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Project review August 2019 by Artem Ruppert (907-451-5285-Alaska DOT M&O Engineering, Fairbanks)

USFWS Copper River Watershed Habitat Enhancement Project

CORDOVA EVOS SITES COP 43, 44, and 45

Coding: **S-suggested change (consider implementing);**

C-make a correction- firmly recommended (makes construction administration simpler/cheaper)

R-required (strongly recommended)

Sheet G-001 (See red-lined Sheet)

1. Suggest labeling Airport, all 3 culvert approximate Mileposts on Copper River Highway (S)
2. Add labels to show direction to Cordova and Copper River (S)
3. Suggest adding table listing Mileposts and other identifiers such as station as on C-100 (S)
4. Clarifying description as noted (maybe move it to general notes to another sheet? (S)
5. Add several lines with general summary info such as length of grade raise, width of roadway, length of project, daily traffic volume (and anything else relevant to project summary (C)
6. Sheet missing G-004 is missing in Drawing Index-delete or add (C)

Sheet G-002 (See red-lined Sheet)

1. Item 201(1) by SY. Better to wrap it up into item 201(3B) Clearing and Grubbing by LS. One less thing to inspect in field-and it has been recent practice at DOT for smaller projects. Add table of lump sum estimated quantities on this sheet-and list approximate clearing square yardage at each site, not just total sum of 2940 SY (C).
2. Item 202(4) Removal of culvert pipe by LF. Cost to remove at each location may be different (1 item listed only) and it is one more item to inspect for construction personnel. Cleaner is deleting this pay item and making removal subsidiary (in specs and general/culvert notes) to individual culvert item itself at each location (see below-also recommending to create an individual pay item for pipe at each location)- (C).
3. Item 602(2)-recommend including thickness of aluminum pipe into name (e.g. 0.150 inches as was used on DOT Denali Hwy pipe at MP 131.5 similar-sized/type pipe in 2017). Also it would be better to have a separate pay item for each location to make figuring out pay progress payments easier as work progresses (and because I recommend to make excavation subsidiary to each culvert item), as follows (e.g.):
602(2)-1 "Structural Plate Aluminum Box Culvert 16'-6" Span x 6'8" Rise W/solid invert, 0.150" thick at COP-43" by LF. Also have 602(2)-2 and 602(2)-3 for COP-44 & COP-45 respectively- (C).

4. Items 203(6)-Borrow and 301(3) ASC E-1: in table show separate quantity for site COP43 and one combined for COP 44 &45 since they are next to each other and have continuous layer spanning both culverts. Also, if project is going to have scales at material site(s), it is more efficient to use item **301(3), Aggregate Surface Course, Grading E-1 by Ton** and avoid field calculations but track quantities on tickets-inspector will take tickets in field-otherwise not clear how to measure (survey before and after?-unnecessary step)-(C).
5. Use item 301(3) Aggregate Surface Course, Grading E-1 (not **base** Course) (S).
6. Item 630(1) Geotextile, Separation by SY should be actually 630(100) Geotextile, Reinforcement, Type II. (?) or indicate where geotextile, separation is used-(C).
7. Consider adding pay item 631(2) Geotextile, Erosion Control by SY for placement under riprap as recommended by DOT Geotechnical and Hydraulics Engineers(C).
8. Add item 613(2) Culvert Marker, by each, 6 total (3 pipes @ inlet + outlet).-(S).
9. Add item 642(3) Three Person survey party by Contingent Sum (CS) or by hour for unexpected survey needs to assist project engineer in field if/when necessary by directive (S).
10. Add pay item 643(25) Traffic Control by Contingent Sum-"S".
11. Add item 640(4) Worker Meals and Lodging, or per diem by LS (State law/Dept. of Labor). (R)
12. Add pay item 643(23) Traffic Price Adjustment by CS-to provide incentive to contractor to handle traffic in a manner acceptable and give tool to Project Engineer to manage traffic & safety (S).
13. Recommend deleting item 203(3) Excavation by CY-it encourages contractor to excavate more than necessary to get paid (and take responsibility to doing it in a safe manner). Unnecessary and time-consuming task in field to measure volume of excavation. Suggest marking Unclassified Excavation subsidiary to each culvert item (in specs and General or Culvert notes). Add verbiage to culvert notes: "Culvert Trench excavation, backfill above embedment material, and compaction for culvert installation will not be measured for payment and is subsidiary to the corresponding individual 602(1) culvert item at each location". If taking this route-add approximate height of embankment at each proposed culvert location in notes. "S"
14. Option to add pay item 204(107) Embedment Material-this material will be used for foundation and extend to above 1 ft. above bottom of pipe. Add note "Width of bedding and backfill shall extend minimum 18' each side from the culvert outside diameter". For this work it is easier to use Borrow-Selected Material, Type A (already existing item in project but won't be measured for payment here-indicated item Borrow Select Fill Material, Type F does not exist in Table 703-9 in referenced 2017 DOT standard specs 703-2.09 in provided Special provisions.-in Special provisions is noted I see -and takes an extra effort to screen and produce-is it worth it?-especially given tight project timelines). I attach verbiage used in special provision for embedment material.-(C).
15. Add verbiage "Re-use existing excavated embankment material meeting Selected Material, Type B (or C?) or better; any new imported material shall be Selected Material, Type A".-(C)
16. Delete items 204(1) Borrow Select Fill Type B and F. Item 203(5) Borrow Select Fill Material, Type A by CY shall be also deleted (also non-DOT standard item names). Instead recommend using item 203(6) Borrow by Ton (will point to use Selected Material, Type A per 703-2.07-1). Otherwise difficult to measure in field and serves no clear purpose. "C"

