APPENDIX C

Section 4(f)

(Note: Station numbers may differ slightly from those in the EA as a result of minor design changes that occurred to avoid sensitive resources.)

CHILKAT BALD EAGLE PRESERVE
DOCUMENTATION FOR:

SECTION 4(f) DE MINIMUS IMPACT FINDING

MEMORANDUM State of Alaska

Department of Transportation & Public Facilities (ADOT&PF)
Design and Engineering Services – Southeast Region
Preconstruction / Preliminary Design & Environmental

TO: Arne Oydna
Project Manager

DATE: March 10, 2009

TELEPHONE NO: 465-4498
FAX NUMBER: 465-4414

FROM: Jim Scholl JS
Project Environmental Coordinator

SUBJECT: 68606 Haines Highway: MP 3.5 to 25.3 / Pullouts for Recreational Access

Reference: Plan Sheets 1 through 19 of the attached Turnout/Recreation Facilities

Arne, A summary of our meeting with :

- Joel Telford, Alaska Department of Natural Resources, Parks Division (DNR Parks) and
- Mike Eberhart, DNR Parks and
- Arne Odyna, ADOT&PF, and
- Jim Heumann, ADOT&PF, and
- Jim Scholl, ADOT&PF is:

Pullout Number	Recommendation / Notes
HNS1	Accept design recommendation.
HNS2	Accept design recommendation.
HNS3	Change design recommendation to provide 1 approach rather than 2.
HNS4	Accept design recommendation. Wayside / parking area is in the Borough; work with Borough to accept operations and maintenance. Clear area right of station 366 is a potential fill site.
HNS4	Accept design recommendation with caveat to check driveway permit for driveway right of station 398+50.
HNS5	Accept design recommendation.
HNS6	Accept design recommendation. Wayside / parking area is in the Borough; work with Borough to maintenance.
HNS7	Accept design recommendation.
HNS8	Change design recommendation to provide 1 approach rather than 2. DNR Parks will need to discuss maintenance with Alaska Department of Fish and Game (ADF&G).

Pullout Number	Recommendation / Notes
HNS	Accept design recommendation.
HNS1	Accept design recommendation to remove access only.
HNS11	Accept design recommendation to remove access only.
HNS12	Change design recommendation to provide 1 approach rather than 2.
HNS13	Do not accept design recommendation. ADOT&PF will work with Joel Telford of DNR Parks on an acceptable approach.
HNS14	Do not accept design recommendation. ADOT&PF will work with Joel Telford of DNR Parks on an acceptable approach.
HNS15	Change design recommendation to provide 2 approaches rather than 1. DNR Parks will accept operations and maintenance. ˜ imit parking to 10 vehicles and provide gravel surface.
HNS16	Maintain e˜ isting access.
HNS17	Change design recommendation to provide two aprons, only. DNR Parks will maintain the pullout.
HNS18	Work with Joel Telford, DNR Parks, on a design recommendation.
HNS1	No change to e˜ isting condition.
HNS2	Accept design recommendation.
HNS21	Accept design recommendation. Talk to ADOT&PF Maintenance and Operations about improving access for busses and improvements for snow removal activities.
HNS22	Accept design recommendation.
HNS23	Accept design recommendation.
HNS24	Work with Joel Telford, DNR Parks, on pullout design.
HNS25	Work with Joel Telford, DNR Parks, on pullout design.
HNS26	Provide 1 approach rather than 2. Pullout not supported by ˜ lukwan.
HNS27	Work with Joel Telford, DNR Parks, on design recommendation.

During the meeting we referenced the, ˜Haines Highway Corridor Parternership Plan˜. This is a Haines Borough document prepared as part of the submission for National Scenic Byway designation for the Haines Highway.

CC: Joel Telford, DNR Parks,
Mike Eberhardt, DNR Parks,
Lori Stepansky, Haines Borough, Tourism Director
Kristen Hansen, DOW˜ Engineers
file

Enclosure: Haines Highway, Turnout/Recreation Facilities
(See EA Appendix A for the referenced enclosures.)

U.S. Department
of Transportation
Federal Highway Administration

Alaska Division

709 West 9th Street, Rm. 851
P.O. Box 21648
Juneau, AK 99802
(907) 586-7418
(907) 586-7420 Fax
www.fhwa.dot.gov/akdiv

December 15, 2010

Mr. Joel Telford
Park Ranger
Alaska Department of Natural Resources
Division of Parks and Outdoor Recreation
Juneau, AK 99811

In Reply Refer To:

Subject: Haines Highway MP 3.5 – 25.3. Improvements
State / Federal Project No. 68606 / SHAK-095-6(28)
Request for concurrence on no adverse effect

Dear Mr. Telford:

As you are aware, the Department of Transportation and Public Facilities (DOT&PF), in cooperation with the Federal Highway Administration (FHWA), plans to improve the Haines Highway from Milepost 3.5 – 25.3. Most of the proposed project would take place within DOT&PF's existing right-of-way (ROW), however, approximately 3.0 acres of the Chilkat Bald Eagle Preserve (the Preserve) would be needed for the proposed road widening and straightening of curves, as described further below. Also, some of the proposed stream relocation and enhancement work would take place within the Preserve. In order to mitigate project impacts to the Preserve, DOT&PF is proposing to relinquish to the Preserve approximately 6.0 acres of similar adjacent habitat within the existing DOT&PF ROW.

The purpose of this letter is to provide you with an overview of the project, describe the anticipated impacts to the preserve and adjacent habitat, and explain our proposed measures to mitigate impacts and enhance Preserve resources. We also request your concurrence that the proposed action will not adversely affect the features, attributes, or activities of the Preserve. We make this request because FHWA has determined that the Preserve is protected by Section 4(f) of the Department of Transportation Act of 1966. Section 4(f) regulations (23 CFR Part 774) prohibit the use of publicly owned land of a wildlife and waterfowl refuge of national, State, or local significance unless: 1) there is no feasible and prudent alternative and the action includes all possible planning to minimize harm to the property from such use, or 2) the use of the property, including measures to minimize harm, would have a *"de minimis"* impact. FHWA will use your written determination regarding impacts in making its 4(F) determination.

Project Description:

The proposed project is located in Haines, Alaska, within the United States Geological Survey (USGS) Quadrangles Skagway A-2, B-2, B-3 (Township 30S, Range 59E, Section 19; Township

30S, Range 58E, Sections 6, 7, 8, 14, 15, 16, 17, 23, 24; Township 29S, Range 58E, Section 31; Township 29S, Range 57E, Sections 5, 6, 8, 9, 14,15,16,23,25,26, 36; Township 28S, Range 56E, Sections 29, 32, 33, 34 – Copper River Meridian, Haines Recording District). Refer to Figure 1 for a location/vicinity map.

The goal of this project is to bring the last portion of the Haines Highway up to National Highway System Standards for a design speed of 55 mph by realigning, widening and straightening portions of the existing roadway. The upgrades will improve the safety, consistency and efficiency of the highway corridor. In addition, DOT&PF is proposing to replace the existing Chilkat River Bridge (also known as the Wells Bridge), and to construct a long-term solution to debris flow problems near mileposts 19 and 23. The Proposed Action includes the following:

Roadway Improvements

- Straighten curves to meet current 55 mph design standards and add additional passing zones.
- Widen the existing roadway shoulders from 2 feet to 6 feet.
- Construct drainage ditches along the roadway for snow removal storage and storm water runoff.
- Repave and restripe the roadway, including new signage.
- Construct driveways to meet the minimum sight distance for a design speed of 55 mph.
- Construct new larger diameter culverts at debris flow areas (MP 19 and MP 23) that would reduce potential for debris overtopping the road and simplify the removal of debris for DOT&PF maintenance staff.

Right-of-Way (ROW), Utilities, and Pipeline

- Acquire approximately 16.3 acres of private property and 3.0 acres of publically owned property from the Preserve (refer to attached Figure Set - Chilkat Bald Eagle Preserve Property Acquisition and ROW Relinquishment).
- Relinquish approximately 6.0 acres of existing DOT&PF ROW to the Preserve as 2:1 mitigation to offset ROW acquisition impacts to this publically owned property.
- Replace and / or relocate utilities and remove existing pipeline in areas where the proposed road alignment differs from the existing alignment.
- Maintain access to utility corridor where utilities are no longer located adjacent to the road.

Proposed New Chilkat River Bridge

- Remove existing bridge and construct a new bridge that meets the following design criteria:
    - 55-mph design speed,
    - Current seismic standards, and
    - Current load requirements for heavy freight vehicles.

Recreation and Pedestrian Accommodations

- Improve surfacing and grading of twenty-three turnouts along the roadway corridor, per your recommendations, to maintain and / or improve existing access to the Chilkat River recreational areas (refer to attached Figure Set – Proposed Turnout Improvements).
- Construct a new parking area to access the Mount Ripinski Trailhead (see attached Figure 2).
- Shift roadway alignment near the Klukwan turn-off to provide space for a possible future pathway connecting the Klukwan Village to the existing roadside trail at the Council Grounds.

As part of the mitigation plan, the Proposed Action also includes the following:

- Replace and upgrade 27 existing fish stream culverts with new appropriately sized culverts to improve fish passage underneath the highway.
- Construct 12,455 linear feet of erosion control along the banks of the Chilkat River, where road widening requires fill in the river. The erosion control will consist of riprap, live cuttings, woody debris, root wads, and/or other bio-stabilization techniques.
- Reconstruct and / or enhance approximately 5,965 linear feet of fish-bearing streams and adjacent riparian habitat.

Proposed Impacts to the Chilkat Bald Eagle Preserve

Approximately 3.0 acres of the Chilkat Bald Eagle Preserve would be permanently acquired to accommodate the Proposed Action. Also, 1.6 acres that would be temporarily accessed for proposed stream mitigation. (DOT&PF would apply for Special Use Permits for the stream mitigation areas.)

The proposed ROW acquisition within the Preserve is summarized below and shown on the attached Figure Set (Chilkat Bald Eagle Preserve Property Acquisition and ROW Relinquishment).

Table 1: Summary of Proposed ROW Acquisition

Acres	Beginning Station	Ending Station	Nearest MP or Landmark	Habitat Type	Figure Number
0.26	431+00	436+00	MP 8.5 / Turnout 7	River Bank / River Bottom	1 of 4
0.02	863+50	864+50	MP 18	Forested Upland	4 of 4
0.47	866+00	872+50	MP 18	Forested Upland	4 of 4
2.26	875+50	883+50	MP 18	Forested Upland	4 of 4
Total Acreage 3.01					

Impact Avoidance, Minimization and Mitigation Measures

Avoidance Measures:

The following design modifications were implemented to avoid adverse impacts to the Preserve:

- The existing road alignment was followed to the extent feasible.
- In areas where realignments are required to improve safety, the alignment was designed to avoid ROW acquisition to the extent feasible.
- The elevation of the road was adjusted to minimize the extent of the fill footprint.
- The existing 300 foot ROW adjacent to the Preserve was reduced to 60 feet from the proposed new centerline where additional ROW from the Preserve is required.
- The curve radius was minimized to the extent possible while still meeting project design criteria.

Mitigation and Enhancement Measures:

To mitigate for the unavoidable ROW acquisition, DOT&PF proposes to relinquish approximately 6.0 acres of existing DOT&PF ROW to the Preserve. The table below summarizes the areas where DOT&PF proposes to relinquish ROW. These areas are also shown on the attached figure set (Chilkat Bald Eagle Preserve Property Acquisition and ROW Relinquishment).

Table 2: Summary of Existing DOT&PF ROW to Potentially be Relinquished

	Acres	**Beginning Station**	**Ending Station**	**Nearest MP or Landmark**	**Habitat Type**	**Figure Number**
	0.52	420+00	428+50	MP 8	River Bank, River Bottom	1 of 4
	2.95	864+50	875+50	MP 17 Salmon egg incubation boxes	Forested Upland	4 of 4
	2.55	873+00	885+50	MP 17 Salmon egg incubation boxes	Forested Upland	4 of 4
Total	**6.02**					

In compliance with the 1987 Cooperative Management Agreement (MOA) between DNR and DOT&PF for this roadway corridor, DOT&PF has consulted with your office regarding the proposed project. As a result of the site visit that you participated in with project team members, followed by several meetings, most of your recommendations for turnout improvements have been incorporated into the preliminary design plan (refer to attached Figure Set – Proposed

Turnout Improvements). Please note that, as explained at our most recent meeting, the project plans do not include a new boat launch that was suggested at the Chilkat River Bridge, however, we intend to construct an access road to the river parallel to the new bridge as part of the project.

In addition to the proposed turnout improvements, DOT&PF is also proposing on-site mitigation to restore and enhance fish habitat along the project corridor. The stream mitigation proposal is based on extensive coordination with a multi-discipline team composed of state and federal resource agency staff, including a Division of Parks and Outdoor Recreation representative. While originally conceived as mitigation for stream and wetland impacts within the ROW, some of these proposed stream mitigation sites would be on Preserve property and would enhance the Preserve. (These areas are shown on the attached Figure Set – Chilkat Bald Eagle Preserve Property Acquisition and ROW Relinquishment.) Each of the sites provides an opportunity to restore and / or enhance the existing stream channels through various methods such as:

Lengthening the channel to provide more fish habitat,
Shifting the stream further away from the road to avoid storm water pollutants, and
Constructing additional meanders and riparian buffers, and or stream bank stabilization.

Table 3: Summary of Proposed Stream Mitigation within the Preserve

	Acres	**Linear Feet**	**Beginning Station**	**Ending Station**	**Nearest MP or Landmark**	**Habitat Type**	**Figure Number**
	0.3	168.5	512+00	515+00	MP 10	Forested wetland with stream	2 of 4
	0.5	480.9	519+00	523+50	MP 10.5 Turnout 9	Forested wetland with stream	2 of 4
	0.3	Root Wad	649+50	652+00	MP 12.5 Turnout 13	Wetland with stream	3 of 4
	0.5	436.5	866+00	872+50	MP 16.5	Forested upland with stream	4 of 4
Total	**1.6**						

By a separate letter, we will ask for your concurrence that the temporary access for stream work does not constitute a use of the Preserve as defined by Section 4(f) regulations.

Based on the above information, FHWA respectfully requests your written concurrence that the proposed action presented would not adversely affect the activities, features and/or attributes of the Chilkat Bald Eagle Preserve. Please contact me at (907) 586-7430, or by email at Tim.Haugh@ dot.gov , if you have any questions or would like to discuss this request. If you wish we can schedule a meeting between FHWA, DOT&PF and the Division of Parks and Outdoor Recreation to go over any details of concern.

Sincerely,

Michael E Vandeburg

Tim A. Haugh
Environmental Program Manager

Enclosures: Referenced enclosures can be found in the EA as noted below.

Figure 1 – Location / Vicinity Map (see EA Figure 1.1-1)
Figure 2 – New Ripinski Trailhead Parking (see EA Figure 1.2-5)
Figure Sets: Chilkat Bald Eagle Preserve Property Acquisition and ROW Relinquishment (Figures 1-4) (see EA Figure Set B)
Proposed Turnout Improvements (Figures 1-19) (see EA Appendix A)

cc w/o enclosures:
Reuben Yost, DOT&PF Project Manager
James Scholl, DOT&PF Environmental Analyst

SEAN PARNELL, GOVERNOR

550 W. 7TH AVE., SUITE 1380
ANCHORAGE, ALASKA 99501
PHONE: 907-269-8700
FAX: 907-269-8907

DEPARTMENT OF NATURAL RESOURCES
DIVISION OF PARKS & OUTDOOR RECREATION

March 2, 2011

Tim Haugh
Environmental Program Manager
Federal Highway Administration, Alaska Division
709 West 9th Street, Rm. 851
P.O. Box 21648
Juneau, AK 99802

Subject: Haines Highway MP 3.5 – 25.3 Improvements
State / Federal Project No. 68606 / SHAK-095-6(28)
FHWA Request for concurrence on no adverse effect

Dear Mr. Haugh:

I have reviewed the information in your December 15, 2010 letter and the accompanying figures. The proposal you present would mitigate the unavoidable acquisition of approximately three acres of Chilkat Bald Eagle Preserve land for highway improvements by relinquishing approximately six acres adjacent to the preserve within the current Haines Highway right-of-way. This two to one replacement with land of similar habitat value, along with improvements to several pullouts and access points to the Preserve, will ensure that highway improvements do not harm the Preserve.

I hereby concur that the proposed action would not adversely affect the activities, features, and/or attributes of the Chilkat Bald Eagle Preserve.

Sincerely,

Ben Ellis
Director
Division of Parks and Outdoor Recreation
State of Alaska

STATE OF ALASKA

SEAN PARNELL, Governor

DEPARTMENT OF NATURAL RESOURCES

Division of Parks and Outdoor Recreation
Southeast Area Office

P.O. BOX 111071
JUNEAU, ALASKA 99811-1071
PHONE: (907) 465-4563
FAX: (907) 586-3113

The Division of Parks and Outdoor Recreation provides outdoor recreation opportunities and conserves and interprets natural, cultural, and historic resources for the use, enjoyment, and welfare of the people.

I, Ben Ellis, the Director of the Alaska Department of Natural Resources with jurisdiction over the Alaska Chilkat Bald Eagle Preserve in Haines Alaska, find that DOT&PF's proposed action to enhance fish habitat on this section 4(f) resource meets the conditions of an exception to the requirements of Section 4(f) as per 23 CFR 774.13(d).

Ben Ellis, Parks Director
Alaska Department of Natural Resources
Division of Parks and Outdoor Recreation

3-13-2012
Date

COOPERATIVE AGREEMENT
between the
ALASKA DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
and the
ALASKA DEPARTMENT OF NATURAL RESOURCES

This cooperative agreement is designed to assist the agencies in cooperatively developing and managing the road system in and adjacent to the Alaska Chilkat Bald Eagle Preserve.

Whereas, the Alaska Department of Transportation and Public Facilities (DOT&PF) is mandated to manage the existing transportation corridor (the Haines Highway) within and adjacent to the Alaska Chilkat Bald Eagle Preserve; and

Whereas, both the Alaska Department of Natural Resources (ADNR) and DOT&PF have a mutual responsibility to efficiently and cooperatively manage their adjacent lands;

NOW, THEREFORE, the parties hereto agree as follows:

ALASKA DEPARTMENT OF NATURAL RESOURCES:

1. To recognize DOT&PF management authority for the right-of-way within and adjacent to the Alaska Chilkat Bald Eagle Preserve and work with DOT&PF to assure compatible management of the corridor.

2. To apply for necessary encroachment permits for any activity on DOT&PF right-of-ways.

3. To review projects that affect alignment of the Haines Highway within or adjacent to the Alaska Chilkat Bald Eagle Preserve and provide recommendations.

4. To review plans for the establishment of Haines Highway pullouts within or adjacent to the Alaska Chilkat Bald Eagle Preserve and approve the location, size, configuration, and contents where ADNR funds or maintenance responsibilities are involved.

5. To clean and maintain toilet and waste facilities, and provide for trash and sewage removal as needed at pullouts designated by ADNR located within or adjacent to the Alaska Chilkat Bald Eagle Preserve.

