US Army Corps of Engineers ®
Seattle District

BIOLOGICAL EVALUATION
FOR INFORMAL ESA CONSULTATION
For: Paradise Cove Residential Bulkhead Replacement
(Corps Reference Number not yet assigned)
Version: May 2012

***** This form is for projects that have insignificant or discountable impacts on listed species. It contains all the information required for a biological evaluation, but in abbreviated form and with minimal instructions on how to fill it out. For more detailed instructions, a format for development of a biological assessment or biological evaluation can be found on the Seattle District Corps website (www.nws.usace.army.mil – click on regulatory and then on endangered species, BA Template). You may also contact the Corps at 206-764-3495 for further information.***

Drawings and Photographs - ***Drawings and photographs must be submitted***. Photographs must be submitted showing local area, shoreline conditions, existing overwater structures, and location of the proposed project. Drawings must include a vicinity map; plan, profile, and cross-section drawings of the proposed structures; and over- and in-water structures on adjacent properties. (For assistance with the preparation of the drawings, please refer to our *Drawing Checklist* located on our website at www.nws.usace.army.mil Select Regulatory – Regulatory/Permits – Forms.) Submit the information to: U.S. Army Corps of Engineers, Regulatory Branch, P.O. Box 3755, Seattle, Washington 98124-3755.

See Drawings, Attachment A
See Photos, Attachment B

Date: July 2022

SECTION A - General Information			
1. **Applicant name**: Mariah Smith-Gentry			
Mailing address: 4715 SW Wildwood Place, Seattle, WA 98136			
Work phone: 206-914-4087	Home phone:	Email: Mariah@wildwingstudios.com	Fax:
2. **Joint-use applicant name (if applicable)**:			
Mailing address:			
Work phone:	Home phone:	Email:	Fax:
3. **Authorized agent name**: Kristin Osterberg, Waterfront Construction, Inc.			
Mailing address: 205 NE Northlake Way, Suite 230, Seattle, WA 98105			
Work phone: 206-334-5096	Home phone:	Email: Kristin@ waterfrontconstruction.com	Fax:
4. **Location where proposed work will occur** Address (street address, city, county): 25630 Bates Walk SW, Vashon Island, King County Location of joint-use property (street address, city, county): Waterbody: Puget Sound			
¼ Section: NW	Section: 26	Township: 22N	Range: 2E
Latitude: 47.37381		Longitude: -122.5161	

5. Description of Work:

Include project drawings and site photographs.

Describe the proposed project in detail. Please describe any mitigation that is being proposed for impacts from your project. Attach a mitigation plan as an appendix, if appropriate.

The proposed emergency work consists of replacing the existing timber bulkhead with an angular rock bulkhead immediately landward and adjacent to the original bulkhead. It would be constructed by embedding rock approximately 2 feet below the base of existing bulkhead into firm, undisturbed soils to prevent further loss of soil from behind the bulkhead. Areas behind the bulkhead will be excavated and a geotextile fabric will be placed prior to backfilling with quarry spalls and capping with crushed stone.

This work has been approved as an emergency action by King County (letter Attachment C). A condition of the HPA issued for the project says that mitigation must be performed within 90 days of construction. Because of the urgent nature of the work, mitigation is still being planned.

Due to tidal and wave action, the existing bulkhead has failed and continues to erode. The bulkhead protects a walkway that is the only ingress and egress for 25 homes, many of which have elderly occupants depending on mobility devices for access to their properties. The bulkhead also protects utility lines that are in danger of being fully exposed to the elements, as well as the septic system for the owner's property. Without a bulkhead repair, residents will lose access to their homes, homes will lose utilities, and the septic system could fail.

Project drawings are attached to this BE.

For projects that include pile driving

If steel or concrete piles are being installed with an impact hammer pile driver, marbled murrelets may be adversely impacted. For installation of any type of pile with a vibratory pile driver, marine mammals may be adversely impacted. A monitoring plan may be required to ensure protection of these species.

Please fill out the following: (obtain information from contractor)	
5.1 Number of piles being replaced:	N/A
5.2 Replacement pile type: (e.g.: ACZA-treated wood, steel, coating used on steel piles)	
5.3 Replacement pile size: (e.g. 12-inch)	
5.4 Installation method: (e.g.: vibratory, impact hammer)	**Note:** Vibratory or impact installation of wood, concrete, plastic, or other non-metal piles of any size is allowed. Impact installation of steel piles in marine waters is not covered under the programmatic and, in freshwater, is only covered programmatically for steel piles up to 10 inches.
5.5 Anticipated dates, number of minutes and number of days vibratory pile driving	Anticipated dates:
5.6 For vibratory installation, will proofing be required? If so, how many pile strikes per pile?	Yes _____ Number of pile strikes per pile _____ No _____

Please fill out the following: (obtain information from contractor)	
5.7 For impact hammer installation, estimate the number of pile strikes required per pile:	N/A
5.8 For impact hammer installation or proofing, estimated number of pile strikes per day:	Minutes per day _____ Number of days _____ Anticipated dates:
5.9 For impact hammer pile driving or proofing, sound attenuation measures:	
5.10 Anticipated dates, number of minutes and number of days of impact hammer pile driving or proofing:	
5.11 Describe substrate into which piling will be driven:	

6. Construction Techniques:
Describe methods and timing of construction to be employed in building the project and any associated features. Identify actions that could affect listed / proposed species or designated / proposed critical habitat and describe in sufficient detail to allow an assessment of potential impacts. Consider actions such as vegetation removal, temporary or permanent elevations in noise level, channel modifications, hydrological or hydraulic alterations, access roads, power lines etc. Also discuss construction techniques associated with any interdependent or interrelated projects.
Address the following:

A. Construction sequencing and timing of each stage (duration and dates):

- Load barge with materials and equipment needed for bulkhead construction
  - 3-man to 4-man basalt bulkhead rocks
  - Including necessary amount of quarry spalls backfill
  - Possible use of excavator on site (brought in by barge)
- Mobilize barge to and from site located on Vashon Island
  - Roughly 12 hours of mobilization per round trip x 2 trips
- Demo existing timber bulkhead
  - Remove wood lagging
  - Remove with crane the existing timber piles
  - Disposal of existing timber materials using proper methods
- Installation of new basalt rock bulkhead
  - Roughly 60 tons of 3-man to 4-man basalt bulkhead rocks, 1500-2500 pounds per rock
- Installation of filter fabric barrier
  - Including the quarry spalls backfill amount required

The project will take 4 to 6 weeks to complete.

B. Site preparation:

A silt and sediment containment boom will be placed around the bulkhead.

C. Equipment to be used:

Equipment will be staged on the work barge. A crane equipped with a clamshell shovel or excavator will be used to excavate behind the bulkhead and place material behind it.

D. Construction materials to be used:

Bulkhead will consist of rock, quarry spalls, permeable ballast, geotextile fabric and beach nourishment materials. See plan set for details.

E. Work corridor:

The construction barge will operate offshore to avoid bottom and shoreline disturbances that could occur with ground-based equipment. A work corridor on the beach, 25 feet wide, was approved by WDFW. Machinery may operate in the beach work corridor.

F. Staging areas and equipment wash outs:

Equipment will be staged on the barge, including a small excavator, if used. The barge will incorporate a filter sock and a perimeter boom. The barge will hold all construction materials during the project and all construction debris will be held in a 20-cy steel debris container that is secured on the barge for upland disposal later.

G. Stockpiling areas:

Building materials will be stockpiled on the barge. Materials to be removed from the site will also be stockpiled on the barge. Large bulkhead rocks may be stockpiled and staged on the beach within the approved 25-foot work corridor.

H. Running of equipment during construction:

Equipment including a barge-mounted crane and possibly a small excavator will run during construction. This equipment will be shut down when not in use.

I. Soil stabilization needs / techniques:

The project itself is a soil stabilization measure; erosion of the residential lot into Puget Sound will be curbed by the new bulkhead.

A sediment containment boom with sediment curtain will be installed and anchored around the bulkhead during work. The containment boom will be inspected regularly and watched, especially during a wind event. Work will be stopped immediately if any part of the containment boom should become loose or unattached and repaired prior to resuming work.

J. Clean-up and re-vegetation:

The area behind the bulkhead is a gravel walkway for access to the homes on Bates Walk. After construction, the area will restored to current conditions.

K. Storm water controls / management:

The project will not introduce any impervious or pollution-generating surface.

L. Source location of any fill used:

Crushed rock/gravel fill and topsoil will be obtained from commercially licensed sources.

M. Location of any spoil disposal:

All rock material will be reused at other sites; no spoil material is anticipated. If debris is generated, it will be taken to an upland facility for disposal or reuse.

7. Action Area

Please describe the action area. The action area means all areas to be affected directly (e.g., earth moving, vegetation removal, construction noise, placement of fill, release of environmental contaminants) and indirectly by the proposed action. (Example: as a direct effect, the action area for pile driving would include the area out to where the noise from the pile driving falls below the level of harm or disturbance for listed species. For vibratory hammer pile driving impacts to killer whales, this level is 120 dB. Action area will include any area where the underwater noise level may exceed 120 dB).

The property contains a single family residence at 25630 Bates Walk SW (see Figure 1). The waterfront shoreline consists of residential yards with landscaping trees, shrubs along the side yards and wooded areas behind the house. A crushed rock walkway is between the front of the house and timber bulkhead at the subject property. Adjoining properties are also bulkheaded. A walkway runs behind the residential bulkheads, and it is the only access to the 25 homes along the Paradise Cove shoreline. See photos for existing conditions.

Adjacent properties to the north, south and east within sight and sound of the removal and construction activities are also single-family residences with bulkheads.

Terrestrial noise will come from construction equipment on-site and is expected to be louder than ambient conditions. The loudest piece of equipment to be used is the crane-mounted excavator, which can reach about 81 dbA. Ambient conditions in a suburban residential area are typically 45 to 50 dbA. According to the Practical Spreading Loss Model for soft-site (non-paved) conditions, noise will be louder than ambient levels for a radius of approximately 1,600 feet.

All work will be completed in the dry at low tide and will not be a source of aquatic noise.

8. Species Information:

Identify each listed or proposed species, including terrestrial species, as well as designated or proposed critical habitat in the action area. Please include information on which listed species use are expected to be found in the action area and the potential for them to be there during project activities.

