DYES INLET LAGOON ARMOR REMOVAL

Kitsap County Department of Community Development

SPECIAL PROVISIONS
(TECHNICAL SPECIFICATIONS)

Prepared by

Natural System Design

April 9, 2026

1 GENERAL REQUIREMENTS AND DEFINITIONS

1.1 General Requirements

The project specifications presented here as Special Provisions define work scope and minimum requirements associated with the implementation / construction of the proposed Dyes Inlet Shoreline Restoration Project. The Special Provisions provided in the following sections supplement the WA Department of Transportation Standard Specifications listed below (referred to as WSDOT thereafter), with new, replaced or modified requirements specific to this project.

> WSDOT Specification: Standard Specifications for Road, Bridge, and Municipal Construction (M 41-10), WA Department of Transportation, 2025.

This project specifications supplement and further explain design notes presented on Contract Plans. They do not replace or modify design sheet notes.

In addition, Contractor shall refer to permit documents for all permitting conditions and constraints and other regulatory requirements.

1.2 Definitions

A. PROJECT: Dyes Inlet Lagoon Armor Removal Project
B. WORK: As defined in Section 1.3
C. Kitsap County: Kitsap County Department of Community Development (KCCD)
D. PM: Project Manager from KCCD, or PM assigned representative
E. Owners: Landowners of properties
F. Contractor: Contractor awarded construction of project
G. Contractor PM: Contractor's project manager responsible for project planning, oversight, QC/QA, and the point of contact for the contractor
H. Consultant: Natural System Design, Inc. (NSD)
I. Engineer: NSD Project Engineer/Engineering Geologist, or Engineer assigned representative
J. Contract Plans / Sheet(s): Final Design Plan Set / Sheet(s)

1.3 Project Work Scope

A. The project WORK consists of furnishing all construction, labor, equipment, and materials, and performing all operations in connection with the construction as detailed on Contract Plans, Bid Schedule and as summarized in Contract Document.

B. The scope of the WORK includes the following main project elements:
   a. Site preparation and TESC/SWPPP installation.
   b. Removing existing shore armor, including rock wall, concrete rubble, wood wall and pilings, etc. per Sheet 5 and Sheet 6. Retaining/Reforming two rock sills per Sections A and B, Sheet 11 and field instruction. Salvage, haul, stockpile and/or disposal of materials as required.
   c. Constructing rock retaining wall and return wall with onsite salvaged rock, per Sheet 8 and relevant section details.
   d. Excavating and regrading shore bank.
   e. Installing cobble toe and gravel-sand beach nourishment to design grade, per Sheet 7 and Sheet 8.
   f. Import topsoil/compost and prepare planting bed.

g. Import and stockpile mulch onsite.
h. Install habitat logs.
i. Final site cleanup and restoration

1.4 Job Measurement and Payment

A. Measurement of lump sum bid items will be based on the value of work completed/incorporated relative to the value of work remaining under the bid item. Payment shall be made based on the contract price and the measurement, which includes all labor, material, equipment and other incidentals required to complete the work. Any estimated quantity provided for a Lump Sum bid item in the Bid Form is approximate, estimated based on available survey data, field observations, and rough volume calculations in CAD. Quantities are provided for reference to the Contractor for bidding purposes. The contractor shall verify the quantities with their own estimate and calculations.

B. Measurement of unit price bid items for imported materials shall include costs for both material and transport to site. For this project, all other costs associated with material installation or placement are included in a separate bid item unless otherwise stated in this specifications document or in the bid form. The quantity for payment is based on the volume/weight or other defined measuring unit with the support of weight tickets from the pit/quarry site or receipts from supplier, and adjusted by the percentage or quantity of the material actually installed or consumed. Material quantity adjustment approved by the Engineer or requested by the Engineer, when within a +/- 20% range, will not be considered as a Change Order, and will be paid or subtracted by the contract unit price.

C. Measurement of unit price or lump sum price bid items for material removal and recycling/disposal or other construction items shall include all necessary costs for material, labor, transport, and recycling/disposal unless otherwise specified on the bid form. Payment for unit price based bid items shall be made based on the contract unit price and the quantities supported by weight tickets or receipts from qualified waste sites, or by field measurements. Payment for lump sum based bid items shall be made based on the contract lump sum price in accordance with Section 1.4A.

D. The Contractor shall keep a daily record of truck trips and estimated or actual loads for both import and export materials.

E. For certain project elements, if imported material cost and labor cost for constructing/installing the material are bundled as one bid item in the Bid Form, the payment will be made in accordance with each method of measurement, adjusted by the percentage of the material actually installed or consumed.

2 MATERIALS

2.1 General

A. All imported and salvaged materials to be installed or placed for the project shall be pre-approved by the Engineer prior to construction. For imported materials specification sheets, gradation sheets / reports, sample materials and/or scaled material photos (with a tape measure placed by the side for reference) shall be submitted and reviewed prior to large quantity shipment to the project site.

