APPENDIX D

TECHNICAL ALIGNMENT REPORT

JUNEAU ACCESS IMPROVEMENTS
SUPPLEMENTAL DRAFT
ENVIRONMENTAL IMPACT STATEMENT

STATE PROJECT NUMBER: 71100
FEDERAL PROJECT NUMBER: STP-000S (131)

Prepared by

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6860 Glacier Highway
Juneau, Alaska 99801-7999

SEPTEMBER 2004

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1.0 PROJECT DESCRIPTION

1.1 Purpose of the Technical Alignment Report

The purpose of this report is to provide readers of the Juneau Access Improvements Supplemental Draft Environmental Impact Statement (SDEIS) with technical information on the East and West Lynn Canal Highway alignments for alternatives being evaluated.

This Technical Alignment Report discusses the highway design and presents the preliminary design plans. Included in this report are discussions of the highway alignments, stormwater drainage, right-of-way and maintenance requirements of the routes. Plans are included to illustrate the topographic features along the routes. References and other information are presented to help readers identify points along the routes and coordinate other reports with roadway features.

1.2 Project Location

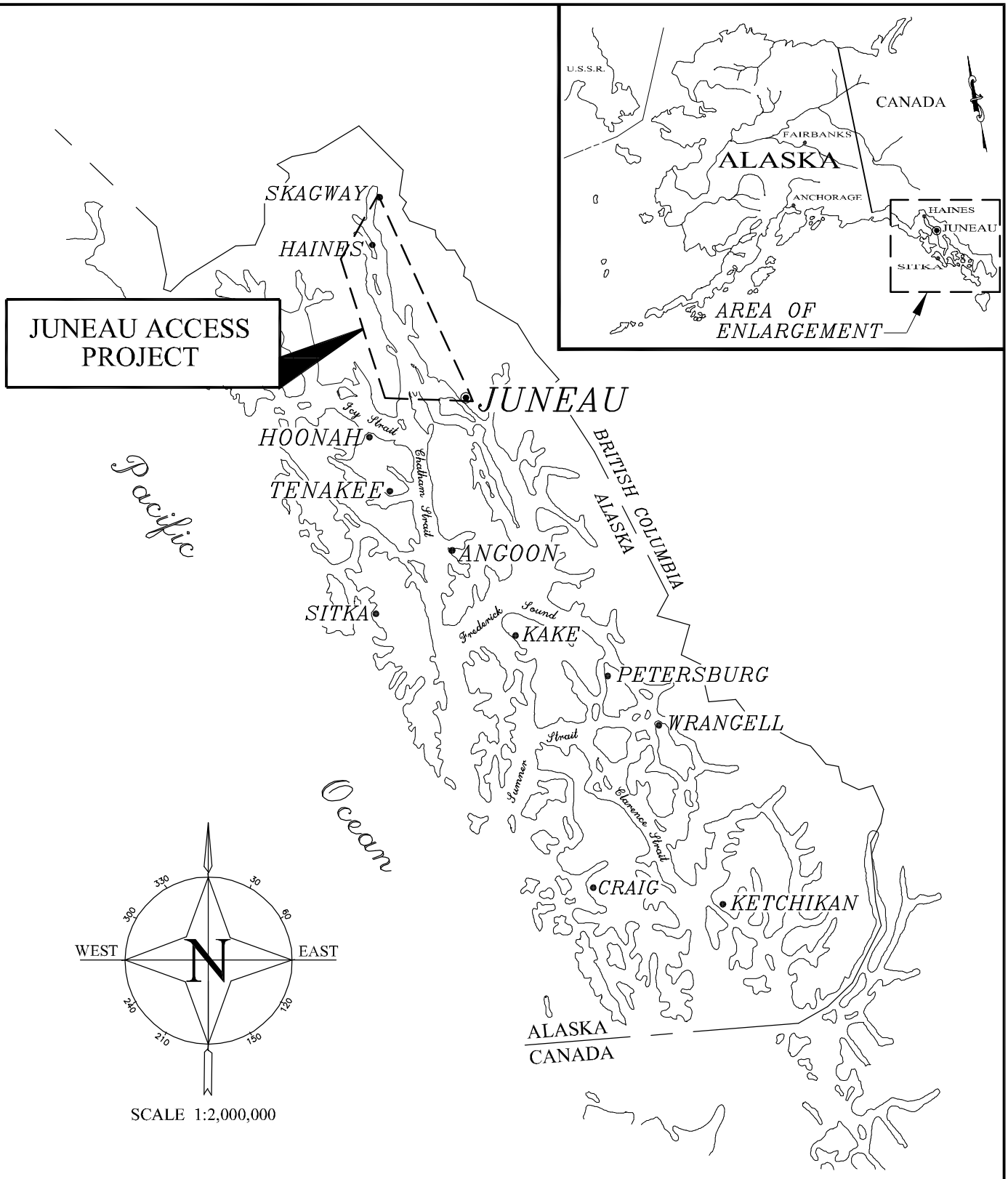
The project is located along the shores of Lynn Canal. Lynn Canal is located in the northern portion of the Southeast Alaska panhandle.

The East Lynn Canal Highway alignment would follow the east shore of Lynn Canal and would connect the end of the Juneau road system at 40.5-mile Glacier Highway, with the City of Skagway road system and the Klondike Highway. The Klondike Highway runs 110 miles to the north to Whitehorse, Yukon Territory. The Klondike Highway is a primary gateway to the continental highway system.

The West Lynn Canal Highway alignment would also begin at 40.5 mile of Glacier Highway. It would extend Glacier Highway 4.5 miles to Sawmill Cove. Traffic would then embark on a shuttle ferry to a new ferry terminal in William Henry Bay. From William Henry Bay, the highway would follow the west side of Lynn Canal on into the Chilkat Inlet, and across the mouth of the Chilkat River to a connection with Mud Bay Road in Haines. The continental highway system and interior Alaska could then be accessed by way of the existing Haines Highway, or by taking a shuttle ferry from the existing ferry terminal in Lutak Inlet to the existing ferry terminal in Skagway.

Figure 1-1 depicts the location within the state and southeast region.

Figure 1-2 depicts Lynn Canal with Alternatives 2 and 3.



STATE OF ALASKA DEPARTMENT OF TRANSPORTATION & PUBLIC FACILITIES S.E. REGION	*JUNEAU ACCESS IMPROVEMENTS* *PROJECT NO.: 71100* *VICINITY MAP*	*FIGURE* 1-1

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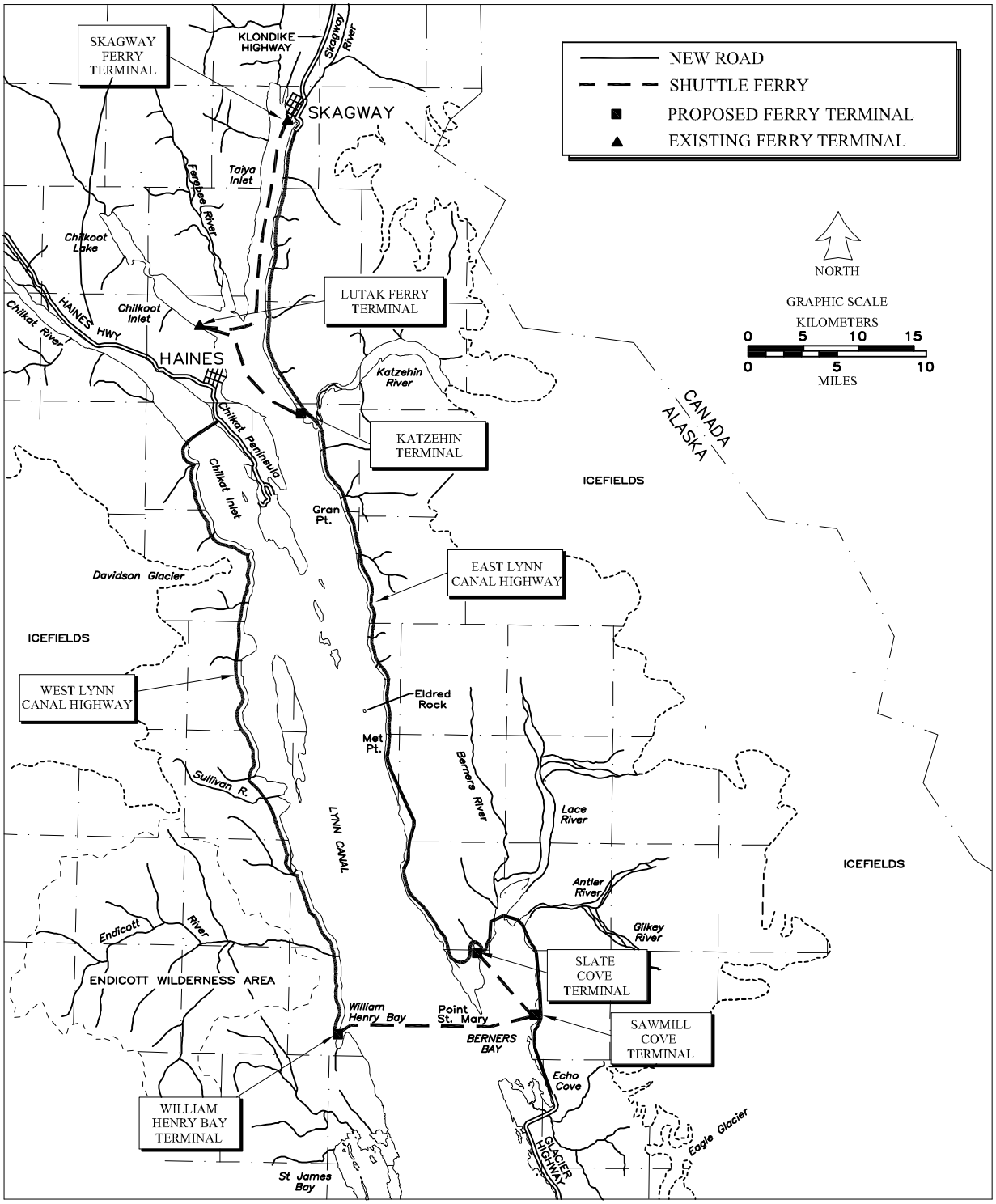

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JUNEAU ACCESS IMPROVEMENTS
PROJECT NO.: 71100
EAST & WEST LYNN CANAL HIGHWAY ALTERNATIVES

FIGURE
1-2

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2.0 DESIGN STANDARDS

2.1 Highway Design Criteria

Factors considered in the selection of the design criteria include the functional classification, design vehicle, design speed and terrain classification of each alternative. The following values have been established for Juneau Access under the guidelines presented in the 2001 AASHTO publication "A Policy on Geometric Design of Highways and Streets".

Functional Classification	Rural Arterial
Design Vehicle	WB-50*
Design Speed	40 MPH
Terrain	Mountainous

*Larger tractor- semitrailer combination

While portions of the routes have rolling features, the overall abruptness of the terrain and the need to make bench cuts to obtain acceptable geometries, led to the selection of the mountainous terrain classification. The project design criteria is shown as minimum/maximum criteria below. This criteria is based on the 2001 AASHTO and the Alaska DOT&PF Preconstruction Manual. Values that provide a flatter or smoother roadway would be utilized when terrain features allow.

Table 2-1

Roadway Design Criteria

Criteria Descriptions	**Design Criteria**
Stopping Sight Distance – ft.	305
Passing Sight Distance – ft.	1470
Minimum Allowable Radius of Horizontal Curve – ft.	535
Maximum Allowable Grade	10%
Minimum Allowable Grade	0%
Maximum Superelevation Rate	6%
**Minimum K-value for Vertical Curves: Sag – ft.	64
Crest – ft.	44
Width of Traveled Way – ft.	11
Width of Shoulder- ft.	4
**K = Rate of Vertical Curvature	

2.2 Design Exceptions

The following design exceptions to the standards have been utilized in the preliminary design of the roadway. These are based on 40 mph design speed and average daily traffic in excess of 400 ADT. All design exceptions that remain through the final design would be described in the *Design Study Report* that would be prepared as each project segment is designed. The exceptions to standards consist of:

Criteria Description	AK State NHS Standard	AASHTO Standard	Juneau Access Project
Lane Width	12ft.	11 ft.	11 ft.
Width of Shoulder	6ft.	6 ft.	4 ft.

Constructing full clear zone recovery areas may be difficult. When feasible, waste and excess excavation will be used to flatten slopes adjacent to the traveled way and provide a recoverable clear zone. Guardrail would be utilized when cost effective. Design exceptions would be considered for specific areas if installation of guardrail is not cost effective.

3.0 RECOMMENDED DESIGN

3.1 Typical Sections

The proposed typical section for the project is shown in Figure 3-1. Also shown are typical sections that would be used in natural seep areas, rock fall ditch areas, guardrail areas, floodplain areas and in areas where bank protection is needed. Additional typical details would be generated during final project development, as conditions require. Typical sections for a combination roadway and retaining wall structure on moderate and steep cross slope areas are also provided.

Clear zone recovery areas would be constructed to the extent feasible. However, in mountainous terrain, protected guardrail sections would generally be required in steep side slope areas. Through cuts will be designed in cases where sliver fills will not catch the natural ground surface. Construction of both alignments would produce more excavation material than embankment requirements. Consequently, wasting of excess excavation material and construction debris on the embankment slopes is anticipated. This is shown on the typical section in Figure 3-1.

Identifying and mitigating rockslides and rockfall hazard areas will be an important part of the final design process (Ralph Swedel, C.P.G., Regional Geologist, Memo: Juneau Access Improvements, Rockslide Hazards). A detailed field investigation will be required to identify areas that will require rockslide/rockfall mitigation. Mitigation will vary from simply modifying the rockfall ditch dimensions to slope stabilization measures.

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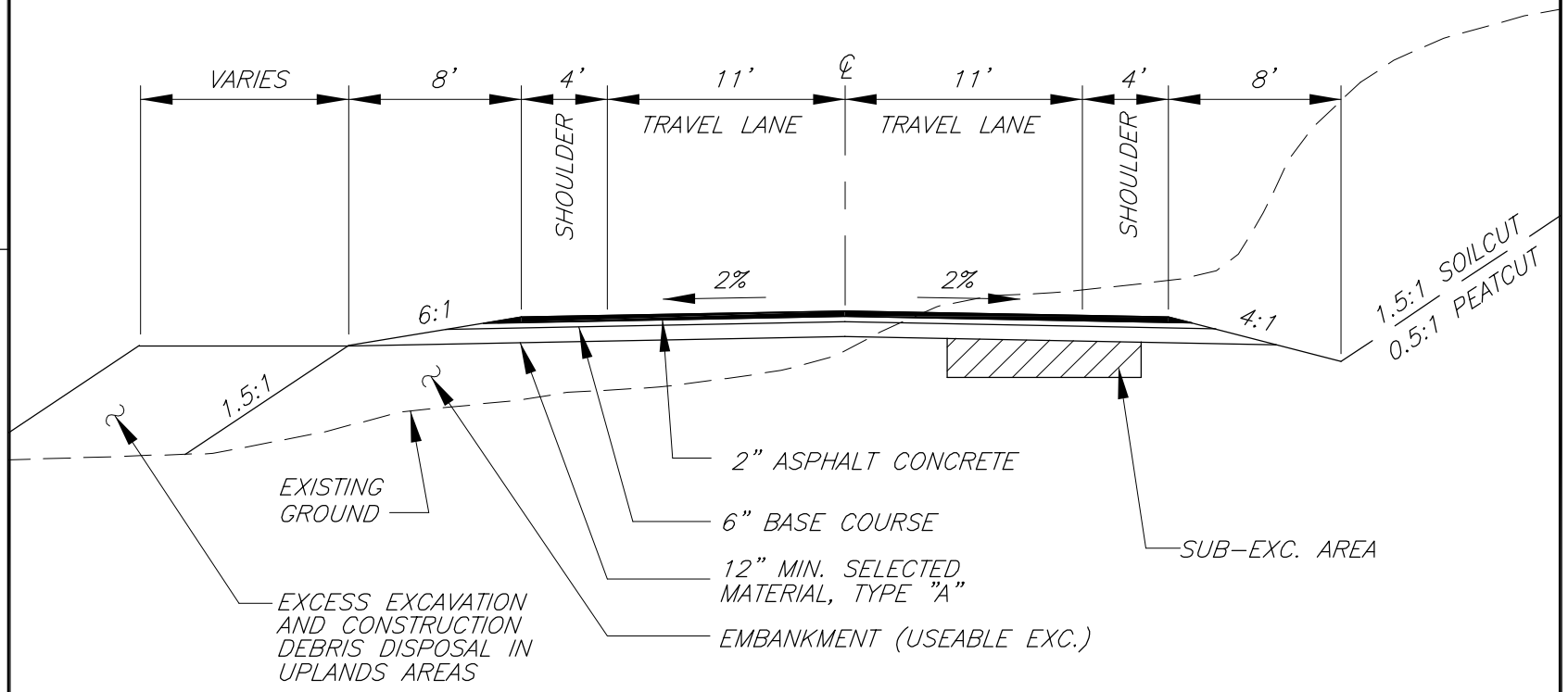
JUNEAU ACCESS IMPROVEMENTS

PROJECT NO.: 71100

TYPICAL ROADWAY SECTION

FIGURE
3-1



TYPICAL ROADWAY SECTION

CUT AND FILL TYPICAL BOTH SIDES OF ROADWAY

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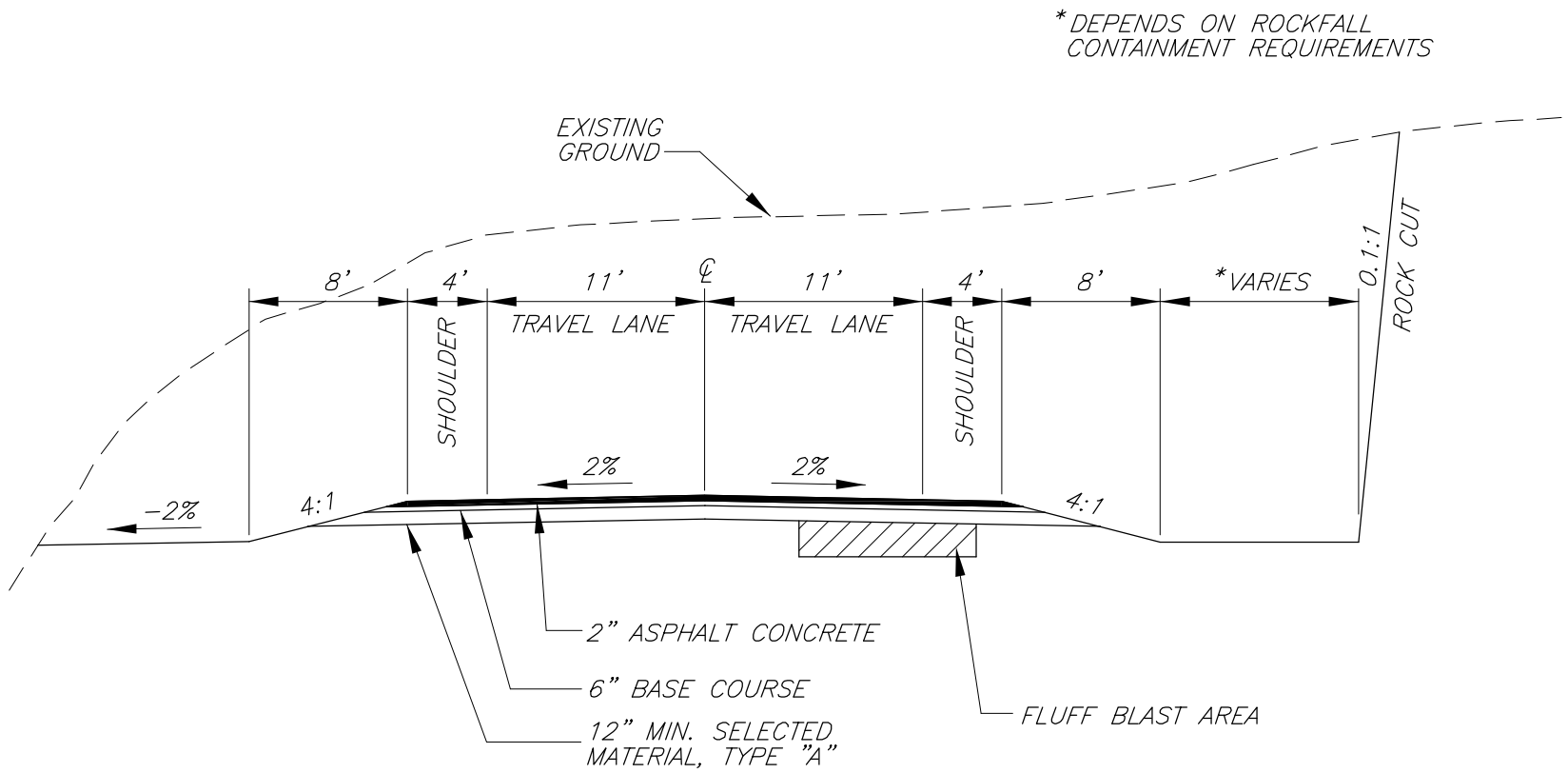
TYPICAL SECTION IN ROCK CUTS

FIGURE
3-2



TYPICAL SECTION IN ROCK CUTS

TYPICAL BOTH SIDES OF ROADWAY

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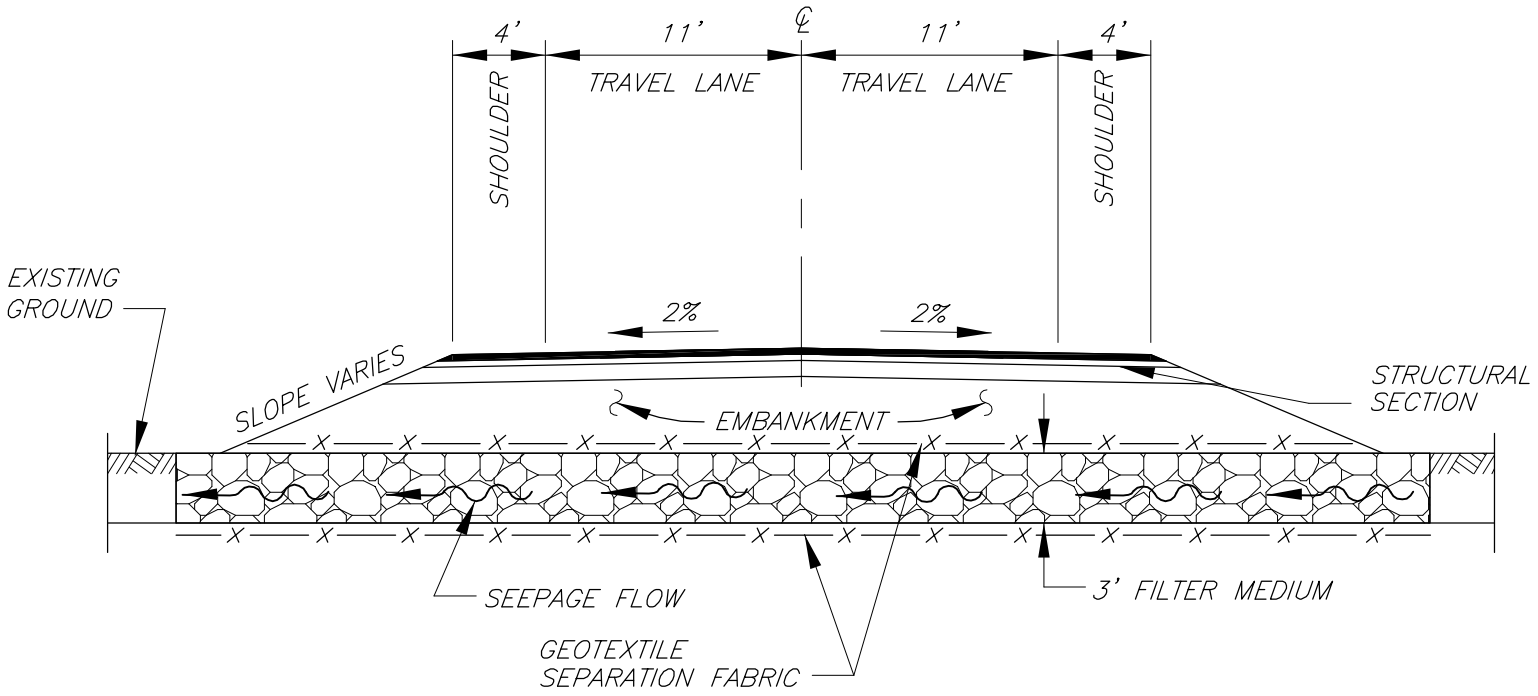
JUNEAU ACCESS IMPROVEMENTS
PROJECT NO.: 71100
TYPICAL ROADWAY SECTION
THROUGH SEEP AREAS

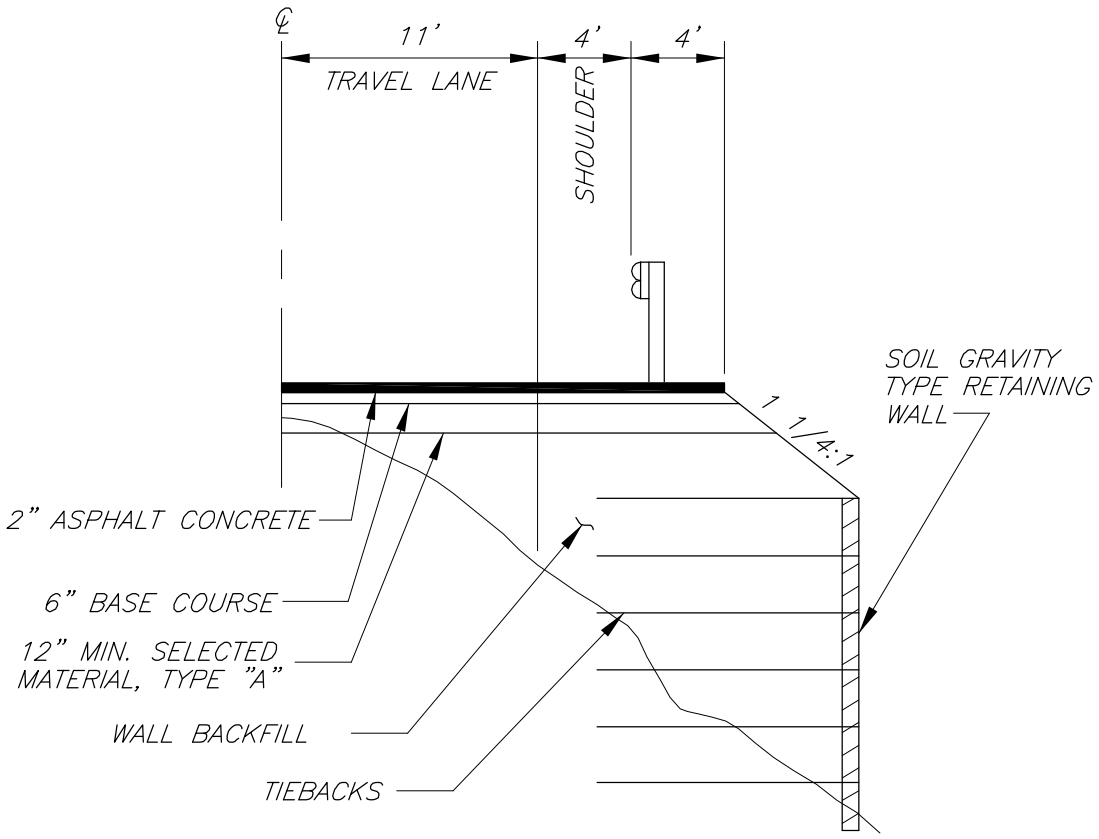
FIGURE
3-3



TYPICAL ROADWAY SECTION THROUGH SEEP AREAS

NOTES:

1. ALL TREES BRUSH AND ORGANIC DEBRIS SHALL BE REMOVED.
2. CLEAN SHOT ROCK, (SCREENED TO A UNIFORM SIZE) SHALL BE USED FOR FILTER MEDIUM.



TYPICAL RETAINING WALL SECTION

WITH RETAINING WALL MODERATE TO STEEP CROSS SLOPE AREA

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

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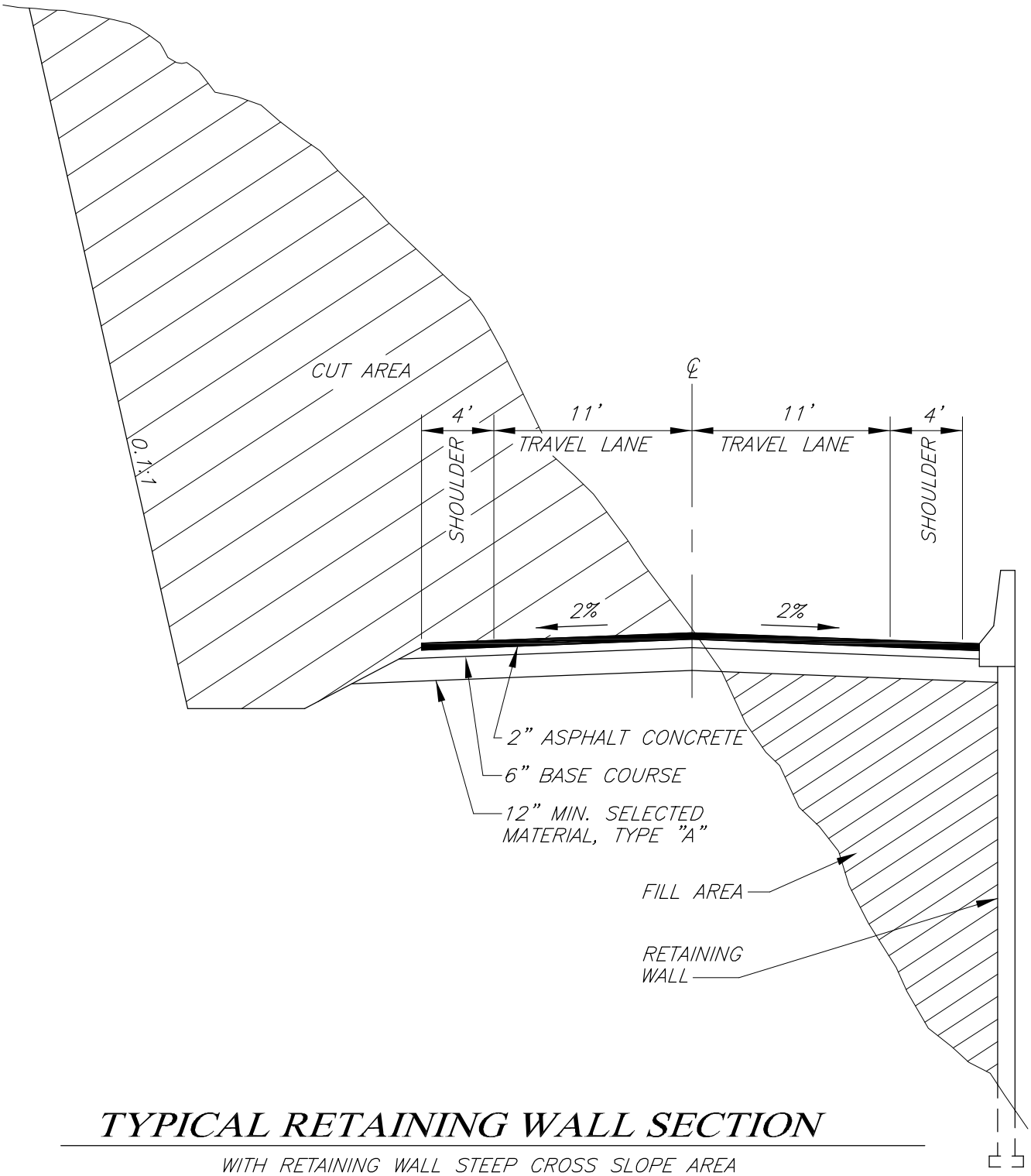

TYPICAL RETAINING WALL SECTION

WITH RETAINING WALL STEEP CROSS SLOPE AREA

STATE OF ALASKA DEPARTMENT OF TRANSPORTATION & PUBLIC FACILITIES S.E. REGION	*JUNEAU ACCESS IMPROVEMENTS* *PROJECT NO.: 71100* *TYPICAL RETAINING WALL SECTION*	*FIGURE* 3-5

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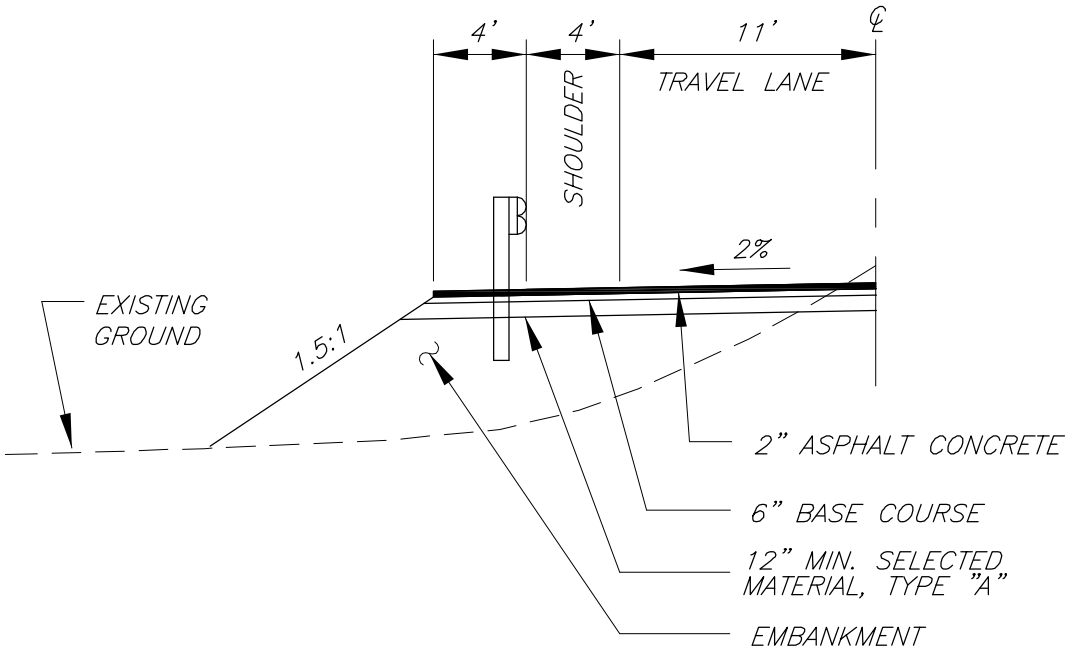

GUARDRAIL TYPICAL

STATE OF ALASKA DEPARTMENT OF TRANSPORTATION & PUBLIC FACILITIES S.E. REGION	*JUNEAU ACCESS IMPROVEMENTS* *PROJECT NO.: 71100* *GUARDRAIL TYPICAL SECTION*	*FIGURE* 3-6

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3.2 Alignment Discussion Overview

The alignments will be discussed separately so that the features unique to the individual alignments can be noted. The discussions will be broken into segments, which were determined by the character of the terrain within the segment. In each segment, the terrain and features that determined the alignment location are described and the type of construction that would be required is identified.

The East Lynn Canal Alternatives 2, 2A, 2B and 2C, West Lynn Canal Alternative 3 and Marine Alternatives 4B and 4D are on the same alignment up to Sawmill Cove. See Figure 1-2. At this point, Alternatives 2A, 3, 4B and 4D ramp down the hillside and terminate at the Sawmill Cove ferry terminal. For the sake of brevity, the alignment and terrain on this overlapping portion of the alignments will only be described in the East Lynn Canal discussion.

Plan and Profile sheets for the East Lynn Canal alternatives are in Attachment A.

West Lynn Canal Plan and Profile sheets covering the alignment from the William Henry Bay ferry terminal to Mud Bay Road are in Attachment B.

Ferry terminal concepts and costs for the various alternatives are presented in Attachment D.

Highway cost estimates for the various alternatives and the excavation and embankment summary for the Alternative 2 and 2C alignment are presented in Attachment E.

3.2.1 East Lynn Canal Discussion

Station 73+14 (MP 40.5) to Station 602+00 (MP 50.5) - Echo Cove to Berners Bay Crossing

This 10.0-mile segment begins at the end of the existing Glacier Highway just north of the Echo Cove boat launch access at milepost 40.5.

The proposed alignment proceeds north, generally following wide benches in the terrain. The portion of the segment up to Station 450+00 has terrain that varies from level to rolling, and is mostly covered with heavy timber. The alignment along this segment is positioned away from the beach to avoid impacts to eagle nest trees and to avoid beach fills. The gently sloping terrain results in horizontal and vertical alignments that have shallow curves and grades that are all less than 7 percent.

At Station 301+00, the alternatives that terminate at Sawmill Cove begin their alignment decent down the slope towards the beach and the terminal staging area.

Construction along this segment would consist of relatively shallow fills and minor cuts into organic soils and rock knobs. An exception is between Station 355+00 and Station 370+00, where the vertical alignment was raised to create a 30 foot fill to mitigate potential impacts at the first avalanche path on the project.

Two 110-foot bridges are scheduled for this segment, one at Sawmill Creek, an anadromous fish stream, and another at an unnamed stream at Station 426+10.

From Station 450+00 to Station 602+00, the terrain becomes steeper, where most if not all, the cuts would be in bedrock. The alignment follows natural benches allowing the grades to remain below 7 percent. There are short stretches of cut that would have backslopes approaching 200 foot in height, an indication of the steep cross slope of the terrain.

Eagle nests that are close to the beach between Station 467+00 and Station 485+00 pushed the alignment uphill into the largest cuts of the segment. This alignment also avoids the Forest Service cabin near Station 470+00 by passing approximately 400 feet uphill of the cabin site.

Station 602+00 (MP 50.5) to Station 761+00 (MP 53.5) - Berners Bay Crossing

This 3.0-mile segment consists of an elevated, armored embankment with two major and one minor bridge crossings.

The horizontal alignment around Berners Bay was established to avoid the intertidal habitat at the head of the bay, to minimize impacts on Berners Bay wetlands and to minimize the length of the river crossings. Another criterion was to place the alignment away from the soft soils that are prevalent at river mouths in Southeast Alaska. The location selected would provide for a stable foundation that can resist liquefaction due to earthquakes.

At the beginning of this segment, a 130-foot long bridge would span an anadromous fish stream at Station 602+10. The Antler and Gilkey Rivers and the Berners and Lace Rivers form the large delta at the head of Berners Bay. The bridge over the Antler and Gilkey Rivers would be 2,150 feet in length, while the bridge over the Lace and Berners Rivers would be 2,500 feet in length. Both river systems have anadromous fish.

Embankment for the highway portion of this segment would need to be imported from quarries or where excess rock excavation is present.

Station 761+00 (MP 53.5) to Station 1390+00 (MP 65.4) - Berners Bay Crossing to Independence Lake

This 11.9-mile segment extends from the Lace and Berners River bridge to the beach near Independence Lake. The terrain is heavily wooded uplands to just past Slate Creek where the terrain transitions into moderate timber interspersed with muskegs.

The alignment for the part of this segment up to Slate Creek has the sharpest curves and steepest grades as well as the largest cuts, of the segment. The curve going through the ridge separating Berners Bay from Slate Creek has a 750-foot radius, while the grades leading into and out of this cut are 7 percent and 6.5 percent, respectively.

The remainder of the segment has gradual grades along the natural benches that run from Slate Creek, across Point Saint Mary peninsula and on to the beach at the end of the segment.

Alternative 2A would start across the Point Saint Mary peninsula near Station 927+50. This is the point where the Slate Cove ferry terminal access for Alternative 2A would merge into the alignment defined for Alternatives 2, 2B and 2C.

Construction on this rolling and gently sloping terrain would consist of low cuts and fills. This segment would require borrowed material to be imported from either quarries or other roadway sections where excess rock excavation is present.

The alignment crosses three anadromous fish streams on this segment: Slate Creek, Sweeny Creek and Sherman Creek, with bridge lengths of 270 feet, 180 feet and 250 feet, respectively.

Station 1390+00 (MP 65.4) to Station 1503+00 (MP 67.6) – Independence Lake North

This 2.1-mile segment closely follows the beach line on an elevated fill with minor uphill cuts at various points. The alignment follows the beach line to avoid eagle nest trees on the hillsides and to mitigate the avalanche zone within the segment limits.

The horizontal alignment has long tangents and gradual curves, while the vertical alignment has long, relatively flat stretches with minor grades of less than 2 percent. Where the alignment drops down onto the beach to avoid eagle tress and avalanche zones, riprap slopes would be constructed to protect the roadway from wave action.

The avalanche zone between Station 1465+00 and Station 1485+00 was mitigated by shifting the alignment out onto the beach and by elevating the roadway. This would distance the alignment from potential slides and create an impoundment area for snow and other avalanche debris. The avalanche zone may be further mitigated by creating borrow pits in the runout area of avalanche zone and constructing training dikes.

The stream flowing out of Independence Lake is an identified anadromous fish stream and would be crossed with a 90-foot long bridge.

Station 1503+00 (MP 67.6) to Station 1640+00 (MP 70.2) – Met Point South

Steep, rocky terrain, numerous eagle nest trees and avalanche chutes, and the Met Point sea lion haulout area characterize this 2.6-mile segment.

The horizontal alignment generally follows the contours on well-defined benches with relatively few through cuts. The alignment is curvilinear, but the curves are gradual with generous tangents in between.

The vertical alignment is rolling, but not excessively so. The need to avoid impacts to the Met Point sea lion haulout and eagle nest trees resulted in two grades over 7 percent. Both are short in duration.

Construction would generally involve bench cuts into the rock slopes with some downhill fills. Some benches are narrow, forcing the alignment into rock cuts up to 100 feet in height. In some of the steeper areas, partial bench cuts with downhill retaining walls would be needed. Through the Met Point sea lion haulout area, the alignment is shifted uphill as far as possible and the grade is dropped to induce a through-cut situation in order to provide a screen between the haulout and the roadway. Where this is not possible, screening structures would be constructed.

At Station 1555+00, the alignment moves onto the beach below the steep terrain and eagle nest located at Station 1560+00. The fill at this point would be armored with riprap.

There are three avalanche zones on this segment. All are minor in nature and are mitigated by moving the alignment close to the beach on fills or in minor daylighted cuts.

The alignment crosses an unnamed stream with a 100-foot long bridge at Station 1546+00.

Station 1640+00 (MP 70.6) to Station 2150+00 (MP 79.8) – Met Point North to Level Point

This 9.7-mile segment remains on or very close to the beach to avoid impacts to several uphill eagle nests. The exceptions are at Stations 1750+00, 1773+00, 1795+00 and between Stations 1980+00 and 2020+00, where the alignment moves uphill to get around other eagle nest trees located closer to the water. This low alignment also provides mitigation for most of the twenty-two avalanche zones on the segment.

This beach alignment results in a very gradual vertical alignment over most of the segment. The profile starts to roll only in the areas where the alignment had to move uphill to get around eagle nest trees. This creates steeper grades, though none exceed 7 percent.

Construction would vary from fill construction on the beach with flattened slopes against the beach cliffs, to partial bench cuts with fills to the beach, to full benches and through cuts. Fill slopes that catch on the beach would be protected with riprap. Where fills would otherwise end up falling into deep water, retaining walls or reinforced earth walls would be constructed. All cuts would be in rock with appropriately designed ditches to contain rockfall. Some cuts, such as those near Station 1720+00, would reach 160 feet in height.

Two of the twenty-two avalanche zones in this segment, at Stations 2100+35 and 2087+40, would require special mitigation measures. The low alignment on an elevated fill and cuts with daylighted slopes provide partial mitigation.

The alignment crosses unnamed streams with a 70-foot long bridge at Station 1767+80 and an 80-foot long bridge at Station 2025+80.

Station 2150+00 (MP 79.8) to Station 2590+00 (MP 88.2)– Level Point to Katzehin River

The terrain on this 8.3-mile segment is more abrupt that on previous segments. Steep rock slopes run from the shoreline to the base of near vertical cliffs in many locations. Beach benches are mostly nonexistent forcing the alignment into benched sidehill cuts.

The alignment has many curves as it was positioned to get around abrupt terrain features while trying to minimize impacts to the many eagle nest trees on this segment, as well as the Gran Point sea lion haulout. Considering the terrain, the vertical alignment, while rolling, remains below the 8 percent maximum grade.

The first 2,000 feet of the segment is on a bench above shoreline cliffs and at the base of steep rock slopes. The grade is very gradual considering the type of terrain present. This gradual

grade extends through the next portion of this segment which runs past USGS Triangulation Point PAT 2 and on to Station 2210+00, where the terrain becomes steeper.

From this 2100+00, eagle nests, avalanche zones and the sea lion haulout at Gran Point are factors in the positioning of the alignment. The line shifts required to avoid these constraints create a situation where the roadway elevation varies from a low of 50 feet at the end of the segment to a high of 210 feet near Gran Point. This area generates the highest excavation volumes of the segments south of the Katzehin River.

At Gran Point, the alignment is shifted uphill to increase the distance between the haulout and the roadway. Where possible, the profile was lowered into a through cut situation to create screening from the haulout. Where the screening is inadequate or the profile moves into a fill/retaining wall condition, screening walls would be constructed.

There are thirteen avalanche zones along this segment. To mitigate the zones at Station 2269+82 and Station 2278+70, the alignment was moved close to the beach. The zones at Station 2306+20 and Station 2323+07 are in deep, well defined chutes and would be spanned by 120-foot bridges. The remaining zones are low frequency, requiring only normal treatments such as elevated fill and/or daylighted downhill cut slopes.

There would be four other bridges on this segment. Yeldagalga Creek would be spanned by a 60-foot structure, while the unnamed drainages at Stations 2403+40, 2443+00 and 2565+10 would be spanned by structures of 120 feet, 200 feet and 160 feet, respectively.

Station 2590+00 (MP 88.2) to Station 2754+00 (MP 91.3) – South Katzehin River to Katzehin Point

This 3.1-mile segment is comprised of the approach to the Katzehin River crossing, the crossing itself and the embankment construction across the river delta flats. The alignment consists of long tangents, gradual curves and an essentially flat grade.

Construction would consist primarily of elevated embankment fills with rock cut ditches on the uphill side of the roadway for brief stretches. Where the fills reach the beach, as at the beginning and end of the segment, riprap slope protection would be placed to protect the embankment from wave action. The preliminary bridge length of the multiple span Katzehin River bridge is 2,300 feet.

The alignment stays below the eagle nest trees on the segment. The segment ends in the paths of two low hazard avalanche zones. The elevated fill section at these points would provide the recommended hazard reduction.

Under alternative 2B, the alignment would terminate at the Katzehin Ferry terminal staging area at Station 2743+75. Alternatives 2 and 2A would require construction of the Katzehin ferry terminal for access to Haines.

Station 2754+00 (MP 91.3) to Station 3505+00 (MP 105.5) - Katzehin Point to Sturgill's Landing

The east side of Taiya Inlet is dominated by steep rock slopes projecting into very deep water. The highway on this 14.2-mile segment would be benched into these slopes for its entire length.

While the slopes are steep, they are evenly graded. The alignment was adjusted uphill or downhill to avoid the many eagle nest trees along the segment. The even grading of the slopes allowed this to be accomplished without adversely affecting the quality of horizontal alignment that has relatively long tangents and gradual curves. The even graded slopes also allowed the alignment to be positioned in the most desirable elevation to mitigate the twenty-seven avalanche zones on the segment. This even grading of the slopes also allowed for a very desirable vertical alignment that is rolling, but only has five grades that fall between 7 and 8 percent.

