MEMORANDUM

To: SR 520 Program Files

From: Anthony Sarhan, FHWA Major Projects Oversight Manager;
Allison Hanson, WSDOT ESO Mega Projects Environmental Director

Date: November 12, 2013

Copies To: Dave Becher, WSDOT SR 520 Floating Bridge & Landings Engineering Manager;
Margaret Kucharski, WSDOT SR 520 Environmental Lead;
Rona Spellecacy, SR 520 Environmental Planner

Subject: **SR 520, I-5 to Medina: Bridge Replacement and HOV Project – Pontoon Repairs with Coffer Cell**

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 associated with use of a coffer cell for pontoon repairs.

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, January 2012, July 2012, October 2012, February 2013, and February 2013), and other memoranda. As the project proceeds with final design and 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.

As described in the FEIS, 21 longitudinal pontoons, two cross pontoons, and 54 supplemental stability pontoons will support the new floating bridge across Lake Washington. WSDOT has determined that Pontoons U and V require repairs before they can be installed to support the floating bridge structure.

The pontoons in need of repair are currently moored in Lake Washington. WSDOT is proposing to utilize a floating coffer dam, or "coffer cell", to complete the repair work needed on Pontoons U and V. The coffer cell would provide the dry environment necessary to complete the repair work.

Additional detail about the coffer cell operation and the repair activities to be conducted are provided below.

Floating Coffer Cell Operations

The coffer cell would consist of a three sided structure that would be attached to one end of a pontoon to create a dry area where repairs can be completed. Attachment 1 provides a three dimensional drawing of the coffer cell. Attachment 2 provides a diagram showing how the coffer cell would be attached to a pontoon.

The coffer cell would be fabricated in Tacoma, WA, and barged to Lake Washington. The coffer cell would be located and the repairs performed near the Eastside Staging Area within the approved limits of construction. Attachment 3 shows where the coffer cell and pontoons will be located during the repair of Pontoon V. Once Pontoon V is repaired, it would be placed in its final position and joined to Pontoon W; Pontoon U would then be moved into position for repairs using the coffer cell. Repair operations would include the following steps:

1. A derrick barge would be moored alongside the staging area dolphin piles with the pontoon moored along the west side of the derrick barge. The purpose of the derrick barge is to hold the pontoon in place during repair operations. The floating coffer cell would then be placed using tug boats so that it encapsulates the end of a pontoon, 30 feet in from the pontoon end wall.

2. Once the coffer cell is attached, the trapped water would be pumped out of the cell to create a dry area. Approximately 300,000 gallons of water would be pumped out of the coffer cell and transferred into temporary holding tanks located on top of the pontoon. The removal of the water would result in a hydraulic seal of the coffer cell to the bottom of the pontoon.

3. Once the repairs have been completed and the coffer cell cleaned, the coffer cell would be removed by transferring water from the holding tanks back into the coffer cell. The water from the holding tanks would be pumped back into the coffer cell until it causes the coffer cell seal to be hydraulically released and lake water would flood the cell. Once the coffer cell is unsealed, the water would discharge from the coffer cell into Lake Washington. The water from the temporary holding tanks would be tested prior to discharge to detect excessive turbidity and confirm that the pH level in the tanks is similar to lake water pH levels. The holding tank water would be treated using a sand filtration system to address turbidity; carbon dioxide would be used to reduce the pH level if needed before pumping water from the tanks into the coffer cell.

Secondary containment would be placed inside the coffer cell to capture any debris and prevent any construction materials from being exposed to lake water. Prior to flooding the coffer cell, large items within the coffer cell would be removed by hand and the floor of the coffer cell would be swept to remove any additional lose debris. A crew with a work skiff would be present during the flooding process to pick up any floating debris that was not removed during the cleaning process.

A fish handling plan would be implemented during the attaching and removing of the coffer cell to minimize any effects to fish that could be present during coffer cell operations.

After flooding and removing the coffer cell, it would then be towed to the next pontoon or temporarily staged at the Eastside Staging Area until needed.

Pontoon Repair Activities

Pontoons U and V would be repaired in Lake Washington using the coffer cell described above. Repairs would begin once the coffer cell is installed in Lake Washington, by approximately November 2013. Repairs are expected to take approximately nine months.

