	**Cat. I**
SC 5.0 Wetlands in Coastal Lagoons *(see p. 91)* Does the wetland meet all of the following criteria of a wetland in a coastal lagoon? — The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks — The lagoon in which the wetland is located contains surface water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon *(needs to be measured near the bottom)* YES = Go to SC 5.1 NO ✓ not a wetland in a coastal lagoon SC 5.1 Does the wetland meets all of the following three conditions? — The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of invasive plant species (see list of invasive species on p. 74). — At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. — The wetland is larger than 1/10 acre (4350 square feet) YES = Category I NO = Category II	**Cat. I** **Cat. II**

Wetland name or number ~~B~~ A

SC 6.0 Interdunal Wetlands *(see p. 93)* Is the wetland unit west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? YES - go to SC 6.1 NO ✓ not an interdunal wetland for rating ***If you answer yes you will still need to rate the wetland based on its functions.*** In practical terms that means the following geographic areas: • Long Beach Peninsula- lands west of SR 103 • Grayland-Westport- lands west of SR 105 • Ocean Shores-Copalis- lands west of SR 115 and SR 109 SC 6.1 Is the wetland one acre or larger, or is it in a mosaic of wetlands that is once acre or larger? YES = Category II NO – go to SC 6.2 SC 6.2 Is the unit between 0.1 and 1 acre, or is it in a mosaic of wetlands that is between 0.1 and 1 acre? YES = Category III	**Cat. II** **Cat. III**
Category of wetland based on Special Characteristics *Choose the "highest" rating if wetland falls into several categories, and record on p. 1.* If you answered NO for all types enter "Not Applicable" on p.1	

APPENDIX B

IMPORTANT INFORMATION ABOUT YOUR WETLAND DELINEATION/MITIGATION AND/OR STREAM CLASSIFICATION REPORT

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

Attachment to and part of Report 21-1-12396-002

Date: June 4, 2013
To: Ms. Joleen Fuson
JMJ Team

IMPORTANT INFORMATION ABOUT YOUR WETLAND DELINEATION/MITIGATION AND/OR STREAM CLASSIFICATION REPORT

A WETLAND/STREAM REPORT IS BASED ON PROJECT-SPECIFIC FACTORS.

Wetland delineation/mitigation and stream classification reports are based on a unique set of project-specific factors. These typically include the general nature of the project and property involved, its size, and its configuration; historical use and practice; the location of the project on the site and its orientation; and the level of additional risk the client assumed by virtue of limitations imposed upon the exploratory program. The jurisdiction of any particular wetland/stream is determined by the regulatory authority(s) issuing the permit(s). As a result, one or more agencies will have jurisdiction over a particular wetland or stream with sometimes confusing regulations. It is necessary to involve a consultant who understands which agency(s) has jurisdiction over a particular wetland/stream and what the agency(s) permitting requirements are for that wetland/stream. To help reduce or avoid potential costly problems, have the consultant determine how any factors or regulations (which can change subsequent to the report) may affect the recommendations.

Unless your consultant indicates otherwise, your report should not be used:

- If the size or configuration of the proposed project is altered.
- If the location or orientation of the proposed project is modified.
- If there is a change of ownership.
- For application to an adjacent site.
- For construction at an adjacent site or on site.
- Following floods, earthquakes, or other acts of nature.

Wetland/stream consultants cannot accept responsibility for problems that may develop if they are not consulted after factors considered in their reports have changed. Therefore, it is incumbent upon you to notify your consultant of any factors that may have changed prior to submission of our final report.

Wetland boundaries identified and stream classifications made by Shannon & Wilson are considered preliminary until validated by the U.S. Army Corps of Engineers (Corps) and/or the local jurisdictional agency. Validation by the regulating agency(s) provides a certification, usually written, that the wetland boundaries verified are the boundaries that will be regulated by the agency(s) until a specified date, or until the regulations are modified, and that the stream has been properly classified. Only the regulating agency(s) can provide this certification.

MOST WETLAND/STREAM "FINDINGS" ARE PROFESSIONAL ESTIMATES.

Site exploration identifies wetland/stream conditions at only those points where samples are taken and when they are taken, but the physical means of obtaining data preclude the determination of precise conditions. Consequently, the information obtained is intended to be sufficiently accurate for design, but is subject to interpretation. Additionally, data derived through sampling and subsequent laboratory testing are extrapolated by the consultant who then renders an opinion about overall conditions, the likely reaction to proposed construction activity, and/or appropriate design. Even under optimal circumstances, actual conditions may differ from those thought to exist because no consultant, no matter how qualified, and no exploration program, no matter how comprehensive, can reveal what is hidden by earth, rock, and time. Nothing can be done to prevent the unanticipated, but steps can be taken to help reduce their impacts. For this reason, most experienced owners retain their consultants through the construction or wetland mitigation/stream classification stage to identify variances, to conduct additional evaluations that may be needed, and to recommend solutions to problems encountered on site.

WETLAND/STREAM CONDITIONS CAN CHANGE.

Since natural systems are dynamic systems affected by both natural processes and human activities, changes in wetland boundaries and stream conditions may be expected. Therefore, delineated wetland boundaries and stream classifications cannot remain valid for an indefinite period of time. The Corps typically recognizes the validity of wetland delineations for a period of five years after completion. Some city and county agencies recognize the validity of wetland delineations for a period of two years. If a period of years have passed since the wetland/stream report was completed, the owner is advised to have the consultant reexamine the wetland/stream to determine if the classification is still accurate.

Construction operations at or adjacent to the site and natural events such as floods, earthquakes, or water fluctuations may also affect conditions and, thus, the continuing adequacy of the wetland/stream report. The consultant should be kept apprised of any such events and should be consulted to determine if additional evaluation is necessary.

THE WETLAND/STREAM REPORT IS SUBJECT TO MISINTERPRETATION.

Costly problems can occur when plans are developed based on misinterpretation of a wetland/stream report. To help avoid these problems, the consultant should be retained to work with other appropriate professionals to explain relevant wetland, stream, geological, and other findings, and to review the adequacy of plans and specifications relative to these issues.

DATA FORMS SHOULD NOT BE SEPARATED FROM THE REPORT.

Final data forms are developed by the consultant based on interpretation of field sheets (assembled by site personnel) and laboratory evaluation of field samples. Only final data forms customarily are included in a report. These data forms should not, under any circumstances, be drawn for inclusion in other drawings because drafters may commit errors or omissions in the transfer process. Although photographic reproduction eliminates this problem, it does nothing to reduce the possibility of misinterpreting the forms. When this occurs, delays, disputes, and unanticipated costs are frequently the result.

To reduce the likelihood of data form misinterpretation, contractors, engineers, and planners should be given ready access to the complete report. Those who do not provide such access may proceed under the mistaken impression that simply disclaiming responsibility for the accuracy of information always insulates them from attendant liability. Providing the best available information to contractors, engineers, and planners helps prevent costly problems and the adversarial attitudes that aggravate them to a disproportionate scale.

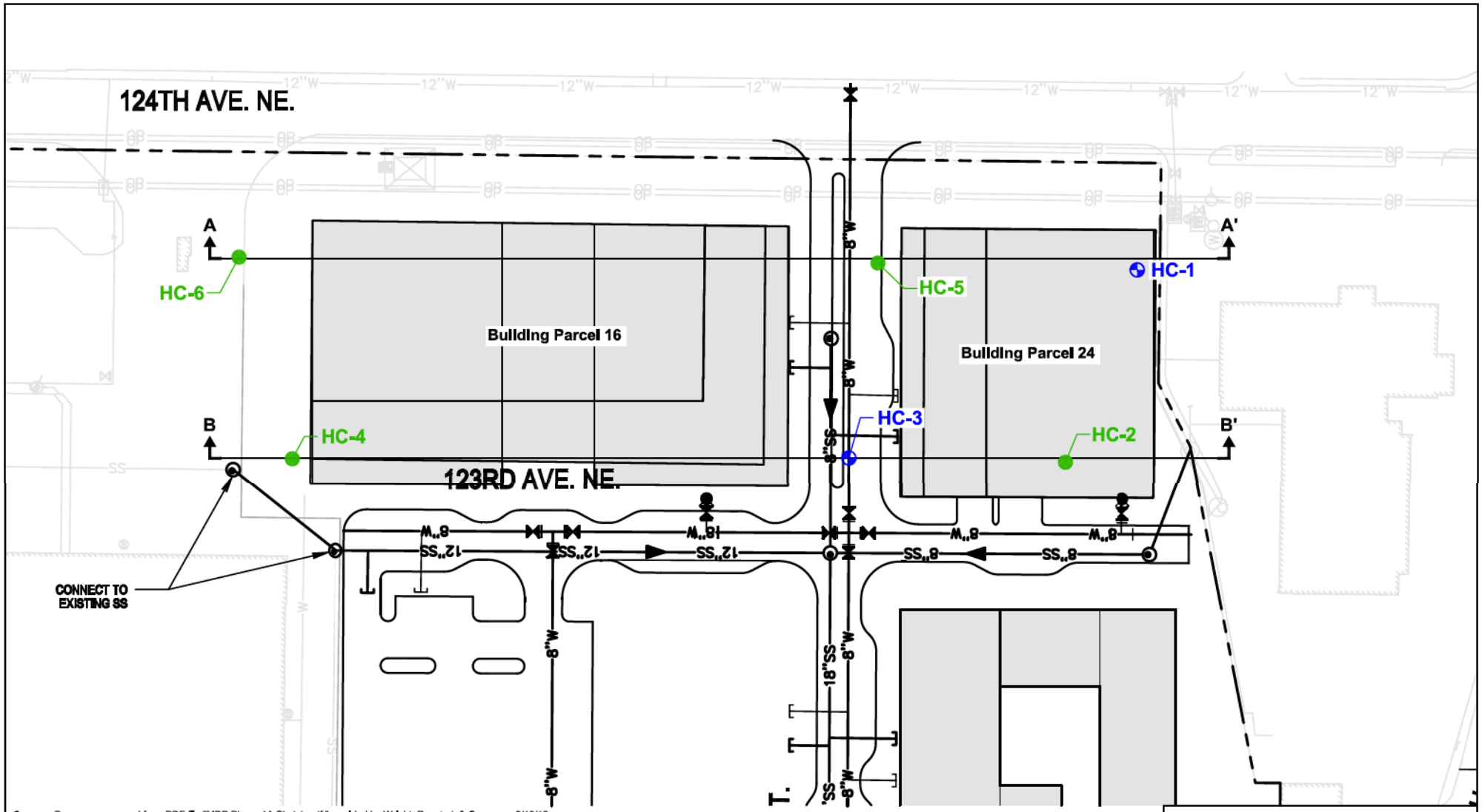
READ RESPONSIBILITY CLAUSES CLOSELY.

Because a wetland delineation/stream classification is based extensively on judgment and opinion, it is far less exact than other design disciplines. This situation has resulted in wholly unwarranted claims being lodged against consultants. To help prevent this problem, consultants have developed a number of clauses for use in written transmittals. These are not exculpatory clauses designed to foist the consultant's liabilities onto someone else; rather, they are definitive clauses that identify where the consultant's responsibilities begin and end. Their use helps all parties involved recognize their individual responsibilities and take appropriate action. Some of these definitive clauses are likely to appear in your report, and you are encouraged to read them closely. Your consultant will be pleased to give full and frank answers to your questions.

THERE MAY BE OTHER STEPS YOU CAN TAKE TO REDUCE RISK.

Your consultant will be pleased to discuss other techniques or designs that can be employed to mitigate the risk of delays and to provide a variety of alternatives that may be beneficial to your project.

Contact your consultant for further information.



Source: Base map prepared from PDF file "MDP Phase 1A Sketch.pdf," provided by Wright, Runstad, & Company, 3/13/12.

HC-1 Monitoring Well Location and Number

HC-2 Boring Location and Number

A A' Cross Section Location and Designation

N

0 60 120
Scale In Feet

Spring District Phase 1A
Bellevue, Washington

Site and Exploration Plan

17860-00 4/12

HARTCROWSER

Figure
2

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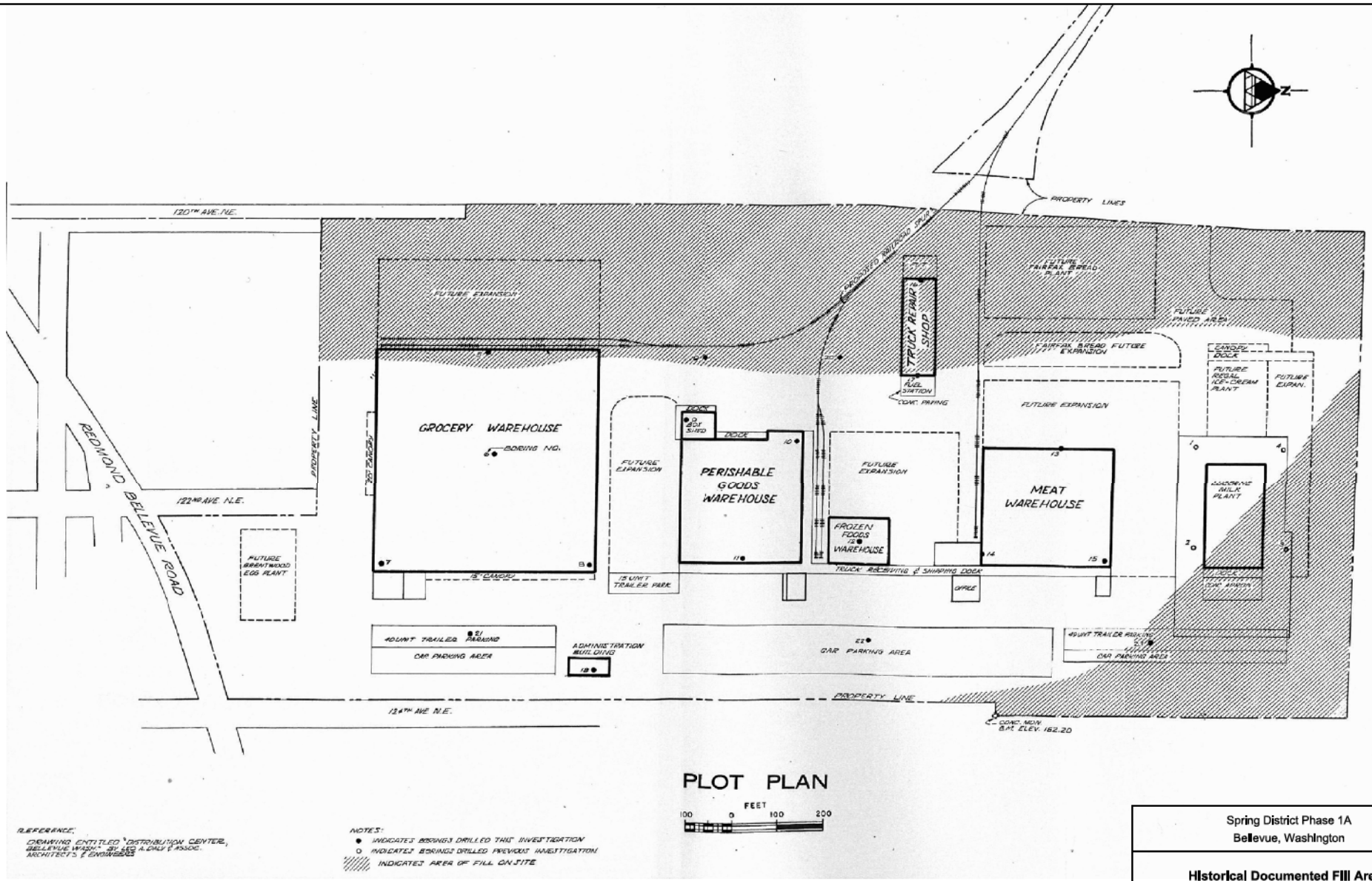

Spring District Phase 1A
Bellevue, Washington

Historical Documented Fill Areas

17860-00 4/12

HARTCROWSER

Figure 3

Reference: Dames & Moore 1957. Report of Foundation Investigation, Structures and Parking Areas, Proposed Distribution Center, Bellevue, Washington.

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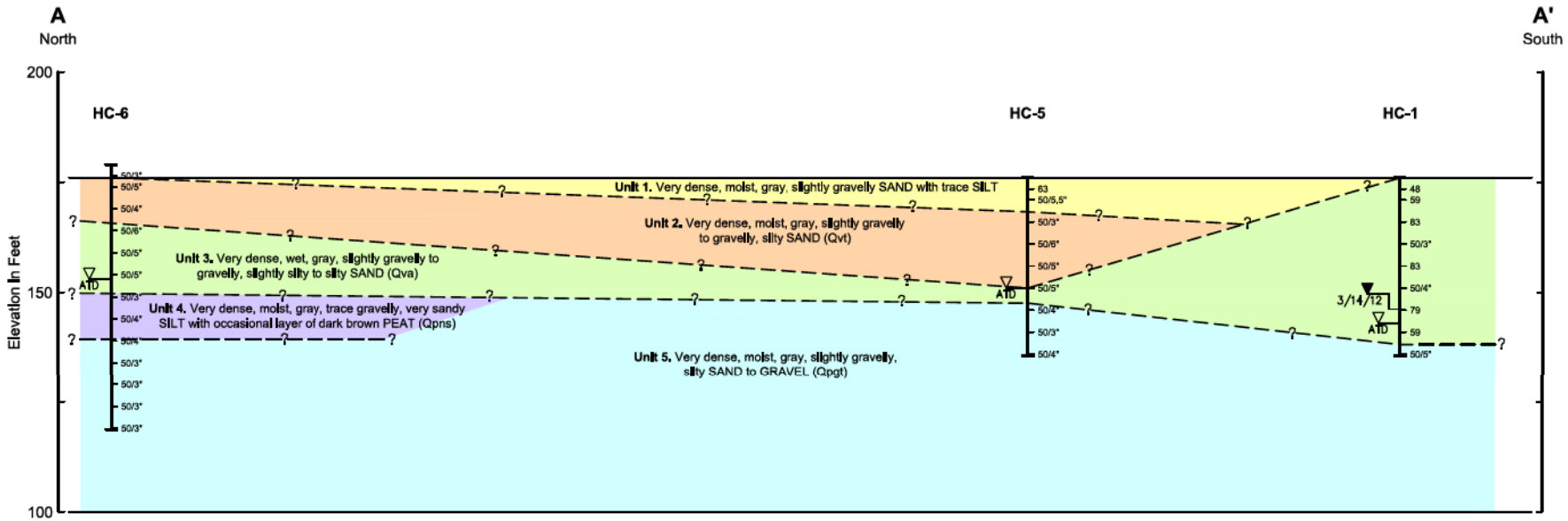

Geologic Unit Key

Qvt - Vashon Till
Qva - Vashon Advance Outwash
Qpns - Pre-Vashon Nonglacial Soil (Paleosol)
Qpgt - Pre-Vashon Glacial Till

Note:
Contact between soil units is interpolated between borings and represents our interpretation of subsurface conditions based on currently available data.

HC-1 Exploration Number

Exploration Location

ATD Water Level

48 Standard Penetration Resistance in Blows per Foot

Horizontal Scale in Feet
0 50 100
0 25 50
Vertical Scale in Feet
Vertical Exaggeration x 2

Spring District Phase 1A
Bellevue, Washington

Generalized Subsurface Cross Section A-A'

17860-00 4/12

HARTCROWSER

Figure
4

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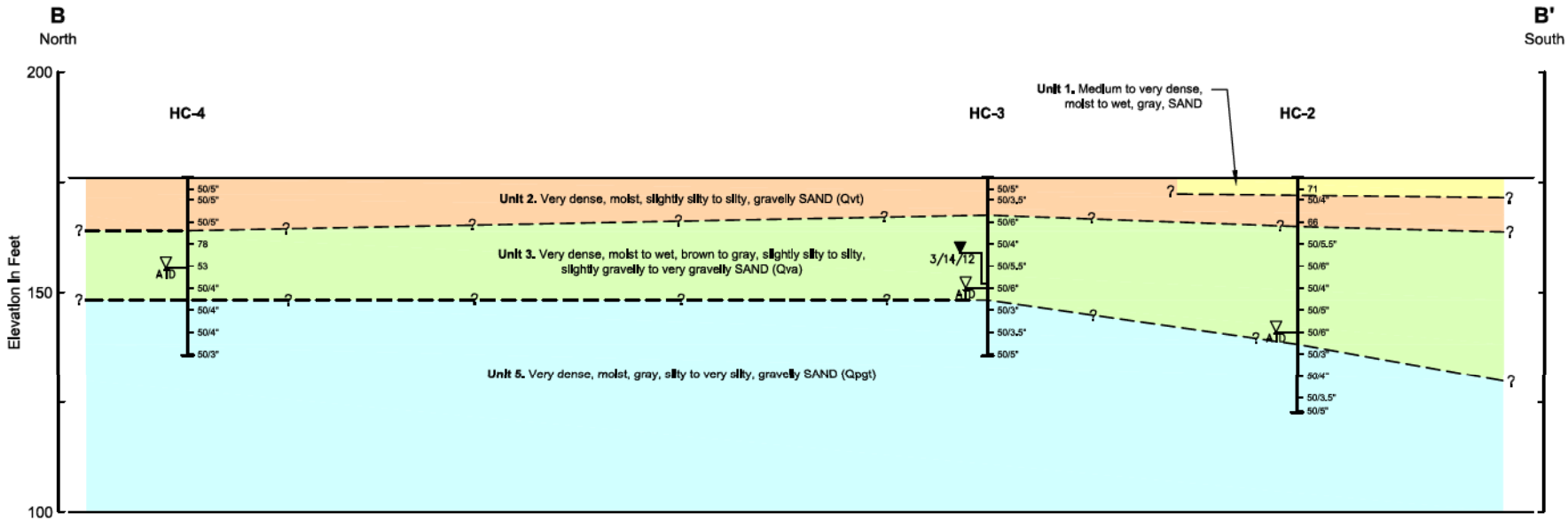

Geologic Unit Key
Qvt - Vashon Till
Qva - Vashon Advance Outwash
Qpgt - Pre-Vashon Glacial Till

HC-2 Exploration Number

Exploration Location

ATD Water Level

66 Standard Penetration Resistance In Blows per Foot

Horizontal Scale in Feet
0 50 100
0 25 50
Vertical Scale In Feet
Vertical Exaggeration x 2

Note:
Contact between soil units is interpolated between borings and represents our interpretation of subsurface conditions based on currently available data.

