



**Juneau Access Improvements Project  
Final Supplemental  
Environmental Impact Statement**

**2017 Update to Appendix D  
Technical Alignment Report**

**Prepared for:**

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

**State Project Number: 71100  
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**2017**

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## **Attachments**

- Attachment A: Revised East Lynn Canal Plan and Profile Sheets
- Attachment B: Revised West Lynn Canal Plan and Profile Sheets
- Attachment C: Revised Highway Maintenance Cost Estimate
- Attachment D: Revised Marine Terminal Plans and Cost Update
- Attachment E: Revised Road Engineer's Estimate

## **Acronyms and Abbreviations**

|        |  |
|--------|--|
| AASHTO | American Association of State Highway and Transportation Officials |
| ACF    | Alaska Class Ferry   |
| ADT    | average daily traffic  |
| AMHS   | Alaska Marine Highway System                                       |
| ATB    | Asphalt Treated Base   |
| CIP    | Capital Improvement Plan   |
| DOT&PF | Alaska Department of Transportation and Public Facilities          |
| EATB   | Emulsified Asphalt Treated Base                                    |
| EIS    | Environmental Impact Statement                                     |
| FEIS   | Final Environmental Impact Statement                               |
| JAI    | Juneau Access Improvements   |
| MP     | Milepost   |
| NEPA   | National Environmental Policy Act                                  |
| NHS    | National Highway System  |
| SEIS   | Supplemental Environmental Impact Statement                        |

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## **1. Introduction**

In September 2004, the Juneau Access Improvement (JAI) Project-Technical Alignment Report was prepared and included as Appendix D of the JAI Supplemental Draft Environmental Impact Statement (EIS) in January 2005. During development of the JAI 2006 Final EIS, the Alaska Department of Transportation and Public Facilities (DOT&PF) responded to comments on the Supplemental Draft EIS and incorporated new data and new analysis into the project. Changes were made to Alternative 2B, and Alternatives 2, 2A, and 2C were dropped from the range of reasonable alternatives. These revisions required the preparation of an Addendum to Appendix D – Alignment Technical Report, which was included in Appendix W of the 2006 Final EIS.

The 2006 Addendum to Appendix D described changes to the design criteria, updated the alignment discussion where changes occurred, provided updated bridge summaries, provided updated plan and profile sheets where changes occurred, updated ferry terminal layouts and cost estimates, updated the Engineer’s Estimate, and provided an errata sheet for the original technical report.

As part of the JAI Project 2014 Draft Supplemental Environmental Impact Statement (SEIS), additional changes and updates to design criteria, plans, and costs have been prepared and are presented in this *2014 Update to Appendix D – Technical Alignment Report*. This Update incorporates and replaces the 2006 Addendum to Appendix D. The information reported in the 2004 Technical Alignment Report Appendix D remains valid unless replaced with new information presented in this Update.

Due to the extent of changes to the Alternative 2B and 3 alignments, new plan and profile sheets are provided, as are new ferry terminal layouts and highway and ferry terminal cost estimates.

### **1.1 Project Description**

As required by the National Environmental Policy Act (NEPA), this technical report considers the following reasonable alternatives.

#### **1.1.1 Alternative 1 – No Action**

The No Action Alternative (Alternative 1) includes a continuation of mainline ferry service in Lynn Canal and incorporates two Day Boat Alaska Class Ferries (ACFs). The Alaska Marine Highway System (AMHS) would continue to be the National Highway System (NHS) route from Juneau to Haines and Skagway, and no new roads or ferry terminals would be built. In addition to the Day Boat ACFs, programmed improvements include improved vehicle and passenger staging areas at the Auke Bay and Haines ferry terminals to optimize traffic flow on and off the Day Boat ACFs as well as expansion of the Haines Ferry Terminal to include a new double bow berth to accommodate the Day Boat ACFs. This alternative is based on the most likely AMHS operations in the absence of any capital improvements specific to the JAI Project.

Mainline service would include two round trips per week in the summer and one per week in the winter with Auke Bay-Haines-Skagway-Haines-Auke Bay routing. During the summer, one Day Boat ACF would make one round trip between Auke Bay and Haines six days per week, and one

would make two round trips per day between Haines and Skagway six days per week. The Day Boat ACFs would not sail on the seventh day because the mainliner is on a similar schedule. In the winter, ferry service in Lynn Canal would be provided primarily by the Day Boat ACFs three times per week. The *M/V Malaspina* would no longer operate as a summer day boat in Lynn Canal.

### **1.1.2 Alternative 1B – Enhanced Service with Existing AMHS Assets**

Alternative 1B includes all of the components of Alternative 1, No Action, but focuses on enhancing service using existing AMHS assets without major initial capital expenditures. Similar to Alternative 1, Alternative 1B includes: a continuation of mainline ferry service in Lynn Canal; the AMHS would continue to be the NHS route from Juneau to Haines and Skagway; no new roads or ferry terminals would be built; and in addition to the Day Boat ACFs, programmed improvements include improved vehicle and passenger staging areas at the Auke Bay and Haines ferry terminals to optimize traffic flow on and off the Day Boat ACFs as well as expansion of the Haines Ferry Terminal to include a new double bow berth to accommodate the Day Boat ACFs. Service to other communities would remain the same as the No Action Alternative. Alternative 1B keeps the *M/V Malaspina* in service after the second Day Boat ACF is brought online to provide additional capacity in Lynn Canal. Enhanced services included as part of Alternative 1B are a 20 percent reduction in fares for trips in Lynn Canal and extended hours of operations for the reservation call center.

Mainline service would include two round trips per week in the summer and one per week in the winter with Auke Bay-Haines-Skagway-Haines-Auke Bay routing. During the summer, the *M/V Malaspina* would make one round-trip per day five days per week on a Skagway-Auke Bay-Skagway route. On the sixth day, the *M/V Malaspina* would sail on the Skagway-Auke Bay-Haines-Skagway route, and on the seventh day, it would sail that route in reverse (Skagway-Haines-Auke Bay-Skagway). One Day Boat ACF would make one round trip between Auke Bay and Haines seven days per week. The other Day Boat ACF would make two round-trips per day between Haines and Skagway six days per week; it would not sail on the seventh day because the mainliner would be on a similar schedule. In the winter, ferry service in Lynn Canal would be provided primarily by the Day Boat ACFs three times per week.

### **1.1.3 Alternative 2B – East Lynn Canal Highway to Katzehin, Shuttles to Haines and Skagway**

Alternative 2B would construct the East Lynn Canal Highway (50.8 miles, including 47.9 miles of new highway and upgrade to 2.9 miles of the existing Glacier Highway) from Echo Cove around Berners Bay to a new ferry terminal 2 miles north of the Katzehin River. Ferry service would connect Katzehin to Haines and Skagway. In addition, this alternative includes modifications to the Skagway Ferry Terminal to include a new end berth and construction of a new conventional monohull ferry to operate between Haines and Skagway. Mainline ferry service would end at Auke Bay. This alternative assumes the following improvements will have been made independent of the JAI Project before Alternative 2B would come on-line: two Day Boat ACFs, improved vehicle and passenger staging areas at the Haines Ferry Terminal to optimize traffic flow on and off the Day Boat ACFs, and expansion of the Haines Ferry Terminal to include two new double bow berths.



During the summer months, one Day Boat ACF would make eight round trips per day between Haines and Katzechin, a second Day Boat ACF would make six round trips per day between Skagway and Katzechin, and the Haines-Skagway shuttle ferry would make two trips per day. During the winter, one Day Boat ACF would make six round trips per day between Haines and Katzechin, and a second Day Boat ACF would make four round trips per day between Skagway and Katzechin. The Haines-Skagway shuttle would not operate; travelers going between Haines and Skagway would travel to Katzechin and transfer ferries.

#### **1.1.4 Alternative 3 – West Lynn Canal Highway**

Alternative 3 would upgrade/extend the Glacier Highway (5.2 miles, including 2.3 miles of new highway and upgrade to 2.9 miles of the existing Glacier Highway) from Echo Cove to Sawmill Cove in Berners Bay. New ferry terminals would be constructed at Sawmill Cove in Berners Bay and at William Henry Bay on the west shore of Lynn Canal, and the Skagway Ferry Terminal would be modified to include a new end berth. A new 38.9-mile highway would be constructed from the William Henry Bay Ferry Terminal to Haines with a bridge across the Chilkat River/Inlet connecting into Mud Bay Road. A new conventional monohull ferry would be constructed and would operate between Haines and Skagway. Mainline ferry service would end at Auke Bay. This alternative assumes the following improvements will have been made independent of the JAI Project before Alternative 3 would come on-line: two Day Boat ACFs, improved vehicle and passenger staging areas at the Haines Ferry Terminal to optimize traffic flow on and off the Day Boat ACFs, and expansion of the Haines Ferry Terminal to include two new double bow berths.

During the summer, two Day Boat ACFs would make six round-trips per day between Sawmill Cove and William Henry Bay (total of 12 trips each direction), and the Haines-Skagway shuttle ferry would make six round-trips per day. During the winter, one Day Boat ACF would make four round-trips per day between Sawmill Cove and William Henry Bay, and the Haines-Skagway shuttle ferry would make four round-trips per day.

#### **1.1.5 Alternatives 4A through 4D – Marine Alternatives**

All four marine alternatives would include continued mainline ferry service in Lynn Canal with a minimum of two trips per week in the summer and one per week in the winter with Auke Bay-Haines-Skagway-Haines-Auke Bay routing. Each marine alternative includes a new conventional monohull shuttle that would make two round trips per day between Haines and Skagway six days a week in the summer and a minimum of three round trips per week between Haines and Skagway in the winter. The AMHS would continue to be the NHS route from Juneau to Haines and Skagway. These alternatives assume the following improvements will have been made independent of the JAI Project before the alternative comes on-line: improved vehicle and passenger staging areas at the Auke Bay and Haines ferry terminals to optimize traffic flow on and off the Day Boat ACFs, and expansion of the Haines Ferry Terminal to include new double bow berths.

##### **1.1.5.1 Alternative 4A – Fast Vehicle Ferry Service from Auke Bay**

Alternative 4A would construct two new fast vehicle ferries (FVFs). No new roads would be built for this alternative, and the Auke Bay Ferry Terminal would be expanded to include a new double stern berth. A new conventional monohull ferry would be constructed and would operate

between Haines and Skagway. The *M/V Malaspina* would no longer operate as a summer day boat in Lynn Canal, and the Day Boat ACFs would no longer operate in Lynn Canal. The FVFs would make two round trips between Auke Bay and Haines and two round trips between Auke Bay and Skagway per day in the summer. During the winter, one FVF would make one round trip between Auke Bay and Haines and one round trip between Auke Bay and Skagway each day.

#### **1.1.5.2 Alternative 4B – Fast Vehicle Ferry Service from Berners Bay**

Similar to Alternative 4A, Alternative 4B would construct two new FVFs. This alternative would upgrade/extend Glacier Highway (5.2 miles, including 2.3 miles of new highway and 2.9 miles of the existing Glacier Highway) from Echo Cove to Sawmill Cove in Berners Bay, where a new ferry terminal would be constructed. The Auke Bay Ferry Terminal would be expanded to include a new double stern berth. A new conventional monohull ferry would be constructed and would operate between Haines and Skagway. The *M/V Malaspina* would no longer operate as a summer day boat in Lynn Canal, and the Day Boat ACFs would no longer operate in Lynn Canal. In the summer, the FVFs would make two round trips between Sawmill Cove and Haines and two round trips between Sawmill Cove and Skagway per day. During the winter, one FVF would make one round trip between Auke Bay and Haines and one round trip between Auke Bay and Skagway each day.

#### **1.1.5.3 Alternative 4C – Conventional Monohull Service from Auke Bay**

Alternative 4C would use Day Boat ACFs to provide additional ferry service in Lynn Canal. No new roads would be built for this alternative. The Auke Bay Ferry Terminal would be expanded to include a new double stern berth, and the Skagway Ferry Terminal would be expanded to include a new bow berth. A new conventional monohull ferry would be constructed and would operate between Haines and Skagway. In the summer, one Day Boat ACF would make one round trip per day between Auke Bay and Haines, and one Day Boat ACF would make one round trip per day between Auke Bay and Skagway. During the winter, one Day Boat ACF would alternate between a round trip to Haines one day and a round trip to Skagway the next day.

#### **1.1.5.4 Alternative 4D – Conventional Monohull Service from Berners Bay**

Alternative 4D would use Day Boat ACFs to provide additional ferry service in Lynn Canal. This alternative would upgrade/extend Glacier Highway (5.2 miles, including 2.3 miles of new highway and 2.9 miles of the existing Glacier Highway) from Echo Cove to Sawmill Cove in Berners Bay, where a new ferry terminal would be constructed. The Auke Bay Ferry Terminal would be expanded to include a new double stern berth, and the Skagway Ferry Terminal would be expanded to include a new bow berth. This alternative includes construction of a new conventional monohull ferry that would operate between Haines and Skagway. In the summer, the Day Boat ACFs would make two trips per day between Sawmill Cove and Haines and two trips per day between Sawmill Cove and Skagway. During the winter, a Day Boat ACF would operate from Auke Bay, alternating between a round trip to Haines one day and to Skagway the next day.

## 2. Design Standards

### 2.1 Highway Design Criteria

The highway has been designed following the American Association of State Highway and Transportation Officials' (AASHTO's) "A Policy on Geometric Design of Highways and Streets." Over the years AASHTO has updated its design guidance, with the latest update occurring in 2011. Based on this latest update, the following revision is made to Roadway Design Criteria: The minimum Allowable Radius of a Horizontal Curve has been reduced from 510 feet to 485 feet using a design speed of 40 mph.

### 2.2 Design Exceptions

The following design exception will be required for Alternatives 2B and 3 (see Table 2-1); supporting reasons are quoted from AASHTO:

Table 2-1: Alaska State National Highway System Standard

| Criteria Description | AASHTO Standard | Juneau Access Improvements Project |
|----------------------|-----------------|------------------------------------|
| Width of shoulder    | 6 ft.           | 4 ft.                              |

The reasons for the exception have remained the same, with slight changes in wording:

- **Reason:** The State of Alaska has adopted the AASHTO Standard as its standard.
- **Shoulder Widths:** AASHTO Standards indicate that a 4-foot-wide usable shoulder should be considered for rural arterials with average daily traffic (ADT) less than 400 that have travel lanes 11 feet wide and Design Speeds from 40 to 55 mph. This would apply to Alternatives 4B and 4D. For ADTs between 400 and 1,500, relevant to Alternatives 2B and 3, a 6-foot-wide usable shoulder should be considered.
- **AASHTO states:** "As a minimum, 0.6 m [2 ft] of the shoulder width should be paved to provide for pavement support, wide vehicles, and collision avoidance."
- **AASHTO also states:** "Where bicycles are to be accommodated on the shoulder, a minimum paved width of 1.2 m [4 ft] should be used."

The DOT&PF has elected to use the 4-foot paved usable shoulder width to minimize construction impacts while still providing for bicyclists and pedestrians.

### **3. Recommended Design**

#### **3.1 Typical Sections**

The highway typical section has been revised to replace the 4-inch-thick layer of Emulsified Asphalt Treated Base (EATB) with 2 inches of Asphalt Treated Base (ATB) and 4 inches of Aggregate Base Course, Grading D-1. The combined ATB and Base Course will provide a more durable structural section. The ATB and Base Course have been included in the Engineer's Estimates for all alternatives and are shown on the typical sections.

Select material below the base and pavement section has increased from 12 inches to 24 inches where the road is constructed on frost susceptible soils. Providing a non-frost susceptible material below the road base is critical in preserving the integrity of the road structure and will minimize long term maintenance efforts.

The ditch width has increased from 8 feet to 10 feet. The wider ditch width will better accommodate subsurface drainage from the 24-inch select material to the ditch and provide more capacity for drainage and snow storage.

The attached Figure 3-1 through Figure 3-6 reflect this change and provide information on various typical sections.

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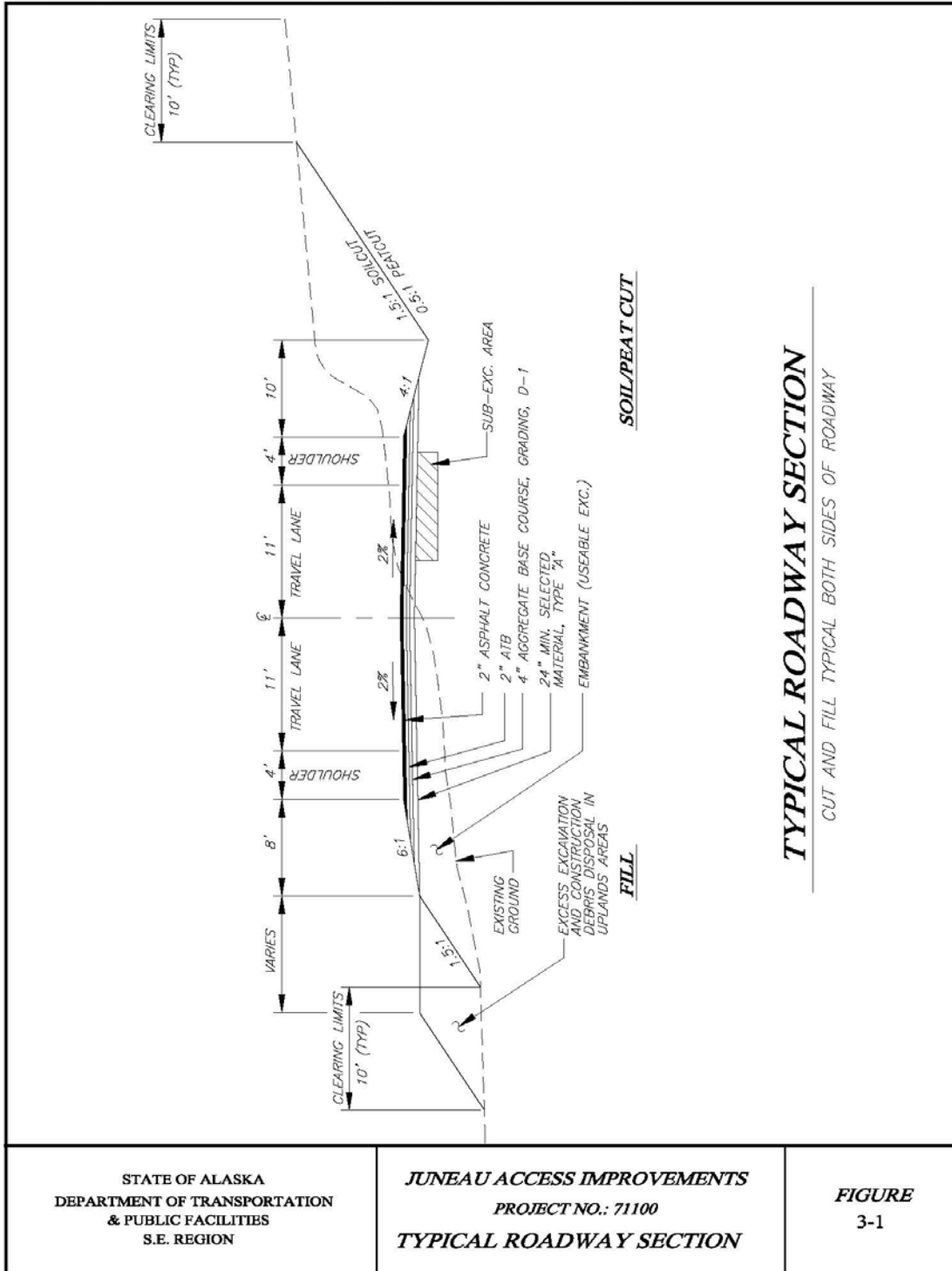


Figure 3-1: Typical Roadway Section

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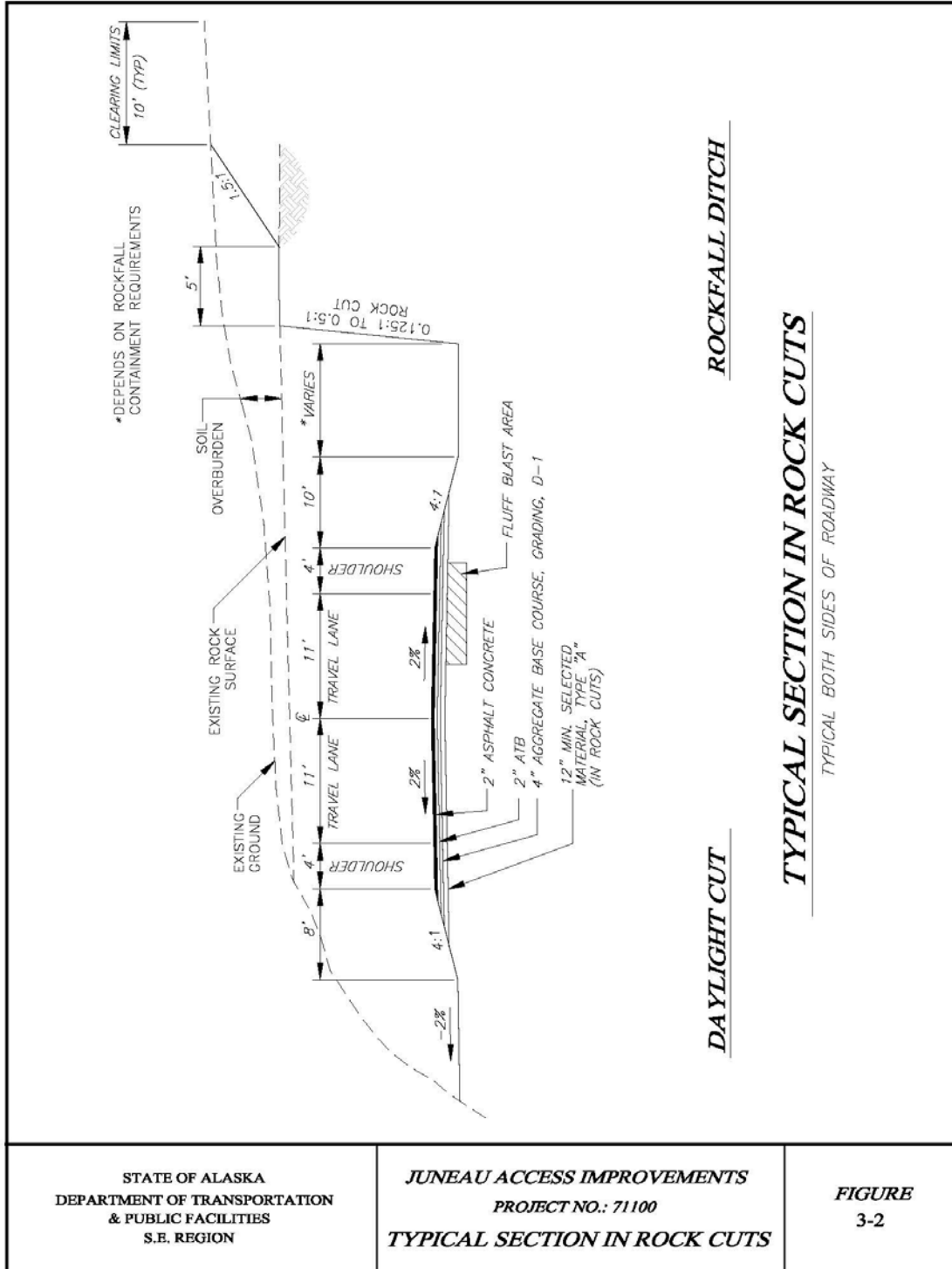


Figure 3-2: Typical Section in Rock Cuts

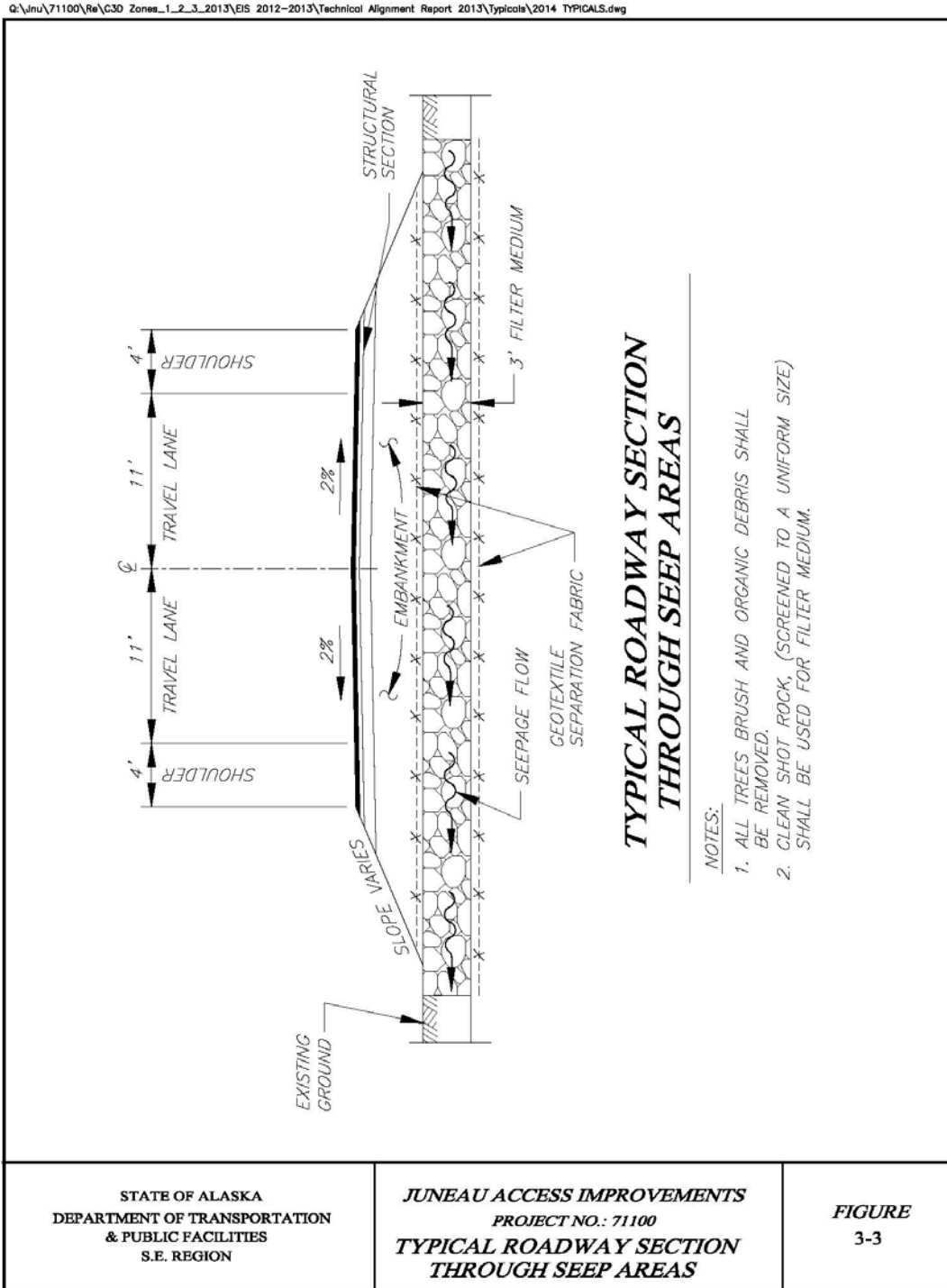
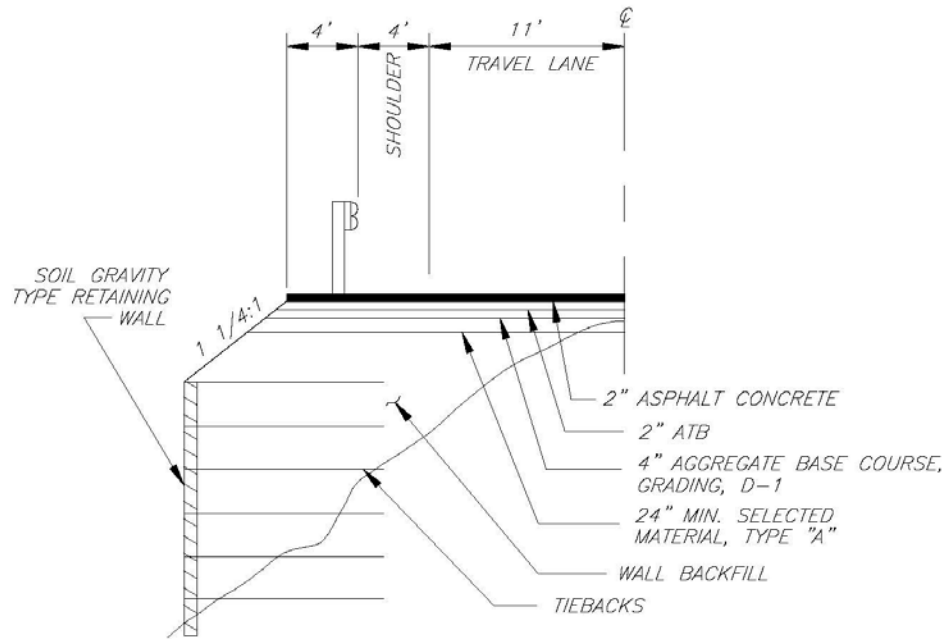


Figure 3-3: Typical Roadway Section through Seep Areas

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**TYPICAL RETAINING WALL SECTION**

WITH RETAINING WALL MODERATE TO STEEP CROSS SLOPE AREA

|   |   |               |
|---|---|---------------|
| STATE OF ALASKA<br>DEPARTMENT OF TRANSPORTATION<br>& PUBLIC FACILITIES<br>S.E. REGION | JUNEAU ACCESS IMPROVEMENTS<br>PROJECT NO.: 71100<br>TYPICAL RETAINING<br>WALL SECTION | FIGURE<br>3-4 |
|---|---|---------------|

Figure 3-4: Typical Retaining Wall Section (Moderate to Steep)



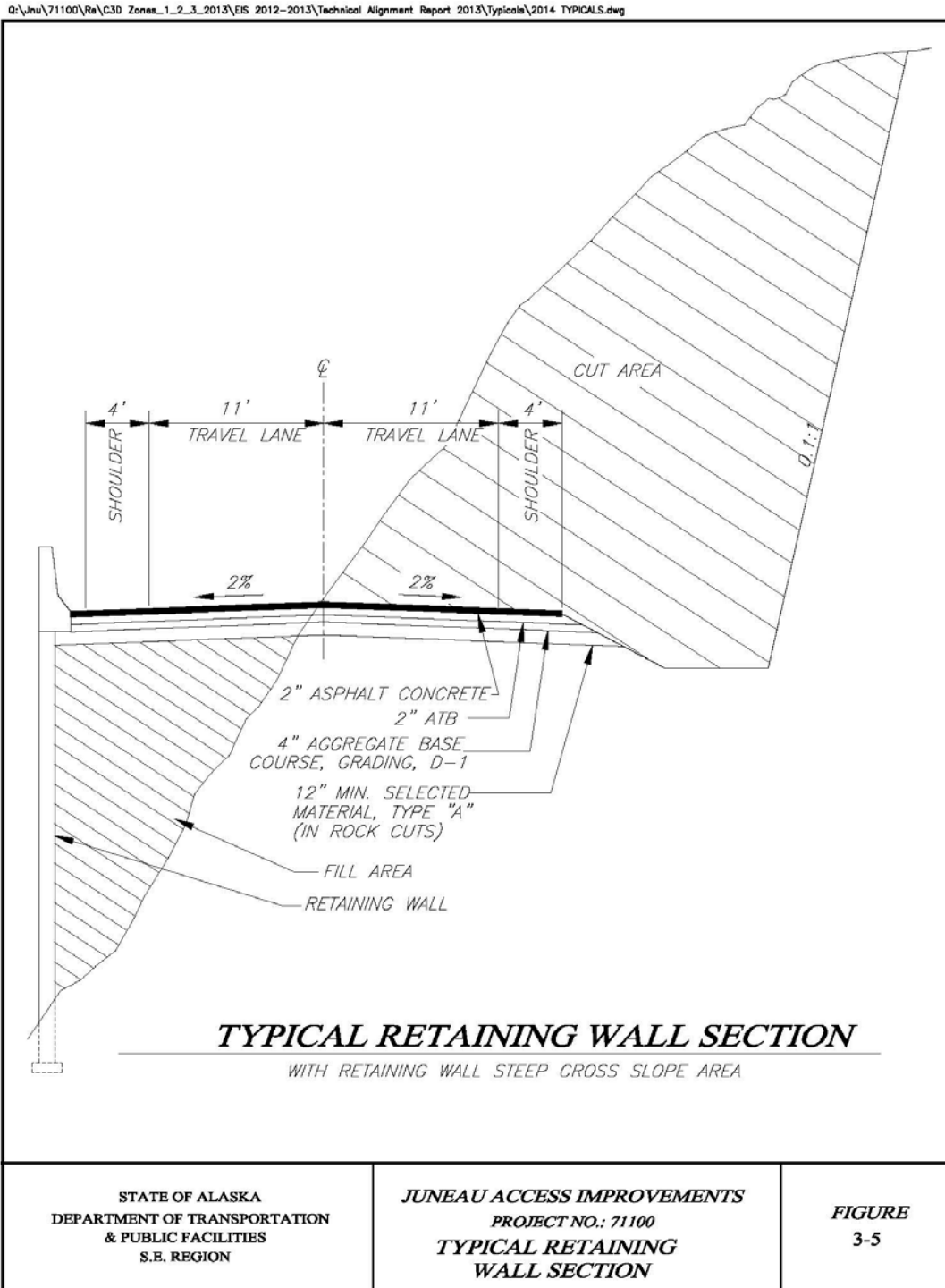


Figure 3-5: Typical Retaining Wall Section (Steep)

Q:\jnu\71100\Ra\C3D Zones\_1\_2\_3\_2013\EIS 2012-2013\Technical Alignment Report 2013\Typicals\2014 TYPICALS.dwg

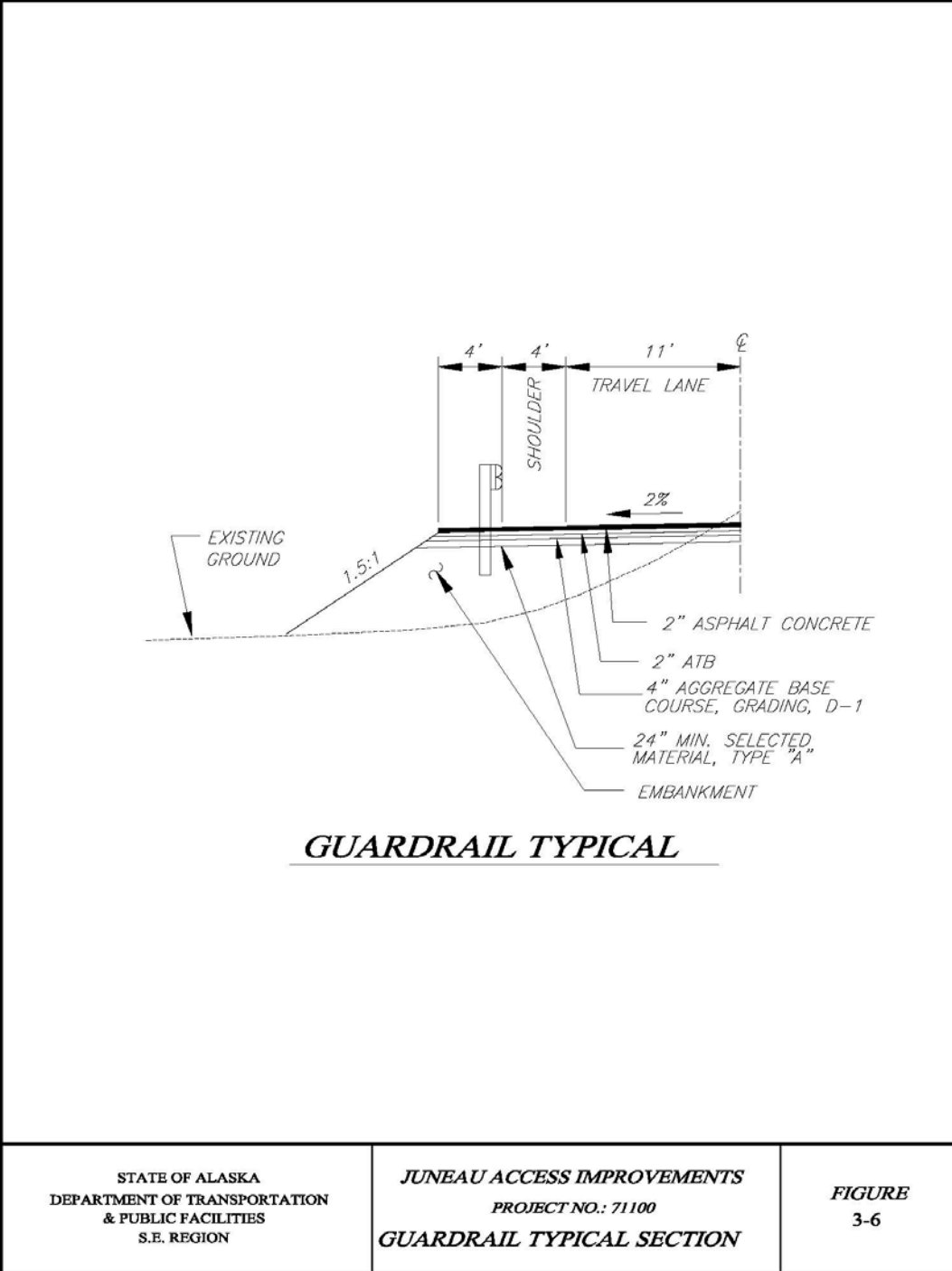


Figure 3-6: Guardrail Typical Section

## **3.2 Alignment Discussion Overview**

### **3.2.1 East Lynn Canal Discussion**

Note: The stationing along this route has changed from the 2006 Final EIS (FEIS) and 2008 Corps of Engineers Permit Alignment due to the numerous alignment revisions. The stationing provided in the discussion reflects stationing on the revised plan sheets in Attachment A.

**Station 58+00 (Milepost [MP] 40.5) to Station 562+50 (MP 50.1) – Echo Cove to Berners Bay Crossing – (Plan Sheets 1 - 7)** – This segment had minor alignment revisions for better bridge crossings, to minimize wetland impacts, and to avoid eagle nests.

In 2011, the pioneer road from Echo Cove to Cascade Point was reconstructed and widened. The current alignment between Station 64+75 and Station 207+00 will straddle the Goldbelt Cascade Point Road centerline alignment.

The curve at station 255+00 was lengthened to shift the alignment into a rock outcropping in order to generate material. Just beyond this at station 277+00, the crossing of Sawmill Creek was shifted downhill to avoid multiple converging creeks and boggy terrain. The crossing of Boulder Creek at station 393+00 was also shifted to take advantage of a better crossing. Here the alignment was shifted uphill.

Additional adjustments to the alignment were made between Station 207+00 and Station 410+00 to avoid emergent wetlands and minimize impacts to lower value wetlands.

Beginning approximate station 410+00 and extending to 520+00 the alignment is shifted uphill to follow geotechnical investigative recommendations, to meet commitments for a minimum 50 foot offset from the water, and to avoid the primary zones (330-foot radius around the nest tree) of eagle nests #076, #119, and #074.

From Station 520+00 forward, the alignment was optimized by making minor downhill shifts where possible, and by following the curvature of the terrain more closely. Two new eagle nests were identified in this area. Nest #294 at station 521+60 Left and nest #292 at station 561+40 Right both required shifting the alignment to avoid the nests. To optimize the first bridge crossing at Berners Bay (Antler Slough) and to reduce shoreline impacts, the alignment was shifted about 500 feet upstream at station 572+00.

**Station 562+50 (MP 50.1) to Station 756+50 (MP 53.6) - Berners Bay Crossing – (Plan Sheets 7 - 9)** – This segment is largely unchanged but does have some minor alignment revisions to better line up with the bridge crossings. A bridge was added to cross a newly identified anadromous fish stream and avoid riparian wetlands.

**Station 756+50 (MP 53.6) to Station 1401+00 (MP 65.8) – Berners Bay Crossing to Independence Lake – (Plan Sheets 9 - 19)** – This 12.2-mile segment was revised at multiple points to minimize or eliminate impacts to wetlands, to better avoid eagle nests, to make use of better stream crossings and foundation soils, to avoid steep ravine areas, to minimize cut heights, and to use the existing Jualin Road corridor where feasible.

**Station 1401+00 (MP 65.8) to Station 1520+00 (MP 68.1) – Independence Lake North – (Plan Sheets 19 - 20)** – The alignment was shifted uphill to decrease the amount of marine fill and for better confined crossings through two debris flows and avalanche chutes.

**Station 1520+00 (MP 68.1) to Station 1615+00 (MP 69.9) – Met Point South – (Plan Sheets 20 - 22)** – In this segment, the alignment was shifted uphill in a couple areas to avoid boulder debris and to move the bridge crossing 10E to avoid complex channel morphology, debris deposition, and to reduce marine fill. Also two new eagle nests were identified in 2012, nest #236 at station 1521+00 Right and #233 at station 1573+00 Right, causing minor shifts to avoid the nests.

**Station 1615+00 (MP 69.9) to Station 2096+00 (MP 79.0) – Met Point North to Level Point – (Plan Sheets 22 - 29)** – This segment is characterized by numerous active debris flows and rockfall hazards. Geotechnical investigations identified large areas of steep talus slopes requiring special consideration for crossing. The general recommendation was to avoid cuts through the talus fields. The alignment has been shifted in many locations to provide for better crossings over the mapped debris flows and both horizontal and vertical adjustments for crossing the talus slopes. The majority of alignment shifts have been uphill to minimize these hazards. The original alignment closely followed the beach, therefore the shifts have also resulted in less marine fill. A large heavy-duty bridge was added at station 1735+58 to cross below an unstable talus slope and steep cliff face.

Also, seven new eagle nests were identified in 2012. The new nests and respective locations are; #105 at station 1650+00 Left, #102 at station 1713+00 Left, #149 at station 1714+00 Left, #212 at station 1912+00 Right, #211 at station 1952+00 Right, #033 at station 2014+00 Left, and #157 at station 2098+00 Left.

**Station 2096+00 (MP 79.0) to Station 2635+00 (MP 89.2) – Level Point to Katzehin River – (Plan Sheets 29 - 37)** – This segment is also characterized by numerous active debris flows and rockfall hazards. The alignment has been shifted either uphill or downhill in many locations to minimize the risks from these hazards. Shifts were also made to move bridge crossings into more favorable terrain. Numerous steep talus slopes present unique construction challenges.

From station 2140+00 to 2203+00, the alignment has predominantly been shifted uphill to minimize the risk from cutting through talus slopes. A better bridge crossing of Yeldagala Creek at station 2245+00 resulted in an uphill shift. The alignment remained shifted uphill to optimize the crossings of many debris flows and rockfall hazards.

A major shift is at Gran Point, station 2357+00, where the alignment now travels through two tunnels to avoid the hazards due to the rock cliffs and to shield the sea lion haulout. The alignment remains uphill to station 2454+00 to avoid very steep and difficult terrain. The first tunnel is located between approximate stations 2363+00 and 2371+00, with a length of 800 feet. The second tunnel is located between approximate stations 2378+00 and 2382+50, with a length of 450 feet.

Another major shift is at station 2540+00 where the alignment follows the contours at the water's edge and places deep water fill from station 2565+50 to 2581+00. The decision was made to shift the alignment into the water to avoid rockfall hazards from the cliffs above.

Between station 2595+00 and 2629+00, the alignment had minor shifts to better fit the terrain and to eliminate marine wetlands impacts.

Three new eagle nests were identified in 2012 within this segment. Nest #157 is at the beginning of this segment but was discussed in the previous segment. Nest #029 is at station 2233+00 Left, #024 is at station 2451+00 Left, and #204 is at station 2501+60 Right.

**Station 2635+00 (MP 89.2) to Station 2771+86 (MP 91.8) – South Katzehin River to Katzehin Ferry Terminal – (Plan Sheets 37 - 38)** – The Katzehin River Bridge was skewed to minimize exposure to the rockfall hazard along the southern bank of the river and to avoid a slough immediately north of the river. The need for a wildlife undercrossing was identified at station 2704+00 resulting in the need for bridge 20E. Its length is 130 feet.

The alignment on this segment was kept at the base of the mountain between station 2725+00 and the ferry terminal at station 2770+00 to eliminate estuarine wetlands impacts and to avoid eagle nest #196 at station 2740+00 Left. The ferry terminal fill was moved south to avoid the runoff of an avalanche path.

### **3.2.2 West Lynn Canal Discussion**

The alignment along the west side of Lynn Canal is mainly unchanged except for minor shifts to avoid new eagle nests identified in 2012; revised plan and profile sheets are included in Attachment B.

Nest #402, station 5675+53 Right, is situated at the top of steep terrain above the beach. The alignment consists of a through cut with steep terrain above making any uphill alignment shift difficult. The profile was raised to increase the distance from the cut limit to the nest.

At station 5745+37, nest #403 and the roadway are on a slight bench with steep slopes both uphill and downhill with very little room for shifting. The nest is situated uphill of the road. The roadway was shifted towards the seaward side to maximize the distance between the road and nest, thereby increasing retaining wall height.

Nest #406, station 5940+00 Right, is over the bank near the beach. The road would be in a through cut at a knob with a bench area both before and after the knob. The profile was raised to lessen the height of cut and to increase the distance between the nest and cut limit.

### **3.3 Drainage, Structures, and Bridges**

Table 3-1, East Lynn Canal Bridge and Structure Summary, has been updated to include the new Alternative 2B bridges, snowsheds, and tunnels. Geotechnical investigation identified numerous new bridge locations due to the need to span active debris flows or other drainages.

Bridges north of station 1300+00 have been divided into 3 classifications; standard, special, and

heavy duty. Standard bridges are planned at crossings that can be spanned using common length concrete girders that are readily available. Special bridges are those that require girder lengths longer than those for standard bridges, require special foundation design, or may require other elements such as curvature. Heavy Duty bridges are those required at special crossings such as avalanche chutes or very difficult crossings. These bridges are required to address various hazards such as avalanche side loading and extreme topographic conditions. Figure 3-7, Bridge Elevations (originally Figure 3-8), was updated to distinguish between multiple span bridges for major and minor crossings.

Table 3-2 (originally Table 3-3) was updated to summarize the avalanche zones along the East Lynn Canal route. Avalanche sheds are anticipated at avalanche path numbers ELC019, ELC020, and ELC021 (paths are identified in Appendix J, *Snow Avalanche Report*, of the Supplemental Draft EIS, October 2004, and the 2014 Update to Appendix J). These paths have a combined width of 1,500 feet at this point, so it is assumed that the final design will include sheds with a total length of approximately 1,500 feet to mitigate for these high hazard avalanche zones. These are identified in Table 3-1.

**Table 3-1: East Lynn Canal Bridge and Structure Summary**

| Bridge No. / Structure ID | Approx. Station | Highway Milepost | Length (ft) | Intermediate Piers | Name                     |
|---------------------------|-----------------|------------------|-------------|--------------------|--------------------------|
| 1E                        | 276+72          | 44.4             | 128         | 0                  | Sawmill Creek (A)        |
| 2E                        | 391+98          | 46.6             | 128         | 0                  | Boulder Creek            |
| 3E                        | 572+17          | 50.0             | 144         | 0                  | unnamed (A)              |
| 4Ea                       | 641+86          | 51.3             | 2,759       | 19                 | Antler/Gilkey Rivers (A) |
| 4Eb                       | 671+09          | 51.9             | 128         | 0                  | Wildlife Undercrossing   |
| 4Ec                       | 694+48          | 52.3             | 118         | 0                  | Wildlife Undercrossing   |
| 4Ed                       | 723+79          | 52.9             | 118         | 0                  | unnamed                  |
| 5E                        | 728+39          | 53.0             | 2,881       | 20                 | Berners/Lace Rivers (A)  |
| 6E                        | 921+15          | 56.7             | 288         | 2                  | Slate Creek (A) (SP)     |
| 7E                        | 1306+03         | 64.0             | 118         | 0                  | Sweeny Creek (A)         |
| 8E                        | 1343+71         | 64.7             | 60          | 0                  | Sherman Creek (A)        |
| 9E                        | 1453+18         | 66.8             | 144         | 0                  | Independence Creek (A)   |
| 10E                       | 1561+01         | 68.8             | 128         | 0                  | unnamed                  |
| 11E                       | 1669+80         | 70.9             | 144         | 0                  | unnamed (SP)             |
| 12E                       | 1677+80         | 71.1             | 144         | 0                  | unnamed (HD)             |
| 13E                       | 1681+30         | 71.2             | 118         | 0                  | unnamed                  |
| 14E                       | 1703+78         | 71.6             | 128         | 0                  | unnamed (HD)             |
| 15E                       | 1735+58         | 72.2             | 400         | 3                  | (HD)                     |
| 16E                       | 1784+50         | 73.1             | 300         | 0                  | unnamed (HD)             |
| 17E                       | 1984+00         | 76.9             | 160         | 0                  | unnamed (SP)             |
| 18E                       | 2039+52         | 77.9             | 300         | 0                  | unnamed (HD)             |
| LC019                     | 2057+00         | 78.2             | 800         | N/A                | Paxton Creek (SS)        |
| LC020                     | 2103+00         | 79.1             | 300         | N/A                | unnamed (SS)             |
| LC021                     | 2116+00         | 79.3             | 400         | N/A                | Kemp Creek (SS)          |
| 19E                       | 2244+80         | 81.8             | 160         | 0                  | Yeldagalga Creek (SP)    |
| 20E                       | 2260+80         | 82.1             | 128         | 0                  | unnamed                  |
| 21E                       | 2282+00         | 82.5             | 128         | 0                  | unnamed (HD)             |
| 22E                       | 2293+37         | 82.7             | 128         | 0                  | unnamed (HD)             |

| Bridge No. / Structure ID | Approx. Station | Highway Milepost    | Length (ft) | Intermediate Piers | Name                   |
|---------------------------|-----------------|---------------------|-------------|--------------------|------------------------|
| 23E                       | 2320+84         | 83.2                | 150         | 0                  | unnamed (HD)           |
| 24E                       | 2337+93         | 83.5                | 144         | 0                  | unnamed (HD)           |
| Tunnel 1                  | 2367+00         | 84.1                | 800         | N/A                | unnamed (Tunnel)       |
| Tunnel 2                  | 2380+00         | 84.3                | 450         | N/A                | unnamed (Tunnel)       |
| 25E                       | 2422+39         | 85.1                | 128         | 0                  | unnamed                |
| 26E                       | 2481+03         | 86.2                | 128         | 0                  | unnamed (SP)           |
| 27E                       | 2589+53         | 88.3                | 128         | 0                  | unnamed                |
| 28Ea                      | 2637+65         | 89.2                | 2,590       | 18                 | Katzehin River (A)     |
| 28Eb                      | 2703+45         | 90.4                | 128         | 0                  | Wildlife Undercrossing |
| Total Bridges 32          |                 | Total Length 12,563 |             |                    |                        |
| Total Snow Sheds 3        |                 | Total Length 1,500  |             |                    |                        |
| Total Tunnels 2           |                 | Total Length 1,250  |             |                    |                        |

(A) = Anadromous fish stream

(SP) = Special Bridge

(HD) = Heavy Duty Bridge

(SS) = Snow Shed

\* Bridges not labeled as SP or HD are Standard Bridges

**Table 3-2: East Lynn Canal Snow Avalanche Summary**

| ID      | Station | ID      | Station |
|---------|---------|---------|---------|
| LC001   | 353+50  | LC020   | 2102+65 |
| LC002   | 1490+68 | LC021   | 2114+62 |
| LC003   | 1514+45 | LC022   | 2122+86 |
| LC003-1 | 1517+42 | LC023   | 2128+85 |
| LC004   | 1629+60 | LC024   | 2140+96 |
| LC005   | 1678+60 | LC025   | 2282+59 |
| LC005-1 | 1692+00 | LC026   | 2294+14 |
| LC006   | 1704+50 | LC026-1 | 2308+00 |
| LC007   | 1721+25 | LC027   | 2311+00 |
| LC008   | 1733+70 | LC028   | 2321+34 |
| LC009   | 1748+30 | LC028-1 | 2328+33 |
| LC010   | 1752+82 | LC028-2 | 2331+98 |
| LC011   | 1757+83 | LC029   | 2338+67 |
| LC012   | 1786+08 | LC030   | 2350+62 |
| LC013   | 1827+75 | LC031   | 2389+79 |
| LC014   | 1849+28 | LC031-1 | 2444+00 |
| LC015   | 1946+46 | LC031-2 | 2449+00 |
| LC016   | 1978+00 | LC032   | 2504+83 |
| LC017   | 2040+93 | LC033   | 2513+79 |
| LC018   | 2054+01 | LC034   | 2572+96 |
| LC019   | 2056+95 | LC035   | 2771+78 |
| LC019-1 | 2086+98 |         |         |

Source: Appendix Z Update to Appendix J - Snow Avalanche Report

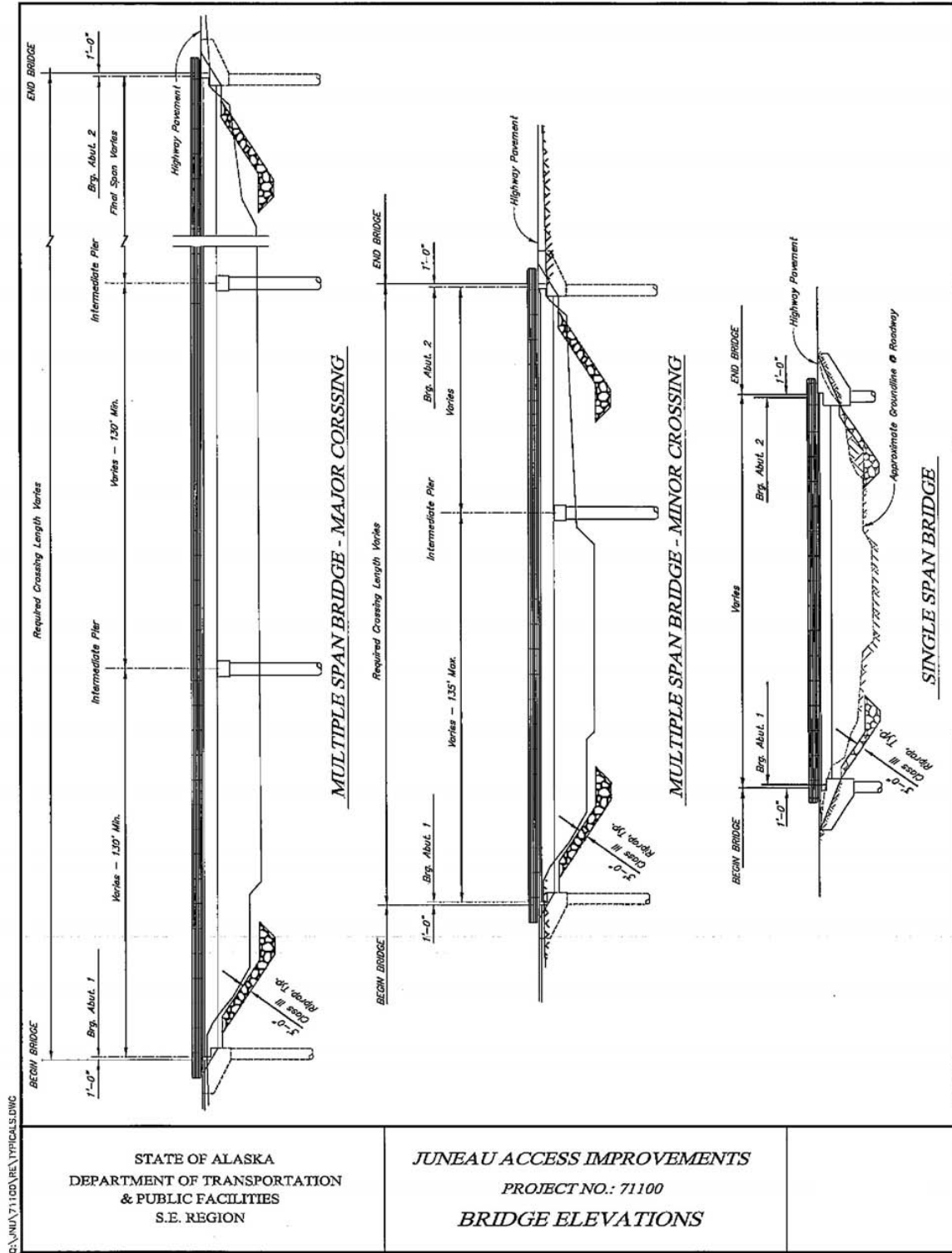


Figure 3-7: Bridge Elevations



### **3.4 Maintenance and Operational Requirements**

Revised highway maintenance cost estimates are included in Attachment C.

### **3.5 Marine Terminal Plans and Costs**

Revised marine terminal plans and cost updates are included in Attachment D.

The ferry terminal facilities proposed at Sawmill Cove, William Henry Bay and Katzehin will be equipped with a heated waiting area and public restrooms. All terminal facilities will be constructed to current ADA accessibility requirements. Heat and electrical service will be provided via generator. Food or lodging services are not contemplated in the proposed development plans. Public telephone facilities are not proposed at any of the terminals.

### **3.6 Geological Hazard Considerations**

#### **3.6.1 Introduction**

A total of 112 hazards have been identified along the portion of the current proposed alignment for Alternative 2B between stations 1480+00 and 2770+00 (EOP). These hazards were identified during the Lynn Canal Highway - Phase 1 - Zone 4 Geotechnical Investigation conducted by the Department in 2006. The focus of the Phase I geotechnical investigation of Zone 4 was to conduct preliminary surficial mapping along the 2006 Alignment. This mapping was conducted from the 2006 alignment left to the beach and right 1000 feet. Along with the surficial mapping, preliminary hazard mapping was conducted that emphasized identification of all possible hazards so they could be addressed in the early design phase of the project. All hazards were mapped with low grade GPS and LiDAR-based remote sensing. They were then categorized by the type of hazard, and described using a predetermined list of parameters. Based on the description of the parameters the hazards were all classified using the Geologic Hazard Rating System (GHRs) and ranked using the Hazard Index Number (HIN) (See Appendix G of the Lynn Canal Highway - Phase 1 - Zone 4 Geotechnical Investigation). The GHRs and HIN were both developed by the Department specifically for this project and based on other systems currently used in other states along existing road corridors. The systems used for this project are somewhat unique in that they are used along a proposed road corridor that is currently undeveloped. While identification of the type of hazard is very reliable, the parameters used to develop the GHRs and the HIN values are very preliminary and speculative in nature because there is no maintenance history or ongoing hazard monitoring. It should be expected that as design efforts continue and more field work is completed, many hazards will be downgraded and their extents reduced while some will be upgraded and their extents expanded. It is important to understand that the GHRs and HIN values are not tied to the hazard, but are calculated for the exact location where the alignment crosses the hazard. As the alignment is adjusted so too must the GHRs and HIN values be adjusted. Table 3-3 is a summary of all identified geologic hazards, which includes preliminary mitigation strategies. 33 of the identified hazards in this section of Alternative 2B have been avoided by the current alignment and no mitigation is needed to specifically address these locations.

Although not classified as a geologic hazard to the traveling public, there is the potential for encountering acid-generating rock for Alternatives 2B and 3. On site investigations to date have

not identified acid-generating rock within the limits of Alternatives 2B and 3. Comments received on the Draft SEIS referenced sources that indicated a potential for encountering acid-generating rock for Alternatives 2B and 3. Based on recent experience in Southeast Alaska and reference materials<sup>1</sup>, the Department concurs that there is a potential for encountering acid-generating rock. Specifically, the potential exists within Alternative 2B between stations 57+00 and 1459+00. Mineralization associated with potential for causing acid rock drainage is described in bedrock units along the Alternative 3 corridor. If identified during design level geotechnical investigations, this rock type will be avoided or a plan will be established for the appropriate use or disposal of the material.

### **3.6.2 Discussion of Hazards**

For this project six different types of hazards were identified; debris flows, hazard rocks, landslides, rockfalls, rockslides, and soil raveling. It should be noted that avalanches were not covered in this investigation and are discussed in the Update to Appendix J – Avalanche Technical Report. Of these hazards the most common and most significant are the debris flows and rockfalls. Mitigating hazards falls into several categories; avoidance, removal, conveyance, stabilization, protection, and maintenance.

#### **3.6.2.1 Debris Flows**

The Current Alignment between stations 1480+00 and 2770+00 crosses 43 debris flows. The vast majority of the debris flows are crossed in the active transport zone of the debris flow system which is characterized as highly channelized, steep gradients (10-15%), with a combination of erosion and deposition of levees. Crossing a debris flow in the transport zone is optimal and typically presents the narrowest, best confined area to cross. Ideally the crossing will convey the debris flow event under the road via a bridge or through the road in a specially design culvert structure in such a way as to not impede the flow. This minimizes any deposition of debris material and reduces maintenance.

Where conveyance cannot be reasonably achieved the roadway may be protected with a debris basin constructed on the uphill side of the road and sized to contain the volume of a single design event. Construction of the basins will be limited by the terrain and will require continual maintenance effort to keep the basin cleared of accumulated debris.

#### **3.6.2.2 Rockfall**

There are 53 identified rockfall hazards along the Current Alignment between stations 1480+00 and 2770+00.

Mitigation strategies for rockfall hazards include avoidance, removal, stabilization, and protection. Twenty-three of the identified rockfall hazards have been effectively mitigated by avoidance or removal of the rockfall initiation zone by blasting operations required to construct

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<sup>1</sup> Bureau of Mines Investigations in the Juneau Mining District, Alaska, 1984-1988, Volume 2.-Detailed Mine, Prospect, and Mineral Occurrence Descriptions, Section C, West Lynn Canal Descriptions. Wilson, F.H., Hults, C.P., Mull, C.G, and Karl, S.M, comps., 2015, Geologic map of Alaska: U.S. Geological Survey Scientific Investigations Map 3340, pamphlet 196 p., 2 sheets, scale 1:1,584,000, <http://dx.doi.org/10.3133/sim3340>.  
USGS Mineral Resources Program <https://minerals.usgs.gov/>

the current alignment. The remaining rockfall hazards will be mitigated with stabilization and protection. Stabilization includes hand scaling, special blasting, and rock bolting. Protection includes draped mesh, attenuation fences, barrier fences and widened rockfall catchment ditches (see Figures 3-8 and 3-9). These mitigation measures can be mixed together to provide the optimal mitigation for each individual rockfall hazard as more field work is completed.

The following are “Hazard ID” descriptions used in Table 3-3:

- DF – Debris Flow: Episodic, channelized, gravity driven events that are mixtures of sediment and water. These events can produce a wide range of particle sizes, and create debris flow deposits described in Section 3.2.4.<sup>2</sup> These deposits also have the potential to create thick organic deposits at the beach line.
- RS – Rock Slide: Characterized by large volume events that fail from bedrock outcrops. These events create talus deposits described in Section 3.2.41.
- RF – Rockfall: Detachment of individual rocks or relatively small groups of rocks from a steep rock face. There is generally little or no shear displacement. These events create talus soils described in Section 3.2.41.
- SR – Soil Raveling: Particle by particle failure over time from steep soil slopes. This type of event is common in glacial outwash deposits described in Section 3.2.41.
- LS – Translational Sliding: Slope failure via planar sliding of soils that can include trees and other debris. This type of event is seen in glacial outwash deposits described in Section 3.2.41.
- HR – Hazard Rock: Perched boulders that could become dislodged either during or after construction of the road. These rocks are often mega-boulders.

**Table 3-3: Alternative 2B Geologic Hazard Summary and Mitigation Options**

| Approx. Station 2006 FEIS Alignment | Approx. Station 2012 SEIS Alignment | Hazard ID | Avalanche ID (If Applicable) | Current Alignment Mitigation Condition* | Mitigation Category   | Mitigation Strategy                                |
|-------------------------------------|-------------------------------------|-----------|------------------------------|---|-----------------------|--|
| 1492+90                             |                                     | DF01      | ELC002                       | PM                                      | Protection/Conveyance | Catchment basin / Debris flow mitigation structure |
| 1514+50                             |                                     | DF02      | ELC003                       | PM                                      | Conveyance            | Debris flow mitigation structure                   |
| 1517+00                             |                                     | DF03      | ELC003-1                     | PM                                      | Protection/Conveyance | Catchment basin / Debris flow mitigation structure |
| 1521+80                             |                                     | RS01      |                              | EM                                      | Avoidance             | Does not impact current alignment                  |
| 1549+00                             |                                     | RF01      |                              | EM                                      | Avoidance             | Does not impact current alignment                  |
| 1553+00                             |                                     | RF02      |                              | EM                                      | Avoidance             | Does not impact current alignment                  |
| 1584+50                             |                                     | RF03      |                              | EM                                      | Avoidance             | Does not impact current alignment                  |

<sup>2</sup> Final Report – Lynn Canal Highway Phase I Zone 4 Geotechnical Investigation, 2006

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| <b>Approx. Station 2006 FEIS Alignment</b> | <b>Approx. Station 2012 SEIS Alignment</b> | <b>Hazard ID</b> | <b>Avalanche ID (If Applicable)</b> | <b>Current Alignment Mitigation Condition*</b> | <b>Mitigation Category</b> | <b>Mitigation Strategy</b>                           |
|--|--|------------------|-------------------------------------|--|----------------------------|--|
| 1605+50                                    |  | RF04             |                                     | PM   | Protection                 | Widened rockfall catchment ditch / Attenuation fence |
| 1657+00                                    |  | RF05             |                                     | EM   | Avoidance                  | Does not impact current alignment                    |
| 1668+50                                    |  | DF04             |                                     | EM   | Conveyance                 | Bridge 11E   |
| 1673+80                                    |  | DF05             |                                     | PM   | Protection/<br>Conveyance  | Catchment basin / Debris flow mitigation structure   |
| 1677+00                                    |  | DF06             | ELC005                              | EM   | Conveyance                 | Bridge 12E   |
| 1701+50                                    | 1704+50                                    | DF07             | ELC006                              | EM   | Conveyance                 | Bridge 14E   |
| 1719+90                                    |  | DF08             | ELC007                              | PM   | Conveyance/<br>Protection  | Catchment basin / Debris flow mitigation structure   |
| 1726+00                                    |  | RF06 /<br>RF07   |                                     | U  | Protection/<br>Avoidance   | Possible Realignment                                 |
|  |  | DF09             | ELC008                              | EM   | Conveyance                 | Bridge 15E   |
| 1742+50                                    |  | DF10             |                                     | PM   | Conveyance/<br>Protection  | Catchment basin / Debris flow mitigation structure   |
| 1746+40                                    |  | DF11             | ELC009                              | PM   | Conveyance/<br>Protection  | Catchment basin / Debris flow mitigation structure   |
| 1751+00                                    |  | DF12             | ELC010                              | PM   | Conveyance/<br>Protection  | Catchment basin / Debris flow mitigation structure   |
| 1756+10                                    | 1757+50                                    | DF13             | ELC011                              | PM   | Protection                 | Catchment basin                                      |
| 1759+30                                    | 1761+00                                    | RF08             |                                     | PM   | Protection                 | Attenuation fence                                    |
| 1772+50                                    | 1773+50                                    | DF14             |                                     | PM   | Conveyance/<br>Protection  | Catchment basin / Debris flow mitigation structure   |
| 1782+00                                    | 1784+50                                    | DF15             |                                     | PM   | Conveyance                 | Debris flow mitigation structure                     |
| 1783+00                                    | 1786+00                                    | DF16             | ELC012                              | EM   | Conveyance                 | Bridge 16E   |
| 1824+10                                    | 1824+00                                    | DF17 /<br>DF18   | ELC013                              | PM   | Conveyance/<br>Protection  | Catchment basin / Debris flow mitigation structure   |
| 1845+30                                    | 1849+00                                    | DF19             | ELC014                              | PM   | Protection/<br>Conveyance  | Catchment basin / Debris flow mitigation structure   |
| 1852+00                                    | 1854+75                                    | DF20             |                                     | PM   | Protection                 | Catchment basin                                      |
| 1853+30                                    | 1856+00                                    | RF10             |                                     | EM   | Avoidance                  | Does not impact current alignment                    |
| 1864+80                                    | 1867+00                                    | RF11             |                                     | EM   | Avoidance                  | Does not impact current alignment                    |
| 1893+30                                    | 1895+50                                    | DF21             |                                     | PM   | Conveyance/<br>Protection  | Catchment basin / Debris flow mitigation structure   |
| 1915+20                                    | 1918+50                                    | RF12             |                                     | EM   | Avoidance                  | Does not impact current alignment                    |
| 1931+80                                    | 1932+00                                    | RF13             |                                     | EM   | Avoidance                  | Does not impact current alignment                    |

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|-------------------------------------|-------------------------------------|-----------|------------------------------|---|----------------------------|--|
| 1933+70                             | 1934+00                             | RF14      | ELC015                       | PM                                      | Protection/<br>Avoidance   | Elevated ditch with MSE impact wall                  |
| 1946+80                             | 1948+00                             | RF15      |                              | PM                                      | Protection/<br>Avoidance   | Elevated ditch with MSE impact wall                  |
| 1983+30                             | 1984+50                             | DF22      | ELC016                       | EM                                      | Conveyance                 | Bridge 17E   |
| 2015+00                             | 2015+00                             | RF16      |                              | EM                                      | Avoidance                  | Does not impact current alignment                    |
| 2041+20                             | 2040+00                             | DF23      | ELC017                       | EM                                      | Conveyance                 | Bridge 18E   |
| 2043+40                             | 2042+00                             | SR01      |                              | EM                                      | Avoidance                  | Does not impact current alignment                    |
| 2054+40                             | 2054+00                             | DF24      | ELC018                       | PM                                      | Conveyance/<br>Protection  | Catchment basin / Debris flow mitigation structure   |
| 2056+50                             | 2057+00                             | DF25      | ELC019                       | EM                                      | Conveyance/<br>Protection  | Snowshed   |
| 2059+00                             | 2060+00                             | DF26      | ELC019                       | EM                                      | Conveyance /<br>Protection | Snowshed   |
| 2088+00                             | 2089+00                             | DF27      | ELC019-1                     | PM                                      | Protection                 | Catchment basin / Barrier Berm                       |
| 2102+30                             | 2103+00                             | DF28      | ELC020                       | EM                                      | Protection                 | Snowshed   |
| 2115+00                             | 2116+00                             | DF29      | ELC021                       | EM                                      | Protection                 | Snowshed   |
| 2123+00                             | 2123+00                             | DF30      | ELC022                       | PM                                      | Conveyance/<br>Protection  | Catchment basin / Debris flow mitigation structure   |
| 2129+00                             | 2129+00                             | RF17      | ELC023                       | PM                                      | Protection                 | Widened rockfall catchment ditch / Attenuation fence |
| 2129+40                             | 2129+00                             | SR02      | ELC023                       | PM                                      | Removal                    | Removal of hazard / Draped mesh                      |
| 2134+00                             | 2133+50                             | RF18      |                              | EM                                      | Removal                    | Removal of hazard                                    |
| 2140+50                             | 2141+00                             | DF31      |                              | PM                                      | Conveyance/<br>Protection  | Catchment basin / Debris flow mitigation structure   |
| 2142+70                             | 2142+40                             | RF19      | ELC024                       | PM                                      | Protection                 | Widened rockfall catchment ditch / Attenuation fence |
| 2144+60                             | 2144+00                             | RF20      | ELC024                       | PM                                      | Protection                 | Widened rockfall catchment ditch / Attenuation fence |
| 2154+00                             | 2154+00                             | RF21      |                              | EM                                      | Avoidance                  | Does not impact current alignment                    |
| 2204+00                             | 2205+00                             | LS01      |                              | EM                                      | Avoidance                  | Does not impact current alignment                    |
| 2206+60                             | 2206+00                             | DF32      |                              | PM                                      | Conveyance/<br>Protection  | Catchment basin / Debris flow mitigation structure   |
| 2219+60                             | 2220+00                             | LS02      |                              | EM                                      | Avoidance                  | Does not impact current alignment                    |

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|-------------------------------------|-------------------------------------|-----------|------------------------------|---|---------------------------------|--|
| 2252+50                             | 2251+50                             | DF33      |                              | PM                                      | Conveyance/Protection           | Debris flow mitigation structure or Bridge           |
| 2252+50                             | 2252+80                             | RF22      |                              | PM                                      | Protection                      | Widened rockfall catchment ditch                     |
| 2254+90                             | 2255+00                             | RF23      |                              | EM                                      | Avoidance                       | Does not impact current alignment                    |
| 2258+90                             | 2259+00                             | RF24      |                              | PM                                      | Protection                      | Widened rockfall catchment ditch                     |
| 2261+10                             | 2261+50                             | RS02      |                              | EM                                      | Avoidance                       | Bridge 20E   |
| 2263+50                             | 2263+50                             | SR03      |                              | EM                                      | Avoidance                       | Does not impact current alignment                    |
| 2283+50                             | 2282+00                             | DF34      | ELC025                       | PM                                      | Avoidance/Conveyance/Protection | Bridge 21E / Debris flow mitigation structure        |
| 2290+60                             | 2290+00                             | RF25      |                              | EM                                      | Avoidance                       | Does not impact current alignment                    |
| 2293+80                             | 2293+50                             | DF35      | ELC026                       | EM                                      | Conveyance                      | Bridge 22E   |
| 2299+10                             | 2299+25                             | LS03      |                              | PM                                      | Stabilization                   | Draped mesh  |
| 2300+20                             | 2300+00                             | RF26      |                              | PM                                      | Protection/Stabilization        | Widened rockfall catchment ditch / Rock bolting      |
| 2303+50                             | 2303+00                             | RF27      | ELC026-1                     | U                                       | Avoidance/Protection            | Possible Realignment                                 |
| 2311+10                             | 2311+00                             | DF36      | ELC027                       | EM                                      | Protection                      | Debris flow shed                                     |
| 2321+20                             | 2322+00                             | DF37      | ELC028                       | EM                                      | Avoidance                       | Bridge 23E   |
| 2322+10                             | 2322+50                             | RF28      |                              | PM                                      | Stabilization                   | Widened rockfall catchment ditch / Rock bolting      |
| 2328+10                             | 2327+80                             | RF29      | ELC028-1                     | PM                                      | Protection/Stabilization        | Widened rockfall catchment ditch / Rock bolting      |
| 2331+40                             | 2331+40                             | RF30      | ELC028-2                     | PM                                      | Protection                      | Widened rockfall catchment ditch / Attenuation fence |
| 2334+70                             | 2334+70                             | RF31      |                              | PM                                      | Protection                      | Widened rockfall catchment ditch / Attenuation fence |
| 2338+00                             | 2338+00                             | DF38      | ELC029                       | EM                                      | Conveyance                      | Bridge 24E   |
| 2361+10                             | 2362+00                             | RF32      |                              | EM                                      | Avoidance                       | Tunnel   |
| 2364+20                             | 2365+00                             | RF33      |                              | EM                                      | Avoidance                       | Tunnel   |
| 2374+90                             | 2375+00                             | HR01      |                              | EM                                      | Avoidance                       | Does not impact current alignment                    |
| 2379+40                             | 2382+00                             | HR02      |                              | EM                                      | Avoidance                       | Tunnel   |

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|--|--|------------------|-------------------------------------|--|----------------------------|---|
| 2382+50                                    | 2385+00                                    | RF34             |                                     | EM   | Avoidance                  | Does not impact current alignment                       |
| 2388+00                                    | 2389+00                                    | RF35             | ELC031                              | EM   | Avoidance                  | Does not impact current alignment                       |
| 2420+70                                    | 2429+00                                    | SR04             |                                     | EM   | Avoidance                  | Does not impact current alignment                       |
| 2426+80                                    | 2432+00                                    | LS04             |                                     | EM   | Avoidance                  | Does not impact current alignment                       |
| 2454+50                                    | 2462+00                                    | RF36             |                                     | PM   | Protection                 | Widened rockfall catchment ditch / Attenuation fence    |
| 2456+00                                    | 2464+75                                    | LS05             |                                     | EM   | Avoidance                  | Does not impact current alignment                       |
| 2459+00                                    | 2467+50                                    | DF40             |                                     | PM   | Conveyance                 | Debris flow mitigation structure                        |
| 2460+40                                    | 2468+50                                    | DF41             |                                     | EM   | Protection                 | Debris flow shed  |
| 2466+10                                    | 2475+00                                    | RF37             |                                     | PM   | Protection                 | Scaling, trim blasting, rock bolting and crest doweling |
| 2473+00                                    | 2481+00                                    | RF38             |                                     | EM   | Conveyance                 | Bridge 26E  |
| 2480+30                                    | 2489+00                                    | RF39             |                                     | PM   | Protection                 | Widened rockfall catchment ditch                        |
| 2484+00                                    | 2492+00                                    | RF40             |                                     | PM   | Protection                 | Attenuation fence                                       |
| 2490+70                                    | 2499+00                                    | DF42             |                                     | EM   | Conveyance/Protection      | Debris flow shed  |
| 2495+00                                    | 2503+00                                    | RF41             | ELC032                              | PM   | Protection                 | Widened rockfall catchment ditch                        |
| 2499+50                                    | 2507+75                                    | RF42             | ELC032                              | PM   | Protection                 | Widened rockfall catchment ditch                        |
| 2517+80                                    | 2526+00                                    | HR03             |                                     | EM   | Avoidance                  | Does not impact current alignment                       |
| 2526+00                                    | 2534+00                                    | HR04             |                                     | EM   | Avoidance                  | Does not impact current alignment                       |
| 2528+00                                    | 2536+00                                    | RF43             |                                     | PM   | Protection                 | Rockfall barrier  |
| 2531+00                                    | 2539+00                                    | RF44             |                                     | PM   | Protection                 | Rockfall barrier  |
| 2536+10                                    | 2544+00                                    | RF45             |                                     | EM   | Avoidance                  | Does not impact current alignment                       |
| 2546+70                                    | 2556+00                                    | RF46             |                                     | EM   | Avoidance                  | Does not impact current alignment                       |
| 2549+80                                    | 2559+00                                    | RF47             |                                     | EM   | Avoidance                  | Rockfall barrier / Scaling and rock bolting             |
| 2552+80                                    | 2562+50                                    | LS06             |                                     | EM   | Avoidance                  | Does not impact current alignment                       |

| Approx. Station 2006 FEIS Alignment | Approx. Station 2012 SEIS Alignment | Hazard ID | Avalanche ID (If Applicable) | Current Alignment Mitigation Condition* | Mitigation Category | Mitigation Strategy  |
|-------------------------------------|-------------------------------------|-----------|------------------------------|---|---------------------|--|
| 2554+30                             | 2563+25                             | HR05      |                              | PM                                      | Avoidance/Removal   | Does not impact current alignment / Removal of hazard rock |
| 2556+50                             | 2566+00                             | RF49      |                              | EM                                      | Avoidance           | Does not impact current alignment                          |
| 2557+80                             | 2567+50                             | RF50      |                              | EM                                      | Avoidance           | Does not impact current alignment                          |
| 2559+30                             | 2569+00                             | RF51      |                              | EM                                      | Avoidance           | Does not impact current alignment                          |
| 2561+80                             | 2572+00                             | LS07      |                              | EM                                      | Avoidance           | Does not impact current alignment                          |
| 2563+30                             | 2573+00                             | DF43      | ELC034                       | PM                                      | Conveyance          | Debris flow mitigation structure                           |
| 2564+70                             | 2575+00                             | RF52      |                              | PM                                      | Protection          | Widened rockfall catchment ditch                           |
| 2618+90                             | 2628+00                             | RF53      |                              | PM                                      | Protection          | Widened rockfall catchment ditch                           |

Source: Final Report – Lynn Canal Highway Phase I Zone 4 Geotechnical Investigation, 2006 and Update to 2006 Geotechnical Report Appendix G – Geologic Hazard Analysis

\* PM – Partially Mitigated. These hazards have been partially mitigated by incorporating standard engineering techniques to reduce the risk of the hazard.

EM – Effectively Mitigated. These hazards have been effectively mitigated by removing the hazard or by realigning the highway to avoid the hazard. Hazards that are conveyed across the roadway via structures such as bridges and sheds are considered effectively mitigated.

U – Unmitigated. These hazards have no standard engineering techniques to mitigate and may require modification to the current horizontal and/or vertical alignment during final design to partially or effectively mitigate the hazard.



