Juneau Access Improvements Project
Draft Supplemental Environmental Impact Statement

Appendix HH
Draft U.S. Coast Guard Preliminary Bridge Permit Evaluation Report
(preceded by transmittal letter to FHWA)

Prepared for:

Alaska Department of Transportation
& Public Facilities
6860 Glacier Highway
Juneau, Alaska 99801-7999

State Project Number: 71100
Federal Project Number: STP-000S(131)

Prepared by:

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January 2014

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THE STATE of ALASKA
GOVERNOR SEAN PARNELL

Department of Transportation and Public Facilities

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January 24, 2014

Mr. Peter Forsling
Federal Highway Administration
709 West 9th Street
Juneau, Alaska 99801

Subject: **Juneau Access Improvements Project**
Federal Project Number: STP-000S(131)
State Project Number: 71100
Preliminary Waterway Evaluations for U.S. Coast Guard bridge permit requirements per 23 CFR 650, Subpart H

Dear Mr. Forsling,

As part of the preparation of the Supplemental Environmental Impact Statement (SEIS) for the Juneau Access Improvements (JAI) Project, the Alaska Department of Transportation and Public Facilities (DOT&PF) has evaluated the navigability of waterway crossings for the JAI Project, Alternative 2B-East Lynn Canal Highway to Katzehin with Shuttles to Haines and Skagway, to assist the Federal Highway Administration (FHWA) in assessing the need for U.S. Coast Guard (USCG) bridge permits in accordance with 23 CFR 650, Subpart H-Navigational Clearances for Bridges and 33 CFR 115.70-Advance Approval of Bridges.

The law defining the FHWA's authority declares in 23 USC 144(c), and implemented in 23 CFR 650.805(b), that the bridge permit requirement "does not apply" for crossings with waters

> (1)..."*which are not used or are not susceptible to use in their natural condition or by reasonable improvement as a means to transport interstate or foreign commerce and (2) which are (i) not tidal, or (ii) if tidal, used only by recreational boating, fishing, and other small vessels less than 21 feet in length.*"

While the USCG must determine navigability for purposes of the Rivers and Harbors Act/General Bridge Act, FHWA must determine whether the permit requirements of that Act apply to the particular crossing under its independent statutory authority. To aide in this determination, the DOT&PF has collected navigational and waterway usage information including interviews with local boaters, agency personnel, fishermen and other relevant parties for the waterways being crossed along the Alternative 2B alignment.

The three rivers that may be considered navigable include the Katzehin, Berners/Lace, and Antler rivers. Based on the information collected and evaluated, the DOT&PF concludes that these three rivers are tidal rivers used predominantly by recreational boating, fishing, and other small vessels that are less than 21 feet long and not used for transport of interstate or foreign commerce; therefore, under 23 CFR 650.805(b) the Katzehin, Lace and Antler rivers are not navigable rivers requiring a USCG bridge permit.

If any of these waterways were determined to require a Bridge Permit based on 23 CFR 650, Subpart H, they would be subject to preapproval under 33 CFR 115.70 as they would only be accessed by small watercraft which may include small motorboats but not include cabin cruisers or sailing vessels.

The attached report from the DOT&PF provides relevant supporting documentation for this determination for the consideration of the FHWA. If you have further questions or comments related to the conclusion or information in the report, please contact me at (907) 465-2065 or by email at mike.vigue@alaska.gov.

Respectfully,

Michael Vigue
JAI Project Manager, DOT&PF

Enclosure: JAI USCG Bridge Permit Evaluation Report

cc: Reuben Yost, Deputy Commissioner, DOT&PF
Tim Haugh, Environmental Program Manager, FHWA AK Division

U.S. Coast Guard Bridge Permit Evaluation Report

DRAFT

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Federal Project Number: STP-000S(131)
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Acronyms and Abbreviations

ADNR	Alaska Department of Natural Resources
CFR	Code of Federal Regulations
DOT&PF	Alaska Department of Transportation & Public Facilities
EHT	Extreme High Tide
FEIS	Final Environmental Impact Statement
FHWA	Federal Highway Administration
JAI	Juneau Access Improvements
MHW	Mean High Water
OHW	Ordinary High Water
USCG	U.S. Coast Guard
USFS	U.S. Forest Service

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1. Introduction

Navigational and waterway usage information has been collected for the Juneau Access Improvements (JAI) Project, Alternative 2B-East Lynn Canal Highway to Katzehin with Shuttles to Haines and Skagway, to assist the Federal Highway Administration (FHWA) in assessing the need for U.S. Coast Guard (USCG) bridge permits in accordance with 23 Code of Federal Regulations (CFR) 650, Subpart H-Navigational Clearances for Bridges and 33 CFR 115.70-Advance Approval of Bridges. Waterways evaluated in detail under 23 CFR 650, Subpart H, include proposed bridge crossings over the Katzehin River, Berners/Lace rivers, and Antler River along the east side of Lynn Canal.

2. Regulatory Background

Waterway crossings associated with the JAI Project, Alternative 2B, were evaluated to determine their navigational status based upon 23 CFR 650, Subpart H-Navigational Clearances for Bridges and 33 CFR 115.70, Advance Approval of Bridges.

The purpose of 23 CFR 650, Subpart H is "*to establish policy and set forth coordination procedures for Federal-aid highway bridges which require navigational clearances*." Evaluations for Alternative 2B have been developed to better understand the characteristics of each waterway and their current usage based upon available information per the following parts of 23 CFR 650, Subpart H:

Bridges not requiring a USCG Permit must meet the following two criteria under 23 CFR 650.805(b):

> "*A USCG permit shall not be required if the FHWA determines that the proposed construction, reconstruction, rehabilitation, or replacement of the federally aided or assisted bridge is over waters*
>
> > *(1) which are not used or are not susceptible to use in their natural condition or by reasonable improvement as a means to transport interstate or foreign commerce*
> > *AND*
> > *(2) which are (i) not tidal, or (ii) if tidal, used only by recreational boating, fishing, and other small vessels less than 21 feet in length."*

Under 23 CFR 650.807 Bridges requiring a USCG Permit (b):

> "*A USCG permit shall be required when a bridge crosses waters which are:*
>
> > *(1) tidal and used by recreational boating, fishing, and other small vessels 21 feet or greater in length*
> > *OR*
> > *(2) used or susceptible to use in their natural condition or by reasonable improvement as a means to transport interstate or foreign commerce..."*

In addition, 33 CFR 115.70 Advance Approval of Bridges states:

> "*(a) The General Bridge Act of 1946 requires the approval of the location and plans of bridges prior to start of construction (33 U.S.C. 525). The Commandant has given his advance approval to the location and plans of bridges to be constructed across reaches*

of waterways navigable in law, but not actually navigated other than by logs, log rafts, rowboats, canoes and small motorboats. In such cases the clearances provided for high water stages will be considered adequate to meet the reasonable needs of navigation.

(b) The term 'small motorboats' shall be interpreted in the light of the things and conditions with which it is associated. The term means rowboats, canoes and other similar craft with outboard motors. It does not include sailing or cabin cruiser craft."

2.1 Project Waterways and Regulatory Applicability

There are small creeks and streams crossed by the Alternative 2B alignment that are generally less than 20 feet in width with less than 2 feet of water depth. Topographically, these streams and creeks are also steep and, as such, would generally not be navigable by motorized boats. Canoeing or kayaking may occur on some of these streams and creeks but it would be of a limited nature due to topographical constraints and shallow water depths. These small streams and creeks are not used for foreign commerce nor known to be accessed by recreational boats over 21 feet in length; therefore, per 23 CFR 650.805, these crossing locations are not expected to require a Bridge Permit.

Of the numerous waterway crossings proposed as part of Alternative 2B, only three rivers have been identified as possible navigable waters requiring Bridge Permit consideration: Katzehin, Lace, and Antler rivers. As such, only the Katzehin, Lace, and Antler rivers are described in further detail in this report in consideration of USCG bridge permitting requirements under 23 CFR 650, Subpart H.

If any of the waterway crossings proposed as part of Alternative 2B were determined to be navigable under USCG regulations, they would be subject to preapproval under 33 CFR 115.70 as they would only be accessed by small watercraft which may include small motorboats but not include cabin cruisers or sailing boats. This preapproval would not require bridge permits from the USCG.

3. Description of Rivers and Obstructions

One of the two criteria for bridges not requiring a USCG Permit (23 CFR 650.805(b)(1))is the natural condition of the river as it relates to navigation, "*are not used or are not susceptible to use in their natural condition or by reasonable improvement as a means to transport interstate or foreign commerce"*. The following section describes the rivers and natural or manmade obstructions that might affect navigation relevant to this provision of the regulations.

As part of the JAI Project 2006 Final Environmental Impact Statement (FEIS), stream surveys were conducted along the alignment for Alternative 2B. These included field surveys in 1994 and additional research in 2003 and 2013. For each river, a summary of these surveys is provided, including photographs taken during the 1994 field surveys. Table 3-1 provides site locations for the rivers and bridge crossings.

Table 3-1: Site Location Information for River and Bridge Crossing

Site Location Information	Katzehin River	Lace River	Antler River
Distance between river mouth and bridge location	Approximately 0.3 mile	Approximately 2 miles	Approximately 0.7 mile
Section, Township, Range, Meridian	Section 10, Township 31 South, Range 60 East, Copper River Meridian	Section 24, Township 35 South, Range 62 East, Copper River Meridian	Sections 29, Township 35 South, Range 63 East, Copper River Meridian
Latitude; Longitude	135°17'23.82"W; 59°12'4.071"N	134°59'40.15"W; 58°48'50.606"N	134°57'16.074"W; 58°48'41.418"N
Nearest city	Approximately 6 air miles southeast of Haines, Alaska on the east side of Lynn Canal	Approximately 34 air miles south of Haines, Alaska on the east side of Lynn Canal in Berners Bay	Approximately 37 air miles south of Haines, Alaska on the east side of Lynn Canal in Berners Bay

3.1 Katzehin River

The Katzehin River (Photograph 3-1 and Photograph 3-2; Table 3-1) is a large glacial stream that flows approximately 12 miles through a classic U-shaped valley, originating 500 feet in elevation from the Meade Glacier. The river is an active braided stream channel, and is home to a very productive run of chum salmon. The north bank expands into a large floodplain for one mile, after which the mountains meet the river. Predominant vegetation growing on the floodplain is Sitka spruce, while grasses dominate towards the mouth. There is a 60-degree slope, 3,000 feet in elevation, on the south bank. Much of the rock is exposed, and hemlock and Sitka alder are growing on the steep cliffs. Many small runoff streams originating from these steep slopes drain into the Katzehin River. Large pools and many side tributaries provide excellent fish-rearing habitat.

There are no manmade obstructions downstream or upstream of the proposed bridge site. Natural obstructions are present both upstream and downstream in the form of gravel bars. The main channel of this river is roughly 30 feet wide and varies in depth due to tidal influence, which is prohibitive for large vessels other than airboats or small jet boats. This river is glacially fed and no communities or bridges exist on the river between the crossing site and the Meade Glacier.

Photograph 3-1: Katzehin River looking downstream, note debris and obstructed channel

Photograph 3-2: Katzehin River looking upstream, note obstructed channel

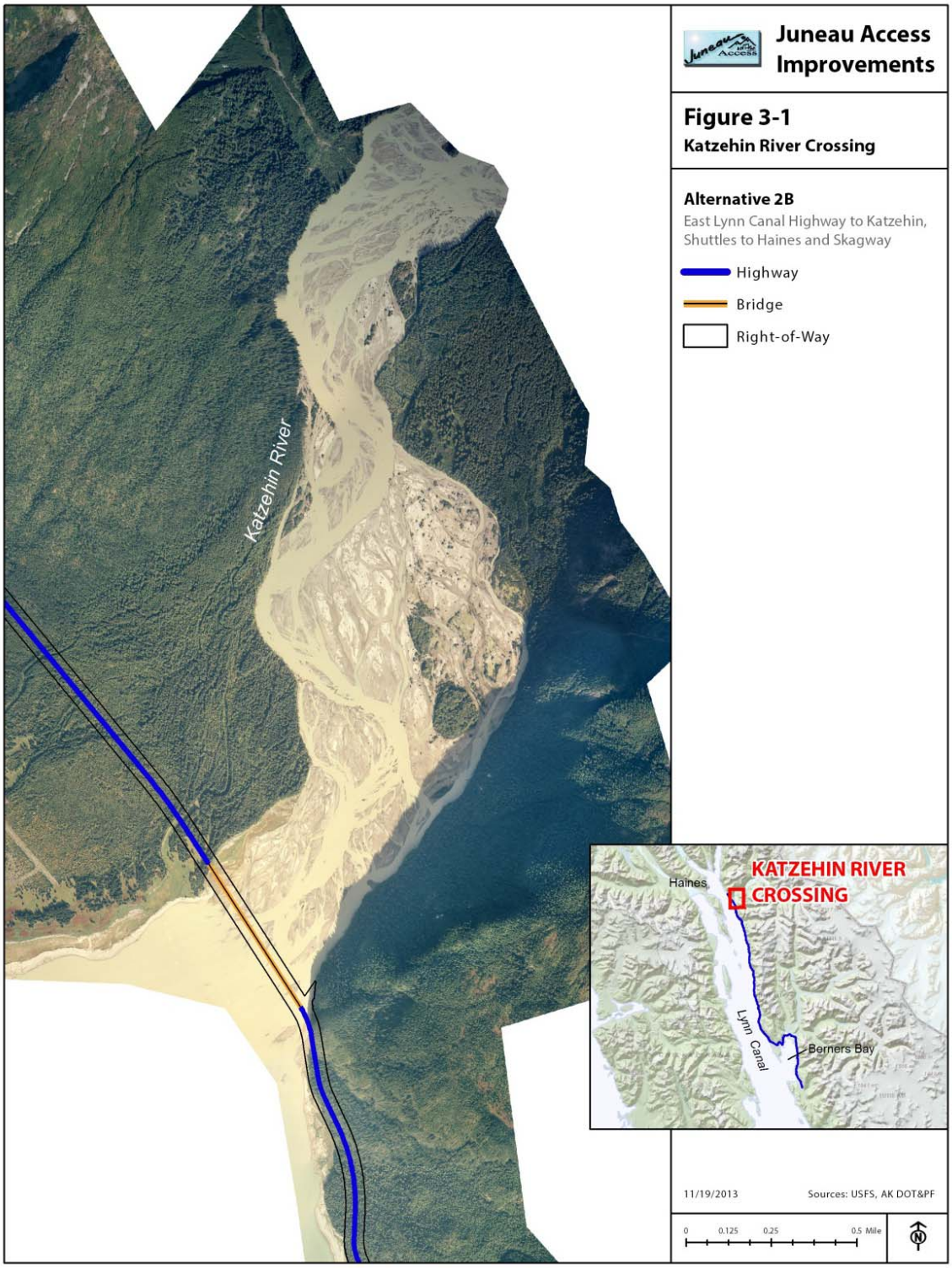


Figure 3–1: Katzehin River Crossing

3.2 Lace River

Overall, the Lace River (Photograph 3-3; Figure 3–2) is a classic braided glacial river system. The mouth of the Lace River is located at the north end of Berners Bay. It originates from an arm of the Meade Glacier, at approximately 800 feet in elevation, and flows south for 20 miles into Berners Bay. The river deposits sand and silt, creating many sand bars scattered throughout the channel. The bottom strata are composed primarily of sand and silt. The water is silty and flows at a moderate rate with a gradient less than one percent. There is no canopy cover over this river, and predominant vegetation is Sitka alder, devils club, and grasses that grow along the west bank. Undercutting is prevalent along the bank, and the west bank includes many side sloughs. Small tributary streams (water runoff from uphill slopes) deposit fresh and clear water, creating excellent areas for fish rearing habitat.

There are no manmade obstructions downstream or upstream of the proposed bridge site. Natural obstructions are present both upstream and downstream in the form of sand and gravel bars. Sand and gravel bars are prevalent throughout the stretch of river at the proposed bridge crossing. This river is glacially fed, and no communities or bridges exist on the river between the crossing site and the Meade Glacier.

The Lace and Berners rivers are referred to as the Berners/Lace river(s) at times within this report as the river users in the Berners Bay area access the Berners River using the Lace River from Berners Bay. The Lace River and the Berners River are two separate rivers at their headwaters and converge approximately 3.25 miles from the river mouth. At the mouth of the river and the proposed bridge location this river is referred to as the Lace River.

Photograph 3-3: Lace River looking upstream, location unknown

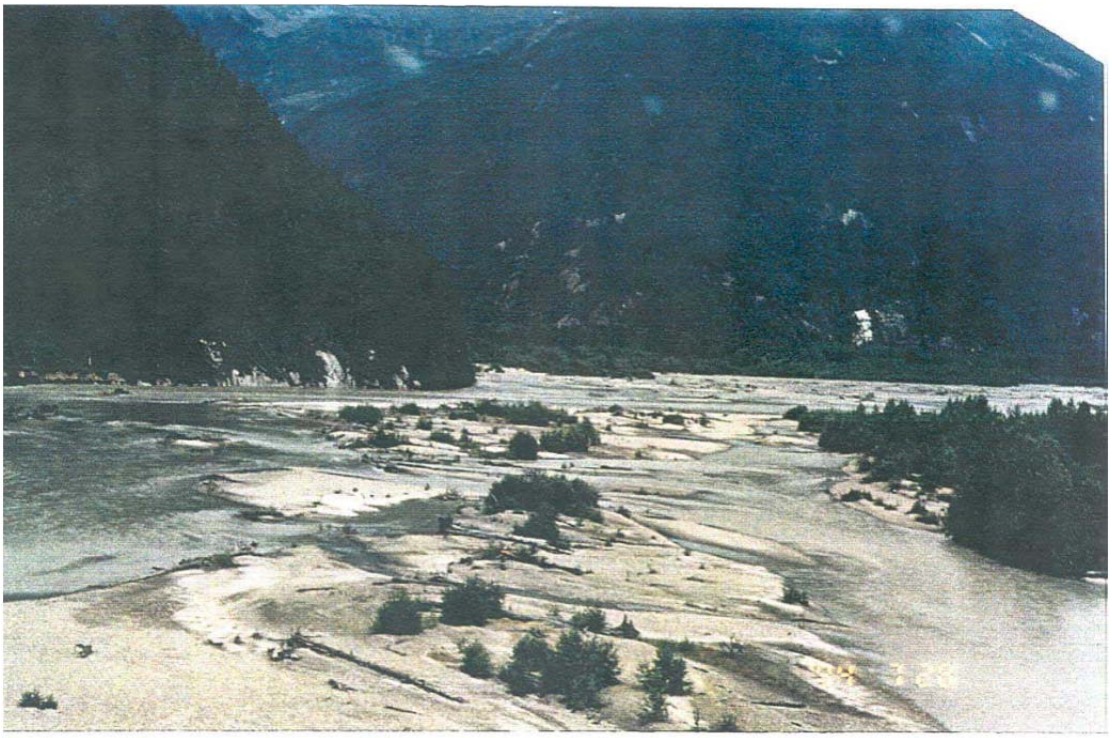
Figure 3–2: Berners, Lace, and Antler River Crossings

3.3 Antler River

The Antler River (Photograph 3-4; Figure 3–2) is a large braided river and is part of a classic glacial system that flows from the Antler Glacier. It is located at the north end of Berners Bay. This river is very silty and has a low to moderate velocity. Because of the silt deposition, sand bars are present throughout the stream. There are many trees that are overturned and lie across and in the river. The bottoms of the various channels are flat, and the substrate is composed of gravel, sand, and silt. The banks are highly vegetated and dominant vegetation includes Sitka alder, sedges, grasses, lupine, and Sitka spruce within the forested area.

According to Nick Yurko (Yurko, 2013), local boat user and member of the Alaska State Game Board, the Antler River main channel shifts at the south end of the bay. He estimates it has moved between 200 to 300 yards on the south side. The location of the main channel for the north side (Sugar Loaf) has remained fairly stable.

There are no manmade obstructions downstream or upstream of the proposed bridge site. Natural obstructions are present both upstream and downstream in the form of sand bars. Because of the silt deposition, sand bars are present throughout the river. Overturned trees are present in and across the river. According to a local boater, there have been some winters where ice dams build up near the Antler Lake, and when the dam breaks it floods the lower section, bringing whole trees through the area (Yurko, 2013). The debris and sand bars prohibit large vessels other than airboats or small jet boats from using the river. This river is glacially fed and no communities or bridges exist on the river between the crossing site and the Antler Glacier.



Photograph 3-4: Antler River looking upstream, note obstructed channel

3.4 Summary of Rivers and Obstructions Evaluation

. All three rivers evaluated are generally glacial systems with braided channels, heavy silt loads, and relatively shallow, tidally influenced depths. Large woody debris, and sand and gravel bars are prevalent, making vessel navigation on the rivers difficult and limited. The waters of the Katzehin, Lace, and Antler rivers are not used and are not susceptible to use in their natural condition or by reasonable improvement as a means to transport interstate or foreign commerce. Thus, the three rivers "*are not used or are not susceptible to use in their natural condition or by reasonable improvement as a means to transport interstate or foreign commerce"* as stated in 23 CFR 650.805(b)(1).

4. Boat Type and Access

The second criterion for bridges not requiring a USCG Permit (23 CFR 650.805(b)(2)) includes tidal waterways that are "*used only by recreational boating, fishing, and other small vessels less than 21 feet in length"* . The following section describes the general boat use in Berners Bay and the Katzehin River areas as well as specific information for each of the three rivers.

Generally, the Katzehin, Berners/Lace, and Antler rivers are located in undeveloped areas between Haines/Skagway and Juneau, Alaska, with property adjacent to the proposed bridge crossings owned by the U.S. Forest Service. The JAI 2006 FEIS notes that airboats are the largest and primary vessels on the Berners/Lace and Antler rivers. Vessel use on the Katzehin River was not described in the JAI 2006 FEIS. As very little information is available on boat usage in the three identified river systems, interviews were initiated with various entities that either have knowledge of or use the rivers. Documentation for each interview is found is Appendix B.

Based on recent interviews, the largest and primary vessels used on the Berners/Lace and Antler rivers continue to be airboats. Jet boats are the largest vessels known to be used on the Katzehin River. No waterway use as a means to transport interstate or foreign commerce has been documented, and no commercial operators utilizing motorized boats are known to access these rivers. Interviews conducted to date indicate the rivers are primarily accessed with smaller (20 feet or less) jet boats and airboats; however, there is one private airboat that is 26 feet in length, reportedly requires 11 feet of vertical clearance, and travels on the rivers in the Berners Bay area (Haffner, 2013). Currently, there are no known plans to improve the waterways to allow for navigation of larger vessels or improve access to support interstate or foreign commerce. No marinas, marine repair facilities, public boat ramps, or private docks are located on or within several miles of the three rivers, which may limit access and use of the rivers by potential users (primarily recreational users).

An Alaska airboat manufacturer was contacted to discuss general airboat specifications. Based upon a telephone interview with Randy Quincy of Airboat Wasilla (Quincy, 2013), one of Alaska's only airboat manufacturers for commercial and personal use vessels, the typical personal use airboat size is 16 to 18 feet long with a maximum height of 12 feet (Photograph 4–1). Airboat Wasilla has manufactured two boats known to reside in Juneau that are reportedly used by local moose hunters. Both boats were identified to be roughly 16.5 feet long, 7 feet wide, with a maximum height of 10 feet. Airboat Wasilla is currently constructing a personal use airboat that would be shipped to Petersburg that is also less than 18 feet long.

Photograph 4-1: Typical airboat used on Alaska river systems

Randy further stated that they have constructed commercial use airboats for rural communities that are 23 to 24 feet long, and he has seen airboats as long as 30 feet, but it was uncommon. A typical "large" airboat would range between 20 and 23 feet, and airboats, regardless of length, are not expected to exceed 12 feet in height. He further added that airboat usage in coastal areas

may be limited to shallow waters due to potential hazards such as deep waters and tidal influence. In deep or rough waters, airboats can become hard to navigate, take on water more readily, and have a greater tendency to flip (Foote and Reynolds, 1995).

Telephone interviews in Appendix B indicated that most airboats operating on the Berners/Lace and Antler rivers are 14 to 20 feet long, requiring up to 15 feet in vertical clearance, and jet boats operating on all three rivers are 16 to 18 feet long, requiring up to 8 feet in vertical clearance. The typical boat for all three rivers is less than 21 feet long, requiring vertical clearances between 8 and 15 feet. One 26-foot airboat was identified to operate in the Berners/Lace rivers and one 25-foot airboat is known to exist in the vicinity of Haines/Skagway; however, it is not currently used to access the Katzehin River (Turner and Haffner, 2013). During hunting season, boats longer than 21 feet were observed by Don in close proximity to the mouth of the Katzehin River. These boats are reported to be used as hunting camps, and smaller boats are then used to access the Katzehin River and surrounding hunting areas (Turner, 2013). Water depths at the proposed bridge crossing are not sufficient to support cabin cruisers or ocean fishing boats with a deep or semi-v hull except at high tide. Only smaller flat bottom jet boats or airboats could maintain stability at low tide at the proposed crossing location therefore the hunting camps are not expected to be compromised by the proposed bridge crossing.

4.1 Katzehin River

Appendix E of the *1997 Tongass Land Management Plan Revision, Final Environmental Impact Statement* (USFS, 1997), included an evaluation of the Katzehin River. The evaluation identifies the river as inaccessible and wild for the region. No boat access was identified; however, a USDA Forest Service (USFS) cabin (unmaintained) is present near the mouth of the river.

One private jet boat operator and two tour/guide services, all located in Haines, were interviewed related to usage in the Lynn Canal area including the Katzehin River:

- Don Turner, local contractor and private operator
- Don ‘Duck” Hesse, Chilkat River Adventures
- Al Gilliam, Alaska Cross Country Guiding and Rafting

Details from individual interviews are described in the following paragraphs and communication logs are located in Appendix B. All interviewed parties operate in the Katzehin River as well as other waterways in Lynn Canal. Currently there are no known commercial operators on the Katzehin River using motorized boats. Activities on the river include recreation, hunting, fishing, and trapping.

Don Turner (Turner, 2013), a local hunter and contractor in Haines, travels 8 to 9 miles up river to hunt moose with his 16-foot jet boat. Don said that approximately 4 to 5 people with jet boats hunt the area annually for moose, and that other folks hunted bear on the Katzehin flats near the river mouth. During hunting season, Don anchors his jet boat at the Katzehin River and travels back and forth by plane, as weather and tides can make safe travel across the canal via a small vessel a safety concern.

Don Turner remembers airboat usage in the past, but he has not seen a lot of airboat use in the Haines area in recent years. He also indicated he'd seen a 25-foot ocean boat(s), cabin cruisers and or fishing vessels, traveling into the first 0.25 mile of the Katzehin River during high tide. The boat(s) is reported to anchor in a protected area and is used as a hunting base camp for private hunting parties. Actual location of anchoring and number of boats was not known by Don. Based upon current bridge plans, the river conditions at the crossing location are not suitable for use by cabin cruisers and or fishing vessels.

Don "Duck" Hesse, Chilkat River Adventures (Hesse, 2013), has been a resident of Haines for approximately 50 years and operates river tours on the Chilkat River near Haines. Duck indicated that few people use the Katzehin River, as it is a wild river. He knows people who hunt the Katzehin Flats with 18-foot jet boats, but he did not think they traveled very far upriver.

Al Gilliam, Alaska Cross Country Guiding and Rafting (Gilliam, 2013), is also a long-time Haines resident operating tours on the Chilkat River. Al owns a 25-foot airboat, but currently does not operate it on the Katzehin River. He used to lead brown bear hunts in the vicinity of the Katzehin River, but due to current harvest limitations he no longer guides in the area.

Al indicated that locals from Haines traveled across the canal by plane or jet boat to hunt moose in the area. He also shared that there is a USFS cabin near the mouth of the Katzehin River with an airstrip (the airstrip and the cabin have recently been reported in disrepair). He suspected the jet boats were likely 20 feet or less in length. He added that people may use larger prop boats at high tide and anchor near the mouth and travel inland by small skiff. Al said he believed airboats could be and likely were used on calm days to access the Katzehin River across Lynn Canal. Al said a number of years ago there was a group of people from Skagway that would travel the coastline by airboat to the Katzehin River, but he does not have any current knowledge to suggest this still takes place.

In summary, based upon telephone interviews and an email from Wendy Steinberger of the Alaska Department of Natural Resources (ADNR; Steinberger, 2013), the primary users in the Katzehin River are hunters; however, it is possible that the area supports some recreational jet and airboat users. Of the interviewed users in the vicinity of Haines, small jet boats (< 21 feet long) were believed to be the primary vessels used (Hesse, 2013), although there was acknowledgment that airboat usage was possible only during calm weather. Many professionals and recreational users discussed the dangers of crossing Lynn Canal and operating airboats on ocean waters. Of the interviewed parties, one airboat longer than 21 feet operates out of the Haines area but is not currently using the Katzehin River (Gilliam, 2013). Some hunting parties may use larger boats (unknown how many) to access the first 0.25 mile from the mouth of the river. Based upon water depths at the crossing location, access at or beyond the crossing location would not be possible by cabin cruiser or fishing vessels typically used in ocean waters or deeper river systems. Currently there are no known commercial operators on the Katzehin River.

4.2 Berners/Lace Rivers

Historical research of the river systems by the ADNR indicates that the rivers in the Berners Bay area including the Berners, Lace, and Antler rivers were historically travelled by the Auk people using pole boats for berries and fish pre-statehood. Appendix E of the *1997 Tongass Land*

Management Plan Revision, Final Environmental Impact Statement (USFS, 1997), included an evaluation of the Berners River indicating that access to this area is "largely by airboat". The 2006 JAI FEIS evaluation of the Lace River does not discuss access; however, it does indicate that the Lace River area is highly valued for recreation and hunting.

Five airboat and one jet boat operators were interviewed related to usage in the Berners Bay area, including the Berners/Lace and Antler rivers:

- Kurt Miller, private operator who works for Alaska Department of Transportation and Public Facilities (DOT&PF) Marine Facilities
- Ron Haffner, private operator
- Mike Nizich, private operator
- Nick Yurko, private operator who serves on the Alaska State Game Board
- Horst Schram, private operator
- Bill Blackburn, private operator

Details from individual interviews are described in the following paragraphs and communication logs are located in Appendix B. All interviewed parties operate in the Berners/Lace and Antler rivers as well as other waterways in the Berners Bay area. Currently there are no known commercial operators on the Berners/Lace River using motorized boats. Activities on the river include recreation, hunting, fishing, and trapping.

Kurt Miller, DOT&PF Marine Facilities (Miller, 2013), was contacted as a known boat operator in the area and a person with local boating knowledge. Kurt has operated jet boats in the Berners/Lace and Antler rivers. Kurt owns two jet boats, 16 and 18 feet long, requiring roughly 8 feet of vertical clearance. Kurt further stated that generally boats using the rivers in the area are 20 feet or less in length. He said the rivers were shallow but you could get a 24-foot jet boat into the river; however, he is unaware of anyone using a jet boat that large in the river. He only knows of 40 to 50 jet boats and 12 airboats that use the Berners/Lace and Antler rivers. Kurt said to his knowledge there is no commercial traffic, as access in these areas is tidally influenced. A lot of operators travel into these rivers at high tide.

According to Kurt, the Lace River is very hard to navigate without an airboat, as the first 3 to 4 miles of the river are wide and shallow. The areas around the Lace River were used for moose hunting at one time, but as a result of a few hard winters, moose hunting in the vicinity of the Lace River has declined in recent years. Kurt expects that moose hunting may pick back up in the future in the areas surrounding the Berners/Lace rivers.

Ron Haffner (Haffner, 2013) owns the largest airboats identified using the Berners/Lace and Antler rivers, 20 and 26 feet long. Ron is not aware of anyone else operating airboats 20 feet or greater in size and is not aware of any commercial users on rivers in the Berners Bay area. Ron has a permitted cabin with the USFS on the Berners River.

Ron indicated that the Berners/Lace and Antler rivers were accessed mainly by airboat, but there were jet boats accessing the Antler River. Ron thought the Lace River was not suitable for jet

boat use. He believes there are approximately 12 people operating airboats and 20 operating jet boats on the rivers in the Berners Bay area.

Mike Nizich (Nizich, 2013) has a permitted cabin in the Berners Bay area and operates a 16-foot airboat, and his son operates an 18-foot airboat. Mike said that outboard jets are used on the rivers, but people have to arrive at high tide and leave before low tide to avoid being stranded. Mike indicated that small boats less than 20 feet long generally frequent the rivers in the vicinity of Berners Bay, with the exception of Ron Haffner's large airboat, which Mike indicated should need approximately 11 feet of vertical clearance.

Nick Yurko (Yurko, 2013) serves on the Alaska State Game Board and owns a 14-foot airboat that would need an 8-foot vertical clearance; his son-in-law has a 16-foot airboat. Nick used to operate jet boats in the area. Nick also has two float houses/cabins in the vicinity of the Berners/Lace rivers. The first float house is in Berners Bay and is on land at low tide. The second float house is roughly 5 miles up the Lace River. Both float houses are registered as boats through the State of Alaska, Department of Motor Vehicles. Nick uses a 22-foot-long aluminum runabout to access his float house on the incoming tide near the mouth of the Berners River, and his airboat is kept near his float house in Berners Bay, at the mouth of the Berners River.

Nick travels in the Berners/Lace rivers and surrounding areas 12 months out of the year and has been traveling in these river systems since the 1970s. Nick is an avid hunter and trapper in the area and said he uses his airboat like a snow machine in the winter. He noted that people rarely trap in the area, but he has been trapping wolves, wolverines, lynx, martens, and other animals since the 1970s.

Horst Schram (Schram, 2013) is a private airboat operator and owns a seafood processing facility in Juneau; he operates a 14-foot airboat in the Berners Bay area and has a USFS-permitted cabin on the Berners River. He also has a boat with an outboard prop that he uses in Berners Bay but not in the river systems. Horst accesses his cabin in the summer and fall and has been active in the Berners Bay river systems since 1972. Horst uses the river systems for hunting and fishing and is unaware of any commercial operators on the rivers in the Berners Bay area.

Bill Blackburn (Blackburn, 2013) operates a 15-foot airboat in the Berners Bay area rivers and would like to see at least 15 feet of vertical clearance for the proposed bridge crossings at high water. He hunts and camps in the Berners Bay area.

In summary, all interviewed parties operate jet boats and airboats between 14 and 20 feet long, with the exception of Ron Haffner's 26-foot airboat. Parties identified between 8 and 15 feet in desired vertical clearance to ensure safe travel under proposed bridge crossings at high water. Local knowledge of airboat use dates back to the 1950s with Ron Haffner's family, and most of the interviewed parties have been living and operating in Berners Bay since the 1970s.

4.3 Antler River

Historical research of the river systems by the ADNR indicates that the rivers in the Berners Bay area, including the Berners/Lace and Antler rivers, were historically travelled by the Auk people

using pole boats. Appendix E of the *1997 Tongass Land Management Plan Revision, Final Environmental Impact Statement* (USFS, 1997), included an evaluation of the Antler River indicating current access by canoe and airboat.

The following information includes similar dialog used to describe boat use on the Berners/Lace rivers, as the same operators and types of vessels are used in those river systems.

Five airboat and one jet boat operators were interviewed related to usage in the Berners Bay area, including the Berners/Lace and Antler rivers:

- Kurt Miller, DOT&PF Marine Facilities and private operator
- Ron Haffner, private operator
- Mike Nizich, private operator
- Nick Yurko, private operator who serves on the Alaska State Game Board
- Horst Schram, private operator
- Bill Blackburn, private operator

Details from individual interviews are described in the following paragraphs and communication logs are located in Appendix B. All interviewed parties operate in the Berners/Lace and Antler rivers, as well as other waterways in the Berners Bay area. Currently there are no known commercial operators on the Antler River using motorized boats. Activities on the river include recreation, hunting, fishing, and trapping.

Kurt Miller, DOT&PF Marine Facilities (Miller, 2013), was contacted as a known boat operator in the area and a person with local boating knowledge. Kurt has operated jet boats in the Berners/Lace and Antler rivers. Kurt owns two jet boats, 16 and 18 feet long, requiring roughly 8 feet of vertical clearance. Kurt further stated that generally, boats using the rivers in the area are 20 feet or less in length. He said the rivers were shallow, but you could get a 24-foot jet boat into the river; however, he is unaware of anyone using a jet boat that large in the river. He only knows of 40 to 50 jet boats and 12 airboats that use the Berners/Lace and Antler rivers. Kurt said to his knowledge there is no commercial traffic, as access in these areas is tidally influenced. A lot of operators travel into these rivers at high tide.

Ron Haffner (Haffner, 2013) owns the largest airboats identified using the Berners/Lace and Antler rivers, 20 and 26 feet long. Ron is not aware of anyone else operating airboats 20 feet or greater in size and is not aware of any commercial users on rivers in the Berners Bay area. Ron has a permitted cabin with the USFS on the Berners River.

Ron indicated that the Berners/Lace and Antler rivers were accessed mainly by airboat, but there were jet boats accessing the Antler River. Ron thought the Lace River was not suitable for jet boat use. He believes there are approximately 12 people operating airboats in the area and maybe another 20 operating jet boats. Ron indicated that jet boats accessed the Antler River because there was a deeper channel than in the Berners/Lace rivers.

Mike Nizich (Nizich, 2013) has a permitted cabin in the Berners Bay area and operates a 16-foot airboat, and his son operates an 18-foot airboat. Mike said that outboard jets are used on the

rivers, but people have to arrive at high tide and depart before low tide to avoid being stranded. He recalls that in the 1970s a prop boat could be used in the Antler River, but the channel has filled since then, making it shallow and difficult to navigate prop boats. Mike believes jet boats may be used more on the Antler River than on the Berners/Lace rivers as the channel is faster and deeper at the mouth. Mike indicated that small boats less than 20 feet long generally frequent the area rivers, with the exception of Ron Haffner's large airboat.

Nick Yurko (Yurko, 2013) serves on the Alaska State Game Board and owns a 14-foot airboat that would need an 8-foot vertical clearance; his son-in-law has a 16-foot airboat. Nick used to operate jet boats in the area. Nick also has two float houses/cabins in the vicinity of the Berners/Lace rivers. The first float house is in Berners Bay and is on land at low tide. The second float house is roughly 5 miles up the Lace River. Both float houses are registered as boats in navigable waters. Nick uses a 22-foot-long aluminum runabout to access his float house on the incoming tide near the mouth of the Berners River, and his airboat is kept near his float house in Berners Bay, at the mouth of the Berners River.

Nick travels in the Berners/Lace rivers and surrounding areas 12 months out of the year and has been traveling in these river systems since the 1970s. Nick is an avid hunter and trapper in the area and said he uses his airboat like a snow machine in the winter. He noted that people rarely trap in the area, but he has been trapping wolves, wolverines, lynx, martens, and other animals since the 1970s.

Nick noted that a jet boat could operate in the Antler River until freeze-up and that he used to use a jet boat for hunting and trapping in the area. Most people traveling into the Antler River go roughly 3 miles upstream to the split between the Antler and Gilkey rivers.

Horst Schram (Schram, 2013) is a private airboat operator and owns a seafood processing facility in Juneau; he operates a 14-foot airboat in the Berners Bay area and has a USFS-permitted cabin on the Berners River. He also has a boat with an outboard prop that he uses in Berners Bay but not in the river systems. Horst accesses his cabin in the summer and fall and has been active in the Berners Bay river systems since 1972. Horst uses the river systems for hunting and fishing and is unaware of any commercial operators on the rivers in the Berners Bay area.

Bill Blackburn (Blackburn, 2013) operates a 15-foot airboat in the Berners Bay area rivers and would like to see at least 15 feet of vertical clearance for the proposed bridge crossings at high water. He hunts and camps in the Berners Bay area.

In summary, all interviewed parties operate jet boats and airboats between 14 and 20 feet long, with the exception of Ron Haffner's 26-foot airboat. Parties identified between 8 and 15 feet in desired vertical clearance to ensure safe travel under the proposed bridge crossings. Local knowledge of airboat use dates back to the 1950s with Ron Haffner's family, and most of the interviewed parties have been living and operating in Berners Bay since the 1970s.

4.4 Summary of Boat Type and Access

Based on interviews, the largest and primary vessels used on the Berners/Lace and Antler rivers are airboats. Jet boats are the largest vessels used on the Katzehin River. No commercial

operators utilizing motorized boats are known to access these rivers. Interviews conducted to date indicate the rivers are accessed primarily with smaller (20 feet or less) jet boats and airboats for recreation, hunting, and fishing. The one private airboat that is 26 feet long reportedly requires 11 feet of vertical clearance, and travels on the rivers in the Berners Bay area. Thus, the three tidal rivers are "*used only by recreational boating, fishing, and other small vessels less than 21 feet in length*" as stated in 23 CFR 650.805(b)(2).

5. Hunting, Fishing, and Recreation

Hunting, fishing and recreation were also evaluated to assess the use of the rivers as tidal waters "*used only by recreational boating, fishing, and other small vessels"* under USCG jurisdiction (23 CFR 650.805(b)(2)). The following section describes the documented uses in Berners Bay and the Katzehin River areas.

Based upon available information, only one registered hunting guide is listed in Guide Use Area 01-04, Juneau and the surrounding project vicinity (ADCCED, 2013a, 2013b). This guide is based out of Haines, Alaska; however, he does not hold a permit with the USFS to lead guided hunts in the Tongass National Forest, for which the Berners/Lace, Antler, and Katzehin rivers are access points.

The USFS Special Use Supervisor in Juneau, Jennifer Berger (Berger, 2013), was contacted regarding general river use and known guide operations, as the USFS issues permits for guided operations on lands they manage. Jennifer indicated that there were some kayak guides in the area, Above and Beyond and Alaska Discovery, that were currently guiding sightseeing tours. She indicated that the guides may use the Berners/Lace and Antler rivers, but the USFS has not permitted commercial use on the Katzehin River.

Other groups Jennifer identified as potential users of the Berners/Lace or Antler rivers include:

- Echo Ranch Bible Camp – Hiking and Canoe trips in Berners Bay area
- University of Alaska - Fairbanks Outdoor Leadership Class – Unknown where these classes are held
- Sea Runner Guide Service – Freshwater fishing guides
- Bear Creek Outfitters – Verified Antler fly in operation

Jennifer indicated that no one with a permit from the USFS was doing guided hunts within the Tongass National Forest in the upper Lynn Canal and Berners Bay areas. Some of the USFS Cabin Permit holders have jet or airboats that they use on some of the waterways in the Tongass National Forest. The USFS has a proposal from someone who is considering a jet boat sightseeing tour operation on the Lace River. The gentleman is just getting started and plans on operating a 19-foot jet boat on the Lace River with trips to include 1 to 2 people per trip, with 4 to 5 trips annually.

According to Wendy Steinberger (Steinberger, 2013) of the ADNR, all of the Berners Bay rivers are currently used by jet and airboats to access hunting and fishing grounds. Wendy further noted that she knows of several people who currently utilize the Berners/Lace and Antler rivers

for moose, deer, and bear hunting from Echo Cove. In 1997 when she was working in Haines, she noted that one of the locals took his jet boat over to the Katzehin River to go hunting.

A review of internet sources did not identify commercial or guided fishing operations on the Katzehin, Berners/Lace, or Antler rivers; however, local fishing guides and professionals were contacted to verify expected usage. The president of the Juneau Charter Boat Operators, Kevin Burchfield (Burchfield, 2013), was contacted regarding fishing charter use of these rivers. Kevin indicated that currently there were no charter operations on these rivers; however, there could be some fly fishing guides.

In a telephone conversation with Brad Elfers (Elfers, 2013), owner of Alaska Fly Fishing Goods in Juneau, he indicated he was not aware of any fly fishing guides operating on the Berners/Lace or the Antler rivers who accessed the area by boat. He further stated that the Antler River would be the only one of the three rivers he felt would be suitable for fly fishing. Brad stated that Bear Creek Outfitters operates on the Antler River, but they fly in and hike to the river. He expects that individuals may access the rivers with personal boats, but did not feel that a jet boat longer than 20 feet could access the Berners/Lace or Antler rivers safely.

Greg Schlachter (Schlachter, 2013), a fly fishing guide from Haines, Alaska, indicated he did not lead fly fishing trips on the Katzehin, Berners/Lace, or Antler rivers. He stated that he did not know of anyone guiding on the Katzehin River, but that he knew some local hunters who used the river. The boats he has seen using the area are primarily 18-foot jet boats, but airboats may be able to access.

Several private boat users for the Katzehin, Berners/Lace, and Antler rivers were interviewed to help identify additional usage of the river systems (Haffner, 2013; Schram, 2013; Yurko, 2013). Three of the parties interviewed held permits from the USFS for cabins, and one person operated two float houses on the Berners River. These parties all operate airboats and indicated they use the cabins recreationally and during hunting season.

Some travel by other small watercraft such as kayaks, rafts, and canoes occurs on these waterways; however, these vessels are small in size. Due to the braided nature of these rivers, presence of sand and gravel bars, shallow depths, and presence of large woody debris, navigation is likely challenging for all vessels.

5.1 Summary of Hunting, Fishing and Recreation

Based on internet searches and interviews with resource agencies, local businesses and private boat users operating within the project vicinity there is only one known airboat that exceeds 21 feet in length. This airboat operates in the vicinity of Berners Bay and requires 11 feet of vertical clearance. No boats over 21 feet in length are known to access the Katzehin River. In addition, no commercial operators or licensed hunting/fishing guides were identified that use the rivers in the Berners Bay area or the Katzehin River. Thus, the three tidal rivers are "*used only by recreational boating, fishing, and other small vessels less than 21 feet in length*" as stated in 23 CFR 650.805(b)(2).

6. Emergency Response and Patrol

Emergency response and patrol use of the three rivers evaluated to assess the use of the rivers as tidal waters "*used only by recreational boating, fishing, and other small vessels"* (23 CFR 650.805(b)(2)). The USFS, Alaska State Troopers, Alaska Wildlife Troopers, and Juneau Fire and Rescue were interviewed, and discussions are summarized below. Communication logs for the interviews are in Appendix B.

Jennifer Berger of the USFS (Berger, 2012) indicated that emergency rescue in the vicinity was typically conducted by the Alaska State Troopers, Sea Dogs, or the Juneau Mountain Rescue. Most calls that are located on USFS-managed lands go into the Alaska State Troopers.

Jennifer indicated that the USFS does not travel on the Katzehin River but may use the Berners/Lace or Antler rivers. The USFS typically uses small jet boats (less than 19 feet) on the Berners/Lace, Antler, and other waterways, as necessary. They access the Katzehin only by helicopter.

The Alaska State Troopers (Birt, 2013) were contacted regarding emergency rescue in the vicinities of Haines and Juneau. The troopers verified they were the appropriate emergency responders for the area and that they may use a public safety vessel, a 16- to 18-foot jet boat, if practical. The troopers may also have a local volunteer with an airboat assist with their efforts, if available. The troopers in Haines could not recall a rescue in more than a year and in Juneau there had not been a water rescue in 3 years.

According to the troopers, they sometimes use Sea Dogs or Alaska Mountain Rescue, but Sea Dogs did not operate boats in the river systems and Alaska Mountain Rescue was land-based. Most access by the troopers in the vicinity of Berners Bay is done by aircraft. The troopers also indicated that the USCG only conducts air rescues in the areas around Juneau or Haines.

