FH#_____
(Office Use Only)

FISH HABITAT PERMIT APPLICATION

Alaska Department of Fish and Game - Habitat Section

Office Locations

A. APPLICANT

Name: Francisco Sanchez (District Ranger)

Mailing Address: 33599 Ranger Station Spur

Email Address: francisco.sanchez@usda.gov

Phone: 907-288-7730 Alt Phone: _____

AGENT / POINT OF CONTACT:

Name: John Lang

Mailing Address: 33599 Ranger Station Spur

Email Address: John.Lang@usda.gov

Phone: 907-288-7719 Alt Phone: _____

B. PROJECT DESCRIPTION:

Replace the existing timber structured bridge that spans Trail River near the Trail Lake campground on the Chugach National Forests' Seward Ranger District. The replacement bridge will be a single span prestressed concrete bridge. The proposed work includes removal of the existing concrete pier located in the middle of Trail River.

C. PROJECT TIME FRAME: May15, 2022 to July 15, 2022

D. PROJECT LOCATION:

Water body name: Lower Trail Creek

Anadromous stream number: 244-30-10010-2225

Latitude & longitude in decimal degrees: -149.3771; 60.4226

Section 24 Township 004N Range 001W Meridian Seward USGS Quad Seward B-7 NE

E. WATERBODY CHARACTERISTICS:

Water body width: 130 feet Water body depth: Variable

Substrate type (Boulder, cobble, gravel, sand, mud): Bedrock

Stream gradient: 3 percent

PLEASE COMPLETE THE APPLICABLE SECTIONS BELOW:
A list of best practices for many commonly authorized activities can be found at our Habitat Permits Website.

F. IN-WATER WORK:

Will you place a structure or any fill below ordinary high water? ☐ Yes ■ No

Will you remove material from below ordinary high water? ■ Yes ☐ No

Type and amount: Concrete bridge pier (1)

Will you alter the bed or banks of the water body? ☐ Yes ■ No

How? _____

Will you use tracked or wheeled equipment below ordinary high water? ☐ Yes ■ No

What type? _____

Will you drive piles below ordinary high water? ☐ Yes ■ No

How many and what type? _____

Pile installation method: ☐ vibratory hammer ☐ impact hammer ☐ drilled

☐ other: _____

Will you divert the stream around the work area? ☐ Yes ■ No

How long will the stream be diverted? _____

How will you divert the stream? _____

_____

Will you be placing a coffer dam or silt fencing to isolate the work area? ■ Yes ☐ No

Will you dewater the work area with a pump? ■ Yes ☐ No

Who will trap fish and remove them from the work area? Seward RD fisheries personnel.

Capture and relocation of fish will require an Aquatic Resource Permit from the ADF&G Division of Sport Fish.

G. **STREAM CROSSINGS:**

What type of vehicles or equipment will cross the stream or lake?

None, bridge R/R will utilize two cranes.

How many crossings (one-way) will be required? None

Will you build ice bridges for winter crossing? ☐ Yes ■ No

H. **WATER WITHDRAWAL:**

Pump intake size (inches): _____ Maximum pumping rate (gpm): _____

Total daily amount (gal): _____ Total seasonal amount (gal): _____

Water withdrawal from fish-bearing waterbodies will require appropriate intake screening to avoid impacts to fish. Screening criteria can vary by location depending on the species of fish and life stages present at the time of withdrawal. Contact the Habitat Section for more information on intake screens.

Intake screening specifications (attach photos if available):

Water may be deflected around the base of the existing concrete pier with sandbags per ~~section 3.13 of 3/08/2018 preliminary design report.pdf included with this permit application.~~

Please attach plans, specifications, aerial photographs, site rehabilitation plans, or other information in support of your application. Submit your completed application by postal mail, email, or in person at the appropriate Habitat Section office.

I certify all information provided in my application and supporting documents is true and complete to the best of my knowledge.

Francine Cinche
Applicant Signature

June 7, 2021
Date

TRAIL RIVER CAMPGROUND BRIDGE REPLACEMENT

Region 10

Chugach National Forest

Seward Ranger District

Preliminary Design Report

Prepared By _____
David Scovell, PE
Bridge Designer

Rogue River-Siskiyou NF
3040 Biddle Road
Medford, OR
97504

Reviewed By _____
Griff Berg, PE
Forest Engineer, Chugach NF

Telephone: (541) 618-2081
Email: dscovell@fs.fed.us

Date: February 2, 2018
:

Technical Approval: _____
Kathryn Van Hecke, PE
Regional Bridge Engineer, R6

Technical Approval: _____
Eric Antrim, PE
Regional Bridge Engineer, R10

Reviewed By: ----------
Sam Carlson, PE
Director of Engineering, R10

Contents

1 Introduction

The Trail River Bridge site lies in the vicinity of Trail River Campground on the Seward Ranger District approximately 95 miles south of Anchorage, Alaska. The site is located on Forest Development Road 2050 (Trail River Road) at milepost 0.40, T.4N., R.1W., Sec. 24. The road is known as the Trail River Road which accesses the high use Trail River Campground during summer months.

Trail River is the outlet stream for Lower Trail Lake and is in mountainous terrain -on approximately 4% grade- meandering through steep rock gorges with narrow flood plains adjacent to the stream. The terrain is mountainous and gorge slopes consist of relatively dense, mature stands of trees with underlying bushes and grasses.

Trail River is an important fish-bearing stream that flows into Kenai Lake. At the present, the two lane roadway is carried over the stream channel by a two-span, 142-foot long timber structure comprised of two 70-foot spans supported by concrete abutments and concrete pier. The current bridge has a clear width of 22-feet and accommodates two lanes of traffic.

Constructed in 1964 this bridge has exceeded the original design service life of 50 years, is structurally and functionally deficient, and has been approved for FHWA FLTP funding in FY2020.

2 Overall Project Scope

This project consists of replacing the existing two-span timber structure with a single span prestressed concrete bridge. The proposed work includes removal of the existing concrete pier located in the middle of Trail River which generates ongoing maintenance issues related to drift accumulation at the pier.