Benching and rockfall ditches would result in the highest volume of excavation on the project. A side benefit of the rockfall ditches is that they would provide snow storage areas for winter maintenance operations. Several back slopes would be 50 to 60 feet in height, with a few extending above 160 feet for short distances. During design these areas would be evaluated to determine if short tunnels or tubes would be more cost effective than excavation.

All of the avalanche chutes would be mitigated by the rockfall ditches and by daylighting the downhill cuts. This would minimize the packing of snowslide materials and provide for easier snow removal. The alignment moves uphill in the vicinity of the talus slope south of Sturgills Creek, with widened ditches and flattened slopes to provide a stable embankment and reduce slide hazard.

There would be six bridges on this segment. The unnamed drainages at Stations 3025+00, 3050+35, 3157+00, 3287+95 and 3305+10 would be spanned by bridges 260 feet, 130 feet, 120 feet, 120 feet and 200 feet, respectively. Kasidaya Creek is the final major drainage on the segment that requires a bridge. It would be spanned by a 240-foot long structure.

Station 3505+00 (MP 105.5) to Station E.O.P. (MP 109.1) – Sturgill's Landing to Skagway

Before Sturgill's Landing, the alignment for this 3.6-mile segment turns inland and begins a 7.2 percent climb in a bench cut in rock along the base of the mountain and just above the Lower Dewey Lake drainage system at Sturgill's Creek. Cuts up to 70 feet in height would be encountered along this section.

At Station 3530+00, the alignment crosses the drainage on a 150-foot bridge and enters onto the ridge that runs above the Lower Dewey Lake bench. The alignment along this section was set to minimize impacts to the trail system and lakeside areas.

Construction along the brush and timber covered ridge would consist of alternating fills and through cuts in rock knobs, the largest of which extends from Station 3608+00 to Station 3622+00.

At the east end of the plateau, the alignment drops below the west end of the lake, crosses a 300 foot long bridge over the flume, tramline and trail, then begins a 7.7 percent decent into Skagway. The roadway would be benched into the slope coming off the ridge. Some of the cut backslopes would reach 100 feet in height. During final design, efforts would be made to reduce the height of the backslopes and to limit views of the roadway from town. Where needed to limit downhill fills, retaining walls or reinforced earth walls would be constructed. At Station 3684+00, the alignment

crosses a 400 foot bridge spanning the Whitepass/Yukon Railroad track and then ties into a retaining wall supported approach that descends to match 23rd Ave. at Main Street. Signage and minor street reconfiguration would be used to direct traffic into and out of Skagway.

Two additional structures would be installed to maintain the continuity of the trail system. The first is a pedestrian tunnel under the roadway at Station 3555+50. The other is a pedestrian bridge over the through cut at Station 3609+50.

Note: The 1997 Draft EIS alignment into Skagway crossed Sturgill's Creek, traversed the shore above the high-tide line, and then crossed the White Pass dock. The exact connection with the Skagway street system was not established.

The owners of the White Pass dock have expanded operations and are no longer interested in joint use. During 2003 fieldwork, additional historic resources in the area were documented. The high cost of replacing the dock and reconfiguring the railroad tracks, combined with potential impacts to historic resources, downtown Skagway traffic, planned City of Skagway harbor improvements, and contained sites, led to a new alignment through the lower Dewey Lake area.

Tunnels which would bypass the dock and avoid the need to reconfigure the railroad were also investigated (Lachel & Associates, Inc., Juneau Access Study, Skagway Tunnels Engineering Recommendations and Geotechnical Design Basis, October 8, 2003). The up to $49 million capital costs and up to $2 million annual maintenance costs contributed to the decision to pursue the Lower Dewey Lake alignment.

3.2.2 West Lynn Canal Discussion

Milepost 40.5 to Sawmill Creek are discussed under section 3.2.1.

Station 4025+00 (MP 1.1) to Station 4293+00 (MP 6.2) – William Henry Bay to Endicott River Crossing

The alignment on this 5.1-mile segment ramps up from the proposed William Henry Bay ferry terminal onto a wide bench which is followed over most of the segment. This puts the alignment uphill from most of the eagle nest trees along the segment. The bench is heavily timbered over its entire length.

In general, the bench is wide enough to contain the alignment shifts necessitated by the eagle nest trees and geological features of importance (caves, sinkholes, etc.) found within the segment. At several points, though, the terrain steepens and shifts towards the beach, forcing the alignment into large cuts. These cuts are of short duration and lead back onto the system of benches.

Four bridges would be required on this segment. The first bridge would be a 228-foot structure over William Henry Creek. The unnamed creeks at Station 4146+17 and Station 4165+00 would require bridges of 136 feet and 100 feet, respectively. The longest bridge of the segment would be a 240-foot structure over the unnamed creek at Station 4213+00. Both William Henry Creek and the unnamed creek at Station 4146+17 are anadromous fish streams.

There are two avalanche zones on the segment, but neither would have an impact on the roadway.

Station 4293+00 (MP 6.2) to Station 4346+00 (MP 7.2) – Endicott River Crossing

This 1.0-mile segment begins with the alignment descending off the bench and onto the 1,100-foot long bridge that would cross the Endicott River, an anadromous fish stream. The remainder of this segment would consist of an elevated fill constructed on the brush-covered gravels that form the Endicott River alluvial fan.

Station 4346+00 (MP 7.2) to Station 4757+00 (MP 14.9) –Endicott River Crossing to the Sullivan River Crossing

Wide timber covered benches are frequent along this 7.8-mile long segment, but the numerous eagle nests, important geological features, and stretches of abrupt terrain, limit the placement of the alignment. This feature avoidance results in an alignment that courses back and forth over the benches, sometimes dropping to lower benches or onto the beach fringe. This movement produces a more curvilinear alignment, though still within desirable standards.

The vertical alignment is rolling, but all grades remain below 7 percent.

Five major drainages requiring bridges would be crossed on this segment. The bridge locations and lengths are as follows: Station 4431+40 – 120 feet, Station 4456+90 – 100 feet, Station 4560+50 – 450 feet, Station 4607+00 – 130 feet and Station 4683+07 – 200 feet. (All but the stream at 4456+90 are anadromous fish streams.)

The two avalanche zones on the segment are minor in nature and would have minimal impact on the roadway.

Station 4757+00 (MP 14.9) to Station 4910+00 (MP 17.8) – Sullivan River Crossing

This 2.9-mile segment begins on a wide plateau that extends to Station 4786+00. At this point the alignment drops down onto the Sullivan River floodplain. A 600-foot long bridge over the Sullivan River, an anadromous fish stream, would begin at Station 4800+50 and climb at a gradual 0.7 percent grade to the north bank of the river. From here, the grade steepens to 6 percent to get onto the gradually sloping terrain that extends to Station 4874+00.

For the final length of the segment, the alignment drops down to the beach fringe. Here it skirts along the base of the beach cliffs, crosses a 154-foot long bridge over an anadromous fish stream at Station 4883+30, and proceeds on a flat grade built on an elevated fill on to the end of the segment.

Station 4910+00 (MP 17.8) to Station 5107+00 (MP 21.6) – Sullivan River Crossing North

The alignment on this 3.7-mile segment begins by climbing from the beach fringe to an elevation of nearly 300 feet to avoid eagle nest trees and to stay above steep cliffs that extend to the beach.

From the high point at Station 4981+00, the alignment begins a moderate decent to get below steep terrain near Station 5020+00 and closer to the beach to mitigate the avalanche zone at Station 5033+95.

The remainder of the alignment is shifted uphill to avoid eagle nest trees and to take advantage of natural benches. The segment terminates at the alluvial fan of an unnamed glacial stream.

A 100-foot long bridge would span the large drainage at Station 5076+00. One additional avalanche zone would be crossed at Station 5078+65. This zone would be mitigated by constructing the roadway on an elevated fill.

Station 5107+00 (MP 21.6) to Station 5412+00 (MP 27.4) – Glacier Point S Base South

The alignment on this 5.8-mile segment shifts between two glacial stream/alluvial fan crossings and their associated bridges and sidehill runs on natural benches with occasional large cuts into steep backslopes.

The alluvial fan crossings would be accomplished on elevated fills through brush and low timber. The portions of the alignment on sidehill benches are in heavy timber and typically have minor uphill cuts with minor downhill fills. The large cuts are in rock and would be constructed with typical flat-bottomed rockfall ditches.
There would be four bridges along this segment. The first would be a 200-foot long structure over the unnamed glacier stream at Station 5143+50. Next, at Station 5188+20, a 125-foot long bridge would span a deep gorge that is the chute for the only avalanche on this segment. A 100-foot long bridge at Station 5232+50 would provide the crossing over an anadromous fish stream. Finally, a 500 foot long, multiple span structure would be needed to cross the glacial river at Station 5287+00.

The alignment on this segment terminates at the USGS marker Glacier Point S Base, which is the start of the Davidson Glacier alluvial fan.

Station 5412+00 (MP 27.4) to Station 5660+00 (MP 32.1) – Davidson Glacier

The alignment on this 4.7-mile long segment would be built on an elevated fill through the brush and timber covering the Davidson Glacier alluvial fan. The relatively flat terrain of the alluvial fan allowed a very smooth and gradual alignment and profile to be developed. However, additional curves were added to the alignment to avoid encroachments into numerous ponds and associated wetlands fringes between Station 5545+00 and the end of the segment.

Three bridges would be required to complete this segment. The first would cross an unnamed stream at Station 5414+50 with a 100-foot long structure. A 400-foot long, multiple span structure would be needed to cross the Glacier River. Likewise, another 400 foot long, multiple span structure would be needed to cross the unnamed outlet of Davidson Glacier Lake, an anadromous fish stream.

There are no avalanche zones along this segment and the eagle nest trees were easily avoided.

Station 5660+00 (MP 32.1) to Station 5970+00 (MP 37.9) – South Chilkat River

On a majority of this 5.9-mile segment, the alignment follows the heavily timbered benches and moderate slopes that are just above the beach cliffs. Construction on these benches would consist primarily of rock cuts of varying magnitude, with some downhill fills. At Anchorage Point, the construction would shift to fills placed on the alluvial fan of a glacial stream.

The alignment on the first four miles of this segment, to Station 5873+00, follows one of the bench systems. The resulting alignment has long tangents and gentle curves on a rolling grade that goes up to, but does not exceed, 7 percent.

Three of the four bridges in this segment would be in this first four miles. The first bridge would be 234 feet long and cross the deep gorge at Station 5688+37. This gorge handles the discharge from the first three of the eight avalanche zones along the segment. The Ludaseska Creek crossing would require a multiple span bridge 428 feet long. At Station 5770+02, a 130-foot bridge would span a deep, unnamed drainage.

The alluvial fan at Anchorage Point extends from Station 5873+00 to Station 5931+00. The alignment along this section has long tangents and long sweeping curves. The profile has moderate grades between 4.9 percent and 5.3 percent as it rolls over the alluvial mound created by the glacial stream. The stream it at the top of the mound. A 300-foot long, multiple span bridge would be required to make this crossing.
The final 3,900 feet of alignment is back on a bench to its termination at the end of the segment. The alignment on this final section continues the gradual nature of the entire segment, as does the profile.

The avalanche zones at Station 5807+85 and Station 5944+75, would be mitigated by elevated fills with large diameter culverts providing the drainage.

Station 5970+00 (MP 37.9) to Station 6078+00 (MP 40.0) –Chilkat River Crossing

The 2.0-mile Chilkat River crossing extends from Reen Point to Mud Bay Road and would consist of 6,350 foot and 2,850 foot long bridges separated by a 2,000-foot long causeway to the northwest of Pyramid Island. To avoid eagle nest trees, the causeway would be in the intertidal zone in an area of glacial silt deposition. A short embankment section would connect the end of the bridge to Mud Bay Road at a tee-intersection.

3.3 Drainage and Bridges

Preliminary bridge lengths were determined by DOT&PF staff using contour data generated from LIDAR surveys for both the East and West Lynn Canal corridors and from Plan and Profile sheets for each alignment. Tables 3-1 and 3-2 summarize the length of each bridge and the number of intermediate piers, if any.

The DOT&PF has committed to crossing all anadromous fish streams with bridges. The preliminary alignments have bridges at all known anadromous fish streams. Drainages with resident fish would be crossed either by bridge or with culverts designed to allow fish passage.

All bridges, with the exception of bridges 27E and 28E, would utilize bulb-tee girders as the structural deck. All bridges would be 33 feet wide (see Figure 3-7 for a bulb-tee bridge typical

section.) Bridges less than 135 feet in length would be single span, while bridges over 135 foot would be multiple span (see Figure 3-8 for examples of single and multiple span bridge profiles.)

Bridge 27E spans the gorge below the Lower Dewey Lake dam and will be visible from the Lower Dewey Lake trail. For this reason, a bridge with an architecturally interesting under structure, such as an arch supported structure, may be designed for this location.

Bridge 28E is on a curve and is skewed in relation to the White Pass/Yukon Railroad tracks as it descends to match 23rd Street in Skagway. It is anticipated that a deep steel I-beam structure would be needed to make the long span required to clear the tracks. A steel bridge at this location would also be more compatible with the railroad setting.

Foundation design for the bridges would be performed during the final design. Onsite geotechnical investigations, including drilling, would be conducted at each bridge site at that time.

Culvert design would occur during the final design and construction phase. All existing stream channels would be provided with a cross culvert. Oversizing of cross culverts would occur where icing is anticipated. Ditch flows are not expected to be a problem due to the roadway embankment being shot rock in most areas. Natural seep areas would be allowed to flow through and under the roadway embankment. Embankment in wetland areas would have additional cross culverts located to ensure equalization of ground water.

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Table 3-1

East Lynn Canal Bridge Summary

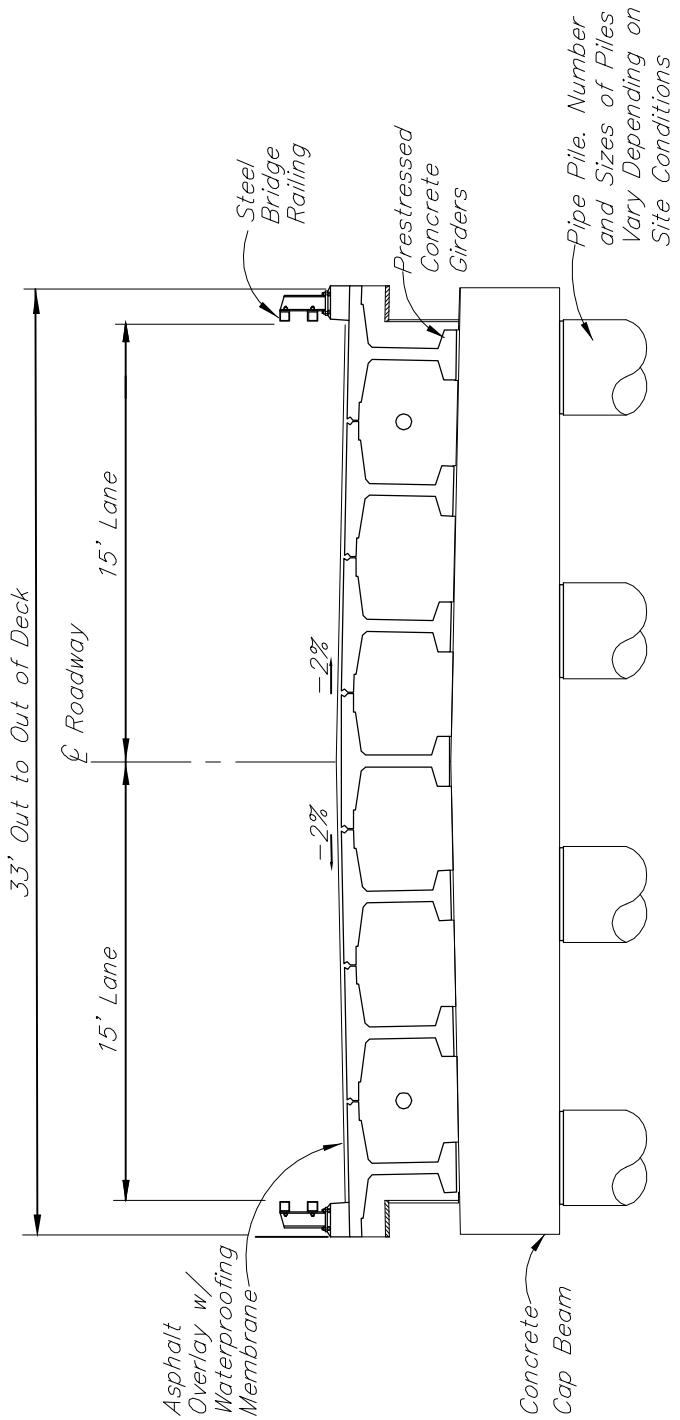
Bridge No.	Begin Station	Highway Milepost	Length (ft)	Intermediate Piers	Name
1E	288+90	44.6	110	0	Sawmill Creek (A)
2E	426+10	47.2	110	0	unnamed
3E	602+10	50.5	130	0	Antler Slough (A)
4E	648+50	51.4	2,150	15	Gilkey/Antler Rivers (A)
5E	736+00	53.1	2,500	17	Berners/Lace Rivers (A)
6E	908+30	56.3	270	1	Slate Creek (A)
7E	1294+10	63.6	180	1	Sweeny Creek (A)
8E	1328+70	64.3	250	1	Sherman Creek (A)
9E	1439+50	66.4	90	0	Independence Creek (A)
10E	1546+00	68.4	100	0	unnamed
11E	1767+80	72.6	70	0	unnamed
12E	2025+80	77.5	80	0	unnamed
13E	2229+50	81.3	60	0	Yeldagalga Creek
14E	2305+40	82.8	120	0	unnamed
15E	2322+40	83.1	120	0	unnamed
16E	2403+40	84.6	120	0	unnamed
17E	2443+00	85.4	200	1	unnamed
18E	2565+10	87.7	160	1	unnamed
19E	2613+00	88.6	2,300	16	Katzehin River (A)
20E	3025+00	96.4	260	1	unnamed
21E	3050+35	96.9	130	0	unnamed
22E	3157+00	98.9	120	0	unnamed
23E	3287+95	101.4	120	0	unnamed
24E	3305+10	101.7	200	1	unnamed
25E	3436+60	104.2	240	1	Kasidaya Creek
26E	3529+50	106	150	1	Sturgill Creek
27E	3623+70	107.7	300	2	Dewey Lake Trail
28E	3684+00	108.9	400	2	Skagway Railroad Overpass
Total Bridges 28		**Total Length 11,040**			

(A) = Anadromous fish stream

Table 3-2
West Lynn Canal Bridge Summary

Bridge No.	Begin Station	Highway Milepost	Length(ft)	Intermediate Piers	Name
1W	295+75	44.6 Glacier Hwy	110	0	Sawmill Creek (A)
2W	4063+25	0.7 Lynn Canal Hwy	228	1	Henry Creek (A)
3W	4146+17	2.2	136	0	unnamed (A)
4W	4164+10	2.6	100	0	unnamed
5W	4212+77	3.5	240	1	unnamed
6W	4294+30	5.1	1,100	7	Endicott River (A)
7W	4430+52	7.7	120	0	unnamed (A)
8W	4457+77	8.1	100	0	unnamed
9W	4558+35	10.1	450	3	unnamed (A)
10W	4606+50	11	130	0	unnamed (A)
11W	4683+45	12.4	200	1	unnamed (A)
12W	4800+00	14.6	600	4	Sullivan River (A)
13W	4883+80	16.2	154	1	unnamed (A)
14W	5076+81	19.9	100	0	unnamed
15W	5143+50	21.2	200	1	unnamed
16W	5188+20	22.0	125	0	unnamed
17W	5232+77	22.8	100	0	unnamed
18W	5287+00	23.9	500	3	unnamed
19W	5414+75	26.3	100	0	unnamed
20W	5473+00	27.3	400	2	Glacier River
21W	5573+00	29.3	400	2	unnamed (A)
22W	5688+37	31.5	234	1	unnamed
23W	5725+75	32.2	428	3	Ludaseska Creek
24W	5770+02	33.0	130	0	unnamed
25W	5903+00	35.5	300	2	unnamed
26W	5967+50	36.8	6,350	46	W.Chilkat Crossing (A)
27W	6048+00	38.2	2,850	21	E.Chilkat Crossing (A)
Total Bridges 27		**Total Length 15,885**			

(A) = Anadromous fish stream



BRIDGE TYPICAL SECTION

STATE OF ALASKA DEPARTMENT OF TRANSPORTATION & PUBLIC FACILITIES S.E. REGION	*JUNEAU ACCESS IMPROVEMENTS* *PROJECT NO.: 71100* *BRIDGE TYPICAL SECTION*	*FIGURE* 3-7

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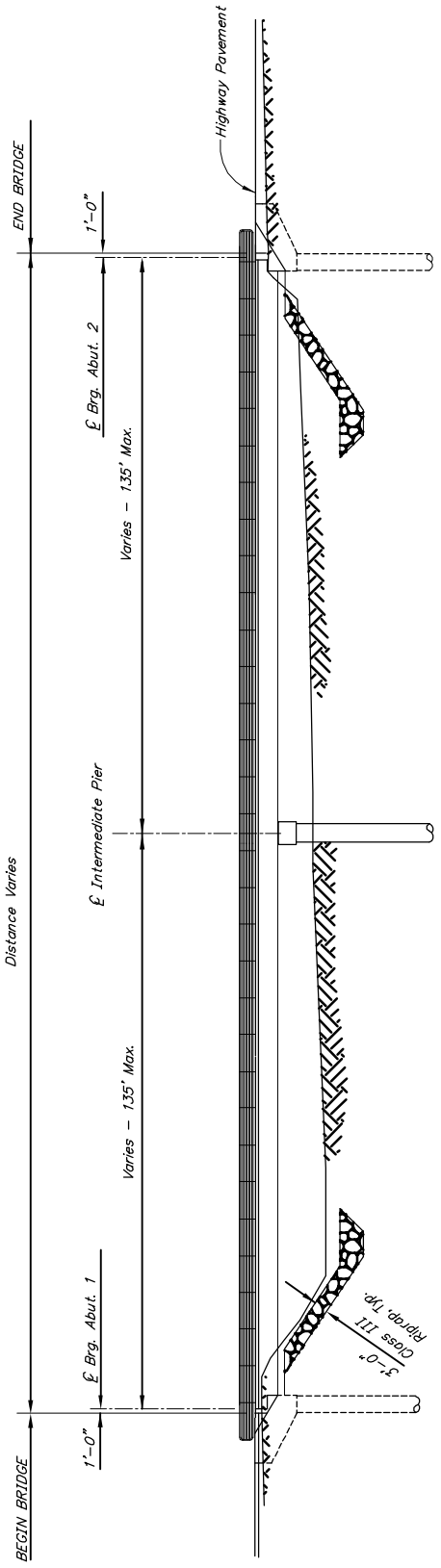
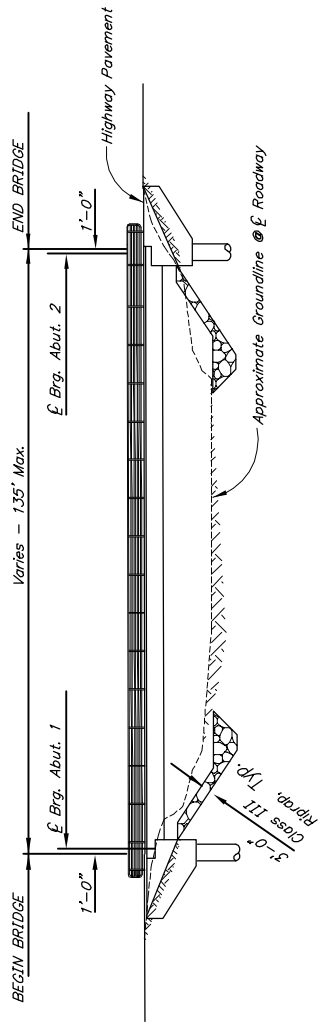


MULTIPLE SPAN BRIDGE



SINGLE SPAN BRIDGE

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION
& PUBLIC FACILITIES
S.E. REGION

JUNEAU ACCESS IMPROVEMENTS

PROJECT NO.: 71100

BRIDGE ELEVATIONS

FIGURE
3-8

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3.4 Right-of-Way Requirements

East Lynn Canal Route

The proposed East Lynn Canal route traverses through both public and private lands, with the majority passing through the Tongass National Forest. The proposed right-of-way corridor width across private lands will be a minimum of 150 feet, except where existing right-of-ways exist, or conditions require a specific width. The right-of-way corridor width across National Forest land, and State Department of Natural Resource land is proposed to be 300 feet.

The first three miles of the project to Cascade Point passes through land owned by Goldbelt Inc., with the sub-surface estate held by the Sealaska Corporation. The U.S. Forest Service owns a right-of-way within these lands, which roughly parallels the proposed route.

Once leaving the Goldbelt property the route traverses through the Tongass National Forest for the next 62 miles. Within these lands there are other owners including mineral surveys near Sherman Creek owned by Coeur Alaska, Inc., river crossings in Berners Bay and the Katzehin River cross tide and submerged lands managed by the State Department of Natural Resources (DNR), the Low Point Light House Reserve managed by the U.S. Coast Guard, and a FERC power project near Skagway.

After leaving the Tongass National Forest the route passes through ¾ mile of state land, approximately 2 miles of land owned by the City of Skagway. It then passes through a parcel of land owned by the State of Alaska Mental Health Trust, before it crosses the White Pass Railroad onto platted right-of-way in the City of Skagway.

Ferry terminal sites on the East Lynn Canal route at Sawmill Cove, Slate Cove and Katzehin Delta are located on U.S. Forest Service land and state tidelands.

West Lynn Canal Route

The proposed West Lynn Canal route traverses through both public and private lands. The proposed right-of-way corridor width across private lands will be a minimum of 150 feet, except where existing right-of-ways exist, or conditions require a specific width. The right-of-way corridor width across National Forest land and State Department of Natural Resource land is proposed to be 300 feet.

The route begins at the end of the Veterans Memorial Highway on the east side of Lynn Canal. As with the East Lynn Canal route, approximately the first three miles to Cascade Point passes through land owned by Goldbelt Inc., with the sub-surface estate held by Sealaska Corporation. The U.S. Forest Service owns a right-of-way within these lands, which roughly parallels the proposed route.

The eastside ferry terminal would be constructed on U.S. Forest Service land at Sawmill Cove, and on State tidelands. The westside terminal would be constructed on State tidelands, and on Tongass National Forest land.

The route traverses approximately 28 miles of National Forest land with intermittent crossings of state and private land. A Native veteran's application area is crossed at William Henry Bay. It also crosses a Native allotment approximately one mile north of the Sullivan River.

At Davidson Point the route crosses approximately 4.5 miles of land consisting of 7 private properties, 4 parcels owned by the University of Alaska, and two parcels under the management of the State DNR. In the area of Pyramid Harbor the route crosses approximately 1.5 miles of land consisting of State DNR land, 3 private parcels, and 2 parcels owned by the University of Alaska. The route crosses State DNR tidelands and uplands connecting into the existing Mud Bay Road Right of Way.

3.5 Maintenance and Operation Requirements

Maintenance of the East Lynn Canal route would require the location of a Lynn Canal DOT&PF maintenance facility near milepost 64. This would also be the location of a proposed rest stop with public restroom facilities. Skagway and Juneau maintenance stations would also assist with the maintenance effort along the route.

The Haines Maintenance Station will perform maintenance of the West Lynn Canal route. The Juneau Maintenance Station will maintain the segment up to the Sawmill Cove ferry terminal.

Most of the maintenance effort on the two routes will occur during the winter. Snow removal, avalanche control and cleanup would constitute a bulk of the maintenance effort.

Special design efforts would be employed to reduce maintenance and operational costs on the corridor. They are as follows: constructing bridges over narrow and well defined avalanche chutes, over-sizing culvert pipes to reduce ice damming and subsequent thawing, berm and dike construction to re-direct avalanche debris away from roadways and the use of an avalanche monitoring system for more cost effective control.

Tables 3-3 and 3-4 summarize the avalanche zones along the East Lynn Canal and West Lynn Canal routes. The East Lynn Canal snow avalanche summary (Table 3-3) lists 74 avalanches within the limits of the project. Only 63 of these have potential impacts on the roadway. The West Lynn Canal snow avalanche summary lists 19 avalanches within the limits of the project. Only 17 of these have potential impacts on the roadway.

A detailed analysis of the maintenance work and costs involved with the routes can be found in Attachment C – Highway Maintenance Cost Estimates.

A detailed analysis of the avalanche monitoring, and mitigation program are contained in The Snow Avalanche Technical Studies.

Table 3-3

East Lynn Canal Snow Avalanche Summary

ID	STATION	ID	STATION
LC001	378+01	LC032	2481+09
LC002	1478+37	LC033	2487+68
LC003	1503+23	LC034	2547+74
LC003-1	1506+90	LC035	2747+57
LC004	1615+32	LC036	2757+34
LC005	1663+80	LC037	2764+01
LC005-1	1677+92	LC038	2777+75
LC006	1690+90	LC039	2900+46
LC007	1708+20	LC040A	2949+01
LC008	1718+95	LC040B	2953+49
LC009	1733+34	LC040C	2959+46
LC010	1737+42	LC040D	2969+16
LC011	1742+66	LC040E	2973+22
LC012	1769+74	LC040F	2978+34
LC013	1811+55	LC041	3028+51
LC014	1832+47	LC042	3051+10
LC015	1929+73	LC043	3065+97
LC016	1968+65	LC044	3074+39
LC017	2026+12	LC045	3082+23
LC018	2037+31	LC046	3087+85
LC019	2042+21	LC047	3095+99
LC019-1	2071+54	LC048	3105+24
LC020	2087+40	LC049	3199+97
LC021	2100+35	LC050	3204+45
LC022	2107+37	LC051	3215+66
LC023	2113+34	LC051-1	3269+37
LC024	2126+18	LC052	3288+68
LC025	2269+82	LC053	3306+20
LC026	2278+70	LC053-1	3333+91
LC026-1	2284+72	LC054	3463+55
LC027	2293+41	LC055	3484+53
LC028	2306+20	LC056	3515+56
LC028-1	2313+15	LC056-1	3571+87
LC028-2	2317+40	LC056-2	3583+10
LC029	2323+07	LC057	3601+87
LC030	2335+01	LC058	3607+65
LC031	2364+07	LC059	3613+00

Table 3-4

West Lynn Canal Snow Avalanche Summary

ID	STATION
WLC001A	4193+70
WLC001B	5204+50
WLC002A	4225+50
WLC002B	4230+50
WLC003	4376+24
WLC004	4511+73
WLC005	5033+95
WLC006A	5069+00
WLC006B	5078+65
WLC006C	5089+50
WLC007	5189+00
WLC008	5689+50
WLC009A	5778+75
WLC009B	5797+15
WLC009C	5807+85
WLC010A	5930+60
WLC010B	5940+45
WLC010C	5944+75
WLC010D	5949+90

ATTACHMENT A

East Lynn Canal

Plan and Profile Sheets

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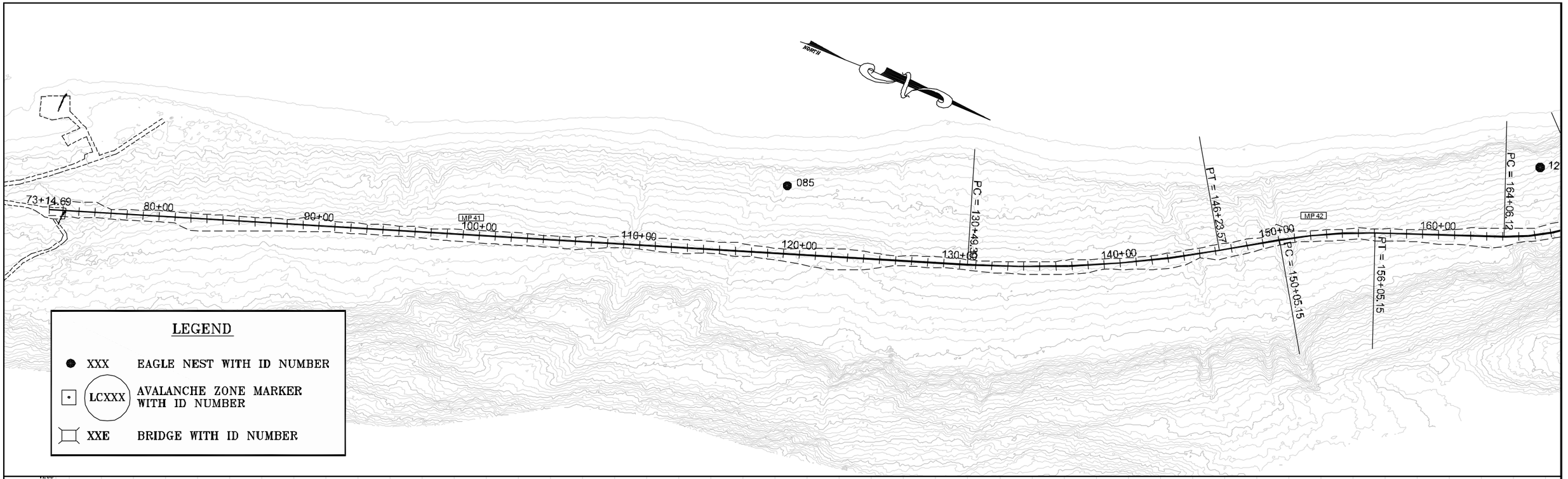
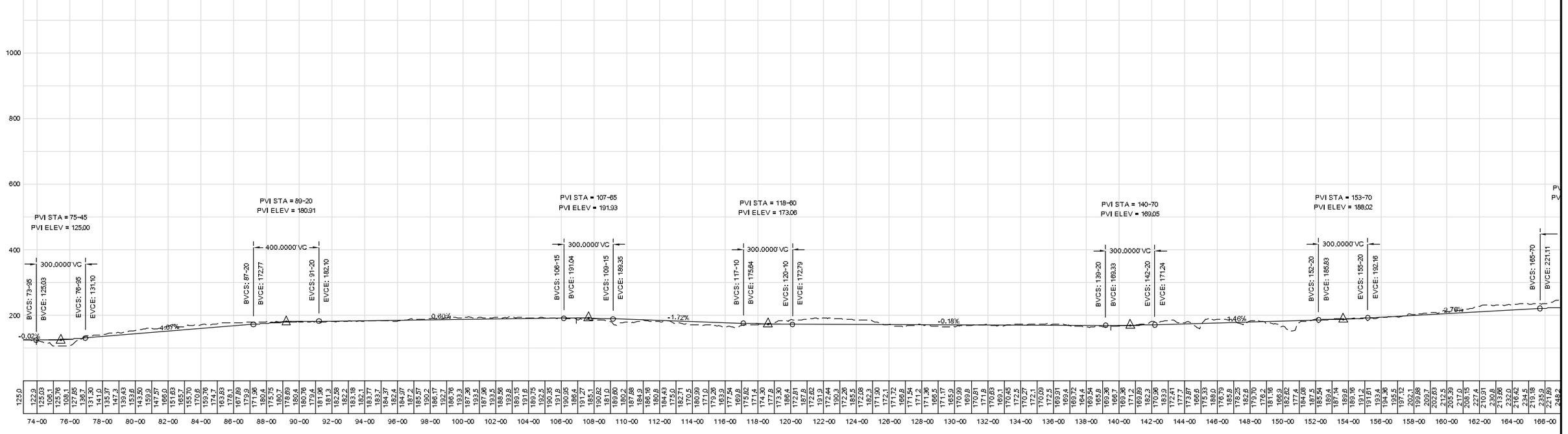
STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

PROJECT NO. 71100
JUNEAU ACCESS IMPROVEMENTS
ECHO COVE TO SKAGWAY
1"=600' PLANS

DESIGNED BY	
CHECKED BY	
DRAFTED BY	R. SNYDER
	9/21/98

SPECIFICATIONS
STANDARDS
COMPUTER DESIGNATION





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RECORD OF REVISIONS

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
SOUTHEAST REGION DESIGN & CONSTRUCTION

JUNEAU *JUNEAU ACCESS* *ALASKA*
PROJECT NO. 71100

EAST LYNN CANAL
B.O.P TO STA. 166+00

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DRAWN BY:	DATE: *2004*
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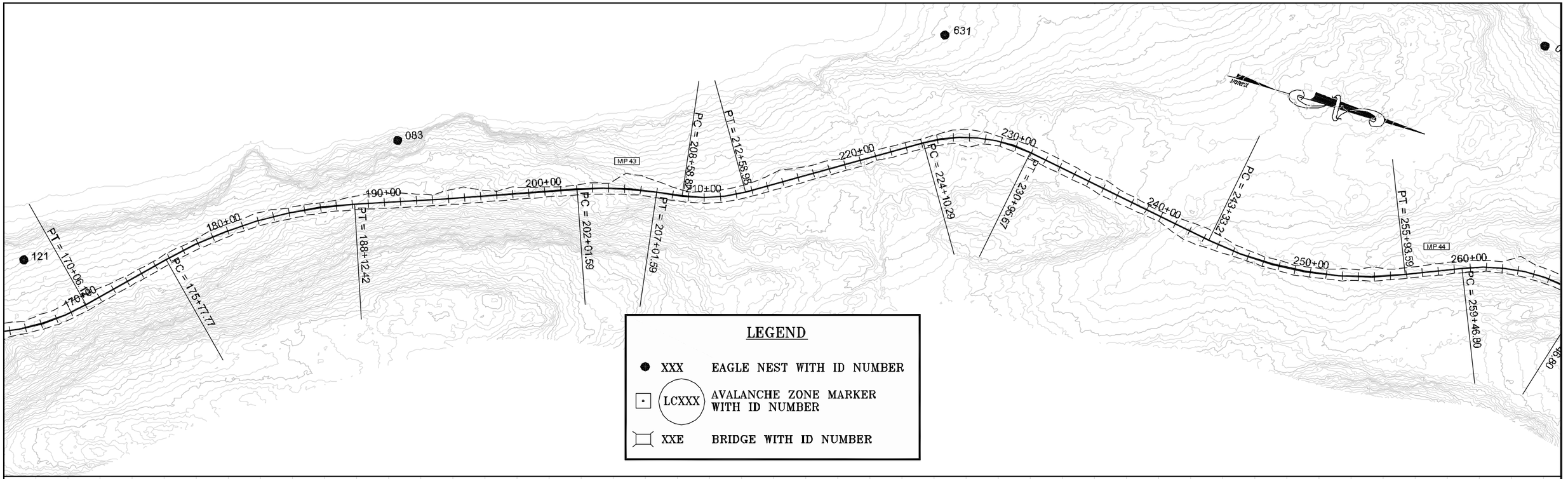

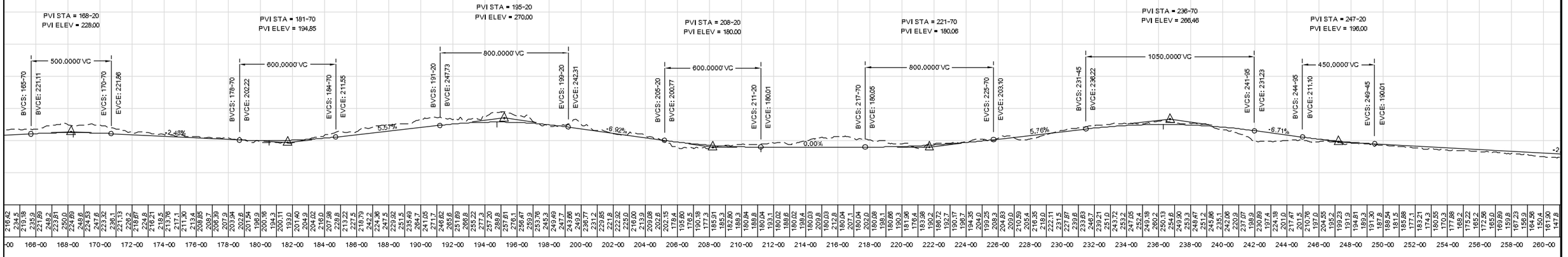

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STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
SOUTHEAST REGION DESIGN & CONSTRUCTION

JUNEAU *JUNEAU ACCESS* *ALASKA*
PROJECT NO. 71100

EAST LYNN CANAL
STA. 166+00 TO STA. 260+00

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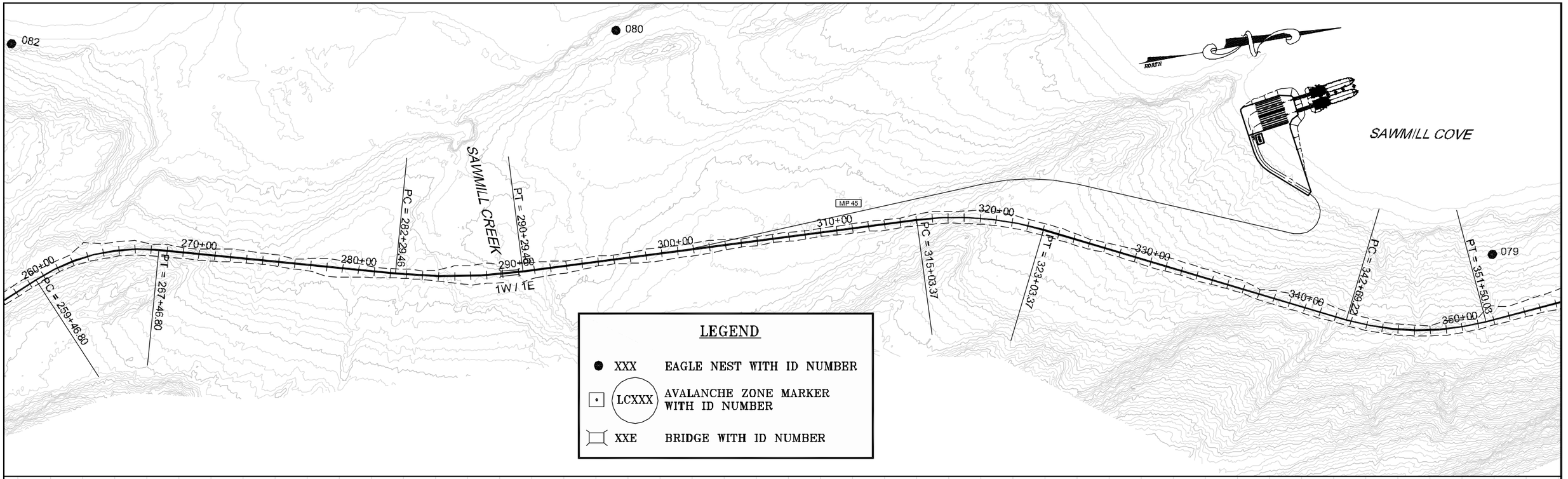

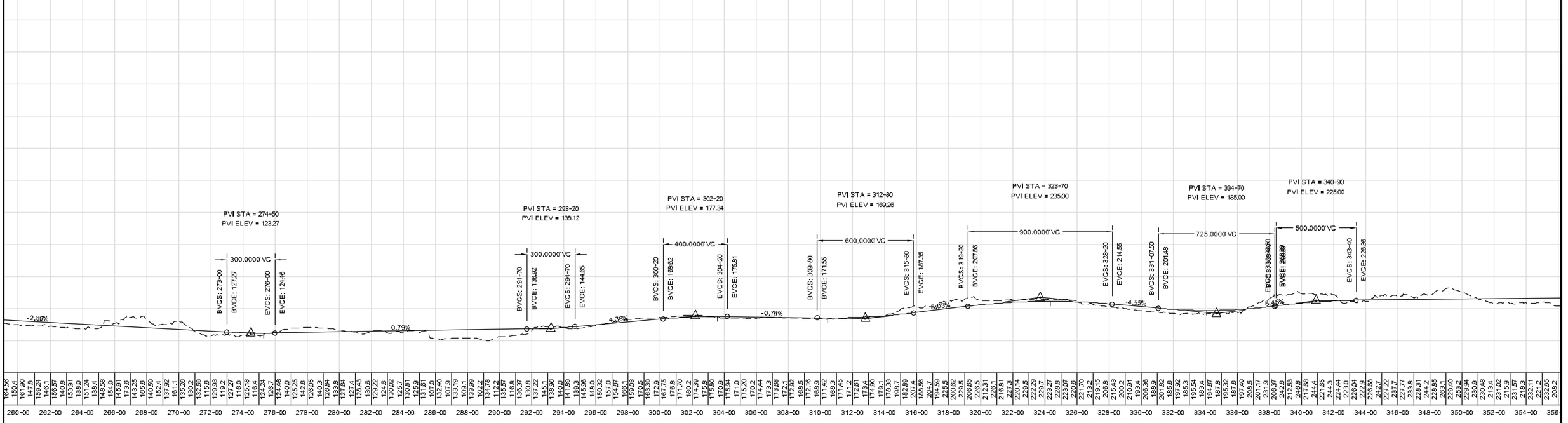

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RECORD OF REVISIONS

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
SOUTHEAST REGION DESIGN & CONSTRUCTION

JUNEAU *JUNEAU ACCESS* *ALASKA*
PROJECT NO. 71100

EAST LYNN CANAL
STA. 260+00 TO STA. 355+00

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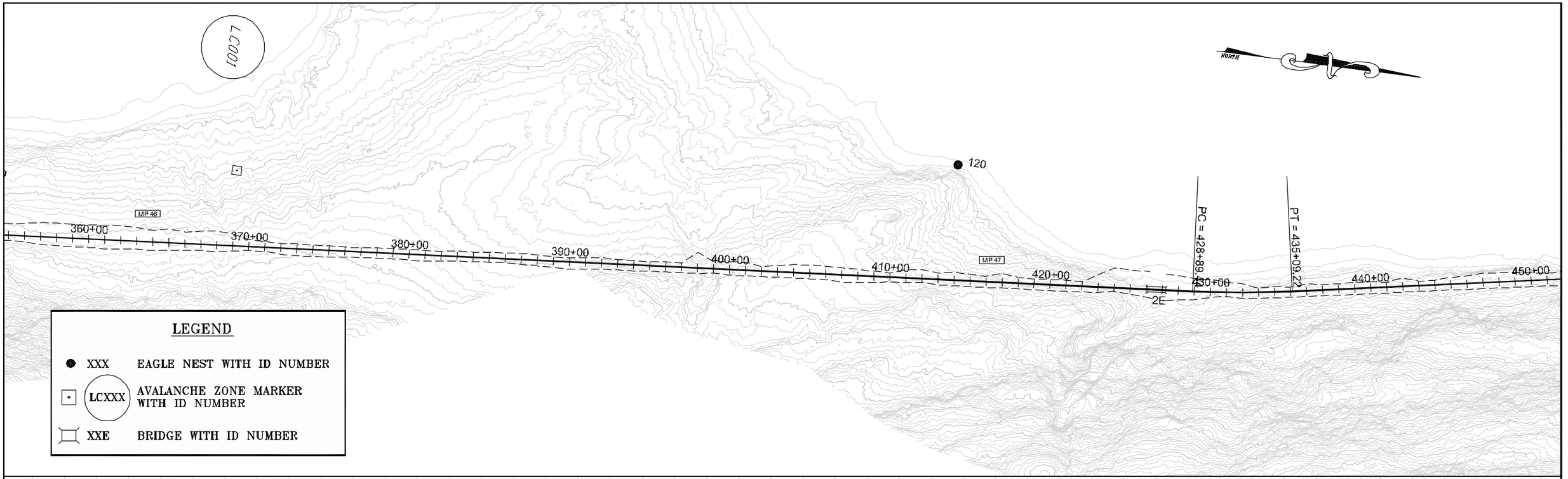
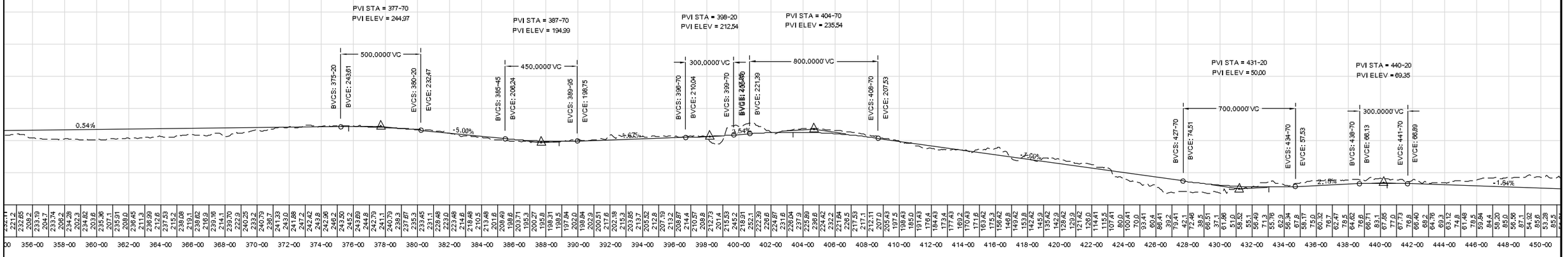
DRAWN BY:	DATE: *2004*
CHECKED BY:	SHEET *4* OF *39*





