SOUTH TONGUE POINT RESTORATION PROJECT

ASTORIA, CLATSOP COUNTY, OREGON

Columbia River Estuary Study Taskforce (CREST)

818 Commercial Street, Suite 203

Astoria, Oregon 97103

CONSTRUCTION SPECIFICATIONS AND SPECIAL PROVISIONS

DECEMBER 2022

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STANDARD SPECIFICATIONS

INTRODUCTION

The following Amendments and Special Provisions shall be used in conjunction with the 2021 Oregon Department of Transportation (ODOT) Oregon Standard Specifications for Construction, hereafter "Standard Specifications". The following Standard Specifications sections do not apply to the work:

- 00400 Drainage and Sewers
- 00500 Bridges
- 00600 Bases
- 00700 Wearing Surfaces
- 00800 Permanent Traffic Safety and Guidance Devices
- 00900 Permanent Traffic Control and Illumination Systems

AMENDMENTS TO THE STANDARD SPECIFICATIONS

The following Amendments to the Standard Specifications are made a part of this contract and supersede any conflicting provisions of the Standard Specifications. ODOT has not published any amendments to the standard specifications as of the date of the writing.

The deletion, amendment, alteration, or addition to any subsection or portion of the Standard Specifications is meant to pertain only to that particular portion of the section, and in no way should it be interpreted that the balance of the section does not apply unless stated as such.

All instances of text within the standard specifications that contain "Agency" shall be replaced by, refer to, or imply "Columbia River Estuary Task Force" or "CREST". Contracting Agency Representative (CAR) shall also refer to "CREST".

SPECIAL PROVISIONS

INTRODUCTION TO THE SPECIAL PROVISIONS

The work on this project shall be accomplished in accordance with the Standard Specifications. The Standard Specifications, as modified or supplemented by the Amendments to the Standard Specifications and these Special Provisions, all of which are made a part of the Contract Documents, shall govern all of the Work.

These Special Provisions are made up of both General Special Provisions (GSPs) from various sources, which may have project-specific fill-ins; and project-specific Special Provisions. Each Provision supplements, modifies, or replaces the comparable Standard Specification, or is a new Provision.

PART 00100 – GENERAL CONDITIONS

DESCRIPTION OF WORK

The South Tongue Point Restoration Project involves the reconnection and restoration of tidal habitat areas along the Columbia River in Clatsop County, Oregon. All work will be accomplished in the vicinity of the following area:

- The project site is called South Tongue Point and consists of work on property owned by The Clatsop Community College (College) identified as parcel 809120000106 and the State of Oregon Department of State Lands, identified as parcel 809120000107. Primary site access will be provided by the College from Liberty Lane as shown on the plans.

All improvements shall consist of those items of work listed on the Bid sheet and as shown on the accompanying Plans. The Contractor shall perform all labor and furnish all materials, equipment and incidentals required to make each item complete. Work shall include, but not be limited to:

1. Masticate or mulch existing vegetation within limits of disturbance for each grading site. Salvage and stockpile masticated or mulched vegetation and topsoil layer along perimeter of grading sites.
2. Grade tidal channel networks, flow-through channels, scrapedown area, and forested swale. Utilize excavated cut material in designated Fill Area 1 and Fill Area 2.
3. Incorporate salvaged and stockpiled mix of vegetation and topsoil into finished grade surfaces and habitat features as specified to support healthy soil development processes.
4. Install aquatic and terrestrial large wood habitat features.
5. Construct unpaved pedestrian trail by partially obliterating temporary construction access routes.

Contractor shall verify conditions on the site. Water elevations shown on the drawings may not represent conditions at the time of construction. The site is subject to fluctuating water levels.

SECTION 00150 – ORGANIZATION, CONVENTIONS, ABBREVIATIONS, AND DEFINITIONS

00110.20 – DEFINITIONS

This Section is supplemented with the following:

All references in the Standard Specifications to the terms “State”, “Department of Transportation”, “Secretary of Transportation”, “Secretary”, “Headquarters”, and “State Treasurer” shall be revised to read “Contracting Agency” (the Contracting Agency is The Columbia River Estuary Task Force, hereafter “CREST”)”.

The venue of all causes of action arising from the advertisement, award, execution, and performance of the contract shall be in the Superior Court of Clatsop County.

Additive

A supplemental unit of work or group of bid items, identified separately in the proposal, which may, at the discretion of the Contracting Agency, be awarded in addition to the base bid.

Alternate

One of two or more units of work or groups of bid items, identified separately in the proposal, from which the Contracting Agency may make a choice between different methods or material of construction for performing the same work.

Contract Documents

See definition for “Contract”.

Contract Time

The Period of Time established by the terms and conditions of the contract within which the work must be physically completed.

Dates

Bid Opening Date

The date on which the Contracting Agency opens and reads the bids.

Award Date

The date of the formal decision of the Contracting Agency to accept the lowest responsible and responsive bidder for the work.

Contract Execution Date

The date the Contracting Agency officially signs the contract.

Notice to Proceed Date

The date stated in the Notice to Proceed on which the contract time begins.

Substantial Completion Date

The day the Contracting Agency's Representative determines the Contracting Agency has full and unrestricted use and benefit of the facilities, both from the operational and safety standpoint, and only minor incidental work, replacement of temporary substitute facilities, or correction or repair remains for the physical completion of the total contract.

Physical Completion Date

The day all of the work is physically completed on the project. All documentation required by the contract and required by law does not necessarily need to be furnished by the Contractor by this date.

Completion Date

The day all the work specified in the contract is completed and all the obligations of the Contractor under the contract are fulfilled by the Contractor. All documentation required by the contract and required by law must be furnished by the Contractor before establishment of this date.

Final Acceptance Date

The date on which the Contracting Agency accepts the work as complete.

Notice of Award

The written notice from the Contracting Agency to the successful bidder signifying the Contracting Agency's acceptance of the bid.

Notice to Proceed

The written notice from the Contracting Agency authorizing and directing the Contractor to proceed with the work and establishing the date on which the contract time begins.

Traffic

Both vehicular and non-vehicular traffic, such as pedestrians.

SECTION 00120 – BIDDING REQUIREMENTS AND PROCEDURES

00120.05 REQUESTS FOR PLANS, SPECIAL PROVISIONS, AND BID BOOKLETS

Amend this section and replace it with the following:

Information as to where Bid Documents can be obtained or reviewed will be found in the Call for Bids (Request for Bids) for the work.

After award of the contract, plans and specifications will be issued electronically to the Contractor at no cost as detailed below:

To Prime Contractor	**No. of Sets**	**Basis of Distribution**
Half-size plans (e.g., 11" x 17")	1	One set to be furnished electronically as a PDF upon request.

Additional plans and Contract Provisions may be purchased by the Contractor.

SECTION 00150 – CONTROL OF WORK

00150.60 – CONSTRUCTION EQUIPMENT RESTRICTIONS

Amend this section with the following:

(d) Protection of Sensitive Wetland Areas and Waterbodies – All construction equipment operating in wetlands or waterbodies (ponded areas, channels, and river) shall exclusively use bio-based hydraulic fluids. Bio-based hydraulic fluids include those made with renewable resources such as natural vegetable oil.

(e) Equipment for Soft Soil Conditions – Soft soil conditions may necessitate the use of low-ground pressure equipment or smaller sized equipment. Contractor may propose the use of temporary matting to protect sensitive wetlands and in wet or soft soil conditions; the use of temporary matting and geotextiles to be approved by the Contracting Agency's Representative prior to use.

SECTION 00170 – LEGAL RELATIONS AND RESPONSIBILITIES

00170.02 PERMITS, LICENCES AND TAXES

Amend this section as follows:

The Contracting Agency has obtained the below-listed permit(s) for this project. All contacts with the permitting agency concerning the below-listed permit(s) shall be through the Contracting Agency. A copy of all permits received will be provided to the Contractor upon award. Contractor shall comply with all permit requirements at all times and furnish monitoring data if required.

Name of document	**Permitting Agency**	**Permit Reference #**
Section 404 Permit	U.S. Army Corps of Engineers	
Fill-Removal Authorization	Oregon Department of State Lands	
Construction Stormwater 1200A	Oregon Department of Environmental Quality	
City of Astoria Planning Approval	City of Astoria Planning Department	
Eagle Incidental Take Permit	U.S. Fish and Wildlife Service	

The Contractor shall obtain additional permits as necessary. All costs to obtain and comply with additional permits shall be included in the applicable bid items for the work involved.

SECTION 00180 – PROSECUTION AND PROGRESS

This section is supplemented with the following:

00180.01 Project Duration

This project shall be physically completed within ***80*** calendar days from the date of mobilization.

