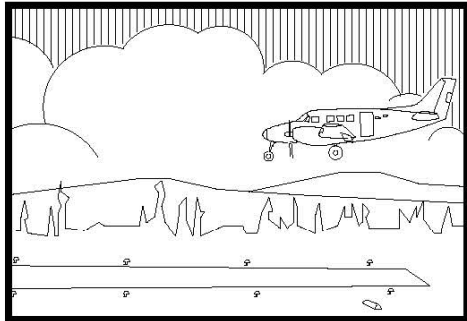


DESIGN STUDY REPORT

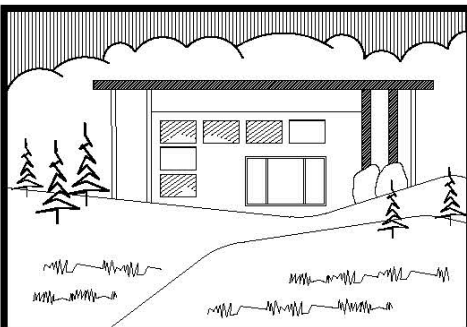
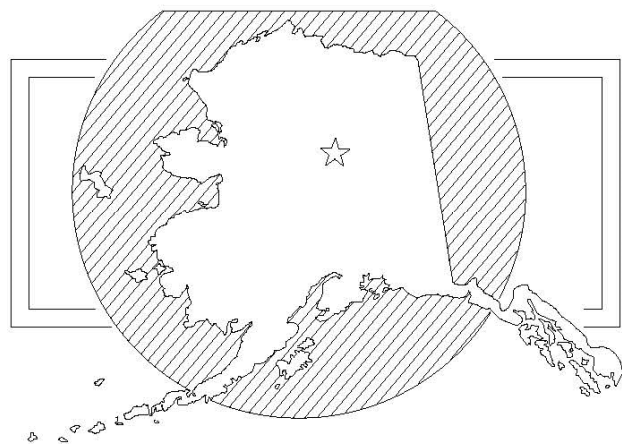
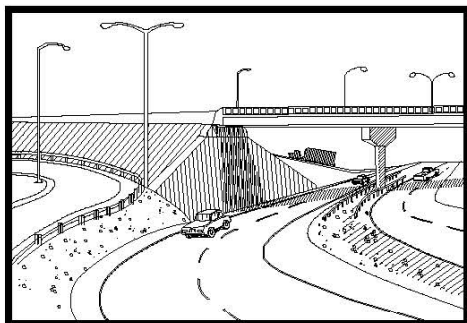
Aurora Drive Noyes Slough Bridge No. 209 Replacement

NFHWHY00124/0629001



STATE OF ALASKA

Department of Transportation
and Public Facilities



NORTHERN REGION

May 2022

DESIGN APPROVAL


AURORA DRIVE NOYES SLOUGH BRIDGE NO. 209 REPLACEMENT

PROJECT NO. NFHWY00124/0629001

Requested by:  5/20/2022

Lauren Little, P.E.
Engineering Manager
Northern Region

Date

Design Approval
Granted:  5/20/2022

Sarah E. Schacher, P.E.
Preconstruction Engineer
Northern Region

Date

Distribution: NR Design Directive 20-01 Distribution

DESIGN STUDY REPORT
FOR

AURORA DRIVE NOYES SLOUGH BRIDGE NO. 209 REPLACEMENT

PROJECT NO. NFHWY00124/0629001

PREPARED BY: Brandon Irvine, P.E.



ALASKA DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
NORTHERN REGION DESIGN AND ENGINEERING SERVICES
MAY 2022

AURORA DRIVE NOYES SLOUGH BRIDGE NO. 209 REPLACEMENT
PROJECT NO. NFHWY00124/0629001

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INTRODUCTION/HISTORY

The Alaska Department of Transportation and Public Facilities (DOT&PF), in cooperation with the Federal Highways Administration (FHWA), proposes to replace the existing bridge (#0209) over the Noyes Slough located on Aurora Drive.

The bridge is located in Fairbanks, Alaska, 0.2 miles south of the intersection of College Road and Aurora Drive. It serves nearly 4,000 vehicles daily and is used to provide the Aurora neighborhood with direct access to the College Road corridor. Frequent vehicle use includes school buses and two MACS Transit bus lines, as well as emergency services from the City of Fairbanks Aurora fire station.

The existing bridge is 103 feet long and 36 feet wide. Originally constructed in the early 1960s, in 2018 it was inspected and received a sufficiency rating of 71.6 out of 99. A score of 50 or less is typically required to warrant replacement; however, this bridge has multiple issues that, taken together, make it undesirable to rehabilitate as opposed to replace. The bridge deck is in poor condition, and the center of the deck is supported by a center pier that has high scour potential, in part due to catching large amounts of floating logs/debris. The sidewalk across the bridge is only 3 feet wide and effectively only 2.5 feet wide at each end of the bridge which is not ADA compliant.

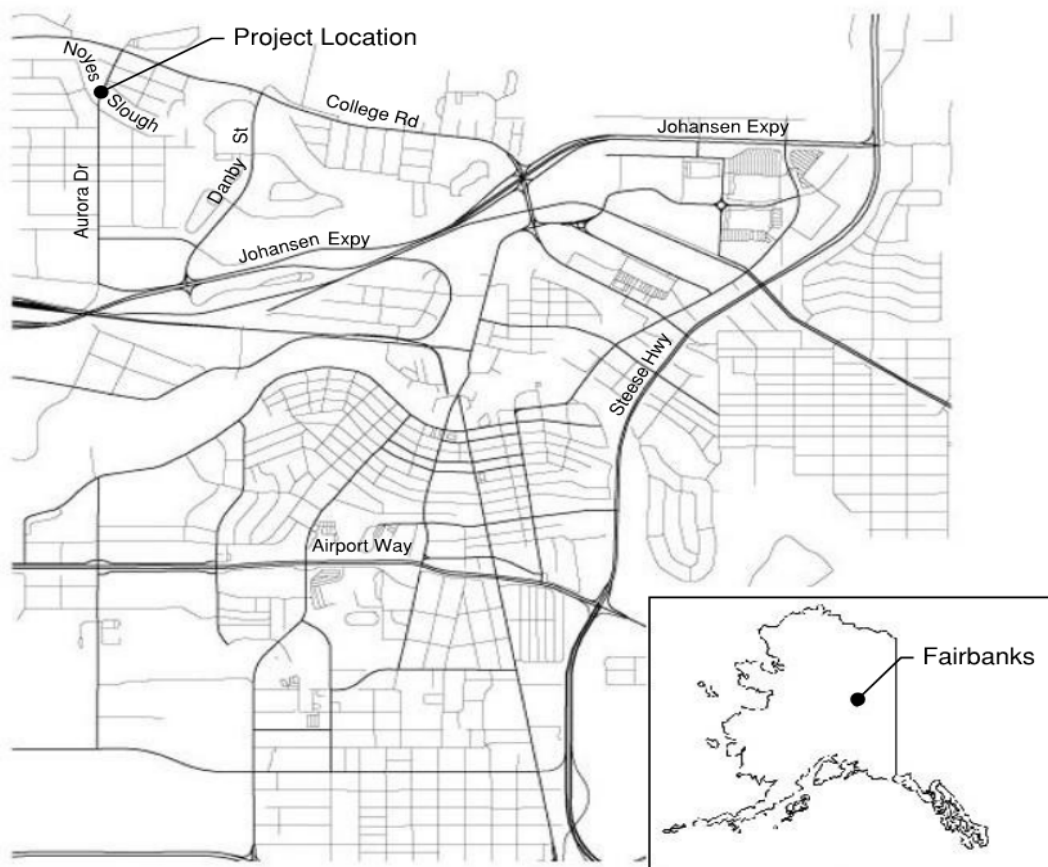


Figure 1. Location Map

PROJECT DESCRIPTION

This project addresses the structural deficiencies and safety issues of the old bridge by replacing the entire structure with a slightly shorter, wider bridge that meets current design standards. In addition, approximately 250 feet of Aurora Drive both to the north and south of the bridge will be reconstructed, including ADA-compliant pedestrian curb ramps and driveway cuts.

The existing two-span bridge will be replaced with a single span, 100-foot-long by 42.33-foot-wide, concrete-decked bulb-tee girder bridge. The existing bridge pier catches debris and causes a scour hazard. As the proposed bridge does not require an intermediate support, this pier will be removed. The extra bridge width will accommodate two 12-foot lanes, each with 2-foot shoulders, and provide ADA-compliant 5.5-foot-wide sidewalks and bridge railing.

The total project length is approximately 0.1 miles.

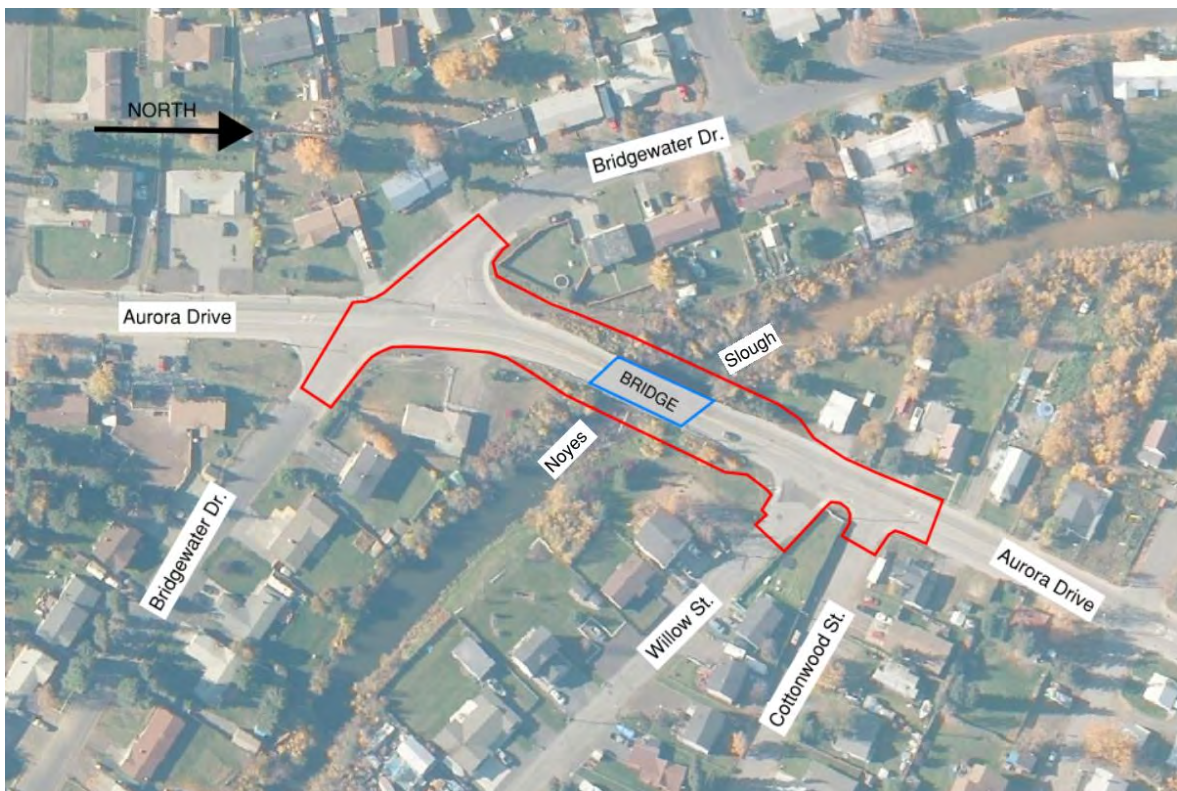


Figure 2. Project Area

DESIGN STANDARDS

The design standards followed for this project are:

- State of Alaska DOT&PF *Highway Preconstruction Manual* (HPCM)
- State of Alaska DOT&PF *Highway Drainage Manual*, 2006
- State of Alaska DOT&PF *Alaska Traffic Manual*, 2016 with latest Interim Revisions
- State of Alaska DOT&PF *Alaska Flexible Pavement Design Manual*, 2020
- State of Alaska DOT&PF *Bridges and Structures Manual* (BSM), 2017
- AASHTO *A Policy on Geometric Design of Highways and Streets*, 2011

- AASHTO *Roadside Design Guide*, 2011
- AASHTO *Guide for the Development of Bicycle Facilities*, 2012
- AASHTO *LRFD Bridge Design Specification*, 2017 Edition, with latest Interim Revisions
- AASHTO *Guide Specifications for LRFD Seismic Bridge Design*, 2011 Edition, with latest Interim Revisions
- Americans with Disabilities Act (ADA) Standards Adopted by the U.S. Department of Justice (2010) and the U.S. Department of Transportation (2006)

The design designation and design criteria for this project are in Appendix A.

DESIGN EXCEPTIONS AND DESIGN WAIVERS

A waiver is needed for non-adherence to DOT’s Treated Base policy. See Appendix E for the included waiver.

DESIGN ALTERNATIVES

No alternatives were developed for the roadway or bridge typical section, as this approximately 600-foot-long project needs to match the existing 12-foot lane and 5-foot sidewalk widths at each end. This provides continuity for drivers and ADA-compliant continuity for pedestrians. Across the bridge, an additional 2-foot shoulder is provided.

In the initial stages of the project, several bridge design options were considered. The earliest of these generally maintained the existing channel width and therefore required very long bridge girders. Prestressed concrete girders were considered, but given the width of the channel, these girders would have been quite deep and therefore would have required raising the road profile to provide adequate hydraulic clearance. Steel girders were also considered but ruled out given their high cost and the fact that they are not commonly used in the region.

Once the hydrologic and hydraulic (H&H) analysis was performed, it was determined that the channel width could be decreased without adverse hydraulic effects, and therefore, a clear span prestressed concrete girder design was preferred. Pile-supported abutments were desired due to the potential for liquefaction of loose alluvial soils during an earthquake. During development of the H&H report, the minimum waterway width/opening was evaluated for riprap protected “spill through” and sheet-pile-protected abutments. The goal was to limit the bridge length to approximately 100 feet so that the minimum height girders (42 inches) could be used. This would allow lowering the road profile to meet sight distance requirements with the minimum length of road reconstruction, all within the existing ROW. The sheet-pile-protected abutments allowed for the shortest bridge length (100 feet) and minimized the encroachment into the waterway.

With the bridge profile set, the bridge alignment was shifted slightly to the left (west) to avoid having to relocate the sewer and natural gas line on the right. A portion of the water line on the west side was going to be relocated anyway, so a slight shift did not significantly change that work.

PREFERRED DESIGN ALTERNATIVE

The preferred alternative includes the following features:

- A 100-foot-long single-span prestressed concrete girder replacement bridge with pile-supported abutments protected by sheet piling.
- 5-foot-wide shared use sidewalks
- 2-foot shoulders (edge of lane to face of curb, consisting of 6 inches of asphalt and 18 inches of concrete gutter)
- 2-foot shift to the west, essentially keeping the upstream edge of the bridge near the existing upstream edge since the new bridge is wider than the existing.

3R ANALYSIS

Not applicable. This is a reconstruction project.

TRAFFIC ANALYSIS

A detailed traffic analysis was not performed as a part of this study. Aurora Drive has a functional classification of Urban Major Collector through the project area.

No additional turn lanes or through lanes are required. See Appendix A for complete Design Designation.

