MEMORANDUM

To: SR 520 Program Files

From: Randy Everett, FHWA Major Projects Oversight Manager;
Allison Hanson, WDSOT ESO Mega Projects Environmental Director

Date: May 14, 2012

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Subject: **SR 520, I-5 to Medina: Bridge Replacement and HOV Project – Proposed Changes to Construction Elements and Delivery Methods for the Floating Bridge and Landings Phase of the Project**

The purpose of this memorandum is to document National Environmental Policy Act (NEPA), State Environmental Policy Act (SEPA), Endangered Species Act (ESA), and Section 106 and 4(f) compliance for the SR 520, I-5 to Medina: Bridge Replacement and HOV Project (Project) associated with proposed changes to some of the construction elements and delivery methods that were evaluated in the SEPA Addendum for the Floating Bridge and Landings Phase of the Project, approved in November 2011, and the NEPA Environmental Reevaluation for the Floating Bridge and Landings Phase of the Project, approved in January 2012.

Environmental documentation for the SR 520, I-5 to Medina: Bridge Replacement and HOV Project includes the Final Environmental Impact Statement (June 2011) and supporting discipline reports, the Record of Decision (August 2011), SEPA Addenda (October and November 2011), NEPA Environmental Reevaluations (December 2011 and January 2012), as well as subsequently filed memoranda. As the project proceeds with final design and moves toward construction, proposed modifications to design and delivery methods have been compared to findings in the Final Environmental Impact Statement (FEIS), Record of Decision (ROD), and other existing reports and documentation. These modifications, and their potential environmental effects, are described below.

Reduced Size and Revised Design of the Temporary Eastside Over-Water Staging Area

Current Design Assumptions

As described in the Final EIS, ROD, November 2011 Floating Bridge and Landings SEPA Addendum (herein, SEPA Addendum) and January 2012 Floating Bridge and Landings NEPA Environmental Reevaluation (herein, NEPA Reevaluation), construction along SR 520 would be staged from both land and water. In the Final EIS, WSDOT identified ten potential land-based staging areas, and noted that over-water construction activities would occur from barges to access the pontoons being assembled in their final alignment. Barges would be used to stage construction materials, store construction equipment, transport demolition debris, provide a work area for construction personnel, and store water containment systems and water storage tanks.

In the SEPA Addendum and NEPA Environmental Reevaluation, WSDOT identified one over-water staging area located near the east approach, for pontoon outfitting and to assemble bridge elements. This Eastside staging area would have been located approximately 100 feet north of the new floating bridge alignment and approximately 450 feet from the eastern shore of Lake Washington, within the limits of construction. To accommodate up to 16 pontoons (longitudinal and supplemental) and associated barges, this staging area could have resulted in up to 4.1 acres of over-water coverage at any given time over the 3-year bridge construction period.

At the staging area, the pontoons would have been secured with temporary Danforth type anchors and six mooring dolphins, each consisting of four 30-inch-diameter steel pilings. The mooring dolphins would have been located in water that is approximately 40 feet deep, and would displace approximately 118 square feet of benthic substrate.

Proposed Design Assumptions

Upon further consideration and evaluation of the need for and design of the Eastside staging area, and recognition of potential issues related to wind-loading on the pontoons, WSDOT has decided to replace the Eastside staging area for an over-water staging area with a smaller design. WSDOT now proposes to reduce the 16-pontoon staging area to a staging area designed for single-pontoon moorage, to accommodate one longitudinal pontoon and to allow the joining of four supplemental pontoons (Exhibit 1). This smaller staging area would be located approximately 500 feet north of the new bridge alignment and approximately 400 feet from the eastern shore of Lake Washington. As with the Eastside staging area, this single-pontoon staging area would not extend outside of the limits of construction, and would be removed after construction, in approximately 3 years.

In this revised configuration, the barges and pontoon would be secured at the west end of the staging area to a mooring dolphin, consisting of three 60-inch-diameter steel pilings (Exhibit 1). The east end of the staging area would utilize the steel casing for one of the drilled shaft anchors being installed for the floating bridge. Pontoon assembly would be positioned between the mooring dolphin and the shaft anchor using mooring lines attached to the corners of the longitudinal pontoon. The piles and shaft casing will be installed using vibratory methods only; no impact pile driving is expected.

This change would result in reduced impact to the benthic substrate of Lake Washington compared to the Eastside staging area configuration described in the SEPA Addendum and NEPA Environmental Reevaluation. The maximum over-water coverage would decrease from 4.1 acres to approximately 1.2 acres, and the impact to benthic substrate would decrease from 118 square feet to approximately 59 square feet. The proposed changes to the Eastside staging area will reduce the overall number of in-water piles from 24 to 4, including the drilled shaft casing and the three-pile mooring dolphin.

