SR 520 Evergreen Point
Floating Bridge and Landings Project

Environmental Compliance Plan
Volume II

Appendix B.2
Temporary Erosion and Sediment Control Plan—SR 520 FBL Site

REVISION 2

Released for Construction

March 2012
(Revised September 19, 2012)

SR 520 Evergreen Point Floating Bridge and Landings Project Maintenance Facility

Temporary Erosion and Sedimentation Control (TESC) Plan Narrative and Stormwater Pollution Prevention Plan (SWPPP)

PREPARED FOR SUBMITTAL TO:
Washington Department of Transportation

PREPARED BY:
BergerABAM
33301 Ninth Avenue South, Suite 300
Federal Way, WA 98003-2600
206-431-2300
Contact: Connie Linden, P.E.

ON BEHALF OF:
Kiewit/General/Manson, A Joint Venture

Contents

1.0 Introduction **1**

2.0 Site Description **5**

2.1 Existing Conditions **5**
2.2 Proposed Construction Activities **7**

3.0 Construction Stormwater BMPs **9**

3.1 12 BMP Elements **10**
- ***3.1.1 Element #1 – Mark Clearing Limits*** **10**
- ***3.1.2 Element #2 – Establish Construction Access*** **10**
- ***3.1.3 Element #3 – Control Flow Rates*** **11**
- ***3.1.4 Element #4 – Install Sediment Controls*** **12**
- ***3.1.5 Element #5 – Stabilize Soils*** **12**
- ***3.1.6 Element #6 – Protect Slopes*** **13**
- ***3.1.7 Element #7 – Protect Drain Inlets*** **14**
- ***3.1.8 Element #8 – Stabilize Channels and Outlets*** **15**
- ***3.1.9 Element #9 – Control Pollutants*** **15**
- ***3.1.10 Element #10 – Control Dewatering*** **17**
- ***3.1.11 Element #11 – Maintain BMPs*** **17**
- ***3.1.12 Element #12 – Manage the Project*** **18**

3.2 Site Specific BMPs **21**

4.0 Construction Phasing and BMP Implementation **22**

5.0 Pollution Prevention Team **25**

5.1 Roles and Responsibilities **25**
5.2 Team Members **25**

6.0 Site Inspections and Monitoring **27**

6.1 Site Inspection **27**
- ***6.1.1 Site Inspection Frequency*** **27**
- ***6.1.2 Site Inspection Documentation*** **28**

6.2 Stormwater Quality Monitoring **28**
- ***6.2.1 Turbidity Sampling*** **28**
- ***6.2.2 pH*** **29**

7.0 Reporting and Recordkeeping **31**

7.1 Recordkeeping **31**
- **7.1.1 Site Log Book** **31**
- **7.1.2 Records Retention** **31**
- **7.1.3 Access to Plans and Records** **31**
- **7.1.4 Updating the SWPPP** **31**

7.2 Reporting **32**

7.2.1 Discharge Monitoring Reports **32**
7.2.2 Notification of Noncompliance **32**
7.2.3 Permit Application and Changes **32**
Appendix A – Site Plans and Geotechnical Report (Excerpt) **33**
Appendix B – Construction BMPs **35**
Appendix C – Alternative Construction BMP List (NOT USED) **36**
Appendix D – General Permit **37**
Appendix E – WSDOT Site Inspection Form (and Site Log) **39**
Appendix F – Engineering Calculations **41**

1.0 Introduction

Kiewit/General/Manson, a Joint Venture (KGM), has prepared this Temporary Erosion and Sediment Control Plan (TESC) Narrative and Stormwater Pollution Prevention Plan (SWPPP) for the Washington State Department of Transportation (WSDOT) to address erosion control during construction of the State Route (SR) 520 Evergreen Point Floating Bridge and Landings Project (SR 520 FBL Project) East Approach and Maintenance Facility, located within the uplands portion of the project site. The SR 520 FBL Site includes the upland areas within the City of Medina and over-water areas within Lake Washington in both Medina and Seattle jurisdictions. This TESC Narrative and SWPPP are prepared in support of the National Pollutant Discharge Elimination System (NPDES) Construction General Stormwater Permit (CGSWP) and City of Medina construction requirements for the upland Site activities within the City of Medina, which includes constructing Piers 2 and 3 (abutment) of the SR 520 FBL east approach, a maintenance facility and associated parking lot for the SR 520 floating bridge, an access road for the maintenance facility, site storm conveyance system, water quality structure (wet bioswale), and utilities to serve the Maintenance Facility. This document is also provided to meet the WSDOT Conformed RFP document, Section 2.8.3.2.3, Environmental Plans and Strategies (Part II), requirements. Section 2.8.3.2.3 of the Conformed RFP requires that KGM prepare and implement a TESC Plan describing measures to minimize erosion and control sediment during construction activities. To implement the TESC Plan, KGM will identify a certified TESC Lead who will develop, implement, and update the TESC Plans as construction progresses and site conditions dictate. The TESC Lead will, for the life of the Project, hold a current Certificate of Training in Construction Site Erosion and Sediment Control from a course approved by the Washington State Department of Ecology (Ecology). KGM will provide a copy of the course certificate or other documentation verifying completion of the certification course to WSDOT, and shall make this Certificate of Training available to WSDOT upon request throughout the duration of the project.

The TESC Plan (which includes the narrative and plans) will be prepared and implemented in accordance with Section 2.14, Stormwater Management, of the Conformed RFP, Chapter 6 of the WSDOT *Highway Runoff Manual* (Conformed RFP, Appendix D6), and Division 8 of the WSDOT Standard 1 Specifications (Conformed RFP Appendix D18). KGM's TESC Plan addresses project specific permit conditions as described in the Environmental Commitments List (Conformed RFP Appendix C1) and the requirements of Section 2.29 (Maintenance during Construction) of the Conformed RFP.

Upland construction activities, located within the City of Medina, include site preparation clearing and grubbing, and construction of: temporary staging areas and access roads, temporary sediment treatment ponds and retaining walls, permanent shoring walls, and the east approach structure that connects the floating bridge to the at-grade highway to the east of the Medina shoreline. A bridge maintenance facility will also be constructed under the east approach structure consisting of an upland facility and parking lot. KGM will operate and manage dewatered groundwater and stormwater in the uplands project area in compliance with the SR 520 FBL Project NPDES CSWGP. Construction is expected to being on 3/26/12 and is expected

to be complete by 9/26/15. A construction phasing and BMP implementation schedule is given below in Section 4.0.

The SR 520 uplands project site is located to the north of the existing SR 520 Evergreen Point FPL east approach, west of the existing Evergreen Point Road, and is bordered along the west by the Lake Washington shoreline.

The upland site was previously developed with residential homes, primarily in the eastern portion of the site. These residential structures have been demolished and the eastern portion of the site is now developed with an asphalt construction roadway, constructed by Eastside Corridor Constructors who currently occupies the site, gravel parking and staging areas, and a temporary sediment control pond. The western portion of the site is primarily vegetated and includes a dirt pedestrian path to the shoreline, and the existing bridge abutment and piers, which are located in the southern portion of the site. At the shoreline, there are two wood docks and bulkhead along the shoreline.

The site is currently under permit coverage (CGSWP) with the Eastside Corridor Constructors. In April 2012, KGM will mobilize on to the site, occupying the western portion of the upland site and will share the eastern portion of the site, including the asphalt construction access and northern parking area. The laydown area centrally located along Evergreen Point Road will be retained by Eastside Corridor Constructors through July 2013. Permit coverage responsibility for the western portion of the site, which totals approximately 3.9 acres, will be removed from the Eastside Corridor Constructors CSWGP permit. KGM will receive separate permit coverage for this area (see Appendix A for site coverage map). Coverage responsibility for the remaining eastern portion of the site, which contains the asphalt construction access and parking/staging areas, will remain with Eastside Corridor Constructors until July 28, 2013. After this date (July 28, 2013), permit coverage for the entire upland site will transfer to KGM. KGM will be responsible for the stabilization of the acreage covered by their NPDES CSWGP.

The existing temporary sediment pond, constructed by Eastside Corridor Constructors and located to the west of the asphalt construction access, treats drainage from the construction access and parking/staging areas in the eastern portion of the site. In April 2012 when KGM mobilizes on the site to begin construction of Piers 2 and 3 (abutment), building and parking lot shoring walls and site walls, this temporary sediment pond must be removed. With the temporary sediment pond removal, the storm drain that conveys drainage to the pond will be re-routed by Eastside Corridor Constructors to a treatment facility to the east. A new temporary sediment pond will be constructed by KGM in the southwestern corner of the site. This pond is sized (see sizing calculations in Appendix F) to accommodate drainage from the upland site (see Section 3.1.3, Element #3, Control Flow Rates). This TESC and SWPPP describe Best Management Practices (BMPs) selected for stormwater handling and water quality control for the construction period anticipated at the SR 520 uplands project site. BMPs are physical, structural, and/or managerial practices that aid to prevent or reduce the pollution of receiving waters (Lake Washington). The goals of this TESC and SWPPP are to provide a plan and methodology to prevent turbid discharges and sediments from leaving the construction site, such that sediment and erosion control for construction activities are in compliance with State and

local regulations. If construction activities or site conditions change from those shown on this Plan, this Plan will be modified by KGM's Certified Erosion and Sediment Control Lead (CESCL) to accommodate the changed condition, and will be reviewed by the KGM Engineer. The TESC and SWPPP will be retained on the site throughout the duration of the project construction. Development and implementation of this TESC and SWPPP is a requirement of the Conformed RFP for the project. Any field changes to the TESC Plans must be documented on the Plans.

The purpose of this TESC and SWPPP is to describe temporary and permanent erosion and sediment control measures, pollution prevention measures, inspection/monitoring activities, and recordkeeping to be implemented during the three-year construction period for the uplands construction. TESC Plans showing BMPs details and layout are provided in Appendix A. The objectives of this TESC and SWPPP are to:

- Implement BMPs to minimize erosion and sedimentation from precipitation at the SR 520 uplands construction site, and to identify, reduce, eliminate, or prevent the pollution of stormwater.

- Prevent violations of surface water quality or sediment management standards. This includes protecting Lake Washington and the Lake's shoreline.

- Prevent adverse water quality impacts to the receiving waters (Lake Washington).

- Contain and prevent fugitive dust from leaving the site.

KGM will keep a copy of the TESC and Erosion and Sediment Control Inspection reports on the site at all times during the project duration. KGM will also keep an updated copy of the TESC Plans (sheets) and Erosion and Sediment Control Inspection Reports per the NPDES permit conditions.

This TESC and SWPPP are prepared based on the requirements of the Ecology SWPPP Template and the Construction Stormwater General Permit, *Stormwater Management Manual for Western Washington (SWMMWW 2005)*. This TESC and SWPPP is divided into seven main sections, with appendices that include stormwater related reference materials. The topics presented in each of the main sections are summarized below:

- <u>Section 1 – Introduction:</u> This section provides a summary description of the project, and the organization of the TESC Plan Narrative/SWPPP document.

- <u>Section 2 – Site Description:</u> This section provides a detailed description of the existing site conditions, proposed construction activities, and calculated stormwater flow rates for existing conditions and posted- construction conditions.

- Section 3 – Construction BMPs: This section provides a detailed description of the BMPs to be implemented based on the 12 required elements of the TESC Plan Narrative/ SWPPP (SWMMWW 2005).

- Section 4 – Construction Phasing and BMP Implementation: This section provides a description of the timing of the BMP implementation in relation to the project schedule.

- Section 5 – Pollution Prevention Team: This section identifies the appropriate contact names (emergency and non-emergency), monitoring personnel, and the onsite temporary erosion and sedimentation control inspector.

- Section 6 – Inspection and Monitoring: This section provides a description of the inspection and monitoring requirements such as the parameters of concern to be monitored, sample locations, sample frequencies, and sampling methods for all stormwater discharge locations from the site.

- Section 7 – Recordkeeping: This section describes the requirements for documentation of the BMP implementation, site inspections, monitoring results, and changes to the implementation of certain BMPs due to site factors experienced during construction.

Supporting documentation and standard forms are provided in the following Appendices:

- Appendix A –
  1. Maintenance Facility Site Preparation Plans and TESC Plans
  2. Geotechnical Report (Excerpts)
  3. Site Plan – Site Shared Use (April 2012 through July 2013 between Eastside Corridor Constructors and KGM)

- Appendix B – Construction BMPs

- Appendix C – Alternative Construction BMP list (not used)

- Appendix D – General Permit

- Appendix E – Site Log and Inspection Forms

- Appendix F – Engineering Calculations

2.0 Site Description

2.1 Existing Conditions

The uplands portion of the SR 520 Project site is located in the City of Medina, east of the Lake Washington shoreline, and is adjacent to the north of the existing SR 520 east approach bridge. The site is bordered to the east by Evergreen Point Road. A site vicinity map and coordinates are provided in Appendix A.

The SR 520 uplands site was previously developed with residential homes in the eastern portion of the site. The western portion of the site was largely covered by trees with understory. An existing pedestrian path, which includes intermittent cinder-block walls, is located to the north of the existing bridge abutment, and leads to the shoreline in the southwestern portion of the site. The aforementioned residential homes and associated structures, located in the eastern portion of the site, have been demolished by Eastside Corridor Constructors. This eastern area is now developed with staging areas, gravel parking area, and asphalt construction access road. There is also a temporary erosion control pond located to the west of the construction access road. The existing asphalt access roadway, constructed by Eastside Corridor Constructors, provides construction access from the existing SR 520 east approach and from Evergreen Point Road. The existing temporary erosion control pond on the site accommodates drainage from the eastern developed areas of the site.

As noted in Section 1.0 above, the site is currently under permit coverage (CGSWP), with Eastside Corridor Constructors named as is the permitee. With KGM will mobilizing on to the site in April 2012, the western portion of the upland site will be occupied by KGM and the eastern portion of the site, including the asphalt construction access and northern parking area, will be shared by KGM and Eastside Corridor Constructors. Permit coverage responsibility for the western portion of the site, which totals approximately 3.9 acres, will be removed from the Eastside Corridor Constructors CSWGP permit. KGM will receive separate permit coverage for this area (see Appendix A for site coverage map). Coverage responsibility for the remaining eastern portion of the site, which contains the asphalt construction access and parking/staging areas, will remain with Eastside Corridor Constructors until July 28, 2013. After this date (July 28, 2013), permit coverage for the entire upland site will transfer to KGM. The existing temporary sediment pond, constructed by Eastside Corridor Constructors, treats drainage from the construction access and parking/staging areas in the eastern portion of the site. In April 2012 when KGM mobilizes on the site to begin construction of Piers 2 and 3 (abutment), building and parking lot shoring walls and site walls, this temporary sediment pond must be removed. With the temporary sediment pond removal, the storm drain that conveys drainage to the pond will be re-routed by Eastside Corridor Constructors to a treatment facility to the east. A new temporary sediment pond will be constructed by KGM in the southwestern corner of the site.

The onsite tributary drainage basin area totals 4.65 acres. Offsite drainage from the east approach (east of the existing abutment and west of the Evergreen Point Road overpass), which

totals 1.55 acres, is now conveyed through the southern portion of the site by an 18-inch pipe to an existing outfall at Lake Washington. This drainage will continue to be routed to the existing outfall, downstream of the temporary sediment pond. Once the FB&L construction is complete and the permanent wetpond is constructed for the upland site, drainage from this offsite 1.55 acre area will be routed to the site for treatment at the permanent wetpond. In the interim, prior the completion of the FB&L construction, drainage from this 1.55 acre area will be by-passed, because this area will be treated prior to discharge by the Eastside Transit and HOV Project

Site topography generally slopes from the east to the west to the Lake Washington shoreline. There are steep slopes in the western portion of the site that range from 50-percent to nearly vertical west of the existing abutment. Critical areas on the site include steep slopes, which may pose erosion risk after clearing and grubbing activities if not properly covered, and sensitive shoreline area along the western portion of the SR 520 uplands project site.

Soils at the SR 520 uplands project site consist of fill, Holocene Colluvial Deposits, Vashon Recessional Lacustrine Deposits, Vashon Glacial Till, Vashon Lacustrine Deposits, pre-Vashon Glacial Outwash, and pre-Vashon Lacustrine Deposits. A subsurface profile, an excerpt taken from the Geotechnical Report dated February 2012 and prepared by GeoEngineers, is provided in Appendix A. Groundwater is primarily within the Pre-Vashon Glacial Outwash deposits, which form an aquifer mid-slope on the bluff. Groundwater was also encountered within the Pre-Vashon Lacustrine Deposits that form the lower portion of the bluff. Monitoring wells indicate water levels at approximately elevation +45 feet for this aquifer. This represents close to 20 feet of head above the foundation subgrade elevation (approximately 25-28.5 feet). The Geotechnical Report recommends dewatering wells be installed and pumped in advance of excavation work to lower artesian pressures. For groundwater dewatering BMPs see Section 3 Element #10.

Temporary cut slopes may be utilized on the site during construction. Recommendations provided by the Geotechnical Report (Appendix A) for temporary cuts slopes are as follows:

No steeper than:

- 0.75H:1V in the unsaturated Glacial Till and Vashon Lacustrine soils (Type A)
- 1H:1V in the pre-Vashon Glacial Outwash and pre-Vashon Lacustrine soils (Type B)
- 1.5H:1V in the fill, Holocene Colluvial Deposits, and Recessional deposits (Type C)

These cut slope recommendations apply to fully dewatered conditions. The Geotechnical Report recommends that flatter may be necessary if seepage is present or if sloughing occurs. Given the vicinity of the aquifers and the steep slopes on the site, erosion potential is high. For slope stabilization BMPs see Section 3, Elements #5 and #6 of this TESC and SWPPP.

2.2 Proposed Construction Activities

The proposed development within the project areas includes constructing Piers 2 and 3 (abutment) of the SR 520 FBL east approach, a maintenance facility and associated parking lot for the SR 520 floating bridge, an access road for the maintenance facility, site storm conveyance system, shoring/retaining walls, water quality structure (wet bioswale), and utilities to serve the maintenance facility. The proposed maintenance facility along with the associated parking will be located underneath the east approach of the SR 520 FBL.

Permanent flow control facilities are not required for the site, since the site drainage discharges to receiving waters (Lake Washington). Lake Washington is classified as a flow control exempt water body in Ecology's Stormwater Management Manual for Western Washington (SMMWW), Volume 1, Appendix I-E. Permanent water quality facilities are required for the site, and will be accommodated by a wet bioswale. Offsite drainage, which includes 1.55 acres of roadway drainage from the new east approach, will be conveyed to the site's conveyance system. The wet bioswale is sized to accommodate this off-site tributary drainage. Sizing calculations for the permanent onsite closed conveyance system and wet bioswale will be provided in the final hydraulic report that will be prepared for the project.

Construction activities will include site preparation, TESC installation, temporary construction road, excavation for the building foundations and shoring/retaining walls, poured concrete foundations, CMU building construction, site-wide grading, and concrete roadway paving. To facilitate site access early in the work sequence for the bridge and east approach elements, KGM will build a primary temporary construction access road from the top of the hillside down to the shoreline area. At the top of the hillside and the eastern portion of the site near Evergreen Point Road, construction access and egress will be at the existing construction access point from Evergreen Point Road and the new permanent driveway location. At the steeper hillside portions of the site to the west, the primary construction access road will traverse the site from north to south, turning north as it approaches the bottom of the hillside near the shoreline. The schedule and phasing of BMPs during construction is provided in Section 4.0.

Stormwater runoff for the site construction condition was calculated using MGS Flood, using a 15-minute time step. The temporary sediment control pond that will be used during construction is designed using the 2-year storm event. The WSDOT *Highway Runoff Manual* and the DOE *SWMMWW* (Volume II) requires projects where construction will extend beyond one year to design temporary sediment ponds for the 10-year storm event. However available area on the site, given site topography and planned development, is not available to construct a pond to accommodate the 10-year storm event. Therefore to meet erosion and sediment control treatment requirements a Chitosan Enhanced Sand Filter will be used in conjunction with the temporary sediment pond to treat drainage prior to discharging to Lake Washington. The area tributary to the temporary sediment control pond is 5.08 acres. Drainage from the remaining 1.12 acres, located on the south side of the SR 520 east approach, cannot be captured and routed to the temporary erosion control pond due to topography. This area will be protected by silt fencing, high visibility fencing, and other appropriate BMPs.

After the existing SR 520 east approach is demolished, the site will be graded and permanent stormwater management elements will be constructed.

The following summarizes details regarding the total site areas and areas tributary to the temporary sediment control pond:

Total site area:	6.20 acres
Percent impervious area before construction:	0 %
Percent impervious area after construction:	64 %
Disturbed area during construction:	5.60 acres
Total site area tributary to the temporary sediment pond:	5.08 acres
Disturbed area tributary to the temporary sediment pond:	4.48 acres
2-year stormwater runoff peak flow prior to construction (existing):	0.122 cfs
10-year stormwater runoff peak flow prior to construction (existing):	0.446 cfs
2-year stormwater runoff peak flow during construction:	1.189 cfs
10-year stormwater runoff peak flow during construction:	1.890 cfs

Stormwater flow calculations are provided in Appendix F.

3.0 Construction Stormwater BMPs

KGM will select, install, monitor and maintain all erosion and sediment control BMPs in accordance with the requirements described in the WSDOT *Highway Runoff Manual* (Conformed RFP Appendix D6) and the Environmental Commitments List (Conformed RFP Appendix C1). The twelve standard elements outlined in the DOE SMMWW (2005), Volume II, are used as the primary approach for erosion and sediment control and are summarized in the sections that follow.

Chemical treatment BMPs, including Chitosan enhanced sand filtration systems, if proposed for use must be approved by Ecology prior to use. A Chitosan enhance sand filtration system is proposed for the project, in conjunction with a temporary erosion control pond. A description and design calculations specifically addressing the Chitosan enhanced filtration system design (designed by Northwest Soil Cement) and intended use is provided in Appendix B.

The onsite tributary drainage basin area, as noted in Section 2.0 above, totals 4.65 acres. Offsite drainage from the east approach (east of the existing abutment and west of the Evergreen Point Road overpass), which totals 1.55 acres, will be routed to the upland site temporary sediment pond once the east approach is demolished. Prior to demolition of the east approach, east approach drainage, totaling 1.55 acres, will continue to be routed to the existing outfall, downstream of the temporary sediment pond.

Drainage will be pumped from the temporary sediment pond to the Chitosan enhanced sand filtration system to be treated prior to release to Lake Washington at the existing outfall point at a newly constructed stilling basin (Type 2 catch basin) and rock energy dissipation pad. At the existing outfall point an existing 18-inch outfall pipe currently discharges directly to the shoreline slightly west of the normal high water mark. This 18-inch existing outfall pipe is located at the shoreline along the west side of the SR 520 uplands project site, within the WSDOT Limited Access Right-of-Way, as shown on the Site Plan provided in Appendix A. With the construction of Pier 3 (abutment) and Pier 2, the existing 18-inch outfall pipe will need to be reconstructed, as shown on the TESC Plans provided in Appendix A. The existing 18-inch outfall pipe currently conveys drainage from the 1.55 acres at the east approach. A new outfall stilling basin structure (Type 2 catch basin) and rock energy dissipation pad, as mentioned above, will be constructed at the existing outfall point, east (upland) of the normal high water mark, and the reconstructed east approach outfall pipe will connect to this new stilling basin structure. An emergency overflow structure will be provided for the temporary sediment pond, which will also connect to the new stilling basin structure. The offsite drainage (1.55 acres) from the east approach, mentioned above, will be treated in the interim by the Eastside Transit and HOV Project until the FB&L is constructed.

KGM shall not use experimental BMPs, unless these BMPs are approved by Ecology in writing prior to their use.

3.1 12 BMP Elements

3.1.1 Element #1 – Mark Clearing Limits

To protect adjacent residential properties and adjoining shoreline, Heritage trees (located in the northeastern corner of the site and along the southern Limited Access ROW) required by the Conformed RFP to remain, the shoreline, vegetation to remain, and site clearing limits will be clearly designated by use of high visibility fencing (HVF) and silt fencing (see Appendix A for Site Plans). HVF used to protect heritage trees shall be placed at the tree drip lines to protect tree roots. In general, natural vegetation and native topsoil shall be retained in an undisturbed state to the maximum extent possible along the WSDOT Limited Access Right-of-Way where practical. The BMPs relevant to marking the clearing limits that will be applied for this project include:

- Preserving Natural Vegetation
- High Visibility Fence
- Silt Fence

3.1.2 Element #2 – Establish Construction Access

Stabilized construction access points will be maintained to minimize the tracking of sediment onto public roads. Currently, there is an asphalt construction road looped through the site, connecting the site to the existing SR 520 FBL east approach roadway located to the south and to Evergreen Point Road, which borders the site to the east. This looped asphalt construction access road, which was constructed by Eastside Corridor Constructors, will be used by KGM and Eastside Corridor Constructors through July 2013. After July 2013, KGM will take control of the entire site, at which time the existing looped asphalt construction road will be removed and a rocked construction access will be constructed at the location of the permanent Maintenance Facility Access Road to the west site of the Maintenance Facility (see Appendix A for TESC Plans). In the interim, while the existing asphalt looped construction access road is in place (through July 2013), to facilitate site access for early work sequence for the bridge and east approach elements, KGM will build a temporary construction access road from the top of the hillside down to the shoreline area. At the top of the hillside and the eastern portion of the site near Evergreen Point Road, construction access and egress will continue at the existing asphalt construction access point at Evergreen Point Road. At the steeper hillside portions of the site to the west, the primary construction access road will traverse the site from north to south, turning north as it approaches the bottom of the hillside near the shoreline. The schedule and phasing of BMPs during construction is provided in Section 4.0. See also the TESC Plans and details provided in Appendix A.

Sweeping and cleaning shall be employed to prevent sediment from entering State waters. All wash wastewater shall be controlled on site. An at grade wheel wash will be used, if necessary, at the exit from the site to prevent tracking of site soils or materials onto the roadway. The

specific BMPs related to establishing construction access that will be used on this project include:

- Stabilized Construction Entrance (and Roads)
- Wheel Wash (If site conditions require)

3.1.3 Element #3 – Control Flow Rates

In order to protect the properties and waterways downstream of the project site, stormwater discharges from the site will be controlled. The specific BMPs for flow control that shall be used on this project include:

- Temporary Sediment Control Pond

Lake Washington is classified as a flow control exempt water body in Ecology's Stormwater Management Manual for Western Washington (SMMWW), Volume 1, Appendix I-E. However, in order to reduce potential shoreline erosion and provide water quality, a temporary sediment pond will be installed by KGM. The temporary sediment pond has been sized to meet the required sediment trapping criteria for a 2-year storm event, as computed by MGS Flood. The sediment pond will be constructed near the shoreline and south property line. Runoff up to the 10-year storm event (as computed by MGS Flood) will be pumped to a Chitosan Enhanced Sand Filter System, which will treat surface water drainage prior to release to a new stilling basin structure (Type 2 catch basin) which will be located at the existing outfall point. Current at the existing outfall point, an existing 18-inch outfall pipe discharges directly to the shoreline, slightly west of the normal high water mark. With the construction of Pier 3 (abutment) and Pier 2, the existing 18-inch outfall pipe will need to be reconstructed, as shown on the TESC Plans provided in Appendix A. The existing 18-inch outfall pipe currently conveys drainage from the 1.55 acres at the east approach directly to the outfall point. A new outfall stilling basin structure (Type 2 catch basin) and rock energy dissipation pad, mentioned above, will be constructed at the existing outfall point, east (upland) of the normal high water mark, and the reconstructed east approach outfall pipe will connect to this new stilling basin structure. An emergency overflow structure will be provided for the temporary sediment pond, which will also connect to the new stilling basin structure to provide a bypass for the pond for storm events (as computed by MGS Flood) above the 10-year event. Discharge from the temporary sediment control pond/Chitosan Enhanced Filter System will be monitored at sampling points as noted on the TESC Plans provided in Appendix A for pH and turbidity in accordance with NPDES permit requirements.

The 2-year, 15-minute design flow rate was calculated using MGS Flood (see Appendix F**)** per section 4-3.3 of the Highway Runoff Manual. The WSDOT *Highway Runoff Manual* and the DOE *SWMMWW* (Volume II) requires projects where construction will extend beyond one year to design temporary sediment ponds for the 10-year storm event. However as noted in Section 2 above, available area on the site, given site topography and planned development, is not available to construct a pond to accommodate the 10-year storm event. Therefore to meet erosion and sediment control treatment requirements a Chitosan Enhanced Sand Filter will be

used in conjunction with the temporary sediment pond to treat drainage prior to discharging to Lake Washington. The Chitosan Enhanced Sand Filter system is designed to accommodate, combine with the storage provided by the temporary sediment pond, discharge from storm events up to the 10-year storm.

3.1.4 Element #4 – Install Sediment Controls

All stormwater runoff from disturbed areas shall pass through an appropriate sediment removal BMP before leaving the construction site. Silt fence and HVF will be installed and will be maintained at the perimeter of the site. The specific BMPs to be used for controlling sediment on the site include:

- Silt Fence
- Straw Wattles
- Portable Water Storage Tanks (e.g., Baker Tank) for sedimentation
- Temporary Sediment Pond
- Construction Stormwater Chemical Treatment, Chitosan Filtration System (see Appendix B for SWPPP specifically addressing the Chitosan Filtration System)

In addition, a temporary block wall with an impermeable liner, keyed in along the wall, will be constructed along the western portion of the construction access road that will be constructed east of the shoreline. The construction road along this temporary block wall is sloped away from the wall to the east, where drainage continues to sheet flow to a temporary catch basin, which then conveys drainage to the temporary sediment pond.

3.1.5 Element #5 – Stabilize Soils

No soils shall remain exposed or un-worked for more than 7 days during the dry season (May 1 to September 30) and 2 days during the wet season (October 1 to April 30). Regardless of the time of year, all soils shall be stabilized at the end of the shift before a holiday or weekend if needed based on weather forecasts.

Selected permanent soil stabilization measures must be used that are appropriate for the time of year, site conditions, estimated duration of use, and the water quality impacts that stabilization agents may have on downstream waters or groundwater. If permanent stabilization measures such as seeding do not become fully established due to site or weather conditions, KGM shall employ other temporary BMP measures such as plastic covering, mulching, nets and blankets or other temporary BMP measures necessary to protect exposed soils and slopes from saturation and erosion.

During dry periods, fugitive dust from activities on the site will be controlled by a water truck. Fugitive dust will be controlled per the BMPs specified in the Fugitive Dust Prevention and Control Plan (see Appendix E of the ECP).

Exposed and unworked soils shall be stabilized with the application of effective BMPs to prevent erosion throughout the life of the project. The specific BMPs for soil stabilization that shall be used include:

- Temporary and Permanent Seeding
- Mulching
- Nets and Blankets
- Plastic Covering
- Surface Roughening/Soil Amendment (to facilitate plantings establishment)
- Dust Control (see the Fugitive Dust Prevention and Control Plan, Appendix E of the ECP)

In general, cut and fill slopes will be stabilized as soon as possible and soil stockpiles will be temporarily covered with plastic sheeting. All stockpiled soils shall be stabilized from erosion, protected with sediment trapping measures, covered at all times when not in use, and where possible, will be located away from storm drain inlets, waterways, and drainage channels.

3.1.6 Element #6 – Protect Slopes

All cut and fill slopes will be designed, constructed, and protected in a manner that minimizes erosion. The following specific BMPs will be used to protect slopes for this project:

- Temporary and Permanent Seeding
- Interceptor Dike and Swale
- Check Dams
- Plastic Covering
- Nets and Blankets

Per City of Medina conditions under the SR 520 Maintenance Facility Substantial Development and Conditional Use Permit, all work within critical areas will be monitored by qualified geotechnical personnel.

3.1.7 Element #7 – Protect Drain Inlets

All storm drain inlets and culverts made operable during construction shall be protected to prevent unfiltered or untreated water from entering the drainage conveyance system. Any storm drain inlets located adjacent to the site that may be exposed to equipment and vehicles moving on and off the site will have storm drain inlet protection installed as shown on the TESC Plans. The following inlet protection measures will be applied:

- Storm Drain Inlet Protection

In addition to providing storm drain inlet protection, existing storm conveyance pipes conveying drainage through the site and culverts at the construction entrance at Evergreen Point Road shall be protected or re-constructed if necessary.

In the existing condition, there is an 18-inch storm drain pipe that conveys drainage collected from the existing east approach (1.55 acres) of the SR 520 FBL to a rocked pad located at the shoreline of Lake Washington, slightly west of the normal high water mark. This existing 18-inch outfall pipe will be disturbed by excavation work necessary to construct the new Pier 3 (abutment) of the SR 520 FBL east approach. Therefore, this 18-inch outfall pipe must be re-constructed with a temporary pipe from the final upstream catch basin, which is located in the shoulder north of the existing east approach abutment. This reconstructed discharge pipe, a 12-inch flex discharge pipe (high density polyethylene pipe (HDPE)), will be constructed and routed through the Pier 3 construction zone to a new catch basin Type 2 stilling basin, which will be installed at the existing outfall point, as shown on the TESC Plans. If gravity flow cannot be achieved with this temporary 12-inch flex discharge pipe, a pump system will be installed north of the existing outfall catch basin (located within the SR 520 FBL shoulder), and drainage will be pumped to a stilling basin (noted above) that will be installed at the existing outfall at the Lake Washington shoreline. The offsite drainage (1.55 acres) from the east approach, mentioned above, will be treated in the interim by the Eastside Transit and HOV Project until the FB&L is constructed.

In addition to the SR 520 FBL temporary 12-inch flex discharge pipe, an emergency overflow pipe from the temporary sediment pond, and a discharge pipe from the Chitosan filtration system pumps will connect to the new stilling basin, which will be constructed at the existing shoreline outfall point, upland of the normal high water mark. The existing 18-inch outfall pipe will be removed. A rock energy dissipation pad will be constructed at the new stilling basin (see the TESC Plans provided in Appendix A).

The first priority is to keep all access roads clean of sediment and keep street wash water separate from entering storm drains until treatment can be provided. Storm Drain Inlet Protection will be implemented for all drainage inlets and culverts that could potentially be impacted by sediment-laden runoff on and near the project site.

3.1.8 Element #8 – Stabilize Channels and Outlets

Where site runoff is to be conveyed in channels, that is interceptor swales, efforts will be taken to prevent downstream erosion. All temporary conveyance channels (interceptor swales) shall be designed, constructed, and stabilized to withstand the peak 10-year storm event calculated using MGS Flood and 15-minute time steps. All outlets of conveyance systems shall be adequately armored to prevent erosion around the outfall structures, adjacent slopes, and downstream reaches. The specific BMPs for channel and outlet stabilization that shall be used on this project include:

- Rock-Lined Channels
- Check Dams
- Outlet Protection

3.1.9 Element #9 – Control Pollutants

All pollutants, including waste materials and demolition debris, that occur onsite shall be handled and disposed of in a manner that does not cause contamination of stormwater. Good housekeeping and preventative measures will be taken to ensure that the site will be kept clean, well-organized, and free of debris. If required, BMPs to be implemented to control specific sources of pollutants are discussed below.

Potentially contaminated soils:

- All work will be conducted in accordance with the project Soil and Groundwater Management Plan (Appendix F of the ECP). It is not expected that any contaminated material will be encountered. As a contingency, if any of the earthwork activities encounter contaminated material, the area of contamination will be segregated with stormwater barriers to minimize run-on to the area, and to eliminate any run-off from the area. Contaminated material within the work area will be removed for off-site disposal at an appropriately licensed facility.

Vehicles, construction equipment, and/or petroleum product storage/dispensing:

- All vehicles, equipment, and petroleum product storage/dispensing areas will be inspected regularly to detect any leaks or spills, and to identify maintenance needs to prevent leaks or spills.
- On-site fueling tanks and petroleum product storage containers shall include secondary containment.
- Spill prevention measures, such as drip pans and absorbent pads, will be used when conducting maintenance and repair of vehicles or equipment.

- Spill kits will be kept "on hand" where construction activity will takes place adjacent to the shoreline (of Lake Washington).

- In order to perform emergency repairs on site, temporary plastic will be placed beneath the vehicle.

- Contaminated surfaces shall be cleaned immediately following any discharge or spill incident.

- Debris and Waste Materials will be drummed or stockpiled in such a way to protect the shoreline until waste materials can be disposed off the site at an appropriate waste facility. Stockpiles will be covered with Plastic Sheeting and surrounded by silt fencing until disposed offsite.

- Vegetable based hydraulic fluid will be used in components of equipment operating below OHWM.

Chemical storage:

- Any chemicals stored in the construction areas will conform to the appropriate source control BMPs listed in Volume IV of the Ecology stormwater manual. All chemicals shall have cover, containment, and protection provided on site in accordance with BMP C153 for Material Delivery, Storage and Containment as noted in the Ecology SWMMWW 2005.

- Application of agricultural chemicals, including fertilizers and pesticides, shall be conducted in a manner and at application rates that will not result in loss of chemical to stormwater runoff. Manufacturers' recommendations for application procedures and rates shall be followed.

Excavation spoils dewatering waste:

- Dewatering BMPs and BMPs specific to the excavation are discussed under Element 10.

Concrete and grout:

- Store all concrete-related construction products such as form release agent, curing compound, bonding agent under cover and away from drainage areas.

- Collect concrete slurry waste in a permanent concrete washout facility or directly disposing of waste materials.

- Use Eco-Pans or similar containers for waste concrete and construction products.

- Cover concrete slurry pans or containers when not in use.

- Process water and slurry resulting from concrete work will be prevented from entering the waters of the State by implementing Concrete Handling measures (BMP C151, Ecology SWMMWW 2005).

Sanitary wastewater:

- Portable sanitation facilities will be firmly secured, regularly maintained, and emptied when necessary.

- Wheel wash or tire bath wastewater shall be discharged to a separate on-site treatment system or to the sanitary sewer as part of Wheel Wash implementation.

3.1.10 Element #10 – Control Dewatering

Clean, non-turbid dewatering water will not be routed through stormwater sediment ponds, and may be discharged to systems tributary to the receiving waters of the State in a manner that does not cause erosion, flooding, or a violation of State water quality standards in the receiving water (Lake Washington). Dewatering water containing turbidity above discharge standards will be treated and monitored prior to discharge. BMPs to be used for sediment trapping and turbidity reduction include the following:

- Temporary Sediment Pond

- Construction Stormwater Chemical Treatment (BMP C250)

- Construction Stormwater Filtration (BMP C 251)

- Concrete Handling (BMP C151)

3.1.11 Element #11 – Maintain BMPs

All temporary and permanent erosion and sediment control BMPs shall be maintained and repaired as needed to ensure continued performance of their intended function during seasonally dry and wet months. Maintenance and repair shall be conducted in accordance with each particular BMPs specification and any problems will be corrected as soon as possible and no more than 10 days following the inspection. Visual monitoring of the BMPs will be conducted according to the following schedule:

- Wet Season (October 1 – April 30) – every working day.

- Dry Season (May 1- September 30) – at least once every five working days when there is no runoff event, each working day when there is a runoff event, and within 24 hours of the event.

- If the site becomes inactive, and is temporarily stabilized, the inspection frequency will be reduced to once every month.

All temporary erosion and sediment control BMPs shall be removed after the temporary BMPs are no longer needed. Trapped sediment shall be removed or stabilized on site. Disturbed soil resulting from removal of BMPs or vegetation shall be permanently stabilized in a timely manner and per permit specifications.

3.1.12 Element #12 – Manage the Project

As this project site is located west of the Cascade Mountain Crest, the project will be managed according to the following key project components:

Phasing of Construction

- The construction project is being phased to the extent practicable in order to prevent soil erosion, and, to the maximum extent possible, the transport of sediment from the site during construction.

- Re-vegetation of exposed areas and maintenance of that vegetation shall be an integral part of the clearing activities during each phase of construction, per the Scheduling BMP (C 162).

Seasonal Work Limitations

- From October 1 through April 30, clearing, grading, and other soil disturbing activities shall comply with the wet season BMPs listed below. As required by City of Medina Substantial Development and Conditional Use permits for the project, permission will be acquired from the City of Medina for clearing and earthwork to occur during this time, based on adherence to the listed wet season BMPs. To prevent silt-laden runoff from leaving the site, a Chitosan Enhanced Filtration system in conjunction with a sediment pond and cover measures will be used. In addition, the following wet season BMPs will be utilized:

- If clearing trees is conducted prior to start of earthwork, equipment will be used to minimize the extent of ground disturbance.

- The ground surface in and surrounding the construction area will be sloped to promote runoff of precipitation away from work areas and to prevent ponding of water.

- Exposed work areas will be covered with plastic. The use of sloping, ditching, sumps, dewatering, and other measures will be employed as necessary to permit proper completion of the work.

- Earthwork will be accomplished in small sections to minimize exposure to wet conditions. The size of construction equipment may have to be limited to reduce potential soil disturbance. It may be necessary to excavate soils with an excavator located so that equipment does not traffic over the excavated area.

- Use of a sub-grade stabilization geo-grid where heavy equipment will traverse areas of the site that do not already contain gravel-based access roads

- Fill material will consist of gravel borrow with minimal fines, as approved by the geotechnical engineer.

- Compacting soils. A smooth-drum vibratory roller, or equivalent, will roll the surface to seal out as much water as possible.

- In-place soil or fill soil that becomes wet and unstable and/or too wet to suitably compact will be removed and replaced with clean, granular soil.

- Excavation and placement of structural fill material will be observed on a full-time basis by a geotechnical engineer (or representative) experienced in earthwork to determine that all work is being accomplished in accordance with the project specifications and our recommendations.

- Grading and earthwork will not be accomplished during periods of heavy, continuous rainfall.

- From October 1 through April 30, no soils will remain exposed and un-worked for more than two days.

- Daily visual monitoring of the BMPs.

- The following activities are exempt from the seasonal clearing and grading limitations:

    - Routine maintenance and necessary repair of erosion and sediment control BMPs;

    - Routine maintenance of public facilities or existing utility structures that do not expose the soil or result in the removal of the vegetative cover to soil; and

Coordination with Utilities and Other Jurisdictions

- Care has been taken to coordinate with utilities, other construction projects, and the local jurisdiction in preparing this TESC and SWPPP and scheduling the construction work. All work conducted on the site must meet the commitments of the KGM Construction Mitigation Plan prepared for the City of Medina.

Inspection and Monitoring

- All BMPs shall be inspected, maintained, and repaired as needed to assure continued performance of their intended function. Site inspections shall be conducted by a person who is knowledgeable in the principles and practices of erosion and sediment control. This person has the necessary skills to:
    - Assess the site conditions and construction activities that could impact the quality of stormwater, and
    - Assess the effectiveness of erosion and sediment control measures used to control the quality of stormwater discharges.
- A certified CESCL shall be on-site or on-call at all times.
- Whenever inspection and/or monitoring reveals that the BMPs identified in this TESC and SWPPP are inadequate, due to the actual discharge of or potential to discharge a significant amount of any pollutant, appropriate BMPs or design changes shall be implemented as soon as possible.

Maintaining an Updated Construction TESC and SWPPP

- This TESC and SWPPP shall be retained on-site as part of the Environmental Compliance Plan at all times during the duration of the project. A site log book will also be maintained for all on-site construction activities.
- This TESC and SWPPP shall be modified whenever there is a change in the design, construction, operation, or maintenance at the construction site that has, or could have, a significant effect on the discharge of pollutants to receiving waters of the State.
- This TESC and SWPPP shall be modified if, during inspections or investigations conducted by the owner/operator, or the applicable local or state regulatory authority, it is determined that the TESC and SWPPP is ineffective in eliminating or significantly minimizing pollutants in stormwater discharges from the site. The TESC and SWPPP shall be modified as necessary to include additional or modified BMPs designed to correct problems identified. Revisions to the TESC and SWPPP shall be completed within seven (7) days following the inspection.
- Records will be maintained in accordance with Section 7.1.2, below.

3.2 Site Specific BMPs

Site specific BMPs are shown on the TESC Plan Sheets and Details in Appendix A and Appendix B. This narrative and the associated plan sheets and details will be updated annually and/or if BMPs changed based on site conditions.

4.0 Construction Phasing and BMP Implementation

The BMP implementation schedule is driven by the construction schedule. The following provides a sequential list of the proposed construction schedule milestones and the corresponding BMP implementation schedule. The list contains key milestones such as wet season construction.

BMP implementation schedule listed below is keyed to proposed phases of the construction project, and reflects differences in BMP installations and inspections that relate to wet season construction. The project site is located west of the Cascade Mountain Crest. As such, the dry season is considered to be from May 1 to September 30 and the wet season is considered to be from October 1 to April 30.

Estimate of Construction start date:	03 / 26 / 2012
Estimate of Construction finish date:	09 / 26 / 2015
Mobilize equipment on site:	04 / 02 / 2012
Mobilize and store all ESC and soil stabilization products (store materials on hand BMP C150):	04 / 02 / 2012
Install ESC measures:	04 / 02 / 2012
Install stabilized construction entrance:	04 / 03 / 2012
Begin clearing and grubbing:	04 / 03 / 2012
Demolish existing retaining walls:	04 / 03 / 2012
Excavation for building foundations	12 / 03 / 2012
Soil stabilization on excavated sideslopes (in idle, no work areas as shown on ESC plans)	04 / 30 / 2012
Temporary erosion control measures (hydroseeding)	05 / 01 / 2012
Begin concrete pour and implement BMP C151:	07 / 02 / 2012
Excavate and install new utilities and services (Phase 1):	07 / 16 / 2012
Begin building construction:	12 / 17 / 2012
Complete Phase 1 utility construction	08 / 30 / 2012

Begin implementing soil stabilization and sediment control BMPs throughout the site in preparation for wet season:	09 / 03 / 2012
Wet Season start and end dates:	**10 / 01 to 4 / 30**
Site inspections and monitoring conducted weekly and for applicable rain events as detailed in Section 6 of this SWPPP:	10 / 01 / 2012
Implement Element #12 BMPs and manage site to minimize soil disturbance during the wet season	10 / 01 / 2012
Dry Season start and end dates:	**05 / 01 to 9 / 30**
Site grading begins:	04 / 16 / 2012
Excavate and install new utilities and services (Phase 2):	08 / 31 / 2012
Site grading ends:	10 / 01 / 2013
Building construction complete:	02 / 24 / 2014
Final landscaping and planting begins:	06 / 01 / 2015
Permanent erosion control measures (hydroseeding):	08 / 01 / 2015

5.0 Pollution Prevention Team

5.1 Roles and Responsibilities

The pollution prevention team consists of personnel responsible for implementation of the SWPPP, including the following:

- KGM Environmental Compliance Inspector (ECI)/CESCL – primary design-builder contact, responsible for site inspections (BMPs, visual monitoring, sampling, etc.); to be called upon in case of failure of any ESC measures. Personnel responsible for conducting water quality monitoring

- KGM Environmental Manager (EM) – has overall responsibility for ensuring KGM complies with all environmental laws and governmental approvals, and identified environmental commitments.

- WSDOT Environmental Compliance Assurance Inspector (ECAI) – primary WSDOT contact for site inspections and in the case of failure of any ESC measures or non-compliance events, the ECAI will coordinate with the WSDOT ECP to evaluate the situation, determine the appropriate corrective actions and measures, and document (in the project files) the situation and decisions. The ECAI serves as the backup to the ECM.

- WSDOT Environmental Compliance Manager (ECM) – is the first point of contact for notification in the case of failure of any ESC measures or non-compliance event and will be responsible for notifying the WSDOT Construction Project Engineer immediately following a non-compliance event.

- WSDOT Project Engineer (PE) – coordinate and prepare the appropriate response to the regulatory and/or resource agency. The response shall include documentation about the non-compliance vent and how it as resolved, including any preliminary mitigation solutions.

5.2 Team Members

The pollution prevention team is responsible for implementing, enforcing, maintaining, and revising the TESC and SPCC. The Design-Builder is responsible for installing and maintaining all temporary BMPs through the duration of the construction phase and responsible for removing the BMPs when they are no longer needed per the requirements in this plan.

Whenever an inspection reveals that the BMPs specified in the TESC and SWPPP may be inadequate, due to the actual or potential discharge of a significant amount of any pollutant, subcontractors and/or KGM personnel will immediately notify KGM's ECI/CESCL, and EM. The EM will contact WSDOT's on-site ECAI, who will notify the WSDOT ECM and the

WSDOT PE in accordance with WSDOT's Environmental Compliance Assurance Procedures (ECAP; Appendix J of the Environmental Compliance Plan) notification requirements.

Names and contact information for those identified as members of the Pollution Prevention Team are provided in the following table.

Table 5.1 – Construction Pollution Prevention Team Members

Title	Name(s)	Phone Number
KGM Environmental Compliance Inspector/Certified Erosion and Sediment Control Lead (CESCL)	**Andrew Kinkade**	**Cell: 925-570-1260** **Andrew.Kindade@kiewit.com**
KGM Environmental Manager	**Robert Brenner**	**Office: 425-576-7138** **Cell: 425-577-2939** **Robert.Brenner@kiewit.com**
WSDOT Environmental Compliance Assurance Inspector	**Alex Warner**	**Office: 425-576-7041** **Cell: 206-276-4489** **warnera@wsdot.wa.gov**
WSDOT Environmental Compliance Manager	**Stephen Sax**	**Office: 425-576-7133** **Cell: 206-713-9783** **SaxSJ@wsdot.wa.gov**
WSDOT Principal Engineer	**Dave Becher**	**Office: 425-576-7045** **bercherd@wsdot.wa.gov**

6.0 Site Inspections and Monitoring

Monitoring includes visual inspection and documentation of the inspection and monitoring findings in a site log book in accordance with the requirements of the NPDES Construction Stormwater General Permit for the Maintenance Facility. A site log book will be maintained for all on-site construction activities and will be updated to reflect actual site conditions. The log book will include:

- A record of the implementation of the TESC and SWPPP and other permit requirements, including the installation and maintenance of BMPs;
- Site inspections; and,
- Stormwater quality monitoring.

For convenience, the inspection form and water quality monitoring forms included in this TESC and SWPPP include (see Appendix E) the required information for the site log book. This TESC and SWPPP may function as the site log book if desired, or the forms may be separated and included in a separate site log book. However, if separated, the site log book but must be maintained on-site and be made available upon request to Ecology or the local jurisdiction.

6.1 Site Inspection

All BMPs will be inspected, maintained, and repaired as needed to ensure continued performance of their intended function, and in compliance with the NPDES permit and/or other WSDOT/KGM project permits. Site inspections will be conducted by the CESCL per Section 2.8.3.2.4.3 of the SR 520 FBL Project Conformed RFP and BMP C160. The name and contact information for the CESCL is provided in Section 5 (above) of this TESC and SWPPP.

Site inspection will occur in all areas disturbed by construction activities and at all stormwater discharge points. Stormwater will be examined for the presence of suspended sediment, turbidity, discoloration, and oily sheen. The site inspector will evaluate and document the effectiveness of the installed BMPs and determine if it is necessary to repair or replace any of the BMPs to improve the quality of stormwater discharges. All maintenance and repairs will be documented in the site log book or forms provided in this document. All new BMPs or design changes will be documented in the TESC and SWPPP as soon as possible.

6.1.1 Site Inspection Frequency

Per conditions of Section 2.8.3.2.4.2 of the SR 520 FBL Conformed RFP, KGM shall inspect and properly document all on-site erosion and sediment control BMPs at least once every 7 Calendar Days, and within 24 hours of runoff events in which stormwater discharges from the site. KGM will review the TESC Plan for compliance with relevant Environmental

Commitments (Conformed RFP Appendix C1), and make markups regarding changed BMP's to the onsite document directly following inspections.

Site inspections will be conducted as detailed in Section 3.1.12. For sites with temporary stabilization measures, the site inspection frequency can be reduced to once every month if the site operator has successfully applied for inactive status for the site using Permit Fee Activity Status Change Form, which can be found at the following web site. http://www.ecy.wa.gov/programs/wq/permits/permit_fees/ConstructionActivityStatusChangeForm.pdf

6.1.2 Site Inspection Documentation

The site inspector will record each site inspection using the required WSDOT site log inspection forms provided in Appendix E. The WSDOT site inspection log forms may be separated from this TESC and SWPPP, but will be maintained on-site and be made available upon request to Ecology or the local jurisdiction (City of Medina).

6.2 Stormwater Quality Monitoring

6.2.1 Turbidity Sampling

Monitoring requirements for the project site will include either turbidity or water transparency sampling to monitor site discharges for water quality compliance with the NPDES Construction Stormwater General Permit (CSWGP). Monitoring points will be located downstream of the temporary sediment pond and Chitosan Filtration System, prior to co-mingling with the existing off-site runoff (drainage from the existing 1.55 acres of the SR 520 FBL east approach roadway). Sampling will be conducted at all discharge points within 24 hours of any discharge from the site and at least once per calendar week.

Turbidity or transparency monitoring will follow the analytical methodologies described in Section S4 of the CSWGP. The key benchmark value is 25 nephelometric turbidity units (NTU) for the downstream receiving water body. If the 25 NTU benchmark for turbidity is exceeded in any sample collected from the monitoring point, the following steps will be conducted:

- Ensure all BMPs specified in this TESC and SWPPP are installed correctly to specifications and functioning as intended.
- Assess whether additional BMPs should be implemented and document revisions and the date that the activity occurred to the logbook, TESC and SWPPP, and TESC plan sheets, as necessary.
- Sample discharge location daily until the analysis results are less than 25 NTU.

If the turbidity is greater than 25 NTU (or transparency is less than 32 cm) but less than 250 NTU (transparency greater than 6 cm) the following steps will be conducted:

- The SWPPP will be reviewed and appropriate revisions made within 7 days of the date the discharge exceeded the benchmark.

- A process will immediately begin to fully implement and maintain appropriate source control and/or treatment BMPs as soon as possible. The additional treatment BMPs should address the problems within 10 days of the date the sample exceeded the benchmark value. If installation of necessary treatment BMPs is not feasible within 10 days, Ecology may approve additional time if requested within the initial 10-day response period. Additional treatment BMPs to be considered will include, but are not limited to off-site treatment, infiltration, filtration and chemical treatment.

- All BMP implementation and maintenance will be documented in site log book.

If the turbidity exceeds 250 NTU at any time, the following steps will be conducted:

- Notify Ecology by phone within 24 hours of analysis (see Section 5.0 of this TESC and SWPPP for contact information).

- The SWPPP will be reviewed and appropriate revisions made within 7 days of the date the discharge exceeded the benchmark.

- A process will immediately begin to fully implement and maintain appropriate source control and/or treatment BMPs as soon as possible. The additional treatment BMPs should address the problems within 10 days of the date the sample exceeded the benchmark value. If installation of necessary treatment BMPs is not feasible within 10 days, Ecology may approve additional time if requested within the initial 10-day response period. Additional treatment BMPs to be considered will include, but are not limited to off-site treatment, infiltration, filtration and chemical treatment.

- Describe inspection results and remedial actions taken in the site log book and in monthly discharge monitoring reports as described in Section 7.0 of this TESC and SWPPP.

- Continue sampling daily at the monitoring point until the discharge is in compliance with the water quality limit for turbidity, or the discharge stops or is eliminated.

- The WSDOT ECM will be immediately notified of the turbidity exceedance.

6.2.2 pH

The benchmark range for pH is 6.5 (minimum) to 8.5 (maximum) standard units, which are the allowable discharge limit to surface waters of the state. Sampling and monitoring for pH will occur during the phase of construction when concrete pouring will be conducted until fully cured (3 weeks from last pour) and discharges are documented to be between pH 6.5 to 8.5. Samples will be collected

weekly at the monitoring point prior to discharge to Lake Washington. Samples will be analyzed for pH using a calibrated pH meter and recorded in the site log book.

If a pH greater than 8.5 is measured at the monitoring point that has the potential to discharge to Lake Washington, the following steps will be conducted:

1. Prevent (detain) all discharges from leaving the site and entering surface waters, receiving water, or storm drains.

2. Implement CO2 sparging or dry ice treatment in accordance with Ecology BMP C252. Other non approved treatments proposed for reducing pH levels, such as hydrochloric acid (HCl) or ascorbic acid, require written approval from Ecology before use.

3. Describe inspection results and remedial actions that are taken in the site log book and in monthly discharge monitoring reports as described in Section 7.0 of this TESC and SWPPP.

7.0 Reporting and Recordkeeping

7.1 Recordkeeping

7.1.1 Site Log Book

A site log book will be maintained for all on-site construction activities and will include:

- A record of the implementation of the TESC and SWPPP and other permit requirements, including the installation and maintenance of BMPs;
- Site inspections; and,
- Stormwater quality monitoring.

For convenience, the inspection form and water quality monitoring forms included in this TESC and SWPPP include the required information for the site log book.

7.1.2 Records Retention

Records of all monitoring information (site log book, inspection reports/checklists, sampling results, calibration and maintenance records, etc.), this Stormwater Pollution Prevention Plan, and any other documentation of compliance with permit requirements will be retained during the life of the construction project and for a minimum of three years following the termination of permit coverage in accordance with permit condition S5.C.

7.1.3 Access to Plans and Records

The TESC and SWPPP, General Permit, Notice of Authorization letter, and Site Log Book will be retained on site and will be made immediately available upon request to Ecology or the City of Medina. A copy of this TESC and SWPPP will be provided to Ecology within 14 days of receipt of a written request for the TESC and SWPPP from Ecology. Any other information requested by Ecology will be submitted within a reasonable time. A copy of the TESC and SWPPP or access to the TESC and SWPPP will be provided to the public when requested in writing in accordance with NPDES CSWG permit Condition S5.G.

7.1.4 Updating the SWPPP

In accordance with Conditions S3, S4.B, and S9.B.3 of the General Permit, this TESC and SWPPP will be modified if the TESC and SWPPP is ineffective in eliminating or significantly minimizing pollutants in stormwater discharges from the site or there has been a change in design, construction, operation, or maintenance at the site that has a significant effect on the discharge, or potential for discharge, of pollutants to the waters of the State. The TESC and SWPPP will be modified within seven days of determination based on inspection(s) that

additional or modified BMPs are necessary to correct problems identified, and an updated timeline for BMP implementation will be prepared.

7.2 Reporting

7.2.1 Discharge Monitoring Reports

Discharge Monitoring Reports (DMRs) will be submitted to Ecology monthly. If there is no discharge during a given monitoring period, KGM shall submit the form as required, with the words "No discharge" entered in the place of monitoring results. The DMR due date is 15 days following the end of each month.

7.2.2 Notification of Noncompliance

If any of the terms and conditions of the permit is not met, and it causes a threat to human health or the environment, the following steps will be taken in accordance with permit section S5.F:

- Ecology will be immediately notified of the failure to comply.
- The WSDOT ECM will be immediately notified of the failure to comply.
- Immediate action will be taken to control the noncompliance issue and to correct the problem. If applicable, sampling and analysis of any noncompliance will be repeated immediately and the results submitted to Ecology within five (5) days of becoming aware of the violation.
- A detailed written report describing the noncompliance will be submitted to Ecology within five (5) days, unless requested earlier by Ecology.

Any time turbidity sampling indicates turbidity is 250 nephelometric turbidity units (NTU) or greater or water transparency is 6 centimeters or less, the Ecology regional office will be notified by phone within 24 hours of analysis as required by permit condition S5.A (see Section 5.0 of this SWPPP for contact information).

In accordance with permit condition S4.F.6.b, the Ecology regional office will be notified if chemical treatment other than CO_2 sparging is planned for adjustment of high pH water (see Section 5.0 of this SWPPP for contact information).

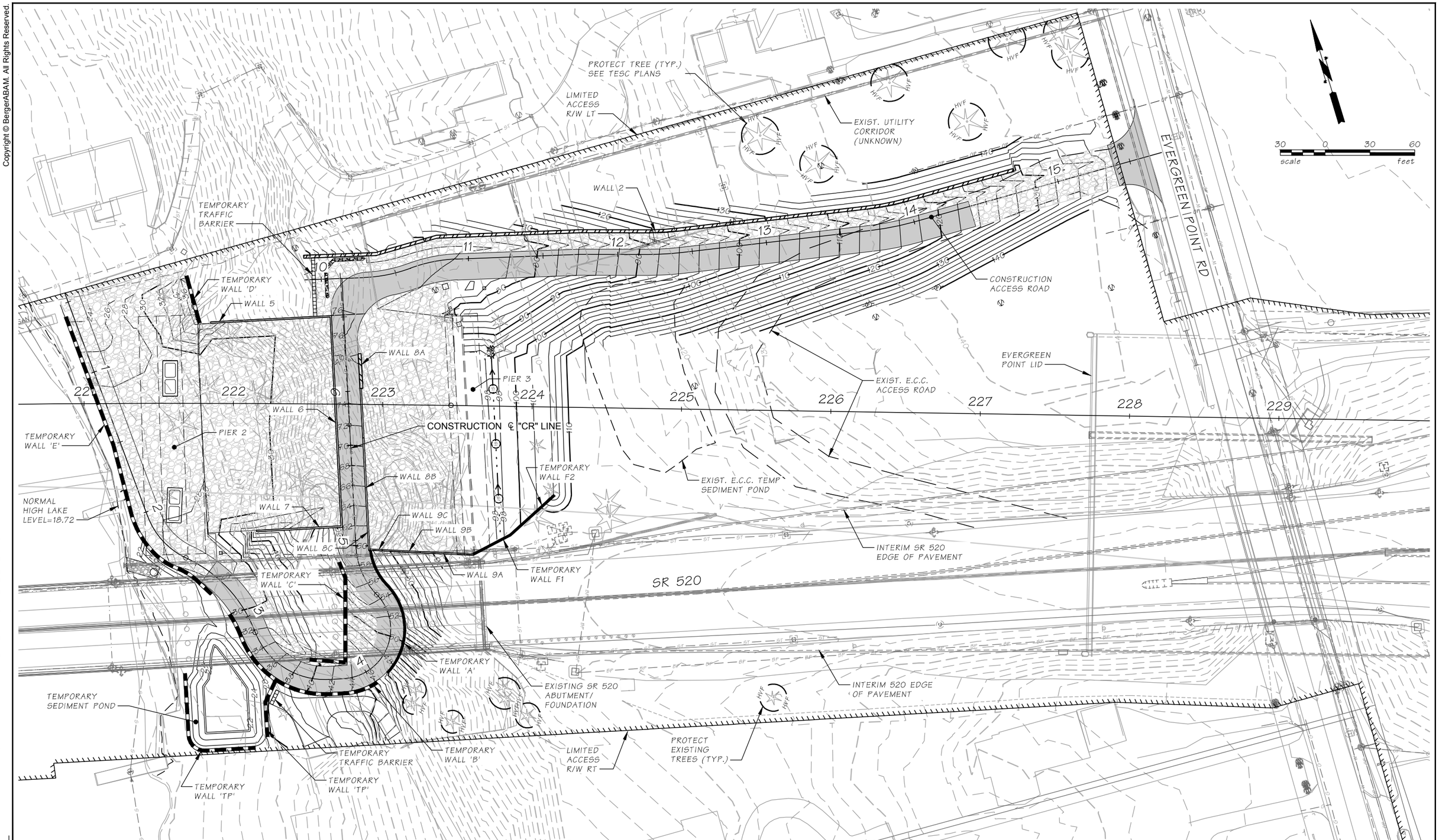
7.2.3 Permit Application and Changes

In accordance with permit condition S2.A, a complete application form will be submitted to Ecology and the appropriate local jurisdiction (if applicable) to be covered by the CSWGP.

Appendix A – Site Plans

1. Maintenance Facility Site Preparation Plans and TESC Plans
2. Geotechnical Report (Excerpts)
3. Site Plan – Site Shared Use (April 2012 through July 2013 between Eastside Corridor Constructors and KGM)

Copyright © BergerABAM. All Rights Reserved.



FILE NAME	Q:\FederalWay\2012\FAPWT-12-060\CADD\Dwgs\MF_MaintBldg\8066_MF_C_002_01.dwg				
TIME	11:02 AM				
DATE	3/20/12				
PLOTTED BY	Strandberg, Brian				
DESIGNED BY	Bollen, BJ	3/12			
ENTERED BY	Strandberg, BC	3/12			
CHECKED BY	Linden, CE	3/12			
PROJ. ENGR.	Lewis, R	3/12			
REGIONAL ADM.		3/12	REVISION	DATE	BY

REGION NO.	STATE	FED.AID PROJ.NO.
10	WASH	
JOB NUMBER 8066		
CONTRACT NO.		LOCATION NO.

JAMES S. GUARRE — STATE OF WASHINGTON — 14208 — STRUCTURAL ENGINEER — PROFESSIONAL ENGINEER
DATE
P.E. STAMP BOX

CONNIE E. LINDAN — STATE OF WASHINGTON — 42793 — REGISTERED PROFESSIONAL ENGINEER
DATE
P.E. STAMP BOX

Washington State Department of Transportation

KGM — Kiewit/General/Manson, A JOINT VENTURE

kpff

BergerABAM

SR 520
I-5 TO MEDINA - STG. 1 EVERGREEN PT. FLOATING BRIDGE AND LANDINGS
MAINTENANCE FACILITY SITE PREPARATION PLAN

OVERALL SITE PLAN

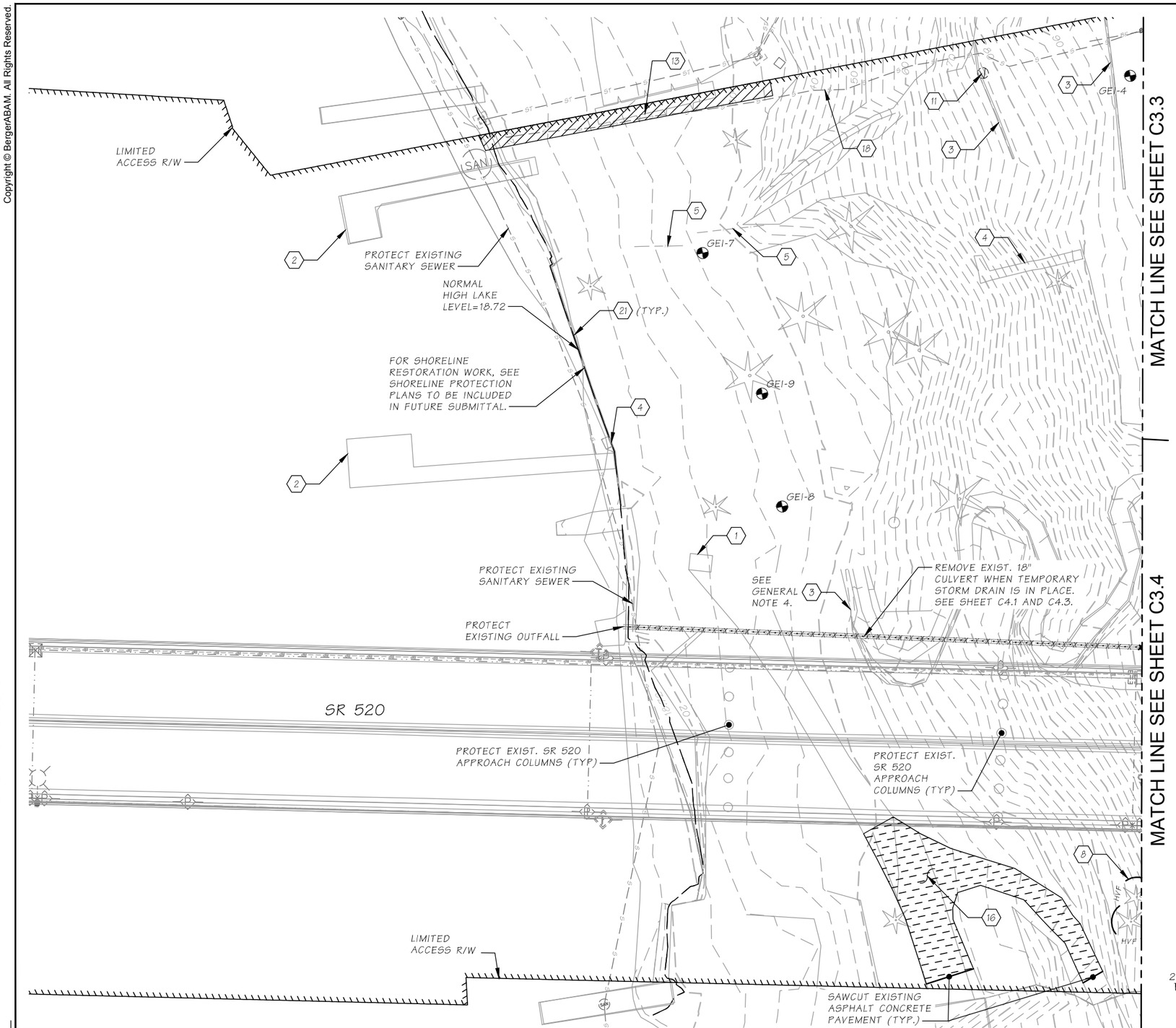
PLAN REF NO C2.1

SHEET 4 OF 36 SHEETS

VOLUME 15 - CIVIL PACKAGE #1 - RFC - 3/26/12

Strandberg, Brian on: 3/24/2012 8:15 AM File: Q:\FederalWay\2012\FAPWT-12-060\CADD\Dwgs\MF_MaintBldg\8066_MF_C_002_01.dwg
SR ___ JOB NO. ___ SHEET ___

Copyright © BergerABAM. All Rights Reserved.



DEMOLITION NOTES:

(ONLY DEMOLITION NOTES APPLICABLE TO THIS SHEET ARE SHOWN)

1. DEMOLISH EXISTING CONCRETE SLAB AND BLOCK
2. DEMOLISH DOCK. SEE GENERAL NOTE 7.
3. DEMOLISH RETAINING WALL. PROTECT ADJACENT PROPERTIES AT LOCATIONS WHERE RETAINING WALL ABUTS ADJACENT PROPERTIES.
4. DEMOLISH STAIRS
5. REMOVE FENCE
8. PROTECT EXISTING TREE, SEE TESC PLANS
11. REMOVE WATER SERVICE AND VALVE. CAP AND PROVIDE THRUST BLOCKING AT EXISTING WATERMAIN. SEE GENERAL NOTE ON SHEET C8.2 FOR THRUST BLOCKING.
13. PROTECT ADJACENT PROPERTY OWNER'S EXISTING LANDSCAPING, REPLACE IN KIND SHOULD DAMAGE OCCUR.
16. DEMOLISH EXISTING ASPHALT CONCRETE DRIVEWAY. SEE GENERAL NOTES SHEET C2.2
18. REMOVE 6" ASB. CP SANITARY SEWER MAIN. PRIOR TO PIPE REMOVAL, SEE ASBESTOS SANITARY SEWER PIPE REMOVAL NOTE ON SHEET C2.2 AND GENERAL NOTE ON SHEET C8.3.
21. REMOVE EXISTING BULKHEADS ALONG LAKE WASHINGTON SHORELINE AS REQUIRED TO CONSTRUCT TEMPORARY RETAINING WALL 'E'. SEE SHEET C5.1 FOR TEMPORARY RETAINING WALL 'E' LOCATION.

LEGEND:

ASPHALT DEMOLITION

UTILITIES DEMOLITION

GROUNDWATER MONITORING WELL

GENERAL NOTES:

1. FOR ASB. CP REMOVAL REQUIREMENT SEE SHEET C2.2 & C8.1. SEE SHEET C8.2 FOR SEWER REPLACEMENT WORK.
2. REMOVE UTILITY POLES AFTER ALL UTILITIES HAVE BEEN RELOCATED OFF THE POLES. COORDINATE W/ PUGET SOUND ENERGY.
3. CLEAR AND GRUB INCLUDING TREES, EXCEPT THOSE DESIGNATED TO REMAIN, AND INVASIVE VEGETATION. SEE TESC PLANS.
4. REMOVE EXISTING CINDER BLOCK WALL IN ITS ENTIRETY ALONG PEDESTRIAN PATH.
5. ELECTRONIC DRAWINGS WILL BE MADE AVAILABLE TO ASSIST IN LOCATING STRUCTURES IDENTIFIED ON THESE DRAWINGS TO BE REMOVED/DEMOLISHED/PROTECTED.
6. ALL GROUNDWATER MONITORING WELLS SHALL BE REMOVED AND/OR DECOMMISSIONED PRIOR TO ANY EXCAVATION WORK.
7. IN-WATER DEMOLITION MUST COMPLY WITH ENVIRONMENTAL COMMITMENTS STATED IN ALL APPLICABLE PROJECT PERMITS, INCLUDING: USFWS AND NMFS BIOLOGICAL OPINIONS; CITY OF MEDINA SHORELINE SUBSTANTIAL DEVELOPMENT PERMITS; WDFW HYDRAULIC PROJECT APPROVAL; WA DEPT OF ECOLOGY CLEAN WATER ACT SECTION 401 WATER QUALITY CERTIFICATION; AND ACOE CLEAN WATER ACT SECTION 404 AND SECTION 10 PERMITS. ALL PROJECT WORK MUST BE CONDUCTED IN COMPLIANCE WITH THE SR-520 FLOATING BRIDGE AND LANDINGS PROJECT ENVIRONMENTAL COMPLIANCE PLAN.

FILE NAME	Q:\FederalWay\2012\FAPWT-12-060\CADD\Dwgs\MF_MaintBldg\8066_MF_C_003_02.dwg			
TIME	11:02 AM			
DATE	3/20/12			
PLOTTED BY	Strandberg, Brian			
DESIGNED BY	Bollen, BJ	3/12		
ENTERED BY	Strandberg, BC	3/12		
CHECKED BY	Linden, CE	3/12		
PROJ. ENGR.	Lewis, R	3/12		
REGIONAL ADM.		3/12	REVISION	DATE / BY

REGION NO.	STATE	FED.AID PROJ.NO.
10	WASH	
JOB NUMBER 8066		
CONTRACT NO.		LOCATION NO.

JAMES S. GUARRE — STATE OF WASHINGTON — 14208 — STRUCTURAL ENGINEER — PROFESSIONAL ENGINEER — DATE — P.E. STAMP BOX

CONNIE E. LINDEN — STATE OF WASHINGTON — 42793 — REGISTERED PROFESSIONAL ENGINEER — DATE — P.E. STAMP BOX

Washington State Department of Transportation

KGM Kelsey/General/Manson, A JOINT VENTURE — kpff — BergerABAM

SR 520
I-5 TO MEDINA - STG. 1 EVERGREEN PT. FLOATING BRIDGE AND LANDINGS
MAINTENANCE FACILITY SITE PREPARATION PLAN

SITE PREPARATION

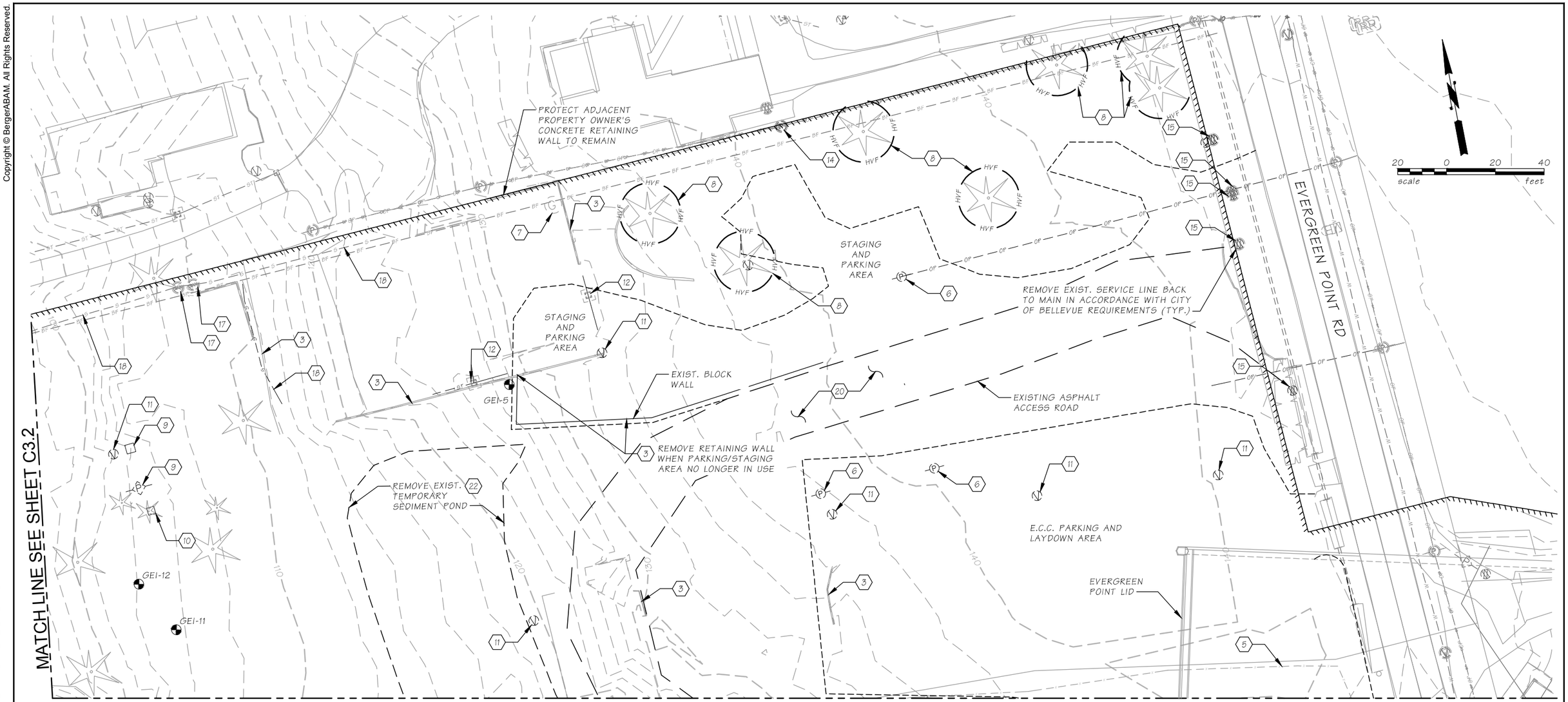
PLAN REF NO C3.2

SHEET 7 OF 36 SHEETS

VOLUME 15 - CIVIL PACKAGE #1 - RFC - 3/26/12

Strandberg, Brian on: 3/24/2012 8:17 AM File: Q:\FederalWay\2012\FAPWT-12-060\CADD\Dwgs\MF_MaintBldg\8066_MF_C_003_02.dwg
SR ___ JOB NO. ___ SHEET ___

Copyright © BergerABAM. All Rights Reserved.



DEMOLITION NOTES: (ONLY DEMOLITION NOTES APPLICABLE TO THIS SHEET ARE SHOWN)

3. DEMOLISH RETAINING WALL. PROTECT ADJACENT PROPERTIES AT LOCATIONS WHERE RETAINING WALL ABUTS ADJACENT PROPERTIES.
5. REMOVE FENCE.
6. REMOVE POWER POLE.
7. REMOVE UST. SEE GENERAL NOTES SHEET C2.2.
8. PROTECT EXISTING TREE, SEE TESC PLANS.
9. REMOVE POWER BOX, SEE GENERAL NOTES SHEET C2.2.
10. REMOVE TELEPHONE RISER.
11. REMOVE WATER SERVICE AND VALVE. CAP AND PROVIDE THRUST BLOCKING AT EXISTING WATERMAIN. SEE GENERAL NOTE ON SHEET C8.2 FOR THRUST BLOCKING.
12. REMOVE DRAINAGE STRUCTURE.
13. PROTECT ADJACENT PROPERTIES AT LOCATIONS WHERE RETAINING WALL ABUTS ADJACENT PROPERTIES.
14. PROTECT EXISTING UTILITY.
15. REMOVE WATER METER.
17. REMOVE SANITARY SEWER CLEANOUT.
18. REMOVE SANITARY SEWER MAIN. SEE ASBESTOS SANITARY SEWER PIPE REMOVAL NOTE ON SHEET C2.2.
20. DEMOLISH EXISTING ASPHALT CONSTRUCTION ACCESS WHEN NO LONGER IN USE.
22. 12" POND INLET WILL BE RE-DIRECTED TO A STORM FACILITY TO THE EAST BY OTHERS (E.C.C.). IF RE-ROUTING WORK IS NOT COMPLETED BY E.C.C. AT TIME TEMPORARY POND IS TO BE REMOVED, PROVIDE TEMPORARY SEDIMENT CONTROL STORAGE FACILITY (I.E. POND OR BAKER TANK).

LEGEND:

GROUNDWATER MONITORING WELL

GENERAL NOTES:

1. FOR ASB. CP REMOVAL REQUIREMENT SEE SHEET C2.2 & C8.1. SEE SHEET C8.2 FOR SEWER REPLACEMENT WORK.
2. REMOVE UTILITY POLES AFTER ALL UTILITIES HAVE BEEN RELOCATED OFF THE POLES. COORDINATE W/ PUGET SOUND ENERGY.
3. CLEAR AND GRUB INCLUDING TREES, EXCEPT THOSE DESIGNATED TO REMAIN, AND INVASIVE VEGETATION. SEE TESC PLANS.
4. REMOVE EXISTING CINDER BLOCK WALL IN ITS ENTIRETY ALONG PEDESTRIAN PATH.
5. ELECTRONIC DRAWINGS WILL BE MADE AVAILABLE TO ASSIST IN LOCATING STRUCTURES IDENTIFIED ON THESE DRAWINGS TO BE REMOVED/DEMOLISHED/PROTECTED.
6. ALL GROUNDWATER MONITORING WELLS SHALL BE REMOVED AND/OR DECOMMISSIONED PRIOR TO ANY EXCAVATION WORK.

FILE NAME	Q:\FederalWay\2012\FAPWT-12-060\CADD\Dwgs\MF_MaintBldg\8066_MF_C_003_03.dwg			
TIME	11:02 AM			
DATE	3/20/12			
PLOTTED BY	Strandberg, Brian			
DESIGNED BY	Bollen, BJ	3/12		
ENTERED BY	Strandberg, BC	3/12		
CHECKED BY	Linden, CE	3/12		
PROJ. ENGR.	Lewis, R	3/12		
REGIONAL ADM.		3/12	REVISION	DATE / BY

REGION NO.	STATE	FED.AID PROJ.NO.
10	WASH	
JOB NUMBER 8066		
CONTRACT NO.		LOCATION NO.

JAMES S. GUAERE — STATE OF WASHINGTON — 14208 — STRUCTURAL ENGINEER — PROFESSIONAL ENGINEER — DATE — P.E. STAMP BOX

CONNIE E. LINDEN — STATE OF WASHINGTON — 42793 — REGISTERED PROFESSIONAL ENGINEER — DATE — P.E. STAMP BOX

Washington State Department of Transportation

KGM Kiewit/General/Manson, A JOINT VENTURE

kpff

BergerABAM

SR 520
I-5 TO MEDINA - STG. 1 EVERGREEN PT. FLOATING BRIDGE AND LANDINGS
MAINTENANCE FACILITY SITE PREPARATION PLAN

SITE PREPARATION

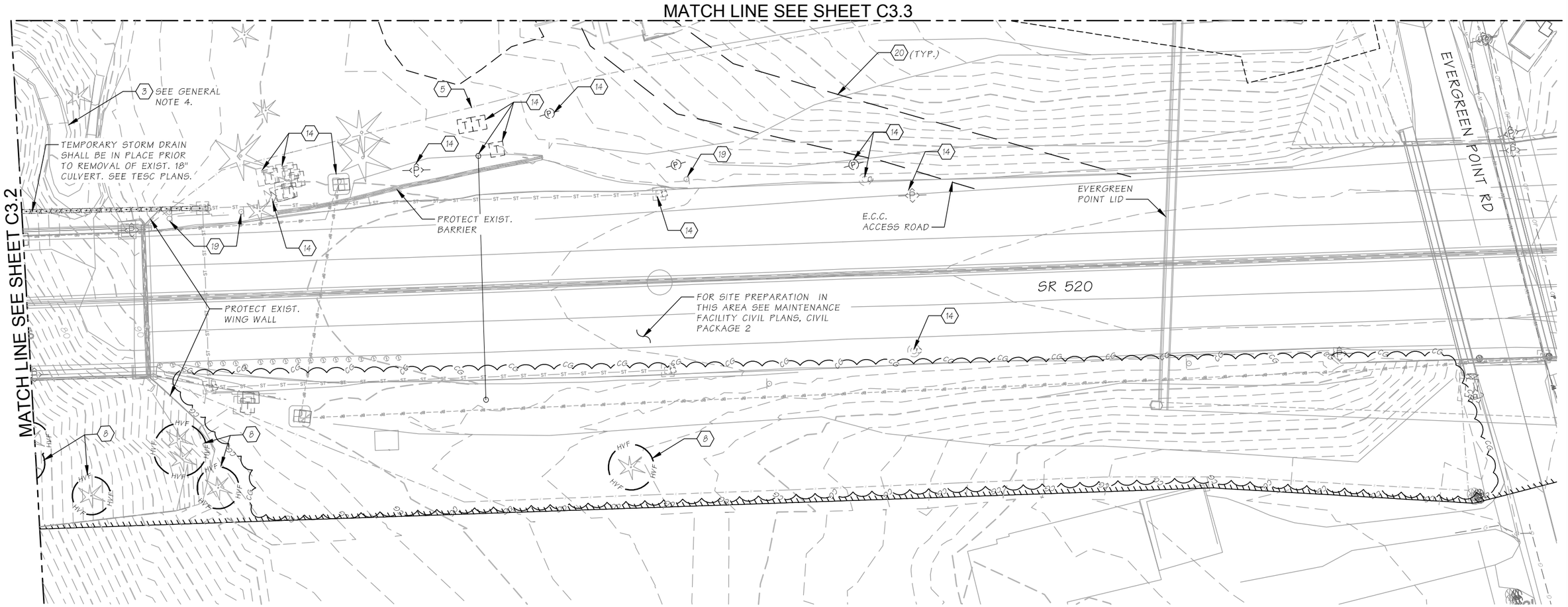
PLAN REF NO C3.3

SHEET 8 OF 36 SHEETS

VOLUME 15 - CIVIL PACKAGE #1 - RFC - 3/26/12

Strandberg, Brian on: 3/24/2012 8:17 AM File: Q:\FederalWay\2012\FAPWT-12-060\CADD\Dwgs\MF_MaintBldg\8066_MF_C_003_03.dwg
SR ___ JOB NO. ___ SHEET ___

Copyright © BergerABAM. All Rights Reserved.



DEMOLITION NOTES:
(ONLY DEMOLITION NOTES APPLICABLE TO THIS SHEET ARE SHOWN)

- 3 DEMOLISH RETAINING WALL.
- 5 REMOVE FENCE.
- 8 PROTECT EXISTING TREE, SEE TESC PLANS.
- 14 PROTECT EXISTING UTILITY.
- 19 PROTECT EXISTING SIGNAGE
- 20 DEMOLISH EXITING ASPHALT CONSTRUCTION ACCESS WHEN NO LONGER IN USE.

GENERAL NOTES:

1. FOR ASB. CP REMOVAL REQUIREMENT SEE SHEET C2.2 & C8.1. SEE SHEET C8.2 FOR SEWER REPLACEMENT WORK.
2. REMOVE UTILITY POLES AFTER ALL UTILITIES HAVE BEEN RELOCATED OFF THE POLES. COORDINATE W/ PUGET SOUND ENERGY.
3. CLEAR AND GRUB INCLUDING TREES, EXCEPT THOSE DESIGNATED TO REMAIN, AND INVASIVE VEGETATION. SEE TESC PLANS.
4. REMOVE EXISTING CINDER BLOCK WALL IN ITS ENTIRETY ALONG PEDESTRIAN PATH.
5. ELECTRONIC DRAWINGS WILL BE MADE AVAILABLE TO ASSIST IN LOCATING STRUCTURES IDENTIFIED ON THESE DRAWINGS TO BE REMOVED/DEMOLISHED/PROTECTED.
6. ALL GROUNDWATER MONITORING WELLS SHALL BE REMOVED AND/OR DECOMMISSIONED PRIOR TO ANY EXCAVATION WORK.

LEGEND:

- x-x-x - UTILITIES DEMOLITION

20 0 20 40
scale feet

FILE NAME	Q:\FederalWay\2012\FAPWT-12-060\CADD\Dwgs\MF_MaintBldg\8066_MF_C_003_04.dwg						
TIME	11:02 AM						
DATE	3/20/12						
PLOTTED BY	Strandberg, Brian						
DESIGNED BY	Bollen, BJ	3/12					
ENTERED BY	Strandberg, BC	3/12					
CHECKED BY	Linden, CE	3/12					
PROJ. ENGR.	Lewis, R	3/12					
REGIONAL ADM.		3/12	REVISION	DATE	BY		

REGION NO.	STATE	FED.AID PROJ.NO.
10	WASH	
JOB NUMBER 8066		
CONTRACT NO.		LOCATION NO.

JAMES S. GUARRE — STATE OF WASHINGTON — 14208 — STRUCTURAL ENGINEER — PROFESSIONAL ENGINEER
DATE
P.E. STAMP BOX

CONNIE E. LINDEN — STATE OF WASHINGTON — 42793 — REGISTERED PROFESSIONAL ENGINEER
DATE
P.E. STAMP BOX

Washington State Department of Transportation
KGM Kelsey/Gannett/Marison, A JOINT VENTURE
kpff
BergerABAM

SR 520
I-5 TO MEDINA - STG. 1 EVERGREEN PT. FLOATING BRIDGE AND LANDINGS
MAINTENANCE FACILITY SITE PREPARATION PLAN

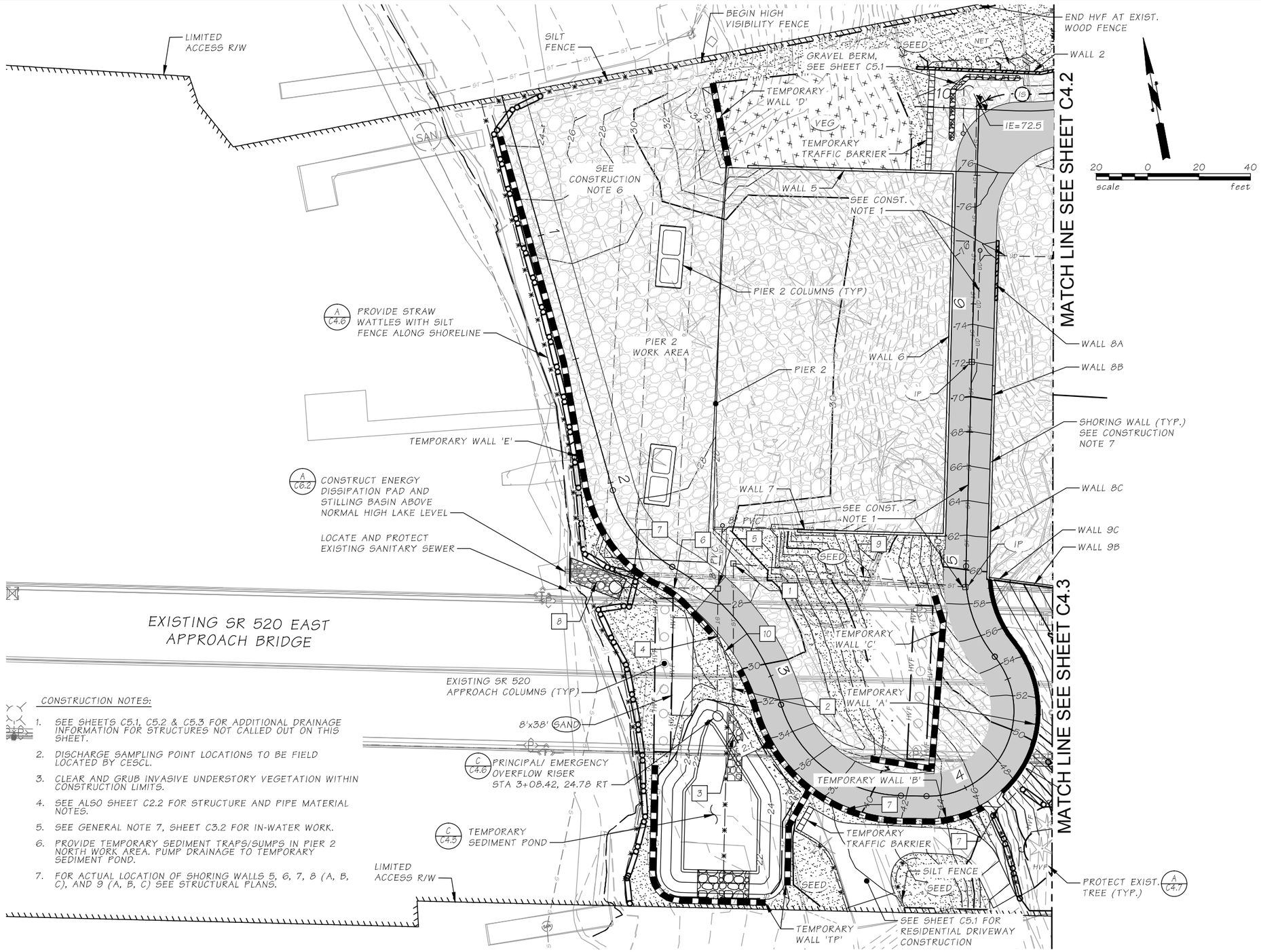
SITE PREPARATION

PLAN REF NO C3.4
SHEET 9 OF 36 SHEETS

VOLUME 15 - CIVIL PACKAGE #1 - RFC - 3/26/12

Strandberg, Brian on: 3/24/2012 8:18 AM File: Q:\FederalWay\2012\FAPWT-12-060\CADD\Dwgs\MF_MaintBldg\8066_MF_C_003_04.dwg
SR ___ JOB NO. ___ SHEET ___

Copyright © BergerABAM. All Rights Reserved.



LEGEND:

- VEG — PROTECT EXISTING TREES AND VEGETATION
- ENTR — STABILIZED CONSTRUCTION ENTRANCE/ROAD PAD SEE WSDOT STD PLAN I-80.10-01
- NET — EROSION CONTROL BLANKET SEE WSDOT STD PLAN I-60.10-00
- IP — INLET PROTECTION SEE WSDOT STANDARD PLAN I-40.20-00
- SEED — EROSION CONTROL HYDROSEED MIX, SEE SHEET C4.4
- SAND — CHITOSAN ENHANCED SANDFILTER, BACKWASH TANK & SKIMMER PUMPS. SEE PLANS DESIGNED BY NORTHWEST SOIL CEMENT.
- ASPHALT SURFACING
- SILT FENCE, SEE WSDOT STANDARD PLAN I-30.15-00
- STRAW WATTLES W/ SILT FENCE (A/C4.6)
- C — CUT SLOPE
- IS — INTERCEPTOR SWALE
- HVF — HIGH VISIBILITY FENCE SEE WSDOT STANDARD PLAN I-10.10-01
- CF — CONSTRUCTION FENCE
- CHECK DAM, SEE WSDOT STD PLAN I-50.20-00. SPACING SHOWN IS SCHEMATIC. SEE STD PLAN FOR REQUIRED SPACING.
- WATTLE INSTALLATION ON SLOPE, SEE WSDOT STANDARD PLAN I-30.30-00.

CONSTRUCTION NOTES:

1. SEE SHEETS C5.1, C5.2 & C5.3 FOR ADDITIONAL DRAINAGE INFORMATION FOR STRUCTURES NOT CALLED OUT ON THIS SHEET.
2. DISCHARGE SAMPLING POINT LOCATIONS TO BE FIELD LOCATED BY CESCL.
3. CLEAR AND GRUB INVASIVE UNDERSTORY VEGETATION WITHIN CONSTRUCTION LIMITS.
4. SEE ALSO SHEET C2.2 FOR STRUCTURE AND PIPE MATERIAL NOTES.
5. SEE GENERAL NOTE 7, SHEET C3.2 FOR IN-WATER WORK.
6. PROVIDE TEMPORARY SEDIMENT TRAPS/SUMPS IN PIER 2 NORTH WORK AREA. PUMP DRAINAGE TO TEMPORARY SEDIMENT POND.
7. FOR ACTUAL LOCATION OF SHORING WALLS 5, 6, 7, 8 (A, B, C), AND 9 (A, B, C) SEE STRUCTURAL PLANS.

TEMPORARY STRUCTURE NOTES:

1. CB TYPE 1
   STA 2+59.16, 14.69' LT (A/C6.1)
   RIM=27.6 W/ BEEHIVE GRATE
   IE=24.50 (12" S) (12" E, SEE SHEET C5.3 PROFILE.)
2. 67LF 12" HDPE @ 1.0%
3. 12" HDPE (IE=23.83) W/ DEBRIS BARRIER (C/C6.1) (B/C4.7)
   AND RIP RAP PAD
4. 48LF 18" HDPE @1.04%
5. CB TYPE 2-48" W/ SOLID LID
   STA 2+60.78, 3.4' LT
   RIM=27.8±
   IE=21.25 (18" S,W)
   IE=22.50 (8" PVC UNDERDRAIN, N)
6. 40LF 18" HDPE @4.1%
7. 12" FLEX PIPE (HDPE SDR 32.5) PROVIDE PIPE ANCHORING AT HORIZONTAL AND VERTICAL BENDS AND AT 50 FT MAXIMUM INTERVALS. STRAP PIPE TO TOP OF TEMPORARY WALLS 'B' AND 'E' WHERE SHOWN. CONNECT TO STILLING BASIN.
8. ENERGY DISSIPATION PAD AND STILLING BASIN. STA 2+31, 19.53 RT. (A/C6.2) (C/C6.2)
9. 90LF 12" HDPE. ANCHOR PIPE. SEE SHEET C5.3 FOR PROFILE AND PIPE ANCHOR LOCATIONS AND DETAIL. SEE ALSO CONSTRUCTION NOTE 1.
10. BURY 12" FLEX PIPE (HDPE 32.5) AND PROVIDE PLATE PROTECTION BETWEEN TEMPORARY WALLS 'B' AND 'E'.

FILE NAME	Q:\FederalWay\2012\FAPWT-12-060\CADD\Dwgs\MF_MaintBldg\8066_MF_C_004_01.dwg			
TIME	11:02 AM			
DATE	3/20/12			
PLOTTED BY	Strandberg, Brian			
DESIGNED BY	Bollen, BJ	3/12		
ENTERED BY	Strandberg, BC	3/12		
CHECKED BY	Linden, CE	3/12		
PROJ. ENGR.	Lewis, R	3/12		
REGIONAL ADM.		3/12	REVISION	DATE / BY

REGION NO.	STATE	FED.AID PROJ.NO.
10	WASH	
JOB NUMBER 8066		
CONTRACT NO.		LOCATION NO.

JAMES S. GUARRE — STATE OF WASHINGTON — 14208 — STRUCTURAL ENGINEER — PROFESSIONAL ENGINEER — DATE — P.E. STAMP BOX

CONNIE E. LINDEN — STATE OF WASHINGTON — 42793 — REGISTERED PROFESSIONAL ENGINEER — DATE — P.E. STAMP BOX

Washington State Department of Transportation

KGM Kennit/Generaltr/Munson, A JOINT VENTURE — kpff — BergerABAM

SR 520
I-5 TO MEDINA - STG. 1 EVERGREEN PT. FLOATING BRIDGE AND LANDINGS
MAINTENANCE FACILITY SITE PREPARATION PLAN

TEMPORARY EROSION CONTROL

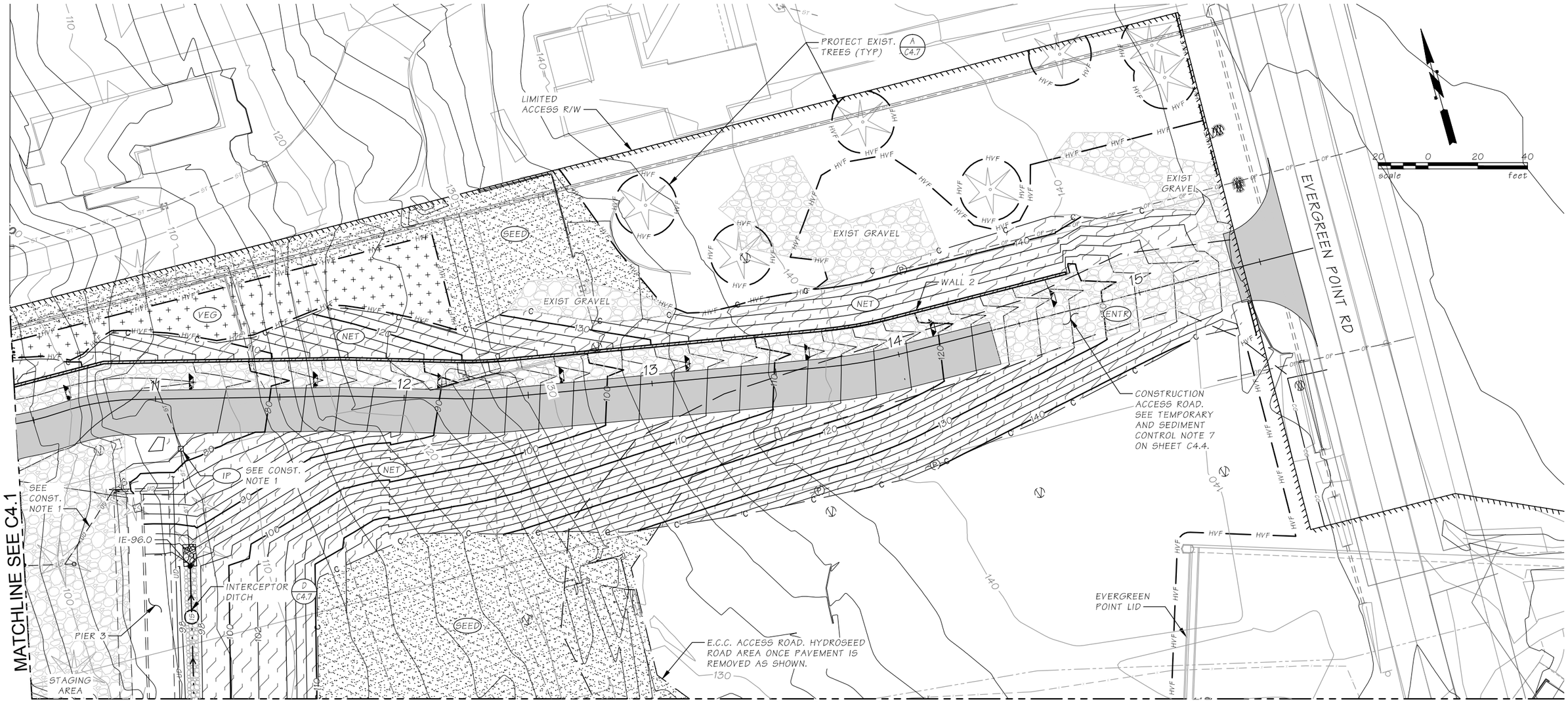
PLAN REF NO C4.1

SHEET 10 OF 36 SHEETS

VOLUME 15 - CIVIL PACKAGE #1 - RFC - 3/26/12

Strandberg, Brian on: 3/24/2012 8:53 AM File: Q:\FederalWay\2012\FAPWT-12-060\CADD\Dwgs\MF_MaintBldg\8066_MF_C_004_01.dwg
SR ___ JOB NO. ___ SHEET ___

Copyright © BergerABAM. All Rights Reserved.



LEGEND:

- VEG — PROTECT EXISTING TREES AND VEGETATION
- ENTR — STABILIZED CONSTRUCTION ENTRANCE/ ROAD PAD SEE WSDOT STANDARD PLAN I-80.10-01
- NET — EROSION CONTROL BLANKET SEE WSDOT STANDARD PLAN I-60.10-00
- IP — INLET PROTECTION SEE WSDOT STANDARD PLAN I-40.20-00
- SEED — EROSION CONTROL HYDROSEED MIX, SEE SHEET C4.4
- ASPHALT SURFACING
- SILT FENCE, SEE WSDOT STD PLAN I-30.15-00
- C — CUT SLOPE
- IS — INTERCEPTOR SWALE
- HVF — HIGH VISIBILITY FENCE SEE WSDOT STD PLAN I-10.10-01
- CHECK DAM, SEE WSDOT STD PLAN I-50.20-00. SPACING SHOWN IS SCHEMATIC. SEE STD PLAN FOR REQUIRED SPACING.

CONSTRUCTION NOTES:

1. SEE SHEETS C5.1, C5.2 & C5.3 FOR ADDITIONAL DRAINAGE INFORMATION FOR STRUCTURES NOT CALLED OUT ON THIS SHEET.
2. SEE ALSO SHEET C2.2 FOR STORM STRUCTURE AND PIPE MATERIAL NOTES.

FILE NAME	Q:\FederalWay\2012\FAPWT-12-060\CADD\Dwgs\MF_MaintBldg\8066_MF_C_004_02.dwg				
TIME	11:02 AM				
DATE	3/20/12				
PLOTTED BY	Strandberg, Brian				
DESIGNED BY	Bollen, BJ	3/12			
ENTERED BY	Strandberg, BC	3/12			
CHECKED BY	Linden, CE	3/12			
PROJ. ENGR.	Lewis, R	3/12			
REGIONAL ADM.		3/12	REVISION	DATE	BY

REGION NO.	STATE	FED.AID PROJ.NO.
10	WASH	
JOB NUMBER 8066		
CONTRACT NO.		LOCATION NO.

JAMES S. GUAERE — STATE OF WASHINGTON — 34208 — STRUCTURAL ENGINEER — PROFESSIONAL ENGINEER
DATE
P.E. STAMP BOX

CONNIE E. LINDEN — STATE OF WASHINGTON — 42793 — REGISTERED PROFESSIONAL ENGINEER
DATE
P.E. STAMP BOX

Washington State Department of Transportation
KGM — Kennett/Goldsmith/Mansion, A JOINT VENTURE
kpff
BergerABAM

SR 520
I-5 TO MEDINA - STG. 1 EVERGREEN PT. FLOATING BRIDGE AND LANDINGS
MAINTENANCE FACILITY SITE PREPARATION PLAN

TEMPORARY EROSION CONTROL

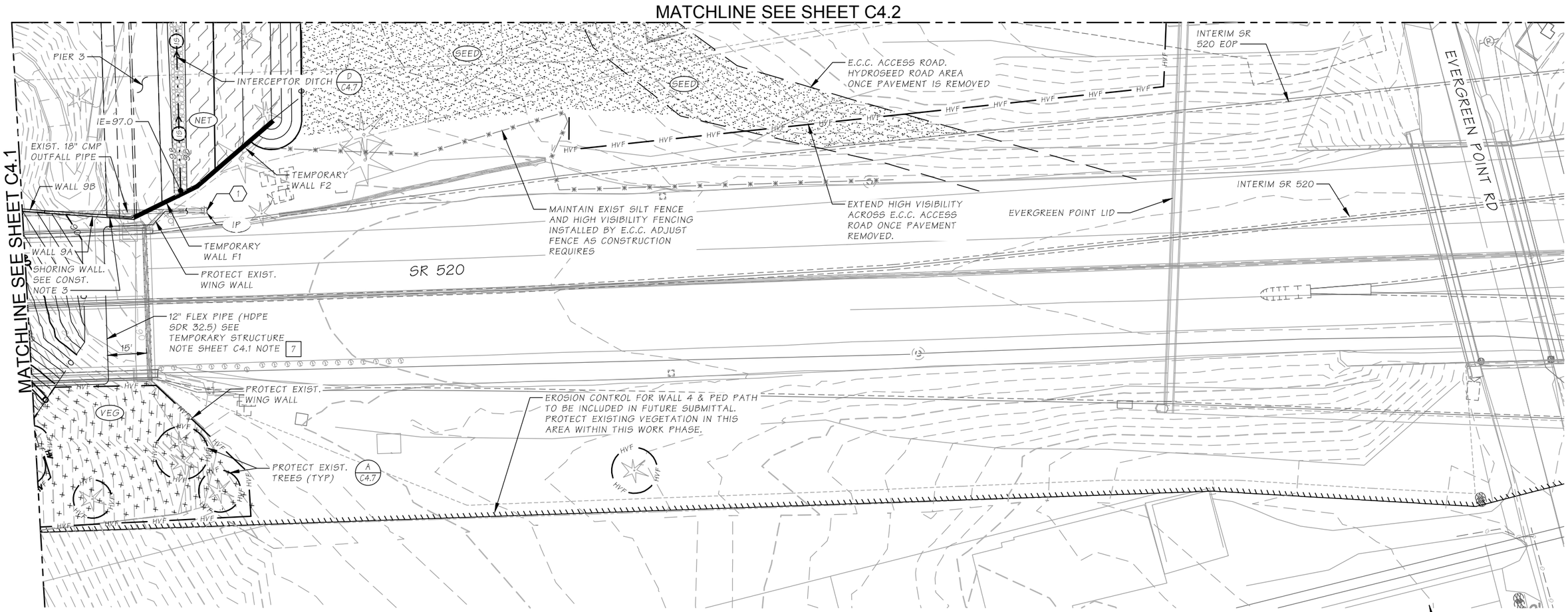
PLAN REF NO C4.2

SHEET 11 OF 36 SHEETS

VOLUME 15 - CIVIL PACKAGE #1 - RFC - 3/26/12

Strandberg, Brian on: 3/24/2012 8:20 AM File: Q:\FederalWay\2012\FAPWT-12-060\CADD\Dwgs\MF_MaintBldg\8066_MF_C_004_02.dwg
SR ___ JOB NO. ___ SHEET ___

Copyright © BergerABAM. All Rights Reserved.



LEGEND:

- VEG — PROTECT EXISTING TREES AND VEGETATION
- NET — EROSION CONTROL BLANKET SEE WSDOT STANDARD PLAN I-60.10-00
- IP — INLET PROTECTION SEE WSDOT STANDARD PLAN I-40.20-00
- SEED — HYDROSEED, SEE SHEET C4.4
- SILT FENCE, SEE WSDOT STANDARD PLAN I-30.15-00
- C — CUT SLOPE
- HVF — HIGH VISIBILITY FENCE SEE WSDOT STANDARD PLAN I-10.10-01
- WATTLE INSTALLATION ON SLOPE, SEE WSDOT STD PLAN I-30.10-00.

TEMPORARY STORM DRAINAGE NOTES

1. PROVIDE TEMPORARY 12" HDPE CONNECTION FROM EXISTING CATCH BASIN TO NEW WETWELL. PROVIDE MINIMUM PIPE SLOPE OF 1.0%. WETWELL SHALL BE INSTALLED WITH MINIMUM HORIZONTAL CLEARANCE OF 5' FROM EXISTING UTILITIES/STRUCTURES AND TEMPORARY SHORING WALL/PGA, AND MINIMUM VERTICAL CLEARANCE OF 1' FROM SHORING WALL PGA. CONNECT 12" FLEX PIPE DOWNSTREAM OF PUMP CHECK/ISOLATION VALVES.

