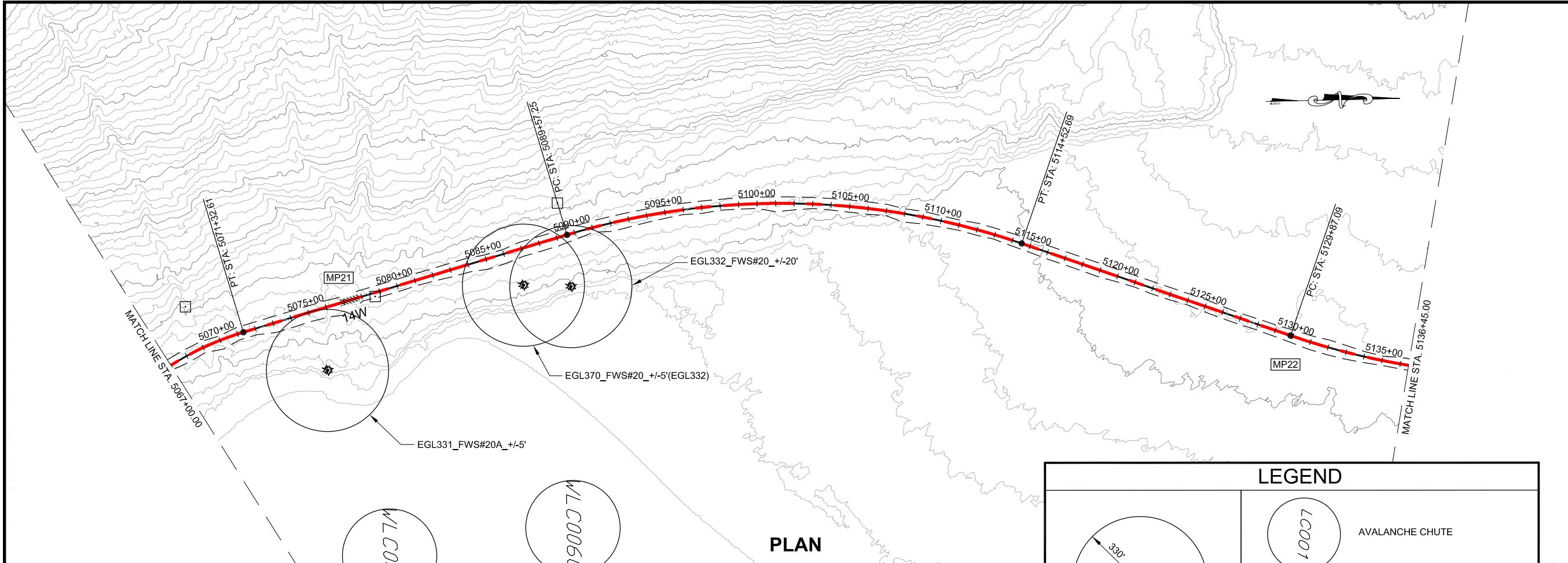


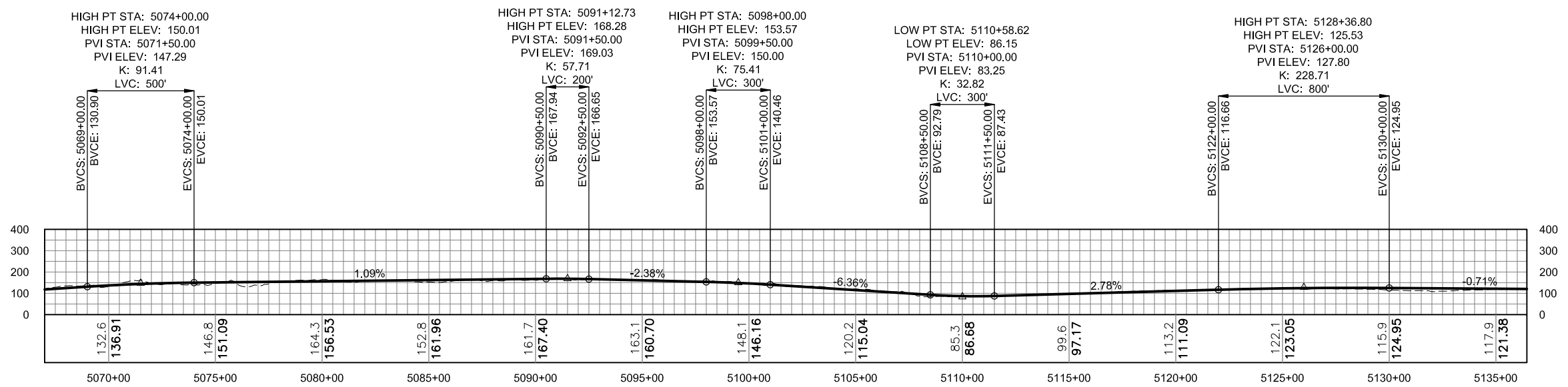
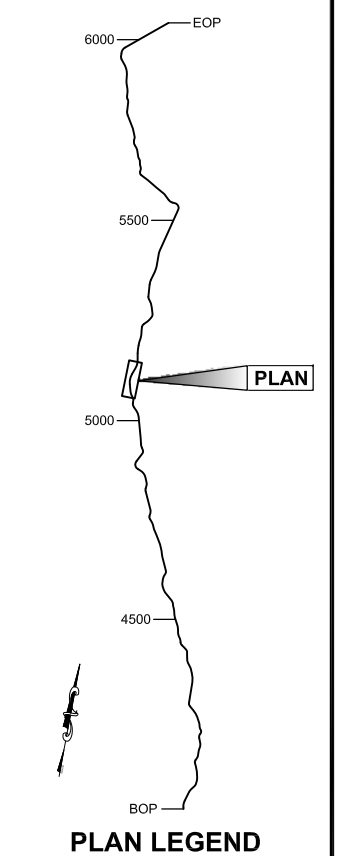
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ATTACHMENT NUMBER		
RECORD OF REVISIONS		
No.	DATE	DESCRIPTION



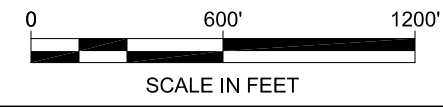
PLAN

LEGEND

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



PROFILE



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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

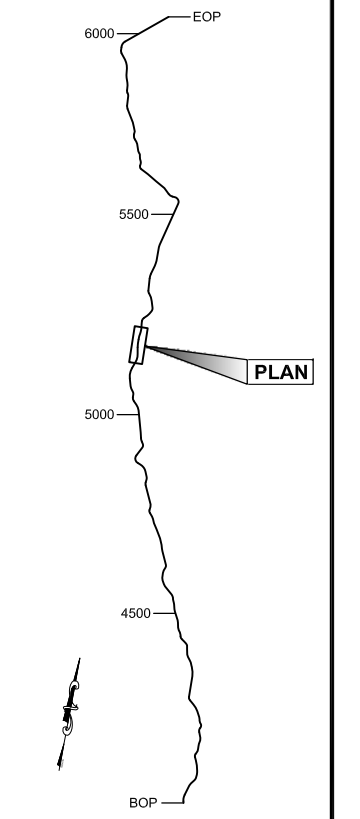
PROJECT DESIGNATION
71100

STATE	YEAR
ALASKA	2013
SHEET NUMBER	TOTAL SHEETS
WL16	XX

ADDENDUM NUMBER

ATTACHMENT NUMBER

RECORD OF REVISIONS		
No.	DATE	DESCRIPTION



PLAN LEGEND

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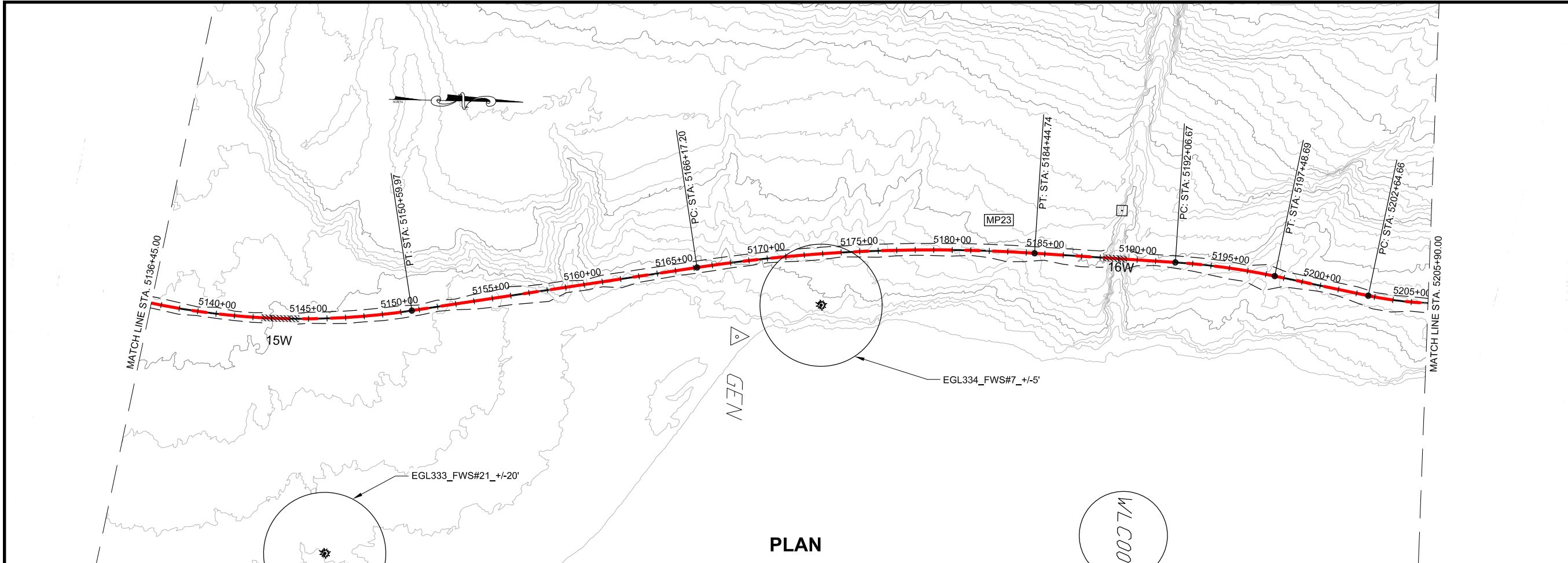
STATE OF ALASKA
 DEPARTMENT OF TRANSPORTATION
 & PUBLIC FACILITIES
 SOUTHEAST REGION

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

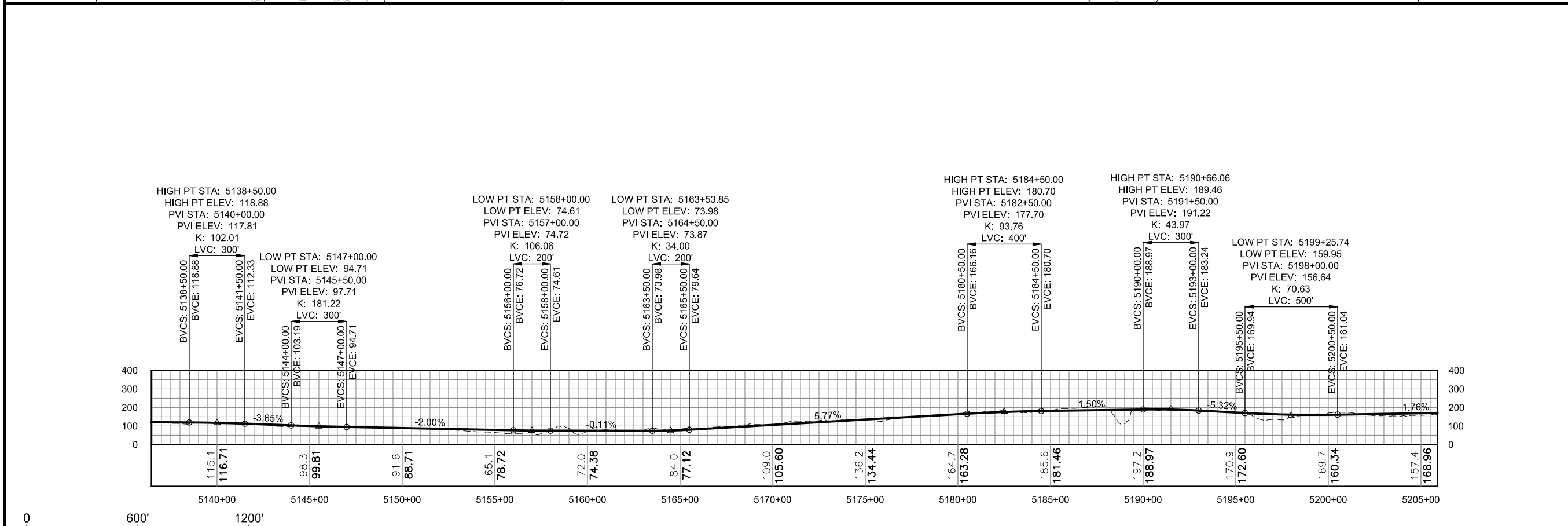
**2012 EIS
 PLAN & PROFILE
 VIEW**

PROJECT DESIGNATION
71100

STATE	YEAR
ALASKA	2013
SHEET NUMBER	TOTAL SHEETS
WL17	XX

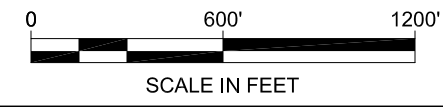


PLAN

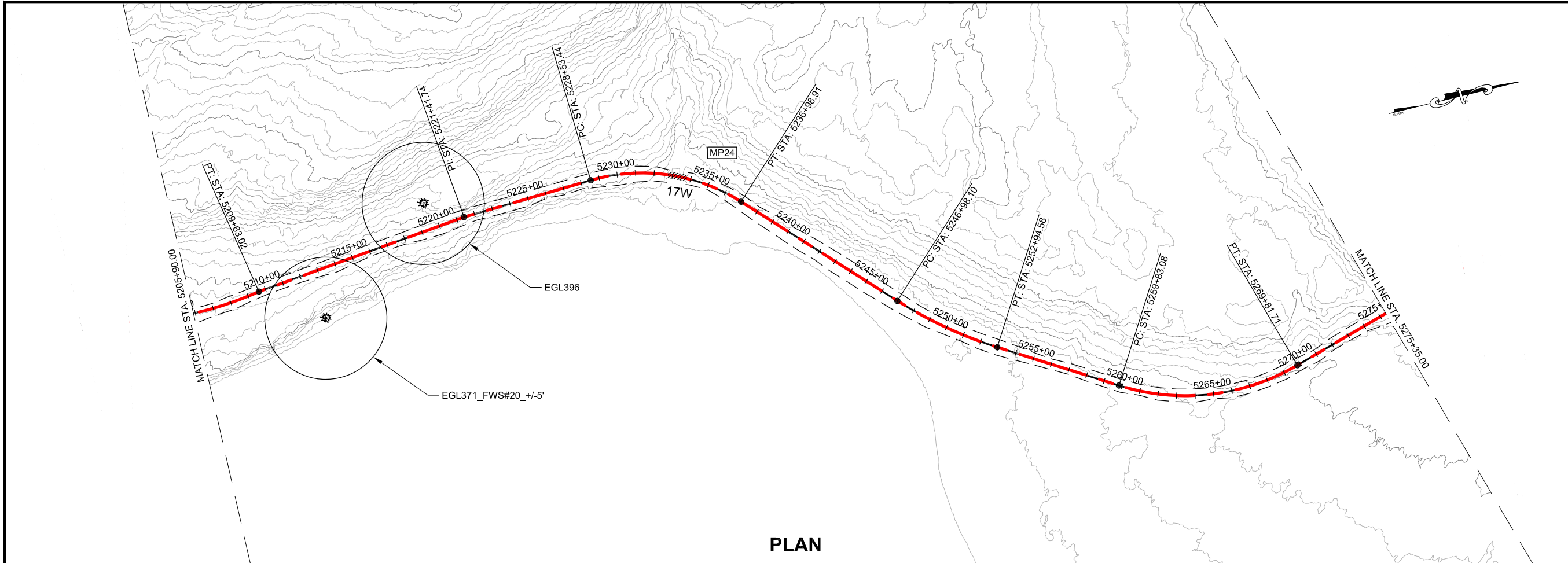
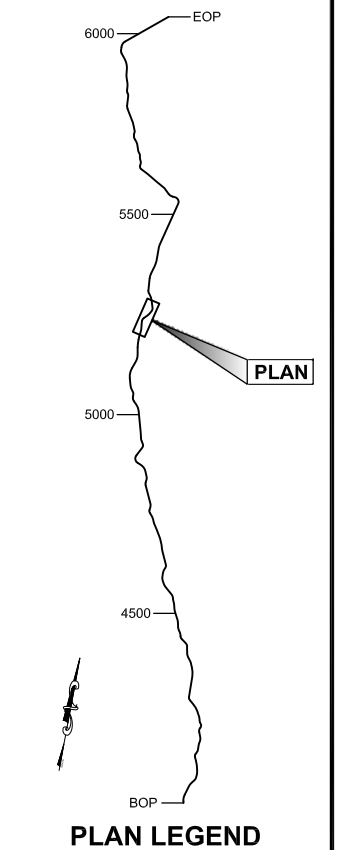