Alaska Wildlife Troopers patrol the rivers in the Haines area; however, based upon a conversation with Trooper VanSpronsen (VanSpronsen, 2013), patrol of the Katzehin River is infrequent. If the wildlife troopers were to travel on this river it would be by 18-foot jet boat.

Juneau Fire and Rescue was contacted by email and indicated they do not operate on these rivers.

6.1 Summary of Emergency Response and Patrol

Based upon telephone interviews and email responses emergency response and patrol in the areas are conducted primarily by air in the vicinity of the Katzehin River and Berners Bay; however, some small jet boats less than 19 feet in length are used, if appropriate. Thus, the three tidal rivers are "*used only by recreational boating, fishing, and other small vessels less than 21 feet in length*" as stated in 23 CFR 650.805(b)(2).

7. Descriptions of Bridges

Bridges for the three river crossings were preliminarily designed as part of the 2006 FEIS. Minor modifications have occurred to the overall alignment of Alternative 2B; however, these changes have not affected the basic bridge design components. Descriptions of the proposed bridges and

river conditions at the bridge site are further described in the following sections and in Table 7-1 for each crossing location.

Table 7-1: Waterway and proposed bridge characteristics at proposed bridge site

Characteristics (in feet)	Katzehin River	Lace River	Antler River
Mean Tidal Range	14.11 at the Haines/Skagway Station (closest recorded location) [a]	13.74 at Juneau Station (closest recorded location) [b]	13.74 at Juneau Station (closest recorded location) [b]
Mean Diurnal Tidal Range	16.73	16.31	16.31
Elevation of Mean High Water (MHW)	15.8	14.7	14.7
Elevation of Extreme High Tide (EHT)	21.2	21.3	21.3
Vertical clearance from MHW (main navigational channel)	17 minimum	18 minimum	18 minimum
Vertical clearance from EHT (main navigational channel)	11 minimum	17 minimum	12 minimum
Horizontal clearance+	140	140	140 for most spans and approximately 236 at the main channel.
Length of bridge	2,600	2,881	2,762
Width of bridge	33	33	33
Width of waterway^	2,820	2,650	2,600

+ Horizontal clearance is measured from face of pile to face of pile.
^ Width of waterway is measured from ordinary high water (OHW) to OHW.
[a]Source: NOAA, 2013a.
[b]Source: NOAA, 2013b.

7.1 Katzehin River

At the proposed bridge crossing of the Katzehin River, the gradient of the river was 2 percent, and as this waterway is tidally influenced, depth will vary based upon tidal stage. The total width of the braided system from OHW to OHW is approximately 2,820 feet. The water was characterized as silty and flowing at a low velocity. The substrate was fairly uniform and composed of silt and gravel. Pools were observed, and large woody debris was scattered on the banks and in the river. There was evidence of flooding along the banks, but in general banks were identified as fairly stable, composed of gravel and silt. The predominant vegetation at the time of inspection was Sitka spruce, Sitka alder, western hemlock, and herbaceous vegetation. There was no vegetation coverage over the river.

The proposed Katzehin River Bridge is 2,600 feet long, with 144-foot spans supported by 19 piers. Each pier would consist of three 4-foot-diameter steel piles that would be placed in line with the river flow. The north abutment would extend 100 feet beyond open high water, leaving the stream bank intact, providing passage for wildlife, and avoiding impacts to riparian

vegetation. Approximately 2.6 acres of floodplain would be filled for the approach at the south abutment. Bridge supports would be spaced and designed to accommodate the predicted 100-year flood volume with no more than a 1-foot rise in backwater. Bridge drawings were not specifically prepared for the Katzehin River but are similar to those prepared for the Lace River (Appendix A).

7.2 Lace River

At the proposed bridge crossing, the main channel of the Lace River splits and flows around a small island; the channels at the time of survey were approximately 400 feet to either side of the island. Since this waterway is tidally influenced, actual depth would range based upon tidal stage. The total width of the braided system from OHW to OHW is approximately 2,650 feet. The bottom stratum was composed primarily of sand and silt, which was identified as feeling and looking like the consistency of mud. Sand bars and riffles were observed.

The proposed bridge for the Lace River is 2,881 feet long, with 144-foot spans supported by 19 piers. Each pier consists of three 4-foot-diameter steel piles placed in line with the river flow. Abutments and riprap armoring would be placed at least 50 feet back from the stream bank to minimize disturbance to the banks and to provide passage for wildlife. Bridge supports would be spaced and designed to accommodate the predicted 100-year flood volume with no more than a 1-foot rise in backwater. The 2006 preliminary bridge plan sheets are shown in Appendix A.

7.3 Antler River

The river at the proposed bridge crossing had morphology similar to that of the overall stream at the time of the 1994 field surveys. The substrate was uniform and composed of gravel, sand, and silt. There were side sloughs with low water velocities within the bridge crossing area, and rearing fish were noted. Since this waterway is tidally influenced, actual depth would range based upon tide stage. The braided channel of the Antler River is approximately 2,600 feet wide from OHW to OHW. Large woody debris, pools, and undercut banks were identified in the vicinity of the crossing location.

The total bridge length at the Antler River is approximately 2,762 feet, which currently includes a total of 17 piers from abutment to abutment, spanning a wide, shallow, braided river. Since this waterway is tidally influenced, depth would range based upon tidal stage. The entire bridge structure crosses multiple channels and low areas in the surrounding uplands to allow for wildlife movement and to minimize fill in wetlands.

Each pier would consist of three 4-foot-diameter steel piles placed in line with the river flow. Abutments and riprap armoring would be placed at least 50 feet back from the stream banks to minimize disturbance to the banks and to provide passage for wildlife. Bridge supports would be spaced and designed to accommodate the predicted 100-year flood volume with no more than a 1-foot rise in backwater. The main channel of the Antler River, identified as the Eulachon Channel, has approximately 236 feet of horizontal clearance and generally represents the deepest point in the Antler River. The 2006 preliminary bridge plan sheets are shown in Appendix A.

7.4 Summary of Bridges

Currently, there are no known plans to improve the waterways to allow for navigation of larger vessels or improve access to support interstate or foreign commerce. No marinas, marine repair facilities, public boat ramps, or private docks are located on or within several miles of the three rivers, which may limit access and use of the rivers by potential users (primarily recreational users). Planned vertical and horizontal clearances at MHW and EHT at the Katzehin, Lace and Antler rivers provide sufficient navigational openings for vessels known to travel in the vicinity of Berners Bay and the Katzehin River.

8. Conclusion

The JAI Project Alternative 2B would cross three rivers identified as possible navigable waters requiring a Section 9 Bridge Permit: Katzehin, Lace, and Antler rivers. Based on river conditions, current vessel usage and anticipated bridge heights at the proposed crossing locations, it is not anticipated that USCG Section 9 Bridge Permits under the Rivers and Harbors Act/General Bridge Act would be necessary per 23 CFR 650 and 33 CFR 115.

Based on the information collected to date, the Katzehin, Lace, and Antler rivers are tidal rivers used predominantly by recreational boating, fishing, and other small vessels that are less than 21 feet long. As covered in the summaries above, per 23 CFR 650.805 the Katzehin, Lace and Antler rivers are not expected to require a Bridge Permit from the USCG under Section 9 of the Rivers and Harbors Act/General Bridge Act.

In the event the Lace and Antler rivers are determined to require a Bridge Permit as a result of the identified 26-foot airboat using the Berners Bay area rivers, under 33 CFR 115.70 the Commandant has granted advanced approval of bridges that are "*constructed across reaches of waterways navigable in law, but not actually navigated other than by logs, log rafts, rowboats, canoes and small motorboats. In such cases the clearances provided for high water stages will be considered adequate to meet the reasonable needs of navigation*". As the 26-foot boat is not a cabin cruiser and would only require 11 feet of vertical clearance for passage, the proposed bridges at the Lace and Antler rivers would provide more than adequate clearance at MHW (minimum of 18 feet at both rivers) and EHT (minimum 17 feet at the Lace and minimum of 12 feet at the Antler rivers).

33 CFR 115.70 further defines small motor boats as "*rowboats, canoes and other similar craft with outboard motors. It does not include sailing or cabin cruiser craft.*" As sail boats and cabin cruisers were not identified to use the rivers in the Berners Bay area, they would be subject to advanced approval and would not require a Bridge Permit prior to construction.

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Appendix A
Bridge Plans

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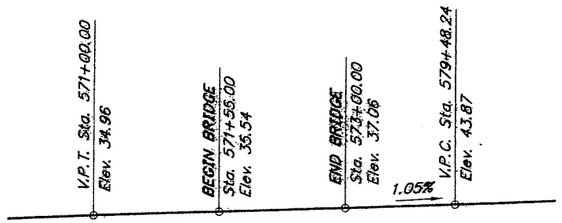
STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	NH-HPRL-093-3(33)/68937	2006	N21	232



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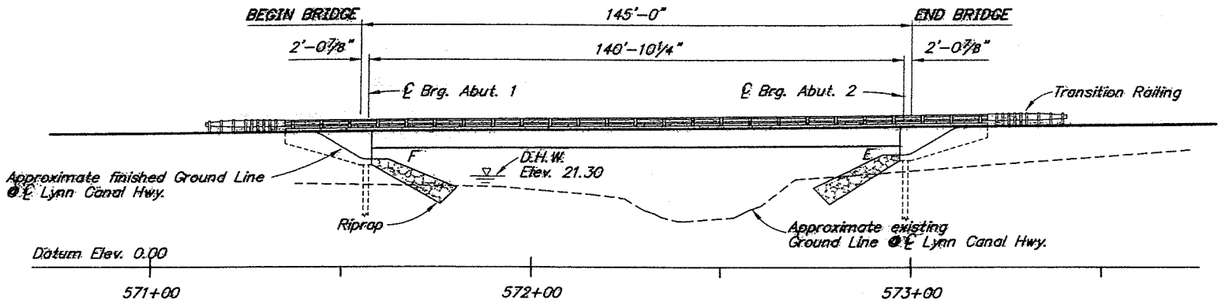

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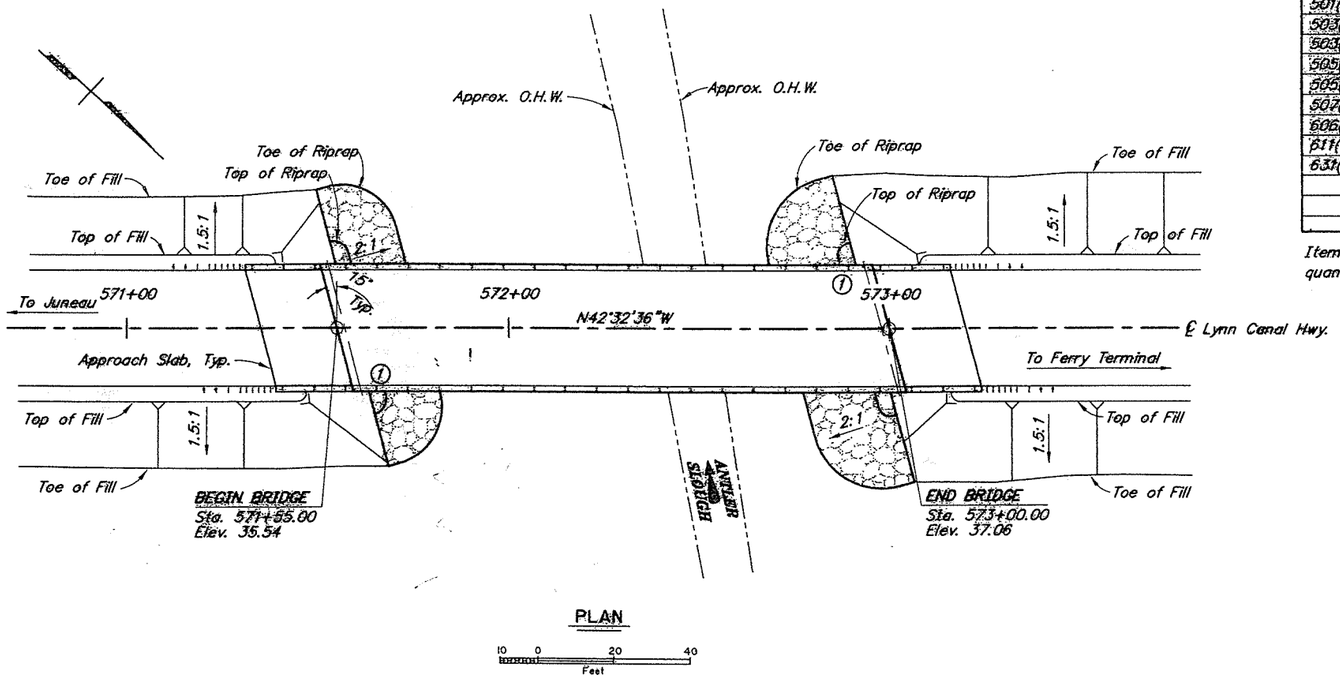

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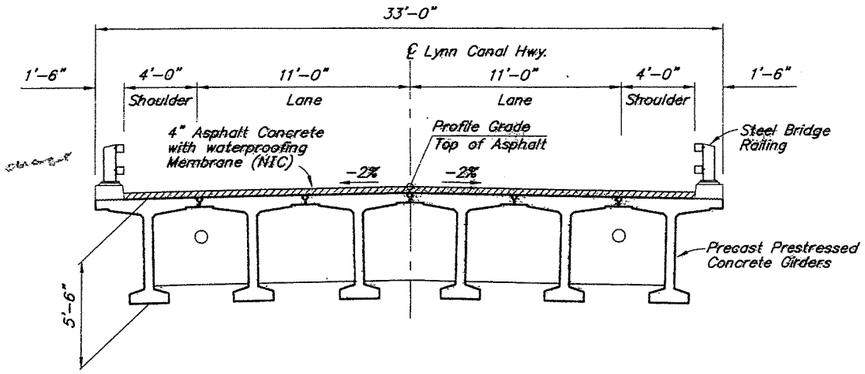

TYPICAL SECTION

12 0 4 8
In. Feet

BRIDGE BASIS OF ESTIMATE

ITEM NO.	ITEM	PAY UNIT	ESTIMATING UNIT	SUBST.	SUPERST.	TOTAL
205(3)	Foundation Fill	CY	CY	850	———	850
501(1)	Class A Concrete	LS	CY	104.4	54.9	159.3
501(2)	Class A-A Concrete	LS	CY	———	46.0	46.0
501(7B)	Precast Concrete Member (143' Decked Bulb-Tee)	EA	EA	———	6	6
503(1)	Reinforcing Steel	LS	LBS	33,245	———	33,245
503(2)	Epoxy-Coated Reinforcing Steel	LS	LBS	3230	12,475	15,710
505(5B)	Furnish Structural Steel Piles - 2'-0"ø	LF	LF	1092.9	———	1092.9
505(6B)	Drive Structural Steel Piles - 2'-0"ø	EA	EA	12	———	12
507(1)	Steel Bridge Railing	LF	LF	———	370.0	370.0
606(12)	Guardrail / Bridge Rail Connection	EA	EA	———	4	4
611(1)	Riprap, Class II	CY	CY	550	———	550
631(2)	Geotextile, Erosion Control, Class 1	SY	SY	750	———	750

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

BRIDGE DRAWING INDEX

① Approximate location of Bridge Number Plate.

DESIGNED BY: Elmer Marx	CHECKED: Peter Glessel	LAYOUT BY: Elmer Marx	CHECKED BY: Peter Glessel
DRAWN BY: Sam Sollie	CHECKED: Elmer Marx	SPECIFICATIONS BY: Elmer Marx	P S & E COMPARED: Peter Glessel
QUANTITIES BY: Elmer Marx	CHECKED: Peter Glessel	APPROVAL RECOMMENDED BY:	Rich Pratt

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
BRIDGE SECTION

STATE OF ALASKA 49TH
Elmer E. Marx III
No. CE 9490
9/19/06
REGISTERED PROFESSIONAL ENGINEER

ANTLER SLOUGH BRIDGE
LYNN CANAL HIGHWAY
GENERAL LAYOUT

BRIDGE NO. 2165
DWG. NO. 1

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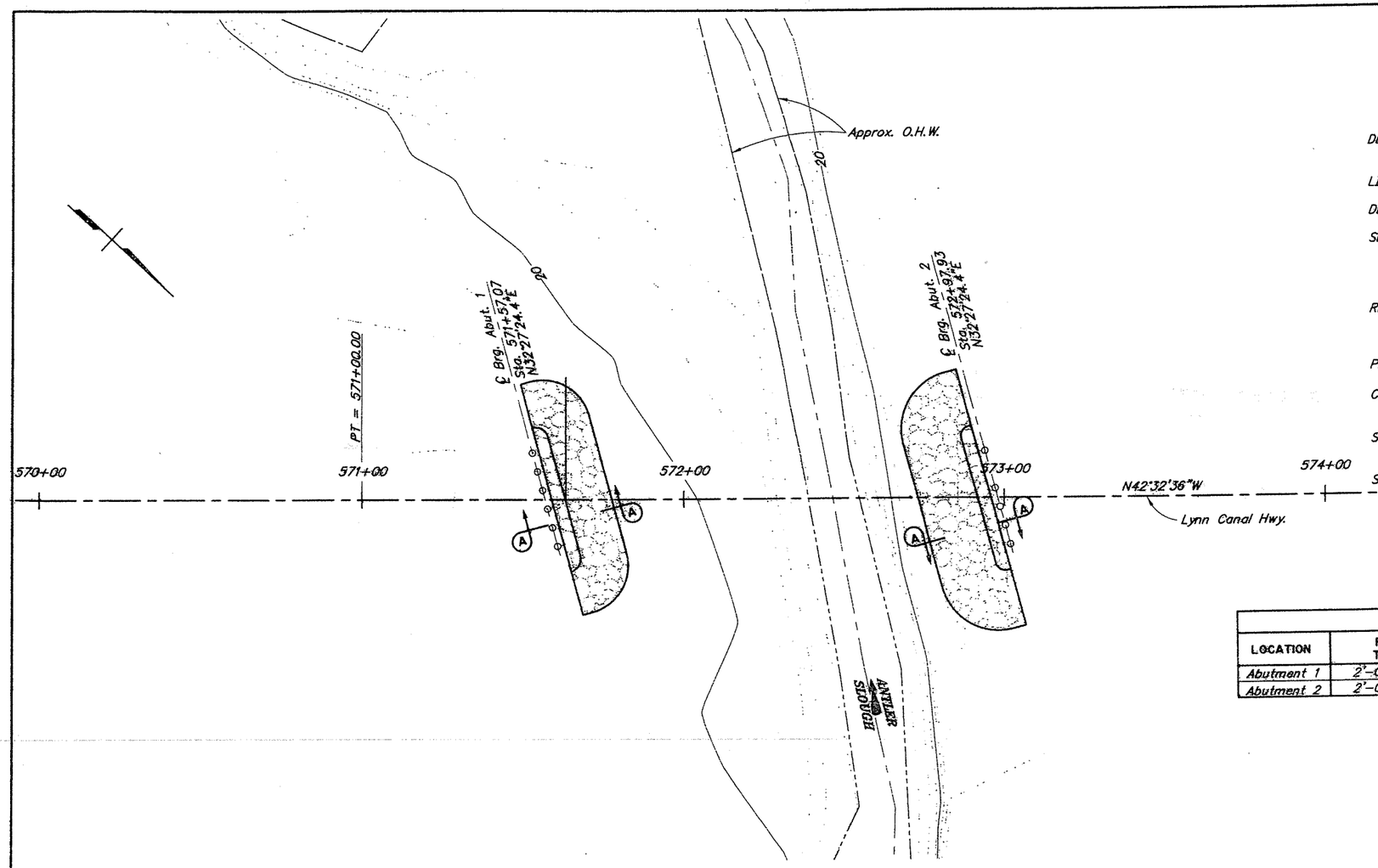
STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	NH-HPRL-093-3(33)/68937	2006	N22	232



SITE PLAN

10 0 20 40
Feet

GENERAL NOTES

DESIGN: ..... AASHTO LRFD Bridge Design Specifications, Third Edition, 2004, with latest interim specifications.

LIVE LOAD: HL-93

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

SEISMIC PARAMETERS: ..... Acceleration Coefficient, a = 0.2 g
Site Coefficient, s = 1.5
Liquefaction Potential = moderate
AASHTO 90% probability of not being exceeded in 50 years.

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

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

CONCRETE: ..... Use Class A Concrete unless otherwise noted, f'c = 4000 psi.
Use Class A-A Concrete for approach slab, f'c = 5000 psi.

STRUCTURAL STEEL: ..... Use ASTM A709, Grade 36. Fy = 36,000 psi.
Unless otherwise noted.

STRUCTURAL STEEL PILING: ..... Use API 5L X52 PSL2, Fy = 52,000 psi for Pipe Piles.
Pile Tip reinforcing is required.

PILE TABLE

LOCATION	PILE TYPE	ESTIMATED BEDROCK ELEVATION, FT.	MINIMUM TIP ELEVATION, FT.	ESTIMATED TIP ELEVATION, FT.	DESIGN LOAD, kips	ULTIMATE LOAD, kips
Abutment 1	2'-0"ø x 1/2"	>230	-18.0	-64.0	240	720
Abutment 2	2'-0"ø x 1/2"	>230	-18.0	-64.0	240	720

HYDRAULIC & HYDROLOGIC SUMMARY

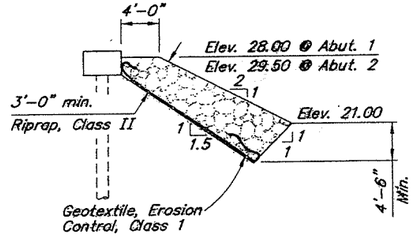
Flood Frequency (Yr.)	50	100	500	EHT[1]
Exceedance Probability (%)	2	1	0.2	
Design Discharge (ft³/sec)	919	1830	1300	
Design High Water (ft)	17.87	18.1	18.6	21.30
Anticipated Add'l Backwater (ft)	0.0	0.0		
Contraction Scour (ft)		0.0	0.0	
Abutment Scour (ft)		n.c.	n.c.	
Pier Scour (ft)		n.a.	n.a.	

Drainage Area for this crossing: 3.1 square miles.

Hydraulic Capacity: 10,200 cfs at Low Superstructure Elevation 29.4 which has an exceedance probability of equal to or less than 0.2 percent.

Total scour equals contraction scour + local scour.

1 - Extreme High Tide Governs for Design High Water (DHW)



SECTION A-A

12 0 4 8 12
In. Feet

ABBREVIATIONS

℄	= Centerline	kip	= thousand pounds
ℙ	= Plate	ksf	= kips per square foot
&	= and	Lt.	= left
@	= at	max.	= maximum
ø	= diameter	min.	= minimum
A/C	= asphalt concrete	n.a.	= not applicable
Approx.	= approximate	n.f.	= near face
Abut.	= Abutment	NIC	= not in contract
bot.	= bottom	No.	= number
Br.	= bridge	n.c.	= not calculated
btwn.	= between	O.H.W.	= Ordinary High Water
Brg.	= Bearings	psf	= pounds per square foot
C.I.P.	= cast in place	psi	= pounds per square inch
CdP	= complete joint penetration	R.O.W.	= right of way
Clr.	= clear, clearance	Rt.	= right
D.H.W.	= design high water	S.I.P.	= stay in place
dia.	= diameter	spc.	= space, spaces
Dwg.	= drawing	Sta.	= station
Elev.	= elevation	Symm.	= symmetric
e.f	= each face	Typ.	= typical
E	= expansion bearing	UT	= ultrasonic testing
F	= fixed bearing	Yr.	= year
f.f.	= far face	w/	= with
ft.	= feet		
Hwy.	= highway		
Jt.	= joint		

DESIGNED BY: Elmer Marx	CHECKED: Peter Glassel	HYDRAULICS BY: Mark Miles	CHECKED BY: Alana Castle
DRAWN BY: Sam Sollie	CHECKED: Elmer Marx	FOUNDATIONS REVIEWED BY: Bruce Brunette	
QUANTITIES BY: Elmer Marx	CHECKED: Peter Glassel		

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
BRIDGE SECTION

STATE OF ALASKA 49TH
Elmer E. Marx III
No. CE 9490
5/19/06
REGISTERED PROFESSIONAL ENGINEER

ANTLER SLOUGH BRIDGE

LYNN CANAL HIGHWAY

SITE PLAN

BRIDGE NO. 2165

DWG. NO. 2

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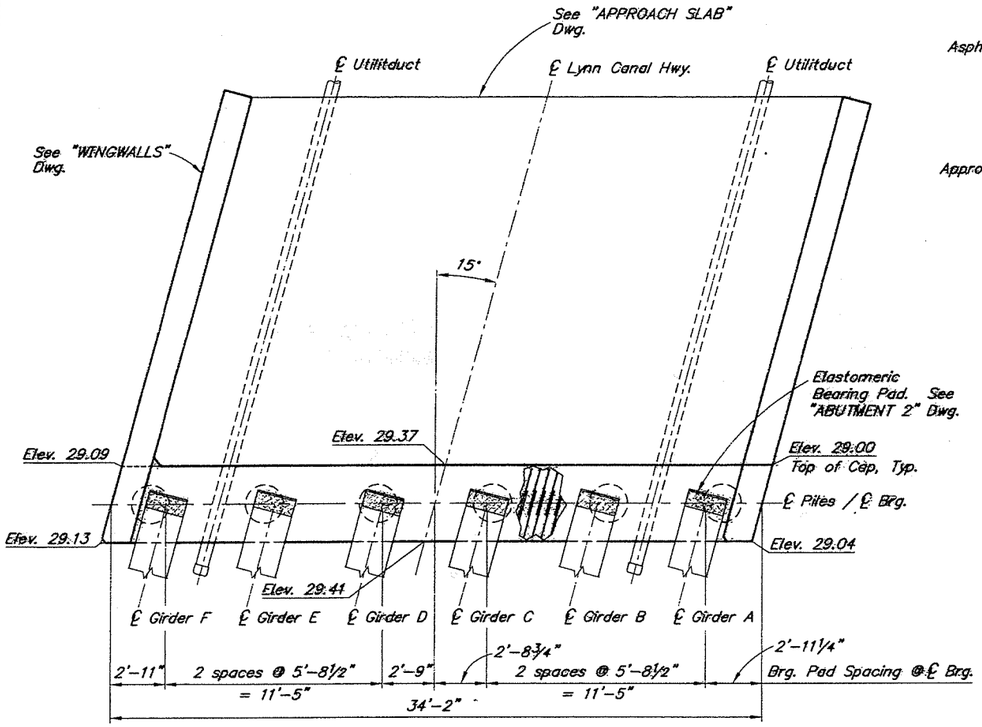
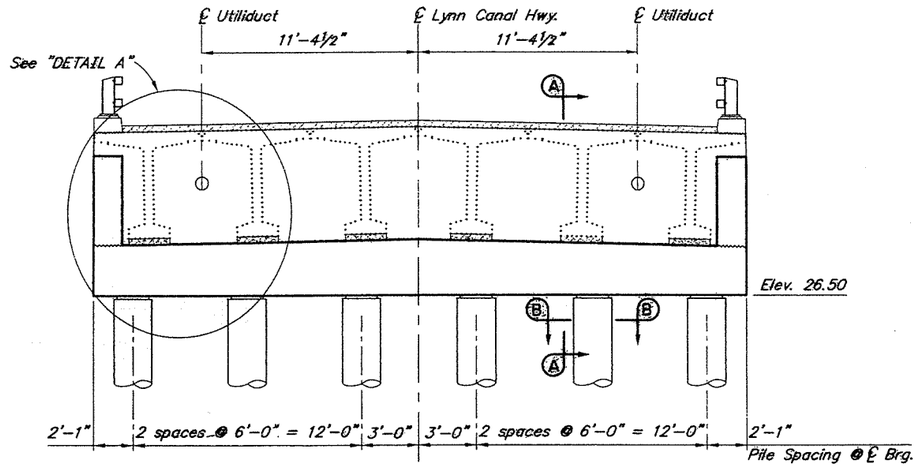
STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	NH-HPRL-093-3(33)/68937	2006	N23	232



PLAN

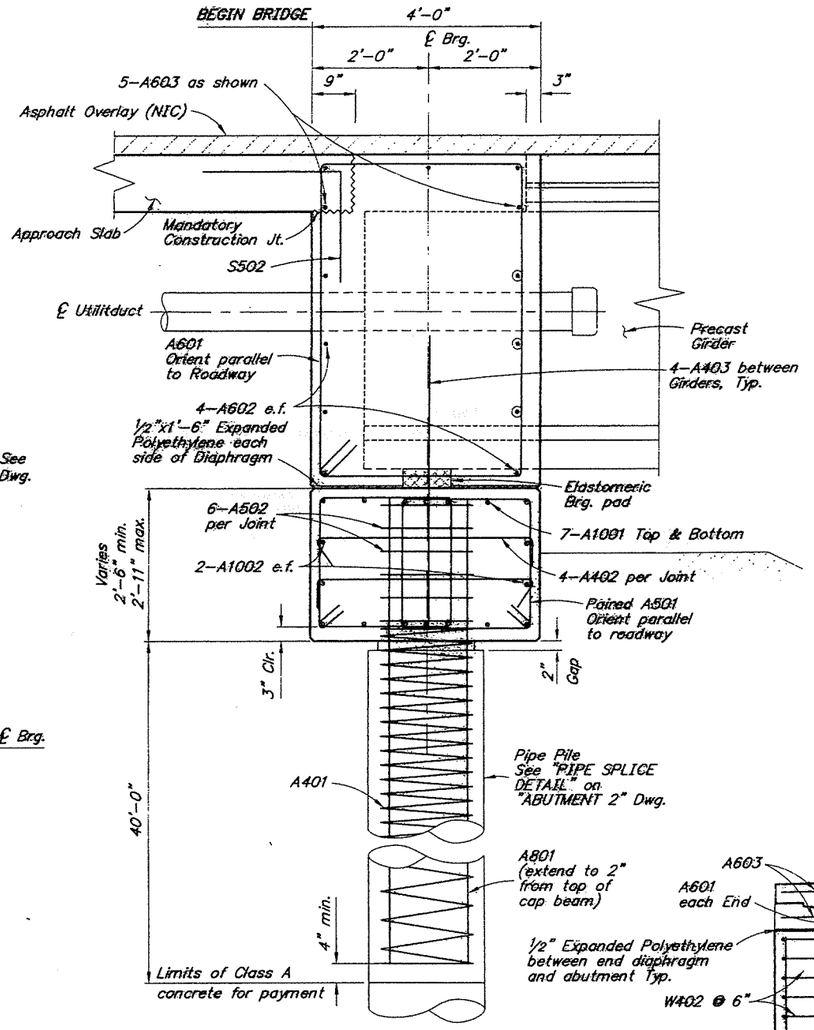
12 0 4 8 In. Feet



ELEVATION

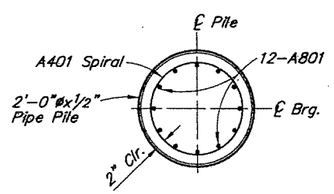
(Looking back on station)

12 0 4 8 In. Feet



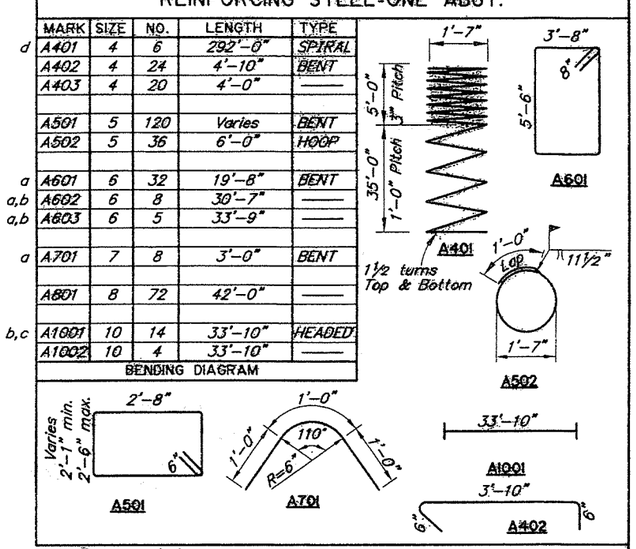
SECTION A-A

12 6 0 1 2 3 In. Feet

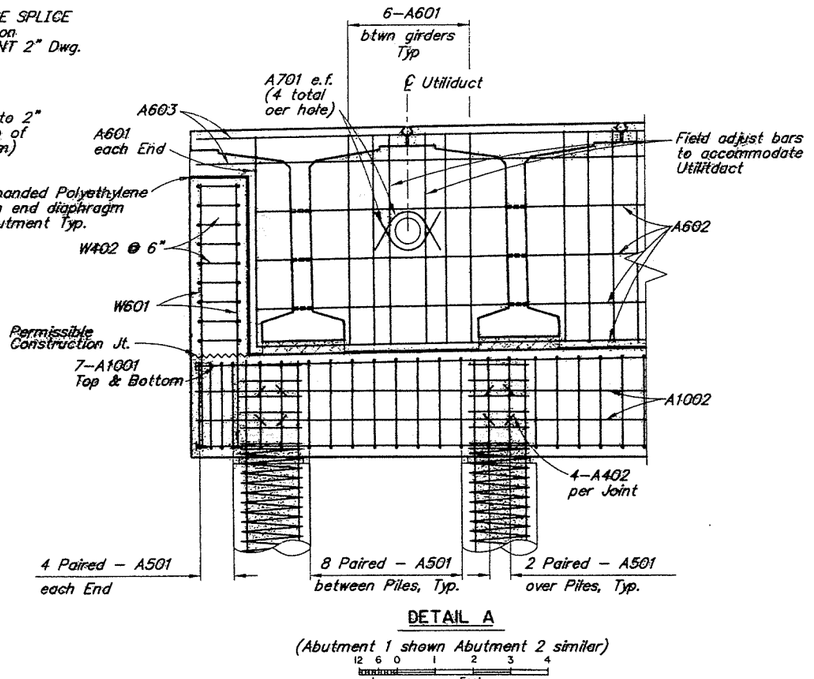


SECTION B-B

12 6 0 1 2 3 In. Feet



a – Epoxy coated
b – Field adjust to match cross slope.
c – Headed bar to conform to ASTM A970.



DETAIL A

(Abutment 1 shown Abutment 2 similar)

12 6 0 1 2 3 4 In. Feet

DESIGNED BY: Elmer Marx	CHECKED: Peter Glessel	
DRAWN BY: Sam Sollie	CHECKED: Elmer Marx	
QUANTITIES BY: Elmer Marx	CHECKED: Peter Glessel	

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
BRIDGE SECTION

STATE OF ALASKA 49TH
Elmer E. Marx III
No. CE 9490
5/19/06
REGISTERED PROFESSIONAL ENGINEER

ANTLER SLOUGH BRIDGE

LYNN CANAL HIGHWAY

ABUTMENT 1

BRIDGE NO. 2165

DWG. NO. 3

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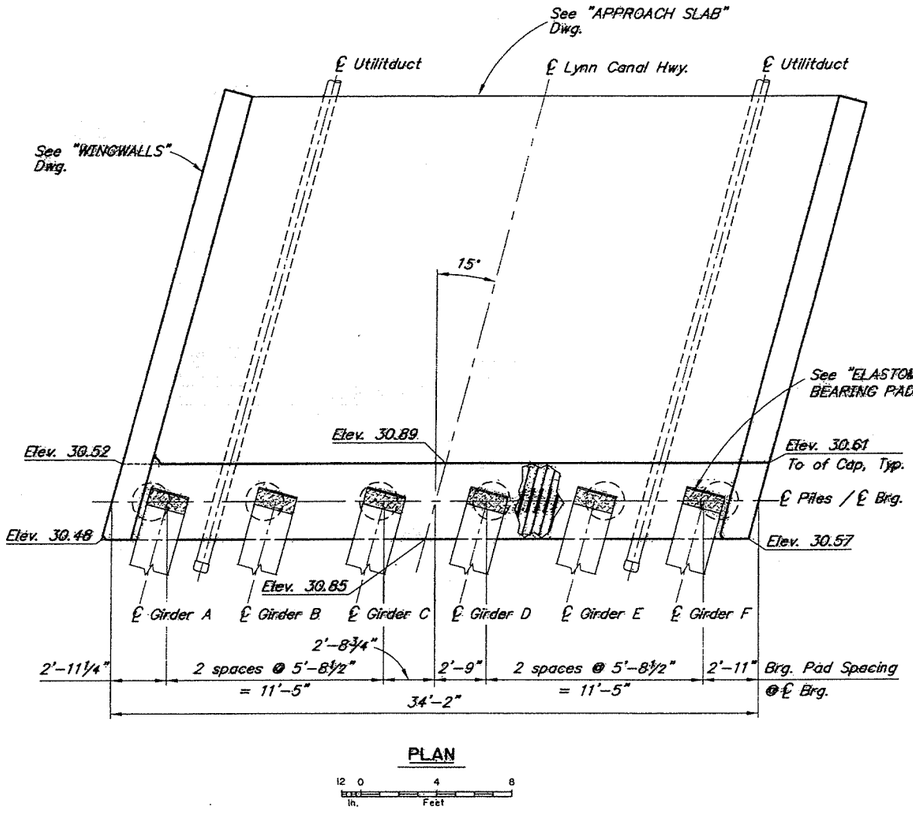
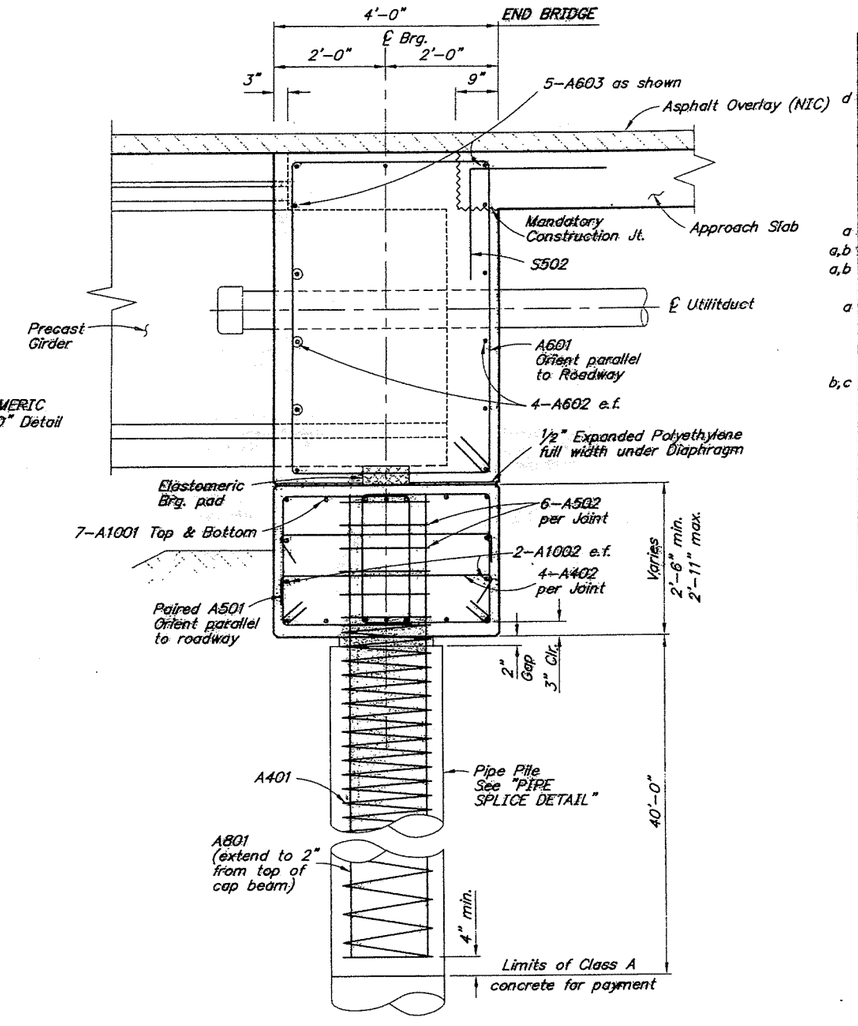
STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	NH-HPRL-093-3(33)/68937	2006	N24	232



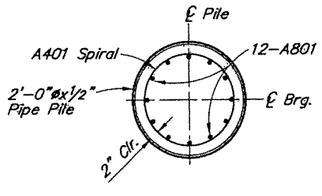
PLAN

12 0 4 8
In. Feet



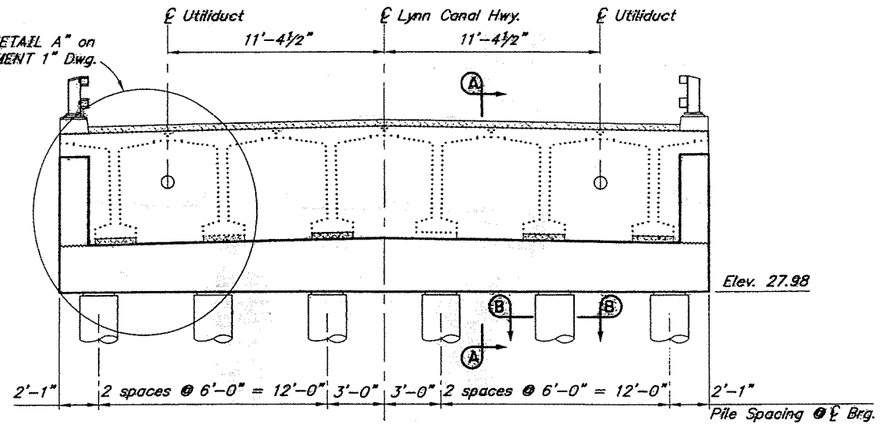
SECTION A-A

12 6 0 1 2 3
In. Feet



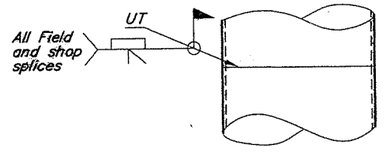
SECTION B-B

12 6 0 1 2 3
In. Feet



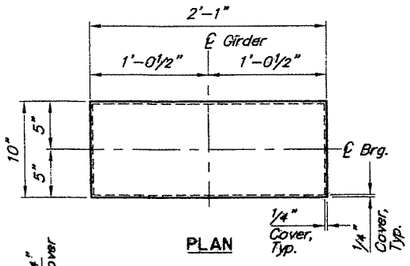
ELEVATION

12 0 4 8
In. Feet

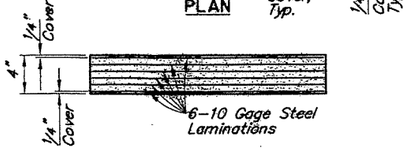


PIPE SPLICE DETAIL

12 6 0 1 2 3 4
In. Feet



PLAN



ELEVATION
ELASTOMERIC BEARING PAD

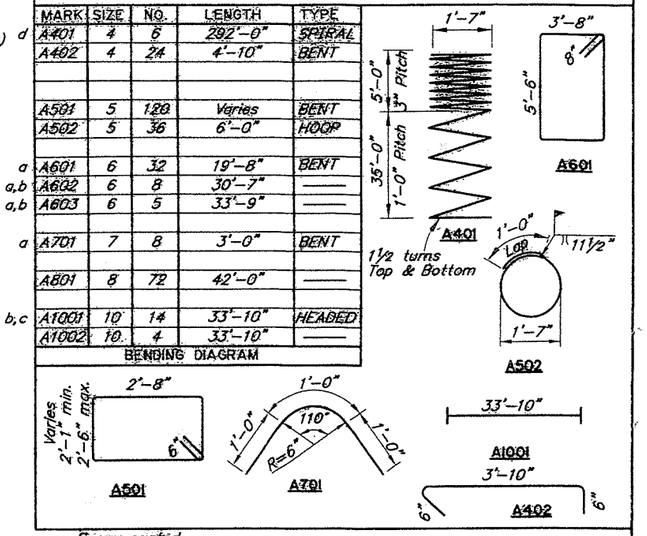
(50 Durometer, Grade 5)
Dead Load = 114 k
Live Load = 78 k

12 6 0 1
In. Feet

REINFORCING STEEL-ONE ABUT.

	MARK	SIZE	NO.	LENGTH	TYPE
d	A401	4	6	292'-0"	SPIRAL
	A402	4	24	4'-10"	BENT
	A501	5	120	Varies	BENT
	A502	5	36	6'-0"	HOOP
a	A601	6	32	19'-8"	BENT
a,b	A602	6	8	30'-7"	——
a,b	A603	6	5	33'-9"	——
a	A701	7	8	3'-0"	BENT
	A801	8	72	42'-0"	——
b,c	A1001	10	14	33'-10"	HEADED
	A1002	10	4	33'-10"	——

BENDING DIAGRAM



a – Epoxy coated
b – Field adjust to match cross slope.
c – Headed bar to conform to ASTM A970.