   IF REQUIRED, PUMP SYSTEM SHALL MEET THE FOLLOWING: PROVIDE DUPLEX IMMERSIBLE PUMP SYSTEM WITH 4" DISCHARGE. VARIABLE SPEED PUMPS WITH PUMP CAPACITY RANGING FROM 335 GPM (SINGLE PUMP ON) TO 900 GPM (TWO PUMPS ON). PUMP SHALL BE EXPLOSION PROOF, AND PACKAGE SHALL INCLUDE CHECK AND ISOLATION VALVES, VFD CONTROL PANEL, LEVEL CONTROLS, AUDIBLE / VISUAL INDICATORS, FIBERGLASS 60" DIA X 16' DEEP WETWELL AND SHALL INCLUDE LIFTING RAILS AND HATCH. PROVIDE TEMPORARY ELECTRIC SERVICE (460 V) AND BACKUP GENERATOR.

CONSTRUCTION NOTES:

1. SEE ALSO CONSTRUCTION ROAD PLAN SHEET C5.1
2. SEE ALSO SHEET C2.2 FOR STORM STRUCTURE AND STORM PIPE MATERIAL NOTES.
3. FOR ACTUAL LOCATION OF SHORING WALLS 5, 6, 7, 8 (A, B, C), 9 (A, B, C) AND TEMPORARY WALLS F1 AND F2 SEE STRUCTURAL PLANS.

20 0 20 40
scale feet

FILE NAME	Q:\FederalWay\2012\FAPWT-12-060\CADD\Dwgs\MF_MaintBldg\8066_MF_C_004_03.dwg						
TIME	11:02 AM						
DATE	3/20/12						
PLOTTED BY	Strandberg, Brian						
DESIGNED BY	Bollen, BJ	3/12					
ENTERED BY	Strandberg, BC	3/12					
CHECKED BY	Linden, CE	3/12					
PROJ. ENGR.	Lewis, R	3/12					
REGIONAL ADM.		3/12	REVISION	DATE	BY		

REGION NO.	STATE	FED.AID PROJ.NO.
10	WASH	
JOB NUMBER 8066		
CONTRACT NO.		LOCATION NO.

JAMES S. GUAERE — STATE OF WASHINGTON — 14208 — STRUCTURAL ENGINEER — PROFESSIONAL ENGINEER
DATE
P.E. STAMP BOX

CONNIE E. LINDEN — STATE OF WASHINGTON — 42793 — REGISTERED PROFESSIONAL ENGINEER
DATE
P.E. STAMP BOX

Washington State Department of Transportation
KGM — Kiewit/Granite/Manson, A JOINT VENTURE
kpff
BergerABAM

SR 520
I-5 TO MEDINA - STG. 1 EVERGREEN PT. FLOATING BRIDGE AND LANDINGS
MAINTENANCE FACILITY SITE PREPARATION PLAN

TEMPORARY EROSION CONTROL

PLAN REF NO C4.3
SHEET 12 OF 36 SHEETS

VOLUME 15 - CIVIL PACKAGE #1 - RFC - 3/26/12

Strandberg, Brian on: 3/24/2012 8:20 AM File: Q:\FederalWay\2012\FAPWT-12-060\CADD\Dwgs\MF_MaintBldg\8066_MF_C_004_03.dwg
SR ___ JOB NO. ___ SHEET ___

Copyright © BergerABAM. All Rights Reserved.

TEMPORARY EROSION AND SEDIMENT CONTROL NOTES:

1. THE BMP FACILITIES SHOWN ON THIS TESC PLAN SHALL REMAIN IN PLACE UNTIL ALL CONSTRUCTION IS COMPLETED AND PROJECT SITE IS PERMANENTLY STABILIZED.
2. THE BOUNDARIES OF THE CLEARING LIMITS SHOWN ON THESE PLANS SHALL BE CLEARLY FLAGGED WITH HVF OR SILT FENCE PRIOR TO CONSTRUCTION AND DURING THE CONSTRUCTION PERIOD. NO DISTURBANCE BEYOND THE CLEARING LIMITS SHALL BE PERMITTED. THE CLEARING LIMITS SHALL BE MAINTAINED FOR THE DURATION OF CONSTRUCTION.
3. THE BMP FACILITIES SHOWN ON THESE PLANS MUST BE CONSTRUCTED PRIOR TO OR IN CONJUNCTION WITH ALL CLEARING AND GRADING SO AS TO ENSURE THAT THE TRANSPORT OF SEDIMENT TO SURFACE WATERS, DRAINAGE SYSTEMS, AND ADJACENT PROPERTIES IS MINIMIZED.
4. THE BMP FACILITIES SHOWN ON THESE PLANS ARE THE MINIMUM REQUIREMENTS FOR ANTICIPATED SITE CONDITIONS. DURING THE CONSTRUCTION PERIOD, BMP FACILITIES SHALL BE MAINTAINED IN ACCORDANCE WITH THE TESC PLAN NARRATIVE AND SWPPP. UPGRADES TO BMP'S SHOWN NECESSARY TO ACCOUNT FOR UNEXPECTED STORM EVENTS OR CHANGING SITE CONDITIONS WILL BE REVIEWED AND DETERMINED BY CESCL (E.G., ADDITIONAL SUMP PUMPS, RELOCATION OF DITCHES AND SILT FENCES, ETC.).
5. THE BMP FACILITIES SHALL BE INSPECTED AND MAINTAINED IN ACCORDANCE WITH THE TESC NARRATIVE AND SWPPP AND THE NPDES GENERAL STORMWATER CONSTRUCTION PERMIT.
6. AT NO TIME SHALL MORE THAN ONE FOOT OF SEDIMENT BE ALLOWED TO ACCUMULATE WITHIN A CATCH BASIN. ALL CATCH BASINS AND CONVEYANCE PIPING SHALL BE CLEANED PRIOR TO PAVING. THE CLEANING OPERATION SHALL NOT FLUSH SEDIMENT-LADEN WATER INTO THE DOWNSTREAM SYSTEM.
7. STABILIZED CONSTRUCTION ENTRANCES AND ROADS SHALL BE INSTALLED AT THE BEGINNING OF CONSTRUCTION AND MAINTAINED FOR THE DURATION OF THE PROJECT. SEE THE TESC PLAN NARRATIVE AND SWPPP AND NPDES GENERAL STORMWATER CONSTRUCTION PERMIT FOR MAINTENANCE REQUIREMENTS AND ADDITIONAL MEASURES THAT MAY BE NEEDED TO PREVENT PAVEMENT TRACKING.
8. ALL REFERENCES MADE TO STANDARD PLANS SHALL BE TO THE WASHINGTON STATE DEPARTMENT OF TRANSPORTATION STANDARD PLANS, AND SHALL BE IN ACCORDANCE WITH THE 2010 EDITION.
9. WHERE STRAW MULCH FOR TEMPORARY EROSION CONTROL IS REQUIRED, IT SHALL BE APPLIED AT A MINIMUM THICKNESS OF 3 INCHES.
10. REMOVE ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES UPON PERMANENT STABILIZATION OF THE PROJECT SITE.
11. RECORDS SHALL BE KEPT IN ACCORDANCE WITH THE TESC PLAN NARRATIVE AND SWPPP AND NPDES GENERAL STORMWATER CONSTRUCTION PERMIT.

EROSION CONTROL HYDROSEED MIX NOTES:

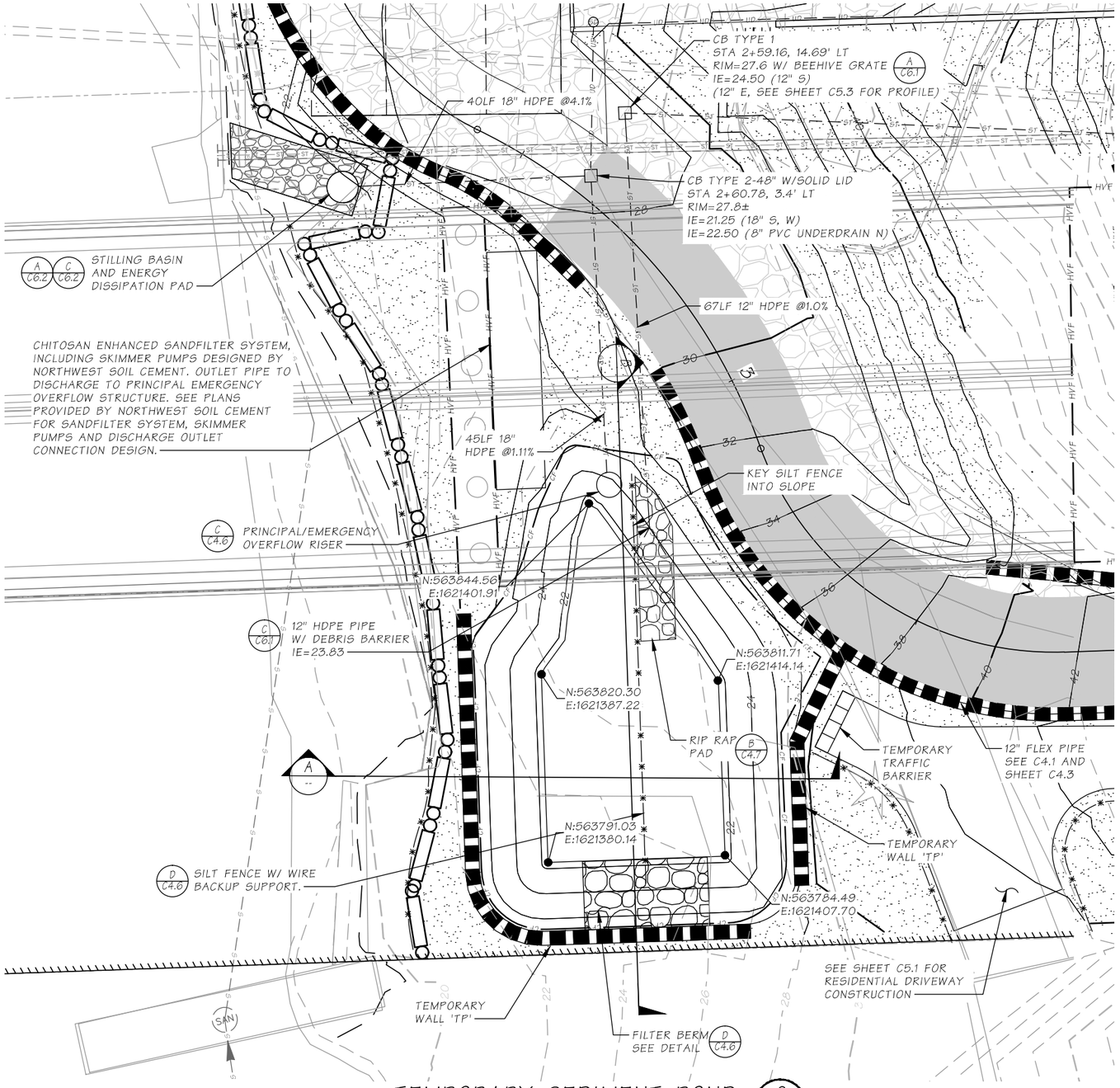
1. HYDROSEEDING SHALL BE APPLIED PER WSDOT STANDARD SPECIFICATION 8-01.3(2).
2. APPLY GRASS SEED MIX AT A RATE OF 170 POUNDS PER ACRE.
3. APPLY A SLOW RELEASE ORGANIC FERTILIZER AT A RATE OF 400 LBS/ACRES. THE N-P-K FORMULA SHALL BE WITHIN THE FOLLOWING RANGE: NITROGEN 6-8%, PHOSPOROUS 2-4%, POTASSIUM 3-4%.

EROSION CONTROL HYDROSEED MIX

CHEWINGS OR ANNUAL BLUEGRASS
FESTUCA RUBRA VAR. COMMUTATE OR POA ANNA
40% WEIGHT
98% PURITY
90% GERMINATION
PERRENIAL RYE
LOLIUM PERENNE
50% WEIGHT
98% PURITY
90% GERMINATION
REDTOP OR COLONIAL BENTGRASS
AGROSTIS ALBA OR AGROSTIS TENUIS
5% WEIGHT
92% PURITY
85% GERMINATION
WHITE DUTCH CLOVER
TRIFOLIUM REPENS
5% WEIGHT
98% PURITY
90% GERMINATION

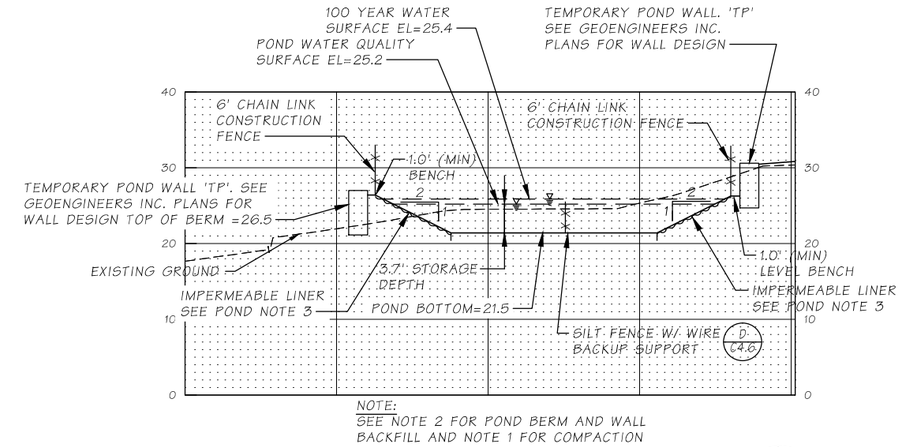
TEMPORARY EROSION AND SEDIMENT CONTROL (TESC) PLAN REQUIREMENTS	BEST MANAGEMENT PRACTICES - BMP'S (AS REQUIRED)
ELEMENT #1: DELINEATE CLEARING AND GRADING LIMITS	PRESERVE NATURAL VEGETATION; HIGH VISIBILITY FENCE; SILT FENCE
ELEMENT #2: ESTABLISH CONSTRUCTION ACCESS	STABILIZED CONSTRUCTION ENTRANCE, WHEEL WASH
ELEMENT #3: CONTROL FLOW RATES	TEMPORARY SEDIMENT CONTROL POND
ELEMENT #4: INSTALL SEDIMENT CONTROLS	SILT FENCE; STRAW WATTLES; PORTABLE WATER STORAGE TANKS; TEMPORARY SEDIMENT POND; CONSTRUCTION STORMWATER CHEMICAL TREATMENT; CHITOSAN FILTER.
ELEMENT #5: STABILIZE SOILS	TEMPORARY & PERMANENT SEEDING; MULCHING; NETS AND BLANKETS; PLASTIC COVERING; SURFACE ROUGHENING (SOIL AMENDMENT; DUST CONTROL;
ELEMENT #6: PROTECT SLOPES	TEMPORARY & PERMANENT SEEDING; PRESERVE VEGETATION; SURFACE ROUGHENING; NETS AND BLANKETS; PLASTIC COVERING; INTERCEPTOR DIKE & SWALE; CHECK DAMS;
ELEMENT #7: PROTECT DRAIN INLETS	STORMDRAIN INLET PROTECTION;
ELEMENT #8: STABILIZE CHANNELS AND OUTLETS	ROCK LINED CHANNELS; OUTLET PROTECTION; CHECK DAMS
ELEMENT #9: CONTROL POLLUTANTS	CONCRETE HANDLING; SAWCUTTING AND SURFACE POLLUTION PREVENTION; FUGITIVE DUST CONTROL; SPILL PREVENTION, CONTROL, AND COUNTER MEASURES PLAN (SPCC); SANITARY WASTEWATER; EXCAVATION SPOILS/DEWATERING WASTE
ELEMENT #10: CONTROL DE-WATERING	TEMPORARY SEDIMENT POND; CONTROLED DISCHARGE; PORTABLE WATER STORAGE TANKS
ELEMENT #11: MAINTAIN BMP'S	IN ACCORDANCE WITH NPDES GENERAL STORMWATER CONSTRUCTION PERMIT "THE PERMITTEE MUST INSPECT ALL AREAS DISTURBED BY CONSTRUCTION ACTIVITIES, ALL BMP'S, AND ALL STORMWATER DISCHARGE POINTS AT LEAST ONCE EVERY CALENDAR WEEK AND WITHIN 24 HOURS OF ANY DISCHARGE FROM THE SITE. THE PERMITTEE MUST EVALUATE THE EFFECTIVENESS OF THE BMP'S AND DETERMINE IF IT IS NECESSARY TO INSTALL, MAINTAIN OR REPAIR BMP'S TO IMPROVE THE QUALITY OF STORM DISCHARGES. THE PERMITTEE MUST CORRECT THE PROBLEMS WITHIN 7 DAYS OF THE INSPECTION."
ELEMENT #12: MANAGE THE PROJECT	PHASE CONSTRUCTION; SEASONAL WORK LIMITATIONS; COORDINATION WITH UTILITIES AND OTHER CONTRACTORS; INSPECTION AND MONITORING

Copyright © BergerABAM. All Rights Reserved.



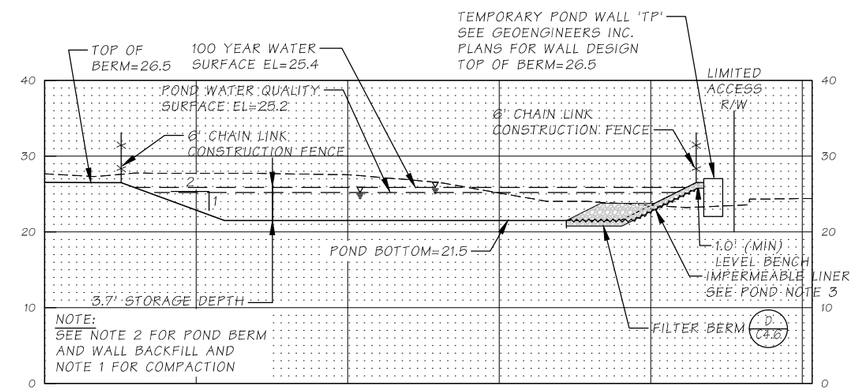
TEMPORARY SEDIMENT POND C / C4.1

SCALE: 1"=20'



TEMPORARY SEDIMENT POND SECTION A / --

SCALE: 1"=20' H&V



TEMPORARY SEDIMENT POND SECTION B / --

SCALE: 1"=20' H&V

POND NOTES

1. SEE GEOENGINEERS, INC. PLANS FOR TEMPORARY POND 'TP' WALL DESIGN, INCLUDING LEVELING PAD, FOUNDATION, SUBGRADE, AND COMPACTION REQUIREMENTS.
2. WALL AND POND BERM BACKFILL SHALL BE: GRAVEL BORROW, WSDOT STD. SPEC. 9-03.14 (4). SEE GEOENGINEERS, INC. PLANS FOR BACKFILL PLACEMENT.
3. PROVIDE IMPERMEABLE LINER, 20ML HDPE, AT POND WALL SLOPES. SEE WALL DESIGN PLANS PROVIDED BY GEOENGINEERS, INC. FOR KEYING OF IMPERMEABLE LINER AT WALL. PROVIDE 1.0' KEY AT TOE OF POND SLOPE.
4. POND SURFACE AREA AT EL. 25.2 = 2,477 SF
   POND VOLUME AT EL. 25.2 = 49,484 GALLONS (6,615 CUBIC FEET)

GENERAL NOTES:

1. SEE ALSO SHEET C4.1

DATUM

(NAVD) 88

FILE NAME	Q:\FederalWay\2012\FAPWT-12-060\CADD\Dwgs\MF_MaintBldg\8066_MF_C_004_05.dwg					
TIME	11:02 AM					
DATE	3/20/12					
PLOTTED BY	Strandberg, Brian					
DESIGNED BY	Bollen, BJ	3/12				
ENTERED BY	Strandberg, BC	3/12				
CHECKED BY	Linden, CE	3/12				
PROJ. ENGR.	Lewis, R	3/12				
REGIONAL ADM.		3/12	REVISION	DATE	BY	

REGION NO.	STATE	FED.AID PROJ.NO.
10	WASH	
JOB NUMBER 8066		
CONTRACT NO.		LOCATION NO.

JAMES S. GUARRE — STATE OF WASHINGTON — 14208 — STRUCTURAL ENGINEER — PROFESSIONAL ENGINEER — DATE — P.E. STAMP BOX

CONNIE E. LINDEN — STATE OF WASHINGTON — 42793 — REGISTERED PROFESSIONAL ENGINEER — DATE — P.E. STAMP BOX

Washington State Department of Transportation

KGM Kiewit/General/Manson, A JOINT VENTURE

kpff

BergerABAM

SR 520
I-5 TO MEDINA - STG. 1 EVERGREEN PT. FLOATING BRIDGE AND LANDINGS
MAINTENANCE FACILITY SITE PREPARATION PLAN

TEMPORARY EROSION CONTROL POND SECTION

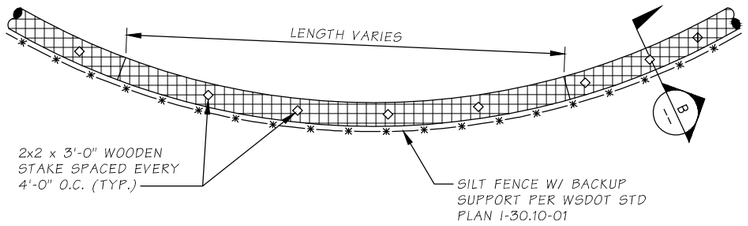
PLAN REF NO C4.5

SHEET 14 OF 36 SHEETS

VOLUME 15 - CIVIL PACKAGE #1 - RFC - 3/26/12

Strandberg, Brian on: 3/24/2012 8:26 AM File: Q:\FederalWay\2012\FAPWT-12-060\CADD\Dwgs\MF_MaintBldg\8066_MF_C_004_05.dwg
SR ___ JOB NO. ___ SHEET ___

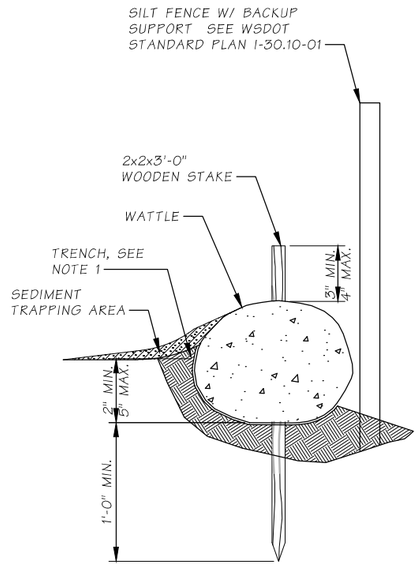
Copyright © BergerABAM. All Rights Reserved.



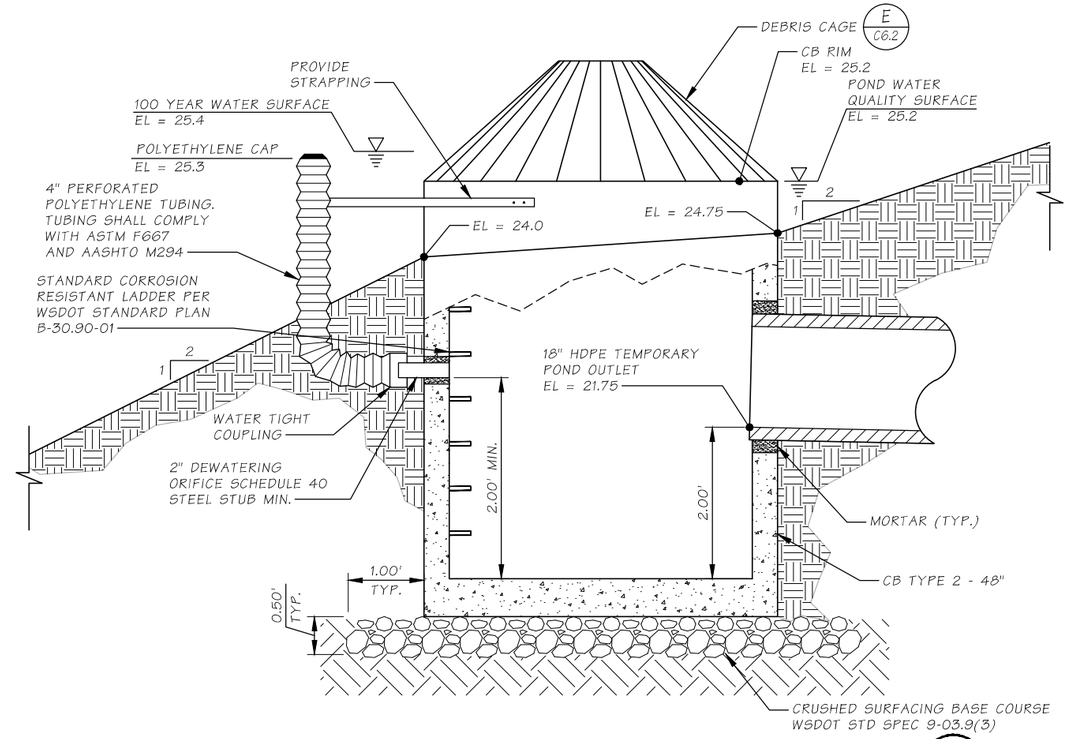
NOTES:

1. WATTLES SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATION 9-14.5(5). INSTALL WATTLES ALONG CONTOURS. INSTALLATION SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATION 8-01.3(10).
2. SECURELY KNOT EACH END OF WATTLE. ABUT ADJACENT WATTLES TIGHTLY, END TO END, WITHOUT OVERLAPPING THE ENDS.
3. PILOT HOLES MAY BE DRIVEN THROUGH THE WATTLES AND INTO THE SOIL WHEN SOIL CONDITIONS REQUIRE.
4. LIVE STAKES PER WSDOT STD. SPEC. 9-14.6(1)B MAY BE USED FOR PERMANENT INSTALLATION AND SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATION 9-14.5(6).
5. WATTLES SHALL BE INSPECTED REGULARLY, AND IMMEDIATELY AFTER A RAINFALL PRODUCES RUNOFF, TO ENSURE THEY REMAIN THOROUGHLY ENTRENCHED AND IN CONTACT WITH THE SOIL.
6. PERFORM MAINTENANCE IN ACCORDANCE WITH STANDARD SPECIFICATION 8-01.3(15).

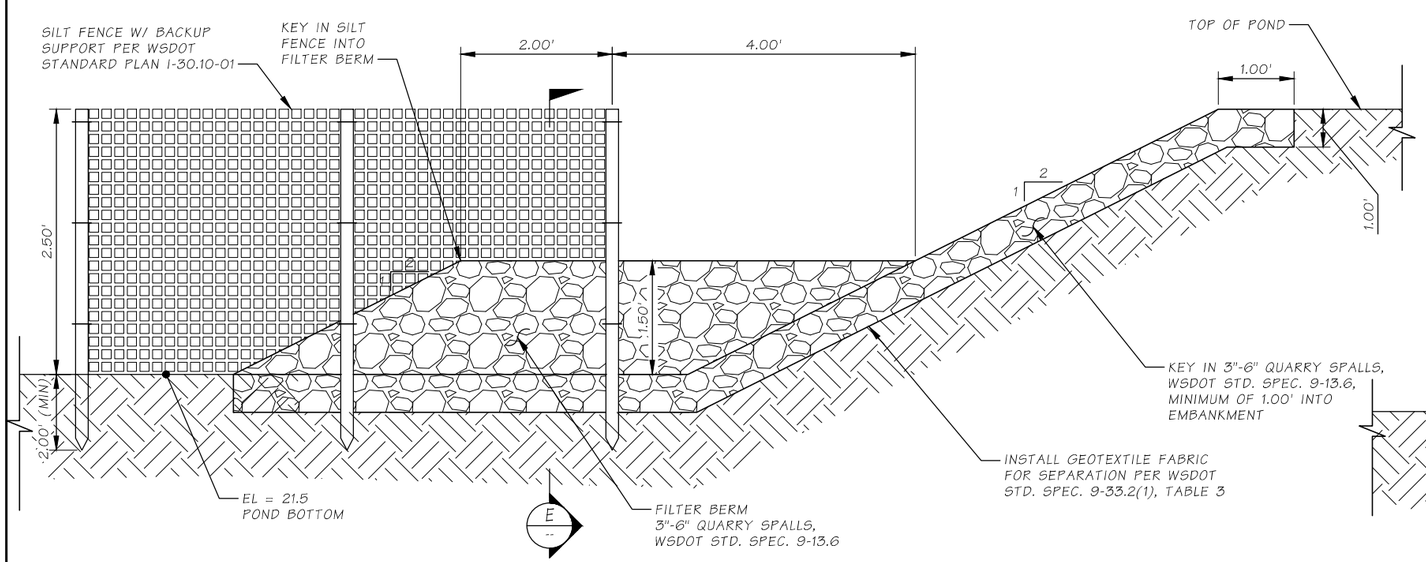
STRAW WATTLE (A / C4.1)
SCALE: NTS



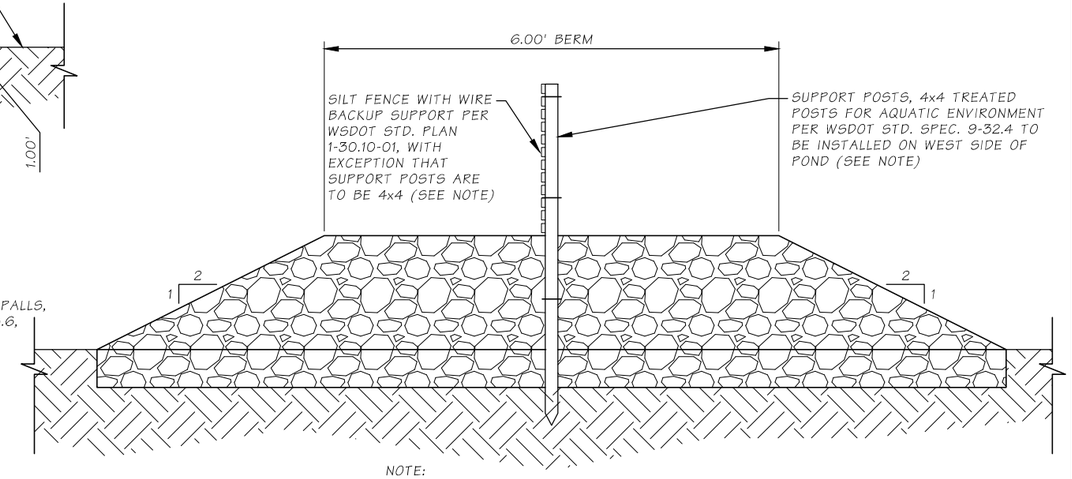
SECTION (B / ---)
SCALE: NTS



PRINCIPAL / EMERGENCY OVERFLOW RISER DETAIL (C / C4.1 & C4.5)
SCALE: NTS



FILTER BERM DETAIL (D / C4.5)
SCALE: NTS



NOTE:
SECTION OUTSIDE BERM IS SIMILAR

SECTION (E / --)
SCALE: NTS

FILE NAME	Q:\FederalWay\2012\FAPWT-12-060\CADD\Dwgs\MF_MaintBldg\8066_MF_C_004_06.dwg				
TIME	11:02 AM				
DATE	3/20/12				
PLOTTED BY	Strandberg, Brian				
DESIGNED BY	Bollen, BJ	3/12			
ENTERED BY	Strandberg, BC	3/12			
CHECKED BY	Linden, CE	3/12			
PROJ. ENGR.	Lewis, R	3/12			
REGIONAL ADM.		3/12	REVISION	DATE	BY

REGION NO.	STATE	FED.AID PROJ.NO.
10	WASH	
JOB NUMBER 8066		
CONTRACT NO.		LOCATION NO.

JAMES S. GUARRE — STATE OF WASHINGTON — 14208 — STRUCTURAL ENGINEER — PROFESSIONAL ENGINEER — DATE — P.E. STAMP BOX

CONNIE E. LINDEN — STATE OF WASHINGTON — 42793 — REGISTERED — PROFESSIONAL ENGINEER — DATE — P.E. STAMP BOX

Washington State Department of Transportation

KGM Kiewit/General/Manson, A JOINT VENTURE — kpff — BergerABAM

SR 520
I-5 TO MEDINA - STG. 1 EVERGREEN PT. FLOATING BRIDGE AND LANDINGS
MAINTENANCE FACILITY SITE PREPARATION PLAN

TEMPORARY EROSION CONTROL NOTES & DETAILS

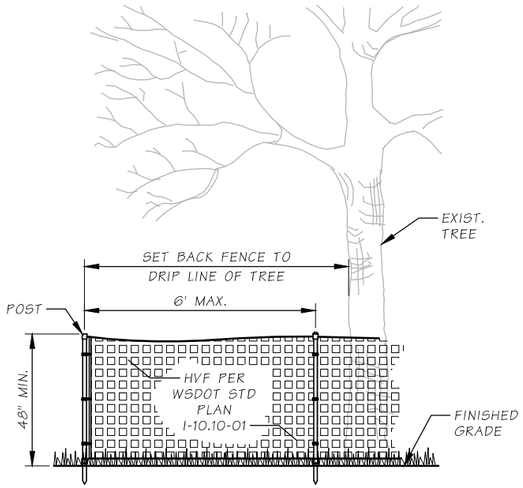
PLAN REF NO C4.6

SHEET 15 OF 36 SHEETS

VOLUME 15 - CIVIL PACKAGE #1 - RFC - 3/26/12

Strandberg, Brian on: 3/24/2012 8:22 AM File: Q:\FederalWay\2012\FAPWT-12-060\CADD\Dwgs\MF_MaintBldg\8066_MF_C_004_06.dwg
SR ___ JOB NO. ___ SHEET ___

Copyright © BergerABAM. All Rights Reserved.

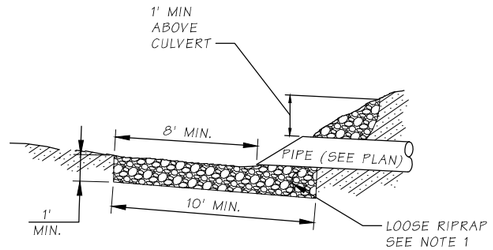


NOTE:

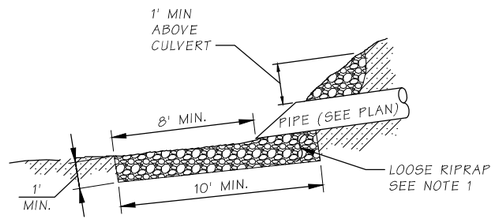
1. SEE WSDOT STD PLAN 1-10.10 FOR MATERIAL/INSTALLATION REQUIREMENTS.

TREE PROTECTION FENCE (A)

SCALE: NTS — C4.1, C4.2 & C4.3



INLET



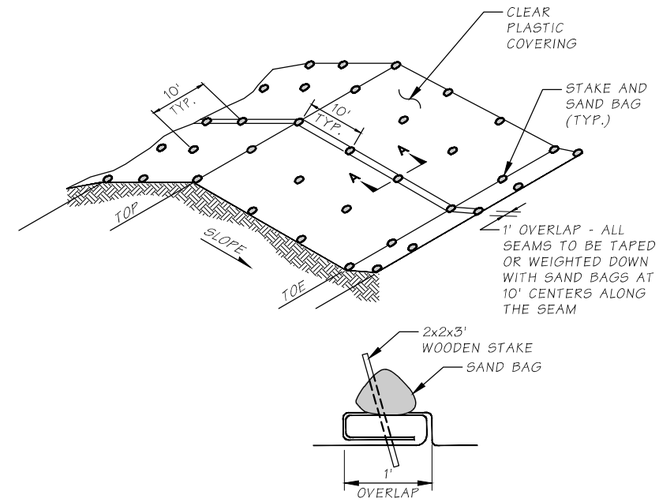
OUTLET

NOTES:

1. RIPRAP SHALL BE IN ACCORDANCE WITH WSDOT STD SPEC. 9-13.1.
2. GRADATION SHALL MEET WSDOT STD SPEC. 9-13.6.

RIPRAP PAD DETAIL (B)

SCALE: NTS — C4.1 & C4.5



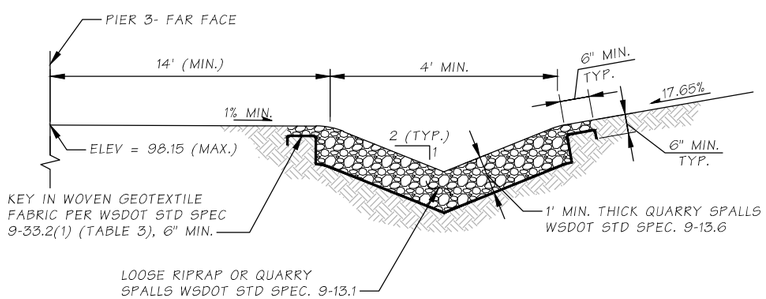
SECTION A-A

PLASTIC COVERING (C)

SCALE: NTS — --

PLASTIC COVERING NOTES

1. PLASTIC SHEETING SHALL HAVE A MINIMUM THICKNESS OF 6 MILS AND SHALL MEET THE REQUIREMENTS OF WSDOT STANDARD SPECIFICATION SECTION 9-14.5(3).
2. COVERING SHALL BE INSTALLED AND MAINTAINED TIGHTLY IN PLACE BY USING SANDBAGS ON ROPES WITH A MAXIMUM 10-FOOT GRID SPACING IN ALL DIRECTIONS. ALL SEAMS SHALL BE TAPED OR WEIGHTED DOWN FULL LENGTH AND THERE SHALL BE AT LEAST A 12 INCH OVERLAP OF ALL SEAMS.
3. WHEN THE COVERING IS USED ON UN-SEEDED SLOPES, IT SHALL BE KEPT IN PLACE UNTIL THE NEXT SEEDING PERIOD.
4. PLASTIC COVERING SHEETS SHALL BE BURIED TWO FEET AT THE TOP OF SLOPES IN ORDER TO PREVENT SURFACE WATER FLOW BENEATH SHEETS.
5. PROPER MAINTENANCE INCLUDES REGULAR CHECKS FOR RIPS AND DISLODGED ENDS. ENSURE SHEETING IS SECURE AT TOE AND OVERLAPS.



INTERCEPTOR DITCH (D)

SCALE: NTS — C4.2, C4.3

FILE NAME	Q:\FederalWay\2012\FAPWT-12-060\CADD\Dwgs\MF_MaintBldg\8066_MF_C_004_07.dwg		
TIME	11:02 AM		
DATE	3/20/12		
PLOTTED BY	Strandberg, Brian		
DESIGNED BY	Bollen, BJ	3/12	
ENTERED BY	Strandberg, BC	3/12	
CHECKED BY	Linden, CE	3/12	
PROJ. ENGR.	Lewis, R	3/12	
REGIONAL ADM.		3/12	

REVISION	DATE	BY

REGION NO.	STATE	FED.AID PROJ.NO.
10	WASH	
JOB NUMBER 8066		
CONTRACT NO.		LOCATION NO.

P.E. STAMP BOX — DATE

P.E. STAMP BOX — DATE

Washington State Department of Transportation

KGM Kelsey/Generale/Mariano, A JOINT VENTURE — kpff — BergerABAM

SR 520
I-5 TO MEDINA - STG. 1 EVERGREEN PT. FLOATING BRIDGE AND LANDINGS
MAINTENANCE FACILITY SITE PREPARATION PLAN

TEMPORARY EROSION CONTROL NOTES & DETAILS

PLAN REF NO C4.7

SHEET 16 OF 36 SHEETS

VOLUME 15 - CIVIL PACKAGE #1 - RFC - 3/26/12

Strandberg, Brian on: 3/24/2012 8:22 AM File: Q:\FederalWay\2012\FAPWT-12-060\CADD\Dwgs\MF_MaintBldg\8066_MF_C_004_07.dwg
SR ___ JOB NO. ___ SHEET ___

RELEASED FOR CONSTRUCTION

GEOENGINEERS

Memorandum

8410 154th Avenue NE, Redmond, WA 98052, Telephone: 425.861.6000, Fax: 425.861.6050

www.geoengineers.com

To:	Kiewit-General-Manson SR 520 Evergreen Point Floating Bridge and Landings Project Design Build Team
From:	Whitney Trent, PE; David Phelps, PE; and Daniel Campbell, PE
Date:	February 9, 2012
File:	0180-267-01
Subject:	SR 520 Maintenance Facility Foundation and Shoring Wall Recommendations

DANIEL J. CAMPBELL STATE OF WASHINGTON 29633 REGISTERED PROFESSIONAL ENGINEER 2/9/12

INTRODUCTION

The purposes of this memorandum are to summarize the subsurface soil and groundwater conditions and to provide conclusions and recommendations related to the geotechnical design parameters for the proposed maintenance facility and associated shoring walls at the SR 520 Evergreen Point Floating Bridge and Landings Project in Medina, Washington. The location of the maintenance facility relative to surrounding physical features is shown on the Vicinity Map, Figure 1. The proposed maintenance facility and bridge configuration are presented on the Site Plan, Figure 2.

The proposed maintenance facility is a three story concrete masonry unit (CMU) and cast-in-place (CIP) structure that will be benched into the existing slope under the new East Approach bridge structures between Piers 2 and 3. Shoring walls will be constructed around the east, north, and south sides of the building to support the adjacent slope. The permanent shoring walls will not be incorporated into the maintenance facility building walls; an approximately 4-foot setback will be maintained around the perimeter of the building. Permanent cantilever soldier pile and soldier pile and tieback walls will support the upslope (east) side, north side, and south side, daylighting to the west. The east shoring wall is tiered; the upper tier supports the hillside for the parking level and the lower tier supports the hillside for the maintenance facility structure. The tiers are offset by approximately 17½ feet.

The proposed maintenance facility is approximately 80 feet in the east-west direction and 130 feet in the north-south direction and will be supported on shallow foundations. The structure will be founded at approximately Elevation +28 feet, with an elevator pit in the northeast corner extending down to about Elevation +25. The upper parking lot will be constructed at approximately Elevation +76.4 feet. The maintenance facility will be accessed via a concrete access road.

SUBSURFACE CONDITIONS

Eleven borings (GEI-1 through GEI-5 and GEI-7 through GEI-12) were recently completed by GeoEngineers along the alignment of the approach bridges; boring GEI-6 was not completed and is not included in this memorandum. In addition, 18 borings were completed near the east approach bridges by Shannon & Wilson and Washington State Department of Transportation (WSDOT) for the RFP phase of the project. The approximate locations of the borings are shown on the Site Plan, Figure 2. Based on our observations from the borings, the subsurface conditions around the maintenance facility and associated shoring walls consist of fill, Holocene colluvial deposits, Vashon recessional lacustrine deposits,

Disclaimer: Any electronic form, facsimile or hard copy of the original document (email, text, table, and/or figure), if provided, and any attachments are only a copy of the original document. The original document is stored by GeoEngineers, Inc. and will serve as the official document of record.

Vashon glacial till, Vashon lacustrine deposits, pre-Vashon glacial outwash, and pre-Vashon lacustrine deposits. Each geologic unit is summarized below.

- **Fill** was observed to be limited to areas near the top of the slope in the vicinity of Pier 3 and was likely placed during the construction of the existing temporary park-and-ride and SR 520 Approach Bridge. The fill was observed to range up to 7 feet thick and generally consists of medium dense sand with variable silt and gravel content.
- **Holocene Colluvial Deposits** were observed at the toe of the slope near Pier 2. We anticipate that Colluvial deposits are also present along the face of the slope between Piers 2 and 3, where the proposed maintenance facility will be notched into the hillside. The colluvial soils were observed to extend about 4-feet below the ground surface where encountered in the borings and generally consist of medium dense silty sand with gravel. The thickness of these deposits may be slightly greater along the slope. These deposits accumulated after the retreat of the last glacial ice sheet and have not been glacially overridden.
- **Vashon Recessional Lacustrine Deposits** were observed below the mudline of Lake Washington near Pier 1. The Vashon recessional lacustrine deposits were observed to range from about 2 to 12 feet thick where encountered in the borings and generally consist of medium stiff to stiff silt and clay. These deposits accumulated during the retreat of the last glacial ice sheet and have not been glacially overridden.
- **Vashon Glacial Till** was observed near the ground surface at the top of the slope near Pier 3. The glacial till deposits were observed to be about 6 to 12 feet thick and generally consist of very dense/hard silty sand and sandy silt with gravel. These deposits have been glacially overridden.
- **Vashon Lacustrine Deposits** were observed below the glacial till near Pier 3. The Vashon lacustrine deposits were observed to range from about 10 to 20 feet thick and generally consist of very dense/hard silty sand with gravel and silt/clay with variable sand and gravel content. These deposits have been glacially overridden.
- **Pre-Vashon Glacial Outwash Deposits** were observed below the Vashon lacustrine deposits near Pier 3. The glacial outwash deposits were observed to range from about 14 to 24 feet thick and generally consist of very dense gravel with variable silt content. These deposits have been glacially overridden.
- **Pre-Vashon Lacustrine Deposits** were observed below the Vashon recessional lacustrine and Pre-Vashon glacial outwash deposits across the bridge alignments. The pre-Vashon lacustrine deposits were observed to extend to the depth explored near Piers 2 and 3 and the maintenance facility, and to approximately Elevation -100 to -110 feet near Pier 1. These deposits have been glacially overridden and generally consist of very stiff to hard silt and clay. Thin interbedded sand layers were observed within the borings and a more substantial 3 to 10-foot thick sand layer was observed between about Elevation -50 and -60 feet.

Profile views showing our interpretation of the generalized subsurface conditions along the alignment of the proposed eastbound and westbound bridges and the northern extent of the maintenance facility are shown in cross-sections A-A', B-B', and C-C' on Figures 3A to 3B, Figures 4A to 4B, and Figure 5, respectively. Transverse cross sections showing our interpretation of the generalized subsurface conditions at the maintenance facility are shown on Figures 6 through 8. Boring logs for explorations completed near the

proposed maintenance facility are presented in Appendix A and the associated laboratory testing results are presented in Appendix B.

The majority of the spread footing foundations at the maintenance facility will be supported on glacially consolidated pre-Vashon Lacustrine deposits. Holocene colluvial deposits and/or recessional deposits may be encountered at footing subgrade elevations along the western portion of the building.

Groundwater

Groundwater is present primarily within the Pre-Vashon Glacial Outwash deposits, which form an aquifer mid-slope on the bluff. This aquifer is located between aquitards formed above by the low-permeability Vashon Lacustrine Deposits, and below by the Pre-Vashon Lacustrine deposits, which create an effective perching horizon for the aquifer.

Groundwater elevations within the Pre-Vashon Outwash Deposits are mostly recorded close to the geologic contact with the overlying Vashon Lacustrine Deposits, indicating the aquifer is fully saturated. Higher water levels recorded in H-114P-09 suggest recharge occurs through the Vashon Lacustrine Deposits, but the relatively flat water levels observed in other monitoring wells, around Elevation +75 feet, suggest there is little or no lateral hydraulic gradient, which would be consistent with the formation pinching out behind the face of the bluff, as indicated in Figures 3B, 4B and 5.

A pumping test conducted for the Pier 3 foundation dewatering established that the hydraulic conductivity of the Pre-Vashon Outwash Deposits is relatively low. Exposure of the formation on the bluff during excavation will encounter low to moderate seepage quantities that may cause sloughing and caving. If the excavation coincides with dewatering for the Pier 3 footing above the maintenance building, this will likely significantly reduce groundwater seepage reaching the cut.

A second body of groundwater is present within the Pre-Vashon Lacustrine Deposits forming the lower portions of the bluff. Groundwater movement within this thick aquitard appears to occur mainly within sand stringers or layers that allow the sub artesian pressures within the bluff, around Elevation +45 feet, to become artesian approaching the toe of the bluff. Recharge of these layers is likely slow and limited to regional aquitard cross-flow or leakage from above, which will maintain artesian pressure below the excavation for the maintenance building. The lower portion of the shoring wall to be constructed behind the maintenance facility will likely exhibit some minor seepage, especially from any sand layers within the formation; these are not expected to be of high permeability and will likely bleed off within a few days.

SOIL PARAMETERS AND METHODS OF ANALYSIS

The soil parameters used in the analyses are based on the conditions observed in the borings, geotechnical laboratory index testing results, research of parameters routinely used by the local geotechnical engineering community for the similar soil conditions, and our professional judgment. The estimated soil parameters for each of the geologic units described in the Subsurface Conditions section of this memorandum are presented in Table 1.

TABLE 1. ESTIMATED SOIL PARAMETERS

Geologic Unit	Unit Weight, γ (pcf)	Friction Angle, ϕ (degrees)	Cohesion, C (psf)	Young's Modulus, E (ksf)	Poisson's Ratio, υ
Proposed Fill	130	36	0	-	-
Existing Fill	125	34	0	-	-
Colluvial Deposits	125	34	0	-	-
Vashon Recessional Lacustrine	125	0	2,000	-	-
Vashon Glacial Till	135	40	250	-	-
Vashon Lacustrine (Drained)	125	34	500	-	-
Vashon Lacustrine (Undrained)	125	0	5000	-	-
Pre-Vashon Glacial Outwash	130	40	50	4,000	0.30
Pre-Vashon Lacustrine (Drained)	125	34	250	2,000	0.35
Pre-Vashon Lacustrine (Undrained)	125	0	4000	2,000	0.35

The engineering analyses to develop the bearing capacities for the foundations were completed using a spreadsheet developed by GeoEngineers (based on the AASHTO 2010 LRFD Bridge Design Manual methodology). The earth pressure design parameters were also estimated using a spreadsheet developed by GeoEngineers (based on Rankine and Mohr-Coulomb earth pressure theory). Global stability analyses were completed using the commercial computer design/analysis software package SLOPE/W in conjunction with SEEP/W, both distributed by Geo-Slope International.

CONCLUSIONS AND RECOMMENDATIONS

Earthquake Engineering

Design Parameters

MAINTENANCE FACILITY

The seismic design of the maintenance facility should be completed using the design criteria presented in Section 1613 of the 2009 International Building Code (IBC) and in accordance with the Chapter 21 of the American Society of Civil Engineers (ASCE) 7-05. The acceleration coefficients for design are based on the expected ground motion at the project site that has a 2 percent probability of exceedance in a 50-year period (approximate 2,475-year return period). Our recommended IBC design parameters are summarized in Table 2. Our recommended IBC design response spectrum for the maintenance facility is presented on Figure 9. Based on these values, our recommended PGA for design of the maintenance facility is 0.35g.

TABLE 2. 2009 IBC SEISMIC DESIGN PARAMETERS

2009 IBC Parameter	Recommended Value
Site Class	D
Spectral acceleration for short periods, S_S (g)	1.32
Spectral acceleration for a 1-second periods, S_1 (g)	0.45
Site coefficient, F_a	1.00
Site coefficient, F_v	1.55

SHORING WALLS

The seismic design of the supporting shoring walls should be completed using the design criteria presented in the WSDOT Geotechnical Design Manual (GDM), AASHTO specifications, and site-specific probabilistic seismic hazard (PSHA) analysis results completed during the RFP process (Shannon & Wilson, 2009). The acceleration coefficients for design are based on the expected ground motion at the project site that has a 7 percent probability of exceedance in a 75-year period (approximate 1,000-year return period).

Based on the soil conditions encountered in the borings along the proposed shoring walls, it is our opinion that Site Class D is appropriate for design. A peak ground acceleration (PGA) of 0.52g was estimated for Site Class D soils based on the results of the 2009 PSHA. The results of the 2009 PSHA and our recommended design spectrum are presented as Figure 10 and are summarized in Table 3.

TABLE 3. AASHTO SEISMIC PARAMETERS

AASHTO Seismic Parameter	Recommended Value
Site Class	D
PGA x F_{pga} (g)	0.52
S_{DS} (g)	1.34
S_{D1} (g)	0.93

Liquefaction Potential

Liquefaction is a phenomenon where soils experience a rapid loss of internal strength as a consequence of strong ground shaking. Ground settlement, lateral spreading and/or sand boils may result from liquefaction. Structures supported on liquefiable soils could suffer foundation settlement or lateral movement that could be severely damaging to the structures.

Conditions favorable to liquefaction typically occur in loose to medium dense, clean to moderately silty sand that is below the groundwater level. Based on our evaluation of the subsurface conditions at the site, we conclude that the soils located within the vicinity of the proposed maintenance facility and associated shoring walls have a low potential for liquefaction during a design earthquake event.

Ground Rupture

Historically, the engineering community has considered I-90 as the approximate northern extent of the Seattle Fault Zone, and recent studies suggest strands of the fault may be located as far south as the Newcastle area. Given the distance to the closest inferred projection of the fault (approximately 4 miles), the thickness of glacially consolidated soils above the fault (approximately 1,500 feet) and the infrequent

recurrence interval (thought to be on the order of 1,000 years), it is our opinion the probability of a damaging fault rupture along the alignment of the bridges is low and does not warrant specific design consideration.

Concrete Access Road

Section 2.7.4.4 of the RFP Technical Requirements requires the Maintenance Facility Access Road and Parking Area pavement consist of:

- 0.67 feet of PCCP without dowel bars
- 0.35 feet of CSBC
- 1.02 feet total

We anticipate the pavement subgrade will generally consist of medium dense to dense or stiff to hard native material in a firm and unyielding condition or compacted structural fill extending to these materials. Acceptable structural fill materials and compaction methods are summarized in the "Earthwork and Structural Fill" section of this memorandum.

The grade of the western 350 feet of the concrete pavement access road will be near that of the anticipated groundwater level in the area. Therefore, an underdrain system may be required below the pavement section. The need for a pavement underdrain system should be determined at the time of construction based on the actual conditions encountered. For planning purposes, we recommend an approximately 350-foot-long lateral underdrain be constructed below the north side of the access road. Consistent with Figure 6-9.1 of the WSDOT Hydraulics Manual, the underdrain system should consist of a 4-inch-diameter perforated PVC pipe (WSDOT Standard Specification 9-05.2(6)) placed within a 12-inch by 12-inch trench and enveloped with Gravel Backfill for Drains (WSDOT Standard Specification 9-03.12(4)). The top of the underdrain trench should be hydraulically connected to the CSBC layer below the concrete pavement.

Construction of the access road will require retaining walls along the north and south extents of the roadway. The design of these walls is currently underway and will be addressed in a future companion memorandum.

Excavation Support

We understand the existing hillside east of and adjacent to the maintenance facility will be supported by permanent shoring walls to the north, south, and east of the building. The east shoring wall will be a tiered system with a 17.5 feet offset between the two walls to facilitate construction access. The upper shoring wall will support the west and south extents of the parking lot (Elevation +76.4 feet). The west portion of the wall increases in height from north to south with a maximum wall height of approximately 18 feet. The upper shoring wall will turn to the east and wrap around the south side of the parking lot, decreasing in height from west to east with a maximum wall height of 18 feet. After construction of the upper shoring wall the parking area will be graded to Elevation +76.4 feet. This will require placement of new fill in the southwest portion of the parking lot. Acceptable structural fill materials and compaction methods are summarized in the "Earthwork and Structural Fill" section of this memorandum. The lower east shoring wall will support the hillside for construction of the maintenance facility. The top of the lower east wall will follow the access road grade (about Elevation +76 feet at the north end and Elevation +58 feet at the south end); the bottom of the wall extends down to the maintenance facility footing subgrade elevation at about Elevation +28 feet, with a maximum wall height of approximately 48 feet.

The north and south shoring walls will support the hillside for construction of the maintenance facility. The walls will extend down to the maintenance facility subgrade at about Elevation +28 feet, except near the northeast corner, which extends down to Elevation +25 feet for the elevator shaft. Both the north and south walls will decrease in height with the natural slope as it descends to the west. Maximum wall heights for the north and south wall are approximately 48 feet and 30 feet, respectively.

Cantilever soldier pile and soldier pile and tieback walls are the preferred shoring alternative for excavation support based on discussions with the project team. The west and south parking lot walls (upper east wall) will be supported primarily with a cantilever soldier pile wall; a 23-foot section at the north end of the wall will be supported by a CIP gravity wall. The lower east and north shoring walls will be supported with a soldier pile and tieback wall. The south shoring wall will be supported with a soldier pile and tieback wall at its maximum height and will transition to a cantilever soldier pile wall as the wall height decreases. The planned shoring walls will be permanent. Design information and recommendation for the shoring walls are provided in the following sections.

Excavation Considerations

The site soils may be excavated with conventional excavation equipment, such as trackhoes or dozers. It may be necessary to rip the glacially consolidated soils locally to facilitate excavation. The contractor should be prepared for occasional cobbles and boulders in the site soils, particularly within the glacial till and outwash deposits.

Soldier Pile and Tieback Walls

Soldier pile walls consist of steel beams that are concreted into drilled vertical holes located along the wall alignment, typically 8 feet on center. After excavation to specified elevations, tiebacks are installed, if necessary. Once the tiebacks are installed, the pullout capacity of each tieback is tested, and the tieback is locked-off to the soldier pile at or near the design tieback load. Tiebacks typically consist of steel strands that are installed into pre-drilled holes and then either tremied or pressure grouted. Temporary timber lagging is typically installed behind the flanges of the steel beams to retain the soil located between the soldier piles. Permanent shotcrete or CIP fascia panels are designed to retain the soil load for the permanent condition.

SOLDIER PILES

We recommend that soldier pile walls be designed using the earth pressure diagrams presented in Figures 11 through 13. The earth pressures presented in Figures 11 through 13 apply to CIP gravity walls, full-height cantilever soldier pile walls, and full-height soldier pile walls with a single level or multiple levels of tiebacks, as specified on the figures. These figures present the active and passive pressures with the appropriate resistance factors as well as information related to how the earth pressures should be applied.

The seismic earth pressures are based on the Mononobe-Okabe method set forth in the AASHTO LRFD Bridge Design Manual and recommended in Section 15.4.29 of the WSDOT GDM. The incremental seismic earth pressure depicted on the figure is based on an assumed PGA of 0.52g determined as described in the Earthquake Engineering section above.

The earth pressure diagrams assume drained conditions immediately behind the walls. The groundwater observations from the borings and piezometers suggest the groundwater is currently situated at or above the shoring wall elevations. The shoring wall designs shall include permanent drainage systems to prevent

hydrostatic pressures from building up behind the wall. Drainage is discussed in more detail in the following sections.

The nominal passive resistance may be computed using the unfactored (nominal) passive pressures shown on the attached earth pressure diagrams, Figures 11 through 13. The appropriate resistance factors for passive resistance are shown in Table 4 and on the figures.

TABLE 4. LRFD REDUCTION FACTORS FOR PASSIVE RESISTANCE

Limit State	Passive Resistance
Strength	0.75
Service	1.0
Extreme	0.9

We recommend that the embedded portion of the soldier piles be at least 2.5 feet in diameter and extend a minimum distance of 10 feet below the base of the excavation to resist "kick-out" and act as a shear key to resist deep seated landslides. The axial capacity of the soldier piles must resist the downward component of the anchor loads and other vertical loads, as appropriate. The axial compression capacity of the solider piles for the various load states can be estimated using the capacity chart presented as Figure 14. The data points associated with this plot are attached as Tables 5.

TABLE 5. AXIAL COMPRESSION CAPACITY OF SHORING WALL SOLDIER PILES

Elevation (feet)	Depth (feet)	Total Service Capacity for 2.5-foot-diameter Drilled Shaft (kips)		
		Service Limit State (1-inch Settlement)	Strength Limit State	Extreme Limit State
25	0	150	70	180
20	5	200	110	260
15	10	260	140	340
10	15	310	180	420
5	20	370	220	500

We recommend that the embedded portion of the soldier pile hole drilled below the excavation be backfilled with structural concrete. Care should be taken to make sure the loose soil is removed from the bottom of the soldier pile excavations prior to the installation of the soldier pile or concrete because loose soil left in the bottom of the hole could lead to undesirable settlement of the soldier pile.

LAGGING

We recommend the use of temporary timber lagging for the shoring walls, with either a shotcrete face or a concrete face cast directly against the lagging for permanent support. We recommend the temporary timber lagging be sized using the procedures outlined in the Federal Highway Administration's Geotechnical Engineering Circular No. 4. The site soils are best described as competent soils. Table 6 presents recommended lagging thicknesses (roughcut) as a function of soldier pile clear span and depth. These values are consistent with Section 6-16.3(6)B of the 2010 WSDOT Standard Specifications for Soil Type 1.

TABLE 6. RECOMMENDED TEMPORARY LAGGING THICKNESS

Depth (feet)	Recommended Lagging Thickness (roughcut) 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 50	3 inches	3 inches	3 inches	4 inches	4 inches	5 inches

Lagging should be installed promptly after excavation, especially in areas where perched groundwater or seepage is present or where clean sand and gravel soils are present and caving soil conditions are likely. The workmanship associated with lagging installation is important for maintaining the integrity of the excavation.

The earth pressure diagrams presented in Figures 11 through 13 can be used to design the permanent facing for the soldier pile walls. However, in consideration of the soil arching anticipated between the soldier piles, we recommend a moment reduction factor of 0.5 be applied to the bending moments calculated using the earth pressure diagrams. The lagging or facing span length should be assumed to be equivalent to the soldier pile spacing.

The space behind the temporary timber lagging should be backfilled as soon as practicable. Material used as backfill in voids situated behind the lagging should not cause buildup of hydrostatic pressure behind the wall. Pea gravel or sand slurry can be used to backfill voids if they develop behind the wall. Lean concrete may be used as backfill behind the wall in areas where excessive caving is observed. Based on our experience, the voids between each lean concrete lift are sufficient for preventing the buildup of hydrostatic pressure behind the wall.

TIEBACKS

Tieback anchors can be used for wall heights where cantilever soldier pile walls are not cost-effective. Tieback anchors should extend sufficiently far behind the wall to develop anchorage beyond the “no-load” zone and within a stable soil mass; the recommended no-load zone is depicted on Figures 11 through 13. Permanent tieback anchors require a minimum bonded length of 8 feet. The anchors should be inclined downward at 15 degrees below the horizontal. Corrosion protection will be required for the permanent tiebacks.

Centralizers or similar techniques should be used to keep the tieback in the center of the hole during grouting. Structural grout or concrete should be used to fill the bond zone of the tiebacks. A bond breaker, such as plastic sheathing, should be placed around the portion of the tieback located within the no-load zone.

Loose soil and slough should be removed from the holes drilled for tieback anchors prior to installing the tieback. The contractor should take necessary precautions to minimize loss of ground and prevent disturbance to previously installed anchors and existing improvements in the site vicinity. Holes drilled for tiebacks should be grouted and/or filled promptly to reduce the potential for loss of ground.

We recommend a nominal (unfactored) adhesion value between the anchor and soil of 2.5 ksf with the assumption that the anchors will be post grouted.

All tieback anchors should be proof-tested, except for anchors that are performance tested, to confirm that the tiebacks have adequate pullout capacity. A minimum of 5 percent of the wall's tiebacks should be performance tested. The pullout resistance of tiebacks should be designed using the LRFD reduction factors shown on the earth pressure diagrams. These reduction factors are summarized in Table 7.

TABLE 7. LRFD REDUCTION FACTORS FOR TIEBACK ANCHORS

Limit State	Pullout Resistance of Anchors
Strength	1.0
Service	1.0
Extreme	1.0

The pullout resistance should be verified by completing at least two successful verification tests in each soil type. We anticipate the bonded zone of permanent anchors will be situated primarily within lacustrine silt and clay soils. Thus, for planning purposes two verification tests are expected. The actual number of verification tests completed for this project will be adjusted during construction by GeoEngineers' field representative based on the prevailing conditions observed during mass excavation. If equipment changes are made or the installation technique is modified, additional verification tests will be required. Each tieback should be proof-tested or performance tested to 115 percent of the design load. Performance, proof, and verification tests should be completed as described in Appendix C, "Ground Anchor Load Tests and Shoring Monitoring Program."

DRAINAGE

The temporary dewatering system at Pier 3, consisting of either dewatering wells or vacuum wellpoints, will drawdown the water in the Pre-Vashon glacial outwash, reducing seepage at the face of the upper parking lot and maintenance facility shoring walls during construction. This will increase stability at the face of the walls and reduce the potential for caving during anchor installation, provided the Pier 3 temporary dewatering system remains operational throughout the shoring wall excavation. Detailed information regarding the Pier 3 dewatering system is presented in a companion memorandum dated January 6, 2012.

Permanent drainage will be provided with a vertical spacing of approximately ⅛- to ¼-inch between adjacent lagging timbers. In addition, strips of drainage composite material should be placed vertically between the solider piles and horizontally at the base of the shoring walls. The drainage composite material should consist of Mirafi G100, Ameridrain 500, or equivalent. Vertical drainage strips should be a minimum of 16 inches wide and horizontal drainage strips at the base of the walls should be a minimum of 36 inches wide. The drainage strips will connect into the perimeter drains along the north, east, and south walls.

CONSTRUCTION CONSIDERATIONS

Temporary casing or drilling fluid may be required to install the soldier piles where:

- Loose fill or colluvium is present (we anticipate that these soils will be encountered along the face of the slope and in areas of previous grading, as depicted on our cross-sections, Figure 3A through Figure 8);
- The native soils do not have adequate cementation or cohesion to prevent caving or raveling; and/or
- The soldier pile extends below perched or static groundwater levels.

If standing groundwater or drilling fluid is present in drilled holes, grout must be placed using the tremmie method. GeoEngineers should observe and document the installation and testing of the shoring components to verify conformance with the design assumptions and recommendations.

West Building Wall

Maintenance Facility

The west building of the maintenance facility will support an earthen berm along the west face. The maximum berm height along this wall is approximately 20 feet. An earth pressure diagram for the design of the west building wall is presented on Figure 15. This figure presents the at-rest, active, and passive pressures as well as information related to how the earth pressures should be applied. The lateral earth pressures on shallow foundations may also be resisted by friction on the base of the footings. For footings supported on glacially consolidated soils, the ultimate frictional resistance may be computed using a coefficient of friction of 0.60 applied to vertical dead-load forces. If unsuitable (colluvial) soils are exposed at the footing subgrade these materials should be removed and replaced as described in the "Subgrade Preparation" and "Subgrade Protection" sections of this memorandum.

It is our understanding that the west building wall will be designed for the at-rest condition. Based on discussions with the structural team, we understand the west wall will engage the building frame resulting in a relatively rigid wall. Thus the wall will not be able to deflect sufficiently to develop lower active earth pressures.

The seismic earth pressures are based on the Mononobe-Okabe method recommended in Section 15.4.29 of the WSDOT GDM. The incremental seismic earth pressure depicted on the figure is based on an assumed PGA of 0.35g determined as described in the Earthquake Engineering section above.

The earth pressure diagram assumes drained conditions immediately behind the wall. The groundwater observations from the borings and piezometers suggest the groundwater is generally at or above the footing elevations. The west wall design should include a permanent drainage system to prevent hydrostatic pressures from building up behind the wall. The system should maintain the groundwater level below the lowest finish grade elevation in front of the wall.

Shallow Foundations

General

We understand the proposed maintenance facility will be supported on shallow foundations. Based on the soil conditions observed during the field exploration program, it is our opinion that shallow foundations are feasible for support of the structure. The shallow foundations for the building may be constructed on either the native glacially consolidated soils or on structural fill that extends down to the glacially consolidated soils. The design footing subgrade elevations provided by the structural engineer are summarized in Table 8.

TABLE 8. ELEVATION OF GLACIALLY CONSOLIDATED SOILS

Foundation Location	Proposed Footing Subgrade Elevation (feet)
Interior Spread Footings	28
Continuous Footings	28.5
Elevator Pit Mat Foundation	25

At the western extent of the building footprint some removal and replacement of loose soils (Holocene colluvial or Vashon recessional deposits) is anticipated to be required. In this area foundations are anticipated to bear at Elevation +28 to +28.5 feet. For planning purposes, we anticipate that up to 3 feet of soil should be planned to be removed and replaced as described in the "Subgrade Preparation" and "Subgrade Protection" sections of this memorandum.

Allowable Bearing Capacity

We understand the foundations for the maintenance facility are currently sized as 8-foot by 8-foot shallow spread footings and 4-foot to 8-foot-wide continuous footings. Where the subgrade has been prepared per our recommendations, the shallow foundations may be designed using the allowable bearing pressures presented on Figures 16 and 17. The data points associated with each plot are summarized in Tables 9 and 10. The figures and tables provide allowable bearing capacity for the combination of dead and long-term live loads. Bearing pressures may be increased by one-third to account for short term live loads such as those induced by wind or seismic forces.

The widths referenced in Figures 16 and 17 are effective widths and should be corrected for eccentric loading conditions by the following equation:

$$B' = B - 2e_y$$

Where:

B' is the effective footing width

B is the actual footing width

e_Y is the eccentricity along the footing width

The eccentricity is measured from the center of the footing to the location of the resultant reaction force along the length of the footing (x-axis) and the width of the footing (y-axis). Refer to chapter 8.11 of the WSDOT GDM for additional information regarding eccentricity.

TABLE 9. CONTINUOUS FOOTING BEARING CAPACITY

Effective Width, B' (feet)	Bearing Capacity for Continuous Footing (ksf)	
	Allowable	Short-Term Live Load (Seismic)
2	5.6	7.5
4	6.5	8.7
6	7.4	9.9
8	8.0	10.7

Effective Width, B' (feet)	Bearing Capacity for Continuous Footing (ksf)	
	Allowable	Short-Term Live Load (Seismic)
10	7.2	9.6
12	6.5	8.7
14	6.0	7.9
16	5.4	7.2
18	5.0	6.6
20	4.66	6.2
22	4.4	5.8

Notes:
1. Bearing pressures are for footings bearing at Elevation +28.5 feet or deeper.
2. If unsuitable soils are encountered at the footing subgrade elevation they must be removed and replaced with adequately compacted structural fill, lean concrete, or controlled density fill.
3. Bearing capacities are for effective lengths and widths and should be corrected for eccentric loading conditions.

TABLE 10. SQUARE SPREAD FOOTING BEARING CAPACITY

Effective Width, B' (feet)	Bearing Capacity for Continuous Footing (ksf)	
	Allowable	Short-Term Live Load (Seismic)
2	8.5	11.4
4	9.1	12.1
6	9.6	12.8
8	10.1	13.4
10	10.6	14.1
12	11.1	14.8
14	11.6	15.5
16	12.1	16.2
18	11.0	14.7
20	9.9	13.2
22	9.0	12.0

Notes:
1. Bearing pressures are for footings bearing at Elevation +28.5 feet or deeper.
2. If unsuitable soils are encountered at the footing subgrade elevation they must be removed and replaced with adequately compacted structural fill, lean concrete, or control density fill.
3. Bearing capacities are for effective lengths and widths and should be corrected for eccentric loading conditions.

Modulus of Subgrade Reaction for Mat Foundations

We understand that the elevator pit will be supported on a mat foundation bearing at approximately Elevation +25 feet. A modulus of subgrade reaction of 70 pounds per cubic inch (pci) is recommended for design of the building's elevator pit mat foundation. This value assumes the mat foundation is placed directly over firm/dense native soils or structural fill placed directly above the firm/dense native soils.

Lateral Resistance of Shallow Foundations

The lateral forces on shallow foundations may be resisted by passive resistance on the sides of footings and by friction on the base of the footings. The values for passive resistance and coefficient of friction presented on Figure 15 are appropriate for evaluating the lateral resistance of the maintenance facility foundations. For footings supported on glacially consolidated soils, the ultimate frictional resistance may be computed using a coefficient of friction of 0.60 applied to vertical dead-load forces. If unsuitable soils (Holocene colluvial or Vashon recessional deposits) are exposed at the footing subgrade these materials should be removed and replaced as described in the "Subgrade Preparation" and "Subgrade Protection" sections of this memorandum. The passive pressure resistance can be estimated using an equivalent fluid density of 290 pcf. This value assumes the soil adjacent to the sides of the footings consists of native glacial soil or engineered fill for a horizontal distance of at least three times the footing depth.

Construction Considerations

The fine-grained soils anticipated at the footing subgrade will be susceptible to disturbance when wet. These soils should be protected as described in the "Subgrade Protection" section of the memorandum.

Drainage

TEMPORARY DEWATERING

Excavation for the maintenance facility will occur below the potentiometric surface recorded in monitoring wells and VWPs installed within the bluff. These indicate water levels around Elevation +45 feet, which will represent an excess artesian head of around 20 feet above the foundation subgrade elevation (approximately 25 to 28.5 feet).

A dewatering analysis was performed to assess the potential impact of artesian pressures in the subgrade soils, and to estimate the appropriate level of dewatering effort required to reduce artesian pressures in the Pre-Vashon Lacustrine Deposits forming the subgrade soils for the maintenance facility. Unloading of the slope face during excavation, resulting in elastic rebound, is expected to cause some reduction in excess pore pressures within the subgrade; however, this will likely only be temporary. Therefore, we recommended that dewatering wells be installed and pumped in advance of the excavation to lower artesian pressures and prevent problems such as heave, uplift and softening of the exposed subgrade.

The dewatering analysis was performed assuming a variety of aquifer properties to represent sand stringers or layers containing groundwater within the low-permeability lacustrine soils forming the foundation subgrade. Sand stringers were simulated with moderate hydraulic conductivity (between 10^{-4} and 10^{-3} cm/s) and limited thicknesses (1 to 3 feet) using a confined leaky aquifer analytical drawdown model with superposition to represent the coalescence of cones of depression formed by pumping from adjacent wells. It was found that a layout of four dewatering wells, each located near a corner of the facility, pumped at moderate flow rates ranging from 1 to 2 gallons per minute (gpm) each would create sufficient drawdown of 20 feet or more across the foundation area.

The four dewatering wells, one near each corner of the pad to depressurize the subgrade, need to penetrate to at least Elevation 0 ft or below, resulting in well depths of between 30 and 70 feet from original ground surface. Completed wells should be a minimum 6 inches in diameter with 20-foot-long wellscreens. We estimate discharge rates of between 1 and 2 gpm. Dewatering wells can be turned off and

decommissioned once the floor slab has been cast, with the underslab drainage layer (described below) protecting the slab and structure against uplift.

PERIMETER FOOTING DRAINS

Positive drainage should be provided for all perimeter foundation elements. The drainage for perimeter foundations constructed using CIP techniques should consist of a minimum 2-foot-wide zone of Gravel Backfill for Pipe Zone Bedding, WSDOT Standard Specification 9-03.12(3), with the exception that the percent passing the U.S. No. 200 sieve is to be less than 3 percent. A perforated or slotted drainpipe should be placed near the base of the perimeter footing to provide drainage. The drainpipe should be surrounded by a minimum of 6 inches of Gravel Backfill for Drains, WSDOT Standard Specification 9-03.12(5), or an alternative approved by GeoEngineers. The Gravel Backfill for Drains material should be wrapped with a geotextile filter fabric meeting the requirements of construction geotextile for underground drainage, WSDOT Standard Specification 9-33. The footing drain should be connected to a header pipe and routed to a sump or gravity drain. Appropriate cleanouts for drainpipe maintenance should be installed. A larger-diameter pipe will allow for easier maintenance of drainage systems.

It may be feasible to combine the perimeter drainage system around the north, south and east sides of the maintenance facility with the drainage system for the shoring walls because the building walls and shoring walls will only be offset about 4 feet.

UNDERSLAB DRAINAGE

The artesian groundwater level is currently above the proposed footing elevations. For long-term groundwater drainage, we recommend that an underslab drainage system be installed. The underslab drainage system should consist of at least 12 inches of 1.5-inch minus clean crushed gravel with negligible sand or silt (Section 9-03.1(4)C, grading No. 57 of the WSDOT Standard Specifications), or an alternative approved by GeoEngineers. The underslab drainage material should be placed between spread footings but should not be placed below these foundation elements. The underslab drainage material should be underlain by a geotextile filter fabric meeting the requirements of construction geotextile for underground drainage, WSDOT Standard Specification 9-33, Tables 1 and 2.

A series of minimum 4-inch-diameter perforated pipes should be placed at the base of the gravel and should be spaced 20 foot on center. The drainage pipes should be similar to those described above. The drainage pipe should be either machine slotted or perforated. The slots should be a maximum of ⅛-inch-wide with four slots per inch and extend the lower 60-degree perimeter of the pipe. Perforated pipe should have two rows of ⅛-inch holes spaced 120 degrees apart and at 4 inches on-center. The underslab drainage system pipes should be connected to a header pipe and routed to a sump or gravity drain.

A vapor barrier may be installed below the slab for portions of the lower level consisting of occupied space or rooms with moisture-sensitive floor coverings. This vapor barrier should be placed on top of the underslab drainage system, but should not be placed below the foundation elements. The underslab drainage system will be placed between foundation elements up to the top of footing elevation (Elevation +30 feet). The vapor barrier should be placed above the underslab drainage layer and below the finished floor slab.

The underslab drainage system will be constructed at approximately Elevation +28.5 feet. We understand that the elevator pit will extend below the understand drainage system. This portion of the building should be designed considering buoyant forces.

PERMANENT DISCHARGE TO LAKE WASHINGTON

We estimate the permanent drainage system for the shoring walls, perimeter footing drains, and underslab drainage will produce approximately 20 to 40 gpm when the steady-state condition has been reached. The collected water will be discharged toward Lake Washington via the groundwater treatment and stormwater infiltration system at the lake shoreline.

The proposed permanent drainage system at the maintenance facility has less of an impact on the groundwater flow to Lake Washington than the RFP concept design. During the design process, the maintenance facility has moved further west, resulting in shallower cuts into the existing slope. This will have a lesser impact on the artesian groundwater conditions than the layout proposed in the RFP. Additionally, the perched water drained from the Pre-Vashon glacial outwash deposits and colluvial deposits will be collected in the shoring wall drainage system and reinfiltrated at the lake shoreline, essentially augmenting the flow to Lake Washington.

Global Stability

In order to more accurately model the complex groundwater conditions (static and artesian groundwater regimes along with multiple permanent drainage systems), we developed a finite element model using SEEP/W which was incorporated into our global stability analysis. Sections along the north, south, east, and west portions of the building (B-B', C-C' and E-E') were evaluated. Constant head boundary conditions were used at the edges of the model domain to simulate the groundwater conditions observed in the borings and monitoring wells. Lake Washington was assumed to be at Elevation +18 feet for the analyses. A boundary condition was applied along the bottom western half of the model to simulate the artesian pressure observed in the monitoring wells in our north and south sections. Artesian pressure was modeled in our west and east section below the maintenance facility excavation. The parameters assigned to each geologic unit are shown on the results of the SEEP/W analysis, Figures 18 through 21, which show the calculated total groundwater head. Low hydraulic conductivity ratios (vertical to horizontal) were assigned to the pre-Vashon lacustrine deposits to simulate the horizontal thin sand layers interbedded within the lower permeable silt and clay soils.

The global stability was evaluated using SLOPE/W and the pore water pressure distribution developed from the SEEP/W model at the following locations:

- Behind Pier 3 extending to the bottom of the maintenance facility excavation, and
- Overall stability behind the north and south shoring walls.

The GDM requires a minimum factor of safety of 1.5 for static conditions, 1.25 for temporary conditions, and 1.1 for seismic conditions for slopes supporting bridge foundations and walls supporting bridge abutments.

The global stability of the interim condition at the upper parking lot South shoring wall (where the slope has been cut to install Pier 3 and the upper parking lot South shoring wall) was not specifically evaluated using SLOPE/W because the final configuration (with the toe of the slope cut out for the maintenance facility East shoring wall) is a more critical case by visual inspection. Internal stability of the North, South, and East shoring walls were not evaluated using SLOPE/W because the internal stability is taken into account in the design of the walls.

Calculation of k_h Parameter

For evaluation of the seismic stability, typically a k_h value of 0.5 times the PGA is used in a pseudo-static analysis. WSDOT recognizes that when evaluating the stability of tall slopes this k_h value is conservative and allows for further reductions based on the approach outlined in Section 8.3.1 of the National Cooperative Highway Research Program (NCHRP) Report 611. The normalized spectral shape for our site best matches the NCHRP Upper Bound (UB) Spectral Shape. Accordingly, the site PGA may be reduced in accordance with Figure 6-13 in NCHRP and as further described in our Calculations Package. The design k_h values used in our slope stability analyses are presented in Table 11.

TABLE 11. DESIGN K_H VALUES

Figure Number	Location	Section	Slope Height (feet)	α	Design k_h (g)
22, 23, 30 - 33	Pier 3 Abutment to Maintenance Facility Cut (Location 1)	C-C'	85	0.83	0.22
24, 25, 34 - 37	Pier 3 Abutment to Maintenance Facility Cut (Location 2)	B-B'	85	0.83	0.22
26, 27, 38 - 41	North Shoring Wall Cut	E-E'	90	0.82	0.21
28, 29, 42 - 45	South Shoring Wall Cut	E-E'	31	0.92	0.24

Analysis Results

The results of the stability analyses are presented in Table 12 and on Figures 20 through 31. We evaluated the permanent and temporary condition for both circular and block failure mechanisms. The temporary condition evaluated the stability of the slope prior to the construction of Pier 2 and the Maintenance Facility. The case with the minimum factor of safety for the temporary condition is presented in Table 12 and on Figures 22 through 27. The case with the minimum factor of safety for the permanent condition is presented in Table 13 and on Figures 30 through 45. Surcharges, such as traffic and foundation loads, were included in the analyses as appropriate; live loads, such as traffic surcharges, were not included in the pseudo-static seismic analyses. It should be noted that to achieve the target static safety factor for potential failure surfaces, the soldier piles for the planned tied-back shoring walls associated with the maintenance facility need to be embedded at least 10 feet below the base of the excavation.

TABLE 12. RESULTS OF SLOPE STABILITY EVALUATION – TEMPORARY CONDITION

Figure Number	Location	Section	Temporary Factor of Safety
22, 23	Pier 3 Abutment to Maintenance Facility Cut (Location 1)	C-C'	1.34
24, 25	Pier 3 Abutment to Maintenance Facility Cut (Location 2)	B-B'	1.34
26, 27	North Shoring Wall Cut	E-E'	1.37
28, 29	South Shoring Wall Cut	E-E'	1.35

TABLE 13. RESULTS OF SLOPE STABILITY EVALUATION – PERMANENT CONDITION

Figure Number	Location	Section	Static Factor of Safety	Pseudo-Static Factor of Safety
30 - 33	Pier 3 Abutment to Maintenance Facility Cut (Location 1)	C-C'	1.53	> 1.1
34 - 37	Pier 3 Abutment to Maintenance Facility Cut (Location 2)	B-B'	1.50	> 1.1
38 - 41	North Shoring Wall Cut	E-E'	1.64	> 1.1
42 - 45	South Shoring Wall Cut	E-E'	1.53	> 1.1

Excavation Considerations

Temporary Soil Cut Slopes

Temporary cut slopes may be utilized around the site during construction, where feasible. We recommend that temporary cut slopes be inclined in accordance with the Occupational Safety and Health Administration (OSHA) Technical Manual (OTM). Based on OSHA classification, the site soils are characterized as Type A, Type B, and Type C soils. Thus, we recommend that temporary cut slopes be no steeper than 0.75H:1V in the unsaturated glacial till and Vashon lacustrine soils (Type A), no steeper than 1H:1V in pre-Vashon glacial outwash and pre-Vashon lacustrine soils (Type B) and no steeper than 1½H:1V (horizontal:vertical) in fill, colluvial and recessional deposits (Type C). These cut slope recommendations apply to fully dewatered conditions. Flatter slopes may be necessary if seepage is present on the cut face or if localized sloughing occurs. For open cuts at the site we recommend:

- No traffic, construction equipment, stockpiles or building supplies be allowed at the top of the cut slopes within a distance of at least 5 feet from the top of the cut.
- Exposed soil along the slope be protected from surface erosion using waterproof tarps or visqueen.
- Construction activities be scheduled so that the length of time the temporary cut is left open is reduced to the extent practical.
- Erosion control measures be implemented as appropriate such that runoff from the site is reduced to the extent practical.
- Surface water is diverted away from the excavation.
- The general condition of the slopes be observed periodically by a geotechnical engineer to confirm adequate stability.

Permanent Soil Slopes

We recommend that permanent soil slopes, either completed using cuts or fills, be constructed no steeper than 2H:1V. To achieve uniform compaction on fill slopes, we recommend the slope be slightly overbuilt and subsequently cut back to expose properly compacted fill.

Earthwork and Structural Fill

Subgrade Preparation

The exposed foundation subgrade should be evaluated after site grading is complete. Subgrade preparation should be in accordance with Section 2-09.3(3) of the 2010 WSDOT Standard Specifications. If unsuitable

soils are exposed at the subgrade elevation they should be removed and replaced with adequately compacted structural fill, lean concrete, or controlled density fill. Actual removal and replacement depths will be determined during foundation construction. GeoEngineers should be involved in the over-excavation process to assist the contractor in identifying adequate bearing soils and to evaluate whether the work is completed in accordance with our recommendations. The exposed subgrade should be protected as described in the "Subgrade Protection" section below.

Subgrade Protection

The fine-grained soils expected at the footing and slab subgrade elevations are extremely sensitive to moisture and disturbance and should be protected. We recommend a working pad consisting of a lean concrete "rat slab" or quarry spalls on the bottom of the footing excavations to protect the footing subgrade soils from water and/or wet weather during placement of reinforcement bars and preparation for concrete placement. The actual thickness and type of the working pad will be dependent on the anticipated traffic loads. For planning purposes construction access road or staging areas could require up to 3 feet of quarry spalls to adequately protect the fine-grained subgrade from disturbance. One foot of quarry spalls or a thin rat slab should provide sufficient protection for subgrade areas subject only to foot traffic and weather.

If the subgrade soils become muddy or unstable it will be necessary to over-excavate down to undisturbed glacially consolidated soils to utilize the bearing capacities recommended in this memorandum. We recommend that the condition of footing excavations be observed by GeoEngineers prior to placement of reinforcement to confirm that the bearing soils are properly prepared and are consistent with the recommendations contained in this memorandum.

Structural Fill

Materials used to construct building pads, roadways and parking areas, and to backfill behind retaining walls and within utility trenches are classified as structural fill for the purpose of this report. Structural fill material quality varies depending upon its use as described below:

1. As a minimum, structural fill placed in parking areas, to backfill utility trenches and to construct embankments should meet the criteria for common borrow as described in Section 9-03.14(3) of the WSDOT Standard Specifications. Common borrow will be suitable for use as structural fill for these applications during dry weather conditions only. If structural fill is placed during wet weather, the structural fill should consist of gravel borrow as described in Section 9-03.14(1) of the WSDOT Standard Specifications, with the additional restriction that the fines content be limited to no more than 5 percent.
2. Structural fill placed below foundation elements should consist of gravel borrow (WSDOT Standard Specification 9-03.14(1)), Class A or B foundation material (WSDOT Standard Specification 9-03.17), or quarry spalls (WSDOT Standard Specification 9-13.6),
3. Structural fill placed immediately outside the drainage zone of below-grade and retaining walls should consist of gravel backfill for walls in conformance with Section 9-03.12(2) of the WSDOT Standard Specifications.
4. Structural fill placed within 6 inches of foundation, wall and underslab drains should meet the requirements of gravel backfill for drains conforming to Section 9-03.12(4) of the WSDOT Standard Specifications.

5. Structural fill placed as crushed surfacing base course below sidewalks and pavements should meet the requirements of crushed rock base course conforming to Section 9-03.9(3) of the WSDOT Standard Specifications.

6. Structural fill placed as working pad material should consist quarry spalls in conformance with Section 9-13.6 of the WSDOT Standard Specifications.

Use of On-site Soils

The subsurface soils observed in the explorations (pre-Vashon Lacustrine, pre-Vashon glacial outwash, glacial till, and Vashon lacustrine deposits), generally contain a high percentage of fines (silt) and are moisture-sensitive. These soils generally meet the criteria for common borrow and may be suitable for use as structural fill during dry weather. These soils will generally not be suitable for use during wet weather placement. In addition, it is important to note that in their native condition these soils are expected to be above their optimum moisture content for compaction. Therefore, aeration of excavated native soils will likely be necessary to dry these materials before they can be adequately compacted.

Fill Placement and Compaction Criteria

Structural fill should be mechanically compacted to a firm, non-yielding condition. Each lift should be conditioned to the proper moisture content and compacted to the specified density before placing subsequent lifts. Structural fill should be compacted to the following criteria:

1. Structural fill placed behind retaining walls and shoring walls should be compacted in general accordance with Method C of Section 2-03.3(14)C of the WSDOT Standard Specifications, with the exception that all layers within 5 feet of the back of walls should be compacted to 90-percent of the maximum dry density. Care should be taken when compacting fill near the back of walls to avoid overcompaction and hence overstressing the walls. We recommend that hand operated compaction equipment be used within 5 feet of the back of the retaining wall.

2. Structural fill in new pavement and roadway areas, including utility trench backfill, should be compacted in general accordance with Method B of Section 2-03.3(14)C of the WSDOT Standard Specifications.

3. Structural fill placed below floor slabs or foundations should be compacted in general accordance with Method C of Section 2-03.3(14)C of the WSDOT Standard Specifications.

4. Structural fill placed as crushed rock base course below pavements should be compacted in general accordance with Method C of Section 2-03.3(14)C of the WSDOT Standard Specifications.

5. Structural fill for permanent slopes should be compacted in general accordance with Method B of Section 2-03.3(14)C of the WSDOT Standard Specifications.

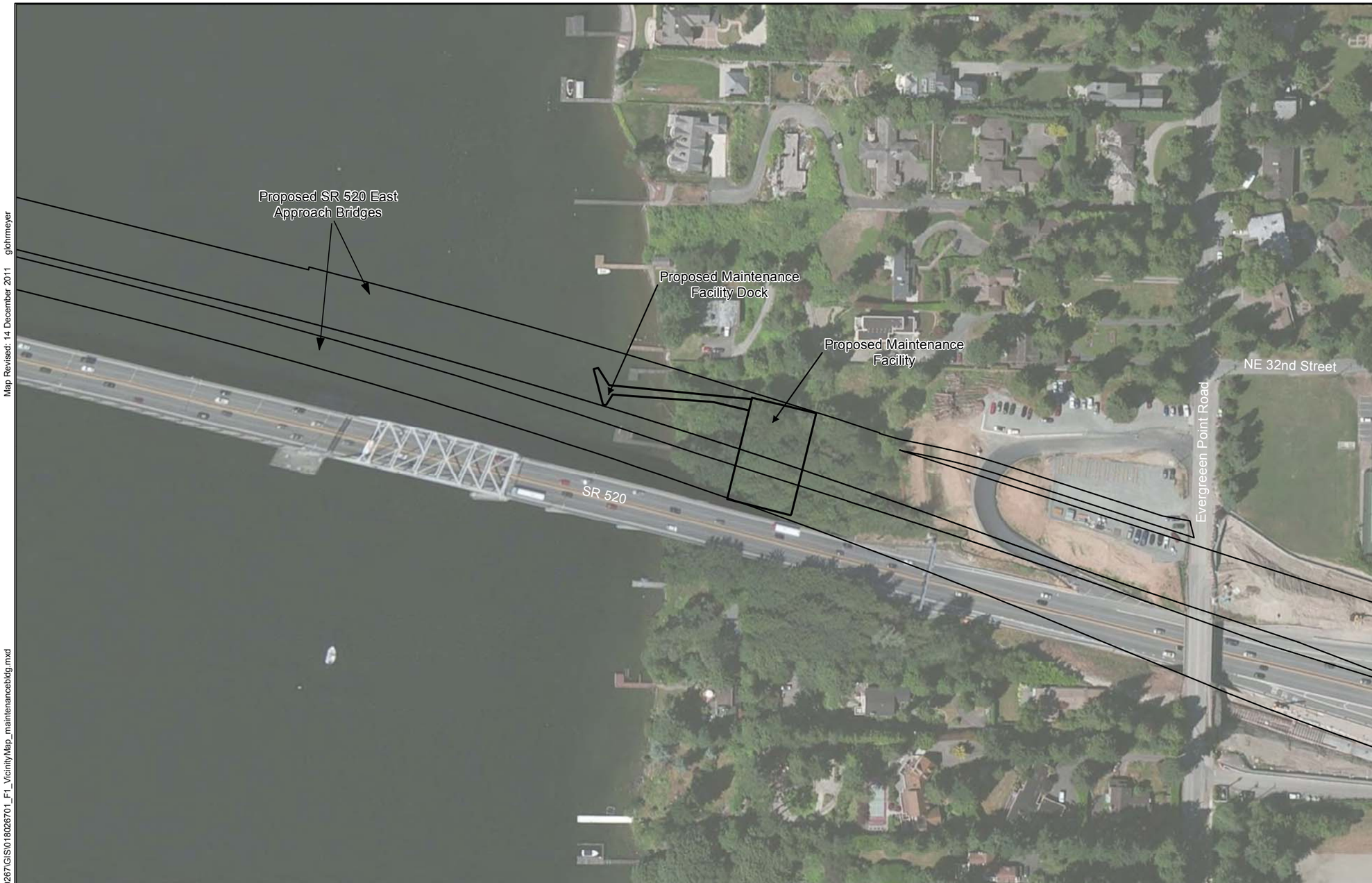
6. <u>Non-structural fill</u>, such as fill placed in landscape areas, should be compacted in general accordance with Method A of Section 2-03.3(14)C of the WSDOT Standard Specifications. In areas intended for future development, a higher degree of compaction should be considered to reduce the settlement potential of the fill soils.

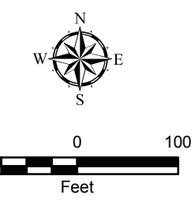
We recommend that a representative from our firm be present during proof-rolling and/or probing of the exposed subgrade soils prior to fill placement to confirm the subgrade materials and their preparation are consistent with design assumptions, Our representative will evaluate the adequacy of the subgrade soils, identify areas needing further work and advise on any modifications to procedures that may be appropriate for the prevailing conditions.

We understand in-place density tests to confirm compaction criteria for the fill soils is being achieved will be completed by a materials testing lab.

Attachments:
Figure 1. Vicinity Map
Figure 2. Site Plan – East Landing
Figures 3a and 3b. Section A-A' - Profile
Figures 4a and 4b. Section B-B' - Profile
Figure 5. Section C-C' - Profile
Figure 6. Section D-D' – Pier 2 Profile
Figure 7. Section E-E' –Profile
Figure 8. Section F-F' – Pier 3 Profile
Figure 9. 5% Damped 2/3 MCE Design Response Spectra – 2009 IBC
Figure 10. 5% Damped Site Specific Response Spectra – 1000-yr Return Period
Figure 11. Earth Pressure Diagrams for Parking Lot West and South Shoring Walls
Figure 12. Earth Pressure Diagram for Maintenance Facility Lower East Shoring Wall
Figure 13. Earth Pressure Diagrams for Maintenance Facility North and South Shoring Walls
Figure 14. Maintenance Facility Shoring Walls
Figure 15. Earth Pressure Diagram for Maintenance Facility West Building Wall
Figure 16. Spread Footing Bearing Capacity
Figure 17. Continuous Footing Bearing Capacity
Figures 18 through 45. Global Stability Figures
Appendix A. Boring Logs
Appendix B. Laboratory Testing
Appendix C. Ground Anchor Load Tests and Shoring Monitoring Program

WLT:DSP:DJC:nlu





Data Source:
"8066_CV_X_CH.dwg provided by Berger ABAM on 12-01-11.
Aerial from Bing/ESRI (2009)

Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet

Notes:
1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

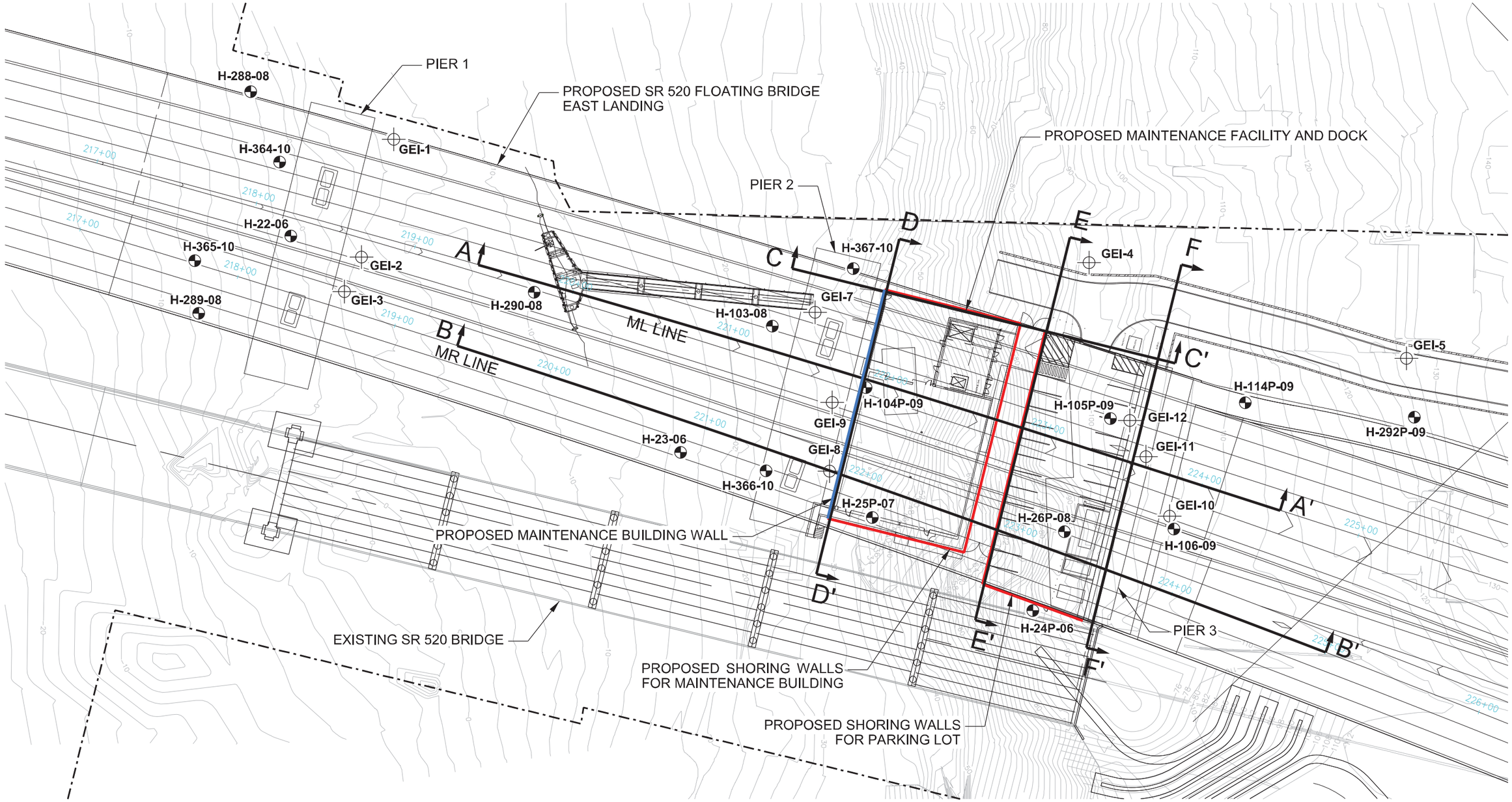
Vicinity Map

SR 520 Evergreen Point Floating
Bridge and Landings Project
Medina, Washington

GEOENGINEERS

Figure 1

Office: RED Path: \\red\projects\0\0180267\GIS\018026701_F1_VicinityMap_maintenancebldg.mxd Map Revised: 14 December 2011 glohmeyer



Notes

1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. can not guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Reference: "CIP Balanced Cantilever General Plan & Elevation; Sheet EAS-1.1 for 520 Evergreen Point Bridge" provided by Berger ABAM on 12-01-11.

Legend

GEI-1	Borings by GeoEngineers
H-22-06	Previous Boring by Others
	Proposed Shoring Walls
	Proposed Building Wall

N W E S

60 0 60
FEET

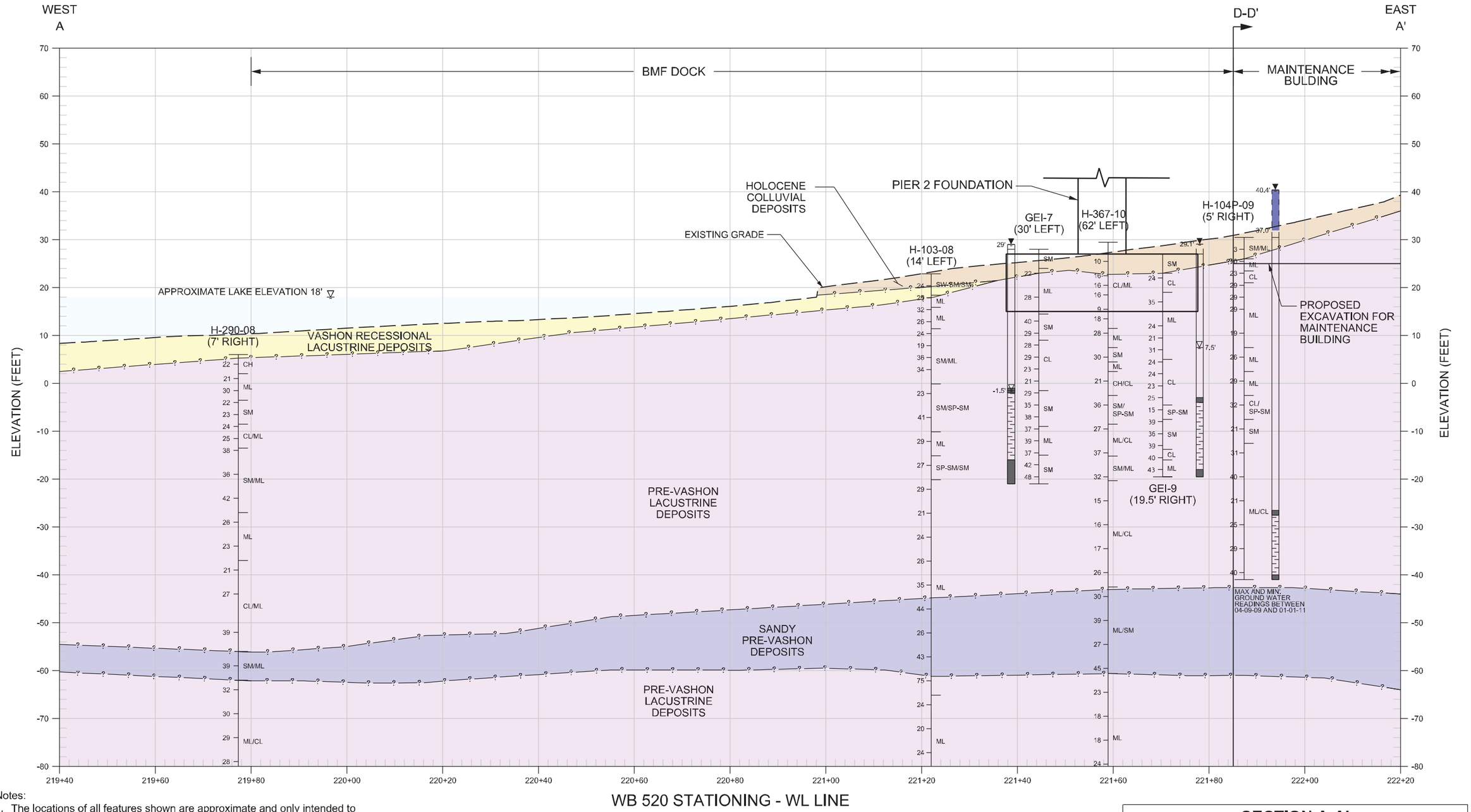
Site Plan
East Landing

SR 520 Evergreen Point Floating Bridge and Landings Project
Medina, Washington

GEOENGINEERS

Figure 2

P:\0\0180267\01\CAD\Maintenance Facility\Site Plan Figure 2.dgn blane Figure 2 17x11 (in.) 60.0000 / in. 11:10:33 AM 12/21/2011



Notes:

1. The locations of all features shown are approximate and only intended to convey conceptual information.
2. The subsurface conditions shown are based on interpolation between widely spaced borings and should be considered approximate.
3. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Reference: Base drawing provided by BERGER ABAM.

LEGEND:

- BLOW COUNT
- SOIL CONTACT
- INFERRED GEOLOGIC CONTACT
- PERCHED GROUNDWATER LEVEL
- SOIL CLASSIFICATION
- GROUNDWATER OBSERVED AT TIME OF DRILLING
- BORING # H-290-08 — 7' RIGHT — OFFSET FROM SECTION / ELEVATION
- MONITORING WELL: MAX. AND MIN. GROUNDWATER ELEV. MEASURED IN OBSERVATION WELL; SCREENED INTERVAL; SAND FILTER
- VIBRATING WIRE PIEZOMETER: MAX. AND MIN. GROUNDWATER ELEV. BASED ON VWP PRESSURE READING; VWP LOCATION

HORIZONTAL SCALE: 1"=20'
VERTICAL SCALE: 1"=20'
VERTICAL EXAGGERATION: 1.0X

20 0 20
FEET

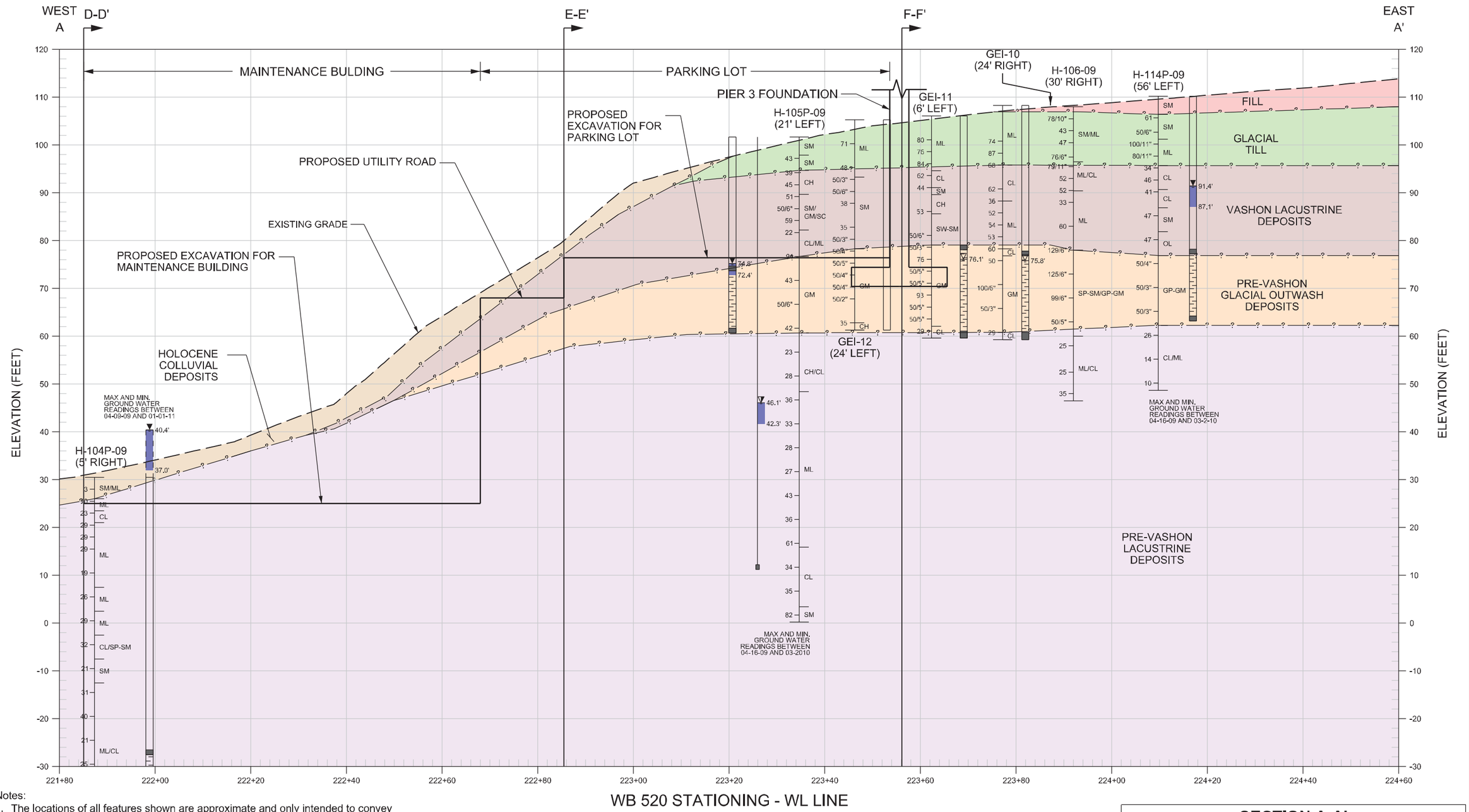
SECTION A-A'
PROFILE

SR 520 Evergreen Point Floating Bridge and Landings Project
Medina, Washington

GEOENGINEERS

Figure 3A

P:\0\0180267\01\CAD\Maintenance Facility\Section A-A_Figure 3.dgn blane 6:45:26 PM 12/17/2011 20.0000 ft / in. 17x11 (in.) Figure 3A



Notes:

1. The locations of all features shown are approximate and only intended to convey conceptual information.
2. The subsurface conditions shown are based on interpolation between widely spaced borings and should be considered approximate.
3. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Reference: Base drawing provided by BERGER ABAM.