The single-pontoon staging area is expected to adequately accommodate pontoon outfitting, and this reduction in size and capacity is not expected to delay the current bridge construction schedule. However, WSDOT may ultimately determine that a second single-pontoon staging area is necessary to prevent schedule delays. The second single-pontoon staging area would be located to the north of the staging area described above, and would be similarly configured. If WSDOT decides that this staging area would be needed to maintain schedule and progress, appropriate environmental documentation would be prepared at that time. WSDOT may also reconsider a variation of the Eastside staging area; however, the single-pontoon staging area is the preferred option at this time.

Reduced Size and Revised Design of the Eastside Temporary Work Bridge

Current Design Assumptions

In the SEPA Addendum and NEPA Environmental Reevaluation, WSDOT noted that the work bridge needed to support floating bridge construction on the Eastside would be considerably smaller than the design evaluated in the Final EIS. The Final EIS work bridge design included 165 piles, displacing 875 square feet of benthic substrate, and resulting in 0.4 acre of over-water coverage. Comparatively, the smaller work bridge described in the SEPA Addendum and NEPA Environmental Reevaluation would have only required 40 piles, would have displaced 300 square feet of benthic substrate, and would have reduced over-water coverage to 0.2 acre.

Proposed Design Assumptions

Since the SEPA Addendum and NEPA Environmental Reevaluation, the design of the work bridge has been further refined, requiring fewer and smaller piles. WSDOT now proposes to construct a work bridge with 23 pile supports, reducing displacement of benthic substrate from 300 square feet to approximately 107 square feet, and resulting in no net increase to over-water coverage, which would remain at approximately 0.2 acre (Exhibit 2). The revised work bridge also eliminates a portion of the gangways that were proposed in the SEPA Addendum and NEPA Environmental Reevaluation.

In addition to the slight modifications to the substructure, WSDOT also has identified a need to extend the work bridge, and proposes to construct a ramp at the waterward end. This ramp would facilitate loading and unloading of equipment and materials to the barges. The loading ramp would be 20 feet wide and 60 feet long and supported by ten, 24-inch-diameter steel piles (Exhibit 2). The end of the ramp would be suspended by a pulley system and steel cable to allow the ramp to be raised or lowered within a few feet to match the elevation of the barge and water level.

Approximately 40 feet west of the loading ramp, a mooring dolphin consisting of three, 24-inch piles would be installed (Exhibit 2). This mooring dolphin would aid in barge moorage, and would facilitate the transfer of equipment and materials between the barge and work bridge. All pilings for the work bridge, ramp and mooring dolphin would be installed using vibratory methods and would be finished or proof tested using an impact hammer.

Temporarily positioning a barge(s) between the ramp and mooring dolphin would allow trucks to deliver concrete to the new bridge structure, and would facilitate the unloading of barges that service land based work. It is anticipated that the setup would be used for several days at a time, and then the barge(s) would be moved until the next time concrete is needed or a materials barge arrived with a shipment for land based work. Given the loads projected, such as use by concrete delivery trucks, making the ramp of a grated material is not feasible. Therefore, the ramp will be constructed of a solid deck. Regardless of changes to these construction elements, WSDOT will remain in compliance with the terms and conditions outlined in the Biological Opinion.

Cumulatively, the proposed changes to the work bridge have resulted in a net reduction of in-water piles from 40 to 34, which include the piles needed for the ramp and mooring dolphin. The design changes in the size of the work bridge footprint, the addition of the loading ramp, and reduction in gangways results in roughly the same amount of over-water coverage as previously evaluated – 0.2 acres.

East Navigation Channel Blockage

The aforementioned ramp and mooring dolphin alone would not adversely affect use of the navigation channel, as there would be approximately 125 feet between the mooring dolphin and the location of the first new bridge pontoon. However, WSDOT has recently determined that equipment and construction operations would result in the east navigation channel being closed for periods extending from between several days to several months.

Current Assumptions

The Final EIS, SEPA Addendum and NEPA Environmental Reevaluation state that the east navigation channel would be closed for a total of 214 days spread out over the three year duration of construction. During the closures, the west navigation channel would be open. Construction would be staged so that the east and west navigation channels would not be closed on the same days; navigational access would be maintained during construction by ensuring that at least one of the navigational channels under the bridge was available at all times.

Proposed Assumptions

Consistent with the commitments included in the Final EIS, SEPA Addendum and NEPA Environmental Reevaluation, WSDOT will ensure that the two navigation channels are not closed at the same time. However, as construction schedules and project delivery methods have progressed, WSDOT has identified the need to close the east navigation channel for extended periods of time, culminating in more than the 214 days of closure discussed in previous documentation. .