DOT&PF has indicated no reported vehicle crashes within the project area from 2012 through 2016.

Pedestrian and Bicycle counts were performed near the Aurora Bridge Crossing from approximately 7AM to 7PM for four days by ADOT&PF Transportation Data Programs. The data collected that helped aid the decision for the pedestrian improvements to the bridge is presented below:

DAY IN WEEK	DATE	PEDS			BICYCLES			TOTAL
		SB	NB	SUBTOTAL	SB	NB	SUBTOTAL	
Saturday	7/18/21	26	30	56	22	21	43	99
Sunday	7/19/21	21	20	41	31	25	56	97
Tuesday	7/21/21	16	17	33	9	8	17	50
Wednesday	7/22/21	17	21	38	13	22	35	73

HORIZONTAL/VERTICAL ALIGNMENT

The horizontal alignment essentially replicates the existing alignment/horizontal curve with slight adjustments to allow shifting the bridge centerline 2 feet to the west. Starting at the southern end, the tangent along Aurora Drive was maintained, while the curvature was shifted slightly north and the radius slightly reduced to line up with the shifted bridge centerline. On the north side, a small deflection angle of 0.22 degrees was added to accommodate the bridge shift.

The vertical alignment was controlled by the minimum bridge deck elevation and the intent to meet the desirable (not minimum) sight distances. The profile was able to be lowered 4 inches at the south end of the bridge and 1 foot, 5 inches at the north end of the bridge. This will improve the sight distance for all vehicles traveling this part of Aurora Drive as well as those using the intersections of Willow and Cottonwood Streets near the north end of the project. See Appendix C for the preliminary plan and profile sheets.

TYPICAL SECTION(S)

The Proposed Typical sections for the project are described below.

- **Bridge Section** – The new bridge deck will have 12-foot lanes with 2-foot shoulders. Both sides will have 5-foot-6-inch-wide ADA-compliant sidewalks. The lanes and shoulders will have a 2% cross-slope, and the sidewalk will be sloped at 1.5%. Both sides will also have a 1-foot-8-inch-wide, three-tube steel combination pedestrian bridge railing. The bridge will be supported by 3-foot-6-inch-tall pre-stressed concrete girders.

Polyester Concrete will be used in the girder keyways and as a bridge deck overlay, with accommodation made for a future 4-inch asphalt overlay. The use of polyester concrete is considered “experimental” and is subject to change based on pending performance results from other projects.

The bridge section is shown in Figure 3.

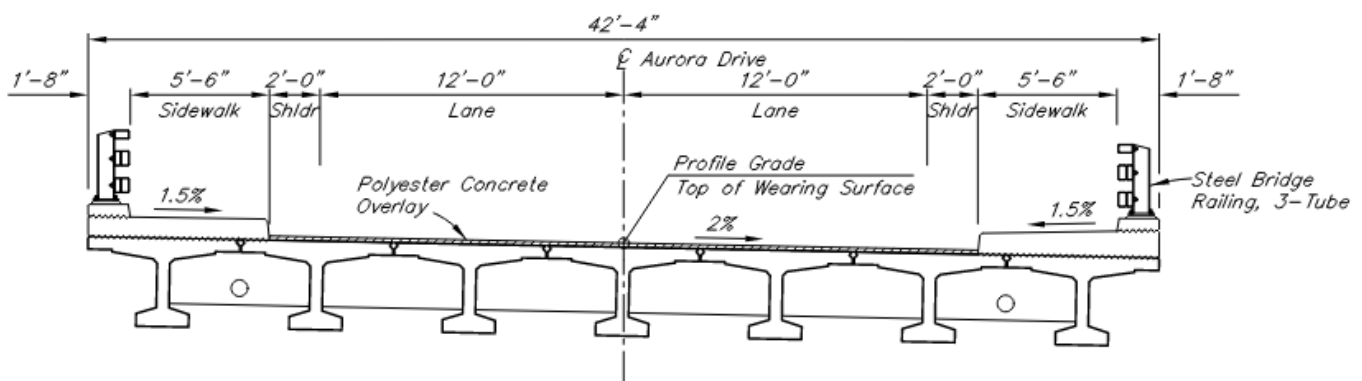


Figure 3. Bridge Section

- **Roadway Section**
 - **North of Bridge** – The roadway lanes will be 12 feet wide, but the shoulder width will vary from 2 feet down to zero over a 50-foot transition to the existing roadway. Both

sides will have 5-foot-wide ADA-compliant sidewalks. The lanes and shoulders will have a 2% cross-slope, and the sidewalks will be sloped at 1.5%. Both sides will have crash-worthy guardrail, the face of which will be flush with the back of sidewalk.

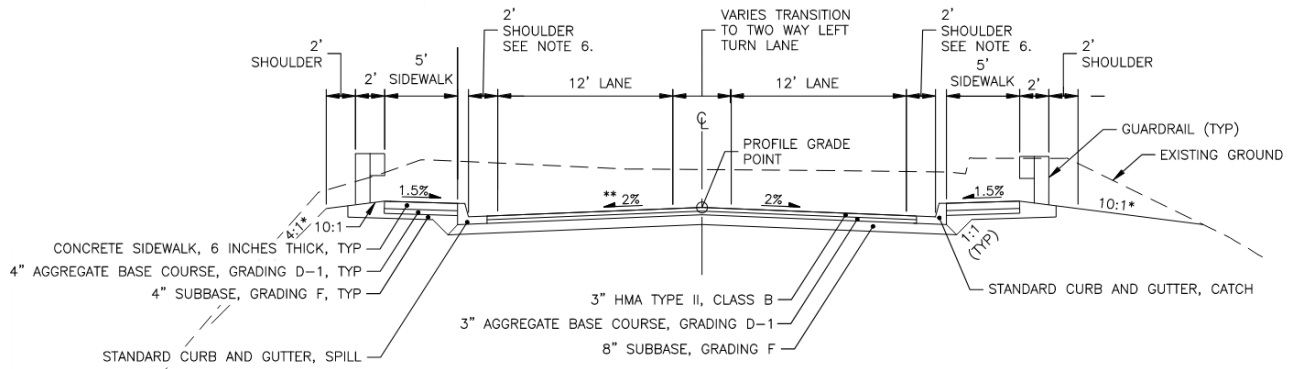


Figure 4. Roadway Section (North)

- **South of Bridge** – The roadway lane widths will be 12 feet wide, and the shoulder width will be 2 feet, including the gutter width. Both sides will have 5-foot-wide, ADA-compliant sidewalks. The lanes and shoulders will transition from 2% cross-slope to a +/-4% superelevated slope. The sidewalks will be sloped at 1.5%. Both sides will have crash-worthy guardrail, the face of which will be flush with the back of sidewalk.

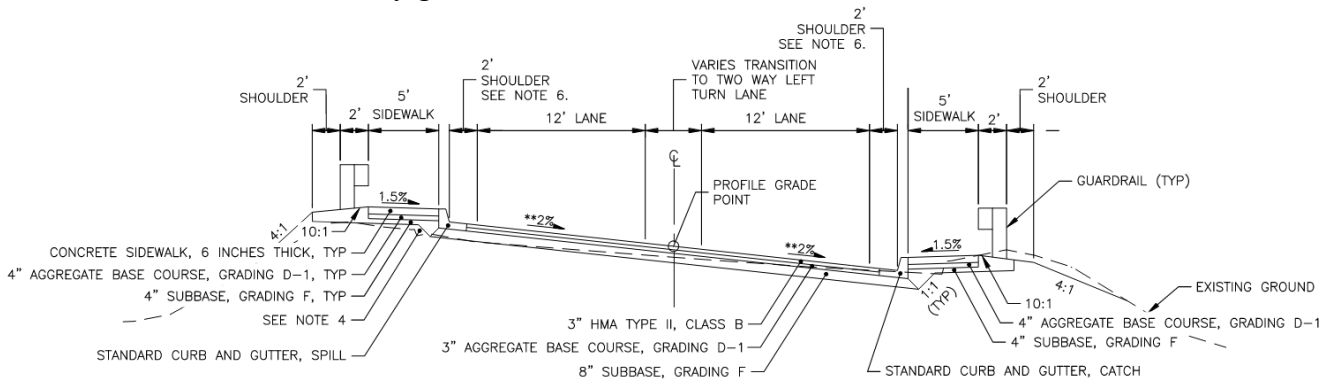


Figure 5. Roadway Section (South)

PAVEMENT DESIGN

The roadway structural section and surfaces will be replaced with a flexible pavement structure design that complies with DOT&PF's pavement general policy. The pavement design will align with the design used during the 2017 Aurora Drive resurfacing project. The road profile is being lowered so the existing embankment material, which may contain large size aggregate, could end up in the milling process. Therefore a layer of Subbase, Grading F will be added to the structural section in order accommodate a future mill and pave of Aurora Drive.

North and South of the Bridge Deck

In the proposed project area, the borings show a thick layer of gravel, and there have not been reported problems due to drainage or roadway structure instability. The designed replacement pavement structure will be described in the plans as the following (from top down):

- 3 inches HMA, Type II, Class “B”
- 3 inches Aggregate Base Course, Grading D-1
- 8 inches Subbase, Grading F

See Appendix E for approved pavement design.

PRELIMINARY BRIDGE LAYOUT

This project will replace the existing Aurora Drive Noyes Slough Bridge #209 with a new 100-foot-long by 42.3-foot-wide, precast, prestressed decked, bulb-T concrete girder bridge. See Appendix D for the preliminary bridge plans.

RIGHT-OF-WAY REQUIREMENTS

All improvements will occur within existing right-of-way limits however the following single acquisition will be acquired:

1. Lot 2E will be acquired for use as a staging area for the bridge construction as well as future maintenance access. It is located directly South of the intersection of Aurora Dr. and Willow St.

Temporary Construction Permits will be obtained for driveway reconstruction.

Temporary Construction Easements will be obtained for sidewalk and utility construction.

A Permanent Easement and Temporary Permit for work in Noyes Slough has been acquired from the Alaska Department of Natural Resources.

MAINTENANCE CONSIDERATIONS

Maintenance personnel have reported issues with logs, brush, and debris becoming caught on the existing center pier and blocking the channel. The channel must then be cleared using mechanical removal methods.

The existing two-span bridge will be replaced with a clear-span bridge. Since the proposed bridge has no pier it will greatly reduce the anticipated short-term and long-term maintenance requirements at the crossing.

The existing sidewalks on the bridge itself are too narrow to be maintained via mechanical means during the winter months and therefore are often not maintained at all in winter. The proposed sidewalks will be wider than existing and therefore will be easier to maintain via mechanical means.

This project will reconstruct approximately 0.33 existing lane miles and will increase the total lane miles of Aurora Drive by 0.01.

MATERIAL SOURCES

All material sites will be Contractor-furnished.

UTILITY RELOCATION & COORDINATION

Utilities are present in the project area and include the following:

- Golden Heart Utilities (GHU): Water and sewer lines and sewer lift station
- Golden Valley Electric Association (GVEA): Overhead electric
- Interior Gas Utility (IGU): Natural gas line
- Alaska Communication Systems (ACS): Overhead communications
- General Communications Inc. (GCI): Overhead communications

There are two 12-inch water mains west of and parallel to the bridge. Within the slough channel, the closer line is 7 feet from the proposed bridge abutments. On both ends of the slough crossing, both water lines angle back towards the bridge abutments and will therefore need to be relocated on both the north and south sides of the slough crossing. This relocation should take place primarily outside the extents of the slough channel on both the north and south banks.

A 12-inch sanitary sewer line runs parallel to the bridge on the east side. Its routing was confirmed by CUC's video inspection of the line in May 2019. According to video observations and as-builts, this pipe is made from reinforced polymer mortar (trade name "Techite") except for the 90-foot slough crossing, which is concrete-encased Schedule 40 steel pipe. The pipe connects to a manhole on the North bank and a lift station on the South bank. The proposed bridge location will place the bridge sheet-pile abutment protection 14.5 feet from the sewer line on the south side and 20 feet away on the north side.

The addition of a cured-in-place pipe liner should be considered to reinforce the existing Techite pipe on either side of the slough crossing so that vibrations from sheet pile driving don't damage the sewer line. The liner should be installed from the lift station to the next manhole on the north side. The liner, when fully cured, functions as a full-strength pipe. Unlike a traditional pipe replacement, a cure-in-place liner can be installed without trenching or deep excavation and will greatly limit future maintenance on this section of sewer line.

A natural gas line also runs parallel to the bridge on the east side. It is located several feet closer to the bridge than the sewer line. It has been decided through coordination with the utility that a 5-foot separation between the gas line and the sheet-pile abutment protection is sufficient. The proposed separations will be roughly 8.5 feet on both the north and south sides.

There is an overhead power crossing about 50 feet south of the bridge crossing. This crossing feeds power to a street light on the southeast side of the bridge and then runs to another street light on the northeast side. This light pole on the northeast side of the bridge will need to have its overhead power feed disconnected during construction to accommodate crane activity on the bridge. This pole may also need to be temporarily removed during construction.

An existing telephone communications line runs north-south across the southern end of the project. A telephone communications line crosses Aurora Drive and Willow Street on the north side of the project.

ACCESS CONTROL FEATURES

Access control will not be modified with this project. Current access control level consists of driveway/entrance regulations.

The project will replace two curb-cut style driveways within the project limits. The new driveways will be ADA-compliant.

PEDESTRIAN/BICYCLE (ADA) PROVISIONS

This project will replace all sidewalk and curb and gutter within the project extents. The segments of Aurora Drive both North and South of the bridge will receive 5-foot-wide sidewalks with ADA-compliant curb ramps at the side street intersections to match the rest of the corridor. The new bridge will be constructed with 5-foot, 6-inch-wide sidewalk on both sides (to match the 5-foot sidewalk and 6-inch curb) and ADA accessible paths leading to the bridge.

Bicycle traffic currently shares the roadway and/or sidewalk with vehicle motorists and pedestrians. Post-construction, bicycles may share the road with vehicles or use the new wider sidewalks.

SAFETY IMPROVEMENTS

Safety improvements from this project include:

- Widening shoulders, which will provide more space between the sidewalks and the traffic lanes
- Widening sidewalks on the bridge, which will provide more space between pedestrians/bicyclists
- Upgrading guardrails and bridge rails to meet current standards
- Improving sight distance over the bridge and at intersections located immediately north and south of the bridge
- Improve bridge hydraulic and seismic performance

INTELLIGENT TRANSPORTATION SYSTEM FEATURES

Not applicable. There are no intelligent transportation system features within the project limits.

DRAINAGE

The relatively level sections of roadway to the north and south of the bridge are elevated 1 foot to 3 feet above the Ordinary High Water (OHW) elevation of the slough. The Noyes Slough Bridge is elevated approximately 11 to 12 feet above the OHW elevation. Noyes Slough is the

lowest point within the project area, and water generally flows towards the slough and ultimately to the Chena River.

There are only two known drainage issues in the area. The storm drain system occasionally freezes up in spring, which can cause overflow and ice buildup on the road surface. This ice buildup has not posed significant concern to safety or property. There is also a small area of settlement that holds water on the west side of Aurora opposite Cottonwood Street. This area will be corrected as part of the repave and new curb and gutter installation.

The new bridge will direct drainage off the bridge surface via a curb and gutter system. This drainage will then make its way into the nearby storm drain system via catch basins and eventually into Noyes Slough.