PATH:		
BY:	DATE:	DESCRIPTION OF CHANGE:
RECORD OF REVISIONS		

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
SOUTHEAST REGION DESIGN & CONSTRUCTION

JUNEAU *JUNEAU ACCESS* *ALASKA*
PROJECT NO. 71100

EAST LYNN CANAL
STA. 355+00 TO STA. 450+00

DESIGNED BY:	PROJECT NO. *71100*
DRAWN BY:	DATE: *2004*
CHECKED BY:	SHEET *5* OF *39*

LEGEND

- XXX — EAGLE NEST WITH ID NUMBER
- LCXXX — AVALANCHE ZONE MARKER WITH ID NUMBER
- XXE — BRIDGE WITH ID NUMBER

NORTH

076 119 074 629

CABIN

MP 48 MP 49

450+00 460+00 470+00 480+00 490+00 500+00 510+00 520+00 530+00 540+00

PC = 454+43.91 PT = 460+43.91 PC = 461+82.43 PT = 467+82.43 PC = 468+52.99 PT = 474+52.99 PC = 478+61.83 PT = 484+61.83 PC = 498+01.88 PT = 504+01.88 PC = 510+07.25 PT = 518+07.25 PC = 528+21.21 PT = 533+60.46 PC = 538+99.62 PT = 544+99.62

PVI STA = 456-20
PVI ELEV = 43.12
500.0000' VC
BVCS: 453-70 BVCE: 47.22
EVCS: 459-70 EVCE: 58.44
6.43%

PVI STA = 467-70
PVI ELEV = 113.60
700.0000' VC
BVCS: 464-20 BVCE: 92.15
EVCS: 471-20 EVCE: 108.00
-1.89%

PVI STA = 476-20
PVI ELEV = 100.00
600.0000' VC
BVCS: 473-20 BVCE: 104.80
EVCS: 479-20 EVCE: 120.83
6.88%

PVI STA = 484-20
PVI ELEV = 155.00
700.0000' VC
BVCS: 480-70 BVCE: 130.94
EVCS: 487-70 EVCE: 146.83
-2.34%

PVI STA = 502-70
PVI ELEV = 111.80
300.0000' VC
BVCS: 501-20 BVCE: 115.30
EVCS: 504-20 EVCE: 103.17
-5.76%

PVI STA = 511-70
PVI ELEV = 60.00
400.0000' VC
BVCS: 509-70 BVCE: 71.51
EVCS: 513-70 EVCE: 59.96
-0.02%

PVI STA = 536-70
PVI ELEV = 59.50
350.0000' VC
BVCS: 534-95 BVCE: 59.53
EVCS: 538-45 EVCE: 65.94
3.68%

BVCS: 546-20

PATH:		
BY:	DATE:	DESCRIPTION OF CHANGE:

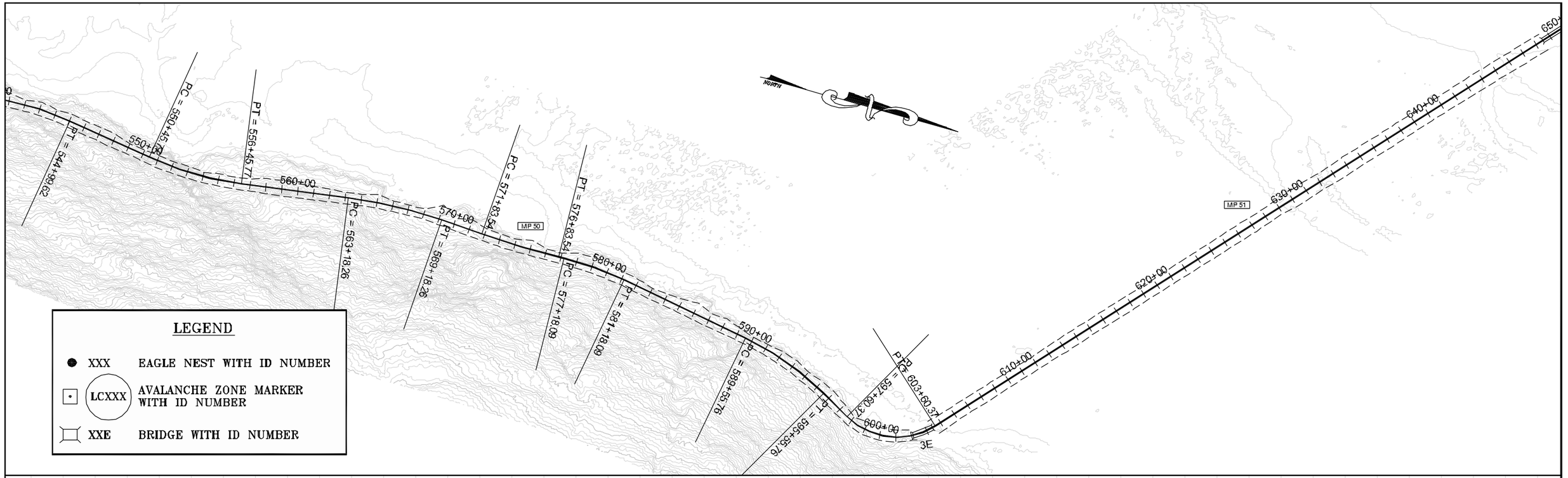
RECORD OF REVISIONS

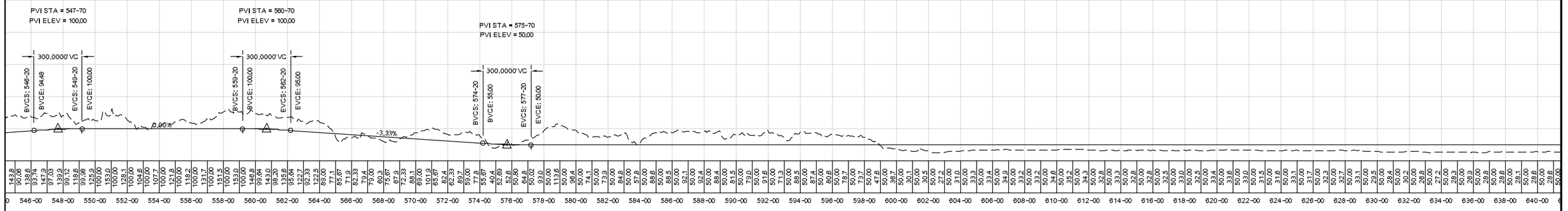
STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
SOUTHEAST REGION DESIGN & CONSTRUCTION

JUNEAU — *JUNEAU ACCESS PROJECT NO. 71100* — *ALASKA*

EAST LYNN CANAL
STA. 450+00 TO STA. 545+00

DESIGNED BY:	PROJECT NO. *71100*
DRAWN BY:	DATE: *2004*
CHECKED BY:	SHEET *6* OF *39*





PATH:		
BY:	DATE:	DESCRIPTION OF CHANGE:

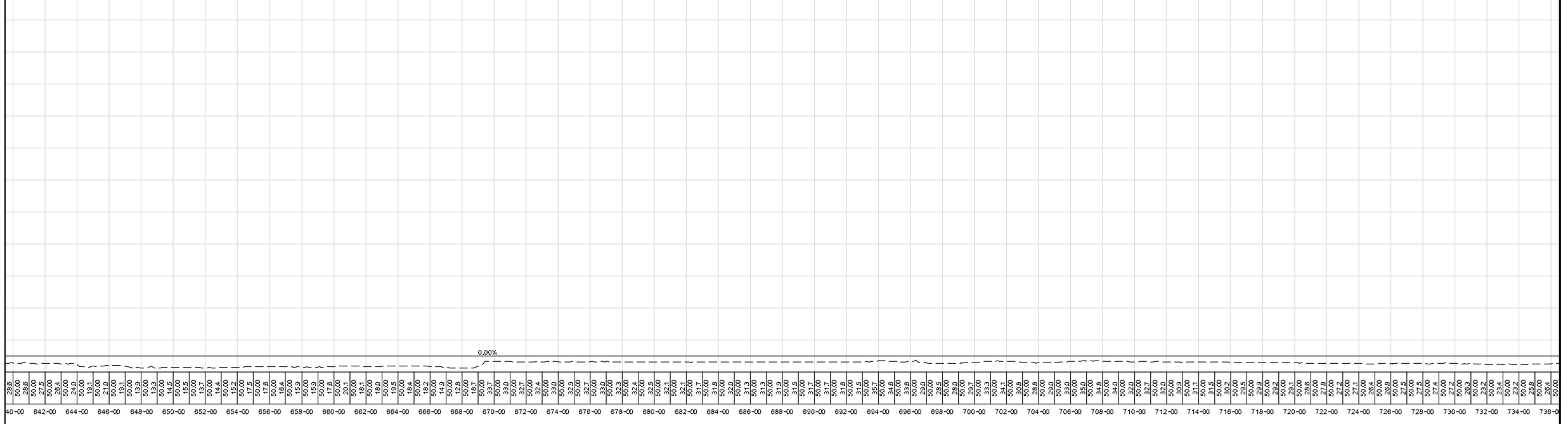
RECORD OF REVISIONS

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
SOUTHEAST REGION DESIGN & CONSTRUCTION

JUNEAU *JUNEAU ACCESS PROJECT NO. 71100* *ALASKA*

EAST LYNN CANAL
STA. 545+00 TO STA. 640+00

DESIGNED BY:	PROJECT NO. *71100*
DRAWN BY:	DATE: *2004*
CHECKED BY:	SHEET *7* OF *39*



PATH:		
BY:	DATE:	DESCRIPTION OF CHANGE:

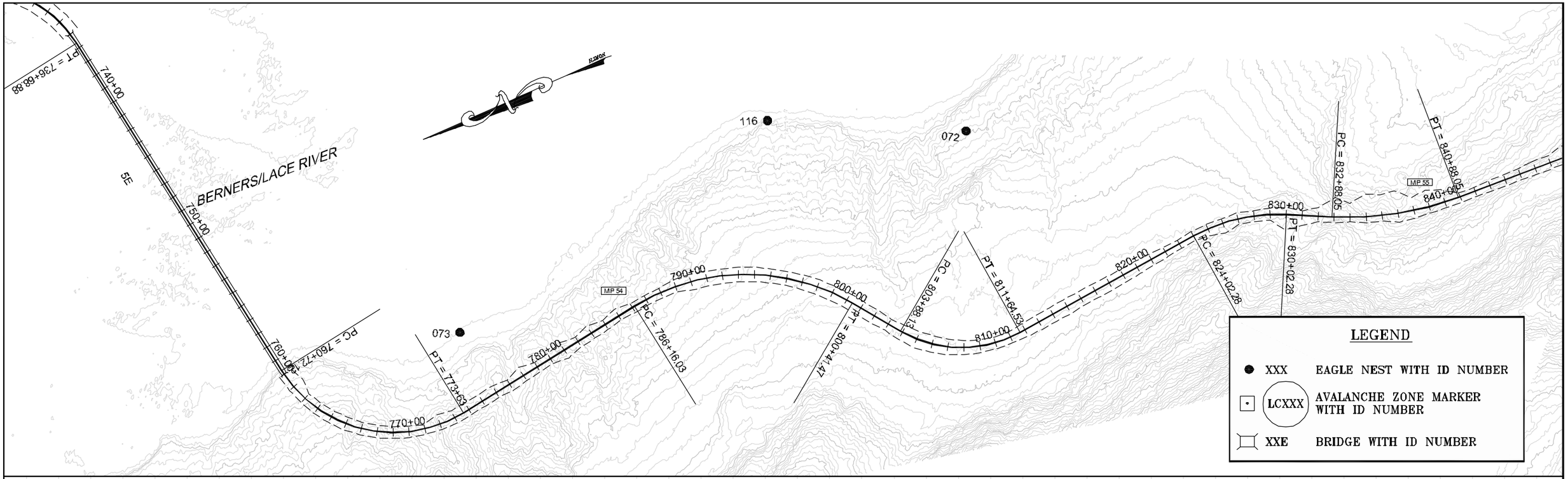
RECORD OF REVISIONS

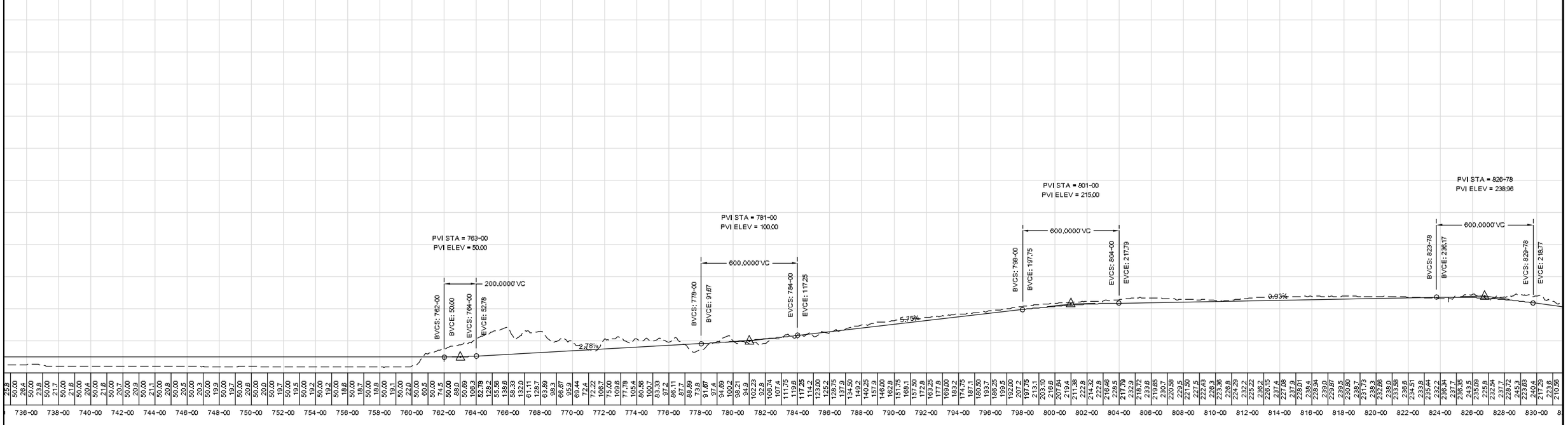
STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
SOUTHEAST REGION DESIGN & CONSTRUCTION

JUNEAU *JUNEAU ACCESS PROJECT NO. 71100* *ALASKA*

EAST LYNN CANAL
STA. 640+00 TO STA. 735+00

DESIGNED BY:	PROJECT NO. *71100*
DRAWN BY:	DATE: *2004*
CHECKED BY:	SHEET *8* OF *39*





PATH:		
BY:	DATE:	DESCRIPTION OF CHANGE:

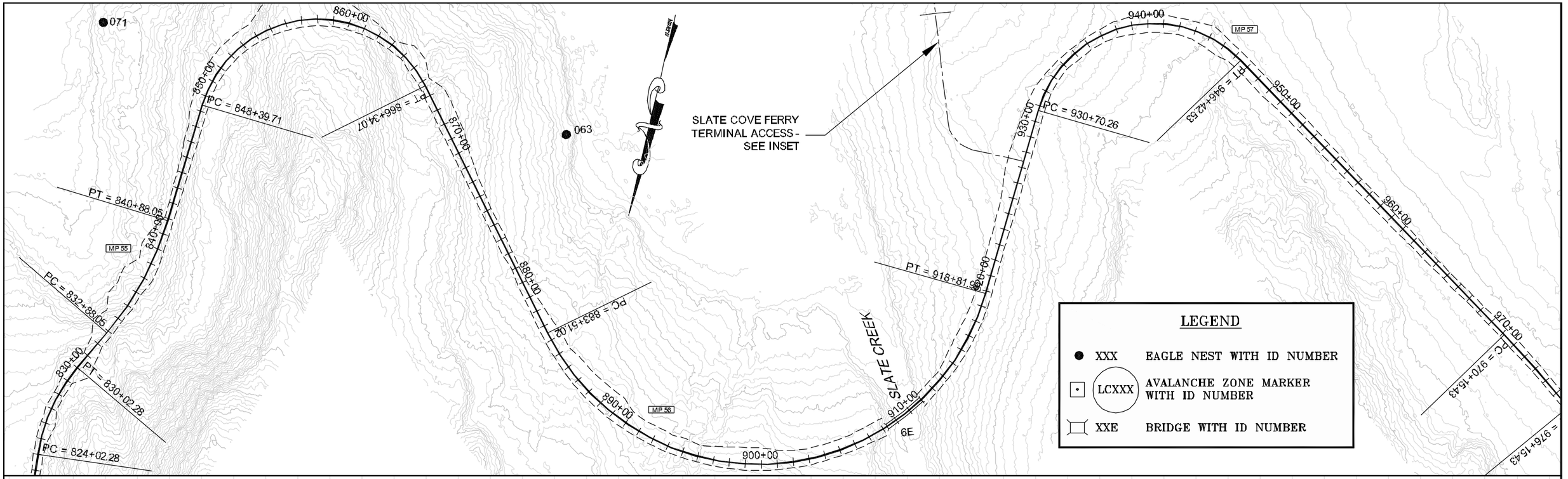
RECORD OF REVISIONS

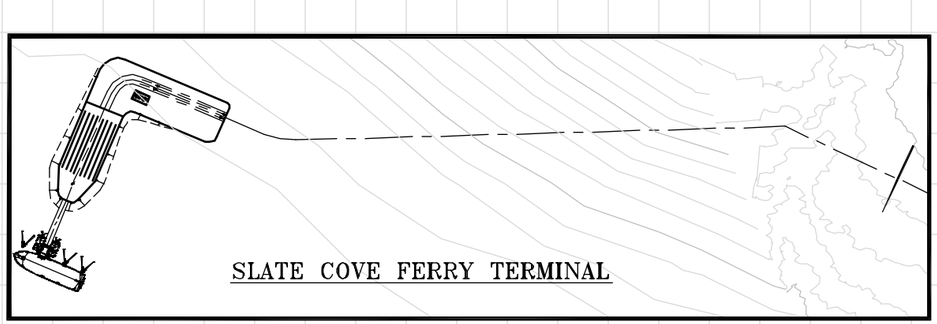
STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
SOUTHEAST REGION DESIGN & CONSTRUCTION

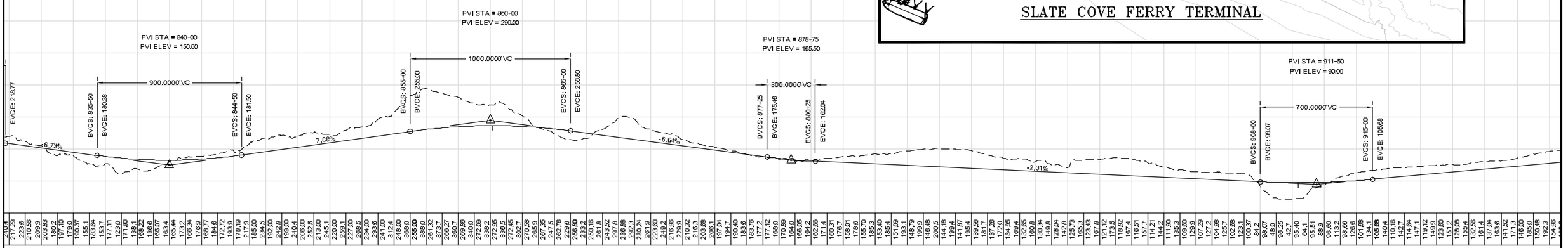
JUNEAU *JUNEAU ACCESS PROJECT NO. 71100* *ALASKA*

EAST LYNN CANAL
STA. 735+00 TO STA. 831+00

DESIGNED BY:	PROJECT NO. *71100*
DRAWN BY:	DATE: *2004*
CHECKED BY:	SHEET *9* OF *39*







PATH:		
BY:	DATE:	DESCRIPTION OF CHANGE:

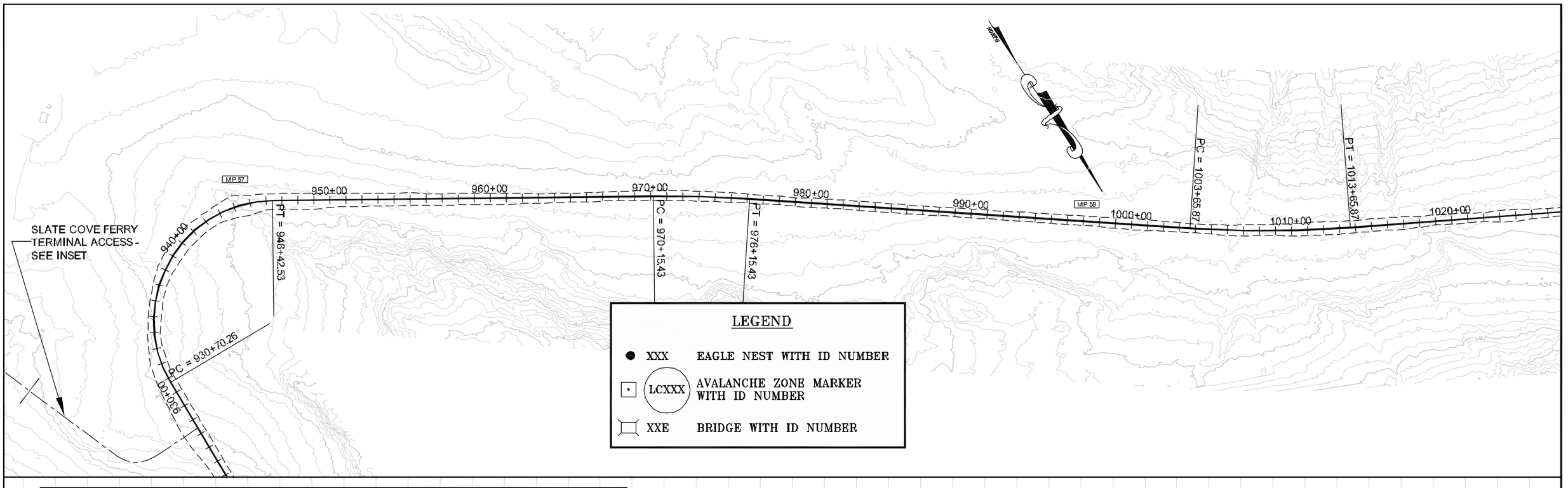
RECORD OF REVISIONS

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
SOUTHEAST REGION DESIGN & CONSTRUCTION

JUNEAU *JUNEAU ACCESS* *ALASKA*
PROJECT NO. 71100

EAST LYNN CANAL
STA. 831+00 TO STA. 926+00

DESIGNED BY:	PROJECT NO. *71100*
DRAWN BY:	DATE: *2004*
CHECKED BY:	SHEET *10* OF *39*



PATH:		
BY:	DATE:	DESCRIPTION OF CHANGE:

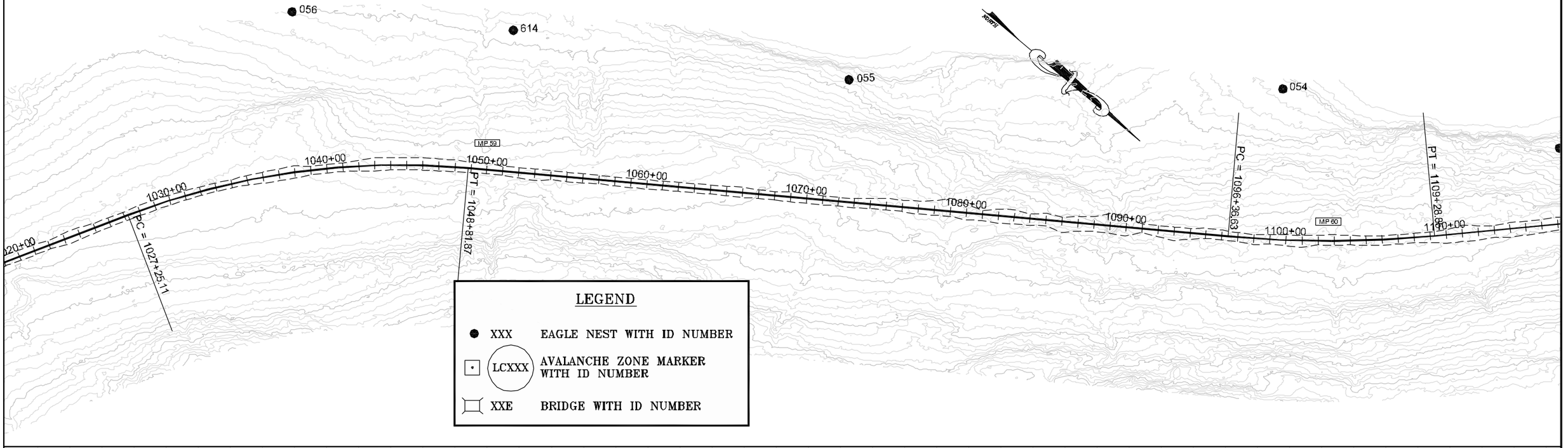
RECORD OF REVISIONS

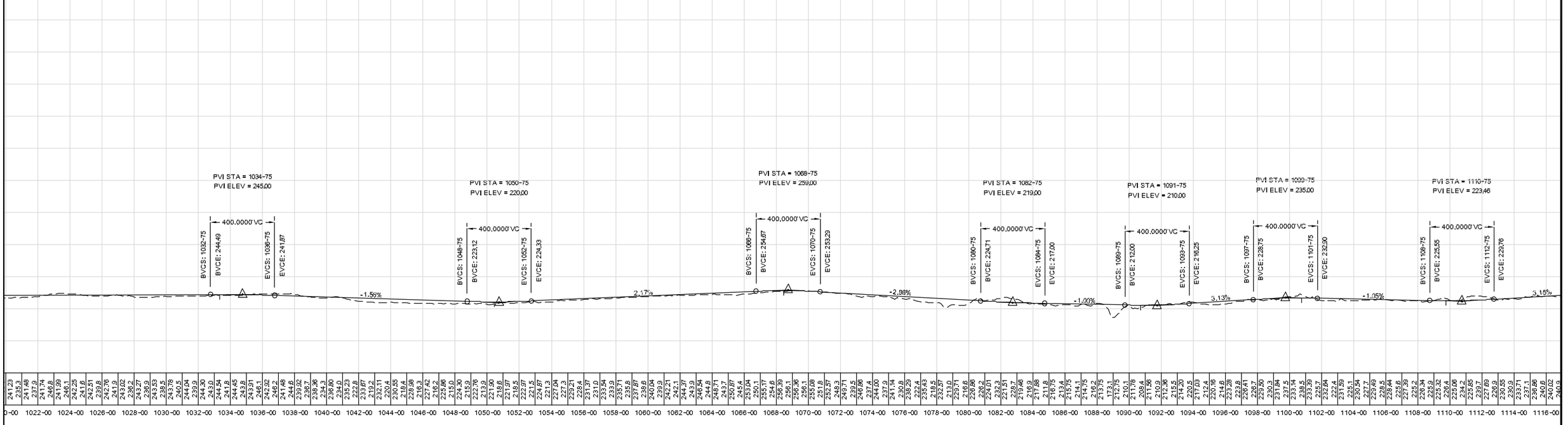
STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
SOUTHEAST REGION DESIGN & CONSTRUCTION

JUNEAU *JUNEAU ACCESS* *ALASKA*
PROJECT NO. 71100

EAST LYNN CANAL
STA. 926+00 TO STA. 1021+00

DESIGNED BY:	PROJECT NO. *71100*
DRAWN BY:	DATE: *2004*
CHECKED BY:	SHEET *11* OF *39*





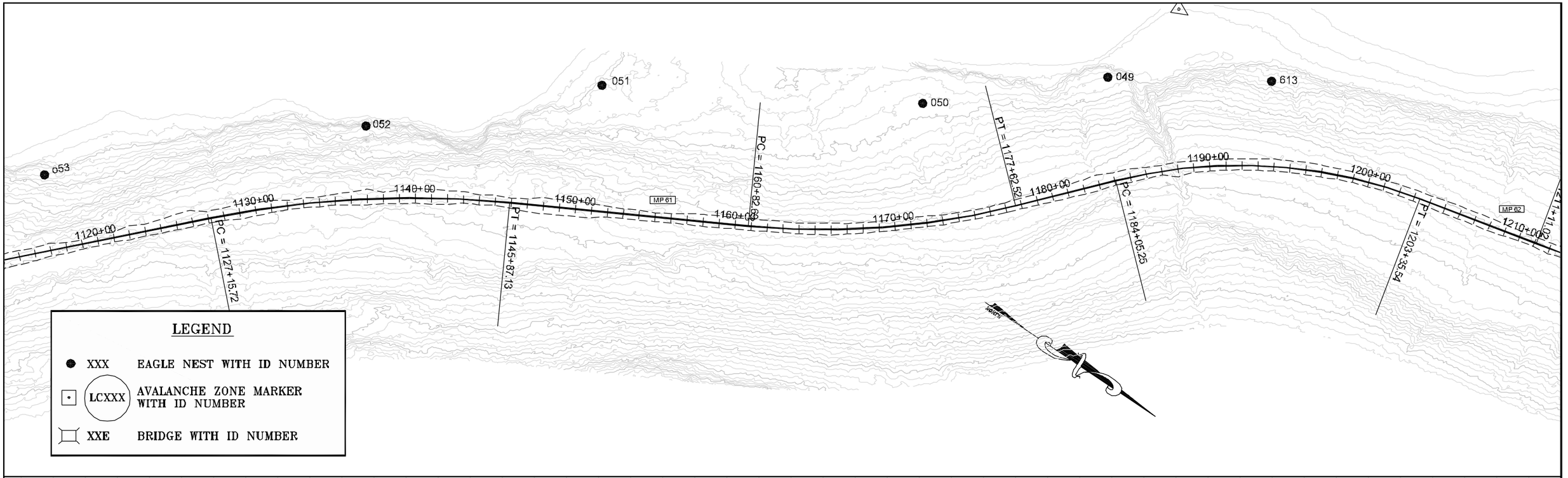
PATH:		
BY:	DATE:	DESCRIPTION OF CHANGE:
RECORD OF REVISIONS		

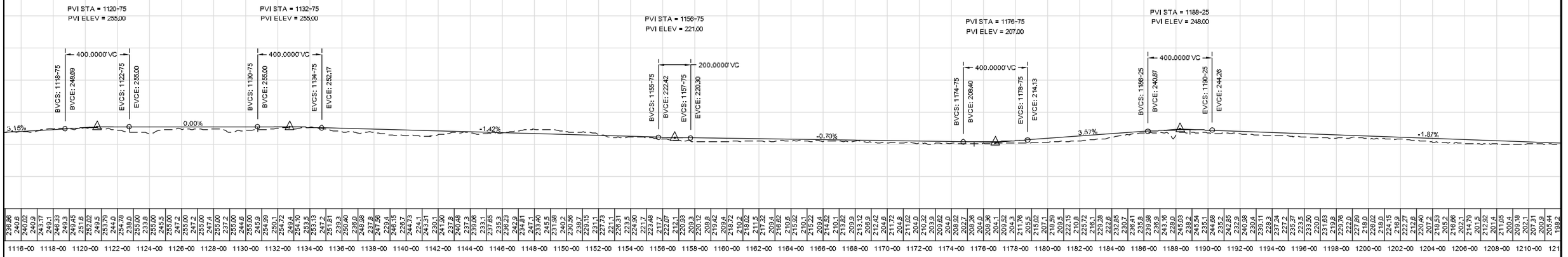
STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
SOUTHEAST REGION DESIGN & CONSTRUCTION

JUNEAU *JUNEAU ACCESS PROJECT NO. 71100* *ALASKA*

EAST LYNN CANAL
STA. 1021+00 TO STA. 1116+00

DESIGNED BY:	PROJECT NO. *71100*
DRAWN BY:	DATE: *2004*
CHECKED BY:	SHEET *12* OF *39*





PATH:		
BY:	DATE:	DESCRIPTION OF CHANGE:

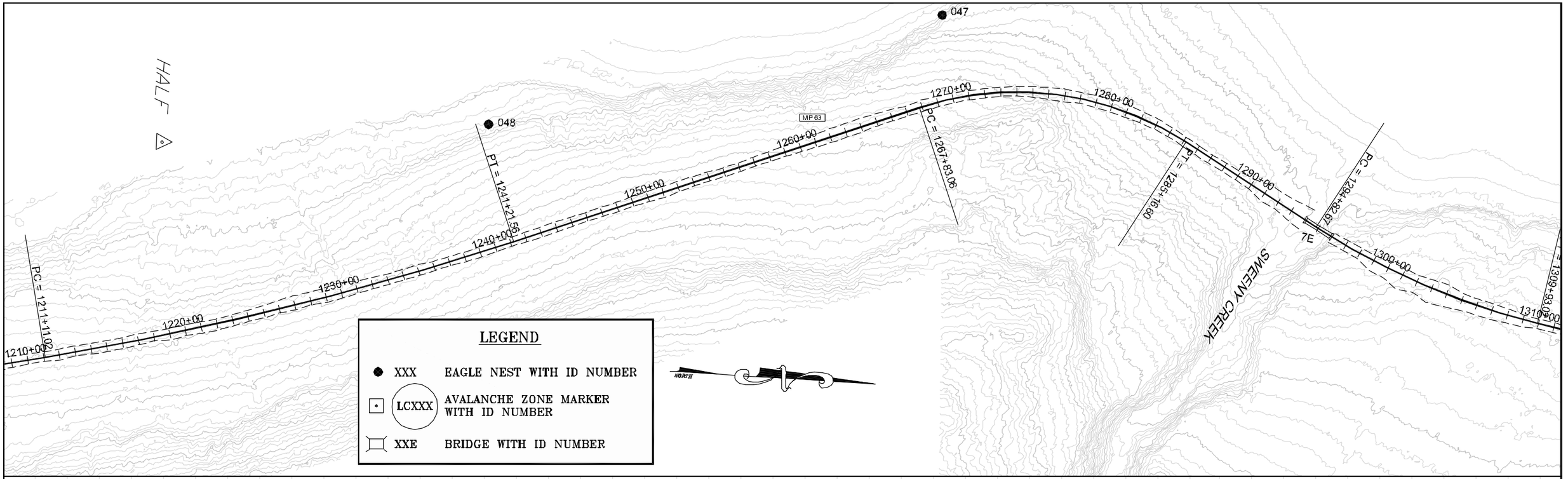
RECORD OF REVISIONS

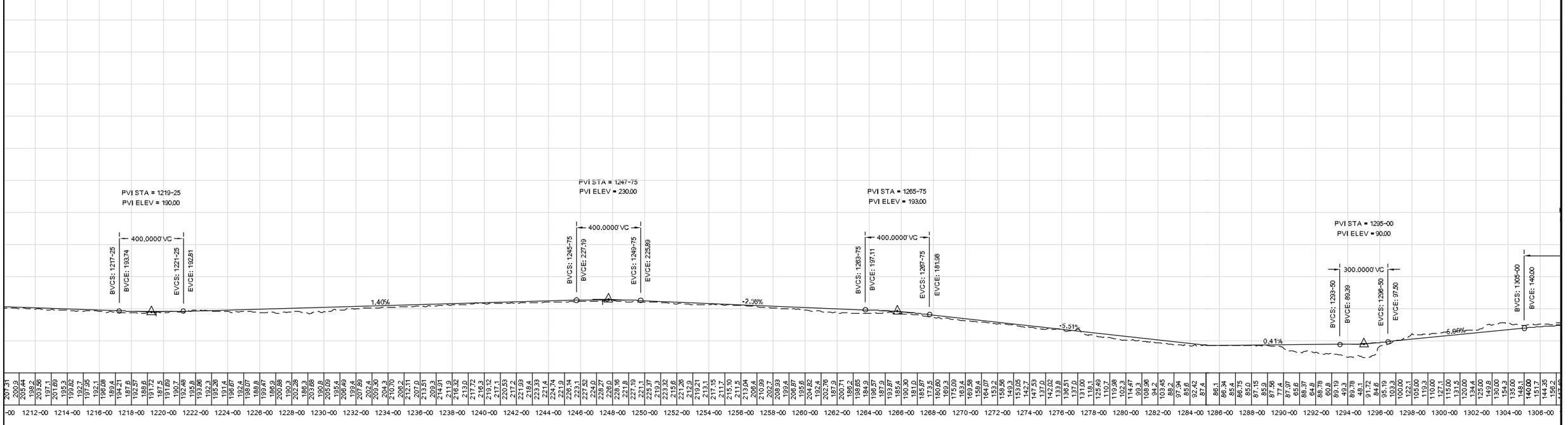
STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
SOUTHEAST REGION DESIGN & CONSTRUCTION

JUNEAU *JUNEAU ACCESS PROJECT NO. 71100* *ALASKA*

EAST LYNN CANAL
STA. 1116+00 TO STA. 1211+00

DESIGNED BY:	PROJECT NO. *71100*
DRAWN BY:	DATE: *2004*
CHECKED BY:	SHEET *13* OF *39*





PATH:		
BY:	DATE:	DESCRIPTION OF CHANGE:

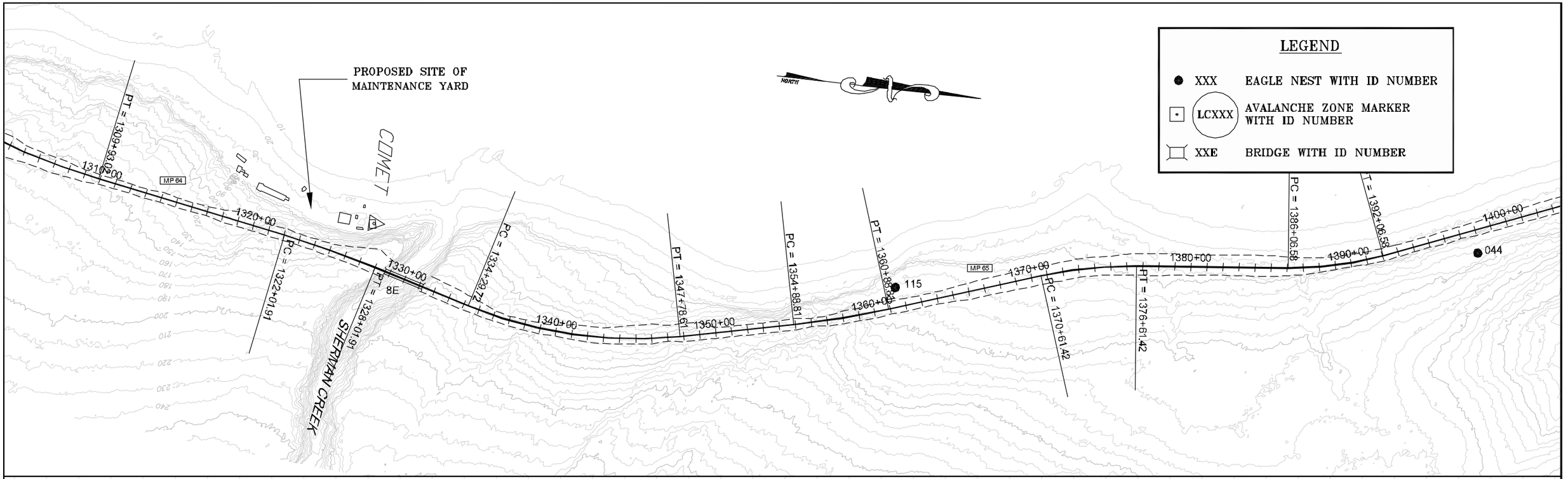
RECORD OF REVISIONS

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
SOUTHEAST REGION DESIGN & CONSTRUCTION

JUNEAU *JUNEAU ACCESS* *ALASKA*
PROJECT NO. 71100

EAST LYNN CANAL
STA. 1211+00 TO STA. 1306+00

DESIGNED BY:	PROJECT NO. *71100*
DRAWN BY:	DATE: *2004*
CHECKED BY:	SHEET *14* OF *39*



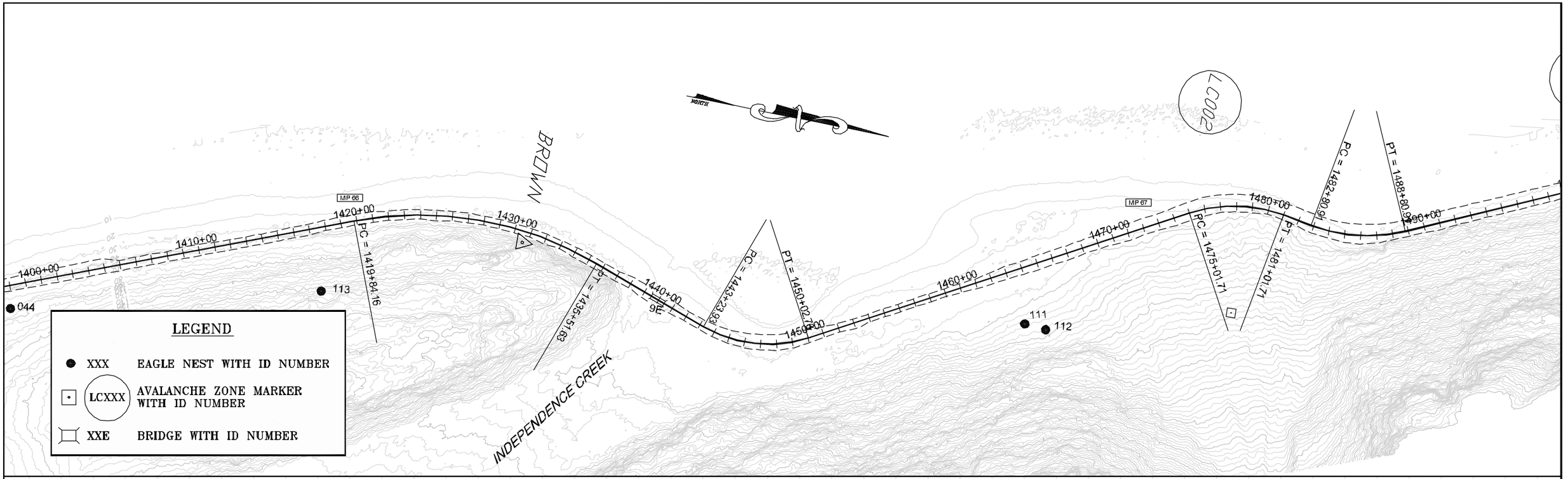
PATH:		
BY:	DATE:	DESCRIPTION OF CHANGE:
RECORD OF REVISIONS		

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
SOUTHEAST REGION DESIGN & CONSTRUCTION

JUNEAU *JUNEAU ACCESS PROJECT NO. 71100* *ALASKA*

EAST LYNN CANAL
STA. 1306+00 TO STA. 1401+00

DESIGNED BY:	PROJECT NO. *71100*
DRAWN BY:	DATE: *2004*
CHECKED BY:	SHEET *15* OF *39*



PATH:		
BY:	DATE:	DESCRIPTION OF CHANGE:

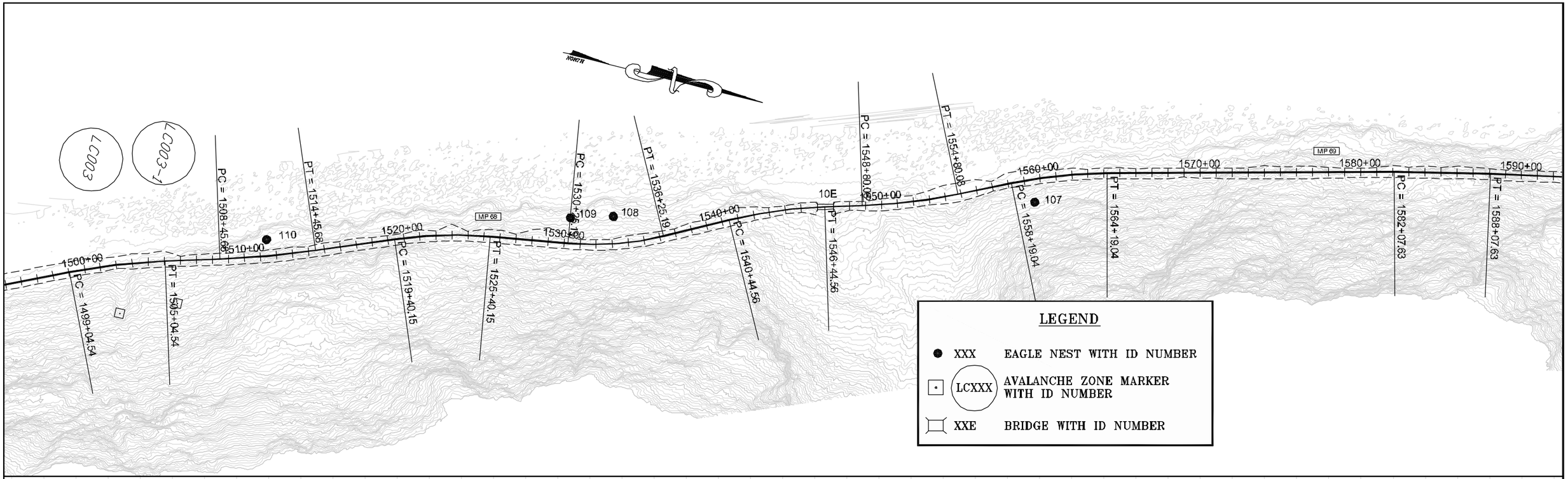
RECORD OF REVISIONS

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
SOUTHEAST REGION DESIGN & CONSTRUCTION