Spring District Phase 1A
Bellevue, Washington

Generalized Subsurface Cross Section B-B'

17860-00 4/12

HARTCROWSER

Figure
5

EAL 04/5/12 17860-00-004.dwg

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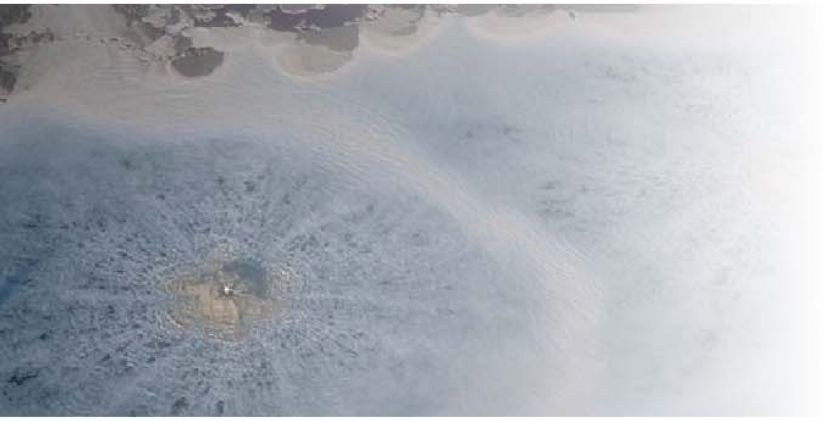
Attachment F
Geotechnical Report
by Hart Crowser dated April 6, 2012



Geotechnical Engineering Design Study
Spring District Phase 1A
Bellevue, Washington

Prepared for
Wright Runstad & Company

April 6, 2012
17860-00

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www.hartcrowser.com

Geotechnical Engineering Design Study Spring District Phase 1A Bellevue, Washington

Prepared for
Wright Runstad & Company

April 6, 2012
17860-00

Prepared by
Hart Crowser, Inc.

Matthew Veenstra, PE
Project
Geotechnical Engineer

David Winter, PE, LEED AP
Vice President

1700 Westlake Avenue North, Suite 200
Seattle, Washington 98109-6212
Fax 206.328.5581
Tel 206.324.9530

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CONTENTS

	Page
INTRODUCTION	1
PURPOSE, SCOPE, AND USE OF THIS STUDY	1
Purpose	1
Scope	1
Use of this Study	2
SITE AND PROJECT DESCRIPTION	2
Site Location	2
Historic and Current Site Use	2
Proposed Site Use	3
SUBSURFACE CONDITIONS	3
Interpretation of Subsurface Conditions	3
Subsurface Soil Conditions	4
Groundwater Conditions	4
GEOTECHNICAL ENGINEERING DESIGN RECOMMENDATIONS	5
Site Preparation	5
Temporary Cuts	6
Support of Excavation/Shoring	7
Foundation Design Recommendations	15
Lateral Pressures on Permanent Subgrade Walls	19
Floor Slab Design Recommendations	19
Seismic Design Recommendations	21
Structural Fill Selection and Placement	22
Drainage Considerations	23
RECOMMENDED ADDITIONAL GEOTECHNICAL SERVICES	27
REFERENCES	28

CONTENTS (Continued)

Page

FIGURES

1 Vicinity Map
2 Site and Exploration Plan
3 Historical Documented Fill Areas
4 Generalized Subsurface Cross Section A-A′
5 Generalized Subsurface Cross Section B-B′
6 Soldier Pile/Tieback Shoring – General Design
7 Determination of Lateral Pressure from Surcharge Loads Acting on Adjacent Shoring

APPENDIX A
FIELD EXPLORATION METHODS AND ANALYSIS

APPENDIX B
LABORATORY TESTING PROGRAM

APPENDIX C
SHORING MONITORING AND ANCHOR TESTING PROGRAM

GEOTECHNICAL ENGINEERING DESIGN STUDY
SPRING DISTRICT PHASE 1A
BELLEVUE, WASHINGTON

INTRODUCTION

This report presents our geotechnical engineering design recommendations for Building Parcels 16 and 24 of Phase 1A of the Spring District Development in Bellevue Washington (Figures 1 and 2).

This report contains the following main sections:

- Introduction;
- Purpose, Scope, and Use of This Study;
- Site and Project Description;
- Subsurface Conditions;
- Geotechnical Engineering Design Recommendations; and
- Recommended Additional Geotechnical Services.

Figures follow the main text to illustrate the project vicinity, exploration locations, subsurface cross sections, and geotechnical design recommendations. Appendices present boring logs, laboratory test results, and shoring monitoring and testing recommendations.

PURPOSE, SCOPE, AND USE OF THIS STUDY

Purpose

The purpose of our work has been to:

- Assess subsurface conditions;
- Assist the structural engineer in developing foundation and seismic design criteria; and
- Provide geotechnical recommendations and consultation relevant to design and construction.

Scope

Our scope of work included the following:

- Drill six borings to depths of about 40 to 60 feet across the building areas;
- Install two groundwater monitoring wells to depths of 30 to 40 feet;

- Test selected soil samples collected from our explorations;
- Develop geotechnical recommendations for building design and construction including:
  - Excavation retention, including recommendations for open cuts, alternative shoring systems, performance requirements, and monitoring and testing during construction;
  - Lateral soil pressure on temporary and permanent subgrade walls, including earthquake loading;
  - Allowable bearing pressure on spread foundations and estimated settlement;
  - Slab-on-grade design modulus, subgrade preparation, and installation of drains;
  - Groundwater monitoring during construction and long term; and
  - Structural fill placement and compaction, including potential reuse of excavated soils.

Use of this Study

We completed this work in general accordance with our proposal dated January 13, 2012. Our report is for the exclusive use of Wright Runstad & Company and their design consultants for specific application to the subject project and site. We completed this study in accordance with generally accepted geotechnical practices for the nature and conditions of work completed in the same or similar localities, at the time the work was performed. We make no other warranty, express or implied.

SITE AND PROJECT DESCRIPTION

Site Location

The project site is located northwest of the intersection of 124th Ave NE and NE 12th Street in Bellevue, Washington (Figure 1). The building site includes Building Parcels 16 and 24, located at the southeast corner of the project site (Figure 2).

Historic and Current Site Use

Based on our review of a previous geotechnical report (Dames & Moore 1957), we understand that before 1954 the site was used for agriculture. During 1954 and 1955 the site was graded for construction of a Safeway Stores, Inc., distribution center. Grading included cutting high areas and filling low areas. The Dames & Moore (1957) report indicates that fill was placed on the west and

northeast portions of the project site (Figure 3). Based on this information and our current explorations, we do not expect fill thickness to exceed about 3 feet within the footprints of Building Parcels 16 and 24.

The project site is currently occupied by a distribution center and includes several buildings. The existing buildings are single story with shallow footing foundations. The building site is relatively level and is paved with asphalt and concrete.

Proposed Site Use

We understand the proposed buildings will be mid-rise office buildings with a combined area of about 440,000 square feet and about 1,100 parking stalls. We understand that the excavation(s) will be as deep as five levels below grade and will require temporary shoring.

SUBSURFACE CONDITIONS

Interpretation of Subsurface Conditions

Our interpretation of the subsurface conditions in the building area is based on materials encountered in our explorations, laboratory testing of soil samples, and our field observations. We advanced six borings (HC-1 to HC-6) to depths of about 40 to 60 feet and installed groundwater monitoring wells in borings HC-1 and HC-3. Exploration locations are shown on Figure 2. Historical documentation of fill across the project site is shown on Figure 3. Cross sections illustrating the interpreted subsurface conditions across the building site are shown on Figures 4 and 5.

The conclusions and recommendations in this report are based on subsurface conditions interpreted from explorations at the site and soil properties inferred from field observations and laboratory tests. The nature and extent of variations between the explorations may not become evident until construction begins. If variations exist, it may be necessary to re-evaluate the recommendations in this report.

Details of the conditions observed at the exploration locations are shown on the boring logs included in Appendix A and should be referred to for specific information. Results of the laboratory tests for this study are presented in Appendix B.

Subsurface Soil Conditions

We divided the subsurface into general soil units 1 to 5 according to their relative density, texture, and geologic interpretation. The units are presented from the ground surface downward.

- **Unit 1.** Unit 1 consists of medium to very dense, moist, gray, slightly gravelly SAND with trace silt and poorly graded SAND. This unit may include fill comprised of site soils and/or recessional outwash deposits. This unit was encountered in borings HC-2 and HC-5.

- **Unit 2.** Unit 2 consists of Vashon till (Qvt) deposits characterized by very dense, moist, gray, silty, gravelly SAND.

- **Unit 3.** Unit 3 consists of Vashon advance outwash (Qva) deposits characterized by very dense, wet, gray, silty, gravelly SAND. Groundwater was encountered in this unit.

- **Unit 4.** Unit 4 consists of pre-Vashon nonglacial (paleosol) (Qpns) deposits characterized by very dense, moist, gray, very sandy SILT with occasional layers of dark brown PEAT (overconsolidated and not compressible).

- **Unit 5.** Unit 5 consists of pre-Vashon glacial till deposits (Qpgt) characterized by very dense, moist, gray, slightly gravelly, silty SAND to GRAVEL. Drilling resistance of the test borings increased considerably in this unit.

Groundwater Conditions

At the time of drilling, groundwater was noted in all the borings. Borings HC-1 and HC-3 were completed as piezometers to measure water levels. Water level readings were taken on March 14, 2011. The water level depths are shown in Table 1.

Table 1 - Observed Groundwater Depths

Boring ID	Time of Drilling (feet)	Depth on 3-14-2012
HC-1	34	29.8
HC-2	35	n.a.
HC-3	25	24.1
HC-4	21	n.a.
HC-5	25	n.a.
HC-6	26	n.a.

The observed groundwater was encountered in Unit 3, outwash deposits, and is likely perched on Unit 5 glacial till deposits. Isolated perched water-bearing zones are often encountered in these soils and should be anticipated during construction.

Water levels were measured at the times and under the conditions stated on the boring logs. Fluctuations in the groundwater conditions, including depth and volume, may be caused by variations in rainfall, temperature, season, and other factors.

GEOTECHNICAL ENGINEERING DESIGN RECOMMENDATIONS

This section of the report presents our conclusions and recommendations for geotechnical aspects of design and construction. We have developed our recommendations based on our current understanding of the project and the subsurface conditions encountered in our explorations. If the nature or location of the proposed facilities are different than we have assumed, Hart Crowser should be notified so we can change or confirm our recommendations.

Site Preparation

General Site Preparation

Site preparation will involve removal of existing pavement and sidewalks and abandoning or removing any existing underground utilities within the new building area.

Abandoned underground utilities should be removed or completely grouted. Ends of remaining abandoned utility lines should be sealed to prevent piping of soil or water into the pipe.

Site preparation for footings, slabs-on-grade, and pavement sections should include the following procedures to provide a firm and non-yielding subgrade:

- Remove all visible organic materials, debris, and other deleterious materials from subgrade areas.

- Proof roll all paved areas with a heavy vibratory compactor or fully loaded dump truck before filling to delineate soft or loose areas. It is important that this condition be verified by a geotechnical engineer from Hart Crowser.

- Overexcavate and replace soft and loose, wet, or yielding soils under paved areas with structural fill as described in the ***Fill Selection, Placement, and Compaction*** section.

- Prepare footing subgrade areas as indicated in the ***Foundation Design Recommendations*** section.

Site Dewatering

As previously stated, groundwater was encountered in Unit 3 outwash soils, perched on Unit 5 till soils. Allowances should be made for temporary dewatering to handle perched water and wet weather conditions. We expect that conventional trench and sump methods will be sufficient for temporary dewatering. The use of wellpoints and soil berms may be necessary in some areas to stabilize the face of the excavation. The contractor should be prepared to provide temporary drainage, such as sumps, to maintain excavations in a workable condition.

Temporary Cuts

We understand that open cuts may be used in some areas. The stability and safety of cut slopes depend on a number of factors, including:

- The type and density of the soil;
- The presence and amount of any seepage;
- Depth of cut;
- Proximity of the cut to any surcharge loads near the top of the cut, such as stockpiled material, traffic loads, structures, etc.;
- Duration of the open excavation; and
- Care and methods used by the contractor.

Based on these factors, we recommend:

- Use plastic sheeting to protect slopes from erosion; and
- Limit the duration of the open excavation to the shortest time possible.

Because of the variables involved, actual slope grades required for stability in temporary cut areas can only be estimated before construction. We recommend that stability of the temporary slopes used for construction be the sole responsibility of the contractor, since the contractor is in control of the construction operation and is continuously at the site to observe the nature and condition of the subsurface. Excavations should be made in accordance with all local, state, and federal safety requirements.

Support of Excavation/Shoring

We understand that the excavation will be as deep as 50 feet below ground surface, and that soil nails and soldier pile/tieback shoring systems are being considered. Subsurface conditions encountered in our explorations indicate that soil nails with shotcrete facing or soldier piles with tiebacks are technically feasible.

Soil Nail Support of Excavation

General Considerations

Soil nailing consists of a series of small diameter (typically 6- to 8-inch) holes drilled in a regular grid pattern, filled with reinforcing steel and structural grout, and connected to or covered by a shotcrete wall. The pattern and length of the nails vary depending on the soil type, the depth of cut, and other factors. The nails and shotcrete are installed sequentially as the excavation deepens. Exposed soil needs to be nailed and shotcrete applied on the same day that the lift is excavated. On large sites with good access, soil nail shoring can be installed faster and cost less than other methods.

It is the responsibility of the Contractor to consider or verify actual ground conditions at the site and determine the construction methods and procedures for installation of the soil nails and facing. Cobbles, boulders, or debris may be encountered and could impact construction. Loose soils near the surface could necessitate use of vertical elements or backslopes for stability. Face stability in gravelly soil or soils with groundwater may also require special measures for safe and efficient excavation, nail installation, and shotcreting.

Design Recommendations

A design for a soil nail system, including plans and specifications, is best completed after the owner and design team have finalized the proposed excavation geometry. Hart Crowser can complete the design or the excavation subcontractor can do it as a design-build with Hart Crowser's review.

We recommend the following for soil nail design:

- Design methods should be in accordance with FHWA "Geotechnical Engineering Circular No. 7, Soil Nail Walls" (2003).

- The design should consider surface loading from traffic and site equipment, and loads from adjacent structures.

- Permanent wall drainage should be incorporated to relieve potential hydrostatic pressures, intercept and divert water away from the wall (and toe of the wall), and convey water to the permanent drainage system. Typically this drainage and pressure relief is provided via Miradrain (or equivalent) strips affixed to the soil behind the shotcrete. Surface water runoff should be directed away from the top of the wall.

- Nails should be steel bars without couplers, splices, or welds, and should be installed with centralizers.

- Soil nail spacing should be a minimum of 3 feet and a maximum of 6 feet horizontally;

- Soil nail lengths should also be plotted and compared with any underground support elements of the adjacent structures.

The soil nail system should be designed to performance specifications, and the designer should be able to demonstrate that:

- No failure surface exists through or outside the nails with a factor of safety less than 1.35 against sliding;

- The nails are not stressed in excess of 80 percent of their yield stress; and

- The mobilized bond stress is less than half the ultimate adhesion between the grout and the soil. Ultimate adhesion is determined by the soil shear strength and must be justified by both pullout testing before nail installation and by limited production nail testing.

Construction and Testing Recommendations

Construction sequencing is especially important in soil nail construction. Soil nail wall systems are designed so that the excavation proceeds in staged cuts, i.e., a single row of nails around the excavation. We recommend the contractor:

- Test each soil type to demonstrate the unsupported face will be stable over the proposed time period;

- Control surface water during construction;

- Limit excavation height to the minimum necessary for practical and timely application of shotcrete, typically no more than an unsupported height of about 6 feet;

- Allow no soil nail holes to remain ungrouted overnight;

- Grout the hole as soon as possible after drilling;

- Pump structural grout into the hole through the auger or through a tube extended to the bottom of the hole;

- Verify the soil nail lengths by field testing, and adjust lengths as needed in response to changing soil and conditions;

- Reduce "stand-up time" of cuts and limit the total area of wall constructed during one shift to preserve face stability. We recommend that the initial stand-up time be limited to one shift unless the contractor's demonstration test for each soil type shows that longer stand-up times are possible, and as approved by the shoring designer and Hart Crowser;

- Expect cobbles, boulders, debris, and/or groundwater seepage to be encountered;

- Take care not to "mine out" large cavities in granular soils if drilling with a continuous flight auger;

- Drill soil nail holes in a manner that will minimize loss of ground and not disturb previously installed anchors. During soil nail drilling, wet or saturated zones may be encountered, and caving or "blow in" could occur. Drilling with a casing would reduce the potential for these conditions and loss of ground;

- Maintain continuous cutting return if using pneumatic drilling techniques so that air pressure is not "channeled" to nearby utility vaults, corridors, or subgrade slabs, which may damage such structures;

- Note the presence of existing facilities adjacent to the project site, including buried utilities and foundations, as these may affect the location and the length of the soil nail holes; and

- Monitor potential movement of the shoring system and potential ground settlement adjacent to the excavation, as we describe in Appendix C.

To allow for latitude in method of installation, we recommend that selection of the materials and the installation technique be left to the shoring contractor. The selected soil nail installation method must be subject to field verification with performance testing and proof testing as discussed below and in Appendix C.

Soil nail adhesion is highly dependent on soil conditions encountered during construction and on installation techniques. We recommend that a performance-based specification be used and the shoring contractor be responsible to determine the installation techniques to achieve the design anchor adhesion.

- The soil nail specifications should include an appropriate number of verification load tests (200 percent) and proof load tests (150 percent) on production nails. Typically, one verification test is required for each soil type, whereas proof testing is normally required on 5 percent of the production nails;

- Verification test nails should have a unbounded length of at least 3 feet but not longer than a maximum length such that the nail load does not exceed 90 percent of the nail bar tensile allowable load. The nail hole should be fully grouted after testing;

- For testing, a load reaction system must be provided by the Contractor, and is subject to the designer's approval.

- We recommend that Hart Crowser select the test locations based on observation of the soil conditions as the excavation proceeds.

Typical horizontal movement for soil nail walls is approximately 0.1 to 0.5 percent of the excavation depth. To minimize horizontal movement, nails may be pre-stressed.

Soldier Pile/Tieback Support of Excavation

The geotechnical criteria for the design of a conventional soldier pile/tieback shoring wall are lateral soil pressures and vertical bearing capacity of soldier piles. Figure 6 provides recommended parameters as discussed in this section.

Lateral Earth Pressures

Lateral earth pressures for the design of conventional shoring depend on the type of shoring, its ability to deform, and the presence or absence of structures within the "deformation zone." This zone can be defined by a line extending into the retained soil from the base of the wall at a slope of about 1H:1V. If the top of the shoring is allowed to deform at least 0.001 to 0.002 times the height and if no settlement-sensitive structures or utilities are located in the deformation zone, shoring may be designed using active earth pressures. If settlement-sensitive structures or utilities exist within the potential deformation zone, or

where the shoring system is too stiff to allow sufficient lateral movement to develop an active condition, at-rest earth pressures should be used to design the shoring. Theoretically, little movement should occur behind shoring properly designed and installed for at-rest conditions.

The main shoring walls will require multiple rows of tieback anchors. The walls should be designed using the apparent earth pressures given below. An apparent earth pressure diagram for soldier pile/tieback shoring is shown on Figure 6.

- For flexible walls (i.e., deflection at least 0.001 times the height of the shoring), use an equivalent active fluid weight of 17H pcf, where H is the effective height of the wall, as shown on Figure 6. For sloped areas above the shoring, calculate active pressures by assuming the top of the wall is located one-half of the way up the height of the adjacent slope. For street loads assume an equivalent height equal to 2 feet of soil.

- For non-yielding walls use equivalent fluid weights of 30H pcf.

- Multiple-braced shoring should be designed using a trapezoidal apparent earth pressure distribution, as shown on Figure 6.

- If soil and equipment will *not* be stockpiled on the uphill side of the excavation, it will not be necessary to include a surcharge load in the design. If material and equipment will be stockpiled, a surcharge load should be included in the design.

Additional lateral pressures due to surcharge loads (e.g., buildings, footings, heavy equipment, large material stockpiles) should be calculated using the methods shown on Figure 7. These additional loads would be additive to those calculated for the shoring walls. We recommend Hart Crowser review or complete the estimated surcharge loads when surcharge loads, footprints, and foundation plans of adjacent structures are available.

Soldier Pile Design and Installation

Soldier piles must be designed to carry bending stresses from earth pressures. Also, the embedded portion of the piles must be embedded deeply enough to resist lateral kickout and vertical loads.

- Design soldier piles in accordance with recommendations on Figure 6.

- Design soldier piles for bending using a uniform load equivalent to 80 percent of the design values. Analyze for shear using the total load.

- For design against kickout, compute the lateral resistance on the basis of passive pressure acting over twice the diameter of the soldier pile section or the pile spacing, whichever is less. Use a factor of safety no less than 1.5 for calculation of passive resistance.

- Embed soldier piles or sheet piles a minimum of 8 feet below the base of the excavation or required structural depth, whichever is greater.

Conditions such as caving soil and groundwater can loosen soil at the bottom of the soldier pile borehole reducing the bearing capacity. Tieback destressing and shoring failure could occur if soldier pile bearing capacity is inadequate and soldier piles settle under the vertical component of the inclined tieback load. We recommend that a Hart Crowser representative closely monitor soldier pile installation for these conditions so that construction methods can be adjusted accordingly.

- The contractor should be prepared to case the soldier pile installations. The need for casing should be determined in the field at the time of installation.

- The contractor should be prepared to tremie concrete from the bottom of the hole to displace groundwater or drilling mud used to maintain an open hole.

- The contractor should be prepared to excavate the soldier piles in a manner that prevents "heave" or "boiling" at the bottom of the soldier pile excavation. It may be necessary to over-drill the borehole and backfill the bottom of the borehole with structural concrete bearing on undisturbed soil.

- Drilling mud should not be used unless the mix is reviewed and approved by the geotechnical and structural engineer.

Gravel, cobbles and large boulders are common in these soils and could adversely impact constructability. Soldier pile shoring system construction may be difficult if cobbles or loose sand and gravel are encountered in the excavation. If these conditions are encountered, substantial raveling of the soil could occur. The Contractor should be prepared to place lagging in small vertical increments and should also be prepared to backfill voids behind the shoring system during construction due to loss of ground.

Timber lagging is often used to prevent loss of ground between the soldier piles. The lagging is inserted between the webs of the soldier piles and is designed for some fraction of the applied pressure on the wall.

Prompt and careful installation of lagging, particularly in areas of seepage and loose soil, is important to maintain the integrity of the excavation. The proper installation should be the responsibility of the shoring contractor to prevent soil failure, sloughing and loss of ground, and to provide safe working conditions.

We recommend that the temporary timber lagging thickness (rough cut) be sized using the values below. These lagging sizes are based on recommendations in FHWA GEC 4 (FHWA 1999) and our experience from similar excavations in Bellevue.

Excavation Depth (feet)	Recommended Lagging Thickness (rough-cut) for Clear Spans of:					
	5 feet	6 feet	7 feet	8 feet	9 feet	10 feet
0 to 25	2 inches	3 inches	3 inches	3 inches	4 inches	4 inches
25 to 130	3 inches	3 inches	3 inches	4 inches	4 inches	5 inches

- Backfill voids greater than 1 inch using sand, pea gravel, or a porous slurry. Backfill the void spaces progressively as the excavation deepens. The backfill must not allow potential hydrostatic pressure buildup behind the wall. Drainage behind the wall must be maintained or hydrostatic water pressure should be added to the recommended lateral earth pressures.

- If there is a slope above the wall, we recommend installing extra lagging above the shoring wall to provide a partial barrier for material that could ravel down from the slope face and fall into the excavation.

