

# Specifications – 100%

## **CORDOVA FISH PASSAGES** *Copper River Watershed Habitat Enhancement Project* *Cordova, Alaska*

### **GENERAL REQUIREMENTS**

#### **Scope of work**

The scope of work requires one extension of existing culvert and removal of three (3) existing culverts along Copper River Highway (locations identified in a table below), and supply and installation of three (3) larger aluminum structural plate box culverts for stream-simulation application as described in these contract documents. The contractor is to supply all labor, materials, and equipment as required to complete the work.

#### Locations

<b>Stream Name</b>	<b>ADFG Number</b>	<b>CRWP ID</b>	<b>Latitude</b>	<b>Longitude</b>	<b>HWY MP</b>
Lower Copper River Tributary	20100508	COP 43	N60.44235	W145.13415	24.85
Lower Copper River Tributary	20100510	COP 44	N60.44300	W145.12830	25.05
Lower Copper River Tributary	20100511	COP 45	N60.44318	W145.12714	25.09
Lower Copper River Tributary	20100512	COP 46	N60.44374	W145.12038	25.13

All construction shall be completed in accordance with the Alaska Department of Transportation and Public Facilities (ADOT&PF) Standard Specifications for Highway Construction (SSHC) 2017 or later edition. Project specific special provisions are provided in the following sections. The requirements contained in the standard specifications and special provisions are hereby made a part of this solicitation and resultant contract.

Contractor shall provide all necessary resources to complete this contract without any adjustments to the original bid amount or contract time.

Road closures are only allowed for Installation of Structural Plate Aluminum Box culverts work. Road Closure times for each culvert installation shall be minimized to either 3 consecutive night shift closures between 8pm-8am, or a single consecutive 36-hour closure that shall begin at 8pm. Closures shall be coordinated with and approved by the Engineer two weeks in advance so that proper public notice may be given. See Special provisions 643-3.03 for notification requirements. Develop Traffic Control Plan for the above road closures for approval. Road Closure interval may include one or several culverts and work may be performed on several pipes simultaneously. The Contractor is only allowed to have one 3 consecutive -day 12-hour closures or a single 36-hour closure before 3-calendar day break must occur. During such break the Contractor shall have at least 1 lane of road open for traffic. Then additional closure may be implemented.

The contractor shall remain on site and shall remain engaged in this project from the time excavation begins until water is flowing down the new culvert and simulation channel, and Copper River Highway is drivable. All work below the ordinary high-water mark must be completed

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between June 1 and July 31, 2020 or as stipulated by the Alaska Department of Fish and Game (ADFG) Fish Habitat Permit. All construction activities must be completed by August 15<sup>th</sup>, 2020.

### **Permits**

The contractor is to coordinate permitting with Copper River Watershed Project (CRWP) Program Director to obtain or transfer existing permits to the contractor, including but not limited to:

- ADF&G fish habitat permit
- ADF&G resource permit
- US Army Corps of Engineers Alaska District (ACOE) wetland permit 404
- Alaska Department of Natural Resources (ADNR) water use permit

The contractor is also required to obtain permits and approvals from:

- Affected utility companies
- Land Owner (ADOT&PF) Use permit
- ADOT&PF for traffic control and road closure
- Alaska Department of Environmental Conservation (ADEC) SWPPP Permit

If more than one (1) acre of land is being disturbed, the contractor shall obtain (the latest version) Construction General Permit, develop a SWPPP based on that permit and submit a Notice of Intent (NOI) to ADEC. A Construction General Permit and NOI will not be required if less than (1) acre of land is disturbed. However, the contractor shall still develop a SWPPP and follow best management practices under that SWPPP when less than (1) acre of land is disturbed.

### **Utility Locates**

Contractor shall verify locations of all underground utilities present at the site. Before any excavation begins on the Highway, the Contractor shall obtain and fully execute an ADOT&PF Use permit. A minimum of (2 weeks) lead time for coordination with regulatory agencies must be allowed. The Contractor will also be required to furnish all locations, as well as sketches, redlines, and detailed information regarding the utilities and proposed work.

The contractor shall coordinate use and traffic control permits with ADOT&PF.

### **Road closures**

If fully closing the road for construction, provide alternative road routes and all required signage. Coordinate road closure(s) with ADOT&PF, including the schedule of work, signage and traffic control requirements.

### **Other Requirements**

Wherever the specifications or special provisions refer to the “Engineer” substitute with “Copper River Watershed Project.”

Contractor must wash equipment prior to mobilization to or from the city of Cordova to ensure that the spread of invasive species is prevented.

Contractor shall notify the ADFG, and the Engineer a minimum of 72 hours prior to:

- The initial excavation at the start of the project.
- Diverting stream flows into a temporary diversion channel or culvert.
- Placement of new culverts to allow for inspection of bedding materials and finish grade.
- Backfill of culvert above the spring line (to verify the invert elevations).

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- Placement of materials within the newly constructed channel to allow for inspection of the subgrade and fill material.
- Re-watering of the new stream bed and diverting stream flows into the newly constructed channel.

A representative from the Alaska Department of Fish and Game shall be given the opportunity to be onsite during stream diversion and dewatering of the constructed channel to relocate trapped fish. If the ADFG declines the opportunity to be onsite, the Contractor is responsible for relocating trapped fish in accordance with the Permits.

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## **COPPER RIVER WATERSHED HABITAT ENHANCEMENT PROJECT**

### **SPECIAL PROVISIONS**

#### **TO THE**

#### **ALASKA DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION 2017 EDITION**

### SECTION 105 CONTROL OF WORK

**105-1.18 WARRANTIES.** Add the following:

If within two years after the date of the Project Completion or such longer period of time as may be prescribed elsewhere by the Contract, any work found to be defective, the Contractor shall promptly and without cost to the CRWP, and in accordance with the Engineer's written instructions, either *correct defective work, or, if it has been rejected by the Engineer, remove it from the site and* replace it with conforming work. If the Contractor does not promptly comply with the terms of such instructions, or in an emergency where delay would cause serious risk of loss or damage, the CRWP may have the defective work corrected or the rejected work removed and replaced, and all direct, indirect and consequential costs of such removal and replacement (including but not limited to fees and charges of engineers, architects, attorneys and other professionals) will be borne by the Contractor.

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## SECTION 201 CLEARING AND GRUBBING

### **201-1.01 DESCRIPTION.** Add the following:

Selectively cut and remove trees as needed to complete the work. The contractor is to give the Engineer 72-hour notice and cut only the trees approved for removal.