SECTION 00320 – CLEARING AND GRUBBING

The following subsections are amended as follows:

00320.40 Clearing Operations

Supplement paragraph (b)(4) Salvaging Vegetation and Natural Materials with the following:

Salvage and stockpile native trees larger than 8 inches DBH for reuse per Section 1046, unless otherwise directed by CAR to preserve trees. Prior to salvage of large wood, trees, shrubs, and smaller vegetative materials from onsite, CAR and Contractor shall coordinate to identify and mark proposed salvaged and preserved materials. Smaller diameter woody material and vegetation shall be salvaged along with the upper 3 inches of topsoil within the construction limits, for reuse as a soil amendment according to Special Provisions 1040 and 1046. Salvaged topsoil stockpiled for reuse shall be free from plastic, glass, metal, concrete, or other deleterious materials. Woody materials and vegetation smaller than 8 inches DBH shall be masticated, mulched, or otherwise broken into particle sizes smaller than 3 inches measured in the longest direction using excavator mounted or other CAR approved equipment. CAR approval of stockpiled materials is required prior to reuse as soil amendment.

00320.90 Payment

Pay Item	**Unit of Measurement**
(a) Mastication of vegetation for salvage and reuse	Acre
(b) Salvage of topsoil and masticated vegetation	Area

Salvage and stockpile of native trees larger than 8 inches DBH is incidental to construction of habitat feature pay items per Section 1046.

SECTION 00330 – EARTHWORK

The following subsections are amended as follows:

00330.41 Excavations

Change 00330.41(a)(4) to read as follows:

Earthwork quantities are approximate. Quantities are calculated based on bank volumes between Existing Grade and Finished Grade surfaces.

Excess Materials – If the quantities of excavated materials are greater than required to meet targeted grading slopes and elevations, the additional materials shall be placed in the nearest designated Fill Area and above the maximum tide elevation as shown on the Plans, unless otherwise directed by CAR. Fill placed within the designated Fill Areas shall be compacted in lifts not exceeding 12-inches. Compact to a be firm and unyielding condition. Acceptance of the compaction methods and final compaction shall be determined and accepted by the CAR.

The United States Fish and Wildlife Service (USFWS) intends to provide one operator and one mid-sized excavator for a period of three weeks, at no cost, to support the project. Earthwork identified in the project bid items for onsite haul, placement, and grading only shall be performed in coordination with grading site excavation performed with the USFWS operator and equipment. For the purposes of estimating Contractor haul distance, it is assumed that the grading site that the cut material shall originate from will be Flow-Through Channel 1. USFWS excavation production rate is assumed as a minimum of 900 cubic yards per day for a total of 15 working days. Contactor to coordinate with CAR and USFWS on scheduling and performance of this bid item.

Optional additional general excavation shall be performed following completion and CAR acceptance of all base contract general excavation and work performed in coordination with USFWS. Optional additional general excavation is intended to provide a pay item for Contractor supported completion of grading site excavation work if USFWS's production rate or total work period is less than the estimated amounts.

This section is amended as follows:

00330.43 Earthwork Compaction Requirements

This section is amended as follows:

(a) General – The density requirements of Section 00330.43 do not apply to grading and fill placement on the site. Light compaction by driving tracked or rubber tire equipment over the surface a minimum of two times is sufficient for fills. Final grade to be within +/- 3 inches of specified grade. Final grade to be measured and approved at least 2 weeks after placement and light compaction of earlier layers to account for initial settlement. Do not leave ruts or tracks in final grading; smooth as necessary. CAR to approve final grading and measurements.

00330.80 Measurement

Supplement this section as follows:

Measurement for material excavated by USFWS and which the Contractor is responsible for onsite haul, placed, and Fill Area grading shall be measured on a volume basis for the portion of Flow-Through Channel 1 excavated by USFWS. The portion shall be determined by CAR survey of the point of beginning and point of completion along Flow-Through Channel 1 of USFWS excavation, and calculated by the Engineer as the DTM volume between both points.

SECTION 01030 – SEEDING

Materials

01030.13 Seed

Supplement paragraph (f) with the following:

Unless otherwise notified by CAR, Contractor will provide soil preparation and seeding, and surface topdressing of newly graded finished earth surfaces specified in the following paragraph, unless indicated otherwise, and at all areas inside or outside the limits of construction that are disturbed by the Contractor's operations.

Areas (Restoration Seeding Areas) to be seeded are indicated in the plans. All disturbed areas and exposed soil below elevation 7.2 feet shall remain unseeded and replanted as shown on the plans and per Section 01040. All disturbed areas above elevation 7.2 feet and below 9.5 feet shall be seeded with the scrub-shrub high marsh native seed mix, Seed Mix A, based on the elevation and planting zones described in the drawings, excluding zone perimeter areas shown on the plans for fascine bundle or brush trench installation. All disturbed areas shown on the plans for brush trench installation shall be seeded with the brush trench native seed mix, Seed Mix B. All disturbed areas between elevation 9.5 feet and the upper limit of disturbance as shown on the Plans, with the exception of the pedestrian trail, shall be seeded with the riparian forest native seed mix, Seed Mix C. All disturbed areas shown on the plans for upland fill slopes, upland fill tops, and the pedestrian trail shall be seeded with the upland fill native seed mix, Seed Mix D.

Seed shall be applied to disturbed areas within 24 hours of completing earthwork, prior to demobilization from a work area. Seeds shall be certified “Weed Free,” indicating there are no noxious or nuisance weeds in the seed. Seeding will be performed between September 1 and September 31 unless the construction period extends beyond those dates.

After seeding, the disturbed areas seeded by application methods other than hydroseeding should be covered with straw mulch material at a minimum rate of 2 tons per acre. Hydroseeded areas do not need straw mulch. The contractor shall provide a method satisfactory to the CAR for determining weight of mulch furnished. Material specifications for the mulch are provided in Section 01030.15. Sunlight shall not be completely excluded from penetrating to the ground surface. Mulch shall be applied on the same day as the seed is installed.

Seed shall be purchased by a local nursery and shall be applied evenly throughout the planting areas per drawings.

Seed Mix A: Scrub-Shrub High Marsh shall be composed as follows:

MIX	COMMON NAME	SCIENTIFIC NAME	POUNDS PER ACRE OF PLS (PLS = PURE LIVE SEED)
Seed Mix A: Scrub-Shrub High Marsh	Nodding beggartick	*Bidens cernua*	2
	Meadow barley	*Hordeum brachyantherum*	3.5
	American sloughgrass	*Beckmannia syzigachne*	4
	Northern water-plantain	*Alisma triviale*	2
	Tufted hairgrass	*Deschampsia cespitosa*	3
	Rice cutgrass	*Leersia oryzoides*	2
	Bluejoint grass	*Calamagrostis canadensis*	1
	California brome	*Bromus carinatus*	8
	Spike bentgrass	*Agrostis exarata*	0.4
	Common rush	*Juncus effusus ssp. pacificus*	3
	Small-fruited bulrush	*Scirpus microcarpus*	1
	Narrow mannagrass	*Glyceria leptostachya*	3.5
		Total Pounds PLS per acre =	**33.4**

Seed Mix B: Brush Trench shall be composed as follows:

MIX	COMMON NAME	SCIENTIFIC NAME	POUNDS PER ACRE OF PLS (PLS = PURE LIVE SEED)
Seed Mix B: Brush Trench	Tufted hairgrass	*Deschampsia cespitosa*	2
	Rice cutgrass	*Leersia oryzoides*	7
	Slough sedge	*Carex obnupta*	0.25
	Small-fruited bulrush	*Scirpus microcarpus*	2
	Common rush	*Juncus effusus ssp. pacificus*	3
		Total Pounds PLS per acre =	**14.3**

Seed Mix C: Riparian Forest shall be composed as follows:

MIX	COMMON NAME	SCIENTIFIC NAME	POUNDS PER ACRE OF PLS (PLS = PURE LIVE SEED)
Seed Mix C: Riparian Forest	Common camas	*Camassia quamash*	2
	Slender hairgrass	*Deschampsia elongata*	4
	Blue wildrye	*Elymus glaucus*	5
	Riverbank lupine	*Lupinus rivularis*	1
	Cow parsnip	*Heracleum maximum*	0.75
	Meadow barley	*Hordeum brachyantherum*	5
		Total Pounds PLS per acre =	**17.75**

Seed Mix D: Upland Fill shall be composed as follows:

MIX	COMMON NAME	SCIENTIFIC NAME	POUNDS PER ACRE OF PLS (PLS = PURE LIVE SEED)
Seed Mix C: Upland Fill	Blue wildrye	*Elymus glaucus*	8
	Slender hairgrass	*Deschampsia elongata*	5
	Alaska brome	*Bromus sitchensis*	8
	Red fescue	*Festuca rubra rubra*	4
	Meadow barley	*Hordeum brachyantherum*	8
	Riverbank lupine	*Lupinus rivularis*	1
		Total Pounds PLS per acre =	**34**

01030.14 Fertilizer

Replace this section with the following:
Fertilizer shall not be used.