U.S Fish and Wildlife Service at: http://westernwashington.fws.gov/se/SE_List/endangered_Species.asp

National Marine Fisheries Service at:
510 Desmond Dr., SE # 103
Lacey, WA 98503

(360) 753-9530
http://www.nwr.noaa.gov

The following species were listed as of August 11, 2011 (Steller sea lions and bocaccio have since been delisted):

USFWS SPECIES
BIRDS
Marbled murrelet
Northern spotted owl

Canada lynx
Columbia white-tailed deer
Gray wolf (western WA)
Gray wolf (eastern WA)
Grizzly bear
Woodland caribou
Pygmy rabbit (Columbia Basin DPS)

INSECTS
Oregon silverspot butterfly

PLANTS
Bradshaw's desert parsley
Marsh sandwort
Showy stickseed
Wenatchee Mtns. Checker-mallow
Golden paintbrush
Kincaid's lupine
Nelson's checker-mallow
Water howellia
Spalding's catchfly
Ute ladies'-tresses

FISH
Bull trout, Columbia River
Bull trout, coastal-Puget Sound
Dolly varden, coastal-Puget Sound

NMFS SPECIES
FISH
Chum, Columbia River
Chum, Hood Canal summer
Chinook, lower Columbia River
Chinook, upper Columbia River spring
Chinook, Puget Sound
Chinook, Snake River fall
Chinook, Snake River spring-summer
Chinook, upper Willamette River
Coho, lower Columbia River
Sockeye, Ozette Lake
Sockeye, Snake River
Steelhead, upper Columbia River
Steelhead, middle Columbia River
Steelhead, lower Columbia River
Steelhead, Snake River
Steelhead, upper Willamette River
Steelhead, Puget Sound
Sturgeon, Green (southern DPS)
Eulachon, Pacific (southern DPS)
Bocaccio (Georgia Basin DPS)
Rockfish, canary (Georgia Basin DPS)
Rockfish, yelloweye (Georgia Basin DPS)

MARINE MAMMALS
Humpback whale
Blue whale
Fin whale
Sei whale
Sperm whale
Southern resident killer whale
Steller sea lion

REPTILES-AMPHIBIANS
Leatherback sea turtle
Loggerhead sea turtle
Green sea turtle
Olive Ridley sea turtle

Table 2. Species and Critical Habitat Covered in this Biological Evaluation

Species	Common Name	Status	Agency	Critical Habitat
Oncorhynchus tshawytscha	Puget Sound Chinook salmon	Threatened	NMFS	Designated
O. mykiss	Puget Sound steelhead	Threatened	NMFS	Not Designated
Salvelinus confluentus	Bull trout	Threatened	USFWS	Designated
Orcinus orca	Southern resident killer whale	Endangered	NMFS	Designated
Megaptera novaeangliae	Humpback whale	Endangered	NMFS	Not designated
Brachyramphus marmoratus	Marbled murrelet	Threatened	USFWS	Designated

Species	Common Name	Status	Agency	Critical Habitat
Sebastes ruberrimus	Yelloweye rockfish	Threatened	NMFS	N/A
S. paucispinus	Boccaccio	Threatened	NMFS	N/A

9. Existing Environmental Conditions:
Describe existing environmental conditions for the following:

A. Shoreline riparian vegetation and habitat features

The property is located on the western shoreline of Vashon Island. A crushed rock path is present between the house and the bulkhead. The side yard has been planted with ornamental trees and shrubs, and natural forest trees are present behind the house up the slope. A utility corridor also runs behind the bulkhead, carrying electrical and communications wiring.

B. Aquatic substrate and vegetation (include information on the amount and type of eelgrass or macroalgae present at the site)

The Washington Department of Natural Resources' eelgrass mapper shows eelgrass, a mixture of native *Zostera marina* and non-native *Z. japonica*, in the subtidal zone in front of the Smith-Gentry residence (WDNR 2022).

C. Surrounding land/water uses

Paradise Cove is a residential neighborhood with homes concentrated along the shoreline and few homes inland.

D. Level of development

Vashon Island is generally rural in character, with one small town, and most homes concentrated along the shoreline. Upland industries include strawberry farming, dog breeding, and artisanal products. The island is roughly 1.5 miles wide at Paradise Cove, and across the island on the east side is the Maury Island Aquatic Preserve.

E. Water quality

According to the 303(d) List mapping utility (Ecology 2022), the waters of Paradise Cove are Category 2 (Waters of Concern) for bacteria. Across Colvos Passage, at Richmond Point, waters are Category 5 (Polluted) for 4,4'-DDE, PCBs, and mercury.

F. Describe use of the action area by listed salmonid fish species.

The aquatic habitat is used by bull trout and salmon species as part of the migration corridor to the Pacific Ocean. Adult salmonids can be found year-round in Puget Sound (UW 2016). Bates Creek, which flows into Puget Sound just south of the project site, does not show use by any salmonid species (WDFW 2022).

G. Is the project located within designated / proposed bull trout or Pacific salmon critical habitat? If so, please address the proposed projects' potential direct and indirect effect to primary constituent elements (Critical habitat templates can be found on the Corps website at: http://www.nws.usace.army.mil/Missions/CivilWorks/Regulatory/PermitGuidebook/EndangeredSpecies.aspx, select Forms, Tools and References; Forms and Templates; Critical Habitat Assessment Forms.

The project area is excluded from designated bull trout critical habitat, which includes the eastern nearshore area of Puget Sound to a depth of 33 feet MLLW. The project is within designated critical habitat for Puget Sound Chinook salmon and Puget Sound Steelhead. Steelhead are shown to use Christensen Creek, about 2 miles north of the site. Effects analysis is provided in the response to #10 below.

H. Describe use of the action area by other listed fish species (green sturgeon, eulachon, bocaccio, canary rockfish and yelloweye rockfish).

Rockfish live in Puget Sound. Rockfish are deep-water fish and rarely use waters shallower than 80 feet (74 Fed. Reg. 18516). They also require habitat complexity, especially refugia in the form of overhanging rock. The waters of Colvos Passage reach a depth of approximately 350 feet at the center in the project area (Fishermap 2022). Rockfish larvae may be found in the water off shore of the site. Mature rockfish are likely to be found in deeper water in Colvos Passage.

I. Is the project located within designated/proposed critical habitat for any of the species listed below? If so please address the proposed projects' potential direct and indirect effect to primary constituent elements. Please see the NOAA-Fisheries and US Fish and Wildlife websites (www.nwr.noaa.gov and www.fws.gov/pacific respectively) for further information.

Southern resident killer whale	*Marbled murrelet*
Northern spotted owl	*Western snowy plover*
Green sturgeon	*Eulachon*

The action area is within designated critical habitat for Southern Resident Killer Whales. The project effects are addressed in #10 below.

J. Describe use of action area by marbled murrelets. How far to the nearest marbled murrelet nest site or critical habitat? Some information is available on the Fish and Wildlife Service website: http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B08C.

The nearest documented foraging area is on the western side of Bainbridge Island, 18 miles north (WDFW 2022c). The nearest nesting area is in the Olympic Mountains, more than 45 miles east of the project site (71 Fed. Reg. 53837). Marbled murrelets could be found in Colvos Passage. Marbled Murrelet diet consists mainly of small schooling fish found in waters less than 100 feet deep (WDFW 2022c). The waters of Colvos Passage drop off rapidly and the suitable range for such fish is narrow.

K. Describe use of action area by the spotted owl. How far to the nearest spotted nest site or critical habitat? Some information is available on the Fish and Wildlife Service website: http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B08B.

The nearest nesting habitat is approximately 30 miles west in the Olympic Mountains. Old-growth forest suitable for nesting does not exist in the Action Area.

L. **For marine areas only:** Describe use of action area by Southern Resident killer whales. How often have they been seen in the area and during what months of the year? For information on noise impacts on killer whales and other marine mammals, please see the National Marine Fisheries website: http://www.nwr.noaa.gov/Marine-Mammals/MM-consults.cfm.

Southern Resident Killer Whales are seen in Colvos Passage in summer (Orca Network 2022). In July 2022, they have been sighted frequently near Ruston Point (Tacoma), south of Vashon Island. They could access the area either by Colvos Passage or the wider Sound east of the island, where the shipping lanes are located. In July 22, a gray whale was seen Colvos Passage. The water is deep enough to be suitable for use by Southern Resident Killer Whales.

M. **For marine areas and Columbia River:** How far is the nearest steller sea lion haulout site from the action area? Describe their use of the action area. See the National Marine Fisheries website: http://www.nwr.noaa.gov/Marine-Mammals/MM-consults.cfm for information on the steller sea lion and location of their haulout sites.

Steller sea lions were delisted in 2013. The nearest haulouts are in Commencement Bay, several miles southeast of the site.

N. **For marine areas only: Forage Fish Habitat** – only complete this section if the project is in tidal waters.

Check box if Washington Department of Fish and Wildlife (WDFW) documented habitat is present. Go to the WDFW website for this information: http://wdfw.wa.gov/fish/forage/forage.htm, then search for each species under the link to Biology, then the link to Documented Spawning Grounds (if available, please attach a copy of the Hydraulic Project Approval from WDFW):

Surf Smelt: ☐ **Pacific Herring:** ☐ **Sand Lance:** ☐

Check box if the proposed action will occur in potentially suitable forage fish spawning habitat:

Surf Smelt: ☐ **Pacific Herring:** ☐ **Sand Lance:** ☐

If no boxes are checked, please explain why site is not suitable as forage fish spawning habitat.

The site is suitable for forage fish spawning; however, none is documented. The bulkheaded shoreline may discourage use of the beach.

Please describe the type of substrate and elevation and presence of aquatic vegetation at the project area. For example:

At +10 to +5 feet above MLLW, there is no aquatic vegetation, the substrate consists of large cobbles.

At +5 to +1 foot above MLLW, there is eelgrass and the substrate consists of fine sand.

The intertidal zone in front of the bulkhead is sandy/rocky, and eelgrass is documented in the subtidal shallows. The bottom drops off rapidly to very deep water within a hundred feet of the shore. Sand Lance spawning is documented about 1,100 feet to the south of the site.

The work window in this tidal reference area is July 16-February 15.

10. Effects Analysis

Describe the direct and indirect effects of the action on the proposed and listed species as well as designated and proposed critical habitat within the action area. Consider the impact to both individuals and the population. Discuss the short-term, construction-related, impacts as well as the long-term and permanent effects.

Direct Impacts:

Sediments: During pulling of piles and other existing bulkhead materials, some silts and sediments will be disturbed along the shoreline. Some sedimentation may also be caused during topsoil installation behind the bulkhead.

Sediment suspension is expected to be short-term and localized, and would not result in chronic sediment delivery to adjacent waters. The failing bulkhead is currently delivering chronic sedimentation, and the replacement bulkhead will remedy this.

Small salmonids could be temporarily displaced or stressed by increased turbidity, though the sediment containment boom is expected to effectively contain this turbidity to a small area and work will occur at low tide when fish are not present. The project will meet state water quality standards.

Noise: Construction equipment including the crane and excavator will create construction noise audible to neighbors and in-water in the action area. Work will be done in the dry at low tide, so noise will not carry in water. The chance of behavioral changes to fish is negligible since the in-water area directly adjacent to the project activities will be cordoned off with a silt boom, preventing fish from accessing the area, the work will occur in the dry, and the maximum noise level anticipated during construction is well below the disturbance thresholds for juvenile and adult salmonids.

Potential spills: Short-term risks include the potential for petroleum spills that can occur with any heavy equipment operation. The level of impact to the aquatic environment is expected to be minor because of the small amount of petroleum products available for spillage during typical construction activities, and because of spill containment measures that will be employed.

Beach nourishment gravels: Adding beach nourishment gravels will replace beach sediments that are lost over the life of the bulkhead. The bulkhead slows natural shoreline erosion processes that supply beach nourishment that can cause lowering of the beach elevation.

Indirect Impacts:

Indirect impacts are minimal, as the shoreline will remain bulkheaded after construction and the bulkhead will be properly constructed to prevent erosion of sediments behind the wall (Figure 6). .

Conversion from a timber to a rock bulkhead will improve habitat complexity by removing a vertical wall and replacement by armoring with more surface area.

11. Conservation measures:

Conservation measures are measures that would reduce or eliminate adverse impacts of the proposed activity (examples: work done during the recommended work window (to avoid times when species are most likely to be in the area), silt curtain, erosion control best management practices, percent grating on a pier to reduce shading impacts).

The project will pull the bulkhead back slightly landward up to a foot at the base and taper backwards. This will restore up to 50 feet of beach that is currently covered by the existing timber bulkhead.

Removal of angular rocks on the beach will restore about 150 square feet of beach by removal of larger angular rocks. Removal of the rocks will uncover soft beach sediments that are normal to the area.
A total of 11 creosote piles will be pulled and the associated creosote timber laggings will be removed. Creosote contains many chemicals that are toxic in the marine environment. Removal will reduce leaching of these chemicals into the marine environment over time.

Beach nourishment gravel will replenish beach substrates that slowly erode away along bulkheaded beach fronts. The beach nourishment gravels will be sized to WDFW standards and will help restore beach elevations.

The rock bulkhead will reduce the hard reflecting waves associated with vertical surfaces. The rock armoring will be a slight improvement over existing conditions.