6. To assist DOT&PF in the enforcement of trespass and other violations within the Haines Highway right-of-way as requested by DOT&PF and/or the Alaska Department of Public Safety.

7. To review DOT&PF proposals for gravel permits and erosion control devices and to provide recommendations.

8. To review DOT&PF vegetation management practices for the Haines Highway Corridor adjacent to the Alaska Chilkat Bald Eagle Preserve.

9. To review DOT&PF proposals for placement of signs in the Haines Highway Corridor which are intended to facilitate use of the Alaska Chilkat Bald Eagle Preserve.

10. To apply to DOT&PF for any air space assignment determined necessary by ADNR.

ALASKA DEPARTMENT OF TRANSPORTATION
AND PUBLIC FACILITIES:

1. To provide technical assistance to ADNR in the establishment and creation of pullouts along the Haines Highway within or adjacent to the Alaska Chilkat Bald Eagle Preserve.

2. To review highway pullout plans for the Haines Highway and approve the location, size, configuration, and contents.

3. To grade and provide replacement surfacing material and clear snow from designated highway pullouts as determined by DOT&PF and ADNR within or adjacent to the Alaska Chilkat Bald Eagle Preserve.

4. Remove and dispose of slide material as determined appropriate by DOT&PF. If disposal within the preserve is determined to be necessary, all appropriate permits must be obtained including an incompatible use permit from ADNR.

5. To provide ADNR a map showing widths of highway right-of-ways for the Haines Highway adjacent to the Alaska Chilkat Bald Eagle Preserve.

6. To assign ADNR the management responsibility for guides and outfitters for the Haines Highway Corridor adjacent to the Alaska Chilkat Bald Eagle Preserve.

7. To provide the location of survey markers to ADNR as needed for location of highway pullouts or highway alignment.

8. To apply for all necessary permits including incompatible use permits for the removal of gravel, rip rap, or other materials for road maintenance.

9. To submit to ADNR plans for any unpermitted gravel pits, or erosion control devices, and to obtain all necessary permits including incompatible use permits for work proposed within the Alaska Chilkat Bald Eagle Preserve.

10. To submit to ADNR for review vegetation management practices for the Haines Highway Corridor adjacent to Alaska Chilkat Bald Eagle Preserve.

11. To submit to ADNR for review signs proposed in the Haines Highway Corridor which are intended to facilitate use of the Alaska Chilkat Bald Eagle Preserve.

THE DEPARTMENT OF NATURAL RESOURCES AND
THE DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
MUTUALLY AGREE:

1. Nothing in the cooperative agreement shall obligate any party in expenditure of funds, or by future payments of money, in excess of appropriations authorized by law.

2. Each party agrees that it will be responsible for its own acts and the results thereof; and each party shall not be responsible for the acts of the other party; and each party agrees it will assume to self the risk and liability resulting in any manner under the agreement.

3. Each party will comply with all applicable laws, regulations, and executive orders relative to equal employment opportunity.

4. Nothing herein is intended to conflict with federal, state, or local laws or regulations. If there are conflicts, the laws and regulations shall prevail, and this agreement will be amended at first opportunity to bring it into conformance with conflicting laws or regulations.

5. Either the ADNR or DOT&PF may terminate its participation in this cooperative agreement by providing to the other party notice in writing sixty days in advance of the date on which its termination becomes effective.

6. Amendments to this agreement may be proposed by either agency and shall become effective upon approval of both parties.

7. The effective date of this agreement shall be from the date of final signatures.

COOPERATIVE AGREEMENT

The parties have executed this agreement as of:

10/27/87
Date

Mark S. Hickey
Commissioner
Alaska Department of Transportation
and Public Facilities

11/8/87
Date

Judith M. Brady
Commissioner
Alaska Department of Natural Resources

TOTAL P.04

CHILKAT RIVER BRIDGE
DOCUMENTATION FOR:

PROGRAMMATIC SECTION 4(f) FOR USE OF HISTORIC BRIDGES

Recommendation for Determination of Eligibility

for the Chilkat River Bridge (SKG-247)

Appendix H of Cultural Resource Consultants Report, *Archeological Field Survey*
Of Proposed Alternatives for the Improvement of the Haines Highway from Milepost 3.5 to 25.3
(DOT&PF Project Number 68606)
October 2011

Appendix H
Documentation for Determination of Eligibility
for the Chilkat River Bridge (SKG-247)

Introduction

The Chilkat River Bridge (SKG-247) is located at the crossing of the Chilkat River on the Haines Highway in Section 29 of Township 28S, Range 56E, of the Copper River Meridian (Latitude/Longitude 59°24'54.87" N, Longitude 135°55'56.11" W). It can be found on the USGS Quad Map Skagway B-3 (Figure H-1). The Alaska Department of Transportation and Public Facilities (DOT&PF) identifies this as Bridge No. 0742. Historical information on this bridge can be found on the Alaska Historic Resources Survey (AHRS) for SKG-00247.

Historic Context

In 1893, after receiving permission from the Chilkat Tlingit, Jack Dalton developed the Dalton Trail—a toll trail—from Pyramid Harbor, on the western side of the Chilkat River, to the interior gold fields. In 1904, because of the large amount of traffic along the trail, the Alaska Road Commission (ARC) began construction of a wagon road—Road No. 3—from Haines through Klukwan and Wells to the gold mining areas of Porcupine and Pleasant Camp. With the completion of this new road in 1908, the Dalton Trail fell into disuse (Gibson et al. 1980:110). In 1943, construction of the Haines Highway bypassed the section of wagon road from Klukwan to Wells. The new highway was built by the U. S. Army and connected Haines with the Alaska Highway at Haines Junction (Alaska Department of Highways 1971:4; Sheldon Museum and Cultural Center 2006).

Dalton Trail Timber Trestle Bridge

Historically, three timber trestle bridges have carried people and goods across the Chilkat River at or near the location known historically as "Wells" and "Jacquot's Landing." The first (SKG-547), along the Dalton Trail, crossed the river about one half mile downstream from the current Haines Highway. Stumps of the old timber piles remain visible in the river (Figure H-2).

Early Wells Bridge History

The ARC built a new timber trestle bridge north of the Dalton Trail in 1909 (SKG-548). According to Buzzell (2007:48), "[t]he ARC built and repaired bridges on numerous trails and wagon roads that served as feeders to railroads and ports." This trestle was approximately 23 feet upstream from the current Haines Highway bridge. It was composed of more than 300 feet of trestlework and two, 100-foot long timber through truss Howe spans. In 1916, the ARC replaced a section of flood-damaged trestle with a 60-foot king-post timber span (Figure H-3).

After the construction of the king-post span, the length of trestlework decreased somewhat, but was most likely longer than today's bridge, as the north end of the trestle curved sharply upstream on descending trestlework as it neared the riverbank, then tied into the shore near a

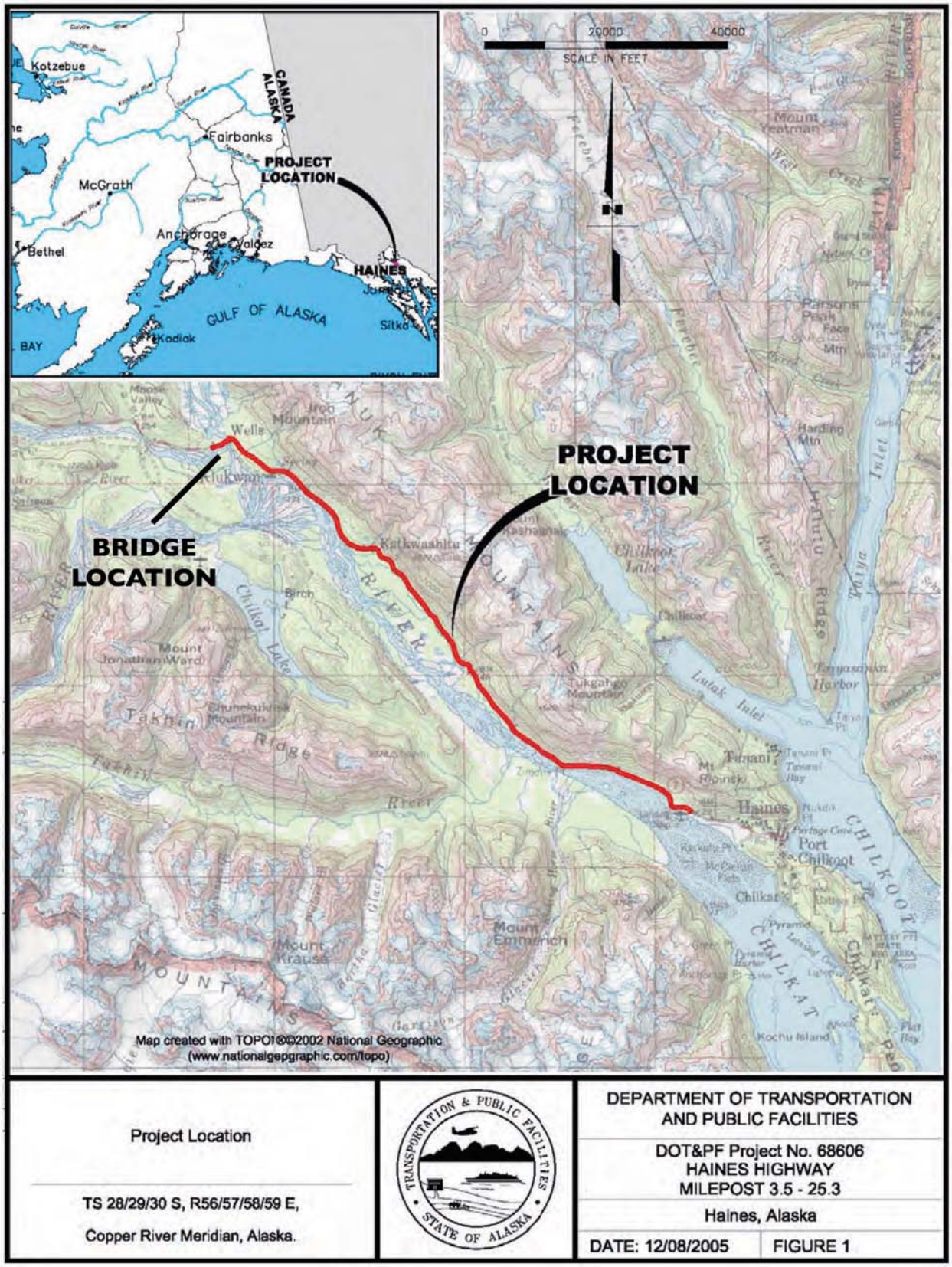

Figure H-1. Location map for the Haines Highway project showing the site of the Chilkat River Bridge.

Figure H-2. Old piles in the Chilkat River marking the former location of Dalton Trail trestle (SKG-547), downstream from the current bridge.

Figure H-3. King-post span installed on the first Wells trestle (SKG-548).

small building, boat dock, and landing. Today, a large cottonwood tree marks the location. No explanation for this curve has been found, but it may be that an already standing structure was in line with the highway's proposed right-of-way, forcing the highway alignment to go upstream (Figure H-4). The south approach of the bridge at Wells left the riverbank at a typical 90-degree angle. A few remaining trestle bents are in situ along the Haines Highway north of the river, as the old right of way slowly merges into the present day right of way (Figure H-5).

The bridge had a wood planked driving deck laid perpendicular to the stringers. A large timber bull rail and wood railings delineated the edge of the bridge deck and provided some degree of

Figure H-4. Northern end of the first Wells trestle showing the curve at the northern bank of the river.

Figure H-5. Remains of timber trestle bents from the first bridge crossing at Wells (SKG-548).

safety for both vehicles and pedestrians (Figure H-6). Signboards hung from each end of the through truss spans' portal bracing.

Detailed information about this bridge is limited, with only a few surviving photographs showing the main design features of this bridge. A few of the sway braces (Figure H-7) and wood pilings are still visible in the river upstream from the north end of the current bridge, marking the location of this bridge.

A 1918 flood damaged the bridge and the ARC deemed it unsafe for travel (Buzzell 2007:57). However, because of a holdover lack of funding from World War I, it was not until 1924 that the bridge was either repaired or replaced by a combined effort of the Bureau of Public Roads and the Alaska Territory. This may be when both 100-foot long through truss Howe spans and the lone king-post span were replaced with trestlework. A 1943 photograph of the future trestle across the Chilkat River shows the bridge without the Howe or king-post spans (Figure H-8).

In 1943, ARC built a new timber trestle bridge (SKG-549) to replace the 1924 bridge. This was the first two-lane bridge over the Chilkat River on the Haines Highway. A hand-drawn DOT&PF plan shows it as a basic timber trestle for the entire crossing (Figure H-9). This bridge was about 23 feet down river from the earlier bridge. A few old piles from the 1943 bridge remain in situ under the south approach of the current bridge (Figure H-10). It was a straightforward timber trestle bridge, with timber bents supporting timber stringers and a wood planked driving deck. Unlike the previous bridge, this one contained no through truss or king-post spans.

Figure H-6. Vehicle on the first Wells Bridge showing the through truss Howe spans.

Current Chilkat River Bridge Description

The Alaska Road Commission erected the current Chilkat River Bridge in 1958 in the same right-of-way as the previous timber trestle bridge (Figures H-11 and

Figure H-7. Sway braces in the the Chilkat River at the location of the first Wells trestle.

H-12). It is a 10-span steel girder bridge on concrete piers and abutments. Overall, the bridge is 504 feet long with a 24-foot wide deck.

The cast-in-place, reinforced concrete roadway is supported by four steel stringers placed in parallel under the entire length of the bridge. The roadway crown is approximately two inches higher in the center of the road than the outside edge (Figure H-13). Additional stiffening plates welded to the bottom center of the stringers have increased the load rating of the steel girders but no date for this work has been found. Bolted to the stringers are lateral braces made from large channel sections, spaced nine per span (three per row of stringers). Short pieces of channel are also bolted to the outer stringer along the entire length of the bridge to support the concrete curb and steel safety railing (Figure H-14). Impressions left on the underside of the outer edge of the bridge deck show that shiplap boards were placed perpendicular to the boards used to form the main section of the roadway.

The steel spans are comprised of a steel girder and floor beam system that is anchored to the piers and abutments with steel girder shoes. A Kaiser Steel plant in California fabricated the structural steel and steel bridge railings. Kaiser was a major supplier of steel to the Pacific Coast markets in the 1950s. All of the stringer connections are bolted. The steel stringers originally were painted with red lead. Where newer aluminum paint has peeled, the red lead is visible. The bridge railings are painted yellow (Figure H-15).

The abutments are cast in place footings with wing walls. Nine steel-pile, reinforced concrete piers support the spans, each poured with the use of cofferdams. The piers are 25 feet 6 inches wide and 20 feet 1/4 inch high, with a 14-foot 1/2 inch wide bull nose capped with a half-round 6-inch steel cap facing upstream (see Figure H-14). The abutments are 50 feet on center from each other.

Figure H-8. Erecting the 1943 timber trestle. Sheldon Museum

Construction of the steel bridge began by closing the downstream or southbound lane of the timber trestle bridge to traffic. This side of the trestle became false work that supported the construction of the steel bridge (Hank Jacquot, personal communication 2009). Evidence of this technique is visible on the underside of the poured concrete roadway (Figure H-16). Impressions left in the concrete reveal that the outer 2/3 of the roadway was poured and supported by using shiplap form boards running parallel to the roadway. Two rows of short boards under the center area of the roadway were placed perpendicular to the roadway. Each lane of the steel bridge was poured independently of the other, so to maintain traffic flow across on of the bridges during construction.

Impressions from plywood sheets used to form the piers around driven steel piles are also visible on the concrete piers. Marks from the she bolts that held the forms in place are also visible. Upon completion of the steel bridge, workers used an air-powered underwater saw to cut down the remaining lengths of piles from the 1943 timber trestle bridge.

The steel safety railing system is comprised of various steel shapes: I-beam, T-beam, channels, and angles (Figures H-17 and H-18). Bolts hold the vertical posts and horizontal railings together. The curbing is concrete, approximately 15 inches tall and 10 inches wide, roughly in an ‘L’ shape. The bridge does not have a pedestrian sidewalk.

Local Haines contractors Kyle and Peterman were in charge of construction, with all supplies delivered by truck. Local men, including Hank Jacquot, were employed to construct the bridge

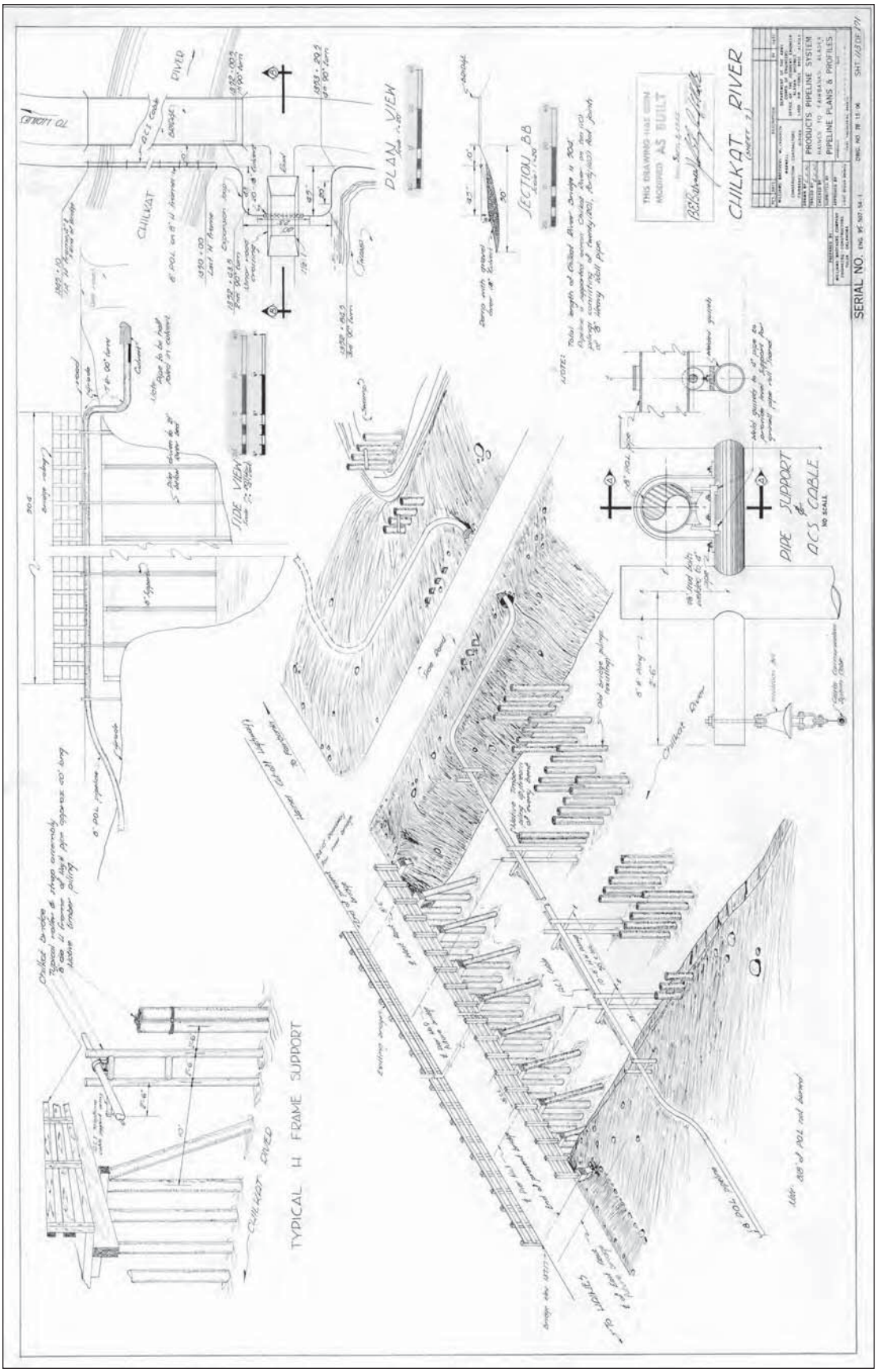

Figure H-9. 1955 plans of the Haines-Fairbanks Pipeline showing the completed 1943 timber trestle and the location of the former bridge.

