

Appendix C. Location Hydraulic Study



STEESE – JOHANSEN EXPRESSWAY INTERCHANGE

MEMORANDUM

Subject: Location Hydraulic Study
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To: Lauren Little, PE – DOT&PF
Date: February 21, 2020

1. INTRODUCTION

This Location Hydraulic Study (LHS) was prepared to evaluate and assess any potential hydraulic impacts from the proposed Steese Expressway – Johansen Expressway Interchange Project (project) on the base floodplain. The LHS is a requirement of Chapter 23 of the Code of Federal Regulations (CFR) Section 650.111 which defines an encroachment as any action within the limits of the base floodplain.

2. PROJECT DESCRIPTION

The Alaska Department of Transportation and Public Facilities (DOT&PF) is proposing to construct improvements at the intersection of the Steese Expressway and the Johansen Expressway and include realignment of adjacent access as necessary. The project will address operational and safety improvements. The intersection is located north and east of downtown Fairbanks.

3. FLOODPLAINS

The Federal Emergency Management Agency (FEMA) National Flood Insurance Program has studied the project area in detail and created maps which include the flood plain for the 1% annual chance flood (ZONE AE) and areas outside of the 1% annual chance flood plain. The Steese-Johansen Interchange is in an area labeled Zone X of the Chena River on the NFIP Map Panel 02090C4385J. See Figure 1. Zone X in this location is defined as areas protected by levees from 1% annual chance flood. The project is located downstream of the Moose Creek Dam and Diversion Structure, which provides detention and diversion of flow, allowing a maximum of 12,000 cfs (the 1% annual chance flow) to pass into the Chena River. The extents of the 1% annual chance flood, also described as the base flood plain, are located more than one mile south of the project.

4. RISKS ASSOCIATED WITH IMPLEMENTATION OF THE ACTION

There are no risks or consequences associated with the probability of flooding attributable to the project. Reconstruction of the intersection will result in minor changes in geometry as compared to existing conditions. The proposed construction will not have encroachments in the flood plain and therefore no impact on the base floodplain. Any potential risks would only occur in the event of a catastrophic failure of the Moose Creek Dam.

5. IMPACTS ON NATURAL AND BENEFICIAL FLOOD PLAIN VALUES

Fish, wildlife, plants, open space, natural beauty, scientific study, outdoor recreation, agriculture, forestry, natural moderation of floods, water quality maintenance, and groundwater recharge are all components of natural and beneficial flood plain values. This project will not impact the natural and beneficial flood plain values of the Chena River as the project is located well outside of the base flood plain extents.

6. MEASURES TO MINIMIZE FLOOD PLAIN IMPACTS ASSOCIATED WITH THE ACTION

As there are no flood plain impacts associated with this project, there are no measures required to specifically minimize the impacts to the flood plain. Proposed work will not impact water conveyance of the Chena River.

In general terms of surface water impacts, the drainage of the proposed intersection will be improved by replacing existing culverts, installing new culverts and reconfiguring ditches to relieve current ponding issues at this project site. Erosion and sediment control measures will be implemented during construction and the footprint of the project will be minimized to the extent practicable.

7. CONSISTENCY WITH EXISTING WATERSHED AND FLOOD PLAIN MANAGEMENT PROGRAMS

The project will not involve encroachments in the base flood plain and will not have any impacts to the flood plain. Conveyance and storage capacity of the 1% annual chance flow will not be affected by the proposed reconstruction at the project location.

FIGURE 1: PROJECT LOCATION WITH FEMA NFIP FLOODPLAIN MAPPING