To minimize navigational effects, WSDOT will maintain the navigation channel on the west side of the bridge and the center draw span during periods when the east navigation channel is closed. During these temporary blockages, boats that are taller than the west navigation channel height of 44 feet may contact WSDOT and request use of the center draw span or permission to use the taller east navigation channel provided it is clear of construction materials at that time, or if barges or equipment could be moved in time. However, most boats in Lake Washington are less than 44 feet in height and will be able to use the west navigation channel.

Additionally, to further minimize effects to navigation, both the east and west navigation channels will open and free of obstructions during specific events and holidays that traditionally have higher volumes of boat traffic.

Consistent with prior commitments, details related to these most recent navigation channel procedures were published in a Local Notice to Mariners. The Local Notice to Mariners identified that the opening of the draw span would not be available during the morning and afternoon rush hours – similar to existing conditions. During the remainder of the time, the draw span could be opened with one hour's advance notice during the day and two hours' notice at night.

Installation and Use of Single-point Moorage Buoys

The Final EIS describes the presence of construction equipment, barges, tug boats, tall cranes and work bridges within the limits of construction for the Floating Bridge and Landings phase of the project, but does not discuss how this equipment would be anchored while supporting construction activities on the lake. Recently, WSDOT has determined that the preferred method to secure this equipment during project construction consists of utilizing a number of single-point moorage buoys within the limits of construction. WSDOT would use 12-foot- diameter buoys and would anchor the buoys with a 2-inch metal chain and 30,000-pound Danforth type anchor.

As construction progresses multiple buoys may be installed throughout the site and moved as necessary, dependent upon the needs of the project at various points in time. Approximately 30 buoys could be placed and occupied at one time, and all buoys would remain within the limits of construction.

The use of these buoys would minimize the amount of temporary benthic disturbance compared to the placement and removal of anchors each time a barge or other equipment was moved. The single-point mooring buoys would remain stationary for periods of construction and equipment would be connected or detached as needed. These buoys would be anchored in water depths of approximately 40 feet or greater, which would help minimize potential effects to outmigrating juvenile salmonids. The buoys will be marked and approved per standards of the United States Coast Guard.

Consistency with Existing Environmental Documents

The aforementioned changes in construction elements and project delivery methods would result in a slight reduction in construction impacts compared to those discussed in the SEPA Addendum and NEPA Reevaluation, and in the Final EIS. By reducing the size and magnitude

of activity at the Eastside staging area, over-water coverage would decrease from 4.1 acres to approximately 1.2 acres, and the overall number of in-water piles would be reduced from 24 to 4. The revised design of the work bridge and ramp would also result in a reduction of the number of in-water piles from 40 to 34, and would not result in an increase to over-water coverage.

Overall, the total number of temporary in-water piles would be reduced by approximately 40%, decreasing from a total of 64 in-water piles to 38 in-water piles. Temporary over-water coverage would also be reduced, decreasing from a total of approximately 4.3 acres to approximately 1.4 acres – more than a 30% reduction compared to the designs included in the SEPA Addendum and NEPA Environmental Reevaluation.

The east navigation channel would be blocked for periods lasting from several days and several months, but the west navigation channel would remain open during these blockages and the center draw span would be available, except during the morning and afternoon rush hours. Additionally, use of the single-point moorage buoys would minimize the amount of disturbance to the benthic substrate of Lake Washington.

A WSDOT Biologist has reviewed the potential construction changes, and has provided an update to the U.S. Fish and Wildlife Service and National Marine Fisheries Service. Through this update, the Services and WSDOT have determined that formal consultation under the Endangered Species Act (ESA) would not be required for ESA compliance. The proposed activities would not warrant an amendment to the existing Biological Opinion; therefore, the Project will continue to operate under the existing Incidental Take Statement, Reasonable and Prudent Measures, and implementing Terms and Conditions.

The proposed construction changes will not require upland ground disturbing activities, and will not affect adjacent historic resources. A WSDOT Cultural Resources Specialist has determined that no additional analysis or consultation is necessary for Section 106 compliance or Section 4(f) compliance.

As documented above, the project remains compliant with current federal, state, local, and departmental regulations and directives with regard to NEPA/SEPA processes, the Endangered Species Act, Section 106 and 4(f). Therefore, no additional environmental review is required.

