Copper River Watershed Habitat Enhancement Project

Cordova EVOS Site COP 43, 44, and 45

65% Plans and Specifications Review Comments

Steve McGroarty

September 10, 2019

Plans:

General Comment – Plans are not clear. Plan Sheet material fill-design or legend for Weir Substrate, Culvert Substrate and Riprap are very similar and could be confusing to a contractor.

Sheet G-002:

* Estimate of Quantities –
	+ DOT&PF plan sets typically just list a single pay item for Borrow; whether it needs to be Selected Material, Type A or Selected Material, Type B is controlled by the typical sections.
	+ “Borrow Select Fill Material, Type F” is not a standard Alaska DOT&PF material type; this should be “Subbase, Grading F”.
	+ “Geotextile, Separation” should not be used on the project. There will be two types of geotextile used on the project and both should be listed in the Estimate of Quantities. The geotextile layers used in the foundation under the box culverts should be “Geotextile, Reinforcement – Type 2”. There should also be geotextile under the riprap; this should be “Geotextile, Erosion Control”.
* General Notes –
	+ Note 8 should be revised to comply with DOT&PF specification for fill maximum lift-thickness. Section 204-3.01 CONSTRUCTION REQUIREMENTS (STRUCTURE EXCAVATION FOR CONDUITS AND MINOR STRUCTURES) limits culvert bedding and backfill lifts to a maximum thickness of 6 inches. Section 203-3.03 EMBANKMENT CONSTRUCTION limits embankment fill lefts to a maximum of 8 inches.

Sheet C-101:

* If it has not already been done, I suggest the profile be checked to make sure it complies with sight-distance requirements.

Sheet C-101:

* Typical Culvert Section –
	+ Standard Alaska DOT&PF material types should be used:
		- “Select Fill Material, Type A” should be “Selected Material, Type A”. The thickness of the Selected Material, Type A should be shown on the typical section.
		- “Select Fill Material, Type B” should be “Selected Material, Type B”.
		- “Select Fill Material Type F” should be “Subbase, Grading F”.
		- “Geotextile Type 2” should be “Geotextile, Reinforcement – Type 2”.
		- “6” E-1 Gravel” should be “Aggregate Surface Course, Grading E-1”. The dimension should be shown on the typical section.
	+ It is unclear what the “Existing Road” arrow is trying to indicate.
	+ Horizontal dimension of culvert backfill should be shown on the typical section. It is unclear whether the vertical 1-foot thick Subbase, Grading F culvert bedding can be placed as shown on the typical section.
	+ Note 1 – states “Excavated material may be used for Fill Material, Type A as approved by the Engineer.” The geotechnical drilling suggests that the existing road embankment may meet the requirements of Selected Material, Type A; however, the culvert excavation will extend into the foundation soils which are less likely to meet the requirements of Selected Material, Type A or possibly Type B. I suggest that Note 1 be replaced with: “Where Selected Material, Type B is specified on the typical sections Unclassified Excavation of the existing embankment may be used provided the materials meet Selected Material, Type C requirements.” The project should consider what the contractor will need to do with excavated material that cannot be used as Selected Material, Type B.
	+ Notes on Stream and Culvert Substrate Material do not provide clear guidance on how the material should or should not be placed. Note 5 requires the placement of rocks in the channel by hand – does this mean “all rocks” or “some rocks”? Suggest working with the Hydraulics Section on revisions to these notes. Recommend inclusion of a note that requires placement of substrate to be accomplished in a manner that does not damage the bottom of the box culvert.
* Typical Road Section –
	+ Standard Alaska DOT&PF material types should be used:
		- “Select Fill Material, Type A” should be “Selected Material, Type A”.
		- “6” E-1 Gravel” should be “Aggregate Surface Course, Grading E-1”. The dimension should be shown on the typical section.
* Roadway Notes – Note # 5:
	+ Note 5 – states “Excavated material from culvert installation may be used for Select material, Type A Fill if approved by the Engineer.” The geotechnical drilling suggests that the existing road embankment may meet the requirements of Selected Material, Type A; however, the culvert excavation will extend into the foundation soils which are less likely to meet the requirements of Selected Material, Type A or possibly Type B. I suggest that Note 5 be replaced with: “Where Selected Material, Type B is specified on the typical sections Unclassified Excavation may be used provided the materials meet Selected Material, Type C requirements.” The project should consider what the contractor will need to do with excavated material that cannot be used as Selected Material, Type B.
* Typical Collar Riprap Detail-
	+ Geotextile, Erosion Control should be placed between embankment fill and riprap and also between the waterway bank and riprap.
	+ 3 feet of riprap seems significantly less than is typically included in projects; recommend the designer work with the Hydraulics Section on this issue.

Sheets C-200, C-201, and C-202:

* Box Culvert Table indicates the minimum cover thickness is 1.4 feet. This conflicts with the information on the Typical Culvert section on Sheet C-101, which indicates a minimum cover thickness of 2.0 feet. Recommend review of the Plan Set and Specifications for consistency.
* Legend – The symbol for Culvert, Stream and Weir Substrate is the same. “Culvert Substrate” is defined by the gradations in Table 1 and Table 2 on Sheet C-101; however, I did not see any mention that Channel Substrate and Weir Substrate have the same gradations or requirements. Suggest clarification of this.