Salvage and stockpile native organic soils and vegetative mat as required by this contract.

### **201-3.01 GENERAL.** Delete the first sentence and add the following.

The contractor will restrict all work to the project / excavation / clearing limits as shown on the drawings.

### **201-3.02 Clearing:** Add the following:

Clearing and grubbing is not permitted within the migratory bird window of May 15 to July 15; except as permitted by Federal, State and local laws, and when approved by the agencies having jurisdiction (AHJ) or Engineer. Active nests shall not be disturbed (unless approved by AHJ). The contractor is responsible for completing clearing and grubbing as necessary to finish the project within the permitted time frame. It will be the contractor's responsibility to remove and dispose of all stumps in the way of construction activity (unless the debris are approved to be re-used on the project).

### **201-3.03 Grubbing** Add the following:

Vegetative mats will be made available offsite. The contractor shall harvest and transport vegetation from an approved offsite location. The contractor is to notify the Engineer 72 hours in advance of vegetative mat placement, so arrangements can be made for offsite harvest. The contractor is to harvest vegetative mats within 1 day of transplanting from the locations (within 5 miles from the project site) approved by Engineer.

### **201-5.01 BASIS OF PAYMENT.** Add the following:

Item 201 (3A) Clearing and Grubbing is subsidiary to Pay Item 602 (2) Aluminum Box Culvert. Vegetative Mats harvest, transportation and placement is subsidiary to Pay Item 671(2) Toewood Bank Reconstruction.

## SECTION 202 REMOVAL OF STRUCTURES AND OBSTRUCTIONS

### 202-3.01 GENERAL.

**Existing Culvert Pipe:** The existing culvert pipes shall be legally disposed of offsite. Upon approval by ADOT, all culverts replaced shall be salvaged and delivered to Cordova state ADOT&PF M&O Maintenance Yard.

### 202-5.01 BASIS OF PAYMENT. Add the following:

Item 202 (4) Removal of Structures and Obstructions is subsidiary to Item 602(2) Aluminum Box Culvert.

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## SECTION 203 EXCAVATION AND EMBANKMENT

### **203-2.01 MATERIALS.** *Add the following:*

Borrow. Approved material required for embankments or for other portions of the work and obtained from sources outside the right-of-way limits for the project.

### **203-3.01 GENERAL.** *Add the following:*

Inspect excavation for hazardous conditions before worker entry daily and as conditions change. Inspections are to be completed by a competent person as defined by OSHA.

The contractor shall test and reuse the existing material in construction if approved by the Engineer representative. If additional material is required, supplement with borrow to maintain the side slopes and elevations as shown on the drawings. Fill all ditches and low areas to prevent ponding (unless required for drainage). Grade the disturbed adjacent areas to drain into the new channels; grade all other disturbed areas to the approximate original ground contour and assure proper drainage.

The contractor shall perform a gradation test on the existing embankment material in accordance with ASTM D-422. Density testing shall be completed according to ASTM D698 / AASHTO T99 (Proctor Test) or ASTM D1557 / AASHTO T180 Modified Proctor Test.

### **203-3.03 EMBANKMENT CONSTRUCTION.** *Delete the first paragraph and add the following:*

Prior to any excavation of the existing embankment at or below the existing water level, a cofferdam made out of super sacks and/or other methods shall be installed as shown on the drawings. Use only approved materials in construction of road embankment and culvert backfill.

### *Delete the second paragraph and add the following:*

Borrow materials for the new embankment shall be selected material Type A for backfill and Subbase, Grading F for bedding; all meeting the requirements of Subsection 703-2.07 and 703-2.09. Selected material Type A and Subbase, Grading F materials shall be obtained from borrow sources that have been laboratory tested and meet the project gradation requirements.

**203-3.06 COMPACTION BY PROOF ROLLING.** *Add the following:* Proof-roll the base of excavation and where the embankment crosses previously undisturbed ground, prior to placing new embankment material, to the extent that ensures the first lift of material placed upon it can be compacted to the specified density. Omit proof rolling only if approved by the Engineer and if necessary, to prevent liquefaction of surface soils.

### **203-5.01 BASIS OF PAYMENT**

Payment will be made under:

	<b>Pay Item</b>	<b>Pay Unit</b>
203 (6) – 1	Borrow	Ton
203 (6) – 2	Subbase, Grading F	Ton

## SECTION 204 STRUCTURE EXCAVATION FOR CONDUITS AND MINOR STRUCTURES

**204-2.01 MATERIALS.** Delete the first 3 sentences and add the following:

Backfill material around the culvert will be ADOT&PF Borrow Selected Material Type A and bedding material Subbase, Grading F as described in Section 703-2.07 and 703-2.09.

**204-5.01 BASIS OF PAYMENT.** Delete the fourth paragraph and substitute the following:

Item 204 (1) Structure Excavation for Conduits and Minor Structures is a subsidiary to Pay Item 602(2) Aluminum Box Culvert. Subbase, Grading F materials is subsidiary to Pay Item 203 (6) – 2.

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## SECTION 301 AGGREGATE BASE AND SURFACE COURSE

**301-1.01 DESCRIPTION.** *Add the following:*

Construct an aggregate surface course on an approved foundation, as shown on the Plans. Use Aggregate Surface Course, Grading E-1 surface course as described in 703-2.03.

**301-5.01 BASIS OF PAYMENT.** Water for compaction, added to the aggregate on the grade, is subsidiary. Subbase, Grading F materials is subsidiary to Pay Item 203 (6) – 2.

Payment will be made under:

	<b>Pay Item</b>	<b>Pay Unit</b>
301 (3)	Aggregate Surface Course, Grading E-1	Ton

## SECTION 602 STRUCTURAL PLATE, ALUMINUM PLATE, AND BOX CULVERTS

### **602-1.01 DESCRIPTION.** *Add the following:*

Contractor shall provide manufacturer-designed culvert bridges to meet the contract requirements and provide an independent check. Inspect and perform quality acceptance on culvert bridges. Provide design calculations with load ratings for the culvert bridges for review and approval.

### *Add the following Subsection:*

### **602-1.02 DEFINITIONS.**

**Culvert Bridge** stands for culverts and buried structures meeting the requirements of National Bridge Inspection Standards (NBIS) CFR§650.305; individual culverts and buried structures greater than 10 feet in width, as measured along the centerline of roadway crossing over the structure. When specified in the contract or required by the DOR (Designer of Record), this includes the headwalls, toe walls, wingwalls, and foundation.