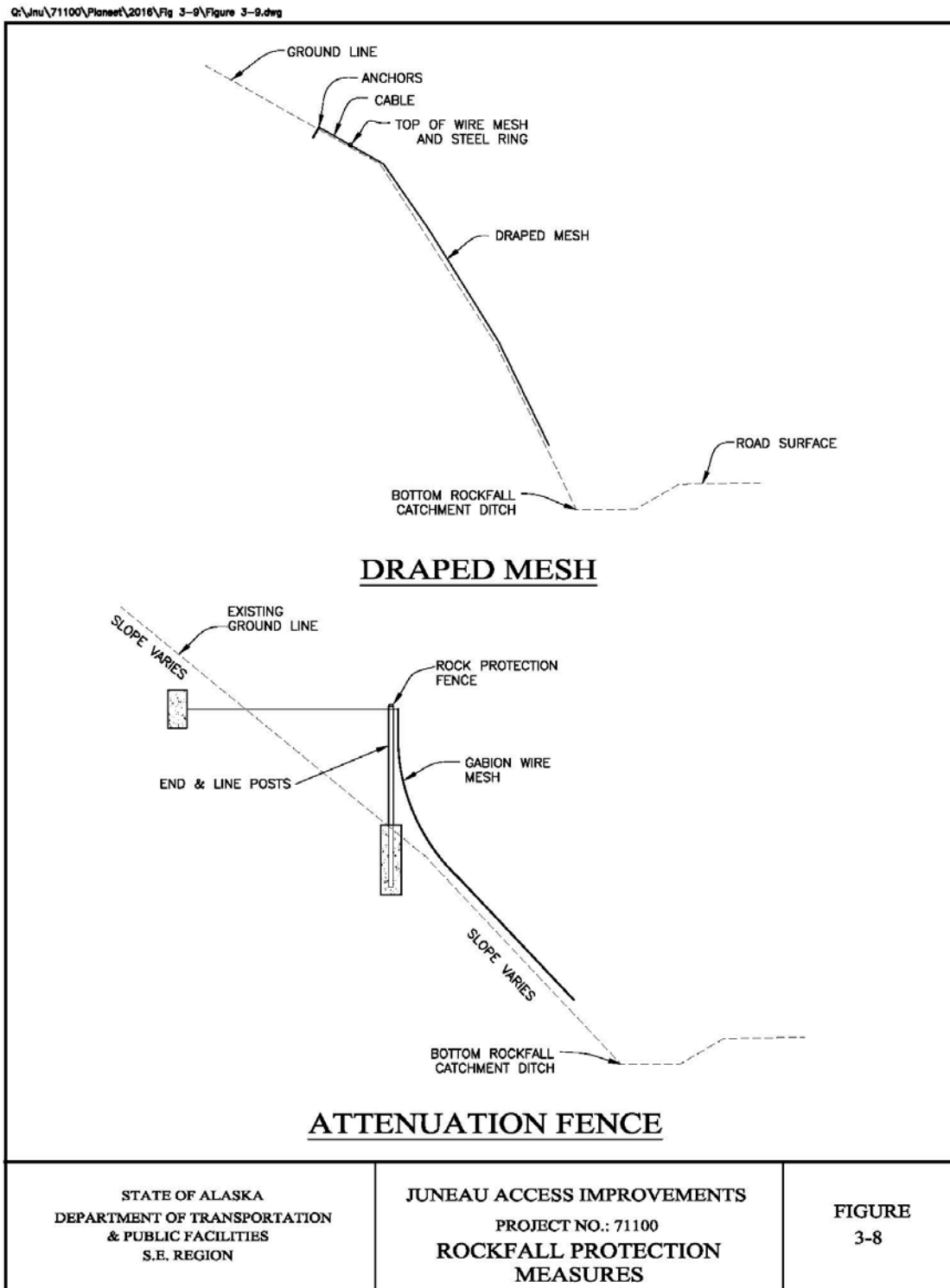
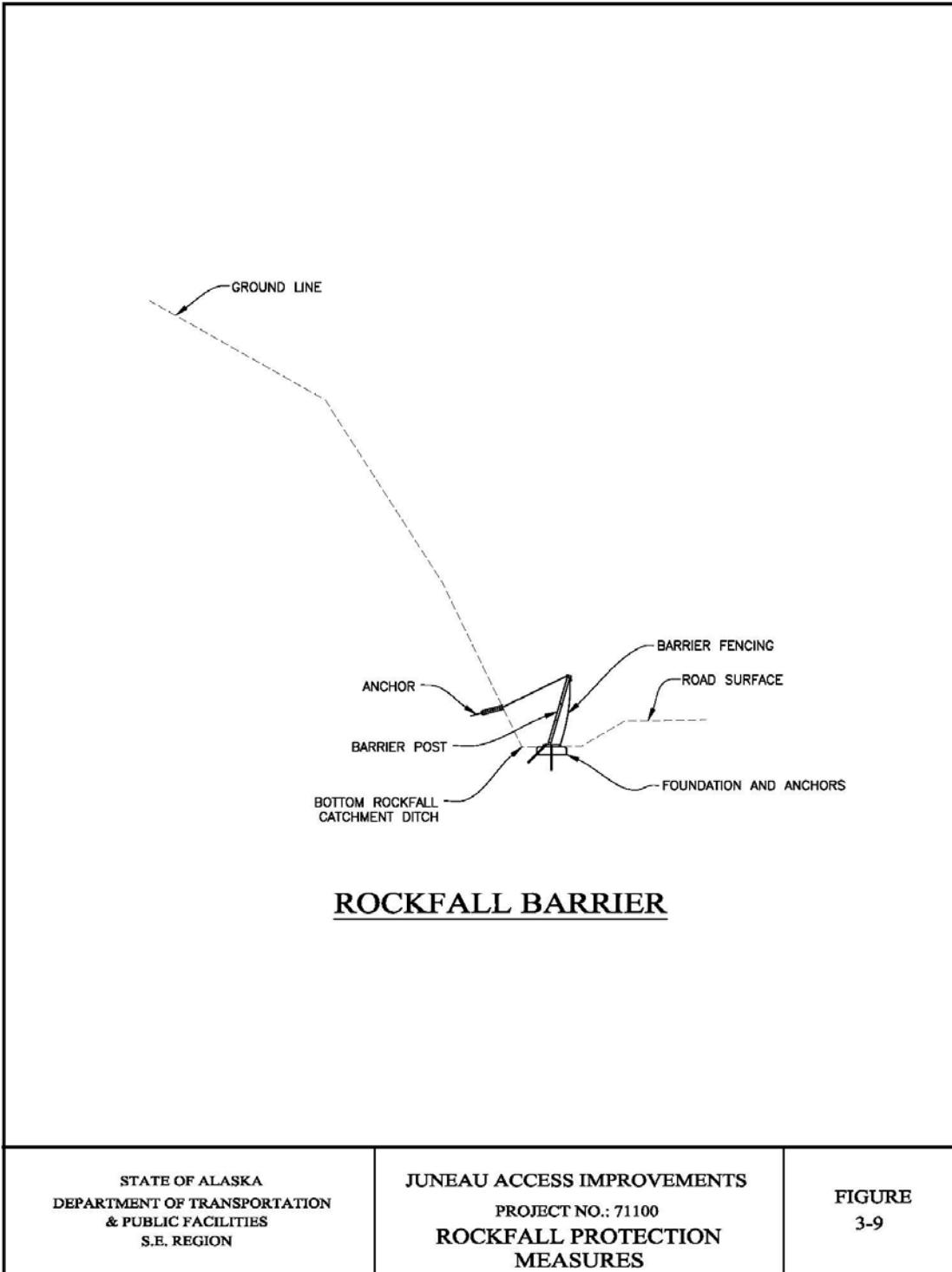


Figure 3-8: Debris Flow Mitigation Structure

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**Figure 3-9: Rockfall Mitigation Options**

## 4. Highway Costs

### 4.1 Engineer's Estimate Discussion

The engineer's estimates for Alternatives 2B, 3, 4B, and 4D highway segments have been updated to reflect current layouts, quantities, and unit prices for construction year 2012; see Attachment E. The estimates for Alternatives 2B and 3 were also updated to include camp costs, which were not included in the original estimates in the 2006 FEIS and but were identified as necessary in the subsequent 2009 cost report. Adjustments have also been made to costs related to preliminary development, mitigation, right of way, maintenance building, and avalanche control Capital Improvement Plan (CIP). Right of way, maintenance building, and avalanche control CIP only apply to Alternatives 2B and 3. The M&O facility estimates are based on costs for similar recently constructed facilities. The Indirect Cost Allocation Plan (ICAP) rate has also increased from 4.66 percent used in the 2009 cost report to 4.79 percent for Alternative 2B and from 4.3 percent used in the 2006 FEIS to 4.79 percent for Alternatives 3, 4B and 4D.

Unit prices were updated to reflect inflation costs from year 2008 to year 2012. The 2009 cost report included unit prices from the 2008 construction year for Alternative 2B only. The inflation rate was obtained by comparing the Construction Cost Indices for years 2008 and 2012 provided by the Washington State Department of Transportation. This resulted in an inflation rate of 8.3% over the 4-year period. The unit prices in the 2009 cost report were updated based on this inflation rate and the resulting unit prices were also applied to Alternatives 3, 4B, and 4D.

Additional field reconnaissance and data on debris flows, avalanche areas, talus fields, and wildlife undercrossings since the 2006 FEIS has increased the number and magnitude of bridges required to pass these areas. These improvements are included in the Alternative 2B estimate and summarized in Table 3-1. Avalanche sheds were also added to this alternative to mitigate high hazard avalanche zones. The estimate for the sheds was based on a comparison with other recently planned and/or constructed snow sheds, including the Snoqualmie Pass area in the State of Washington. The 2013 Update to Appendix J, *Snow Avalanche Report*, Figure 13, provides an estimated cost range for the three snow sheds proposed at avalanche paths ELC019, ELC020 and ELC021. Based on these ranges, the average cost per linear foot for each snow shed is \$17,000 per linear foot. Applying an average unit cost of \$17 thousand per lineal foot to the three avalanche sheds briefly discussed in Section 3.3 yields a cost of approximately \$25.5 million. This cost is included in the updated estimate for Alternative 2B.

The preceding improvements are exclusive to the northern 28-mile segment of Alternative 2B, which was in the Final Design Phase until it was determined a supplemental EIS was required. Given the fact that more detailed information is available for this segment, and additional costs have been identified and included in the estimate, the construction contingency for this segment was reduced from 15 percent to 10 percent in the current estimate. The contingency is still higher than other Alternative 2B segments, in part to address potential higher costs for new bridge crossings at active debris flows. Geotechnical investigation identified locations that may require special design that could result in higher construction costs.

The contingency for all other segments within this alternative remains at 5 percent, which was the original contingency contained within the 2009 cost report.

The construction contingency for the West Lynn Canal portion of Alternative 3 has been set at 30 percent, due to the much more limited data available for this road segment. However, the segment on the east side of Lynn Canal has a construction contingency of 5 percent, which is consistent with the other alternatives that include this segment.

## **4.2 Engineer's Estimate Discussion – 2016 Update**

The engineer's estimates for Alternatives 2B, 3, 4B, and 4D highway segments have been updated to reflect current unit prices for construction year 2016; see Attachment E. The Indirect Cost Allocation Plan (ICAP) rate has also been adjusted to the current rate of 4.65%. The maintenance and operations costs have also been updated to construction year 2016 for each alternative; see Attachment C. Capital costs related to maintenance for roads and avalanche control are reflected in the updated engineer's estimates in Appendix E.

The marine facility costs have been updated to construction year 2016; see Attachment D. The marine facility costs are not reflected in the engineer's estimate in Attachment E, but are included in the Estimate of Alternatives Summary in Table 4-1.

Unit prices were updated to reflect inflation costs from year 2012 to year 2016. The inflation rate was obtained by comparing the Construction Cost Indices (CCI) for years 2012 and 2016 provided by the Washington State Department of Transportation (WSDOT). The latest CCI provided by WSDOT was for year 2015, whereas the earliest was for year 1990. A trendline was developed using the data from years 1990 to 2015 to predict the CCI in year 2016. This resulted in an inflation rate of 16.3% over the 4-year period.

The 2012 engineer's estimate update that was included in the Draft SEIS incorporated several geologic hazard mitigation measures such as debris flow structures and rock-bolt stabilization. Further refinement of the design details for Alternative 2B was completed to address public comments on the Draft SEIS related to geologic hazards. The 2016 engineer's estimate update includes additional pay items that were established for Alternative 2B as a result of the design refinement, which address all geologic hazards identified in the 2006 Geotechnical Report for the portion of highway from Independence Creek to Katzehin River. These items include debris flow sheds, rockfall barriers and rockfall attenuation fences. The number of debris flow mitigation structures was also increased to address areas where structures may be determined necessary during final design. Section 3.6 of this report summarizes geologic hazards that were identified in the geotechnical report and proposed mitigation strategies for each hazard. These added mitigation measures have resulted in an increase to the engineer's estimate for Alternative 2B.

A conservative approach was taken by adding a contingent sum item to the engineer's estimates for Alternatives 2B and 3 to account for the potential of encountering acid-generating rock. If identified during design level geotechnical investigations, this rock type will be avoided or a plan will be established for the appropriate use or disposal of the material. The contingent sum estimate assumes the potential for disposal of approximately 50,000 cubic yards of material at an approved location.

**Table 4-1: Estimate of Alternatives Summary**

|                |                            | 2014 Draft SEIS | Final SEIS |
|----------------|----------------------------|-----------------|------------|
| <b>Alt 1</b>   |                            |                 |            |
| Operations     |                            |                 |            |
|                | AMHS                       | \$15.4          | \$18.2     |
|                | Total                      | \$15.4          | \$18.2     |
| <b>Alt 1B</b>  |                            |                 |            |
| Operations     |                            |                 |            |
|                | AMHS                       | \$23.8          | \$26.5     |
|                | Total                      | \$23.8          | \$26.5     |
| <b>Alt. 2B</b> |                            |                 |            |
| Construction:  |                            |                 |            |
|                | Road                       | \$522.7         | \$619.5    |
|                | Katzehin Terminal          | \$20.2          | \$26.4     |
|                | Skagway Terminal           | \$8.6           | \$9.6      |
|                | Shuttle Vessel             | \$22.3          | \$24.7     |
|                | Total                      | \$573.8         | \$680.2    |
| Operations:    |                            |                 |            |
|                | Highway                    | \$2.8           | \$2.4      |
|                | AMHS                       | \$17.6          | \$18.5     |
|                | Total                      | \$20.4          | \$20.9     |
| <b>Alt. 3</b>  |                            |                 |            |
| Construction:  |                            |                 |            |
|                | Road                       | \$421.6         | \$487.3    |
|                | Sawmill Cove Terminal      | \$19.0          | \$21.7     |
|                | William Henry Bay Terminal | \$17.3          | \$23.3     |
|                | Skagway Terminal           | \$8.6           | \$9.6      |
|                | Shuttle Vessel             | \$48.9          | \$53.7     |
|                | Total                      | \$515.4         | \$595.6    |
| Operations:    |                            |                 |            |
|                | Highway                    | \$2.3           | \$2.2      |
|                | AMHS                       | \$19.4          | \$19.9     |
|                | Total                      | \$21.7          | \$22.1     |
| <b>Alt. 4A</b> |                            |                 |            |
| Construction:  |                            |                 |            |
|                | Auke Bay Terminal          | \$40.6          | \$44.1     |
|                | Shuttle Vessel             | \$22.3          | \$24.7     |
|                | (2) Fast Vehicle Ferry     | \$164.4         | \$181.4    |
|                | Total                      | \$235.9         | \$250.2    |

Juneau Access Improvements Project Final SEIS  
2017 Update to Appendix D - Technical Alignment Report

|                      |                        | 2014 Draft SEIS | Final SEIS |
|----------------------|------------------------|-----------------|------------|
| <b>Operations:</b>   |                        |                 |            |
|                      | AMHS                   | \$33.7          | \$33.7     |
|                      | Total                  | \$33.7          | \$33.7     |
| <b>Alt. 4B</b>       |                        |                 |            |
| <b>Construction:</b> |                        |                 |            |
|                      | Road                   | \$8.0           | \$10.2     |
|                      | Auke Bay Terminal      | \$40.6          | \$44.1     |
|                      | Sawmill Cove Terminal  | \$19.0          | \$21.7     |
|                      | Shuttle Vessel         | \$22.3          | \$24.7     |
|                      | (2) Fast Vehicle Ferry | \$196.6         | \$216.9    |
|                      | Total                  | \$295.1         | \$317.6    |
| <b>Operations:</b>   |                        |                 |            |
|                      | Highway                | \$0.05          | \$0.02     |
|                      | AMHS                   | \$31.95         | \$33.23    |
|                      | Total                  | \$32.00         | \$33.25    |
| <b>Alt. 4C</b>       |                        |                 |            |
| <b>Construction:</b> |                        |                 |            |
|                      | Auke Bay Terminal      | \$40.6          | \$44.1     |
|                      | Skagway Terminal       | \$8.6           | \$9.6      |
|                      | Shuttle Vessel         | \$22.3          | \$24.7     |
|                      | Total                  | \$71.5          | \$78.4     |
| <b>Operations:</b>   |                        |                 |            |
|                      | AMHS                   | \$20.0          | \$22.7     |
|                      | Total                  | \$20.0          | \$22.7     |
| <b>Alt. 4D</b>       |                        |                 |            |
| <b>Construction:</b> |                        |                 |            |
|                      | Road                   | \$8.0           | \$10.2     |
|                      | Auke Bay Terminal      | \$40.6          | \$44.1     |
|                      | Sawmill Cove Terminal  | \$19.0          | \$21.7     |
|                      | Skagway Terminal       | \$8.6           | \$9.6      |
|                      | Shuttle Vessel         | \$22.3          | \$24.7     |
|                      | Total                  | \$98.5          | \$110.3    |
| <b>Operations:</b>   |                        |                 |            |
|                      | Highway                | \$0.05          | \$0.02     |
|                      | AMHS                   | \$20.75         | \$24.20    |
|                      | Total                  | \$20.80         | \$24.22    |

Note: Costs above represented in millions.

**Attachment A**

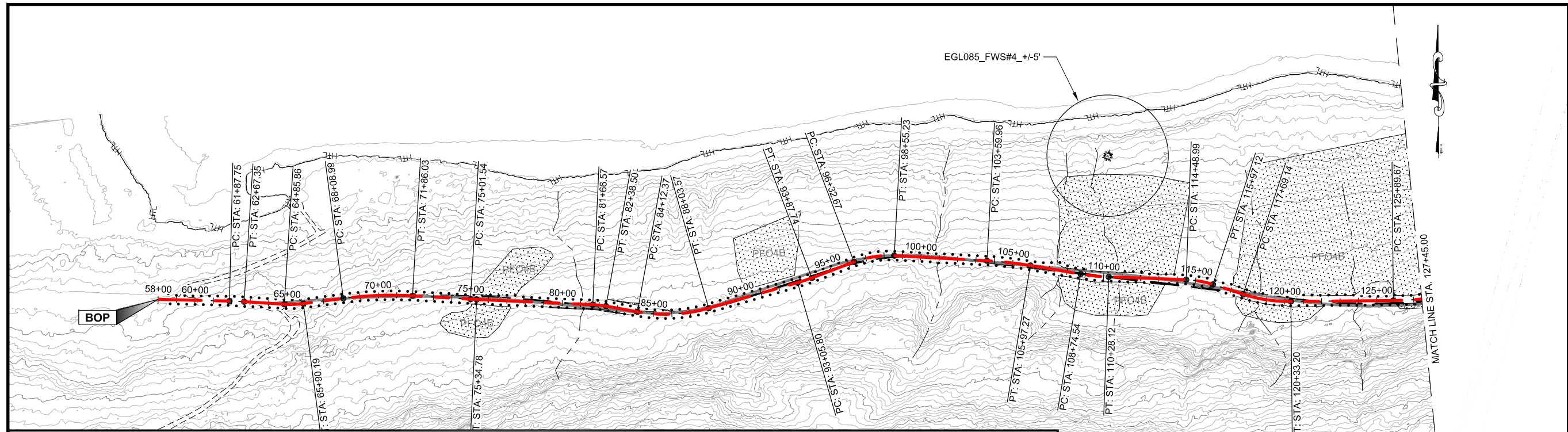
**Juneau Access Improvements Project**

**Revised East Lynn Canal Plan and Profile Sheets**

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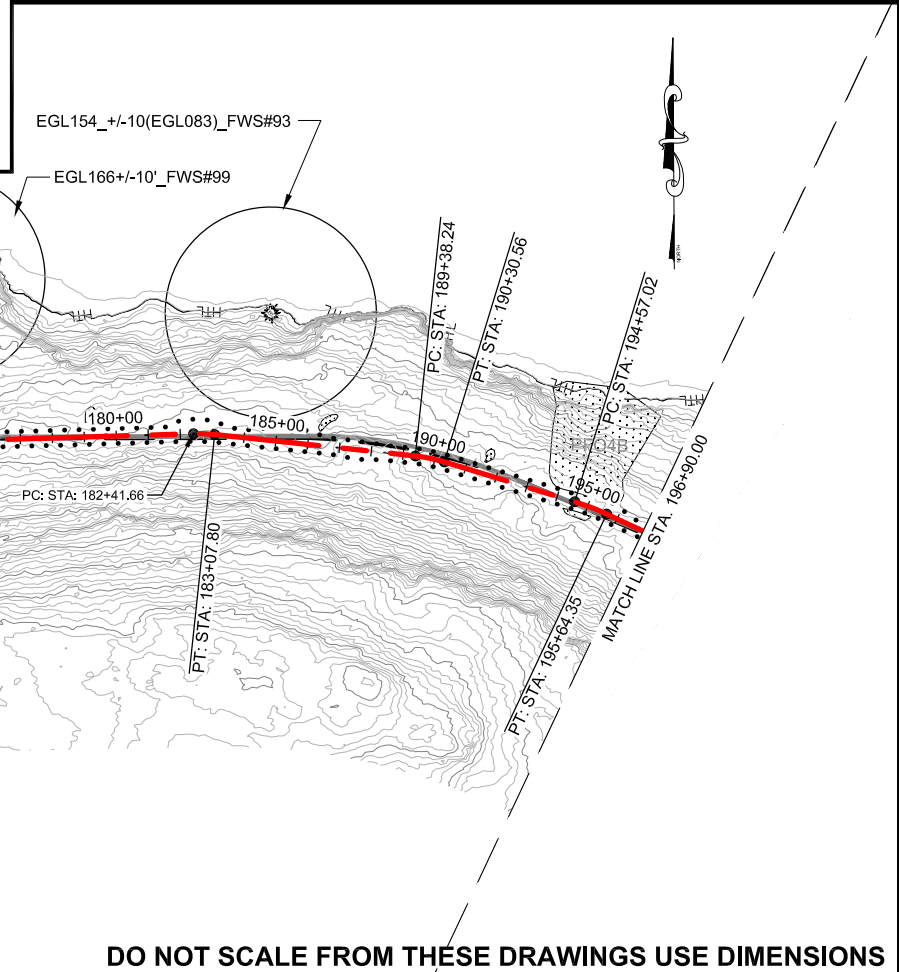
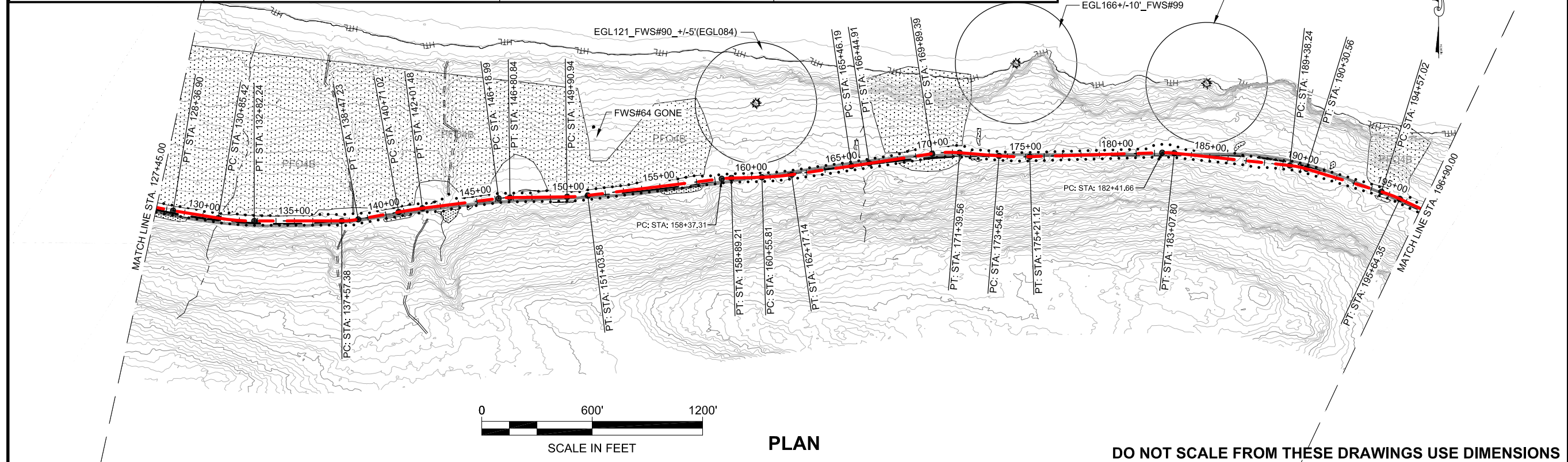
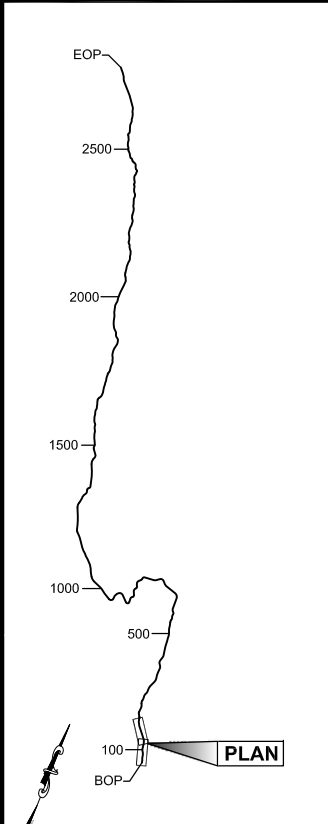
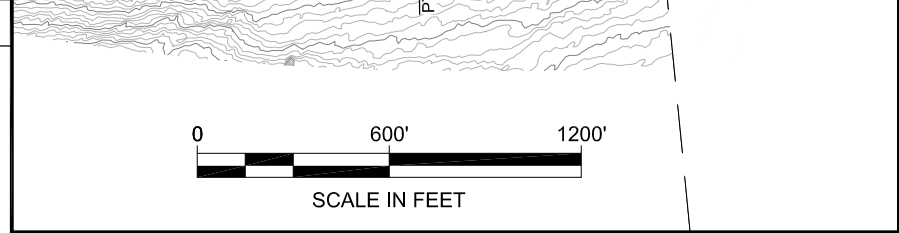


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### LEGEND

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|--|----------------------------|-------------------------------|---------------|--|-------------------------|
|  | CURRENT ALIGNMENT          |                               | BRIDGES       |  | AVALANCHE CHUTE         |
|  | PROPOSED FILL SLOPE        |                               | WETLAND       |  | AVALANCHE STARTING ZONE |
|  | PROPOSED CUT SLOPE         | <b>GEO HAZARD AREA LEGEND</b> |               |  |                         |
|  | PROPOSED WALL              | DF:                           | DEBRIS FLOW   |  |                         |
|  | 2006 FEIS ALIGNMENT        | HR:                           | HAZARD ROCK   |  |                         |
|  | 2008 CORP PERMIT ALIGNMENT | LS:                           | LAND SLIDE    |  |                         |
|  |                            | RF:                           | ROCK FALL     |  |                         |
|  |                            | RS:                           | ROCK SLIDE    |  |                         |
|  |                            | SR:                           | SOIL RAVELING |  |                         |



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PROJECT #71100

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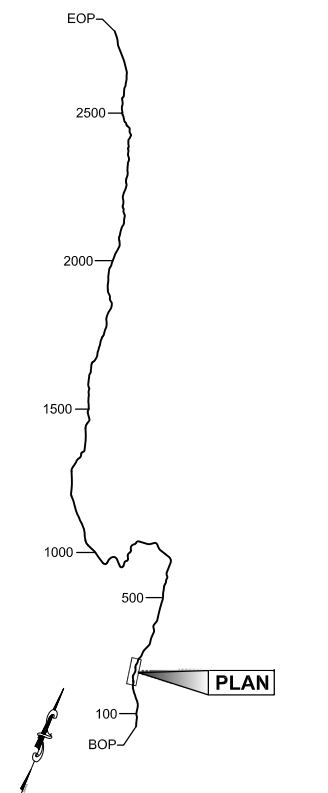
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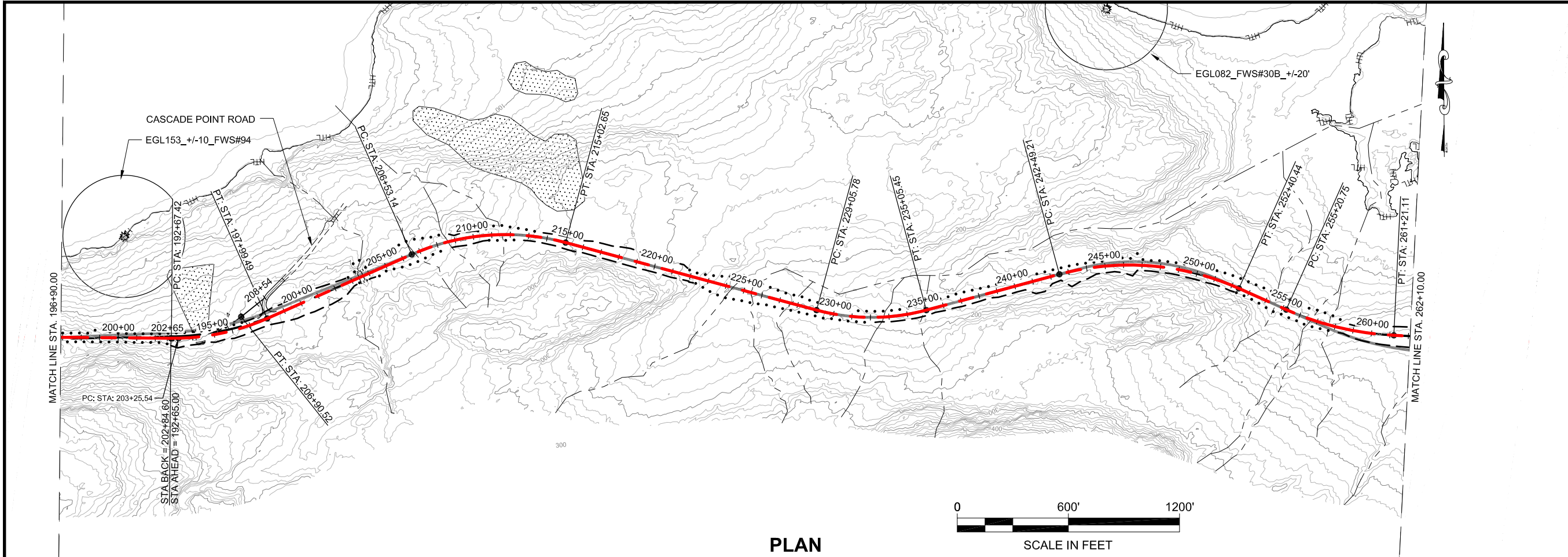
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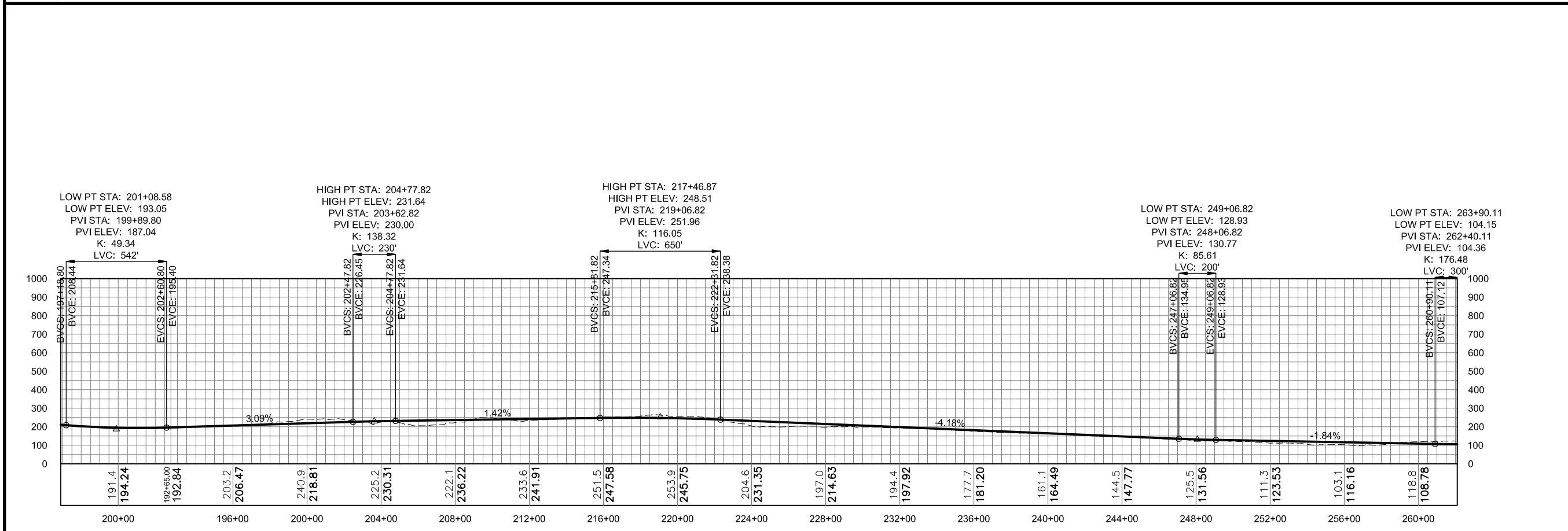
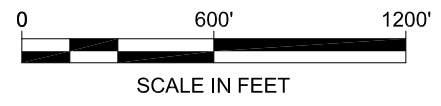
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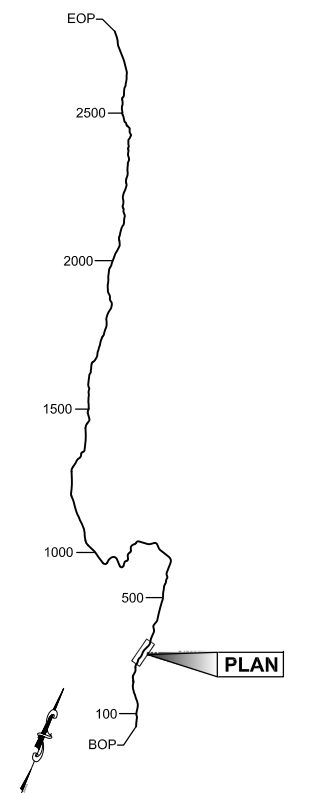


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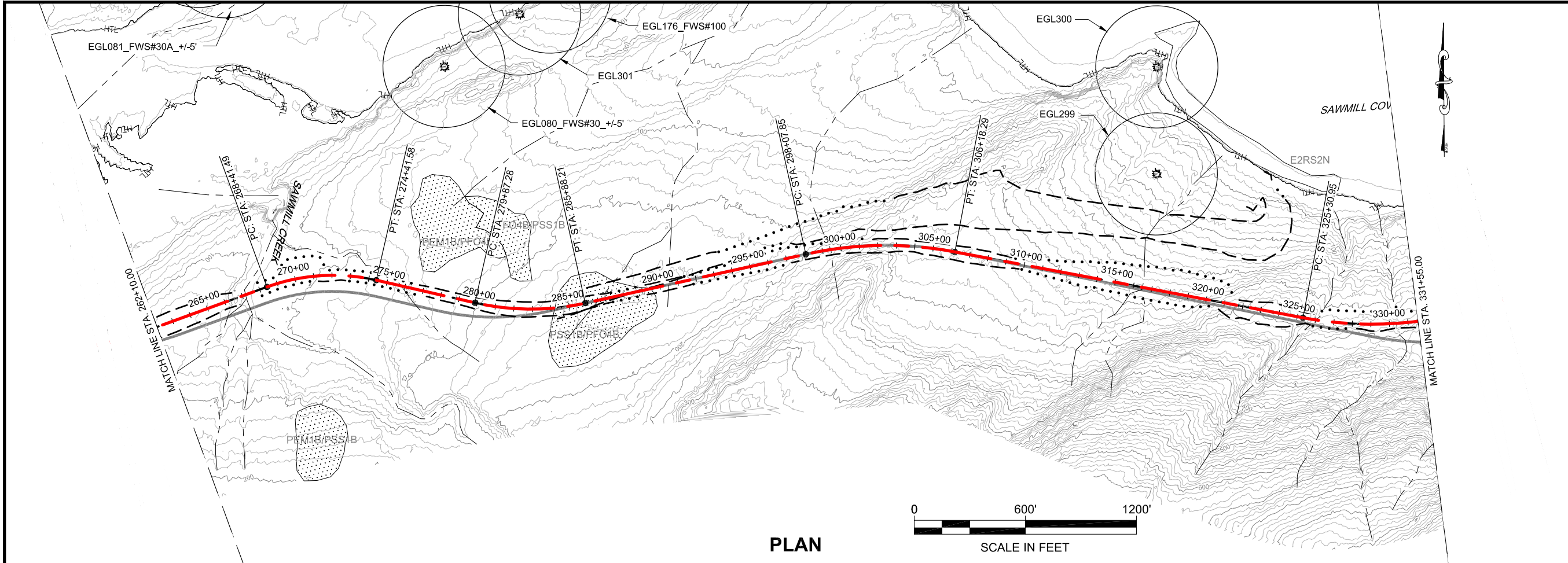
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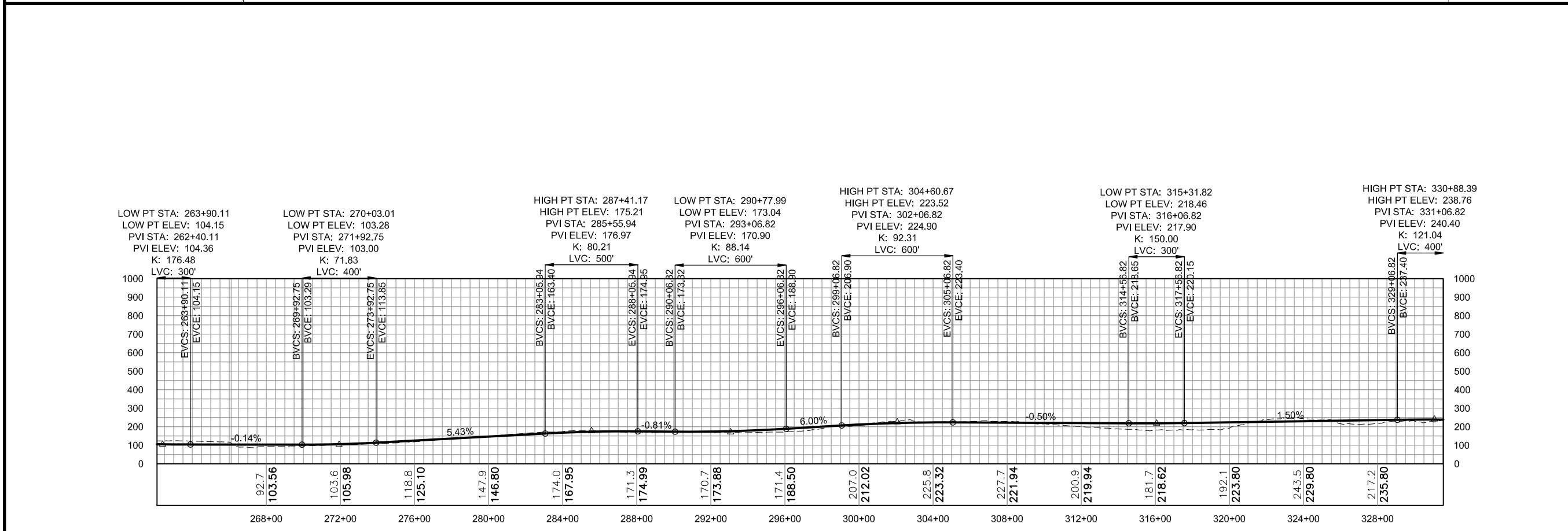
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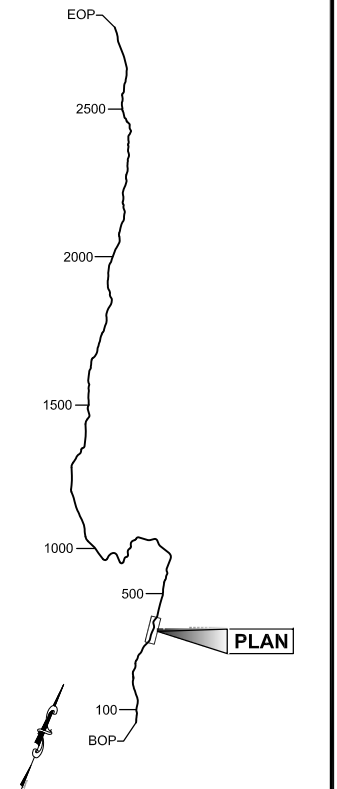


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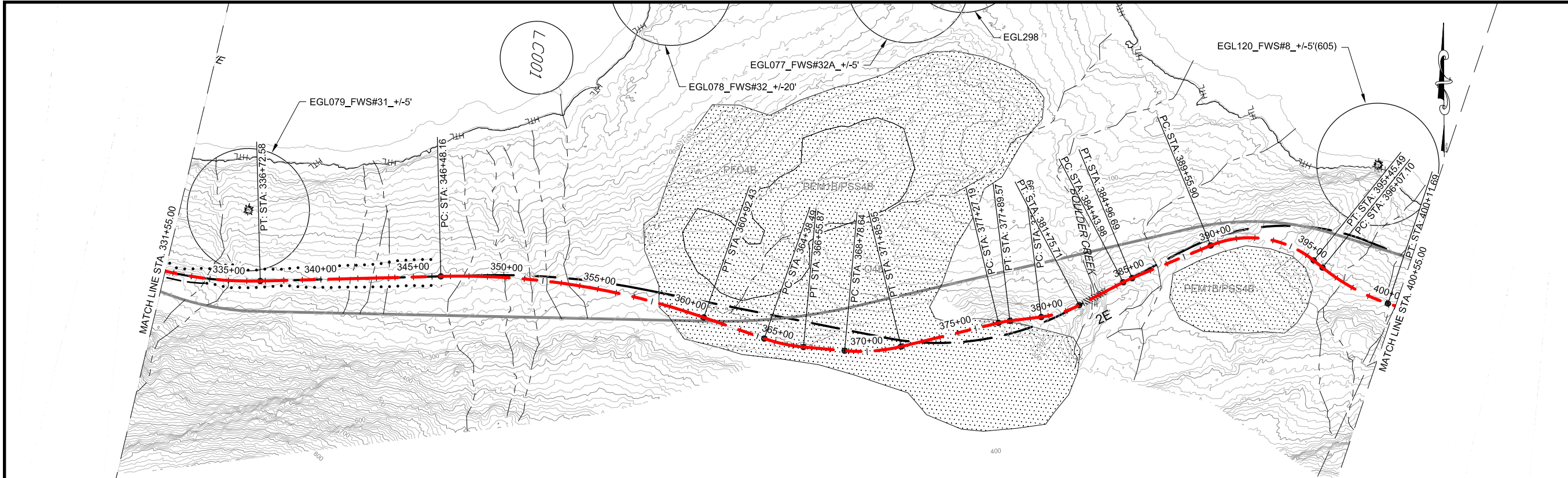
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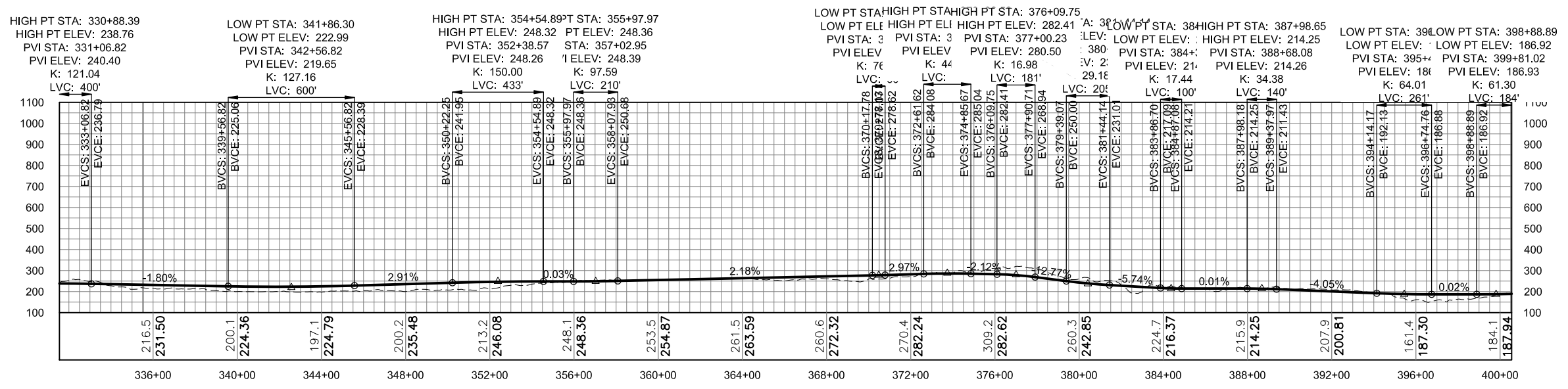
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### LEGEND

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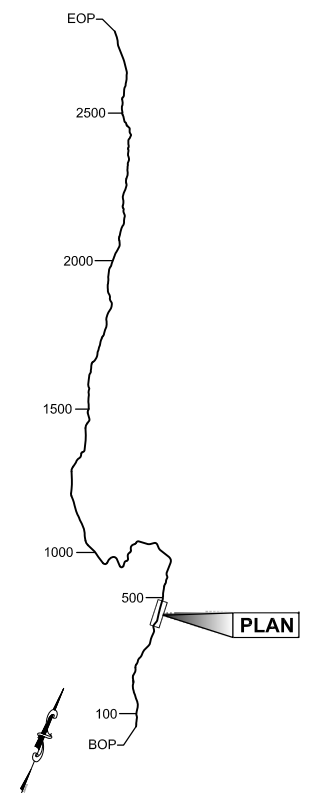
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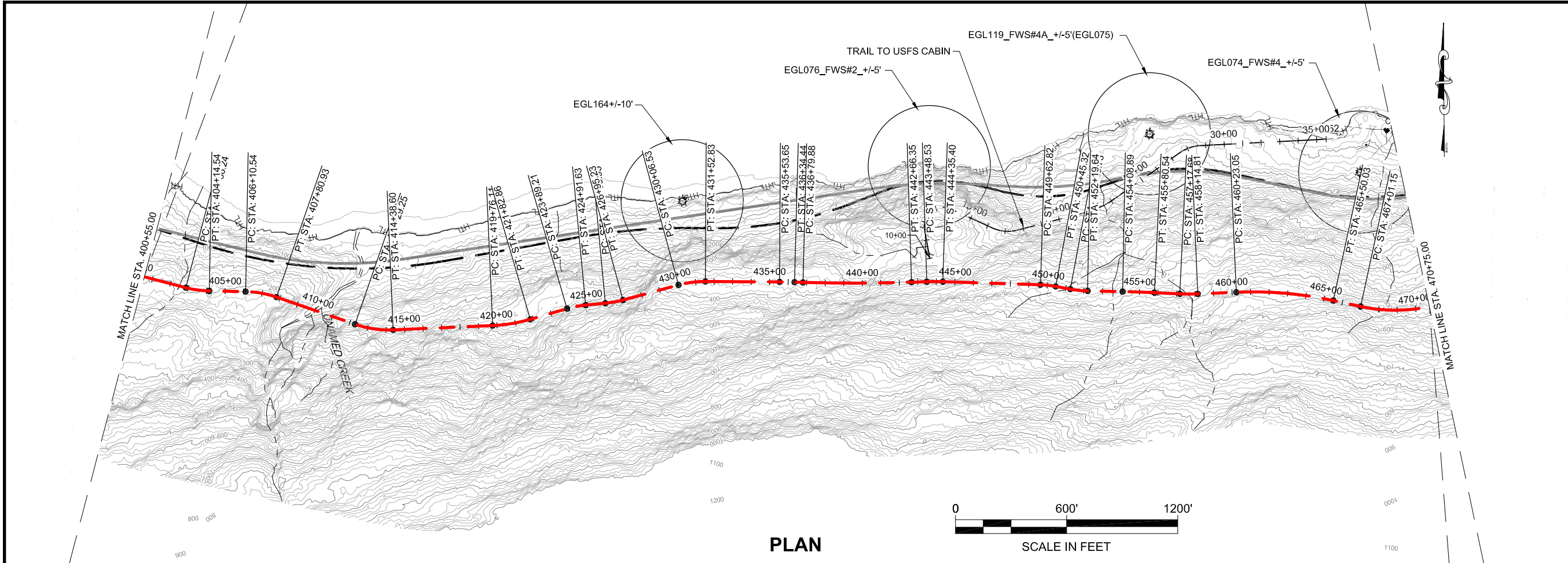
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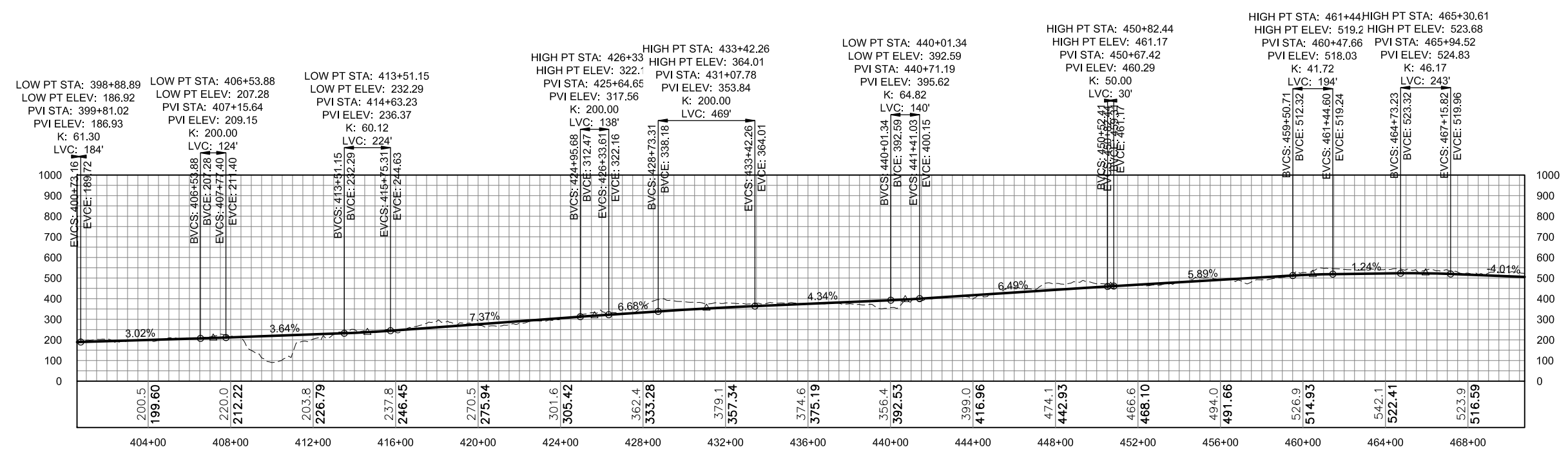
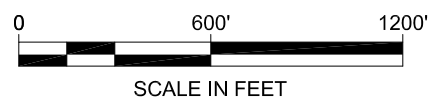
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| EL5          | 38           |



PLAN

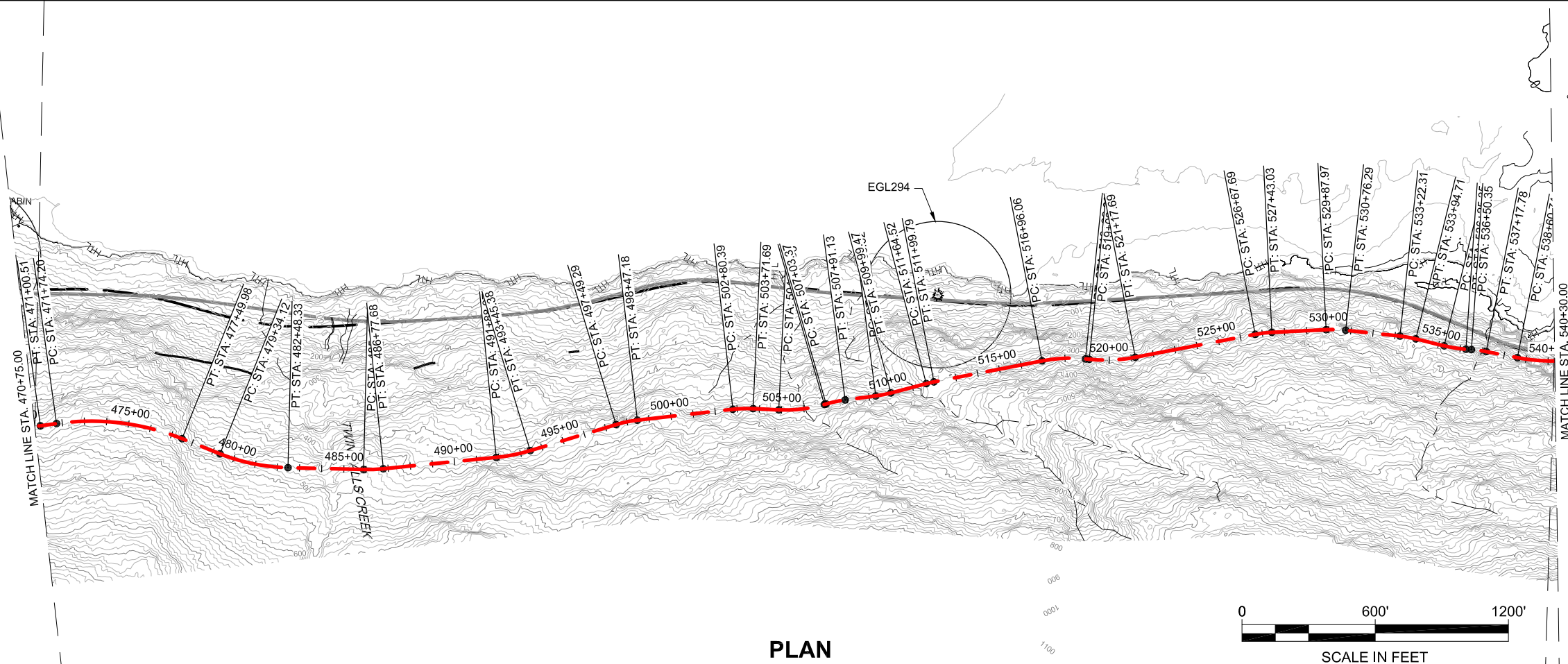


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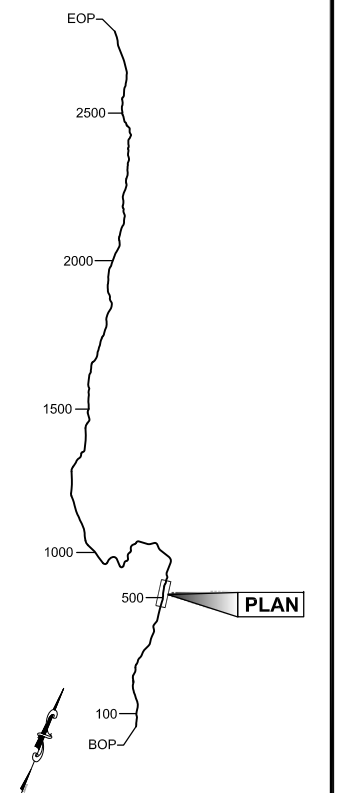
DO NOT SCALE FROM THESE DRAWINGS USE DIMENSIONS



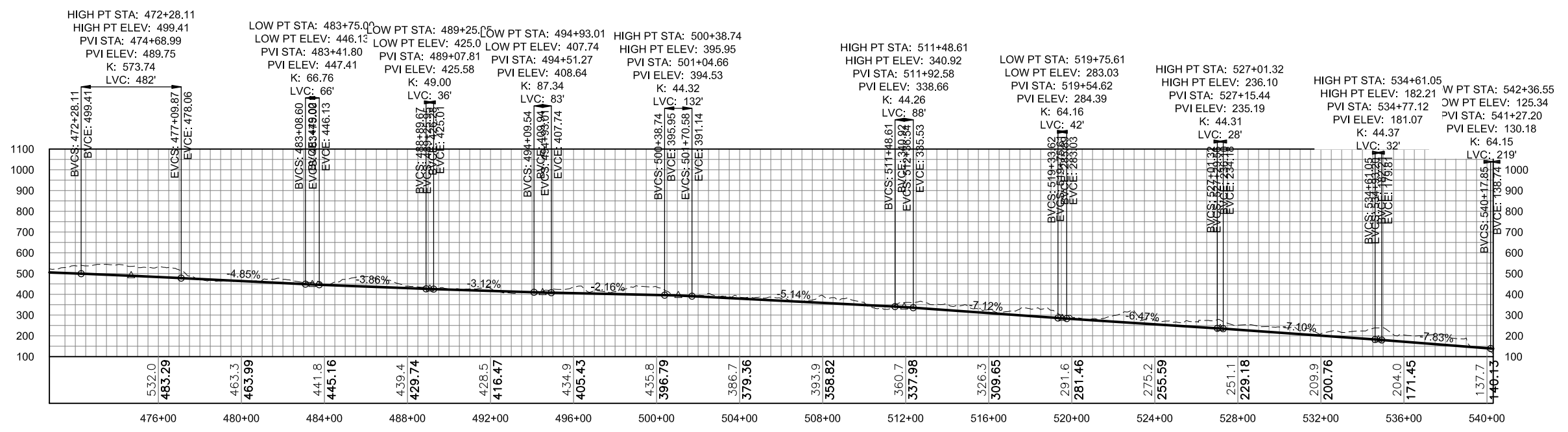
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PLAN



PLAN LEGEND



PROFILE

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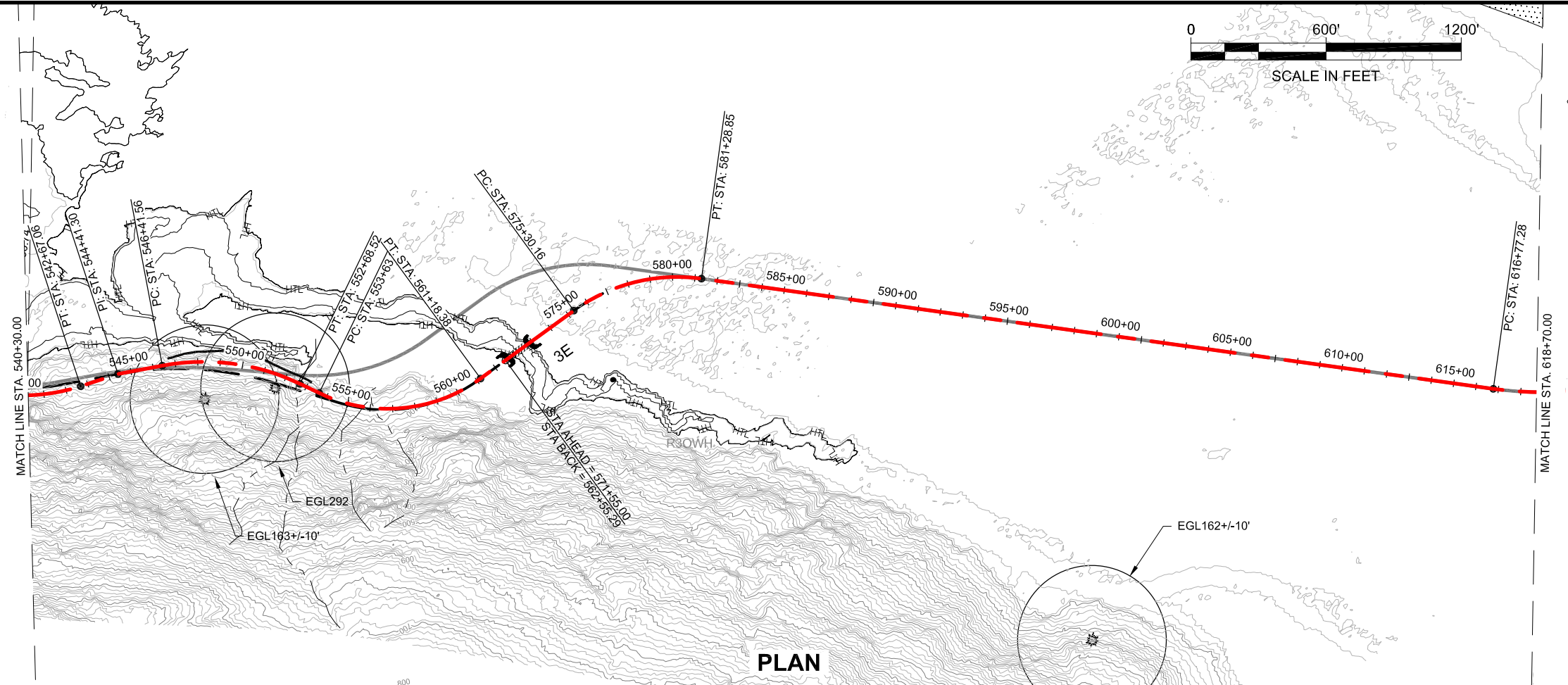
STATE OF ALASKA  
DEPARTMENT OF TRANSPORTATION  
& PUBLIC FACILITIES  
SOUTHEAST REGION

JNU-EAST LYNN CANAL  
HIGHWAY, ALTERNATIVE 2B  
PROJECT #71100

**2013 EIS  
PLAN VIEW**

| PROJECT DESIGNATION |              |
|---------------------|--------------|
| <b>71100</b>        |              |
| STATE               | YEAR         |
| <b>ALASKA</b>       | <b>2013</b>  |
| SHEET NUMBER        | TOTAL SHEETS |
| <b>EL6</b>          | <b>38</b>    |



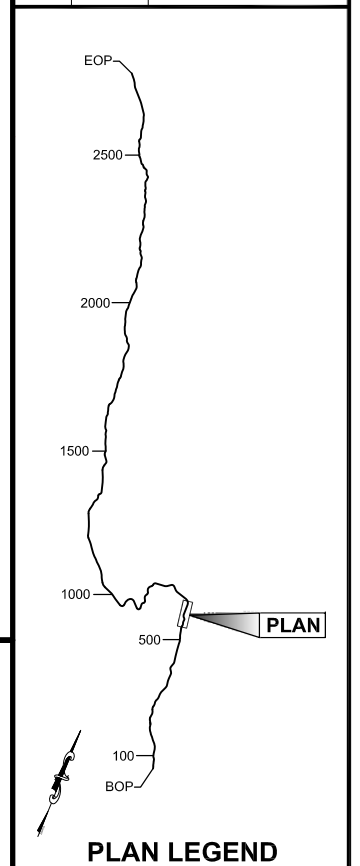


PLAN

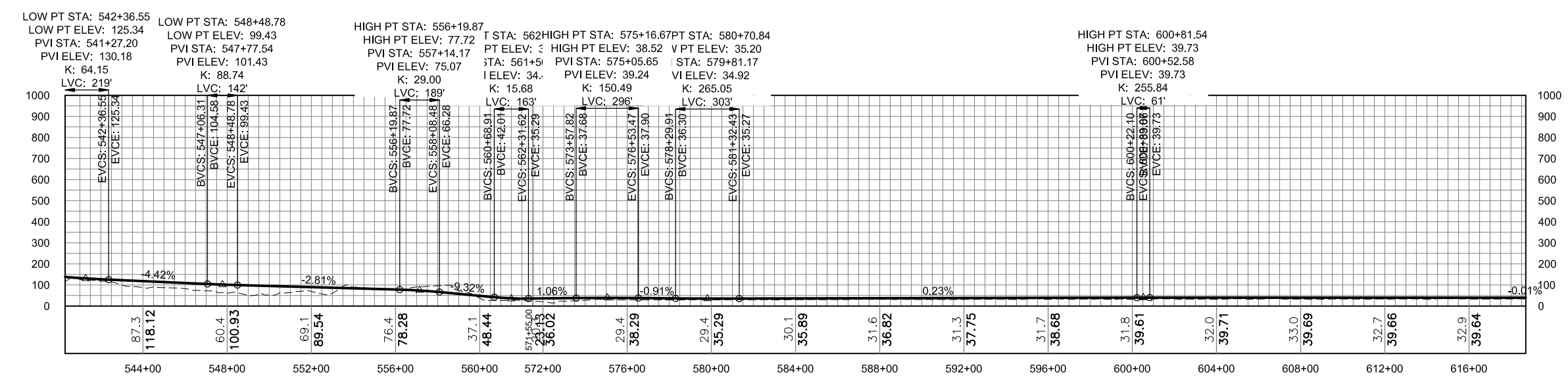
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GEARY, NATE (DOT)  
TAB: EL7\Friday, October 04, 2013 12:42:24 PM

| ADDENDUM NUMBER     |      |             |
|---------------------|------|-------------|
| ATTACHMENT NUMBER   |      |             |
| RECORD OF REVISIONS |      |             |
| No.                 | DATE | DESCRIPTION |
|                     |      |             |
|                     |      |             |



PLAN LEGEND



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SOUTHEAST REGION

JNU-EAST LYNN CANAL  
HIGHWAY, ALTERNATIVE 2B  
PROJECT #71100

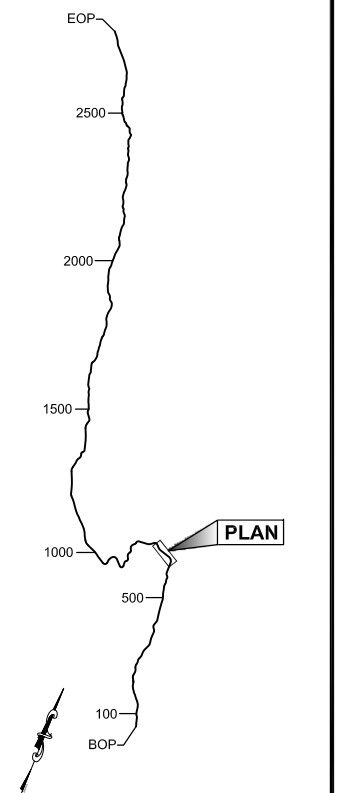
**2013 EIS  
PLAN VIEW**

PROJECT DESIGNATION  
**71100**

|               |              |
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| STATE         | YEAR         |
| <b>ALASKA</b> | <b>2013</b>  |
| SHEET NUMBER  | TOTAL SHEETS |
| <b>EL7</b>    | <b>38</b>    |



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& PUBLIC FACILITIES  
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JNU-EAST LYNN CANAL  
HIGHWAY, ALTERNATIVE 2B  
PROJECT #71100

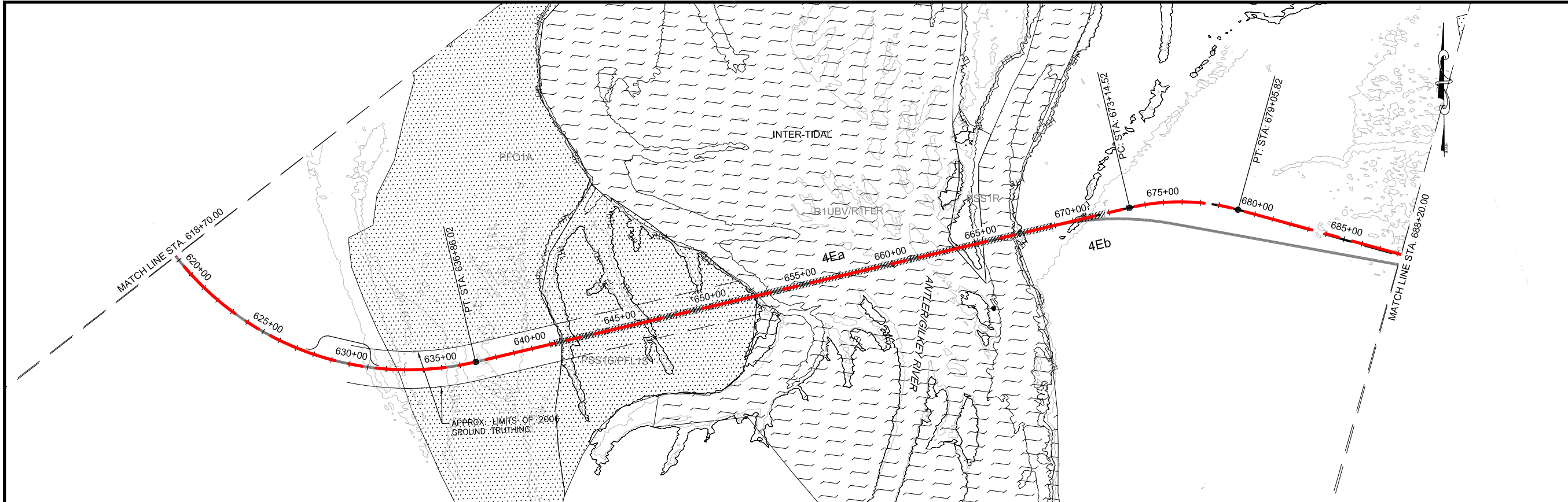
**2013 EIS  
PLAN VIEW**

PROJECT DESIGNATION

**71100**

|               |             |
|---------------|-------------|
| STATE         | YEAR        |
| <b>ALASKA</b> | <b>2013</b> |

|              |              |
|--------------|--------------|
| SHEET NUMBER | TOTAL SHEETS |
| <b>EL8</b>   | <b>38</b>    |



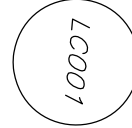
**LEGEND**

- CURRENT ALIGNMENT
- PROPOSED FILL SLOPE
- PROPOSED CUT SLOPE
- PROPOSED WALL
- 2006 FEIS ALIGNMENT
- 2008 CORP PERMIT ALIGNMENT

- BRIDGES
- WETLAND

**GEO HAZARD AREA LEGEND**

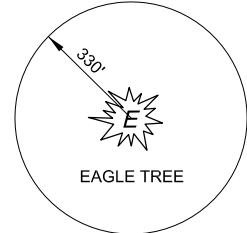
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- HR: HAZARD ROCK
- LS: LAND SLIDE
- RF: ROCK FALL
- RS: ROCK SLIDE
- SR: SOIL RAVELING



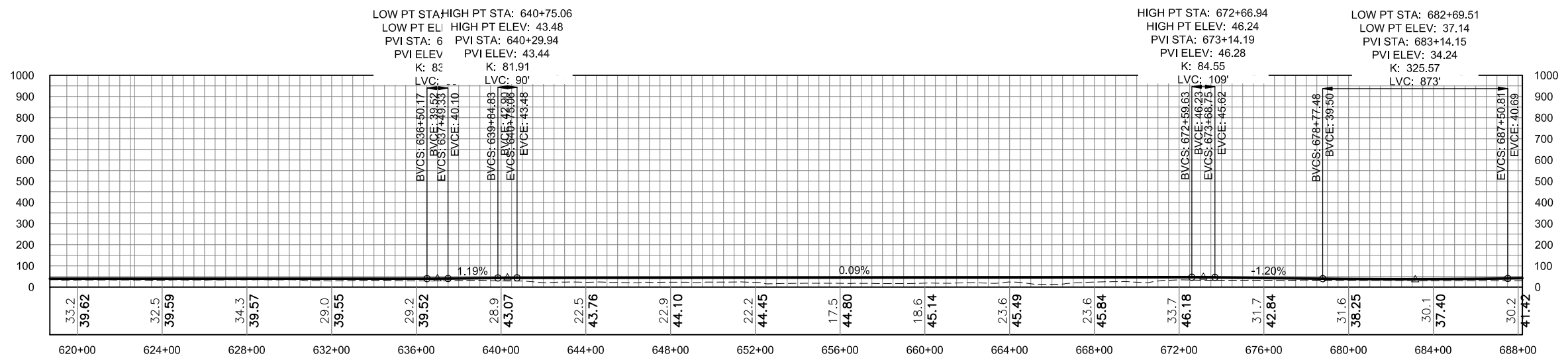
AVALANCHE CHUTE



AVALANCHE STARTING ZONE



EAGLE TREE



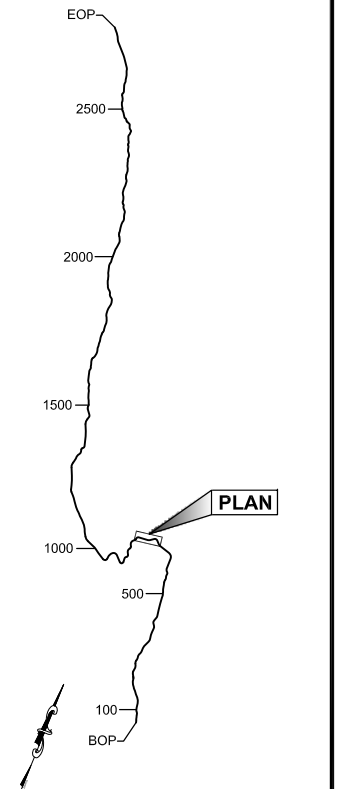
**PROFILE**

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| No. | DATE | DESCRIPTION |
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SOUTHEAST REGION

JNU-EAST LYNN CANAL  
HIGHWAY, ALTERNATIVE 2B  
PROJECT #71100

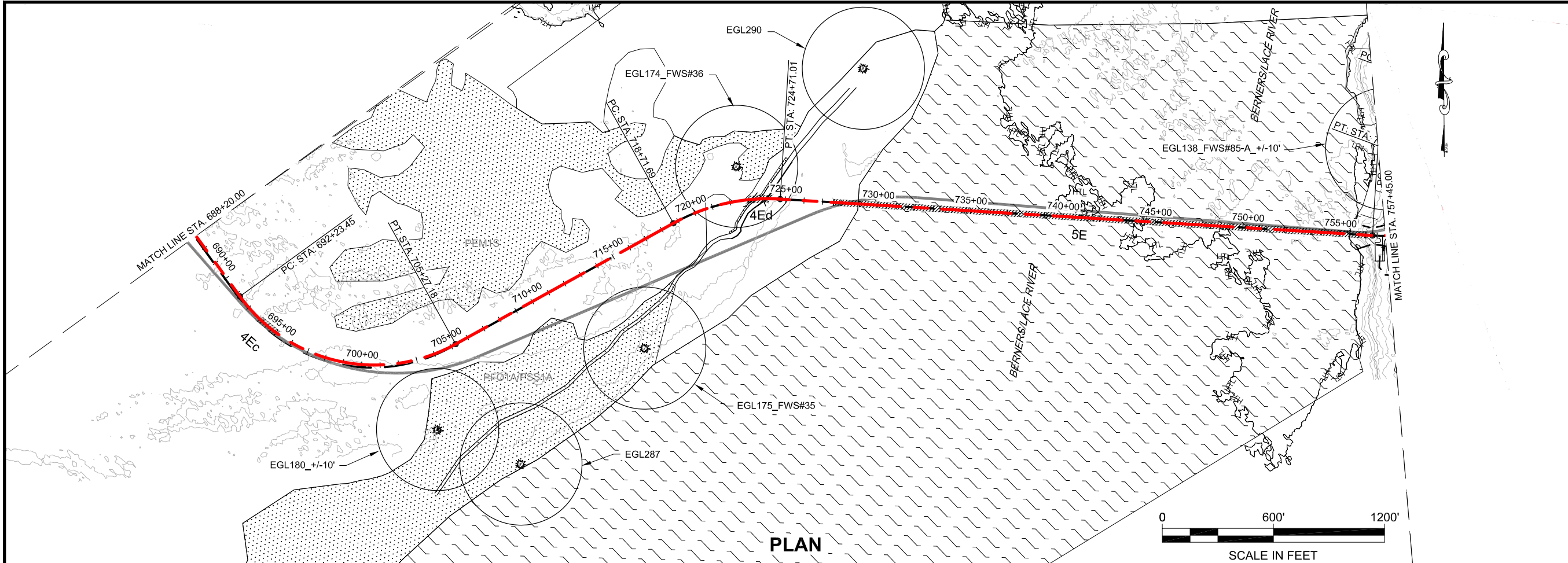
**2013 EIS  
PLAN VIEW**

PROJECT DESIGNATION

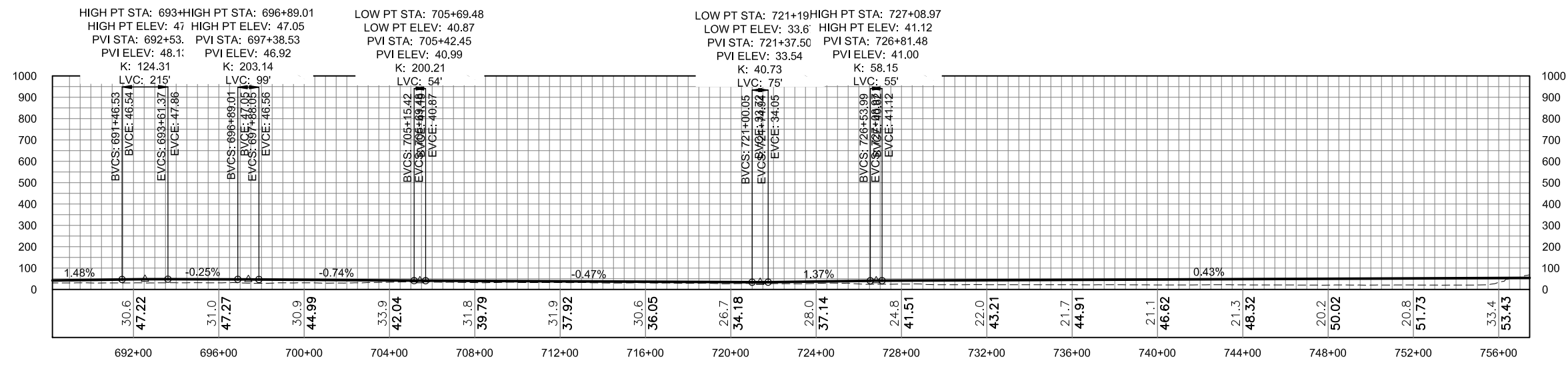
**71100**

| STATE         | YEAR        |
|---------------|-------------|
| <b>ALASKA</b> | <b>2013</b> |

| SHEET NUMBER | TOTAL SHEETS |
|--------------|--------------|
| <b>EL9</b>   | <b>38</b>    |



PLAN

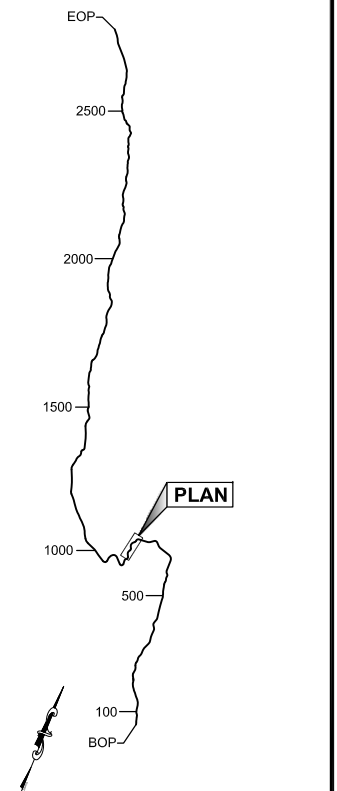


PROFILE

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| No. | DATE | DESCRIPTION |
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SOUTHEAST REGION

JNU-EAST LYNN CANAL  
HIGHWAY, ALTERNATIVE 2B  
PROJECT #71100

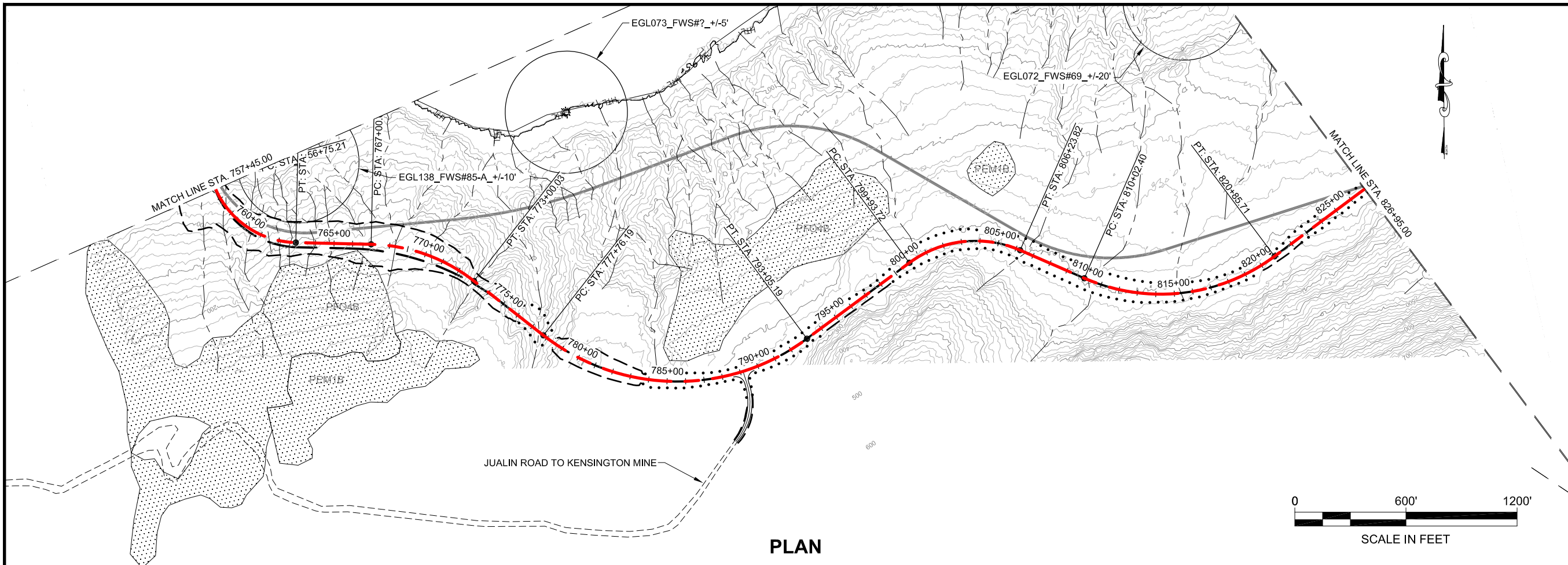
**2013 EIS  
PLAN VIEW**

PROJECT DESIGNATION

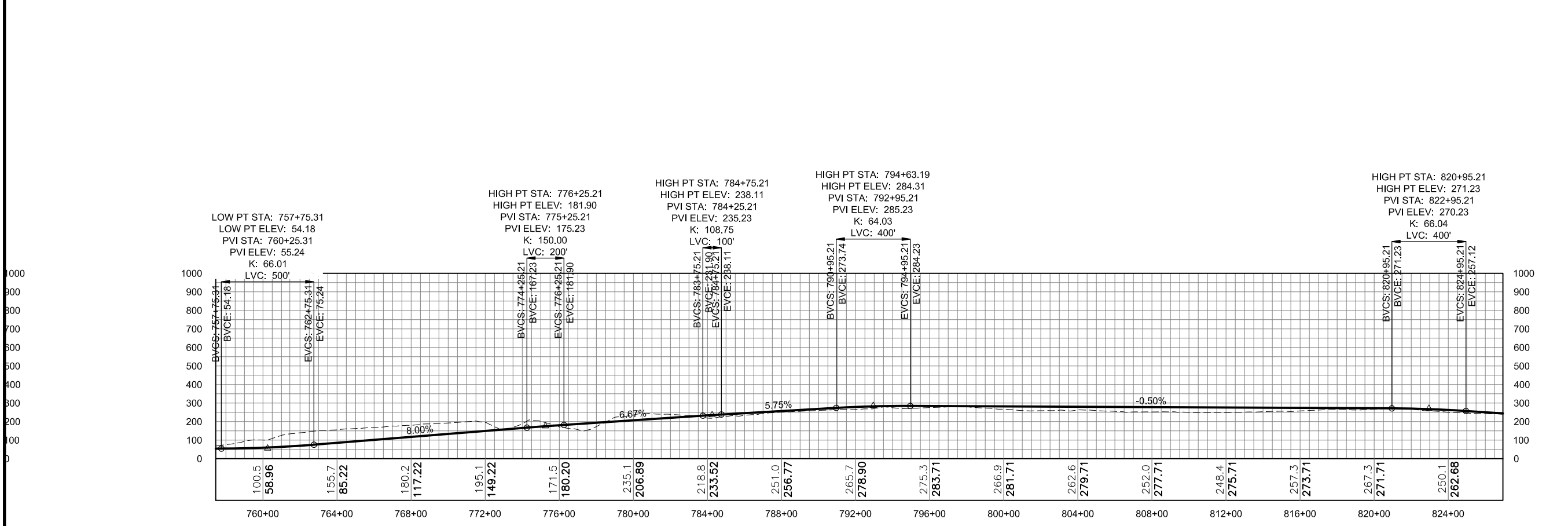
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| STATE         | YEAR        |
|---------------|-------------|
| <b>ALASKA</b> | <b>2013</b> |

| SHEET NUMBER | TOTAL SHEETS |
|--------------|--------------|
| <b>EL10</b>  | <b>38</b>    |



PLAN

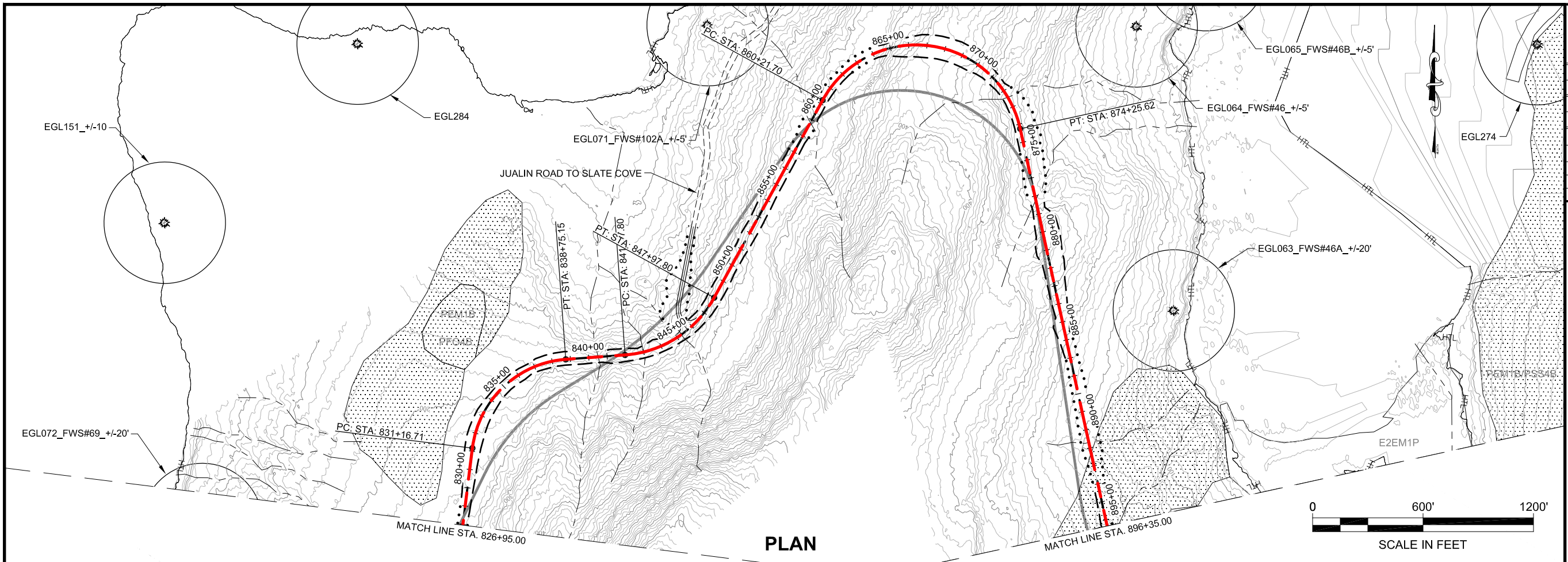


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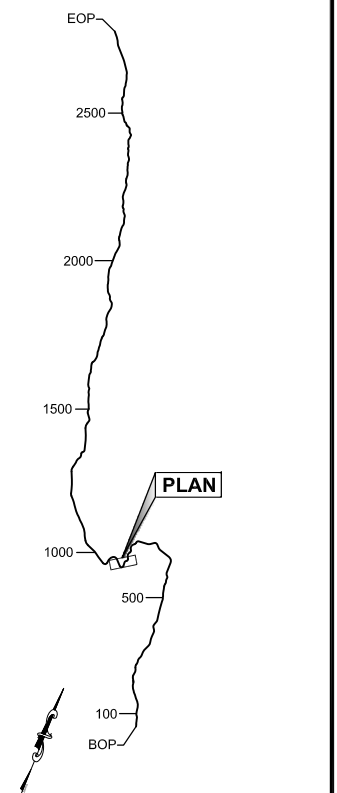
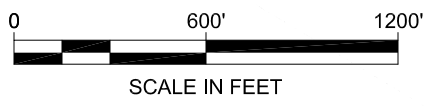
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| No. | DATE | DESCRIPTION |
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**PLAN**