01030.15 Mulch

Replace this section with the following:
Mulch shall be Straw meeting the requirements of Section 01030.15(b) for areas not specified for hydroseeding. For areas specified for hydroseeding, mulch shall meet the requirements of Section 01030.15(a) for hydromulch and the HIP requirements provided on the plans, unless otherwise approved by CAR.

Construction

01030.41 Area Preparation
Supplement this section with the following:

(f) Method "F" (Restoration Seeding Areas) - Areas to be seeded are shown in the Plans. Prior to seedbed cultivation blended salvaged topsoil and masticated vegetation shall be spread and tilled or ripped into finished grade surfaces above elevation 6 feet to loosen compacted subsurface soils and intermix the salvaged materials for soil amendment. The blended salvaged topsoil and masticated vegetation shall be applied to grading sites as follows:

- Flow-Through Channel 1;
- Flow-Through Channel 2;
- Tidal Channel Network 1;
- Tidal Channel Network 4;
- Tidal Channel Network 5; and,
- Tidal Channel Network 6.

The blended salvaged topsoil and masticated vegetation shall be omitted from the following grading sites:

- Tidal Channel Network 2;
- Tidal Channel Network 3;
- Fill Area 1; and,
- Fill Area 2.

Intermixing of salvaged materials shall take place no less than 2 weeks prior to seeding.

Prior to seeding, the soil shall be in a weed-free and bare condition.

01030.48 Application

Supplement this section with the following:

The application rate for the scrub-shrub high marsh native seed mix (Seed Mix A) shall be 33.4 pounds of pure live seed per acre. The application rate for the brush trench native seed mix (Seed Mix B) shall be 14.3 pounds of pure live seed per acre. The application rate of the riparian forest native seed mix (Seed Mix C) shall be 17.75 pounds of pure live seed per acre. The application rate for the upland fill native seed mix (Seed Mix D) shall be 34 pounds of pure live seed per acre.

(f) Restoration seed cultivation, except for pedestrian trail and fill areas

Cultivation and seeding for disturbed areas, except for the pedestrian trail and fill areas, shall be by Contractor selection and CAR approval of the following options:

1. Drill seed/crimping
    a) Use a no-till grass seed drill to achieve approximately 1/8 inch of soil cover over seed.
    b) Hand or mechanically spread seed.
    c) Dry mulch per 01030.15.
    d) Use a crimping disc to incorporate the mulch and seed into surficial soils
2. Chain harrow
    a) Use a heavier chain harrow to roughen the seedbed to a depth of 1/2-inches to 1-inch.
    b) Hand or mechanically spread seed.
    c) Dry mulch per 01030.15.
    d) Lighter chain harrow to a depth of 1/4-inch to 1/2-inch over top to incorporate seed.
3. Contractor proposed and CAR approved equivalent cultivation and seeding method.

(g) Restoration seed cultivation for pedestrian trail and fill areas

Cultivation and seeding for the disturbed areas associated with the pedestrian trail and fill areas, shall be by Contractor selection and CAR approval of the following options:

1. Hydroseeding, hydromulching, and tacking
    a. No fertilizer shall be used with hydroseed applications.

b. Contractor proposed tackifier method as per either 01030.48(a)(4)(a) or 01030.48(a)(4)(b).
c. If Contractor selects hydroseeding and tacking, straw mulch in addition to and overtop of applied hydromulch is not required.

2. Hand or mechanically spread seed, followed by application of dry powder tackifier per the rate specified by 01030.48(b)(3)(a).

Maintenance

01030.60 General

Supplement this section with the following:

- **Scrub-Shrub High Marsh Seeding** (Seed Mix A) – 90% coverage of ground surface or greater
- **Brush Trench Seeding** (Seed Mix B) - 90% coverage of ground surface or greater
- **Riparian Forest Seeding** (Seed Mix C) – 90% coverage of ground surface or greater
- **Upland Fill Seeding** (Seed Mix D) – 90% coverage of ground surface or greater

SECTION 01040 – PLANTING

Supplement this section with the following. Where conflicts arise, the more stringent specification shall govern.

Description

01040.01 References

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

A. AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)
   ANSI Z60.1 (1996) Nursery Stock
B. L.H. BAILEY HORTORIUM (LHBH)
   LHBH (1976) Hortus Third

Supplement this section with the following. Where conflicts arise, the more stringent specification shall govern.

01040.03 General

Add the following requirements:

(e) Licensure

Construction company shall hold a landscape contractors license in the state where the work is performed and have a minimum of two years landscape construction experience. Submit copy of license.

01040.04 Coordination

Supplement this section with the following:

(a) Planting Work Plan (PWP) shall also include the following information:

1. Pre-Construction Submittals:
    a. Copies of State Landscape Contractor's License;
    b. Time Restrictions and Planting Conditions; and,
    c. Scheduled dates and locations for each type of planting.
2. Product Data Submittals:
    a. Local species materials; and,
    b. Documentation indicating species and source of all nursery stock, potted plants, seed mix, and live cuttings.
3. Certificate Submittals:
    a. Nursery certifications; and,
    b. Indication of names of plants in accordance with LHBM, including type, quality, and size.

Materials

01040.10 General

Supplement the section with the following:

Project Materials list submitted under this section shall include the following, matching the quantities and locations as stated on the Plans.

Zone 1 – Low Marsh

Common Name	Scientific Name
Giant bur-reed	*Sparganium eurycarpum*
Softstem bulrush	*Schoenoplectus tabernaemontani*
Creeping spikerush	*Eleocharis palustris*
Lyngbye's sedge	*Carex lyngbyei*
Northern water-plantain	*Alisma triviale*
Wapato	*Sagittaria latifolia*

Zone 2 – Mid Marsh

Common Name	Scientific Name
Small-fruited bulrush	*Scirpus microcarpus*
Pacific silverweed	*Potentilla pacifica/Potentilla anserina ssp. pacifica*
Lyngbye's sedge	*Carex lyngbyei*
Broadleaf cattail	*Typha latifolia*
Softstem bulrush	*Schoenoplectus tabernaemontani*

Zone 3 – Fascine Bundles

Plant with fascine bundles per Section 1046 and as shown on the plans.

Zone 4 - Scrub-Shrub High Marsh

Seed with Seed Mix A per Section 01030, and plant with the following:

Common Name	Scientific Name
Northern water plantain	*Alisma triviale*
Pacific willow	*Salix lucida* ssp. *lasiandra*
Hooker willow	*Salix hookeriana*
Sitka willow	*Salix sitchensis*
Black twinberry	*Lonicera involucrata*
Red osier dogwood	*Cornus sericea*
Common sneezeweed	*Helenium autumnale*
Slenderbeak sedge	*Carex athrostachya*
Spirea	*Spiraea douglasii*
Thick-head sedge	*Carex pachystachya*

Zone 5 –Brush Trench

Seed with Seed Mix B per Section 01030, and plant with the following:

Common Name	Scientific Name
Spirea	*Spiraea douglasii*
Hooker willow	*Salix hookeriana*
Red osier dogwood	*Cornus sericea*
Slough sedge	*Carex obnupta*

Zone 6 –Riparian Forest

Seed with Seed Mix C per Section 01030, and plant with the following:

Common Name	Scientific Name
Snowberry	*Symphoricarpus albus*
Nootka rose	*Rosa nutkana*
Pacific crabapple	*Malus fusca*
Thimbleberry	*Rubus parviflorus*
Red elderberry	*Sambucus racemosa*
Red alder	*Alnus rubra*
Scouler willow	*Salix scouleriana*
Sitka spruce	*Picea sitchensis*
Pacific ninebark	*Physocarpus capitatus*
Red osier dogwood	*Cornus sericea*
Black twinberry	*Lonicera involucrata*
Cottonwood	*Populus trichocarpa*
Western red cedar	*Thuja plicata*
Osoberry	*Oemleria cerasiformis*
Cascara	*Rhamnus purshiana*

Zone 7 –Upland Fill Slopes

Seed with Seed Mix D per Section 01030, and plant with the following:

Common Name	Scientific Name
Snowberry	*Symphoricarpus albus*
Thimbleberry	*Rubus parviflorus*
Red alder	*Alnus rubra*
Sitka spruce	*Picea sitchensis*
Osoberry	*Oemleria cerasiformis*
Cascara	*Rhamnus purshiana*
Coyote bush	*Baccharis pilularis ssp. consanguinea*
Red flowering currant	*Ribes sanguineum*
Red elderberry	*Sambucus racemosa*
Salal	*Gaultheria shallon*

Zone 8 –Upland Fill Tops
Seed with Seed Mix D per Section 01030.