**Culvert Bridge Design Package (CBDP).** DOR design calculations, DOR load ratings, IE design check calculations, IE load ratings, working drawings, and specifications.

**Designer of Record (DOR).** A civil engineer registered as a Professional Engineer in the State of Alaska, and in responsible charge of the work described. The DOR must have adequate and relevant prior structural design and inspection experience. The DOR may delegate portions of design, quality acceptance, and inspection work, to qualified technicians. The DOR and qualified technicians must not be supervised by, or under the direction of the Contractor's superintendent and work crew.

**Independent Design Check (IDC).** An independent design check of the design and load rating calculations including but not limited to: design, load ratings, location and dimensions of the foundation, structural members, connections, erection plan and temporary bracing (when required), safety barrier, and independent calculations of design loads, member stress, material properties, hydraulic capacity and scour protection.

**Independent Engineer (IE).** An engineer registered as Professional Engineer in the State of Alaska, and in responsible charge of the independent design check. The engineer responsible for the check must have adequate and relevant prior structural design experience.

**602-2.02 GEOTECHNICAL DATA AND HYDROLOGY INFORMATION.** The Contactor is responsible for obtaining additional geotechnical data as necessary for the design and construction of the culvert bridge.

The Contractor is responsible for obtaining hydrology and hydraulics data as necessary for the design and construction of the culvert bridge.

### *Add the following Subsection:*

**602-2.03 DESIGN REQUIREMENTS.** Retain the services of a DOR to design and provide a CBDP for each culvert bridge. Retain the services of an IE to perform an IDC of each CBDP.

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1. Design culvert bridges according to the following documents:
  - a. Alaska DOT&PF Standard Specifications for Highway Construction for recommended construction methods, material properties, and sampling and testing.
  - b. AASHTO LRFD Bridge Design Specifications, as modified by Subsection 602-2.03;
  - c. Alaska Highway Preconstruction Manual; and the
  - d. Alaska Bridges and Structures Manual (BSM).
2. Design culvert bridges that:
  - a. Support 100% of HL93 live loads or the Contractor's maximum construction load whichever is greater, without overstress. Follow the most recent version, including interim version, of the AASHTO LRFD Bridge Design Specifications. Indicate governing live load on working drawings;
  - b. Meet the design life specified in AASHTO LRFD Bridge Design Specifications after allowing for metal section loss associated with abrasion and pH levels of the substrate and water;
  - c. Meet the seismic acceleration values recommended in the AASHTO LRFD Bridge Design Specifications;
  - d. Include the capacities and demands of load-supporting members in the design calculations;
  - e. Meet the dimensions, stations, offsets and elevations of inverts and riprap requirements shown on the plans;
  - f. Provide the minimum hydraulic capacity shown on the Plans when openings are required to allow for the passage of water; and
  - g. Provide the minimum horizontal and vertical clearances shown on the Plans when openings are required to allow the passage of traffic. If no vertical clearance is provided, follow the requirements in the Alaska Highway Preconstruction Manual.
3. Provide working drawings for culvert bridges including:
  - a. Dimensions controlling the culvert bridge design and erection, including proposed fill depth, corrugation spacing, corrugation depth, gauge thickness, concrete thickness, reinforcing steel size and locations, clear opening sizes, utility size and locations, and similar controlling dimensions;
  - b. Design loads and material properties; and
  - c. The soil bearing values.
4. Provide load ratings for the culvert bridges according to the most recent version, interim version, of the AASHTO Manual for Bridge Evaluation (MBE) and the BSM. Load rate metal and concrete culvert bridges using the Load Factor Rating (LFR) and Load and Resistance Factor Rating (LRFR) methods.

Provide load ratings that reflect the bridge culvert final as-constructed condition. Include values for moment, shear and, where applicable, thrust for concrete culvert bridges. Include values for wall area, buckling, and seam strength for metal culvert bridges. Specify live load type, placement for maximum stress, distribution, and impact.

Include the following cases for LFR load ratings:

- a. Inventory with multiple lanes and impact included
- b. Operating with multiple lanes and impact not included
- c. Operating with one lane centered on the roadway and impact not included.

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Include the following cases for LRFR load ratings:

- d. Inventory with multiple lanes and impact included
- e. Operating with multiple lanes and impact included
- f. Operating with one centered on the roadway and impact not included.

Add the following Subsection:

**602-2.04 DESIGN SUBMITTALS AND REVIEW.** Submit the following for review and approval at least 30 days prior to the beginning or construction related to the culvert bridges:

1. The CBDP. The design drawings and load ratings in the CBDP must be stamped with the seal of, dated by, and signed by the DOR;
2. An IDC letter stamped with the seal of, dated by, and signed by the IE certifying: “The Culvert Design Bridge Package meets the AASHTO LRFD Bridge Design Specifications, the AASHTO Manual for Bridge Evaluation, and the Contract requirements”.

Revise and resubmit the CBDP to incorporate any comments received during review. Resubmit the IDC letter after comments have been incorporated.

The approval of the CBDP shall not be construed as complete review but will only indicate that the general method of construction and working drawings are acceptable to the CRWP, that the CBDP appears complete, and that an IDC letter was provided. The Contractor shall remain responsible for all aspects of the culvert bridge.

**602-3.01 CONSTRUCTION REQUIREMENTS.** Add the following: When shown on the Plans, place riprap in accordance with Section 611.

Do not begin fabrication or construction of culvert bridges without the written approval of the Engineer. Do not open culvert bridges to traffic without approval of the Engineer.

**602-5.01 BASIS OF PAYMENT.** Replace the first sentence with the following: Structure excavation, bedding, and backfill for culvert is paid for under this Section 602 (2). The CBDP, engineering, inspection, labor, equipment, and materials necessary to design, load rate, and install culvert bridges are subsidiary.