DESIGNED BY: Elmer Marx	CHECKED: Peter Glossa		
DRAWN BY: Sam Sollie	CHECKED: Elmer Marx		
QUANTITIES BY: Elmer Marx	CHECKED: Peter Glossa		

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
BRIDGE SECTION

STATE OF ALASKA 49 TH
Elmer E. Marx III
No. CE 9490
5/19/06
REGISTERED PROFESSIONAL ENGINEER

ANTLER SLOUGH BRIDGE

LYNN CANAL HIGHWAY

ABUTMENT 2

BRIDGE NO. 2165
DWG. NO. 4

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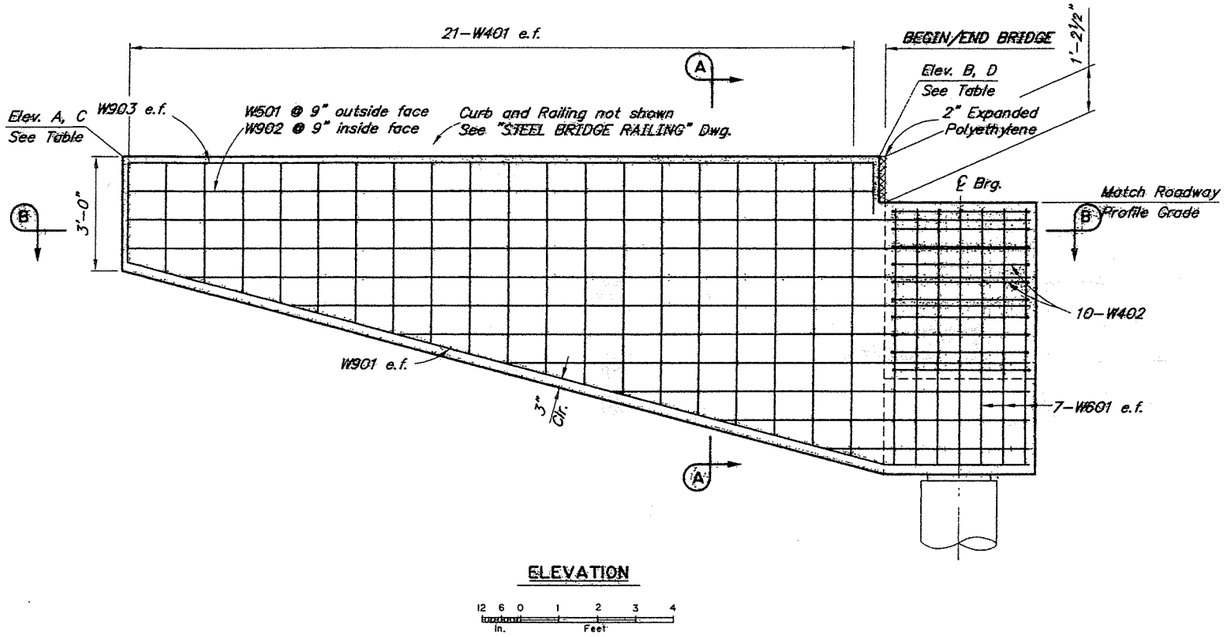
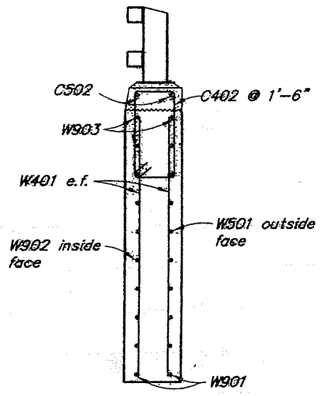
STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	NH-HPRL-093-3(33)/68937	2006	N25	232



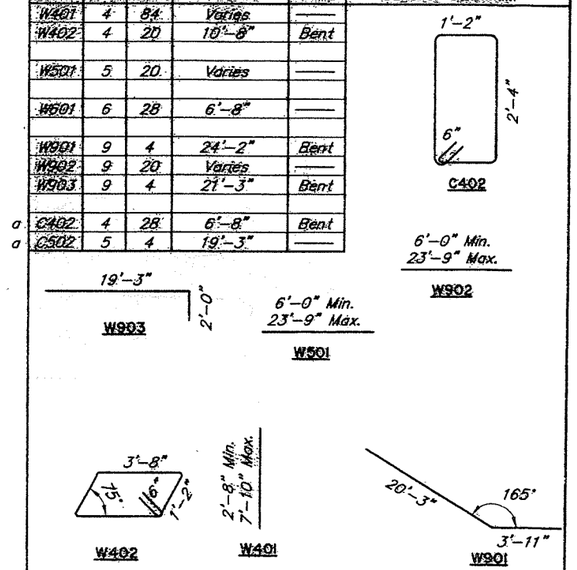
ELEVATION



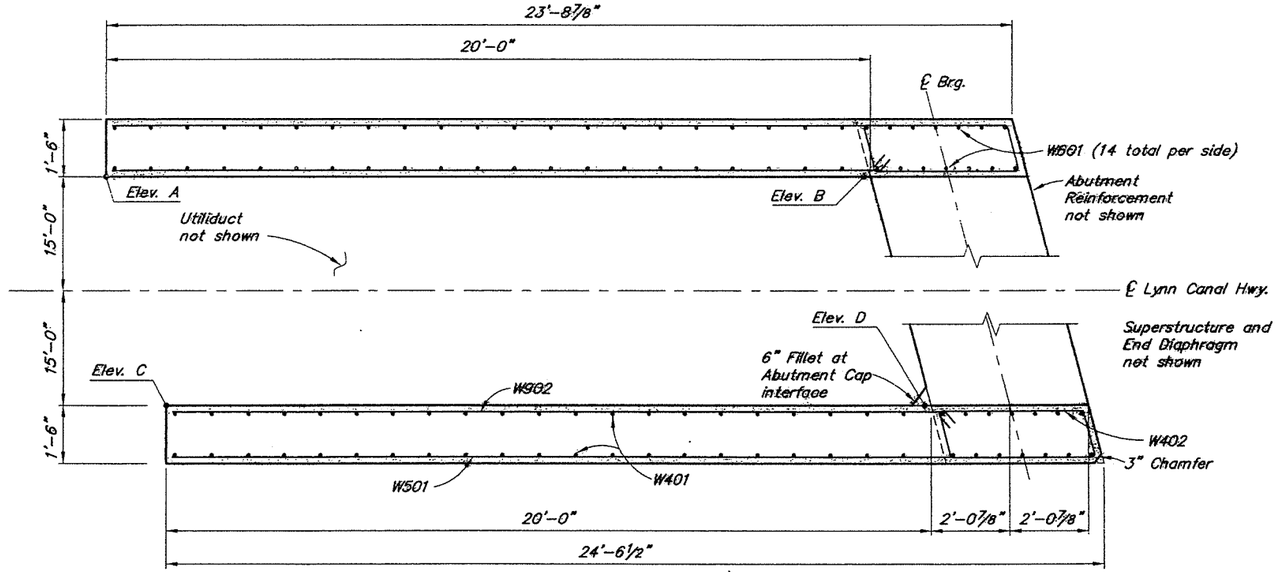
SECTION A-A

REINFORCING STEEL-ONE ABUTMENT

MARK	SIZE	NO.	LENGTH	TYPE	BENDING DIAGRAM
W401	4	84	Varies	——	
W402	4	20	18'–8"	Bent	
W501	5	20	Varies	——	
W601	6	28	6'–8"	——	
W901	9	4	24'–2"	Bent	
W902	9	20	Varies	——	
W903	9	4	21'–3"	Bent	
a C402	4	28	6'–8"	Bent	
a C502	5	4	19'–3"	——	

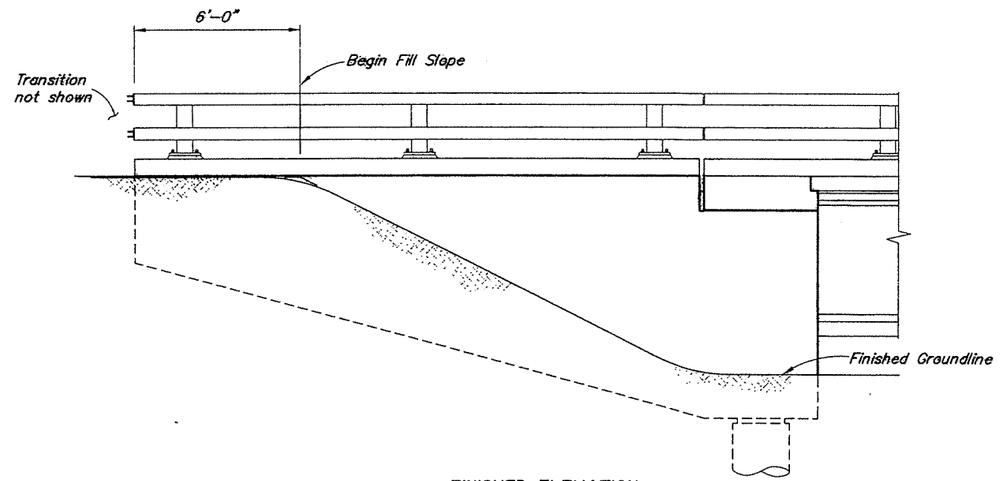


a – Epoxy Coated



SECTION B-B

TOP OF WALL ELEVATION TABLE (FT)				
LOCATION	A DOWNSTREAM	B DOWNSTREAM	C UPSTREAM	D UPSTREAM
ABUTMENT 1	34.55	34.86	34.74	34.95
ABUTMENT 2	36.60	36.39	36.68	36.47



FINISHED ELEVATION

DESIGNED BY: Elmer Marx	CHECKED: Peter Glessel		
DRAWN BY: Sam Sollie	CHECKED: Elmer Marx		
QUANTITIES BY: Elmer Marx	CHECKED: Peter Glessel		

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
BRIDGE SECTION

STATE OF ALASKA 49TH
Elmer E. Marx III
No. CE 9490
5/15/06
REGISTERED PROFESSIONAL ENGINEER

ANTLER SLOUGH BRIDGE

LYNN CANAL HIGHWAY

WINGWALLS

BRIDGE NO. 2165
DWG. NO. 5

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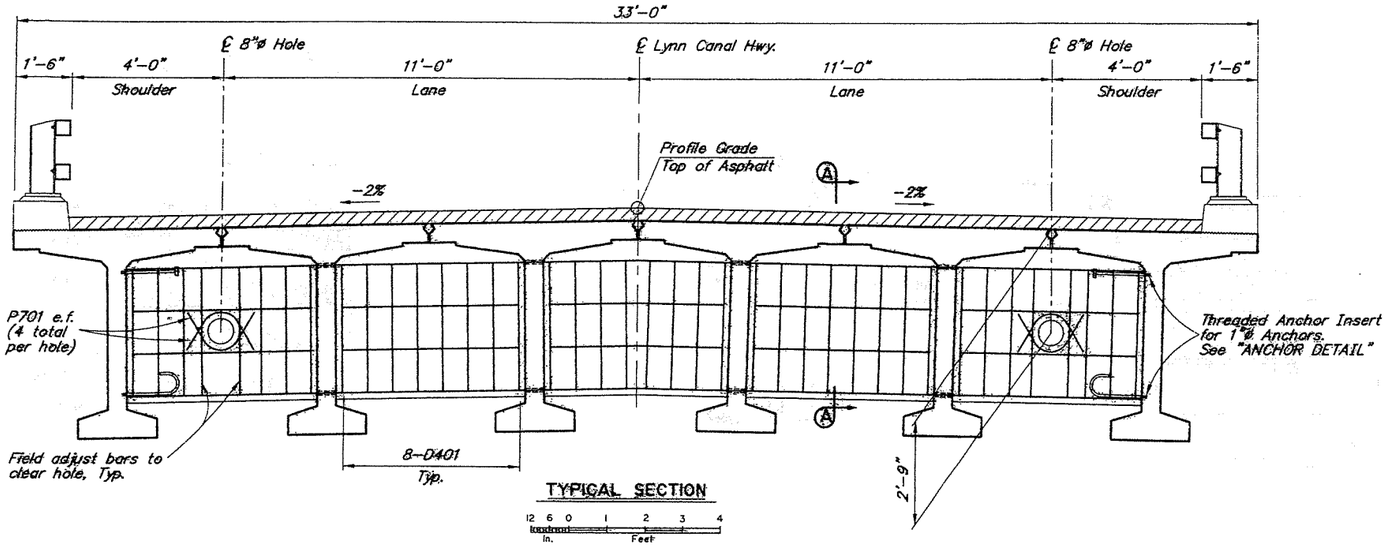
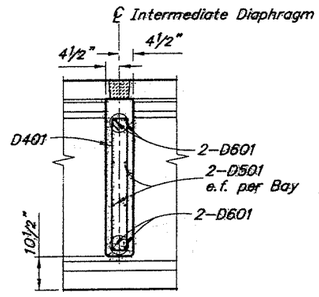
STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	NH-HPRL-093-3(33)/68937	2006	N26	232



TYPICAL SECTION

12 6 0 1 2 3 4 In. Feet

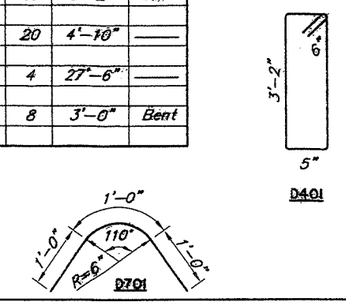


SECTION A-A

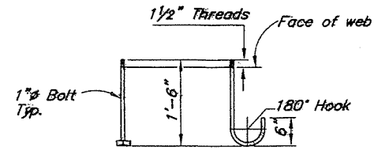
12 6 0 1 2 3 4 In. Feet

REINFORCING STEEL-INTER. DIAPHRAGM

MARK	SIZE	NO.	LENGTH	TYPE	BENDING DIAGRAM
D401	4	40	8'-2"	Bent	
D501	5	20	4'-10"	——	
D601	6	4	27'-6"	——	
D701	7	8	3'-0"	Bent	



a — Epoxy coated.

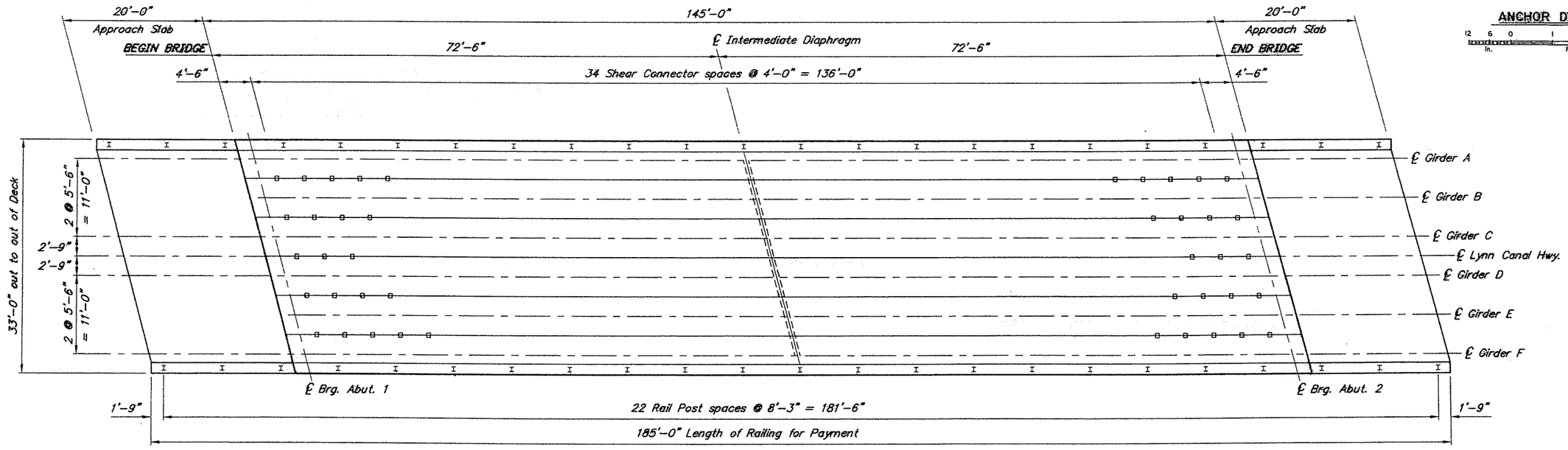


TOP ANCHOR BOTTOM ANCHOR

ASTM A307 GALVANIZED

ANCHOR DETAIL

12 6 0 1 2 3 In. Feet



FRAMING PLAN

12 0 4 8 12 In. Feet

DESIGNED BY: Elmer Marx	CHECKED: Peter Glossel	
DRAWN BY: Sam Sollie	CHECKED: Elmer Marx	
QUANTITIES BY: Elmer Marx	CHECKED: Peter Glossel	

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
BRIDGE SECTION

STATE OF ALASKA 49TH
Elmer E. Marx III
No. CE 9490
5/19/06
REGISTERED PROFESSIONAL ENGINEER

ANTLER SLOUGH BRIDGE

LYNN CANAL HIGHWAY

FRAMING PLAN AND TYPICAL SECTION

BRIDGE NO. 2165

DWG. NO. 6

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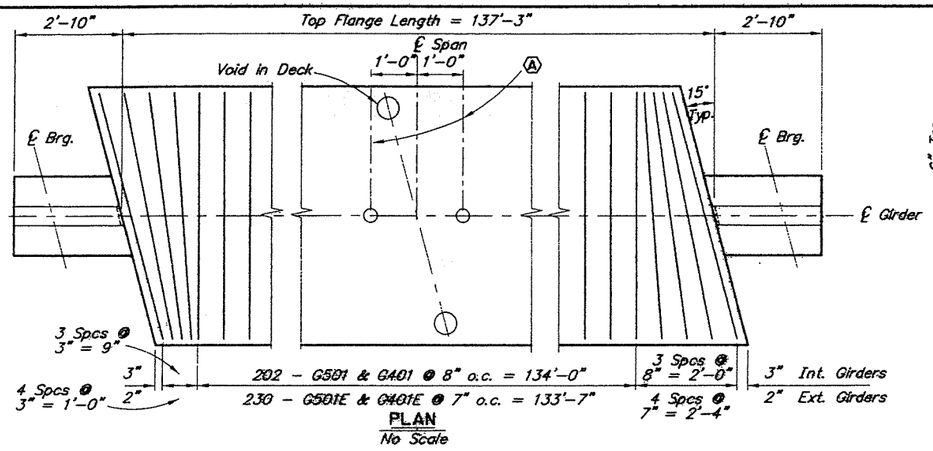
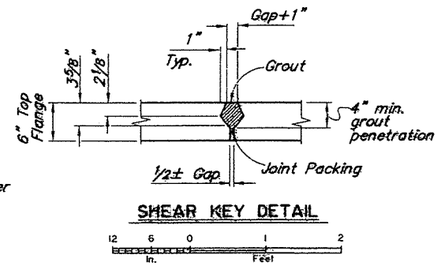
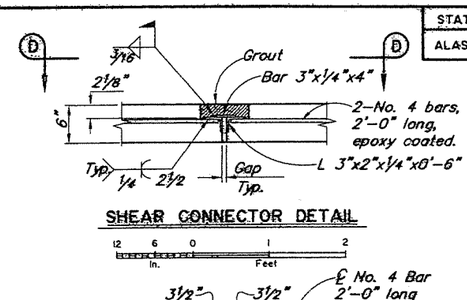
STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	NH-HPRL-093-3(33)/68937	2006	N27	232



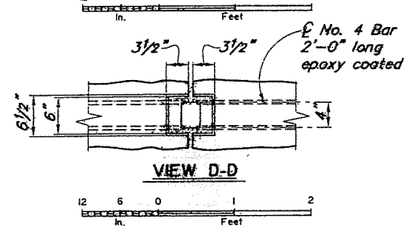
PLAN
No Scale



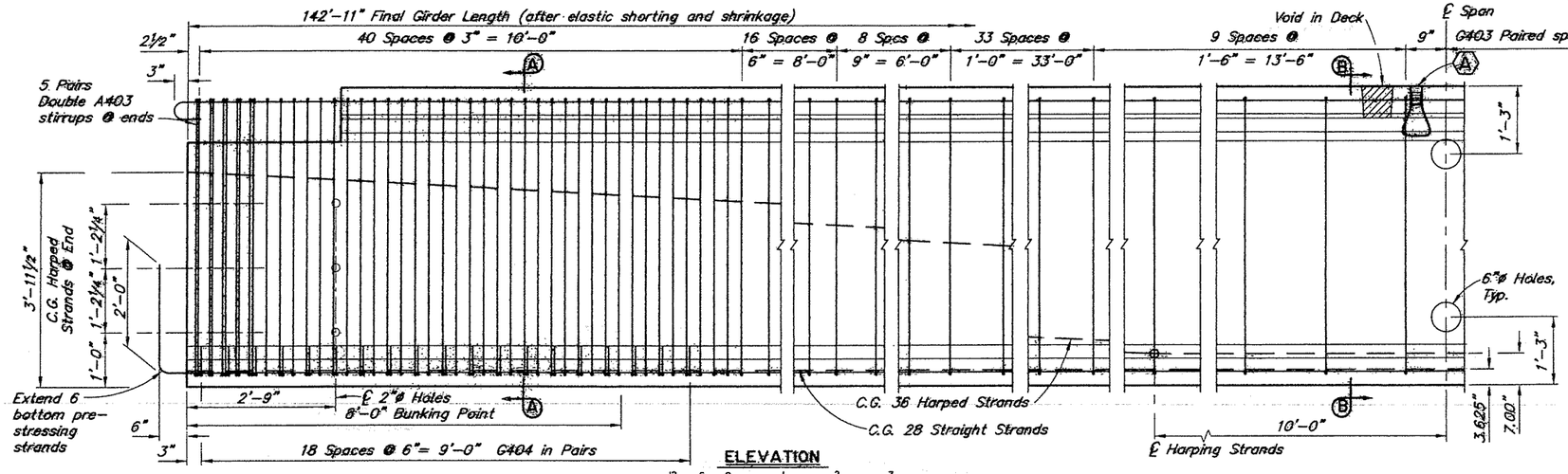
SHEAR KEY DETAIL



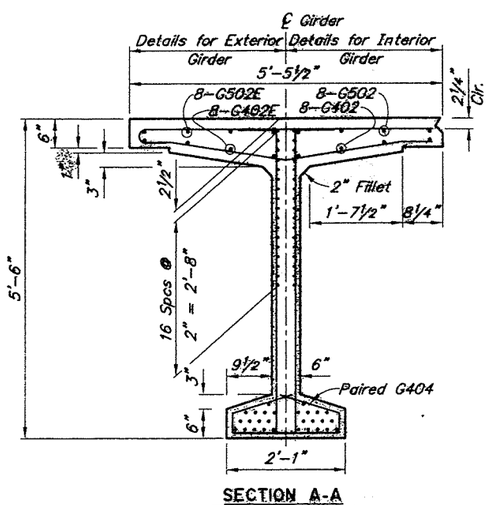
SHEAR CONNECTOR DETAIL



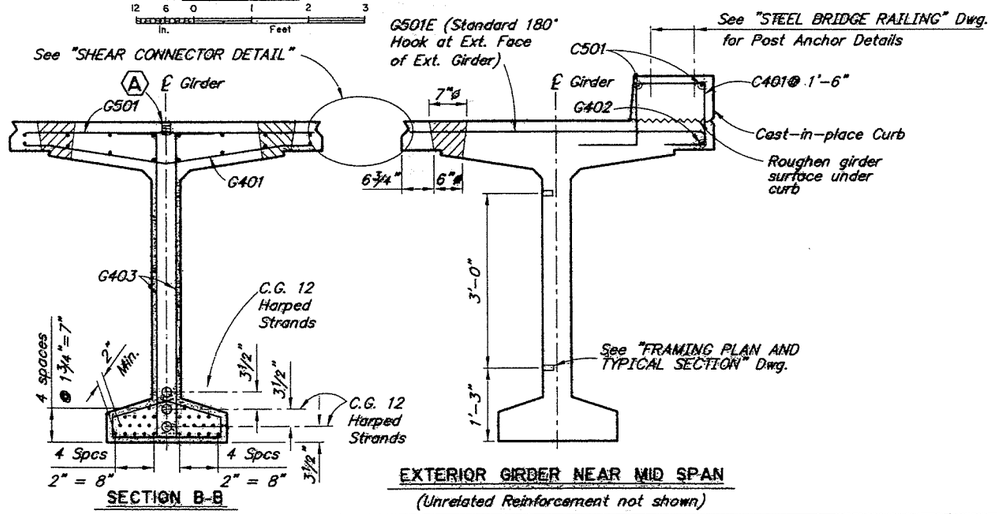
VIEW D-D



ELEVATION
12 6 0 1 2 3
In. Feet



SECTION A-A



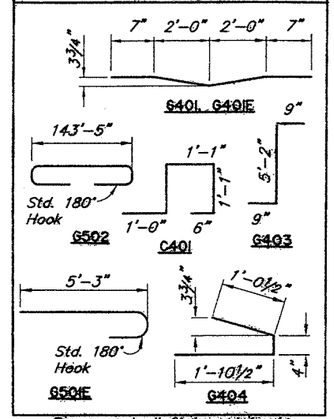
SECTION B-B

EXTERIOR GIRDER NEAR MID SPAN
(Unrelated Reinforcement not shown)

a REINFORCING STEEL SCHEDULE-ONE GIRDER

	MARK	SIZE	NO.	LENGTH	TYPE
	G401	4	206	5'-3"	Bent
e	G401E	4	238	5'-3"	Bent
b	G402	4	8	136'-11"	–
b,e	G402E	4	8	136'-11"	–
	G403	4	448	6'-8"	Bent
	G404	4	76	3'-3"	Bent
	G501	5	208	5'-2"	–
e	G501E	5	238	5'-10"	Bent
b	G502	5	8	144'-7"	Bent
b,e	G502E	5	8	144'-7"	Bent
c,e	C401	4	98	4'-9"	Bent
b,e	C501	5	2	144'-8"	

BENDING DIAGRAM



a – Epoxy coat all Girder reinforcing

b – Length does not include splices. Minimum lap splice length for splices shall be: 2'-0" for #4 bars, 2'-6" for #5 bars.

c – Ship 6 loose for end diaphragm.

e – Exterior Girder only.

GIRDER NOTES

Use normal weight concrete having the following strengths:
At Stress Transfer f'ci = 6560 psi
At 28 days f'c = 7500 psi

Use ½" round low relaxation strands having an ultimate strength of 270 ksi and a cross section area of 0.153 in.²

Design is based on the following steel stresses:
Pretensioning – Jacking Stress 189 ksi
After initial losses – 170 ksi
After all losses – 149 ksi

1" clear on all reinforcing except as noted.

Deflect forms to compensate for camber and roadway grade.

Provide a magnesium float finish on the roadway surface of the precast member. Roughen the surface under the railing.

Omit Shear Key and Shear Connector on outside of exterior girders.

Cast Girder ends plumb with respect to roadway grade.

(A) 1"x1'-0" Coil Anchor Insert for vertical adjustment of girders. Recess 2". Prevent concrete from filling hole.

Install web holes and web anchor inserts parallel to ℄ Brg.

DESIGNED BY: Elmer Marx	CHECKED: Peter Glessel		
DRAWN BY: Sam Sollie	CHECKED: Elmer Marx		
QUANTITIES BY: Elmer Marx	CHECKED: Peter Glessel		

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
BRIDGE SECTION

STATE OF ALASKA 49TH
Elmer E. Marx III
No. CE 9490
REGISTERED PROFESSIONAL ENGINEER

ANTLER SLOUGH BRIDGE

LYNN CANAL HIGHWAY

GIRDERS

BRIDGE NO. 2165
DWG. NO. 7

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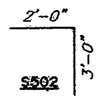
STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	NH-HPRL-093-3(33)/68937	2006	N28	232

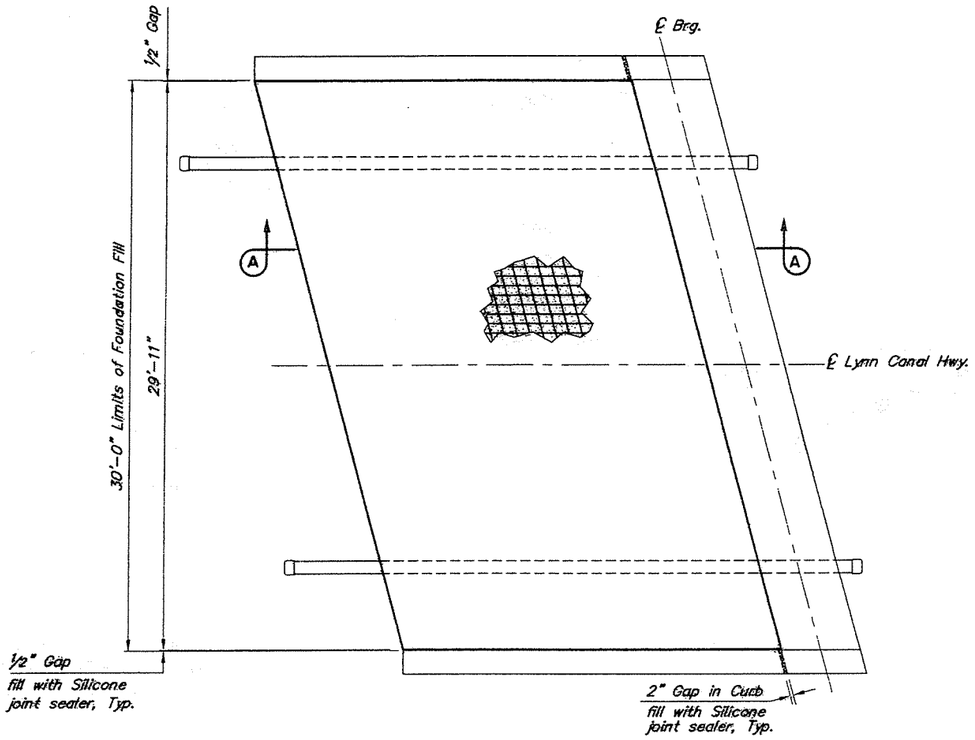
REINFORCING STEEL - ONE APPROACH SLAB

	MARK	SIZE	NO.	LENGTH	TYPE
a,b	S401	4	62	30'-7"	——
a	S501	5	60	20'-5"	——
a	S502	5	30	5'-0"	Bent
a	S801	8	60	20'-5"	——

BENDING DIAGRAM



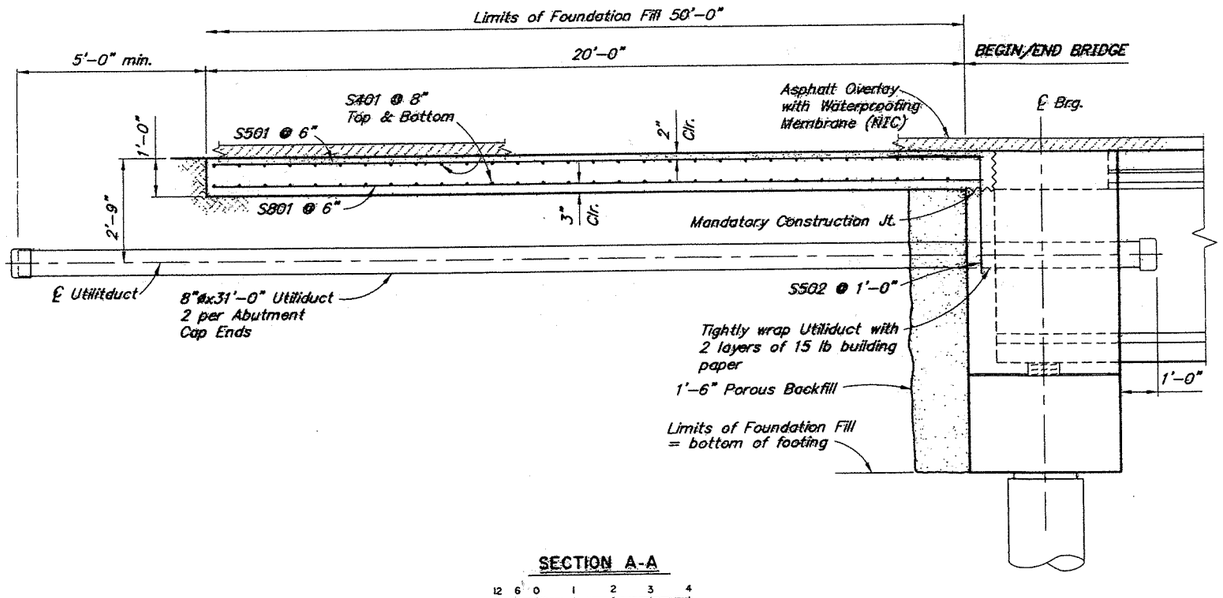
a – Epoxy coat all reinforcing steel.
b – Field adjust bars to match cross slope.



PLAN

(Abutment 1 shown Abutment 2 similar)

12 0 4 8
In. Feet



SECTION A-A

12 6 0 1 2 3 4
In. Feet

DESIGNED BY: Elmer Marx	CHECKED: Peter Glossel	STATE OF ALASKA DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES BRIDGE SECTION	ANTLER SLOUGH BRIDGE LYNN CANAL HIGHWAY APPROACH SLAB
DRAWN BY: Sam Sollie Jr.	CHECKED: Elmer Marx		BRIDGE NO. 2165 DWG. NO. 8
QUANTITIES BY: Elmer Marx	CHECKED: Peter Glossel		

STATE OF ALASKA 49TH
Elmer E. Marx III
No. CE 9490
REGISTERED PROFESSIONAL ENGINEER

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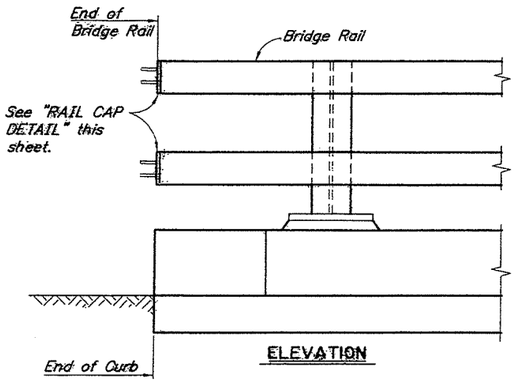
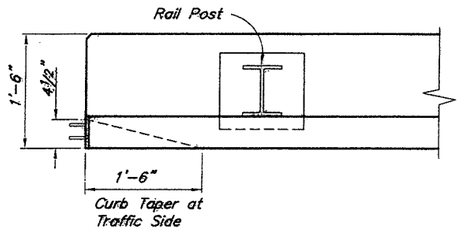
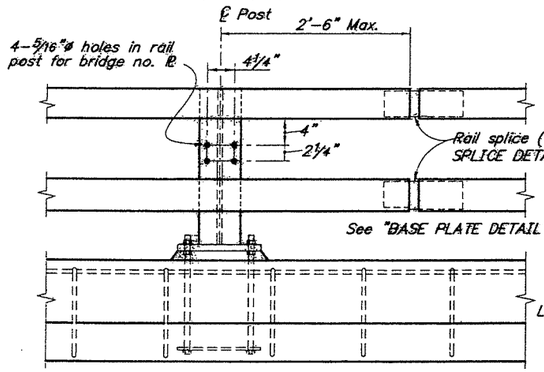
STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	NH-HPRL-093-3(33)/68937	2006	N29	232



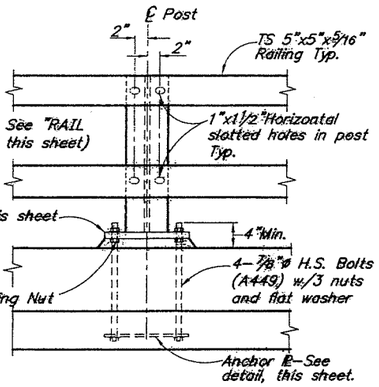
ELEVATION



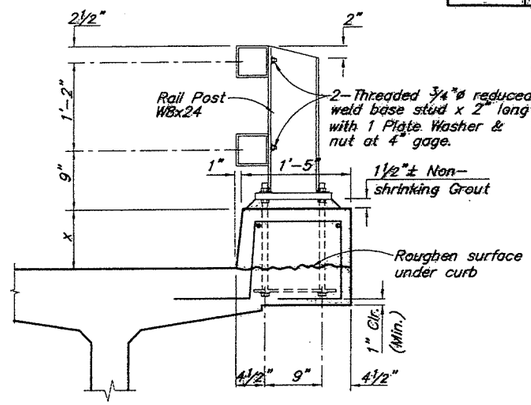
PLAN



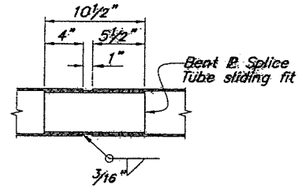
EXPANSION JOINT



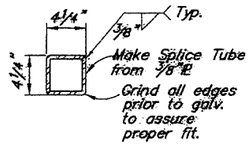
TYPICAL POST ELEVATION



TYPICAL SECTION



RAIL SPLICE DETAIL



SPLICE TUBE

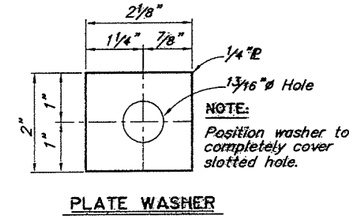
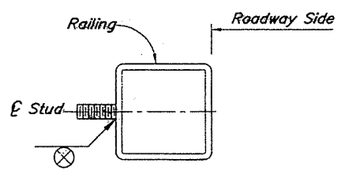
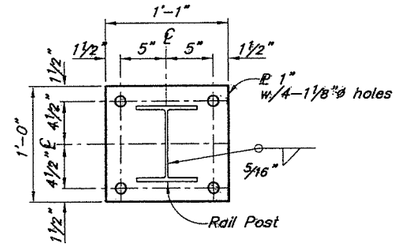


PLATE WASHER

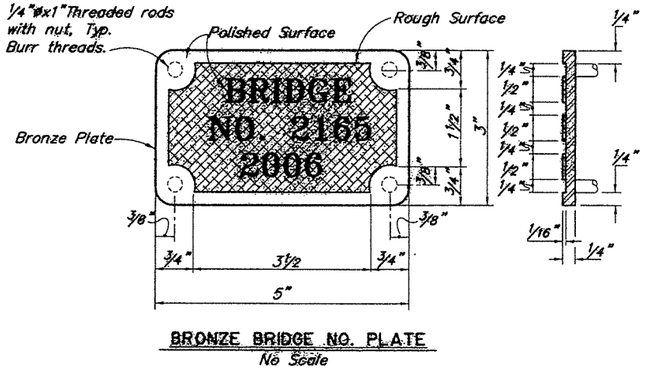
No Scale



RAILING STUD DETAIL

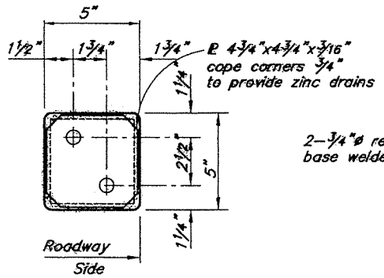


BASE PLATE DETAIL

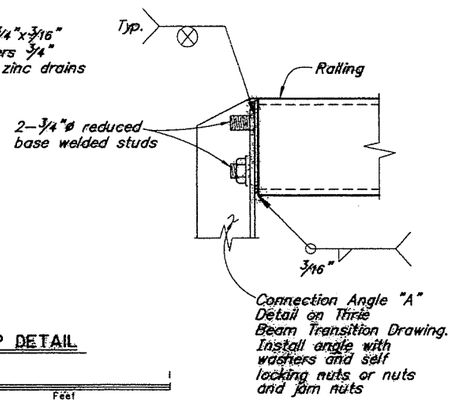


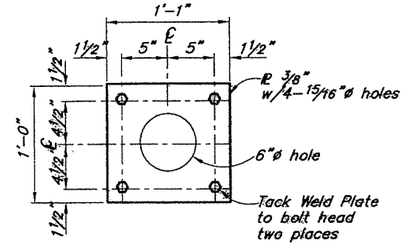
BRONZE BRIDGE NO. PLATE

No Scale



RAIL CAP DETAIL





ANCHOR PLATE DETAIL

CURB HEIGHT DATA	
ASPHALT THICKNESS (Inches)	CURB HEIGHT "X" (Inches)
0	7"
2"	9"
3"	10"
4"	10"

NOTES

1. Locate bridge number plates on right hand side of approaching traffic near each end as shown (2 total).
2. Furnish bridge number plates. Use bronze that conforms to A.S.T.M. B98-90, Alloy "A" or "B". Use "Century" type style lettering. Use studs and nuts that conform to UNS C65100 or C65500. Braze ¼"ø threaded rod to back of plate with nut - 4 required. Use locking nuts or lock washers on all machine bolts.
3. Provide railing expansion joints at 50'-0" maximum intervals. Railing shall be continuous over 2 posts minimum.
4. Use grout with a minimum 24 hour f'c of 3000 psi.
5. See Bridge plans for rail post spacing.
6. See Std. Dwg. G-31.00 for Thrie Beam Transition.

DESIGNED BY: Elmer Marx	CHECKED: Peter Glessel
DRAWN BY: Sam Sollie	CHECKED: Elmer Marx
QUANTITIES BY: Elmer Marx	CHECKED: Peter Glessel

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
BRIDGE SECTION

STATE OF ALASKA 49 TH
Elmer E. Marx III
No. CE-9490
5/19/06
REGISTERED PROFESSIONAL ENGINEER

ANTLER SLOUGH BRIDGE

LYNN CANAL HIGHWAY

STEEL BRIDGE RAILING

BRIDGE NO. 2165

DWG. NO. 9

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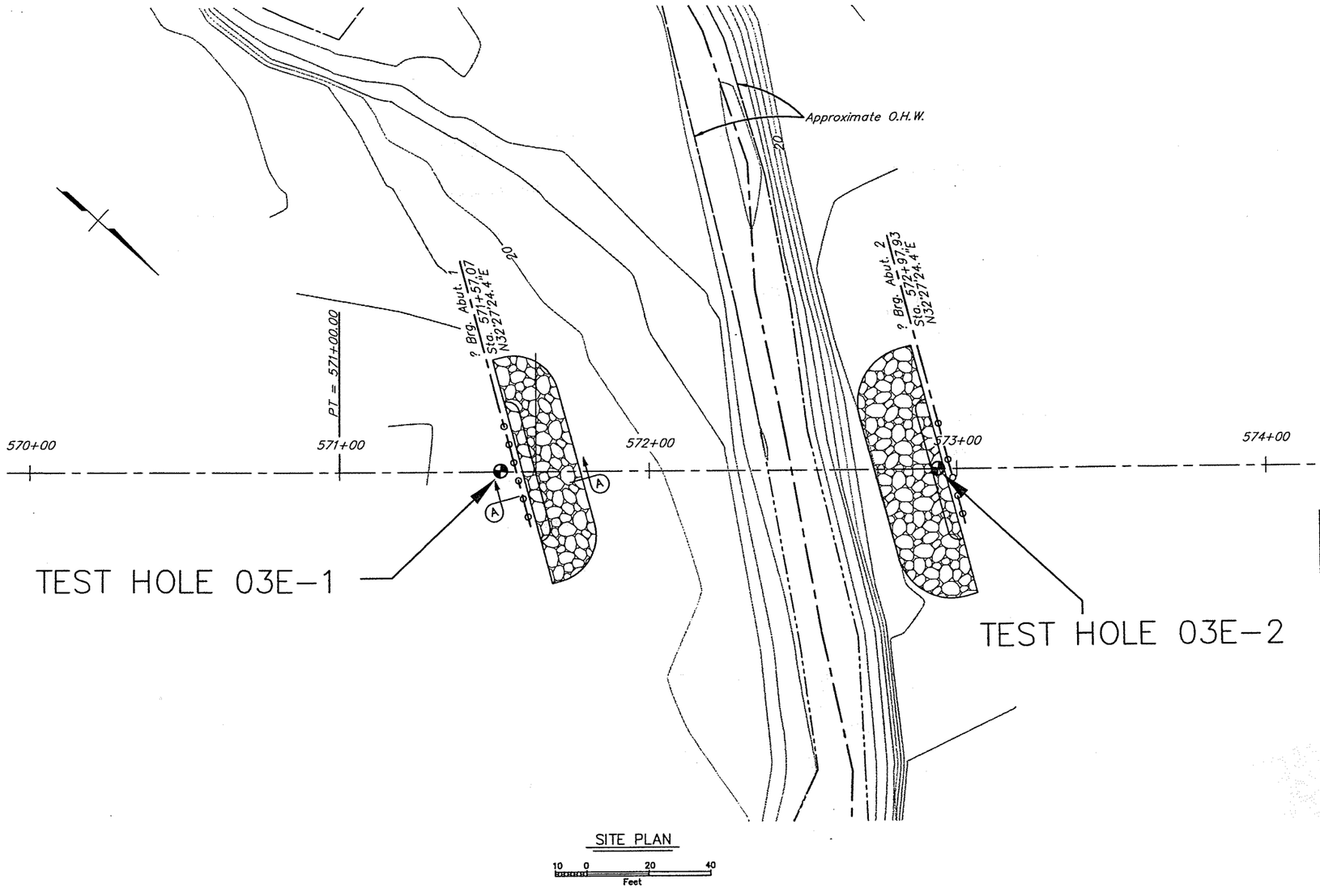
STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	68937	2006	N30	232



SITE PLAN

10 0 20 40
Feet

DESIGNED BY:	CHECKED:	HYDRAULICS BY:	CHECKED BY:
DRAWN BY: M.McDONALD	CHECKED: R.SWEDELL	FOUNDATIONS REVIEWED BY:	
QUANTITIES BY:	CHECKED:		

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
BRIDGE SECTION

ANTLER SLOUGH BRIDGE

LYNN CANAL HIGHWAY

TEST HOLE LOCATION MAP

BRIDGE NO. 2165
DWG. NO. 10

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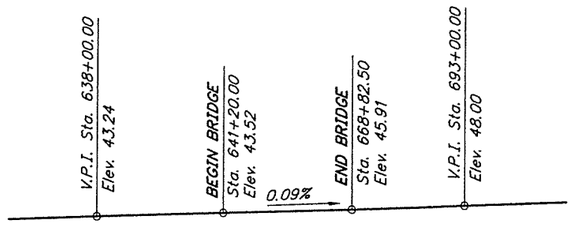
STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	NH-HPRL-093-3(33)/68937	2006	N31	232

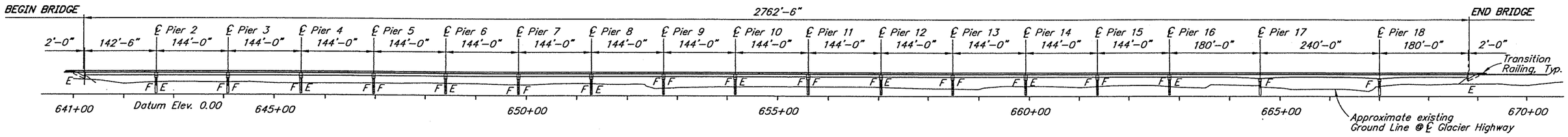


PROFILE GRADE DATA

No Scale

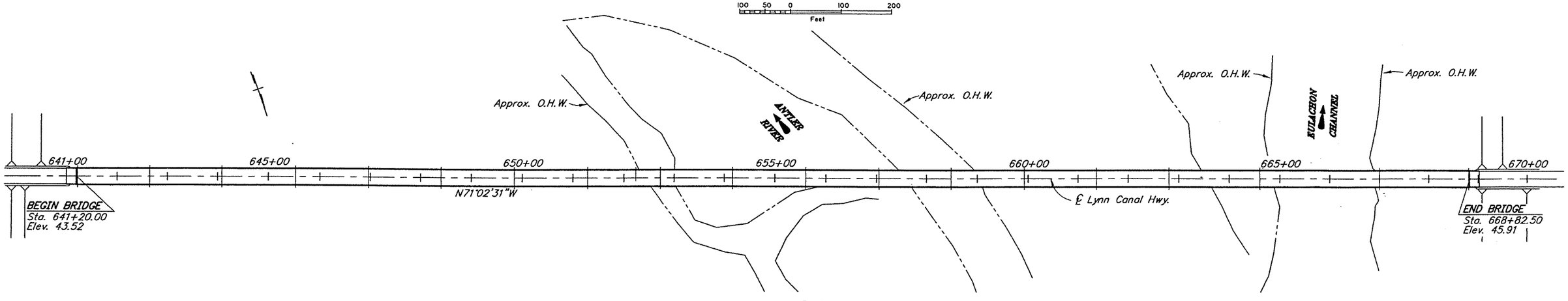
BRIDGE DRAWING INDEX	
TITLE	DWG. NO.
GENERAL LAYOUT 1	1
GENERAL LAYOUT 2	2
SITE PLAN	3
FOUNDATION PLAN	4
ABUTMENT 1	5
ABUTMENT 19	6
ABUTMENT 1 WINGWALLS	7
EXPANSION PIERS	8
FIXED PIERS	9
BULB-TEE TYPICAL SECTION	10
FRAMING PLAN	11
BULB-TEE GIRDERS	12
DECK DRAINS	13
ABUTMENT 1 APPROACH SLAB	14
STEEL BRIDGE RAILING	15