Project objectives include widening of the traveled way, installation of a crash tested bridge rail system, removal of the center pier, and creation of a low maintenance durable structure with a service life of 75 to 100 years. Increase of the traveled way and a new rail system will increase public safety for vehicle operators and pedestrians.

Included in the objectives is redesign of the approach roadway vertical and horizontal alignments and adding 60-foot asphalt aprons to redirect runoff from the roadway and bridge away from the channel.

A new single span concrete bridge structure approximately centered on the existing alignment is proposed to replace the existing bridge.

The proposed vertical alignment for this segment of the roadway is shown on the attached Plan & Profile and places the bridge deck at a finish grade elevation of 485 feet or 4 feet above existing and almost 30 feet above the channel elevation. The proposed horizontal alignment would place the bridge on a tangent segment while approach roadways would be on a 285-foot and 145-foot radius.

A crowned roadway with cross slope of 2% from centerline to either side would apply over the entire project length

The Preliminary Design Report is based on a topographic survey and visual inspections carried out to date. The Preliminary Design Report outlines the concept and design standards that apply to the preferred alternative, selected from viable alternatives considered.

3 Factors Influencing the Design

3.1 Service Requirements

3.1.1 Traffic Volume

As noted above, the Trail River road (FSR 2050) provides access to the high use Trail River Campground. Forest Road 2050 is a two lane roadway with crushed aggregate surfacing.

The road is located on Forest Service Land and does not service private residents. Based on a road analysis the seasonally adjusted ADT is estimated to be less than 400 vehicles per day (high season). As such the design standards for this low volume roadway will be in accordance with the Forest Service Handbook and AASHTO Low Volume Roads as it relates to roadway alignments and lane widths. The design speed is 25 mph.

3.1.2 Utilities

There are no existing utility services at the bridge site.

3.1.3 Deck Drainage

- Runoff from the deck surface is to be accommodated as follows:

The proposed vertical alignment places approaches on 1.5% and 2% grades while the main bridge span is cambered due to prestressing. The resulting profile will force runoff to drain off the bridge toward approaches and then to rock lined slope drains along embankment slopes. Outlet points of slope drains will be a minimum 50 feet from the active channel.

3.1.4 Provision for Pedestrians and Cyclists

As this is a rural site and approaches to the bridge are crushed aggregate, no provision for pedestrians or cyclists will be made. Note, however, that the proposed deck clear width will be increased from 22 to 30 feet in accordance with curve widening requirements. As such we will create 4-foot shoulders at each side of roadway and increase available safe space if pedestrians or cyclists attempt to cross the bridge. Having said that, additional deck width is not being provided to encourage pedestrians or cyclists.

3.2 Geometrics

The proposed horizontal alignment would place the bridge on a tangent segment of roadway while approach roadways would be on a 285-foot and 145-foot radius. Proposed curve radii conform closely to the existing approach roadway.

The proposed vertical alignment places the bridge on a crest vertical curve with 1.5% and 2.0% approach grades sloping down to low points at each end of bridge. Refer to Plan & Profile drawing in Appendix B.

3.3 Design Standards

Criteria		Comments
Standards	*AASHTO (1), FS Manual*	*See below*
Construction	FP-14	With FS special provisions
Functional Classification	Arterial roadway	Two-lanes, ML-4
Surface type proposed	Asphalt pavement	On bridge & approaches
Design Volume	400 vpd	Estimated ADT
Lane width	11 feet	Based on paved roadway
Curve Widening	5 feet	Based on 145-foot radius

Table 3.3, (1) Bridge design - AASHTO LRFD Bridge Design Specifications, 2012

3.4 Construction Permits

	Type of Permit Required	
Type of Structure	**Federal**	**State of Oregon**
Bridge	Corps of Engineers (COE)	Division of State Lands (DSL)

Table 3.4: 404 permits required for removal of existing concrete pier due to presence of ESL species habitat at site

3.5 Site Seismicity

Seismic design will be carried out to AASHTO LRFD “Bridge Design Specifications” utilizing AASHTO Seismic Design Maps. The seismic factors applicable for the site and structure are shown in Table 3.5, with other factors determined from AASHTO Section 3.10 unless otherwise noted:

Soil Profile Type	Type I (bedrock)
Seismic Zone, Z	0.60g (1000 yr peak ground acceleration)
Importance Category	1.0 (other bridges)
Response modification factor–wall type pier	R = 2
Response modification factor–connections	R = 0.80

Table 3.5 Parameters for Seismic Design

3.6 Hydrology / Hydraulics

Minimum freeboard clearance for a bridge in this setting would typically be on the order of 3 to 5 feet to allow passage of large drift/debris piles. Due to the height of this structure above the stream, hydraulics is not a concern and an analysis of hydraulic capacity and freeboard will not be performed. The channel bottom and walls are comprised of bedrock which extends up to footing elevations. Visual inspection of the rock indicates that erosion or scour of the channel banks is not anticipated.

A topographical survey was completed by Randy Schrank with Chugach National Forest Engineering personnel in 2017 and was used to generate the site survey.

3.7 Structure Sizing

Due to the height of roadway above channel elevation, hydraulics will not play a part in structure sizing. Structure span length will controlled by the location of sound bedrock at each channel edge and the need to provide a reasonable setback from channel edge so as to preclude potential erosion under abutment footings during the service life of the structure.

3.7.1 Embankment Scour Protection

As noted above, visual inspection of the rock indicates that erosion or scour of the channel banks is not anticipated. In addition, embankment toes are well above high water elevations.

3.8 Foundation Conditions

3.8.1 Site Investigations and Ground Conditions

A preliminary visual inspection of exposed bedrock at the site indicates competent bearing material exists at the proposed abutment footings.