01040.12 Product Delivery, Storage, and Handling

Supplement this section with the following:

Contractor must notify CAR 48 hours or more in advance of deliveries so that CAR may arrange for inspection of plants.

Deliver branched plants with branches tied, exposed, and covered with material which allows air circulation. Prevent damage to branches, trunks, root systems, and root balls and desiccation of leaves.

Deliver plants with durable waterproof labels in weather-resistant ink. Provide labels stating the correct botanical and common plant name and variety as applicable and size as specified in the list of required plants. Labels shall be legible for a minimum of 21 days after delivery to the planting site.

Do not store plants for more than 5 days on-site prior to installation. Store and protect plants not planted on the day of arrival at the site as follows:

- Shade and protect plants in outside storage areas from the wind and direct sunlight until planted.
- Heel-in bare root plants.
- Keep plants in a moist condition until planted by watering with a spray.
- Do not store plant material directly on concrete or bituminous surfaces.

Do not drop or dump plants from vehicles. Avoid damaging plants being moved from nursery or storage area to planting site. Handle balled and burlapped, bare root, and container plants carefully to avoid damaging or breaking the earth ball or root structure. Do not handle plants by the trunk or stem. Remove damaged plants from the site.

01040.14 Topsoil

Supplement this section with the following:

Prior to stockpiling topsoil, eradicate on site undesirable growing vegetation. Clear and grub existing vegetation minimum one week prior to stockpiling existing topsoil.

01040.19 Plants

Supplement this section with the following:

(b) Quality

Furnish plants grown under climatic conditions similar to those in the locality of the project or sourced as local species materials. Plants of the same specified size shall be of uniform size and character of growth.

(c) Certification

Furnish nursery stock in accordance with ANSI Z60.1, except as otherwise specified or indicated. Each plant or group of planting shall have a "key" number indicated on the nursery certifications of the plant schedule.

The following requirements will additionally be required. Where conflicts arise, the more stringent specification shall govern:

- Indicate names of plants in accordance with the LHBH, including type, quality, and size.
- Indicate on nursery letterhead the name of plants in accordance with the LHBH, including botanical common names, quality, and size.
- Submit documentation indicating species and source of all nursery stock, potted plants, seed mix and live cuttings.

(d) Inspection

All plants shall comply with all Federal and State Laws requiring inspection for plant diseases and infestation.

Final inspection will be made upon written request from the Contractor at least 10 days prior to the last day of the one-year warranty period. Final acceptance will be based upon a minimum 90% survival of all potted stock and satisfactory cover of cuttings.

Construction

01040.49 General Planting

Supplement this section with the following:

- The time limitation from delivery to installing plant material shall be a maximum of 5 days. The time limitation between installing the plant material and placing the mulch shall be a maximum of 24 hours.
- Notify CAR at least seven (7) working days prior to installation of plant materials.
- Do not plant when ground is frozen, snow covered, muddy, or when air temperature exceeds 90 degrees Fahrenheit.

Plant Establishment

01040.70 General

Delete the first sentence of the paragraph and replace with the following:

All plants shall be guaranteed for one year beginning on the date of inspection by the CAR to commence the plant establishment period, against defects including death and unsatisfactory growth, except for defects resulting from weather conditions unusual for the warranty period.

01040.73 Corrective Work

Supplement this section with the following:

Replace, in accordance with the Drawings and specifications, all plants that are dead or have lost 20 percent or more of their branches, as determined by the CAR, are in an unhealthy or unsightly condition, and have lost their natural shape due to dead branches, or other causes due to the Contractor's negligence. The cost of such replacements is at the Contractor's expense. All replacement plants shall be guaranteed for one (1) year after installation, unless otherwise specified.

Remove and immediately replace all plants, as determined by the CAR, to be unsatisfactory during the initial planting installation.

When work is found to not meet design intent and specifications, maintenance period will be extended at no additional cost to CREST until work has been completed, inspected and accepted by CAR.

B. REPLANTING

Replant with the same species and size for all potted stock determined to be dead or dying during the one-year warranty period.

C. FINAL INSPECTION AND ACCEPTANCE

Final inspection will be made upon written request from the Contractor at least 10 days prior to the last day of the one-year warranty period. Final acceptance will be based upon a minimum 90% survival of all potted stock and satisfactory cover of cuttings.

D. UNSATISFACTORY WORK

When work is found to not meet design intent and specifications, maintenance period will be extended at no additional cost to CREST until work has been completed, inspected and accepted by CAR.

Measurement

01040.80 Measurement

(d) Plant Materials

Supplement this section with the following:

Revegetation plantings will be measured on a unit basis and supported by Contractor submitted nursery receipts per plant installed in the project area and per pound of seed installed.

01040.90 Payment

Supplement this section with the following:

Payment will be made in accordance with Section 01040 of the Standard Specifications for the following items:

Pay Item	**Unit of Measurement**
(h) Native Plant Revegetation	Acre installed

SECTION 01046 – HABITAT FEATURES

Section 01046, which is not a Standard Specification, is included in this Project by Special Provision.

01046.00 Scope

Work under this section consists of the construction of Habitat Features in accordance with the Plans and these Special Provisions.

Five types of Habitat Features will be constructed:

A. Aquatic Habitat Wood Features (AHWF)

The AHWF is intended to enhance aquatic habitat conditions within the tidal channels by emulating the natural accumulations of large wood, providing shade and cover for juvenile salmonid habitat enhancement, and supplying detritus for food web cycling within the restoration area and the adjacent mainstem Columbia River habitats. AHWF are constructed using a combination of Contractor imported habitat logs with rootwads and CAR stockpiled site select salvaged large wood materials for Contractor installation as angled pile log groups.

B. Salvaged Large Wood, Non-Embedded (SLW)

The SLW is intended to enhance aquatic habitat conditions within the tidal channels by emulating the natural accumulations of large wood, providing shade and cover for juvenile salmonid habitat enhancement, and supplying detritus for food web cycling within the restoration area and the adjacent mainstem Columbia River habitats. SLW is constructed from CAR stockpiled site salvaged wood materials, which may include Salvaged Whole Trees (SWL), Salvaged Trees Without Rootwads, and Salvaged Rootwads without log stems. Construction methods for SLW are equivalent regardless of material.

C. Nurse Log (NL)

The NL is intended to provide multiple benefits including improvement of soil moisture capacity, healthy soil development processes through invigoration of detritivores and fungi, and providing macroinvertebrate habitat.

D. Brush Trench (BT)

The BT is a bioengineering technique that emulates the accumulation of smaller woody materials (e.g., branches) that naturally occurs in established riparian and marsh habitats, or other depositional locations between changes in grade and overbank flow conditions. BTs invigorate healthy soil development processes by improving soil moisture capacity, enhancing nutrient cycling, and facilitating mycorrhizal symbiosis with native plantings. BTs can also act as vegetative filter fences to exclude access or spread of invasive species, and both slow the rate and improve the quality of surface runoff and shallow groundwater flows. BTs are shown on the Plans upslope of the Scrub-Shrub High Marsh revegetation zone to exclude landward originating and potentially downslope propagating RCG seed or viable plant materials from penetrating this and the lower elevation habitat zones.

E. Fascine Bundles

Fascine bundles are a bioengineering technique that support early and faster development of dense woody vegetation coverage along specified alignments. As fascine bundle vegetation establishes, the woody stems and foliage provide native plant material competition for the propagation of non-native invasive plant species like reed canary grass (RCG). Additionally, fascine bundles provide wildlife cover, nesting habitat, and increase surface roughness to reduce the potential for erosive damaged to finished grades. Fascine Bundles are shown on the Plans downslope of the Scrub-Shrub High Marsh revegetation zone to exclude river transported and deposited RCG seed or viable plant materials from penetrating this and the higher elevation habitat zones.

01046.10 Material

Furnish materials meeting the following requirements:

(a) Wood Materials

Wood materials shall be imported logs and/or originate from site salvaged sources including from CAR provided stockpiles and/or contractor clearing and grubbing activities. The Contractor is responsible for verifying the location, quantity, dimensions, equipment needs, haul distances for all CAR provided stockpiled large wood. Log sourcing for imported wood materials shall be the responsibility of the Contractor, unless otherwise agreed upon by the CAR prior to delivery of imported wood to the site. The Contractor is responsible for haul and transport of imported logs to the site. All Contractor proposed imported wood shall be inspected and approved by the CAR prior to site import. All undesirable growth from wood shall only be pruned if designated by CAR. All attached root systems shall not be pruned unless designated by CAR.