Drainage Recommendations

Groundwater seepage may occur across the excavation and so it is appropriate to install wall drainage on the shoring wall and behind the permanent wall. The recommended lateral earth pressures herein do not include a hydrostatic increment.

- Install a continuous drainage medium (or a layer of Miradrain) directly to the lagging between each pair of soldier piles or soil nails, as recommended by the shoring designer; and

- Include filter fabric protection between the drainage medium and the retained soil or lagging.

Tieback Anchor Design and Testing

Tieback anchors used for external lateral support of the soldier pile walls should be designed using the following recommendations:

- Design anchors in accordance with Figure 6.
- Locate anchors no closer to each other than three tieback diameters.
- Pump structural concrete into the anchor zone either using the drill casing as it is withdrawn, or from a grout hose/tremie hose placed at the bottom of the anchor.
- Fill the portion of the tieback within the no-load zone using a sand-pozzolan-water mixture, or equivalent non-cohesive mixture. Or, install a bond breaker such as plastic sheathing or a PVC pipe around the tie rods within the no-load zone.
- Grout and backfill drilled installations immediately after drilling; do not leave holes open overnight. This will help prevent possible collapse of the holes, loss of ground, and surface subsidence.
- Care should be taken not to "mine out" large cavities in granular soil if drilling with a continuous flight auger.
- Maintain continuous cutting return if using pneumatic drilling techniques so that air pressure is not "channeled" to nearby utility vaults, corridors, or subgrade slabs, which may damage such structures.
- Anchor lengths should also be plotted and compared with any underground support elements of the adjacent structures.
- The shoring contractor should particularly note the presence of existing facilities adjacent to the project site, including buried utilities and foundations, as these may affect the location and the length of the anchor holes.
- To allow for latitude in method of installation, we recommend that selection of the materials and the installation technique be left to the shoring contractor. The selected tieback anchor installation method must be subject to field verification with performance testing and proof testing as discussed in Appendix C.

- Install the anchor holes in a manner that will minimize ground loss and not disturb previously installed anchors. During tieback drilling, wet or saturated zones may be encountered, and caving or "blow in" could occur. Drilling with a casing would reduce the potential for these conditions and ground loss.

- Hart Crowser should review the design for anchor locations, capacities, and related criteria prior to implementation.

For anchor pullout, we recommend a factor of safety of at least 2.0. This factor of safety provides for a reasonable additional load capacity should an unforeseen increase in unit soil load develop because of irregularities that can occur during anchor installation. The variable soil conditions and unit friction values mean that some field changes in anchor length may be necessary.

Foundation Design Recommendations

The proposed buildings can be supported on spread footings. This section includes our geotechnical recommendations for foundation design and construction.

Vertical Foundation Design

- We understand that the footings may bear between about 10 and 50 feet below ground surface. Continuous and isolated spread footings may bear on the native very dense sand and gravel or structural fill compacted to 95 percent of the modified Proctor maximum dry density (ASTM D 1557) bearing on the native very dense sand and gravel.

- Recommended allowable bearing pressures:
  - 5 kips per square foot (ksf) for shallow footings bearing less than 10 feet below ground surface;
  - 14 kips per square foot (ksf) for shallow footings bearing more than 10 feet below ground surface.

- Isolated spread and continuous (i.e., strip) footings should have a minimum width of 2.5 and 1.5 feet, respectively.

- For at-grade structures, interior spread footings should bear a minimum of 12 inches below adjacent slab-on-grade and exterior spread footings and perimeter strip footings should bear a minimum of 18 inches below adjacent grade.

- Allowable soil bearing pressures may be increased by up to one-third for loads of short duration, such as those caused by wind or seismic forces.

Vertical Spring Constants for Foundations

Foundation settlement models under loading conditions often use vertical spring constants applicable to the soils on which the foundations bear. Depending on the elevation of the foundation elements, the underlying soil may vary in its density and consistency. Loading type, such as static or dynamic loading, can have an effect on the stiffness of the springs.

We recommend using a vertical subgrade modulus (K_{V1}) of 300 pounds per cubic inch (pci) for shallow foundations, mat foundations, and slabs-on-grade bearing on the very dense/hard, glacially overridden Sand/Silt. Note that the spring constant provided is based on a 1-foot by 1-foot vertically loaded plate, and obtained from standard charts and references. Subgrade moduli tend to decrease with increasing area of a foundation element. For this reason, the subgrade modulus will need to be reduced based on the actual dimensions of the foundation modeled.

We recommend that the initial subgrade modulus for individual foundation elements be calculated using the following equations (U.S. Navy 1982):

$K_v = K_{V1}\ (B+1)^2/(4B^2)$ for footings for $B \leq 20$ feet

$K_v = K_{V1}\ (B+1)^2/(2B^2)$ for footings for $B \geq 40$ feet

Where B = foundation width in feet. Interpolate for intermediate values of B.

Although many formulas calculate the reduced subgrade modulus, final determination of the subgrade modulus value to be used will depend on:

- The structural and geotechnical engineer's experience designing similar foundations in similar soil conditions;

- The quantity, magnitude, and area of the footings under various loads; and

- Back-checking settlement predictions from structural modeling with geotechnical settlement estimates for given foundation geometries.

The structural engineer should consider the value of the spring constant given above as a starting point for an iterative design process. Hart Crowser should review the final deformation estimates from the structural model, revise

settlement estimates for final foundation geometry and loading (if necessary), and confirm that estimated settlement is compatible with modeled deformations. Based on these settlement evaluations, modifications to the spring constant used in the structural model may be required.

Vertical Foundation Settlement

We expect the native load-bearing soil and structural fill to generally behave elastically, with settlement occurring as the design loads are applied or shortly thereafter. Based on our allowable bearing pressures, we estimate that settlement of shallow footings constructed on bearing soils as described herein will be less than about 3/4 inch. Based on variations in subsurface soil conditions and construction practices across a particular structure, we estimate that differential settlement between adjacent footings could be approximately one-half of the total settlement.

Foundation Resistance to Lateral Loads

Shallow foundation resistance to lateral loads is from passive soil resistance against the side(s) of the footing and/or frictional resistance along the base of the footing. For foundation resistance to lateral loads we recommend:

- Footings should be founded outside an imaginary 1H:1V plane projected upward from the bottom edge of adjacent footings or utility trenches.

- For passive resistance to lateral loads, use an equivalent fluid density to represent the passive resistance of the soil. For a typical footing poured against *in situ* very dense, glacially overridden soils, we recommend an allowable passive equivalent fluid density of 400 pounds per cubic foot (pcf) in a triangular pressure distribution. Ignore passive resistance in the upper 2 feet below adjacent ground surface. A factor of safety of 1.5 has been applied to this these values.

- Use an allowable coefficient of friction to resist sliding of 0.25 (including a factor of safety of 1.5) for footings poured neat on the granular structural fill or the native medium dense to very dense sand and gravel.

These recommendations are based on expected conditions and need to be confirmed in the field. We recommend having a qualified geotechnical engineer or geologist observe exposed subgrades before footing construction to verify suitable bearing surfaces.

Foundation Construction Considerations

The estimated foundation settlement assumes that careful preparation and protection of the exposed subgrade will occur before concrete placement as discussed herein. Any loosening of the materials during construction could result in larger settlement. It is important that foundation excavations be cleaned of loose or disturbed soil prior to placing any concrete and that there is no standing water in any foundation excavation.

- It may be necessary to locally overexcavate beneath individual footings to expose the acceptable bearing soil layer. Localized overexcavation may be required if unacceptable soil conditions (i.e., loose, wet, or organic soil) are observed below the proposed base of the footing during construction. If overexcavation beneath footings is necessary, backfill the overexcavated zone with lean mix concrete or structural fill placed in accordance with the recommendations in the ***Structural Fill*** section of this report.

- Where structural fill is used to replace the overexcavated material, the overexcavation, at a minimum, should extend outward and downward from the outer edges of the footing to the bearing layer at an angle no steeper than 1 horizontal to 1 vertical (1H:1V). For example, a 4-foot by 4-foot footing with 2 feet of overexcavation will require an 8-foot by 8-foot bearing area at the base of the overexcavation.

- Footings should be founded outside of an imaginary 1H:1V plane projected upward from the bottom edge of adjacent footings or utility trenches.

- Hart Crowser should observe and document exposed subgrades before foundation construction.

If the foundation excavations are to be left open for any length of time (more than a few hours) or if there is a chance of disturbance from construction activities or water infiltration, we recommend the excavations be protected by one of the following methods:

- Excavating to near-finished subgrade elevation, then immediately before placing steel and concrete, remove disturbed soil to establish final grades; or

- Placing a nominal 2- to 4-inch-thick “mud mat” consisting of lean concrete at the bottom of the footing excavations. This should be completed immediately after the excavation has been checked and approved by Hart Crowser.

Lateral Pressures on Permanent Subgrade Walls

Permanent walls constructed immediately adjacent to temporary shoring should be designed for the same earth pressures used in the design of the shoring system.

Walls backfilled on only one side will require drainage or must be designed for full hydrostatic pressure.

Subgrade walls backfilled on only one side may be used in some areas. For typical granular fill soils, active and at-rest pressures may be determined using equivalent fluid unit weights of 30 and 55 pcf, respectively. For wall footings founded on the very dense native soils, an allowable passive equivalent fluid pressure of 400 pcf may be used. For wall footings backfilled with granular structural fill, an allowable passive equivalent fluid pressure of 300 pcf may be used. These passive pressures include a factor of safety equal to 1.5. Note that the equivalent fluid density does not include any surface loading conditions or loading due to groundwater hydrostatic pressure.

The use of active and passive pressure is appropriate if the subgrade wall is allowed to yield a minimum 0.1 percent of the height. For a non-yielding wall, at-rest conditions should be used.

For base sliding resistance, an allowable coefficient of friction of 0.25 is suitable for the *in situ* dense native soils and structural fills.

Seismic Loading Against Permanent Walls. The lateral earth pressures for permanent walls must include a seismic earth pressure increment. This additional lateral earth pressure can be approximated as a rectangular uniform load of 14·H for a yielding wall with a flat backslope at the top of wall. This increment is calculated using the IBC hazard level for the site location.

Floor Slab Design Recommendations

Floor slabs can be designed as slab-on-grade structures above a free-draining capillary break drainage layer and native medium dense to very dense, sandy gravel or structural fill. Note that in some areas of the site, the underlying clean native sand and gravel may serve as a natural capillary break. This should be assessed during construction. Do not construct near-grade floor slabs directly on the existing topsoil or other loose fill soil. Unsuitable soil must be overexcavated and replaced with compacted structural fill.

We recommend that slabs-on-grade be constructed on a minimum thickness of 12 inches of dense material. This 12-inch zone can consist of:

- Dense to very dense native material;
- Densely compacted structural fill;
- Native loose material that is compacted to a dense condition; or
- A combination of the above.

As part of this 12-inch zone, we recommend that the upper 4 inches consist of free-draining material (less than 3 percent fines based on minus 3/4-inch fraction) to serve as a capillary break layer. On-site soil that meets the criteria may be used as this capillary break material. This layer is intended to reduce the potential for moisture migrating up through the slab.

For the design and construction of slab-on-grade floors, we recommend the following:

- Compact the drainage layer to the criteria discussed in the ***Structural Fill*** section of this report.
- Use a modulus of subgrade reaction of 300 pci for design of floor slabs on the very dense native sand and gravel, and/or compacted structural fill (see commentary on modulus of subgrade reaction in **Vertical Foundation Support** section); and
- Perform a grain size analysis on any soil that is proposed as capillary break material. Hart Crowser can perform the gradational analysis if it is not available from the material source.

Following excavation and footing construction, the proposed slab-on-grade areas should be observed by Hart Crowser to determine whether loosening of the soil near the ground surface has occurred. If loose areas are observed, they should be re-compacted or removed and replaced to provide a dense, non-yielding surface for the placement of the drainage layer and slab-on-grade. We recommend proof rolling the subgrade area for slabs-on-grade with a heavy vibratory roller or fully loaded dump truck.

Structural fill should be placed only after unsuitable soil has been removed and the exposed subgrade compacted in place to a dense condition. Hart Crowser should assess the suitability of the subgrade during construction.

Seismic Design Recommendations

In this section we provide seismic design recommendations including input to construct a code-based design response spectrum and a discussion of seismically-induced geotechnical hazards.

Code-Based Response Spectrum

The structural engineer uses the design response spectrum to seismically analyze the proposed structure. Two methods may be used to obtain the design response spectrum: (1) a design method based on generic soil properties to develop the spectrum at the ground surface, or (2) a site-specific method that develops the response spectrum based on site-specific soil properties calculated at the depth of interest to the structural engineer. For this project, we understand the structural engineer is using the code-based response spectrum based on generic soil properties.

We understand that the seismic design of the proposed buildings will be performed in accordance with the 2009 International Building Code (IBC). The basis of design for this code is two-thirds of the hazard associated with an earthquake with 2 percent probability of exceedance in 50 years, which corresponds to an average return period of 2,475 years. We obtained the seismic hazard from the United States Geologic Survey 2002 National Seismic Hazard Maps (USGS 2002) for Latitude 47.622 and Longitude –122.176. Below, we provide parameters for seismic design in accordance with this code.

- Maximum Considered Earthquake Spectral Response Acceleration at Short Periods, S_s = 1.340 g;
- Maximum Considered Earthquake Spectral Response Acceleration at Periods of One Second, S_1 = 0.453 g; and
- Site Class C.

Seismically Induced Geotechnical Hazards

Based on inspection of the site soils, the risk of liquefaction or significant ground deformation, including lateral spreading and landslides, from the design earthquake is vey low.

The site lies about 2.5 miles north of the mapped Seattle Fault Zone. Because there are not any known faults underlying the site, the hazard associated with surface rupture at the site during the structure's design life is very low.

Structural Fill Selection and Placement

Structural fill should be used beneath structures, surrounding utilities, and below paved areas. Structural fill may be selected from on-site excavated soil or imported soil provided the soil meets the gradation and moisture content requirements below and can be suitably compacted to provide a firm and unyielding surface. The following provides our recommendations for structural fill selection and placement.

Structural Fill Selection

Use of On-Site Excavated Soils as Structural Fill

The suitability of on-site excavated site soil for use as structural fill depends on the gradation and moisture content of the soil when it is placed. As the amount of fines (that portion passing the No. 200 sieve) increases, the soil becomes increasingly sensitive to small changes in moisture content and adequate compaction becomes more difficult to achieve. Soil containing more than about 5 percent fines cannot be consistently compacted to a dense non-yielding condition when the water content is greater than about 2 percent above or below optimum. Reusable soil must also be free of organic and other compressible material.

Generally, soil units 1 through 3 are suitable for reuse as structural fill. However, the fines content of these soils may vary across the site and could have a fines content high enough to be moisture-sensitive, which could impact construction.

Use of Imported Soil as Structural Fill

Using imported soil for structural fill is recommended in areas where the native soil cannot be sufficiently compacted. For imported soil to be used as structural fill, we recommend using a non-silty, well-graded sand or sand and gravel with less than 5 percent fines for placement during wet weather. Compaction of material containing more than about 5 percent fines may be difficult if the material is wet or becomes wet during rainy weather. During dry weather, imported soil can contain 20 to 30 percent by weight fines, provided it is compacted at a moisture content within 2 percent of the optimum moisture content.

Structural Fill Placement

- Structural fill should only be placed on a dense and non-yielding subgrade.

- Before placing structural fill, samples of the fill need to be tested using a modified Proctor test conforming to the ASTM D 1557 test procedure, including determination of optimum and natural moisture content, maximum dry density, and gradation. The samples must be representative of the material that will be placed on the job site.

- Compaction of soil containing more than about 5 percent fines content may be difficult if the soil is wetter than the optimum moisture content. If fill soil becomes too wet to compact it can increase construction duration, result in unusable soil that needs to be hauled off site, and require importing additional soil. During dry grading conditions, the fines content may be increased provided that the soil is compacted near its optimum moisture content.

- Place and compact all structural fill in lifts with a loose thickness no greater than 10 inches. If small, hand-operated compaction equipment is used to compact structural fill, fill lifts should not exceed 6 inches in loose thickness.

- In areas of general site filling, compact structural fill to a minimum of 90 percent below an elevation corresponding to 2 feet below final subgrade. Below all structures and/or within 2 feet of final subgrade, the compaction requirement should be at least 95 percent. The minimum dry densities recommended here are a percentage of the modified Proctor maximum dry densities as determined by the ASTM D 1557 test procedure.

- The compacted densities of each lift should be verified by a qualified geotechnical engineer or engineering geologist.

Drainage Considerations

We encountered groundwater in all of our test borings. Therefore, groundwater control should be considered including installation of drainage under slabs and behind walls and foundations, waterproofing under slabs and behind walls, and overall site drainage.

Beneath Slabs-on-Grade

- Provide subslab drainage using a combination of perimeter and cross drains. This drainage layer also serves as a capillary break and is intended to eliminate the buildup of hydrostatic pressure beneath the slab and to provide permanent control of groundwater beneath the floor slab and behind the perimeter walls.

- The capillary break/drainage layer should consist of at least 6 inches of drainage material, with perforated drainage pipe embedded at the base of this layer. Note that a minimum of 2 inches of drainage material should surround cross drain pipes. We recommend using drainage material conforming to Section 9-03.12(4) of the WSDOT Standard Specifications for Road, Bridge, and Municipal Construction.

- Cross drains should be spaced on about 50-foot centers and perimeter drains should extend around the perimeter of the building. Cross and perimeter drains (with cleanouts) should consist of at least 4-inch-diameter perforated pipe surrounded by at least 2 inches of drainage material. The cross drains and the perimeter drains should be tied together and drain to a suitable discharge point. The drainage pipes should be sloped to drain and outlet at a suitable discharge location.

- A layer of polyethylene sheeting (visqueen) should be used to protect the drainage layer from concrete as the floor slab is poured.

- Drainage material should consist of well-graded sand and gravel with a fine-grained fraction of less than 3 percent by dry weight (percentage of material passing the US No. 200 sieve based on the minus 3/4-inch fraction).

- Any soil that is to be considered as capillary break or drainage material should be submitted to Hart Crowser for gradation analysis and approval.

- Drainage material should conform to Section 9-03.12(4) of the WSDOT Standard Specifications for Road, Bridge, and Municipal Construction.

Behind Basement Walls

Below-grade walls should have adequate drainage to prevent the buildup of hydrostatic pressure. We recommend the following.

- Drainage can consist of drainage composite panels (i.e., a Miradrain-type system) laid flush on the outside of the timber or against the soil face and connected to a collector pipe that runs along the footing at an elevation lower than the bottom of the floor slab. This will allow water collected outside the wall to be tight-lined beneath the slab and into a perimeter drain.

- Additional drainage and protection may be locally necessary if significant groundwater seepage is encountered during site excavation. Provisions should be available to supplement the recommended drainage system. Such additions may include weep holes through temporary or permanent walls.

Behind Backfilled Walls

Walls backfilled with soil on only one side will require drainage or must be designed for full hydrostatic pressure. We recommend the following:

- Place at least 18 inches of free-draining, well-graded sand and gravel (less than 3 percent fines based on minus 3/4-inch fraction) against walls to prevent hydrostatic pressure buildup.

- The backfill/drainage medium should be continuous and envelop the perimeter drains behind the walls so that they are in direct hydraulic connection to each other. We recommend that drains (with cleanouts) consist of 4-inch-diameter perforated pipe that is bedded in free-draining material. The drain holes or slots in the pipe should be compatible with the surrounding drainage material.

- Alternatively, drainage composite material can be used in lieu of granular drainage material.

Around Foundations

- For permanent foundation drainage, perimeter drains should be installed near the base of the perimeter or wall footings.

- The perimeter drains should be a minimum 4-inch-diameter perforated pipe and should be surrounded by 6 inches of drainage material.

- All drainage pipe should be sloped to drain.

Waterproofing

Note that the subslab and basement wall drainage system recommendations are intended to prevent hydrostatic pressure buildup that could damage the structure. The recommended systems may not result in a totally dry wall or slab.

If a more water-resistant finish is required below grade, we recommend that a waterproofing system such as a heavy plastic membrane liner, bentonite clay panels (i.e., Volclay or equivalent), or other interior or exterior sealants be used. A waterproofing expert should be consulted for more detailed information.

Site Drainage

Final grades should be sloped to carry surface water runoff away from structures to prevent water from infiltrating near the foundation walls. Roof drainage and new pavement drainage should not be tied into the subdrain system.

Pavement Design Recommendations

Parking Lot Pavement Sections

We recommend a parking lot pavement section of 3 inches of hot-mix asphalt (HMA) over 6 inches of crushed surfacing base course (CSBC). This recommendation assumes a minimum subgrade resilient modulus of 20,000 psi.

Roadway Pavement Sections

We used the 1993 AASHTO Guide for Design of Pavement Structures and Supplements empirical equation for flexible pavement design to calculate several pavement section thicknesses for a range of maximum Equivalent Single Axle Loads (ESALs) and provide the results in Table 2.

Assumed design input parameters as required in the 1993 AASHTO Guide for Design of Pavement Structures and Supplements are summarized as follows:

- **Design Life:** 25 years
- **Design Equivalent Single Axle Loads (ESALs):** Not specified.
- **Reliability Value:** 85 to 90 percent
- **Combined Standard Error of Traffic Prediction and Performance Prediction:** 0.5
- **Initial and Terminal Serviceability Index:** 4.5 and 3.0, respectively
- **Layer Coefficients:** 0.44 for Hot-Mix Asphalt (HMA) and 0.13 for Crushed Surfacing Base Course (CSBC).
- **Drainage Coefficient:** 1.0
- **Resilient Modulus:** 28,000 psi for CSBC and 22,500 psi for subgrade soils

Table 2 - Flexible Pavement Recommendations

Reliability (%)	CSBC Thickness (inches)	Asphalt Thickness (inches)	Max ESALs
85	6	2	10,000
90	6	2	8,000
85	6	3	76,000
90	6	3	57,000
90	6	4	275,000
90	6	5	1,000,000
90	6	6	2,600,000
90	6	7	6,500,000
90	6	8	14,000,000
90	6	10	66,000,000

Note that the City of Bellevue minimum pavement thickness for typical public streets requires 4 inches of hot mix asphalt class 1/2 inch PG 64-22 over 6 inches of hot mix asphalt class 1-inch PG 64-22.

These pavement section recommendations assume that the subgrade is properly prepared and has a minimum resilient modulus of 22,500 psi and that the CSBC is compacted to 95 percent of the maximum dry density as determined by the modified Proctor test (ASTM D 1557).

RECOMMENDED ADDITIONAL GEOTECHNICAL SERVICES

Before construction begins, we recommend that Hart Crowser:

- Meet with the design team periodically as the design plans become more complete;
- Review the surface loads of adjacent buildings on the shoring and permanent walls;
- Review final foundation plans, shoring design plans and specifications; and
- Review applicable civil elements to see that the geotechnical engineering recommendations are properly interpreted and implemented into the design.

During the construction phase of the project, we recommend that Hart Crowser observe the following activities:

- Installation of shoring systems;
- Review of shoring system displacement and monitoring results;
- Excavation, subgrade preparation, and placement of foundations and slabs-on-grade;
- Placement and compaction of structural fill;
- Installation of subslab and wall drainage, if necessary; and
- Other geotechnical considerations which may arise during the course of construction.