**PLAN LEGEND**

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DRAWN BY:

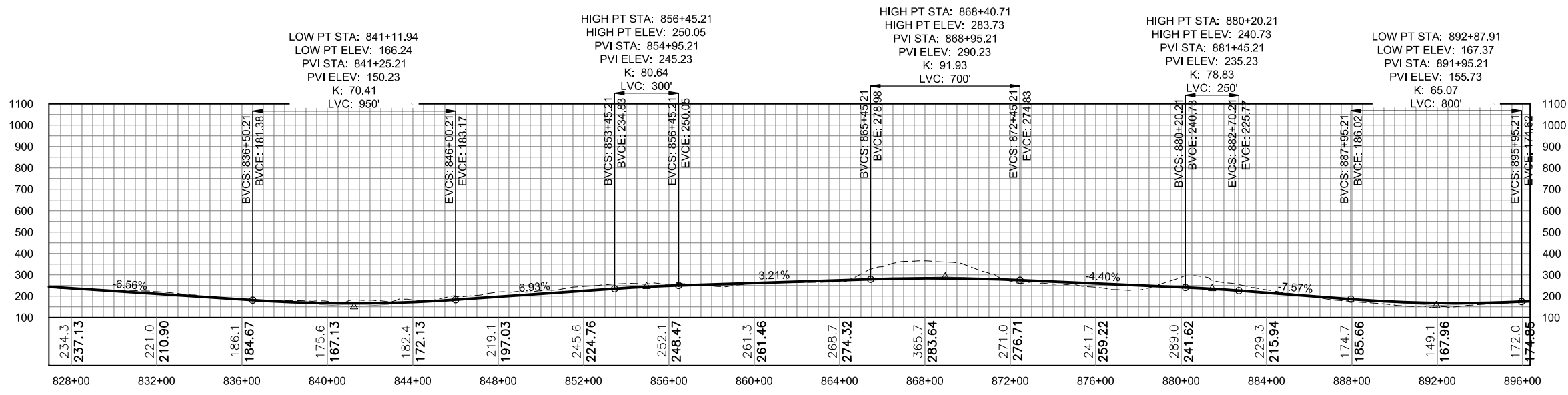
STATE OF ALASKA  
DEPARTMENT OF TRANSPORTATION & PUBLIC FACILITIES  
SOUTHEAST REGION  
**JNU-EAST LYNN CANAL  
HIGHWAY, ALTERNATIVE 2B  
PROJECT #71100**

**2013 EIS  
PLAN VIEW**

PROJECT DESIGNATION

**71100**

| STATE         | YEAR         |
|---------------|--------------|
| <b>ALASKA</b> | <b>2013</b>  |
| SHEET NUMBER  | TOTAL SHEETS |
| <b>EL11</b>   | <b>38</b>    |

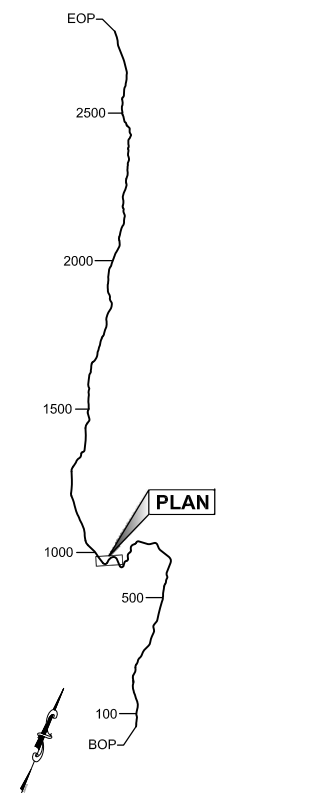


**PROFILE**

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| No. | DATE | DESCRIPTION |
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JNU-EAST LYNN CANAL  
HIGHWAY, ALTERNATIVE 2B  
PROJECT #71100

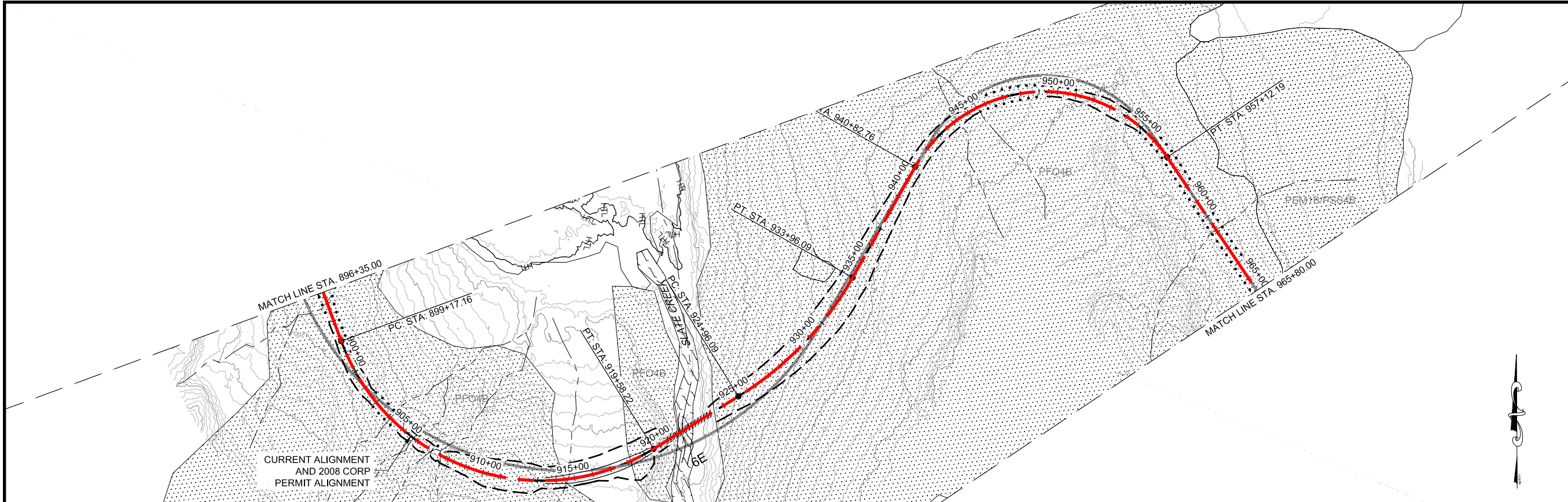
**2013 EIS  
PLAN VIEW**

PROJECT DESIGNATION

**71100**

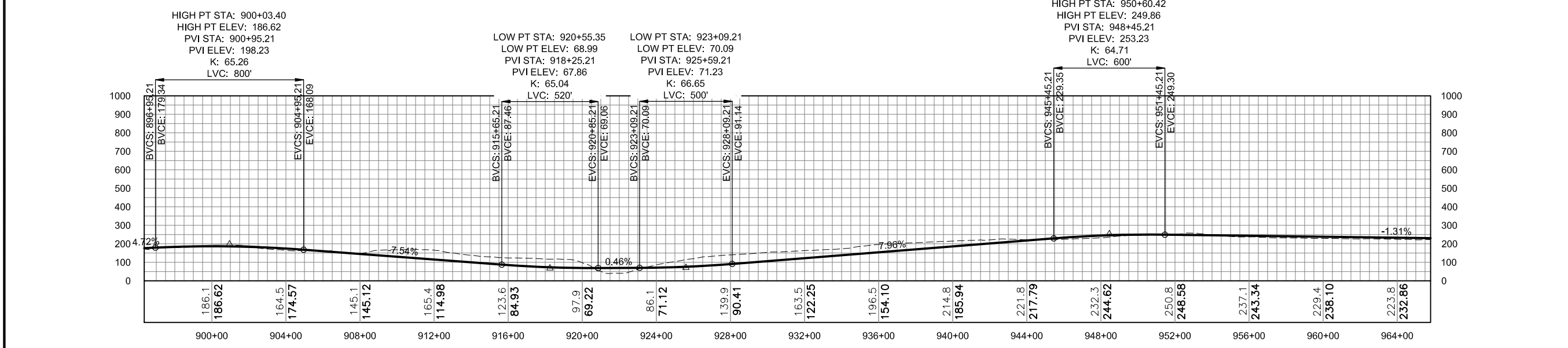
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| STATE         | YEAR        |
| <b>ALASKA</b> | <b>2013</b> |

|              |              |
|--------------|--------------|
| SHEET NUMBER | TOTAL SHEETS |
| <b>EL12</b>  | <b>38</b>    |



**LEGEND**

|  |                            |                               |               |  |                         |
|--|----------------------------|-------------------------------|---------------|--|-------------------------|
|  | CURRENT ALIGNMENT          |                               | BRIDGES       |  | AVAILANCE CHUTE         |
|  | PROPOSED FILL SLOPE        |                               | WETLAND       |  | AVAILANCE STARTING ZONE |
|  | PROPOSED CUT SLOPE         | <b>GEO HAZARD AREA LEGEND</b> |               |  |                         |
|  | PROPOSED WALL              | DF:                           | DEBRIS FLOW   |  |                         |
|  | 2006 FEIS ALIGNMENT        | HR:                           | HAZARD ROCK   |  |                         |
|  | 2008 CORP PERMIT ALIGNMENT | LS:                           | LAND SLIDE    |  |                         |
|  |                            | RF:                           | ROCK FALL     |  |                         |
|  |                            | RS:                           | ROCK SLIDE    |  |                         |
|  |                            | SR:                           | SOIL RAVELING |  |                         |



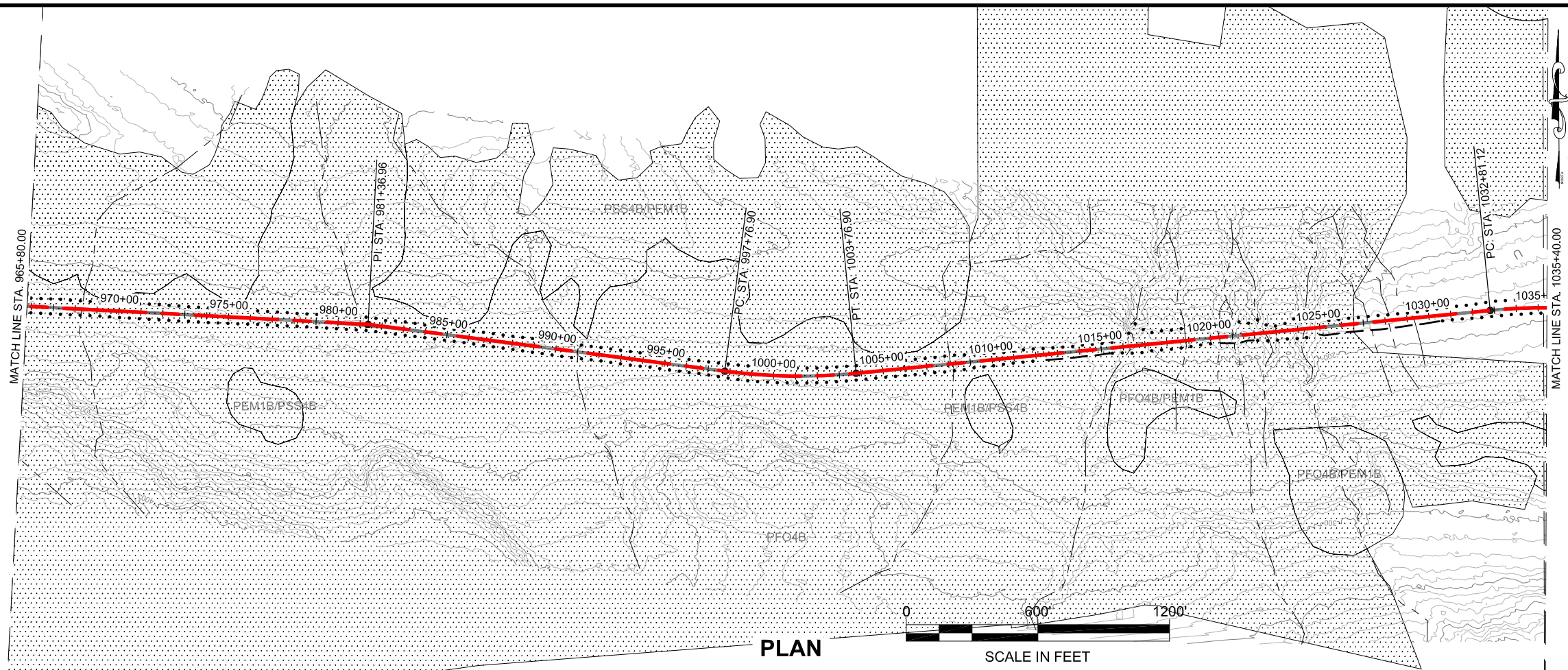
PROFILE

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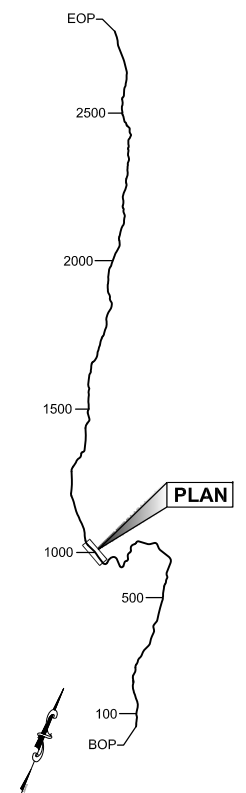


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PLAN

SCALE IN FEET



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SOUTHEAST REGION

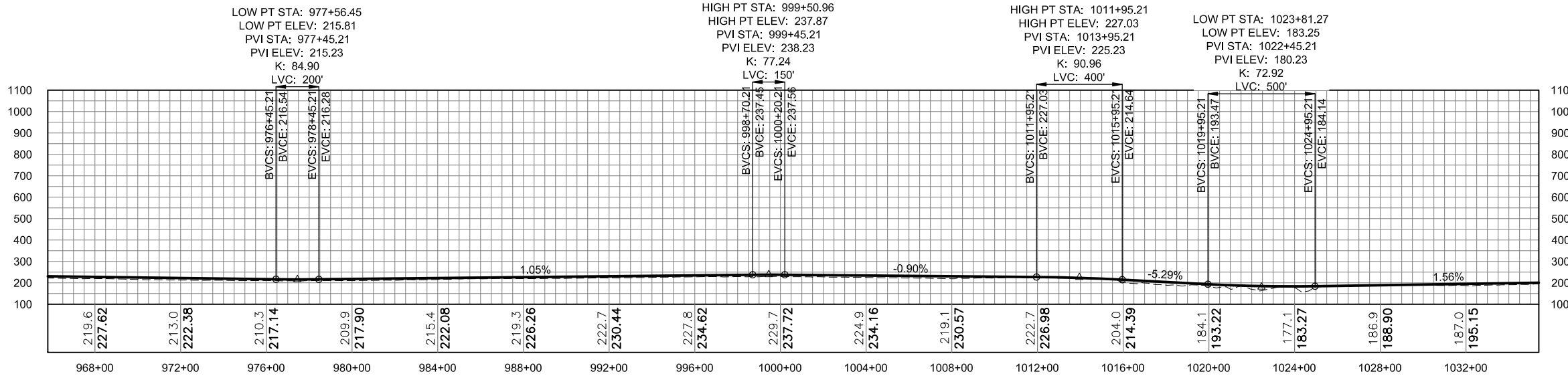
JNU-EAST LYNN CANAL  
HIGHWAY, ALTERNATIVE 2B  
PROJECT #71100

**2013 EIS  
PLAN VIEW**

PROJECT DESIGNATION  
**71100**

| STATE         | YEAR        |
|---------------|-------------|
| <b>ALASKA</b> | <b>2013</b> |

| SHEET NUMBER | TOTAL SHEETS |
|--------------|--------------|
| <b>EL13</b>  | <b>38</b>    |

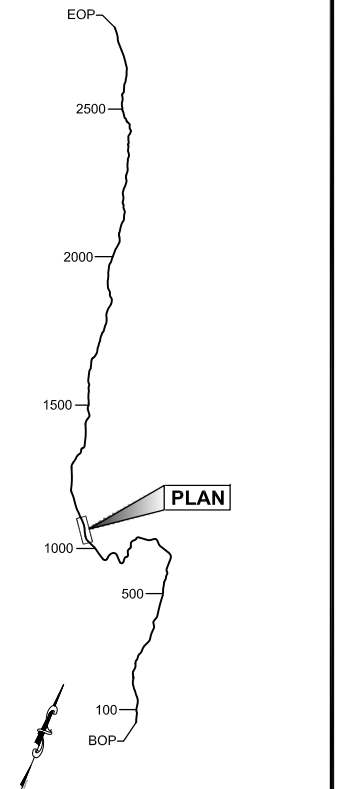


PROFILE

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| No. | DATE | DESCRIPTION |
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& PUBLIC FACILITIES  
SOUTHEAST REGION

JNU-EAST LYNN CANAL  
HIGHWAY, ALTERNATIVE 2B  
PROJECT #71100

**2013 EIS  
PLAN VIEW**

PROJECT DESIGNATION

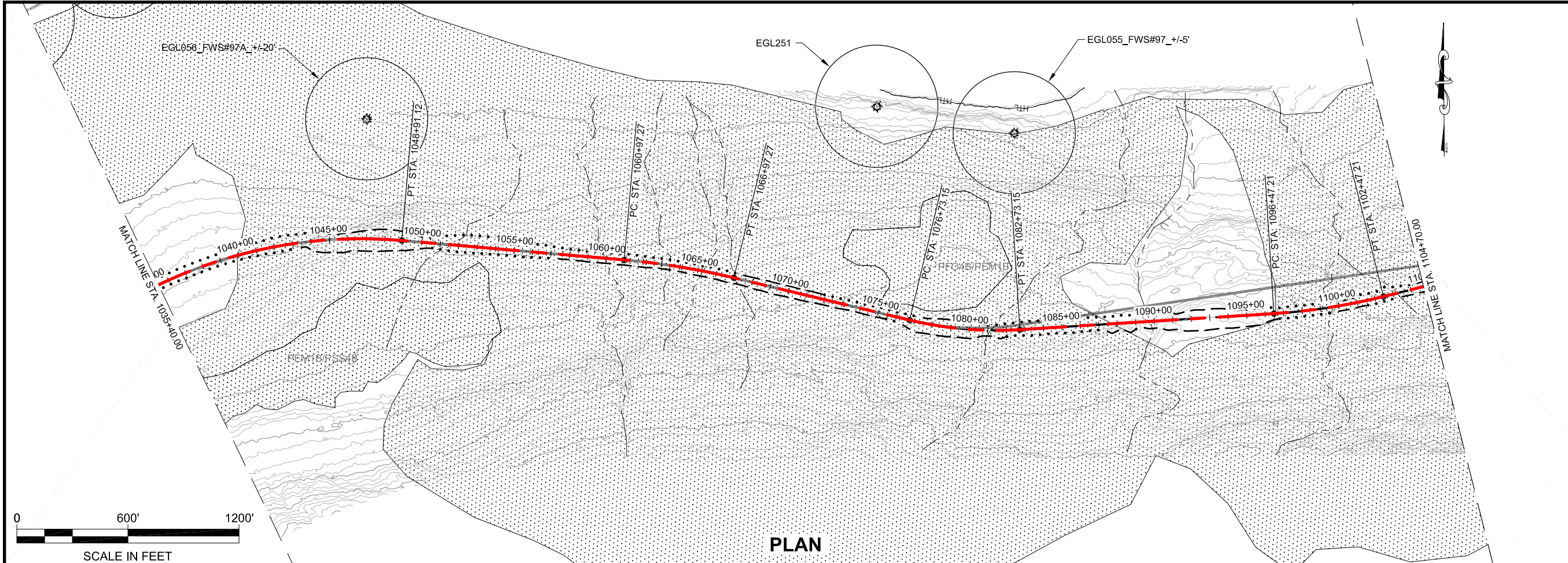
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STATE YEAR

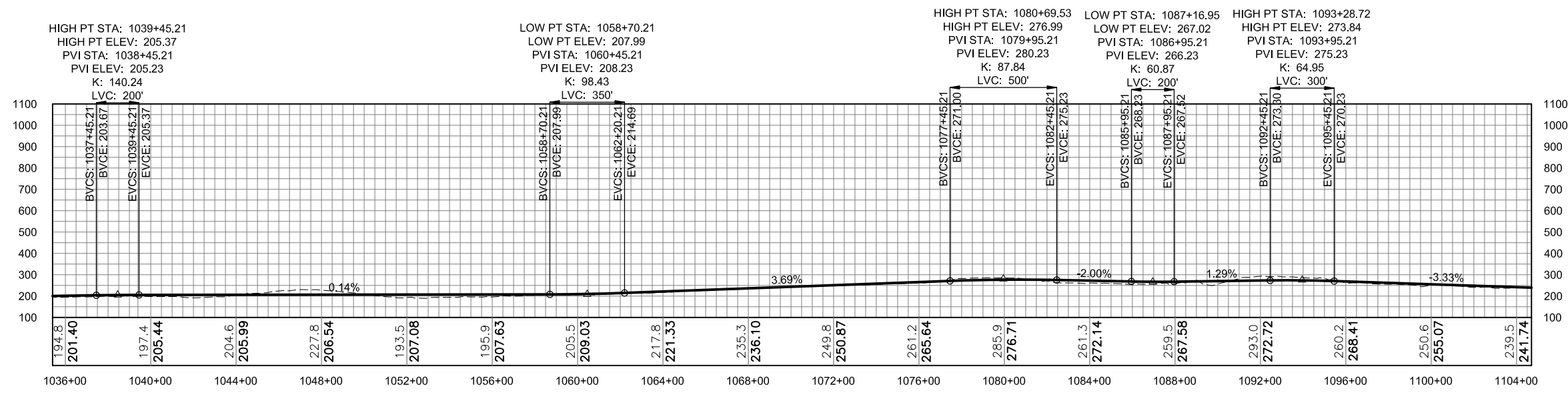
**ALASKA 2013**

SHEET NUMBER TOTAL SHEETS

**EL14 38**



PLAN

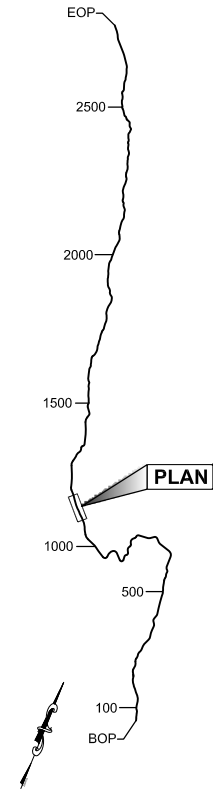


PROFILE

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| No. | DATE | DESCRIPTION |
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& PUBLIC FACILITIES  
SOUTHEAST REGION

JNU-EAST LYNN CANAL  
HIGHWAY, ALTERNATIVE 2B  
PROJECT #71100

**2013 EIS  
PLAN VIEW**

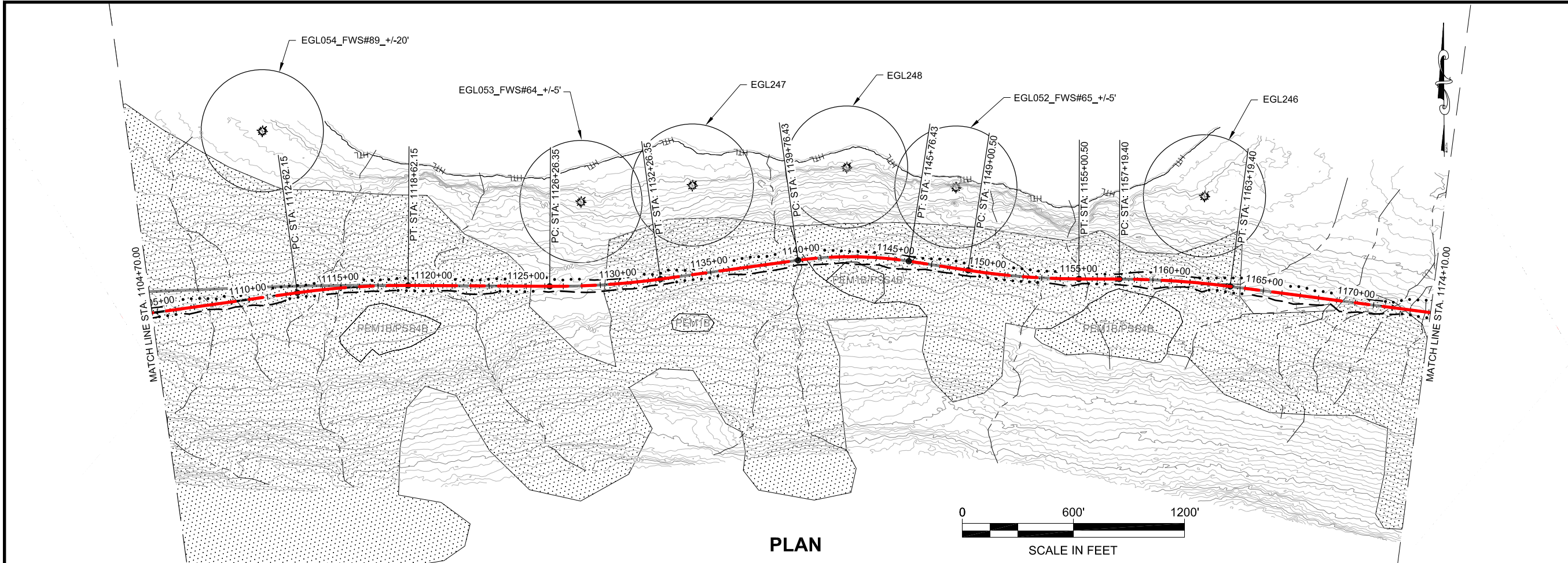
PROJECT DESIGNATION

**71100**

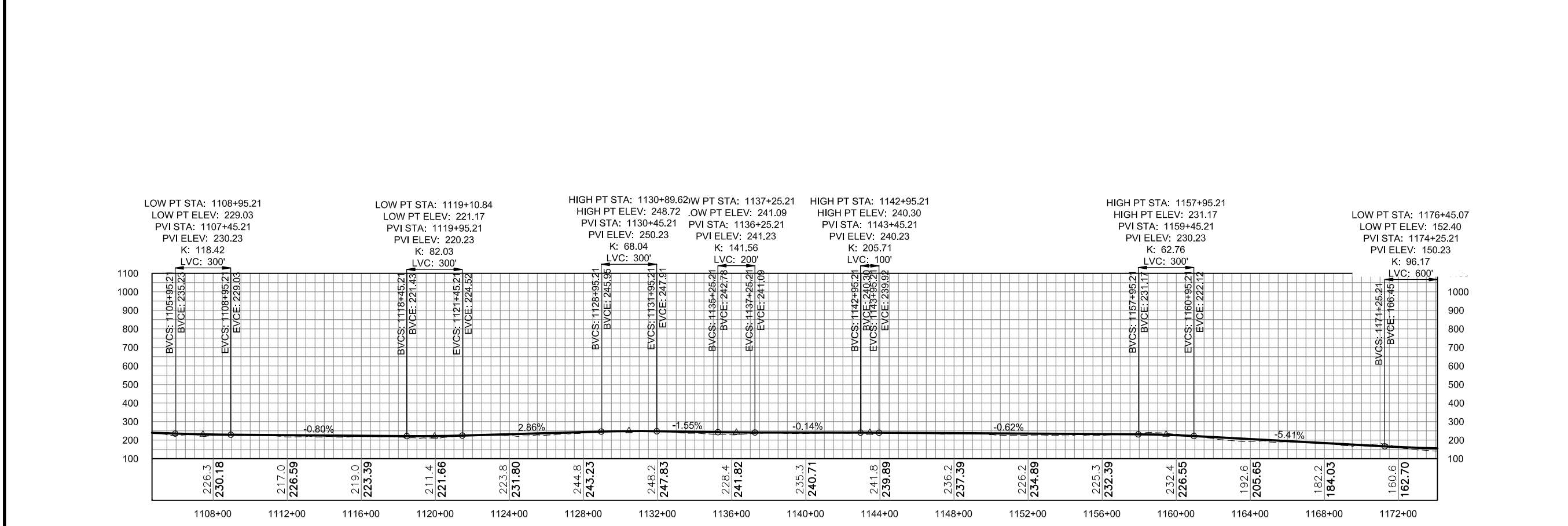
| STATE         | YEAR        |
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| <b>ALASKA</b> | <b>2013</b> |

SHEET NUMBER TOTAL SHEETS

**EL15 38**



PLAN

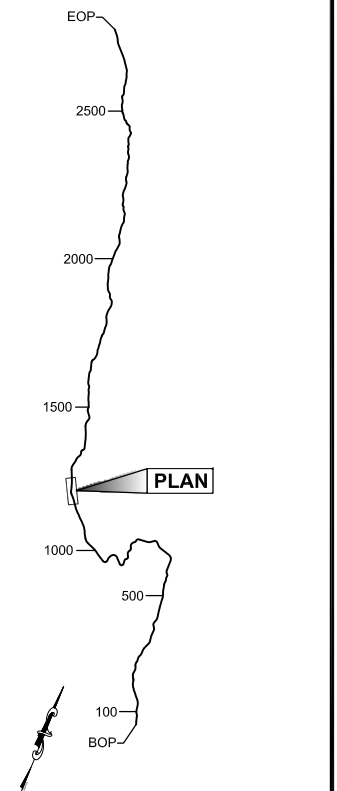


PROFILE

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SOUTHEAST REGION

JNU-EAST LYNN CANAL  
HIGHWAY, ALTERNATIVE 2B  
PROJECT #71100

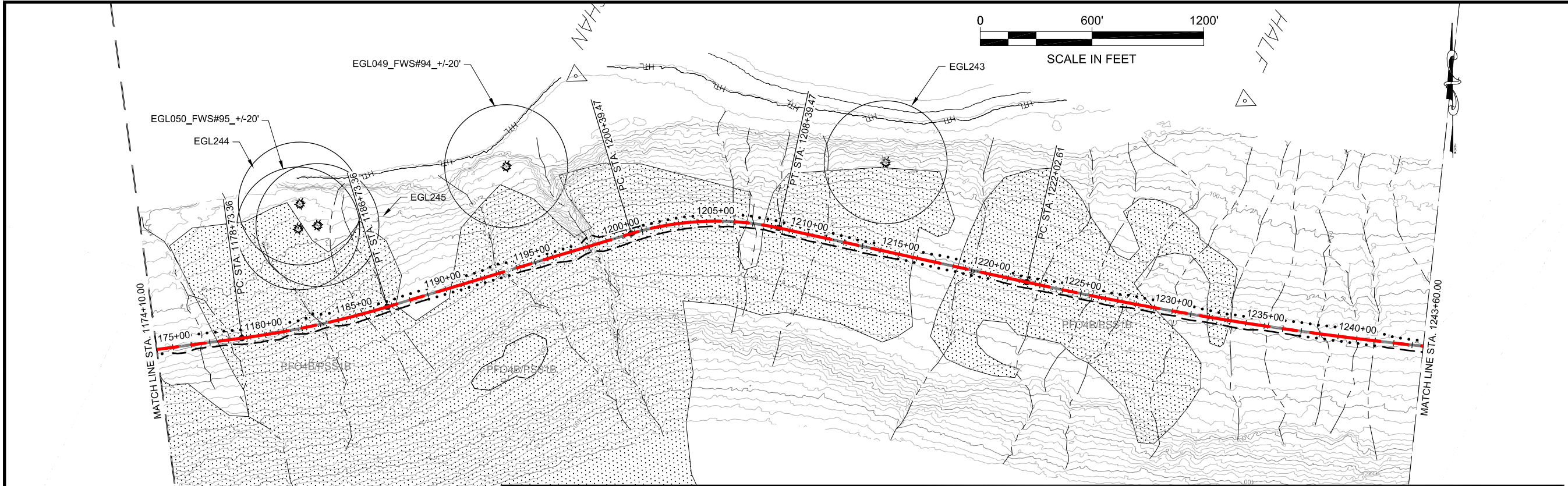
### 2013 EIS PLAN VIEW

PROJECT DESIGNATION

**71100**

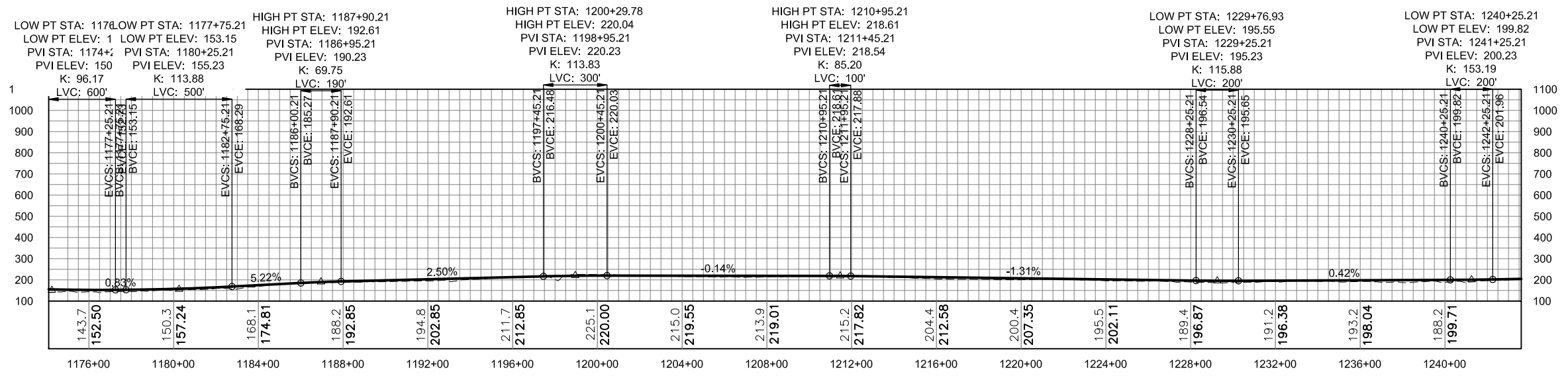
| STATE         | YEAR        |
|---------------|-------------|
| <b>ALASKA</b> | <b>2013</b> |

| SHEET NUMBER | TOTAL SHEETS |
|--------------|--------------|
| <b>EL16</b>  | <b>38</b>    |



### LEGEND

|  |  |  |
|--|--|--|
|  | <ul style="list-style-type: none"> <li> CURRENT ALIGNMENT</li> <li> PROPOSED FILL SLOPE</li> <li> PROPOSED CUT SLOPE</li> <li> PROPOSED WALL</li> <li> 2006 FEIS ALIGNMENT</li> <li> 2008 CORP PERMIT ALIGNMENT</li> </ul> | <h4 style="text-align: center;">GEO HAZARD AREA LEGEND</h4> <ul style="list-style-type: none"> <li> BRIDGES</li> <li> WETLAND</li> <li>DF: DEBRIS FLOW</li> <li>HR: HAZARD ROCK</li> <li>LS: LAND SLIDE</li> <li>RF: ROCK FALL</li> <li>RS: ROCK SLIDE</li> <li>SR: SOIL RAVELING</li> </ul> |
|  |  | <ul style="list-style-type: none"> <li> AVALANCHE CHUTE</li> <li> AVALANCHE STARTING ZONE</li> </ul>   |



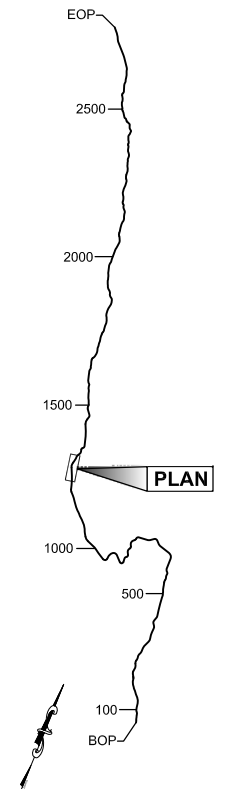
### PROFILE

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DEPARTMENT OF TRANSPORTATION  
& PUBLIC FACILITIES  
SOUTHEAST REGION

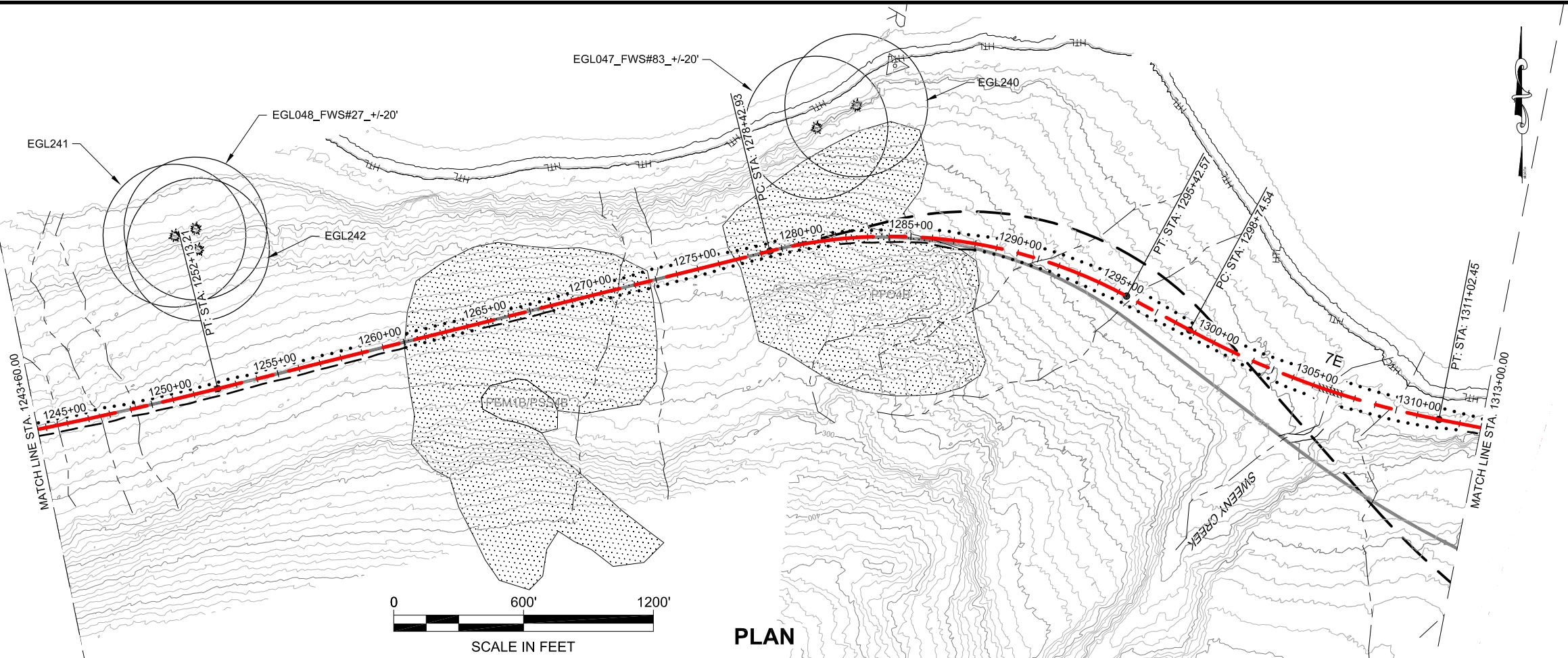
JNU-EAST LYNN CANAL  
HIGHWAY, ALTERNATIVE 2B  
PROJECT #71100

**2013 EIS  
PLAN VIEW**

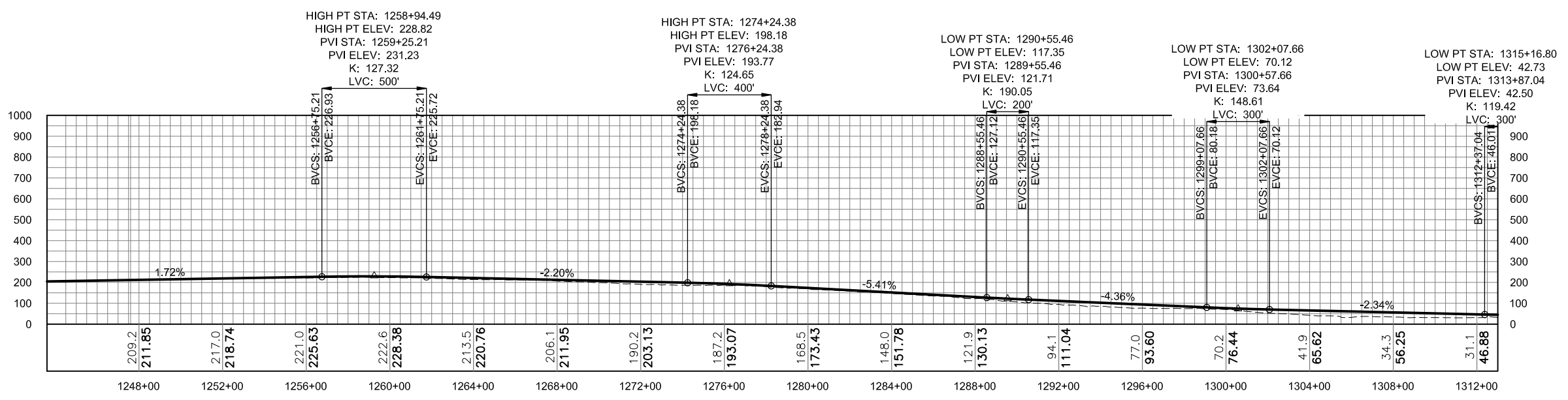
PROJECT DESIGNATION

**71100**

| STATE         | YEAR         |
|---------------|--------------|
| <b>ALASKA</b> | <b>2013</b>  |
| SHEET NUMBER  | TOTAL SHEETS |
| <b>EL17</b>   | <b>38</b>    |



PLAN

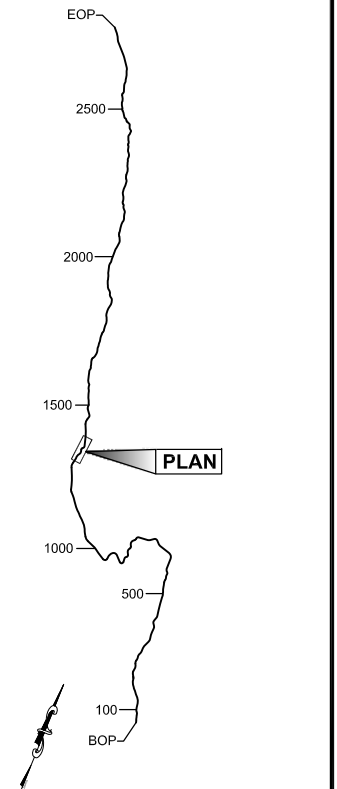


PROFILE

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| No. | DATE | DESCRIPTION |
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SOUTHEAST REGION

JNU-EAST LYNN CANAL  
HIGHWAY, ALTERNATIVE 2B  
PROJECT #71100

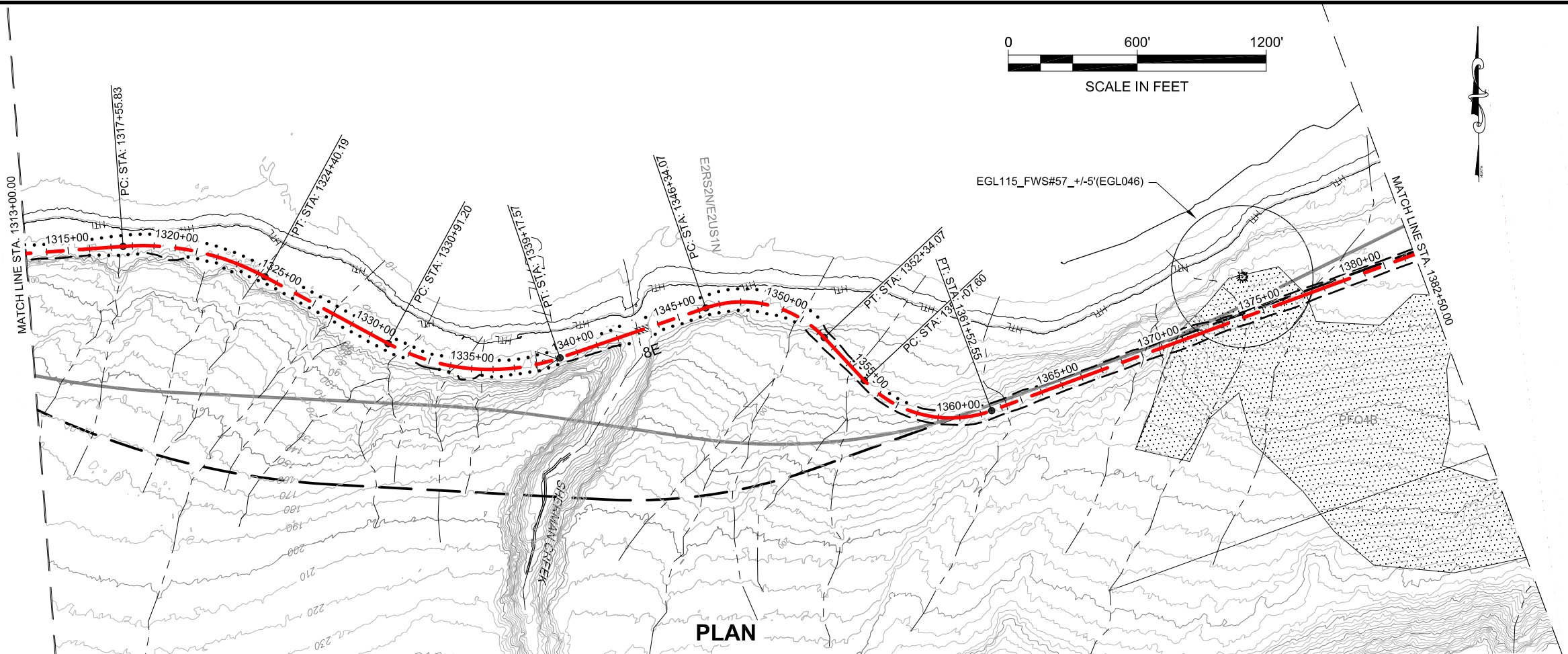
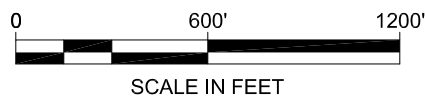
**2013 EIS  
PLAN VIEW**

PROJECT DESIGNATION

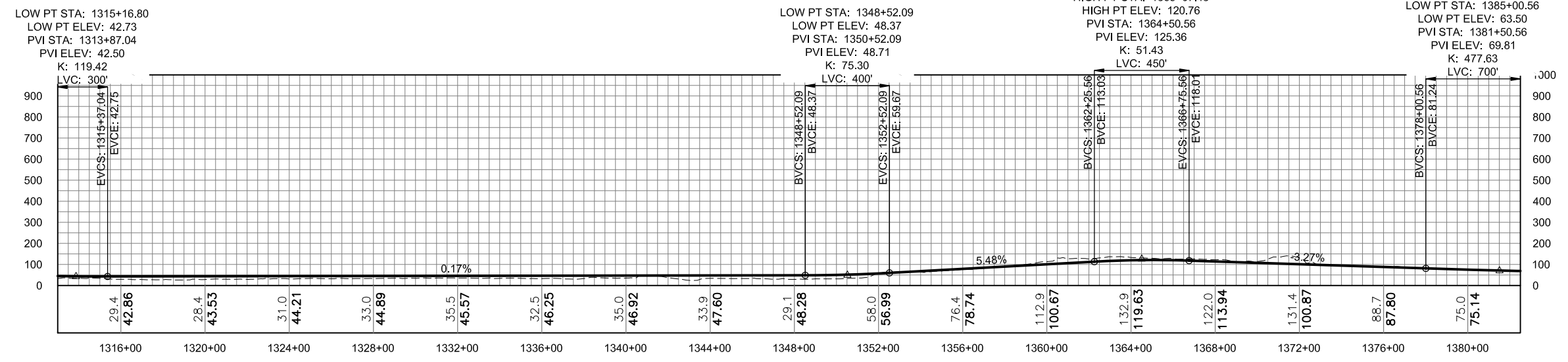
**71100**

|               |             |
|---------------|-------------|
| STATE         | YEAR        |
| <b>ALASKA</b> | <b>2013</b> |

|              |              |
|--------------|--------------|
| SHEET NUMBER | TOTAL SHEETS |
| <b>EL18</b>  | <b>38</b>    |



PLAN



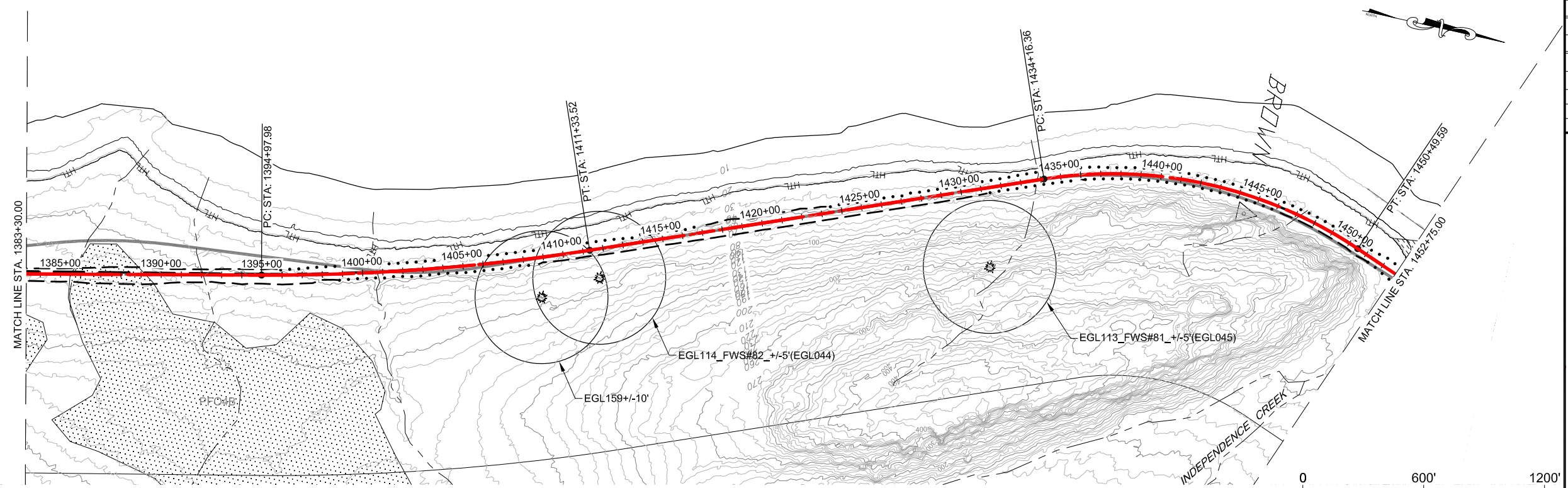
PROFILE

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6.80  
3  
4

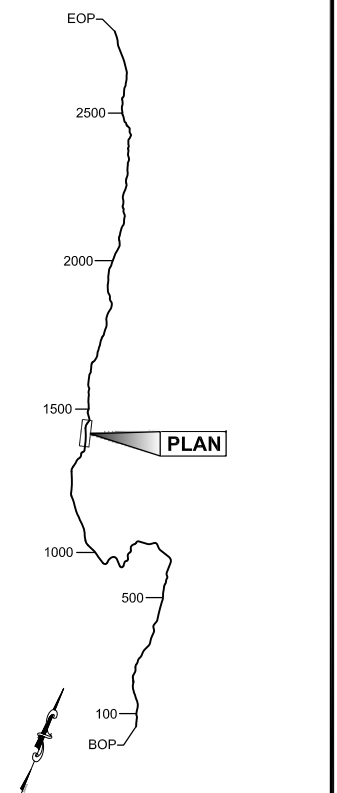


| No. | DATE | DESCRIPTION |
|-----|------|-------------|
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**PLAN**

SCALE IN FEET



**PLAN LEGEND**

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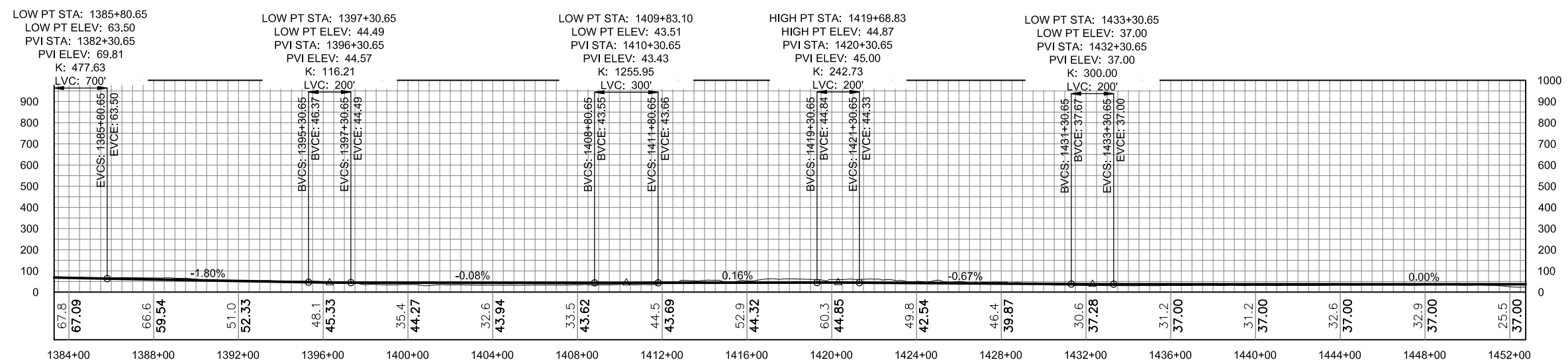
DRAWN BY:

STATE OF ALASKA  
DEPARTMENT OF TRANSPORTATION  
& PUBLIC FACILITIES  
SOUTHEAST REGION

JNU-EAST LYNN CANAL  
HIGHWAY, ALTERNATIVE 2B  
PROJECT #71100

**2013 EIS  
PLAN VIEW**

|                     |              |
|---------------------|--------------|
| PROJECT DESIGNATION |              |
| <b>71100</b>        |              |
| STATE               | YEAR         |
| <b>ALASKA</b>       | <b>2013</b>  |
| SHEET NUMBER        | TOTAL SHEETS |
| <b>EL19</b>         | <b>38</b>    |

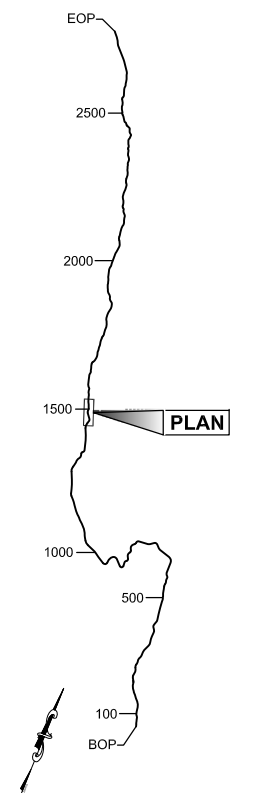


**PROFILE**

DO NOT SCALE FROM THESE DRAWINGS USE DIMENSIONS



| No. | DATE | DESCRIPTION |
|-----|------|-------------|
|     |      |             |
|     |      |             |



PLAN LEGEND

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DEPARTMENT OF TRANSPORTATION & PUBLIC FACILITIES  
SOUTHEAST REGION

JNU-EAST LYNN CANAL  
HIGHWAY, ALTERNATIVE 2B  
PROJECT #71100

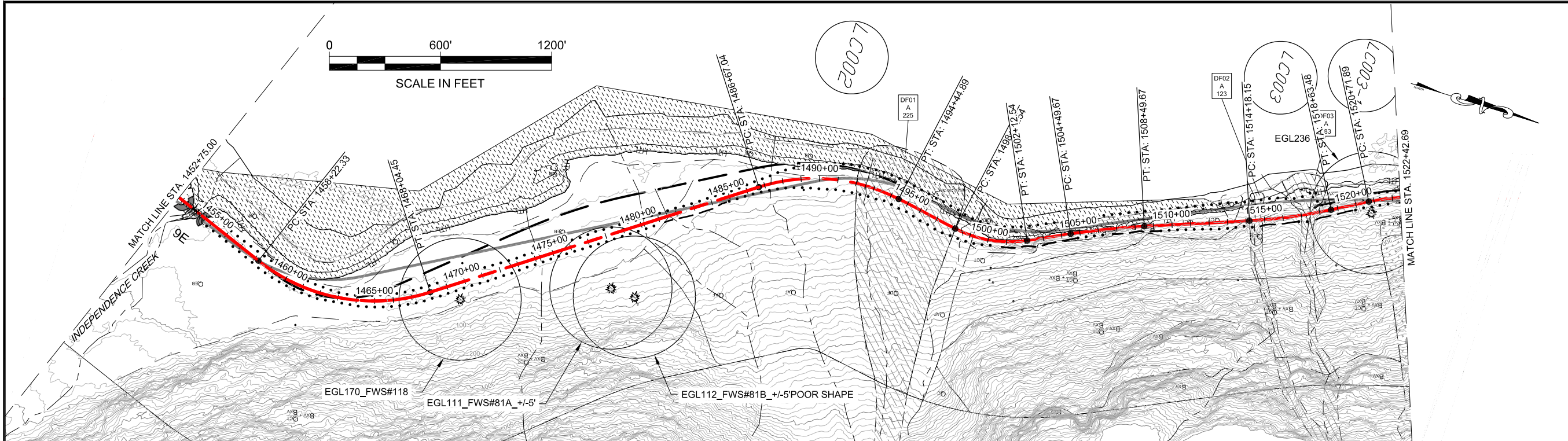
**2013 EIS  
PLAN VIEW**

PROJECT DESIGNATION

**71100**

|               |             |
|---------------|-------------|
| STATE         | YEAR        |
| <b>ALASKA</b> | <b>2013</b> |

|              |              |
|--------------|--------------|
| SHEET NUMBER | TOTAL SHEETS |
| <b>EL20</b>  | <b>38</b>    |



EAGLE TREE

**LEGEND**

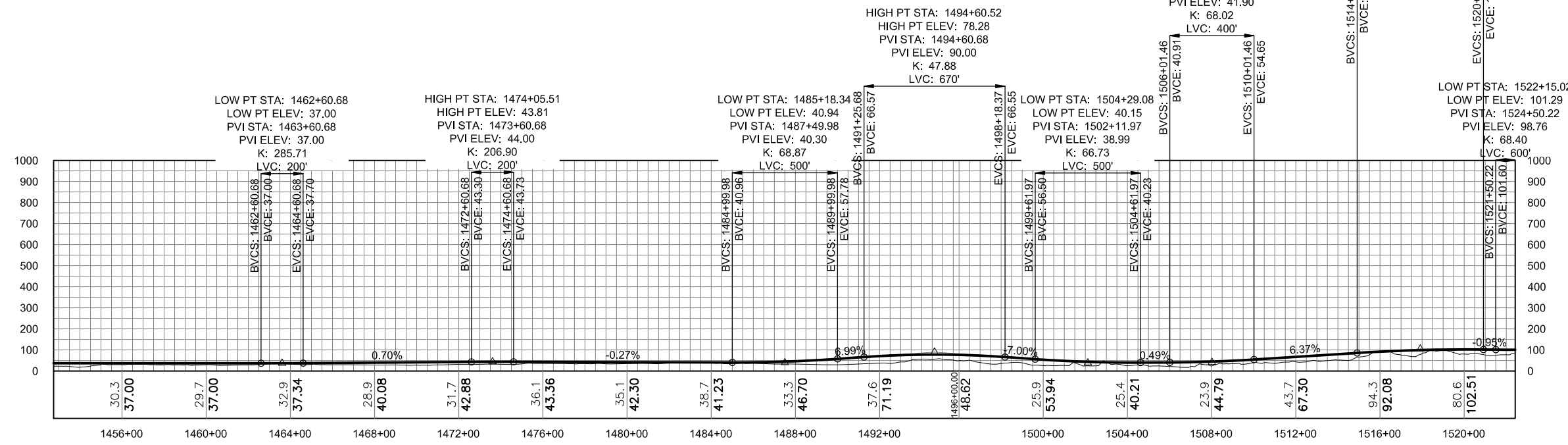
- +—+— CURRENT ALIGNMENT
- ..... PROPOSED FILL SLOPE
- - - - - PROPOSED CUT SLOPE
- — — — — PROPOSED WALL
- — — — — 2006 FEIS ALIGNMENT
- — — — — 2008 CORP PERMIT ALIGNMENT

**GEO HAZARD AREA LEGEND**

- BRIDGES
- WETLAND
- DF: DEBRIS FLOW
- HR: HAZARD ROCK
- LS: LAND SLIDE
- RF: ROCK FALL
- RS: ROCK SLIDE
- SR: SOIL RAVELING

**PLAN**

- AVALANCHE CHUTE
- AVALANCHE STARTING ZONE



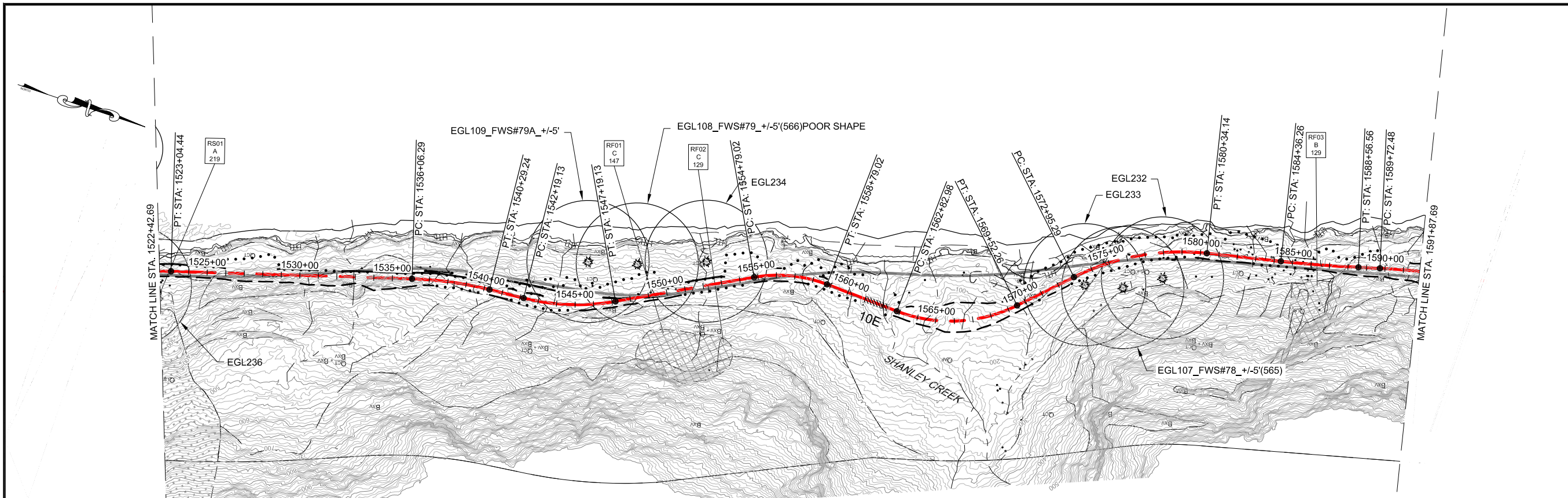
**PROFILE**

**DO NOT SCALE FROM THESE DRAWINGS USE DIMENSIONS**

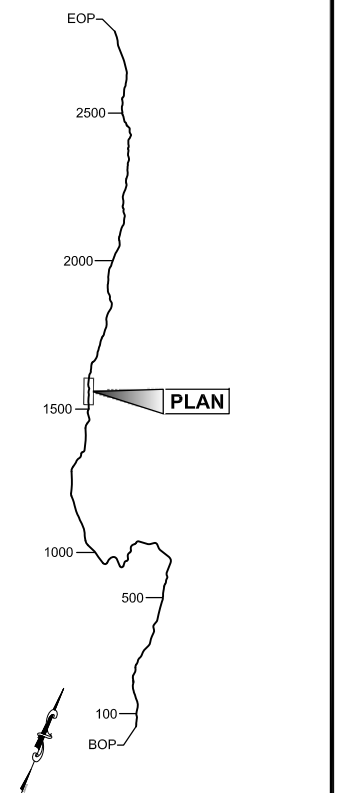




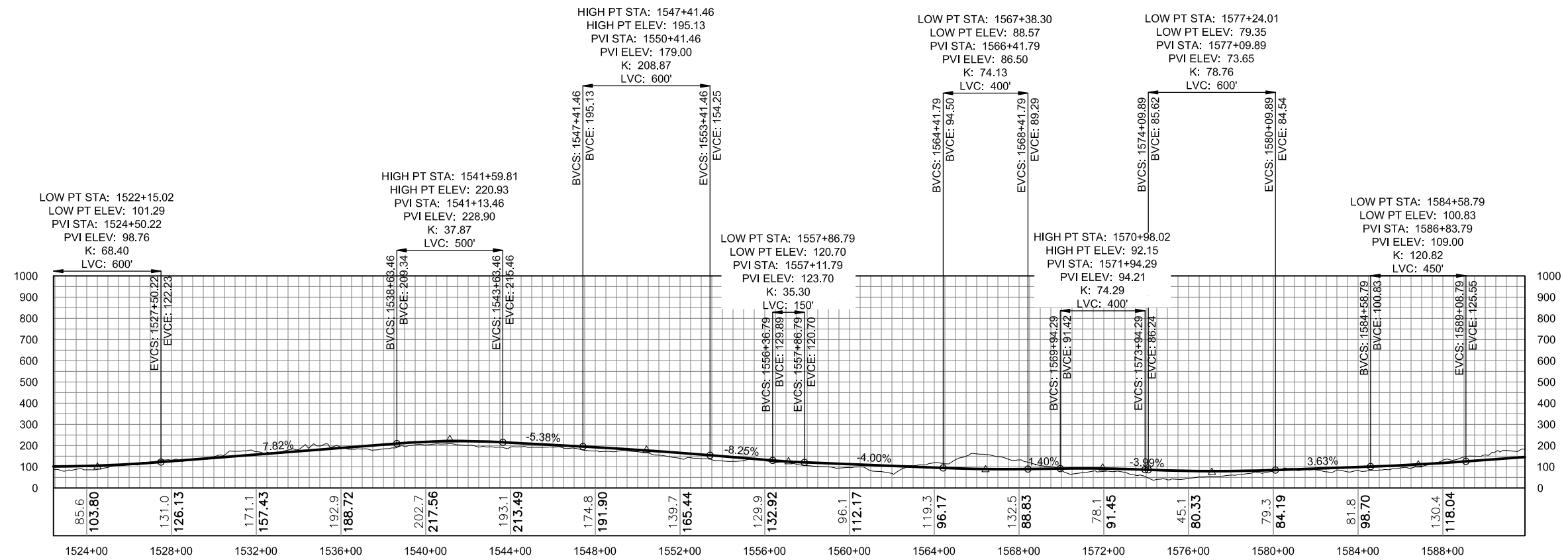
| No. | DATE | DESCRIPTION |
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PLAN



PLAN LEGEND



PROFILE

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SOUTHEAST REGION

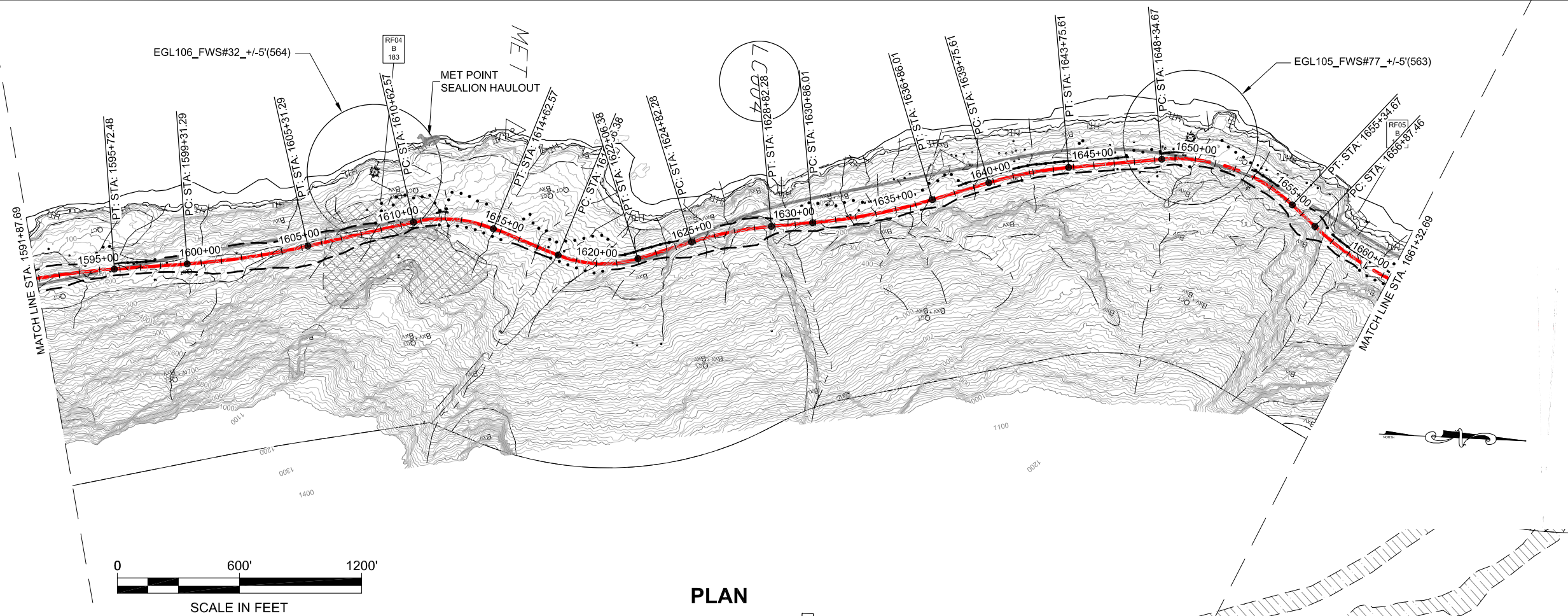
JNU-EAST LYNN CANAL  
HIGHWAY, ALTERNATIVE 2B  
PROJECT #71100

**2013 EIS  
PLAN VIEW**

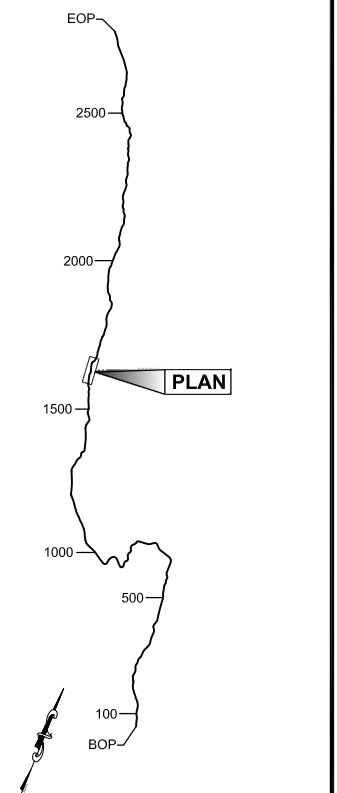
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|---------------------|--------------|
| PROJECT DESIGNATION |              |
| 71100               |              |
| STATE               | YEAR         |
| ALASKA              | 2013         |
| SHEET NUMBER        | TOTAL SHEETS |
| EL21                | 38           |



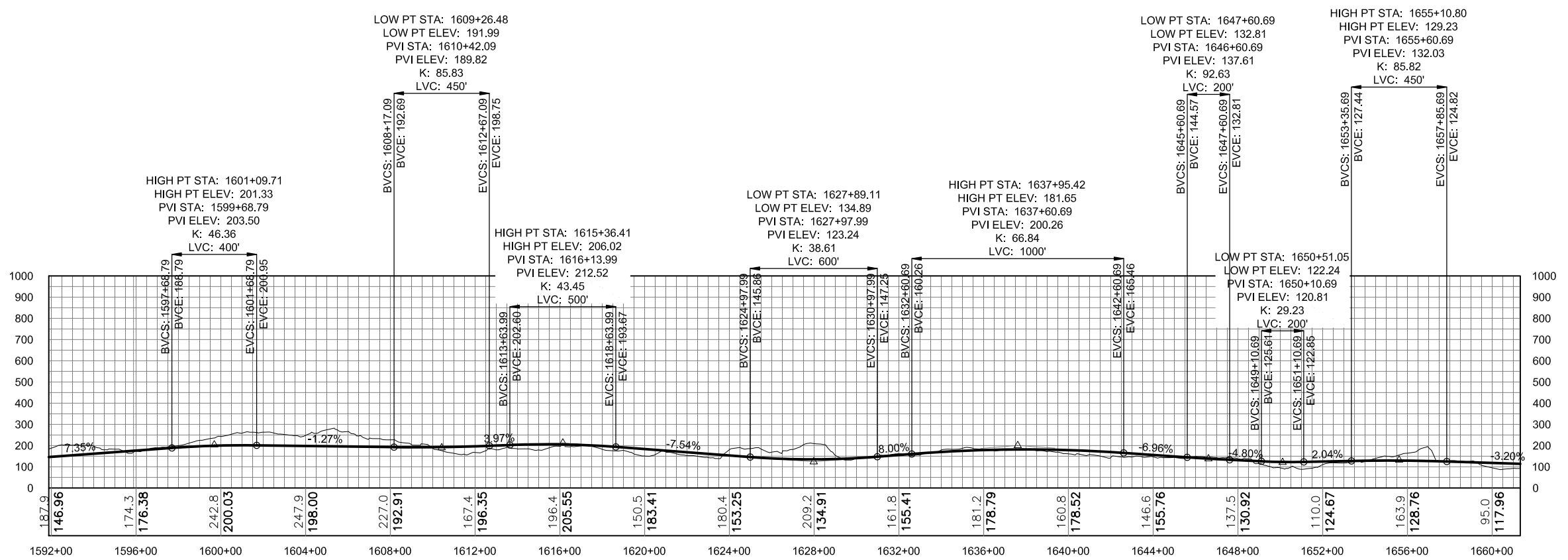
| No. | DATE | DESCRIPTION |
|-----|------|-------------|
|     |      |             |
|     |      |             |



PLAN



PLAN LEGEND



PROFILE

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& PUBLIC FACILITIES  
SOUTHEAST REGION

JNU-EAST LYNN CANAL  
HIGHWAY, ALTERNATIVE 2B  
PROJECT #71100

**2013 EIS  
PLAN VIEW**

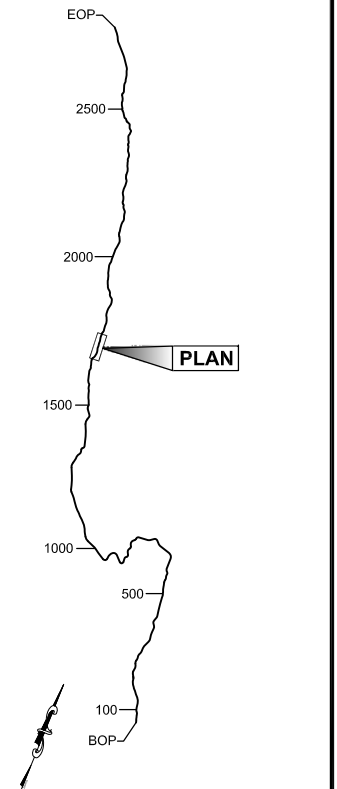
PROJECT DESIGNATION

**71100**

| STATE        | YEAR         |
|--------------|--------------|
| ALASKA       | 2013         |
| SHEET NUMBER | TOTAL SHEETS |
| EL22         | 38           |



| RECORD OF REVISIONS |      |             |
|---------------------|------|-------------|
| No.                 | DATE | DESCRIPTION |
|                     |      |             |
|                     |      |             |



**PLAN LEGEND**

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& PUBLIC FACILITIES  
SOUTHEAST REGION