Habitat Logs:

1. Shall conform to the dimensions as indicated on the Plans and herein.
2. Shall have a diameter not less than the diameter indicated on the Plans, measured as the diameter at breast height (DBH).
3. Shall be sourced from Sitka Spruce or other conifer species with prior approval by CAR.
4. Shall include an intact rootwad mass. The rootwad mass shall have a diameter equal to or greater than three (3) times the log diameter (DBH), or otherwise approved by the CAR. The rootwad mass shall have a length equal to or greater than two (2) times the log DBH, or as otherwise approved by the CAR.
5. Shall have a maximum diameter of taper of 1 inch per 10 feet, or as otherwise approved by the Engineer.
6. Shall be from sound stock and appropriate for the intended feature construction. The trunk of the logs shall be reasonably straight and uniform, and free from excessive bends, bulges, and limbs that will impede the placement of additional logs in the applicable feature. Logs exhibiting breakage, rot, splitting, holes, pest infestation, foreign objects/finishes, vandalism, burn, and

other damages are unacceptable and may be rejected by the CAR. Rejected logs shall be removed from the site and disposed of at the Contractor's expense.

7. Limbs shall be trimmed within one inch of the face of the log. Limbs do not include the rootwad mass.
8. Rootwad mass shall not be trimmed unless designated by the Engineer and approved by the CAR.
9. Rootwad masses shall conform to the dimensions indicated in the Plans and herein.
10. Rootwad masses shall be reasonably uniform and full; rootwads that are asymmetrical may be rejected by the CAR.
11. All Contractor proposed Habitat Logs will be inspected by the CAR prior to installation and acceptance of imported logs.

Salvaged Large Wood

Salvaged large wood materials shall originate from onsite sources located within the grading and planting work limits shown on the Plans. Salvaged Large Wood consists of whole trees or portions of whole trees that are selectively removed by the Contractor from the grading extents shown on the plans and as directed by the CAR and from CAR provided stockpile locations. Trees located outside of the work extents shown shall be protected in place unless the Contractor identifies trees as potential hazards to safe performance of the project work by construction equipment and personnel. Trees identified by the Contractor as potential hazards may be considered for additional salvaged large wood sourcing by the Contractor with CAR approval. Salvaged large wood may be processed by the Contractor to generate log portions meeting the specified criteria and dimensions shown on the plans, or as otherwise approved by the CAR. All wood will be inspected and approved by the CAR before installation as habitat features. All undesirable growth from wood shall only be pruned if designated by CAR. All attached root systems shall not be pruned unless designated by CAR. Salvaged Large Wood shall meet and be salvaged based on the following criteria:

1. Wood salvaging shall use methods to protect surrounding vegetation.
2. Prior to salvage, Contractor shall identify and mark proposed salvage large wood for inspection by CAR. Marking of proposed salvaged large wood shall be done in a manner that does not damage the bark, trunk, branches, leaves, or roots of the tree. Flagging and CAR inspection shall be coordinated by Contractor prior to clearing and grubbing.
3. Suitability of salvaged wood shall be determined by the CAR.
4. CAR approved Salvaged Large Wood may be removed by the Contractor during clearing activities as specified by Section 00320.
5. Salvaged Large Wood shall be placed as non-embedded on top of CAR approved finished grades, unless otherwise directed by the CAR.

Select Salvaged Large Wood

Select salvaged large wood materials shall meet the requirements of Salvaged Large Wood, but will be identified by the CAR as Red Alder meeting the dimensions shown on the plans and decay classification requirements for Contractor construction of angled pile log groups as part of the AHWFs. The CAR will

identify and approve select salvaged large wood and coordinate with the Contractor on marking these materials for use in AHWF's. The Contractor will be responsible for confirming the dimensions and integrity of select salvaged large wood before hauling from the CAR stockpile location and/or installation.

Nurse Logs:

1. Shall conform to the dimensions as indicated on the Plans and herein.
2. Shall have a diameter not less than the diameter indicated on the Plans by either of the following measurements:
    A. Diameter measured as diameter at breast height (DBH) for whole trees.
    B. Diameter measured at the midpoint of log length (cut end to end) for processed portions of whole trees.
3. Shall be sourced from salvaged large wood unless otherwise approved by CAR for import at Contractor's expense.
4. Do not include an intact rootwad mass.
5. Shall have a maximum diameter of taper of 1 inch per 10 feet, or as otherwise approved by the Engineer.
6. Shall be sourced from sound stock and appropriate for the intended feature construction. The trunk of the logs shall be reasonably straight and uniform, and free from excessive bends, bulges, and limbs that will impede the placement of the log. Logs exhibiting breakage, rot, splitting, holes, pest infestation, foreign objects/finishes, vandalism, burn, and other damages are unacceptable and subject to CAR rejection and approval for use in habitat features. CAR rejected logs shall be removed from the site or otherwise stockpiled per CAR direction.
7. Limbs shall be trimmed within one inch of the face of the log, unless otherwise approved by CAR.

(b) Amended Soil Backfill

Amended soil backfill shall consist of a blended media created by mixing salvaged topsoil and masticated vegetation per Section 00320 with native backfill excavated for HF construction. Amended soil backfill mixing shall achieve a consistent and homogenous matrix to support native plant and seed establishment as well as detrital processes. The portion of salvaged topsoil and masticated vegetation mixed with native backfill shall not exceed 50-percent of the amended soil backfill, unless otherwise approved by the Engineer.

01046.40 Construction

Habitat Features be installed as shown on the Plans as Aquatic Habitat Wood Features, Salvaged Large Wood, Nurse Logs, Brush Trenches, and Fascine Bundles. Salvaged Large Wood will be placed in locations and orientations generally shown on the plans and as directed by the CAR. Salvaged Large Wood is identified on the plans as Salvaged Rootwads, Salvaged Tree without Rootwads, and Salvaged Whole Tree with Rootwads.

01046.80 Measurement

Work performed under this Section will be measured on the unit basis per AHWF, SLW, and NL installed in the Project Area. Measurement for constructed BT and Fascines will be per linear foot installed, not counting gaps as directed by CAR.

01046.90 Payment

The accepted quantities of Habitat Features will be paid for at the Contract unit price, per unit of measurement, for the following items:

	Pay Item	**Unit of Measurement**
(a)	Aquatic Habitat Wood Feature (AHWF)	Each
(b)	Salvaged Large Wood (SLW)	Each
(c)	Nurse Log (NL)	Each
(d)	Brush Trench (BT)	Linear Foot
(e)	Fascine Bundles	Linear Foot

For all items listed, the unit contract price per each for item shall be full pay for installing the Feature as shown on the Plans or as directed by the CAR including hauling, excavation, backfill and compaction, and any required vegetative control measures.

SECTION 01050 – FENCING

Temporary Fencing. The contractor shall provide temporary fencing and locking gates wherever necessary to prevent pedestrians and unauthorized vehicles from entering work areas. Contractor is responsible for providing sufficient temporary fencing, gates, or alternate security measures to protect equipment and construction features through the duration of the contract. Contractor to submit proposed temporary fencing type for approval by CAR a minimum of seven (7) days prior to installation. Contractor shall coordinate with CAR for display of CAR provided public information and exclusion signage for duration of the contract.

Existing Fencing. Unless shown otherwise on the plans or described herein, the contractor shall maintain all existing gates and fencing at the site in good condition at all times. Gates shall be closed immediately after entering or exiting.

Contractor may remove existing fencing within the permanent and temporary work areas shown on the plans per prior approval by the CAR and in accordance with Section 00310.

APPENDIX 1: SURVEY CONTROL POINT TABLE

The following table provides northing and eastings for the survey control points shown on the plans. Northing and easting coordinates are relative to the North American Datum of 1983 (NAD83) using the Oregon State Plane North [NAD83] horizontal projection with units of international feet. The elevations are referenced to the North American Vertical Datum of 1988 (NAVD88) with units of feet.

