Chapter 2 Project Alternatives

This chapter describes the alternatives WSDOT evaluated in this Final EIS, including two build alternatives and the No Build Alternative, and then generally describes how the alternatives would be built. This chapter identifies the Preferred Alternative and environmentally preferable alternative and explains how FHWA and WSDOT reached these decisions. This chapter also discusses how WSDOT evaluated and screened all potential sites before being advanced as alternatives for analysis in this Final EIS.

What alternatives does WSDOT evaluate in this Final EIS?

This Final EIS evaluates the following three alternatives:

- Aberdeen Log Yard Alternative (Preferred Alternative) in Aberdeen, Washington
- Anderson & Middleton Alternative in Hoquiam, Washington
- No Build Alternative

Each build alternative would include the following actions:

- Constructing a new casting basin facility in Grays Harbor
- Constructing the 33 pontoons needed to replace the existing capacity of the Evergreen Point Bridge
- Transporting pontoons from the casting basin to approved moorage locations in Grays Harbor
- Mooring the 33 pontoons built for the SR 520 Pontoon Construction Project
- Maintaining the Grays Harbor casting basin facility while owned by WSDOT

WSDOT considered the option of using the CTC facility in Tacoma; however, this option is not part of either build alternative. See details about this option later in this chapter under *What is the CTC facility option?*

What is a "Preferred Alternative"?

A Preferred Alternative is the alternative that the lead agencies believe would best fulfill the project purpose and need. A Preferred Alternative is identified after considering the lead agencies' statutory missions and responsibilities, as well as economic, environmental, technical, and social factors.

The build alternatives do *not* include the following actions:

- Constructing additional pontoons needed for the SR 520, I-5 to Medina: Bridge Replacement and HOV Project
- Transporting pontoons built at the proposed Grays Harbor facility to Lake Washington
- Transporting pontoons built at the existing CTC facility to Lake Washington
- Building the Evergreen Point Bridge roadway structure on the 33 pontoons built for the proposed SR 520 Pontoon Construction Project and/or on additional pontoons built for the proposed SR 520, I-5 to Medina: Bridge Replacement and HOV Project
- Constructing the emergency replacement of the Evergreen Point Bridge
- Using the Grays Harbor casting basin facility for future unforeseen uses

Transporting the pontoons, adding roadway structure to the pontoons, and constructing the emergency replacement bridge are actions that would need to be evaluated as part of any bridge replacement effort but are not critical to catastrophic bridge failure preparedness, which is the purpose of the proposed SR 520 Pontoon Construction Project. Therefore, these actions are not evaluated in this EIS and would be covered under a separate environmental review process for bridge replacement (whether it was an emergency or not). Constructing additional pontoons, adding roadway structure to the pontoons, and transporting the pontoons are proposed activities as part of the SR 520, I-5 to Medina: Bridge Replacement and HOV Project and are being evaluated under that project's review process. Exhibit 2-1 lists which proposed actions are analyzed under each SR 520 Program EIS. Any unforeseen future uses of the Grays Harbor casting basin would be evaluated under their own review processes once those uses are known.

At the new casting basin facility, WSDOT would launch the completed pontoons into Grays Harbor and tow them to an approved moorage location in the harbor until needed.

EXHIBIT 2-1
Which Project's EIS Evaluates the Proposed SR 520 Program Actions?

Proposed Action	SR 520 Pontoon Construction Project	SR 520, I-5 to Medina: Bridge Replacement and HOV Project
Constructing a new casting basin facility in Grays Harbor	▲	
Constructing the 33 pontoons needed to replace the existing capacity of the Evergreen Point Bridge	▲	
Potentially using the existing CTC casting basin facility in Tacoma to construct some of the 33 pontoons		▲
Transporting pontoons from the casting basin to approved moorage locations in Grays Harbor	▲	
If the CTC facility is used for pontoon construction, transporting pontoons to approved moorage sites in Puget Sound		▲
Mooring the 33 pontoons built for the SR 520 Pontoon Construction Project	▲	
Maintaining the Grays Harbor casting basin facility while owned by WSDOT	▲	▲[a]
Constructing additional pontoons needed for the SR 520, I-5 to Medina: Bridge Replacement and HOV Project		▲
Transporting pontoons built at the proposed Grays Harbor facility to Lake Washington		▲
Transporting pontoons built at the existing CTC facility to Lake Washington		▲
Building the Evergreen Point Bridge roadway structure on top of the 33 pontoons built for the SR 520 Pontoon Construction Project and/or on top of additional pontoons built for the SR 520, I-5 to Medina: Bridge Replacement and HOV Project		▲
Constructing the emergency replacement of the Evergreen Point Bridge		▲

[a] This action would occur only if the Grays Harbor casting basin facility is used to construct supplemental stability pontoons for the proposed SR 520, I-5 to Medina: Bridge Replacement and HOV Project.

When the SR 520 Pontoon Construction Project is completed, WSDOT could build additional pontoons needed for the Evergreen Point Bridge replacement in the Grays Harbor casting basin. The environmental effects of constructing those pontoons, however, are analyzed under the separate environmental process for the SR 520, I-5 to Medina: Bridge Replacement and HOV Project. Pontoons for future WSDOT bridge replacement projects could also be produced at this facility if it is still available, although there are no plans to replace other floating bridges at this time. (See the section entitled *What would happen to the casting basin facility when the project is completed?* in Chapter 1 for more information on future use of the facility.) Appendix B, Description of the Alternatives and Construction Techniques Discipline Report, describes in detail the alternatives and conceptual design for the new casting basin facility and pontoons.

What is the Aberdeen Log Yard Alternative (Preferred Alternative)?

The design for the Aberdeen Log Yard Alternative will continue to be refined after the Record of Decision is issued in January 2011. In accordance with the provisions of SAFETEA-LU, this Final EIS captures the maximum range of project effects that could result based on this alternative, as described in the following sections. The section *Why was Aberdeen Log Yard selected as the Preferred Alternative?* later in this chapter discusses the reasons why this alternative was selected as the Preferred Alternative.

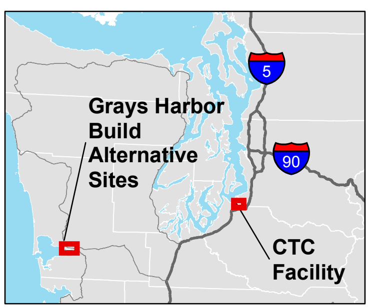
Workers prepare pontoons for floatout at the CTC facility.

Site Characteristics

The 55-acre Aberdeen Log Yard Alternative site lies on the north shore of Grays Harbor (Exhibit 2-2). The mostly flat site is undeveloped except for unpaved access roads. The site is bounded on the west by a Port of Grays Harbor industrial terminal property, on the east by a City of Aberdeen wastewater treatment plant, and on the north by railroad tracks. The casting basin and support facilities would occupy the entire site.

The site's shoreline has gradual slopes covered with blackberry brambles and alder tree saplings, a few wetlands (see Section 3.1, Ecosystems, in Chapter 3 for more information), and limited hard armoring (stone, concrete, or rock that minimizes erosion potential). A lumber mill was built on the site in the early 1900s. Nearly all visible mill structures were removed before 1971. Until recently, the site was used primarily to store logs. All logs have been removed and the site is now vacant. Between 1971 and 1981, the shoreline was extended southward by backfilling with sediments dredged from the Chehalis River, accumulated wood waste, and other fill material. Section 3.7, Cultural Resources, in Chapter 3 provides information about the prehistoric and historic uses of this site.

The Aberdeen Log Yard property currently sits mostly unoccupied.



Potential haul route

Existing railroad

Build Alternative Site

Existing CTC facility

City limits

N 0 2,000 4,000 Feet

Source: Grays Harbor County (2006) GIS Data (Waterbody and Street). Horizontal datum for all layers is State Plane Washington South NAD 83; vertical datum for layers is NAVD88.

Exhibit 2-2. **Project Vicinity Map**

SR 520 Pontoon Construction Project

Washington State Department of Transportation

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Project Features

Exhibit 2-3 shows the conceptual site design layout of the Aberdeen Log Yard Alternative. To support pontoon construction activities at the casting basin, the Aberdeen Log Yard Alternative would require several support facilities, such as access roads, a concrete batch plant where concrete for the casting basin and pontoons would be produced, large laydown areas, stormwater handling and water treatment areas, office space, and a designated parking area for workers. These features are described briefly in the following sections and in more detail in Appendix B, Description of Alternatives and Construction Techniques Discipline Report.

What is a laydown area?

A laydown area is an area that has been cleared for the temporary storage of construction equipment and supplies. Laydown areas are usually covered with rock and/or gravel to ensure accessibility and safe maneuverability for vehicle transport and off-loading. For the SR 520 Pontoon Construction Project, laydown areas would be used for temporary storage and to fabricate and assemble pontoon formwork.