PROFILE

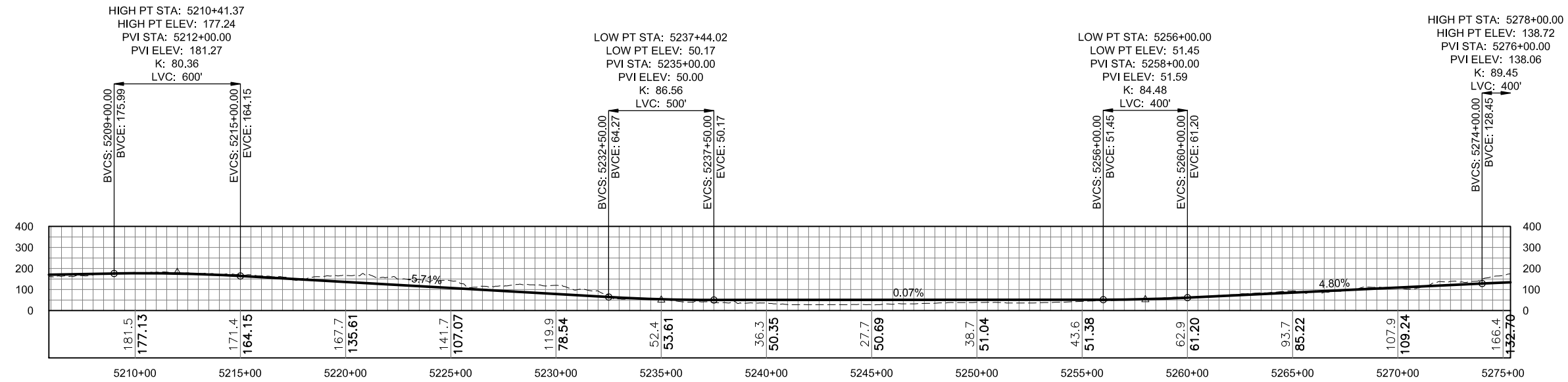
DO NOT SCALE FROM THESE DRAWINGS USE DIMENSIONS



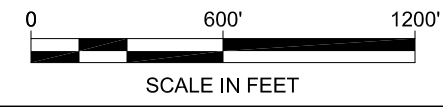
RECORD OF REVISIONS		
No.	DATE	DESCRIPTION



PLAN



PROFILE



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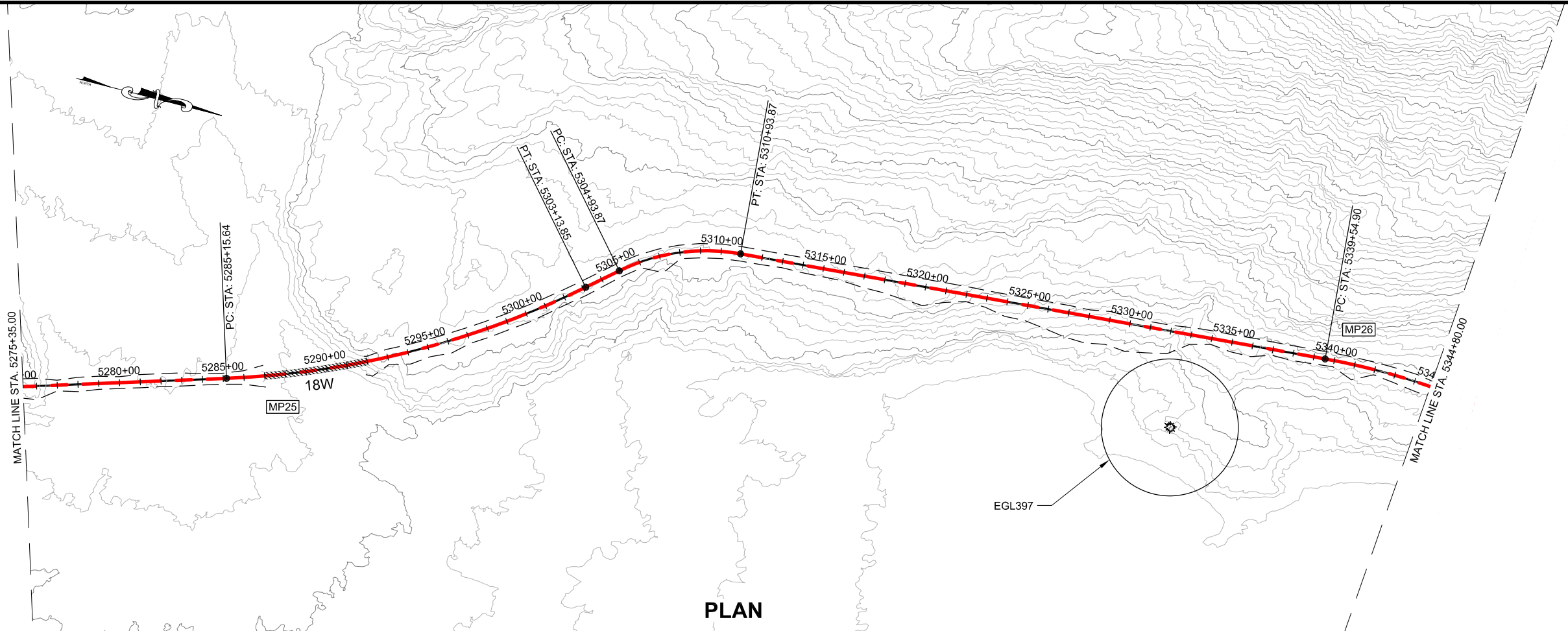
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 DESIGNED BY:
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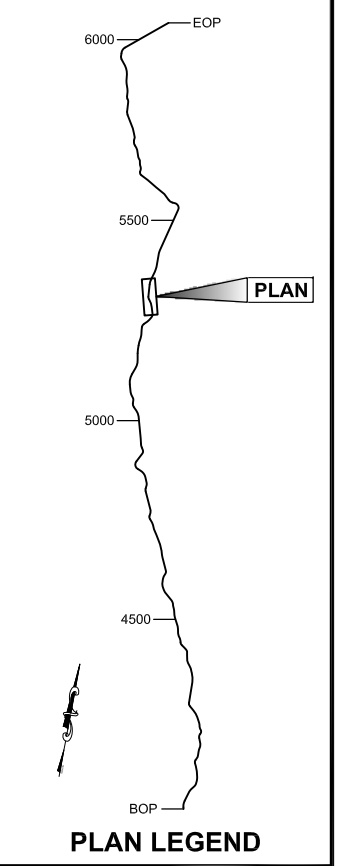
STATE OF ALASKA
 DEPARTMENT OF TRANSPORTATION
 & PUBLIC FACILITIES
 SOUTHEAST REGION
 JNU-WEST LYNN CANAL
 HIGHWAY, ALTERNATIVE 3
 PROJECT #71100
**2012 EIS
 PLAN & PROFILE
 VIEW**

PROJECT DESIGNATION	
71100	
STATE	YEAR
ALASKA	2013
SHEET NUMBER	TOTAL SHEETS
WL18	XX

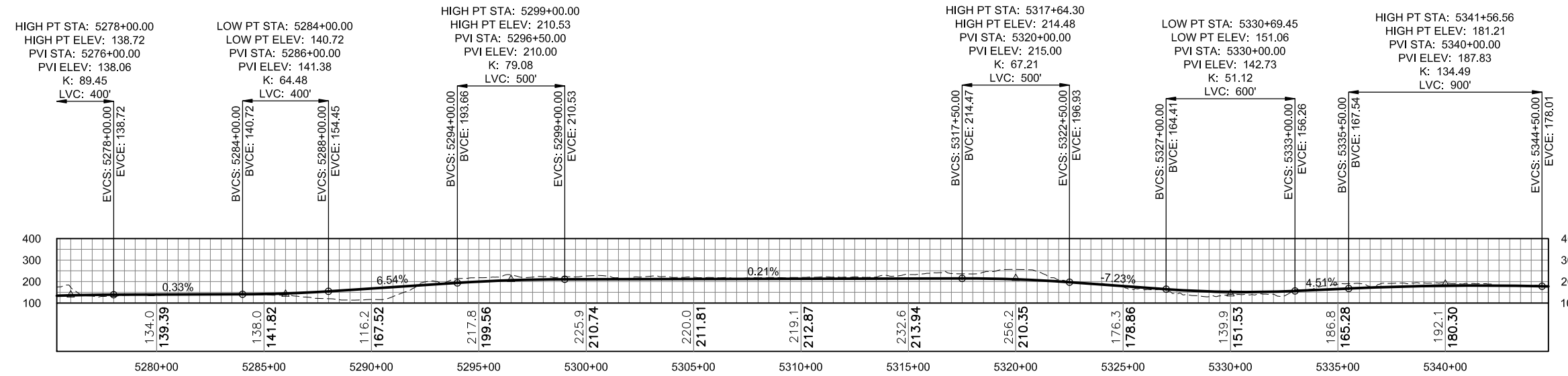
ADDENDUM NUMBER		
ATTACHMENT NUMBER		
RECORD OF REVISIONS		
No.	DATE	DESCRIPTION



PLAN

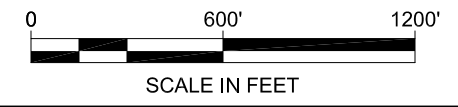


PLAN LEGEND



PROFILE

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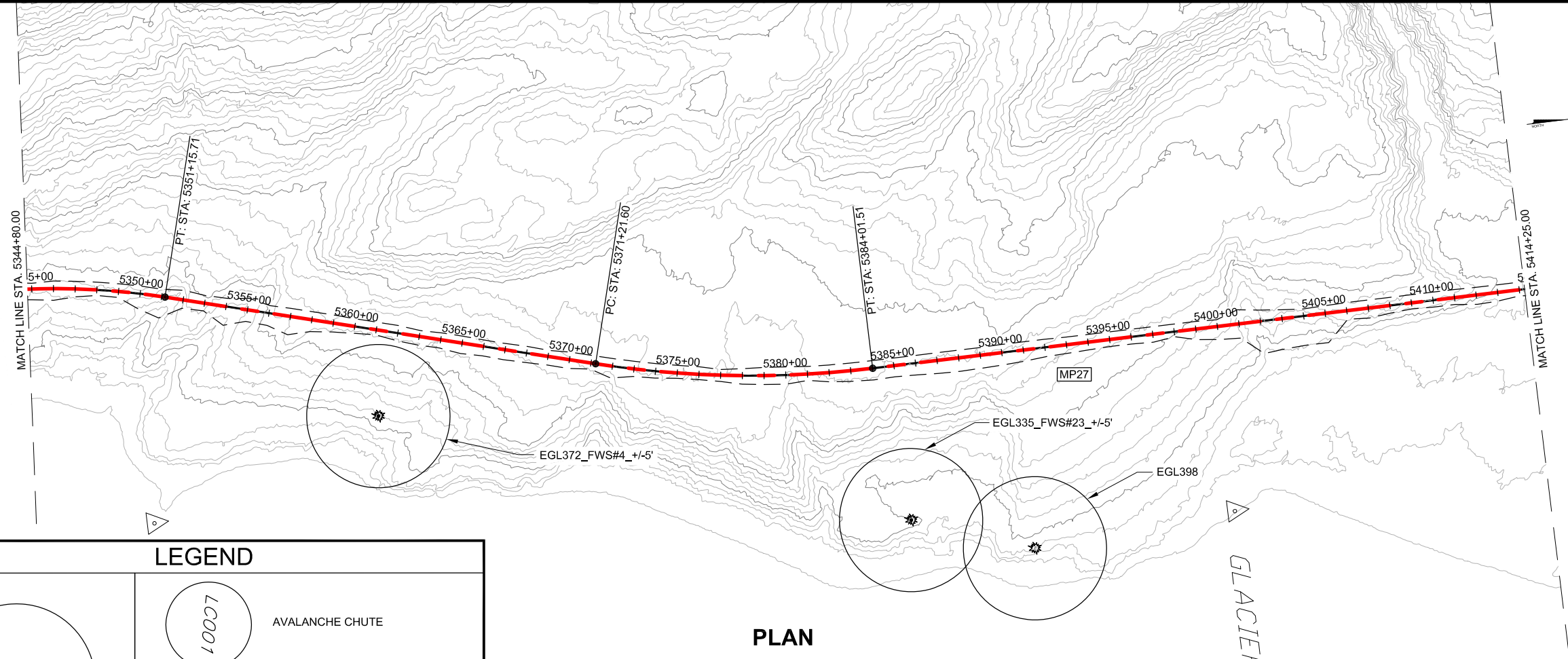
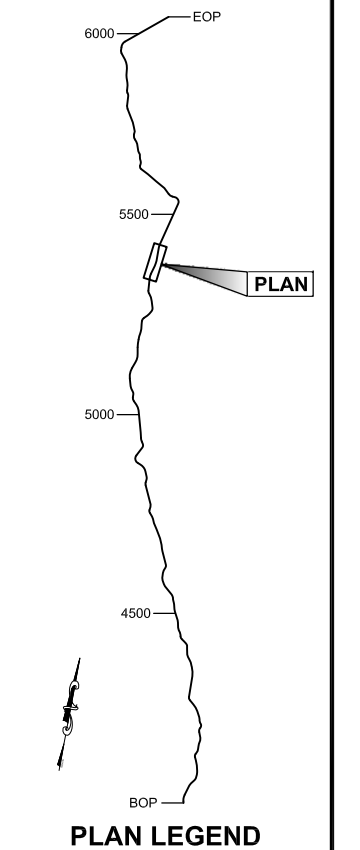
STATE OF ALASKA
 DEPARTMENT OF TRANSPORTATION
 & PUBLIC FACILITIES
 SOUTHEAST REGION

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

**2012 EIS
 PLAN & PROFILE
 VIEW**

PROJECT DESIGNATION	
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STATE	YEAR
ALASKA	2013
SHEET NUMBER	TOTAL SHEETS
WL19	XX

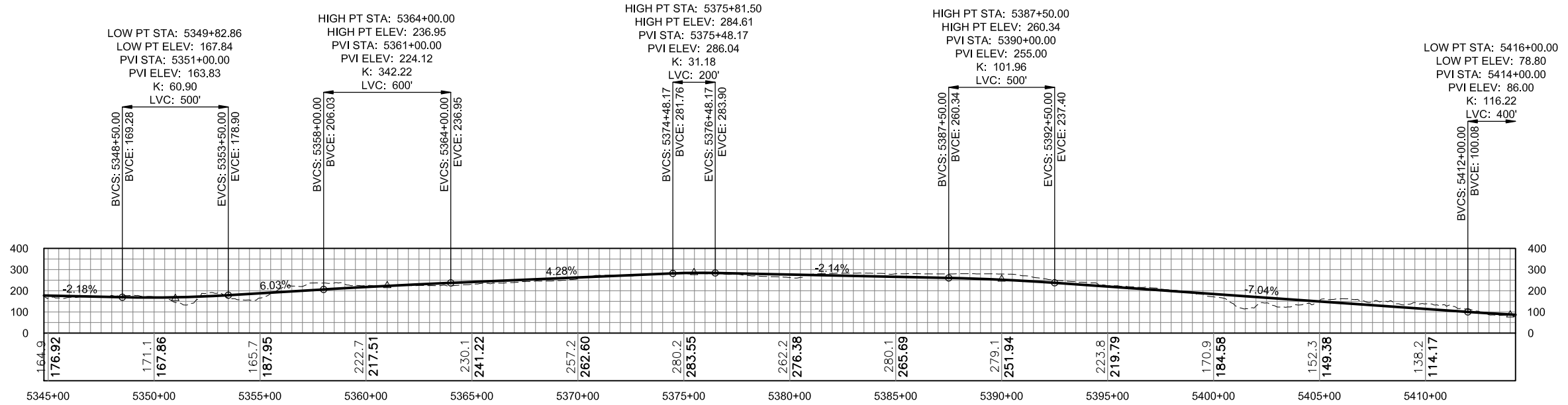
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ATTACHMENT NUMBER		
RECORD OF REVISIONS		
No.	DATE	DESCRIPTION