Findings affecting the structure at this site included:

- The presence of competent bedrock indicates that spread footing foundations are an appropriate alternative for this site. Cast-in-place spread footings will to be set into the bedrock which is located approximately 3.5 to 7 feet below the existing roadway elevations.
- Embankment slopes - the maximum recommended slope of approach roadway embankments is 1.5H:1V. Using this embankment slope it appears that construction of the new bridge and approaches will impact approximately 0.10 acres of additional land along the existing roadway alignment.
- Settlement is not considered to be a problem at this site -for the proposed foundations- due to the presence of bedrock. Although geotechnical testing of bedrock has not been performed, bearing capacities of between 5,000 and 10,000 pounds per square-foot would be conservative.

  Required embankment height could exceed 10 feet at bridge ends which means settlement of approach fills could become an issue. For this reason it is recommended that a select backfill material conforming to Section 704 of the Standard Specifications be used in embankment construction.
- Earthquake induced liquefaction is not an issue at this site.

3.9 Constraints on Span Arrangements and Clearances

The following is to be considered for any proposed structure:

- It is desirable not to place piers in the water for potential impacts to aquatic species and hydraulics as well as practicalities of construction and access
- It is desirable to keep the vertical and horizontal alignments as close as possible to existing in order to minimize roadway cut and fill quantities as well as impacts to previously undisturbed flora and fauna.

3.10 Constraints on Construction Materials and Methods

The site is approximately 25 miles from Seward (as the crow flies) which poses a moderate risk to structural steel bridge components as the potential of chloride contamination exists. For this reason there is justification for using concrete over steel materials. Steel alternatives will require galvanizing or painting to protect against corrosion which increases initial cost and maintenance cost over the life of the structure.

The site's remoteness favours the use of prefabricated or precast concrete girders for a bridge to minimize time spent on site and to ensure a reasonable quality of bridge is constructed. In this respect precast concrete deck and/or beam units fabricated off site should be considered.

Cast-in-place (CIP) concrete construction as required is a viable material option due to the presence of concrete suppliers within 1 1/2 hours of the site. The amount of CIP concrete should be limited however due to the variability in cost and quality control.

3.11 Fish and Wildlife Restrictions

3.11.1 Fish and Wildlife Work Restrictions

Meet the terms and conditions of the Alaska Department of Fish and Game as required for activities that may affect aquatic and wildlife species on the Kenai Peninsula.

Alaska Department of Fish and Game guidelines for timing in-stream work for Trail River is May 15th to July 15th.

3.12 Cultural Resources

As the existing bridge is over 50 years old, there is a requirement for registration with SHPO as part of the NEPA process.

3.13 Interaction of Construction with Traffic and Stream Flows

It will be possible to close access to the Trail River Campground during construction activities. As such a detour roadway and bridge is not required.

Stream diversion or dewatering may be required during removal of the existing bridge pier in order to keep concrete rubble out of the stream. This work would be completed during the in-stream work window of May 15th to July 15th.

The stream diversion system will likely be limited to sandbags surrounding footing excavations to prevent sediment or concrete from entering into the stream. The following measures will be used as guidelines for bridge construction:

Conservation Measures Along with the general conservation measures summarized at the end of this section, the following conservation measures will be used to minimize sediment and turbidity and the effects of fish handling/transport:

1. Isolate construction area and remove fish from project area. Fish shall be removed from project area (see fish capture guidelines below).

2. Dewater Construction Site – Upstream of the isolated construction area, coffer dams (diversions) constructed with non-erosive materials are typically used to divert stream flow with pumps or a by-pass culvert. Diversions constructed with material mined from the streambed or floodplain are not permitted. Pumps must have fish screens and be operated in accordance with NMFS fish screen criteria. Dissipate flow energy at the bypass outflow to prevent damage to riparian vegetation or stream channel. If diversion allows for downstream fish passage, (*i.e*., is not screened), place diversion outlet in a location to promote safe reentry of fish into the stream channel, preferably into pool habitat with cover. When necessary, pump seepage water from the dewatered work area to a temporary storage and treatment site or into upland areas and allow water to filter through vegetation prior to reentering the stream channel.

3. Stream Re-Watering – Upon project completion, slowly re-water the construction site to prevent loss of surface water downstream as the construction site streambed absorbs water and to prevent a sudden increase in stream turbidity. Monitor downstream during re-watering to prevent stranding of aquatic organisms below the construction site

4. Fish Handling – If capture, removal, and relocation of fish are required, follow these steps:

    a. All fish capture, removal, and handling activities shall be conducted by an experienced fisheries biologist or technician.

    b. Isolate capture area – Install block nets at upstream and downstream locations and leave in a secured position to preclude fish from entering the project area. Leave nets secured to the stream channel bed and banks until fish capture and transport activities are complete. If block nets or traps remain in place more than one day, monitor the nets and or traps at least on a daily basis to ensure they are secured to the banks and free of organic accumulation and to minimize fish predation in the trap.

    c. Fish Capture Options

        i. Collect fish by hand or dip nets, as the area is slowly dewatered.

        ii. Seining – Use seine with mesh of such a size to ensure capture of the residing ESA-listed fish.

        iii. Minnow traps – Traps will be left in place overnight and in conjunction with seining

        iv. Electrofishing – Prior to dewatering, use electrofishing only where other means of fish capture may not be feasible or effective. The protocol for electrofishing includes the following:

            If fish are observed spawning during the in-water work period, electrofishing shall not be conducted in the vicinity of spawning adult fish or active redds.

            Only Direct Current (DC) or Pulsed Direct Current (PDC) shall be used.

            Conductivity <100 use voltage ranges from 900 to 1100. Conductivity from 100 to 300 then use voltage ranges from 500 to 800. Conductivity greater than 300 then use voltage to 400.

Begin electrofishing with minimum pulse width and recommended voltage and then gradually increase to the point where fish are immobilized and captured. Turn off current once fish are immobilized.

Do not allow fish to come into contact with anode. Do not electrofish an area for an extended period of time. Remove fish immediately from water and handle as described below. Dark bands on the fish indicate injury, suggesting a reduction in voltage and pulse width and longer recovery time.

5. Handling and Release –Fish must be handled with extreme care and kept in water for the maximum extent possible during transfer procedures.