2.2 Rock For Rock Walls

A. All rock materials for rock wall structures shall be hard, rough, and durable angular quarry stones, free of organic material, infilled joints, seams or other defects.

B. For this project armor rock for rock walls shall be salvaged from removed rockery at the time of existing rockery removal.

C. Rock sizes for rock retaining wall are indicated on Sheet 12 rock wall detail and on cross-section sheets (Sheet 10 and Sheet 11). Large 2-man rock and mixed size 3-man angular rock shall be salvaged and installed as per Contract Plans and Sections. Refer to Table 1 for rock weight and dimension conversions.

Table 1. Rock size per WSDOT 9-13.7(1)

Rock Size	Rock Weight (lbs)	Average Dimension (inches*)
1-Man Rock	50 to 200	12 to 18
2-Man Rock	200 to 700	18 to 28
3-Man Rock	700 to 2,000	28 to 36
4-Man Rock	2,000 to 4,000	36 to 48
5-Man Rock	4,000 to 6,000	48 to 54
6-Man Rock	6,000 to 8,000	54 to 60

*Average Dimension = (Length + Width + Height)/3

D. In general, more regular armor rocks in shape, such as rectangular, tabular, or cubic are more suitable rock wall construction. Armor rocks in irregular shape may be used while matching with surrounding rocks in shape and interlock one other. All qualified rock shall have a shape ratio (defined as the longest dimension length / the shortest dimension length, or length / height) less than 3. The use of round, thin, flat, or long and needle-like shapes is not allowed.

2.3 Quarry Spalls for Rock Wall Base and Backfill

A. Quarry Spalls for rock wall backfill shall be angular quarry stones with sizes of 3” - 8". Quarry spalls shall be salvaged from the base and the back of the existing rock wall after the armor stones are removed. Quarry spalls shall be carefully collected to keep them free of dirt and other foreign material.

B. The gradation for quarry spalls shall in general meet **WSDOT 9-13.1(2)** requirements as shown in Table 2 below, or approved by the Engineer.

Table 2. Quarry spalls gradation, per WSDOT 9-13.1(2) (all percentages are by weight)

Sieve Size/Number	Percent Passing
8”	100%
3”	40% max
¾”	10% max

2.4 Geotextile

A. Geotextile material shall meet WSDOT 9-33.1 specifications. The geotextile for rock wall base and back shall be non-woven with minimum grab tensile strength 250 lb. The recommended geotextile grade for this project is Mirafi™ 1100N or equivalent approved by the Engineer.

2.5 Beach Cobble for Cobble Toe

A. Beach Cobble for cobble toe shall be free from dirt, clay, rock fines, fractured rock, and other foreign materials. Beach cobble shall not contain organic matter considered objectionable by the Engineer.

B. Beach cobble shall be naturally occurring rounded rock, free of thin, flat and elongated pieces. Beach cobble shall be sound, durable rock with less than 15% by weight having any cleavage or fractures. Aggregates from rock quarries, ledge rock, and talus slopes are not acceptable for beach cobble.

C. Beach cobble shall consist of mixed pebble and cobble with a gradation meeting WSDOT 9-03.11(2), 4-inch Stream Cobble, as shown in Table 3.

Table 3. Beach cobble gradation, per WSDOT 9-13.1(2) (all percentages are by weight)

Sieve Size/Number	Percent Passing
4”	99-100%
3”	70-90%
1-1/2”	20-50%
3/4”	10% max

D. Prior to be placed at the toe of the beach, the imported beach cobble shall be mixed with approximately 20% of beach quality native bank sediment salvaged from bank excavation onsite. Refer to 2.5C for salvaging of native bank sediment.

2.6 Beach Nourishment Aggregates

A. All beach nourishment aggregates shall be clean, naturally occurring, and free of debris, wood, and other organics or deleterious material. Gravel shall be water-rounded, well-graded, and contain no more than 10% fractured rock by weight.

B. Pit-Run Gravel Sand Mix:

   a. Pit-Run Gravel Sand Mix for Beach nourishment can be directly imported from approved pit, with some flexibility for its gradation, pre-approved at the discretion of the Engineer. The gradation shall conform close to 75% of beach quality gravelly sand (Table 4) well mixed with 25% of gravel mixture (WSDOT 9-03.12(5), Table 5).

   b. Refer to Section 2.6D regarding the possibility of replacing or partially replacing Pit-Run Gravel Sand Mix with native sediment salvaged from the site.