Pontoon repairs include three main activities:

1. Structural crack repair. Epoxy resin would be injected into the cracks on the pontoon. Approximately 10 gallons of epoxy would be used for each pontoon.

2. Installation of additional structural reinforcement referred to as transverse post-tensioning. Once the cracks have been repaired, transverse post tensioning would be installed through the pontoon walls. The post tension tendons run transversely through the pontoon interior walls and are anchored to the exterior walls. Once the tendons have been stressed, concrete blocks would be installed over the anchor heads to protect the reinforcement structures.

3. Placement of a Carbon Fiber Reinforced Polymer wrap. Carbon Fiber Reinforced Polymer (CFRP) would be adhered to the underside and portion of the end-wall of the pontoon and impregnated with epoxy resin to protect the epoxy injected crack repair areas.

Secondary containment would be placed inside the coffer cell during the application of epoxy resin and installation of the concrete blocks over the anchor heads to prevent any epoxy or concrete spilling onto the coffer cell floor. The coffer cell floor would be cleaned of any debris prior to pumping of water from the temporary holding tanks into the coffer cell and lowering of the coffer cell into the water. These practices would be implemented to ensure that no material or debris associated with the repair activities would be released to open water.

Once repairs are completed, the pontoons would be temporarily moored in the lake until they could be installed to support the floating bridge.

Consistency with Environmental Documentation

A WSDOT Biologist has reviewed the proposed changes, and provided an update to the U.S. Fish and Wildlife Service and National Marine Fisheries Service on September 19, 2013. Based on the information available to date, the proposed activities would not change the extent of take authorized for the project under the Endangered Species Act (ESA) and therefore, reinitiation of formal consultation is not required for ESA compliance.

The activities described above would be conducted within the limits of construction that were identified in the Final EIS, and were referenced in the Memorandum of Agreement among WSDOT, FHWA, and the Muckleshoot Indian Tribe (MIT). No additional impacts to tribal fisheries are expected beyond those previously described in the Final EIS and ROD. FHWA and WSDOT will continue to engage in appropriate coordination with the Muckleshoot Indian Tribe.

The activities described above would not require ground disturbing activities or other improvements inconsistent with the current operation of the facilities, and would not have potential to affect any 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 related to historic properties as a result of the proposed changes.

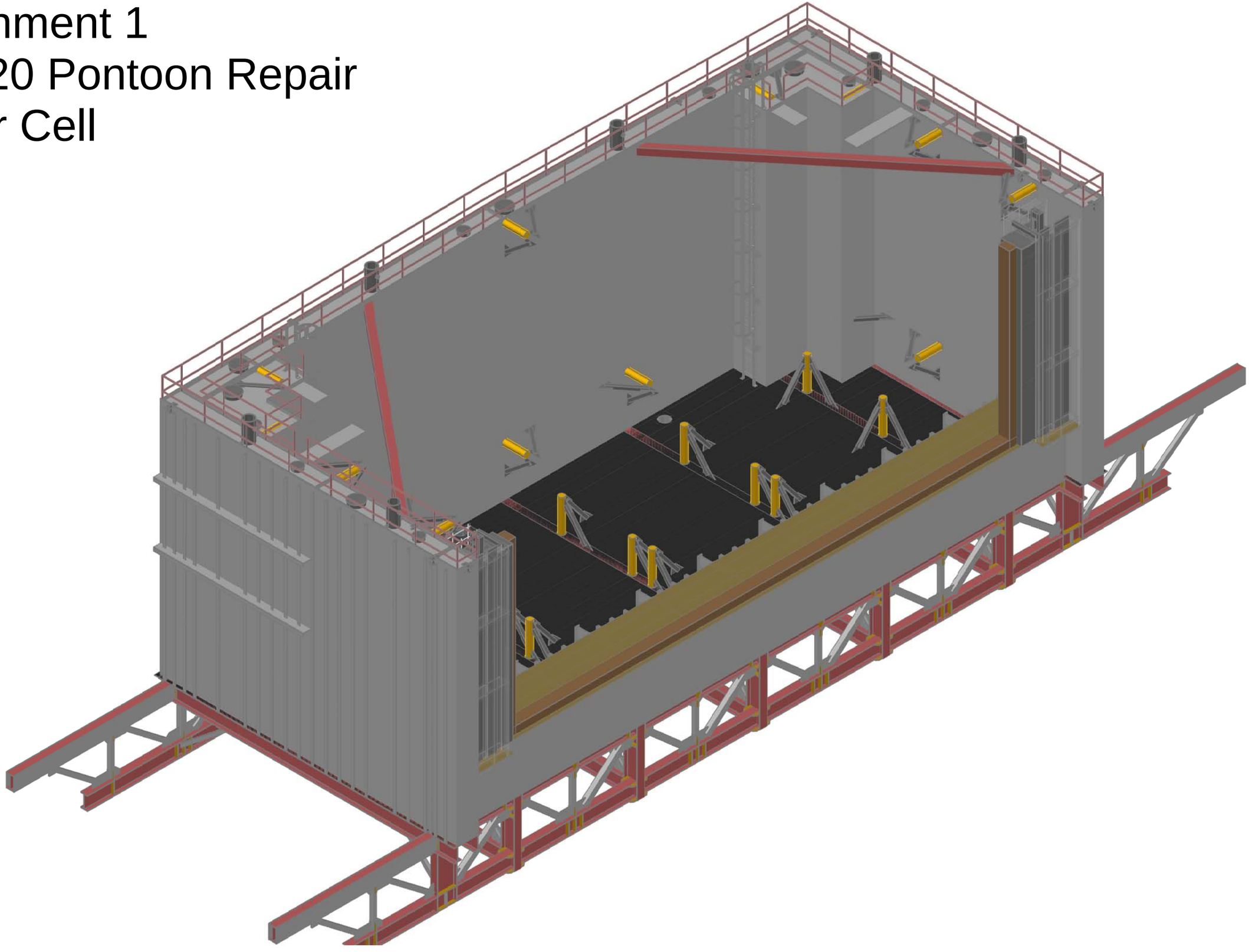
As documented above, the project remains compliant with current federal, state, local, and departmental regulations and directives with regard to NEPA/SEPA processes, Section 106 and 4(f), and the Endangered Species Act. No additional environmental review is required.