17. Estimate of Quantities (EOQ) shall have rows containing item name AND ONLY ONE quantity given. Thus, quantity distribution of pay items shall be given in a separate table elsewhere (this sheet or others) and sum of these shall total those listed in EOQ-“S”
18. Several suggestions to change general notes (see attachment redlines). Wrong project name in title box-“S”
19. Recommend adding verbiage in General notes “Any dewatering for culvert installation is subsidiary to 672(1) Stream Diversion & Dewatering” pay item. It shall comply with the State of Alaska Department of Environmental Conservation (DEC)-required permit that contractor is required to obtain”. Or adding to specifications “General Requirements”- “C”.
20. Consider adding pay item 646(1) CPM scheduling by Lump Sum if concerned with timely completion of permits and construction administration. Normally it does not add much additional cost and contractor is doing it internally anyway –“S”.
21. DOT recommends to have SWPPP specifications and following pay items added due to environmental sensitivity of work locations (even if area is less than 1 acre): “R”
 - 641(1) Erosion, Sediment and Pollution Control (by Lump Sum)
 - 641(3) Temporary Erosion, Sediment and Pollution Control (by Lump Sum)
 - 641(4) Temporary Erosion, Sediment and Pollution Control Additives (by Contingent Sum)
 - 641(5) Temporary Erosion, Sediment and Pollution Control by Directive (by Contingent Sum)
 - 641(6) Withholding (by Contingent Sum)
 - 641(7) SWPPP Manager (by Lump Sum)
22. Consider 644 pay items: 644(1) Field Office by L.S. (includes office and mobile internet) and 644(2) Field Laboratory by L.S. and 644(6) Vehicles by L.S. (and specifications). Would project use technician with nuclear gauge who will check compaction. DOT normally has item 644(15) Nuclear Testing Equipment Storage Shed by each. “S”.
23. Consult with DOT M&O in Cordova (Robbie Matson) if they want 642(1) Calcium Chloride placed on final wearing course Aggregate base Course, Grading E-1. If yes, at what rate? –“R”.

Sheet G-003 (See red-lined Sheet)

1. Backfill Cross Section: No reason to use clean gravel for silt fence support. Could be any material-“S”.

Sheet V-100, V-101 and V-102 (See red-lined Sheet)

1. Wrong Title for project- “R”
2. Unclear why these sheets are included into plan set. If included into plan set, use “NOT FOR CONSTRUCTION” STAMP. Otherwise it can be included into Supplemental material available to Bidders-“S”.