LEGEND

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

PLAN



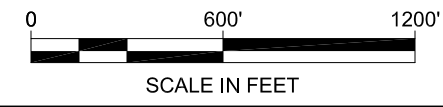
PROFILE

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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
WL20	XX

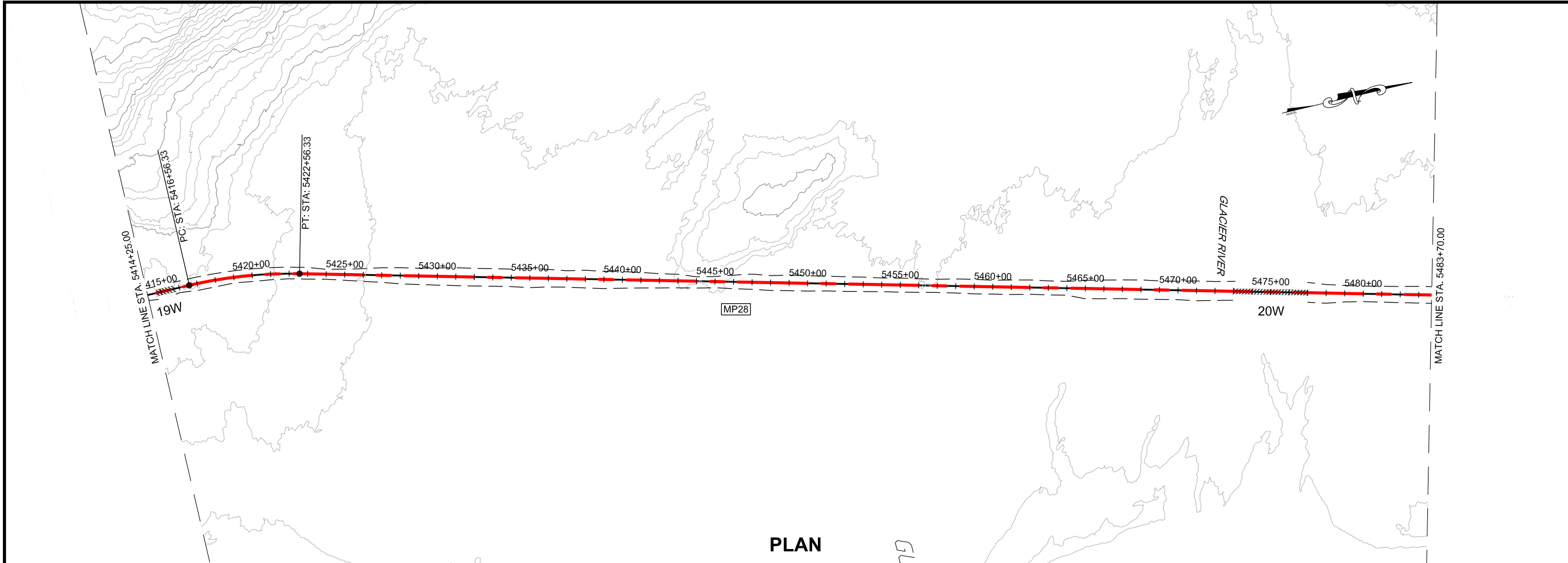


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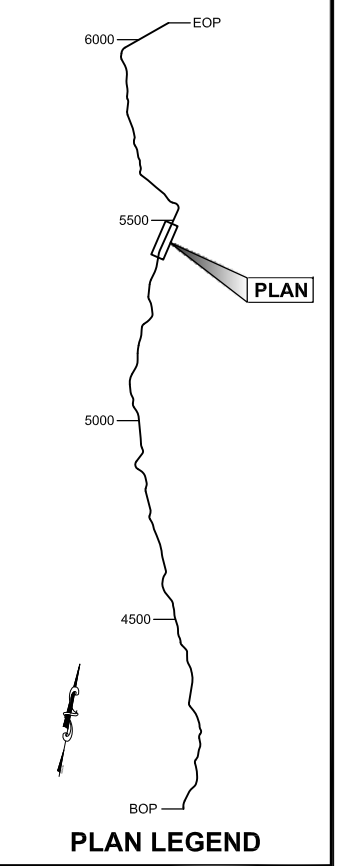
ATTACHMENT NUMBER

RECORD OF REVISIONS

No.	DATE	DESCRIPTION



PLAN



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STATE OF ALASKA
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 & PUBLIC FACILITIES
 SOUTHEAST REGION

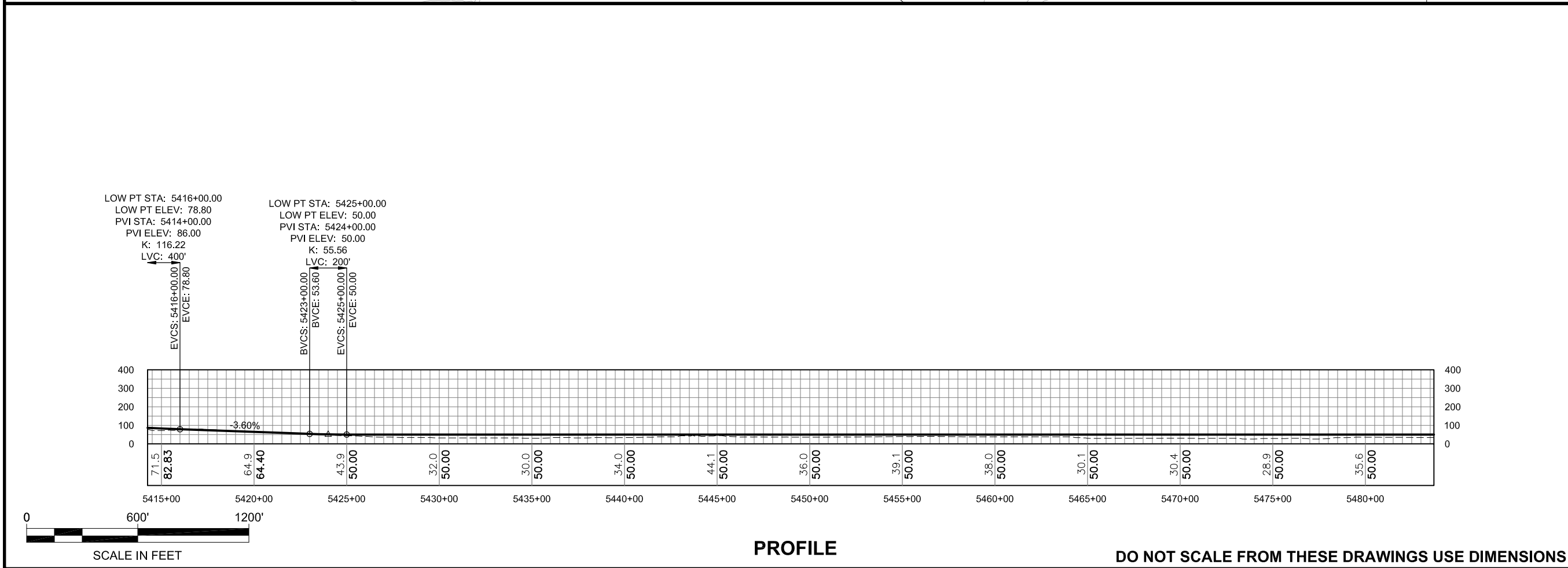
JNU-WEST LYNN CANAL
 HIGHWAY, ALTERNATIVE 3
 PROJECT #71100

**2012 EIS
 PLAN & PROFILE
 VIEW**

PROJECT DESIGNATION
71100

STATE	YEAR
ALASKA	2013

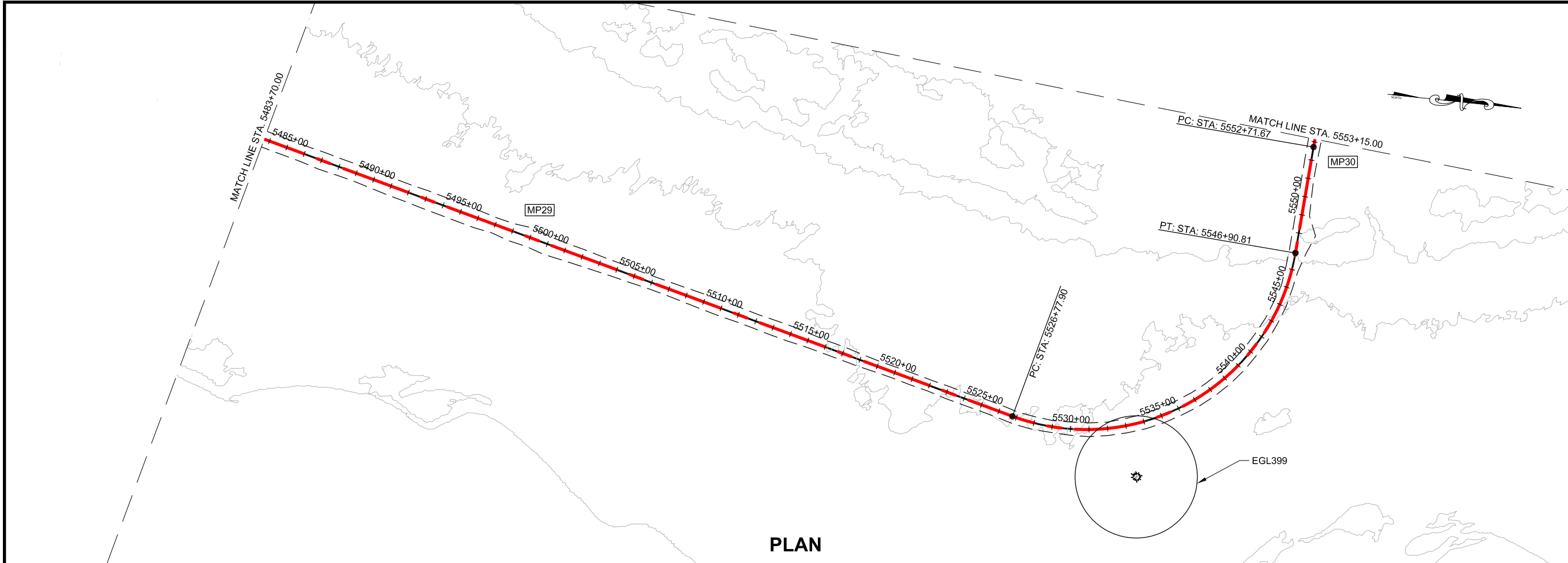
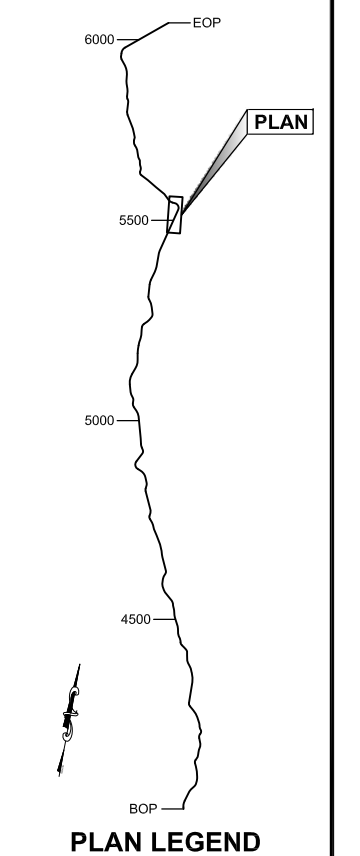
SHEET NUMBER	TOTAL SHEETS
WL21	XX



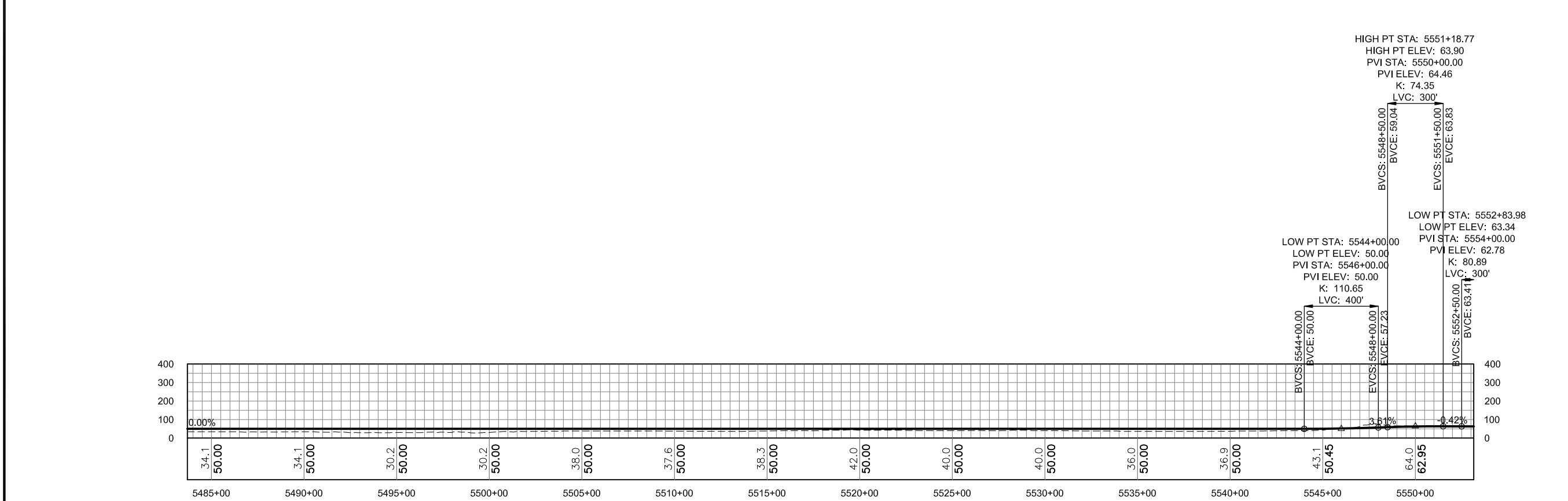
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RECORD OF REVISIONS		
No.	DATE	DESCRIPTION