Casting Basin and Launch Channel

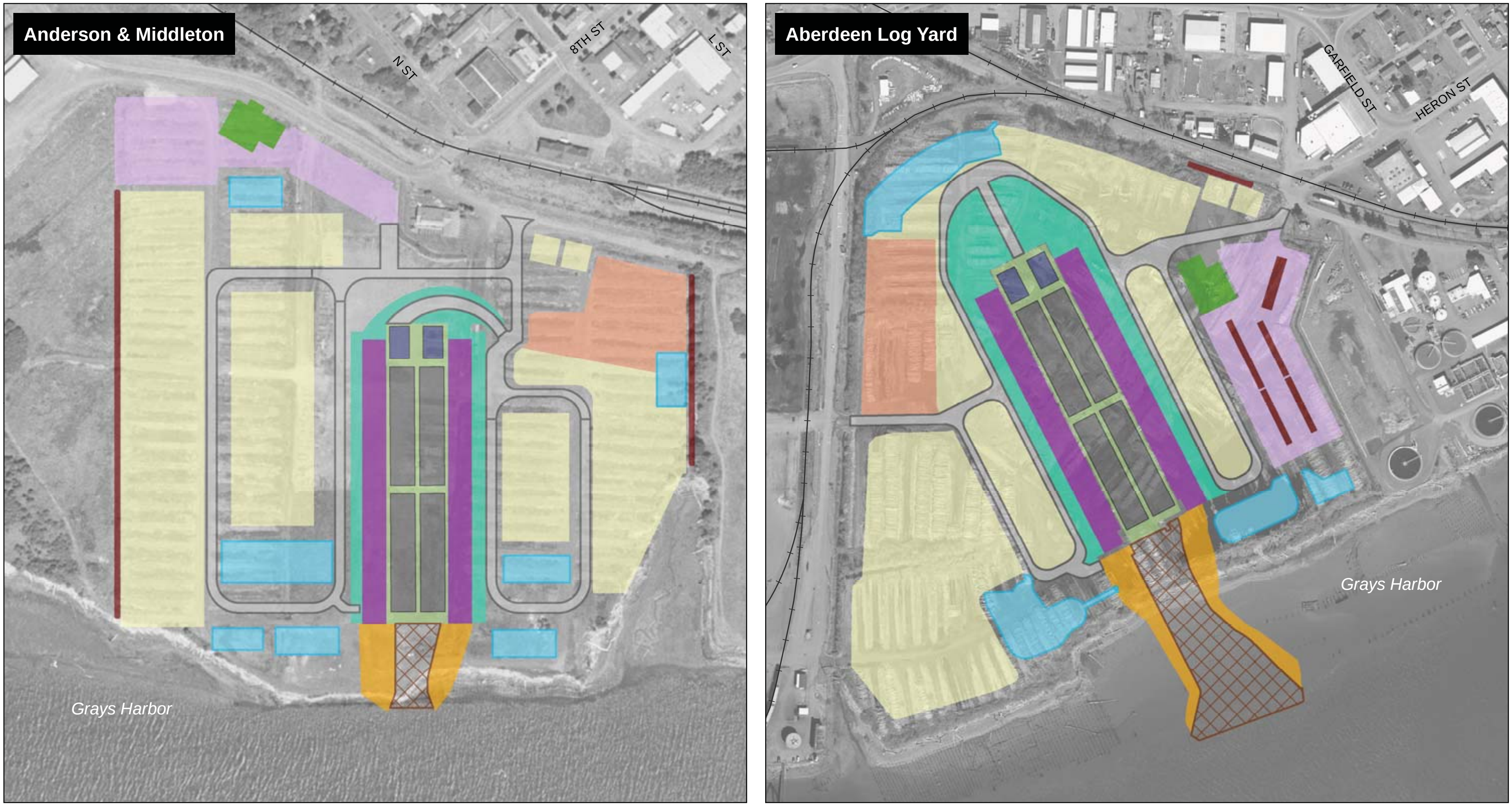
At the Aberdeen Log Yard site, the casting basin would be approximately 150 feet upland from the existing Grays Harbor shoreline. The casting basin would measure approximately 30 feet deep, 1,200 feet long, and 200 feet wide, although these dimensions could change somewhat as project design is finalized. Exhibit 2-4 shows the total area of the casting basin and other project site components.

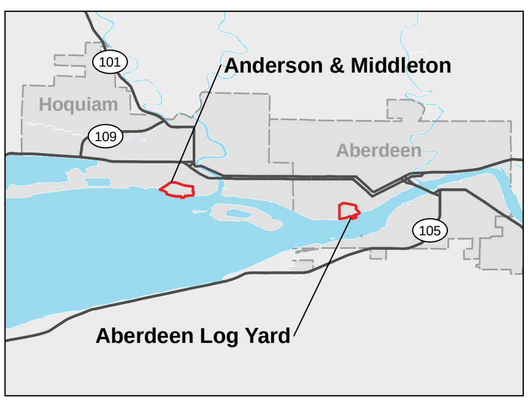
The casting basin side walls would be sloped back from the basin floor and covered with riprap. The casting basin gate would consist of three stacked metal sections. In preparation for pontoon float-out, sluice gates incorporated into the metal casting basin gate would be opened to control the flow of water from Grays Harbor into the casting basin. When the water level in the casting basin reaches the same level as the water in Grays Harbor, a crane would lift the gate open to allow the pontoons to be towed out of the basin. After pontoon float-out, the crane would lower the gate back into place at low tide, with the sluice gates closed to minimize the amount of water that would need to be pumped out of the basin.

What is riprap?

Riprap is broken stone, cut stone blocks, or rubble that is placed on slopes to stabilize and protect them from erosion.

Trucks would haul the materials required to build the facility to the site and would haul excavated soils and construction debris away from the site along designated haul routes (Exhibit 2-2). Trains and/or barges could also be used to support facility construction. The launch channel would consist of an onshore portion that would be excavated in dry conditions between the casting basin and shoreline, a breach in the existing shoreline berm to accommodate the pontoon launch channel, and a channel that would be dredged in wet conditions extending offshore to deep water near the navigation channel in Grays Harbor.





- Existing railroad
- Crane rail area
- Infiltration trench
- Access road
- Launch channel
- Rock side slope
- Concrete batch plant
- Supplemental stability pontoon
- Longitudinal pontoon
- Water treatment area
- Casting basin
- Casting basin side slope
- Dry storage and laydown area
- Office
- Parking

N

0 125 250 500 Feet

Source: WSDOT (2005, 2006) aerial photograph, USDA-FSA (2006) aerial photograph, Grays Harbor County (2006) GIS Data (Road), Horizontal datum for all layers is State Plane Washington South NAD 83; vertical datum for base layers is NAVD88; vertical datum for design layers is MLLW.

Exhibit 2-3. **Conceptual Layouts for Grays Harbor Build Alternative Sites**

SR 520 Pontoon Construction Project

Washington State Department of Transportation

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EXHIBIT 2-4
Approximate Areas of Casting Basin and Other Project Components

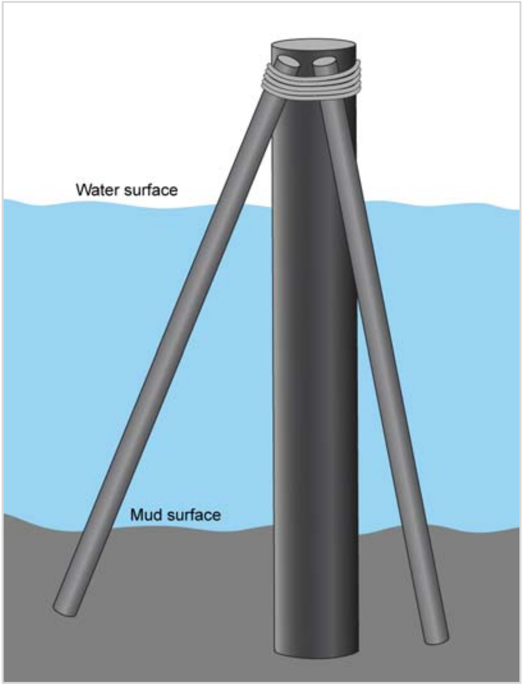
Feature	Grays Harbor Build Alternatives (square feet) [a]
Casting basin	675,000 [b]
Concrete batch plant	100,000
Laydown and dry storage areas	369,000
Office space and parking	164,000
Water treatment area	135,000
Access roads	150,000

[a] The approximate areas of the project components listed in this exhibit would be the same for either Grays Harbor build alternative. The differences between the two build alternatives are listed later in this chapter.

[b] This square footage represents the total footprint of the casting basin with sloped side walls. The internal work area (the slab floor of the basin) would be 227,000 square feet. The basin walls would be sloped back to the top of the basin and covered with riprap.

At the Aberdeen Log Yard site, WSDOT would install a row of piles (also called pilings) connected by a steel rail on both sides of the launch channel. Overall, the maximum number of piles in the launch channel would be about 70. The piles would aid in maneuvering pontoons out of the casting basin. Two turning dolphins (a dolphin is an in-water structure to guide vessels; see Exhibit 2-5) would be placed at the mouth of the launch channel to help maneuver the pontoons into the navigation channel. All piles and dolphins in the launch channel would be designed so as not to substantially impede fish movements.

EXHIBIT 2-5
Example of Turning Dolphin Construction.



Completed pontoons would be stored in Grays Harbor until needed. Pontoon towing and moorage are discussed in more detail later in this chapter in the *Pontoon Towing and Moorage* section.

Support Facilities

The concrete needed to construct the proposed casting basin and pontoons would require a special mix and precise sequencing when pouring the concrete. In addition, the sheer amount of concrete needed for construction (as much as 1,000 cubic yards per day) would require a consistent source of concrete and prompt delivery. WSDOT proposes to construct an onsite concrete batch plant at the Aberdeen Log Yard site.

WSDOT would use gravel-surfaced laydown areas surrounding the casting basin to store and assemble pontoon construction materials, such as steel rebar and wooden or steel forms. These areas would also provide space to store materials and construct items such as precast concrete elements and rebar cages that form the internal reinforcing skeleton of concrete pontoons. A covered area would also be provided so that some materials sensitive to corrosion could be kept dry while being stored.

The Aberdeen Log Yard site would have indoor office space in temporary work trailers where construction officials and supervisors would coordinate and manage the casting basin and pontoon construction. Parking areas would serve onsite workers and provide several hundred parking spaces. WSDOT anticipates that all employee-parking areas would be located onsite.

Water, sanitary sewer, communication, and electrical service would be extended to serve the project site as needed, and local utility providers would provide service. Additionally, WSDOT would install a fire suppression water line.

Stormwater and Water Treatment

WSDOT would design a water handling and treatment system to address stormwater runoff, casting basin process water, and water from the dewatering systems. For typical stormwater runoff, WSDOT would apply basic water quality treatment best management practices in accordance with the WSDOT *Highway Runoff Manual* (WSDOT 2008a) or the Washington State Department of Ecology's (Ecology's) *Stormwater Management Manual for Western Washington* (Ecology 2005a), as applicable. All process water would be pumped from the casting basin to a collection system of wet ponds where the water would be monitored and treated in accordance with the National Pollutant Discharge Elimination System (NPDES) Sand and Gravel Permit issued for the site by Ecology, before being discharged into Grays Harbor or to an approved offsite facility. Temporary erosion and sediment control best management practices would be installed in accordance with WSDOT's *Highway Runoff Manual*, as appropriate, as well as the NPDES Construction Stormwater General Permit issued for the site by Ecology.

Best management practices applied during site construction would include implementing a spill prevention and control plan designed to meet the terms of the NPDES Construction Stormwater General Permit. Best management practices implemented during pontoon construction would be governed by the NPDES Sand and Gravel Permit.

What is dewatering?

Dewatering is the removal of groundwater from a work area during site construction and operation and is necessary to maintain reasonably dry working conditions. During construction of the new casting basin facility, vacuum pumps would extract groundwater from wells installed across the work area and carry the water to a collection system. Once the casting basin is built, the soils surrounding it would be passively dewatered (via gravity) to keep the basin dry.

What is process water?

For this project, process water would result from any water that comes into direct contact with uncured concrete. The pontoons must be kept wet while they are curing so that the concrete will reach the proper strength when fully cured. Any rainfall or water applied to the pontoons while they are curing that runs off would be considered process water.

What are best management practices?

Best management practices are effective and practical policies, managerial practices, maintenance procedures, and structural or nonstructural methods that, when used individually or in combination, prevent or reduce adverse environmental effects. Best management practices are designed and implemented to protect ecosystems, water resources, communities, structures, and landscapes, and they can include physical structures, such as silt fences or settling ponds, and construction methods, such as conducting certain activities during dry periods.