PRELIMINARY PLAN



ELEVATION

100 50 0 100 200
Feet



PLAN

100 50 0 100 200
Feet

① *Approximate location of Bridge Number Plate.*

DESIGNED BY:	CHECKED:	LAYOUT BY:	CHECKED BY:
DRAWN BY:	CHECKED:	SPECIFICATIONS BY:	P S & E COMPARED:
QUANTITIES BY:	CHECKED:	APPROVAL RECOMMENDED BY:	

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
BRIDGE SECTION

ANTLER RIVER BRIDGE

LYNN CANAL HIGHWAY

GENERAL LAYOUT 1

BRIDGE NO. 2166

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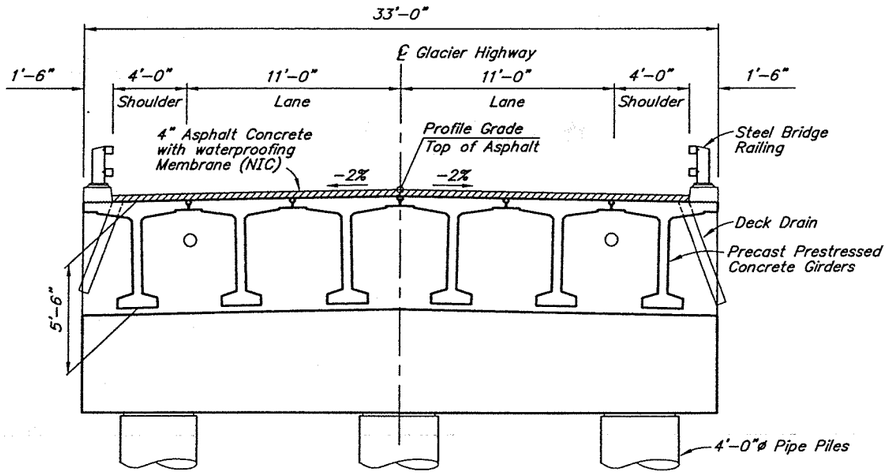
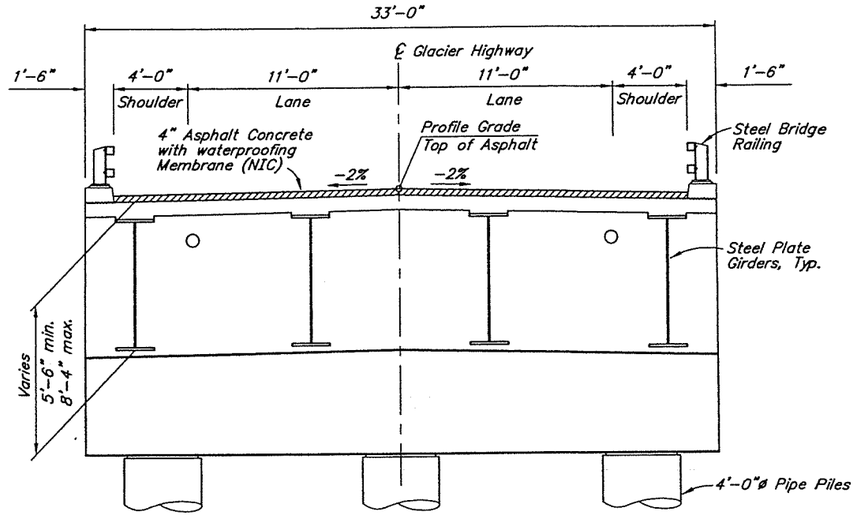
STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	NH-HPRL-093-3(33)/68937	2006	N32	232



TYPICAL SECTION BULB-TEE

(SPANS 1–15)

12 0 4 8
In. Feet



TYPICAL SECTION STEEL PLATE GIRDER

(SPANS 16–18)

12 0 4 8
In. Feet

DESIGNED BY:	CHECKED:
DRAWN BY:	CHECKED:
QUANTITIES BY:	CHECKED:

PRELIMINARY PLAN

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
BRIDGE SECTION

ANTLER RIVER BRIDGE

LYNN CANAL HIGHWAY

GENERAL LAYOUT 2

BRIDGE NO. 2166

DWG NO. 3

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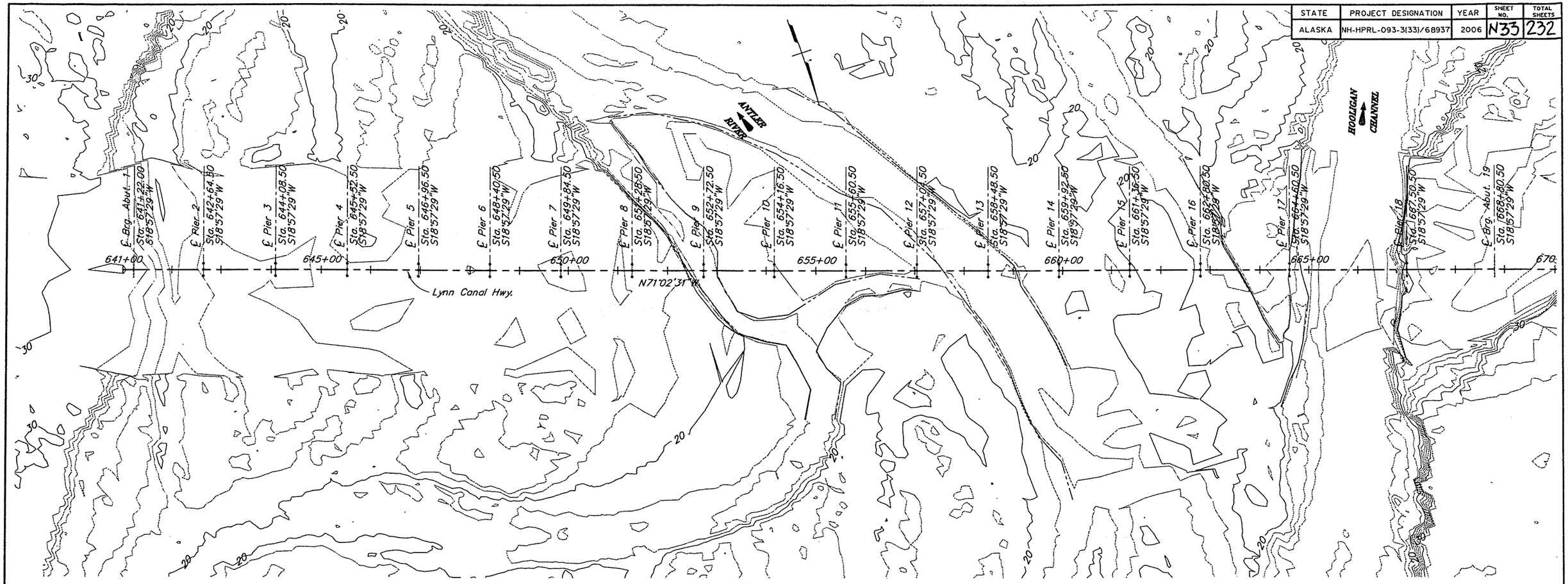
STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	NH-HPRL-093-3(33)/68937	2006	N33	232



SITE PLAN

100 50 0 100 200
Feet

BRIDGE BASIS OF ESTIMATE

ITEM NO.	ITEM	PAY UNIT	ESTIMATING UNIT	SUBST.	SUPERST.	TOTAL
205(3)	Foundation Fill	CY	CY			1200
501(4)	Class A Concrete	CY	CY			2800.0
501(10)	Class A–A Concrete	CY	CY			626.0
501(7B)	Precast Concrete Member (143'–0" Decked Bulb–Tee)	EA	EA			90
501(9)	Bridge Expansion Joint	EA	EA			330
503(3)	Reinforcing Steel	LBS	LBS			575,000
503(4)	Epoxy–Coated Reinforcing Steel	LBS	LBS			270,000
504(2)	Structural Steel	LBS	LBS			1,000,000
505(5B)	Furnish Structural Steel Piles (2'–0"øx½")	LF	LF			1200
505(5C)	Furnish Structural Steel Piles (4'–0"øx1")	LF	LF			6375
505(6B)	Drive Structural Steel Piles (2'–0"øx½")	EA	EA			12
505(6C)	Drive Structural Steel Piles (4'–0"øx1")	EA	EA			51
507(1)	Steel Bridge Railing	LF	LF			5605
606(12)	Guardrail / Bridge Rail Connection	EA	EA			4
611(1)	Riprap, Class II	CY	CY			1000
631(2)	Geotextile, Erosion Control, Class 1	SY	SY			1000

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

HYDRAULIC & HYDROLOGIC SUMMARY

Flood Frequency (Yr.)	50	100	500
Exceedance Probability (%)	2	1	0.2
Discharge (ft^3/sec)	35,100	38,500	46,900
Water Surface Elevation (ft)	24.1	24.4	25.0
Anticipated Add'l Backwater (ft)	0.1	0.1	
Contraction Scour (ft)		0.0	0.1
Abutment Scour (ft)		n.c.	n.c.
Pier Scour (ft)		7.4	7.8

Drainage Area for this crossing: 322.5 square miles.

Hydraulic Capacity: >>100,000 cfs at Low Superstructure Elevation[1] of 36.8 ft. which has an exceedance probability of equal to or less than 0.2 percent.

Total scour equals contraction scour + local scour.

OHW[1] (ft)	18.7
Extreme High Tide (ft)	21.3
Mean High Water, Tidal (ft)	14.8

1 – Located at upstream edge of deck, east bank of Antler River.

GENERAL NOTES

DESIGN: ..... *AASHTO LRFD Bridge Design Specifications, Third Edition, 2004, with latest interim specifications.*

LIVE LOAD: *HL–93*

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

SEISMIC PARAMETERS: ..... *Acceleration Coefficient, a = 0.2 g*
Site Coefficient, s = 1.5
Liquefaction Potential = High
AASHTO 90% probability of not being exceeded in 50 years.

REINFORCEMENT: ..... *ASTM A706, Fy = 60,000 psi*
Space reinforcement evenly unless otherwise noted.
Use ASTM A970 headed reinforcing bars.

PRESTRESSED CONCRETE: ..... *See "BULB–TEE GIRDERS" Dwg.*

CONCRETE: ..... *Use Class A Concrete concrete unless otherwise noted, f'c = 4000 psi.*
Use Class A–A concrete for approach slabs, and C.I.P. deck f'c = 5000 psi.

STRUCTURAL STEEL: ..... *ASTM A709, Grade 50T3. Fy = 50,000 psi, Unless otherwise noted.*

STRUCTURAL STEEL PILING: *Use API 5L PSL2 X52, Fy = 52,000 psi for Pipe Piles.*
Pile Tip reinforcing is required.

DESIGNED BY:	CHECKED:	HYDRAULICS BY:	CHECKED BY:
DRAWN BY:	CHECKED:		
QUANTITIES BY:	CHECKED:		

PRELIMINARY PLAN

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
BRIDGE SECTION

ANTLER RIVER BRIDGE

LYNN CANAL HIGHWAY

SITE PLAN

BRIDGE NO. 2166

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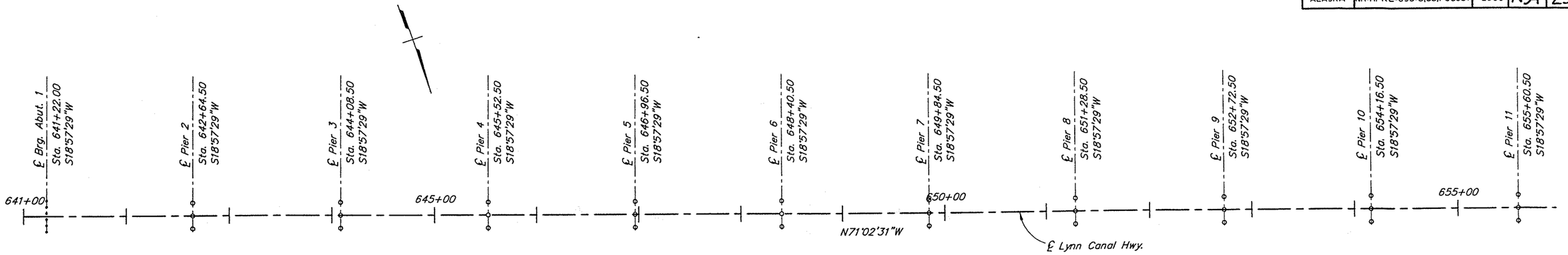
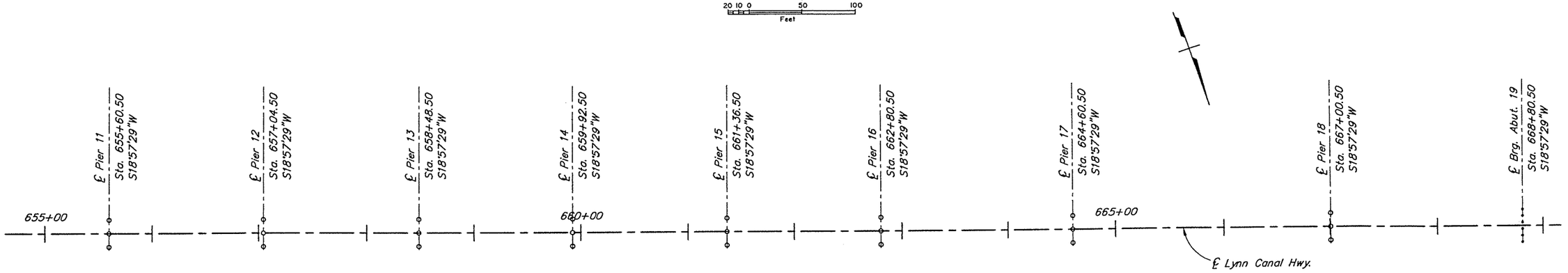
STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	NH-HPRL-093-3(33)/68937	2006	N34	232



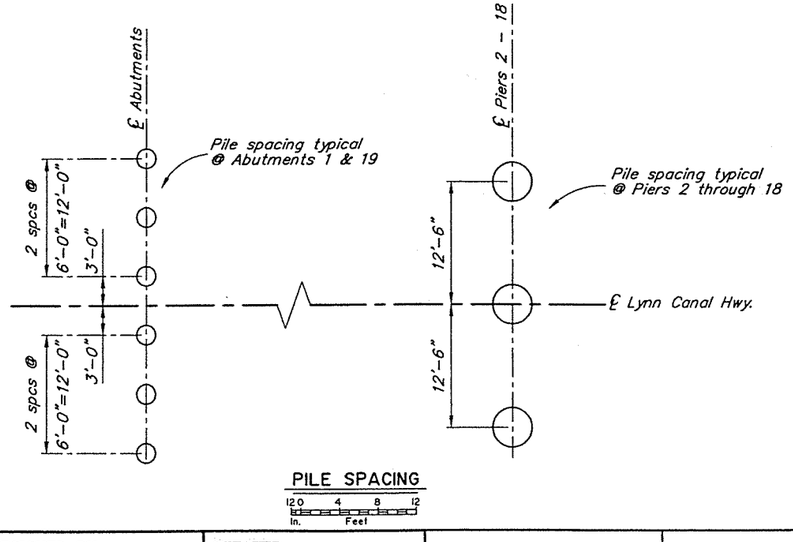
FOUNDATION PLAN - ABUTMENT I THROUGH PIER II

20 10 0 50 100
Feet



FOUNDATION PLAN - PIER II THROUGH ABUTMENT 19

20 10 0 50 100
Feet



PILE SPACING

12 0 4 8 12
In. Feet

PRELIMINARY PLAN

PILE TABLE

LOCATION	PILE TYPE	MINIMUM TIP ELEVATION, FT.	ESTIMATED TIP ELEVATION, FT.	DESIGN LOAD, kips	ULTIMATE LOAD, kips
Abutment 1	2'-0"øx1/2"				
Pier 2	4'-0"øx1"				
Pier 3	4'-0"øx1"				
Pier 4	4'-0"øx1"				
Pier 5	4'-0"øx1"				
Pier 6	4'-0"øx1"				
Pier 7	4'-0"øx1"				
Pier 8	4'-0"øx1"				
Pier 9	4'-0"øx1"				
Pier 10	4'-0"øx1"				
Pier 11	4'-0"øx1"				
Pier 12	4'-0"øx1"				
Pier 13	4'-0"øx1"				
Pier 14	4'-0"øx1"				
Pier 15	4'-0"øx1"				
pier 16	4'-0"øx1"				
Pier 17	4'-0"øx1"				
Pier 18	4'-0"øx1"				
Abutment 19	2'-0"øx1/2"				

DESIGNED BY:	CHECKED:		
DRAWN BY:	CHECKED:	FOUNDATIONS REVIEWED BY:	
QUANTITIES BY:	CHECKED:		

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
BRIDGE SECTION

ANTLER RIVER BRIDGE
LYNN CANAL HIGHWAY
FOUNDATION PLAN

BRIDGE NO. 2166
DWG NO. 4

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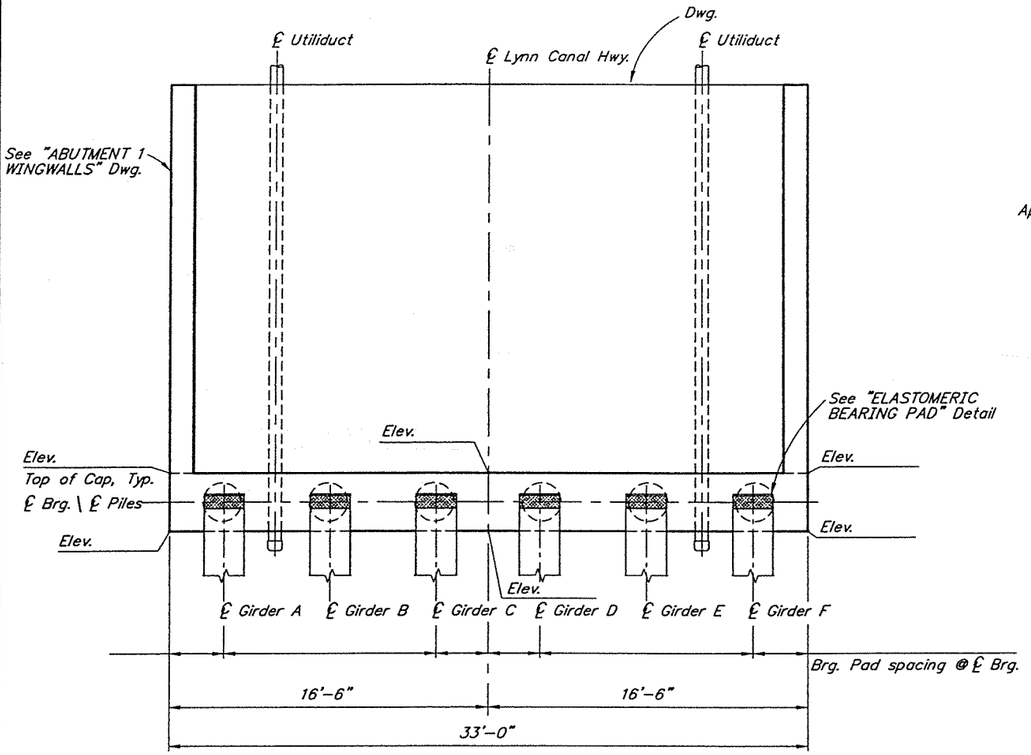
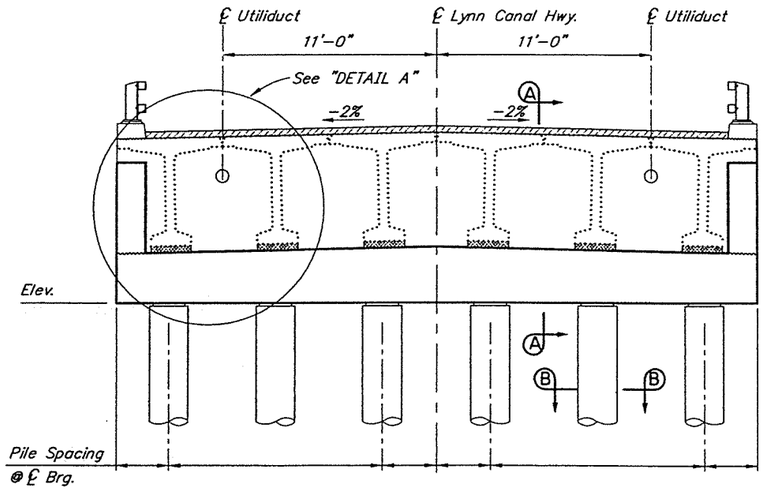
STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	NH-HPRL-093-3(331)/68937	2006	N35	232



PLAN

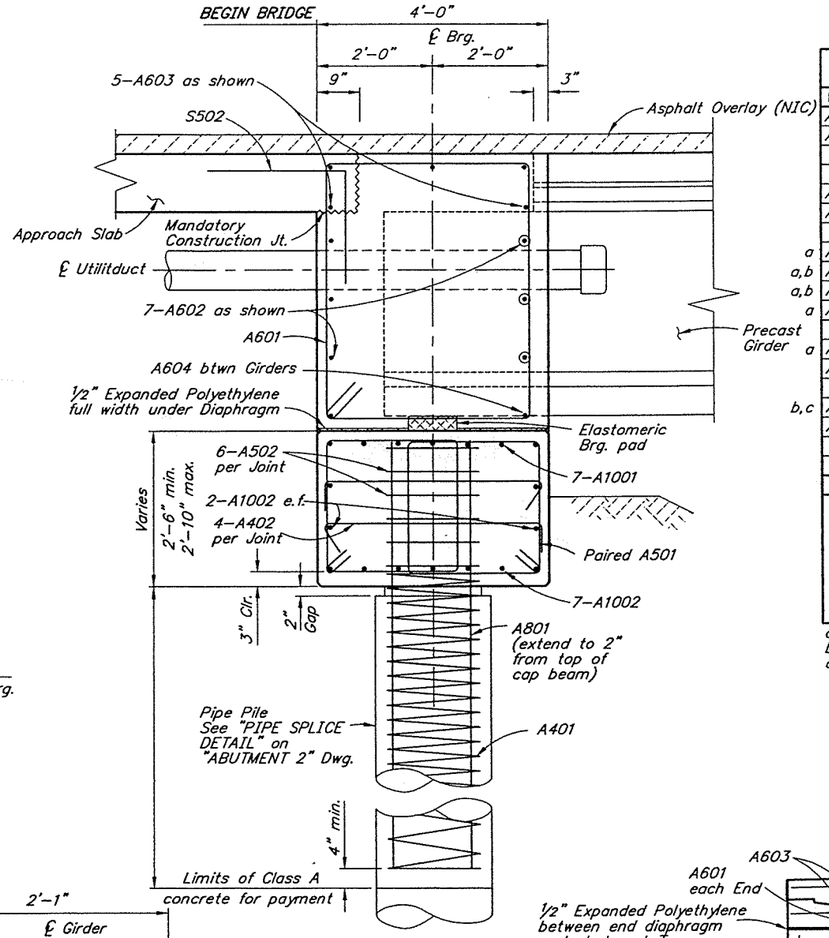
12 0 5 10 In. Feet

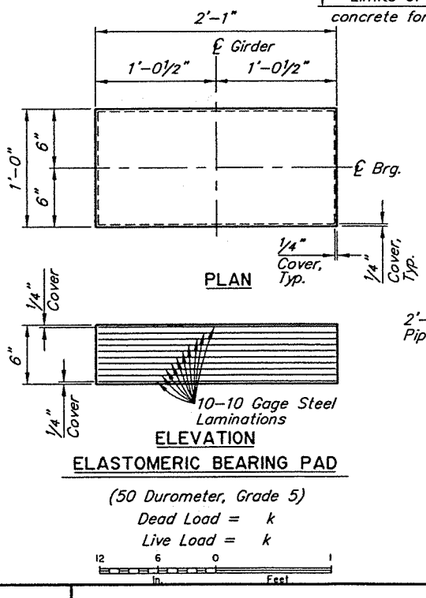


ELEVATION

(Looking back on station)

12 0 5 10 In. Feet

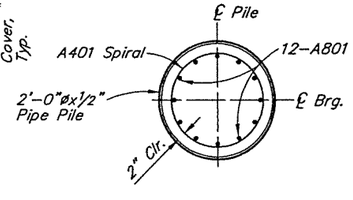




12 6 0 1 2 3 In. Feet

SECTION A-A

12 6 0 1 2 3 In. Feet



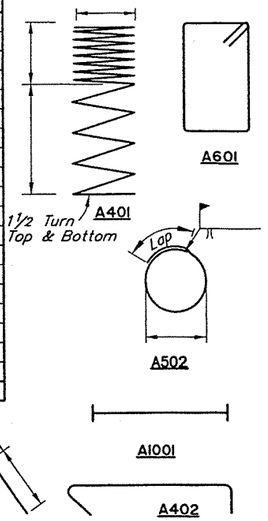
SECTION B-B

12 6 0 1 2 3 In. Feet

REINFORCING STEEL-ONE ABUT.

	MARK	SIZE	NO.	LENGTH	TYPE
	A401	4	6		SPIRAL
	A402	4	24		BENT
	A501	5	120		BENT
	A502	5	36		BENT
a	A601	6	32		BENT
a,b	A602	6	7		——
a,b	A603	6	5		——
a	A604	6	5		——
a	A701	7	8		BENT
	A801	8	72		——
b,c	A1001	10	7		HEADED
	A1002	10	7		——

BENDING DIAGRAM



a – Epoxy coated
b – Field adjust to match cross slope.
c – Headed bar to conform to ASTM A970.

DETAIL A

(Abutment 1 shown Abutment 2 similar)

12 6 0 1 2 3 4 In. Feet

DESIGNED BY:	CHECKED:
DRAWN BY:	CHECKED:
QUANTITIES BY:	CHECKED:

PRELIMINARY PLAN

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
BRIDGE SECTION

ANTLER RIVER BRIDGE

LYNN CANAL HIGHWAY

ABUTMENT 1

BRIDGE NO. 2166

DWG. NO. 5

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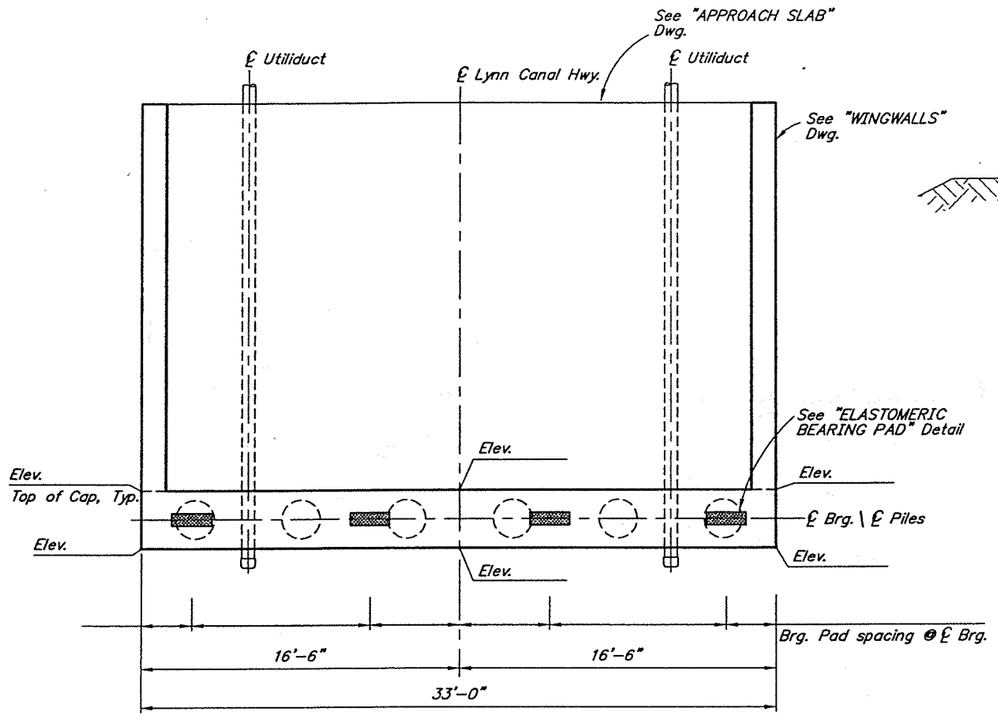
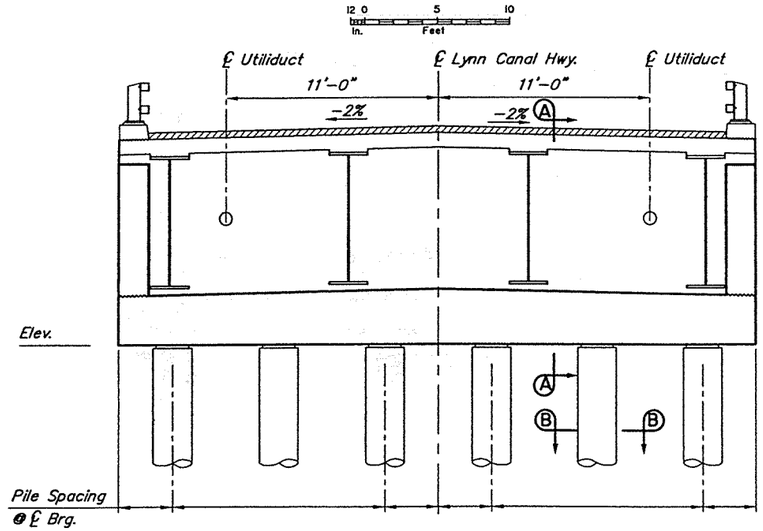
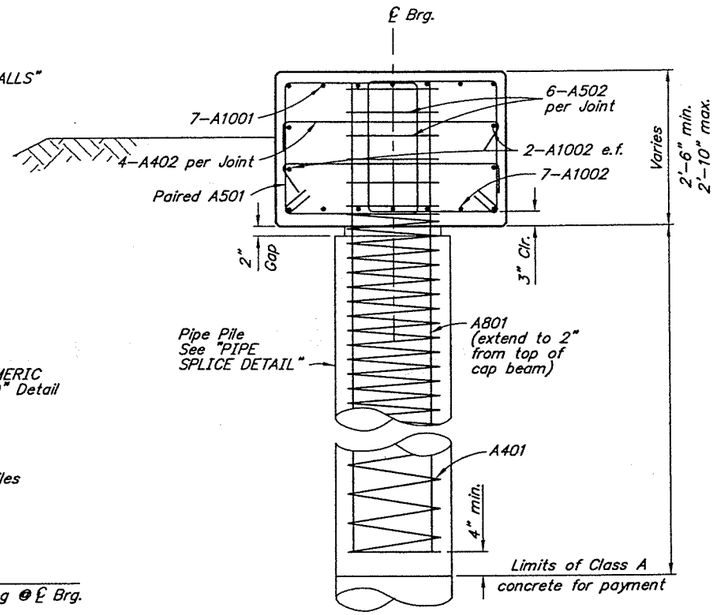
STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	NH-HPRL-093-3(33)/68937	2006	N36	232



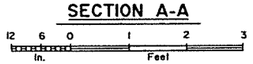
PLAN

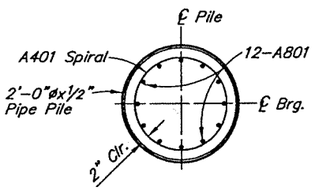


ELEVATION

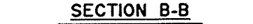


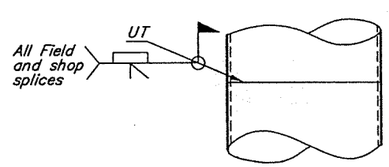
SECTION A-A



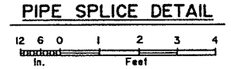


SECTION B-B





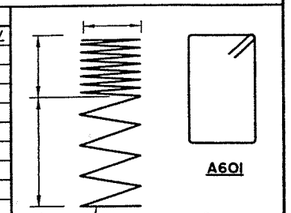
PIPE SPLICE DETAIL

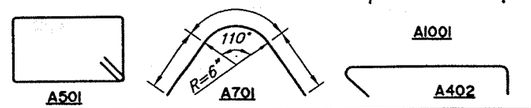


REINFORCING STEEL-ONE ABUT.

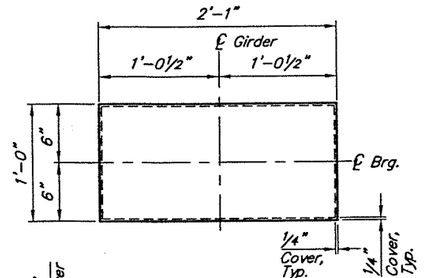
	MARK	SIZE	NO.	LENGTH	TYPE
	A401	4	6		SPIRAL
	A402	4	24		BENT
	A403	4	20		——
	A501	5	120		BENT
	A502	5	36		BENT
a	A601	6	32		BENT
a,b	A602	6	7		——
a,b	A603	6	5		——
a	A604	6	5		——
a	A701	7	8		BENT
	A801	8	72		——
b,c	A1001	10	14		HEADED
	A1002	10	4		——

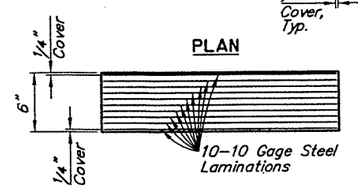
BENDING DIAGRAM





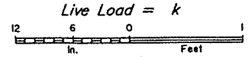
a – Epoxy coated
b – Field adjust to match cross slope.
c – Headed bar to conform to ASTM A970.





ELEVATION
ELASTOMERIC BEARING PAD

(50 Durometer, Grade 5)
Dead Load = k
Live Load = k



DESIGNED BY:	CHECKED:
DRAWN BY:	CHECKED:
QUANTITIES BY:	CHECKED:

PRELIMINARY PLAN

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
BRIDGE SECTION

ANTLER RIVER BRIDGE

LYNN CANAL HIGHWAY

ABUTMENT 19

BRIDGE NO. 2166
DWG NO. 6

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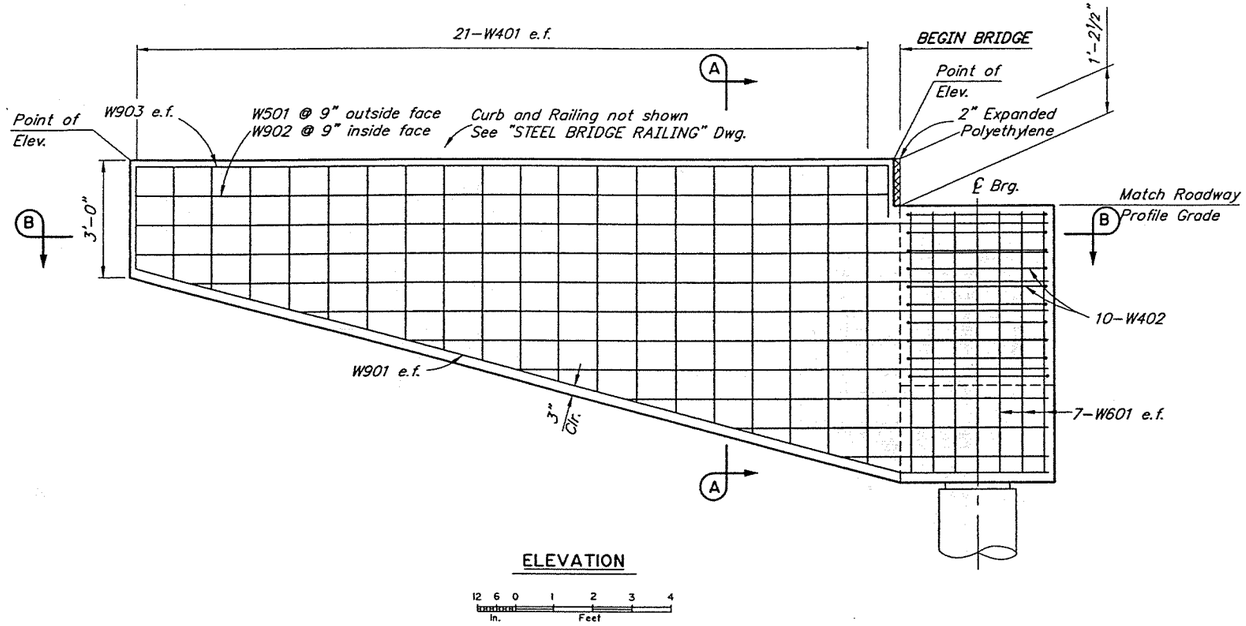
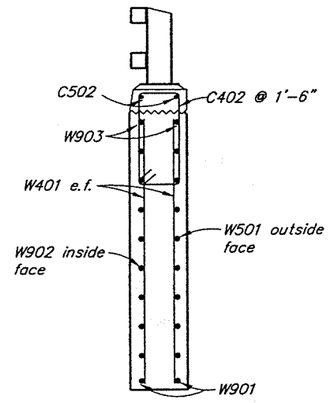
STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	NH-HPRL-093-3(33)/68937	2006	N37	232



ELEVATION

12 6 0 1 2 3 4
In. Feet

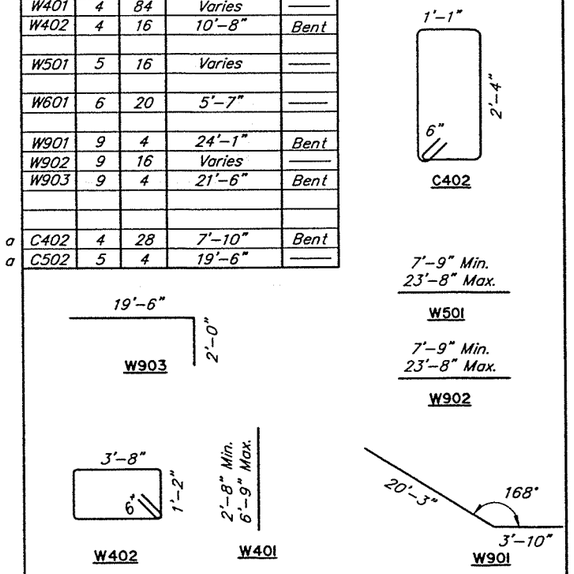


SECTION A-A

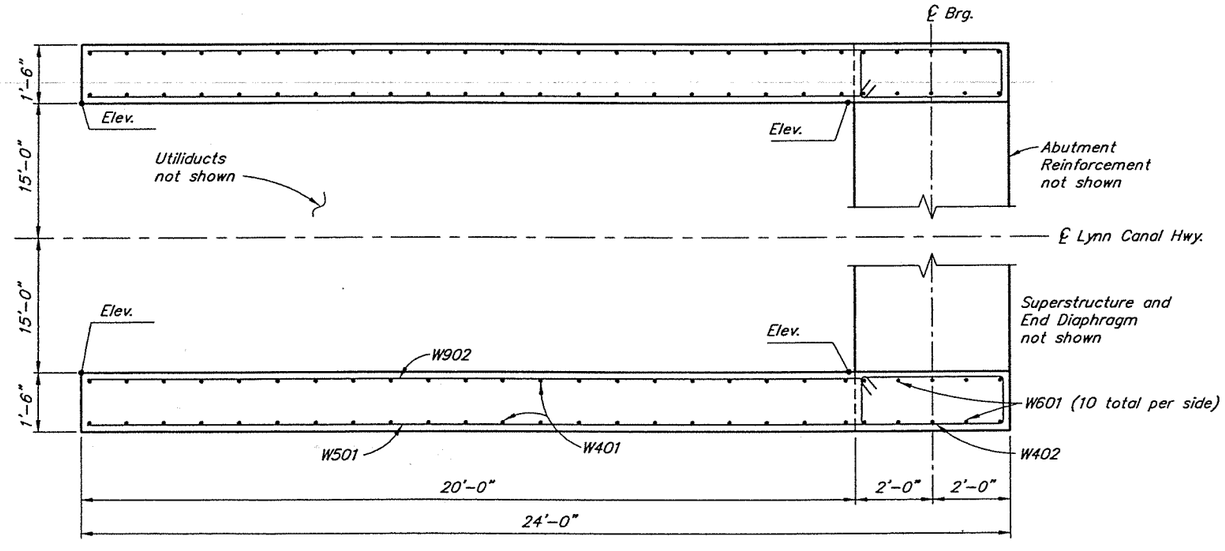
12 6 0 1 2 3 4
In. Feet

REINFORCING STEEL-ONE ABUTMENT

	MARK	SIZE	NO.	LENGTH	TYPE	BENDING DIAGRAM
	W401	4	84	Varies	——	
	W402	4	16	10'–8"	Bent	
	W501	5	16	Varies	——	
	W601	6	20	5'–7"	——	
	W901	9	4	24'–1"	Bent	
	W902	9	16	Varies	——	
	W903	9	4	21'–6"	Bent	
a	C402	4	28	7'–10"	Bent	
a	C502	5	4	19'–6"	——	

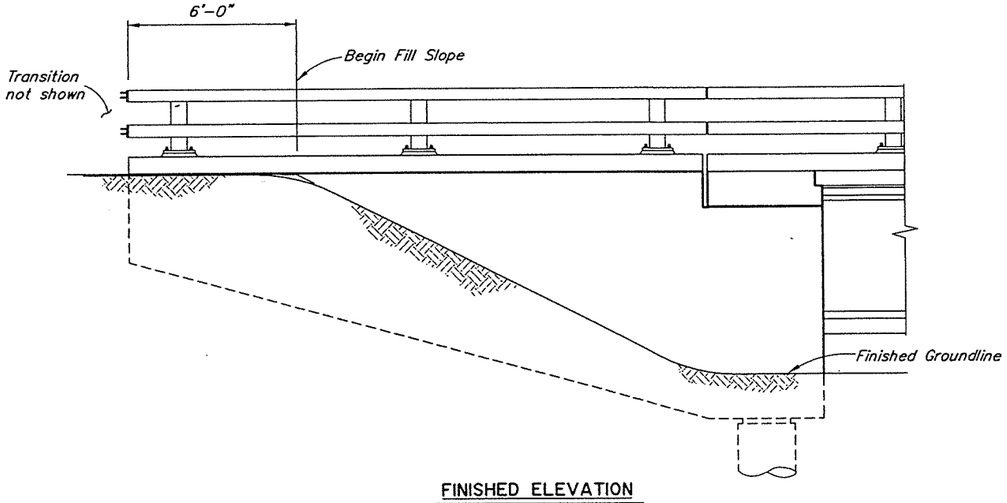


a – Epoxy Coated



SECTION B-B

12 6 0 1 2 3 4
In. Feet



FINISHED ELEVATION

12 0 1 2 3 4
In. Feet

DESIGNED BY:	CHECKED:
DRAWN BY:	CHECKED:
QUANTITIES BY:	CHECKED:

PRELIMINARY PLAN

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
BRIDGE SECTION

ANTLER RIVER BRIDGE

LYNN CANAL HIGHWAY

ABUTMENT 1 WINGWALLS

BRIDGE NO. 2166
DWG NO. 7

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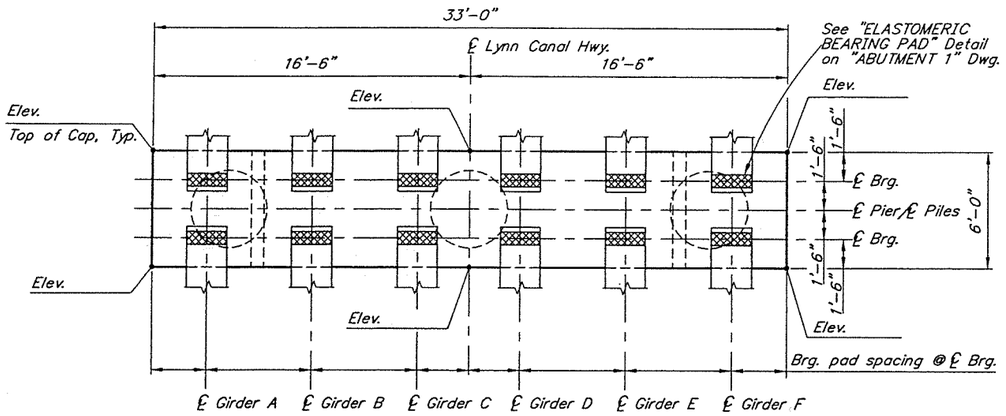
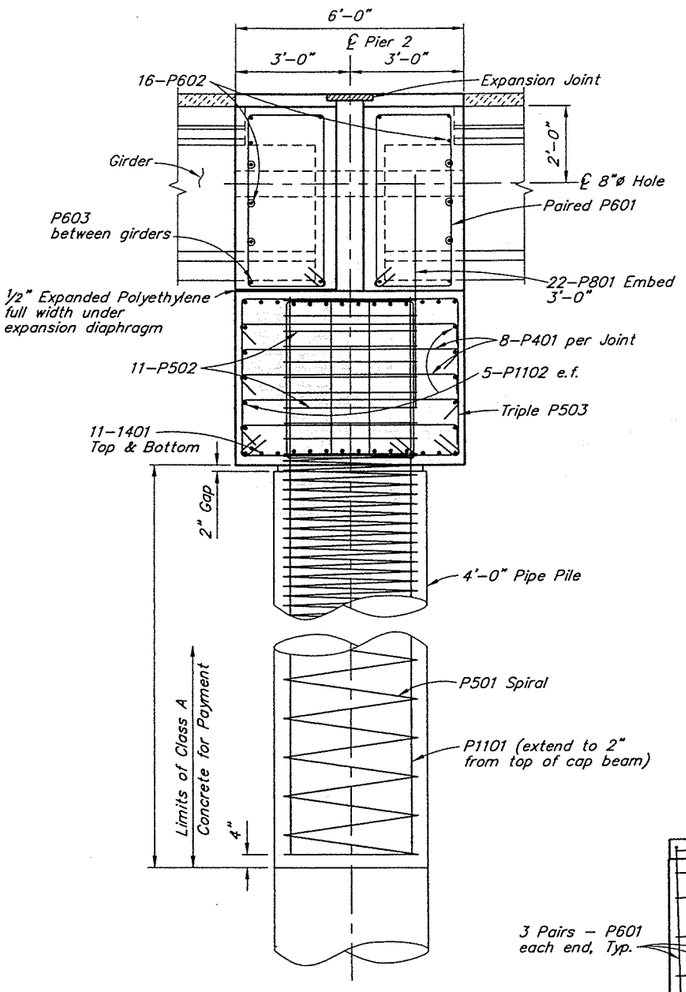
STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	NH-HPRL-093-3(33)/68937	2006	N38	232



PLAN

12 0 4 8 In. Feet



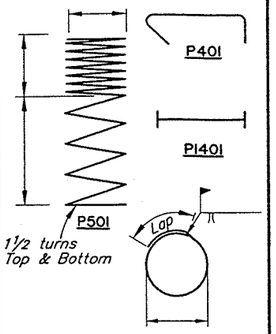
SECTION A-A

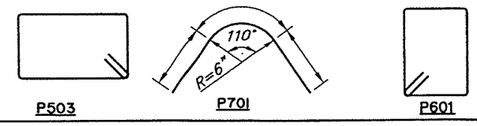
12 6 0 1 2 3 4 In. Feet

REINFORCING STEEL - PIER

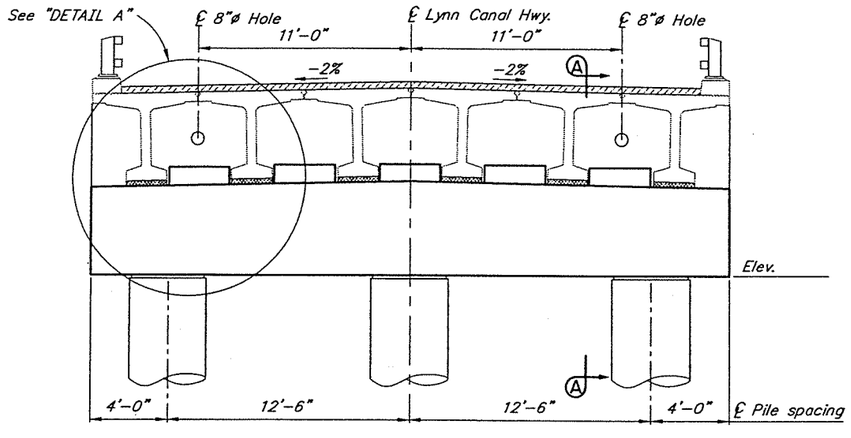
	MARK	SIZE	NO.	LENGTH	TYPE
	P401	4	24		BENT
	P501	5	3		SPIRAL
	P502	5	33		BENT
	P503	5	135		BENT
a	P601	6	72		BENT
a,c	P602	6	16		——
a	P603	6	10		——
a	P701	7	8		BENT
	P801	8	22		——
	P1101	11	60		——
	P1102	11	10		——
b,c	P1401	14	22		HEADED

BENDING DIAGRAM



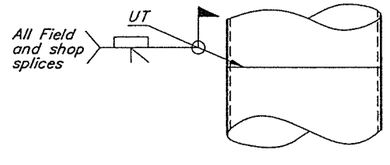


a – Epoxy coated
b – Field adjust bars to match crown.
c – Headed bar to conform to ASTM A970.