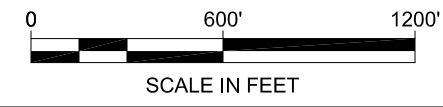


PLAN



PROFILE

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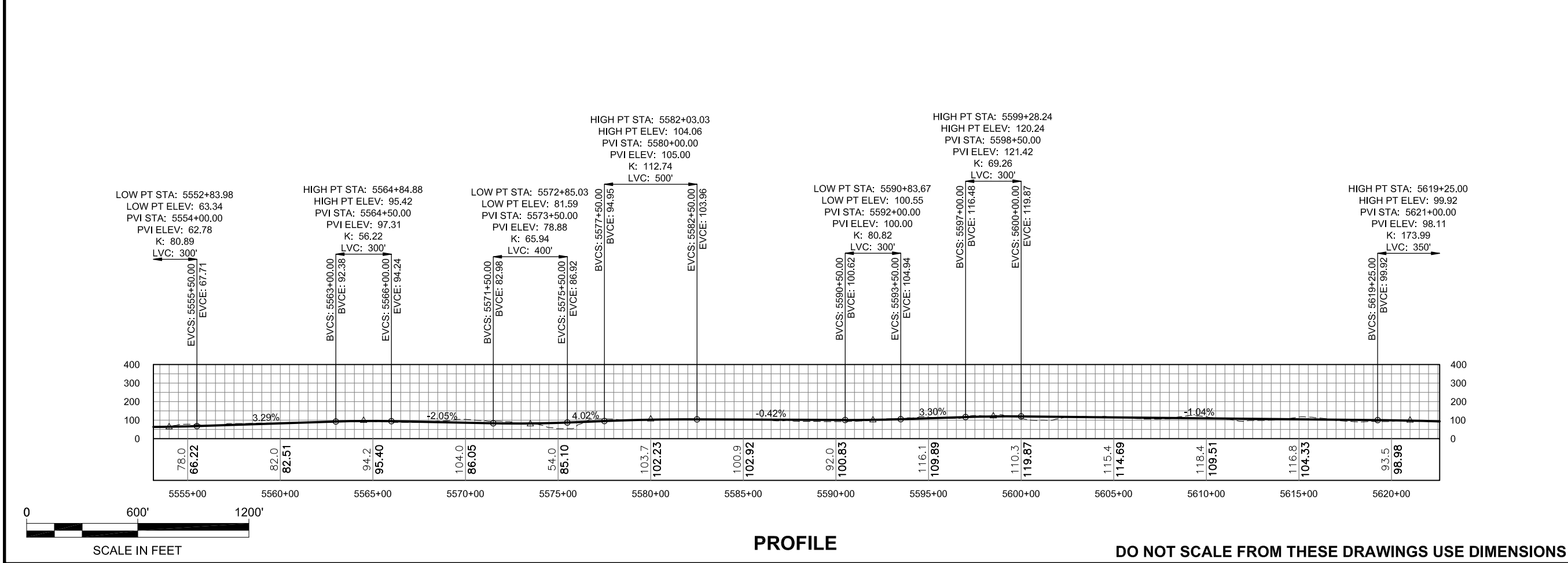
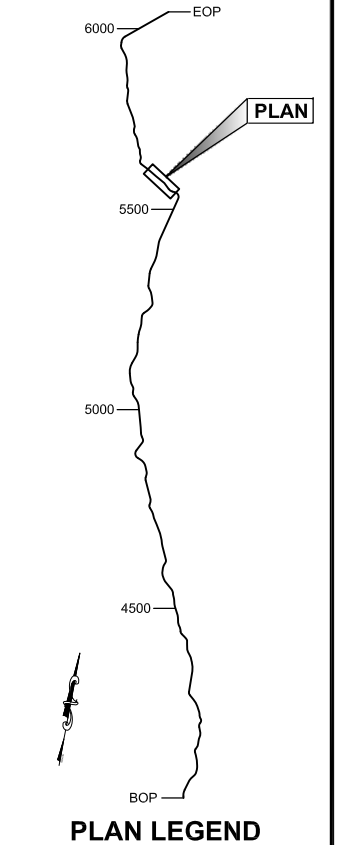
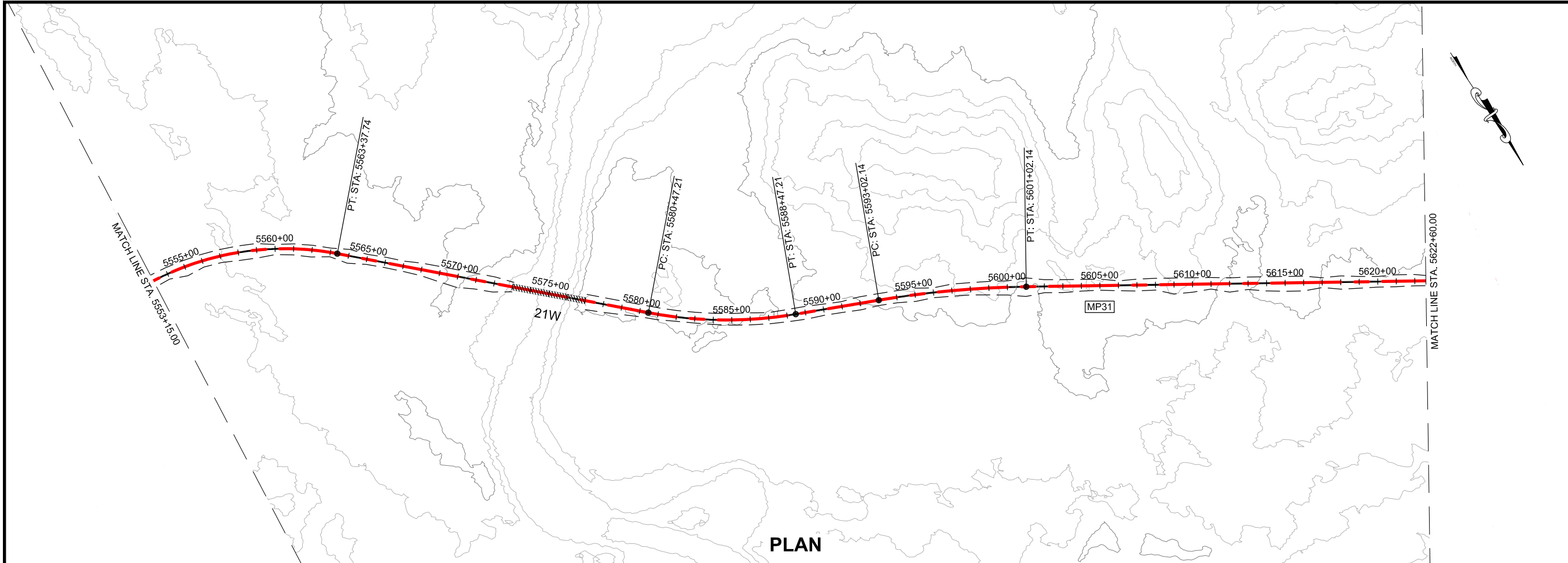


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STATE OF ALASKA DEPARTMENT OF TRANSPORTATION & PUBLIC FACILITIES SOUTHEAST REGION	
JNU-WEST LYNN CANAL HIGHWAY, ALTERNATIVE 3 PROJECT #71100	
2012 EIS PLAN & PROFILE VIEW	
PROJECT DESIGNATION 71100	
STATE ALASKA	YEAR 2013
SHEET NUMBER WL22	TOTAL SHEETS XX

ADDENDUM NUMBER		
ATTACHMENT NUMBER		
RECORD OF REVISIONS		
No.	DATE	DESCRIPTION



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 DEPARTMENT OF TRANSPORTATION & PUBLIC FACILITIES
 SOUTHEAST REGION

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

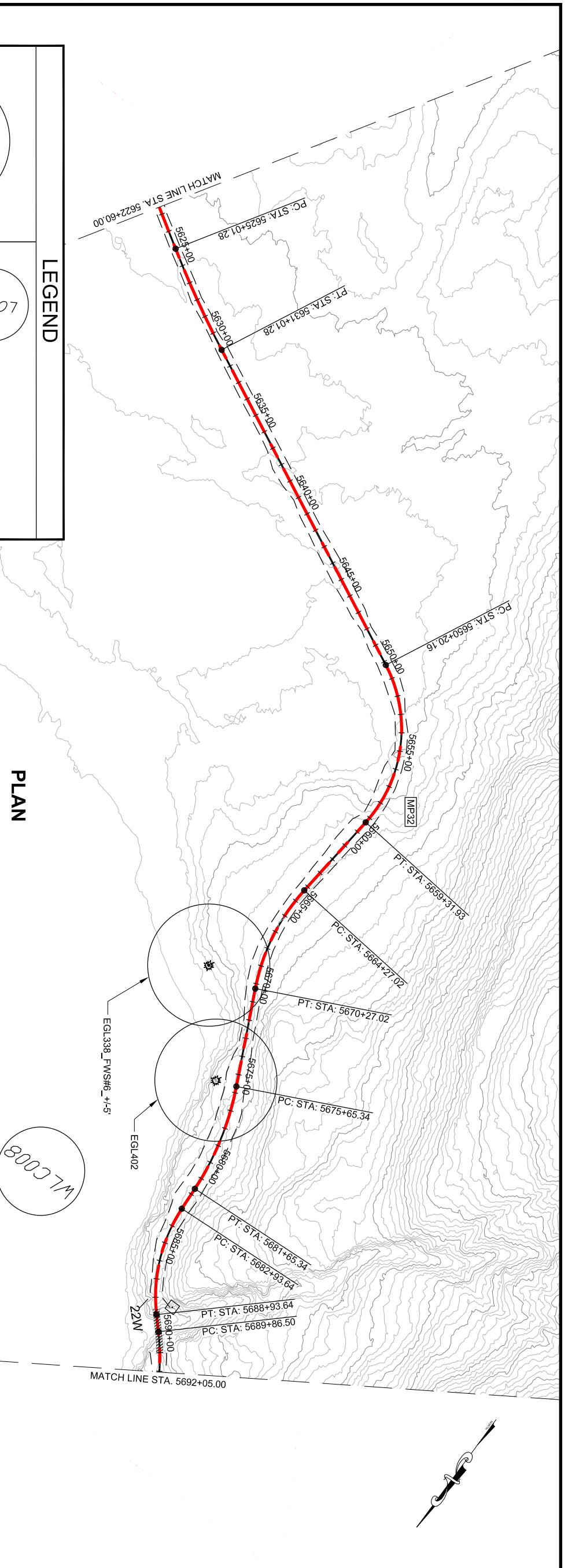
**2012 EIS
 PLAN & PROFILE
 VIEW**

PROJECT DESIGNATION
71100

STATE	YEAR
ALASKA	2013
SHEET NUMBER	TOTAL SHEETS
WL23	XX

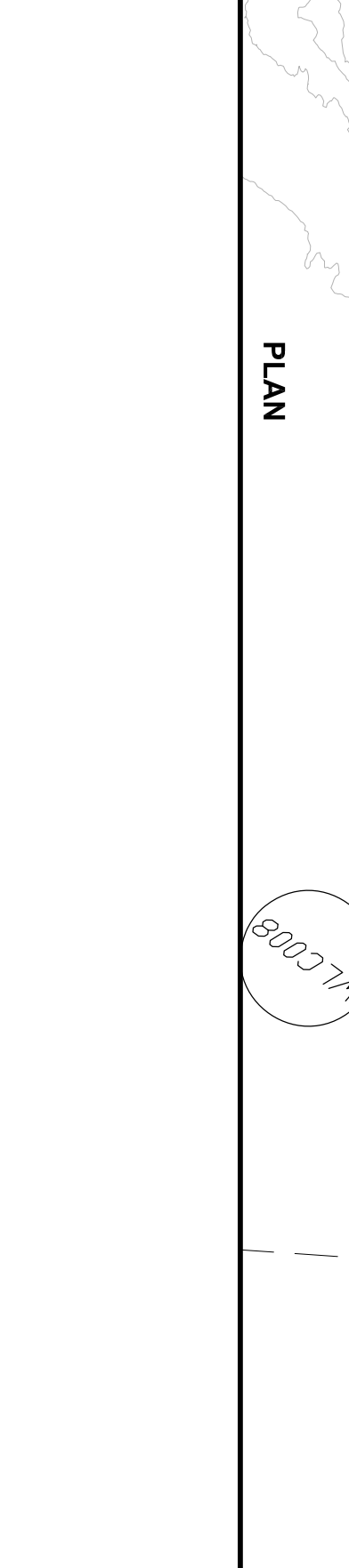
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LEGEND

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



PROFILE

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SCALE IN FEET

0 600' 1200'

0 100 200 300 400

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

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

EVCS: 5622+75.00
EVCE: 92.78
LVC: 350'

BVCS: 5628+00.63
BVCE: 76.76
EVCS: 5630+00.63
EVCE: 73.96
LVC: 200'

LOW PT STA: 5629+85.20
HIGH PT ELEV: 99.92
LOW PT ELEV: 73.95
PVI STA: 5621+00.00
PVI ELEV: 98.11
K: 173.99
LVC: 350'

LOW PT STA: 5652+00.00
HIGH PT ELEV: 79.57
LOW 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
LOW PT STA: 5665+00.00
LOW PT ELEV: 160.15
PVI STA: 5673+50.00
PVI ELEV: 120.35
K: 42.90
LVC: 500'

LOW PT STA: 5675+94.86
HIGH PT ELEV: 125.16
LOW PT STA: 5673+50.00
LOW PT ELEV: 148.36
PVI STA: 5678+00.00
PVI ELEV: 120.35
K: 148.36
LVC: 900'

HIGH PT STA: 5689+50.00
HIGH PT ELEV: 151.67
LOW PT STA: 5683+00.00
LOW PT ELEV: 147.34
PVI STA: 5686+00.00
PVI ELEV: 147.34
K: 4771.28
LVC: 700'

Grades: -3.05%, 0.25%, 6.97%, -4.68%, -1.38%

PATH: J:\JUN17\1001\DR\10_2012 EIS
 DINGS\71100_2012 EIS WEST LYNN
 PLANS.DWG
 GEAR, NATE (DOT)
 TAB: WL24 Friday, October 04, 2013 1:25:03 PM

APPENDUM NUMBER
 ATTACHMENT NUMBER

NO.	DATE	DESCRIPTION

RECORD OF REVISIONS

DESIGNED BY:
 DRAWN BY:
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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