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

Region / Mode Official	Date
[illegible]	11/12/13

FHWA Official	Date
Anthony Sarhan	11/12/13

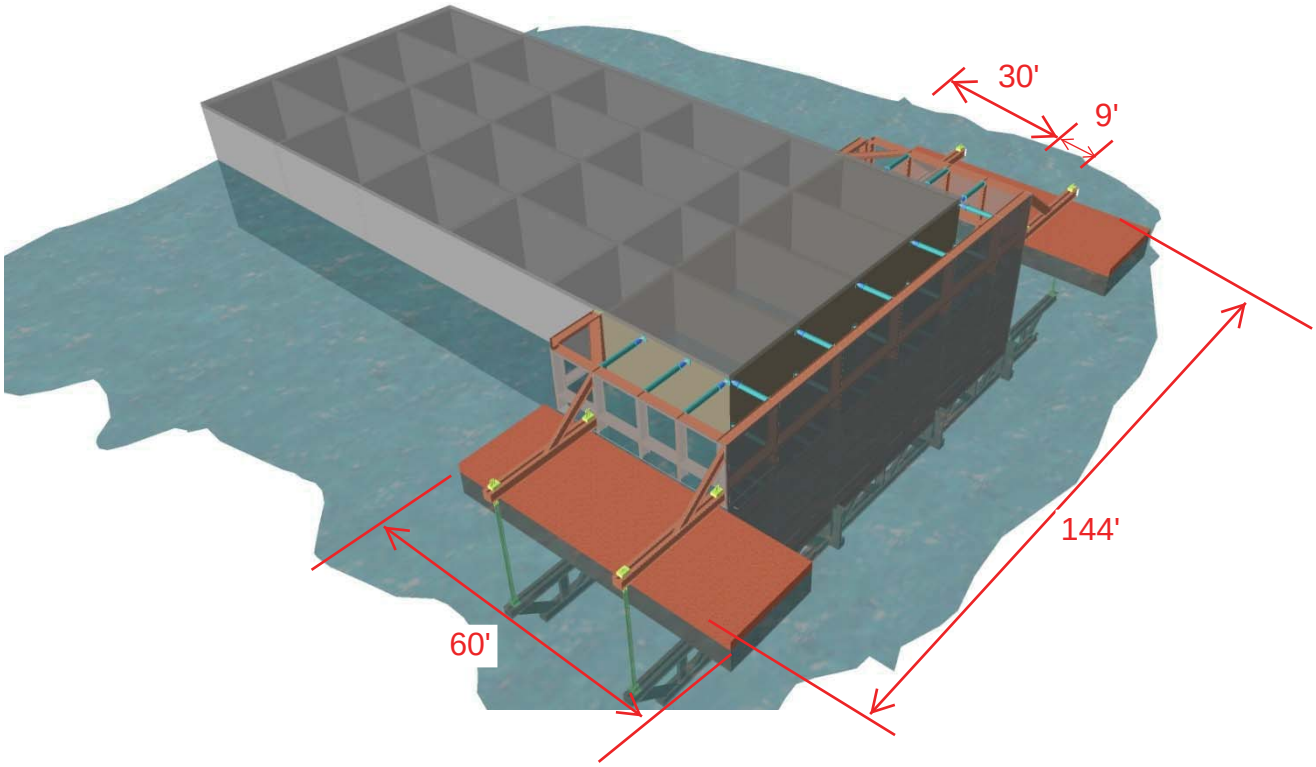
Attachment 1
SR 520 Pontoon Repair
Coffer Cell