Dewatering

WSDOT would install two different types of dewatering systems to remove groundwater from the casting basin work area. Before and during construction of the casting basin facility, a temporary construction dewatering system would operate at the site. During pontoon-building operations and after the SR 520 Pontoon Construction Project is completed, but while the site is still maintained, a permanent dewatering system would be in place. To prevent ground settlement on adjacent properties, groundwater from dewatering operations would be reinfiltrated into trenches near the site perimeter (on the site perimeter at the Anderson & Middleton site and near the eastern perimeter at the Aberdeen Log Yard site; see Exhibit 2-3). These two systems are described in the following sections.

Construction (Temporary) Dewatering System

A temporary construction dewatering system is necessary to keep the excavation areas reasonably dry during casting basin construction. At the Aberdeen Log Yard site, groundwater that is withdrawn during dewatering would be reinfiltrated into trenches located along the eastern perimeter of the property. This would maintain the groundwater elevations and would minimize the potential for settlement of adjacent off-property structures.

Operation (Permanent) Dewatering System

A permanent dewatering system is necessary to keep the casting basin reasonably dry during pontoon construction and to maintain the site while not in use. This system would dewater the bottom of the excavated area (basin floor) to prevent heaving (hydrostatic uplift) on the excavation floor.

WSDOT would construct the operation dewatering system during site development. This system would include both passive (water flow via gravity) and active (water pumping) components. WSDOT would install drain lines around the sloped side walls and at the bottom of the casting basin to capture groundwater, which would then seep through the pipes and flow by gravity to a collection point. At the collection point, the groundwater would be monitored and reinfiltrated into trenches located near the eastern perimeter of the site (see Exhibit 2-3) in accordance with the NPDES Construction Stormwater General Permit and Sand and Gravel Permits.

Types of Pontoons to Be Constructed

For this project, WSDOT would construct three types of pontoons needed for a four-lane replacement of the Evergreen Point Bridge if the bridge failed. Exhibit 2-6 lists the types of pontoons to be built, how many of each would be built, and their approximate dimensions. Exhibit 2-7 illustrates how these pontoons would be configured to replace the Evergreen Point Bridge in the event of catastrophic failure.

How big are the longest pontoons?

Each of the longest pontoons—longitudinal pontoons—would stretch from goal post to goal post (about 360 feet) on a football field and weigh twice as much as WSDOT's largest ferry (about 12,000 tons).

EXHIBIT 2-6
Pontoon Types, Quantity, and Approximate Dimensions

Pontoon Type	Quantity	Width (feet)	Length (feet)	Height (feet)	Weight (tons)
Cross (western portion of bridge)	1	75	240	34	10,100
Cross (eastern portion of bridge)	1	75	240	35	10,550
Longitudinal	21	75	360	29	11,100
Supplemental stability	10	60	98	29	2,650 to 3,000 (depending on whether an anchor cable is attached)

Pontoon Towing and Moorage

The number and availability of existing marine berths for storing pontoons in Grays Harbor are limited and could not accommodate moorage of all pontoons built for this project for the anticipated moorage duration; therefore, WSDOT is analyzing a pontoon moorage site in the Grays Harbor area (Exhibit 2-8) as part of the proposed project.

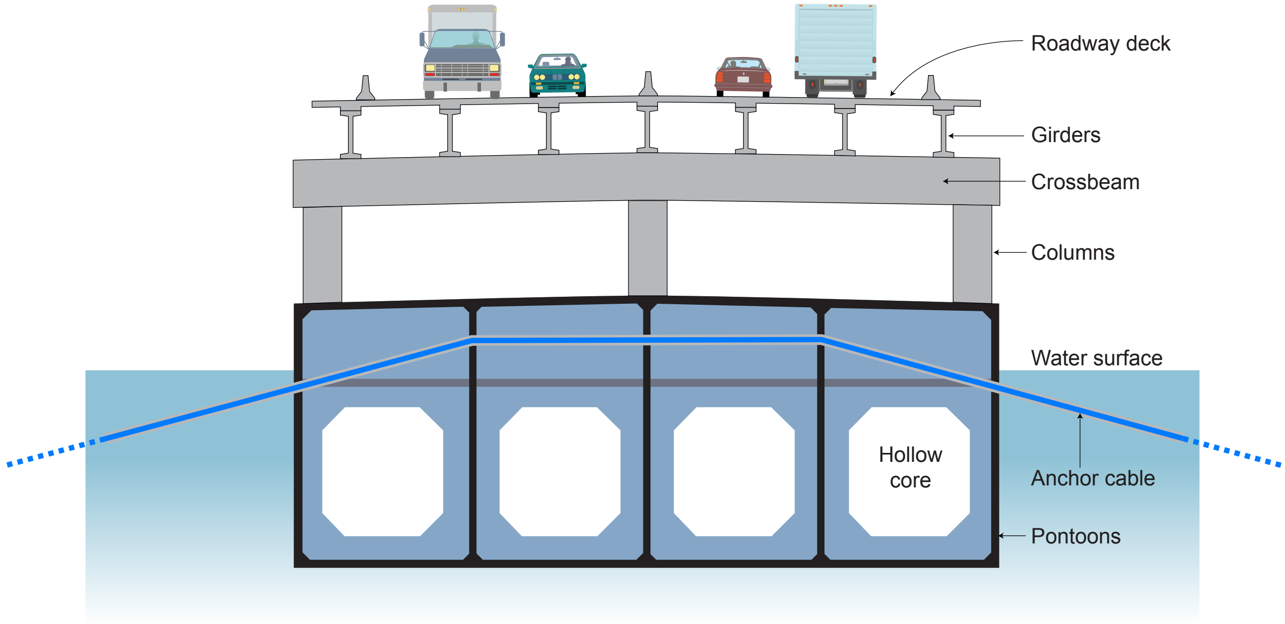
WSDOT proposed to store completed pontoons at a moorage location in outer Grays Harbor (see Exhibit 2-8). The completed pontoons would be towed out of the casting basin and moored in Grays Harbor until needed for either catastrophic failure response or the planned replacement of the Evergreen Point Bridge. Towing each pontoon from the casting basin to its moorage location would require up to two tugboats, a process similar to moving a barge or other large vessel. This type of activity regularly occurs throughout Grays Harbor and Puget Sound as part of normal port operations.

What types of pontoons would WSDOT build for this project?

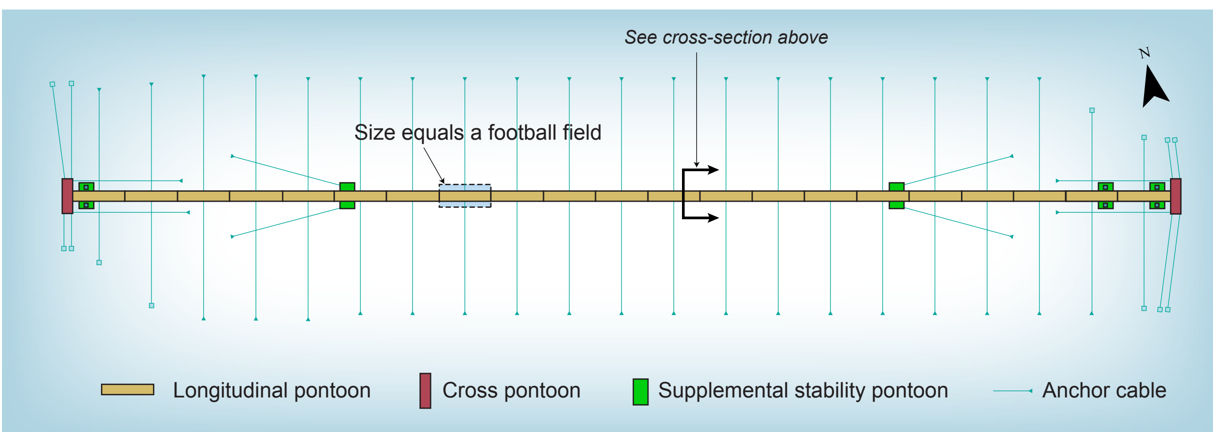
Cross pontoons are used to support the western and eastern highrise portion of the Evergreen Point Bridge; this project would require two cross pontoons.

Longitudinal pontoons make up most of the floating bridge section that crosses Lake Washington.

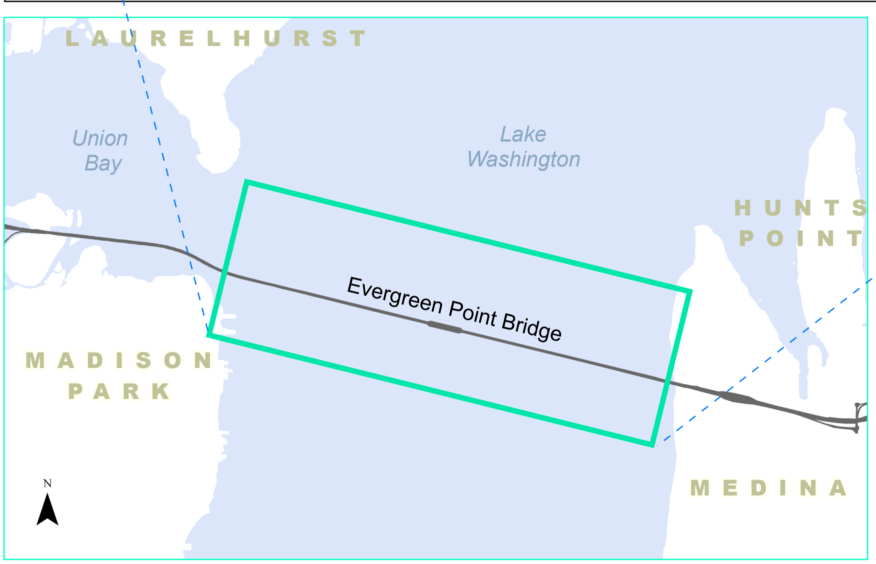
Supplemental stability pontoons are the smallest of the three types of pontoons and are strategically placed alongside longitudinal pontoons to provide additional stability.