LEGEND:

- BLOW COUNT
- SOIL CONTACT
- INFERRED GEOLOGIC CONTACT
- PERCHED GROUNDWATER LEVEL
- SOIL CLASSIFICATION
- GROUNDWATER OBSERVED AT TIME OF DRILLING
- BORING # → H-104P-09
- 5' RIGHT → OFFSET FROM SECTION / ELEVATION
- MAX. AND MIN. GROUNDWATER ELEV. MEASURED IN OBSERVATION WELL
- SCREENED INTERVAL
- SAND FILTER
- MONITORING WELL
- MAX. AND MIN. GROUNDWATER ELEV. BASED ON VWP PRESSURE READING
- VWP LOCATION
- VIBRATING WIRE PIEZOMETER

HORIZONTAL SCALE: 1"=20'
VERTICAL SCALE: 1"=20'
VERTICAL EXAGGERATION: 1.0X

20 0 20
FEET

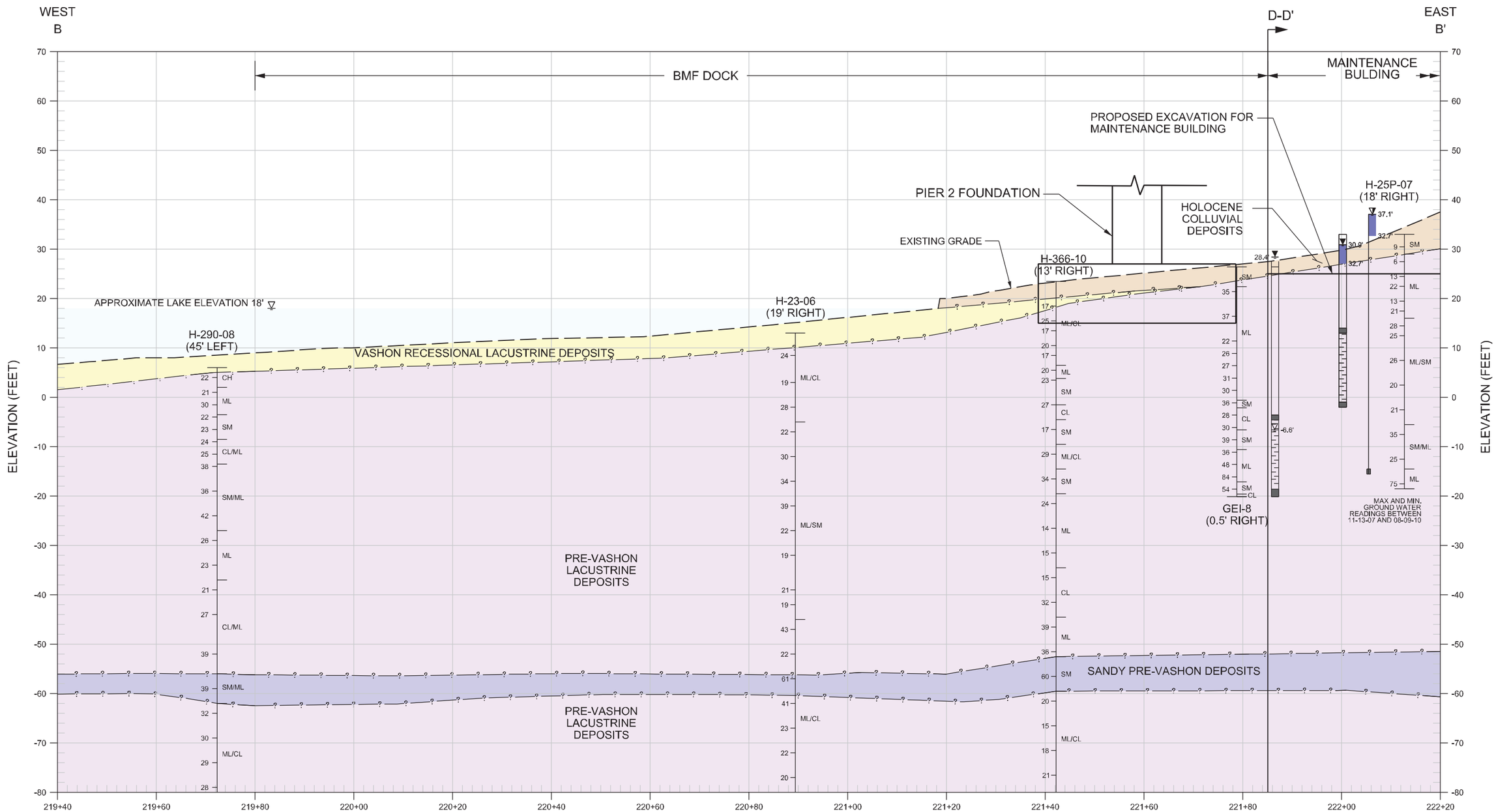
SECTION A-A'
PROFILE

SR 520 Evergreen Point Floating
Bridge and Landings Project
Medina, Washington

GEOENGINEERS

Figure 3B

P:\0\0180267\01\CAD\Maintenance Facility\Section A-A_Figure 3.dgn blane Figure 3B 17x11 (in.) 20.0000 ft / in. 10:44:14 AM 12/19/2011



Notes:

1. The locations of all features shown are approximate and only intended to convey conceptual information.
2. The subsurface conditions shown are based on interpolation between widely spaced borings and should be considered approximate.
3. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Reference: Base drawing provided by BERGER ABAM.

LEGEND:

- BLOW COUNT
- SOIL CONTACT
- INFERRED GEOLOGIC CONTACT
- PERCHED GROUNDWATER LEVEL
- SM SOIL CLASSIFICATION
- GROUNDWATER OBSERVED AT TIME OF DRILLING
- BORING # H-290-08 — 45' LEFT — OFFSET FROM SECTION / ELEVATION
- MAX. AND MIN. GROUNDWATER ELEV. MEASURED IN OBSERVATION WELL — SCREENED INTERVAL — SAND FILTER — MONITORING WELL
- MAX. AND MIN. GROUNDWATER ELEV. BASED ON VWP PRESSURE READING — VWP LOCATION — VIBRATING WIRE PIEZOMETER

HORIZONTAL SCALE: 1"=20'
VERTICAL SCALE: 1"=20'
VERTICAL EXAGGERATION: 1.0X

20 0 20
FEET

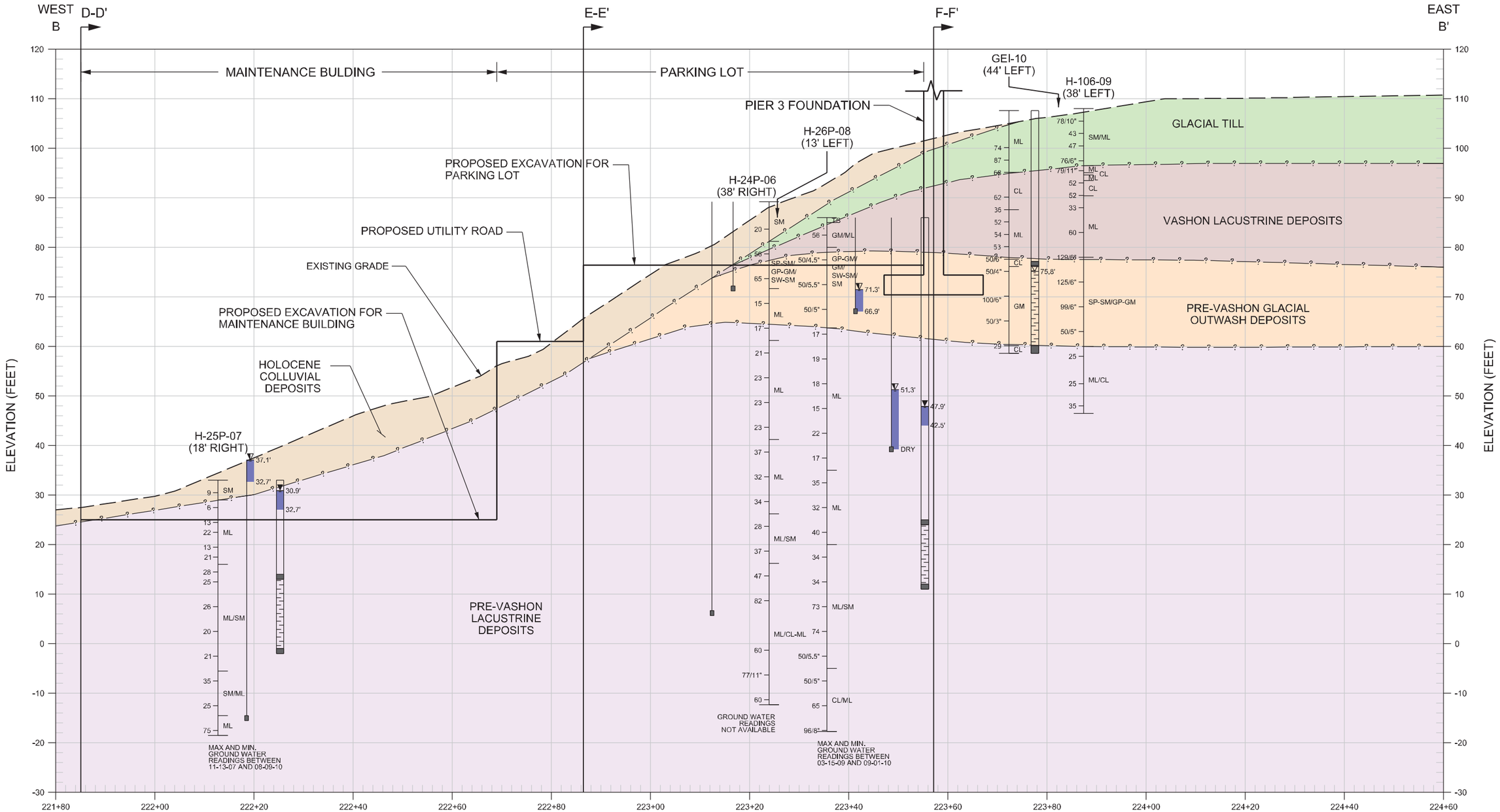
SECTION B-B'
PROFILE

SR 520 Evergreen Point Floating Bridge and Landings Project
Medina, Washington

GEOENGINEERS

Figure 4A

P:\0\0180267\01\CAD\Maintenance Facility\Section B-B_Figure 4.dgn blane Figure 4A 17x11 (in.) 20.0000 ft / in. 2:51:32 PM 12/17/2011



Notes:

1. The locations of all features shown are approximate and only intended to convey conceptual information.
2. The subsurface conditions shown are based on interpolation between widely spaced borings and should be considered approximate.
3. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Reference: Base drawing provided by BERGER ABAM.

LEGEND:

- BLOW COUNT
- SOIL CONTACT
- INFERRED GEOLOGIC CONTACT
- PERCHED GROUNDWATER LEVEL
- SOIL CLASSIFICATION
- GROUNDWATER OBSERVED AT TIME OF DRILLING
- BORING # — H-25P-07
- 18' RIGHT — OFFSET FROM SECTION / ELEVATION
- MAX. AND MIN. GROUNDWATER ELEV. MEASURED IN OBSERVATION WELL — MONITORING WELL
- SCREENED INTERVAL
- SAND FILTER
- MAX. AND MIN. GROUNDWATER ELEV. BASED ON VWP PRESSURE READING — VIBRATING WIRE PIEZOMETER
- VWP LOCATION

HORIZONTAL SCALE: 1"=20'
VERTICAL SCALE: 1"=20'
VERTICAL EXAGGERATION: 1.0X

20 0 20
FEET

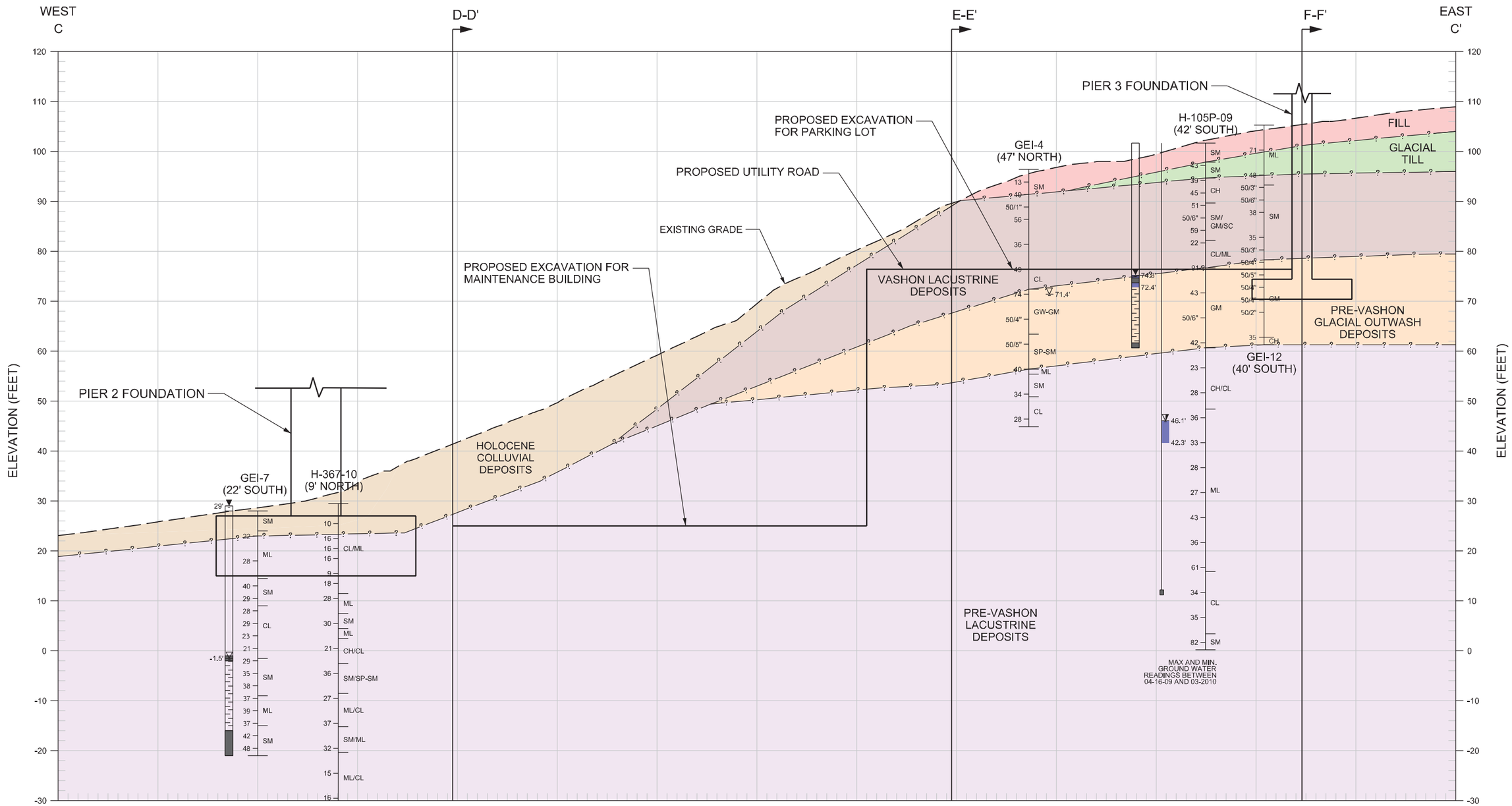
SECTION B-B'
PROFILE

SR 520 Evergreen Point Floating
Bridge and Landings Project
Medina, Washington

GEOENGINEERS

Figure 4B

P:\0\0180267\01\CAD\Maintenance Facility\Section B-B_Figure 4.dgn blane Figure 4B 17x11 (in.) 20.0000 ft / in. 3:00:20 PM 12/18/2011



Notes:

1. The locations of all features shown are approximate and only intended to convey conceptual information.
2. The subsurface conditions shown are based on interpolation between widely spaced borings and should be considered approximate.
3. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Reference: Base drawing provided by BERGER ABAM.

LEGEND:

- BLOW COUNT
- SOIL CONTACT
- INFERRED GEOLOGIC CONTACT
- PERCHED GROUNDWATER LEVEL
- SM SOIL CLASSIFICATION
- GROUNDWATER OBSERVED AT TIME OF DRILLING
- BORING # → H-105P-09
- 42' SOUTH ← OFFSET FROM SECTION / ELEVATION
- 40' MAX. AND MIN. GROUNDWATER ELEV. MEASURED IN OBSERVATION WELL
- 37'
- ← SCREENED INTERVAL
- ← SAND FILTER
- MONITORING WELL
- 40' MAX. AND MIN. GROUNDWATER ELEV. BASED ON VWP PRESSURE READING
- 37'
- ← VWP LOCATION
- VIBRATING WIRE PIEZOMETER

HORIZONTAL SCALE: 1"=20'
VERTICAL SCALE: 1"=20'
VERTICAL EXAGGERATION: 1.0X

20 0 20
FEET

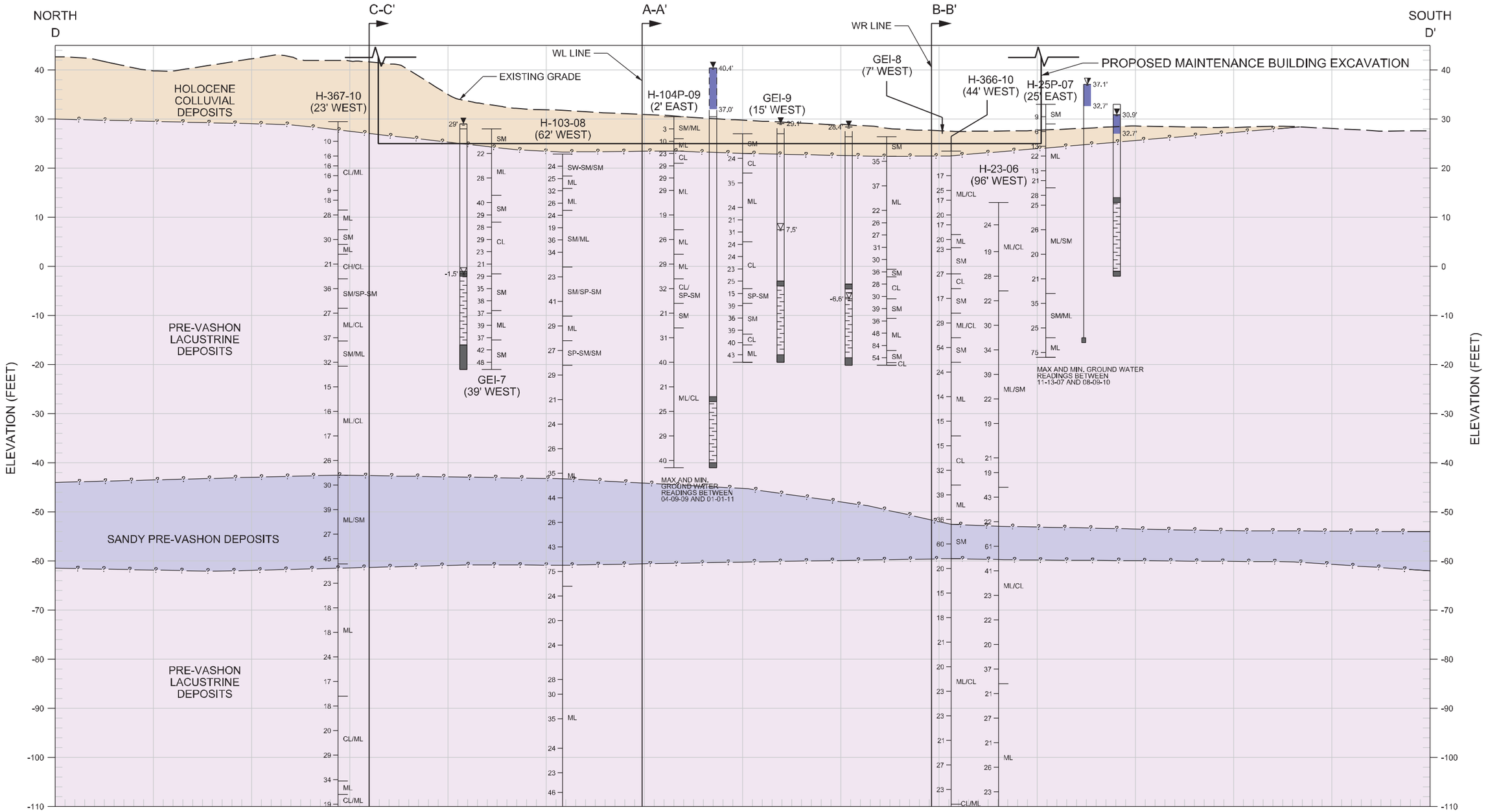
SECTION C-C'
PROFILE

SR 520 Evergreen Point Floating
Bridge and Landings Project
Medina, Washington

GEOENGINEERS

Figure 5

P:\0\0180267\01\CAD\Maintenance Facility\Section C-C_Figure 5.dgn blane 17x11 (in.) 20.0000 ft / in. 4:33:25 PM 12/17/2011 Figure 5



Notes:

1. The locations of all features shown are approximate and only intended to convey conceptual information.
2. The subsurface conditions shown are based on interpolation between widely spaced borings and should be considered approximate.
3. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Reference: Base drawing provided by BERGER ABAM.

LEGEND:

- BLOW COUNT
- SOIL CONTACT
- INFERRED GEOLOGIC CONTACT
- PERCHED GROUNDWATER LEVEL
- SOIL CLASSIFICATION
- GROUNDWATER OBSERVED AT TIME OF DRILLING
- BORING # → H-104P-09
- 29' EAST → OFFSET FROM SECTION / ELEVATION
- MAX. AND MIN. GROUNDWATER ELEV. MEASURED IN OBSERVATION WELL
- SCREENED INTERVAL
- SAND FILTER
- MONITORING WELL
- MAX. AND MIN. GROUNDWATER ELEV. BASED ON VWP PRESSURE READING
- VWP LOCATION
- VIBRATING WIRE PIEZOMETER

HORIZONTAL SCALE: 1"=20'
VERTICAL SCALE: 1"=20'
VERTICAL EXAGGERATION: 1.0X

20 0 20
FEET

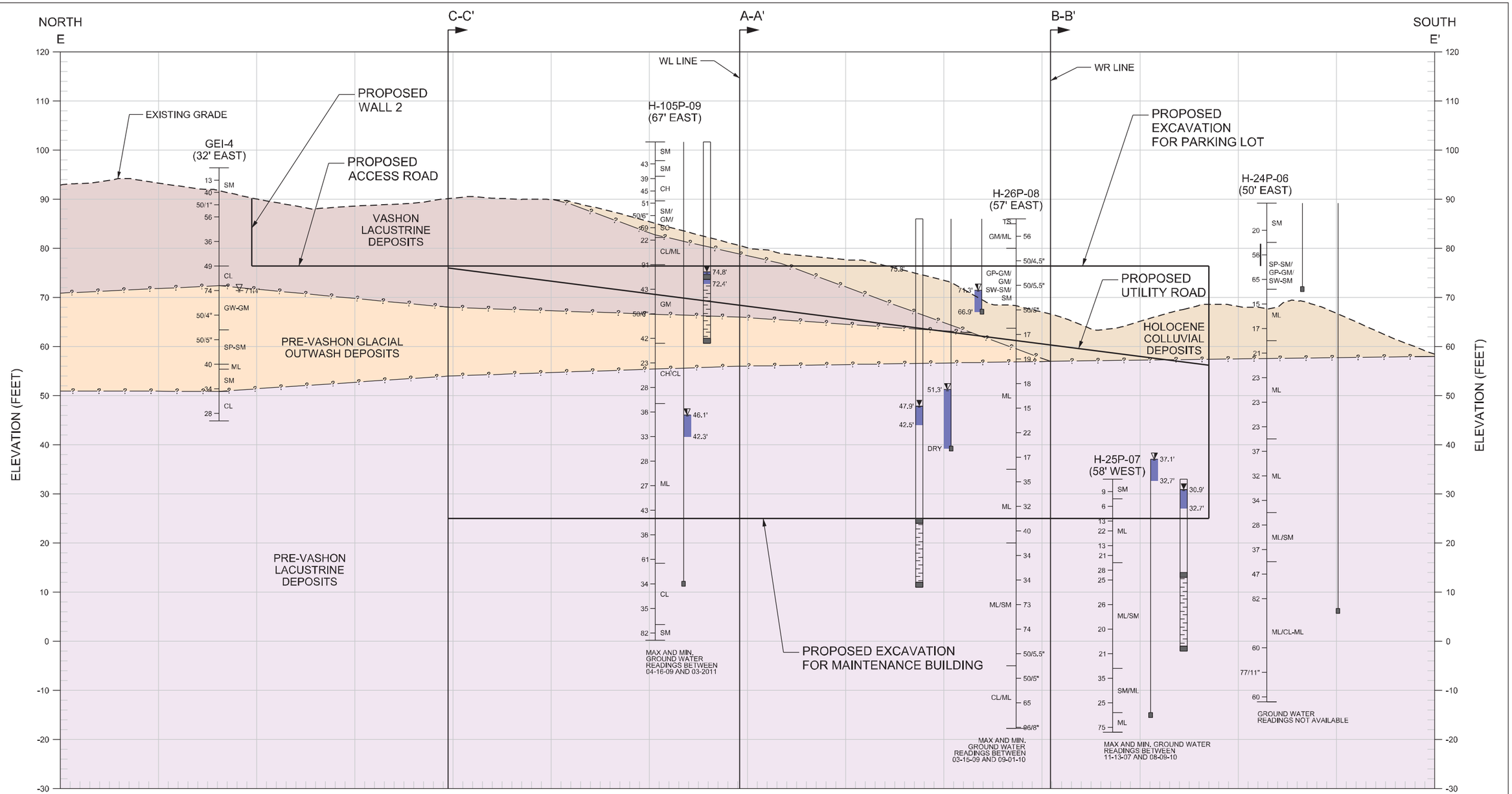
SECTION D-D'
PIER 2 PROFILE

SR 520 Evergreen Point Floating Bridge and Landings Project
Medina, Washington

GEOENGINEERS

Figure 6

Figure 6 17x11 (in.) 20.0000 ft / in. 10:58:57 AM 12/19/2011 blane
P:\0\0180267\01\CAD\Maintenance Facility\Section D-D_Figure 6.dgn



Notes:

1. The locations of all features shown are approximate and only intended to convey conceptual information.
2. The subsurface conditions shown are based on interpolation between widely spaced borings and should be considered approximate.
3. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Reference: Base drawing provided by BERGER ABAM.

LEGEND:

- BLOW COUNT
- SOIL CONTACT
- INFERRED GEOLOGIC CONTACT
- PERCHED GROUNDWATER LEVEL
- SOIL CLASSIFICATION
- GROUNDWATER OBSERVED AT TIME OF DRILLING
- BORING # H-114P-09 — 58' EAST — OFFSET FROM SECTION / ELEVATION
- MAX. AND MIN. GROUNDWATER ELEV. MEASURED IN OBSERVATION WELL
- SCREENED INTERVAL
- SAND FILTER
- MONITORING WELL
- MAX. AND MIN. GROUNDWATER ELEV. BASED ON VWP PRESSURE READING
- VWP LOCATION
- VIBRATING WIRE PIEZOMETER

HORIZONTAL SCALE: 1"=20'
VERTICAL SCALE: 1"=20'
VERTICAL EXAGGERATION: 1.0X

20 0 20
FEET

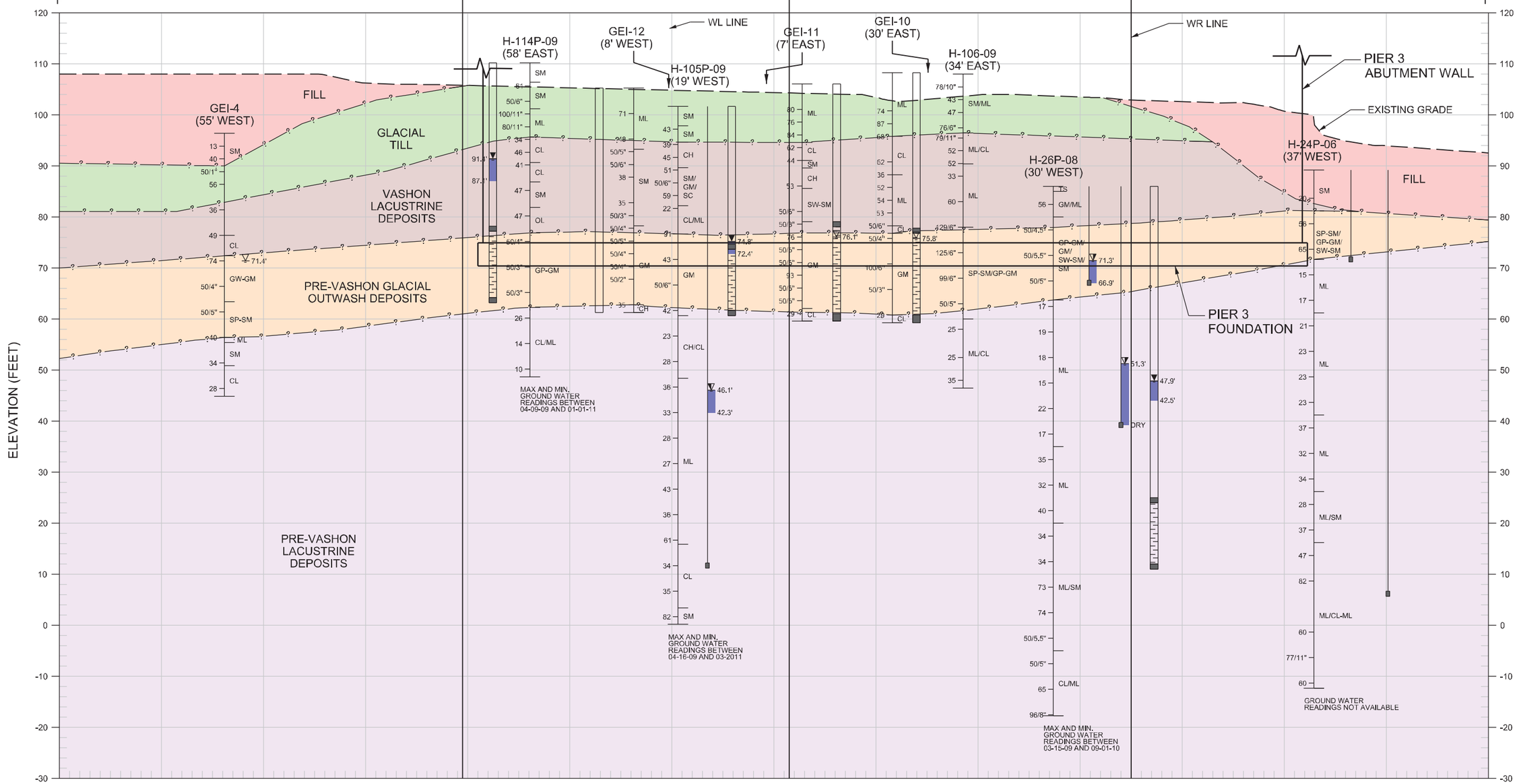
SECTION E-E'
PROFILE

SR 520 Evergreen Point Floating Bridge and Landings Project
Medina, Washington

GEOENGINEERS

Figure 7

P:\0\0180267\01\CAD\Maintenance Facility\Section E-E_Figure 7.dgn blane 10:59:19 AM 12/21/2011 20.0000 ft / in. 17x11 (in.) Figure 7



Notes:

1. The locations of all features shown are approximate and only intended to convey conceptual information.
2. The subsurface conditions shown are based on interpolation between widely spaced borings and should be considered approximate.
3. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Reference: Base drawing provided by BERGER ABAM.

LEGEND:

- BLOW COUNT
- SOIL CONTACT
- INFERRED GEOLOGIC CONTACT
- PERCHED GROUNDWATER LEVEL
- SM — SOIL CLASSIFICATION
- GROUNDWATER OBSERVED AT TIME OF DRILLING
- BORING # → H-114P-09 58' EAST — OFFSET FROM SECTION / ELEVATION
- 91.4' — MAX. AND MIN. GROUNDWATER ELEV. MEASURED IN OBSERVATION WELL; 87.1'; SCREENED INTERVAL; SAND FILTER — MONITORING WELL
- 91.4' — MAX. AND MIN. GROUNDWATER ELEV. BASED ON VWP PRESSURE READING; 87.1'; VWP LOCATION — VIBRATING WIRE PIEZOMETER

HORIZONTAL SCALE: 1"=20'
VERTICAL SCALE: 1"=20'
VERTICAL EXAGGERATION: 1.0X

20 0 20
FEET

SECTION F-F'
PIER 3 PROFILE

SR 520 Evergreen Point Floating
Bridge and Landings Project
Medina, Washington

GEOENGINEERS

Figure 8

P:\0\0180267\01\CAD\Maintenance Facility\Section F-F_Figure 8.dgn blane 17x11 (in.) 20.0000 ft / in. 1:41:08 PM 12/17/2011 Figure 8

Appendix A
Boring Logs

Total Depth:	101.5 ft.	Northing:	235,770 ft.	Drilling Method:	Mud Rotary	Hole Diam.:	5 in.
Top Elevation:	89.2 ft.	Easting:	1,293,429 ft.	Drilling Company:	WSDOT	Rod Diam.:	1-3/4"
Vert. Datum:	NAVD88	Station:		Drill Rig Equipment:	CME 55	Hammer Type:	Automatic
Horiz. Datum:	NAD 83-91	Offset:		Other Comments:			

SOIL DESCRIPTION

Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines indicated below represent the approximate boundaries between material types, and the transition may be gradual.

Medium dense, gray and brown, slightly gravelly to gravelly, silty SAND, trace of clay; moist; scattered charcoal fragments, irregular iron-oxide staining; (Hc) SM.

8.0

Very dense, brown, slightly silty, gravelly SAND to slightly silty, sandy GRAVEL; moist to wet; subrounded to subangular; (Qpgo) SP-SM/GP-GM/SW-SM.

17.5

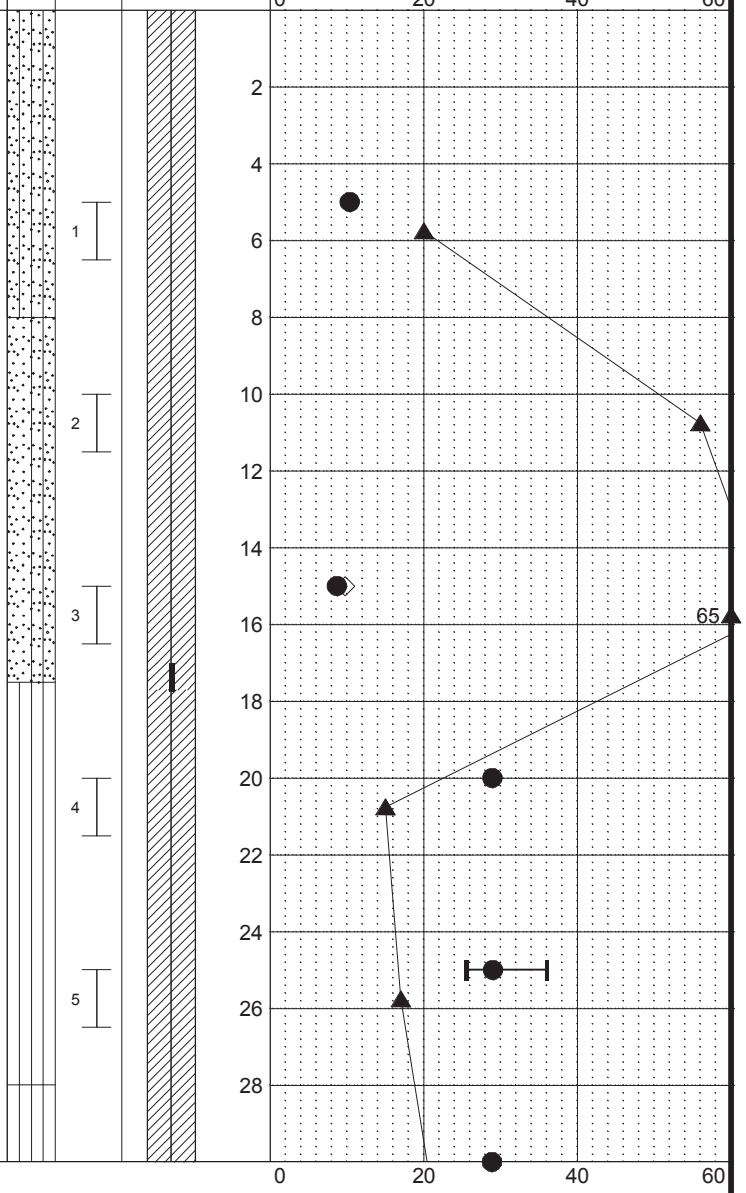
Very stiff, gray, clayey SILT, trace of fine sand; moist; (Qpnl/Qpgl) ML.

28.0

Very stiff, gray, slightly fine sandy, slightly clayey to clayey SILT; moist to wet; faintly bedded;

CONTINUED NEXT SHEET

Depth, ft. | Symbol | Samples | Ground-water | Depth, ft.



LEGEND

- * Sample Not Recovered
- Standard Penetration Test
- Piezometer Screen and Sand Filter
- Bentonite-Cement Grout
- Bentonite Chips/Pellets
- Bentonite Grout
- Groundwater Level in VWP

◇ % Fines (<0.075mm)
● % Water Content
Plastic Limit ⊢●⊣ Liquid Limit
Natural Water Content

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
3. The discussion in the text of this report is necessary for a proper understanding of the nature of the subsurface materials.
4. Groundwater level, if indicated above, is for the date specified and may vary.
5. USCS designation is based on visual-manual classification and selected lab testing.

SR 520/I-5 to Medina - Stage 1
Evergreen Point Floating Bridge and Landings

LOG OF BORING H-24p-06

October 2010 | 21-1-20624-552

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

EXHIBIT A-6
Sheet 1 of 4

Total Depth:	101.5 ft.	Northing:	235,770 ft.	Drilling Method:	Mud Rotary	Hole Diam.:	5 in.
Top Elevation:	89.2 ft.	Easting:	1,293,429 ft.	Drilling Company:	WSDOT	Rod Diam.:	1-3/4"
Vert. Datum:	NAVD88	Station:		Drill Rig Equipment:	CME 55	Hammer Type:	Automatic
Horiz. Datum:	NAD 83-91	Offset:		Other Comments:			

SOIL DESCRIPTION

Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines indicated below represent the approximate boundaries between material types, and the transition may be gradual.

Depth, ft. | Symbol | Samples | Ground-water | Depth, ft.

PENETRATION RESISTANCE (blows/foot)

▲ Hammer Wt. & Drop: *140 lbs / 30 inches*

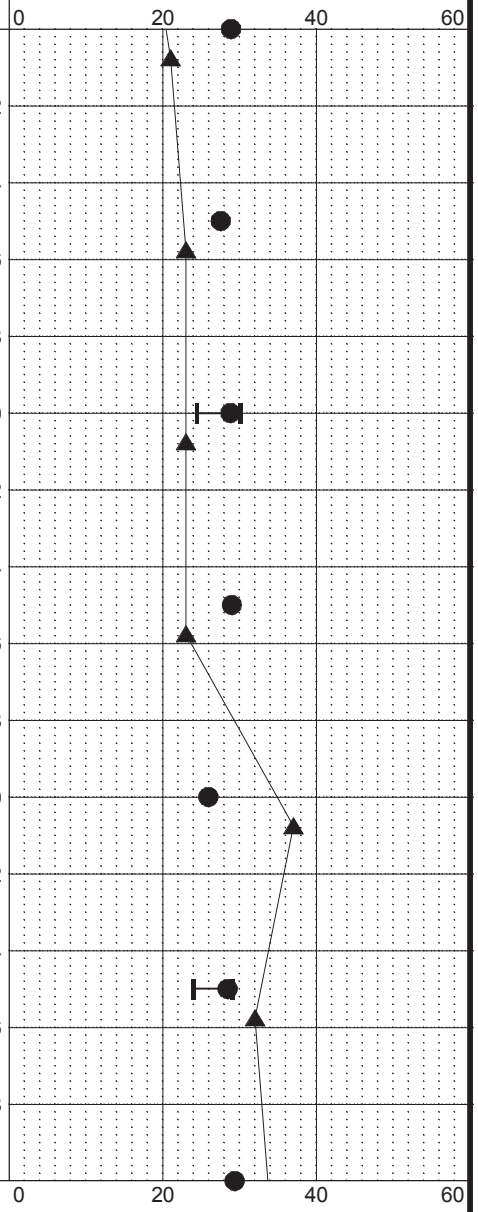
(Qpnl/Qpgl) ML.

Samples: 6, 7, 8, 9, 10, 11

48.0

Hard, gray, slightly clayey SILT, trace of fine sand, to slightly clayey, fine sandy SILT; wet; scattered organic fragments; (Qpnl/Qpgl) ML.

CONTINUED NEXT SHEET



LEGEND

- * Sample Not Recovered
- Standard Penetration Test
- Piezometer Screen and Sand Filter
- Bentonite-Cement Grout
- Bentonite Chips/Pellets
- Bentonite Grout
- Groundwater Level in VWP

◇ % Fines (<0.075mm)

● % Water Content

Plastic Limit ├─●─┤ Liquid Limit

Natural Water Content

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
3. The discussion in the text of this report is necessary for a proper understanding of the nature of the subsurface materials.
4. Groundwater level, if indicated above, is for the date specified and may vary.
5. USCS designation is based on visual-manual classification and selected lab testing.

SR 520/I-5 to Medina - Stage 1
Evergreen Point Floating Bridge and Landings

LOG OF BORING H-24p-06

October 2010 | 21-1-20624-552

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

EXHIBIT A-6
Sheet 2 of 4

Total Depth:	101.5 ft.	Northing:	235,770 ft.	Drilling Method:	Mud Rotary	Hole Diam.:	5 in.
Top Elevation:	89.2 ft.	Easting:	1,293,429 ft.	Drilling Company:	WSDOT	Rod Diam.:	1-3/4"
Vert. Datum:	NAVD88	Station:		Drill Rig Equipment:	CME 55	Hammer Type:	Automatic
Horiz. Datum:	NAD 83-91	Offset:		Other Comments:			

SOIL DESCRIPTION

Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines indicated below represent the approximate boundaries between material types, and the transition may be gradual.

Depth, ft. | Symbol | Samples | Ground-water | Depth, ft.

PENETRATION RESISTANCE (blows/foot)

▲ Hammer Wt. & Drop: *140 lbs / 30 inches*

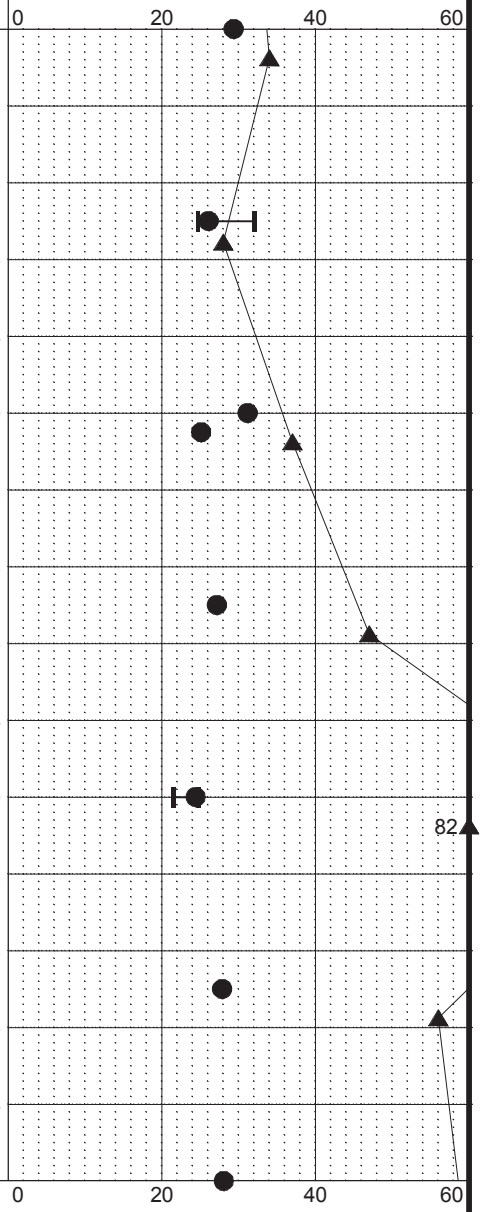
63.0

Interbedded, very stiff to hard, gray, clayey SILT, trace of fine sand, and medium dense to dense, trace of clay to slightly clayey, silty, fine SAND; moist to wet; (Qpnl/Qpgl) ML/SM.

73.0

Hard, gray, slightly clayey SILT, trace of fine sand, to slightly clayey, fine sandy SILT; moist; interbedded with layers of silty clay and silty fine sand; (Qpnl/Qpgl) ML/CL-ML.

CONTINUED NEXT SHEET



LEGEND

- * Sample Not Recovered
- Standard Penetration Test
- Piezometer Screen and Sand Filter
- Bentonite-Cement Grout
- Bentonite Chips/Pellets
- Bentonite Grout
- Groundwater Level in VWP

◇ % Fines (<0.075mm)

● % Water Content

Plastic Limit ⊢●⊣ Liquid Limit

Natural Water Content

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
3. The discussion in the text of this report is necessary for a proper understanding of the nature of the subsurface materials.
4. Groundwater level, if indicated above, is for the date specified and may vary.
5. USCS designation is based on visual-manual classification and selected lab testing.

SR 520/I-5 to Medina - Stage 1
Evergreen Point Floating Bridge and Landings

LOG OF BORING H-24p-06

October 2010 | 21-1-20624-552

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

EXHIBIT A-6
Sheet 3 of 4

REV 3

SR520_MASTER_LOG_E 21-20624.GPJ SHAN_WIL.GDT 10/27/10 Log: PHZ Rev: TWH Typ: LKN

Total Depth:	101.5 ft.	Northing:	235,770 ft.	Drilling Method:	Mud Rotary	Hole Diam.:	5 in.
Top Elevation:	89.2 ft.	Easting:	1,293,429 ft.	Drilling Company:	WSDOT	Rod Diam.:	1-3/4"
Vert. Datum:	NAVD88	Station:		Drill Rig Equipment:	CME 55	Hammer Type:	Automatic
Horiz. Datum:	NAD 83-91	Offset:		Other Comments:			

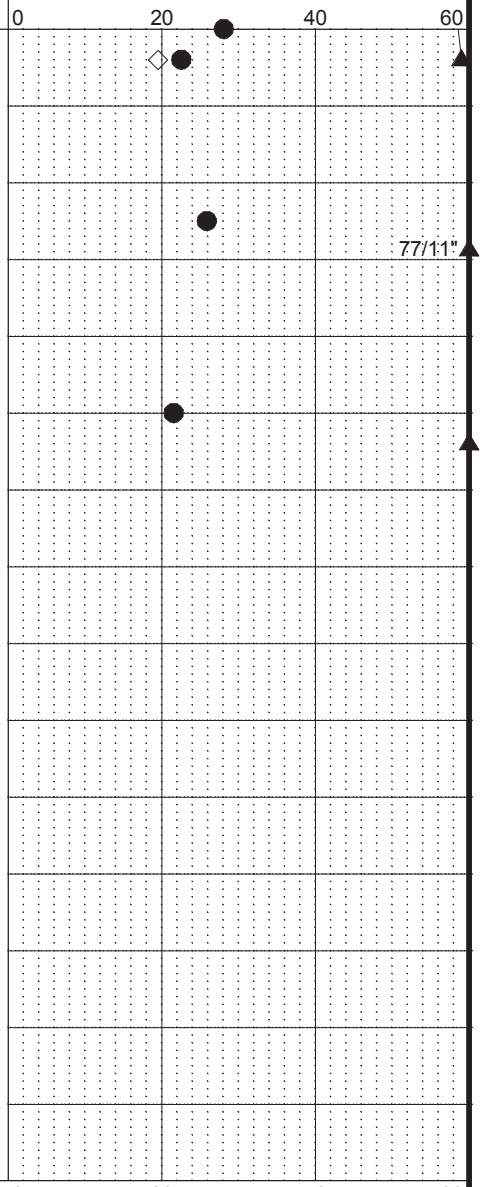
SOIL DESCRIPTION

Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines indicated below represent the approximate boundaries between material types, and the transition may be gradual.

Depth, ft. | Symbol | Samples | Ground-water | Depth, ft.

PENETRATION RESISTANCE (blows/foot)

▲ Hammer Wt. & Drop: 140 lbs / 30 inches



101.5

BOTTOM OF BORING
COMPLETED 10/28/2006

Note: It is our opinion that VWP groundwater data from H-24p-06 is not consistent with our understanding of subsurface conditions at the site and may not be representative of actual groundwater conditions.

LEGEND

* Sample Not Recovered

Standard Penetration Test

Piezometer Screen and Sand Filter

Bentonite-Cement Grout

Bentonite Chips/Pellets

Bentonite Grout

Groundwater Level in VWP

◇ % Fines (<0.075mm)

● % Water Content

Plastic Limit ├─●─┤ Liquid Limit

Natural Water Content

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
3. The discussion in the text of this report is necessary for a proper understanding of the nature of the subsurface materials.
4. Groundwater level, if indicated above, is for the date specified and may vary.
5. USCS designation is based on visual-manual classification and selected lab testing.

SR 520/I-5 to Medina - Stage 1
Evergreen Point Floating Bridge and Landings

LOG OF BORING H-24p-06

October 2010 | 21-1-20624-552

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

EXHIBIT A-6
Sheet 4 of 4

REV 3

SR520_MASTER_LOG_E 21-20624.GPJ SHAN_WIL.GDT 10/27/10 Log: PHZ Rev: TWH Typ: LKN

Total Depth:	51.5 ft.	Northing:	~ 235,826 ft.	Drilling Method:	Hollow Stem Auger	Hole Diam.:	10 in.
Top Elevation:	~ 33 ft.	Easting:	~ 1,293,332 ft.	Drilling Company:	Boart Longyear	Rod Diam.:	NWJ
Vert. Datum:	NAVD88	Station:		Drill Rig Equipment:	Rubber-Tread Track	Hammer Type:	Automatic
Horiz. Datum:	NAD 83-91	Offset:		Other Comments:	▼		

SOIL DESCRIPTION

Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines represent the approximate boundaries between material types, and the transition may be gradual.

Loose, brown, slightly gravelly, silty SAND; moist; scattered organics; (Hc) SM.

4.0

Loose to medium dense, gray, slightly fine sandy SILT, trace of clay; moist; locally trace of sand, locally dipping beds; (Qvrl) ML.

17.0

Interbedded, medium dense, gray, trace of clay to slightly clayey SILT and silty, fine SAND; moist; laminated; (Qpnl/Qpgl) ML/SM.

- Wet below about 24 feet.
- Interbedded with slightly clayey silt below about 25 feet

CONTINUED NEXT SHEET

Depth, ft. | Symbol | PID, ppm | Samples | Ground-water | Depth, ft.

PID, ppm	Samples
0	1
0	2
0	3 E
0	4
0	5
0	6
0	7
0	8
0	9

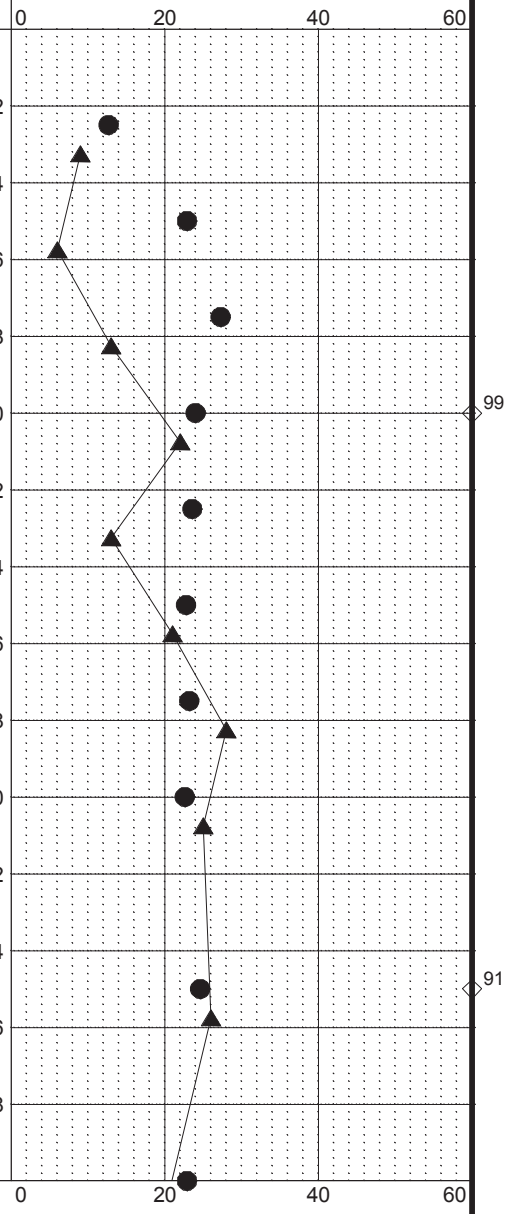
artesian conditions: water level measured 3.4 feet above ground surface in VWP on 4/20/10

4/20/2010

6/18/2008

PENETRATION RESISTANCE (blows/foot)

▲ Hammer Wt. & Drop: 140 lbs / 30 inches



◇ % Fines (<0.075mm)

● % Water Content

LEGEND

- * Sample Not Recovered
- E Environmental Sample Obtained
- Standard Penetration Test
- Piezometer Screen and Sand Filter
- Bentonite-Cement Grout
- Bentonite Chips/Pellets
- Bentonite Grout
- ▼ Groundwater Level in Well
- ▼ Groundwater Level in VWP

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
3. The discussion in the text of this report is necessary for a proper understanding of the nature of the subsurface materials.
4. Groundwater level, if indicated above, is for the date specified and may vary.
5. USCS designation is based on visual-manual classification and selected lab testing.

SR 520/I-5 to Medina - Stage 1
Evergreen Point Floating Bridge and Landings

LOG OF BORING H-25p-07 (Revised 9/2010)

October 2010 | 21-1-20624-552

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

EXHIBIT A-7
Sheet 1 of 2

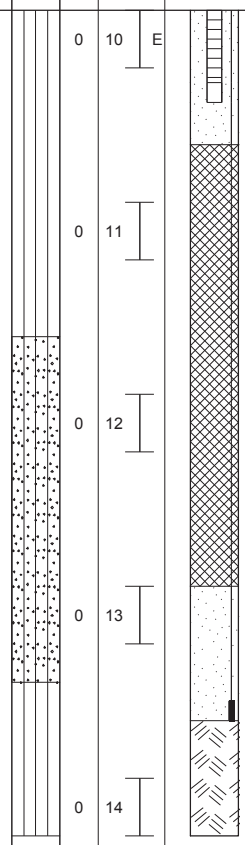
REV 3

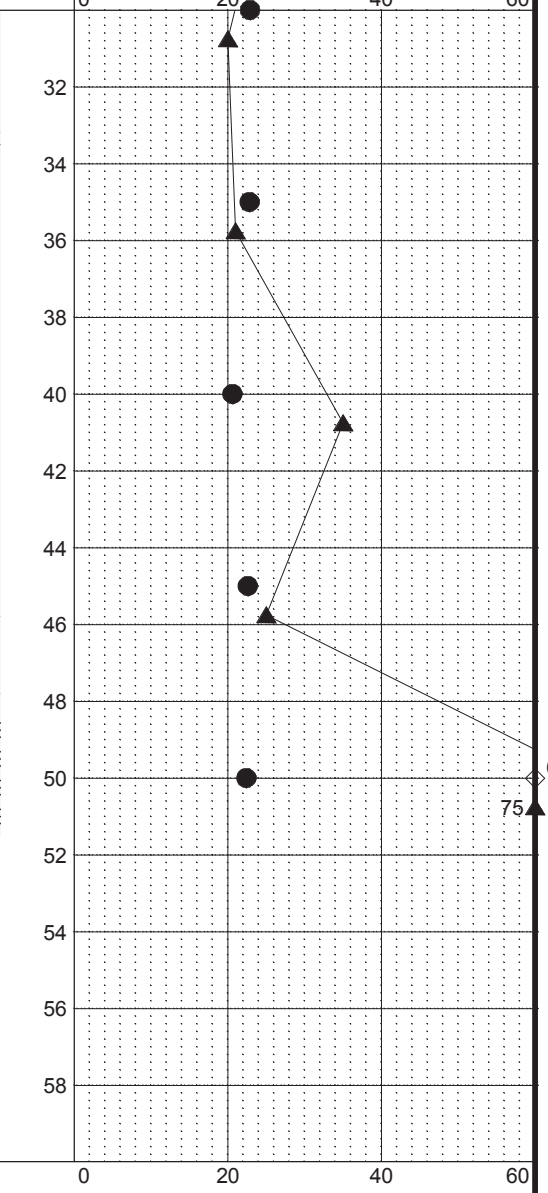
SR520_MASTER_LOG_E 21-20624.GPJ SHAN_WIL.GDT 10/27/10 Log: KES Rev: PHZ Typ: EET

Total Depth:	51.5 ft.	Northing:	~ 235,826 ft.	Drilling Method:	Hollow Stem Auger	Hole Diam.:	10 in.
Top Elevation:	~ 33 ft.	Easting:	~ 1,293,332 ft.	Drilling Company:	Boart Longyear	Rod Diam.:	NWJ
Vert. Datum:	NAVD88	Station:		Drill Rig Equipment:	Rubber-Tread Track	Hammer Type:	Automatic
Horiz. Datum:	NAD 83-91	Offset:		Other Comments:			

SOIL DESCRIPTION *Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines represent the approximate boundaries between material types, and the transition may be gradual.*	Depth, ft.
Medium dense to dense, gray, silty, fine SAND to fine sandy SILT; wet; locally bedded; (Qpnl/Qpgl) SM/ML.	38.5
Very dense, gray, fine sandy SILT; wet; locally bedded; (Qpnl/Qpgl) ML.	47.5
BOTTOM OF BORING COMPLETED 10/25/2007	51.5

Notes:
(a) Slug tests were performed in this borehole.
(b) Borehole location based on global positioning system (GPS) hand-held unit. Elevation estimated from project contour data.





LEGEND

- * Sample Not Recovered
- E Environmental Sample Obtained
- Standard Penetration Test
- Piezometer Screen and Sand Filter
- Bentonite-Cement Grout
- Bentonite Chips/Pellets
- Bentonite Grout
- Groundwater Level in Well
- Groundwater Level in VWP

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
3. The discussion in the text of this report is necessary for a proper understanding of the nature of the subsurface materials.
4. Groundwater level, if indicated above, is for the date specified and may vary.
5. USCS designation is based on visual-manual classification and selected lab testing.

SR 520/I-5 to Medina - Stage 1
Evergreen Point Floating Bridge and Landings

LOG OF BORING H-25p-07 (Revised 9/2010)

October 2010 | 21-1-20624-552

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

EXHIBIT A-7
Sheet 2 of 2

REV 3

SR520_MASTER_LOG_E 21-20624.GPJ SHAN_WIL.GDT 10/27/10 Log: KES Rev: PHZ Typ: EET

Total Depth:	103.7 ft.	Northing:	~ 235,817 ft.	Drilling Method:	Mud Rotary	Hole Diam.:	6 in.
Top Elevation:	~ 86 ft.	Easting:	~ 1,293,448 ft.	Drilling Company:	Crux Subsurface, Inc.	Rod Diam.:	AJ 1-3/4" OD
Vert. Datum:	NAVD88	Station:		Drill Rig Equipment:	Skid Rig	Hammer Type:	Cathead
Horiz. Datum:	NAD 83-91	Offset:		Other Comments:			

SOIL DESCRIPTION

Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines represent the approximate boundaries between material types, and the transition may be gradual.

Depth, ft.	Soil description
	TOPSOIL
1.0	Very dense, brown, silty, sandy GRAVEL, trace of clay; moist to wet; irregular iron-oxide stains, intermixed with hard, brown, sandy, clayey silt; (Hc) GM/ML. Note: Blow counts may be artificially high due to the presence of gravel.
6.0	Very dense, brown, slightly silty to silty, sandy GRAVEL to slightly silty to silty, gravelly SAND; moist to wet; iron-oxide stained; (Qpgo) GP-GM/GM/SW-SM/SM.
21.0	Stiff to very stiff, gray, slightly clayey to clayey SILT and medium dense SILT, trace of fine sand, trace of clay; moist; locally wet, scattered silty, fine sand layers; (Qpnl/Qpgl) ML.

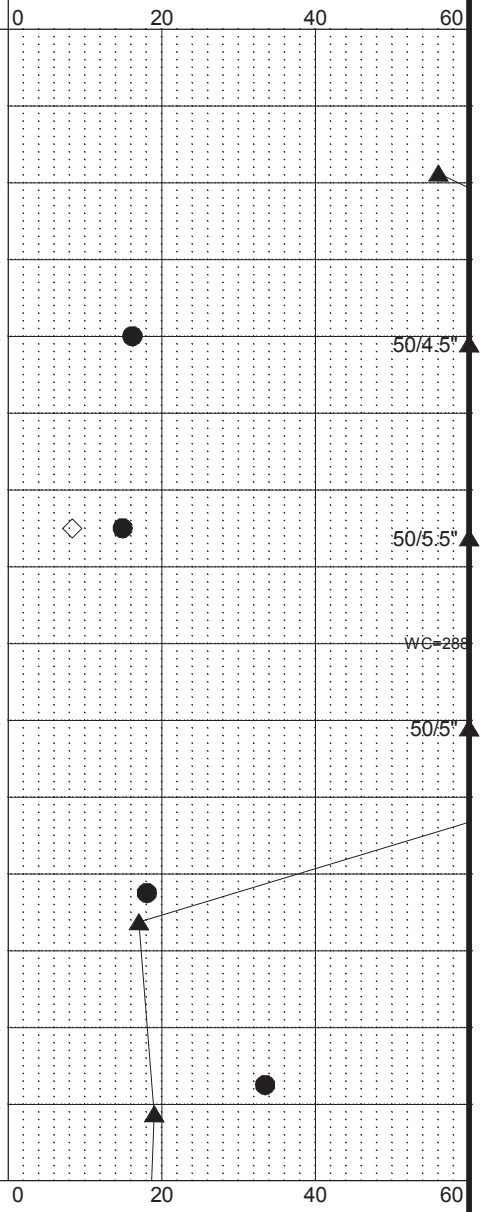
CONTINUED NEXT SHEET

Samples	PID, ppm
1 E	21
2	14
3	14
4 E	16
5	10
6	

Ground-water: 11/18/2009

PENETRATION RESISTANCE (blows/foot)

▲ Hammer Wt. & Drop: *140 lbs / 30 inches*



◇ % Fines (<0.075mm)

● % Water Content

Plastic Limit ├─●─┤ Liquid Limit

Natural Water Content

LEGEND

- * Sample Not Recovered
- E Environmental Sample Obtained
- Standard Penetration Test
- Piezometer Screen and Sand Filter
- Bentonite-Cement Grout
- Bentonite Chips/Pellets
- Bentonite Grout
- Groundwater Level in Well
- Groundwater Level in VWP

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
3. The discussion in the text of this report is necessary for a proper understanding of the nature of the subsurface materials.
4. Groundwater level, if indicated above, is for the date specified and may vary.
5. USCS designation is based on visual-manual classification and selected lab testing.

SR 520/I-5 to Medina - Stage 1
Evergreen Point Floating Bridge and Landings

LOG OF BORING H-26p-08 (Revised 9/2010)

October 2010 | 21-1-20624-552

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

EXHIBIT A-8
Sheet 1 of 4

REV 3

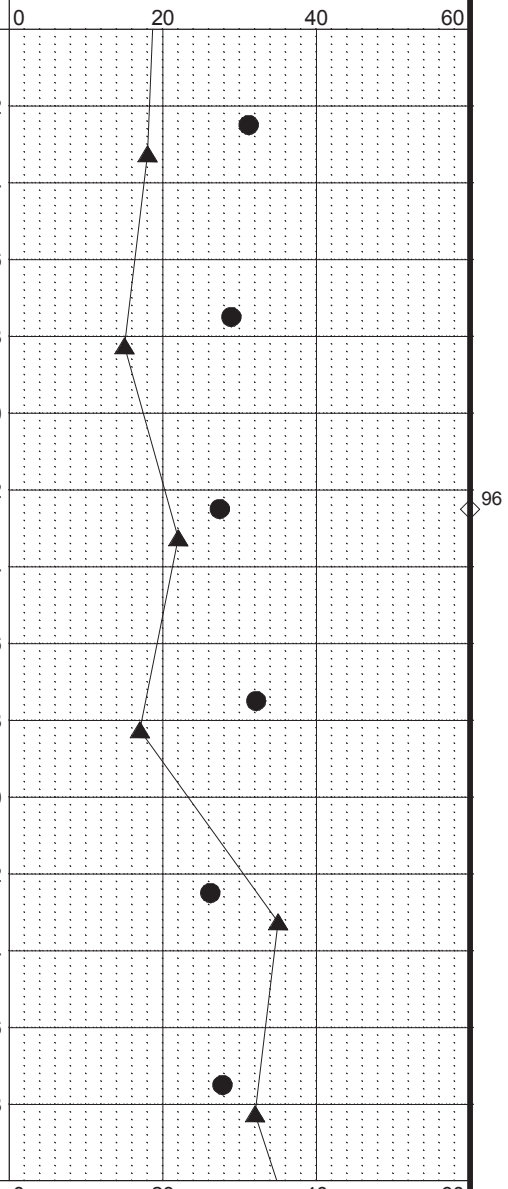
SR520_MASTER_LOG_E 21-20624.GPJ SHAN_WIL.GDT 10/27/10 Log: EDB Rev: PHZ Typ: LKN

Total Depth:	103.7 ft.	Northing:	~ 235,817 ft.	Drilling Method:	Mud Rotary	Hole Diam.:	6 in.
Top Elevation:	~ 86 ft.	Easting:	~ 1,293,448 ft.	Drilling Company:	Crux Subsurface, Inc.	Rod Diam.:	AJ 1-3/4" OD
Vert. Datum:	NAVD88	Station:		Drill Rig Equipment:	Skid Rig	Hammer Type:	Cathead
Horiz. Datum:	NAD 83-91	Offset:		Other Comments:			

SOIL DESCRIPTION *Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines represent the approximate boundaries between material types, and the transition may be gradual.*	Depth, ft.	Symbol	PID, ppm	Samples	Ground-water	Depth, ft.
			0	7	2/17/2010	32
			0	8	2/17/2010	34, 36, 38
			0	9		40, 42
			0	10		44, 46, 48
Dense, gray, trace of fine sand to slightly fine sandy SILT; moist; locally trace of clay, laminated; (Qpnl/Qpgl) ML.	51.0		0	11		50, 52, 54
CONTINUED NEXT SHEET			0	12		56, 58

PENETRATION RESISTANCE (blows/foot)

▲ Hammer Wt. & Drop: *140 lbs / 30 inches*



◇ % Fines (<0.075mm)

● % Water Content

Plastic Limit ├─●─┤ Liquid Limit

Natural Water Content

LEGEND

- * Sample Not Recovered
- E Environmental Sample Obtained
- Standard Penetration Test
- Piezometer Screen and Sand Filter
- Bentonite-Cement Grout
- Bentonite Chips/Pellets
- Bentonite Grout
- Groundwater Level in Well
- Groundwater Level in VWP

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
3. The discussion in the text of this report is necessary for a proper understanding of the nature of the subsurface materials.
4. Groundwater level, if indicated above, is for the date specified and may vary.
5. USCS designation is based on visual-manual classification and selected lab testing.

SR 520/I-5 to Medina - Stage 1
Evergreen Point Floating Bridge and Landings

LOG OF BORING H-26p-08 (Revised 9/2010)

October 2010 21-1-20624-552

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

EXHIBIT A-8
Sheet 2 of 4

SR520_MASTER_LOG_E 21-20624.GPJ SHAN_WIL.GDT 10/27/10 Log: EDB Rev: PHZ Typ: LKN

REV 3

Total Depth:	103.7 ft.	Northing:	~ 235,817 ft.	Drilling Method:	Mud Rotary	Hole Diam.:	6 in.
Top Elevation:	~ 86 ft.	Easting:	~ 1,293,448 ft.	Drilling Company:	Crux Subsurface, Inc.	Rod Diam.:	AJ 1-3/4" OD
Vert. Datum:	NAVD88	Station:		Drill Rig Equipment:	Skid Rig	Hammer Type:	Cathead
Horiz. Datum:	NAD 83-91	Offset:		Other Comments:			

SOIL DESCRIPTION

Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines represent the approximate boundaries between material types, and the transition may be gradual.

Depth, ft. | Symbol | PID, ppm | Samples | Ground-water | Depth, ft.

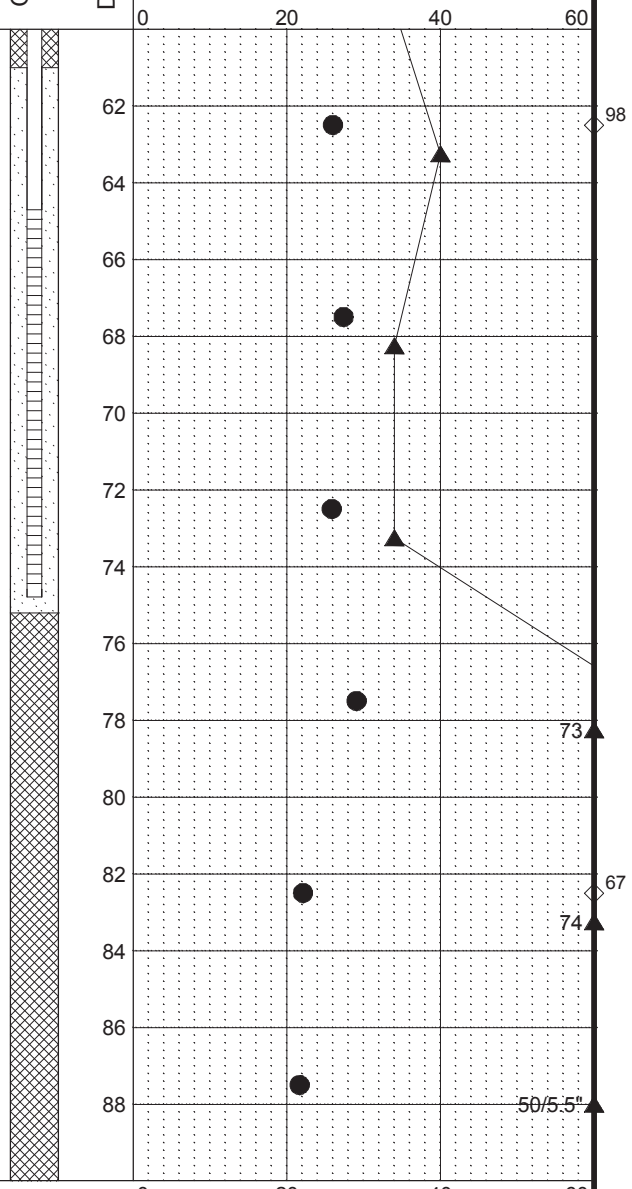
PENETRATION RESISTANCE (blows/foot)

▲ Hammer Wt. & Drop: *140 lbs / 30 inches*

66.0

Interbedded, hard, gray, slightly clayey to clayey SILT, trace of fine sand, and dense to very dense, gray, silty, fine SAND; moist; (Qpnl/Qpgl) ML/SM.

CONTINUED NEXT SHEET



LEGEND

- * Sample Not Recovered
- E Environmental Sample Obtained
- Standard Penetration Test
- Piezometer Screen and Sand Filter
- Bentonite-Cement Grout
- Bentonite Chips/Pellets
- Bentonite Grout
- Groundwater Level in Well
- Groundwater Level in VWP

◇ % Fines (<0.075mm)

● % Water Content

Plastic Limit ├─●─┤ Liquid Limit

Natural Water Content

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
3. The discussion in the text of this report is necessary for a proper understanding of the nature of the subsurface materials.
4. Groundwater level, if indicated above, is for the date specified and may vary.
5. USCS designation is based on visual-manual classification and selected lab testing.

SR 520/I-5 to Medina - Stage 1
Evergreen Point Floating Bridge and Landings

LOG OF BORING H-26p-08 (Revised 9/2010)

October 2010 | 21-1-20624-552

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

EXHIBIT A-8
Sheet 3 of 4

REV 3

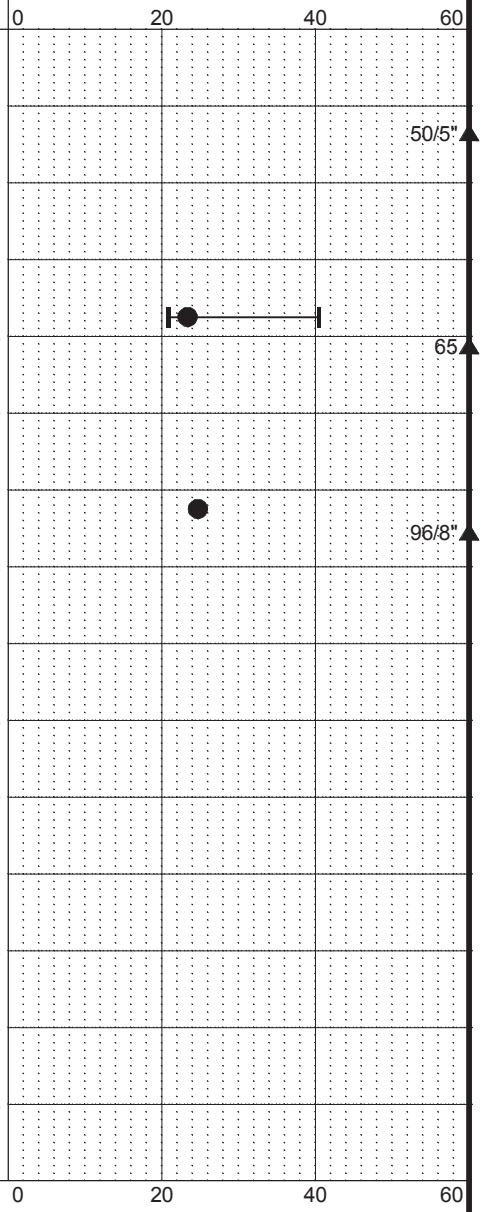
SR520_MASTER_LOG_E 21-20624.GPJ SHAN_WIL.GDT 10/27/10 Log: EDB Rev: PHZ Typ: LKN

Total Depth:	103.7 ft.	Northing:	~ 235,817 ft.	Drilling Method:	Mud Rotary	Hole Diam.:	6 in.
Top Elevation:	~ 86 ft.	Easting:	~ 1,293,448 ft.	Drilling Company:	Crux Subsurface, Inc.	Rod Diam.:	AJ 1-3/4" OD
Vert. Datum:	NAVD88	Station:		Drill Rig Equipment:	Skid Rig	Hammer Type:	Cathead
Horiz. Datum:	NAD 83-91	Offset:		Other Comments:			

SOIL DESCRIPTION *Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines represent the approximate boundaries between material types, and the transition may be gradual.*	Depth, ft.	Symbol	PID, ppm	Samples	Ground-water	Depth, ft.
Interbedded, hard, gray, silty CLAY and clayey SILT, trace of fine sand; moist; numerous light gray silt partings, scattered silty sand seams; (Qpnl/Qpgl) CL/ML.	91.0		0	19 * 20 21		92 94 96 98 100 102 104 106 108 110 112 114 116 118
BOTTOM OF BORING COMPLETED 2/26/2008	103.7					

Notes:
(a) Slug tests were performed in this borehole.
(b) Borehole location based on global positioning system (GPS) hand-held unit. Elevation estimated from project contour data.

PENETRATION RESISTANCE (blows/foot)
▲ Hammer Wt. & Drop: *140 lbs / 30 inches*



LEGEND

- * Sample Not Recovered
- E Environmental Sample Obtained
- Standard Penetration Test
- Piezometer Screen and Sand Filter
- Bentonite-Cement Grout
- Bentonite Chips/Pellets
- Bentonite Grout
- Groundwater Level in Well
- Groundwater Level in VWP

◇ % Fines (<0.075mm)
● % Water Content
Plastic Limit ⊢●⊣ Liquid Limit
Natural Water Content

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
3. The discussion in the text of this report is necessary for a proper understanding of the nature of the subsurface materials.
4. Groundwater level, if indicated above, is for the date specified and may vary.
5. USCS designation is based on visual-manual classification and selected lab testing.

SR 520/I-5 to Medina - Stage 1
Evergreen Point Floating Bridge and Landings

LOG OF BORING H-26p-08 (Revised 9/2010)

October 2010 21-1-20624-552

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

EXHIBIT A-8
Sheet 4 of 4

Total Depth:	71.5 ft.	Northing:	235,904 ft.	Drilling Method:	Mud Rotary	Hole Diam.:	6 in.
Top Elevation:	30.5 ft.	Easting:	1,293,327 ft.	Drilling Company:	Boart Longyear	Rod Diam.:	NWJ
Vert. Datum:	NAVD 88	Station:		Drill Rig Equipment:	CME 850 Track	Hammer Type:	Automatic
Horiz. Datum:	NAD 83-91	Offset:		Other Comments:			

SOIL DESCRIPTION

Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines represent the approximate boundaries between material types, and the transition may be gradual.

Very loose, mottled brown and gray, slightly fine gravelly, silty SAND and sandy, clayey SILT; wet; iron-oxide stained, sand seams, clayey zones, trace to scattered fine organics; (Hc/Hf) SM/ML.

4.5

Stiff, gray, slightly clayey SILT, trace of fine sand and gravel; moist; massive, trace to scattered fine organics, mica; (Qvrl) ML.

7.0

Very stiff, gray, silty CLAY, trace of fine sand; moist; thin-bedded to laminated, scattered partings and seams of silt, trace of fine organics; (Qpnl/Qpgl) CL.

9.5

Very stiff, gray, trace of fine sand to slightly fine sandy, slightly clayey to clayey SILT; moist; thin-bedded, scattered interbeds of fine sandy silt, trace of fine organics, mica; (Qpnl/Qpgl) ML.

23.0

Interbedded, medium dense, gray, fine sandy SILT and very stiff, slightly clayey SILT, trace of fine sand; moist to wet; scattered fine organics; (Qpnl/Qpgl) ML.

28.0

Very stiff, gray, slightly clayey to clayey SILT, trace of fine sand; moist; thin-bedded, trace

CONTINUED NEXT SHEET

Depth, ft. | Symbol | PID, ppm | Samples | Ground-water | Depth, ft.

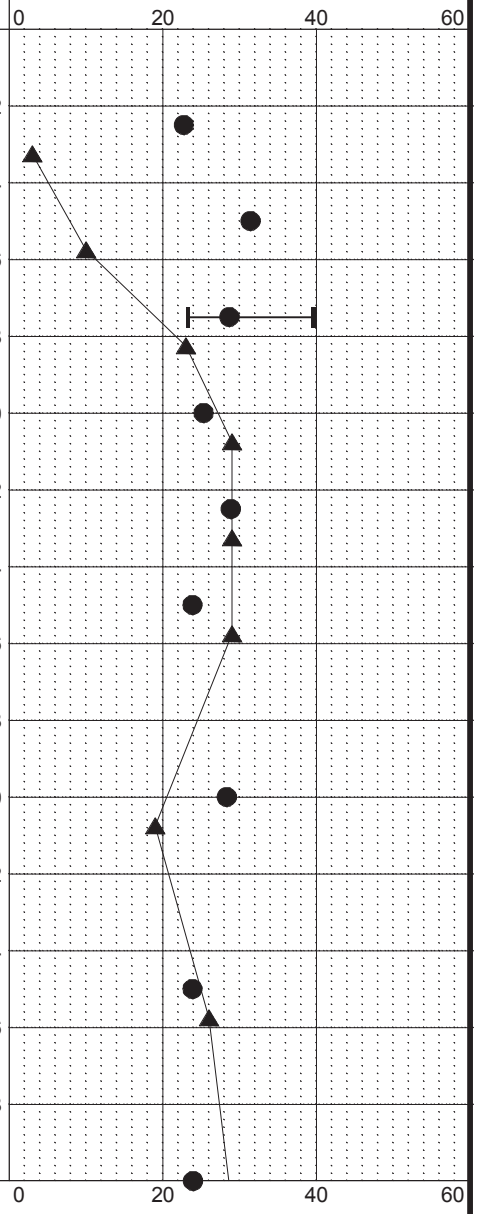
PID, ppm: 0, 0, 0, 0, 0, 0

Samples: 1, 2, 3 (E), 4, 5, 6, 7, 8

Ground-water: 1/6/2010 — artesian conditions: water level 4.5 feet above ground surface on 3/1/10

PENETRATION RESISTANCE (blows/foot)

▲ Hammer Wt. & Drop: *140 lbs / 30 inches*



◇ % Fines (<0.075mm)

● % Water Content

Plastic Limit ├─●─┤ Liquid Limit

Natural Water Content

LEGEND

- * Sample Not Recovered
- E Environmental Sample Obtained
- Standard Penetration Test
- Pressuremeter Test (f=failed)
- Piezometer Screen and Sand Filter
- Bentonite-Cement Grout
- Bentonite Chips/Pellets
- Bentonite Grout
- Groundwater Level in Well

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
3. The discussion in the text of this report is necessary for a proper understanding of the nature of the subsurface materials.
4. Groundwater level, if indicated above, is for the date specified and may vary.
5. USCS designation is based on visual-manual classification and selected lab testing.

SR 520/I-5 to Medina - Stage 1
Evergreen Point Floating Bridge and Landings

LOG OF BORING H-104p-09 (Revised 9/2010)

October 2010 — 21-1-20624-552

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

EXHIBIT A-10
Sheet 1 of 3

REV 3

SR520_MASTER_LOG_E 21-20624.GPJ SHAN_WIL.GDT 10/27/10 Log: GBB Rev: PHZ Typ: CLP

Total Depth:	71.5 ft.	Northing:	235,904 ft.	Drilling Method:	Mud Rotary	Hole Diam.:	6 in.
Top Elevation:	30.5 ft.	Easting:	1,293,327 ft.	Drilling Company:	Boart Longyear	Rod Diam.:	NWJ
Vert. Datum:	NAVD 88	Station:		Drill Rig Equipment:	CME 850 Track	Hammer Type:	Automatic
Horiz. Datum:	NAD 83-91	Offset:		Other Comments:			

SOIL DESCRIPTION

Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines represent the approximate boundaries between material types, and the transition may be gradual.

of fine organics, mica; (Qpnl/Qpgl) ML.

33.0

Interbedded, hard, gray, silty CLAY and dense, gray, slightly silty, fine SAND; moist; thin-bedded, trace of fine organics, mica; (Qpnf/Qpnl/Qpgl) CL/SP-SM.

38.0

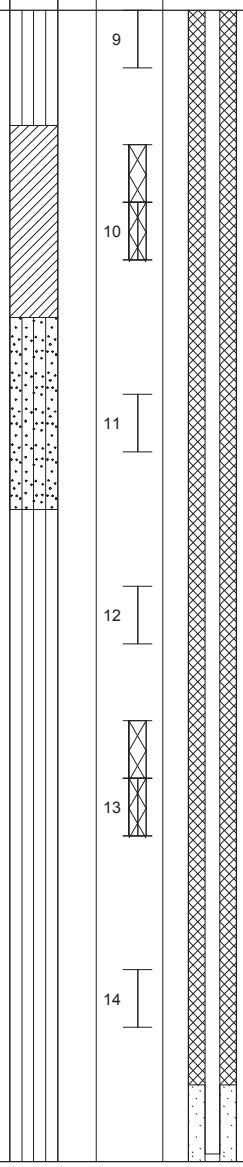
Medium dense, gray, silty, fine SAND; moist to wet; thin interbeds of silty clay, trace of fine organics, mica; (Qpgo/Qpnf) SM.

43.0

Very stiff to hard, gray, trace of fine sand to slightly fine sandy, slightly clayey to clayey SILT and silty CLAY; moist; thick- to thin-bedded, scattered sand partings, clayey zones, trace of fine organics, mica; (Qpnl/Qpgl) ML/CL.

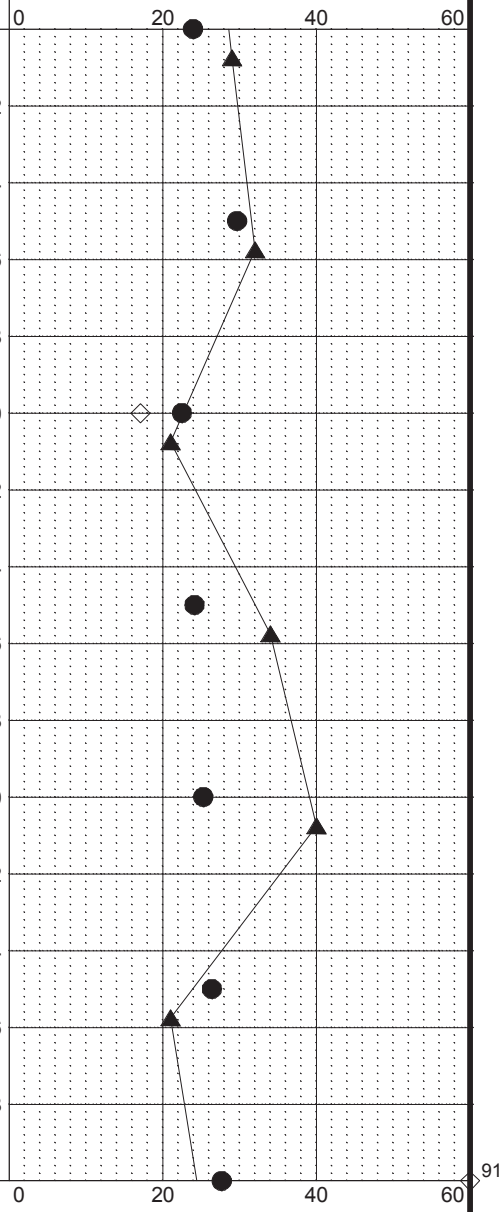
CONTINUED NEXT SHEET

Depth, ft. | Symbol | PID, ppm | Samples | Ground-water | Depth, ft.



PENETRATION RESISTANCE (blows/foot)

▲ Hammer Wt. & Drop: 140 lbs / 30 inches



◇ % Fines (<0.075mm)

● % Water Content

Plastic Limit ├─●─┤ Liquid Limit

Natural Water Content

LEGEND

- * Sample Not Recovered
- E Environmental Sample Obtained
- Standard Penetration Test
- Pressuremeter Test (f=failed)
- Piezometer Screen and Sand Filter
- Bentonite-Cement Grout
- Bentonite Chips/Pellets
- Bentonite Grout
- Groundwater Level in Well

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
3. The discussion in the text of this report is necessary for a proper understanding of the nature of the subsurface materials.
4. Groundwater level, if indicated above, is for the date specified and may vary.
5. USCS designation is based on visual-manual classification and selected lab testing.

SR 520/I-5 to Medina - Stage 1
Evergreen Point Floating Bridge and Landings

LOG OF BORING H-104p-09 (Revised 9/2010)

October 2010 | 21-1-20624-552

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

EXHIBIT A-10
Sheet 2 of 3

REV 3

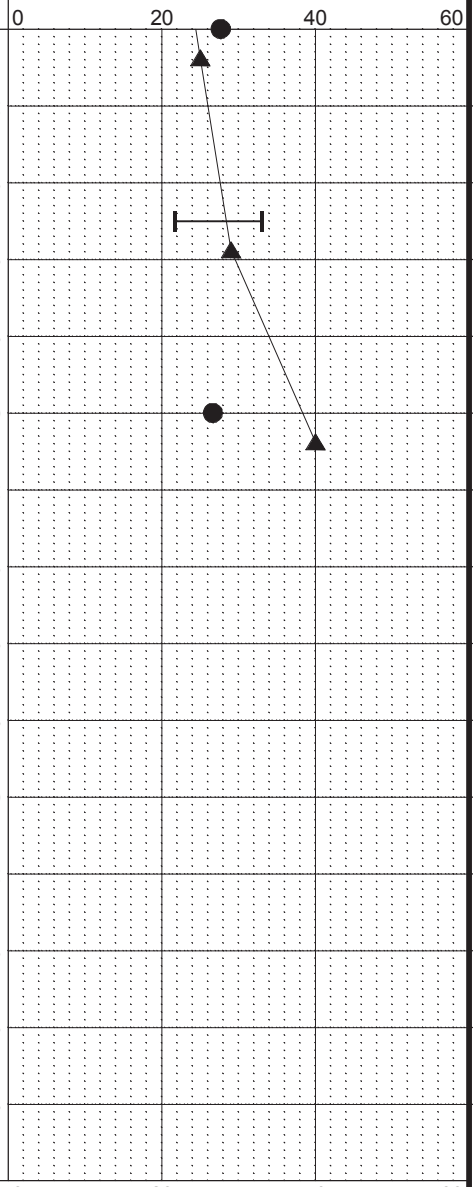
SR520_MASTER_LOG_E 21-20624.GPJ SHAN_WIL.GDT 10/27/10 Log: GBB Rev: PHZ Typ: CLP

Total Depth:	71.5 ft.	Northing:	235,904 ft.	Drilling Method:	Mud Rotary	Hole Diam.:	6 in.
Top Elevation:	30.5 ft.	Easting:	1,293,327 ft.	Drilling Company:	Boart Longyear	Rod Diam.:	NWJ
Vert. Datum:	NAVD 88	Station:		Drill Rig Equipment:	CME 850 Track	Hammer Type:	Automatic
Horiz. Datum:	NAD 83-91	Offset:		Other Comments:			

SOIL DESCRIPTION *Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines represent the approximate boundaries between material types, and the transition may be gradual.*	Depth, ft.	Symbol	PID, ppm	Samples	Ground-water	Depth, ft.
				15		62
						64
				16		66
						68
						70
				17		
BOTTOM OF BORING COMPLETED 1/7/2009	71.5					72
						74
						76
						78
						80
						82
						84
						86
						88

Notes:
(a) Pressuremeter tests were performed in this borehole.
(b) Slug tests were performed in this borehole.

PENETRATION RESISTANCE (blows/foot)
▲ Hammer Wt. & Drop: *140 lbs / 30 inches*



LEGEND

- * Sample Not Recovered
- E Environmental Sample Obtained
- Standard Penetration Test
- Pressuremeter Test (f=failed)
- Piezometer Screen and Sand Filter
- Bentonite-Cement Grout
- Bentonite Chips/Pellets
- Bentonite Grout
- Groundwater Level in Well

◇ % Fines (<0.075mm)
● % Water Content
Plastic Limit ├─●─┤ Liquid Limit
Natural Water Content

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
3. The discussion in the text of this report is necessary for a proper understanding of the nature of the subsurface materials.
4. Groundwater level, if indicated above, is for the date specified and may vary.
5. USCS designation is based on visual-manual classification and selected lab testing.

SR 520/I-5 to Medina - Stage 1
Evergreen Point Floating Bridge and Landings

LOG OF BORING H-104p-09 (Revised 9/2010)

October 2010 21-1-20624-552

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

EXHIBIT A-10
Sheet 3 of 3

REV 3

SR520_MASTER_LOG_E 21-20624.GPJ SHAN_WIL.GDT 10/27/10 Log: GBB Rev: PHZ Typ: CLP

Total Depth:	101.5 ft.	Northing:	235,886 ft.	Drilling Method:	Mud Rotary	Hole Diam.:	6 in.
Top Elevation:	101.7 ft.	Easting:	1,293,476 ft.	Drilling Company:	Boart Longyear	Rod Diam.:	NWJ
Vert. Datum:	NAVD 88	Station:		Drill Rig Equipment:	CME 850 Track	Hammer Type:	Automatic
Horiz. Datum:	NAD 83-91	Offset:		Other Comments:			

SOIL DESCRIPTION

Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines represent the approximate boundaries between material types, and the transition may be gradual.

Description	Depth, ft.
Brown, silty SAND; moist; numerous organics (twigs, roots, wood fragments); (Topsoil) SM.	3.8
Dense, brown-gray, silty, fine SAND, trace of gravel; moist; (weathered Qvt) SM.	7.0
Hard, brown and gray, silty CLAY, trace of coarse sand and gravel; moist; scattered iron-oxide stained silt seams, scattered slickensides; (Qvgl) CH.	12.0
Very dense, brown, trace of clay to clayey, silty, fine gravelly SAND and silty, sandy GRAVEL; moist to wet; (Qpgo/Qpnf) SM/GM/SC.	19.5
Very stiff, brown, slightly sandy to sandy, silty CLAY to clayey SILT, trace of coarse sand and fine gravel; moist; scattered iron-oxide staining; (Qpgl) CL/ML.	25.0
Dense to very dense, gray, silty, sandy GRAVEL; wet; gravelly, clayey silt zone between approximately 25 and 26.5 feet; (Qpgo) GM.	

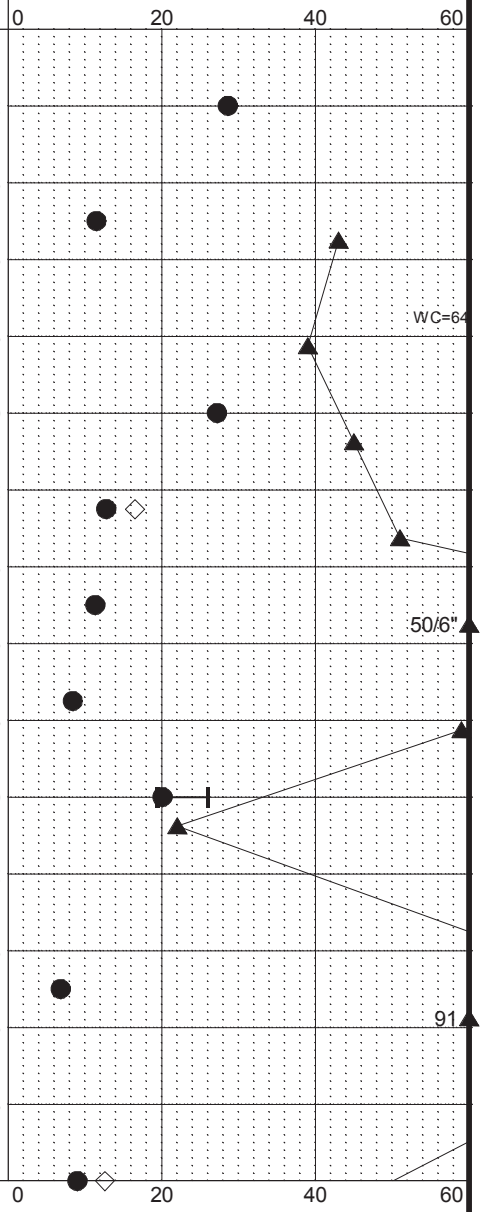
CONTINUED NEXT SHEET

Samples	PID, ppm
1 (G, E)	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0

Ground-water: 4/27/2010

PENETRATION RESISTANCE (blows/foot)

▲ Hammer Wt. & Drop: *140 lbs / 30 inches*



LEGEND

- * Sample Not Recovered
- E Environmental Sample Obtained
- G Grab Sample
- Standard Penetration Test
- Piezometer Screen and Sand Filter
- Bentonite-Cement Grout
- Bentonite Chips/Pellets
- Bentonite Grout
- Groundwater Level in Well
- Groundwater Level in VWP

◇ % Fines (<0.075mm)

● % Water Content

Plastic Limit ⊢●⊣ Liquid Limit

Natural Water Content

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
3. The discussion in the text of this report is necessary for a proper understanding of the nature of the subsurface materials.
4. Groundwater level, if indicated above, is for the date specified and may vary.
5. USCS designation is based on visual-manual classification and selected lab testing.

SR 520/I-5 to Medina - Stage 1
Evergreen Point Floating Bridge and Landings

LOG OF BORING H-105p-09 (Revised 9/2010)

October 2010 21-1-20624-552

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

EXHIBIT A-11
Sheet 1 of 4

REV 3

SR520_MASTER_LOG_E 21-20624.GPJ SHAN_WIL.GDT 10/27/10 Log: KH Rev: PHZ Typ: CLP

Total Depth:	101.5 ft.	Northing:	235,886 ft.	Drilling Method:	Mud Rotary	Hole Diam.:	6 in.
Top Elevation:	101.7 ft.	Easting:	1,293,476 ft.	Drilling Company:	Boart Longyear	Rod Diam.:	NWJ
Vert. Datum:	NAVD 88	Station:		Drill Rig Equipment:	CME 850 Track	Hammer Type:	Automatic
Horiz. Datum:	NAD 83-91	Offset:		Other Comments:			

SOIL DESCRIPTION

Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines represent the approximate boundaries between material types, and the transition may be gradual.

Depth, ft. | Symbol | PID, ppm | Samples | Ground-water | Depth, ft.

PENETRATION RESISTANCE (blows/foot)

▲ Hammer Wt. & Drop: *140 lbs / 30 inches*

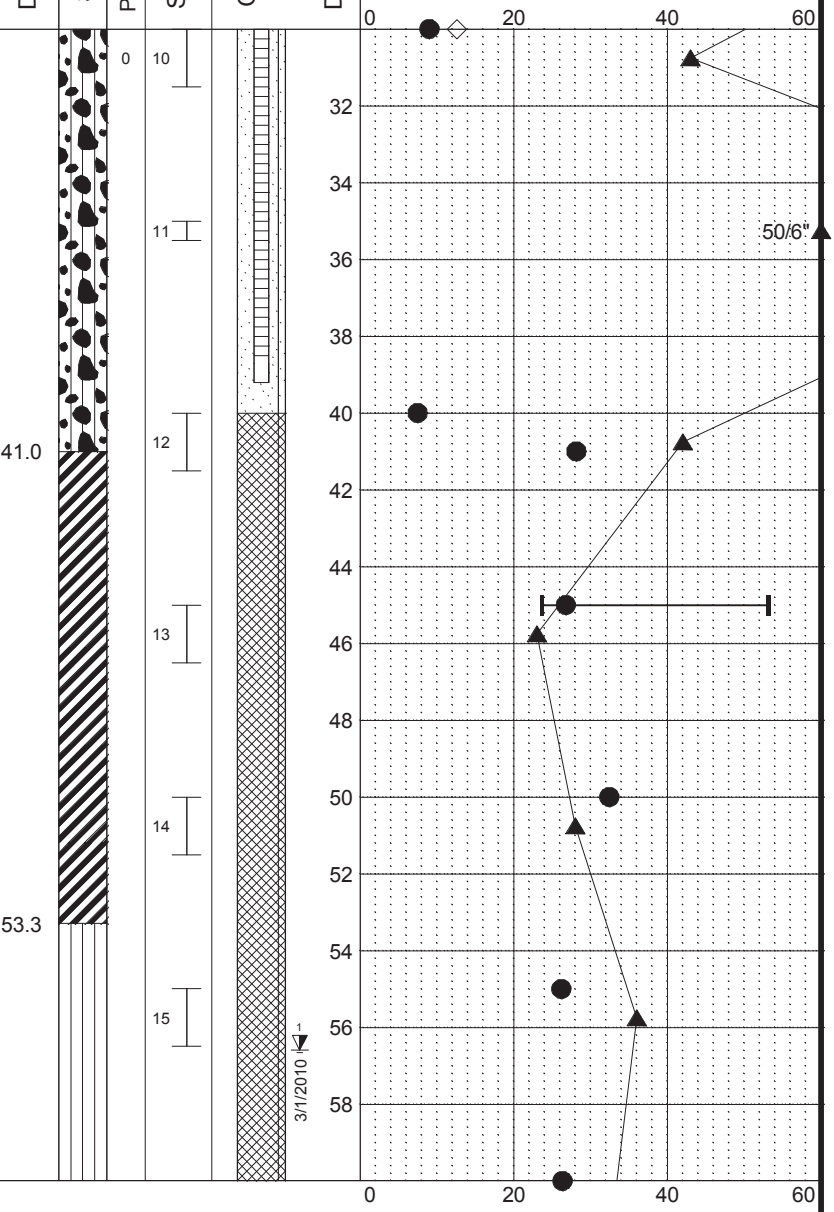
Very stiff, gray, silty CLAY, trace of fine sand; moist; disturbed texture, slickensides, scattered silt partings; (Qpgl) CH/CL.

41.0

Very stiff to hard, gray, slightly clayey to clayey SILT, trace of sand to dense, sandy SILT; moist to wet; trace of fine organics; (Qpnl/Qpgl) ML.

53.3

CONTINUED NEXT SHEET



LEGEND

- * Sample Not Recovered
- E Environmental Sample Obtained
- Grab Sample
- Standard Penetration Test
- Piezometer Screen and Sand Filter
- Bentonite-Cement Grout
- Bentonite Chips/Pellets
- Bentonite Grout
- Groundwater Level in Well
- Groundwater Level in VWP

◇ % Fines (<0.075mm)

● % Water Content

Plastic Limit ⊢●⊣ Liquid Limit

Natural Water Content

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
3. The discussion in the text of this report is necessary for a proper understanding of the nature of the subsurface materials.
4. Groundwater level, if indicated above, is for the date specified and may vary.
5. USCS designation is based on visual-manual classification and selected lab testing.

SR 520/I-5 to Medina - Stage 1
Evergreen Point Floating Bridge and Landings

LOG OF BORING H-105p-09 (Revised 9/2010)

October 2010 | 21-1-20624-552

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

EXHIBIT A-11
Sheet 2 of 4

REV 3

SR520_MASTER_LOG_E 21-20624.GPJ SHAN_WIL.GDT 10/27/10 Log: KH Rev: PHZ Typ: CLP

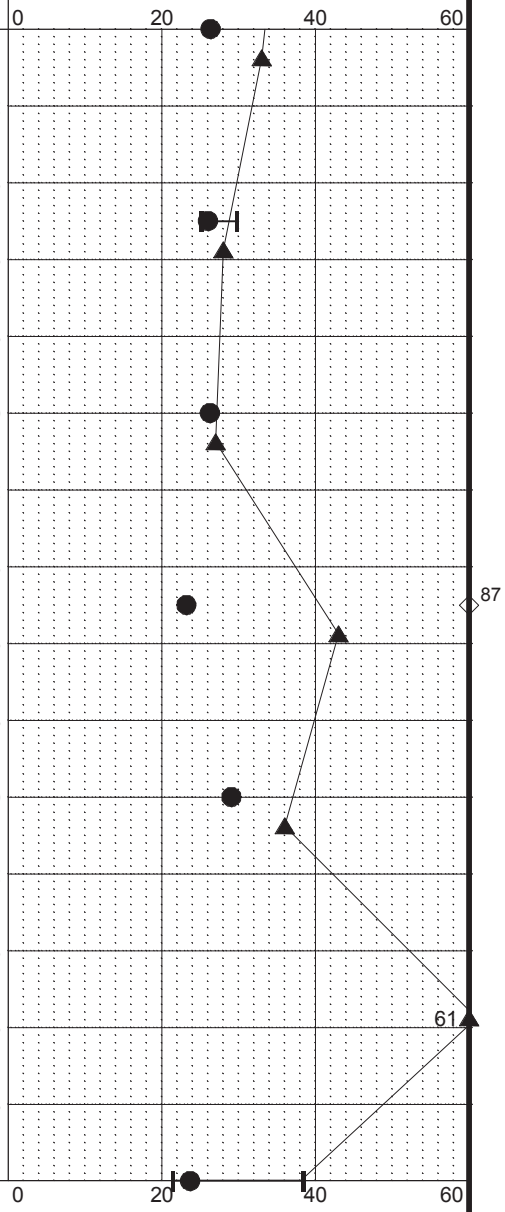
Total Depth:	101.5 ft.	Northing:	235,886 ft.	Drilling Method:	Mud Rotary	Hole Diam.:	6 in.
Top Elevation:	101.7 ft.	Easting:	1,293,476 ft.	Drilling Company:	Boart Longyear	Rod Diam.:	NWJ
Vert. Datum:	NAVD 88	Station:		Drill Rig Equipment:	CME 850 Track	Hammer Type:	Automatic
Horiz. Datum:	NAD 83-91	Offset:		Other Comments:			

SOIL DESCRIPTION *Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines represent the approximate boundaries between material types, and the transition may be gradual.*	Depth, ft.	Symbol	PID, ppm	Samples	Ground-water	Depth, ft.
				16		62
						64
				17		66
						68
				18		70
						72
						74
				19		76
						78
				20		80
						82
						84
Hard, gray, silty CLAY; moist; trace of fine organics; (Qpnl/Qpgl) CL.	85.8			21 *		86
						88

CONTINUED NEXT SHEET

PENETRATION RESISTANCE (blows/foot)

▲ Hammer Wt. & Drop: *140 lbs / 30 inches*



◇ % Fines (<0.075mm)

● % Water Content

Plastic Limit ├─●─┤ Liquid Limit

Natural Water Content

LEGEND

- * Sample Not Recovered
- E Environmental Sample Obtained
- Grab Sample
- Standard Penetration Test
- Piezometer Screen and Sand Filter
- Bentonite-Cement Grout
- Bentonite Chips/Pellets
- Bentonite Grout
- Groundwater Level in Well
- Groundwater Level in VWP

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
3. The discussion in the text of this report is necessary for a proper understanding of the nature of the subsurface materials.
4. Groundwater level, if indicated above, is for the date specified and may vary.
5. USCS designation is based on visual-manual classification and selected lab testing.

SR 520/I-5 to Medina - Stage 1
Evergreen Point Floating Bridge and Landings

LOG OF BORING H-105p-09 (Revised 9/2010)

October 2010 21-1-20624-552

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

EXHIBIT A-11
Sheet 3 of 4

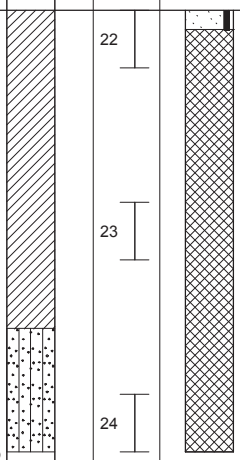
REV 3

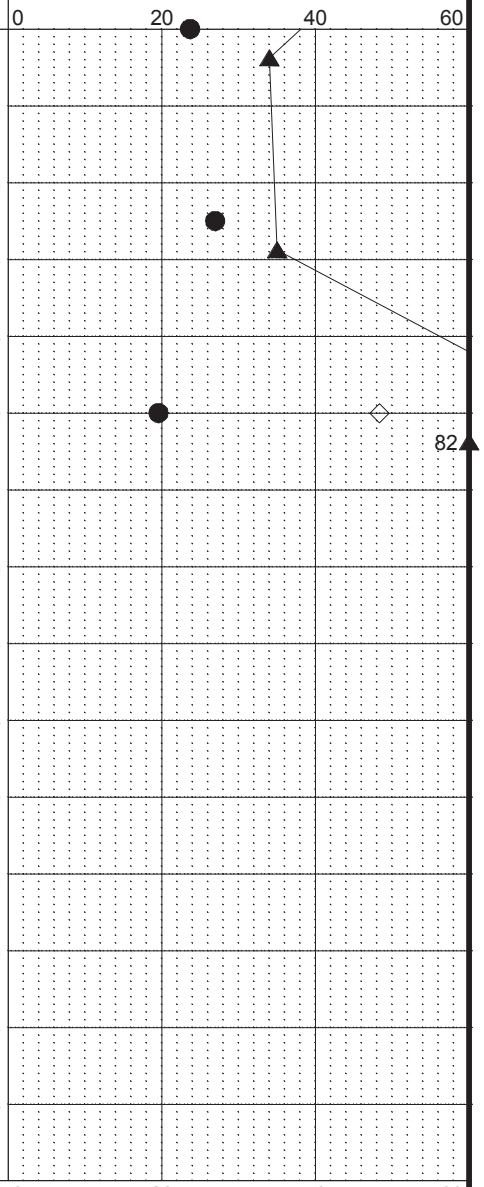
SR520_MASTER_LOG_E 21-20624.GPJ SHAN_WIL.GDT 10/27/10 Log: KH Rev: PHZ Typ: CLP

Total Depth:	101.5 ft.	Northing:	235,886 ft.	Drilling Method:	Mud Rotary	Hole Diam.:	6 in.
Top Elevation:	101.7 ft.	Easting:	1,293,476 ft.	Drilling Company:	Boart Longyear	Rod Diam.:	NWJ
Vert. Datum:	NAVD 88	Station:		Drill Rig Equipment:	CME 850 Track	Hammer Type:	Automatic
Horiz. Datum:	NAD 83-91	Offset:		Other Comments:			

SOIL DESCRIPTION *Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines represent the approximate boundaries between material types, and the transition may be gradual.*	Depth, ft.
Very dense, gray, silty, fine SAND; wet; trace of fine organics; (Qpnl/Qpgl) SM.	98.3
BOTTOM OF BORING COMPLETED 4/9/2009 Note: Slug tests were performed in this borehole.	101.5

Symbol | PID, ppm | Samples | Ground-water | Depth, ft.





LEGEND

- * Sample Not Recovered
- E Environmental Sample Obtained
- Grab Sample
- Standard Penetration Test
- Piezometer Screen and Sand Filter
- Bentonite-Cement Grout
- Bentonite Chips/Pellets
- Bentonite Grout
- Groundwater Level in Well
- Groundwater Level in VWP

◇ % Fines (<0.075mm)
● % Water Content
Plastic Limit ├─●─┤ Liquid Limit
Natural Water Content

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
3. The discussion in the text of this report is necessary for a proper understanding of the nature of the subsurface materials.
4. Groundwater level, if indicated above, is for the date specified and may vary.
5. USCS designation is based on visual-manual classification and selected lab testing.

SR 520/I-5 to Medina - Stage 1
Evergreen Point Floating Bridge and Landings

LOG OF BORING H-105p-09 (Revised 9/2010)

October 2010 | 21-1-20624-552

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

EXHIBIT A-11
Sheet 4 of 4

REV 3

SR520_MASTER_LOG_E 21-20624.GPJ SHAN_WIL.GDT 10/27/10 Log: KH Rev: PHZ Typ: CLP

Total Depth:	61.5 ft.	Northing:	235,819 ft.	Drilling Method:	Advanced Casing	Hole Diam.:	3 in.
Top Elevation:	108.0 ft.	Easting:	1,293,515 ft.	Drilling Company:	Salisbury	Rod Diam.:	BDBGM
Vert. Datum:	NAVD 88	Station:		Drill Rig Equipment:	Viper 1 Difficult Access	Hammer Type:	Cathead
Horiz. Datum:	NAD 83-91	Offset:		Other Comments:			

SOIL DESCRIPTION

Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines represent the approximate boundaries between material types, and the transition may be gradual.