The purpose of this work is to observe compliance with the design concepts, specifications, and recommendations, and to allow design changes or evaluation of appropriate construction measures in the event that subsurface conditions differ from those anticipated before construction starts.

REFERENCES

Dames & Moore 1957. Report of Foundation Investigation, Structures and Parking Areas, Proposed Distribution Center, Bellevue, Washington.

Federal Highway Administration 1999. Geotechnical Engineering Circular No. 4 – Ground Anchors and Anchored Systems, June 1999, Report No. FHWA-IF-99-015.

Federal Highway Administration 2003. Geotechnical Engineering Circular No. 7 – Soil Nail Walls, March 2003, Report No. FHWA0-IF-03-017.

Post Tensioning Institute 2004. Recommendations for Prestressed Rock and Soil Anchors, Third Edition.

USGS 2002. USGS Earthquakes Hazards Program - National Seismic Hazard Mapping Project, USGS Web Site. Last Retrieved September 29, 2005, from http://eqhazmaps.usgs.gov/

US Navy 1982. Soil Mechanics, Design Manual 7.1, NAVFAC DM-7.1/7.2.

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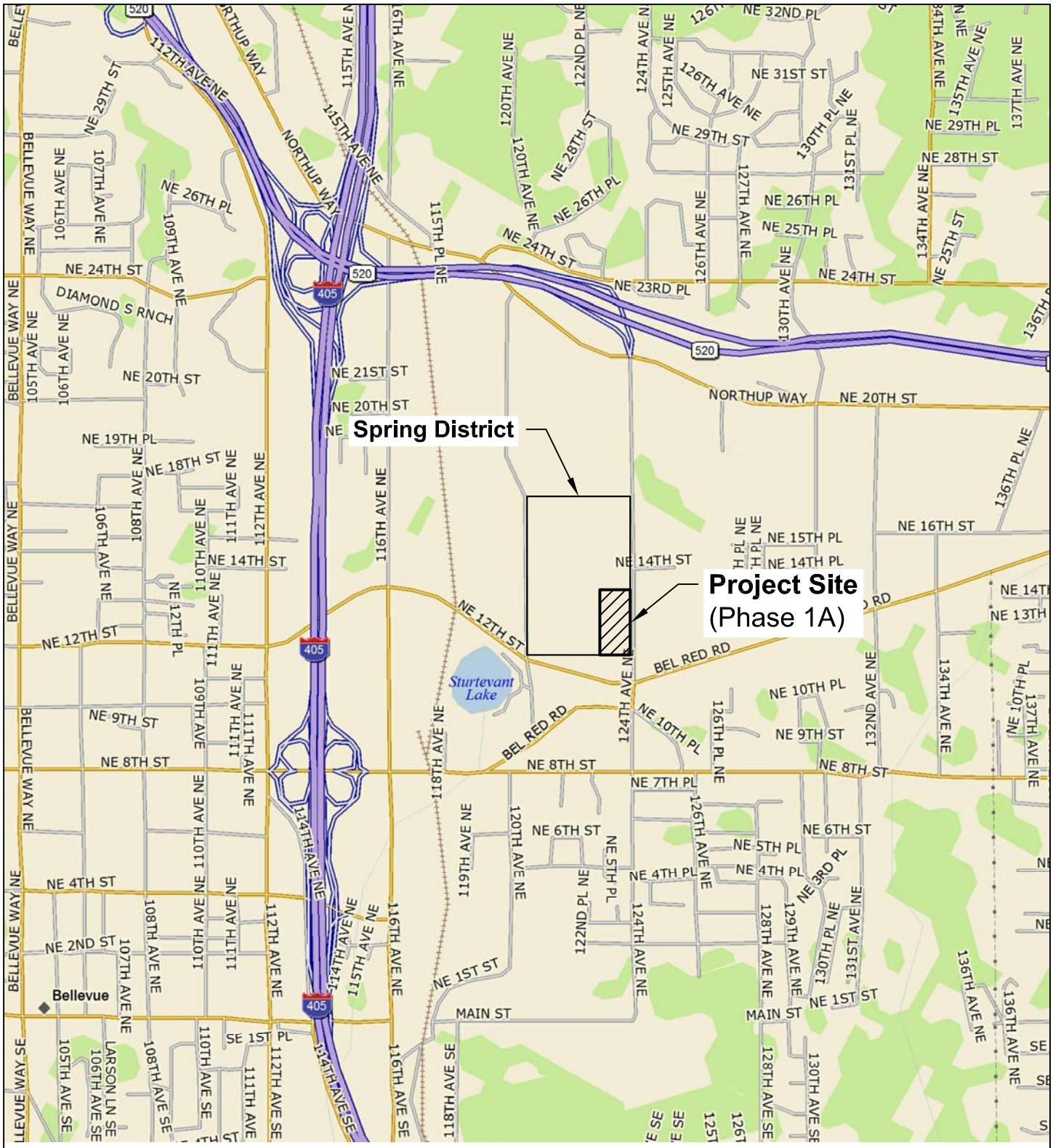

Source: Base map prepared from DeLorme Topo 7.0, 2007.

0 1500 3000

Scale in Feet

N

Spring District Phase 1A
Bellevue, Washington

Vicinity Map

17860-00 4/12

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Figure

1

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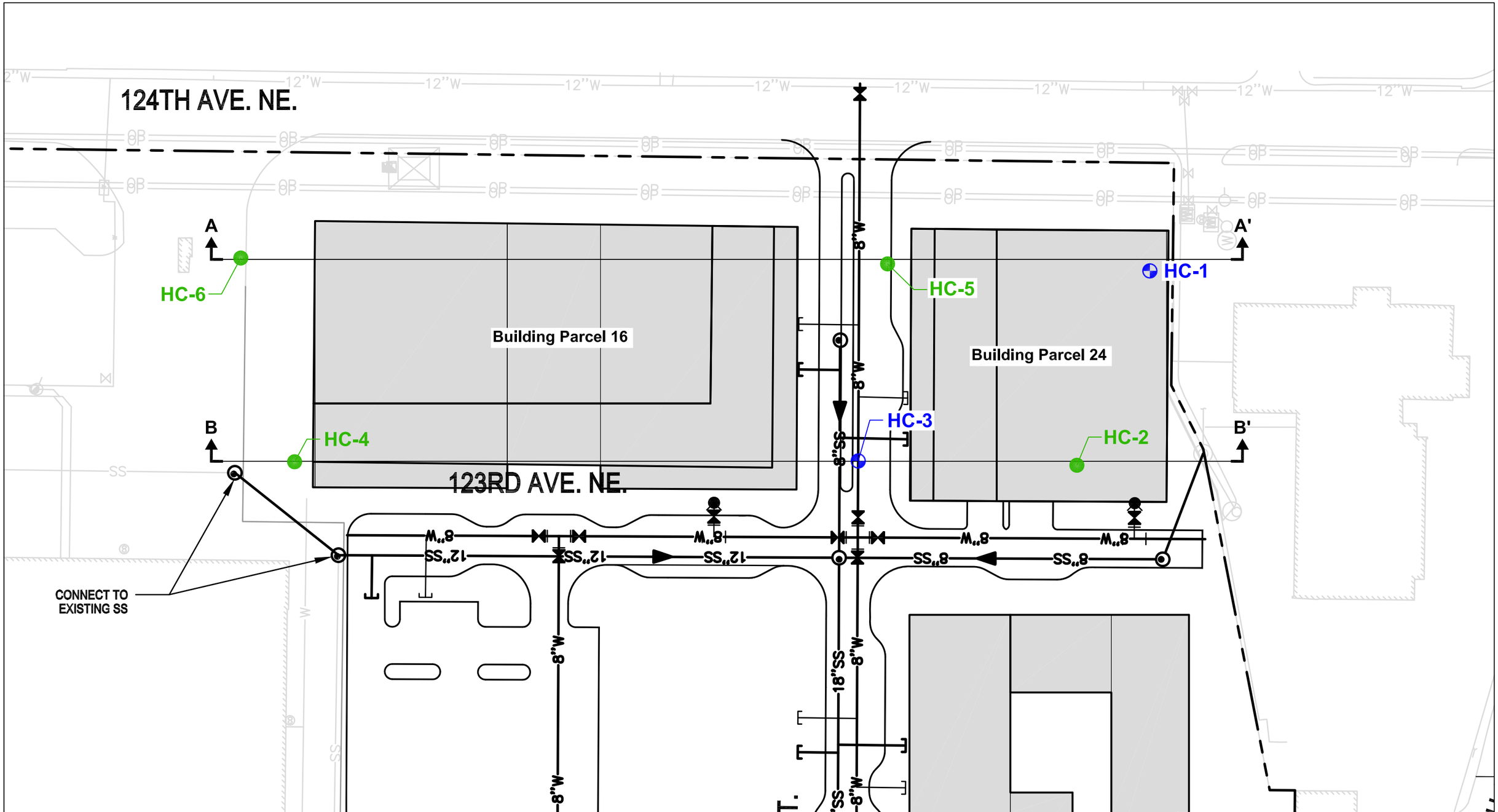

Source: Base map prepared from PDF file "MDP Phase 1A Sketch.pdf," provided by Wright, Runstad, & Company, 3/13/12.

HC-1 Monitoring Well Location and Number

HC-2 Boring Location and Number

A A' Cross Section Location and Designation

N

0 60 120
Scale in Feet

Spring District Phase 1A
Bellevue, Washington

Site and Exploration Plan

17860-00 4/12

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Figure
2

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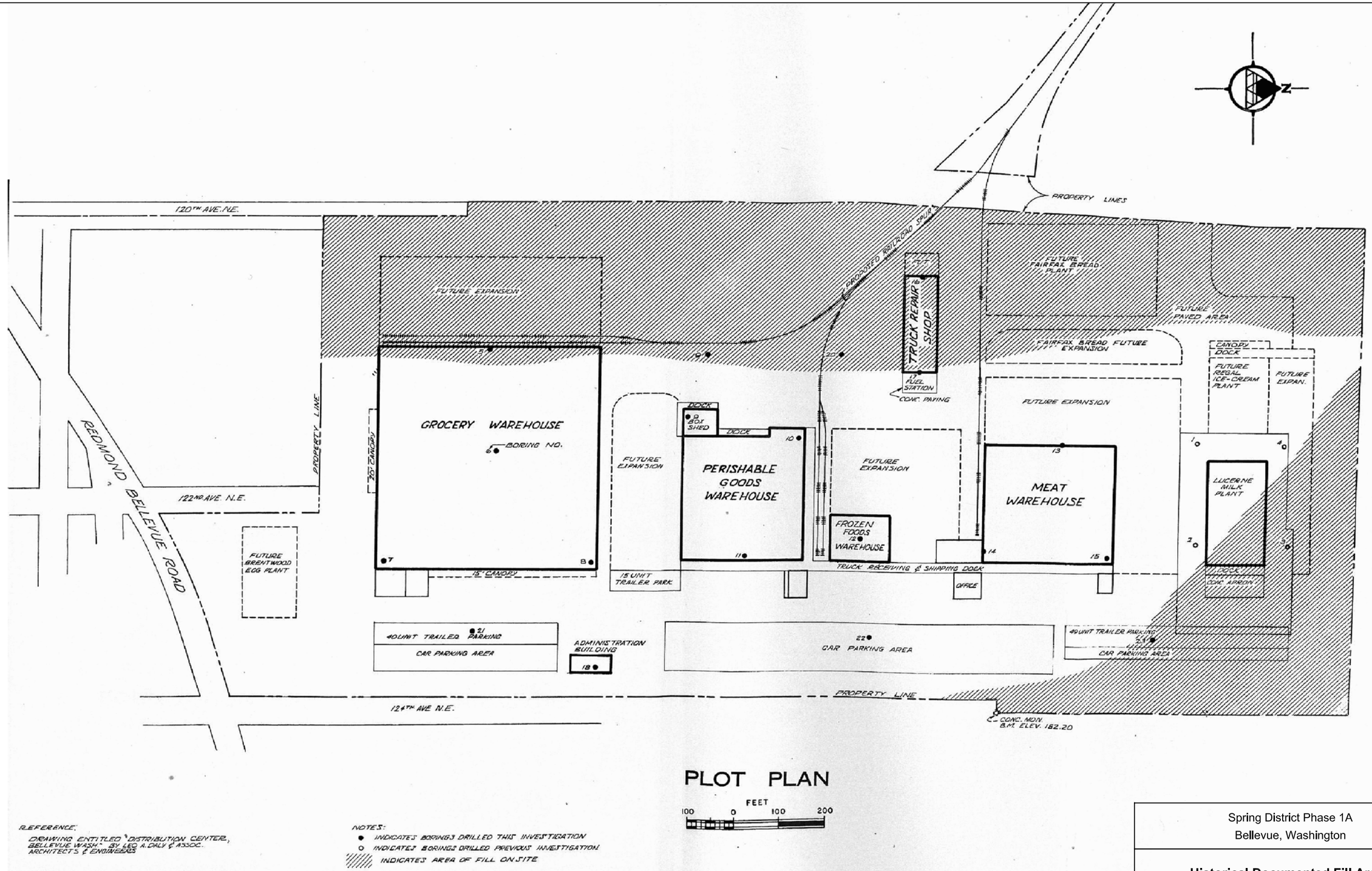

PLOT PLAN

FEET
100 0 100 200

REFERENCE:
DRAWING ENTITLED "DISTRIBUTION CENTER, BELLEVUE WASH." BY LEO A. DALY & ASSOC. ARCHITECTS & ENGINEERS

NOTES:
● INDICATES BORINGS DRILLED THIS INVESTIGATION
○ INDICATES BORINGS DRILLED PREVIOUS INVESTIGATION
INDICATES AREA OF FILL ON SITE

Spring District Phase 1A
Bellevue, Washington

Historical Documented Fill Areas

17860-00 4/12

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Figure
3

Reference: Dames & Moore 1957. Report of Foundation Investigation, Structures and Parking Areas, Proposed Distribution Center, Bellevue, Washington.

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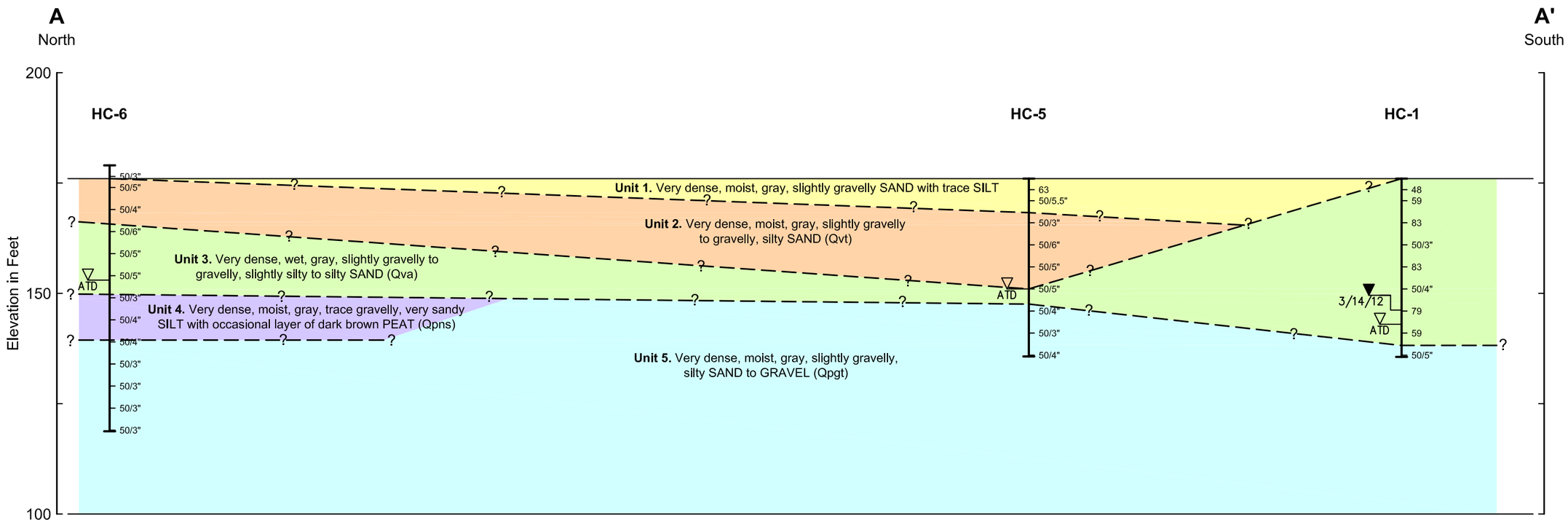

Geologic Unit Key
Qvt - Vashon Till
Qva - Vashon Advance Outwash
Qpns - Pre-Vashon Nonglacial Soil (Paleosol)
Qpgt - Pre-Vashon Glacial Till

HC-1 Exploration Number

Exploration Location

ATD Water Level

48 Standard Penetration Resistance in Blows per Foot

Horizontal Scale in Feet
0 50 100
0 25 50
Vertical Scale in Feet
Vertical Exaggeration x 2

Note:
Contact between soil units is interpolated between borings and represents our interpretation of subsurface conditions based on currently available data.

Spring District Phase 1A
Bellevue, Washington

Generalized Subsurface Cross Section A-A'

17860-00 4/12

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Figure
4

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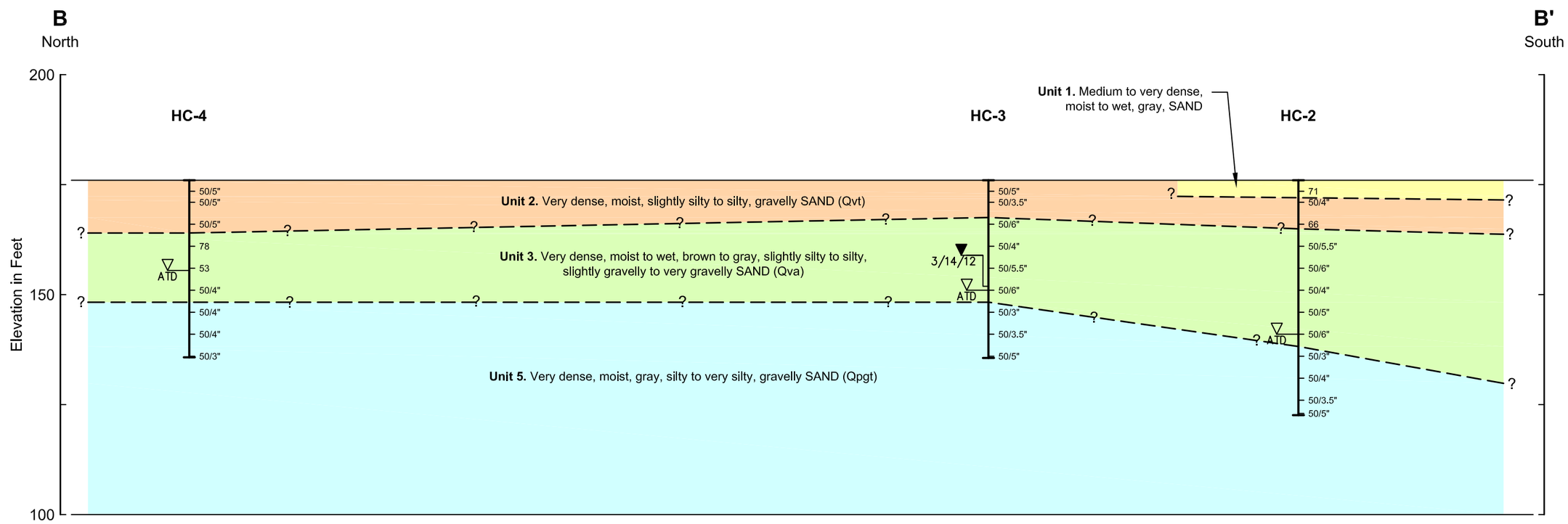

Geologic Unit Key
Qvt - Vashon Till
Qva - Vashon Advance Outwash
Qpgt - Pre-Vashon Glacial Till

HC-2 Exploration Number

Exploration Location

ATD Water Level

66 Standard Penetration Resistance in Blows per Foot

Horizontal Scale in Feet
0 50 100
0 25 50
Vertical Scale in Feet
Vertical Exaggeration x 2

Note:
Contact between soil units is interpolated between borings and represents our interpretation of subsurface conditions based on currently available data.

Spring District Phase 1A
Bellevue, Washington

Generalized Subsurface Cross Section B-B'

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Figure
5

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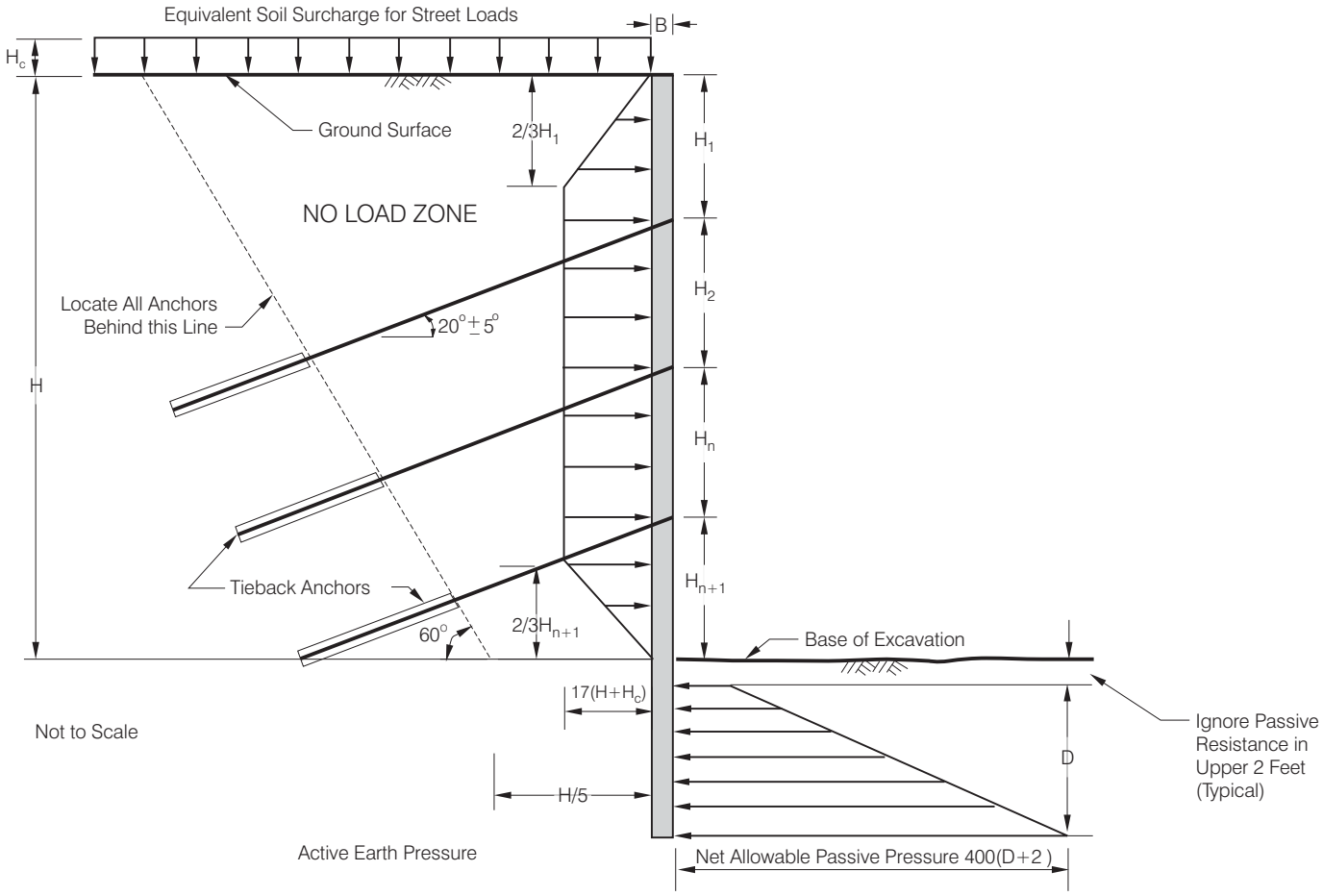
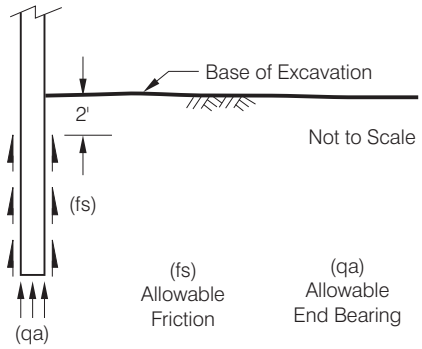
A. General Soil Pressures - No Load Zone



B. Vertical Capacity of Soldier Pile



	(fs) Allowable Friction	(qa) Allowable End Bearing
SAND/GRAVEL	2 KSF	$\frac{6D}{B} \leq 60$ KSF

Recommended Minimum Embedment Depth
8 Feet below Base of Excavation

C. Preliminary Anchor Pullout Resistance

	Ultimate Adhesion in KSF	Ultimate Pullout in KLF
SAND/GRAVEL	6.4	10.0

Verify with load test to 200 percent of allowable values. Recommended anchor pullout safety factor of 2.0. Ultimate pullout for 0.5-foot-diameter, straight-shaft, pressure-grouted anchor. See text.