Bridge and Pontoon Cross-Section



Aerial View of Pontoon Configuration

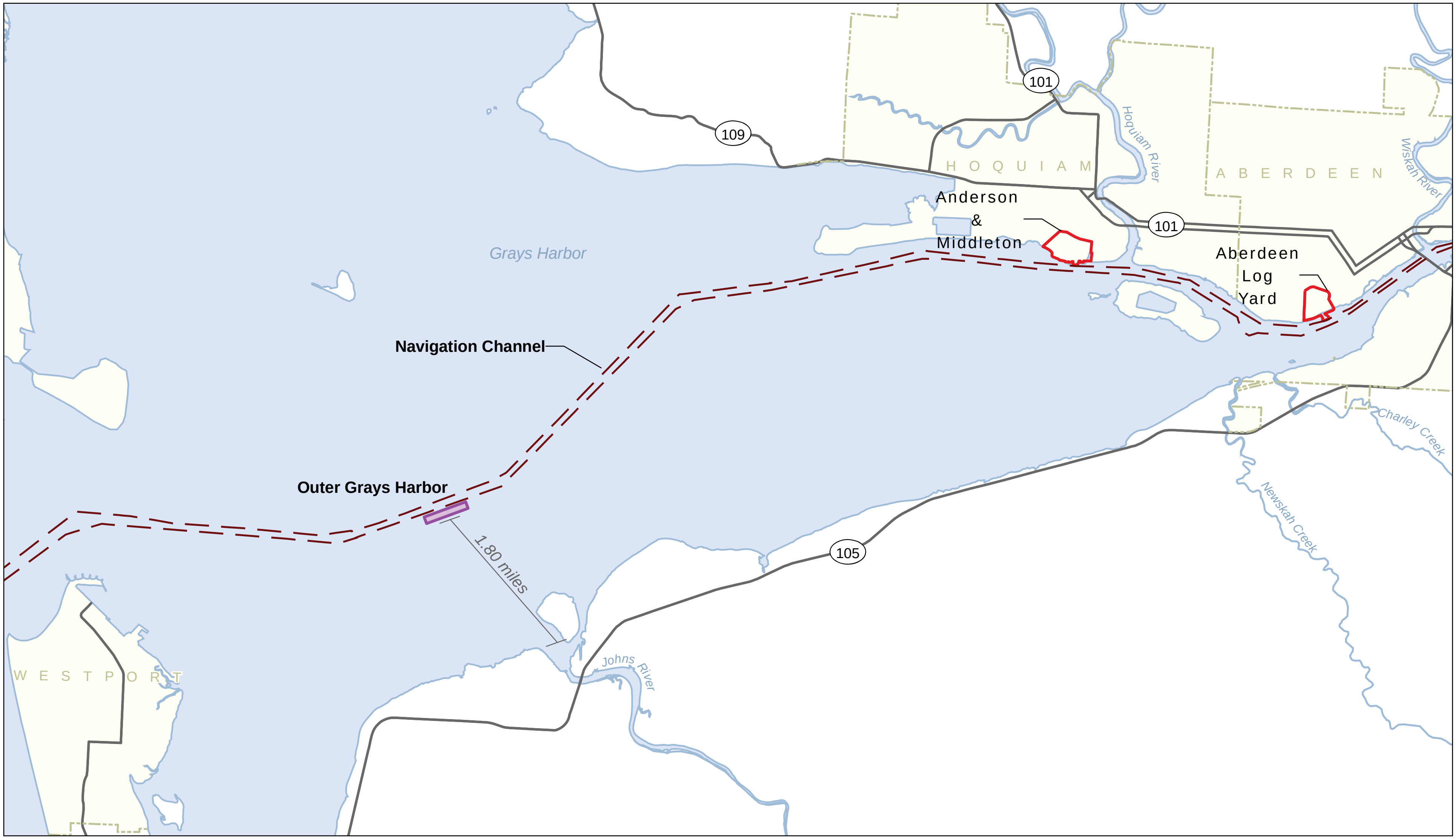


Area of Detail

Exhibit 2-7. **Pontoon Configuration to Replace the Existing Evergreen Point Bridge**

Pontoon Construction Project

Washington State Department of Transportation



Proposed pontoon moorage location

Build Alternative Site

Navigation channel

City limits

N

0 0.5 1 2 Miles

Source: Grays Harbor County (2006) GIS Data (Waterbody and Street). Horizontal datum for all layers is State Plane Washington South NAD 83; vertical datum for layers is NAVD88.

Exhibit 2-8. **Grays Harbor Proposed Pontoon Moorage Location**

SR 520 Pontoon Construction Project

Washington State Department of Transportation

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The proposed moorage location would be about 1.5 nautical miles from the Grays Harbor shoreline near the Johns River. No submerged aquatic vegetation, shipwrecks, or downed aircraft were identified by sonar scanning or underwater video profiling at this proposed location. This area is between 25 and 55 feet deep (relative to mean lower low water [MLLW]), with a relatively featureless bottom characterized by sand waves.

The proposed Grays Harbor moorage location could moor up to 33 pontoons by rafting pontoons in groups of three (for the larger pontoons) and attaching them to anchors (Exhibit 2-9).

If catastrophic failure of the Evergreen Point Bridge were to occur before the planned bridge replacement, the pontoons would be towed out of Grays Harbor as soon as seasonal towing windows allow (for example, not during stormy winter weather). However, if there were no catastrophic failure before the planned bridge replacement, the pontoons could be stored in Grays Harbor for up to 1.5 years, based on the schedule proposed for the SR 520 Program's I-5 to Medina: Bridge Replacement and HOV Project. If catastrophic failure does not occur and the schedule for the planned bridge replacement were to be delayed, the storage periods would likely be longer.

Pontoons would be anchored in at least 25 feet of water. The underside of the floating pontoons would extend about 13 to 17 feet underwater. The pontoons would always float at least 8 feet above the harbor bottom, even during the lowest tides. WSDOT would keep the pontoons out of maintained and marked navigation channels and would identify the pontoons with navigation lighting in compliance with U.S. Coast Guard requirements.

WSDOT would equip all moored pontoons with sensors and transmitters and remotely monitor them for spatial location, proper position in the water, and water intrusion. In addition, WSDOT would stage replacement moorage components such as chain and fenders in the pontoons and would also maintain a cache of emergency supplies and emergency pumps in the pontoons. Prior to pontoon moorage, WSDOT would develop a full emergency response plan and maintain an agreement with a tug company for appropriate tugs to be staged locally, standing ready to respond in case of an emergency.

Casting Basin Facility Construction

The following subsections briefly describe the site construction activities, launch channel construction, and shoreline berm

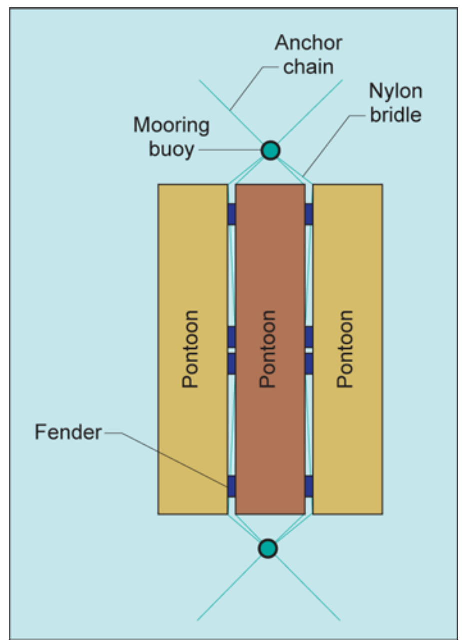
What is mean lower low water?

The height of mean lower low water is the average daily lowest tide, recalculated every 19 years.

What is mean higher high water?

Mean higher high water is the average daily highest tide, recalculated every 19 years.

EXHIBIT 2-9
Conceptual Pontoon Open-Water Anchorage Design



modifications. For more information on construction techniques, see Appendix B.


A tugboat pulls a completed pontoon from the CTC facility casting basin.

Site Construction

WSDOT anticipates a 16-hour workday (over two shifts), 6 days per week, for casting basin construction, with the possibility of multiple shifts working 24 hours a day, 7 days a week. WSDOT would prepare the casting basin facility site by first installing silt fencing and other temporary erosion and sediment control measures. Vegetation would then be removed along with any remnants of previous site development, such as old pavement, building foundations, and utility poles. Next, WSDOT would grade the site to remove the top 1 to 2 feet of soil and debris, install temporary utilities to serve construction needs, and place gravel on the site to accommodate heavy equipment needed for facility construction activities.

WSDOT would then proceed with site construction by installing the construction (temporary) dewatering system to keep working areas reasonably dry. Next, piles to support the casting basin floor would be driven from the existing ground surface before the casting basin is excavated. The piles would be driven using a hydraulic pile-driving hammer until resistance is encountered, after which an impact hammer would be used until the right capacity is reached. The impact hammer would drive the piles to the bearing (stable) layer, ensuring each pile is firmly in place.

The casting basin excavation effort would be substantial and would require a combination of backhoes, loaders, excavators, and dump trucks to haul material away for disposal in a manner compliant with applicable regulations and/or to stockpile material onsite. Once the basin is excavated, WSDOT would stabilize the sloped side walls by covering them with a layer of riprap. Then WSDOT would construct the casting basin slab floor with pile-supported, reinforced concrete. A construction dewatering system would pump groundwater from the basin's perimeter to maintain dry conditions during casting basin construction.


In-water dredging would take place during launch channel construction.

Activities necessary for adding other essential site features, such as access roads, utilities, parking, and laydown areas, would also occur during casting basin construction. WSDOT would likely place the required utilities (water, sewer, electrical, and communications lines) underground and would install water treatment (wet) ponds.

The batch plant used to supply concrete for the casting basin and pontoons would then be built on a concrete pad base, along with loading and storage areas.

Launch Channel Construction

The upland portion of the launch channel—the area between the shoreline berm and the casting basin—would be excavated first, allowing the excavation to occur with the berm intact, keeping the excavation area dry. WSDOT proposes leaving the shoreline berm in place and reinforcing it with a temporary metal sheet pile during excavation of the onshore portion of the launch channel and construction of the removable casting basin gate.

Backhoes and excavators likely would be used to excavate the channel to 15 feet below MLLW to achieve a safe operating depth of 13 feet below MLLW (about 25 to 30 feet deep). The side slopes would be lined with riprap to hold the soil in place. The removable casting basin gate would also be constructed at this time.

When the upland portion of the launch channel is excavated, WSDOT would begin to dredge the waterward (offshore) portion of the launch channel. The waterward portion of the launch channel would be dredged using a clamshell to the same depth of 15 feet below MLLW. Clamshell operations would be conducted from a barge. WSDOT would reinforce the shoreline berm with temporary metal sheet pile during dredging of the waterward portion of the launch channel. After completing channel excavation, dredging the sides of the shoreline berm, and installing the basin gate, the sheet pile would be removed and the berm would be breached to connect the onshore and offshore portions of the channel.

When the launch channel is constructed, WSDOT would install the row of piles connected by a steel rail on both sides of the launch channel and then place the two turning dolphins at the mouth of the launch channel. The dolphins would rise approximately 16 feet above the surface of the water, give or take a few feet depending on tide levels.

Shoreline Berm Modification

WSDOT would modify the existing shoreline berm to accommodate the launch channel. About 300 linear feet of the existing berm at the Aberdeen Log Yard site would be removed to connect the casting basin to Grays Harbor via the launch channel.

Material Exported from and Imported to the Site

Total loaded and unloaded truck trips for excavation, site construction, and material import and export during pontoon construction are estimated to be nearly 193,000 trips. These truck trips would occur over approximately 3.5 years. See Section 3.14, *Transportation*, for more detail about estimated truck trips for each alternative. WSDOT intends to stockpile much of the excavated materials onsite to minimize the number of truck trips. The stockpile would be planted with vegetation to stabilize it.