Sheet C-100 (See also red-lined Sheet)

1. Suggest including culvert skew values information (if any) at each pipe location-“S”.
2. Would be helpful to show value cover over pipe as drawn with proposed grade raises-“S”.
3. Recommend listing quantities (E-1, borrow) separately over Grade Raise Area 1 (COP 43) and Grade Raise Area 2 (COP 44 & 45) somewhere. List length of these areas on this sheet or elsewhere-“S”.
4. Why can't we have the most cover/highest curve point directly over the pipe? If cover for HL-93 is 1.4 to 4 ft, we'd like to have at least 2.5 ft over pipe at Centerline. At hinge points we'd like to have more than minimum 1.4 ft cover. Grading and erosion can further reduce gravel cover – “S”.
5. We are concerned that currently 584-ft long section with 3-curves (VC) over COP 43 from 1+72 to 7+56 may not be long enough and routine grading activities might reduce cover over time causing potential pipe damage. Recommend lengthen E-1 cover placement to 800', say from 0+00 to 8+00. “S”. That would increase K-values that seems low now and make grade raise more gradual. To be verified with Cordova M&O (Robbie Matson).
6. We are concerned that currently 679-ft long section with 4-curves (VC) over COP 44 and COP 45 from 11+99 to 18+78 may not be long enough and grading activities might reduce cover causing potential pipe damage. Recommend lengthen E-1 cover placement to 1000', say from sta. 10+00 to 20+00. “C”. That would increase K-values that seems low now and make grade raise more gradual. To be verified with Cordova M&O (Robbie Matson).
7. Is this road interval in normal crown section or it is superelevated in sections?
8. Consider combining grade raise areas from station 0+00 to 20+00 in one continuous interval – “S”.
9. Add Distance to The Airport (on left) and Copper River (on right)-“S”.

Sheet C-101 (See also red-lined Sheet)

1. Roadway note 1-rephrase to read “Road Grades and alignments, as shown on plans, may be subject to minor revisions as/when directed by the Engineer” - “S”
2. Typical culvert section “existing embankment” is better; Spell out full official item name to match EOQ list – “S”.
3. Typical Culvert Section-see redlines-show details (slopes) for substrate inside pipe
4. Add/modify several labels as suggested-“S”.
5. DOT had used requirement for min 2:1 excavation slope; 1:1 slope may not be safe and not meet OSHA requirements. However 1:1 excavation slopes may be Ok for relatively shallow digouts. –“S”.
6. Add note to point out reinforcing rib and haunch-“S”.
7. All material layer name revisions are as described/proposed for Sheet G-002 (EOQ).

Sheet C-200 to C-202 (See also red-lined Sheet).

1. In table: list plate thickness-suggest using 0.150 inches; for reinforcing rib-use “per manufacturer recommendations” –“S”
2. May want to add any culvert notes, list skew and H&H Hydro data etc.; Show arrow to indicate direction of flow. It should be clear at a glance what flow direction is-“S”.

3. Legend: make linetype solid for new culvert (DOT convention) while existing culvert is dash line-
"S".

Sheet C-400 to C-402(See also red-lined Sheet)

1. Unclear what thickness of riprap needs to be at collar & weir. 2ft? "R"
2. Consider adding layer of 631(2) Geotextile, Erosion Control, Class I under riprap.-"R"
3. Adjust labels for Bedding type of material (suggested above to use Aggregate Surface Course, grading E-1"- "S"
4. Not clear what VAP concept is (Vertical Adjustment Potential). Maybe clarify significance of it in Notes?-"S"
5. Non-recoverable slopes 2:1. Had the RSAP analysis been done for roadside safety (culvert ends)? Possible modification may include "barnroof design" would be combined 6:1 and 2:1 slope; or 6:1, 3:1 and 2:1 on RT & LT to ensure "clear zone" is met for certain MPH road design and road type. -"R"
6. Recommend noting cover above culvert at road centerline & elevation of culvert at C/L on approved profile- "C"
7. AT both RT & LT hinge points (16' from road Centerline) indicate thickness of cover over top of culvert. We do not want it to be minimum value (1.4 ft) there, recommend getting it closer to 2',
"C".
8. Other suggestions as noted-"S".

Sheet C-500

1. Section B: better label is "Embankment fill" (than road fill)-"S"

Specifications (SEE REDLINES “S” in attached PDF)

Comment about construction sequencing. DOT is unwilling to close road for 30 days. Consider using half-width construction.

If plan is to pre-assemble aluminum pipe at each location and place it in trench in one piece then consider the following verbiage (used at another DOT project in 2017 for similar pipe).

“Road closures are only allowed at each site for installation of Aluminum SPP Box culvert. Road closure times 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 Project Engineer three 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.

-Consider salvaging existing culverts and delivering removed culverts to Cordova State DOT M&O (only if in good undamaged condition AND make this subsidiary to culvert item at each location.