JUNEAU *JUNEAU ACCESS PROJECT NO. 71100* *ALASKA*

EAST LYNN CANAL
STA. 1401+00 TO STA. 1496+00

DESIGNED BY:	PROJECT NO. *71100*
DRAWN BY:	DATE: *2004*
CHECKED BY:	SHEET *16* OF *39*



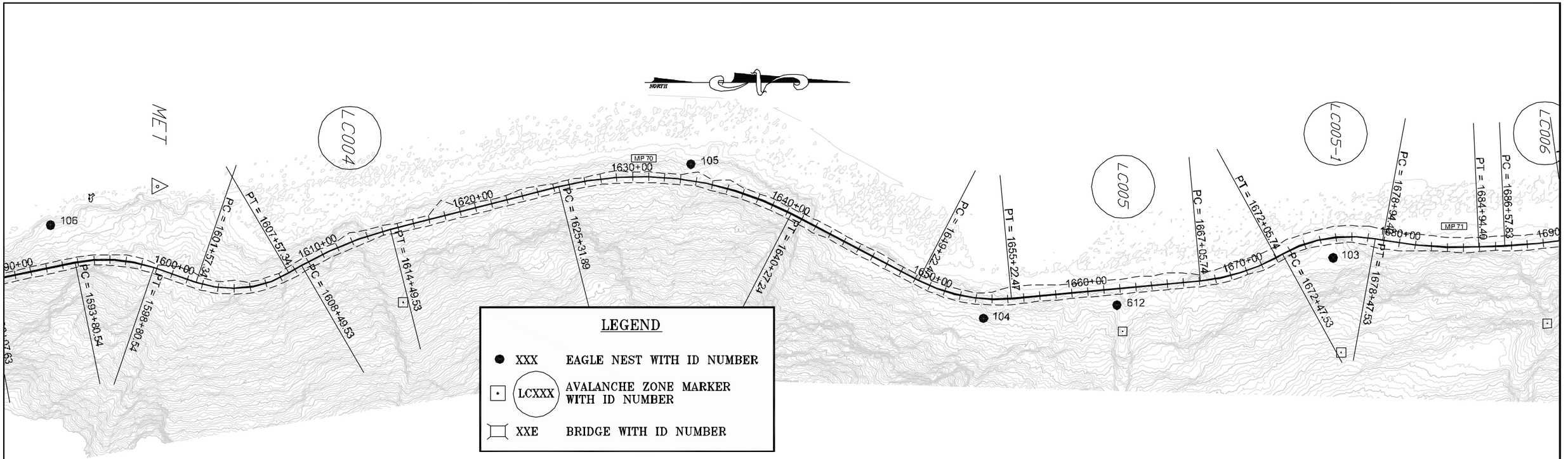
PATH:		
BY:	DATE:	DESCRIPTION OF CHANGE:
RECORD OF REVISIONS		

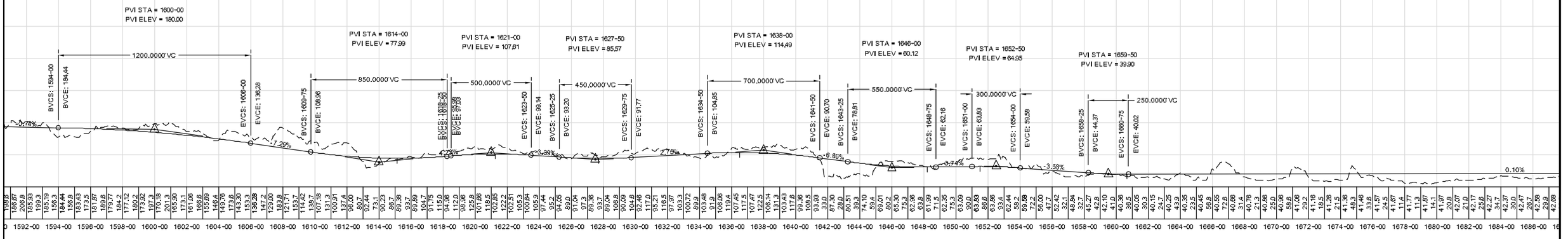
STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
SOUTHEAST REGION DESIGN & CONSTRUCTION

JUNEAU *JUNEAU ACCESS PROJECT NO. 71100* *ALASKA*

EAST LYNN CANAL
STA. 1496+00 TO STA. 1592+00

DESIGNED BY:	PROJECT NO. 71100
DRAWN BY:	DATE: 2004
CHECKED BY:	SHEET 17 OF 39





PATH:		
BY:	DATE:	DESCRIPTION OF CHANGE:

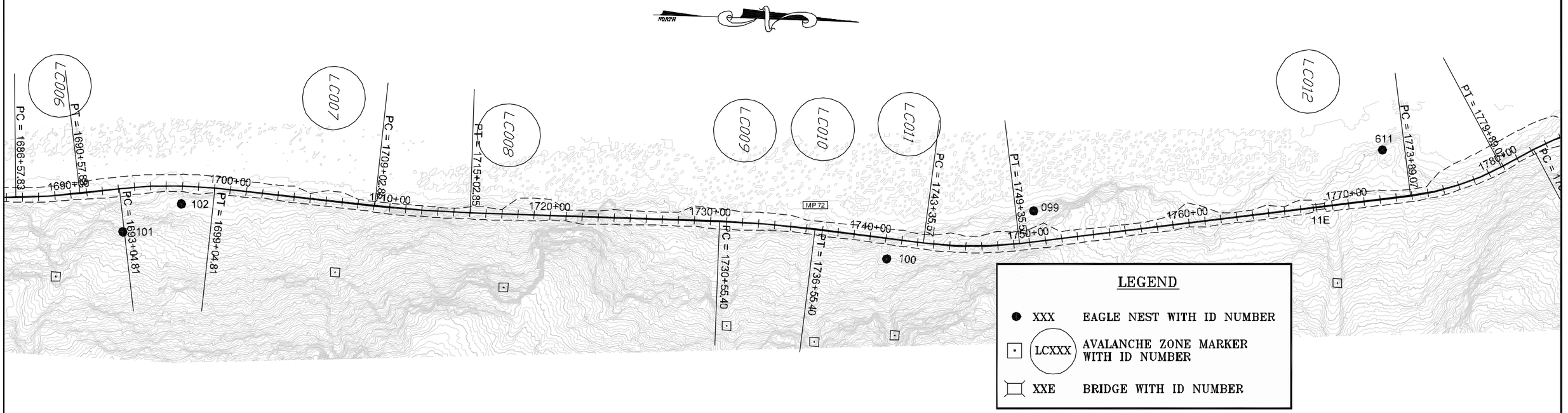
RECORD OF REVISIONS

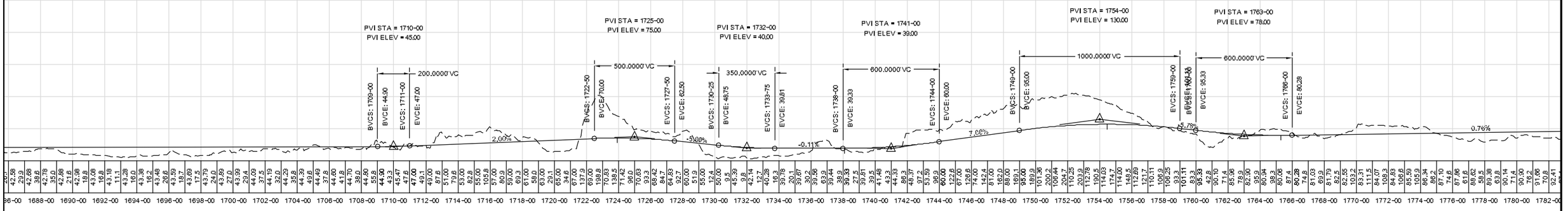
STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
SOUTHEAST REGION DESIGN & CONSTRUCTION

JUNEAU *JUNEAU ACCESS* *ALASKA*
PROJECT NO. 71100

EAST LYNN CANAL
STA. 1592+00 TO STA. 1687+00

DESIGNED BY:	PROJECT NO. *71100*
DRAWN BY:	DATE: *2004*
CHECKED BY:	SHEET *18* OF *39*





PATH:		
BY:	DATE:	DESCRIPTION OF CHANGE:

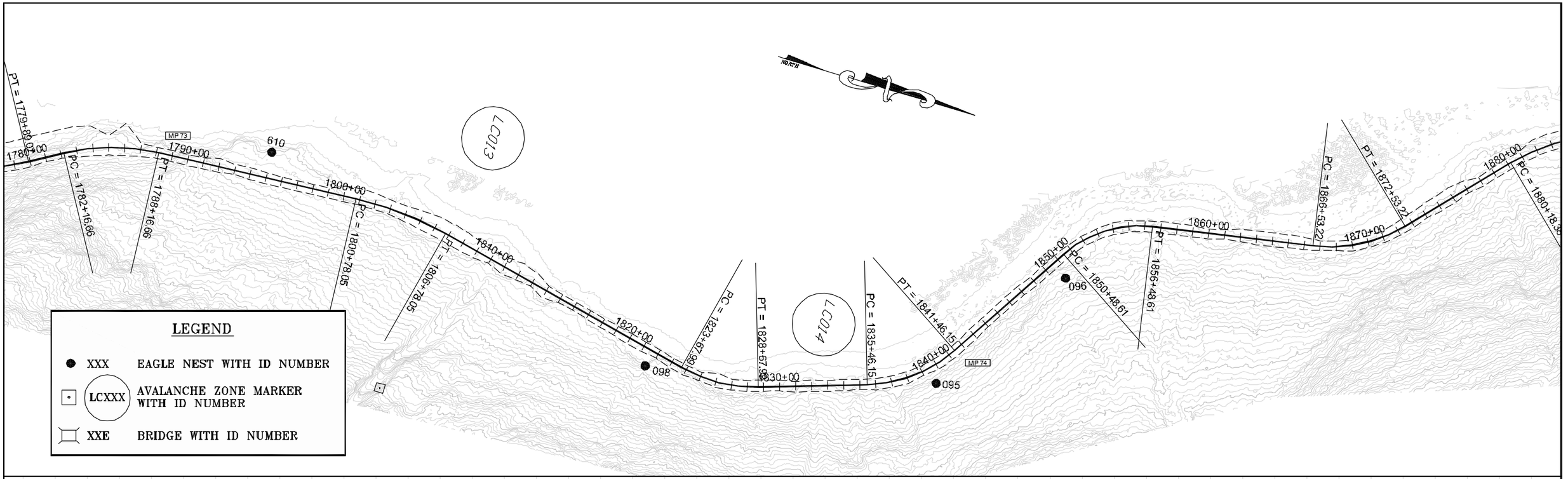
RECORD OF REVISIONS

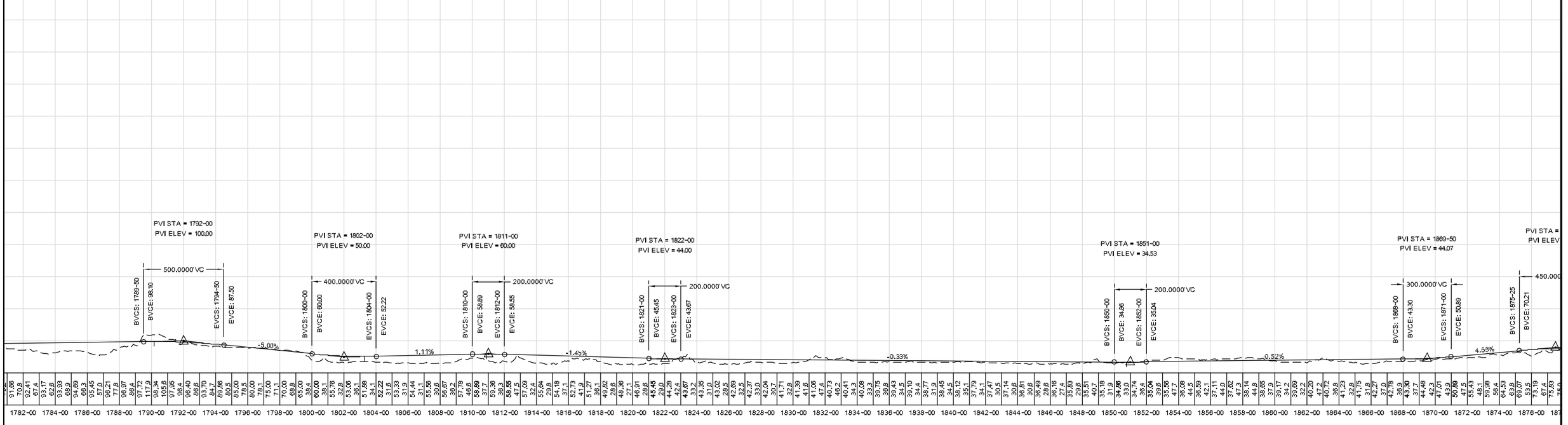
STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
SOUTHEAST REGION DESIGN & CONSTRUCTION

JUNEAU *JUNEAU ACCESS* *ALASKA*
PROJECT NO. 71100

EAST LYNN CANAL
STA. 1687+00 TO STA. 1782+00

DESIGNED BY:	PROJECT NO. *71100*
DRAWN BY:	DATE: *2004*
CHECKED BY:	SHEET *19* OF *39*





PATH:		
BY:	DATE:	DESCRIPTION OF CHANGE:

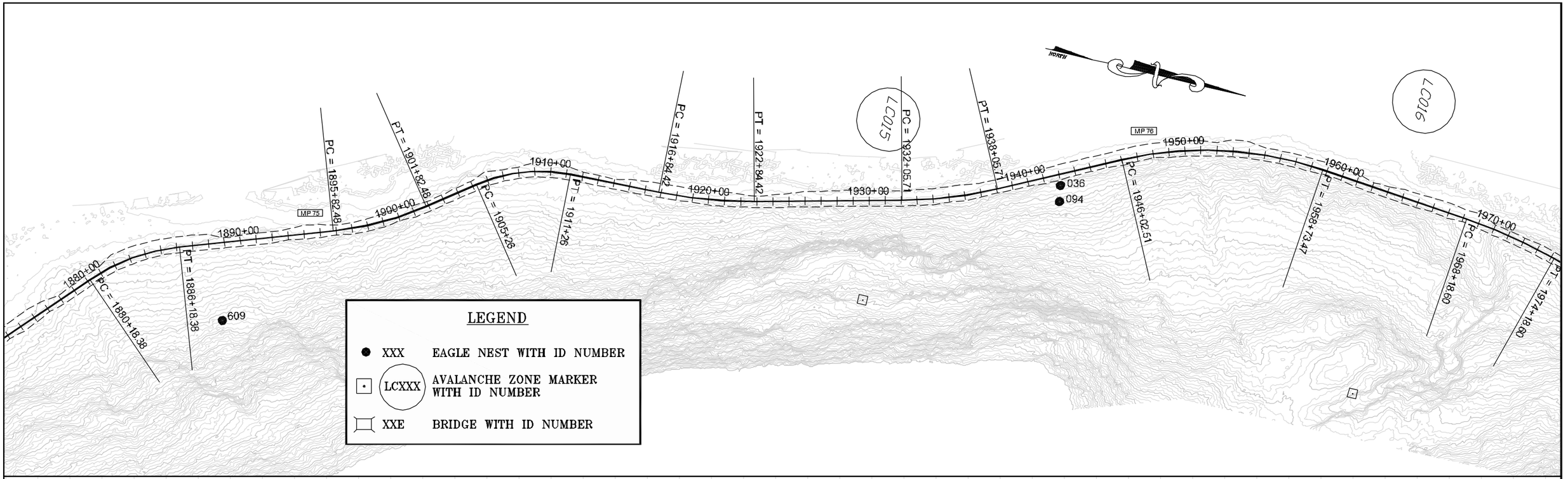
RECORD OF REVISIONS

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
SOUTHEAST REGION DESIGN & CONSTRUCTION

JUNEAU *JUNEAU ACCESS* *ALASKA*
PROJECT NO. 71100

EAST LYNN CANAL
STA. 1782+00 TO STA. 1877+00

DESIGNED BY:	PROJECT NO. *71100*
DRAWN BY:	DATE: *2004*
CHECKED BY:	SHEET *20* OF *39*



PATH:		
BY:	DATE:	DESCRIPTION OF CHANGE:

RECORD OF REVISIONS

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
SOUTHEAST REGION DESIGN & CONSTRUCTION

JUNEAU *JUNEAU ACCESS* *ALASKA*
PROJECT NO. 71100

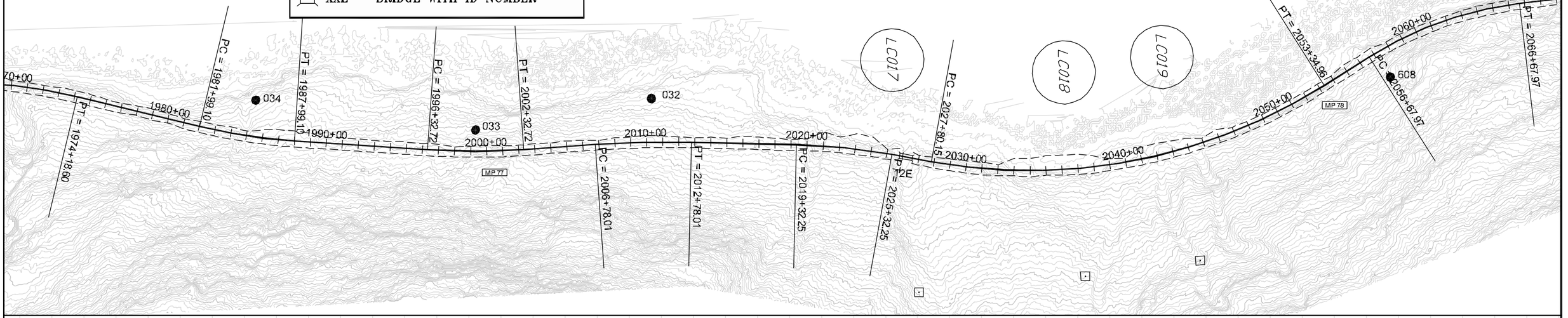
EAST LYNN CANAL
STA. 1877+00 TO STA. 1972+00

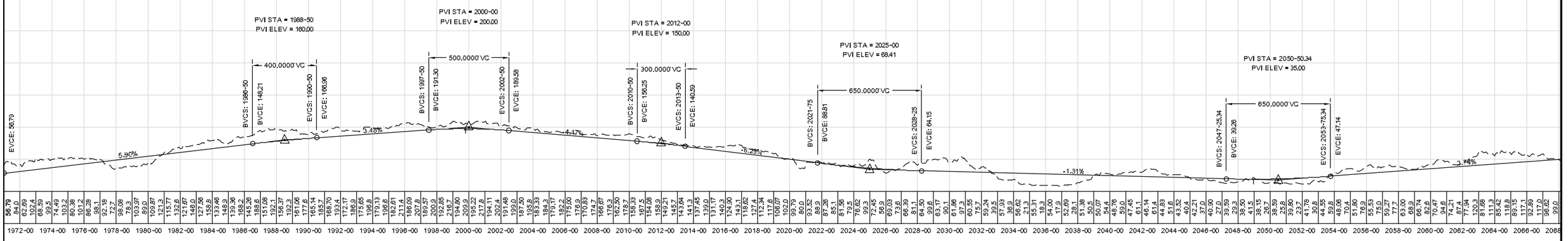
DESIGNED BY:	PROJECT NO. *71100*
DRAWN BY:	DATE: *2004*
CHECKED BY:	SHEET *21* OF *39*

LEGEND

- XXX — EAGLE NEST WITH ID NUMBER
- LCXXX — AVALANCHE ZONE MARKER WITH ID NUMBER
- XXE — BRIDGE WITH ID NUMBER

NORTH





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56.79	84.0	62.89	103.4	65.59	99.5	74.49	103.2	80.38	101.2	86.28	98.1	92.18	97.2	98.08	78.3	103.97	89.0	109.87	121.3	115.77	132.8	121.67	149.0	127.56	158.8	133.46	148.9	139.36	169.2	145.26	188.8	151.06	178.1	156.37	192.3	161.06	177.8	165.14	185.7	168.70	193.4	172.17	197.3	175.65	196.8	179.13	196.8	182.61	211.4	186.09	207.8	189.57	202.3	192.85	216.7	194.80	209.9	195.22	217.8	194.11	202.4	191.48	189.0	187.85	195.8	183.33	184.3	179.17	182.2	175.00	178.3	170.83	176.7	166.67	176.3	162.50	178.7	158.33	167.5	154.08	158.9	149.21	145.7	144.64	141.3	137.45	139.0	131.17	140.3	124.30	143.1	118.62	122.4	112.94	117.8	106.07	102.0	99.70	80.0	93.52	88.9	87.26	81.1	81.68	79.5	76.62	99.3	72.45	56.9	69.03	73.8	66.39	81.1	64.80	99.8	63.17	90.1	61.86	97.3	60.55	75.7	59.24	57.5	57.93	36.2	56.62	21.3	55.31	18.3	54.00	17.9	52.69	28.1	51.38	51.5	50.07	54.4	48.76	59.0	47.45	61.1	46.14	61.4	44.83	53.6	43.52	40.4	42.21	37.0	40.90	27.0	39.59	23.3	38.30	41.5	38.15	28.7	36.89	25.8	39.80	23.7	41.78	30.8	44.35	39.8	46.06	70.4	51.80	76.9	55.53	75.0	59.27	77.7	63.00	68.4	66.74	82.6	70.47	94.8	74.21	87.4	77.94	120.3	81.68	111.3	85.42	118.8	89.15	117.1	92.89	117.0	96.62	99.0

PATH:		
BY:	DATE:	DESCRIPTION OF CHANGE:

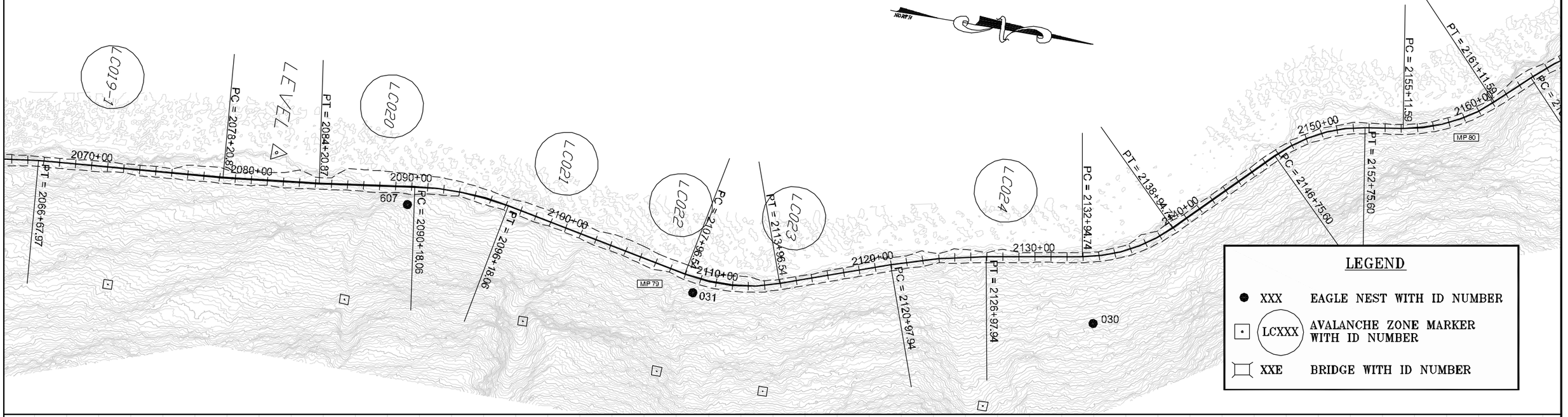
RECORD OF REVISIONS

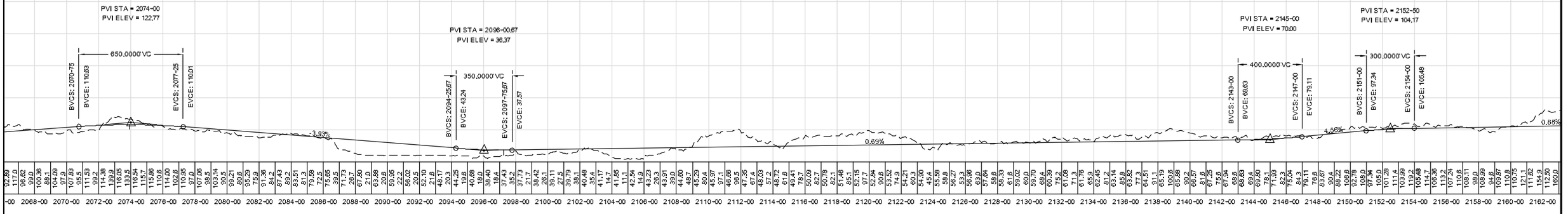
STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
SOUTHEAST REGION DESIGN & CONSTRUCTION

JUNEAU — *JUNEAU ACCESS PROJECT NO. 71100* — *ALASKA*

EAST LYNN CANAL
STA. 1972+00 TO STA. 2067+00

DESIGNED BY:	PROJECT NO. *71100*
DRAWN BY:	DATE: *2004*
CHECKED BY:	SHEET *22* OF *39*





PATH:		
BY:	DATE:	DESCRIPTION OF CHANGE:

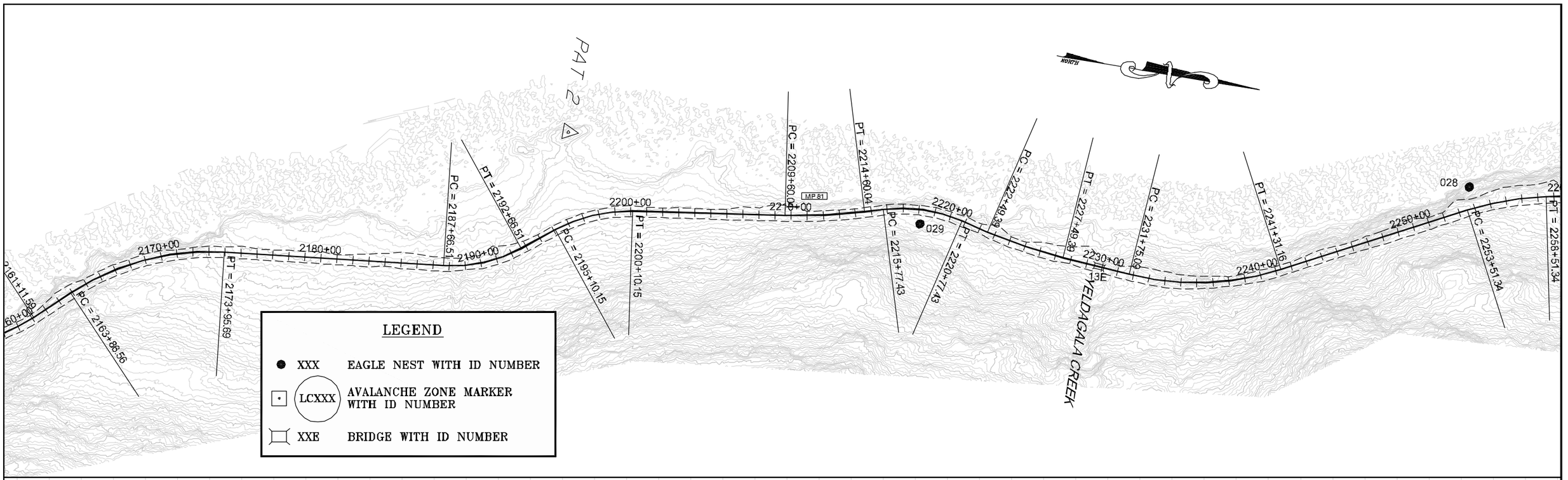
RECORD OF REVISIONS

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
SOUTHEAST REGION DESIGN & CONSTRUCTION

JUNEAU *JUNEAU ACCESS* *ALASKA*
PROJECT NO. 71100

EAST LYNN CANAL
STA. 2067+00 TO STA. 2162+00

DESIGNED BY:	PROJECT NO. *71100*
DRAWN BY:	DATE: *2004*
CHECKED BY:	SHEET *23* OF *39*



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BY:	DATE:	DESCRIPTION OF CHANGE:
RECORD OF REVISIONS		

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
SOUTHEAST REGION DESIGN & CONSTRUCTION

JUNEAU *JUNEAU ACCESS* *ALASKA*
PROJECT NO. 71100

EAST LYNN CANAL
STA. 2162+00 TO STA. 2257+00

DESIGNED BY:	PROJECT NO. *71100*
DRAWN BY:	DATE: *2004*
CHECKED BY:	SHEET *24* OF *39*

LEGEND

- XXX — EAGLE NEST WITH ID NUMBER
- LCXXX — AVALANCHE ZONE MARKER WITH ID NUMBER
- XXE — BRIDGE WITH ID NUMBER

NORTH

LC025 LC026 LC026-1 LC027 LC028-1 LC028-2 LC029 LC030

GRAN

MP 82 MP 83

2260+00 2270+00 2280+00 2290+00 2300+00 2310+00 2320+00 2330+00 2340+00 2350+00

PT = 2258+51.34
PC = 2266+88.92
PT = 2271+88.92
PC = 2272+91.64
PT = 2277+91.64
PC = 2285+26.64
PT = 2290+26.64
PC = 2291+55.02
PT = 2296+55.02
PC = 2297+23.08
PT = 2301+23.08
PC = 2305+59.81
PC = 2306+60.43
PT = 2311+60.43
PC = 2319+47.38
PT = 2330+00.00
PC = 2332+23.96
PT = 2338+23.96
PC = 2351+16.77

027 026 606 605

14E 15E

PVI STA = 2271-00
PVI ELEV = 70.00
400.0000' VC
BVCS: 2269-00
BVCE: 83.00
EVCS: 2273-00
EVCE: 67.52
-6.50%
-1.24%

PVI STA = 2282-00
PVI ELEV = 56.38
550.0000' VC
BVCS: 2279-25
BVCE: 59.78
EVCS: 2284-75
EVCE: 74.20
6.46%

PVI STA = 2289-50
PVI ELEV = 105.00
550.0000' VC
BVCS: 2286-75
BVCE: 87.17
EVCS: 2292-25
EVCE: 103.38
-0.59%

PVI STA = 2298-00
PVI ELEV = 100.00
375.0000' VC
BVCS: 2296-12.50
BVCE: 101.10
EVCS: 2299-87.50
EVCE: 86.25
-8.00%

PVI STA = 2304-00
PVI ELEV = 70.00
650.0000' VC
BVCS: 2307-25
BVCE: 84.00
4.31%

PVI STA = 2310-50
PVI ELEV = 98.00
300.0000' VC
BVCS: 2309-00
BVCE: 91.54
EVCS: 2312-00
EVCE: 101.14
2.10%

PVI STA = 2321-00
PVI ELEV = 120.00
400.0000' VC
BVCS: 2319-00
BVCE: 115.81
EVCS: 2323-00
EVCE: 133.13
6.88%

PVI STA = 2337-00
PVI ELEV = 225.00
900.0000' VC
BVCS: 2332-50
BVCE: 195.47
EVCS: 2341-50
EVCE: 193.35
-7.03%

PVI STA = 2348-50
PVI ELEV = 1000.
BVCS: 2348-50
BVCE: 144.11

PATH:		
BY:	DATE:	DESCRIPTION OF CHANGE:

RECORD OF REVISIONS

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
SOUTHEAST REGION DESIGN & CONSTRUCTION

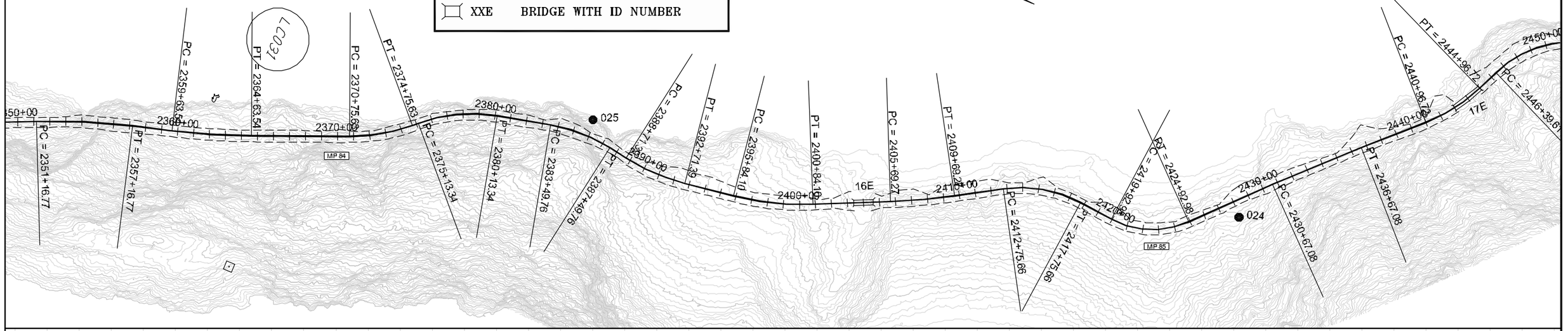
JUNEAU *JUNEAU ACCESS* *ALASKA*
PROJECT NO. 71100

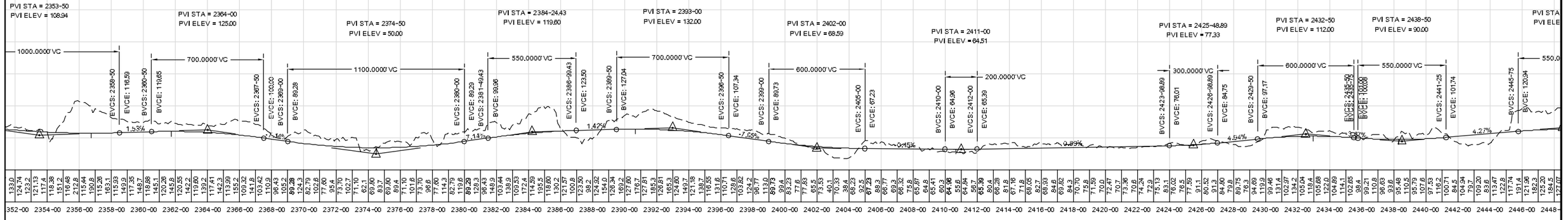
EAST LYNN CANAL
STA. 2257+00 TO STA. 2352+00

DESIGNED BY:	PROJECT NO. *71100*
DRAWN BY:	DATE: *2004*
CHECKED BY:	SHEET *25* OF *39*

LEGEND

- XXX — EAGLE NEST WITH ID NUMBER
- LCXXX — AVALANCHE ZONE MARKER WITH ID NUMBER
- XXE — BRIDGE WITH ID NUMBER





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BY:	DATE:	DESCRIPTION OF CHANGE:

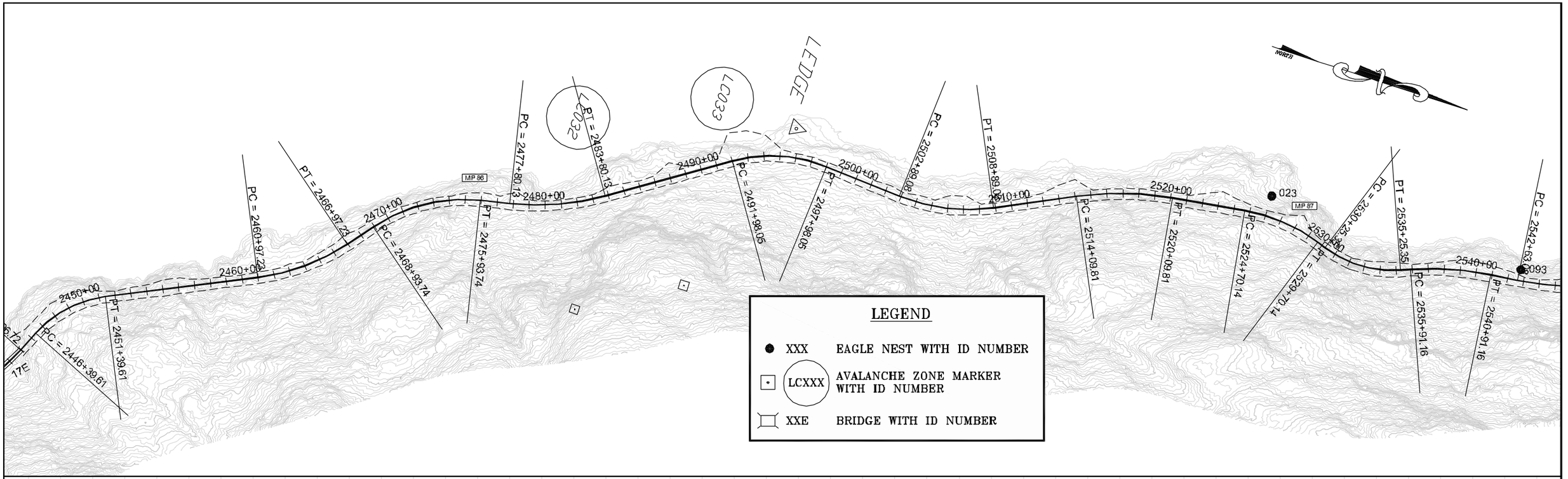
RECORD OF REVISIONS

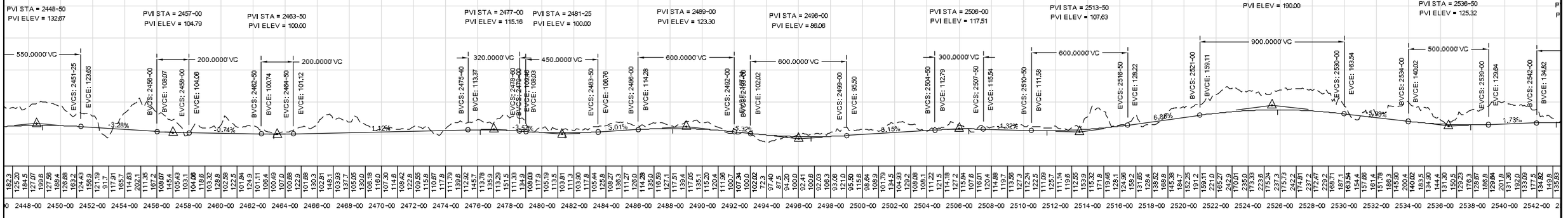
STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
SOUTHEAST REGION DESIGN & CONSTRUCTION

JUNEAU — *JUNEAU ACCESS PROJECT NO. 71100* — *ALASKA*

EAST LYNN CANAL
STA. 2352+00 TO STA. 2497+00

DESIGNED BY:	PROJECT NO. *71100*
DRAWN BY:	DATE: *2004*
CHECKED BY:	SHEET *26* OF *39*





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BY:	DATE:	DESCRIPTION OF CHANGE:

RECORD OF REVISIONS

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
SOUTHEAST REGION DESIGN & CONSTRUCTION

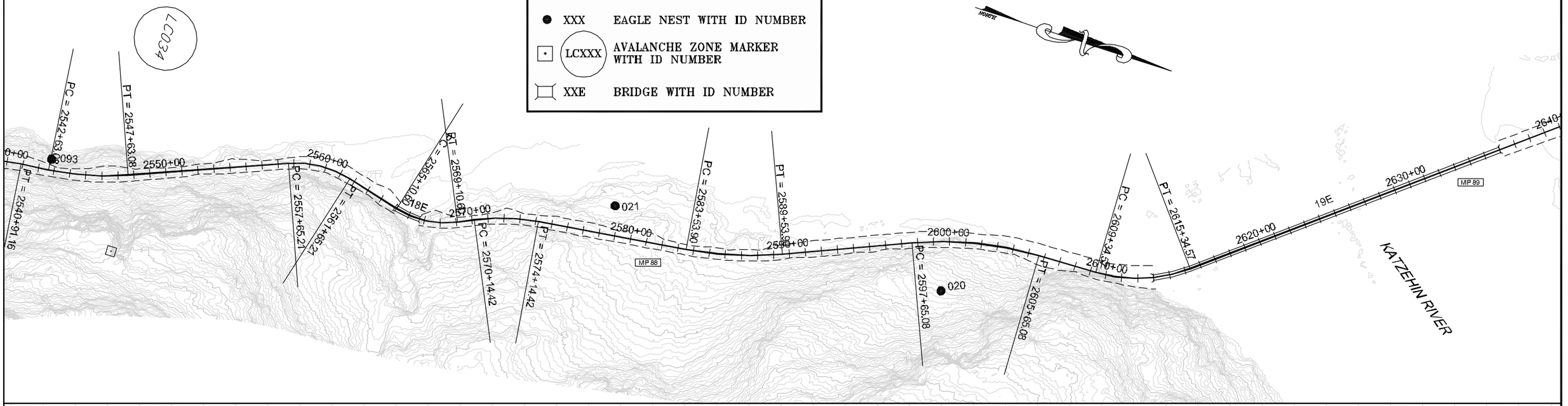
JUNEAU *JUNEAU ACCESS* *ALASKA*
PROJECT NO. 71100

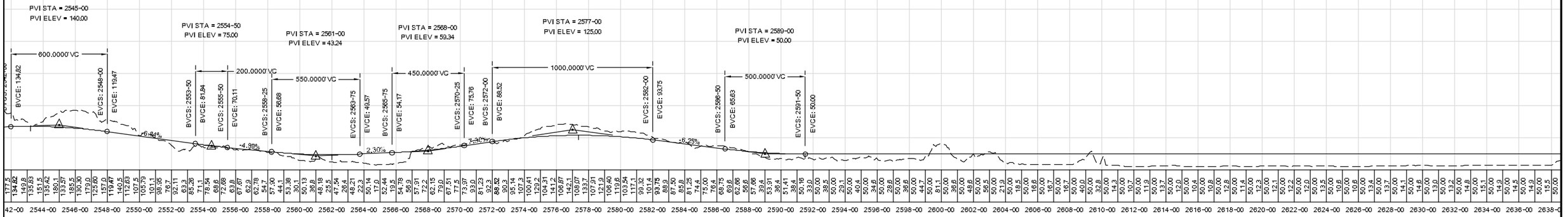
EAST LYNN CANAL
STA. 2447+00 TO STA. 2542+00

DESIGNED BY:	PROJECT NO. *71100*
DRAWN BY:	DATE: *2004*
CHECKED BY:	SHEET *27* OF *39*

LEGEND

- XXX — EAGLE NEST WITH ID NUMBER
- LCXXX — AVALANCHE ZONE MARKER WITH ID NUMBER
- XXE — BRIDGE WITH ID NUMBER





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BY:	DATE:	DESCRIPTION OF CHANGE:

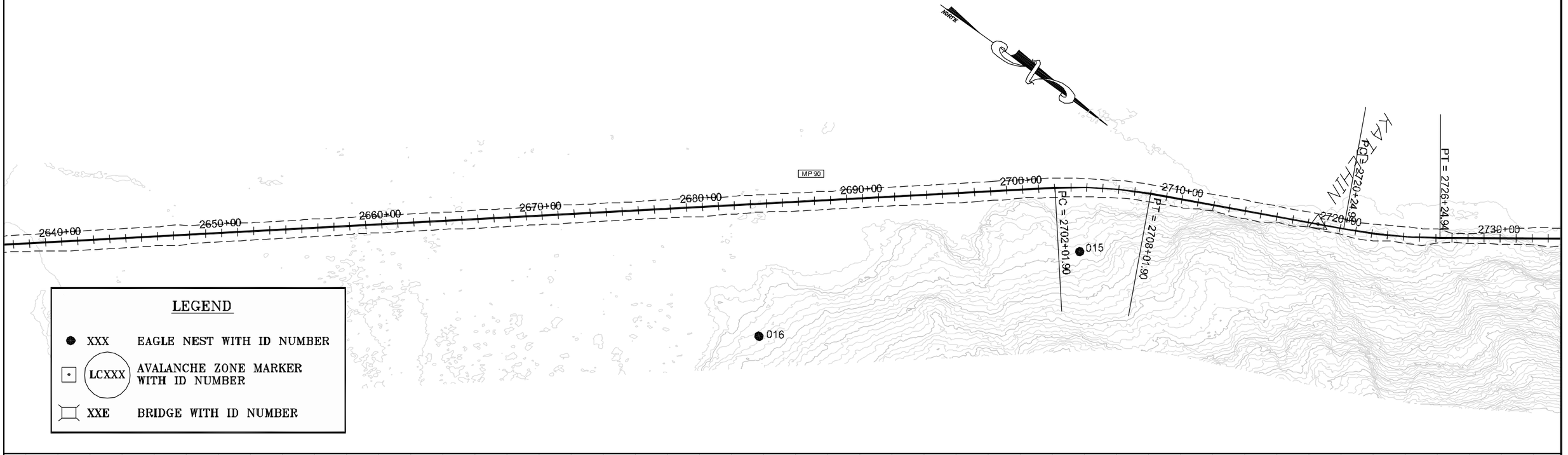
RECORD OF REVISIONS

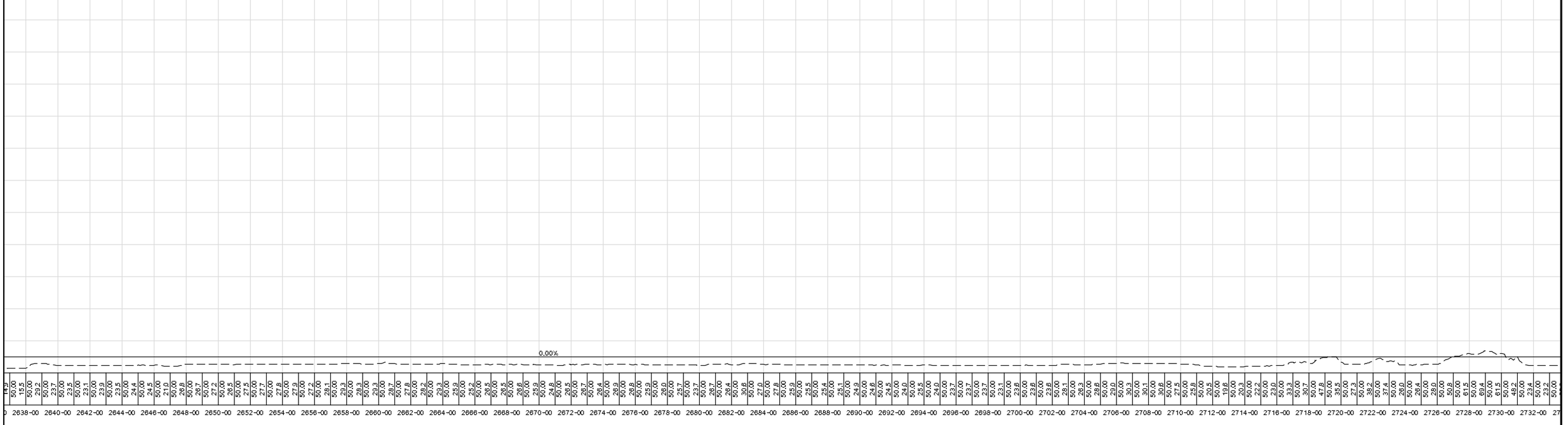
STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
SOUTHEAST REGION DESIGN & CONSTRUCTION