The Puget Sound Nearshore Habitat Conservation Calculator will be used to calculate habitat mitigation to offset the impacts of the replaced bulkhead. Mitigation may include additional beach nourishment gravel placement, riparian preservation or enhancement, or mitigation options offsite if available.

Proposed work window:
The Corps of Engineers' recommended in-water work window for Tidal Reference Area 4 (Tacoma) is July 16-February 15. There is no documented forage fish spawning in the project area; therefore, no further restrictions to the work window are warranted.

Other conservation measures:
A silt fence landward of the work and a silt and sediment containment boom (floating and anchored) around the bulkhead will contain silt and sediment that may escape during demolition and construction. The barge will contain a perimeter containment sock to keep silt and debris from reentering the water.

Erosion BMPs will be used on shore during construction (e.g., covering exposed ground during construction to prevent loose soils from washing into the water during rain events).

Hazardous material containment materials such as spill absorbent pads and trained personnel will be required onsite during any phase of construction where machinery is in operation near surface waters.

The work barge will not be allowed to ground out, and care will be taken to avoid macroalgae beds when anchoring.

Work will be done in sections. One section will be equal to the length of bulkhead that can be removed, replaced, and backfilled in one day.

Existing site features, including a large tree near the bulkhead, will be protected from damage.

See Figure 5 for a full list of specifications and procedures.

The project will follow the requirements of the HPA.

12. Determination of Effect:
Provide a summary of impacts concluding with statement(s) of effect, by species. Even projects that are intended to benefit the species might have short-term adverse impacts and those must be addressed. Only the following determinations are valid for listed species or designated critical habitat:

No effect. Literally no effect. No probability of any effect. The action is determined to have 'no effect' if there are no proposed or listed salmon and no proposed or designated critical habitat in the action area or downstream from it. This effects determination is the responsibility of the action agency to make and does not require NMFS review.

May Affect, Not Likely to Adversely Affect (NLAA) – Insignificant, discountable, or beneficial effects. The effect level is determined to be 'may affect, not likely to adversely affect' if the proposed action does not have the potential to hinder attainment of relevant properly functioning indicators and has a negligible (extremely low) probability of taking proposed or listed salmon or resulting in the destruction or adverse modification of their habitat. An insignificant effect relates to the size of the impact and should never reach the scale where take occurs. A 'discountable effect' is defined as being so extremely unlikely to occur that a reasonable person cannot detect, measure, or evaluate it. This level of effect requires informal consultation, which consists of NMFS and/or USFWS concurrence with the action agency's determination.

May Affect, Likely to Adversely Affect (LAA) **This form is not appropriate for use with a project that is LAA listed species. Please see the Biological Assessment (BA) template on the Corps website: http://www.nws.usace.army.mil/PublicMenu/Menu.cfm?sitename=REG&pagename=mainpage_ESA**

Chinook Salmon – Puget Sound ESU

This project **may affect, but is not likely to adversely affect** Puget Sound Chinook because:

- Maintaining bulkheads can reduce beach habitat and cause long-term erosion of beaches.
- Work will be done during the allowable work window when juveniles are unlikely to be present.
- Work will be done in the dry as much as possible.
- Noise and turbidity will stay below thresholds for behavioral disturbance.
- Adult Chinook stay far enough offshore that there should be no impacts to adults.
- Conservation measures listed in section 11 will be used to minimize project effects.
- Minor turbidity may result from debris removal and silt curtain deployment and removal, possibly resulting in behavioral changes of any salmonids present. This turbidity would be localized, minor, and temporary.
- The project is short in duration.

The project will improve ecological conditions at the site by:

- Restoring up to 50 square feet of beach.
- Removing angular rock from about 150 square feet of beach
- Replacing the vertical timber lagging bulkhead with a tapered rock bulkhead with more surface area to reduce wave reflection that can erode beach sediments
- Placing beach nourishment materials in front of the finished bulkhead.
- Creosote-treated wood piles will be removed from the water and substrates.
- Determining mitigation by using the Puget Sound Nearshore Habitat Conservation Calculator

Chinook Salmon – Critical Habitat

The action area is within Critical habitat Unit 10. This critical habitat unit includes the following elements:

- Estuarine areas
- Nearshore marine areas
- Offshore marine areas

Spawning takes place in tributary streams of the White River Watershed and points south. Habitat suitable for spawning is not present in the action area; the area serves as a migratory corridor between the ocean and spawning areas in natal streams.

The project **may affect, but is not likely to adversely affect** designated critical habitat for Puget Sound Chinook salmon because:

- Maintaining bulkheads can reduce beach habitat and cause long-term erosion of beaches.
- Minor turbidity may result from debris removal and silt curtain deployment and removal, but this turbidity would be localized, minor, and temporary.
- Turbidity from bulkhead work will be contained by the silt curtain.
- Habitat complexity may be slightly improved by the introduction of small spaces between the bulkhead rocks.
- Conservation measures listed in section 11 will be used to minimize project effects.
- The project is short in duration.

The project will improve ecological conditions at the site by:

- Restoring up to 50 square feet of beach.
- Removing angular rock from about 150 square feet of beach
- Replacing the vertical timber lagging bulkhead with a tapered rock bulkhead with more surface area to reduce wave reflection that can erode beach sediments
- Placing beach nourishment materials in front of the finished bulkhead.
- Creosote-treated wood piles will be removed from the water and substrates.
- Determining mitigation by using the Puget Sound Nearshore Habitat Conservation Calculator.

Steelhead Trout – Puget Sound DPS

The project **may affect, but is not likely to adversely affect** steelhead trout because:

- Maintaining bulkheads can reduce beach habitat and cause long-term erosion of beaches.
- The allowable work window that protects other salmon species and bull trout also protects steelhead by allowing work only when juveniles are unlikely to be present.
- Work will be done in the dry as much as possible.
- Noise and turbidity will stay below thresholds for behavioral disturbance.
- Adult steelhead stay far enough offshore that there should be no impacts to adults.
- Conservation measures listed in section 11 will be used to minimize project effects.
- Minor turbidity may result from debris removal and silt curtain deployment and removal, possibly resulting in behavioral changes of any salmonids present. This turbidity would be localized, minor, and temporary.
- The bulkhead will remain within the original footprint and no new dry land will be created.
- The project is short in duration.

The project will improve ecological conditions at the site by:

- Restoring up to 50 square feet of beach.
- Removing angular rock from about 150 square feet of beach
- Replacing the vertical timber lagging bulkhead with a tapered rock bulkhead with more surface area to reduce wave reflection that can erode beach sediments
- Placing beach nourishment materials in front of the finished bulkhead.

- Creosote-treated wood piles will be removed from the water and substrates.
- Determining mitigation by using the Puget Sound Nearshore Habitat Conservation Calculator

Puget Sound Steelhead – Critical Habitat

Colvos Passage is within designated critical habitat for Puget Sound Steelhead marine unit 4. The primary constituent elements determined essential to the conservation of Pacific salmon and steelhead are:

1. Freshwater spawning sites with water quantity and quality conditions and substrate supporting spawning, incubation, and larval development.
2. Freshwater rearing sites with water quantity and floodplain connectivity to form and maintain physical habitat conditions and support juvenile growth and mobility; water quality and forage supporting juvenile development; and natural cover such as shade, submerged and overhanging large wood, log jams and beaver dams, aquatic vegetation, large rocks and boulders, side channels, and undercut banks.
3. Freshwater migration corridors free of obstruction with water quantity and quality conditions and natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, side channels, and undercut banks supporting juvenile and adult mobility and survival.
4. Estuarine areas free of obstruction with water quality, water quantity and salinity conditions supporting juvenile and adult physiological transitions between fresh-and saltwater; natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, and side channels, and juvenile and adult forage, including aquatic invertebrates and fishes, supporting growth and maturation.
5. Nearshore marine areas free of obstruction with water quality and quantity conditions and forage, including aquatic invertebrates and fishes, supporting growth and maturation; and natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, and side channels.
6. Offshore marine areas with water quality conditions and forage, including aquatic invertebrates and fishes, supporting growth and maturation.

The Action Area provides PCEs 4 (estuarine areas), and 5 (nearshore marine areas), and PCE 6 (offshore marine areas) is present nearby. The Puget Sound is considered both marine and estuarine, as salinity increases from south to north, and the inland sea provides a gentle transition from freshwater to saltwater.

The project **may affect, but is not likely to adversely affect** designated critical habitat for Puget Sound Chinook steelhead because:

- Minor turbidity may result from debris removal and silt curtain deployment and removal, but this turbidity would be localized, minor, and temporary.
- Turbidity from bulkhead work will be contained by the silt curtain.
- Habitat complexity may be slightly improved by the introduction of small spaces between the bulkhead rocks.
- Conservation measures listed in section 11 will be used to minimize project effects.
- The project is short in duration.

The project will improve ecological conditions at the site by:

- Restoring up to 50 square feet of beach.

- Removing angular rock from about 150 square feet of beach
- Replacing the vertical timber lagging bulkhead with a tapered rock bulkhead with more surface area to reduce wave reflection that can erode beach sediments
- Placing beach nourishment materials in front of the finished bulkhead.
- Creosote-treated wood piles will be removed from the water and substrates.
- Determining mitigation by using the Puget Sound Nearshore Habitat Conservation Calculator

Bull Trout – Coastal/Puget Sound IRU

The project **may affect, but is not likely to adversely affect** bull trout because:

- Maintaining bulkheads can reduce beach habitat and cause long-term erosion of beaches.
- Work will be done within the work window that protects bull trout by allowing work only when juveniles are unlikely to be present.
- Work will be done in the dry as much as possible.
- Noise and turbidity will stay below thresholds for behavioral disturbance.
- Adult bull trout stay far enough offshore that there should be no impacts to adults.
- Conservation measures listed in section 11 will be used to minimize project effects.
- Minor turbidity may result from debris removal and silt curtain deployment and removal, possibly resulting in behavioral changes of any salmonids present. This turbidity would be localized, minor, and temporary.
- The project is short in duration.

The project will improve ecological conditions at the site by:

- Restoring up to 50 square feet of beach.
- Removing angular rock from about 150 square feet of beach
- Replacing the vertical timber lagging bulkhead with a tapered rock bulkhead with more surface area to reduce wave reflection that can erode beach sediments
- Placing beach nourishment materials in front of the finished bulkhead.
- Creosote-treated wood piles will be removed from the water and substrates.

Bull Trout – Coastal/Puget Sound Critical Habitat

Bull trout's designated critical habitat (unit 2) is present in the action area. Bull trout habitat includes the following elements:

- Springs, seeps and groundwater flows
- Migratory habitat
- Abundant food base
- Habitat complexity
- Temperature range of 36 to 59° F
- Substrates suitable for spawning
- Natural hydrograph or appropriate flow control
- Sufficient water quality and quantity
- Few nonnative predators

Water temperatures are slowly rising in the Puget Sound, but this shoreline reach is less affected by industrial activity. There is good macroalgae coverage in the intertidal zone. Water

temperatures will not be affected by the project. Migratory habitat, food base, natural hydrograph, water quality and quantity, substrate materials, and presence or absence of non-native predators will not be affected by the project.

The project **may affect, but is not likely to adversely affect** designated critical habitat for Puget Sound bull trout because:

- Minor turbidity may result from debris removal and silt curtain deployment and removal, but this turbidity would be localized, minor, and temporary.
- Turbidity from bulkhead work will be contained by the silt curtain.
- Habitat complexity may be slightly improved by the introduction of small spaces between the bulkhead rocks.
- Conservation measures listed in section 11 will be used to minimize project effects.
- The project is short in duration.

The project will improve ecological conditions at the site by:

- Restoring up to 50 square feet of beach.
- Removing angular rock from about 150 square feet of beach
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- Placing beach nourishment materials in front of the finished bulkhead.
- Creosote-treated wood piles will be removed from the water and substrates.