Legend

H_c = Equivalent Surcharge Height
H = Excavation Height
D = Embedment Depth

Notes

1. Determine depth of embedment (D) to prevent soldier pile kickout and provide sufficient vertical capacity.
2. Active pressure assumed to act over pile spacing.
3. Passive pressures assumed to act over twice the grouted soldier pile diameter or the pile spacing, whichever is smaller. Passive pressures include Factor of Safety of 1.5.
4. Recommended pressure distribution adjacent to significant surcharge loads (i.e., buildings, crane) should include additional lateral pressures as described in report text and on Figure 7.
5. It is assumed that the site is drained during construction, and hydrostatic pressures do not act on the walls.
6. All dimensions in feet. Pressures and surcharge in pounds per square foot.

Spring District Phase 1A
Bellevue, Washington

Soldier Pile/Tieback Shoring - General Design

17860-00 4/12

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Figure
6

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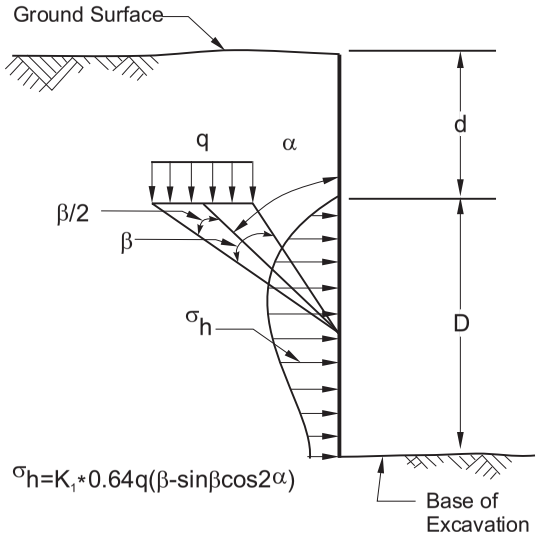
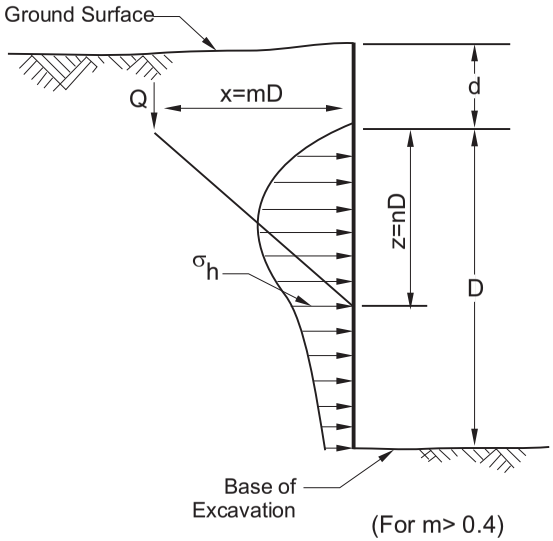
A. Strip Footing Cross Section View



$\sigma_h = K_1 * 0.64q(\beta - \sin\beta\cos 2\alpha)$

B(1). Small Isolated Footing (Point Load) Cross Section View



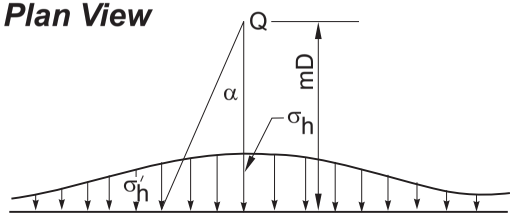
(For m> 0.4)

$$\sigma_h = K_1 * \frac{1.77Q}{D^2} \frac{m^2 n^2}{(m^2+n^2)^3}$$

(For m≤ 0.4)

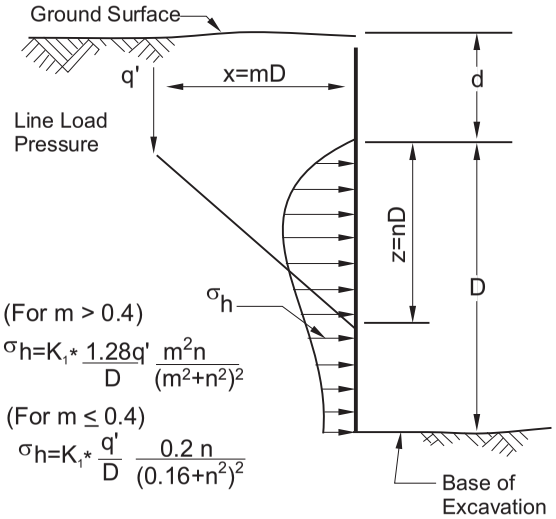
$$\sigma_h = K_1 * \frac{0.28Q}{D^2} \frac{n^2}{(0.16+n^2)^3}$$

B(2). Plan View



$$\sigma'_h = K_1 * \sigma_h \cos^2(1.1\alpha)$$

C. Narrow Continuous Wall Footing (Line Load) Parallel to Excavation Cross Section View



(For m > 0.4)

$$\sigma_h = K_1 * \frac{1.28q'}{D} \frac{m^2 n}{(m^2+n^2)^2}$$

(For m ≤ 0.4)

$$\sigma_h = K_1 * \frac{q'}{D} \frac{0.2\,n}{(0.16+n^2)^2}$$

Definition and Units

Q	Footing Load in Pounds
D	Excavation Depth below Footing in Feet
d	Depth to Base of Footing in Feet
σ_h	Lateral Soil Pressure in PSF
q	Unit Loading Pressure in PSF
q'	Footing Load in Pounds per Foot
α, β	Radians

K_1	Conditions
0.35	Active earth pressures on a flexible wall (e.g., shoring)
0.5	At-rest conditions, where surcharge loads exist before excavation
1.0	At-rest conditions, where surcharge loads are applied after construction of permanent wall

Notes:

1. Lateral pressures due to adjacent structures should be added to lateral pressures on Figures 6.
2. Wall footings acting other than parallel to the excavation can be treated as series of discrete point loads, using approach B.
3. Contact Hart Crowser for surcharge recommendations if necessary.

Spring District Phase 1A
Bellevue, Washington

Determination of Lateral Pressure Acting on Adjacent Shoring from Surcharge Loads

17860-00 4/12

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Figure 7

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APPENDIX A
FIELD EXPLORATION METHODS AND ANALYSIS

APPENDIX A
FIELD EXPLORATION METHODS AND ANALYSIS

This appendix documents the processes Hart Crowser used to determine the nature of the soils underlying the project site addressed by this report. The discussion includes information on the following subjects:

- Interpretation of Explorations;
- Location of Explorations;
- Soil Borings; and
- Standard Penetration Test (SPT) Procedures.

Interpretation of Explorations

The boring logs in this appendix show our interpretation of the drilling, sampling, and testing data. In the field, we classified the samples taken from the borings according to the methods presented on Figure A-1 - Key to Exploration Logs. The logs indicate the soil types and the depths where the soils change; note that the change may be gradual.

Location of Explorations

Subsurface explorations for this project include six hollow-stem auger borings across the site. Figure 2 shows the location of explorations, located by hand taping or pacing from existing physical features. The ground surface elevations at these locations were interpreted from elevations shown on the survey titled *Safeway, Inc., Bellevue Distribution Center, Lot 3, ALTA / ACSM Land Title Survey,* dated March 22, 2007, and performed by W&H Pacific. The method used determines the accuracy of the location and elevation of the explorations.

Soil Borings

The soil borings used a 3-3/8-inch inside diameter hollow-stem auger and were drilled with a truck-mounted drill rig subcontracted by Hart Crowser. The drilling was continuously observed by an engineering geologist from Hart Crowser. Detailed field logs were prepared for each boring. We obtained samples at 2-1/2- to 5-foot-depth intervals using the Standard Penetration Test (SPT) and split-spoon samplers.

The boring logs are presented on Figures A-2 through A-7 at the end of this appendix.

Standard Penetration Test (SPT) Procedures

This test is an approximate measure of soil density and consistency. To be useful, the results must be used with engineering judgment in conjunction with other tests. The SPT (as described in ASTM D 1586) was used to obtain disturbed samples. This test employs a standard 2-inch outside diameter split-spoon sampler. Using a 140-pound hammer, free-falling 30 inches, the sampler is driven into the soil for 18 inches. The number of blows required to drive the sampler the last 12 inches only is the Standard Penetration Resistance. This resistance, or blow count, measures the relative density of granular soils and the consistency of cohesive soils. The blow counts are plotted on the boring logs at their respective sample depths.

Soil samples are recovered from the split-barrel sampler, field classified, and placed into water-tight jars. They are then taken to Hart Crowser's laboratory for further testing.

In the Event of Hard Driving

Very dense materials may preclude driving the total 18-inch sample. When this happens, the penetration resistance is entered on logs as follows:

Penetration less than 6 inches. The log indicates the total number of blows over the number of inches of penetration.

Penetration greater than 6 inches. The blow count noted on the log is the sum of the total number of blows completed after the first 6 inches of penetration. This sum is expressed over the number of inches driven that exceed the first 6 inches. The number of blows needed to drive the first 6 inches are not reported. For example, a blow count series of 12 blows for 6 inches, 30 blows for 6 inches, and 50 (the maximum number of blows counted within a 6-inch increment for SPT) for 3 inches would be recorded as 80/9.

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Key to Exploration Logs

Sample Description

Classification of soils in this report is based on visual field and laboratory observations which include density/consistency, moisture condition, grain size, and plasticity estimates and should not be construed to imply field nor laboratory testing unless presented herein. Visual-manual classification methods of ASTM D 2488 were used as an identification guide.

Soil descriptions consist of the following:
Density/consistency, moisture, color, minor constituents, MAJOR CONSTITUENT, additional remarks.

Density/Consistency

Soil density/consistency in borings is related primarily to the Standard Penetration Resistance. Soil density/consistency in test pits and probes is estimated based on visual observation and is presented parenthetically on the logs.

SAND or GRAVEL Density	Standard Penetration Resistance (N) in Blows/Foot	SILT or CLAY Consistency	Standard Penetration Resistance (N) in Blows/Foot	Approximate Shear Strength in TSF
Very loose	0 to 4	Very soft	0 to 2	<0.125
Loose	4 to 10	Soft	2 to 4	0.125 to 0.25
Medium dense	10 to 30	Medium stiff	4 to 8	0.25 to 0.5
Dense	30 to 50	Stiff	8 to 15	0.5 to 1.0
Very dense	>50	Very stiff	15 to 30	1.0 to 2.0
		Hard	>30	>2.0

Sampling Test Symbols

- 1.5" I.D. Split Spoon
- Grab (Jar)
- 3.0" I.D. Split Spoon
- Shelby Tube (Pushed)
- Bag
- Cuttings
- Core Run

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS GRAPH	SYMBOLS LETTER	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS (MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE)	GRAVEL AND GRAVELLY SOILS (MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE)	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
				GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
	SAND AND SANDY SOILS (MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE)	CLEAN SANDS (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
				SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND - SILT MIXTURES
				SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS (MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE)	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

Moisture

Dry	Little perceptible moisture
Damp	Some perceptible moisture, likely below optimum
Moist	Likely near optimum moisture content
Wet	Much perceptible moisture, likely above optimum

Minor Constituents	Estimated Percentage
Trace	<5
Slightly (clayey, silty, etc.)	5 - 12
Clayey, silty, sandy, gravelly	12 - 30
Very (clayey, silty, etc.)	30 - 50

Laboratory Test Symbols

GS	Grain Size Classification
CN	Consolidation
UU	Unconsolidated Undrained Triaxial
CU	Consolidated Undrained Triaxial
CD	Consolidated Drained Triaxial
QU	Unconfined Compression
DS	Direct Shear
K	Permeability
PP	Pocket Penetrometer Approximate Compressive Strength in TSF
TV	Torvane Approximate Shear Strength in TSF
CBR	California Bearing Ratio
MD	Moisture Density Relationship
AL	Atterberg Limits

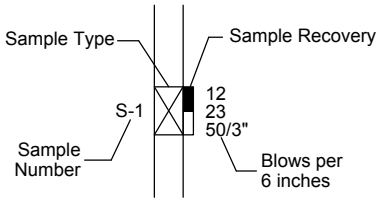
Water Content in Percent
Liquid Limit
Natural
Plastic Limit

PID	Photoionization Detector Reading
CA	Chemical Analysis
DT	In Situ Density in PCF
OT	Tests by Others

Groundwater Indicators

- Groundwater Level on Date or (ATD) At Time of Drilling
- Groundwater Seepage (Test Pits)

Sample Key



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17860-00 *3/12*

Figure A-1

Boring Log & Construction Data for Monitoring Well HC-1

Location: See Figure 2
Approximate Ground Surface Elevation: 176 Feet
Horizontal Datum: N.A.
Vertical Datum: NAVD 88

Drill Equipment: Hollow Stem Auger
Hammer Type: SPT
Hole Diameter: 4 inches
Logged By: J. Overton Reviewed By: M. Veenstra

USCS Class	Soil Descriptions	Depth in Feet
SP-SM	2 inches of Asphalt.	0
	Dense to very dense, moist, gray, slightly silty, slightly gravelly to gravelly SAND (Qva).	5, 10, 15, 20
ML	Very dense, moist to wet, gray, slightly gravelly, very sandy SILT (Qva).	25
SP-SM	Very dense, moist to wet, gray SAND with trace gravel and trace silt (Qva).	30, 35
SM	Very dense, moist, gray, silty, gravelly SAND (Qpgt)	40
	Bottom of Boring at 40.4 Feet.	
	Started 03/06/12.	
	Completed 03/06/12.	

Well Construction: Flush mount monument; Concrete; Bentonite chips; 10-20 Silica sand; Screened 2" PVC; 3-14-12; ATD

Sample	Blows per Foot	LAB TESTS
S-1	8 20 28	
S-2	8 27 32	
S-3	8 37 46	
S-4	32 50/3"	
S-5	15 37 46	GS
S-6	15 50/4"	GS
S-7	7 32 47	
S-8	7 27 32	
S-9	50/5"	

STANDARD PENETRATION RESISTANCE: ▲ Blows per Foot (0, 10, 20, 30, 40, 50+)

● Water Content in Percent (0, 20, 40, 60, 80, 100+)

NEW BORING LOG 1786000-BL.GPJ HC_CORP.GDT 3/22/12

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. USCS designations are based on visual manual classification (ASTM D 2488) unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

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17860-00 3/12

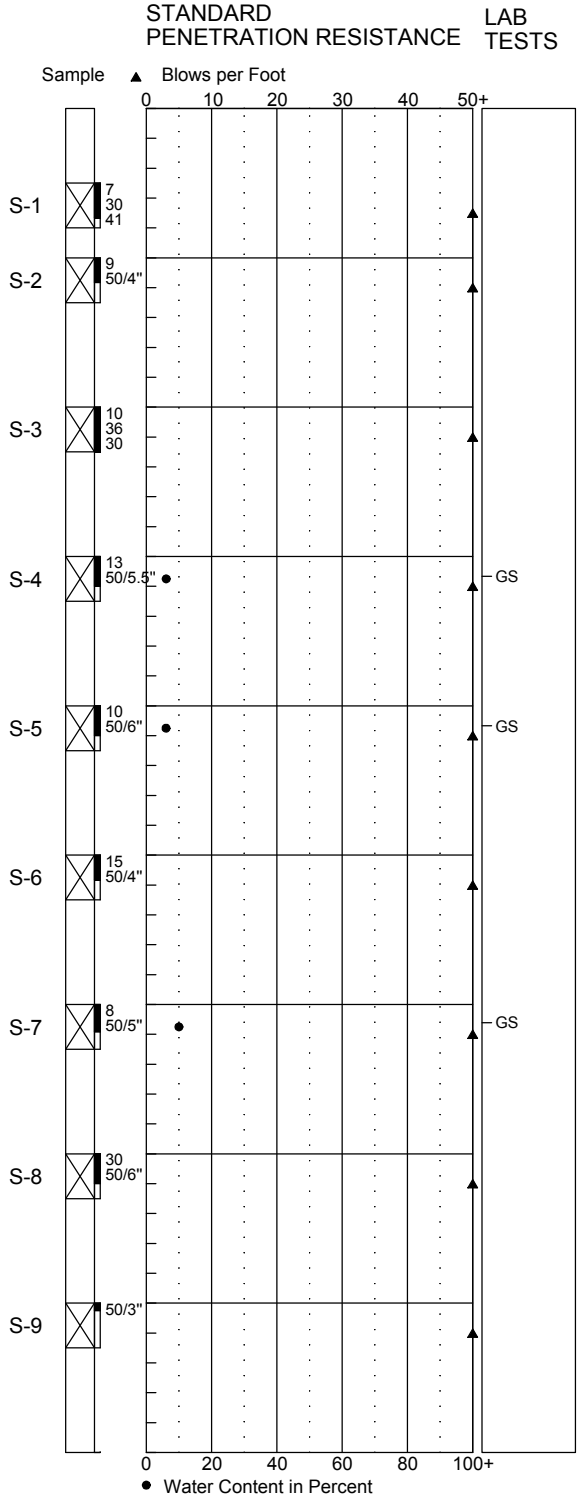
Figure A-2

Boring Log HC-2

Location: See Figure 2
Approximate Ground Surface Elevation: 176 Feet
Horizontal Datum: N.A.
Vertical Datum: NAVD 88

Drill Equipment: Hollow Stem Auger
Hammer Type: SPT
Hole Diameter: 4 inches
Logged By: J. Overton Reviewed By: M. Veenstra

USCS Class	Soil Descriptions	Depth in Feet
SP	2 inches of Asphalt.	0
	Medium to very dense, moist to wet, gray SAND.	
SM	Very dense, moist, gray, gravelly, silty SAND (Qvt).	5
		10
SP-SM	Very dense, moist, brown to gray, slightly silty to silty, slightly to very gravelly SAND (Qva).	15
		20
		25
		30
		35 ATD
SM	Very dense, moist, gray, gravelly, silty to very silty SAND (Qpgt). Increased drilling resistance.	40
		45



NEW BORING LOG 1786000-BL.GPJ HC_CORP.GDT 3/22/12

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. USCS designations are based on visual manual classification (ASTM D 2488) unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

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17860-00 *3/12*

Figure A-3 *1/2*

Boring Log HC-2

Location: See Figure 2
Approximate Ground Surface Elevation: 176 Feet
Horizontal Datum: N.A.
Vertical Datum: NAVD 88

Drill Equipment: Hollow Stem Auger
Hammer Type: SPT
Hole Diameter: 4 inches
Logged By: J. Overton Reviewed By: M. Veenstra

USCS Class	Graphic Log	Soil Descriptions	Depth in Feet
SM		Very dense, moist, gray, gravelly, silty to very silty SAND (Qpgt). (cont'd)	45
			50
		Bottom of Boring at 53.4 Feet. Started 03/06/12. Completed 03/06/12.	55
			60
			65
			70
			75
			80
			85
			90

STANDARD PENETRATION RESISTANCE — LAB TESTS

Sample ▲ Blows per Foot

Sample	Blows per Foot
S-10	50/4"
S-11	50/3.5"
S-12	50/5"

0 10 20 30 40 50+

0 20 40 60 80 100+

● Water Content in Percent

NEW BORING LOG 1786000-BL.GPJ HC_CORP.GDT 3/22/12

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. USCS designations are based on visual manual classification (ASTM D 2488) unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

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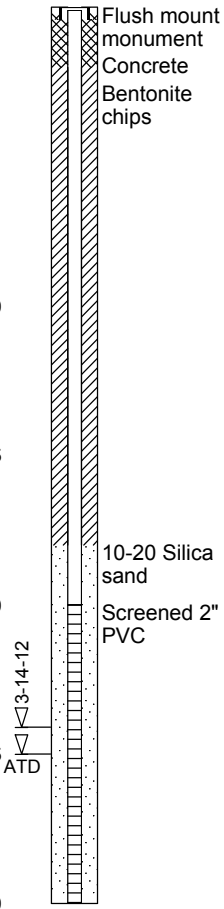
Boring Log & Construction Data for Monitoring Well HC-3

Location: See Figure 2
Approximate Ground Surface Elevation: 176 Feet
Horizontal Datum: N.A.
Vertical Datum: NAVD 88