JUNEAU — *JUNEAU ACCESS PROJECT NO. 71100* — *ALASKA*

EAST LYNN CANAL
STA. 2542+00 TO STA. 2638+00

DESIGNED BY:	PROJECT NO. *71100*
DRAWN BY:	DATE: *2004*
CHECKED BY:	SHEET *28* OF *39*





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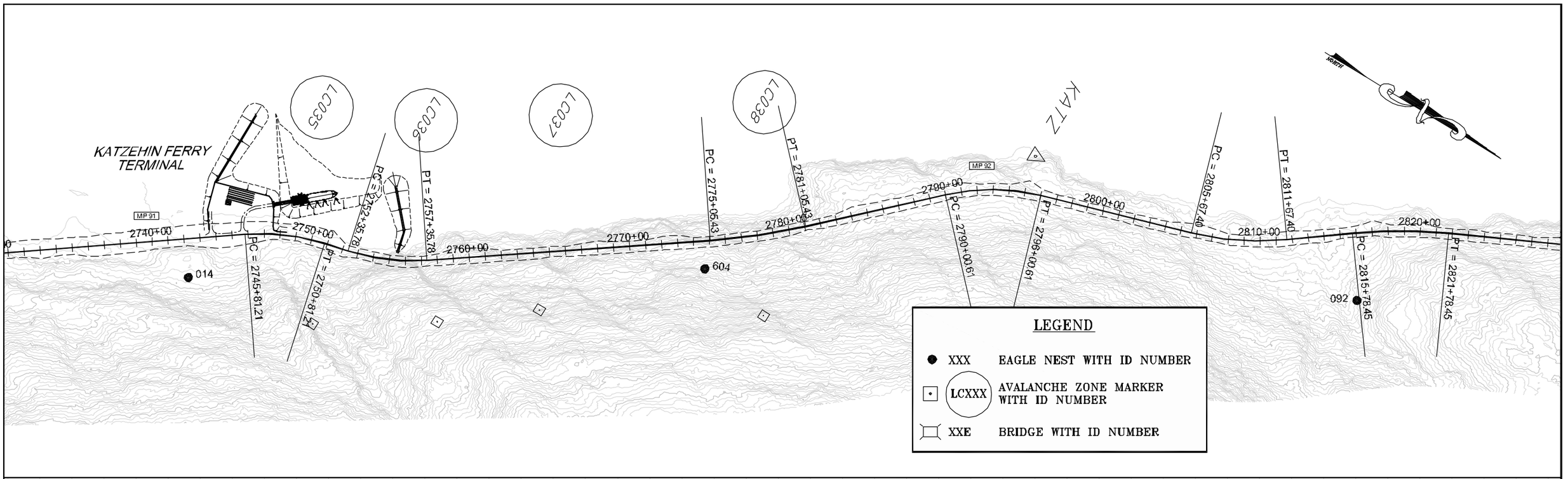
RECORD OF REVISIONS

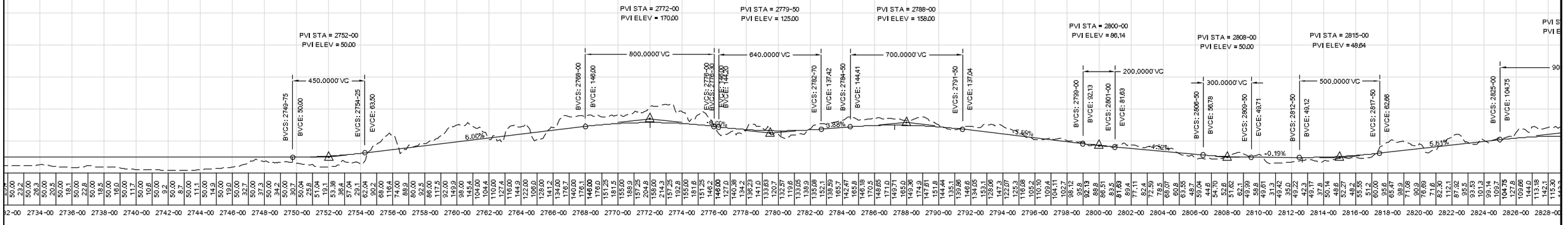
STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
SOUTHEAST REGION DESIGN & CONSTRUCTION

JUNEAU *JUNEAU ACCESS* *ALASKA*
PROJECT NO. 71100

EAST LYNN CANAL
STA. 2638+00 TO STA. 2733+00

DESIGNED BY:	PROJECT NO. *71100*
DRAWN BY:	DATE: *2004*
CHECKED BY:	SHEET *29* OF *39*





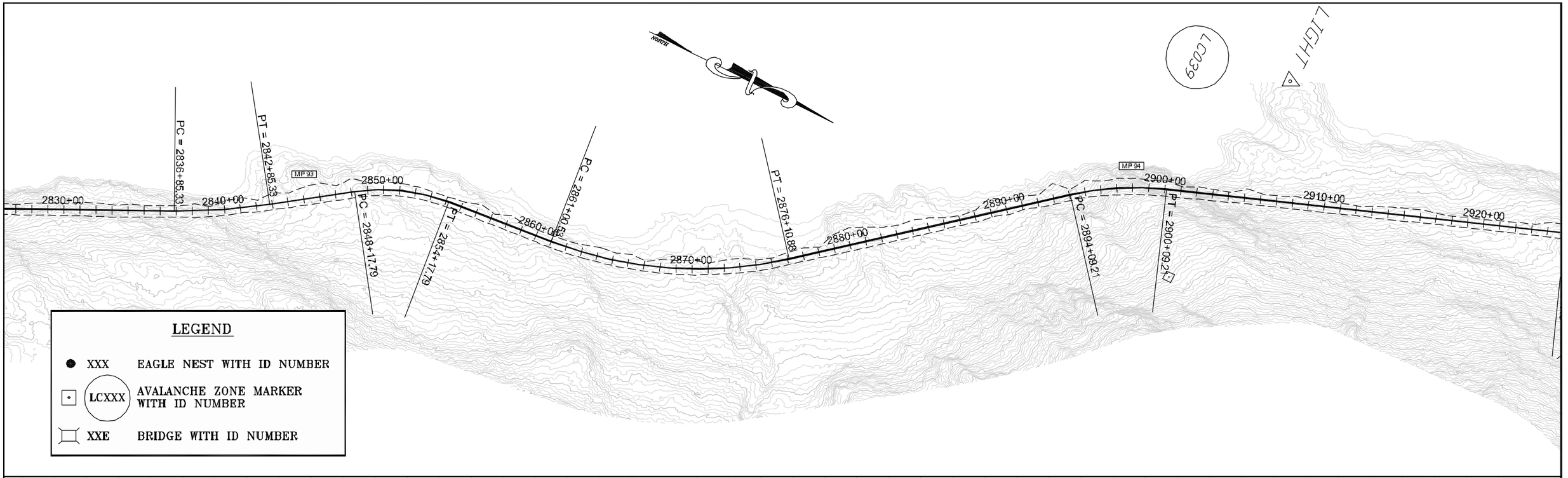
PATH:		
BY:	DATE:	DESCRIPTION OF CHANGE:
RECORD OF REVISIONS		

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
SOUTHEAST REGION DESIGN & CONSTRUCTION

JUNEAU *JUNEAU ACCESS PROJECT NO. 71100* *ALASKA*

EAST LYNN CANAL
STA. 2733+00 TO STA. 2828+00

DESIGNED BY:	PROJECT NO. *71100*
DRAWN BY:	DATE: *2004*
CHECKED BY:	SHEET *30* OF *39*



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BY:	DATE:	DESCRIPTION OF CHANGE:

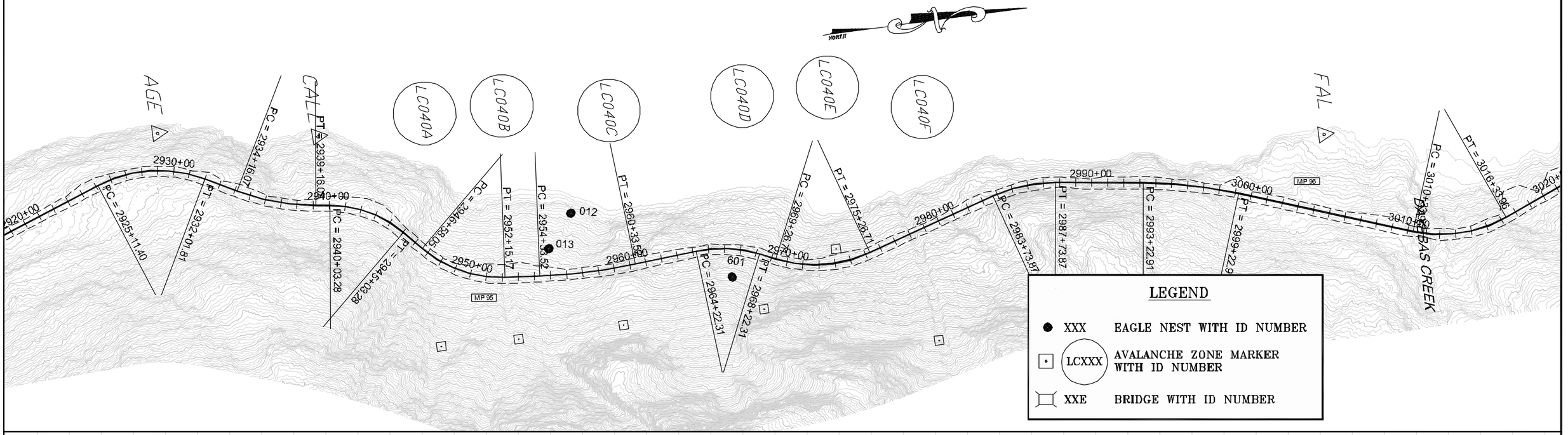
RECORD OF REVISIONS

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
SOUTHEAST REGION DESIGN & CONSTRUCTION

JUNEAU *JUNEAU ACCESS* *ALASKA*
PROJECT NO. 71100

EAST LYNN CANAL
STA. 2828+00 TO STA. 2923+00

DESIGNED BY:	PROJECT NO. *71100*
DRAWN BY:	DATE: *2004*
CHECKED BY:	SHEET *31* OF *39*



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BY:	DATE:	DESCRIPTION OF CHANGE:

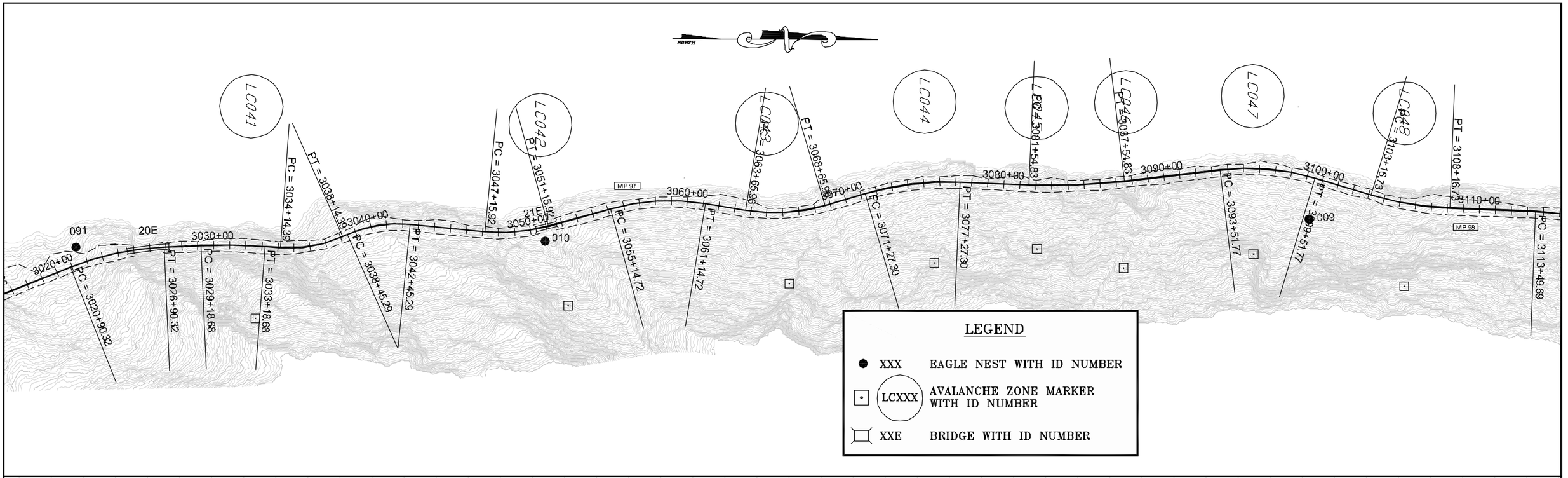
RECORD OF REVISIONS

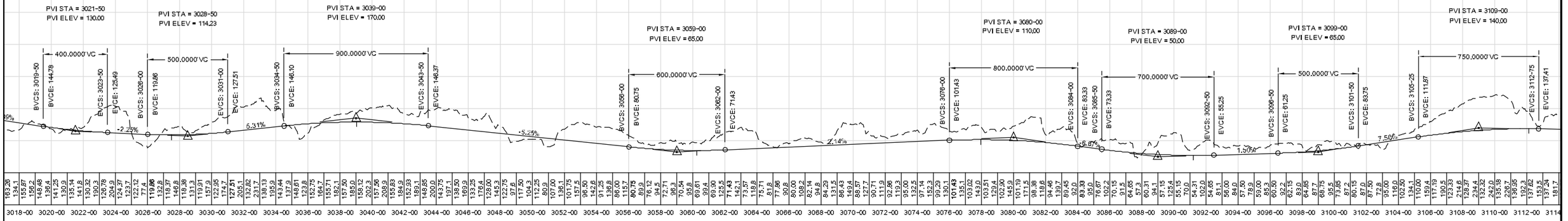
STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
SOUTHEAST REGION DESIGN & CONSTRUCTION

JUNEAU *JUNEAU ACCESS* *ALASKA*
PROJECT NO. 71100

EAST LYNN CANAL
STA. 2923+00 TO STA. 3018+00

DESIGNED BY:	PROJECT NO. *71100*
DRAWN BY:	DATE: *2004*
CHECKED BY:	SHEET *32* OF *39*





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BY:	DATE:	DESCRIPTION OF CHANGE:

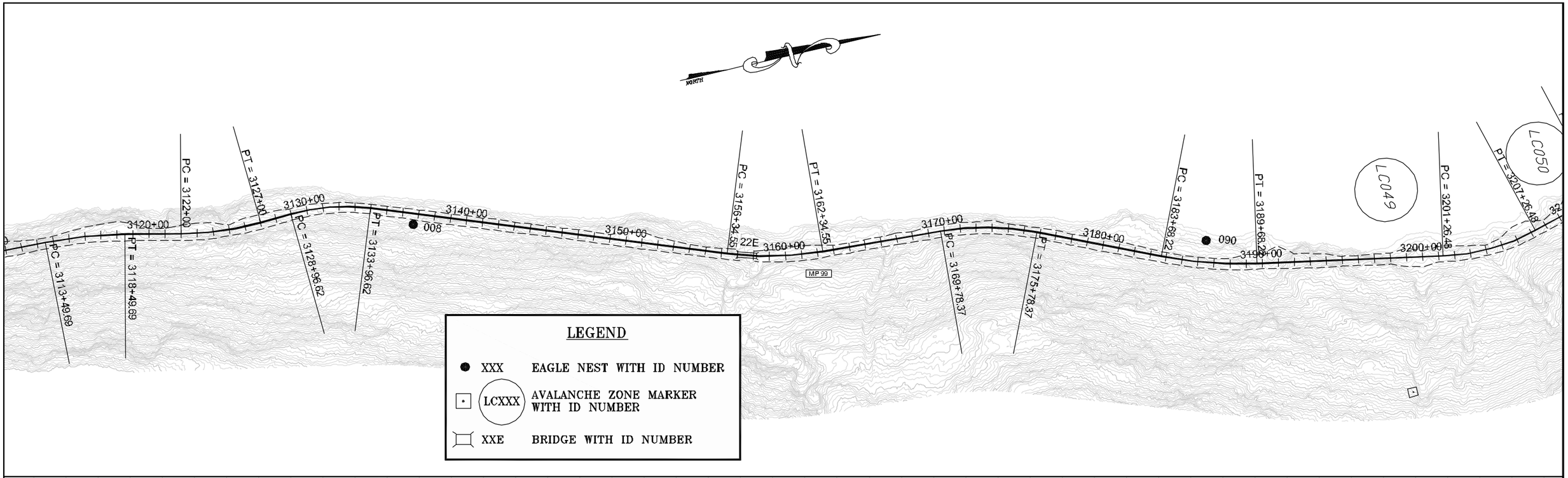
RECORD OF REVISIONS

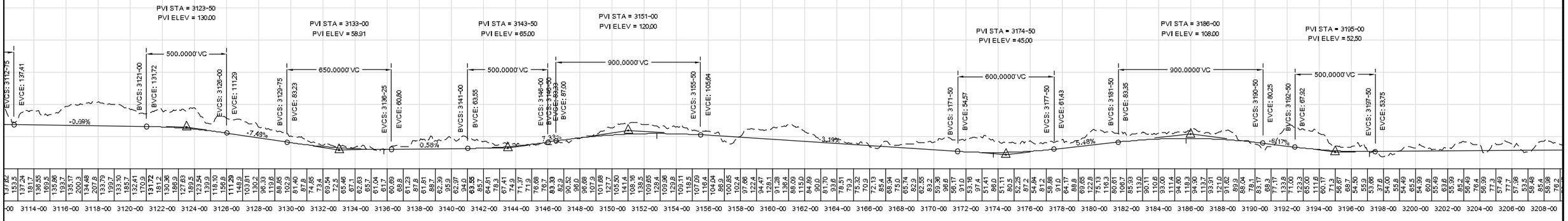
STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
SOUTHEAST REGION DESIGN & CONSTRUCTION

JUNEAU *JUNEAU ACCESS* *ALASKA*
PROJECT NO. 71100

EAST LYNN CANAL
STA. 3018+00 TO STA. 3113+00

DESIGNED BY:	PROJECT NO. *71100*
DRAWN BY:	DATE: *2004*
CHECKED BY:	SHEET *33* OF *39*





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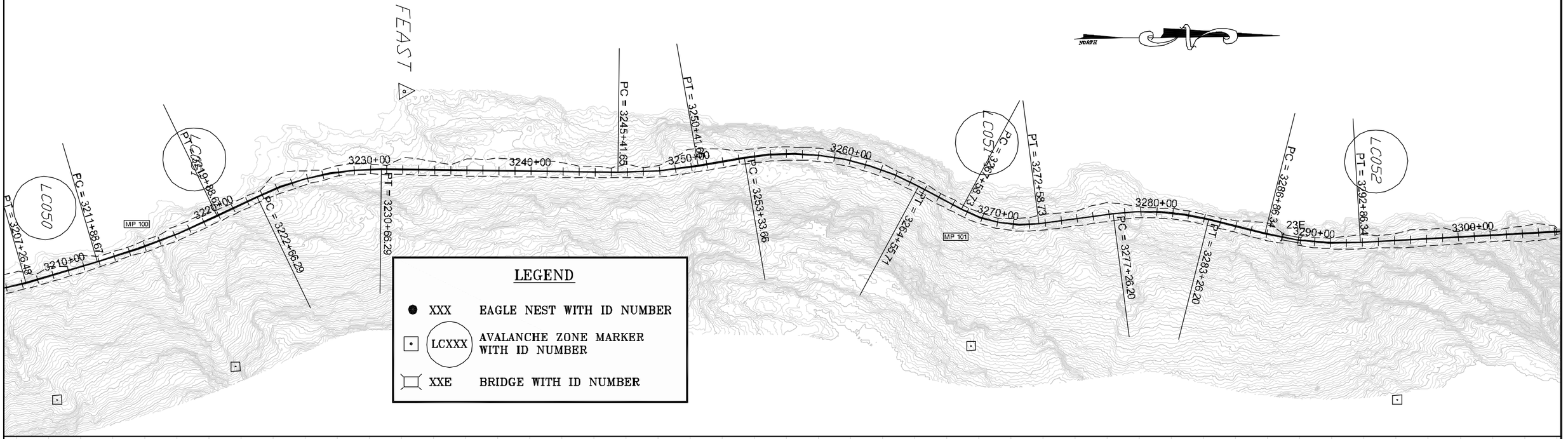
RECORD OF REVISIONS

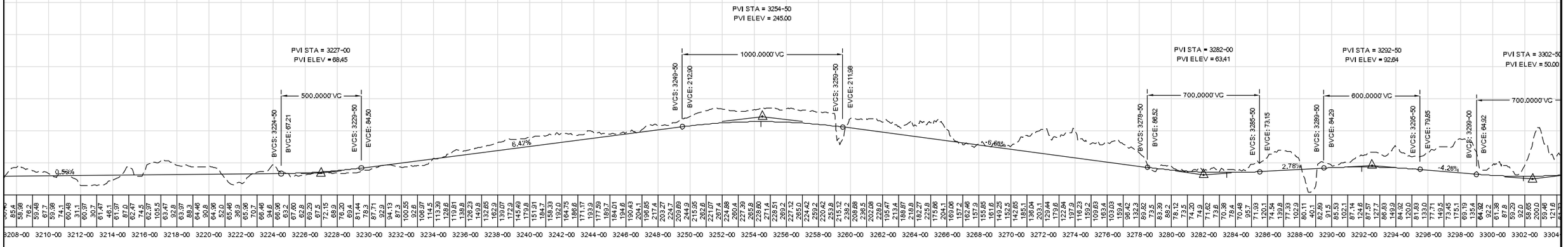
STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
SOUTHEAST REGION DESIGN & CONSTRUCTION

JUNEAU *JUNEAU ACCESS PROJECT NO. 71100* *ALASKA*

EAST LYNN CANAL
STA. 3113+00 TO STA. 3208+00

DESIGNED BY:	PROJECT NO. *71100*
DRAWN BY:	DATE: *2004*
CHECKED BY:	SHEET *34* OF *39*





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RECORD OF REVISIONS		

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
SOUTHEAST REGION DESIGN & CONSTRUCTION

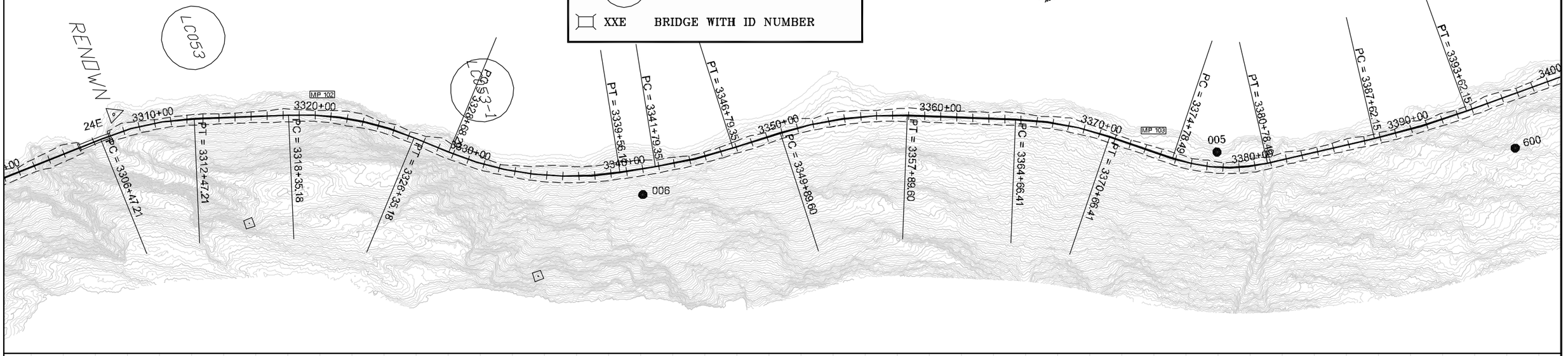
JUNEAU *JUNEAU ACCESS* *ALASKA*
PROJECT NO. 71100

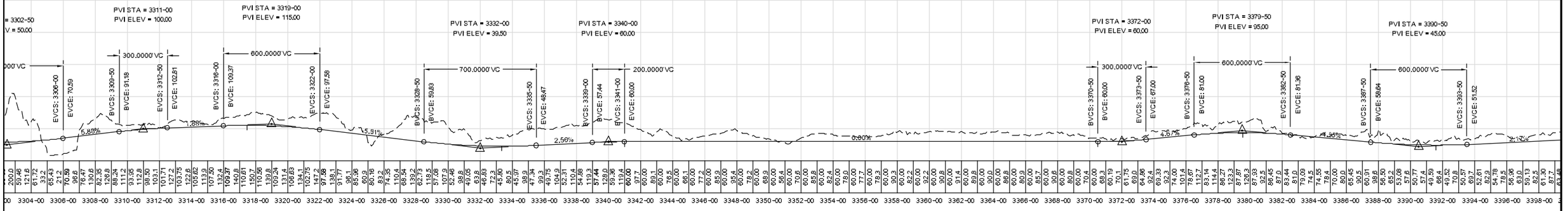
EAST LYNN CANAL
STA. 3208+00 TO STA. 3303+00

DESIGNED BY:	PROJECT NO. *71100*
DRAWN BY:	DATE: *2004*
CHECKED BY:	SHEET *35* OF *39*

LEGEND

- XXX — EAGLE NEST WITH ID NUMBER
- LCXXX — AVALANCHE ZONE MARKER WITH ID NUMBER
- XXE — BRIDGE WITH ID NUMBER





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RECORD OF REVISIONS

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
SOUTHEAST REGION DESIGN & CONSTRUCTION

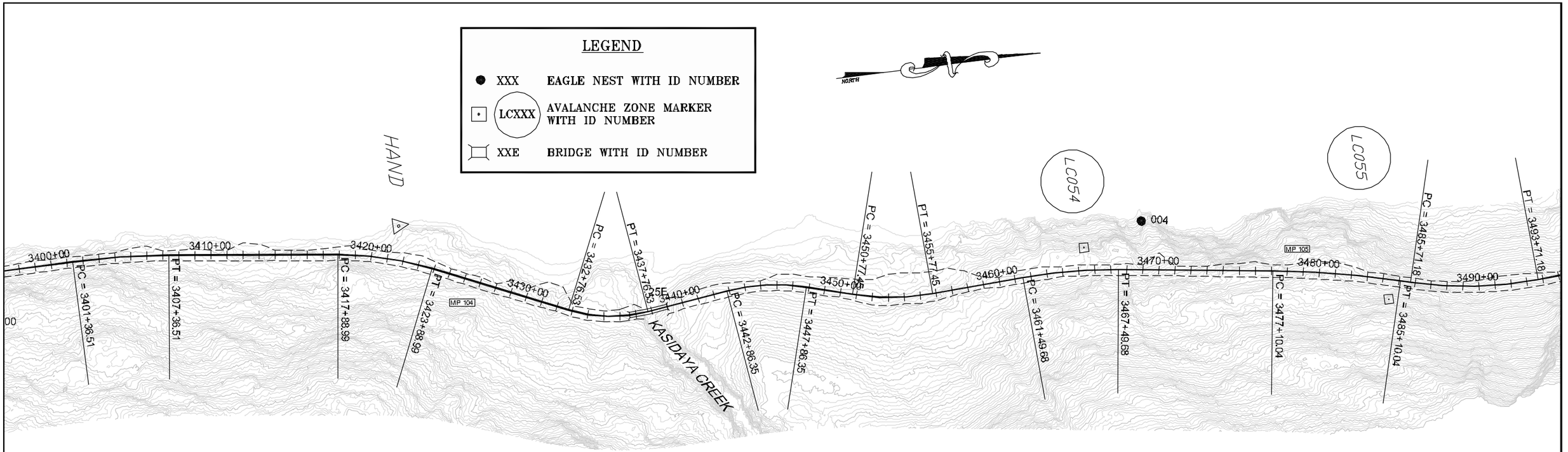
JUNEAU — *JUNEAU ACCESS* — *ALASKA*
PROJECT NO. 71100

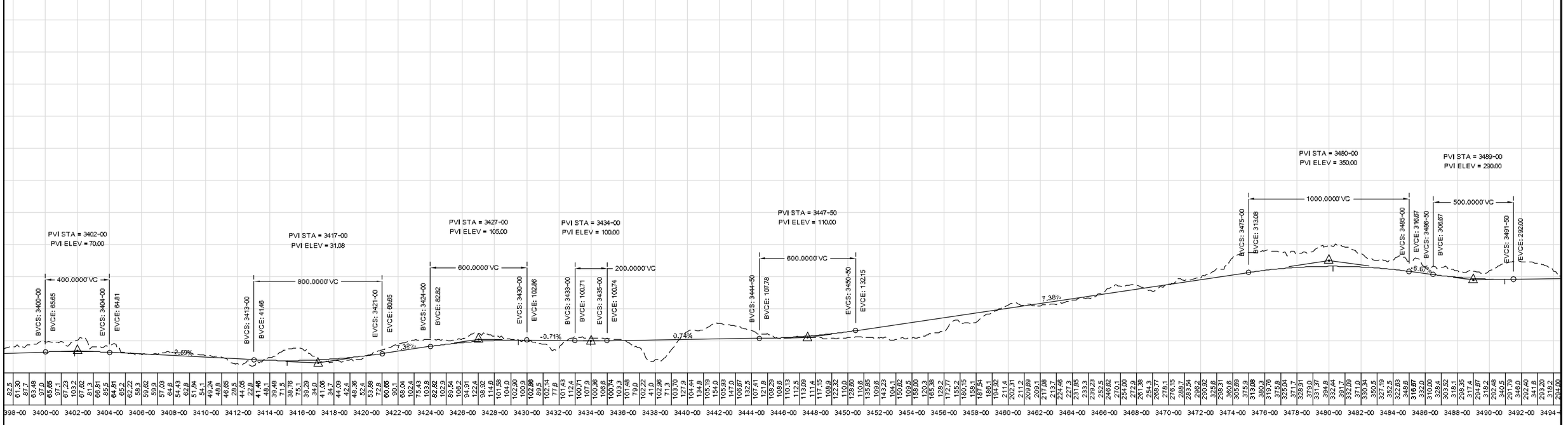
EAST LYNN CANAL
STA. 3303+00 TO STA. 3398+00

DESIGNED BY:	PROJECT NO. *71100*
DRAWN BY:	DATE: *2004*
CHECKED BY:	SHEET *36* OF *39*

LEGEND

- XXX — EAGLE NEST WITH ID NUMBER
- LCXXX — AVALANCHE ZONE MARKER WITH ID NUMBER
- XXE — BRIDGE WITH ID NUMBER





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BY:	DATE:	DESCRIPTION OF CHANGE:

RECORD OF REVISIONS

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
SOUTHEAST REGION DESIGN & CONSTRUCTION

JUNEAU — *JUNEAU ACCESS* — *ALASKA*
PROJECT NO. 71100

EAST LYNN CANAL
STA. 3398+00 TO STA. 3494+00

DESIGNED BY:	PROJECT NO. *71100*
DRAWN BY:	DATE: *2004*
CHECKED BY:	SHEET *37* OF *39*

LEGEND

- XXX — EAGLE NEST WITH ID NUMBER
- LCXXX — AVALANCHE ZONE MARKER WITH ID NUMBER
- XXE — BRIDGE WITH ID NUMBER

LC056
LC056-1
LC056-2
SHAFT
GARB
STURGILL'S LANDING
STURGILLS CREEK
STURGILL'S LANDING TRAIL
002
003
26E
MP 108
MP 107

PT = 3493+71.18
3500+00
PC = 3498+48.69
PT = 3504+48.69
3510+00
PC = 3508+89.43
PT = 3514+89.43
3520+00
PC = 3526+00.68
PT = 3532+00.68
3530+00
PC = 3532+53.74
PT = 3538+53.74
3540+00
3550+00
PC = 3549+81.68
PT = 3558+26.55
3560+00
PC = 3560+11.50
PT = 3568+76.99
3570+00
3580+00
3590+00
PC = 3591+95.45

PVI STA = 3501-50
PVI ELEV = 300.00
200.0000' VC
BVCS: 3500-50
BVCE: 299.20
EVCS: 3502-50
EVCE: 301.95
0.80%
1.95%

PVI STA = 3509-00
PVI ELEV = 314.60
350.0000' VC
BVCS: 3507-25
BVCE: 311.19
EVCS: 3510-75
EVCE: 309.80

PVI STA = 3516-00
PVI ELEV = 294.60
800.0000' VC
BVCS: 3512-00
BVCE: 306.03
2.86%
EVCS: 3520-00
EVCE: 323.35
7.13%

PVI STA = 3550-00
PVI ELEV = 539.00
700.0000' VC
BVCS: 3546-50
BVCE: 513.84
EVCS: 3553-50
EVCE: 527.38
-3.32%

PVI STA = 3560-00
PVI ELEV = 505.80
700.0000' VC
BVCS: 3556-50
BVCE: 517.42
EVCS: 3563-50
EVCE: 522.36
4.74%

PVI STA = 3582-00
PVI ELEV = 610.00
300.0000' VC
BVCS: 3580-50
BVCE: 602.30
EVCS: 3583-50
EVCE: 621.61
7.74%

PATH:		
BY:	DATE:	DESCRIPTION OF CHANGE:

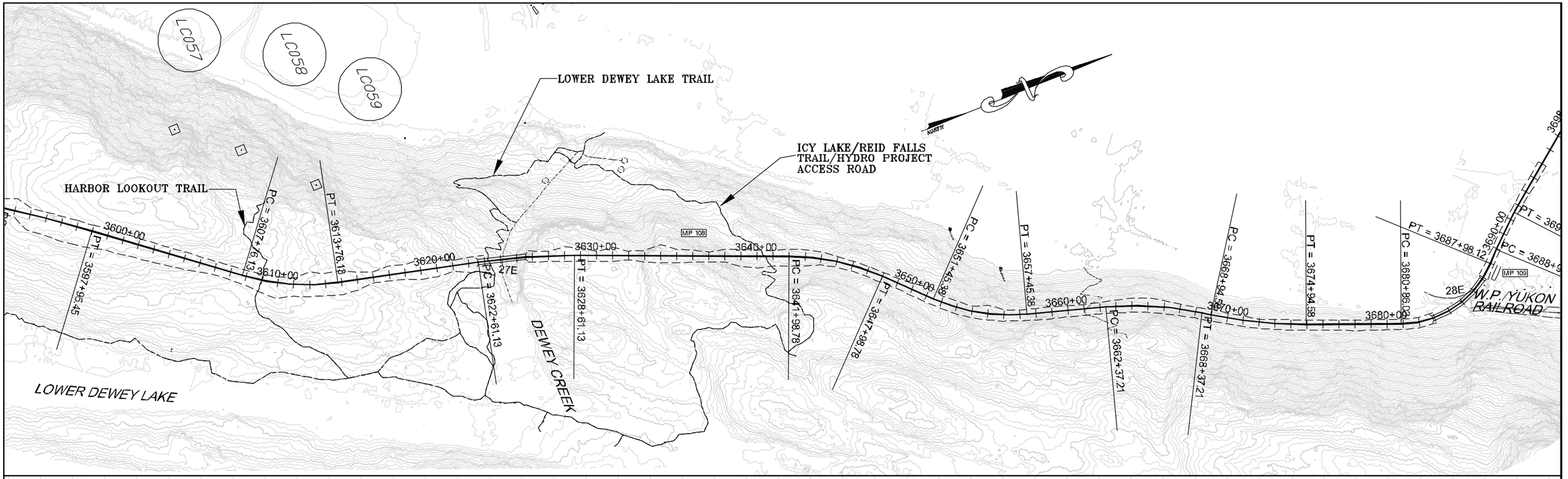
RECORD OF REVISIONS

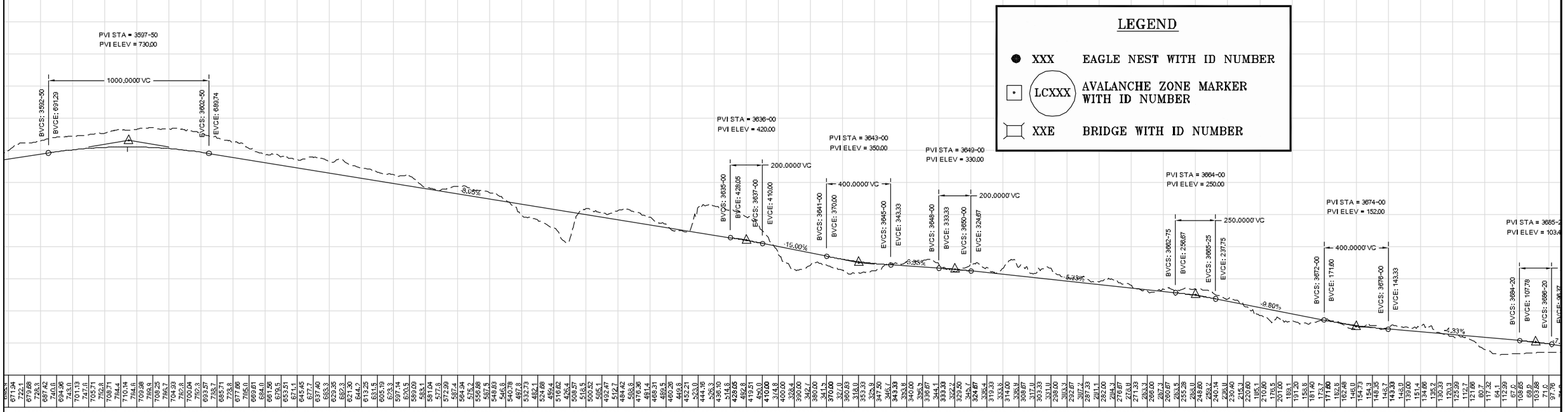
STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
SOUTHEAST REGION DESIGN & CONSTRUCTION

JUNEAU — *JUNEAU ACCESS* — *ALASKA*
PROJECT NO. 71100

EAST LYNN CANAL
STA. 3494+00 TO STA. 3590+00

DESIGNED BY:	PROJECT NO. *71100*
DRAWN BY:	DATE: *2004*
CHECKED BY:	SHEET *38* OF *39*





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BY:	DATE:	DESCRIPTION OF CHANGE:

RECORD OF REVISIONS

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
SOUTHEAST REGION DESIGN & CONSTRUCTION

JUNEAU — *JUNEAU ACCESS* — *ALASKA*
PROJECT NO. 71100

EAST LYNN CANAL
STA. 3590+00 TO STA. 3686+00

DESIGNED BY:	PROJECT NO. *71100*
DRAWN BY:	DATE: *2004*
CHECKED BY:	SHEET *39* OF *39*

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ATTACHMENT B

West Lynn Canal

Plan and Profile Sheets

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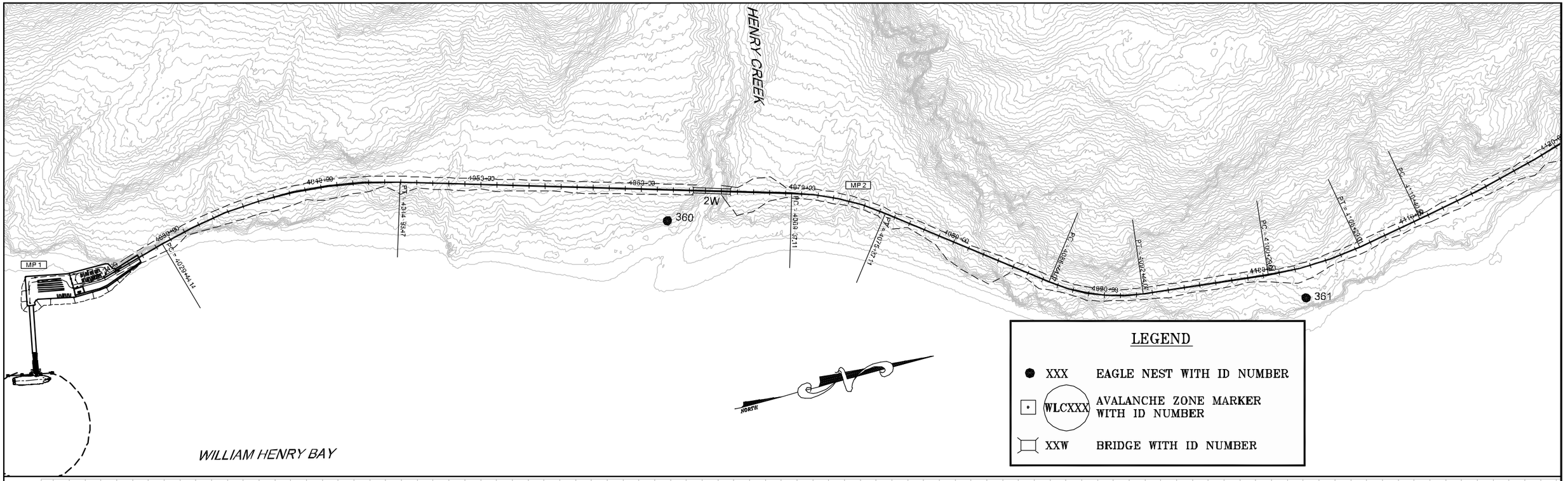
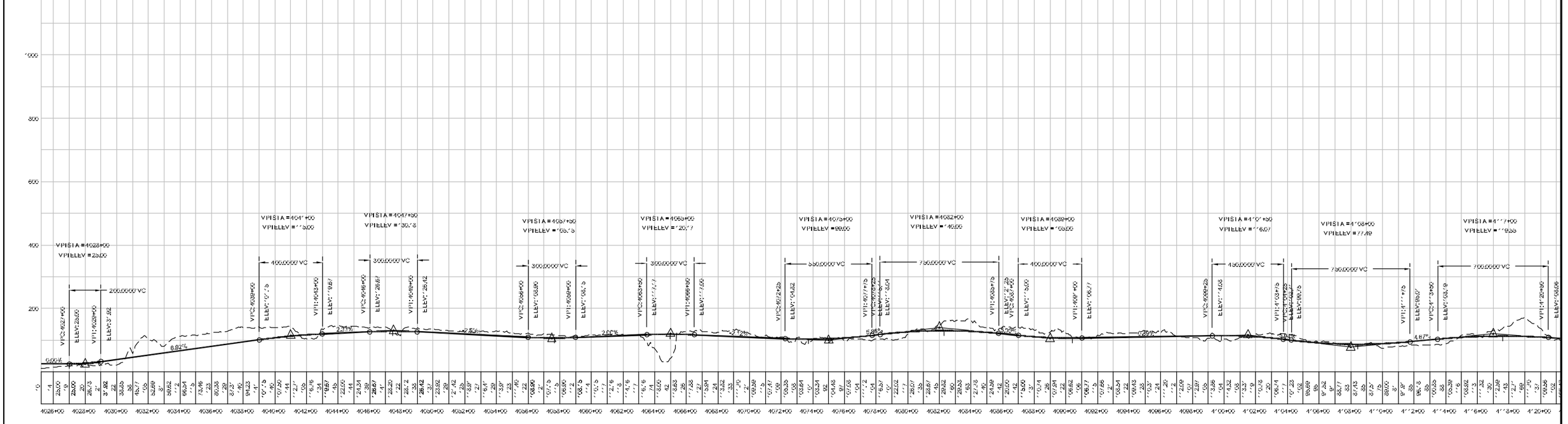
STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

PROJECT NO. 71100
JUNEAU ACCESS IMPROVEMENTS
WILLIAM HENRY BAY TO HAINES
1" = 600' PLANS

DESIGNED BY	
CHECKED BY	
DRAFTED BY	R. SNYDER 9/21/98

SPECIFICATIONS
STANDARDS
COMPUTER DESIGNATION





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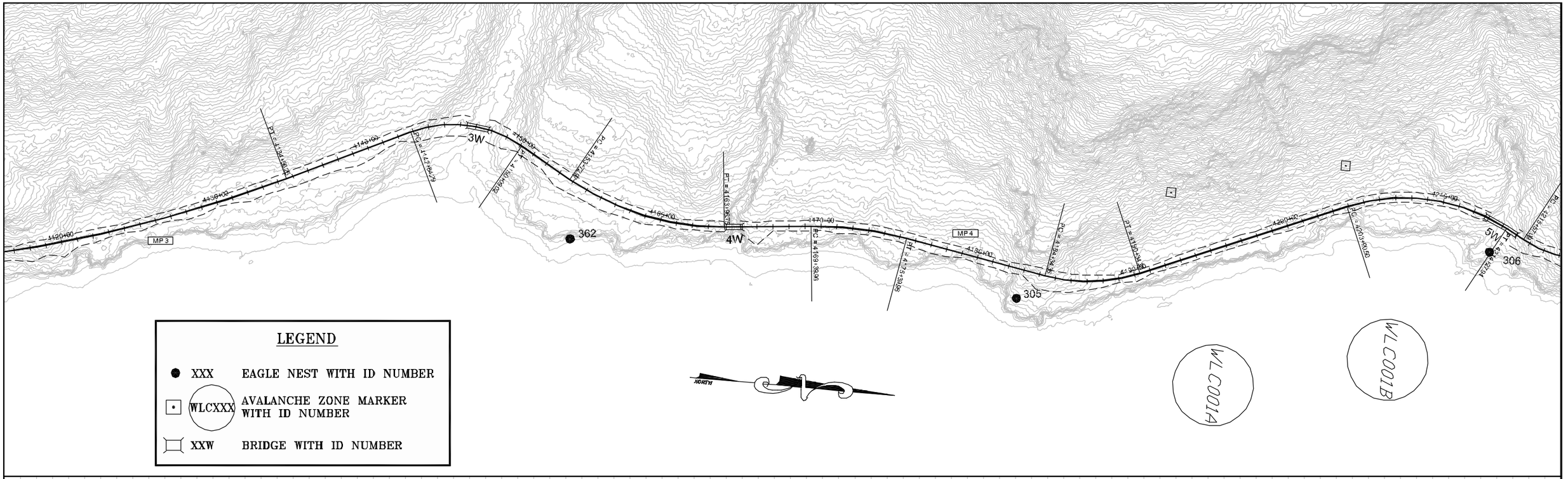
BY:	DATE:	DESCRIPTION OF CHANGE:
RECORD OF REVISIONS		

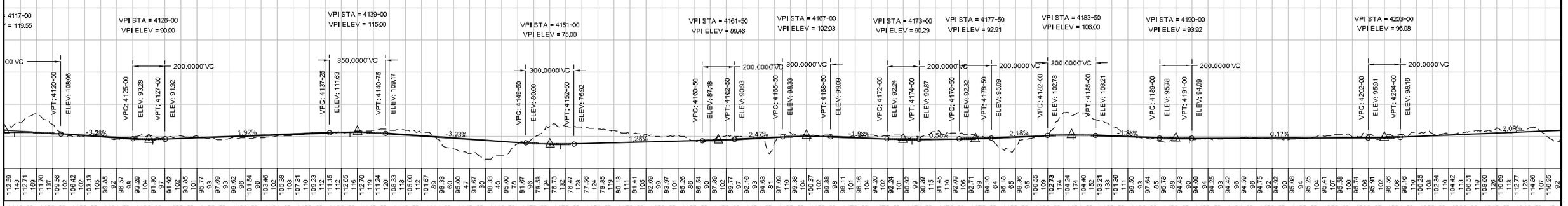
STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
SOUTHEAST REGION DESIGN & CONSTRUCTION

JUNEAU — *JUNEAU ACCESS* — *ALASKA*
PROJECT NO. 71100

WEST LYNN CANAL
B.O.P. TO STA. 4121+00

DESIGNED BY:	PROJECT NO. *71100*
DRAWN BY:	DATE: *2004*
CHECKED BY:	SHEET *2* OF *23*





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BY:	DATE:	DESCRIPTION OF CHANGE:

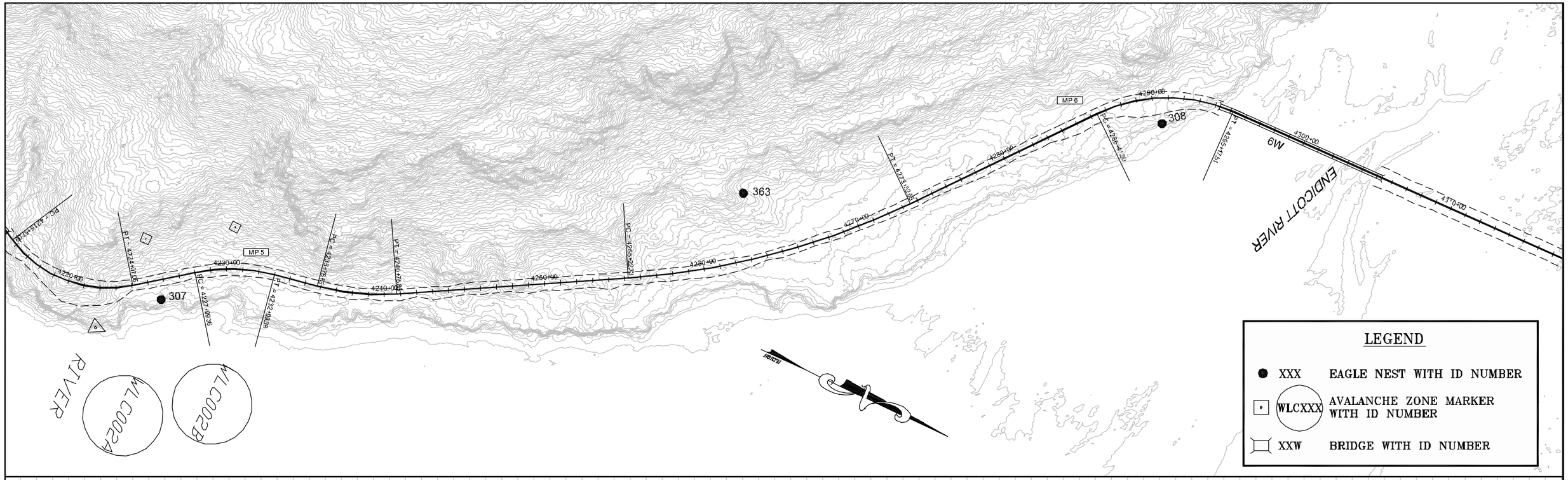
RECORD OF REVISIONS

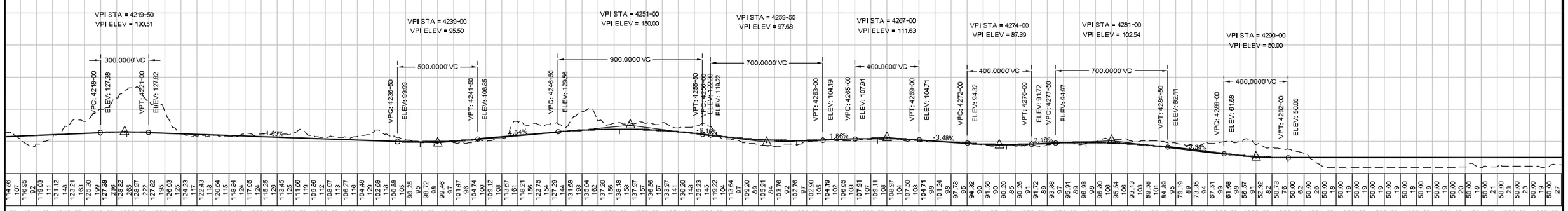
STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
SOUTHEAST REGION DESIGN & CONSTRUCTION

JUNEAU *JUNEAU ACCESS* *ALASKA*
PROJECT NO. 71100

WEST LYNN CANAL
STA. 4121+00 TO STA. 4216+00

DESIGNED BY:	PROJECT NO. *71100*
DRAWN BY:	DATE: *2004*
CHECKED BY:	SHEET *3* OF *23*





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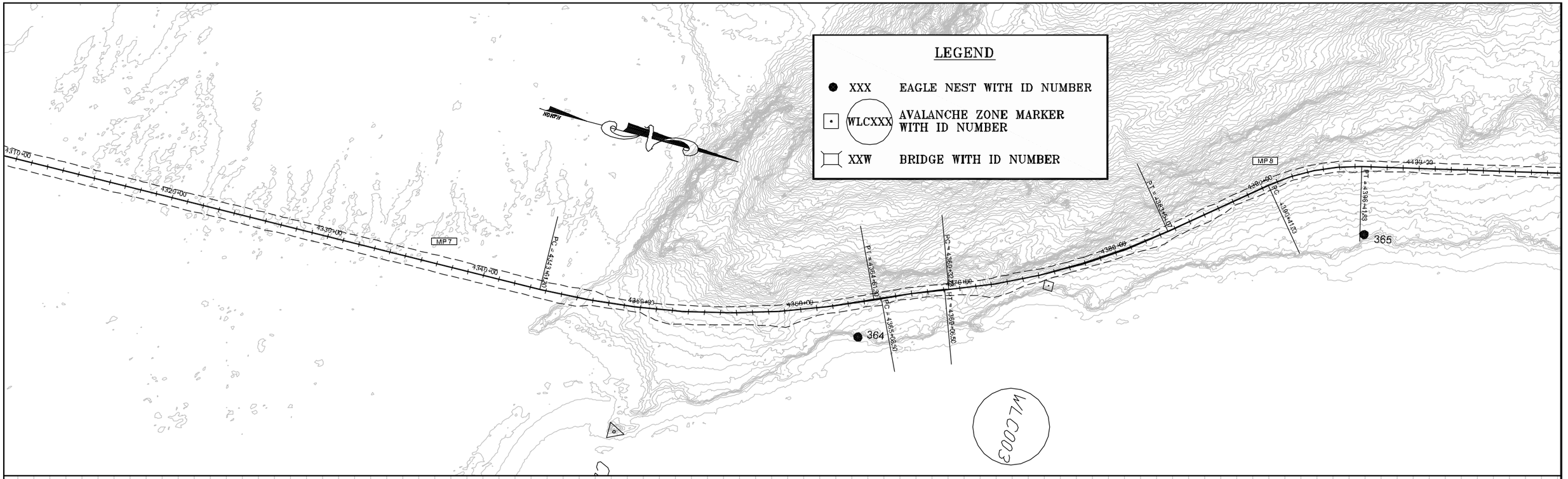
RECORD OF REVISIONS

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
SOUTHEAST REGION DESIGN & CONSTRUCTION

JUNEAU *JUNEAU ACCESS* *ALASKA*
PROJECT NO. 71100

WEST LYNN CANAL
STA. 4216+00 TO STA. 4311+00

DESIGNED BY:	PROJECT NO. *71100*
DRAWN BY:	DATE: *2004*
CHECKED BY:	SHEET *4* OF *23*



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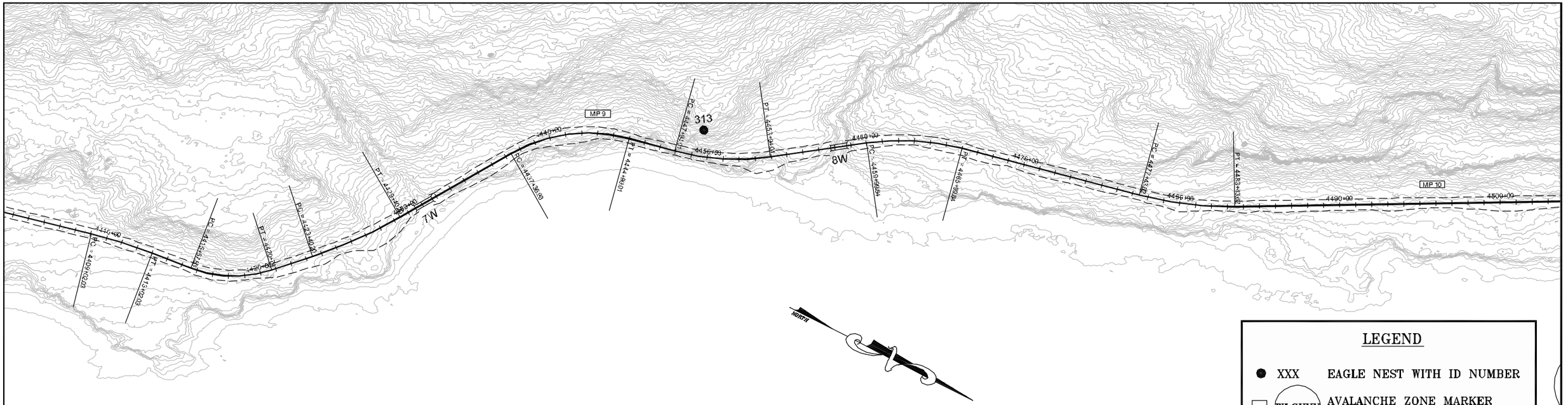
RECORD OF REVISIONS

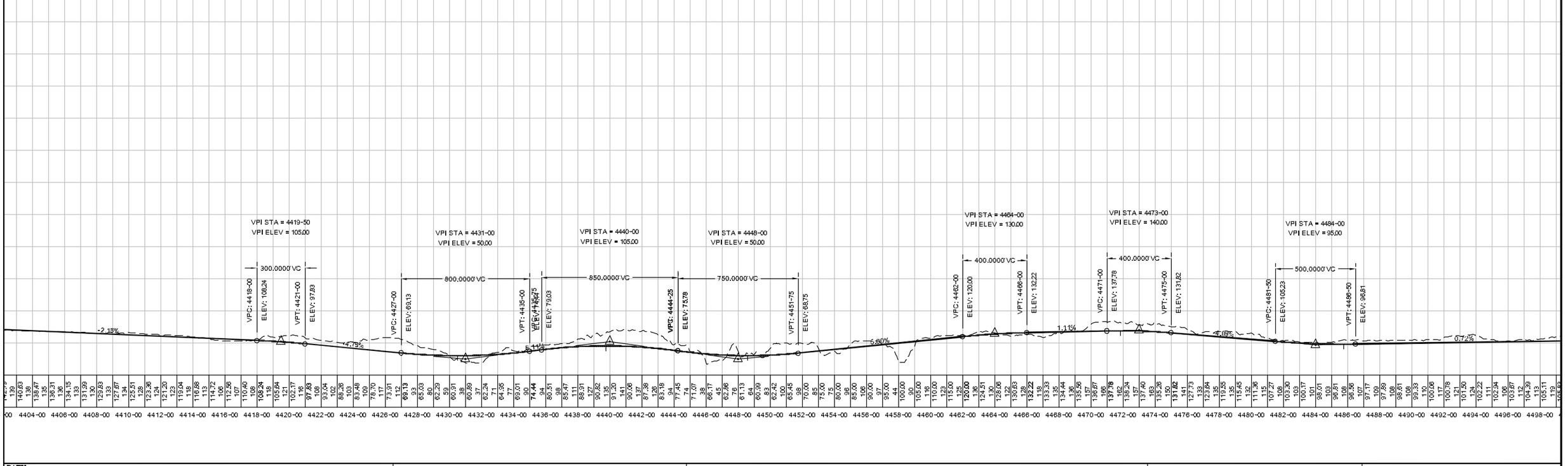
STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
SOUTHEAST REGION DESIGN & CONSTRUCTION

JUNEAU *JUNEAU ACCESS* *ALASKA*
PROJECT NO. 71100

WEST LYNN CANAL
STA. 4311+00 TO STA. 4406+00

DESIGNED BY:	PROJECT NO. *71100*
DRAWN BY:	DATE: *2004*
CHECKED BY:	SHEET *5* OF *23*





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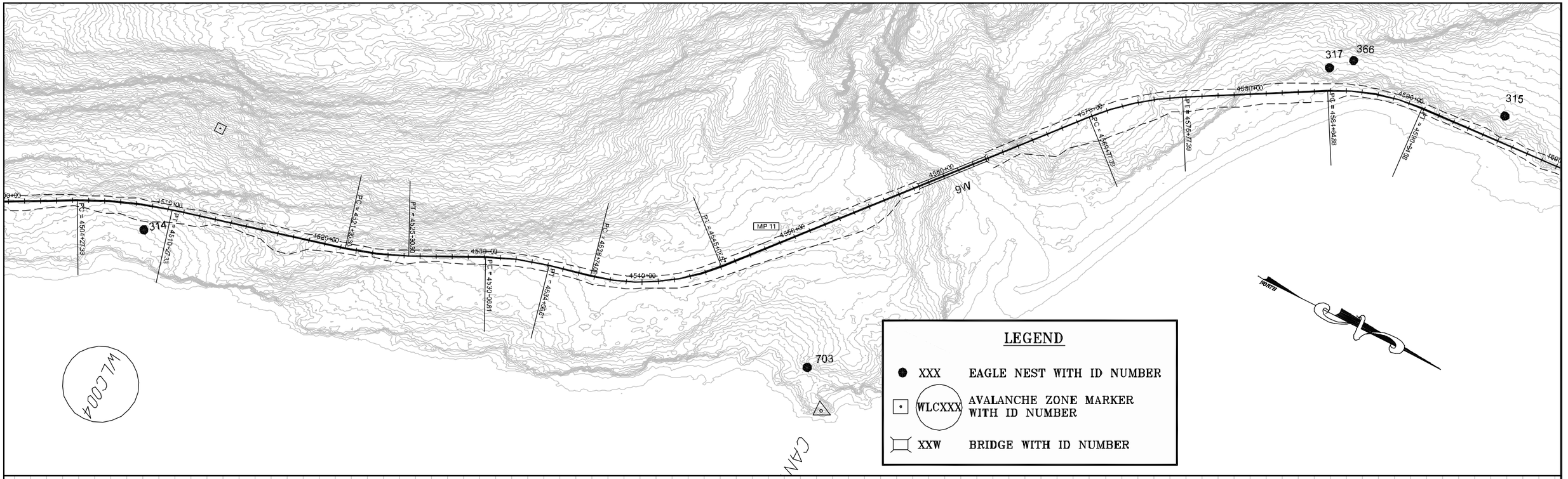
RECORD OF REVISIONS

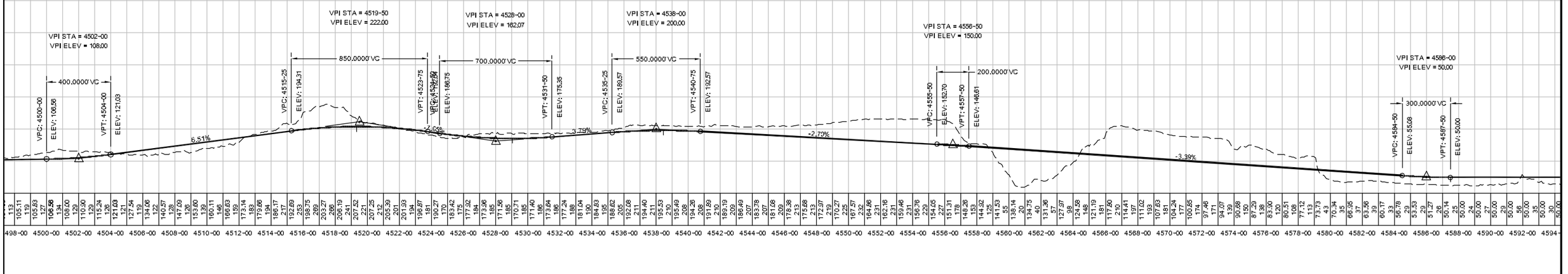
STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
SOUTHEAST REGION DESIGN & CONSTRUCTION

JUNEAU *JUNEAU ACCESS* *ALASKA*
PROJECT NO. 71100

WEST LYNN CANAL
STA. 4406+00 TO STA. 4501+00

DESIGNED BY:	PROJECT NO. *71100*
DRAWN BY:	DATE: *2004*
CHECKED BY:	SHEET *6* OF *23*





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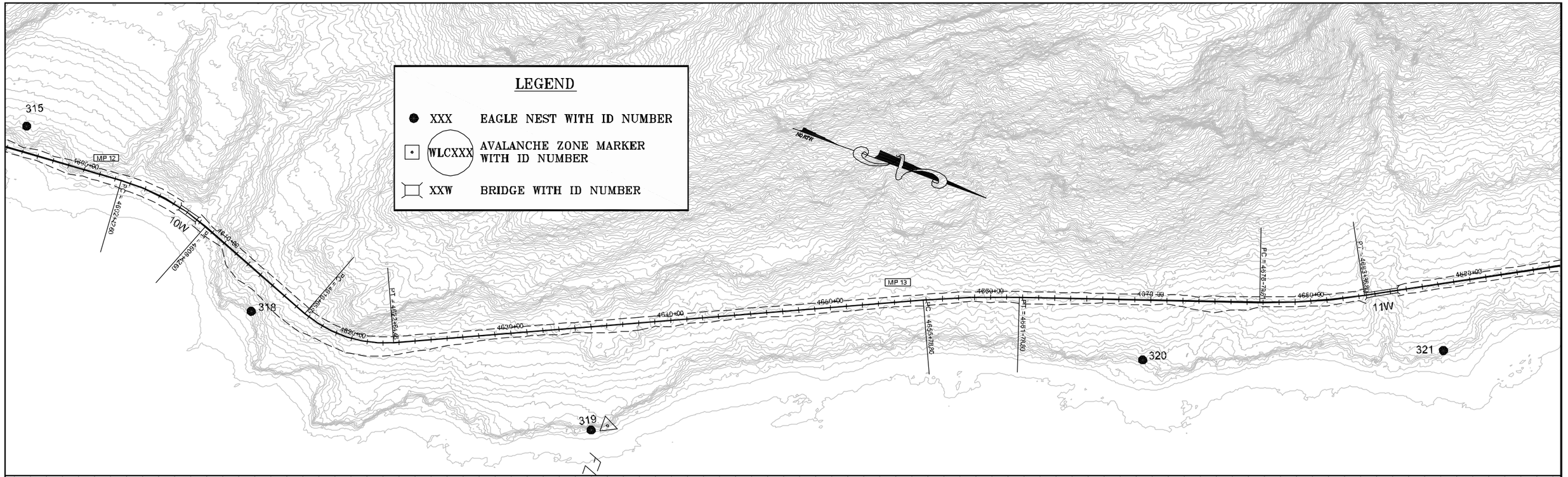
RECORD OF REVISIONS

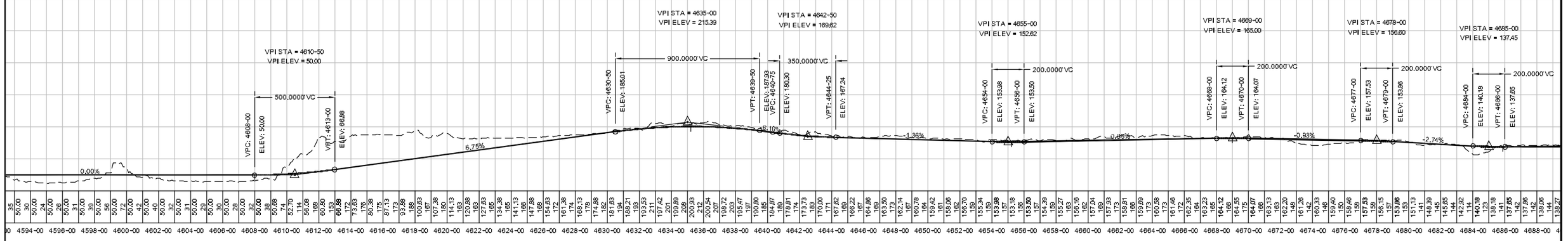
STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
SOUTHEAST REGION DESIGN & CONSTRUCTION

JUNEAU *JUNEAU ACCESS* *ALASKA*
PROJECT NO. 71100

WEST LYNN CANAL
STA. 4501+00 TO STA. 4596+00

DESIGNED BY:	PROJECT NO. *71100*
DRAWN BY:	DATE: *2004*
CHECKED BY:	SHEET *7* OF *23*





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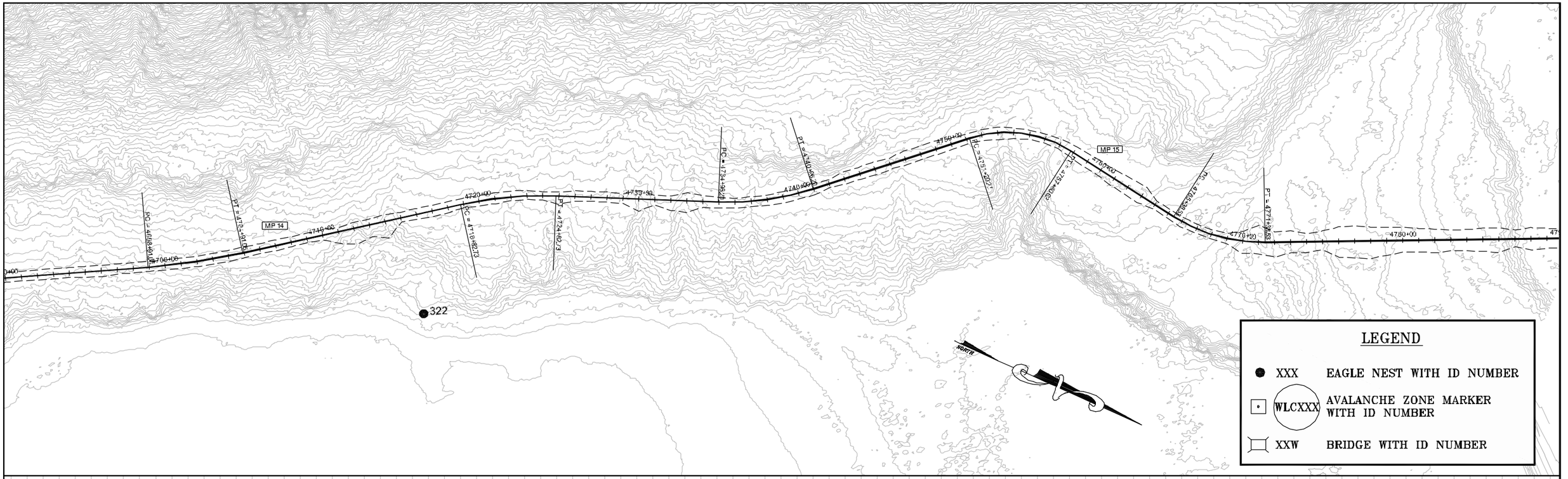
STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
SOUTHEAST REGION DESIGN & CONSTRUCTION

JUNEAU *JUNEAU ACCESS* *ALASKA*
PROJECT NO. 71100

WEST LYNN CANAL
STA. 4596+00 TO STA. 4691+00

DESIGNED BY:	PROJECT NO. *71100*
DRAWN BY:	DATE: *2004*
CHECKED BY:	SHEET *8* OF *23*



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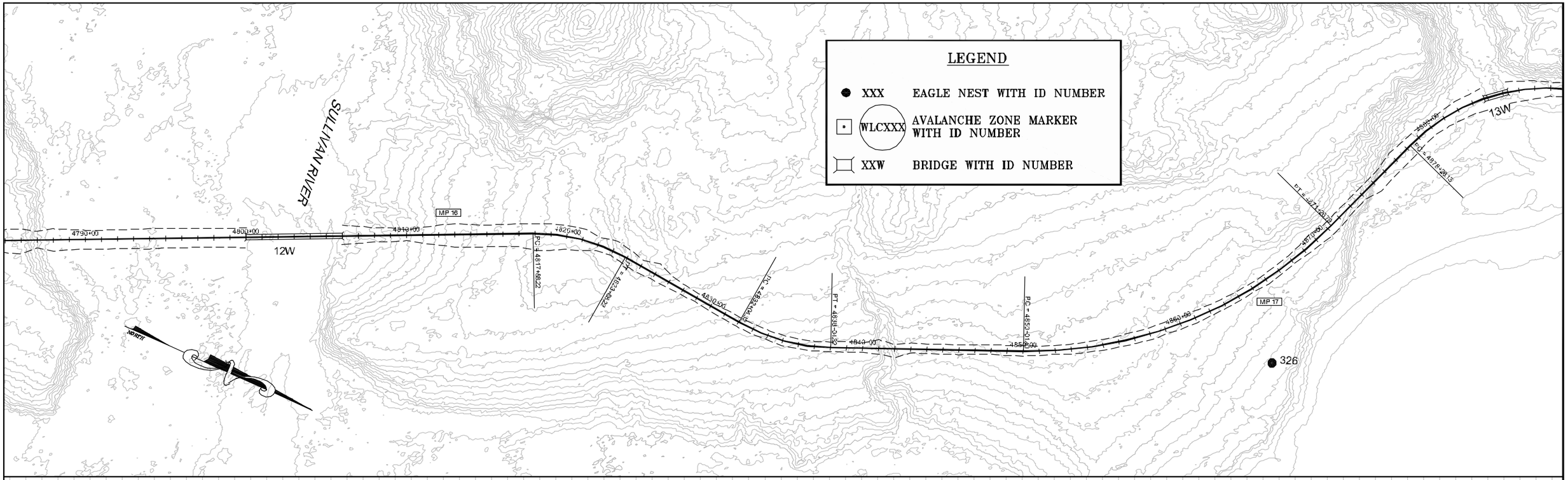
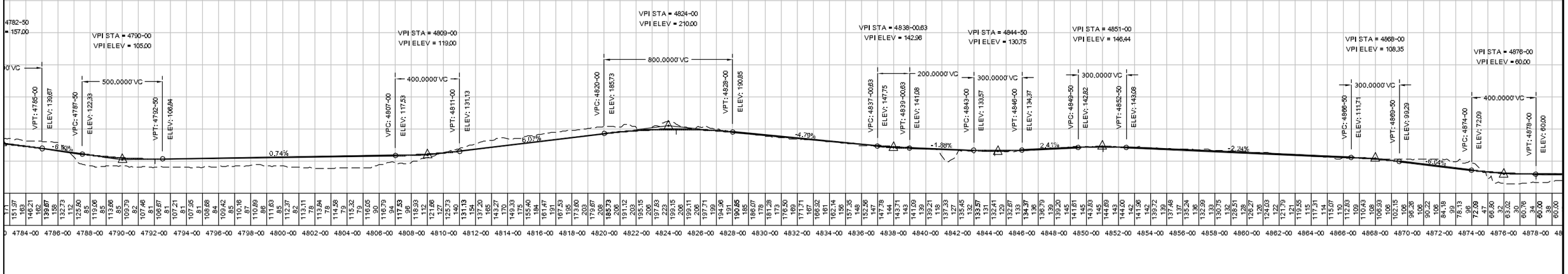
STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
SOUTHEAST REGION DESIGN & CONSTRUCTION

JUNEAU *JUNEAU ACCESS* *ALASKA*
PROJECT NO. 71100

WEST LYNN CANAL
STA. 4691+00 TO STA. 4786+00

DESIGNED BY:	PROJECT NO. *71100*
DRAWN BY:	DATE: *2004*
CHECKED BY:	SHEET *9* OF *23*





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BY:	DATE:	DESCRIPTION OF CHANGE:

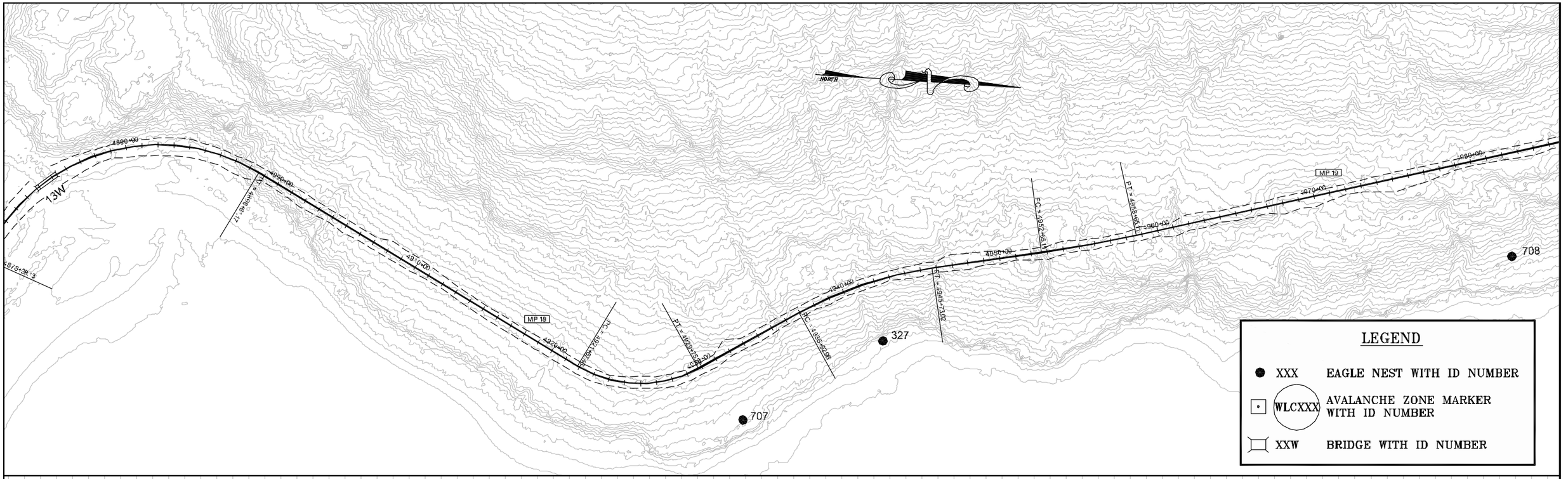
RECORD OF REVISIONS

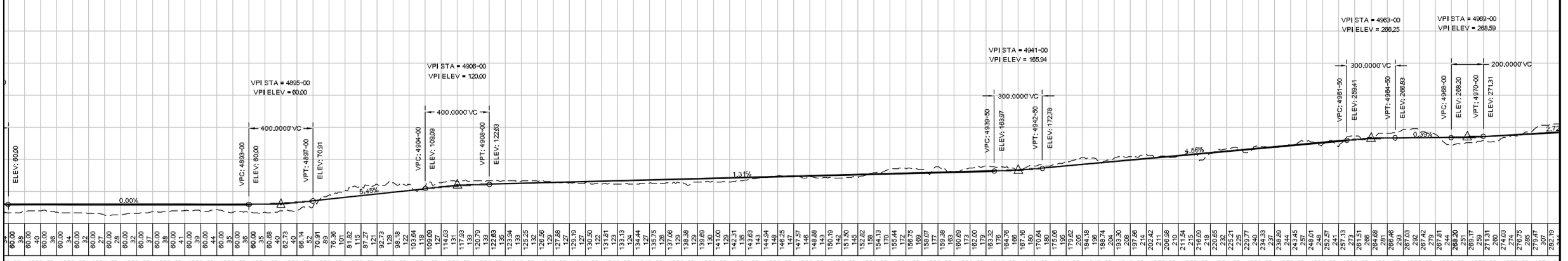
STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
SOUTHEAST REGION DESIGN & CONSTRUCTION

JUNEAU *JUNEAU ACCESS* *ALASKA*
PROJECT NO. 71100

WEST LYNN CANAL
STA. 4786+00 TO STA. 4881+00

DESIGNED BY:	PROJECT NO. *71100*
DRAWN BY:	DATE: *2004*
CHECKED BY:	SHEET *10* OF *23*





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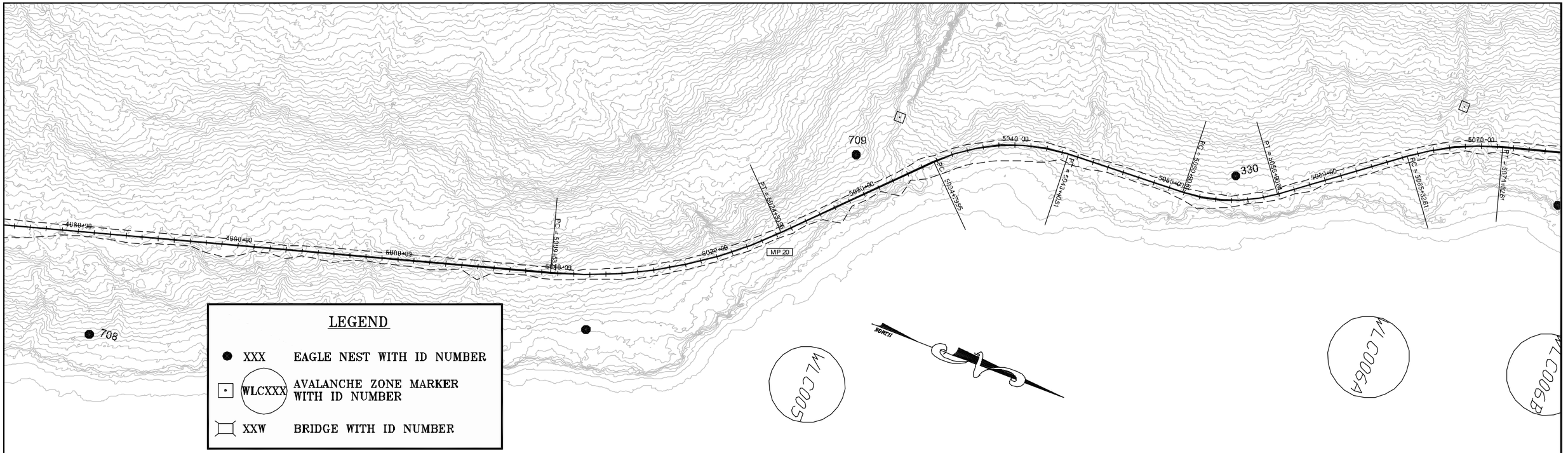
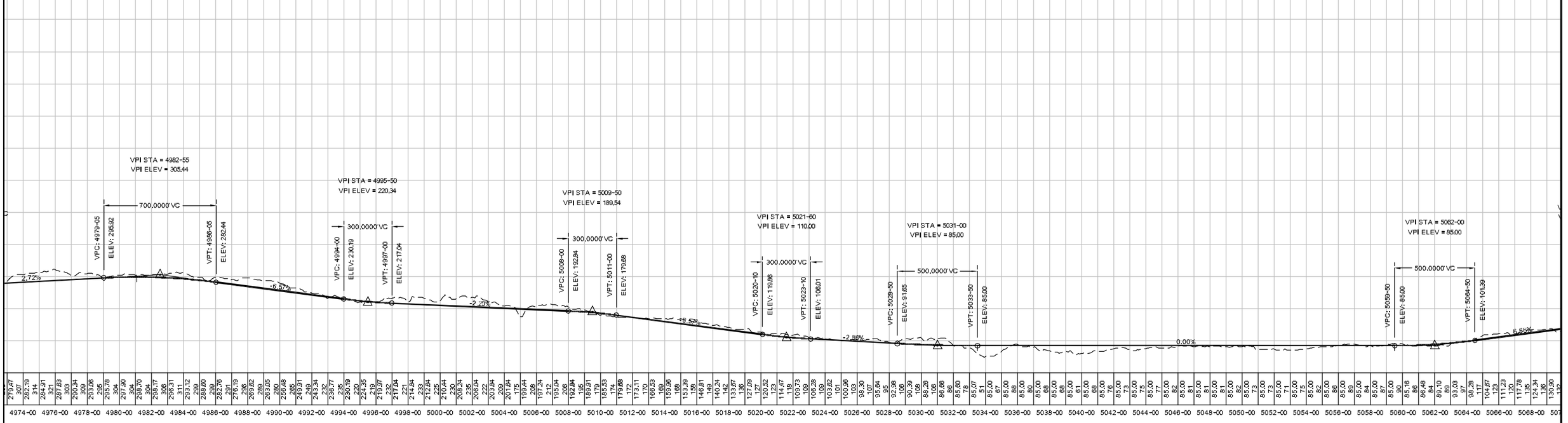
STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
SOUTHEAST REGION DESIGN & CONSTRUCTION

JUNEAU *JUNEAU ACCESS* *ALASKA*
PROJECT NO. 71100

WEST LYNN CANAL
STA. 4881+00 TO STA. 4976+00

DESIGNED BY:	PROJECT NO. *71100*
DRAWN BY:	DATE: *2004*
CHECKED BY:	SHEET *11* OF *23*





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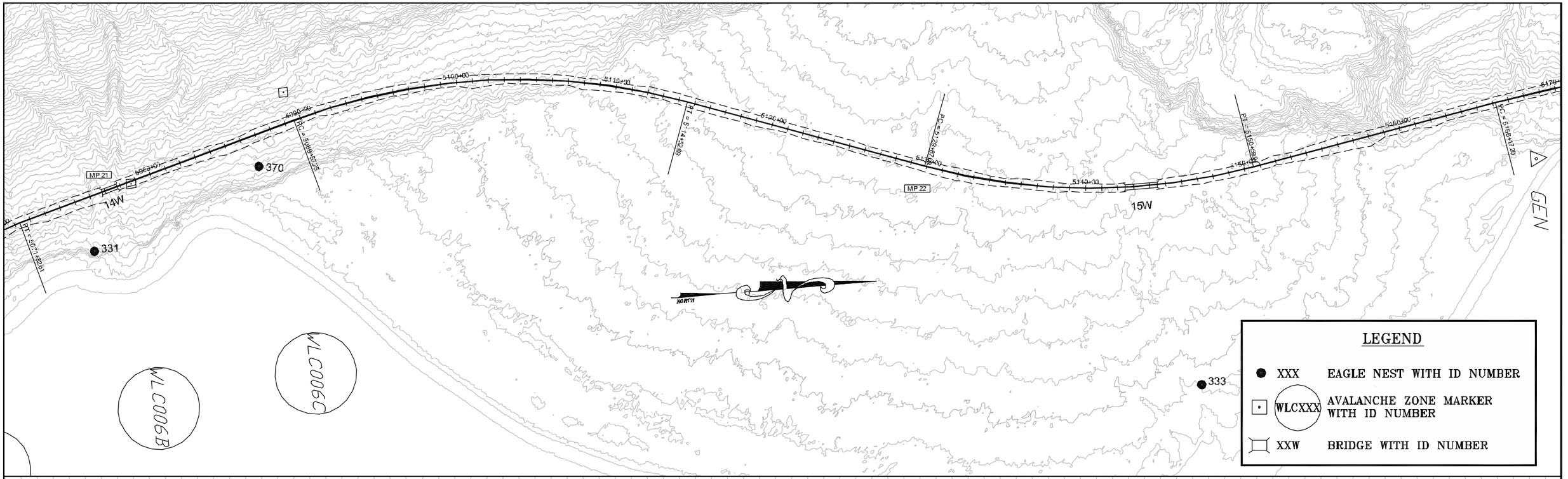
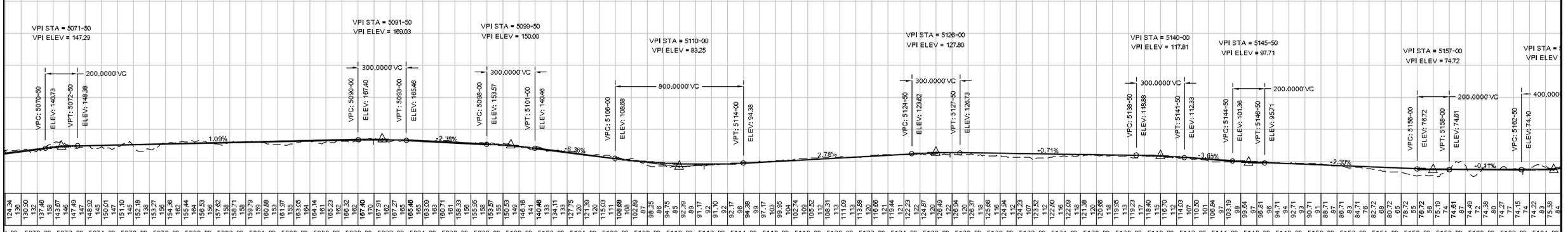
STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
SOUTHEAST REGION DESIGN & CONSTRUCTION

JUNEAU *JUNEAU ACCESS* *ALASKA*
PROJECT NO. 71100

WEST LYNN CANAL
STA. 4976+00 TO STA. 5071+00

DESIGNED BY:	PROJECT NO. *71100*
DRAWN BY:	DATE: *2004*
CHECKED BY:	SHEET *12* OF *23*





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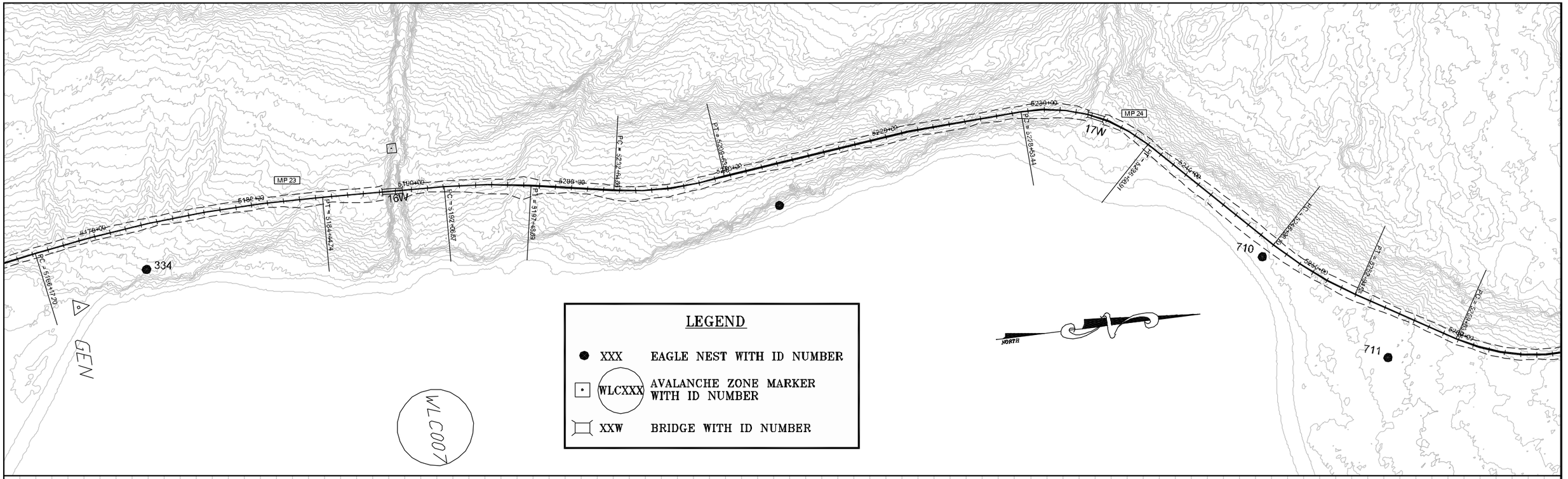
RECORD OF REVISIONS

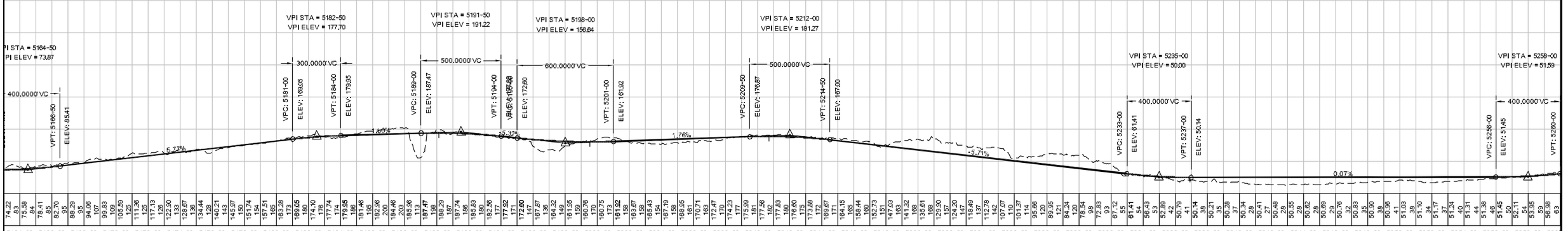
STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
SOUTHEAST REGION DESIGN & CONSTRUCTION

JUNEAU *JUNEAU ACCESS* *ALASKA*
PROJECT NO. 71100

WEST LYNN CANAL
STA. 5071+00 TO STA. 5166+50

DESIGNED BY:	PROJECT NO. *71100*
DRAWN BY:	DATE: *2004*
CHECKED BY:	SHEET *13* OF *23*





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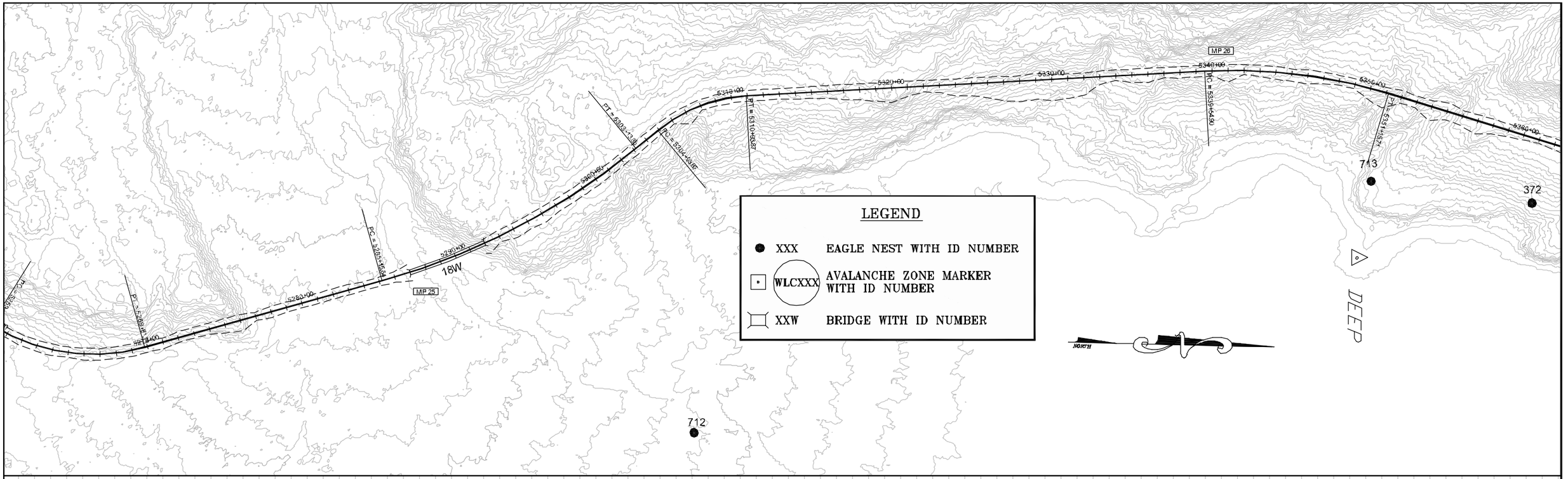
RECORD OF REVISIONS

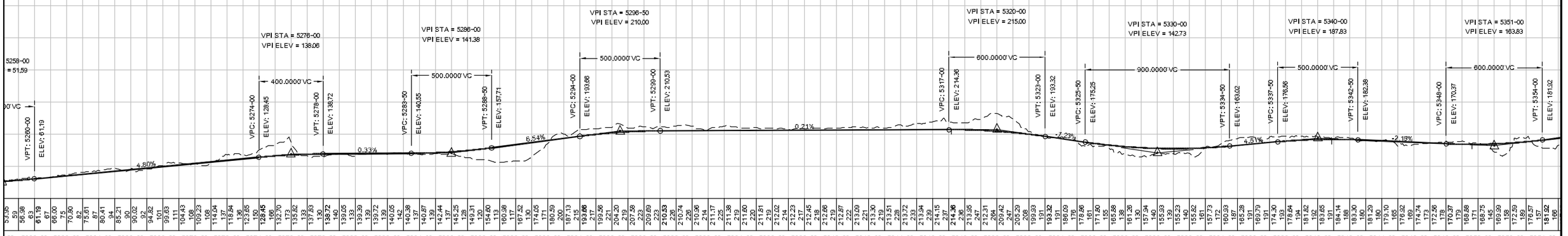
STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
SOUTHEAST REGION DESIGN & CONSTRUCTION