Southern Resident Killer Whale

Southern resident killer whales may be found in Puget Sound during the summer months. They are more likely to be found in the deeper waters of the shipping lanes east of Vashon Island than in Colvos Passage; however, they are sighted in the Passage several times every summer. None have been sighted yet in 2022; however, a humpback whale was seen in June. The Action Area encompasses a very small area of the shoreline. Whales are rarely found in water less than 20 feet deep. The project will take place as soon as permitted, and may happen during early autumn while whales are still relatively common, but project effects are very localized. Project activities will not reach the disturbance threshold for cetaceans. In addition, noise is expected to short in duration. Effects to their salmonid prey species are minimal and discountable. Therefore, it is determined that this project will have **no effect** on Southern Resident killer whales.

Critical Habitat

The Action Area lies within Critical Habitat Area 2: Puget Sound. Critical habitat includes waters deeper than 20 feet MLLW (71 Fed. Reg. 69054).

The primary constituent elements essential for conservation of the Southern Resident killer whale are:

(1) Water quality to support growth and development;
(2) Prey species of sufficient quantity, quality, and availability to support individual growth, reproduction, and development, as well as overall population growth; and
(3) Passage conditions to allow for migration, resting, and foraging.

Noise will not reach the disturbance threshold for cetaceans within the action area. Project activities will not have any significant effect on their prey. This project will have **no effect** on designated critical habitat for Southern Resident killer whales.

Humpback Whale

Humpback whale sightings in Puget Sound were extremely rare in the late 1900s. Only three sightings were confirmed to be humpback whales (Falcone *et al.* 2005). The humpback whale population was decimated by whaling, but one of the reasons attributed to its slow recovery is the overfishing of herring, the humpbacks' favored prey in this area (Falcone *et al.* 2005). Humpback whales have been sighted in Puget Sound almost annually in the most recent decade, usually near the southern tip of Vashon Island where there is a large herring holding area (Seattle Times 2008, WDFW 2010). A humpback whale was sighted in Colvos Passage in June 2022 (Orca Network 2022).

Adult humpback whales are 40 to 50 feet long and weigh up to 40 tons (ACS 2010); they cannot access water as shallow as that found in the action area. Project noise will not reach the behavioral effects threshold for cetaceans. This project will have **no effect** on humpback whales.

Marbled Murrelet

Marbled murrelets nest in the old-growth forests, including those on the Olympic Peninsula and in the northern Cascades, and forage in the Puget Sound. The birds may fly 60 miles between their feeding and nesting grounds (71 Fed. Reg. 53837). Marbled murrelets feed by diving for fish in open water up to 30 meters (98 feet) deep. The Action Area lies on a relatively narrow passage between Vashon Island and the mainland, and the water depth drops off rapidly to 350 feet; however, suitable habitat exists for foraging and murrelets may dive in the Action Area. Human activity will be confined to a short distance from the shoreline. Noise will not reach the disturbance threshold for marbled murrelets. This project will have **no effect** on marbled murrelets.

Critical Habitat

Designated critical habitat for marbled murrelets exists on the Olympic Peninsula and in the Northern Cascades, approximately 50 miles east and west of the project site, respectively (61 Fed. Reg. 26256). The Action Area is not within designated critical habitat for marbled murrelets. This project will have **no effect** on designated critical habitat for marbled murrelets.

Bocaccio, Yelloweye Rockfish, and Canary Rockfish

On April 20, 2011, the following were listed by NMFS (76 Fed. Reg. 20558).

Boccaccio	*Sebastes paucispinus*	Endangered
Yelloweye rockfish	*S. ruberrimus*	Threatened
Canary rockfish	*S. pinniger*	Threatened

Canary rockfish were delisted in 2019.

Rockfish are deep-water fish and rarely use waters shallower than 80 feet (74 Fed. Reg. 18516). They also require habitat complexity, especially refugia in the form of overhanging rock that is absent on the stretch of shoreline where the project is located. Adult rockfish may be in the deep waters of Colvos Passage, but project effects will not reach that far. Because there is no suitable habitat within the Action Area for the proposed rockfish species, and because project activities will not damage planktonic larvae, it is determined this project will have **no effect** on bocaccio and yelloweye rockfish.

Species and Critical Habitat Effects Determination Summary

Species	Common Name	Effect Determination	Critical Habitat Effect Determination
Oncorhynchus tshawytscha	Puget Sound Chinook salmon	NLAA*	No Effect

Species	Common Name	Effect Determination	Critical Habitat Effect Determination
O. mykiss	Puget Sound steelhead	NLAA	Not Designated
Salvelinus confluentus	Bull trout	NLAA	No Effect
Eumetopias jubatus	Steller sea lion	No Effect	No Effect
Orcinus orca	Southern resident killer whale	No Effect	No Effect
Megaptera novaeangliae	Humpback whale	No Effect	Not designated
Brachyramphus marmoratus	Marbled murrelet	No Effect	No Effect
Sebastes paucispinus	Bocaccio	No Effect	N/A
S. ruberrimus	Yelloweye rockfish	No Effect	N/A

* NLAA=May Affect, Not Likely to Adversely Affect

13. EFH Analysis

Essential Fish Habitat (EFH) is broadly defined by the Act (now called the Magnuson-Stevens Act or the Sustainable Fisheries Act) to include "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity". This language is interpreted or described in the 1997 Interim Final Rule [62 Fed. Reg. 66551, Section 600.10 Definitions] -- Waters include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include historic areas if appropriate; substrate includes sediment, hard bottom, structures underlying the waters, and associated biological communities; necessary means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem; and "spawning, breeding, feeding, or growth to maturity" covers a species' full life cycle.

Additional guidance for EFH analyses can be found at the NOAA Fisheries web site under the Sustainable Fisheries Division.

A. Description of the Proposed Action (may refer to BA project description)

See Section 5 of the biological evaluation.

B. Addresses EFH for Appropriate Fisheries Management Plans (FMP)

Pacific Fisheries Management Council (PFMC). 1998a. The Coastal pelagic Species Fishery Management Plan: Amendment 8.

PFMC. 1998b. Final Environmental Assessment/Regulatory Review for Amendment 11 to the Pacific Coast Groundfish Fishery Management Plan.

PFMC. 1999. Amendment 14 to the Pacific Coast salmon plan, Appendix A. Identification and description of Essential Fish Habitat, adverse impacts, and recommended conservation measures for salmon. Available: http://www.psfmc.org/efh.html

C. Effects of the Proposed Action

Project effects include construction noise and minor turbidity. The maximum expected noise (81 dBA) is below the behavioral disturbance effects thresholds for listed salmonids, and work will be done in the dry at low tide.

ii. Effects on Managed Species (unless effects to an individual species are unique, it is not necessary to discuss adverse effects on a species-by species basis)

Groundfish

Groundfish include several species of rockfish, flatfish, roundfish, sharks, skates, and ratfish. Rockfish generally prefer deeper water than that of the project area. Flatfish such as halibut and flounder could be present during project activities, but they will probably be excluded by the silt curtain.

Coastal Pelagic Species

Managed coastal pelagic species include northern anchovy, Jack mackerel, Pacific sardine, Pacific (chub) mackerel, and market squid. Anchovy, mackerel, and sardines could be found in Puget Sound. Project noise will not reach the behavioral disturbance threshold for listed salmonid species. Turbidity will be minor and localized to a very small area, and fish will be excluded by the silt curtain. Project effects to these fish are so minor and avoidable as to be negligible. Creosote-treated boards and piles will be removed, and habitat complexity may be slightly improved by the small spaces between the bulkhead rocks.

Salmon Species

Managed salmon species include Chinook, coho, and pink salmon. . Effects to salmon species are minor and discountable, and described in detail in the BE Section 12. Creosote-treated boards and piles will be removed, and habitat complexity may be slightly improved by the small spaces between the bulkhead rocks.

iii. Effects on Associated Species, Including Prey Species

Forage fish in the area include herring, sand lance, and surf smelt. The nearest documented surf smelt spawning beach is about a mile south of the project site (WDFW 2022).

iv. Cumulative Effects

This project will not contribute to existing stressors on managed fish populations.

D. Proposed Conservation Measures

Conservation measures are outlined in Section 14 of the Biological Evaluation.

E. Conclusions by EFH (taking into account proposed conservation measures)

Due to the minimal size of the project footprint and conservation measures used, the effects of the project to EFH will be negligible and no adverse effects to EFH are expected.

14. References:

Include any studies or papers that support statements made in this form (example: reference the source for the listed species that are covered).

American Cetacean Society (ACS). 2010. Fact Sheet: Humpback Whale. Queried online: http://69.5.22.59/factpack/humpback.htm, February 8, 2010.

Berge, H.B. and B.V. Mavros. 2001. King County Bull Trout Program: 2000 Bull Trout Surveys. Prepared for King County Department of Natural Resources, Water and Land Resources Division. Seattle, Washington.

Washington Department of Ecology (Ecology). Coastal Atlas interactive mapper. https://apps.ecology.wa.gov/coastalatlas/tools/Map.aspx Queried Feb. 1, 2022.

Washington Department of Ecology (Ecology). 2022. 2018 EPA-Approved 303(d) Water Quality Assessment. Olympia, WA.

Falcone, E., J. Calambokidis, G. Steiger, M. Malleson, J. Ford. 2005. Humpback whales in the Puget Sound/Georgia Strait Region. Prepared for Cascadia Research. Olympia, Washington.

Fishermap.org. https://usa.fishermap.org/depth-map/puget-sound-wa/ Interactive bathymetry mapper for Puget Sound. Accessed July 27, 2022.

Jeffries, S.J., P.J. Gearin, H.R. Huber, D.L. Saul and D.A. Pruett. 2000. Atlas of Seal and Sea Lion Haulouts in Washington. Prepared for Washington Dept. of Fish and Wildlife. February 2000.

King County. 2005. Green/Duwamish and Central Puget Sound Watershed Salmon Habitat Plan—August 2005

National Marine Fisheries Service (NMFS). 2006. Status Review of West Coast Steelhead from Washington, Idaho, Oregon, and California. Technical Memorandum NMFS/NWFSC 27. August 2006.

Pacific Fisheries Management Council (PFMC). 1998a. The Coastal pelagic Species Fishery Management Plan: Amendment 8.

PFMC. 1998b. Final Environmental Assessment/Regulatory Review for Amendment 11 to the Pacific Coast Groundfish Fishery Management Plan.

PFMC. 1999. Amendment 14 to the Pacific Coast salmon plan, Appendix A. Identification and description of Essential Fish Habitat, adverse impacts, and recommended conservation measures for salmon. Available: http://www.psfmc.org/efh.html

Seattle Times. May 29, 2008. Humpback Whale Visiting Puget Sound. Associated Press.

Southard, S.L., R.M. Thom, G.D. Williams, J.D. Toft, C.W. May, G.A. McMichael, J.A. Vucelick, J.T. Newell, J.A. Southard. 2006. Impacts of Ferry Terminals on Juvenile Salmon Movement along Puget Sound Shorelines. Prepared by Battelle Memorial Laboratory for Washington State Department of Transportation. WSDOT Report No. WA-RD 648.1. Seattle, WA.

U.S. Fish and Wildlife Service. 1997. Recovery Plan for the Threatened Marbled Murrelet (*Brachyramphus marmoratus*) in Washington, Oregon, and California. Portland, Oregon. 203 pp.

Washington Department of Fish and Wildlife (WDFW). 2022a. Forage fish information web page. http://wdfw.wa.gov/fish/forage/forage.htm

WDFW. 2022b. Priority Habitats and Species Interactive Maps. http://apps.wdfw.wa.gov/phsontheweb/.

WDFW. 2022c. Marbled Murrelet information page. https://wdfw.wa.gov/species-habitats/species/brachyramphus-marmoratus#desc-range. Accessed July 27. 2022.

Washington Department of Natural Resources Interactive Eelgrass Mapper. https://wadnr.maps.arcgis.com/apps/webappviewer/index.html Queried Feb. 1, 2022.