Noyes Slough has been identified by the Alaska Department of Fish and Game (ADF&G) as both an anadromous fish habitat and likely to support resident fish. With implementation of ADF&G Fish Habitat Permit provisions, no adverse effect to anadromous or resident fish is expected.

Riprap revetments may be constructed along the toe of the sheet-pile walls as needed to protect the stream and crossing from future erosion.

The proposed improvements will occur within a FEMA-mapped 100-year floodplain. A location Hydraulics study has been performed, and the improvements are not expected to impact the 100-year flood elevation.

According to the Western Regional Climate Center website, the average annual total precipitation in Fairbanks, Alaska is 10.53 inches, and the average annual total snowfall is 65.2 inches.

SOIL CONDITIONS

Surface evidence of roadway instability problems is neither evident nor reported; however, under specific seismic conditions, there is potential for liquefaction of soils under the bridge and roadway.

A roadway centerline geotechnical investigation was not conducted. A geotechnical bridge foundation with centerline approach investigation was conducted in November 2018. Except for a seasonally frozen layer, no frozen ground was encountered along the proposed alignment during bridge foundation investigation. Bore logs have been received and an official geotechnical report is pending.

Bridge foundation soils consisted of silty gravel, silt with sand, sand with silt and gravel, sand with gravel, gravel with silt and sand, gravel with sand, and sand. Soil liquefaction during the design seismic event is anticipated due to the soil composition, soil blow counts observed during explorations, and other subsurface conditions in the area. A foundation geotechnical report with design recommendations is pending.

The water table fluctuates by several feet seasonally in response to precipitation, surface runoff, and river levels.

EROSION AND SEDIMENT CONTROL

The project will include an Erosion and Sediment Control Plan (ESCP). This plan will describe best management practices (BMPs) that may be used during construction and serve as a guide for development of the Storm Water Pollution Prevention Plan (SWPPP). The project will disturb approximately 1.1 acres and therefore will require coverage under the Construction General Permit (CGP) managed by the Alaska Department of Environmental Conservation (ADEC) under the Alaska Pollutant Discharge Elimination System (APDES).

The primary potential for erosion will occur in areas of bridge replacement. Temporary stockpiles of excavated material will also have erosion potential. Perimeter control, inlet/outlet control at storm drains and culverts, soil stabilization, construction scheduling, and other measures as described in the ESCP will be used as appropriate to control storm water discharge.

The project occurs within the Municipal Separate Storm Sewer System (MS4) managed by the City of Fairbanks. Noyes Slough is also listed by ADEC as an impaired water body affected by sediment, debris, petroleum hydrocarbons, oil and grease from urban runoff. A Total Maximum Daily Load (TMDL) has been established for debris and petroleum hydrocarbons, oil, and grease.

Runoff from the Aurora Drive bridge currently flows directly into Noyes Slough from the bridge deck. This project will direct flow via curb and gutter to the existing storm drain system, which consists of nearby catch basins leading to discharge points along Noyes Slough. Although the wider bridge deck may result in increased runoff, the routing of this runoff through the existing storm drain system will result in greater capacity to remove sediment and debris before it reaches the slough.

ENVIRONMENTAL COMMITMENTS

The following are the environmental commitments from the environmental document approved in February 2019:

- Due to the bridge closure during construction, coordination with the Danby/Wembly Roundabout project is needed to allow continuous fire department access from the station on Aurora Drive.
 - Note: The Danby/Wembly roundabout project was completed in Fall 2019. Therefore, this need to coordinate road closures is no longer anticipated.
- To mitigate potential for construction noise impacts resulting from pile/sheet pile driving, no pile driving will occur from 11:00 p.m. to 7:00 a.m.; pile driving noise levels will be monitored; and noise- dampening devices will be installed on construction equipment and/or hearing protection provided to nearby residents for the duration of pile driving work.

The following permits and authorizations are required:

- USACE Section 404/10; includes Abbreviated Permit Process, Nationwide Permit, and General Permit
- ADF&G Fish Habitat Permit (Title 16.05.871 and Title 16.05.841)
- Flood Hazard
- ADEC 401
- ADEC APDES

- Noise

See Appendix B for the Environmental Document, not including the appendices.

WORK ZONE TRAFFIC CONTROL

This project is not “significant” for Traffic Control purposes, as defined in Section 1400.2 of the Alaska Highway Preconstruction Manual.

Aurora Drive will be closed from Bridgewater Drive to just north of Cottonwood Street to all traffic, both pedestrian and vehicle, for the majority of construction. This information was presented to the public during the public open house meeting on October 10, 2018. Vehicle traffic will be detoured via Danby Street and/or College Road. The total closure duration is estimated to be 9 months.

The proposed closure will overlap with school. School buses will need to follow detour routes. MACS transit lines traverse the project area. Stops served by crossing the Aurora Drive bridge will be relocated to Danby Street. VanTran service will continue into the neighborhoods on either side of the closure.

A traffic control plan will be developed by the Contractor during construction.

VALUE ENGINEERING

A Value Engineering study is not required for this project and therefore will not be prepared.

COST ESTIMATE

The estimated costs for this project are as follows:

Design	\$1,627,355.00
Utilities	\$120,000.00
Right of Way	\$195,713.00
Construction (Includes 18% Engineering)	\$5,310,373
	<hr/>
Total Cost of Project	\$7,253,441.00

APPENDIX A

**DESIGN CRITERIA
AND
DESIGN DESIGNATION**

Project Name: Aurora Drive Noyes Slough Bridge No. 209 Replacement	
<input checked="" type="checkbox"/> New Construction/Reconstruction <input type="checkbox"/> Reconstruction (3R) <input type="checkbox"/> Other:	
Project Number:	NFHwy00124 / 0629001 <input type="checkbox"/> NHS <input type="checkbox"/> Non NHS
Functional Classification:	Urban Major Collector
Design Year:	2040 Present ADT: 3500
Design Year ADT:	4110 Mid Design Period ADT: 3830
DHV:	480 Directional Split: 45% SB - 55% NB
Percent Trucks:	3.85 Equivalent Axle Loading: 311,938
Pavement Design Year:	2040 Design Vehicle: WB-65
Terrain:	Level Number of Roadways: 1
Design Speed:	35 mph
Width of Traveled Way:	12' min lane width
Width of Shoulders:	Outside: N/A, C&G Inside: N/A, C&G
Cross Slope:	2%
Superelevation Rate:	6% max
Minimum Radius of Curvature:	340'
Minimum K-Value for Vertical Curve:	Sag: 49 Crest: 29
Maximum Allowable Grade:	9%
Minimum Allowable Grade:	0.3%
Stopping Sight Distance:	250'
Lateral Offset to Obstruction:	1.5' from face of curb; 3' at intersections
Vertical Clearance:	N/A
Bridge Width:	42.333'
Bridge Structural Capacity:	HL-93
Passing Sight Distance:	550'
Surface Treatment:	T/W: HMA Shoulders: N/A
Side Slope Ratios:	Foreslopes: 4:1 min Backslopes: N/A
Degree of Access Control:	Stop control at sidestreets. Yield for Aurora SB to Bridgewater movement
Median Treatment:	N/A
Illumination:	Existing lighting to remain
Curb Usage and Type:	Standard C&G on outer edges of roadway and at splitter island edges
Bicycle Provisions:	Share Roadway
Pedestrian Provisions:	5' Sidewalk
Misc. Criteria:	

Proposed - Designer/Consultant: Brandon Irvine Digitally signed by Brandon Irvine
Date: 2019.10.17 15:45:35-08'00' **Date:** 10/17/2019
Accepted - Engineering Manager: [Signature] **Date:** 5/20/2022
Approved - Preconstruction Engineer: [Signature] **Date:** 5/20/2022

Shaded criteria are the *FWHA 13 controlling criteria*. For NHS routes only, these criteria must meet the minimums established in the Green Book (*AASHTO A Policy on Geometric Design of Highways and Streets*). For all other routes, these criteria must meet the minimums established in the *Alaska Highway Preconstruction Manual*. Otherwise a Design Exception must be approved.

Design Criterion marked with a " # " do not meet minimums and have a Design Exception(s) and/or Design Waiver(s) approved. See Appendix ___ for Design Exception/Design Waiver approval(s) and approved design criteria values.

MEMORANDUM

State of Alaska Department of Transportation & Public Facilities

TO: Sarah E. Schacher, P.E.,
Preconstruction Engineer
Northern Region

DATE: March 12, 2019

FILE NO: I:\Traffic Data\Design\2019\AuroraDr_NFHwy00124

**TELEPHONE
NO:** 451-5150

FROM: Scott Vockerath
Traffic Data Manager
Fairbanks Field Office

SUBJECT: Aurora Dr. Noyes Slough Bridge No. 209
Replacement NFHWY00124/0629001
Design Designation Request

Please approve the attached design designation by signing the endorsement below which enables your staff to proceed.

Contact our office if you have any questions.

 3/12/2019

Sarah E. Schacher, P.E., Preconstruction Engineer Date

cc: Joe Kemp, P.E., Engineering Manager, Northern Region

Attachment

DESIGN DESIGNATION
Northern Region Planning
Traffic Data & Forecasting

ROUTE NAME: Aurora Dr
STATE ROUTE NO: 150125
CDS MILEAGE: 0.1569-0.1764
FUNCTIONAL CLASS: Major Collector
URBAN/RURAL: Urban

	YEAR	AADT	%	
AADT	2017	3500		
	2030	3830		
	2040	4110		
DHV	2030		11.60	440
	2040			480
D				45-55
T			3.85	Total
			0.10	Class 4
			3.40	Class 5
			0.25	Class 6
		0.10	Class 8	
ESAL'S (Design Lane)	To Be Provided by Design			

Traffic Data Request Form

TDR Form-1-10/20/03

Alaska Department of Transportation & Public Facilities

Requested By: Joe Kemp		Design Project Number: NFHWY00124	Date Requested: 3/4/19
Base Year: 2017 Base Year Total AADT: 3500 AADT Growth Rate Forward (%/yr): 0.70 End Year: Back Cast (%/yr): Begin Year:		Common Route Name: Aurora Dr Functional Class: <u>Urban/Rural</u> Major Collector Historic M.P. Interval:	CDS Route Name: Aurora Dr CDS M.P. Interval: 0.1569-0.1764
Truck Category	Load Factor (ESALs per Truck)	% of Total AADT in Truck Category	Lane Configuration Sketch: (Designer: Provide sketch of lane layout. Number each lane and show directions.) Indicate North
2-axle			
3-axle	See		
4-axle	attached		
5-axle			
≥ 6-axle			
Percent of Base Year Total AADT for Each Numbered Lane in Configuration Sketch:			Comments:
Lane # 1	% 45		
Lane # 2	% 55		
Lane #	%		
Lane #	%		
Lane #	%		
Lane #	%		
Data Provided By: Scott Vockerath	Provider's Signature:		Date Provided: 3/12/19

Figure 6-1. Traffic Data Request (TDR) Form



Submitted Data Request Type: Design Designations Request (Northern)	
Latest Status Update:	Data Request Record has been assigned to an email address
Assigned to the following e-mail address:	jill.sullivan@alaska.gov; scott.vocker
Record Creation:	March 04, 2019 10:30:37 AM
Routed to assigned e-mail address:	March 04, 2019 04:01:25 PM
Request Resolution:	Resolution Pending

Requestor

First Name: *	Joe
Last Name: *	Kemp
Email: *	joseph.kemp@alaska.gov
Additional Email Contacts:	<input type="text"/> +
Date Needed: (AKST)	2019-03-25

Project Information

Project Name: *	Aurora Drive Noyes Slough Bridge No. 209 Replacement
Project Engineer (s): *	Joe Kemp +
State Project Number: *	NFHwy00124
Federal Project Number: *	0629001
Route ID: *	150125
Milepoint (To/From): *	0.00 to 0.85
Construction Year: *	2021

Please select the type of project. *

Reconstruction
 Rehabilitation
 New Construction
 Other (please describe): Reconstruction

Project Notes:

Please select the project's region to view the Data Fields that are available to request. *

Central

Northern

Southcoast

Data Fields Requested: (please pick at least one) *

Present AADT

Design Year AADT (Please specify Year) ~~2021~~ 2040

Mid Design Year AADT (Please specify Year) ~~2021~~ 2030

Design Hourly Volume (DHV)

Directional Split (D)

Percent Trucks






























Road Functional Classification

Intersection Turning Movements (Please specify Locations)

Please specify any other requested data fields not listed above:



Report Route Log
CDS Route AURORA DRIVE (150125)
From Milepoint 0
To Milepoint 0.7
Filter FacilityType INTERCHANGE RAMP;NON-INVENTORY;WYE;SECONDARY FERRY ACCESS;ROUNDBABOUT;PRIMARY FERRY ACCESS;NON-INTERCHANGE RAMP;MAINLINE;CONNECTOR

Milepoint	Attribute	Side	Feature CDS	Description	Viewer
0	 Intersection	B	150100	COLLEGE ROAD	 
0	Traffic Link	-	-	Start AL002481	 
0	Functional Class	-	-	Start MAJOR COLLECTOR	 
0	FHWA Urban Area	-	-	Start URBANIZED AREA (FAIRBANKS)	 
0.0445	Traffic Station	-	-	30351000	 
0.1569	 Bridge	U	-	Start NOYES SLOUGH (0209)	 
0.1764	 Bridge	U	-	End NOYES SLOUGH (0209)	 
0.3592	Traffic Link	-	-	AL002481 -> AL003172	 
0.3592	 Intersection	B	-	CARR AVENUE	 
0.5061	Traffic Station	-	-	30357000	 
0.693	Traffic Link	-	-	AL003172 -> AL003171	 
0.693	 Intersection	L	177350	WEMBLEY AVENUE	 

Computations and Historical Data

Project: Aurora Dr Noyes Slough Bridge Replacement

Historical AADTs

Link	Start CDS	Start Feature	End CDS	End Feature	Year										
					1980	1981	1982	1983	1984	1985					
1	0.000	College Rd	0.359	Carr Ave											

Link	Year														
	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
1		6032		6606				4217	3635	3641			3394		

Link	Year														
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
1			3673	3268	3216	3550	3756		3233	3160			3772	3457	3513

Link	Year	
	2016	2017
1	3488	3527

Growth Rate: 0.70% Based on historical trends

Growth Factors:	Year	Factor
	2030	1.095
	2040	1.174

Future AADT	Year	AAADT
	2017	3500
	2030	3830
	2040	4110

D Factor (30) 45-55

K-Factor (30) 11.60% Obtained from Continous Count at College Rd East of Hayes

Design Hourly Volume (DHV)
 2030 440
 2040 480

Class Data

Station ID	Station Description	MP	Year	Percent by Class								Total Truck %
				4	5	6	8	9	10	13		
13420527	College Rd East Of Hayes Ave (CCS)	3.722	2018	0.10	3.40	0.25	0.10	0.00	0.00	0.00	0.00	3.85
				Load Factor	1.00	0.50	0.85	1.20	1.55	2.24	2.24	
				Number of Axles	2/3	2	3	4	5	6	7+	

APPENDIX B

ENVIRONMENTAL DOCUMENT

State of Alaska
Department of Transportation & Public Facilities



CATEGORICAL EXCLUSION DOCUMENTATION FORM
(NEPA Assignment Program Projects)

The environmental review, consultation, and other actions required by the applicable Federal environmental laws for this project are being, or have been carried out by the DOT&PF pursuant to 23 U.S.C 327 and a Memorandum of Understanding dated November 3, 2017, and executed by FHWA and DOT&PF.