Exhibit 2-2 shows the proposed haul routes; where possible, the haul routes would be on established state routes. WSDOT might also elect to import and/or export some material by barge and/or rail, depending on whether costs, schedule, and logistics favor using these alternate transportation methods as the project design and schedule is refined.

Pontoon Construction

WSDOT would take the following steps to construct and store the pontoons:

- Deliver materials to the facility
- Form pontoon components
- Prepare reinforcing steel for the pontoons
- Manufacture concrete
- Place concrete in formwork
- Cure concrete
- Perform water quality treatment activities
- Flood casting basin and open gate
- Tow pontoons out and moor them
- Close gate and drain casting basin

Pontoons are reinforced concrete structures. To build them, concrete would be poured around steel rebar cages surrounded by wooden or steel forms. When the concrete has set, the forms would be removed and the pontoons would be cured in the casting basin.

After construction of each group of pontoons is complete, WSDOT would thoroughly clean and pressure-wash the work area and collect and treat the washwater before discharging it into Grays Harbor or an approved water treatment facility in accordance with NPDES permit conditions. The basin would then be flooded to allow the pontoons to safely float within the casting basin. After the water level inside the basin reaches the water level in Grays Harbor (or the Blair Waterway at the CTC facility), the casting basin access gate would be lifted open and the pontoons towed out of the basin by a tugboat.

What is the concrete curing process?

Curing involves keeping the concrete moist while it hardens and is the process by which concrete achieves its best strength. Concrete strengthens as a result of a chemical reaction that occurs when it is in contact with water; this reaction bonds the elements of the cement together, creating a stone-like material. To keep the concrete moist, any surface that is not covered by the forms is covered with plastic or wet tarps or kept wet with a mister or sprinkler. Proper curing can take 3 to 14 days, depending on external conditions and the elements in the concrete.

What is the Anderson & Middleton Alternative?

The project features for the Anderson & Middleton Alternative are described below and in many instances are the same as those described above for the Aberdeen Log Yard Alternative.

Site Characteristics

The Anderson & Middleton property is mostly empty (view from site looking east).

The privately owned Anderson & Middleton Alternative site is located about 2,000 feet west of the Hoquiam River on the north shore of Grays Harbor in Hoquiam (Exhibit 2-2). The site is surrounded by industrial maintenance shop buildings to the west, railroad tracks to the north, and vacant industrial property to the east. The site is currently vacant except for a small office building on the northern edge of the property, some gravel roads, an asphalt pad, and a truck scale; a rock berm borders the shoreline of the 105-acre property. WSDOT would purchase about 93 acres of this property, and the casting basin and support facilities would occupy about 55 acres. In the early twentieth century, there were machine shops, refuse burners, and a lumber mill on part of this site, but by the late 1960s all former mill structures were gone. The site was used for timber storage until the late 1980s and has been mostly unused since. For more information about the prehistoric and historical uses of this site, please see Section 3.7, *Cultural Resources*, in Chapter 3 of this Final EIS.

Project Features

Exhibit 2-3 shows the conceptual site design layout of the Anderson & Middleton Alternative site. To support pontoon construction activities at the casting basin, this alternative would require the same support facilities as described above for the Aberdeen Log Yard Alternative: access roads, a concrete batch plant, large laydown areas, a precast fabrication yard, stormwater handling and water treatment areas, office space, and a designated parking area for workers. The Anderson & Middleton Alternative design also includes a rail spur for possible use in transporting materials to and from the site. These features are described briefly in the following sections and in more detail in Appendix B.

Casting Basin and Launch Channel

The casting basin design would be the same as described previously for the Aberdeen Log Yard Alternative. Because the offshore water depth at the Anderson & Middleton site drops much more quickly than at the Aberdeen Log Yard site, the offshore portion of the launch channel would be shorter and would need fewer piles for maneuvering the pontoons (23 versus about 70).

Support Facilities, Stormwater and Water Treatment, and Dewatering

Support facilities, stormwater and water treatment, and construction and operation dewatering systems at the Anderson & Middleton site would be the same as described above for the Aberdeen Log Yard Alternative.

Types of Pontoons to Be Constructed, Pontoon Towing, and Moorage

The types of pontoons to be constructed would be the same as described for the Aberdeen Log Yard Alternative. Pontoons built at the Anderson & Middleton site would be towed and moored in the same manner and for the same length of time as described for the Aberdeen Log Yard Alternative.

Casting Basin Facility Construction

Site Construction

At the Anderson & Middleton site, site preparation and construction activities would be the same as described for the Aberdeen Log Yard Alternative.

Launch Channel Construction

At the Anderson & Middleton site, launch channel construction activities would be the same as described above for the Aberdeen Log Yard Alternative, although the launch channel would be shorter and would require fewer piles for maneuvering pontoons within the channel.

Shoreline Berm Modification

The rock berm along the shoreline at the Anderson & Middleton site is weathered and degraded. The berm would need to be reinforced to prevent further degradation and to protect the site against flooding during storms. At a minimum, WSDOT would repair the shoreline berm's eroded portions to their original shape. Additionally, WSDOT might need to reinforce and shore up the existing berm in vulnerable areas where it has eroded or been damaged over the years by storms. The berm height could also be increased to prevent waves from overtopping it, and the bottom of the berm could be armored to better protect the shoreline against wave action.

Material Exported from and Imported to the Site

Total loaded and unloaded truck trips for excavation, site construction, and material import and export during pontoon construction are estimated to be 174,000 trips over approximately 3.5 years. The truck haul route is shown on Exhibit 2-2. See Section 3.14, *Transportation*, for more detail about estimated truck trips for each alternative.

WSDOT might also elect to import and/or export some material by barge or rail. Use of barge or rail to move material to and from the Grays Harbor site would result in fewer truck trips than indicated above.

Pontoon Construction

WSDOT pontoon-building operations under the Anderson & Middleton Alternative would be the same as described for the Aberdeen Log Yard Alternative.

What is the CTC facility option?

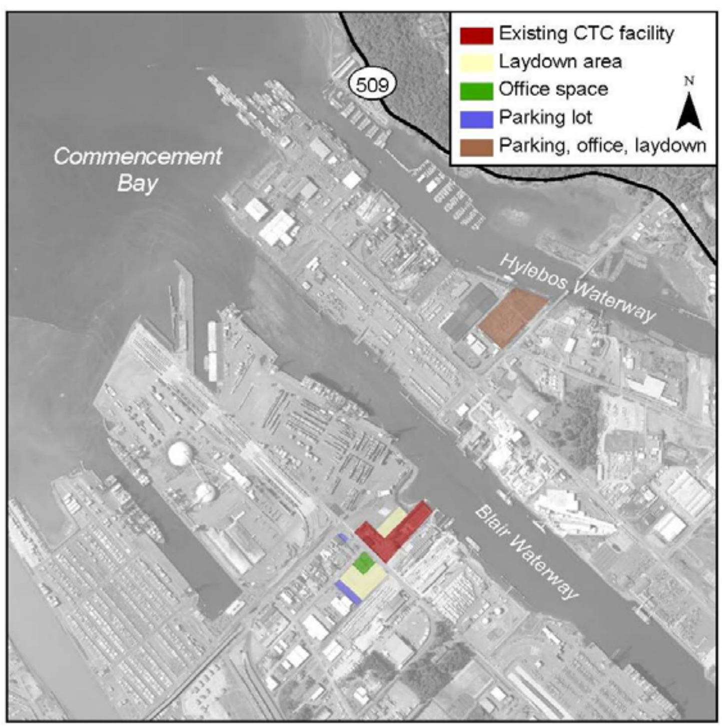
WSDOT analyzed the possible use of the CTC facility in Tacoma to build additional pontoons. WSDOT has determined that the use of the CTC facility would not provide sufficient cost, schedule, and logistics advantages to support this option and meet the proposed project's purpose and need. Therefore, the CTC facility is not part of the Aberdeen Log Yard (Preferred Alternative) or the Anderson & Middleton Alternative.

Although WSDOT does not plan on using the CTC facility option at this time, if the CTC facility were to be used in the future for pontoon-building operations, additional environmental documentation would be needed and completed. Under this option, WSDOT considered building up to ten smaller supplemental stability pontoons and up to three large longitudinal pontoons at the CTC facility over the life of the project. The CTC casting basin is next to an existing concrete batch plant that could sufficiently serve pontoon-building operations at the CTC facility.

For the SR 104 Hood Canal Bridge Project, WSDOT leased about 17 additional acres at several nearby properties for construction laydown areas, parking areas, and office space to support pontoon construction activities at the CTC site; WSDOT would again lease those and/or other nearby properties if the CTC facility were used. Exhibit 2-10 shows the existing CTC facility and other nearby parcels leased to support the Hood Canal project.

If the CTC facility is used, WSDOT would moor pontoons built in Tacoma at existing available marine berths within Puget Sound, subject to availability. Based on a 2009 preliminary assessment of available marine berth space, WSDOT concluded that suitable space would be available for securing pontoons among the major ports in Puget Sound for the foreseeable future. Any pontoons built at the CTC facility would be stored at existing marine berths in Puget Sound for up to 1.5 years.

EXHIBIT 2-10
Aerial View of CTC Facility as Used for the Hood Canal Project



What is the No Build Alternative?

An EIS analyzes a No Build Alternative to assess what would happen if the project were not built. The No Build Alternative is also used as a baseline condition against which to measure and compare the project's build alternatives. For the SR 520 Pontoon Construction Project, the No Build Alternative means that WSDOT would not construct or store pontoons needed to respond to a catastrophic failure of the Evergreen Point Bridge. Under the No Build Alternative, WSDOT would not build a new casting basin facility to manufacture pontoons for Evergreen Point Bridge catastrophic failure response. Therefore, the resulting environmental effects of the proposed project activities would not occur.

Under the No Build Alternative, pontoons would not be available for catastrophic failure response, and emergency bridge replacement would take approximately 5 years, opposed to 1.5 years with the build alternatives. As described in Chapter 1, the Evergreen Point Bridge is a critical component of the Puget Sound region's transportation system, and the economic consequences of a catastrophic failure and subsequent 5-year closure would be severe.

For this Final EIS, WSDOT assumes that, if unused by this project, the build alternative sites would continue to be used as they are today: the Aberdeen Log Yard would remain a log yard and the Anderson & Middleton site would remain mostly inactive. The use of the Grays Harbor properties has remained unchanged since the 1990s, and no known plans for further development of either site are being considered at this time. Potential future uses for these two properties—other than the proposed SR 520 Pontoon Construction Project—are speculative and, therefore, not considered under the No Build Alternative. In summary, under the No Build Alternative, the existing conditions and uses at all proposed alternative sites would continue as they are today.

What are the primary differences between the build alternatives?

