Draft H&H Report

Any design or recommendations must meet or exceed those included in the F&G/DOT MOA.

http://dot.alaska.gov/stwddes/desenviron/assets/pdf/procedures/dot_adfg_fishpass080301.pdf

This document will be reverenced.

Pg. 1, 2nd paragraph, 2nd sentence – Choose another word for "backing", maybe justification.

Replaced with "analysis"

Pg. 2, Location Map – Show airport and Mile Post's at 5-mile intervals. Show Pilot Point, referenced on page 3. Will add landmarks per request

Pg. 3, last sentence – Choose another word for "petered out". (not yet an industry accepted hydrologic term). "petered out", dictionary defined as "to diminish gradually and stop; dwindle to nothing" we will look for an industry accepted wording.

Pg. 5, 2nd paragraph, 1st & 2nd sentences –replace "believe" with "assumed". Will make change as requested

Last paragraph – If from page 4, the flows "..high flows jump the banks..", it is "..a relatively common occurrence..", and "..there are no high banks for flood waters to overcome, almost any high flow event floods out into the forest.", shouldn't some component of the overflow discharge be included, if it overtops on a regular basis? This is of course the central conundrum of these site. We have confirmed that these overbank events happen on a regular basis but it is unclear how much of this overbank flow gets into the small drainages that end at our sites. There is an extensive series of channels that emanate from the overtopping area but most of them appear to trend off to the west without crossing the Saddlebag Glacier road into our basins. Site COP 42 that drains the pond just west of the logging road has seen glacial flows but all the overtopping events in COP 43, 44, &45 are precipitated by beaver activity according to M&O. If we are to include flows from these overtopping events even a small percentage of the Saddlebag River flood flows will result in 3 plus 20' structures in locations where 3 less than 4" structures have survived for a significant period. This is a cost versus risk call with a lot of poorly defined variables and historic performance as the only real indicator of future performance. (standard stock market warnings aside). Let's discuss at your convenience.

Pg. 6 – Show culvert locations and low point of road. Will add per request

Pg. 7 – "poor construction" or inadequate culvert sizing? Beaver ponds will tend to attenuate flows. Will change wording to include culvert sizing and invert elevations in this consideration.

Pg. 9, Table 2 – Would suggest checking inputs to HY-8, or use a different software program, because this table indicates that the roadway may overtop on almost a yearly basis. What is the storage capacity behind the road embankment? We will double check our numbers, two points are taken, one is that this roadway is in fact frequently overtopped most often by beaver activity and the second is that our flow numbers are calculated from a series of

conservative assumptions designed to include a factor of safety. The resultant flows will show overtopping on a shorter recurrence interval than is seen in real time.

Proposed Site characteristics, 2nd bullet – Are the USGS road and Saddlebag Glacier Road the same road? Yes, these are the same location, we will check document for consistence of landmark references.

On the three plan sheets (COP 43, 44 & 45), there are several places where the 48-foot and 49-foot contour lines cross the road centerline. Where is the low point of 48.80'? We are assuming that the new culverts will require raising the roadway so that the overtopping will not accure along the redesigned roadway. The low point will then be east and west of the project area near COP 42 or COP 46.

Proposed culvert design – How were the culverts sized, if the embedment depths were not entered into HY-8? Did you use "User Defined" option for the culvert shape in HY-8? Was the fish-passage substrate, subtracted from the area of the waterway area? We had to make some assumptions at this point, we will reevaluate structures, placement, flow velocities, substrate sizing and embedment depths I our final calculations.

F&G/DOT MOA requires a minimum 20% burial of pipe arches and boxes. Noted, this depth will also be driven by stream substrate sizing D100.

Provide detail of low-flow channel within culvert, and include low-flow analysis. Will be provided once the USFWS completes their low flow analysis.

Pg. 10, Table 3 – Proposed culvert grade should more closely match channel grade. This will be revaluated, will include a set of Vertical Adjustment Potential VAP lines for each culvert in the design scetches. Include discharge and velocities for Q_{fish}. Will include in final

Table 4 – How can the culvert be sized to pass the 100-year flood event, at 0.8 times the culvert rise, but the roadway is overtopped at a significantly smaller discharge? This is the challenge of an essentially flat stretch of road with low cover on the existing small culverts. The only way to do this is with wide flat structures. Compromises may have to be made in design criteria.

Has there been any discussion about designing a high-water crossing, at the low-point of the highway embankment, so that the road is not completely wash-out, and can be quickly repaired? See Armored Embankment details in attached PDF. We should discuss this option if we think it is viable, open to discussion.

Draft Geotech Report

Any design or recommendations must meet, or exceed, those included in the DOT&PF Standard Specifications for Highway Construction, and culvert manufacturer specifications.

http://www.dot.state.ak.us/stwddes/dcsspecs/index.shtml

We would not recommend either an open-bottom culvert, or a concrete headwall in any of the proposed culvert crossings. Please consider an aluminum box with full invert, or an aluminum structural plate pipe arch. Remove and revise all references to concrete footings.

Pg. 5, 2nd paragraph – Culvert Embedment Material is composed of -2" material with 0-6 % minus 200, and extends 18 inches on both sides of culvert, and 12 inches from top and bottom of culvert.

3rd paragraph – For QA/QC, include reference to MSTF Table for Backfill and Foundation Fill for Major Structures.
http://www.dot.state.ak.us/stwddes/dcsconst/assets/pdf/mstf_highway_hl.pdf

4th paragraph – Lifts should not exceed 8 inches (uncompacted) per Section 203 Standard Specs.

5th paragraph – Consider specifying a capillary cut-off layer, if silts may be incorporated into the lower portion of the embankment.

Pg. 6, 2nd paragraph – Consider stabilizing foundation with alternating layers of geotextile and clean gravel.

For all site recommendations:

Review ConTech Structural Plate Design Guide for specifications, and soil-bearing limitations.