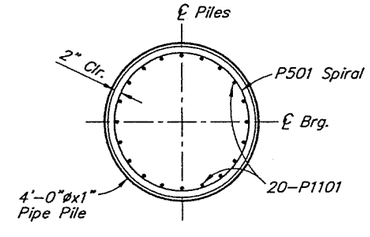
ELEVATION

12 0 4 8 In. Feet



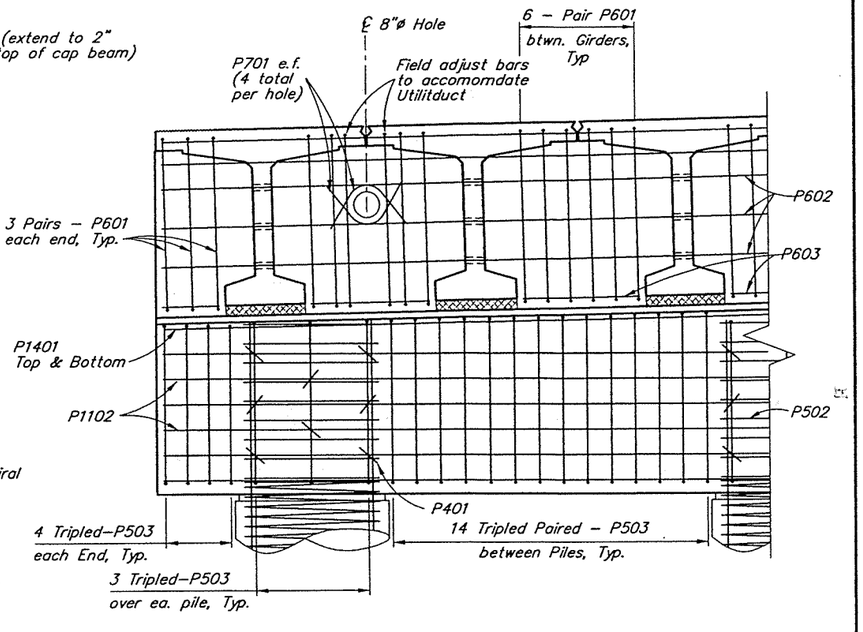
PIPE SPLICE DETAIL

12 6 0 1 2 3 4 In. Feet



SECTION B-B

12 6 0 1 2 3 4 In. Feet



DETAIL A

12 6 0 1 2 3 4 In. Feet

DESIGNED BY:	CHECKED:
DRAWN BY:	CHECKED:
QUANTITIES BY:	CHECKED:

PRELIMINARY PLAN

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
BRIDGE SECTION

ANTLER RIVER BRIDGE

LYNN CANAL HIGHWAY

EXPANSION PIERS

BRIDGE NO. 2166
DWG. NO. 8

P:\JUNEAU ACCESS\ZONE 2\2166-1.dwg, 5/24/2006 4:10:24 PM

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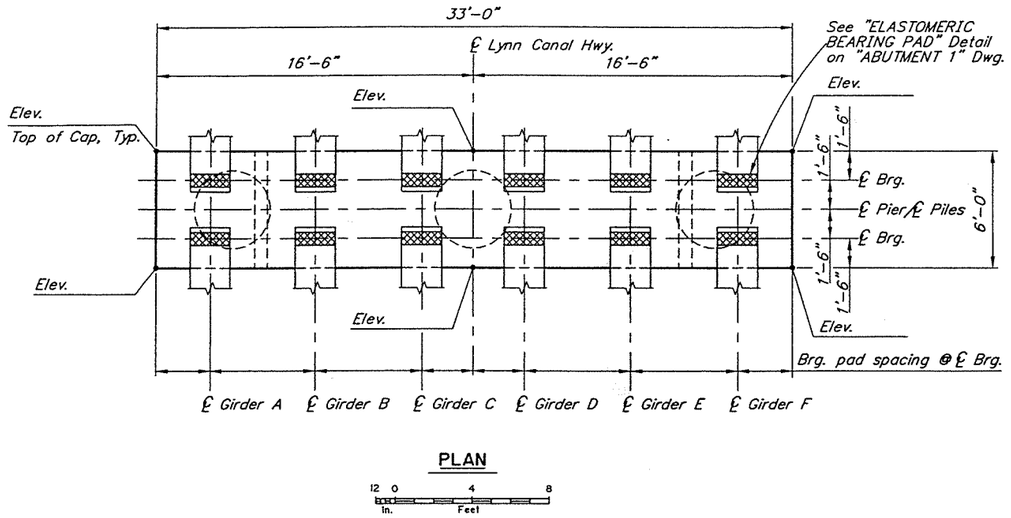
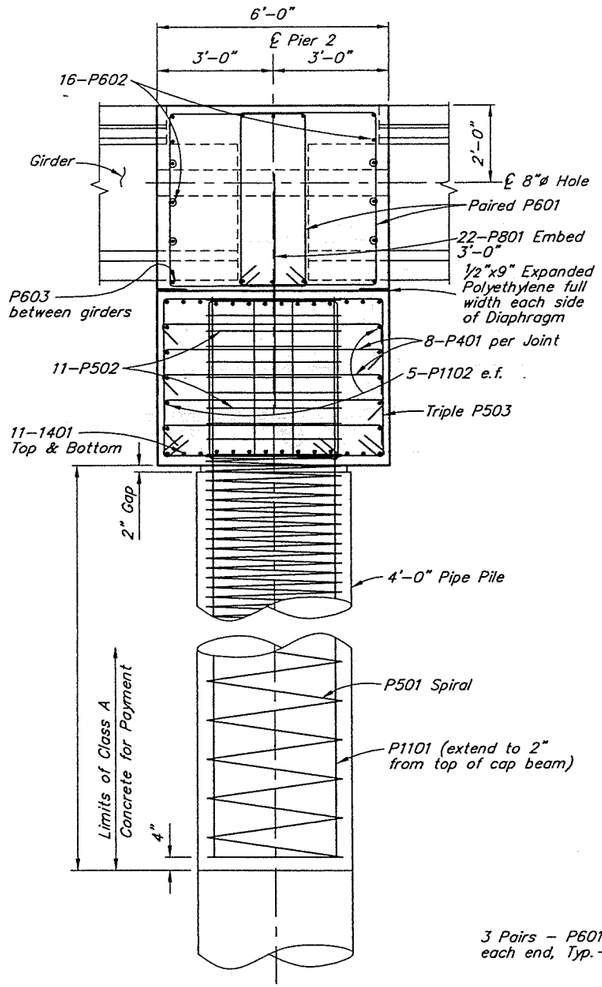
STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	NH-HPRL-093-3(33)/68937	2006	N39	232



PLAN

12 0 4 8
In. Feet



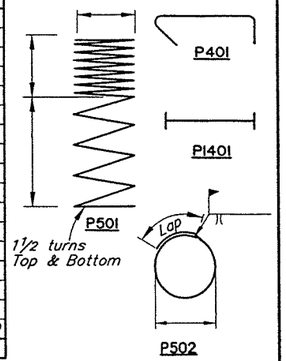
SECTION A-A

12 6 0 1 2 3 4
In. Feet

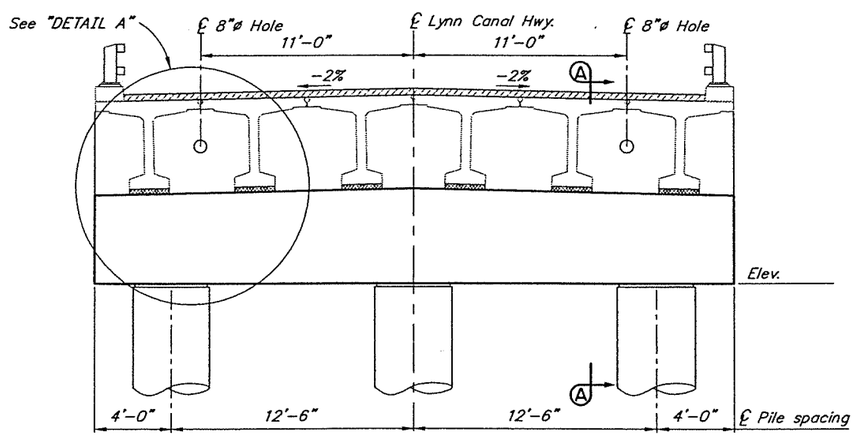
	MARK	SIZE	NO.	LENGTH	TYPE
	P401	4	24		BENT
	P501	5	3		SPIRAL
	P502	5	33		BENT
	P503	5	135		BENT
a	P601	6	72		BENT
a,c	P602	6	16		——
a	P603	6	10		——
a	P701	7	8		BENT
	P801	8	22		——
	P1101	11	60		——
	P1102	11	10		——
b,c	P1401	14	22		HEADED

REINFORCING STEEL - PIER

BENDING DIAGRAM

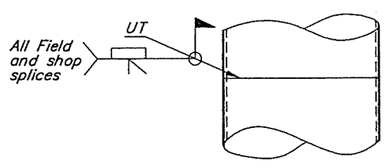


a – Epoxy coated
b – Field adjust bars to match crown.
c – Headed bar to conform to ASTM A970.



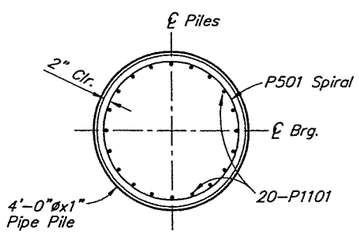
ELEVATION

12 0 4 8
In. Feet



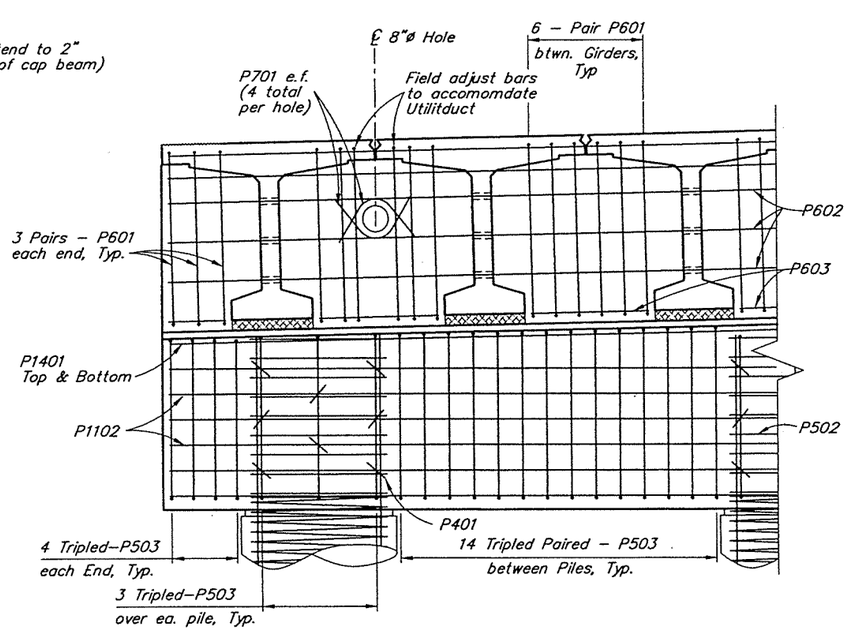
PIPE SPLICE DETAIL

12 6 0 1 2 3 4
In. Feet



SECTION B-B

12 6 0 1 2 3 4
In. Feet



DETAIL A

12 6 0 1 2 3 4
In. Feet

DESIGNED BY:	CHECKED:
DRAWN BY:	CHECKED:
QUANTITIES BY:	CHECKED:

PRELIMINARY PLAN

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
BRIDGE SECTION

ANTLER RIVER BRIDGE

LYNN CANAL HIGHWAY

FIXED PIERS

BRIDGE NO. 2166

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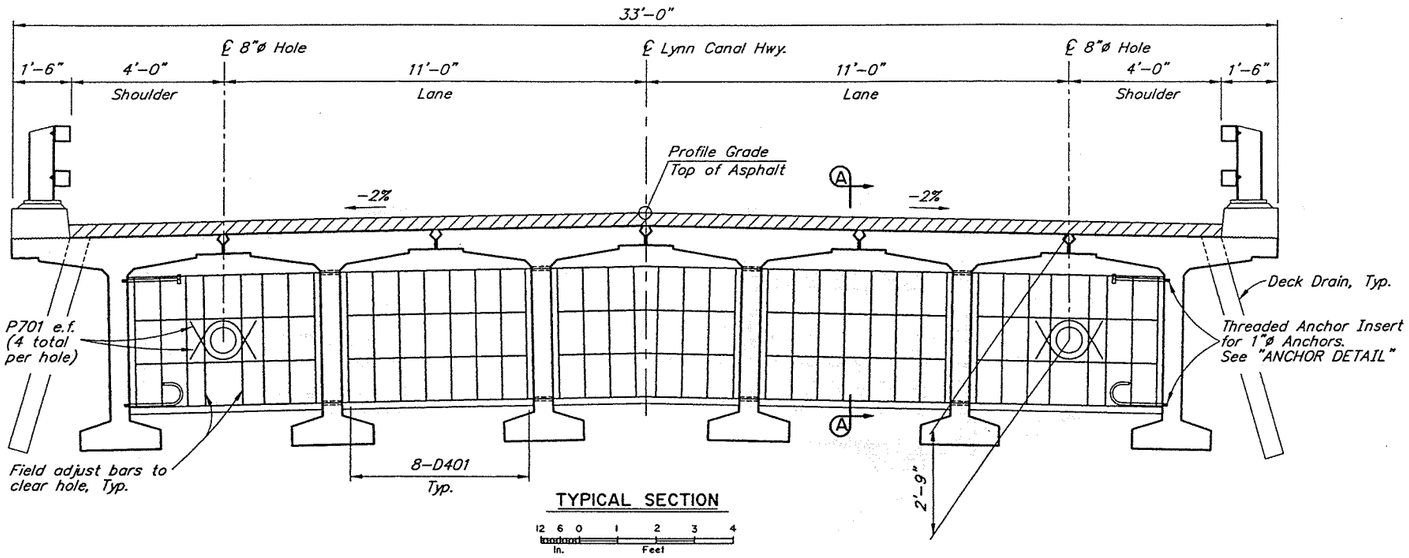
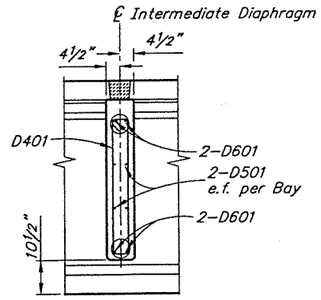
STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	NH-HPRL-093-3(33)/68937	2006	N40	232



TYPICAL SECTION

12 6 0 1 2 3 4
In. Feet

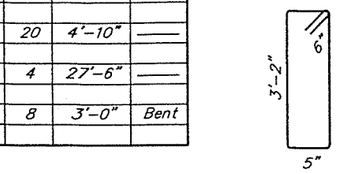


SECTION A-A

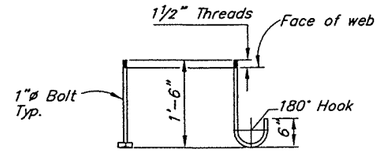
12 6 0 1 2 3 4
In. Feet

a REINFORCING STEEL-ONE DIAPHRAGM

MARK	SIZE	NO.	LENGTH	TYPE	BENDING DIAGRAM
D401	4	40	8'-2"	Bent	
D501	5	20	4'-10"	——	
D601	6	4	27'-6"	——	
D701	7	8	3'-0"	Bent	



a – Epoxy coated.



TOP ANCHOR BOTTOM ANCHOR

ASTM A307 GALVANIZED

ANCHOR DETAIL

12 6 0 1 2 3
In. Feet

DESIGNED BY:	CHECKED:
DRAWN BY:	CHECKED:
QUANTITIES BY:	CHECKED:

PRELIMINARY PLAN

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION
AND PUBLIC FACILITIES
BRIDGE SECTION

ANTLER RIVER BRIDGE

LYNN CANAL HIGHWAY

BULB-TEE TYPICAL SECTION

BRIDGE NO. 2166

DWG. NO. 10

E:\JUNEAU ACCESS\ZONE 2\2166-1.dwg, 5/24/2006 4:10:34 PM

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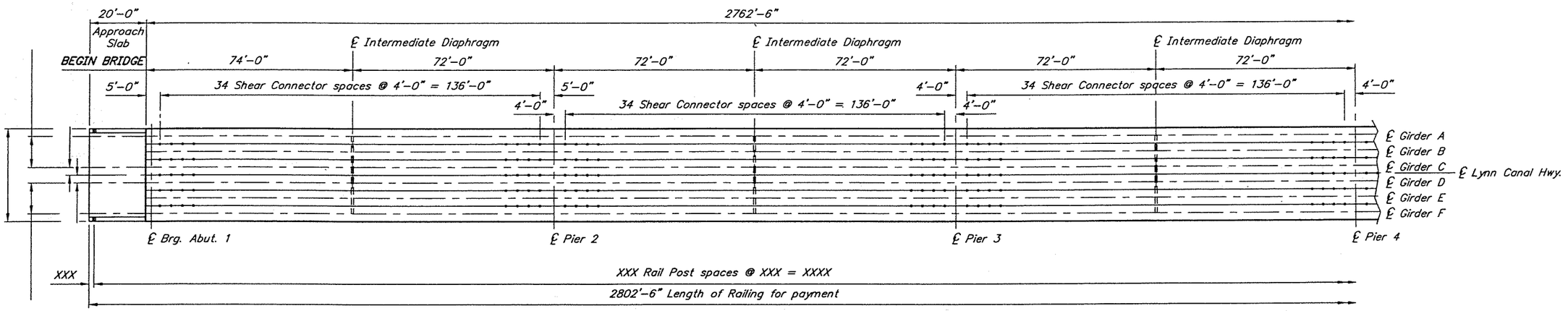
STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	NH-HPRL-093-3(33)/68937	2006	N41	232



FRAMING PLAN

10 0 20 40
Feet

DESIGNED BY:	CHECKED:
DRAWN BY:	CHECKED:
QUANTITIES BY:	CHECKED:

PRELIMINARY PLAN

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
BRIDGE SECTION

ANTLER RIVER BRIDGE

LYNN CANAL HIGHWAY

FRAMING PLAN

BRIDGE NO. 2166

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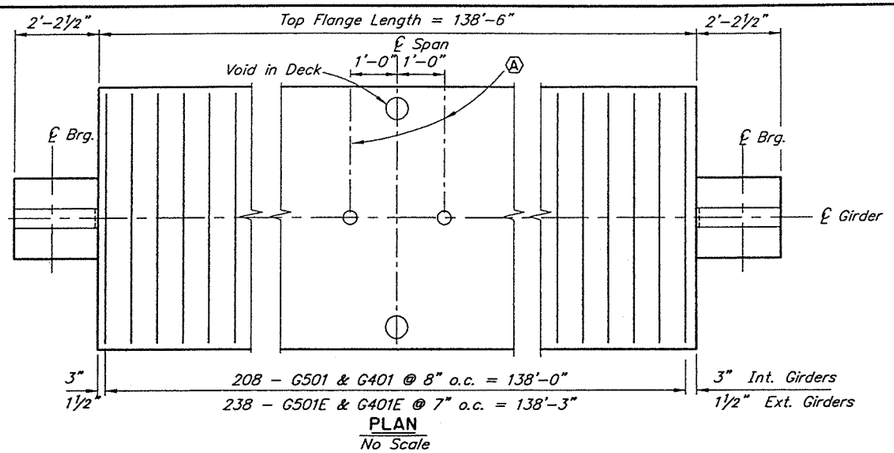
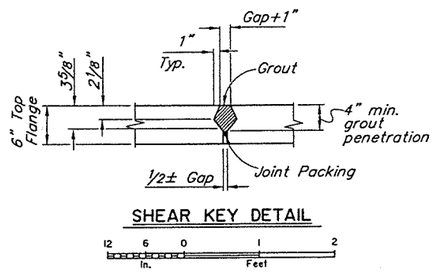
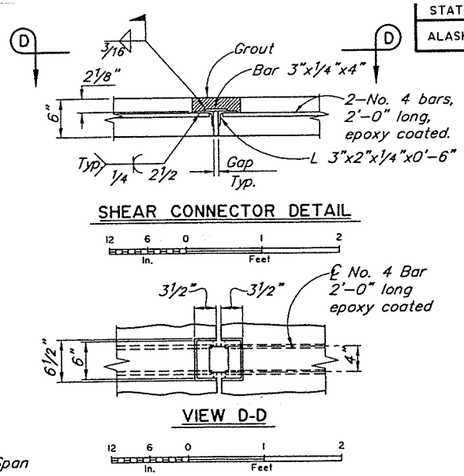
STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	NH-HPRL-093-3(33)/68937	2006	N42	232



PLAN
No Scale



SHEAR KEY DETAIL



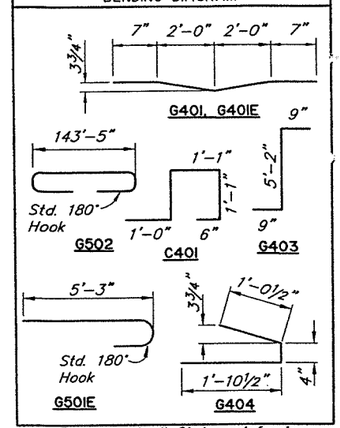
SHEAR CONNECTOR DETAIL

VIEW D-D

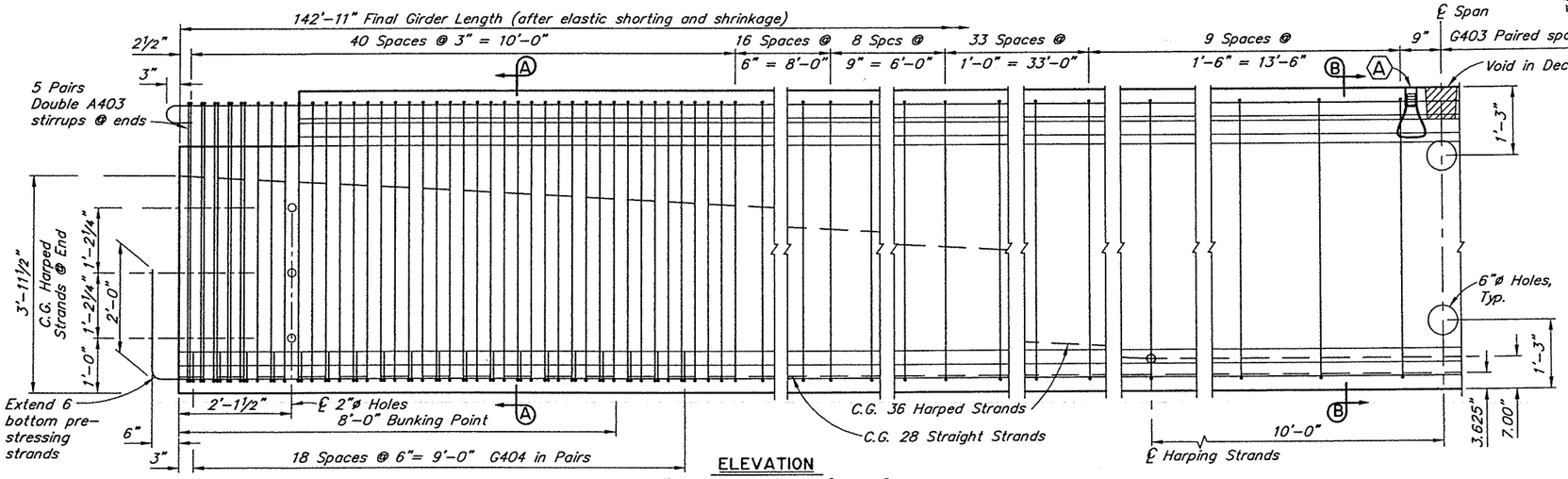
	MARK	SIZE	NO.	LENGTH	TYPE
	G401	4	211	5'-3"	Bent
e	G401E	4	238	5'-3"	Bent
b	G402	4	8	136'-11"	–
b,e	G402E	4	8	136'-11"	–
	G403	4	448	6'-8"	Bent
	G404	4	76	3'-3"	Bent
	G501	5	211	5'-2"	–
e	G501E	5	238	5'-10"	Bent
b	G502	5	8	144'-7"	Bent
b,e	G502E	5	8	144'-7"	Bent
c,e	C401	4	98	4'-9"	Bent
b,e	C501	5	2	144'-8"	

a REINFORCING STEEL SCHEDULE-ONE GIRDER

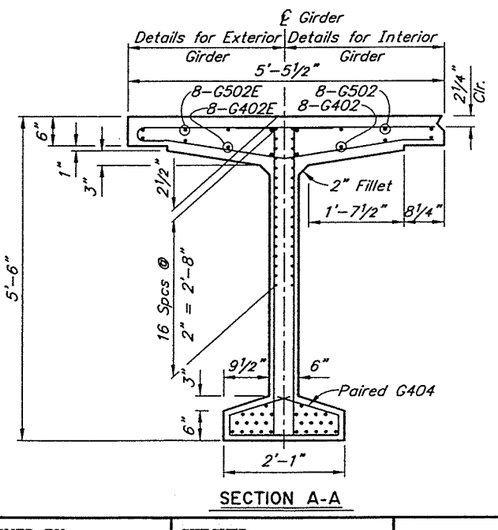
BENDING DIAGRAM



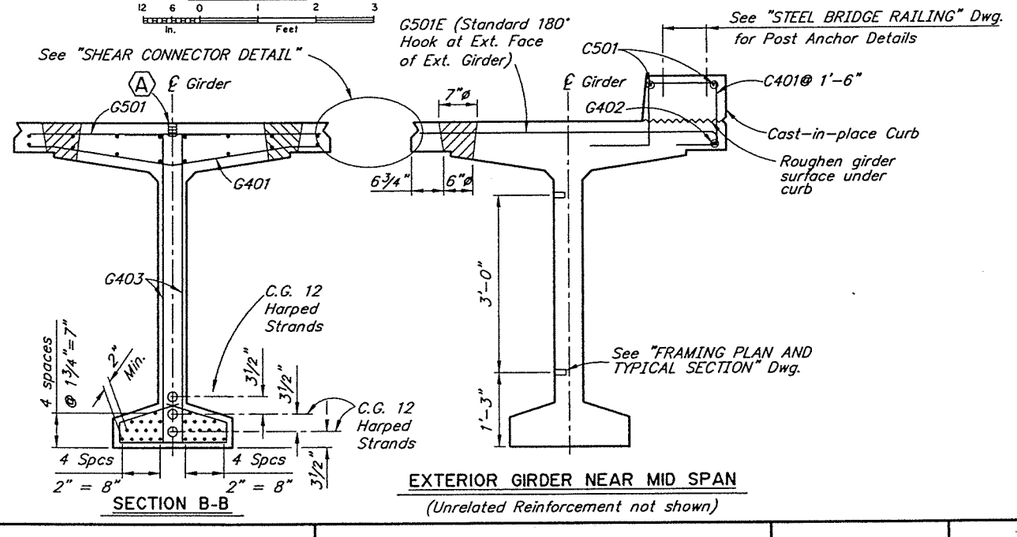
a – Epoxy coat all Girder reinforcing
b – Length does not include splices. Minimum lap splice length for splices shall be: 2'-0" for #4 bars, 2'-6" for #5 bars.
c – Ship 6 loose for end diaphragm.
e – Exterior Girder only.



ELEVATION



SECTION A-A



SECTION B-B

EXTERIOR GIRDER NEAR MID SPAN
(Unrelated Reinforcement not shown)

GIRDER NOTES

Use normal weight concrete having the following strengths:
At Stress Transfer f'ci = 6500 psi
At 28 days f'c = 7500 psi

Use ½" round low relaxation strands having an ultimate strength of 270 ksi and a cross section area of 0.153 in²

Design is based on the following steel stresses:
Pretensioning – Jacking Stress 189 ksi
After initial losses – 170 ksi
After all losses – 140 ksi

1" clear on all reinforcing except as noted.

Deflect forms to compensate for camber and roadway grade.

Provide a magnesium float finish on the roadway surface of the precast member. Roughen the surface under the railing.

Omit Shear Key and Shear Connector on outside of exterior girders.

Cast Girder ends plumb with respect to roadway grade.

(A) 1"x1'-0" Coil Anchor Insert for vertical adjustment of girders. Recess 2". Prevent concrete from filling hole.

Install web holes and web anchor inserts parallel to ℄ Brg.

Deck drains blockouts not shown.

DESIGNED BY:	CHECKED:
DRAWN BY:	CHECKED:
QUANTITIES BY:	CHECKED:

PRELIMINARY PLAN

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
BRIDGE SECTION

ANTLER RIVER BRIDGE

LYNN CANAL HIGHWAY

BULB-TEE GIRDERS

BRIDGE NO. 2166
DWG NO. 12

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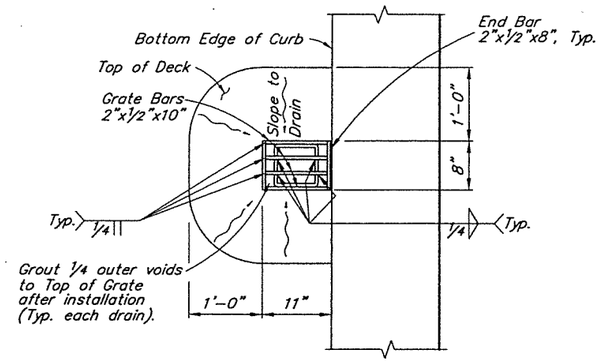
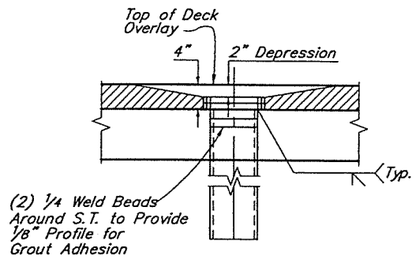
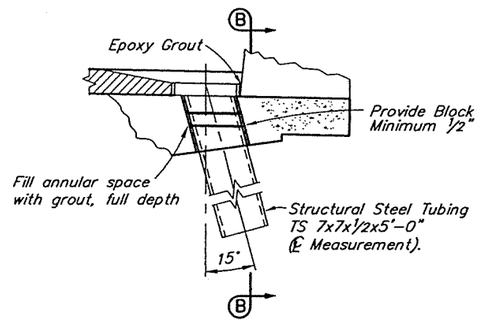
STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	NH-HPRL-093-3(33)/68937	2006	N43	232



DECK DRAIN-PLAN



SECTION B-B



DRAIN

DRAIN DETAILS

12 6 0 1 2
In. Feet

DESIGNED BY:	CHECKED:
DRAWN BY:	CHECKED:
QUANTITIES BY:	CHECKED:

PRELIMINARY PLAN

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
BRIDGE SECTION

ANTLER RIVER BRIDGE

LYNN CANAL HIGHWAY

DECK DRAINS

BRIDGE NO. 2166

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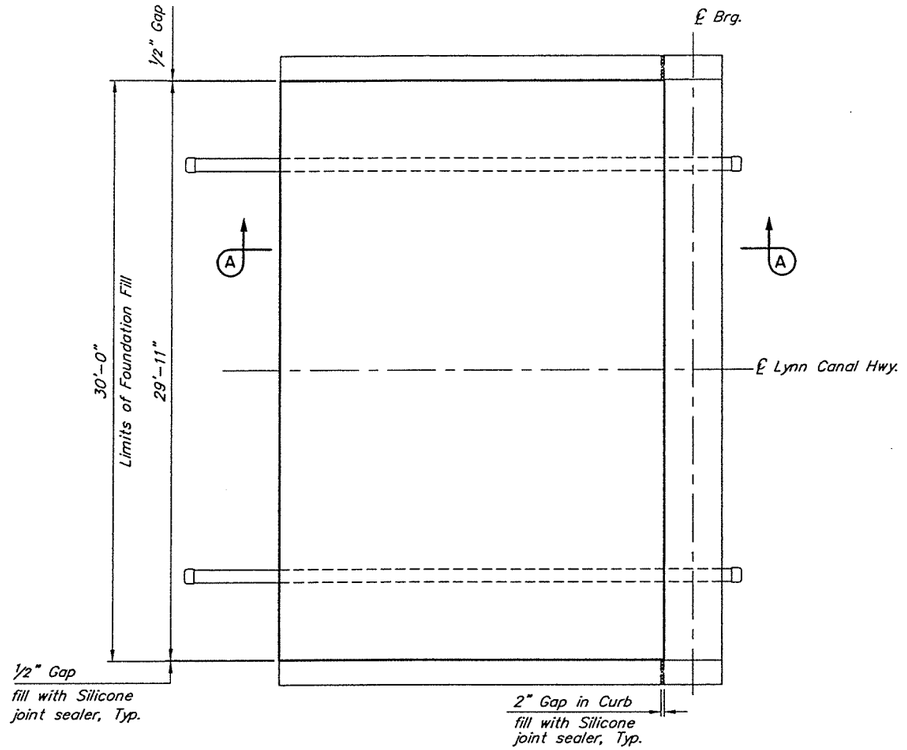
STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	NH-HPRL-093-3(331)/68937	2006	N14	232

a REINFORCING STEEL - ONE APPROACH SLAB

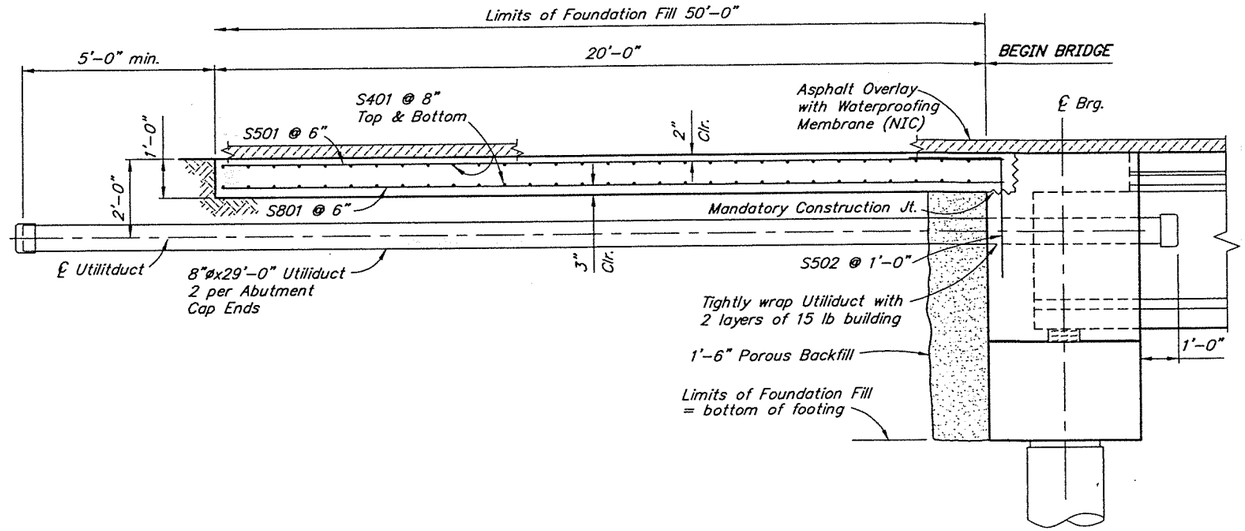
	MARK	SIZE	NO.	LENGTH	TYPE	BENDING DIAGRAM
b	S401	4	62	30'-7"	——	
	S501	5	60	20'-5"	——	
	S502	5	30	5'-0"	BENT	2'-0", 3'-0", S502
	S801	8	60	20'-5"	——	

a – Epoxy coat all reinforcing steel.
b – Field adjust to match cross slope.



PLAN

12 0 4 8
In. Feet



SECTION A-A

12 6 0 1 2 3 4
In. Feet

DESIGNED BY:	CHECKED:
DRAWN BY:	CHECKED:
QUANTITIES BY:	CHECKED:

PRELIMINARY PLAN

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION
AND PUBLIC FACILITIES
BRIDGE SECTION

ANTLER RIVER BRIDGE

LYNN CANAL HIGHWAY

ABUTMENT 1 APPROACH SLAB

BRIDGE NO. 2166

DWG NO. 14

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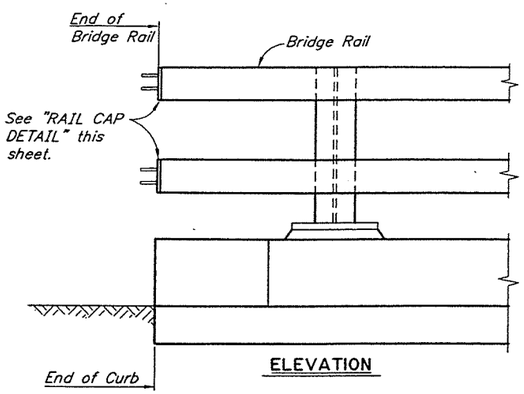
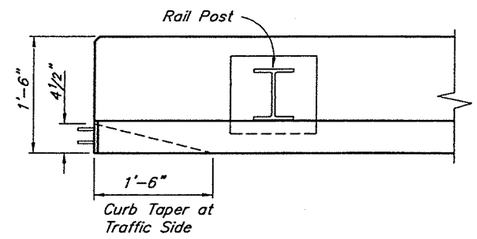
STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	NH-HPRL-093-3(33)/68937	2006	N45	232

CURB HEIGHT DATA	
ASPHALT THICKNESS (Inches)	CURB HEIGHT "X" (Inches)
0	7"
2"	9"
3"	10"
4"	10"

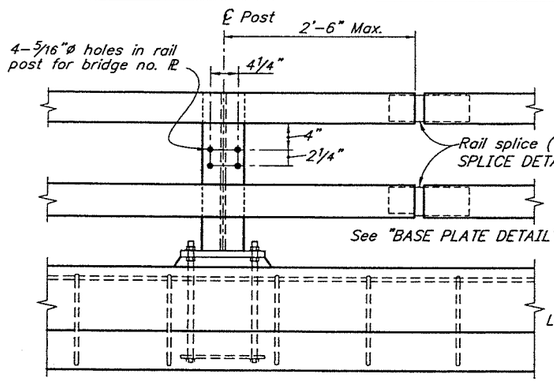


ELEVATION

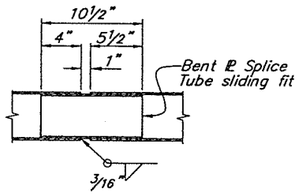


PLAN

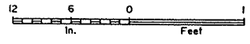
END POST DETAIL

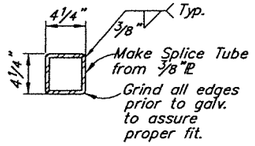


EXPANSION JOINT

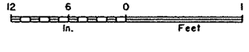


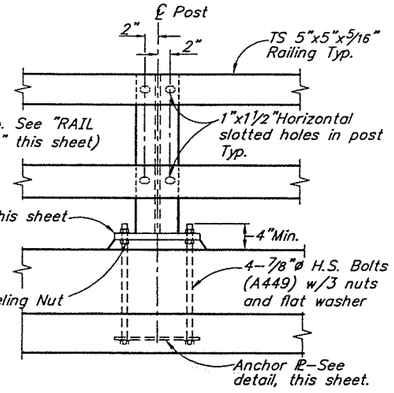
RAIL SPLICE DETAIL



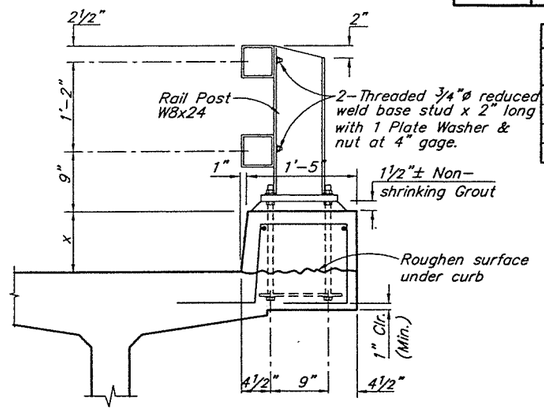


SPLICE TUBE

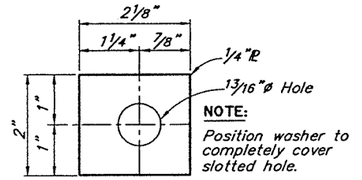




TYPICAL POST ELEVATION

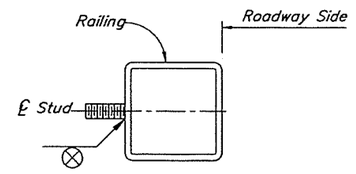


TYPICAL SECTION

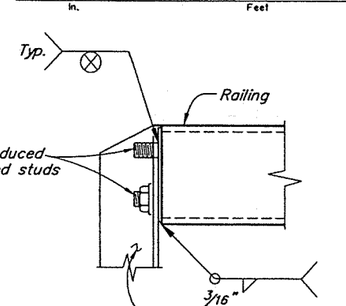


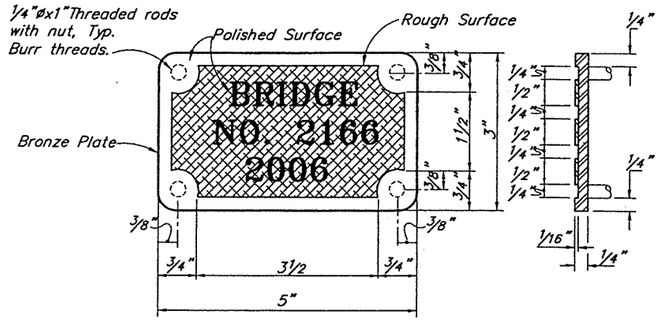
NOTE:
Position washer to completely cover slotted hole.

PLATE WASHER
No Scale

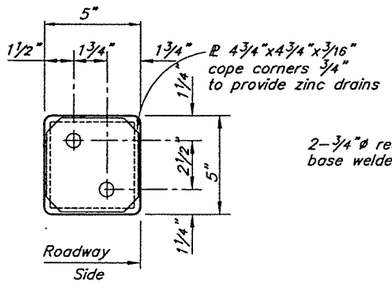


RAILING STUD DETAIL

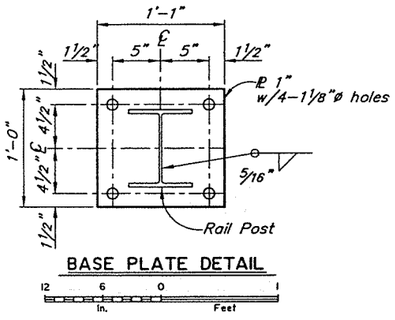




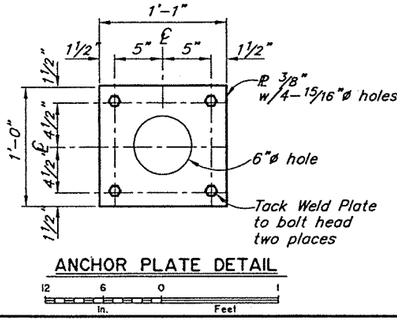
BRONZE BRIDGE NO. PLATE
No Scale



RAIL CAP DETAIL



BASE PLATE DETAIL



ANCHOR PLATE DETAIL

NOTES

1. Locate bridge number plates on right hand side of approaching traffic near each end as shown (2 total).
2. Furnish bridge number plates. Use bronze that conforms to A.S.T.M. B98-90, Alloy "A" or "B". Use "Century" type style lettering. Use studs and nuts that conform to UNS C65100 or C65500. Braze ¼"ø threaded rod to back of plate with nut - 4 required. Use locking nuts or lock washers on all machine bolts.
3. Provide railing expansion joints at 50'-0" maximum intervals. Railing shall be continuous over 2 posts minimum.
4. Use grout with a minimum 24 hour f'c of 3000 psi.
5. See Bridge plans for rail post spacing.
6. See Std. Dwg. G-31.00 for Thrie Beam Transition.