**JNU-EAST LYNN CANAL  
HIGHWAY, ALTERNATIVE 2B  
PROJECT #71100**

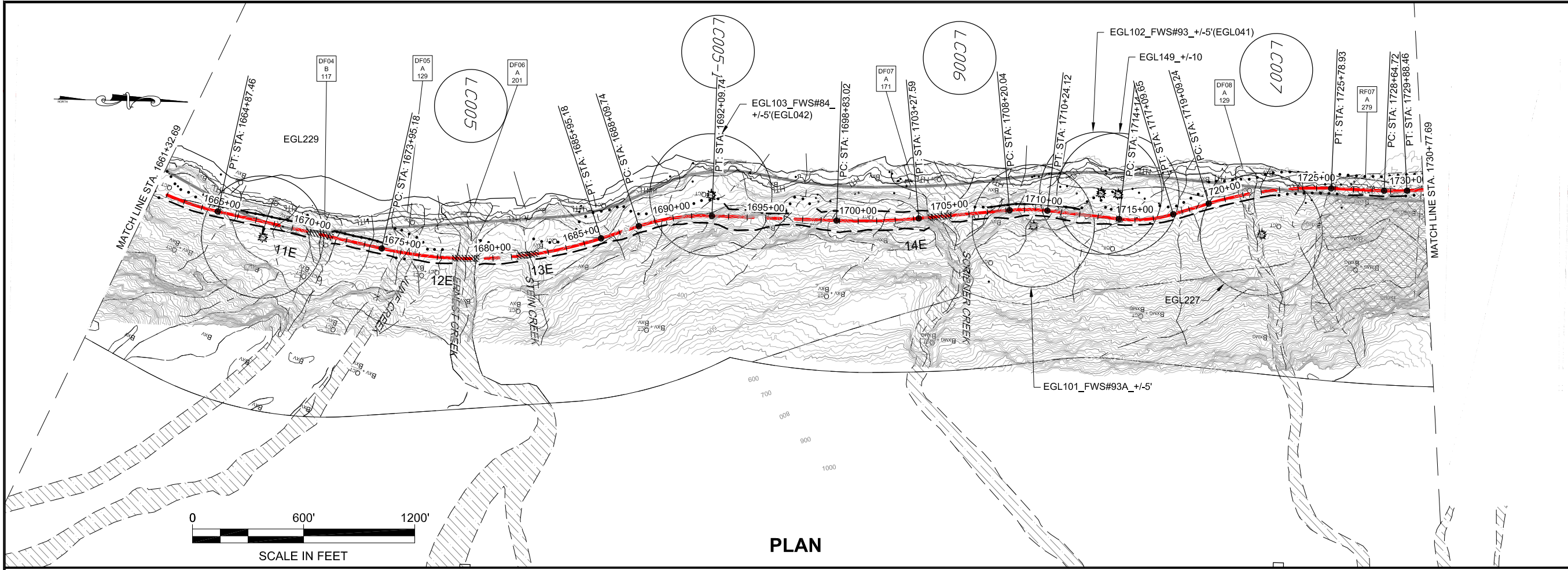
**2013 EIS  
PLAN VIEW**

PROJECT DESIGNATION

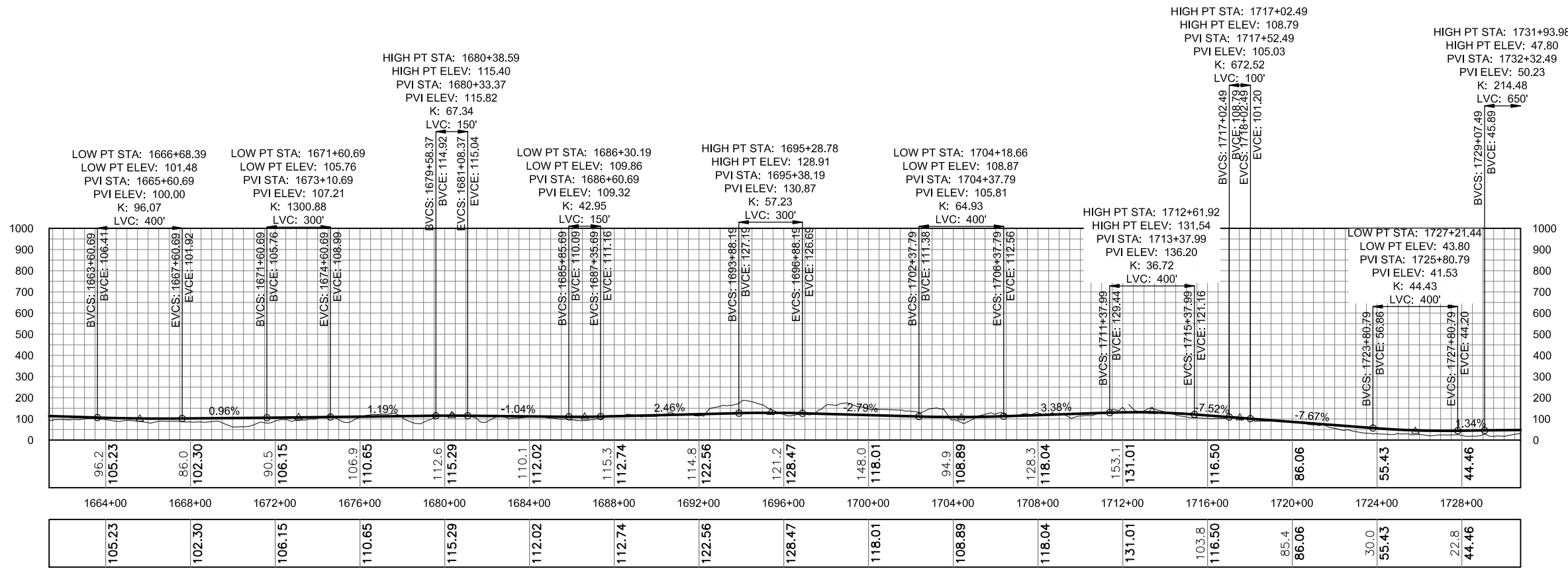
**71100**

| STATE         | YEAR        |
|---------------|-------------|
| <b>ALASKA</b> | <b>2013</b> |

| SHEET NUMBER | TOTAL SHEETS |
|--------------|--------------|
| <b>EL23</b>  | <b>38</b>    |



**PLAN**

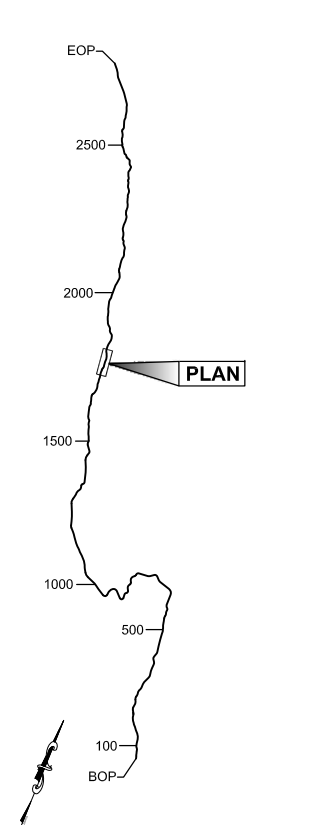


**PROFILE**

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| RECORD OF REVISIONS |      |             |
|---------------------|------|-------------|
| No.                 | DATE | DESCRIPTION |
|                     |      |             |
|                     |      |             |



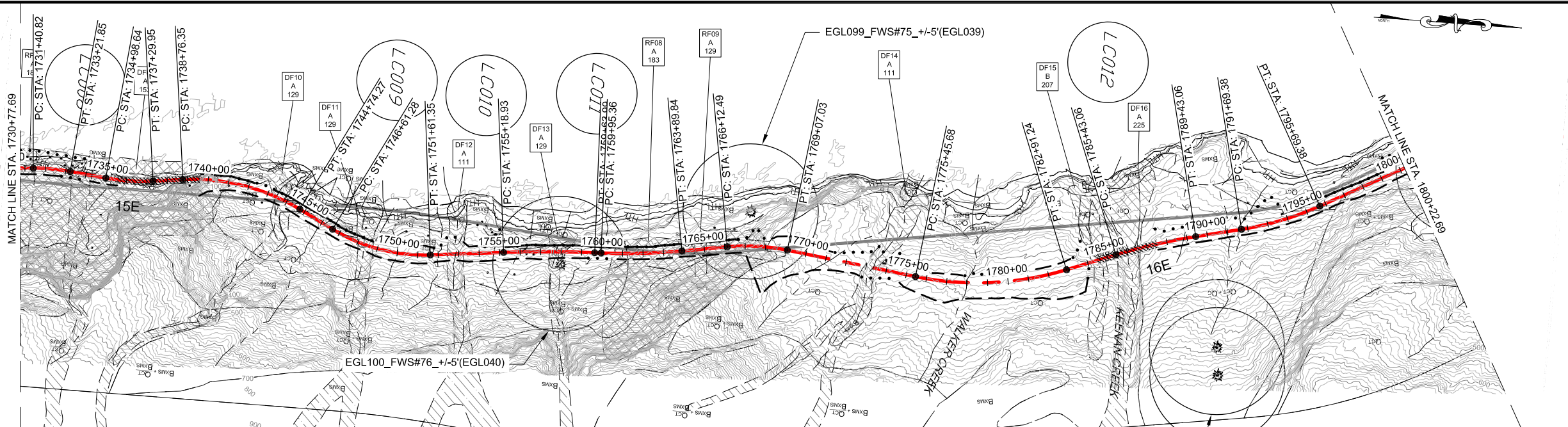
PLAN LEGEND

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DRAWN BY:

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DEPARTMENT OF TRANSPORTATION & PUBLIC FACILITIES  
SOUTHEAST REGION  
JNU-EAST LYNN CANAL  
HIGHWAY, ALTERNATIVE 2B  
PROJECT #71100

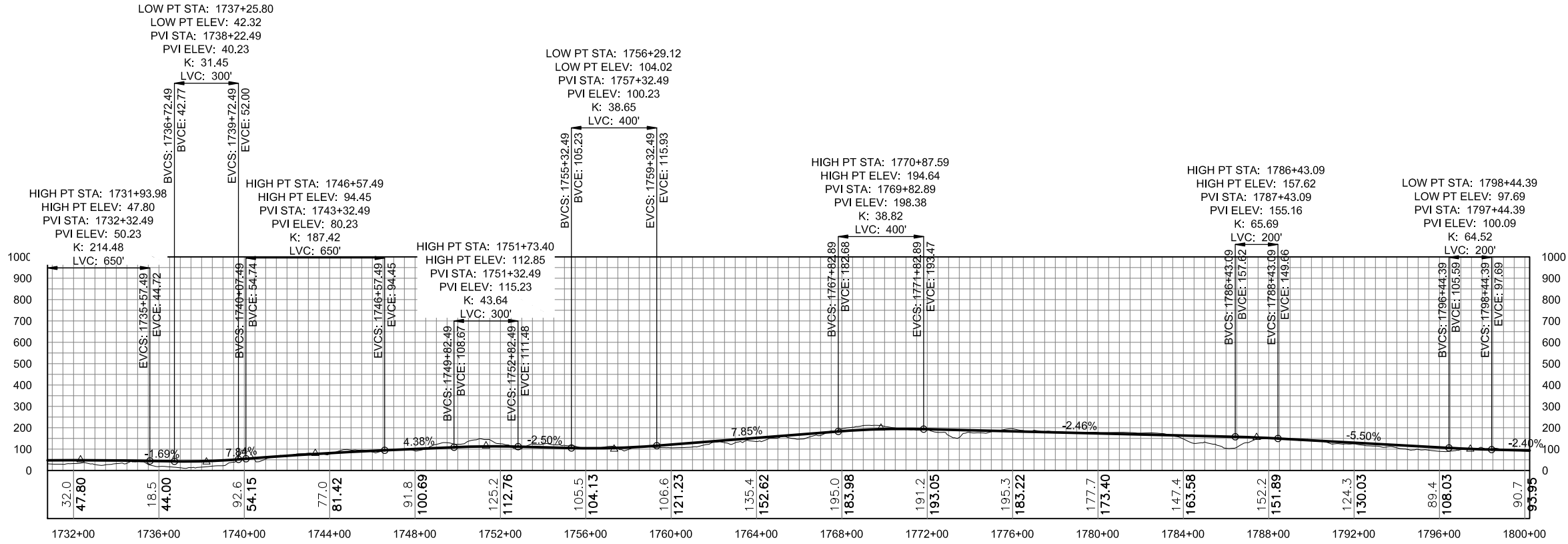
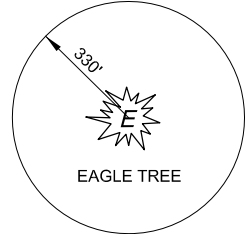
## 2012 EIS PLAN VIEW

|                     |              |
|---------------------|--------------|
| PROJECT DESIGNATION |              |
| 71100               |              |
| STATE               | YEAR         |
| ALASKA              | 2012         |
| SHEET NUMBER        | TOTAL SHEETS |
| EL24                | 38           |



### LEGEND

|  |                            |                               |               |  |                         |
|--|----------------------------|-------------------------------|---------------|--|-------------------------|
|  | CURRENT ALIGNMENT          |                               | BRIDGES       |  | AVALANCHE CHUTE         |
|  | PROPOSED FILL SLOPE        |                               | WETLAND       |  | AVALANCHE STARTING ZONE |
|  | PROPOSED CUT SLOPE         | <b>GEO HAZARD AREA LEGEND</b> |               |  |                         |
|  | PROPOSED WALL              | DF:                           | DEBRIS FLOW   |  |                         |
|  | 2006 FEIS ALIGNMENT        | HR:                           | HAZARD ROCK   |  |                         |
|  | 2008 CORP PERMIT ALIGNMENT | LS:                           | LAND SLIDE    |  |                         |
|  |                            | RF:                           | ROCK FALL     |  |                         |
|  |                            | RS:                           | ROCK SLIDE    |  |                         |
|  |                            | SR:                           | SOIL RAVELING |  |                         |



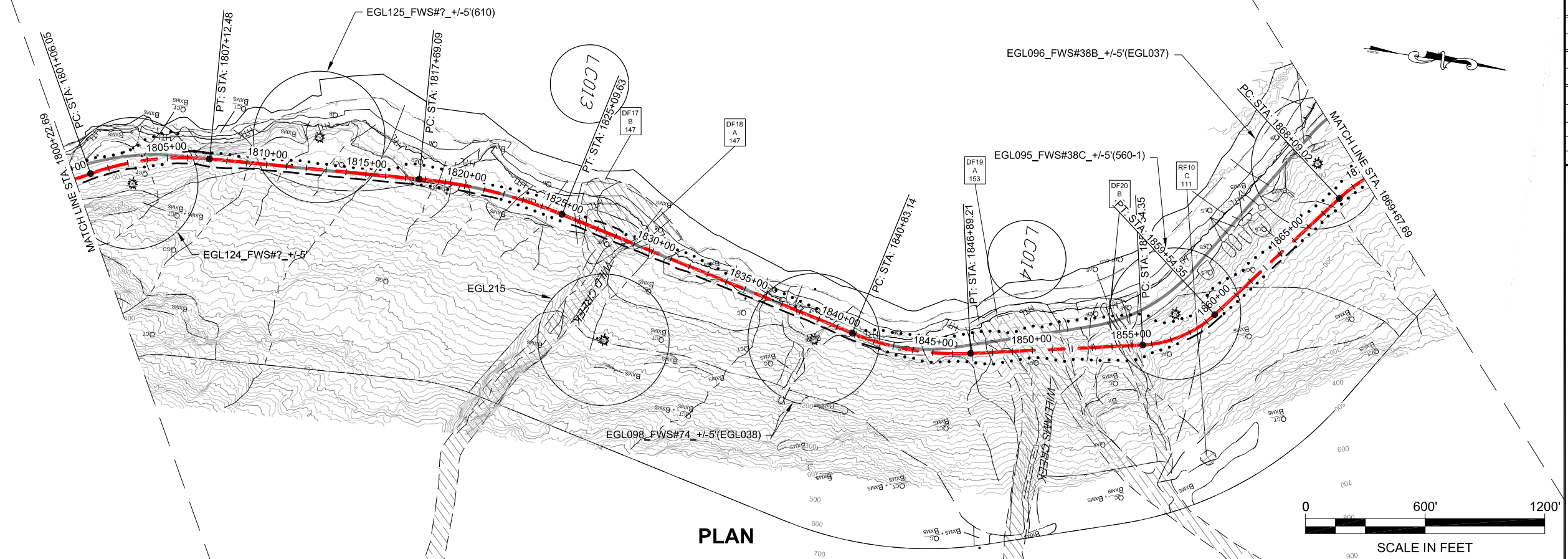
PROFILE

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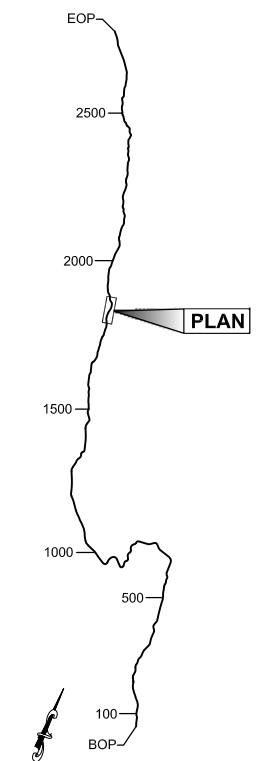
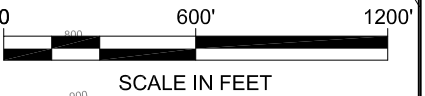




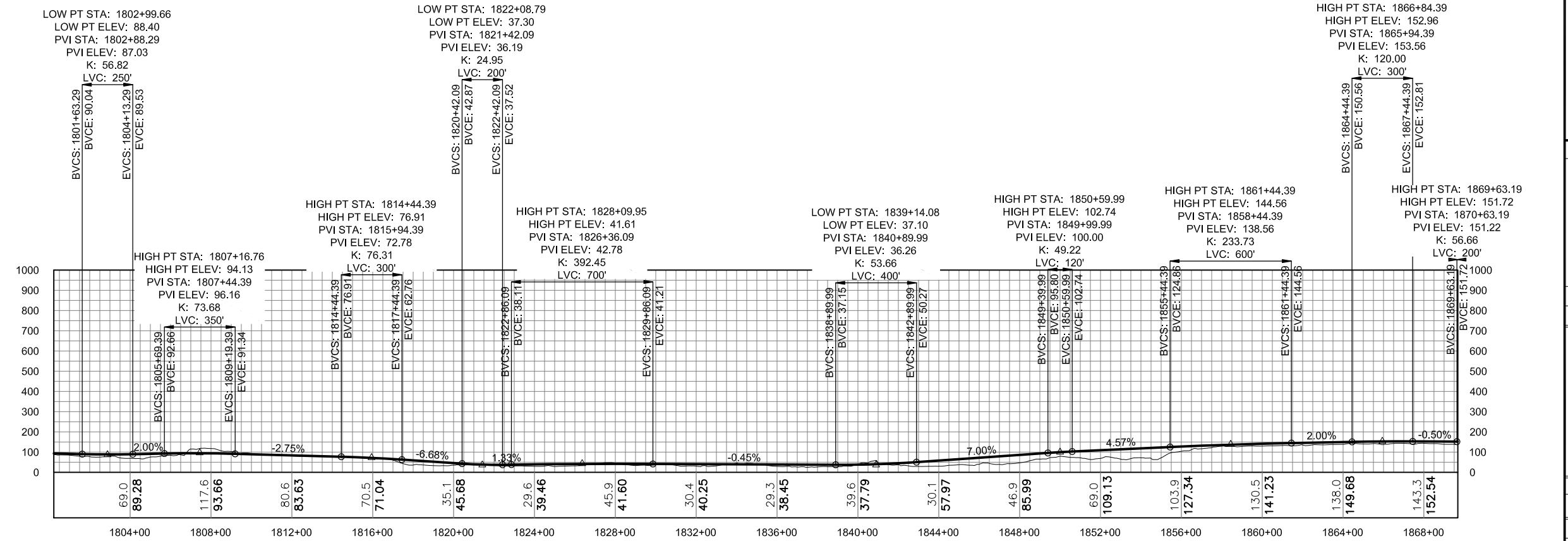
| No. | DATE | DESCRIPTION |
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PLAN



PLAN LEGEND



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& PUBLIC FACILITIES  
SOUTHEAST REGION

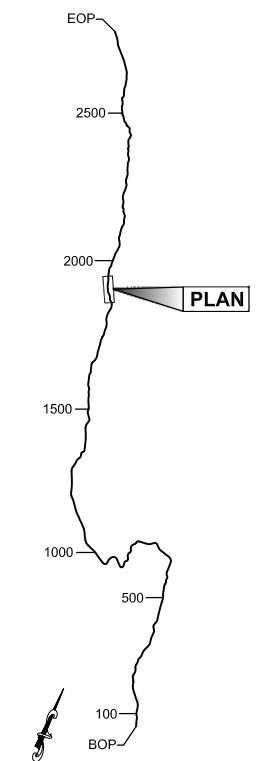
JNU-EAST LYNN CANAL  
HIGHWAY, ALTERNATIVE 2B  
PROJECT #71100

**2013 EIS  
PLAN VIEW**

| PROJECT DESIGNATION |              |
|---------------------|--------------|
| <b>71100</b>        |              |
| STATE               | YEAR         |
| <b>ALASKA</b>       | <b>2013</b>  |
| SHEET NUMBER        | TOTAL SHEETS |
| <b>EL25</b>         | <b>38</b>    |



| No. | DATE | DESCRIPTION |
|-----|------|-------------|
|     |      |             |
|     |      |             |



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& PUBLIC FACILITIES  
SOUTHEAST REGION

JNU-EAST LYNN CANAL  
HIGHWAY, ALTERNATIVE 2B  
PROJECT #71100

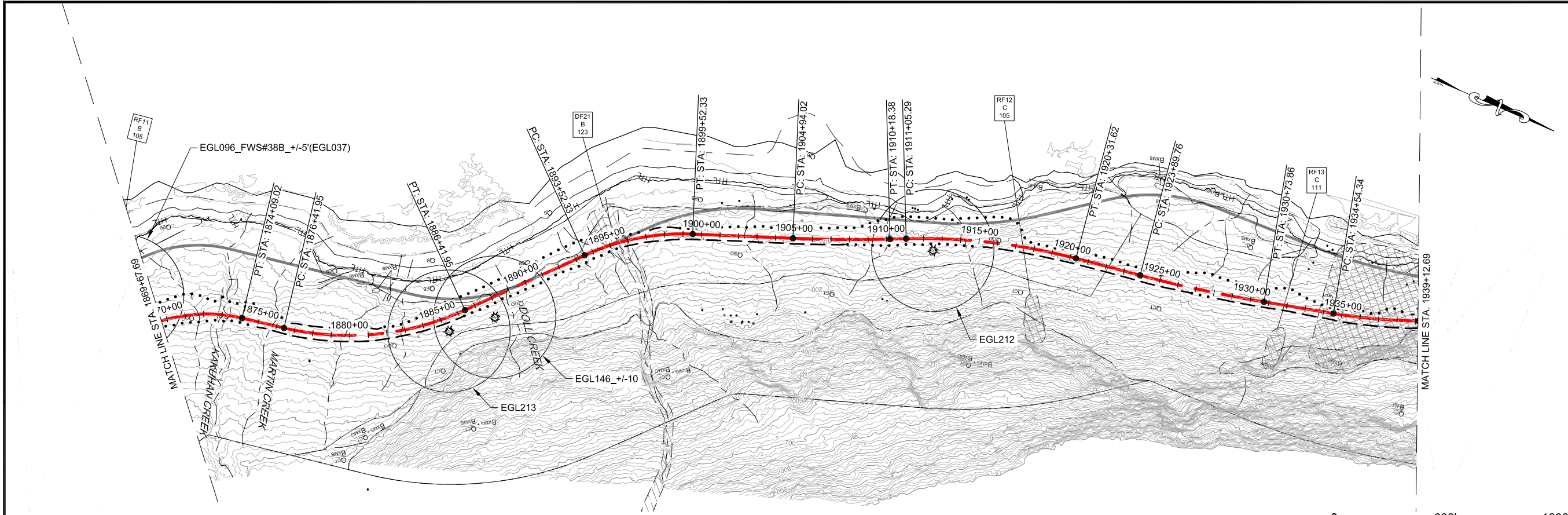
**2013 EIS  
PLAN VIEW**

PROJECT DESIGNATION

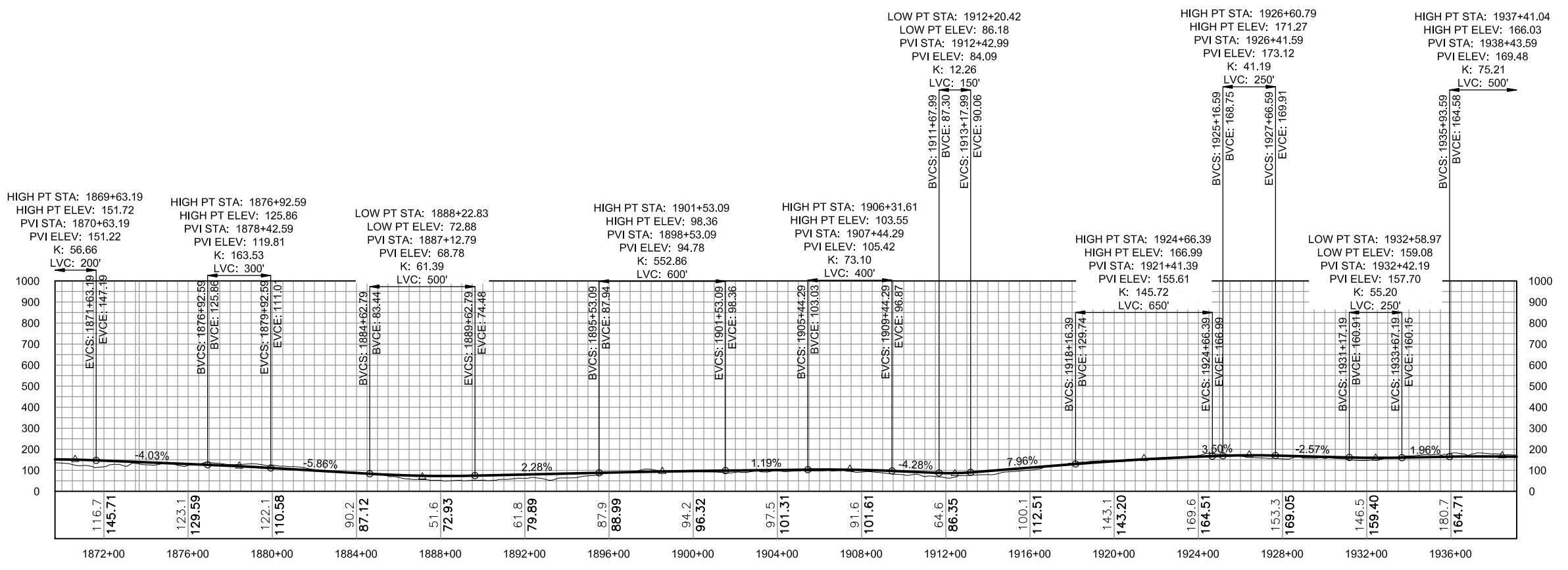
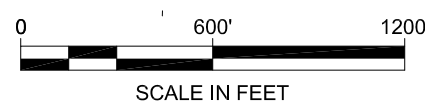
**71100**

|               |             |
|---------------|-------------|
| STATE         | YEAR        |
| <b>ALASKA</b> | <b>2013</b> |

|              |              |
|--------------|--------------|
| SHEET NUMBER | TOTAL SHEETS |
| <b>EL26</b>  | <b>38</b>    |



**PLAN**

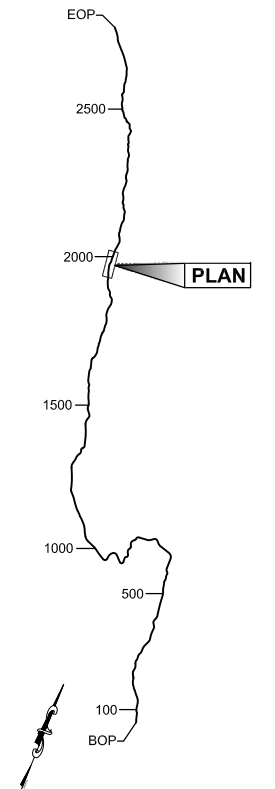


**PROFILE**

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| No. | DATE | DESCRIPTION |
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DRAWN BY:

STATE OF ALASKA  
 DEPARTMENT OF TRANSPORTATION  
 & PUBLIC FACILITIES  
 SOUTHEAST REGION

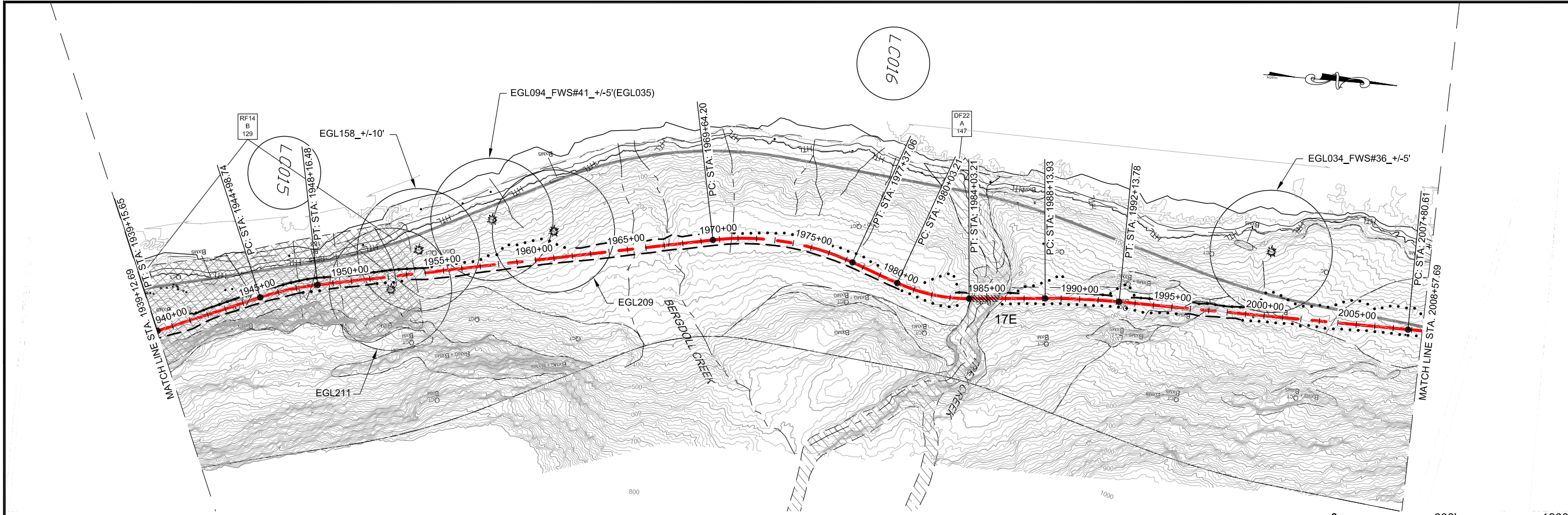
JNU-EAST LYNN CANAL  
 HIGHWAY, ALTERNATIVE 2B  
 PROJECT #71100

**2013 EIS  
 PLAN VIEW**

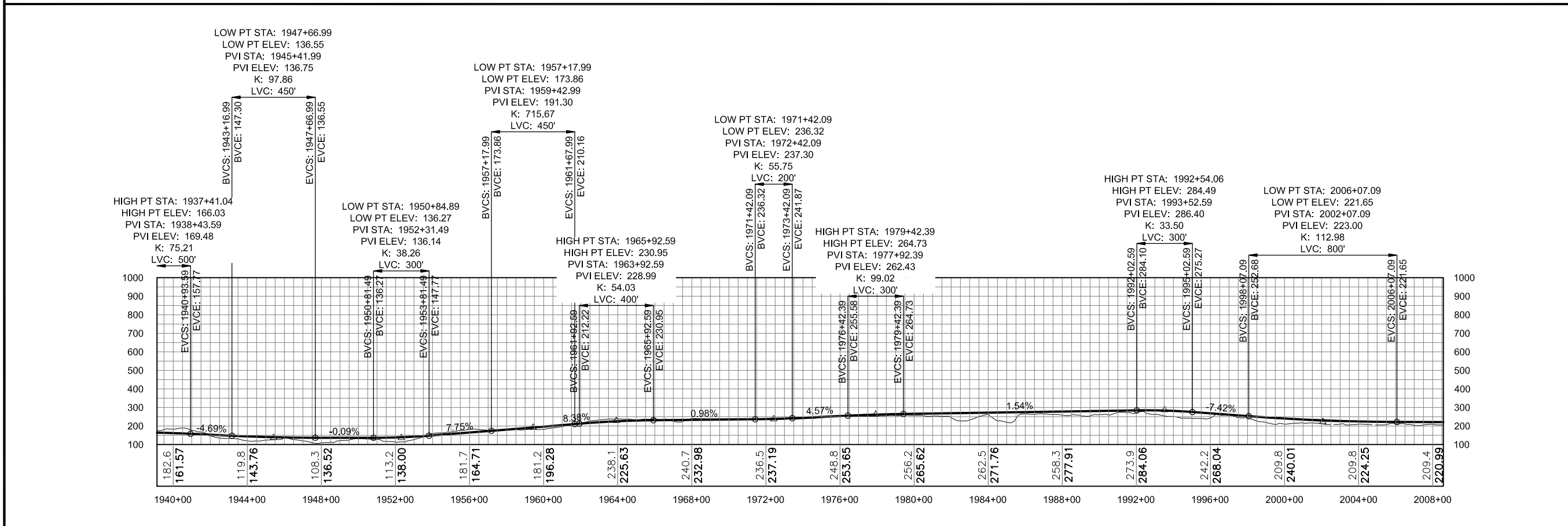
PROJECT DESIGNATION  
**71100**

| STATE         | YEAR        |
|---------------|-------------|
| <b>ALASKA</b> | <b>2013</b> |

| SHEET NUMBER | TOTAL SHEETS |
|--------------|--------------|
| <b>EL27</b>  | <b>38</b>    |



PLAN

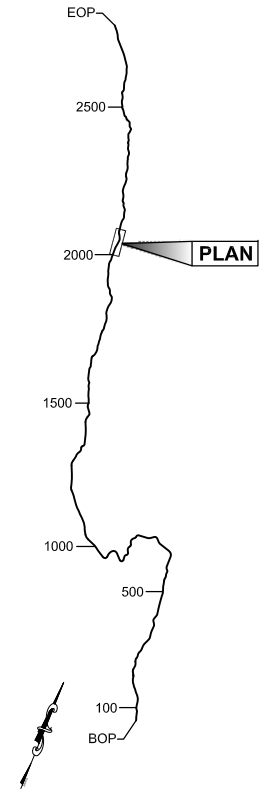


PROFILE

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| No. | DATE | DESCRIPTION |
|-----|------|-------------|
|     |      |             |
|     |      |             |



PLAN LEGEND

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STATE OF ALASKA  
DEPARTMENT OF TRANSPORTATION  
& PUBLIC FACILITIES  
SOUTHEAST REGION

JNU-EAST LYNN CANAL  
HIGHWAY, ALTERNATIVE 2B  
PROJECT #71100

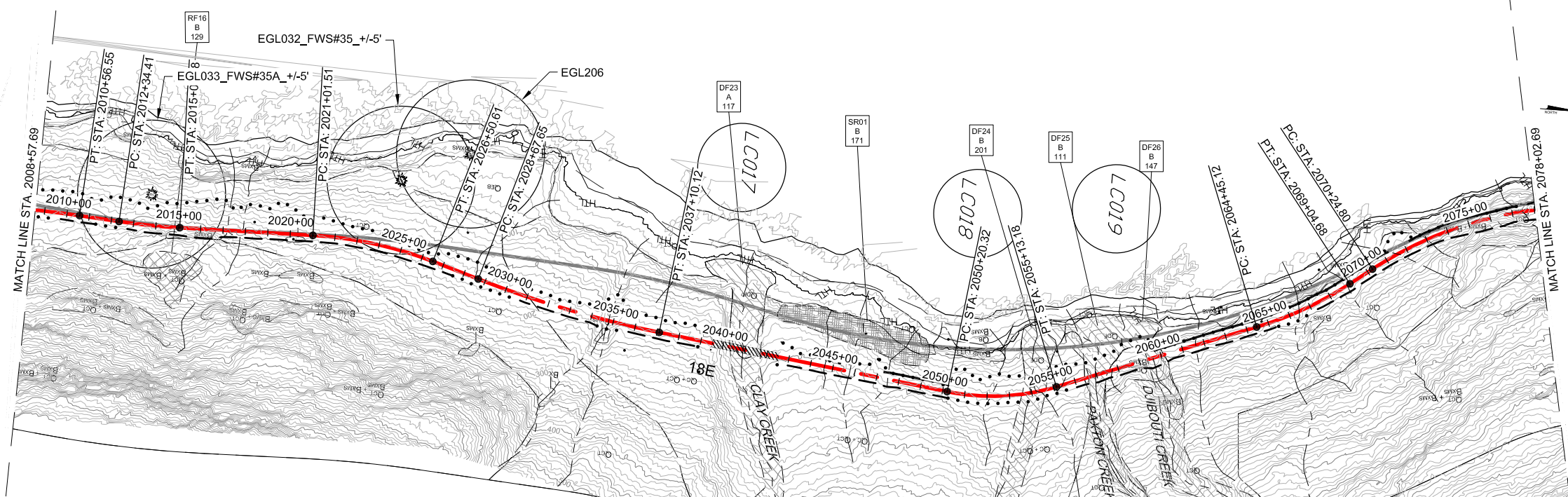
**2013 EIS  
PLAN VIEW**

PROJECT DESIGNATION

**71100**

|               |             |
|---------------|-------------|
| STATE         | YEAR        |
| <b>ALASKA</b> | <b>2013</b> |

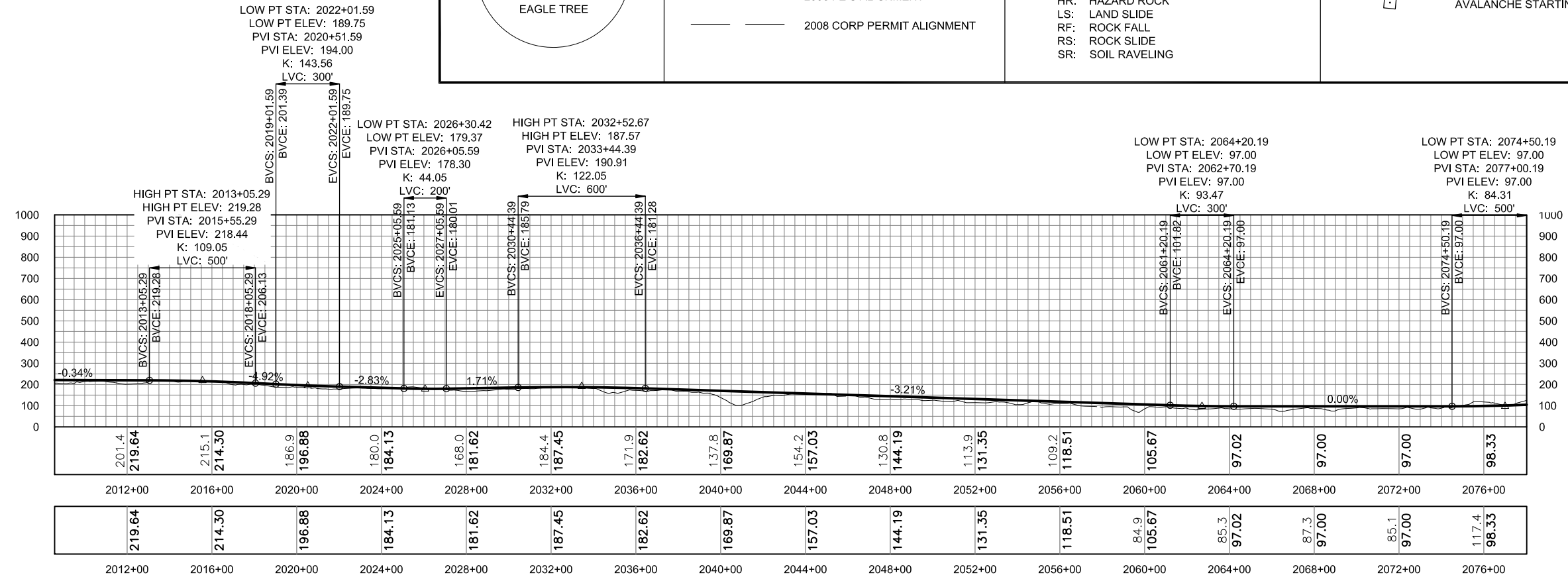
|              |              |
|--------------|--------------|
| SHEET NUMBER | TOTAL SHEETS |
| <b>EL28</b>  | <b>38</b>    |



PLAN

### LEGEND

|  |                            |   |         |  |                         |
|--|----------------------------|---|---------|--|-------------------------|
|  | CURRENT ALIGNMENT          |   | BRIDGES |  | AVALANCHE CHUTE         |
|  | PROPOSED FILL SLOPE        |   | WETLAND |  | AVALANCHE STARTING ZONE |
|  | PROPOSED CUT SLOPE         | <b>GEO HAZARD AREA LEGEND</b><br>DF: DEBRIS FLOW<br>HR: HAZARD ROCK<br>LS: LAND SLIDE<br>RF: ROCK FALL<br>RS: ROCK SLIDE<br>SR: SOIL RAVELING |         |  |                         |
|  | PROPOSED WALL              |   |         |  |                         |
|  | 2006 FEIS ALIGNMENT        |   |         |  |                         |
|  | 2008 CORP PERMIT ALIGNMENT |   |         |  |                         |



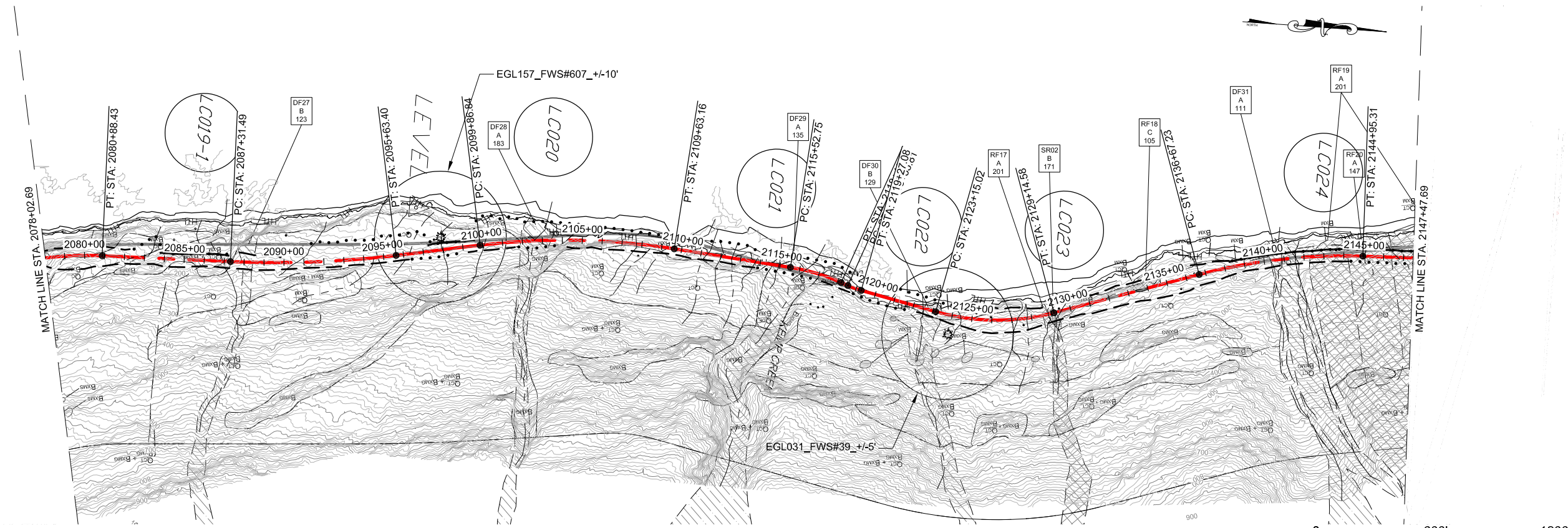
PROFILE

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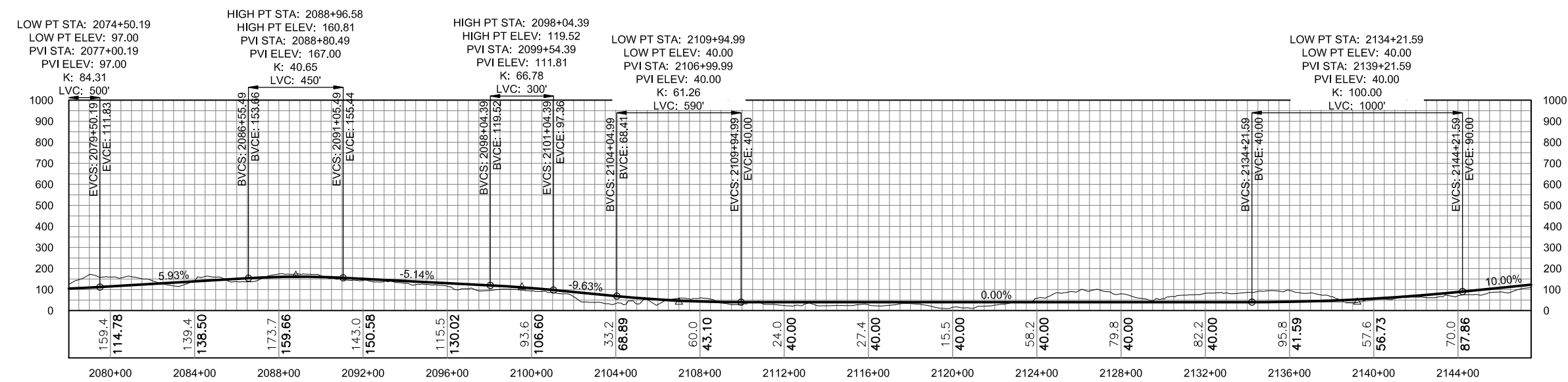
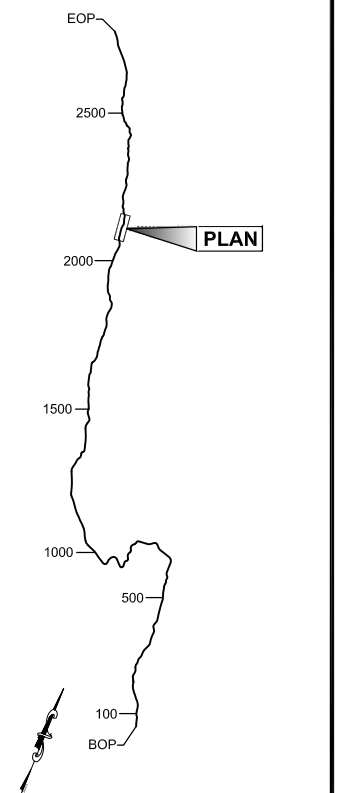




| No. | DATE | DESCRIPTION |
|-----|------|-------------|
|     |      |             |
|     |      |             |



PLAN



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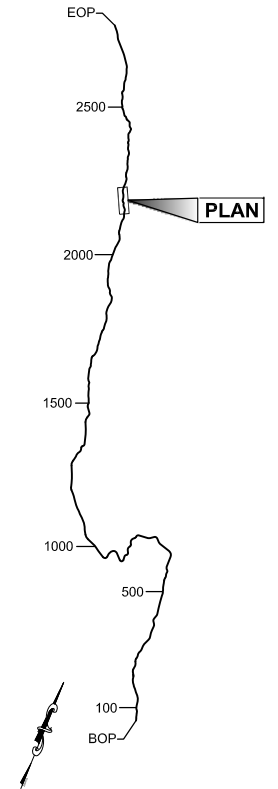
STATE OF ALASKA  
DEPARTMENT OF TRANSPORTATION  
& PUBLIC FACILITIES  
SOUTHEAST REGION

JNU-EAST LYNN CANAL  
HIGHWAY, ALTERNATIVE 2B  
PROJECT #71100

2013 EIS  
PLAN VIEW

| PROJECT DESIGNATION |              |
|---------------------|--------------|
| <b>71100</b>        |              |
| STATE               | YEAR         |
| <b>ALASKA</b>       | <b>2013</b>  |
| SHEET NUMBER        | TOTAL SHEETS |
| <b>EL29</b>         | <b>38</b>    |





PLAN LEGEND

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DEPARTMENT OF TRANSPORTATION & PUBLIC FACILITIES  
SOUTHEAST REGION

JNU-EAST LYNN CANAL  
HIGHWAY, ALTERNATIVE 2B  
PROJECT #71100

**2013 EIS  
PLAN VIEW**

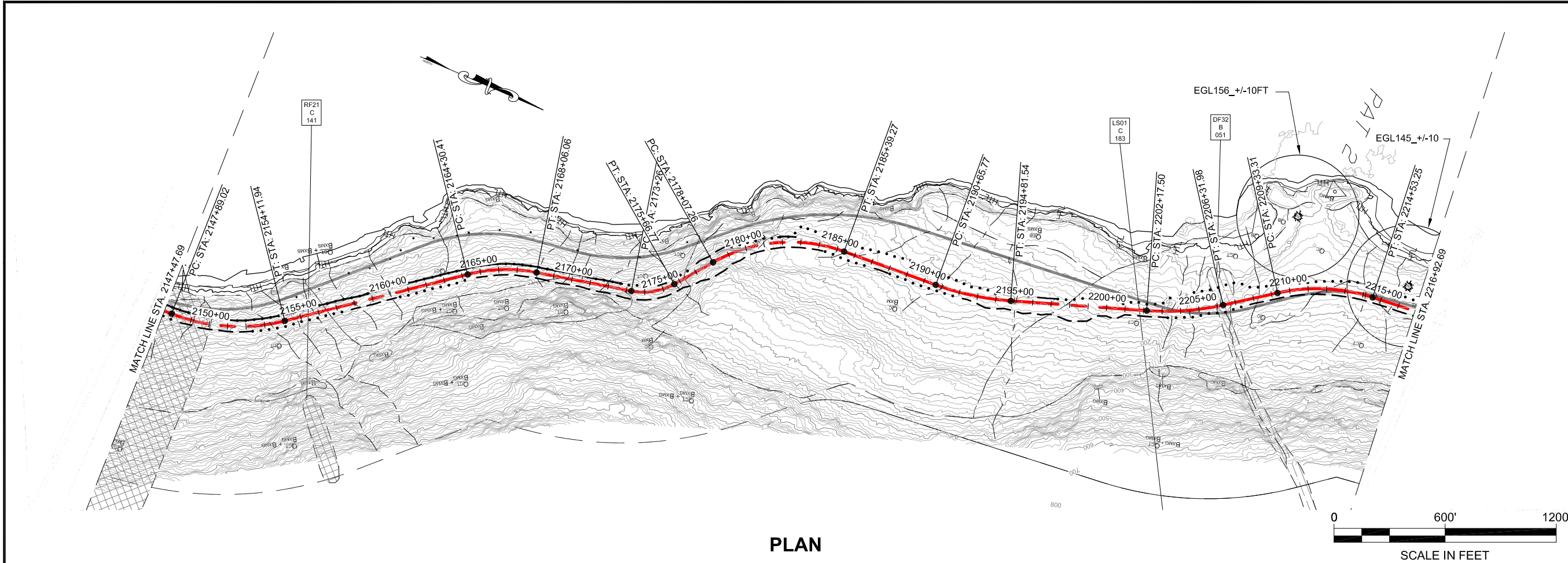
PROJECT DESIGNATION

**71100**

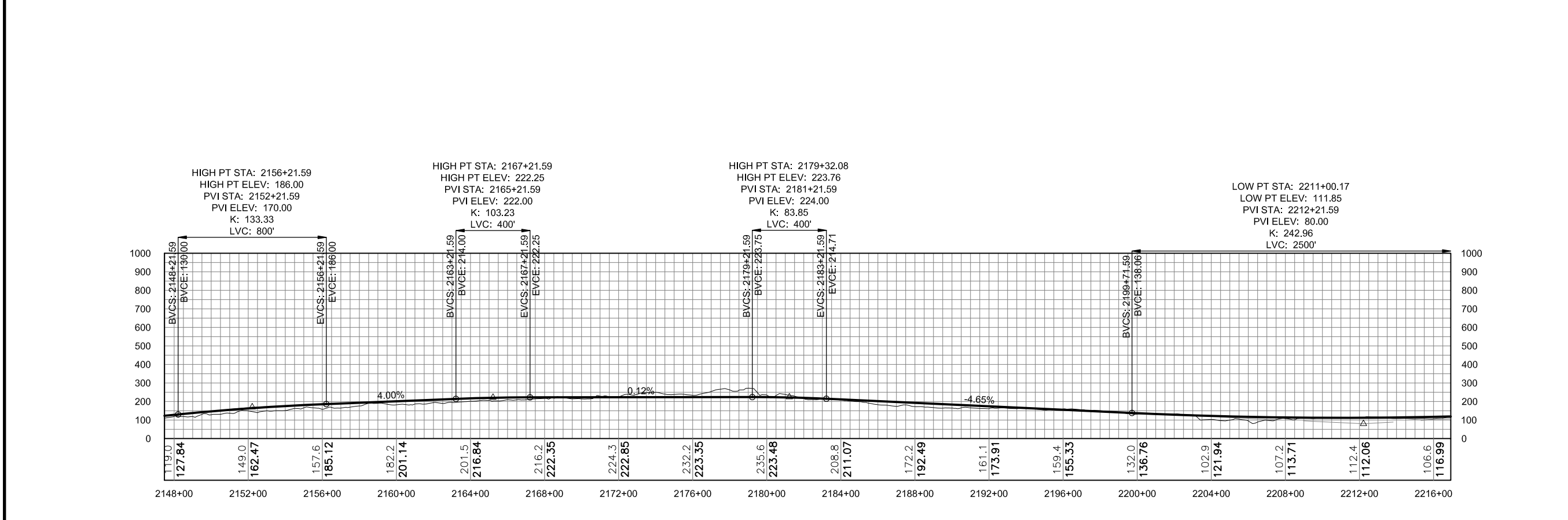
| STATE         | YEAR        |
|---------------|-------------|
| <b>ALASKA</b> | <b>2013</b> |

| SHEET NUMBER | TOTAL SHEETS |
|--------------|--------------|
| <b>EL30</b>  | <b>38</b>    |

| SHEET NUMBER | TOTAL SHEETS |
|--------------|--------------|
| <b>EL30</b>  | <b>38</b>    |



PLAN

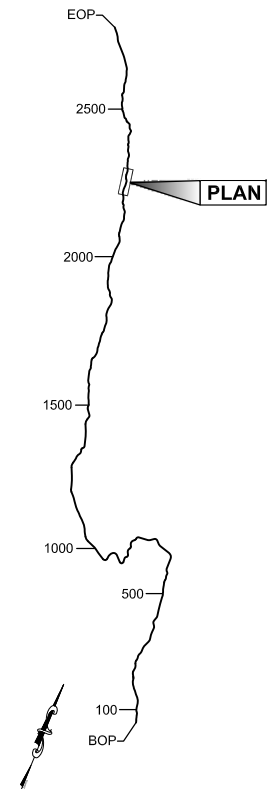


PROFILE

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| No. | DATE | DESCRIPTION |
|-----|------|-------------|
|     |      |             |
|     |      |             |



PLAN LEGEND

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DRAWN BY:

STATE OF ALASKA  
DEPARTMENT OF TRANSPORTATION  
& PUBLIC FACILITIES  
SOUTHEAST REGION

JNU-EAST LYNN CANAL  
HIGHWAY, ALTERNATIVE 2B  
PROJECT #71100

**2013 EIS  
PLAN VIEW**

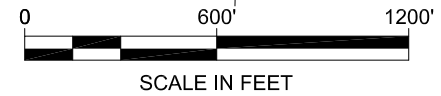
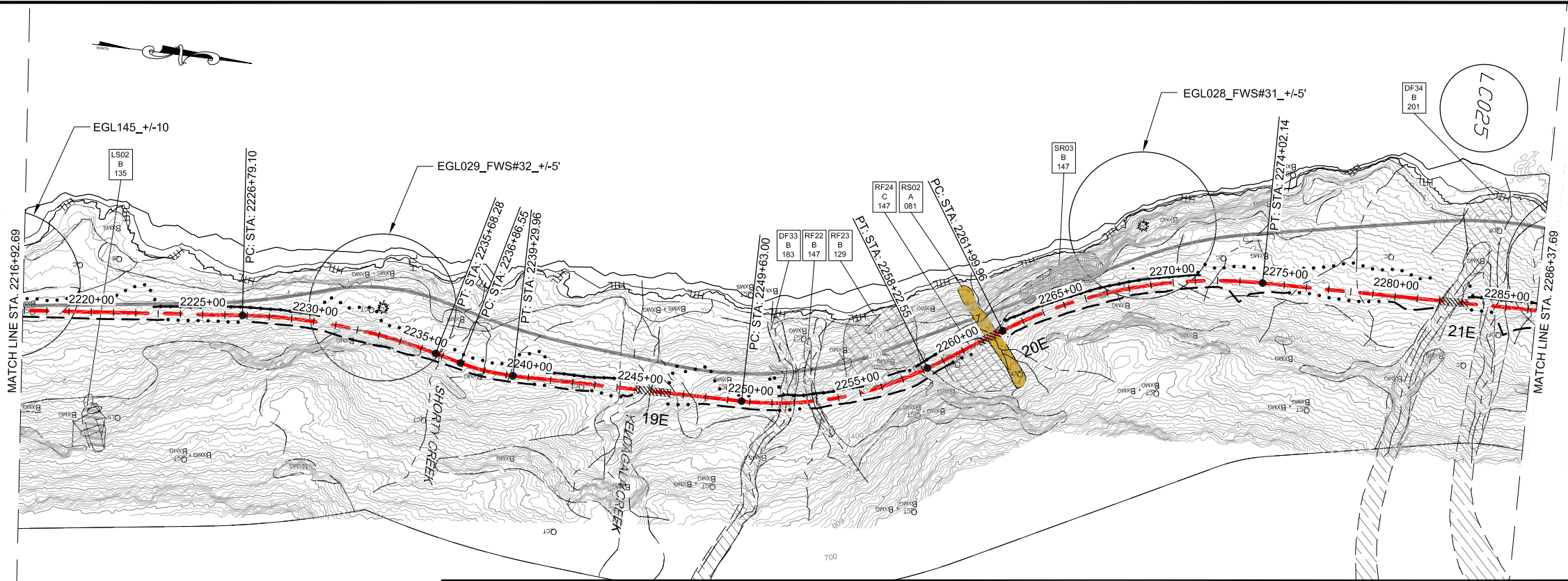
PROJECT DESIGNATION

**71100**

STATE ALASKA YEAR 2013

SHEET NUMBER TOTAL SHEETS

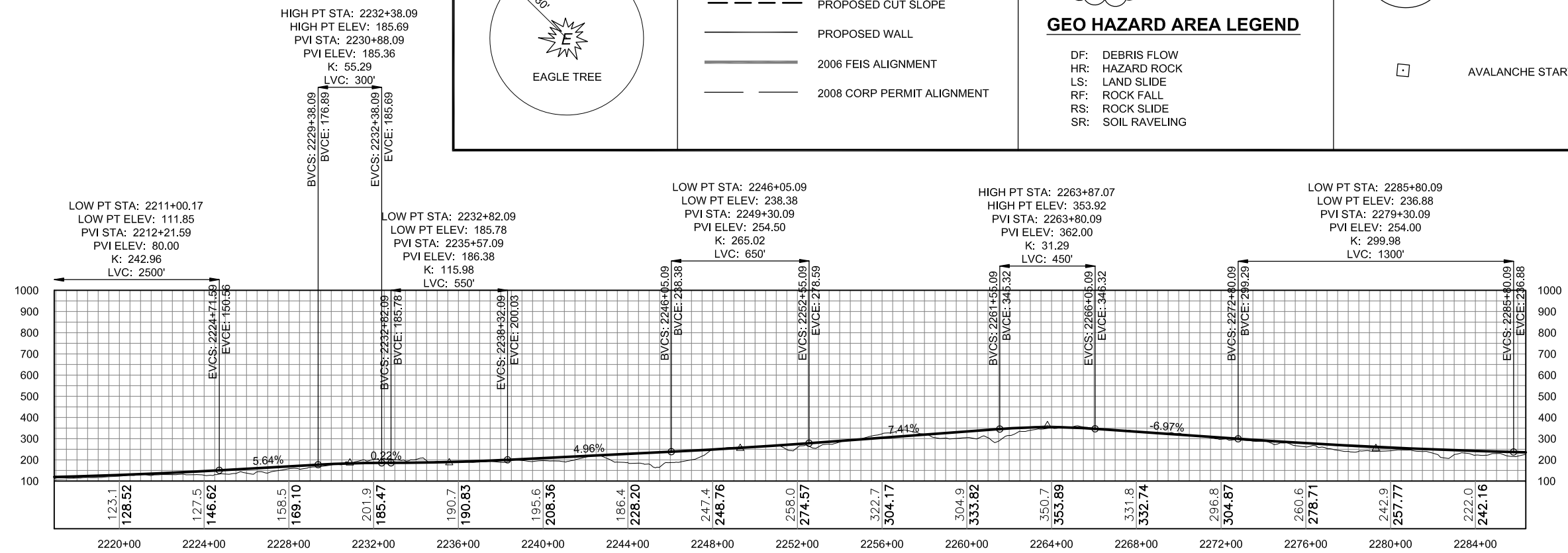
EL31 38



PLAN

**LEGEND**

|  |                            |                               |               |  |                         |
|--|----------------------------|-------------------------------|---------------|--|-------------------------|
|  | CURRENT ALIGNMENT          |                               | BRIDGES       |  | AVALANCHE CHUTE         |
|  | PROPOSED FILL SLOPE        |                               | WETLAND       |  | AVALANCHE STARTING ZONE |
|  | PROPOSED CUT SLOPE         | <b>GEO HAZARD AREA LEGEND</b> |               |  |                         |
|  | PROPOSED WALL              | DF:                           | DEBRIS FLOW   |  |                         |
|  | 2006 FEIS ALIGNMENT        | HR:                           | HAZARD ROCK   |  |                         |
|  | 2008 CORP PERMIT ALIGNMENT | LS:                           | LAND SLIDE    |  |                         |
|  |                            | RF:                           | ROCK FALL     |  |                         |
|  |                            | RS:                           | ROCK SLIDE    |  |                         |
|  |                            | SR:                           | SOIL RAVELING |  |                         |

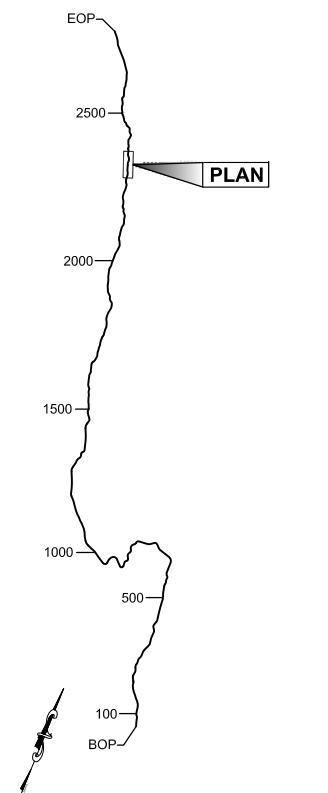


PROFILE

DO NOT SCALE FROM THESE DRAWINGS USE DIMENSIONS



| No. | DATE | DESCRIPTION |
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|     |      |             |
|     |      |             |



PLAN LEGEND

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DRAWN BY:

STATE OF ALASKA  
DEPARTMENT OF TRANSPORTATION  
& PUBLIC FACILITIES  
SOUTHEAST REGION

JNU-EAST LYNN CANAL  
HIGHWAY, ALTERNATIVE 2B  
PROJECT #71100

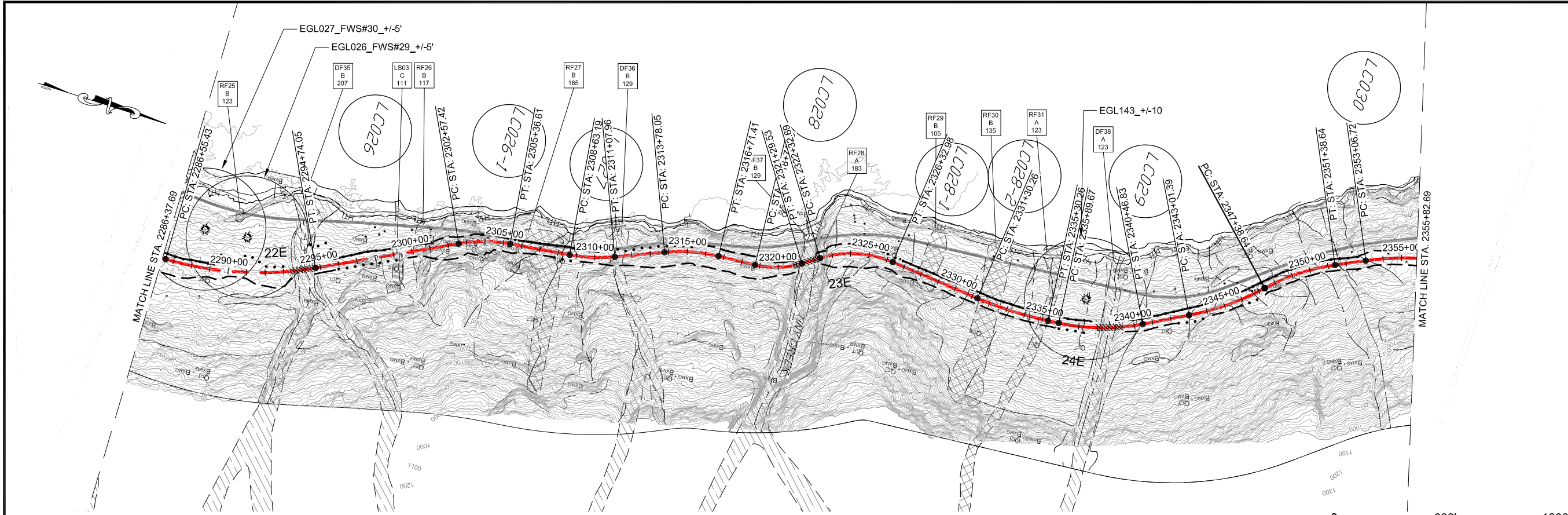
**2013 EIS  
PLAN VIEW**

PROJECT DESIGNATION

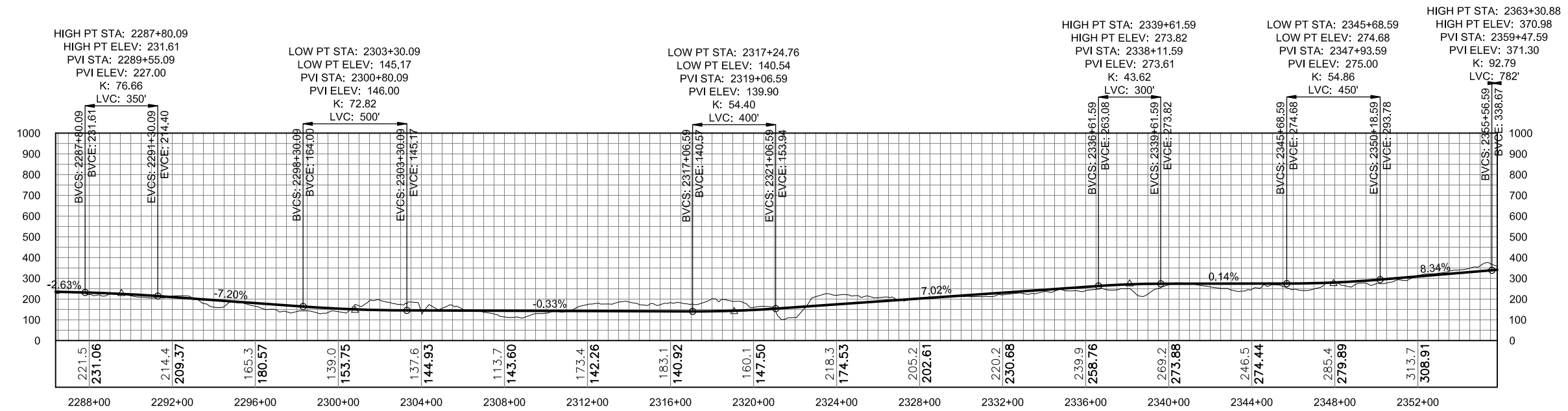
**71100**

|               |             |
|---------------|-------------|
| STATE         | YEAR        |
| <b>ALASKA</b> | <b>2013</b> |

|              |              |
|--------------|--------------|
| SHEET NUMBER | TOTAL SHEETS |
| <b>EL32</b>  | <b>38</b>    |



PLAN



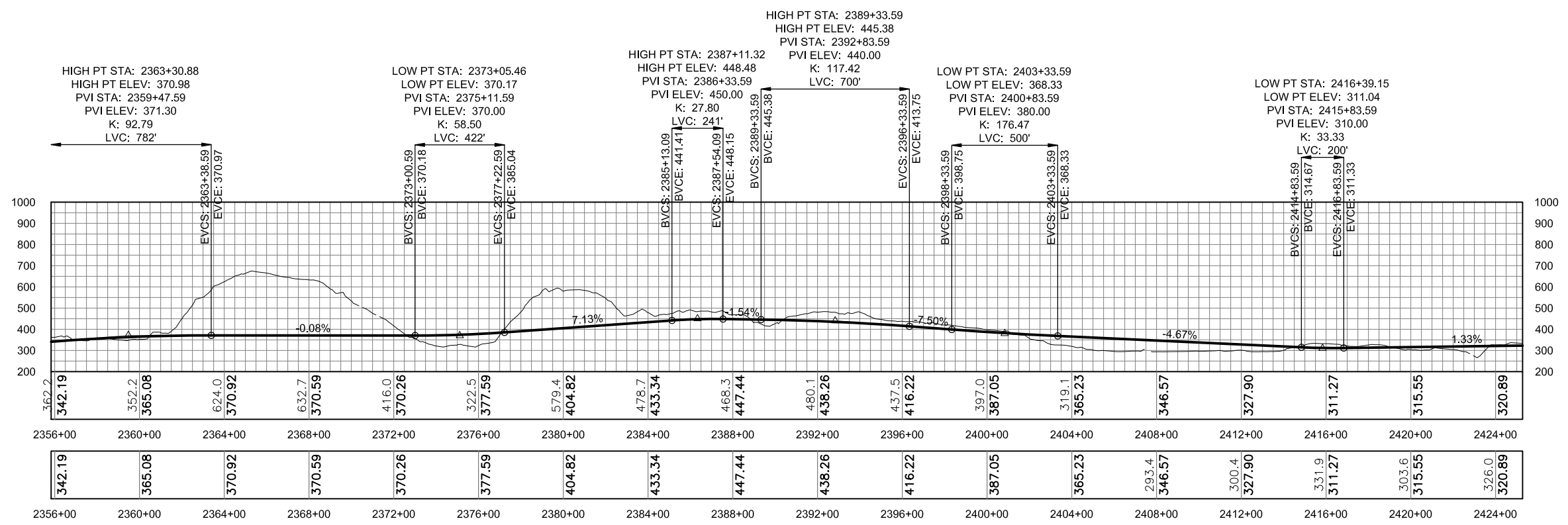
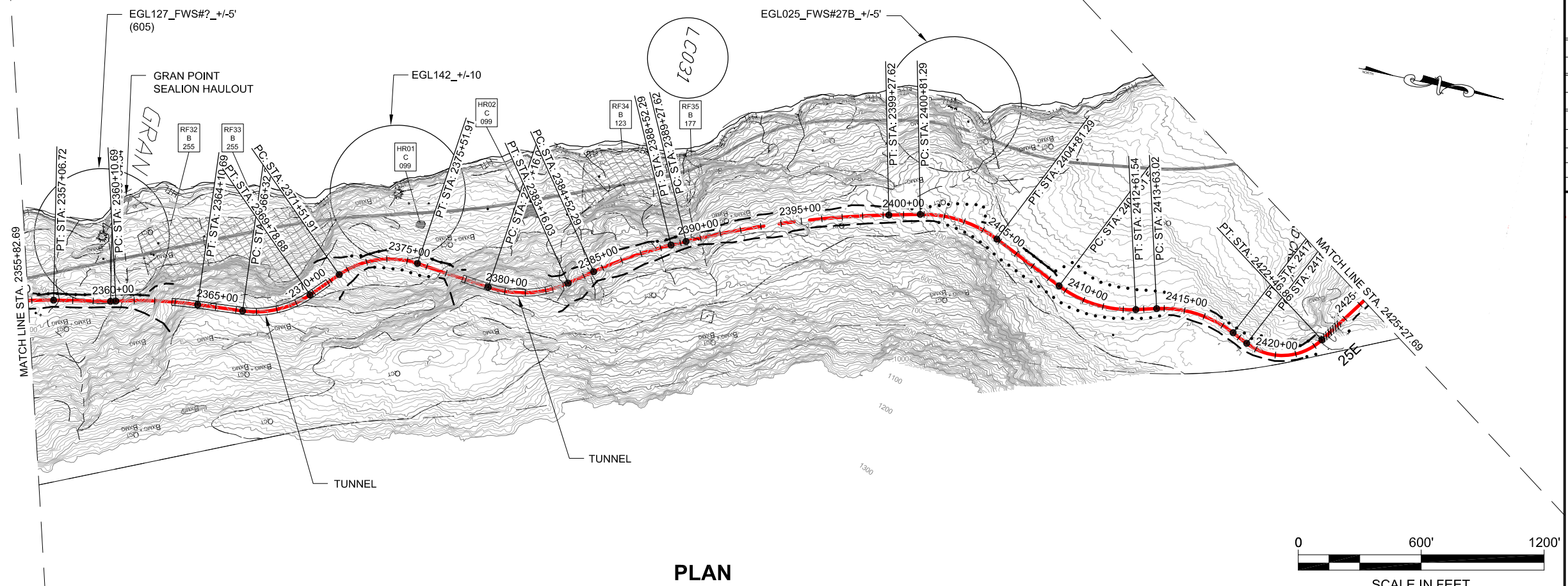
PROFILE

DO NOT SCALE FROM THESE DRAWINGS USE DIMENSIONS





| No. | DATE | DESCRIPTION |
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|     |      |             |



**PLAN LEGEND**

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& PUBLIC FACILITIES  
SOUTHEAST REGION

JNU-EAST LYNN CANAL  
HIGHWAY, ALTERNATIVE 2B  
PROJECT #71100

**2013 EIS  
PLAN VIEW**

PROJECT DESIGNATION

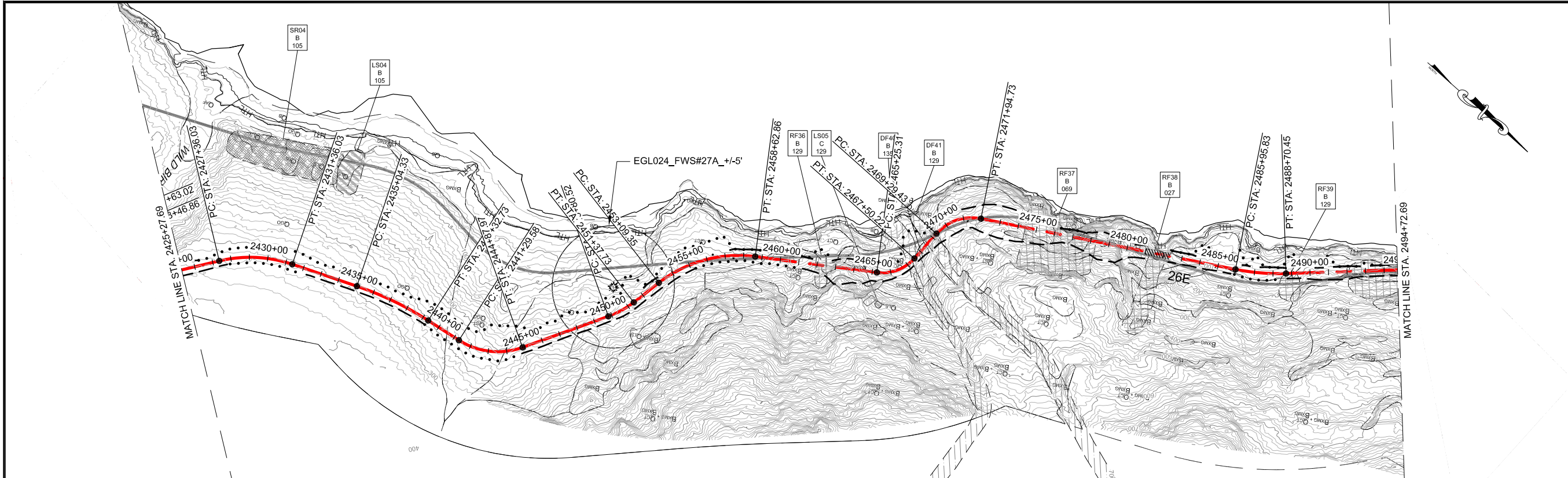
**71100**

| STATE         | YEAR        |
|---------------|-------------|
| <b>ALASKA</b> | <b>2013</b> |

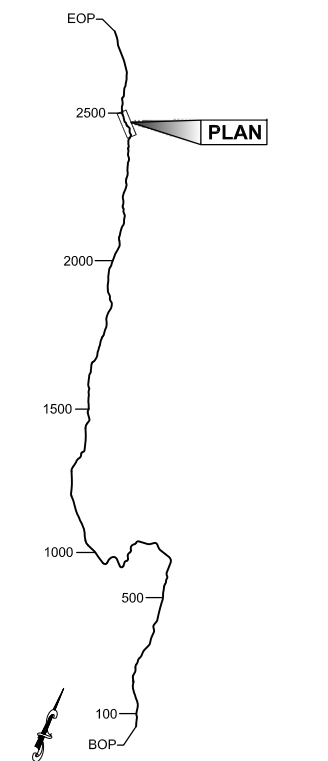
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|--------------|--------------|
| <b>EL33</b>  | <b>38</b>    |



| ADDENDUM NUMBER     |      |             |
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| ATTACHMENT NUMBER   |      |             |
| RECORD OF REVISIONS |      |             |
| No.                 | DATE | DESCRIPTION |
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PLAN



PLAN LEGEND

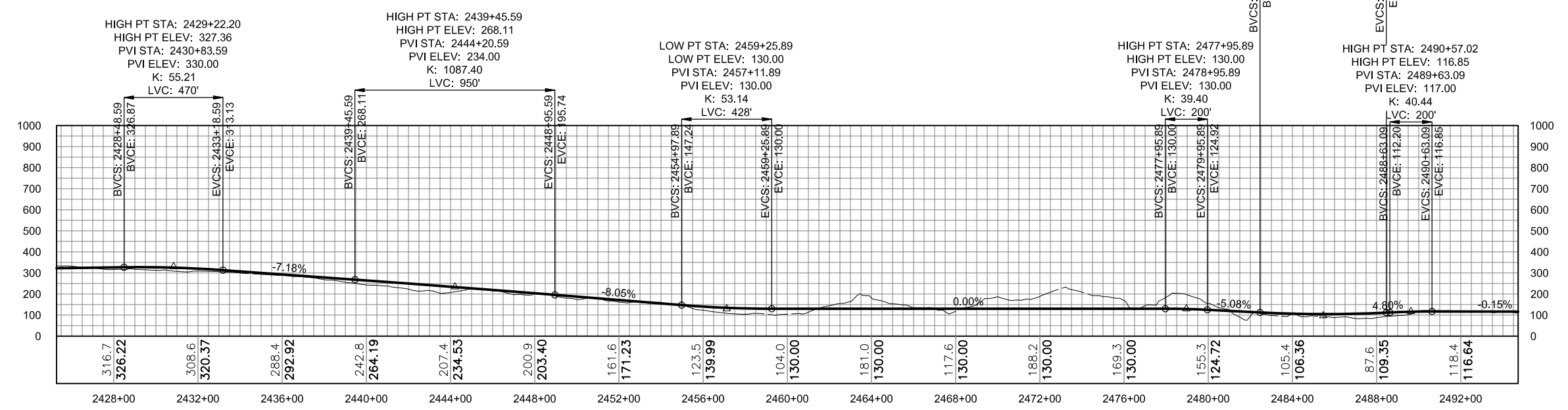
EAGLE TREE

**LEGEND**

- +—+— CURRENT ALIGNMENT
- ..... PROPOSED FILL SLOPE
- PROPOSED CUT SLOPE
- PROPOSED WALL
- 2006 FEIS ALIGNMENT
- 2008 CORP PERMIT ALIGNMENT

**GEO HAZARD AREA LEGEND**

- BRIDGES
- WETLAND
- DF: DEBRIS FLOW
- HR: HAZARD ROCK
- LS: LAND SLIDE
- RF: ROCK FALL
- RS: ROCK SLIDE
- SR: SOIL RAVELING
- AVALANCHE CHUTE
- AVALANCHE STARTING ZONE



PROFILE

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& PUBLIC FACILITIES  
SOUTHEAST REGION

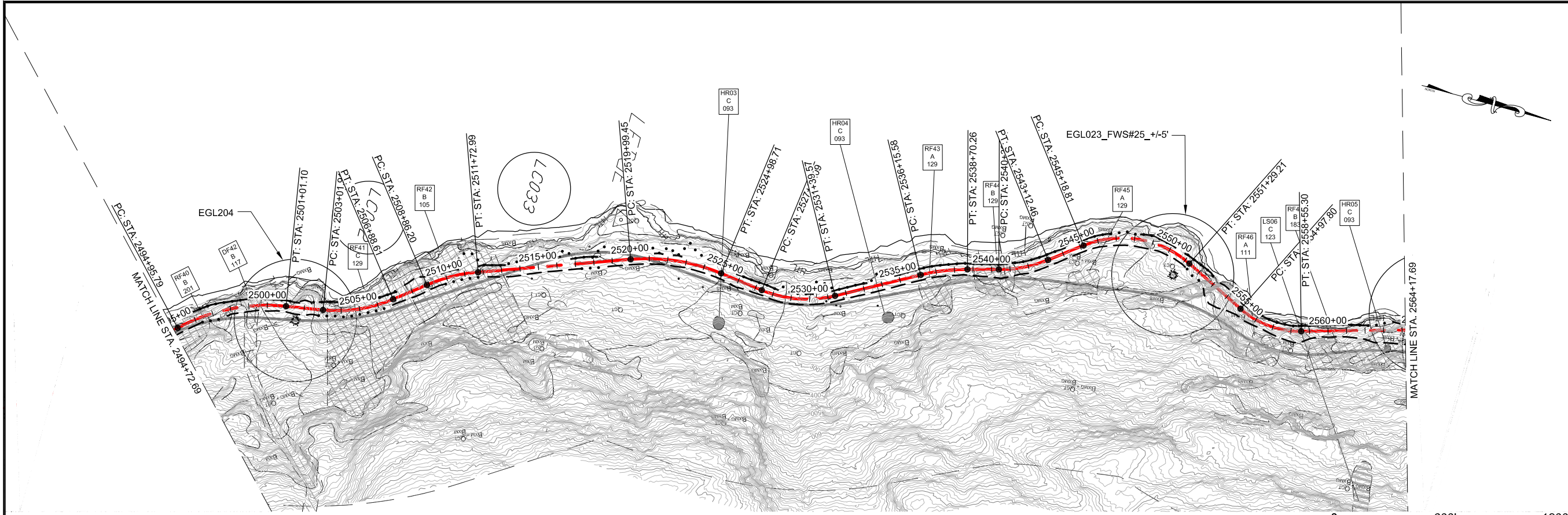
JNU-EAST LYNN CANAL  
HIGHWAY, ALTERNATIVE 2B  
PROJECT #71100

**2013 EIS  
PLAN VIEW**

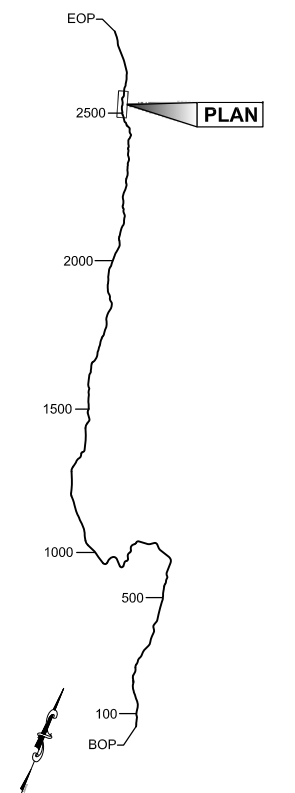
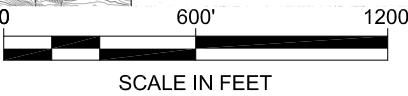
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|---------------------|--------------|
| PROJECT DESIGNATION |              |
| <b>71100</b>        |              |
| STATE               | YEAR         |
| <b>ALASKA</b>       | <b>2013</b>  |
| SHEET NUMBER        | TOTAL SHEETS |
| <b>EL34</b>         | <b>38</b>    |