Payment will be made under:

	<b>Pay Item</b>	<b>Pay Unit</b>
602 (2)	Supply and Install Structural Plate Aluminum Box Culvert 16'-10" Span x 8'-3" Rise with Solid Invert, Haunch 0.175" Crown, 0.125" Thick	Linear Foot

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### SECTION 603 CULVERTS AND STORM DRAINS

**603-5.01 BASIS OF PAYMENT.** *Add the following:*

Payment will be made under:

Pay Item	Pay Unit
603 (2) 36"X48" Corrugated Steel Pipe Arch, 12 ga w/ connecting band	Linear Foot

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## SECTION 611 RIPRAP

### **611-2.01 MATERIALS.** *Add the following:*

Meet the following gradation for the class II. Percentages are by total weight; weights are for each stone:

- 50-100% weighing 200 pounds or more
- 0-15% weighing up to 25 pounds
- 0-10% weighing more than 400 pounds

### **611-3.01 CONSTRUCTION REQUIREMENTS.** *Add the following:*

Use riprap to construct revetment to the lines and grades shown on the Plans. Use borrow or salvaged organic soil to fill surface and sub-surface voids in the riprap to the satisfaction of the Engineer. Borrow or salvaged organic soil shall not prevent rock to rock contact. Cover riprap with 4" of topsoil and seed.

### **611-5.01 BASIS OF PAYMENT.** *Add the following:*

Filling voids in riprap with borrow or salvaged organic soils is subsidiary to Pay Item 611(2) Riprap, Class II. Geotextile, Erosion Control, Class I is subsidiary to Pay Item 611(2) Riprap, Class II.

Payment will be made under:

	<b>Pay Item</b>	<b>Pay Unit</b>
611 (2)	Riprap, Class II	Ton

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### SECTION 613 MONUMENTS AND MARKERS

**613-1.01 DESCRIPTION.** Delete subsection in entirety and substitute the following:  
Furnish and install culvert marker posts according to the Plans.

**631-5.01 BASIS OF PAYMENT.**

Payments will be made under:

	Pay Item	Pay Unit
613 (2)	Culvert Marker Post	EA

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## SECTION 618 SEEDING

**618-1.01 DESCRIPTION.** Delete subsection in entirety and substitute the following:

Topsoil and seed new or disturbed slopes, riprap slope protection, and other areas shown on the drawings. Place the soil, then seed and water. Provide a living ground cover on slopes as soon as possible.

**618-3.01 SOIL PREPARATION.** Add the following:

Apply seed as detailed in subsection 618-3.03 immediately after the shaping of the slopes. Cover all slopes to be seeded with topsoil according to Section 620. Complete slope preparation as soon as topsoil is placed on the slopes.

**618-3.03 APPLICATION.** Add the following:

Evenly mix the seeds in a sack immediately before dispersing or adding to a hydro seeding solution, and then evenly mix the seeds into solution. Water lightly, keep top 1/8" soil moist until final acceptance of the Project is received.

Apply at one pound per 1000 square feet (43 lbs./Acre) or as recommended by the seed supplier

Contractor must provide the Engineer with seed tags provided by seed supplier showing seed purity and germination in compliance with Section 724 Seed for approval prior to applying seed to project site.

**618-4.01 METHOD OF MEASUREMENT.** Add the following:

The quantity of seeding shall include all cultivation, seeding, and limestone if required.

**618-5.01 BASIS OF PAYMENT.** Add the following:

Furnishing, mobilizing, modifying, operating, and maintaining all materials and equipment necessary to install seed is subsidiary to pay item 618(1) Seeding. For warranty and more on maintenance requirements see Section 690-3.05.

Payment will be made under:

	<b>Pay Item</b>	<b>Pay Unit</b>
618 (1)	Seeding	Acre

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### SECTION 620 TOPSOIL

**620-1.01 DESCRIPTION.** First paragraph Add the following:

The contractor shall revegetate the ground as specified on the drawings with vegetative (veg) mat to match the existing landscape. Veg mat needs to have a 4-inch layer of topsoil below.

Where vegetative mat is not available, or is not feasible due to ground contours, or does not match the surrounding area, the contractor is to apply topsoil and seed. Contractor must stabilize the fill material from erosion.

**620-3.01 PLACING.** Add the following:

Place native organic soils (salvaged from clearing, grubbing, and excavation work) or topsoil to meet the requirements of Section 726 to a thickness of 4 inches (or as shown on the drawings) on all disturbed ground away from the road prism; seed according to Section 618, Seeding, of these specifications.

**620-5.01 BASIS OF PAYMENT.**

Item 620 (1) Topsoil is a subsidiary to Pay Item 618 (1) Seeding.

## SECTION 630 GEOTEXTILE FOR EMBANKMENT AND ROADWAY SEPARATION, STABILIZATION AND REINFORCEMENT

### **630-1.01 DESCRIPTION.** *Add the following:*

Prepare ground surface, and furnish and place geotextiles for separation, stabilization, and/or reinforcement as shown on the Plans.

**630-2.01 MATERIALS.** Use materials that conform to the following:  
Geotextiles and Sewn Seam Strength Subsection 729-2.01.

### **630-3.01 CONSTRUCTION.**

1. Surface Preparation. Prepare ground surface by removing stumps, brush, boulders, and sharp objects. Fill holes and ruts over 3 inches deep, with material shown on the Plans or as approved by the Engineer.
2. Geotextile Placement. Unroll geotextile directly onto the prepared surface. Stretch geotextile to remove any creases, folds or wrinkles. Do not drag the geotextile through mud or over sharp objects that could damage the geotextile. Do not expose geotextiles to sunlight for longer than 14 days after removal of protective covering. Do not allow geotextiles to get wet prior to installation.
  - a. Geotextile, Reinforcement placed under culverts shall be placed perpendicular to the road centerline (i.e. parallel to the culvert centerline), with two 15-foot wide with 6.5-foot overlapped pieces of geotextile centered under the culvert centerline. Seams parallel to the road centerline (i.e. perpendicular to the culvert centerline) shall not be allowed.
4. Material Placing and Spreading. During placing and spreading of material, maintain a minimum depth of 6 inches of cover material at all times between the geotextile and the wheels or tracks of the construction equipment. Limit the size and weight of construction equipment to reduce rutting in the initial lift above the geotextile to not greater than 3 inches deep to prevent overstressing the geotextile.

Place the cover material and spread in only one direction for the entire length of the geotextile. On weak subgrades limit height of dumped cover material to prevent localized subgrade and/or geotextile failure.

Compact using a smooth drum roller. Do not allow construction equipment to make sudden stops, starts, or turns on the cover material. Do not allow turning of vehicles on the initial lift of cover material above the geotextile. Fill any ruts over 3 inches deep occurring during construction with material shown on the Plans; do not grade adjacent material into rut; and compact to the specified density.