I. Project Information:

A. Project Name: Aurora Drive Noyes Slough Bridge #209 Replacement

B. Federal Project Number: 0629(001)

C. State Project Number: NFHWY00124

D. Primary/Ancillary Project Connections:

None.

E. CE Designation: 23 CFR 771.117(d)(13)

F. List of Attachments:

Appendix A: COA, Appendix B: Public Involvement, Appendix C: NOI, Appendix D: Agency Coordination, Appendix E: 106 PA Streamlined Review, Appendix F: Location Hydraulic Study.

G. Project Scope (Use STIP Project Description)

Project Description:

Replace the Noyes Slough Bridge on Aurora Drive in Fairbanks. (Need ID: 26076)

H. Project Purpose and Need:

The existing bridge is in need of extensive repair and replacement has been determined as a better long-term option. The purpose of the project is to replace the bridge, improving sight distance while maintaining clearances below the bridge.

I. Project Description:

Project will replace the Noyes Slough Bridge #0209 on Aurora Drive in Fairbanks. Work will include flattening the grade and resurfacing work on several adjacent roads including Tamarack Street, Bridgewater Drive, Cottonwood Drive, Willow Street, Hilling Avenue, Esquire Avenue, and Jack Street.

II. Environmental Consequences

- For each "yes," summarize the activity evaluated and the magnitude of the impact.
- For any consequence category with an asterisk (*), additional information must be attached such as an alternatives analysis, agency coordination or consultation, avoidance measures, public notices, or mitigation statement.
- Include direct and indirect impacts in each analysis.

A. Right-of-Way Impacts

1. Additional right-of-way required. If no, skip to 2.

a. Permanent easements required.

Estimated number of parcels: 0

b. Full or partial property acquisition required.

<u>N/A</u>	<u>YES</u>	<u>NO</u>
	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input checked="" type="checkbox"/>

A. Right-of-Way Impacts

N/A YES NO

Estimated number of full parcels: 0

Estimated number of partial parcels: 0

c. Property transfer from state or federal agency required. *If yes, list agency in No. 4 below.*

d. Business or residential relocations required. If yes, insert the number of relocations below, summarize the findings of the conceptual stage relocation study in No. 4 below and attach the conceptual stage relocation study. If no, skip to 2.

i. Number of business relocations: 0

ii. Number of residential relocations: 0

e. Last-resort housing required.

2. Will the project or activity have disproportionately high and adverse human health or environmental effects on minority populations and low-income populations as defined in [E.O. 12898](#) (FHWA Order 6640.23A, June 2012)?

3. The project will involve use of ANILCA land that requires an [ANILCA Title XI](#) approval.

4. Summarize the right-of-way impacts, if any:

An easement for the bridge will be required from the Alaska Department of Natural Resources, as the existing bridge does not have such an easement on file. Attached in Appendix D.

B. Social and Cultural Impacts

YES NO

1. The project will affect neighborhoods or community cohesion.

2. The project will affect travel patterns and accessibility (e.g. vehicular, commuter, bicycle, or pedestrian).

3. The project will affect school boundaries, recreation areas, churches, businesses, police and fire protection, etc.

4. The project will affect the elderly, handicapped, nondrivers, transit-dependent, minority and ethnic groups, or the economically disadvantaged.

5. There are unresolved project issues or concerns of a federally-recognized Indian Tribe [as defined in [36 CFR 800.16\(m\)](#)].

6. Summarize the social and cultural impacts, if any:

There will be no social or cultural impacts.

C. Economic Impacts

YES NO

1. The project will have adverse economic impacts on the regional and/or local economy, such as effects on development, tax revenues and public expenditures, employment opportunities, accessibility, and retail sales.

2. The project will adversely affect established businesses or business districts.

3. Summarize the economic impacts, if any:

No economic impacts are expected from the project.

D. Land Use and Transportation Plans

N/A YES NO

1. Project is consistent with land use plan(s).

Identify the land use plan(s) and date The Fairbanks North Star Borough Comprehensive Plan, September 2005. This project is consistent with the plans land use.

2. Project is consistent with transportation plan(s).

Identify the transportation plan(s) and date. Fairbanks Metropolitan Area Transportation System, Fairbanks Metro 2040, "A Roadmap to 2040", January 2015

3. Project would induce adverse indirect and cumulative effects on land use or transportation. *If yes, attach analysis.*

*

4. Summarize how the project is consistent or inconsistent with the land use plan(s) and transportation plan(s):

This project is listed in the 2016-2019 Alaska Statewide Improvement Program, Amendment 3, June 28, 2017 as need ID: 26076. It is also listed in the Fairbanks Metropolitan Area Transportation System, Fairbanks Metro 2040, "A Roadmap to 2040" prepared January 2015. It does not change land use and does not change transportation alignment.

E. Impacts to Historic Properties

N/A YES NO

Consider the February 2015 DOT&PF Cultural Resources Confidentiality Guidelines for cultural resource attachments.

1. Does the project involve a road that is included on the "List of Roads Treated as Eligible" in the Alaska Historic Roads PA? *If yes, follow the Interim Guidance for Addressing Alaska Historic Roads.*

2. Does the project qualify as a Programmatic Allowance under the Section 106 Programmatic Agreement? *If yes, attach the Section 106 PA Streamlined Project Review Screening Record approved by the Regional PQI and skip to 10.*

*

3. Date Consultation/Initiation Letters sent n/a *Attach copies to this form.*

a. List consulting parties n/a

b. If no letters were sent, explain why not. *Attach "Section 106 Proceed Directly to Findings Worksheet", if applicable Project is suitable for use of the 106 P.A.*

4. Date "Finding of Effect" Letters sent n/a *Attach copies to this form*

a. State "Finding of Effect" n/a

b. State any changes to consulting parties n/a

5. List responding consulting parties, comment date, and summarize: n/a

6. Are there any unresolved issues with consulting parties?

*

If yes, the Section 106 process may not be complete, Statewide Cultural Resources Manager consultation is required. Attach consultation.

7. Date SHPO concurred with "Finding of Effect" n/a *Attach copy to this form.*

- | E. Impacts to Historic Properties | <u>N/A</u> | <u>YES</u> | <u>NO</u> |
|--|-------------------------------------|--------------------------|-------------------------------------|
| 8. Is a National Register of Historic Places listed or eligible property in the Area of Potential Effect? | | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 9. Will there be an adverse effect on a historic property? <i>If yes, attach correspondence (including response from ACHP) and signed MOA. If yes, Programmatic Categorical Exclusions (PCEs) do not apply.</i> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 10. Summarize any effects to historic properties. <i>List affected sites (by AHRS number only) and any commitments or mitigative measures. Include any commitments or mitigative measures in Section V.</i>
Bridge replacement is a Tier 2 Allowance in the 106 PA, (2.p. Bridge Replacement). The 106 PA Streamlined Project Review Screening Record was signed 12/14/2018 and attached in Appendix E. | | | |

- | F. Wetland Impacts | <u>YES</u> | <u>NO</u> |
|---|-------------------------------------|-------------------------------------|
| 1. Project affects wetlands as defined by the U.S. Army Corps of Engineers (USACE). <i>If yes, complete the remainder of this section and document public and agency coordination required per E.O. 11990, Protection of Wetlands. If no, skip to Section G.</i> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Are the wetlands delineated in accordance with the " <u>Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Alaska Region (Version 2.0) Sept. 2007</u> "? | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 3. Estimated area of wetland involvement (acres): <u><0.1</u> | | |
| 4. Estimated fill quantities (cubic yards): <u>150</u> | | |
| 5. Estimated dredge quantities (cubic yards): <u>120</u> | | |
| 6. Is a USACE authorization anticipated?
<i>If yes, identify type:</i>
NWP <input checked="" type="checkbox"/> Individual <input type="checkbox"/> General Permit <input type="checkbox"/> Other <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 7. Wetlands Finding <i>Attach the following supporting documentation as appropriate:</i>
<input type="checkbox"/> <i>Avoidance and Minimization Checklist, and Mitigation Statement</i>
<input type="checkbox"/> <i>Wetlands Delineation.</i>
<input type="checkbox"/> <i>Jurisdictional Determination.</i>
<input type="checkbox"/> <i>Copies of public and resource agency letters received in response to the request for comments.</i> | | |
| a. Are there practicable alternatives to the proposed construction in wetlands?
<i>If yes, the project cannot be approved as proposed.</i> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| b. Does the project include all practicable measures to minimize harm to wetlands?
<i>If no, the project cannot be approved as proposed.</i> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| c. Only practicable alternative: Based on the evaluation of avoidance and minimization alternatives, there are no practicable alternatives that would avoid the project's impacts on wetlands. The project includes all practicable measures to minimize harm to the affected wetlands as a result of construction. <i>If no, the project cannot be approved as proposed.</i> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 8. Summarize the wetlands impacts and mitigation, if any. <i>Include any commitments or mitigative measures in Section V.</i>
The project will replace existing bridge with a different style bridge, will remove the existing center pier which will improve flow and return pier area to the slough. The project will use sheet piles to protect abutment and will reconfigure the flow channel between the sheet pile abutments which is a slight realignment based on current OHW as designated on the preliminary bridge design drawings. This project should comply with provisions for a USACE Nationwide Permit. | | |

G. Water Body Involvement

N/A YES NO

1. Does the project affect the following:
 - a. A water body.
 - b. A navigable water body as defined by USCG, (i.e. Section 9)? *
 - c. Waters of the U.S. as defined by the USACE, Section 404? *
 - d. Navigable Waters of the U.S. as defined by the USACE (Section 10)? *
 - e. Fish passage across a stream frequented by salmon or other fish (i.e. [Title 16.05.841](#))?
 - f. A resident fish stream ([Title 16.05.841](#))?
 - g. A cataloged anadromous fish stream, river or lake (i.e. [Title 16.05.871](#))? *
 - h. A designated Wild and Scenic River or land adjacent to a Wild and Scenic River? *If yes, the Regional Environmental Manager should consult with the NEPA Program Manager to determine applicability of Section 4(f).*
2. Proposed water body involvement:

Bridge Culvert Embankment Fill Relocation
 Diversion Temporary Permanent Other
3. Type of stream or river habitat impacted:

Spawning Rearing Pool Riffle Undercut bank
 Other
4. Amount of fill below (cubic yards):
 OHW 150 MHW _____ HTL _____

5. Summarize the water body impacts and mitigation, if any. *Include any commitments or mitigative measures in [Section V](#).*

A two span bridge with center pier will be replaced with a single span bridge, eliminating the center pier. Sheet pile will be driven at this location that will narrow the slough at this location. Fill will be placed behind the sheet pile at a location that was previously within the designated OHW channel. The center pier removal will decrease the accumulation of debris that affects the flow capacity through the slough. The overall change is not certain at this time but could be benign with respect to the generally limited flow through this slough, as detailed in the Location Hydraulic Study. No United States Coast Guard permit will be required.

H. Fish and Wildlife

N/A YES NO

1. Anadromous and resident fish habitat. *Any activity or project that is conducted below the ordinary high water mark of an anadromous stream, river, or lake requires a Fish Habitat Permit.*
 - a. Database name(s) and date(s) queried: [Fish Resource Monitor \(Anadromous Mapper\)](#); October 6, 2017
 - b. Anadromous fish habitat present in project area. *
 - c. Resident fish habitat present in project area *
 - d. Adverse effect on spawning habitat. *
 - e. Adverse effect on rearing habitat. *
 - f. Adverse effect on migration corridors. *

H. Fish and Wildlife

N/A YES NO

- g. Adverse effect on subsistence species. *
- 2. Essential Fish Habitat (EFH). *EFH includes any anadromous stream used by any of the five species of Pacific salmon for migration, spawning or rearing, as well as other coastal, nearshore and offshore areas as designated by NMFS.*
 - a. Database name(s) and date(s) queried: Fish Resource Monitor (Anadromous Mapper); October 6, 2017
 - b. EFH present in project area
 - c. Project proposes construction in EFH. *If yes, describe EFH impacts in H.6.*
 - d. Project may adversely affect EFH. *If yes, attach EFH Assessment.* *
 - e. Project includes conservation recommendations proposed by NMFS. *If NMFS conservation recommendations are not adopted, formal notification must be made to NMFS. Summarize the final conservation measures in H.6 and list in Section V.*
- 3. Wildlife Resources:
 - a. Project is in area of high wildlife/vehicle accidents.
 - b. Project would bisect migration corridors.
 - c. Project would segment habitat.
- 4. Bald and Golden Eagle Protection Act. *If yes to any below, consult with USFWS and attach documentation of consultation.*
 - a. Eagle data source(s) and date(s) : There are no trees suitable for nests in the vicinity of the project. No nests have been observed there.
 - b. Project visible from an eagle nesting tree? *
 - c. Project within 330 feet of an eagle nesting tree? *
 - d. Project within 660 feet of an eagle nesting tree? *
 - e. Will the project require blasting or other activities that produce extreme loud noises within 1/2 a mile from an active nest? *
 - f. Is an eagle permit required? *
- 5. Is the project consistent with the Migratory Bird Treaty Act?
- 6. Summarize fish and wildlife impacts and mitigation, including timing windows, if any. *Include any commitments or mitigative measures in Section V.*
 The project will remove the existing bridge pier from the slough. This will not change slough hydraulic gradient nor other aspects of habitat other than to remove a pier that is a catch point for debris such as trees. The area where the pier is removed should return to a habitat similar to the rest of the slough and so a slight increase in rearing habitat. An ADF&G Fish Habitat permit will be required for the pier removal work. Pile driving for new bridge not anticipated to be in water but set back from edge of slough.

I. Threatened and Endangered Species (T&E)

YES NO

- 1. Database name(s) and date(s) queried: IPaC, October 15, 2018
- 2. Listed threatened or endangered species present in the project area.
- 3. Threatened or endangered species migrate through the project area.
- 4. Designated critical habitat in the project area.

- I. Threatened and Endangered Species (T&E)** YES NO
5. Proposed or Candidate species present in project area.
6. What is the effect determination for the project? *Select one.*
- a. Project has no effect on listed or proposed T&E species or designated critical habitat.
- b. Project is not likely to adversely affect a listed or proposed T&E species or designated critical habitat. *Informal Section 7 consultation is required. Attach consultation documentation, including concurrence from the Federal agency, to this form.* *
- c. Project is likely to adversely affect a listed or proposed T&E species or designated critical habitat. *If yes, consult the NEPA Program Manager.* *
7. Summarize the findings of the consultation, conferencing, biological evaluation, or biological assessment and the opinion of the agency with jurisdiction, or state why no coordination was conducted. *Include any commitments or mitigative measures in Section V.*
There will be no Threatened and Endangered Species or critical habitat present in the project area.

- J. Invasive Species** YES NO
1. Database name(s) and date(s) queried: AKEPIC 1/22/2019
2. Does the project include all practicable measures to minimize the introduction or spread of invasive species, making the project consistent with [E.O. 13112](#) (Invasive Species)? *If yes, list measures in J.3.*
3. Summarize invasive species impacts and minimization measures, if any. *Include any commitments or mitigative measures in Section V.*
There are no invasive species indicated in the vicinity of the project on the AKEPIC mapper.