3.14 Aesthetics

The bridge is located in a rural area and no specific architectural measures are proposed for the structure. The proposed structure would have a conventional form that is common to many Forest Service bridges and reflects the functional nature of the structure. This form is effective in its simplicity, but has no particular character or individuality that is relevant to its setting. Surfaces of concrete exposed to viewing will be given a Class 2 “Rubbed Finish”.

Other opportunities for enhancing the aesthetic appeal of the bridge exist through the style adopted for the bridge rail used. For this reason the Oregon DOT standard two-tube curb mount rail is proposed to provide a more open rail feature and “break up” the large vertical surfaces of a solid parapet.

3.15 Side Protection Requirements

TL-3 barriers will be required in the form of the two-tube curb mounted rail in accordance with Oregon DOT Bridge Standard Drawings. Barriers will be extended onto the bridge approaches in accordance with DOT guardrail standards.

3.16 Access for Inspection and Maintenance

For a bridge, access for inspection and maintenance for areas above the deck would be from the bridge deck. Inspection and maintenance work required below deck will require the use of a snooper crane or from a platform.

4 Design Alternatives

4.1 Superstructure Alternatives

Given the conditions and geometric constraints of this site, only single span structure options were considered for the Trail River Campground Bridge Replacement. Below are listed possible single span alternatives:

- Single-span prestressed concrete deck bulb-T girders,
- Single-span prestressed concrete bulb-I girders with concrete deck (CIP or precast),
- Single-span steel plate girders with concrete deck (CIP or precast),

The investigation phase study narrowed down the choice of structure type to prestressed concrete girder alternates based on construction and maintenance cost, durability, construction time constraints, and availability.

4.1.1 Alternate 1 - Prestressed concrete deck bulb-T girder bridge

This alternative involves the use of five 66-inch deck bulb-T prestressed concrete girders spanning 145'-4 ½". For this alternative the deck surface is integral with the girder and does not need to be cast later. Figure 4.1 illustrates a typical arrangement. Refer to Appendix B for the Plan & Profile of the proposed bridge.

Assuming 2-tube curb mounted rails the deck width would provide for a total of 30'-0" between barrier faces, consisting of 4-foot shoulders each side of two 11-foot lanes. This option would have each abutments supported on spread footings bearing on underlying bedrock. Abutments will have wingwalls to contain approach fills.

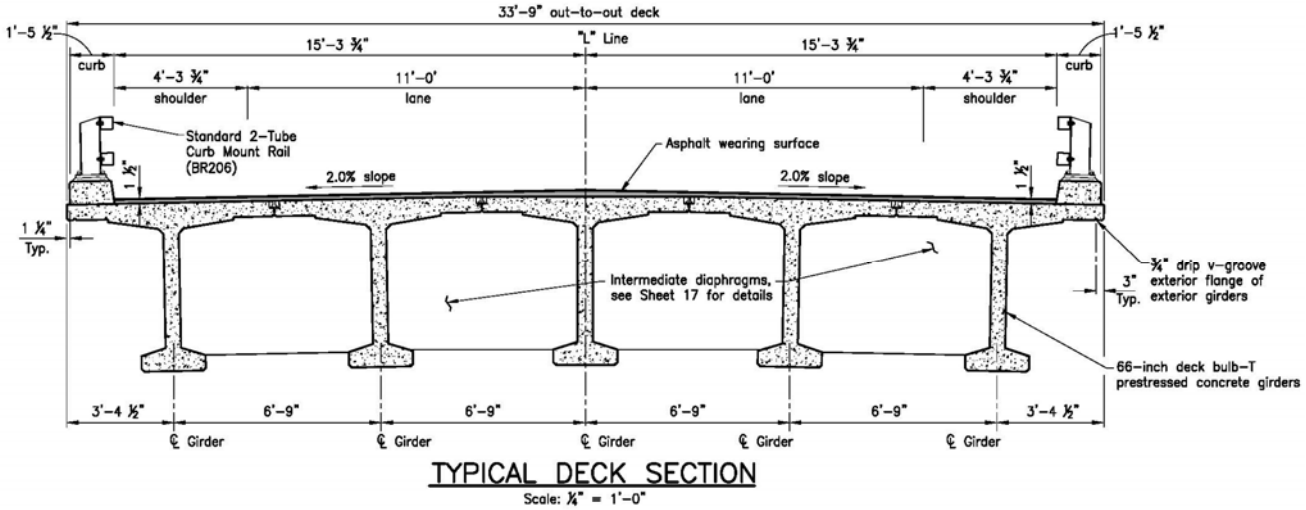


Figure 4.1: Cross-section of deck bulb-T alternate

4.1.2 Alternate 2 - Prestressed concrete bulb-I girder w/deck slab bridge

This alternative involves the use of five 63-inch bulb-I prestressed concrete girders spanning 145'-4 ½". For this alternative a cast-in-place deck is then poured on the girders to create the driving surface. Figure 4.2 illustrates a typical arrangement. Refer to Appendix B for the Plan & Profile of the proposed bridge.

Assuming 2-tube curb mounted rails the deck width would provide for a total of 30'-0" between barrier faces, consisting of 4-foot shoulders each side of two 11-foot lanes. This option would have each abutments supported on spread footings bearing on underlying bedrock. Abutments will have wingwalls to contain approach fills.