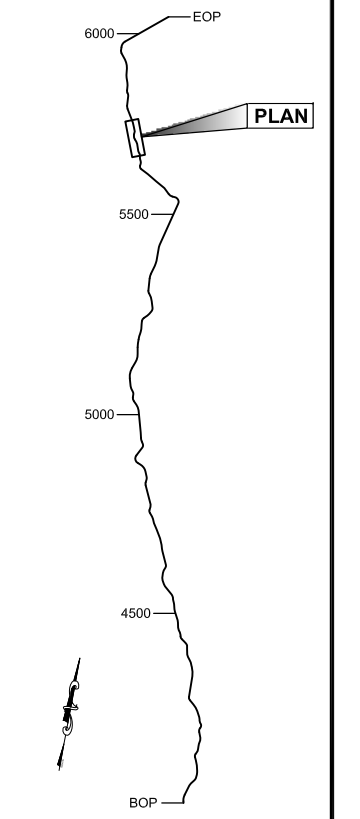
STATE	YEAR
ALASKA	2013

SHEET NUMBER TOTAL SHEETS
 WL24 XX

PLAN LEGEND

DRAFT

ADDENDUM NUMBER		
ATTACHMENT NUMBER		
RECORD OF REVISIONS		
No.	DATE	DESCRIPTION



PLAN LEGEND

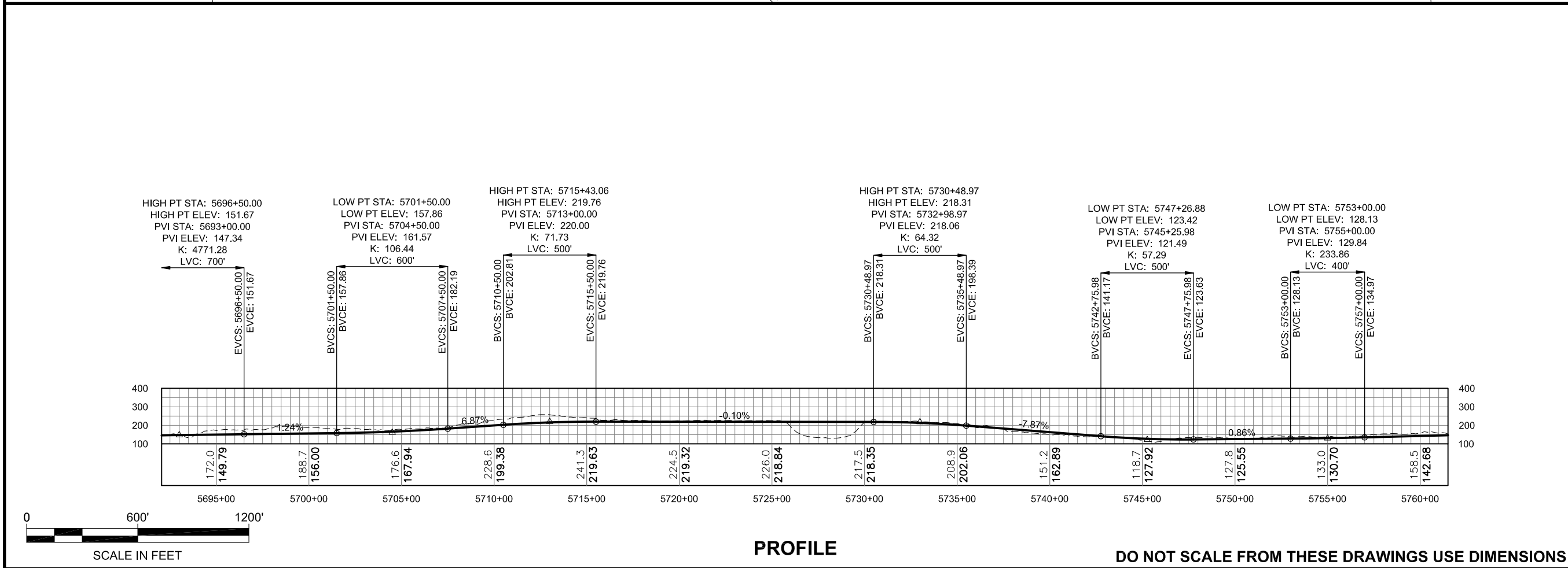
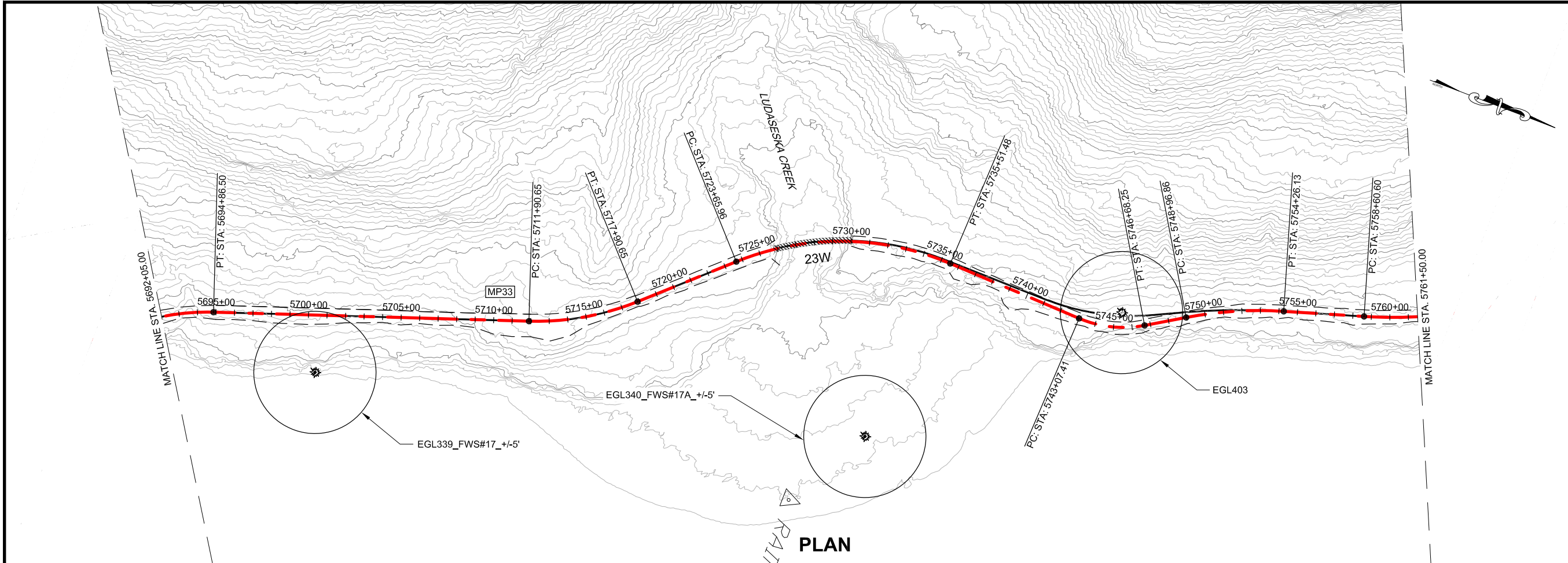
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STATE OF ALASKA
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 & PUBLIC FACILITIES
 SOUTHEAST REGION
 JNU-WEST LYNN CANAL
 HIGHWAY, ALTERNATIVE 3
 PROJECT #71100
**2012 EIS
 PLAN & PROFILE
 VIEW**

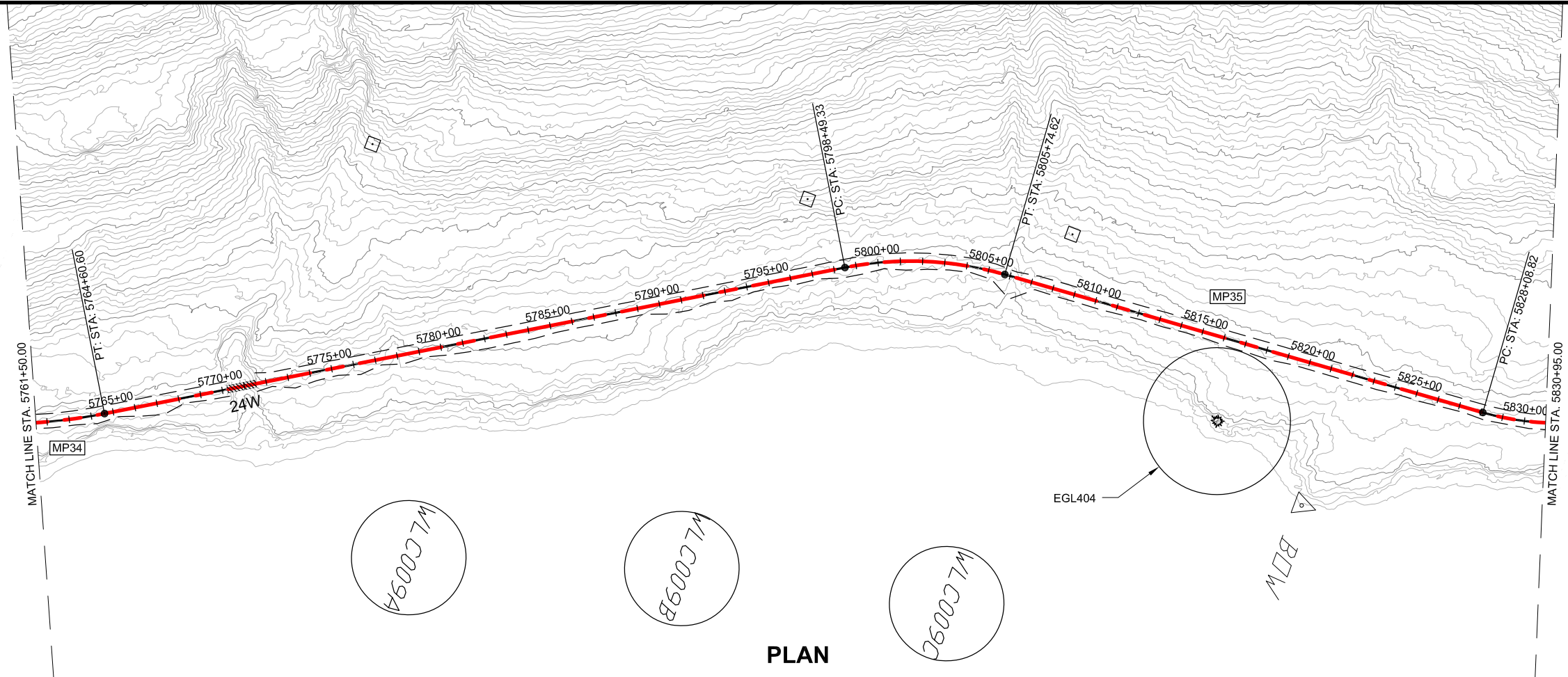
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71100	
STATE	YEAR
ALASKA	2013
SHEET NUMBER	TOTAL SHEETS
WL25	XX



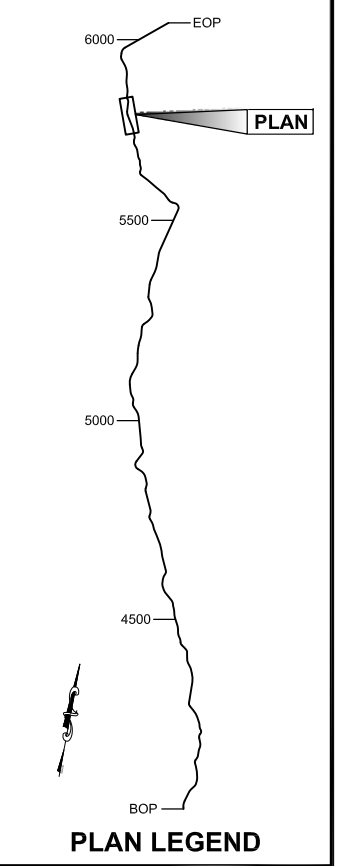
PROFILE

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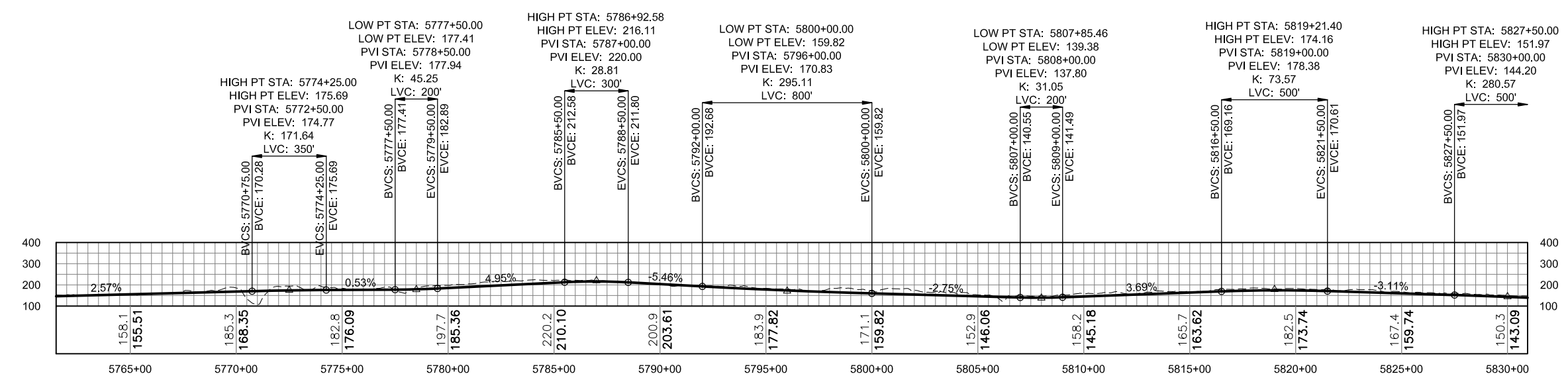
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RECORD OF REVISIONS		
No.	DATE	DESCRIPTION



PLAN



PLAN LEGEND



PROFILE

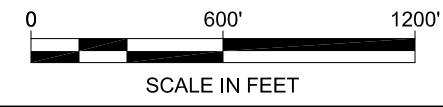
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 PROJECT #71100
**2012 EIS
 PLAN & PROFILE
 VIEW**

PROJECT DESIGNATION	
71100	
STATE	YEAR
ALASKA	2013
SHEET NUMBER	TOTAL SHEETS
WL26	XX

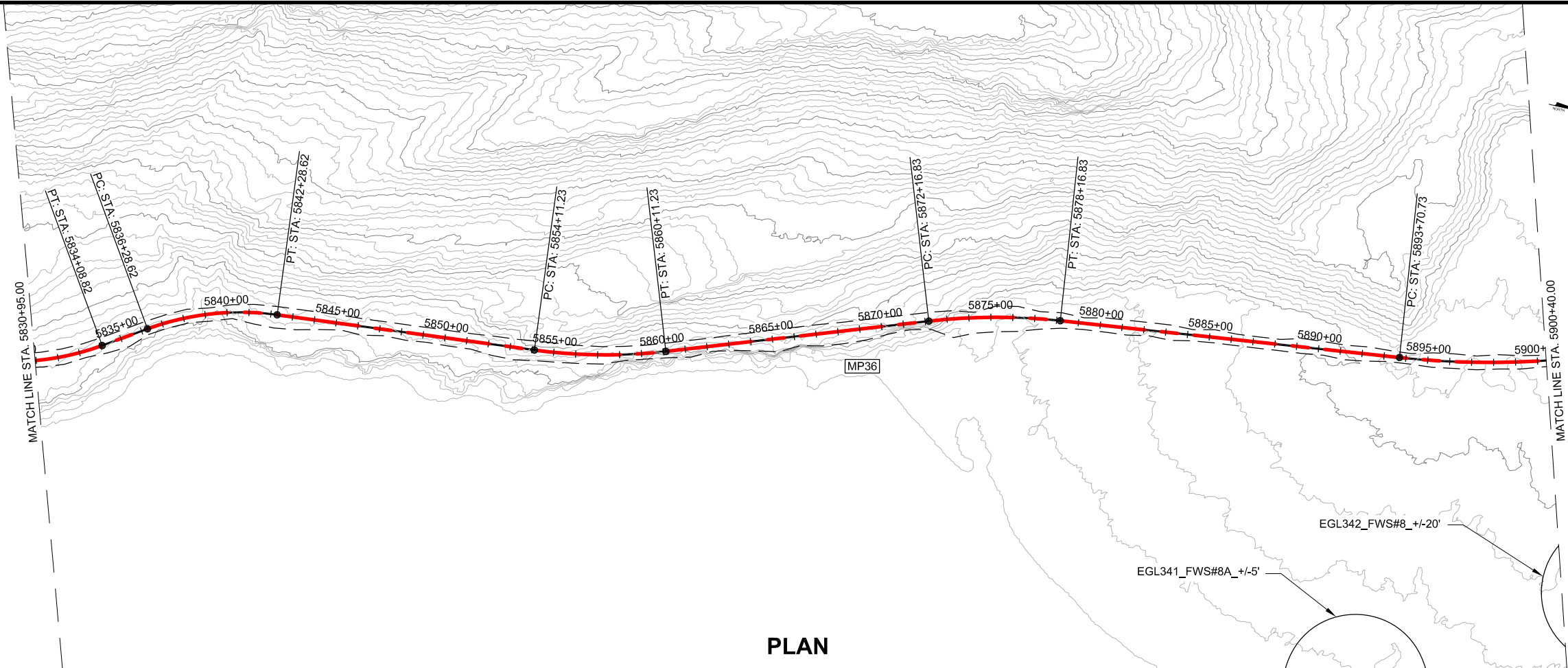


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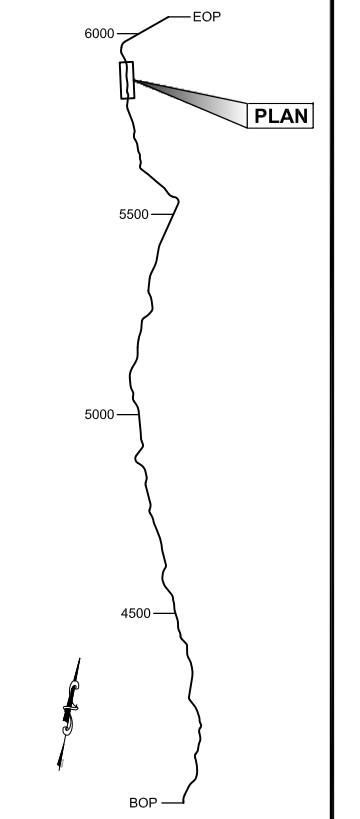
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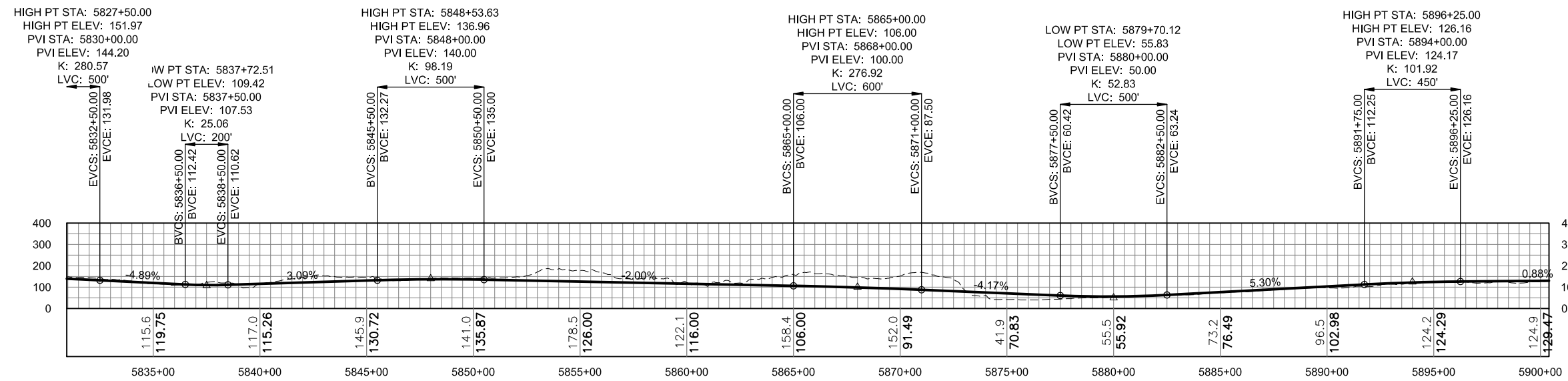
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No.	DATE	DESCRIPTION