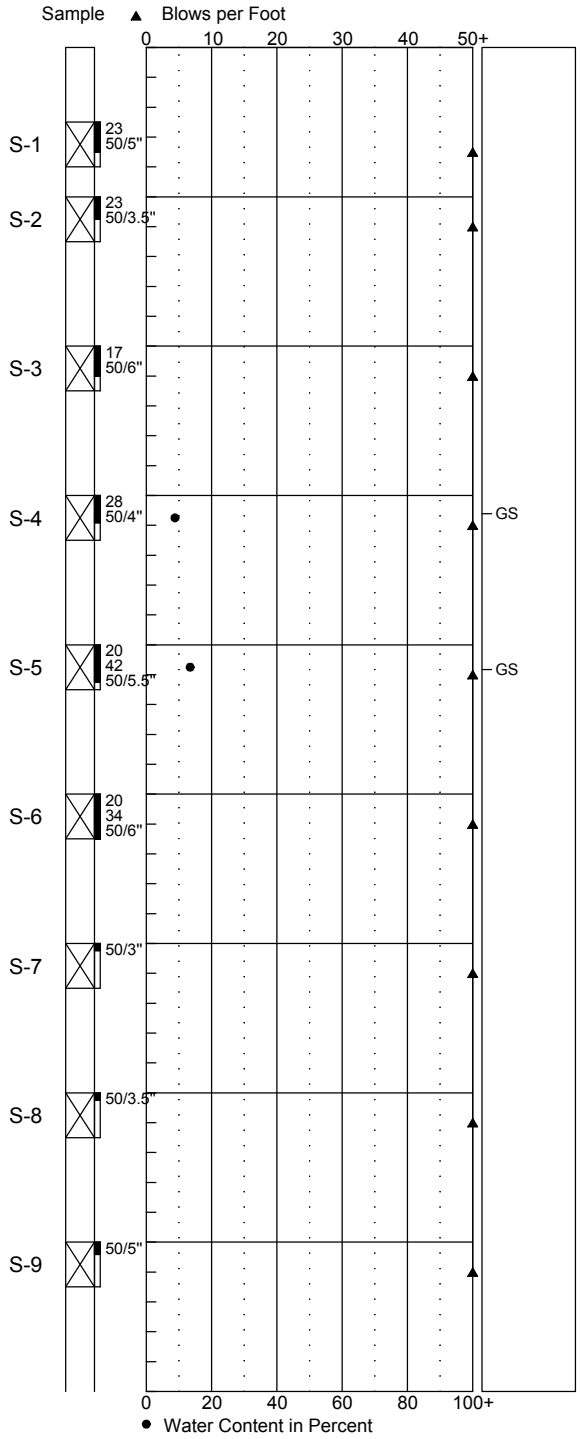
Drill Equipment: Hollow Stem Auger
Hammer Type: SPT
Hole Diameter: 4 inches
Logged By: J. Overton Reviewed By: M. Veenstra

USCS Class	Soil Descriptions	Depth in Feet
	9 inches of Concrete.	0
SP-SM	Very dense, moist, gray to brown, slightly silty to silty, gravelly SAND (Qvt).	5
SP-SM	Very dense, moist, brown-gray, trace to slightly gravelly, slightly silty to silty SAND (Qva).	10
		15
	Moist to wet.	20
	Wet.	25
SM	Very dense, moist, gravelly, silty SAND (Qpgt)	30
		35
		40
	Bottom of Boring at 40.4 Feet. Started 03/05/12. Completed 03/05/12.	45

Well Construction



STANDARD PENETRATION RESISTANCE — LAB TESTS



NEW BORING LOG 1786000-BL.GPJ HC_CORP.GDT 3/22/12

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. USCS designations are based on visual manual classification (ASTM D 2488) unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

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17860-00 3/12

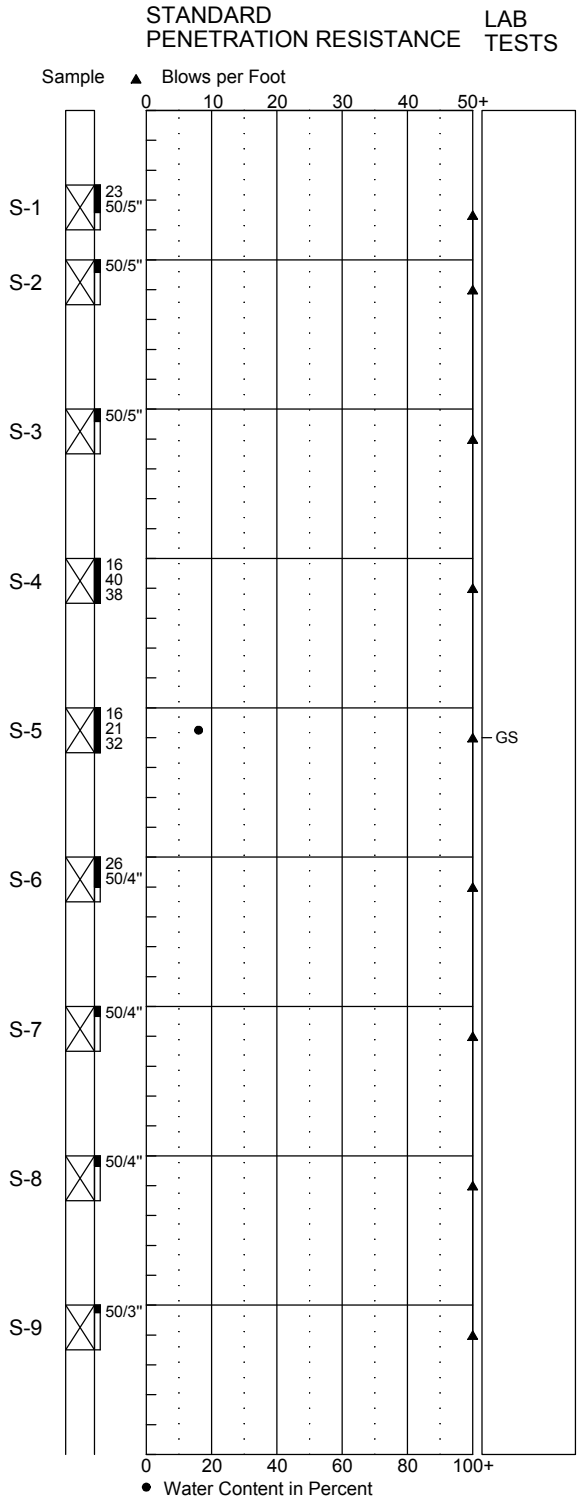
Figure A-4

Boring Log HC-4

Location: See Figure 2
Approximate Ground Surface Elevation: 176 Feet
Horizontal Datum: N.A.
Vertical Datum: NAVD 88

Drill Equipment: Hollow Stem Auger
Hammer Type: SPT
Hole Diameter: 4 inches
Logged By: J. Overton Reviewed By: M. Veenstra

USCS Class	Soil Descriptions	Depth in Feet
	9 inches of Concrete.	0
SM	Very dense, moist, gray, silty, gravelly SAND (Qvt).	
	Cobbles.	
	Very gravelly.	5
		10
SM	Very dense, moist, gray, slightly gravelly to gravelly, slightly to very silty SAND (Qva).	
		15
		20 ATD
		25
SM	Very dense, moist, gray, silty, gravelly SAND (Qpgt)	
		30
		35
		40
	Bottom of Boring at 40.3 Feet. Started 03/07/12. Completed 03/07/12.	45



NEW BORING LOG 1786000-BL.GPJ HC_CORP.GDT 3/22/12

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. USCS designations are based on visual manual classification (ASTM D 2488) unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

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17860-00 3/12

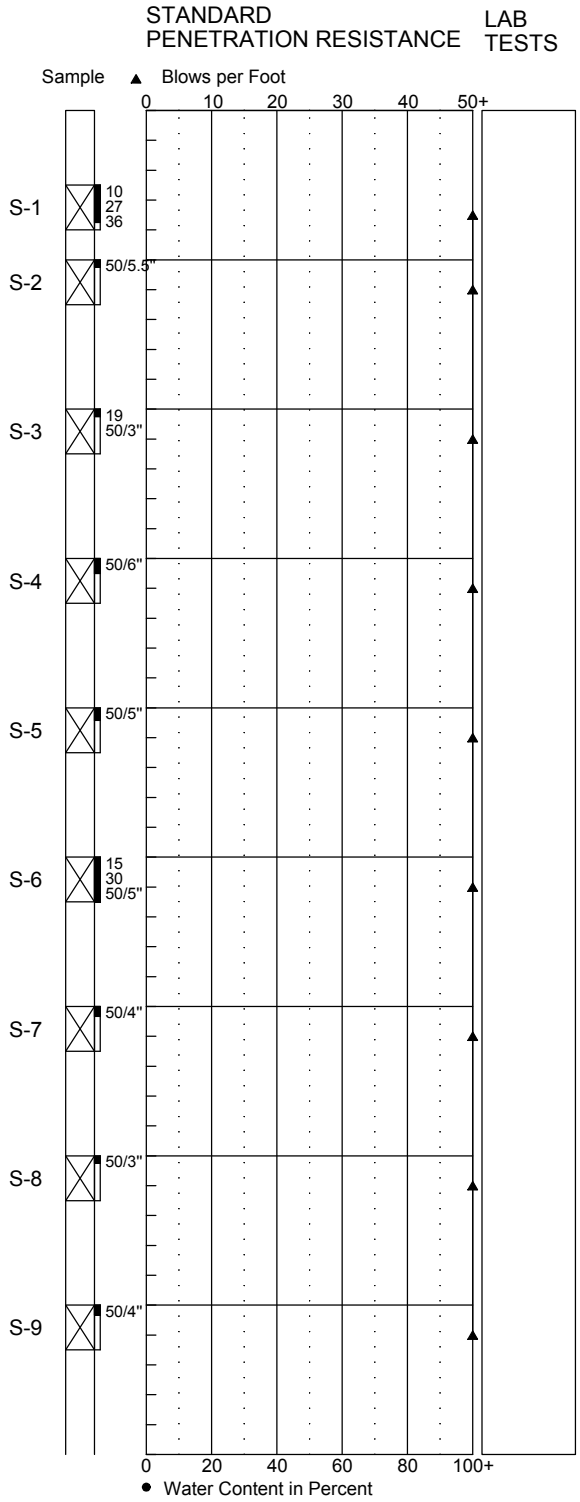
Figure A-5

Boring Log HC-5

Location: See Figure 2
Approximate Ground Surface Elevation: 176 Feet
Horizontal Datum: N.A.
Vertical Datum: NAVD 88

Drill Equipment: Hollow Stem Auger
Hammer Type: SPT
Hole Diameter: 4 inches
Logged By: J. Overton Reviewed By: M. Veenstra

USCS Class	Graphic Log	Soil Descriptions	Depth in Feet
SP-SM		2 inches of Asphalt.	0
		Very dense, moist, gray, slightly gravelly SAND with trace silt.	5
SM		Very dense, moist, gray, slightly gravelly to gravelly, silty SAND (Qvt). Cobbles.	10, 15, 20
SM		Very dense, wet, gray, silty SAND (Qva).	25 ATD
SM		Very dense, moist, gray, slightly gravelly to gravelly, silty SAND (Qpgt). Increasing drilling resistance.	30, 35
		Bottom of Boring at 40.3 Feet. Started 03/05/12. Completed 03/05/12.	40, 45



NEW BORING LOG 1786000-BL.GPJ HC_CORP.GDT 3/22/12

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. USCS designations are based on visual manual classification (ASTM D 2488) unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

HARTCROWSER

17860-00 3/12

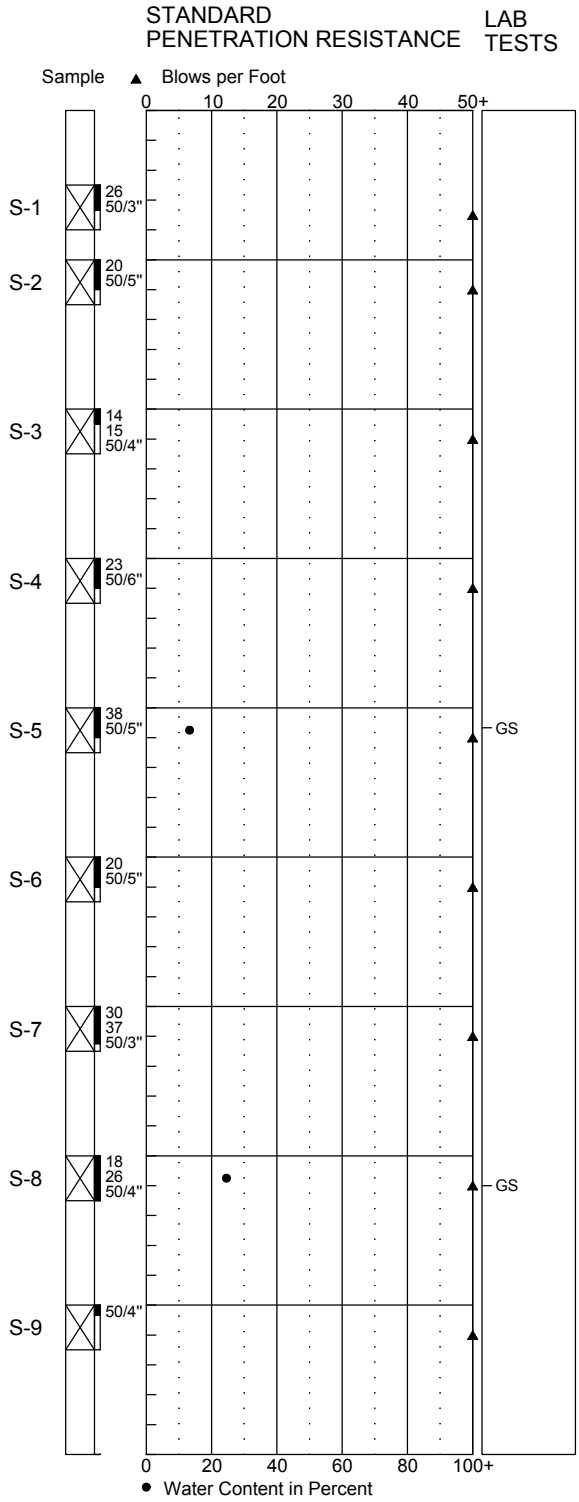
Figure A-6

Boring Log HC-6

Location: See Figure 2
Approximate Ground Surface Elevation: 179 Feet
Horizontal Datum: N.A.
Vertical Datum: NAVD 88

Drill Equipment: Hollow Stem Auger/Mud Rotary
Hammer Type: SPT
Hole Diameter: 4 inches
Logged By: J. Overton Reviewed By: M. Veenstra

USCS Class	Graphic Log	Soil Descriptions	Depth in Feet
		9 inches of Concrete.	0
SM		Very dense, moist, gray, gravelly, silty SAND (Qvt).	5, 10
SP-SM		Very dense, wet, gray, gravelly SAND with trace silt and cobbles (Qva).	15
SM		Very dense, wet, gray, slightly gravelly to gravelly, slightly silty to silty SAND (Qva).	20, 25 ATD
ML		Very dense, moist, gray, trace gravelly, very sandy SILT with occasional layer of dark brown, consolidated PEAT (Qpns). 3-inch thick consolidated peat layer.	30, 35
GP		Very dense, wet, gray GRAVEL (Qpgt). (No samples recovered.)	40, 45



NEW BORING LOG 1786000-BL.GPJ HC_CORP.GDT 3/22/12

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. USCS designations are based on visual manual classification (ASTM D 2488) unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

HARTCROWSER

Boring Log HC-6

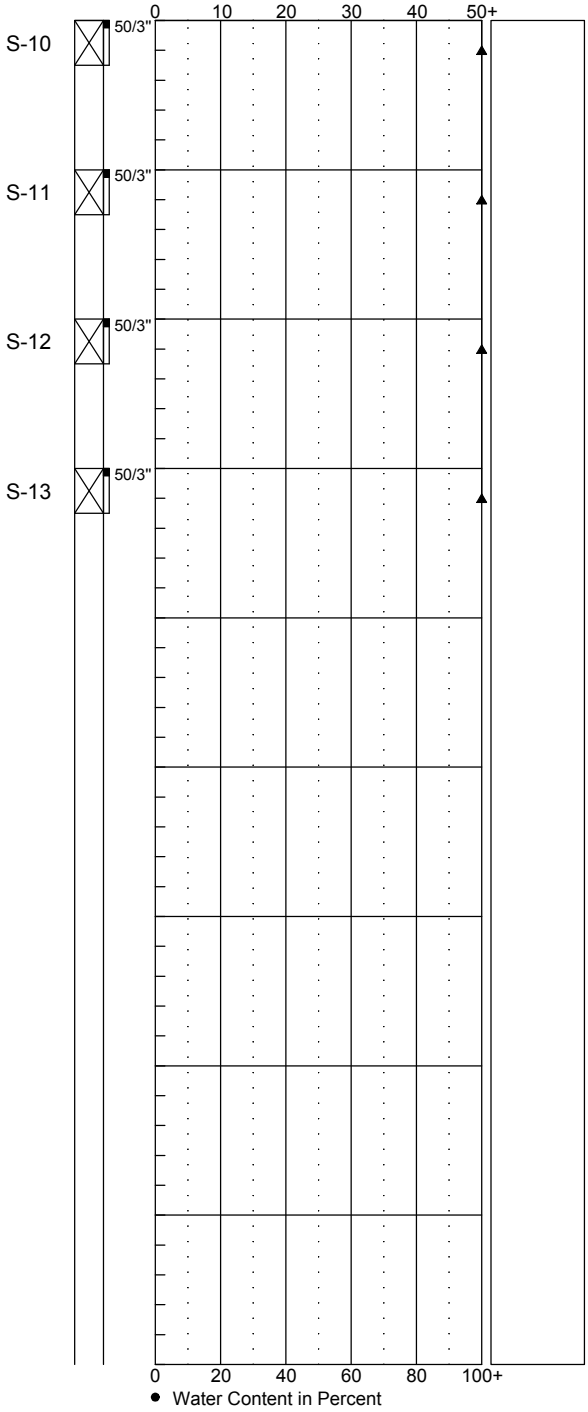
Location: See Figure 2
Approximate Ground Surface Elevation: 179 Feet
Horizontal Datum: N.A.
Vertical Datum: NAVD 88

Drill Equipment: Hollow Stem Auger/Mud Rotary
Hammer Type: SPT
Hole Diameter: 4 inches
Logged By: J. Overton Reviewed By: M. Veenstra

USCS Class	Graphic Log	Soil Descriptions	Depth in Feet
GP		Very dense, wet, gray GRAVEL (Qpgt). (No samples recovered.) (cont'd)	45
			50
			55
			60
		Bottom of Boring at 60.3 Feet. Started 03/07/12. Completed 03/07/12.	
			65
			70
			75
			80
			85
			90

STANDARD PENETRATION RESISTANCE — LAB TESTS

Sample ▲ Blows per Foot



1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. USCS designations are based on visual manual classification (ASTM D 2488) unless otherwise supported by laboratory testing (ASTM D 2487).
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17860-00 3/12
Figure A-7 2/2

NEW BORING LOG 1786000-BL.GPJ HC_CORP.GDT 3/22/12

APPENDIX B
LABORATORY TESTING PROGRAM

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APPENDIX B
LABORATORY TESTING PROGRAM

A laboratory testing program was performed for this study to evaluate the basic index and geotechnical engineering properties of the site soils. Disturbed samples were tested. The tests performed and the procedures followed are outlined below.

Soil Classification

Field Observation and Laboratory Analysis. Soil samples from the explorations were visually classified in the field and then taken to our laboratory where the classifications were verified in a relatively controlled laboratory environment. Field and laboratory observations include density/consistency, moisture condition, and grain size and plasticity estimates.

The classifications of selected samples were checked by laboratory tests such as Atterberg limits determinations and grain size analyses. Classifications were made in general accordance with the Unified Soil Classification (USC) System, ASTM D 2487, as presented on Figure B-1.

Water Content Determinations

Water contents were determined for most samples recovered in the explorations in general accordance with ASTM D 2216, as soon as possible following their arrival in our laboratory. The results of these tests are plotted or presented at their respective sample depth on the exploration logs. In addition, water contents are routinely determined for samples subjected to other testing. These are also presented on the exploration logs.

Grain Size Analysis (GS)

Grain size distribution was analyzed on representative samples in general accordance with ASTM D 422. Wet sieve analysis was used to determine the size distribution greater than the U.S. No. 200 mesh sieve. The size distribution for particles smaller than the No. 200 mesh sieve was determined by the hydrometer method for a selected number of samples. The results of the tests are presented as curves plotting percent finer by weight versus grain size.

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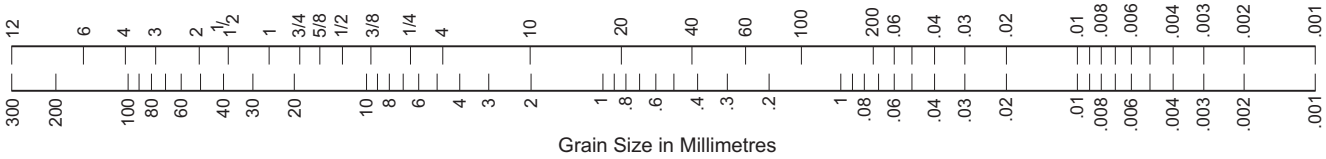
Unified Soil Classification (USC) System
Soil Grain Size

Size of Opening In Inches	Number of Mesh per Inch (US Standard)	Grain Size in Millimetres



COBBLES	GRAVEL	SAND	SILT and CLAY
Coarse-Grained Soils			Fine-Grained Soils

Coarse-Grained Soils

G W	G P	G M	G C	S W	S P	S M	S C
Clean GRAVEL <5% fines	*	GRAVEL with >12% fines		Clean SAND <5% fines	*	SAND with >12% fines	
GRAVEL >50% coarse fraction larger than No. 4				SAND >50% coarse fraction smaller than No. 4			
Coarse-Grained Soils >50% larger than No. 200 sieve							

G W and S W $\left(\frac{D_{60}}{D_{10}}\right)$ >4 for G W, >6 for S W & $1 \leq \left(\frac{(D_{30})^2}{D_{10} \times D_{60}}\right) \leq 3$

G P and S P Clean GRAVEL or SAND not meeting requirements for G W and S W

G M and S M Atterberg limits below A line with PI <4

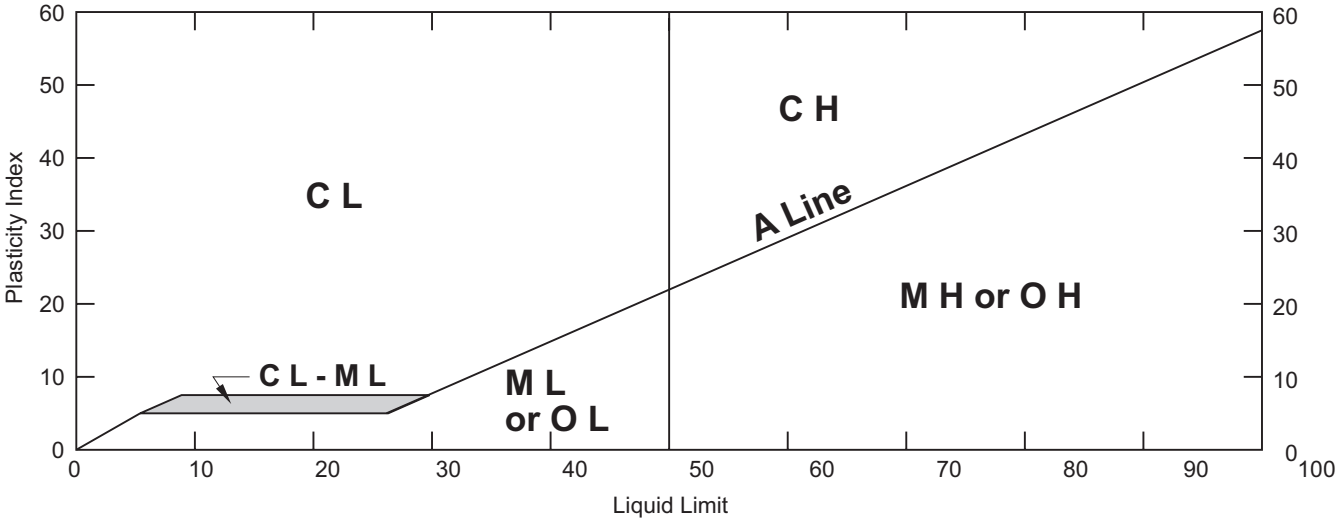
G C and S C Atterberg limits above A Line with PI >7

* Coarse-grained soils with percentage of fines between 5 and 12 are considered borderline cases requiring use of dual symbols.