Each build alternative would require construction and design modifications tailored to the unique physical characteristics of the selected site. For example, the depth to various geologic layers of each site is different (Section 3.2, *Geology and Soils*, in Chapter 3), which would influence pile length for foundation support. The different topography and nearshore characteristics of each site would influence project components such as launch channel dimensions and shoreline armoring. Local regulations and codes unique to each site could also influence the design of both the casting basin facility and support facilities.

The pontoon launch channel at the Aberdeen Log Yard site would be longer than with the Anderson & Middleton Alternative (585 feet long versus 350 feet long, respectively), although the channel would be about the same width (approximately 300 feet wide) at the shoreline.

Exhibit 2-11 presents examples of potential differences based on the current preliminary design completed for each alternative for this analysis.

EXHIBIT 2-11
Examples of Potential Construction Differences between the Grays Harbor Build Alternatives

Component	Aberdeen Log Yard Alternative (Preferred Alternative)	Anderson & Middleton Alternative
Casting basin		
Approximate volume material excavated from casting basin	475,000 cubic yards	423,000 cubic yards
Average pile length	100 to 120 feet	135 to 150 feet
Launch channel		
Approximate launch channel size	Onshore: 200 feet long,[a] 63,000 square feet	Onshore: 150 feet long,[a] 58,000 square feet
	Offshore: 470 feet long,[a] 125,000 square feet	Offshore: 120 feet long,[a] 16,000 square feet
Approximate volume material excavated for launch channel	Onshore: 63,000 cubic yards	Onshore: 43,900 cubic yards
	Offshore: 87,000 cubic yards	Offshore: 6,900 cubic yards

[a]The launch channel width is not indicated because the width varies. At the base of the channel excavation, it would be about 140 feet wide, but at the shoreline surface, it would be about 300 feet wide. The square footage provided accommodates these variations.

Why was Aberdeen Log Yard selected as the Preferred Alternative?

Key factors supporting Aberdeen Log Yard as the Preferred Alternative are mostly engineering-based and consider cost and risks. Key differentiating factors supporting the Preferred Alternative are discussed in the following sections.

Project Costs and Risks

Conceptual engineering estimates indicate that constructing a casting basin facility at the Aberdeen Log Yard site would cost substantially less than at the Anderson & Middleton site. Higher development costs at the Anderson & Middleton site are associated primarily with foundation requirements.

Conceptual engineering estimates indicate that a deep-pile foundation—the most reliable foundation type identified for both sites—would cost substantially less at the Aberdeen Log Yard site than at the Anderson & Middleton site because shorter piles could be used to reach the bearing layer, which is approximately 30 feet shallower than at the Anderson & Middleton site. Up to 2,200 piles would be needed for the proposed deep-pile foundation, so the shorter piles used at the Aberdeen site would result in substantial cost savings. Another factor contributing to higher costs with the Anderson & Middleton Alternative would be the need to install a berm or noise wall to shield adjacent residences from project-generated noise.

What is precontact?

Precontact refers to the period before European explorers and settlers established contact with the indigenous native American people who inhabited the region.

Available geotechnical investigations indicate that dewatering at either site could pull water out of the soil over an area (zone of influence) that extends beyond the property boundaries. Dewatering at the Anderson & Middleton site could have a greater effect on adjacent wetlands because there are over 30 acres of known wetlands adjacent to this site. Potential dewatering effects on wetlands would be less of a risk at the Aberdeen Log Yard site because adjacent wetlands are small (less than 0.5 acre total).

Cultural Resources

As described in Section 3.7, Cultural Resources, of Chapter 3, the lumber mill works at both of the Grays Harbor build alternative sites are considered historical-period archaeological sites. At the Anderson & Middleton site, the lumber mill works are part of the identified archaeological site that also includes remnants of a precontact Native American fish trap complex.

WSDOT has determined, and the Washington State Department of Archaeological and Historic Preservation (DAHP) has formally concurred, that there are no archaeological sites on the Aberdeen Log Yard property is that are eligible for listing on the National Register of Historic Places (NRHP).

The archaeological site on the Anderson & Middleton property is eligible for listing on the NRHP. The archaeological site includes the remnants of a fish trap complex and a historical lumber mill. The lumber mill remnants are a noncontributing element to the site's NRHP eligibility because the mill remnants lack sufficient integrity and research potential to contribute to the overall integrity of the archaeological site (see Appendix A to Appendix I, Cultural Resources Discipline Report). Further consultation with FHWA, DAHP, and the concerned tribes would be required to determine whether the fish trap complex warrants preservation in place.

Why might a Preferred Alternative be developed to a higher level of detail?

SAFETEA-LU permits the Preferred Alternative to be developed to a higher level of detail than the other alternatives for only the following reasons: (1) To facilitate the development of mitigation measures or (2) to facilitate concurrent compliance with other applicable environmental laws.

Because the current Preferred Alternative (Aberdeen Log Yard Alternative) would not affect the fish trap complex, this determination will not be made at this time. Avoiding the fish trap complex further supports the Preferred Alternative selection.

Did all alternatives receive the same level of analysis?

WSDOT has—as allowed under Section 6002 of SAFETEA-LU—developed some preliminary design components of the Preferred Alternative, which was identified in August 2009, to a higher level of detail than the other alternatives being considered. These design components include the casting basin gates, hydraulic control structure, launch channel, shoreline protection, water-handling facilities, and some site utilities.

With a more detailed design, WSDOT could develop more specific mitigation measures and more easily ensure compliance with applicable environmental laws and regulations, such as Section 404 of the Clean Water Act (CWA), Section 106 of the National Historic Preservation Act (NHPA), and Section 7 of the Endangered Species Act (ESA).

Advancing preliminary design between the publication of the Draft EIS and Final EIS has allowed WSDOT to better assess potential effects on natural and built environment resources and to further develop mitigation for these effects. For example, refining design of the casting basin gate from two gates to one has reduced the gate area footprint, which in turn has allowed for a narrower launch channel, thereby reducing effects on aquatic resources and enabling WSDOT to more closely determine mitigation for effects.

Also, refining the proposed water handling facilities and site utilities preliminary design has led to more refined water treatment and discharge strategies, thereby allowing WSDOT to better assess how anticipated permit conditions can be met and evaluate any potential residual water quality effects.

Although the design refinements have been developed for the Preferred Alternative, WSDOT has made reasonable assumptions about the Anderson & Middleton Alternative and has evaluated those design refinements as appropriately applied to both build alternatives given their respective site characteristics.

Even after a Preferred Alternative has been identified and additional time and resources have been used to more fully develop the Preferred Alternative, NEPA requires that the lead agencies must be able to select a different alternative or the No Build Alternative, if warranted, at the end of the NEPA process. Final design of the project is not allowed to be completed under after the Record of Decision (ROD) is issued.

WSDOT has ensured that all alternatives in this Final EIS have been evaluated objectively. In accordance with SAFETEA-LU, the design-

What is Section 404 of the Clean Water Act?

Section 404 of the Clean Water Act requires U.S. Army Corps of Engineers approval before dredging or placing any fill materials in U.S. waters, including special aquatic sites. The fundamental rationale of the program is that no discharge of dredged or fill material will be permitted if there is a practicable alternative that would be less damaging to the environment or if the discharge would lead to unacceptable degradation to the nation's waters. Special aquatic sites regulated by this program include wetlands, mudflats, and vegetated shallows.

NEPA Section 101(b) (42 USC § 4331) states:

In order to carry out the policy set forth in this Act, it is the continuing responsibility of the federal government to use all practicable means to improve and coordinate federal plans, functions, programs, and resources to the end that the nation may:

1. Fulfill the responsibilities of each generation as trustee of the environmental for future generations;
2. Assure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings;
3. Attain the widest range of beneficial uses of the environment without degradation, risk to health or safety, or other undesirable and unintended consequences;
4. Preserve important historic, cultural, and natural aspects of our national heritage, and maintain, wherever possible, an environment which supports diversity and variety of individual choice;
5. Achieve a balance between population and resource use which will permit high standards of living and a wide sharing of life’s amenities; and
6. Enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.

builder has not been involved in nor biased the NEPA process, and effects associated with all alternatives were analyzed equally. Furthermore, the design-build contract executed in January 2010 includes provisions requiring that no commitments be made to a particular alternative and that all reasonable alternatives, including the No Build Alternative, continue to be considered until the NEPA Record of Decision (ROD) for the project is issued. The design-build contract includes termination provisions in the event that the No Build Alternative is selected.

What is the environmentally preferable alternative?

The environmentally preferable alternative is the alternative that best protects, preserves, and enhances historic, cultural, and natural resources, and that causes the least damage to the biological and physical environment, as expressed in NEPA Section 101(b). The environmentally preferable alternative is not necessarily the same as the Preferred Alternative.

The Council on Environmental Quality regulations for implementing NEPA require that the ROD (40 CFR 1505.2(b)) specify the alternative or alternatives that were considered to be environmentally preferable. FHWA and WSDOT have elected to identify the environmentally preferable alternative in this Final EIS in addition to the ROD.

While both Grays Harbor build alternatives provide opportunities to meet NEPA requirements to protect the environment for succeeding generations, the Aberdeen Log Yard Alternative would better preserve cultural and natural resources. Specifically, although more dredging (3.0 acres versus 0.38 acre affected, respectively) would be necessary to develop the Aberdeen Log Yard site, fewer wetlands would be directly eliminated by the Aberdeen Log Yard Alternative, with less risk of eliminating any nearby wetlands through dewatering than the Anderson & Middleton Alternative (1.1 acres affected versus 4.8 acres affected with the potential of affecting over 30 acres of nearby wetlands, respectively). WSDOT plans to mitigate for all dredging and wetland effects, as discussed in Chapter 5, but would be unable to predetermine the degree to which wetlands near the Anderson & Middleton site might be affected until the project was underway. The greater quantifiable potential effect to wetlands under the Anderson & Middleton Alternative and the magnitude of the risk of affecting an indeterminable acreage of nearby wetlands that might require unforeseen additional mitigation would outweigh the greater adverse effects of dredging under the Aberdeen Log Yard Alternative, for which WSDOT will mitigate.

Further, as noted above, the Anderson & Middleton site contains remnants of a precontact fish trap complex that WSDOT has determined, and the DAHP has concurred, is eligible for listing in the NRHP. The Aberdeen Log Yard site does not contain historic or cultural resources that are eligible for listing on the NRHP, and the DAHP concluded that "the project will not have an adverse effect on historic properties if the Preferred Alternative is selected" (see Appendix B to the Cultural Resources Discipline Report, which is Appendix I in this Final EIS).

In addition, residences adjacent to the Anderson & Middleton site would be affected by project-generated noise. WSDOT would need to build a barrier such as a wall or berm to protect these residences from noise exceeding the state noise regulations (Washington Administrative Code [WAC] 173-60). There are no residences near the Aberdeen Log Yard site where project-generated noise would exceed the state noise control ordinance. Therefore, WSDOT has identified the Aberdeen Log Yard Alternative (the Preferred Alternative) as the environmentally preferable alternative because it could better meet the criteria outlined in Section 101(b) of NEPA.