PLAN

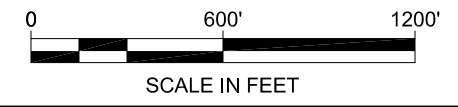


PLAN LEGEND



PROFILE

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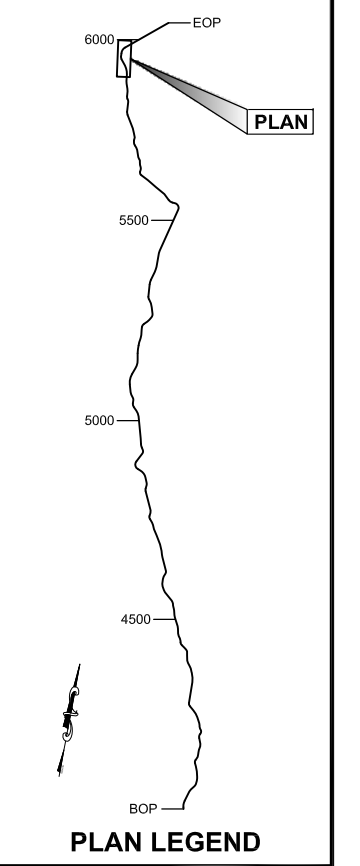
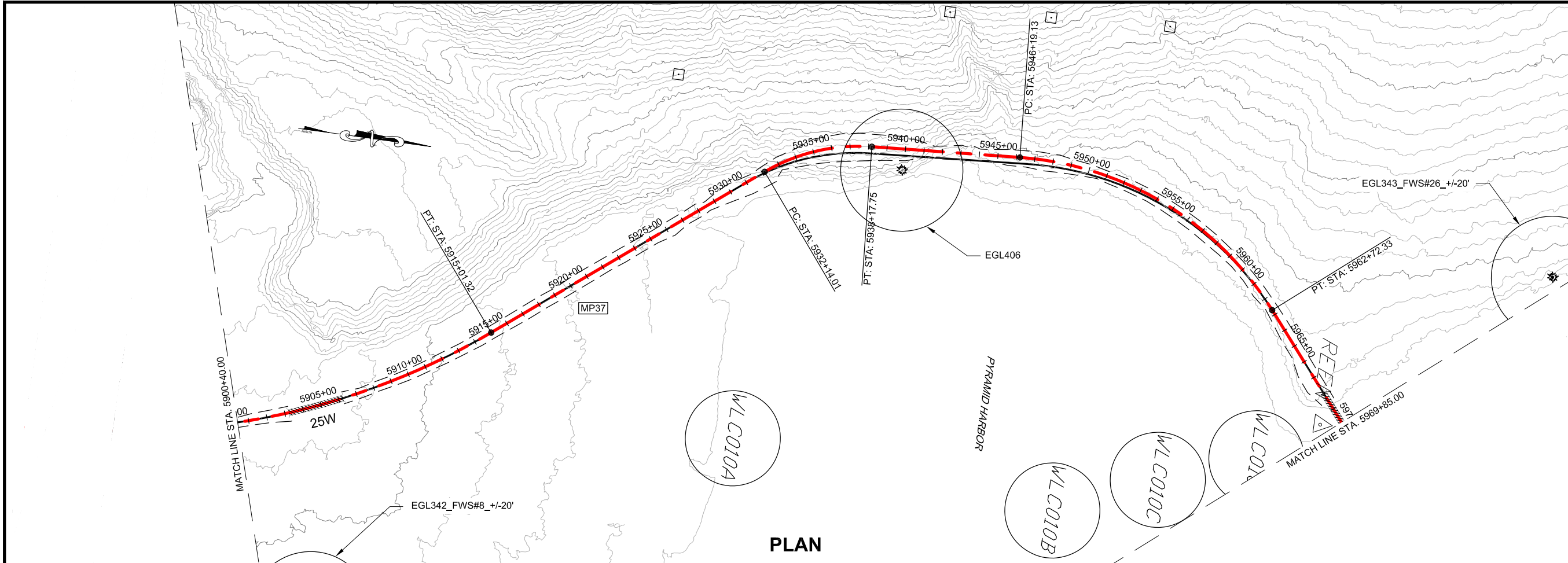
STATE OF ALASKA
 DEPARTMENT OF TRANSPORTATION
 & PUBLIC FACILITIES
 SOUTHEAST REGION

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

**2012 EIS
 PLAN & PROFILE
 VIEW**

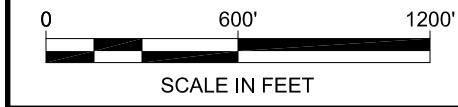
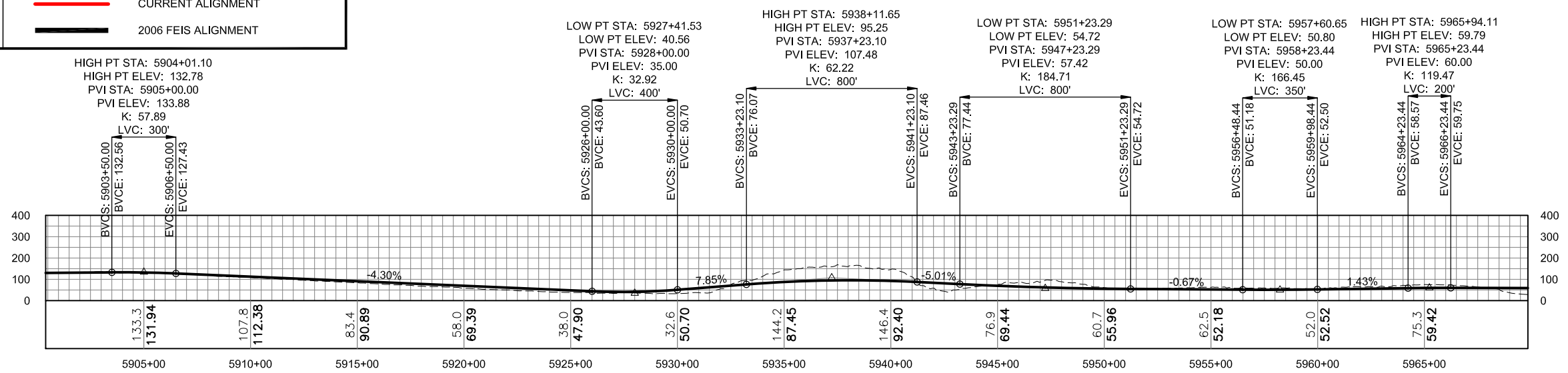
PROJECT DESIGNATION	
71100	
STATE	YEAR
ALASKA	2013
SHEET NUMBER	TOTAL SHEETS
WL27	XX

RECORD OF REVISIONS		
No.	DATE	DESCRIPTION



LEGEND

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



PROFILE

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 SOUTHEAST REGION

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

**2012 EIS
 PLAN & PROFILE
 VIEW**

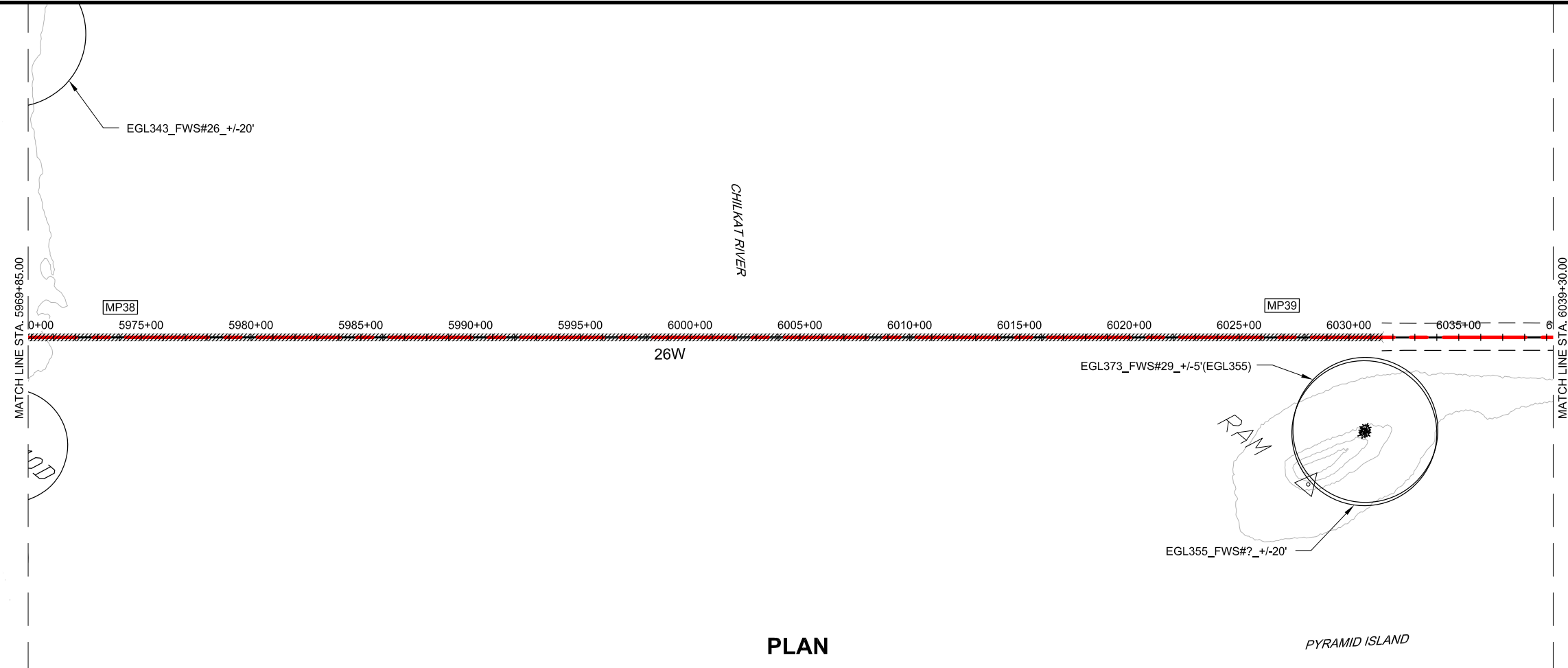
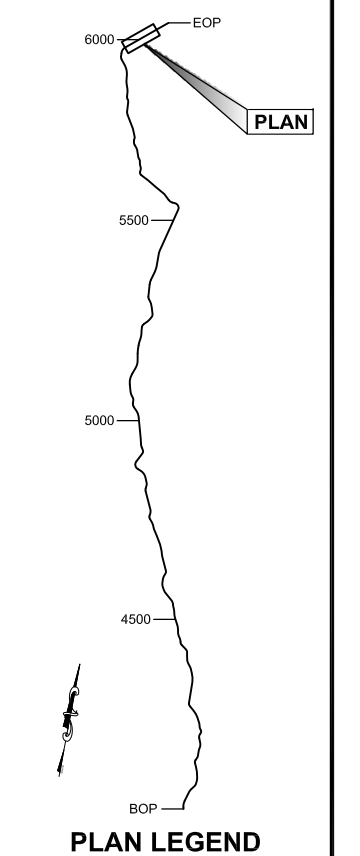
PROJECT DESIGNATION
71100

STATE	YEAR
ALASKA	2013
SHEET NUMBER	TOTAL SHEETS
WL28	XX

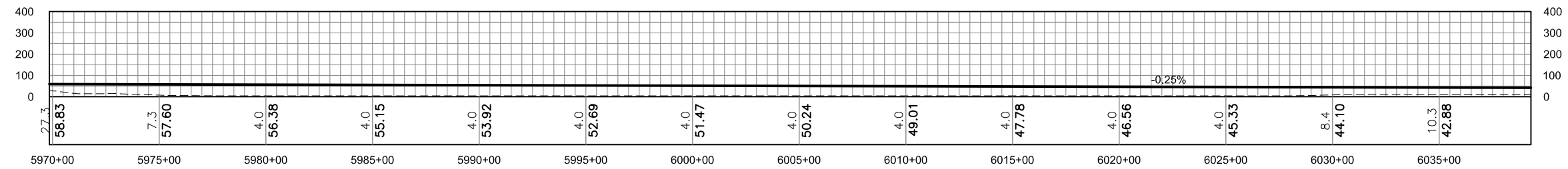
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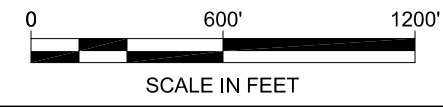
RECORD OF REVISIONS		
No.	DATE	DESCRIPTION



PLAN



PROFILE



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

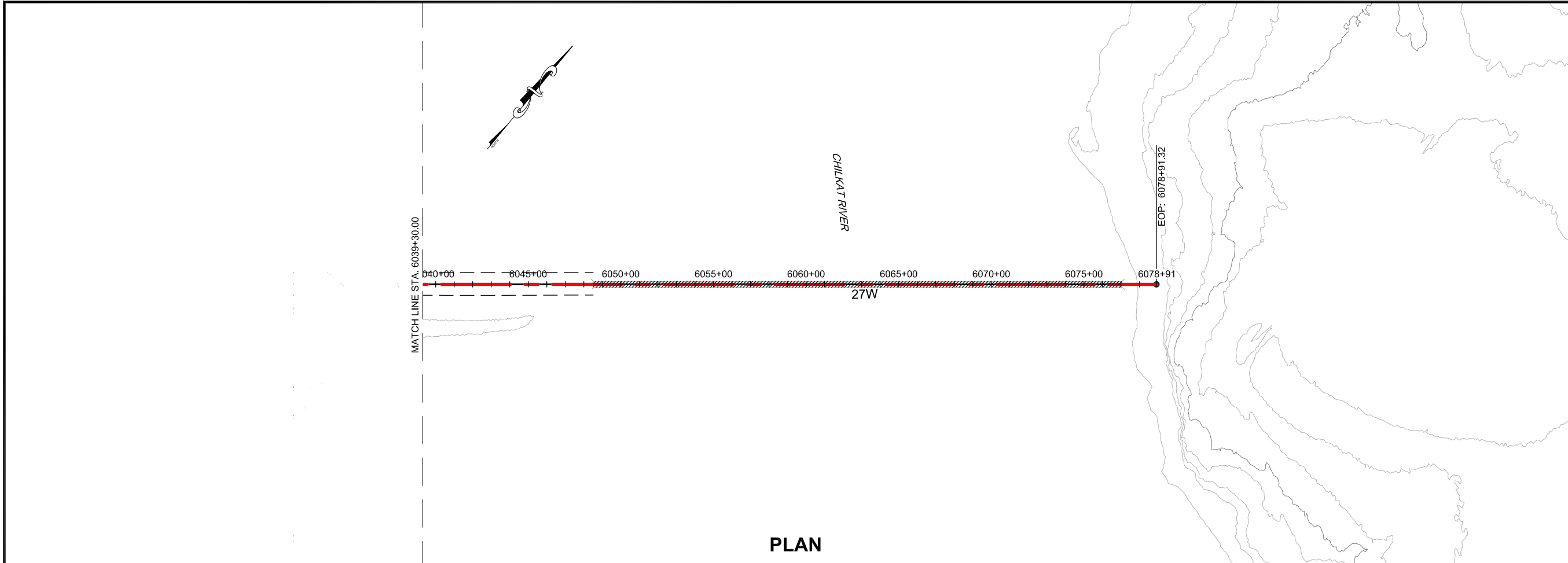
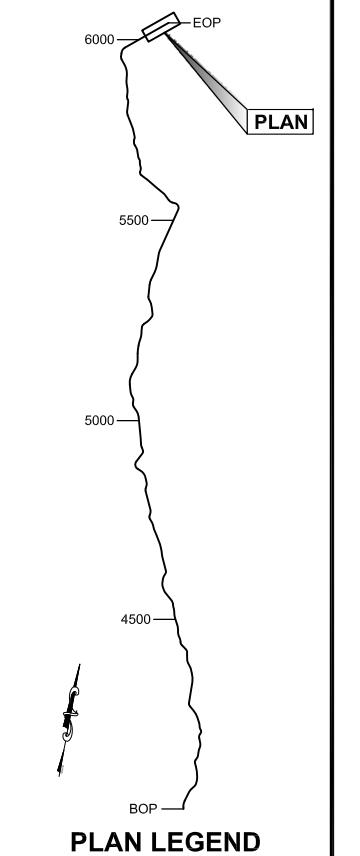
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STATE ALASKA	YEAR 2013
SHEET NUMBER WL29	TOTAL SHEETS XX