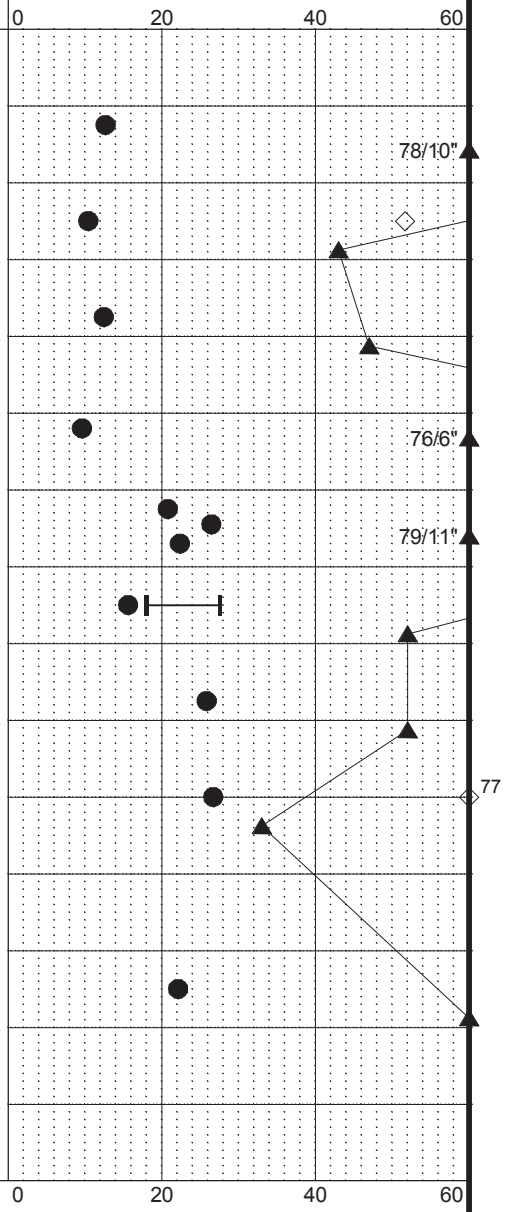
Soil description	Depth, ft.
TOPSOIL.	0.5
Dense to very dense, brown, trace of fine gravel to fine gravelly, silty SAND to sandy SILT; moist; scattered iron-oxide staining, scattered boulders at 9.5 feet, diamict texture; (weathered Qvt) SM/ML.	11.5
Very dense, orange and brown, trace of clay to clayey SILT, trace of fine sand; moist; abundant iron-oxide staining, scattered, gray, silty clay clasts, sheared texture; (Qvgl) ML.	12.9 / 13.4
Hard, gray, silty CLAY; moist; scattered silt partings, laminated, 1-inch-thick clayey silt layer, sheared texture; (Qvgl) CL.	14.5
Very dense, orange and brown, slightly clayey SILT, trace of fine sand; moist; scattered to abundant iron-oxide staining, scattered fractures; (Qvgl) ML.	17.6
Hard, gray, silty CLAY, trace of sand and fine gravel; moist; (Qvgl) CL.	19.5
Very dense, brown, slightly fine sandy SILT, trace of clay; moist; scattered iron-oxide staining, vertical silty clay seam, 1/2-inch thick horizontal silty clay layer, scattered mica; (Qpnl/Qpgl) ML.	24.5
Dense, gray-brown to dark brown, slightly fine sandy to fine sandy SILT; moist;	

CONTINUED NEXT SHEET

Samples	PID, ppm
1 (E)	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0

PENETRATION RESISTANCE (blows/foot)

▲ Hammer Wt. & Drop: *140 lbs / 30 inches*



LEGEND

- * Sample Not Recovered
- E Environmental Sample Obtained
- Standard Penetration Test

◇ % Fines (<0.075mm)

● % Water Content

Plastic Limit ├─●─┤ Liquid Limit

Natural Water Content

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
3. The discussion in the text of this report is necessary for a proper understanding of the nature of the subsurface materials.
4. Groundwater level, if indicated above, is for the date specified and may vary.
5. USCS designation is based on visual-manual classification and selected lab testing.

SR 520/I-5 to Medina - Stage 1
Evergreen Point Floating Bridge and Landings

LOG OF BORING H-106-09 (Revised 9/2010)

October 2010 | 21-1-20624-552

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

EXHIBIT A-12
Sheet 1 of 3

REV 3

SR520_MASTER_LOG_E 21-20624.GPJ SHAN_WIL.GDT 10/27/10 Log: EAS Rev: PHZ Typ: LKN

Total Depth:	61.5 ft.	Northing:	235,819 ft.	Drilling Method:	Advanced Casing	Hole Diam.:	3 in.
Top Elevation:	108.0 ft.	Easting:	1,293,515 ft.	Drilling Company:	Salisbury	Rod Diam.:	BDBGM
Vert. Datum:	NAVD 88	Station:		Drill Rig Equipment:	Viper 1 Difficult Access	Hammer Type:	Cathead
Horiz. Datum:	NAD 83-91	Offset:		Other Comments:			

SOIL DESCRIPTION

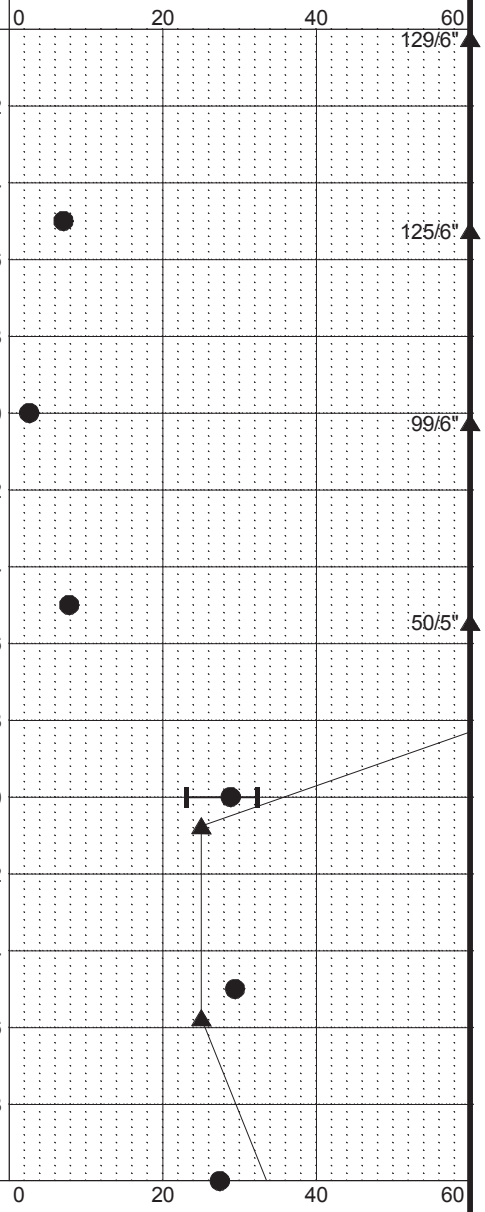
Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines represent the approximate boundaries between material types, and the transition may be gradual.

Soil Description	Depth, ft.	PID, ppm	Samples	Ground-water Depth, ft.
scattered to abundant organics and wood fragments, laminated, scattered iron-oxide stained seams; (Qpnl) ML.	30.0		10 *	
Very dense, gray, fine sandy SILT; wet; trace of organics; (Qpnl/Qpgl) ML.				
Very dense, gray, slightly silty, gravelly SAND to slightly silty, sandy GRAVEL; wet; scattered fine sand seams inferred from cuttings and drill action; (Qpgo) SP-SM/GP-GM.		0	11	
Note: Layer description is based on poor sample recovery.		0	12	
		0	13	
Very stiff to hard, gray, clayey SILT to silty CLAY, trace of fine sand; moist; scattered silty, fine sand seams and silty clay seams, trace of fine organics; (Qpnl/Qpgl) ML/CL.	48.0	0	14	
		0	15	

CONTINUED NEXT SHEET

PENETRATION RESISTANCE (blows/foot)

▲ Hammer Wt. & Drop: *140 lbs / 30 inches*



LEGEND

* Sample Not Recovered

E Environmental Sample Obtained

Standard Penetration Test

◇ % Fines (<0.075mm)

● % Water Content

Plastic Limit ├─●─┤ Liquid Limit

Natural Water Content

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
3. The discussion in the text of this report is necessary for a proper understanding of the nature of the subsurface materials.
4. Groundwater level, if indicated above, is for the date specified and may vary.
5. USCS designation is based on visual-manual classification and selected lab testing.

SR 520/I-5 to Medina - Stage 1
Evergreen Point Floating Bridge and Landings

LOG OF BORING H-106-09 (Revised 9/2010)

October 2010 21-1-20624-552

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

EXHIBIT A-12
Sheet 2 of 3

REV 3

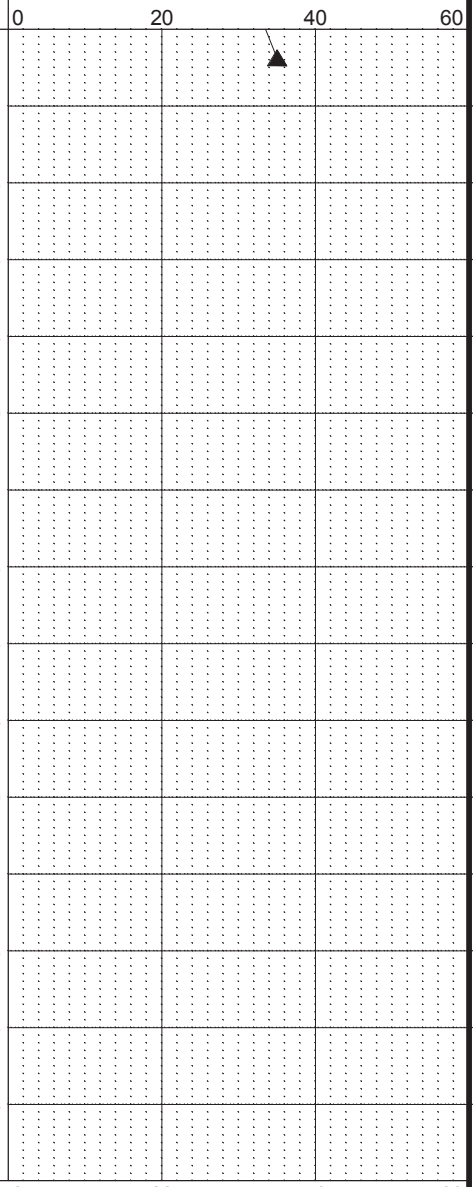
SR520_MASTER_LOG_E 21-20624.GPJ SHAN_WIL.GDT 10/27/10 Log: EAS Rev: PHZ Typ: LKN

Total Depth:	61.5 ft.	Northing:	235,819 ft.	Drilling Method:	Advanced Casing	Hole Diam.:	3 in.
Top Elevation:	108.0 ft.	Easting:	1,293,515 ft.	Drilling Company:	Salisbury	Rod Diam.:	BDBGM
Vert. Datum:	NAVD 88	Station:		Drill Rig Equipment:	Viper 1 Difficult Access	Hammer Type:	Cathead
Horiz. Datum:	NAD 83-91	Offset:		Other Comments:			

SOIL DESCRIPTION *Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines represent the approximate boundaries between material types, and the transition may be gradual.*	Depth, ft.	Symbol	PID, ppm	Samples	Ground-water	Depth, ft.
			0	16		
BOTTOM OF BORING COMPLETED 2/3/2009	61.5					62 64 66 68 70 72 74 76 78 80 82 84 86 88

PENETRATION RESISTANCE (blows/foot)

▲ Hammer Wt. & Drop: *140 lbs / 30 inches*



LEGEND

* Sample Not Recovered

E Environmental Sample Obtained

Standard Penetration Test

◇ % Fines (<0.075mm)

● % Water Content

Plastic Limit ├─●─┤ Liquid Limit

Natural Water Content

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
3. The discussion in the text of this report is necessary for a proper understanding of the nature of the subsurface materials.
4. Groundwater level, if indicated above, is for the date specified and may vary.
5. USCS designation is based on visual-manual classification and selected lab testing.

SR 520/I-5 to Medina - Stage 1
Evergreen Point Floating Bridge and Landings

LOG OF BORING H-106-09 (Revised 9/2010)

October 2010 21-1-20624-552

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

EXHIBIT A-12
Sheet 3 of 3

REV 3

SR520_MASTER_LOG_E 21-20624.GPJ SHAN_WIL.GDT 10/27/10 Log: EAS Rev: PHZ Typ: LKN

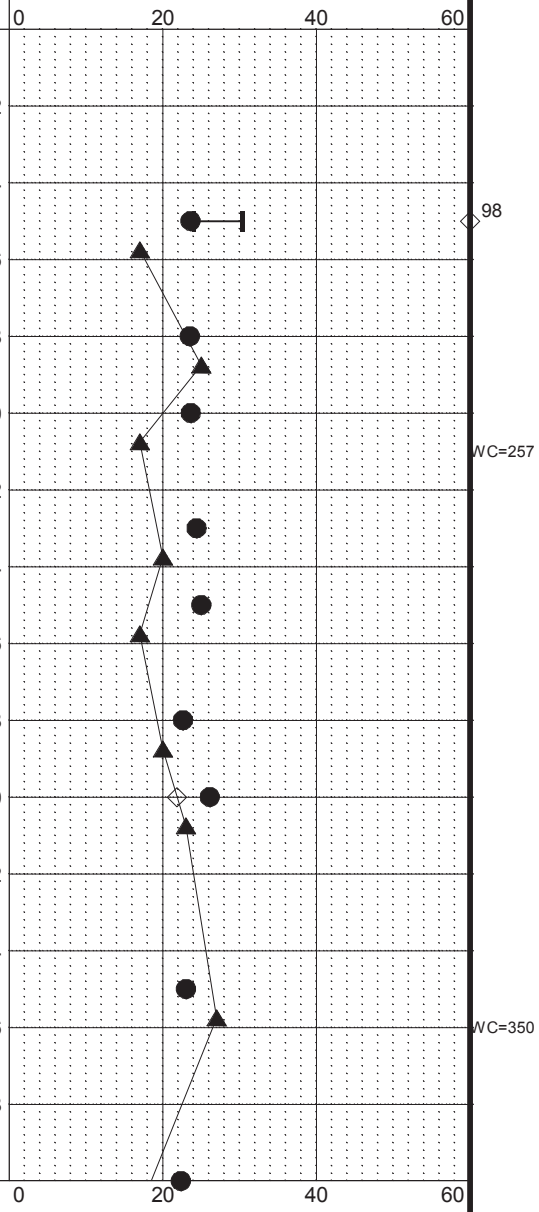
Total Depth:	251.5 ft.	Northing:	235,874 ft.	Drilling Method:	Advanced Casing	Hole Diam.:	6 in.
Top Elevation:	23.5 ft.	Easting:	1,293,277 ft.	Drilling Company:	WSDOT	Rod Diam.:	AWJ
Vert. Datum:	NAVD 88	Station:		Drill Rig Equipment:	CME 45 Skid Rig 9C4-2	Hammer Type:	Automatic
Horiz. Datum:	NAD 83/91	Offset:		Other Comments:			

SOIL DESCRIPTION *Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines represent the approximate boundaries between material types, and the transition may be gradual.*	Depth, ft.	Symbol	PID, ppm	Samples	Ground-water	Depth, ft.
Very stiff, gray, slightly clayey to clayey SILT, trace of fine sand grading to silty CLAY, trace of fine sand; moist; laminated, scattered horizontal to steeply inclined silt and silty, fine sand partings and seams, trace of fine organics; (Qvrl) ML/CL.			0	1	Artesian Conditions Observed During Drilling	
			0	2		
			0	3		
			0	4		
			0	5		
Medium dense, gray, slightly fine sandy to fine sandy SILT, trace of clay; wet; scattered irregular fine sand seams, trace of fine organics; (Qpnl/Qpgl) ML.	17.0		0	6		
Medium dense, gray, silty, fine SAND; wet; scattered clayey silt seams, trace of fine organics; (Qpnl/Qpgl) SM.	19.7			7		
Very stiff, gray, silty CLAY, trace of sand; moist; scattered light gray silt partings and seams, trace of fine organics; (Qpnl/Qpgl) CL.	25.0		0	8		
Medium dense, gray, silty, fine SAND; wet;	28.0					

CONTINUED NEXT SHEET

PENETRATION RESISTANCE (blows/foot)

▲ Hammer Wt. & Drop: *140 lbs / 30 inches*



LEGEND

* Sample Not Recovered

Standard Penetration Test

◇ % Fines (<0.075mm)

● % Water Content

Plastic Limit ⊢●⊣ Liquid Limit

Natural Water Content

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
3. The discussion in the text of this report is necessary for a proper understanding of the nature of the subsurface materials.
4. Groundwater level, if indicated above, is for the date specified and may vary.
5. USCS designation is based on visual-manual classification and selected lab testing.

SR 520/I-5 to Medina - Stage 1
Evergreen Point Floating Bridge and Landings

LOG OF BORING H-366-10

December 2010 21-1-20624-552

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

EXHIBIT A-5
Sheet 1 of 9

REV 3

SR520_MASTER_LOG_E_SIMP 21-20624.GPJ SHAN_WIL.GDT 12/14/16 Log: EAS Rev: DPO Typ: LKN

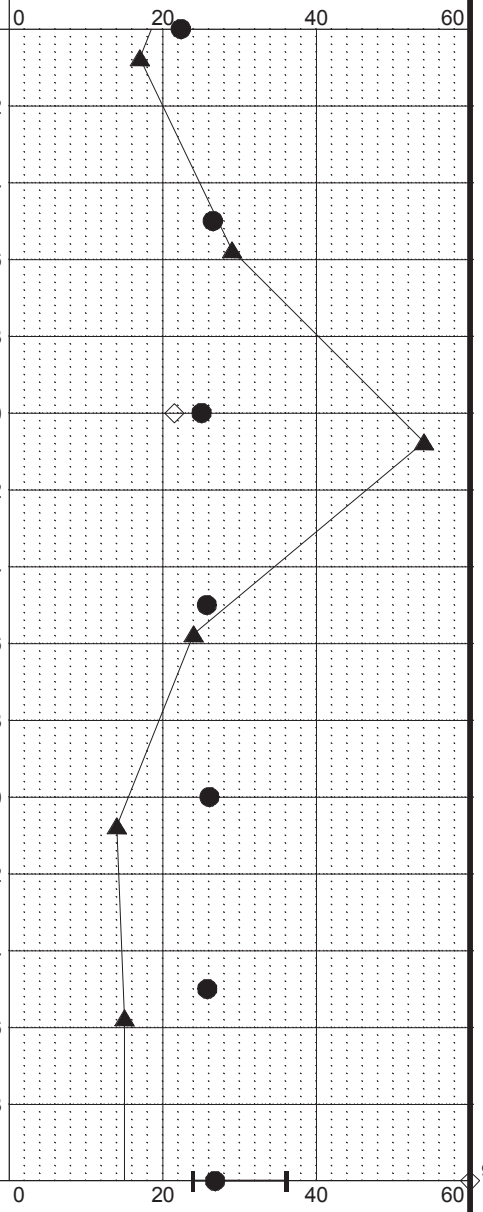
Total Depth:	251.5 ft.	Northing:	235,874 ft.	Drilling Method:	Advanced Casing	Hole Diam.:	6 in.
Top Elevation:	23.5 ft.	Easting:	1,293,277 ft.	Drilling Company:	WSDOT	Rod Diam.:	AWJ
Vert. Datum:	NAVD 88	Station:		Drill Rig Equipment:	CME 45 Skid Rig 9C4-2	Hammer Type:	Automatic
Horiz. Datum:	NAD 83/91	Offset:		Other Comments:			

SOIL DESCRIPTION *Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines represent the approximate boundaries between material types, and the transition may be gradual.*	Depth, ft.	Symbol	PID, ppm	Samples	Ground-water	Depth, ft.
trace of fine organics; (Qpnf/Qpgo) SM.			0	9		32
Interbedded, very stiff, gray, trace of fine sand to fine sandy, trace of clay to clayey SILT and silty CLAY, trace of fine sand; moist; scattered fine sand partings, trace to scattered fine organics; (Qpnl/Qpgl) ML/CL.	33.0		0	10		34, 36
Very dense, gray, silty, fine SAND; wet; (Qpnf/Qpgo) SM.	38.0		0	11		38, 40, 42
Stiff to very stiff, gray, slightly clayey to clayey SILT, trace of fine sand; moist to wet; locally fine sandy, trace to scattered fine organics; (Qpnl/Qpgl) ML. - Lost drilling fluid circulation between about 45 and 50 feet.	43.0		0	12		44, 46, 48
			0	13		50, 52
			0	14		54, 56
Very stiff to hard, gray, silty CLAY, trace of fine sand; moist; trace of fine organics;	58.0					58

CONTINUED NEXT SHEET

PENETRATION RESISTANCE (blows/foot)

▲ Hammer Wt. & Drop: *140 lbs / 30 inches*



LEGEND

* Sample Not Recovered

Standard Penetration Test

◇ % Fines (<0.075mm)

● % Water Content

Plastic Limit ├─●─┤ Liquid Limit

Natural Water Content

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
3. The discussion in the text of this report is necessary for a proper understanding of the nature of the subsurface materials.
4. Groundwater level, if indicated above, is for the date specified and may vary.
5. USCS designation is based on visual-manual classification and selected lab testing.

SR 520/I-5 to Medina - Stage 1
Evergreen Point Floating Bridge and Landings

LOG OF BORING H-366-10

December 2010 21-1-20624-552

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

EXHIBIT A-5
Sheet 2 of 9

REV 3

SR520_MASTER_LOG_E_SIMP 21-20624.GPJ SHAN_WIL.GDT 12/14/10 Log: EAS Rev: DPO Typ: LKN

Total Depth:	251.5 ft.	Northing:	235,874 ft.	Drilling Method:	Advanced Casing	Hole Diam.:	6 in.
Top Elevation:	23.5 ft.	Easting:	1,293,277 ft.	Drilling Company:	WSDOT	Rod Diam.:	AWJ
Vert. Datum:	NAVD 88	Station:		Drill Rig Equipment:	CME 45 Skid Rig 9C4-2	Hammer Type:	Automatic
Horiz. Datum:	NAD 83/91	Offset:		Other Comments:			

SOIL DESCRIPTION

Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines represent the approximate boundaries between material types, and the transition may be gradual.

(Qpnl/Qpgl) CL.

- Layer of wet, silty, fine sand at about 65 feet.

68.0

Hard, light gray, slightly fine sandy, clayey SILT to dense, fine sandy SILT, trace of clay; moist; decreasing clay content with depth, local wet zones, trace of fine organics; (Qpnl/Qpgl) ML.

76.0

Dense to very dense, gray, silty, fine SAND; wet; scattered clayey silt seams; (Qpnl/Qpgl) SM.

83.0

Very stiff, gray, clayey SILT, trace of fine sand to silty CLAY, trace of fine sand; moist; locally laminated, trace of fine organics; (Qpnl/Qpgl) ML/CL.

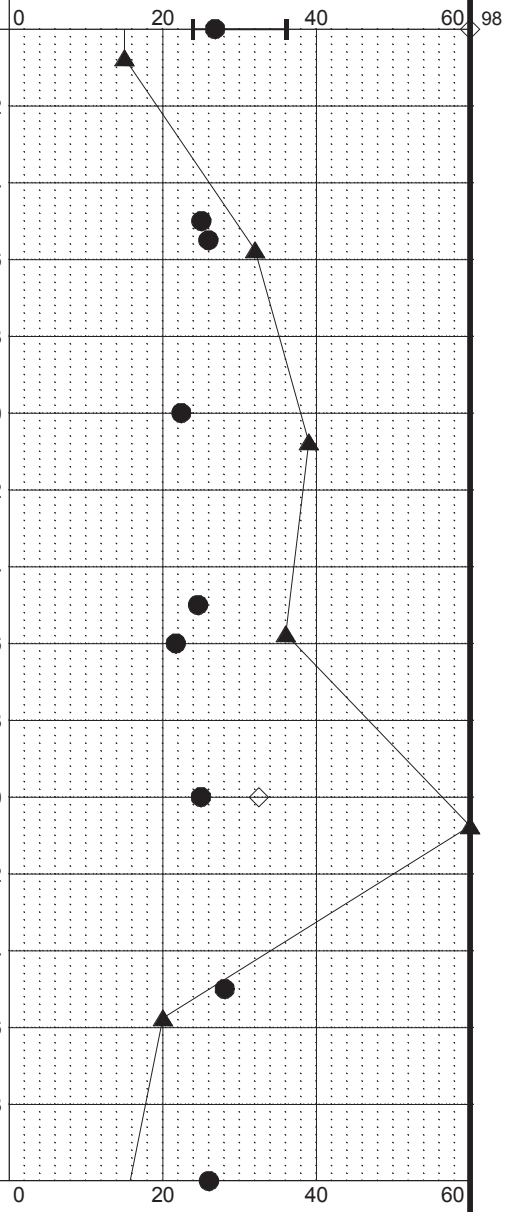
CONTINUED NEXT SHEET

Depth, ft.	PID, ppm	Samples
	0	15
	0	16
	0	17
	0	18
	0	19
	0	20

Ground-water

PENETRATION RESISTANCE (blows/foot)

▲ Hammer Wt. & Drop: 140 lbs / 30 inches



LEGEND

* Sample Not Recovered

Standard Penetration Test

◇ % Fines (<0.075mm)

● % Water Content

Plastic Limit ⊢●⊣ Liquid Limit

Natural Water Content

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
3. The discussion in the text of this report is necessary for a proper understanding of the nature of the subsurface materials.
4. Groundwater level, if indicated above, is for the date specified and may vary.
5. USCS designation is based on visual-manual classification and selected lab testing.

SR 520/I-5 to Medina - Stage 1
Evergreen Point Floating Bridge and Landings

LOG OF BORING H-366-10

December 2010 21-1-20624-552

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

EXHIBIT A-5
Sheet 3 of 9

REV 3

SR520_MASTER_LOG_E_SIMP 21-20624.GPJ SHAN_WIL.GDT 12/14/16 Log: EAS Rev: DPO Typ: LKN

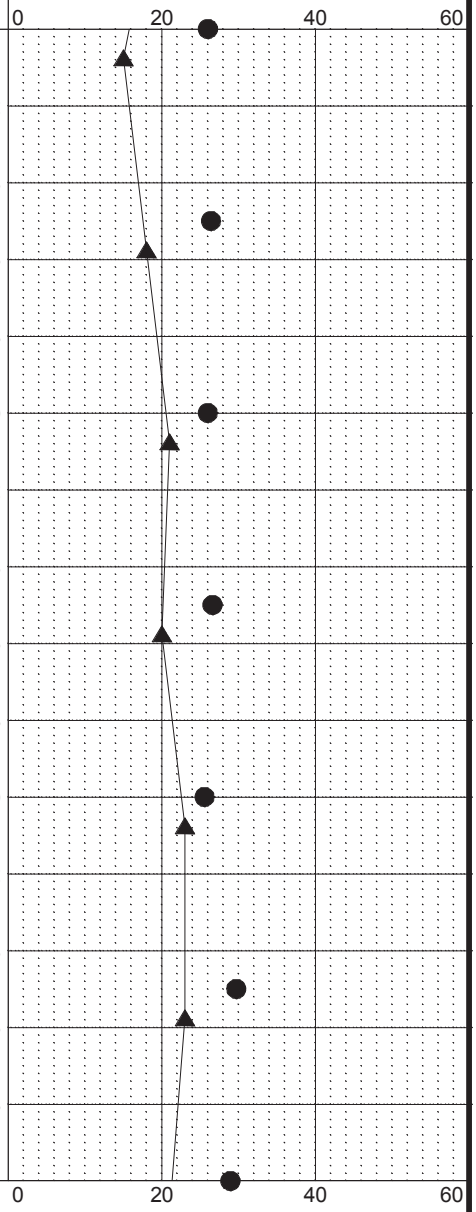
Total Depth:	251.5 ft.	Northing:	235,874 ft.	Drilling Method:	Advanced Casing	Hole Diam.:	6 in.
Top Elevation:	23.5 ft.	Easting:	1,293,277 ft.	Drilling Company:	WSDOT	Rod Diam.:	AWJ
Vert. Datum:	NAVD 88	Station:		Drill Rig Equipment:	CME 45 Skid Rig 9C4-2	Hammer Type:	Automatic
Horiz. Datum:	NAD 83/91	Offset:		Other Comments:			

SOIL DESCRIPTION *Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines represent the approximate boundaries between material types, and the transition may be gradual.*	Depth, ft.	Symbol	PID, ppm	Samples	Ground-water	Depth, ft.
- Locally wet appearance at 100 feet.			0	21		92
						94
			0	22		96
						98
			0	23		100
						102
						104
			0	24		106
						108
			0	25		110
						112
						114
			0	26		116
						118

CONTINUED NEXT SHEET

PENETRATION RESISTANCE (blows/foot)

▲ Hammer Wt. & Drop: *140 lbs / 30 inches*



LEGEND

* Sample Not Recovered

Standard Penetration Test

◇ % Fines (<0.075mm)

● % Water Content

Plastic Limit ├─●─┤ Liquid Limit

Natural Water Content

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
3. The discussion in the text of this report is necessary for a proper understanding of the nature of the subsurface materials.
4. Groundwater level, if indicated above, is for the date specified and may vary.
5. USCS designation is based on visual-manual classification and selected lab testing.

SR 520/I-5 to Medina - Stage 1
Evergreen Point Floating Bridge and Landings

LOG OF BORING H-366-10

December 2010 21-1-20624-552

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

EXHIBIT A-5
Sheet 4 of 9

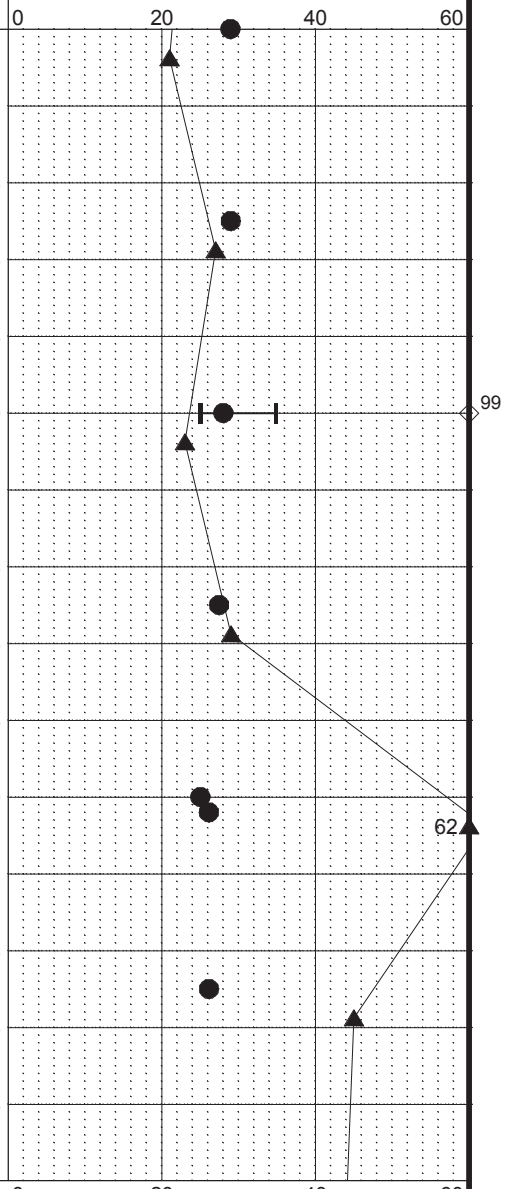
Total Depth:	251.5 ft.	Northing:	235,874 ft.	Drilling Method:	Advanced Casing	Hole Diam.:	6 in.
Top Elevation:	23.5 ft.	Easting:	1,293,277 ft.	Drilling Company:	WSDOT	Rod Diam.:	AWJ
Vert. Datum:	NAVD 88	Station:		Drill Rig Equipment:	CME 45 Skid Rig 9C4-2	Hammer Type:	Automatic
Horiz. Datum:	NAD 83/91	Offset:		Other Comments:			

SOIL DESCRIPTION *Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines represent the approximate boundaries between material types, and the transition may be gradual.*	Depth, ft.	Symbol	PID, ppm	Samples	Ground-water	Depth, ft.
			0	27		122
						124
			0	28		126
						128
			0	29		130
						132
Very stiff to hard, gray, trace of sand to slightly sandy, silty CLAY, trace of gravel, to gravelly, clayey SILT, trace of sand; moist; (Qpgl) CL/ML.	133.0					134
			0	30		136
- Layer of wet, silty, fine sand from about 140 to 140.5 feet.						138
			0	31		140
						142
Hard, gray, slightly sandy to sandy, clayey SILT to silty CLAY; moist; scattered wet silt and silty, fine sand seams and partings, trace of organics; (Qpgl/Qpnl) ML/CL.	143.0		0	32		144
						146
Hard, gray, slightly sandy to sandy, slightly clayey to clayey SILT, trace of fine gravel; (Qpgl)	148.0					148

CONTINUED NEXT SHEET

PENETRATION RESISTANCE (blows/foot)

▲ Hammer Wt. & Drop: *140 lbs / 30 inches*



LEGEND

* Sample Not Recovered

Standard Penetration Test

◇ % Fines (<0.075mm)

● % Water Content

Plastic Limit ├─●─┤ Liquid Limit

Natural Water Content

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
3. The discussion in the text of this report is necessary for a proper understanding of the nature of the subsurface materials.
4. Groundwater level, if indicated above, is for the date specified and may vary.
5. USCS designation is based on visual-manual classification and selected lab testing.

SR 520/I-5 to Medina - Stage 1
Evergreen Point Floating Bridge and Landings

LOG OF BORING H-366-10

December 2010 21-1-20624-552

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

EXHIBIT A-5
Sheet 5 of 9

REV 3

SR520_MASTER_LOG_E_SIMP 21-20624.GPJ SHAN_WIL.GDT 12/14/16 Log: EAS Rev: DPO Typ: LKN

Total Depth:	251.5 ft.	Northing:	235,874 ft.	Drilling Method:	Advanced Casing	Hole Diam.:	6 in.
Top Elevation:	23.5 ft.	Easting:	1,293,277 ft.	Drilling Company:	WSDOT	Rod Diam.:	AWJ
Vert. Datum:	NAVD 88	Station:		Drill Rig Equipment:	CME 45 Skid Rig 9C4-2	Hammer Type:	Automatic
Horiz. Datum:	NAD 83/91	Offset:		Other Comments:			

SOIL DESCRIPTION

Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines represent the approximate boundaries between material types, and the transition may be gradual.

moist; (Qpgm) ML.

153.0

Hard, gray, trace of sand to sandy, slightly clayey to clayey SILT, trace of gravel; moist; locally laminated; (Qpgl) ML.

- Gravelly layer at about 154 feet inferred from drill action.

158.0

Medium dense, gray, silty, fine to medium SAND; wet; (Qpgo) SM.

163.0

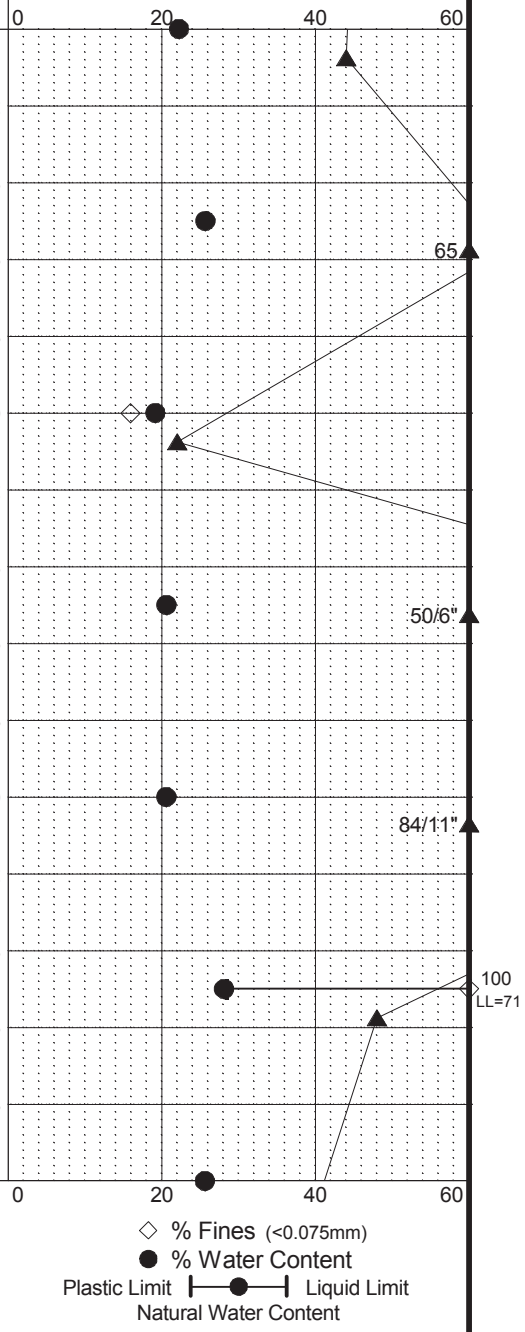
Hard, gray, trace of clay to slightly clayey, slightly fine sandy SILT, trace of fine gravel; moist; scattered irregular clay seams with slickensides; (Qpgl) ML.

173.0

Hard, gray, silty CLAY, trace of sand and gravel; moist; locally laminated, scattered silt pockets and partings; (Qpgl) CH/CL.

CONTINUED NEXT SHEET

Depth, ft.	PID, ppm	Samples
	0	33
	0	34
	0	35
	0	36
	0	37
	0	38



LEGEND

* Sample Not Recovered

Standard Penetration Test

◇ % Fines (<0.075mm)

● % Water Content

Plastic Limit ├─●─┤ Liquid Limit

Natural Water Content

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
3. The discussion in the text of this report is necessary for a proper understanding of the nature of the subsurface materials.
4. Groundwater level, if indicated above, is for the date specified and may vary.
5. USCS designation is based on visual-manual classification and selected lab testing.

SR 520/I-5 to Medina - Stage 1
Evergreen Point Floating Bridge and Landings

LOG OF BORING H-366-10

December 2010 21-1-20624-552

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

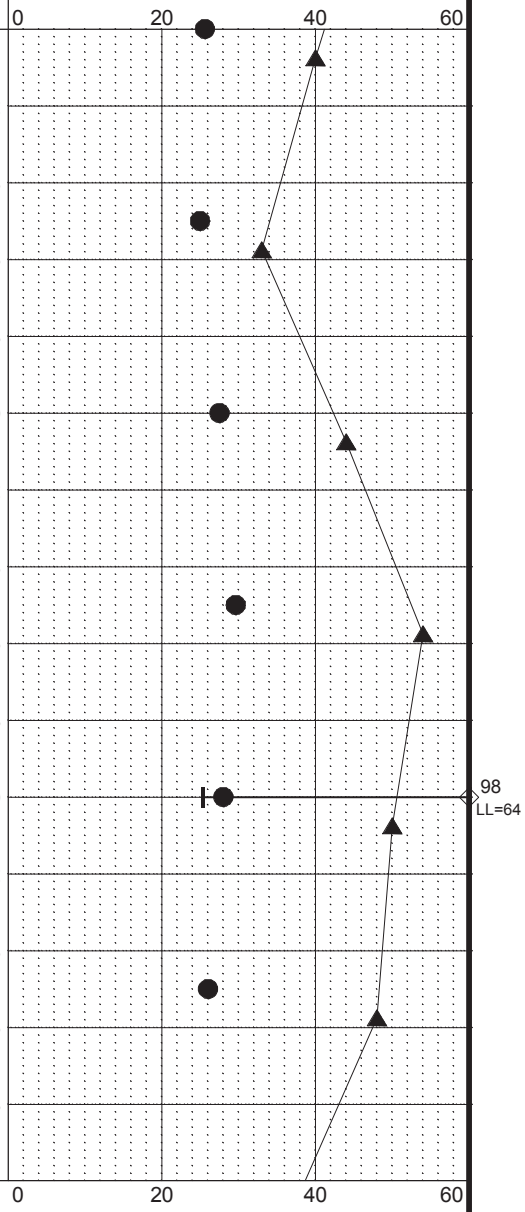
EXHIBIT A-5
Sheet 6 of 9

REV 3

SR520_MASTER_LOG_E_SIMP 21-20624.GPJ SHAN_WIL.GDT 12/14/10 Log: EAS Rev: DPO Typ: LKN

Total Depth:	251.5 ft.	Northing:	235,874 ft.	Drilling Method:	Advanced Casing	Hole Diam.:	6 in.
Top Elevation:	23.5 ft.	Easting:	1,293,277 ft.	Drilling Company:	WSDOT	Rod Diam.:	AWJ
Vert. Datum:	NAVD 88	Station:		Drill Rig Equipment:	CME 45 Skid Rig 9C4-2	Hammer Type:	Automatic
Horiz. Datum:	NAD 83/91	Offset:		Other Comments:			

SOIL DESCRIPTION *Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines represent the approximate boundaries between material types, and the transition may be gradual.*	Depth, ft.	Symbol	PID, ppm	Samples	Ground-water	Depth, ft.	PENETRATION RESISTANCE (blows/foot) ▲ Hammer Wt. & Drop: 140 lbs / 30 inches
			0	39		182	
						184	
			0	40		186	
						188	
			0	41		190	
						192	
						194	
			0	42		196	
						198	
			0	43		200	
						202	
						204	
			0	44		206	
						208	



CONTINUED NEXT SHEET

LEGEND

* Sample Not Recovered

Standard Penetration Test

◇ % Fines (<0.075mm)

● % Water Content

Plastic Limit ├─●─┤ Liquid Limit

Natural Water Content

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
3. The discussion in the text of this report is necessary for a proper understanding of the nature of the subsurface materials.
4. Groundwater level, if indicated above, is for the date specified and may vary.
5. USCS designation is based on visual-manual classification and selected lab testing.

SR 520/I-5 to Medina - Stage 1
Evergreen Point Floating Bridge and Landings

LOG OF BORING H-366-10

December 2010 21-1-20624-552

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

EXHIBIT A-5
Sheet 7 of 9

REV 3

SR520_MASTER_LOG_E_SIMP 21-20624.GPJ SHAN_WIL.GDT 12/14/10 Log: EAS Rev: DPO Typ: LKN

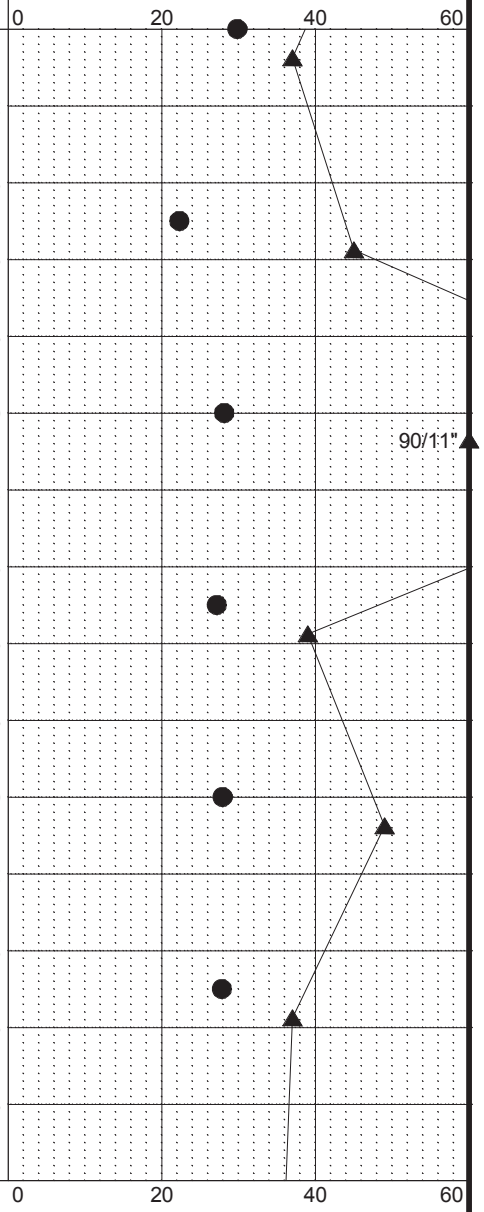
Total Depth:	251.5 ft.	Northing:	235,874 ft.	Drilling Method:	Advanced Casing	Hole Diam.:	6 in.
Top Elevation:	23.5 ft.	Easting:	1,293,277 ft.	Drilling Company:	WSDOT	Rod Diam.:	AWJ
Vert. Datum:	NAVD 88	Station:		Drill Rig Equipment:	CME 45 Skid Rig 9C4-2	Hammer Type:	Automatic
Horiz. Datum:	NAD 83/91	Offset:		Other Comments:			

SOIL DESCRIPTION *Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines represent the approximate boundaries between material types, and the transition may be gradual.*	Depth, ft.	Symbol	PID, ppm	Samples	Ground-water	Depth, ft.
- Note: Blow count at 220 feet may be artificially high because slough at the bottom of the borehole caused overfilling of sampler.			0	45		212
			0	46		214, 216
			0	47		218, 220
			0	48		222, 224, 226
			0	49		228, 230
			0	50		232, 234, 236
						238

CONTINUED NEXT SHEET

PENETRATION RESISTANCE (blows/foot)

▲ Hammer Wt. & Drop: *140 lbs / 30 inches*



LEGEND

* Sample Not Recovered

Standard Penetration Test

◇ % Fines (<0.075mm)

● % Water Content

Plastic Limit ├─●─┤ Liquid Limit

Natural Water Content

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
3. The discussion in the text of this report is necessary for a proper understanding of the nature of the subsurface materials.
4. Groundwater level, if indicated above, is for the date specified and may vary.
5. USCS designation is based on visual-manual classification and selected lab testing.

SR 520/I-5 to Medina - Stage 1
Evergreen Point Floating Bridge and Landings

LOG OF BORING H-366-10

December 2010 21-1-20624-552

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

EXHIBIT A-5
Sheet 8 of 9

REV 3

SR520_MASTER_LOG_E_SIMP 21-20624.GPJ SHAN_WIL.GDT 12/14/16 Log: EAS Rev: DPO Typ: LKN

Total Depth:	251.5 ft.	Northing:	235,874 ft.	Drilling Method:	Advanced Casing	Hole Diam.:	6 in.
Top Elevation:	23.5 ft.	Easting:	1,293,277 ft.	Drilling Company:	WSDOT	Rod Diam.:	AWJ
Vert. Datum:	NAVD 88	Station:		Drill Rig Equipment:	CME 45 Skid Rig 9C4-2	Hammer Type:	Automatic
Horiz. Datum:	NAD 83/91	Offset:		Other Comments:			

SOIL DESCRIPTION	Depth, ft.	Symbol	PID, ppm	Samples	Ground-water	Depth, ft.
Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines represent the approximate boundaries between material types, and the transition may be gradual.			0	51		
			0	52		
			0	53		
BOTTOM OF BORING COMPLETED 7/25/2010	251.5					

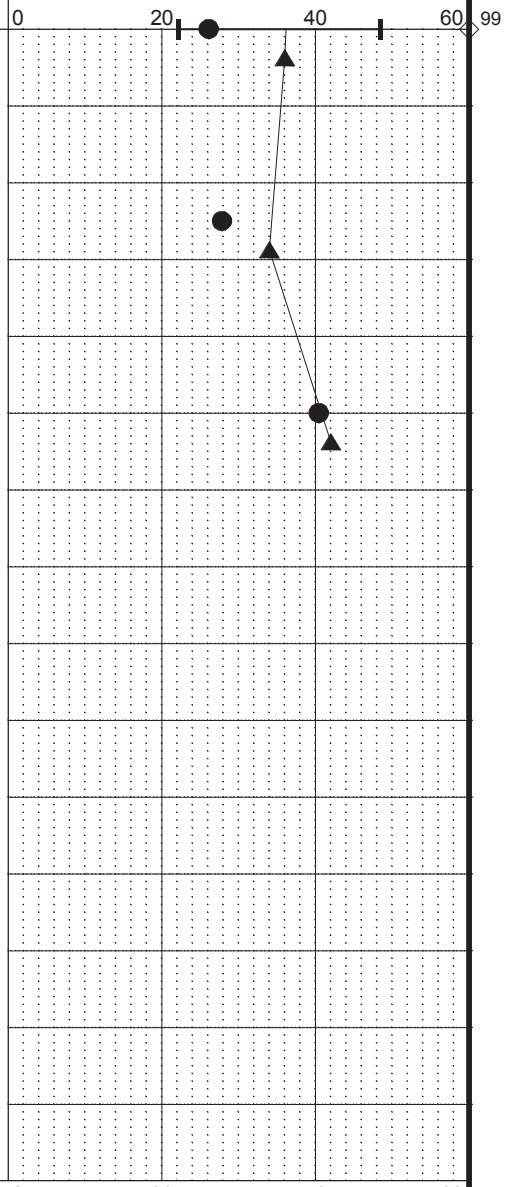
Notes:

(a) Drilled using a 4.5-inch outside diameter (O.D.) casing to 50 feet below ground surface, and 3.5-inch O.D. casing from 50 feet to bottom of boring.

(b) On July 23, 2010, drilling was stopped for the day at a depth of 140 feet. Artesian conditions developed overnight and were observed in the morning on July 24, 2010.

PENETRATION RESISTANCE (blows/foot)

▲ Hammer Wt. & Drop: *140 lbs / 30 inches*



LEGEND

* Sample Not Recovered

Standard Penetration Test

◇ % Fines (<0.075mm)

● % Water Content

Plastic Limit ├─●─┤ Liquid Limit

Natural Water Content

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
3. The discussion in the text of this report is necessary for a proper understanding of the nature of the subsurface materials.
4. Groundwater level, if indicated above, is for the date specified and may vary.
5. USCS designation is based on visual-manual classification and selected lab testing.

SR 520/I-5 to Medina - Stage 1
Evergreen Point Floating Bridge and Landings

LOG OF BORING H-366-10

December 2010 21-1-20624-552

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

EXHIBIT A-5
Sheet 9 of 9

REV 3

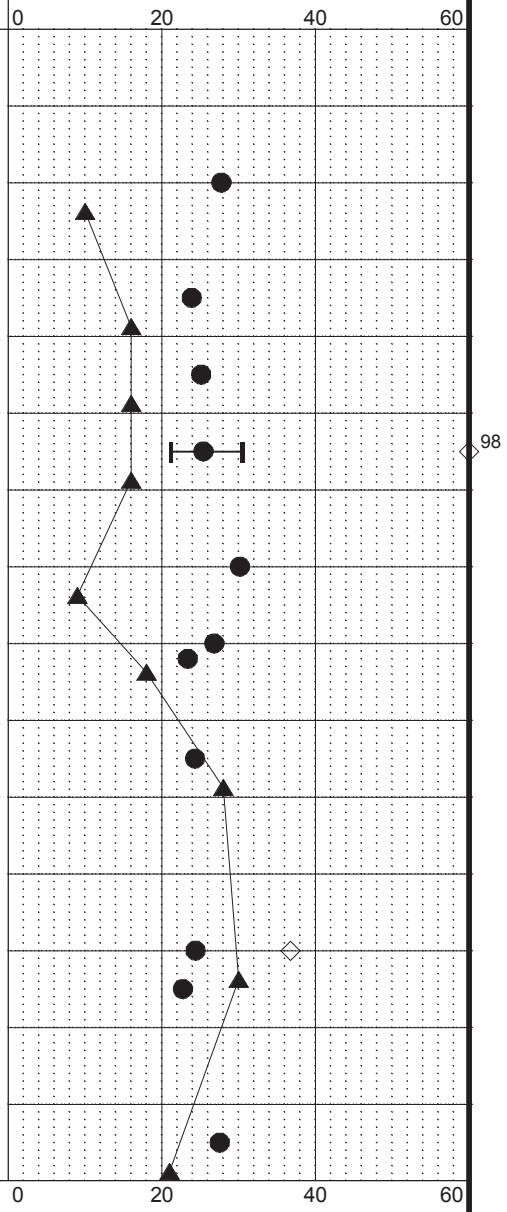
SR520_MASTER_LOG_E_SIMP 21-20624.GPJ SHAN_WIL.GDT 12/14/16 Log: EAS Rev: DPO Typ: LKN

Total Depth:	215.5 ft.	Northing:	235,980 ft.	Drilling Method:	Advanced Casing	Hole Diam.:	6 in.
Top Elevation:	29.5 ft.	Easting:	1,293,318 ft.	Drilling Company:	WSDOT	Rod Diam.:	AWJ
Vert. Datum:	NAVD 88	Station:		Drill Rig Equipment:	CME 45 Skid Rig 9C4-2	Hammer Type:	Automatic
Horiz. Datum:	NAD 83/91	Offset:		Other Comments:			

SOIL DESCRIPTION *Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines represent the approximate boundaries between material types, and the transition may be gradual.*	Depth, ft.	Symbol	PID, ppm	Samples	Ground-water	Depth, ft.
Stiff to very stiff, silty CLAY, trace of fine sand to clayey SILT, trace of fine sand; moist; scattered, fine sandy silt and fine sand seams and partings, scattered iron-oxide-stained silt partings above approximately 6 feet, trace of fine organics, local wet zones; (Qvrl) CL/ML.			0	1	Artesian Conditions Observed During Drilling	2, 4, 6
			0	2		8
			0	3		10
			0	4		12
			0	5		14
				6		16
Medium dense, gray, trace of clay to slightly clayey SILT, trace of fine sand; wet; scattered fine sand and clayey silt seams, trace of fine organics; (Qpnl/Qpgl) ML.	18.0		0	7		18, 20
Dense, gray, silty, fine SAND; wet; trace of fine organics; (Qpnl/Qpgl) SM.	22.0		0	8		22, 24
Very stiff, gray, slightly clayey to clayey SILT, trace of fine sand; moist; laminated, trace of fine organics; (Qpnl/Qpgl) ML.	25.0					26
Very stiff, gray, silty CLAY; moist; scattered irregular and dipping, silty, fine sand and	27.0		0	9		28
CONTINUED NEXT SHEET						

PENETRATION RESISTANCE (blows/foot)

▲ Hammer Wt. & Drop: *140 lbs / 30 inches*



LEGEND

* Sample Not Recovered

Standard Penetration Test

◇ % Fines (<0.075mm)

● % Water Content

Plastic Limit ├─●─┤ Liquid Limit

Natural Water Content

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
3. The discussion in the text of this report is necessary for a proper understanding of the nature of the subsurface materials.
4. Groundwater level, if indicated above, is for the date specified and may vary.
5. USCS designation is based on visual-manual classification and selected lab testing.

SR 520/I-5 to Medina - Stage 1
Evergreen Point Floating Bridge and Landings

LOG OF BORING H-367-10

December 2010 21-1-20624-552

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

EXHIBIT A-6
Sheet 1 of 8

REV 3

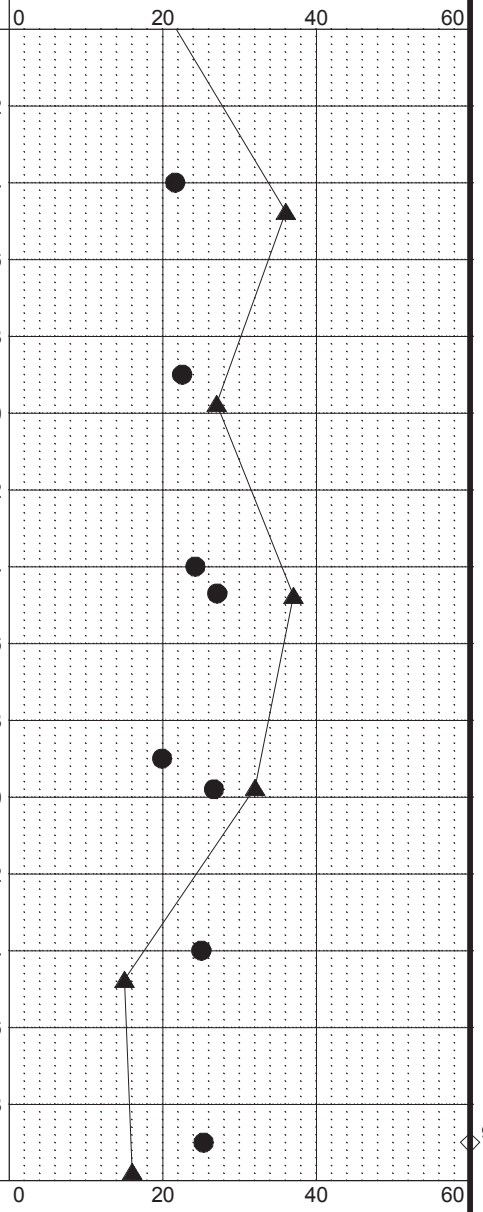
SR520_MASTER_LOG_E_SIMP 21-20624.GPJ SHAN_WIL.GDT 12/14/16 Log: EAS Rev: DPO Typ: LKN

Total Depth:	215.5 ft.	Northing:	235,980 ft.	Drilling Method:	Advanced Casing	Hole Diam.:	6 in.
Top Elevation:	29.5 ft.	Easting:	1,293,318 ft.	Drilling Company:	WSDOT	Rod Diam.:	AWJ
Vert. Datum:	NAVD 88	Station:		Drill Rig Equipment:	CME 45 Skid Rig 9C4-2	Hammer Type:	Automatic
Horiz. Datum:	NAD 83/91	Offset:		Other Comments:			

SOIL DESCRIPTION *Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines represent the approximate boundaries between material types, and the transition may be gradual.*	Depth, ft.	Symbol	PID, ppm	Samples	Ground-water
silt partings; (Qpnl/Qpgl) CH/CL.					
Dense, gray, slightly silty to silty, fine to medium SAND; wet; (Qpnf/Qpgo) SM/SP-SM.	32.0		0	10	
Interbedded, very stiff to hard, gray, trace of clay to slightly clayey, trace of fine sand to fine sandy SILT to silty CLAY, trace of sand; moist; scattered silty, fine sand seams, trace of fine organics; (Qpnl/Qpgl) ML/CL.	38.0		0	11	
Dense, gray, silty, fine SAND to fine sandy SILT; wet; trace of fine organics; (Qpnl/Qpgl) SM/ML.	44.7		0	12	
Very stiff to hard, gray, slightly fine sandy, slightly clayey to clayey SILT to silty CLAY, trace of fine sand; moist; scattered, wet, fine sandy silt and silty, fine sand seams, trace of fine organics; (Qpnl/Qpgl) ML/CL.	49.8		0	13	
			0	14	
CONTINUED NEXT SHEET			0	15	

PENETRATION RESISTANCE (blows/foot)

▲ Hammer Wt. & Drop: *140 lbs / 30 inches*



LEGEND

* Sample Not Recovered

Standard Penetration Test

◇ % Fines (<0.075mm)

● % Water Content

Plastic Limit ├─●─┤ Liquid Limit

Natural Water Content

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
3. The discussion in the text of this report is necessary for a proper understanding of the nature of the subsurface materials.
4. Groundwater level, if indicated above, is for the date specified and may vary.
5. USCS designation is based on visual-manual classification and selected lab testing.

SR 520/I-5 to Medina - Stage 1
Evergreen Point Floating Bridge and Landings

LOG OF BORING H-367-10

December 2010 21-1-20624-552

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

EXHIBIT A-6
Sheet 2 of 8

REV 3

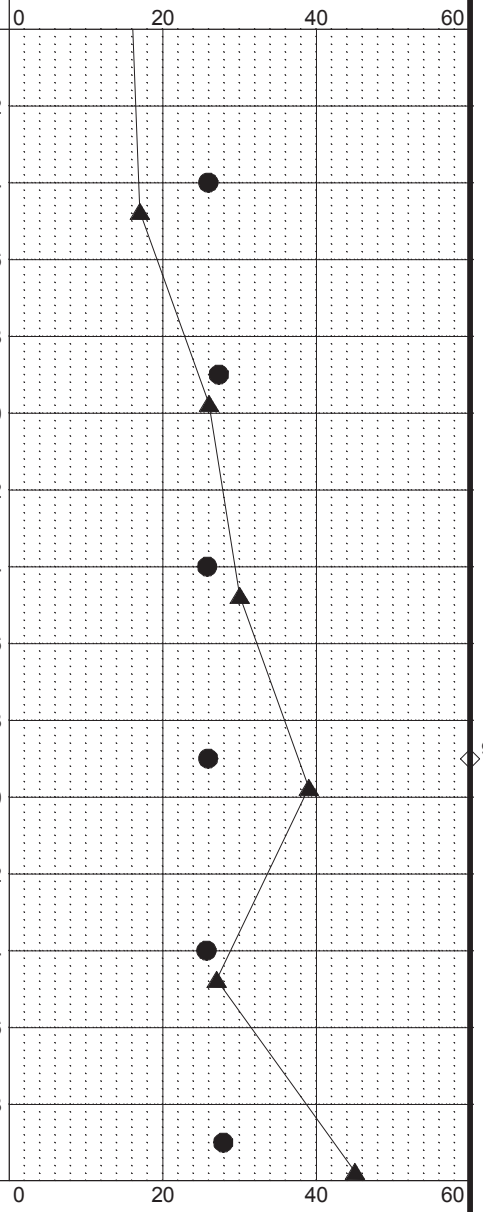
SR520_MASTER_LOG_E_SIMP 21-20624.GPJ SHAN_WIL.GDT 12/14/16 Log: EAS Rev: DPO Typ: LKN

Total Depth:	215.5 ft.	Northing:	235,980 ft.	Drilling Method:	Advanced Casing	Hole Diam.:	6 in.
Top Elevation:	29.5 ft.	Easting:	1,293,318 ft.	Drilling Company:	WSDOT	Rod Diam.:	AWJ
Vert. Datum:	NAVD 88	Station:		Drill Rig Equipment:	CME 45 Skid Rig 9C4-2	Hammer Type:	Automatic
Horiz. Datum:	NAD 83/91	Offset:		Other Comments:			

SOIL DESCRIPTION *Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines represent the approximate boundaries between material types, and the transition may be gradual.*	Depth, ft.	Symbol	PID, ppm	Samples	Ground-water	Depth, ft.
			0	16		64
			0	17		70
Interbedded, medium dense to dense, gray, slightly fine sandy SILT and silty, fine SAND; moist to wet; trace of fine organics; (Qpnl/Qpgl) ML/SM.	72.0		0	18		74
			0	19		80
			0	20		84
CONTINUED NEXT SHEET			0	21		

PENETRATION RESISTANCE (blows/foot)

▲ Hammer Wt. & Drop: *140 lbs / 30 inches*



LEGEND

* Sample Not Recovered

Standard Penetration Test

◇ % Fines (<0.075mm)

● % Water Content

Plastic Limit ├─●─┤ Liquid Limit

Natural Water Content

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
3. The discussion in the text of this report is necessary for a proper understanding of the nature of the subsurface materials.
4. Groundwater level, if indicated above, is for the date specified and may vary.
5. USCS designation is based on visual-manual classification and selected lab testing.

SR 520/I-5 to Medina - Stage 1
Evergreen Point Floating Bridge and Landings

LOG OF BORING H-367-10

December 2010 21-1-20624-552

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

EXHIBIT A-6
Sheet 3 of 8

REV 3

SR520_MASTER_LOG_E_SIMP 21-20624.GPJ SHAN_WIL.GDT 12/14/16 Log: EAS Rev: DPO Typ: LKN

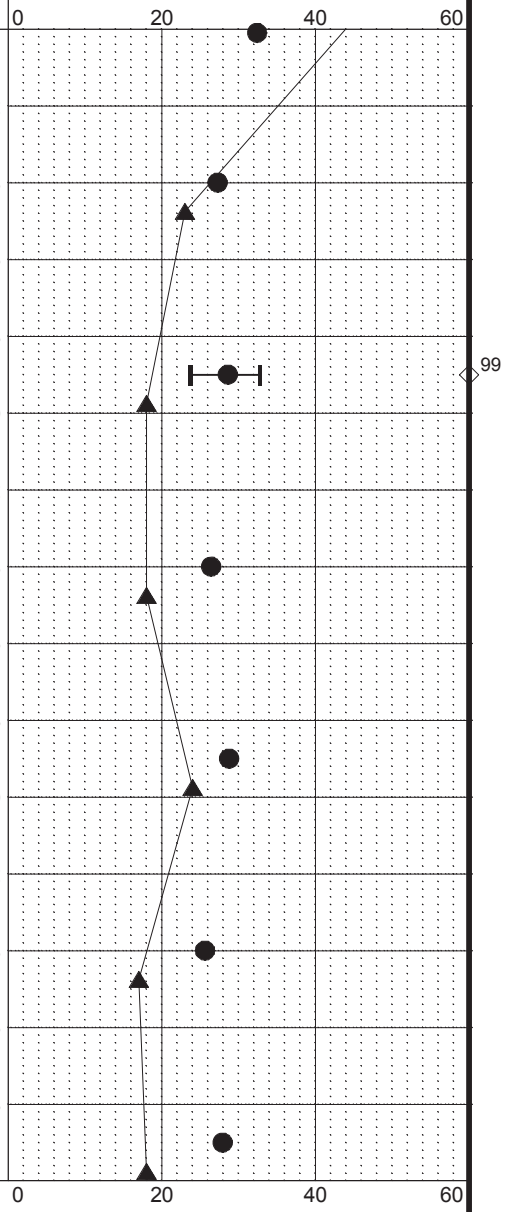
Total Depth:	215.5 ft.	Northing:	235,980 ft.	Drilling Method:	Advanced Casing	Hole Diam.:	6 in.
Top Elevation:	29.5 ft.	Easting:	1,293,318 ft.	Drilling Company:	WSDOT	Rod Diam.:	AWJ
Vert. Datum:	NAVD 88	Station:		Drill Rig Equipment:	CME 45 Skid Rig 9C4-2	Hammer Type:	Automatic
Horiz. Datum:	NAD 83/91	Offset:		Other Comments:			

SOIL DESCRIPTION *Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines represent the approximate boundaries between material types, and the transition may be gradual.*	Depth, ft.	Symbol	PID, ppm	Samples	Ground-water	Depth, ft.
Very stiff to hard, gray, slightly clayey to clayey SILT, trace of fine sand; moist; locally trace of clay, locally laminated, interbedded with silty clay above approximately 92 feet, scattered fine sandy silt and fine sand seams, trace of fine organics; (Qpnl/Qpgl) ML.	90.1		0	22		92, 94, 96
			0	23		98, 100
			0	24		102, 104
- Local wet zones below about 109 feet.			0	25		106, 108, 110
			0	26		112, 114
Very stiff to hard, gray, silty CLAY, trace of fine to medium sand, clayey SILT, trace of fine sand; moist; scattered irregular silt	117.0		0	27		116, 118

CONTINUED NEXT SHEET

PENETRATION RESISTANCE (blows/foot)

▲ Hammer Wt. & Drop: *140 lbs / 30 inches*



LEGEND

* Sample Not Recovered

Standard Penetration Test

◇ % Fines (<0.075mm)

● % Water Content

Plastic Limit ⊢●⊣ Liquid Limit

Natural Water Content

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
3. The discussion in the text of this report is necessary for a proper understanding of the nature of the subsurface materials.
4. Groundwater level, if indicated above, is for the date specified and may vary.
5. USCS designation is based on visual-manual classification and selected lab testing.

SR 520/I-5 to Medina - Stage 1
Evergreen Point Floating Bridge and Landings

LOG OF BORING H-367-10

December 2010 21-1-20624-552

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

EXHIBIT A-6
Sheet 4 of 8

REV 3

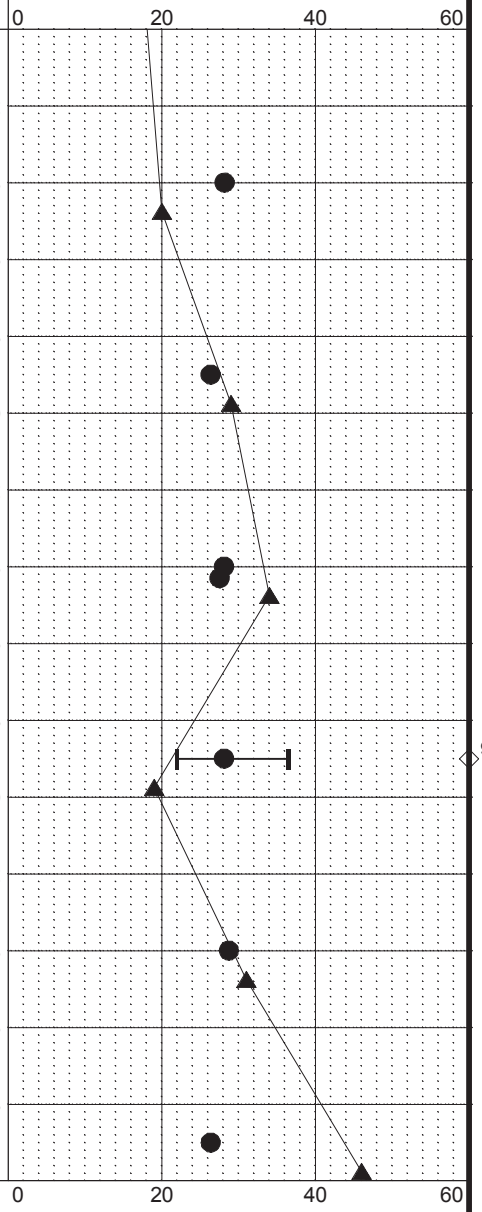
SR520_MASTER_LOG_E_SIMP 21-20624.GPJ SHAN_WIL.GDT 12/14/16 Log: EAS Rev: DPO Typ: LKN

Total Depth:	215.5 ft.	Northing:	235,980 ft.	Drilling Method:	Advanced Casing	Hole Diam.:	6 in.
Top Elevation:	29.5 ft.	Easting:	1,293,318 ft.	Drilling Company:	WSDOT	Rod Diam.:	AWJ
Vert. Datum:	NAVD 88	Station:		Drill Rig Equipment:	CME 45 Skid Rig 9C4-2	Hammer Type:	Automatic
Horiz. Datum:	NAD 83/91	Offset:		Other Comments:			

SOIL DESCRIPTION *Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines represent the approximate boundaries between material types, and the transition may be gradual.*	Depth, ft.	Symbol	PID, ppm	Samples	Ground-water	Depth, ft.
seams and partings; (Qpgl) CL/ML.						122
			0	28		124
						126
						128
			0	29		130
						132
						134
Hard, gray, slightly clayey SILT, trace of sand; moist to wet; (Qpgl) ML.	134.3		0	30		136
Very stiff, gray, silty CLAY, trace of sand; moist; (Qpgl) CL.	137.0					138
			0	31		140
Hard, gray, slightly clayey to clayey SILT, trace of sand; moist; scattered wet, slightly silty, fine sand seams; (Qpgl) ML.	142.0					142
			0	32		144
						146
						148
CONTINUED NEXT SHEET			0	33		

PENETRATION RESISTANCE (blows/foot)

▲ Hammer Wt. & Drop: *140 lbs / 30 inches*



LEGEND

* Sample Not Recovered

Standard Penetration Test

◇ % Fines (<0.075mm)

● % Water Content

Plastic Limit ├─●─┤ Liquid Limit

Natural Water Content

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
3. The discussion in the text of this report is necessary for a proper understanding of the nature of the subsurface materials.
4. Groundwater level, if indicated above, is for the date specified and may vary.
5. USCS designation is based on visual-manual classification and selected lab testing.

SR 520/I-5 to Medina - Stage 1
Evergreen Point Floating Bridge and Landings

LOG OF BORING H-367-10

December 2010 21-1-20624-552

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

EXHIBIT A-6
Sheet 5 of 8

REV 3

SR520_MASTER_LOG_E_SIMP 21-20624.GPJ SHAN_WIL.GDT 12/14/10 Log: EAS Rev: DPO Typ: LKN

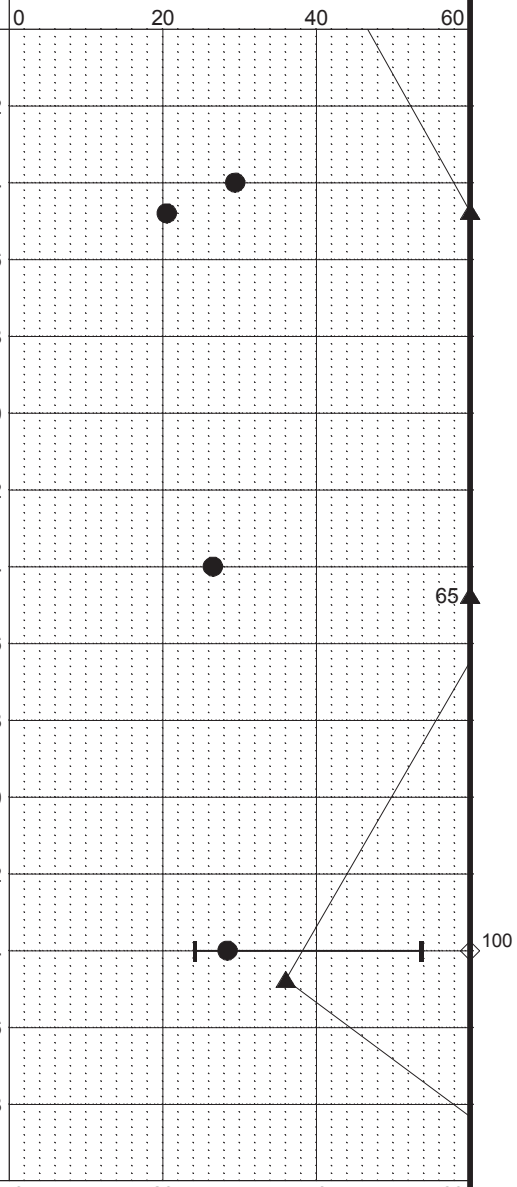
Total Depth:	215.5 ft.	Northing:	235,980 ft.	Drilling Method:	Advanced Casing	Hole Diam.:	6 in.
Top Elevation:	29.5 ft.	Easting:	1,293,318 ft.	Drilling Company:	WSDOT	Rod Diam.:	AWJ
Vert. Datum:	NAVD 88	Station:		Drill Rig Equipment:	CME 45 Skid Rig 9C4-2	Hammer Type:	Automatic
Horiz. Datum:	NAD 83/91	Offset:		Other Comments:			

SOIL DESCRIPTION *Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines represent the approximate boundaries between material types, and the transition may be gradual.*	Depth, ft.	Symbol	PID, ppm	Samples	Ground-water	Depth, ft.
Interbedded, very dense, gray, trace of clay to slightly clayey, slightly fine sandy SILT to silty, fine SAND; wet; (Qpgl) ML/SM.	154.8		0	34		
Interbedded, hard, gray, trace of clay to slightly clayey SILT, trace of fine sand and silty CLAY, trace of fine sand; moist to wet; laminated, scattered wet, silty sand seams, trace of fine organics; (Qpgl) ML/CL.	160.0		0	35		
Hard, gray, silty CLAY, trace of sand; moist; scattered light gray silt partings, pockets, and seams inclined up to 75 degrees; (Qpgl) CH/CL.	170.0		0	36		

CONTINUED NEXT SHEET

PENETRATION RESISTANCE (blows/foot)

▲ Hammer Wt. & Drop: *140 lbs / 30 inches*



LEGEND

* Sample Not Recovered

Standard Penetration Test

◇ % Fines (<0.075mm)

● % Water Content

Plastic Limit ⊢●⊣ Liquid Limit

Natural Water Content

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
3. The discussion in the text of this report is necessary for a proper understanding of the nature of the subsurface materials.
4. Groundwater level, if indicated above, is for the date specified and may vary.
5. USCS designation is based on visual-manual classification and selected lab testing.

SR 520/I-5 to Medina - Stage 1
Evergreen Point Floating Bridge and Landings

LOG OF BORING H-367-10

December 2010 21-1-20624-552

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

EXHIBIT A-6
Sheet 6 of 8

REV 3

SR520_MASTER_LOG_E_SIMP 21-20624.GPJ SHAN_WIL.GDT 12/14/16 Log: EAS Rev: DPO Typ: LKN

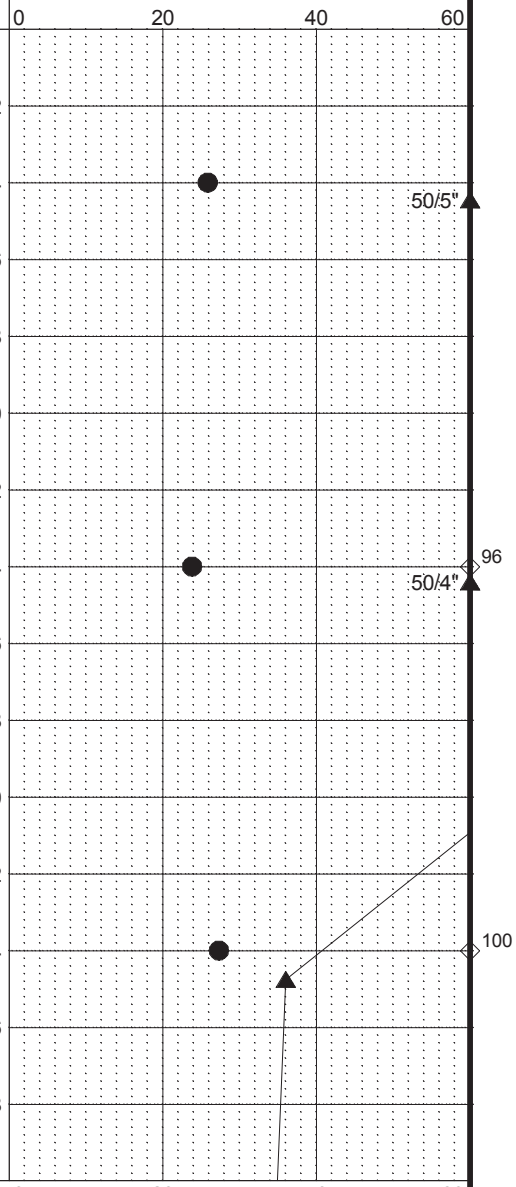
Total Depth:	215.5 ft.	Northing:	235,980 ft.	Drilling Method:	Advanced Casing	Hole Diam.:	6 in.
Top Elevation:	29.5 ft.	Easting:	1,293,318 ft.	Drilling Company:	WSDOT	Rod Diam.:	AWJ
Vert. Datum:	NAVD 88	Station:		Drill Rig Equipment:	CME 45 Skid Rig 9C4-2	Hammer Type:	Automatic
Horiz. Datum:	NAD 83/91	Offset:		Other Comments:			

SOIL DESCRIPTION *Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines represent the approximate boundaries between material types, and the transition may be gradual.*	Depth, ft.	Symbol	PID, ppm	Samples	Ground-water	Depth, ft.
- Layer of gravel at approximately 186 feet inferred from drill action.			0	37		182, 184, 186, 188, 190
Very dense, gray SILT, trace of clay and fine sand; moist to wet; trace of fine organics (Qpgl) ML.	192.0		0	38		192, 194, 196
Hard, gray, silty CLAY, trace of fine sand; moist; scattered silt pockets, trace of organics; (Qpgl) CH/CL.	198.0		0	39		198, 200, 202, 204, 206, 208

CONTINUED NEXT SHEET

PENETRATION RESISTANCE (blows/foot)

▲ Hammer Wt. & Drop: *140 lbs / 30 inches*



LEGEND

* Sample Not Recovered

Standard Penetration Test

◇ % Fines (<0.075mm)

● % Water Content

Plastic Limit ├─●─┤ Liquid Limit

Natural Water Content

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
3. The discussion in the text of this report is necessary for a proper understanding of the nature of the subsurface materials.
4. Groundwater level, if indicated above, is for the date specified and may vary.
5. USCS designation is based on visual-manual classification and selected lab testing.

SR 520/I-5 to Medina - Stage 1
Evergreen Point Floating Bridge and Landings

LOG OF BORING H-367-10

December 2010 21-1-20624-552

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

EXHIBIT A-6
Sheet 7 of 8

REV 3

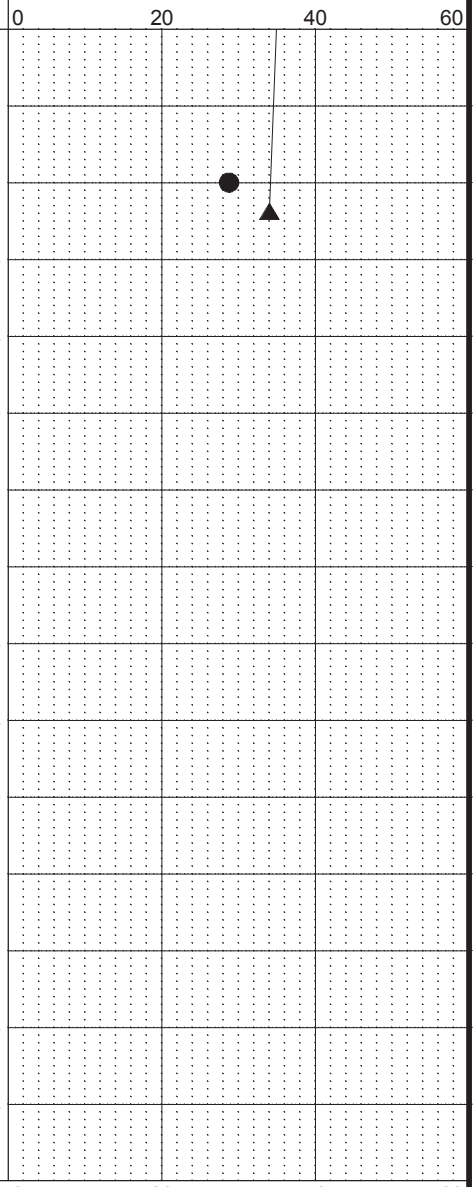
SR520_MASTER_LOG_E_SIMP 21-20624.GPJ SHAN_WIL.GDT 12/14/10 Log: EAS Rev: DPO Typ: LKN

Total Depth:	215.5 ft.	Northing:	235,980 ft.	Drilling Method:	Advanced Casing	Hole Diam.:	6 in.
Top Elevation:	29.5 ft.	Easting:	1,293,318 ft.	Drilling Company:	WSDOT	Rod Diam.:	AWJ
Vert. Datum:	NAVD 88	Station:		Drill Rig Equipment:	CME 45 Skid Rig 9C4-2	Hammer Type:	Automatic
Horiz. Datum:	NAD 83/91	Offset:		Other Comments:			

SOIL DESCRIPTION *Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines represent the approximate boundaries between material types, and the transition may be gradual.*	Depth, ft.	Symbol	PID, ppm	Samples	Ground-water	Depth, ft.
			0	40		
BOTTOM OF BORING COMPLETED 7/28/2010	215.5					

Notes:
(a) Drilled using a 5.5-inch outside diameter (O.D.) casing to 92 feet below mudline, then a 4.5-inch O.D. casing from 92 to 137 feet, and 3.5-inch O.D. casing from 137 feet to bottom of boring.
(b) Artesian water flowed from borehole while drilling on 7/28/2010. Switched from 5-foot sampling interval to 10-foot sampling interval to reach deeper depth and grout hole on 7/28/2010.

PENETRATION RESISTANCE (blows/foot)
▲ Hammer Wt. & Drop: *140 lbs / 30 inches*



LEGEND
* Sample Not Recovered
Standard Penetration Test

◇ % Fines (<0.075mm)
● % Water Content
Plastic Limit ├─●─┤ Liquid Limit
Natural Water Content

NOTES
1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
3. The discussion in the text of this report is necessary for a proper understanding of the nature of the subsurface materials.
4. Groundwater level, if indicated above, is for the date specified and may vary.
5. USCS designation is based on visual-manual classification and selected lab testing.

SR 520/I-5 to Medina - Stage 1
Evergreen Point Floating Bridge and Landings

LOG OF BORING H-367-10

December 2010 21-1-20624-552

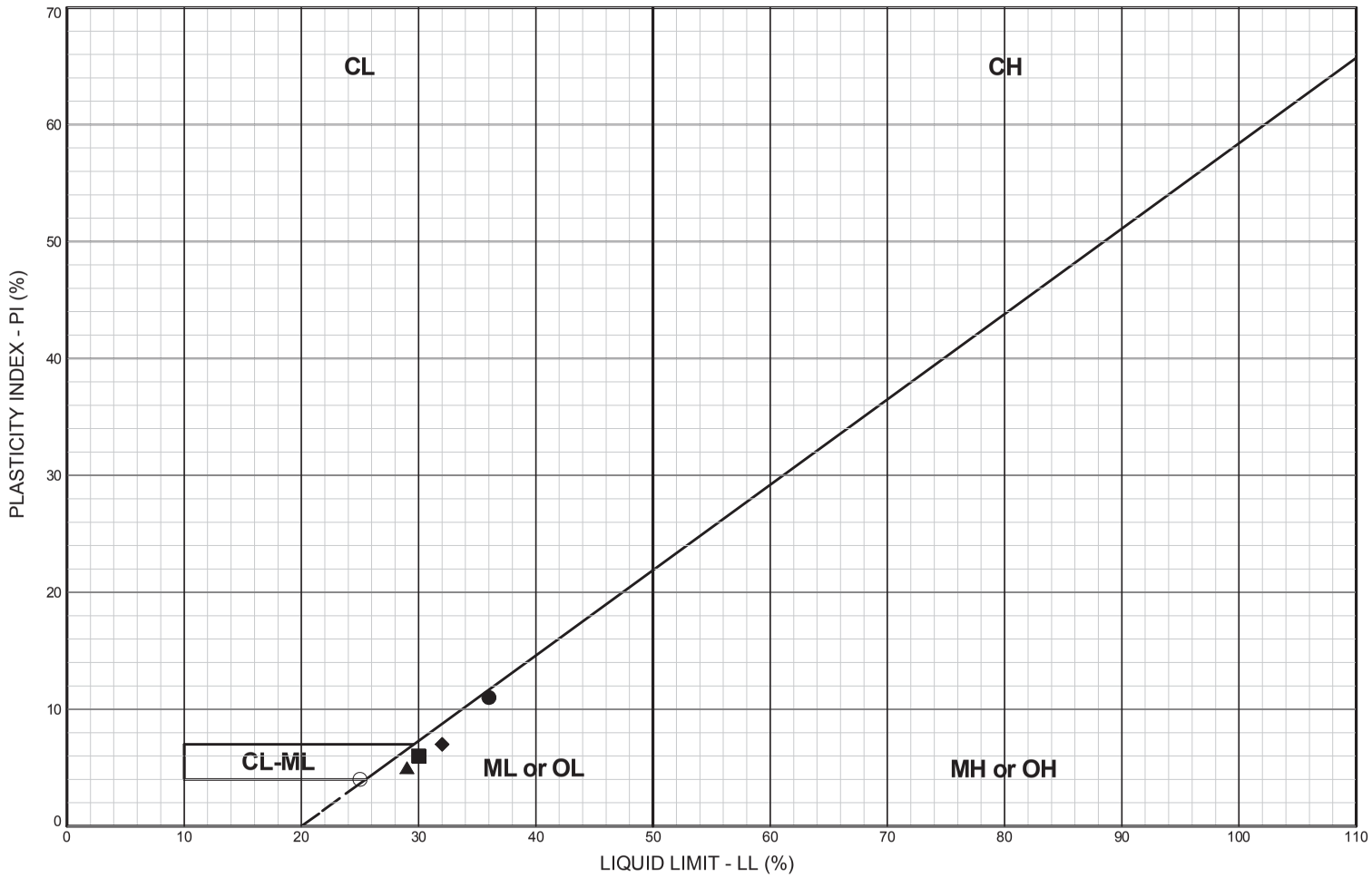
SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

EXHIBIT A-6
Sheet 8 of 8

REV 3

SR520_MASTER_LOG_E_SIMP 21-20624.GPJ SHAN_WIL.GDT 12/14/16 Log: EAS Rev: DPO Typ: LKN

APPENDIX B
Laboratory Testing



LEGEND

CL: Low plasticity inorganic clays; sandy and silty clays

CH: High plasticity inorganic clays

ML or OL: Inorganic and organic silts and clayey silts of low plasticity

MH or OH: Inorganic and organic silts and clayey silts of high plasticity

CL-ML: Silty clays and clayey silts

BORING AND SAMPLE NO.	DEPTH (feet)	U.S.C.S. SYMBOL	SOIL CLASSIFICATION	LL %	PL %	PI %	NAT. W.C. %	PASS. #200, %
● H-24p-06, S-5	25.0	ML	Gray, clayey SILT, trace of fine sand	36	25	11	29.0	
■ H-24p-06, S-8	40.0	ML	Gray-brown, slightly clayey, fine sandy SILT	30	24	6	28.8	
▲ H-24p-06, S-11	55.0	ML	Gray, slightly clayey SILT, trace of fine sand	29	24	5	28.4	
◆ H-24p-06, S-13	65.0	ML	Gray-brown, slightly clayey, fine sandy SILT	32	25	7	26.1	
○ H-24p-06, S-16	80.0	CL-ML	Gray-brown, slightly clayey, fine sandy SILT, trace of medium sand	25	21	4	24.4	

SR 520/ I-5 to Medina - Stage 1
Evergreen Point Floating Bridge and Landings

PLASTICITY CHART
BORING H-24p-06

October 2010 21-1-20624-552

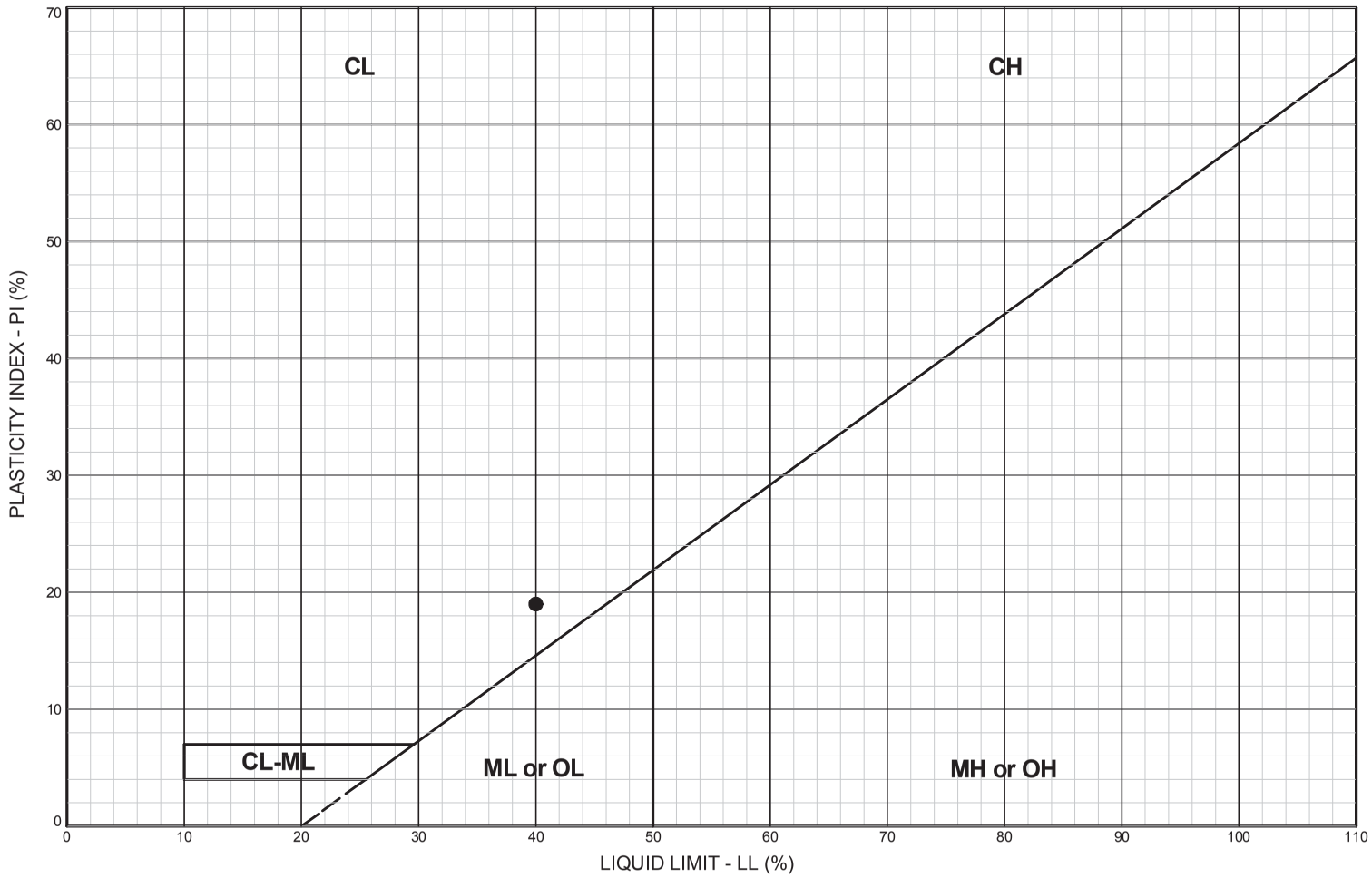
SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

EXHIBIT E-9

WSDOT

SR520_ATT_MAIN_LOCAL_COPY 21-20624.GPJ SHAN_WIL.GDT 8/9/10

EXHIBIT E-9



LEGEND

CL: Low plasticity inorganic clays; sandy and silty clays

CH: High plasticity inorganic clays

ML or OL: Inorganic and organic silts and clayey silts of low plasticity

MH or OH: Inorganic and organic silts and clayey silts of high plasticity

CL-ML: Silty clays and clayey silts

BORING AND SAMPLE NO.	DEPTH (feet)	U.S.C.S. SYMBOL	SOIL CLASSIFICATION	LL %	PL %	PI %	NAT. W.C. %	PASS. #200, %
● H-26p-08, S-20	97.5	CL	Gray, silty CLAY, trace of fine sand	40	21	19	23.3	

SR 520/ I-5 to Medina - Stage 1
Evergreen Point Floating Bridge and Landings

PLASTICITY CHART
BORING H-26p-08

October 2010 21-1-20624-552

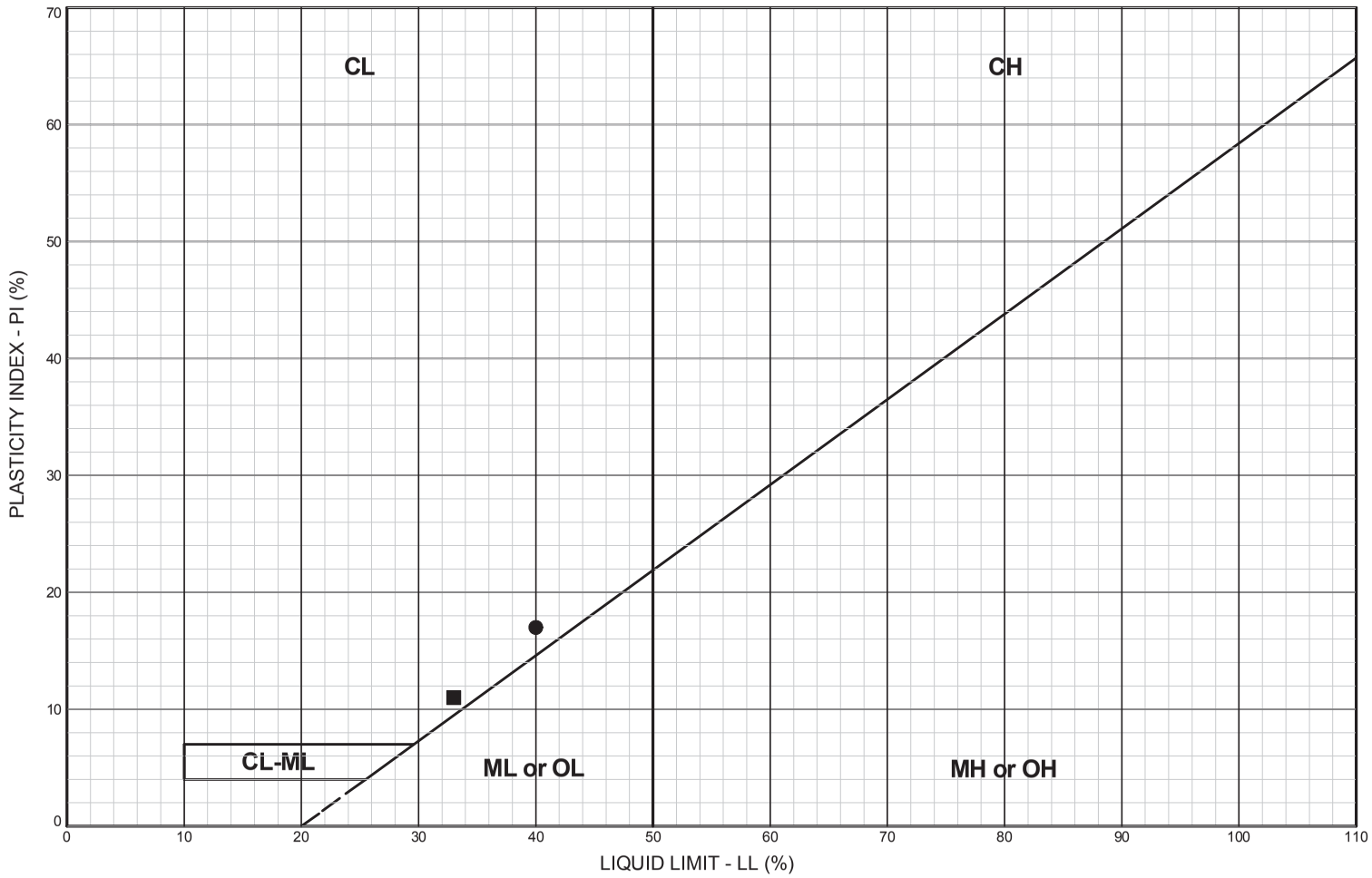
SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

EXHIBIT E-10

WSDOT

SR520_ATT_MAIN_LOCAL_COPY 21-20624.GPJ SHAN_WIL.GDT 8/9/10

EXHIBIT E-10



LEGEND

CL: Low plasticity inorganic clays; sandy and silty clays

CH: High plasticity inorganic clays

ML or OL: Inorganic and organic silts and clayey silts of low plasticity

MH or OH: Inorganic and organic silts and clayey silts of high plasticity

CL-ML: Silty clays and clayey silts

BORING AND SAMPLE NO.	DEPTH (feet)	U.S.C.S. SYMBOL	SOIL CLASSIFICATION	LL %	PL %	PI %	NAT. W.C. %	PASS. #200, %
● H-104p-09, S-3	7.5	CL	Gray, silty CLAY, trace of fine sand	40	23	17	28.7	
■ H-104p-09, S-16	65.0	CL	Gray, silty CLAY	33	22	11		

SR 520/ I-5 to Medina - Stage 1
Evergreen Point Floating Bridge and Landings

PLASTICITY CHART
BORING H-104p-09

October 2010 21-1-20624-552

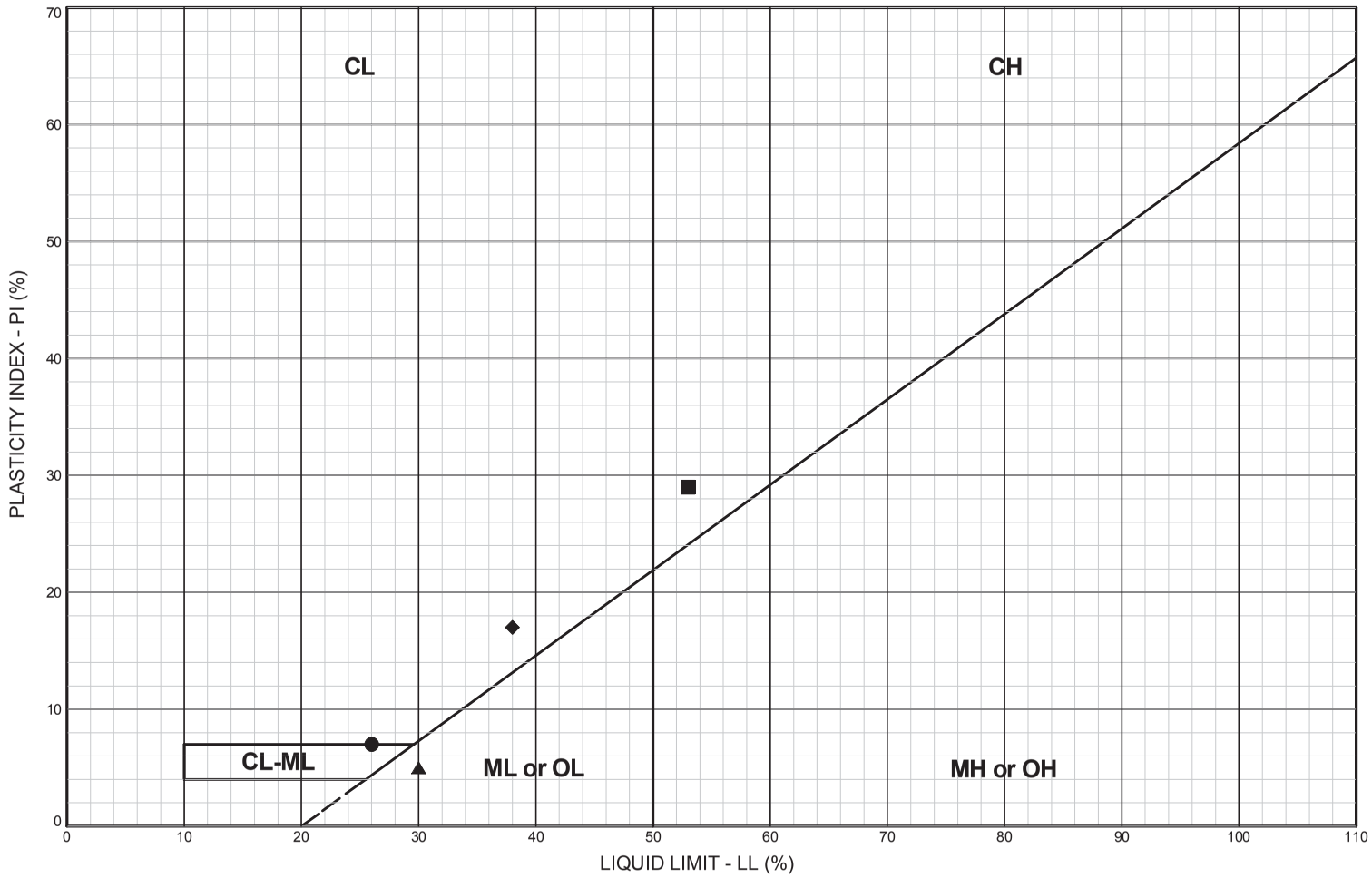
SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

EXHIBIT E-12

WSDOT

EXHIBIT E-12

SR520_ATT_MAIN_LOCAL COPY 21-20624.GPJ SHAN_WIL.GDT 8/9/10



LEGEND

CL: Low plasticity inorganic clays; sandy and silty clays

CH: High plasticity inorganic clays

ML or OL: Inorganic and organic silts and clayey silts of low plasticity

MH or OH: Inorganic and organic silts and clayey silts of high plasticity

CL-ML: Silty clays and clayey silts

BORING AND SAMPLE NO.	DEPTH (feet)	U.S.C.S. SYMBOL	SOIL CLASSIFICATION	LL %	PL %	PI %	NAT. W.C. %	PASS. #200, %
● H-105p-09, S-8	20.0	CL-ML	Brown, slightly sandy, silty CLAY, trace of fine gravel	26	19	7	20.1	
■ H-105p-09, S-13	45.0	CH	Gray, silty CLAY, trace of fine sand; scattered light gray silt partings	53	24	29	26.8	
▲ H-105p-09, S-17	65.0	ML	Gray, slightly clayey, fine sandy SILT	30	25	5	26.0	
◆ H-105p-09, S-22	90.0	CL	Gray, silty CLAY	38	21	17	23.7	

SR 520/ I-5 to Medina - Stage 1
Evergreen Point Floating Bridge and Landings

PLASTICITY CHART
BORING H-105p-09

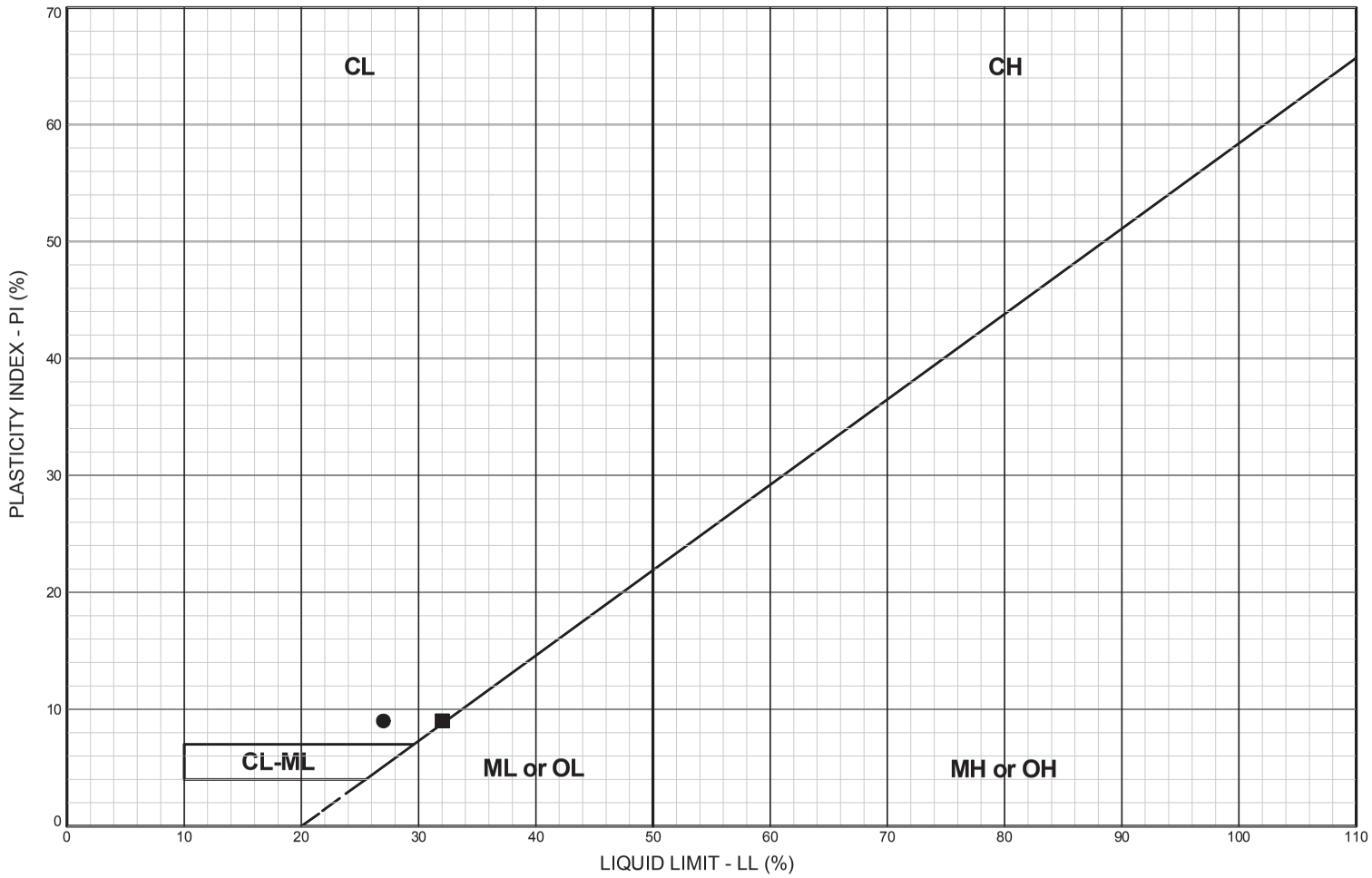
October 2010 21-1-20624-552

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

EXHIBIT E-13

WSDOT

SR520_ATT_MAIN_LOCAL COPY 21-20624.GPJ SHAN_WIL.GDT 8/9/10



LEGEND

CL: Low plasticity inorganic clays; sandy and silty clays

CH: High plasticity inorganic clays

ML or OL: Inorganic and organic silts and clayey silts of low plasticity

MH or OH: Inorganic and organic silts and clayey silts of high plasticity

CL-ML: Silty clays and clayey silts

BORING AND SAMPLE NO.	DEPTH (feet)	U.S.C.S. SYMBOL	SOIL CLASSIFICATION	LL %	PL %	PI %	NAT. W.C. %	PASS. #200, %
● H-106-09, S-6	15.0	CL	Gray, silty CLAY, trace of sand and fine gravel	27	18	9	15.6	
■ H-106-09, S-14	50.0	CL	Gray, silty CLAY, trace of fine sand	32	23	9	28.8	

SR 520/ I-5 to Medina - Stage 1
Evergreen Point Floating Bridge and Landings

PLASTICITY CHART
BORING H-106-09

October 2010 21-1-20624-552

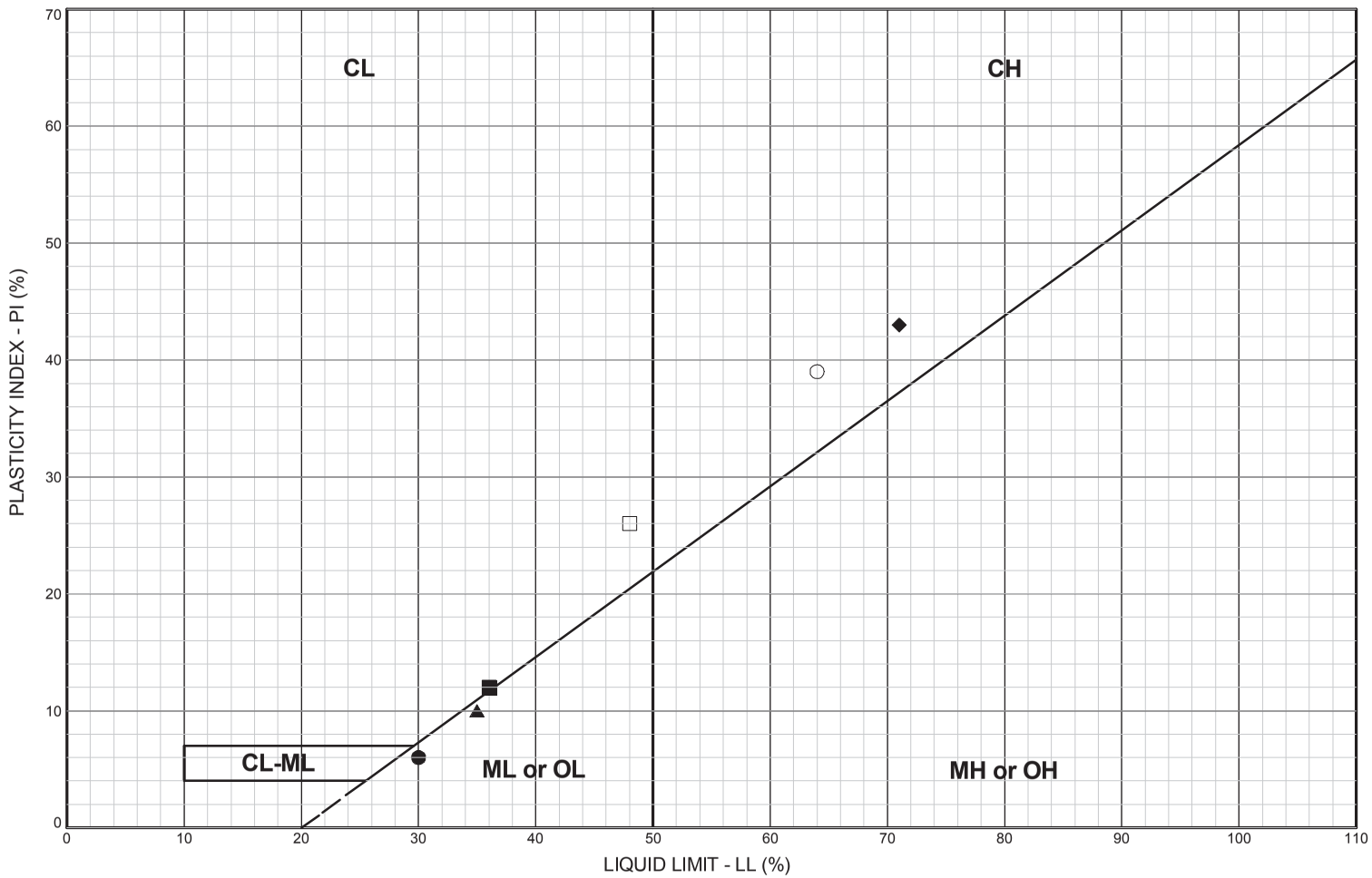
SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