5. Geotextile Repair. Repair and replace damaged geotextile (torn, punctured, or disturbed at the overlaps or sewn joints). For damage evidenced by visible geotextile damage, subgrade pumping, intrusion, or embankment distortion, remove the backfill around and under the damaged or displaced area, and repair with material matching the damaged material. Make patches overlap or sew patches to the existing geotextile.

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- a. **Reinforcement.** Overlay torn area with geotextile with a minimum 3-foot overlap around the edges of the torn or damaged area. Ensure the patch remains in place when cover material is placed over the affected area.

**630-4.01 METHOD OF MEASUREMENT.** By multiplying plan neat line width by the measured length in final position parallel to installation centerline along the ground surface. No allowance will be made for overlap, whether at joints or patches.

**630-5.01 BASIS OF PAYMENT.** Material used to fill ruts and holes will be paid for at the unit price for the type of material used.

Payment will be made under:

	<b>Pay Item</b>	<b>Pay Unit</b>
630 (3B)	Geotextile, Reinforcement Type 2	Square Yard

### **SECTION 631 GEOTEXTILE FOR SUBSURFACE DRAINAGE AND EROSION CONTROL**

#### **631-5.01 BASIS OF PAYMENT.**

Item 631 (2) Geotextile for Subsurface Drainage and Erosion Control is a subsidiary to Pay Item 611 (2) Riprap Class II.

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### SECTION 640 MOBILIZATION AND DEMOBILIZATION

**640-3.01 CONSTRUCTION REQUIREMENTS.** *Add the following:*

Pressure wash all tracked equipment, excavation equipment, and excavation hauling equipment prior to every mobilization to ensure that the spread of invasive species is minimized. Clean equipment so that no invasive species would have the chance of being spread or imported into the site. At a minimum, there should be no visible dirt on equipment.

All equipment must be re-washed every time if it was removed from the site before it is returned to the site.

**640-5.01 BASIS OF PAYMENT.**

Payment will be made under:

	<b>Pay Item</b>	<b>Pay Unit</b>
640 (1)	Mobilization and Demobilization	Lump Sum
640 (4)	Worker Meals and Lodging, or per Diem	Lump Sum

## SECTION 641 EROSION SEDIMENT AND POLLUTION CONTROL

### **641-1.01 DESCRIPTION.** *Add the following:*

Provide project administration and Work relating to control of erosion, sedimentation, and discharge of pollutants, according to this section and applicable local, state, and federal requirements.

### **641-1.03 PLAN SUBMITTALS.** *Add the following:*

Partial and incomplete submittals will not be accepted for review. Any submittal that is re-submitted or revised after submission, but before the review is completed, will restart the submittal review timeline. No additional Contract time or additional compensation will be allowed due to delays caused by partial or incomplete submittals or required re-submittals.

Storm Water Pollution Prevention Plan. Submit an electronic copy and three hard copies of the SWPPP to the Engineer for approval. Deliver these documents to the Engineer at least 21 days before beginning Construction Activity.

The CWRP will review the SWPPP submittals within 14 days after they are received. Submittals will be returned to the Contractor and marked as either “rejected” with reasons listed or as “approved” by the CWRP. When the submittal is rejected, the Contractor must revise and resubmit the SWPPP. The 14-day review period will restart when the contractor submits an electronic copy and three hard copies of the revised SWPPP to the Engineer for approval.

After the SWPPP is approved by the CWRP, the Contractor must sign and certify the approved SWPPP.

### DEC SWPPP Review.

- Transmit a copy of the CWRP approved SWPPP to DEC
- Transmit a copy of the delivery receipt confirmation to the Engineer within (7) days of receiving the confirmation; and
- Retain a copy of delivery receipt confirmation in the SWPPP

### **641-1.06 RESPONSIBILITY FOR STORM WATER PERMIT COVERAGE.**

- CWRP and the Contractor are jointly responsible for permitting and permit compliance with the project zone.
- The Contractor is responsible for permitting and permit compliance outside of project zone. The Contractor has sole responsibility for compliance with all federal, state, and local requirements, and for securing all necessary clearances, rights, and permits.
- An entity, that owns or operates material source or disposal site outside of project zone, is responsible for permitting and permit compliance. The Contractor has sole responsibility to verify that the entity has appropriate permit coverage.
- The CWRP is not responsible for permitting or permit compliance, and is not liable for fines resulting from noncompliance with permit conditions:
  - For areas outside the project zone
  - For construction activity and support activities outside of project zone and;
  - For commercial plants, commercial material sources, and commercial disposal sites.

## Specifications – 100%

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### **641-2.04 RESPONSIBILITY AND AUTHORITY OF THE SWPPP MANAGER.**

The SWPPP Manager must be available at all times to administer SWPPP requirements and be physically present within the project zone or the project office, for at least eight hours per day when construction activities are occurring.

The SWPPP Manager shall have the Contractor's complete authority and be responsible for suspending construction activities that do not conform to the SWPPP.

### **641-5.01 BASIS OF PAYMENT.**

Payment will be made under:

<b>Pay Item</b>		<b>Pay Unit</b>
641 (1)	Erosion, Sediment and Pollution Control Administration	Lump Sum
641 (3)	Temporary Erosion and Pollution Control	Lump Sum
641 (4)	Temporary Erosion, Sediment and Pollution Control Additives	Contingent Sum
641 (5)	Temporary Erosion, Sediment and Pollution Control by Directive	Contingent Sum
641 (6)	Withholding	Contingent Sum
641 (7)	SWPPP Manager	Lump Sum

## SECTION 642 CONSTRUCTION SURVEYING AND MONUMENTS

**642-3.01 GENERAL.** *First paragraph Add the following:*

The contractor shall submit for approval the qualifications of all persons engaged in grade control. The lead person establishing and checking grades in the field must have a minimum of 2 years of relative experience and be assigned to the project with the primary responsibility of grade control. Equipment operators or other personnel with other project responsibilities cannot be responsible for grade control duties. At least one person competent in setting, adjusting and recording grades shall always be on site during streambed excavation, culvert placement and backfill operations.

**642-4.01 METHOD OF MEASUREMENT.** *Delete all 6 paragraphs and add the following:*

No measurement of quantities will be made.

*Delete the Pay Item table and add the following:*

**642-5.01 BASIS OF PAYMENT.** Construction Surveying includes field and office work required to accomplish the work, including furnishing necessary personnel, equipment, transportation and supplies.

Traffic control devices necessary for the survey parties are considered subsidiary.