ADDENDUM NUMBER

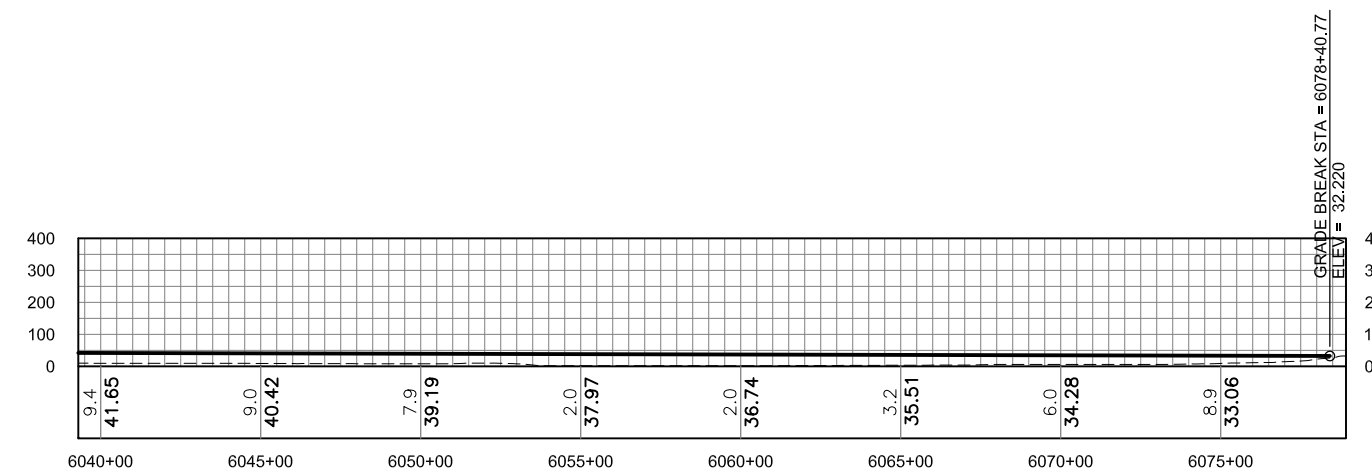
ATTACHMENT NUMBER

RECORD OF REVISIONS

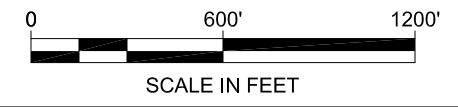
No.	DATE	DESCRIPTION



PLAN



PROFILE



DO NOT SCALE FROM THESE DRAWINGS USE DIMENSIONS

CHECKED BY:

DRAFT

DESIGNED BY:

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
WL30	XX

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.

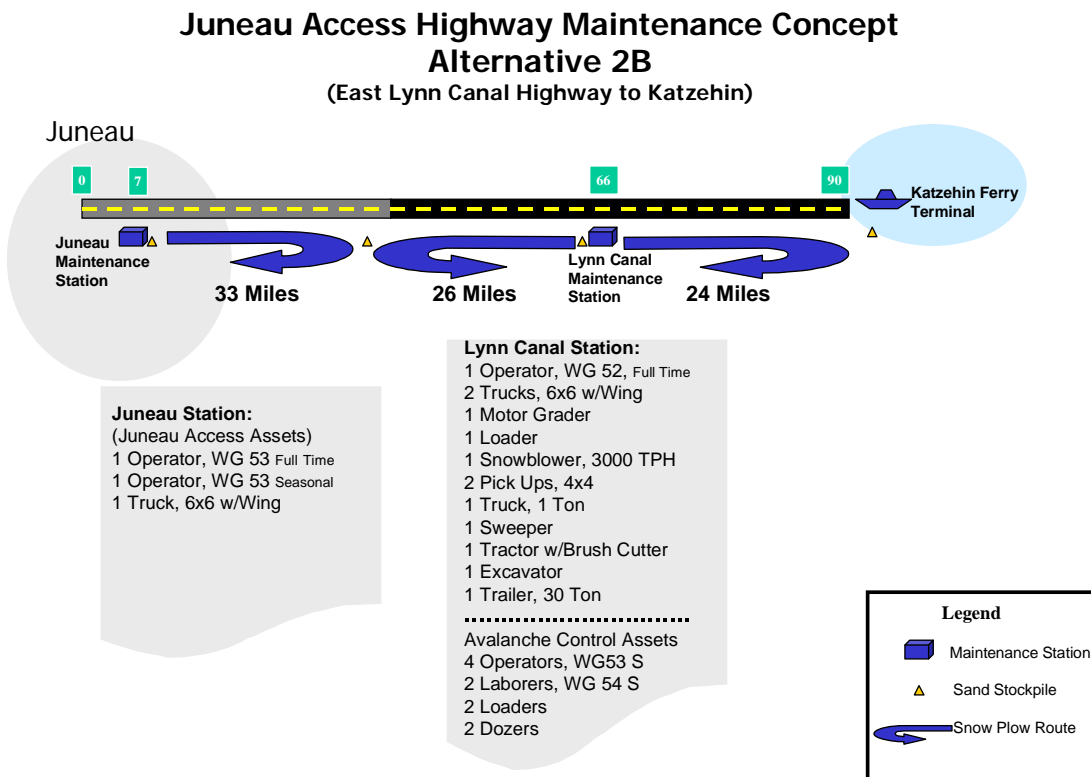
The cost of Juneau Access highway maintenance is driven by the addition of new road miles and new maintenance facilities. Alternatives 1, 1B, 4A, and 4C have no new highway sections. Alternatives 2B, and 3 will have significant highway cost because of the new highway miles. Alternatives 4B and 4D have 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.

Alternative	Brief Description	New Road Miles
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.

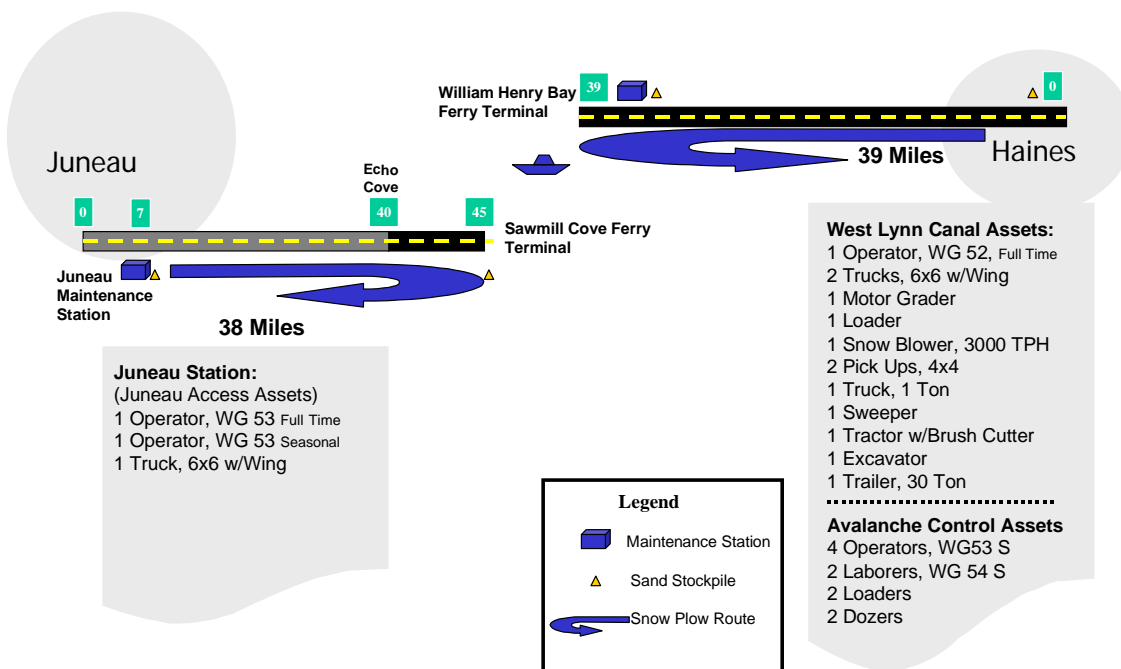
Juneau Maintenance Station would be augmented with one full time operator and one seasonal position, to assist in maintaining the highway from Juneau to Cascade Point. Juneau Station would be required to place a higher priority on maintenance of the highway from Echo Cove to Cascade Point than they presently 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).

Juneau Access Highway Maintenance Concept Alternative 3 (West Lynn Canal Highway)



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

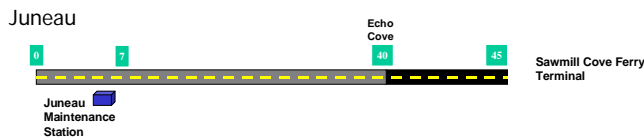
Station	No.	Job title	WG	Status
Haines	1	Equipment Operator	53	FT
Haines	4	Equipment Operator (Avalanche Control)	53	PT
Juneau	1	Equipment Operator	53	FT
Juneau	1	Equipment Operator	53	PT

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

Budget Line	Description	Cost
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
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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
	Grand Total	\$968,532
	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 (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 (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

Budget Line	Description	Cost
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
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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>
Grand Total	\$908,921
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 (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	<u>\$35,000</u>
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 (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

Equipment	Op Cost	Rep Cost	Units	Monthly Cost	Annual Cost
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)

	Op Cost	Rep Cost	Units	Monthly Cost	Annual Cost
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

Equipment	Op Cost	Rep Cost	Units	Monthly Cost	Annual Cost
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

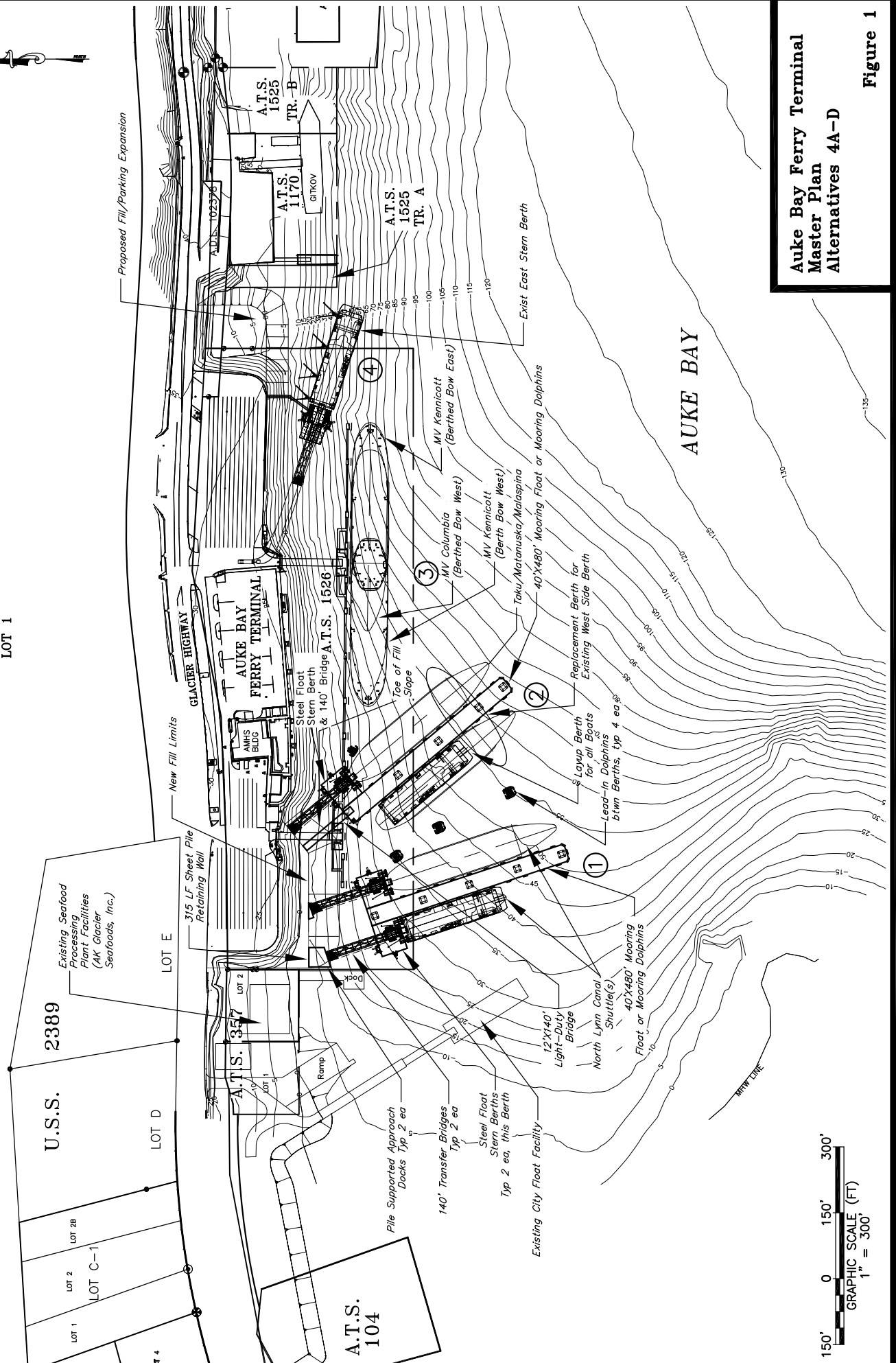
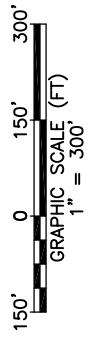
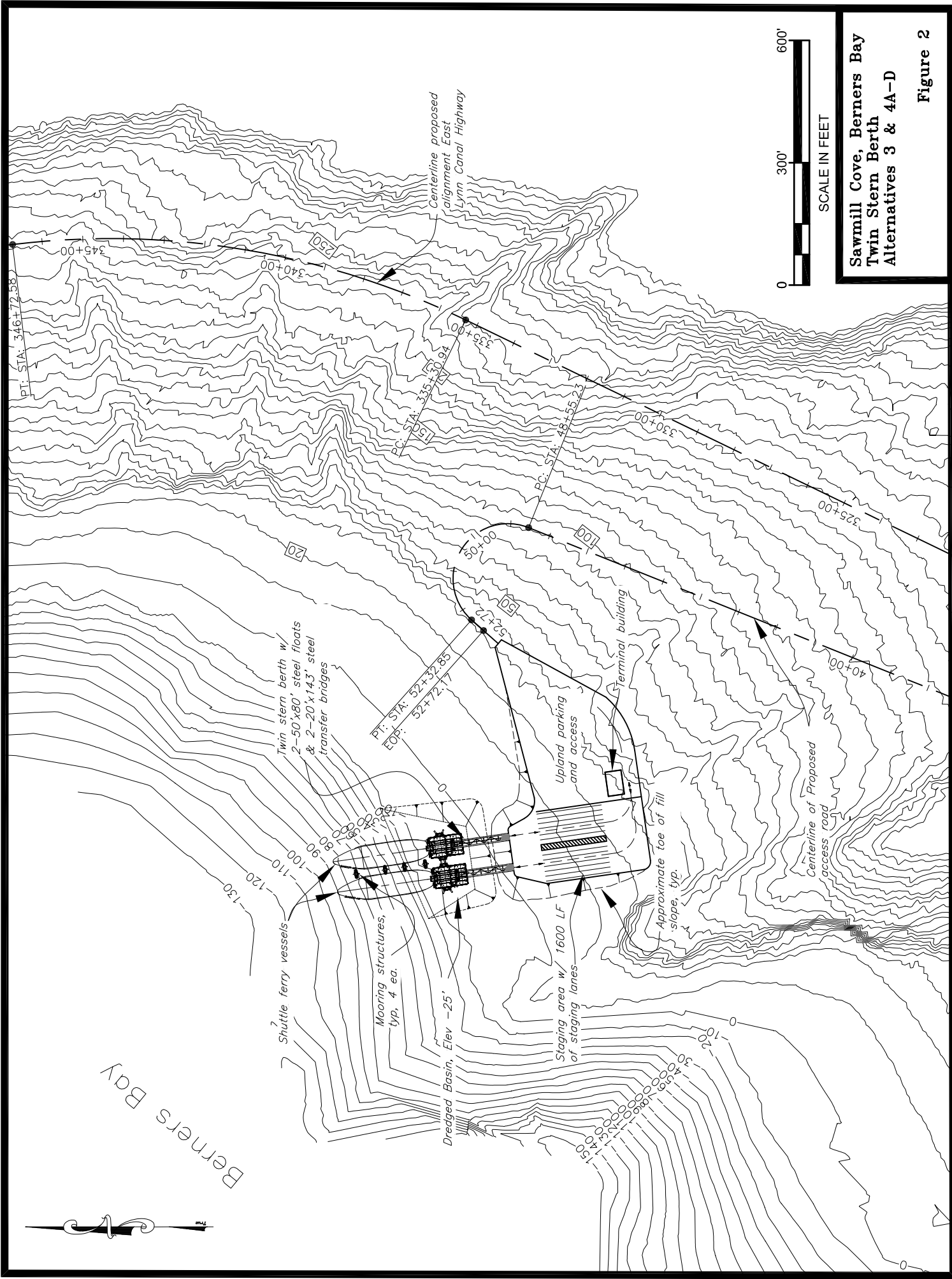