Table 4. Gradation of gravelly sand (all percentages are by weight)

SIEVE SIZE	PERCENT PASSING
1-1/2"	100%
3/4"	80-100%
1/4"	65-90%
#4	20-45%
#16	0-10%
#100	0-5%

Table 5. Gravel gradation, WSDOT 9-03.12(5) (all percentages are by weight)

SIEVE SIZE	PERCENT PASSING
1½"	99-100
1"	50-100
¾"	0-20
3/8"	0-2
No. 200	0-1.5

C. Coarse Sand: Coarse Sand shall conform to the gradation as specified in Table 6.

Table 6. Gradation of coarse sand (all percentages are by weight)

SIEVE SIZE	PERCENT PASSING
2"	90-100%
#4	80-100%
#8	60-85%
#16	20-50%
#50	10-30%
#100	0-4%
#200	0-3%

D. Salvaging Native Bank Sediment

a. Native sediment salvaged from bank excavation shall be beach quality clean gravelly sandy sediment, free of debris, wood, and other organics or deleterious material.

b. Salvaging native sediment shall be pre-approved by the Engineer or at the discretion of the Engineer if visual inspection confirms it meets the specification of Section 2.6B.

c. The qualified salvaged native sediment if approved by the Engineer shall be used to replace or partially replace the Pit-Run Gravel-Sand Mix as specified in Section 2.6B. This will be determined and notified to the Contractor prior to ordering/shipment of the Pit-Run Gravel-Sand Mix.

2.7 Wood Strand Much

A. Mulch to be used for covering the construction access path as part of the site preparation and SWPPP requirements shall be wood strand mulch. Refer to WSDOT 9-14.5(4) for specifications.

B. The mulch shall be salvaged and reused for covering the pedestrian paths as part of Bid Item 27.

C. Additional mulch used for SWPPP shall be collected and stockpiled onsite after the project as incidental to Bid Item 10.

2.8 Wood Chip Mulch

A. Mulch for the planting area may be arborist wood chip mulch 1-2 inch chunks derived from the mechanical grinding or shredding of whole trees or portions of trees. Composted product or bark may not be substituted.

B. Wood chip mulch shall be free from weeds, weed seed, deleterious materials, and foreign materials, resin, tannin, or other compounds detrimental to plant life. Mulch containing any amount of cedar wood is unacceptable. No construction waste may be included.

C. At least 1-gallon mulch sample is to be presented for approval prior to shipment.

2.9 Topsoil Type A

A. Topsoil for planting areas shall be from accredited sources subject to approval.

B. Topsoil shall consist of 2/3 Sandy Loam conforming to USDA soil texture class “Sandy Loam” certification and 1/3 composted organic material.

C. Sandy loam shall consist largely of sand, but with enough silt and clay present to give it a small amount of stability. Individual sand grains shall be of sufficient size to be seen and felt readily. Upon squeezing in the hand when dry, it shall form a cast that not only holds its shape when the pressure is released but withstands careful handling without breaking.

D. The mixed soil shall meet the following gradation:

Table 7. Soil gradation.

SIEVE SIZE	PERCENT PASSING (BY WEIGHT)
3/8 inch	100%
#4	95%
#10	85%
#30	70%
#60	50%
#100	30%
#270	**15%**

E. The mixed soil shall have a pH range of 5.0 to 6.5, with dolomite lime added as necessary to attain this range.

F. Compost for Topsoil Type A shall conform to the material specifications outlined for “Fine Compost” in Section 9-14.4(8) of the Standard Specifications.

G. The Contractor shall submit the following for approval by KCCD:

   a. 1 gallon bag of imported Topsoil Type A sample

   b. Product Certificates and Material Test Reports

   c. Delivery Slips: Provide delivery slips as proof of shipment of specified materials.

2.10 Habitat Logs

A. All imported logs shall not be treated with any chemicals and shall be free of rot.

B. The minimum length is 28 FT from end to end, and the diameter shall be over 20", DBH. Logs with trimmed rootward are preferred.

C. Photos of the sample logs shall be submitted for approval.

3 CONSTRUCTION PLANNING AND PREPARATION

3.1 General Requirements

A. The Contractor shall submit a brief written Construction Work Plan (per Section 3.2) no later than Five (5) workdays prior to the scheduled start of construction. No physical work is to be performed at the site until the Construction Work Plan is reviewed and approved by PM and Engineer.

B. The Contractor's site preparation shall be checked and approved by PM and Engineer prior to the start of any actual construction work.

C. The Work Plan, especially project progress status and work schedule revisions shall be updated weekly. A regular weekly short meeting shall be scheduled. In case of any unexpected schedule changes, PM and Engineer shall be notified at least 48 hours in advance.

D. The Contractor is responsible for locating, reaffirming any existing underground utility lines prior to digging.

E. The Contractor shall protect utility boxes, existing drainage system, other permanent infrastructure, and any specific structures/portion of structures called out to remain within the work area. Damages caused by construction activities shall be repaired or restored by the Contractor.

F. The Contractor shall protect established landscape, plants and trees within project site. Damages caused by construction activities shall be repaired or restored by the Contractor.