Washington State Department of Transportation (WSDOT). 2020. Advanced Training Manual for Preparing Biological Assessments. January 2020. Olympia, WA.

15. Appendices:
As needed include mitigation, revegetation plans, monitoring plans, results of studies, water quality information, etc.

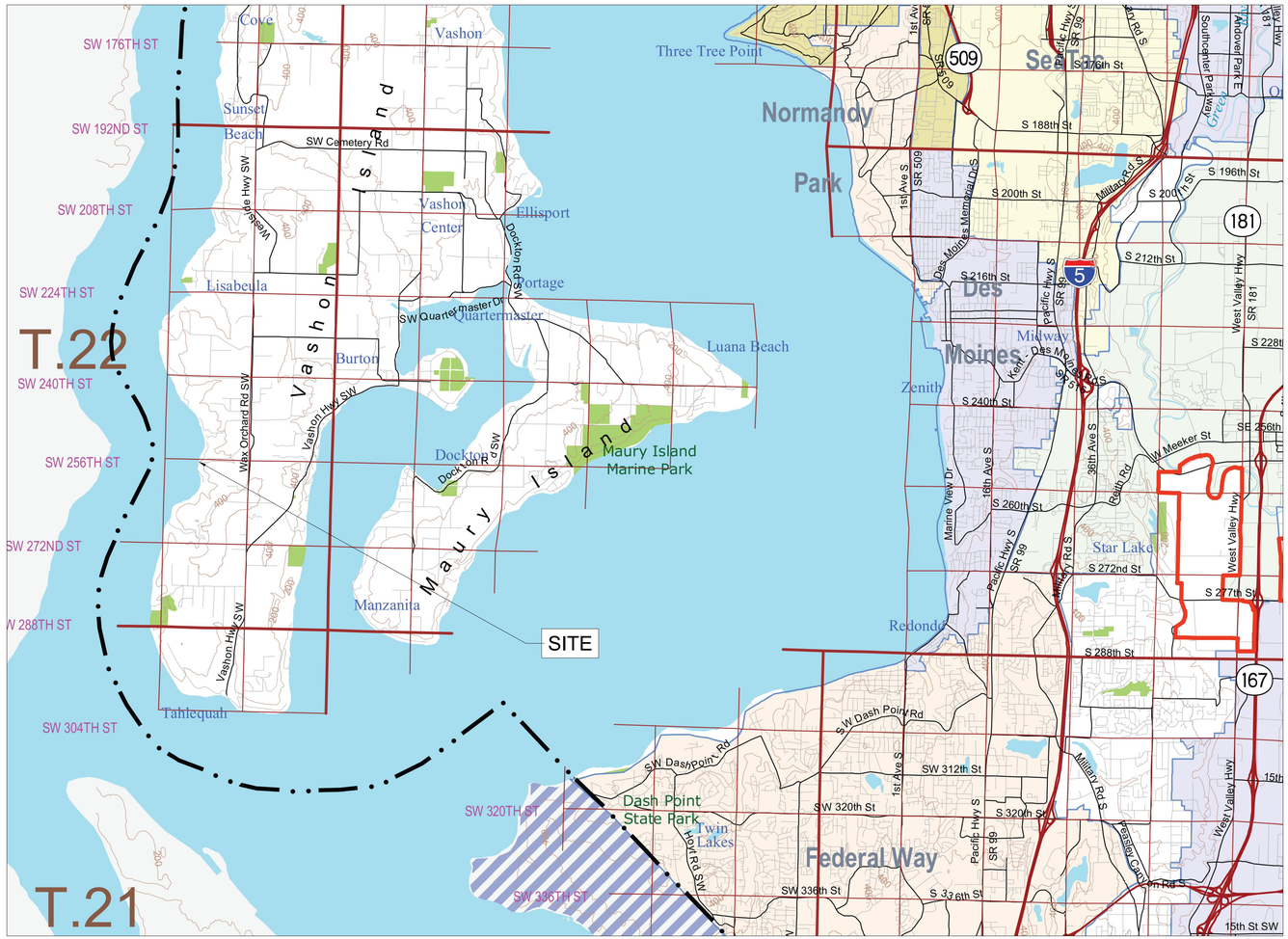
Attachment A

Project Drawings

GENTRY SMITH EMERGENCY BULKHEAD REPLACEMENT

KING COUNTY, WASHINGTON

SECTION 26, TOWNSHIP 22 NORTH, RANGE 02 EAST



VICINITY MAP

NOT TO SCALE

SITE ADDRESS

HOUSE #4:
25630 BATES WALK SW
VASHON, WASHINGTON 98070
PARCEL NOS. 262202-9030, 262202-9062
& 262202-TRCT

OWNER / DEVELOPER

MARIAH GENTRY & BRENNEN SMITH
25630 BATES WALK SW
VASHON, WASHINGTON 98070

CONTRACTOR

T.B.D.

CIVIL ENGINEER

ELLISPORT ENGINEERING, INC
20501 81ST AVENUE SW
VASHON, WA 98070
(206) 463-5311

BENCHMARK AND DATUM

DATUM IS ASSUMED:
TOPOGRAPHIC AND BOUNDARY INFORMATION IS BASED ON INFORMATION PROVIDED BY KING COUNTY GIS. THE TOPOGRAPHY WAS GENERALLY CONFIRMED IN THE FIELD. CONTENT PROVIDED HEREIN MAY BE DEEMED RELIABLE BUT IS NOT GUARANTEED. THIS IS NOT A SURVEY.
VALUES FOR OHW AND HTL ARE RELATIVE TO A DATUM OF MLLW = 0.

LEGAL DESCRIPTIONS

PARCEL NO. 262202-9030:
POR GL 1 BEG AT NE COR OF S 100 FT OF N 300 FT OF SD GL TH W ALG N LN THOF 520.65 FT TH S 13-00-00 W 10 FT TH S 66-30-00 W 12.20 FT TH S 13-00-00 W 38.70 FT TH N 77-00-00 W 25 FT M/L TO MDR LN OF PUGET SOUND TH SLY ALG SD MDR LN 10 FT M/L TO PT ON LN PLW & 10 FT SWLY OF ABOVE DESCR LN RNG N 77-00-00 W & TPOB TH S 77-00-00 E TO NXN WITH S LN OF N 300 FT OF GL 1 TH W ALG SD S LN TO GOV MDR LN TH NELY ALG SD MDR LN TO TPOB & UND 1/2 INT IN 2ND CL TD LDS ADJ TGW 2ND CL TD LDS ADJ FOLG - POR GL 1 DAF - BAAP ON E BDRY LN SD GL 1 200 FT S OF NE COR THOF TH W AT RIGHT ANGLES 520.65 FT TH S 13-00-00 W 10 FT TH S 66-30-00 W 12.20 FT TH S 13-00-00 W 38.70 FT TH N 77-00-00 W 25 FT M/L TO MDR LN PUGET SOUND TH SLY ALG MDR LN 10 FT M/L TO LN PLW & 10 FT SLY OF COURSE DESC AS BEARING N 77-00-00 W TH S 77-00-00 E TO NXN WITH LN AT RT ANGLES TO E LN SD LOT 1 FROM A PT 300 FT S OF NE COR SD LOT TH E ALG SD LN TO E LN SD LOT TH N 100 FT TO POB

PARCEL NO. 262202-9062:
POR OF GL 1 BEG AT PT ON E LN GL 1 DIST 200 FT S OF NE COR TH W AT R/A 520.65 FT TH S 13-00-00 W 10 FT TH S 66-30-00 W 12.20 FT TH S 13-00-00 W 38.70 FT TH N 77-00-00 W 25 FT M/L TO MDR LN OF PUGET SOUND TH SLY ALG SD MDR LN 10 FT M/L TO PT CALLED A & TO PT ON LN PLW & 10 FT SWLY OF THE ABOVE DESC COURSE OF N 77-00-00 W TH S 77-00-00 E TO NXN WITH LN DRN AT R/A TO E LN OF GL 1 FRM PT 300 FT S OF NE COR OF SD GL TH E ALG SD PLL LN TO E LN OF GL 1 TH N ALG E LN 100 FT TO POB & 2ND CL TD LDS ADJ & UND 1/2 INT IN 2ND CL TD LDS ADJ FOLG POR MEAS ALG MDR LN BEG AT ABOVE DESC PT A & RNG TH SWLY ALG MDR LN TO NXN WITH S LN OF N 300 FT OF GL 1

CONTRACTOR NOTE

ALL EXISTING UTILITIES SHOWN ON PLANS ARE TO BE VERIFIED HORIZONTALLY AND VERTICALLY PRIOR TO ANY CONSTRUCTION. ALL EXISTING FEATURES INCLUDING BURIED UTILITIES ARE SHOWN AS INDICATED ON RECORD MAPS AND SURVEY FURNISHED BY OTHERS. WE ASSUME NO LIABILITY FOR THE ACCURACY OF THOSE RECORDS AND SURVEY, FOR THE FINAL LOCATION OF EXISTING UTILITIES IN AREAS CRITICAL TO CONSTRUCTION CONTACT THE UTILITY OWNER/AGENCY.

SHEET INDEX

VICINITY PLAN & PROJECT INFORMATION	C1
SITE PLAN	C2
SITE PLAN - BENCHMARKS	C2.1
PROPOSED PLAN & SECTION	C3
DETAIL & GENERAL NOTES	C4

PRIVATE IMPROVEMENTS

_____
DEVELOPMENT ENGINEER DATE

KING COUNTY ORDINANCE NUMBER(S) _____

THESE ACTIONS MUST BE COMPLETED PRIOR TO BEGINNING CONSTRUCTION:

1. CONTACT THE APPLICANT'S RETAINED ENGINEER TO COORDINATE REQUIRED INSPECTIONS.

2. APPOINT A TRAINED ESC LEAD WHO SHALL BE PROVIDED A COPY OF THE ESC PLAN & INSPECTION SCHEDULE.

3. CONTACT _____, THE AREA INSPECTOR, AT ___-___-____, TO COORDINATE THE PRECONSTRUCTION MEETING AND COUNTY INSPECTIONS.

FAILURE TO OBTAIN REQUIRED INSPECTIONS MAY ENDANGER OR DELAY PROJECT APPROVAL.

ALL WORK IN THE PUBLIC RIGHT-OF-WAY REQUIRES A PERMIT FROM THE KING COUNTY PUBLIC WORKS DEPARTMENT.