Point #	Northing	Easting	Elevation
1	934082.97	7379485.69	14.865
2	934475.96	7379137.85	15.061
3	934277.12	7379291.64	14.853
4	935036.97	7378799.68	14.679
5	935442.38	7378577.02	14.694
6	936972.65	7377058.62	79.854
7	936618.19	7379941.15	16.305
8	936313.37	7378154.88	17.284
9	936298.12	7378290.88	16.738
10	934738.71	7379652.01	17.087
11	934798.02	7379601.54	19.193
12	934290.48	7379925.92	13.094
13	934036.21	7379954.05	8.902
14	935571.53	7379388.92	17.792
15	935650.93	7379382.61	17.631

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APPENDIX 2: STANDARD DRAWINGS AND DETAILS

DRAWINGS

RD1000 – CONSTRUCTION ENTRANCE – TYPE 1

RD1005 – CHECK DAMS TYPE 1, 3 AND 4

RD1040 – SEDIMENT FENCE

DETAILS

6006 –TURBIDITY BARRIER

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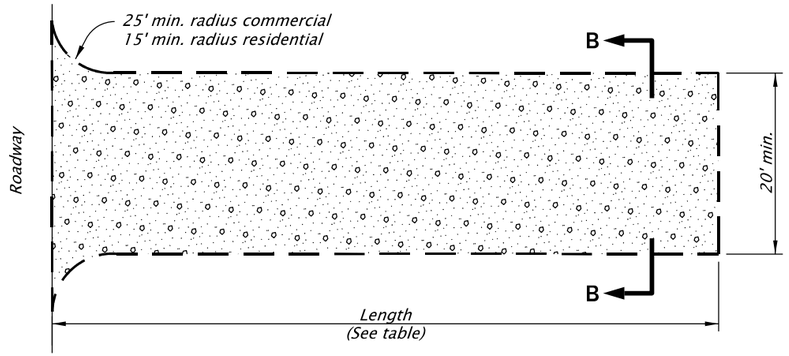
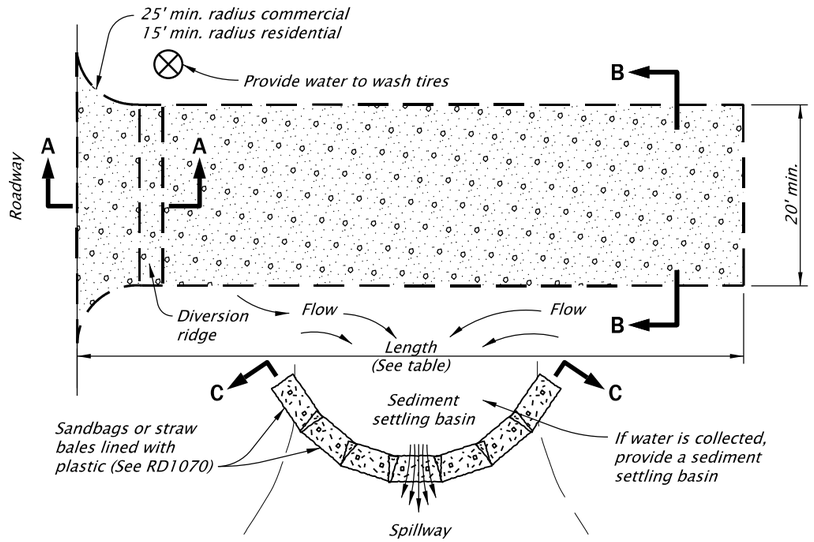


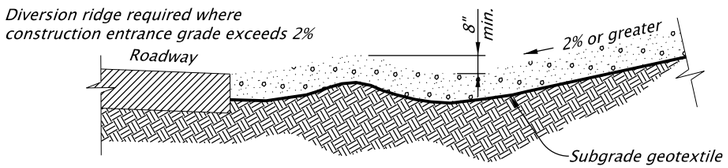
CONSTRUCTION ENTRANCE - TYPE 1

NOT TO SCALE



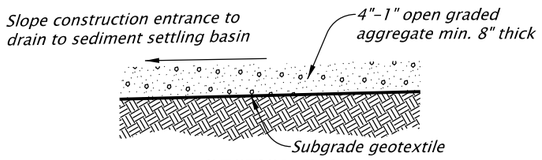
CONSTRUCTION ENTRANCE - TYPE 2

NOT TO SCALE



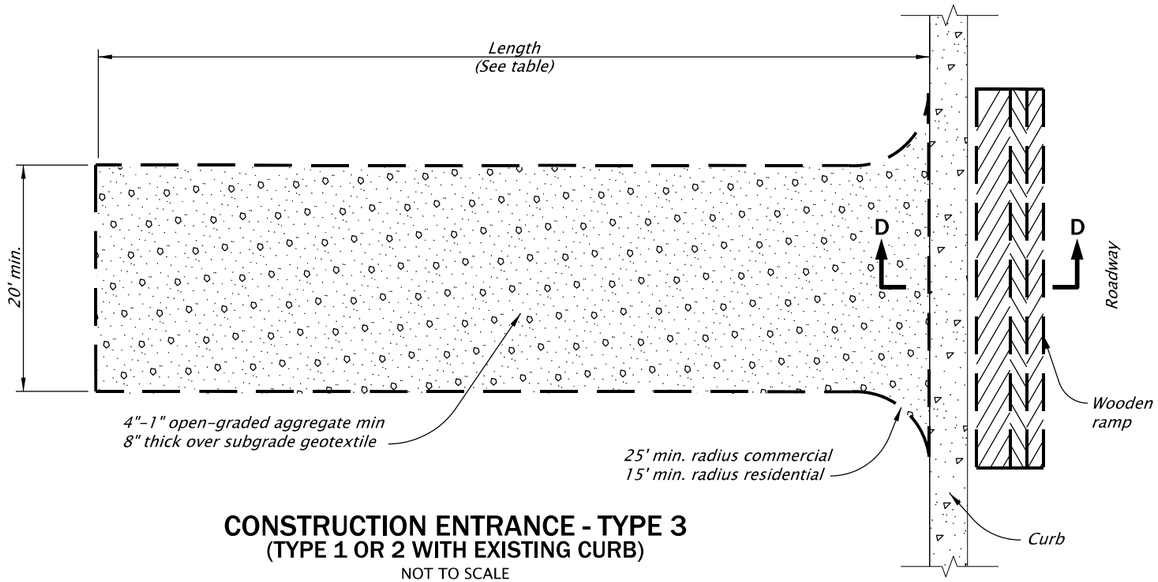
SECTION A-A

NOT TO SCALE



SECTION B-B

NOT TO SCALE



CONSTRUCTION ENTRANCE - TYPE 3
(TYPE 1 OR 2 WITH EXISTING CURB)

NOT TO SCALE

SECTION C-C

NOT TO SCALE

WOODEN CURB RAMP SECTION D-D

NOT TO SCALE

NOTES:

1. *The Type 1 entrance is a simple entrance without a diversion ridge or settling basin.*
2. *The wooden ramp may be used on either Type 1 or Type 2 entrances in situations where there is curb and the curb is not removed for the construction entrance.*

CONSTRUCTION ENTRANCE TABLE MINIMUM LENGTH	
Length (FT)	*Area Of Exposed Soil (Acre)*
20	*0.25*
50	*0.25 < A < 1.0*
100	*A > 1.0*

CALC. BOOK NO. N/A

SDR DATE January, 2021

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

OREGON STANDARD DRAWINGS

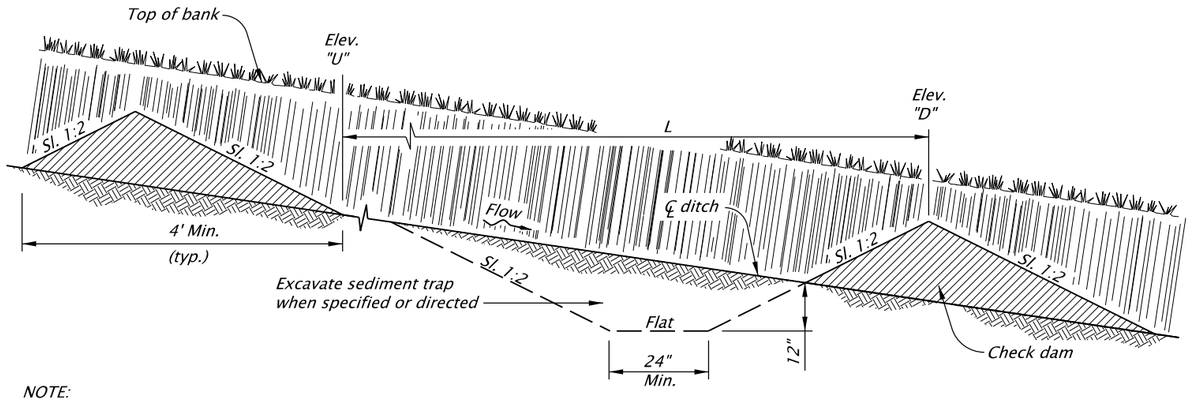
CONSTRUCTION ENTRANCES

2021

DATE	REVISION DESCRIPTION
Jan 2021	Removed Calc book numbers

rd1000.dgn 01-20-2021

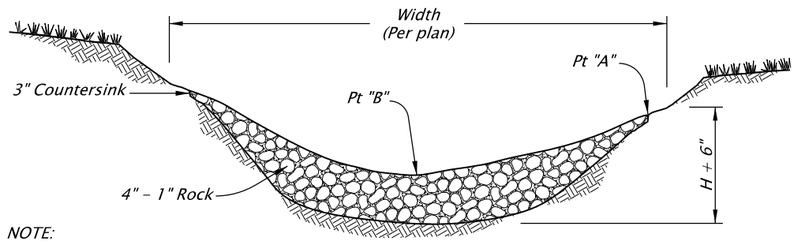
RD1000



NOTE:
L = Spacing along swale or ditch so that Elevation "U" equals Elevation "D".