Figure H-10. Pilings from the 1943 bridge (SKG-549) in place beneath the southern end of the current bridge.

Figure H-11. Approach to the bridge looking southward toward Haines.

Figure H-12. Downstream side of bridge looking southward toward Haines. .

Figure H-13. Peaked roadway crown and north abutment.

Figure H-14. Upstream end of one of the concrete piers with a steel face showing the short channel sections welded to the stringers to support the curb.

Figure H-15. Yellow-painted safety railing and concrete deck and curb.

Figure H-16. Form marks on the underside of the concrete roadway showing the sequence of the concrete deck pour.

Figure H-17. Safety railings and posts mounted to the concrete curb.

Figure H-18. Formed concrete approaches and safety railings.

using timber from the Jacquot property when necessary (Hank Jacquot, personal communication 2009). During work on the concrete bridge, no life jackets or safety harnesses were employed, but a safety line was strung across the river, and kept afloat by intermittently placed bouys.

Various weather collecting devices and a solar panel with a United States Geological Survey (USGS) tag are located on posts near the south approach to the bridge. A conduit attached to the stringers connects the solar panel to river level monitoring device attached to the upstream end of the third pier from the south.

A General Telephone and Electronics (GTE) conduit that had earlier hung on the nearby Haines-Fairbanks Pipeline towers now runs along the outermost stringer on the upstream side of the bridge. A Tlingit and Haida Regional Electrical Utility line also now runs underneath the bridge. It had formerly been in the unused gasoline pipeline on the same towers.

Eligibility Recommendations

In order for a particular property—a district, site, building, structure, or object—to qualify for the National Register, it must meet one or more of the National Register Criteria for Evaluation and retain enough historic integrity necessary to convey its significance (National Park Service 1997). The National Register Criteria are:

A. Association with events that have made a significant contribution to the broad patterns of history.
B. Association with the lives of significant persons.
C. Embodiment of the distinctive characteristics of a type, period, or method of construction, or representation of the work of a master, or possession of high artistic values, or representation of a significant and distinguishable entity whose components may lack individual distinction.
D. Having yielded, or having the ability to yield, information important in prehistory or history.

Integrity is the ability of a property to convey its significance. The seven aspects of integrity (location, design, setting, materials, workmanship, feeling and association) are defined in National Register Bulletin 15 Part VIII (National Park Service 1997).

Bulletin 15 states that "To retain historic integrity a property will always possess several, and usually most, of the aspects." Properties important under Criteria A or B ideally should retain some features of all seven aspects of integrity. However, integrity of design and workmanship might not be as important. To be eligible under Criterion C, a property must retain the physical features that characterize its type, period, or method of construction. Retention of design, workmanship, and materials are usually more important than location, setting, feeling, and association. For properties eligible under Criterion D, integrity is based upon the property's potential to yield specific data that addresses important research questions (National Park Service 1997:46).

Criterion A: Association with Significant Events

The 1958 Chilkat River Bridge is not associated with significant events in Alaskan history. It does date to the period when the U.S. Congress forced a merger between the ARC and BPR in 1956 and the newly empowered BPR Bridge Unit began to follow federal guidelines and contracting standards for bridge construction and design (United States 1957). It is also from the time when the Territory of Alaska was preparing for statehood. However, the bridge has no direct relationship with these events and, viewed in the broadest sense, is simply the fourth bridge across the Chilkat River in this general locale. It therefore is recommended as not eligible under Criterion A.

Criterion B: Association with the Lives of Significant Persons

Historic research has not connected the bridge to a person important in the development of Wells, Haines, or Alaska, or anyone directly associated with its construction, and is therefore not recommended as eligible under Criterion B as it is not "associated with the lives of persons significant in our past."

Criterion C: Distinctive Characteristics of a Type, Period, or Method of Construction

The Chilkat River Bridge is significant under Criterion C as distinctly characteristic of a type,

period, or method of construction. Its mulit-span, steel girder construction with concrete piers, abutments, and bridge deck is very characteristic of mid-century bridge architecture. Most of the bridges built in Alaska in the "early 1950s to the late 1970s" were the steel stringer type bridges (Buzzell 2007:223).

According to *A Context for Common Historic Bridge Types: NCHRP Project 25-25, Task 15, "*[Criterion C] applies to the common bridge types that are technologically significant or that illustrate engineering advances...The longer and more complex examples of a common type may also be eligible under this criterion" (Slater and Jackson 2005:1-6). Buzzell (2007:223) notes that steel stringer bridges that may be eligible for listing on the National Register "are those built before 1958 that retain integrity." However, he also includes eligible steel stringer bridges as those "that have aesthetic qualities incorporated into their design, such as railings, wing walls or breast walls" or those "that were built from standard plans, or that have significant span lengths or a significant number of spans" (Buzzell 2007:223).

This bridge is certainly not the only one of its type in Alaska, as there are 165 other "SS/RC" (steel stringer bridge with a reinforced concrete deck) bridges in the State's inventory. Two date to 1937 and 1940, and 45 were constructed in the 1950s. Sixteen are from the early 1960s and the rest were built after 1965. Several of the 1950s bridges are along the Denali, Richardson, Parks, and Steese highways and most are less than 100 feet in length. Longer bridges built during this era are at Canyon Creek (1950, 290 feet), Caribou Creek (1950, 233 feet), Chistochina River (1955, 333 feet), Illinois Street and Minnie Street in Fairbanks (1951 and 1953, 135 feet), and Teklanika River (1955, 334 feet). The longest bridge of this type, built in 1986, spans 1,254 feet across the channel between Kodiak and Near Island.

At 504 feet, this is the longest historic bridge of this type in Alaska. Its method of construction, erected in linear halves while supported on falsework of the former bridge, is unique. The Character Defining Features for a steel stringer bridge, as defined by Buzzell (2007:223), are "the rolled steel stringers themselves, and may include the railings, floor system, abutments, and piers." This bridge has its original reinforced concrete piers and abutments and reinforced concrete deck. The railings appear like the original and may have been replaced in kind. The bridge has its original four steel stringers; although, additional stiffening plates appear to have been added to these sometime later. Therefore, this bridge is recommended as eligible under Criterion C.

Criterion D: Potential to Yield Information Important in Prehistory or History

The bridge is not likely to yield information important in prehistory or local, regional, or national history and therefore is not recommended as eligible under Criterion D.

Integrity

Historic integrity is "the authenticity of a property's historic identity, evidenced by the survival of physical characteristics that existed during the property's prehistoric or historic period. The following are the seven qualities of historic integrity:

- *Location* is the place where the historic property was constructed or the place where the historic event took place.
- *Design* is the composition of elements that constitute the form, plan, space, structure, and style of a property.
- *Setting* is the physical environment of a historic property that illustrates the character of the place.
- *Materials* are the physical elements combined in a particular pattern or configuration to form the structure during a period in the past.
- *Workmanship* is the physical evidence of the crafts of a particular culture or people during any given period of history.
- *Feeling* is the quality that a historic property has in evoking the aesthetic or historic sense of a past period of time.
- *Association* is the direct link between a property and the event or person for which the property is significant.

Of the seven qualities of historic integrity, none have been altered.

Location: The bridge remains in its originally constructed location.

Setting: The setting for the bridge is still rural and rugged, with minimal intrusion of modern elements constructed around the area of the bridge. Buildings belonging to the ARC and private individuals were in Welles before the bridge construction began.

Materials: The bridge retains the use of steel and concrete structural materials.

Design: The design of the original bridge has not been altered. No additional safety railings have been added, a typical addition to many highway bridges.

Workmanship: No structural changes have been made to the bridge and as such, the workmanship of the bridge remains as built, without any lesser qualities of workmanship added to the structure.

Feeling: The bridge conveys the feeling of a 1950s design with its relatively lightweight construction and steel and concrete components.

Association: The bridge retains its historic association as part of the Haines Highway.

Recommendation

The Chilkat River Bridge is recommended as eligible for the National Register under Criterion C. The historic integrity of the original multi-span steel girder bridge has not been compromised by any reconstruction or rehabilitation. It is also a near perfect example of its type and, at 504 feet, the longest multi-span steel girder historic bridge in Alaska. As an active bridge on the Haines Highway, it is in good condition, having managed to retain its historical—

although not necessarily its structural—integrity. The period of significance for the Chilkat River Bridge is 1958.

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DOT&PF Bridge Section Bridge Evaluation Memorandums

MEMORANDUM

State of Alaska

Department of Transportation & Public Facilities
Statewide Design & Engineering Services Division /Bridge Section

TO: Reuben Yost
Project Manager
Southeast Region Design

FROM: Richard A Pratt, P.E.
Chief Bridge Engineer

CONTACT: Elmer E. Marx, P.E.
465-6941
elmer.marx@alaska.gov

DATE: October 29, 2009

BRIDGE NO: 742
TELEPHONE NO: 465-2975
FAX NUMBER: 465-6947
TEXT TELEPHONE: 465-3652

RE: Revised Preliminary Bridge Plans and Cost Estimates

SUBJECT: Chilkat River Bridge
Haines Highway

As requested, we have prepared some additional preliminary bridge alternatives for the subject project. Three bridge options are presented. Specifically, we have examined the following:

Option 1	Widen and rehabilitate the existing bridge
Option 2	Replace the existing bridge on a parallel roadway alignment
Option 3	Replace the existing bridge on the existing roadway alignment

The preliminary bridge cost estimates are attached. They include all bridge-related pay items (including temporary work structures) as well as an 11% mobilization allowance (10% of subtotal cost including mobilization and demobilization pay item), a 15% construction engineering allowance, and a 4.24% ICAP allowance.

We have very little foundation, hydraulic, topographic, or other design information for this site. Consequently, a 25% contingency is included. Due to the unpredictable nature of rehabilitation work, we recommend using a 30% contingency for Option 1. As information becomes available, we will incrementally decrease the contingency value (percentage) until we provide the final bridge cost estimate.

The bridge is located in a high seismic zone. Based upon the USGS/AASHTO seismic hazard maps and the anticipated soil classification, we anticipate the bridge will be classified as Seismic Design Category "D" requiring the most stringent seismic detailing. Although this is not particularly onerous for the replacement options, it does add substantial cost to the rehabilitation option.

A brief summary and list of the advantages and disadvantages for each option is provided on the following sheets.

If you have any questions, please contact Elmer.

Attachments

Option 1 – Widen and rehabilitate the existing bridge

503.75 FT long, ten-span, steel girder bridge
Maximum span length = 50 FT
Vertical clearance under bridge (navigation) ~ 9 FT
Bridge related pay items (w/o mobilization, CE, ICAP, or contingency) = $7.6M
Bridge related pay items (w/ mobilization, CE, ICAP, and 30% contingency) = $13.1M

ADVANTAGES	DISADVANTAGES
Does not require any significant changes in the existing roadway alignment in the vicinity near the bridge.	Most expensive bridge option.
Navigation can be maintained under the bridge during construction although some intermittent closures would likely be required.	The bridge was built in 1958 for 50-year design life. The life expectancy of the rehabilitated bridge would not be as great as the replacement bridge options.
	Although not verified by physical testing, bridges of this vintage are typically coated in lead-based paint. Repainting of the bridge is likely required and is included in the cost estimate. Full containment of the bridge is required during painting to satisfy environmental requirements.
	The existing bridge is not capable of accommodating construction equipment. Thus, a temporary work structure will be required in order to install pier piles and to set bridge girders. The existing bridge piers must be widened and strengthened to accommodate the wider superstructure.
	It has been suggested that the navigation clearance below the existing bridge is inadequate. This option does not change the existing navigational clearances.
	The rehabilitated bridge would include new crash-tested railing, a new stronger deck, two new lines of steel girders, and significantly improved piers. Nonetheless, it is likely that the rehabilitated bridge would not meet all of the current code requirements.

In order to widen and rehabilitate the bridge, many new bridge components are required including the railing, deck, exterior girders, pier cap, and pier piles. Therefore, only the existing steel girders and portions of the concrete abutments and piers are retained in the completed structure. Although technically feasible, this option is more expensive than the replacement options while offering no significant advantages. We do not recommend that this option be advanced for further consideration.

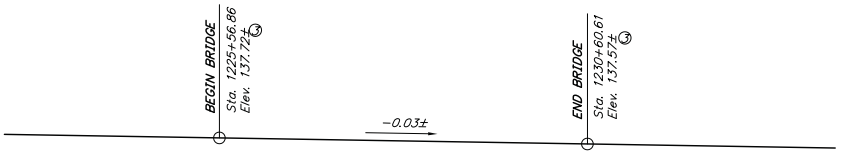
STATE OF ALASKA DOT/PF
COMPUTATIONS
Chilkat River Bridge Widening

DATE 10/29/2009
BRIDGE No. 742
By EEM

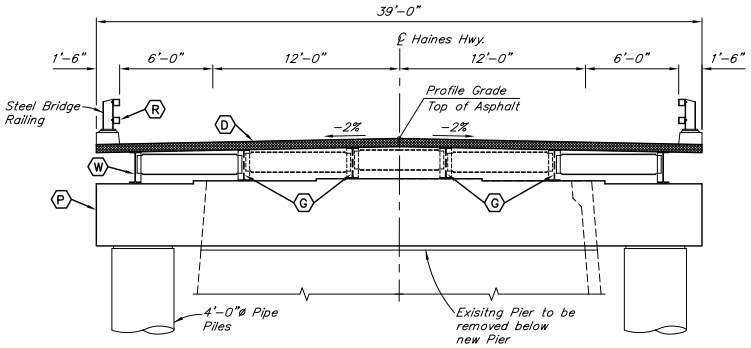
Option 1
Widen and Rehabilitate Existing Bridge
ESTIMATE OF QUANTITIES AND COST

Item No.	ITEM	UNIT	UNIT PRICE	QUANTITY	AMOUNT
202(1)	Removal of Structures and Obstructions	LS-SF	$25	2,535	$63,375
205(3)	Foundation Fill	CY	$50	100	$5,000
501(1)	Class A Concrete	LS-CY	$1,200	700	$840,000
501(2)	Class A-A Concrete	LS-CY	$1,400	625	$875,000
503(1)	Reinforcing Steel	LS-LBS	$2.25	215,000	$483,750
503(2)	Epoxy Coated Reinforcing Steel	LS-LBS	$2.50	270,000	$675,000
504(1)	Structural Steel	LS-LBS	$3.00	120,000	$360,000
505(5A)	Furnish Structural Steel Piles (HP14x117)	LF	$100	800	$80,000
505(6A)	Drive Structural Steel Piles (HP14x117)	LF	$25	800	$20,000
505(5B)	Furnish Structural Steel Piles (48"x 1" PIPE)	LF	$450	2,160	$972,000
505(6B)	Drive Structural Steel Piles (48" x 1" PIPE)	LF	$75	2,160	$162,000
505(7)	Pile Driving Equipment	LS	$100,000	1	$100,000
505(11)	Pile Restrike	DAY	$3,000	33	$99,000
507(1)	Steel Bridge Railing	LF	$225	1,067.5	$240,188
510(1)	Removal of Concrete Bridge Deck	SF	$25	13,100	$327,500
512(x)	Temporary Work Structure	LS-SF	$100	17,000	$1,700,000
513(1)	Field Painting Steel Structures	LS-SF	$25	17,500	$437,500
606(12)	Guardrail / Bridge Rail Connection	EACH	$3,000	4	$12,000
611(1)	Riprap, Class II	CY	$50	2,500	$125,000
631(2)	Geotextile, Erosion Control, Class 2	SY	$2.50	2,500	$6,250
	SUBTOTAL				**$7,583,563**
	Mobilization & Demobilization	LS	11%		$842,618
	SUBTOTAL				**$8,426,181**
	Construction Engineering	LS	15%		$1,263,927
	SUBTOTAL				**$9,690,108**
	ICAP	LS	4.24%		$410,861
	SUBTOTAL				**$10,100,968**
	Contingency	LS	30%		$3,030,290
	TOTAL				**$13,131,259**

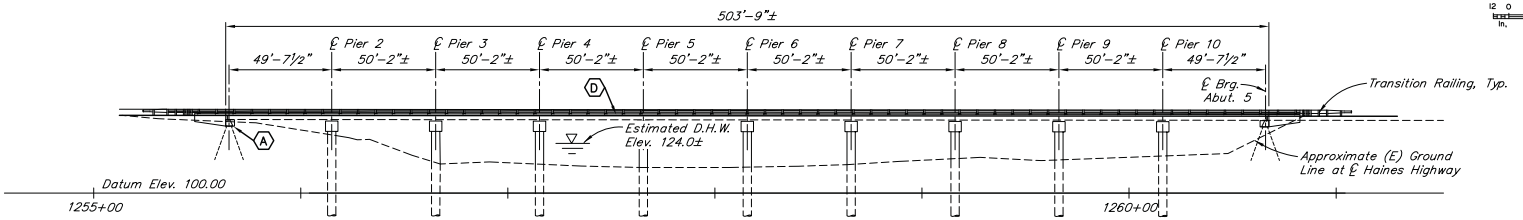
STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA		2008		