Figure 1





Berners Bay

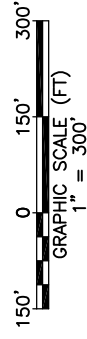


**Sawmill Cove, Berners Bay
Twin Stern Berth
Alternatives 3 & 4A-D**

Figure 2



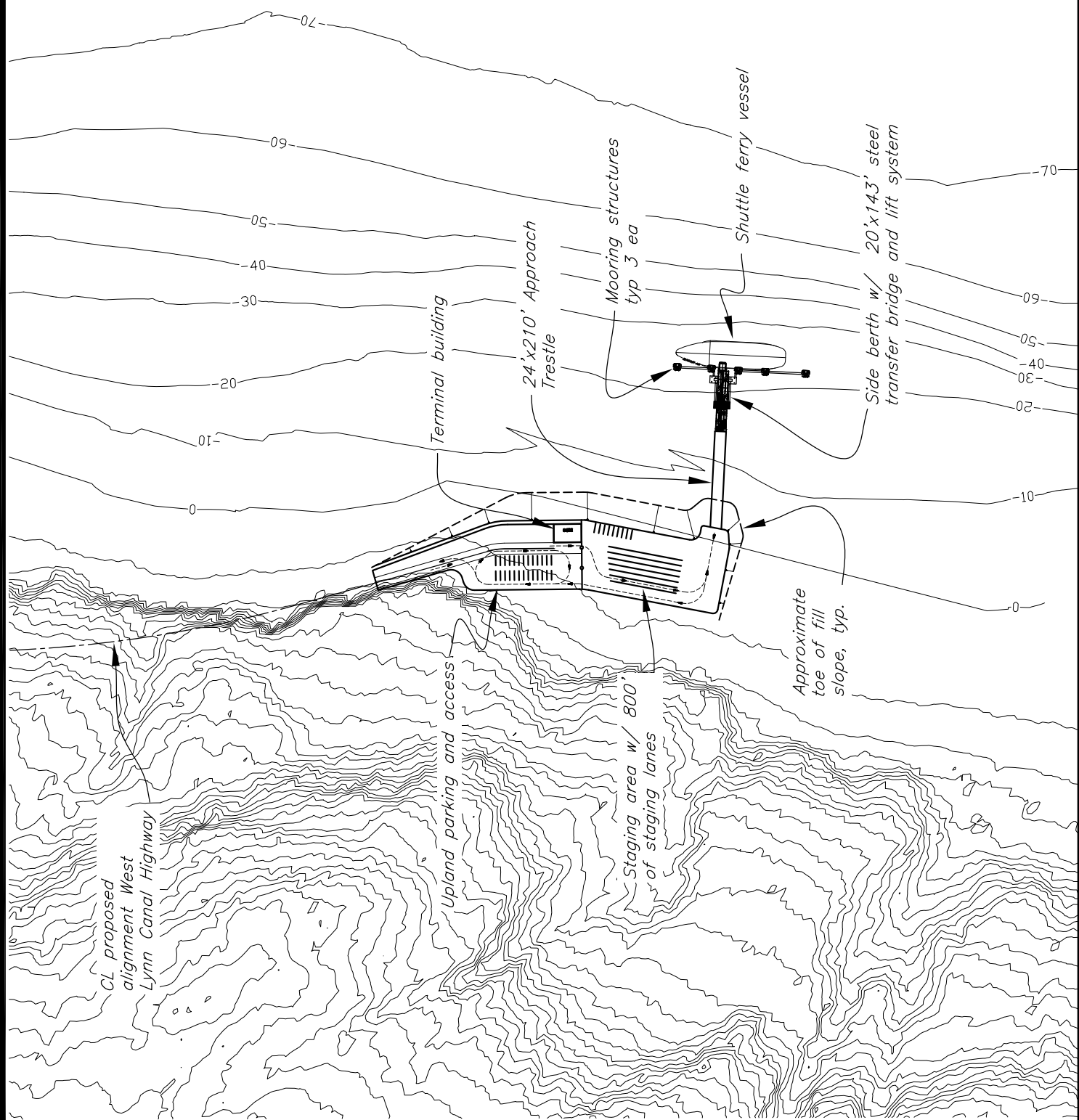
WILLIAM HENRY BAY

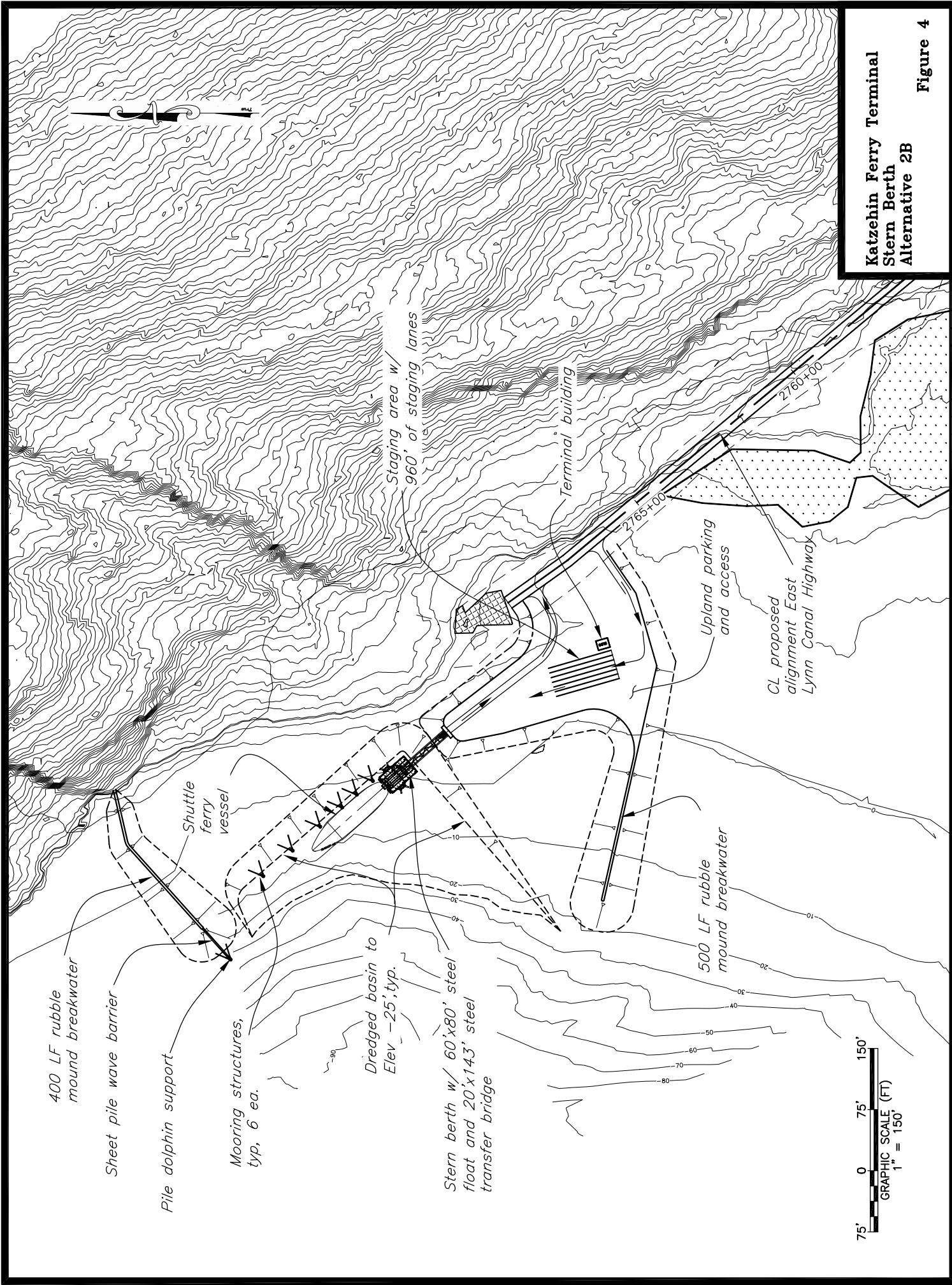


**William Henry Bay
Side Berth
Alternative 3**

Figure 3

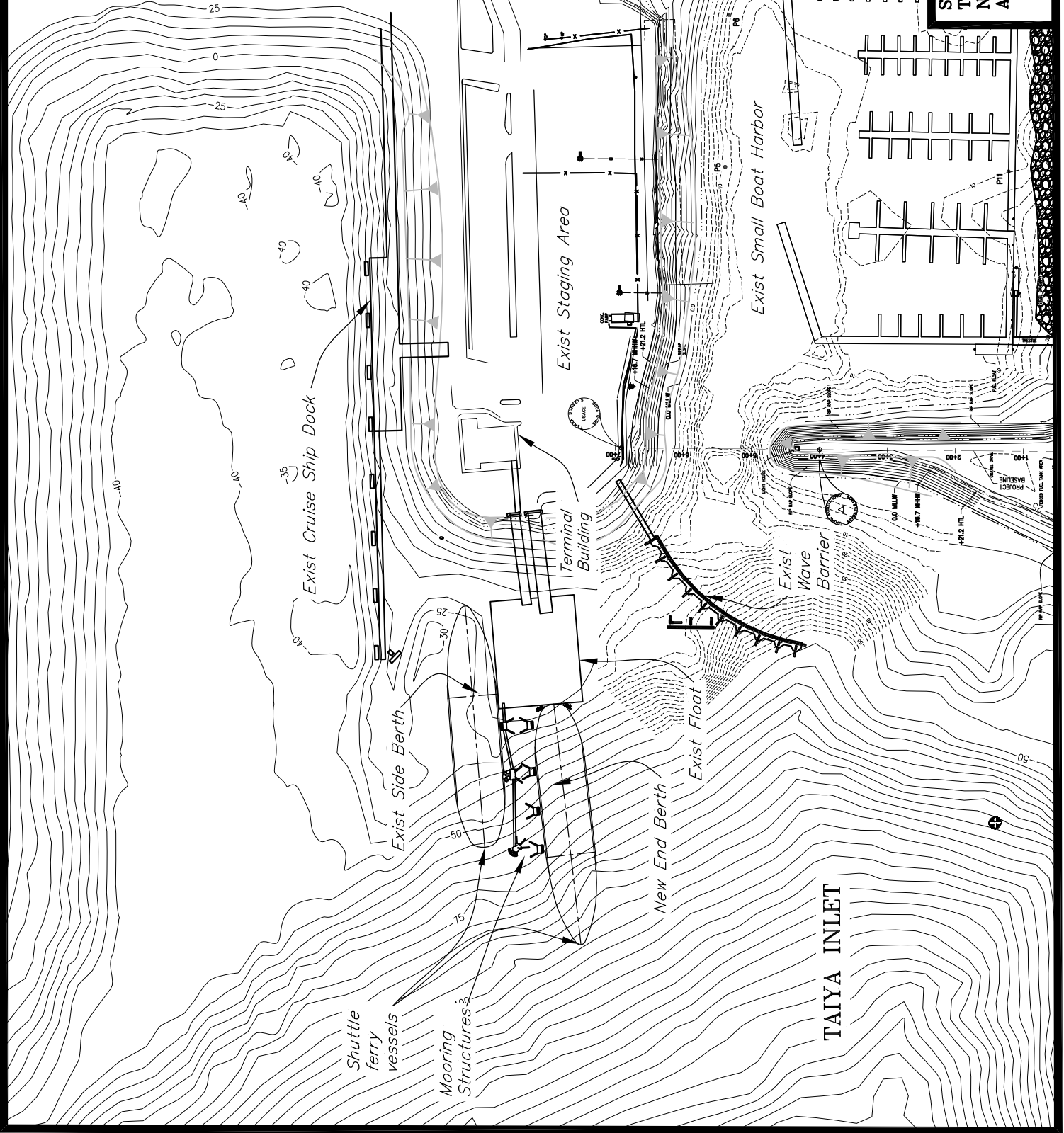
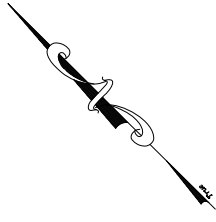
G:\jha\1100\WF\Plan_S&L_Revisions_2012\William Henry Bay.dwg





Katzehin Ferry Terminal Stern Berth Alternative 2B

Figure 4



**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	General					
	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	Marine Facilities					
	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) 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) Steel Piles / Prestressed Concrete Deck	SF	\$300	2,000	\$600,000	
	Sanitary Sewer Pumpout Piping	LF	\$75	600	\$45,000	
	Potable Water Supply Piping (Heat Trace, Arctic Pipe)	LF	\$100	600	\$60,000	
	Fuel Supply Piping (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	Upland Improvements (West Staging Area)				
		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	General				
	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	Dredged Mooring Basin				
	Dredged Mooring Basin (Includes placement as upland fill or disposal)	CY	\$30.00	16,000	\$480,000
3	Marine Facilities				
	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) (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	Upland Improvements (Access/Staging Area)				
	Embankment (Local Excavation)	CY	\$15.00	68,000	\$1,020,000
	Riprap Slope Protection	CY	\$65	5,500	\$357,500
	12" Aggregate Surface Course (Approx 135,000sf)	CY	\$20.00	5,000	\$100,000
	Asphalt Concrete Surfacing (2" thick) (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	Building Structures				
	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	General				
	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	Marine Facilities				
	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	Upland Improvements (Access/Staging Area)				
	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 (Approx 96,500 sf)	CY	\$20.00	3,600	\$72,000
	Asphalt Concrete Surfacing (2" thick) (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	Building Structures				
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	General				
	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	Mooring Basin & Breakwaters				
	Dredged Mooring Basin (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	Marine Facilities				
	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 (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	Upland Improvements (Access/Staging Area)				
	Import Embankment - Borrow (Classified Materials)	CY	\$12.00	50,000	\$600,000
	Riprap Slope Protection (NIC Breakwaters)	CY	\$65	6,000	\$390,000
	12" Aggregate Surface Course (Approx 103,000 sf)	CY	\$20.00	4,000	\$80,000
	Asphalt Concrete Surfacing (2" thick) (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	Building Structures				
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)**

Item No.	Item	Units	Unit Price	Quantity	Amount
1	General				
	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
2	Marine Facilities				
	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
		PROJECT TOTAL			619,450,485.55

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
				PROJECT TOTAL		487,328,677.71

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
					<u>11,641,754.44</u>
				Construction Engineering	698,505.27
					<u>12,340,259.71</u>
				ICAP	573,822.08
					<u>12,914,081.78</u>
				Construction Contingency	582,087.72
				Mitigation	250,000.00
				Glacier Highway Extension Credit	(3,874,000.00)
				Preliminary Development	300,000.00
				PROJECT TOTAL	<u>10,172,169.51</u>