- K. Contaminated Sites** YES NO
1. Database name(s) and date(s) queried: DEC Contaminated Sites Mapper 1/22/2019
2. There are known or potentially contaminated sites within or adjacent to the existing and/or proposed ROW. *If yes, attach ADEC coordination documentation and summarize below in IV.K.4.* *
3. There are contaminated sites within 1,500 feet of where excavation dewatering is anticipated? *If yes, attach ADEC coordination correspondence and summarize below in IV.K.4.*
4. Summarize the contaminated site impacts and mitigation, if any. *Include any commitments or mitigative measure in Section IV.*
There are no active contaminated sites adjacent to, or within 1500 feet of the project, as of January 22, 2019

- L. Air Quality (Conformity)** N/A YES NO
1. The project is located in an air quality maintenance area or nonattainment area (CO or PM-10 or PM-2.5). *If yes, indicate CO or PM-10 or PM-2.5 , and complete the remainder of this section. If no, skip to Section M.*

- | L. Air Quality (Conformity) | N/A | YES | NO |
|---|-------------------------------------|-------------------------------------|-------------------------------------|
| 2. The project is exempt from an air quality analysis per 40 CFR 93.126 (Table 2 and Exempt Projects). <i>If no, a project-level air quality conformity determination is required for CO nonattainment and maintenance areas, and a qualitative project-level analysis is required for both PM-2.5 and PM-10 nonattainment and maintenance areas.</i> | | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. The project is included in a conforming Long Range Transportation Plan (LRTP) and Transportation Improvement Program (TIP).
a. List dates of FHWA/FTA conformity determination: <u>February 15, 2017</u> | | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 4. Have there been a significant change in the scope or the design concept as described in the most recent conforming TIP and LRTP? <i>If yes, describe changes in L.8. In addition, the project must satisfy the conformity rule's requirements for projects not from a plan and TIP, or the plan and TIP must be modified to incorporate the revised project (including a new conformity analysis).</i> | | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 5. A CO project-level analysis was completed meeting the requirements of Section 93.123 of the conformity rule. The results satisfy the requirements of Section 93.116(a) for all areas or 93.116(b) for nonattainment areas. <i>Attach a copy of the analysis.</i> | <input checked="" type="checkbox"/> | <input type="checkbox"/> * | <input type="checkbox"/> |
| 6. A PM-2.5 project-level air quality analysis was completed meeting the requirements of Section 93.123 of the conformity rule. The results satisfy the requirements of Section 93.116 . <i>Attach a copy of the analysis.</i> | <input checked="" type="checkbox"/> | <input type="checkbox"/> * | <input type="checkbox"/> |
| 7. A PM-10 project-level air quality analysis was completed meeting the requirements of Section 93.123 of the conformity rule. The results satisfy the requirements of Section 93.116 . <i>Attach a copy of the analysis.</i> | <input checked="" type="checkbox"/> | <input type="checkbox"/> * | <input type="checkbox"/> |
| 8. Summarize air quality impacts, mitigation, and agency coordination, if any. <i>Include any commitments or mitigative measures in Section V.</i>
Bridge replacement is a listed exemption, 40 CFR 93.126 (Table 2). | | | |

- | M. Floodplain Impacts (23 CFR 650, Subpart A) | YES | NO |
|--|---------------------------------------|-------------------------------------|
| 1. Project encroaches into the base (100 year) flood plain in fresh or marine waters. Identify floodplain map source and date : <u>02090C4360J, dated March 17, 2014</u>

<i>If yes, attach documentation of public involvement conducted per E.O. 11988 and 23 CFR 650.109. Consult with the regional or Statewide Hydraulics/Hydrology expert and attach the required location hydraulic study developed per 23 CFR 650.111. Answer questions M.1.a through d.</i>

<i>If no, skip to M.2.</i> | <input checked="" type="checkbox"/> * | <input type="checkbox"/> |
| a. Is there a longitudinal encroachment into the 100-year floodplain? | <input type="checkbox"/> * | <input checked="" type="checkbox"/> |
| b. Is there significant encroachment as defined by 23 CFR 650.105(q) ? <i>If yes, attach a copy of FHWA's finding required by 23 CFR 650.115.</i> | <input type="checkbox"/> * | <input checked="" type="checkbox"/> |
| c. Project encroaches into a regulatory floodway. | <input checked="" type="checkbox"/> * | <input type="checkbox"/> |
| d. The proposed action would increase the base flood elevation one-foot or greater. | <input type="checkbox"/> * | <input checked="" type="checkbox"/> |
| 2. Project conforms to local flood hazard requirements. | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

M. Floodplain Impacts (23 CFR 650, Subpart A)

YES NO

- 3. Project is consistent with E.O. 11988 (Floodplain Protection). *If no, the project cannot be approved as proposed.*
- 4. Summarize floodplain impacts and mitigation, if any. *Include any commitments or mitigative measures in Section V.*

The project will install a single span bridge. This removes the need for the existing center pier. This will provide a less restricted flow and the potential to trap debris that might interfere with downstream transport of water in a high water event. The project will require a FNSB Floodplain Permit, LHS and Public Notice (attached in Public Involvement). Location Hydraulic Study is attached, in Appendix F.

N. Noise Impacts (23 CFR 772)

YES NO

- 1. Does the project involve any of the following? *If yes, complete N.2. If no, a noise analysis is not required. Skip to section O.*
 - a. Construction of highway on a new location.
 - b. Substantial alteration in vertical or horizontal alignment as defined in 23 CFR 772.5.
 - c. An increase in the number of through lanes.
 - d. Addition of an auxiliary lane (except a turn lane).
 - e. Addition or relocation of interchange lanes or ramps added to a quadrant to complete an existing partial interchange.
 - f. Restriping existing pavement for the purpose of adding a through-traffic lane or an auxiliary lane.
 - g. Addition of a new or substantial alteration of a weigh station, rest stop, ride-share lot or toll plaza.
- 2. Identify below which category of land uses are adjacent: *A noise analysis is required if any lands in Categories A through E are identified, and the response to N.1 is 'yes'.*

Category A: Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.

Category B: Residential. This includes undeveloped lands permitted for this category.

Category C (exterior): Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, daycare centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings. This includes undeveloped lands permitted for this category.

Category D (interior): Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios.

Category E: Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not listed above. This includes undeveloped lands permitted for this category.

3. Does the noise analysis identify a noise impact? *If yes, explain in N.4*
4. Summarize the findings of the attached noise analysis and noise abatement worksheet, if applicable:
This is a Type III project, so a noise study is not required. See Section P.8. for construction impacts.

O. Water Quality Impacts

N/A YES NO

1. Project would involve a public or private drinking water source. *If yes, explain in O.7*
2. Project would result in a discharge of storm water to a Water of the U.S. (per [40 CFR 230.3\(s\)](#))
3. Project would discharge storm water into or affect an ADEC designated Impaired Waterbody. *If any of the Impaired Waterbodies have an approved or established Total Maximum Daily Load, describe project impacts in O.7*
- a. List name(s), location(s), and pollutant(s) causing impairment:
Noyes Slough is a 303(D) list Category 2- for sediment as of the Final 2014-2016 Integrated Report. It is still listed as a 303 Category 4a for debris and 303 Category 4a for petroleum hydrocarbons; with a TMDL for debris of 0 and TMDL for Petroleum - no visible sheen.
4. Estimate the acreage of ground-disturbing activities that will result from the project?
approximately 1 acre.
5. Is there a Municipal Separate Storm Sewer System (MS4) APDES permit, or will runoff be mixed with discharges from an APDES permitted industrial facility?
- a. If yes, list APDES permit number and type: AKS-053406
6. Would the project discharge storm water to a water body within a national park or state park; a national or state wildlife refuge?
7. Summarize the water quality impacts and mitigation, if any. *Include any commitments or mitigative measures in Section V.*
Removal of the in-stream pier will eliminate frequent log jams at the bridge, resulting in potential for better water flow in the slough and improved water quality.

P. Construction Impacts

N/A YES NO

1. There will be temporary degradation of water quality.
2. There will be a temporary stream diversion.
3. There will be temporary degradation of air quality.
4. There will be temporary delays and detours of traffic.
5. There will be temporary impacts on businesses.
6. There will be temporary noise impacts.
7. There will be other construction impacts (e.g. TCEs/TCPs, utility relocations, staging areas, etc.).

P. Construction Impacts

N/A YES NO

8. Summarize construction impacts and mitigation for each 'yes' above. *Include any commitments or mitigative measures in Section V.*

- 1) Potential for some sediment loss to Noyes Slough will be minimized by SWPPP.
- 2) Temporary stream diversion to one side of channel will occur during pier removal work.
- 3) Minor and temporary dust generation during bridge replacement is possible.
- 4) Aurora Drive will be closed at Noyes Slough for the duration of the replacement, traffic will need to use Wembly Avenue for access. Access is available to the north side of bridge by College Road. There is insufficient room to construct a traffic detour. The route around the location will be an inconvenience but there is not a reasonable alternative.
- 5) There are very few businesses located on the north end of Aurora, result in some delay and detours for access during construction, but access will be maintained for the duration of the project.
- 6) There will be temporary noise impacts generated by construction activities for this bridge replacement project, including removal of old piles as well as pile driving and installing sheet piles. The project will comply with the City of Fairbanks Noise Ordinance, to include no pile driving from 11:00 pm to 7:00 am.

This project is a Type III Project, so a noise analysis is not required. However the bridge being replaced is in close proximity to the neighborhood it services, with some residences within 100 to 150 feet of pile driving locations. The piles to be driven are 24 inch diameter and will be driven to a depth of approximately 100 feet. The noisy construction activities required for this bridge replacement project were addressed during a public meeting (10/10/2018) and no comments/concerns were received at that time.

In order to mitigate noise impacts, the project will monitor noise levels generated from pile driving activities. Should measurements so indicate, noise dampening devices may be fitted to construction equipment and/or hearing protection devices provided to the residents of nearby homes for the duration of the pile driving activities (estimated to be about two weeks for bridge abutment piles and another two weeks for sheet piles).

Q. Section 4(f)/6(f)

YES NO

1. Section 4(f) (23 CFR 774)

- a. Was detailed Section 4(f) resource identification conducted for this project, other than that required for Section 106 compliance? *If no, attach consultation with the NEPA Program Manager stating further Section 4(f) resource identification was not required.* YES NO*
- b. Does a Section 4(f) resource exist within the project area; or is the project adjacent to a Section 4(f) resource? *If yes, attach consultation with the NEPA Program Manager to determine applicability of Section 4(f). If no, skip to Q.2.* YES* NO
- c. Does an exception listed in 23 CFR 774.13 apply to this project? *If yes, attach consultation with the NEPA Program Manager, and documentation from the official with jurisdiction, if required.* YES* NO
- d. Does the project result in the "use" of a Section 4(f) property? "Use" includes a permanent incorporation of land, adverse temporary occupancy, or constructive use. *If no, attach consultation with the NEPA Program Manager and skip to Q.2.* YES NO*
- e. Has a *de minimis* impact finding been prepared for the project? *If yes, attach the finding.* YES* NO
- f. Has a Programmatic Section 4(f) Evaluation been prepared for the project? *If yes, attach the evaluation.* YES* NO

Q. Section 4(f)/6(f)

YES NO

g. Has an Individual Section 4(f) Evaluation been prepared for the project? *If yes, attach the evaluation.*

*

2. Section 6(f) (36 CFR 59)

a. Were funds from the Land and Water Conservation Fund Act (LWCFA) used for improvement to a property that will be affected by this project?

b. Is the use of the property receiving LWCFA funds a "conversion of use" per Section 6(f) of the LWCFA? *Attach the correspondence received from the ADNR 6(f) Grants Administrator.*

3. Summarize Section 4(f)/6(f) involvement, if any:

DNR, the property owner has determined that Noyes Slough is not a significant resource and so it is not a 4(f) property as stated in attached email (Appendix D).

III. Permits and Authorizations

N/A YES NO

1. USACE, Section 404/10 Includes Abbreviated Permit Process, Nationwide Permit, and General Permit

2. Coast Guard, Section 9

3. ADF&G Fish Habitat Permit ([Title 16.05.871](#) and [Title 16.05.841](#))

4. Flood Hazard

5. ADEC Non-domestic Wastewater Plan Approval

6. ADEC 401

7. ADEC APDES

8. Noise

9. Eagle Permit

10. Other. If yes, list below.

IV. Comments and Coordination

N/A YES NO

1. Public/agency involvement for project. *Required if protected resources are involved.*

2. Public Meetings. Date(s): October 10, 2018

3. Newspaper ads. *Attach certified affidavit of publication as an appendix.*

Name of newspaper and date: August 27, 30 and September 6, 2017

4. Alaska Online Public Notice date: August 25, 2017

5. Agency scoping letters. Date sent: August 9, 2017

6. Agency scoping meeting. Date of meeting: _____

7. Field review. Date: _____

8. Summarize comments and coordination efforts for this project. Discuss pertinent issues raised. *Attach correspondence that demonstrates coordination and that there are no unresolved issues.*

The Fairbanks Fire Department indicated that the construction of the Danby Wembly Roundabout and the Aurora Noyes Slough Bridge #209 projects cannot be constructed concurrently as this would result in unacceptable constraints on emergency response from the Aurora Drive Fire Station.

DNR inquired about existence of an easement for the bridge and determined that one is required. (see Appendix D).

USF&WS commented that there may be nesting swallows on the underside of the bridge or in material sites. Review of the biannual inspection reports from 2000 to 2016 did not reveal any nest structures. Contractor will use private source for any materials required of which the location is not known at this time.

Fish and Game responded that the project will require a Fish Habitat Permit due to the current indications of use of the slough by (King) salmon. A fish habitat permit will be obtained.

One resident of the area stated that there is a low spot on Aurora Drive near the intersecting streets (Cottonwood and Willow), previous paving project (Vibrating rollers) caused his windows rattle after project was over. He also has concern about how much pounding or vibration will come with abutment construction as some house foundations have cracks. This project will flatten the pavement at those intersections which should eliminate ponding. It is uncertain what the age or style of these windows were but there was only minor construction activity involved with repaving. The driving of new pile and sheet pile may cause some vibration, and the effect on adjacent structures cannot be predicted.

Another inquired if all the trees (in the DOT ROW) will need to be cut down. They are 30 years old. Only those necessary for project will be removed.

An adjacent property inhabitant stated that they will need access in and out during construction. All residents will have access during construction.

One commenter stated that she walks over the bridge and asked about detours for construction and that the existing sidewalks over the bridge are too narrow for a bike or stroller. Another stated that is concerned about protection of the wildlife and nature and that in times of high water, air boats or river boats blow past causing high backwash on our residential properties, destroying beaver dens and disturbing residential ducks. The amount of debris that accumulates at the base of the current bridge causes damming and is unsightly. The bridge will not be available during construction. There is no room for a detour at this location. The new bridge will have wider sidewalks. Care will be taken during construction to minimize any wildlife impacts, but after construction DOT has no control over use of the slough. The removal of the center pier should greatly reduce any debris accumulation by the bridge.

Some residents have properties that border directly on the slough with little clearance so it is important to keep the water and debris flowing particularly in times of high waters. The removal of the center pier should improve water flow.