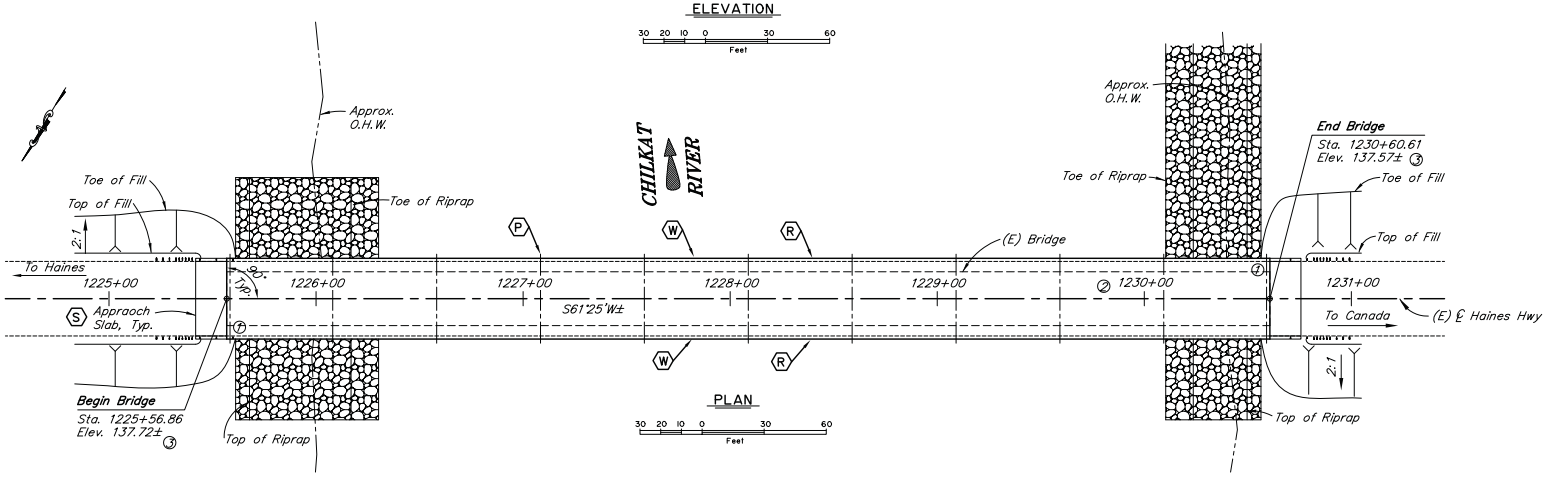
EXISTING PROFILE GRADE DATA
No Scale



TYPICAL SECTION



ELEVATION



PLAN

LEGEND	
A	– Abutment widening
D	– New Deck
G	– Repaint (E) Girders
P	– New pier Cap and Piles, Typ.
R	– New Railing
S	– Approach Slab
W	– New Girder Widening

BRIDGE DRAWING INDEX

TITLE	DWG. NO.
GENERAL LAYOUT	1
SITE PLAN	2

PRELIMINARY PLAN

REHABILITATION

OPTION 1

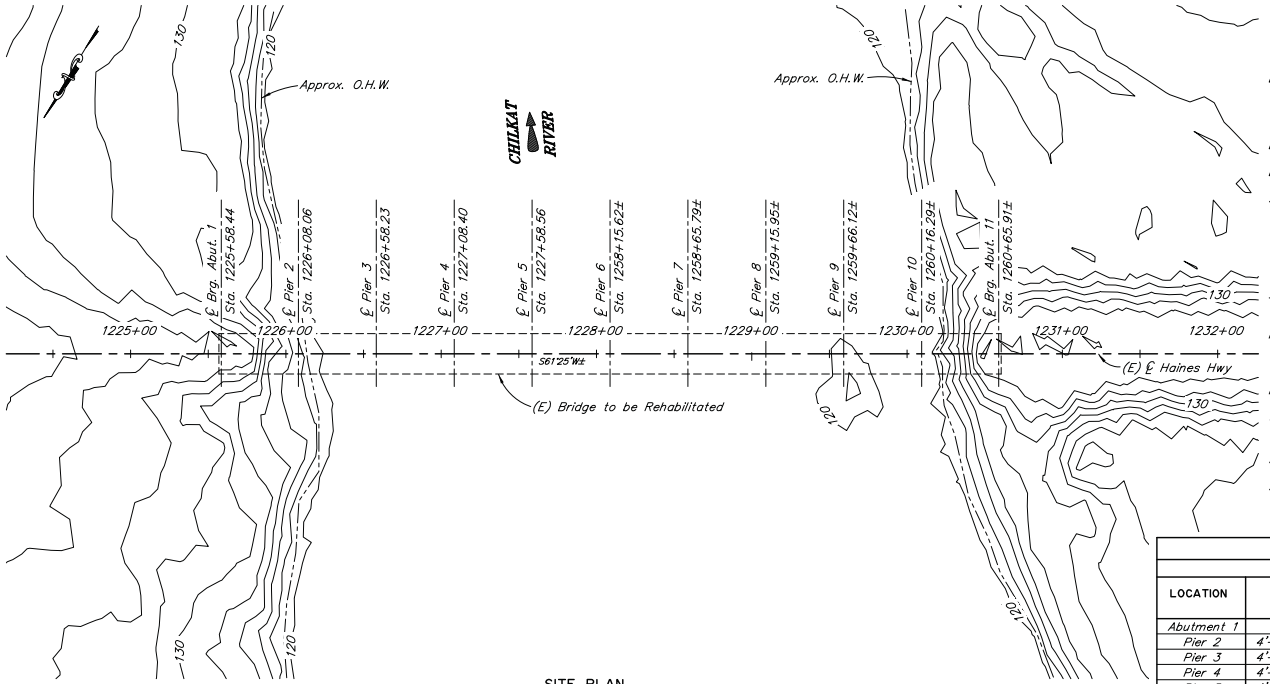
① Approximate location of Bridge Number Plate.

② Proposed Station 1230+00 is equal to the existing station 1260+06.89.

③ Elevations are for existing Bridge.

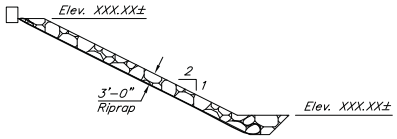
DESIGNED BY: Elmer Marx	CHECKED: Engineer	LAYOUT BY: Elmer Marx	CHECKED BY: Engineer	STATE OF ALASKA DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES BRIDGE SECTION	CHILKAT RIVER BRIDGE HAINES HIGHWAY GENERAL LAYOUT
DRAWN BY: Sam Sollie	CHECKED: Elmer Marx	SPECIFICATIONS BY: Elmer Marx	P S & E COMPARED: Engineer		BRIDGE NO. 742 DWG. NO. 1
QUANTITIES BY: Elmer Marx	CHECKED: Engineer	APPROVAL RECOMMENDED BY: Rich Pratt			

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA		2008		



SITE PLAN

10 0 40 80
Feet



RIPRAP DETAIL

240 4 8 12 16 20 24
In. Feet

GENERAL NOTES

DESIGN: ..... AASHTO LRFD Bridge Design Specifications, Fourth Edition, 2007, with latest interim specifications.
Seismic design per AASHTO Guide Specifications for LRFD Seismic Bridge Design, 2009

LIVE LOAD:..... HL-93

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

SEISMIC PARAMETERS:..... PGA = 0.322
Ss = 0.744
S1 = 0.287
Site Class = D
Liquefaction Potential = Low
AASHTO 7% probability of exceedance in 75 years.

ICE LOAD:..... Effective ice crushing strength = 16 ksf
Design ice thickness = 1 ft.

REINFORCEMENT:..... ASTM A706, Fy = 60,000 psi
Space reinforcement evenly unless otherwise noted.
Headed bars – ASTM A970.

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

CONCRETE:..... Class A Concrete, f'c = 4000 psi.
Class A-A Concrete – approach slabs, f'c = 5000 psi.

STRUCTURAL STEEL:..... ASTM A709, Grade 36T3, Fy = 36,000 psi, unless otherwise noted.

STRUCTURAL STEEL PILING:... H-Piles – ASTM A709, Grade 50T3, Fy = 50,000 psi.
Pipe Piles – API 5L X52 PSL2, Fy = 52,000 psi.
Pile Tip reinforcing is required.

PILE DATA TABLE

LOCATION	PILE TYPE	DRIVING CRITERIA: MINIMUM PENETRATION (ft)	DRIVING CRITERIA: ESTIMATED PILE TIP ELEVATION (ft)	DRIVING CRITERIA: DRIVING RESISTANCE (K)	DESIGN DATA: STRENGTH I FACTORED LOAD (K)	DESIGN DATA: NOMINAL RESISTANCE (K)	DESIGN DATA: RESISTANCE FACTOR, Φ
Abutment 1							
Pier 2	4'-0"Øx1" Pipe						
Pier 3	4'-0"Øx1" Pipe						
Pier 4	4'-0"Øx1" Pipe						
Pier 5	4'-0"Øx1" Pipe						
Pier 6	4'-0"Øx1" Pipe						
Pier 7	4'-0"Øx1" Pipe						
Pier 8	4'-0"Øx1" Pipe						
Pier 9	4'-0"Øx1" Pipe						
Pier 10	4'-0"Øx1" Pipe						
Abutment 11							

HYDRAULIC & HYDROLOGIC SUMMARY

Flood Frequency (Yr.)	50	100	500
Exceedance Probability (%)	2	1	0.2
Design Discharge (ft³/sec)			
Design High Water (ft)			
Anticipated Add'l Backwater (ft)			
Contraction Scour (ft)			
Abutment Scour (ft)			
Pier Scour (ft)			

Drainage Area for this crossing: XX.X square miles.

Hydraulic Capacity: cfs at Low Superstructure Elevation which has an exceedance probability of equal to or less than 0.2 percent.

Total scour equals contraction scour + local scour.

ABBREVIATIONS:

℄	= Centerline	f.f.	= far face
ℙ	= Plate	Hwy.	= highway
&	= and	LB	= pound
@	= at	LF	= linear foot
ø	= diameter	LS	= lump sum
Approx.	= approximate	Lt.	= left
Abut.	= Abutment	max.	= maximum
bot.	= bottom	min.	= minimum
Br.	= bridge	MSE	= mechanically stabilized earth
btwn.	= between	n.a.	= not applicable
Brg.	= Bearings	n.c.	= not calculated
C.I.P.	= cast in place	n.f.	= near face
Clr.	= clear, clearance	No.	= number
Col.	= column	O.H.W.	= ordinary high water
CSL	= crosshole sonic logging	PT	= Post Tensioned
CY	= cubic yard	PVC	= point of vertical curve
dia.	= diameter	PVI	= point of vertical intersection
D.H.W.	= Design High Water	PVT	= point of vertical tangent
Dwg.	= drawing	Rt.	= right
(E)	= existing	spc.	= space, spaces
EA	= each	Sta.	= station
Elev.	= elevation	SY	= square yard
e.f	= each face	Symm.	= symmetric
E.O.W.	= edge of water	Typ.	= typical
e.w	= each way		

BRIDGE BASIS OF ESTIMATE

ITEM NO.	ITEM	UNIT	SUBST.	SUPERST.	TOTAL

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

PRELIMINARY PLAN

REHABILITATION

OPTION 1

DESIGNED BY: Elmer Marx	CHECKED: Engineer	HYDRAULICS BY: Engineer	CHECKED BY: Engineer	STATE OF ALASKA DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES BRIDGE SECTION	CHILKAT RIVER BRIDGE HAINES HIGHWAY SITE PLAN
DRAWN BY: Sam Sollie	CHECKED: Elmer Marx	FOUNDATIONS REVIEWED BY: Engineer			BRIDGE NO. 742 DWG. NO. 2
QUANTITIES BY: Elmer Marx	CHECKED: Engineer				

Option 2 – Replace the existing bridge on a parallel roadway alignment

540 FT long, four-span, precast concrete girder bridge
Maximum span length = 135 FT
Minimum centerline roadway elevation on bridge ~ 146.0 FT
Vertical clearance under bridge (navigation) ~ 15 FT
Bridge related pay items (w/o mobilization, CE, ICAP, or contingency) = $6.7M
Bridge related pay items (w/ mobilization, CE, ICAP, and 25% contingency) = $11.1M

ADVANTAGES	DISADVANTAGES
Least expensive bridge option.	The existing bridge is not capable of accommodating construction equipment. Thus, a temporary work structure will be required in order to install pier piles and to set bridge girders.
Significantly improves the navigational clearance below the bridge, from a 48-ft by 9-ft opening to a 128-ft by 15-ft opening.	Although we do not have the existing Right of Way (ROW) boundaries at this time, it may be that the parallel roadway alignment would require the acquisition of additional ROW.
The existing bridge can be used to maintain vehicular traffic during construction of the new bridge. Thus, the cost of traffic maintenance (not included in the bridge cost) would be less than the other options.	In order to provide additional navigational clearance below the bridge, a roadway profile grade raise is required. Thus, the width of the approach roadway embankment will be greater than that of the existing structure and, in this case, relocated on a new roadway alignment offset from the existing alignment. Additional cost associated with the approach roadway fill and possible ROW acquisition will need to be considered.
Navigation can be maintained under the bridge during construction although some intermittent closures would likely be required.	
The proposed bridge will satisfy all current code requirements and provide for a 75-year life.	

The Alaska DOT&PF has successfully used precast concrete decked bulb-tee girder bridges throughout the state. This style of bridge has proven to be a very cost-effective, durable structure in most environments.

At this time, there is no proposed roadway alignment for this option. For convenience, the preliminary bridge plans provide stationing values based upon station 0+00.00 at the begin bridge location. If this option is developed, the stationing will be modified to reflect the revised roadway plan and profile.

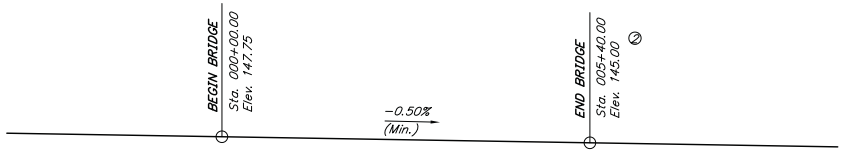
STATE OF ALASKA DOT/PF
COMPUTATIONS
Chilkat River Bridge Replacement

Option 2
540 ft long four span bridge - Parallel Alignment
ESTIMATE OF QUANTITIES AND COST

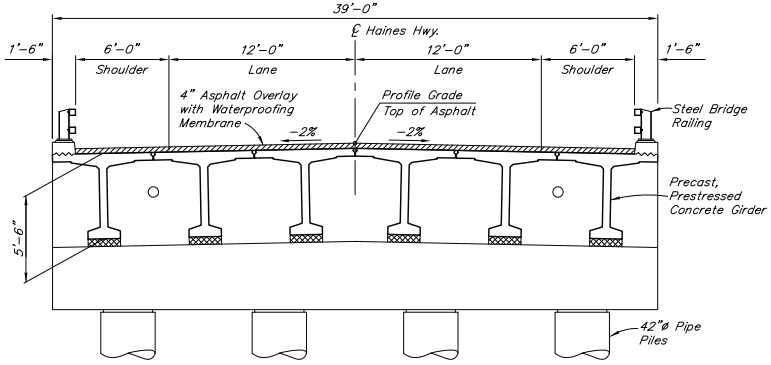
DATE 10/29/2009
BRIDGE No. 742
By EEM

Item No.	ITEM	UNIT	UNIT PRICE	QUANTITY	AMOUNT
202(1)	Removal of Structures and Obstructions	LS-SF	$25	13,223	$330,586
205(3)	Foundation Fill	CY	$50	1,200	$60,000
501(1)	Class A Concrete	LS-CY	$1,200	655	$786,000
501(2)	Class A-A Concrete	LS-CY	$1,400	55.2	$77,287
501(7)	Precast Concrete Member	EACH	$75,000	24	$1,800,000
503(1)	Reinforcing Steel	LS-LBS	$2.25	110,000	$247,500
503(2)	Epoxy Coated Reinforcing Steel	LS-LBS	$2.50	82,500	$206,250
505(5A)	Furnish Structural Steel Piles (HP14x117)	LF	$100	1,200	$120,000
505(6A)	Drive Structural Steel Piles (HP14x117)	LF	$25	1,200	$30,000
505(5B)	Furnish Structural Steel Piles (42" x 1" PIPE)	LF	$400	1,440	$576,000
505(6B)	Drive Structural Steel Piles (42" x 1" PIPE)	LF	$75	1,440	$108,000
505(7)	Pile Driving Equipment	LS	$100,000	1	$100,000
505(11)	Pile Restrike	DAY	$3,000	15	$45,000
507(1)	Steel Bridge Railing	LF	$225	1,160	$261,000
508(1)	Waterproofing Membrane	LS-SF	$3.00	20,880	$62,640
512(x)	Temporary Work Structure	LS-SF	$100	17,000	$1,700,000
606(12)	Guardrail / Bridge Rail Connection	EACH	$3,000	4	$12,000
611(1)	Riprap, Class II	CY	$50	2,500	$125,000
631(2)	Geotextile, Erosion Control, Class 2	SY	$2.50	2,500	$6,250
	SUBTOTAL				**$6,653,513**
	Mobilization & Demobilization	LS	11%		$739,279
	SUBTOTAL				**$7,392,793**
	Construction Engineering	LS	15%		$1,108,919
	SUBTOTAL				**$8,501,711**
	ICAP	LS	4.88%		$414,884
	SUBTOTAL				**$8,916,595**
	Contingency	LS	25%		$2,229,149
	TOTAL				**$11,145,744**

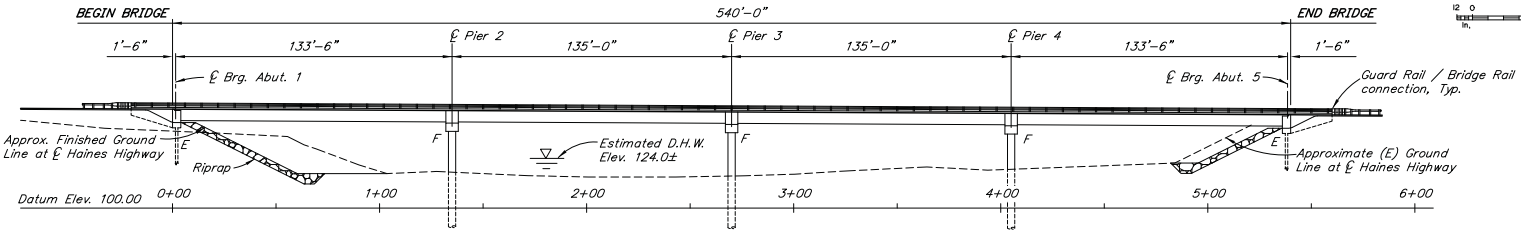
STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA		2008		