G. The Contractor shall take into consideration the daily workable low tide window.

H. The Contractor shall work with PM and the Engineer providing oversight on the field and consider their recommendations and design interpretations, especially for the elements that require field determination or verification.

3.2 Work Plan, Equipment, and Personnel

A. The Construction Work Plan shall include:

   a. A list of key construction personnel and the supervisory chain of responsibility.

b. A list of equipment and manufacturer's specifications.

c. Implementation procedures, sequence, and estimated schedule of key project elements.

d. Plans/sketches showing construction access, temporary staging, materials stockpiling for both north and south sites.

e. Brief TESC & SPCC plan, including proposed BMP items, strategies to contain fluids if a hydraulic line is broken.

f. Proposed waste sites for construction debris disposal/recycling.

3.3 Construction Surveying, Marking and Staking

A. The Contractor is required to participate in a pre-construction site walk-through with PM and the Engineer.

B. The Contractor shall be responsible for setting, maintaining, and resetting all stakes, marks, and lines necessary for the Work based on job requirements set forth in subsequent sections.

C. The Contractor shall refer to the primary monuments shown on Sheet 1 (MON# 1, 2, 3) and set up secondary control points as needed for measuring and stake setting.

D. The Contractor shall have Self-Leveling Laser Tripod properly set up on site during the construction for checking and verifying elevations of excavation and fill grades/subgrades, and for rock wall elevation/height control.

E. Stake setting or marking shall include but not be limited to the following:

a. Construction access and staging, stockpiling areas.

b. Crossing of seven cross sections, with marked excavation/fill grades.

c. Excavation limits and new rock wall alignments.

d. Beach nourishment grades and boundaries.

F. Stake setup shall be inspected and approved by the Engineer on site.

G. Confirmation of final finish beach grade and crest line elevation at project close-out.

3.4 Construction Access, Staging and Stockpiling Areas

A. The Contractor shall include construction access and staging/stockpiling plan as part of the Work Plan submittal (see Section 3.2) to be approved by PM, Engineer and Landowners. The plan shall follow BMP requirements and TESC/SWPPP as specified in Section 3.5.

B. Consider using wood strand mulch (BMP C121, Section 2.7) to cover the construction access path. Install and maintain a minimum 3" of blanket mulch over at least the soil ground of the access path. Recover the mulch and store it on site after the completion of the project for landscaping use.

C. Mulching is not allowed inside the proposed beach excavation/fill area. The Contractor shall maintain and contain the mulch to prevent it from being carried or dragged into the beach nourishment working area. Steel plates may be used for beach access as needed.

D. Depending on weather and site soil conditions (wetness and clay content) at the time of construction, the Contractor shall determine whether stabilized construction entrance/exit using quarry spalls (BMP C105) is required. Mulching can be effective for construction entrance/exit if there is no high clay content or muddy soil.

E. Quarry spalls pads may not be required if delivery and haul trucks are only staying on the mulch covered access path with no need of directly entering the excavation site.

F. If the quarry spall pad is not installed, it is the contractor's responsibility to install alternative measures if required. The costs should be lumped into the Construction Access bid item above. Such measures may include adding additional length of mulch cover for the construction access path or washing truck tires as seen necessary at a designated tire washing station on the access path, with a pressure washer machine.

G. Designated material loading/offloading areas, temporary stockpiling and equipment staging areas shall be planned and properly prepared. A recommended and permit-approved arrangement of staging and stockpiling areas for both north and south sites are attached as Sheet 1. Any significant changes to the staging or stockpiling areas shall be included in Contractor's submitted work plan doe approval, which may also require additional agency review and approval.

H. For stockpiling materials such as quarry spalls and beach nourishment materials, proper liners may be required beneath the stockpiles to prevent the imported materials or the soil ground being mixed with dissimilar materials.

I. Minimize stockpile area as practically possible.

3.5 Erosion Control and Water Pollution Prevention

A. The Contractor is responsible for planning, furnishing and installing/implementing erosion control and water pollution prevention measures as required per Contract Plans and all permit requirements, or as necessary, to prevent siltation or silt-laden waters, or contaminated chemicals from entering waters of the State of Washington, and to ensure that effective pollution control /spill response measures are in place in case of accidents or other emergency situations.

B. Specific Work may include, excluding any measures or requirements covered by Section 3.6:

   a. Brief TESC and SPCC plans, including proposed BMPs, strategies to contain fluids if a hydraulic line is broken (as part of the Work Plan submittal).

   b. Use bio hydraulic fluid for equipment operating on the beach.

   c. Comply with "Erosion Control and Pollution Prevention" notes on Construction Planning and TESC/SWPPP" Sheet1.

   d. Any necessary BPM implementations, excluding "Mulching" which is part of "Construction Access" bid item.

   e. Straw wattles, erosion control blanket as required in the event of heavy rain or large runoff.