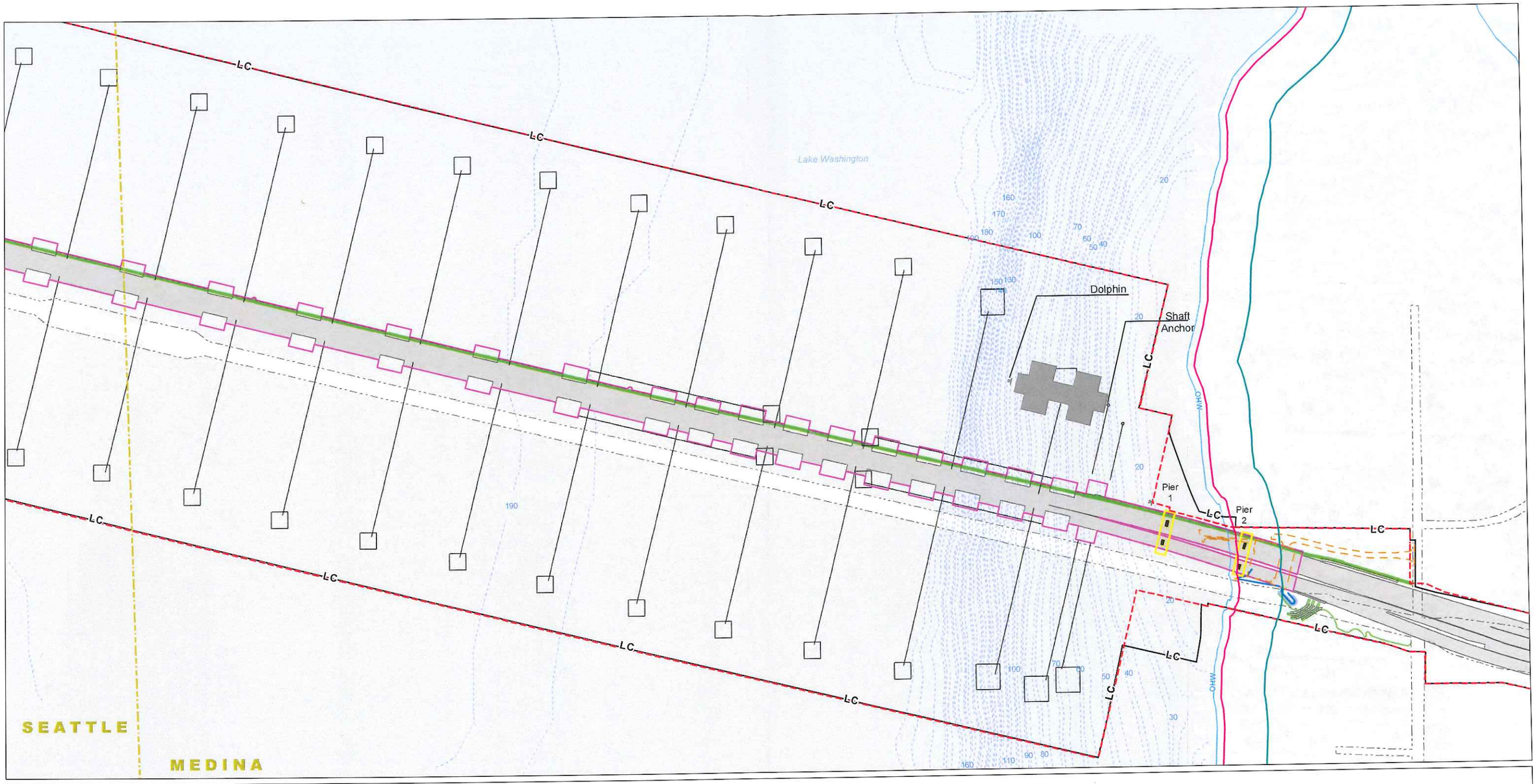
We have reviewed and agree with the contents of this memorandum.