General Notes

No.	Revision/Issue	Date
		2.10.22
		1.28.22

Firm Name and Address

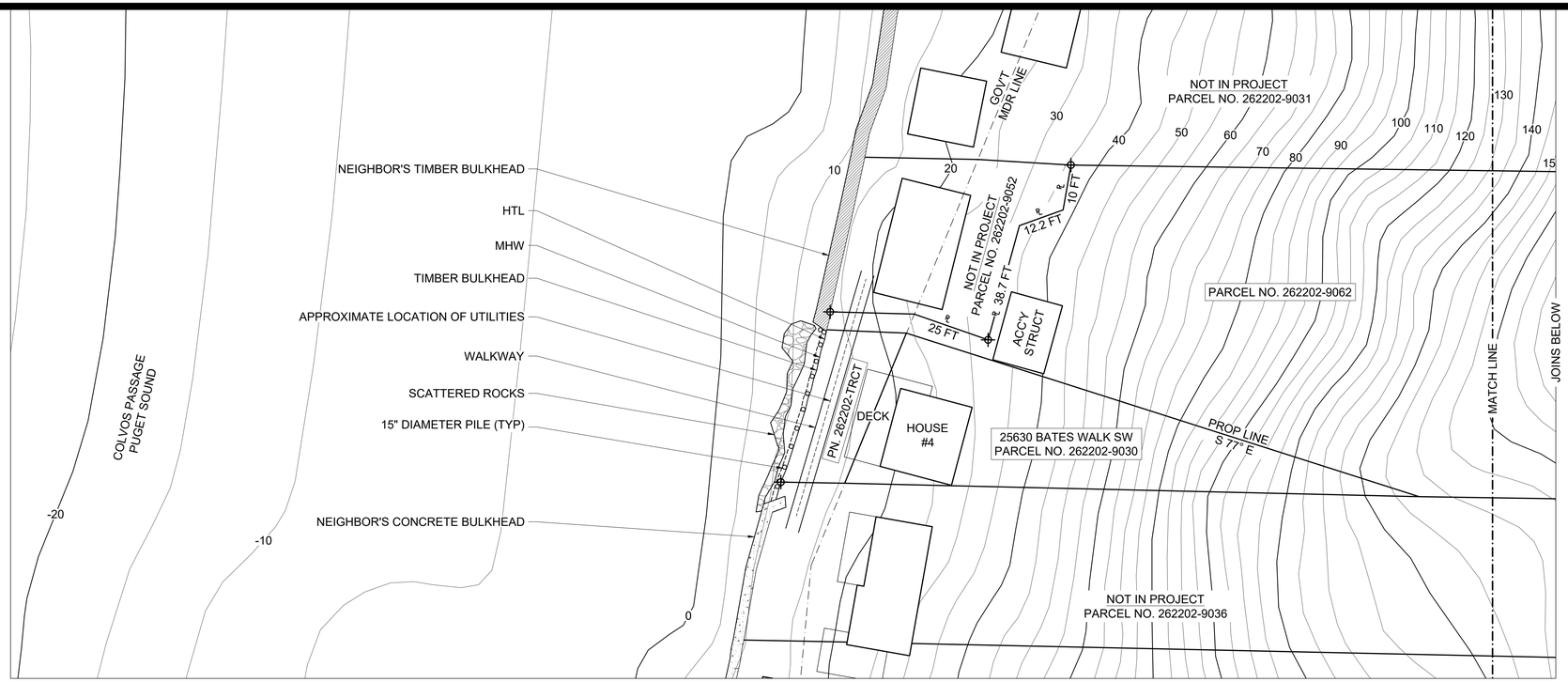
ELLISPORT ENGINEERING, INC.
20501 81st Ave SW
Vashon, WA 98070
206.463.5311 - phone
206.463.2578 - fax

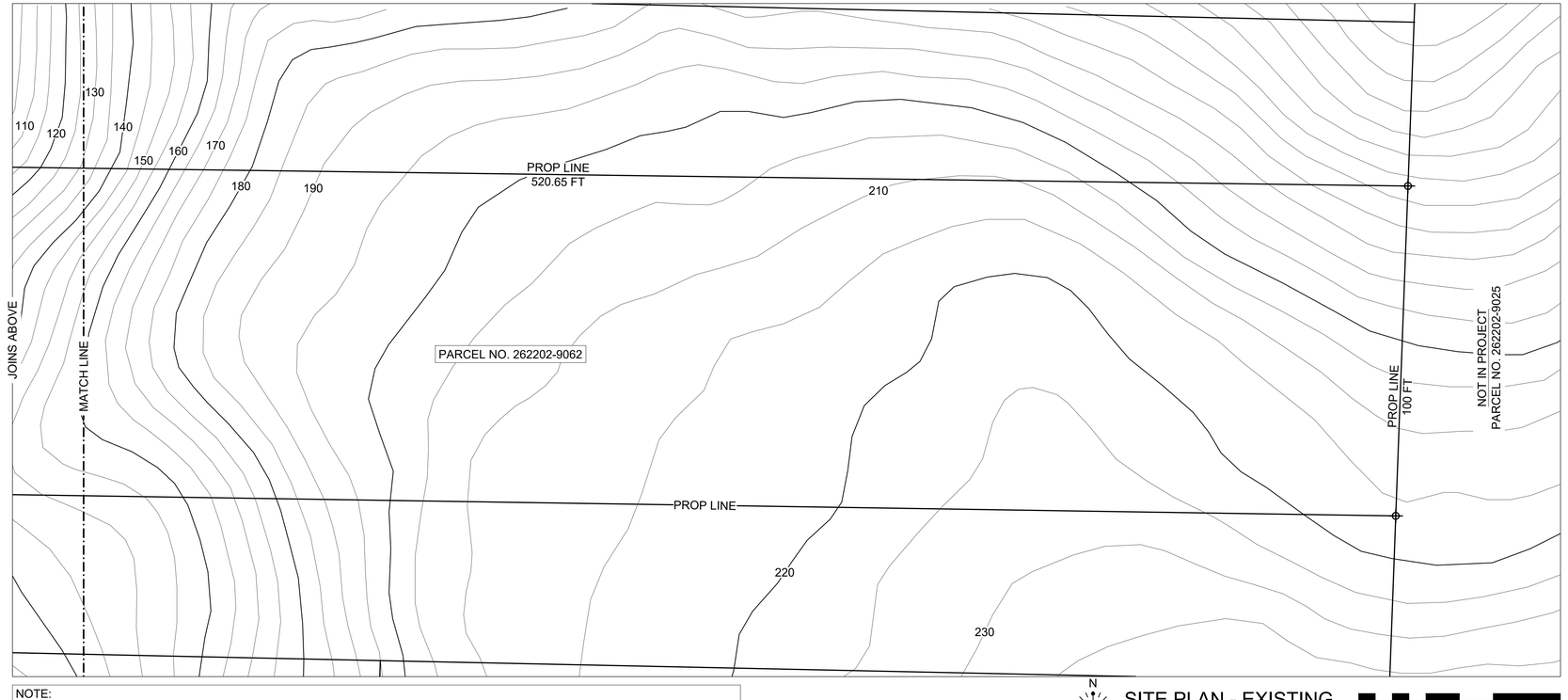
STEPHEN T. KICINSKI — STATE OF WASHINGTON — 25752 — REGISTERED PROFESSIONAL ENGINEER
Stephen T. Kicinski
12/28/21

Project Name and Address

GENTRY SMITH BULKHEAD
25630 Bates Walk SW
Vashon, Washington 98070

Project	GENTRY SMITH
Date	28 DEC 2021
Drafter	DSD
Engineer	STK
Sheet	C1





NOTE:
SITE PLAN HAS BEEN ESTABLISHED THROUGH KING COUNTY GIS INFORMATION AND QUARTER SECTION MAP qs_NW262202, BUT DOES NOT CONSTITUTE A LEGAL SURVEY AND SHOULD BE CONSIDERED APPROXIMATE ONLY.

N

SITE PLAN - EXISTING

1" = 20'-0"

0' 20' 40' 60'

General Notes

No.	Revision/Issue	Date
		2.10.22
		1.28.22

Firm Name and Address

ELLISPORT ENGINEERING, INC.
20501 81st Ave SW
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206.463.5311 - phone
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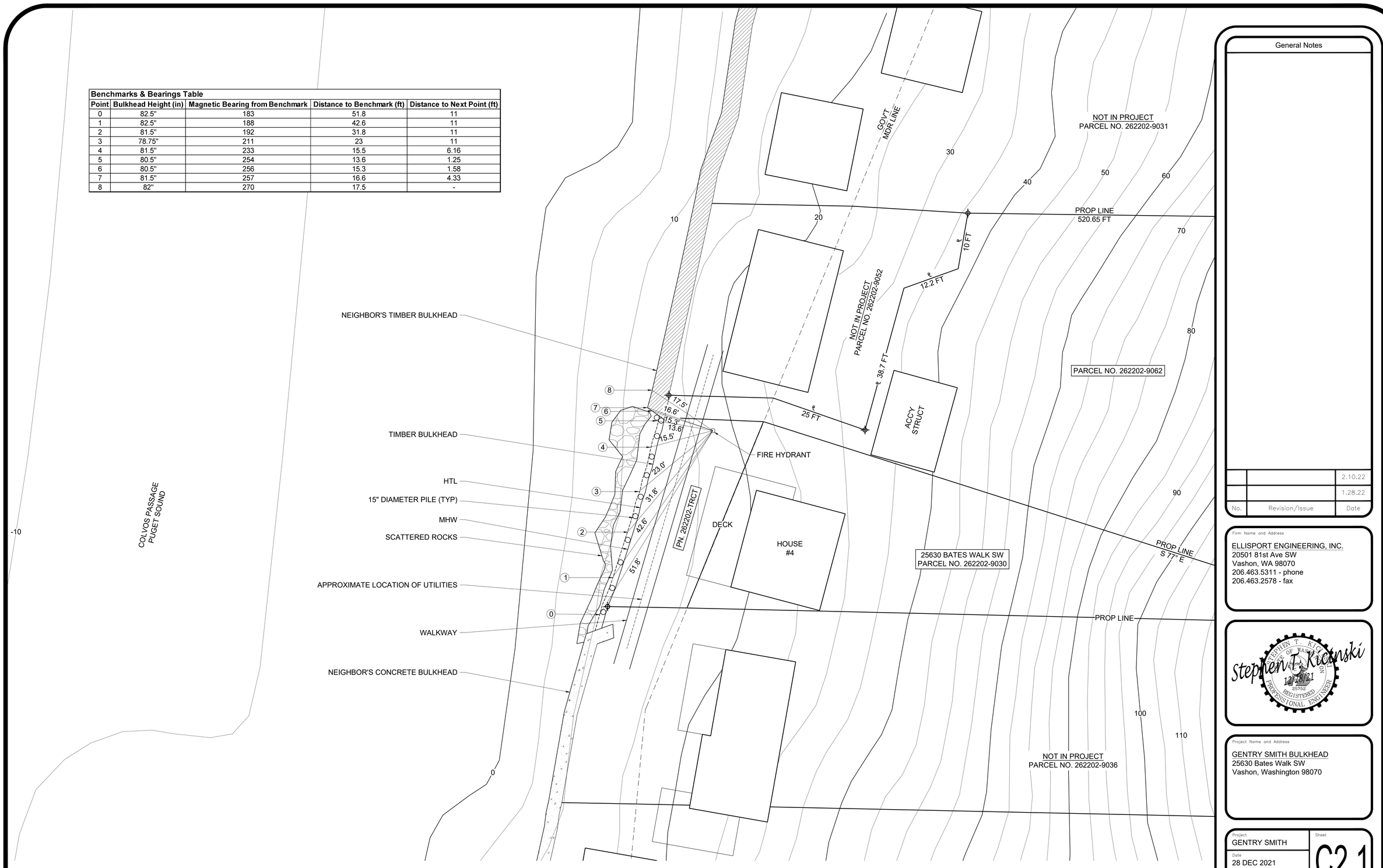
STATE OF WASHINGTON
STEPHEN T. KICINSKI
35752
REGISTERED
PROFESSIONAL ENGINEER
12/28/21

Project Name and Address

GENTRY SMITH BULKHEAD
25630 Bates Walk SW
Vashon, Washington 98070

Project	Sheet
GENTRY SMITH	C2
Date: 28 DEC 2021	
Drafter: DSD / Engineer: STK	

Benchmarks & Bearings Table				
Point	Bulkhead Height (in)	Magnetic Bearing from Benchmark	Distance to Benchmark (ft)	Distance to Next Point (ft)
0	82.5"	183	51.8	11
1	82.5"	188	42.6	11
2	81.5"	192	31.8	11
3	78.75"	211	23	11
4	81.5"	233	15.5	6.16
5	80.5"	254	13.6	1.25
6	80.5"	256	15.3	1.58
7	81.5"	257	16.6	4.33
8	82"	270	17.5	-



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N

SITE PLAN - EXISTING - BENCHMARKS

1" = 10'-0"

0' 10' 20' 30'

General Notes

No.	Revision/Issue	Date
		2.10.22
		1.28.22

Firm Name and Address

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STATE OF WASHINGTON
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12/28/21