C. General requirements include:

   a. Construction timing is one of the key factors to minimize environmental impacts; all work shall occur Comply with all federal and local level permit requirements associated with erosion control and water pollution prevention.

3.6 Gazebo Relocation and Water Spigot Relocation

A. This work consists of disassembling, removing, and reinstalling the existing Gazebo to a different location on site.

B. All disassembled parts shall be properly stored at a safe location approved by the Landowner. All small assembly parts shall be sorted, wrapped and properly stored separately.

C. The gazebo shall be reinstalled at a proper location directed/confirmed by the Landowner at near end of the project.

D. The Contractor shall take precautions in disassembling, transporting and reinstalling the gazebo to ensure it's not damaged or scratched.

E. One water spigot on the Best property shall be relocated to a further inland location unaffected by the project and approved by the Landowner/PM.

F. The spigot shall be properly reconnected to the existing water line, and any section of abandoned underground water pipe with future daylight potential shall be removed.

3.7 Existing Tree/Plant Protection and Redwood Tree Transplant

A. Refer to planting plan sheets (Sheets 13 and 14) and relevant design notes on the sheets for existing tree and plant protection requirements.

B. Redwood tree transplant consists of excavating and removing the redwood tree, with root protection at the south site, and transporting and replanting it at a new location further landward.

C. The whole tree transplant process shall be under the direction and oversight of a licensed professional arborist/ landscapist.

3.8 Clearing and Grubbing and Removing Obstacles

A. All inland areas where common excavation/fill or landscaping/planting are proposed (excluding armor removal area) shall be cleared and grubbed as necessary. Areas requiring minimal or no grubbing are the designated tree/plant protection areas, especially for the south end of the south site (see Sheet 8) where four living trees need to be protected, and a large tree root system is already exposed on the eroded shore side.

B. Clearing and grubbing include mainly removing lawns and limited patches of vegetation. No tree removal is included. It also includes salvaging reusable top soil (after removing vegetation) and grading proposed planting areas. Refer to Sheet 13 General Notes for details.

C. This work shall include collecting and stocking drift logs from the beach for reuse.

D. This work shall also include removing any obstacles within the work area as necessary, including portions of fences. Water spigot and Gazebo relocation are excluded (refer to Section 3.6).

E. Removing objects not called out on Contract Plans will require Engineer and Landowner's preapproval. Reusable objects removed from the site shall be stored onsite following the direction of the Landowner and/or PM/Engineer.

F. All resultant unusable debris shall be hauled and disposed of at a qualified waste site.

3.9 Site Restoration and Final Inspection

A. Repair/restore the site and removed objects, including salvaged beach logs.

B. Remove temporary TESC/SWPPP installation. Salvaging mulch for reuse on paths or for storage (for future use on planting areas by KCCD).

C. Survey equipment set up for inspection check. Final acceptance inspection walkthrough and successful completion of punch list.

D. Final Cleanup.

4 REMOVAL OF SHORE ARMOR

4.1 Removal of Deteriorated Pilings

A. This work consists of removal and haul off of all existing beach pilings within the work area as indicated on Contract Plans. All pilings are assumed to be untreated wood. The Contractor shall inform the PM immediately if any treated wood is found.

B. Piling shall be removed in the "dry" during low tide events.

C. All pilings shall be completely removed via direct pull, or approved equal method. The Contractor shall take a precaution or deploy a proper approach trying not to break or crush the piling.

D. Pilings unable to be fully removed shall be cut or broken off at least 18 inches below the pre-existing surface. All holes shall be filled, right after the pulling or cut, with native sediment excavated from the site.

E. Collect all removed pilings including pieces of wood from splintering and damage, dispose of them at a qualified waste site.

4.2 Rock Armor Removal

Rock Armor Removal includes 3 sub bid items (12A, 12, B, and 12C) involving different haul and disposal requirements. The work is specified herein.

A. Rock Armor Removal

   a. This work consists of removing all large size armor stones (boulders) from existing rock wall(s) and rock revetment(s) on the shore bank per Contract Plans, except for two locations where small rock sills are to be retained/reformed in place. Refer to Section 4.2D for retaining/reforming rock sills.

   b. This shall also include removing semi-exposed base armor rock up to two feet below toe grade at the base.

   c. Rock wall/revetment removal shall proceed section by section in conjunction with the following in order, which is to stabilize the exposed bank after rock removal and to prevent any potential bank erosion caused by rising tide and wave runup.

      i. Spalls removal at rock base and backfill (Section 4.3)

      ii. Bank excavation and grading (Section 5.1)

      iii. Cobble toe placement (Section 6.1)

   d. A certain quantity of angular boulders and quarry spalls from the removal shall be salvaged for reuse. Refer to Section 4.2B and 4.2C for rock salvaging and stockpiling.