DESIGNED BY:	CHECKED:
DRAWN BY:	CHECKED:
QUANTITIES BY:	CHECKED:

PRELIMINARY PLAN

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
BRIDGE SECTION

ANTLER RIVER BRIDGE

LYNN CANAL HIGHWAY

STEEL BRIDGE RAILING

BRIDGE NO. 2166

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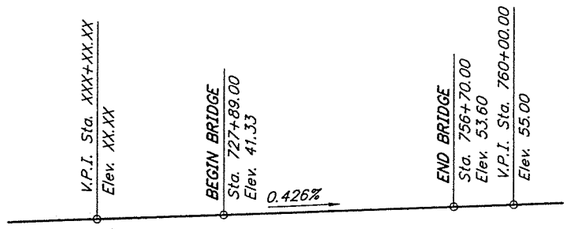
STATE	PROJECT DESIGNATION	YEAR	PROJ. NO.	TOTAL SHEETS
ALASKA	NH-HPRL-093-3(33)/68937	2006	NCA	232



PROFILE GRADE DATA

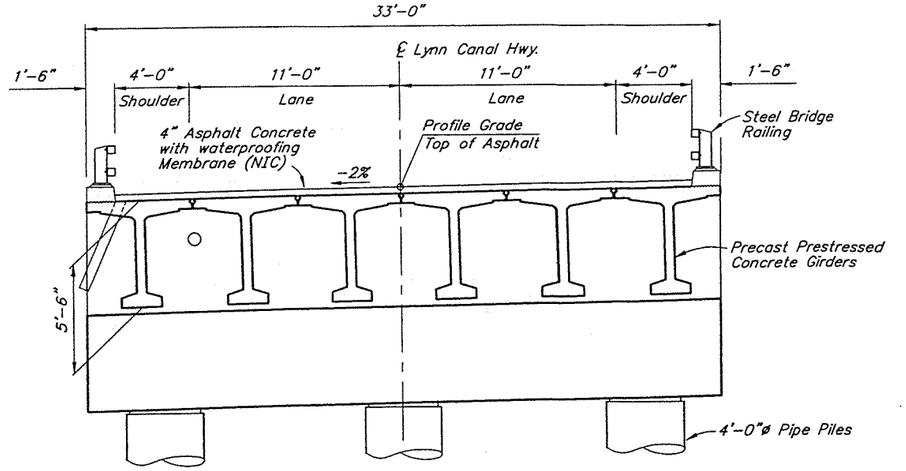
No Scale

roadway @ 731 = 42.65'
side height = 5.5'
37.05
HW elev. 21.00
16.05' clearance @ HW

MHW = 14.9

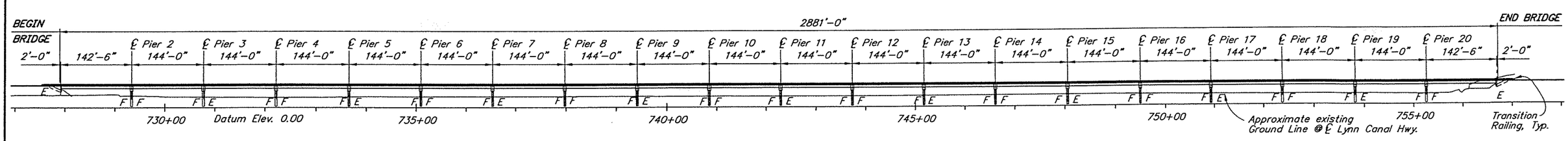
BRIDGE DRAWING INDEX	
TITLE	DWG. NO.
GENERAL LAYOUT	1
SITE PLAN	2
FOUNDATION PLAN	3
ABUTMENT 1	4
ABUTMENT 21	5
WINGWALLS ABUTMENT 1	6
WINGWALLS ABUTMENT 21	7
EXPANSION PIERS	8
FIXED PIERS	9
TYPICAL SECTION	10
FRAMING PLAN	11
GIRDERS	12
DECK DRAINS	13
APPROACH SLAB	14
STEEL BRIDGE RAILING	15

PRELIMINARY PLAN



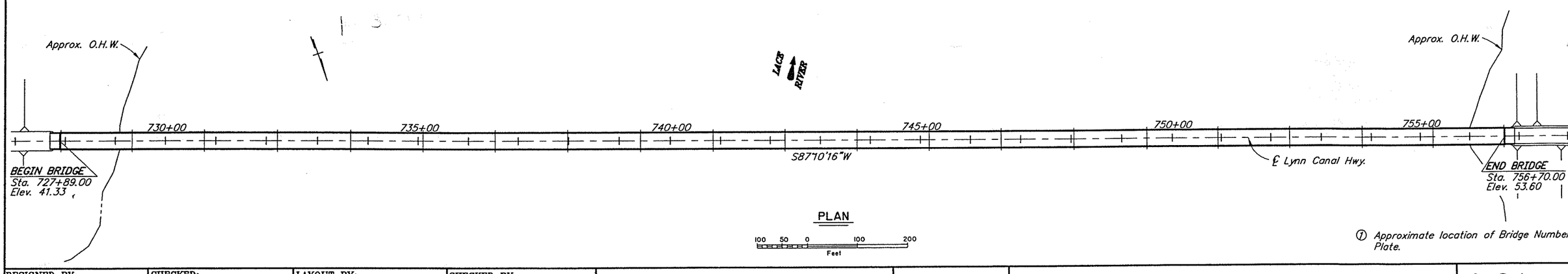
TYPICAL SECTION BULB-TEE

12 0 4 8
In. Feet



ELEVATION

100 50 0 100 200
Feet



PLAN

100 50 0 100 200
Feet

① Approximate location of Bridge Number Plate.

DESIGNED BY:	CHECKED:	LAYOUT BY:	CHECKED BY:
DRAWN BY:	CHECKED:	SPECIFICATIONS BY:	P S & E COMPARED:
QUANTITIES BY:	CHECKED:	APPROVAL RECOMMENDED BY:	

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
BRIDGE SECTION

LACE RIVER BRIDGE

LYNN CANAL HIGHWAY

GENERAL LAYOUT

BRIDGE NO. 2169
DWG. NO. 1

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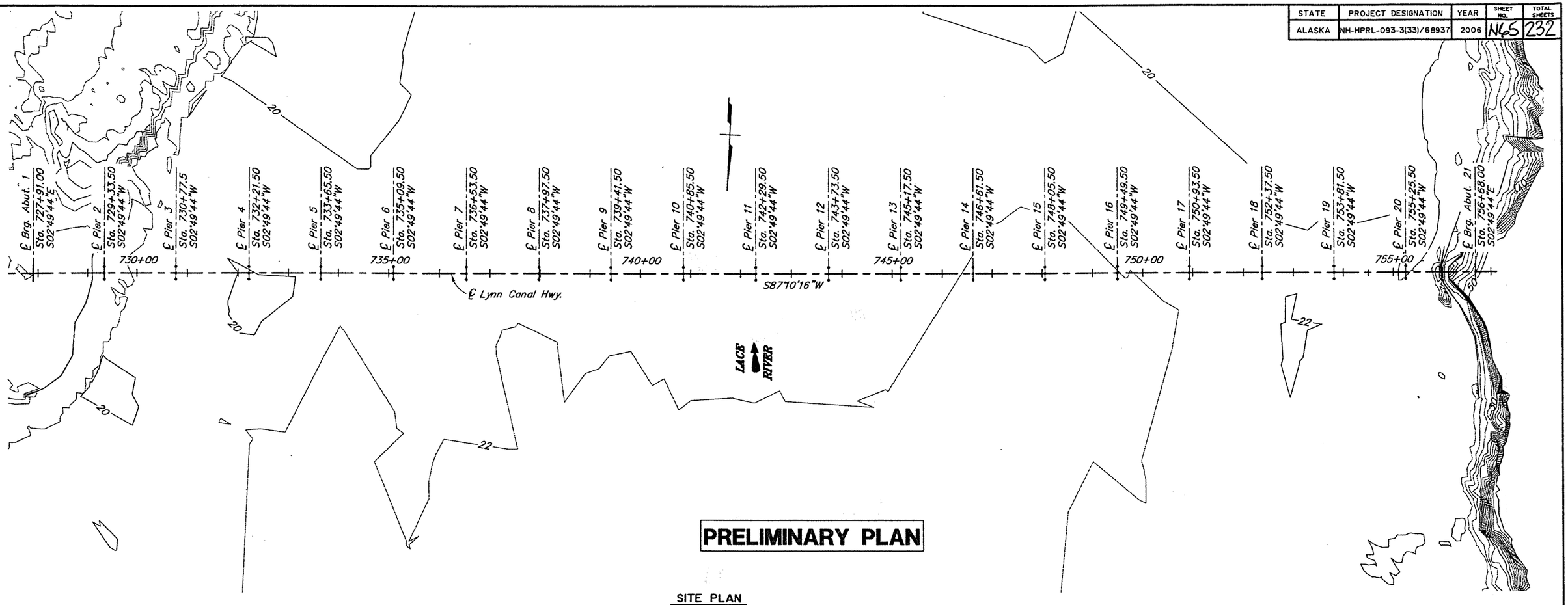
STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	NH-HPRL-093-3(33)/68937	2006	N65	232



PRELIMINARY PLAN

SITE PLAN

100 50 0 100 200
Feet

BRIDGE BASIS OF ESTIMATE

ITEM NO.	ITEM	PAY UNIT	ESTIMATING UNIT	SUBST.	SUPERST.	TOTAL
205(3)	Foundation Fill	CY	CY			1300
501(4)	Class A Concrete	CY	CY			4300.0
501(10)	Class A–A Concrete	CY	CY			46.0
501(7B)	Precast Concrete Member (143'–0" Decked Bulb–Tee)	EA	EA			120
501(9)	Bridge Expansion Joint	EA	EA			330
503(3)	Reinforcing Steel	LBS	LBS			650,000
503(2)	Epoxy–Coated Reinforcing Steel	LBS	LBS			100,000
505(5B)	Furnish Structural Steel Piles (2'–0"øx½")	LF	LF			600
505(5C)	Furnish Structural Steel Piles (4'–0"øx1")	LF	LF			7980
505(6B)	Drive Structural Steel Piles (2'–0"øx½")	EA	EA			6
505(6C)	Drive Structural Steel Piles (4'–0"øx1")	EA	EA			57
507(1)	Steel Bridge Railing	LF	LF			5842
606(12)	Guardrail / Bridge Rail Connection	EA	EA			4
611(1)	Riprap, Class II	CY	CY			500
631(2)	Geotextile, Erosion Control, Class 1	SY	SY			500

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

HYDRAULIC & HYDROLOGIC SUMMARY

Flood Frequency (Yr.)	50	100	500
Exceedance Probability (%)	2	1	0.2
Discharge (ft³/sec)	42,200	46,300	56,400
Water Surface Elevation (ft)	25.3	25.5	26.1
Anticipated Add'l Backwater (ft)	0.0	0.0	
Contraction Scour (ft)		0.3	0.3
Abutment Scour (ft)		n.c.	n.c.
Pier Scour (ft)		6.6	6.8

Drainage Area for this crossing: 403 square miles.

Hydraulic Capacity: >>100,000 cfs at Low Superstructure Elevation[1] of 36.2 ft. which has an exceedance probability of equal to or less than 0.2 percent.

Total scour equals contraction scour + local scour.

OHW[1] (ft)	22.8
Extreme High Tide (ft)	21.3
Mean High Water, Tidal (ft)	14.8

1 – Located at downstream edge of deck, east bank of Lace River.

GENERAL NOTES

DESIGN: ..... AASHTO LRFD Bridge Design Specifications, Third Edition, 2004, with latest interim specifications.

LIVE LOAD:..... HL–93

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

SEISMIC PARAMETERS:..... Acceleration Coefficient, a = 0.2 g
Site Coefficient, s = 1.5
Liquefaction Potential = High
AASHTO 90% probability of not being exceeded in 50 years.

REINFORCEMENT:..... ASTM A706, Fy = 60,000 psi
Space reinforcement evenly unless otherwise noted.
Use ASTM A970 headed reinforcing bars.

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

CONCRETE:..... Use Class A Concrete concrete unless otherwise noted, f'c = 4000 psi.
Use Class A–A concrete for approach slab, f'c = 5000 psi.

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

STRUCTURAL STEEL PILING:... Use API 5L PSL2 X52, Fy = 52,000 psi for Pipe Piles.
Pile Tip reinforcing is required.

DESIGNED BY:	CHECKED:	HYDRAULICS BY:	CHECKED BY:
DRAWN BY:	CHECKED:	FOUNDATIONS REVIEWED BY:	
QUANTITIES BY:	CHECKED:		

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
BRIDGE SECTION

LACE RIVER BRIDGE

LYNN CANAL HIGHWAY

SITE PLAN

BRIDGE NO. 2169

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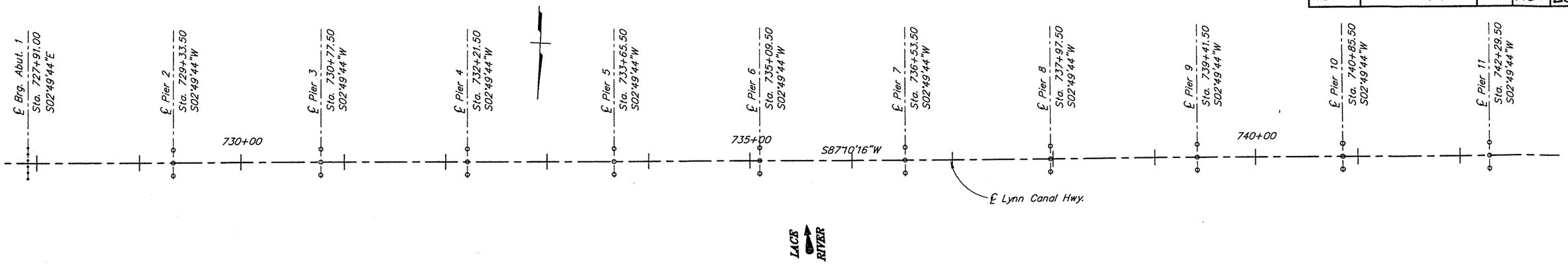
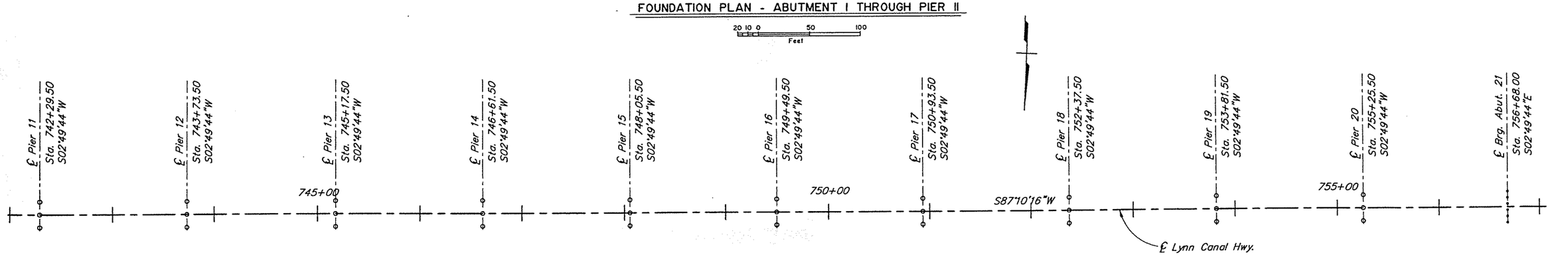
STATE	PROJECT DESIGNATION	YEAR	NO.	SHEETS
ALASKA	NH-HPRL-093-3(33)/68937	2006	NG6	232



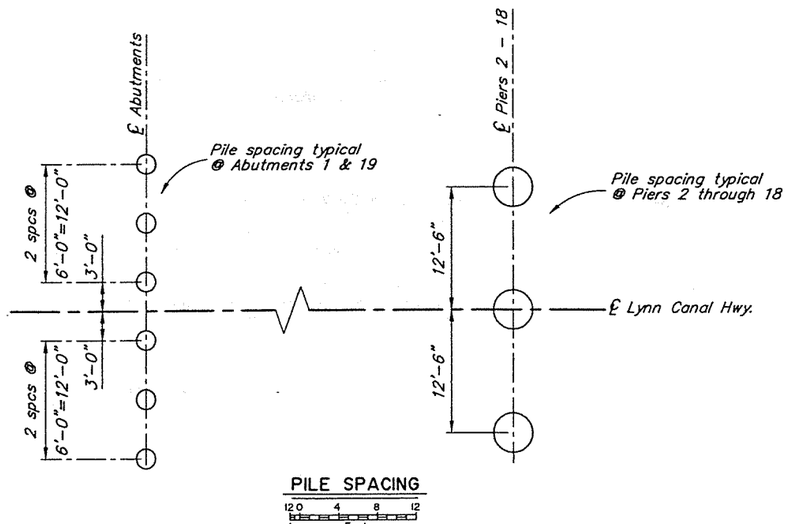
FOUNDATION PLAN - ABUTMENT 1 THROUGH PIER 11

20 10 0 50 100
Feet



FOUNDATION PLAN - PIER 11 THROUGH ABUTMENT 21

20 10 0 50 100
Feet



PILE SPACING

12 0 4 8 12
In. Feet

PRELIMINARY PLAN

PILE TABLE

LOCATION	PILE TYPE	MINIMUM TIP ELEVATION, FT.	ESTIMATED TIP ELEVATION, FT.	DESIGN LOAD, kips	ULTIMATE LOAD, kips
Abutment 1	2'-0"ø x 1/2"				
Pier 2	4'-0"ø x 1"				
Pier 3	4'-0"ø x 1"				
Pier 4	4'-0"ø x 1"				
Pier 5	4'-0"ø x 1"				
Pier 6	4'-0"ø x 1"				
Pier 7	4'-0"ø x 1"				
Pier 8	4'-0"ø x 1"				
Pier 9	4'-0"ø x 1"				
Pier 10	4'-0"ø x 1"				
Pier 11	4'-0"ø x 1"				
Pier 12	4'-0"ø x 1"				
Pier 13	4'-0"ø x 1"				
Pier 14	4'-0"ø x 1"				
Pier 15	4'-0"ø x 1"				
Pier 16	4'-0"ø x 1"				
Pier 17	4'-0"ø x 1"				
Pier 18	4'-0"ø x 1"				
Pier 19	4'-0"ø x 1"				
Pier 20	4'-0"ø x 1"				
Abutment 21	2'-0"ø x 1/2"				

DESIGNED BY:	CHECKED:	
DRAWN BY:	CHECKED:	FOUNDATIONS REVIEWED BY:
QUANTITIES BY:	CHECKED:	

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
BRIDGE SECTION

LACE RIVER BRIDGE
LYNN CANAL HIGHWAY
FOUNDATION PLAN

BRIDGE NO. 2169
DWG NO. 3

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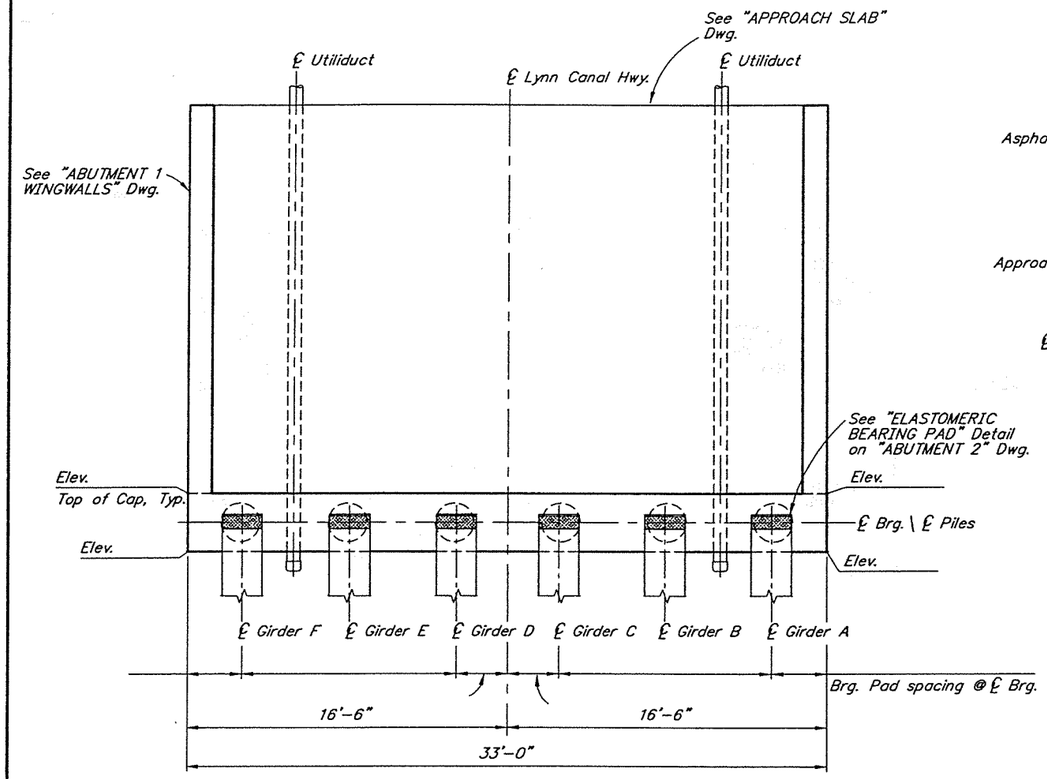
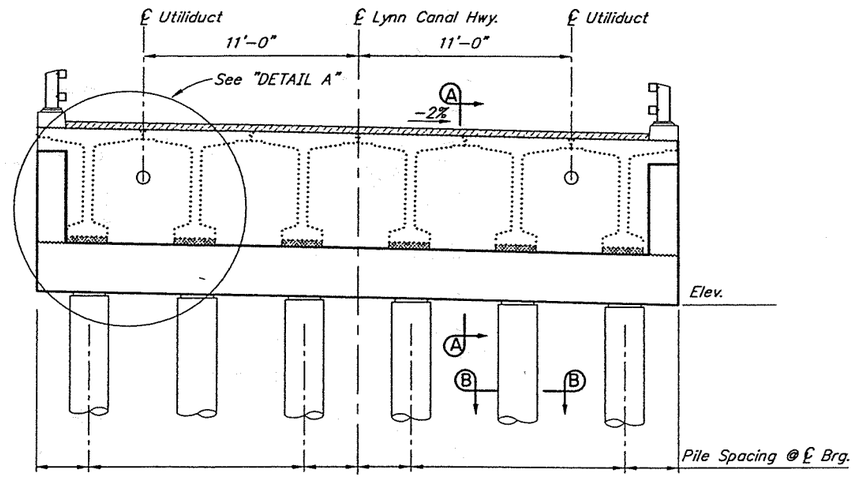
STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	NH-HPRL-093-3(33)/68937	2006	N67	232



PLAN

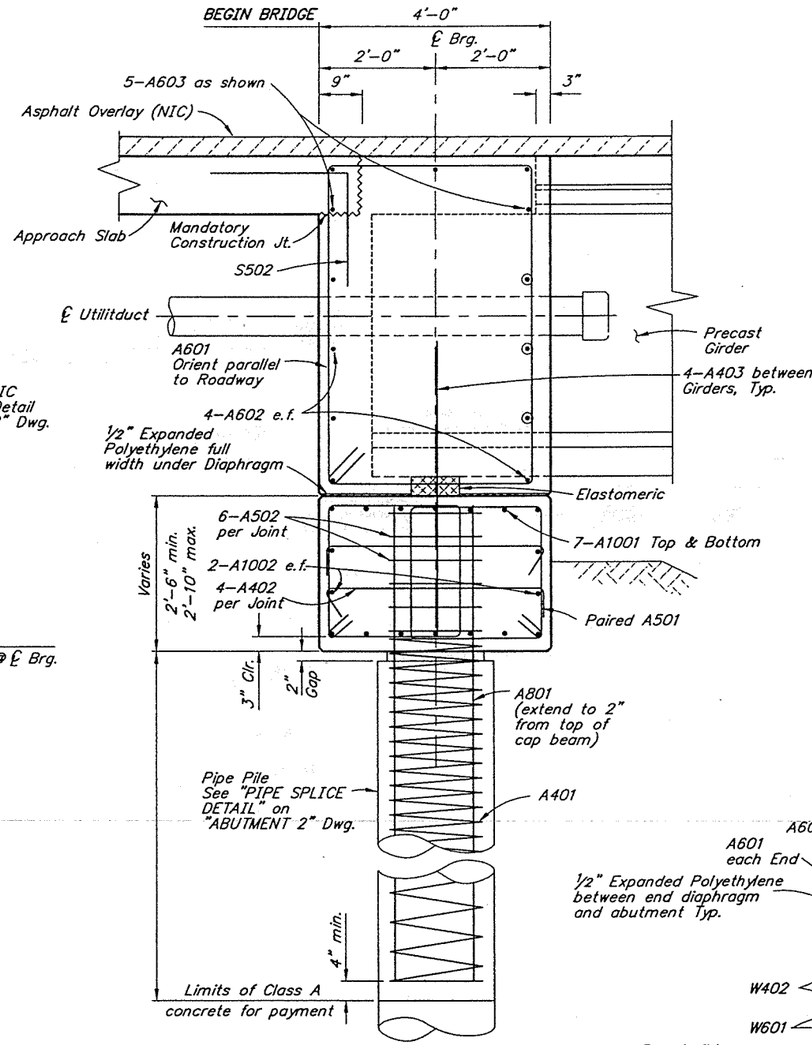
12 0 5 10 In. Feet



ELEVATION

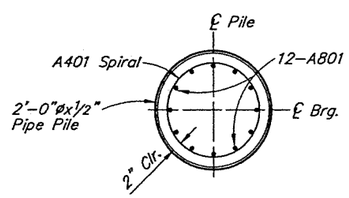
(Looking back on station)

12 0 5 10 In. Feet



SECTION A-A

12 6 0 1 2 3 In. Feet

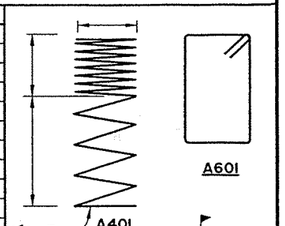


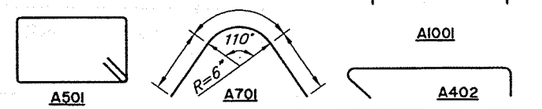
SECTION B-B

12 6 0 1 2 3 In. Feet

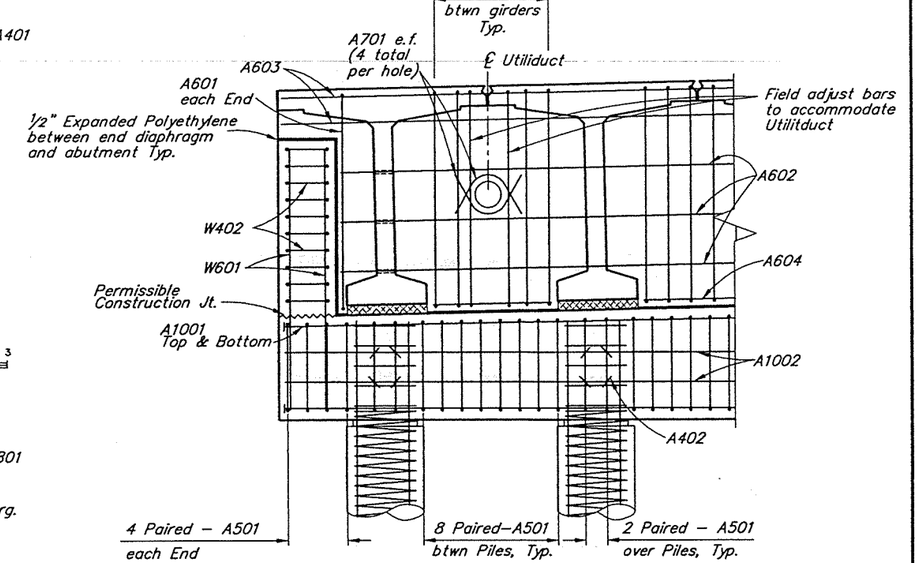
REINFORCING STEEL-ONE ABUT.

	MARK	SIZE	NO.	LENGTH	TYPE
	A401	4	6		SPIRAL
	A402	4	24		BENT
	A501	5	120		BENT
	A502	5	36		BENT
a	A601	6	32		BENT
a,b	A602	6	7		——
a,b	A603	6	5		——
a	A604	6	5		——
a	A701	7	8		BENT
	A801	8	72		——
b,c	A1001	10	14		HEADED
	A1002	10	4		——
	BENDING DIAGRAM				





a – Epoxy coated
b – Field adjust to match cross slope.
c – Headed bar to conform to ASTM A970.



DETAIL A

(Abutment 1 shown Abutment 2 similar)

12 6 0 1 2 3 4 In. Feet

DESIGNED BY:	CHECKED:
DRAWN BY:	CHECKED:
QUANTITIES BY:	CHECKED:

PRELIMINARY PLAN

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
BRIDGE SECTION

LACE RIVER BRIDGE

LYNN CANAL HIGHWAY

BRIDGE NO. 2169

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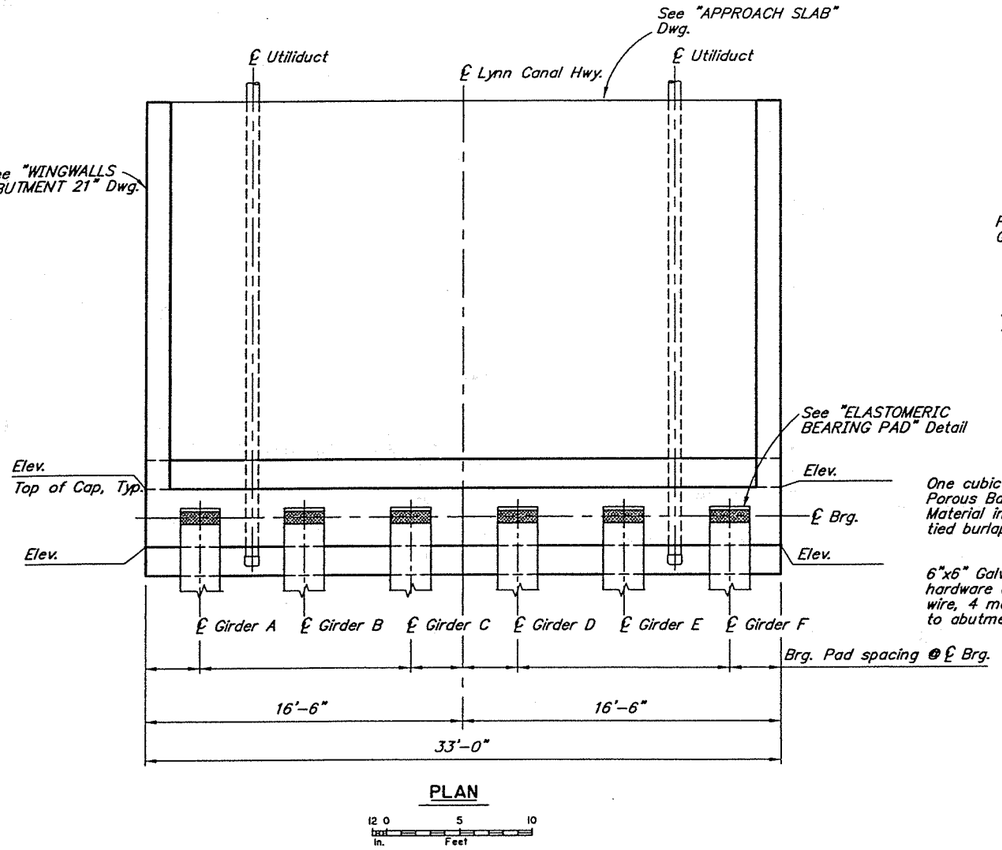
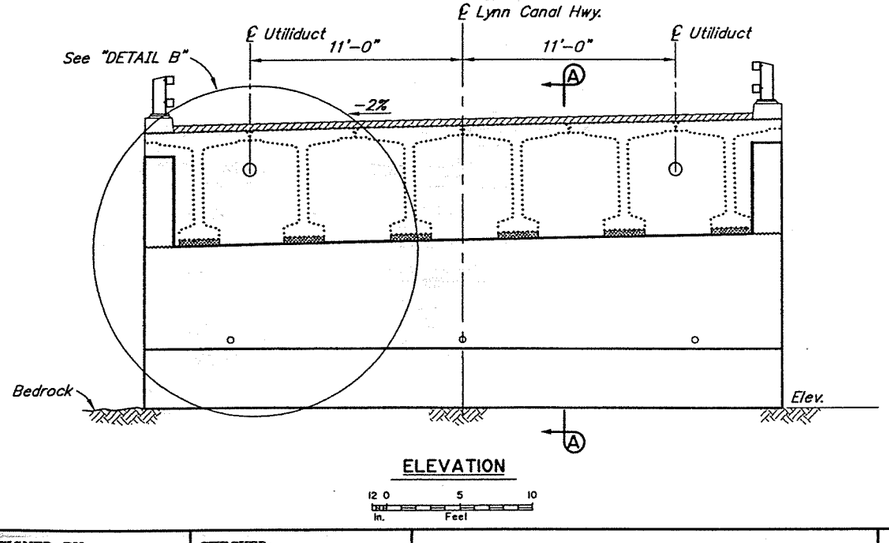
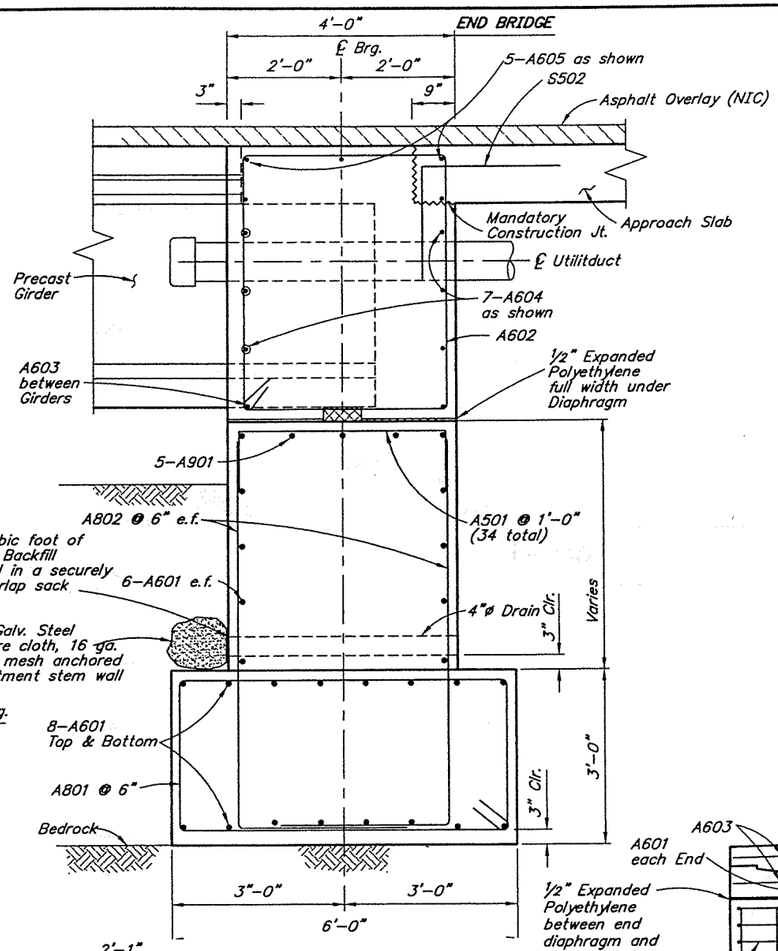
STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	NH-HPRL-093-3(331)/68937	2006	N68	232



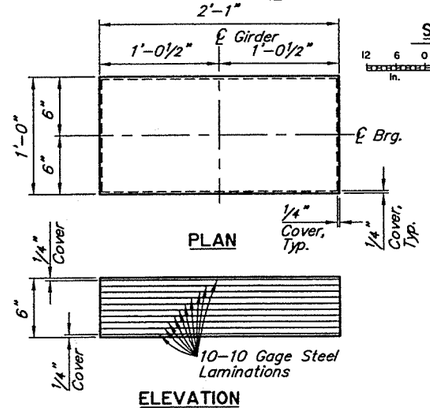
PLAN



ELEVATION



SECTION A-A



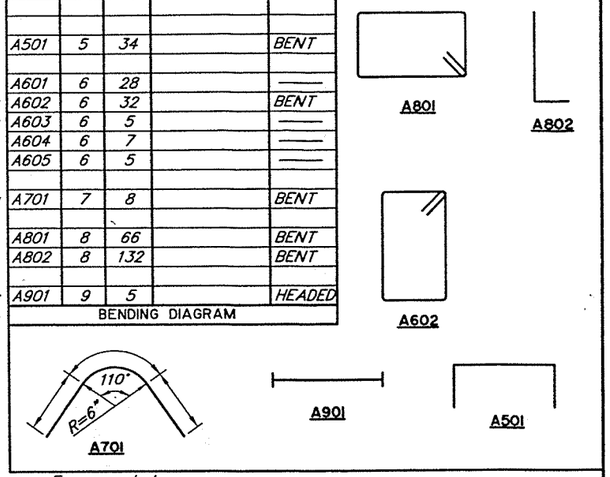
PLAN

ELEVATION
ELASTOMERIC BEARING PAD
(50 Durometer, Grade 5)
Dead Load = k
Live Load = k

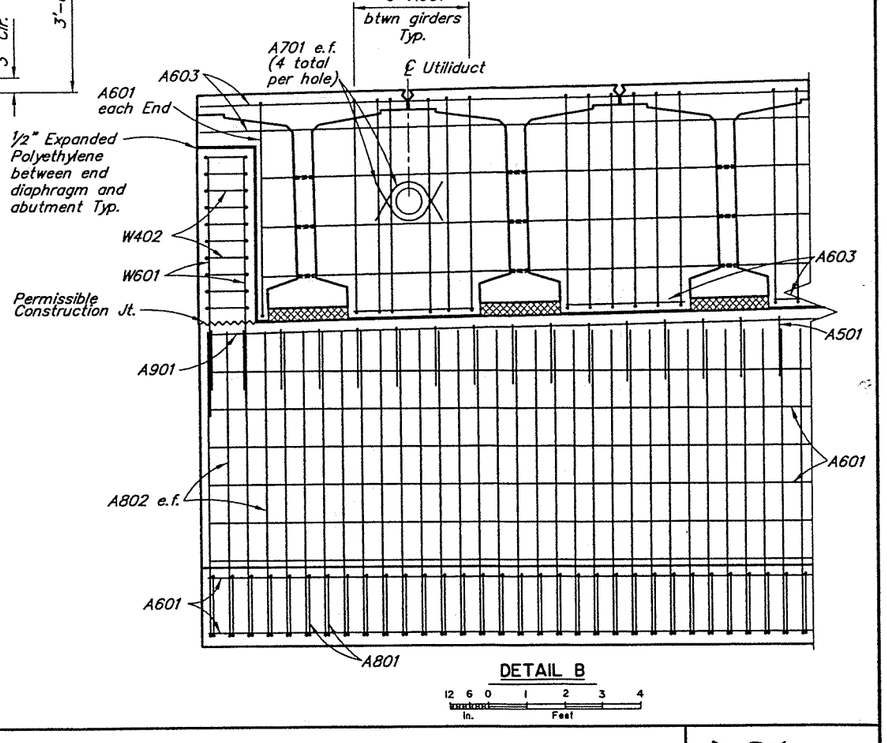
REINFORCING STEEL-ONE ABUT.

	MARK	SIZE	NO.	LENGTH	TYPE
c	A501	5	34		BENT
	A601	6	28		—
a	A602	6	32		BENT
a	A603	6	5		—
a,b	A604	6	7		—
a,b	A605	6	5		—
a	A701	7	8		BENT
	A801	8	66		BENT
	A802	8	132		BENT
b,c	A901	9	5		HEADED

BENDING DIAGRAM



a – Epoxy coated
b – Field adjust bars to match cross slope.
c – Headed bars to conform to ASTM A970.



DETAIL B

DESIGNED BY:	CHECKED:
DRAWN BY:	CHECKED:
QUANTITIES BY:	CHECKED:

PRELIMINARY PLAN

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
BRIDGE SECTION

LACE RIVER BRIDGE

LYNN CANAL HIGHWAY

ABUTMENT 21

BRIDGE NO. 2169

DWG NO. 5

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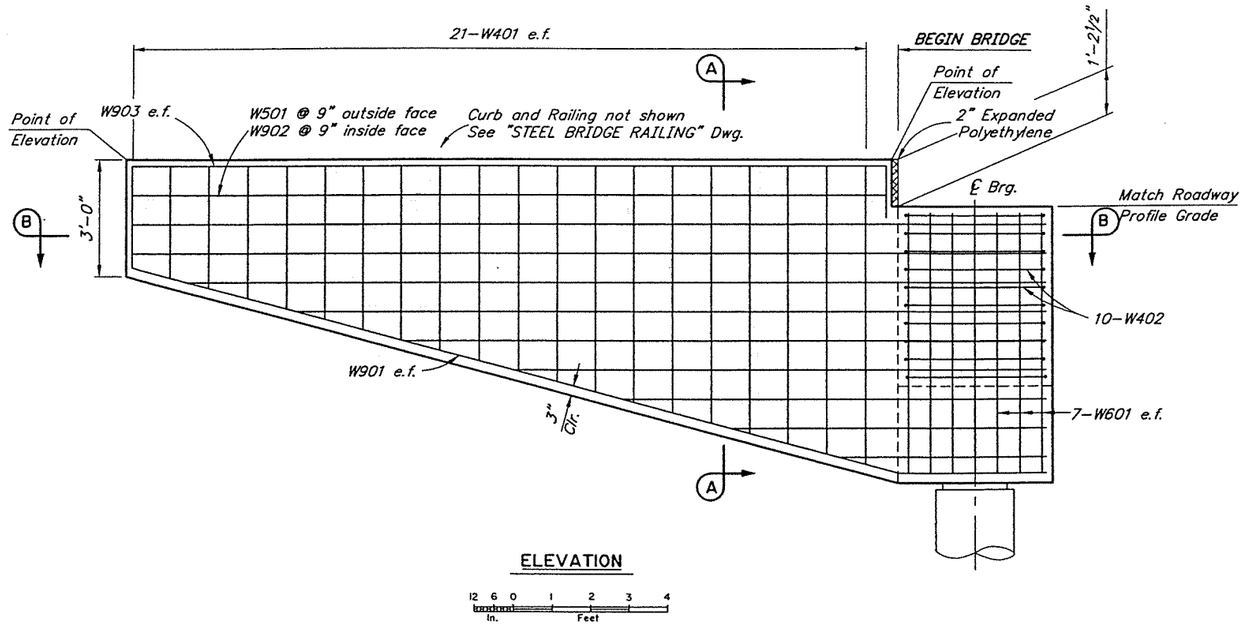
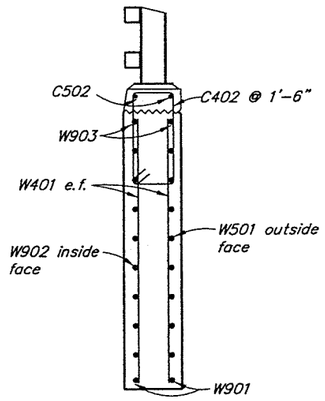
STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	NH-HPRL-093-3(33)/68937	2006	NG9	232



ELEVATION

12 6 0 1 2 3 4 In. Feet

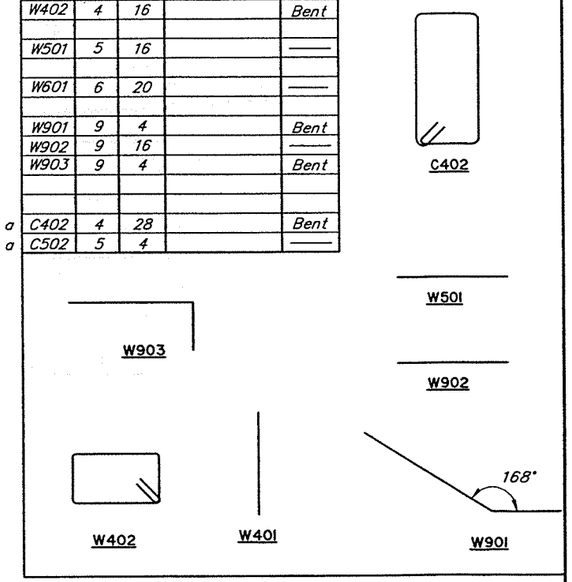


SECTION A-A

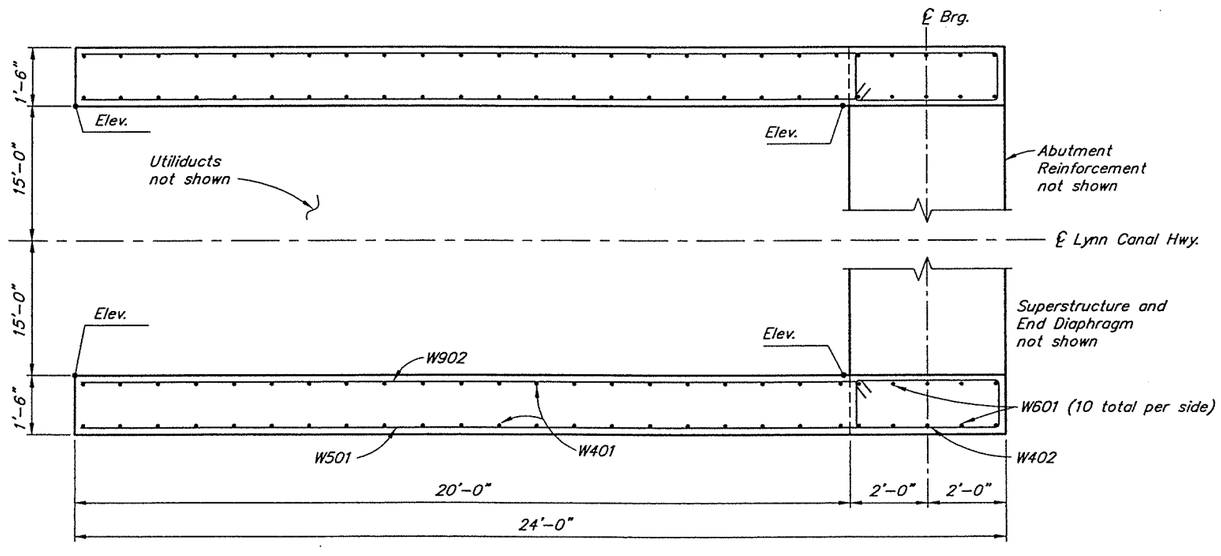
12 6 0 1 2 3 4 In. Feet

REINFORCING STEEL-ONE ABUTMENT

	MARK	SIZE	NO.	LENGTH	TYPE	BENDING DIAGRAM
	W401	4	84		——	
	W402	4	16		Bent	
	W501	5	16		——	
	W601	6	20		——	
	W901	9	4		Bent	
	W902	9	16		——	
	W903	9	4		Bent	
a	C402	4	28		Bent	
a	C502	5	4		——	

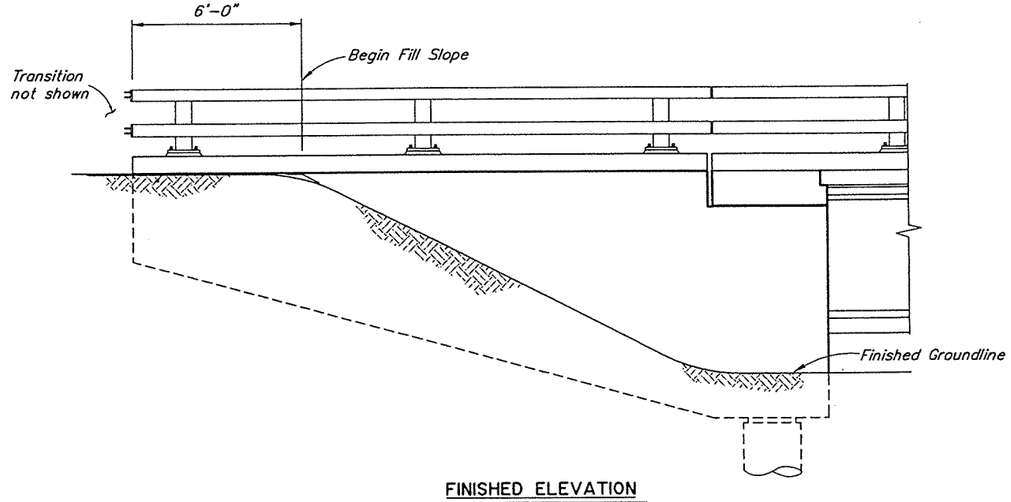


a – Epoxy Coated



SECTION B-B

12 6 0 1 2 3 4 In. Feet



FINISHED ELEVATION

12 0 1 2 3 4 In. Feet

DESIGNED BY:	CHECKED:
DRAWN BY:	CHECKED:
QUANTITIES BY:	CHECKED:

PRELIMINARY PLAN

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
BRIDGE SECTION

LACE RIVER BRIDGE

LYNN CANAL HIGHWAY

WINGWALLS, ABUTMENT 1

BRIDGE NO. 2169

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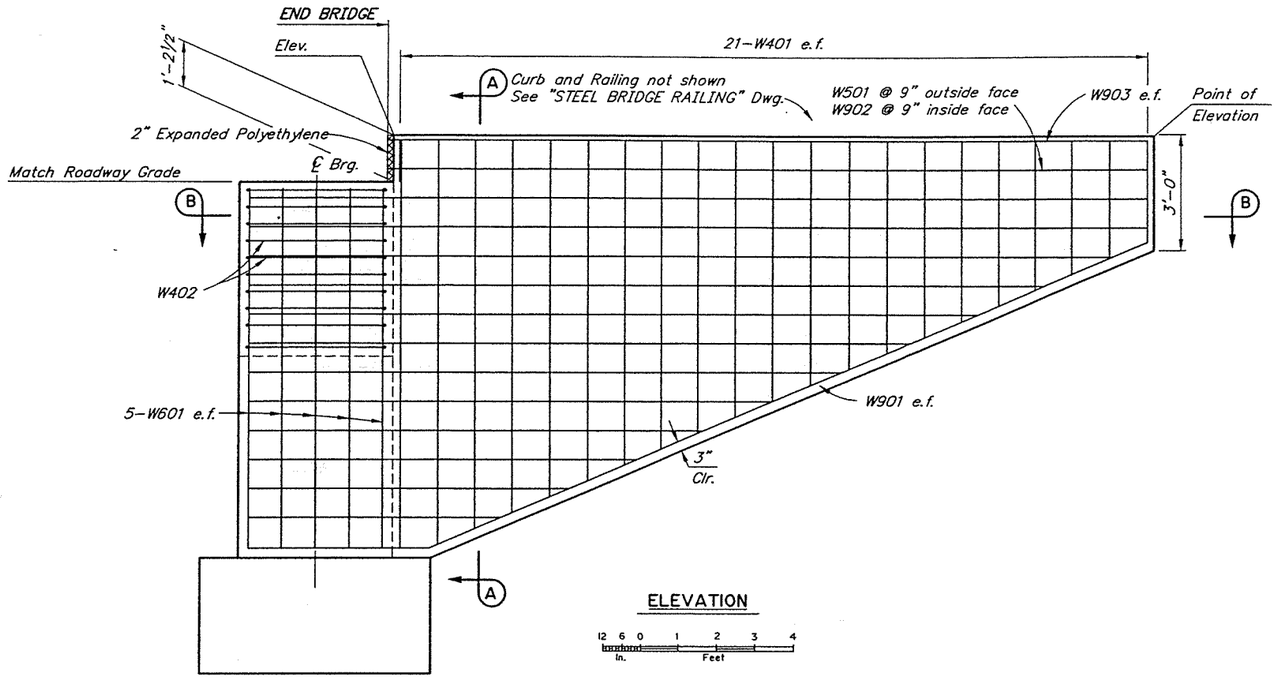
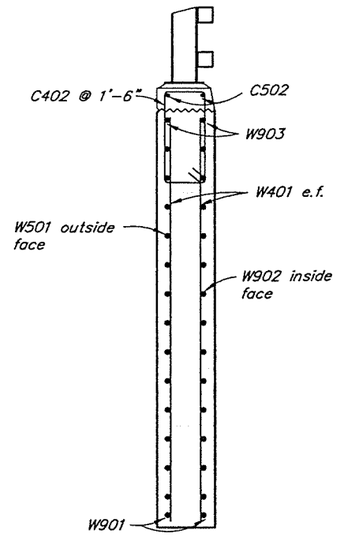
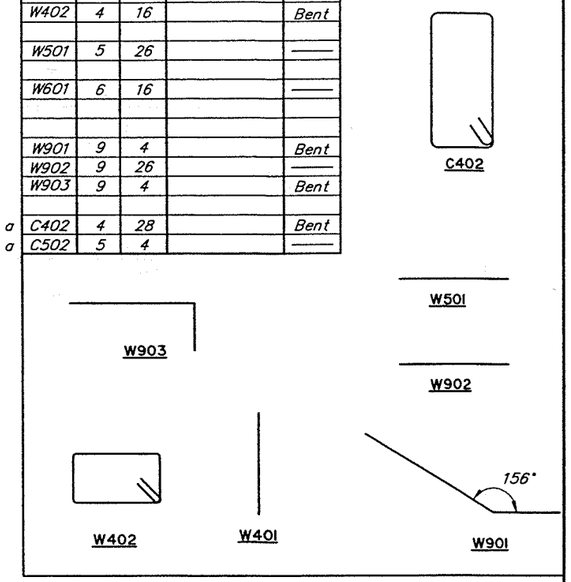
STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	NH-HPRL-093-3(33)/68937	2006	N76	232



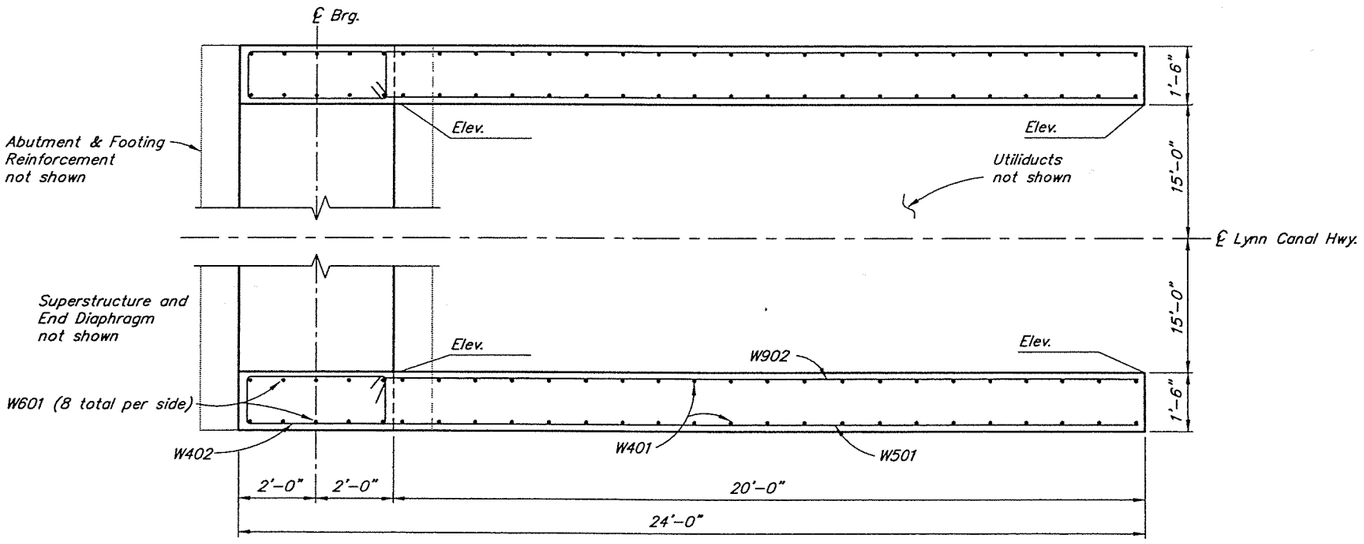


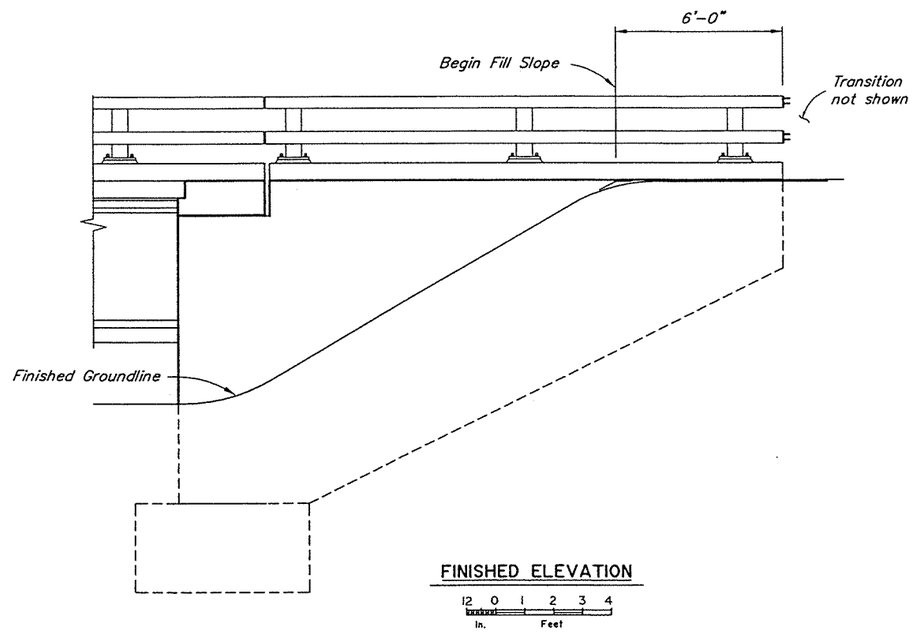
REINFORCING STEEL-ONE ABUTMENT

	MARK	SIZE	NO.	LENGTH	TYPE	BENDING DIAGRAM
	W401	4	84		——	
	W402	4	16		Bent	
	W501	5	26		——	
	W601	6	16		——	
	W901	9	4		Bent	
	W902	9	26		——	
	W903	9	4		Bent	
a	C402	4	28		Bent	
a	C502	5	4		——	



a – Epoxy Coated





DESIGNED BY:	CHECKED:
DRAWN BY:	CHECKED:
QUANTITIES BY:	CHECKED:

PRELIMINARY PLAN

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
BRIDGE SECTION

LACE RIVER BRIDGE

LYNN CANAL HIGHWAY

WINGWALLS ABUTMENT 21

BRIDGE NO. 2169
DWG NO. 7

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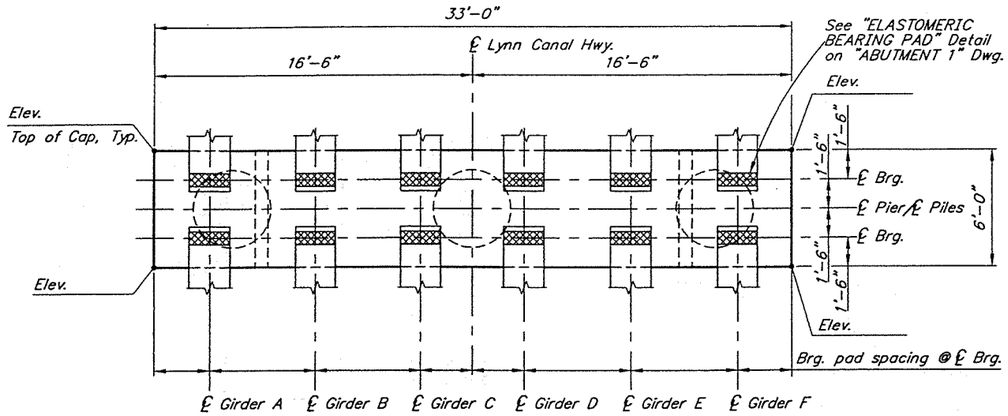
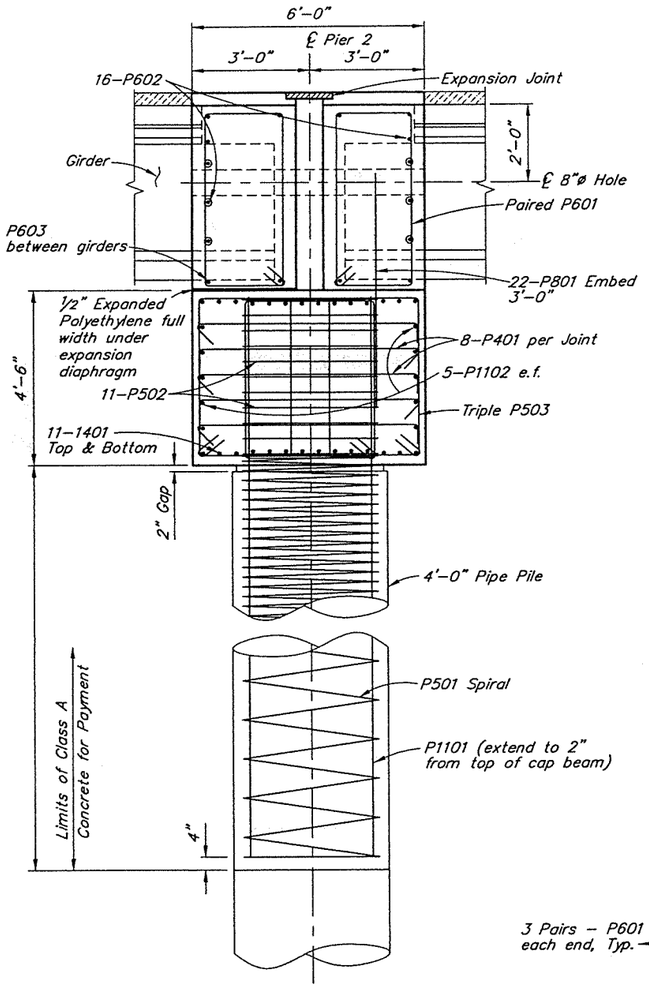
STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	NH-HPRL-093-3(33)/68937	2006	N71	232



PLAN

12 0 4 8
In. Feet



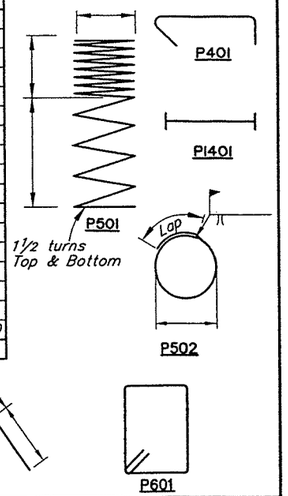
SECTION A-A

12 6 0 1 2 3 4
In. Feet

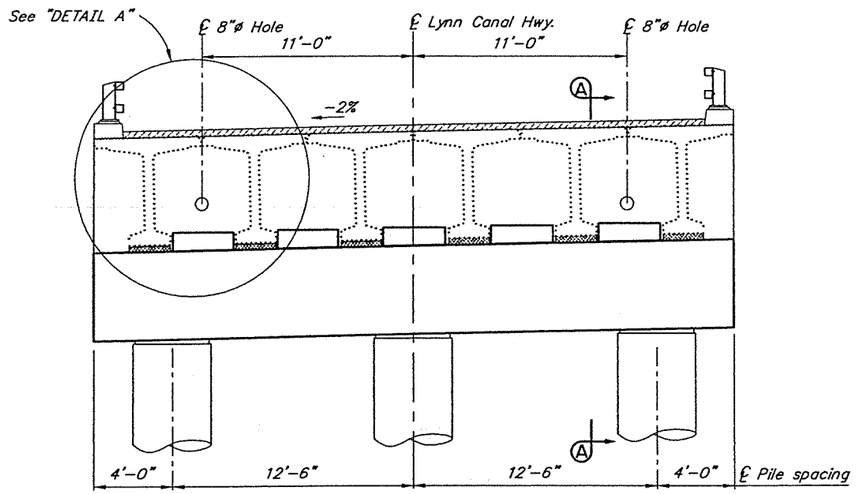
REINFORCING STEEL - PIER

	MARK	SIZE	NO.	LENGTH	TYPE
	P401	4	24		BENT
	P501	5	3		SPIRAL
	P502	5	33		BENT
	P503	5	135		BENT
a	P601	6	72		BENT
a,c	P602	6	16		——
a	P603	6	10		——
a	P701	7	8		BENT
	P801	8	22		——
	P1101	11	60		——
	P1102	11	10		——
b,c	P1401	14	22		HEADED

BENDING DIAGRAM

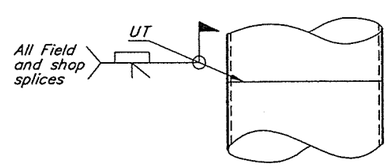


a – Epoxy coated
b – Field adjust bars to match crown.
c – Headed bar to conform to ASTM A970.



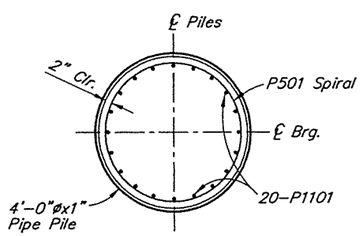
ELEVATION

12 0 4 8
In. Feet



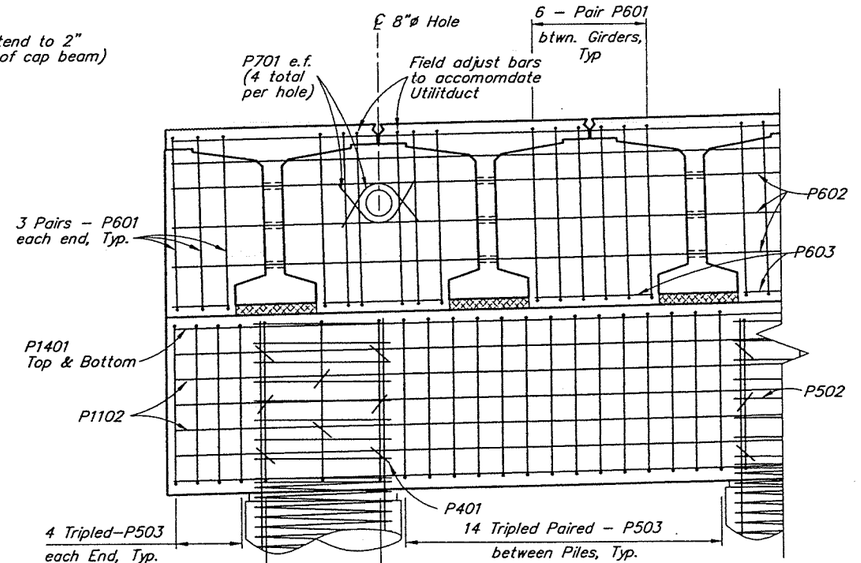
PIPE SPLICE DETAIL

12 6 0 1 2 3 4
In. Feet



SECTION B-B

12 6 0 1 2 3 4
In. Feet



DETAIL A

12 6 0 1 2 3 4
In. Feet

DESIGNED BY:	CHECKED:
DRAWN BY:	CHECKED:
QUANTITIES BY:	CHECKED:

PRELIMINARY PLAN

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
BRIDGE SECTION

LACE RIVER BRIDGE

LYNN CANAL HIGHWAY

EXPANSION PIERS

BRIDGE NO. 2169
DWG NO. 8

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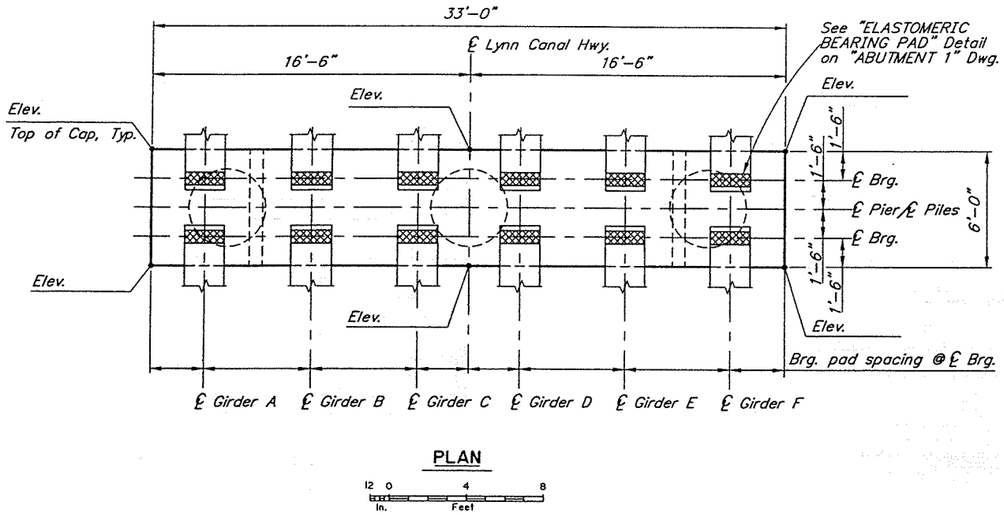
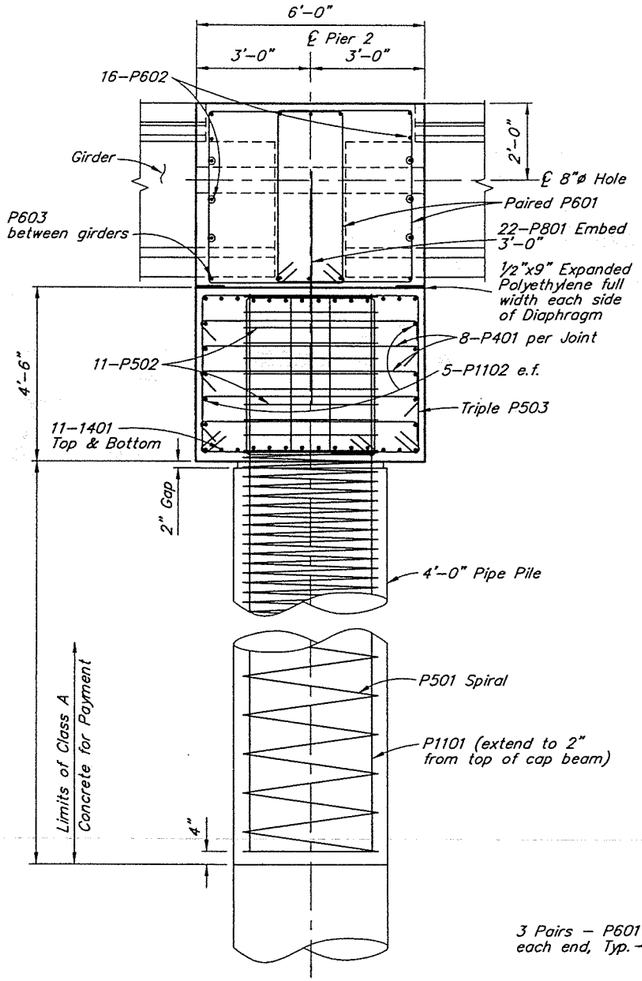
STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	NH-HPRL-093-3(33)/68937	2006	N72	232



PLAN

12 0 4 8 In. Feet



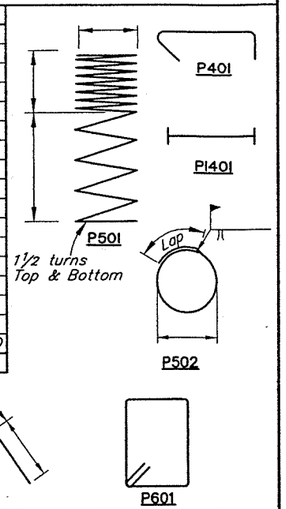
SECTION A-A

12 6 0 1 2 3 4 In. Feet

	MARK	SIZE	NO.	LENGTH	TYPE
	P401	4	24		BENT
	P501	5	3		SPIRAL
	P502	5	33		BENT
	P503	5	135		BENT
a	P601	6	72		BENT
a,c	P602	6	16		——
a	P603	6	10		——
a	P701	7	8		BENT
	P801	8	22		——
	P1101	11	60		——
	P1102	11	10		——
b,c	P1401	14	22		HEADED

REINFORCING STEEL - PIER

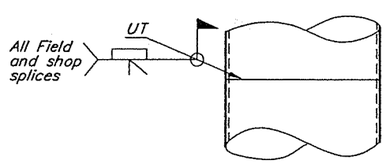
BENDING DIAGRAM



a – Epoxy coated
b – Field adjust bars to match crown.
c – Headed bar to conform to ASTM A970.

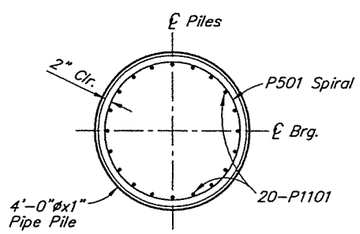
ELEVATION

12 0 4 8 In. Feet



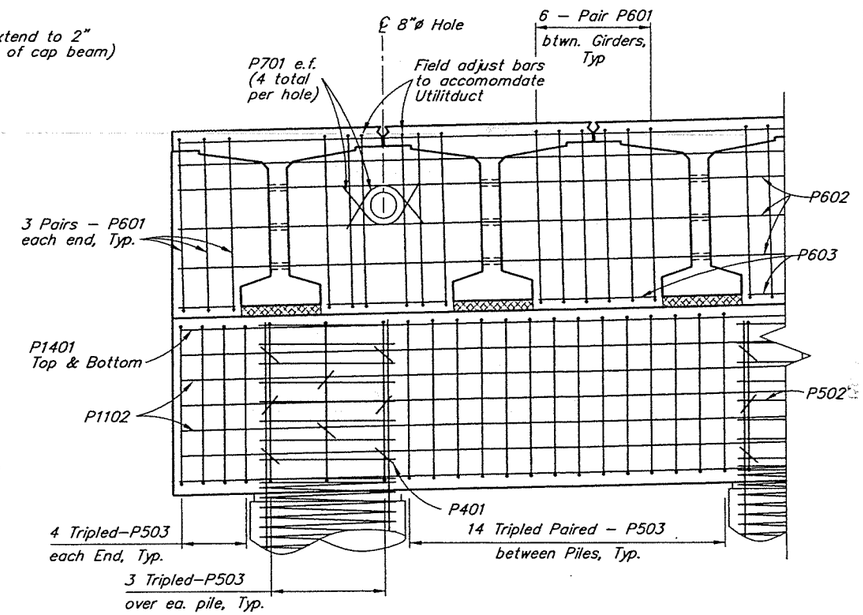
PIPE SPLICE DETAIL

12 6 0 1 2 3 4 In. Feet



SECTION B-B

12 6 0 1 2 3 4 In. Feet



DETAIL A

12 6 0 1 2 3 4 In. Feet

DESIGNED BY:	CHECKED:
DRAWN BY:	CHECKED:
QUANTITIES BY:	CHECKED:

PRELIMINARY PLAN

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
BRIDGE SECTION

LACE RIVER BRIDGE

LYNN CANAL HIGHWAY

FIXED PIERS

BRIDGE NO. 2169

DWG NO. 9

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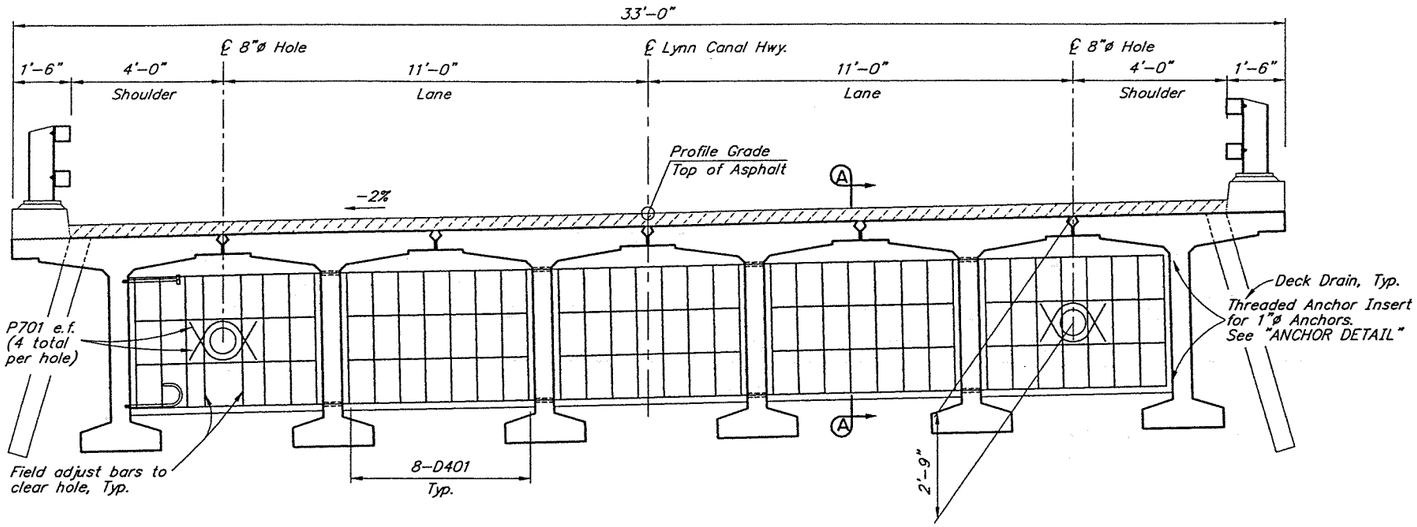
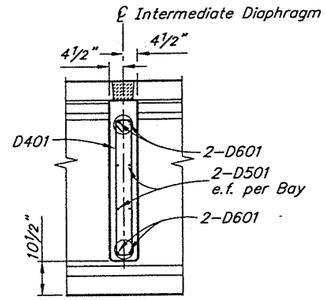
STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	NH-HPRL-093-3(33)/68937	2006	W73	232



TYPICAL SECTION

12 6 0 1 2 3 4
In. Feet

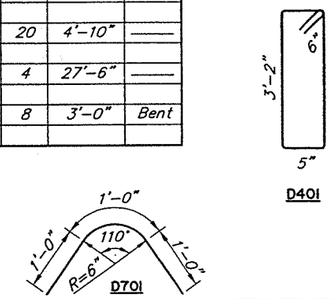


SECTION A-A

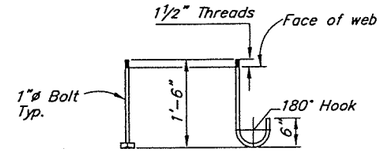
12 6 0 1 2 3 4
In. Feet

a REINFORCING STEEL-ONE DIAPHRAGM

MARK	SIZE	NO.	LENGTH	TYPE	BENDING DIAGRAM
D401	4	40	8'-2"	Bent	
D501	5	20	4'-10"	——	
D601	6	4	27'-6"	——	
D701	7	8	3'-0"	Bent	



a - Epoxy coated.



TOP ANCHOR BOTTOM ANCHOR

ASTM A307 GALVANIZED

ANCHOR DETAIL

12 6 0 1 2 3
In. Feet

DESIGNED BY:	CHECKED:
DRAWN BY:	CHECKED:
QUANTITIES BY:	CHECKED:

PRELIMINARY PLAN

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
BRIDGE SECTION

LACE RIVER BRIDGE
LYNN CANAL HIGHWAY
TYPICAL SECTION

BRIDGE NO. 2169
DWG. NO. 10

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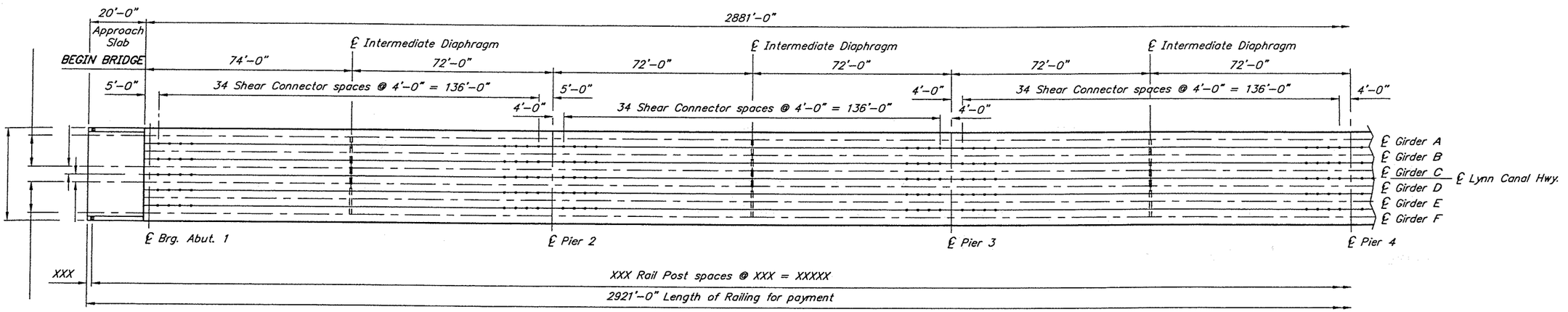
STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	NH-HPRL-093-3(33)/68937	2006	N74	232



FRAMING PLAN

10 0 20 40
Feet

DESIGNED BY:	CHECKED:
DRAWN BY:	CHECKED:
QUANTITIES BY:	CHECKED:

PRELIMINARY PLAN

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
BRIDGE SECTION

LACE RIVER BRIDGE

LYNN CANAL HIGHWAY

FRAMING PLAN

BRIDGE NO. 2169

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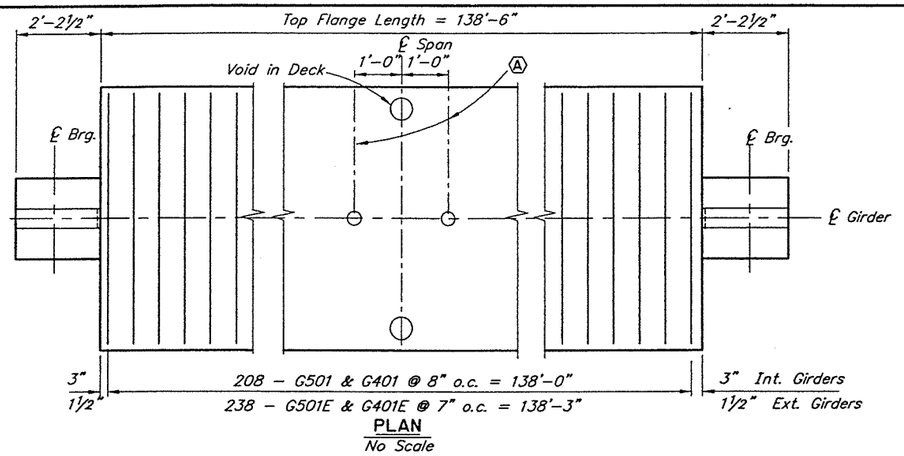
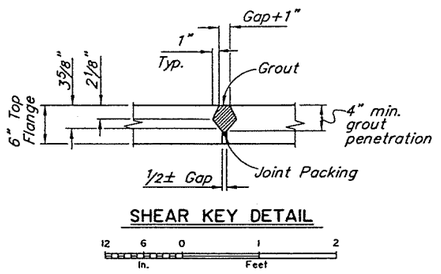
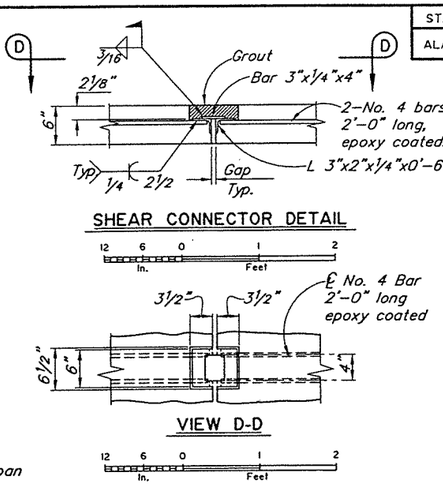
STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	NH-HPRL-093-3(33)/68937	2006	N75	232



PLAN
No Scale



SHEAR KEY DETAIL



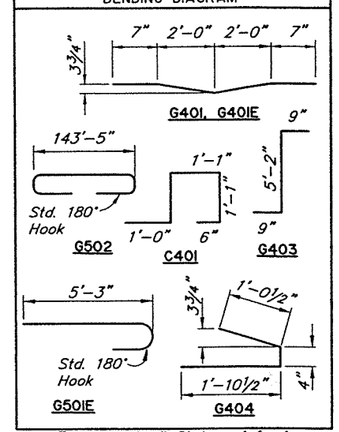
SHEAR CONNECTOR DETAIL

VIEW D-D

MARK	SIZE	NO.	LENGTH	TYPE
G401	4	211	5'-3"	Bent
e G401E	4	238	5'-3"	Bent
b G402	4	8	136'-11"	–
b,e G402E	4	8	136'-11"	–
G403	4	448	6'-8"	Bent
G404	4	76	3'-3"	Bent
G501	5	211	5'-2"	–
e G501E	5	238	5'-10"	Bent
b G502	5	8	144'-7"	Bent
b,e G502E	5	8	144'-7"	Bent
c,e C401	4	98	4'-9"	Bent
b,e C501	5	2	144'-8"	

a REINFORCING STEEL SCHEDULE-ONE GIRDER

BENDING DIAGRAM

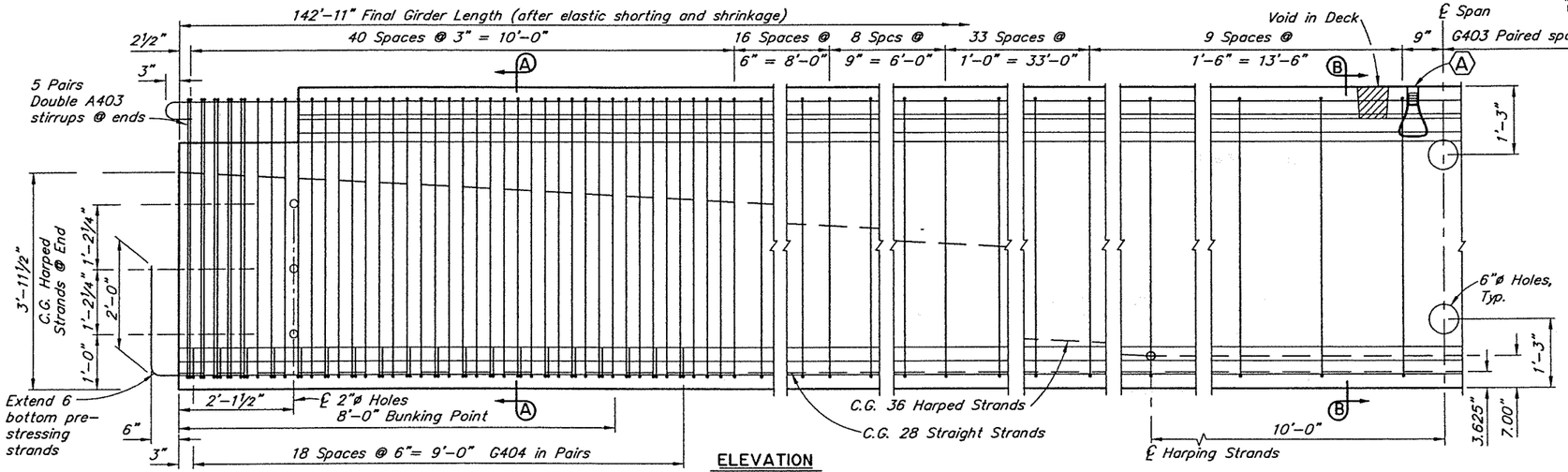


a – Epoxy coat all Girder reinforcing

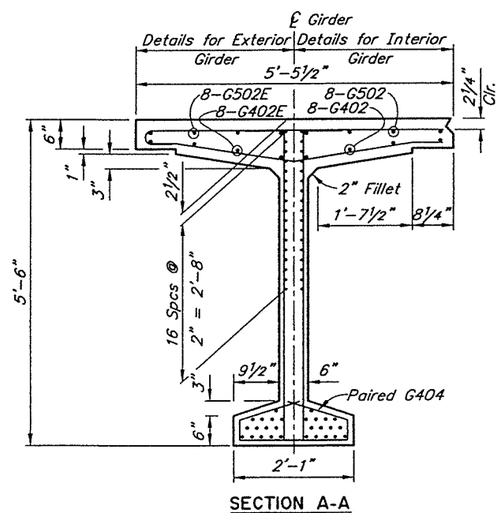
b – Length does not include splices. Minimum lap splice length for splices shall be: 2'-0" for #4 bars, 2'-6" for #5 bars.

c – Ship 6 loose for end diaphragm.

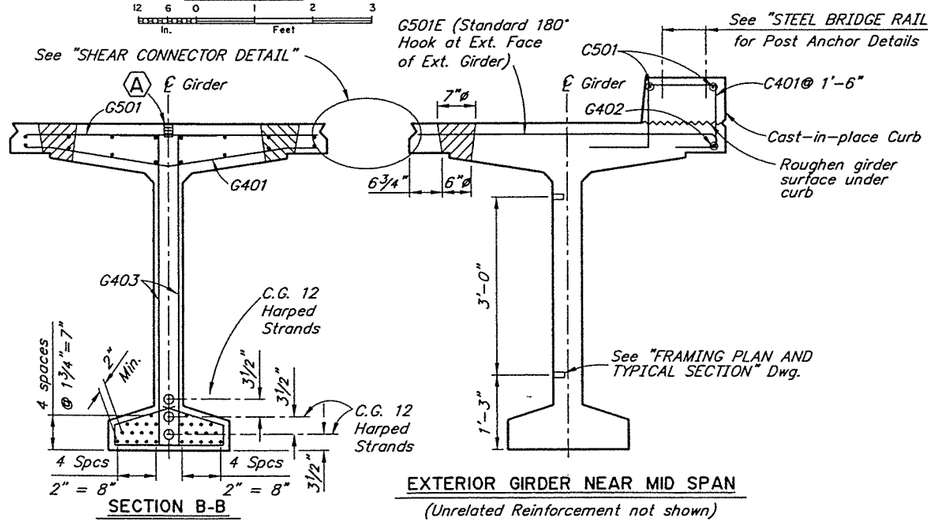
e – Exterior Girder only.



ELEVATION



SECTION A-A



SECTION B-B

EXTERIOR GIRDER NEAR MID SPAN
(Unrelated Reinforcement not shown)

GIRDER NOTES

Use normal weight concrete having the following strengths:
At Stress Transfer f'ci = 6500 psi
At 28 days f'c = 7500 psi

Use ½" round low relaxation strands having an ultimate strength of 270 ksi and a cross section area of 0.153 in.²

Design is based on the following steel stresses:
Pretensioning – Jacking Stress 189 ksi
After initial losses – 170 ksi
After all losses – 140 ksi

1" clear on all reinforcing except as noted.

Deflect forms to compensate for camber and roadway grade.

Provide a magnesium float finish on the roadway surface of the precast member. Roughen the surface under the railing.

Omit Shear Key and Shear Connector on outside of exterior girders.

Cast Girder ends plumb with respect to roadway grade.

(A) 1"x1'-0" Coil Anchor Insert for vertical adjustment of girders. Recess 2". Prevent concrete from filling hole.

Install web holes and web anchor inserts parallel to ℄ Brg.

Deck drain blockouts not shown.

DESIGNED BY:	CHECKED:
DRAWN BY:	CHECKED:
QUANTITIES BY:	CHECKED:

PRELIMINARY PLAN

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
BRIDGE SECTION

LACE RIVER BRIDGE

LYNN CANAL HIGHWAY

GIRDERS

BRIDGE NO. 2169

DWG NO. 12

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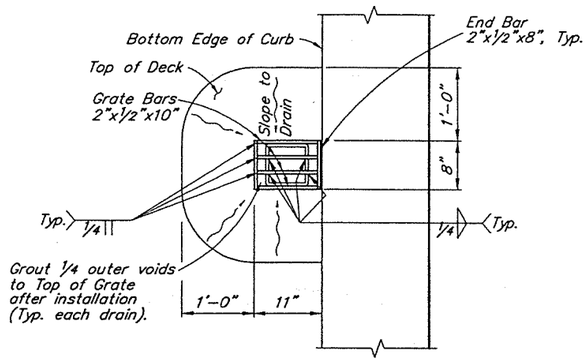
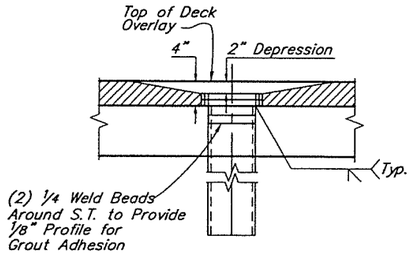
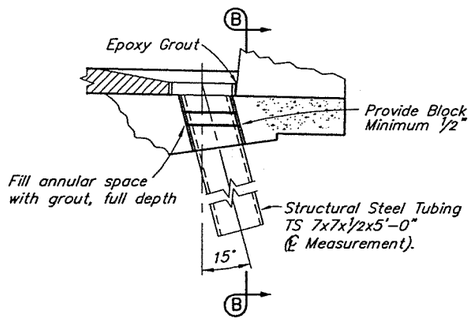
STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	NH-HPRL-093-3(33)/68937	2006	N76	232



DECK DRAIN-PLAN



SECTION B-B



DRAIN

DRAIN DETAILS

12 6 0 1 2
In. Feet

DESIGNED BY:	CHECKED:
DRAWN BY:	CHECKED:
QUANTITIES BY:	CHECKED:

PRELIMINARY PLAN

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
BRIDGE SECTION

LACE RIVER BRIDGE

LYNN CANAL HIGHWAY

DECK DRAINS

BRIDGE NO. 2169
DWG NO. 13

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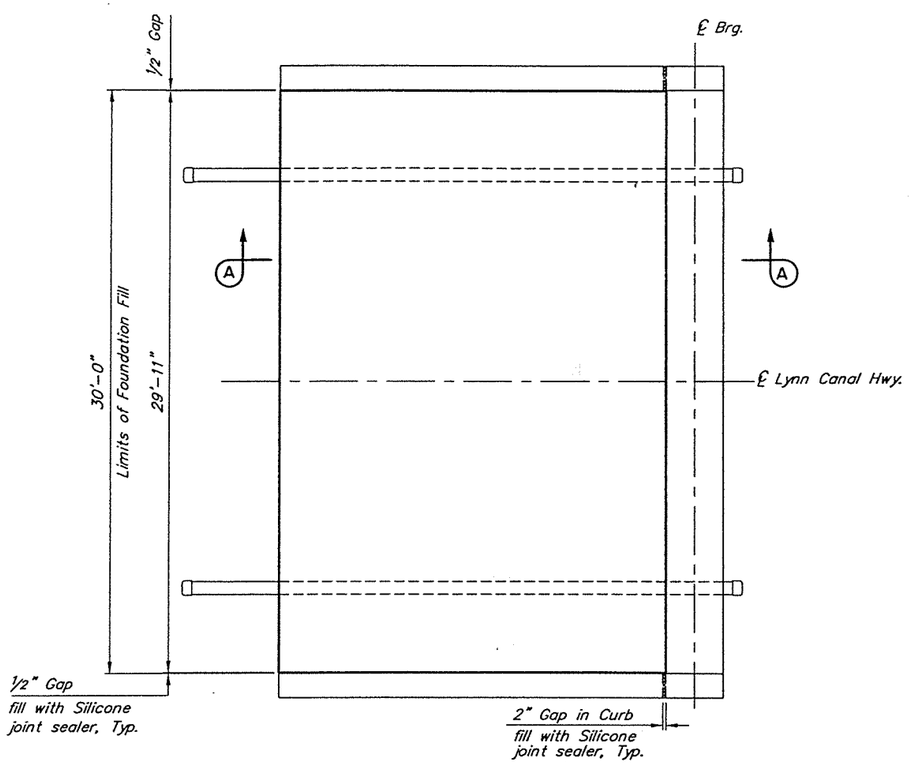
STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	NH-HPRL-093-3(33)/68937	2006	177	232

a REINFORCING STEEL - ONE APPROACH SLAB

	MARK	SIZE	NO.	LENGTH	TYPE	BENDING DIAGRAM
b	S401	4	62	30'-7"	——	2'-0" / 3'-0" / S502
	S501	5	60	20'-5"	——	
	S502	5	30	5'-0"	BENT	
	S801	8	60	20'-5"	——	

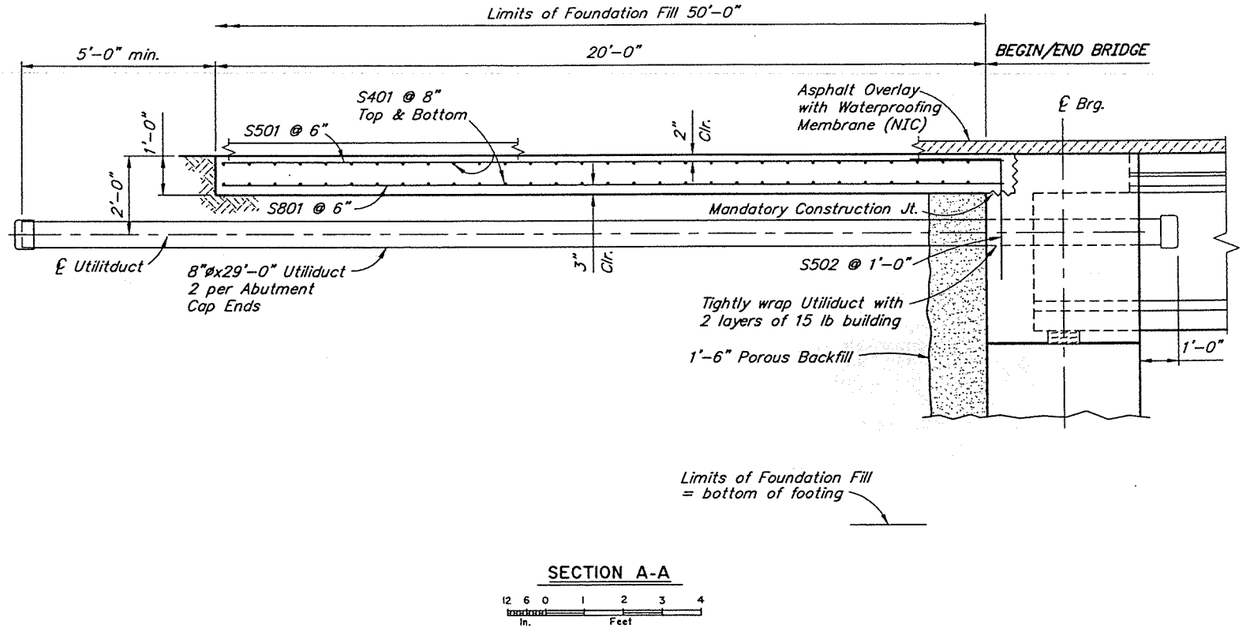
a – Epoxy coat all reinforcing steel.
b – Field adjust to match cross slope.