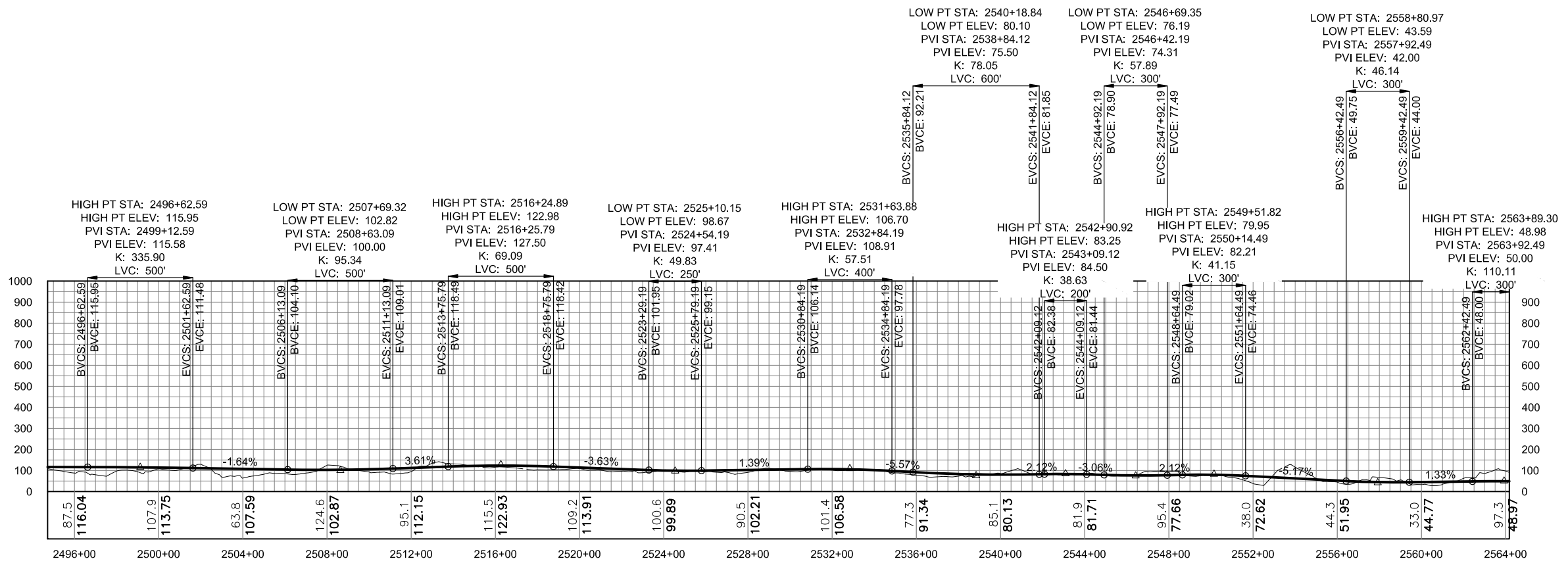
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PLAN



PLAN LEGEND



PROFILE

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& PUBLIC FACILITIES  
SOUTHEAST REGION

JNU-EAST LYNN CANAL  
HIGHWAY, ALTERNATIVE 2B  
PROJECT #71100

**2013 EIS  
PLAN VIEW**

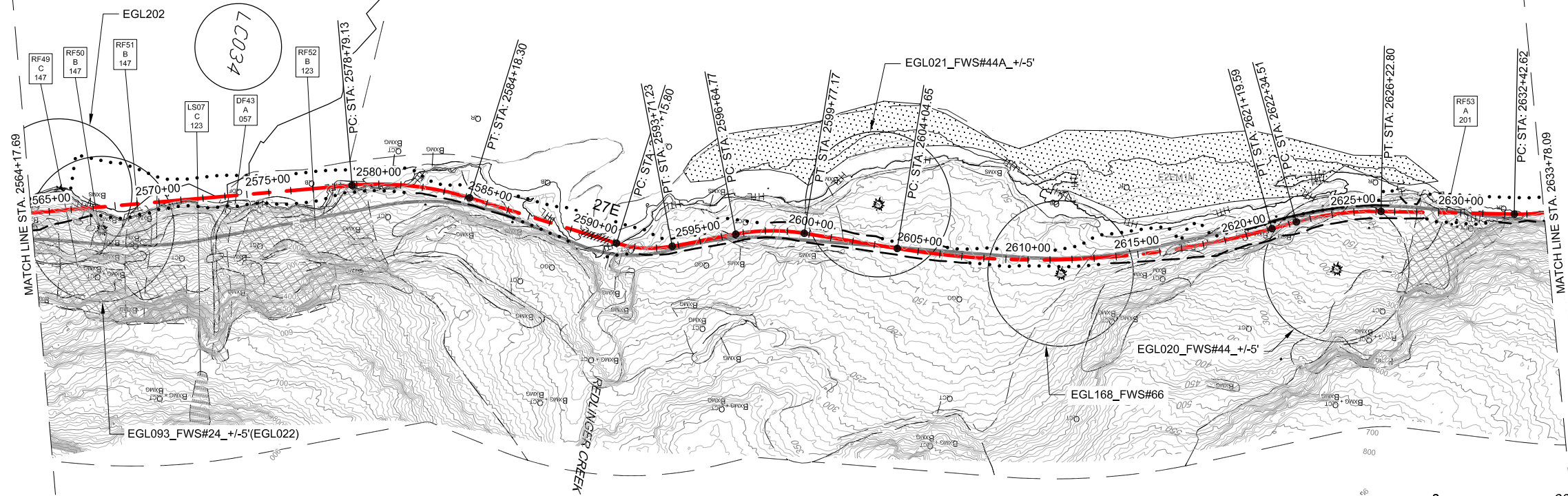
PROJECT DESIGNATION

**71100**

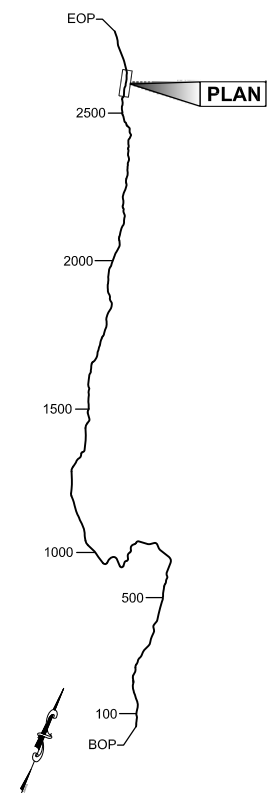
| STATE        | YEAR         |
|--------------|--------------|
| ALASKA       | 2013         |
| SHEET NUMBER | TOTAL SHEETS |
| EL35         | 38           |



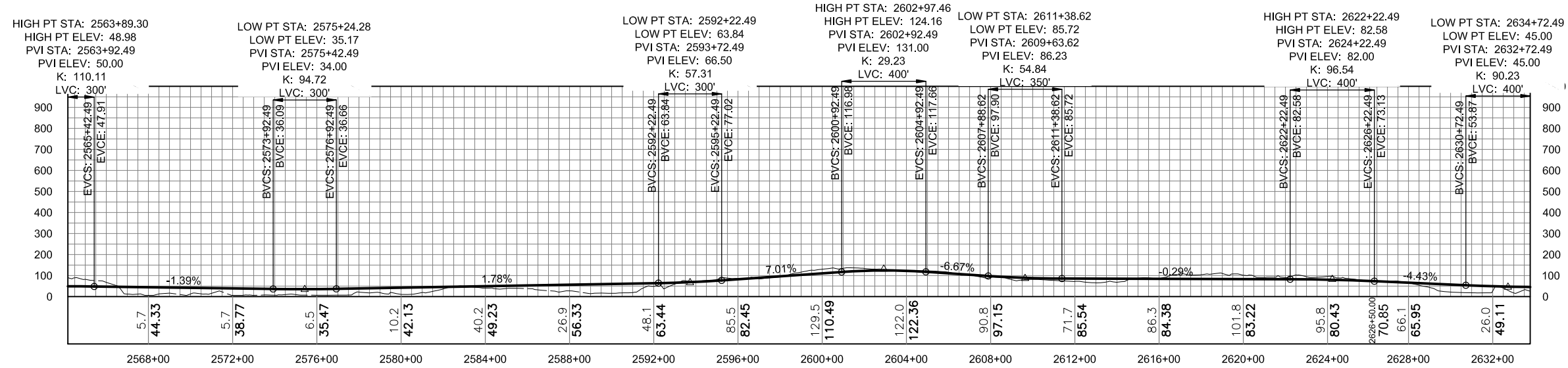
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PLAN



PLAN LEGEND



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& PUBLIC FACILITIES  
SOUTHEAST REGION

JNU-EAST LYNN CANAL  
HIGHWAY, ALTERNATIVE 2B  
PROJECT #71100

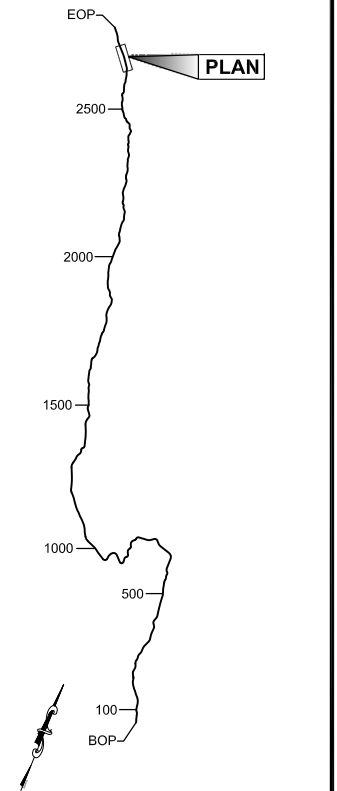
**2013 EIS  
PLAN VIEW**

| PROJECT DESIGNATION |              |
|---------------------|--------------|
| <b>71100</b>        |              |
| STATE               | YEAR         |
| <b>ALASKA</b>       | <b>2013</b>  |
| SHEET NUMBER        | TOTAL SHEETS |
| <b>EL36</b>         | <b>38</b>    |





| No. | DATE | DESCRIPTION |
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SOUTHEAST REGION

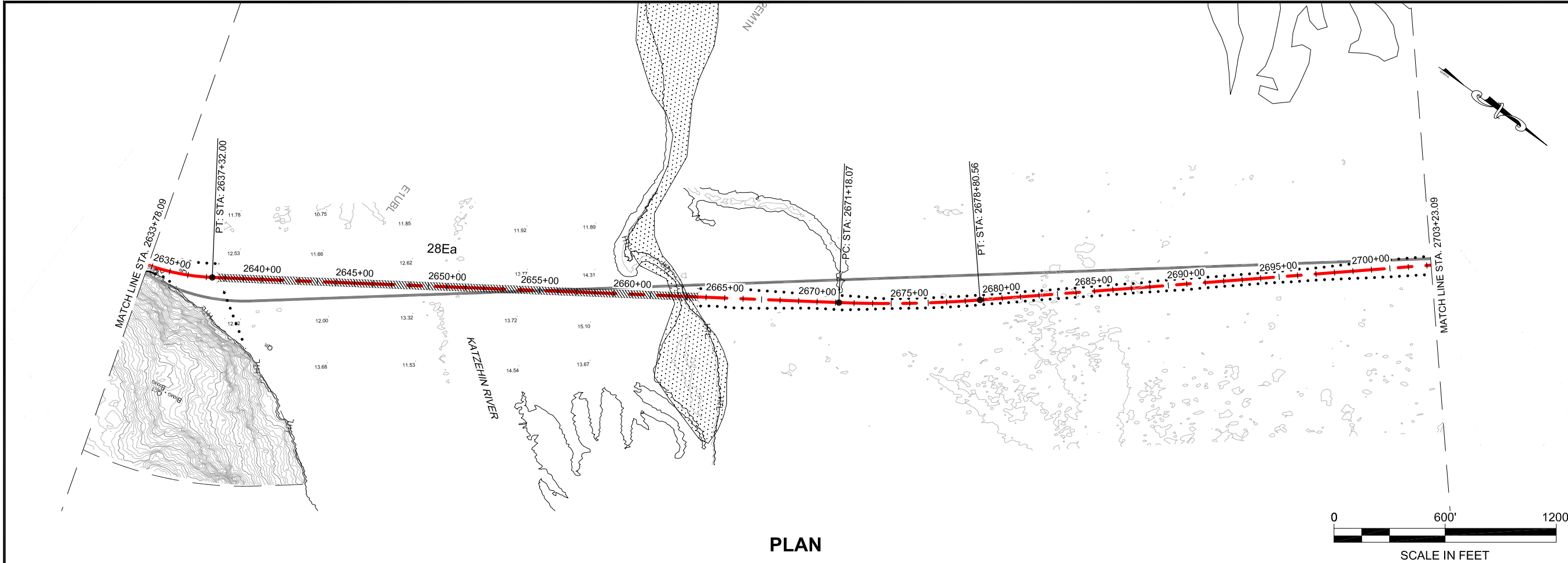
JNU-EAST LYNN CANAL  
HIGHWAY, ALTERNATIVE 2B  
PROJECT #71100

**2013 EIS  
PLAN VIEW**

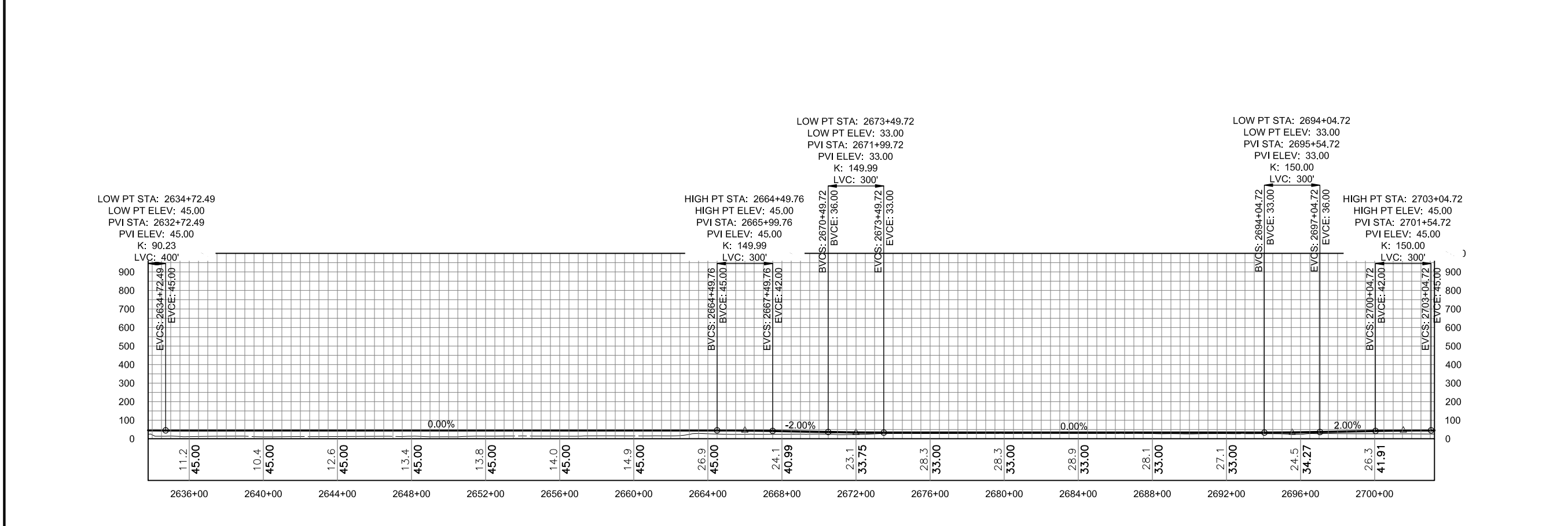
PROJECT DESIGNATION

**71100**

| STATE         | YEAR         |
|---------------|--------------|
| <b>ALASKA</b> | <b>2013</b>  |
| SHEET NUMBER  | TOTAL SHEETS |
| <b>EL37</b>   | <b>38</b>    |



PLAN

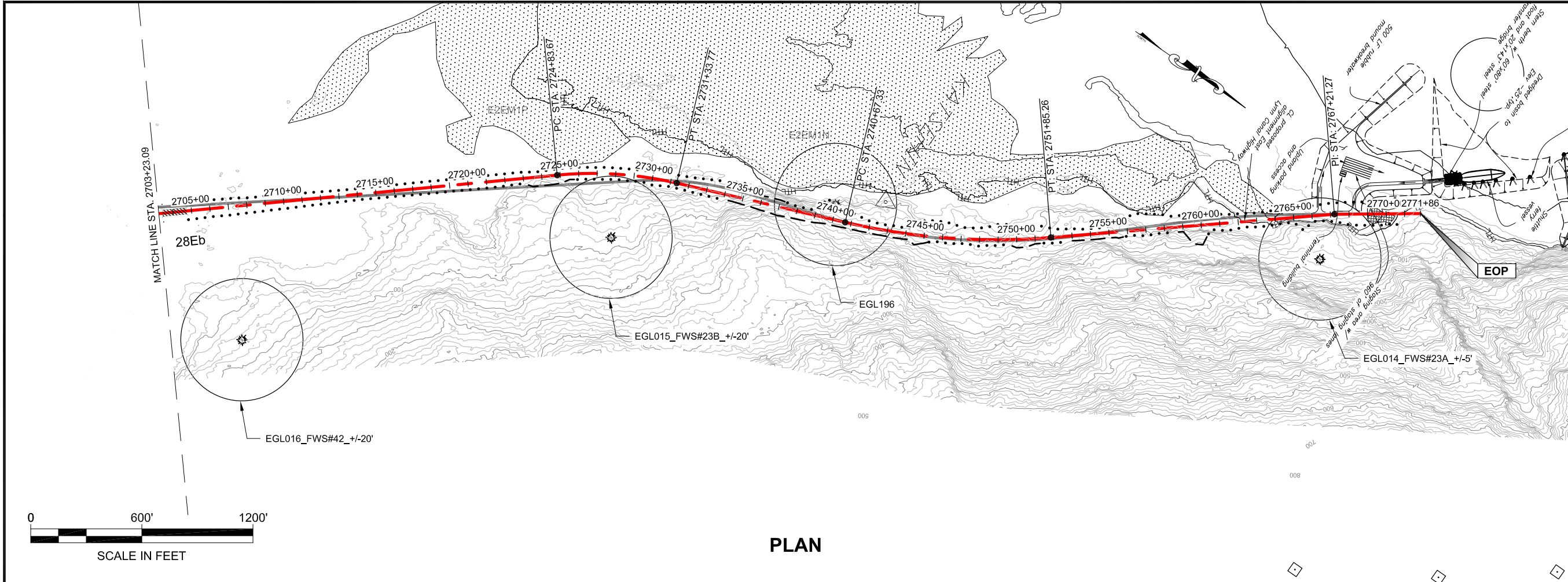


PROFILE

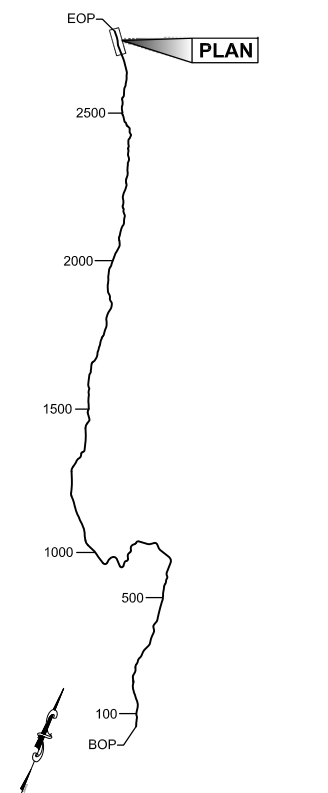
DO NOT SCALE FROM THESE DRAWINGS USE DIMENSIONS



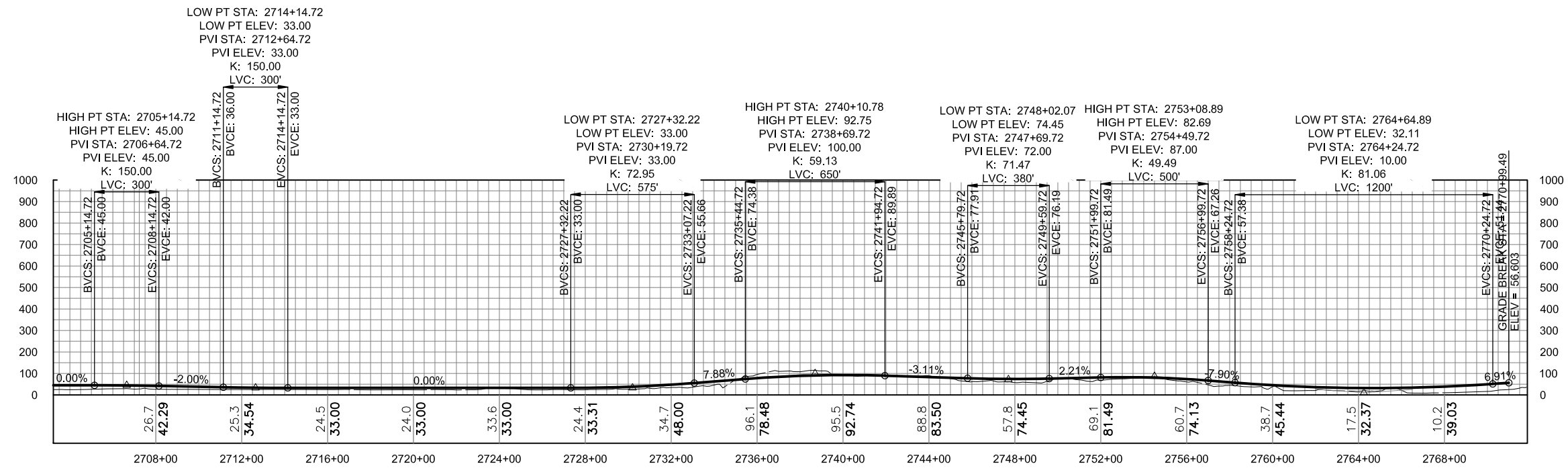
| No. | DATE | DESCRIPTION |
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PLAN



PLAN LEGEND



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SOUTHEAST REGION

JNU-EAST LYNN CANAL  
HIGHWAY, ALTERNATIVE 2B  
PROJECT #71100

**2012 EIS  
PLAN VIEW**

|                     |              |
|---------------------|--------------|
| PROJECT DESIGNATION |              |
| 71100               |              |
| STATE               | YEAR         |
| ALASKA              | 2012         |
| SHEET NUMBER        | TOTAL SHEETS |
| EL38                | 38           |



**Attachment B**

**Juneau Access Improvements Project**

**Revised West Lynn Canal Plan and Profile Sheets**

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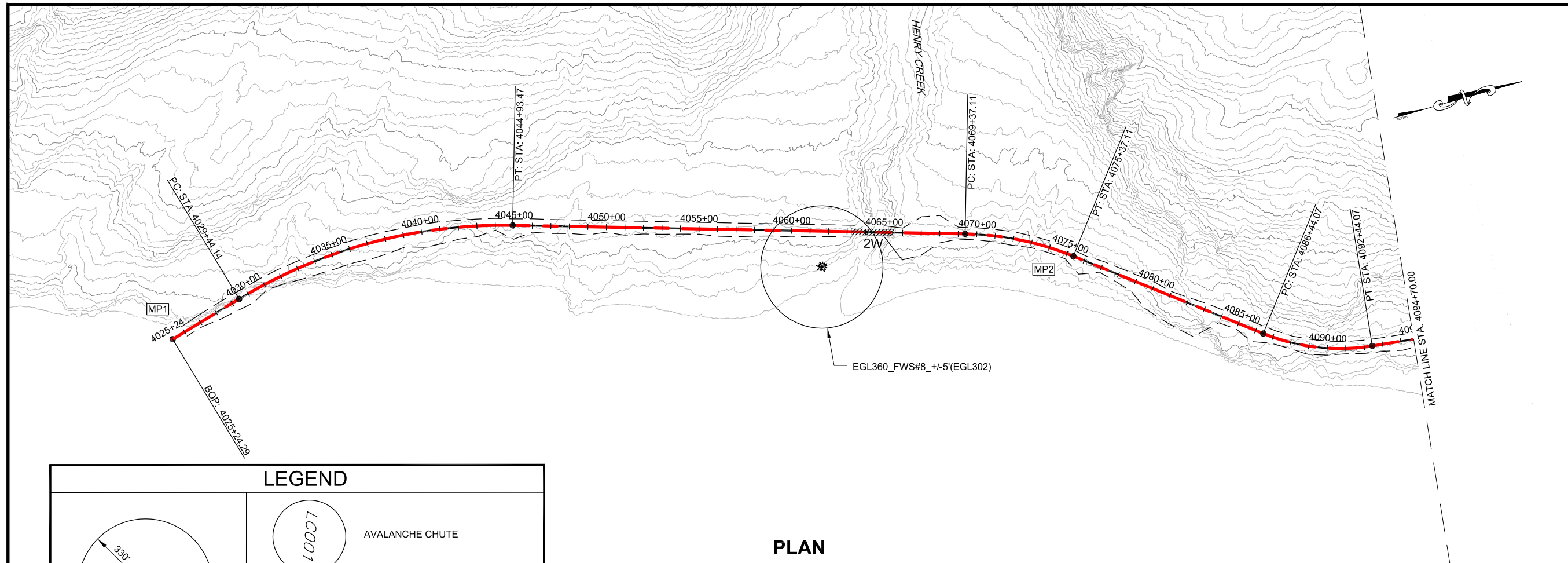
ADDENDUM NUMBER

ATTACHMENT NUMBER

RECORD OF REVISIONS

| No. | DATE | DESCRIPTION |
|-----|------|-------------|
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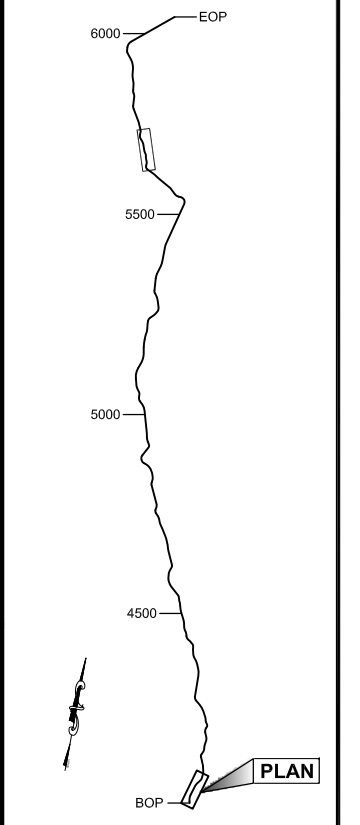
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PLAN

**LEGEND**

|  |                          |
|--|--------------------------|
|  | EAGLE TREE               |
|  | AVAILANCHE CHUTE         |
|  | AVAILANCHE STARTING ZONE |
|  | BRIDGES                  |
|  | CURRENT ALIGNMENT        |
|  | 2006 FEIS ALIGNMENT      |



PLAN LEGEND

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 & PUBLIC FACILITIES  
 SOUTHEAST REGION

JNU-WEST LYNN CANAL  
 HIGHWAY, ALTERNATIVE 3  
 PROJECT #71100

**2012 EIS**

**PLAN & PROFILE**

**VIEW**

PROJECT DESIGNATION

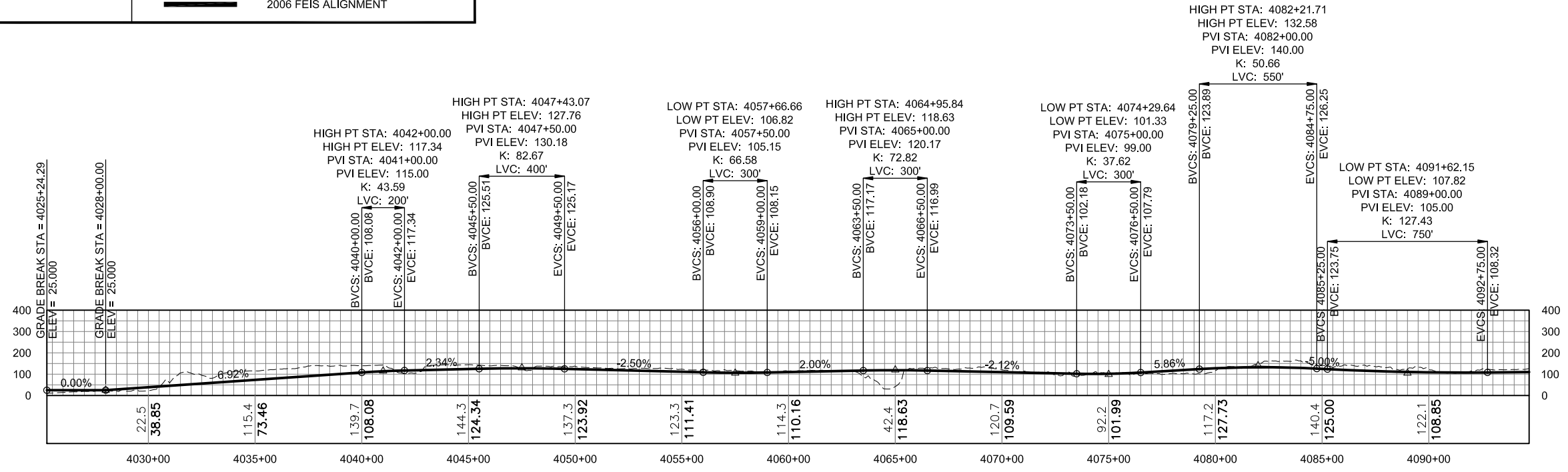
**71100**

STATE YEAR

**ALASKA 2013**

SHEET NUMBER TOTAL SHEETS

**WL1 XX**



PROFILE

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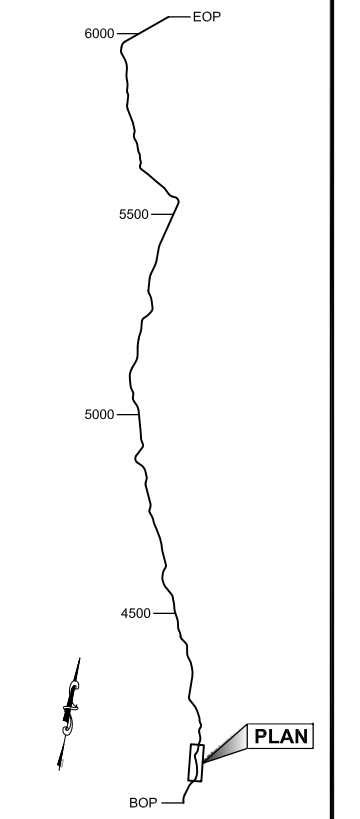
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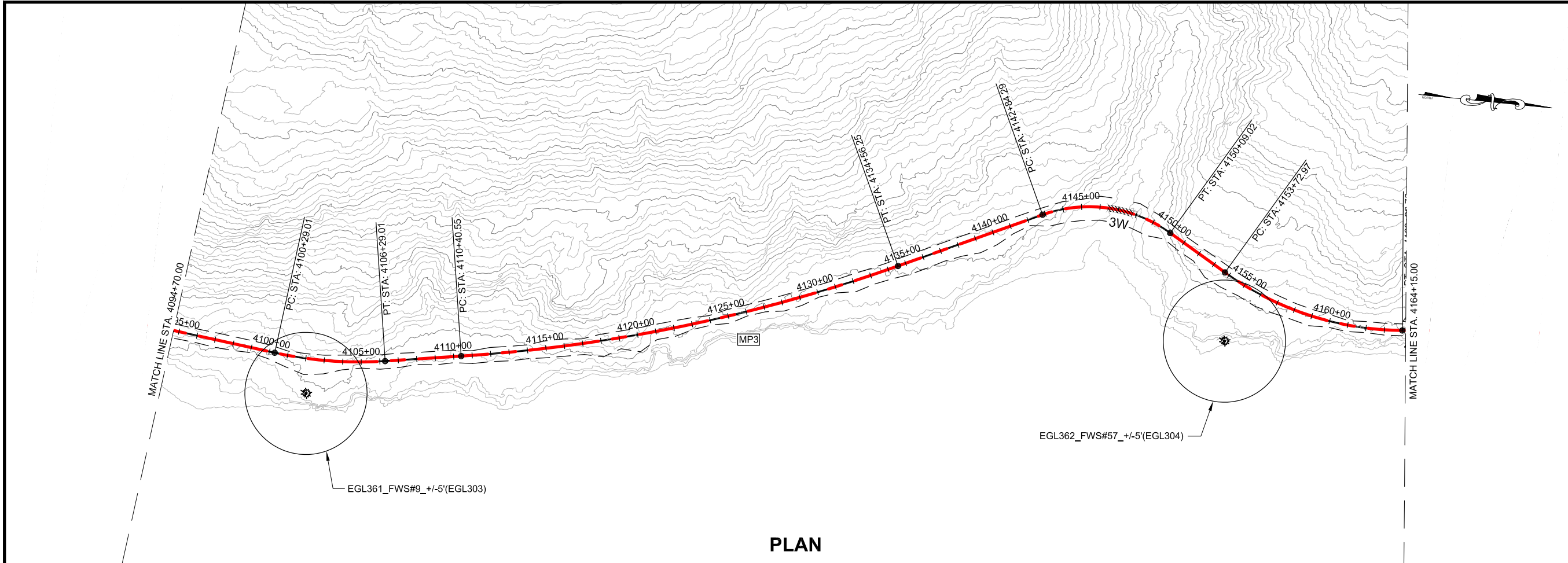
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 DEPARTMENT OF TRANSPORTATION  
 & PUBLIC FACILITIES  
 SOUTHEAST REGION

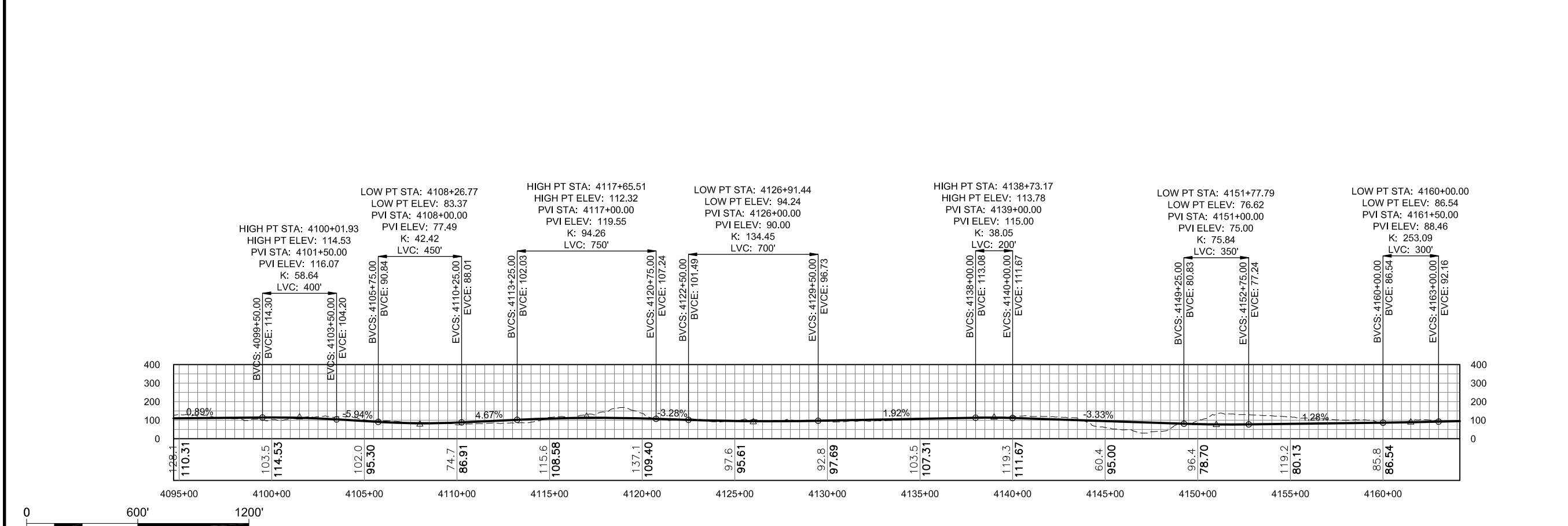
JNU-WEST LYNN CANAL  
 HIGHWAY, ALTERNATIVE 3  
 PROJECT #71100

**2012 EIS  
 PLAN & PROFILE  
 VIEW**

|                     |              |
|---------------------|--------------|
| PROJECT DESIGNATION |              |
| 71100               |              |
| STATE               | YEAR         |
| ALASKA              | 2013         |
| SHEET NUMBER        | TOTAL SHEETS |
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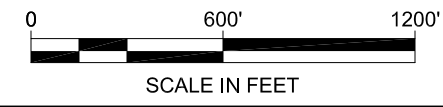


**PLAN**



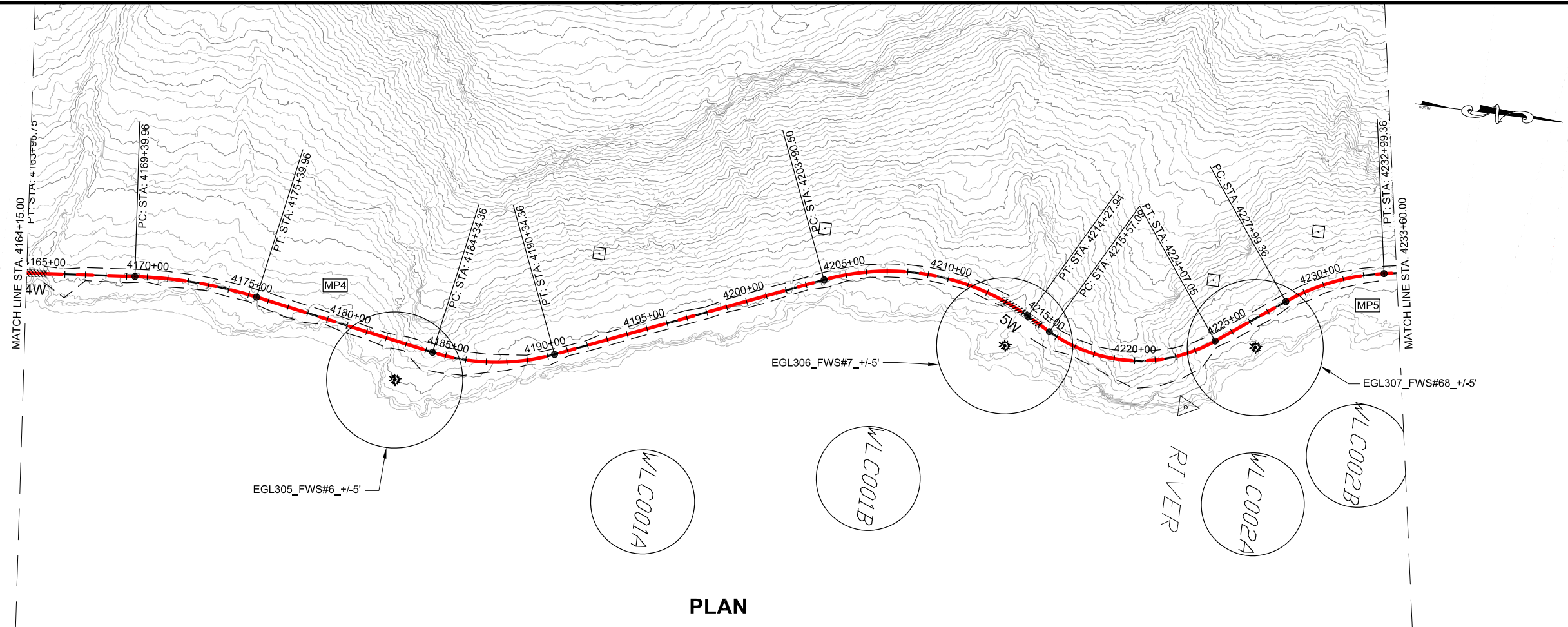
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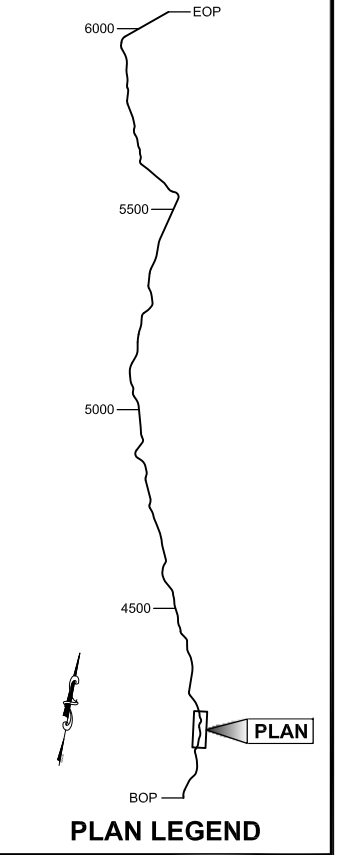




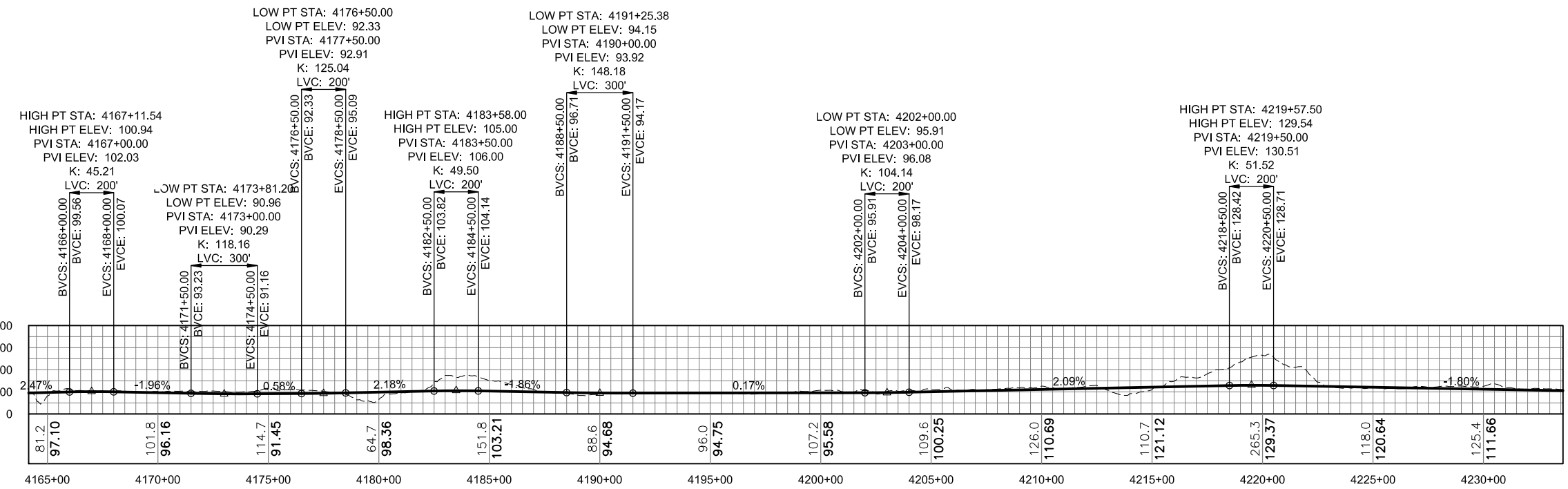
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PLAN

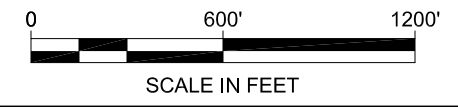


PLAN LEGEND



PROFILE

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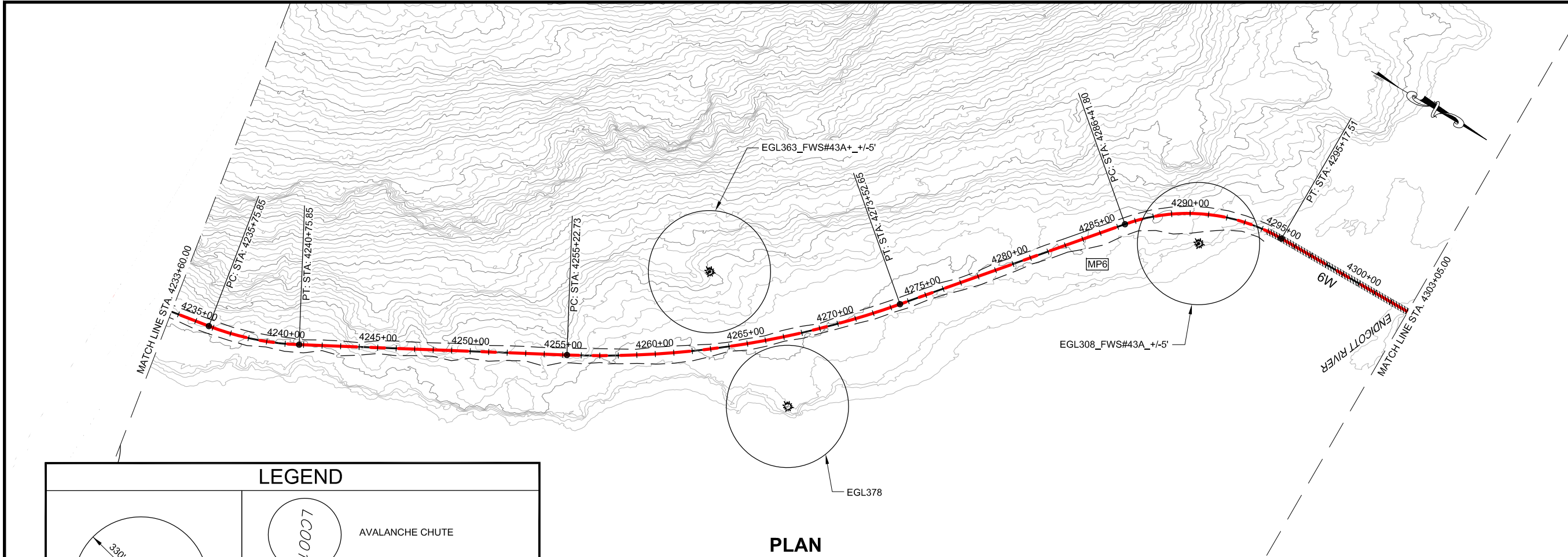
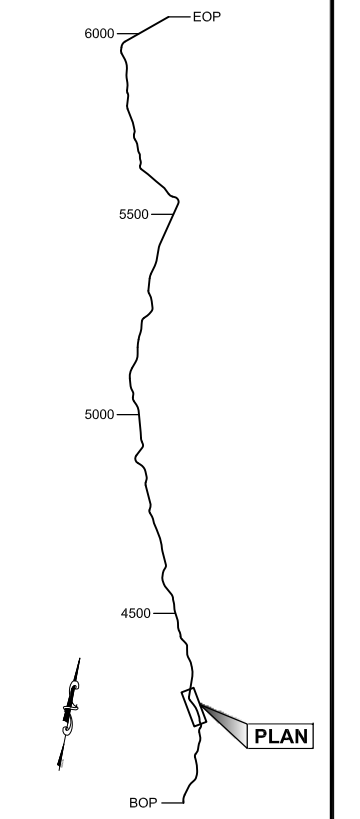
CHECKED BY:  
 DESIGNED BY:  
 DRAWN BY:

**DRAFT**

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|--|---------------------------|
| STATE OF ALASKA<br>DEPARTMENT OF TRANSPORTATION<br>& PUBLIC FACILITIES<br>SOUTHEAST REGION |                           |
| JNU-WEST LYNN CANAL<br>HIGHWAY, ALTERNATIVE 3<br>PROJECT #71100                            |                           |
| <b>2012 EIS<br/>PLAN &amp; PROFILE<br/>VIEW</b>  |                           |
| PROJECT DESIGNATION<br><b>71100</b>  |                           |
| STATE<br><b>ALASKA</b>   | YEAR<br><b>2013</b>       |
| SHEET NUMBER<br><b>WL3</b>   | TOTAL SHEETS<br><b>XX</b> |



| ADDENDUM NUMBER     |      |             |
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| ATTACHMENT NUMBER   |      |             |
| RECORD OF REVISIONS |      |             |
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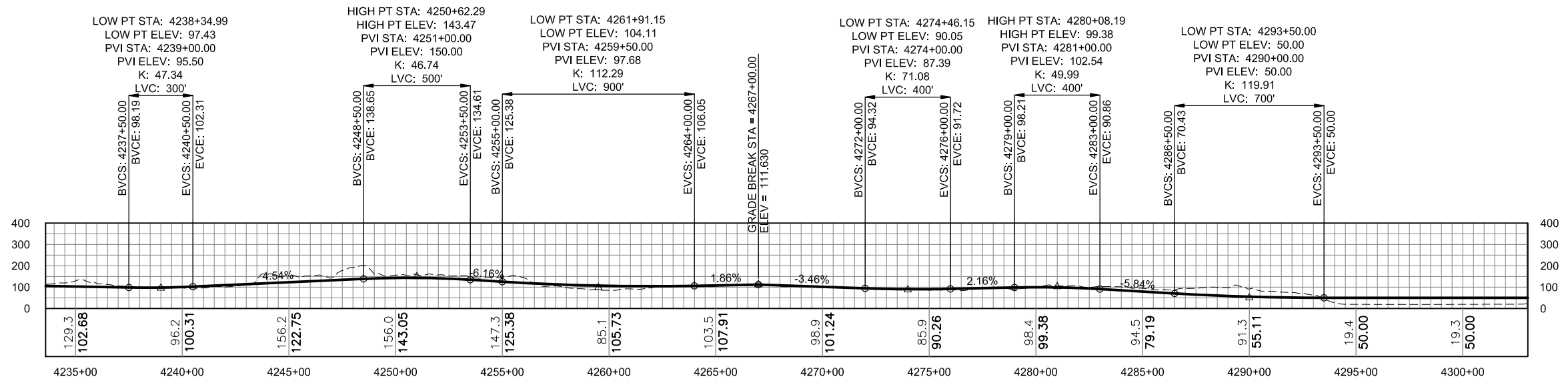


### LEGEND

|  |  |                         |
|--|--|-------------------------|
|  |  | AVALANCHE CHUTE         |
|  |  | AVALANCHE STARTING ZONE |
|  |  | BRIDGES                 |
|  |  | CURRENT ALIGNMENT       |
|  |  | 2006 FEIS ALIGNMENT     |

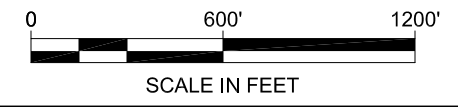
**PLAN**

**PLAN LEGEND**



**PROFILE**

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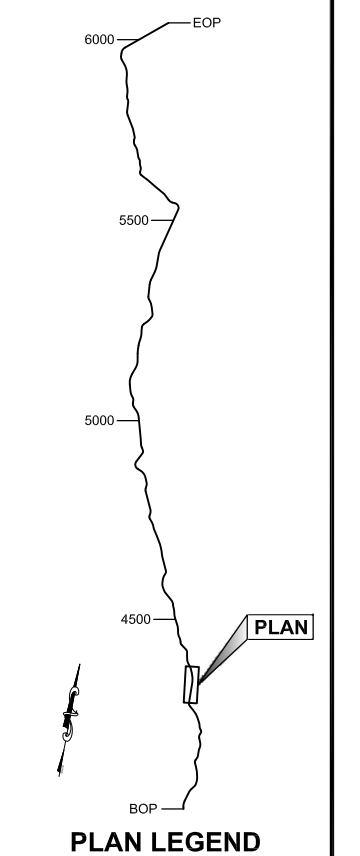
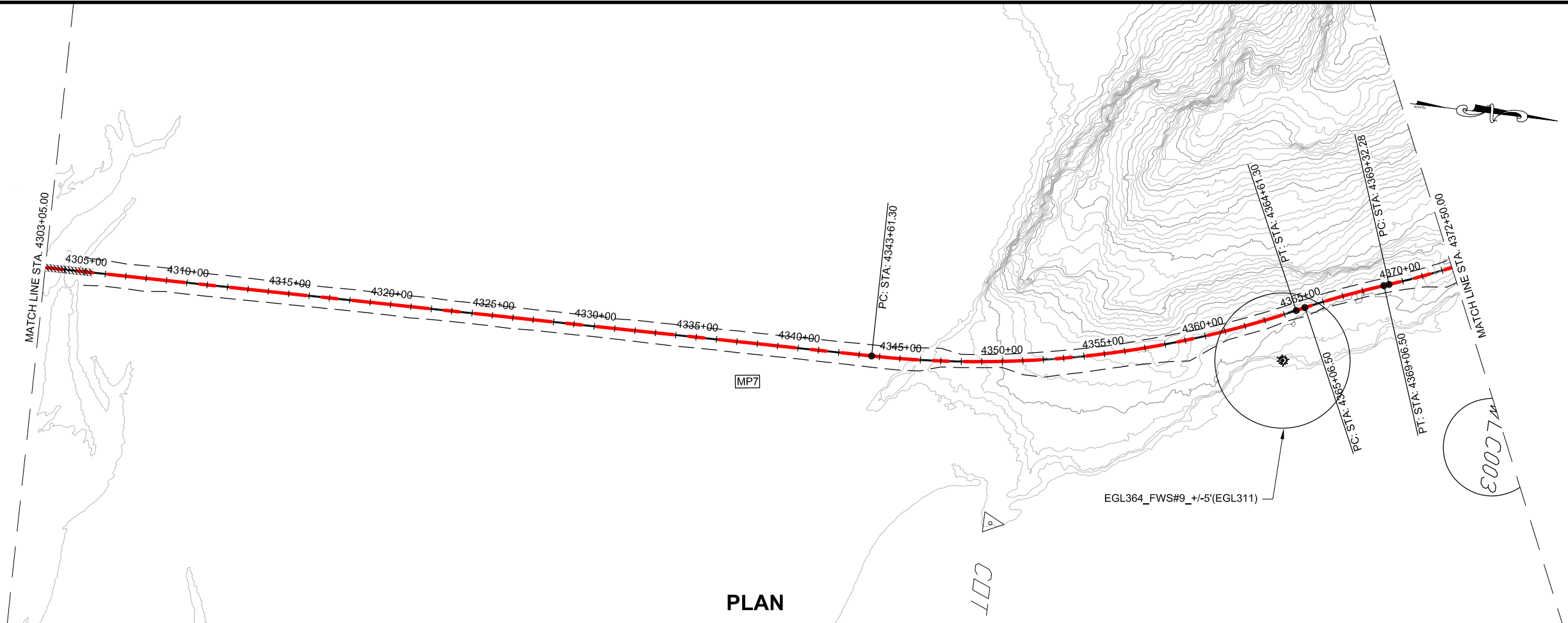
JNU-WEST LYNN CANAL  
 HIGHWAY, ALTERNATIVE 3  
 PROJECT #71100

**2012 EIS  
 PLAN & PROFILE  
 VIEW**

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|---------------------|--------------|
| PROJECT DESIGNATION |              |
| 71100               |              |
| STATE               | YEAR         |
| ALASKA              | 2013         |
| SHEET NUMBER        | TOTAL SHEETS |
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| RECORD OF REVISIONS |      |             |
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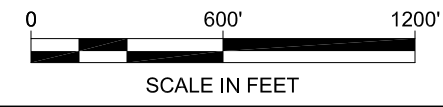
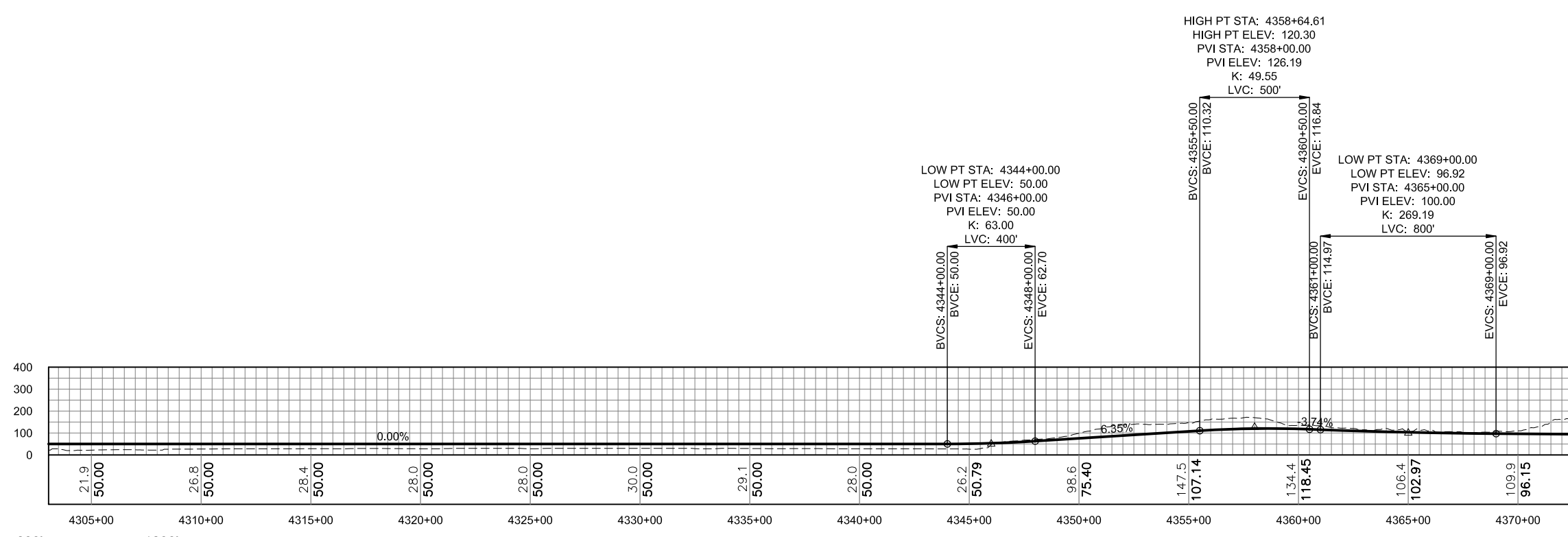


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 DEPARTMENT OF TRANSPORTATION  
 & PUBLIC FACILITIES  
 SOUTHEAST REGION  
 JNU-WEST LYNN CANAL  
 HIGHWAY, ALTERNATIVE 3  
 PROJECT #71100  
**2012 EIS  
 PLAN & PROFILE  
 VIEW**

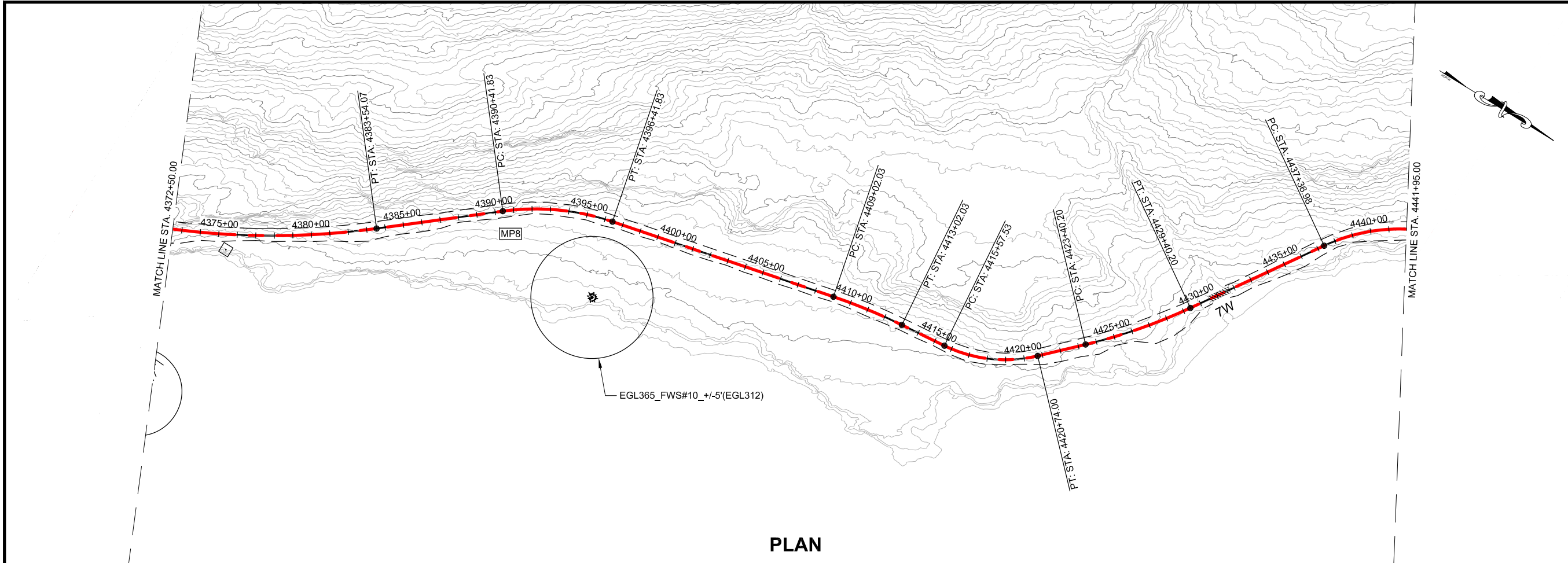
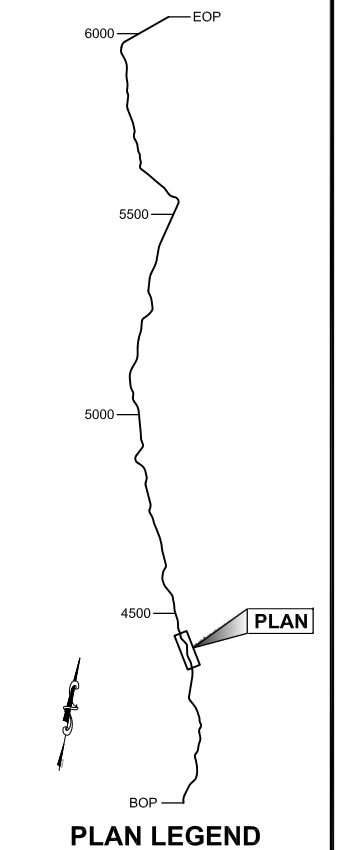
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| <b>71100</b>        |              |
| STATE               | YEAR         |
| <b>ALASKA</b>       | <b>2013</b>  |
| SHEET NUMBER        | TOTAL SHEETS |
| <b>WL5</b>          | <b>XX</b>    |



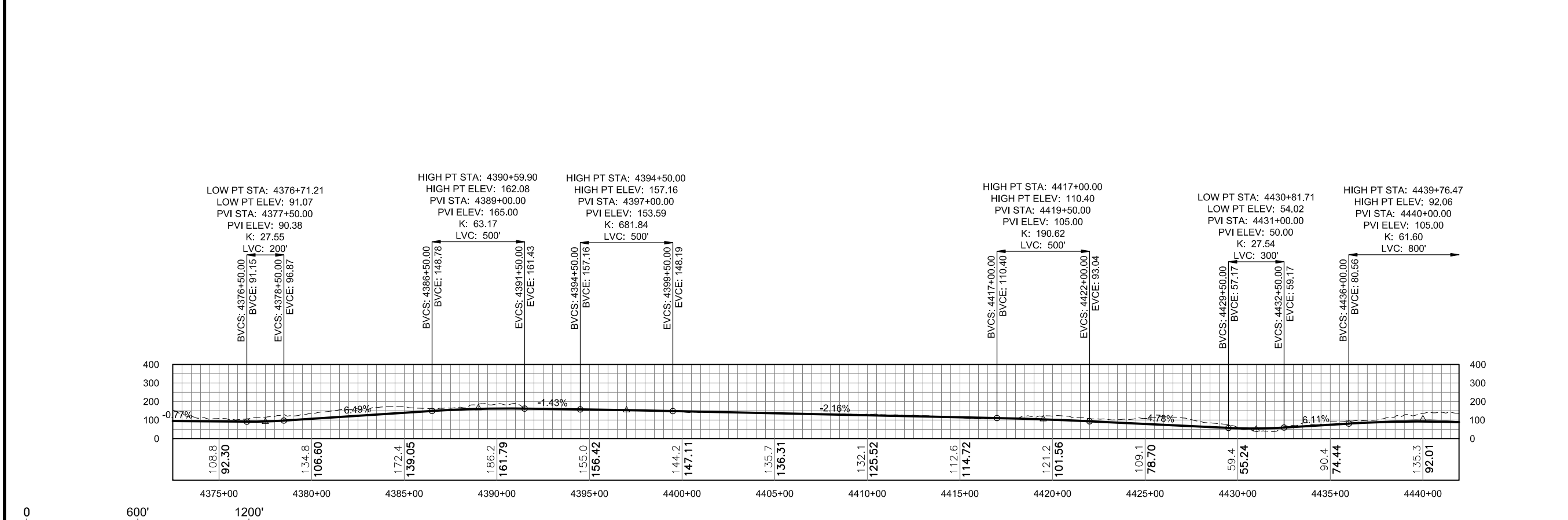




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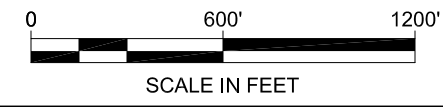


PLAN



PROFILE

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 SOUTHEAST REGION

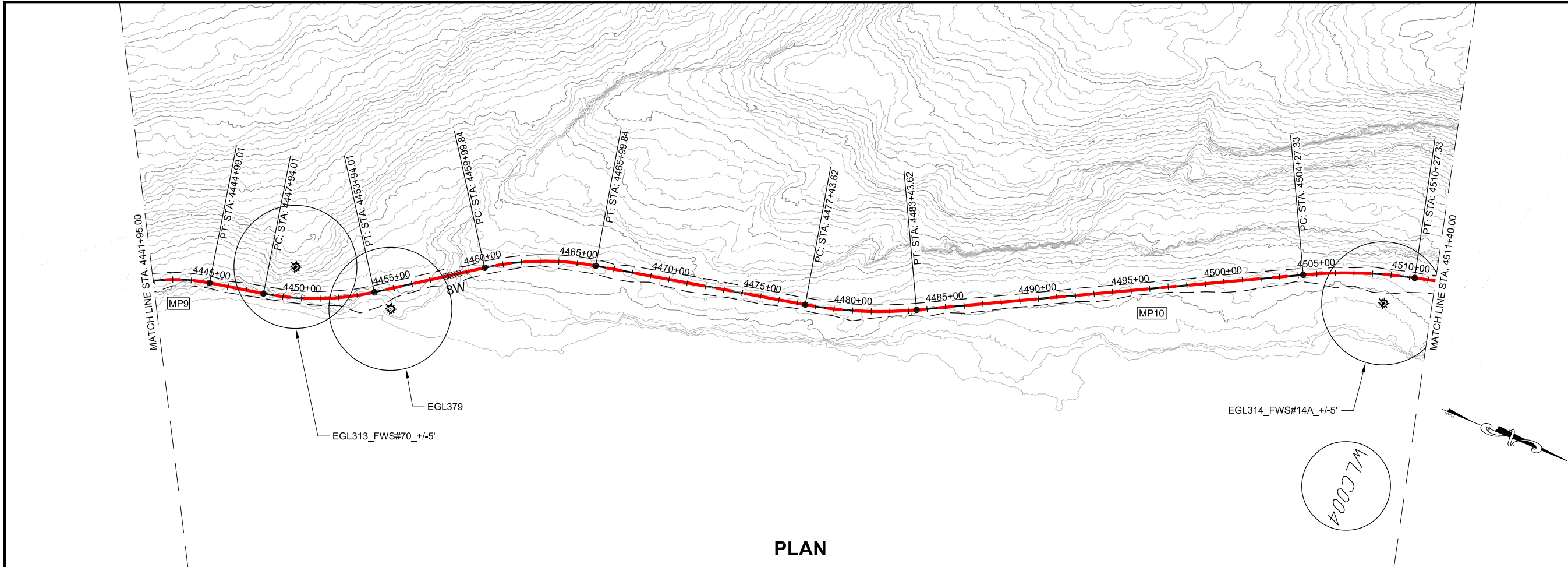
JNU-WEST LYNN CANAL  
 HIGHWAY, ALTERNATIVE 3  
 PROJECT #71100

**2012 EIS  
 PLAN & PROFILE  
 VIEW**

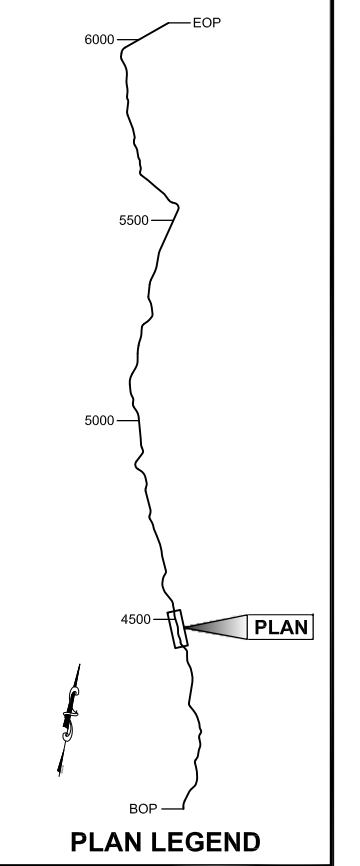
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| STATE               | YEAR         |
| ALASKA              | 2013         |
| SHEET NUMBER        | TOTAL SHEETS |
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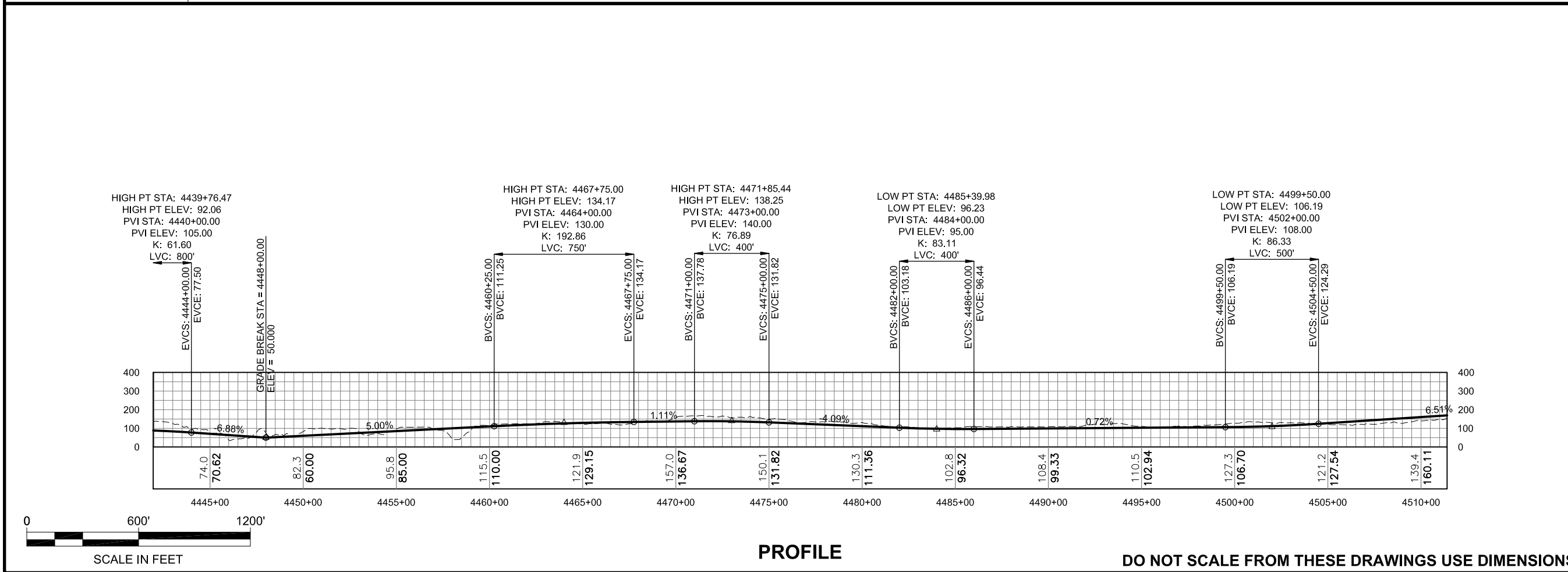
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| RECORD OF REVISIONS |      |             |
| No.                 | DATE | DESCRIPTION |
|                     |      |             |
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**PLAN**



**PLAN LEGEND**



**PROFILE**

**DO NOT SCALE FROM THESE DRAWINGS USE DIMENSIONS**

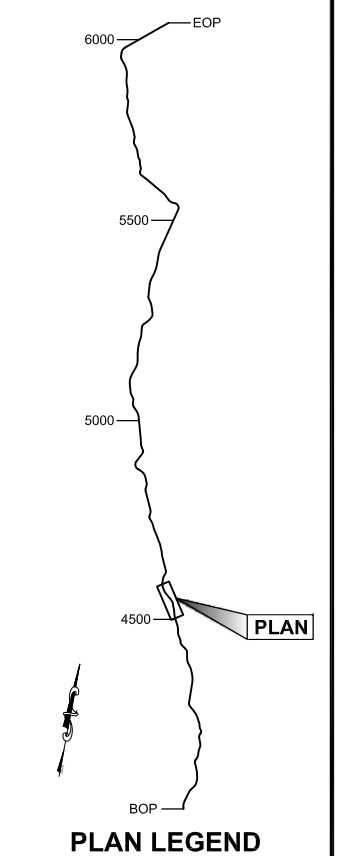
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**DRAFT**

|  |                           |
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| STATE OF ALASKA<br>DEPARTMENT OF TRANSPORTATION<br>& PUBLIC FACILITIES<br>SOUTHEAST REGION |                           |
| JNU-WEST LYNN CANAL<br>HIGHWAY, ALTERNATIVE 3<br>PROJECT #71100                            |                           |
| <b>2012 EIS<br/>PLAN &amp; PROFILE<br/>VIEW</b>  |                           |
| PROJECT DESIGNATION<br><b>71100</b>  |                           |
| STATE<br><b>ALASKA</b>   | YEAR<br><b>2013</b>       |
| SHEET NUMBER<br><b>WL7</b>   | TOTAL SHEETS<br><b>XX</b> |



| ADDENDUM NUMBER     |      |             |
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| RECORD OF REVISIONS |      |             |
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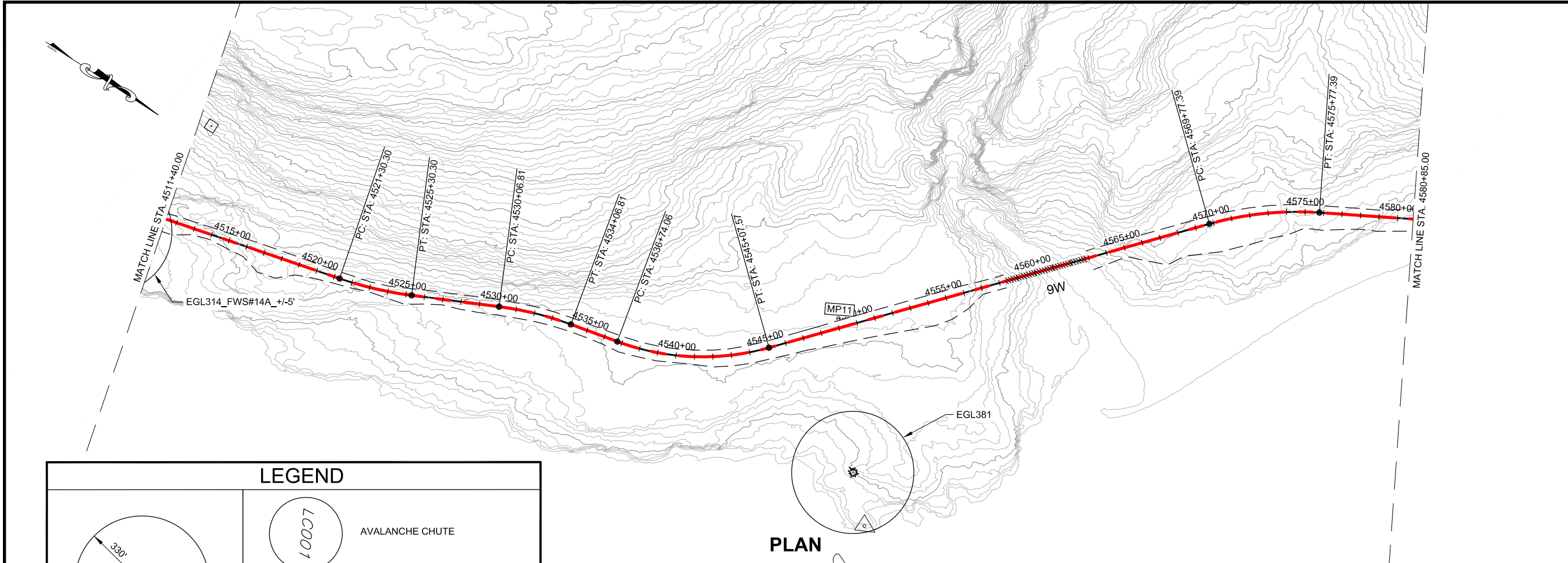
DRAWN BY:

STATE OF ALASKA  
 DEPARTMENT OF TRANSPORTATION  
 & PUBLIC FACILITIES  
 SOUTHEAST REGION

JNU-WEST LYNN CANAL  
 HIGHWAY, ALTERNATIVE 3  
 PROJECT #71100

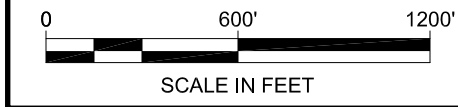
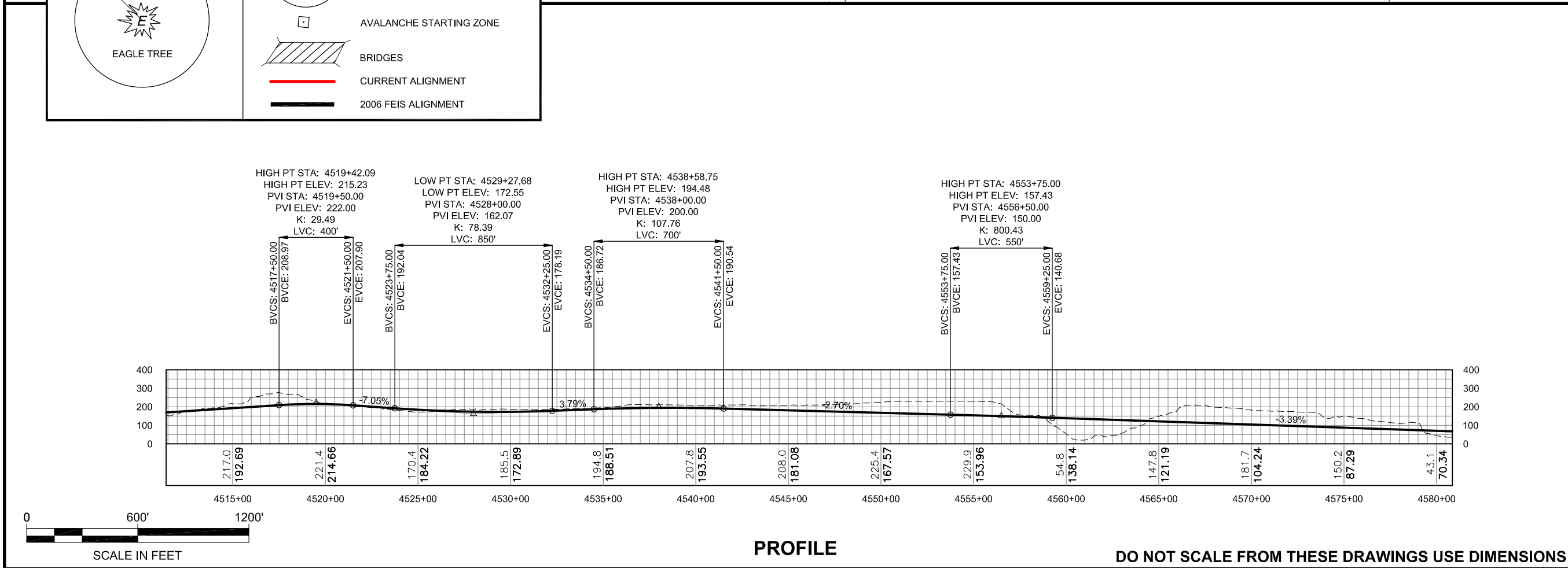
**2012 EIS  
 PLAN & PROFILE  
 VIEW**

|                     |              |
|---------------------|--------------|
| PROJECT DESIGNATION |              |
| 71100               |              |
| STATE               | YEAR         |
| ALASKA              | 2013         |
| SHEET NUMBER        | TOTAL SHEETS |
| WL8                 | XX           |



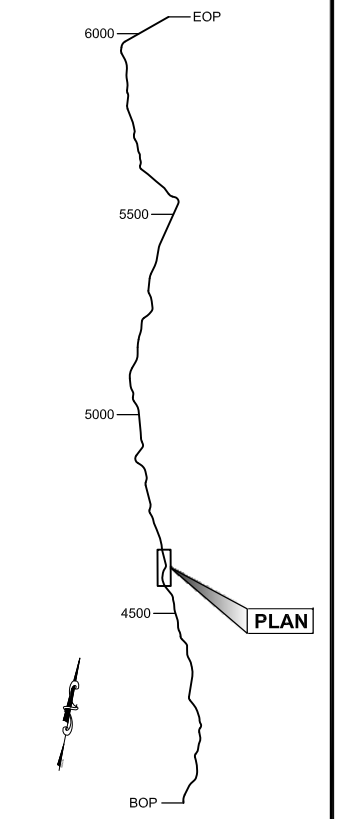
**LEGEND**

- EAGLE TREE
- AVALANCHE CHUTE
- AVALANCHE STARTING ZONE
- BRIDGES
- CURRENT ALIGNMENT
- 2006 FEIS ALIGNMENT





| ADDENDUM NUMBER     |      |             |
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| ATTACHMENT NUMBER   |      |             |
| RECORD OF REVISIONS |      |             |
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**PLAN LEGEND**

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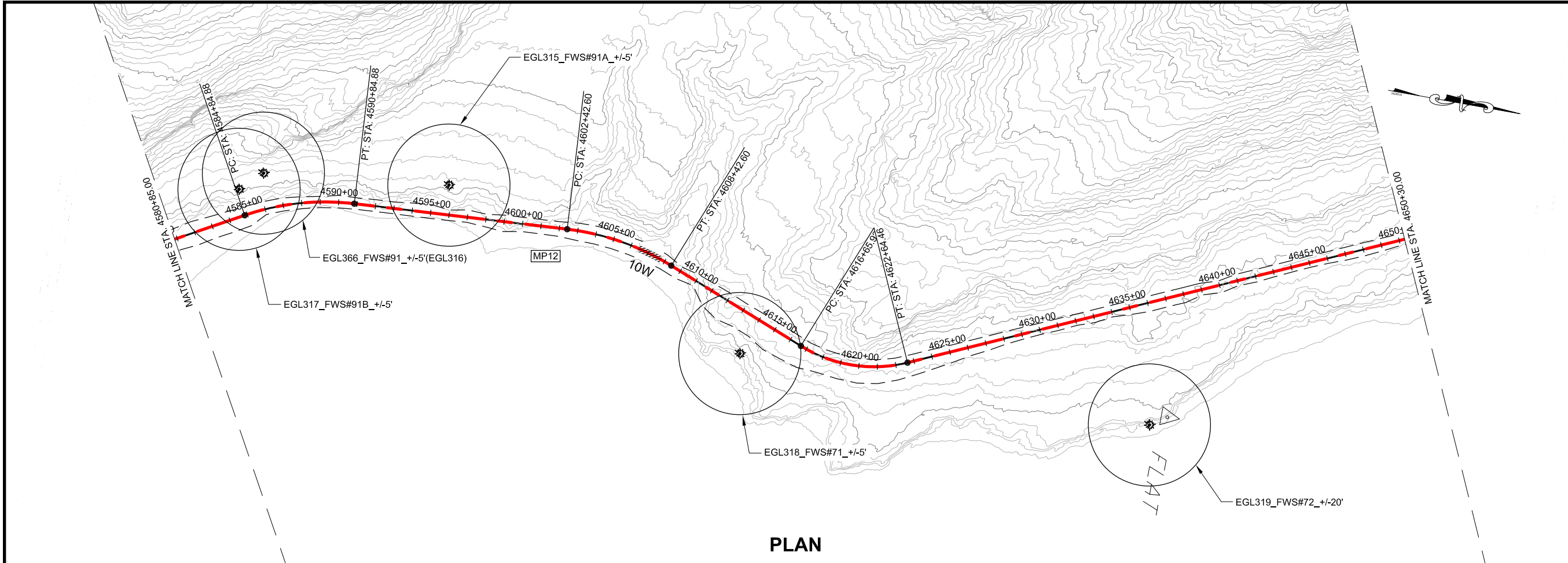
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 DEPARTMENT OF TRANSPORTATION  
 & PUBLIC FACILITIES  
 SOUTHEAST REGION