EXHIBIT E-14

WSDOT

SR520_ATT_MAIN_LOCAL_COPY 21-20624.GPJ SHAN_WIL.GDT 8/9/10

EXHIBIT E-14



LEGEND

CL: Low plasticity inorganic clays; sandy and silty clays

CH: High plasticity inorganic clays

ML or OL: Inorganic and organic silts and clayey silts of low plasticity

MH or OH: Inorganic and organic silts and clayey silts of high plasticity

CL-ML: Silty clays and clayey silts

BORING AND SAMPLE NO.	DEPTH (feet)	U.S.C.S. SYMBOL	SOIL CLASSIFICATION	LL %	PL %	PI %	NAT. W.C. %	PASS. #200, %
● H-366-10, S-1	5.0	ML	Gray, clayey SILT, trace of fine sand	30	24	6	23.6	98.5
■ H-366-10, S-15	60.0	CL	Gray, silty CLAY, trace of fine sand	36	24	12	26.8	98.3
▲ H-366-10, S-29	130.0	ML	Gray, clayey SILT, trace of fine sand	35	25	10	28.0	99.2
◆ H-366-10, S-38	175.0	CH	Gray, silty CLAY	71	28	43	28.1	99.7
○ H-366-10, S-43	200.0	CH	Gray, silty CLAY, trace of sand	64	25	39	28.0	97.8
□ H-366-10, S-51	240.0	CL	Gray, silty CLAY, trace of fine sand	48	22	26	26.1	99.4

SR 520/I-5 to Medina - Stage 1
Evergreen Point Floating Bridge and Landings

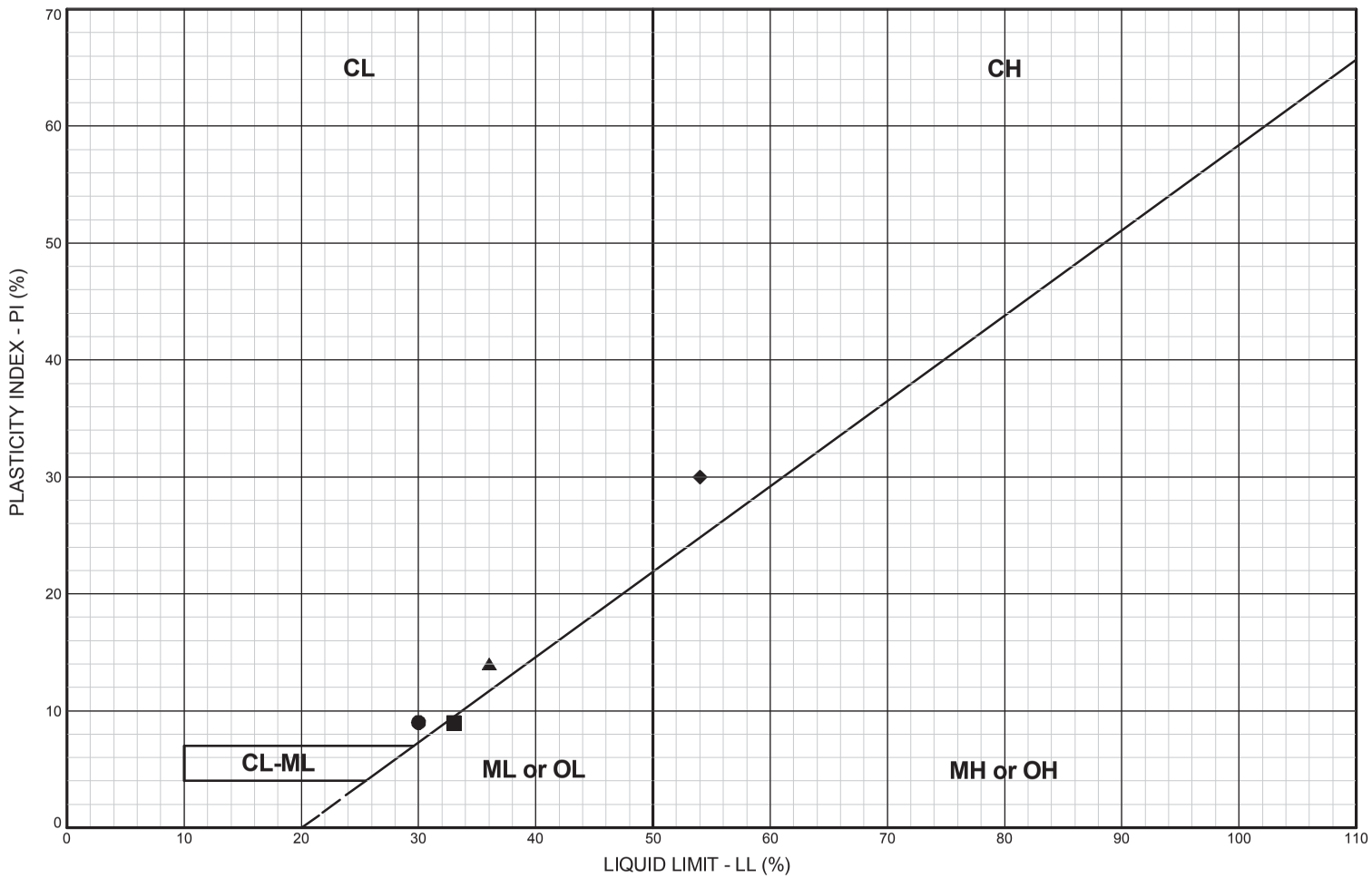
PLASTICITY CHART
Boring H-366-10

December 2010 21-1-20624-552

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

EXHIBIT C-4

SR520_ATT_MAIN_21-20624.GPJ SHAN_WIL.GDT 12/2/10



LEGEND

CL: Low plasticity inorganic clays; sandy and silty clays

CH: High plasticity inorganic clays

ML or OL: Inorganic and organic silts and clayey silts of low plasticity

MH or OH: Inorganic and organic silts and clayey silts of high plasticity

CL-ML: Silty clays and clayey silts

BORING AND SAMPLE NO.	DEPTH (feet)	U.S.C.S. SYMBOL	SOIL CLASSIFICATION	LL %	PL %	PI %	NAT. W.C. %	PASS. #200, %
● H-367-10, S-4	11.0	CL	Gray, silty CLAY, trace of fine sand	30	21	9	25.4	98.1
■ H-367-10, S-23	99.0	ML	Gray, clayey SILT, trace of fine sand	33	24	9	28.6	98.6
▲ H-367-10, S-31	139.0	CL	Gray, silty CLAY, trace of fine sand	36	22	14	28.1	98.6
◆ H-367-10, S-36	174.0	CH	Gray, silty CLAY	54	24	30	28.4	99.6

SR 520/I-5 to Medina - Stage 1
Evergreen Point Floating Bridge and Landings

PLASTICITY CHART
Boring H-367-10

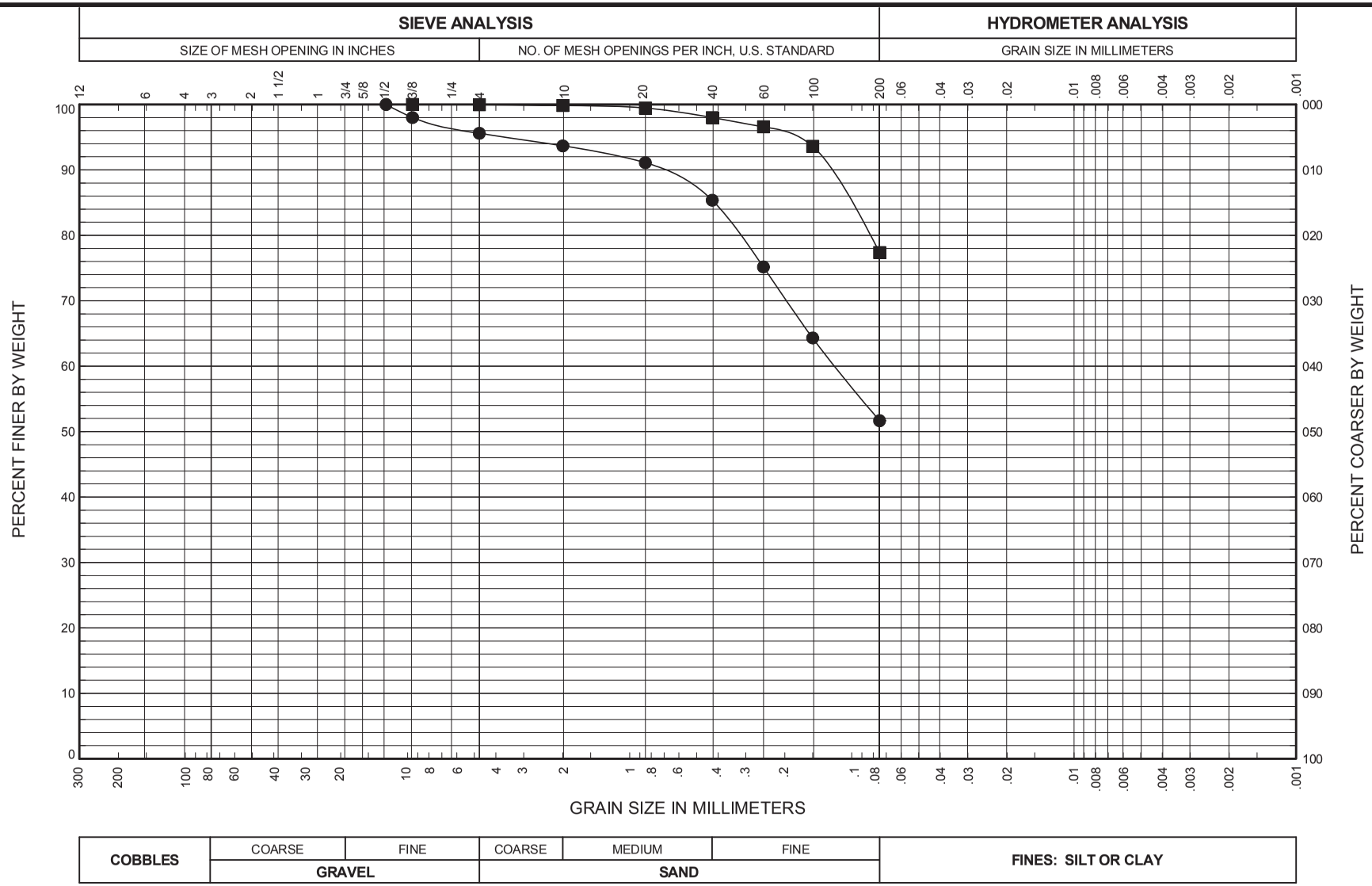
December 2010 21-1-20624-552

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

EXHIBIT C-5

SR520_ATT_MAIN_21-20624.GPJ SHAN_WIL.GDT 12/2/10

EXHIBIT C-5



BORING AND SAMPLE NO.	DEPTH (feet)	U.S.C.S. SYMBOL	SAMPLE DESCRIPTION	FINES %	NAT. W.C. %	LL %	PL %	PI %
● H-106-09, S-2	5.0	ML	Brown, sandy SILT, trace of fine gravel	51.7	10.4			
■ H-106-09, S-8	20.0	ML	Gray-brown, fine sandy SILT; scattered wood fragments	77.4	26.7			

SR 520/ I-5 to Medina - Stage 1
Evergreen Point Floating Bridge and Landings

GRAIN SIZE DISTRIBUTION
BORING H-106-09

October 2010 21-1-20624-552

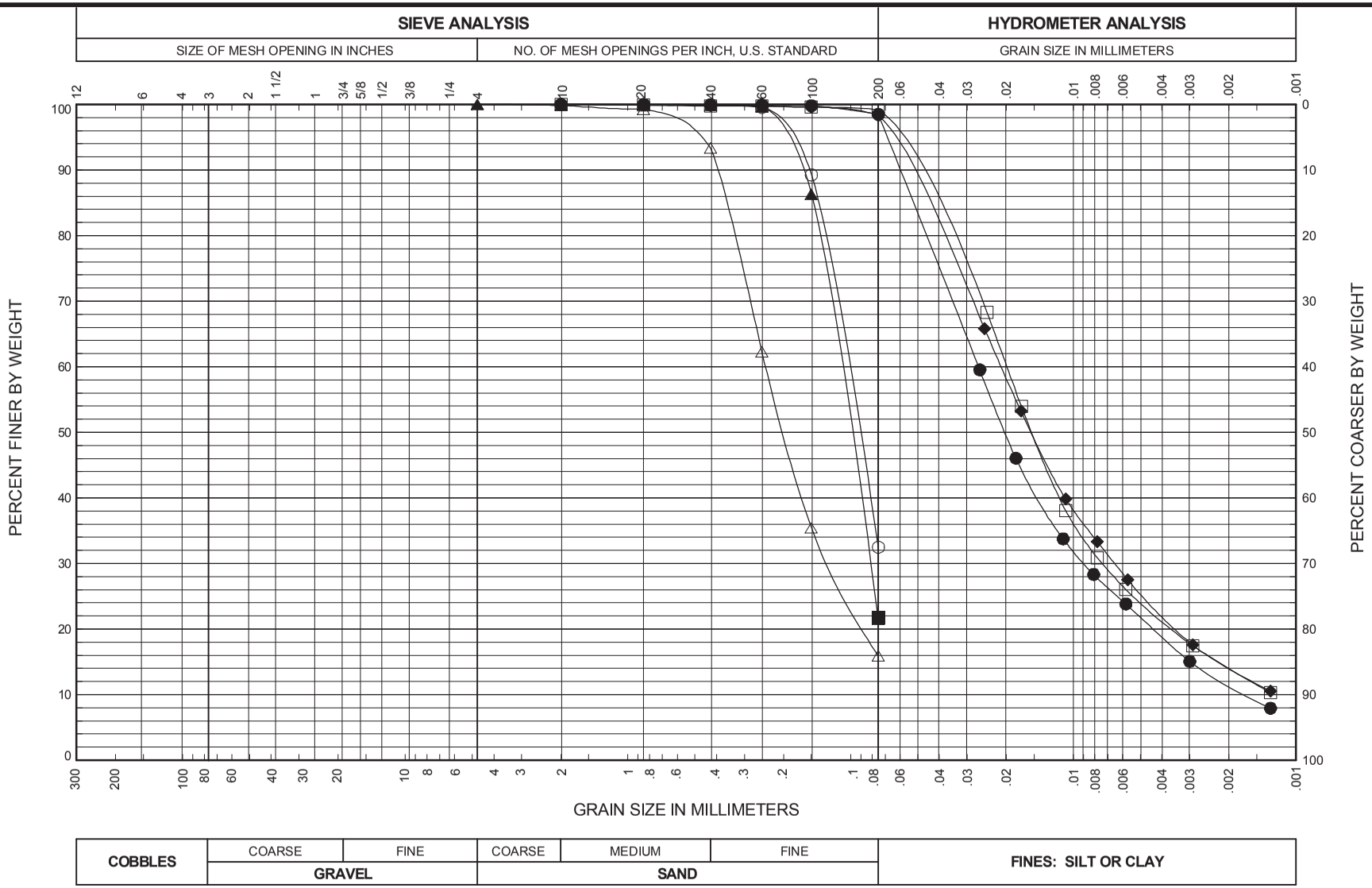
SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

EXHIBIT E-65

WSDOT

EXHIBIT E-65

SR520 GSA MAIN LOCAL COPY 21-20624.GPJ SHAN WIL.GDT 8/9/10



BORING AND SAMPLE NO.	DEPTH (feet)	U.S.C.S. SYMBOL	SAMPLE DESCRIPTION	FINES %	NAT. W.C. %	LL %	PL %	PI %
● H-366-10, S-1	5.0	ML	Gray, clayey SILT, trace of fine sand	98.5	23.6	30	24	6
■ H-366-10, S-7	20.0	SM	Gray, silty, fine SAND; trace of organics	21.8	26.1			
▲ H-366-10, S-11	40.0	SM	Gray, silty, fine SAND	21.5	25.0			
◆ H-366-10, S-15	60.0	CL	Gray, silty CLAY, trace of fine sand	98.3	26.8	36	24	12
○ H-366-10, S-19	80.0	SM	Gray, silty, fine SAND	32.5	25.0			
□ H-366-10, S-29	130.0	ML	Gray, clayey SILT, trace of fine sand	99.2	28.0	35	25	10
△ H-366-10, S-35	160.0	SM	Gray, silty, fine to medium SAND	15.9	19.1			

SR 520/I-5 to Medina - Stage 1
Evergreen Point Floating Bridge and Landings

GRAIN SIZE DISTRIBUTION
Boring H-366-10

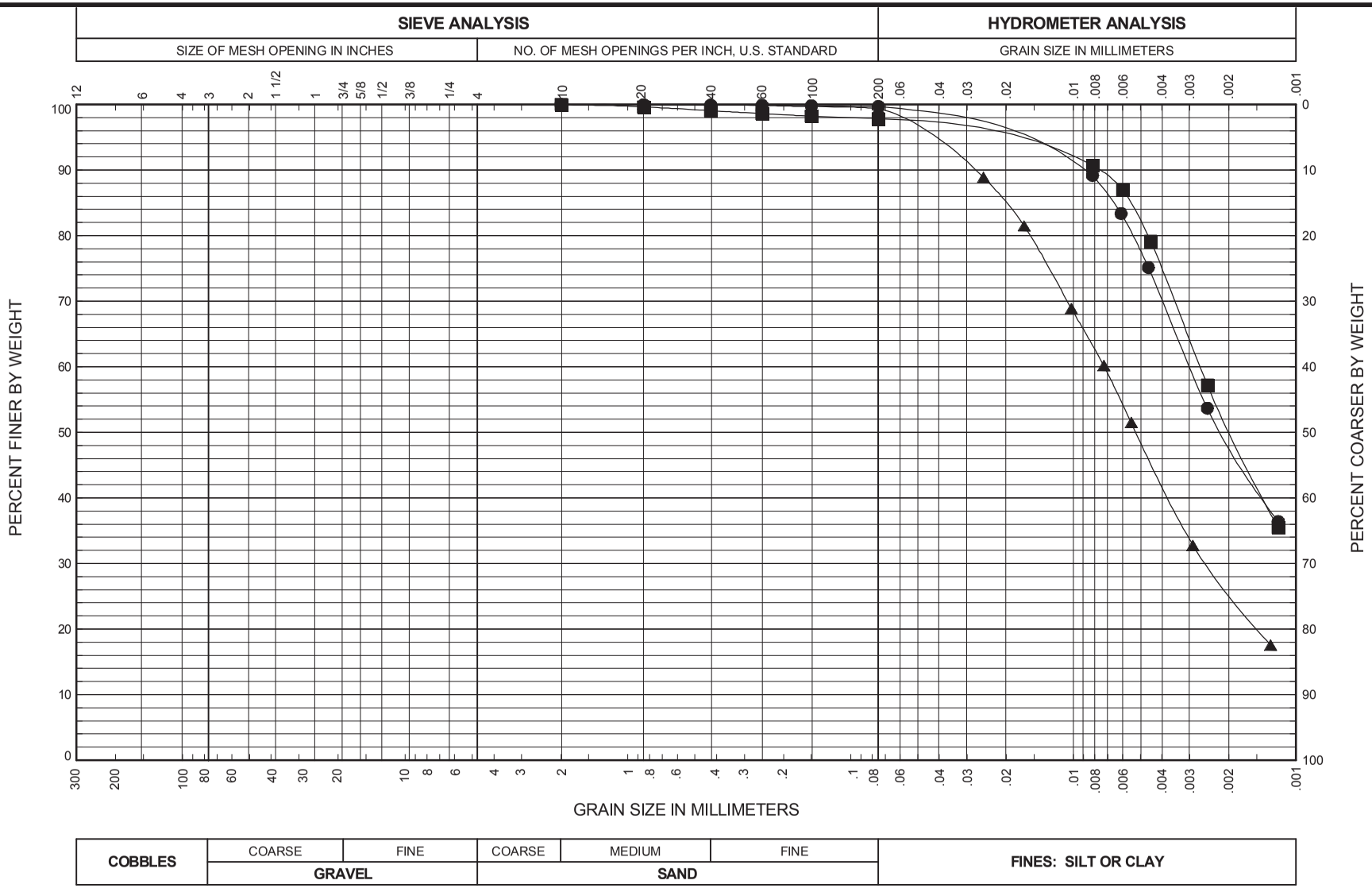
December 2010 | 21-1-20624-552

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

EXHIBIT C-8
Sheet 1 of 2

SR520_GSA_MAIN 21-20624.GPJ SHAN_WIL.GDT 12/2/10

EXHIBIT C-8



BORING AND SAMPLE NO.	DEPTH (feet)	U.S.C.S. SYMBOL	SAMPLE DESCRIPTION	FINES %	NAT. W.C. %	LL %	PL %	PI %
● H-366-10, S-38	175.0	CH	Gray, silty CLAY	99.7	28.1	71	28	43
■ H-366-10, S-43	200.0	CH	Gray, silty CLAY, trace of sand	97.8	28.0	64	25	39
▲ H-366-10, S-51	240.0	CL	Gray, silty CLAY, trace of fine sand	99.4	26.1	48	22	26

SR 520/I-5 to Medina - Stage 1
Evergreen Point Floating Bridge and Landings

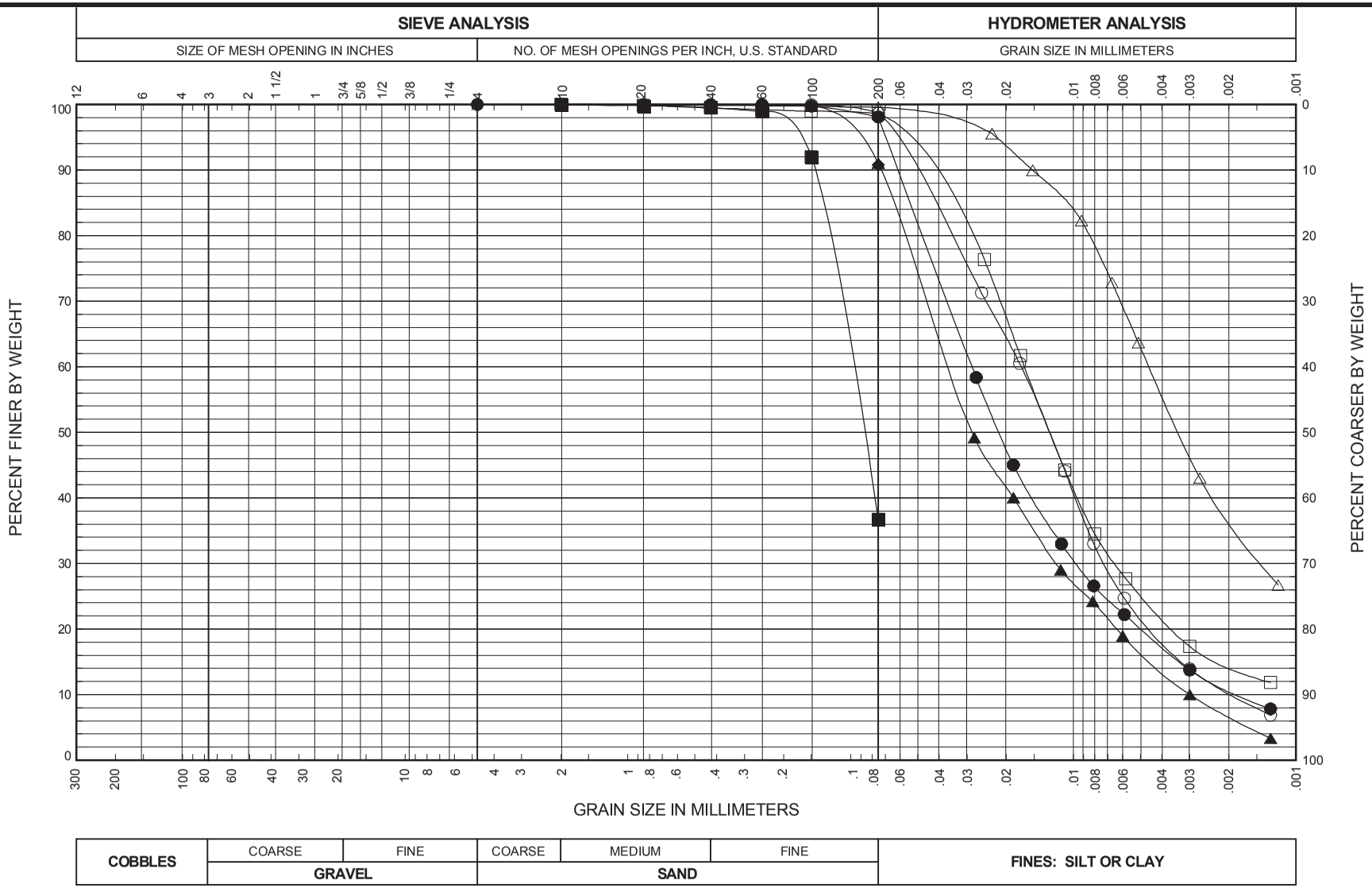
GRAIN SIZE DISTRIBUTION
Boring H-366-10

December 2010 21-1-20624-552

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

EXHIBIT C-8
Sheet 2 of 2

SR520_GSA_MAIN 21-20624.GPJ SHAN_WIL.GDT 12/2/10



BORING AND SAMPLE NO.	DEPTH (feet)	U.S.C.S. SYMBOL	SAMPLE DESCRIPTION	FINES %	NAT. W.C. %	LL %	PL %	PI %
● H-367-10, S-4	11.0	CL	Gray, silty CLAY, trace of fine sand	98.1	25.4	30	21	9
■ H-367-10, S-8	24.0	SM	Gray, silty, fine SAND	36.7	24.4			
▲ H-367-10, S-15	59.0	ML	Gray, slightly fine sandy, clayey SILT	91.0	25.3			
◆ H-367-10, S-19	79.0	ML	Gray, slightly fine sandy SILT, trace of clay; trace of organics	90.7	25.9			
○ H-367-10, S-23	99.0	ML	Gray, clayey SILT, trace of fine sand	98.6	28.6	33	24	9
□ H-367-10, S-31	139.0	CL	Gray, silty CLAY, trace of fine sand	98.6	28.1	36	22	14
△ H-367-10, S-36	174.0	CH	Gray, silty CLAY	99.6	28.4	54	24	30

SR 520/I-5 to Medina - Stage 1
Evergreen Point Floating Bridge and Landings

GRAIN SIZE DISTRIBUTION
Boring H-367-10

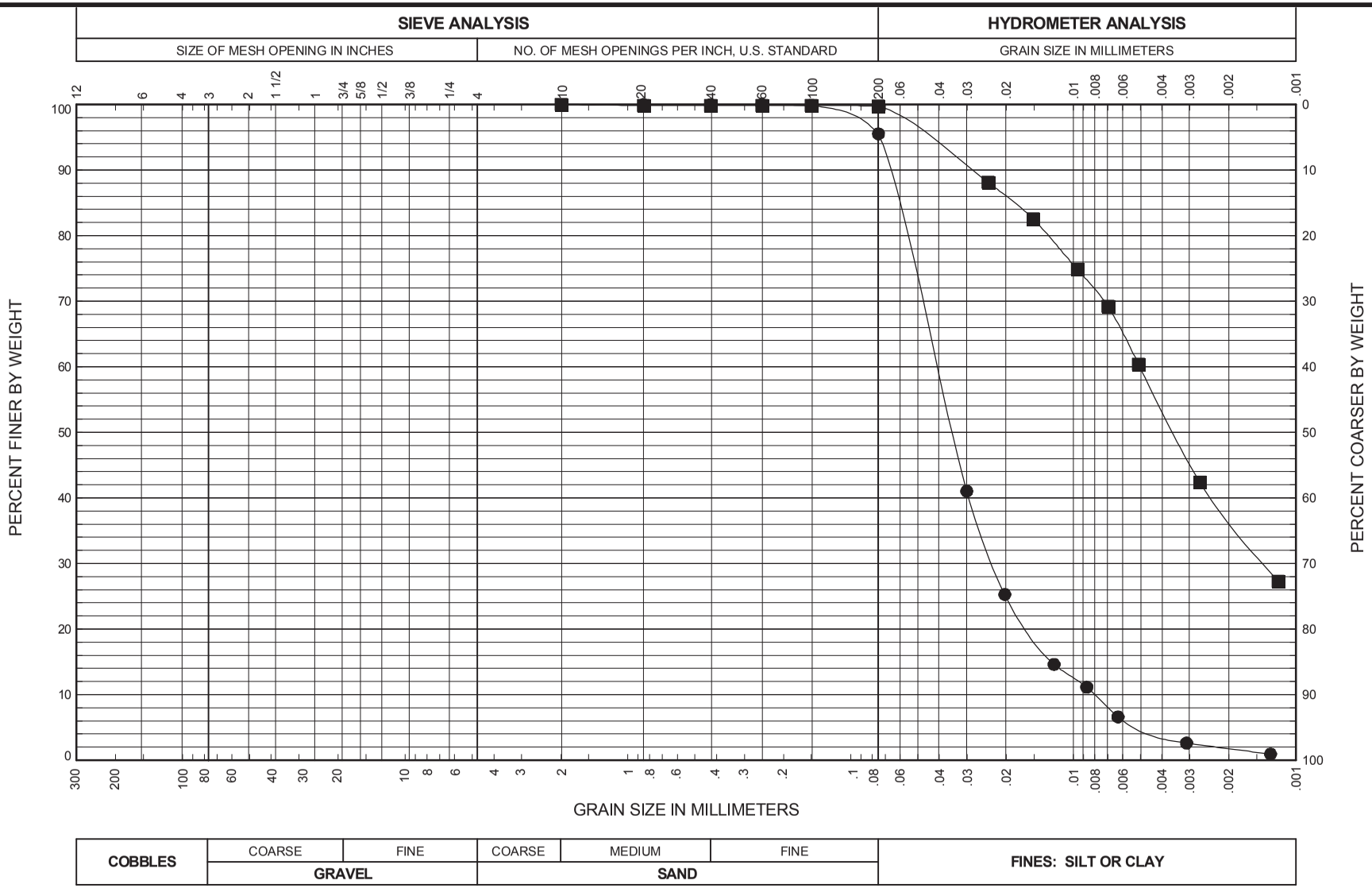
December 2010 | 21-1-20624-552

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

EXHIBIT C-9
Sheet 1 of 2

SR520_GSA_MAIN 21-20624.GPJ SHAN_WIL.GDT 12/2/10

EXHIBIT C-9



BORING AND SAMPLE NO.	DEPTH (feet)	U.S.C.S. SYMBOL	SAMPLE DESCRIPTION	FINES %	NAT. W.C. %	LL %	PL %	PI %
● H-367-10, S-38	194.0	ML	Gray SILT, trace of fine sand and clay	95.5	23.8			
■ H-367-10, S-39	204.0	CH	Gray, silty CLAY, trace of fine sand	99.7	27.3			

SR 520/I-5 to Medina - Stage 1
Evergreen Point Floating Bridge and Landings

GRAIN SIZE DISTRIBUTION
Boring H-367-10

December 2010 21-1-20624-552

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

EXHIBIT C-9
Sheet 2 of 2

SR520_GSA_MAIN 21-20624.GPJ SHAN_WIL.GDT 12/2/10

EXHIBIT C-9

SR 520 Evergreen Point
Floating Bridge and Landings Project

Environmental Compliance Plan
Volume III

Appendix C
Spill Prevention, Control, and Countermeasures Plan

REVISION 2

Released for Construction

SR 520 Evergreen Point
Floating Bridge and Landings Project

Environmental Compliance Plan

Appendix C
Spill Prevention, Control, and Countermeasures Plan

Prepared for Submittal to
Washington State Department of Transportation

Prepared by
Floyd|Snider

On behalf of
Kiewit/General/Manson, A Joint Venture

October 5, 2012

REVISION 2
Released for Construction

Table of Contents

Introduction **C-1**

Elements **C-3**

1. RESPONSIBLE PERSONNEL C-3
2. SPILL REPORTING C-3
3. PROJECT AND SITE INFORMATION C-3
   - 3.A. The Project Work C-3
   - 3.B. The Site Location and Boundaries C-5
   - 3.C. The Drainage Pathways from the Site C-5
   - 3.D. The Distances of Nearby Waterways and Sensitive Areas from the Site C-6
4. POTENTIAL SPILL SOURCES C-7
   - 4.A. Activities with Potentially Hazardous Materials C-7
   - 4.B. Diesel Fuel C-7
   - 4.C. Gasoline Fuel C-8
   - 4.D. Hydraulic Oil C-8
   - 4.E. Construction Equipment C-8
   - 4.F. Concrete-Related Operations C-8
5. PRE-EXISTING CONTAMINATION C-9
   - 5.A. Unanticipated Discovery of Hazardous Waste or Impacted Soil C-10
6. SPILL PREVENTION AND RESPONSE TRAINING C-10
7. SPILL PREVENTION C-10
   - 7.A. Spill Response Kit Contents and Location C-10
   - 7.B. Security Measures for Potential Spill Sources C-11
   - 7.C. Methods Used to Prevent Stormwater from Contacting Hazardous Materials C-11
   - 7.D. Secondary Containment Practices and Structures for Hazardous Materials C-13
   - 7.E. BMPs Used to Prevent Discharges to Groundwater or Water During Mixing and Transfers of Hazardous Materials and Fuel C-13
   - 7.F. Refueling Procedures for Marine and Over-Water Equipment C-14
   - 7.G. Daily Inspection and Cleanup Procedures that Ensure All Marine and Over-Water Equipment are Free of All External Petroleum-Based Products C-15
   - 7.H. Routine Equipment, Storage Area, and Structure Inspection and Maintenance Practices C-15
   - 7.I. Site Inspection Procedures and Frequency C-16

8. SPILL RESPONSE C-16
8.A. A Spill of Each Type of Hazardous Material at Each Location Identified in 4. Potential Spill Sources C-16
8.B. Stormwater that has Come into Contact with Hazardous Materials C-17
8.C. A Release or Spill of Any Known Pre-Existing Contamination and Contaminant Source Described in 5. Pre-Existing Contamination C-18
8.D. A Release or Spill of any Unknown Pre-Existing Contamination and Contaminant Sources (such as Buried Pipes or Tanks) That May be Unexpectedly Encountered During Project Work C-18
8.E. A Spill Occurring During Work with Equipment Used Below the Ordinary High Water Line C-18
9. PROJECT SITE MAP C-19
10. SPILL REPORT FORM C-20
References C-21

List of Tables

Table C.1 SPCCP Contacts
Table C.2 Federal, State, and Local Agencies to be Notified in the Event of a Spill
Table C.3 Hazardous Materials Brought or Generated On-Site
Table C.4 Spill Response Procedures for Spills of Each Type of Hazardous Material at Each Location Identified in Section 4.
Table C.5 Spill Response Procedures for Stormwater that has Contacted Hazardous Materials
Table C.6 Spill Response Procedures for Releases or Spills of any Pre-Existing Contamination and Contaminant Sources Encountered during Project Work
Table C.7 Spill Response Procedures for Spills Occurring During Work with Equipment Used Below the Ordinary High Water Line

List of Figures

Figure C.1 External Regulatory Reporting Requirements Flow Chart
Figure C.2 Kenmore Yard Site Layout TESC & Spill Control
Figure C.3 CTC Site Layout and Spill Control
Figure C.4 Floating Bridge and Landings Site Layout
Figure C.5 Medina Site Layout
Figure C.6 Port of Tacoma EB-1 Wharf, Pontoon Outfitting Location
Figure C.7 Port of Seattle Terminal 18 Wharf, Pontoon Outfitting Location
Figure C.8 Vigor Shipyards, Pontoon Outfitting Location

List of Attachments

Attachment C.1 Spill Report Form
Attachment C.2 Additional Items Brought On-Site Log
Attachment C.3 Material Safety Data Sheets
Attachment C.4 Standard Procedures for Land-Based Fueling Operations
Attachment C.5 Shipboard Oil Pollution Emergency Plan
Attachment C.6 Audit and Inspection Logs

List of Abbreviations/Acronyms

Abbreviation/ Acronym	Definition
BMP	Best Management Practice
CSWGP	Construction Stormwater General Permit
CTC Facility	Concrete Technology Corporation Pontoon Casting Facility
ECAP	Environmental Compliance Assurance Procedures
ECI	KGM Environmental Compliance Inspector
Ecology	Washington State Department of Ecology
ECP	Environmental Compliance Plan
EIS	Environmental Impact Statement
GDR	Geotechnical Data Report
Kenmore Yard	Kenmore Construction and Support Yard
KGM	Kiewit/General/Manson, A Joint Venture
KGM EM	KGM Environmental Manager
MSDS	Material Safety Data Sheet
MTCA	Model Toxics Control Act
NPDES	National Pollutant Discharge Elimination System
PE	Project Engineer
RCW	Revised Code of Washington
RFP	Request for Proposal
SOPEP	Shipboard Oil Pollution Emergency Plan
SPCCP	Spill Prevention, Control, and Countermeasures Plan
SR 520 FBL Project	State Route 520 Evergreen Point Floating Bridge and Landings Project
SR 520 FBL Site	Floating Bridge and Landings Site
T-18	Terminal 18
UST	Underground Storage Tank
WAC	Washington Administrative Code
WSDOT	Washington State Department of Transportation
WSDOT ECM	WSDOT Environmental Compliance Manager

Introduction

Kiewit/General/Manson, A Joint Venture (KGM) has prepared this Spill Prevention, Control, and Countermeasures Plan (SPCCP) for the Washington State Department of Transportation (WSDOT) to facilitate construction of the State Route (SR) 520 Evergreen Point Floating Bridge and Landings Project (SR 520 FBL Project). The SR 520 FBL Project includes work activities at three locations: the Kenmore Construction Support Yard (Kenmore Yard); the Concrete Technology Corporation Pontoon Casting Facility (CTC Facility) and the adjacent Port of Tacoma property; and the Floating Bridge and Landings Site (SR 520 FBL Site) that includes both upland areas within the City of Medina and over-water areas within Lake Washington in both Medina and Seattle jurisdictions. Additionally, pontoons will be outfitted at three remote outfitting locations that are existing deep berth locations where KGM will lease space. These remote outfitting locations include the Port of Tacoma EB-1 Wharf on the Blair Waterway in Tacoma, the Port of Seattle Terminal 18 (T-18) wharf on Harbor Island in Seattle, and Vigor Shipyards on Harbor Island in Seattle.

KGM will implement this SPCCP for all project work in accordance with the requirements of Section 2.8 of the Request for Proposal (RFP) and the Project Environmental Commitments List (WSDOT 2010, Appendix A of the Environmental Compliance Plan [ECP]). A copy will remain at the project work area at all times until completion of the project.

KGM plans to use the Kenmore Yard for casting concrete bridge deck panels and anchors and for general construction staging and support for construction of the new floating bridge and landings. Concrete supplemental pontoons for the new bridge will be constructed by KGM at the CTC Facility. Work within the SR 520 FBL Site includes construction of fixed east and west approach structures, assembly of the floating bridge across Lake Washington, and construction of the maintenance facility in the bridge right-of-way within Medina. Following completion of the new bridge and landings, demolition and removal of the existing floating bridge and landing structures will occur before project demobilization.

Per the requirements of the RFP, the SPCCP will be updated by KGM throughout project construction so that the written plan reflects actual site conditions and practices. KGM will update the plan in accordance with the National Pollutant Discharge Elimination System (NPDES) permit requirements and maintain a copy of the updated SPCCP at each project site. All project employees will be trained in spill prevention and containment, will know where the SPCCP and spill response kits are located, and will have immediate access to them. If hazardous materials are encountered or spilled during construction, KGM will implement this plan to control and contain the material until appropriate measures can be taken. KGM will supply and maintain the response spill kits of appropriate size within close proximity to hazardous materials and equipment.

KGM will implement the spill prevention measures identified in the SPCCP before performing any of the following activities:

- Placing materials or equipment in staging, work, or storage areas
- Refueling, washing, or maintaining equipment
- Stockpiling materials

Per the RFP, occupational safety and health requirements that may pertain to the SPCCP implementation are contained in, but not limited to, Washington Administrative Code (WAC)

Chapters 296-824 and 296-843. The SPCCP was prepared in accordance with the WSDOT Hazardous Materials Program plan requirements and the April 2011 amendment to the Standard Specification Section 1-07.15(1) (WSDOT 2011a).

Per the Project Environmental Commitments List (Appendix A of the ECP), KGM shall ensure that spill response equipment and materials designated in the SPCCP are located on the work area and are replenished throughout the duration of project activities, including oil-absorbent materials to be used in the event of a spill. The necessary best management practices (BMPs), as described below, will be implemented to prevent the release of contamination to ground surface and/or adjacent surface water bodies.

Elements

1. RESPONSIBLE PERSONNEL

The Kenmore Yard and CTC Facility Superintendants, as environmental site leads, are responsible for updating the SPCCP and coordinating spill prevention and response at the respective project sites. The KGM Environmental Compliance Inspector (ECI) will be responsible for the SPCCP spill prevention and response at the SR 520 FBL Site. All SPCCP responsible personnel with corresponding contact information are presented in Table C.1.

2. SPILL REPORTING

In the event of a spill or encounters of hazardous materials, subcontractors and/or KGM personnel will immediately notify the ECI and KGM Environmental Manager (KGM EM). The KGM EM will contact the WSDOT on-site Environmental Compliance Assurance Inspector, who will notify the WSDOT Environmental Compliance Manager (WSDOT ECM) and the WSDOT Project Engineer (PE) in accordance with WSDOT Environmental Compliance Assurance Procedures (ECAP; Appendix K of the ECP) notification requirements. Following immediate response and reporting procedures, the KGM EM will prepare the Spill Incident Report Form (Attachment C.1) and submit it to the WSDOT ECM. KGM will work with the WSDOT ECM to ensure that the proper information and data are collected to be accurately communicated to the appropriate agencies. Once the spill has been reported internally, external agency notifications will be performed according to the external regulatory reporting steps presented in Figure C.1. Emergency contact information for SPCCP responsible KGM and WSDOT personnel are provided in Table C.1. In addition, federal, state, and local agencies to be notified in the event of a spill are provided in Table C.2.

3. PROJECT AND SITE INFORMATION

3.A. The Project Work

The SR 520 FBL Project includes work activities at three locations: the Kenmore Yard, located at the north end of Lake Washington; the CTC Facility, located in Tacoma along the Blair Waterway; and the SR 520 FBL Site, which includes both upland areas within the City of Medina and over-water areas within Lake Washington in both Medina and Seattle jurisdictions. Additionally, pontoons will be outfitted at three remote outfitting locations that are existing deep berth locations where KGM will lease space. These remote outfitting locations include the Port of Tacoma EB-1 Wharf on the Blair Waterway in Tacoma, the Port of Seattle T-18 wharf on Harbor Island in Seattle, and Vigor Shipyards on Harbor Island in Seattle.

WSDOT has prepared an Environmental Impact Statement (EIS) for the SR 520 FBL Project (WSDOT 2011b) in compliance with the State Environmental Policy Act (SEPA) and the National Environmental Policy Act (NEPA).

Kenmore Yard

The Kenmore Yard, located at 6423 NE 175th Street, Kenmore, Washington, at the north end of Lake Washington and adjacent to both the Kenmore Navigation Channel and the Sammamish River will be used as a supplemental construction yard for the SR 520 FBL Project (Figure C.2).

The site consists of two primary areas that will be utilized, Lot A and Lot B. Lot A is approximately 14 acres, gravel surfaced and includes approximately 300 feet of wharf at the Kenmore Navigation Channel. Lot B is 4 acres and asphalt paved. Access to the Kenmore Yard is from NE 175th Street.

The Kenmore Yard will be used for the following activities:

- Construction of casting slabs and utility upgrades to prepare the site for use by KGM.
- Precasting of gravity anchors, fluke anchors, and bridge deck panels. Materials staging and storage, barge loading and unloading, and general operations to support bridge construction.
- Storage of completed precast components on the gravel-surfaced areas of the yard in preparation for transport to the SR 520 FBL Site.

CTC Facility

The CTC Facility is located at 1123 Port of Tacoma Road in Tacoma, Washington, along the Blair Waterway, Commencement Bay, within a zone of heavy industry and shipping. The facility will be used for pontoon construction, which is consistent with current facility activities (Figure C.3). The adjacent Port of Tacoma property will be used for construction trailer placement, temporary storage of construction materials, parking, and pontoon mock-up construction.

Once pontoons are ready for transport and the casting basin has been sufficiently flooded to float the pontoons, the pontoons will be transported by water to Lake Washington.

Floating Bridge and Landings—Medina

The SR 520 FBL Site includes in-water construction and assembly of the new bridge and demolition of the existing bridge within Lake Washington, construction of the east approach and support piers and bridge maintenance facility located along the shoreline within the City of Medina, and construction of the off-shore west approach structure within City of Seattle jurisdiction (Figures C.4 and C.5). Construction activities and associated BMPs are described in detail in the Construction Water Quality Monitoring and Protection Plan (CWQMPP) as provided in Appendix I of the ECP.

Remote Pontoon Outfitting Locations

Pontoon outfitting consists of constructing the bridge superstructure and columns that support the roadway, installing pier cross beams between the columns, and placing the precast concrete roadway deck panels. Pontoons fabricated at either the Aberdeen Casting Basin or the CTC Facility may be moored and outfitted at one of three remote (off-site) outfitting locations: the Port of Tacoma EB-1 Wharf on the Blair Waterway in Tacoma, the Port of Seattle T-18 wharf on Harbor Island in Seattle, and Vigor Shipyards on Harbor Island in Seattle (Figures C.6, C.7, and C.8). Each of these outfitting locations is am existing commercial shipping or mooring facility regularly used by large vessels or barges.

No ground disturbing activities will be conducted at any of the remote outfitting locations. Potential outfitting activities will be the same at all three locations and the same as those activities performed during pontoon outfitting operations within the temporary eastside staging

area in Lake Washington; however, pontoons will not be joined at the remote outfitting locations. The specific BMPs that will be implemented during pontoon outfitting within the temporary eastside staging area are described in detail in the CWQMPP as provided in Appendix I of the ECP. These same BMPs will be implemented at the remote outfitting locations.

3.B. The Site Location and Boundaries

As described above, project work includes use of three sites: the Kenmore Yard, the CTC Facility, the SR 520 FBL Site (Figures C.2 through C.5), and the three remote (off-site) pontoon outfitting locations. All SR 520 FBL Site project work will be conducted within the Limits of Construction/Impact Area Footprint, as defined in the RFP (WSDOT 2010). All proposed construction activities to be conducted at the CTC Facility are consistent with current facility operations and will not include any major site alternations or any in-water site work or alternations. Work at the adjacent Port of Tacoma property will include construction of a partial pontoon mock-up, an approximately 20-foot by 20-foot section of pontoon to be used as an example of pontoon construction techniques. Construction of the pontoon mock-up will be conducted on a paved area with temporary containment berming that will collect all concrete construction process water, including rain water that contacts uncured concrete.

Construction support activities to be conducted at the Kenmore Yard will be in conformance with Washington State Department of Ecology (Ecology) Consent Decree requirements (Attorney General 2001), site permits, and will not include shoreline or in-water alterations.

Pontoon moorage and outfitting at any of the three remote outfitting locations will be conducted in conformance with the existing commercial or industrial facility use and environmental and permit requirements.

3.C. The Drainage Pathways from the Site

KGM will operate in compliance with the NPDES Construction Stormwater General Permit (CSWGP) for the Kenmore Yard. In order to protect the surrounding property and waterways during construction activities, stormwater discharges from the site will be controlled and improvements will be made to segregate stormwater from process water that results from construction activities. Three sediment trap ponds will receive stormwater and will discharge to gravel infiltration beds, for on-site infiltration. Discharge to Lake Washington will only occur during emergency overflow conditions in extreme storm events associated with the emergency outfalls. If they occur, emergency outfall discharges will be sampled per the NPDES CSWGP requirements.

CTC currently discharges stormwater runoff, process wastewater discharges, as well as groundwater seepage, into the graving dock to the Blair Waterway under an active NPDES Permit via a single facility outfall. The wastewater is discharged from a settling basin via a float-triggered pump. The outfall is a single port PVC pipe located on the bank that discharges above the water level of the waterway. At the Port of Tacoma property, the process water collected from the pontoon mock-up construction work area will be pumped to a truck or holding tank to be disposed of off-site at a permitted facility.

In addition, pollution control measures include berming to contain and control runoff and weekly sweeping of the entire paved area to minimize transport of fine cement and aggregate particles to the waterway.

For the construction activities conducted within the upland portion of the SR 520 FBL Site, KGM will operate in compliance with the NPDES CSWGP for the SR 520 FBL Project and the associated TESCP (Appendix B.2).

Construction stormwater, including turbid water from cofferdam dewatering, will be collected and pumped to the temporary sediment control pond and potential temporary holding tanks (Baker Tanks) as needed for on-site treatment prior to discharge to Lake Washington. Concrete slurries and washout will be collected for off-site disposal. Discharge of construction stormwater to Lake Washington will be monitored to ensure compliance with the NPDES permit requirements.

During construction, a temporary ecology block wall will be installed along the shoreline, just above the ordinary high water mark. This temporary block wall will support temporary construction access roadway fill, which will allow level access and will accommodate the necessary turning area for heavy equipment to the Pier 2 and maintenance facility construction areas. Additionally, this temporary wall will serve a critical purpose as part of the shoreline construction BMPs, in addition to silt fencing, to ensure that stormwater runoff and soil from the construction site do not flow directly into the lake. During site disruption, the wall will serve as a hard edge to the construction site. The wall will also provide an internal temporary swale and underdrain that will direct runoff to the temporary erosion and sediment control facilities for treatment prior to discharge.

The three remote pontoon outfitting locations (Port of Tacoma EB-1, Port of Seattle T-18, and Vigor Shipyards) are located along the Blair Waterway, and the East and West Waterways of Harbor Island, respectively. At any of the three locations rainfall (stormwater) that falls onto fully cured and clean concrete surfaces will run off into the receiving water bodies. All concrete process water, however, will be collected, containerized at the facility wharfs, and pumped to storage tanks where the concrete process waters will either be transported off-site to a disposal facility, or will be discharged into the sanitary sewer. Appropriate sanitary discharge permits will be obtained for any discharges of concrete process water, and pre-treatment will be conducted as required to conform to the sanitary discharge permit requirements.

Site drainage pathways are illustrated in the project site layout maps (Figures C.2 through C.8).

3.D. The Distances of Nearby Waterways and Sensitive Areas from the Site

The CTC Facility is bordered by the Blair Waterway shoreline to the north in a zoned industrial use area. The shoreline and work areas have limited vegetation and no wetland and/or sensitive areas.

The Kenmore Yard is also zoned industrial and is bordered by Lake Washington to the west and the Sammamish River to the south. This site is adjacent to sensitive aquatic areas because it borders the location where the Sammamish River enters Lake Washington. Construction support activities will be limited to the interior of the site, and a shoreline buffer (which will include the shoreline wetlands) will remain undisturbed along the south and west shoreline perimeters of the facility during construction activities.

Project activities for the construction of the new floating bridge and landings and the associated maintenance facility, as well as the demolition of the existing floating bridge, will include: over-water and in-water activities within Lake Washington, and activities within the eastern shoreline of the lake in Medina. BMPs, as listed in this plan and in the TESCPs, will be implemented to protect shoreline and in-water sensitive aquatic areas.

4. POTENTIAL SPILL SOURCES

A description of each potentially hazardous material brought onto the site or generated on-site (including materials used for equipment operation, refueling, maintenance, or cleaning) is found in Table C.3. Additional items brought on-site will be listed accordingly in the Additional Items Brought On-Site Log (Attachment C.2). The material safety data sheets (MSDS) for each material listed in Table C.3 are included in Attachment C.3, and/or will be accessible by KGM personnel online per the service "MSDSonline" (www.msdsonline.com). Spill response procedures for each material listed are included in Table C.4.

4.A. Activities with Potentially Hazardous Materials

There are a number of hazardous materials that will be used at all project support locations during construction. The hazardous materials found in the highest volumes during construction will be diesel fuel, hydraulic oil, and concrete and its associated process water. The following sections discuss fueling, maintenance, and concrete operations.

4.B. Diesel Fuel

Diesel fuel is necessary for fueling excavating equipment, cranes, on- and off-road trucks, passenger trucks, and other heavy equipment normally associated with any type of construction project undertaken by WSDOT. Any fueling of vehicles and/or equipment will be performed only by trained KGM personnel. Fueling procedures for land-based and water-based equipment are detailed in Attachments C.4 and C.5.

Project support locations may have both an on-site refueling facility and/or mobile refueling trucks. The anticipated locations of stationary on-site refueling facilities are provided in the site layout maps (Figures C.2 through C.5). All refueling facilities will have appropriate signage of the designated refueling area, be fully self-contained, skid mounted, and compliant with secondary containment requirements for portable refueling operations. Any refueling facility will be located at least 50 feet away from the shoreline, and BMPs will be in place to ensure that spills from the fueling facility do not enter the stormwater systems. All appropriate refueling procedures will be strictly followed (refer to Attachments C.4 and C.5). The refueling truck will have a double-walled tank and spill-resistant nozzles. Spill prevention BMPs, such as sorbent pads, will be used to ensure that no spills will reach the ground during refueling operations. Other BMPs (Attachment C.4) that will be used during fuel transfer operations include, but are not limited to the following:

- Secondary containment will be placed under hose reels and protected from weather.
- Sorbent pads will be placed under refueling area to catch any drips and/or spills and any drips will be wiped up immediately.
- Fuel storage tanks will be double hulled and properly labeled. If fuel storage tanks are not double hulled they will require secondary containment at all times.
- Hoses and fittings on all equipment will be inspected daily and as equipment is used, and drip pans will be placed under fuel transfer areas.
- Funnels will be used when applicable and necessary.
- Refueling will require trained KGM personnel who will remain present at all times during any refueling.

- No topping off will occur.
- Fuel will not be stored on unlevel ground.
- Maintain spill kits at refueling facilities that will include sorbent pads.
- Gauges will be ensured to be working properly on fuel tanks and all equipment will be inspected for drips.

Diesel fuel will also be used for marine operations. Marine refueling procedures are discussed further below in Section 7.F, and will strictly follow U.S. Coast Guard procedures. Tugs used for marine operations will refuel at their moorage locations. These vessels have very large fuel tanks and generally do not require refueling for extended periods of time.

4.C. Gasoline Fuel

Gasoline fuel is commonly used in equipment such as small pumps and generators. Gasoline will be stored throughout project construction and demolition and will be contained within closed systems. In addition, extra gasoline when not in use will be located on-site in secondary containment. Smaller gasoline containers used for hand refueling of small pumps and generators will be stored when not in use in lockable flammable cabinets located within locked and fenced maintenance or storage area. Any fueling of equipment will be performed only by trained KGM personnel. Similar to the diesel fuel procedures summarized in Section 4.B, refueling procedures and BMPs will be strictly followed (refer to Attachment C.4).

4.D. Hydraulic Oil

Hydraulic oil is commonly used in equipment such as pile-driving equipment, excavators, booms, tower crane cables, and turrets. Hydraulic oil will be stored throughout project construction and demolition. Hydraulic oil will be contained within closed systems on the equipment itself. In addition, extra hydraulic oil will be located on-site in secondary containment systems associated with the small maintenance and refueling site.

4.E. Construction Equipment

All equipment will be inspected daily for leaks, drips, or maintenance needs. Any equipment not deemed sufficiently serviceable or at risk of developing a hydraulic leak will be taken out of operation until such time that it can be made operational without risking a significant hydraulic oil spill. If diesel, gasoline, or hydraulic oil is found to be leaking to land, the equipment will be immediately stopped, spill pads will be placed under the leaking location, and the leak will be repaired. Contaminated soil will be dug out, placed within barrels, and removed for proper disposal. WSDOT will be immediately notified of the spill per this SPCCP. Diesel, gasoline, and hydraulic oil spills to water will immediately have booms placed around them, the equipment and/or operations will cease, and the spill location on the equipment identified and the leak stopped. The appropriate regulatory agencies will be notified, as well as WSDOT.

4.F. Concrete-Related Operations

Concrete will be used both during casting of bridge components and pontoon construction activities. Uncured or green concrete has a very high pH and can be damaging to the environment. High pH stormwater will be contained to localized areas where concrete casting,

curing, and process water is generated during the construction. All process water generated at each support location will be captured, treated, and monitored in compliance with the NPDES permits and 401 Water Quality Certification (Appendix H of the ECP). Drummed products are used in precasting operations, including form release agent, curing compound, and bonding agent. These compounds will be stored on secondary containment and covered to prevent materials from coming in contact with any stormwater. BMPs for concrete-related operations are included in the Collection, Containment, and Disposal Plan, Appendix D of the ECP.

5. PRE-EXISTING CONTAMINATION

A summary of pre-existing site conditions relative to potential contamination and hazardous materials is provided in the SGMP (Appendix F of the ECP). As described in RFP Section 2.8.4.6.6 and in the Hazardous Material Discipline Report (Appendix E4 of the RFP), WSDOT has conducted an initial survey of potential soil and groundwater contamination (WSDOT 2010). WSDOT has not identified any areas with known or anticipated contamination within the project limits of any of the support locations. No underground storage tanks (USTs) have been identified within the project construction limits. If a previously unidentified UST is encountered, KGM will immediately notify WSDOT prior to initiating the SPCCP that outlines the appropriate steps to decommission and remove the tank and document the finding. This effort will be considered a Differing Site Condition (DSC) in accordance with Section 1-04 of the General Provisions in Chapter 1 of the RFP (WSDOT 2010). If previously unidentified hazardous materials or USTs are encountered, the KGM EM will coordinate with WSDOT and will ensure that this plan is implemented. In addition, the KGM EM will immediately notify Ecology within 24 hours of discovery per WAC 173-360-360. All applicable rules and regulations associated with UST removal activities include, but are not limited to, the following:

- Resource Conservation and Recovery Act (RCRA; 42 U.S.C. Sec. 6901, et. 30 seq.)
- Underground Storage Tank Regulations (Revised Code of Washington [RCW] 90.76, WAC 173-360)
- Model Toxics Control Act (RCW 70.105D, WAC 173-340-450)
- Hazardous Waste Management (RCW 70.105)

As stated in the Hazardous Material Discipline Report (Appendix E4 of the RFP), many terms are commonly used to describe different types of problem materials that require special handling and disposal when encountered at construction sites (WSDOT 2010). “Hazardous materials” is used as a common term for all types of contaminated or hazardous media, including contaminated environmental media, dangerous waste, hazardous substances, hazardous waste, toxic waste, problem waste, solid wastes, and petroleum products.

As described in the ECP, much of the Kenmore Yard was built out into Lake Washington by historical landfilling. In 2001, the property owners entered into a Consent Decree with Ecology that defined the cleanup requirements associated with the landfill on the site. The excavations for casting slab construction at the Kenmore Yard will be in a combination of the clean surface materials and the underlying landfill cover material; no native soils will be disturbed.

The SR 520 FBL Site upland areas located within the City of Medina have been previously investigated by WSDOT for geotechnical purposes (Appendix G2 of the RFP; WSDOT 2010). Additionally, environmental soil and groundwater testing was conducted on samples from explorations collected throughout the SR 520 FBL Project extent by WSDOT.

The soil and groundwater chemical testing results are included in the Geotechnical Data Report (Appendix G2 of the RFP; WSDOT 2010). The results of environmental testing indicate that the soils within the SR 520 FBL Site upland areas located within the City of Medina are not contaminated. Nearly all analytical sample results were either non-detect or detected at low-level concentrations less than the Model Toxics Control Act (MTCA) Method A cleanup levels for unrestricted land use. Select groundwater samples did show metals concentrations greater than MTCA Method A cleanup levels; however, as stated in the Geotechnical Baseline Report, these concentrations did not exceed the Washington State chronic surface water criterion calculated for this project (Appendix G1 of the RFP; WSDOT 2010).

No ground disturbing activities will be conducted by KGM at the CTC Facility or the remote outfitting locations.

5.A. Unanticipated Discovery of Hazardous Waste or Impacted Soil

If unanticipated hazardous or contaminated wastes are discovered, KGM will immediately cease work and contact the KGM EM, Mike Shaw at (360) 265-0405. The KGM EM will then notify WSDOT and all appropriate and applicable regulatory agencies, including Ecology and/or the U.S. Environmental Protection Agency. The reporting flow chart for encountering hazardous waste or impacted soil is included in Figure C.1. The area in which the hazardous waste, impacted soil, drums, or storage tank is found will be properly marked and secured with temporary fencing until the situation can be evaluated by the KGM EM. Refer to the SGMP for procedures in the event of discovery of hazardous waste or impacted soils during excavation (Appendix F of the ECP).

Unanticipated contaminated soils removed from the site will be disposed of at an appropriate landfill or disposal facility. These procedures are detailed in the SGMP provided as Appendix F to this ECP. All hazardous waste manifests, bills of lading, and all other documentation required to transport and dispose of any excavated materials off-site will be prepared and provided to WSDOT. WSDOT will be designated as the generator and will sign all manifests for hazardous waste associated with construction debris and/or maintenance waste.

6. SPILL PREVENTION AND RESPONSE TRAINING

KGM employees and subcontractors, including refueling and maintenance contractors, will be trained on the contents of this SPCCP, including review of all SPCCP components and requirements, to complete any level of work activity in accordance with WAC 296-824. Training will include personnel roles and responsibilities, emergency recognition, spill source and receptor recognition, spill prevention planning and techniques, spill response measures, and spill reporting protocol. Prior to the start of daily work activities, tool box meetings will take place with a review of the tool box “play cards,” which identify specific risks and environmental protocols to avoid such risks. Training will include information specific to each hazardous material listed in Table C.3.

7. SPILL PREVENTION

7.A. Spill Response Kit Contents and Location

Appropriately sized spill kits will be maintained in close proximity to all hazardous materials and equipment, and will be immediately accessible to all project personnel. The spill kit locations are

included in the project site layout maps (Figures C.2 through C.5). The following table shows the work area where a particular type of spill kit may be located.

Type of Spill Kit	Spill Kit Contents	Spill Kit Location(s)
General Work Area Universal Spill Kit	Containment drum, sorbent pads and socks, Nitrile gloves, and plastic bag	Several locations within Area of Work
Vehicle/Mobile Equipment Kit	Containment bag, sorbent pads and socks, and Nitrile gloves	Vehicles and moveable equipment
Truck Kit	5-gallon bucket, sorbent pads and socks, Nitrile gloves, and plastic bag	In fueling vehicles and any vehicles regularly located a distance from general construction areas
Conex Kit	Containment drum, sorbent pads and socks, Nitrile gloves, and plastic bag	Fueling and maintenance area
Marine “Tug Pack”	95-gallon overpack drum, 4 sorbent booms (5” × 10’), 2 sorbent sweeps (19” × 100’), 1 sorbent pad (16” × 20”), 25 spill bags (4mil), duct tape, and petro-flex gloves	On all tugs, barges, and water-based equipment

7.B. Security Measures for Potential Spill Sources

Potential spill sources will be limited to operating equipment and the associated materials needed for daily servicing. Any staging and decontamination areas will be located within fenced and/or inaccessible areas. Any flow control valves and/or drain valves associated with any on-site storage containers or system will be securely locked in the closed position while not in use. Any bulk storage of fuel or oil will also be secured. Any other hazardous materials remaining overnight will be secured within lockable flammable storage cabinets and/or secured within secondary containment.

7.C. Methods Used to Prevent Stormwater from Contacting Hazardous Materials

All hazardous materials used in the project work areas will be associated with heavy equipment lubrication, motive power, or hydraulic power. Portable equipment (for example, powered saws of various types and other smaller equipment) will be stored within secondary containment adjacent to the area of use. To avoid any impacts to stormwater, only portable equipment will be used within 50 feet of any shoreline area, and any fuel in use will be returned to the refueling/maintenance/material storage areas (Figures C.2 through C.5).

All staging areas will be fenced and typically located adjacent to areas of project construction. Construction staging areas will vary in size and could require grading or excavation to level the site and install drainage improvements, depending on site conditions. Drainage conveyance systems for the movement of stormwater from a collection point to an outfall may consist of drainage pipes and temporary stormwater facilities (such as ponds, vaults, and catch basins) and may use gravity or pumps to move the stormwater.

In addition, secondary containment will consist of a portable plastic tub in which fueling operations will occur. Spill kits will be located inside fueling trucks and next to the fueling areas in an event of a spill and all fueling and/or spill procedures will be followed by trained KGM personnel. Site layout maps are included in Figures C.2 through C.5, and identify the location of equipment staging, storage, and refueling areas in secondary containment at all project support locations.

To prevent stormwater from coming into contact with hazardous materials during in-water and over-water construction activities at the SR 520 FBL Site, vehicles and equipment used for in-water/over-water work will be inspected daily, and will be kept clean of excessive build-up of oil and grease. Spill kits, visqueen plastic, and containment booms will be kept within construction vehicles/barges for easy deployment in the event of a release.

Concrete Structure General Cleanliness and Management for Stormwater Pollution Prevention

Concrete used for bridge construction will be poured in the dry or within confined waters that will not be discharged to surface water, and only cured concrete will be allowed to contact surface water.

During construction activities conducted for the SR 520 FBL Project, KGM will operate in compliance with the SR 520 FBL Project 401 WQC (provided in Appendix A of the ECP) and the Construction Water Quality Monitoring and Protection Plan (provided in Appendix I of the ECP).

There are three types of water associated with bridge construction in-water and over-water activities that require management:

- **Concrete Process Water:** Concrete process water is defined as concrete slurry resulting from drilled shafts, grinding residue water, and any other concrete-derived waters. All concrete process water will be contained and collected for off-site upland disposal at a licensed facility.
- **High pH Stormwater:** High pH stormwater is defined as rainwater that falls on uncured “green” concrete during the first 7 days of the curing process. Stormwater that falls on uncured concrete will be contained, tested, and treated as necessary to ensure compliance with pH and turbidity water quality standards prior to discharge to the lake. If high pH stormwater mixes with concrete process water, then it becomes concrete process water and will be contained and collected for off-site upland disposal at a licensed facility.
- **Work Area Stormwater**: Work area stormwater is defined as rainwater that falls onto bridge work areas of active construction that contain debris and/or stockpiled materials. These work areas will require that catch basins be blocked for water containment and collection. Work area stormwater will be contained, tested, and treated as necessary to ensure compliance with pH and turbidity water quality standards prior to discharge to the lake.

The CWQMPP (Appendix I of the ECP) describes the BMPs that will be implemented to fully contain and collect process water. Process water will be pumped to holding tanks for off-site disposal. In all other work areas that contain debris, stockpiled materials, or grinding residues, specific measures will be implemented such that rain falling within the work area (considered to be stormwater) will be collected and treated as necessary. Portable tents, drop cloths, tarps,

sheeting, and plywood panels will also be used to cover work areas and temporary stockpile materials between uses to prevent any potential generation of impacted stormwater.

The cured concrete surfaces of the pontoons, finished bridge roadway surfaces, and work areas will be cleaned so that if stormwater falls onto the clean, cured concrete surfaces and bridge work areas it will be allowed run off the structure or surface to the lake. Surface cleaning to prevent the generation of potentially impacted stormwater will include sweeping and debris collection and removal.

7.D. Secondary Containment Practices and Structures for Hazardous Materials

All repairs and routine maintenance will be performed within equipment staging/storage areas in secondary containment at all project support locations. Shop cloths, drain pans, and spill pads will be used during routine maintenance of equipment to prevent spills. A spill response kit will be located within this maintenance/refueling area. All chemical and/or fuel and oil storage will include adequate secondary containment.

All portable containers, including drums and smaller containers, will have secondary containment, such as double-walled construction or plastic spill pallets, or will be stored in structures engineered to provide secondary containment capable of preventing discharge to waters of the State. Drums and storage containers will be consolidated whenever possible and stored in controlled material storage areas with restricted access. All drums and containers will be labeled accurately to describe the date the chemical was brought on site, date opened, and use of the chemical.

When in use, concrete trucks will be parked on a containment surface consisting of plastic that will be removed daily and disposed of appropriately. The trucks and equipment will be inspected daily and wet-fueled with appropriate spill protection measures.

Storing of hazardous chemicals in proper facilities and clearly marked containers is a very important aspect of not only employee safety but environmental safety as well. Proper storage and marking of containers lessens the likelihood of an accident and provides organization of these materials on the job site. A notebook containing MSDS will be maintained on-site. In addition, all MSDS will be available to KGM personnel through the MSDSonline service (www.msdsonline.com) to ensure compliance with employees' right-to-know rules and regulations for chemicals used on-site. Oily rags or other sources of possible combustion will be stored in secondary containment using properly marked containers away from any source of heat or ignition.

All equipment will be serviced by a certified fuel supplier or certified and trained KGM employee.

7.E. BMPs Used to Prevent Discharges to Groundwater or Water during Mixing and Transfers of Hazardous Materials and Fuel

Primarily, fuel storage areas shall be bermed and include secondary containment to minimize the potential for surface spills. BMPs that will be implemented by only trained KGM personnel include the following:

- Hazardous materials will be stored and/or transferred in the designated refueling/maintenance area as much as practicable. Large overhead cranes associated with pontoon construction will be refueled and serviced at their location

using a truck with appropriate secondary containment and spill prevention measures as described in Attachment C.4.

- Nonhazardous or less hazardous materials will be substituted for hazardous materials whenever possible.
- Proper equipment, including pumps, funnels, and drain pans, will be used during hazardous material transfers, especially during refueling.
- KGM trained personnel will not “top off” containers.
- Incoming construction equipment will be checked for leaking hazardous materials (including oil and fuel) when they enter the project support locations, or daily if they are on-site for multiple days.
- Equipment and vehicles will be routinely inspected for leaks of hazardous materials (including fuel and oil).
- Necessary repairs to equipment and vehicles will be made immediately or as soon as possible.
- KGM personnel will inspect equipment, read gauges, and look for leaks, spills, or signs of trouble.
- Equipment will be cared for and will not be overloaded.
- Engine manufacturer’s recommended maintenance schedule will be followed.
- If raining, work will be performed under a covered area.
- When servicing an engine, the fuel, oil, and lubricants will be immediately cleaned up.
- Hoses or parts will not be stored overhead or where they cannot be observed.
- Detergents or emulsifiers will never be used to deal with oil or fuel spills.

7.F. Refueling Procedures for Marine and Over-Water Equipment

Standard marine refueling procedures will be used to refuel all over-water equipment. Over-water refueling procedures are provided in Attachment C.4. These procedures include fueling procedures for portable equipment on floating platforms and fueling procedures for commercial watercraft.

The risk of pollution increases significantly during refueling, operation, or servicing of portable equipment on floating platforms (e.g., flat deck barges, derrick barges, pontoons, etc.). The measures provided in Attachment C.4 are designed to eliminate, minimize, and mitigate the risk of a spill.

KGM and associated subcontractors will ensure that all construction-related debris is collected and contained and that no debris, garbage, or fuel enters the harbor. Visual monitoring for floating debris (trash, oil sheen, etc.) will take place and will be removed via boat as necessary.

7.G. Daily Inspection and Cleanup Procedures that Ensure All Marine and Over-Water Equipment are Free of All External Petroleum-Based Products

The barge and/or equipment that may either enter surface water or be used over-water will be maintained such that no visible sheen from petroleum products appears within the surface water body. If sheen appears around equipment in the water, the equipment will be contained within an oil boom and shall be removed from the water, cleaned, and/or maintained appropriately.

If equipment leaks occur during any work activity, KGM will immediately remove the equipment from within the water to a location where pollutants cannot enter any water. The equipment will not be allowed within the water until all leaks have been corrected and the equipment cleaned. KGM will ensure that if any potential leaking equipment is stored in the uplands, that the uplands area is also cleaned immediately.

KGM and their associated subcontractors will regularly check fuel hoses, oil drums, oil or fuel transfer valves, and fittings of all equipment used in the uplands, as well as on over-water barges, for leaks, and shall maintain and store materials properly to prevent spills. A daily equipment inspection log is included in Attachment C.6.

7.H. Routine Equipment, Storage Area, and Structure Inspection and Maintenance Practices

All equipment will be inspected for leaks at the beginning and end of each shift. Preventive equipment maintenance will be performed in accordance with the frequency recommended by the manufacturer.

Construction materials and equipment will not be stored on land where high tides, wave action, or upland runoff can cause materials to enter surface water. Equipment on land will be stored at least 50 feet away from any shoreline area. No cleaning solvents or chemicals used for tools or equipment cleaning shall be discharged to ground surface or surface water. While the use of solvents and/or chemicals is not anticipated, any chemical washing of tools and/or equipment will be completed in the equipment storage and refueling area with secondary containment, as shown in Figures C.2 through C.5.

Equipment will be turned off when not in use. KGM will ensure that only well-maintained and properly functioning equipment and vehicles will be used.

KGM will ensure that spill response equipment and materials are located within the work area and are replenished throughout the life of the SR 520 FBL Project, including oil absorbent materials to be used in the event of a spill or if any oil product is observed in the water.

KGM will secure and proactively store oil booms such that rapid and effective deployment of each oil boom can be accomplished in the event of a hazardous material spill. KGM will take the necessary measures, such as stopping operations, controlling of surface water wake, and the deployment absorbent material, immediately to ensure that no discharges are directed to a location outside the area contained by these oil booms.

7.I. Site Inspection Procedures and Frequency

SPCC-specific site inspection audits will be completed by the KGM EM, Kenmore Yard and CTC Facility Superintendants, or the ECI weekly to insure that spill controls are in place and remain effective.

The following information will be documented and recorded on site inspection audit forms (included in Attachment C.6):

- The location of the storage container
- The integrity of the container
- The integrity of the secondary containment (if required)
- Whether spill kit is readily available and adequately equipped
- Inadvertent discovery of hazardous materials
- Any corrective actions that are required

In addition, KGM will conduct daily visual inspections to ensure that spill kits are present and BMPs are being appropriately implemented.

8. SPILL RESPONSE

8.A. A Spill of Each Type of Hazardous Material at Each Location Identified in Section 4. Potential Spill Sources

Potential spill sources derived from heavy equipment include fuel, hydraulic fluid, coolant, and transmission fluid. Spills should be responded to according to the following protocol:

- Get Help:
  - Cease operations.
  - Notify the KGM EM.
  - If the spill cannot be safely and effectively controlled, or if any injuries have occurred, notify the fire department (911).
  - The Site Superintendant or ECI will notify the KGM EM, who will notify the WSDOT ECM. At this point, the WSDOT PE will trigger WSDOT's internal notification process.
- Assess Hazard:
  - Assess the quantity of substance spilled.
  - Assess the extent of the affected area.
  - Determine the source of the spilled material.
- Secure Spill Response and Personal Protective Equipment:
  - If the spill cannot be safely and effectively controlled, direct safe evacuation of the area, and notify outside response services (Global Diving and Salvage; refer to Table C.1 for contact information).
  - If the spill can be safely and effectively controlled by KGM personnel, then:
    - secure the area, and

  - obtain appropriate spill response equipment and personal protective equipment.

- Contain and Eliminate Spill Source:
  - Contain the spill with sandbags or mini-booms to prevent entry to catch basins, storm drains, or ditches that discharge into waters of the state.
  - Seal or stop the source of the spill by closing valves, providing containment, or deactivating pumps.
- Spill Cleanup and Mitigating Environmental Impact:
  - Spills onto the Ground (Soil):
    - Clean up the spill immediately.
    - Apply absorbent material, berm, divert, or contain the spill.
    - Collect spilled material and place into labeled drums.
    - Collect absorbent and other material used to clean up the spill, label the container, and properly dispose of waste at an approved disposal facility.
    - Report spill in accordance with the WSDOT ECAP by contacting the WSDOT PE (Appendix K).
    - Decontaminate the affected area, equipment, and surfaces that have contacted the spilled material.
  - Spills into Waterways:
    - Clean up the spill immediately.
    - Deploy boom and absorbent to contain the spill.
    - Clean up absorbent and waste materials and dispose of at an approved waste disposal facility.
    - Decontaminate the affected area, equipment, and surfaces that have contacted the spilled material.

All spill residue, absorbents, contaminated soils/debris will be cleaned up and managed off-site at an appropriate permitted facility. Storage containers will be properly maintained and labeled.

If a spill cannot be safely and effectively contained and controlled by KGM, a designated spill cleanup contractor will be contacted. Global Diving and Salvage is indicated in Table C.1 and are the locally-preferred spill responders.

8.B. Stormwater that has Come into Contact with Hazardous Materials

Should stormwater come into contact with hazardous materials, the area immediately downgradient shall be contained to prevent any further runoff of contaminated stormwater. Materials that will be used to contain runoff include mini-booms. Response and reporting procedures will follow those provided above in Section 8.A.

Materials used to contain contaminated stormwater will be disposed of in a manner consistent with federal, state, and local regulations. For characterization, handling or management, and disposal methods, responders should refer to the MSDS for the specific hazardous material (Attachment C.3 or available through MSDSonline) and the applicable local, Washington State, and federal requirements. If an MSDS is not available for a specific material, characterization of

the material will be determined by an analytical laboratory, the materials will be handled in a manner consistent with environmental industry standards, and material disposal will be conducted in accordance with disposal facility requirements and all applicable regulations, as stated herein. Spill response procedures for stormwater that have come in contact with hazardous materials are included in Table C.5.

8.C. A Release or Spill of Any Known Pre-Existing Contamination and Contaminant Source Described in Section 5. Pre-Existing Contamination

All contaminated soil and groundwater will be handled in accordance with the SGMP (Appendix F of the ECP).

Appropriate handling and disposal procedures will be implemented based on the level of contamination detected. Contaminated soils will be placed in lined, sealed dump trucks and hauled to the disposal site. BMPs will be implemented to ensure that excavated contaminated soils will not spill, overflow, or be released during transport to the disposal site. The handling, stockpiling, transport, and disposal of contaminated media will be conducted in accordance with state and federal regulations. The KGM EM or ECI will be responsible for the management of contaminated media and documentation for all material transported off-site.

Following excavation and any necessary waste characterization, KGM will follow proper disposal procedures by obtaining truck lading tags, waste manifest, and/or scale tickets. All hazardous waste manifests, bills of lading, and all other documentation required to transport and dispose of any excavated materials off-site will be prepared and provided to WSDOT. WSDOT will be designated as the generator and will sign all manifests.

8.D. A Release or Spill of any Unknown Pre-Existing Contamination and Contaminant Sources (such as Buried Pipes or Tanks) That May be Unexpectedly Encountered During Project Work

All contaminated groundwater and soil will be handled in accordance with the SGMP (Appendix F of the ECP). Section 5. above provides information on the process that will be followed in the event a UST is encountered. The exact approach followed will depend on what potential containment source (i.e., tank, pipe, etc.) is encountered and will be determined in consultation with WSDOT if such a discovery occurs. Spill response procedures for releases or spills of any pre-existing contamination and contaminant sources encountered during project work is included in Table C.6.

8.E. A Spill Occurring During Work with Equipment Used Below the Ordinary High Water Line

Spill responses occurring with equipment used below the ordinary high water line will follow the procedures described in detail in the Shipboard Oil Pollution Emergency Plan (SOPEP) provided in Attachment C.5. Spill response procedures for spills occurring during work with equipment below the ordinary high water line are included in Table C.7. The SOPEP outlines spill response activities for small spills to water from a vessel, as well as activities required in the event of a major spill incident, including vessel grounding or explosion. Because the most likely scenario is a small spill to water from an equipment malfunction, such as leakage from pipes or tank overflows, the general activities required for such a spill are provided below. For larger spills, refer directly to the SOPEP. The actions listed below and in the SOPEP are

consistent with standard spill response activities. These response activities will be applicable to spills from all vessels conducting in-water work.

For small spills (pipe leaks and/or tank overflows):

1. Stop the flow of any spilled product.
   - Close headers and other valves (if applicable).
   - Isolate leaking sections of hose or pipe.
   - Employ damage control equipment.
2. Ensure safety of personnel.
   - Warn all vessel and facility personnel in the immediate area.
   - Put on personal protective equipment, Level C, as required.
3. Perform initial assessment and containment.
   - Assess spill volume, movement, and weather.
   - Identify local environmentally-sensitive areas.
4. Notify the appropriate people as indicated on the list of SPCC Contacts provided in Table C.1. This contact list is site-specific and will be updated with appropriate numbers throughout the duration of the project.
5. Deploy containment recovery equipment.
   - For light sheens and small slicks, deploy sorbent sweeps, booms, or pads. For larger spills, obtain and launch containment boom.
   - Maintain cleanup efforts until commercial assistance arrives.
6. Document the spill with the Spill Report Form provided in Attachment C.1.

Over-water BMPs will include the following:

- All fluid out of any equipment will flow into a containment tub.
- Fuel hoses, oil drums, and oil or fuel transfer valves and fittings on equipment will be checked daily for drips or leaks, and shall be properly maintained and stored to prevent spills into the surface water.
- Spill response kits will be stationed on the vessel. Additional spill containment equipment will be stored on-site in the uplands.
- Secondary containment, or spill kit diapers will be placed under the necessary equipment (i.e., heavy equipment, generators, and flame cabinet).
- The hydraulic fluid used for equipment being used over-water will be vegetable oil, where practicable.

9. PROJECT SITE MAP

Site layout maps are included in Figures C.2 through C.5 and present the following information:

- Site location and boundaries.
- Site access roads.
- Nearby waterways.

- Locations of work where hazardous materials, equipment, and decontamination areas identified in Section 4.
- The location of spill prevention and response equipment described in Sections 7. and 8. in areas of work.

Pre-existing contamination or contaminant sources have not been previously identified and are therefore not represented on the site layout maps.

10. SPILL REPORT FORM

The Spill Report Form is included in Attachment C.1.

References

Attorney General of Washington, Ecology Division (Attorney General). 2001. Consent Decree No. 01-2-222187-6SEA, State of Washington, Department of Ecology v. Pioneer Towing Company, Inc. August.

Washington State Department of Transportation (WSDOT). 2010. *SR 520 Evergreen Point Floating Bridge and Landings Project Request for Proposal.* Olympia, Washington. 6 December.

———. 2011a. Amendment to Section 1-07.15(1) of *Standard Specifications for Road, Bridge, and Municipal Construction.* M 41-10. April.

———. 2011b. *Final Environmental Impact Statement and Section 4(f) and 6(f) Evaluations, SR 520 Bridge Replacement and HOV Program.* SR 520, I-5 to Medina: Bridge Replacement and HOV Project. June.

SR 520 Evergreen Point
Floating Bridge and Landings Project

Environmental Compliance Plan
Volume III

Appendix C
Spill Prevention, Control, and Countermeasures Plan

Tables

REVISION 2

Released for Construction

Table C.1
SPCCP Contacts

Responsibility	Name and Title	Phone Number
Primary SPCC Contact Kenmore Yard (Spill Responder)	Ron Wika, Kenmore Yard Superintendant	Office: 425-429-0053
Primary SPCC Contact CTC Facility (Spill Responder)	Rich Spratt, CTC Facility Superintendant	Office: 206-255-5240
Primary SPCC Contact FBL (Spill Responder)	Andrew Kinkade, Environmental Compliance Inspector	Cell: 925-570-1260
Secondary SPCC Contact (Spill Responder)	Robert Brenner, KGM Environmental Manager	Office: 425-576-7138 Cell: 425-577-2939
Spill Response Subcontractor	Global Diving and Salvage Aaron Harrington, Environmental Division Manager	Office: 206-623-0621 Cell: 260-730-9362
WSDOT SPCC Primary Contact	Stephen Sax, WSDOT Environmental Compliance Manager	Office: 425-576-7133 Cell: 206-713-9783
WSDOT SPCC Secondary Contact	Alex Warner, WSDOT Environmental Compliance Inspector	Office: 425-576-7041 Cell: 206-276-4489

Abbreviations:

CTC Facility	Concrete Technology Corporation Pontoon Casting Facility
FBL	Floating Bridge and Landings
KGM	Kiewit/General/Manson, A Joint Venture
SPCC	Spill Prevention, Control, and Countermeasures
WSDOT	Washington State Department of Transportation

Table C.2
Federal, State, and Local Agencies to be Notified in the Event of a Spill

Incident	Emergency Contact/Agency	Contact Number
Spill to Water	1. USEPA National Response Center 24 Hour National Spill Reporting Line	1-800-424-8802
	2. U.S. Coast Guard, Seattle WA	1-206-217-6002
	3. Ecology Northwest Regional Office	1-425-649-7000
	4. Washington Emergency Management Division	1-800-258-5990 or 1-800-OILS-911
	5. USEPA Region 10, Emergency Response Line	1-206-553-1263
	6. Kenmore Property Owner—Gary Sergeant	Cell: 425-486-2756
	7. CTC Manager on Duty	Office: (253) 383-3545
Land-Based Spill	1. USEPA National Response Center 24 Hour National Spill Reporting Line	1-800-424-8802
	2. Ecology Northwest Regional Office	1-425-649-8802
	3. Washington Emergency Management Division	1-800-OILS-911
	4. USEPA Region 10, Emergency Response Line	1-206-553-1263
	5. City of Kenmore, Tacoma, Medina Fire Departments	911
	6. Kenmore Property Owner—Gary Sergeant	Office: 425-486-2756
	7. CTC Manager on Duty	Office: (253) 383-3545
Underground Storage Tank	UST Hotline	1-800-826-7716
	Ecology Northwest Regional Contact	1-425-649-7000
Environmental Cleanup Specialists		
Water-Based Spill	NRC Environmental Services 24-hour Emergency Response	1-206-546-7150 1-800-337-7455
	Global Diving and Salvage, Inc.	1-206-623-0621

Table C.2
Federal, State, and Local Agencies to be Notified in the Event of a Spill

Incident	Emergency Contact/Agency	Contact Number
Environmental Cleanup Specialists (continued)		
Land-Based Spill	Apex Environmental	1-360-532-3590
	Evergreen Environmental	1-360-533-6141

Abbreviations:

CTC	Concrete Technology Corporation
Ecology	Washington State Department of Ecology
USEPA	U.S. Environmental Protection Agency
UST	Underground Storage Tank

Table C.3
Hazardous Materials Brought or Generated On-Site

Material	Intended Use	Estimated Maximum Quantity	Location(s)	Decontamination Location	Disposal Procedures
Diesel	Fuel	TBD	Crane Generators Service/Utility Trucks Excavation and Other Heavy Equipment[1] Barges Derrick Barges Tugboats	Site Entrance	Authorized Vendor
Gasoline	Fuel	TBD	Small hand operated equipment, pumps, and generators	Site Entrance	Authorized Vendor
Engine Oil	Engine Lubrication	TBD	Crane Generators Service/Utility Trucks Excavation and Other Heavy Equipment[1] Barges Derrick Barges Tugboats	Site Entrance	Authorized Vendor
Hydraulic Fluid	Hydraulic Powering of Heavy Equipment	TBD	Crane Generators Service/Utility Trucks Excavation and Other Heavy Equipment[1] Barges Derrick Barges Tugboats	Site Entrance	Authorized Vendor

Table C.3
Hazardous Materials Brought or Generated On-Site

Material	Intended Use	Estimated Maximum Quantity	Location(s)	Decontamination Location	Disposal Procedures
Coolant	Prevent Overheating	TBD	Crane Generators Service/Utility Trucks Excavation and Other Heavy Equipment[1] Barges Derrick Barges Tugboats	Site Entrance	Authorized Vendor
Transmission Fluid	Equipment transmission lubrication	TBD	Crane Generators Service/Utility Trucks Excavation and Other Heavy Equipment[1] Barges Derrick Barges Tugboats	Site Entrance	Authorized Vendor
Concrete	Casting and Pontoon Construction	TBD	Site-Wide	Site Concrete Disposal Areas	Authorized Vendor
Curing Compound	Assisting in Curing of the Basin During Construction and Curing of Pontoons During Operations	TBD	Stored, and/or Located Near Intended Use Areas	TBD	TBD
Process Water	Generated in Concrete Production	TBD	TBD	TBD	TBD

Note:
1 Other heavy equipment includes backhoes, excavators, forklifts, loader, paver, jackhammer, vibratory equipment, and pile driver.

Abbreviation:
TBD To Be Determined

Table C.4
Spill Response Procedures for Spills of Each Type of Hazardous Material at Each Location Identified in Section 4.[1,2,3] (including actions to be taken and equipment to be used)

	Spill Response Task			
Hazardous Material and Location	**Assess the Spill**	**Secure the Area**	**Contain and Eliminate the Spill Source**	**Clean Up Spilled Material, Decontaminate Equipment, Dispose of Spilled and Contaminated Material**
Petroleum Hydrocarbons Diesel fuel, gasoline fuel, engine oil, hydraulic fluid, and transmission fluid Petroleum hydrocarbons are found in most mobile and stationary pieces of equipment used at the job site Petroleum hydrocarbons will be stored on-site in above ground storage tanks inside locked and fenced maintenance or storage area	Assess the quantity of substance spilled Assess the extent of the affected area Determine the source of the spilled material	Cease operations and if the spill cannot be safely and effectively controlled, direct safe evacuation of the area and notify outside response services If the spill can be controlled by KGM personnel, secure the area and obtain appropriate spill response equipment Shut down all equipment and ignition sources in the spill area	Contain the spill with sandbags or mini-booms to prevent entry to catch basins, storm drains, or ditches that discharge to waters of the State Seal or stop the source of the spill by closing valves, providing containment, or deactivating pumps Apply absorbent material or berms to divert or contain the spill Immediately place booms around hydraulic oil spills to water	Spills to ground: • Immediately clean up the spill • Apply absorbent material, berm, divert, or contain the spill • Collect spilled material and place into labeled drums • Collect absorbent and other material used to clean up the spill, label the container, and properly dispose of waste at an approved facility • Report spill in accordance with WSDOT Procedures per SPCCP Contacts in Table C.1 Spills to waterways: • Immediately clean up the spill • Clean up absorbent and waste materials and dispose of at an approved waste disposal facility • Decontaminate the affected area, equipment, and surfaces that have contacted the spilled material

Table C.4
Spill Response Procedures for Spills of Each Type of Hazardous Material at Each Location Identified in Section 4.[1,2,3] (including actions to be taken and equipment to be used)

	Spill Response Task			
Hazardous Material and Location	**Assess the Spill**	**Secure the Area**	**Contain and Eliminate the Spill Source**	**Clean Up Spilled Material, Decontaminate Equipment, Dispose of Spilled and Contaminated Material**
Petroleum Hydrocarbons (continued) Diesel fuel, gasoline fuel, engine oil, hydraulic fluid, and transmission fluid Petroleum hydrocarbons are found in most mobile and stationary pieces of equipment used at the job site Petroleum hydrocarbons will be stored on-site in above ground storage tanks inside a locked and fenced maintenance or storage area	Assess the quantity of substance spilled Assess the extent of the affected area Determine the source of the spilled material	Cease operations and if the spill cannot be safely and effectively controlled, direct safe evacuation of the area and notify outside response services If the spill can be controlled by KGM personnel, secure the area and obtain appropriate spill response equipment Shut down all equipment and ignition sources in the spill area.	Contain the spill with sandbags or mini-booms to prevent entry to catch basins, storm drains, or ditches that discharge to waters of the State Seal or stop the source of the spill by closing valves, providing containment, or deactivating pumps Apply absorbent material or berms to divert or contain the spill Immediately place booms around hydraulic oil spills to water	Contaminated soil will be dug out, placed within barrels, and removed for proper disposal Contaminated soil will be dug out, placed within barrels, and removed for proper disposal If spill is too large, dangerous, or involved, work with spill response subcontractor and emergency personnel to clean up spill Disposal of spilled and contaminated material and all decontamination fluids in accordance with all regulations at a legally permitted facility in accordance with WSDOT Specification 2-03.3(7)C Within 7 days of disposal, provide documentation bills of lading or chain-of- custody documents substantiating such disposal to the WSDOT Project Engineer
Coolant Located in mobile and stationary construction equipment	Same as above	Same as above	Same as above	Same as above

Table C.4
Spill Response Procedures for Spills of Each Type of Hazardous Material at Each Location Identified in Section 4.[1,2,3] (including actions to be taken and equipment to be used)

	Spill Response Task			
Hazardous Material and Location	**Assess the Spill**	**Secure the Area**	**Contain and Eliminate the Spill Source**	**Clean Up Spilled Material, Decontaminate Equipment, Dispose of Spilled and Contaminated Material**
Form Oil (Grifcote LV-50) Stored on-site in original containers and smaller temporary containers for daily use	Same as above	Same as above	Same as above	Same as above
Curing Compound	Same as above	Same as above	Same as above	Same as above
Concrete, concrete slurry, process water, fresh concrete, runoff water from storm events	Same as above	Same as above	Same as above	Same as above

Notes:
1 Except for spills occurring during working with equipment used below the ordinary high water line.
2 Oil, paint, and solvent spills shall be prevented from reaching storm drains or other discharge points.
3 It is acceptable to combine materials covered by the same response procedures, as long as each material is clearly identified.

Abbreviations:
KGM Kiewit/General/Manson, A Joint Venture
SPCCP Spill Prevention Control and Countermeasures Plan
WSDOT Washington State Department of Transportation

Table C.5
Spill Response Procedures for Stormwater that has Contacted Hazardous Materials (including actions to be taken and equipment to be used)

Assess Contaminated Stormwater	Secure the Area	Contain and Eliminate the Contaminated Stormwater and its Source	Clean Up Contaminated Stormwater, Decontaminate Equipment, Dispose of Contaminated Stormwater and Supplies
Petroleum-Contaminated Stormwater	Contain the area immediately downgradient of the spill to prevent further runoff of contaminated material	Contain runoff using mini-booms Stormwater ponds will have oil booms and oil turndowns to help prevent any release of petroleum that may be collected within a stormwater control pond	Follow the response and reporting procedures outlined in Section 8.A. and: • Dispose of materials used to contain contaminated stormwater in a manner consistent with federal, state, and local regulations
Concrete-Contaminated Stormwater	Same as above	Same as above	Same as above

Table C.6
Spill Response Procedures for Releases or Spills of any Pre-Existing Contamination and Contaminant Sources Encountered during Project Work
(including actions to be taken and equipment to be used)

	Spill Response Task			
Hazardous Material and Location	**Assess the Spill**	**Secure the Area**	**Contain and Eliminate the Spill Source**	**Clean Up Spilled Material, Decontaminate Equipment, Dispose of Spilled and Contaminated Material**
If contaminated materials encountered during excavation or soil disturbing activities, the spill response procedures will be followed	Assess the quantity of contamination Assess the extent of the affected area If possible, determine the source of the contamination	Cease operations and if the spill cannot be safely and effectively controlled, direct safe evacuation of the area and notify outside response services Immediately contact the KGM EM Properly mark and secure the area with temporary fencing until the site is evaluated by the KGM EM and WSDOT If the spill can be controlled by KGM personnel, secure the area and obtain appropriate spill response equipment Shut down all equipment and ignition sources in the contamination area	Contain the contamination with sandbags or mini-booms to prevent entry to catch basins, storm drains, or equivalent that discharge to waters of the State Apply absorbent material or berms to divert or contain the contamination	All contaminated soil and groundwater will be handled and cleaned up in accordance with the SGMP provided as Appendix F to the ECP As necessary and at the direction of WSDOT, develop a site Investigation work Plan and Remediation Plan

Abbreviations::

ECP Environmental Compliance Plan
EM Environmental Manager
KGM Kiewit/General/Manson, A Joint Venture
SGMP Soil and Groundwater Management Plan
WSDOT Washington State Department of Transportation

Table C.7
Spill Response Procedures for Spills Occurring During Work with Equipment Used Below the Ordinary High Water Line (including actions to be taken and equipment to be used)

	Spill Response Task			
Hazardous Material and Location	**Assess the Spill**	**Secure the Area**	**Contain and Eliminate the Spill Source**	**Clean Up Spilled Material, Decontaminate Equipment, Dispose of Spilled and Contaminated Material**
Petroleum Hydrocarbons Diesel fuel, gasoline fuel, engine oil, hydraulic fluid, and transmission fluid Petroleum hydrocarbons are found in most mobile and stationary pieces of equipment used at the job site	Assess the quantity of substance spilled Assess the extent of the affected area Determine the source of the spilled material	Cease operations and if the spill cannot be safely and effectively controlled, direct safe evacuation of the area and notify outside response services If the spill can be controlled by KGM personnel, secure the area and obtain appropriate spill response equipment Shut down all equipment and ignition sources in the spill area	Seal or stop the source of the spill by closing valves, providing containment, or deactivating pumps Immediately place booms around spills to water to contain Apply sorbent pads or berms to divert or contain the spill *Consult the Shipboard Oil Pollution Emergency Plan (Attachment C.5) for details*	Spills to waterways: • Immediately clean up the spill • Clean up absorbent and waste materials and dispose of at an approved waste disposal facility • Decontaminate the affected area, equipment, and surfaces that have contacted the spilled material • *Consult the Shipboard Oil Pollution Emergency Plan (Attachment C.5) for details*

Abbreviation:
KGM Kiewit/General/Manson, A Joint Venture

SR 520 Evergreen Point
Floating Bridge and Landings Project

Environmental Compliance Plan
Volume III

Appendix C
Spill Prevention, Control, and Countermeasures Plan

Figures

REVISION 2

Released for Construction

Trigger: Hazardous Material Spill or Encounter
(Not a life threatening emergency)
Site Personnel Contact Andrew Kinkade

If a spill is **caused by the Design-Builder**, the Design-Builder immediately reports to WSDOT Project Engineer (PE) then together KGM and WSDOT on a case-by-case basis will notify required regulatory agencies as indicated below.
If **pre-existing UST or contamination**, the Contractor reports to WSDOT Project Inspector (PI). The PI notifies the PE who follows ECAP (Construction Manual 1-2.2K) to determine internal and external reporting procedures.*

Spill to Water
Including ponds, ditches, seasonally dry streams, and wetlands

Immediately call National Response Center (24 hour)

1-800-424-8802

AND

Immediately call Washington State Division of Emergency Management (24 hour)

1-800-258-5990

AND

Immediately call Ecology Northwest Regional Office

Spill to Soil
Including encounters of pre-existing contamination

If an **immediate** threat to health or environment (i.e., explosive, flammable, toxic vapors, shallow groundwater, nearby creek) **immediately** call Ecology Northwest Regional Office

OR

* If NOT immediately threatening, but **may be a threat** to health or the environment, complete the response/cleanup and report to Ecology Northwest Regional Office within 90 days

Underground Storage Tank (UST)
Encountering unknown USTs in excavations

If confirmed release from UST, report to Ecology Northwest Regional Office **within 24 hours**

WHEN

* Removal of regulated tank, submit written report to Ecology **within 30/90 days** per WAC 173-360-385 and WAC 173-340-450

* Denotes that reporting is conducted through ECAP where the DB initiates all ECAP project reporting and outside regulatory agency reporting is conducted dependent upon Design-Builder/WSDOT Permit ownership.

Ecology Northwest Regional Office Number

Northwest (Bellevue) (425) 649-7000

http://www.ecy.wa.gov/programs/spills/other/reportaspill.htm

SR 520 Evergreen Point Floating Bridge and Landings Project
Environmental Compliance Plan
Appendix C: SPCCP

Figure C.1
External Regulatory Reporting Requirements Flow Chart

WATER-TIGHT BARGE FOR SHORT TERM GRAVITY ANCHOR CASTING

CURBING AT WHARF EDGE

SPILL KIT LOCATION (TYP) SPILL KITS ADDITIONALLY LOCATED ON ALL MOBILE EQUIPMENT

WATERWAY

EXISTING WHARF AREA BARGE TRANSLOAD AREA

CONSTRUCTION ENTRANCE

GLACIER NORTHWEST INC.
6423 N.E. 175TH ST.
TAX PARCEL NUMBER 1126049020

EXISTING STRUCTURE

EMERGENCY OUTFALL MONITORING POINT

EMERGENCY OUTFALL MANUAL VALVE

SEDIMENT TRAP WITH OIL BOOM (TYP)

1

SILT FENCE & HVF

MAINTAIN VEGETATED PERIMETER BERM

DECK PANEL STORAGE

FLUKE ANCHOR STORAGE

CASTING SLABS

CASTING SLAB

2

INLET PROTECTION

APPROXIMATE LOCATION STORAGE AREA FOR DRUMMED PRODUCTS (EG: FORM RELEASE AGENT, CURLING COMPOUND, BONDING AGENT) ON SECONDARY CONTAINMENT AND COVERED

TEMPORARY OFFICE TRAILERS AND LIMITED PARKING

MINOR AMOUNTS OF UNLEADED GAS IN CANS FOR HAND EQUIPMENT, STORAGE IN FLAMMABLE CABINETS

EMERGENCY OUTFALL MONITORING POINT

EMERGENCY OUTFALL MANUAL VALVE

SEDIMENT TRAP WITH OIL BOOM

PIONEER TOWING CO. INC.
6525 N.E. 175TH St.
KENMORE WA 98028
TAX PARCEL NUMBER 1126049001
ZONE REGIONAL BUSINESS

PRE-TREATMENT AND STORAGE OF CONCRETE CASTING PROCESS WATER IN ABOVE GROUND BAKER TANKS - DISCHARGE TO SANITARY (TYP)

LAKE WASHINGTON

SHORELINE VEGETATION TO BE PROTECTED

SEDIMENT TRAP WITH OIL BOOM

3

EXISTING STRUCTURE

SAMMAMISH RIVER

PROTECT AND MAINTAIN PERIMETER BERM

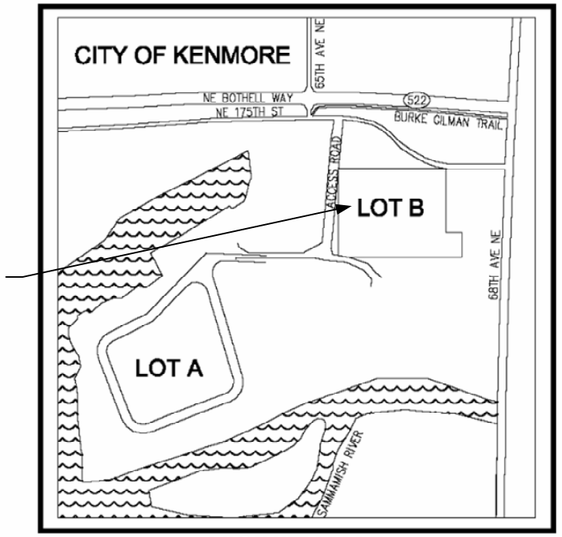
DECK PANEL STORAGE AREA

APPROXIMATE LOCATION STORAGE AREA FOR DRUMMED PRODUCTS IN ACTIVE USE - SECONDARY CONTAINMENT

EMERGENCY OUTFALL MANUAL VALVE

EMERGENCY OUTFALL MONITORING POINT

EXISTING PAVED LOT B WILL BE USED FOR PARKING AND MATERIALS STORAGE AND STAGING



VICINITY MAP

NOTE: 4 SPILL KITS WILL BE LOCATED AT LOT B. LOT B WILL BE USED FOR PARKING, LUMBER AND STEEL LAYDOWN AND FORM PANEL FABRICATION

NOTES:

1. ALL STORMWATER INFILTRATES ON SITE UP TO A 100 YEAR STORM
2. MANUALLY - OPERATED OUTFALLS FOR EXTREME STORM EVENTS. EMERGENCY DISCHARGE MONITORED FOR PH, TURBIDITY, DO AND TEMPERATURE.

LEGEND:

- CONSTRUCTION ENTRANCE
- SILT FENCE & HVF
- INLET PROTECTION
- SPILL KIT LOCATION
- SECONDARY CONTAINMENT

N

60' 0 60' 120'

SCALE: 1"=60'

Plotted: Oct 28, 2011 - 11:17am evesc Layout: Layout1
k:\2011\111081 Kenmore Project\Drawings\Exhibits\Kenmore TESC and Spill Control Plan.dwg

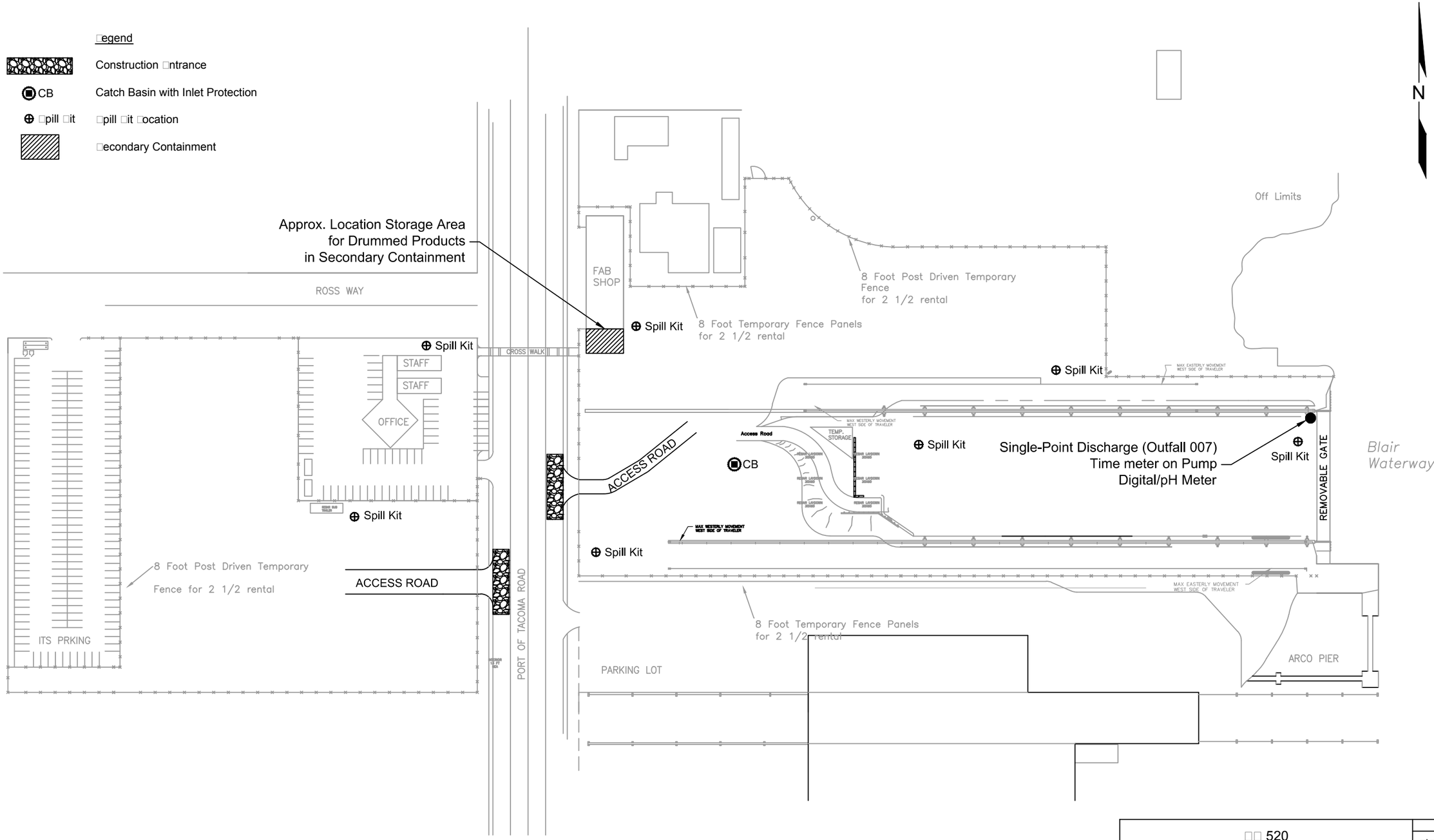
kpff Consulting Engineers
101 Stewart Street, Suite 400
Seattle, Washington 98101
(206) 382-0600 Fax (206) 382-0500

NO.	DATE	BY	REVISION

SR 520 EVERGREEN POINT FBL PROJECT
ENVIRONMENTAL COMPLIANCE PLAN
APPENDIX C: SPPCP

KENMORE YARD SITE LAYOUT
TESC & SPILL CONTROL

DRAWN: EV	PROJECT NO.: 111081
DESIGN: ED	SCALE: 60
CHECKED: JR	DATE: OCT 10, 2011
DRAWING NO. C.2	
SHEET NO. 1 OF 1	

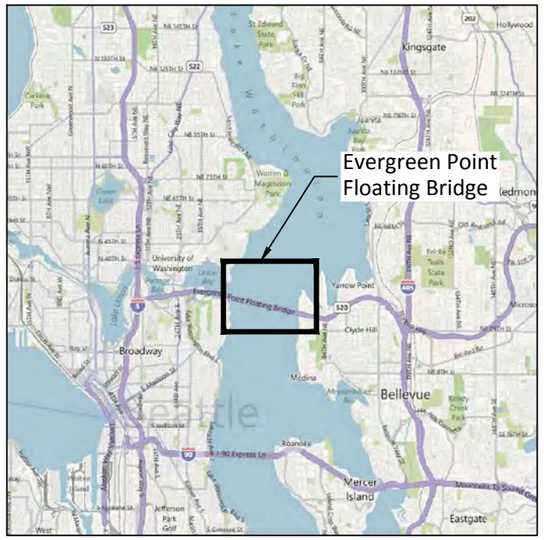


Note:
2 spill kits will be located at the adjacent Port of Tacoma properties (see Port of Tacoma lease agreement Premises Figure in Appendix). Port of Tacoma properties will be used for parking, construction office placement, construction and fabrication support, and construction material storage and staging.

