

# MEMORANDUM

# State of Alaska

Department of Transportation & Public Facilities  
Design and Engineering Services – Southeast Region  
Preconstruction / Materials

TO: Jim Petropulos, P.E.  
PD&E Group Chief

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PROJECT NUMBER: 68405

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SUBJECT: Trip Report- Phase II  
Reconnaissance of KTN Shelter  
Cove Road

## INTRODUCTION

At the request of Project Manager, Jim Petropulos, P.E., a Phase II geotechnical reconnaissance investigation was conducted for the Ketchikan Shelter Cove Road project. The Phase I investigation was conducted in the Fall of 2007 and produced a preferred alignment from Lake Harriet Hunt to Shelter Cove. The preferred alignment was staked by DOT&PF survey crews using inertial GPS equipment. The purpose of the Phase II reconnaissance investigation was to follow the staked alignment, record any pertinent observations, and determine if it is viable. The field work was completed between August 11 and August 22, 2008 by Mitch McDonald, Nate Geary, and Michael Walters. This memo presents some of the basic observations which will be discussed in more detail in a report to follow.

## SUMMARY OF FINDINGS

### OPTION 2- Lake Harriet Hunt

The alignment staked for Option 2 needs only minor adjustments to optimize it further. The significant features of this alignment are the numerous large gulleys that will have to be crossed. However, all the crossings can be accomplished with culverts and large fills. Bedrock along the alignment appears to be very shallow with a few exceptions. The quality of the rock is notably poor along the margins of the West and East Lineaments and cuts should be kept to a minimum and as low as possible through this portion of the alignment. The end of the alignment where it ties into the existing White River Road may be susceptible to shallow slope failures in thicker, high angle soil deposits. Avoiding these will be difficult and typical sections should be developed to address this possibility.

### OPTION 3-Lake Harriet Hunt

The staked alignment for this option followed very favorable terrain. Slopes begin to steepen at approximately station 40+00. Due to the current limits of active logging it was unsafe to proceed beyond this station and the end of the

terrain will be bench cut with steep, potentially raveling slopes continuing above the cut limits. This option intersects a very steep and narrow logging road that will require upgrade to match the design criteria of this project.

#### LEASK COVE TO BAT COVE

From the end of the existing logging road near the mouth of Leask Creek the proposed Option 6 alignment rounds the nose of a fairly steep hillside below a significant gorge. This gorge should be avoided if any future realignments are investigated. The hillside running parallel to George Inlet is fairly moderate with only a few short steep sections. The soils are saturated, colluvium that appear to be five feet or less thick over the bedrock. The colluvium appears to be mostly angular rocks 6-12 inches in diameter, supported in a matrix of saturated silt with some organics. At least two, small, inactive debris chutes were observed.

Rock cuts made into this slope may experience some small localized shallow soil failures above the daylight limits. Areas particularly susceptible to this include those with high moisture contents and areas near small creeks that become active during high rain events.

Fill embankments placed over these soils may be susceptible to global slope failures. Failures could result from sliding of the soft saturated soils along the bedrock contact. Typical sections for fills along this slope should either require the removal of the overburden soils down to bedrock, or provide sufficient amounts of fill to act as a buttress to maintain minimum factors of safety.

#### BAT COVE

The proposed alignment along the west side of Bat Cove cuts across steep slopes. These slopes are comprised of shallow, silty, colluvial soils over bedrock. Numerous boulders are raveling from small bedrock outcrops and weathering out of the colluvium creating a minor hazard. It is recommended that a pay item be included for the removal of hazard rocks identified during design phase geotechnical investigations. The slopes also have an abundant amount of dead and living trees that will constitute a hazard to the road. These will need to be identified during construction and removed. Plans and specifications should provide a pay item for removal of hazard trees outside of the standard clearing limits.

The proposed alignment along the east side of Bat Cove is currently rising at steep grades in a thru cut over 100 feet high. The cut on the uphill side will have a steeply rising natural slope 100's of feet above the daylight limits. This slope was observed to contain rockfall hazards from fractured bedrock outcrops producing angular boulders averaging 1-2 feet across, with some reaching diameters of 5 feet. This hazard will need to be mitigated prior to construction of the thru cut while access is still possible. Realignment of the road closer to the beach would help to eliminate this hazard. Additionally, a realignment would also improve the cut geometry that will be required as the alignment rounds the nose of the hillside as it turns out of Bat Cove.

### BAT COVE TO THE GORGE

As the proposed alignment climbs out of Bat Cove, it begins to traverse a very steep hillside above the beaches of George Inlet. Several shallow localized soil failures were noted along this slope and appeared to involve quantities between 50 and 200 cubic yards. It is reasonable to expect these slope failures to also occur above the daylight limits of the road cuts. Possible mitigation of suspect slopes could be removal of the material down to the bedrock contact, or placement of a Class I or II rip rap blanket. At approximate station 522+00 the proposed alignment traverses down off this steep slope and onto a bench that also contains the Swan Lake transmission lines. The road is currently located at the base of the steep slope and in a flooded trough that appears to be a wetland. Soft marshy soils along this section may pose a settlement issue. High groundwater and flooding caused by heavy rainfall observed during this field investigation may require a very coarsely graded embankment foundation to allow transmission of water through the embankment. Realigning the road so that it cuts along the lower reaches of the hillside would effectively avoid this problem area, but would then be subjected the possibility of soil failures as discussed previously.

### THE GORGE TO SHELTER COVE ROAD

The terrain from The Gorge to the Shelter Cove logging road is favorable for road construction. Minor realignments along the last 1000 feet or so of the alignment would reduce the exposure of the fill embankments to flood waters in the North Salt Creek drainage.

### **CONCLUSIONS**

The staked alignment appears to be a satisfactory corridor for the proposed road project to connect Lake Harriet Hunt to Shelter Cove. Option 2 is better than Option 3, however, use of the existing White River Road may still be the best option. The White River Road avoids the steep grades required along the Option 2 and 3 alignments, and remains at much lower elevations, allowing for longer use into the fall and early spring when the Lake Harriet Hunt area is covered with snow. It is anticipated that upgrade of the existing White River Road may be less than construction of either Option 2 or 3. Use of this road does come with a known history of slope failures, and it should be considered likely that some form of slope mitigation may be required along portions of the White River Road should it be selected as the preferred alignment.

Option 6 appears to be satisfactory as well. There will be some slopes that present challenges during construction, but none that would pose a substantial obstacle. It is recommended however that a minor realignment be considered for the portion of the proposed alignment along the east side of Bat Cove from station 495+00 to 530+00.