Payment will be made under:

	<b>Pay Item</b>	<b>Pay Unit</b>
642 (1)	Construction Surveying	Lump Sum
642 (3)	Three Person Survey Party	Hour

# Specifications – 100%

## SECTION 643 TRAFFIC MAINTENANCE

### **643-1.03 TRAFFIC CONTROL PLAN.** Add the following:

The contractor shall submit for approval to ADOT&PF and the Engineer a traffic control plan prepared under the supervision of a Traffic Control Supervisor assigned to this project. No work shall begin on the project site until the traffic control plan is approved.

### **643-3.03 PUBLIC NOTICE.** Add the following:

- Alaska DOT &PF NR Public Information Officer Caitlin.Frye@alaska.gov (907)451-5307
- DOT&PF M&O Valdez District Superintendent Robert.Dunning@alaska.gov (907)834-1039
- DOT&PF Cordova Foreman M&O Robert.Mattson@alaska.gov (907)424-3202
- Orca Adventure Lodge (907) 424-7249 orcaadventurelodge@gmail.com
- Glacier Lodge, Luke Borer (907) 429-7394 Luke Borer interest@childsglacierlodge.com

### **643-4.01 METHOD OF MEASUREMENT.** Delete items 1 thru 16 and add the following:

Traffic Maintenance will be lump sum and shall include preparation of TCPs, and all labor, materials, traffic control devices and equipment required to implement the Traffic Control Plans as specified and as directed. Temporary construction signs, flagging and pilot car, if required by TCP, will be subsidiary.

### **643-5.01 BASIS OF PAYMENT.** Delete paragraphs 1 - 17 and add the following:

Traffic Maintenance. The contract price includes all resources required to provide all required Traffic Control Plans and public notices, and the maintenance of all roadways, approaches, crossings, intersections and pedestrian and bicycle facilities, as required. This item also includes any temporary construction signs and traffic control devices required but not shown on the bid schedule.

Payment will be made under:

	<b>Pay Item</b>	<b>Pay Unit</b>
643 (2)	Traffic Maintenance	Lump Sum
643 (25)	Traffic Control	Contingent Sum

# Specifications – 100%

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## SECTION 671 TOEWOOD BANK RECONSTRUCTION

**671-1.01 GENERAL.** Add the following:

Conduct a Toewood Bank Reconstruction as detailed on the Plans. Inspect excavation for hazardous conditions before worker entry daily and as conditions change. Inspections are to be completed by a competent person as defined by OSHA.

The contractor is to test and reuse the existing material in construction if approved by the Engineer representative. If additional material is required, supplement with borrow to maintain the side slopes and elevations as shown on the drawings. Fill all ditches and low areas to prevent ponding (unless required for drainage). Grade the disturbed adjacent areas to drain into the new channels; grade all other disturbed areas to the approximate original ground contour and assure proper drainage. Contractor must stabilize the fill material from erosion.

**671-2.01 MATERIALS.**

Use riprap class I to anchor foundation logs as shown on the Plans. Use salvaged backfill to fill voids in the riprap to the satisfaction of the Engineer.

**671-5.01 BASIS OF PAYMENT.** Add the following:

The contract price includes all resources required to provide all required: clearing and grubbing, salvaging, harvesting, stockpiling, transporting and placing native organic soils and seeding.

Payment will be made under:

	Pay Item	Pay Unit
671 (2)	Toewood Bank Reconstruction	Linear Foot

## SECTION 672 STREAM DIVERSION & DEWATERING

### 672-1.01 DESCRIPTION.

The Work under this Section consists of performing all operations pertaining to the dewatering of Work areas and diversion of surface and subsurface water flows for excavation and backfill during construction operations as shown on the drawings.

### 672-1.02 GENERAL.

A recommended Stream Diversion Plan has been provided on the drawings. The provided stream diversion plan is intended to convey the engineered design concept. The location shown, and the design can be adjusted by the contractor as needed to better fit field conditions, including the locations of bulk bags (Super Sacks), coffer dams, the diversion culvert, and related items. The contractor *can propose an alternative diversion plan* to the Engineer for approval. The Contractor shall review the contract documents and submit any changes to the Engineer for approval in writing in advance before implementing a modified plan. Divert water and dewater work area only as approved by the permits. The streambed, downstream of the work shall not be allowed to dry out. The contractor shall use work methods that will allow the portion of the streambed, outside the limits of construction, to remain wet for the duration of this project.

#### Required Notifications:

The Contractor shall provide notification a minimum of 72 hours prior, or as required by the permit, to the USFWS, Alaska Department of Fish and Game (ADFG) and the Engineer of record before:

1. Diverting stream flows into the temporary diversion culvert.
2. Diverting stream flows into the reconstructed channel within the new culvert.

### 672-2.01 MATERIALS.

Contractor shall be responsible for obtaining, mobilizing, operating, and maintaining all materials and equipment necessary to complete dewatering operations, including machinery, bulk bags, sandbags, hoses, pumping facilities, piping, temporary culverts, and the like. All material costs are incidental to pay item 672(1) Stream Diversion & Dewatering.

### 672-3.01 CONSTRUCTION.

Comply with construction design, installation, and operation of dewatering systems with current safety and environmental regulations. Work must be performed in dry conditions. Minimize disturbance of undisturbed ground. Engineer will approve placement of pads for dewatering equipment.

Maintain 24-hour pump operation for trench dewatering until backfill is at least 1' above the groundwater elevation.

### 672-3.02 DEWATERING.

Acceptance of Contractor's written Stream Diversion Plan by the Engineer does not relieve Contractor of responsibility for the exercise of reasonable precaution, prudent construction practices, overloading or misuse of existing or new structures, the adequacy and safety of such works, and the potential damage due to undermining existing or completed works.

Relocate all the fish contained within any coffer/diversion dams, the scour pool, or the old channel before the site is completely dewatered. Place relocated fish in the closest pool upstream of the construction area. If trash pumps are used for stream diversion, the intake must be operated and

## Specifications – 100%

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maintained to prevent fish entrapment, entrainment, or injury. Around the intake use perforated or slotted plate and woven wire with a mesh size not greater than 1/10 inch or a profile bar and wedge wire with openings not greater than 1/10 inch. Intake velocities shall not exceed a passive velocity of 0.2 feet per second (fps) or an active velocity 0.5 fps.