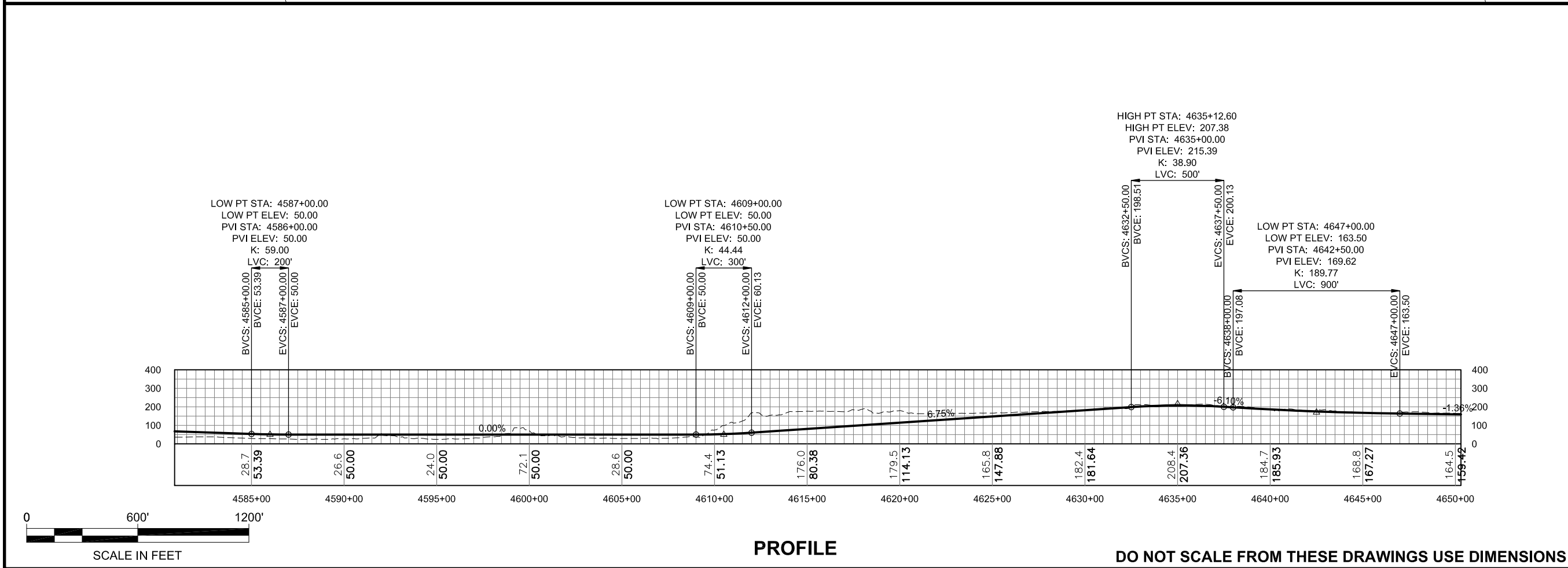
JNU-WEST LYNN CANAL  
 HIGHWAY, ALTERNATIVE 3  
 PROJECT #71100

**2012 EIS  
 PLAN & PROFILE  
 VIEW**

|                     |              |
|---------------------|--------------|
| PROJECT DESIGNATION |              |
| <b>71100</b>        |              |
| STATE               | YEAR         |
| <b>ALASKA</b>       | <b>2013</b>  |
| SHEET NUMBER        | TOTAL SHEETS |
| <b>WL9</b>          | <b>XX</b>    |



**PLAN**

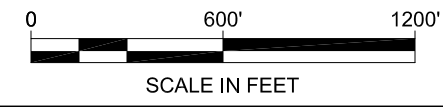


LOW PT STA: 4587+00.00  
 LOW PT ELEV: 50.00  
 PVI STA: 4586+00.00  
 PVI ELEV: 50.00  
 K: 59.00  
 LVC: 200'

LOW PT STA: 4609+00.00  
 LOW PT ELEV: 50.00  
 PVI STA: 4610+50.00  
 PVI ELEV: 50.00  
 K: 44.44  
 LVC: 300'

HIGH PT STA: 4635+12.60  
 HIGH PT ELEV: 207.38  
 PVI STA: 4635+00.00  
 PVI ELEV: 215.39  
 K: 38.90  
 LVC: 500'

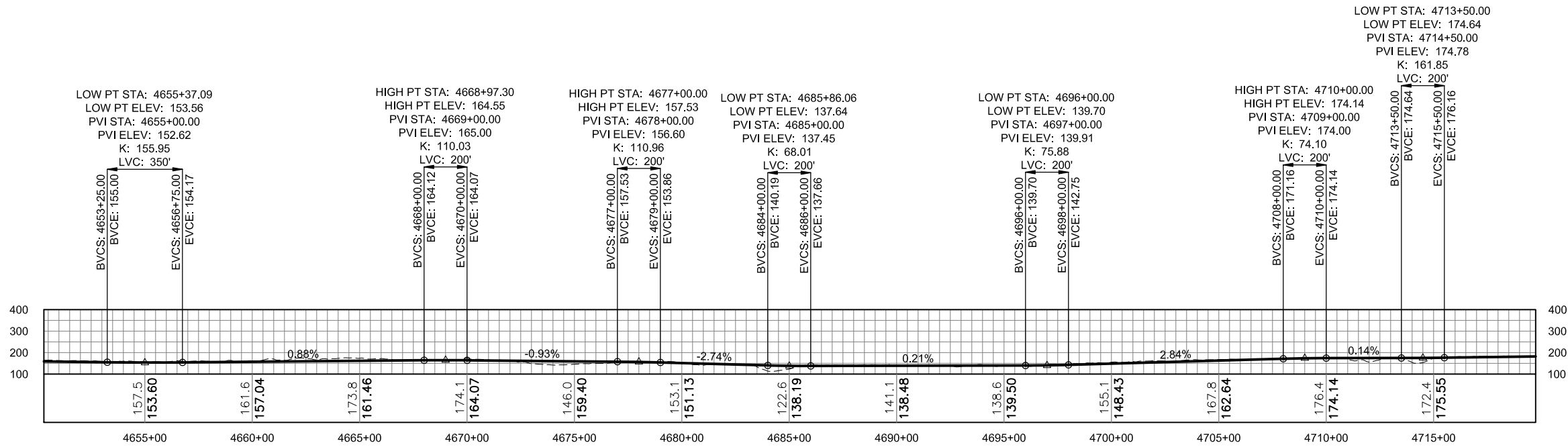
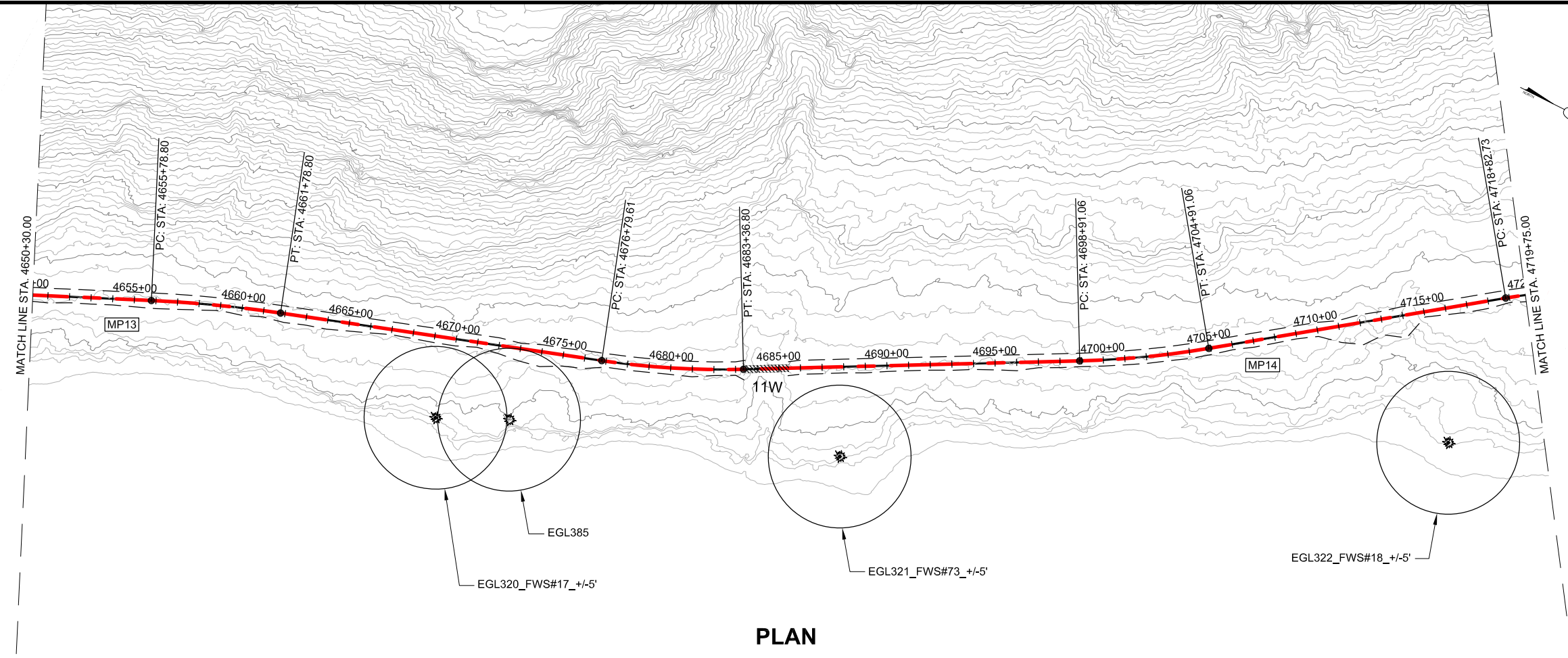
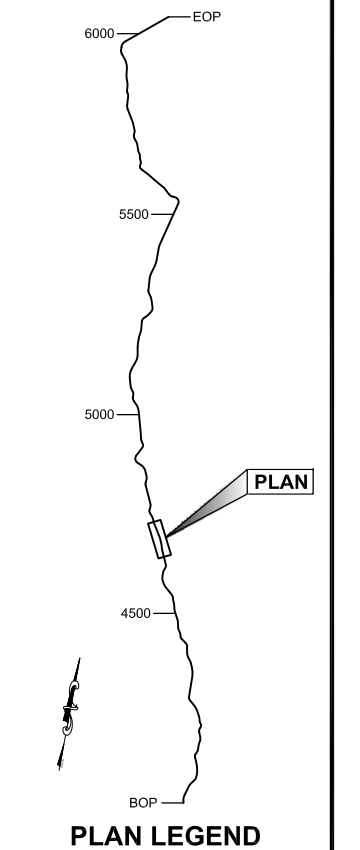
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 LOW PT ELEV: 163.50  
 PVI STA: 4642+50.00  
 PVI ELEV: 169.62  
 K: 189.77  
 LVC: 900'



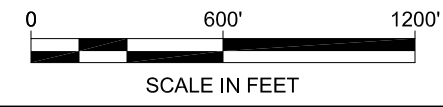




| ADDENDUM NUMBER     |      |             |
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| ATTACHMENT NUMBER   |      |             |
| RECORD OF REVISIONS |      |             |
| No.                 | DATE | DESCRIPTION |
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**PROFILE**



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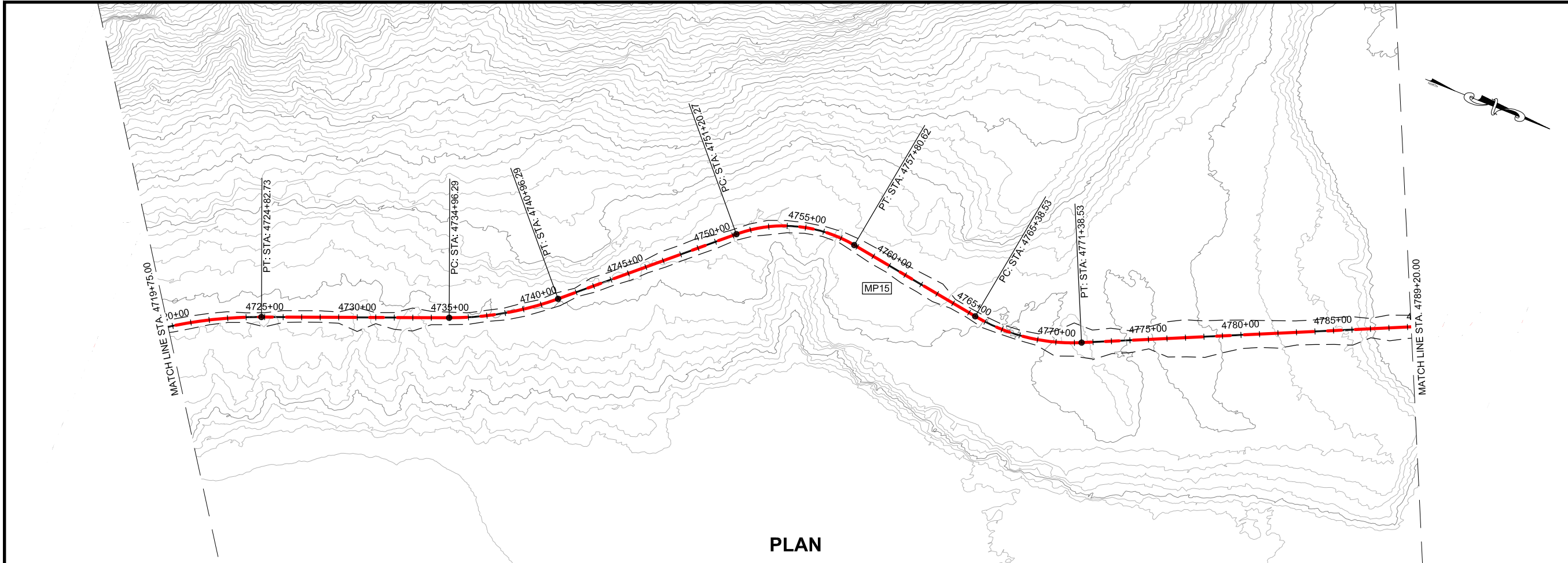
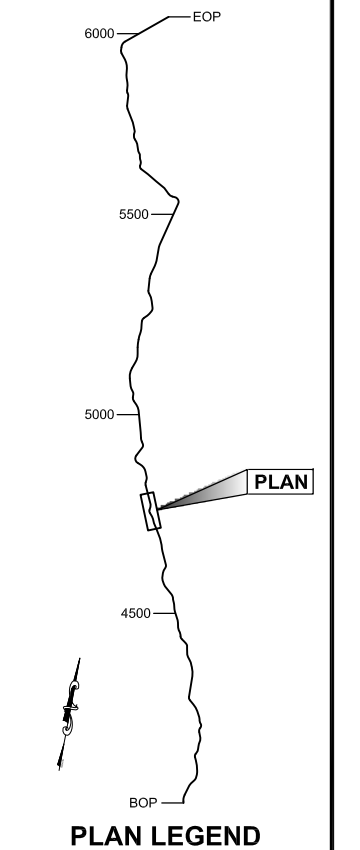
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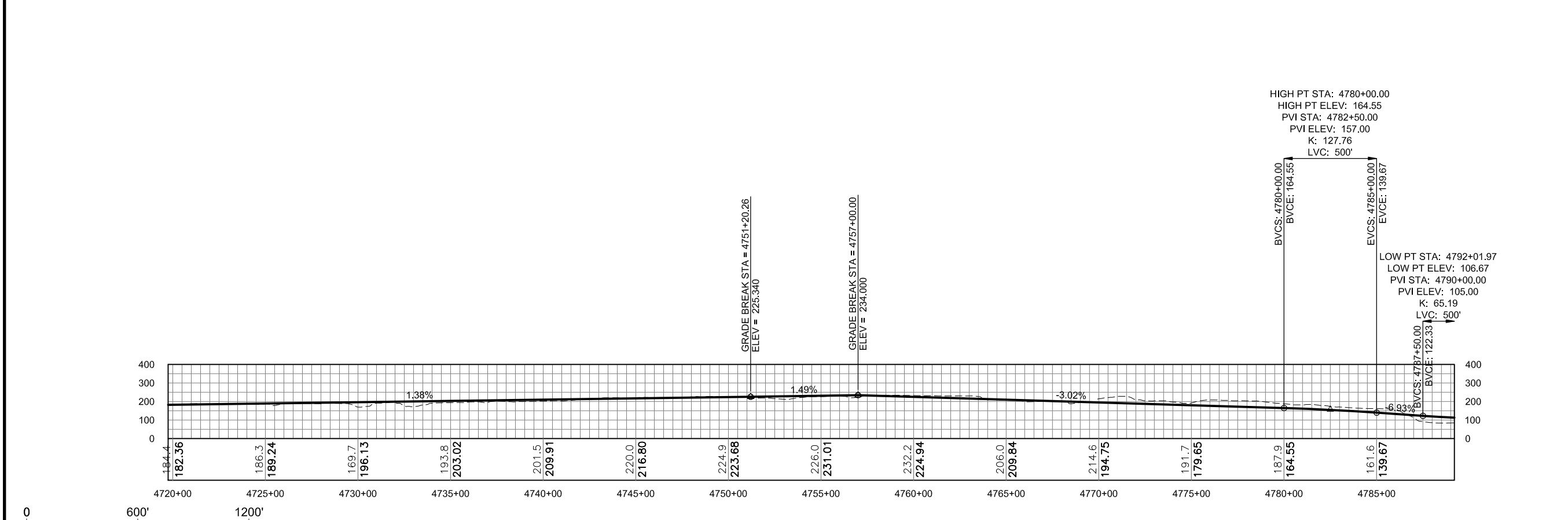
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| STATE OF ALASKA<br>DEPARTMENT OF TRANSPORTATION<br>& PUBLIC FACILITIES<br>SOUTHEAST REGION |                           |
| JNU-WEST LYNN CANAL<br>HIGHWAY, ALTERNATIVE 3<br>PROJECT #71100                            |                           |
| <b>2012 EIS<br/>PLAN &amp; PROFILE<br/>VIEW</b>  |                           |
| PROJECT DESIGNATION<br><b>71100</b>  |                           |
| STATE<br><b>ALASKA</b>   | YEAR<br><b>2013</b>       |
| SHEET NUMBER<br><b>WL10</b>  | TOTAL SHEETS<br><b>XX</b> |



| ADDENDUM NUMBER     |      |             |
|---------------------|------|-------------|
| ATTACHMENT NUMBER   |      |             |
| RECORD OF REVISIONS |      |             |
| No.                 | DATE | DESCRIPTION |
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|                     |      |             |



**PLAN**



**PROFILE**

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 SOUTHEAST REGION

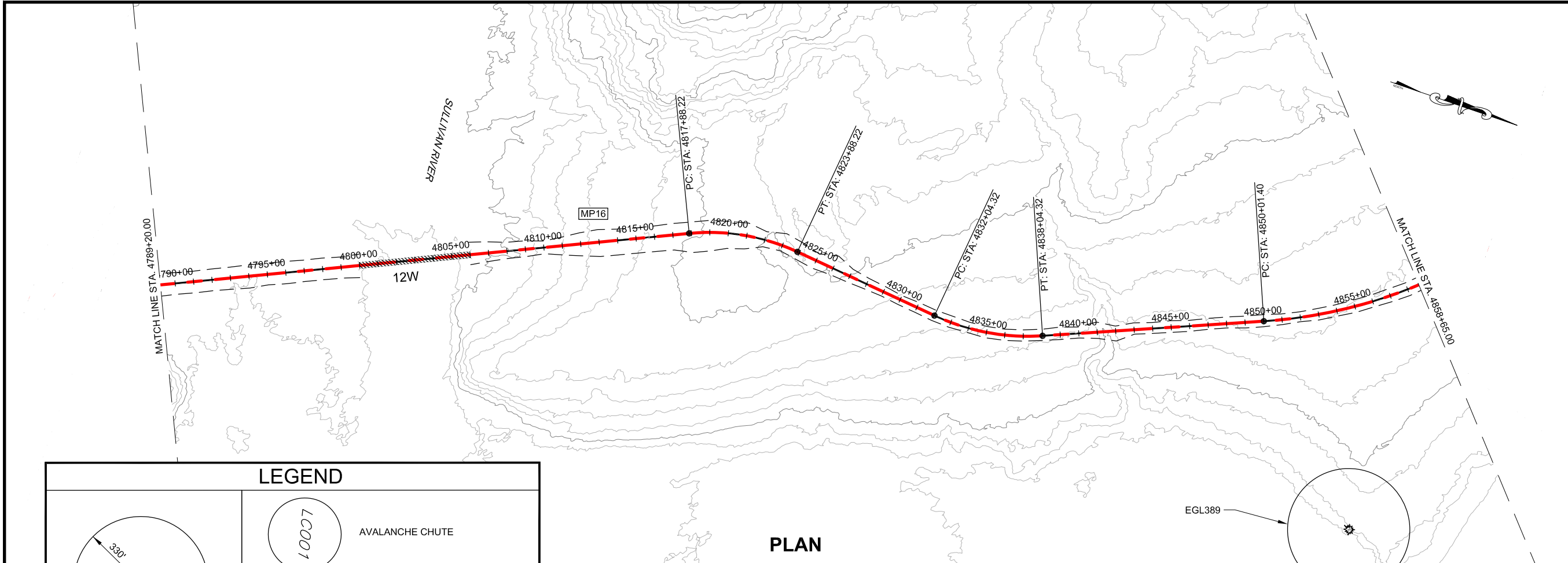
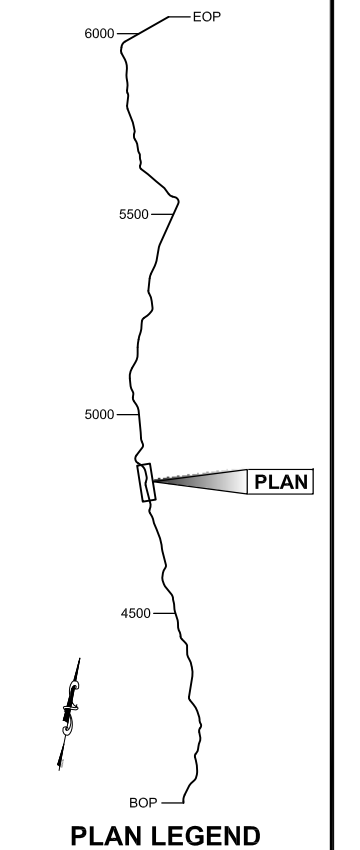
JNU-WEST LYNN CANAL  
 HIGHWAY, ALTERNATIVE 3  
 PROJECT #71100

**2012 EIS  
 PLAN & PROFILE  
 VIEW**

|                     |              |
|---------------------|--------------|
| PROJECT DESIGNATION |              |
| 71100               |              |
| STATE               | YEAR         |
| ALASKA              | 2013         |
| SHEET NUMBER        | TOTAL SHEETS |
| WL11                | XX           |

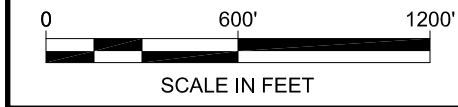
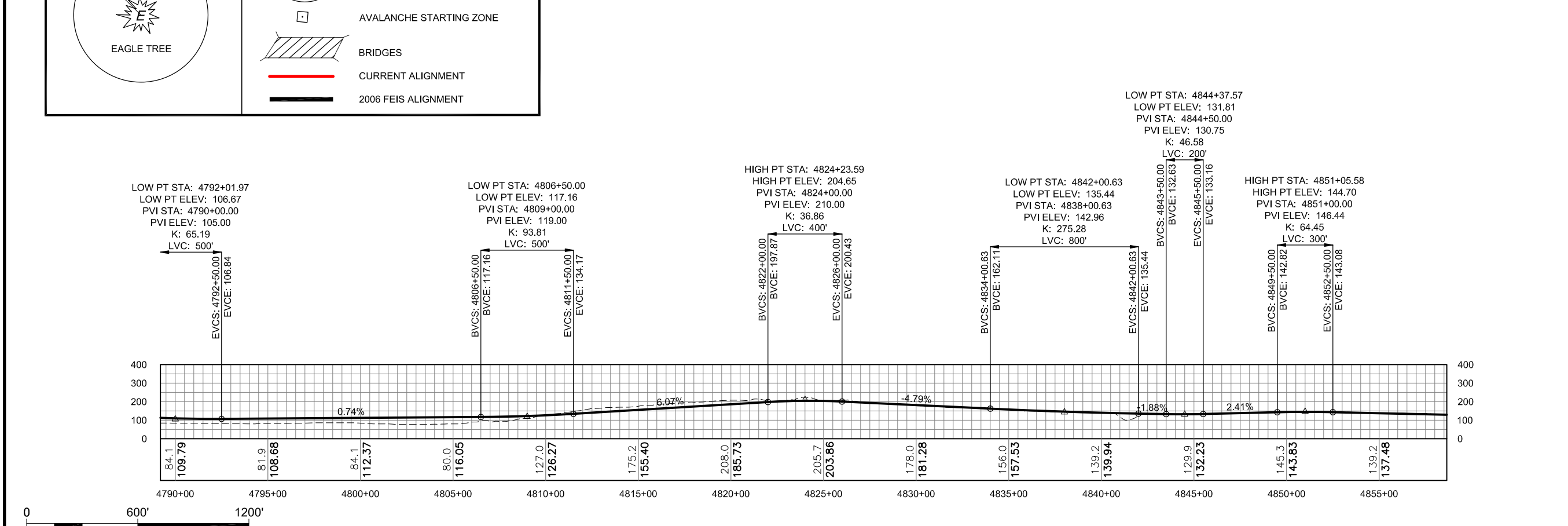


| ADDENDUM NUMBER     |      |             |
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| ATTACHMENT NUMBER   |      |             |
| RECORD OF REVISIONS |      |             |
| No.                 | DATE | DESCRIPTION |
|                     |      |             |
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**LEGEND**

|  |                         |
|--|-------------------------|
|  | EAGLE TREE              |
|  | AVALANCHE CHUTE         |
|  | AVALANCHE STARTING ZONE |
|  | BRIDGES                 |
|  | CURRENT ALIGNMENT       |
|  | 2006 FEIS ALIGNMENT     |



**PROFILE**

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|--|---------------------------|
| STATE OF ALASKA<br>DEPARTMENT OF TRANSPORTATION<br>& PUBLIC FACILITIES<br>SOUTHEAST REGION |                           |
| JNU-WEST LYNN CANAL<br>HIGHWAY, ALTERNATIVE 3<br>PROJECT #71100                            |                           |
| <b>2012 EIS<br/>PLAN &amp; PROFILE<br/>VIEW</b>  |                           |
| PROJECT DESIGNATION<br><b>71100</b>  |                           |
| STATE<br><b>ALASKA</b>   | YEAR<br><b>2013</b>       |
| SHEET NUMBER<br><b>WL12</b>  | TOTAL SHEETS<br><b>XX</b> |

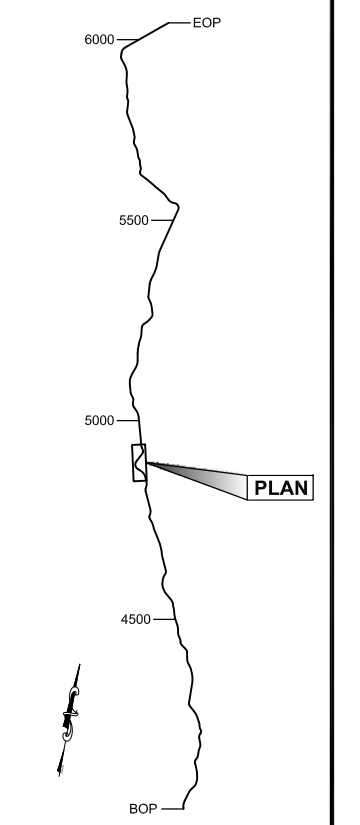


ADDENDUM NUMBER

ATTACHMENT NUMBER

RECORD OF REVISIONS

| No. | DATE | DESCRIPTION |
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 SOUTHEAST REGION

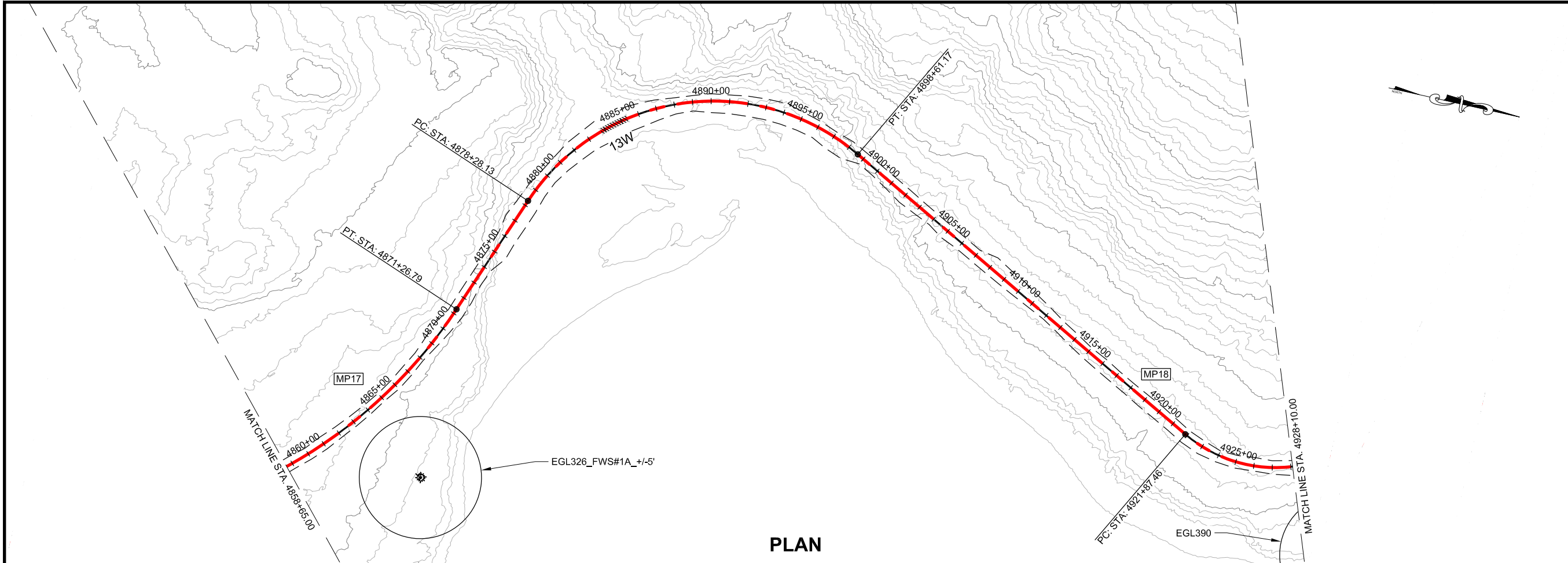
JNU-WEST LYNN CANAL  
 HIGHWAY, ALTERNATIVE 3  
 PROJECT #71100

**2012 EIS  
 PLAN & PROFILE  
 VIEW**

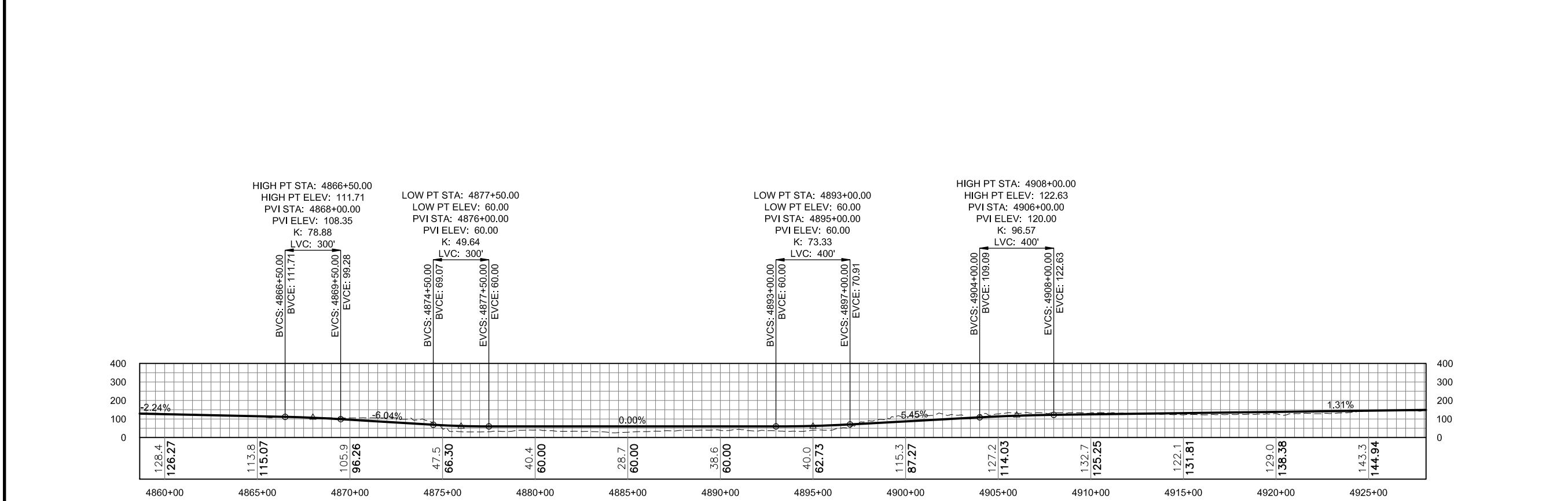
PROJECT DESIGNATION  
**71100**

| STATE         | YEAR        |
|---------------|-------------|
| <b>ALASKA</b> | <b>2013</b> |

| SHEET NUMBER | TOTAL SHEETS |
|--------------|--------------|
| <b>WL13</b>  | <b>XX</b>    |

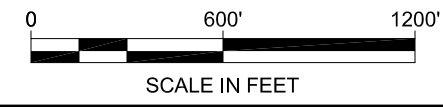


**PLAN**



**PROFILE**

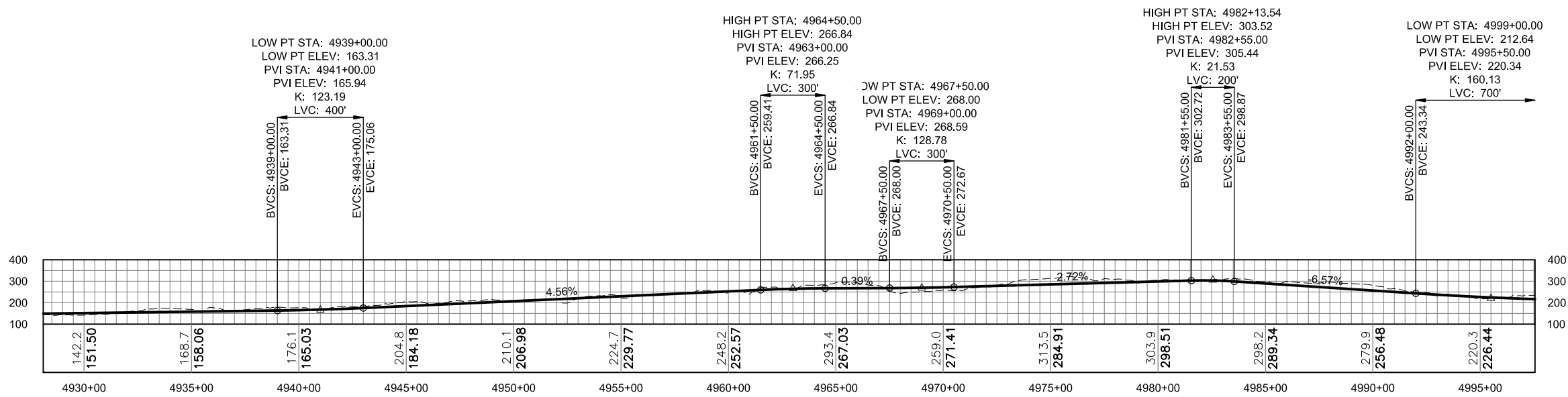
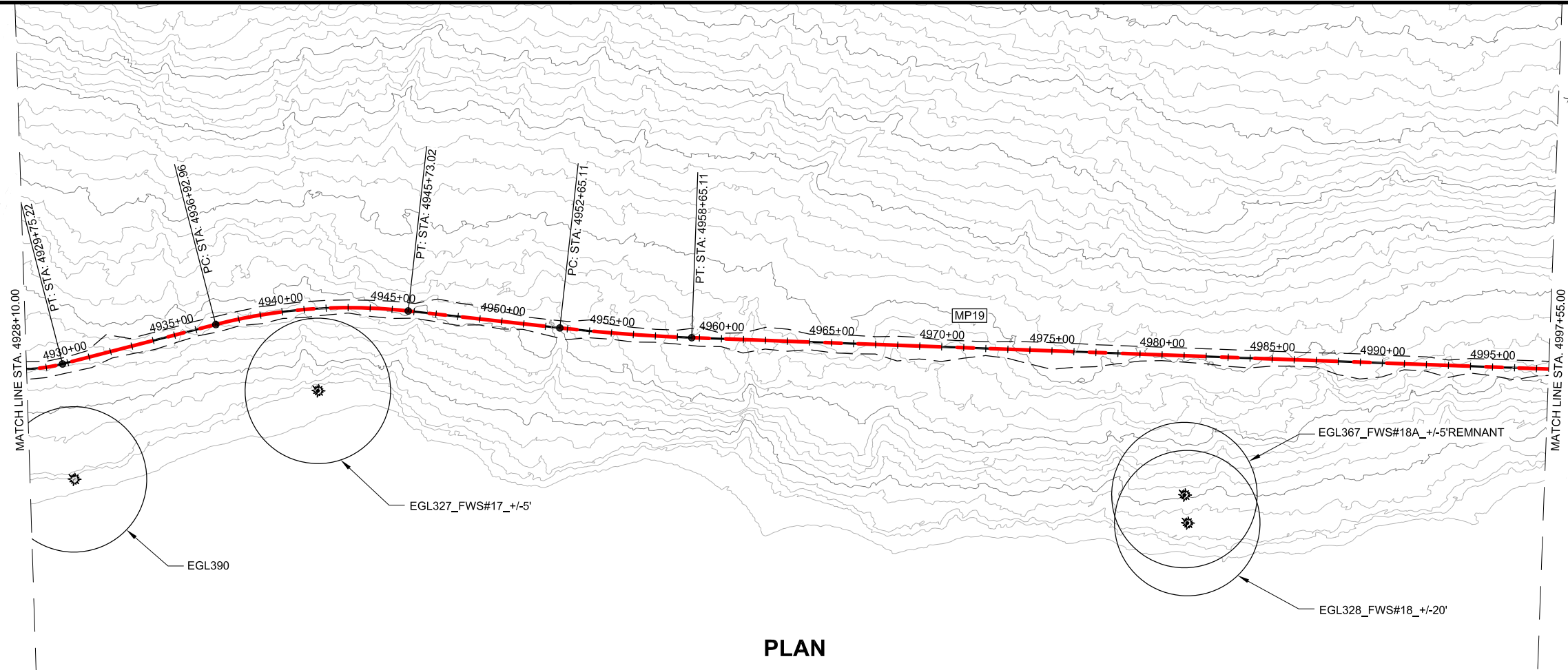
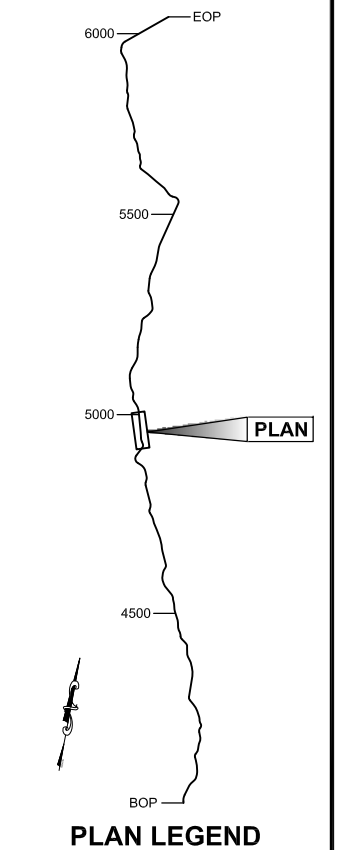
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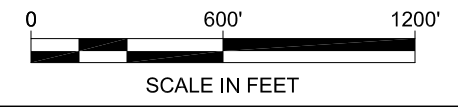




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 SOUTHEAST REGION

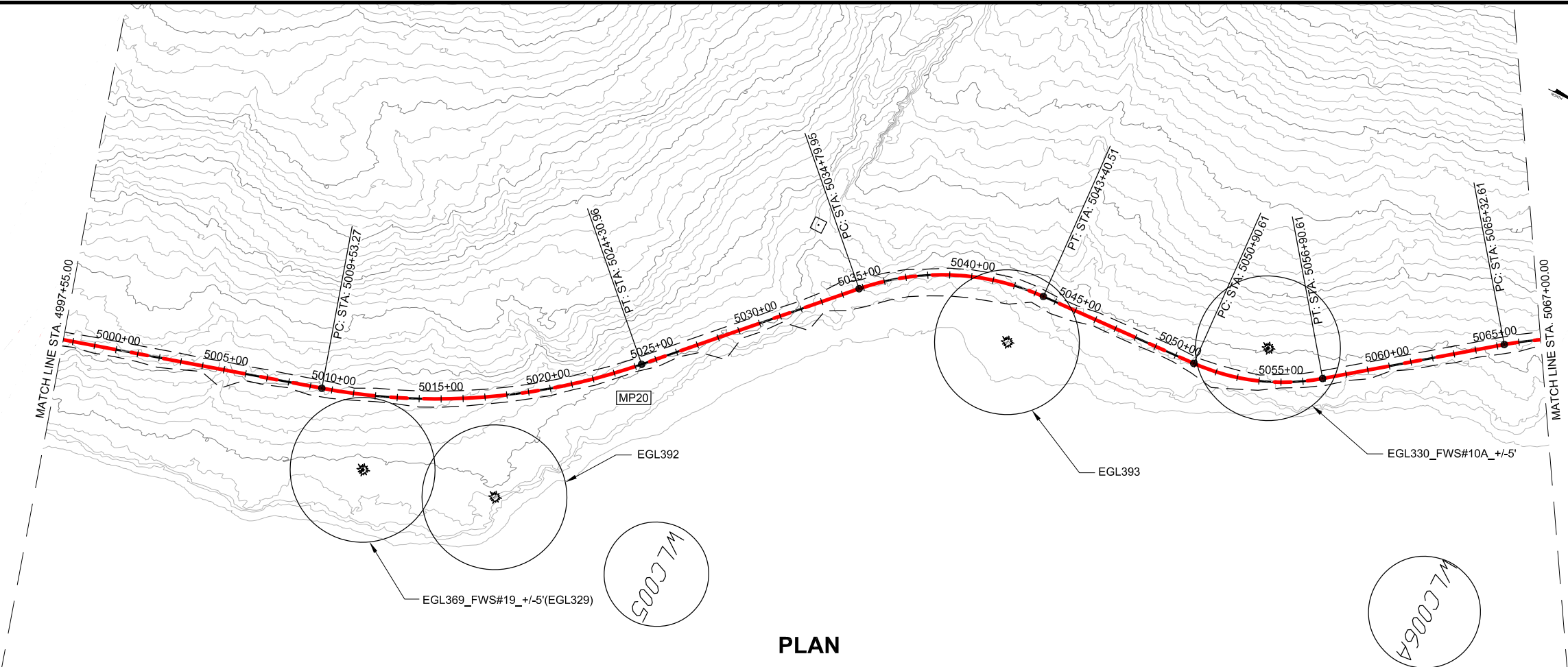
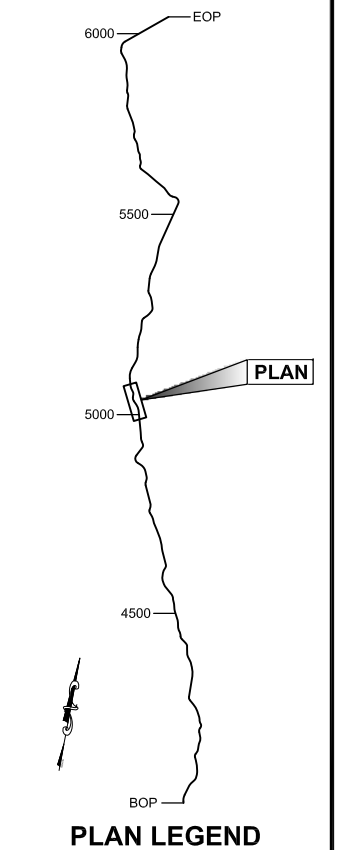
JNU-WEST LYNN CANAL  
 HIGHWAY, ALTERNATIVE 3  
 PROJECT #71100

**2012 EIS  
 PLAN & PROFILE  
 VIEW**

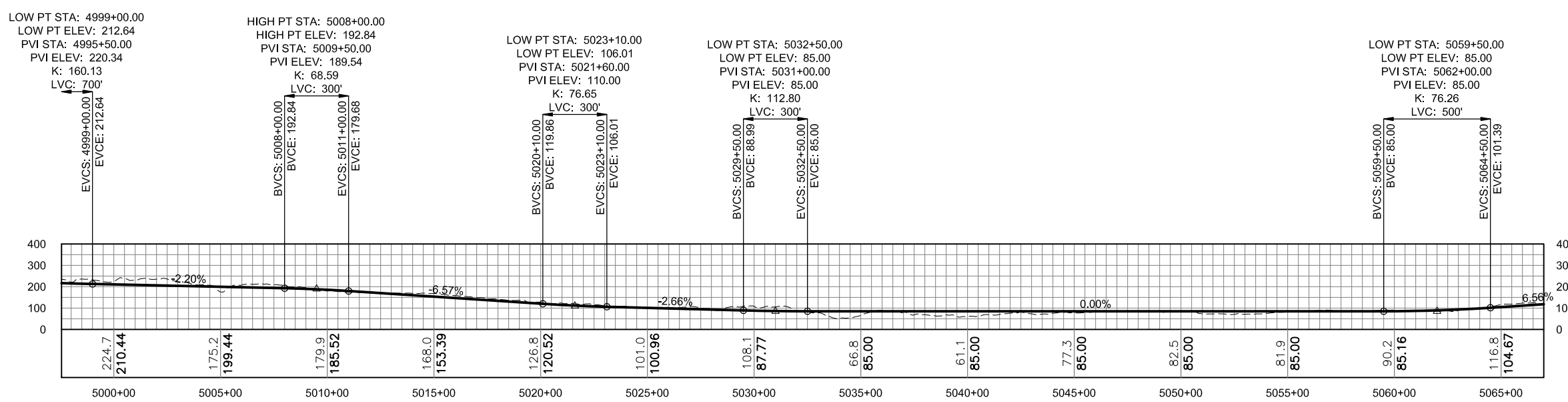
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| <b>71100</b>        |              |
| STATE               | YEAR         |
| <b>ALASKA</b>       | <b>2013</b>  |
| SHEET NUMBER        | TOTAL SHEETS |
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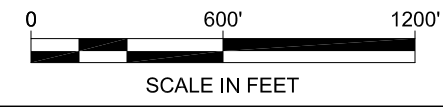
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| RECORD OF REVISIONS |      |             |
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**PLAN**



**PROFILE**



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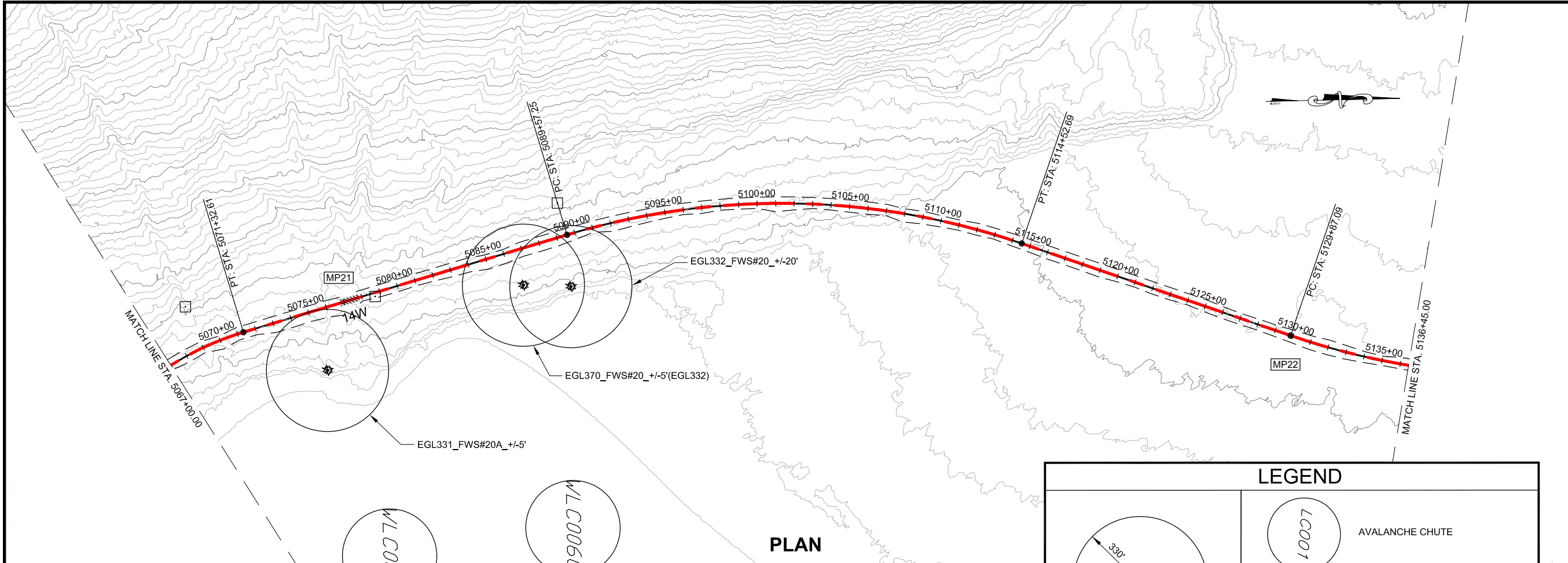
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STATE OF ALASKA  
 DEPARTMENT OF TRANSPORTATION  
 & PUBLIC FACILITIES  
 SOUTHEAST REGION  
 JNU-WEST LYNN CANAL  
 HIGHWAY, ALTERNATIVE 3  
 PROJECT #71100  
**2012 EIS  
 PLAN & PROFILE  
 VIEW**

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|---------------------|--------------|
| PROJECT DESIGNATION |              |
| <b>71100</b>        |              |
| STATE               | YEAR         |
| <b>ALASKA</b>       | <b>2013</b>  |
| SHEET NUMBER        | TOTAL SHEETS |
| <b>WL15</b>         | <b>XX</b>    |

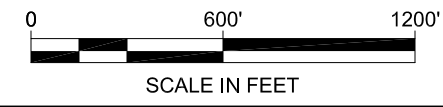
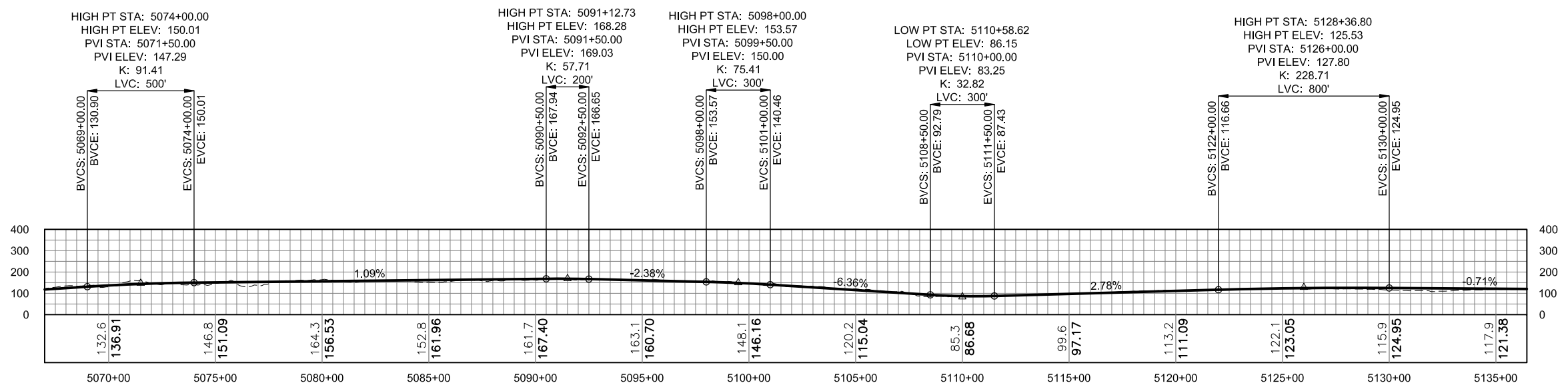
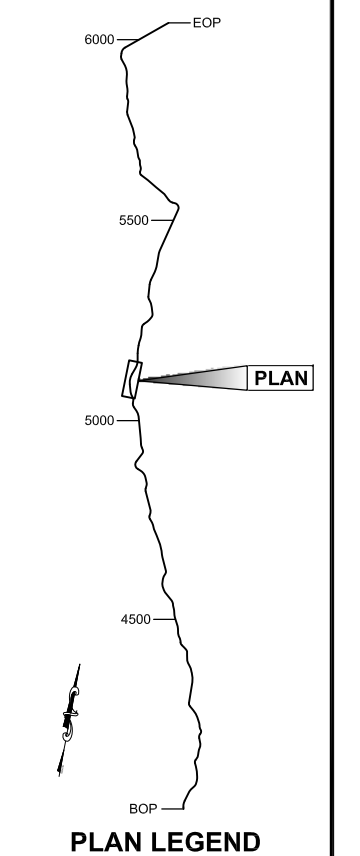


| ADDENDUM NUMBER     |      |             |
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| ATTACHMENT NUMBER   |      |             |
| RECORD OF REVISIONS |      |             |
| No.                 | DATE | DESCRIPTION |
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**LEGEND**

|  |                         |
|--|-------------------------|
|  | EAGLE TREE              |
|  | 1000 AVALANCHE CHUTE    |
|  | AVALANCHE STARTING ZONE |
|  | BRIDGES                 |
|  | CURRENT ALIGNMENT       |
|  | 2006 FEIS ALIGNMENT     |



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 SOUTHEAST REGION

JNU-WEST LYNN CANAL  
 HIGHWAY, ALTERNATIVE 3  
 PROJECT #71100

**2012 EIS  
 PLAN & PROFILE  
 VIEW**

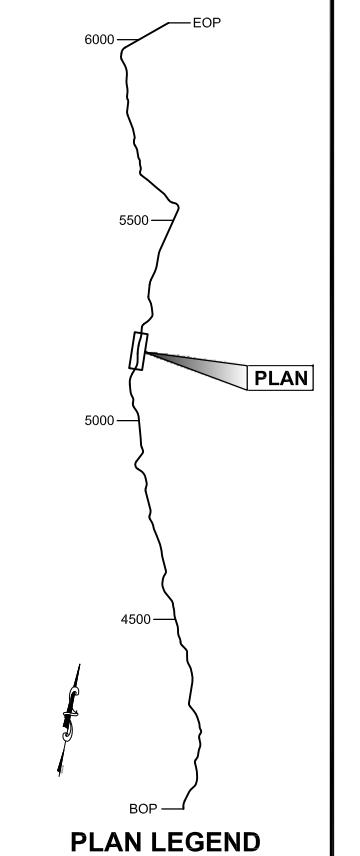
PROJECT DESIGNATION  
**71100**

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|--------------|--------------|
| STATE        | YEAR         |
| ALASKA       | 2013         |
| SHEET NUMBER | TOTAL SHEETS |
| WL16         | XX           |



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| ADDENDUM NUMBER   |  |
| ATTACHMENT NUMBER |  |

| RECORD OF REVISIONS |      |             |
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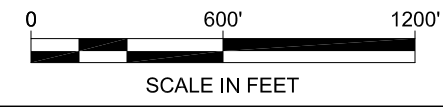
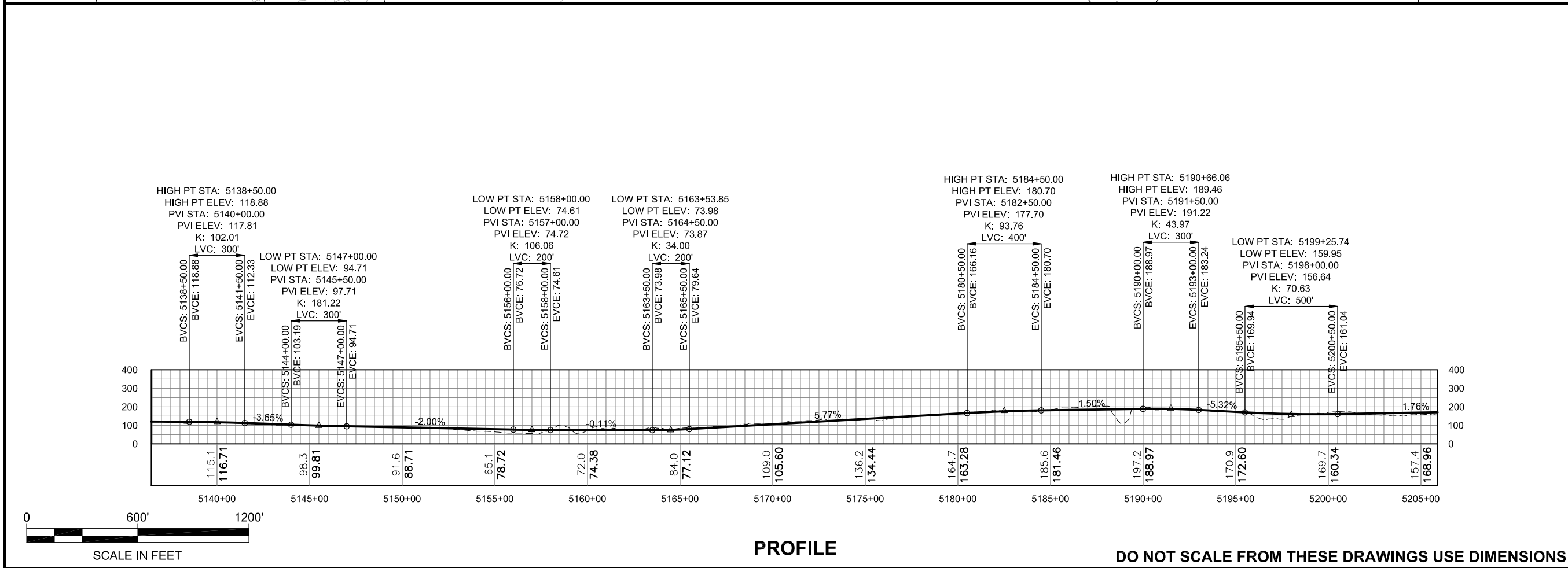
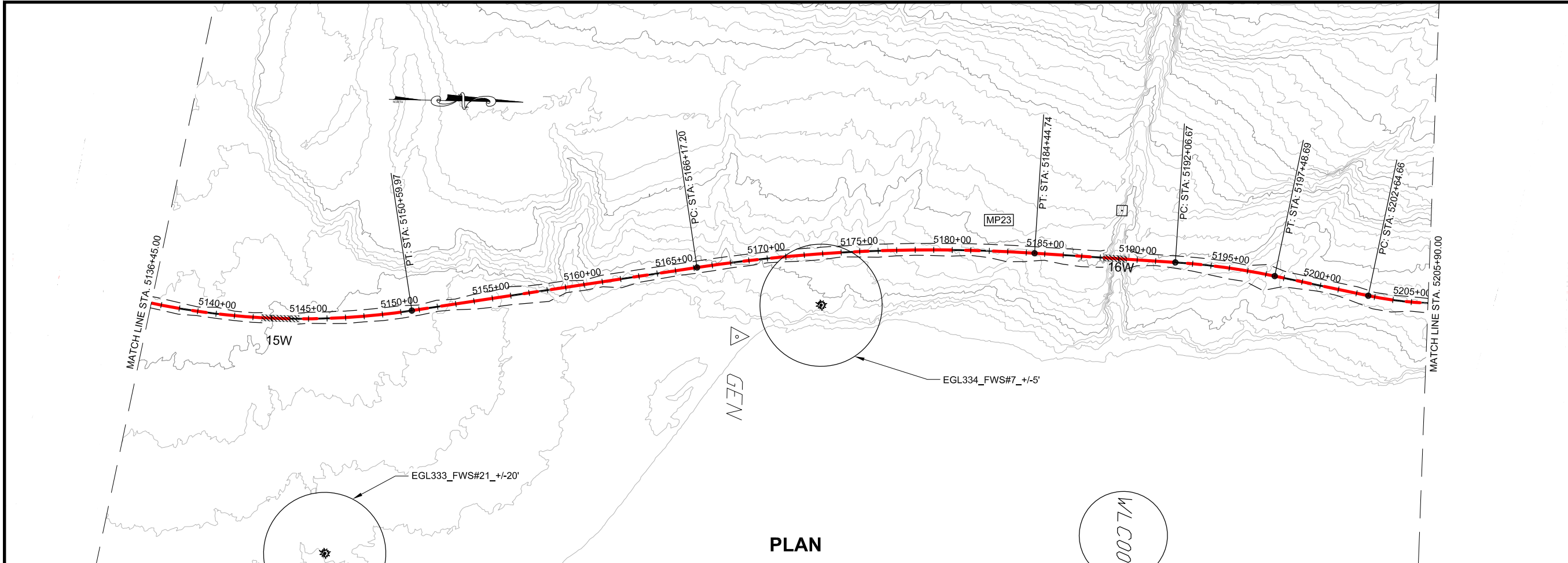
STATE OF ALASKA  
 DEPARTMENT OF TRANSPORTATION  
 & PUBLIC FACILITIES  
 SOUTHEAST REGION

**JNU-WEST LYNN CANAL  
 HIGHWAY, ALTERNATIVE 3  
 PROJECT #71100**

**2012 EIS  
 PLAN & PROFILE  
 VIEW**

PROJECT DESIGNATION  
**71100**

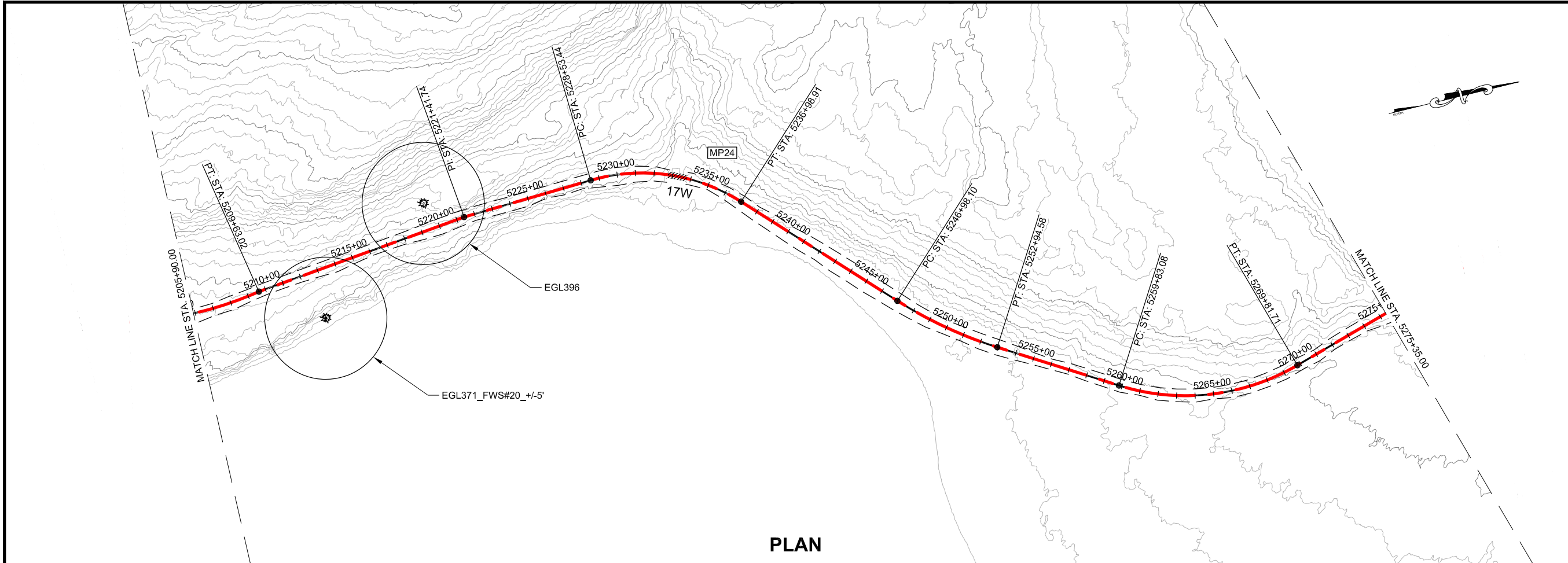
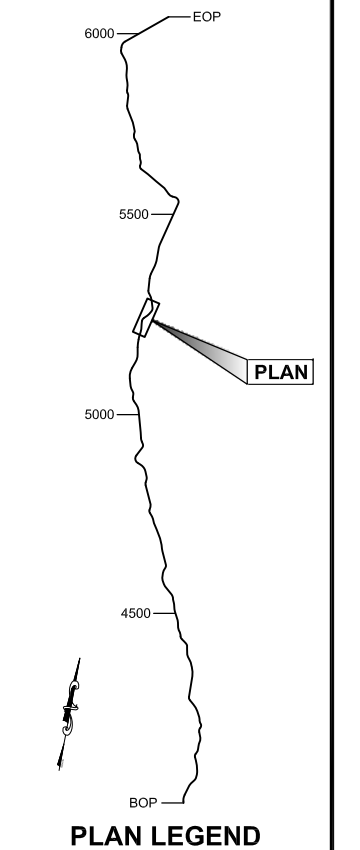
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| STATE         | YEAR         |
| <b>ALASKA</b> | <b>2013</b>  |
| SHEET NUMBER  | TOTAL SHEETS |
| <b>WL17</b>   | <b>XX</b>    |



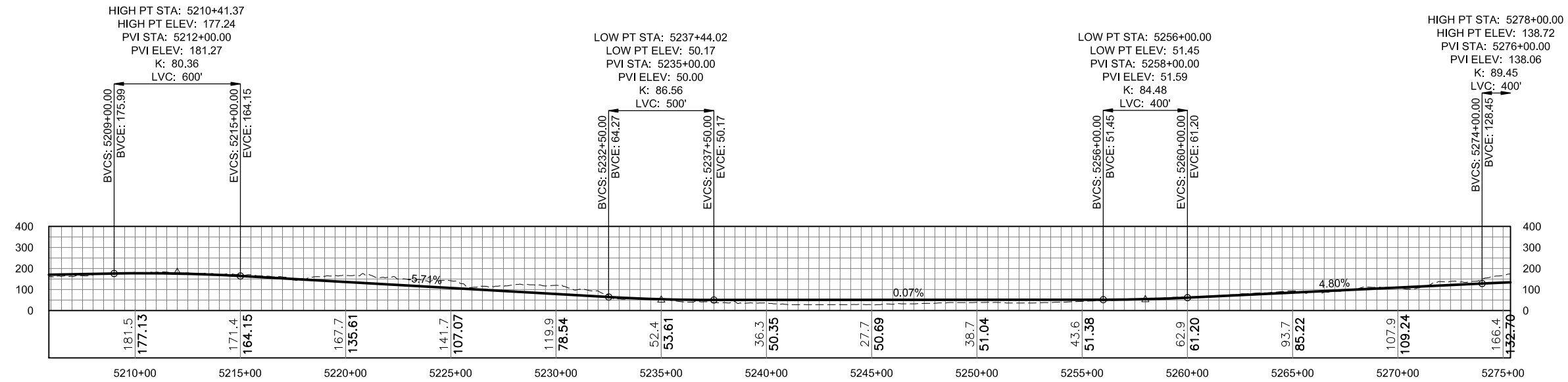




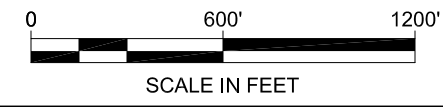
| RECORD OF REVISIONS |      |             |
|---------------------|------|-------------|
| No.                 | DATE | DESCRIPTION |
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PLAN



PROFILE



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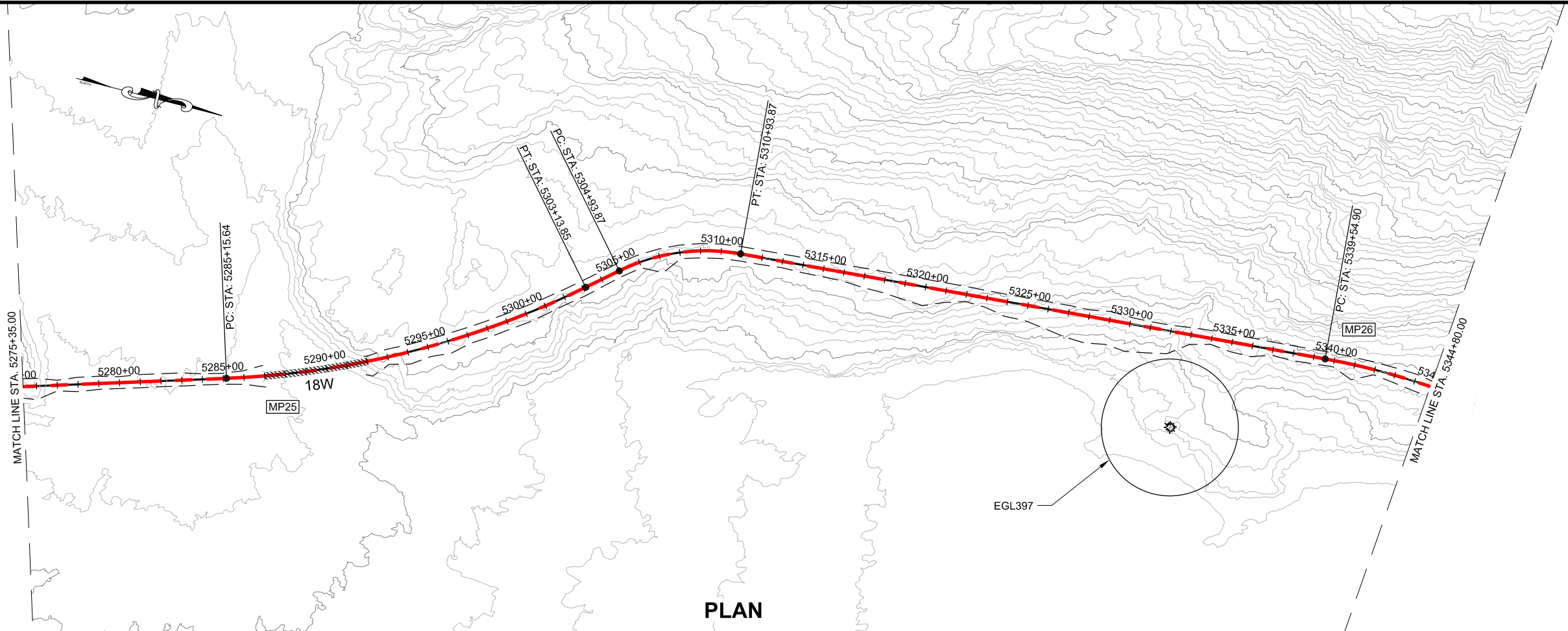
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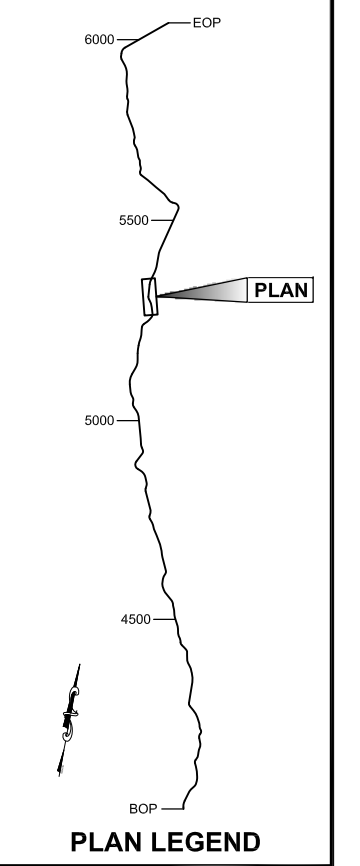
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| STATE OF ALASKA<br>DEPARTMENT OF TRANSPORTATION<br>& PUBLIC FACILITIES<br>SOUTHEAST REGION |                           |
| JNU-WEST LYNN CANAL<br>HIGHWAY, ALTERNATIVE 3<br>PROJECT #71100                            |                           |
| <b>2012 EIS<br/>PLAN &amp; PROFILE<br/>VIEW</b>  |                           |
| PROJECT DESIGNATION<br><b>71100</b>  |                           |
| STATE<br><b>ALASKA</b>   | YEAR<br><b>2013</b>       |
| SHEET NUMBER<br><b>WL18</b>  | TOTAL SHEETS<br><b>XX</b> |



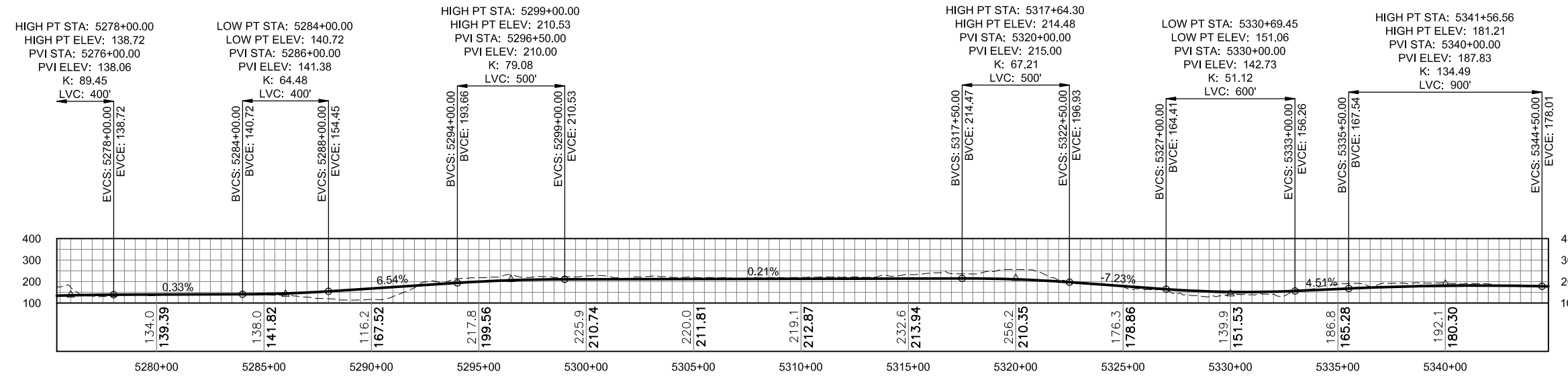
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| RECORD OF REVISIONS |      |             |
| No.                 | DATE | DESCRIPTION |
|                     |      |             |
|                     |      |             |



PLAN

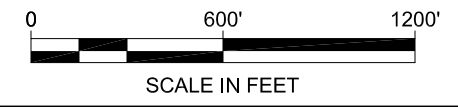


PLAN LEGEND



PROFILE

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 & PUBLIC FACILITIES  
 SOUTHEAST REGION

JNU-WEST LYNN CANAL  
 HIGHWAY, ALTERNATIVE 3  
 PROJECT #71100

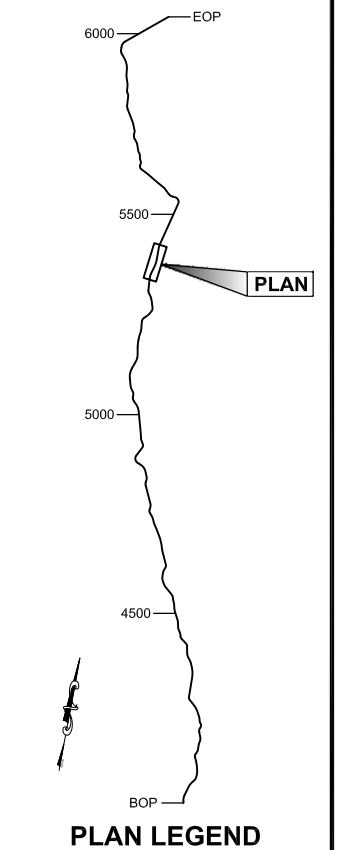
**2012 EIS  
 PLAN & PROFILE  
 VIEW**

PROJECT DESIGNATION  
**71100**

|              |              |
|--------------|--------------|
| STATE        | YEAR         |
| ALASKA       | 2013         |
| SHEET NUMBER | TOTAL SHEETS |
| WL19         | XX           |



| ADDENDUM NUMBER     |      |             |
|---------------------|------|-------------|
| ATTACHMENT NUMBER   |      |             |
| RECORD OF REVISIONS |      |             |
| No.                 | DATE | DESCRIPTION |
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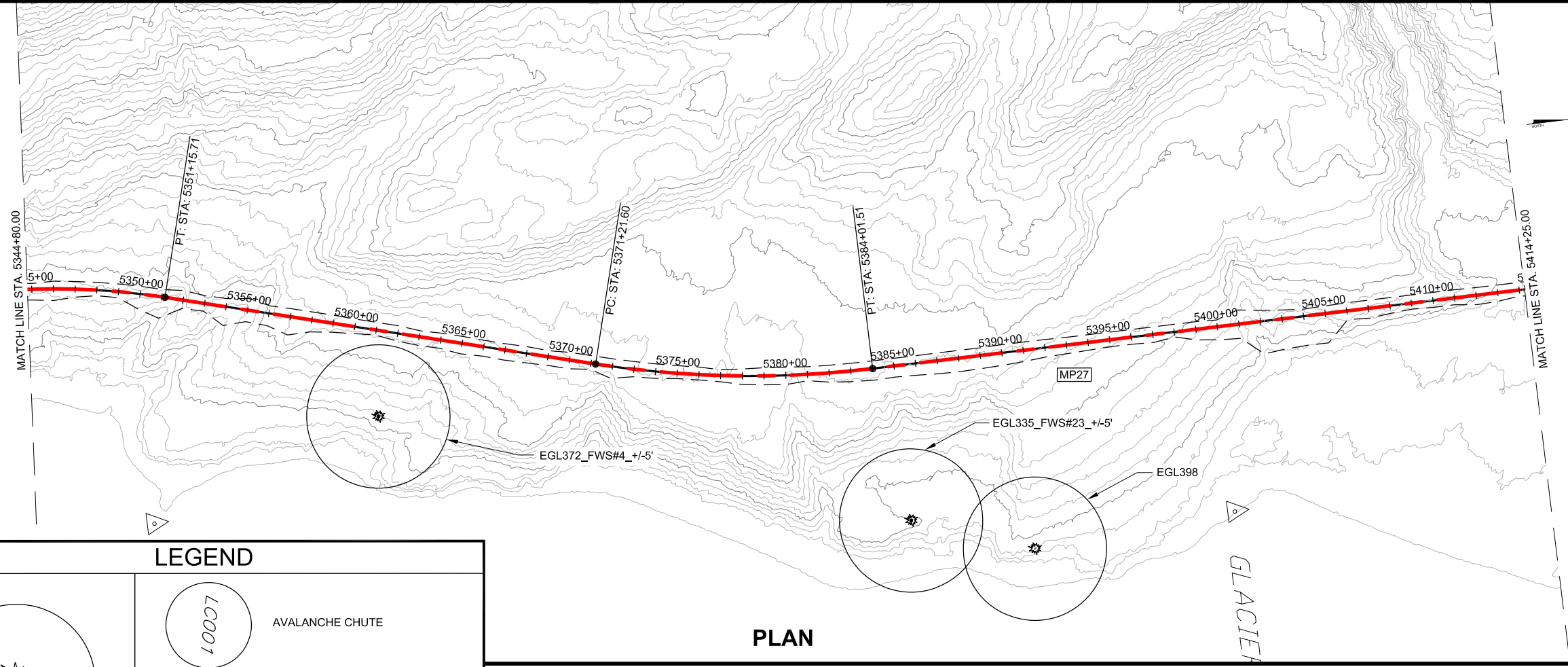
STATE OF ALASKA  
 DEPARTMENT OF TRANSPORTATION  
 & PUBLIC FACILITIES  
 SOUTHEAST REGION

JNU-WEST LYNN CANAL  
 HIGHWAY, ALTERNATIVE 3  
 PROJECT #71100

**2012 EIS  
 PLAN & PROFILE  
 VIEW**

PROJECT DESIGNATION  
**71100**

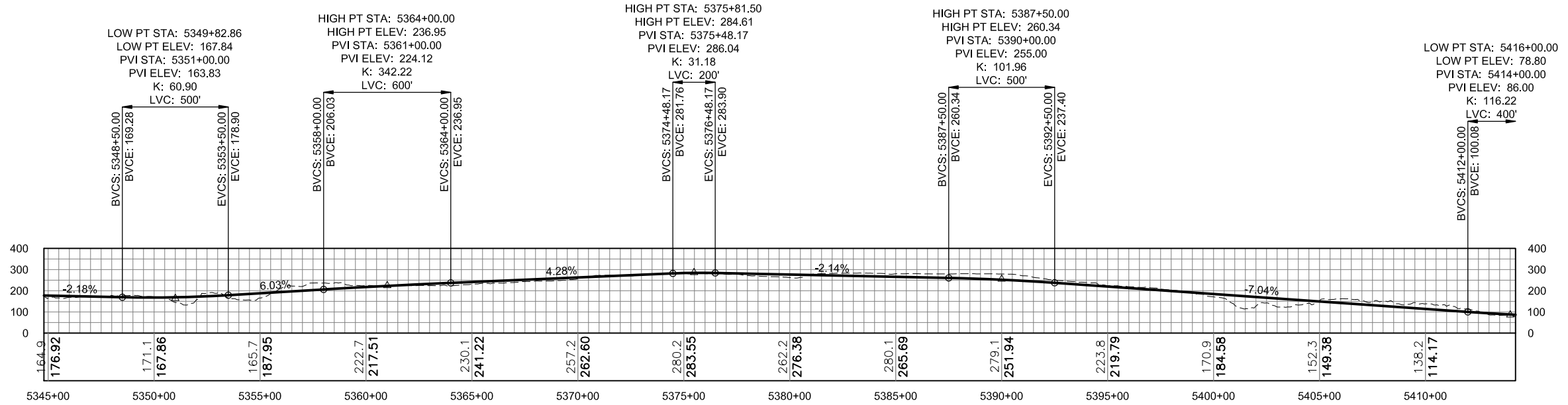
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| STATE         | YEAR         |
| <b>ALASKA</b> | <b>2013</b>  |
| SHEET NUMBER  | TOTAL SHEETS |
| <b>WL20</b>   | <b>XX</b>    |