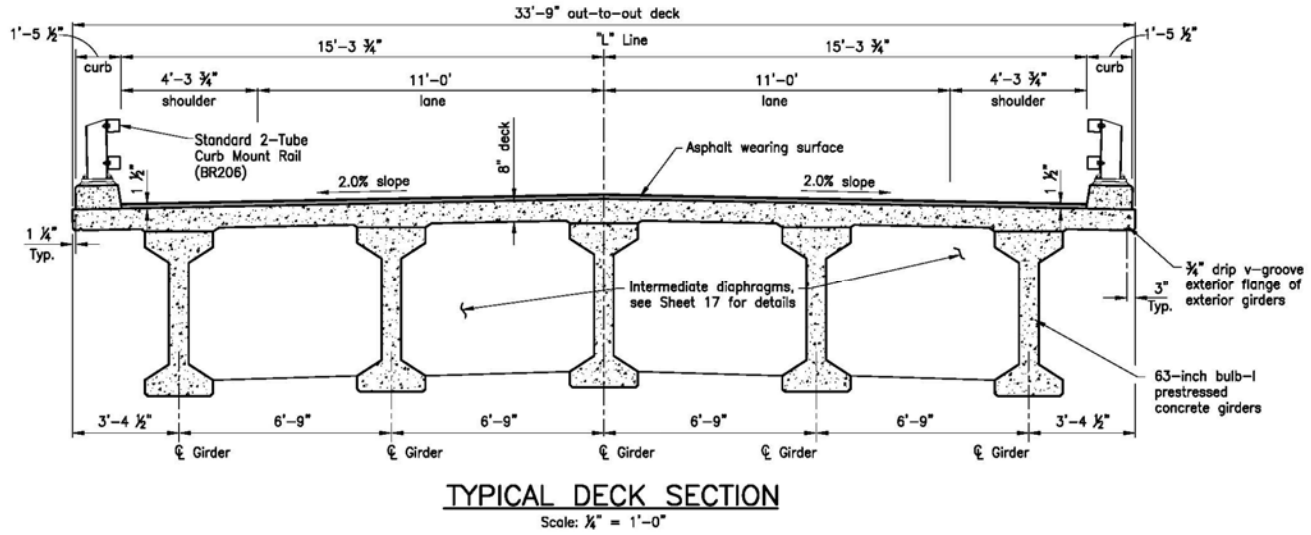


Figure 4.2: Cross-section of bulb-I with concrete deck slab alternate

Table 4.1 Structure Estimated Construction Costs

Option	Estimated Cost
Deck bulb-T girders	$1,493,000 (w/10% contingency)
Bulb-I girders w/deck slab	$1,828,000 (w/10% contingency)

4.2 Likely Methods of Construction

4.2.1 General

Both alternatives have the same horizontal and vertical alignments, very similar abutments, and the same approach embankment requirements.

The proposed alignment places the new roadway and bridge along the centerline of existing horizontal alignment and above existing roadway elevation (see Plan & Profile).

Concrete abutments can be formed up and cast right at ground level and precast concrete girders set by cranes sitting at bridge ends.

Girders will be transported to site by truck and set in place using cranes. Bridge girders will likely be set using two large cranes which will “pass” girders from a crane on the near side to one at the far side. Typically a smaller crane is placed at the approach which delivery trucks will be coming. The smaller crane supports one girder end and the truck the other. Acting in tandem (truck-crane) the end of girder is boomed out over the channel approximately 50’ to 55’. At this point the cranes perform a swap with the larger crane (at far side of channel)

attaching to the girder end. The smaller crane then picks up the end previously carried by the truck and the girder is swung into place.

A curb mount rail system will be installed along deck edges by splicing curb reinforcing to dowels cast into the precast girders. This rail system is based on the Oregon DOT crash tested TL-3, two-tube curb mounted rail which has also been adopted by the Alaska DOT.

An asphalt concrete overlay will be installed on precast girders to provide a smooth driving surface and to create a "crowned" roadway for drainage. Asphalt paving will extend approximately 60 feet onto approaches for drainage and to prevent carryover of gravel onto the bridge deck. Approach guardrails and road signage will complete the bridge.

4.3 Construction Materials and Durability

All alternatives are concrete construction and will be designed with appropriate concrete density and sufficient cover to reinforcement to ensure adequate durability for the level of exposure.

The steel guardrail will be hot dip galvanized to give a minimum life to first major maintenance of 25 years assuming a corrosive environment.

4.4 Structure Aesthetics

No specific aesthetic improvements are proposed for the bridges as the structure is located in a rural environment with relatively low traffic volume and hence does not justify the cost associated with significant aesthetic treatment.

4.5 Maintenance

For concrete construction there are no extraordinary maintenance requirements to the structure. The bridge is located in a rural setting remote from urban development; hence no consideration has been given to the use of anti-graffiti coatings to any areas.

4.6 Conclusions and Recommendations

Based on a comparison of viable alternatives, the single-span prestressed concrete deck bulb-T girder option appears to be the most cost effective for this site.

The main characteristic that makes the deck bulb-T girder alternative more desirable over other alternatives is that they are fabricated with an integral deck. Once placed and welded together the bridge superstructure is essentially completed.

Steel and prestressed concrete girder alternatives requiring the additional step of using cast-in-place or precast deck will be more expensive and require more construction time

Construction activities require experienced and competent contractors in order for the work to be done promptly and properly. As such –in the bid selection process- we recommend that equal emphasis be placed on contractor project experience and cost.

We therefore recommend that the single-span prestressed deck bulb-T girder alternative proceed to final design. The estimated cost for this alternative is $1,493,000. A breakdown of the estimates for both alternatives is included in Appendix A. Preliminary drawings showing the Title Sheet, Vicinity Map, Plan & Profile, Superstructure, and Roadway Cross-section sheets are included in Appendix B.