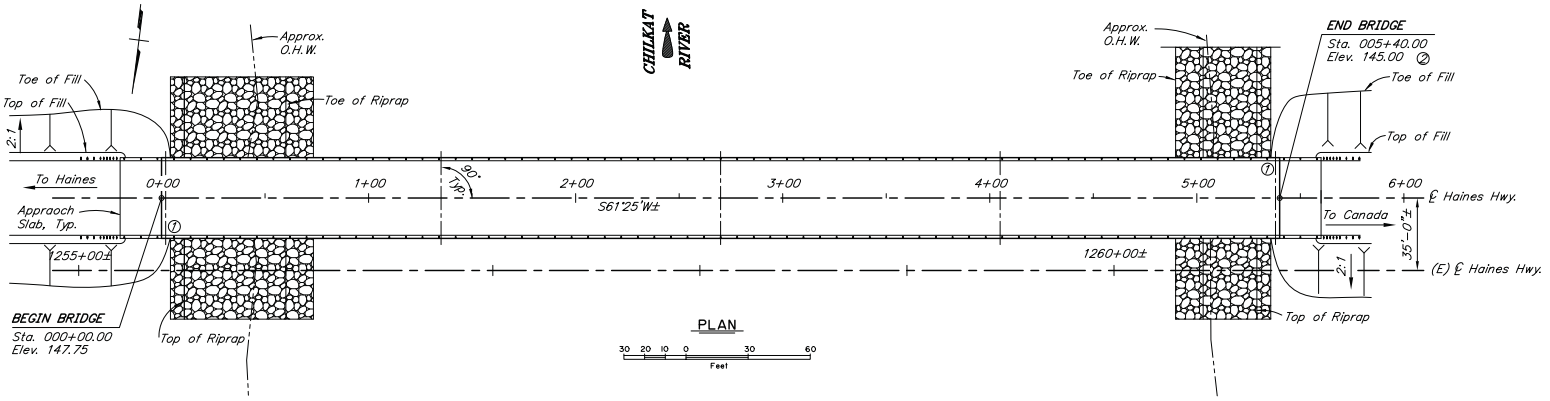
PROFILE GRADE DATA
No Scale



TYPICAL SECTION
12 0 4 8
In. Feet



ELEVATION
30 20 10 0 30 60
Feet



PLAN
30 20 10 0 30 60
Feet

BRIDGE DRAWING INDEX	
TITLE	DWG. NO.
GENERAL LAYOUT	1
SITE PLAN	2

PRELIMINARY PLAN

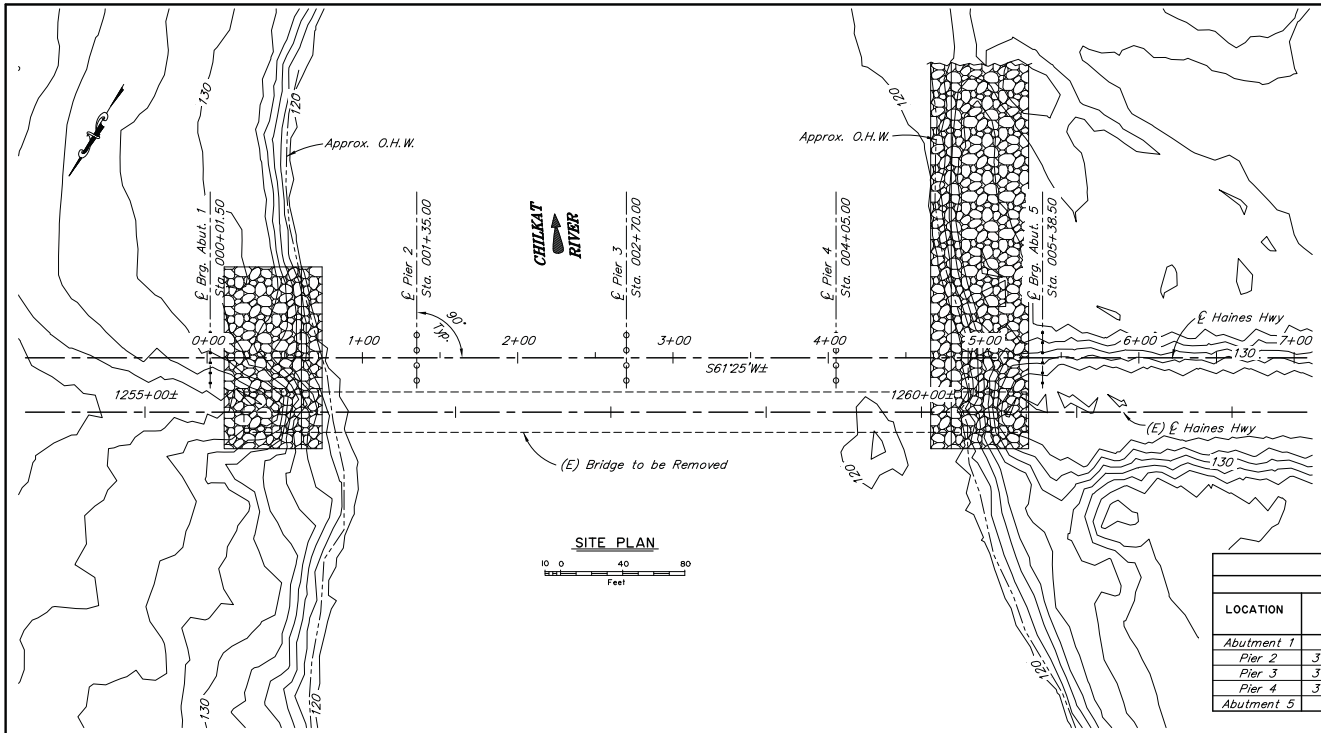
OPTION 2

① Approximate location of Bridge Number Plate.

② Minimum elevation to provide 15'-0" navigation clearance.

DESIGNED BY: Elmer Marx	CHECKED: Engineer	LAYOUT BY: Elmer Marx	CHECKED BY: Engineer	STATE OF ALASKA DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES BRIDGE SECTION	CHILKAT RIVER BRIDGE HAINES HIGHWAY GENERAL LAYOUT
DRAWN BY: Sam Sollie	CHECKED: Elmer Marx	SPECIFICATIONS BY: Elmer Marx	P S & E COMPARED: Engineer		BRIDGE NO. 742 DWG. NO. 1
QUANTITIES BY: Elmer Marx	CHECKED: Engineer	APPROVAL RECOMMENDED BY: Rich Pratt			

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA		2008		



SITE PLAN

10 0 40 80
Feet

GENERAL NOTES

DESIGN: ..... AASHTO LRFD Bridge Design Specifications, Fourth Edition, 2007, with latest interim specifications.
Seismic design per AASHTO Guide Specifications for LRFD Seismic Bridge Design, 2009

LIVE LOAD:..... HL-93

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

SEISMIC PARAMETERS:..... PGA = 0.322
Ss = 0.744
S1 = 0.287
Site Class = D
Liquefaction Potential = Low
AASHTO 7% probability of exceedance in 75 years.

ICE LOAD:..... Effective ice crushing strength = 16 ksf
Design ice thickness = 1 ft.

REINFORCEMENT:..... ASTM A706, Fy = 60,000 psi
Space reinforcement evenly unless otherwise noted.
Headed bars – ASTM A970.

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

CONCRETE:..... Class A Concrete, f'c = 4000 psi.
Class A-A Concrete – approach slabs, f'c = 5000 psi.

STRUCTURAL STEEL:..... ASTM A709, Grade 36T3, Fy = 36,000 psi, unless otherwise noted.

STRUCTURAL STEEL PILING:... H-Piles – ASTM A709, Grade 50T3, Fy = 50,000 psi.
Pipe Piles – API 5L X52 PSL2, Fy = 52,000 psi.
Pile Tip reinforcing is required.

PILE DATA TABLE

LOCATION	PILE TYPE	DRIVING CRITERIA: MINIMUM PENETRATION (ft)	DRIVING CRITERIA: ESTIMATED PILE TIP ELEVATION (ft)	DRIVING CRITERIA: DRIVING RESISTANCE (K)	DESIGN DATA: STRENGTH I FACTORED LOAD (K)	DESIGN DATA: NOMINAL RESISTANCE (K)	DESIGN DATA: RESISTANCE FACTOR, Φ
Abutment 1	HP14x117						
Pier 2	3'-6"Øx1" Pipe						
Pier 3	3'-6"Øx1" Pipe						
Pier 4	3'-6"Øx1" Pipe						
Abutment 5	HP14x117						

HYDRAULIC & HYDROLOGIC SUMMARY

Flood Frequency (Yr.)	50	100	500
Exceedance Probability (%)	2	1	0.2
Design Discharge (ft³/sec)			
Design High Water (ft)			
Anticipated Add'l Backwater (ft)			
Contraction Scour (ft)			
Abutment Scour (ft)			
Pier Scour (ft)			

Drainage Area for this crossing: XX.X square miles.

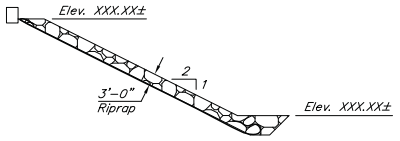
Hydraulic Capacity: cfs at Low Superstructure Elevation which has an exceedance probability of equal to or less than 0.2 percent.

Total scour equals contraction scour + local scour.

BRIDGE BASIS OF ESTIMATE

ITEM NO.	ITEM	UNIT	SUBST.	SUPERST.	TOTAL

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



RIPRAP DETAIL

2 4 8 12 16 20 24
In. Feet

OPTION 2

PRELIMINARY PLAN

ABBREVIATIONS:

℄	= Centerline	f.f.	= far face
ℙ	= Plate	Hwy.	= highway
&	= and	LB	= pound
@	= at	LF	= linear foot
ø	= diameter	LS	= lump sum
Approx.	= approximate	Lt.	= left
Abut.	= Abutment	max.	= maximum
bot.	= bottom	min.	= minimum
Br.	= bridge	MSE	= mechanically stabilized earth
btwn.	= between	n.a.	= not applicable
Brg.	= Bearings	n.c.	= not calculated
C.I.P.	= cast in place	n.f.	= near face
Clr.	= clear, clearance	No.	= number
Col.	= column	O.H.W.	= ordinary high water
CSL	= crosshole sonic logging	PT	= Post Tensioned
CY	= cubic yard	PVC	= point of vertical curve
dia.	= diameter	PVI	= point of vertical intersection
D.H.W.	= Design High Water	PVT	= point of vertical tangent
Dwg.	= drawing	Rt.	= right
(E)	= existing	spc.	= space, spaces
EA	= each	Sta.	= station
Elev.	= elevation	SY	= square yard
e.f.	= each face	Symm.	= symmetric
E.O.W.	= edge of water	Typ.	= typical
e.w	= each way		

DESIGNED BY: Elmer Marx	CHECKED: Engineer	HYDRAULICS BY: Engineer	CHECKED BY: Engineer	STATE OF ALASKA DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES BRIDGE SECTION	CHILKAT RIVER BRIDGE HAINES HIGHWAY SITE PLAN
DRAWN BY: Sam Sollie	CHECKED: Elmer Marx	FOUNDATIONS REVIEWED BY: Engineer			BRIDGE NO. 742 DWG. NO. 2
QUANTITIES BY: Elmer Marx	CHECKED: Engineer				

Option 3 – Replace the bridge on the existing roadway alignment

540 FT long, four-span, precast concrete girder bridge
Maximum span length = 135 FT
Minimum centerline roadway elevation on bridge ~ 146.0 FT
Vertical clearance under bridge (navigation) ~ 15 FT
Bridge related pay items (w/o mobilization, CE, ICAP, or contingency) = $7.1M
Bridge related pay items (w/ mobilization, CE, ICAP, and 25% contingency) = $11.9M

ADVANTAGES	DISADVANTAGES
Significantly improves the navigational clearance below the bridge, from a 48-ft by 9-ft opening to a 128-ft by 15-ft opening.	The existing bridge cannot be used to maintain vehicular traffic during construction of the new bridge. In order to accommodate vehicular traffic, a temporary detour bridge will be required.
* Since a temporary work structure is required to construct a replacement bridge, the added cost of building a combination detour/work structure is not particularly great (about $400,000)	In order to provide additional navigational clearance below the bridge, a roadway profile grade raise is required. Thus, the width of the approach roadway embankment will be greater than that of the existing structure. Additional cost associated with the approach roadway fill will need to be considered.
Because this bridge would replace the existing bridge on the existing roadway alignment, it is assumed that no work outside of the existing ROW would be required. This assumption will need to be verified as information becomes available.	* A separate work structure may also be required if it is unacceptable to work from the temporary detour bridge. The cost of a separate work structure is about $1.7M. The additional of a work structure would make this the most expensive option.
Navigation can be maintained under the bridge during construction although some intermittent closures would likely be required.	
The proposed bridge will satisfy all current code requirements and provide for a 75-year life.	

* The preliminary cost estimate for this bridge is based upon the assumption that the a dual work bridge / detour bridge is used rather than a separate structure for each function.

Other than the location, this option is very nearly the same bridge as that presented in Option 2. However, because this bridge is located on the existing alignment, a temporary detour bridge would be required thereby increasing the overall bridge cost.

Also, the proposed roadway profile grade will need to be raised approximately four feet near the bridge in order to provide the desired 15 feet vertical navigation clearance.

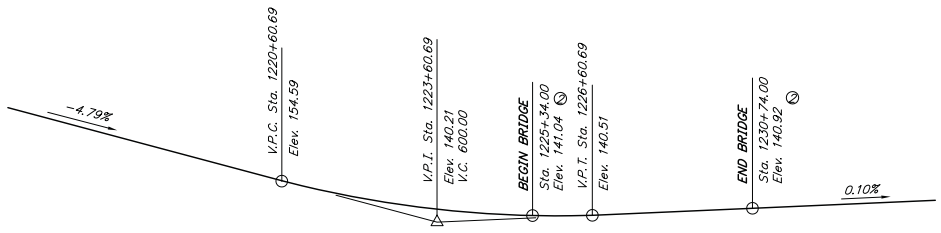
STATE OF ALASKA DOT/PF
COMPUTATIONS
Chilkat River Bridge Replacement

Option 3
540 ft long four span bridge - Existing Alignment
ESTIMATE OF QUANTITIES AND COST

DATE 10/29/2009
BRIDGE No. 742
By EEM

Item No.	ITEM	UNIT	UNIT PRICE	QUANTITY	AMOUNT
202(1)	Removal of Structures and Obstructions	LS-SF	$25	13,223	$330,586
205(3)	Foundation Fill	CY	$50	1,200	$60,000
501(1)	Class A Concrete	LS-CY	$1,200	655	$786,000
501(2)	Class A-A Concrete	LS-CY	$1,600	55.2	$88,328
501(7)	Precast Concrete Member	EACH	$75,000	24	$1,800,000
503(1)	Reinforcing Steel	LS-LBS	$2.25	110,000	$247,500
503(2)	Epoxy Coated Reinforcing Steel	LS-LBS	$2.50	82,500	$206,250
505(5A)	Furnish Structural Steel Piles (HP14x117)	LF	$100	1,200	$120,000
505(6A)	Drive Structural Steel Piles (HP14x117)	LF	$25	1,200	$30,000
505(5B)	Furnish Structural Steel Piles (42" x 1" PIPE)	LF	$400	1,440	$576,000
505(6B)	Drive Structural Steel Piles (42" x 1" PIPE)	LF	$75	1,440	$108,000
505(7)	Pile Driving Equipment	LS	$100,000	1	$100,000
505(11)	Pile Restrike	DAY	$3,000	15	$45,000
507(1)	Steel Bridge Railing	LF	$250	1,160	$290,000
508(1)	Waterproofing Membrane	LS-SF	$3.00	20,880	$62,640
520(1)	Temporary Crossing (work structure)	LS-SF	$125	17,000	$2,125,000
606(12)	Guardrail / Bridge Rail Connection	EACH	$3,000	4	$12,000
611(1)	Riprap, Class II	CY	$50	2,500	$125,000
631(2)	Geotextile, Erosion Control, Class 2	SY	$2.50	2,500	$6,250
	SUBTOTAL				**$7,118,554**
	Mobilization & Demobilization	LS	11%		$790,950
	SUBTOTAL				**$7,909,505**
	Construction Engineering	LS	15%		$1,186,426
	SUBTOTAL				**$9,095,931**
	ICAP	LS	4.88%		$443,881
	SUBTOTAL				**$9,539,812**
	Contingency	LS	25%		$2,384,953
	TOTAL				**$11,924,765**

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA		2008		



PROFILE GRADE DATA
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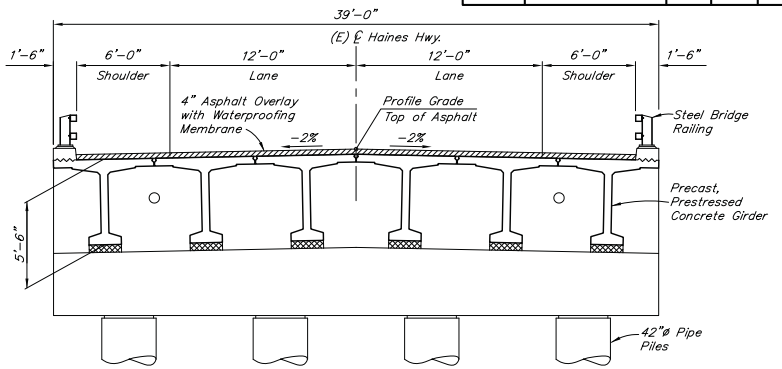
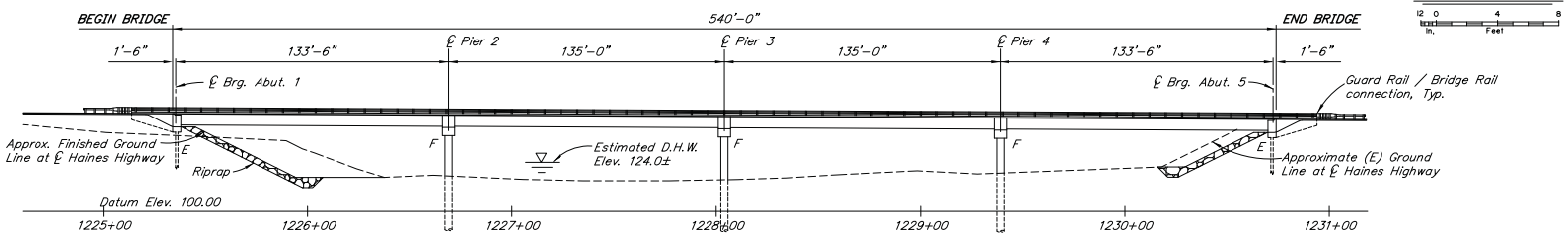
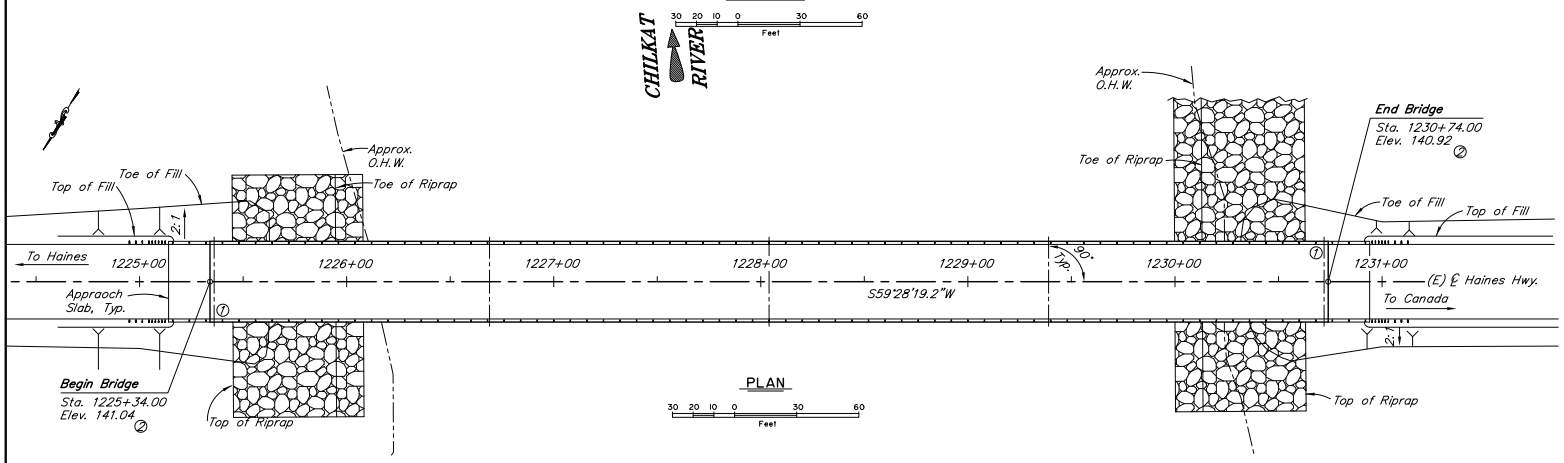