Sheets C-400, C-401, and C-402:

* Standard Alaska DOT&PF material types should be used:
	+ - “Type F Culvert Bedding” should be “Subbase, Grading F”.
		- “Geotextile Type 2” should be “Geotextile, Reinforcement – Type 2”.

Specifications:

General Requirements:

* Scope of Work-
	+ Recommend that you discuss the question of road closure duration with Alaska DOT&PF Northern Region Maintenance Engineer (Dan Adamczak); I doubt that the road can be closed to 30 consecutive days. Suggest that the question of half-width construction be considered and that if this is going to be a requirement of the Department, then this should be clearly stated in the Special Provisions or on the Plan Set.

* + Suggest that you consider the timing requirements; it is not obvious to me why all construction activities must be completed by May 1. This also appears to conflict with Specification 690, which requires watering of replaced vegetative mat until September 30th. This may also require more crews and more equipment that might increase project costs.
* Permits-
	+ Language requires the contractor to provide alternative road routes if fully closing the road; I am not sure this is feasible on this project. Recommend that you discuss the question of road closure duration with Alaska DOT&PF Northern Region Maintenance Engineer (Dan Adamczak).

Page 3 of the Specifications-65% is titled Standard Modifications to the Alaska Department of Transportation and Public Facilities Standard Specifications for Highway Construction 2017 Edition; suggest you discuss this title with Alaska DOT&PF Northern Region Maintenance Engineer (Dan Adamczak) as I think these should more properly be termed Special Provisions.

Section 105 Control of Work:

* Unless defined elsewhere, CRWP should be defined.

Section 203-3.01 General-

* The second paragraph requires the contractor to test and reuse existing material in construction if approved by the owner/government representative. I suggest that you may want to reconsider if this approach will be practical given the project location, logistics and timing limitations. It may be more expedient and practical to allow the excavation of the existing embankment to be used as Selected Material, Type B if it meets the requirements of Selected Material, Type C as this does not require laboratory testing. This approach may eliminate the need for the requirement to perform gradation tests on the existing embankment material as required by the third paragraph.

Section 203-5.01 Basis of Payment-

* Pay Item 203(3) is listed for both for Unclassified Excavation and Usable Excavation. I believe that normally each pay item can only apply to a specific task or material. Elsewhere in the document, the contractor is required to complete construction in accordance with Alaska DOT&PF Standard Specifications for Highway Construction. Alaska DOT&PF typically does not include a pay item for Usable Excavation, nor is it clear how a contractor could know ahead of construction what percentage of the existing embankment is usable vs. unusable. Standard Specifications require the contractor to incorporate usable excavation into the project prior to bringing in borrow; I believe the cost for this is typically included in the bid cost for Unclassified Excavation.
* Pay Item 203 (5) is listed for both Re-use Select Fill Material Type A and Borrow Select Material, Type A. I believe that normally each pay time can only apply to a specific task or material. I believe the re-use of existing embankment is normally incorporated into the overall project costs and is not a stand-alone bid item.

Section 204-2.01 Materials-

* Culvert bedding and backfill is defined as “ADOT&PF Select Material Type F”; this should be Subbase, Grading F.
* General backfill is defined as “ADOT&PF Select Material Type A”, but it is shown on the Typical Culvert Section as “Select Fill Material Type B” on Sheet C-101. Suggest you delete mention of the general backfill as a specific material type in the specifications as it is already shown on the plans.

Section 204-5.01 Basis of Payment-

* Alaska DOT&PF Standard Specifications lists the pay item as 204(1) Structure Excavation, not fill type.

Section 602-2.02 Geotechnical Data and Hydrology Information-

* Recommend that you modify this section to delete “the Department” and include whatever agency is going to be issuing the plans and entering into the contract for the work.
* Recommend that you clearly define Armored Channel Substrate and indicate that it is either subsidiary to the Culvert or indicate how the contractor will be paid for it. You may want to clarify that the cost for the Armored Substrate includes all costs associated with production, handling and placement of the material.

Section 630-3.01 Construction-

* Upon review of the plan set, the recommendation for incorporating a single 15-foot wide layer of geotextile under the culvert centerline appears to conflict with the Typical Culvert Section on Sheet C-101 as this shows geotextile widths of 22.5 feet and 16.5 feet. I suggest that you eliminate the requirement to place the geotextile centered under the culvert and allow seems parallel to the culvert centerline with a minimum overlap of 7 feet.

Section 630-4.01 Method of Measurement-

* Pay Item table should be under Section 630-5.01 Basis of Payment.
* Pay Item table incorrectly lists Geotextile, Separation instead of Geotextile, Reinforcement – Type 2.

Section 672-1.02-

* The document requires notification of the “Engineer of record”, I suspect this should simply refer to the Engineer as I expect the notification requirement should be given to the Project Engineer, not the Engineer of Record.

Section 690-2.01 Materials-

* Channel Armor Substrate references Section 204; however, the material type “Channel Armor Substrate” is not defined in Section 204. “Armored Channel Substrate” is mentioned in Special Provision 204, but it is not defined there. Recommend that the Plan Set and Specifications be reviewed for consistency in terms.
* I get the impression that Armored Channel Substrate to be placed within the culverts and Weir Substrate (which is never defined), and some of the Stream Substrate are the same material but I could not find where this is clearly stated. This issue and how each material will be paid for should be clarified.