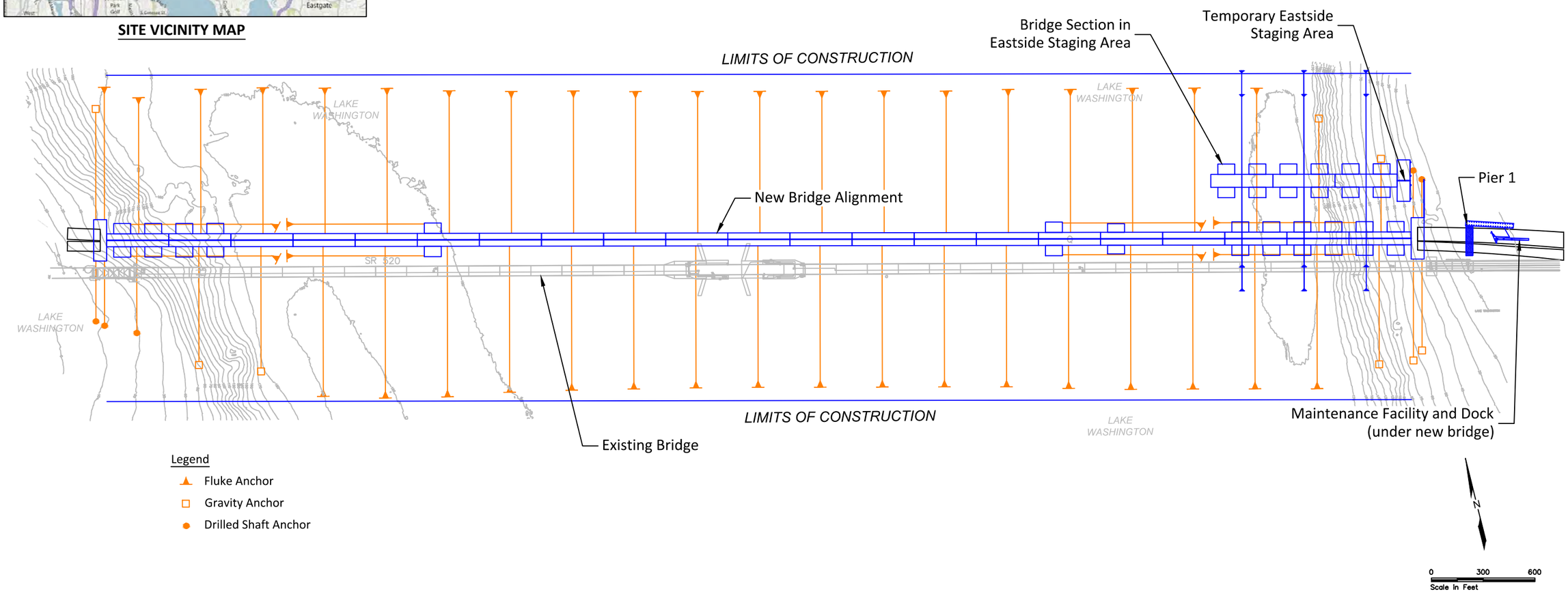
0 120 240
Scale in Feet

520 N POINT BOP CT NINTA CMPIANC PAN APPNI C: PCCP	C.3
CTC IT A T AN PI CNT	

Plot Date: 10/2/11 - 2:2 pm Plotted by: swp
Drawing Path: Project Clients: Lloyd and Linder:CTC Drawing Name: CTC001.dwg



SITE VICINITY MAP



K:\Project\clients\Floyd and Snider\520-WQM Plan\520WQM-003.dwg

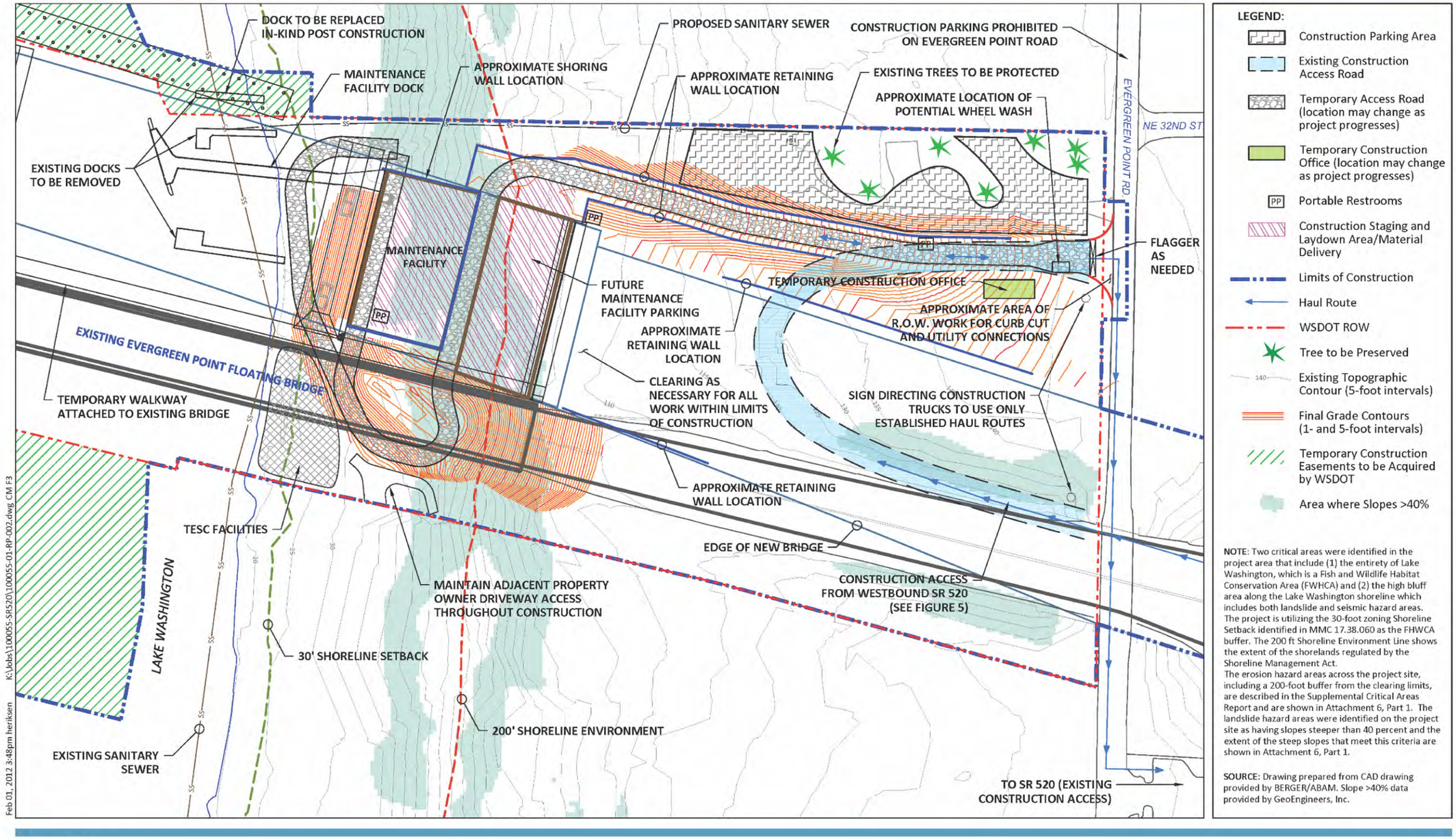
Kiewit / General / Manson
A Joint Venture

Corporate Campus East
3015 112th Avenue N.E. - Suite 100
Bellevue, WA, 98004

SR 520 EVERGREEN POINT
FLOATING BRIDGE AND LANDINGS
ENVIRONMENTAL COMPLIANCE PLAN
APPENDIX C: SPCCP

FLOATING BRIDGE AND LANDINGS SITE LAYOUT

DRAWN: BTS	PROJECT NO.:
DESIGN: TS	SCALE: AS SHOWN
CHECKED: JM	DATE: JAN. 16, 2012
DRAWING NO. **Figure C.4**	



Note:
Taken from Figure 3, Mitigation Site Plan, of the Medina Construction Mitigation Plan.

SR 520 Evergreen Point
Floating Bridge and Landings
Environmental Compliance Plan
Appendix C: Spill Prevention, Control, and Countermeasures Plan

Figure C.5
Medina Site Layout

SR 520 Evergreen Point Floating Bridge and Landings Environmental Compliance Plan Appendix C: SPCCP

Figure C.6
Port of Tacoma EB-1 Wharf
Pontoon Outfitting Location

SR 520 Evergreen Point
Floating Bridge and Landings
Environmental Compliance Plan
Appendix C: SPCCP

Figure C.7
Port of Seattle Terminal 18 Wharf
Pontoon Outfitting Location

SR 520 Evergreen Point
Floating Bridge and Landings
Environmental Compliance Plan
Appendix C: SPCCP

Figure C.8
Vigor Shipyards
Pontoon Outfitting Location

SR 520 Evergreen Point
Floating Bridge and Landings Project

Environmental Compliance Plan
Volume III

Appendix C
Spill Prevention, Control, and Countermeasures Plan

Attachment C.1
Spill Report Form

REVISION 2

Released for Construction

Attachment C.1
Spill Prevention, Control, and Countermeasures Plan Spill Report Form

INSTRUCTIONS

Form to be prepared by Superintendant or Designee. Complete this form for any type of petroleum product or hazardous materials/waste spill or incident. Provide a copy of this report to the KGM Environmental Manager.

1. Person Reporting the Spill or Incident

Name:	Address:
Organization:	
Title:	
Telephone:	Signature:
Fax:	

2. Type of Spill

Common Name of Spilled Substance:	
Quantity Spilled (Estimate):	
Concentration (Estimate):	
Date of Spill:	
Time Spill Started: AM/PM	Time Spill Ended: AM/PM

3. Location of Spill

Spill to Land	Spill to Water Body
Name of Site:	Name of Site:
Street Address:	Location of discharge with reference to a fixed point:
City/Town:	Description of the area from which spilled material may reach:
Country:	

4. If No Spill, Describe Incident Below

5. Actions Taken

To Contain Spill or Impact of Incident:
To Clean Up Spill or Recover from Incident:
To Remove Cleanup Materials:
To Prevent Reoccurrence:

6. Person Responsible for Managing Termination/Closure of Incident or Spill

Name:
Organization:
Title:
Telephone:
Fax:

SR 520 Evergreen Point
Floating Bridge and Landings Project

Environmental Compliance Plan
Volume III

Appendix C
Spill Prevention, Control, and Countermeasures Plan

Attachment C.2
Additional Items Brought On-Site Log

REVISION 2

Released for Construction

Attachment C.2
Spill Prevention, Control, and Countermeasures Plan
Additional Items Brought On-Site Log

Items listed below are beyond those listed on Table C.3 of the Spill Prevention, Control, and Countermeasures Plan. Logs maintained by the Environmental Manager are retained at the KGM office.

Date	Equipment	Quantity	Materials Brought On-site	Maximum Quantity

SR 520 Evergreen Point
Floating Bridge and Landings Project

Environmental Compliance Plan
Volume III

Appendix C
Spill Prevention, Control, and Countermeasures Plan

Attachment C.3
Material Safety Data Sheets

REVISION 2

Released for Construction

MATERIAL SAFETY DATA SHEET

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

PRODUCT

Product Name: **ULTRA LOW SULFUR DIESEL**
Product Description: Hydrocarbons and Additives
Product Code: 152017-00, 97AJ26, 97AJ39, 97AJ40, 97AL49, 97AV80, 97BB19, 97BJ98, 97BJ99, 97BK00, 97BK01, 97BK02, 97BK03, 97BK04, 97BK05, 97BK06, 97BN31, 97BN32, 97BN33, 97BN68, 97BN70, 97BN71, 97BN72, 97BN89, 97BN90, 97BN91, 97BN92, 97BN93, 97BN94, 97BN95, 97BN96, 97BN97, 97BR17, 97BR20, 97BR21, 97BR27, 97BR28, 97BR29, 97Y564
Intended Use: Diesel engine fuel

COMPANY IDENTIFICATION

Supplier: **EXXON MOBIL CORPORATION**
3225 GALLOWS RD.
FAIRFAX, VA. 22037 USA

24 Hour Health Emergency	609-737-4411
Transportation Emergency Phone	800-424-9300
ExxonMobil Transportation No.	281-834-3296
Product Technical Information	800-662-4525, 800-947-9147
MSDS Internet Address	http://www.exxon.com, http://www.mobil.com

SECTION 2 COMPOSITION / INFORMATION ON INGREDIENTS

Reportable Hazardous Substance(s) or Complex Substance(s)

Name	CAS#	Concentration*
FATTY ACIDS, METHYL ESTERS		0 - 20%
Fuels, diesel	68334-30-5	80 - > 99%

Hazardous Constituent(s) Contained in Complex Substance(s)

Name	CAS#	Concentration*
ETHYL BENZENE	100-41-4	0.1 - 1%
NAPHTHALENE	91-20-3	0.1 - 1%

* All concentrations are percent by weight unless material is a gas. Gas concentrations are in percent by volume.

NOTE: Composition may contain up to 0.5% performance additives and / or dyes.

SECTION 3 HAZARDS IDENTIFICATION

This material is considered to be hazardous according to regulatory guidelines (see (M)SDS Section 15).

POTENTIAL PHYSICAL / CHEMICAL EFFECTS

Combustible. Material can release vapors that readily form flammable mixtures. Vapor accumulation could flash and/or explode if ignited. Material can accumulate static charges which may cause an incendiary electrical discharge.

POTENTIAL HEALTH EFFECTS

Repeated exposure may cause skin dryness or cracking. Possible human cancer hazard. If swallowed, may be aspirated and cause lung damage. Under conditions of poor personal hygiene and prolonged repeated contact, some polycyclic aromatic compounds (PACs) have been suspected as a cause of skin cancer in humans. May be irritating to the eyes, nose, throat, and lungs. May cause central nervous system depression. High-pressure injection under skin may cause serious damage.

Target Organs: Lung | Skin |

ENVIRONMENTAL HAZARDS

Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

NFPA Hazard ID:	Health:	1	Flammability:	2	Reactivity:	0
HMIS Hazard ID:	Health:	1*	Flammability:	2	Reactivity:	0

NOTE: This material should not be used for any other purpose than the intended use in Section 1 without expert advice. Health studies have shown that chemical exposure may cause potential human health risks which may vary from person to person.

SECTION 4 FIRST AID MEASURES

Inhalation

Remove from further exposure. For those providing assistance, avoid exposure to yourself or others. Use adequate respiratory protection. If respiratory irritation, dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance. If breathing has stopped, assist ventilation with a mechanical device or use mouth-to-mouth resuscitation.

SKIN CONTACT

Remove contaminated clothing. Dry wipe exposed skin and cleanse with waterless hand cleaner and follow by washing thoroughly with soap and water. For those providing assistance, avoid further skin contact to yourself or others. Wear impervious gloves. Launder contaminated clothing separately before reuse. Discard contaminated articles that cannot be laundered. If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

EYE CONTACT

Flush thoroughly with water. If irritation occurs, get medical assistance.

Ingestion

Seek immediate medical attention. Do not induce vomiting.

NOTE TO PHYSICIAN

If ingested, material may be aspirated into the lungs and cause chemical pneumonitis. Treat appropriately.

PRE-EXISTING MEDICAL CONDITIONS WHICH MAY BE AGGRAVATED BY EXPOSURE

Hydrocarbon Solvents/Petroleum Hydrocarbons- Skin contact may aggravate an existing dermatitis.

SECTION 5 FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA

Appropriate Extinguishing Media: Use water fog, foam, dry chemical or carbon dioxide (CO2) to extinguish flames.

Inappropriate Extinguishing Media: Straight Streams of Water

FIRE FIGHTING

Fire Fighting Instructions: Evacuate area. Prevent runoff from fire control or dilution from entering streams, sewers, or drinking water supply. Firefighters should use standard protective equipment and in enclosed spaces, self-contained breathing apparatus (SCBA). Use water spray to cool fire exposed surfaces and to protect personnel.

Unusual Fire Hazards: Combustible.

Hazardous Combustion Products: Smoke, Fume, Aldehydes, Sulfur Oxides, Incomplete combustion products, Oxides of carbon

FLAMMABILITY PROPERTIES

Flash Point [Method]: >55C (131F) [ASTM D-93]
Flammable Limits (Approximate volume % in air): LEL: 0.6 UEL: 7.0
Autoignition Temperature: >200°C (392°F)

SECTION 6 ACCIDENTAL RELEASE MEASURES

NOTIFICATION PROCEDURES

In the event of a spill or accidental release, notify relevant authorities in accordance with all applicable regulations. US regulations require reporting releases of this material to the environment which exceed the applicable reportable quantity or oil spills which could reach any waterway including intermittent dry creeks. The National Response Center can be reached at (800)424-8802.

PROTECTIVE MEASURES

Avoid contact with spilled material. Warn or evacuate occupants in surrounding and downwind areas if required due to toxicity or flammability of the material. See Section 5 for fire fighting information. See the Hazard Identification Section for Significant Hazards. See Section 4 for First Aid Advice. See Section 8 for Personal Protective Equipment.

SPILL MANAGEMENT

Land Spill: Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area). Stop leak if you can do it without risk. All equipment used when handling the product must be grounded. Do not touch or walk through spilled material. Prevent entry into waterways, sewer, basements or confined areas. A vapor suppressing foam may be used to reduce vapors. Use clean non-sparking tools to collect absorbed material. Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers. Large Spills: Water spray may reduce vapor; but may not prevent ignition in closed spaces.

Water Spill: Stop leak if you can do it without risk. Eliminate sources of ignition. If the Flash Point exceeds the Ambient Temperature by 10 degrees C or more, use containment booms and remove from the surface by skimming or with suitable absorbents when conditions permit. If the Flash Point does not exceed the Ambient Air Temperature by at least 10C, use booms as a barrier to protect shorelines and allow material to evaporate. Seek the advice of a specialist before using dispersants.

Water spill and land spill recommendations are based on the most likely spill scenario for this material; however, geographic conditions, wind, temperature, (and in the case of a water spill) wave and current direction

and speed may greatly influence the appropriate action to be taken. For this reason, local experts should be consulted. Note: Local regulations may prescribe or limit action to be taken.

ENVIRONMENTAL PRECAUTIONS

Large Spills: Dike far ahead of liquid spill for later recovery and disposal. Prevent entry into waterways, sewers, basements or confined areas.

SECTION 7 HANDLING AND STORAGE

HANDLING

Avoid all personal contact. Do not siphon by mouth. Use proper bonding and/or grounding procedures. Do not use as a cleaning solvent or other non-motor fuel uses. For use as a motor fuel only. It is dangerous and/or unlawful to put fuel into unapproved containers. Do not fill container while it is in or on a vehicle. Static electricity may ignite vapors and cause fire. Place container on ground when filling and keep nozzle in contact with container. Do not use electronic devices (including but not limited to cellular phones, computers, calculators, pagers or other electronic devices, etc.) in or around any fueling operation or storage area unless the devices are certified intrinsically safe by an approved national testing agency and to the safety standards required by national and/or local laws and regulations. Prevent small spills and leakage to avoid slip hazard. Material can accumulate static charges which may cause an electrical spark (ignition source).

Static Accumulator: This material is a static accumulator.

STORAGE

Keep container closed. Handle containers with care. Open slowly in order to control possible pressure release. Store in a cool, well-ventilated area. Storage containers should be grounded and bonded. Drums must be grounded and bonded and equipped with self-closing valves, pressure vacuum bungs and flame arresters.

SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE LIMIT VALUES

Exposure limits/standards (Note: Exposure limits are not additive)

Source	Form	Limit / Standard			NOTE	Source
ETHYL BENZENE		TWA	435 mg/m3	100 ppm	N/A	OSHA Z1
ETHYL BENZENE		STEL	125 ppm		N/A	ACGIH
ETHYL BENZENE		TWA	100 ppm		N/A	ACGIH
Fuels, diesel	Stable Aerosol.	TWA	5 mg/m3		N/A	ExxonMobil
Fuels, diesel	Vapor.	TWA	200 mg/m3		N/A	ExxonMobil
FUELS, DIESEL [total hydrocarb, vapor&aerosol]	Inhalable fraction and vapor	TWA	100 mg/m3		Skin	ACGIH
NAPHTHALENE		TWA	50 mg/m3	10 ppm	N/A	OSHA Z1
NAPHTHALENE		STEL	15 ppm		Skin	ACGIH
NAPHTHALENE		TWA	10 ppm		Skin	ACGIH

NOTE: Limits/standards shown for guidance only. Follow applicable regulations.

ENGINEERING CONTROLS

The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Control measures to consider:
Use explosion-proof ventilation equipment to stay below exposure limits.

PERSONAL PROTECTION

Personal protective equipment selections vary based on potential exposure conditions such as applications, handling practices, concentration and ventilation. Information on the selection of protective equipment for use with this material, as provided below, is based upon intended, normal usage.

Respiratory Protection: If engineering controls do not maintain airborne contaminant concentrations at a level which is adequate to protect worker health, an approved respirator may be appropriate. Respirator selection, use, and maintenance must be in accordance with regulatory requirements, if applicable. Types of respirators to be considered for this material include:
No special requirements under ordinary conditions of use and with adequate ventilation.

For high airborne concentrations, use an approved supplied-air respirator, operated in positive pressure mode. Supplied air respirators with an escape bottle may be appropriate when oxygen levels are inadequate, gas/vapor warning properties are poor, or if air purifying filter capacity/rating may be exceeded.

Hand Protection: Any specific glove information provided is based on published literature and glove manufacturer data. Glove suitability and breakthrough time will differ depending on the specific use conditions. Contact the glove manufacturer for specific advice on glove selection and breakthrough times for your use conditions. Inspect and replace worn or damaged gloves. The types of gloves to be considered for this material include:
Chemical resistant gloves are recommended. If contact with forearms is likely wear gauntlet style gloves.

Eye Protection: If contact with material is likely, chemical goggles are recommended.

Skin and Body Protection: Any specific clothing information provided is based on published literature or manufacturer data. The types of clothing to be considered for this material include:
Chemical/oil resistant clothing is recommended.

Specific Hygiene Measures: Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Discard contaminated clothing and footwear that cannot be cleaned. Practice good housekeeping.

ENVIRONMENTAL CONTROLS

See Sections 6, 7, 12, 13.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Typical physical and chemical properties are given below. Consult the Supplier in Section 1 for additional data.

GENERAL INFORMATION

Physical State: Liquid
Color: Clear (May Be Dyed)
Odor: Petroleum/Solvent
Odor Threshold: N/D

IMPORTANT HEALTH, SAFETY, AND ENVIRONMENTAL INFORMATION

Relative Density (at 15 C): 0.81 - 0.87
Density (at 15 °C): 810 kg/m³ (6.76 lbs/gal, 0.81 kg/dm³) - 876 kg/m³ (7.31 lbs/gal, 0.88 kg/dm³)
Flash Point [Method]: >55C (131F) [ASTM D-93]
Flammable Limits (Approximate volume % in air): LEL: 0.6 UEL: 7.0
Autoignition Temperature: >200°C (392°F)
Boiling Point / Range: 145C (293F) - 370C (698F)
Vapor Density (Air = 1): > 2 at 101 kPa
Vapor Pressure: 0.067 kPa (0.5 mm Hg) at 20 C
Evaporation Rate (N-Butyl Acetate = 1): N/D
pH: N/A
Log Pow (n-Octanol/Water Partition Coefficient): > 3.5
Solubility in Water: Negligible
Viscosity: 1.7 cSt (1.7 mm²/sec) at 40 C - 4.1 cSt (4.1 mm²/sec) at 40 C
Oxidizing Properties: See Hazards Identification Section.

OTHER INFORMATION

Freezing Point: N/D
Melting Point: N/A
Pour Point: < -6°C (21°F)

SECTION 10 STABILITY AND REACTIVITY

STABILITY: Material is stable under normal conditions.

CONDITIONS TO AVOID: Open flames and high energy ignition sources.

MATERIALS TO AVOID: Halogens, Strong Acids, Strong Bases, Strong oxidizers

HAZARDOUS DECOMPOSITION PRODUCTS: Material does not decompose at ambient temperatures.

HAZARDOUS POLYMERIZATION: Will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

ACUTE TOXICITY

Route of Exposure	Conclusion / Remarks
Inhalation	
Toxicity (Rat): LC50 > 5000 mg/m³	Minimally Toxic. Based on test data for structurally similar materials.
Irritation: Data available.	Elevated temperatures or mechanical action may form vapors, mist, or fumes which may be irritating to the eyes, nose, throat, or lungs. Based on test data for structurally similar materials.
Ingestion	
Toxicity (Rat): LD50 > 5000 mg/kg	Minimally Toxic. Based on test data for structurally similar materials.

Skin	
Toxicity (Rabbit): LD50 > 5000 mg/kg	Minimally Toxic. Based on test data for structurally similar materials.
Irritation (Rabbit): Data available.	May dry the skin leading to discomfort and dermatitis. Based on test data for structurally similar materials.
Eye	
Irritation (Rabbit): Data available.	May cause mild, short-lasting discomfort to eyes. Based on test data for structurally similar materials.

CHRONIC/OTHER EFFECTS

For the product itself:

Sensitization: Non-sensitizing to the skin of laboratory animals.
Vapor concentrations above recommended exposure levels are irritating to the eyes and the respiratory tract, may cause headaches and dizziness, are anesthetic and may have other central nervous system effects. Small amounts of liquid aspirated into the lungs during ingestion or from vomiting may cause chemical pneumonitis or pulmonary edema.
Diesel fuel: Caused cancer in animal tests. Caused mutations in vitro. Repeated dermal exposures to high concentrations in test animals resulted in reduced litter size and litter weight, and increased fetal resorptions at maternally toxic doses. Dermal exposure to high concentrations resulted in severe skin irritation with weight loss and some mortality. Inhalation exposure to high concentrations resulted in respiratory tract irritation, lung changes/infiltration/accumulation, and reduction in lung function.
Diesel exhaust fumes: Carcinogenic in animal tests. Inhalation exposures to exhaust for 2 years in test animals resulted in lung tumors and lymphoma. Extract of particulate produced skin tumors in test animals. Caused mutations in vitro.

Contains:

NAPHTHALENE: Exposure to high concentrations of naphthalene may cause destruction of red blood cells, anemia, and cataracts. Naphthalene caused cancer in laboratory animal studies, but the relevance of these findings to humans is uncertain.
ETHYLBENZENE: Caused cancer in laboratory animal studies. The relevance of these findings to humans is uncertain.

Additional information is available by request.

The following ingredients are cited on the lists below:

Chemical Name	CAS Number	List Citations
ETHYL BENZENE	100-41-4	5
NAPHTHALENE	91-20-3	2, 5

--REGULATORY LISTS SEARCHED--

1 = NTP CARC	3 = IARC 1	5 = IARC 2B
2 = NTP SUS	4 = IARC 2A	6 = OSHA CARC

SECTION 12 ECOLOGICAL INFORMATION

The information given is based on data available for the material, the components of the material, and similar materials.

ECOTOXICITY

Material -- Expected to be toxic to aquatic organisms. May cause long-term adverse effects in the aquatic environment.

MOBILITY

More volatile component -- Highly volatile, will partition rapidly to air. Not expected to partition to sediment and wastewater solids.

High molecular wt. component -- Low solubility and floats and is expected to migrate from water to the land. Expected to partition to sediment and wastewater solids.

PERSISTENCE AND DEGRADABILITY

Biodegradation:

Material -- Expected to be inherently biodegradable

Atmospheric Oxidation:

More volatile component -- Expected to degrade rapidly in air

SECTION 13 DISPOSAL CONSIDERATIONS

Disposal recommendations based on material as supplied. Disposal must be in accordance with current applicable laws and regulations, and material characteristics at time of disposal.

DISPOSAL RECOMMENDATIONS

Product is suitable for burning in an enclosed controlled burner for fuel value or disposal by supervised incineration at very high temperatures to prevent formation of undesirable combustion products.

REGULATORY DISPOSAL INFORMATION

RCRA Information: Disposal of unused product may be subject to RCRA regulations (40 CFR 261). Disposal of the used product may also be regulated due to ignitability, corrosivity, reactivity or toxicity as determined by the Toxicity Characteristic Leaching Procedure (TCLP). Potential RCRA characteristics: IGNITABILITY.

Empty Container Warning Empty Container Warning (where applicable): Empty containers may contain residue and can be dangerous. Do not attempt to refill or clean containers without proper instructions. Empty drums should be completely drained and safely stored until appropriately reconditioned or disposed. Empty containers should be taken for recycling, recovery, or disposal through suitably qualified or licensed contractor and in accordance with governmental regulations. DO NOT PRESSURISE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND, OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION. THEY MAY EXPLODE AND CAUSE INJURY OR DEATH.

SECTION 14 TRANSPORT INFORMATION

LAND (DOT)

Proper Shipping Name: DIESEL FUEL
Hazard Class & Division: COMBUSTIBLE LIQUID
ID Number: NA1993
Packing Group: III
Marine Pollutant: Yes
ERG Number: 128
Label(s): NONE
Transport Document Name: NA1993, DIESEL FUEL, COMBUSTIBLE LIQUID, PG III, MARINE

POLLUTANT

Footnote: The flash point of this material is greater than 100 F. Regulatory classification of this material varies. DOT: Flammable liquid or combustible liquid. OSHA: Combustible liquid. IATA/IMO: Flammable liquid.

LAND (TDG)

Proper Shipping Name: GAS OIL
Hazard Class & Division: 3
UN Number: 1202
Packing Group: III

SEA (IMDG)

Proper Shipping Name: GAS OIL
Hazard Class & Division: 3
EMS Number: F-E, S-E
UN Number: 1202
Packing Group: III
Marine Pollutant: Yes
Label(s): 3
Transport Document Name: UN1202, GAS OIL, 3, PG III, (55°C c.c.), MARINE POLLUTANT

AIR (IATA)

Proper Shipping Name: GAS OIL
Hazard Class & Division: 3
UN Number: 1202
Packing Group: III
Label(s) / Mark(s): 3
Transport Document Name: UN1202, GAS OIL, 3, PG III

SECTION 15 REGULATORY INFORMATION

OSHA HAZARD COMMUNICATION STANDARD: When used for its intended purpose, this material is classified as hazardous in accordance with OSHA 29CFR 1910.1200.

NATIONAL CHEMICAL INVENTORY LISTING: AICS, IECSC, DSL, EINECS, ELINCS, KECI, PICCS, TSCA

EPCRA: This material contains no extremely hazardous substances.

CERCLA: This material is not subject to any special reporting under the requirements of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). Contact local authorities to determine if other reporting requirements apply.

SARA (311/312) REPORTABLE HAZARD CATEGORIES: Fire. Delayed Health.

SARA (313) TOXIC RELEASE INVENTORY:

Chemical Name	CAS Number	Typical Value
ETHYL BENZENE	100-41-4	0.1 - 1%
NAPHTHALENE	91-20-3	0.1 - 1%

The following ingredients are cited on the lists below:

Chemical Name	CAS Number	List Citations
ETHYL BENZENE	100-41-4	1, 4, 10
Fuels, diesel	68334-30-5	1, 18, 19
NAPHTHALENE	91-20-3	1, 4, 5, 9, 10

--REGULATORY LISTS SEARCHED--

1 = ACGIH ALL	6 = TSCA 5a2	11 = CA P65 REPRO	16 = MN RTK
2 = ACGIH A1	7 = TSCA 5e	12 = CA RTK	17 = NJ RTK
3 = ACGIH A2	8 = TSCA 6	13 = IL RTK	18 = PA RTK
4 = OSHA Z	9 = TSCA 12b	14 = LA RTK	19 = RI RTK
5 = TSCA 4	10 = CA P65 CARC	15 = MI 293	

Code key: CARC=Carcinogen; REPRO=Reproductive

SECTION 16 OTHER INFORMATION

N/D = Not determined, N/A = Not applicable

THIS SAFETY DATA SHEET CONTAINS THE FOLLOWING REVISIONS:

Revision Changes:
Section 01: Product Code was modified.
Section 09: Density - Header was added.
Section 09: Density kg/m3(lbs/gal) was added.
Section 04: First Aid Inhalation - Header was modified.
Section 08: Exposure Limit Values - Header was modified.
Section 05: Fire Fighting Measures - Unusual Fire Hazards was added.
Section 05: Fire Fighting Measures - Unusual Fire Hazards - Header was added.
Section 10 Stability and Reactivity - Header was modified.
Section 13: Disposal Recommendations - Note was modified.
Section 09: Evaporation Rate - Header was modified.
Section 08: Personal Protection was modified.
Section 07: Handling and Storage - Handling was modified.
Hazard Identification: HMIS Health was modified.
Section 11: Dermal Lethality Test Data was modified.
Section 11: Oral Lethality Test Data was modified.
Section 11: Inhalation Lethality Test Data was modified.
Section 05: Hazardous Combustion Products was modified.
Section 09: Relative Density - Header was modified.
Section 09: Viscosity was modified.
Section 14: Transport Document Name was modified.
Section 14: Transport Document Name was modified.
Section 14: Marine Pollutant - Header was added.
Section 14: Marine Pollutant was added.
Section 14: Marine Pollutant - Header was added.
Section 14: Marine Pollutant was added.
Section 14: Transport Document Name was modified.
Composition: Component Table was modified.

Section 15: List Citations Table was modified.
Section 15: List Citation Table - Header was modified.
Section 15: SARA (311/312) REPORTABLE HAZARD CATEGORIES was modified.
Section 16: Code to MHCs was modified.
Section 14: DOT Footnote was modified.
Section 16: NA Contains was modified.
Section 08: Exposure limits/standards was deleted.
Section 08: Exposure Limits Table was modified.
Section 09: Oxidizing Properties was modified.
Section 08: OEL Table - Notation Column - Header was modified.
Section 04: First Aid Ingestion - Header was modified.
THIS MSDS COVERS THE FOLLOWING MATERIALS: DIESEL NO. 2 | ESSO DIESEL FUEL | EXXON DIESEL FUEL | LOW SULFUR DIESEL | MARINE DIESEL FUEL | MOBIL DIESEL FUEL | ULTRA LOW SULFUR DIESEL | WINTERIZED DIESEL FUEL

PRECAUTIONARY LABEL TEXT:
Contains: FATTY ACIDS, METHYL ESTERS, Fuels, diesel
WARNING!
HEALTH HAZARDS
Repeated exposure may cause skin dryness or cracking. Possible human cancer hazard. If swallowed, may be aspirated and cause lung damage.
Target Organs: Lung | Skin |

PHYSICAL HAZARDS
Combustible. Material can accumulate static charges which may cause an incendiary electrical discharge.

PRECAUTIONS
Avoid contact with skin. Do not siphon by mouth. Use proper bonding and/or grounding procedures.

FIRST AID
Eye: Flush thoroughly with water. If irritation occurs, get medical assistance.

Oral: Seek immediate medical attention. Do not induce vomiting.

Skin: Remove contaminated clothing. Dry wipe exposed skin and cleanse with waterless hand cleaner and follow by washing thoroughly with soap and water. For those providing assistance, avoid further skin contact to yourself or others. Wear impervious gloves. Launder contaminated clothing separately before reuse. Discard contaminated articles that cannot be laundered. If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

FIRE FIGHTING MEDIA
Use water fog, foam, dry chemical or carbon dioxide (CO_2) to extinguish flames.

SPILL/LEAK
Land Spill: Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area). Stop leak if you can do it without risk. Prevent entry into waterways, sewer, basements or confined areas. A vapor suppressing foam may be used to reduce vapors. Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers.

Water Spill: Stop leak if you can do it without risk. Eliminate sources of ignition. If the Flash Point exceeds the

Ambient Temperature by 10 degrees C or more, use containment booms and remove from the surface by skimming or with suitable absorbents when conditions permit. If the Flash Point does not exceed the Ambient Air Temperature by at least 10C, use booms as a barrier to protect shorelines and allow material to evaporate. Seek the advice of a specialist before using dispersants.

This warning is given to comply with California Health and Safety Code 25249.6 and does not constitute an admission or a waiver of rights. This product contains a chemical known to the State of California to cause cancer, birth defects, or other reproductive harm. Chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm are created by the combustion of this product.

The information and recommendations contained herein are, to the best of ExxonMobil's knowledge and belief, accurate and reliable as of the date issued. You can contact ExxonMobil to insure that this document is the most current available from ExxonMobil. The information and recommendations are offered for the user's consideration and examination. It is the user's responsibility to satisfy itself that the product is suitable for the intended use. If buyer repackages this product, it is the user's responsibility to insure proper health, safety and other necessary information is included with and/or on the container. Appropriate warnings and safe-handling procedures should be provided to handlers and users. Alteration of this document is strictly prohibited. Except to the extent required by law, re-publication or retransmission of this document, in whole or in part, is not permitted. The term, "ExxonMobil" is used for convenience, and may include any one or more of ExxonMobil Chemical Company, Exxon Mobil Corporation, or any affiliates in which they directly or indirectly hold any interest.

Internal Use Only
MHC: 1A, 0B, 0, 0, 1, 1 PPEC: C

DGN: 7079307XUS (1012398)

Copyright 2002 Exxon Mobil Corporation, All rights reserved

MATERIAL SAFETY DATA SHEET

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

PRODUCT

Product Name: **POWER GUARD HEAVY DUTY DIESEL ENGINE OIL DETROIT DIESEL 2-CYCLE**
Product Description: Base Oil and Additives
Product Code: 20203010F540, 451070-00, 97AS50
Intended Use: Engine oil

COMPANY IDENTIFICATION

Supplier: **EXXON MOBIL CORPORATION**
3225 GALLOWS RD.
FAIRFAX, VA. 22037 USA

24 Hour Health Emergency	609-737-4411
Transportation Emergency Phone	800-424-9300
ExxonMobil Transportation No.	281-834-3296
MSDS Requests	713-613-3661
Product Technical Information	800-662-4525, 800-947-9147
MSDS Internet Address	http://www.exxon.com, http://www.mobil.com

SECTION 2 COMPOSITION / INFORMATION ON INGREDIENTS

Reportable Hazardous Substance(s) or Complex Substance(s)

Name	CAS#	Concentration*
ZINC DITHIOPHOSPHATE	68649-42-3	< 2.5%

* All concentrations are percent by weight unless material is a gas. Gas concentrations are in percent by volume.

SECTION 3 HAZARDS IDENTIFICATION

This material is not considered to be hazardous according to regulatory guidelines (see (M)SDS Section 15).

POTENTIAL HEALTH EFFECTS

Low order of toxicity. Excessive exposure may result in eye, skin, or respiratory irritation. High-pressure injection under skin may cause serious damage.

NFPA Hazard ID:	Health:	0	Flammability:	1	Reactivity:	0
HMIS Hazard ID:	Health:	0	Flammability:	1	Reactivity:	0

NOTE: This material should not be used for any other purpose than the intended use in Section 1 without expert advice. Health studies have shown that chemical exposure may cause potential human health risks which may vary from person to person.

SECTION 4 FIRST AID MEASURES

INHALATION

Remove from further exposure. For those providing assistance, avoid exposure to yourself or others. Use adequate respiratory protection. If respiratory irritation, dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance. If breathing has stopped, assist ventilation with a mechanical device or use mouth-to-mouth resuscitation.

SKIN CONTACT

Wash contact areas with soap and water. If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

EYE CONTACT

Flush thoroughly with water. If irritation occurs, get medical assistance.

INGESTION

First aid is normally not required. Seek medical attention if discomfort occurs.

SECTION 5 FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA

Appropriate Extinguishing Media: Use water fog, foam, dry chemical or carbon dioxide (CO2) to extinguish flames.

Inappropriate Extinguishing Media: Straight Streams of Water

FIRE FIGHTING

Fire Fighting Instructions: Evacuate area. Prevent runoff from fire control or dilution from entering streams, sewers, or drinking water supply. Firefighters should use standard protective equipment and in enclosed spaces, self-contained breathing apparatus (SCBA). Use water spray to cool fire exposed surfaces and to protect personnel.

Hazardous Combustion Products: Smoke, Fume, Aldehydes, Sulfur oxides, Oxides of carbon, Incomplete combustion products

FLAMMABILITY PROPERTIES

Flash Point [Method]: >200C (392F) [ASTM D-92]
Flammable Limits (Approximate volume % in air): LEL: 0.9 UEL: 7.0
Autoignition Temperature: N/D

SECTION 6 ACCIDENTAL RELEASE MEASURES

NOTIFICATION PROCEDURES

In the event of a spill or accidental release, notify relevant authorities in accordance with all applicable regulations U.S. regulations require reporting releases of this material to the environment which exceed the reportable quantity or oil spills which could reach any waterway including intermittent dry creeks. The National Response Center can be reached at (800)424-8802.

SPILL MANAGEMENT

Land Spill: Stop leak if you can do it without risk. Recover by pumping or with suitable absorbent.

Water Spill: Stop leak if you can do it without risk. Confine the spill immediately with booms. Warn other shipping. Remove from the surface by skimming or with suitable absorbents. Seek the advice of a specialist before using dispersants.

Water spill and land spill recommendations are based on the most likely spill scenario for this material; however, geographic conditions, wind, temperature, (and in the case of a water spill) wave and current direction and speed may greatly influence the appropriate action to be taken. For this reason, local experts should be consulted. Note: Local regulations may prescribe or limit action to be taken.

ENVIRONMENTAL PRECAUTIONS

Large Spills: Dike far ahead of liquid spill for later recovery and disposal. Prevent entry into waterways, sewers, basements or confined areas.

SECTION 7 HANDLING AND STORAGE

HANDLING

Avoid contact with used product. Prevent small spills and leakage to avoid slip hazard.

Static Accumulator: This material is a static accumulator.

STORAGE

Do not store in open or unlabelled containers.

SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE LIMIT VALUES

Exposure limits/standards for materials that can be formed when handling this product: When mists / aerosols can occur, the following are recommended: 5 mg/m³ - ACGIH TLV, 10 mg/m³ - ACGIH STEL, 5 mg/m³ - OSHA PEL.

NOTE: Limits/standards shown for guidance only. Follow applicable regulations.

ENGINEERING CONTROLS

The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Control measures to consider:

No special requirements under ordinary conditions of use and with adequate ventilation.

PERSONAL PROTECTION

Personal protective equipment selections vary based on potential exposure conditions such as applications, handling practices, concentration and ventilation. Information on the selection of protective equipment for use with this material, as provided below, is based upon intended, normal usage.

Respiratory Protection: If engineering controls do not maintain airborne contaminant concentrations at a level which is adequate to protect worker health, an approved respirator may be appropriate. Respirator selection, use, and maintenance must be in accordance with regulatory requirements, if applicable. Types of respirators to be considered for this material include:

No special requirements under ordinary conditions of use and with adequate ventilation.

For high airborne concentrations, use an approved supplied-air respirator, operated in positive pressure mode. Supplied air respirators with an escape bottle may be appropriate when oxygen levels are inadequate, gas/vapor warning properties are poor, or if air purifying filter capacity/rating may be exceeded.

Hand Protection: Any specific glove information provided is based on published literature and glove manufacturer data. Work conditions can greatly effect glove durability; inspect and replace worn or damaged gloves. The types of gloves to be considered for this material include:

No protection is ordinarily required under normal conditions of use.

Eye Protection: If contact is likely, safety glasses with side shields are recommended.

Skin and Body Protection: Any specific clothing information provided is based on published literature or manufacturer data. The types of clothing to be considered for this material include:

No skin protection is ordinarily required under normal conditions of use. In accordance with good industrial hygiene practices, precautions should be taken to avoid skin contact.

Specific Hygiene Measures: Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Discard contaminated clothing and footwear that cannot be cleaned. Practice good housekeeping.

ENVIRONMENTAL CONTROLS

See Sections 6, 7, 12, 13.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Typical physical and chemical properties are given below. Consult the Supplier in Section 1 for additional data.

GENERAL INFORMATION

Physical State: Liquid
Form: Clear
Color: Brown
Odor: Characteristic
Odor Threshold: N/D

IMPORTANT HEALTH, SAFETY, AND ENVIRONMENTAL INFORMATION

Relative Density (at 15 C): 0.893
Flash Point [Method]: >200C (392F) [ASTM D-92]
Flammable Limits (Approximate volume % in air): LEL: 0.9 UEL: 7.0
Autoignition Temperature: N/D
Boiling Point / Range: > 316C (600F)
Vapor Density (Air = 1): N/D
Vapor Pressure: < 0.013 kPa (0.1 mm Hg) at 20 C

Evaporation Rate (n-butyl acetate = 1): N/D
pH: N/A
Log Pow (n-Octanol/Water Partition Coefficient): > 3.5
Solubility in Water: Negligible
Viscosity: 160 cSt (160 mm2/sec) at 40 C | 15.5 cSt (15.5 mm2/sec) at 100C
Oxidizing Properties: See Sections 3, 15, 16.

OTHER INFORMATION
Freezing Point: N/D
Melting Point: N/A
Pour Point: -15°C (5°F)
DMSO Extract (mineral oil only), IP-346: < 3 %wt

SECTION 10 STABILITY AND REACTIVITY

STABILITY: Material is stable under normal conditions.

CONDITIONS TO AVOID: Excessive heat. High energy sources of ignition.

MATERIALS TO AVOID: Strong oxidizers

HAZARDOUS DECOMPOSITION PRODUCTS: Material does not decompose at ambient temperatures.

HAZARDOUS POLYMERIZATION: Will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

ACUTE TOXICITY

Route of Exposure	Conclusion / Remarks
Inhalation	
Toxicity (Rat): LC50 > 5000 mg/m3	Minimally Toxic. Based on test data for structurally similar materials.
Irritation: No end point data.	Negligible hazard at ambient/normal handling temperatures. Based on assessment of the components.
Ingestion	
Toxicity (Rat): LD50 > 2000 mg/kg	Minimally Toxic. Based on test data for structurally similar materials.
Skin	
Toxicity (Rabbit): LD50 > 2000 mg/kg	Minimally Toxic. Based on test data for structurally similar materials.
Irritation (Rabbit): Data available.	Negligible irritation to skin at ambient temperatures. Based on test data for structurally similar materials.
Eye	
Irritation (Rabbit): Data available.	May cause mild, short-lasting discomfort to eyes. Based on test data for structurally similar materials.

CHRONIC/OTHER EFFECTS

For the product itself:

Diesel engine oils: Not carcinogenic in animals tests. Used and unused diesel engine oils did not produce any carcinogenic effects in chronic mouse skin painting studies.
Oils that are used in gasoline engines may become hazardous and display the following properties:
Carcinogenic in animal tests. Caused mutations in vitro. Possible allergen and photoallergen. Contains polycyclic aromatic compounds (PAC) from combustion products of gasoline and/or thermal degradation products.

Contains:
Base oil severely refined: Not carcinogenic in animal studies. Representative material passes IP-346, Modified Ames test, and/or other screening tests. Dermal and inhalation studies showed minimal effects; lung non-specific infiltration of immune cells, oil deposition and minimal granuloma formation. Not sensitizing in test animals.

Additional information is available by request.

The following ingredients are cited on the lists below: None.

--REGULATORY LISTS SEARCHED--

1 = NTP CARC	3 = IARC 1	5 = IARC 2B
2 = NTP SUS	4 = IARC 2A	6 = OSHA CARC

SECTION 12 ECOLOGICAL INFORMATION

The information given is based on data available for the material, the components of the material, and similar materials.

ECOTOXICITY
Material -- Not expected to be harmful to aquatic organisms.

MOBILITY
Base oil component -- Low solubility and floats and is expected to migrate from water to the land. Expected to partition to sediment and wastewater solids.

PERSISTENCE AND DEGRADABILITY
Biodegradation:
Base oil component -- Expected to be inherently biodegradable

BIOACCUMULATION POTENTIAL
Base oil component -- Has the potential to bioaccumulate, however metabolism or physical properties may reduce the bioconcentration or limit bioavailability.

SECTION 13 DISPOSAL CONSIDERATIONS

Disposal recommendations based on material as supplied. Disposal must be in accordance with current applicable laws and regulations, and material characteristics at time of disposal.

DISPOSAL RECOMMENDATIONS
Product is suitable for burning in an enclosed controlled burner for fuel value or disposal by supervised incineration at very high temperatures to prevent formation of undesirable combustion products.

REGULATORY DISPOSAL INFORMATION
RCRA Information: The unused product, in our opinion, is not specifically listed by the EPA as a hazardous waste (40 CFR, Part 261D), nor is it formulated to contain materials which are listed as hazardous wastes. It does not exhibit the hazardous characteristics of ignitability, corrositivity or reactivity and is not formulated with

contaminants as determined by the Toxicity Characteristic Leaching Procedure (TCLP). However, used product may be regulated.

Empty Container Warning PRECAUTIONARY LABEL TEXT: Empty containers may retain residue and can be dangerous. DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION; THEY MAY EXPLODE AND CAUSE INJURY OR DEATH. Do not attempt to refill or clean container since residue is difficult to remove. Empty drums should be completely drained, properly bunged and promptly returned to a drum reconditioner. All containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations.

SECTION 14 TRANSPORT INFORMATION

LAND (DOT) : Not Regulated for Land Transport

LAND (TDG) : Not Regulated for Land Transport

SEA (IMDG) : Not Regulated for Sea Transport according to IMDG-Code

AIR (IATA) : Not Regulated for Air Transport

SECTION 15 REGULATORY INFORMATION

OSHA HAZARD COMMUNICATION STANDARD: When used for its intended purposes, this material is not classified as hazardous in accordance with OSHA 29 CFR 1910.1200.

NATIONAL CHEMICAL INVENTORY LISTING: TSCA

EPCRA: This material contains no extremely hazardous substances.

SARA (311/312) REPORTABLE HAZARD CATEGORIES: None.

SARA (313) TOXIC RELEASE INVENTORY:

Chemical Name	CAS Number	Typical Value
ZINC DITHIOPHOSPHATE	68649-42-3	< 2.5%

The Following Ingredients are Cited on the Lists Below:

Chemical Name	CAS Number	List Citations
PHOSPHORUS	7723-14-0	1, 4
ZINC DITHIOPHOSPHATE	68649-42-3	13, 15, 17

--REGULATORY LISTS SEARCHED--

1 = ACGIH ALL	6 = TSCA 5a2	11 = CA P65 REPRO	16 = MN RTK
2 = ACGIH A1	7 = TSCA 5e	12 = CA RTK	17 = NJ RTK
3 = ACGIH A2	8 = TSCA 6	13 = IL RTK	18 = PA RTK
4 = OSHA Z	9 = TSCA 12b	14 = LA RTK	19 = RI RTK

5 = TSCA 4 10 = CA P65 CARC 15 = MI 293

Code key: CARC=Carcinogen; REPRO=Reproductive

SECTION 16 OTHER INFORMATION

N/D = Not determined, N/A = Not applicable

THIS SAFETY DATA SHEET CONTAINS THE FOLLOWING REVISIONS:
No revision information is available.

The information and recommendations contained herein are, to the best of ExxonMobil's knowledge and belief, accurate and reliable as of the date issued. You can contact ExxonMobil to insure that this document is the most current available from ExxonMobil. The information and recommendations are offered for the user's consideration and examination. It is the user's responsibility to satisfy itself that the product is suitable for the intended use. If buyer repackages this product, it is the user's responsibility to insure proper health, safety and other necessary information is included with and/or on the container. Appropriate warnings and safe-handling procedures should be provided to handlers and users. Alteration of this document is strictly prohibited. Except to the extent required by law, re-publication or retransmission of this document, in whole or in part, is not permitted. The term, "ExxonMobil" is used for convenience, and may include any one or more of ExxonMobil Chemical Company, Exxon Mobil Corporation, or any affiliates in which they directly or indirectly hold any interest.

Internal Use Only
MHC: 0, 0, 0, 0, 0, 0 PPEC: A

DGN: 7079908XUS (543376)

Copyright 2002 Exxon Mobil Corporation, All rights reserved

MATERIAL SAFETY DATA SHEET

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

PRODUCT

Product Name: **MOBIL HYDRAULIC AW 68**
Product Description: Base Oil and Additives
Product Code: 201560106520, 583039-49, 970557
Intended Use: Hydraulic fluid

COMPANY IDENTIFICATION

Supplier: **EXXON MOBIL CORPORATION**
3225 GALLOWS RD.
FAIRFAX, VA. 22037 USA

24 Hour Health Emergency	609-737-4411
Transportation Emergency Phone	800-424-9300
ExxonMobil Transportation No.	281-834-3296
Product Technical Information	800-662-4525, 800-947-9147
MSDS Internet Address	http://www.exxon.com, http://www.mobil.com

SECTION 2 COMPOSITION / INFORMATION ON INGREDIENTS

No Reportable Hazardous Substance(s) or Complex Substance(s).

SECTION 3 HAZARDS IDENTIFICATION

This material is not considered to be hazardous according to regulatory guidelines (see (M)SDS Section 15).

POTENTIAL HEALTH EFFECTS

Low order of toxicity. Excessive exposure may result in eye, skin, or respiratory irritation. High-pressure injection under skin may cause serious damage.

NFPA Hazard ID:	Health:	0	Flammability:	1	Reactivity:	0
HMIS Hazard ID:	Health:	0	Flammability:	1	Reactivity:	0

NOTE: This material should not be used for any other purpose than the intended use in Section 1 without expert advice. Health studies have shown that chemical exposure may cause potential human health risks which may vary from person to person.

SECTION 4 FIRST AID MEASURES

Inhalation

Remove from further exposure. For those providing assistance, avoid exposure to yourself or others. Use adequate respiratory protection. If respiratory irritation, dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance. If breathing has stopped, assist ventilation with a mechanical device or use

mouth-to-mouth resuscitation.

SKIN CONTACT

Wash contact areas with soap and water. If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

EYE CONTACT

Flush thoroughly with water. If irritation occurs, get medical assistance.

Ingestion

First aid is normally not required. Seek medical attention if discomfort occurs.

SECTION 5 FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA

Appropriate Extinguishing Media: Use water fog, foam, dry chemical or carbon dioxide (CO2) to extinguish flames.

Inappropriate Extinguishing Media: Straight Streams of Water

FIRE FIGHTING

Fire Fighting Instructions: Evacuate area. Prevent runoff from fire control or dilution from entering streams, sewers, or drinking water supply. Firefighters should use standard protective equipment and in enclosed spaces, self-contained breathing apparatus (SCBA). Use water spray to cool fire exposed surfaces and to protect personnel.

Unusual Fire Hazards: Pressurized mists may form a flammable mixture.

Hazardous Combustion Products: Smoke, Fume, Aldehydes, Sulfur Oxides, Incomplete combustion products, Oxides of carbon

FLAMMABILITY PROPERTIES

Flash Point [Method]: >218C (424F) [ASTM D-92]
Flammable Limits (Approximate volume % in air): LEL: 0.9 UEL: 7.0
Autoignition Temperature: N/D

SECTION 6 ACCIDENTAL RELEASE MEASURES

NOTIFICATION PROCEDURES

In the event of a spill or accidental release, notify relevant authorities in accordance with all applicable regulations. US regulations require reporting releases of this material to the environment which exceed the applicable reportable quantity or oil spills which could reach any waterway including intermittent dry creeks. Th National Response Center can be reached at (800)424-8802.

SPILL MANAGEMENT

Land Spill: Stop leak if you can do it without risk. Recover by pumping or with suitable absorbent.

Water Spill: Stop leak if you can do it without risk. Confine the spill immediately with booms. Warn other shipping. Remove from the surface by skimming or with suitable absorbents. Seek the advice of a specialist before using dispersants.

Water spill and land spill recommendations are based on the most likely spill scenario for this material; however, geographic conditions, wind, temperature, (and in the case of a water spill) wave and current direction and speed may greatly influence the appropriate action to be taken. For this reason, local experts should be consulted. Note: Local regulations may prescribe or limit action to be taken.

ENVIRONMENTAL PRECAUTIONS

Large Spills: Dike far ahead of liquid spill for later recovery and disposal. Prevent entry into waterways, sewers, basements or confined areas.

SECTION 7 HANDLING AND STORAGE

HANDLING

Prevent small spills and leakage to avoid slip hazard.

Static Accumulator: This material is a static accumulator.

STORAGE

Do not store in open or unlabelled containers.

SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure limits/standards for materials that can be formed when handling this product: When mists / aerosols can occur, the following are recommended: 5 mg/m³ - ACGIH TLV, 10 mg/m³ - ACGIH STEL, 5 mg/m³ - OSHA PEL.

NOTE: Limits/standards shown for guidance only. Follow applicable regulations.

ENGINEERING CONTROLS

The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Control measures to consider:

No special requirements under ordinary conditions of use and with adequate ventilation.

PERSONAL PROTECTION

Personal protective equipment selections vary based on potential exposure conditions such as applications, handling practices, concentration and ventilation. Information on the selection of protective equipment for use with this material, as provided below, is based upon intended, normal usage.

Respiratory Protection: If engineering controls do not maintain airborne contaminant concentrations at a level which is adequate to protect worker health, an approved respirator may be appropriate. Respirator selection, use, and maintenance must be in accordance with regulatory requirements, if applicable. Types of respirators to be considered for this material include:

No special requirements under ordinary conditions of use and with adequate ventilation.

For high airborne concentrations, use an approved supplied-air respirator, operated in positive pressure mode. Supplied air respirators with an escape bottle may be appropriate when oxygen levels are inadequate, gas/vapor warning properties are poor, or if air purifying filter capacity/rating may be exceeded.

Hand Protection: Any specific glove information provided is based on published literature and glove manufacturer data. Glove suitability and breakthrough time will differ depending on the specific use conditions. Contact the glove manufacturer for specific advice on glove selection and breakthrough times for your use conditions. Inspect and replace worn or damaged gloves. The types of gloves to be considered for this material include:

No protection is ordinarily required under normal conditions of use.

Eye Protection: If contact is likely, safety glasses with side shields are recommended.

Skin and Body Protection: Any specific clothing information provided is based on published literature or manufacturer data. The types of clothing to be considered for this material include:

No skin protection is ordinarily required under normal conditions of use. In accordance with good industrial hygiene practices, precautions should be taken to avoid skin contact.

Specific Hygiene Measures: Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Discard contaminated clothing and footwear that cannot be cleaned. Practice good housekeeping.

ENVIRONMENTAL CONTROLS

See Sections 6, 7, 12, 13.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Typical physical and chemical properties are given below. Consult the Supplier in Section 1 for additional data.

GENERAL INFORMATION

Physical State: Liquid
Color: Amber
Odor: Characteristic
Odor Threshold: N/D

IMPORTANT HEALTH, SAFETY, AND ENVIRONMENTAL INFORMATION

Relative Density (at 15 C): 0.882
Flash Point [Method]: >218C (424F) [ASTM D-92]
Flammable Limits (Approximate volume % in air): LEL: 0.9 UEL: 7.0
Autoignition Temperature: N/D
Boiling Point / Range: > 316C (600F)
Vapor Density (Air = 1): > 2 at 101 kPa
Vapor Pressure: < 0.013 kPa (0.1 mm Hg) at 20 C

Evaporation Rate (N-Butyl Acetate = 1): N/D
pH: N/A
Log Pow (n-Octanol/Water Partition Coefficient): > 3.5
Solubility in Water: Negligible
Viscosity: 68 cSt (68 mm²/sec) at 40 C | 8.5 cSt (8.5 mm²/sec) at 100C
Oxidizing Properties: See Sections 3, 15, 16.

OTHER INFORMATION

Freezing Point: N/D
Melting Point: N/A
Pour Point: -12°C (10°F)
DMSO Extract (mineral oil only), IP-346: < 3 %wt

SECTION 10 STABILITY AND REACTIVITY

STABILITY: Material is stable under normal conditions.

CONDITIONS TO AVOID: Excessive heat. High energy sources of ignition.

MATERIALS TO AVOID: Strong oxidizers

HAZARDOUS DECOMPOSITION PRODUCTS: Material does not decompose at ambient temperatures.

HAZARDOUS POLYMERIZATION: Will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

ACUTE TOXICITY

Route of Exposure	Conclusion / Remarks
Inhalation	
Toxicity (Rat): LC50 > 5000 mg/m³	Minimally Toxic. Based on assessment of the components.
Irritation: No end point data.	Negligible hazard at ambient/normal handling temperatures. Based on assessment of the components.
Ingestion	
Toxicity (Rat): LD50 > 5000 mg/kg	Minimally Toxic. Based on test data for structurally similar materials.
Skin	
Toxicity (Rabbit): LD50 > 5000 mg/kg	Minimally Toxic. Based on test data for structurally similar materials.
Irritation (Rabbit): Data available.	Negligible irritation to skin at ambient temperatures. Based on assessment of the components.
Eye	
Irritation (Rabbit): Data available.	May cause mild, short-lasting discomfort to eyes. Based on assessment of the components.

CHRONIC/OTHER EFFECTS

Contains:

Base oil severely refined: Not carcinogenic in animal studies. Representative material passes IP-346, Modified Ames test, and/or other screening tests. Dermal and inhalation studies showed minimal effects; lung non-specific infiltration of immune cells, oil deposition and minimal granuloma formation. Not sensitizing in test

animals.

Additional information is available by request.

The following ingredients are cited on the lists below: None.

--REGULATORY LISTS SEARCHED--

1 = NTP CARC	3 = IARC 1	5 = IARC 2B
2 = NTP SUS	4 = IARC 2A	6 = OSHA CARC

SECTION 12 ECOLOGICAL INFORMATION

The information given is based on data available for the material, the components of the material, and similar materials.

ECOTOXICITY

Material -- Not expected to be harmful to aquatic organisms.

MOBILITY

Base oil component -- Low solubility and floats and is expected to migrate from water to the land. Expected to partition to sediment and wastewater solids.

PERSISTENCE AND DEGRADABILITY

Biodegradation:

Base oil component -- Expected to be inherently biodegradable

BIOACCUMULATION POTENTIAL

Base oil component -- Has the potential to bioaccumulate, however metabolism or physical properties may reduce the bioconcentration or limit bioavailability.

SECTION 13 DISPOSAL CONSIDERATIONS

Disposal recommendations based on material as supplied. Disposal must be in accordance with current applicable laws and regulations, and material characteristics at time of disposal.

DISPOSAL RECOMMENDATIONS

Product is suitable for burning in an enclosed controlled burner for fuel value or disposal by supervised incineration at very high temperatures to prevent formation of undesirable combustion products.

REGULATORY DISPOSAL INFORMATION

RCRA Information: The unused product, in our opinion, is not specifically listed by the EPA as a hazardous waste (40 CFR, Part 261D), nor is it formulated to contain materials which are listed as hazardous wastes. It does not exhibit the hazardous characteristics of ignitability, corrositivity or reactivity and is not formulated with contaminants as determined by the Toxicity Characteristic Leaching Procedure (TCLP). However, used product may be regulated.

Empty Container Warning Empty Container Warning (where applicable): Empty containers may contain residue and

can be dangerous. Do not attempt to refill or clean containers without proper instructions. Empty drums should be completely drained and safely stored until appropriately reconditioned or disposed. Empty containers should be taken for recycling, recovery, or disposal through suitably qualified or licensed contractor and in accordance with governmental regulations. DO NOT PRESSURISE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND, OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION. THEY MAY EXPLODE AND CAUSE INJURY OR DEATH.

SECTION 14 TRANSPORT INFORMATION

LAND (DOT) : Not Regulated for Land Transport

LAND (TDG) : Not Regulated for Land Transport

SEA (IMDG) : Not Regulated for Sea Transport according to IMDG-Code

AIR (IATA) : Not Regulated for Air Transport

SECTION 15 REGULATORY INFORMATION

OSHA HAZARD COMMUNICATION STANDARD: When used for its intended purposes, this material is not classified as hazardous in accordance with OSHA 29 CFR 1910.1200.

NATIONAL CHEMICAL INVENTORY LISTING: AICS, IECSC, DSL, EINECS, KECI, PICCS, TSCA
Special Cases:

Inventory	Status
ENCS	Restrictions Apply

EPCRA: This material contains no extremely hazardous substances.

SARA (311/312) REPORTABLE HAZARD CATEGORIES: None.

SARA (313) TOXIC RELEASE INVENTORY: This material contains no chemicals subject to the supplier notification requirements of the SARA 313 Toxic Release Program.

The following ingredients are cited on the lists below: None.

--REGULATORY LISTS SEARCHED--

1 = ACGIH ALL	6 = TSCA 5a2	11 = CA P65 REPRO	16 = MN RTK
2 = ACGIH A1	7 = TSCA 5e	12 = CA RTK	17 = NJ RTK
3 = ACGIH A2	8 = TSCA 6	13 = IL RTK	18 = PA RTK
4 = OSHA Z	9 = TSCA 12b	14 = LA RTK	19 = RI RTK
5 = TSCA 4	10 = CA P65 CARC	15 = MI 293	

Code key: CARC=Carcinogen; REPRO=Reproductive

SECTION 16 OTHER INFORMATION

N/D = Not determined, N/A = Not applicable

THIS SAFETY DATA SHEET CONTAINS THE FOLLOWING REVISIONS:
No revision information is available.

The information and recommendations contained herein are, to the best of ExxonMobil's knowledge and belief, accurate and reliable as of the date issued. You can contact ExxonMobil to insure that this document is the most current available from ExxonMobil. The information and recommendations are offered for the user's consideration and examination. It is the user's responsibility to satisfy itself that the product is suitable for the intended use. If buyer repackages this product, it is the user's responsibility to insure proper health, safety and other necessary information is included with and/or on the container. Appropriate warnings and safe-handling procedures should be provided to handlers and users. Alteration of this document is strictly prohibited. Except to the extent required by law, re-publication or retransmission of this document, in whole or in part, is not permitted. The term, "ExxonMobil" is used for convenience, and may include any one or more of ExxonMobil Chemical Company, Exxon Mobil Corporation, or any affiliates in which they directly or indirectly hold any interest.

Internal Use Only
MHC: 0B, 0B, 0, 0, 0, 0 PPEC: A

DGN: 2006835XUS (1013233)

Copyright 2002 Exxon Mobil Corporation, All rights reserved

MATERIAL SAFETY DATA SHEET

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

PRODUCT

Product Name: **MOBIL HEAVY DUTY SCA PRECHARGED COOLANT/ANTIFREEZE**
Product Description: Glycol
Product Code: 351010101594, 840405, 97AA94
Intended Use: Antifreeze/coolant

COMPANY IDENTIFICATION

Supplier: **EXXON MOBIL CORPORATION**
3225 GALLOWS RD.
FAIRFAX, VA. 22037 USA

24 Hour Health Emergency	609-737-4411
Transportation Emergency Phone	800-424-9300
ExxonMobil Transportation No.	281-834-3296
Product Technical Information	800-662-4525, 800-947-9147
MSDS Internet Address	http://www.exxon.com, http://www.mobil.com

SECTION 2 COMPOSITION / INFORMATION ON INGREDIENTS

Reportable Hazardous Substance(s) or Complex Substance(s)

Name	CAS#	Concentration*
Diethylene Glycol	111-46-6	1 - 5%
Ethylene Glycol	107-21-1	90 - 100%

* All concentrations are percent by weight unless material is a gas. Gas concentrations are in percent by volume.

SECTION 3 HAZARDS IDENTIFICATION

This material is considered to be hazardous according to regulatory guidelines (see (M)SDS Section 15).

POTENTIAL HEALTH EFFECTS

May cause harm to the unborn child. Harmful or fatal if swallowed. May cause kidney failure and central nervous system effects if ingested. Prolonged exposure to elevated concentrations of mists or liquids may cause irritation to skin, eyes, and the respiratory tract Excessive exposure may result in eye, skin, or respiratory irritation. High-pressure injection under skin may cause serious damage.

Target Organs: Kidney | Reproductive system |

NFPA Hazard ID:	Health:	1	Flammability:	1	Reactivity:	0
HMIS Hazard ID:	Health:	2*	Flammability:	1	Reactivity:	0

NOTE: This material should not be used for any other purpose than the intended use in Section 1 without expert advice. Health studies have shown that chemical exposure may cause potential human health risks which may vary from person

to person.

SECTION 4 FIRST AID MEASURES

Inhalation

Remove from further exposure. For those providing assistance, avoid exposure to yourself or others. Use adequate respiratory protection. If respiratory irritation, dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance. If breathing has stopped, assist ventilation with a mechanical device or use mouth-to-mouth resuscitation.

SKIN CONTACT

Wash contact areas with soap and water. If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

EYE CONTACT

Flush thoroughly with water. If irritation occurs, get medical assistance.

Ingestion

Seek immediate medical attention.

NOTE TO PHYSICIAN

This product contains ethylene glycol and/or diethylene glycol which, if ingested, are metabolized to toxic metabolites by the enzyme alcohol dehydrogenase, for which ethanol and 4-methylpyrazole {U.S. drug name Fomepizole, trade name Antizol} are antagonists. Administration of oral or intravenous ethanol or intravenous 4-methylpyrazole may arrest further metabolism of this material and thereby ameliorate the toxicity. Use of ethanol or 4-methylpyrazole does not affect toxic metabolites that are already present and is not a substitute for hemodialysis.

SECTION 5 FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA

Appropriate Extinguishing Media: Use water fog, alcohol-resistant foam, dry chemical or carbon dioxide (CO_2) to extinguish flames.

Inappropriate Extinguishing Media: Straight Streams of Water or Regular Foam

FIRE FIGHTING

Fire Fighting Instructions: Evacuate area. Prevent runoff from fire control or dilution from entering streams, sewers, or drinking water supply. Firefighters should use standard protective equipment and in enclosed spaces, self-contained breathing apparatus (SCBA). Use water spray to cool fire exposed surfaces and to protect personnel.

Unusual Fire Hazards: Hazardous material. Firefighters should consider protective equipment indicated in Section 8.

Hazardous Combustion Products: Smoke, Fume, Aldehydes, Incomplete combustion products, Oxides of carbon

FLAMMABILITY PROPERTIES

Flash Point [Method]: 119C (246F) [Setaflash Closed Cup]
Flammable Limits (Approximate volume % in air): LEL: 3.2 UEL: 15.3
Autoignition Temperature: >371°C (700°F)

SECTION 6 ACCIDENTAL RELEASE MEASURES

Notification Procedures

In the event of a spill or accidental release, notify relevant authorities in accordance with all applicable regulations. US regulations require reporting releases of this material to the environment which exceed the applicable reportable quantity or oil spills which could reach any waterway including intermittent dry creeks. The National Response Center can be reached at (800)424-8802.

PROTECTIVE MEASURES

Avoid contact with spilled material. Warn or evacuate occupants in surrounding and downwind areas if required due to toxicity or flammability of the material. See Section 5 for fire fighting information. See the Hazard Identification Section for Significant Hazards. See Section 4 for First Aid Advice. See Section 8 for Personal Protective Equipment.

SPILL MANAGEMENT

Land Spill: Stop leak if you can do it without risk. Do not touch or walk through spilled material. Small Spills: Absorb with earth, sand or other non-combustible material and transfer to containers for later disposal. Recover by pumping or with suitable absorbent.

Water Spill: Stop leak if you can do it without risk. Consult an expert. Warn other shipping. Material will sink. Remove material, as much as possible, using mechanical equipment.

Water spill and land spill recommendations are based on the most likely spill scenario for this material; however, geographic conditions, wind, temperature, (and in the case of a water spill) wave and current direction and speed may greatly influence the appropriate action to be taken. For this reason, local experts should be consulted. Note: Local regulations may prescribe or limit action to be taken.

ENVIRONMENTAL PRECAUTIONS

Remove debris in path of spill and remove contaminated debris from shoreline and water surface and dispose of according to local regulations. Large Spills: Dike far ahead of liquid spill for later recovery and disposal. Prevent entry into waterways, sewers, basements or confined areas.

SECTION 7 HANDLING AND STORAGE

HANDLING

Avoid breathing mists or vapors. Avoid contact with skin. Prevent small spills and leakage to avoid slip hazard.

Static Accumulator: This material is not a static accumulator.

STORAGE

Do not store in open or unlabelled containers.

SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE LIMIT VALUES

Exposure limits/standards (Note: Exposure limits are not additive)

Source	Form	Limit / Standard			NOTE	Source
Diethylene Glycol		TWA	10 mg/m3		N/A	AIHA WEEL
Ethylene Glycol	Aerosol.	Ceiling	100 mg/m3		N/A	ACGIH

NOTE: Limits/standards shown for guidance only. Follow applicable regulations.

ENGINEERING CONTROLS

The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Control measures to consider:

No special requirements under ordinary conditions of use and with adequate ventilation.

Personal Protection

Personal protective equipment selections vary based on potential exposure conditions such as applications, handling practices, concentration and ventilation. Information on the selection of protective equipment for us with this material, as provided below, is based upon intended, normal usage.

Respiratory Protection: If engineering controls do not maintain airborne contaminant concentrations at a level which is adequate to protect worker health, an approved respirator may be appropriate. Respirator selection, use, and maintenance must be in accordance with regulatory requirements, if applicable. Types of respirators to be considered for this material include:

No protection is ordinarily required under normal conditions of use and with adequate ventilation.

For high airborne concentrations, use an approved supplied-air respirator, operated in positive pressure mode. Supplied air respirators with an escape bottle may be appropriate when oxygen levels are inadequate, gas/vapor warning properties are poor, or if air purifying filter capacity/rating may be exceeded.

Hand Protection: Any specific glove information provided is based on published literature and glove manufacturer data. Glove suitability and breakthrough time will differ depending on the specific use conditions. Contact the glove manufacturer for specific advice on glove selection and breakthrough times for your use conditions. Inspect and replace worn or damaged gloves. The types of gloves to be considered for this material include:

If prolonged or repeated contact is likely, chemical resistant gloves are recommended. If contact with forearms is likely, wear gauntlet style gloves.

Eye Protection: If contact is likely, safety glasses with side shields are recommended.

Skin and Body Protection: Any specific clothing information provided is based on published literature or manufacturer data. The types of clothing to be considered for this material include:

If prolonged or repeated contact is likely, chemical, and oil resistant clothing is recommended.

Specific Hygiene Measures: Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective

equipment to remove contaminants. Discard contaminated clothing and footwear that cannot be cleaned. Practice good housekeeping.

ENVIRONMENTAL CONTROLS

See Sections 6, 7, 12, 13.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Typical physical and chemical properties are given below. Consult the Supplier in Section 1 for additional data.

GENERAL INFORMATION

Physical State: Liquid
Color: pink
Odor: Characteristic
Odor Threshold: N/D

IMPORTANT HEALTH, SAFETY, AND ENVIRONMENTAL INFORMATION

Relative Density (at 15 C): 1.115
Flash Point [Method]: 119C (246F) [Setaflash Closed Cup]
Flammable Limits (Approximate volume % in air): LEL: 3.2 UEL: 15.3
Autoignition Temperature: >371°C (700°F)
Boiling Point / Range: 171C (340F) - 175C (347F)
Vapor Density (Air = 1): 2.1 at 101 kPa [n-Butyl Acetate]
Vapor Pressure: < 0.013 kPa (0.1 mm Hg) at 20 C
Evaporation Rate (N-Butyl Acetate = 1): N/D
pH: 6 [Estimated]
Log Pow (n-Octanol/Water Partition Coefficient): < 2
Solubility in Water: Complete
Viscosity: <15.6 cSt (15.6 mm^2/sec) at 40 C
Oxidizing Properties: See Hazards Identification Section.

OTHER INFORMATION

Freezing Point: -18°C (0°F)
Melting Point: N/D

SECTION 10 STABILITY AND REACTIVITY

STABILITY: Material is stable under normal conditions.

CONDITIONS TO AVOID: Excessive heat. High energy sources of ignition.

MATERIALS TO AVOID: Strong oxidizers, Strong Acids

HAZARDOUS DECOMPOSITION PRODUCTS: Material does not decompose at ambient temperatures.

HAZARDOUS POLYMERIZATION: Will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

ACUTE TOXICITY

Route of Exposure	Conclusion / Remarks
Inhalation	
Toxicity (Rat): LC50 > 5000 mg/m³	Minimally Toxic. Based on test data for structurally similar materials.
Irritation: Data available.	Negligible hazard at ambient/normal handling temperatures. Based on test data for structurally similar materials.
Ingestion	
Toxicity (Human): LDLo 100 ml	Moderately toxic. Based on test data for structurally similar materials.
Skin	
Toxicity (Rabbit): LD50 > 2000 mg/kg	Minimally Toxic. Based on test data for structurally similar materials.
Irritation (Rabbit): Data available.	Negligible irritation to skin at ambient temperatures. Based on test data for structurally similar materials.
Eye	
Irritation (Rabbit): Data available.	May cause mild, short-lasting discomfort to eyes. Based on test data for structurally similar materials.

CHRONIC/OTHER EFFECTS

Contains:

DIETHYLENE GLYCOL (DEG): Orally, DEG is more toxic to humans than animal test data indicate. Probable lethal dose for an adult is about 50 ml (2 oz.), or 2 -3 swallows. Smaller amounts may cause kidney degenerati and failure. Benign urinary bladder tumors were observed in rats, no tumors were observed in mice.
ETHYLENE GLYCOL (EG): Repeated high oral exposure has caused kidney damage, neurological effects, degeneration of the liver and changes in blood chemistry and circulating blood cells in laboratory animals. Repeated overexposure has the potential to cause similar toxic effects in humans. EG causes developmental and reproductive effects at high dose levels in laboratory animals. The relevance of these findings to humans is uncertain.

Additional information is available by request.

The following ingredients are cited on the lists below: None.

--REGULATORY LISTS SEARCHED--

1 = NTP CARC	3 = IARC 1	5 = IARC 2B
2 = NTP SUS	4 = IARC 2A	6 = OSHA CARC

SECTION 12 ECOLOGICAL INFORMATION

The information given is based on data available for the material, the components of the material, and similar materials.

ECOTOXICITY

Material -- Not expected to be harmful to aquatic organisms.

MOBILITY

Material -- Expected to remain in water or migrate through soil.

PERSISTENCE AND DEGRADABILITY

Biodegradation:
Material -- Expected to be readily biodegradable.
Atmospheric Oxidation:
Material -- Expected to degrade rapidly in air

BIOACCUMULATION POTENTIAL
Material -- Potential to bioaccumulate is low.

SECTION 13 DISPOSAL CONSIDERATIONS

Disposal recommendations based on material as supplied. Disposal must be in accordance with current applicable laws and regulations, and material characteristics at time of disposal.

DISPOSAL RECOMMENDATIONS
Even though this product is biodegradable, it must not be indiscriminately discarded into the environment. Product is suitable for burning in an enclosed controlled burner for fuel value or disposal by supervised incineration at very high temperatures to prevent formation of undesirable combustion products.

REGULATORY DISPOSAL INFORMATION
RCRA Information: The unused product, in our opinion, is not specifically listed by the EPA as a hazardous waste (40 CFR, Part 261D), nor is it formulated to contain materials which are listed as hazardous wastes. It does not exhibit the hazardous characteristics of ignitability, corrositivity or reactivity and is not formulated with contaminants as determined by the Toxicity Characteristic Leaching Procedure (TCLP). However, used product may be regulated.

Empty Container Warning Empty Container Warning (where applicable): Empty containers may contain residue and can be dangerous. Do not attempt to refill or clean containers without proper instructions. Empty drums should be completely drained and safely stored until appropriately reconditioned or disposed. Empty containers should be taken for recycling, recovery, or disposal through suitably qualified or licensed contractor and in accordance with governmental regulations. DO NOT PRESSURISE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND, OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION. THEY MAY EXPLODE AND CAUSE INJURY OR DEATH.

SECTION 14 TRANSPORT INFORMATION

LAND (DOT)
Proper Shipping Name: ENVIRONMENTALLY HAZARDOUS SUBSTANCES, LIQUID, N.O.S. (Ethylene Glycol)
Hazard Class & Division: 9
ID Number: 3082
Packing Group: III
Product RQ: 5263.16 lbs - Ethylene Glycol
ERG Number: 171
Label(s): 9
Transport Document Name: UN3082, ENVIRONMENTALLY HAZARDOUS SUBSTANCES, LIQUID, N.O.S. (Ethylene Glycol), 9, PG III, RQ

Footnote: This material is not regulated under 49 CFR when the quantity in a package is less than the Product RQ.

LAND (TDG): Not Regulated for Land Transport

SEA (IMDG): Not Regulated for Sea Transport according to IMDG-Code

AIR (IATA): Not Regulated for Air Transport

SECTION 15 REGULATORY INFORMATION

OSHA HAZARD COMMUNICATION STANDARD: When used for its intended purpose, this material is classified as hazardous in accordance with OSHA 29CFR 1910.1200.

NATIONAL CHEMICAL INVENTORY LISTING: AICS, DSL, EINECS, ENCS, KECI, PICCS, TSCA

EPCRA: This material contains no extremely hazardous substances.

CERCLA:

Chemical Name	CAS Number	Typical Value	Component RQ	Product RQ
Ethylene Glycol	107-21-1	90 - 100%	5000 lbs	5263.16 lbs

SARA (311/312) REPORTABLE HAZARD CATEGORIES: Immediate Health. Delayed Health.

SARA (313) TOXIC RELEASE INVENTORY:

Chemical Name	CAS Number	Typical Value
Ethylene Glycol	107-21-1	90 - 100%

The following ingredients are cited on the lists below:

Chemical Name	CAS Number	List Citations
Diethylene Glycol	111-46-6	16, 18, 19
Ethylene Glycol	107-21-1	1, 13, 16, 17, 18, 19

--REGULATORY LISTS SEARCHED--

1 = ACGIH ALL	6 = TSCA 5a2	11 = CA P65 REPRO	16 = MN RTK
2 = ACGIH A1	7 = TSCA 5e	12 = CA RTK	17 = NJ RTK
3 = ACGIH A2	8 = TSCA 6	13 = IL RTK	18 = PA RTK
4 = OSHA Z	9 = TSCA 12b	14 = LA RTK	19 = RI RTK
5 = TSCA 4	10 = CA P65 CARC	15 = MI 293	

Code key: CARC=Carcinogen; REPRO=Reproductive

SECTION 16 OTHER INFORMATION

N/D = Not determined, N/A = Not applicable

THIS SAFETY DATA SHEET CONTAINS THE FOLLOWING REVISIONS:
Revision Changes:
Section 06: Notification Procedures - Header was modified.
Section 08: Personal Protection - Header was modified.
Section 06: Accidental Release - Spill Management - Land was modified.
Section 14: Sea (IMDG) - Header was modified.
Section 14: Air (IATA) - Header was modified.
Section 14: LAND (TDG) - Header was modified.
Section 14: LAND (TDG) Default was modified.
Section 14: Sea (IMDG) - Default was modified.
Section 14: Air (IATA) - Default was modified.
Section 16: Land Spill was modified.
Section 09: Oxidizing Properties was modified.
Section 14: DOT Footnote was added.

PRECAUTIONARY LABEL TEXT:
Contains: Ethylene Glycol
DANGER!
HEALTH HAZARDS
May cause harm to the unborn child. Harmful or fatal if swallowed.
Target Organs: Kidney | Reproductive system |

FIRST AID
Inhalation: Remove from further exposure. For those providing assistance, avoid exposure to yourself or others. Use adequate respiratory protection. If respiratory irritation, dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance. If breathing has stopped, assist ventilation with a mechanical device or use mouth-to-mouth resuscitation.

Eye: Flush thoroughly with water. If irritation occurs, get medical assistance.

Oral: Seek immediate medical attention.

Skin: Wash contact areas with soap and water. If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

FIRE FIGHTING MEDIA
Use water fog, alcohol-resistant foam, dry chemical or carbon dioxide (CO_2) to extinguish flames.

SPILL/LEAK
Land Spill: Stop leak if you can do it without risk. Small Spills: Absorb with earth, sand or other non-combustible material and transfer to containers for later disposal. Recover by pumping or with suitable absorbent. Do not touch or walk through spilled material.

Water Spill: Stop leak if you can do it without risk. Report spills as required to appropriate authorities. Material will sink. This product emulsifies, disperses or is miscible in water. Consult an expert.

The information and recommendations contained herein are, to the best of ExxonMobil's knowledge and belief, accurate and reliable as of the date issued. You can contact ExxonMobil to insure that this document is the most current available

from ExxonMobil. The information and recommendations are offered for the user's consideration and examination. It is the user's responsibility to satisfy itself that the product is suitable for the intended use. If buyer repackages this product, it is the user's responsibility to insure proper health, safety and other necessary information is included with and/or on the container. Appropriate warnings and safe-handling procedures should be provided to handlers and users. Alteration of this document is strictly prohibited. Except to the extent required by law, re-publication or retransmission of this document, in whole or in part, is not permitted. The term, "ExxonMobil" is used for convenience, and may include any one or more of ExxonMobil Chemical Company, Exxon Mobil Corporation, or any affiliates in which they directly or indirectly hold any interest.

Internal Use Only
MHC: 2, 0, 0, 0, 0, 0 PPEC: C

DGN: 7074335XUS (1011502)

Copyright 2002 Exxon Mobil Corporation, All rights reserved

MATERIAL SAFETY DATA SHEET

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

PRODUCT

Product Name: **MOBIL DELVAC SYNTHETIC TRANSMISSION FLUID 50**
Product Description: Synthetic Base Stocks and Additives
Product Code: 20152010E010, 511600-00, 97AC48
Intended Use: Manual transmission fluid

COMPANY IDENTIFICATION

Supplier: **EXXON MOBIL CORPORATION**
3225 GALLOWS RD.
FAIRFAX, VA. 22037 USA

24 Hour Health Emergency	609-737-4411
Transportation Emergency Phone	800-424-9300
ExxonMobil Transportation No.	281-834-3296
Product Technical Information	800-662-4525, 800-947-9147
MSDS Internet Address	http://www.exxon.com, http://www.mobil.com

SECTION 2 COMPOSITION / INFORMATION ON INGREDIENTS

Reportable Hazardous Substance(s) or Complex Substance(s)

Name	CAS#	Concentration*
AMINES, C11-14 BRANCHED ALKYL MONOHEXYL AND DIHEXYL PHOSPHATES	80939-62-4	1 - 5%
DIISODECYL ADIPATE	27178-16-1	20 - 30%

* All concentrations are percent by weight unless material is a gas. Gas concentrations are in percent by volume.

SECTION 3 HAZARDS IDENTIFICATION

This material is not considered to be hazardous according to regulatory guidelines (see (M)SDS Section 15).

POTENTIAL HEALTH EFFECTS

Low order of toxicity. Excessive exposure may result in eye, skin, or respiratory irritation. High-pressure injection under skin may cause serious damage.

ENVIRONMENTAL HAZARDS

Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

NFPA Hazard ID:	Health:	0	Flammability:	1	Reactivity:	0
HMIS Hazard ID:	Health:	0	Flammability:	1	Reactivity:	0

NOTE: This material should not be used for any other purpose than the intended use in Section 1 without expert advice. Health studies have shown that chemical exposure may cause potential human health risks which may vary from person to person.

SECTION 4 FIRST AID MEASURES

Inhalation

Remove from further exposure. For those providing assistance, avoid exposure to yourself or others. Use adequate respiratory protection. If respiratory irritation, dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance. If breathing has stopped, assist ventilation with a mechanical device or use mouth-to-mouth resuscitation.

SKIN CONTACT

Wash contact areas with soap and water. Remove contaminated clothing. Launder contaminated clothing before reuse. If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

EYE CONTACT

Flush thoroughly with water. If irritation occurs, get medical assistance.

Ingestion

First aid is normally not required. Seek medical attention if discomfort occurs.

SECTION 5 FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA

Appropriate Extinguishing Media: Use water fog, foam, dry chemical or carbon dioxide (CO2) to extinguish flames.

Inappropriate Extinguishing Media: Straight Streams of Water

FIRE FIGHTING

Fire Fighting Instructions: Evacuate area. Prevent runoff from fire control or dilution from entering streams, sewers, or drinking water supply. Firefighters should use standard protective equipment and in enclosed spaces, self-contained breathing apparatus (SCBA). Use water spray to cool fire exposed surfaces and to protect personnel.

Hazardous Combustion Products: Smoke, Fume, Aldehydes, Sulfur Oxides, Incomplete combustion products, Oxides of carbon

FLAMMABILITY PROPERTIES

Flash Point [Method]: >190C (374F) [ASTM D-92]
Flammable Limits (Approximate volume % in air): LEL: 0.9 UEL: 7.0
Autoignition Temperature: N/D

SECTION 6 ACCIDENTAL RELEASE MEASURES

NOTIFICATION PROCEDURES

In the event of a spill or accidental release, notify relevant authorities in accordance with all applicable regulations. US regulations require reporting releases of this material to the environment which exceed the applicable reportable quantity or oil spills which could reach any waterway including intermittent dry creeks. The National Response Center can be reached at (800)424-8802.

SPILL MANAGEMENT

Land Spill: Stop leak if you can do it without risk. Recover by pumping or with suitable absorbent.

Water Spill: Stop leak if you can do it without risk. Confine the spill immediately with booms. Warn other shipping. Remove from the surface by skimming or with suitable absorbents. Seek the advice of a specialist before using dispersants.

Water spill and land spill recommendations are based on the most likely spill scenario for this material; however, geographic conditions, wind, temperature, (and in the case of a water spill) wave and current direction and speed may greatly influence the appropriate action to be taken. For this reason, local experts should be consulted. Note: Local regulations may prescribe or limit action to be taken.

ENVIRONMENTAL PRECAUTIONS

Large Spills: Dike far ahead of liquid spill for later recovery and disposal. Prevent entry into waterways, sewers, basements or confined areas.

SECTION 7 HANDLING AND STORAGE

HANDLING

Avoid all personal contact. Prevent small spills and leakage to avoid slip hazard.

Static Accumulator: This material is a static accumulator.

STORAGE

Do not store in open or unlabelled containers.

SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE LIMIT VALUES

Exposure limits/standards (Note: Exposure limits are not additive)

Source	Form	Limit / Standard			NOTE	Source
DIISODECYL ADIPATE		TWA	5 mg/m3		N/A	ExxonMobil

Exposure limits/standards for materials that can be formed when handling this product: When mists / aerosols can occur, the following are recommended: 5 mg/m³ - ACGIH TLV, 10 mg/m³ - ACGIH STEL, 5 mg/m³ - OSHA PEL.

NOTE: Limits/standards shown for guidance only. Follow applicable regulations.

ENGINEERING CONTROLS

The level of protection and types of controls necessary will vary depending upon potential exposure conditions.

Control measures to consider:
No special requirements under ordinary conditions of use and with adequate ventilation.

PERSONAL PROTECTION

Personal protective equipment selections vary based on potential exposure conditions such as applications, handling practices, concentration and ventilation. Information on the selection of protective equipment for use with this material, as provided below, is based upon intended, normal usage.

Respiratory Protection: If engineering controls do not maintain airborne contaminant concentrations at a level which is adequate to protect worker health, an approved respirator may be appropriate. Respirator selection, use, and maintenance must be in accordance with regulatory requirements, if applicable. Types of respirators to be considered for this material include:
No special requirements under ordinary conditions of use and with adequate ventilation.

For high airborne concentrations, use an approved supplied-air respirator, operated in positive pressure mode. Supplied air respirators with an escape bottle may be appropriate when oxygen levels are inadequate, gas/vapor warning properties are poor, or if air purifying filter capacity/rating may be exceeded.

Hand Protection: Any specific glove information provided is based on published literature and glove manufacturer data. Glove suitability and breakthrough time will differ depending on the specific use conditions. Contact the glove manufacturer for specific advice on glove selection and breakthrough times for your use conditions. Inspect and replace worn or damaged gloves. The types of gloves to be considered for this material include:
Chemical resistant gloves are recommended.

Eye Protection: If contact is likely, safety glasses with side shields are recommended.

Skin and Body Protection: Any specific clothing information provided is based on published literature or manufacturer data. The types of clothing to be considered for this material include:
Chemical/oil resistant clothing is recommended.

Specific Hygiene Measures: Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Discard contaminated clothing and footwear that cannot be cleaned. Practice good housekeeping.

ENVIRONMENTAL CONTROLS

See Sections 6, 7, 12, 13.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Typical physical and chemical properties are given below. Consult the Supplier in Section 1 for additional data.

GENERAL INFORMATION

Physical State: Liquid
Color: Amber
Odor: Characteristic
Odor Threshold: N/D

contaminants as determined by the Toxicity Characteristic Leaching Procedure (TCLP). However, used product may be regulated.

Empty Container Warning Empty Container Warning (where applicable): Empty containers may contain residue and can be dangerous. Do not attempt to refill or clean containers without proper instructions. Empty drums should be completely drained and safely stored until appropriately reconditioned or disposed. Empty containers should be taken for recycling, recovery, or disposal through suitably qualified or licensed contractor and in accordance with governmental regulations. DO NOT PRESSURISE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND, OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION. THEY MAY EXPLODE AND CAUSE INJURY OR DEATH.

SECTION 14 TRANSPORT INFORMATION

LAND (DOT): Not Regulated for Land Transport

LAND (TDG): Not Regulated for Land Transport

SEA (IMDG): Not Regulated for Sea Transport according to IMDG-Code

AIR (IATA): Not Regulated for Air Transport

SECTION 15 REGULATORY INFORMATION

OSHA HAZARD COMMUNICATION STANDARD: When used for its intended purposes, this material is not classified as hazardous in accordance with OSHA 29 CFR 1910.1200.

NATIONAL CHEMICAL INVENTORY LISTING: AICS, IECSC, DSL, EINECS, ENCS, KECI, PICCS, TSCA

EPCRA: This material contains no extremely hazardous substances.

SARA (311/312) REPORTABLE HAZARD CATEGORIES: None.

SARA (313) TOXIC RELEASE INVENTORY: This material contains no chemicals subject to the supplier notification requirements of the SARA 313 Toxic Release Program.

The following ingredients are cited on the lists below: None.

--REGULATORY LISTS SEARCHED--

1 = ACGIH ALL	6 = TSCA 5a2	11 = CA P65 REPRO	16 = MN RTK
2 = ACGIH A1	7 = TSCA 5e	12 = CA RTK	17 = NJ RTK
3 = ACGIH A2	8 = TSCA 6	13 = IL RTK	18 = PA RTK
4 = OSHA Z	9 = TSCA 12b	14 = LA RTK	19 = RI RTK
5 = TSCA 4	10 = CA P65 CARC	15 = MI 293	

Code key: CARC=Carcinogen; REPRO=Reproductive

SECTION 16 OTHER INFORMATION

N/D = Not determined, N/A = Not applicable

THIS SAFETY DATA SHEET CONTAINS THE FOLLOWING REVISIONS:

Revision Changes:
Section 04: First Aid Inhalation - Header was modified.
Section 04: First Aid Skin was modified.
Section 04: First Aid Ingestion - Header was modified.
Section 06: Notification Procedures - Header was modified.
Section 11: Skin Irritation Conclusion was modified.
Section 10 Stability and Reactivity - Header was modified.
Section 13: Disposal Recommendations - Note was modified.
Section 09: Evaporation Rate - Header was modified.
Section 08: Personal Protection was modified.
Section 07: Handling and Storage - Handling was modified.
Section 11: Inhalation Lethality Test Data was modified.
Section 05: Hazardous Combustion Products was modified.
Section 06: Accidental Release - Spill Management - Water was modified.
Section 09: Relative Density - Header was modified.
Section 09: Viscosity was modified.
Section 09: Viscosity was modified.
Section 08: Hand Protection was modified.
Section 08: Skin and Body Protection was modified.
Section 14: Sea (IMDG) - Header was modified.
Section 14: Air (IATA) - Header was modified.
Section 14: LAND (TDG) - Header was modified.
Section 14: LAND (DOT) - Header was modified.
Section 15: List Citation Table - Header was modified.
Section 14: LAND (DOT) - Default was modified.
Section 14: LAND (TDG) Default was modified.
Section 14: Sea (IMDG) - Default was modified.
Section 14: Air (IATA) - Default was modified.
Section 15: National Chemical Inventory Listing was modified.
Section 16: Code to MHCs was modified.
Section 16: Code to PPEs was modified.
Section 08: Exposure limits/standards was modified.
Hazard Identification: OSHA - May be Hazardous Statement was modified.
Section 06: Notification Procedures was modified.
Section 11: Chronic Tox - Component was modified.
Section 09: Oxidizing Properties was modified.
Section 08: OEL Table - Notation Column - Header was modified.
Section 08: Exposure Limit Values - Header was modified.
Section 01: Company Contact Methods Sorted by Priority was modified.

The information and recommendations contained herein are, to the best of ExxonMobil's knowledge and belief, accur and reliable as of the date issued. You can contact ExxonMobil to insure that this document is the most current available from ExxonMobil. The information and recommendations are offered for the user's consideration and

IMPORTANT HEALTH, SAFETY, AND ENVIRONMENTAL INFORMATION

Relative Density (at 15 C): 0.86
Flash Point [Method]: >190C (374F) [ASTM D-92]
Flammable Limits (Approximate volume % in air): LEL: 0.9 UEL: 7.0
Autoignition Temperature: N/D
Boiling Point / Range: > 316C (600F)
Vapor Density (Air = 1): > 2 at 101 kPa
Vapor Pressure: < 0.013 kPa (0.1 mm Hg) at 20 C
Evaporation Rate (N-Butyl Acetate = 1): N/D
pH: N/A
Log Pow (n-Octanol/Water Partition Coefficient): > 3.5
Solubility in Water: Negligible
Viscosity: 132 cSt (132 mm^2/sec) at 40 C | 17.8 cSt (17.8 mm^2/sec) at 100C
Oxidizing Properties: See Hazards Identification Section.

OTHER INFORMATION

Freezing Point: N/D
Melting Point: N/A
Pour Point: -40°C (-40°F)
DMSO Extract (mineral oil only), IP-346: < 3 %wt

SECTION 10 STABILITY AND REACTIVITY

STABILITY: Material is stable under normal conditions.

CONDITIONS TO AVOID: Excessive heat. High energy sources of ignition.

MATERIALS TO AVOID: Strong oxidizers

HAZARDOUS DECOMPOSITION PRODUCTS: Material does not decompose at ambient temperatures.

HAZARDOUS POLYMERIZATION: Will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

ACUTE TOXICITY

Route of Exposure	Conclusion / Remarks
Inhalation	
Toxicity (Rat): LC50 > 5000 mg/m^3	Minimally Toxic. Based on assessment of the components.
Irritation: No end point data.	Negligible hazard at ambient/normal handling temperatures. Based on assessment of the components.
Ingestion	
Toxicity (Rat): LD50 > 2000 mg/kg	Minimally Toxic. Based on test data for structurally similar materials.
Skin	
Toxicity (Rabbit): LD50 > 2000 mg/kg	Minimally Toxic. Based on test data for structurally similar materials.
Irritation (Rabbit): Data available.	Mildly irritating to skin with prolonged exposure. Based on test data for structurally similar materials.
Eye	

Irritation (Rabbit): Data available.	May cause mild, short-lasting discomfort to eyes. Based on test data for structurally similar materials.

CHRONIC/OTHER EFFECTS

Contains:

Synthetic base oils: Not expected to cause significant health effects under conditions of normal use, based on laboratory studies with the same or similar materials. Not mutagenic or genotoxic. Not sensitizing in test animals and humans.

Phenyl-alpha-naphthylamine (PAN): Undiluted PAN is a skin sensitizer. Human testing with lubricants containing 1.0% PAN caused no reactions indicative of sensitization.

Additional information is available by request.

The following ingredients are cited on the lists below: None.

--REGULATORY LISTS SEARCHED--

1 = NTP CARC	3 = IARC 1	5 = IARC 2B
2 = NTP SUS	4 = IARC 2A	6 = OSHA CARC

SECTION 12 ECOLOGICAL INFORMATION

The information given is based on data available for the material, the components of the material, and similar materials.

ECOTOXICITY

Material -- Expected to be harmful to aquatic organisms. May cause long-term adverse effects in the aquatic environment.

MOBILITY

Base oil component -- Low solubility and floats and is expected to migrate from water to the land. Expected to partition to sediment and wastewater solids.

SECTION 13 DISPOSAL CONSIDERATIONS

Disposal recommendations based on material as supplied. Disposal must be in accordance with current applicable laws and regulations, and material characteristics at time of disposal.

DISPOSAL RECOMMENDATIONS

Product is suitable for burning in an enclosed controlled burner for fuel value or disposal by supervised incineration at very high temperatures to prevent formation of undesirable combustion products.

REGULATORY DISPOSAL INFORMATION

RCRA Information: The unused product, in our opinion, is not specifically listed by the EPA as a hazardous waste (40 CFR, Part 261D), nor is it formulated to contain materials which are listed as hazardous wastes. It does not exhibit the hazardous characteristics of ignitability, corrositivity or reactivity and is not formulated with

examination. It is the user's responsibility to satisfy itself that the product is suitable for the intended use. If buyer repackages this product, it is the user's responsibility to insure proper health, safety and other necessary information is included with and/or on the container. Appropriate warnings and safe-handling procedures should be provided to handlers and users. Alteration of this document is strictly prohibited. Except to the extent required by law, re-publication or retransmission of this document, in whole or in part, is not permitted. The term, "ExxonMobil" is used for convenience, and may include any one or more of ExxonMobil Chemical Company, Exxon Mobil Corporation, or any affiliates in which they directly or indirectly hold any interest.

Internal Use Only
MHC: 0, 0, 0, 0, 2, 0 PPEC: C

DGN: 7053375XUS (1011317)

Copyright 2002 Exxon Mobil Corporation, All rights reserved

SR 520 Evergreen Point
Floating Bridge and Landings Project

Environmental Compliance Plan
Volume III

Appendix C
Spill Prevention, Control, and Countermeasures Plan

Attachment C.4
Standard Procedures for Land-Based Fueling Operations

REVISION 2

Released for Construction

General Construction Company

Land Based Fueling Procedures

1 If a job site or fixed facility utilizes an authorized and approved stationary fuel tank it must have: double spill containment, spill kit available, collision protection (e.g. jersey barriers or ecology blocks) must follow all construction fire protection and prevention requirements and must be secured against vandalism or theft.
The following fueling procedures are mandatory.

- Equipment shall be taken to the stationary tank to be filled.
- While fueling a designated person shall be monitoring the tank to prevent overfilling at all times.
- The equipment is to be turned off. If the equipment is on wheels, it is to be chocked.

If it is not possible to move the equipment to the stationary tank to be filled, then the following is to be performed.

2 You must have a 110 gallon or smaller rated fuel tank installed in the bed of a designated job truck. This job truck is to be used to transfer the fuel from the stationary tank to the equipment. All fueling procedures apply. Any truck with a fuel tank installed shall NOT be driven off the jobsite or on a public roadway.

If it is not possible to fuel out of a designated job truck due to volume required, access, etc. then the following is to be performed.

3 Set up an authorized offsite fueling service to fuel the equipment. The fueling service must have appropriate permits, SPCC plan, and insurance.

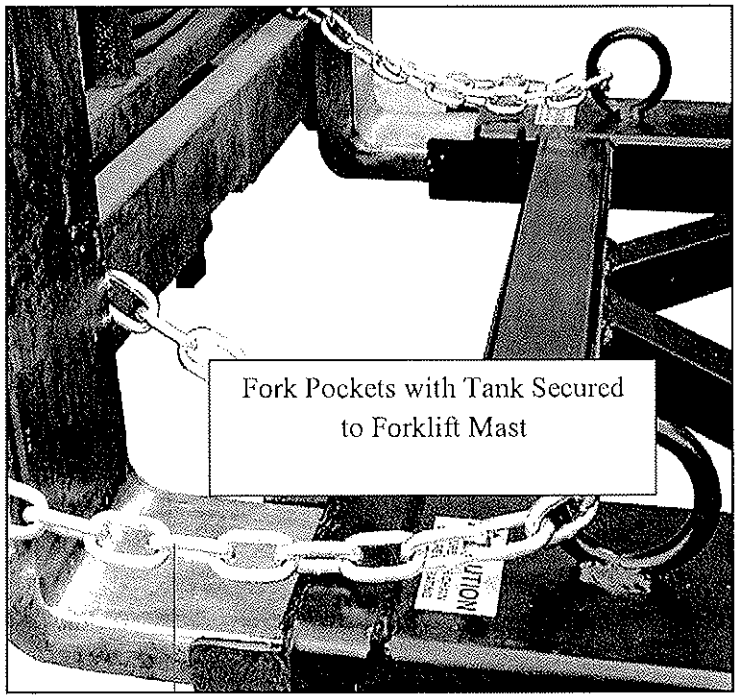
After all other resources have been exhausted then it is permissible to transport a fuel tank with a powered industrial vehicle to perform the fueling.

4 If a forklift or telehandler is used, then the following must be adhered to and addressed in a specific jobsite Job Hazard Analysis (JHA).

- The Job Sponsor or above must sign off on the operation.
- The tank shall have fork pockets or similar to prevent the tank from sliding on the forks (see photo).
- The tank must be secured to the mast of the forklift or telehandler (see photo).
- The forklift or telehandler is to only travel in 1st or "low" gear.
- The tank is to be kept as low to the ground as possible. Typically 6".
- A designated spotter will walk alongside the forklift or telehandler in clear view of the operator and the oncoming terrain so as to serve as a second set of eyes. The designated flagger is to be no closer than 15' yet no further than 25' from the forklift or telehandler. If the

operator and flagger cannot communicate with normal speaking voices, then radios shall be employed.

- When fueling, the forklift or telehandler is to be turned off, the wheels chocked, and the tank set firmly on the ground.



NOTE: *Only trained and authorized operators shall be allowed to operate any GCC powered industrial vehicles and are required to follow all safety rules as specified in Section 15 of the District Safety Manual.*

General Construction Company

PORTABLE EQUIPMENT ON FLOATING PLATFORMS FUELING PROCEDURES

(generators, light plants, forklifts, saws, compressors, etc.)

ENVIRONMENTAL GUIDELINES

Fuel, hazardous materials or any type of contaminated water should never be discharged overboard. The risk of pollution increases significantly during refueling, operation or servicing of portable equipment on floating platforms (e.g. flat deck barges, flexi-floats, derrick barges, pontoons, etc.). The following measures are designed to eliminate, minimize and mitigate the risk of a spill.

REFUELING OPERATIONS

- Use propane fueled equipment whenever possible;
- Fuel storage tanks will be double hull and properly labeled;
- Secondary containment will be placed under hose reels and protected from inclement weather;
- Stop all engines and turn off all electrical switches;
- Transferring fuel from any piece of floating equipment to another piece of floating equipment will have 100% containment with an oil boom around both pieces.; This includes the pontoons, so keep fuel tanks and equipment on the smaller construction barges to avoid having to put oil boom around such big pieces;
- Use portable spill containment berm when refueling equipment on any floating platform (e.g. flat deck barges, derrick barges, pontoons, etc.);
- Chock wheels on all rubber tired equipment;
- Use funnels when required;
- Store all hazardous materials in flam cabinet with secondary containment;
- Secure all equipment prior to fly-over and re-check immediately at destination;
- Close fuel tank vents, secure hoses and make sure nozzles are drip dried prior to fly over;
- Refueling is a two person operation. Maintain presence at all times when refueling;
- No topping off. Leave sufficient head space;
- Avoid and or minimize storage of hazardous materials on flexi-floats or take extra precautions;
- Do not store fuel or equipment on unlevel ground;
- Maintain spill kits on every floating platform at all times for instant use if needed;
- Do not prop fuel nozzles open
- Make sure gauges are working properly; Know the capacity of fuel tank;
- Inspect hoses, fittings, drip pans on all equipment;
- Wipe up drips immediately;

- Hang nozzles up;
- Be prepared and refuel periodically. Don't refuel when the rush is on.
- Third party fuel suppliers must have a spill prevention and countermeasure plan and insurance;
- All guidelines apply to our subs;
- Pay attention to surroundings. Watch out for rouge wakes or waves and inclement weather;
- Use an absorbent pad around nozzle to catch splash-backs or drips. Clean up any spilled fuel with absorbent cloths;
- Maintain nozzle contact with fill pipe;
- DO NOT use automatic stop device; DO NOT chock nozzles open;
- Make sure nozzle is dripped dried before it is removed from tank and hold nozzle upright to prevent fuel from dripping out of nozzle;
- If oil is spilt remove instantly using an absorbent pad;
- When pouring from a portable tank, use a proper funnel or spout with matching capacity;
- Store fuel in an area that is protected from inclement weather and away from water's edge;
- Never use detergents or emulsifiers to deal with oil or fuel spills;
- Used oil absorbents should be disposed of properly at approved facilities.

OPERATING EQUIPMENT

- Chock wheels on all rubber tired equipment;
- Inspect equipment read the gauges and routinely look for leaks, spills or signs of trouble (vibrations, squeals, squeaks, noise, smoke, temperature, etc.);
- Keep an eye open for trouble;
- Don't overload and take care of equipment.

SERVICING EQUIPMENT

- Follow the engine manufacturer's recommended maintenance schedule;
- Perform work over drop cloth; and under cover if raining;
- Deploy oil boom for overwater service activities;
- When servicing the engine ensure that fuel, oil and lubricants are cleaned up immediately;
- DO NOT store hoses or, parts over head or where they can't be observed.
- Never use detergents or emulsifiers to deal with oil or fuel spills.

General Construction Company

COMMERCIAL WATERCRAFT

(work skiffs and other water craft not covered under the GC SOPEP)

ENVIRONMENTAL GUIDELINES

Fuel, hazardous materials or any type of contaminated water should never be discharged overboard. The risk of pollution increases significantly during refueling, servicing or bilge pumping. The following measures are designed to eliminate, minimize and mitigate the risk of a spill.