Water resulting from Contractor's dewatering effort may not be pumped or otherwise diverted into creeks unless required permits, including, but not limited to, ADNR, ADEC and the U.S. Environmental Protection Agency, are obtained. Under no circumstances will the Contractor be allowed to divert water from the excavation onto roadways. Contractor is to provide a disposal site for excess water, within the limits of construction, in accordance with all necessary permits.

Maintain the dewatering pumping operations to ensure return flow does not exceed State of Alaska water quality standards. Water pumped from the construction site may require additional filtration by filter fabrics, settling, or other methods to prevent turbid water from directly entering the stream. Turbid water pumped from the work site for the purpose of lowering the water table in the trench during stream channel reconstruction shall be discharged at least 100 feet from stream flows, except when performing dewatering procedures described in the next subsection.

### **672-3.03 REWATERING.**

Conduct re-watering activities to minimize sediment movement downstream of the site upon completion of in-stream work. Prior to re-diverting full stream flows to reconstructed channel (including culvert), wet the channel to wash fines into stream bed. Slowly wet the channel through use of pumps or by diverting a small portion of stream flows into the reconstructed channel. Provide means for collecting sediment and turbid water at downstream end of reconstructed channel. Capture and pump turbid water from downstream end of channel back to upstream end of channel until fines are washed into stream bed and water runs clear as determined by the Engineer. After the initial sediment is removed, slowly breach the coffer/diversion dams to avoid a large pulse of water being sent through the newly constructed channel.

### **672-4.01 METHOD OF MEASUREMENT.** Section 109.

Temporary culverts, pumps, hoses, stilling basins, sandbags, bulk bags (e.g., Super Sacks), plastic liners, temporary rock and riprap, and other materials will not be measured for payment.

### **672-5.01 BASIS OF PAYMENT.**

All administrative costs, materials, equipment and labor necessary to complete the scope of work as specified under this section and not paid for under other items on the bid schedule, including temporary culverts, pumps, hoses, stilling basins, sandbags, bulk bags (e.g., Super Sacks), plastic liners, temporary rock and riprap, are subsidiary to Item 672 (1), Stream Diversion & Dewatering.

Payment will be made under:

<b>Pay Item</b>		<b>Pay Unit</b>
672 (1)	Stream Diversion & Dewatering	Lump Sum

## **SECTION 690 WATERWAY**

### **690-1.01 DESCRIPTION.**

Construct a waterway bed (stream bed, river bed, creek bed, and or similar), and waterway bank (protection and revegetation), at the location shown on the drawings.

### **690-1.02 REFERENCES.**

Stream Bank Revegetation and Protection: A Guide for Alaska; published by Alaska Department of Fish and Game; printed copy available from the CWRP, and electronic copy available on the internet.

### **690-2.01 MATERIALS.**

Clearing and Grubbing	Section 201
Seeding	Section 618 & 724
Topsoil	Section 620 & 726
Aluminum Box Culvert	Section 602

Waterway Bank Fill: Selected Material, Type A.

Salvaged Organic Soil: Salvaged topsoil, overburden material, or useable excavation high in organics and fines.

### **690-3.01 CONSTRUCTION REQUIREMENTS.**

Provide equipment of a size and type to efficiently complete the work with the least impact on the waterway. Submit to the Engineer a list of equipment to be used during construction for review and approval. Do not damage the culvert structure or surface finish. Do not operate equipment directly on the surface of the culvert; work off of protective pad/dunnage or waterway bed fill material.

### **690-3.02 EXCAVATION.**

Excavate to the dimensions shown on the Plans. Control excavated material to minimize disturbance to the new channel and banks.

### **690-3.03 WATERWAY BED.**

Place channel armor substrate material in the channel by methods that do not cause segregation or damage. The Channel Armor Substrate will be placed in lifts of various depths depending on the size of the material. The large riprap boulders are to be placed so that they are in solid contact with each other. The fines in between the larger riprap are an integral part of the waterway bed and are to be compacted tightly into the voids. Acceptable methods involve using water pressure, metal rods and hand tamping methods to force material into the voids until full. Make waterway bed surface roughness similar to the natural waterway bed. Layers of riprap separated by layers of fines are not acceptable.

### **690-3.04 WATERWAY BANK.**

Tie the ends of constructed banks to the existing grade. Modify bank height and width as necessary to create a smooth transition from constructed bank to existing grade. Replace vegetative mat along the channel banks.

## Specifications – 100%

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### Construct Banks:

Place the bank reconstruction materials as shown on the Plans and noted in the Specifications. Place the bank fill material with vegetative mat such that the top of the bank, the vegetated mat, is flat and at the same elevation as the existing bank.

1. Install Erosion Control measures before beginning work.
2. Salvage/harvest and stockpile vegetative mat.
3. Excavate the waterway bank.
4. Place waterway bank fill.
5. Place vegetative mat on the topsoil. Plant vegetative mats between June 1 and August 31.
  - a.) Wet the bank. Soak vegetative mats to saturation prior to placing.
  - b.) If the vegetative mat has lost topsoil, such that the in-place thickness of the mat will not be 12-inches thick, place additional topsoil over the Willows, filling voids, and increasing the mat thickness to 12-inches plus the initial 4-inches of topsoil.
  - c.) Stake all areas to be planted with vegetative mats as shown on the Plans prior to installation. Notify the Engineer of the delineated areas three working days prior to installation. Install only after receiving the Engineers approval.
  - d.) Place vegetative mats tightly together, without gaps, with full contact of the root mass to the soil surface below, tamp into place and anchor with wooden stakes 18-inches long and spaced 1 per square yard.

### **690-3.05 ESTABLISHMENT PERIOD**

Establishment period shall extend for two complete growing seasons after the required planting is completed. A growing season is from May 1 to September 30. The engineer may choose to withhold some payment until vegetation is established.

Employ all possible means to preserve the vegetative mat in a healthy and vigorous condition to ensure successful establishment. During this period, perform the necessary weeding to keep the area of disturbance free from invasive species. Water as frequently as necessary to keep the immediate root area moist at all times.

The engineer may, but is not required to, determine the Project is complete except for the period of establishment, and issue a letter of final acceptance. After final acceptance, work or materials due under this subsection during any remaining period of establishment are considered warranty obligations that continue to be due following final acceptance in accordance with Subsection 105-1.18

### **690-3.06 PLANT REPLACEMENT**

Engineer and Contractor's representative, in the spring of the year following the planting year and before June 30, inventory Willow cuttings, transplants, and vegetative mat planted on the project to determine the number/area of dead plants/organic materials.