How did WSDOT choose potential sites to evaluate?

In 2004, WSDOT began constructing a casting basin in Port Angeles to build pontoons for both the SR 104 Hood Canal Bridge and the SR 520 Evergreen Point Bridge. In late 2004, WSDOT left the Port Angeles site after discovering buried human remains and cultural artifacts belonging to the lower Elwha Klallam Tribe and its ancestors and immediately solicited port authorities, private land owners, and tribal nations in search of a new site. In early 2005, the urgency of constructing pontoons for the SR 104 Hood Canal Bridge Project—which was already underway—led WSDOT to decide to build pontoons at CTC's existing casting basin in Tacoma. Efforts to find a new casting basin site for the SR 520 Program's I-5 to Medina: Bridge Replacement and HOV Project—and then for the SR 520 Pontoon Construction Project—continued. WSDOT identified potential casting basin facility sites between 2004 and 2008 through the following activities:

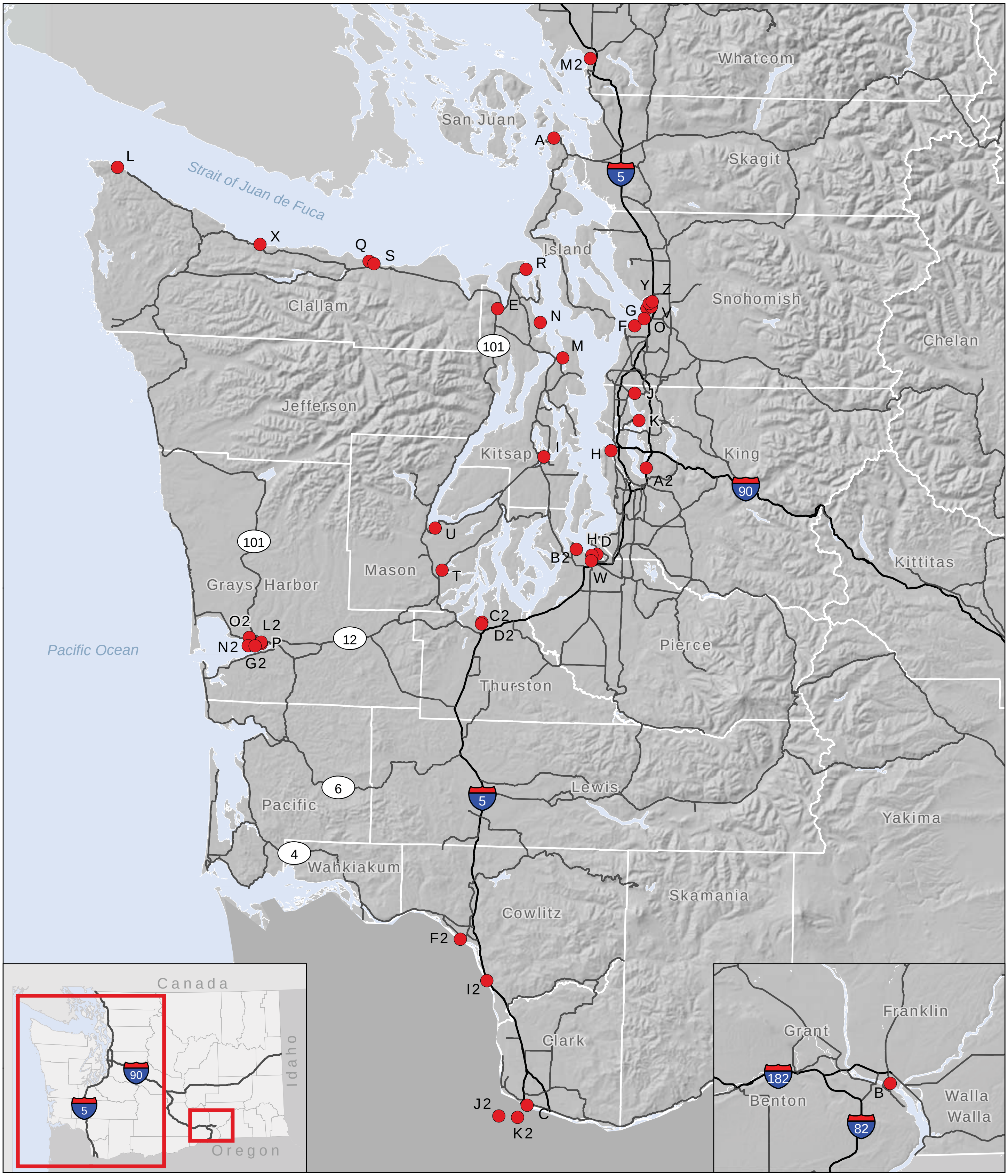
- Direct solicitation via letter sent to 38 port districts, six private landowners or land development companies, and two tribes
- Advertisement in the Seattle Daily Journal of Commerce
- Advertisement on WSDOT's Contract Ad & Award Web page
- Suggestions from expert review panels

- Real estate property searches

Based on the project's purpose and need, WSDOT established several key criteria for identifying potential casting basin sites for initial consideration: it had to be at least 30 contiguous acres and have 900 to 1,000 feet of waterfront in a protected harbor or channel with adequate depth and room to move large tugboats and pontoons. Ultimately, WSDOT considered sites smaller than 30 acres if adjacent properties were available that—together with the originally considered site—comprised at least 30 contiguous acres. Both developed and undeveloped sites were considered. WSDOT's search for potential casting basin facility construction sites resulted in a list of 39 candidate sites to consider for further analysis (see Exhibit 2-12 for the locations of these sites). For complete details on the search for potential casting basin facility construction sites, including required site features and criteria, please see Appendix B, Description of the Alternatives and Construction Techniques Discipline Report.

How did WSDOT screen and select potential sites for analysis?

The process WSDOT used to identify the range of alternatives included conducting public scoping, collaborating with participating and cooperating agencies, and consulting with tribes. This section describes that process and provides the rationale for eliminating candidate sites. To determine which sites would make up the range of alternatives to be fully analyzed in the Final EIS, WSDOT developed criteria to screen potential alternatives with the help of an advisory environmental review panel and participating agencies and tribes (the PCPACT team). The screening criteria (Exhibit 2-13) included required physical site characteristics, logistical constraints, and consideration of unacceptable adverse effects and regulatory constraints. If a site failed on any screening criterion, then it was considered an unreasonable or impracticable site and was eliminated from further consideration. Before developing site-screening criteria with the PCPACT team, WSDOT had identified the casting basin method as the preferred pontoon construction method (see *Why is WSDOT analyzing the casting basin method for building pontoons?* later in this chapter). Sites that could not accommodate the casting basin method were dismissed from further consideration before the screening criteria (in Exhibit 2-13) were developed.



Candidate casting basin facility site

County boundary

Note: Site H includes locations in Seattle and Tacoma.
Site M is the same as site E2 listed in Exhibit 2-14.
Site A is the same as site H2 listed in Exhibit 2-14.

Source: WSDOT (1995) GIS Data (County). Horizontal datum for all layers is State Plane Washington South NAD 83; vertical datum for layers is NAVD88.

N

0 10 20 Miles

Exhibit 2-12. **Candidate Casting Basin Facility Sites**

SR 520 Pontoon Construction Project

Washington State Department of Transportation

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Exhibit 2-14 presents all of the sites considered and dismissed from further study and the criteria on which their dismissal was based; Exhibit 2-12 also shows these sites by location. For a more detailed description of the alternatives that were dismissed from further consideration and the rationale for their dismissal, please see Appendix B, Description of the Alternatives and Construction Techniques Discipline Report. Information gathering and the screening process continued until WSDOT reviewed all of the sites. Of the 39 sites evaluated, the screening process eliminated 36 sites because they failed at least one of the screening criteria. Three sites— the Port of Grays Harbor Industrial Development District Number 1 (IDD #1), Anderson & Middleton, and Aberdeen Log Yard—were further analyzed. WSDOT initiated a 30-day comment period on this potential range of alternatives. WSDOT received 144 comments from the public and participating agencies. The scoping comments addressed various topics, including lack of support for IDD #1 given the potential for extensive wetland effects, concerns about effects on fish and wildlife, and effects related to increased traffic and noise. Public comments indicated a general consensus regarding the need for the project and no direct opposition for locating the new pontoon construction facility in the Grays Harbor area.

EXHIBIT 2-13
Screening Criteria for Casting Basin Facility Construction Site

Criteria	Rationale
Physical site characteristics	
1. Sufficient draft achievable and appropriate channel characteristics	The site must have 22 feet of draft logistically and economically achievable with the initial dredging effort to accommodate pontoon float-outs. Maintaining the needed 22-foot draft during active construction must be logistically and economically achievable after considering dredging volume, frequency, area, and environmentally sensitive areas. There must be reliable access between the casting basin and deep water.
2. Size	A minimum of 30 contiguous acres is needed to accommodate a single pontoon construction and/or storage facility, critical onsite infrastructure, laydown area, and stormwater treatment facilities.
3. Appropriate shoreline characteristics	The site must have direct water access with at least 150 feet of shoreline length to accommodate an entrance channel for the casting basin. The site must have an elevation between MHHW levels and 10 feet above MHHW. The site must have a nearshore protected area for temporary pontoon moorage to ensure that pontoons do not sustain damage while in holding before transport.

EXHIBIT 2-13
Screening Criteria for Casting Basin Facility Construction Site

Criteria	Rationale
Logistical constraints	
4. Towing feasibility	There must be established navigable water routes between the site and Lake Washington. The costs and risks associated with the tow must be acceptable.
5. Domestic location	Purchase of materials, long-term leasing strategies, foreign environmental processes, overseeing construction in another country, and challenging interagency coordination all excluded foreign sites from consideration for this project.
Unacceptable adverse effects	
6. Unacceptable adverse effects on natural resources and noncompliance with environmental regulations	Developing and operating the facility must comply with all environmental regulations; developing and operating the facility must not result in unacceptable adverse effects that could not be mitigated. Unacceptable effects on natural resources that could not be mitigated would likely lead to permit or approval denials.
7. Cultural resources	Site development must not require direct effects on significant archaeological resources for which effects could not be mitigated or direct effects on historical structures or sites that must be preserved in place.
Unacceptable constraints	
8. Cultural resources	Known large-scale or complicated recovery work cannot begin until completion of NEPA process and would delay schedule and prevent expedited construction. The extent and significance of resources might not be fully understood until excavation is underway, presenting unanticipated costs and schedule risks.
9. Hazardous materials: MTCA or federal or state superfund site	Hazardous materials cleanup cannot begin until completion of NEPA process and would delay schedule and prevent expedited construction. Extent of contamination might not be fully understood until cleanup actions are underway, presenting unanticipated costs and schedule risks.
10. Compatibility with zoning and land use regulations	Rezoning or major land use action process cannot begin until NEPA completion and would delay schedule and prevent expedited construction. Site must not require a substantial zoning change or land use action that would undermine the intent of local comprehensive plans or result in unacceptable degradation of the surrounding area and its current character.
11. Site availability and term of availability	The site cannot require condemnation; the owner must be a willing seller or lessor. The site must be available to WSDOT for construction of additional floating bridge structures supporting the full buildout of the SR 520 Evergreen Point Bridge.