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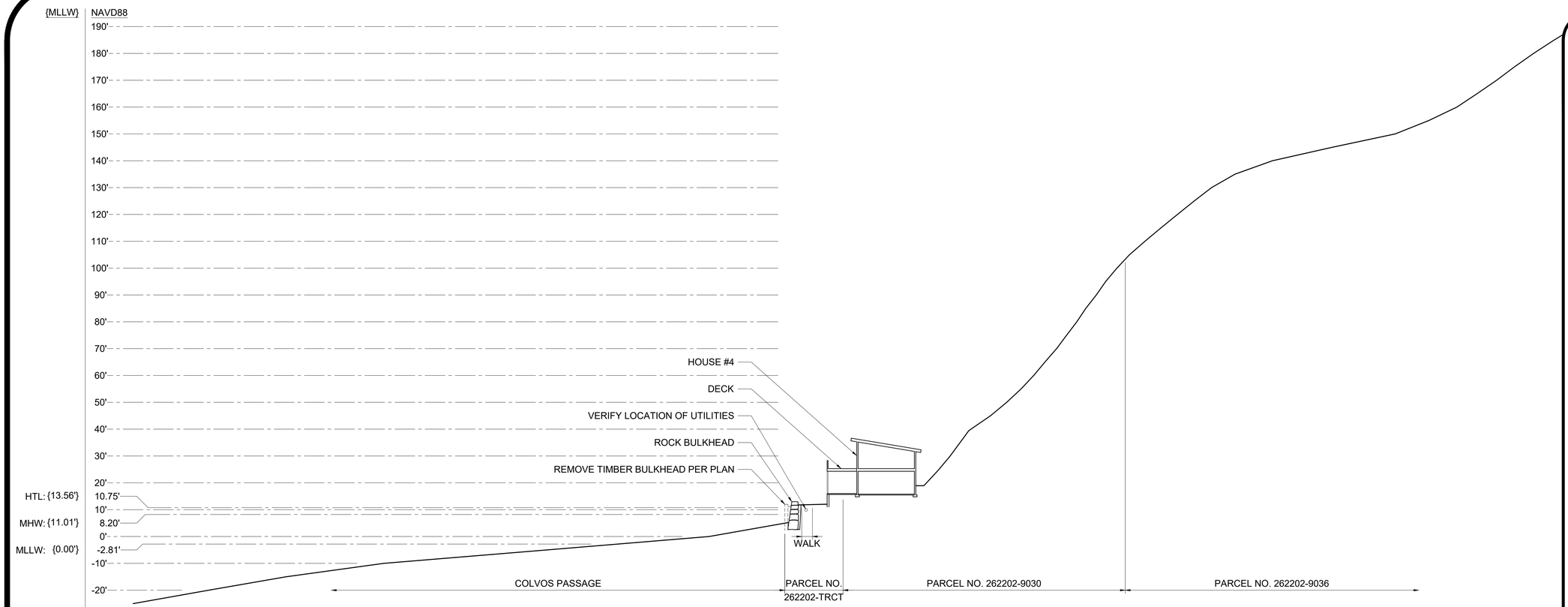
25630 Bates Walk SW
Vashon, Washington 98070

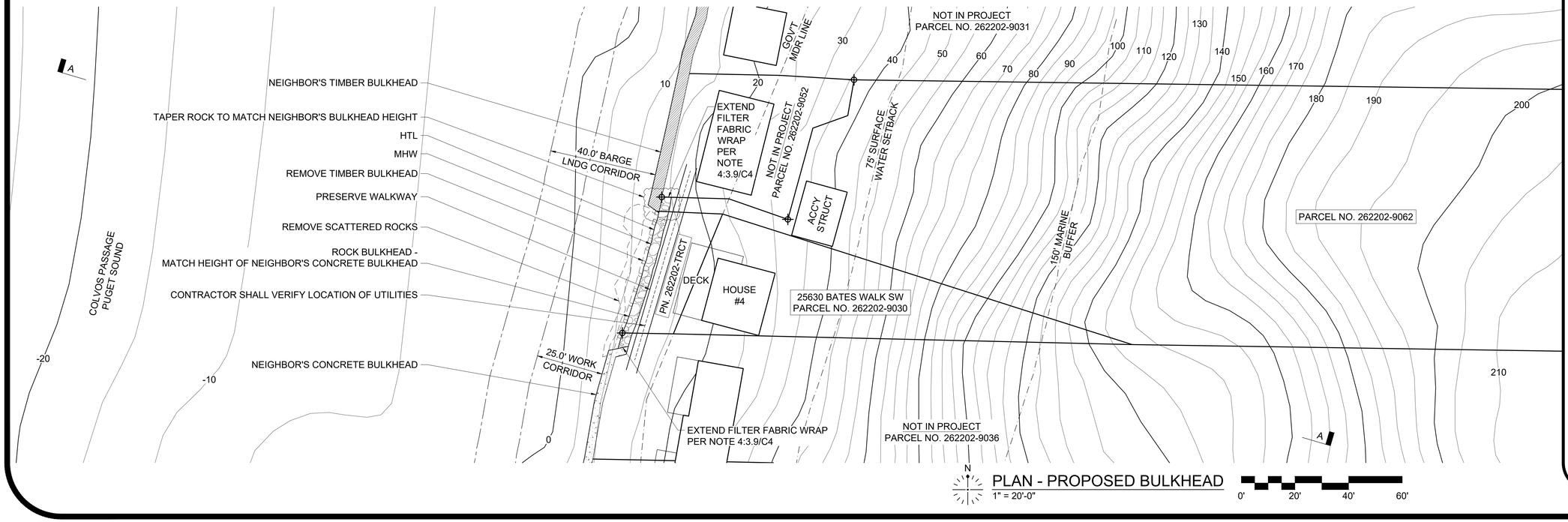
Project	Sheet
GENTRY SMITH	C2.1
Date: 28 DEC 2021	
Drafter: DSD	Engineer: STK



SECTION - PROPOSED BULKHEAD

1" = 20'-0"

0' 20' 40' 60'



PLAN - PROPOSED BULKHEAD

1" = 20'-0"

0' 20' 40' 60'

General Notes

No.	Revision/Issue	Date
		2.10.22
		1.28.22

Firm Name and Address

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STEPHEN T. KICINSKI — STATE OF WASHINGTON — 25752 — REGISTERED PROFESSIONAL ENGINEER

Stephen T. Kicinski 12/28/21

Project Name and Address

GENTRY SMITH BULKHEAD
25630 Bates Walk SW
Vashon, Washington 98070

Project	Sheet
GENTRY SMITH	C3
Date: 28 DEC 2021	
Drafter: DSD / Engineer: STK	

PART 1: GENERAL

1. THE CONTRACTOR SHALL OBTAIN AND CONFORM TO ALL LOCAL AND STATE PERMITS REQUIRED TO COMPLETE THE WORK. IF PERMIT REQUIREMENTS CONFLICT WITH THESE PLANS, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE OWNER AND ENGINEER OF RECORD OF ANY CONFLICTS, SO THAT MODIFICATIONS TO THE PLANS CAN BE PROVIDED, AS APPROPRIATE.

2. WORK SHALL INCLUDE FURNISHING ALL MATERIALS, LABOR, EQUIPMENT, AND SUPERVISION FOR CONSTRUCTION OF THE ROCK BULKHEAD IN ACCORDANCE WITH THESE PLANS AND SPECIFICATIONS, AND IN GENERAL CONFORMANCE WITH THE LINES, GRADES, DESIGN, AND DIMENSIONS SHOWN ON THE DRAWINGS OR AS ESTABLISHED BY THE OWNER OR THE OWNERS' REPRESENTATIVE.

3. THE CONTRACTOR SHALL CONTACT THE ONE-CALL UNDERGROUND UTILITY LOCATION SERVICE AT 1-800-424-5555 TO HAVE ANY AND ALL UTILITIES LOCATED AT LEAST 2 FULL BUSINESS DAYS PRIOR TO BEGINNING SITE EXCAVATION.

4. ALL MATERIALS AND WORKMANSHIP SHALL CONFORM TO THE CONTRACT DOCUMENTS, NOTES AND THE INTERNATIONAL BUILDING CODE.

5. DURING CONSTRUCTION THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFETY AND STABILITY OF THE ADJACENT PROPERTIES AND DOWNGRADE AREAS.

6. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION PROCEDURES INCLUDING EXCAVATION OF EXCESS SOIL, PROTECTION OF ADJACENT PROPERTY, STRUCTURES, STREETS, AND UTILITIES IN ACCORDANCE WITH ALL APPLICABLE NATIONAL, STATE AND LOCAL SAFETY REGULATIONS.

7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING THE WORK OF ALL TRADES, AND SHALL CHECK AND VERIFY ALL DIMENSIONS. ALL DISCREPANCIES SHALL BE CALLED TO THE ATTENTION OF THE ENGINEER *IN WRITING* AND SHALL BE RESOLVED BEFORE PROCEEDING WITH THE WORK.

8. THE DRAWINGS INDICATE THE TYPICAL DETAILS OF CONSTRUCTION. WHERE CONDITIONS ARE NOT SPECIFICALLY INDICATED, BUT ARE OF SIMILAR CHARACTER TO DETAILS SHOWN, SIMILAR DETAILS OF CONSTRUCTION SHALL BE USED SUBJECT TO REVIEW BY THE STRUCTURAL ENGINEER.

9. ALL INFORMATION SHOWN ON THE DRAWINGS RELATIVE TO EXISTING CONDITIONS IS GIVEN AS THE BEST PRESENT KNOWLEDGE BUT WITHOUT ANY GUARANTEE OF WARRANTY OF ACCURACY. WHERE ACTUAL CONDITIONS CONFLICT WITH THE DRAWINGS, THEY SHALL BE REPORTED IN WRITING TO THE STRUCTURAL ENGINEER SO THAT PROPER REVISIONS MAY BE DEVELOPED. MODIFICATIONS OF DETAILS OF CONSTRUCTION SHALL NOT BE MADE WITHOUT PRIOR WRITTEN APPROVAL OF THE STRUCTURAL ENGINEER.

10. ANY AND ALL CONTRACTOR INITIATED CHANGES SHALL BE SUBMITTED IN WRITING TO THE ENGINEER FOR APPROVAL PRIOR TO IMPLEMENTATION OF THE CONSTRUCTION.

11. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL SAFETY PRECAUTIONS AND THE METHODS, TECHNIQUES, SEQUENCES, OR PROCEDURES REQUIRED TO PERFORM THE WORK.

12. VEGETATION REMOVAL UPSLOPE FOR THE BULKHEAD SHALL BE MINIMIZED. PRESERVE ALL TREES.

13. CONTRACTOR TO MAINTAIN REASONABLE ACCESS TO BOTH PARKING AREA AND PATHWAY TO NEIGHBORING PROPERTIES DURING CONSTRUCTION.

14. AT CONSTRUCTION COMPLETION, THE CONTRACTOR SHALL PERFORM FINAL CLEANUP OF THE SITE. FINAL CLEANUP INCLUDES, BUT IS NOT LIMITED TO:

    1) REMOVAL OF ALL RUBBISH, SURPLUS MATERIALS AND DISCARDED MATERIALS.

    2) REMOVAL AND PROPER DISPOSAL OF ALL TREATED PILES.

    3) REMOVAL OF ALL EQUIPMENT.

    4) RESTORATION OF PARKING AREA AND ROAD, REMOVING TIRE TRACKS AND FILLING POTHOLES.

    5) FINAL GRADING PER PLANS.

15. THE OWNER OR OWNERS REPRESENTATIVE SHALL WALK THROUGH WITH THE CONTRACTOR WHEN FINAL CLEANUP IS COMPLETE.

PART 2: MATERIALS

1. BULKHEAD ROCK SHALL BE NON-WEATHERED, ANGULAR, HARD, SOUND, AND DURABLE. ROCK SHALL BE FREE OF SEAMS, CRACKS, AND OTHER DEFECTS THAT REDUCE ITS RESISTANCE TO WEATHER. ROCK SHALL HAVE A MINIMUM DENSITY OF 160 POUNDS PER CUBIC FOOT. THE ROCK TYPE IDENTIFIED BY THE CONTRACTOR SHALL BE APPROVED BY THE OWNER PRIOR TO MOBILIZATION. APPROXIMATE ROCK SIZE IS PRESENTED IN THE TABLE BELOW.