B. Rock Salvaging and

   a. Approximately 50 CY of good-quality angular boulders with proper shapes and forms and mixed sizes (with approval of the Engineer) shall be salvaged and to be reused on site for the new retaining wall and the return wall. The work for this salvaging is incidental to rock removal for Bid Item 12A.

b. Additional 60 CY of good-quality angular boulders with proper shapes and forms and mixed sizes (under the direction of the Engineer) shall be salvaged and hauled and stored at a local temporary storage site approximately 14 miles from the site. The work for this salvaging and hauling is incidental to rock removal for Bid Item 12B.

c. Rock salvaging shall follow the requirements as specified in Section 2.2.

d. Salvaged rock shall be visually inspected by the Engineer prior to the installation or hauling.

C. All rock not salvaged for reuse or local storage shall be hauled and recycled/disposed of at a qualified waste site. This is incidental to rock removal for Bid Item 12C.

D. Spalls Salvaging

a. Salvaging quarry spalls shall meet the requirements as specified in Section 2.3.

b. Salvage approximately 25 CY of clean and good quality quarry spalls from removed rock wall base (if any) and at the backfill, or from the filer layer of rock revetment, or from some of the riprap rock if the sizes and gradation are adequate. Spalls salvaging shall be field verified and directed by the Engineer. Spalls salvaging is incidental to Bid Item 12 A.

E. Retaining/Reforming Two Rock Sills

a. A portion of the existing rock armor shall be retained at two locations as indicated on Contract Plans (see Sheet 5).

b. It is expected that some rock pieces need to be repositioned or replaced with better fit rocks to form more stable sill structures at these locations.

c. This construction is to be directed and/or overseen by the Engineer on site.

d. This work is covered by Bid Item 12D.

4.3 Concrete, Rubble, Spalls, Wood Wall and Site Debris Removal

This bid item includes all the work specified herein.

A. Concrete Rubble Removal

a. Remove all large concrete rubble pieces used as shore armor within removal/demolition areas as indicated on Contract Plans; haul and recycle concrete rubble at a qualified waste site.

b. Demolish a concrete staircase as beach access as indicated on Sheet 6 (at just south side of Section 4); haul and recycle the rubble at a qualified waste site.

B. Wood Retaining Wall Removal

a. Demolish a section of wood retaining wall at the south site, and haul, recycle the wood at a qualified waste site. Remove all large concrete rubble pieces used as shore armor within removal/demolition areas as indicated on Contract Plans; haul and recycle concrete rubble at a qualified waste site.

C. Spalls, Ripraps and Rockery Debris Removal

a. Scrap and clear all spall base and backfill below and behind the removed rock wall.

b. Scrap and clear the spall layer or rockery debris beneath the removed revetment and concrete rubble if any found.

c. Scrap and clear all spalls or rockery debris behind the wood retaining wall if any found.

d. Scrap and clear all small rock riprap and rockery debris on certain parts of the bank.

e. All scraping and clearing actions listed above shall be to the extent that the bare earth soil is largely exposed. If any geotextile or other fabric lining is found, the fabrics shall be removed.

f. Haul and dispose of all collected quarry spalls, riprap rocks and other rockery debris.

D. Collect, haul and dispose of all site debris (excluding clearing and grubbing debris which is part of Bid Item 9).

5 BANK/INLAND EXCAVATION AND GRADING

5.1 Bank Inland Excavation for Pocket Beaches

A. Earth excavation shall start at the bank and gradually grade up landward to maintain slope stability and to minimize erosion potential.

B. Excavation shall proceed immediately following the removal of shore armor and any filter layer behind, and shall follow the same shift from one section to the next along the shore as for shore armor removal as specified in Section 4.2A(c).

C. Excavate the bank to the proposed design surface grade per Contract Plans. Avoid any over-excavation as possible in areas where native sediment is the design finished grade.

D. During bank/inland excavation, salvage clean and high-quality native sediment at the direction of the Engineer. The quality and adequacy of the native sediment, and salvaging quantities will be field verified by the Engineer in accordance with the specifications presented in Section 2.6D (Native Sediment Salvaging) and Section 2.6B (Pit-run Gravel Sand Mix).

E. Haul and dispose of all unused sediment to a qualified waste site.

5.2 Excavation for Wall Installation

A. Bank cut slope shown on section detail (Sheet 12) is illustrative. Ensure bank stability during and after excavating the bank.

B. Bank excavation shall minimize soil disturbance. Install proper and necessary temporary slope stabilization and / or erosion control measures as necessary.

C. Excavate a keyway (trench) to the grade indicated on rock wall section sheets, and enough width for base rock installation. Avoid over excavation below required grade or beyond the extent necessary. Avoid unnecessary earth disturbance in the surroundings. Thoroughly compact the keyway base with a hand-held vibratory soil compactor.

D. The subgrade below base rock should slope approximately 2-3% landward.

E. High quality gravelly sandy material excavated from the keyway excavation may be salvaged for reuse at the direction of the Engineer. Refer to Section 5.1D.