D_{10}, D_{30}, and D_{60} are the particles diameter of which 10, 30, and 60 percent, respectively, of the soil weight are finer.

Fine-Grained Soils

M L	C L	O L	M H	C H	O H	Pt
SILT	CLAY	Organic	SILT	CLAY	Organic	Highly Organic Soils
Soils with Liquid Limit <50%			Soils with Liquid Limit >50%			
Fine-Grained Soils >50% smaller than No. 200 sieve						



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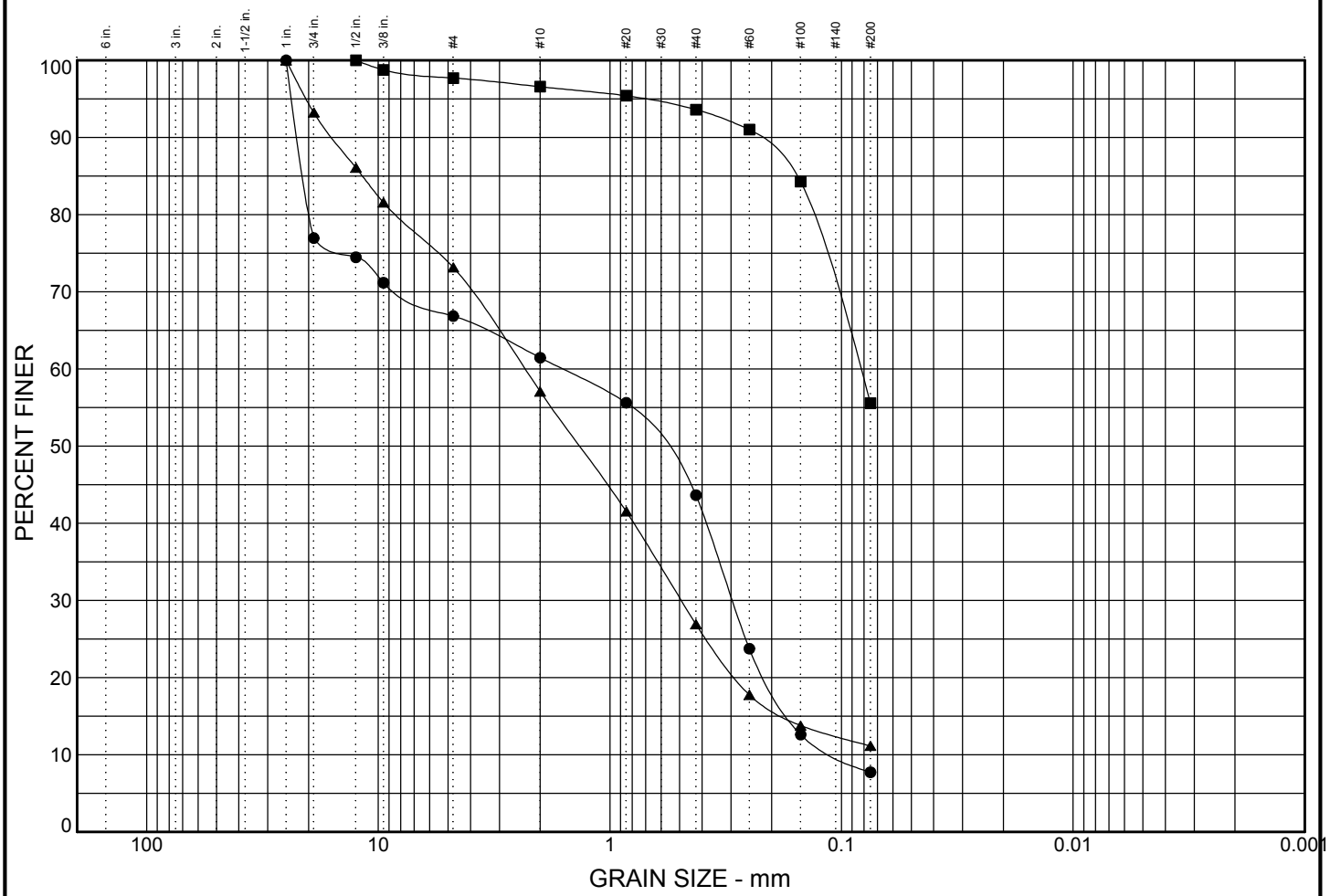
SRF Grain Size (B-1).cdr 3/06

17860-00 *3/12*

Figure B-1

Particle Size Distribution Test Report



	% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
●	0.0	33.1	59.1	7.7	
■	0.0	2.3	42.1	55.6	
▲	0.0	26.8	62.0	11.2	

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●			20.909	1.615	0.614	0.295	0.167	0.103	0.52	15.60
■			0.158	0.083						
▲			11.7	2.339	1.354	0.492	0.175		1.87	42.39

MATERIAL DESCRIPTION	USCS	NAT. MOIST.
● slightly silty, very gravelly SAND	SP-SM	4.6%
■ very sandy SILT, trace gravel	ML	16.8%
▲ slightly silty, gravelly SAND	SW-SM	6.1%

Remarks:

●

■ Classification based on MA results only.

▲

Project: Spring District

Client:

● Source: HC-1 Sample No.: S-5 Depth: 20.0 to 21.5
■ Source: HC-1 Sample No.: S-6 Depth: 25.0 to 26.5
▲ Source: HC-2 Sample No.: S-4 Depth: 15.0 to 16.5

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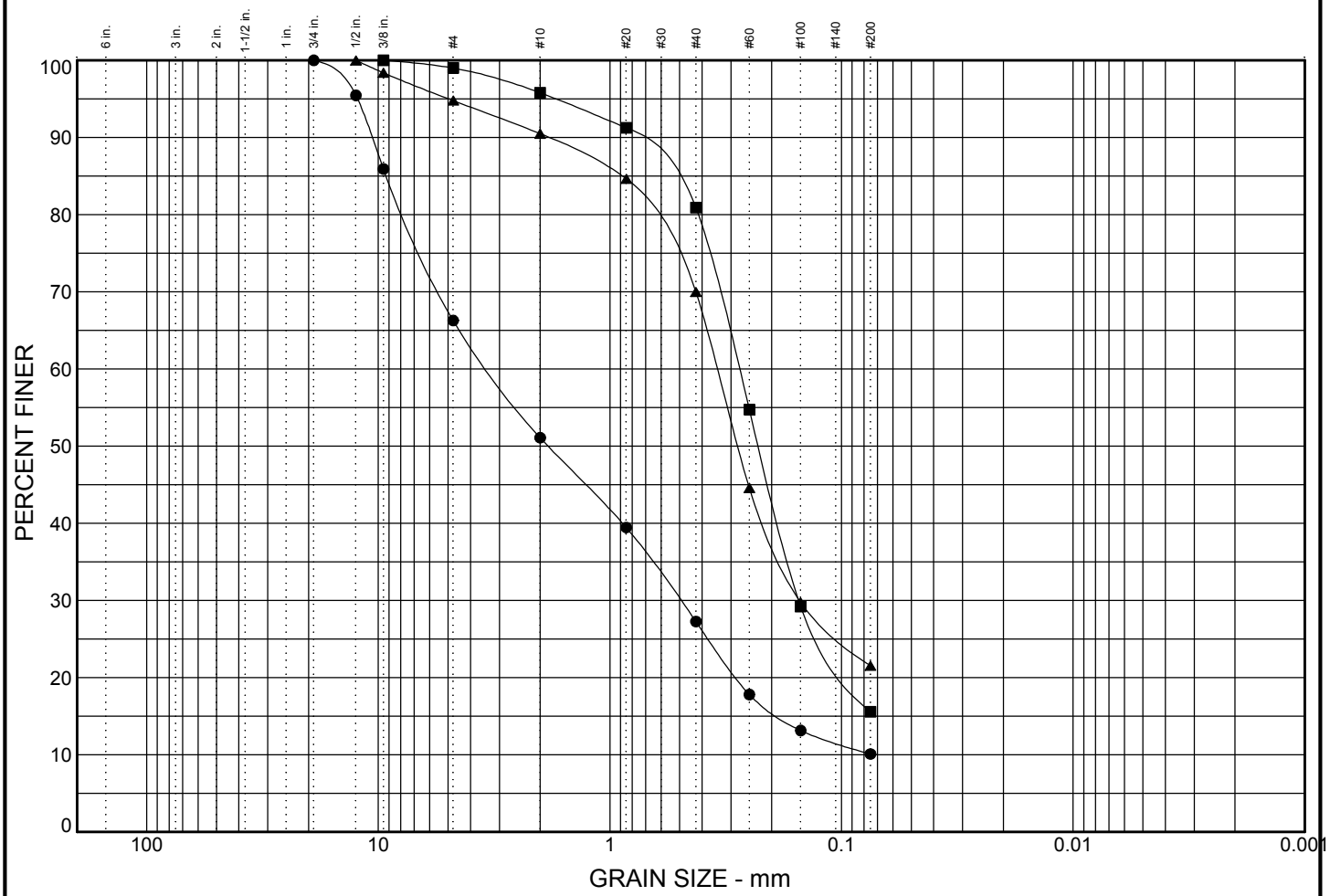
17860-00 *3/12*

Figure B-2

GRAIN SIZE 1786000-BL.GPJ HC_CORP.GDT 3/22/12

Particle Size Distribution Test Report



	% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
●	0.0	33.7	56.2	10.1	
■	0.0	1.0	83.4	15.6	
▲	0.0	5.2	73.2	21.5	

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●			9.195	3.321	1.846	0.496	0.184		1.01	45.33
■			0.559	0.278	0.227	0.152				
▲			0.894	0.345	0.28	0.151				

MATERIAL DESCRIPTION	USCS	NAT. MOIST.
● slightly silty, very gravelly SAND	SW-SM	6.1%
■ silty SAND, trace gravel	SM	10.0%
▲ slightly gravelly, silty SAND	SM	8.8%

Remarks:

●

■

▲

Project: Spring District

Client:

● Source: HC-2 Sample No.: S-5 Depth: 20.0 to 21.5
■ Source: HC-2 Sample No.: S-7 Depth: 30.0 to 31.5
▲ Source: HC-3 Sample No.: S-4 Depth: 15.0 to 16.5

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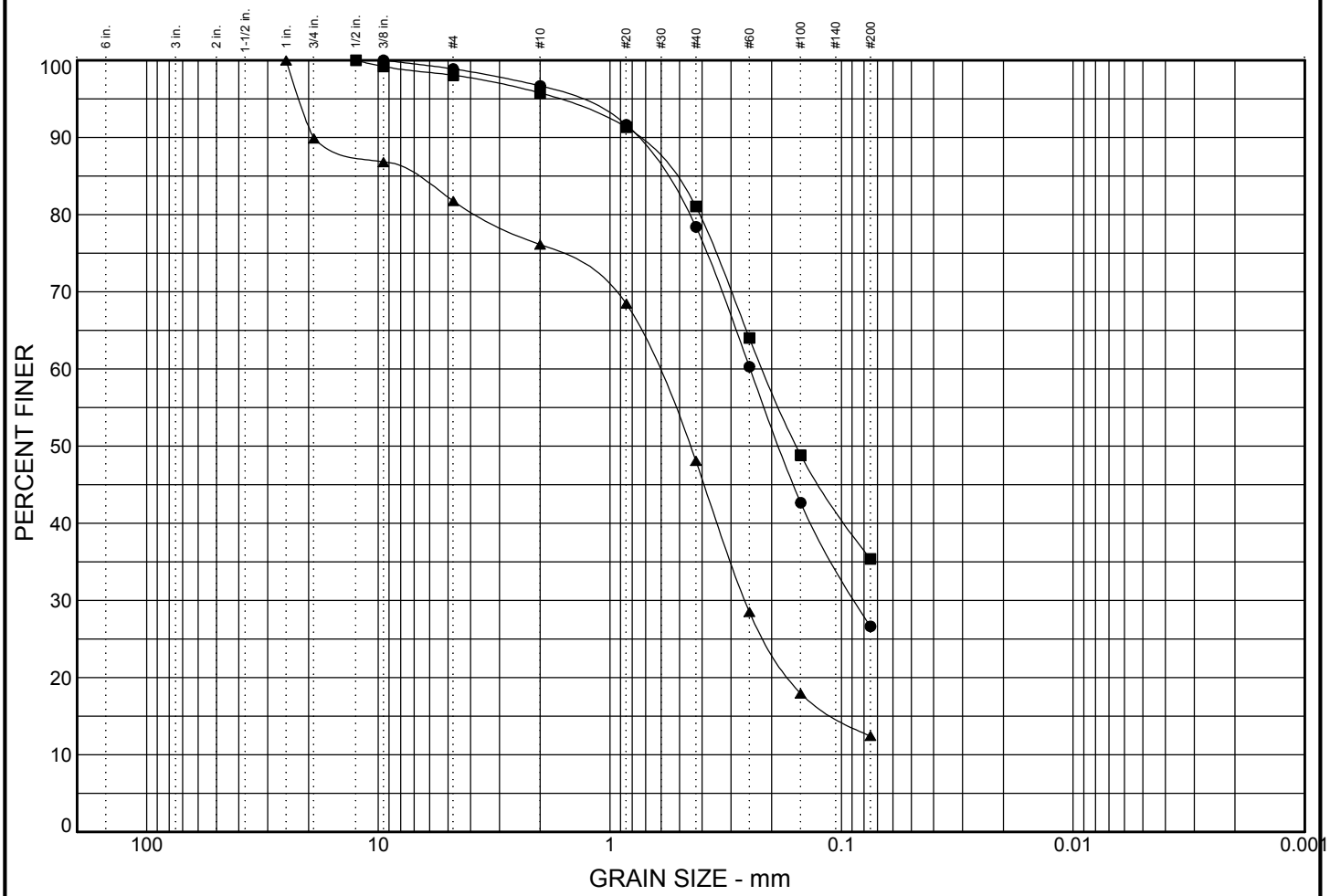
17860-00 *3/12*

Figure B-3

GRAIN SIZE 1786000-BL.GPJ HC_CORP.GDT 3/22/12

Particle Size Distribution Test Report



	% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
●	0.0	1.1	72.2	26.6	
■	0.0	1.9	62.7	35.4	
▲	0.0	18.2	69.3	12.4	

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●			0.6	0.248	0.186	0.087				
■			0.555	0.218	0.156					
▲			7.405	0.637	0.454	0.26	0.103		1.93	11.55

MATERIAL DESCRIPTION	USCS	NAT. MOIST.
● silty SAND, trace gravel	SM	13.4%
■ very silty SAND, trace gravel	SM	16.0%
▲ silty gravelly SAND	SW-SM	13.3%

Remarks:

●

■ Classification based on MA results only.

▲

Project: Spring District

Client:

● Source: HC-3 Sample No.: S-5 Depth: 20.0 to 21.5
■ Source: HC-4 Sample No.: S-5 Depth: 20.0 to 21.5
▲ Source: HC-6 Sample No.: S-5 Depth: 20.0 to 21.5

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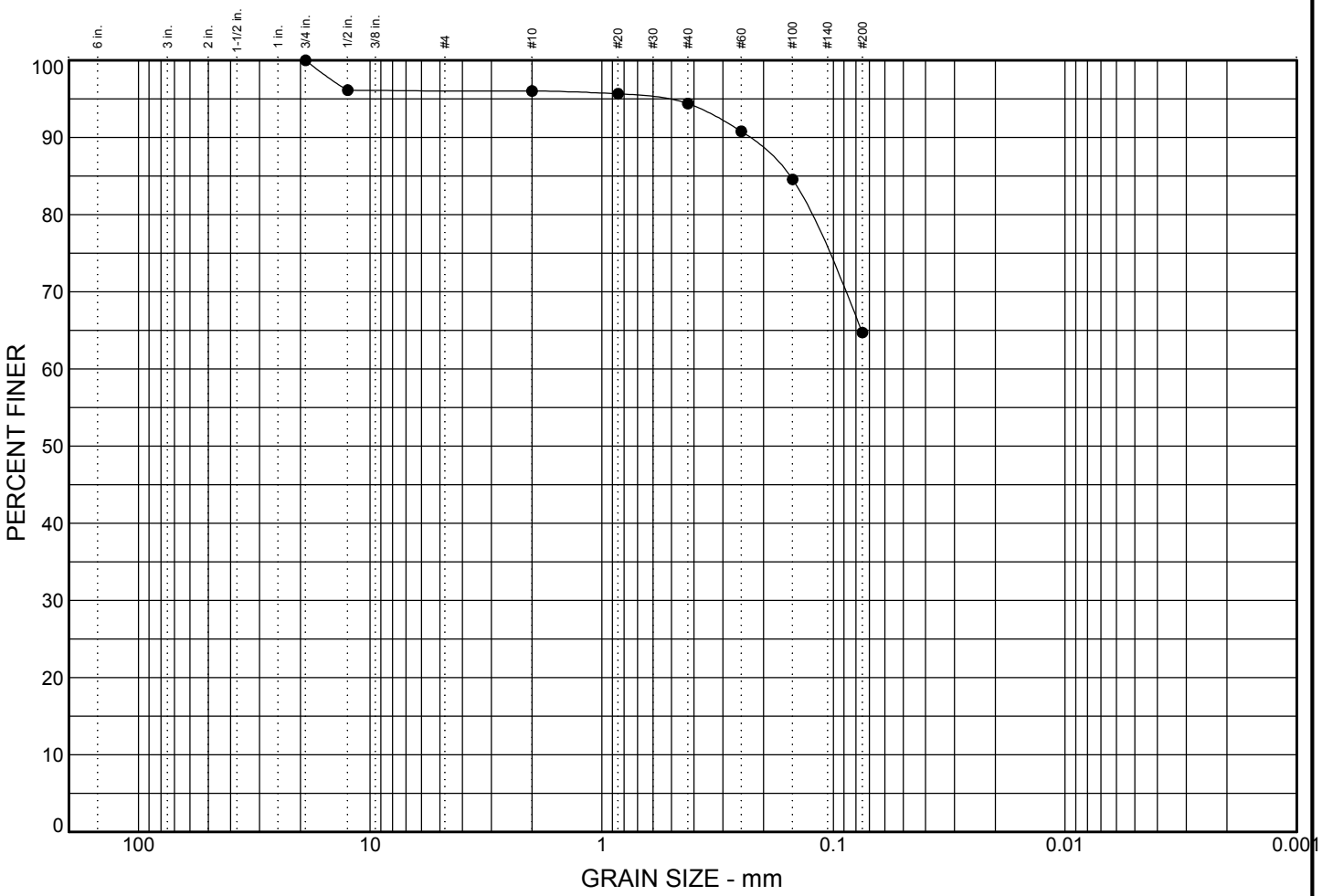
17860-00 *3/12*

Figure B-4

Particle Size Distribution Test Report



	% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
●	0.0	3.9	31.4	64.7	

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●			0.155							

MATERIAL DESCRIPTION	USCS	NAT. MOIST.
● very sandy SILT, trace gravel	ML	24.6%

Remarks:

● Classification based on MA results only.

Project: Spring District

Client:

● Source: HC-6 Sample No.: S-8 Depth: 35.0 to 36.5

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17860-00 *3/12*

Figure B-5

GRAIN SIZE 1786000-BL.GPJ HC_CORP.GDT 3/22/12

APPENDIX C
SHORING MONITORING AND ANCHOR TESTING PROGRAM

APPENDIX C
SHORING MONITORING AND ANCHOR TESTING PROGRAM

Shoring Monitoring Program

The intent of the shoring monitoring program is to provide early warning if the shoring does not perform as anticipated. We recommend that the following components be included in the shoring monitoring program during construction:

- Adjacent property surveys, if applicable;
- Optical surveying; and
- Geotechnical instrumentation.

All data should be submitted weekly to the shoring designer, geotechnical engineer, and structural engineer for review. Details of our expectations for shoring monitoring are included in the following paragraphs.

Permitting agencies typically require that shoring monitoring plans establish displacement limits and associated remedial actions. We have found that the following approach has typically been acceptable. If more than 0.5 inch of displacement occurs, Hart Crowser, the shoring designer, and the structural engineer should determine the cause of displacement and develop remedial measures with the owner and contractor, if warranted. If displacements greater than about 1 inch, unacceptable performance, or other adverse impacts occur, the contractor should notify Hart Crowser, the shoring designer, and the structural engineer immediately to determine whether contingency measures should be implemented. If warranted, the project team should confirm and the contractor should implement remedial measures specific to the situation. Remedial measures may include more frequent shoring monitoring/surveying, construction and/or design changes to limit and/or correct detrimental displacements. Construction may need to be stopped until remedial measures are implemented. When adjacent property or right-of-way (ROW) could be affected, the appropriate agency and property/ROW owner should be notified of the proposed remedy to gain approval before implementation.

Adjacent Property Surveys

We recommend that adjacent property (structures, sidewalks, utilities, etc.) be surveyed before, during, and after construction. The pre-construction survey will establish the baseline documentation of existing conditions, such as identifying the size and locations of any cracks. The surveys should consist of a videotape

and/or photographs of adjacent facilities and detailed mapping of all cracks. Any existing cracks could be monitored with a crack gage placed across the crack.

Optical Surveying

We recommend optical surveying of horizontal and vertical movement of the following: (1) the surface of the adjacent streets; (2) adjacent parking areas as applicable; and (3) the shoring system itself. The contractor should establish two reference lines adjacent to the excavation at horizontal distances back from the excavation face of about 1/3H and H, where H is the final excavation height. Typically, these lines will be established near the curb line and across the street from the excavation face. The points on the adjacent facilities should be set on sound points not prone to movement by normal traffic/use, preferably in areas not obstructed during construction. The surface and adjacent facility points should be spaced at about 50 feet horizontally, but each side of the excavation should have at least four equally spaced points. Points on the shoring wall should be placed at every other soldier pile or at about every 25 feet for soil nail walls.

The measuring system for the shoring monitoring should have a system accuracy (i.e., accounting for all factors) of at least 0.01 foot. All reference points on the ground surface and existing adjacent facilities should be installed and read before excavation. The frequency of readings will depend on the results of previous readings and the rate of construction. At a minimum, readings on surface streets and adjacent facilities should be taken every other week, or as recommended by Hart Crowser, until the permanent structure is completed to street grades. Readings on the top of the wall should be taken at least twice and preferably three times a week. We recommend that the contractor conduct most readings and that their data be verified by an independent surveyor at least once per week.