Another commenter stated that they would like to see wider, lower, user friendly sidewalks for pedestrians and bikers on a wider bridge. Another is glad to see sight distance improvements, doesn't think 12' lanes are necessary and that current design does not specifically accommodate bicycles. Should consider modifying the typical to 10' lanes, 4' shoulders, and 6' sidewalks. The new sidewalk configuration should be more user friendly. The lane widths are designed to best provide for bridge traffic.

V. Environmental Commitments and Mitigation Measures

List all environmental commitments and mitigation measures included in the project.

Due to the bridge closure during construction, coordination with the Danby Wembly Roundabout project is needed to allow continuous fire department access from station on Aurora Drive.

To mitigate potential for construction noise impacts resulting from pile/sheet pile driving - no pile driving will occur from 11:00 pm to 7:00 am, pile driving noise levels will be monitored and noise

V. Environmental Commitments and Mitigation Measures

dampening devices will be installed on construction equipment and/or hearing protection provided to nearby residents for the duration of pile driving work.

VI. Environmental Documentation Approval

N/A YES NO

1. Do any unusual circumstances exist, as described in [23 CFR 771.117\(b\)](#)? If yes, attach consultation with the NEPA Program Manager demonstrating that a CE is appropriate. *

2. The project meets the criteria of one of the following [DOT&PF Programmatic Approvals](#) authorized in the Nov. 13, 2017 "[Chief Engineer Directive – Programmatic Categorical Exclusions](#)".

- If yes, select the appropriate Programmatic Approval below, and the CE documentation form may be approved by the Regional Environmental Manager.
- If no, the CE documentation form must be approved by a NEPA Program Manager.

- a. Programmatic Approval 1
- b. Programmatic Approval 2
- c. Programmatic Approval 3

VII. Environmental Documentation Approval Signatures

Prepared by:


[Signature] Environmental Impact Analyst

Date: 2-11-18

Thomas Benjamin
[Print Name] Environmental Impact Analyst

Reviewed by:


[Signature] Engineering Manager

Date: 2/12/18

JOE KEMP
[Print Name] Engineering Manager

Programmatic CE

Approved by:

[Signature] Regional Environmental Manager

Date: _____

[Print Name] Regional Environmental Manager

VII. Environmental Documentation Approval Signatures

Non-Programmatic CE

Approval

Recommended by:

Brett Nelson
[Signature] Regional Environmental Manager

Date:

2-13-19

Brett Nelson
[Print Name] Regional Environmental Manager

Approved by:

[Signature]
[Signature] NEPA Program Manager

Date:

02/19/19

Melissa Goldstein
[Print Name] NEPA Program Manager

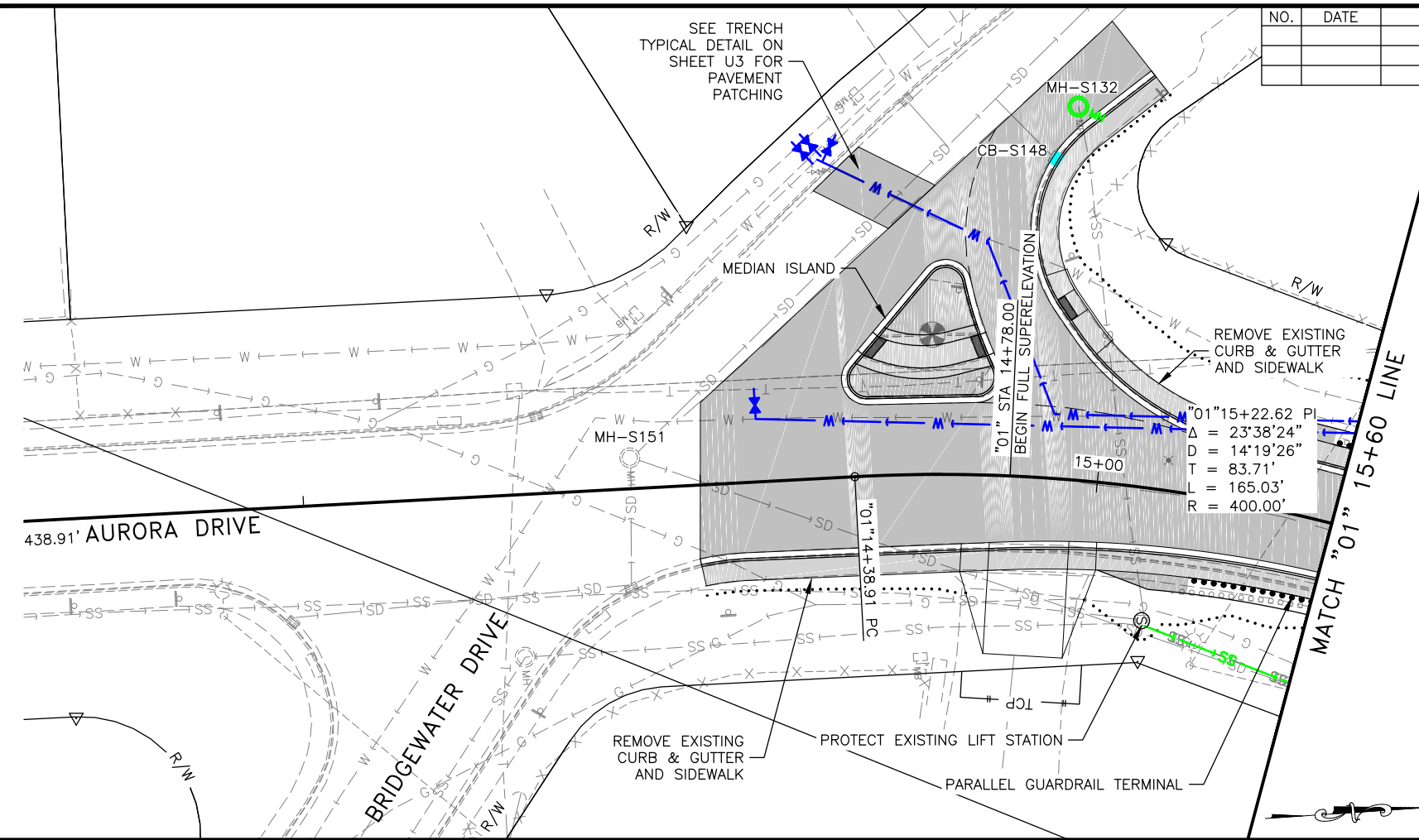
APPENDIX C

PRELIMINARY PLAN AND PROFILE SHEETS

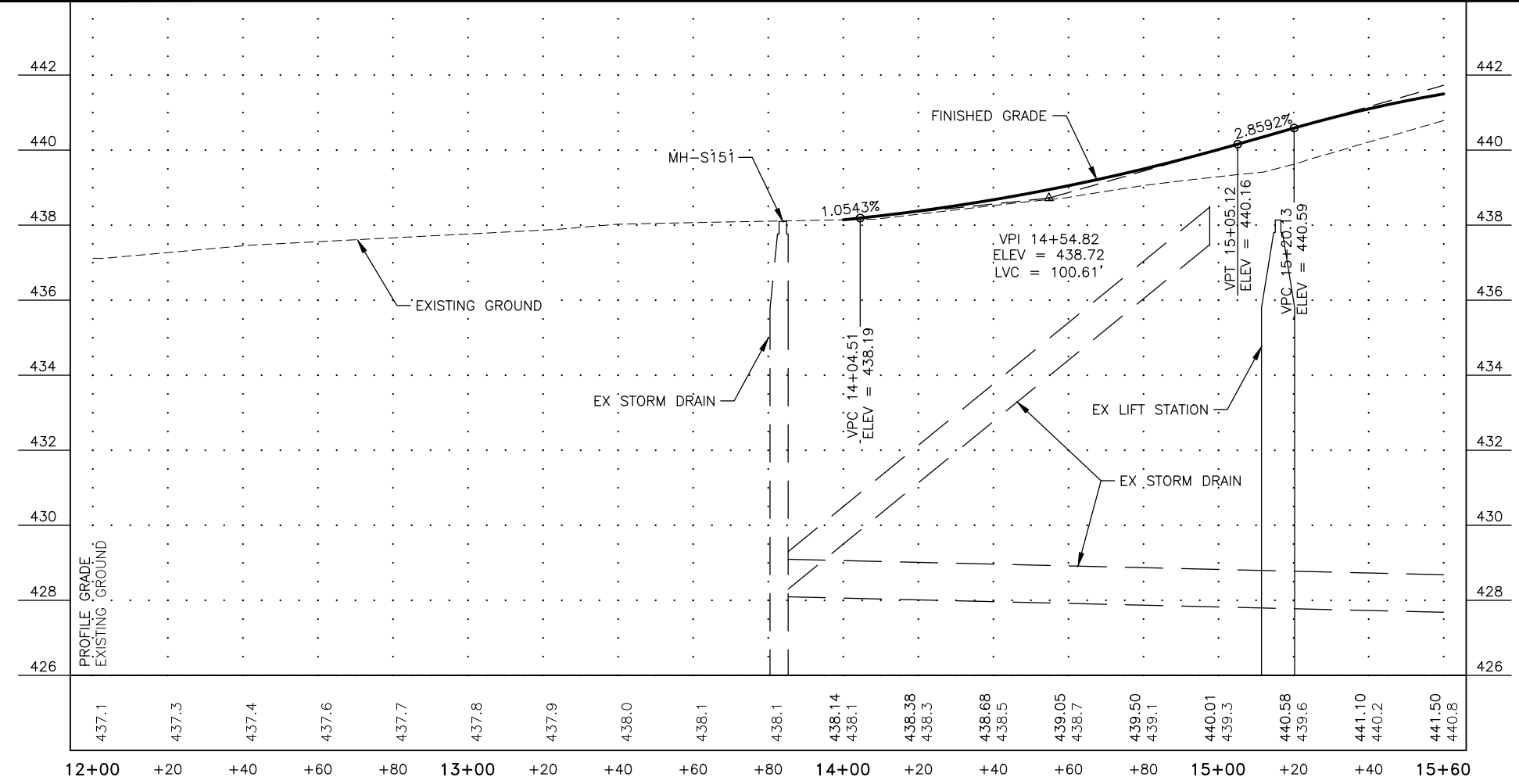
NO.	DATE	REVISION	STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
			ALASKA	0629001/NFHWY00124	2022	F1	F2

NOTES:

- FOR PARALLEL GUARDRAIL TERMINALS, CONSTRUCT THE GUARDRAIL TERMINAL WIDENING IN ACCORDANCE WITH THE "ALTERNATE DETAIL" ON STANDARD PLAN G-20.12. SEE REMARKS COLUMN IN GUARDRAIL SUMMARY TABLE ON SHEET D2 FOR END OFFSET (X).
- SEE APPROACH DETAILS ON SHEET E4.
- REMOVE ALL EXISTING GUARDRAIL. SEE GUARDRAIL SUMMARY TABLE ON SHEET D2.
- SAWCUT AND MATCH EXISTING PAVEMENT AT AURORA DR, BRIDGEWATER DR, WILLOW ST, COTTONWOOD ST, AND ALL APPROACHES. SEE DETAIL ON SHEET B1.
- ADJUST THE EXISTING SANITARY SEWER MH FRAMES, CATCH BASIN INLET FRAMES, EXISTING STORM DRAIN MANHOLE RIMS, AND WATER VALVE BOX ELEVATIONS AS LISTED IN THE SUMMARY TABLE ON SHEET D2.