REFUELING OPERATIONS

- Layout watercraft to prevent slip, trip and fall hazards; and make sure fire extinguisher is present;
- Secure watercraft to fueling station (e.g. fuel barge or floating platform);
- Stop all engines and turn off all electrical switches;
- Transferring fuel from any piece of floating gear to another piece of floating gear will have 100% containment with an oil boom around both pieces.; This includes the pontoons, so keep fuel tanks and equipment on the smaller construction barges to avoid having to put oil boom around such big pieces;
- Pay attention to surroundings. Watch out for rouge wakes or waves;
- Make sure gauges are working properly; Know the capacity of fuel tank;
- Refueling is a two person operation. Maintain presence at all times when refueling;
- Use an absorbent pad around nozzle to catch splash-backs or drips. Clean up any spilled fuel with absorbent cloths;
- Maintain nozzle contact with fill pipe;
- DO NOT overfill the tank. Leave space to avoid spillage during normal motion of the vessel;
- When refueling at a pump station DO NOT use automatic stop device; DO NOT chock nozzles open;
- Make sure nozzle is dripped dried before it is removed from tank and hold nozzle upright to prevent fuel from dripping out of nozzle;
- Ensure that fuel is not discharged over the side or into any part of the vessel;
- Regularly check that boat fuel line connectors are tight;
- If oil is spilt in the bilge or hull, remove instantly using an absorbent pad; Keep drip trays clean;
- Maintain spill kits on every water craft at all times for instant use if needed;
- Use caution when pumping fuel into a portable fuel tank;
- Fill portable tanks at upland facilities or away from the water's edge;
- Only use a portable fuel tank you can handle easily and hold securely;
- When pouring from a portable tank, use a proper funnel or spout with matching capacity;
- Close the vent of portable fuel tanks when the engine is not in use or when the tank is stored;

- Store fuel in an area that is protected from inclement weather and away from water's edge;;
- Never use detergents or emulsifiers to deal with oil or fuel spills;
- Used oil absorbents should be disposed of properly at approved facilities.

SERVICING EQUIPMENT

- Follow the engine manufacturer's recommended maintenance schedule;
- Perform work over drop cloth; and under cover if raining;
- Deploy oil boom around water craft for overwater service activities;
- When servicing the engine ensure that fuel, oil and lubricants are cleaned up immediately;
- DO NOT store hoses or, parts over head or where they can't be observed.
- Never use detergents or emulsifiers to deal with oil or fuel spills.

BILGE PUMPING OPERATIONS

- Ensure bilge water is clean before pumping out;
- Oil absorbent pads can be placed in the bilge to absorb any oil or fuel that may be present;
- Commercial watercraft equipped with automatic bilge pumps must be inspected prior to discharge;
- Contaminated water shall be collected and delivered to an approved upland disposal facility;
- Never use detergents or emulsifiers to deal with oil or fuel spills.

SR 520 Evergreen Point
Floating Bridge and Landings Project

Environmental Compliance Plan
Volume III

Appendix C
Spill Prevention, Control, and Countermeasures Plan

Attachment C.5
Shipboard Oil Pollution Emergency Plan

REVISION 2

Released for Construction

SHIPBOARD OIL POLLUTION EMERGENCY PLAN

Valid until SEPTEMBER 21, 2015

For:

General Construction Company
3838 West Marginal Way S.W.
Seattle, WA 98106
(206) 938-6750

For:

Crane Barge and General Cargo Barge Fleet

While transiting International and U.S. Navigable Waters in the delivery of General cargo for construction

REVISION #10 November 12, 2010
REVISION #9 August 20, 2010
REVISION #8 March 10, 2010
REVISION #7 September 22, 2009
REVISION #6 June 19, 2009
REVISION #5 February 28, 2008
REVISION #4 January 15, 2004
REVISION #3 August 27, 2003

Original Plan Prepared September 1995

By

GENERAL CONSTRUCTION COMPANY
Seattle, Washington
(206) 938-6750

U.S. Department of Homeland Security
United States Coast Guard

Commandant
United States Coast Guard

ATTN VESSEL RESPONSE PLANS
2100 2ND ST SW STOP 7581
WASHINGTON DC 20593-7581
Staff Symbol: CG-5431
Phone: (202) 372-1209
Fax: (202) 372-1921
Email: vrp@uscg.mil

16460
April 1, 2010

GENERAL CONSTRUCTION COMPANY
ATTN: ROGER TEIGEN
3838 W. MARGINAL WAY S.W.,
SEATTLE, WA 98106-1108

DB TACOMA (505025)

Your Shipboard Oil Pollution Emergency Plan (SOPEP) has been reviewed and found to be in compliance with the requirements of Regulation 37 of Annex I of the International Convention for the Prevention of Pollution from Ships (MARPOL 73/78).

This approval will remain valid until SEPTEMBER 21, 2015. You must review your plan annually within 1 month of the anniversary date of the plan's expiration date and submit a letter to this office certifying that the review has been completed. Any alteration or revision made to the plan, with the exception of those made to the appendices and non-mandatory provisions must be submitted to this office for review and approval prior to the implementation of the revision. Further, the entire plan must be resubmitted to the Coast Guard for reapproval 6 months before the end of the approval period of the plan.

I remind you that your plan is a vital working document and that implementing the plan will help ensure effective response and mitigation in the event of an oil pollution incident. Please be sure that all parties with responsibilities under the plan are familiar with the plan's procedures and requirements.

This letter shall be maintained onboard the vessel and placed in the front of the plan.

U.S. COAST GUARD
COMMANDANT (CG-5431)
WASHINGTON, DC
APPROVED
1-APR-10
VESSEL RESPONSE PLAN

Sincerely,

Xochitl Castañeda

X. L. CASTANEDA
Lieutenant, U.S. Coast Guard
Assistant Team Leader, Vessel Response Plan Program
By direction

The action has been thoroughly reviewed by the USCG, and determined to be categorically excluded under current USCG CE(s) # 31 from further environmental documentation, in accordance with Section 2.B.2. and Figure 2-1 of the National Environmental Policy Act Implementing Procedures and Policy for Considering Environmental Impacts, COMDTINST M16475.1D, as authorized by DHS MD 5100.1.

U.S. Department of Homeland Security
United States Coast Guard

Commandant
United States Coast Guard

ATTN VESSEL RESPONSE PLANS
2100 2ND ST SW STOP 7581
WASHINGTON DC 20593-7581
Staff Symbol: CG-5431
Phone: (202) 372-1209
Fax: (202) 372-1921
Email: vrp@uscg.mil

16460
April 1, 2010

GENERAL CONSTRUCTION COMPANY
ATTN: ROGER TEIGEN
3838 W. MARGINAL WAY S.W.,
SEATTLE, WA 98106-1108

DB OLYMPIA (1027118)

Your Shipboard Oil Pollution Emergency Plan (SOPEP) has been reviewed and found to be in compliance with the requirements of Regulation 37 of Annex I of the International Convention for the Prevention of Pollution from Ships (MARPOL 73/78).

This approval will remain valid until SEPTEMBER 21, 2015. You must review your plan annually within 1 month of the anniversary date of the plan's expiration date and submit a letter to this office certifying that the review has been completed. Any alteration or revision made to the plan, with the exception of those made to the appendices and non-mandatory provisions must be submitted to this office for review and approval prior to the implementation of the revision. Further, the entire plan must be resubmitted to the Coast Guard for reapproval 6 months before the end of the approval period of the plan.

I remind you that your plan is a vital working document and that implementing the plan will help ensure effective response and mitigation in the event of an oil pollution incident. Please be sure that all parties with responsibilities under the plan are familiar with the plan's procedures and requirements.

This letter shall be maintained onboard the vessel and placed in the front of the plan.

U.S. COAST GUARD
COMMANDANT (CG-5431)
WASHINGTON, DC
APPROVED
1-APR-10
VESSEL RESPONSE PLAN

Sincerely,

Xochitl Castañeda

X. L. CASTANEDA
Lieutenant, U.S. Coast Guard
Assistant Team Leader, Vessel Response Plan Program
By direction

The action has been thoroughly reviewed by the USCG, and determined to be categorically excluded under current USCG CE(s) # 31 from further environmental documentation, in accordance with Section 2.B.2. and Figure 2-1 of the National Environmental Policy Act Implementing Procedures and Policy for Considering Environmental Impacts, COMDTINST M16475.1D, as authorized by DHS MD 5100.1.

U.S. Department of Homeland Security
United States Coast Guard

Commandant
United States Coast Guard

ATTN VESSEL RESPONSE PLANS
2100 2ND ST SW STOP 7581
WASHINGTON DC 20593-7581
Staff Symbol: CG-5431
Phone: (202) 372-1209
Fax: (202) 372-1921
Email: vrp@uscg.mil

16460
April 1, 2010

GENERAL CONSTRUCTION COMPANY
ATTN: ROGER TEIGEN
3838 W. MARGINAL WAY S.W.,
SEATTLE, WA 98106-1108

BEAVER (602235)

Your Shipboard Oil Pollution Emergency Plan (SOPEP) has been reviewed and found to be in compliance with the requirements of Regulation 37 of Annex I of the International Convention for the Prevention of Pollution from Ships (MARPOL 73/78).

This approval will remain valid until SEPTEMBER 21, 2015. You must review your plan annually within 1 month of the anniversary date of the plan's expiration date and submit a letter to this office certifying that the review has been completed. Any alteration or revision made to the plan, with the exception of those made to the appendices and non-mandatory provisions must be submitted to this office for review and approval prior to the implementation of the revision. Further, the entire plan must be resubmitted to the Coast Guard for reapproval 6 months before the end of the approval period of the plan.

I remind you that your plan is a vital working document and that implementing the plan will help ensure effective response and mitigation in the event of an oil pollution incident. Please be sure that all parties with responsibilities under the plan are familiar with the plan's procedures and requirements.

This letter shall be maintained onboard the vessel and placed in the front of the plan.

U.S. COAST GUARD
COMMANDANT (CG-5431)
WASHINGTON, DC
APPROVED
1-APR-10
VESSEL RESPONSE PLAN

Sincerely,

Xochitl Castañeda

X. L. CASTANEDA
Lieutenant, U.S. Coast Guard
Assistant Team Leader, Vessel Response Plan Program
By direction

The action has been thoroughly reviewed by the USCG, and determined to be categorically excluded under current USCG CE(s) # 31 from further environmental documentation, in accordance with Section 2.B.2. and Figure 2-1 of the National Environmental Policy Act Implementing Procedures and Policy for Considering Environmental Impacts, COMDTINST M16475.1D, as authorized by DHS MD 5100.1.

U.S. Department of Homeland Security
United States Coast Guard

Commandant
United States Coast Guard

ATTN VESSEL RESPONSE PLANS
2100 2ND ST SW STOP 7581
WASHINGTON DC 20593-7581
Staff Symbol: CG-5431
Phone: (202) 372-1209
Fax: (202) 372-1921
Email: vrp@uscg.mil

16460
April 1, 2010

GENERAL CONSTRUCTION COMPANY
ATTN: ROGER TEIGEN
3838 W. MARGINAL WAY S.W.,
SEATTLE, WA 98106-1108

DB ALAMEDA (1075264)

Your Shipboard Oil Pollution Emergency Plan (SOPEP) has been reviewed and found to be in compliance with the requirements of Regulation 37 of Annex I of the International Convention for the Prevention of Pollution from Ships (MARPOL 73/78).

This approval will remain valid until SEPTEMBER 21, 2015. You must review your plan annually within 1 month of the anniversary date of the plan's expiration date and submit a letter to this office certifying that the review has been completed. Any alteration or revision made to the plan, with the exception of those made to the appendices and non-mandatory provisions must be submitted to this office for review and approval prior to the implementation of the revision. Further, the entire plan must be resubmitted to the Coast Guard for reapproval 6 months before the end of the approval period of the plan.

I remind you that your plan is a vital working document and that implementing the plan will help ensure effective response and mitigation in the event of an oil pollution incident. Please be sure that all parties with responsibilities under the plan are familiar with the plan's procedures and requirements.

This letter shall be maintained onboard the vessel and placed in the front of the plan.

U.S. COAST GUARD
COMMANDANT (CG-5431)
WASHINGTON, DC
APPROVED
1-APR-10
VESSEL RESPONSE PLAN

Sincerely,

Xochitl Castañeda

X. L. CASTANEDA
Lieutenant, U.S. Coast Guard
Assistant Team Leader, Vessel Response Plan Program
By direction

The action has been thoroughly reviewed by the USCG, and determined to be categorically excluded under current USCG CE(s) # 31 from further environmental documentation, in accordance with Section 2.B.2. and Figure 2-1 of the National Environmental Policy Act Implementing Procedures and Policy for Considering Environmental Impacts, COMDTINST M16475.1D, as authorized by DHS MD 5100.1.

U.S. Department of Homeland Security
United States Coast Guard

Commandant
United States Coast Guard

ATTN VESSEL RESPONSE PLANS
2100 2ND ST SW STOP 7581
WASHINGTON DC 20593-7581
Staff Symbol: CG-5431
Phone: (202) 372-1209
Fax: (202) 372-1921
Email: vrp@uscg.mil

16460
April 1, 2010

GENERAL CONSTRUCTION COMPANY
ATTN: ROGER TEIGEN
3838 W. MARGINAL WAY S.W.,
SEATTLE, WA 98106-1108

DB COLUMBIA (1048155)

Your Shipboard Oil Pollution Emergency Plan (SOPEP) has been reviewed and found to be in compliance with the requirements of Regulation 37 of Annex I of the International Convention for the Prevention of Pollution from Ships (MARPOL 73/78).

This approval will remain valid until SEPTEMBER 21, 2015. You must review your plan annually within 1 month of the anniversary date of the plan's expiration date and submit a letter to this office certifying that the review has been completed. Any alteration or revision made to the plan, with the exception of those made to the appendices and non-mandatory provisions must be submitted to this office for review and approval prior to the implementation of the revision. Further, the entire plan must be resubmitted to the Coast Guard for reapproval 6 months before the end of the approval period of the plan.

I remind you that your plan is a vital working document and that implementing the plan will help ensure effective response and mitigation in the event of an oil pollution incident. Please be sure that all parties with responsibilities under the plan are familiar with the plan's procedures and requirements.

This letter shall be maintained onboard the vessel and placed in the front of the plan.

U.S. COAST GUARD
COMMANDANT (CG-5431)
WASHINGTON, DC
APPROVED
1-APR-10
VESSEL RESPONSE PLAN

Sincerely,

Xochitl Castaneda

X. L. CASTANEDA
Lieutenant, U.S. Coast Guard
Assistant Team Leader, Vessel Response Plan Program
By direction

The action has been thoroughly reviewed by the USCG, and determined to be categorically excluded under current USCG CE(s) # 31 from further environmental documentation, in accordance with Section 2.B.2. and Figure 2-1 of the National Environmental Policy Act Implementing Procedures and Policy for Considering Environmental Impacts, COMDTINST M16475.1D, as authorized by DHS MD 5100.1.

U.S. Department of Homeland Security
United States Coast Guard

Commandant
United States Coast Guard

ATTN VESSEL RESPONSE PLANS
2100 2ND ST SW STOP 7581
WASHINGTON DC 20593-7581
Staff Symbol: CG-5431
Phone: (202) 372-1209
Fax: (202) 372-1921
Email: vrp@uscg.mil

16460
April 1, 2010

GENERAL CONSTRUCTION COMPANY
ATTN: ROGER TEIGEN
3838 W. MARGINAL WAY S.W.,
SEATTLE, WA 98106-1108

DB SEATTLE (547079)

Your Shipboard Oil Pollution Emergency Plan (SOPEP) has been reviewed and found to be in compliance with the requirements of Regulation 37 of Annex I of the International Convention for the Prevention of Pollution from Ships (MARPOL 73/78).

This approval will remain valid until SEPTEMBER 21, 2015. You must review your plan annually within 1 month of the anniversary date of the plan's expiration date and submit a letter to this office certifying that the review has been completed. Any alteration or revision made to the plan, with the exception of those made to the appendices and non-mandatory provisions must be submitted to this office for review and approval prior to the implementation of the revision. Further, the entire plan must be resubmitted to the Coast Guard for reapproval 6 months before the end of the approval period of the plan.

I remind you that your plan is a vital working document and that implementing the plan will help ensure effective response and mitigation in the event of an oil pollution incident. Please be sure that all parties with responsibilities under the plan are familiar with the plan's procedures and requirements.

This letter shall be maintained onboard the vessel and placed in the front of the plan.

U.S. COAST GUARD
COMMANDANT (CG-5431)
WASHINGTON, DC
APPROVED
1-APR-10
VESSEL RESPONSE PLAN

Sincerely,

Xochitl Castaneda

X. L. CASTANEDA
Lieutenant, U.S. Coast Guard
Assistant Team Leader, Vessel Response Plan Program
By direction

The action has been thoroughly reviewed by the USCG, and determined to be categorically excluded under current USCG CE(s) # 31 from further environmental documentation, in accordance with Section 2.B.2. and Figure 2-1 of the National Environmental Policy Act Implementing Procedures and Policy for Considering Environmental Impacts, COMDTINST M16475.1D, as authorized by DHS MD 5100.1.

U.S. Department of Homeland Security
United States Coast Guard

Commandant
United States Coast Guard

ATTN VESSEL RESPONSE PLANS
2100 2ND ST SW STOP 7581
WASHINGTON DC 20593-7581
Staff Symbol: CG-5431
Phone: (202) 372-1209
Fax: (202) 372-1921
Email: vrp@uscg.mil

16460
April 1, 2010

GENERAL CONSTRUCTION COMPANY
ATTN: ROGER TEIGEN
3838 W. MARGINAL WAY S.W.,
SEATTLE, WA 98106-1108

DB OAKLAND (1089113)

Your Shipboard Oil Pollution Emergency Plan (SOPEP) has been reviewed and found to be in compliance with the requirements of Regulation 37 of Annex I of the International Convention for the Prevention of Pollution from Ships (MARPOL 73/78).

This approval will remain valid until SEPTEMBER 21, 2015. You must review your plan annually within 1 month of the anniversary date of the plan's expiration date and submit a letter to this office certifying that the review has been completed. Any alteration or revision made to the plan, with the exception of those made to the appendices and non-mandatory provisions must be submitted to this office for review and approval prior to the implementation of the revision. Further, the entire plan must be resubmitted to the Coast Guard for reapproval 6 months before the end of the approval period of the plan.

I remind you that your plan is a vital working document and that implementing the plan will help ensure effective response and mitigation in the event of an oil pollution incident. Please be sure that all parties with responsibilities under the plan are familiar with the plan's procedures and requirements.

This letter shall be maintained onboard the vessel and placed in the front of the plan.

U.S. COAST GUARD
COMMANDANT (CG-5431)
WASHINGTON, DC
APPROVED
1-APR-10
VESSEL RESPONSE PLAN

Sincerely,

Xochitl Castañeda

X. L. CASTANEDA
Lieutenant, U.S. Coast Guard
Assistant Team Leader, Vessel Response Plan Program
By direction

The action has been thoroughly reviewed by the USCG, and determined to be categorically excluded under current USCG CE(s) # 31 from further environmental documentation, in accordance with Section 2.B.2. and Figure 2-1 of the National Environmental Policy Act Implementing Procedures and Policy for Considering Environmental Impacts, COMDTINST M16475.1D, as authorized by DHS MD 5100.1.

U.S. Department of Homeland Security
United States Coast Guard

Commandant
United States Coast Guard

ATTN VESSEL RESPONSE PLANS
2100 2ND ST SW STOP 7581
WASHINGTON DC 20593-7581
Staff Symbol: CG-5431
Phone: (202) 372-1209
Fax: (202) 372-1921
Email: vrp@uscg.mil

16460
April 1, 2010

GENERAL CONSTRUCTION COMPANY
ATTN: ROGER TEIGEN
3838 W. MARGINAL WAY S.W.,
SEATTLE, WA 98106-1108

DB VANCOUVER (587032)

Your Shipboard Oil Pollution Emergency Plan (SOPEP) has been reviewed and found to be in compliance with the requirements of Regulation 37 of Annex I of the International Convention for the Prevention of Pollution from Ships (MARPOL 73/78).

This approval will remain valid until SEPTEMBER 21, 2015. You must review your plan annually within 1 month of the anniversary date of the plan's expiration date and submit a letter to this office certifying that the review has been completed. Any alteration or revision made to the plan, with the exception of those made to the appendices and non-mandatory provisions must be submitted to this office for review and approval prior to the implementation of the revision. Further, the entire plan must be resubmitted to the Coast Guard for reapproval 6 months before the end of the approval period of the plan.

I remind you that your plan is a vital working document and that implementing the plan will help ensure effective response and mitigation in the event of an oil pollution incident. Please be sure that all parties with responsibilities under the plan are familiar with the plan's procedures and requirements.

This letter shall be maintained onboard the vessel and placed in the front of the plan.

U.S. COAST GUARD
COMMANDANT (CG-5431)
WASHINGTON, DC
APPROVED
1-APR-10
VESSEL RESPONSE PLAN

Sincerely,

Xochitl Castañeda

X. L. CASTANEDA
Lieutenant, U.S. Coast Guard
Assistant Team Leader, Vessel Response Plan Program
By direction

The action has been thoroughly reviewed by the USCG, and determined to be categorically excluded under current USCG CE(s) # 31 from further environmental documentation, in accordance with Section 2.B.2. and Figure 2-1 of the National Environmental Policy Act Implementing Procedures and Policy for Considering Environmental Impacts, COMDTINST M16475.1D, as authorized by DHS MD 5100.1.

U.S. Department of Homeland Security
United States Coast Guard

Commandant
United States Coast Guard

ATTN VESSEL RESPONSE PLANS
2100 2ND ST SW STOP 7581
WASHINGTON DC 20593-7581
Staff Symbol: CG-5431
Phone: (202) 372-1209
Fax: (202) 372-1921
Email: vrp@uscg.mil

16460
April 1, 2010

GENERAL CONSTRUCTION COMPANY
ATTN: ROGER TEIGEN
3838 W. MARGINAL WAY S.W.,
SEATTLE, WA 98106-1108

DB PACIFIC (653245)

Your Shipboard Oil Pollution Emergency Plan (SOPEP) has been reviewed and found to be in compliance with the requirements of Regulation 37 of Annex I of the International Convention for the Prevention of Pollution from Ships (MARPOL 73/78).

This approval will remain valid until SEPTEMBER 21, 2015. You must review your plan annually within 1 month of the anniversary date of the plan's expiration date and submit a letter to this office certifying that the review has been completed. Any alteration or revision made to the plan, with the exception of those made to the appendices and non-mandatory provisions must be submitted to this office for review and approval prior to the implementation of the revision. Further, the entire plan must be resubmitted to the Coast Guard for reapproval 6 months before the end of the approval period of the plan.

I remind you that your plan is a vital working document and that implementing the plan will help ensure effective response and mitigation in the event of an oil pollution incident. Please be sure that all parties with responsibilities under the plan are familiar with the plan's procedures and requirements.

This letter shall be maintained onboard the vessel and placed in the front of the plan.

U.S. COAST GUARD
COMMANDANT (CG-5431)
WASHINGTON, DC
APPROVED
1-APR-10
VESSEL RESPONSE PLAN

Sincerely,

Xochitl Castañeda

X. L. CASTANEDA
Lieutenant, U.S. Coast Guard
Assistant Team Leader, Vessel Response Plan Program
By direction

The action has been thoroughly reviewed by the USCG, and determined to be categorically excluded under current USCG CE(s) # 31 from further environmental documentation, in accordance with Section 2.B.2. and Figure 2-1 of the National Environmental Policy Act Implementing Procedures and Policy for Considering Environmental Impacts, COMDTINST M16475.1D, as authorized by DHS MD 5100.1.

U.S. Department of Homeland Security
United States Coast Guard

Commandant
United States Coast Guard

ATTN VESSEL RESPONSE PLANS
2100 2ND ST SW STOP 7581
WASHINGTON DC 20593-7581
Staff Symbol: CG-5431
Phone: (202) 372-1209
Fax: (202) 372-1921
Email: vrp@uscg.mil

16460
April 1, 2010

GENERAL CONSTRUCTION COMPANY
ATTN: ROGER TEIGEN
3838 W. MARGINAL WAY S.W.,
SEATTLE, WA 98106-1108

DB LOS ANGELES (1047575)

Your Shipboard Oil Pollution Emergency Plan (SOPEP) has been reviewed and found to be in compliance with the requirements of Regulation 37 of Annex I of the International Convention for the Prevention of Pollution from Ships (MARPOL 73/78).

This approval will remain valid until SEPTEMBER 21, 2015. You must review your plan annually within 1 month of the anniversary date of the plan's expiration date and submit a letter to this office certifying that the review has been completed. Any alteration or revision made to the plan, with the exception of those made to the appendices and non-mandatory provisions must be submitted to this office for review and approval prior to the implementation of the revision. Further, the entire plan must be resubmitted to the Coast Guard for reapproval 6 months before the end of the approval period of the plan.

I remind you that your plan is a vital working document and that implementing the plan will help ensure effective response and mitigation in the event of an oil pollution incident. Please be sure that all parties with responsibilities under the plan are familiar with the plan's procedures and requirements.

This letter shall be maintained onboard the vessel and placed in the front of the plan.

U.S. COAST GUARD
COMMANDANT (CG-5431)
WASHINGTON, DC
APPROVED
1-APR-10
VESSEL RESPONSE PLAN

Sincerely,

Xochitl Castañeda

X. L. CASTANEDA
Lieutenant, U.S. Coast Guard
Assistant Team Leader, Vessel Response Plan Program
By direction

The action has been thoroughly reviewed by the USCG, and determined to be categorically excluded under current USCG CE(s) # 31 from further environmental documentation, in accordance with Section 2.B.2. and Figure 2-1 of the National Environmental Policy Act Implementing Procedures and Policy for Considering Environmental Impacts, COMDTINST M16475.1D, as authorized by DHS MD 5100.1.

U.S. Department of Homeland Security
United States Coast Guard

Commandant
United States Coast Guard

ATTN VESSEL RESPONSE PLANS
2100 2ND ST SW STOP 7581
WASHINGTON DC 20593-7581
Staff Symbol: CG-5431
Phone: (202) 372-1209
Fax: (202) 372-1921
Email: vrp@uscg.mil

16460
April 1, 2010

GENERAL CONSTRUCTION COMPANY
ATTN: ROGER TEIGEN
3838 W. MARGINAL WAY S.W.,
SEATTLE, WA 98106-1108

DB GENERAL (1042279)

Your Shipboard Oil Pollution Emergency Plan (SOPEP) has been reviewed and found to be in compliance with the requirements of Regulation 37 of Annex I of the International Convention for the Prevention of Pollution from Ships (MARPOL 73/78).

This approval will remain valid until SEPTEMBER 21, 2015. You must review your plan annually within 1 month of the anniversary date of the plan's expiration date and submit a letter to this office certifying that the review has been completed. Any alteration or revision made to the plan, with the exception of those made to the appendices and non-mandatory provisions must be submitted to this office for review and approval prior to the implementation of the revision. Further, the entire plan must be resubmitted to the Coast Guard for reapproval 6 months before the end of the approval period of the plan.

I remind you that your plan is a vital working document and that implementing the plan will help ensure effective response and mitigation in the event of an oil pollution incident. Please be sure that all parties with responsibilities under the plan are familiar with the plan's procedures and requirements.

This letter shall be maintained onboard the vessel and placed in the front of the plan.

U.S. COAST GUARD
COMMANDANT (CG-5431)
WASHINGTON, DC
APPROVED
1-APR-10
VESSEL RESPONSE PLAN

Sincerely,

Xochitl Castañeda

X. L. CASTANEDA
Lieutenant, U.S. Coast Guard
Assistant Team Leader, Vessel Response Plan Program
By direction

The action has been thoroughly reviewed by the USCG, and determined to be categorically excluded under current USCG CE(s) # 31 from further environmental documentation, in accordance with Section 2.B.2. and Figure 2-1 of the National Environmental Policy Act Implementing Procedures and Policy for Considering Environmental Impacts, COMDTINST M16475.1D, as authorized by DHS MD 5100.1.

U.S. Department of Homeland Security
United States Coast Guard

Commandant
United States Coast Guard

ATTN VESSEL RESPONSE PLANS
2100 2ND ST SW STOP 7581
WASHINGTON DC 20593-7581
Staff Symbol: CG-5431
Phone: (202) 372-1209
Fax: (202) 372-1921
Email: vrp@uscg.mil

16460
April 1, 2010

GENERAL CONSTRUCTION COMPANY
ATTN: ROGER TEIGEN
3838 W. MARGINAL WAY S.W.,
SEATTLE, WA 98106-1108

DB ANCHORAGE (599745)

Your Shipboard Oil Pollution Emergency Plan (SOPEP) has been reviewed and found to be in compliance with the requirements of Regulation 37 of Annex I of the International Convention for the Prevention of Pollution from Ships (MARPOL 73/78).

This approval will remain valid until SEPTEMBER 21, 2015. You must review your plan annually within 1 month of the anniversary date of the plan's expiration date and submit a letter to this office certifying that the review has been completed. Any alteration or revision made to the plan, with the exception of those made to the appendices and non-mandatory provisions must be submitted to this office for review and approval prior to the implementation of the revision. Further, the entire plan must be resubmitted to the Coast Guard for reapproval 6 months before the end of the approval period of the plan.

I remind you that your plan is a vital working document and that implementing the plan will help ensure effective response and mitigation in the event of an oil pollution incident. Please be sure that all parties with responsibilities under the plan are familiar with the plan's procedures and requirements.

This letter shall be maintained onboard the vessel and placed in the front of the plan.

U.S. COAST GUARD
COMMANDANT (CG-5431)
WASHINGTON, DC
APPROVED
1-APR-10
VESSEL RESPONSE PLAN

Sincerely,

Xochitl Castañeda

X. L. CASTANEDA
Lieutenant, U.S. Coast Guard
Assistant Team Leader, Vessel Response Plan Program
By direction

The action has been thoroughly reviewed by the USCG, and determined to be categorically excluded under current USCG CE(s) # 31 from further environmental documentation, in accordance with Section 2.B.2. and Figure 2-1 of the National Environmental Policy Act Implementing Procedures and Policy for Considering Environmental Impacts, COMDTINST M16475.1D, as authorized by DHS MD 5100.1.

INTRODUCTION

SCOPE

This Shipboard Oil Pollution Emergency Plan (SOPEP) is written in accordance with the requirements of Regulation 37 of Annex I of the International Convention for the Prevention of Pollution from ships 1973, as modified by the Protocol of 1978 relating thereto (MARPOL 73/78). The purpose of this plan is to provide guidance to the master and officers on board the ship with respect to the steps to be taken when a pollution incident has occurred or is likely to occur. It is also consistent with the existing federal laws, 33 CFR Part 151. This plan will be updated to reflect any significant changes in General Construction Company. This plan contains all information and operational instructions required by the guidelines (Resolution MPEC 54(32)). The appropriate sections or appendices contain names, telephone numbers, telex numbers, etc. of all contacts referenced in the plan, as well as other referenced material.

This plan has been approved by the Coast Guard and, except as provided below, no alteration or revision may be made to any part of it without the prior approval of the Coast Guard. Changes to the seventh section of the plan and the appendices do not require approval by the Coast Guard. The appendices must be maintained up-to-date by the owners, operators and managers.

All Company operations personnel are to be familiar with the use and procedures outlined in this plan. A copy of this plan is accessible in the General Construction Company Equipment office and onboard each crane barge.

VESSEL OPERATIONS

General Construction Company was formed in 1996 to conduct general construction operations in a variety of west coast ports. Company history dates back to 1910 originating in the Pacific Northwest and growing through numerous corporate mergers. General Construction Company operates a fleet of 60 barges U.S. owned and flagged which carry a large variety of materials in support of construction. General Construction Company neither owns or operates any tugs, so all the barges are pulled by contract tugs. General Construction Company operates a total of 60 barges all listed in this plan for continuity. Not all barges are U.S. Coast Guard documented, and not all are over 400 gross tons.

UPDATING PROCEDURES

POLICY

This Vessel Oil Pollution Emergency Plan will be maintained and updated by General Construction Company. The plan will be updated annually to reflect personnel and telephone number changes, oil spill containment and cleanup equipment availability, and any new and relevant information in fulfillment of federal and state requirements. Federal requirements for revision found in 33 CFR 154.1065 including and significant change in: facility configuration; type of oil group handled, oil spill removal organization; or the facility response procedures. In addition the plan must be revised within 5 years of USCG G-MED approval.

REVISION NUMBER 10
DATE: 11-12-10

Attached are revised page for the General Construction Company, Oil Pollution Emergency Plan.

Remove Old Pages	Replace with Revised of New Page
N/A	Information Data Change Only

RECORDS OF REVISIONS

SECTION NUMBER	PAGE NUMBER	DATE OF AMENDMENT	SIGNATURE OF PERSON ENTERING CHANGE	DATE AMENDMENT SENT TO FEDERAL AGENCY
1	3	02-28-08		02-28-08
1	1	06-19-09		06-19-09
4	18	09-22-09		09-23-09
1	3	8-20-10		8-20-10
3-4	3-1/4-5	11-12-10		April 2011

Barge Summary

Name	Official #	Fuel Capacity Gallons	Gross Tonnage
DERRICK BARGES			
DB Tacoma	505025	6,000	557
DB Olympia	1027118	9,500	756
DB Beaver	602235	9,500	577
DB Alameda	1075264	10,000	830
DB Columbia	1048155	7,300	893
DB Seattle	547079	40,000	1158
DB Oakland	1089113	9,500	987
DB Vancouver	587032	8,000	1487
DB Pacific	653245	35,000	2114
DB Los Angeles	1047575	9,000	1799
DB General	1042279	33,500	4040
DB Anchorage	GC599745	10,000	
SPUD BARGES			
GC-26	GC007597	550	
BURRARD BARGE	GC051637	8,000	
DUMP BARGES			
PT. BASALT	597335	200	1086
PT. DEFIANCE	661902	200	1083
PT. NO PT.	505209	200	1288
PT. VASHON	605636	200	957
PT. WILSON	276135	200	964
FLAT DECK BARGES			
GC-101	522512		745
GC-102	522513		745
GC-103	523820		745
GC-104	523821		745
GC-120	558616		902
GC-121	557752		902
GC-151	508395		586
GC-152	507931		523
GC-155	294820		607
GC-156	508468		479
GC-160	297230		607
GC-173	298614		946
GC-175	278799		806
GC-180	503956		768
GC-181	273546		793
GC-183	502560		1095
GC-184	508544		946
GC-185	561206		945
GC-191	288082		1027
GC-192	542082		1097
GC-205	503698		1341

WORST CASE SPILL

A worst case spill is defined as a spill of a vessel's entire cargo and fuel complicated by adverse weather conditions. The worst case spill for General Construction Company would involve the Barge **D.B. SEATTLE** for which the entire capacity of all fuel tanks on the barge, or 40,000 gallons. This plan examines the various component of risk, and therefore better prepares General Construction Company to know what levels of response capability are required.

PETROLEUM

The petroleum product normally transported on these barges (as listed in Table 30.25-1 of 46 CFR) is:

Diesel Fuel Oil: No. 2
Lubricating Oils; various weights.

The physical properties of the petroleum products normally transferred at the facility are listed in the MSDS located onboard in the vessels document cabinet.

VESSEL OPERATIONS

The barges operate within West Coast ports to include: Puget Sound, Anchorage, Juneau, Portland, San Francisco/Oakland, Los Angeles/Long Beach, and San Diego. The barge routes are determined by the specific ports dictated by customer needs within the construction industry.

These barges are crane barges and dry general cargo barges dedicated primarily to the marine construction industry. The only petroleum on board is small quantities of diesel fuel to support the barge machinery. The source of fuel being transferred to the barge can either be the tow vessels, small contract barges, or normally a tank tuck on the dock might deliver the petroleum directly to the barge. The loading of diesel and lubricants always conforms to federal and state requirements, which are acknowledged by the barge representative prior to the loading or transferring. The Oil Transfer Procedures are listed in this plan, Section 4.

BARGE TANK DESCRIPTION

These barges carry only small amounts of oil for machinery and equipment fuel. Petroleum is never carried as cargo. The configuration of barges various with some having internal fuel tanks dedicated to petroleum storage, while others have only tanks located on the specific crane or deck machinery.

OIL SPILL HISTORY

General Construction Company has had (13) small reported oil spills from barges and equipment since the original SOPEP plan was prepared in 1995. In all cases oil pads and boom materials were used to clean these minor spills up very quickly:

(1) January 1996 there was a 10 gallon hydraulic spill where a hydraulic line broke on a underwater hydraulic pipe horse.
(2) September 1996 a similar accident which spilled 5 gallons.
(3) July 1998 a 5 gallon diesel fuel spill from overfilling a day tank during a fuel transfer procedure.
(4) November 1999 a 1 gallon diesel spill when remnant fuel drained from a tank with a unsecured drain plug.
(5) May 2000 a 1 quart clarity 46 hydraulic spill where a hydraulic oil line slipped from a tender while replacing it.
(6) April 2002 a spill was caused by a damaged equipment fuel line and discharged approximately 2 gallons.
(7) January of 2003there was a discharge of hydraulic oil causing a sheen to surface water.
(8) June 2004 there was a discharge of vegetable hydraulic fluid from a pile hammer causing a sheen to surface water.
(9) July of 2004 was due to a discharge of hydraulic fluid when an excavator fell into the water causing a sheen.
(10) January 2006 there was a 1 gallon spill from an overflowed drum.
(11) May 2006 a pressurized hydraulic line was opened and spilled 1 gallon.
(12) February 2007 4 gallon of diesel were spilled while completing a fuel transfer.
(13) November 2007 1 gallon of hydraulic oil spilled as the result of a leaking hose.

TABLE 1. POTENTIAL OIL SPILL SITES AND OPERATIONS

SITE	OPERATION	INCIDENT
CUSTOMER DOCK	LOADING	Tank Overflow Hose Rupture
OPEN WATER	UNDERWAY	Collision, Fire/Explosion Grounding

RISK ASSESSMENT

Potential oil spill situations which could occur during barge operations are listed above in Table 1. The probable situations leading to a potential oil spill range from oil transfer operations while in port to a barge incident while underway such as ramming, or fire/explosion, or grounding. General Construction Company subjects themselves to a certain level of risk, simply by having even a very small quantity of diesel fuel aboard barges.

In addition to the storage of diesel on the barge, the operational activities include the initial loading of diesel into the tank. While it is normally done from a tug or a small mobile facility tank truck on the dock, the highest probability of spill is during this fuel oil loading operations. The cause of any such spill would most likely be due to a mechanical failure or personnel error. The focus of General Construction Company training is not only immediate response capability, but also spill prevention emphasis. Strict adherence to the fuel oil transfer procedures minimizes the risk of an incident. In the event of a mechanical failure resulting in overfilling of a tank, the potential quantity of oil spilled is far less than with collision, fire or explosion. Clean-up action would be taken to contain and recover the oil.

Collision of a crane or general cargo barge with another vessel is always a probability given the level of traffic in Puget Sound, and on coastal waters. For those barges with internal fuel tanks, a severe collision severe damage could result in a tank rupture. This is however only a very remote possibility as the internal tanks are all setback from the exterior shell plating of the barge. The operation of a proven Vessel Traffic Service on Puget Sound, and only one pilot organization for the deep draft vessels lowers this probability. West Coast transportation routes have less traffic than within Puget Sound, but the possibility of meeting traffic situations significantly increases in convergent zones, such as off the mouth of the Columbia River, or San Francisco Bay. There are periods of high fishing vessel activity on some of the major routes. High density boating activity typified by sailboat regattas also present an obstacle for tug and barge traffic. This preponderance of smaller traffic lowers the probability that a collision of the barge would result in extensive hull damage. This reflects an extremely low probability that any collision would penetrate the forward rake and spill the entire or even considerable contents of the tank. A possible outcome of any collision even if the barge is not initially damaged could be the disabling of a tug with an eventual grounding of the barge.

A grounding situation, estimated at relatively low probability itself, presents only remote possibility that the tank would be penetrated. The worst case is only if the entire barge is destroyed in surf action. There are sufficient geographical points which could result in grounding along the barge traffic routes. This rocky terrain would create substantial hull damage with a grounding of any speed.

There is always the potential of a tug having hard contact while tending a loose barge, resulting in hull damage to the barge. General Construction Company has an established vessel retrieval system to facilitate smooth recovery of the barge at a minimum potential for collision and hull damage. The potential of such contact puncturing the fuel tank is quite unlikely.

The potential of fire starting aboard this type of dry cargo barge is remote, although there is always the possibility of fire starting in one auxiliary generator compartment. But it is unlikely this would lead to sufficient damage to the barge to result in a loss of the fuel tank to the water.

Continued vigilance is practiced by all General Construction Company personnel and the contract tug personnel to minimize risk of any accident. Past successful operating records of all crews demonstrate their high level of expertise.

STRUCTURAL INTEGRITY

The barge has ample structural integrity for the general cargo trade as documented by the U.S. Coast Guard Certificate of Inspection. The tugs have a rubber fendering system to protect both the barges and tug hulls.

INSPECTIONS AND MAINTENANCE PROGRAMS

A pre-voyage checklist is completed before every voyage and the vessel is surveyed for longer voyages. Daily safety inspections are performed on the derrick barges and a daily operating log is completed by the crew.

MAXIMUM OPERATING LIMITATIONS OF THE VESSEL

Fuel oil loading operations at a terminal dock will be secured if weather conditions become too severe in the opinion of either the barge representative or the shoreside mobile transfer person in charge.

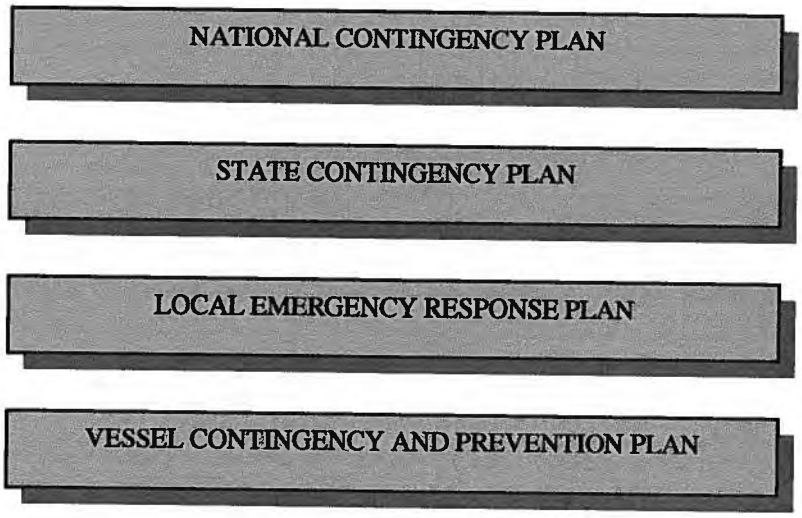
PREAMBLE

The purpose of this plan is to provide guidance to the masters, officers, and management personnel and General Construction Company with a working knowledge of actions to be taken when a pollution incident has occurred or is likely to occur. This plan provides a comprehensive statement within this company as to the potential of an oil spill from General Construction Company vessels, and actions to be taken to mitigate the entire situation.

This plan is solely for barges operated by General Construction Company. It does not directly connect to plans of any vessels engaged in towing General Construction Company barges, as spillage for a tug not owned by them and would come under their company policies. General Construction Company will acknowledge the existence of this plan at all shore facilities where petroleum product is loaded as bunker on either the tug or barges. Barge personnel will ensure fueling facilities have an approved Spill Contingency Response Plan.

Without interfering with shipowner's liability, some coastal States consider it is their responsibility to define techniques and means to be taken against an oil pollution incident and approve such operations which might cause further pollution, i.e., lightening. States are in general entitled to do so under the International Convention relating to Intervention on the High Seas in Cases of Oil Pollution Casualties, 1969 (Intervention Convention).

OIL AND HAZARDOUS SUBSTANCE CONTINGENCY PLANS RELATIONSHIPS



The General Construction Company Shipboard Oil Spill Emergency Plan provides guidance for the first line of incident response. The responsibility for the

containment and clean-up of oil and hazardous substance discharges rests with the company. The plan also outlines company strategy, policy and technology in place to minimize the likelihood of spills occurring.

The local Emergency Response Plan designates emergency assistance activities to each County's Department of Emergency Management. This department provides emergency services such as fire protection, evacuation, and other immediate public health and safety concerns.

The State Contingency Plan gives basic investigative and enforcement responsibilities for oil spills in state navigable waters to the designated state agency (Washington: Department of Ecology, Office of Marine Safety). The designated agency is the predesignated State On-Scene Coordinator and is the Incident Commander for all spills under state jurisdiction. The designated department has authority to take over the containment and clean-up of a spill when the predesignated State On-Scene Coordinator determines that the spiller is unknown or is not performing adequately. If the spiller is performing adequately, the designated department will monitor the response.

The National Contingency Plan gives basic investigative and enforcement responsibilities for oil spills in U.S. navigable waters to the Coast Guard. Then Environmental Protection Agency has jurisdiction for spills on inland navigable waters not covered by the Coast guard. Both the Coast Guard and the EPA predesignate a Federal On-Scene Coordinator (FOSC) within their respective agencies. The FOSC will be provided by the agency having primary jurisdiction over the spill. The Federal government will not take over a spill under their jurisdiction unless the FOSC has determined that the spiller is unknown or that the spiller's response is inadequate.

REGULATORY INFORMATION

Vessels that operate in Washington, Oregon, California and Alaska must comply with Federal and State laws. Federal regulations are enforced by the Environmental Protection Agnecy (EPA) and the United States Coast Guard (U.S.C.G.). State regulations are enforced by Washington State's Department of Ecology (DOE) and Office of Marine Safety (OMS), Oregon's Department of Environmental Quality (DEQ), California's Office of Spill Prevention and Response (OSPR), as well as Alaska's Department of Environmental Conservation (ADEC).

INTERNATIONAL REGULATIONS

MARPOL 73/78

Annex I of MARPOL 73/78 established by the International Maritime Organization (IMO) prohibits the dumping of petroleum in international waters. IMO's Marine Environmental Protection Committee (MEPC) established Regulation 37 of Annex 1 in July 1991 requiring vessels over 400 gross Tons to have an approved Shipboard Oil Pollution Emergency Plan approved by the Flag State.

FEDERAL LAWS

Oil Pollution Act of 1990

This act establishes the most recent culmination of federal water pollution laws with many amendments to the **Federal Water Pollution control Act of 1988 (FWPCA)**, Section 311. The FWPCA in turn builds upon and includes the **Clean Water Act as Amended By The Water Quality Act of 1987 (Public Law 100-4)**. The Clean Water Act, as amended, prohibits the discharge of "harmful quantities" of oil or oily products into the waters of the United States. "Harmful quantity" is defined as "enough to produce a slick or visible sheen on the surface of the water". Under this act, the owner or operator of a vessel or facility from which oil or a hazardous substance is discharged is liable to the U.S. for the actual removal costs as well as costs associated with restoration or replacement of natural resources injured as a result of the discharge. OPA-90 gives limitations of liability for damages resulting from oil pollution and also establishes a fun for the payment of compensation for damages. OPA-90 is administered jointly by the EPA and U.S. Coast Guard where the Clean Water Act was administered by the Environmental Protection Agency and FWPCA by the Coast Guard.

Applicable regulations include:

33 CFR 150 Response Plan for Marine Transportation-Related (MTR) Facilities

This regulation sets parameters for the response plans for all MTR facilities to include deep water ports, Coast Guard regulated onshore facilities, marina tank trucks and railroad tank cars. This covers all facilities which could reasonably be expected to cause substantial harm to the environment by discharging oil into navigable waters. General Construction Company vessels are not subject to this regulation, so long as petroleum is not hauled as cargo.

33 CFR 153 Control of Pollution By Oil and Hazardous Substances, Discharge Removal

The purpose of 153 is to prescribe regulations concerning notification to the Coast Guard of the discharge of oil or hazardous substances as required by the Federal Water Pollution Control Act as amended. Part 153 also prescribes the procedures for the removal of a discharge of oil and the costs that may be imposed or reimbursed for the removal or a discharge of oil or hazardous substances for the Federal Water Pollution Control Act.

33 CFR 154 Oil Pollution Prevention Regulations For Marine Oil Transfer Facilities

Part 154 applies to each facility that transfers oil in bulk to or from any vessel or public vessel with a capacity of 250 or more barrels of oil. This part describes how a facility can meet the operating rules and equipment requirements prescribed in this part and Part 156. Then General Construction Company fuels the barge with bunker, the facility is subject to this regulation.

33 CFR 156 Oil and Hazardous Material Transfer Operations

Part 156 applies to the transfer of oil on the navigable waters of the United States. This part describes the requirements for transfer operations, personnel requirements and supervision. 33 CFR Parts 150, 153, 154, and 156 are administered by the United States Coast Guard.

Occupational Safety and Health Act (OSHA) 29 CFR 1910

29 CFR 1910.120 (q) Emergency Response To Hazardous Substance Release

Employers whose employees are engaged in emergency response shall develop and implement and emergency response plan in writing to handle anticipated emergencies prior to operation and be available for inspections and copying by employees, representatives, and OSHA personnel. This paragraph describes the requirements for emergency response to hazardous substance release and prescribes the elements of an emergency response plan. The plan elements include personnel roles, security, evacuation, response, and personal protection equipment.

29 CFR 1910.1200 Hazardous Communications

Regulations require manufacturers and importers to determine if their products contain hazardous chemicals, and if so, they must make hazard information available through distributors to users in the form of container labels and material safety data sheet (MSDS). All employers of one or more persons are required to determine any chemical-related hazard their employees may be exposed to, and provide information and training to their employees regarding those hazards.

29 CFR 1910.120 (q) and 1910.1200 are administered by the Occupational Safety and Health Administration.

WASHINGTON STATE LAWS

Water Pollution Control Act (Chapter 90.48 RCW)

Under the state Water Pollution control Act, an owner or person having control over oil that is discharged into state waters is strictly liable to the state for all response, cleanup, and damage assessment costs, unless the discharge was authorized, or caused by an act of war, sabotage, or negligence on the part of the U.S. government or Washington State.

This law prohibits oil pollution in any manner whatsoever. Discharges of oil, oily materials, or other hazardous substances into the water or onto the ground MUST BE REPORTED IMMEDIATELY and steps taken to clean up the spill. This law provides for penalties and the spiller is liable for the cost of restoring the environment to its original state prior to the spill.

Model Toxics Control Act (Chapter 173-340 WAC)

The state Model Toxics Control Act imposes liability for all remedial action costs and all natural resource damages resulting from a release. Under this act, petroleum and petroleum products are considered hazardous substances.

90.48 WAC and 173-340 WAC are administered by the Washington Department of Ecology (DOE).

Oil and Hazardous Substance Spill Prevention and Response (Chapter 90-56 RCW)

The purpose of this chapter is to establish spill prevention and response programs.

Chapter 90-56 RCW is regulated by the Department of Ecology.

Washington Industrial Safety and Health Act (WISHA) Chapter 49.17 RCW Administrative Rules Chapter 296-62

296-62-300 WAC Hazardous Waste Operations and Emergency Response

This law prescribes and describes the training, emergency response, and health and safety requirements for hazardous material operations.

296-62-054 through 05427 WAC Hazardous Communications Standard

This standard sets the requirements for information and training on hazardous chemicals used in the workplace. Federal law requires all states to comply with hazard communication regulations. Washington State standards are tailored to the industries in the state.

296-62-3110 WAC and 296-62-054 WAC are administered by the Department of Labor and Industries.

ALASKA STATE LAWS

AS 46.04.030 OIL DISCHARGE PREVENTION AND CONTINGENCY PLANS

Alaska state statute requires oil discharge prevention and contingency plans for exploration, production, and pipeline facilities; storage facilities having a crude oil storage capacity of more than 5,000 barrels or a non-crude oil storage capacity of 10,000 bbls; and tank vessels and oil barges that transport oil as cargo. These facility and vessel contingency plans provide the first line of defense for preventing and responding to spills.

AS 46.04.040 FINANCIAL RESPONSIBILITY FOR OIL DISCHARGES

Each vessel or facility must be specifically covered by an approved form of financial responsibility to respond in damages for claims resulting from an oil discharge.

18 AAC 75

These requirements published under the Alaska Administrative Code deal with the prevention requirements for vessels laden with oil as cargo. Although general cargo barges are not covered in this regulation, there is reverence to tank cars and tank trucks. Other sections of the AAC cover emergency action plans, reporting and notification requirements, response strategies and protection of environmentally sensitive areas.

CALIFORNIA STATE LAWS AND REGULATIONS

Lempert-Keene-Seastrand Oil Spill Prevention and Response Act (Senate Bill 2040)

Under the state Oil Spill Prevention and Response Act, an owner or person having control over oil that is discharged into state waters is strictly liable to the state for all response, cleanup, and damage assessment costs unless the discharge was authorized, or caused by an act of war, sabotage, or negligence on the part of the U.S. government or California State.

These laws prohibit oil pollution in any manner whatsoever. Discharges of oil, oily materials, or other hazardous substances into the water or onto the ground MUST BE REPORTED IMMEDIATELY and steps taken to clean up the spill. This law provides for penalties and total liability for damages to persons or property, public or private. The spiller is also liable for the cost of restoring the environment to its original state prior to the spill.

California Code of Regulations – Title 8

California Occupational Safety and Health Administration enforcement is under Title 8, California Code of Regulation, Section 5192, General Industry Safety Order (GISO). These state regulations are virtually identical to the federal 29CFR 1910.120 requirements.

California Code of Regulations – Title 18

California Department of Fish and Game, Office of Spill Prevention and Response (OSPR) implement through Title 18, Section 840 through 845 the oil transfer and vessel operation requirements mandated by the Lempert-Keene-Seastrand Act. These sections include the establishment of Harbor Safety Committee Plans, and the Oil Spill Prevention and Response Contingency Plans. They also address tank vessel escort regulation and the fee structure and usage for the California Oil Spill Prevention and Administration Fund.

California OSPR implements Section 790 through 797 concerning Financial Responsibility of vessels operating within California State Waters. This requires vessels since January 1, 1992 to demonstrate financial responsibility and obtain a certificate issued by OSPR. This defines "small" barges as those with capacities greater than 10,000 barrels and barges over 50,000 barrels are considered "large". Large barges must demonstrate current financial ability to pay at least 500 million dollars. Small barges are on a formula based dollar amount per barrel accessed on a percentage of the barge's capacity.

California Public Resource Code – State Lands Commission

Sections 8754 through 8760 of the State PRC, derived from the State Oil Spill Prevention and Response Act, address the State Lands Commission responsibilities for prevention, inspection, response, containment, and cleanup programs for a facility activity. This impacts petroleum barge activities to the extent the facilities are adhering to approved operations manuals while transferring oil to or from the barge.

General Construction Company POLICY

It is the policy of General Construction Company to NEVER SACRIFICE SAFETY FOR SPEED AND/OR ECONOMY. The Companies Oil Transfer Procedure guidelines as outlined for each vessel along with the following General Construction Company policies will be carried out during all phases of transfer operations.

- There will be pre-transfer conference before each fuel loading operation with both the General Construction Company tug and barge representatives or the vendor and barge representatives to acknowledge the fuel oil loading procedures.

- There will be one person from General Construction Company whose attention is dedicated to the fuel loading operation.

- Communication is maintained with tug (or shore) and barge personnel during loading. If, for any reason, the communications link on a transfer should be broken – SHUT DOWN.

- If there is any doubt with regard to any part of the transfer operation – SHUT DOWN and REVIEW.

- Fuel oil transfer to the barge will be noted in the tug engineering log.

Remember, the best policy is to PREVENT OIL SPILLS from happening in the first place. The best way to prevent oil spills is to use COMMON SENSE, GOOD HOUSEKEEPING, and follow CORRECT PROCEDURES.

- INSPECT any system before putting it into operation.
- BE SURE all valves are closed and opened for transfers as required, in the right sequence.
- BE ALERT when operating machinery and equipment of any kind.
- BE CLEAN – keep work areas neat – use drip pans, wipe up drips and grease.
- CHECK FOR ITEMS that need repair such as leaky valves, frozen lines.
- Report Potential Problems.
- PREVENT LEAKS by maintaining seals on pumps and keeping valves well packed.
- PREVENT LEAKS in unions and flanged joints by keeping bolts tightened (DO NOT OVER TIGHTEN).

CAUTION IS THE KEY WORD. DO NOT TAKE SHORT CUTS.

NOTIFICATION PROCEDURES

All spills of oil and other hazardous substances must be reported **IMMEDIATELY** to the proper company, state and federal authorities. This includes any incident of damage to the vessel or barge, or any necessary activity to ensure safety of personnel and the vessel. Reports are made for all discharges of oil, with the only exception being discharges of effluence in concentration less than 15 parts per million and meeting all conditions of 33 CFR 151.10 and 33 CFR 157.37. Any significant incident such as grounding or collision presenting probability of oil spillage is also to be reported. Use the Spill Report Form on page 3 – 2 as a guide.

Notify immediately for:

- ANY DISCHARGE OF OIL TO WATER
- ANY DISCHARGE OF A HAZARDOUS SUBSTANCE OTHER THAN OIL
- ANY INCIDENT THAT MIGHT RESULT IN A DISCHARGE OF OIL

Any General Construction Company employee responsible for an operation which results in a spill, or otherwise having knowledge of a spill will notify the appropriate personnel within General Construction Company as follows:

1. The vessel Person In Charge will notify:

General Construction Company (KB&M)	**(360) 694-1201**
General Construction Company Equipment Yard	**(206) 938-6750**
(Work Hours 07:00 – 16:30)	
Jeff Arviso, Area Manager Navy-Marine	(H) (206) 855-4913
Qualified Individual (QI)	(cell) (360) 340-2476
Incident Commander	
Troy Marble, Safety Manager	(H) (360) 694-1201
Qualified Individual (QI)	(cell) (925) 525-1899
Incident Commander	
Pat Boyd, Equipment Manager	(H) (206) 938-3963
Alternate Qualified Individual (AQI)	(cell) (206) 498-8815
Chris Edwards, Equipment Supt.	(H) (253) 838-4040
Alternate Qualified Individual (AQI)	(cell) (206) 730-9790
Jim Stenger, Environmental Manager	(W) (360) 693-1478
Alternate Qualified Individual (AQI)	(cell) (360) 772-1356

2. The General Construction Company will then promptly notify federal, state, local and contract organizations as follows:

A.	National Response Center, Washington, D.C.	1-800-424-8802
	http://www.nrc.uscg.mil	
B.	WA Division of Emergency Management	1-800-258-5990
	http://access.wa.gov	
	Washington State Maritime Commission	(206) 448-7557
C.	Oregon Emergency Response System (24 Hrs)	1-800-452-0311
	OR Dept. of Environmental Quality, NW Region	(503) 229-5696
	http://www.deq.state.or.us	
	Northwest Region Maritime Fire & Safety Assoc.	(503) 228-4361
	Emergency number	(503) 220-2055
D.	CA Office of Emergency Services (California Only)	
	Office of Oil Spill Prevention and Response (OSPR)	1-800-852-7550
E.	Alaska Department of Environmental Conservation	
	http://www.state.ak.us/dec	
	Southeast Area Response Team: Juneau	(907) 465-5250
	Central Area Response Team: Anchorage	(907) 269-7500
	Northern Area Response Team: Fairbanks	(907) 451-2360

F. Depending on the location of the incident, the appropriate local U.S.C.G. will also be notified:

U.S.C.G. MSO, Anchorage, AK	(907) 271-6700
U.S.C.G. MSO, Juneau, AK	(907) 463-2450
U.S.C.G. MSO, Seattle, WA	(206) 217-6232
U.S.C.G. MSO, Portland, OR	(503) 240-9310
U.S.C.G. MSO, San Diego, CA	(619) 683-6495
U.S.C.G. MSO, San Francisco, CA	(510) 437-3073
U.S.C.G. MSO, Los Angeles, CA	(310) 980-4444
WA Department of Ecology, Northwest Region	(425) 649-7000
WA Department of Ecology, Southwest Region	(360) 407-6300
EPA Region 9; CA, NV, AZ, HI (24 Hrs)	(415) 947-3553
EPA Region 10; WA, OR, ID, AK (24 Hrs)	(206) 553-0149

Spill Contractors/Support

National Response Corporation		1-800-899-4672
Global Diving and Salvage	1-800-441-3483	(206) 623-0621
O'Brien's Oil Pollution Service		1-985-781-0804
The Glosten Associates		(206) 624-7850

SPILL REPORT FORM

WHAT TO REPORT: Use the following report as a guide when reporting a spill to company or regulatory authorities. Use the back side of this form to document each notification contact.

Timely Report: Avoid unnecessary delay of initial report to NRC and DOE/DEQ. Remaining information can be passed in follow-up reports.

1. **General Construction Company,**
   3838 West Marginal Way SW, Seattle, WA 98106
   District: 2215 E. 1st Street, Vancouver, WA 98661
   Barge _____ Tow Vessel _____
   REPORTER'S NAME: _____ POSITION in Company _____
   PHONE ( ) _____-_____ FAX ( ) _____-_____
   Local Phone on Scene ( ) _____-_____ or VHF-FM Ch _____ -SSB _____
   Official Number of Vessel_____ Country of Registry_____
   Call Sign of Vessel_____ Ship Size_____
   Need for Outside Assistance_____ Number of Crew_____
   Contact Details of the P&I Club and Correspondent_____

2. SPILL DATE: _____ SPILL TIME: _____

3. SPILL POSITION: Lat: _____ _____'N Long: _____ _____'W
   Dock/Transfer Site _____
   Body of Water _____ Closest Navigation Point _____
   Course _____ Speed _____ Intended Track _____

4. CAUSE: Exact Source if known

5. SOURCE OF SPILL TO WATER: (Barge, Tug, Deck, Valve, Pipe, Hull)

6. PARTY(S) INVOLVED:

7. TYPE OF PRODUCT: QUANTITY DISCHARGED:
   QUANTITY IN WATER
   (Best Estimate Based on flow, Tank Sounding or Visual)

8. POTENTIAL ENVIRONMENTAL THREATS – (Shorelines, Wildlife Habitats, Boat Harbor)

9. SAFETY, CONTAINMENT, AND RESPONSE ACTIONS TAKEN OR PLANNED:

10. EXTENT OF INJURIES: FATALITIES:
    DAMAGE: EVACUATIONS:
    FIRE OR SAFETY HAZARDS?

11. WEATHER CONDITIONS ON SCENE: (Wind speed, direction, air temperature, water conditions, visibility)

FORM CONTINUES ON NEXT PAGE

12. SLICK SIZE AND APPEARANCE:
13. DIRECTION OF SLICK MOVEMENT AND ESTIMATED SPEED:
14. QUANTITY OF OIL ONBOARD:
15. CURRENT CONDITION OF ANY INVOLVED VESSEL (include information to establish seaworthiness and assess damage stability and stress)
16. DATE & TIME OF NEXT REPORT:

AGENCY INITIAL CONTACT RECORD

AGENCY/COMPANY	NAME OF CONTACT	TIME OF CONTACT ESTABLISHED	COMMENTS

AGENCY FOLLOW-UP CONTACT RECORD

AGENCY/COMPANY	NAME OF CONTACT	TIME OF CONTACT ESTABLISHED	COMMENTS

SPILL RESPONSE

The spill response effort to control a discharge is managed by General Construction Company personnel in a manner discussed in this section.

SPILL RESPONSE PERSONNEL

Federal and state law requires that trained personnel and alternates be assigned to each spill response position. The law also requires that each position have enough trained personnel to be continually staffed for a 24 hour period. Trained crew members from within General Construction Company or contract assistance is to be available with sufficient training and experience to professionally operate vessels, skimmers, vacuum trucks, beach cleanup, and other mechanical or manual tasks based on the scope of the incident.

The General Construction Company spill response team identified in this section responds to all spills is U.S. waters, whether a Worst Case of 40,000 gallons from the barge D.B. Seattle, or Average Most Probable discharges of smaller quantity. For an operational spill (tank overflow/pipe or tank leakage) the response team would be comprised mostly of General Construction Company personnel, or the tug personnel if there are no General personnel on the barge. A larger spill immediately requires extensive operational and support assistance from contractors and or cooperatives.

SPILL ACTION PLAN

Should a spill occur form any of the General Construction Company barges, the designated On-scene Response Team Manager will coordinate the incident response and any oil spill cleanup activities on the spill site. The On-scene Response Team Manager will follow the Action Steps as listed in this chapter for the relative type of incident.

DETECTION

Visual detection for accidental oil discharge will be maintained during all fuel oil loading operations with personnel remaining alert to any situation that could possibly result in an oil spill. Fuel oil transfers will require personnel to maintain a close watch on the tug at the transfer pump, fuel transfer hoses and all other connections. All fuel oil transfers are to be made in accordance with the fuel oil transfer procedures. In the event of a spill, the general alarm is to be sounded. Fuel transfer operations, or other general construction operations will be secured immediately and management will be notified. Containment and cleanup operations will be initiated by the on-scene response team in accordance with the contingency plan.

ASSESSMENT

Estimates of oil spilled from transfer operations are determined by following this formula – ELAPSED TIME OF DISCHARGE X THE PUMPING RATE. Estimates of spill volume in open water made by observing size and color of slick. Movement of an oil slick is dependent on the physical characteristics of the oil, tidal currents, wind direction and velocity. Typically, tidal currents will dominate spill movements and spreading unless winds are strong. The rates at which oil spreads, evaporates and breaks down in the environment are all influenced by the process of oxidation, dissolution, dispersion, emulsification and biodegradation.

Assessment of damage stability and longitudinal strengths beyond the capability of vessel's engineer are immediately referred to the support naval engineering, Glosten Associates (listed in Section 3) for proper analysis. Evaluation of stability and longitudinal strength by the support naval engineer needs to be done before any action is taken to transfer water ballast or general cargo. Barge plans to properly evaluate stability are in the General Construction Company Seattle office and also in the Glosten Associates office. The petroleum tanks of these barges even for the internal tanks are so small that they are not significant enough to have any impact upon vessel stability or longitudinal strengths.

METHODS

Personnel Safety is the primary concern during spill response operations. Protecting the environment is the next concern. If weather and water conditions permit, then containment and recovery operations should take place.

In the event of a spill, equipment and personnel will be deployed from the tug and barge. Additional equipment and personnel will be deployed from other sources as conditions dictate. Staging areas will be located on the tug and barge. Staging areas for additional equipment will be selected as conditions dictate. Staging areas will be selected on the basis of access, size, and ability to support heavy equipment. The estimated time for initial response to a spill from a barge is two hours.

The quantity and level of equipment and personnel deployed will be selected depending upon size of the spill and weather and water conditions dictate. If the size or scope of the spill exceeds the resources maintained on the tug and barge, response contractors are immediately called to assist in containment and recovery operations.

CONTAINMENT

General Construction Company carries two harbor booms onboard the crane barges, but would contract for additional booms on an as needed basis. The most likely boom to be contracted would be an 8"X 12" flexible flotation oil containment boom either with an air or a rolled "closed cell" foam filled cylindrical buoyancy chamber, which provides the boom with high reserve buoyancy. Deployment and recovery of the boom would use a wear pad to minimize abrasion. All crane barges also carry an Oil Spill Response Kit "Tug Pack" (contents are: 4 ea 5"X10' sorbent boom, 2 ea 19"X100' sorbent sweep, 1 ea 16"X20" sorbent pads, 25 ea 33"X40"- 4mil spill bags, 1 ea duct tap, 2 ea xl petro flex gloves and 1 ea 95 gal poly overpack drum.

The containment technique chosen depends on the location of the spill, the size and type of discharge, the changing conditions of the water and weather, and the proximity to environmentally sensitive areas. The containment of oil at or near its source of discharge limits the spread of oil and maximizes the oil spill thickness; rapid and effective containment allows for more efficient recovery. Containment has traditionally involved the use of fixed barriers (jetties, docks, etc.), and floating containment booms have been used extensively for containment of oil and certain other floating hazardous materials.

In the event of oil escaping from the initial containment at the spill site, the general alarm will be sounded and the spill can be pursued to open water and contained by means of workboats towing containment boom in any of several configurations. Typically 300-600 feet of boom is towed by one or two vessels to capture or concentrate separated oil slicks. Containment takes place down current to keep the relative speed of the containment boom at approximately 1 knot. If the relative speed of the boom exceeds 1 knot, oil entrainment will occur.

Methods for using booms in relatively sheltered waters, such as canals or rivers, differ from those used in open waters. In sheltered waters, containment barriers are positioned in a variety of ways and are frequently anchored to the shoreline. Exclusion boom should be deployed at an angle to the shoreline to prevent oil from reaching sensitive areas. Diversionary booming positions boom in such a formation that oil and debris are deflected to shore where they can be recovered.

RECOVERY

The most efficient recovery of oil is with a skimmer/pump setup for significant concentration and sorbents for light sheens. General Construction Company has no skimmers in inventory but carries sorbents and equipment on the tug. Where a contractor would provide a skimmer, the oil recovery capacity of the skimmer is determined by the speed of the pump and the water conditions in which it is operating. The operator

determines the need for speed versus a high oil to water recovery ratio. This is adjusted either by pump speed or adjusting the valve on the discharge side of the pump.

LIGHTING

The barges have relatively small quantities of petroleum onboard dedicated for equipment fuel. Therefore transfer of fuel in the event of an emergency is not an issue. The removal of 40,000 gallons from the largest barge would not provide significant change in draft or stability of the barge. Removal or shifting of general construction cargo through a barge to barge transfer would more significantly reduce the load and draft of the barge. This would be used to free a grounded barge or otherwise reduce potential risk to the barge and other cargo. Any cargo lightening would be coordinated with the U.S. Coast Guard, the appropriate coastal state or port authorities.

Onshore Cleanup and Restoration

Oil carried ashore is to be removed quickly so as to minimize damage to property and sensitive ecosystems. Before cleanup f any shoreline takes place, authorization from the appropriate land management agency or private landowner must be procured. Certain land classifications such as national and state parks, game refuges and private land may preclude cleanup operations, even when cleanup activities are indicated for the particular shoreline. Biological and physical characteristics of a contaminated shoreline need to be evaluated. Sheltered shorelines not exposed to flushing action should be given highest priority for protection and cleanup.

Where shorelines are inaccessible by land vehicle because of the absence of a road system, shoreline cleanup equipment and personnel will be transported by vessel or even helicopter as the situation dictates.

Disposal of Oil and Oil Debris

Spilled oil and oil-contaminated debris recovered from water or shoreline cleanup operations must be handled and disposed of properly. Specific disposal methods will depend on the nature of the oil-contaminated material, prevailing weather conditions, geographic location, and available disposal sites. If not handled correctly, disposal can pose temporary and long range problems. A variety of disposal methods can be used on both small and large spills including oil/water separation and recycling of the oil, incineration, and natural degradation.

For small spills the oil and oil/water mixtures recovered adjacent to a vessel or facility will be pumped into waste oil barrels or storage tanks aboard the vessel or at the facility. All oil-saturated sorbents or debris will be placed in heavy-duty plastic bags or open top 55-gallon drums. All such materials will be disposed of locally at an approved location or, if necessary, transported to an approved Pacific Northwest or West Coast disposal facility. In the event of a large spill, recovery equipment and vessels with additional storage capacity will be required for both liquid products and oil soaked debris.

Recovered liquid products will be taken to the nearest oil storage facility available for waste oil storage.

Crisis Management Response Team Task Assignments

The Crisis Management Response Team for General Construction Company consists of the personnel on site at the time of any oil or hazardous materials spill is observed. Additional dock, shoreside, or vessel personnel may be utilized if adequately trained and approved by the Crisis Management Team Leader. Personnel aboard the tug towing the barge, or aboard other support response vessels in the area respond until additional assistance arrives. There is only basic firefighting equipment on the barge and additional firefighting assistance will be requested from municipal or regional sources. Barges have no muster list as they are unmanned vessels. All control plans and lists are maintained up to date on the vessel to ensure the highest response for safety of personnel and the vessel. These lists along with professional seamanship give the Captain and crew sound guidance on appropriate response action steps up to resolution of the incident.

The Crisis Management Team Assignments are as follows:

Crisis Management/Spill Response Personnel
Task Assignment and Phone List

ASSIGNMENT / POSITION	OFFICE PHONE
Crisis Team Leader, Operations Manager: Gregg Woodward (Exec Vice President)	(253) 943-4090 (206) 369-3236
Director of Safety: Troy Marble	(925) 525-1899
Crisis Team Leader Backup: Phil Wallace	(206) 793-5663
Comptroller: Tom Marshall	(360) 624-1212
Purchasing: Josh Parsons	(360) 551-1427
Incident Commander/Qualified Individual: Jeff Arviso	(360) 340-2476
Assistant Incident Commander/AQI: Pat Boyd	(206) 498-8815
Marine Operations/Vessel Crew: Chris Edwards	(206) 730-9790

The Crisis Management Team will draw upon corporate and field personnel as described in the table above. Specific functions are as follows:

CRISIS MANAGEMENT TEAM LEADER

1. The Senior person at the work site, either the job supervisor or the operator, will assume this role until additional personnel arrive and a pre-designated Team Leader is available. Additional assigned personnel will assist until the Response Team Manager is assigned.

2. In the event of a spill, while the barge is being moved from one work site to another, the captain or mate of the contract tug will assume the role of the Crisis Team Manager. The Manager will direct the On-scene Response Team crew in immediate safety and spill containment procedures.

3. Specific initial tasks are to:
   a. Evaluate potential safety risks to personnel in the area.
   b. Establish safety zone and determine level of personal protection equipment.
   c. Stop the source of the spill, if possible.
   d. Shut down and isolate operations.
   e. Initiate immediate containment and recovery procedures as necessary.

4. The On-scene Crisis Team Manager will follow the Notification Procedures.

5. If the size of the spill exceeds available capabilities, the Person-In-Charge will request additional assistance from the Company Incident Command Team.

6. Upon arrival of the Company Incident Command Team, the On-scene Response Team transfers responsibilities to the designated company incident command team members.

7. The Barge supervisor or engineer is responsible for the barge when fuel oil transfer operations are being conducted.

ON-SCENE RESPONSE TEAM MEMBERS – CREW

1. Perform safety, containment, and recovery procedures as directed by On-scene Response Team Manager.

CRISIS COMMAND CENTER

The Crisis Response Team command center is located on the barge, if available, or on the bridge of the tug or any accompanying vessel. If the barge is evacuated for

safety or other reasons and no other suitable floating platform exists, the command center will be relocated to a shoreside facility office in the nearby vicinity.

The Incident Commander will work with the Response Contractor, Logistics Coordinator, and Assistant Incident Commander in selecting an appropriate command center location. The site will be selected based on the following criteria: spill location, road access, property ownership and use rights, environmental sensitivity, and safety issues. Sanitary and life support facilities at the Command Center will be contracted for an established by the Logistics manager as appropriate.

CRISIS MANAGEMENT/INCIDENT COMMAND TEAM TASK ASSIGNMENTS

TEAM LEADER/INCIDENT COMMANDER(IC)/QUALIFIED INDIVIDUAL(QI)

The Team Leader, Incident Commander (IC) is ultimately responsible for overall management of all spill response activities, including: supervision of Incident Command Team and Support Staff functions; implementation of the incident action plan; authorization of personnel, equipment and supplies; and evaluation of the performance of the ICS organization. The QI responsibility for General Construction Company normally is with the Team Leader. The Qualified Individual (QI) is the person within the company incident response organization designated by the owner to have the owner's full authority to act on spill response financial/contractual issues. The responsibilities of the AQI are identical to the QI in the event the QI is not available. The IC/QI also communicates with government agencies and the media when necessary. Primary functions for the Team Leader/QI include:

1. Establishes Command Center location with Operations Manager.

2. Establishes the preliminary strategy for the incident command immediately following activation, based on initial situation reports from the On-scene Response Team Manager.

3. Responsible for development of the incident action plan along with the Assistant Incident Commander. This plan will be prepared during the course of the spill response following each planning meeting. The plan should include incident objectives, organizational structure changes, assignments, communications plan, medical plan, transportation plan, map/chart of the area, and other specific data such as weather forecasts, safety messages, spill trajectory and environmental issues.

4. Conducts initial briefing at the Command Center to include incident organization, current incident activities, summary resources already dispatched, and any special instructions or delegation of authority.

5. Coordinates staff activities and ensures that general welfare and safety of personnel is adequate for all components of the incident.

6. Assesses the severity of the incident and activates any additional assistance agreements or contracts required to ensure the effectiveness of containment and cleanup response actions.

7. Activates the members of the incident command response team as appropriate.

8. Ensures that all response actions are properly performed as established in this contingency plan. These actions include, as appropriate: emergency rescue, evacuation, control and containment actions, salvage operations, sampling and monitoring activities, and cleanup and removal actions.

9. The Assistant Incident Commander maintains close coordination with spill response resources, both internal company resources and contact response contractors, OSRO and support contractors. Ensures proper contractor methods, and proper disposal of oily waste, debris, and contaminated material.

10. Provides all necessary support activities and documentation throughout response operations for purposes of legal action and cost recovery.

11. Acts as direct company liaison with government agency on-scene coordinators (FOSC, SOSC, and local representatives) as follows:
    a. Provide point of contact for FOSC and SOSC government representatives.
    b. Identify representatives from each agency including communications link and location.
    c. Maintain communication with the FOSC (USCG COTP) and appropriate government agency representatives from the initial report. Establish and maintain contact with any new FOSC if one is designated senior to the local COTP due to escalation of government response.
    d. Ensure FOSC, SOSC and other agency representatives are informed of oil spill response activities. Coordinate all company response actions with the appropriate government agency to expedite process.
    e. Coordinate air, ground, and marine traffic control decisions.

12. Coordinates spill response activities with volunteer organizations.

13. As QI, activates and engages in contracting with pre-designated oil spill response contractors.

14. Establishes and obligates the company for additional spill response contractors as necessary.

15. Obligates company funds to carry out response activities until owner is available for direct financial obligation.

ASSISTANT TEAM LEADER/INCIDENT COMMANDER/DUTYPORT CAPTAIN

Responsible for assisting the Incident Commander with every aspect of the response effort. Primary efforts while assisting the IC/QI are to coordinate all company and contract personnel activity involved in response. Specific functions include:

1. Act as first alternate for the incident commander to relieve IC at any time.

2. Functions as the operations coordinator with the environmental representative, safety manager, legal advisor, central operations, communications, public affairs, administration, shoreline operations, and marine operations.

3. Assist the development of the incident action plan. This plan will be prepared during the course of the spill response following each planning meeting. Coordinates daily planning organization meetings to prepare response strategy and ensure response organization is focused on an incident action plan.

4. Develops response strategies for IC, and establish schedule for implementation.

5. Provide direct supervision over OSRO contractors and sub-contractors. Work closely with supervisors in Marine Operations, Shore Operations, and Air Operations.

6. Documents and collects spill data, maintaining accurate activity and resource status.

7. Establishes a check-in procedure for status reports.

8. Assesses progress of response actions and evaluates equipment and manpower capability.

9. Supervises the activities of the field operations units.

10. Prepare alternative strategies, ensure consistency with other sections of this contingency plan.

11. Compile approved immediate action plans and ensure all incident response members are following updated plans.

12. Attend or chair, in the absence of the IC, the planning meeting comprised of the environmental representative, safety manager, legal advisor, central operations, public affairs, administration, and the marine shoreline supervisors.

13. Transmits pertinent information received from government sources (directions and regulations) to the Incident Commander.

14. Submits reports and records as required by government agencies (acting within their legal authority) during the course of the spill.

15. Accompanies government representatives on inspection tours of a spill site.

SAFETY MANAGER

The Safety Manager is responsible for monitoring and assessing hazardous and unsafe situations and developing measures for assuring personnel safety. The Safety Manager will correct unsafe acts or conditions through the regular line of authority, although the manager may exercise emergency authority to stop or prevent unsafe acts when immediate action is required.

1. Obtains briefing from the Incident Commander

2. Identifies hazardous situations associated with the incident.

3. Participates in planning meetings.

4. Reviews Incident Action Plan.

5. Identifies potentially unsafe situations.

6. Ensures that all oil spill personnel are informed of safety requirements.

7. Exercises emergency authority to stop and prevent unsafe acts.

8. Investigates accidents that have occurred within incident area.

9. Reviews and approves a medical plan.

10. Produces and publishes site specific safety plan.

11. Ensures all sub-contractors comply with established safety plan.

12. Works with environmental representative to ensure all volunteers are properly trained, equipped and briefed on potential hazards at the spill site.

13. Supervises and develops procedures to protect habitat, birds, animals, marine life, and vegetation as directed by the Incident Commander. Develops and implements procedures for the cleanup and care of oiled birds, marine life, or other animals and vegetation.

CENTRAL OPERATIONS SUPERVISOR

1. Familiarity with oil spill containment and recovery equipment, pumping and transfer systems, storage and disposal methodology.

2. At the direction of the Incident Commander, works with any of the operations personnel as a problem solver.

3. Recording of data regarding equipment and oily waste disposal. This information should be forwarded to the Command Center for documentation purposes.

4. Proper maintenance of crew and field equipment and oily waste disposal. This information should be forwarded to the Command Center for documentation purposes.

5. Submits logs to the company field accountant at the end of each work period.

6. Updates the Incident Commander regarding the progress of the site operations and related costs.

7. Schedules and coordinates air operations including movement of people and equipment, and airborne spill surveillance.

8. Responsible for the deployment and implementation of onshore containment and recovery operations as directed by Central Operations. Onshore area includes all affected shorelines and tidal areas.

9. Responsible for the proper maintenance of crew and field equipment. Maintains time cards and activity logs (including oil recovered and debris collected).

MARINE OPERATIONS

1. Responsible for the deployment and implementation of the offshore containment and recovery operations as directed by Central Operations. Offshore area includes all affected U.S. waters.

2. Recommends to Central Operations any changes in the operations plan that would increase the effectiveness of offshore containment and recovery operations.

3. Responsible for deployment, operations, and demobilization of all company marine equipment.

4. Assigns a company employee to major subcontracted marine equipment (skimmers, workboats, etc.).
5. Coordinates with Central Operations and Shoreline Operations to provide tugs and barges for the removal of both liquid product and oiled debris from designated beach sites.

6. Submits marine operation logs to Central Operations at the end of each work period.

7. Updates Central Operations regarding the progress of the site operations and related costs.

MINOR OPERATIONAL RESPONSE

Small amounts of oil spilled as a result of operational leakage or a minor overflow of the tank will be cleaned off the barge to minimize discharge to the water. Small spills onto the water are cleaned through the use of the sorbent boom or sweeps. Small operational spill situations are most probably the following category: pipe leakage, tank overflow, or hull leakage.

Pipe Leakage

The incident of pipe or hose leakage is most likely associated with fueling operations for the diesel carried in the barge as auxiliary generator fuel. The piping system used for fueling is maintained in excellent condition and observed by barge personnel during the fueling operation. Once fueling is complete the line is drained. Response to a spill will use the action steps on the checklist as follows:

Pipe Leakage action steps – CHECKLIST

1. STOP THE FLOW OF ANY SPILLED PRODUCT

___ A. Close headers and other valves (if applicable).
___ B. Isolate leaking sections of hose or pipe.
___ C. Employ damage control equipment and required.

2. SAFETY OF PERSONNEL

___ A. Warn all vessel and dock facility personnel in the immediate area.
___ B. Put on personal Protective Equipment (PPE), Level C, as required.

3. INITIAL ASSESSMENT AND CONTAINMENT

___ A. Assess: spill volume, spill movement, weather and current conditions.
___ B. Identify local environmentally sensitive areas.

4. NOTIFICATION

___ A. Notify QI/AQI, Company officials and provide information gathered on Spill Report Form.

___ B. Notify NRC/State.

5. DEPLOYMENT CONTAINMENT RECOVERY EQUIPMENT

___ A. Launch containment boom if sufficient oil exists, for light sheens and small slicks deploy sorbent sweeps, booms or pads.

___ B. Maintain clean-up efforts until commercial assistance arrives.

6. DOCUMENTATION Use Spill Report Form.

Tank Overflow

The incident of spillage during tank overflow is also most likely associated with fueling operations for the diesel auxiliary tank. The engineer on duty remains very attentive to the level of fuel in each tank as filling. Overflow spillage is most likely through the single tank vent. The barge has a deck area with containment sufficient to hold spillage on deck. Response to a spill will use the action steps on the checklist as follows:

Tank overflow Action Steps – CHECKLIST

1. STOP THE FLOW OF ANY SPILLED PRODUCT

___ A. Close headers and other valves (if applicable).

___ B. Isolate overflow location as vent, ullage hole, or other source.

2. SAFETY OF PERSONNEL

___ A. Warn all vessel/facility personnel in the immediate area.

___ B. Put on Personal Protective Equipment (PPE), Level C, as required.

3. INITIAL ASSESSMENT AND CONTAINMENT

___ A. Assess spill volume on deck and into water.

___ B. For spillage onto water assess spill movement, weather and current conditions.

___ C. Identify local environmentally sensitive areas.

4. NOTIFICATION

___ A. Notify QI/AQI, Company officials and provide information gathered on Spill Report form.

___ B. Notify NRC/State.

5. DEPLOY CONTAINMENT RECOVERY EQUIPMENT

___ A. For light sheens and small slicks deploy sorbent sweeps, booms or pads. For larger spills contract and launch containment boom.

___ B. Maintain Cleanup efforts until commercial assistance arrives.

6. DOCUMENTATION Use Spill Report Form.

Hull Failure Leakage

The barge has no fuel tanks using the hull. The probability of hull failure and resultant leakage is non existent. If there were hull failure, it would endanger the barge but not immediately contribute to a spill. Response to hull leakage will use the actions steps on the checklist as follows.

Hull Failure/Leakage Action Steps – CHECKLIST

1. SAFETY OF PERSONNEL

___ A. Warn all vessel and dock/facility personnel in the immediate area.

2. INITIAL ASSESSMENT AND CONTAINMENT

___ A. Assess which portion of the barge, void or water ballast tank which might be flooding.

3. NOTIFICATION

___ A. Notify QI/AQI, Company officials and provide information gathered on Spill Report Form.

___ B. Notify NRC/State.

MAJOR INCIDENT RESPONSE

A major incident such as grounding, fire and explosion, collision, hull failure, or excessive listing of the barge has the potential to discharge the entire contents of the 40,000-gallon tank. The response, while similar to the previously discussed operational spills, require a more significant level of response as indicated in the following action step checklists.

Grounding

A grounding situation can penetrate a tank or cause other structural damage, which could lead to a spill. Response to a spill will use the action steps on the checklist as follows.

Grounding Action Steps – CHECKLIST

1. SAFETY OF PERSONNEL

___ A. Warn all persons in the immediate area.

1. Notify Tug Captain by any means available.
2. Sound General Alarm to alert entire Tug Crew.
3. Eliminate Ignition Sources.

___ B. Put on Personal Protective Equipment (PPE) as required.

2. STOP THE FLOW OF ANY SPILLED PRODUCT

1. Remove oil from barge auxiliary tanks if this is possible.

3. INITIAL ASSESSMENT AND RESPONSE

___ A. Assess potential of additional damage by staying aground versus possibility of sinking or increase spillage if freed up.

___ B. Determine: spill volume, spill movement, weather and current conditions.

___ C. Identify any environmentally sensitive areas.

___ D. Initiate action to contain or divert as necessary on dock, land, or water with boom and sorbent. Prevent contamination of environmentally sensitive areas.

4. NOTIFICATION

___ A. Notify QI/AQI, Company Officials and provide information gathered on Spill Report Form.

___ B. Notify NRC/State.

5. LIGHTENING

___ A. Determine risks to vessel which might necessitate general cargo transfer to other vessel, rather than internal tank transfer onboard.

___ B. Take steps to safely transfer cargo from damaged barge to another vessel.

___ C. Coordinate cargo transfer with appropriate local, state, federal or port state authorities.

6. CONTAINMENT

___ A. Deploy any boom available as appropriate.

___ B. Seek additional available equipment.

7. SET UP COMMAND STRUCTURE/COMMUNICATIONS AS REQUIRED

8. RECOVERY OPERATIONS

___ A. Put out available sorbent materials.

___ B. Deploy skimmer as available and appropriate.

___ C. Work shoreline recovery consistent with environmental sensitive areas.

9. COORDINATE INTERIM AND PERMANENT DISPOSAL

___ A. Obtain necessary permits for liquid and solid wastes.

10. DECONTAMINATION

11. DOCUMENTATION Use Spill Report Form.

Fire/Explosion

Fire is always a threat to cargo, vessel stability and eventually to the tug bunker fuel on the barge. Response to a spill will use the action steps on the checklist as follows:

1. SAFETY OF PERSONNEL

___ A. Warn all persons in the immediate area.
  1. Notify Tug Captain by any means available.
  2. Sound general alarm to alert entire Tug Crew.
  3. Eliminate ignition sources.

___ B. Put on firefighting/Personal Protective Equipment (PPE) as required.

2. INITIAL ASSESSMENT AND RESPONSE

___ A. Assess location of fire and ability for ship's crew to extinguish.

___ B. Identify potential for any spill.

___ C. Be prepared to contain or divert as necessary on dock, land, or water with boom and sorbent. Prevent contamination of environmentally sensitive areas.

3. NOTIFICATION

___ A. Notify QI/AQI, Company Officials and provide information gathered on Spill Report Form.

___ B. Notify NRC/State.

Collision

A collision potentially can penetrate a tank or cause damage such as excessive list or sinkage. Response to a spill will use the action steps on the checklist as follows:

1. SAFETY OF PERSONNEL

___ A. Warn all persons in the immediate area.
  1. Notify Tug Captain by any means available.
  2. Sound general alarm to alert entire tug crew.
  3. Eliminate ignition sources.

___ B. Put on Personal Protective Equipment (PPE) as required.

2. STOP THE FLOW OF ANY SPILLED PRODUCT

___ 1. Remove oil from auxiliary tank (if applicable).

___ 2. Employ damage control equipment as required.

___ 3. Take other actions as necessary.

3. INITIAL ASSSESSMENT AND RESPONSE

___ A. Assess: spill volume, spill movement, weather and current conditions.

___ B. Identify any environmentally sensitive areas.

___ C. Initiate action to contain or divert as necessary on dock, land, or water with boom and sorbent. Prevent contamination of environmentally sensitive areas.

4. LIGHTENING

___ A. Determine risks to vessel which might necessitate general cargo transfer to other vessel, rather than internal tank transfer on board.

___ B. Take steps to safely transfer cargo from damaged barge to another vessel.

___ C. Coordinate cargo transfer will appropriate local, state, federal or port state authorities.

5. NOTIFICATION

___ A. Notify QI/AQI, Company officials and provide information gathered on Spill Report Form.

___ B. Notify NRC/State.

6. CONTAINMENT

___ 1. Deploy any boom available as appropriate.

___ 2. Seek additional available equipment.

7. SET UP COMMAND STRUCTURE/COMMUNICATIONS AS REQUIRED

8. RECOVERY OPERATIONS

___ 1. Put out available sorbent materials.

___ 2. Deploy skimmers as available and appropriate.

___ 3. Work shoreline recovery consistent with environmentally sensitive areas.

9. COORDINATE INTERIM AND PERMANENT DISPOSAL

___ 1. Obtain necessary permits for liquid and solid wastes.

Structural Damage/Excessive List

Any detected structural damage or situations of excessive list are handled like situations of grounding or collision. All incidents require continued assessment as to the potential of spill. Any event which might cause excessive list, whether it is collision, grounding, or an unexplained shift in cargo places the barge in grave danger of potential sinkage. Response to a spill will use the action steps on the checklist as follows:

Structural Damage/Excessive List – CHECKLIST

1. SAFETY OF PERSONNEL

___ A. Warn all persons in the immediate area.

1. Notify Tug Captain by any means available.
2. Sound general alarm to alert entire tug crew.
3. Eliminate ignition sources.

___ B. Put on Personal Protective Equipment (PPE) as required.

2. STOP THE FLOW OF ANY SPILLED PRODUCT

___ 1. Remove oil from auxiliary tank (if applicable).
___ 2. Employ damage control equipment as required.
___ 3. Take other actions as necessary.

3. ININITAL ASSESSMENT AND RESPONSE

___ A. Assess: reason for excessive list.
___ B. Determine potential for spill, or any extent of spill due to list.
___ C. Identify any environmentally sensitive areas.
___ D. Initiate action to contain or divert any spillage as necessary on dock, land, or water with boom and sorbent. Prevent contamination of environmentally sensitive areas.

4. NOTIFICATION

___ A. Notify QI/AQI, Company officials and provide information gathered on potential spill or actual spill on Spill Report Form.
___ B. Notify local USCG of incident and NRC/State if spillage occurs.

Containment System Failure

The incident of spillage due to containment system failure can be caused by improper use or material failure. Shipboard personnel shall assume assigned duty stations. Ensure that scuppers are plugged, vent containment box drain plugs are installed, and other breaches of containment are secured. In the case of material failure, damage control will be implemented to mitigate the failure.

Containment System Failure Action Steps – CHECKLIST

1. STOP THE FLOW OF ANY SPILLED PRODUCT

___ A. Attempt damage control at point of containment system failure.
___ B. Initiate secondary containment (oil containment boom).

2. SAFETY OF PERSONNEL

___ A. Warn all vessel/facility personnel in the immediate area.
___ 1. Notify Tug Captain by any means available.
2. Sound General alarm to alert entire crew.
___ B. Wear the appropriate level of Personal Protective Equipment (PPE)
C. Implement shipboard personnel duty assignments as previously assigned.

3. INITIAL ASSESSMENT AND CONTAINMENT

___ A. Assess spill volume outside of containment area.
___ B. For spillage onto water assess spill movement, weather and current conditions.
___ C. Identify local environmentally sensitive areas.

4. NOTIFICATION

___ A. Notify QI/AQI, Company officials and provide information gathered on Spill

Report form.

___ B. Notify NRC/State.

5. DEPLOY CONTAINMENT RECOVERY EQUIPMENT

___ A. For light sheens and small slicks deploy sorbent sweeps, booms or pads. For larger spills contract and launch containment boom.

___ B. Maintain Cleanup efforts until commercial assistance arrives.

6. DOCUMENTATION Use Spill Report Form.

7. COORDINATE INTERIM AND PERMANENT DISPOSAL

___ A. Obtain necessary permits for liquid and solid wastes.

8. DECONTAMINATION

Submerged/Foundered

A submerged or foundered vessel creates a large potential for safety concerns as well as pollution. The safety of the crew is of utmost concern if a vessel becomes submerged or is foundering.

Submerged/Foundered Action Steps – CHECKLIST

1. SAFETY OF PERSONNEL

___ A. Warn all persons in the immediate area.
   1. Notify Tug Captain by any means available.
   2. Sound General Alarm to alert entire Tug Crew.
   3. Eliminate Ignition Sources.

___ B. Put on Personal Protective Equipment (PPE) as required.
   1. This may include survival suits

2. STOP THE FLOW OF ANY SPILLED PRODUCT

1. As safety allows, before vessel submerges/founders, shut fuel valves.
2. Isolate potential spill sources

3. INITIAL ASSESSMENT AND RESPONSE

___ A. Determine: spill volume, spill movement, weather and current conditions.

___ B. Identify any environmentally sensitive areas.

___ C. Initiate action to contain or divert as necessary on dock, land, or water with boom and sorbent. Prevent contamination of environmentally sensitive areas.

4. NOTIFICATION

___ A. Notify QI/AQI, Company Officials and provide information gathered on Spill Report Form.

___ B. Notify NRC/State.

5. LIGHTENING

___ A. Determine risks to vessel which might necessitate general cargo transfer to other vessel, rather than internal tank transfer onboard. In the case of a submerged vessel, underwater lightening may be required.

___ B. Take steps to safely transfer cargo from damaged barge to another vessel.

___ C. Coordinate cargo transfer with appropriate local, state, federal or port state authorities.

6. CONTAINMENT

___ A. Deploy any boom available as appropriate.

___ B. Seek additional available equipment.

7. SET UP COMMAND STRUCTURE/COMMUNICATIONS AS REQUIRED

8. RECOVERY OPERATIONS

___ A. Put out available sorbent materials.

___ B. Deploy skimmer as available and appropriate.

___ C. Work shoreline recovery consistent with environmental sensitive areas.

9. COORDINATE INTERIM AND PERMANENT DISPOSAL

___ A. Obtain necessary permits for liquid and solid wastes.

10. DECONTAMINATION

11. DOCUMENTATION Use Spill Report Form.

Wrecked or Stranded

A wrecked or stranded situation can cause tank penetration or other structural damage, which could lead to a spill. Response to a spill will use the action steps on the checklist as follows.

Wrecked or Stranded Action Steps – CHECKLIST

1. SAFETY OF PERSONNEL

___ A. Warn all persons in the immediate area.

1. Notify Tug Captain by any means available.
2. Sound General Alarm to alert entire Tug Crew.
3. Eliminate Ignition Sources.

___ B. Put on Personal Protective Equipment (PPE) as required.

2. STOP THE FLOW OF ANY SPILLED PRODUCT

1. Remove oil from barge auxiliary tanks if this is possible.

3. INITIAL ASSESSMENT AND RESPONSE

___ A. Assess potential of additional damage caused by weather or pounding on the wreck. Determine risk of sinking and potential spillage.

___ B. Determine: spill volume, spill movement, weather and current conditions.

___ C. Identify any environmentally sensitive areas.

___ D. Initiate action to contain or divert as necessary on dock, land, or water with boom and sorbent. Prevent contamination of environmentally sensitive areas.

4. NOTIFICATION

___ A. Notify QI/AQI, Company Officials and provide information gathered on Spill Report Form.

___ B. Notify NRC/State.

5. LIGHTENING

___ A. Determine risks to vessel which might necessitate general cargo transfer to other vessel, rather than internal tank transfer onboard.

___ B. Take steps to safely transfer cargo from damaged barge to another vessel.

___ C. Coordinate cargo transfer with appropriate local, state, federal or port state authorities.

6. CONTAINMENT

___ A. Deploy any boom available as appropriate.

___ B. Seek additional available equipment.

7. SET UP COMMAND STRUCTURE/COMMUNICATIONS AS REQUIRED

8. RECOVERY OPERATIONS

___ A. Put out available sorbent materials.

___ B. Deploy skimmer as available and appropriate.

___ C. Work shoreline recovery consistent with environmental sensitive areas.

9. COORDINATE INTERIM AND PERMANENT DISPOSAL

___ A. Obtain necessary permits for liquid and solid wastes.

10. DECONTAMINATION

11. DOCUMENTATION Use Spill Report Form.

Hazardous Vapor Release

The release of hazardous vapor is cause for alarm as inhalation is the most dangerous route of exposure to hazardous materials. Response to a hazardous vapor release will use the action steps on the checklist as follows:

1. SAFETY OF PERSONNEL

___ A. Warn all persons in the immediate area.
   1. Notify Tug Captain by any means available.
   2. Sound general alarm to alert entire Tug Crew.
   3. Eliminate ignition sources.

___ B. Don the highest level of respiratory protection available.

2. <u>INITIAL ASSESSMENT AND RESPONSE</u>

___ A. Assess location of hazardous vapor release.

___ B. Identify options for stopping the release.

___ C. Personnel securing the source of the release must wear positive pressure scba respiratory protection.

___ D. Ventilate the area until hazardous vapors have been eliminated.

3. <u>NOTIFICATION</u>

___ A. Notify QI/AQI, Company Officials and provide information gathered on Spill Report Form.

___ B. Notify NRC/State.

SPILL SCENARIO

This spill scenario illustrates how General Construction Company might react to an oil spill from any of the barges based on a moderate oil spill due to tank rupture. Response is highly situational and is dependent on several variables including weather, season, personnel safety and exact circumstances of the spill. General Construction Company is capable of responding to a worst case discharge of the entire contents of the barge or vessel. They are also very capable of responding to a lesser quantity spill. The USCG calculates the worst case scenario on the total capacity of the barge or 95% of total capacity.

The following hypothetical scenario demonstrates the level of response capability for a worst case spill of 40,000 gallons. This scenario is not intended as a specifically prescribed procedure for all such events as the actual response will be dependent on several variables including weather, season, personnel safety, and priorities established by state and federal agencies.

SCENARIO RESPONSE ASSUMPTIONS

- <u>Detection.</u> There is immediate detection of spill by operating personnel on the tug, or on the barge/shore facility if moored.

- <u>Initial Action.</u> The initial actions of tug personnel are in accordance with this section.

- <u>Personnel.</u> Initial response personnel include all the personnel of the tug. Additional personnel come from primary contractors.

- Notification. Immediately after detection of the incident the tug captain notifies General Construction Company dispatch in accordance with procedures in Section 3. The dispatch notifies senior management who in turn notifies the regulatory authorities. The Safety Manager makes the necessary reports from available information gathered on the spill report form. General Construction Company also alerts contracted environmental services for assistance in primary spill response.

DISCHARGE FROM RUPTURED TANKS

In August, a General Construction Company barge, D.B. Seattle, towed by a contract tug is proceeding North from Seattle outbound with a full load of general construction supplies and 40,000 gallons of fuel for operation of the crane and other equipment on the barge. When the tug and tow are in Admiralty Inlet, abeam of Bush Point, the barge collides with a foreign freighter on the north side of the channel. The side of the barge is demolished as the barge breaks loose from the tug and the fuel tank ruptures, spilling all 40,000 gallons (950 barrels). Response action for this spill follows the Spill Action Plan using contract tug personnel and additional company and contract personnel rushed to the scene.

GEOGRAPHICAL SPECIFIC INFORMATION

This Appendix holds information pertaining to the specific geographical areas of operation for General Construction Company. Information for Puget Sound and for other West Coast Destinations is provided in each geographical specific tab within this appendix. The USCG Captain of the Port is the criteria used to determine limits of a specific geographical area.

Federal/State Notification

Puget Sound:

U.S.C.G. MSO, Seattle, Washington	**(206) 217-6232**
WA Department of Ecology, Northwest Region	**(425) 649-7000**
WA Department of Ecology, Southwest Region	**(360) 407-6300**
EPA, Region 10, WA, OR, ID, AK	**(206) 553-0149**

Columbia River:

U.S.C.G. MSO, Portland, Oregon	**(503) 240-9310**
OR Dept. of Environmental Quality, Northwest Region	**(503) 229-6385**
DEQ Spill Emergency (24 Hours)	**(800) 452-0311**

California Ports:

U.S.C.G. San Diego	**(619) 683-6495**
U.S.C.G. San Francisco Bay	**(510) 437-3073**
U.S.C.G. Los Angeles	**(310) 980-4444**
CA Office of Emergency Services (CA Only) (24 Hours)	**(800) 852-7550**

Alaska Ports:

U.S.C.G. MSO, Anchorage, Alaska	**(907) 271-6700**
U.S.C.G. MSO, Juneau, Alaska	**(907) 463-2450**
ADEC, Division of Spill Prevention & Response	**(907) 465-5250**

Puget Sound, Washington State

Captain of the Port Zone:

The Marine Safety Office, Puget Sound covers the entire confines of Puget Sound to include the Straits of Juan De Fuca, Rosario Straits and all associates U.S. waters.

Unusual Geographic Feature/Traffic Obstacles:

The basic plan describes the potential navigation obstructions and levels of traffic concentration for Puget Sound.

Oil Spill Response Considerations

The Qualified Individual and Alternate QI listed in section 3 are designated for all Puget Sound area spills. The Spill Management Team will be the personnel listed in Section 4.

Global Diving are the Oil Spill Response Organization (OSRO) to be responding on behalf of General Construction Company in the greater Puget Sound area. They will respond for the worst case, MMPD and AMPD level of spills.

The planning volume discharge for the Worst Case, as developed in this plan is 40,000 gallons, the maximum operating carrying capacity for the barge.

Salvage response for General Construction Company will be Global Diving and Salvage Inc. Tank barges for lightering are available from Foss Maritime, with Global Diving and Salvage Inc. providing pumps and other assistance.

Firefighting is provided by General Construction Company or Foss Tugs. Municipal fire fighting is available while operating in the ports of Tacoma, Seattle or Everett.

Lower Columbia River

Captain of the Port Zone:

The Marine Safety Office, Portland covers the Pacific Coast of Washington State from 47°32'N and then south to include the entire coast of Oregon. The Portland COTP zone includes the navigable portions of the Columbia, Snake and Willamette Rivers. General Construction Company transits off the Coast and up the Columbia River and Snake River to the Lewiston area.

Unusual Geographic Feature/Traffic Obstacles:

The Lower Columbia presents a west coast river bar and a restricted river transportation situation. River traffic is coordinated by the Marine Exchange and the two pilot organizations. The river bar at Astoria presents an increased hazard depending upon tidal and weather conditions. The channel restrictions on the river increase the potential for grounding or collision. Traffic congestion occurs at the mouth of the river both with coastwise traffic and sport fishing vessel concentration.

Oil Spill Response Considerations

The Qualified Individual and Alternate QI listed in section 3 are designated for all Lower Columbia River area spills. The Spill Management Team will be the personnel listed in Section 4.

The Marine Fire and Safety Association, and NRC Environmental Services, are the only Oil Spill Response Organization (OSRO) to be responding on behalf of General Construction Company in the Lower River. They will respond for worst case, MMPD and AMPD level of spills.

The federal planning volume discharge for the Worst Case, as developed in the scenario, Section 4, is 40,000 gallons, the maximum operating capacity for the barge D.B. Seattle.

Salvage response for General Construction Company will be Global Diving and Salvage Inc. Barges for lightering are available from General Construction Company or Foss Maritime, with Global Diving and Salvage Inc. providing pumps and other assistance.

Fire fighting is provided by General Construction Company or Foss tugs. Municipal fire fighting is available while operating in the ports of Astoria and Portland.

San Francisco Bay

Captain of the Port Zone:

The Marine Safety Office, San Francisco Bay covers the entire confines of San Francisco Bay and the coast line north to the Oregon California border, and south to the Santa Barbara County Line.

Unusual Geographic Feature/Traffic Obstacles:

The bay is a shallow draft harbor with clean channel markings and a Vessel Traffic Service.

Oil Spill Response Considerations

The General Construction Company Qualified Individual and Alternate QI remain personnel listed in Section 3 apply for San Francisco Bay area spill. The spill management team will be personnel listed in Section 4.

National Response Corporation – NRC is to be responding on behalf of General Construction Company in the San Francisco area.

The federal planning volume discharge for the Worst Case, as developed in the scenario, Section 4, is 40,000 gallons, the maximum operating capacity for the barge D.B. Seattle.

Salvage response for San Francisco is Global Diving and Salvage Inc. Fire fighting resources are the City of San Francisco or Oakland fire departments.

Los Angeles/Long Beach

Captain of the Port Zone:

The harbor and approaches to Los Angeles/Long Beach Harbor are all within the Marine Safety Office, LA/LB COTP zone. This COTP Zone extends to the south where the Orange County and San Diego County lines intersect, where the Marine Safety Office San Diego takes over. To the north it extends to the northern border of Santa Barbara County where jurisdiction of the Captain of the Port of Monterey takes over.

Unusual Geographic Feature/Traffic Obstacles:

The only physical obstruction to harbor approaches are the presence of breakwaters, which are clearly marked. Considerable traffic converges outside the harbor. The existence of a VTS under a State of California and USCG cooperative effort provides excellent traffic advisory coverage of the harbor.

Oil Spill Response Considerations

The General Construction Company Qualified Individual and Alternate QI remain personnel listed in Section 3 apply for Los Angeles area spills. The spill management team will be personnel listed in section 4.

National Response Corporation – NRC is the only Oil Spill Response Organization to be responding on behalf of General Construction Company in the Los Angeles area. Clean Pacific, the local cooperative will respond for significant cases, but the quantity of oil carried on the General Construction Company barges would not normally justify their response.

The federal planning volume discharge for the Worst Case, as developed in the scenario, Section 4, is 40,000 gallons, the maximum operating capacity for the barge D.B. Seattle.

Salvage response for Los Angeles is Global Diving and Salvage Inc. Fire fighting resources are the City of Los Angeles and Long Beach fire departments.

San Diego

Captain of the Port Zone:

The COTP Zone extends south to the border with Mexico. To the north it reaches the San Mateo River, where the Marine Safety Office LA/LB takes over. It runs inland to the intersection of the I-5 or the Pacific Coast Highway depending on the exact location.

Unusual Geographic Feature/Traffic Obstacles:

The only physical obstruction to the harbor approaches is the presence of breakwater on the south side of the harbor.

Oil Spill Response Considerations

The General Construction Company Qualified Individual and Alternate QI remain personnel listed in Section 3 apply for San Diego area spills. The spill management team will be personnel listed in section 4.

National Response Corporation Inc. is the only Oil Spill Response Organization to be responding on behalf of General Construction Company in the San Diego area. Clean Pacific, the local cooperative will respond for significant cases, but the quantity of oil carried on the General Construction Company barges would not normally justify their response.

The federal planning volume discharge for the Worst Case, as developed in the scenario, Section 4, is 40,000 gallons, the maximum operating capacity for the barge D.B. Seattle.

Salvage response for San Diego is Global Diving and Salvage Inc. Fire fighting resources are the City of San Diego fire department.

Cook Inlet, Western Gulf of Alaska

Captain of the Port Zone:

The Marine Safety Office, Anchorage covers the entire Western Portion of the Gulf of Alaska, including Valdez to Kodiak out to the Schumigan Islands to Unimak Pass.

Oil Spill Response Considerations

The General Construction Company Qualified Individual and Alternate QI listed in Sections 3 and 4 are designated for all spills. The spill management team will be the personnel listed in Section 4.

VRCA and CISPRI are the primary Oil Spill Response Organization (OSRO) to be contacted in the event of any spill in this area for the worst case, MMPD AMPD level of spills.

Salvage Response for the Western Gulf of Alaska will be Foss from Alaskan Operations. Fire fighting is provided by the contracting tug, and General Construction Company with equipment onboard or with additional resources available from Foss. Limited municipal fire fighting is available while operating in most ports.

Eastern Gulf of Alaska

Captain of the Port Zone:

The Marine Safety Office, Juneau covers the entire Eastern portion of the Gulf of Alaska, including Juneau, Sitka, Ketchikan and other smaller ports.

Oil Spill Response Considerations

The General Construction Company Qualified Individual and Alternate QI listed in sections 3 and 4 are designated for all spills. The spill management team will be the personnel listed in Section 4.

VRCA and SEAPRO are the primary Oil Spill Response Organizations (OSRO) to be contacted in the event of any spill in this area for the worst case, MMPD and AMPD level of spills.

Salvage response for the Eastern Gulf of Alaska will be Global Diving and Salvage or Foss with available resources out of Southeast Alaska and Seattle.

Fire fighting is provided by contract tugs, with additional resources available from Foss or local municipal fire fighting capabilities.

FINANCIALLY INTERESTED PERSONS

The financially interested parties in the General Construction Company barges include the following:

Owners:	General Construction Company
Cargo Owners:	Not applicable as fuel oil is not cargo.
Insurers:	Willis Corroon Corporation of Seattle 4200 Columbia Centre, 701 5 th Ave. Seattle, WA. 98104
Salvage Interest:	Salvage interest rests solely with individual owners.