JUNEAU *JUNEAU ACCESS* *ALASKA*
PROJECT NO. 71100

WEST LYNN CANAL
STA. 5166+50 TO STA. 5262+00

DESIGNED BY:	PROJECT NO. *71100*
DRAWN BY:	DATE: *2004*
CHECKED BY:	SHEET *14* OF *23*





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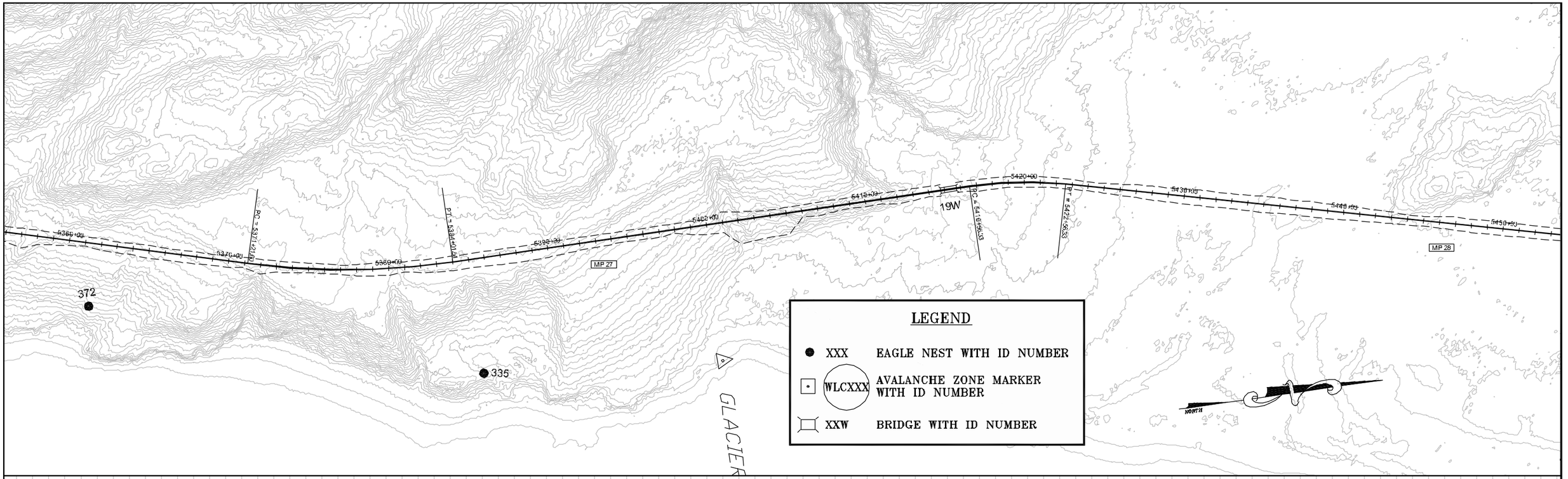
RECORD OF REVISIONS

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
SOUTHEAST REGION DESIGN & CONSTRUCTION

JUNEAU *JUNEAU ACCESS* *ALASKA*
PROJECT NO. 71100

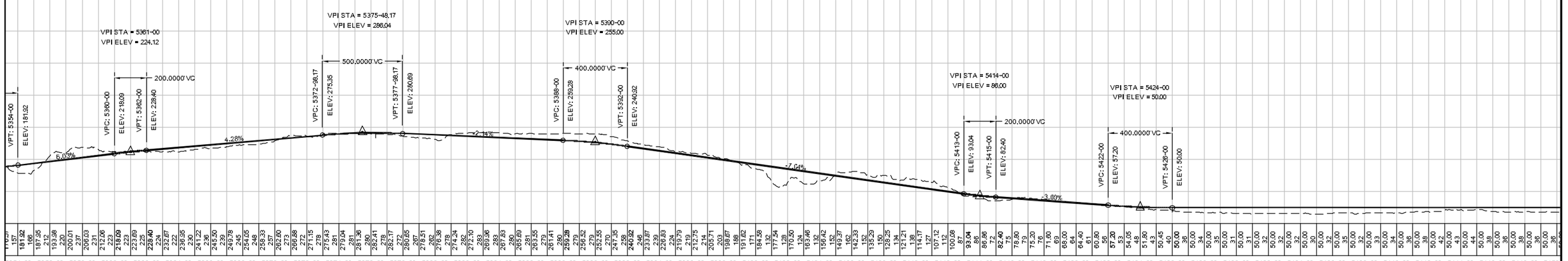
WEST LYNN CANAL
STA. 5262+00 TO STA. 5357+00

DESIGNED BY:	PROJECT NO. *71100*
DRAWN BY:	DATE: *2004*
CHECKED BY:	SHEET *15* OF *23*



LEGEND

- XXX — EAGLE NEST WITH ID NUMBER
- WLCXXX — AVALANCHE ZONE MARKER WITH ID NUMBER
- XXW — BRIDGE WITH ID NUMBER



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BY:	DATE:	DESCRIPTION OF CHANGE:

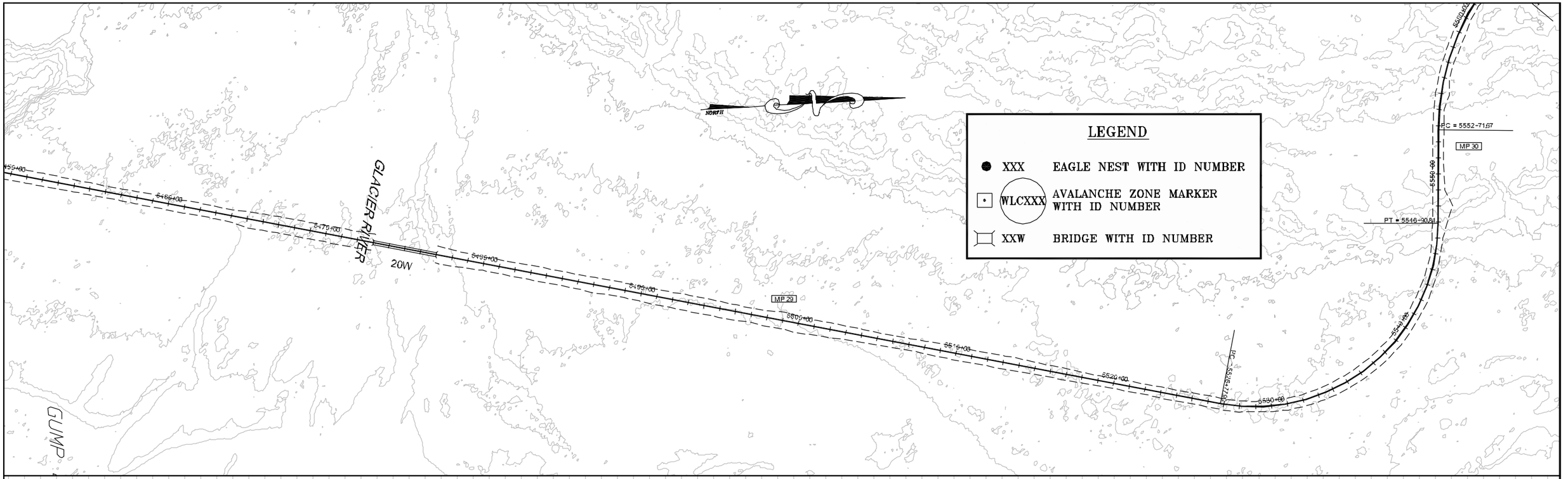
RECORD OF REVISIONS

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
SOUTHEAST REGION DESIGN & CONSTRUCTION

JUNEAU — *JUNEAU ACCESS* — *ALASKA*
PROJECT NO. 71100

WEST LYNN CANAL
STA. 5357+00 TO STA. 5452+00

DESIGNED BY:	PROJECT NO. *71100*
DRAWN BY:	DATE: *2004*
CHECKED BY:	SHEET *16* OF *23*



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RECORD OF REVISIONS

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
SOUTHEAST REGION DESIGN & CONSTRUCTION

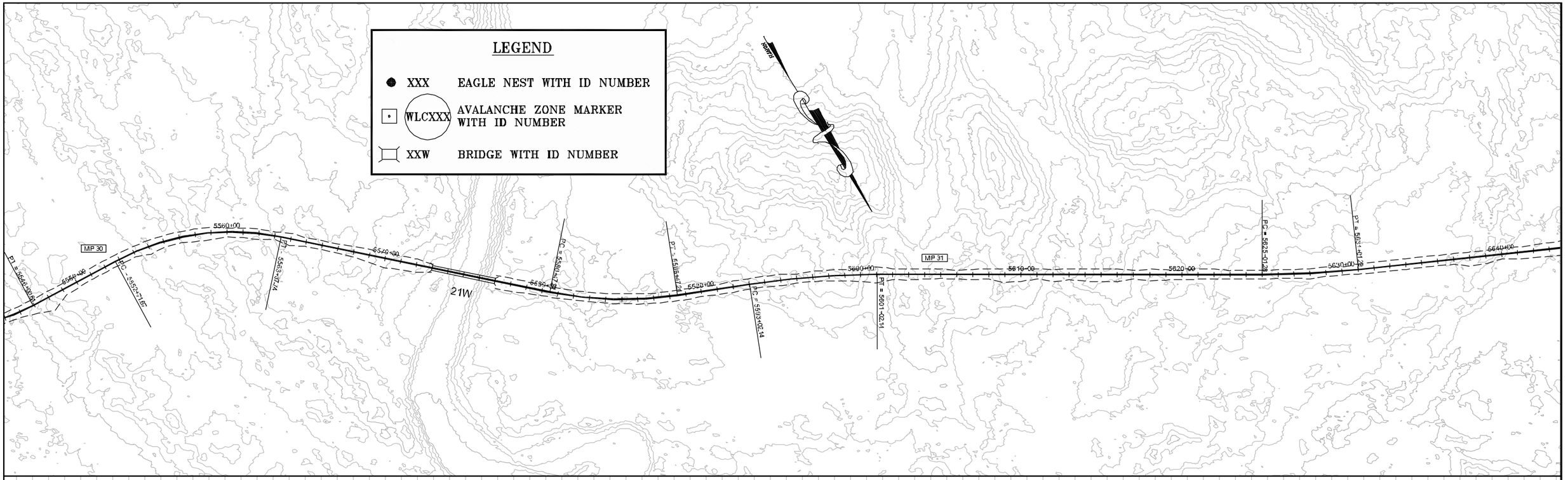
JUNEAU *JUNEAU ACCESS* *ALASKA*
PROJECT NO. 71100

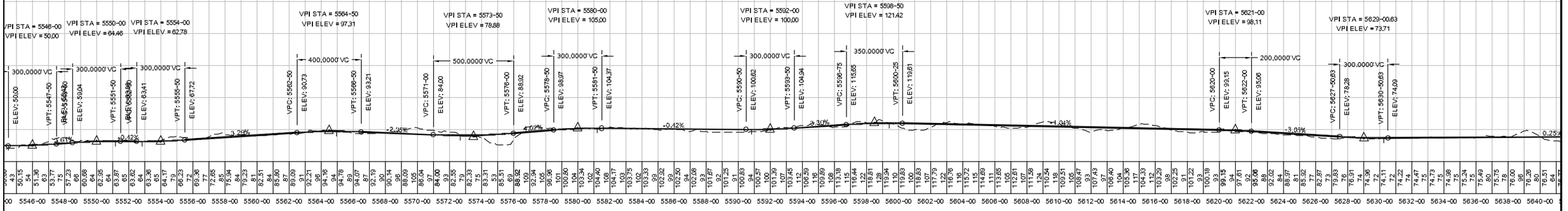
WEST LYNN CANAL
STA. 5452+00 TO STA. 5546+00

DESIGNED BY:	PROJECT NO. *71100*
DRAWN BY:	DATE: *2004*
CHECKED BY:	SHEET *17* OF *23*

LEGEND

- XXX — EAGLE NEST WITH ID NUMBER
- WLCXXX — AVALANCHE ZONE MARKER WITH ID NUMBER
- XXW — BRIDGE WITH ID NUMBER





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BY:	DATE:	DESCRIPTION OF CHANGE:

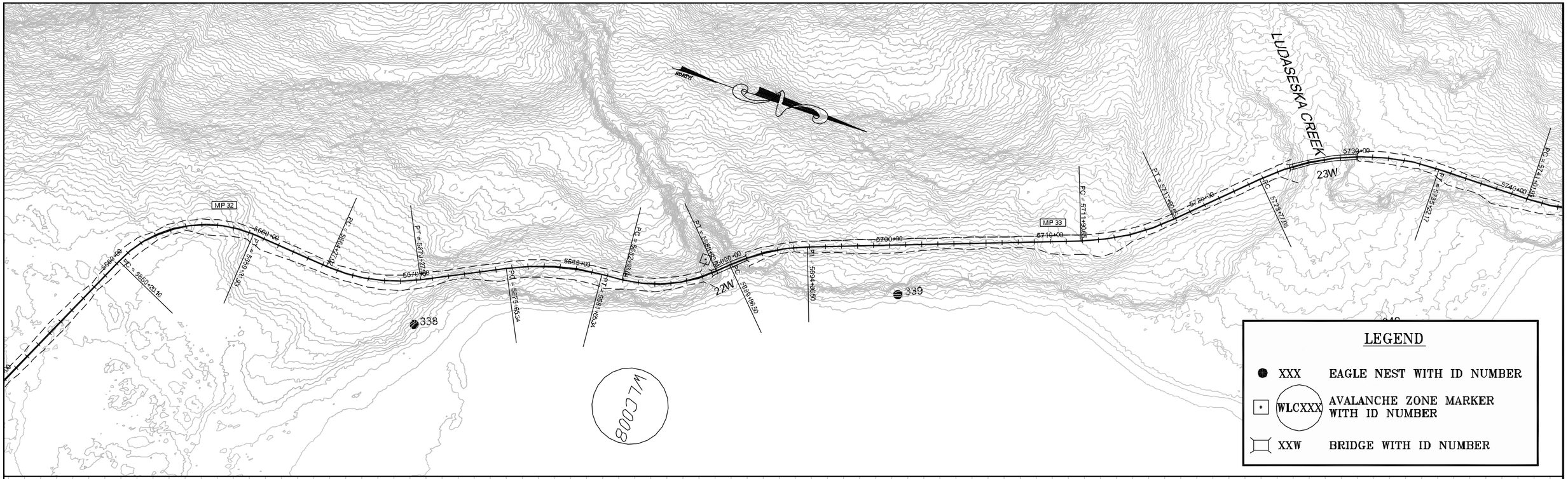
RECORD OF REVISIONS

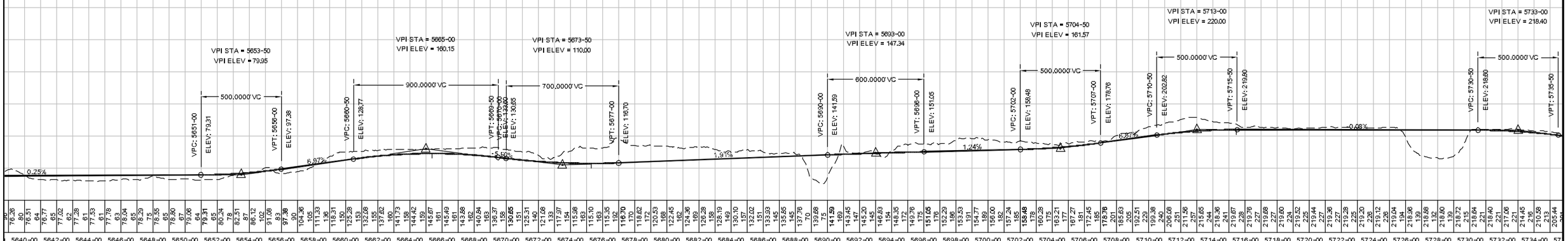
STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
SOUTHEAST REGION DESIGN & CONSTRUCTION

JUNEAU — *JUNEAU ACCESS PROJECT NO. 71100* — *ALASKA*

WEST LYNN CANAL
STA. 5546+00 TO STA. 5642+00

DESIGNED BY:	PROJECT NO. *71100*
DRAWN BY:	DATE: *2004*
CHECKED BY:	SHEET *18* OF *23*





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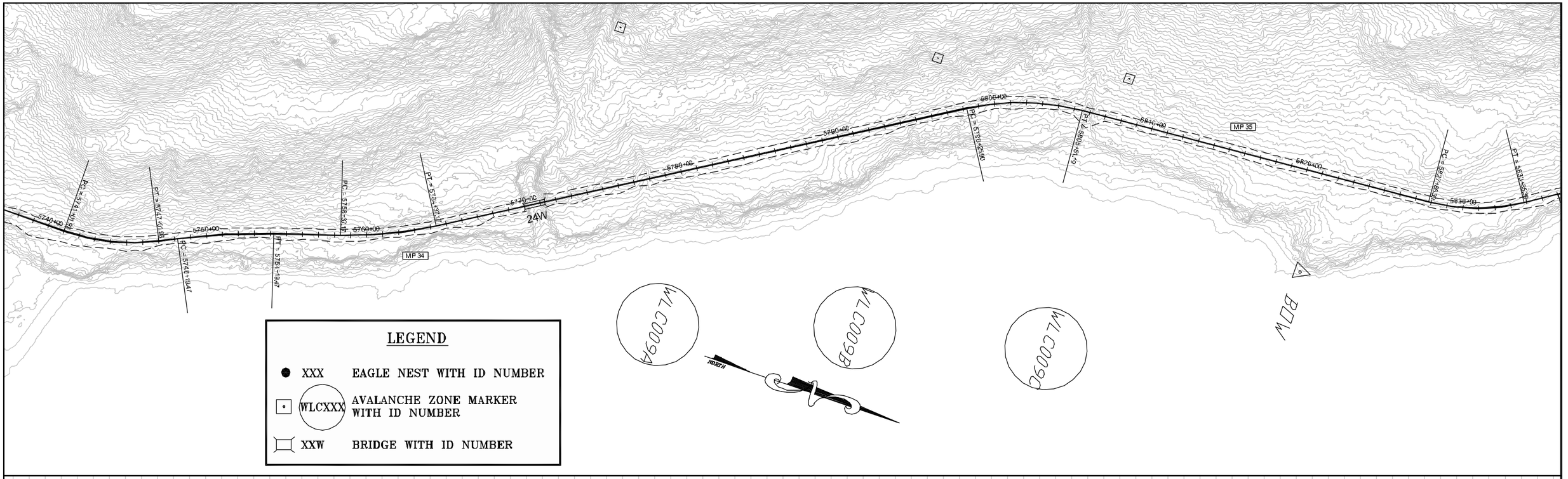
STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
SOUTHEAST REGION DESIGN & CONSTRUCTION

JUNEAU *JUNEAU ACCESS* *ALASKA*
PROJECT NO. 71100

WEST LYNN CANAL
STA. 5642+00 TO STA. 5738+00

DESIGNED BY:	PROJECT NO. *71100*
DRAWN BY:	DATE: *2004*
CHECKED BY:	SHEET *19* OF *23*



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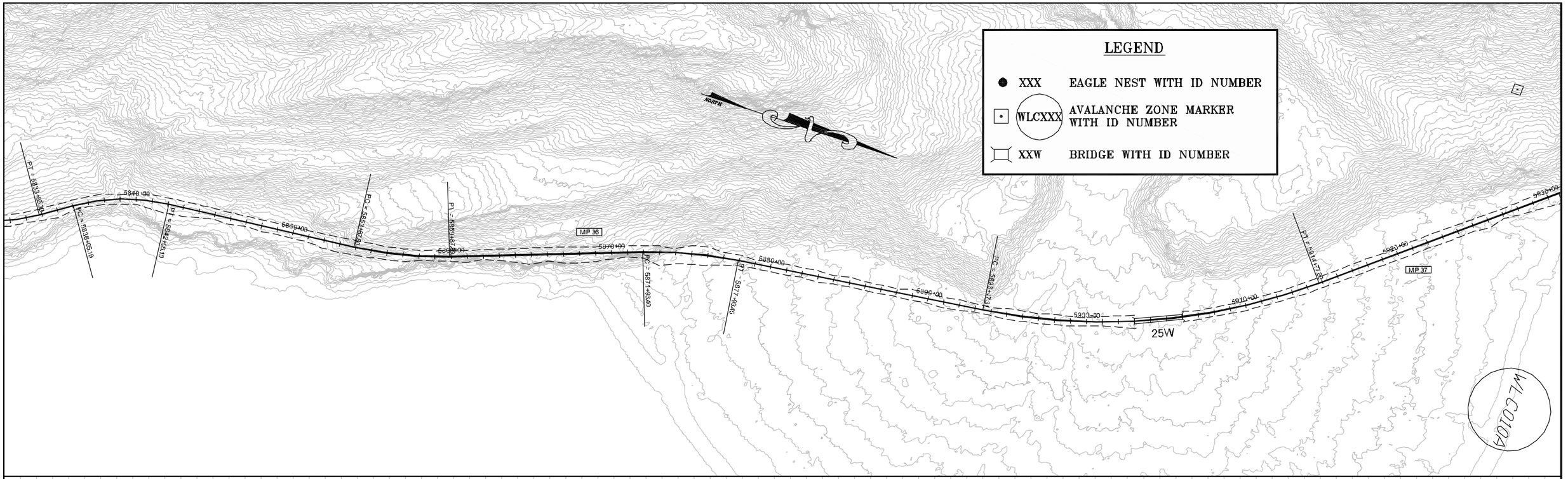
RECORD OF REVISIONS

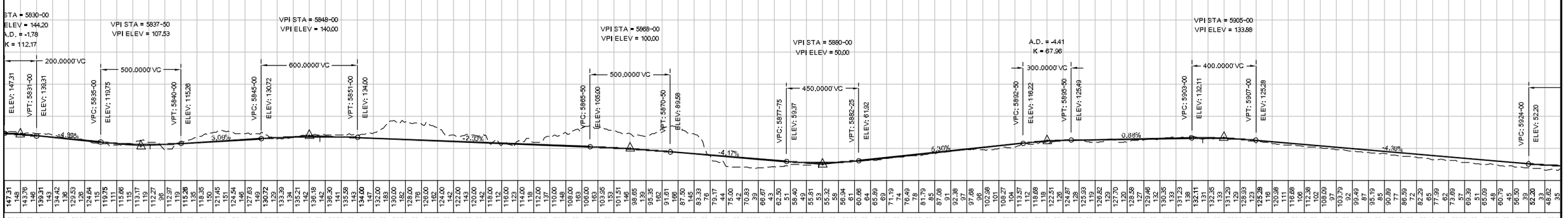
STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
SOUTHEAST REGION DESIGN & CONSTRUCTION

JUNEAU *JUNEAU ACCESS* *ALASKA*
PROJECT NO. 71100

WEST LYNN CANAL
STA. 5738+00 TO STA. 5832+50

DESIGNED BY:	PROJECT NO. *71100*
DRAWN BY:	DATE: *2004*
CHECKED BY:	SHEET *20* OF *23*





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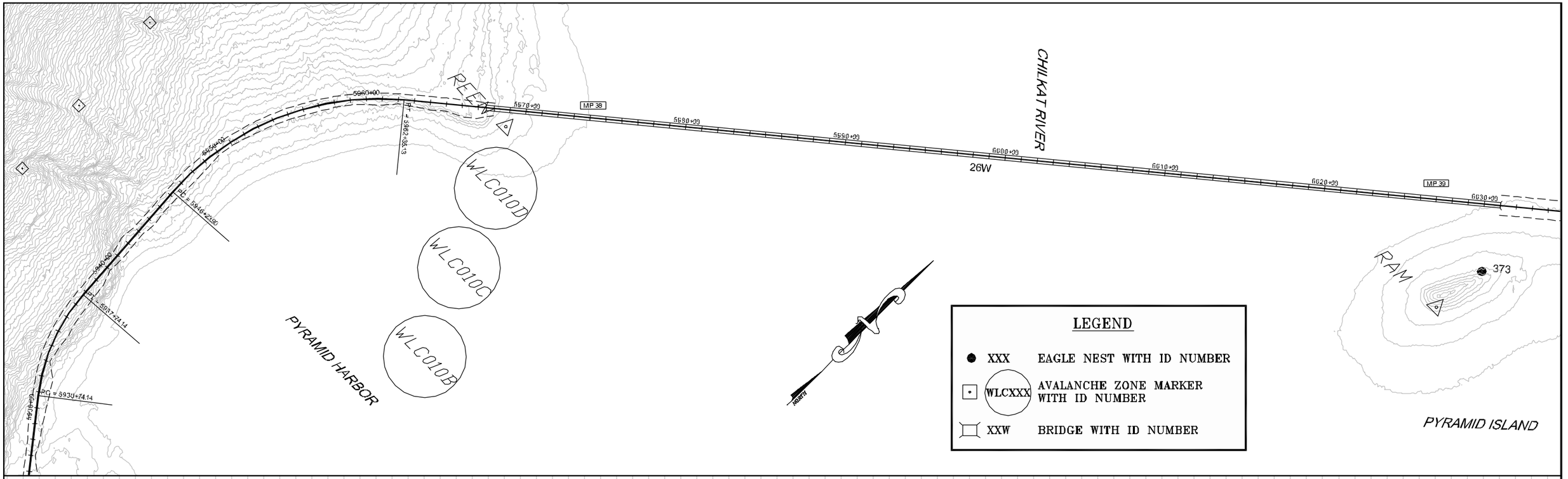
RECORD OF REVISIONS

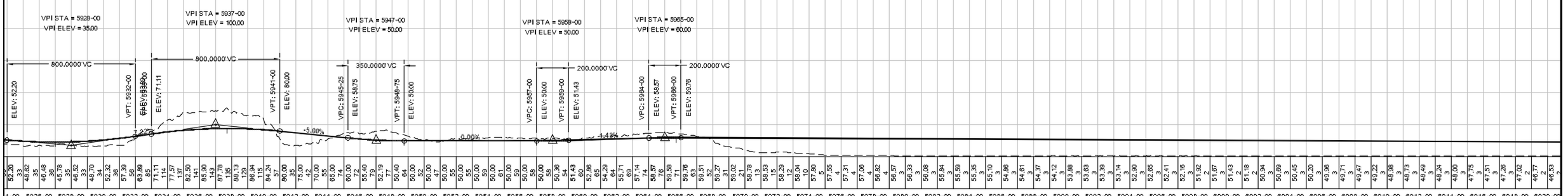
STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
SOUTHEAST REGION DESIGN & CONSTRUCTION

JUNEAU *JUNEAU ACCESS* *ALASKA*
PROJECT NO. 71100

WEST LYNN CANAL
STA. 5832+50 TO STA. 5927+50

DESIGNED BY:	PROJECT NO. *71100*
DRAWN BY:	DATE: *2004*
CHECKED BY:	SHEET *21* OF *23*





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BY:	DATE:	DESCRIPTION OF CHANGE:

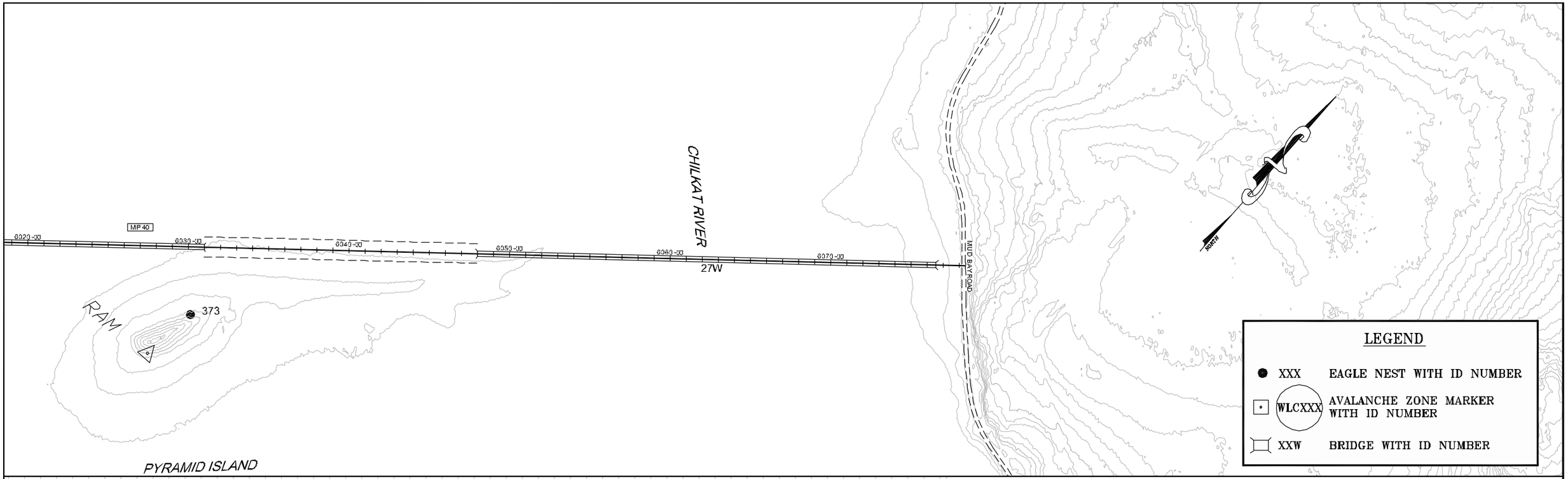
RECORD OF REVISIONS

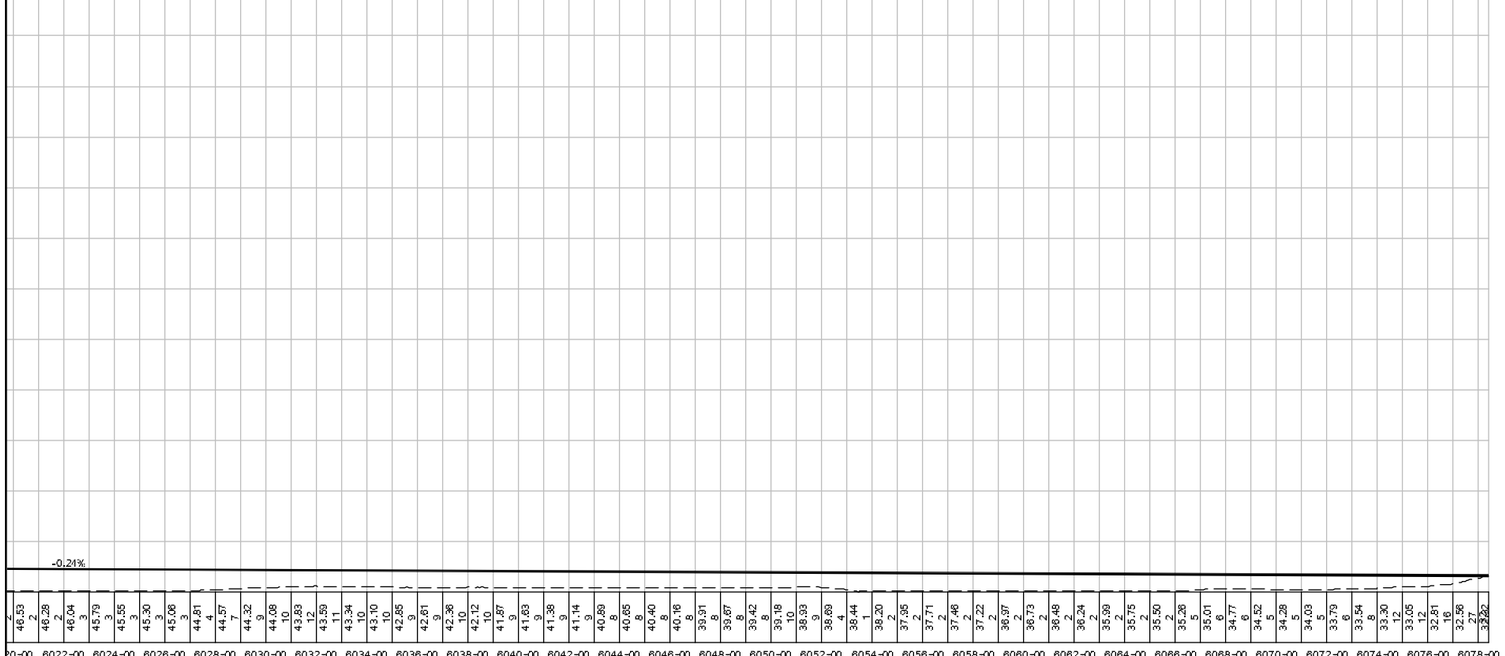
STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
SOUTHEAST REGION DESIGN & CONSTRUCTION

JUNEAU *JUNEAU ACCESS* *ALASKA*
PROJECT NO. 71100

WEST LYNN CANAL
STA. 5927+50 TO STA. 6023+00

DESIGNED BY:	PROJECT NO. *71100*
DRAWN BY:	DATE: *2004*
CHECKED BY:	SHEET *22* OF *23*





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RECORD OF REVISIONS

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
SOUTHEAST REGION DESIGN & CONSTRUCTION

JUNEAU *JUNEAU ACCESS* *ALASKA*
PROJECT NO. 71100

WEST LYNN CANAL
STA. 6023+00 TO E.O.P.

DESIGNED BY:	PROJECT NO. *71100*
DRAWN BY:	DATE: *2004*
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ATTACHMENT C

Highway Maintenance Costs

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Juneau Access
Highway Maintenance Cost Estimates

Prepared by Southeast Region Maintenance & Operations
April 27, 2004

Purpose

The purpose of this document is to provide a basic concept and cost estimate for maintenance of the proposed highways in the Juneau Access study.

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 Technical Studies, Snow Avalanche Report. Those costs are omitted from the cost calculations in this report, but are included in the final table on page 8.

MAINTENANCE CONCEPT

For the purpose of estimating highway maintenance costs, we determined that alternatives 2 and 2C would have identical costs, because the highway alignments and distances are the same for both alternatives. Alternative 2A will have slightly less highway cost. Alternatives 4B and 4D are similar in highway maintenance cost. Alternatives 1, 4A, and 4C have no new highway sections. The alternatives considered in this study, and the new miles of road for each alternative, are depicted in the chart below.

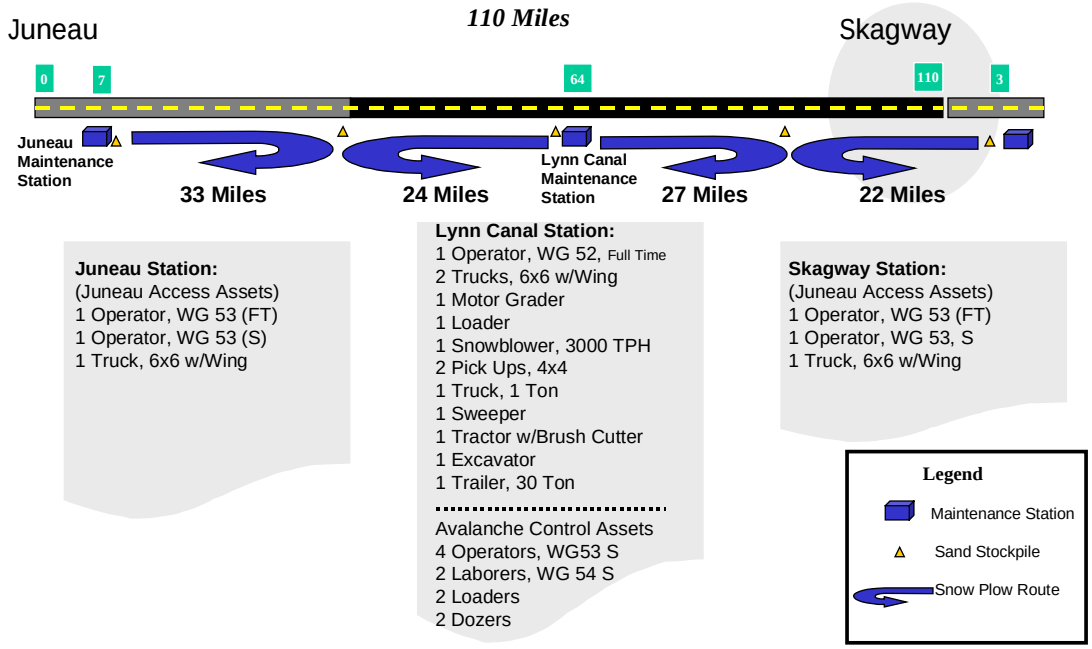
Alternative	Brief Description	New Road Miles
1	No build.	0
2 & 2C	Highway, Echo Cove to Skagway, with ferry terminal connection to Haines	68
2A	Highway, Echo Cove to Sawmill Cove, Ferry across Berners Bay, highway Slate Cove to Skagway	57
2B	Highway, Echo Cove to Katzehin, with ferry terminal connection to Skagway	50
3	Highway, Echo Cove to Sawmill Cove, Ferry across Lynn Canal, Highway West Lynn Canal, William Henry Bay to Haines	44
4A & 4C	Ferry from Auke Bay	0
4B & 4D	Ferry from Sawmill Cove (summer only)	5

Alternatives 2 and 2C – East Lynn Canal Highway

Alternatives 2 and 2C include a 68 mile road connection between existing road ends at Echo Cove and Skagway, with a ferry terminal at Katzehin or Skagway to provide a connection to Haines. The total distance between downtown Juneau and Skagway, including the existing highway and the new highway section, will be approximately 110 miles. The average width of the new highway will be 30 feet, adding 170 new lane miles for maintenance (for maintenance purposes, one lane mile is one mile of 12 foot wide pavement). Additionally, this alternative increases the winter maintenance priority for the Veterans Memorial Highway (Glacier Highway) beyond MP 34. Currently this section of highway receives very little winter maintenance. Under alternatives 2 and 2C this section of highway will become a major year-round thoroughfare and will therefore require high priority winter maintenance.

The maintenance concept for the East Lynn Canal route requires an intermediate maintenance station (the Lynn Canal Station) at approximately the mid point between Juneau and Skagway. This station will be manned 24x7 during the winter months (approximately November through March), and will be equipped with a full array of equipment for highway maintenance. Assets for avalanche control will be located at this station.

Juneau Access Highway Maintenance Concept
Alternative 2 & 2C
(Highway, Echo Cove to Skagway, with Ferry Connection to Haines)



The Lynn Canal station will be responsible for plowing, sanding, and patrolling approximately 25 miles in each direction, as well as avalanche control and avalanche clean up duties. The station will also be responsible for plowing the Katzehin terminal parking/staging area. A total of five equipment operators will be assigned to this station; one full time (FT) and four seasonal part time (PT). The full time operator will function as the station foreman. The operators will be equipped with heavy-duty 6x6 plow trucks with wings, a motor grader, a snow blower, loaders, and other heavy equipment. The four seasonal positions at Lynn Canal Station are identified in the Snow Avalanche report and their costs are reported there. Additionally, annual operating and replacement costs for two loaders, two bulldozers, and one pickup truck are covered in the Snow Avalanche Report.

Four additional operators will be assigned to the new highway segment: two stationed in Juneau (1 FT, 1 PT), and two in Skagway (1 FT, 1 PT). These operators will plow, sand, and patrol approximately 25 miles of highway between their duty stations and a meeting point with the Lynn Canal snowplows. They will also be trained and equipped to assist with avalanche control and clean up. One 6x6 plow truck will be added to each station for this mission. Assigning two new positions to both Juneau and Skagway allows seven-day-a-week coverage of the highway, and provides additional trained personnel for avalanche control.

In summary, a total of nine equipment operators (3 FT and 6 PT) will be assigned to the new highway segment. This level of staffing will provide for seven-day-a-week snowplowing during winter months, and avalanche control and clean up. In summer, the three full time positions will perform summer maintenance activities, primarily on the new route. Six full-time equivalents (FTEs) assigned to 170 lane miles equals 28.3 lane miles per operator. This is within range of the Southeast Alaska average highway maintenance ratio of 28.8 lane miles per operator.

Alternative 2 and 2C 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
Lynn Canal	2	Laborers (Avalanche Control)	56	Temp
Juneau	1	Equipment Operator	53	FT
Juneau	1	Equipment Operator	53	PT
Skagway	1	Equipment Operator	53	FT
Skagway	1	Equipment Operator	53	PT

To facilitate the plowing and sanding operation, sand stockpiles will be located at the meeting points between Juneau and Lynn Canal Station and between Lynn Canal Station and Skagway. Loaders will be positioned at these locations, and will be available for loading sand or for avalanche clean up operations. A sand stock pile will also be located at the Lynn Canal station.

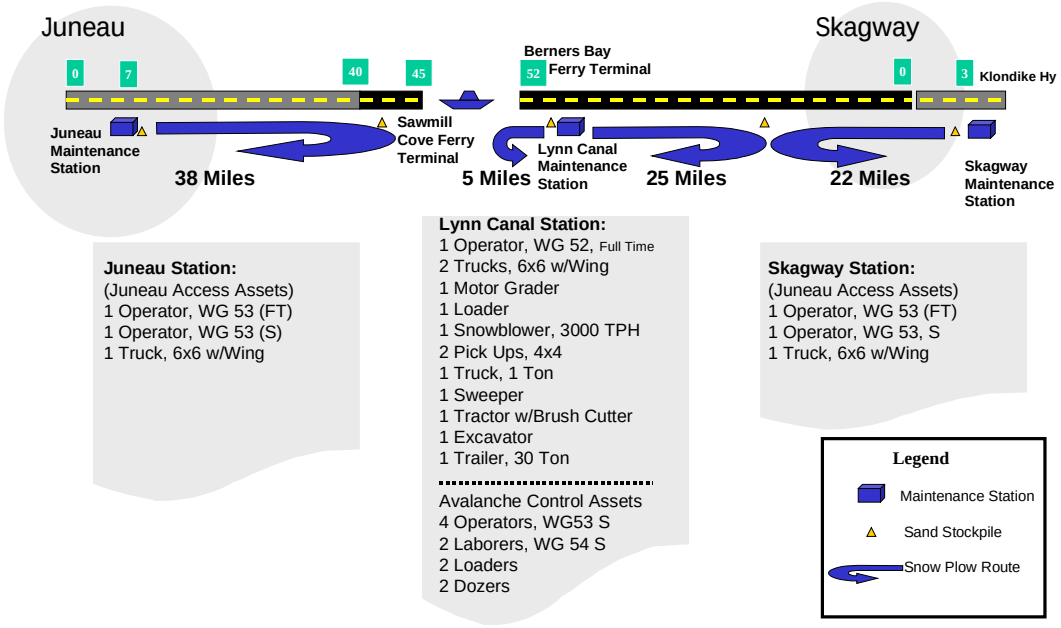
The proposed location of the Lynn Canal station is at Mile Point 64 of the current alignment, the site of an existing mine camp.

The Lynn Canal station will be minimally manned during summer. It will serve as a staging base for summer highway maintenance operations, such as pavement repair, ditching, brushing, slide clean up, guard rail repair, sign repair, and sweeping. A sweeper, brush cutter, excavator, and ancillary equipment will be assigned to this station for summer operations.

Alternative 2A – East Lynn Canal Highway with Ferry Across Berners Bay

Alternative 2A includes a new five mile highway section from Echo Cove to Sawmill Cove, a ferry connection between Sawmill Cove and Slate Cove, and a new 52 mile highway section between Slate Cove and Skagway. A ferry terminal at Katzehin provides a link to Haines. The maintenance concept for this alternative is identical to the maintenance plan for Alternative 2. It includes a Lynn Canal station with similar staffing, and augmentation of both the Juneau and Skagway maintenance stations. The only difference is that there are 11 fewer highway miles to maintain, and two additional terminal parking/staging areas.

Juneau Access Highway Maintenance Concept
Alternative 2A
(Highway Echo Cove to Sawmill Cove, Ferry across Berners Bay, Highway Slate Cove to Skagway)



Alternative 2A Staffing Table

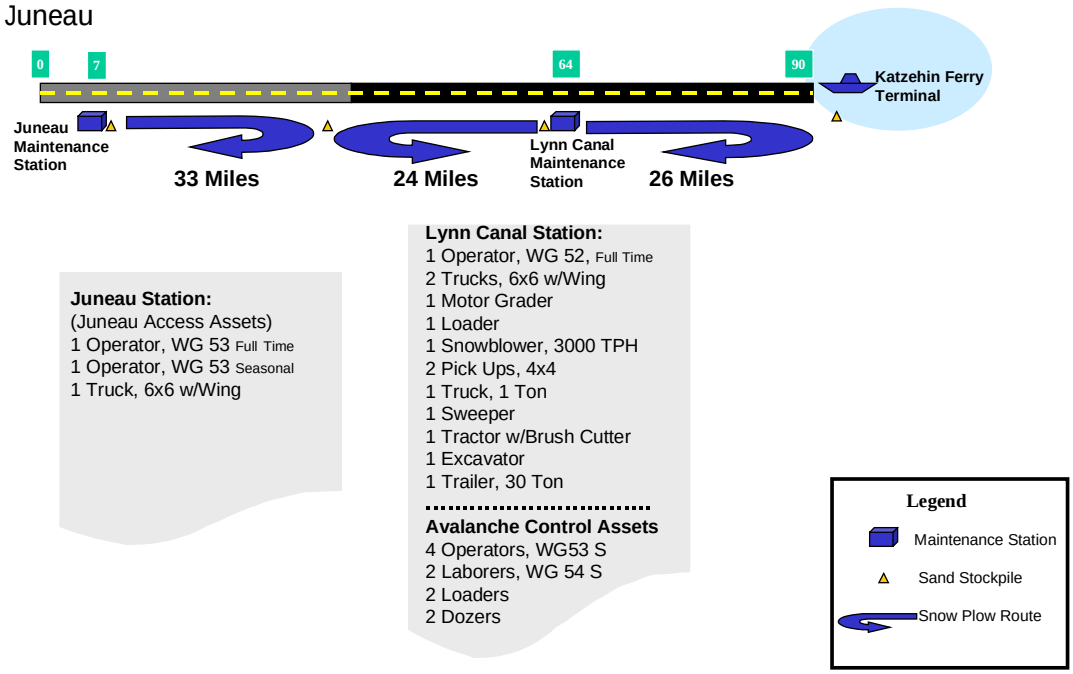
Station	No.	Job title	WG	Status
Lynn Canal	1	Equipment Operator, Foreman	52	FT
Lynn Canal	4	Equipment Operator (Avalanche Control)	53	PT
Lynn Canal	2	Laborers (Avalanche Control)	56	Temp
Juneau	1	Equipment Operator	53	FT
Juneau	1	Equipment Operator	53	PT
Skagway	1	Equipment Operator	53	FT
Skagway	1	Equipment Operator	53	PT

Six full-time equivalents (FTEs) assigned to 142.5 lane miles equals 23.8 lane miles per operator (slightly better level of service than the regional average of 28.8).

Alternative 2B – East Lynn Canal Highway to Katzehin

Alternative 2B proposes approximately 50 miles of new road (125 lane miles), from Echo Cove to Katzehin. The maintenance concept for this alternative is similar to alternatives 2, 2A, and 2C, except that the Skagway maintenance station is not assigned any new road responsibility. A Lynn Canal station is established, and is staffed and equipped as stated above.