F. Haul and dispose of all unused sediment to a qualified waste site.

5.3 Excavation for Cobble Toe and Beach Nourishment

A. Limited excavation and grade preparation are required after rock removal for filling the cobble toe more uniformly in accordance with the Contract Plans.

B. The same excavation and grade preparation shall be executed as for the upper beach where beach nourishment material is to be placed.

5.4 Stormwater Outfall Sawcut and Stabilization

A. Refer to Detail D on sheet 12 for stormwater outfall sawcut and stabilization

B. Bid Item 13 refers to three of the four stormwater outfall concrete pipes with diameters of 6”-8”. A simple sawcut is expected for these outfall pipes to adjust the exposed length of the pipe after the removal of the shore armor. The work and associated requirements include:

   a. Clear sediment on both sides of the pipe. If the base of the pipe outfall is rock or large cobble retain the rock or cobble material, otherwise excavate the base sediment and fill in salvaged quarry spalls to create an erosion control bed.

   b. Place cobble material to construct a cobble berm with slightly higher crest and longer extent landward (than the surrounding cobble toe fill) to cover and stabilize the exposed pipe.

   c. Payment for this bid item only covers the sawcut, while excavation and cobble fill are part of or incidental to other bid items.

C. Bid Item 14 refers to the other large 18” diameter concrete pipes just waterward of the existing gazebo. This pipe may require additional excavation (up to 5 FT landward) to expose the potential pipe connection in case a pipe connection is observed or detected, and it requires additional stabilization (embedment and boulder support). In this case, a sawcut should be made to the inner pipe and the reconnection of the outfall pipe to the inner pipe is required after the sawcut. Payment for this bid item will cover the sawcut, additional excavation and backfill, and placement of boulders.

6 BEACH NOURISHMENT PLACEMENT

6.1 General Requirements

A. Beach nourishment aggregates shall all be well-mixed as required in desired proportions either on site by the Contractor or at the pit prior to the installation.

B. The subgrade shall be smooth and at or slightly below the required grade, so that beach nourishment material can be more evenly distributed above. The subgrade elevation shall be approved by the Engineer prior to the beach nourishment placement.

C. Nourishment aggregates shall be transported and distributed over the beach area to be nourished in accordance with the required volume for each section or subarea.

D. Spread and grade beach nourishment aggregates from upper beach down to achieve desired beach profiles.

E. The finished beach grade shall be inspected and approved by the Engineer

6.2 Cobble Toe Placement and Backfill at the Toe of Rock Walls

A. Mix 20% of salvaged native sediment with the imported streambed cobble.

B. Cobble shall be placed in such a manner that the material will preserve its gradation. Spread and distribute cobble evenly and gently into the designated area, no more than 3 FT from the air to prevent segregating the various sizes or crushing the cobble or underlying material. The larger cobble rocks shall be well distributed in the mass.

C. Grade the finished surface to the design grade and to be level with the surrounding beach grade.

D. Spread a thin layer of native sediment to fill the voids on top of the finished cobble surface.

6.3 Upper Beach Nourishment – North Site

A. Mix 40% of pit-run gravel-sand (Section 2.6B) with 60% of coarse sand (Section 2.6C). At the discretion of the Engineer native sediment may be used to replace the pit-run gravel-sand mix (refer to Section 2.6D).

B. Spread and distribute beach nourishment material evenly and gently into the designated area, no more than 3 FT from the air to prevent segregating the various sizes.

C. Grade the finished surface to the design grade and to be level with the surrounding beach grade.

6.4 Upper Beach Nourishment – South Site

A. The material shall be pit-run gravel-sand (Section 2.6B), or at the discretion of the Engineer native sediment may be used to replace the pit-run gravel-sand mix (refer to Section 2.6D).

B. Spread and distribute beach nourishment material evenly and gently into the designated area, no more than 3 FT from the air to prevent segregating the various sizes.

C. Grade the finished surface to the design grade and to be level with the surrounding beach grade.

7 CONSTRUCTION OF ROCK WALLS

7.1 Keyway Excavation

A. Refer to Section 5.2 on Keyway excavation and compaction for wall installation.

7.2 Geotextile Installation

A. Install geotextile as indicated in Detail A on Sheet 12, and in accordance with the manufacturer's instructions.

B. Place geotextile on smooth graded surface, and in immediate contact with the prepared surface such that there are no void spaces, and that it will not be excessively stretched or torn.

C. Place geotextile in cross-shore direction (from shore to inland); join geotextile sheets by overlapping at least 2 feet.

D. Anchor the geotextile on the top and on slopes using anchor pins recommended by the manufacturer or wood spikes. Fold the geotextile.