SR 520 Evergreen Point
Floating Bridge and Landings Project

Environmental Compliance Plan
Volume III

Appendix C
Spill Prevention, Control, and Countermeasures Plan

Attachment C.6
Audit and Inspection Logs

REVISION 2

Released for Construction

Daily Equipment Inspection Log

(12-pt Environmental Check)

Inspector Name:	Date:	Time:
Project Name/Number:	Total Pieces of Equipment Inspected:	

		YES	NO
1.	Gauges properly working?	☐	☐
2.	Hydraulic hoses free of frays, leaks and drips?	☐	☐
3.	Hydraulic fittings free of damage leaks or drips?	☐	☐
4.	Transmission free of leaks or drips?	☐	☐
5.	Differentials free of leaks and drips?	☐	☐
6.	Equipment clean and free of excessive grease?	☐	☐
7.	Drips pans positioned under equipment?	☐	☐
8.	Spill kits present on equipment?	☐	☐
9.	Cooling systems free of leaks? Check radiator and hoses.	☐	☐
10.	Fuel system free of leaks or drips?	☐	☐
11.	Stationary equipment secure and wheels chocked?	☐	☐
12.	Engine free of leaks or drips?	☐	☐
Describe any observations for items checked ‘NO’:			
*****Corrective actions required:			

*****Initial and date corrective actions upon completion by responsible party.

General Construction Company

Fuel Storage Area Inspection Log

Inspector Name:	Date:	Time:
Project Name/Number:	Fuel Storage Areas Inspected:	

		YES	NO
1.	Petroleum products are managed to reduce adverse impacts on storm water quality?	☐	☐
2.	Clearances are sufficient for safe operations, service & material handling?	☐	☐
3	Petroleum hoses and fittings not leaking?		
4.	Proper signage is in place and legible?	☐	☐
5.	Grounding is used during fuel transfer?		
6.	Fuel dispensing nozzles hung up?	☐	☐
7.	Bulk tanks are in good condition and do not show signs of leakage?	☐	☐
8.	Tank liquid level gauges are in proper working order?	☐	☐
9.	All valve seals and gaskets are tight and show no signs of leakage?	☐	☐
10.	Secondary containment is in good condition and rainwater accumulation is drained appropriately?	☐	☐
11.	Fuel storage areas are securely fenced and facility lighting provides adequate illumination at night	☐	☐
12.	Spill kits present and adequately supplied?	☐	☐

Describe any observations for items checked 'NO'.

*Corrective actions required.

*Initial and date corrective actions upon completion by responsible party.

General Construction Company

Halogen Test Results Log

Project Name and Number:_____.

Date	Vendor Name	Halogen Test Performed By Vendor (Y/N)	Halogen Test Results Pass/Fail or (ppm)*

*Note: If used oil contains greater than or equal to 1,000 ppm total halogens or fails the halogen test the used oil is then considered hazardous waste.

Container Chemical Labels

Chemical Name
_____
Date Purchased
_____

Chemical Name
_____
Date Purchased
_____

Chemical Name
_____
Date Purchased
_____

Chemical Name
_____
Date Purchased
_____

Chemical Name:
_____
Date Purchased: _____
Date Opened: _____

Chemical Name:
_____
Date Purchased: _____
Date Opened: _____

Chemical Name:
_____
Date Purchased: _____
Date Opened: _____

Chemical Name:
_____
Date Purchased: _____
Date Opened: _____

Chemical Name:
_____
Date Purchased: _____
Date Opened: _____

Chemical Name:
_____
Date Purchased: _____
Date Opened: _____

Chemical Name:
_____
Date Purchased: _____
Date Opened: _____

Chemical Name:
_____
Date Purchased: _____
Date Opened: _____

General Construction Company

Monthly Hazardous Material Inventory Log

Project Name/Number _____.

Date _____.

Inventory Completed By	Product Name	List Chemicals	CAS Numbers	Hazard Category	Quantity	Storage Container	MSDS on File (Y/N)
Example	Antifreeze	Ethylene Glycol 85 to 94 % Diethylene Gylcol 0 to 10 %	107-21-1	2	260 gal 55 gal 55 gal	Tote Drum Drum	Yes

General Construction Company

Hazardous and Universal Waste Weekly Inspection Log

Inspector Name:	Date:	Time:
Project Name/Number:	Total Number of Containers:	

	YES	NO
1. Is the area free of debris and other materials?	☐	☐
2. Is the ground clean and dry?	☐	☐
3. Are container tops free of spillage?	☐	☐
4. Is the area free of spills or leaks?	☐	☐
5. Are all of the containers in good condition?(free of dents and corrosion, not bulging, or otherwise deteriorating?)	☐	☐
6. Are all containers properly closed?	☐	☐
7. Are containers labeled with hazardous waste labels?	☐	☐
8. Is the following information on the labels filled out?		
Generator name and address	☐	☐
Accumulation start date	☐	☐
Contents	☐	☐
Physical state	☐	☐
Hazardous properties	☐	☐
9. Is the information on the labels legible?	☐	☐
10. Have wastes been disposed of within the allowable accumulation time?	☐	☐
11. Are the containers compatible with their contents?	☐	☐
12. Are incompatible wastes stored separately?	☐	☐
13. Is there adequate aisle space?	☐	☐

Describe any observations for items checked 'NO'.

*Corrective actions required.

*Initial and date corrective actions upon completion by responsible party.

SR 520 Evergreen Point
Floating Bridge and Landings Project

Environmental Compliance Plan
Volume III

Appendix D
Collection, Containment, and Disposal Plan

REVISION 2

Released for Construction

SR 520 Evergreen Point
Floating Bridge and Landings Project

Environmental Compliance Plan

Appendix D
Collection, Containment, and Disposal Plan

Prepared for Submittal to
Washington State Department of Transportation

Prepared by
Floyd|Snider

On behalf of
Kiewit/General/Manson, A Joint Venture

October 5, 2012

REVISION 2
Released for Construction

Table of Contents

1.0 Introduction D-1

2.0 Project Description D-3

2.1 FACILITY MOBILIZATION AND SITE PREPARATION D-3
2.2 CONCRETE OPERATIONS D-4
2.3 DEMOLITION AND DEMOBILIZATION D-5
2.4 DRAINAGE PATHWAYS D-6
2.5 NEARBY WATERWAYS AND SENSITIVE AREAS D-6

3.0 Project Activities D-9

3.1 BEST MANAGEMENT PRACTICES D-10
3.2 CONCRETE PROCESS WATER MANAGEMENT D-12
3.3 DEMOLITION D-14
3.3.1 Containment and Collection D-14
3.4 STOCKPILING D-14
3.4.1 Containment and Collection D-14
3.4.2 Disposal/Recycle/Reuse D-15
3.5 CONCRETE PLACEMENT D-15
3.5.1 Containment and Collection D-15
3.5.2 Disposal D-15
3.6 EQUIPMENT WASHING D-15
3.6.1 Containment and Collection D-15
3.6.2 Disposal D-16
3.7 SAW CUTTING D-16
3.7.1 Containment and Collection D-16
3.7.2 Disposal D-17

4.0 Training D-19

5.0 Inspections D-21

6.0 Reporting and Response D-23

7.0 References D-25

List of Tables

Table D.1 KGM Environmental Compliance Team Duties and Responsibilities

List of Figures

Figure D.1 Kenmore Yard Site Layout
Figure D.2 CTC Facility Layout
Figure D.3 Floating Bridge and Landings Site Layout
Figure D.4 Medina Site Layout

List of Attachments

Attachment D.1 WSDOT Standard Specifications 5-01.3(11)

List of Abbreviations/Acronyms

Abbreviation/ Acronym	Definition
BMP	Best Management Practice
CCDP	Collection and Containment Disposal Plan
CSWGP	Construction Stormwater General Permit
CTC Facility	Concrete Technology Corporation Pontoon Casting Facility
ECAP	Environmental Compliance Assurance Procedures
ECI	KGM Environmental Compliance Inspector
Ecology	Washington State Department of Ecology
ECP	Environmental Compliance Plan
Kenmore Yard	Kenmore Construction and Support Yard
KGM	Kiewit/General/Manson, A Joint Venture
KGM EM	KGM Environmental Manager
NPDES	National Pollutant Discharge Elimination System
RFP	Request for Proposal
SGMP	Soil and Groundwater Management Plan
SPCC	Spill Prevention, Control, and Countermeasures
SPCCP	Spill Prevention, Control, and Countermeasures Plan
SR 520 FBL Project	State Route 520 Evergreen Point Floating Bridge and Landings Project
SR 520 FBL Site	Floating Bridge and Landings Site
T-18	Terminal 18
WQC	Water Quality Certification
WSDOT	Washington State Department of Transportation

1.0 Introduction

Kiewit/General/Manson, A Joint Venture (KGM) has prepared this Collection, Containment, and Disposal Plan (CCDP) for the Washington State Department of Transportation (WSDOT) to facilitate construction of the State Route (SR) 520 Evergreen Point Floating Bridge and Landings Project (SR 520 FBL Project). The SR 520 FBL Project includes work activities at three locations: the Kenmore Construction Support Yard (Kenmore Yard); the Concrete Technology Corporation Pontoon Casting Facility (CTC Facility) and the adjacent Port of Tacoma property; and the Floating Bridge and Landings Site (SR 520 FBL Site) that includes both upland areas within the City of Medina and over-water areas within Lake Washington in both Medina and Seattle jurisdictions. Additionally, pontoons will be outfitted at three remote outfitting locations that are existing deep berth locations where KGM will lease space. These remote outfitting locations include the Port of Tacoma EB-1 wharf on the Blair Waterway in Tacoma, the Port of Seattle Terminal 18 (T-18) wharf on Harbor Island in Seattle, and Vigor Shipyards on Harbor Island in Seattle. No soil or groundwater disturbing activities will occur at these remote outfitting locations.

KGM will implement this CCDP for any work performed by KGM that may include construction activities related to concrete installation and activities that generate residue from asphalt, concrete, or Portland cement concrete materials during construction activities within any of the above locations. This CCDP is submitted to WSDOT as Appendix D of the SR 520 FBL Project Environmental Compliance Plan (ECP).

This plan demonstrates how KGM will prevent surface and groundwater pollution from concrete- and asphalt-related activities through the implementation of various best management practices (BMPs). The CCDP is supplemental to the project Spill Prevention, Control, and Countermeasures Plan (SPCCP), and incorporates relevant material contained within the Washington State Department of Ecology's (Ecology's) *2005 Storm Water Management Manual for Western Washington, Volume II Construction Storm Water Pollution Prevention* (Ecology 2005). This material includes applicable BMPs for concrete handling, storage, and disposal. The CCDP was prepared as described in Section 2.8.3.2.3.4 of the Request for Proposal (RFP; WSDOT 2010), and will be submitted to WSDOT for acceptance prior to the beginning of any concrete or grinding work.

Concrete waste management procedures and practices are implemented on construction projects where:

- concrete is used as a construction material,
- concrete dust and debris result from demolition activities,
- slurries containing Portland cement concrete or asphalt concrete are generated such as from saw cutting, coring, grinding, grooving, and hydro-concrete demolition,
- concrete trucks and other concrete-coated equipment are washed on-site.

Construction activities involving concrete work can produce process water and slurry that contain fine particles and exhibit high pH values (greater than 8.5 standard units). Uncontrolled process water and slurry could contribute to a violation of water quality standards to receiving groundwater or surface waters. All waters (stormwater, groundwater, and process water) that have come into contact with curing concrete, concrete pours and grindings, or cement-treated soils will be managed and must meet the requirements of the SR 520 FBL Project National Pollution Discharge Elimination System (NPDES) Construction Stormwater General Permit

(CSWGP) for bridge and approach construction, the Kenmore Yard NPDES CSWGP; the existing CTC Facility NPDES Waste Discharge Permit; the 401 Water Quality Certification (WQC) for the SR 520 FBL Project; and the Environmental Commitments List (Appendix C1 of the RFP). Adherence to the CCDP will minimize the volume of water requiring treatment to meet these standards.

The objective of the CCDP is to provide measures that prevent, control, and eliminate the introduction of grinding slurry, concrete debris, or concrete-impacted waters to ditches, culverts, groundwater, wetlands, or other waterways. KGM will implement the measures contained within this plan in order to identify, reduce, eliminate, or prevent stormwater contamination and water pollution.

2.0 Project Description

The purpose of the SR 520 FBL Project is to build a six-lane floating bridge and landings as a component of the Interstate 5 (I-5) to Medina: Bridge Replacement and HOV Project. Construction and assembly of the SR 520 FBL Project will be completed in the City of Medina, and over water on Lake Washington between Medina and Seattle. KGM plans to use the Kenmore Yard for casting concrete bridge deck panels and anchors, and for general construction staging and support for construction of the new floating bridge and landings. Concrete supplemental pontoons for the new bridge will be constructed by KGM at the CTC Facility in Tacoma.

The SR 520 FBL Project involves several phases at each of the work locations. Site layouts of each location can be found in Figures D.1 to D.3 where the following types of work will be done. Concrete work involved in the major phases of work, listed below, is described in the sections that follow:

- Mobilization activities (all three locations)
- Construction of concrete supplemental pontoons (CTC Facility)
- Construction of site infrastructure for concrete precasting (Kenmore Yard)
- Precast construction of concrete bridge deck panels, gravity anchors, and fluke anchors (Kenmore Yard)
- Pontoon outfitting at remote locations (EB-1 Wharf, T-18, and Vigor Shipyards)
- Construction of east approach bridge structure (SR 520 FBL Site in Medina)
- Outfitting and assembly of floating bridge components, construction of west approach structures (Lake Washington)
- Construction of maintenance building (SR 520 FBL Site in Medina)
- Removal of casting slabs and demobilization from Kenmore Yard (Kenmore Yard)
- Deconstruction of existing floating bridge and landing components (SR 520 FBL Site)
- Site demobilization (all three locations)

2.1 FACILITY MOBILIZATION AND SITE PREPARATION

The construction phase at the Kenmore Yard will include concrete work to build casting slabs. Concrete will be provided by truck from the adjacent CalPortland facility. Stormwater generated during construction will be managed in accordance with the NPDES CSWGP for the Kenmore Yard. Stormwater will collect in sediment traps constructed previously by the site owner, and will infiltrate into the ground. Stormwater discharges are only anticipated in storm events greater than a 100-year storm. These discharges would be emergency overflow release events, if they occur, and would be monitored for pH, turbidity, dissolved oxygen, and temperature.

KGM's use of the CTC Facility for pontoon fabrication is consistent with the existing permitted activities at these sites. The adjacent Port of Tacoma property will be used for construction trailer placement, temporary storage of construction materials, parking, and pontoon mock-up construction, with no soil or groundwater disturbing activities. Management of stormwater and process water at the CTC Facility will fall under existing CTC water management practices and be compliant with existing facility NPDES Waste Discharge Permit requirements. At the Port of

Tacoma property, the process water collected from the pontoon mock-up construction work area will be pumped to a truck or holding tank to be disposed of off-site at a permitted facility.

At the upland areas of the SR 520 FBL Site within the City of Medina, the work will include clearing and grubbing of the site, soil excavation and dewatering, and construction of: structural retaining walls, temporary construction staging areas and access roads, a temporary sediment control pond, the foundation of Pier 2 of the east approach, the bridge maintenance facility, and parking lot.

KGM will operate and manage dewatered groundwater and construction stormwater in the uplands area in compliance with the SR 520 FBL NPDES CSWGP. Waters that will be managed, stored, and treated in the sediment control pond and associated water treatment system will include dewatered groundwater, construction stormwater (including concrete process waters), and cofferdam dewater from Pier 2. Dewatered groundwater, dewatered cofferdam water, and construction stormwater will be collected and pumped to the temporary sediment control pond and potential temporary holding tanks (Baker Tank) as needed, for on-site treatment prior to discharge to Lake Washington. Discharge of dewatered groundwater and stormwater to Lake Washington will be monitored and in compliance with the NPDES permit requirements.

The use of these remote locations for pontoon outfitting is consistent with the existing permitted activities at these sites. Each of these outfitting locations is an existing commercial shipping or mooring facility regularly used by large vessels or barges. No ground disturbing activities will be conducted at any of the remote outfitting locations. Potential outfitting activities will be the same at all three locations and the same as those activities performed during pontoon outfitting operations within the temporary eastside staging area in Lake Washington; however, pontoons will not be joined at the remote outfitting locations. The specific BMPs that will be implemented during pontoon outfitting within the temporary eastside staging area are described in detail in the Construction Water Quality Monitoring and Protection Plan (CWQMPP) as provided in Appendix I of the ECP. These BMPs will also be implemented at the remote outfitting locations.

2.2 CONCRETE OPERATIONS

Operations for the project will use significant quantities of concrete to construct the east and west approach structures, maintenance buildings, precast bridge decks and anchors, and supplemental pontoons. Concrete will be trucked to all work areas from off-site concrete batch plants.

Concrete operations for pontoon fabrication at the CTC Facility include casting and assembly of reinforced concrete pontoon structures. Following fabrication, they will be floated out of the basin, and temporarily moored in areas at the Port of Tacoma before being towed to Lake Washington. The process water from the CTC Facility operations, including any stormwater present in the graving dock during casting operations, will be collected and treated to meet the requirements of the facility's NPDES Permit requirements prior to discharge to the Blair Waterway.

Concrete operations to be conducted at the Kenmore Yard include casting of reinforced concrete gravity anchors, fluke anchors, and bridge decking panels. Upon completion, precast concrete components will be stored in the Kenmore Yard, before being loaded onto barges for transport to the SR 520 FBL Site. Process water from Kenmore Yard operations, including all

stormwater falling within bermed areas on casting slabs during the first 7 days of curing, will be collected for pretreatment and discharge to the sanitary sewer.

Process water and general construction stormwater will at all times be handled and treated separately and will meet the appropriate permit (NPDES CSWGP and Waste Discharge Permit) requirements prior to discharge.

Concrete operations to be conducted within the upland area of the SR 520 FBL Site include construction of: the maintenance facility, building shoring walls, parking lot, upland Pier 2 and Pier 3 spread footings, and concrete retaining walls.

Concrete operations to be conducted as in-water and over-water work within the SR 520 FBL Site will construct the east approach (fixed bridge structure), including the Pier 1 spread footing and concrete column. The fixed portion of the east approach will be completed using the segmental concrete-balanced cantilever construction. This method will also be used for the construction of the bridge on top of the Pier 1 and Pier 2 columns.

Concrete operations also include the floating bridge superstructure outfitting by constructing the bridge superstructure and roadway decking on the top of the pontoons within the temporary eastside staging area. Pontoon outfitting will construct the columns that support the roadway, install pier cross beams between the columns, and place and connect the precast concrete roadway deck panels. Outfitting will be conducted primarily within the eastside staging area of Lake Washington, within the limits of construction, or at one of the three remote (off-site) outfitting locations that are existing commercial shipping or mooring facilities.

2.3 DEMOLITION AND DEMOBILIZATION

Demolition activities will primarily be associated with the dismantling and removal of the existing SR 520 floating bridge and landings upon completion of the replacement structures. In addition, the casting slabs will be demolished and there will be a demobilization effort for the construction support facilities at the Kenmore Yard. During any concrete cutting, concrete slurry, grinding residues, and debris shall be managed with the following procedures:

- All concrete residue will be removed (vacuumed) from the roadway and other surfaces on a continuous basis immediately behind the grinding or cutting operations.
- Concrete slurry will not be allowed to drain across open traffic lanes or shoulders.
- Concrete slurry will not be: allowed to drain into any water, placed on a roadway slope within 200 feet of any waterway, or placed in other areas identified by the KGM Environmental Manager (KGM EM).
- Concrete slurry or debris will be prevented from entering ditches, culverts, or other waterways, including wetlands or aquifers.
- Concrete slurry shall be collected from the roadway and disposed of by KGM at an appropriate off-site disposal facility.
- All high pH process water or wastewater (including contaminated stormwater) that is generated during concrete grinding or demolition activities will not be discharged to surface waters or groundwater.

Specific details regarding the demolition of the existing bridge will be added in a later ECP revision.

2.4 DRAINAGE PATHWAYS

The topography of Kenmore Yard and the CTC Facility is relatively flat. All stormwater generated from these project areas will be managed according to applicable NPDES permits.

The Kenmore Yard, upon completion of maintenance activities by the current property owner, prior to KGM occupying the site, will have a crushed rock or gravel surface that will drain internally to sediment traps and on-site infiltration. Stormwater discharge to Lake Washington will only occur in extreme storm events. Emergency overflows will be monitored in accordance with the CSWGP for the Kenmore Yard. At the Kenmore Yard, a perimeter berm, which will be stabilized prior to start of construction, will protect the shoreline vegetative buffer.

Stormwater collected and managed at the CTC Facility will be managed in compliance with the facility's NPDES Waste Discharge Permit requirements prior to discharge into the Blair Waterway in the inner portion of Commencement Bay.

For the construction activities conducted within the upland portion of the SR 520 FBL Project Site, KGM will operate in compliance with the NPDES CSWGP for the project and the associated TESCP (Appendix B.2). Dewatered groundwater, dewatered cofferdam water, and construction stormwater (including concrete process water) will be collected and pumped to the temporary sediment control pond and potential temporary holding tanks (Baker Tank) as needed, for on-site treatment prior to discharge to Lake Washington. Discharge of dewatered groundwater and stormwater to Lake Washington will be monitored to ensure compliance with the NPDES permit requirements.

During construction, a temporary ecology block wall will be installed along the shoreline, just above the ordinary high water mark. This temporary block wall will support temporary construction access roadway fill, which will allow level access and will accommodate the necessary turning area for heavy equipment to the Pier 2 and maintenance facility construction areas. Additionally, this temporary wall will serve a critical purpose as part of the shoreline construction BMPs, in addition to silt fencing, to ensure that stormwater runoff and soil from the construction site do not flow directly into the lake. During site disruption, the wall will serve as a hard edge to the construction site. The wall will also provide an internal temporary swale and underdrain that will direct runoff to the temporary erosion and sediment control facilities for treatment prior to discharge.

2.5 NEARBY WATERWAYS AND SENSITIVE AREAS

The Kenmore Yard and the CTC Facility are not located within aquifer recharge areas or sole-source aquifer recharge areas. The areas surrounding the sites are industrial. The receiving waterways immediately adjacent to the sites include the following:

- Lake Washington (Kenmore Yard and SR 520 FBL Site)
- Kenmore Navigation Channel (Kenmore Yard)
- Sammamish River (Kenmore Yard)
- Blair Waterway in Commencement Bay (CTC Facility)

- The Port of Tacoma Fairliner Habitat Area, located in a small cove next to Washington United Terminals, a container terminal on the west side of the Blair Waterway (CTC Facility)

Wetland mapping from the City of Kenmore identifies two on-site wetland areas located within the vegetated shoreline area of the Kenmore Yard; however, no activities are proposed within the wetland or shoreline vegetated area and these features will not be disturbed by the proposed construction or operations at the site. There are no proposed discharges of fill or turbid water to on-site or off-site wetlands/waters. All Kenmore Yard stormwater will drain internally, and will not be directed towards the existing shoreline vegetation or Lake Washington. Process water will be collected for treatment and approved discharge to the sanitary sewer.

This page intentionally left blank.

3.0 Project Activities

Many concrete-related construction activities will be conducted during the SR520 FBL Project, including the construction of casting slabs, casting of components (pontoons, anchors, and roadway decking), assembly and build-out of the floating bridge and landings, and demolition and removal of the existing floating bridge and landings.

During KGM site preparations at the Kenmore Yard, concrete pads will be fabricated to be used as the casting slabs for roadway decking and anchors. KGM operations at the Kenmore Yard will use concrete for precast construction of gravity anchors, fluke anchors, and roadway deck panels. Concrete will be supplied from the adjacent CalPortland redi-mix batch plant facility.

Work at the CTC Facility will include reinforced concrete pontoon fabrication. Concrete will be trucked to the site from off-site concrete batch plant facilities. Upon completion of casting a pontoon, the casting basin will be cleaned and concrete residue removed, stored, and disposed of in accordance with facility BMPs. Work at the adjacent Port of Tacoma property will include construction of a partial pontoon mock-up, an approximately 20-foot by 20-foot section of pontoon to be used as an example of pontoon construction techniques. Construction of the pontoon mock-up will be conducted on a paved area with temporary containment berming that will collect all concrete construction process water, including rain water that contacts uncured concrete.

Project work in the City of Medina will consist of upland construction activities related to the construction of the bridge east approach and the construction of the maintenance facility. The site work for the construction of the east approach includes clearing and grubbing of the site, soil excavation and dewatering, and construction of: a cantilever solider pile shoring wall, temporary ecology block retaining walls, temporary construction staging areas and access roads, a temporary sediment control pond, in-place casting of the foundation of Pier 2 east approach, and the bridge maintenance facility and parking lot.

The in-water and over-water project construction activities include the following: installation of dolphins and anchors for the construction of a temporary eastside staging area for pontoon staging and assembly and outfitting of the floating bridge components; construction of the Pier 1 spread footing and column; construction of a temporary work trestle; construction of reinforced-concrete drilled shaft foundations; installation of anchors (fluke, gravity, and shaft anchors); and construction of the east approach. The completed bridge roadway will also include grinding and texturing.

In addition, pontoons fabricated at either the Aberdeen Casting Basin or the CTC Facility may be moored and outfitted at one of the three remote (off-site) outfitting locations.

Deconstruction and demolition activities include the demolition of the bridge fixed structures as well as structure removal. The existing bridge superstructure will be deconstructed by saw cutting and impact hammering. After the deck is cut and the diaphragms are severed, the girders would be removed, one at a time, and the cross beams would be removed and all materials loaded onto trucks or barges, and then hauled or shipped for off-site demolition. Underwater anchor decommissioning consists of abandoning all anchors in place with the exception of pile anchors.

Specific details of the demolition of the existing bridge will be included in a later ECP revision.

Pollution prevention measures associated with each type of activity are discussed in the following sections. They are derived from applicable federal, state, and local regulations, including WSDOT Standard Specifications, Amendments to the Standard Specifications (included in the SR 520 Pontoon Construction Design-Build Project Request for Proposal), and the Environmental Procedures Manual (WSDOT 2008a, 2010, 2008b).

To ensure compliance, the KGM Site Superintendant or Environmental Leads will check weather forecasts daily for Seattle, as well as Tacoma, for the concrete-related work at the Kenmore Yard, CTC Facility, and the SR 520 FBL Site. Information, such as predicted wind and rainfall, will be communicated to the superintendents planning concrete work for the day, including the different types of concrete-related construction activities listed above. The probability of wind or rain will be taken into consideration when determining if concrete work should be delayed or moved ahead to minimize the risk of stormwater impacts and production of process water.

3.1 BEST MANAGEMENT PRACTICES

KGM will follow all requirements of the CTC NPDES permit for work at the CTC Facility, the CSWGP for work in the Medina uplands and at the Kenmore Yard, and the 401 WQC for over-water and in-water work at the SR 520 FBL Site. In addition, BMPs will be used to ensure ongoing compliance with these permits. BMPs are defined as

> "schedules of activities, prohibitions of practices, maintenance procedures, and structural and/or managerial practices, that when used singly or in combination, prevent or reduce the release of pollutants to waters of the State."

KGM will implement BMPs to identify, reduce, eliminate, or prevent stormwater contamination and water pollution. Specific BMPs from the Ecology Stormwater Manual for Western Washington, Volume II Construction Stormwater Pollution Prevention (Ecology 2005), applicable to the containment, collection, and disposal of concrete include, but are not limited to the following:

- C151: Concrete Handling
- C152: Saw Cutting and Surfacing Pollution Prevention
- C153: Material Delivery, Storage, and Containment
- C220: Storm Drain Inlet Protection

Additional measures for pollution prevention in relation to construction activities involving concrete include the following:

- Storing all concrete-related construction products such as form release agent, curing compound, and bonding agent under cover and away from drainage areas.
- Collecting concrete slurry waste in a permanent concrete washout facility or directly disposing of waste materials.
- Using Eco-Pans or similar containers or coverings for waste concrete and construction products.
- Covering concrete slurry pans or containers when not in use or using Eco-Pans.
- Using a protected area for quality control testing.

All concrete waste materials, including demolition debris, slurry, cuttings, and wash-out water, shall be managed and disposed of in a manner that does not violate groundwater or surface water quality standards.

At the CTC Facility, consistent with the current facility operations, the BMPs and pollution control measures include the following:

- Berming to contain and control runoff.
- Weekly sweeping of the entire paved area to minimize the transport of fine cement and aggregate particles to the waterway.
- Covering concrete waste dumpsters.
- Using Eco-Pans in tool wash-out areas.

At the CTC Facility, the main settling trough and the various settling and catch basins for stormwater and process wastewater are cleaned once a month. To prevent discharge from the settling basin during cleanup operations, a concrete lined “pond” located near the casting dock receives the discharge from the settling tank during cleaning operations. The pond is emptied back into the settling tank once cleaning operations have been completed.

For the east approach construction and floating bridge superstructure outfitting the following BMPs will be implemented and are consistent with the activities and BMPs described in the project CWQMPP, as required by the Ecology 401 WQC. The same BMPs that will be implemented during outfitting within the eastside staging area within the SR 520 FBL Project Site will also be implemented during potential pontoon outfitting at any of the three remote outfitting locations. The east approach construction and outfitting BMPs include the following:

- The concrete pumps that feed the slick line will be placed at the east abutment because it is the closest point to the water line that truck access can be established (due to the very steep slope).
- The piping system will be located on the employee access walkways to the staging area such that it can be continuously inspected and maintained.
- The concrete pipeline will be supported upon the decking of the main access walkways, which will serve as secondary containment along the majority of the routing.
- Eco-Pans will be used underneath the concrete hopper on the uplands where concrete from the concrete trucks enters the system and a concrete pump pushes it through the pipeline.
- The concrete pipeline will be rigid steel pipe with restrained gasketed joints. During line connections or during cleaning, secondary containment BMPs, such as Eco-Pans and visqueen plastic, will be used.
- Formwork soffit systems will have edge forms and containment curbing systems that will contain concrete cure water and rainfall that falls on curing concrete, so that the water can be collected and treated.
- Eco-Pans and visqueen plastic will be used to contain and collect any concrete or slurry drips to prevent spills. Waste bins that will receive concrete and/or slurry water will be watertight.

- Concrete line cleaning will be conducted by hand on the waste bin barges or other contained areas to minimize potential releases. Grout, followed by water, and then a final sponge “rabbit” will be pushed through the concrete line to ensure removal of all concrete within the line for line maintenance and prevention of line failures after each pour.
- Dry grout bags will be stored under plastic cover.
- A small portable grout mix plant will be used for grout preparation. Grout preparation will be conducted within areas that have secondary containment, using Eco-Pans, visqueen plastic, and temporary curbing.
- Eco-Pans and visqueen plastic or plastic containment buckets will be used to contain and collect any grout and/or epoxy and to prevent spills.
- Temporary curbing will be installed in each area where concrete is being poured. Concrete process water will be contained within the temporary containment area with curbing and visqueen plastic.
- Edge forms will be used to fully contain cure water or rainfall on curing concrete (all concrete process waters).
- Formwork will be secure and watertight to fully contain all concrete process waters.

The completed bridge roadway will also include grinding and texturing. All concrete slurry and grinding residue will be removed from the bridge roadway on a continuous basis immediately behind the grinding operations. Concrete slurry and grinding residual will not be allowed to drain into the lake, and will be collected via vacuum and transported off-site via truck to a permitted disposal site. The following over-water BMPs will be implemented during grinding activities:

- The bridge barrier rail will be in place during all grinding activities.
- Bridge deck drains will be plugged prior to grinding and all concrete slurry and grinding residual will be removed via vacuum from the bridge roadway on a continuous basis immediately behind the grinding operations and transported for off-site disposal.
- Water will be used to minimize and control grinding-generated dusts and residues. All grinding waters will be removed via vacuum from the bridge roadway on a continuous basis immediately behind the grinding operations and transported for off-site disposal.

3.2 CONCRETE PROCESS WATER MANAGEMENT

At the Kenmore Yard, construction process water, including all stormwater that falls on the casting slab areas within the first 7 days of the curing process, will be collected, stored on-site, pretreated, and discharged to the public sanitary sewer system under permit. To prevent any releases to the ground, the casting slabs will be designed to fully collect all water on their surfaces, which will be considered process water. Process water will be collected in sumps and pumped to temporary holding tanks (Baker Tanks) on the site. Pretreatment of the collected process water will occur in these temporary holding tanks. Collected process water will either be re-used in the concrete curing process, or will be transported off-site for disposal to the public sanitary sewer system.

Process water generated during pontoon fabrication at the CTC Facility will be managed according to facility's existing pollution control measures and NPDES permit requirements. At areas where concrete mixing and conveying equipment are washed, small settling basins capture larger, heavier particles. These basins overflow or are pumped to a site drainage system that conveys this settled wash water, along with any stormwater runoff, to a settling trough at the graving dock, where these waters mix with groundwater seepage at the graving dock. The trough at the graving dock acts as a settling tank where further removal of suspended solids in the wastewater is accomplished. There is one outfall that carries the mix of stormwater runoff and the process wastewater discharges, and the groundwater seepage into the graving dock, to the Blair Waterway. The settling basin and the discharge outfall pipe are both equipped with an in-line pH probe. The discharge outfall pipe also contains pH control (i.e., acid injection) for pH adjustment, if necessary. The outfall is a single-port polyvinyl chloride (PVC) pipe located on the bank that discharges above the water level of the waterway.

Process water collected from the partial pontoon mock-up construction work area will be pumped to a truck or holding tank to be disposed of off-site at a permitted facility such as Emerald Waste Services. The work area will be covered as much as possible during construction to reduce rainwater contact with uncured concrete and the amount of process water. After the partial pontoon mock-up has cured, the work area will be cleaned and containment will be removed.

During in-water and over-water activities conducted for bridge construction, KGM will comply with the SR 520 FBL Project 401 WQC (provided in Appendix A of the ECP). There are three types of water associated with bridge construction in-water and over-water activities that require management:

- **Concrete Process Water:** Concrete process water is defined as concrete slurry resulting from drilled shafts, grinding residue water, and any other concrete-derived waters. All concrete process water will be contained and collected for off-site upland disposal at a licensed facility.
- **High pH Stormwater:** High pH stormwater is defined as rainwater that falls on uncured "green" concrete during the first 7 days of the curing process. Stormwater that falls on uncured concrete will be contained, tested, and treated as necessary to ensure compliance with pH and turbidity water quality standards prior to discharge to the lake. If high pH stormwater mixes with concrete process water, then it becomes concrete process water and will be contained and collected for off-site upland disposal at a licensed facility.
- **Work Area Stormwater**: Work area stormwater is defined as rainwater that falls into bridge work areas of active construction that contain debris and/or stockpiled materials. These work areas will require that catch basins be blocked for water containment and collection. Work area stormwater will be contained, tested, and treated as necessary to ensure compliance with pH and turbidity water quality standards prior to discharge to the lake.

For the construction activities conducted within the upland portion of the SR 520 FBL Site, KGM will operate in compliance with the NPDES CSWGP for the SR 520 FBL Project and the associated TESCP (Appendix B.2). Construction stormwater, including turbid water from cofferdam dewatering, will be collected and pumped to the temporary sediment control pond and potential temporary holding tanks (Baker Tanks) as needed for on-site treatment prior to discharge to Lake Washington. Concrete slurries and washout will be collected for off-site disposal.

At the remote pontoon outfitting locations, all process water will be collected, containerized at the facility wharfs, and pumped to storage tanks where the process water will either be transported off-site to a disposal facility, or will be discharged into the sanitary sewer. Appropriate sanitary discharge permits will be obtained for any discharges of process water, and pre-treatment conducted as required to conform to the sanitary discharge permit requirements.

3.3 DEMOLITION

Demolition activities at the Kenmore Yard site will include removal of the concrete casting slabs and temporary roof structure prior to site demobilization.

Specific details regarding the demolition of the existing bridge will be added in a later ECP revision.

3.3.1 Containment and Collection

- Water spray will be used as needed to control concrete dust before and during concrete demolition activities.
- Demolition activities during high winds will be avoided when possible. If rescheduling is not practical, the collection area for water spray and/or debris collection will be expanded to accommodate this factor.
- Demolished concrete debris may be directly loaded into trucks for off-site disposal or recycling (refer to Section 3.4, below, for stockpiling criteria in case direct loading is not possible).
- Sweepings from exposed aggregate concrete will not be swept into the street or storm drain.
- Catch basins located near the demolition operations will be sealed with plastic or other impervious material, blocked with sandbags, or blocked using other adequate prevention methods. The barrier will be correctly sized to prevent leaks and will remain in place until the area is free of any activity-associated debris and/or dust. Additional materials, such as sandbags (to be used for diversion measures), will be readily available during the activities for spill response.

3.4 STOCKPILING

It is not anticipated that demolished concrete debris will be stockpiled for a significant amount of time during the project work. The following measures will be implemented for any concrete stockpile areas.

3.4.1 Containment and Collection

- Stockpiled concrete will be covered with plastic or other appropriate material to prevent contact with rainfall or site stormwater runoff.
- Concrete stockpiles will be securely covered during rain events, when not in use, and at the end of each work day and over the weekends.

3.4.2 Disposal/Recycle/Reuse

- Stockpiled concrete demolition debris will be disposed of or recycled by KGM or its subcontractor.
- Demolished or crushed concrete will not be reused at the Kenmore Yard.

Specific details regarding the disposal/recycling/reuse of the existing bridge material will be added in a later ECP revision.

3.5 CONCRETE PLACEMENT

Concrete placement at the Kenmore Yard and the CTC Facility for precast anchors, deck panels, and pontoons will occur in controlled areas on casting slabs or within the graving dock. In Medina and the SR 520 FBL Site, cast-in-place concrete will be used for bridge structures and the maintenance building. The following measures will be implemented for concrete-placing activities.

3.5.1 Containment and Collection

At the Kenmore Yard and CTC Facility, concrete will only be placed in controlled areas (i.e., casting beds at the Kenmore Yard and the graving dock at the CTC Facility) where all water and residues can be collected as shown in Figures D.1 and D.2. As described above in Section 3.2, the collected process water at Kenmore Yard will either be re-used in the concrete curing process, or will be transported off-site for disposal to the public sanitary sewer system. At the CTC Facility, process water, mixed with stormwater runoff and groundwater seepage, is treated and discharged per the facility NPDES permit to the Blair Waterway, if of acceptable quality.

Washing of concrete trucks and equipment will follow the washout procedures described in Section 3.6, below.

3.5.2 Disposal

Excess concrete will be discarded in designated areas only and be contained so as not to come into direct contact with any groundwater or surface water.

Specific details regarding the disposal of the existing bridge material will be added in a later ECP revision.

3.6 EQUIPMENT WASHING

Washout areas and procedures will be established on-site for all concrete-related activities. The following measures will be implemented for washing activities.

3.6.1 Containment and Collection

- Eco-Pans (mobile, preformed structures) will be designated as the main concrete washout facilities to be used on-site.
- Concrete trucks will not be washed out into storm drains, open ditches, streets, or streams.

- Washout facilities will be located a safe distance away from storm drains, open drainage facilities, or water bodies, and away from construction traffic or access areas to prevent disturbance.
- Catch basins downgradient from washout facilities will be covered during equipment washing to prevent any washwater from entering drainage systems.
- To prevent runoff from the washout area, Eco-Pans large enough to contain the liquid and/or solid waste will be used.
- Eco-Pans will be maintained in sufficient quantity and volume to completely contain all liquid and concrete waste generated by washout operations.
- Concrete washout from concrete pump bins can be washed into concrete pump trucks and discharged into designated washout areas or properly disposed of off-site.
- Eco-Pans will be securely covered with Eco-Pan lids at the end of each work day and over the weekends, or placed in an area with overhead cover. The covering will be free of holes, tears, or other defects that compromise the impermeability of the material. To prevent overtopping of the pans from the collection of any rainwater on the plastic, sheets of wood will be placed between the Eco-Pan and the plastic to provide stability.
- Eco-Pans will be maintained to provide adequate holding capacity.
- Eco-Pans will be used for tool cleanup.

3.6.2 Disposal

- After concrete wastes are washed into the designated areas or containers and allowed to harden (approximately a week), the concrete will be broken up, removed, and disposed of by KGM or its subcontractor off the project site.
- Off-site disposal of concrete process water shall be in accordance with WSDOT Standard Specification 5-01.3(11), provided in Attachment D.1.
- Eco-Pans will be stored in a manner that does not allow water collection when not in use.

3.7 SAW CUTTING

The operations at the project sites will involve saw cutting primarily during the demolition and demobilization work at the SR 520 FBL Site and potentially for removal of casting slabs at the Kenmore Yard. The following containment measures will be implemented during these activities.

3.7.1 Containment and Collection

- Slurry and cuttings will be contained during cutting and surfacing operations, and then vacuumed for collection and disposal.
- Slurry and cuttings will not remain on concrete or asphalt paving overnight.
- Slurry and cuttings will not drain to any natural or constructed drainage conveyance.
- Pavement must be as clean as possible and free from slurry.

- Catch basins located near the saw-cutting operations will be sealed with plastic or other impervious material or blocked with sandbags. The barrier will be correctly sized to prevent leaks and will remain in place until the area is free of any activity-associated debris and/or dust. Additional materials, such as sandbags (to be used for diversion measures), will be readily available during the activities for spill response. If saw cutting is required in areas with limited space available for covering or use of sandbags, extreme care will be taken to control the generation or accumulation of slurry and the work area will be immediately and concurrently vacuumed to eliminate the potential for spilling into catch basins.
- Saw-cutting slurry will be directly contained and hauled off-site by the saw-cutting subcontractor, or contained within on-site covered Eco-Pans and allowed to dry. If this method is ineffective during winter months, KGM will provide an admixture of soils and/or sand to absorb any free liquid and dispose of the material off-site as solid waste.

3.7.2 Disposal

- Dry slurry residue will be disposed of by KGM or its subcontractor off the project site or temporarily stored by KGM in a plastic-lined bermed area for later off-site disposal.
- KGM will use only Ecology-approved, licensed, and permitted waste sites for the disposal of the slurry and will provide WSDOT with a copy of the permit for disposal at the approved site.
- Process water will be treated to meet applicable requirements as outlined in site-specific permits covering the discharge or disposal of process or other waters generated at the project areas.
- Any off-site disposal of concrete process water shall be in accordance with WSDOT Standard Specification 5-01.3(11), provided as Attachment D.1.

Specific details regarding the demolition of the existing bridge will be added in a later ECP revision.

This page intentionally left blank.

4.0 Training

KGM will provide toolbox playcards on concrete cutting and a focused training session for all personnel (KGM and subcontractors) initially involved at each of the construction sites. The site-specific orientation session will be designed to explain environmental considerations so that they can be easily recognized during construction. It will also provide the basis for managers and supervisors to instruct and manage others in compliance activities. For the training program, all construction staff will receive environmental compliance training that covers water quality protection issues, contaminated media management (soils, surface, and groundwater), notification triggers, communications procedures, and spill or discovery response.

The content of this document, including implementation of BMPs as contained within this plan, will be discussed as part of this training.

This page intentionally left blank.

5.0 Inspections

Daily visual spill prevention, control, and countermeasures (SPCC) inspections will be completed and will include inspection of any concrete-related activities to ensure that BMPs are in place and remain effective, and that concrete-handling procedures are followed. The KGM Team will also conduct regular BMP inspections at least weekly, or more often as required (e.g., after excessive rainfall). Table D.1 provides the Environmental Compliance Team member roles and responsibilities. In addition to standard SPCC and temporary erosion and sediment control issues, these inspections will also address concrete issues. Observations will be recorded on the applicable inspection form (refer to Appendix C of the ECP).

This page intentionally left blank.

6.0 Reporting and Response

In the event of a release, subcontractors and/or KGM personnel, will immediately notify the KGM Environmental Compliance Inspector (ECI; or designee), and response procedures will be followed according to those described in the SPCCP (Appendix C of the ECP). The KGM ECI will contact the KGM Project Manager and the KGM EM regarding spill response activities. The KGM EM will immediately contact WSDOT's Environmental Compliance Manager in accordance with the notification requirements in WSDOT's Environmental Compliance Assurance Procedures (ECAP; Appendix K of the ECP).

Following immediate response and reporting procedures, KGM will prepare the SPCC Spill Report Form (Attachment C.1 of the SPCCP) and provide it to the WSDOT Environmental Compliance Manager. KGM will work with the WSDOT Environmental Compliance Manager to ensure that the proper information and data are collected to be accurately communicated to the appropriate agencies.

This page intentionally left blank.

7.0 References

Washington State Department of Ecology (Ecology). 2005. *Storm Water Management Manual for Western Washington, Volume II Construction Storm Water Pollution Prevention*. Prepared by Water Quality Program. Publication No. 05-10-30. February.

Washington State Department of Transportation (WSDOT). 2008a. *Standard Specifications for Road, Bridge, and Municipal Construction*. M 41-10.

———. 2008b. *Environmental Procedures Manual*. M 31-11.05. Environmental and Engineering Environmental Services. Olympia, Washington. October.

———. 2010. *Final Conformed Request for Proposal: SR520 Evergreen Point Floating Bridge and Landings Project.* 6 December.

SR 520 Evergreen Point
Floating Bridge and Landings Project

Environmental Compliance Plan
Volume III

Appendix D
Collection, Containment, and Disposal Plan

Tables

REVISION 2

Released for Construction

Table D.1
KGM Environmental Compliance Team Duties and Responsibilities

Team Member	Environmental Compliance Team Duties and Responsibilities
KGM Environmental Manager	
Robert Brenner Phone Number: 425-576-7138	• Coordinates with KGM ECI, KGM Project Director, and Construction/Demolition Manager • Has stop-work authority • Oversees job-specific environmental compliance program • Provides environmental compliance training and work plan reviews • Develops permit matrix with KGM ECI • Ensures permit compliance and fulfillment of project environmental commitments[1] • Leads the ETF in conjunction with the KGM ECI • Agency liaison[1] • Specialized Training: CESCL, HAZWOPER
KGM Environmental Compliance Inspector	
Andrew Kinkade Phone Number: 925-570-1260	• Environmental Compliance Inspections • Coordinate with WSDOT Archaeological Monitors (UDP) • Reports to the KGM Project Director • Has stop-work authority • KGM EM primary Point-of-Contact • Responsible for project's environmental compliance, compliance reporting, and documentation • Ensures implementation of environmental requirements, permit compliance, and fulfillment of Project Environmental Commitments • Verifies regulatory compliance • Manages/updates environmental plans on-site and maintains Environmental Compliance Notebooks (Land-Based and In-Water) • Document internal, WSDOT, and external communications regarding environmental compliance issues • Oversight and coordination for initial noise monitoring and receiving/handling noise complaints • Develops and implements permit matrix • Leads the ETF in conjunction with the KGM EM • Day-to-day reporting to agencies • Ensures NPDES Permit requirements, as well as other permit requirements

Table D.1
KGM Environmental Compliance Team Duties and Responsibilities

Team Member	Environmental Compliance Team Duties and Responsibilities
Andrew Kinkade Phone Number: 570-1260	• Implements and monitors TESCP BMPs and requirements • Implements Land-Based Water Quality Monitoring requirements • Noxious Weed Control per the CTC Weed Control Plan and the Floating Bridge and Landings Site RFP requirements (Section 2.29.3.3.3; WSDOT 2010b) • Fugitive Dust Prevention and Control Plan requirements • Specialized Training: CESCL, HAZWOPER
Kenmore Yard and CTC Facility Superintendants—Environmental Leads	
Ron Wika—Kenmore Yard Phone Number: 425-429-0053 Rich Spratt—CTC Phone Number: 206-255-5240	• Stop-work authority • Reports to the KGM Project Director • Coordinates with the KGM EM and KGM ECI • Ensures implementation of environmental requirements • Verifies and documents regulatory compliance • CESCL—**Refer to CESCL-Certified Personnel Pool below** • Responsible for quality assurance/quality control
SPCC and Waste Management Lead	
Ron Wika—Kenmore Yard Phone Number: 425-429-0053 Rich Spratt—CTC Phone Number: 206-255-5240 **HAZWOPER/Spill:** Robert Brenner Phone Number: 425-577-2939 Andrew Kinkade Phone Number: 925-570-1260	• SPCC BMPs and requirements • Land-Based Spill Response or coordinate with subcontracted response team if warranted • Collection Containment and Disposal Plan BMPs and requirements • Soil and Groundwater Management Plan BMPs and requirements • Specialized Training: HAZWOPER, spill response
Field Engineer	
Andrew Cowart Phone Number: 916-919-3972	• Noise monitoring • Safety and OSHA requirements
Deck Engineer(s) for Each Project Site Location	
Eric Edwards—All Locations Phone Number: 425-576-7081	• Shipboard SPCC BMPs and requirements (SOPEP)

Table D.1
KGM Environmental Compliance Team Duties and Responsibilities

Team Member	Environmental Compliance Team Duties and Responsibilities
Robert Brenner Phone Number: 425-577-2939 Andrew Kinkade Phone Number: 925-570-1260	• In-Water Spill Response Lead, coordinate with subcontracted spill response if enlisted • Construction Water Quality Monitoring (CWQMPP) for FBL work • Coordination with WSDOT Biologists for fish handling observations and documentation at the CTC Facility, if necessary • Oversight for underwater sound monitoring contractor at the SR 520 FBL Site • Specialized Training: Training In-Water Spill Response
Barge Crew	
Variable—Dependent upon activity taking place	• Shipboard SPCC BMPs and requirements • Visual observations for turbidity • Concrete wharf to barge BMPs
CESCL-Certified Personnel Pool	
All Sites	• Robert Brenner 425-577-2939 • Andrew Kinkade 925-570-1260 • Ilias Sgourides 425-576-7123 • Dirk Van Ulden 714-274-4646 • Casey Shaw 425-576-7144

Note:

1 For KGM-led permits, as identified in the RFP, KGM is the main point of contact for agency coordination and is responsible for external notification and reporting requirements, including those associated with non-compliance events.

Abbreviations:

BMP	Best Management Practice
CESCL	Certified Erosion and Sediment Control Lead
CTC	Concrete Technology Corporation
CTC Facility	Concrete Technology Corporation Pontoon Casting Facility
CWQMPP	Construction Water Quality Monitoring and Protection Plan
ETF	Environmental Task Force
FBL	Floating Bridge and Landings
HAZWOPER	Hazardous Waste Operations and Emergency Response, 40-Hour
Kenmore Yard	Kenmore Construction Support Yard
KGM	Kiewit/General/Manson, A Joint Venture
KGM ECI	KGM Environmental Compliance Inspector
KGM EM	KGM Environmental Manager
NPDES	National Pollutant Discharge Elimination System
OSHA	Occupational Safety and Health Administration
RFP	Request for Proposal
SOPEP	Shipboard Oil Pollution Emergency Procedures
SPCC	Spill Prevention, Control, and Countermeasures
SR	State Route
TESCP	Temporary Erosion and Sediment Control Plan
UDP	Unanticipated Discovery Plan
WSDOT	Washington State Department of Transportation

SR 520 Evergreen Point
Floating Bridge and Landings Project

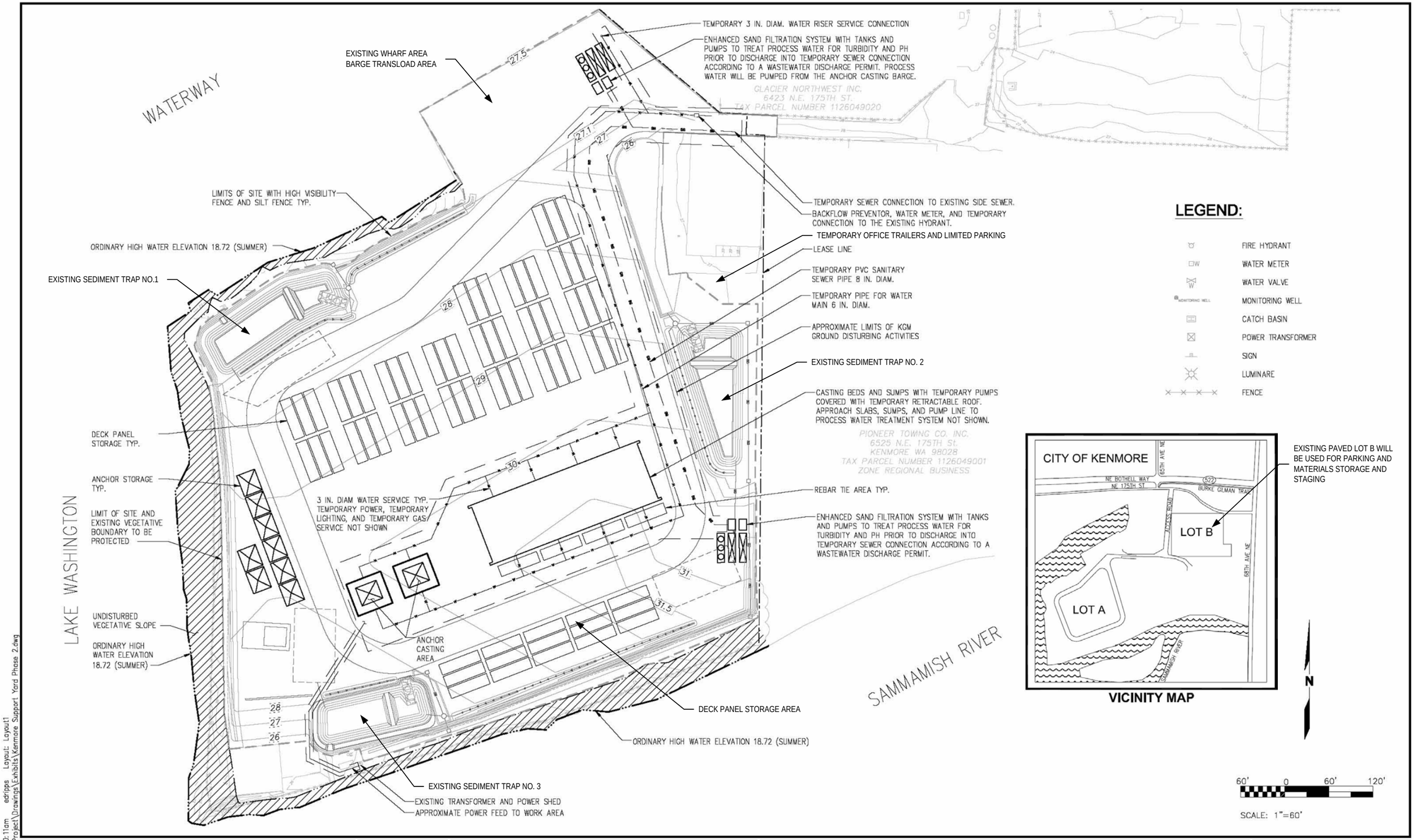
Environmental Compliance Plan
Volume III

Appendix D
Collection, Containment, and Disposal Plan

Figures

REVISION 2

Released for Construction



Plotted: Oct 12, 2011 – 10:11am edripps Layout: Layout1
M:\2011\111081 Kenmore Project\Drawings\Exhibits\Kenmore Support Yard Phase 2.dwg

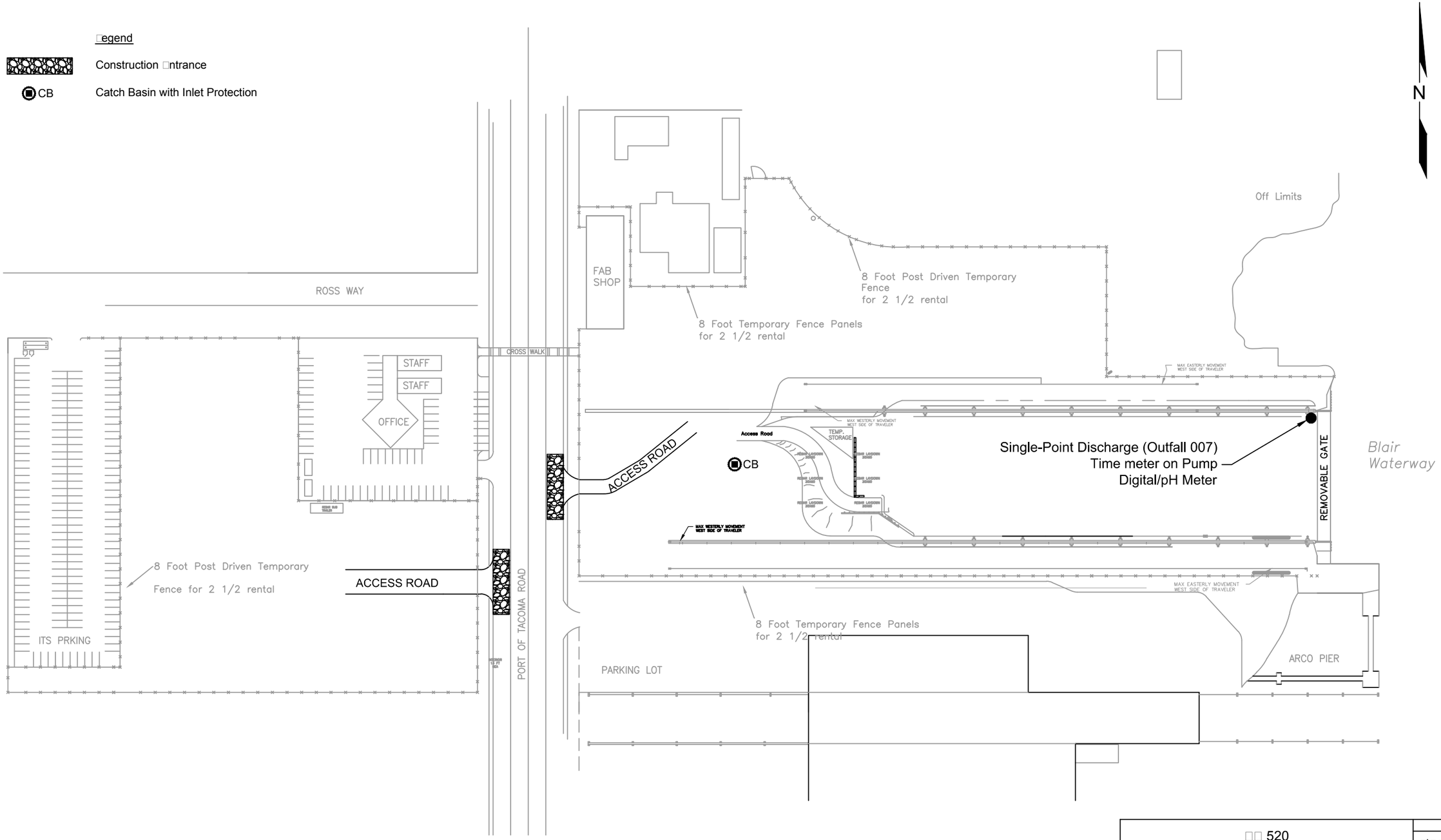
kpff Consulting Engineers
101 Stewart Street, Suite 400
Seattle, Washington 98101
(206) 382-0600 Fax (206) 382-0500

NO.	DATE	BY	REVISION

SR 520 EVERGREEN POINT FBL PROJECT
ENVIRONMENTAL COMPLIANCE PLAN
APPENDIX D: CCDP

KENMORE YARD SITE LAYOUT

DRAWN: EV	PROJECT NO.: 111081
DESIGN: ED	SCALE: 60
CHECKED: JR	DATE: OCT 10, 2011
DRAWING NO.	**D.1**
SHEET NO.	1 OF 1



Note:
Port of Tacoma properties will be used for parking construction office placement construction and fabrication support and construction material storage and staging. see Port of Tacoma lease agreement Premises igure in Appendix

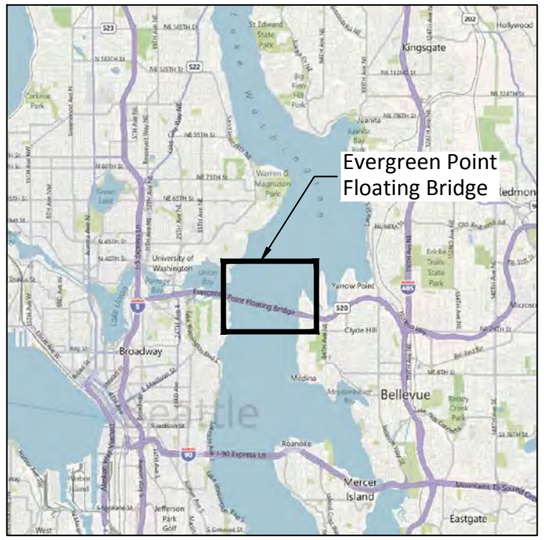
0 120 240
Scale in Feet

520
N P INT B P CT
N I NM NTA C MP IANC P AN
APP N I : CC P

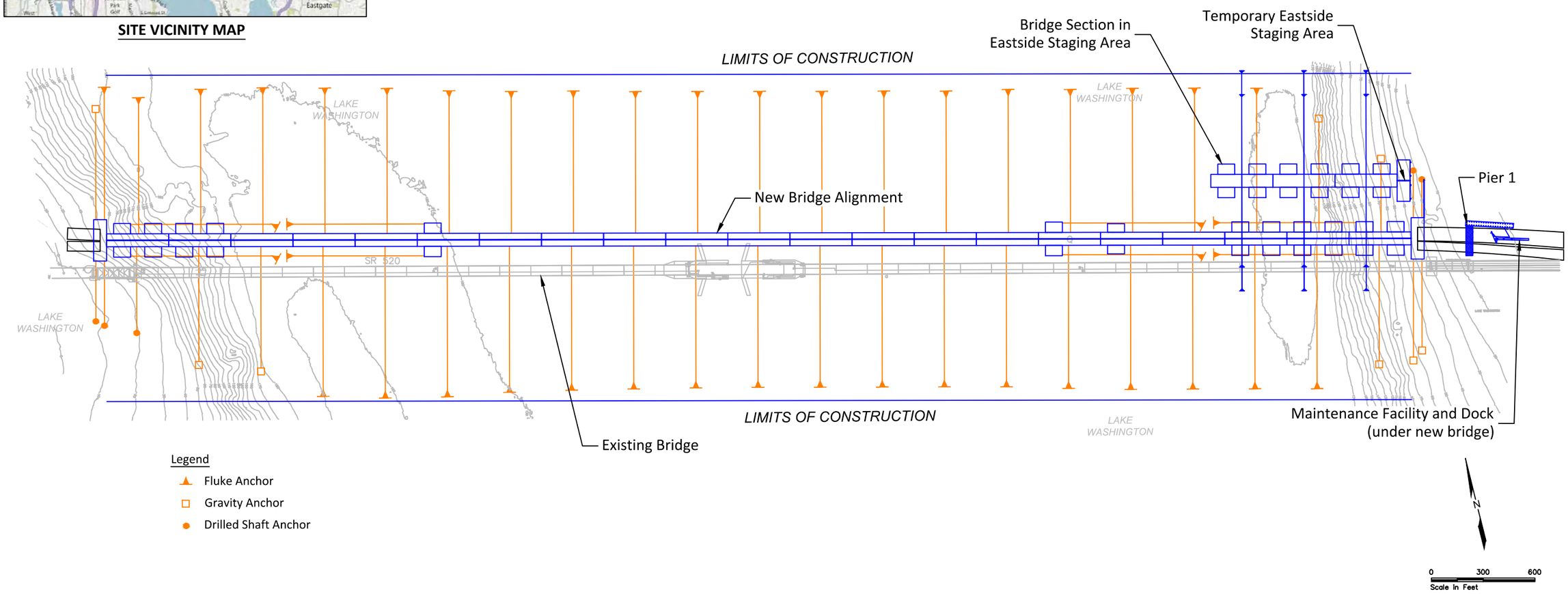
CTC ACI IT A T

.2

Plot ate: 10 2 11 - 2 2 pm Plotted by: swp
rawing Path: project Clients loyd and nider CTC rawing Name: CTC001.dwg



SITE VICINITY MAP



K:\Project\clients\Floyd and Snider\520-WQM Plan\520WQM-003.dwg

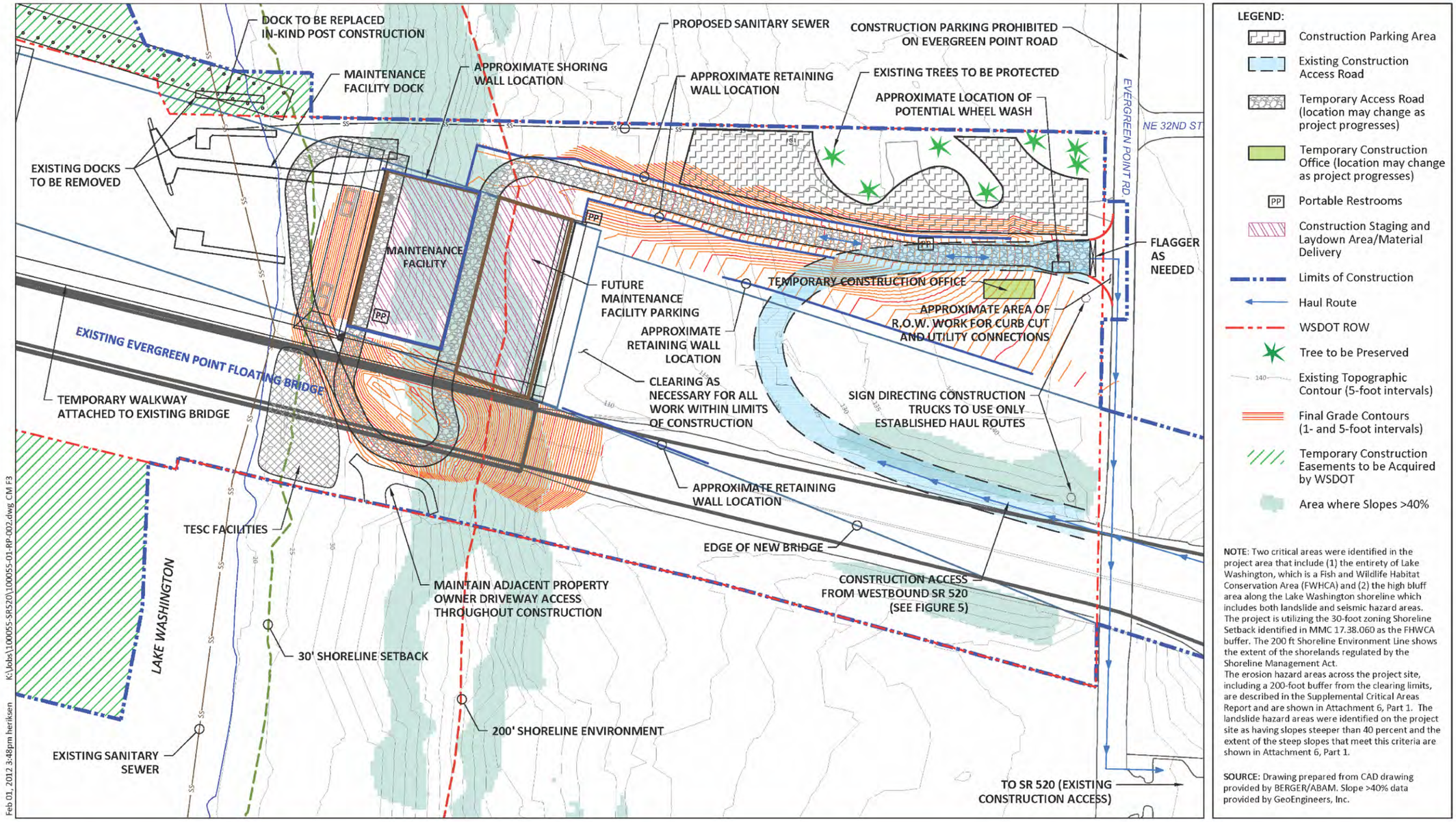
Kiewit / General / Manson
A Joint Venture

Corporate Campus East
3015 112th Avenue N.E. - Suite 100
Bellevue, WA, 98004

SR 520 EVERGREEN POINT
FLOATING BRIDGE AND LANDINGS
ENVIRONMENTAL COMPLIANCE PLAN
APPENDIX D: CCDP

FLOATING BRIDGE AND LANDINGS SITE LAYOUT

DRAWN: BTS	PROJECT NO.:
DESIGN: TS	SCALE: AS SHOWN
CHECKED: JM	DATE: JAN. 16, 2012
DRAWING NO. **Figure D.3**	



Note:
Taken from Figure 3, Mitigation Site Plan, of the Medina Construction Mitigation Plan.

SR 520 Evergreen Point
Floating Bridge and Landings
Environmental Compliance Plan
Appendix D: Collection, Containment, and Disposal Plan

Figure D.4
Medina Site Layout

SR 520 Evergreen Point
Floating Bridge and Landings Project

Environmental Compliance Plan
Volume III

Appendix D
Collection, Containment, and Disposal Plan

Attachment D.1
WSDOT Standard Specifications
5-01.3(11)

REVISION 2

Released for Construction

WSDOT Standard Specification 5-01.3(11)

5-01.3(11) Concrete Slurry

All concrete slurry and grinding residue shall be removed from the Roadway on a continual basis immediately behind the grinding or cutting operations. Slurry shall not be allowed to drain across open traffic lanes and Shoulders. Slurry shall not be allowed to drain into any waterway, placed on the Roadway slope within 200-feet of any waterway, or other areas as designated by the Engineer. Prior to commencing grinding or cutting operations, the Contractor shall submit to the Engineer for approval a plan to prevent contaminants, such as grinding slurry or concrete debris, from entering ditches, culverts, or other waterways, including wetlands or aquifers.

Concrete slurry shall be collected from the Roadway and disposed of by the Contractor off the project site. The Contractor shall provide a copy of the permit for an approved waste site for the disposal of the slurry prior to the start of the grinding.

Opening to traffic shall meet the requirements of Section 5-05.3(17).

SR 520 Evergreen Point
Floating Bridge and Landings Project

Environmental Compliance Plan

Appendix F
Soil and Groundwater Management Plan

REVISION 1

Released for Construction

SR 520 Evergreen Point
Floating Bridge and Landings Project

Environmental Compliance Plan

Appendix F
Soil and Groundwater Management Plan

Prepared for Submittal to
Washington State Department of Transportation

Prepared by
Floyd|Snider

On behalf of
Kiewit/General/Manson, A Joint Venture

March 26, 2012

REVISION 1
Released for Construction

Table of Contents

1.0 Introduction F-1
1.1 EXISTING SITE CONDITIONS F-1
1.2 PROPOSED CONSTRUCTION ACTIVITIES F-3
2.0 Notifications Requirements F-4
3.0 Field Screening Methods F-4
4.0 Contaminated Soil and Groundwater Sampling F-5
5.0 Soil Stockpile and Groundwater Management F-5
6.0 Contaminantion Prevention Procedures F-6
7.0 Handling and Disposal Procedures F-7
7.1 OFF-SITE DISPOSAL LOCATIONS F-8
8.0 Disposal Documentation F-8
9.0 References F-8

List of Tables

Table F.1 Off-Site Disposal Locations

List of Figures

Figure F.1 Kenmore Yard Site Layout
Figure F.2 Floating Bridge and Landings Site Layout
Figure F.3 Medina Site Layout

List of Attachments

Attachment F.1 Contaminated Field Data Form

List of Abbreviations/Acronyms

Abbreviation/ Acronym	Definition
CCDP	Collection and Containment Disposal Plan
CTC Facility	Concrete Technology Corporation Pontoon Casting Facility
Ecology	Washington State Department of Ecology
ECP	Environmental Compliance Plan
HASP	Worker Health and Safety Plan
IDW	Investigation-Derived Waste
Kenmore Yard	Kenmore Construction and Support Yard
KGM	Kiewit/General/Manson, A Joint Venture
KGM EM	KGM Environmental Manager
MTCA	Model Toxics Control Act
NPDES CSWGP	National Pollutant Discharge Elimination System Construction Stormwater General Permit
NTU	Nephelometric Turbidity Unit
RFP	Request for Proposal
SGMP	Soil and Groundwater Management Plan
SPCCP	Spill Prevention, Control, and Countermeasures Plan
SR 520 FBL Project	State Route 520 Floating Bridge and Landings Project
UST	Underground Storage Tank
WSDOT	Washington State Department of Transportation

1.0 INTRODUCTION

Kiewit/General/Manson, A Joint Venture (KGM) has prepared this Soil and Groundwater Management Plan (SGMP) for the Washington State Department of Transportation (WSDOT) to facilitate construction of the State Route (SR) 520 Evergreen Point Floating Bridge and Landings Project (SR 520 FBL Project). The SR 520 FBL Project includes work activities at three locations: the Kenmore Construction Support Yard (Kenmore Yard); the Concrete Technology Corporation Pontoon Casting Facility (CTC Facility) and the adjacent Port of Tacoma property; and the Floating Bridge and Landings Site (SR 520 FBL Site) that includes both upland areas within the City of Medina and over-water areas within Lake Washington in both Medina and Seattle jurisdictions. Additionally, pontoons will be outfitted at three remote outfitting locations that are existing deep berth locations where KGM will lease space. These remote outfitting locations include the Port of Tacoma EB-1 Wharf on the Blair Waterway in Tacoma, the Port of Seattle Terminal 18 wharf on Harbor Island in Seattle, and Vigor Shipyards on Harbor Island in Seattle. No soil or groundwater disturbing activities will be conducted at the remote outfitting locations.

KGM will implement this SGMP for any work performed by KGM that may include soil or groundwater disturbing activities during construction within any of the above locations. It is anticipated that no soil or groundwater disturbing activities will be conducted at the CTC Facility, and that only shallow and limited soil disturbing activities will be conducted at the Kenmore Yard. The bridge's east approach right-of-way and the maintenance building construction within the SR 520 FBL Site within the City of Medina will be the primary location of soil and groundwater disturbing work.

The construction activities, as summarized below in Section 1.2, at the CTC Facility, Kenmore Yard, and SR 520 FBL Site, are not expected to encounter or require the removal and/or disposal of any hazardous materials or contaminated soil and groundwater. If hazardous materials are encountered during construction of the SR 520 FBL Project, however, this plan describes the procedures for the effective management and disposal of contaminated soils and groundwater in accordance with state and federal regulations and the anticipated environmental requirements as described in the Request for Proposal (RFP) Commitments List (Appendix C1 of the RFP; WSDOT 2010). This SGMP is submitted to WSDOT as Appendix F of the SR 520 FBL Project Environmental Compliance Plan (ECP).

1.1 Existing Site Conditions

As described in the RFP Section 2.8.4.6.6 and in the Hazardous Material Discipline Report (Appendix E4 of the RFP), WSDOT has conducted an initial survey of potential soil and groundwater contamination (WSDOT 2010). During this survey WSDOT did not identify any areas within the project limits with known or anticipated contamination; however, a summary of analytes detected in soils and groundwater collected as part of the subsequent WSDOT geotechnical investigation is provided below. Underground storage tanks (USTs) were not identified within the project construction limits of the CTC Facility, Kenmore Yard, and the SR 520 FBL Site. If a previously unidentified UST is encountered, KGM will immediately notify WSDOT and the Spill Prevention Control and Countermeasures Plan (SPCCP) will be implemented (Appendix C of the ECP). If previously unidentified hazardous materials or USTs are encountered, the KGM Environmental Manager (KGM EM) will ensure that this plan is implemented. In addition, the KGM EM will immediately notify the Washington State Department of Ecology (Ecology) within 24 hours of discovery per WAC 173-360-360.

As stated in the Hazardous Material Discipline Report (Appendix E4 of the RFP), many terms are commonly used to describe different types of problem materials that require special handling and disposal when encountered at construction sites. “Hazardous materials” is used as a common term for all types of contaminated or hazardous media, including contaminated environmental media, dangerous waste, hazardous substances, hazardous waste, toxic waste, problem waste, solid wastes, and petroleum products.

As described in the ECP, much of the Kenmore Yard was built out into Lake Washington via historical landfilling. In 2001, the property owners entered into a Consent Decree with Ecology defining cleanup requirements associated with the landfill on the site (Attorney General of Washington 2001). The Consent Decree determines that site conditions are appropriate for continued industrial. Use of the Kenmore Yard for construction support is fully consistent with Consent Decree expectations for continued industrial use. Groundwater and soils at the yard currently are in compliance with Model Toxics Control Act (MTCA) cleanup levels appropriate for industrial use. The existing industrial yard surface consists of clean material—soils and gravels—ranging from 5 to 2 feet in thickness. Underneath the yard surface is landfill cover, and then approximately 15 to 20 feet of artificial fill—landfilled material placed from approximately 1965 through the mid-1970s. Boring logs indicate that the landfilled material is composed primarily of wood, with smaller quantities of concrete, metal, and other construction-related debris and soil matrix.

The SR 520 FBL Site upland areas located within the City of Medina have been previously investigated by WSDOT for geotechnical purposes (RFP Appendix G2; WSDOT 2010). Additionally, environmental soil and groundwater testing was conducted on samples from explorations collected throughout the SR 520 FBL Project extent by WSDOT. Environmental testing was performed to provide data for investigation-derived waste (IDW) disposal options, to obtain additional information for identification of potential contaminants within the project corridor, and to assist with project planning. In general, environmental sampling and testing focused on soil samples collected near the water table interface because of the tendency for many contaminants to float on and travel with groundwater. Additional environmental soil samples were collected throughout the SR 520 corridor at various other intervals where field observations or field screening indicated that there was potential contamination, and a few surface samples were collected for herbicide analysis in areas where spraying was most likely to have occurred or which were downgradient of those areas (i.e., grassy areas at roadside). Additionally, KGM conducted a subsurface geotechnical investigation in support of final design and construction of the East Approach (GeoEngineers 2011). The results of upland soil testing conducted for IDW disposal will also be reviewed and available to the KGM EM, as necessary.

The soil and groundwater chemical testing results are included in the Geotechnical Data Report (Appendix G2 of the RFP; WSDOT 2010). The results of environmental testing indicate that the soils within the upland areas of the SR 520 FBL Site located within the City of Medina are not contaminated. All analytes for samples collected within the KGM work area were either non-detect or detected at low-level concentrations less than the MTCA Method A cleanup levels for unrestricted land use.

The Geotechnical Data Report reported that low-level exceedances of chemical criteria were identified in two samples; however, neither of these sample locations will be disturbed by the proposed work.[1]

[1] Arsenic was detected at a level of 38 mg/kg at 6 feet deep in Sample H-288-08:6, located offshore approximately 50 feet west of the proposed location of the Pier 1 cofferdam. This location will not be disturbed by the project.

Select groundwater samples did have metals concentrations greater than MTCA Method A cleanup levels; however, as stated in the Geotechnical Data Report, these concentrations did not exceed the specific Washington State chronic surface water criteria that were calculated by WSDOT for this project using hardness criteria applicable to this site (Appendix G1 of the RFP; WSDOT 2010). It is also important to understand that these metals concentrations of potential concern were only associated with total metals results, and no criteria exceedances were observed for the dissolved metals analyses. The metals concentrations are associated with soil particles that were present in the groundwater sample.

Construction and dewatering at the SR 520 FBL Site will be performed under the requirements of the Ecology National Pollutant Discharge Elimination System Construction Stormwater General Permit (NPDES CSWGP), and associated discharge monitoring of all water that is released to Lake Washington will be conducted. The NPDES permit requires that water discharged have a turbidity of less than 25 nephelometric turbidity units (NTUs). All water generated during construction or dewatering will be pre-treated through settlement, filtering, and chemical treatment (e.g., chitosan) as necessary to remove soil particles to reduce turbidity to less than 25 NTUs. Because the particulates will be removed prior to discharge, the metals concentrations associated with suspended solids (as seen in the total metals results from previous data) will be significantly reduced. KGM will meet all discharge requirements of the NPDES CSWGP, and will monitor discharge accordingly for turbidity and pH.

1.2 Proposed Construction Activities

KGM's use of the CTC Facility for pontoon fabrication is consistent with the existing permitted facility use and no soil or groundwater disturbing activities will be conducted at the facility. The adjacent Port of Tacoma property will be used for construction trailer placement, temporary storage of construction materials, parking, and pontoon mock-up construction, with no soil or groundwater disturbing activities.

The construction activities at the Kenmore Yard will include casting of concrete bridge deck panels and anchors, materials staging and storage, barge loading and unloading, and general operations to support the bridge construction. At the Kenmore Yard, excavation by KGM for site development associated with the SR 520 FBL Project will be approximately 3 feet in depth for construction of casting slabs, and up to 6 feet for utility trenches. These excavations will be in a combination of the clean surface materials and the underlying landfill cover material; no native soils will be disturbed. Ecology has confirmed that the work proposed at the site is in conformance with Ecology Consent Decree requirements for continued industrial use (Attorney General of Washington 2001). Groundwater and soils at the yard currently are in compliance with MTCA cleanup levels for industrial use. KGM workers performing excavation tasks will work under the requirements of a site-specific Worker Health and Safety Plan (HASP).

SR 520 FBL Site construction work that include soil disturbance activities and to which the SGMP applies include the following activities in Medina:

- Site clearing, grubbing, and grading
- Stormwater drainage conveyance system construction

Additionally, gasoline-range petroleum hydrocarbons and benzene were detected in Sample GP-20-10:2 at 2 feet deep at 47 mg/kg and 0.024 mg/kg, respectively. This sample is located approximately 600 feet east of Evergreen Point Road, south of the proposed roadway alignment in an area that will not be disturbed by the KGM work.

- Dewatered groundwater infiltration system construction
- Floating bridge approach demolition
- Bridge maintenance facility excavation and construction
- Slope and soil stabilization
- East Approach construction, including support structure piers

The site layouts of the Kenmore Yard and the SR 520 FBL Site are shown in Figures F.1 and F.2. A site layout of the CTC Facility is not included because no soil or groundwater disturbing activities will be conducted.

2.0 NOTIFICATIONS REQUIREMENTS

In accordance with Section 1-04 of the General Provisions in Chapter 1 of the RFP, if any previously unidentified hazardous material or UST are encountered during construction, it will be considered a Differing Site Condition, and KGM will immediately notify WSDOT in writing before any contaminated soil or groundwater is disturbed or work is performed in contaminated soil or groundwater (WSDOT 2010). Due to the results of the previous geotechnical investigation and associated soil and groundwater chemical testing within the SR 520 FBL Site, areas of soil and/or groundwater contamination are not anticipated to be encountered. If contaminated soils or groundwater are encountered, the KGM Environmental Compliance Inspector (ECI) or designated environmental lead will document the contamination and notify the KGM EM and follow procedures as outlined in the site-specific HASP referenced in Section 2.2.1.1 of the ECP To minimize schedule delay and costs, the KGM EM will immediately notify WSDOT of any contamination prior to stockpiling or removing any soils or groundwater from the project site. The chain of command and communications protocols are further described in Part I of the ECP.

3.0 FIELD SCREENING METHODS

During construction, potential soil contamination will be identified by odor or by using a photoionization detector, and/or visual observation of staining or sheen. If potential contamination is observed, it will be recorded on a Contaminated Field Data Form (Attachment F.1). The Contaminated Field Data Form will be submitted to WSDOT within 1 week of contamination identification; however, the form will be completed immediately after identifying contamination. The key considerations in documenting the occurrence of contaminated soil will include the following:

- Location of observed contamination
- Extent of contamination (horizontally and vertically, including a sketch with dimensions)
- Relative degree of contamination (i.e., free oil/product, sheen, staining, or odor)
- Impacts to groundwater (i.e., sheen or free oil/product on water surface)
- Visual documentation (photographs)

The Contaminated Field Data Form and all photo documentation will be provided to the KGM EM and WSDOT following an observance of contamination.

4.0 CONTAMINATED SOIL AND GROUNDWATER SAMPLING

If contamination is suspected based on odor and/or visual evidence of staining or sheen, soil sampling may be conducted per WAC 173-360-360 to establish whether soil and/or groundwater exceeds MTCA cleanup levels and to define the extent of contamination. Suspected contaminated soil will be collected by field personnel with hazardous material 40-hour training (HAZWOPER), in accordance with the site-specific HASP. Samples will be submitted to an analytical laboratory, in consultation with WSDOT, for chemicals of concern based on field contamination observations and any existing baseline environmental data that are available within the immediate vicinity of the observed contamination.

In the event of potential soil contamination, construction ground disturbing activities, such as grading or excavation within the potentially contaminated area would stop and/or suspect material would be separately stockpiled until analytical results from potentially contaminated media were received from the laboratory (refer to Section 5.0). Ground disturbing activities outside the potentially contaminated area would continue. If field observations and field screening indicate that contamination may be present, the extent and type of contamination will be documented on the Contaminated Field Data Forms, WSDOT will be notified, and soil samples will be collected and submitted to an analytical laboratory for testing for chemicals of concern.

Based on field observations summarized above in Section 3.0 and if chemicals of concern are detected in soil samples at concentrations greater than MTCA Method A unrestricted land use standards, additional confirmational samples will be collected to determine the extent of contamination. The frequency of soil sample collection will be determined in consultation with WSDOT based on the type and extent of soil contamination identified on-site and following Ecology guidance documents for Site Checks and Site Assessments.

If contaminated groundwater is encountered, it will be pumped and contained separately from other site waters or rain water. Groundwater samples from within the containment tank or similar will be collected and submitted to an analytical laboratory for testing for chemicals of concern and determination of appropriate disposal at a facility permitted to accept the material as characterized.

5.0 SOIL STOCKPILE AND GROUNDWATER MANAGEMENT

As described above, no soil or groundwater disturbing activities will be conducted at the CTC Facility. Additionally, the KGM operations (e.g., fabrication of anchors and other precast structural elements and material staging and storage) at the Kenmore Yard include limited soil disturbing activities in shallow subsurface soils and are not anticipated to encounter contamination. Significant excavation will occur within the uplands of the SR 520 FBL Site for the construction of the east approach and maintenance building facility. Contaminated soils are not anticipated to be encountered.

If contaminated soils are identified, they will be temporarily stockpiled or stored on-site prior to off-site disposal in a contained and lined facility or area. Containment of the stockpile will be accomplished by placing plastic over the ground surface of the stockpile footprint, surrounding the stockpile with an earthen berm or ecology block barrier, and covering with plastic. The plastic cover and liner will consist of reinforced polyethylene sheeting. The plastic cover will extend outside the stockpile footprint and will be anchored to prevent erosion. The plastic cover will prevent surface water runoff and precipitation from contacting the contaminated soils and

carrying soils from the stockpile, as well as preventing wind-blown dust from leaving the stockpile.

If contaminated soils are encountered, temporary stockpile locations will be determined based on current construction activities. A stockpile location will be selected where contaminated material can be safely stockpiled away from adjacent waters and drainage features leading to adjacent waters. A location will be selected in an area that will prevent impacts to groundwater and surface water quality, and to the ongoing operations. Contaminated soil will be stockpiled separately from clean, excavated soil. Because contaminated soils are not expected to be encountered on the site, the exact contaminated soil stockpile locations are not proposed in this plan; however, Figure F.2 shows the areas where contaminated soil stockpiles could potentially be located within the SR 520 FBL Site. Figure F.2 also shows the potential locations of contaminated groundwater tank storage, if contaminated groundwater is identified. In the event that contaminated soil and/or groundwater are encountered, the exact locations will be selected based on the objectives described above and ongoing construction operations in consultation with WSDOT.

BMPs that will be implemented for temporarily stockpiled contaminated soils include temporary fencing (e.g., high-visibility fencing or yellow construction fencing) and covering with plastic sheeting. The fencing and plastic sheeting will be removed once the temporarily stockpiled contaminated soils are removed from the site for off-site disposal. Upon removal of any stockpiled soils that are determined to be contaminated, KGM will conduct testing of the soils below the stockpile site prior to Project Physical Completion to ensure that there is no remaining contamination. If there is residual contamination from contaminated stockpiles, KGM will conduct additional removal activities and confirmational testing to ensure that all contaminated stockpile materials are removed from the site and disposed of at a permitted disposal facility.

If groundwater is present where contamination is encountered (refer to Field Screening Methods in Section 3.0), it will be managed separately from site waters. A Baker Tank, or additional storage as needed for capacity, will be used for temporary on-site storage. Possible treatment and disposal of contaminated groundwater will be determined in consultation with WSDOT based on the field observations, results of groundwater analytical testing, and level of detected contamination.

Groundwater is not expected to be encountered in excavations at the Kenmore Yard. At the SR 520 FBL Site, during construction of the east approach and maintenance facility, dewatered groundwater may also be stored in groundwater storage tanks for treatment and discharge to the lake, or other appropriate disposal.

6.0 CONTAMINANTION PREVENTION PROCEDURES

One of the most important aspects of decontamination is the prevention of contamination. Decontamination includes the cleaning of non-dedicated field equipment that may have or has come into contact with contaminated materials. If field equipment comes into contact with contaminated soils, the equipment will be brushed and wiped to remove any remaining contaminated soils and those soils will be disposed of at a permitted facility.

Good contamination prevention should minimize worker/adjacent resident exposure and help to ensure valid sample results by precluding cross-contamination. For heavy equipment, procedures for contamination avoidance include limiting the surface area of equipment that comes into contact with contamination, if encountered.

Additional contamination prevention procedures for the prevention of spills and releases of hazardous materials and the prevention of surface and groundwater pollution from concrete- and asphalt-related activities are presented in the project SPCCP and the Collection and Containment Disposal Plan (CCDP), respectively (Appendices C and D of the ECP).

Discarded materials, waste materials, field equipment, and supplies will be handled to preclude the potential for spreading contamination, creating a sanitary hazard, or causing litter to be left on-site. Potentially contaminated materials (e.g., clothing, gloves, etc.) will be bagged or drummed with appropriate labeling affixed as regulated, and disposed of and shipped with other hazardous materials. Uncontaminated materials shall be collected, bagged, and disposed of as simple non-hazardous solid waste.

7.0 HANDLING AND DISPOSAL PROCEDURES

KGM will be responsible for proper characterization, transport, handling, and disposal of any hazardous fluids, waste material, and drill cuttings generated by KGM site construction operations in accordance with the project SPCCP and CCDP.

Based on visual observation and soil testing as necessary, soils will be classified as clean, contaminated, or hazardous, based on the levels of contamination in the soils. Appropriate handling and disposal procedures will be implemented based on the level of contamination detected.

Clean soils that require off-site disposal will be transported to a designated off-site disposal location, as defined per Section 7.1. If present, contaminated (e.g., hazardous) soils will be placed in lined, sealed dump trucks and hauled to the disposal site. Best management practices (BMPs) will be implemented to ensure that excavated contaminated soils will not spill, overflow, or be released during transport to the disposal site. If contaminated soils are released during transport to the disposal site, the KGM EM will immediately notify the WSDOT Environmental Compliance Manager and contaminated soils will be contained and cleaned up as necessary, based on the extent of the release, to ensure that no contaminated soils remain and to prevent the spread of contamination.

The handling, stockpiling, transport, and disposal of contaminated media will be conducted in accordance with all federal, state, and local regulations. The KGM EM will be responsible for managing contaminated media and documenting all material transported off-site. If contaminated media are encountered and need to be disposed of off-site, efforts will be made to minimize schedule delays and associated costs.

If contaminated groundwater is encountered, it will be handled and temporarily stored on-site separately from other site waters (i.e., process water, stormwater, and dewatered groundwater). Depending on the volume of contaminated groundwater encountered, Baker Tanks and additional necessary capacity will be used for on-site storage. Analytical testing will be conducted to ensure that off-site permitted disposal location acceptance criteria are met for disposal. KGM will ensure that all groundwater that may require discharge or disposal, whether contaminated or not, will meet specific discharge or disposal criteria (e.g., landfill acceptance criteria). This includes any dewatering groundwater that may require discharge or disposal as required by the Temporary Dewatering Plan (Section 2.6.3.10 of the RFP; WSDOT 2010); however, it is anticipated that following construction, groundwater captured as part of the east approach maintenance facility will be infiltrated via a groundwater infiltration system.

Once loaded with contaminated soils, trucks will immediately leave the site and will not stage. Trucks will depart per the haul routes as defined in and consistent with the Transportation Management Plan, per Section 2.22.3.2 of the RFP and the local agency haul route agreements, and travel directly to the disposal site (WSDOT 2010).

7.1 Off-Site Disposal Locations

Per RFP Section 2.8.3.2.3.7, the off-site permitted disposal locations are identified in Table F.1, and will be updated as needed (WSDOT 2010). If any additional off-site permitted disposal locations are identified prior to the start of construction or during construction, the WSDOT Project Engineer will be notified and KGM will provide WSDOT with all applicable facility permits and acceptance criteria prior to transport or disposal of any material to the additional off-site locations. KGM will ensure that the location-specific acceptance criteria are met for all off-site disposal locations and/or landfills. KGM will be responsible for coordinating with disposal facilities to assure that material is acceptable for disposal and has been characterized per facility requirements.

At the Kenmore Yard, if utility trench excavations extend into the landfilled material, all excavated landfilled material will be disposed off-site at a licensed demolition debris or Subtitle D landfill. If material in the excavation exhibits strong odor or sheen, sampling will be conducted for site chemicals of concern, as defined in the Consent Decree (Attorney General of Washington 2001), and the analytical results will be provided to Ecology for their information.

8.0 DISPOSAL DOCUMENTATION

KGM will provide copies of the required permits and environmental approvals to demonstrate that the listed disposal sites are in compliance with federal, state, and local regulations to the WSDOT Project Engineer prior to material transport off-site for disposal. Following soil disturbing activities and any waste characterization as needed, KGM will follow proper disposal procedures by obtaining truck lading tags, waste manifest, and/or scale tickets. All hazardous waste manifests, bills of lading, the disposal site operator‘s confirmation for receipt of material, and all other documentation in order to transport and dispose of any materials off-site will be prepared and provided to the WSDOT Project Engineer within 1 week of material disposal. WSDOT will be designated as the generator and will sign all manifests.

9.0 REFERENCES

Attorney General of Washington, Ecology Division. 2001. Consent Decree No. 01-2-222187-6SEA, State of Washington, Department of Ecology v. Pioneer Towing Company, Inc. August.

GeoEngineers. 2011. Memorandum to Kiewit-General-Manson SR 520 Evergreen Point Floating Bridge and Landings Project Design Build Team re: Subsurface Investigation Plan for the East Approach. 16 September.

Washington State Department of Transportation (WSDOT). 2010. *SR 520 Evergreen Point Floating Bridge and Landings Project Request for Proposal.* Olympia, Washington. 6 December.

SR 520 Evergreen Point
Floating Bridge and Landings Project

Environmental Compliance Plan

Appendix F
Soil and Groundwater Management Plan

Tables

REVISION 1

Released for Construction

Table F.1
Off-Site Disposal Locations[1]

Off-site Permitted Disposal Location	Disposal Material Type	Disposal Facility and Use Description
To Be Determined	Clean Soils	This site will be used for off-site disposal of clean soils.
Rabanco/Allied Waste Roosevelt Landfill 500 Roosevelt Grade Rd Roosevelt, WA	Subtitle D Landfill	Approved vendor for the transportation and disposal of municipal solid waste, construction debris, contaminated soils and select special waste. It is NOT approved for hazardous waste.
Emerald Services, Inc. **Airport Way Facility** 1500 Airport Way S. Seattle, WA **Tacoma Facility** 1825 Alexander Ave Tacoma, WA **Vancouver Facility** 1300 West 12th St. Vancouver, WA	Dangerous Waste Disposal	Approved vendor for oil, wastewater, and other non-regulated recycling and processing, and dangerous waste storage and transportation. Tacoma facility also approved for solvent and ethylene glycol recycling.
Emerald Services, Inc. **Webster Yard** 7343 East Marginal Way S. Seattle, WA	Hazardous Waste Transfer and Disposal	Approved vendor for used oil, oily waste waters, non-regulated waste (fuel filters, miscellaneous waste waters, oily debris), and as transportation transfer facility for hazardous, non-hazardous, and non-regulated wastes.

Note:

1 If an inert waste landfill is determined to be necessary during site construction and operations, KGM will identify an off-site permitted disposal facility, and provide the Washington State Department of Transportation with all applicable facility permits and acceptance criteria prior to transport or disposal of the inert waste material.

Abbreviation:

KGM Kiewit/General/Manson, A Joint Venture

SR 520 Evergreen Point
Floating Bridge and Landings Project

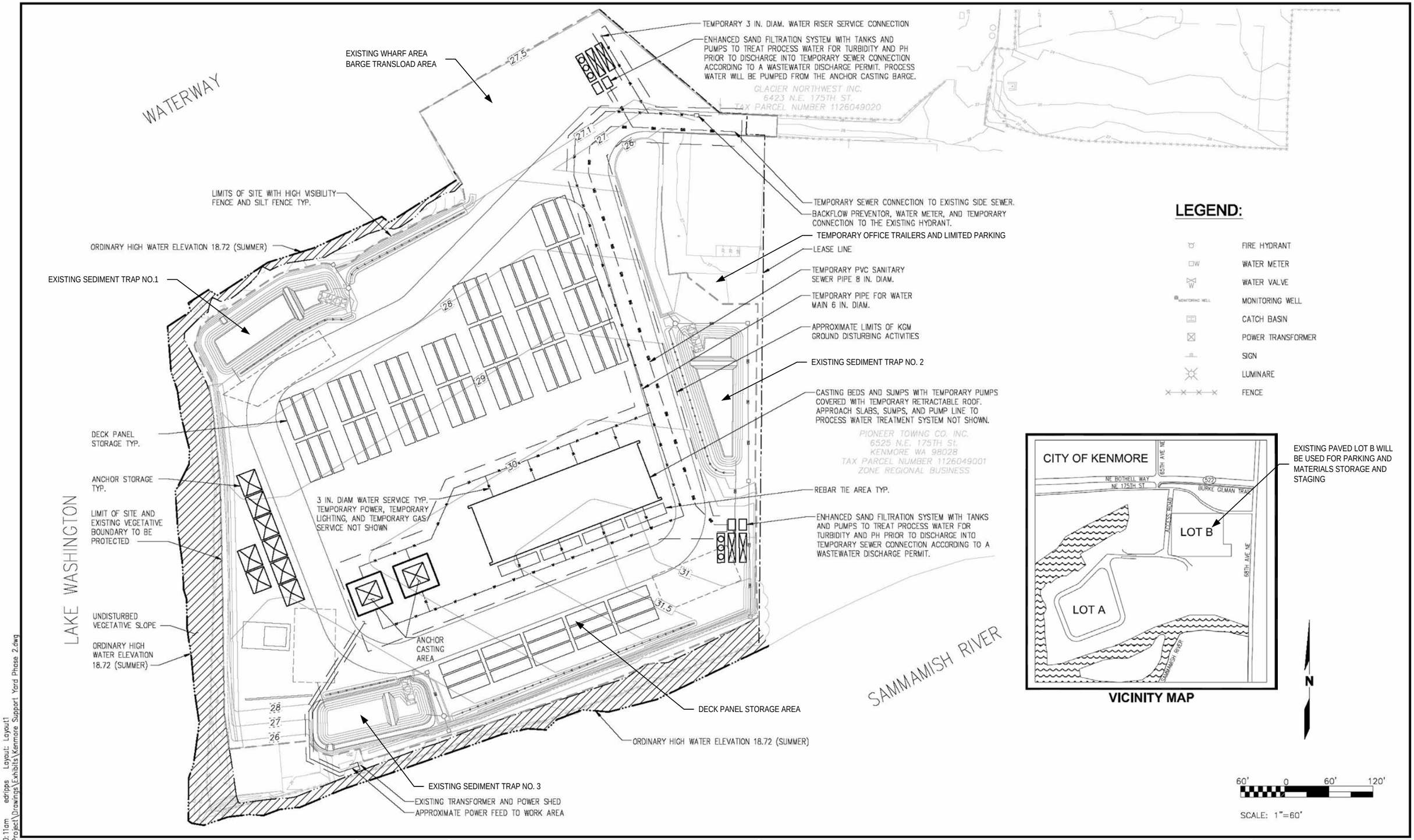
Environmental Compliance Plan

Appendix F
Soil and Groundwater Management Plan

Figures

REVISION 1

Released for Construction



Plotted: Oct 12, 2011 – 10:11am edripps Layout: Layout1
M:\2011\111081 Kenmore Project\Drawings\Exhibits\Kenmore Support Yard Phase 2.dwg

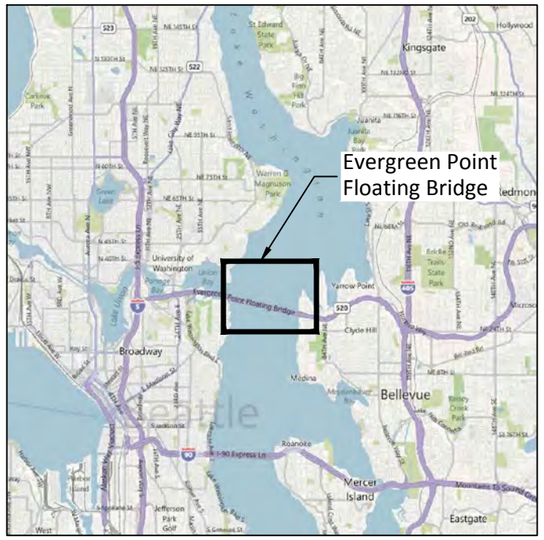
kpff Consulting Engineers
101 Stewart Street, Suite 400
Seattle, Washington 98101
(206) 382-0600 Fax (206) 382-0500

NO.	DATE	BY	REVISION

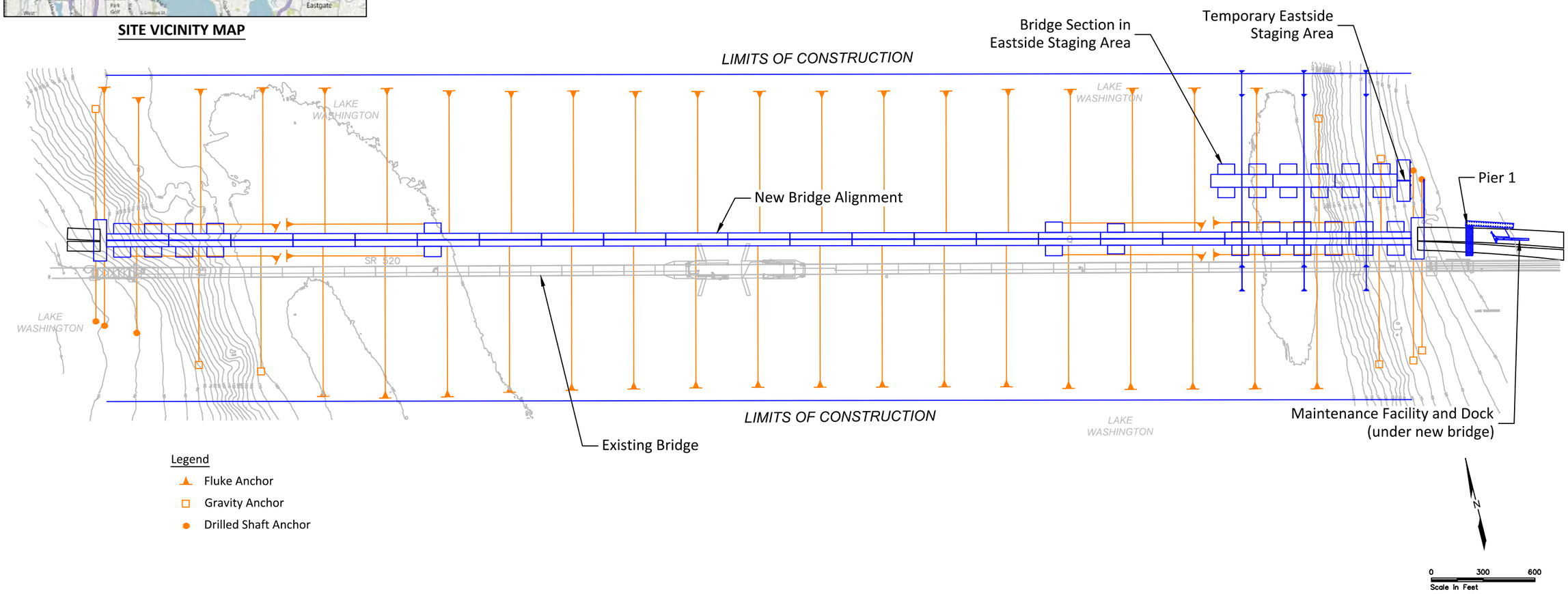
SR 520 EVERGREEN POINT FBL PROJECT
ENVIRONMENTAL COMPLIANCE PLAN
APPENDIX F: SGMP

KENMORE YARD SITE LAYOUT

DRAWN: EV	PROJECT NO.: 111081
DESIGN: ED	SCALE: 60
CHECKED: JR	DATE: OCT 10, 2011
DRAWING NO. F.1	
SHEET NO. 1 OF 1	



SITE VICINITY MAP



K:\Project\clients\Floyd and Snider\520-WQM Plan\520WQM-003.dwg

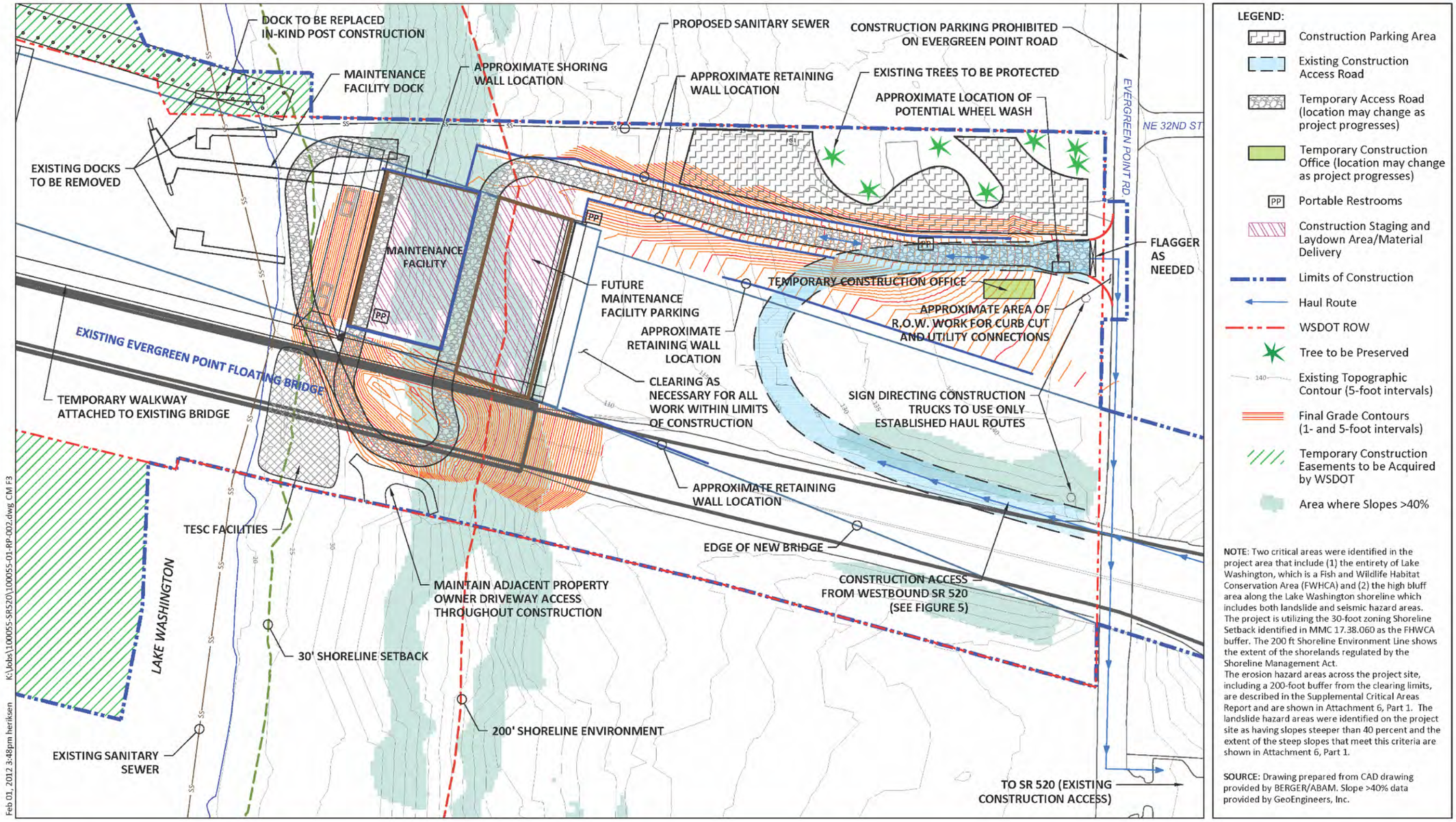
Kiewit / General / Manson
A Joint Venture

Corporate Campus East
3015 112th Avenue N.E. - Suite 100
Bellevue, WA, 98004

SR 520 EVERGREEN POINT FLOATING BRIDGE AND LANDINGS ENVIRONMENTAL COMPLIANCE PLAN APPENDIX F: SGMP

FLOATING BRIDGE AND LANDINGS SITE LAYOUT

DRAWN: BTS	PROJECT NO.:
DESIGN: TS	SCALE: AS SHOWN
CHECKED: JM	DATE: JAN. 16, 2012
DRAWING NO. **Figure F.2**	



Note:
Taken from Figure 3, Mitigation Site Plan, of the Medina Construction Mitigation Plan.

SR 520 Evergreen Point
Floating Bridge and Landings
Environmental Compliance Plan
Appendix F: Soil and Groundwater Management Plan

Figure F.3
Medina Site Layout

SR 520 Evergreen Point
Floating Bridge and Landings Project

Environmental Compliance Plan

Appendix F
Soil and Groundwater Management Plan

Attachment F.1
Contaminated Field Data Form

REVISION 1

Released for Construction

Attachment F.1
Contaminated Field Data Form

Field Personnel: _____ Date/Time: _____

Weather Condition: _____

General Site Information

Site Construction Location: _____ GPS Coordinates: _____

Construction Activity: _____

Construction Activity Duration: _____

Notification of Contamination Observation to EM: _____

Soil Information

Description of contamination observation and location: (staining, odor, debris, etc.) _____

_____

_____

PID Readings: yes/no, if yes, measurements: _____

Soil Type: Gravel ❑ Sand ❑ Silt ❑ Clay ❑ Wood Debris ❑ Other ❑

Was sheen/oil observed: Yes ❑ No ❑ If yes, was a bermed or containment area constructed? Yes ❑ No ❑ Size and description: _____

_____

Groundwater Information

Description of contamination observation and location (odor, sheen, floating oil/product, etc.):

_____

_____

Has groundwater or surface water been impacted by observed soil and/or groundwater contamination? Groundwater ❑ Surface water ❑ None ❑

Nearest drainage feature or surface water body (name, distance, direction): _____

_____

List any containment or absorbent measures implemented: _____

_____