1. Willow Cuttings. At least 4 cuttings per foot, on average over a 4-foot section, for each individual layer, shall be healthy and in a flourishing condition. For areas not meeting this requirement, replant the areas using live staking techniques; space the replacement live stakes at 6-inches along the layer or as directed by the Engineer. Do not remove the dead cuttings.

## Specifications – 100%

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2. Planted new saplings that replaced every tree removed as approved by the Engineer; shall be healthy and in flourishing condition. For those not meeting the requirements – re-plant with new healthy plants.

3. Vegetative Mat. If the planted vegetative mat survival (mat being vigorous and healthy) area is greater than 75% of the original planting area, no replacement mat is required. If the mat survival area is less than 75%, replace the vegetative mat to increase the area to 75% of the originally planted area.

Coordinate the replacement of the vegetative mat with the planting of transplants to minimize damage to healthy organic materials. The Engineer will select which of the dead or unhealthy Willow cuttings, transplants, and vegetative mat area to replace.

Perform replacement planting between July 1 and July 15 according to the original planting procedures and as described in this subsection.

If after the maintenance period a survival rate, as described in 1 and 2 above, of planted organic material has not been attained, replant the materials to attain the levels of survival as described in 1 and 2 above, for each live organic material planted.

Contractor is responsible for replacing plants vandalized, stolen, or damaged during the maintenance period. Replace plants as soon as weather conditions permit. Provide replacement plant quality equal to, or better than, initially specified.

There is additional vegetated mat available for revegetation off site at a designated location. The contractor is to notify the Engineer, coordinate the schedule and provide manpower and equipment for harvesting and transporting the replacement mat to the job site.

All plants are to be sourced locally on the island with an exception of grass seed. Plants are to be obtained from the area(s) identified by the Engineer.

### **690-3.07 MAINTENANCE.**

Install and maintain plastic safety fence meeting the requirements in Section 643, in the locations shown in the Revegetation Details on the Plans. Install plastic safety fence per the manufacturer's recommendations upon completion of waterway bank protection and revegetation. Remove plastic safety fence at the end of the maintenance period for the willow cuttings, live willow stakes, and vegetative mat.

Deepwater vegetative mat, willow cuttings, and transplants immediately after planting. Deepwatering shall provide water penetration throughout the entire layer, to the top of the waterway bank fill, with minimum runoff. Rain will not be considered a substitute for deepwatering unless permitted by the Engineer.

Deepwater the vegetative mat, Willow cuttings and transplants as follows:

1. Once a week until August 20.
2. The Engineer may direct the Contractor to deep water past August 20 or provide supplemental watering any time during the life of the project when weather conditions are excessively warm or dry.

## Specifications – 100%

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Daily water vegetative mat, willow cuttings, and transplants, or as directed by the Engineer. Keep the mats moist until final acceptance of the project or as accepted by the Engineer.

Watering equipment shall be equipped with or followed by a vehicle equipped with a Type B advance warning arrow panel using caution mode according to Part VI of the Alaska Traffic Manual.

The warranty and maintenance period for this work shall extend from the time of planting to September 30 of the second year (second growing season).

### **690-5.01 BASIS OF PAYMENT.**

1. Pay Items 690 (1) include the materials and all work to place and maintain the materials in place, including but not limited to, excavation, placement/backfilling, benching, compacting, filling voids and similar. Pay Item 690 (1) includes the materials and all work to salvage/harvest, store, transport, place and maintain organic materials, salvaged vegetation, topsoil, watering, and similar. Watering is subsidiary.
2. Water diversion is paid under Section 672.
3. Offsite disposal of any material attributed to this feature of work shall be subsidiary to and paid under section Pay Item 602 (2) Aluminum Box Culvert.
4. Vegetative mat shall be a minimum of three (3) feet wide. Vegetative Mats harvest, transportation and placement is subsidiary to Pay Item 671 (2) Toewood Bank Reconstruction.

Payment will be made under:

<b>Pay Item</b>		<b>Pay Unit</b>
690 (1) – 1	Stream/Weir Substrate – Fine Material	Ton
690 (1) – 2	Stream/Weir Substrate – Course Material	Ton

# Specifications – 100%

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## SECTION 703 AGGREGATES

**703-2.09 SUBBASE.** *Add the following:*

Subbase, Grading F. Aggregate containing no muck, frozen material, roots, sod or other deleterious matter and with a plasticity index not greater than 6 as tested by ATM 204 and ATM 205. Meet the following gradation as tested by ATM 304:

SIEVE	PERCENT PASSING BY WEIGHT
2 in	100
No. 4	15 – 65
No. 200	0 – 6

## Specifications – 100%

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### SECTION 724 SEED

**724-2.01 MATERIALS** Add The following:

The required seed mix for this project is:

Name	Proportion by Weight
Nortran Tufted Hair grass, <i>Deschampsia caespitosa</i>	20%
Arctared <sup>1</sup> Red Fescue, <i>Festuca rubra</i>	60%
<i>Calamagrostis canadensis</i>	20%

## Specifications – 100%

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### **SECTION 726 TOPSOIL**

**726-2.01** Delete sentence number 2 and replace with the following:

Contains a minimum of 10 percent organic matter as determined by loss-on-ignition of oven dried samples according to ATM 203.

Topsoil to be weed-free certified. Suppliers are to be approved by the owner or engineer.

### **SECTION 729 GEOSYNTHETICS**

#### **729-2.01 GEOTEXTILE FOR SUBSURFACE DRAINAGE, SEPARATION, STABILIZATION, EROSION CONTROL AND EMBANKMENT REINFORCEMENT.**

1. Subsurface Drainage. Meet AASHTO M 288 for Subsurface Drainage, except provide a minimum permittivity of 0.50 sec-1 and meet Class 2 Strength Property Requirements.
2. Separation. Meet AASHTO M 288 for Separation, except provide a minimum permittivity of 0.50 sec-1 and meet Class 3 Strength Property Requirements.
3. Stabilization. Meet AASHTO M 288 for Stabilization, except provides a minimum permittivity of 0.50 sec-1 and meet Class 1 Strength Property Requirements.
4. Erosion Control. Meet AASHTO M 288 for Permanent Erosion Control and meet Class 1 Strength Property Requirements.
5. Reinforcement. Meet the requirements in Table 729-1 for Type 1 or Type 2.

Package, label, handle and store geotextile materials according to ASTM D 4873.