E. Spread a thin layer of small-size spalls (up to 6”) to help stabilize the geotextile.

F. After completion of rock placement and backfill, fold the end of the geotextile and cover it with 4-6” of cobbles. Use proper size quarry spalls first to seal any large holes and gaps from the back to ensure the fill cobbles won’t escape through the holes or gaps.

7.3 Rock Wall Rock Replacement

A. Rock walls shall be constructed with a batter of approximately 1:4 - 1:5 (horizontal: vertical), with relatively smooth wall face and a level gradually transitioning design crest elevations as shown on Sheet 7.

B. Oversized rock (3 Man or larger) shall be used for the base course rock. Base rock shall be pressed/consolidated to achieve full contact with the base.

C. Each rock shall be placed bearing one another with adjacent rocks as tightly as possible, with no full gap, and minimum gaps and voids. A minimum of 3-point contact and good interlock are required. To achieve that, rock selection and placing orientation based on its size and shape are critical.

D. Also “chinking” with small rock may be applied to provide necessary additional point of support. The chinking rock shall hard quarry rock secured by large rock and immovable.

E. For wall stability, all placed rock should in general or ideally be laying back slightly and with a slightly sloped back surface. This is to ensure each rock center of gravity has a little setback compared to its lower tier, so it is more stable as supported by both the lower course rocks and the backfill. This is more important for the stability of the cap (top course) rock.

F. Each rock shall have sufficient width to achieve the design wall thickness. Single rock depth shall not be short of the design thickness by more than 6 inches.

G. Undersized rocks shall only be occasionally used and evenly distributed over the wall face. No more than two small rocks shall be allowed to be lining together.

H. Voids greater than 6 inches are in general not allowed. If not avoidable, it shall be filled with small size rocks quarry spalls from the back of the wall to prevent any loss/escape of backfill rock.

I. Properly secure and protect exposed bank and the wall (including backfill materials) in construction from wave impact and wave erosion at the end of each workday or prior to each rising tide.

7.4 Rock Wall Backfill

A. Backfill shall follow the completion of no more than two courses (tiers) of rock wall placement until the finished grade shown in Contract Plans is achieved. Always inspect the rock stacking to satisfaction before backfilling the wall with salvaged quarry spalls. Backfill shall progress at each layer-lift with approximately 2 FT in thickness.

B. Inspect and manually place large spalls behind large wall holes or voids as necessary to prevent backfill rock from escaping the wall holes. Fill up the backfill space with quarry spalls and compact each lift thoroughly with the excavator bucket before placing the next lift. Fill the quarry spall up to 4” below the finished grade, fold the geotextile and cover it with the cobble toe material.

C. against the bare bank surface with smaller size imported cobble material. .

D. Fill the keyway (trench) in front of wall with excavated sediments or quarry spalls (if quantity allows) up to 12” below the finished beach grade at the tow. Fill a minimum 12” of same cobble material as used for cobble toe to fill the toe of the rock wall to the design grade per Contract Plans.

8 LANDSCAPING AND PLANTING BED PREPARATION

8.1 Mulch-Covered Pedestrian Paths

A. Crushed rock paths shall be constructed per plans shown on Landscape Sheets 13 and 14.

B. The base for the pedestrian paths shall be slightly higher (~3”) than the planting bed and gently compacted with 2% slope to both sides.

C. Mulch cover for the paths shall be 4” depth at minimum using the recovered mulch previously used for the construction access (see Section 2.7).

8.2 Planting Bed Preparation

A. The contractor shall prepare the planting beds in accordance with the design plans and design notes. Refer to Sheet 13 and Sheet 14 Planting Plans for areas of plating beds for different plants and the associated soil preparation processes described in the design notes on these sheets and/or instructed by KCCD.

8.3 Habitat Log Placement

A. The imported and/or salvaged habitat logs shall be placed on the upper beach/ back shore close to or around the Elevation 12 line, and at locations instructed by the Engineer on the field.

B. Logs shall be placed with at least 1/3 embedment. Log placement is to be field directed by Engineer.

C. Placement of imported logs is incidental to Bid Item 29. Placement of salvaged logs is incidental to Bid Item 10.

9 CONSTRUCTION OVERSIGHT AND INSPECTION

9.1 Construction Oversight

A. Engineer, PM or their representative will generally be present on site or available on call through key construction phases to provide additional instructions, answer questions, and conduct inspections.

B. Pre-arrangement will be worked out between Contractor and Engineer/PM for onsite oversight schedule based on Contractor's construction plan and schedule.

C. The Contractor shall submit field photos on a daily basis while construction is occurring onsite. Engineer's intermediate inspection may either be on site or through the review of the field photos.

9.2 Inspections

A. Progress inspections will be performed by the PM and Engineer in conjunction with onsite oversight through key stages of the construction.

B. A final acceptance inspection will be performed at an agreed schedule in accordance with procedures and requirements presented in WSDOT Section 1-05 Control of Work.