TYPICAL SECTION



ELEVATION



PLAN

BRIDGE DRAWING INDEX	
TITLE	DWG. NO.
GENERAL LAYOUT	1
SITE PLAN	2

PRELIMINARY PLAN

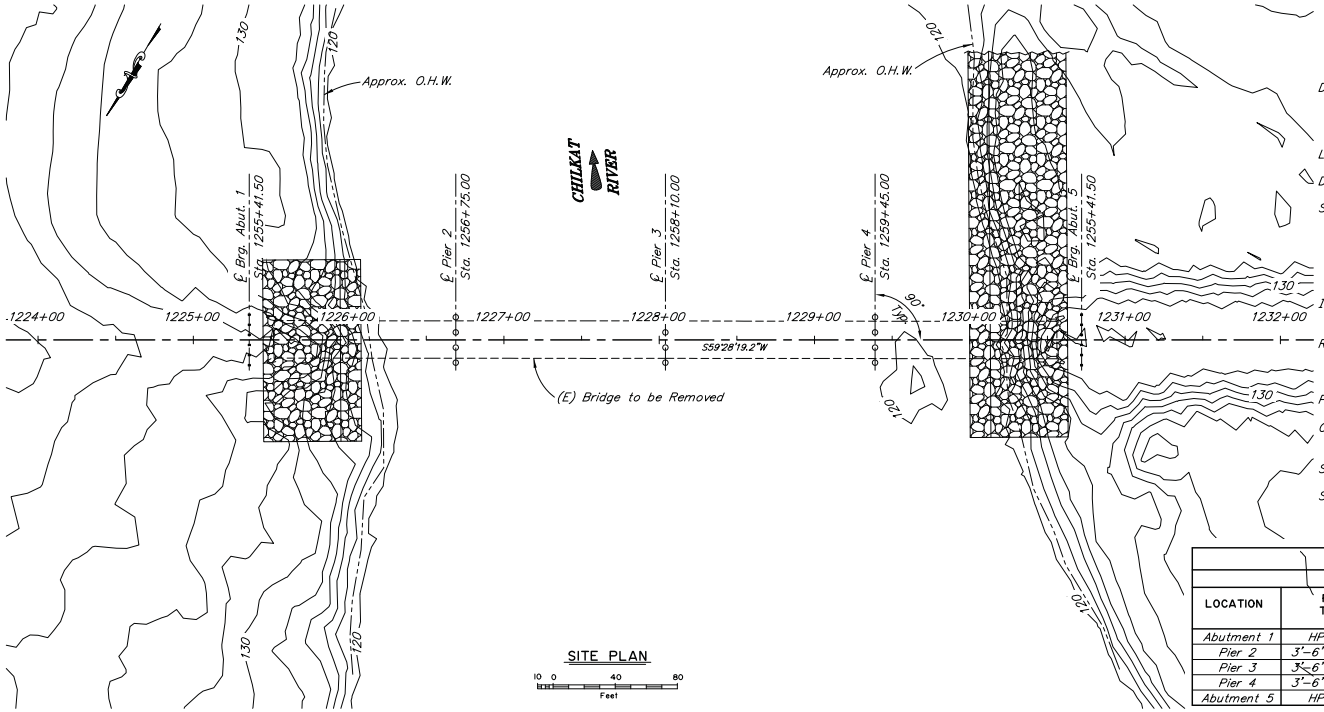
OPTION 3

① *Approximate location of Bridge Number Plate.*

② *4'-0" Grade raise required to provide 15'-0" navigation clearance.*

DESIGNED BY: Elmer Marx	CHECKED: Engineer	LAYOUT BY: Elmer Marx	CHECKED BY: Engineer	STATE OF ALASKA DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES BRIDGE SECTION	CHILKAT RIVER BRIDGE HAINES HIGHWAY GENERAL LAYOUT
DRAWN BY: Sam Sollie	CHECKED: Elmer Marx	SPECIFICATIONS BY: Elmer Marx	P S & E COMPARED: Engineer		BRIDGE NO. 742 DWG. NO. 1
QUANTITIES BY: Elmer Marx	CHECKED: Engineer	APPROVAL RECOMMENDED BY: Rich Pratt			

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA		2008		



SITE PLAN

10 0 40 80 Feet

GENERAL NOTES

DESIGN: ..... AASHTO LRFD Bridge Design Specifications, Fourth Edition, 2007, with latest interim specifications.
Seismic design per AASHTO Guide Specifications for LRFD Seismic Bridge Design, 2009

LIVE LOAD:..... HL-93

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

SEISMIC PARAMETERS:..... PGA = 0.322
Ss = 0.744
S1 = 0.287
Site Class = D
Liquefaction Potential = Low
AASHTO 7% probability of exceedance in 75 years.

ICE LOAD:..... Effective ice crushing strength = 16 ksf
Design ice thickness = 1 ft.

REINFORCEMENT:..... ASTM A706, Fy = 60,000 psi
Space reinforcement evenly unless otherwise noted.
Headed bars - ASTM A970.

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

CONCRETE:..... Class A Concrete, f'c = 4000 psi.
Class A-A Concrete - approach slabs, f'c = 5000 psi.

STRUCTURAL STEEL:..... ASTM A709, Grade 36T3, Fy = 36,000 psi, unless otherwise noted.

STRUCTURAL STEEL PILING:... H-Piles - ASTM A709, Grade 50T3, Fy = 50,000 psi.
Pipe Piles - API 5L X52 PSL2, Fy = 52,000 psi.
Pile Tip reinforcing is required.

PILE DATA TABLE

LOCATION	PILE TYPE	DRIVING CRITERIA: MINIMUM PENETRATION (ft)	DRIVING CRITERIA: ESTIMATED PILE TIP ELEVATION (ft)	DRIVING CRITERIA: DRIVING RESISTANCE (K)	DESIGN DATA: STRENGTH I FACTORED LOAD (K)	DESIGN DATA: NOMINAL RESISTANCE (K)	DESIGN DATA: RESISTANCE FACTOR, Φ
Abutment 1	HP14x117						
Pier 2	3'-6"Øx1" Pipe						
Pier 3	3'-6"Øx1" Pipe						
Pier 4	3'-6"Øx1" Pipe						
Abutment 5	HP14x117						

HYDRAULIC & HYDROLOGIC SUMMARY

Flood Frequency (Yr.)	50	100	500
Exceedance Probability (%)	2	1	0.2
Design Discharge (ft³/sec)			
Design High Water (ft)			
Anticipated Add'l Backwater (ft)			
Contraction Scour (ft)			
Abutment Scour (ft)			
Pier Scour (ft)			

Drainage Area for this crossing: XX.X square miles.

Hydraulic Capacity: cfs at Low Superstructure Elevation which has an exceedance probability of equal to or less than 0.2 percent.

Total scour equals contraction scour + local scour.

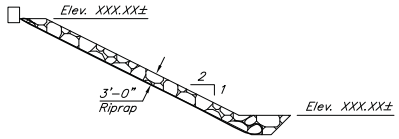
BRIDGE BASIS OF ESTIMATE

ITEM NO.	ITEM	UNIT	SUBST.	SUPERST.	TOTAL

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

OPTION 3

PRELIMINARY PLAN



RIPRAP DETAIL

2 4 0 4 8 12 16 20 24 In. Feet

ABBREVIATIONS:

℄	= Centerline	f.f.	= far face
ℙ	= Plate	Hwy.	= highway
&	= and	LB	= pound
@	= at	LF	= linear foot
ø	= diameter	LS	= lump sum
Approx.	= approximate	Lt.	= left
Abut.	= Abutment	max.	= maximum
bot.	= bottom	min.	= minimum
Br.	= bridge	MSE	= mechanically stabilized earth
btwn.	= between	n.a.	= not applicable
Brg.	= Bearings	n.c.	= not calculated
C.I.P.	= cast in place	n.f.	= near face
Clr.	= clear, clearance	No.	= number
Col.	= column	O.H.W.	= ordinary high water
CSL	= crosshole sonic logging	PT	= Post Tensioned
CY	= cubic yard	PVC	= point of vertical curve
dia.	= diameter	PVI	= point of vertical intersection
D.H.W.	= Design High Water	PVT	= point of vertical tangent
Dwg.	= drawing	Rt.	= right
(E)	= existing	spc.	= space, spaces
EA	= each	Sta.	= station
Elev.	= elevation	SY	= square yard
e.f	= each face	Symm.	= symmetric
E.O.W.	= edge of water	Typ.	= typical
e.w	= each way		

DESIGNED BY: Elmer Marx	CHECKED: Engineer	HYDRAULICS BY: Engineer	CHECKED BY: Engineer	STATE OF ALASKA DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES BRIDGE SECTION	CHILKAT RIVER BRIDGE HAINES HIGHWAY SITE PLAN
DRAWN BY: Sam Sollie	CHECKED: Elmer Marx	FOUNDATIONS REVIEWED BY: Engineer			BRIDGE NO. 742 DWG. NO. 2
QUANTITIES BY: Elmer Marx	CHECKED: Engineer				

MEMORANDUM

State of Alaska

Department of Transportation & Public Facilities
Statewide Design & Engineering Services Division /Bridge Section

TO: Reuben Yost
Project Manager
Southeast Region

DATE: September 8, 2010

BRIDGE NO: 742
TELEPHONE NO: 465-2975
FAX NUMBER: 465-6947
TEXT TELEPHONE: 465-3652

FROM: Richard A Pratt, P.E.
FOR Chief Bridge Engineer

CONTACT: Elmer E. Marx, P.E.
465-6941
elmer.marx@alaska.gov

RE: Option 4 – two bridges

SUBJECT: Chilkat River Bridge
Haines Highway

As requested, we have prepared a fourth preliminary bridge option for the subject project. Specifically, we have developed the preliminary plans and cost estimate for rehabilitation and strengthening of the existing bridge in combination with constructing a new bridge parallel to the existing structure. Each bridge would accommodate one-way traffic and pedestrian facilities.

Please refer to the memo dated October 29, 2009 for information about the previous bridge options. Retaining the number scheme initiated in the previous memo, we are identifying this configuration as Option 4. As indicated on the following sheets, we do not recommend that either Option 1 or Option 4 be considered for further development.

We are also providing additional perspective on the proposed rehabilitation (Option 1 and 4) and widening (Option 1) of the existing Chilkat River Bridge.

The preliminary bridge cost estimate for Option 4 is attached. The estimate includes all bridge-related pay items (including temporary work structures) as well as an 11% mobilization allowance (10% of subtotal cost including mobilization and demobilization pay item), a 15% construction engineering allowance, and a 4.79% ICAP allowance.

We have very little foundation; hydraulic, topographic, or other design information for this site. In addition, due to the unpredictable nature of rehabilitation work and the unusual configuration, we recommend using a 30% contingency for this option.

Please contact Elmer if you have any questions.

EEM/bm

Option 4 – Rehabilitate the existing bridge and build new bridge

503.75 FT long, ten-span, steel girder bridge
540 FT long, four-span precast concrete girder bridge
Maximum span length of existing bridge = 50 FT
Vertical clearance under existing bridge (navigation) ~ 9 FT
Bridge related pay items (w/o mobilization, CE, ICAP, or contingency) = $10M
Bridge related pay items (w/ mobilization, CE, ICAP, and 30% contingency) = $17M

ADVANTAGES	DISADVANTAGES
Although unusual, is technically feasible.	Refer to the disadvantages of Option 1 of the October 29, 2009 memo
If the rehabilitated existing bridge developed problems at a future date (e.g. fatigue cracking in the 50+ year old girders), the new parallel bridge could be used to accommodate traffic. However, the new bridge is not wide enough to accommodate two-way traffic so traffic control would be required.	Depending upon the permissible location of the new bridge, the same work structure required for rehabilitating the existing bridge may be used for construction of the new bridge (this is the assumption used to prepare the cost estimate). On the other hand, it may be necessary to build a separate work bridge for each structure.
After strengthening, the existing bridge would be capable of accommodating vehicle loads similar to that of the new parallel bridge.	The new parallel bridge would be relatively narrow. However, to prevent the new bridge from being classified as fracture critical, at least three supporting piles/columns are required. Geometric restrictions on pile spacing are responsible for the required bridge width.
	If the existing bridge is not strengthened, it would still restrict loads entering or exiting Haines (depending upon which bridge carried inbound / outbound traffic).
	A temporary work bridge will be needed to rehabilitate the existing bridge and to build the new bridge. In order to minimize the cost, that same work bridge could be used for both structures but would need to set between the two. Consequently, the resulting centerline distance between the existing and new bridge would be about 60 feet. Right of way and roadway realignment issues would need to be addressed and may be expensive.

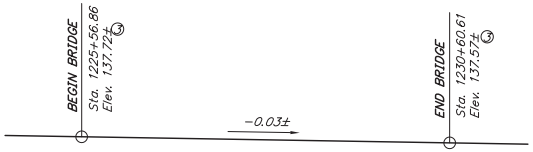
We do not recommend that this option be advanced for further consideration.

STATE OF ALASKA DOT/PF
COMPUTATIONS
Chilkat River Bridge
Option 4
Rehabilitate Existing Bridge AND Build New Bridge
ESTIMATE OF QUANTITIES AND COST

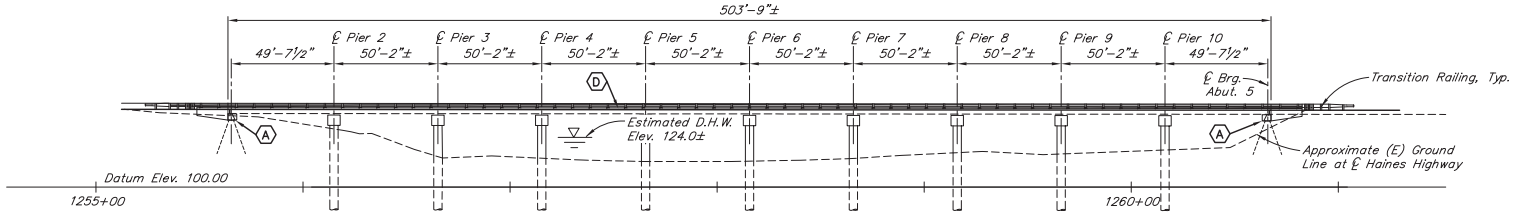
DATE 9/8/2010
BRIDGE No. 742
By EEM

Item No.	ITEM	UNIT	UNIT PRICE	QUANTITY	AMOUNT
	Rehabilitation Pay Items				
501(1)	Class A Concrete	LS-CY	$1,200	550	$660,000
501(2)	Class A-A Concrete	LS-CY	$1,400	350	$490,000
503(1)	Reinforcing Steel	LS-LBS	$2.25	150,000	$337,500
503(2)	Epoxy Coated Reinforcing Steel	LS-LBS	$2.50	185,000	$462,500
504(1)	Structural Steel	LS-LBS	$6.00	80,000	$480,000
505(5B)	Furnish Structural Steel Piles (48"x 1" PIPE)	LF	$450	2,160	$972,000
505(6B)	Drive Structural Steel Piles (48" x 1" PIPE)	LF	$75	2,160	$162,000
505(11)	Pile Restrike	DAY	$3,000	33	$99,000
507(1)	Steel Bridge Railing	LF	$250	1,067.5	$266,875
510(1)	Removal of Concrete Bridge Deck	SF	$25	13,100	$327,500
512(x)	Temporary Work Structure	LS-SF	$100	17,000	$1,700,000
513(1)	Field Painting Steel Structures	LS-SF	$25	17,500	$437,500
606(12)	Guardrail / Bridge Rail Connection	EACH	$3,000	4	$12,000
611(1)	Riprap, Class II	CY	$50	3,000	$150,000
631(2)	Geotextile, Erosion Control, Class 2	SY	$2.50	3,000	$7,500
	New Bridge Pay Items				
205(3)	Foundation Fill	CY	$50	1,200	$60,000
501(1)	Class A Concrete	LS-CY	$1,200	510	$612,000
501(2)	Class A-A Concrete	LS-CY	$1,600	30.7	$49,185
501(7)	Precast Concrete Member	EACH	$75,000	16	$1,200,000
503(1)	Reinforcing Steel	LS-LBS	$2.25	90,000	$202,500
503(2)	Epoxy Coated Reinforcing Steel	LS-LBS	$2.50	67,500	$168,750
505(5A)	Furnish Structural Steel Piles (HP14x117)	LF	$100	800	$80,000
505(6A)	Drive Structural Steel Piles (HP14x117)	LF	$25	800	$20,000
505(5B)	Furnish Structural Steel Piles (36" x 3/4" PIPE)	LF	$375	1,080	$405,000
505(6B)	Drive Structural Steel Piles (36" x 3/4" PIPE)	LF	$75	1,080	$81,000
505(7)	Pile Driving Equipment	LS	$100,000	1	$100,000
505(11)	Pile Restrike	DAY	$3,000	15	$45,000
507(1)	Steel Bridge Railing	LF	$250	1,160	$290,000
508(1)	Waterproofing Membrane	LS-SF	$3.00	11,600	$34,800
606(12)	Guardrail / Bridge Rail Connection	EACH	$3,000	4	$12,000
	SUBTOTAL				**$9,924,610**
	Mobilization & Demobilization	LS	11%		$1,102,734
	SUBTOTAL				**$11,027,345**
	Construction Engineering	LS	15%		$1,654,102
	SUBTOTAL				**$12,681,446**
	ICAP	LS	4.79%		$607,441
	SUBTOTAL				**$13,288,888**
	Contingency	LS	30%		$3,986,666
	TOTAL				**$17,275,554**