APPENDIX C

SITE PHOTOS

Looking down and upstream at existing bridge

Looking downstream at south end of existing bridge

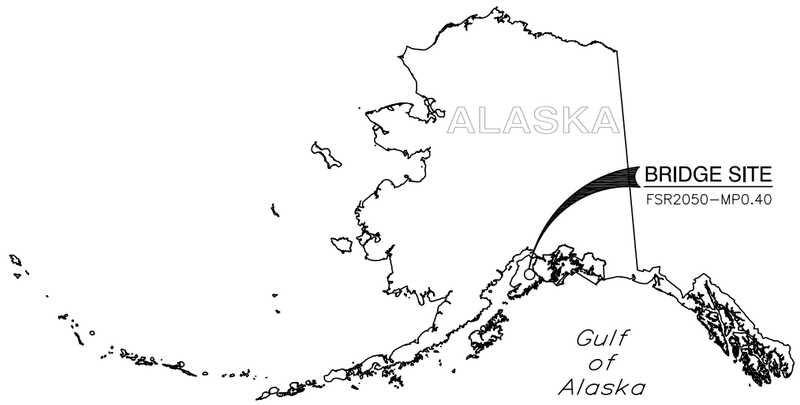
Looking ahead on stationing at deck of existing bridge

Looking ahead along upstream girder at existing bridge and concrete pier

Looking back at concrete pier

Typical bearing pedestals at abutments

Existing abutments cast onto bedrock



LOCATION MAP

UNITED STATES DEPARTMENT OF AGRICULTURE

FOREST SERVICE

ALASKA REGION

CHUGACH NATIONAL FOREST

SEWARD RANGER DISTRICT

• • •

CONSTRUCTION DRAWINGS FOR

TRAIL RIVER CAMPGROUND BRIDGE REPLACEMENT
(STRUCTURE NO. 100430000030138)

Designed By:

_____ _____
Bridge Engineer Date

Approved By:

_____ _____
Forest Engineer Date

Technical Approval By:

_____ _____
Regional Bridge Engineer Date

Approved By:

_____ _____
Director of Engineering, R10 Alaska Region Date

Approved By:

These drawings comply with the Forest Plan and project specific NEPA documentation.

_____ _____
District Ranger Date

PROJECT SITE

Chugach National Forest

DRAWING INDEX

SHEET	TITLE
1	TITLE SHEET
2	VICINITY MAP
3	ESTIMATE OF QUANTITIES
4	TYPICAL SECTIONS
5	PLAN & PROFILE
6	INDEX OF BRIDGE DRAWINGS & GENERAL NOTES
7	GENERAL LAYOUT
8	FOUNDATION PLAN
9	SUPERSTRUCTURE
10	ABUTMENT NO. 1
11	ABUTMENT NO. 1 DETAILS
12	ABUTMENT NO. 1 WINGWALL DETAILS
13	ABUTMENT NO. 2
14	ABUTMENT NO. 2 DETAILS
15	ABUTMENT NO. 2 WINGWALL DETAILS
16	GENERAL DETAILS
17	66" DECK BULB–T PRECAST PRESTRESSED CONCRETE GIRDERS
18	DECK BULB–T GIRDER SCHEDULE, DIAPHRAGM & MISCELLANEOUS DETAILS
XS1–XS2	ROADWAY CROSS–SECTIONS

STANDARD DRAWINGS

BR206	2–TUBE CURB MOUNT RAIL
BR207	2–TUBE CURB MOUNT RAIL TRANSITION
BR350	TEMPORARY DIAPHRAGM BEAM FOR PRESTRESSED CONCRETE GIRDERS
RD400	GUARDRAIL AND METAL MEDIAN BARRIER
RD405	GUARDRAIL AND METAL MEDIAN BARRIER PARTS
RD410	GUARDRAIL PARTS (THRIE BEAM)
RD415	GUARDRAIL AND METAL MEDIAN BARRIER PARTS
RD420	TL–3 ENERGY ABSORBING TERMINAL
RD440	GUARDRAIL INSTALLATION AT BRIDGE ENDS
RD450	GUARDRAIL ANCHORS (STEEL)
RD451	WOOD BREAKAWAY POSTS

TOTAL NUMBER OF SHEETS = 31

USDA FOREST SERVICE - R10
CHUGACH NATIONAL FOREST
161 EAST 1st AVE., DOOR 8
ANCHORAGE, ALASKA 99501

PROJECT NO.:

DRAWN BY: David Scovell, PE DATE: May 2018

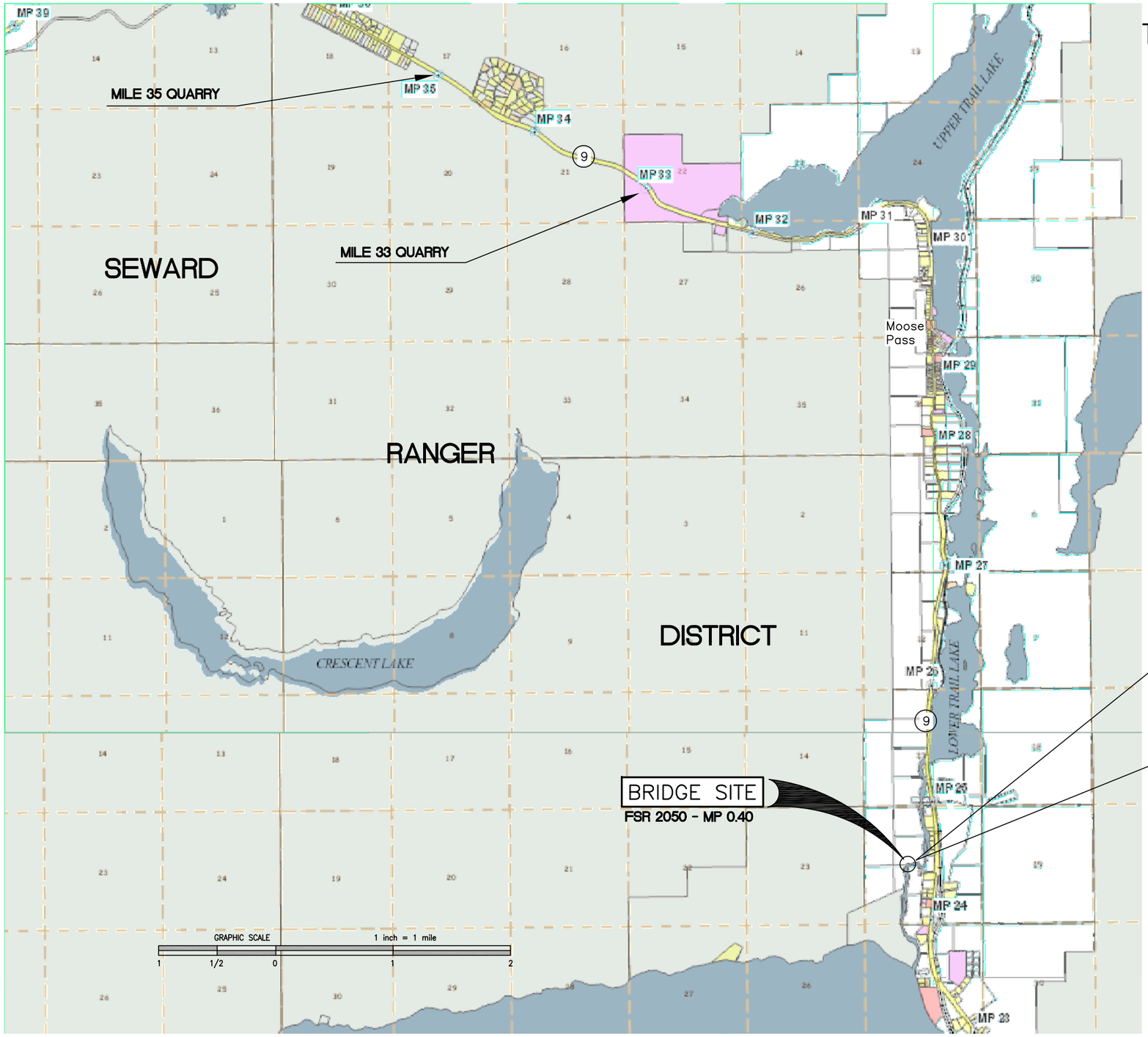
CHECKED BY: - DATE: -

TRAIL RIVER CAMPGROUND BRIDGE REPLACEMENT

Chugach National Forest Seward Ranger District

TITLE

TRAIL RIVER CAMPGROUND BRIDGE REPLACEMENT
Township 4N., Range 01W., Section 24

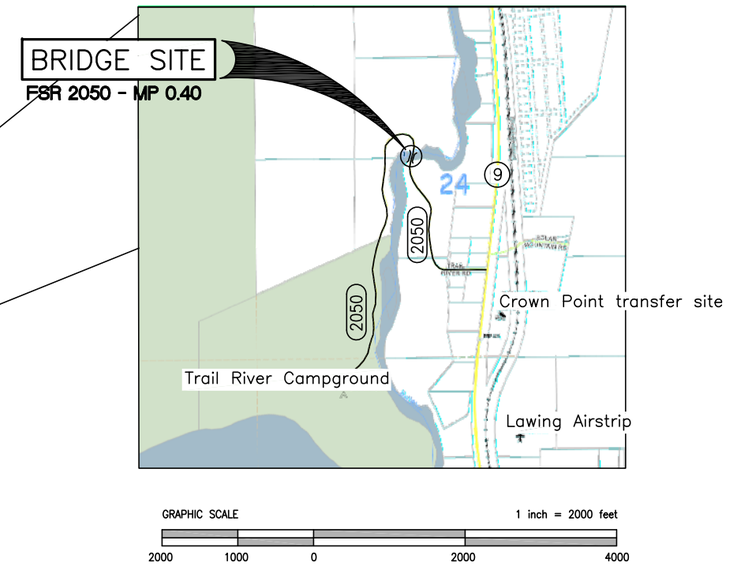


LEGEND

- (9) STATE HIGHWAY
- (2050) FOREST COLLECTOR ROAD
- [W] WATER SOURCE

GOVERNMENT FURNISHED MATERIAL SOURCES:

1) Embankment material at the Mile 33 Quarry ,
2) Embankment and Disposal Area–Mile 35 Quarry as directed,
3) Staging Area: located at bridge site (roadway/bridge to be closed)
4) Water Source on FSR 2050 near M.P. ––.



USDA FOREST SERVICE - R10
CHUGACH NATIONAL FOREST
161 EAST 1st AVE., DOOR 8
ANCHORAGE, ALASKA 99501

PROJECT NO.:

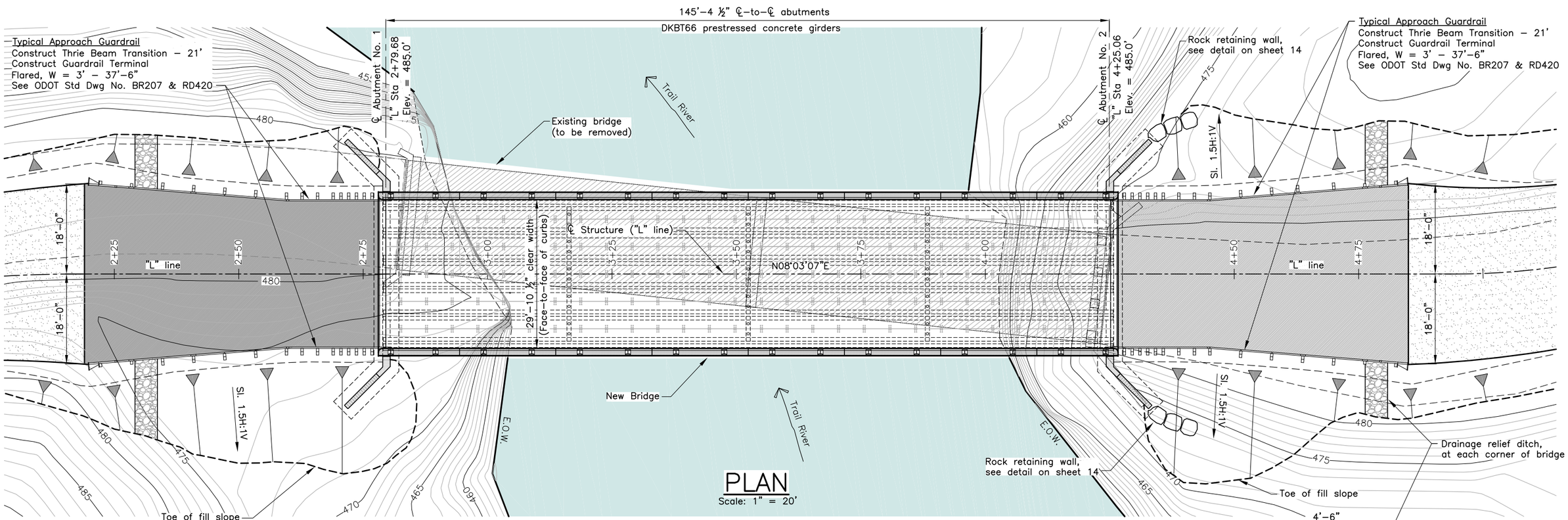
DRAWN BY: David Scovell DATE: May 2018

CHECKED BY: - DATE: -

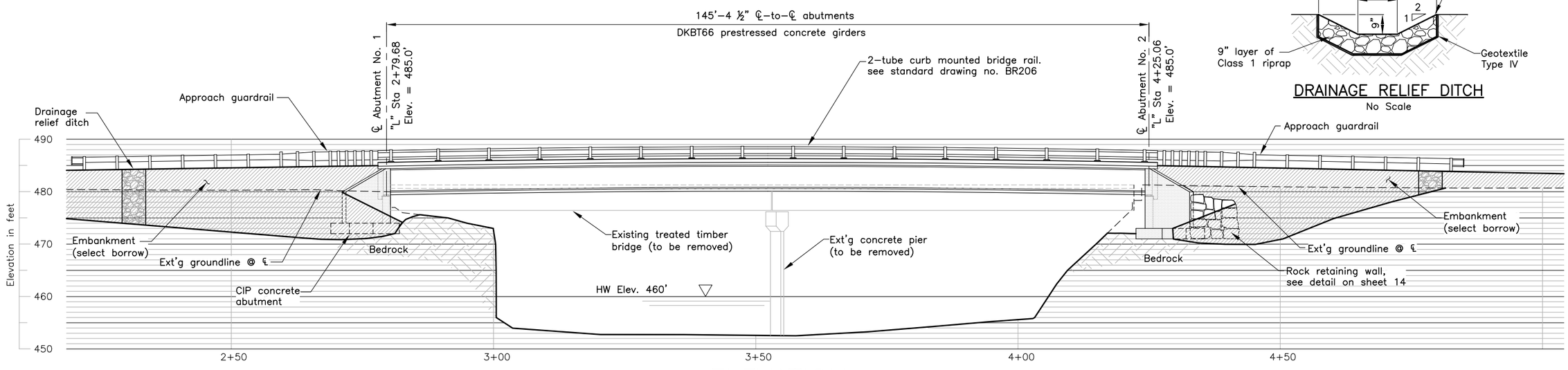
TRAIL RIVER CAMPGROUND BRIDGE REPLACEMENT

Chugach National Forest Seward Ranger District

VICINITY MAP



PLAN
Scale: 1" = 20'



ELEVATION
Scale: 1" = 20'

DRAINAGE RELIEF DITCH
No Scale

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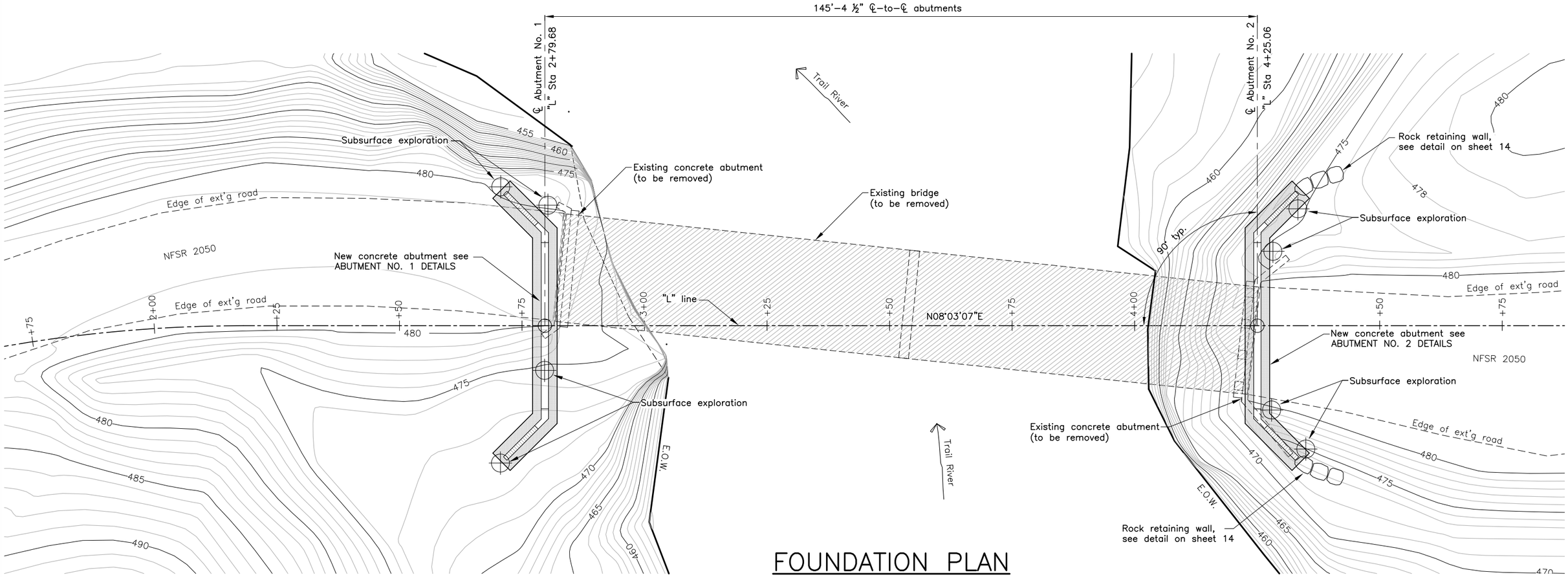
GENERAL LAYOUT



FOUNDATION PLAN

Scale: 1" = 20'

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FOUNDATION PLAN