MHHW mean higher high water
MTCA Model Toxics Control Act
NEPA National Environmental Policy Act
SR State Route
WSDOT Washington State Department of Transportation

EXHIBIT 2-14
Casting Basin Facility Sites Considered and Dismissed

ID	Site	Eliminating Criteria
A	MJB Properties, Anacortes, WA	Size
B	Big Pasco Industrial Center, Pasco, WA	Sufficient draft, towing feasibility
C	Columbia Industrial Park, Vancouver, WA	Towing feasibility
D	Concrete Technology Corporation, Hylebos Waterway, Tacoma, WA[a]	Hazardous materials
E	Discovery Bay, Jefferson County, WA	Compatibility with zoning and land use regulations
F	KLB Construction property, Everett, WA	Sufficient draft, size
G	Snohomish Delta Partners, Everett, WA	Proposal withdrawn by the proponent and resubmitted as Site V (listed below in this exhibit)
H	FCB Facilities Team (various sites), Seattle and Tacoma, WA	Size
I	Puget Sound Naval Shipyard drydock or other floating drydocks, Bremerton, WA	Drydocks unavailable or in disrepair would require a construction method dismissed from consideration (floating drydock)
J	Glacier Northwest Kenmore Premix Plant, Kenmore, WA	Size would require a construction method dismissed from consideration (segmental match-casting)
K	Lake Washington (in-lake), Seattle, WA	Eliminated before the site-screening criteria process because construction method (vertical casting) dismissed from consideration
L	Makah Reservation, Neah Bay, WA	Sufficient draft, appropriate shoreline characteristics, cultural resources
M	Port Gamble Mill site, Port Gamble, WA	Hazardous materials
N	Port Ludlow quarry, Jefferson County, WA	Compatibility with zoning and land use regulations
O	Port of Everett South Terminal, Everett, WA	Site availability
P	Port of Grays Harbor Industrial Development District Parcel #1, Hoquiam, WA	Unlikelihood of being able to demonstrate compliance with USACE Section 404 requirements
Q	Port of Port Angeles Terminal 7, Port Angeles, WA	Size, cultural resources
R	Port of Port Townsend, Port Townsend, WA	Size
S	Rayonier properties, Port Angeles, WA	Cultural resources, hazardous materials
T	Sanderson Field Industrial Park, Shelton, WA	Sufficient draft, appropriate shoreline characteristics, towing feasibility
U	Skokomish River, Mason County, WA	Sufficient draft
V	Snohomish Delta Partners (Miller Shingle Mill), Everett, WA	Sufficient draft
W	Thea Foss Waterway, Tacoma, WA	Size
X	Twin River Clay Quarry, Clallam County, WA	Sufficient draft, appropriate shoreline characteristics

EXHIBIT 2-14
Casting Basin Facility Sites Considered and Dismissed

ID	Site	Eliminating Criteria
Y	Port of Everett Riverside Business Park, Everett, WA	Sufficient draft
Z	Cedar Grove Composting, Snohomish County, WA	Sufficient draft
A2	Lake Washington, Renton, WA	Hazardous materials, compatibility with zoning and land use regulations
B2	Port of Tacoma, Tacoma, WA	Hazardous materials, compatibility with zoning and land use regulations
C2	Washington Department of Natural Resources tidelands, Olympia, WA	Sufficient draft
D2	Port of Olympia, Olympia, WA	Hazardous materials, site availability
E2	Port Gamble, Port Gamble, WA	Hazardous materials
F2	Port of Longview, Longview, WA	Towing feasibility
G2	Weyerhaeuser (Cosmopolis), Aberdeen, WA	Site availability
H2	Port of Anacortes, Anacortes, WA	Size
I2	Port of Kalama, Kalama, WA	Towing feasibility
J2	Northwest Industrial Center, Multnomah County, OR	Towing feasibility, hazardous materials
K2	Hayden Island, Multnomah County, OR	Towing feasibility
M2	Whatcom Waterway, Bellingham, WA	Hazardous materials
O2	Port of Grays Harbor Terminal 3, Hoquiam, WA	Sufficient draft

[a] This CTC differs from the CTC site that is considered in this Final EIS which is on the Blair Waterway.

In February 2009, WSDOT removed IDD #1 as a potential alternative site because adverse effects on wetlands would be comparatively too great relative to the other two sites identified for further analysis in the EIS. Because of the large wetland area on IDD #1, it would be more difficult to obtain the Section 404 permit, which protects wetlands and special aquatic sites; permits under Section 404 of the CWA are issued only for the least environmentally damaging practicable alternative. Because the site-screening process identified two other sites—both practicable and less environmentally damaging—the IDD #1 was no longer viable under screening criteria number 6 (Exhibit 2-13). A second 30-day comment period was conducted to solicit comments on WSDOT's proposal to drop IDD #1 from further consideration, and most comments supported the dismissal (see Appendix A).

Why is WSDOT analyzing the casting basin method for building pontoons?

Several construction methods were considered during the initial stages of the SR 520 Pontoon Construction Project site design process. A casting basin is the preferred construction method because WSDOT has substantial experience with this method, which has been successfully used to build pontoons for all of WSDOT's floating bridges. WSDOT has a high level of confidence that constructing pontoons using the casting basin method would proceed smoothly with low risk of delays or unanticipated costs. As a result, for the purpose of this Final EIS, the casting basin method was analyzed.

What other construction methods did WSDOT review?

Alternative pontoon construction methods that FHWA and WSDOT reviewed during development of the project alternatives are described briefly below. WSDOT determined that the risks associated with each of these methods would be greater than the benefits. Appendix B, Description of Alternatives and Construction Techniques Discipline Report, more thoroughly describes the first four methods listed below and the reasons why they were not considered for further analysis in this Final EIS; the last two bullets describe two additional pontoon construction methods that were submitted to FHWA and WSDOT in late 2009 in design-build proposals:

- **Floating drydock or construction on barges.** This method involves constructing pontoons on a floating drydock, which is a U-shaped barge. After the pontoons are complete, the drydock would be ballasted down so that the bottom portion of the U is submerged, and the pontoons would be floated out. This method does not require a land-based facility and can be used in open water.

- This method was not considered for further analysis for a couple reasons: (1) working over water is more expensive than working on land, and (2) facility construction time would be substantially longer than a casting basin.

- **Vertical casting on Lake Washington.** This method involves working from barges on Lake Washington to construct pontoons vertically, section-by-section, while sinking the completed portion of the pontoon vertically into the lake, then rotating the finished pontoon to a horizontal position.

  This method was not considered for further analysis for several reasons: (1) there are higher risks of pontoon damage during construction; (2) working over water is more expensive than working on land; and (3) this method has never been used to construct large floating concrete structures.

- **Segmental match casting on Lake Washington.** This method—proposed as a way to make a smaller site on Lake Washington viable for pontoon construction—involves building each pontoon incrementally and pushing it out into the lake as it is built.

  This method was not considered for further analysis for several reasons: (1) each incremental movement of the pontoon into the lake presents a damage risk to the pontoon; (2) the mechanism to launch the pontoons into the water are expensive and prone to failure; and (3) each pontoon would require about ten flooding and dewatering cycles, which presents great environmental risks and challenges.

- **Barge launch and barge slip.** Both of these methods have a casting slab at ground level with a system to transfer a finished pontoon onto a grounded barge. The barge rests on an underwater support grid located offshore (barge launch) or in an excavated slip notched into the shoreline (barge slip). Once the pontoon is built and loaded onto the barge, the barge is floated and moved to deeper water and submerged, thus allowing the pontoon to float off the barge and then be towed away. The barge is refloated and regrounded on the support grid.

  These methods, which would apply to building the longitudinal pontoons, were not considered for further analysis for several reasons: (1) loss of or damage to the barge would significantly affect pontoon delivery; (2) transporting pontoons over land creates stresses that pontoons are not designed to withstand and could result in pontoon damage; and (3) obtaining the type of barge necessary for this project would be difficult because they are not readily available.

- **At-grade superflooded casting basin facility.** This method would move pontoons in a way similar to Seattle's Hiram M. Chittenden Locks in Ballard, with water lowered and raised to different levels. Pontoons would be built on an at-grade concrete slab next to a permanently flooded, deep launching slot in the middle of the basin. Temporary walls would be erected around the completed pontoons, the slot gate closed, and that portion of the basin would be superflooded using a pumping system. The pontoons would be floated and moved into the launching slot, then water within the temporary walls would be drained, the slot gate opened, the temporary walls removed, and pontoons towed into the launch channel.

This method was not advanced for further analysis because it did not offer substantial environmental or cost advantages over WSDOT's casting basin concept.

- **Enclosed, at-grade casting building with elevator-lift platform.** This method involves building pontoons in an enclosed, at-grade building, then using a transport system to move the finished pontoons to an offshore "elevator-lift" lowering system to launch the pontoons into deep water.

  This method was not advanced for further analysis because it did not offer substantial environmental or cost advantages over WSDOT's casting basin concept.

How long would it take WSDOT to build the new facility and pontoons?

The new casting basin facility, including all support facilities, would take approximately 1 year to construct. WSDOT proposes to build 33 pontoons in 6 construction cycles over a little less than 2.5 years exclusively at the Grays Harbor casting basin facility. Exhibit 1-4 shows the project's current schedule. WSDOT anticipates that approximately 5 months would be needed to complete each pontoon-construction cycle.

How would WSDOT maintain the casting basin after pontoons for this project are built?

After all pontoons needed for the proposed SR 520 Pontoon Construction Project are built and towed out of the basin, WSDOT would maintain the facility in a manner compliant with all site permits and approvals for the period of time the facility remains in WSDOT's ownership. Use of the casting basin for anything other than building pontoons for the Evergreen Point Bridge would require that all applicable environmental regulatory and permitting processes were reinitiated as appropriate.

For the duration of the casting basin's existence, it would be kept dry when not in use by maintaining the dewatering system and periodically pumping stormwater out of the basin, thereby allowing for easier maintenance and inspection activities. The casting basin would also be kept dry because the gate would not be able to withstand water pressure from the inside. (For instance, if there is water in the casting basin when the tide is out, the water level inside the casting basin might be higher than the water level in Grays Harbor, thus putting pressure on the casting basin gate from the inside as it mimics a dam.)

If at any time during the NEPA/SEPA process the design-builder's approach to casting basin construction is found to result in substantial, adverse environmental effects not disclosed in this Final EIS, then WSDOT will provide additional documentation as required by NEPA and SEPA**.**