Survey Points. Survey markers are typically used throughout the project site, on adjacent facilities and streets, and on soldier piles or other shoring elements. Routine surveying can show progressive movement in the shoring system due to soil movement behind the wall, and can provide an early warning in the event that adjacent roads or structures settle as a result of the excavation. Survey markers should be sufficiently permanent to last until the permanent structure is completed up to surrounding street grades. The contractor should be responsible to reset/replace damaged survey points. It is recommended that reflective sticker “cross-hairs” be scribed on the wall to facilitate easy survey point replacement.

Geotechnical Instrumentation

Inclinometers. Inclinometers are typically used to monitor lateral earth movement below the ground surface. This device consists of a hollow casing placed in a borehole that is typically placed behind the shoring wall at selected locations around the excavation. Inclinometers are monitored regularly during construction. An instrument is lowered down the casing to measure casing deflections at discrete elevations for the entire profile of the casing. Inclinometer casings should extend below the base of the excavation so that the bottom is fixed in soil that will not deform due to the shoring system, typically at least about 15 feet.

Based on the soils, setting, and depth we don't think inclinometers will be needed.

Anchor Testing Program

In this section anchors refer to both tiebacks and soil nails.

Performance Test

A minimum of two performance tests per soil type should be completed before installation of production anchors. Each performance test should be conducted according to the following procedure:

1. The geotechnical engineer will select the testing locations with input from the shoring subcontractor.

2. The maximum stress in the anchor steel should not exceed 80 percent of the ultimate tensile strength for grade 150 ksi steel, or 90 percent of the yield strength for grade 60 or 75 ksi steel during performance testing. (Based on Post Tensioning Institute [PTI] manual.) The soldier piles, vertical elements, shotcrete facing, and/or anchor may require extra reinforcement to permit stressing to 200 percent of design load as required for the performance test.

3. The performance test will measure anchor stress and displacement incrementally to values of unit skin friction equal to 200 percent of the design stress. Load the anchor and measure deflections as follows:

   Load the anchor in increments of 25 percent of the design load (DL) and unload to the aligning load (AL) before incrementally loading to the next load increment (e.g., AL, 0.25 DL, AL, 0.25 DL, 0.50 DL, AL, 0.25 DL, 0.50 DL, 0.75 DL). Ensure that deflection readings stabilize for intermediate load

increments (i.e., 0.25 DL and 0.50 DL, when the new maximum is 0.75 DL) before increasing the load to the next increment. Obtain and record deflection measurements for loading at intervals of 30 seconds, 1 minute, 2 minutes, 3 minutes, and 5 minutes. Measurements shall be made to an accuracy of 0.01 inch.

4. Perform a creep test at 200 percent of design stress reading by holding the load constant to within 50 psi and recording readings at 30 seconds, 1 minute, 2 minutes, 3 minutes, 5 minutes, 6 minutes, and 10 minutes; also record at 20 minutes, 30 minutes, 50 minutes, and 60 minutes, if creep criteria are not met at 10-minute interval.

5. A successful test is one that exhibits a linear or near-linear relationship between unit stress and movement over the entire 200 percent stress range, holds the maximum test unit stress without noticeable creep, and satisfies the apparent free length criteria. Noticeable creep is defined as a rate of movement of more than 0.04 inch between the 1- and 10-minute readings, or not more than 0.08 between the 6- and 60-minute readings. If the reading does not stabilize to 0.08 inch or less per log cycle, the test shall be considered to fail the creep criteria. Apparent free length criteria are as follows:

   - Minimum apparent free length, based on the measured elastic and residual movement, should be greater than 80 percent of the designed free length plus the jack length; and

   - Maximum apparent free length, based on the measured elastic and residual movement, should be less than 100 percent of the designed free length plus 50 percent of the bond length plus the jack length.

6. Perform tests without backfill ahead of the anchor, if the hole will remain open, to avoid any contributory resistance by the backfill. If the hole will not remain open during testing, provide a bond breaker on the anchor steel and backfill the no-load zone specified on the plans with a non-cohesive mixture.

Proof Test

Five percent of production anchors should be tested following the proof testing procedures outlined below:

1. Load each anchor to 130 percent of the design load in increments of approximately 25 percent of the design load (i.e., 0.25 DL, 0.50 DL, 0.75 DL, 1.00 DL, and 1.30 DL). The maximum stress in the anchor steel should not

exceed 80 percent of the ultimate tensile strength for grade 150 ksi steel, or 90 percent of the yield strength for grade 60 or 75 ksi steel during testing.

2. Hold each incremental load for a period long enough to obtain a stable deflection measurement while recording deflections at each load increment. Hold the 130 percent load for a minimum of 5 minutes, recording the movement at times of 30 seconds, 1 minute, 2 minutes, and 5 minutes.

3. A successful test is one that exhibits a linear or near-linear relationship between unit stress and movement over the entire stress range, holds the maximum test unit stress without noticeable creep, and satisfies the apparent free length criteria as indicated for the performance testing. Note that the creep portion of the test need not exceed 10 minutes if the 10-minute creep criteria is met.

   Typically, movement of the anchor in excess of about 3 inches is indicative of deficiencies in installation. Typically, total movement in excess of 12 inches is considered a failure requiring replacement. For total movements between 3 and 12 inches, the geotechnical and structural engineers will determine if a replacement or supplement is required.

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Attachment G
Certificate of Concurrency

CERTIFICATE OF CONCURRENCY

SPRING DISTRICT PHASE 1A

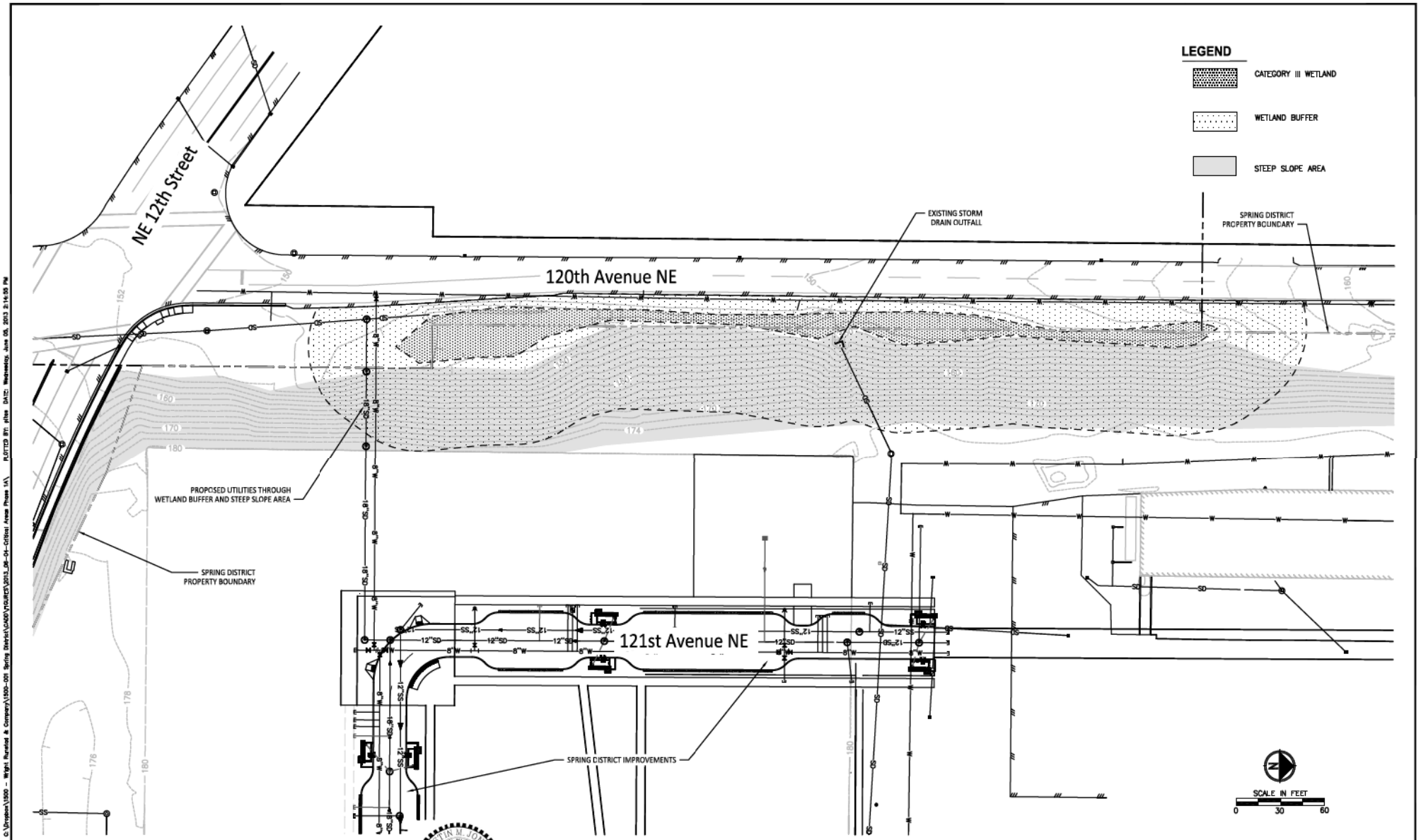
This certificate documents the Transportation Department Director's decision that the development project at 1227 124th Avenue NE (Design Review File No. 12-115899 LD) complies with the requirements of the Traffic Standards Code (BCC 14.10). Under the terms of the Development Agreement for the Spring District, this decision reserves 946 p.m. peak hour trips to Phase 1A of the Spring District Master Development Plan, subject to Process II appeal of either the concurrency determination or the Design Review decision. The concurrency approval issued for Phase 1A shall expire five years from the date of issuance of this Design Review decision, provided that such five year period shall be extended consistent with the provisions of BCC 14.10.040.F; and further provided that in no event may development consisting of more than 1,000,000 square feet of commercial development be vested at any given time.

Director, Transportation Department

7/11/13

Date

Certificate No. 77



REVISIONS	DATE	BY

DESIGNED J. JONES
DRAWN M. CLARK
CHECKED
APPROVED

ONE INCH AT FULL SCALE. IF NOT, SCALE ACCORDINGLY
FILE NAME CritCalAreas
JOB No. 1500-001
DATE 06-05-2013

AUSTIN M. JONES STATE OF WASHINGTON 41829 REGISTERED PROFESSIONAL ENGINEER 06-04-13

THE SPRING DISTRICT

WRIGHT RUNSTAD & COMPANY

nbbj JVJ TEAM

CRITICAL AREAS
SITE PLAN B
CRITICAL AREAS PERMIT SET

SHEET NO. 1 OF 2

CA-001

PATH: G:\Dropbox\1500 - Wright Runstad & Company\1500-001 Spring District\CADD\FIGURES\2013_06-04-Critical Areas Phase 1A\ PLOTTED BY: gtbe DATE: Wednesday, June 05, 2013 2:14:59 PM
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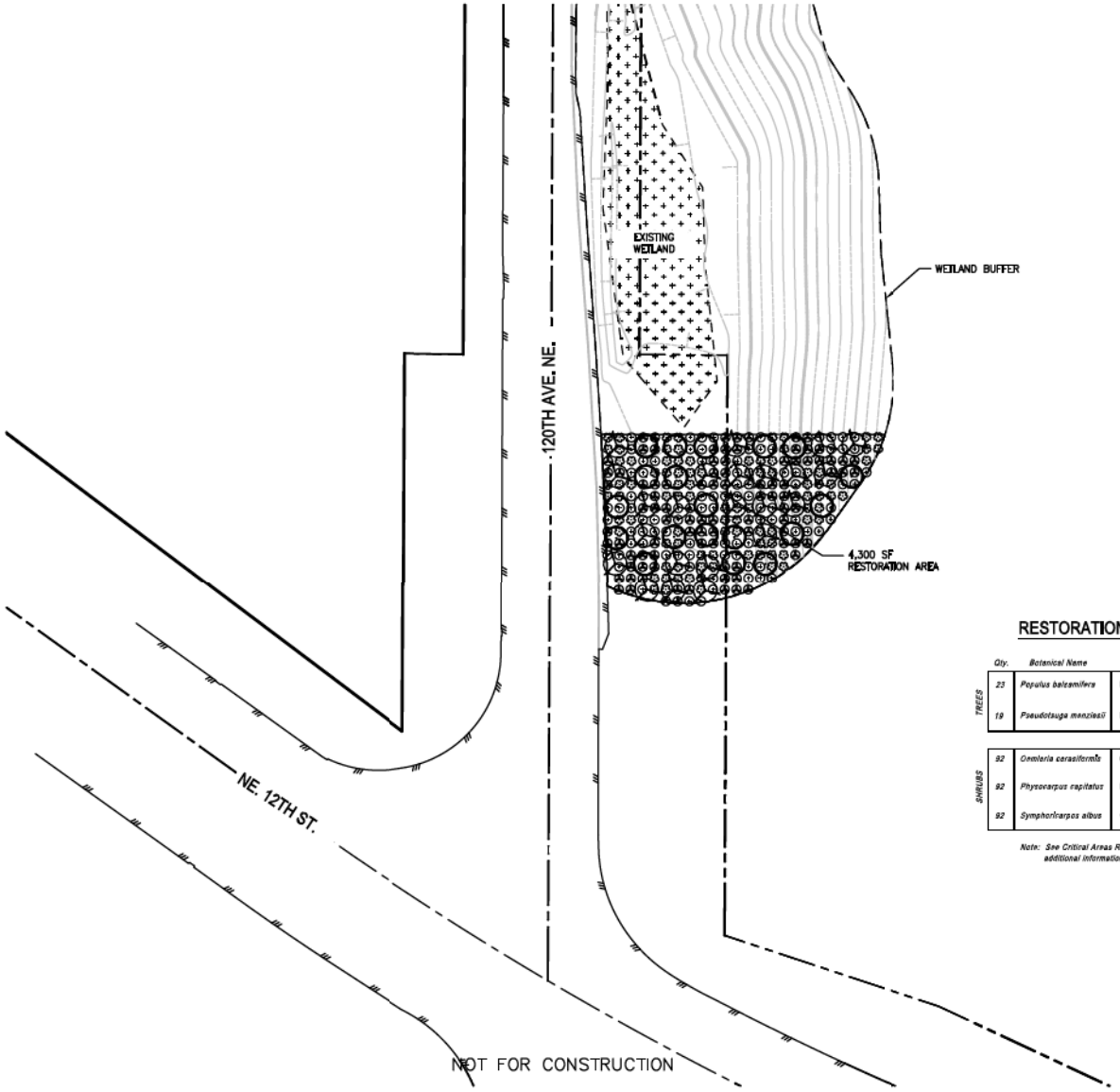
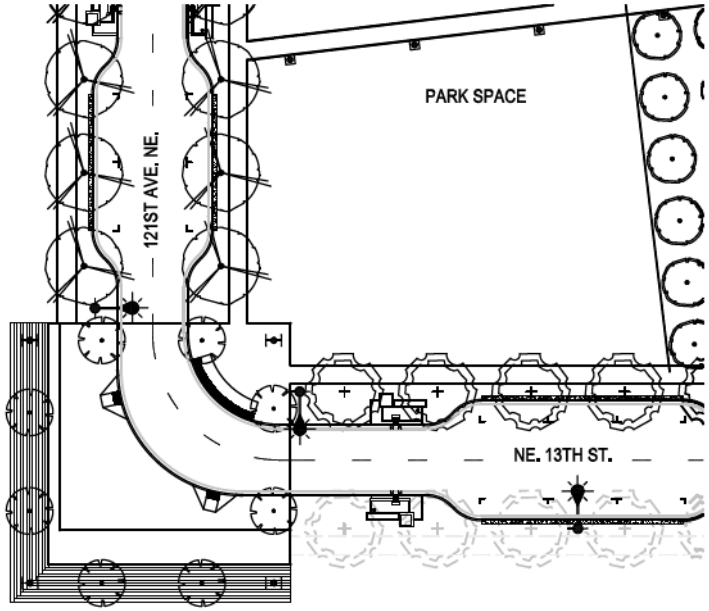




RESTORATION PLANT SCHEDULE

	Qty.	Botanical Name	Common Name	Spacing & Size
TREES	23	*Populus balsamifera*	Black Cottonwood	10' o.c. - 2 Gal. Cont.
	19	*Pseudotsuga menziesii*	Douglas Fir	10' o.c. - 2 Gal. Cont.
SHRUBS	92	*Osmaria cerasiformis*	Common Snowberry	4' o.c. - 1 Gal. Cont
	92	*Physocarpus capitatus*	Pacific Ninebark	4' o.c. - 1 Gal. Cont.
	92	*Symphoricarpos albus*	Common Snowberry	4' o.c. - 1 Gal. Cont.

Note: See Critical Areas Report prepared by Shannon & Wilson, Inc. for additional information.

LEGEND

- Existing Edge of Pavement
- Property Boundary Line
- Existing Wetland

N

SCALE IN FEET
0 20 40

REVISIONS	DATE	BY

DESIGNED D.S.
DRAWN K.B.
CHECKED
APPROVED

ONE INCH AT FULL SCALE. IF NOT, SCALE ACCORDINGLY
FILE NAME PU4575002L-LS1
JOB No. 247-4575-002
DATE 06-05-2013

STATE OF WASHINGTON REGISTERED LANDSCAPE ARCHITECT
JEFF TARGOSZ
LICENSE NO. 638
EXPIRES ON 11/11/2013

THE SPRING DISTRICT

WRIGHT RUNSTAD & COMPANY

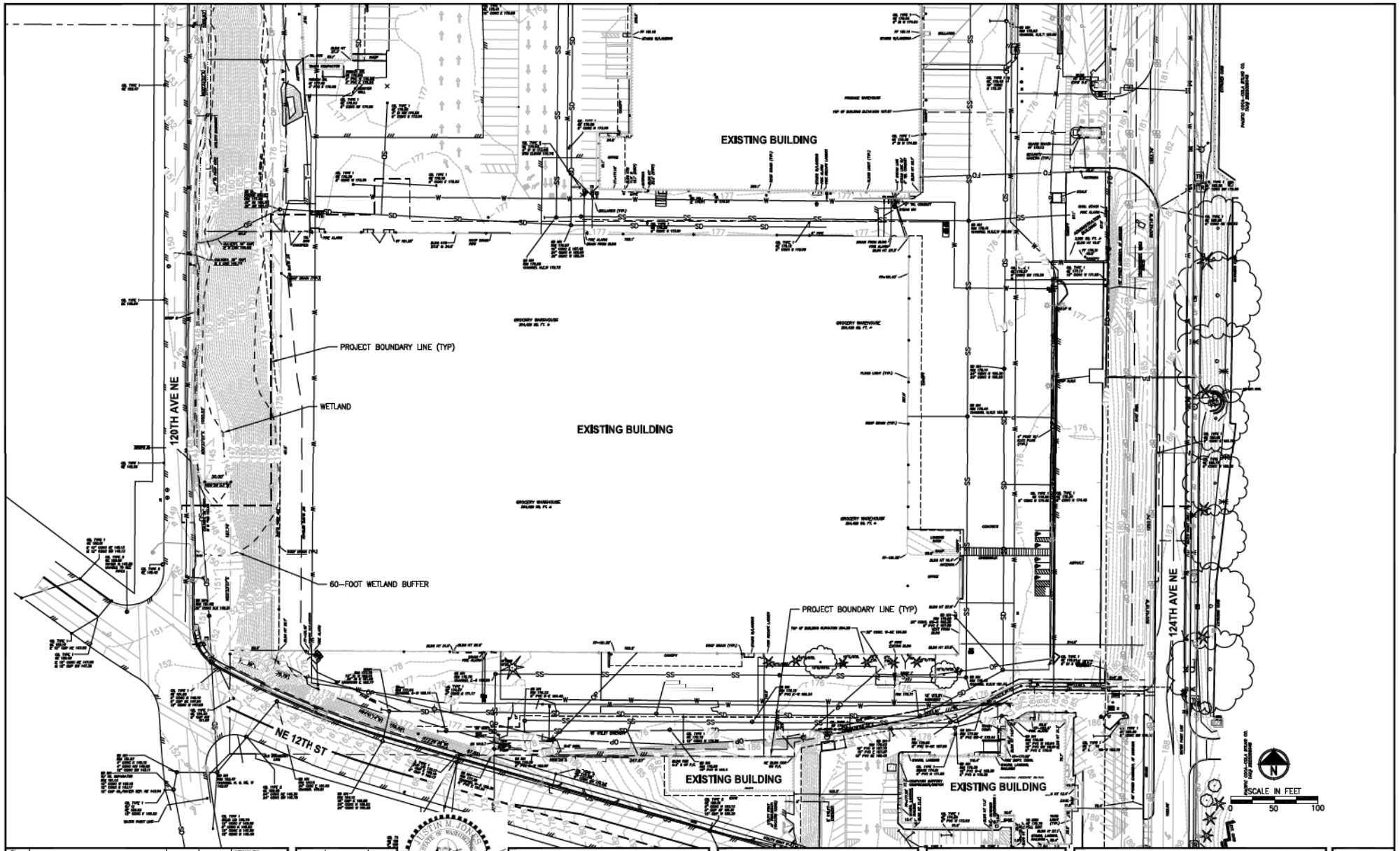
nbbj Parametrix

BUFFER RESTORATION PLANTING PLAN
CRITICAL AREAS PERMIT SET

SHEET NO. 2 OF 2

CA-002

LAYOUT: Buffer Restoration Plan PATH: U:\Projs\Projects\Clients\4575-Wright Runstad\247-4575-002 Spring District\Offices\CADD\PhASE 1A SI\CRITICAL AREAS\SHEETS\ PLOTTED BY: mcnester DATE: Wednesday, June 05, 2013 9:16:17 AM



REVISIONS	DATE	BY	
			DESIGNED
			DRAWN
			CHECKED
			APPROVED

ONE INCH AT FULL SCALE.
IF NOT, SCALE ACCORDINGLY

FILE NAME 1500001C-EX-ST-CA
JOB No. 1500-001
DATE 06-05-2013

AUSTIN M. JONES
STATE OF WASHINGTON
41829
REGISTERED PROFESSIONAL ENGINEER
06-04-13

THE SPRING DISTRICT

WRIGHT RUNSTAD & COMPANY

nbbj

JJT TEAM

BOUNDARY AND TOPOGRAPHIC SURVEY

CRITICAL AREAS PERMIT SET

SHEET NO.
OF

CA-003

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CERTIFICATE OF CONCURRENCY

SPRING DISTRICT PHASE 1A

This certificate documents the Transportation Department Director's decision that the development project at 1227 124th Avenue NE (Design Review File No. 12-115899 LD) complies with the requirements of the Traffic Standards Code (BCC 14.10). Under the terms of the Development Agreement for the Spring District, this decision reserves 946 p.m. peak hour trips to Phase 1A of the Spring District Master Development Plan, subject to Process II appeal of either the concurrency determination or the Design Review decision. The concurrency approval issued for Phase 1A shall expire five years from the date of issuance of this Design Review decision, provided that such five year period shall be extended consistent with the provisions of BCC 14.10.040.F; and further provided that in no event may development consisting of more than 1,000,000 square feet of commercial development be vested at any given time.

Director, Transportation Department

7/11/13

Date

Certificate No. 77