TYPICAL PROFILE SECTION CHECK DAMS (SHOWN WITH AGGREGATE)

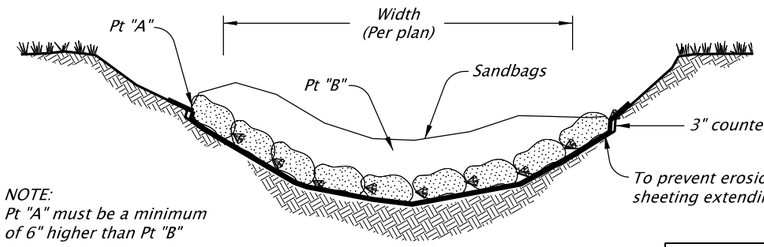
NOT TO SCALE



NOTE:
Pt "A" must be a minimum of 6" higher than Pt "B"

AGGREGATE CHECK DAM - TYPE 1

NOT TO SCALE



NOTE:
Pt "A" must be a minimum of 6" higher than Pt "B"

SANDBAG CHECK DAM - TYPE 4

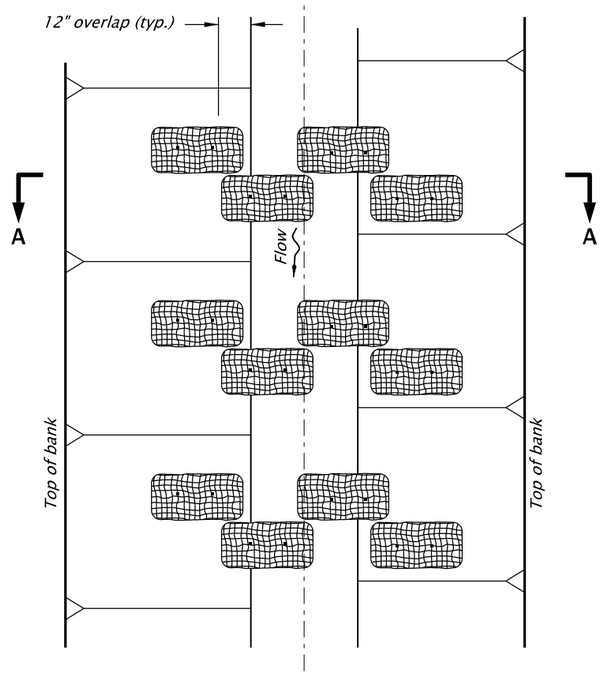
NOT TO SCALE

MAXIMUM CHECK DAM SPACING "L"

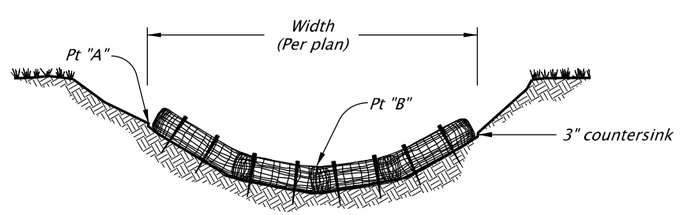
Ditch Grade	H=8"	H=12"	H=18"	H=24"
10%	* *	* *	15'	20'
9%	* *	* *	16'	22'
8%	* *	* *	18'	25'
7%	* *	* *	21'	28'
6%	* *	16'	25'	33'
5%	* *	20'	30'	40'
4%	16'	25'	37'	50'
3%	22'	33'	50'	66'
2%	33'	50'	75'	100'

* * Not allowed H = Min. dam height

NOTES:
1. Type 3 - stake biofilter bags with two 2"x2"x18" (minimum) wood stakes per bag. Drive stakes a minimum of 6" into the ground and flush with the top of the bags. Omit stakes if placed over paved surfaces. Overlap bags 12" minimum at each joint.
2. Type 4 - Tightly abut or overlap ends of sandbags at each joint.
3. Spacing between check dams for all check dam types shall comply with the typical profile section shown above.



PLAN



SECTION A-A

BIOFILTER BAG CHECK DAM - TYPE 3

NOT TO SCALE

CALC. BOOK NO. N/A

SDR DATE January, 2021

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

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OREGON STANDARD DRAWINGS

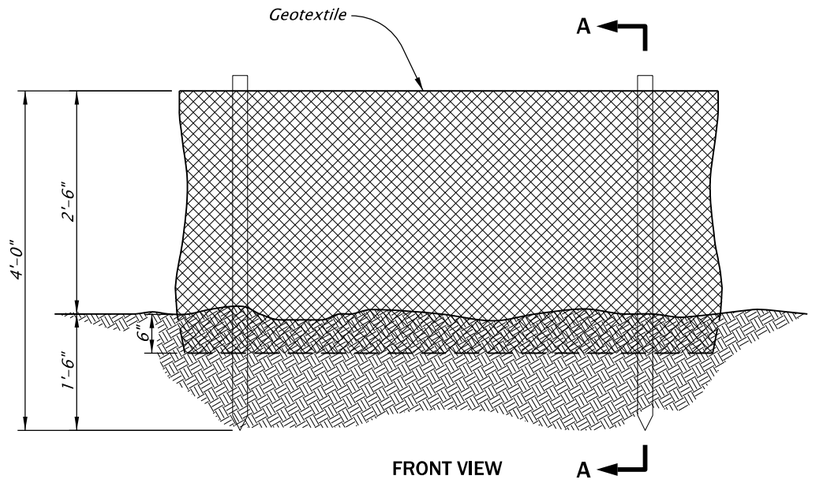
CHECK DAMS TYPE 1, 3 AND 4

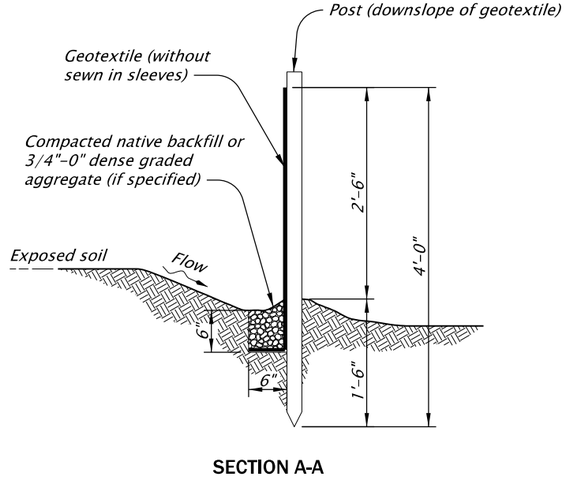
2021

DATE	REVISION DESCRIPTION
Jan 2021	Removed Calc book numbers

rd1005.dgn 01-20-2021

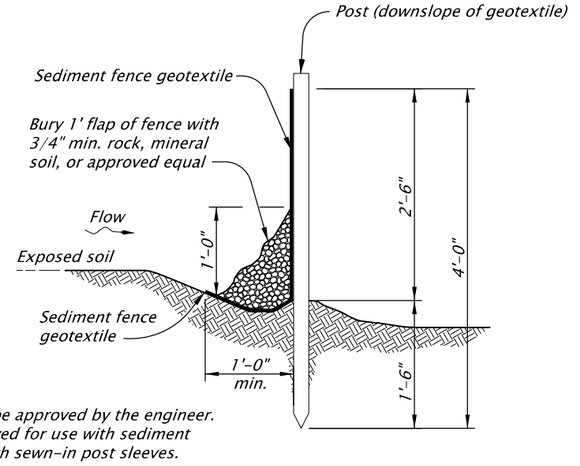
RD1005





SEDIMENT FENCE AND GEOTEXTILE BURY DETAIL - TYPE 1

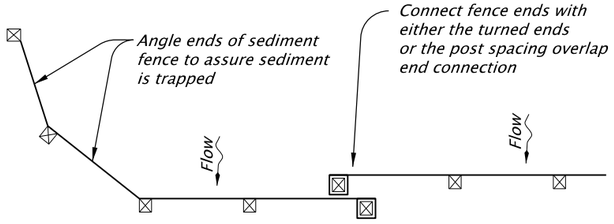
NOT TO SCALE



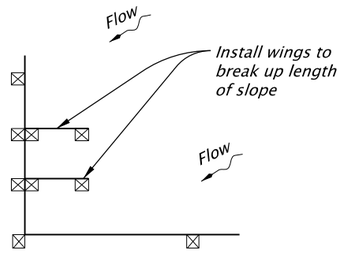
NOTES:
1. Use must be approved by the engineer.
2. Not approved for use with sediment fencing with sewn-in post sleeves.