**PLAN**

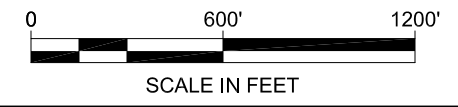
**LEGEND**

- EAGLE TREE
- AVALANCHE CHUTE
- AVALANCHE STARTING ZONE
- BRIDGES
- CURRENT ALIGNMENT
- 2006 FEIS ALIGNMENT



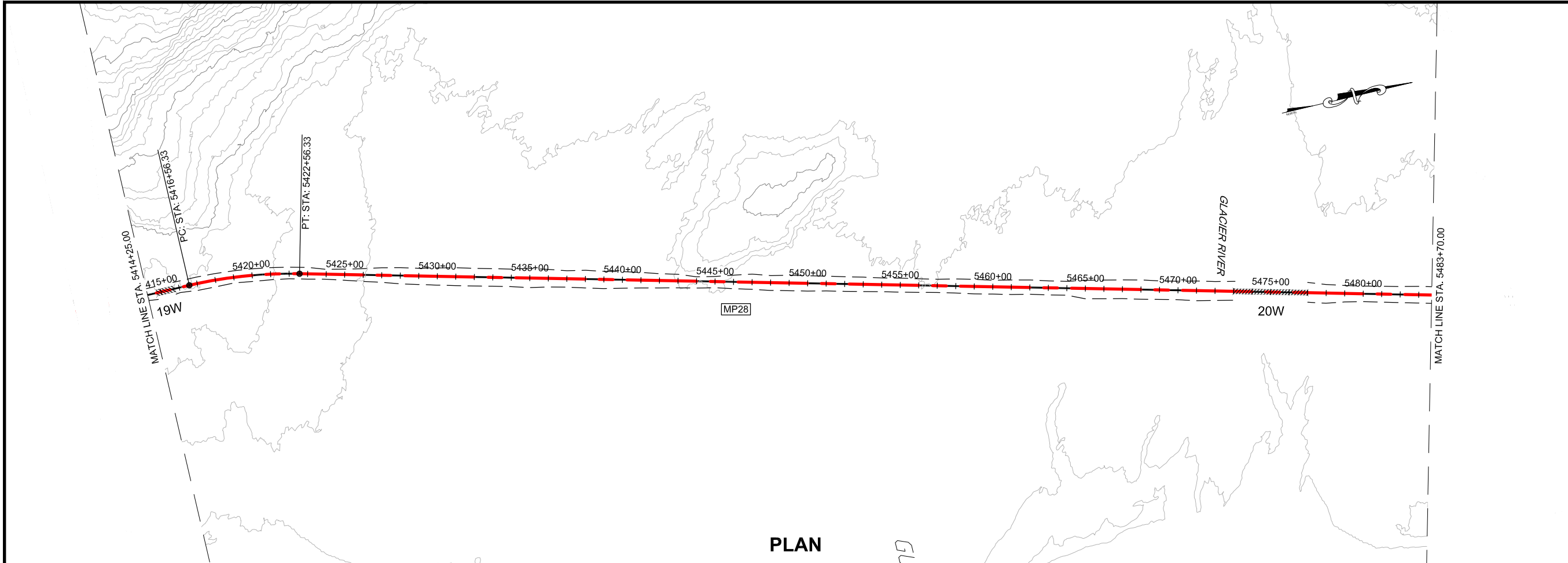
**PROFILE**

**DO NOT SCALE FROM THESE DRAWINGS USE DIMENSIONS**

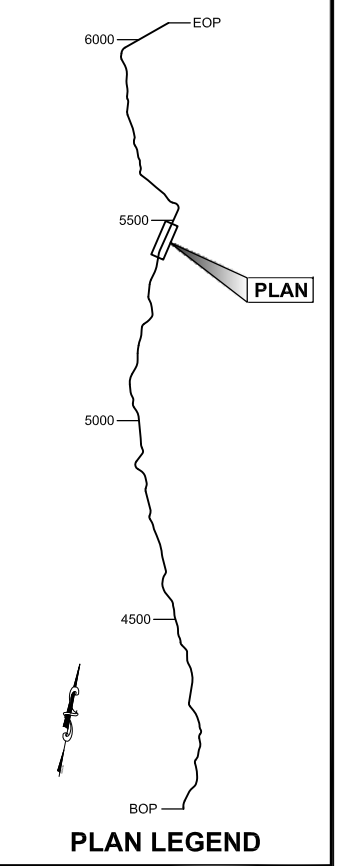




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| ATTACHMENT NUMBER   |      |             |
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| No.                 | DATE | DESCRIPTION |
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PLAN



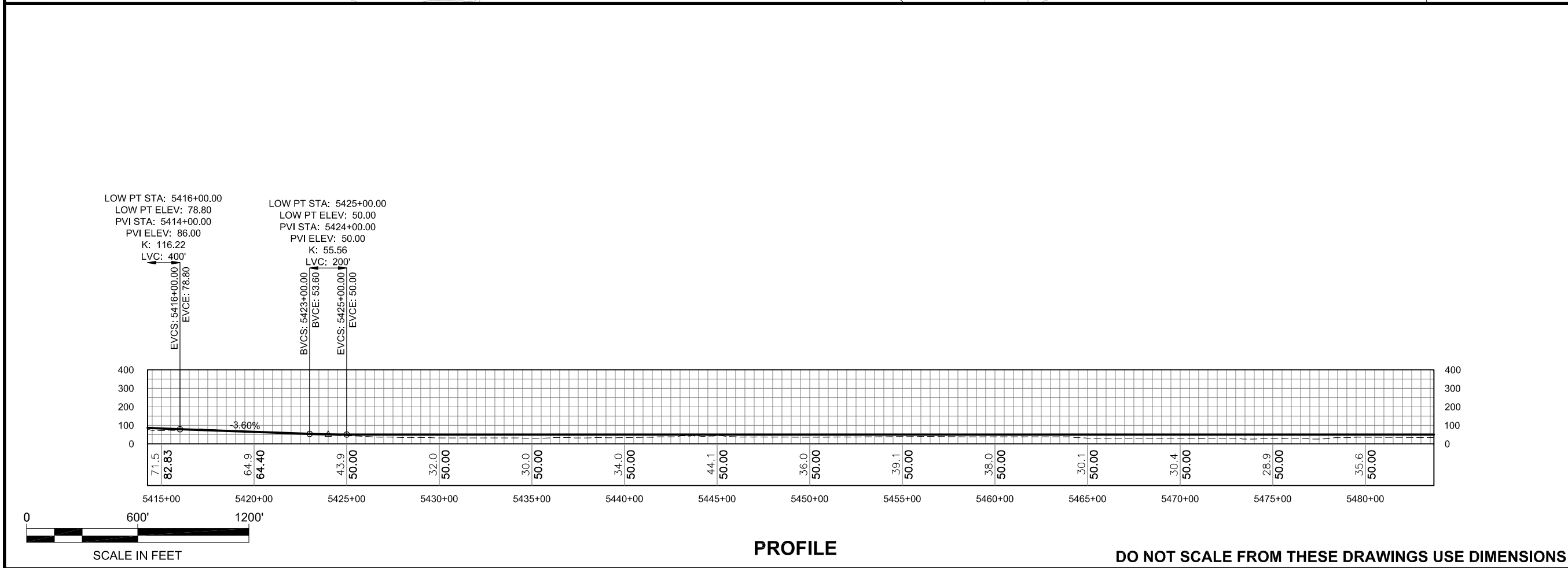
PLAN LEGEND

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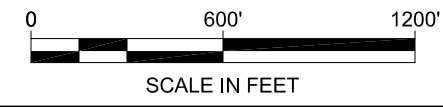
STATE OF ALASKA  
 DEPARTMENT OF TRANSPORTATION  
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 SOUTHEAST REGION  
 JNU-WEST LYNN CANAL  
 HIGHWAY, ALTERNATIVE 3  
 PROJECT #71100  
**2012 EIS  
 PLAN & PROFILE  
 VIEW**

|                     |              |
|---------------------|--------------|
| PROJECT DESIGNATION |              |
| 71100               |              |
| STATE               | YEAR         |
| ALASKA              | 2013         |
| SHEET NUMBER        | TOTAL SHEETS |
| WL21                | XX           |



PROFILE

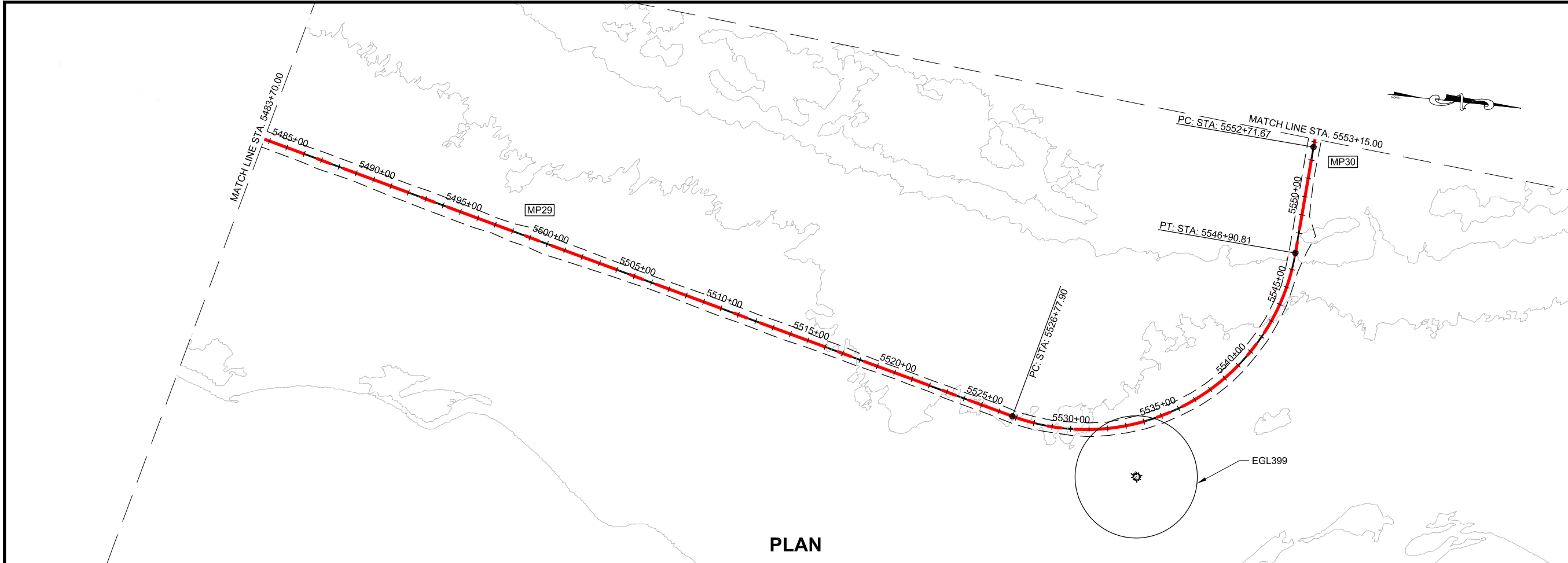
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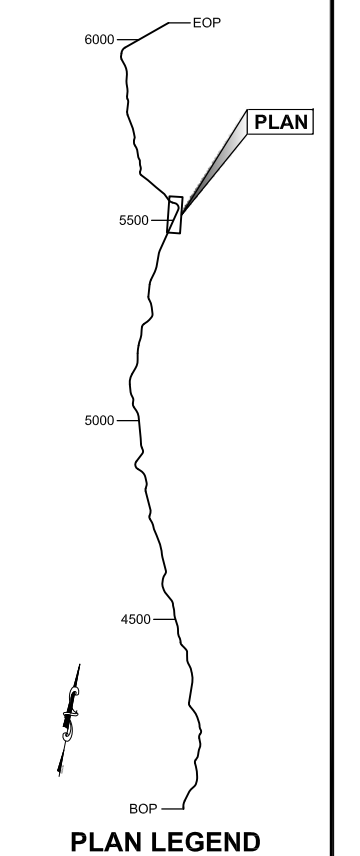




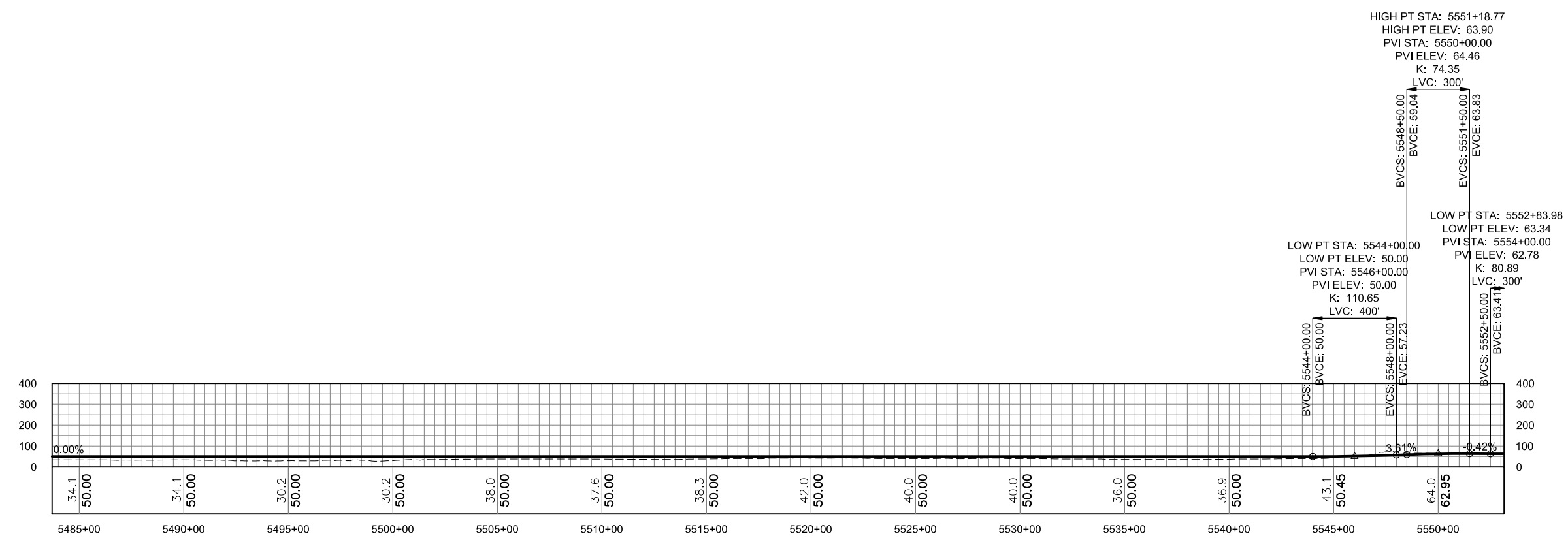
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**PLAN**

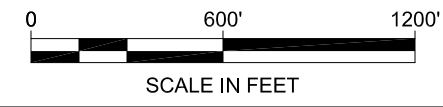


**PLAN LEGEND**



**PROFILE**

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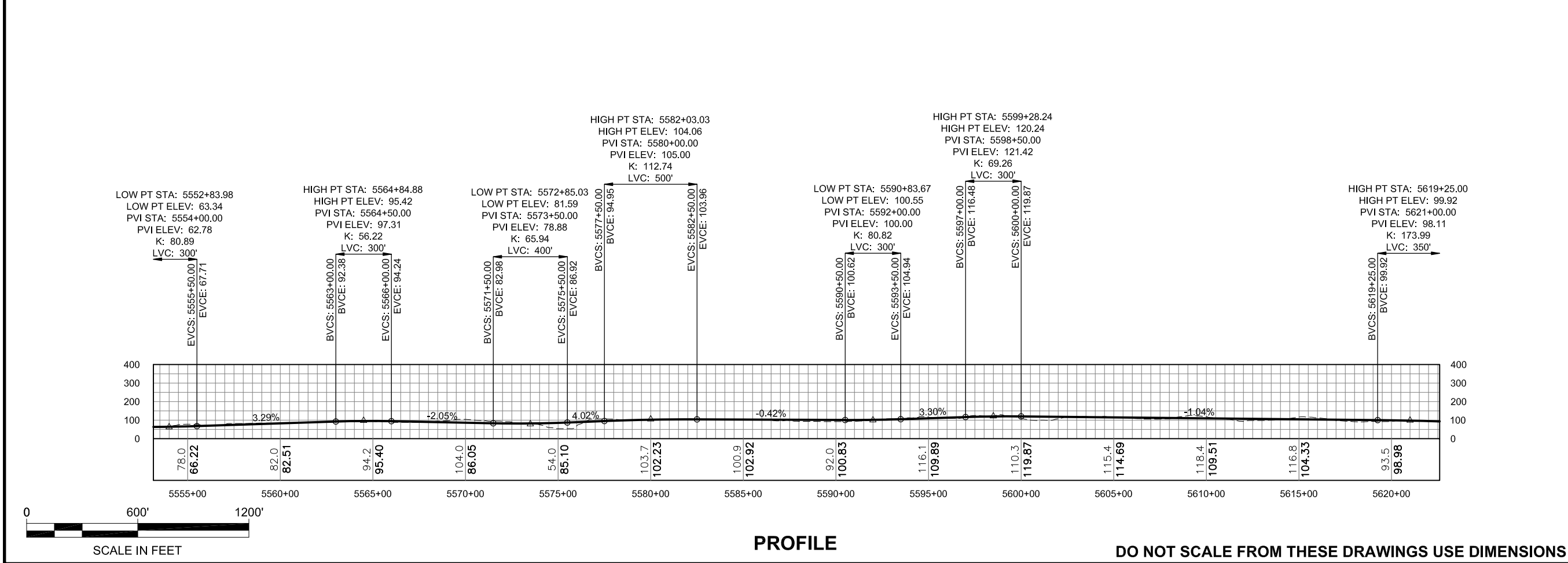
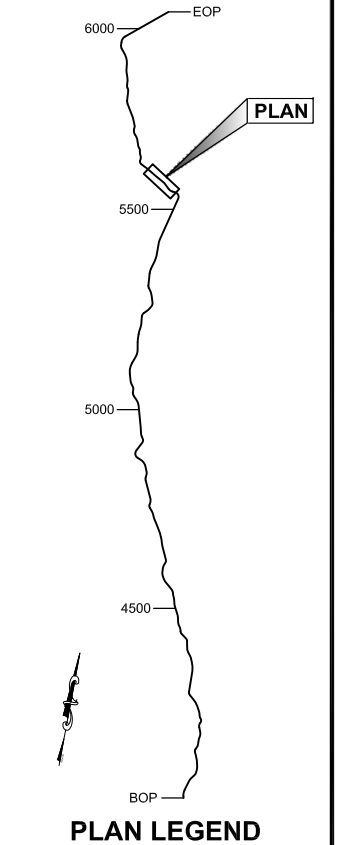
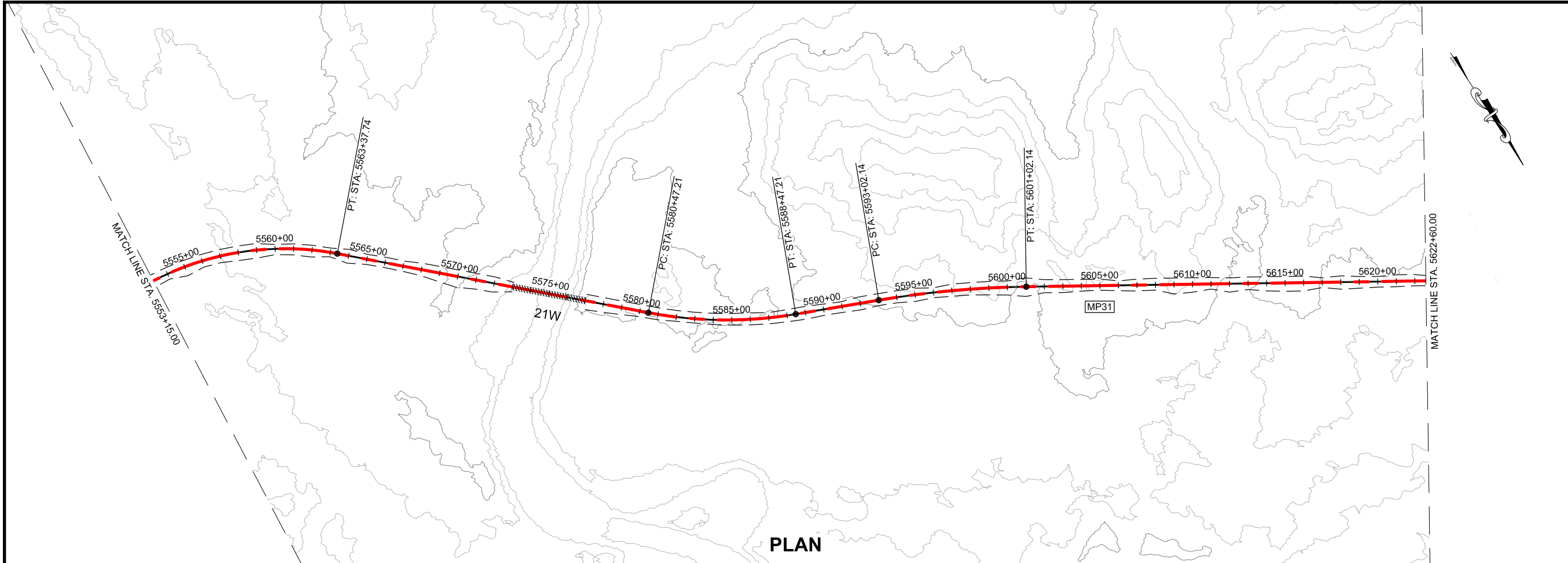
**DRAFT**

STATE OF ALASKA  
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 SOUTHEAST REGION  
 JNU-WEST LYNN CANAL  
 HIGHWAY, ALTERNATIVE 3  
 PROJECT #71100  
**2012 EIS  
 PLAN & PROFILE  
 VIEW**

| PROJECT DESIGNATION |              |
|---------------------|--------------|
| <b>71100</b>        |              |
| STATE               | YEAR         |
| <b>ALASKA</b>       | <b>2013</b>  |
| SHEET NUMBER        | TOTAL SHEETS |
| <b>WL22</b>         | <b>XX</b>    |



| ADDENDUM NUMBER     |      |             |
|---------------------|------|-------------|
| ATTACHMENT NUMBER   |      |             |
| RECORD OF REVISIONS |      |             |
| No.                 | DATE | DESCRIPTION |
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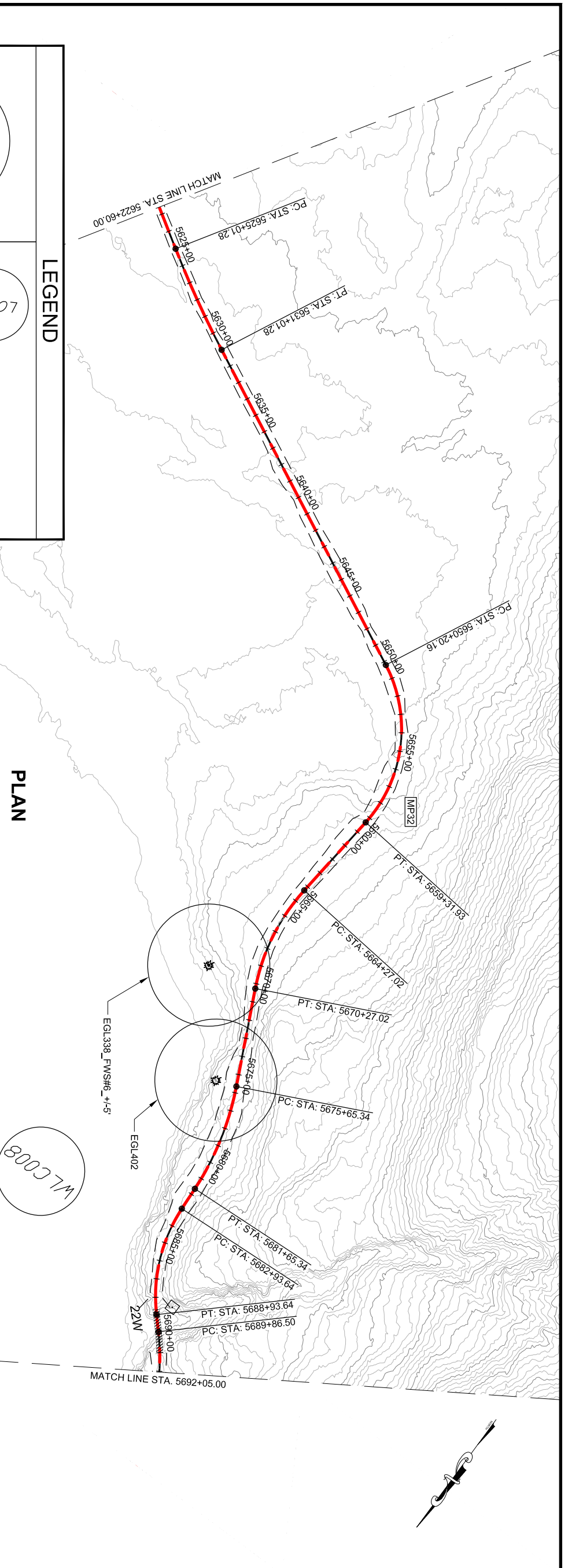
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| STATE OF ALASKA<br>DEPARTMENT OF TRANSPORTATION<br>& PUBLIC FACILITIES<br>SOUTHEAST REGION |                           |
| JNU-WEST LYNN CANAL<br>HIGHWAY, ALTERNATIVE 3<br>PROJECT #71100                            |                           |
| <b>2012 EIS<br/>PLAN &amp; PROFILE<br/>VIEW</b>  |                           |
| PROJECT DESIGNATION<br><b>71100</b>  |                           |
| STATE<br><b>ALASKA</b>   | YEAR<br><b>2013</b>       |
| SHEET NUMBER<br><b>WL23</b>  | TOTAL SHEETS<br><b>XX</b> |

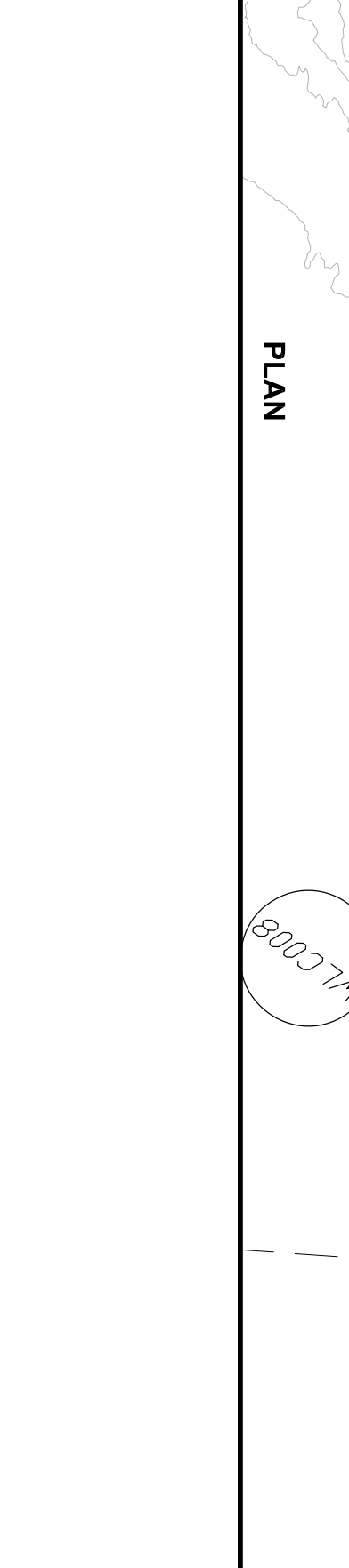
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### LEGEND

- AVALANCHE CHUTE
- AVALANCHE STARTING ZONE
- BRIDGES
- CURRENT ALIGNMENT
- 2006 FEIS ALIGNMENT



HIGH PT STA: 5619+25.00 OW PT STA: 5629+85.20  
 HIGH PT ELEV: 99.92 LOW PT ELEV: 73.95  
 PVI STA: 5621+00.00 PVI STA: 5629+00.63  
 PVI ELEV: 98.11 PVI ELEV: 73.71  
 K: 173.99 K: 60.56  
 LVC: 390' LVC: 200'

HIGH PT STA: 5652+00.00  
 HIGH PT ELEV: 79.57  
 PVI STA: 5653+50.00  
 PVI ELEV: 79.95  
 K: 44.85  
 LVC: 300'

HIGH PT STA: 5665+49.15  
 HIGH PT ELEV: 153.15  
 PVI STA: 5665+00.00  
 PVI ELEV: 160.15  
 K: 42.90  
 LVC: 500'

LOW PT STA: 5675+94.86  
 LOW PT ELEV: 125.16  
 PVI STA: 5673+50.00  
 PVI ELEV: 120.35  
 K: 148.36  
 LVC: 900'

HIGH PT STA: 5689+50.00  
 HIGH PT ELEV: 151.67  
 PVI STA: 5683+00.00  
 PVI ELEV: 147.34  
 K: 4771.28  
 LVC: 700'

EVCS: 5622+75.00 EVCE: 92.78  
 BVCS: 5628+00.63 BVCE: 76.76  
 EVCS: 5630+00.63 EVCE: 73.96  
 BVCS: 5662+50.00 BVCE: 142.72  
 EVCS: 5667+50.00 EVCE: 148.44  
 BVCS: 5669+00.00 BVCE: 141.42  
 EVCS: 5678+00.00 EVCE: 126.58  
 BVCS: 5689+50.00 BVCE: 142.50

-3.05%  
 0.25%  
 6.97%  
 -4.68%  
 -1.38%

81.9  
 85.92  
 72.2  
 73.96  
 76.0  
 75.24  
 79.9  
 76.51  
 60.2  
 77.78  
 66.2  
 79.06  
 102.0  
 90.41  
 150.1  
 125.28  
 159.2  
 152.86  
 158.2  
 137.08  
 162.8  
 125.46  
 168.6  
 129.35  
 156.7  
 136.27  
 74.9  
 143.19

5625+00 5630+00 5635+00 5640+00 5645+00 5650+00 5655+00 5660+00 5665+00 5670+00 5675+00 5680+00 5685+00 5690+00

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 SOUTHEAST REGION  
 JUNI-WEST LYNN CANAL  
 HIGHWAY ALTERNATIVE 3  
 PROJECT #71100  
**PLAN & PROFILE VIEW**  
 PROJECT DESIGNATION  
**71100**

CHECKED BY:  
 PLAN LEGEND

| RECORD OF REVISIONS |                  |
|---------------------|------------------|
| NO.                 | DATE DESCRIPTION |
|                     |                  |
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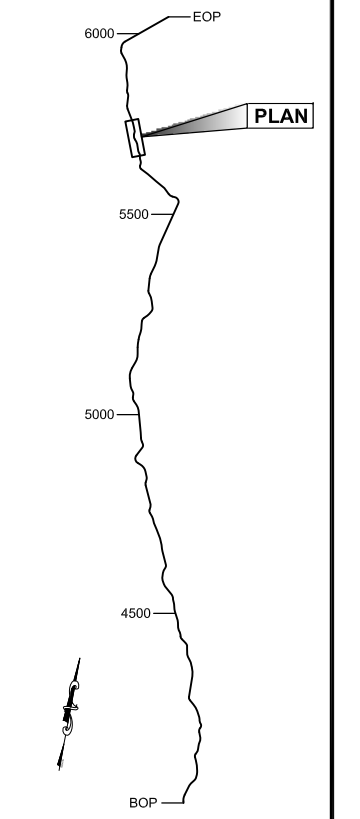
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STATE: **ALASKA** YEAR: **2013**  
 SHEET NUMBER: **WL24** TOTAL SHEETS: **XX**

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 PLANS.DWG  
 GEAR, NATE (DOT)  
 TAB: WL24 Friday, October 04, 2013 1:25:03 PM



| ADDENDUM NUMBER     |      |             |
|---------------------|------|-------------|
| ATTACHMENT NUMBER   |      |             |
| RECORD OF REVISIONS |      |             |
| No.                 | DATE | DESCRIPTION |
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JNU-WEST LYNN CANAL  
 HIGHWAY, ALTERNATIVE 3  
 PROJECT #71100

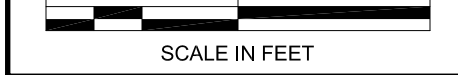
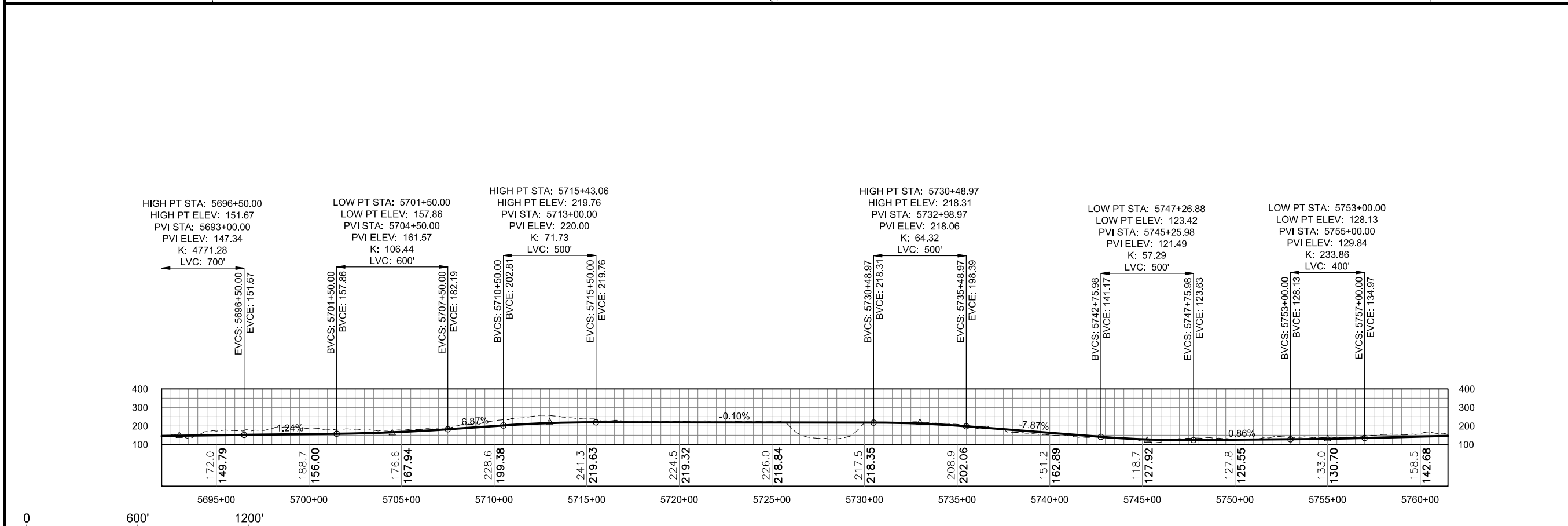
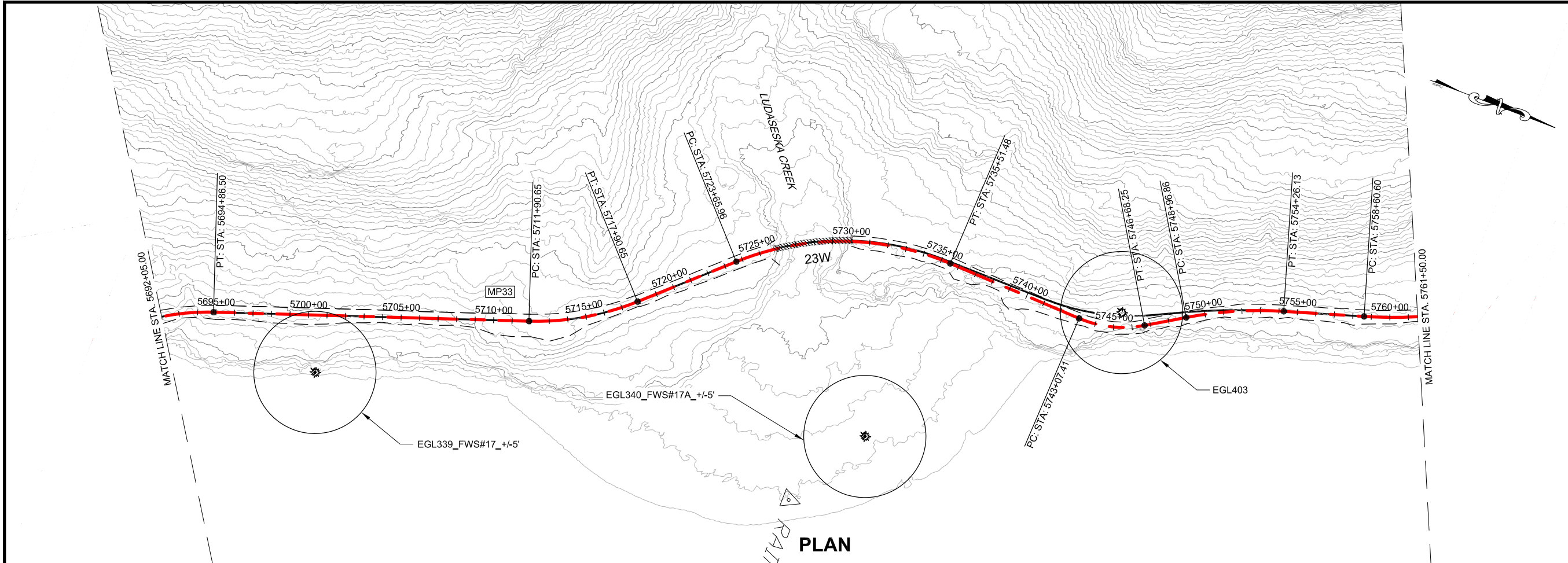
**2012 EIS  
 PLAN & PROFILE  
 VIEW**

PROJECT DESIGNATION

**71100**

|               |             |
|---------------|-------------|
| STATE         | YEAR        |
| <b>ALASKA</b> | <b>2013</b> |

|              |              |
|--------------|--------------|
| SHEET NUMBER | TOTAL SHEETS |
| <b>WL25</b>  | <b>XX</b>    |



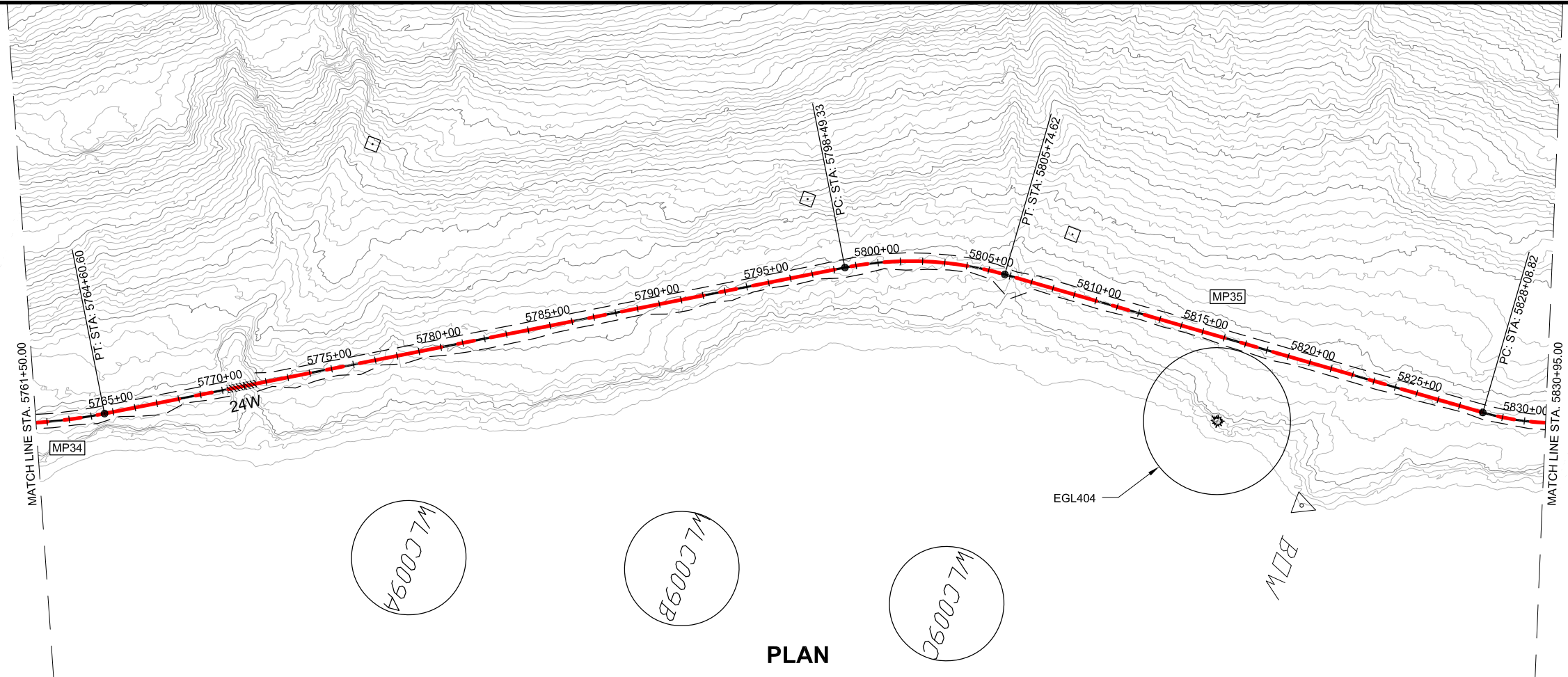
**PROFILE**

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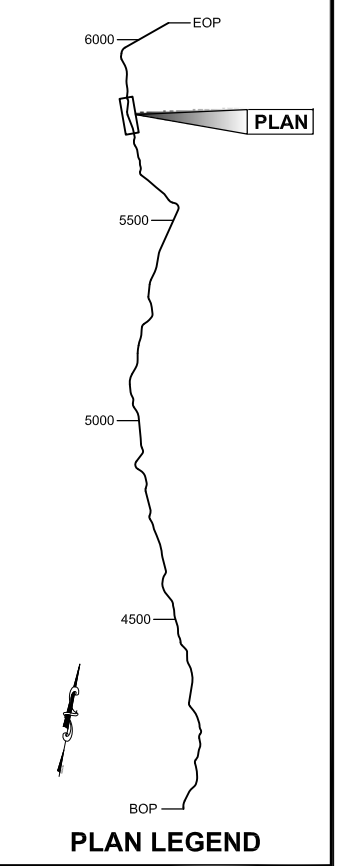




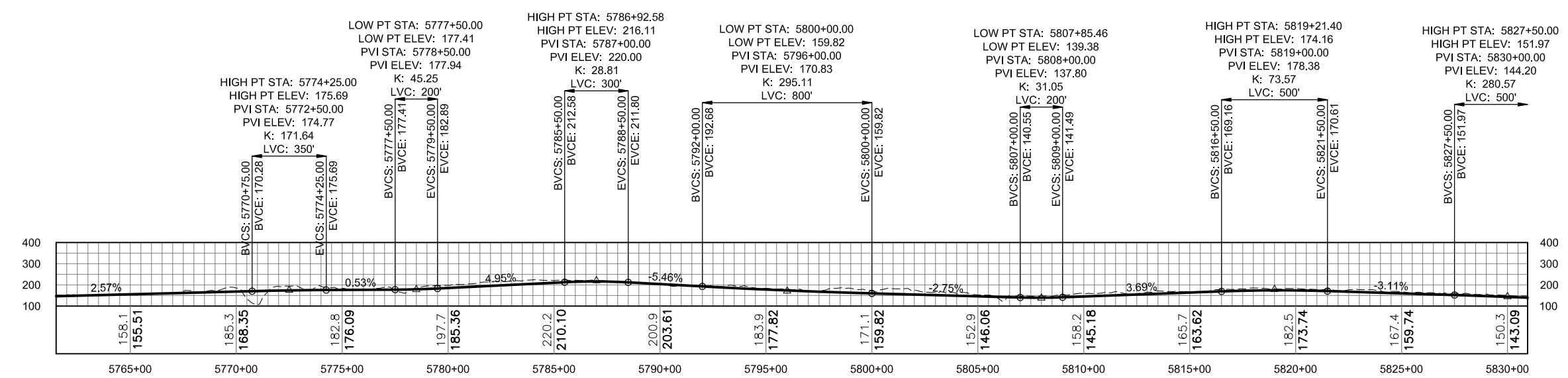
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| No.                 | DATE | DESCRIPTION |
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PLAN

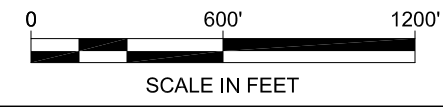


PLAN LEGEND



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 PROJECT #71100

**2012 EIS  
 PLAN & PROFILE  
 VIEW**

PROJECT DESIGNATION  
**71100**

|              |              |
|--------------|--------------|
| STATE        | YEAR         |
| ALASKA       | 2013         |
| SHEET NUMBER | TOTAL SHEETS |
| WL26         | XX           |

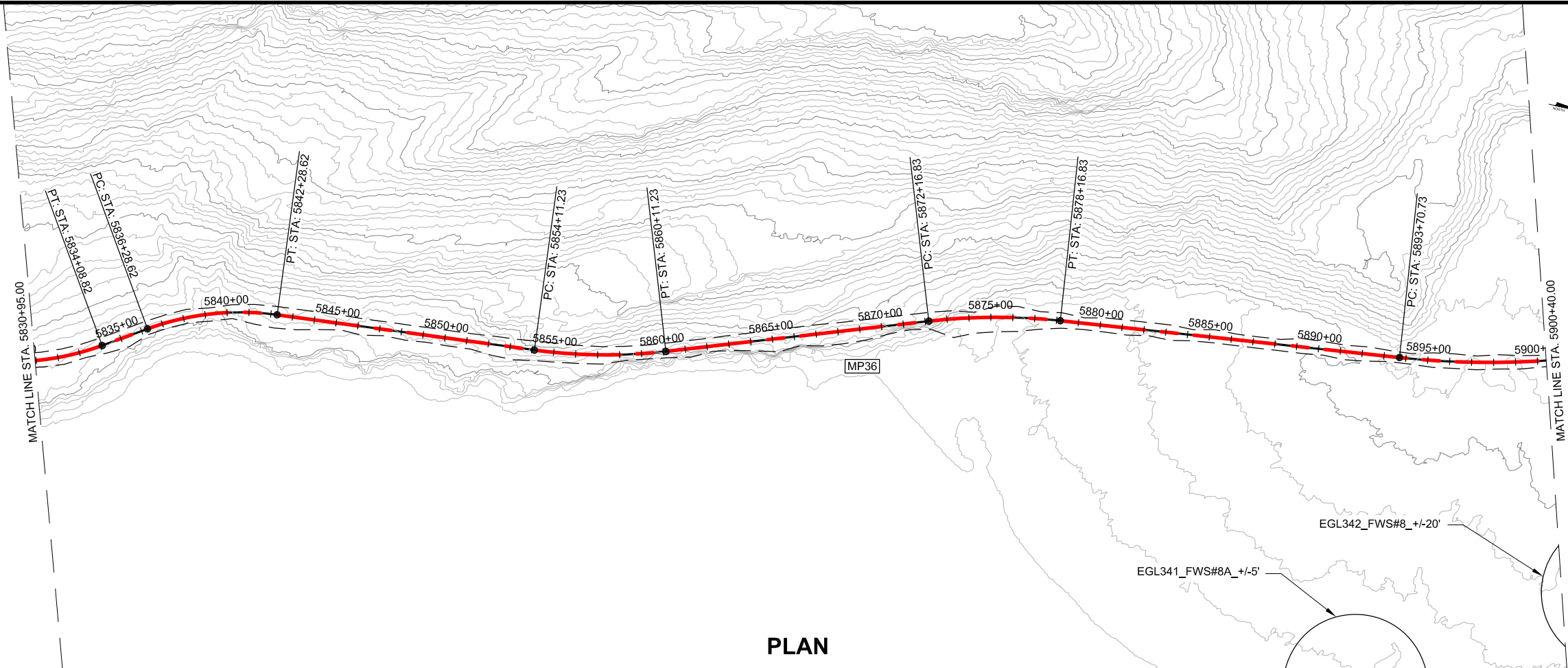


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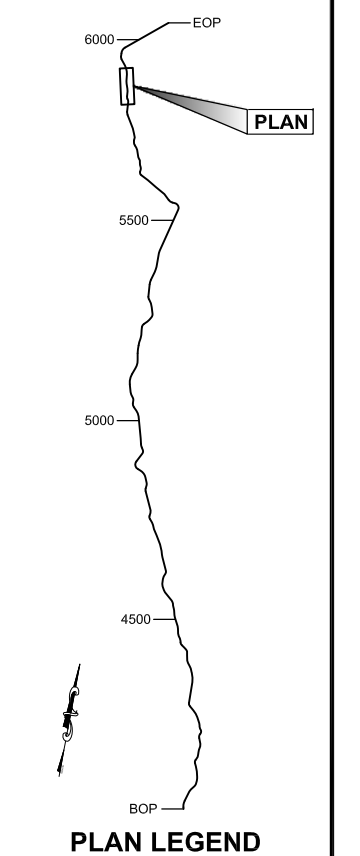
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RECORD OF REVISIONS

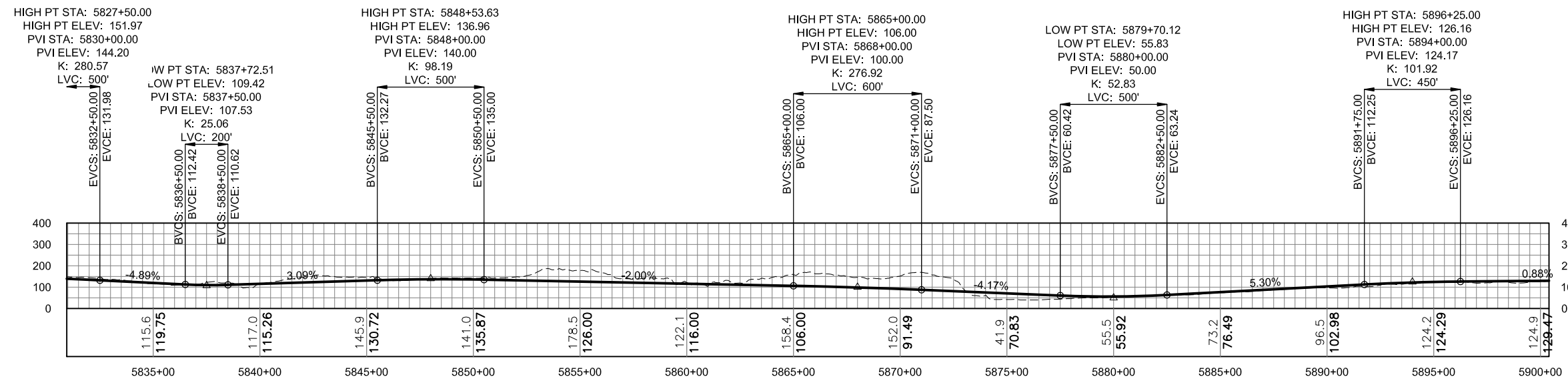
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|     |      |             |



PLAN

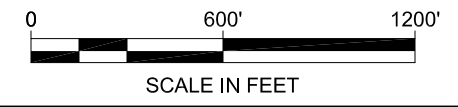


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JNU-WEST LYNN CANAL  
 HIGHWAY, ALTERNATIVE 3  
 PROJECT #71100

**2012 EIS  
 PLAN & PROFILE  
 VIEW**

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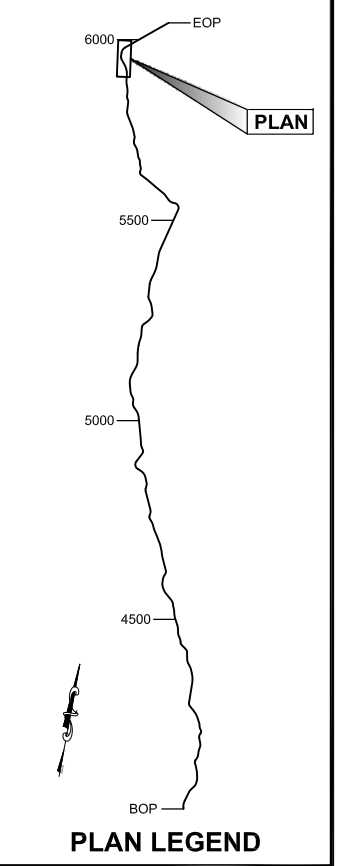
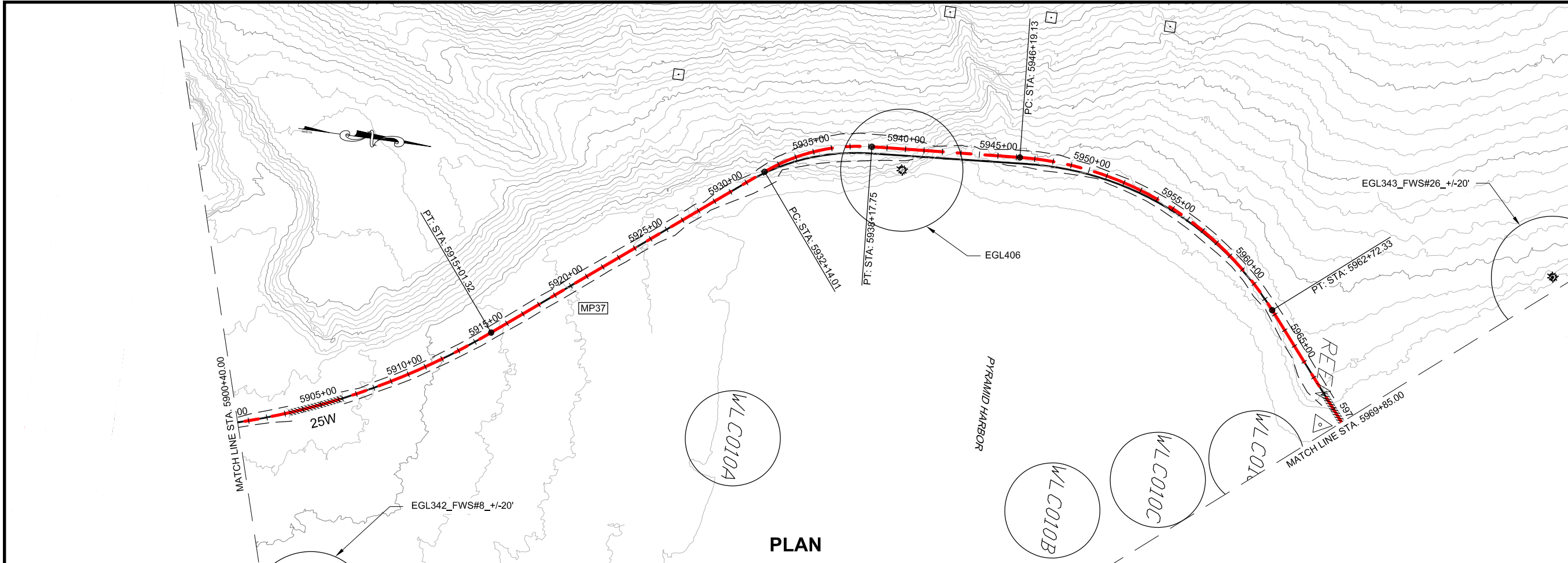
**71100**

| STATE  | YEAR |
|--------|------|
| ALASKA | 2013 |

| SHEET NUMBER | TOTAL SHEETS |
|--------------|--------------|
| WL27         | XX           |

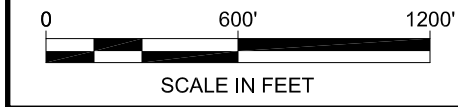
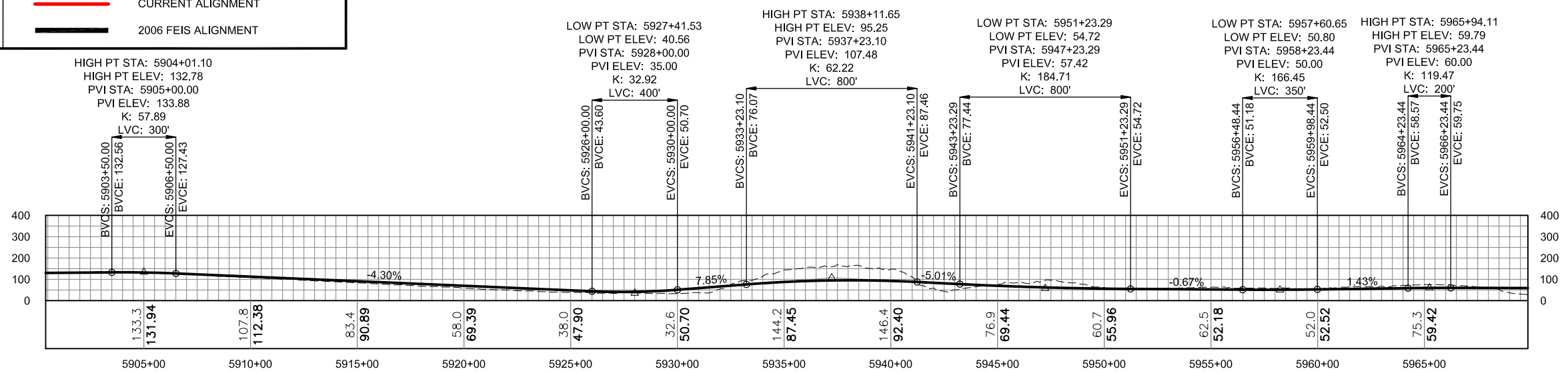


| RECORD OF REVISIONS |      |             |
|---------------------|------|-------------|
| No.                 | DATE | DESCRIPTION |
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**LEGEND**

- EAGLE TREE
- AVALANCHE CHUTE
- AVALANCHE STARTING ZONE
- BRIDGES
- CURRENT ALIGNMENT
- 2006 FEIS ALIGNMENT



**PROFILE**

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 HIGHWAY, ALTERNATIVE 3  
 PROJECT #71100

**2012 EIS  
 PLAN & PROFILE  
 VIEW**

PROJECT DESIGNATION  
**71100**

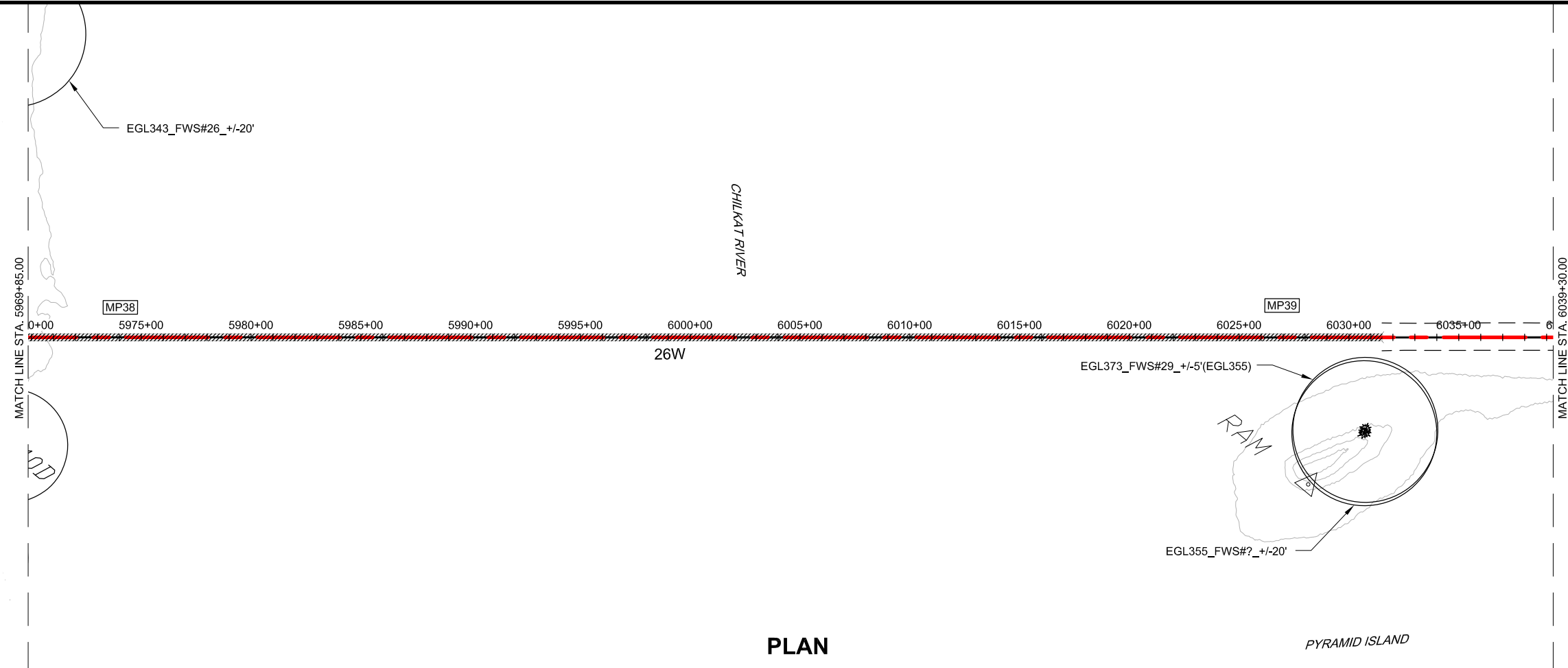
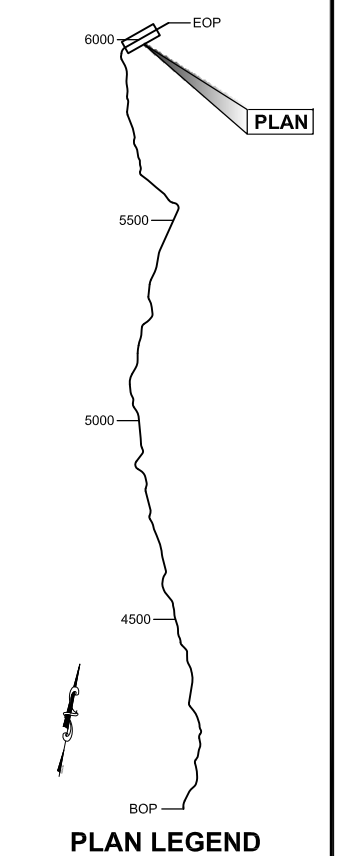
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| STATE         | YEAR         |
| <b>ALASKA</b> | <b>2013</b>  |
| SHEET NUMBER  | TOTAL SHEETS |
| <b>WL28</b>   | <b>XX</b>    |



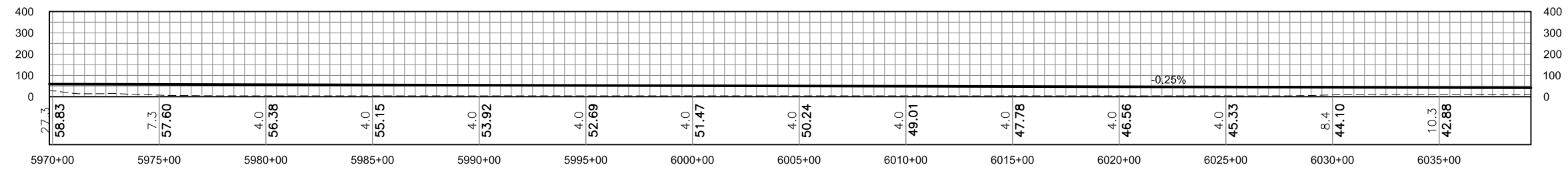
ADDENDUM NUMBER

ATTACHMENT NUMBER

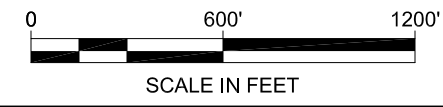
| RECORD OF REVISIONS |      |             |
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|                     |      |             |



PLAN



PROFILE



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 HIGHWAY, ALTERNATIVE 3  
 PROJECT #71100  
**2012 EIS  
 PLAN & PROFILE  
 VIEW**

|                                     |                           |
|-------------------------------------|---------------------------|
| PROJECT DESIGNATION<br><b>71100</b> |                           |
| STATE<br><b>ALASKA</b>              | YEAR<br><b>2013</b>       |
| SHEET NUMBER<br><b>WL29</b>         | TOTAL SHEETS<br><b>XX</b> |



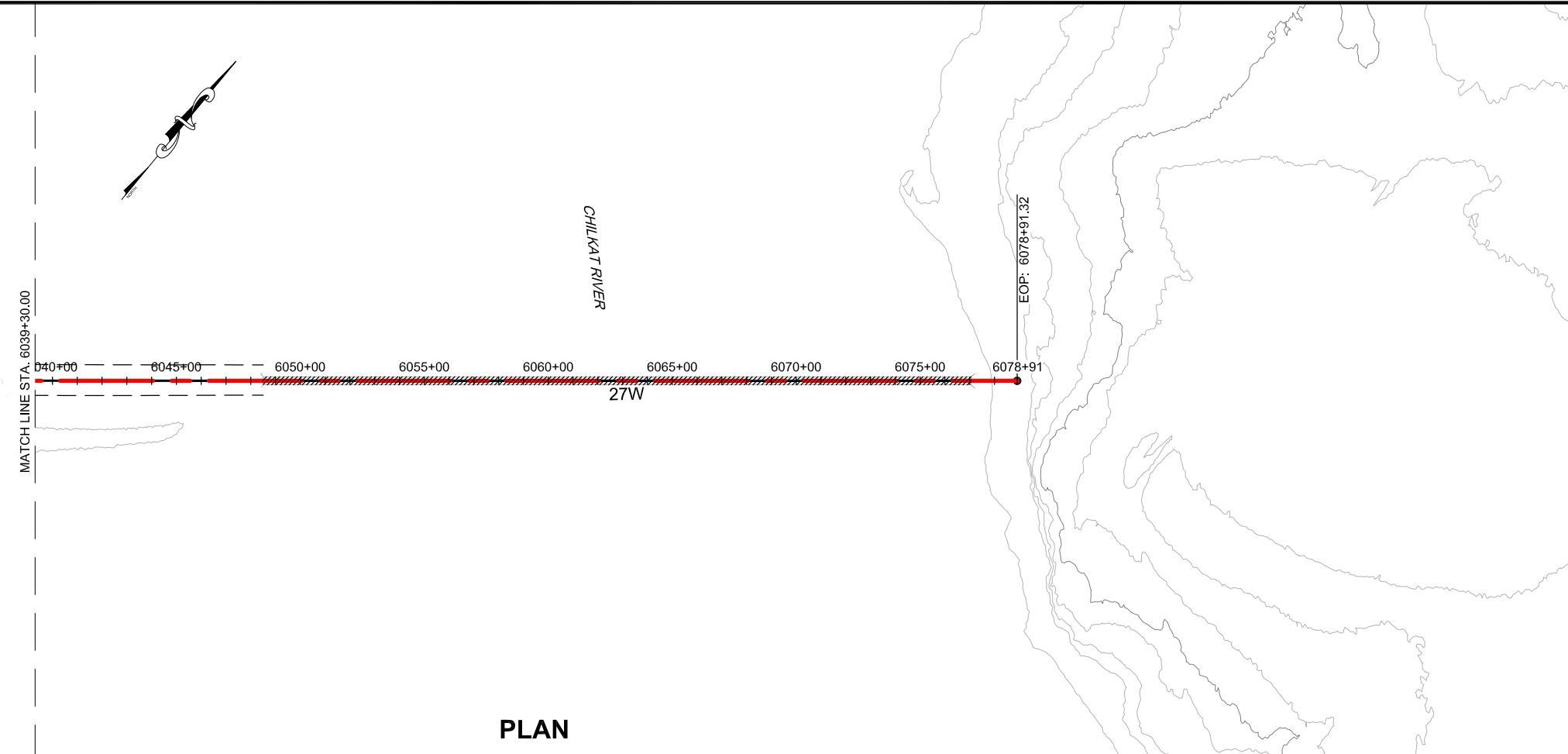


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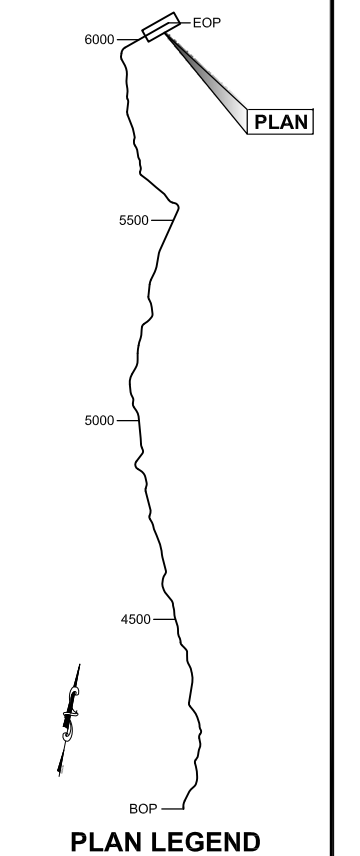
ATTACHMENT NUMBER

RECORD OF REVISIONS

| No. | DATE | DESCRIPTION |
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**PLAN**



**PLAN LEGEND**

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 SOUTHEAST REGION

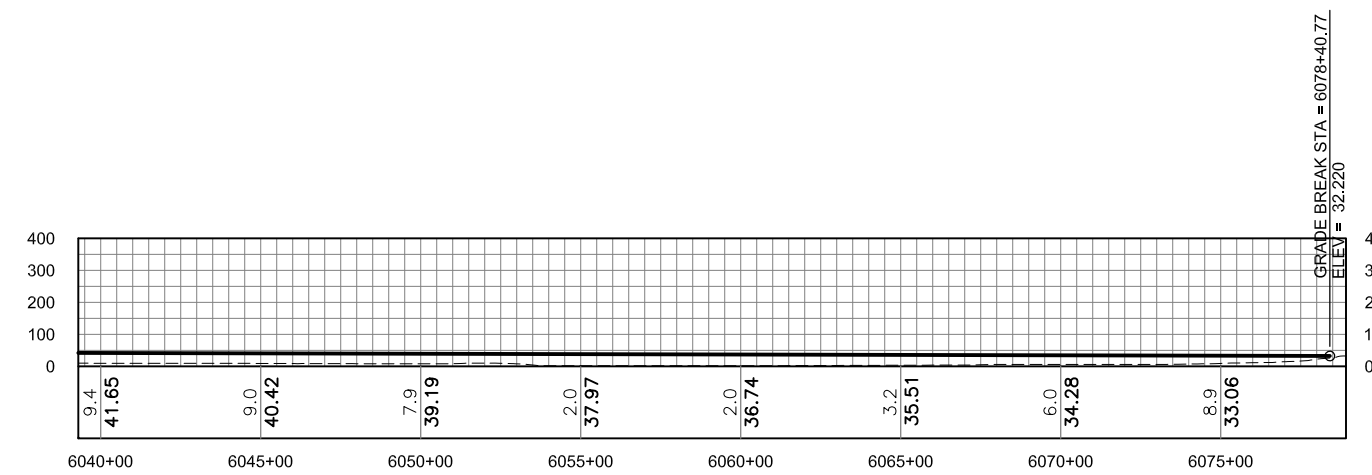
JNU-WEST LYNN CANAL  
 HIGHWAY, ALTERNATIVE 3  
 PROJECT #71100

**2012 EIS  
 PLAN & PROFILE  
 VIEW**

PROJECT DESIGNATION  
**71100**

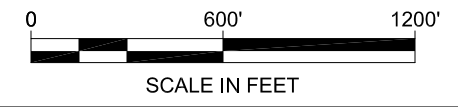
| STATE         | YEAR        |
|---------------|-------------|
| <b>ALASKA</b> | <b>2013</b> |

| SHEET NUMBER | TOTAL SHEETS |
|--------------|--------------|
| <b>WL30</b>  | <b>XX</b>    |



**PROFILE**

**DO NOT SCALE FROM THESE DRAWINGS USE DIMENSIONS**



SCALE IN FEET



**Attachment C**

**Juneau Access Improvements Project**

**Highway Maintenance Cost Estimates**

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## **Attachment C Juneau Access Highway Maintenance Cost Estimates**

Prepared by Southcoast Region Maintenance & Operations  
Updated December 28, 2016

### **PURPOSE**

The purpose of this document is to provide a basic concept and cost estimate for maintenance of new highway segments for the Juneau Access project alternatives. This report was originally prepared in 2003 and updated in 2013, eliminating Alternatives 2, 2A, and 2C. This edition updates costs for Alternatives 2B, 3, 4B, and 4D.

A significant portion of the maintenance cost for the proposed highways is related to avalanche control and clean up. The costs of these activities are reported in the Juneau Access Improvements Snow Avalanche Report Update. Those costs are omitted from the cost calculations in this report, but are included in the final table on page 8.

### **MAINTENANCE CONCEPT**

The basic concept for maintenance of a Juneau Access highway is to use existing forces and equipment at the Juneau and Haines termini, and to establish and staff an intermediate maintenance station at the mid-point between Juneau and the Katzehin River marine terminal for Alternative 2B. For Alternative 3, a small maintenance facility would be established at the William Henry Bay terminal.

In general, a maintenance station can economically maintain a length of highway with a terminus of no more than 25 miles from its home facility. For Alternatives 2B and 3, an intermediate maintenance station is required. Alternatives 4B and 4D do not require an intermediate station: although distance between Juneau station and the Sawmill Cove terminal is 38 miles, the terminal would not be used in winter.

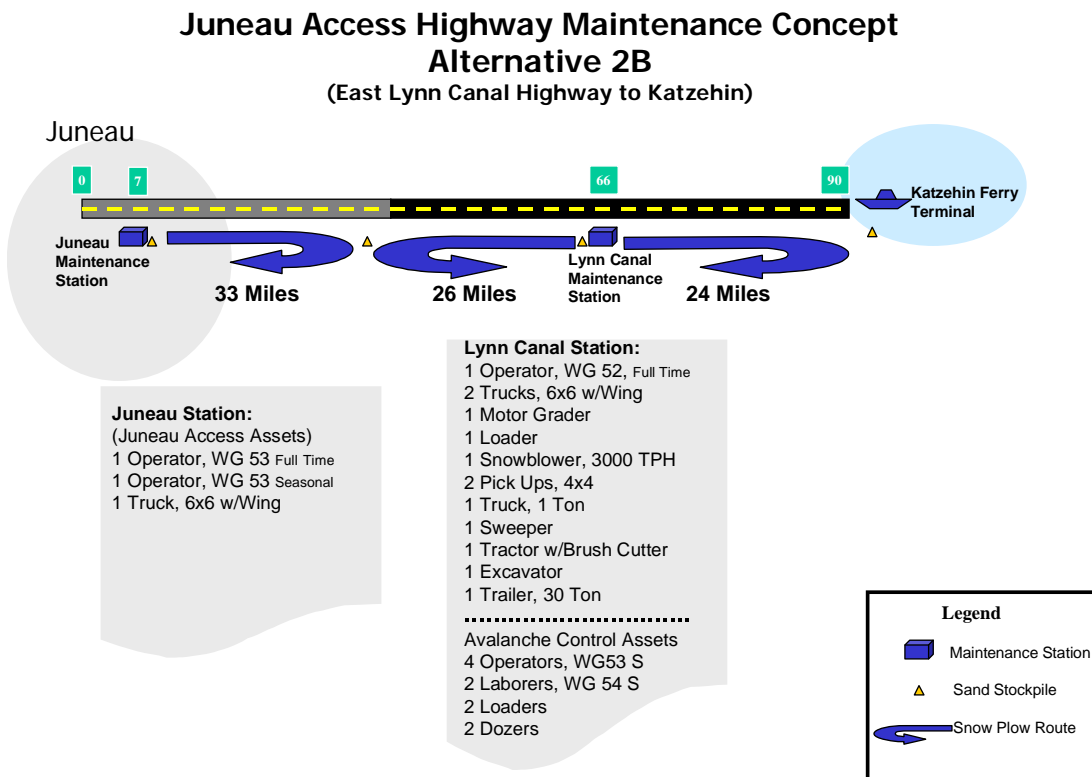
The cost of Juneau Access highway maintenance is driven by the addition of new road miles and new maintenance facilities. Alternatives 1, 1B, 4A, and 4C have no new highway sections. Alternatives 2B, and 3 will have significant highway cost because of the new highway miles. Alternatives 4B and 4D have minimal costs, due to short sections of new highway. They are identical in highway maintenance cost.

The alternatives considered in this study, and the new miles of road for each alternative, are depicted in the chart below.

| <b>Alternative</b> | <b>Brief Description</b>  | <b>New Road Miles</b> |
|--------------------|---|-----------------------|
| 1, 1B              | No construction specifically for Lynn Canal   | 0                     |
| 2B                 | Highway, Echo Cove to Katzehin, with ferry terminal connection to Skagway and Haines                              | 47                    |
| 3                  | Highway, Echo Cove to Sawmill Cove; Ferry across Lynn Canal; Highway West Lynn Canal, William Henry Bay to Haines | 41                    |
| 4A & 4C            | Ferry from Auke Bay   | 0                     |
| 4B & 4D            | Ferry from Sawmill Cove (summer only)   | 2                     |

**Alternative 2B – East Lynn Canal Highway to Katzehin**

Alternative 2B proposes approximately 47 miles of new road (118 lane miles), from Cascade Point to Katzehin. Winter maintenance of Glacier Highway from Echo Cove to Cascade Point would also be increased (currently winter maintenance ends at Echo Cove). A Lynn Canal station would be established, and staffed and equipped as shown below.



A total of seven operators (2 FT and 5 PT) would be assigned to the new highway segment.

**Alternative 2B Staffing Table**

| Station    | No. | Job title                              | WG | Status |
|------------|-----|--|----|--------|
| Lynn Canal | 1   | Equipment Operator, Foreman            | 52 | FT     |
| Lynn Canal | 4   | Equipment Operator (Avalanche Control) | 53 | PT     |
| Juneau     | 1   | Equipment Operator                     | 53 | FT     |

|        |   |                    |    |    |
|--------|---|--------------------|----|----|
| Juneau | 1 | Equipment Operator | 53 | PT |
|--------|---|--------------------|----|----|

Maintenance of the East Lynn Canal highway would be provided by a new maintenance station located at approximately Mile Point 66. One full time foreman/operator and four seasonal positions (avalanche control staff) would be allocated to the new highway. The station would be augmented with two 6x6 plow trucks with wings, a motor grader, snow blower, a loader, an excavator, and various other pieces of equipment. Two loaders and two bulldozers, identified for avalanche control, will also be provided.

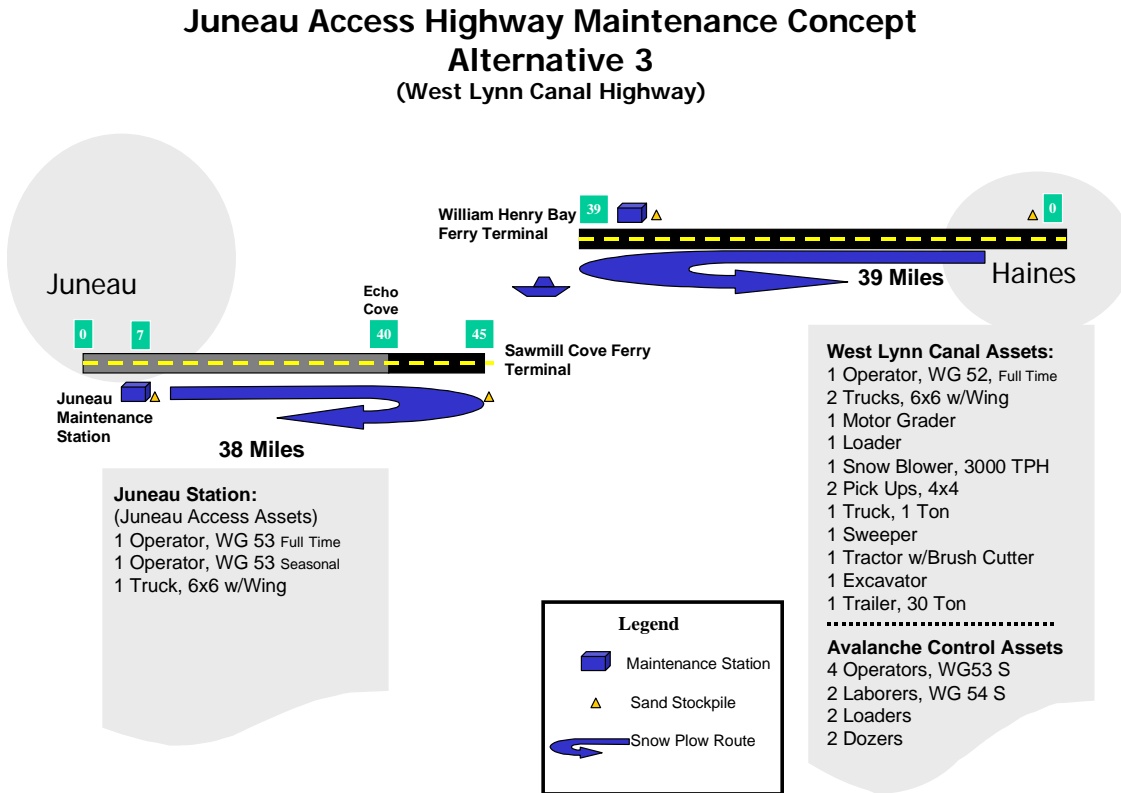
Juneau Maintenance Station would be augmented with one full time operator and one seasonal position, to assist in maintaining the highway from Juneau to Cascade Point. Juneau Station would be required to place a higher priority on maintenance of the highway from Echo Cove to Cascade Point than they presently do. Current Juneau Station staffing allows only sporadic winter maintenance beyond Echo Cove. In effect, Juneau Station will take on three additional center line miles of high priority road maintenance. The Juneau station would be required to assist with avalanche clean up from time to time.

The total staffing increase for Alternative 2B is seven (2 FT; 5 PT). This level of staffing provides seven-day-a-week winter maintenance, including avalanche control and clean up, as well as summer maintenance activities. At 26.2 lane miles per operator, it affords a slightly better level of service than the regional average of 28.8 lane miles per operator.



### Alternative 3 – West Lynn Canal Highway

Alternative 3 calls for construction of approximately 39 miles of new road (97.5 lane miles) between Haines and a ferry terminal at William Henry Bay. An additional two miles of road will be constructed between Cascade Point and a new ferry terminal at Sawmill Cove. Total new construction is 41 miles (102.5 lane miles).



Maintenance of the West Lynn Canal highway would be provided by the Haines Maintenance Station. One full time and four seasonal positions would be allocated to the new highway (this includes four seasonal positions identified for avalanche control). These personnel would operate out of the existing Haines station. The station would be augmented with two 6x6 plow trucks with wings, a motor grader, snow blower, a loader, and various other pieces of equipment. Two loaders and two bulldozers, designated for avalanche control, will also be provided.

An equipment shed and sand stockpile would be located near the William Henry Bay terminal. The shed would house equipment for highway maintenance and avalanche control. It would also provide emergency housing for highway maintenance and avalanche control crews.