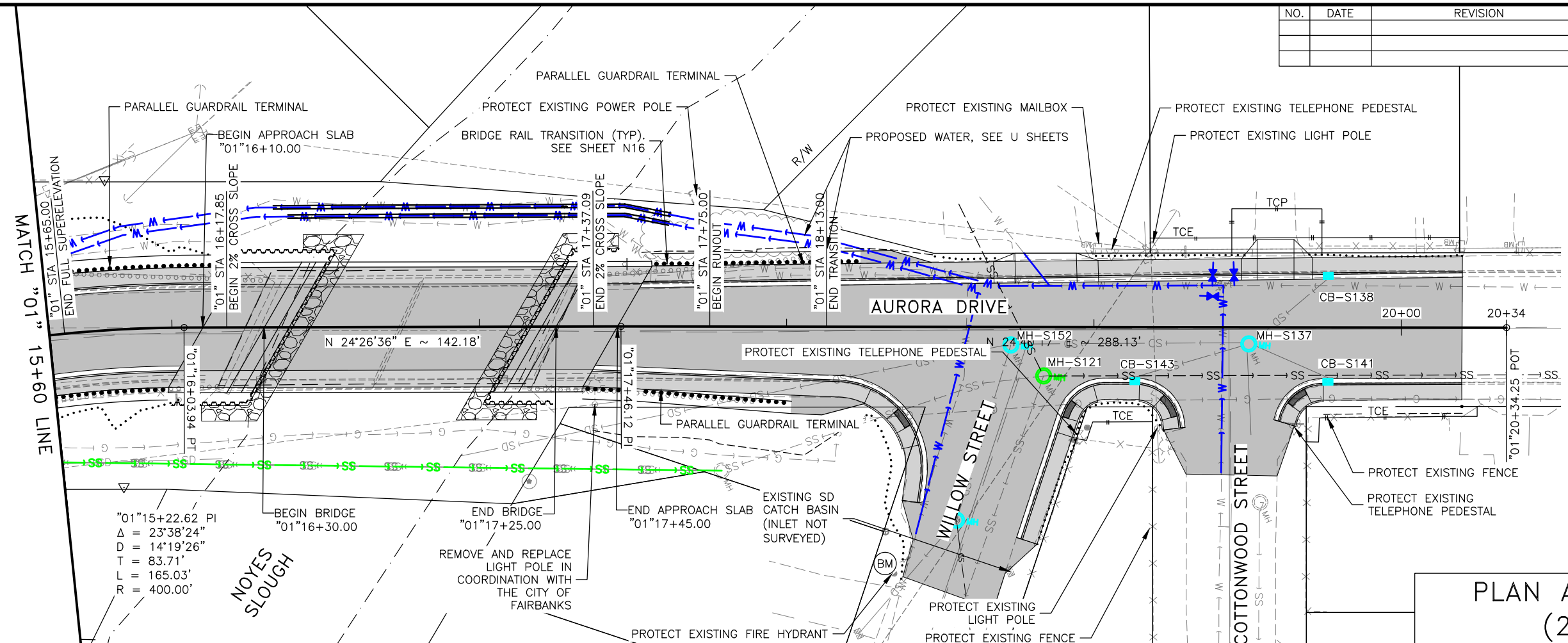
**PLAN AND PROFILE
(1 OF 2)**



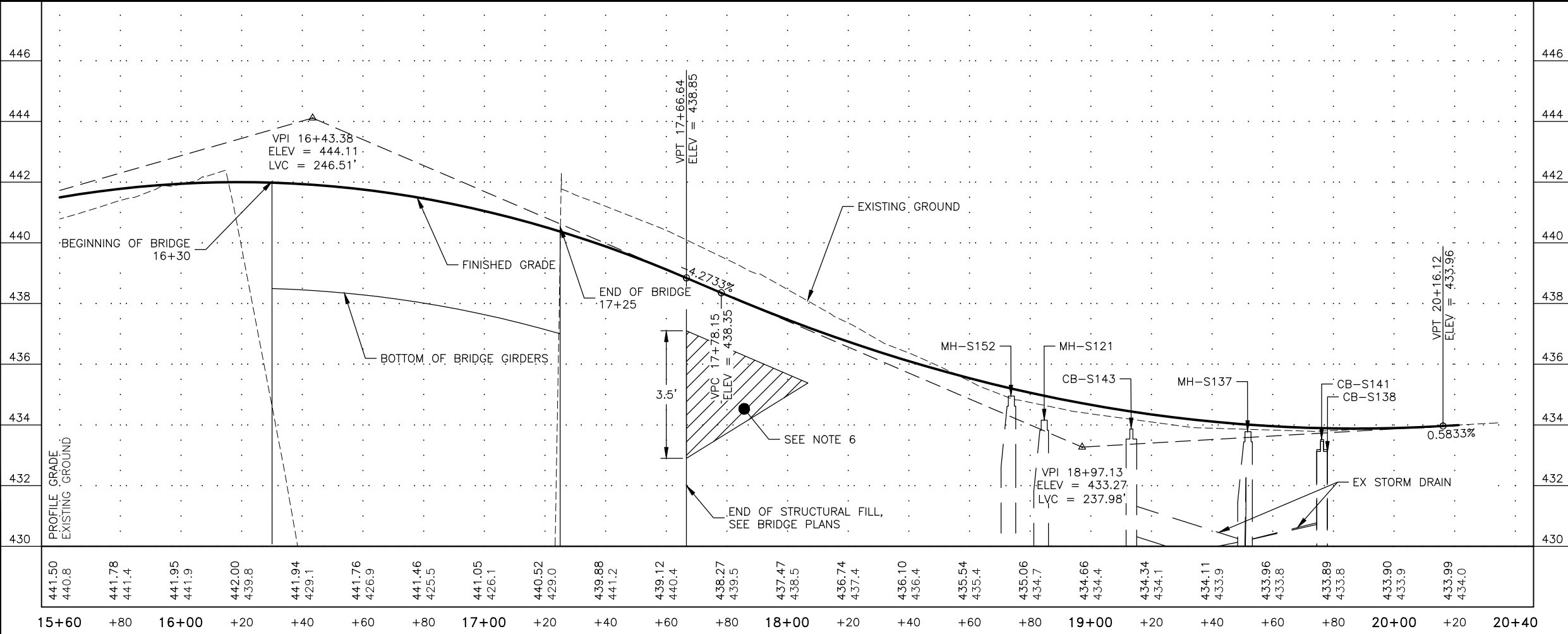
PLANS DEVELOPED BY: RESPEC COMPANY, LLC. CERT. OF AUTHORIZATION NO.: AECC163270, 1028 AURORA DRIVE, FAIRBANKS, AK 99709, (907)452-1414
 N:\Projects\18185FB-AuroraDr_Noyes\C\2001cnst18185fb-10+00.00-16+00.00 Wed, May/11/22, 12:42pm

NO.	DATE	REVISION	STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
			ALASKA	0629001/NFHWY00124	2022	F2	F2

- NOTES:**
- FOR PARALLEL GUARDRAIL TERMINALS, CONSTRUCT THE GUARDRAIL TERMINAL WIDENING IN ACCORDANCE WITH THE "ALTERNATE DETAIL" ON STANDARD PLAN G-20.12. THE END OFFSET (X) SHALL BE 0 FEET, EXCEPT GUARDRAIL TERMINAL 17+34 TO 18+02 RT THE END OFFSET (X) SHALL BE 2 FT. SEE REMARKS SECTION IN SUMMARY TABLE ON D2 FOR MORE INFORMATION.
 - SEE APPROACH DETAILS ON SHEET E4.
 - REMOVE ALL EXISTING GUARDRAIL. SEE GUARDRAIL SUMMARY TABLE ON SHEET D2.
 - SAWCUT AND MATCH EXISTING PAVEMENT AT AURORA DR, BRIDGEWATER DR, WILLOW ST, COTTONWOOD ST, AND ALL APPROACHES, SEE DETAIL ON SHEET B1.
 - ADJUST THE EXISTING SANITARY SEWER MH FRAMES, CATCH BASIN INLET FRAMES, EXISTING STORM DRAIN MANHOLE RIMS, AND WATER VALVE BOX ELEVATIONS AS LISTED IN THE SUMMARY TABLE ON SHEET D2.
 - PLACE ADDITIONAL SUBBASE GRADING F, TAPER DEPTH AT 10:1 AWAY FROM BRIDGE. PLACE UNDER FULL WIDTH OF ROADWAY AND SIDEWALKS.



**PLAN AND PROFILE
(2 OF 2)**

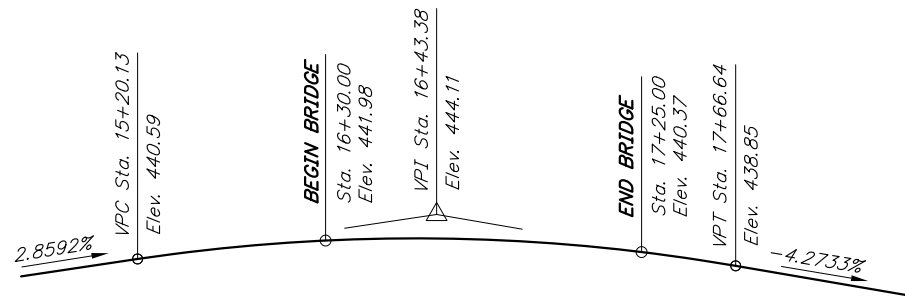


PLANS DEVELOPED BY: RESPEC COMPANY, LLC, CERT. OF AUTHORIZATION NO.: AECC163270, 1028 AURORA DRIVE, FAIRBANKS, AK 99709, (907)452-1414
 N:\Projects\181855FB-AuroraDr_Noyes\c2001\cst181855fb-16+00.00-20+34.25 Wed, May/11/22, 11:30am

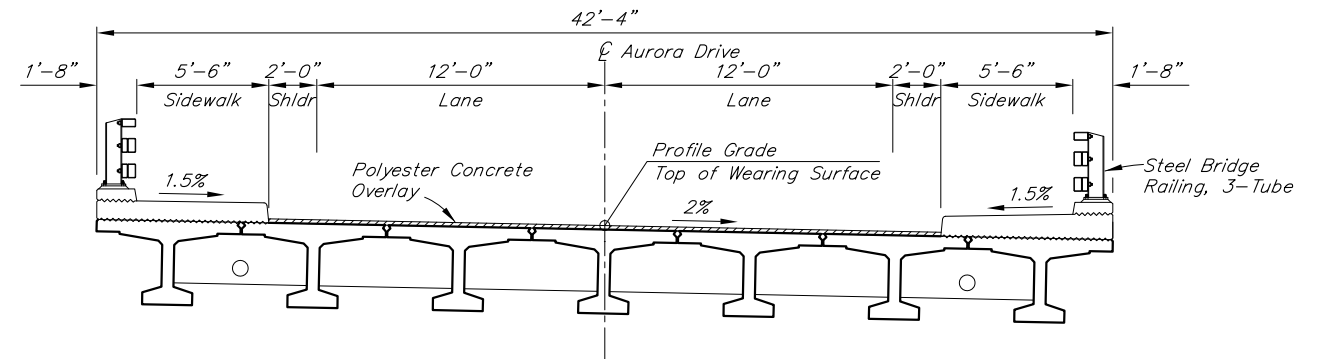
APPENDIX D

PRELIMINARY BRIDGE PLANS

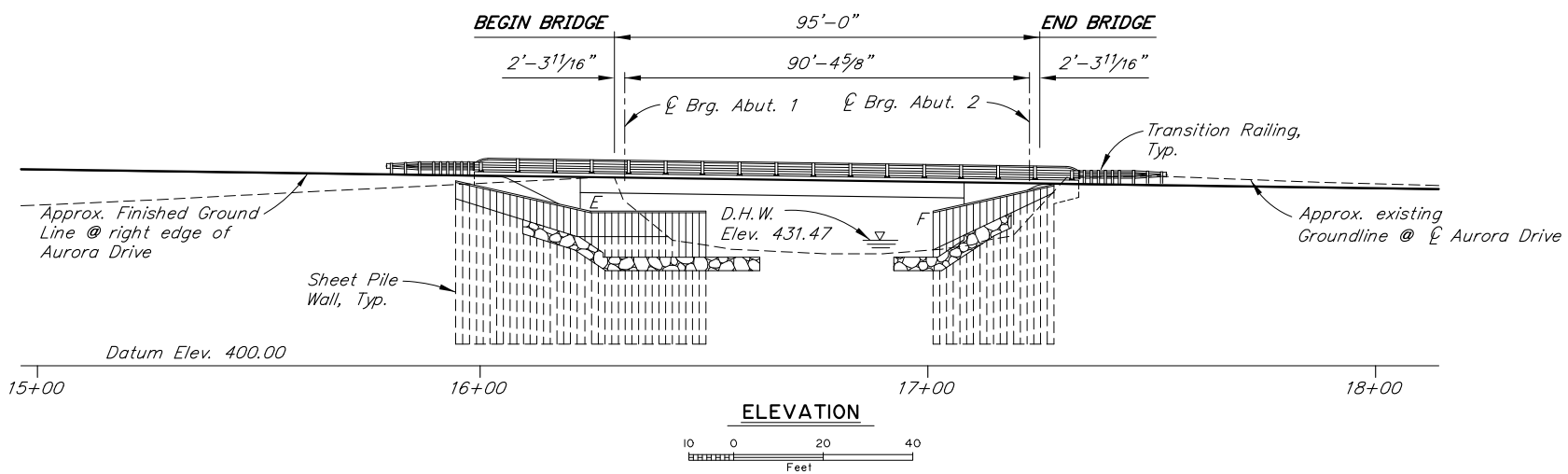
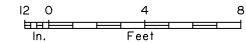
STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	0629001/NFHWO0124	2022	N1	N24



PROFILE GRADE DATA
No Scale



TYPICAL SECTION

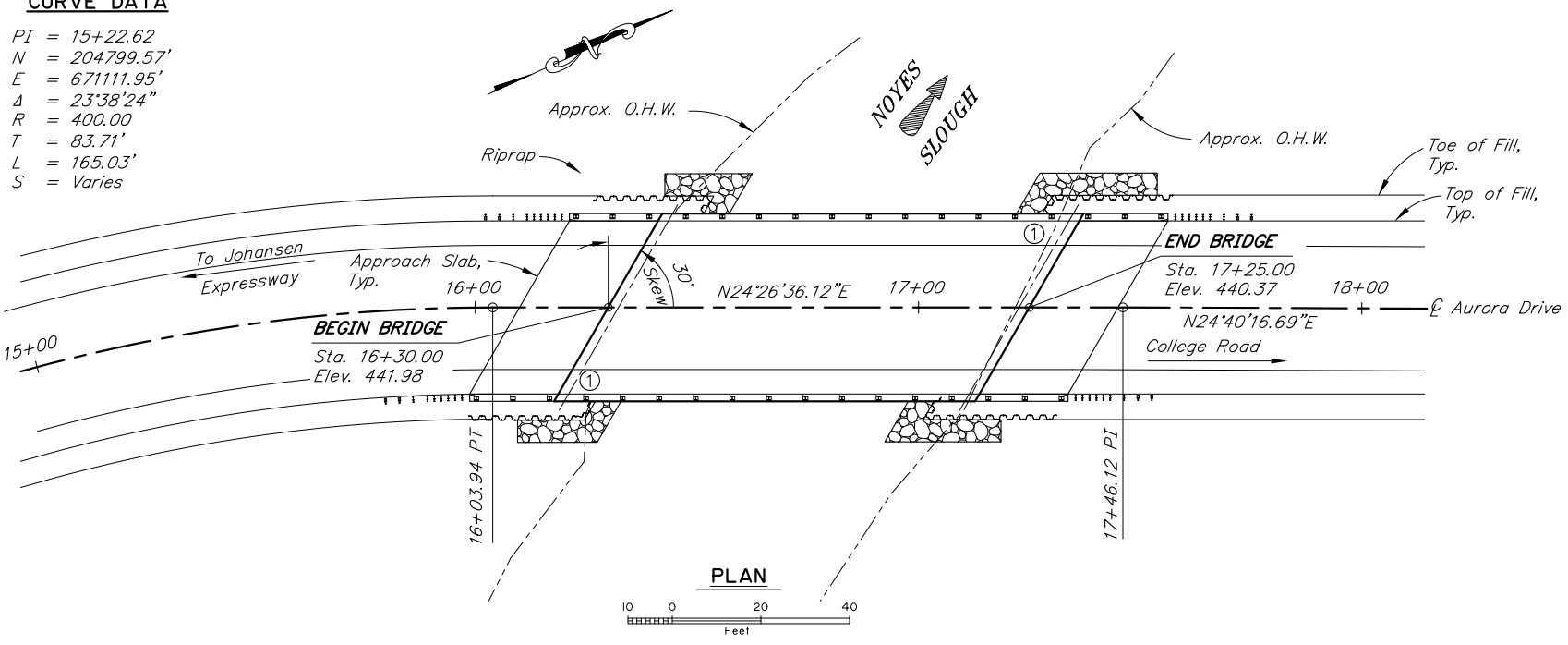


ELEVATION



CURVE DATA

$PI = 15+22.62$
 $N = 204799.57'$
 $E = 671111.95'$
 $\Delta = 23^\circ38'24''$
 $R = 400.00$
 $T = 83.71'$
 $L = 165.03'$
 $S = \text{Varies}$



PLAN



BRIDGE DRAWING INDEX	
TITLE	DWG. NO.
GENERAL LAYOUT	1
SITE PLAN	2
RIPRAP DETAILS	3
SHEET PILE WALLS	4
CABLE SAFETY RAILING	5
ABUTMENT 1	6
ABUTMENT 2	7
ABUTMENT DETAILS	8
WINGWALLS	9
FRAMING PLAN AND TYPICAL SECTION	10
GIRDERS	11
GIRDER DETAILS	12
APPROACH SLABS	13
SIDEWALK DETAILS	14
STEEL BRIDGE RAILING, 3-TUBE	15
TRANSITION RAIL, 3-TUBE	16
TEST HOLE LOGS AND LOCATIONS	17-24

① Denotes location of Bridge No. Plate.

DESIGNED BY: Andrew Wells	CHECKED BY: Jesse Escamilla III	LAYOUT BY: Andrew Wells	CHECKED BY: Jesse Escamilla III
DRAWN BY: Sam Sollie	CHECKED BY: Andrew Wells	SPECIFICATIONS BY: Andrew Wells	P S & E COMPARED: Jesse Escamilla III
QUANTITIES BY: Andrew Wells	CHECKED BY: Jesse Escamilla III	APPROVAL RECOMMENDED BY: Rich Pratt	

STATE OF ALASKA
 DEPARTMENT OF TRANSPORTATION
 AND PUBLIC FACILITIES
 BRIDGE SECTION
 3132 Channel Drive
 Juneau, Alaska 99801
 907-465-2975

NOYES SLOUGH BRIDGE
 AURORA DRIVE
GENERAL LAYOUT



BRIDGE NO. 209
 DWG. NO. 1

R:\cadd\209\209-1 Thu, Apr/28/22 12:43pm

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	0629001/NFHWY00124	2022	N2	N24

GENERAL NOTES

DESIGN:.....AASHTO LRFD Bridge Design Specifications, 2020 Edition, with latest interim specifications.