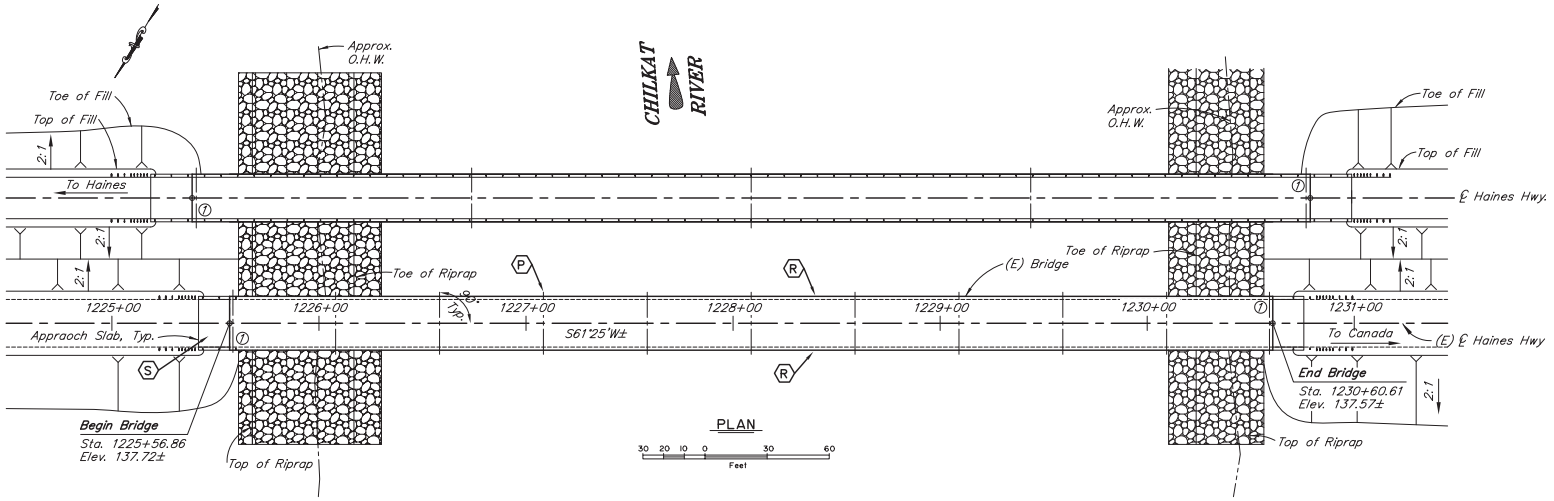
STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA		2010		



EXISTING PROFILE GRADE DATA
No Scale



ELEVATION ③
(Looking Down Stream)
30 20 10 0 30 60
Feet



PLAN
30 20 10 0 30 60
Feet

LEGEND	
A	– Abutment seat widening
D	– New Deck
G	– Repaint (E) Girders
P	– New pier Cap and Piles, Typ.
R	– New Railing
S	– Approach Slab

BRIDGE DRAWING INDEX

TITLE	DWG. NO.
GENERAL LAYOUT	1
TYPICAL SECTION	2
SITE PLAN	3

PRELIMINARY PLAN

REHABILITATION

OPTION 4

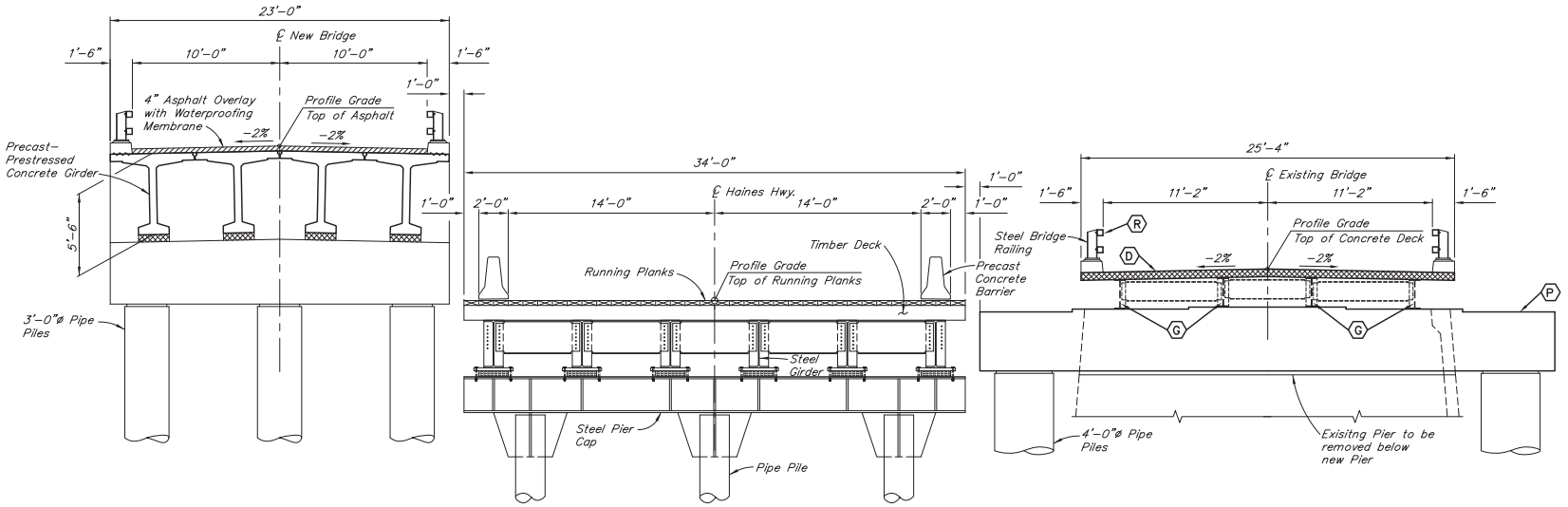
① *Approximate location of Bridge Number Plate.*

② *Proposed Station 1230+00 is equal to the existing station 1260+06.89.*

③ *Elevations are for existing Bridge.*

DESIGNED BY: Elmer Marx	CHECKED: Engineer	LAYOUT BY: Elmer Marx	CHECKED BY: Engineer	STATE OF ALASKA DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES BRIDGE SECTION	CHILKAT RIVER BRIDGE HAINES HIGHWAY GENERAL LAYOUT
DRAWN BY: Sam Sollie	CHECKED: Elmer Marx	SPECIFICATIONS BY: Elmer Marx	P S & E COMPARED: Engineer		BRIDGE NO. 742 DWG. NO. 1
QUANTITIES BY: Elmer Marx	CHECKED: Engineer	APPROVAL RECOMMENDED BY: Rich Pratt			

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA		2010		



PROPOSED BRIDGE

WORK TRESTLE

EXISTING BRIDGE

TYPICAL SECTION

12 0 4 8
In. Feet

LEGEND
(D) – New Deck
(G) – Repaint (E) Girders
(P) – New pier Cap and Piles, Typ.
(R) – New Railing
▨ – Denotes removal and replacement of bridge deck

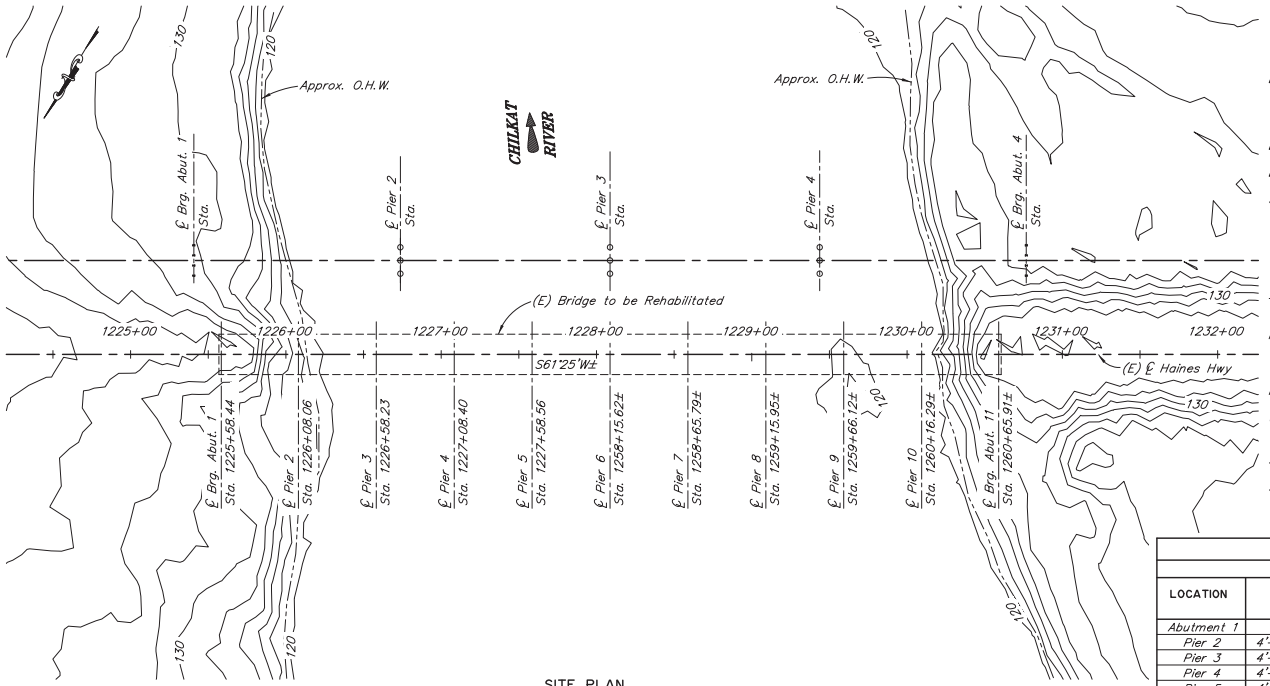
PRELIMINARY PLAN

REHABILITATION

OPTION 4

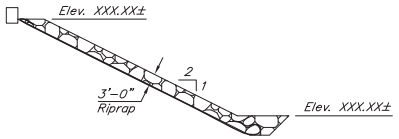
DESIGNED BY: Elmer Marx	CHECKED: Engineer		STATE OF ALASKA DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES BRIDGE SECTION	CHILKAT RIVER BRIDGE HAINES HIGHWAY TYPICAL SECTION
DRAWN BY: Sam Sollie	CHECKED: Elmer Marx			BRIDGE NO. 742 DWG. NO. 2
QUANTITIES BY: Elmer Marx	CHECKED: Engineer			

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA		2010		



SITE PLAN

10 0 40 80
Feet



RIPRAP DETAIL

24 0 4 8 12 16 20 24
In. Feet

GENERAL NOTES

DESIGN: .....AASHTO LRFD Bridge Design Specifications, Fourth Edition, 2007, with latest interim specifications.
Seismic design per AASHTO Guide Specifications for LRFD Seismic Bridge Design, 2009

LIVE LOAD:.....HL-93

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

SEISMIC PARAMETERS:.....PGA = 0.322
Ss = 0.744
S1 = 0.287
Site Class = D
Liquefaction Potential = Low
AASHTO 7% probability of exceedance in 75 years.

ICE LOAD:.....Effective ice crushing strength = 16 ksf
Design ice thickness = 1 ft.

REINFORCEMENT:.....ASTM A706, Fy = 60,000 psi
Space reinforcement evenly unless otherwise noted.
Headed bars - ASTM A970.

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

CONCRETE:.....Class A Concrete, f'c = 4000 psi.
Class A-A Concrete - approach slabs, f'c = 5000 psi.

STRUCTURAL STEEL:.....ASTM A709, Grade 36T3, Fy = 36,000 psi, unless otherwise noted.

STRUCTURAL STEEL PILING:...H-Piles - ASTM A709, Grade 50T3, Fy = 50,000 psi.
Pipe Piles - API 5L X52 PSL2, Fy = 52,000 psi.
Pile Tip reinforcing is required.

PILE DATA TABLE

LOCATION	PILE TYPE	DRIVING CRITERIA: MINIMUM PENETRATION (ft)	DRIVING CRITERIA: ESTIMATED PILE TIP ELEVATION (ft)	DRIVING CRITERIA: DRIVING RESISTANCE (K)	DESIGN DATA: STRENGTH I FACTORED LOAD (K)	DESIGN DATA: NOMINAL RESISTANCE (K)	DESIGN DATA: RESISTANCE FACTOR, Φ
Abutment 1	HP14x117						
Pier 2	4'-0"ø x 1" Pipe						
Pier 3	4'-0"ø x 1" Pipe						
Pier 4	4'-0"ø x 1" Pipe						
Pier 5	4'-0"ø x 1" Pipe						
Pier 6	4'-0"ø x 1" Pipe						
Pier 7	4'-0"ø x 1" Pipe						
Pier 8	4'-0"ø x 1" Pipe						
Pier 9	4'-0"ø x 1" Pipe						
Pier 10	4'-0"ø x 1" Pipe						
Abutment 11	HP14x117						

HYDRAULIC & HYDROLOGIC SUMMARY

	50	100	500
Flood Frequency (Yr.)			
Exceedance Probability (%)	2	1	0.2
Design Discharge (ft³/sec)			
Design High Water (ft)			
Anticipated Add'l Backwater (ft)			
Contraction Scour (ft)			
Abutment Scour (ft)			
Pier Scour (ft)			

Drainage Area for this crossing: XX.X square miles.

Hydraulic Capacity: cfs at Low Superstructure Elevation which has an exceedance probability of equal to or less than 0.2 percent.

Total scour equals contraction scour + local scour.

BRIDGE BASIS OF ESTIMATE

ITEM NO.	ITEM	UNIT	SUBST.	SUPERST.	TOTAL

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

ABBREVIATIONS:

℄	= Centerline	f.f.	= far face
℗	= Plate	Hwy.	= highway
&	= and	LB	= pound
@	= at	LF	= linear foot
ø	= diameter	LS	= lump sum
Approx.	= approximate	Lt.	= left
Abut.	= Abutment	max.	= maximum
bot.	= bottom	min.	= minimum
Br.	= bridge	MSE	= mechanically stabilized earth
btwn.	= between	n.a.	= not applicable
Brg.	= Bearings	n.c.	= not calculated
C.I.P.	= cast in place	n.f.	= near face
Clr.	= clear, clearance	No.	= number
Col.	= column	O.H.W.	= ordinary high water
CSL	= crosshole sonic logging	PT	= Post Tensioned
CY	= cubic yard	PVC	= point of vertical curve
dia.	= diameter	PVI	= point of vertical intersection
D.H.W.	= Design High Water	PVT	= point of vertical tangent
Dwg.	= drawing	Rt.	= right
(E)	= existing	spc.	= space, spaces
EA	= each	Sta.	= station
Elev.	= elevation	SY	= square yard
e.f	= each face	Symm.	= symmetric
E.O.W.	= edge of water	Typ.	= typical
e.w	= each way		

PRELIMINARY PLAN

REHABILITATION

OPTION 4

DESIGNED BY: Elmer Marx	CHECKED: Engineer	HYDRAULICS BY: Engineer	CHECKED BY: Engineer	STATE OF ALASKA DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES BRIDGE SECTION	
DRAWN BY: Sam Sollie	CHECKED: Elmer Marx	FOUNDATIONS REVIEWED BY: Engineer			
QUANTITIES BY: Elmer Marx	CHECKED: Engineer				

CHILKAT RIVER BRIDGE

HAINES HIGHWAY

SITE PLAN

BRIDGE NO. 742

DWG. NO. 3

Current Condition and Observations

All bridges open to the public are inspected on a two-year cycle. A copy of the 2008 bridge inspection report is attached to this memo. Some of the more significant observations for the bridge include:

- The concrete pier walls have spalls and other signs of distress
- The deck expansion joints leak water onto the end diaphragms and substructure. The water is contributing to deterioration of the structure
- The bridge deck has spalls, exposed reinforcing bars, and delaminated concrete areas
- The bridge rail is in poor condition
- The bridge is classified as “scour critical”

Sufficiency Rating and Live Load Capacity

Each bridge is assigned a “sufficiency rating” that is based upon the bridge inspection observations and subsequent capacity analysis. The sufficiency rating formula is a method of evaluating factors that indicate a bridge’s sufficiency to remain in service. The result of the formula is a percentage in which 100 percent represents a sufficient bridge and zero percent represents an insufficient bridge.

In order to qualify for FHWA bridge rehabilitation funds, the sufficiency rating must be less than 80 and a “triggering” item must be present (e.g., deck rating less than 3). A sufficiency rating less than 50 qualifies a bridge to be eligible for FHWA replacement funds. The current sufficiency rating for the Chilkat River Bridge is 56.5 but the bridge has no “triggering item.” Thus, neither bridge rehabilitation nor replacement is eligible for Federal Bridge Funds.

The legal highway truck load is often referred to as the HS-20 live load. The live load capacity of a bridge can be expressed in terms of this “HS” loading nomenclature – higher numbers representing greater truck capacity. The Chilkat River Bridge’s inventory load rating is HS-13.3. This load rating is less than that associated with legal truck loads but does not yet require posting for restricted truck loads. The bridge’s operating rating is HS-29.5. Although this load capacity can accommodate most of the overloads desiring to cross the bridge, it is not adequate to accommodate the heavier loads that would be anticipated for mining or pipeline activities or those required to re-construct the existing bridge (e.g. cranes).

Bridge Widening (Option 1) and Rehabilitation (Option1 and 4) Considerations

A copy of the bridge “As-Built” drawings is attached to this memo. As indicated in the drawings, the bridge has a 24-ft wide roadway. The Haines Highway typical roadway section is 36-ft wide. The existing bridge would need to be widened by 12-ft to match the width of the roadway. It is proposed to widen the bridge symmetrically about the bridge centerline. One line of girders would be required along each side of the existing structure – see Figure 1.

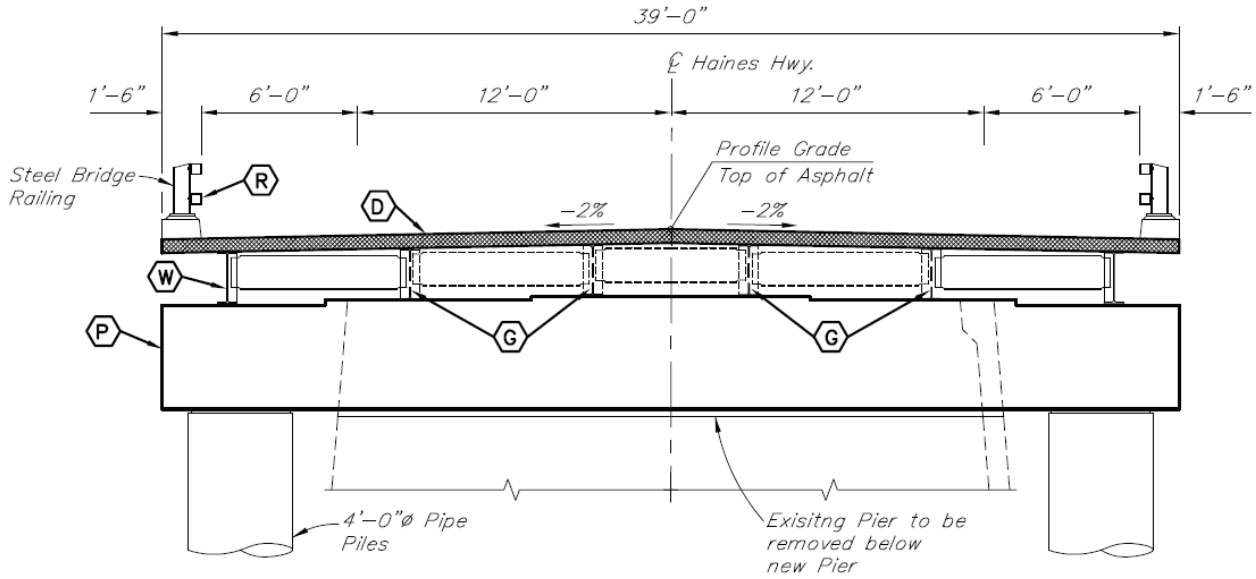


Figure 1 – Widened and Rehabilitated Bridge (Option 1)

The existing piers are not wide enough to accommodate the proposed girder lines and deck. Thus, the piers would need to be widened to accommodate the girders. The piers would also need to be strengthened to accommodate the larger loads and seismic demands (see subsequent section) and to address the “scour critical” condition of the existing piles. In order to widen the existing pier in a manner similar to the existing configuration, a cofferdam would be required. The bridge is close to the water and a conventional cofferdam cannot be placed around the piers without removing the existing girders from the piers. Figure 2 shows a sheet pile cofferdam placed around an existing bridge pier with the superstructure removed.