Region / Mode Official

Date 5/14/12

FHWA Official

Date 5/14/12



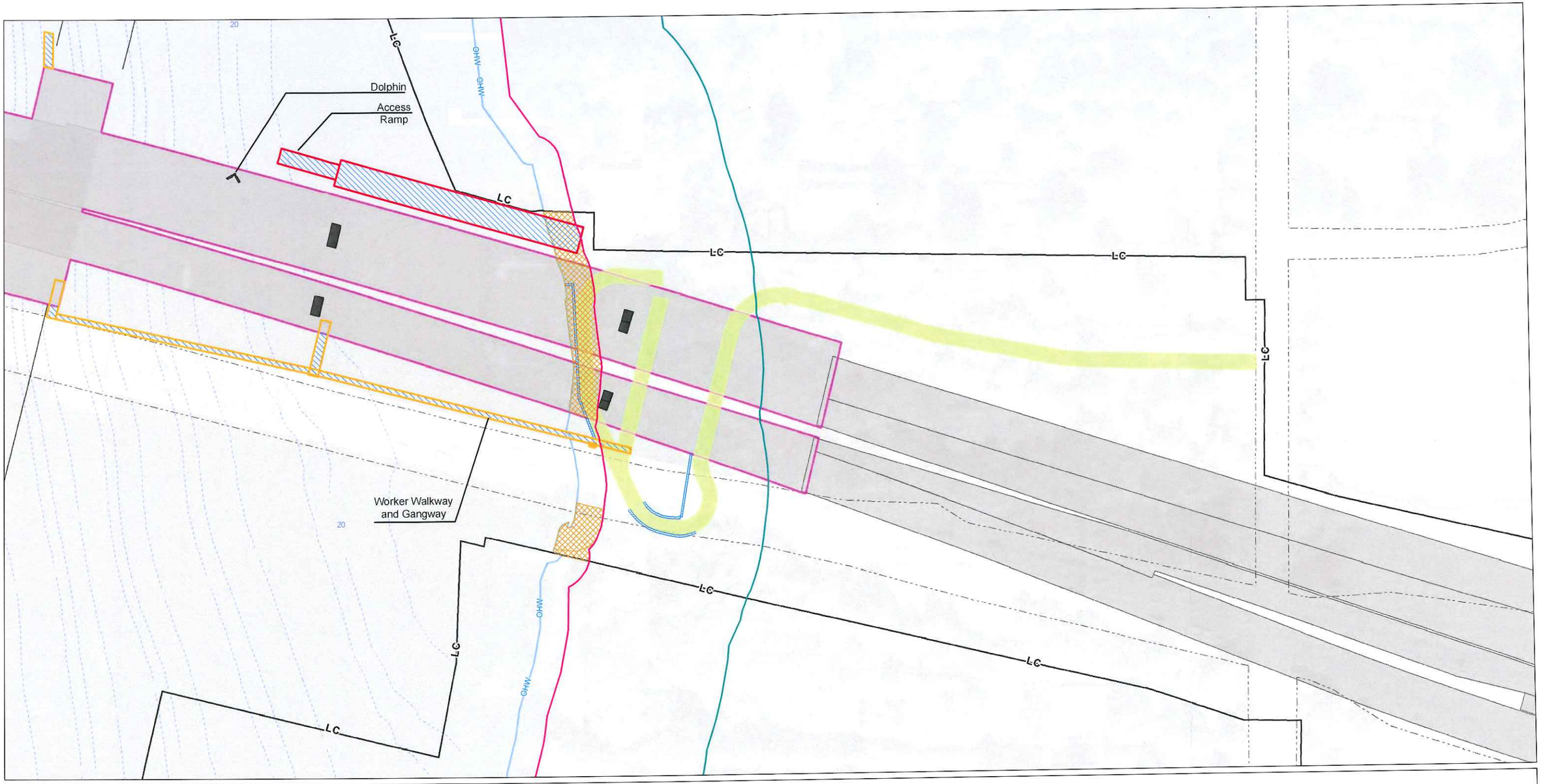
Proposed Edge of Pavement
Bridge Pier
Eastside Staging Area and Mooring Dolphins
Bike/Pedestrian Path
Water Quality Facility
Spread Footing
Outfall
Right-of-Way
Drainage Pipe
Retaining Wall
Anchor and Cable
Limits of Construction
Ordinary High Water Mark (18.57')
5-ft Bathymetry
Existing Edge of Pavement
Elevated Structure
Shoreline Setback
Shoreline Environment
Maintenance Facility Element

SR520 - I-5 TO MEDINA
I-5 to Medina: Bridge Replacement and HOV Project

Washington State Department of Transportation

0 100 200
Feet
HORIZONTAL DATUM:
NAD 83/91
VERTICAL DATUM:
NAVD 88

Exhibit 1
Single Pontoon Staging Area



Proposed Edge of Pavement
Bridge Pier
Water Quality Facility
Outfall
Work Bridge
Worker Walkway and Gangway
Anchor and Cable
Limits of Construction
Elevated Structure
Primary Construction Access
Temporary Retaining Wall
Ordinary High Water Mark (18.57')
5-ft Bathymetry
Shoreline Setback
Shoreline Environment
Temporary Shade

Note: Site will be disturbed throughout limits of construction for construction access and temporary erosion and sediment controls.

SR520 - I-5 TO MEDINA
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Washington State Department of Transportation

0 50 100
Feet
HORIZONTAL DATUM: NAD 83/91
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Exhibit 2
Revised Work Bridge and Ramp