2. QUARRY SPALLS SHALL CONSIST OF 2 TO 6 INCH CRUSHED ROCK THAT CONFORMS TO SECTION 9-13.7(2) OF THE 2018 WSDOT STANDARD SPECIFICATIONS.

3. PERMEABLE BALLAST SHALL CONFORM TO SECTION 9-03.9(2) OF THE 2018 WSDOT STANDARD SPECIFICATIONS.

4. STORMWATER DISPERSION PIPE SHALL CONSIST OF NOMINAL 6-INCH DIAMETER PERFORATED CORRUGATED DOUBLE WALL N-12 HIGH DENSITY POLYETHYLENE (HDPE) PIPE, 6-INCH NOMINAL DIAMETER SDR11 PERFORATED SOLID WALL HDPE PIPE, OR NOMINAL 6-INCH DIAMETER SCHEDULE 40 PVC PIPE. THE PERFORATED DISPERSION PIPE SHALL HAVE A MINIMUM WATER INLET AREA (WIA) OF 1.5 SQUARE INCHES PER LINEAR FOOT OF PIPE. DISPERSION PIPE AND PIPE JOINTS SHALL BE COMPATIBLE WITH REROUTED STORM WATER TIGHTLINE PIPES.

5. GEOTEXTILE FILTER FABRIC SHALL CONSIST OF MIRAFI FW403, OR APPROVED EQUIVALENT.

6. BEACH NOURISHMENT MATERIAL AND PLACEMENT SHALL CONFORM TO WASHINGTON STATE DEPARTMENT OF FISH AND WILDLIFE PROJECT PERMIT REQUIREMENTS.

PART 3: DESIGN CRITERIA

1. ALLOWABLE BEARING CAPACITY OF 1500 PSF BASED ON THE 2018 INTERNATIONAL BUILDING CODE, UNLESS A SITE-SPECIFIC GEOTECHNICAL ENGINEERING REPORT IS PROVIDED.

2. SITE PLAN TOPOGRAPHY WAS OBTAINED FROM THE KING COUNTY GIS WEBSITE, WHICH USES NAVD88 AS THE VERTICAL DATUM.

PART 4: EXECUTION

1. VERIFICATION OF EXISTING SITE CONDITIONS

    1) THE CONTRACTOR SHALL VERIFY ON-SITE GRADES AND CONDITIONS PRIOR TO CONSTRUCTION. THE OWNER AND THE ENGINEER-OF-RECORD SHALL BE IMMEDIATELY NOTIFIED IF ON-SITE CONDITIONS DIFFER FROM THE BULKHEAD DESIGN DRAWINGS.

2. EXCAVATION

    1) THE CONTRACTOR SHALL EXCAVATE TO THE LINES AND GRADES REQUIRED FOR CONSTRUCTION OF THE BULKHEAD, AS SHOWN ON THE DESIGN DRAWINGS.

    2) THE CONTRACTOR SHALL DIVERT SURFACE WATER AND PROVIDE TEMPORARY DEWATERING AS REQUIRED TO PREPARE THE BULKHEAD'S SUBGRADE SOILS.

    3) THE CONTRACTOR SHALL PROTECT EXISTING SITE FEATURES, OFF-SITE FEATURES, AND SITE IMPROVEMENTS FROM DAMAGE DURING CONSTRUCTION INCLUDING, BUT NOT LIMITED TO, THE LARGE TREE NEAR THE BULKHEAD. TEMPORARY EXCAVATION STABILITY AND SHORING SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

    4) THE EXISTING SITE SOILS ALONG THE SHORELINE, PRONE TO WAVE AND TIDAL EROSION WHEN EXPOSED, SHALL BE REMOVED FROM THE SITE UNLESS DISPERSAL OF THE SOIL ON THE BEACH AS NOURISHMENT IS PERMITTED BY THE WASHINGTON STATE DEPARTMENT OF FISH AND WILDLIFE.

    5) SITE EXCAVATIONS SHALL BE COMPLETED IN SECTIONS TO REDUCE THE POTENTIAL FOR TEMPORARY SLOPE INSTABILITY. ONE CONSTRUCTION SECTION SHALL BE EQUAL TO THE LENGTH OF BULKHEAD THAT CAN BE EXCAVATED, BACKFILLED, AND CONSTRUCTED IN ONE WORK DAY.

3. BULKHEAD AND ROCKERY CONSTRUCTION

    1) THE BULKHEAD SHALL BE FOUNDED ON FIRM AND UNYIELDING NATIVE SOILS.

    2) THE BULKHEAD FACE BATTER SHALL BE 8 VERTICAL TO 1 HORIZONTAL.

    3) ROCK SHALL DECREASE IN SIZE FROM THE BOTTOM TO THE TOP OF THE BULKHEAD AT A UNIFORM RATE. REFER TO THE ROCK SIZE DESIGNATION TABLE FOR SPECIFIC ROCK SIZES. CONTRACTOR SHALL NOT SUBSTITUTE A SMALLER ROCK THAN THAT SPECIFIED IN THE TABLE.

    4) EMBEDMENT OF THE LOWEST COURSE OF ROCK SHALL BE A MINIMUM OF 24 INCHES BELOW EXISTING BEACH ELEVATION AT THE FACE OF THE BULKHEAD.

    5) THE LONG DIMENSION OF THE ROCK SHALL EXTEND PERPENDICULAR TO THE ROCK FACE.

    6) ROCKS SHALL BE PLACED TO AVOID CONTINUOUS JOINT PLANES IN VERTICAL OR LATERAL DIRECTIONS. EACH ROCK SHALL BEAR ON TWO OR MORE ROCKS BELOW IT, WITH GOOD FLAT-TO-FLAT ROCK CONTACT.

    7) QUARRY SPALL BACKFILL BEHIND THE BULKHEAD SHALL BE PLACED BEHIND EACH COURSE AND TAMPED TO PROVIDE A STABLE CONDITION PRIOR TO PLACING ROCKS FOR THE NEXT SUCCESSIVE COURSE.

    8) GEOTEXTILE FABRIC SHALL COVER THE BOTTOM OF THE WALL EXCAVATION, EXTEND UP THE CUT FACE, AND COVER THE TOP OF THE QUARRY SPALL BACKFILL. GEOTEXTILE FABRIC JOINTS SHALL OVERLAP AT LEAST 18 INCHES.

    9) CONTRACTOR TO EXTEND FILTER FABRIC ALONG BOTH PROPERTY LINES TO MITIGATE NEIGHBORING PROPERTIES SOIL LOSS.

    10) ROCK WALLS ARE PRIMARILY EROSION CONTROL STRUCTURES. NATIVE MATERIALS MUST BE STABLE AND FREE STANDING IN CUT FACE.

4. QUALITY CONTROL

    1) WE RECOMMEND THAT THE OWNER RETAIN THE ENGINEER-OF-RECORD TO PERFORM PERIODIC OBSERVATIONS DURING CONSTRUCTION.

    2) THE ABOVE FIELD OBSERVATIONS DO NOT RELIEVE THE CONTRACTOR OF THEIR RESPONSIBILITY TO MEET THE MORE STRINGENT OF THE DESIGN DRAWINGS, PERMIT REQUIREMENTS, OR OTHER MANUFACTURER'S REQUIREMENTS.

PART 5: SPECIAL DESIGN PROVISIONS

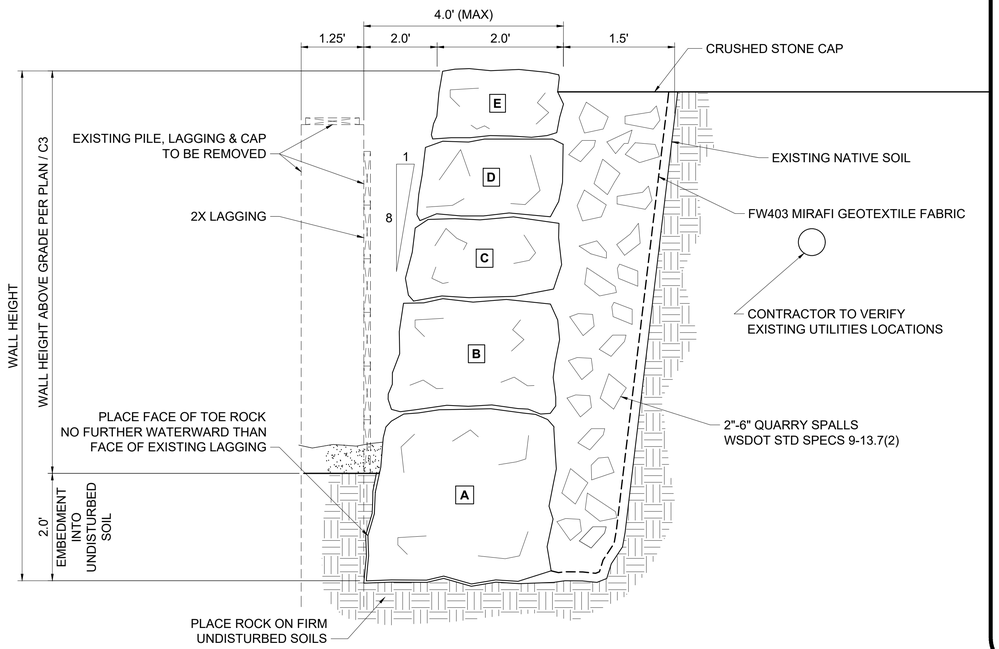
1. THE BULKHEAD SHALL BE COMPLETED IN GENERAL ACCORDANCE WITH THESE PLANS AND THE CURRENT EDITION OF THE ASSOCIATED ROCKERY CONTRACTORS (ARC) STANDARD ROCK WALL CONSTRUCTION GUIDELINES.

2. IF SITE CONDITIONS OR DESIGN PARAMETERS ARE DIFFERENT THAN WHAT HAS BEEN PRESENTED HEREIN, THE OWNER AND ENGINEER-OF-RECORD SHALL BE NOTIFIED IMMEDIATELY.

3. ANY REVISIONS TO DESIGN PARAMETERS OR PROPOSED BULKHEAD GEOMETRY MAY REQUIRE DESIGN MODIFICATIONS PRIOR TO PROCEEDING WITH CONSTRUCTION.

ROCK SIZE DESIGNATION						
WALL HEIGHT (FEET)	HEIGHT ABOVE GRADE (FEET)	A	B	C	D	E
6	4	4	3	3	2	
8	6	5	4	4	3	
10	8	6	5	4	3	3
12	10	6	5	5	4	4
		NUMBER IN TABLE IS EQUAL TO ROCK SIZE				

APPROXIMATE ROCK SIZES		
ROCK SIZE	AVERAGE DIMENSION (IN)	ROCK WEIGHT (LBS)
ONE-MAN	12-18	50-150
TWO-MAN	18-28	200-700
THREE-MAN	28-36	700-2,000
FOUR-MAN	36-48	2,000-4,000
FIVE-MAN	48-54	4,000-6,000
SIX-MAN	54-60	6,000-8,000



TYPICAL BULKHEAD SECTION
NOT TO SCALE

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GENTRY SMITH	C4
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Attachment B

Site Photos

Photo 1 - Upland conditions landward of the bulkhead.

Photo 2 - Conditions landward of bulkhead.

Photo 3 - Conditions landward of the bulkhead looking south.

Photo 3 - Existing bulkhead looking landward from beach.

Photo 5 - Beach conditions looking south.

Photo 6 - Beach conditions looking north.