Seismic design per AASHTO Guide Specifications for LRFD Seismic Bridge Design, 2011 with latest interim revisions.

LIVE LOAD:.....HL-93

DEAD LOAD:.....Includes 50 psf for all wearing surfaces.

SEISMIC PARAMETERS:.....PGA = 0.28
 S_s = 0.65
 S₁ = 0.20
 Site Class = D
 Liquefaction Potential = High
 AASHTO 7% probability of exceedance in 75 years.

REINFORCEMENT:.....ASTM A706, Grade 60, F_y = 60,000 psi
 ASTM A970 Headed bars, Class HA.
 Space reinforcement evenly unless otherwise noted.

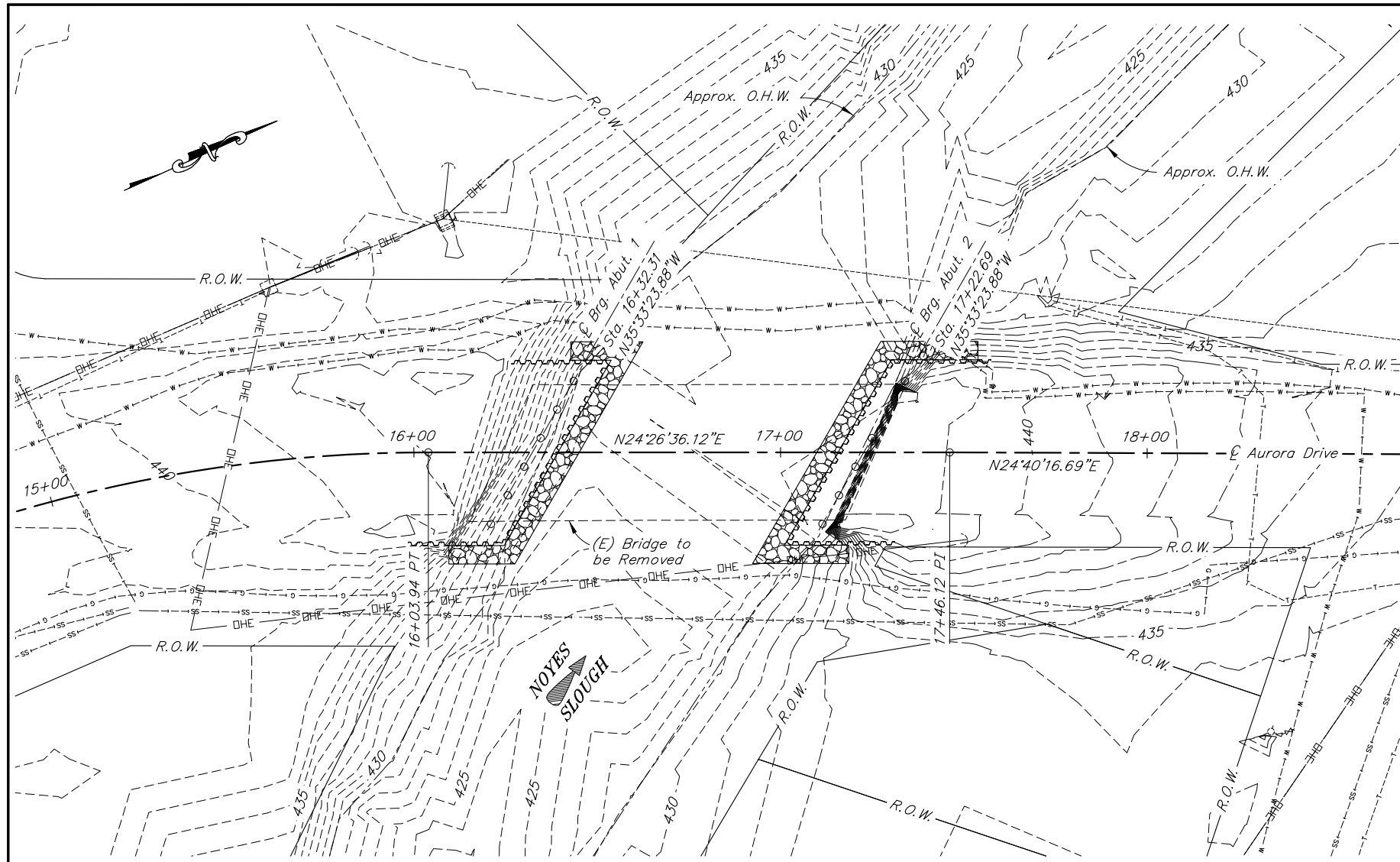
PRESTRESSED CONCRETE:.....See "GIRDERS" Dwg.

CONCRETE:.....Class A Concrete unless otherwise noted, f_c = 4,000 psi

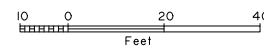
STRUCTURAL STEEL:.....ASTM A709, Grade 36T3, F_y = 36,000 psi
 Galvanize structural steel in accordance with AASHTO M111 unless shown otherwise.

STRUCTURAL STEEL PILING:.....API 5L X52 PSL2, F_y = 52,000 psi.
 or ASTM A709, GR50T3, F_y = 50,000 psi.

STRUCTURAL STEEL SHEET PILE:.....ASTM A572, Grade 50, F_y = 50,000 psi.
 Galvanize all Sheet Piles in accordance with AASHTO M111.



SITE PLAN



PILE DATA TABLE							
LOCATION	PILE TYPE	DRIVING CRITERIA			DESIGN DATA		
		MINIMUM PENETRATION (ft)	ESTIMATED PILE TIP ELEVATION	DRIVING RESISTANCE (k)	STRENGTH FACTORED LOAD (k)	NOMINAL RESISTANCE (k)	RESISTANCE FACTOR, φ
Abutment 1	2'-0"Øx1/2"	70	337	560	365	560	0.65
Abutment 2	2'-0"Øx1/2"	70	315	560	365	560	0.65

ABBREVIATIONS:

- ℄ = centerline
- ℄ = plate
- & = and
- @ = at
- ∅ = diameter
- ± = approximate
- Abut. = abutment
- Approx. = approximate
- b.f. = back/dirt face
- bot. = bottom
- Br. = bridge
- btwn. = between
- Brg. = bearings
- C.I.P. = cast in place
- Clr. = clear, clearance
- CY = cubic yard
- dia. = diameter
- Dwg. = drawing
- E = expansion
- (E) = existing
- EA = each
- Elev. = elevation
- e.a. = each face
- e.w. = each way
- F = fixed
- f.f. = front/air face
- f_c = specified concrete compressive strength
- F_y = yield stress
- Galv. = galvanize
- g-----g----- = gas line
- Hwy. = highway
- ksf = 1000 pounds per square foot
- LB = pound
- LF = linear foot
- LS = lump sum
- Lt. = left
- max. = maximum
- min. = minimum
- n.f. = near face
- No. = number
- a.c. = on center
- O.H.W. = ordinary high water
- OHE = overhead lines
- = phone line underground
- pcf = pounds per cubic foot
- psf = pounds per square foot
- psi = pounds per square inch
- R.O.W. = right of way
- Rt. = right
- Rd. = road
- spc. = space, spaces
- Sta. = station
- SS-----SS----- = storm sewer line
- SF = square feet
- Symm. = symmetric
- Typ. = typical
- VPC = point of vertical curve
- VPI = point of vertical intersection
- VPT = point of vertical tangent
- w----- = water line
- w/ = with

ESTIMATE OF QUANTITIES

ITEM NO.	ITEM	PAY UNIT	ESTIMATING UNIT	SUBST.	SUPERST.	TOTAL QUANTITY
202.0023.0000	Removal of Bridge, No. 209	LS	LS	All Req'd	All Req'd	All Req'd
205.0006.0000	Structural Fill	CY	CY	1,010	---	1,010
501.0001.0000	Class A Concrete	LS	CY	175.2	153.8	329.0
501.0007.0000	Precast Concrete Member, 92'-0" Decked Bulb-Tee	EA	EA	---	7	7
503.0001.0000	Reinforcing Steel	LS	LBS	26,930	---	26,930
503.0002.0000	Epoxy-Coated Reinforcing Steel	LS	LBS	220	22,080	22,300
505.0005.0000	Furnish Structural Steel Pipe Piles, 2'-0" Dia. x 1/2"	LF	LF	1,290	---	1,290
505.0006.0000	Drive Structural Steel Pipe Piles, 2'-0" Dia. x 1/2"	EA	EA	12	---	12
505.0009.0000	Structural Steel Sheet Piles	SF	SF	6,335	---	6,335
507.0001.0003	Steel Bridge Railing, 3-Tube	LF	LF	---	270	270
507.0006.0000	Cable Safety Railing	LF	LF	---	215	215
525.2001.0000	Polyester Concrete Overlay	LS	LS	---	All Req'd	All Req'd
606.0016.0000	Transition Rail	EA	EA	---	4	4
611.0001.0002	Riprap, Class II	CY	CY	130	---	130
631.0002.0001	Geotextile, Erosion Control, Class 1	SY	SY	230	---	230

Item numbers are for reference only. Quantities shown are not necessarily the pay quantities nor the total quantity of the particular item.

DESIGNED BY: Andrew Wells	CHECKED: Jesse Escamilla III	FOUNDATIONS REVIEWED BY: David Hemstreet
DRAWN BY: Sam Sollie	CHECKED: Andrew Wells	
QUANTITIES BY: Andrew Wells	CHECKED: Jesse Escamilla III	

STATE OF ALASKA
**DEPARTMENT OF TRANSPORTATION
 AND PUBLIC FACILITIES**
 BRIDGE SECTION
 3132 Channel Drive
 Juneau, Alaska 99801
 907-465-2975

NOYES SLOUGH BRIDGE
 AURORA DRIVE
SITE PLAN



BRIDGE NO. 209
 DWG. NO. 2

APPENDIX E

PAVEMENT DESIGN

Project Information

Project Name **Noyes Slough**

Project Number **NA**

Designer **NA**

Date **10/10/2019 1:10:19 PM**

Overlay Design

English Units

Metric Units

Traffic Loads

Select Location

AADT **3,500**

% Spring

% Summer

% Fall

% Winter

Load Repetitions

15

35

15

35

Future **311,938**

46791

109178

46791

109178

Asphaltic-Layer Properties

	%Air	%AC	pcf Density
Asphalt_Concrete	4	5.5	148

Load Configuration

Dual Tire - 110 psi

Tire Pressure **110 (psi)** Tire Load **4500 (lbs)**

Load locations
(in)

X	0	13.5				
Y	0	0				

Evaluate at:

X	0	6.75						
Y	0	0						

Pavement Structure

	Use TAI	Thickness (in)	Spring		Summer		Fall		Winter	
			Modulus (ksi)	Poisson Ratio	Modulus (ksi)	Poisson Ratio	Modulus (ksi)	Poisson Ratio	Modulus (ksi)	Poisson Ratio
Asphalt_Concrete	<input checked="" type="checkbox"/>	3	755	0.3	510	0.3	510	0.3	1500	0.3
Agg_Base_P200<6%	<input type="checkbox"/>	3	45	0.35	50	0.35	50	0.35	100	0.35
Select_A_P200<6%	<input type="checkbox"/>	24	25	0.4	35	0.4	35	0.4	90	0.4
Select_C_P200<30%		0	50	0.45	10	0.45	10	0.45	10	0.45
*Not Used										

Project: Noyes Slough Proj No.: NA							New Construction by:NA 10/10/2019 1:10:19 PM				
AADT = 3,500	Past Loadings	Future Loadings						X/Y Load Locations (in): Load = 4500 (lbs) Tire Pressure = 110 (psi)	0 0	13.5 0	
15% Spring 35% Summer 15% Fall 35% Winter ----- Total:	-----	46791 109178 46791 109178 ----- 311,938						X/Y Evaluation Points (in):	6.75 0	0 0	
Layer	Critical Z Coordinate	Asphalt Properties	Season	Modulus (ksi)	Poisson's Ratio	Tensile Critical Micro Strain	Critical Compressive Stress (psi)	Million Cycles to Failure		Future Damage %	Total Damage %
3(in) Asphalt_Concrete	2.99	4% Air 5.5% Asph 148 pcf	Spring	755	0.3	251		1.22		3.84	3.84%
			Summer	510	0.3	263		1.46		7.48	7.48%
			Fall	510	0.3	263		1.46		3.20	3.20%
			Winter	1,500	0.3	104		12.31		0.89	0.89%
Total Damage:										15.41	15.41
3(in) Agg_Base_P200<6%	3.01		Spring	45	0.35		32.00	1.20		3.90	3.90%
			Summer	50	0.35		41.00	0.75		14.49	14.49%
			Fall	50	0.35		41.00	0.75		6.21	6.21%
			Winter	100	0.35		36.30	10.74		1.02	1.02%
Total Damage:										25.62	25.62
24(in) Select_A_P200<6%	6.01		Spring	25	0.4		18.60	1.03		4.52	4.52%
			Summer	35	0.4		22.70	1.62		6.74	6.74%
			Fall	35	0.4		22.70	1.62		2.89	2.89%
			Winter	90	0.4		21.80	40.15		0.27	0.27%
Total Damage:										14.43	14.43
S-Infinite Select_C_P200<30%	30.01		Spring	50	0.45		4.15	1,318.19		0.00	0.00%
			Summer	10	0.45		2.10	41.22		0.26	0.26%
			Fall	10	0.45		2.10	41.22		0.11	0.11%
			Winter	10	0.45		1.25	223.67		0.05	0.05%
Total Damage:										0.43	0.43

MEMORANDUM

State of Alaska
Department of Transportation & Public Facilities
Northern Region Design and Engineering Services

TO: Sarah Schacher, P.E.
Preconstruction Engineer
Northern Region

DATE: October 17, 2019

FILE NO:

PHONE NO: (907) 451-2040

FAX NO: (907) 451-2353

FROM: Jeff Currey, P.E.
Materials Engineer
Northern Region

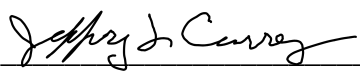
SUBJECT: Aurora Drive Noyes Slough
Bridge #0209 Replacement
NFHWY00124
**Waiver Request – Stabilized
Base Policy**

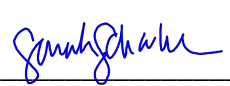
The referenced project is a bridge replacement project that will require vertical alignment adjustment and repaving of a few hundred feet on each end of the new bridge. The existing alignment was repaved in 2016 with three inches of HMA over four inches of Aggregate Base Course, Grading D.

Since the subject project is only paving a few hundred feet on each side of the bridge and is tying into the pavement section described above, I recommend using the same pavement structure for consistency, ease of construction and to accommodate future pavement preservation efforts.

The proposed pavement section of three inches of HMA over three inches of Aggregate Base Course, Grading D meets the AKFPD analysis conservatively, and will accommodate construction of curb & gutter within the project.

Based on these factors I recommend waiving the Stabilized Base Policy for this project.

Recommended:  Date: 10-17-19
Jeff L. Currey, P.E.
Materials Engineer

Approved:  Date: 10/17/2019
Sarah Schacher, P.E.
Preconstruction Engineer

jlc/

cc: Joseph Kemp, P.E., Engineering Manager, Northern Region