PLAN

(Abutment 1 shown Abutment 21 similar)

12 0 4 8
In. Feet



SECTION A-A

12 6 0 1 2 3 4
In. Feet

DESIGNED BY:	CHECKED:
DRAWN BY:	CHECKED:
QUANTITIES BY:	CHECKED:

PRELIMINARY PLAN

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
BRIDGE SECTION

LACE RIVER BRIDGE

LYNN CANAL HIGHWAY

APPROACH SLAB

BRIDGE NO. 2169
DWG. NO. 14

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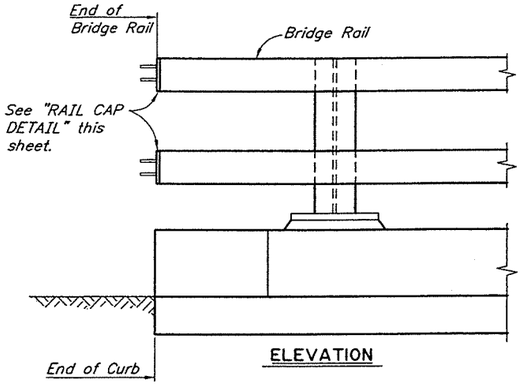
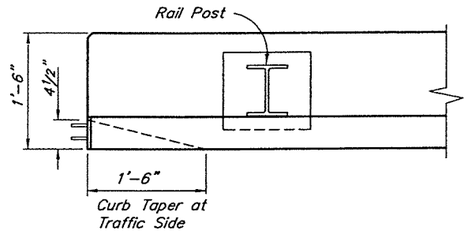
STATE	PROJECT DESIGNATION	YEAR	NO.	SHEETS
ALASKA	NH-HPRL-093-3(33)/68937	2006	N78	232

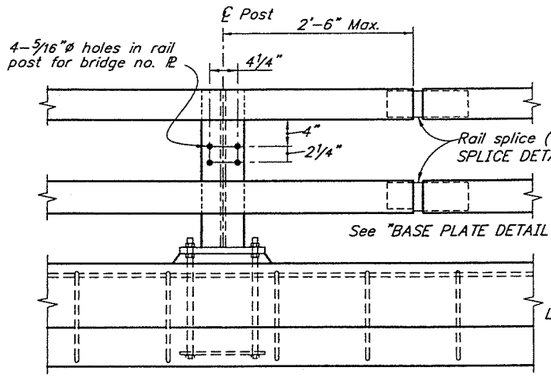


ELEVATION

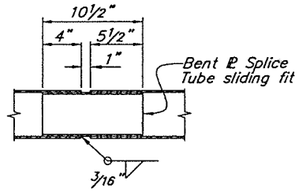


PLAN

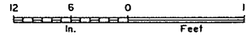
END POST DETAIL

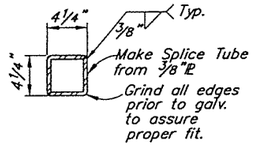


EXPANSION JOINT

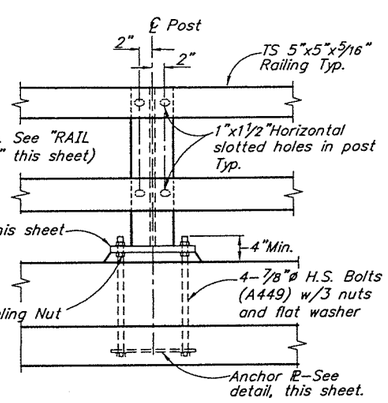


RAIL SPLICE DETAIL

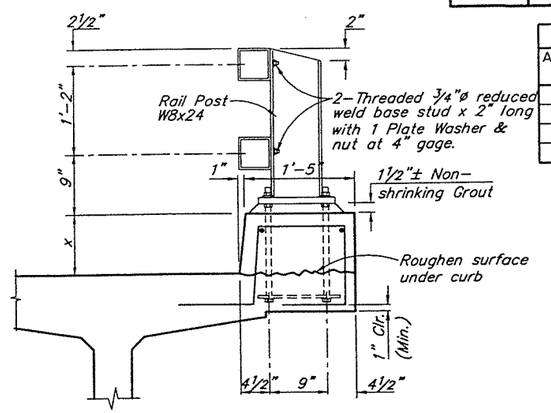




SPLICE TUBE

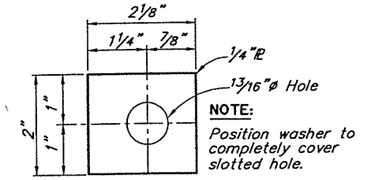


TYPICAL POST ELEVATION



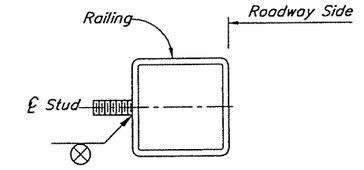
TYPICAL SECTION

CURB HEIGHT DATA	
ASPHALT THICKNESS (Inches)	CURB HEIGHT "X" (Inches)
0	7"
2"	9"
3"	10"
4"	10"

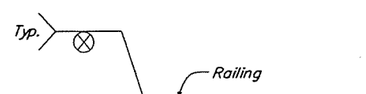


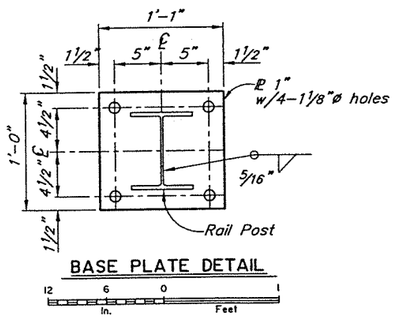
NOTE:
Position washer to completely cover slotted hole.

PLATE WASHER
No Scale

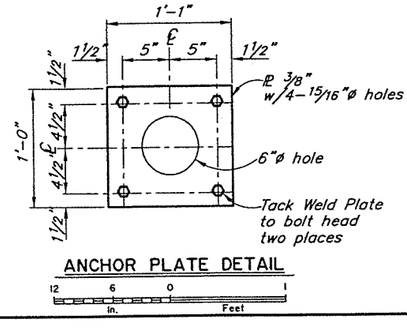


RAILING STUD DETAIL

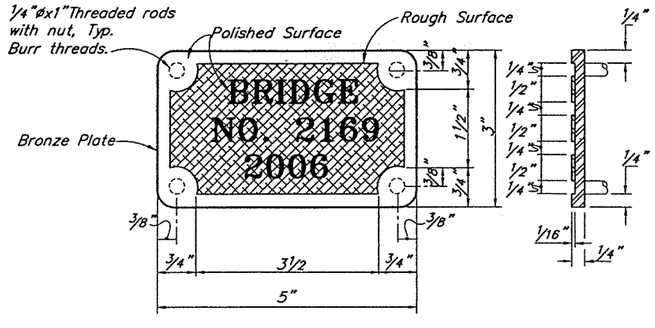




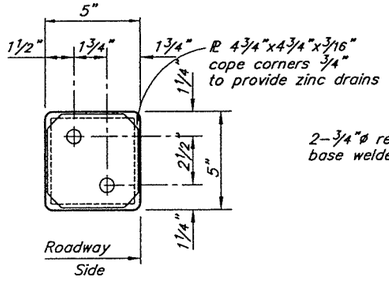
BASE PLATE DETAIL

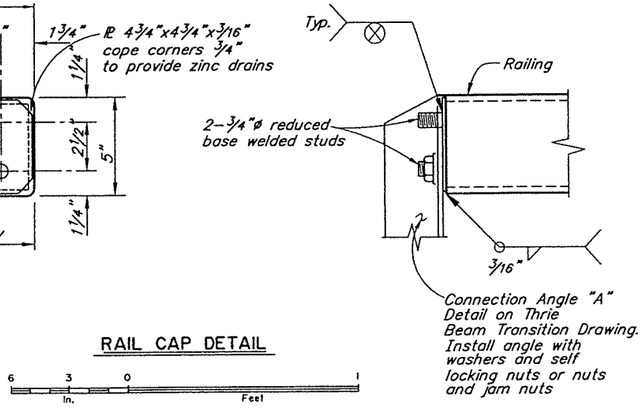


ANCHOR PLATE DETAIL



BRONZE BRIDGE NO. PLATE
No Scale





RAIL CAP DETAIL

NOTES

1. Locate bridge number plates on right hand side of approaching traffic near each end as shown (2 total).
2. Furnish bridge number plates. Use bronze that conforms to A.S.T.M. B98-90, Alloy "A" or "B". Use "Century" type style lettering. Use studs and nuts that conform to UNS C65100 or C65500. Braze ¼"ø threaded rod to back of plate with nut - 4 required. Use locking nuts or lock washers on all machine bolts.
3. Provide railing expansion joints at 50'-0" maximum intervals. Railing shall be continuous over 2 posts minimum.
4. Use grout with a minimum 24 hour f'c of 3000 psi.
5. See Bridge plans for rail post spacing.
6. See Std. Dwg. G-31.00 for Thrie Beam Transition.

DESIGNED BY:	CHECKED:
DRAWN BY:	CHECKED:
QUANTITIES BY:	CHECKED:

PRELIMINARY PLAN

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
BRIDGE SECTION

LACE RIVER BRIDGE

LYNN CANAL HIGHWAY

STEEL BRIDGE RAILING

BRIDGE NO. 2169

DWG. NO. 15

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Appendix B
Communication Logs

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Telephone Record

Federal Project No: STP-000S(131)
AKSAS Project No. 71100

Project:	Juneau Access Improvements SEIS	Project No:	218109
Date:	August 1, 2013	Subject:	Airboat Specifications
Call to:	Randy Quincy, Wasilla Airboats	Phone No:	907-376-6183
Call from:	Jessica Manifold, HDR	Phone No:	907-644-2073

Discussion, Agreement and/or Action:

I contacted Randy Quincy (Co-Owner) of Wasilla Airboats on August 1, 2013 to discuss typical airboat specifications and use. Wasilla Airboats is one of very few airboat manufacturers in Alaska and they construct and ship airboats to order across the state.

Airboat Wasilla has manufactured two boats known to reside in Juneau that are used by local moose hunters. Both boats were identified to be roughly 16.5 feet in length, 7 feet in width with a maximum height of 10 feet. They are currently constructing a personal use airboat that will be shipped to Petersburg that is also less than 18 feet in length.

Randy further stated that they have constructed some commercial use boats for rural communities that are 23 to 24 feet in length and he has seen some airboats as large as 30 feet but it was uncommon. A typical 'large' airboat would range between 20 and 23 feet and airboats regardless of length should not exceed 12 feet in height. He further added that airboat usage in coastal areas may be limited to shallow waters due to potential hazards.

Randy suggested reviewing the listed hunting guides in the area to see if there were any operating on the Katzehin, Berners/Lace or Antler rivers. A search turned up one guide located in Haines.

Telephone Record

Federal Project No: STP-000S(131)
AKSAS Project No. 71100

Project:	Juneau Access Improvements SEIS	Project No:	218109
Date:	August 1, 2013	Subject:	Guided Fishing/Charter Operators
Call to:	Kevin Burchfield, President of the Juneau Charter Boat Operators	Phone No:	907-321-1405
Call from:	Jessica Manifold, HDR	Phone No:	907-644-2073

Discussion, Agreement and/or Action:

Kevin Burchfield, was contacted regarding fishing charter use of these rivers. Kevin indicated that currently there were no charter operations on these rivers; however, there could be some fly fishing guides. He did not know of anyone personally, but indicated that I should contact Brad Elfers owner of Alaska Fly Fishing Goods in Juneau for better info on fly fishing. 907-586-1550.

Telephone Record

Federal Project No: STP-000S(131)
AKSAS Project No. 71100

Project:	Juneau Access Improvements SEIS	Project No:	218109
Date:	August 1, 2013	Subject:	Fly Fishing Guides/Operators
Call to:	Brad Elfers, Alaska Fly Fishing Goods in Juneau	Phone No:	907-586-1550
Call from:	Jessica Manifold, HDR	Phone No:	907-644-2073

Discussion, Agreement and/or Action:

Brad Elfers owner of Alaska Fly Fishing Goods in Juneau was contacted to gather more information on potential fly fishing guides operating boats on the Katzehin, Berners/Lace and Antler rivers. Brad indicated that he was unaware of any commercial guides on the Berners/Lace or Antler Rivers using boats. He further stated that Bear Creek Outfitters does fly in fishing on the Antler River. He suspects they land on Antler Lake and hike down to the river. In Brad's opinion, the Antler is the only river that would be suitable for fly fishing of the three.

Brad suggested contacting the Forest Service as they would have a list of commercial operators on any of the identified rivers as a permit is required.

Brad indicated if private parties were to access the Antler River for fly fishing they would likely travel up the Gilkey to the Antler. He'd expect boats that were used by private parties to be between 14 and 20 feet. He said the Antler has a lot of shallow spots so larger boats may have a hard time. He said either jet or airboat may be used on this river in his opinion.

Brad suggested contacting Greg Schlachter, a fly fishing guide based out of Haines to get better information on the Katzehin River. 907-209-0816. I phoned today and left a message a communication log will be developed if Greg returns my call.

Telephone Record

Federal Project No: STP-000S(131)
AKSAS Project No. 71100

Project:	Juneau Access Improvements SEIS	Project No:	218109
Date:	August 7, 2013	Subject:	Fly Fishing Guides/Operators
Call to:	Greg Schlachter, Fly Fishing Guide in Haines	Phone No:	907-644-2073
Call from:	Jessica Manifold, HDR Alaska	Phone No:	907-209-0816

Discussion, Agreement and/or Action:

Greg returned my call from August 1, 2013.

Greg indicated he did not lead guided fly fishing trips on the Antler, Lace or Katzehin rivers. He indicated that he did not know of anyone guiding on the Katzehin at all and did not know of boat operators guiding trips on the Lace or Antler rivers. He mentioned Bear Creek Outfitters but also verified they were a fly in outfit operating on the Antler River.

I asked Greg if he has any knowledge of hunting guides or boat usage in general on the rivers, he said he could only answer in regard to the Katzehin. He indicated that he was unaware of any guided trips on the Katzehin, but he did know some local hunters used the river. He said the boats he had seen using the area were roughly 18' or smaller jet skiffs.

Greg further added that the Lynn Canal was a dicey area to cross with a jet boat or an airboat which was the primary way folks would have to access the Katzehin River.

Telephone Record

Federal Project No: STP-000S(131)
AKSAS Project No. 71100

Project:	Juneau Access Improvements SEIS	Project No:	218109
Date:	August 7, 2013	Subject:	Guides/Operators – Boat Traffic
Call to:	USFS Special Use Supervisor, Jennifer Berger	Phone No:	907-644-2073
Call from:	Jessica Manifold, HDR Alaska	Phone No:	907-789-6278

Discussion, Agreement and/or Action:

Jennifer returned my call from August 1, 2013.

The US Forest Service (USFS), Special Use Supervisor, Jennifer Berger, in Juneau was contacted regarding general river use and known guide operations as the USFS issues permits for guided operations on their lands. Jennifer indicated that there were some kayak guides in the area, Above and Beyond and Alaska Discovery, that were currently guiding sightseeing tours. She indicated that the guides may use the Berners/Lace and Antler Rivers. There are no commercial users and no Forest Service users on the Katzehin River and the USFS does not allow commercial operations in this area.

Other groups Jennifer identified as potential users of the Berners/Lace or Antler rivers include:

- Echo Ranch Bible Camp – Hiking and Canoe trips in Berners Bay area
- UAF Juneau's Outdoor Recreation Class
- Sea Runner Guide Service, freshwater fishing guides.
- Bear Creek Outfitters verified Antler fly in operation.

There are no hunting guides registered with the USFS, so no one with a valid permit is guiding in these areas, Lace/Antler/Katzehin. There could be independent travelers, but there has only been 1 registered bear guide operating on the Katzehin River in the last 10 years and nothing in more current years. The Katzehin River is difficult to navigate and it not expected to see much use.

Jennifer has a proposal from someone who is considering a jet boat tour operation on the Lace River. The gentleman is just getting started and plans on operating a 19' jet boat on the Lace River with trips to include 1 to 2 people per trip with 4 to 5 trips annually.

The USFS typically uses small jet boats (less than 19') on the Berners/Lace, Antler and other waterways as necessary. They only access the Katzehin by helicopter.

Some of the USFS Cabin Permit holders have jet or airboats that they use on some of the waterways in the Tongess.

She stated that emergency rescue in the vicinity was typically conducted by the Alaska State Troopers, Sea Dogs or the Juneau Mountain Rescue. She is uncertain on vessels used by these operators. She indicated that the USFS does not travel on the Katzehin River but may use the Lace or Antler rivers. Most calls go into the Alaska State Troopers that are located on USFS managed lands. Tom Maltice, City of Juneau Emergency Coordinator would be a good place to start.

Telephone Record

Federal Project No: STP-000S(131)
AKSAS Project No. 71100

Project:	Juneau Access Improvements SEIS	Project No:	218109
Date:	September 27, 2013	Subject:	Berners Bay area boat usage
Call to:	Kurt Miller, ADOT&PF Marine Facilities	Phone No:	907-644-2073
Call from:	Jessica Manifold, HDR Alaska	Phone No:	907-465-1215

Discussion, Agreement and/or Action:

Kurt returned my call.

I introduced myself and explained to Kurt why I was calling. Kurt stated that he had personally been up the Berners/Lace and Antler Rivers. He owns two jet boats, a 16' Lund with a 40 hp and an 18' Wooldridge with a 150 hp. He indicated he could get 5 to 8 miles up the Antler River with his 18' jet boat. Kurt further stated that generally boats running the rivers in the area are 20' or less and there is no commercial traffic to his knowledge as access in these areas is tidally influenced. He said the rivers were shallow but you could get a 24' jet boat into the area, but no one does it that he knows of. He only knows of 40 to 50 jet boats and 12 airboats that use the Berners/Lace and Antler Rivers.

Kurt knew of two cabins up the Berners River but access by jet boat can only happen at a +13 or 14' tide as it is a very narrow river. These cabins are accessed by airboat. Kurt directed me to www.takuriver.com and indicated that the Haffner's and the Schramm's he believed were the permit holders on the cabins on the Berners River and also airboat owners in the area. He stated that there used to be a cabin on the Antler River, but it was no longer present.

Based upon a review of the above referenced webpage and further conversation with Kurt, there is one area airboat expected to exceed 20' in length. Kurt believed there may be couple more area airboats up to 20' in length but most were under 20'. Kurt suggested touching base with local airboat users to collect better information on airboat use in the Berners Bay area.

According to Kurt, the Lace River is very hard to navigate without an airboat, but the area used to be used for moose hunting. Due to a few hard winters moose hunting in the area has declined in recent years. Kurt expects that moose hunting may pick back up in the future in the Berners River area, but the area has not been used heavily for hunting moose in recent years.

Kurt did not have any available information on the Katzehin River but suspected it could be accessed by jet boat and potentially airboat.

Telephone Record

Federal Project No: STP-000S(131)
AKSAS Project No. 71100

Project:	Juneau Access Improvements SEIS	Project No:	218109
Date:	September 27, 2013	Subject:	Berners Bay area boat usage
Call to:	Ron Haffner, private airboat operator	Phone No:	907-723-1008
Call from:	Jessica Manifold, HDR Alaska	Phone No:	907-644-2073

Discussion, Agreement and/or Action:

I phoned Ron Haffner following a visit to www.takuriver.com and reviewing photos of airboats after determining that the Haffner's held a cabin permit on the Berners River. I introduced myself and explained the reason for the phone call.

Ron indicated that he grew up in Juneau and his family had the 1st and only airboats in the 1950s. He stated that the Berners/Lace and Antler Rivers were mainly accessed by airboat, but that there were some jet boats accessing the Antler River as there was a deeper channel. Ron said he felt the Lace River was not suitable for jet boat use. He felt there were about 12 folks operating airboats in the area and maybe another 20 operating jet boats.

Ron owns one 26' airboat and also has a 20' airboat that he uses on the rivers in the Berners Bay area, including the Berners/Lace and Antler Rivers. He is not aware of anyone else operating airboats 20' or over in size and is not aware of any commercial users on these river systems.

Ron also shared that there were two permitted cabins up the Berners River and there was a cabin on the Antler that had reverted back to the USFS and he was not sure if it was still there.

I asked Ron if he was aware of other jet boat or airboat users in the area and he indicated that **Nick Yurko** who sat on the Fisheries Advisory Board may have a lot of good information as he has run airboats and jet boats on the area rivers for the past 30 years. **Eric Masters** was also identified as an airboat user in the area who may have good information.

I asked Ron about his knowledge of emergency services in the area and he indicated it would be handled by the USCG or Sea Dogs and the State Troopers did not have a means to access the rivers that he was aware of unless they contracted with a local. He stated they would need an airboat if they were going to access the areas by boat.

Telephone Record

Federal Project No: STP-000S(131)
AKSAS Project No. 71100

Project:	Juneau Access Improvements SEIS	Project No:	218109
Date:	October 1, 2013	Subject:	Berners Bay area boat usage
Call to:	Mike Nizich, private airboat operator	Phone No:	907-465-3980
Call from:	Jessica Manifold, HDR Alaska	Phone No:	907-644-2073

Discussion, Agreement and/or Action:

I phoned Mike Nizich after receiving his contact information from the ADOT&PF as he has a cabin in the Berners Bay area. I introduced myself and explained why I was calling.

Mike is the owner of a 16' airboat that is roughly 8' in height. He frequents the Berners/Lace and Antler Rivers and has been traveling in these river systems since 1974 or 1975. He said his son has an 18' airboat and they also operate on the Gilkey and Brown rivers. Mike said he was not familiar with boat usage on the Katzehin River or in the vicinity of Haines.

Mike indicated that the waters were very shallow 3 to 4 miles in on the Berners/Lace and Antler Rivers which made it tough for jet boat users to utilize these areas. Outboard jets are used but folks have to come in at high tide and leave before low tide as to not get stuck. He remembers that in the 1970s a prop could be used in the Antler River but the channel has filled in a lot and is wide and shallow now which makes it difficult to navigate.

I asked Mike about boat size, length and height. He indicated that small airboats 14 to 20' in length and some small jet boats use the river systems. I asked him about the 26' airboat and he indicated that yes Ron Haffner had a large flat bottom airboat that was roughly 11' in height. He said this was the largest airboat in the area rivers today that he knew about.

He further stated that the largest jet boat he had witnessed was approximately 18' in length, but mostly he saw 16' boats with single or twin outboard jets. He again stated that once the tide goes out the jet boater are stuck at the lower mouth as the water spreads out wide and shallow but the upper rivers provide good places for jet boaters. He recalls a couple of guys spent all night on a sand bar in a jet boat and the next days tide was not high enough to get themselves unstuck without help. Mike feels the area is 90% airboat users due to the shallow wide river mouths. Jet boats may be used more on the Antler River as the channel is faster and deeper at the mouth.

I asked Mike is he knew of other area operators that might be willing to share information. Mike suggested Nick Yurko (907-789-7536), airboat user and avid operator on the area rivers, would be a good information source. He also stated that Nick's son in law operated an airboat on the rivers.

In the early 1980s there was a guy who tried to do tours with a large airboat but he got it stuck too many times causing folks to miss their cruise ships, flights etc. so the guy stopped running the tours. Mike thought the guy was from out of town but couldn't remember the name of the operation, just recalls it was short lived.

Mike is checking with a friend of his in Haines to see if he can help us find boat operators in the vicinity who may have information on the Katzehin River.

Telephone Record

Federal Project No: STP-000S(131)
AKSAS Project No. 71100

Project:	Juneau Access Improvements SEIS	Project No:	218109
Date:	October 1, 2013	Subject:	Juneau-Haines Emergency Rescue, Boat Usage
Call to:	Alaska State Troopers, Juneau	Phone No:	907-465-4000
Call from:	Jessica Manifold, HDR Alaska	Phone No:	907-644-2073

Discussion, Agreement and/or Action:

I phoned the Alaska State Troopers as they are the appropriate emergency rescue service in the vicinity of Berners Bay and the Lynn Canal including area rivers.

I first spoke with the troopers mainline and verified that emergency rescue including potential water response was handled out of their office. It was verified that if the situation was a water based rescue the State Troopers were the appropriate responders and would do so using a public safety vessel, river boat with an outboard jet, or they might use a volunteer who had a airboat. I asked about sizes of boats and areas accessed, and I was put in contact with Sargent Tim Birt.

Sargent Birt indicated that the public safety vessels were 16' to 18' in length with outboard jets for both the vicinity of Juneau and Haines. He also indicated that volunteer airboats roughly 20' or larger in length might be used for access if available. The state troopers do not have airboats in house.

I asked Sargent Birt how frequent water rescues took place in the vicinity of Juneau and Haines. He said he could not recall a water rescue in the Berners Bay area in the last 3 years, but that water rescues in Haines may be more frequent as they have better access to the rivers there.

I asked about Sea Dogs and the Juneau Mountain Rescue Service, Sargent Birt said these outfits were involved if they were called by the troopers. The Sea Dogs do not have boats and that he Mountain Rescue is a land based service. He further stated that if the troopers needed to access the Berners Bay area it was done primarily by aircraft to get folks out.

I asked about the likelihood of the USCG participating in rescue operations, and he said it was very likely but that the USCG did not have airboats or river boats; they would be strictly air rescue.

Sargent Birt stated that the FWS had wildlife troopers that patrolled the rivers in the vicinity of Haines. Lt. Steve Hall, 465-4000 and Trooper Aaron Frenzel, 465-4005 could provide more information on the types of vessels, frequency and rivers accessed.

Telephone Record

Federal Project No: STP-000S(131)
AKSAS Project No. 71100

Project:	Juneau Access Improvements SEIS	Project No:	218109
Date:	October 1, 2013	Subject:	Haines, Boat Usage on Katzehin River
Call to:	Chilkat River Adventures (Mainline and Owner's cell phones: Don "Duck" and Karen Hesse)	Phone No:	800-478-9827; 907-314-0037; 907-314-0041
Call from:	Jessica Manifold, HDR Alaska	Phone No:	907-644-2073

Discussion, Agreement and/or Action:

I phoned Chilkat River Adventures to try and find additional information on the Katzehin River near Haines. I explained to each person with whom I spoke the reason for the call targeting access to the river and potential boat traffic on the river.

Mainline (Jamie):
Jamie indicated that she was not aware of anyone operating commercial tours on the Katzehin but there could be local traffic as there are a lot of folks with jet boats who might travel across the canal to hunt moose in the area. She suggested calling around in Haines, but also indicated that the owners of Chilkat River Adventures (Don and Karen Hess) might be a good information source. Jamie provided Karen Hess's cellular phone number 907-314-0037 and indicated that Karen and her husband Don known as "Duck" Hess had been in the area for a number of years.

Karen Hess:
Karen indicated that boats, commercial or private, don't generally operate on the Katzehin River to her knowledge. She did not believe it would be navigable by anything but an airboat if the airboat could make it across the canal. She did not have a lot of actual river knowledge of the Katzehin River.

She thought some folks might access the mouth of the river during hunting season; citing that most hunters likely access the area by plane or use an ocean boat to cross the canal and hike in to hunt. She said her husband "Duck" would be a better contact as he'd been in the Haines area for approximately 50 years and was more familiar with the Katzehin River. She provided his cellular phone number 907-314-0041.

Don "Duck" Hess (40 year resident):
Duck indicated that hardly anyone uses the Katzehin River as it is a wild river. He told of a gentleman who tried to access the Katzehin by airboat a few years back and almost sunk the boat. He crossed the Lynn Canal just fine, but took on a lot of water trying to travel on a rough section of the river and had to run the boat up on the bank to avoid sinking. The only way he was able to retrieve his boat was by helicopter. The boat was slung back to Haines.

Duck indicated that some moose hunters hunted the Katzehin Flats but did not travel very far up the river. The hunters used jet boats up to 18' in length to his knowledge. I asked about airboats and he said that would be very tough, referring back to his airboat memory above. He said no one guides over there and no one goes past the flats due to rough river conditions.

I asked Duck if he knew of other folks who might have knowledge of boat use in the area specifically in the vicinity of the Katzehin River. He said his good friend Ron Martin (907-766-2085) was a fisherman and had been a master guide for bear hunts for years. Duck indicated Ron did a lot of fly in guiding, but that he had been in the area for a long time and may have better information or could provide additional contacts. Ron was contacted by phone but as of October 14, 2013 had not returned my call.

Telephone Record

Federal Project No: STP-000S(131)
AKSAS Project No. 71100

Project:	Juneau Access Improvements SEIS	Project No:	218109
Date:	October 1, 2013	Subject:	Haines, Boat Usage on Katzehin River
Call to:	Al Gilliam, Alaska Cross Country Guiding and Rafting, Owner and Hunting Guide	Phone No:	907-767-5522
Call from:	Jessica Manifold, HDR Alaska	Phone No:	907-644-2073

Discussion, Agreement and/or Action:

I phoned Alaska Cross Country Guiding and Rafting to try and find additional information on the Katzehin River near Haines. I explained the reason for the call targeting access to the river and potential boat traffic on the river.

Al Gilliam was agreeable to share his local knowledge of the Katzehin River, citing that he was currently operating on the Chilkat River. Al used to guide brown bear hunts in the vicinity of the Katzehin River, but no longer did due to the forest service limitation on harvest in the area. According to Al, the USFS is reevauating the guide outfitter program and he hoped to be guiding in the area again one day.

He also indicated that locals from Haines traveled across the canal to hunt moose in the area. Al also said there is a USFS cabin near the mouth of the river on the Skagway side along with an airstrip.

I asked him about what types of boats were used for access and if he has any knowledge of the size of boats that currently used the area. He indicated that the hunters primarily used jet boats or the air strip. He suspected the jet boats were likely 20' and under in length and added that folks may use their larger prop boats at high tide and anchor near the mouth and travel inland by small skiff. Al said he believed airboats could be and likely were used on calm days to access the Katzehin across the Lynn Canal.

Al shared that he owned two airboats, a 25' and a 16'. He does not currently take his airboats over to the Katzehin, but he hopes to be guiding out of there in the future. If he were to guide in the area, he would take one of his airboats over at the beginning of hunting season and leave it there for the entire season to avoid frequent trips across the canal. He'd then access it by airplane with customers and setup a camp. Al stated he has the largest airboat in Haines and in his opinion there may be 15 total airboats. The number of airboats operating in the area may include folks coming in from Skagway and Juneau.

Al said a number of years back there was a group of folks from Skagway that would travel the coastline by airboat to the Katzehin River, but he does not have any current knowledge to suggest this still takes place.

I asked him about the height requirement for his 25' airboat and he said he was not sure but that the Wells Bridge at mile 23 of the Haines Highway was being raised 4' to accommodate area airboat users.

Telephone Record

Federal Project No: STP-000S(131)
AKSAS Project No. 71100

Project:	Juneau Access Improvements SEIS	Project No:	218109
Date:	October 3, 2013	Subject:	Berners Bay area boat usage
Call to:	Nick Yurko, private airboat operator and serves on the Alaska State Game Board for ADF&G	Phone No:	907-321-2034
Call from:	Jessica Manifold, HDR Alaska	Phone No:	907-644-2073

Discussion, Agreement and/or Action:

I phoned Nick Yurko after receiving his contact information from other interviewed parties. I introduced myself and explained why I was calling.

Nick is the owner of a 14' airboat that would need 8' in height and also has two float houses/cabins in the vicinity of the Berners/Lace River. The first float house is in the bay just past a waterfall and is tidally influenced. The float house is on land at low tide. The second float house is roughly 5 miles up the Lace River. Both float houses are registered as boats in navigable waters by the State of Alaska, Division of Motor Vehicles. Nick uses a 22' aluminum run about to access his float house on the incoming tide in the Berners Bay area, and his airboat is kept right near his float house.

Nick travels in the Berners/Lace River and surrounding areas 12 months out of the year and has been traveling in these river systems since the 1970s. Nick is an avid hunter and trapper in the area and said he uses his airboat like a snowmachine in the winter. He said not a lot of folks trap in the area, but he has been trapping wolves, wolverines, lynx, martins and other animals since the 1970s.

Nick's seen some flooding on the Berners but the Lace does not flood much as it is very wide (approximately ½ miles) and the channels just travel back and forth. The flooding on the Lace River does not take out landscape that Nick recollects. He said the Antler River moves a lot at the lower end on the bay. He estimates it moved between 200 to 300 yards on the lower side. On the upper side (Sugar Loaf) it does not move much. He has seen some winters where ice dams build up near the Antler Lake, and when the dam breaks it floods the whole lower section bringing whole trees through the area.

Nick said a jet boat would work in the Antler River up until freeze-up and that he used to use a jet boat for hunting and trapping in the area. Most people traveling into the Antler River go about 3 miles and then the Antler River splits left and the Gilkey River splits right. Nick indicated that the Gilkey River does not see a lot of traffic past the mouth of the river due to rocks and navigational challenges even for an airboat.

Nick indicated that he travels to Haines with his airboat via the ferry system to go hunting. He does not hunt in the Katzehin River area, but knows folks hunt the Katzehin flats. Nick does not have knowledge of what types of vessels may be accessing the Katzehin area, but he did indicate a lot of folks travel north to Haines and Skagway to go moose and caribou hunting from Juneau. He also mentioned he'd like to see a road system better developed as the ferry is expensive.

Nick indicated that the Alaska Wildlife Troopers used 18' jet boats and the ADF&G do have small airboats they use to tag salmon fry in the spring and retrieve tags from salmon carcasses.

Most of the area airboats are 14' to 16'. Nick's son-in-law has a 16' airboat that is also used in the Berners Bay river system. Horst Schram (907-209-2277) has a 16' and a 14' airboat and runs with the same folks Nick does. He said Horst has a cabin on the Berners River and operates a seafood processing facility in Juneau.

I asked Nick about contact in the Haines area that might have information on the Katzehin River. He indicated Don Turner of Turner Construction Company out of Haines used to have an airboat. Nick was not sure if he still operated a boat in the area but thought he may have some good local knowledge.

Telephone Record

Federal Project No: STP-000S(131)
AKSAS Project No. 71100

Project:	Juneau Access Improvements SEIS	Project No:	218109
Date:	October 11, 2013	Subject:	Katzehin River boat usage
Call to:	Don Turner, private airboat operator	Phone No:	907-314-0351
Call from:	Jessica Manifold, HDR Alaska	Phone No:	907-644-2073

Discussion, Agreement and/or Action:

I phoned Don after receiving his contact information from Nick Yurko. I introduced myself and explained why I was calling.

Don owns Turner Construction in Haines and has been running jet boats in the area rivers, including the Katzehin, for 20 years. Don has a 16' jet boat and his dad has an 18' jet boat. He felt that 8' of clearance would be adequate for jet boats and thought 15' would take care of possible airboat users citing that the river fluctuates quite a bit.

Don travels up the Katzehin River 8 or 9 miles to hunt for moose, and feels most current usage of the Katzehin River is for hunting moose from September 15th to October 7th. Folks typically use jet boats and Don only knows of 4 or 5 people who travel over to hunt moose in the area. He said there may be some recreational use, but he's most familiar with area hunting. He did indicate that people hunted the Katzehin River flats during bear season near the mouth of the river.

I asked Don about airboat use in the area. He indicated that there used to be airboat use in the Katzehin, but he had not seen much airboat use in the Haines area in recent years. Don indicated that the Lynn Canal was a hard cross for an airboat and airboats are not well suited for ocean travel. He only knows of 2 or 3 people with airboats in Haines.

Don is also an airplane pilot and at times takes his jet boat over to the Katzehin and travels back and forth by plane during hunting season as weather and tides can make safe travel across the canal a problem. He added that once in a while some guys would take their up to 25' ocean boats about ¼ miles up the river at high water and anchor during hunting season. They use the boat as a base camp.

He has no knowledge of commercial use in the area, unless trapping can be considered commercial use. The only known commercial uses in the vicinity of the Katzehin River are sight seeing tours to the Meade Glacier.

Telephone Record

Federal Project No: STP-000S(131)
AKSAS Project No. 71100

Project:	Juneau Access Improvements SEIS	Project No:	218109
Date:	October 11, 2013	Subject:	Berners Bay area boat usage
Call to:	Horst Schram, private airboat operator	Phone No:	907-209-2277
Call from:	Jessica Manifold, HDR Alaska	Phone No:	907-644-2073

Discussion, Agreement and/or Action:

I phoned Horst after receiving his contact information from other interviewed parties. I introduced myself and explained why I was calling.

Horst is the owner of a 14' airboat that would need approximately 11' in height and also has a cabin on the Berners River. He also has a boat with an outboard prop that he uses in Berners Bay but not in the river systems. Horst accesses his cabin on the Berners River in the summer and fall and has been active in the Berners Bay river systems since 1972.

Horst uses the river systems for hunting and fishing and is unaware of any commercial operators on the rivers in the Berners Bay area. He further added that he wanted to see the project move forward and most of his friends also wanted to see the project happen.

Horst was not familiar with boat usage in the Haines area.

Horst had a friend stop into the office, **Bill Blackburn**, who was also an airboat operator in the Berners Bay area. Bill agreed to speak with me briefly. He owns a 15' airboat and indicated he'd like to see at least 15' of clearance under bridges should the project move forward. He does not own a cabin but goes camping and hunting in the river systems.

Telephone Record

Federal Project No: STP-000S(131)
AKSAS Project No. 71100

Project:	Juneau Access Improvements SEIS	Project No:	218109
Date:	October 12, 2013	Subject:	Boat Usage in Haines area rivers, specifically Katzehin
Call to:	Trooper VanSpronsen, Alaska Wildlife Troopers, Haines	Phone No:	907-766-2533
Call from:	Jessica Manifold, HDR Alaska	Phone No:	907-644-2073

Discussion, Agreement and/or Action:

I phoned the Alaska Wildlife Troopers on October 11, 2012 and spoke with Alaska State Trooper Nelson who gave me Wildlife Trooper VanSpronsen's contact information. Trooper Nelson said he was not aware of rescues by boat in his time with the troopers but indicated he was new to the area.

I phoned Trooper VanSpronsen on October 12, 2012. I explained to Trooper VanSpronsen that it was brought to my attention that the wildlife troopers patrolled rivers and waterways in the vicinity of Haines. I specifically asked about the Katzehin River and he indicated that the Wildlife Troopers operated an 18' jet boat but they did not frequently access to Katzehin River. He stated that the area was primarily accessed by recreational jet boats. I asked about airboat use and he indicated that there were not a lot of airboats accessing the area due to stability on the Lynn Canal.

Manifold, Jessica L.

From: Rich Etheridge <Rich_Etheridge@ci.juneau.ak.us>
Sent: Tuesday, August 06, 2013 3:35 PM
To: Manifold, Jessica L.
Subject: RE: Emergency services on remote rivers near Juneau and Haines

Juneau does not have boats that operate in that area. We have two flat bottom John Boats with 80 hp jet outboards. They are primarily used on the Mendenhall river.

Rich Etheridge
Fire Chief

From: Manifold, Jessica L. [mailto:Jessica.Manifold@hdrinc.com]
Sent: Tuesday, August 06, 2013 3:32 PM
To: Rich Etheridge
Subject: Emergency services on remote rivers near Juneau and Haines

Hi Rich-

We are looking for information related to the Katzehin, Lace and Antler rivers between Haines and Juneau. What we are looking for are specifications on any emergency rescue vessels that may be traveling on these rivers, airboats and or jet boats. If you have any information or knowledge of boats that may use these river systems that would be great! If you are not the appropriate person to contact regarding this information can you please suggest who would be a better point of contact.

Thank you for your time and have a great afternoon,

Jessica

JESSICA MANIFOLD
HDR ALASKA, INC.

Senior Environmental Permitter

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Manifold, Jessica L.

From: Steinberger, Wendy S (DNR) <wendy.steinberger@alaska.gov>
Sent: Wednesday, August 14, 2013 11:42 AM
To: Manifold, Jessica L.
Cc: Sorensen, Kevin L (DNR)
Subject: RE: Juneau-Haines River files

Jessica,
So far I have located pre-statehood poling boat use on the Lace, Berners, and Antler Rivers. I am still looking. One item to note; in the Gulkana Litigation records we have located pre-statehood use of airboats and tunnel boats with lifts that were operating on the Gulkana River prior to 1959. If these boats were available at Gulkana there is no reason to imagine that they were not available at other locations in the state.

Wendy Steinberger
Natural Resource Specialist
Navigability Subunit
Public Access Assertion & Defense Unit
Division of Mining, Land and Water
Department of Natural Resources
907-269-6018

From: Manifold, Jessica L. [mailto:Jessica.Manifold@hdrinc.com]
Sent: Thursday, August 08, 2013 11:29 AM
To: Steinberger, Wendy S (DNR)
Cc: Sorensen, Kevin L (DNR)
Subject: RE: Juneau-Haines River files

Thank you so much for your help Wendy!

I look forward to obtaining more information on these waterways! We'll be in touch, and I will see if there are updated files we can provide. Currently we are doing a data gap analysis to determine what information we have or that is readily available and what information is needed.

Have a great week/weekend!

Jessica

JESSICA MANIFOLD
HDR ALASKA, INC.

Senior Environmental Permitter

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From: Steinberger, Wendy S (DNR) [mailto:wendy.steinberger@alaska.gov]
Sent: Thursday, August 08, 2013 11:05 AM

To: Sorensen, Kevin L (DNR); Manifold, Jessica L.
Subject: RE: Juneau-Haines River files

Good Morning Jessica,

Kevin asked if I could get this information out to you quickly.

The Berners Bay Rivers: Antler River, Lace River, Berners River - The River files have very limited information. Uplands are held by the US Forest Service, Tongass National Forest. In the January 1997 Tongass Land Management Plan Revision Final EIS current use of the waterbodies for Wild and Scenic Classifications are discussed. This document discusses guiding and commercial use on these rivers.

Katzehin River (across from Haines): This file is limited to the same USFS January 1997 document.

All of the Berners Bay Rivers are currently used by jet and airboats to access hunting and fishing grounds. I know several people who currently utilize Lace, Berners and Antler Rivers for moose, deer and bear hunting from Echo Cove. In 97 when I was working on the remediation of the Haines tank farm, I was chatting with one of the locals who took his jet boat over to Katzehin River to go hunting.

I have placed calls and emails to people who may help me gather this historic information. With all of the minerals investigations and the subsistence resources it is a matter of finding the written documentation. I have a request into the BLM to obtain closed native allotment file for the lands between Lace and Antler River.

This project will require more significant research that will take more time. From the maps I have seen of the proposed road alignment I believe the location of this proposed road is located within the tidally influenced (back water effect) areas of the rivers. I would need an updated road alignment to verify this.

Wendy Steinberger
Natural Resource Specialist
Navigability Subunit
Public Access Assertion & Defense Unit
Division of Mining, Land and Water
Department of Natural Resources
907-269-6018

From: Sorensen, Kevin L (DNR)
Sent: Wednesday, August 07, 2013 8:02 AM
To: Steinberger, Wendy S (DNR)
Subject: FW: Juneau-Haines River files

Wendy,

I asked Jessica to email her request.

From: Manifold, Jessica L. [mailto:Jessica.Manifold@hdrinc.com]
Sent: Tuesday, August 06, 2013 3:42 PM
To: Sorensen, Kevin L (DNR)
Subject: Juneau-Haines River files

Hi Kevin-

Per our conversation today, can you please let us know if you have files for the Katzehin, Lace and Antler rivers located between Juneau and Haines, Alaska. If you have information available with historical use/navigation I'd be happy to come by and review the files.

Thank you for your time!

Jessica

JESSICA MANIFOLD
HDR ALASKA, INC.

Senior Environmental Permitter

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Manifold, Jessica L.

From: Steinberger, Wendy S (DNR) <wendy.steinberger@alaska.gov>
Sent: Wednesday, August 21, 2013 8:18 AM
To: Manifold, Jessica L.
Subject: Juneau-Haines River files - 1
Attachments: Jan_1997_Tongass_EIS_Antler_River.pdf; Jan_1997_Tongass_EIS_Lace_River.pdf; Jan_1997_Tongass_EIS_Katzehin_River.pdf

Good Morning Jessica,

I figured that you saw my out of office. Here are the documents from the files. I will send the other documents in an additional email. If HDR is working on the bridge design for this project I would recommend the clearance for the airboats currently used on the Berners Bay Rivers.

Wendy Steinberger
Natural Resource Specialist
Navigability Subunit
Public Access Assertion & Defense Unit
Division of Mining, Land and Water
Department of Natural Resources
907-269-6018

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