Juneau Maintenance Station would be augmented with one full time operator and one seasonal position, to assist in maintaining the new highway segment from Echo Cove to Cascade Point. In addition to maintaining the new two mile road segment, Juneau Station would be required to place a higher priority on maintenance of the highway from Echo Cove to Cascade Point than they presently do. Current Juneau Station staffing allows only sporadic winter maintenance beyond Echo Cove. In effect, Juneau Station will take on three additional center line miles of high priority road maintenance. The Juneau station may be required to assist with avalanche clean up from time to time.

The total staffing increase for Alternative 3 is seven (2 FT; 5 PT). This level of staffing provides seven-day-a-week winter maintenance, including avalanche control and clean up, as well as summer maintenance activities. At 24.4 lane miles per operator, it affords a slightly better level of service than the regional average of 28.8 lane miles per operator.

**Alternative 3 Staffing Table**

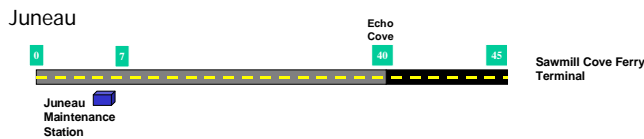
| <b>Station</b> | <b>No.</b> | <b>Job title</b>                       | <b>WG</b> | <b>Status</b> |
|----------------|------------|--|-----------|---------------|
| Haines         | 1          | Equipment Operator                     | 53        | FT            |
| Haines         | 4          | Equipment Operator (Avalanche Control) | 53        | PT            |
| Juneau         | 1          | Equipment Operator                     | 53        | FT            |
| Juneau         | 1          | Equipment Operator                     | 53        | PT            |

### Alternative 4B and 4D – Ferry Service from Sawmill Cove (Summer Only)

These alternatives call for construction of approximately two miles of road from Cascade Point to a new ferry terminal at Sawmill Cove. Because this is a summer only operation (ferry operates out of Auke Bay in winter), this alternative adds no appreciable winter maintenance responsibility. The road from Echo Cove to Sawmill Cove would have a low priority for maintenance in winter.

Based on this assumption, no additional maintenance personnel or equipment would be required. Juneau Maintenance Station would absorb the additional workload associated with maintaining two miles of highway. This would be a low priority road in winter, as is the current section of Glacier Highway from Echo Cove to Cascade Point.

#### Juneau Access Highway Maintenance Concept Alternative 4B & 4D (Road to Sawmill Cove)



No additional highway maintenance assets required for summer maintenance.  
Five mile road from Echo Cove to Sawmill Cove low priority for winter maintenance.

## MAINTENANCE COST ESTIMATES

### Methodology

Maintenance costs for each alternative were estimated in the following manner:

#### Personal Service Costs (Budget Line 1000)

- Based on number of full time and seasonal positions by wage grade (WG) and location
- Salary and benefit costs based on FY16 budget costs for similar positions
- Includes approximately 24% additional for premium pay
- Seasonal positions funded for six months per year

#### Travel Costs (Budget Line 2000)

Based on FY16 costs for similar travel

#### Contractual Costs (Budget Line 3000)

- Equipment costs based on FY16 State Equipment Fleet rates for similar equipment
- Highway striping costs based on FY15 contract amounts
- Utilities costs based on similar sized station
- Miscellaneous costs of 10% added

#### Commodities Costs (Budget Line 4000)

Estimates itemized in major budget account categories and based on costs experienced at similar sized stations

#### Equipment (Budget Line 5000)

No equipment capital costs included. Equipment purchased with capital funds.

#### Management & Overhead

Management and overhead estimated at 8%, similar to actual Southeast District Maintenance and Operations experience.

## Cost Estimates for Alternatives

Based on the maintenance concepts described above, the cost estimates for each alternative are provided in the table below. A detailed breakout of costs for each alternative is attached.

### Annual Highway Maintenance Costs

| Alternative |                         | Annual Maintenance Cost Estimate |
|-------------|-------------------------|----------------------------------|
| 2B          | East Lynn to Katzehin   | \$968,532                        |
| 3           | West Lynn Canal Highway | \$908,921                        |
| 4B & 4D     | Road to Sawmill Cove    | \$18,082                         |

The table below shows the combined annual cost estimate of highway maintenance and avalanche control. Avalanche control cost estimates are taken from the Juneau Access Improvements Snow Avalanche Report, updated January 2016. The report provides several options and cost estimates, based on type of control work provided. This table reflects the cost of the option that ADOT&PF considers most likely to be implemented.

### Annual Highway & Avalanche Control Costs

| Alternative | Highway Maintenance | Avalanche Control | Total Cost  |
|-------------|---------------------|-------------------|-------------|
| 2B          | \$968,532           | \$1,458,719       | \$2,427,251 |
| 3           | \$908,921           | \$1,257,483       | \$2,166,404 |
| 4B & 4D     | \$18,082            | \$0               | \$18,082    |

## SUMMARY

For the East Lynn Canal and West Lynn Canal highway alternatives, total maintenance costs, including avalanche control, are \$17,033 and \$21,136 per lane mile, respectively. This is significantly higher than the average cost for highway maintenance throughout Southeast Alaska (\$9,041). However, it reflects additional personnel and assets assigned to the highway to address the snowfall and avalanche activity expected on this route.

These cost estimates are intended to represent the cost of providing seven day per week highway maintenance during winter, and routine summer maintenance. Staffing and equipment levels include additional equipment operators to perform avalanche control and clean up on a frequent basis. Avalanche control asset costs are addressed in the Juneau Access Improvements Snow Avalanche Report Update, and those costs are not duplicated here, although the assets are

depicted. This is because when the avalanche control personnel are not performing avalanche control, they would be available to perform routine winter maintenance.

Staffing levels for each alternative are estimated to provide an adequate winter level of service, but do not provide active snow plowing and patrolling 24 hours per day. During major snow storms and heavy avalanches, staffing would not be adequate to ensure trafficable roads at all times, and highway closures for avalanche monitoring and clean-up will be necessary similar to existing State highways that experience heavy snowfall and avalanches.

All costs are based on current experiences where possible.

### **COST ADJUSTMENTS SINCE 2013 REPORT**

The current operating cost estimate for Alternative 2B is 12% lower than the 2013 report. The current operating cost estimate for Alternative 3 is 13% lower than the 2013 report. The current operating cost estimate for Alternative 4B and 4D is 42% lower than the 2013 report.

Operating costs for Alternatives 2B and 3 are reduced from the 2013 report due to:

- An error that occurred in the 2013 Avalanche Control Estimated Budget in the Avalanche Control Report that used incorrect multipliers causing overestimation in personnel costs, which then effected the Highway Cost Estimate.
- The number of lane miles to be considered was adjusted in the cost allocation for Alternative 2B. Previous reports showed 192 lane miles, reflecting the distance from the Juneau maintenance facility Mile Point (MP) 7 to the Katzehin terminal MP 92. Current estimate includes only the mileage from Glacier Highway MP 33 at Echo Cove to the Katzehin terminal, 142.5 lane miles, because under current service levels regular winter maintenance ends at MP 33. Full summer and winter maintenance is currently provided by the existing Juneau maintenance crew.
- Commodity costs have been reduced by using lower cost items, such as salt brine and bulk salt, which are more cost effective in snow and ice control than the chemicals previously used. The personnel cost estimate is lower because new staff hiring is at the lower step level of union wages.

Capital costs for Alternatives 2B and 3 increased due to previous estimate based on different loader and bulldozer.

Operating costs for Alternatives 4B and 4D have been adjusted to reflect only the new 2 mile section of highway that will be maintained in summer only. The

remainder of Glacier Highway is currently maintained in summer by the existing Juneau maintenance crew. The 2013 report cost included the section of highway from Auke Bay Ferry Terminal to Sawmill Cove.

**Alternative 2B**

| <b>Budget Line</b> | <b>Description</b>                                  | <b>Cost</b> |
|--------------------|---|-------------|
| Personal Services  | 1 Equipment Operator, WG 52, Full Time (Lynn Canal) | \$101,533   |
|                    | 1 Equipment Operator, WG 53, Full Time (JNU)        | \$95,954    |
|                    | 1 Equipment Operator, WG 53, Seasonal (6 mo.) (JNU) | \$52,775    |
|                    |   | \$250,262   |

Note: Additional 4 equipment operators, WG 53, seasonal, and 2 laborers, seasonal, included in Snow Avalanche Report.

|                   |  |         |
|-------------------|--|---------|
| Travel & Per Diem | Triennial avalanche control training for 3 operators (annual cost) | \$1,560 |
|-------------------|--|---------|

|             |   |           |
|-------------|---|-----------|
| Contractual | Equipment (See Equipment Table, below)                  | \$241,644 |
|             | Utilities   | \$12,000  |
|             | Highway Striping  | \$102,084 |
|             | Training  | \$6,000   |
|             | Communications  | \$4,800   |
|             | Miscellaneous ( @ 10% of above costs, except equipment) | \$12,488  |
|             |   | \$379,016 |

|          |                                      |           |
|----------|--------------------------------------|-----------|
| Supplies | Fuel (bulk)                          | \$63,780  |
|          | Highway sand & aggregate             | \$120,000 |
|          | Winter chemicals                     | \$16,000  |
|          | Blades & chains                      | \$14,901  |
|          | Signs                                | \$6,500   |
|          | Highway paint                        | \$0       |
|          | Asphalt/oil                          | \$8,200   |
|          | Office supplies                      | \$1,000   |
|          | Household                            | \$2,100   |
|          | Structural                           | \$2,100   |
|          | Small Equipment                      | \$5,000   |
|          | Miscellaneous (@ 15% of above costs) | \$26,370  |
|          |                                      | \$265,951 |

|  |  |                  |
|--|--|------------------|
|  | Sub Total                              | \$896,789        |
|  | Management & Overhead @ 8%             | \$71,743         |
|  | <b>Grand Total</b>                     | <b>\$968,532</b> |
|  | Cost per Lane Mile (142.5 lane miles): | \$6,797          |

|  |  |             |
|--|--|-------------|
|  | Avalanche Control Cost (from Avalanche Report):    | \$1,458,719 |
|  | Total Operating Cost (includes Avalanche Control): | \$2,427,251 |
|  | Cost per Lane Mile (including Avalanche Control):  | \$17,033    |



## Alternative 2B (Continued)

| Equipment List*               | Annual Operating and Replacement Cost | Capital Cost<br>(First Year) |
|-------------------------------|---------------------------------------|------------------------------|
| 3 Truck, 6x4 (1 WX)           | \$99,588                              | \$540,000                    |
| 1 Motor Grader (WX)           | \$14,016                              | \$0                          |
| 1 Loader                      | \$19,968                              | \$336,000                    |
| 1 Snowblower                  | \$32,808                              | \$620,000                    |
| 2 Pick Up Truck (1 WX)        | \$8,808                               | \$27,000                     |
| 1 Truck, 1 1/2 T              | \$10,908                              | \$75,000                     |
| 1 Sweeper (WX)                | \$8,712                               | \$0                          |
| 1 Tractor/Brush Cutter        | \$13,776                              | \$165,000                    |
| 1 Excavator                   | \$24,576                              | \$287,121                    |
| 1 Trailer, 30 T               | <u>\$8,484</u>                        | <u>\$35,000</u>              |
|                               | \$241,644                             |                              |
| Total Equipment Capital Cost: |                                       | \$2,085,121                  |

\* Typically some equipment assigned to a new mission is "X" status, meaning it is kept after it has reached its assigned service life. X equipment is normally in good condition with low operating hours when it is assigned the new mission. The State has already paid for the equipment so there is no capital cost for procurement.

| Avalanche Control Equipment (from Snow Avalanche Report) | Capital Cost<br>(First Year) |             |
|--|------------------------------|-------------|
| 2 Loaders  | \$2,071,560                  |             |
| 2 Bull Dozers  | \$2,253,486                  |             |
| 2 Pick Up Trucks (One WX)                                | <u>\$27,000</u>              |             |
| Total Equipment Capital Cost:                            |                              | \$4,352,046 |

**Alternative 3**

| <b>Budget Line</b> | <b>Description</b>                                     | <b>Cost</b>     |
|--------------------|--|-----------------|
| Personal Services  | 2 Equipment Operators, WG 53, Full Time (1 HNS, 1 JNU) | \$203,066       |
|                    | 1 Equipment Operator, WG 53, Seasonal (6 mo.) (HNS)    | <u>\$52,775</u> |
|                    |  | \$255,841       |

Note: Additional 4 equipment operators, WG 53, seasonal, and 2 laborers, seasonal, included in Snow Avalanche Report.

|                   |  |         |
|-------------------|--|---------|
| Travel & Per Diem | Triennial avalanche control training for 5 operators (annual cost) | \$2,600 |
|-------------------|--|---------|

|             |   |                |
|-------------|---|----------------|
| Contractual | Equipment (See Equipment Table below)                   | \$241,644      |
|             | Utilities   | \$6,000        |
|             | Highway Striping  | \$89,052       |
|             | Training  | \$6,000        |
|             | Communications  | \$4,800        |
|             | Miscellaneous ( @ 10% of above costs, except equipment) | <u>\$2,230</u> |
|             |   | \$349,726      |

|          |                                       |                 |
|----------|---------------------------------------|-----------------|
| Supplies | Fuel (bulk)                           | \$63,780        |
|          | Highway sand & aggregate              | \$105,000       |
|          | Winter chemicals                      | \$16,000        |
|          | Blades & chains                       | \$7,500         |
|          | Highway paint                         | \$0             |
|          | Asphalt/oil                           | \$8,200         |
|          | Office supplies                       | \$0             |
|          | Household                             | \$0             |
|          | Structural                            | \$0             |
|          | Small Equipment                       | \$2,500         |
|          | Miscellaneous ( @ 15% of above costs) | <u>\$30,447</u> |
|          |                                       | \$233,427       |

|  |                  |
|--|------------------|
| Sub Total                              | \$841,594        |
| Management & Overhead @ 8%             | <u>\$67,327</u>  |
| <b>Grand Total</b>                     | <b>\$908,921</b> |
| Cost per Lane Mile (102.5 lane miles): | \$8,867.52       |

|  |             |
|--|-------------|
| Avalanche Control Cost (from Avalanche Report):    | \$1,257,483 |
| Total Operating Cost (includes Avalanche Control): | \$2,033,802 |
| Cost per Lane Mile (including Avalanche Control):  | \$21,136    |

### Alternative 3 (Continued)

| Equipment List*               | Annual Operating and Replacement Cost | Capital Cost<br>(First Year) |
|-------------------------------|---------------------------------------|------------------------------|
| 3 Truck, 6x6 (1 WX)           | \$99,588                              | \$540,000                    |
| 1 Motor Grader (WX)           | \$14,016                              | \$0                          |
| 1 Loader                      | \$19,968                              | \$336,000                    |
| 1 Snowblower                  | \$32,808                              | \$620,000                    |
| 2 Pick Up Truck (1 WX)        | \$8,808                               | \$27,000                     |
| 1 Truck, 1 1/2 T              | \$10,908                              | \$75,000                     |
| 1 Sweeper (WX)                | \$8,712                               | \$0                          |
| 1 Tractor/Brush Cutter        | \$13,776                              | \$165,000                    |
| 1 Excavator                   | \$24,576                              | \$287,121                    |
| 1 Trailer, 30 T               | \$8,484                               | \$35,000                     |
| Annual Cost:                  | \$241,644                             |                              |
| Total Equipment Capital Cost: |                                       | \$2,085,121                  |

\* Typically some equipment assigned to a new mission is "X" status, meaning it is kept after it has reached its assigned service life. X equipment is normally in good condition with low operating hours when it is assigned the new mission. The State has already paid for the equipment so there is no capital cost for procurement.

| Avalanche Control Equipment (from Snow Avalanche Report) | Capital Cost<br>(First Year) |             |
|--|------------------------------|-------------|
| 2 Loaders  | \$2,071,560                  |             |
| 2 Bull Dozers  | \$2,253,486                  |             |
| 2 Pick Up Trucks (One WX)                                | <u>\$27,000</u>              |             |
| Total Equipment Capital Cost:                            |                              | \$4,352,046 |

**Equipment Operating Costs**

**ALTERNATIVE 2B**

| <b>Equipment</b>          | <b>Op Cost</b> | <b>Rep Cost</b> | <b>Units</b> | <b>Monthly Cost</b> | <b>Annual Cost</b> |
|---------------------------|----------------|-----------------|--------------|---------------------|--------------------|
| Truck, 6x4                | \$1,799        | \$1,451         | 2            | \$6,500             | \$78,000           |
| Truck, 6x4 (WX)           | \$1,799        | \$0             | 1            | \$1,799             | \$21,588           |
| Motor Grader (WX)         | \$1,168        | \$0             | 1            | \$1,168             | \$14,016           |
| Loader                    | \$408          | \$1,256         | 1            | \$1,664             | \$19,968           |
| Snowblower                | \$766          | \$1,968         | 1            | \$2,734             | \$32,808           |
| Pick Up Truck, 4x4        | \$276          | \$332           | 1            | \$608               | \$7,296            |
| Pick Up Truck, 4x4 (WX)   | \$126          | \$0             | 1            | \$126               | \$1,512            |
| Truck, 1 1/2 T            | \$194          | \$715           | 1            | \$909               | \$10,908           |
| Sweeper (WX)              | \$726          | \$0             | 1            | \$726               | \$8,712            |
| Tractor/Brush Cutter      | \$787          | \$361           | 1            | \$1,148             | \$13,776           |
| Excavator                 | \$492          | \$1,556         | 1            | \$2,048             | \$24,576           |
| Trailer, 30 T             | \$137          | \$570           | 1            | \$707               | \$8,484            |
| Total Monthly Equip Cost: |                |                 |              | \$20,137            |                    |
| Annual Cost:              |                |                 |              | \$241,644           | \$241,644          |

**Equipment provided for Avalanche Control (cost estimated under avalanche control costs)**

|              | <b>Op Cost</b> | <b>Rep Cost</b> | <b>Units</b> | <b>Monthly Cost</b> | <b>Annual Cost</b> |
|--------------|----------------|-----------------|--------------|---------------------|--------------------|
| Loader, 988  | \$1,103        | \$3,755         | 2            | \$9,716             | \$116,597          |
| Dozer, D-8   | \$377          | \$4,085         | 2            | \$8,924             | \$107,092          |
| Pick Up, 4x4 | \$276          | \$332           | 1            | \$608               | \$7,296            |
|              |                |                 |              |                     | \$230,985          |

**ALTERNATIVE 3**

| <b>Equipment</b>          | <b>Op Cost</b> | <b>Rep Cost</b> | <b>Units</b> | <b>Monthly Cost</b> | <b>Annual Cost</b> |
|---------------------------|----------------|-----------------|--------------|---------------------|--------------------|
| Truck, 6x4                | \$1,799        | \$1,451         | 2            | \$6,500             | \$78,000           |
| Truck, 6x4 (WX)           | \$1,799        | \$0             | 1            | \$1,799             | \$21,588           |
| Motor Grader (WX)         | \$1,168        | \$0             | 1            | \$1,168             | \$14,016           |
| Loader                    | \$408          | \$1,256         | 1            | \$1,664             | \$19,968           |
| Snowblower                | \$766          | \$1,968         | 1            | \$2,734             | \$32,808           |
| Pick Up Truck             | \$276          | \$332           | 1            | \$608               | \$7,296            |
| Pick Up Truck, 4x4 (WX)   | \$126          | \$0             | 1            | \$126               | \$1,512            |
| Truck, 1 1/2 T            | \$194          | \$715           | 1            | \$909               | \$10,908           |
| Sweeper (WX)              | \$726          | \$0             | 1            | \$726               | \$8,712            |
| Tractor/Brush Cutter      | \$787          | \$361           | 1            | \$1,148             | \$13,776           |
| Excavator                 | \$492          | \$1,556         | 1            | \$2,048             | \$24,576           |
| Trailer, 30 T             | \$137          | \$570           | 1            | \$707               | \$8,484            |
| Total Monthly Equip Cost: |                |                 |              | \$20,137            |                    |
| Annual Cost:              |                |                 |              | \$241,644           | \$241,644          |

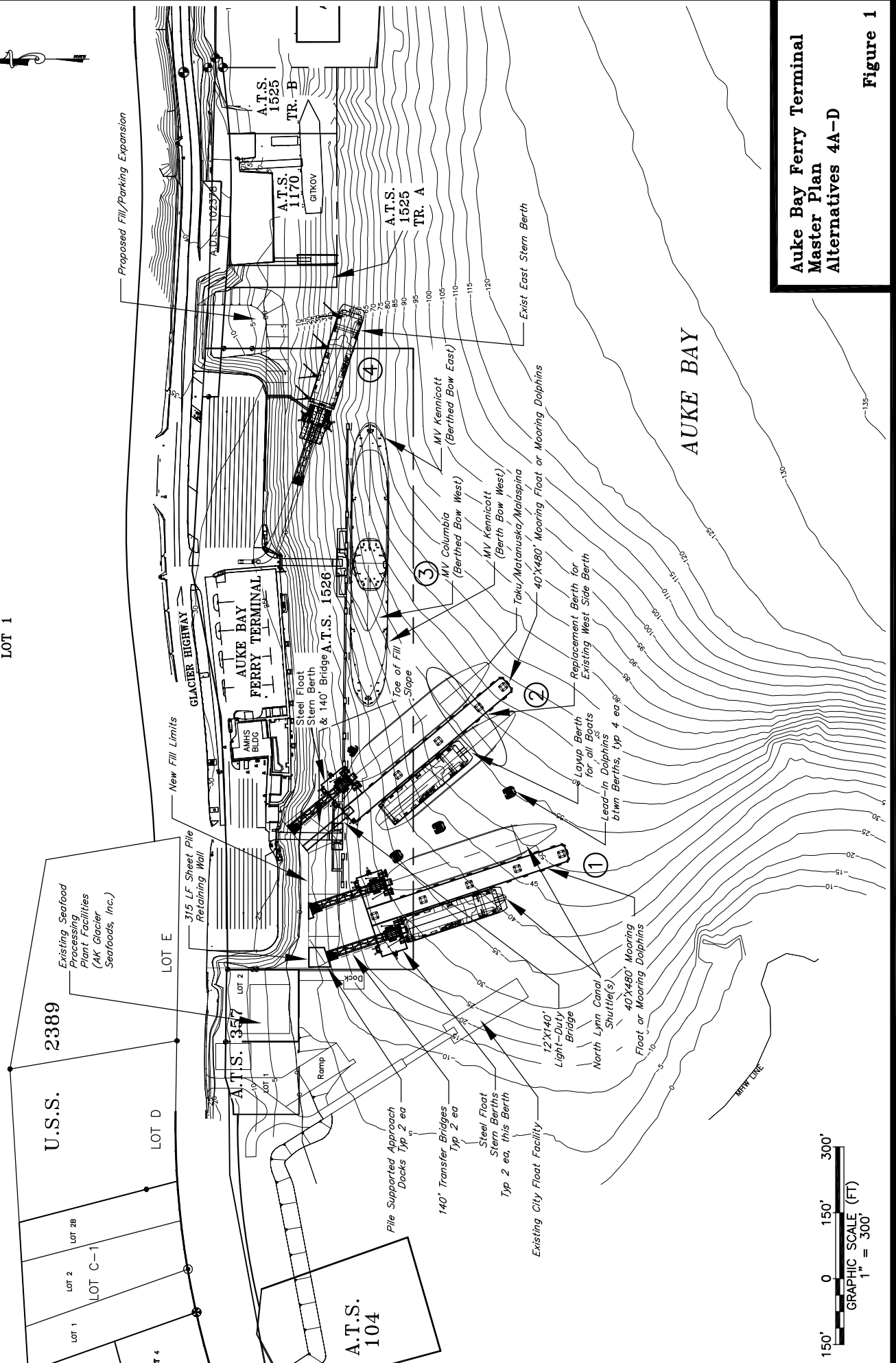
**Attachment D**

**Juneau Access Improvements Project**

**Revised Marine Terminal Plans and Cost Update**

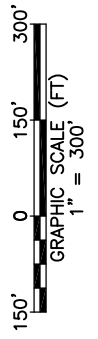
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CITY & BOROUGH OF JUNEAU  
 U.S.S. 3810  
 LOT 1



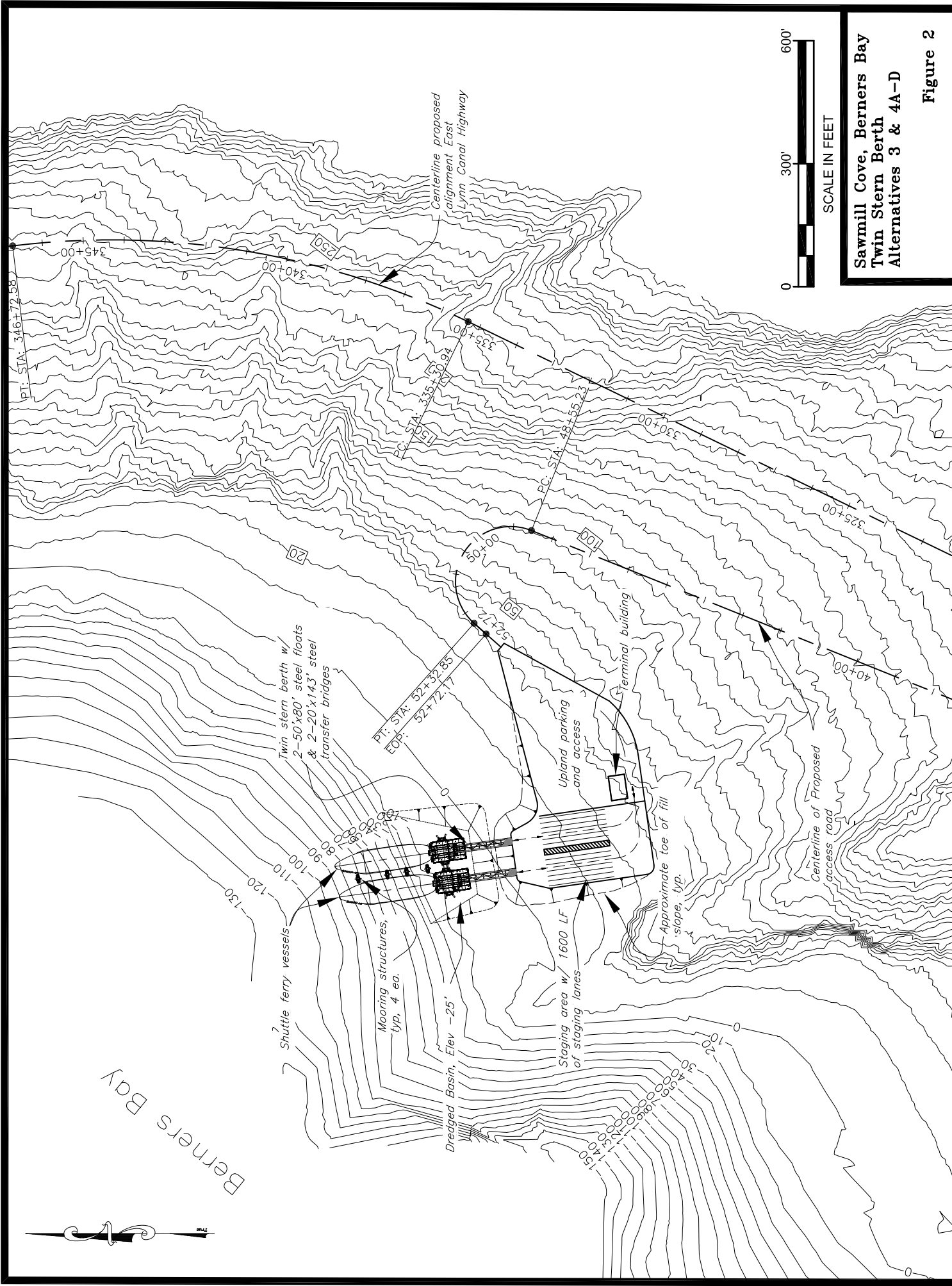
**Auke Bay Ferry Terminal  
 Master Plan  
 Alternatives 4A-D**

**Figure 1**





Berners Bay



SCALE IN FEET

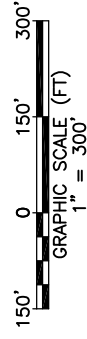
**Sawmill Cove, Berners Bay  
Twin Stern Berth  
Alternatives 3 & 4A-D**

**Figure 2**





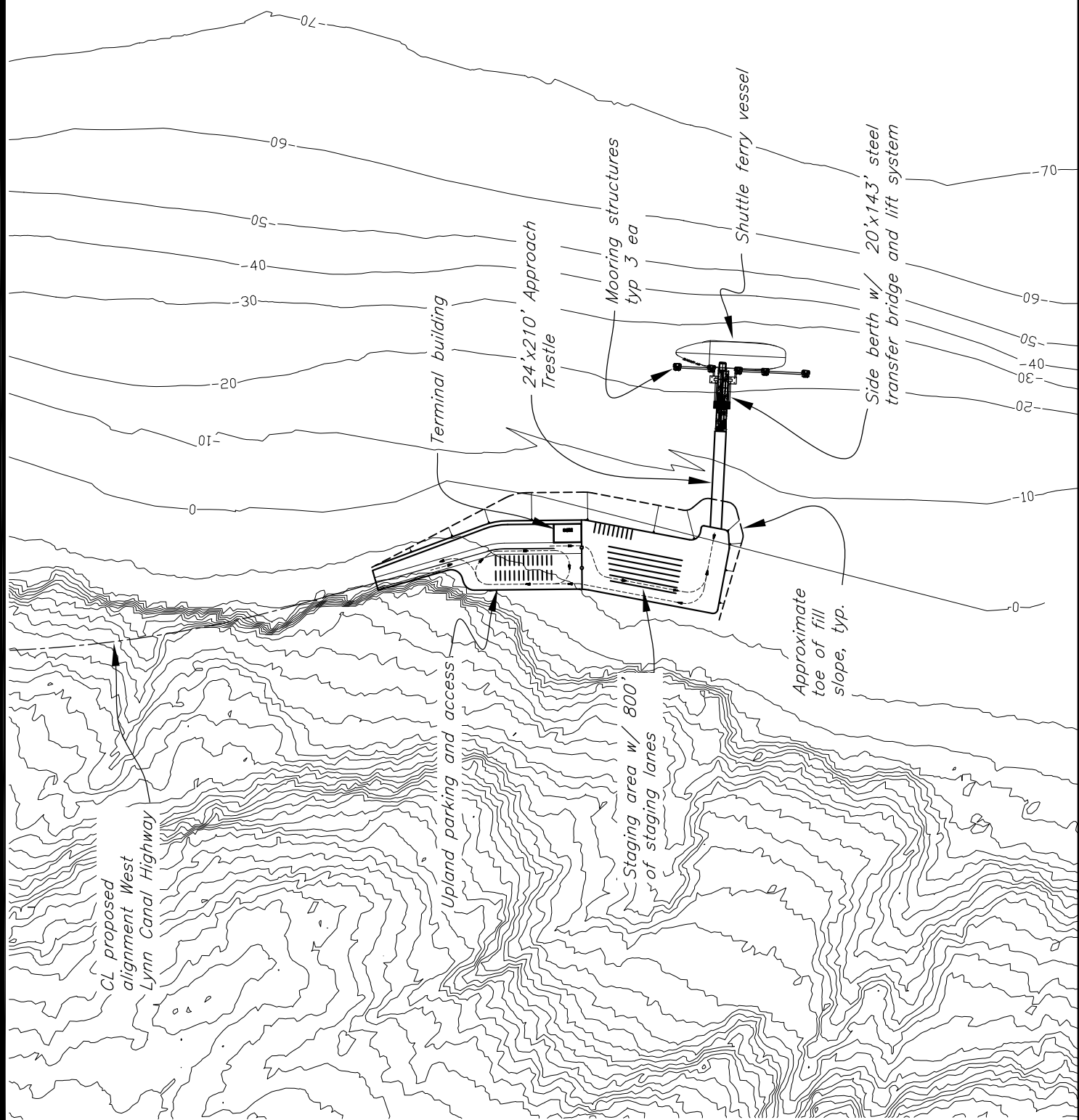
WILLIAM HENRY BAY

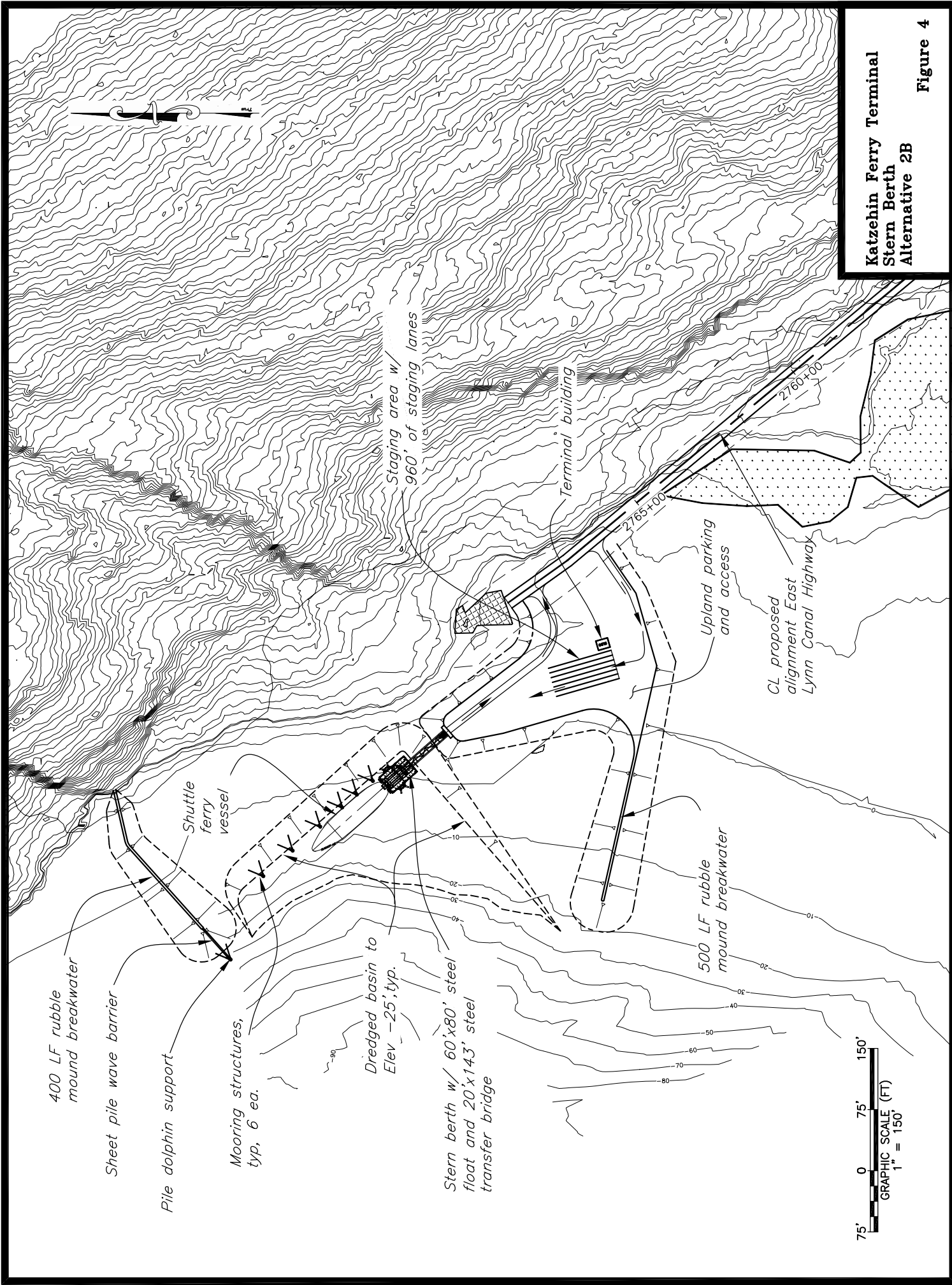


**William Henry Bay  
Side Berth  
Alternative 3**

**Figure 3**

G:\jha\1100\WF\Plan\_S&L\_Revisions\_2012\William Henry Bay.dwg





**Katzehin Ferry Terminal  
Stern Berth  
Alternative 2B**

**Figure 4**

400 LF rubble mound breakwater

Sheet pile wave barrier

Pile dolphin support

Mooring structures, typ. 6 ea.

Dredged basin to Elev. -25', typ.

Stern berth w/ 60'x80' steel float and 20'x143' steel transfer bridge

Shuttle ferry vessel

Staging area w/ 960' of staging lanes

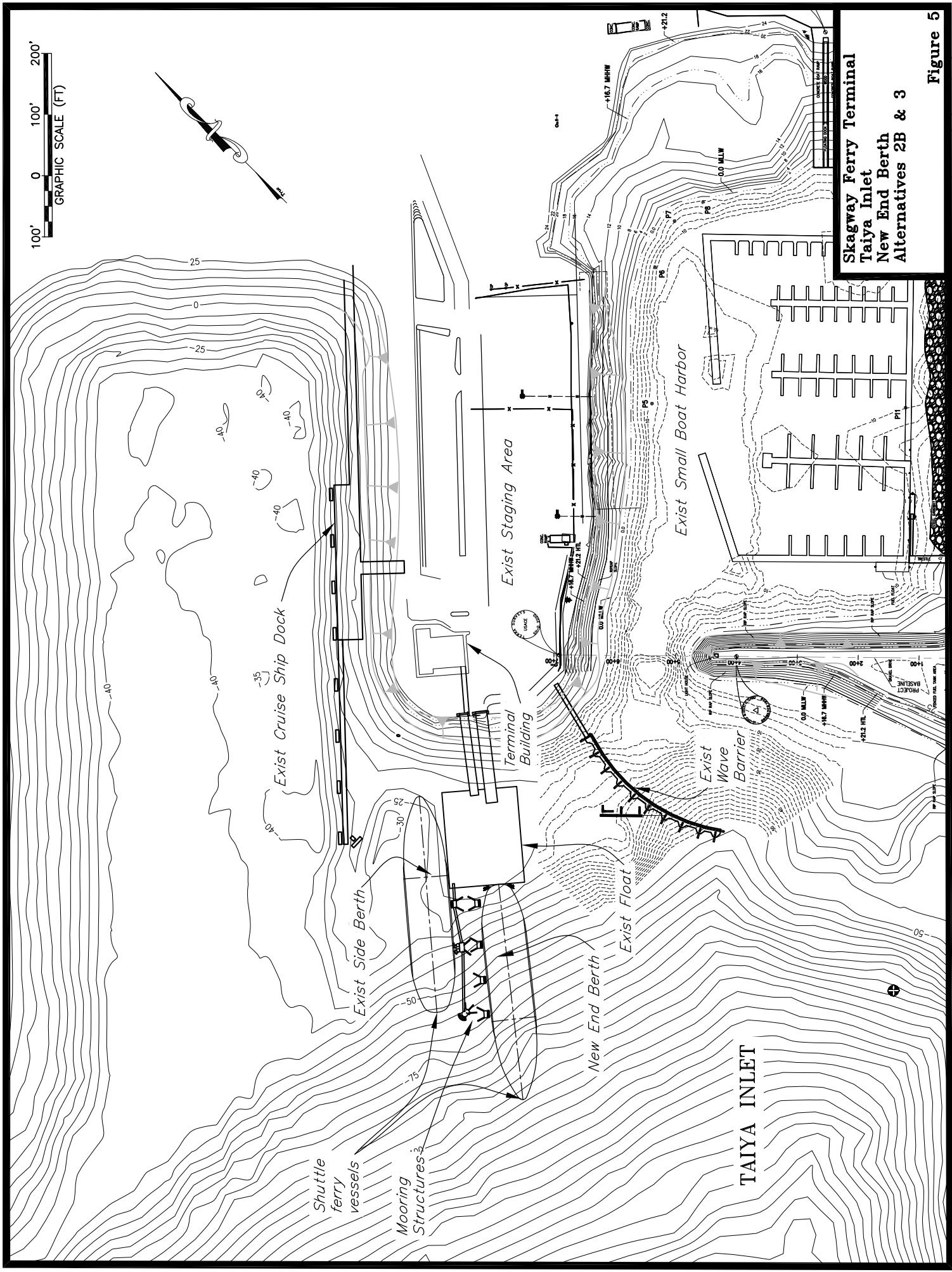
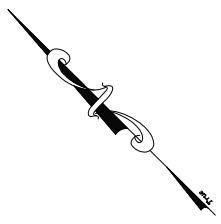
Terminal building

500 LF rubble mound breakwater

Upland parking and access

CL proposed alignment East Lynn Canal Highway





Skagway Ferry Terminal  
Taiya Inlet  
New End Berth  
Alternatives 2B & 3

Figure 5

# SC Region - Marine Engineering

## Project Construction Cost Estimate

PROJECT NUMBER: 71100

PROJECT TITLE: Auke Bay Ferry Terminal - Alternatives 4A-D (Figure 1)

DESCRIPTION: Juneau Access Ferry Terminals Double Twin Stern Berth

| Item No.   | Item   | Unit   | Unit Price | Quantity   | Amount      |             |
|--|--|--|------------|------------|-------------|-------------|
| 1  | <b>General</b>   |  |            |            |             |             |
|  | Mobilization   | LS   | \$800,000  | All Req'd. | \$800,000   |             |
|  | Temporary Erosion and Pollution Control  | CS   | \$25,000   | All Req'd. | \$25,000    |             |
|  | Construction Surveying   | LS   | \$50,000   | All Req'd. | \$50,000    |             |
|  | Traffic Maintenance and Control  | LS   | \$15,000   | All Req'd. | \$15,000    |             |
|  | Furnish and Maintain Field Office  | LS   | \$15,000   | All Req'd. | \$15,000    |             |
|  | Demolition & Removal   | LS   | \$650,000  | All Req'd. | \$650,000   |             |
| 2  | <b>Marine Facilities</b>   |  |            |            |             |             |
|  | 140' Steel Transfer Bridge w/ Apron  | EA   | \$900,000  | 2          | \$1,800,000 |             |
|  | 12'x140' Light-Duty Transfer Bridge to Layup Float                                   | LS   | \$300,000  | 1          | \$300,000   |             |
|  | 50'x60' Steel Bridge Float (3 each)<br>w/ Intermediate Ramp, Apron & Fender Systems  | SF   | \$350      | 9,000      | \$3,150,000 |             |
|  | 4-Pile Stern Float Restraint Dolphins  | EA   | \$350,000  | 6          | \$2,100,000 |             |
|  | 3-Pile Float Restraint Dolphins  | EA   | \$250,000  | 2          | \$500,000   |             |
|  | Lead In Stern Dolphin w/ Fender System   | EA   | \$400,000  | 1          | \$400,000   |             |
|  | Berth Separation Dolphins w/ Fender System   | EA   | \$350,000  | 3          | \$1,050,000 |             |
|  | 40'x480' Mooring Float or Mooring Dolphins (2 Rqd)                                   | SF   | \$250      | 38,400     | \$9,600,000 |             |
|  | 4-Pile, Mooring Float Restraint Dolphins   | EA   | \$350,000  | 10         | \$3,500,000 |             |
|  | On-Float Fender Units  | EA   | \$35,000   | 48         | \$1,680,000 |             |
|  | Pile Supported Bridge Access Docks (2 ea)<br>Steel Piles / Prestressed Concrete Deck | SF   | \$300      | 2,000      | \$600,000   |             |
|  | Sanitary Sewer Pumpout Piping  | LF   | \$75       | 600        | \$45,000    |             |
|  | Potable Water Supply Piping<br>(Heat Trace, Arctic Pipe)                             | LF   | \$100      | 600        | \$60,000    |             |
|  | Fuel Supply Piping<br>(Welded Steel/Corrosion Control Wrapped)                       | LF   | \$100      | 600        | \$60,000    |             |
|  | Electrical Power and Lighting System (Terminal)                                      | LS   | \$500,000  | All Req'd  | \$500,000   |             |
|  | 3  | <b>Upland Improvements (West Staging Area)</b> |            |            |             |             |
|  |  | Sheet Pile Retaining Wall                      | SF         | \$85       | 13,125      | \$1,115,625 |
|  |  | Embankment - Borrow Type D                     | CY         | \$20       | 42,500      | \$850,000   |
|  |  | 6" Crushed Aggregate Base Course               | CY         | \$25       | 560         | \$14,000    |
| 12" Subbase - Grading E                          |  | CY   | \$25       | 1,200      | \$30,000    |             |
| Asphalt Concrete Pavement (2" Thick)             |  | TON  | \$200      | 350        | \$70,000    |             |
| Misc. Asphalt Concrete Replacement/Patching      |  | SY   | \$100      | 150        | \$15,000    |             |
| Metal Beam Guardrail                             |  | LF   | \$50       | 420        | \$21,000    |             |
| Riprap for Slope Protection (Class IV)           |  | CY   | \$50       | 2,500      | \$125,000   |             |
| Traffic Markings                                 |  | LS   | \$25,000   | All Req'd. | \$25,000    |             |
| Electrical Power & Lighting System (Parking Lot) | LS   | \$300,000                                      | All Req'd  | \$300,000  |             |             |

Item Totals \$29,465,625  
 Estimating & Construction Contingencies @ 10% \$2,946,562.50

**Subtotal** **\$32,412,188**

15% Design & Permitting \$4,861,828  
 15% Construction Engineering \$4,861,828

4.65% ICAP \$1,959,316.73

**Project Total =** **\$44,095,160**

Prepared by: KDM  
 Checked by: KDM

Date: 03/14/16  
 Date:

# SC Region - Marine Engineering

## Project Construction Cost Estimate

PROJECT NUMBER: 71100

PROJECT TITLE: Juneau Access Ferry Terminals

DESCRIPTION: Sawmill Cove Ferry Terminal - Twin Stern Berth For Alternatives 3, 4B + 4D  
(Figure 2)

| Item No. | Item  | Units | Unit Price  | Quantity | Amount      |
|----------|---|-------|-------------|----------|-------------|
| 1        | <b>General</b>  |       |             |          |             |
|          | Mobilization/Demobilization   | LS    | \$700,000   | 1        | \$700,000   |
|          | Temporary Erosion and Pollution Control   | CS    | \$250,000   | 1        | \$250,000   |
|          | Construction Surveying  | LS    | \$75,000    | 1        | \$75,000    |
|          | Construction Camp Facilities  | LS    | \$125,000   | 1        | \$125,000   |
| 2        | <b>Dredged Mooring Basin</b>  |       |             |          |             |
|          | Dredged Mooring Basin<br>(Includes placement as upland fill or disposal)                      | CY    | \$30.00     | 16,000   | \$480,000   |
| 3        | <b>Marine Facilities</b>  |       |             |          |             |
|          | Pile Supported Bridge Approach Abutment   | EA    | \$80,000    | 2        | \$160,000   |
|          | 20'x142' Steel Transfer Bridge  | EA    | \$900,000   | 2        | \$1,800,000 |
|          | 50'x80' Steel Bridge Float (or Lift Bridge System)<br>(w/ Intermediate Ramp, Apron & Fenders) | EA    | \$1,600,000 | 2        | \$3,200,000 |
|          | 4-Pile Bridge Float Restraint Dolphins  | EA    | \$350,000   | 3        | \$1,050,000 |
|          | 6-Pile Double Sided Breasting Dolphins  | EA    | \$450,000   | 4        | \$1,800,000 |
|          | Electrical Power and Lighting System (Terminal)   | LS    | \$350,000   | 1        | \$350,000   |
| 3        | <b>Upland Improvements (Access/Staging Area)</b>  |       |             |          |             |
|          | Embankment (Local Excavation)   | CY    | \$15.00     | 68,000   | \$1,020,000 |
|          | Riprap Slope Protection   | CY    | \$65        | 5,500    | \$357,500   |
|          | 12" Aggregate Surface Course<br>(Approx 135,000sf)  | CY    | \$20.00     | 5,000    | \$100,000   |
|          | Asphalt Concrete Surfacing (2" thick)<br>(Approx 135,000 sf)                                  | Ton   | \$200.00    | 1,500    | \$300,000   |
|          | Metal Beam Guardrail  | LF    | \$65        | 950      | \$61,750    |
|          | Potable Water Supply (Well & Piping)  | LS    | \$200,000   | 1        | \$200,000   |
|          | Sanitary Sewer for Bldg (Pkg Treatment Plant/Outfall)   | LS    | \$300,000   | 1        | \$300,000   |
|          | Diesel Generator System, Bldg & Fuel Storage Tank   | LS    | \$600,000   | 1        | \$600,000   |
|          | Electrical Power Supply & Area Lighting System  | LS    | \$400,000   | 1        | \$400,000   |
| 5        | <b>Building Structures</b>  |       |             |          |             |
|          | Terminal Building (24'x40')   | SF    | \$550       | 960.00   | \$528,000   |

Item Totals \$13,857,250

Estimating & Construction Contingencies @ 15% \$2,078,588

**Construction Subtotal \$15,935,838**

15% Design & Permitting \$2,390,376

15% Construction Engineering \$2,390,376

4.65% ICAP \$963,321.38

**Project Total = \$21,679,910**

Prepared by: KDM  
Checked by: KDM

Date: 03/14/16  
Date:

# SC Region - Marine Engineering

## Project Construction Cost Estimate

PROJECT NUMBER: 71100

PROJECT TITLE: Juneau Access Ferry Terminals

DESCRIPTION: William Henry Bay Ferry Terminal - Side Berth w/ Lift Bridge For Alternative 3  
(Figure 3)

| Item No.                                       | Item  | Units     | Unit Price  | Quantity  | Amount      |
|--|---|-----------|-------------|-----------|-------------|
| 1  | <b>General</b>  |           |             |           |             |
|  | Mobilization/Demobilization                                 | LS        | \$850,000   | 1         | \$850,000   |
|  | Temporary Erosion and Pollution Control                     | CS        | \$75,000    | 1         | \$75,000    |
|  | Construction Surveying                                      | LS        | \$150,000   | 1         | \$150,000   |
|  | Construction Camp Facilities                                | LS        | \$350,000   | 1         | \$350,000   |
| 2  | <b>Marine Facilities</b>                                    |           |             |           |             |
|  | Pile Supported Bridge Approach Abutment                     | LS        | \$80,000    | 1         | \$80,000    |
|  | 24' x 550' Pile Supported Approach Trestle                  | SF        | \$350       | 13,200    | \$4,620,000 |
|  | 20'x143' Steel Transfer Bridge                              | LS        | \$900,000   | 1         | \$900,000   |
|  | Bridge Lift Towers & Syncro Lift or Float System            | EA        | \$1,500,000 | 1         | \$1,500,000 |
|  | 6-Pile Breasting Dolphins                                   | EA        | \$450,000   | 2         | \$900,000   |
|  | 4-Pile Breasting Dolphins                                   | EA        | \$350,000   | 3         | \$1,050,000 |
|  | Electrical Power and Lighting System (Terminal)             | LS        | \$350,000   | 1         | \$350,000   |
| 3  | <b>Upland Improvements (Access/Staging Area)</b>            |           |             |           |             |
|  | Clearing & Grubbing   | LS        | \$60,000    | 1         | \$60,000    |
|  | Embankment (Local Excavation)                               | CY        | \$15.00     | 30,000    | \$450,000   |
|  | Riprap Slope Protection                                     | CY        | \$65        | 6,200     | \$403,000   |
|  | 12" Aggregate Surface Course<br>(Approx 96,500 sf)          | CY        | \$20.00     | 3,600     | \$72,000    |
|  | Asphalt Concrete Surfacing (2" thick)<br>(Approx 96,500 sf) | Ton       | \$200.00    | 1,200     | \$240,000   |
|  | Metal Beam Guardrail  | LF        | \$65        | 750       | \$48,750    |
|  | Potable Water Supply (Well & Piping)                        | LS        | \$250,000   | 1         | \$250,000   |
|  | Sanitary Sewer for Bldg (Pkg Treatment Plant/Outfall)       | LS        | \$325,000   | 1         | \$325,000   |
|  | Diesel Generator System, Bldg & Fuel Storage Tank           | LS        | \$650,000   | 1         | \$650,000   |
| Electrical Power Supply & Area Lighting System | LS  | \$400,000 | 1           | \$400,000 |             |
| 4  | <b>Building Structures</b>                                  |           |             |           |             |
| Terminal Building (24'x40')                    | SF  | \$600     | 960.00      | \$576,000 |             |

Item Totals \$14,299,750

Estimating & Construction Contingencies @ 20% \$2,859,950

**Construction Subtotal \$17,159,700**

15% Design & Permitting \$2,573,955

15% Construction Engineering \$2,573,955

4.65% ICAP \$1,037,303.87

**Project Total = \$23,344,914**

Prepared by: KDM  
Checked by: KDM

Date: 03/14/16  
Date:

# SC Region - Marine Engineering

## Project Construction Cost Estimate

PROJECT NUMBER: 71100

PROJECT TITLE: Juneau Access Ferry Terminals

DESCRIPTION: Katzeihin Ferry Terminal (North & South Breakwaters) For Alternative 2B  
(Figure 4)

| Item No.                    | Item   | Units | Unit Price  | Quantity  | Amount      |
|-----------------------------|--|-------|-------------|-----------|-------------|
| 1                           | <b>General</b>   |       |             |           |             |
|                             | Mobilization/Demobilization  | LS    | \$1,000,000 | 1         | \$1,000,000 |
|                             | Temporary Erosion and Pollution Control  | CS    | \$350,000   | 1         | \$350,000   |
|                             | Construction Surveying   | LS    | \$250,000   | 1         | \$250,000   |
|                             | Construction Camp Facilities   | LS    | \$500,000   | 1         | \$500,000   |
| 2                           | <b>Mooring Basin &amp; Breakwaters</b>   |       |             |           |             |
|                             | Dredged Mooring Basin<br>(Includes placement as upland/breakwater fill where usable) | CY    | \$30.00     | 40,000    | \$1,200,000 |
|                             | North Rubble Mound Breakwater  | LF    | \$3,000     | 400       | \$1,200,000 |
|                             | North Sheet Pile Wave Barrier  | LF    | \$5,000     | 110       | \$550,000   |
|                             | Protection Dolphin at Wave Barrier End   | EA    | \$350,000   | 1         | \$350,000   |
|                             | South Rubble Mound Breakwater  | LF    | \$2,500     | 500       | \$1,250,000 |
|                             | Navigational Aids  | EA    | \$10,000    | 2         | \$20,000    |
| 3                           | <b>Marine Facilities</b>   |       |             |           |             |
|                             | Pile Supported Bridge Approach Abutment  | LS    | \$100,000   | 1         | \$100,000   |
|                             | 20'x150' Steel Transfer Bridge   | LS    | \$900,000   | 1         | \$900,000   |
|                             | 50'x80' Steel Bridge Float<br>(w/ Intermediate Ramp & Apron)                         | LS    | \$1,800,000 | 1         | \$1,800,000 |
|                             | 4-Pile Bridge Float Restraint Dolphins   | EA    | \$350,000   | 2         | \$700,000   |
|                             | 4-Pile Breasting Dolphins  | EA    | \$400,000   | 6         | \$2,400,000 |
|                             | Electrical Power and Lighting System (Terminal)                                      | LS    | \$350,000   | 1         | \$350,000   |
|                             |  |       |             |           |             |
| 3                           | <b>Upland Improvements (Access/Staging Area)</b>                                     |       |             |           |             |
|                             | Import Embankment - Borrow<br>(Classified Materials)                                 | CY    | \$12.00     | 50,000    | \$600,000   |
|                             | Riprap Slope Protection (NIC Breakwaters)  | CY    | \$65        | 6,000     | \$390,000   |
|                             | 12" Aggregate Surface Course<br>(Approx 103,000 sf)                                  | CY    | \$20.00     | 4,000     | \$80,000    |
|                             | Asphalt Concrete Surfacing (2" thick)<br>(Approx 103,000 sf)                         | Ton   | \$200.00    | 1,200     | \$240,000   |
|                             | Metal Beam Guardrail   | LF    | \$65        | 850       | \$55,250    |
|                             | Potable Water Supply (Well & Piping)   | LS    | \$200,000   | 1         | \$200,000   |
|                             | Sanitary Sewer for Bldg (Pkg Treatment Plant/Outfall)                                | LS    | \$300,000   | 1         | \$300,000   |
|                             | Diesel Generator System, Bldg & Fuel Storage Tank                                    | LS    | \$650,000   | 1         | \$650,000   |
|                             | Electrical Power Supply & Area Lighting System                                       | LS    | \$350,000   | 1         | \$350,000   |
| 4                           | <b>Building Structures</b>   |       |             |           |             |
| Terminal Building (24'x40') | SF   | \$550 | 960.00      | \$528,000 |             |

Item Totals \$16,313,250

Estimating & Construction Contingencies @ 20% \$3,262,650

**Construction Subtotal \$19,575,900**

15% Design & Permitting \$2,936,385

15% Construction Admin \$2,936,385

4.65% ICAP \$910,279.35

**Project Total = \$26,358,949**

Prepared by: KDM  
Checked by: KDM

Date: 03/14/16  
Date:

# **SC Region - Marine Engineering**

## **Project Construction Cost Estimate**

**PROJECT NUMBER: 71100**

**PROJECT TITLE: Juneau Access Ferry Terminals**

**DESCRIPTION: Skagway Ferry Terminal - End Berth For Alternatives 2B & 3  
(Figure 5)**

| <b>Item No.</b> | <b>Item</b>                                     | <b>Units</b> | <b>Unit Price</b> | <b>Quantity</b> | <b>Amount</b> |
|-----------------|---|--------------|-------------------|-----------------|---------------|
| <b>1</b>        | <b>General</b>                                  |              |                   |                 |               |
|                 | Mobilization/Demobilization                     | LS           | \$600,000         | 1               | \$600,000     |
|                 | Temporary Erosion and Pollution Control         | CS           | \$50,000          | 1               | \$50,000      |
|                 | Construction Surveying                          | LS           | \$75,000          | 1               | \$75,000      |
| <b>2</b>        | <b>Marine Facilities</b>                        |              |                   |                 |               |
|                 | Pile Supported Bridge Approach Abutment         | LS           | \$80,000          | 1               | \$80,000      |
|                 | Access Catwalks & Gangways                      | EA           | \$100,000         | 4               | \$400,000     |
|                 | New Breasting Dolphin Structures                | EA           | \$800,000         | 4               | \$3,200,000   |
|                 | Vehicle Apron & Hydraulic Systems               | LS           | \$300,000         | 1               | \$300,000     |
|                 | Electrical Power and Lighting System (Terminal) | LS           | \$450,000         | 1               | \$450,000     |
|                 | Potable Water for Vessel Utilities              | LS           | \$500,000         | 1               | \$500,000     |
|                 | Sanitary Sewer Vessel Discharge Utilities       | LS           | \$500,000         | 1               | \$500,000     |

*Item Totals* \$6,155,000

Estimating & Construction Contingencies @ 15% \$923,250

**Construction Subtotal** \$7,078,250

15% Design & Permitting \$1,061,738

15% Construction Engineering \$1,061,738

4.65% ICAP \$427,880.21

**Project Total =** \$9,629,605

**Prepared by: KDM**

**Date:** 03/14/16



**Attachment E**

**Juneau Access Improvements Project**

**Revised Road Engineer's Estimate**

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ALTERNATIVE 2B

| Item Number | Item Description                                      | Pay Unit       | Quantity     | Unit Price (2016) | Amount (2016) |
|-------------|---|----------------|--------------|-------------------|---------------|
| 201(1A)     | Clearing  | Acre           | 483          | 8,722.50          | 4,212,967.50  |
| 201(1B)     | Clearing - Zones 2,3 & 5                              | Acre           | 169          | 6,745.40          | 1,139,972.60  |
| 201(6)      | Selective Tree Removal                                | Each           | 350          | 407.05            | 142,467.50    |
| 202(4)      | Removal of Culvert Pipe                               | Linear Foot    | 530          | 19.19             | 10,170.44     |
| 203(2)      | Rock Excavation                                       | Cubic Yard     | 4,910,510    | 15.12             | 74,242,000.69 |
| 203(3)      | Unclassified Excavation                               | Cubic Yard     | 1,104,460    | 6.40              | 7,064,678.39  |
| 203(5)      | Borrow  | Cubic Yard     | 242,500      | 5.23              | 1,269,123.75  |
| 203(10)     | Controlled Blasting                                   | Square Yard    | 238,780      | 24.42             | 5,831,723.94  |
| 203(12)     | Drain Holes   | Linear Foot    | 29,077       | 4.07              | 118,357.93    |
| 203(13)     | Stabilization - Rock Bolt                             | Each           | 5,378        | 1,889.88          | 10,163,747.75 |
| 203(19)     | Barrier Rocks   | Linear Foot    | 4,000        | 10.47             | 41,868.00     |
| 203(20)     | Acid Rock Mitigation                                  | Contingent Sum | All Required | 1,000,000.00      | 1,000,000.00  |
| 205(3)      | Foundation Fill                                       | Cubic Yard     | 7,951        | 31.40             | 249,669.35    |
| 301(1)      | Aggregate Base Course, Grading ____                   | Ton            | 221,795      | 31.40             | 6,964,584.80  |
| 306(1)      | Asphalt Treated Base                                  | Ton            | 103,589      | 53.50             | 5,541,804.32  |
| 401(1)      | Asphalt Concrete, Type II; Class B                    | Ton            | 109,740      | 63.97             | 7,019,519.10  |
| 401(2)      | Asphalt Cement, Grade 58-28                           | Ton            | 11,258       | 883.88            | 9,950,721.04  |
| 402(1)      | STE-1 Asphalt For Tack Coat                           | Ton            | 259          | 883.88            | 228,924.92    |
| 501(1)      | Class A Concrete                                      | Lump Sum       | All Required | 12,610,409.00     | 12,610,409.00 |
| 501(2)      | Class A-A Concrete                                    | Lump Sum       | All Required | 1,649,134.00      | 1,649,134.00  |
| 501(7A)     | Precast Concrete Member (128' Decked Bulb Tee)        | Each           | 18           | 75,885.75         | 1,365,943.50  |
| 501(7B)     | Precast Concrete Member (144' Decked Bulb Tee)        | Each           | 228          | 88,504.30         | 20,178,980.40 |
| 501(7C)     | Precast Concrete Member (118' Decked Bulb Tee)        | Each           | 12           | 75,885.75         | 910,629.00    |
| 501(8)      | Concrete Price Adjustment                             | Contingent Sum | All Required | 0.00              | -             |
| 501(9)      | Bridge Expansion Joint                                | Linear Foot    | 660          | 1,395.60          | 921,096.00    |
| 501(10)     | Screening Structure                                   | Linear Foot    | 6,510        | 186.08            | 1,211,380.80  |
| 501(11)     | Precast Concrete Headwall                             | Each           | 14           | 6,396.50          | 89,551.00     |
| 501(13a)    | Zone 4 Bridges, Standard                              | Linear Foot    | 1,080        | 10,467.00         | 11,304,360.00 |
| 501(13b)    | Zone 4 Bridges, Special                               | Linear Foot    | 592          | 14,537.50         | 8,606,200.00  |
| 501(13c)    | Zone 4 Bridges, Heavy Duty                            | Linear Foot    | 1,822        | 20,934.00         | 38,141,748.00 |
| 501(14)     | Katzehin Bridge                                       | Linear Foot    | 2,590        | 10,467.00         | 27,109,530.00 |
| 501(15)     | Snow Shed   | Linear Foot    | 1,500        | 19,771.00         | 29,656,500.00 |
| 501(16)     | Debris Flow Shed                                      | Linear Foot    | 300          | 12,000.00         | 3,600,000.00  |
| 507(6)      | Safety Railing  | Linear Foot    | 39,465       | 4.65              | 183,591.18    |
| 503(1)      | Reinforcing Steel                                     | Lump Sum       | All Required | 3,719,681.05      | 3,719,681.05  |
| 503(2)      | Epoxy-Coated Reinforcing Steel                        | Lump Sum       | All Required | 1,684,983.48      | 1,684,983.48  |
| 504(2)      | Structural Steel                                      | Pound          | 1,150,000    | 3.20              | 3,677,987.50  |
| 505(5A)     | Furnish Structural Steel Piles - HP14X117             | Linear Foot    | 787.5        | 82.57             | 65,026.24     |
| 505(5B)     | Furnish Structural Steel Pipe Piles - 24 in           | Linear Foot    | 6,668        | 157.01            | 1,046,909.34  |
| 505(5C)     | Furnish Structural Steel Pipe Piles - 48 in dia       | Linear Foot    | 15,161.40    | 633.84            | 9,609,825.97  |
| 505(6A)     | Drive Structural Steel Piles - HP14X117               | Each           | 6            | 6,338.35          | 38,030.10     |
| 505(6b)     | Drive Structural Steel Pipe Piles - 24 in dia         | Each           | 78           | 9,478.45          | 739,319.10    |
| 505(6C)     | Drive Structural Steel Pipe Piles - 48 in dia         | Each           | 111          | 31,401.00         | 3,485,511.00  |
| 505(9)      | Structural Steel Sheet Piles                          | Square Foot    | 3,200        | 58.15             | 186,080.00    |
| 507(1)      | Steel Bridge Railing                                  | Linear Foot    | 14,135       | 284.94            | 4,027,556.23  |
| 511(1)      | Mechanically Stabilized Earth Wall                    | Square Foot    | 860,536      | 63.38             | 54,543,783.56 |
| 514(1)      | Tunnel, Dual Lane/Bi-Directional (300' to <800')      | Linear Foot    | 1,250        | 11,630.00         | 14,537,500.00 |
| 515(1)      | Debris Flow Mitigation Structure                      | Each           | 26           | 319,825.00        | 8,315,450.00  |
| 516(1)      | Rockfall Barrier                                      | Linear Foot    | 625          | 250.00            | 156,250.00    |
| 517(1)      | Rockfall Attenuation Fence                            | Linear Foot    | 2,625        | 50.00             | 131,250.00    |
| 602(3A)     | Structural Plate Arch 20' Span, 8'3 1/2" Rise, 7 Gage | Linear Foot    | 50           | 2,680.72          | 134,035.75    |
| 602(3B)     | Structural Plate Arch 31'9" Span, 10'2" Rise, 7 Gage  | Linear Foot    | 624          | 4,931.12          | 3,077,018.88  |
| 603(17-24)  | 24 Inch Pipe  | Linear Foot    | 26,877       | 98.86             | 2,656,925.84  |
| 603(17-36)  | 36 Inch Pipe  | Linear Foot    | 15,852       | 180.27            | 2,857,560.78  |
| 603(17-48)  | 48 Inch Pipe  | Linear Foot    | 3,924        | 244.23            | 958,358.52    |
| 603(17-60)  | 60 Inch Pipe  | Linear Foot    | 1,774        | 366.35            | 649,896.03    |
| 603(17-72)  | 72 Inch Pipe  | Linear Foot    | 814          | 441.94            | 359,739.16    |
| 603(17-144) | 144 Inch Pipe   | Linear Foot    | 370          | 947.85            | 350,702.65    |
| 606(1)      | W-beam Guardrail                                      | Linear Foot    | 102,057      | 34.89             | 3,560,768.73  |
| 606(12)     | Guardrail/bridge Rail Connection                      | Each           | 36           | 4,070.50          | 146,538.00    |
| 606(13)     | Parallel Guardrail Terminal                           | Each           | 185          | 3,489.00          | 645,465.00    |
| 610(3)      | Ditch Lining  | Station        | 25           | 947.85            | 23,696.13     |

|         |  |                                  |              |               |                       |
|---------|--|----------------------------------|--------------|---------------|-----------------------|
| 611(1A) | Riprap, Class II                             | Cubic Yard                       | 3,885        | 12.79         | 49,700.81             |
| 611(1B) | Riprap, Class IV                             | Cubic Yard                       | 122,000      | 12.79         | 1,560,746.00          |
| 611(3)  | Riprap Slope Stabilization                   | Square Yard                      | 32,022       | 13.37         | 428,278.24            |
| 615(1)  | Standard Sign                                | Square Foot                      | 3,872        | 69.78         | 270,188.16            |
| 618(1)  | Seeding                                      | Acre                             | 206          | 2,733.05      | 563,008.30            |
| 619(2)  | Matting                                      | Square Yard                      | 59,000       | 3.49          | 205,851.00            |
| 630(1)  | Geotextile, Separation                       | Square Yard                      | 176,000      | 3.49          | 614,064.00            |
| 631(2)  | Geotextile, Erosion Control, Class 1         | Square Yard                      | 3,740        | 2.91          | 10,874.05             |
| 633(1)  | Silt Fence                                   | Linear Foot                      | 72,000       | 5.23          | 376,812.00            |
| 637(1)  | Reinforced Soil Slope                        | Square Foot                      | 500          | 25.59         | 12,793.00             |
| 640(1)  | Mobilization And Demobilization              | Lump Sum                         | All Required | 41,523,752.00 | 41,523,752.00         |
| 640(4)  | Worker Meals and Lodging, or Per Diem        | Lump Sum                         | All Required | 1,884,060.00  | 1,884,060.00          |
| 641(1)  | Erosion And Pollution Control Administration | Lump Sum                         | All Required | 100,657.65    | 100,657.65            |
| 641(2)  | Temporary Erosion And Pollution Control      | Contingent Sum                   | All Required | 2,566,741.00  | 2,566,741.00          |
| 641(6)  | Withholding                                  | Contingent Sum                   | All Required | 0.00          | -                     |
| 641(8)  | Preliminary Seeding                          | Acre                             | 47           | 3,198.25      | 150,317.75            |
| 641(9)  | Temporary Rock Check Dam                     | Each                             | 540          | 127.93        | 69,082.20             |
| 641(10) | Settling Pool                                | Each                             | 8            | 674.54        | 5,396.32              |
| 642(1)  | Construction Surveying                       | Lump Sum                         | All Required | 1,986,404.00  | 1,986,404.00          |
| 642(3)  | Three Person Survey Party                    | Hour                             | 700          | 319.83        | 223,877.50            |
| 642(13) | Monumentation with case                      | Each                             | 190          | 668.73        | 127,057.75            |
| 644(1)  | Field Office                                 | Each                             | 3            | 31,982.50     | 95,947.50             |
| 644(2)  | Field Laboratory                             | Each                             | 3            | 31,982.50     | 95,947.50             |
| 644(3)  | Curing Shed                                  | Lump Sum                         | All Required | 6,745.40      | 6,745.40              |
| 644(8a) | Vehicle, 4X4 SUV                             | Each/Month                       | 216          | 505.91        | 109,275.48            |
| 644(8b) | Vehicle, 4X4 ATV                             | Each/Month                       | 288          | 191.90        | 55,265.76             |
| 644(15) | Nuclear Testing Equipment Storage Shed       | Lump Sum                         | All Required | 104,670.00    | 104,670.00            |
| 644(16) | Storage Container                            | Lump Sum                         | All Required | 20,934.00     | 20,934.00             |
| 645(1)  | Training Program, 2 Trainees/Apprentices     | Labor Hour                       | 3,000        | 12.79         | 38,379.00             |
| 646(1)  | CPM Scheduling                               | Lump Sum                         | All Required | 67,454.00     | 67,454.00             |
| 670(1)  | Painted Traffic Markings                     | Lump Sum                         | All Required | 324,477.00    | 324,477.00            |
| 670(8)  | Recessed Pavement Marker                     | Each                             | 4,891        | 44.19         | 216,152.85            |
|         |  |                                  |              |               | 467,982,114.12        |
|         |  | Construction Engineering         |              | 6.00%         | 28,078,926.85         |
|         |  |                                  |              |               | 496,061,040.97        |
|         |  | ICAP                             |              | 4.65%         | 23,066,838.41         |
|         |  |                                  |              |               | 519,127,879.37        |
|         |  | Construction Contingency         |              |               | 37,189,225.87         |
|         |  | Glacier Highway Extension Credit |              |               | (3,874,000.00)        |
|         |  | Camp Costs                       |              |               | 26,927,055.30         |
|         |  | Preliminary Development          |              |               | 18,000,000.00         |
|         |  | Mitigation                       |              |               | 5,610,000.00          |
|         |  | Right of Way                     |              |               | 1,700,000.00          |
|         |  | Maintenance Building             |              |               | 1,500,000.00          |
|         |  | Avalanche Control CIP            |              |               | 11,185,325.00         |
|         |  | Highway M&O Equipment CIP        |              |               | 2,085,000.00          |
|         |  | <b>PROJECT TOTAL</b>             |              |               | <b>619,450,485.55</b> |

**ALTERNATIVE 3**

| Item Number | Item Description   | Pay Unit       | Quantity     | Unit Price (2016)                | Amount (2016)       |                       |
|-------------|--|----------------|--------------|----------------------------------|---------------------|-----------------------|
| 201(1B)     | Clearing   | Lump Sum       | All Required | 930,400.00                       | 930,400.00          |                       |
| 203(2)      | Rock Excavation  | Cubic Yard     | 4,060,000    | 15.12                            | 61,383,140.00       |                       |
| 203(3)      | Unclassified Excavation                                    | Cubic Yard     | 2,118,000    | 6.40                             | 13,547,787.00       |                       |
| 203(10)     | Controlled Blasting  | Square Yard    | 77,918       | 24.42                            | 1,902,991.31        |                       |
| 203(12)     | Drain Holes  | Linear Foot    | 9,490        | 4.07                             | 38,629.05           |                       |
| 203(13)     | Stabilization - Rock Bolt                                  | Each           | 1,755        | 1,889.88                         | 3,316,730.63        |                       |
| 203(20)     | Acid Rock Mitigation                                       | Contingent Sum | All Required | 1,000,000.00                     | 1,000,000.00        |                       |
| 301(2)      | Aggregate Base Course, Grading ____                        | Ton            | 183,815      | 31.40                            | 5,771,974.82        |                       |
| 306(1)      | ATB  | Ton            | 85,846       | 53.50                            | 4,592,589.31        |                       |
| 401(1)      | Asphalt Concrete, Type II; Class B                         | Ton            | 90,948       | 63.97                            | 5,817,488.82        |                       |
| 401(2)      | Asphalt Cement, Grade 58-28                                | Ton            | 9,331        | 883.88                           | 8,247,484.28        |                       |
| 402(1)      | STE-1 Asphalt For Tack Coat                                | Ton            | 218          | 883.88                           | 192,685.84          |                       |
| 501(13a)    | Bridge Structure   | Linear Foot    | 15,885       | 10,467.00                        | 166,268,295.00      |                       |
| 511(1)      | Mechanically Stabilized Earth Wall                         | Square Foot    | 77,446       | 63.38                            | 4,908,798.54        |                       |
| 602(2)      | Structural Plate Pipe-Arch ____ Span, ____ Rise, ____ Gage | Linear Foot    | 2,232        | 4,931.12                         | 11,006,259.84       |                       |
| 603(17-24)  | 24 Inch Pipe   | Linear Foot    | 14,088       | 98.86                            | 1,392,669.24        |                       |
| 603(17-36)  | 36 Inch Pipe   | Linear Foot    | 13,026       | 180.27                           | 2,348,131.89        |                       |
| 603(17-48)  | 48 Inch Pipe   | Linear Foot    | 3,560        | 244.23                           | 869,458.80          |                       |
| 603(17-72)  | 72 Inch Pipe   | Linear Foot    | 3,844        | 441.94                           | 1,698,817.36        |                       |
| 606(1)      | W-beam Guardrail   | Linear Foot    | 8,900        | 34.89                            | 310,521.00          |                       |
| 606(13)     | Parallel Guardrail Terminal                                | Each           | 130          | 3,489.00                         | 453,570.00          |                       |
| 611(1)      | Riprap, Class ____   | Cubic Yard     | 164,500      | 12.79                            | 2,104,448.50        |                       |
| 615(1)      | Standard Sign  | Square Foot    | 3,400        | 69.78                            | 237,252.00          |                       |
| 618(1)      | Seeding  | Lump Sum       | All Required | 348,900.00                       | 348,900.00          |                       |
| 633(1)      | Silt Fence   | Linear Foot    | 206,000      | 5.23                             | 1,078,101.00        |                       |
| 640(1)      | Mobilization And Demobilization                            | Lump Sum       | All Required | 17,212,400.00                    | 17,212,400.00       |                       |
| 640(4)      | Worker Meals and Lodging, or Per Diem                      | Lump Sum       | All Required | 1,732,870.00                     | 1,732,870.00        |                       |
| 641(1)      | Erosion And Pollution Control Administration               | Lump Sum       | All Required | 23,725.20                        | 23,725.20           |                       |
| 641(2)      | Temporary Erosion And Pollution Control                    | Contingent Sum | All Required | 604,760.00                       | 604,760.00          |                       |
| 641(6)      | Withholding  | Contingent Sum | All Required | 0.00                             | -                   |                       |
| 642(1)      | Construction Surveying                                     | Lump Sum       | All Required | 2,267,850.00                     | 2,267,850.00        |                       |
| 642(13)     | Monumentation with case                                    | Each           | 208          | 668.73                           | 139,094.80          |                       |
| 670(1)      | Painted Traffic Markings                                   | Lump Sum       | All Required | 267,490.00                       | 267,490.00          |                       |
| 670(8)      | Recessed Pavement Marker                                   | Each           | 4,052        | 44.19                            | 179,074.09          |                       |
|             |  |                |              |                                  | 322,194,388.31      |                       |
|             |  |                |              | Construction Engineering         | 6.00%               | 19,331,663.30         |
|             |  |                |              |                                  |                     | 341,526,051.60        |
|             |  |                |              | ICAP                             | 4.65%               | 15,880,961.40         |
|             |  |                |              |                                  |                     | 357,407,013.00        |
|             |  |                |              | Construction Contingency         | (5% East, 30% West) | 93,447,878.06         |
|             |  |                |              | Mitigation                       |                     | 3,600,000.00          |
|             |  |                |              | Right of Way                     |                     | 1,500,000.00          |
|             |  |                |              | Maintenance Building             |                     | 1,500,000.00          |
|             |  |                |              | Glacier Highway Extension Credit |                     | (3,874,000.00)        |
|             |  |                |              | Preliminary Development          |                     | 12,000,000.00         |
|             |  |                |              | Camp Costs                       |                     | 13,463,527.65         |
|             |  |                |              | Avalanche Control CIP            |                     | 6,199,259.00          |
|             |  |                |              | Highway M&O Equipment CIP        |                     | 2,085,000.00          |
|             |  |                |              | <b>PROJECT TOTAL</b>             |                     | <b>487,328,677.71</b> |

**ALTERNATIVE 4B/4D**

| Item Number | Item Description                             | Pay Unit       | Quantity     | Unit Price (2016)                | Amount (2016)        |
|-------------|--|----------------|--------------|----------------------------------|----------------------|
| 201(1B)     | Clearing                                     | Lump Sum       | All Required | 17,445.00                        | 17,445.00            |
| 203(2)      | Rock Excavation                              | Cubic Yard     | 270,500      | 15.12                            | 4,089,689.50         |
| 203(3)      | Unclassified Excavation                      | Cubic Yard     | 270,500      | 6.40                             | 1,730,253.25         |
| 203(10)     | Controlled Blasting                          | Square Yard    | 15,400       | 24.42                            | 376,114.20           |
| 203(12)     | Drain Holes                                  | Linear Foot    | 1,876        | 4.07                             | 7,636.26             |
| 203(13)     | Stabilization - Rock Bolt                    | Each           | 347          | 1,889.88                         | 655,786.63           |
| 301(2)      | Aggregate Base Course, Grading ____          | Ton            | 17,179       | 31.40                            | 539,437.78           |
| 306(1)      | ATB  | Ton            | 8,023        | 53.50                            | 429,214.45           |
| 401(1)      | Asphalt Concrete, Type II; Class B           | Ton            | 8,500        | 63.97                            | 543,702.50           |
| 401(2)      | Asphalt Cement, Grade 58-28                  | Ton            | 872          | 883.88                           | 770,743.36           |
| 402(1)      | STE-1 Asphalt For Tack Coat                  | Ton            | 20           | 883.88                           | 17,677.60            |
| 501(13a)    | Bridge Structure                             | Linear Foot    | 100          | 10,467.00                        | 1,046,700.00         |
| 511(1)      | Mechanically Stabilized Earth Wall           | Square Foot    | 350          | 63.38                            | 22,184.23            |
| 603(17-24)  | 24 Inch Pipe                                 | Linear Foot    | 2,560        | 98.86                            | 253,068.80           |
| 603(17-36)  | 36 Inch Pipe                                 | Linear Foot    | 908          | 180.27                           | 163,680.62           |
| 603(17-48)  | 48 Inch Pipe                                 | Linear Foot    | 444          | 244.23                           | 108,438.12           |
| 603(17-72)  | 72 Inch Pipe                                 | Linear Foot    | 132          | 441.94                           | 58,336.08            |
| 606(1)      | W-beam Guardrail                             | Linear Foot    | 630          | 34.89                            | 21,980.70            |
| 606(13)     | Parallel Guardrail Terminal                  | Each           | 6            | 3,489.00                         | 20,934.00            |
| 611(1)      | Riprap, Class ____                           | Cubic Yard     | 1,000        | 12.79                            | 12,793.00            |
| 615(1)      | Standard Sign                                | Square Foot    | 200          | 69.78                            | 13,956.00            |
| 618(1)      | Seeding                                      | Lump Sum       | All Required | 17,445.00                        | 17,445.00            |
| 633(1)      | Silt Fence                                   | Linear Foot    | 20,000       | 5.23                             | 104,670.00           |
| 640(1)      | Mobilization And Demobilization              | Lump Sum       | All Required | 296,565.00                       | 296,565.00           |
| 640(4)      | Worker Meals and Lodging, or Per Diem        | Lump Sum       | All Required | 174,450.00                       | 174,450.00           |
| 641(1)      | Erosion And Pollution Control Administration | Lump Sum       | All Required | 1,395.60                         | 1,395.60             |
| 641(2)      | Temporary Erosion And Pollution Control      | Contingent Sum | All Required | 34,890.00                        | 34,890.00            |
| 641(6)      | Withholding                                  | Contingent Sum | All Required | 0.00                             | -                    |
| 642(1)      | Construction Surveying                       | Lump Sum       | All Required | 34,890.00                        | 34,890.00            |
| 642(13)     | Monumentation with case                      | Each           | 30           | 668.73                           | 20,061.75            |
| 670(1)      | Painted Traffic Markings                     | Lump Sum       | All Required | 43,031.00                        | 43,031.00            |
| 670(8)      | Recessed Pavement Marker                     | Each           | 330          | 44.19                            | 14,584.02            |
|             |  |                |              |                                  | 11,641,754.44        |
|             |  |                |              | Construction Engineering         | 698,505.27           |
|             |  |                |              |                                  | 12,340,259.71        |
|             |  |                |              | ICAP                             | 573,822.08           |
|             |  |                |              |                                  | 12,914,081.78        |
|             |  |                |              | Construction Contingency         | 582,087.72           |
|             |  |                |              | Mitigation                       | 250,000.00           |
|             |  |                |              | Glacier Highway Extension Credit | (3,874,000.00)       |
|             |  |                |              | Preliminary Development          | 300,000.00           |
|             |  |                |              | <b>PROJECT TOTAL</b>             | <b>10,172,169.51</b> |