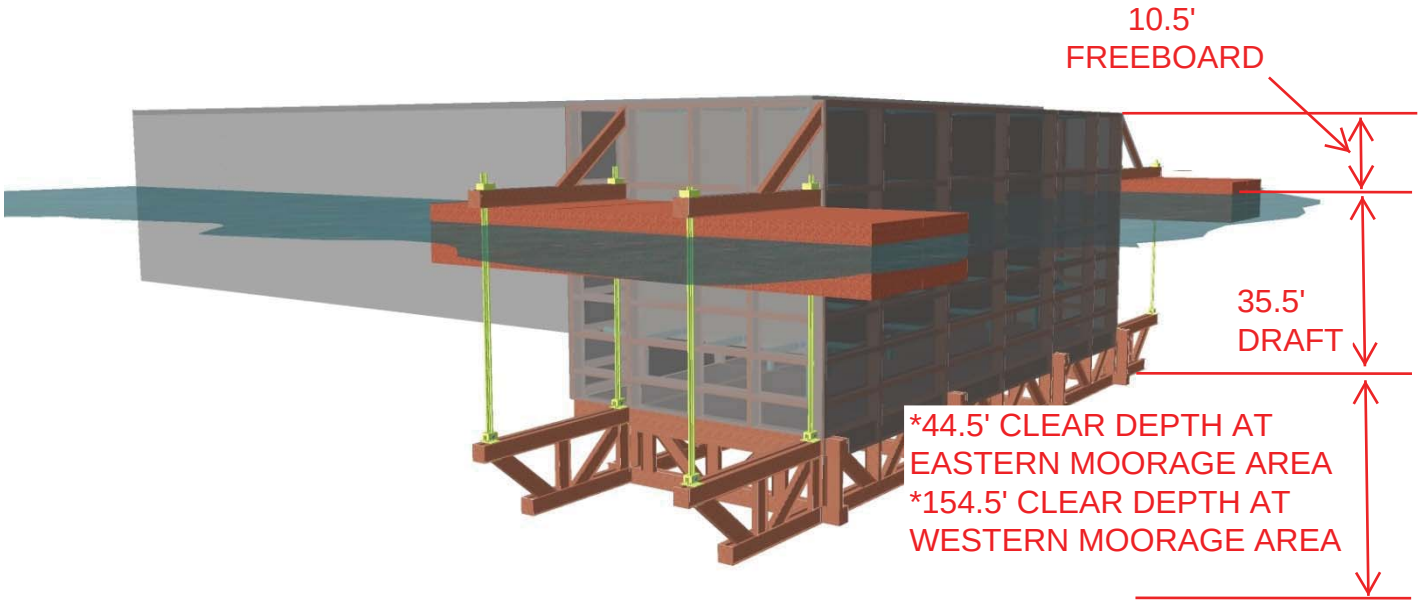


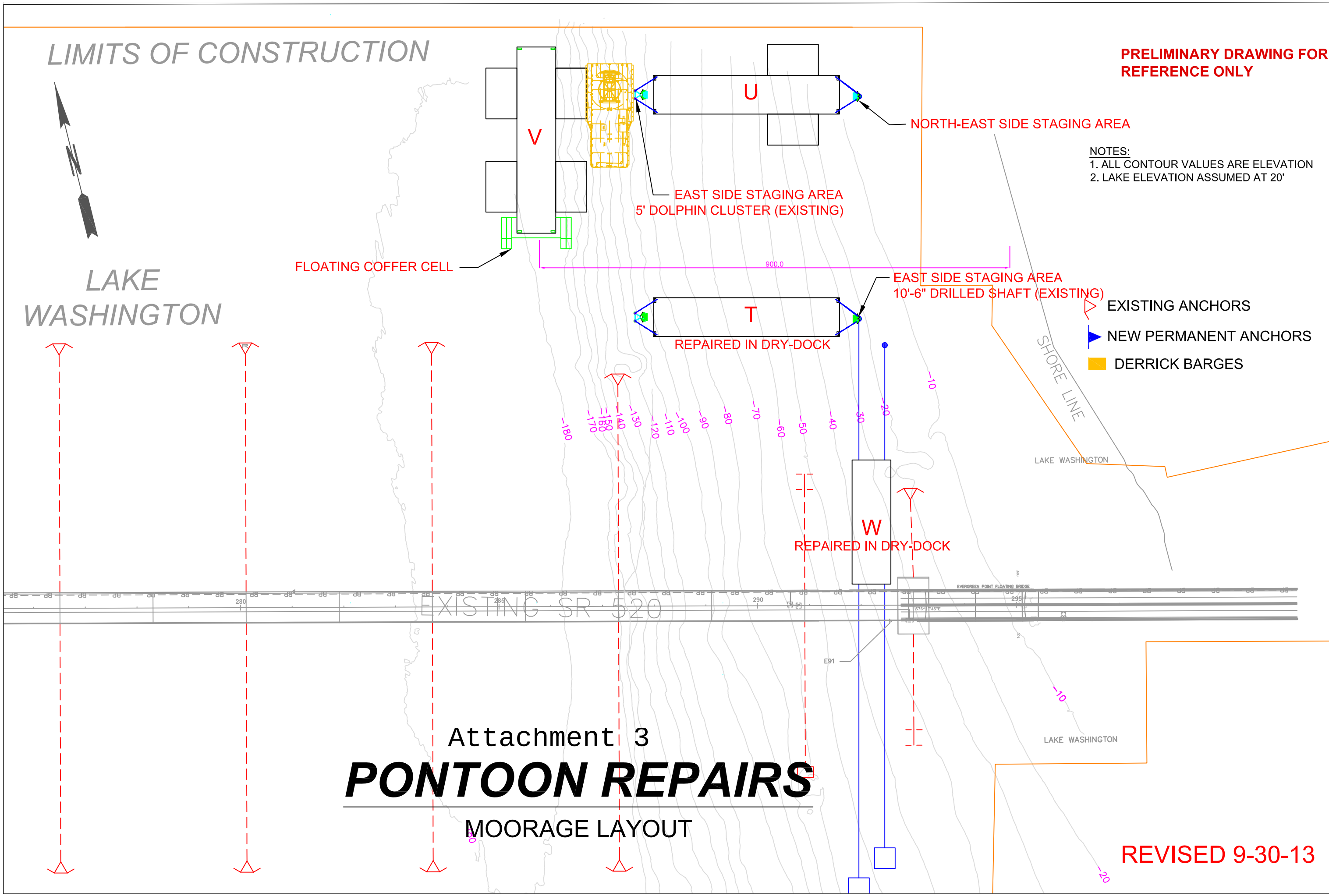
Attachment 2

Large Cofferdam

Ballast Plan







PRELIMINARY DRAWING FOR REFERENCE ONLY

NOTES:
1. ALL CONTOUR VALUES ARE ELEVATION
2. LAKE ELEVATION ASSUMED AT 20'

Attachment 3

PONTOON REPAIRS

MOORAGE LAYOUT

No.	Date	By	Revision

PONTOON REPAIR

SR 520 Floating Bridge and Landings

Kiewit / General / Manson A Joint Venture

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Date: 9/30/13
Drawn: JA
Checked:
Scale: N/A
Sheet