ALTERNATE SEDIMENT FENCE WITHOUT TRENCHING - TYPE 2

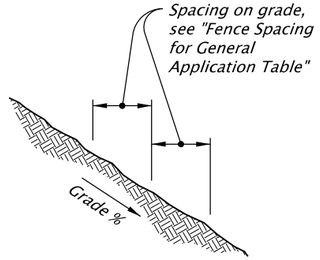
NOT TO SCALE



PLAN VIEW



TERMINATION AT CORNER OR PROPERTY LINE



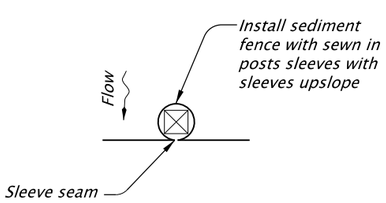
GENERAL NOTES:
1. Use 2"x2" wood fence posts.
2. Posts to be installed on downhill side of sediment fence geotextile. Position posts to prevent separation from geotextile.
3. Compact filter fabric trench backfill and soil on uphill side of fence.
4. Locate fence no closer than three feet to the toe of a slope.
5. Wing spacing shall comply with "Fence Spacing for General Application Table".

FENCE SPACING FOR GENERAL APPLICATION TABLE

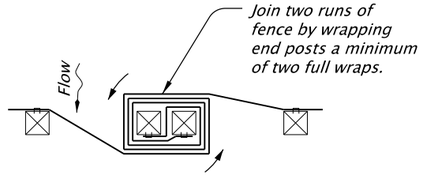
INSTALL PARALLEL ALONG CONTOURS AS FOLLOWS	
GRADE	MAXIMUM SPACING ON GRADE
Grade < 10%	300'
10% ≤ Grade < 15%	150'
15% ≤ Grade < 20%	100'
20% ≤ Grade < 30%	50'
30% ≤ Grade	25'

POST SPACING TABLE

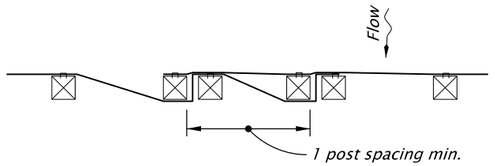
6'	Sediment Fence with Geotextile elongation less than 50%
4'	Sediment Fence with Geotextile elongation 50% or more



GEOTEXTILE WITH POST SLEEVES



TURNED ENDS CONNECTION



POST SPACING OVERLAP CONNECTION

GEOTEXTILE END CONNECTIONS

NOT TO SCALE

CALC. BOOK NO. N/A

SDR DATE January, 2021

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

OREGON STANDARD DRAWINGS

SEDIMENT FENCE

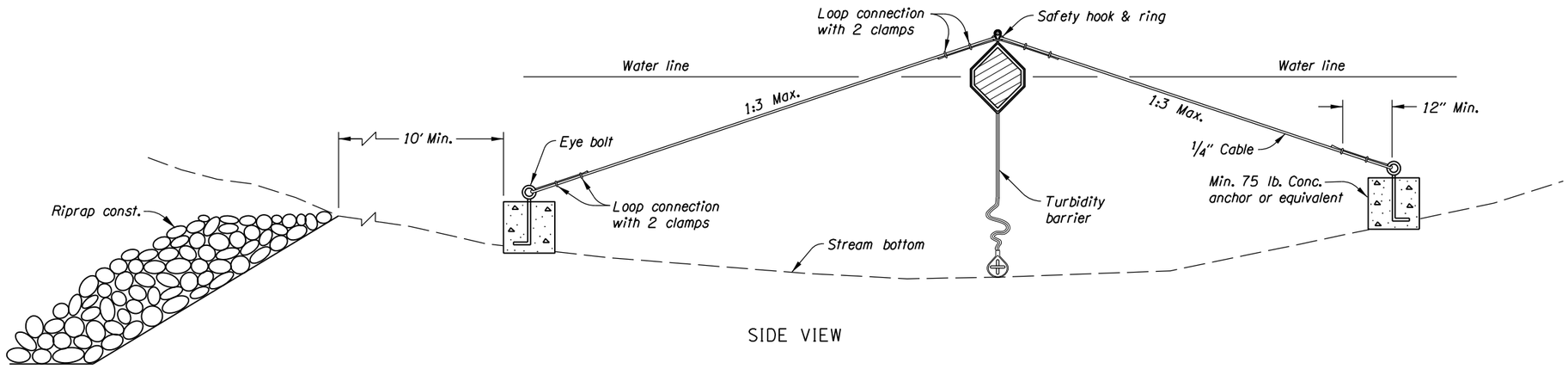
2021

DATE	REVISION DESCRIPTION
Jan 2021	Removed Calc book numbers

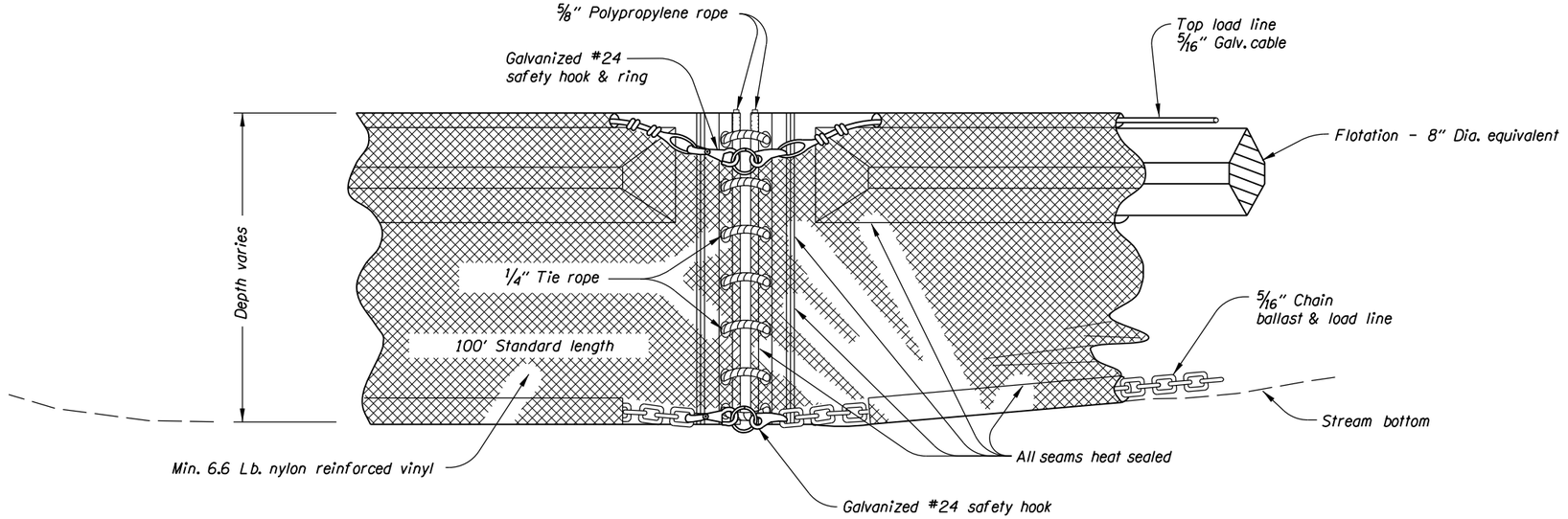
rd1040.dgn 01-20-2021

RD1040

SEDIMENT BARRIER FLOATING



SIDE VIEW



ANCHOR ASSEMBLY

NOTE:

Components of this barrier may be similar or identical to proprietary designs. Any infringement on the proprietary rights of the designer shall be the sole responsibility of the contractor. Substitutions shall be as approved by the engineer.

TURBIDITY BARRIER

The selection and use of this detail, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

OREGON DEPARTMENT OF TRANSPORTATION
TECHNICAL SERVICES
DETAILS

TURBIDITY BARRIER

DETAIL NO.
DET6006

det6006.dgn 10-Feb-2010

DET6006