Figure 2 - Cofferdam around existing pier (Soldotna, AK)

Removing the girders and building cofferdams around the existing piers is very expensive (very approximately $250,000 for each of the nine piers) and time consuming. More cost-effective methods of widening and strengthening the piers are possible. Specifically, large diameter pipe piles could be driven to each side of the existing pier. The two piles would be filled with a reinforced concrete core. A concrete pile cap beam would be cast above the two large diameter pipe piles, encapsulating the upper portion of the existing pier wall. The lower portion of the wall would be removed after the new cap beam was complete – see Figure 1. The rehabilitated pier would improve the seismic performance of the bridge as well as addressing the “scour critical” bridge classification.

Although Option 4 does not require the bridge deck to be widened, the most cost effective method of addressing the seismic and scour deficiencies of the bridge is to place large diameter pipe piles to each side of the existing pier. Thus, even if the superstructure is not widened, the substructure rehabilitation recommendations are unchanged. In this case, the pier cap beam would be somewhat wider than the bridge deck – see Figure 3.

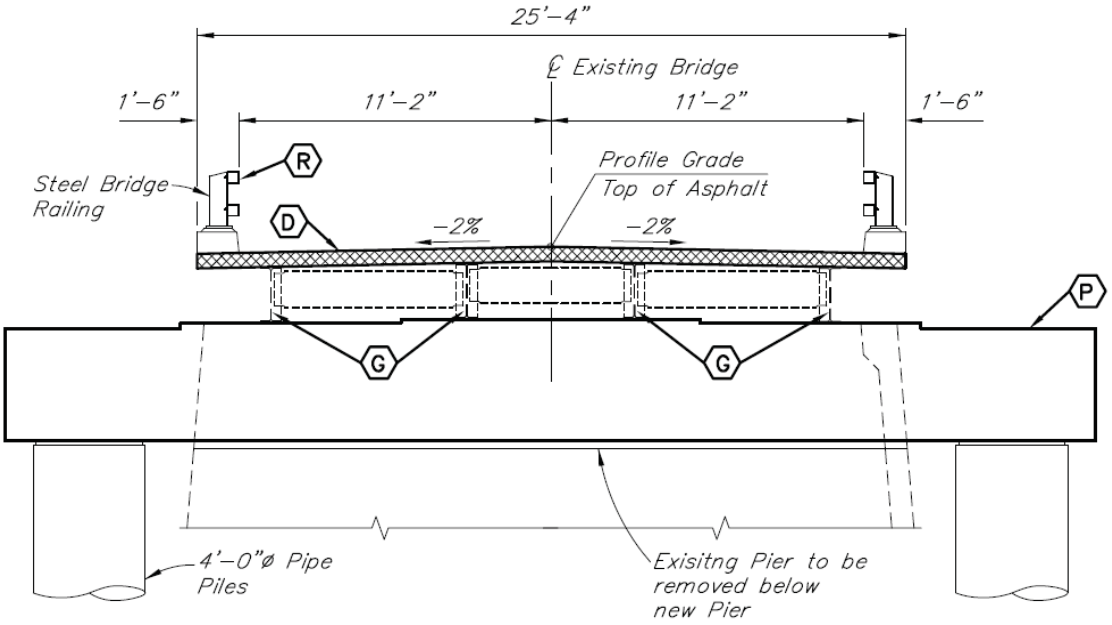


Figure 3 - Rehabilitated Bridge without Superstructure Widening (Option 4)

The existing bridge does not have adequate strength to accommodate the design HS-20 live load. The bridge would need to be strengthened to meet current standards. Cover plates could be welded to the existing steel girders to increase their strength. Cover plates have been associated with steel bridge fatigue problems in the past and would likely required special inspection if utilized.

Although not verified by physical testing, bridges of this vintage were typically coated in lead-based paint. Repainting of the bridge may be required near the expansion joints and along the flanges where cover plates would be required. A containment structure

would need to be placed around most of the bridge during painting to satisfy environmental requirements. Consequently, the cost for repainting a bridge coated in lead-based paints is quite high.

If the existing bridge is retained, the bridge deck would need to be replaced because:

1. The deck is in poor condition
2. Access to the existing girders is required for the strengthening work
3. The bridge deck must be widened (Option 1 only)

The bridge does not have adequate strength to accommodate the large construction equipment required to set girders, drive piles, etc. Furthermore, the bridge would not be capable of accommodating traffic during replacement. Thus, a temporary work/detour bridge is required. The temporary bridge would likely need to be built between the existing bridge and the new bridge to facilitate construction of each. Figure 4 illustrates a standard trestle style work/detour bridge that would be required to accommodate construction equipment and highway traffic.

Figure 4 - Temporary trestle style work/detour bridge (Soldotna, AK)

Seismic Vulnerability and Retrofit

The bridge is comprised of multiple simple spans. The girder end supports are inadequate to accommodate the seismic movements anticipated at this site. Bridges with this type of inadequate bearing seat width have failed during earthquakes – see Figure 5.

Figure 5 - Earthquake induced bridge damage (Alaska 1964)

In order to address seismic deficiencies, numerous retrofit details would be needed. The pipe pile cap beam would need to be widened. Cable restrainers may be required to tie adjacent girder ends together. Concrete shear keys between the steel girders would likely be needed.

Bridge Railing
The existing bridge rail does not meet current safety standards. The existing rail is damaged and would be removed along with the deck. In order to meet the current safety standards, a new crash-tested bridge rail system is required. We propose to use the standard metal two-tube rail that is used throughout the state. If necessary, a three-tube combination pedestrian-traffic railing would be used.

Navigational Clearance
No significant reduction (less than two feet) in the navigation channel width would result as a consequence of the proposed bridge work.

Remaining Service Life
Although many new bridge components are proposed for these options (i.e., bridge railing, cast-in-place deck, exterior girders, steel cover plates, pier caps, and concrete-filled steel pipe piles) the existing steel girders and portions of the concrete abutments and piers are retained in the completed structure. These elements have been in service for over 50 years and would not be expected to provide another 50 years of maintenance-free service. Future maintenance, repairs, and bridge replacement should be anticipated to occur in a period not typically expected for a “new” bridge.

Bridge Appearance
As indicated, there are numerous design objectives including:

- Widening (Option 1 only)
- Strengthening
- Seismic retrofitting and scour countermeasures
- Traffic safety and rail improvements
- Maintenance and painting

The most technically and economically feasible means of addressing these objectives are outlined above. The proposed construction details would appreciably alter the appearance of the bridge.

As indicated in the October 2009 memo, due to the technical challenge and economic high cost, we recommend against advancing the bridge rehabilitation (Option 1 and 4) and widening (Option 1) options for further consideration.

Bridge Salvage Documentation

Tuttell, Maryellen

Subject: FW: 68606 HNS: MP 3.5 to 25.3 / Chilkat R. Bridge
Attachments: 742asbuilts1958.pdf; 0742_Routine_2010.pdf

From: Marx, Elmer E (DOT)
Sent: Monday, April 02, 2012 5:15 PM
To: Van Alstine, Matthew J (DOT)
Cc: Scholl, James W (DOT); Pratt, Richard A (DOT)
Subject: RE: 68606 HNS: MP 3.5 to 25.3 / Chilkat R. Bridge

Hello, Matt and Jim.

We recommend against the reuse of the existing Chilkat River Bridge(#742) at the Klehini River location.

Some of the factors contributing to our recommendation include:

1. The substructure (piers) would not be salvageable and could not be reused at a new location. The existing piles are small and encased in concrete.

2. The Klehini site is in a Seismic Design Category (SDC) "D" – this is the highest, most hazardous zone. The new bridge piers will need to meet current design standards and as such, will not look anything like the existing piers. Thus, the appearance of the bridge will significantly altered. The use of so many unnecessary additional piers (proposed bridge requires only one or two new piers) will be expensive.

3. The cast-in-place concrete deck is in poor condition and will need to be removed from the steel girders (see attached inspection report). Thus, the existing deck cannot be used in the new installation. Based upon past experience, removing the deck from the girders and shear lugs will be difficult and may result in girder damage.

4. The existing girders were design for"H20" live load. This live load is only about 2/3 of the current "HL93" design live load. Thus, the girders would need to be strengthened or the spacing between girders would need to be reduced by about 2-ft. In either situation, the superstructure appearance (from underneath anyway) would be appreciably different.

5. The existing steel girders have cover plates. Although once popular, over time cover plates have proven to be "fatigue prone details" that are not used in most modern construction. Fatigue is often characterized as cracking in steel members that occurs at stresses less than the material's yield stress due to the repetitive application of load. The existing girders have been in service for over 50 years and have been exposed to many fatigue cycles (likely more than one million). The Klehini River Bridge (both new and existing) serves a resource rich region and is required to accommodate heavy trucks. The existing Chilkat River Bridge girders will not likely be able to serve another 75 years (the current standard) without fatigue cracks forming at the cover plates.

6. The existing girder steels (ASTM A 7 and ASTM A 242) are no longer used and are not addressed in the AWS Welding Code. Thus, strengthening and welding of the existing girders will be complicated in that all welds will first need to be qualified by destructive testing prior to utilization on the girders. Furthermore, the AWS Bridge Welding Code does not address the welding of existing structures. Many project-specific special provisions would be needed to address these and other issue associated with the use of salvage bridge members.

7. As with other bridge of this vintage, the existing Chilkat River Bridge girders are most likely coated in lead based paint. The Department is responsible for the removal and proper disposal of the lead based paint prior to reusing the girders in a subject project. Removal of lead based paint has proven to be somewhat expensive.

8. Although a crash tested railing is not likely a mandatory requirement for the new Klehini River Bridge, Department practice has been to use crashworthy rails on most all new bridges. The new bridge railing will look appreciably different from the existing bridge railing.

9. It is unclear if the entire existing bridge or just portions of it must be incorporated into the new Klehini River Bridge. The existing Chilkat River Bridge is about 504-ft long and the proposed Klehini River Bridge is around 360-ft long. Would we need to install the "extra" 144-ft of bridge or could that portion be disposed?

10. FHWA funded projects do not typically include the use of salvaged bridge materials. As we understand, we would need to justify the use of the old material in the new bridge.

Based upon the list of concerns, the cost of using the old steel girders will almost certainly result in a more expensive structure. That is, all of the materials would be new except for the steel girders which would need to be sandblasted, strengthened, repainted, re-erected and cover with a new concrete deck and railing.

Perhaps the existing bridge can be photographed, recorded and cataloged then recycled.

Please let me know if you have any questions.

Regards,

Elmer
465-6941

From: Van Alstine, Matthew J (DOT)
Sent: Monday, April 02, 2012 1:38 PM
To: Marx, Elmer E (DOT)
Cc: Scholl, James W (DOT)
Subject: RE: 68606 HNS: MP 3.5 to 25.3 / Chilkat R. Bridge

Hi Elmer:
What are your thoughts on this?
Thanks,
Matt

From: Scholl, James W (DOT)
Sent: Monday, April 02, 2012 1:34 PM
To: Van Alstine, Matthew J (DOT)
Cc: Marx, Elmer E (DOT)
Subject: 68606 HNS: MP 3.5 to 25.3 / Chilkat R. Bridge

Matt, As you know, the Chilkat R. Bridge (#0742) will be replaced as a part of of the subject. FHWA has determined the bridge to be eligible for the National Register of Historic Places; that means it is also a section 4(f) property. What we need to do is attempt to find parties that may re-use the bridge.

I know you are project manager for 69377 HNS: Klehini R. Bridge (#1216) Replacement Project. Can you use the Chilkat R. Bridge to replace the Klehini R. Bridge?

If you need more information let me know.

Jim Scholl
Environmental Analyst
ADOT&PF SE Region
6860 Glacier Highway
POB 112506
Juneau Alaska 99811-2506

jim.scholl@alaska.gov

(907) 465 4498
(907) 465 3506 FAX

Tuttell, Maryellen

Subject: FW: 68606 HNS: MP 3.5 to 25.3 / Chilkat R. Bridge at Wells

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From: Roger Schnabel [mailto:Roger@seroad.com]
Sent: Tuesday, April 03, 2012 2:29 PM
To: Scholl, James W (DOT)
Subject: RE: 68606 HNS: MP 3.5 to 25.3 / Chilkat R. Bridge at Wells

Mr. Scholl:
Per the note below Southeast Roadbuilder's Inc. is not interested in this bridge. As you may be aware our firm removed and replaced the Little and Big Boulder bridges on this same highway (7 and 10 miles north) in 2005 and salvaged these bridges which are still in inventory with no apparent interest. Salvage and reuse doesn't appear to be of much value, considering the time and effort it would take to keep them structurally acceptable.

Thanks for thinking of us however.
Sincerely,
Roger

From: Scholl, James W (DOT) [mailto:jim.scholl@alaska.gov]
Sent: Tuesday, April 03, 2012 1:22 PM
To: Roger Schnabel
Subject: 68606 HNS: MP 3.5 to 25.3 / Chilkat R. Bridge at Wells

Good Afternoon Roger, As we discussed, DOT&PF is proposing to replace the Chilkat R. Bridge on the Haines Highway near MP 24. DOT&PF is seeking interest from any third-parties that would be interested in removing and transporting the bridge to another location. Please let me know if SE Road Builders is interested.

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Tuttell, Maryellen

From: Scholl, James W (DOT) [jim.scholl@alaska.gov]
Sent: Monday, April 16, 2012 3:30 PM
To: Mark Earnest
Cc: Tuttell, Maryellen
Subject: RE: 68606 HNS: MP 3.5 to 25.3 / Chilkat R. Bridge

Thanks Mark.

Jim Scholl
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From: Mark Earnest [mailto:mearnest@haines.ak.us]
Sent: Monday, April 16, 2012 3:25 PM
To: Scholl, James W (DOT)
Cc: Brian Lemcke; Darsie Culbeck
Subject: RE: 68606 HNS: MP 3.5 to 25.3 / Chilkat R. Bridge

Hi Jim,

Thank you for you kind offer; however, given the condition of the Chilkat River bridge (known locally as the Wells bridge), I do not anticipate or expect that the Borough would be in a position to accept that particular structure for reuse at Klehini River, or anywhere else. Although only the Borough Assembly can make an official decision on this matter, they do not meet until April 24. I will forward the information to them at that time, but I will not be recommending that the Borough accept the bridge.

I would like to express my thanks to you for considering us in this process. I realize that the bridge condition information and challenges of re-use came in after our first discussion.

Mark

From: Scholl, James W (DOT) [mailto:jim.scholl@alaska.gov]
Sent: Tuesday, April 03, 2012 7:30 AM
To: Mark Earnest
Subject: FW: 68606 HNS: MP 3.5 to 25.3 / Chilkat R. Bridge

Mark, Below is what DOT&PF Bridge section thinks of re-using the Chilkat R. Bridge for replacement of the Klehini R. bridge (steel bridge). I thought our bridge engineer's analysis might help guide the Borough's decision.

Jim Scholl
Environmental Analyst

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From: Marx, Elmer E (DOT)
Sent: Monday, April 02, 2012 5:15 PM
To: Van Alstine, Matthew J (DOT)
Cc: Scholl, James W (DOT); Pratt, Richard A (DOT)
Subject: RE: 68606 HNS: MP 3.5 to 25.3 / Chilkat R. Bridge

Hello, Matt and Jim.

We recommend against the reuse of the existing Chilkat River Bridge(#742) at the Klehini River location.

Some of the factors contributing to our recommendation include:

1. The substructure (piers) would not be salvageable and could not be reused at a new location. The existing piles are small and encased in concrete.

2. The Klehini site is in a Seismic Design Category (SDC) "D" – this is the highest, most hazardous zone. The new bridge piers will need to meet current design standards and as such, will not look anything like the existing piers. Thus, the appearance of the bridge will significantly altered. The use of so many unnecessary additional piers (proposed bridge requires only one or two new piers) will be expensive.

3. The cast-in-place concrete deck is in poor condition and will need to be removed from the steel girders (see attached inspection report). Thus, the existing deck cannot be used in the new installation. Based upon past experience, removing the deck from the girders and shear lugs will be difficult and may result in girder damage.

4. The existing girders were design for"H20" live load. This live load is only about 2/3 of the current "HL93" design live load. Thus, the girders would need to be strengthened or the spacing between girders would need to be reduced by about 2-ft. In either situation, the superstructure appearance (from underneath anyway) would be appreciably different.

5. The existing steel girders have cover plates. Although once popular, over time cover plates have proven to be "fatigue prone details" that are not used in most modern construction. Fatigue is often characterized as cracking in steel members that occurs at stresses less than the material's yield stress due to the repetitive application of load. The existing girders have been in service for over 50 years and have been exposed to many fatigue cycles (likely more than one million). The Klehini River Bridge (both new and existing) serves a resource rich region and is required to accommodate heavy trucks. The existing Chilkat River Bridge girders will not likely be able to serve another 75 years (the current standard) without fatigue cracks forming at the cover plates.

6. The existing girder steels (ASTM A 7 and ASTM A 242) are no longer used and are not addressed in the AWS Welding Code. Thus, strengthening and welding of the existing girders will be complicated in that all welds will first need to be qualified by destructive testing prior to utilization on the girders. Furthermore, the AWS Bridge Welding Code does not address the welding of existing structures. Many project-specific special

provisions would be needed to address these and other issue associated with the use of salvage bridge members.

7. As with other bridge of this vintage, the existing Chilkat River Bridge girders are most likely coated in lead based paint. The Department is responsible for the removal and proper disposal of the lead based paint prior to reusing the girders in a subject project. Removal of lead based paint has proven to be somewhat expensive.

8. Although a crash tested railing is not likely a mandatory requirement for the new Klehini River Bridge, Department practice has been to use crashworthy rails on most all new bridges. The new bridge railing will look appreciably different from the existing bridge railing.

9. It is unclear if the entire existing bridge or just portions of it must be incorporated into the new Klehini River Bridge. The existing Chilkat River Bridge is about 504-ft long and the proposed Klehini River Bridge is around 360-ft long. Would we need to install the "extra" 144-ft of bridge or could that portion be disposed?

10. FHWA funded projects do not typically include the use of salvaged bridge materials. As we understand, we would need to justify the use of the old material in the new bridge.

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