Juneau Access Highway Maintenance Concept
Alternative 2B
(East Lynn Canal Highway to Katzehin)



The two operator positions designated for Skagway Station in Alternative 2, 2A, and 2C are deleted for Alternative 2B. A total of seven operators (2 FT and 5 PT) are assigned.

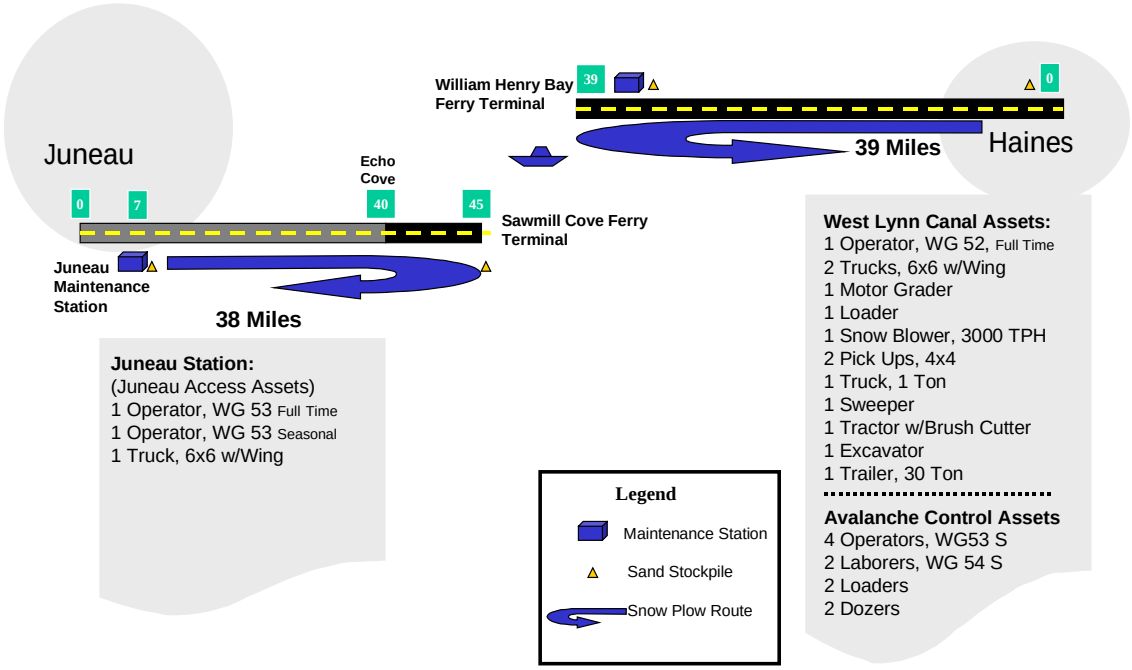
Alternative 2B Staffing Table

Station	No.	Job title	WG	Status
Lynn Canal	1	Equipment Operator, Foreman	52	FT
Lynn Canal	4	Equipment Operator (Avalanche Control)	53	PT
Lynn Canal	2	Laborers (Avalanche Control)	56	Temp
Juneau	1	Equipment Operator	53	FT
Juneau	1	Equipment Operator	53	PT

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 five miles of road will be constructed between Echo Cove and a new ferry terminal at Sawmill Cove . Total road distance is 44 miles (110 lane miles).

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



Maintenance of the West Lynn Canal road will be provided by the Haines Maintenance Station. One full time and four seasonal positions will be allocated to the new highway (this includes four seasonal positions identified for avalanche control). These personnel will operate out of the existing Haines station. The station will 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, identified for avalanche control, will also be provided.

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

Juneau Maintenance Station will be augmented with one full time operator and one seasonal position, to assist in maintaining the new highway segment from Echo Cove to Sawmill Cove. In addition to maintaining the new five mile road segment, Juneau Station will be required to place a higher priority on maintenance of the highway from Juneau to Echo Cove than they presently do. Current Juneau Station staffing allows only sporadic winter maintenance beyond Mile Point 34 of the Veterans Memorial Highway (Glacier Highway). In effect, Juneau Station will take on 10 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

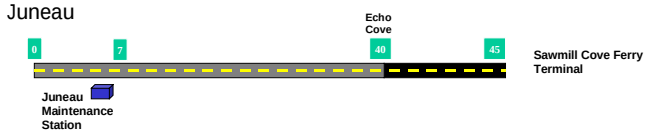
Station	No.	Job title	WG	Status
Haines	1	Equipment Operator	53	FT
Haines	4	Equipment Operator (Avalanche Control)	53	PT
Haines	2	Laborers (Avalanche Control)	56	Temp
Juneau	1	Equipment Operator	53	FT
Juneau	1	Equipment Operator	53	PT

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

These alternatives call for construction of approximately 5 miles of road from Echo Cove to a new ferry terminal at Sawmill Cove. This adds 12.5 lane miles of new road. 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 five miles of highway. This would be a low priority road in winter, as is the current section of Glacier Highway from mile point 26 to the end of the road at Echo Cove.

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 FY04 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 FY03 and FY04 costs for similar travel

Contractual Costs (Budget Line 3000)

- Equipment costs based on FY04 State Equipment Fleet rates for similar equipment
- Highway striping costs based on FY04 contract amounts
- Utilities costs based on similar sized station
- Miscellaneous costs of 10% added

Commodities Costs (Budget Line 4000)

Estimates 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 11%, similar to actual Southeast Region 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
2 & 2C	East Lynn Canal Highway	$776,644
2A	East Lynn Canal Highway with Ferry link	$767,403
2B	East Lynn to Katzehin	$576,445
3	West Lynn Canal Highway	$509,993
4B & 4D	Road to Sawmill Cove	$18,742

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 Technical Studies, Draft Snow Avalanche Report, dated February 2004. 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
2 & 2C	$776,644	$749,566	$1,526,210
2A	$767,403	$749,566	$1,516,969
2B	$576,445	$719,446	$1,295,891
3	$509,993	$733,969	$1,243,962
4B & 4D	$18,742	$0	$18,742

SUMMARY

For the East Lynn Canal and West Lynn Canal highway alternatives, total maintenance costs, including avalanche control, are approximately $8,000 per lane mile. This is about double the cost average for highway maintenance throughout Southeast Alaska. However, it reflects additional personnel and assets assigned to the highway to address the high 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 Technical Studies, Snow Avalanche Report, 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 are 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 is not adequate to ensure trafficable roads at all times, and highway closures for avalanche monitoring and clean up will be necessary.

All costs are based on current experiences where possible.

Updated 2/20/04

Alternative 2 and 2C

Budget Line	Detail	Cost
Personal Services	1 Equipment Operator, WG 52, Full Time (Lynn Canal) 2 Equipment Operators, WG 53, Full Time (JNU & SGY) 2 Equipment Operators, WG 53, Seasonal (6 mo.) (JNU & SGY) Note: Additional 4 equipment operators, WG 53, seasonal, plus 2 laborers, WG 56 temporary, included in avalanche control costs at $159,261.	$82,895 $151,199 $86,459 $320,553
Travel & Per Diem	Avalanche control training for 5 operators @ $850 ea.	$4,250
Contractual	Equipment (See below) Utilities Highway Striping Training Communications Miscellaneous (@ 10% of above costs, except equipment)	$185,796 $7,000 $33,000 $3,000 $1,800 $2,230 $232,826
Supplies	Fuel (bulk) Highway sand & aggregate Winter chemicals Blades & chains Highway paint Asphalt/oil Office supplies Household Structural Small Equipment Miscellaneous	$19,000 $63,000 $14,100 $6,500 $28,050 $2,500 $1,300 $1,300 $1,300 $2,500 $2,500 $142,050
	Sub Total Management & Overhead @ 11% Grand Total	$699,679 $76,965 **$776,644**

Equipment List	Annual Operating and Replacement Cost
4 Truck, 6x6	$87,216
1 Motor Grader	$19,740
1 Loader	$7,668
1 Snowblower	$23,640
1 Pick Up Truck, 4x4	$4,332
1 Truck, 1 1/2 T	$5,136
1 Sweeper	$8,808
1 Tractor/Brush Cutter	$14,052
1 Excavator	$12,624
1 Trailer, 30 T	$2,580
	$185,796

Avalanche Control Equipment (from Snow Avalanche Report)

2 Loaders
2 Bull Dozers
2 Pick Up Trucks

Updated 2/20/04

Alternative 2A

Budget Line	Detail	Cost
Personal Services	1 Equipment Operator, WG 52, Full Time (Lynn Canal)	$82,895
	2 Equipment Operators, WG 53, Full Time (JNU & SGY)	$151,199
	2 Equipment Operators, WG 53, Seasonal (6 mo.) (JNU & SGY)	$86,459
		$320,553
	Note: Additional 4 equipment operators, WG 53, seasonal, plus 2 laborers, WG 56 temporary, included in avalanche control costs at $159,261.	
Travel & Per Diem	Avalanche control training for 5 operators @ $850 ea.	$4,250
Contractual	Equipment (See below)	$185,796
	Utilities	$7,000
	Highway Striping	$28,500
	Training	$3,000
	Communications	$1,800
	Miscellaneous (@ 10% of above costs, except equipment)	$2,230
		$228,326
Supplies	Fuel (bulk)	$19,000
	Highway sand & aggregate	$63,000
	Winter chemicals	$14,100
	Blades & chains	$6,500
	Highway paint	$24,225
	Asphalt/oil	$2,500
	Office supplies	$1,300
	Household	$1,300
	Structural	$1,300
	Small Equipment	$2,500
	Miscellaneous	$2,500
		$138,225
	Sub Total	$691,354
	Management & Overhead @ 11%	$76,049
	Grand Total	**$767,403**

Equipment List	Annual Operating and Replacement Cost
4 Truck, 6x6	$87,216
1 Motor Grader	$19,740
1 Loader	$7,668
1 Snowblower	$23,640
1 Pick Up Truck, 4x4	$4,332
1 Truck, 1 1/2 T	$5,136
1 Sweeper	$8,808
1 Tractor/Brush Cutter	$14,052
1 Excavator	$12,624
1 Trailer, 30 T	$2,580
	$185,796

Avalanche Control Equipment (from Snow Avalanche Report)

2 Loaders
2 Bull Dozers
2 Pick Up Trucks

Updated 2/20/04

Alternative 2B

Budget Line	Detail	Cost
Personal Services	1 Equipment Operator, WG 52, Full Time (Lynn Canal) 1 Equipment Operator, WG 53, Full Time (JNU) 1 Equipment Operator, WG 53, Seasonal (6 mo.) (JNU) Note: Additional 4 equipment operators, WG 53, seasonal, plus 2 laborers, WG 56 temporary, included in avalanche control costs at $159,261.	$82,895 $75,130 $42,973 $200,998
Travel & Per Diem	Avalanche control training for 3 operators @ $850 ea.	$2,550
Contractual	Equipment (See below) Utilities Highway Striping Training Communications Miscellaneous (@ 10% of above costs, except equipment)	$163,992 $7,000 $25,000 $3,000 $1,800 $2,230 $203,022
Supplies	Fuel (bulk) Highway sand & aggregate Winter chemicals Blades & chains Highway paint Asphalt/oil Office supplies Household Structural Small Equipment Miscelaneous	$8,100 $53,000 $13,000 $6,000 $21,250 $2,500 $1,300 $1,300 $1,300 $2,500 $2,500 $112,750
	Sub Total Management & Overhead @ 11% Grand Total	$519,320 $57,125 **$576,445**

Equipment List	**Annual Operating and Replacement Cost**
3 Truck, 6x6	$65,412
1 Motor Grader	$19,740
1 Loader	$7,668
1 Snowblower	$23,640
1 Pick Up Truck, 4x4	$4,332
1 Truck, 1 1/2 T	$5,136
1 Sweeper	$8,808
1 Tractor/Brush Cutter	$14,052
1 Excavator	$12,624
1 Trailer, 30 T	$2,580
	$163,992

Avalanche Control Equipment (from Snow Avalanche Report)

2 Loaders

2 Bull Dozers

2 Pick Up Trucks

Updated 2/20/04

Alternative 3

Budget Line	Detail	Cost
Personal Services	2 Equipment Operators, WG 53, Full Time (1 HNS, 1 JNU) 1 Equipment Operator, WG 53, Seasonal (6 mo.) (HNS) Note: Additional 4 equipment operators, WG 53, seasonal, plus 2 laborers, WG 56 temporary, included in avalanche control costs at $159,261.	$151,199 $43,486 $194,685
Travel & Per Diem	Avalanche control training for 5 operators @ $850 ea.	$4,250
Contractual	Equipment (See below) Utilities Highway Striping Training Communications Miscellaneous (@ 10% of above costs, except equipment)	$142,188 $2,500 $20,000 $3,000 $1,800 $2,230 $171,718
Supplies	Fuel (bulk) Highway sand & aggregate Winter chemicals Blades & chains Highway paint Asphalt/oil Office supplies Household Structural Small Equipment Miscelaneous	$13,000 $37,800 $8,500 $5,000 $17,000 $2,500 $0 $0 $0 $2,500 $2,500 $88,800
	Sub Total Management & Overhead @ 11% Grand Total	$459,453 $50,540 **$509,993**

Equipment List	**Annual Operating and Replacement Cost**
2 Truck, 6x6	$43,608
1 Motor Grader	$19,740
1 Loader	$7,668
1 Snowblower	$23,640
1 Pick Up Truck, 4x4	$4,332
1 Truck, 1 1/2 T	$5,136
1 Sweeper	$8,808
1 Tractor/Brush Cutter	$14,052
1 Excavator	$12,624
1 Trailer, 30 T	$2,580
	$142,188

Avalanche Control Equipment (from Snow Avalanche Report)

2 Loaders

2 Bull Dozers

2 Pick Up Trucks

Updated 2/20/04

Alternative 4B and 4D

Budget Line	Detail	Cost
Personal Services	1 Equipment Operator, WG 53, 300 Hours @ $42/Hr	$12,600
Travel & Per Diem		$0
Contractual	Equipment (See below)	$5,820
	Utilities	$0
	Highway Striping	$2,500
	Training	$0
	Communications	$0
	Miscelaneous	$250
		$8,570
Supplies	Fuel (bulk)	$1,190
	Highway sand & aggregate	$250
	Winter chemicals	$0
	Blades & chains	$0
	Highway paint	$2,125
	Asphalt/oil	$1,250
	Office supplies	$0
	Household	$0
	Structural	$0
	Small Equipment	$0
	Miscellaneous	$3,500
		$8,315
	Sub Total	$16,885
	Management & Overhead @ 11%	$1,857
	Grand Total	**$18,742**

Equipment List	Usage Cost
Pick Up @ 500 Mi.	$125
Brush Cutter @ 40 Hr	$1,377
Excavator @ 40 Hrs	$976
Dump Truck @ 100 Hrs	$3,342
	$5,820

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JUNEAU ACCESS
MAINTENANCE COST ESTIMATE
(Does not include avalanche control costs)
East Lynn Canal, Alternatives 2, 2A, 2C

Personal Services

	Location	Months	Sal + Bene	Notes
Equipment Operator, WG 52	Lynn Canal	12	$82,895	
Equipment Operator, WG 53	Lynn Canal	6		Included in Avalanche Control costs
Equipment Operator, WG 53	Lynn Canal	6		Included in Avalanche Control costs
Equipment Operator, WG 53	Lynn Canal	6		Included in Avalanche Control costs
Equipment Operator, WG 53	Lynn Canal	6		Included in Avalanche Control costs
Laborer	Lynn Canal	Temp		Included in Avalanche Control costs
Laborer	Lynn Canal	Temp		Included in Avalanche Control costs
Equipment Operator, WG 53	Juneau	12	$75,130	
Equipment Operator, WG 53	Juneau	6	$42,973	
Equipment Operator, WG 53	Skagway	12	$76,069	
Equipment Operator, WG 53	Skagway	6	$43,486	
Auto Mechanic, WG 53	Lynn Canal	1	$43,458	
		Personal Services Total:	$364,011	

Travel & Per Diem

Avalanche control training for 6 personnel @ $850 ea.	$5,100	
Travel Total:	$5,100	

Contractual

Equipment	$185,796	See Equipment Sheet
Utilities	$7,000	Similar to Haines Station
Highway Striping (Centerline Miles)	$10,500	
Training	$3,000	
Communications	$1,800	Radios, telephone, cell phone
Miscellaneous (@ 10% of above costs)	$2,230	
Total Contractual:	$210,326	

Supplies

	Units	Cost	Total	
Fuel (Bulk)			$12,000	(minus $9,000 for avalanche)
Highway Sand & Aggregate (tons)	3,000	$21	$63,000	
Winter Chemicals	60	$235	$14,100	
Blades & Chains	20	$75	$1,500	
Highway Paint	1	$20,000	$20,000	
Asphalt/Oil	10	$250	$2,500	
Office	1	$1,300	$1,300	
Household	1	$1,300	$1,300	
Structural	1	$1,300	$1,300	
Small Equipment	10	$250	$2,500	
Miscelaneous	1	$2,500	$2,500	
		Total Supplies:	$122,000	

Total Cost:	$701,437
Admin & Overhead @ 9%:	$63,129
Grand Total:	$764,566

Equipment Operating Costs

Equipment	Op Cost	Rep Cost	Units	Total Cost
Truck, 6x6	$891	$926	4	$7,268
Motor Grader	$709	$936	1	$1,645
Loader	$209	$430	1	$639
Snowblower	$870	$1,100	1	$1,970
Pick Up Truck, 4x4	$126	$235	1	$361
Truck, 1 1/2 T	$60	$368	1	$428
Sweeper	$318	$49	2	$734
Tractor/Brush Cutter	$623	$548	1	$1,171
Excavator	$108	$944	1	$1,052
Trailer, 30 T	$61	$154	1	$215
			Total Monthly Equip Cost:	$15,483
			Annual Cost:	$185,796

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

Loader, 988	2
Dozer, D-8	2
Pick Up, 4x4	1

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ATTACHMENT D

Marine Terminal Concepts

JUNEAU ACCESS MARINE TERMINAL CONCEPTS

November 21, 2003

Attached are conceptual layout drawings and accompanying project cost estimates for potential marine ferry vessel terminals at Auke Bay, Sawmill Cove, Slate Cove, William Henry Bay and Katzehin River. The terminal locations from Berners Bay to Katzehin region are shown on the vicinity map on Figure 1. Following is a discussion concerning these facilities and associated development issues.

General

With the exception of the Auke Bay site, each of the proposed terminal locations are new facilities that would be constructed in a remote area.

All ferry vessels are considered to be Aurora/Leconte or IFA style boats; however, each facility could be adapted for use of larger vessels up to approximately a Taku class vessel. The terminals could also be readily adapted for use by fast ferry type vessels. Approximately 800-1,000 LF of staging lanes is delineated per ferry berth. Parking spaces for a minimum of about 50-75 vehicles should also be provided at each terminal depending on location, number of vessels and required level of ferry service, etc.

All-tide moorage is expected for the “home port” locations.

For ferry traffic between Sawmill Cove and William Henry Bay, two vessels are anticipated to be utilized. Twin berths will therefore be required at the Sawmill Cove site. Sawmill will be considered the homeport for overnight berthing.

The Katzehin River location requires only a single berth as the vessel route would be between Haines or Skagway and Katzehin and schedules can be coordinated so that only one berth is required. Slate Creek also only requires a single berth facility.

For all of the sites, offshore survey data has been recently obtained and is shown on the attached drawings. A minimum bottom elevation of –25 feet MLLW is assumed to be required for safe vessel moorage at low tides at all terminal locations.

Each terminal location will require a building structure for either ticket sales, passenger facilities and/or for maintenance purposes. The size and related building requirements for each terminal location have not been thoroughly identified. For preliminary design purposes, each of the terminal buildings for the various terminal locations is assumed to be roughly 24’x 40’ in size or 960 square feet.

Utility considerations have not been fully developed. Ideally, each of the terminals should provide public restrooms (and means for sewage disposal or off-haul), electric power and potable water. Fuel supply for the vessels is another consideration. Since each of the sites is remote, existing utility infrastructure is not available. Generator facilities and appropriate fuel supply to power the generator will be required to supply electric power considering the remote location of each of these sites. All project cost estimates includes the following elements: Marine facilities including mooring structures, vehicle and pedestrian transfer facilities, dredging

and breakwaters (where deemed necessary, see attached drawings), suitable upland staging area (sized as necessary for vehicle staging and parking), potable water, electric power supply (generator facilities) and on-site sewage disposal. Each of the cost estimates is structured as if they were constructed as a stand-alone project. The cost estimates are inclusive of mobilization, remote camp facilities, design, permitting, construction administration and ICAP. The cost estimates should be restructured as may be applicable if included as part of other project(s).

Auke Bay (Figure 2)

Auke Bay is an existing AMHS terminal facility that presently consists of two side berths. Four primary berth locations are designated on the attached drawing. The drawing shows a master plan expansion scheme that has been under development by DOT&PF for a number of years.

Terminals 1 and 2 consist of two double stern berths (accommodations for four vessels) that would replace the existing west side berth. One of these twin stern berths would accommodate the needs of the Juneau Access project contemplated under Alternatives 4A-D. Under Alternatives 4A-D, two vessels would be utilized for north Lynn Canal service. The other twin stern berth would accommodate future AMHS vessel needs for other ferry routes. Only terminals 1 or 2 would be needed in support of the Juneau Access project.

Terminal 3 shows the existing east side berth remaining in service.

Terminal 4 shows a new stern berth facility that is presently under construction. This terminal is to be utilized for the fast ferry vessel, MV Fairweather. The new stern berth is scheduled to be completed May 2004.

Terminals 1 or 2 consist of twin vehicle transfer bridges supported by steel stern berth floats. The vessels would be moored against a 40'x480' mooring float in order to provide all-tide moorage in the event that one of the berths is utilized as a winter layup berth. Terminal 1 has two bridges that would provide vehicle transfer to two vessels on either side of the mooring float. Terminal 2 contemplates one of the vessels as being a passenger only ferry consistent with previous AMHS planning goals. The access bridge to this berth would accommodate light-duty drive down traffic only. The other berth is equipped with a standard vehicle transfer bridge allowing full drive-on access onto the ferry vessel.

The accompanying cost estimate reflects construction of both Terminals 1 and 2. Since only one of these terminals is needed in support of the Juneau Access alternatives, the costs shown on the attached summary should be reduced by half. A total cost of about $13 million would therefore by appropriate for inclusion in the Juneau Access cost summaries.

Sawmill Cove (Figure 3)

A twin, stern berth facility is shown for this location. The larger cove in this vicinity was selected as the preferred site since it will offer the most protection from northerly wind and waves. The site is relatively well protected from southeast winds but is exposed to the northerly fetch of Berners Bay and, to some extent, refracted waves from Lynn Canal. The berth consists of two bridge support floats and a shared dolphin system comprised of all-tide floating fenders. Access to the vessels would be via twin 143-foot-long steel transfer bridges founded on offshore fill as

generally noted on the drawing. The region under the bridge floats would need to be dredged as noted.

The staging area would be constructed as a combination of tideland and upland fill and encompassing approximately 3.1 acres. The existing upland topography is relatively steep and most of the staging area would likely be constructed near the tidelands in order to avoid deep excavation of the hillside. Offshore bathymetry surveys have been previously conducted in this region and the water depth is well defined. The offshore topography drops into deep water beyond the -20-foot contour line making construction of pile structures difficult. Dredging is therefore required to move the facility more towards the shore to limit the water depth at the outer mooring structure.

Access to the staging area will require a 2,400-foot-long access roadway in order to reach the grade of the proposed highway alignment.

Slate Cove (Figure 4)

This facility is envisioned as a single side berth consisting of a steel transfer bridge abutting offshore fill and supported at the seaward end by a steel bridge float. Fixed dolphin structures with all-tide floating fenders or fixed mooring faces are contemplated depending on vessel needs. This site will not be a home-port for the vessel. The uplands would be constructed as a combination of intertidal and upland fill. Some local excavation of an existing beach-front bluff would also be needed. The total uplands staging area provides a total area of about 2.1 acres. No dredging is required at this site.

The offshore bathymetry for this site is well defined by the recent survey work. The existing cove offers ample water depths and room for vessel turning movements.

There are also development plans for other marine facilities on the east side of the cove due to plans to construct the Kensington Mine in the near future. DOT&PF's proposed layout on the west shore of the cove should not conflict with mine development.

A 2,900-foot-long roadway that connects to the main highway will access the staging area.

William Henry Bay (Figure 5)

This location is the most remote of all the sites. It is somewhat protected from the southeast but it is exposed to severe northerly storms from Lynn Canal. Large waves are known to diffract into the bay, especially during the fall and winter months. Wave protection from the north is not feasible without some sort of breakwater structure. Breakwater options at this site were not evaluated as part of this study effort. The terminals shown on the attached drawing consist of lift-bridge structures (no floats). Vessels cannot safely moor at this location overnight. The vessels should return to Sawmill Cove for overnight berthing. There may also be some periods where inclement weather will prevent vessels from berthing at this location. There are no other feasible locations along the west coast of Lynn Canal in this vicinity where a terminal might be located. The west side of the bay was chosen as the preferred site since it offers the most natural protection from northerly weather. This location is also often used during the summer

season by fish processing vessels. The offshore bathymetry at this site has been well defined by a recent survey. There is ample water depths; however, the beach slope is relatively flat and

a long, pile supported access trestle will be required to reach adequate water depths for vessel berthing.

A single side berth is shown for this location. The transfer bridge is accessed by 24-foot-wide by 210-foot-long pile supported dock structures. The long approach dock is necessary to reach sufficient water depths at this site without dredging. The transfer bridge would be raised and lowered via a mechanical lift system – likely comprised of a counterweight lift system since counterweight systems do not require significant electric power supply (as compared to a synchro-lift winch lift system). Fixed dolphin structures will be utilized to moor the vessels during vessel and pedestrian transfers.

The staging area abuts steep upland topography. The staging area will require some upland excavation into the hillside but will consist mostly of tideland fill. A total uplands area of about 1.9 acres is shown. No dredging is presently contemplated at this terminal location.

Further considerations at this site might include evaluation of potential breakwater alternatives to provide northerly wave protection. Dredging would be required since water depths would not allow the efficient construction of a breakwater structure that would extend far enough offshore without moving the vessel mooring location towards the shore.

Katzehin River (Figures 6-8)

This site is characterized as a large river delta. It is exposed to the north, south and west directions and natural protection in this region is very limited. Wind and waves at this site are a major consideration. The upland topography north of the river mouth becomes extremely steep and rugged. Deep water depths are encountered immediately north of the river delta tidelands. The north side of the river delta was chosen as the most logical location. It affords some southern wave protection, has access to deeper waters and has ample land area for construction of uplands.

A limited wave analysis was conducted for this site. Northern wave heights are estimated at about 6-feet. Westerly or northwesterly direction waves originating from winds coming from the Chilkat and Lutak Inlet valleys are estimated at 3-4 feet. Southerly wave heights were not evaluated but can be considered similar to the predicted wave heights for the northerly direction; however, some protection is probably afforded by the shallow tidelands that extend south of the proposed site. In any event, the wave climate at this site will preclude safe and efficient vessel berthing and transfer of cargo unless wave protection is afforded. If left unprotected, there will be some periods of inclement weather that will prevent ferry berthings.

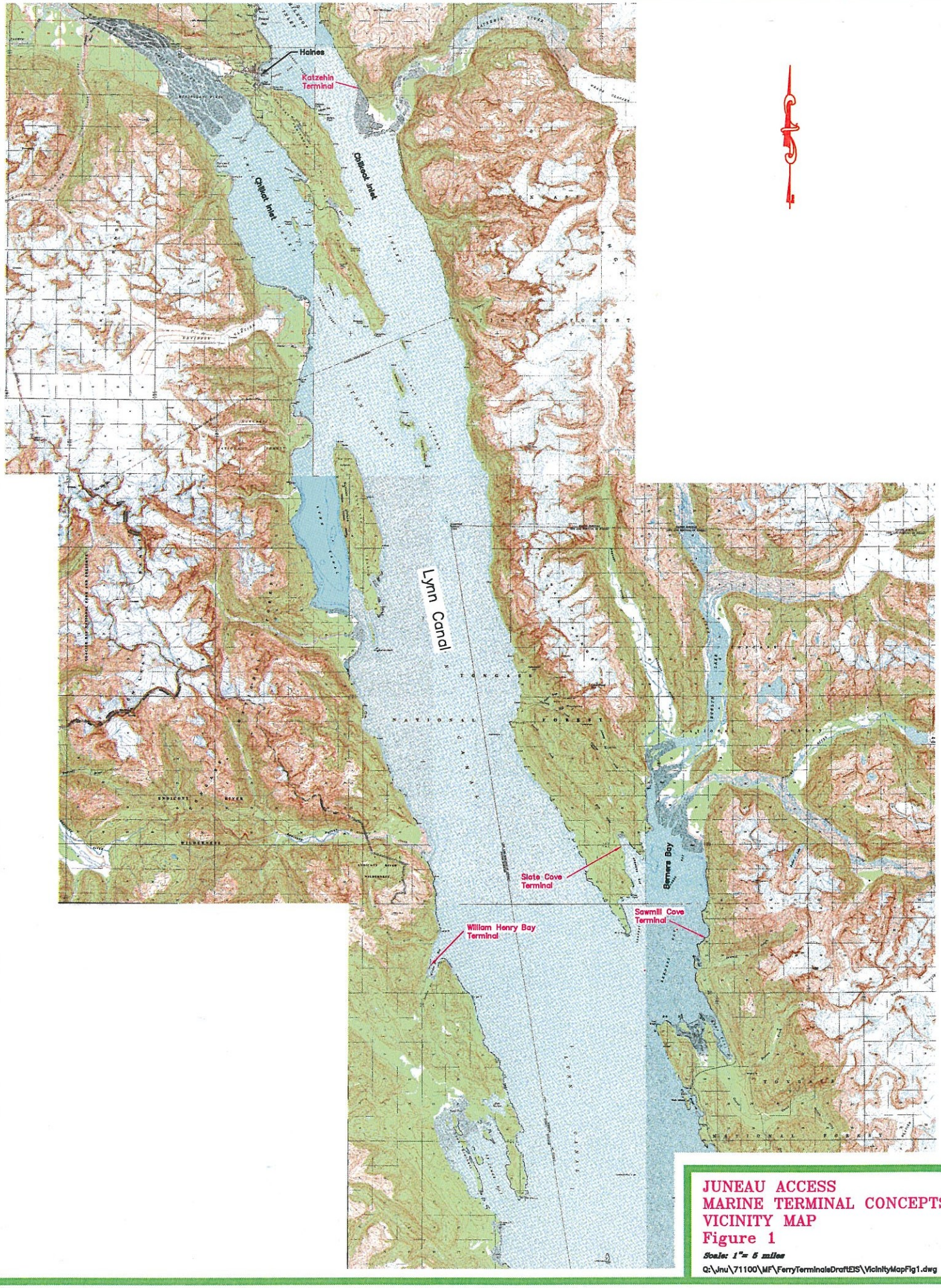
Due to the severe weather exposure at this site, and the perceived need for wave protection, three layouts were evaluated. A stern berth terminal configuration is shown on the attached drawings; however, a side berth may be required under some of the transportation alternatives. A side berth facility would need to be configured somewhat differently than as shown on the three layouts evaluated under this study effort; however, the relative overall size, features, environmental impacts and project cost would be similar whether a side berth or a stern berth

facility is ultimately constructed. A side berth mooring scheme was therefore not developed. The three stern berth layouts are briefly outlined below:

Layout 1 (Figure 6) is an unprotected facility consisting of tideland fill that accesses a lift bridge terminal system (no bridge support float). The lift bridge system and associated offshore mooring structures will prevent damage to the terminal, but since there is no wave protection, there will be periods where loading or berthing will not be possible under this alternative. The uplands shown consist of about 1.9 acres in usable size.

Layout 2 (Figure 7) shows rubble mound breakwater structures sited to the north and south of a dredged mooring basin. A vehicle transfer bridge supported by a float is contemplated for berthing/loading of the vessel. The breakwaters should provide suitable protection from the predominate northerly and southerly wave climates; however, exposure to the west direction is still evident. Some refraction and diffraction of northerly waves will also occur since the north breakwater cannot be feasibly extended due to deep water depths. A total fill area of about 2.4 acres is shown. The dredged basin encompasses about 3 acres.

Layout 3 (Figure 8) is a significant undertaking consisting of a 67-acre dredged mooring basin that is enclosed on all sides by rubble mound breakwaters. Alternative 3 was developed to provide an alternative that would provide all-weather moorage to minimize any loss of vessel sailings due to the exposed nature of this site. The total foot-print of this facility is estimated at nearly 100 acres in size. A 400-foot wide entrance channel provides access to the mooring basin. Preliminary calculations indicate that over 2,000,000 cubic yards of material would need to be dredged to construct this basin. The size of the basin was dictated by using a vessel turning radius of 3 times the length of the vessel (about 700-feet). The basin therefore needs to be roughly 1,500 feet or so wide in order to provide for safe vessel turning maneuvers under windy conditions. It may be possible to decrease the size of this basin pending more detailed engineering studies and discussions with AMHS vessel operators to better ascertain operational constraints of the vessel for access, movement within the basin and berthing needs. The construction of this basin and associated mooring facilities is estimated to exceed $35 million and would be a major impact to the intertidal area. Layout 1 is the least desirable due to lack of wave protection, and it should only be contemplated if loss of service during periods of inclement weather is acceptable. Layout 2 would provide significantly enhanced weather protection; however, exposure to the west is still evident and some berthing losses can still be expected. Layout 3 affords adequate wave protection but has significant costs and higher environmental impact. Layout 2 attempts to balance costs and level of environmental impact and can probably be considered a reasonable option for all alternatives requiring a ferry terminal at the Katzehin site.



JUNEAU ACCESS
MARINE TERMINAL CONCEPTS
VICINITY MAP
Figure 1

Scale: 1"= 6 miles

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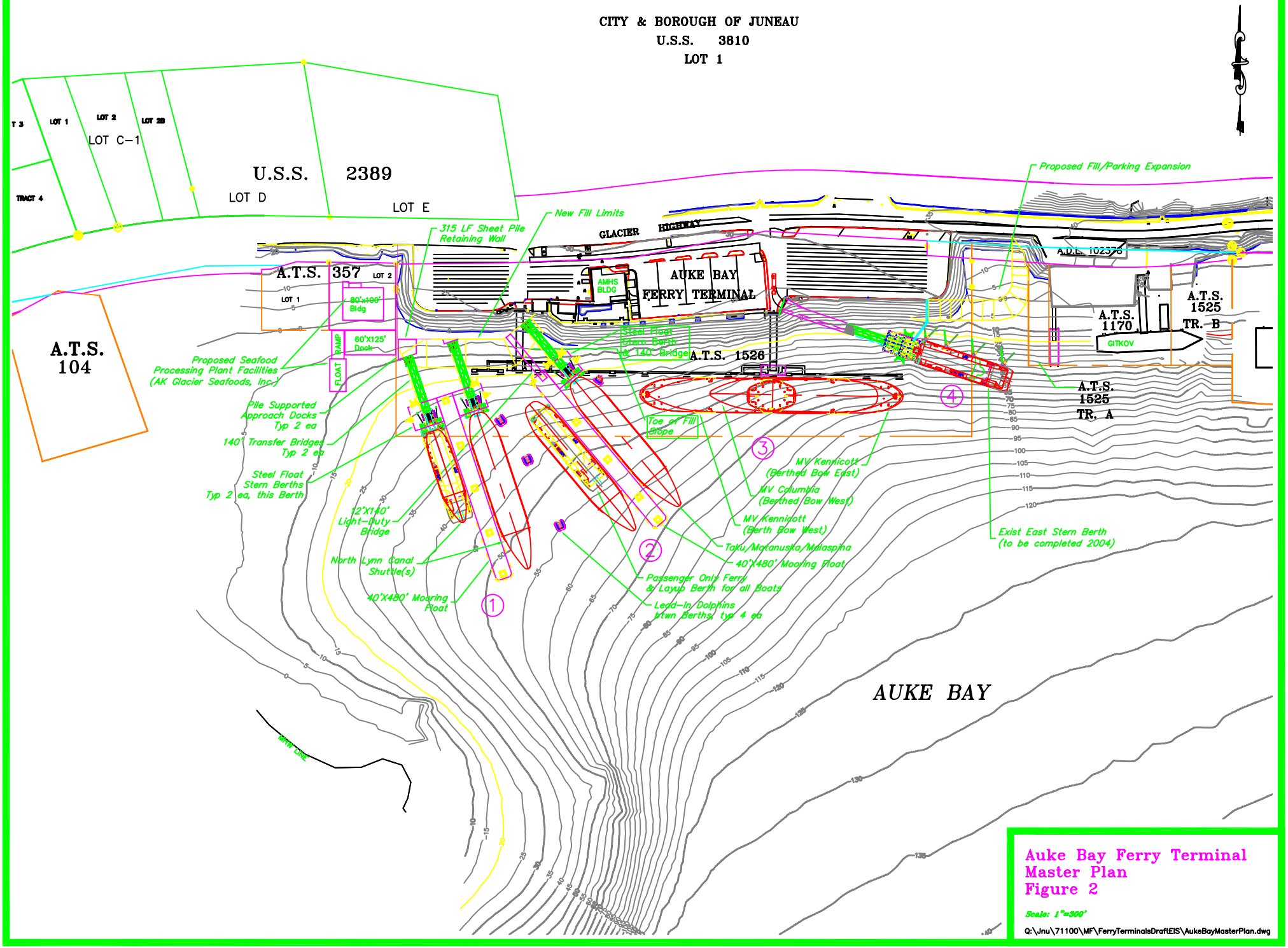
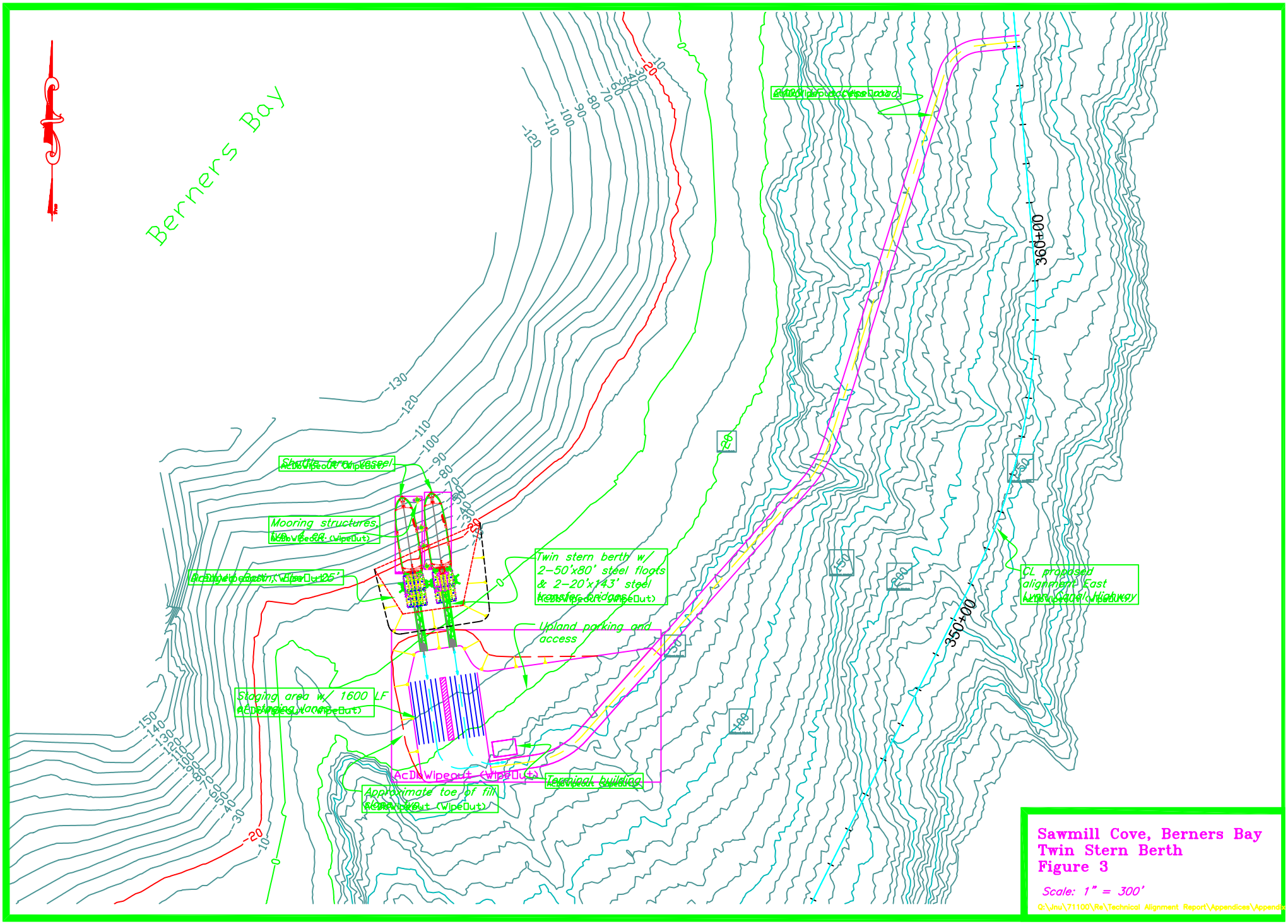

CITY & BOROUGH OF JUNEAU
U.S.S. 3810
LOT 1
U.S.S. 2389
LOT C-1
LOT D
LOT E
TRACT 4
LOT 1
LOT 2
LOT 2B
A.T.S. 104
A.T.S. 357
LOT 2
LOT 1
80'x100' Bldg
60'X125' Dock
RAMP
FLOAT
AMHS BLDG
AUKE BAY FERRY TERMINAL
GLACIER HIGHWAY
A.T.S. 1526
A.T.S. 1170
GITKOV
A.T.S. 1525 TR. B
A.T.S. 1525 TR. A
A.D.L. 102378
AUKE BAY
MHW LINE
Proposed Fill/Parking Expansion
New Fill Limits
315 LF Sheet Pile Retaining Wall
Proposed Seafood Processing Plant Facilities (AK Glacier Seafoods, Inc.)
Pile Supported Approach Docks Typ 2 ea
140' Transfer Bridges Typ 2 ea
Steel Float Stern Berths Typ 2 ea, this Berth
12'X140' Light-Duty Bridge
North Lynn Canal Shuttle(s)
40'X480' Mooring Float
Steel Float Stern Berth & 140' Bridge
Toe of Fill Slope
MV Kennicott (Berthed Bow East)
MV Columbia (Berthed Bow West)
MV Kennicott (Berth Bow West)
Taku/Matanuska/Malaspina
40'X480' Mooring Float
Passenger Only Ferry & Layup Berth for all Boats
Lead-In Dolphins btwn Berths, typ 4 ea
Exist East Stern Berth (to be completed 2004)
1
2
3
4
Auke Bay Ferry Terminal
Master Plan
Figure 2
Scale: 1"=300'
Q:\Jnu\71100\MF\FerryTerminalsDraftEIS\AukeBayMasterPlan.dwg


Berners Bay
Mooring structures
Twin stern berth w/ 2-50'x80' steel floats & 2-20'x143' steel transfer bridges
Upland parking and access
Staging area w/ 1600 LF
Technical building
Approximate toe of fill
CL proposed alignment East
360+00
350+00
Sawmill Cove, Berners Bay
Twin Stern Berth
Figure 3
Scale: 1" = 300'
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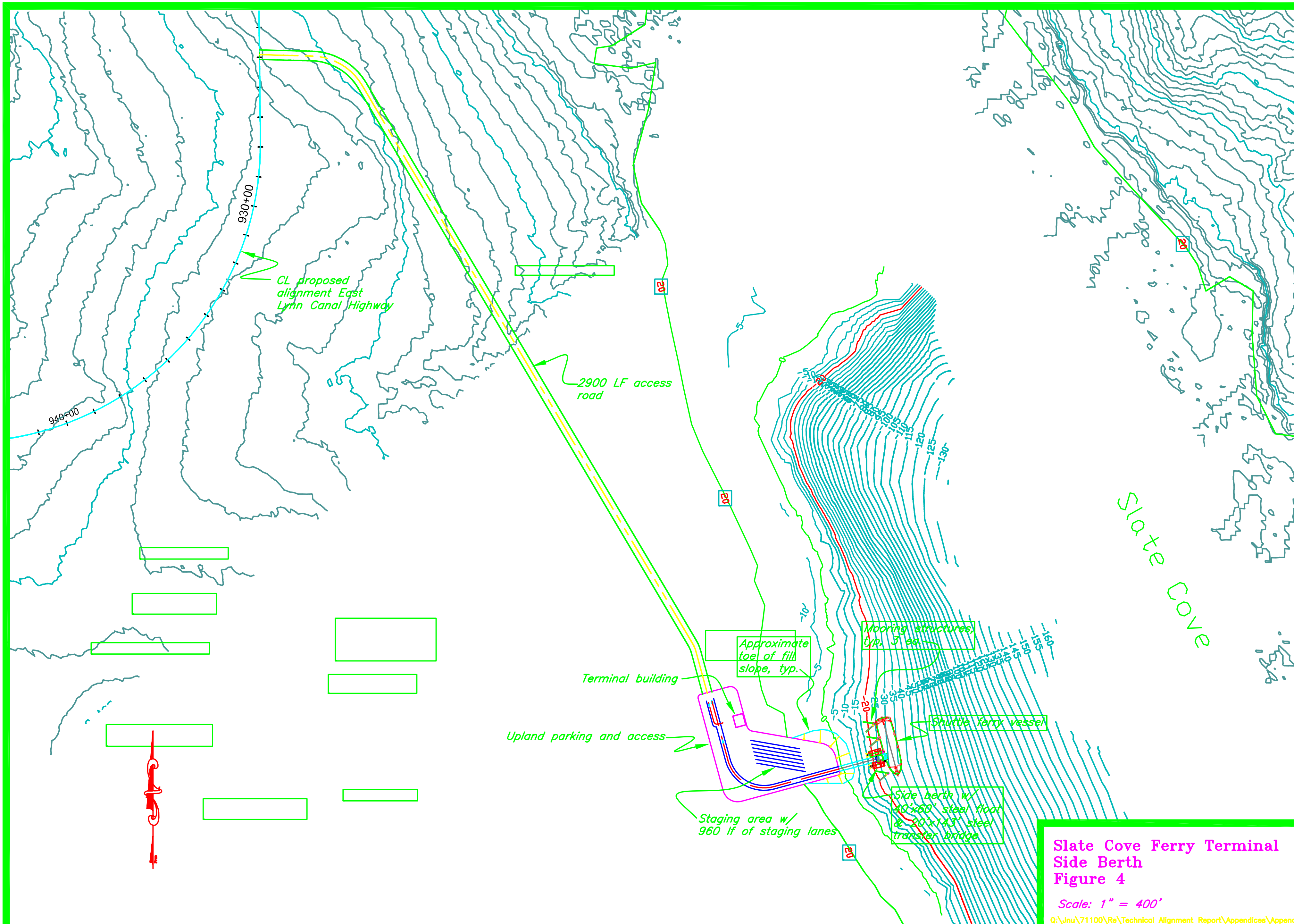

Slate Cove Ferry Terminal
Side Berth
Figure 4

Scale: 1" = 400'

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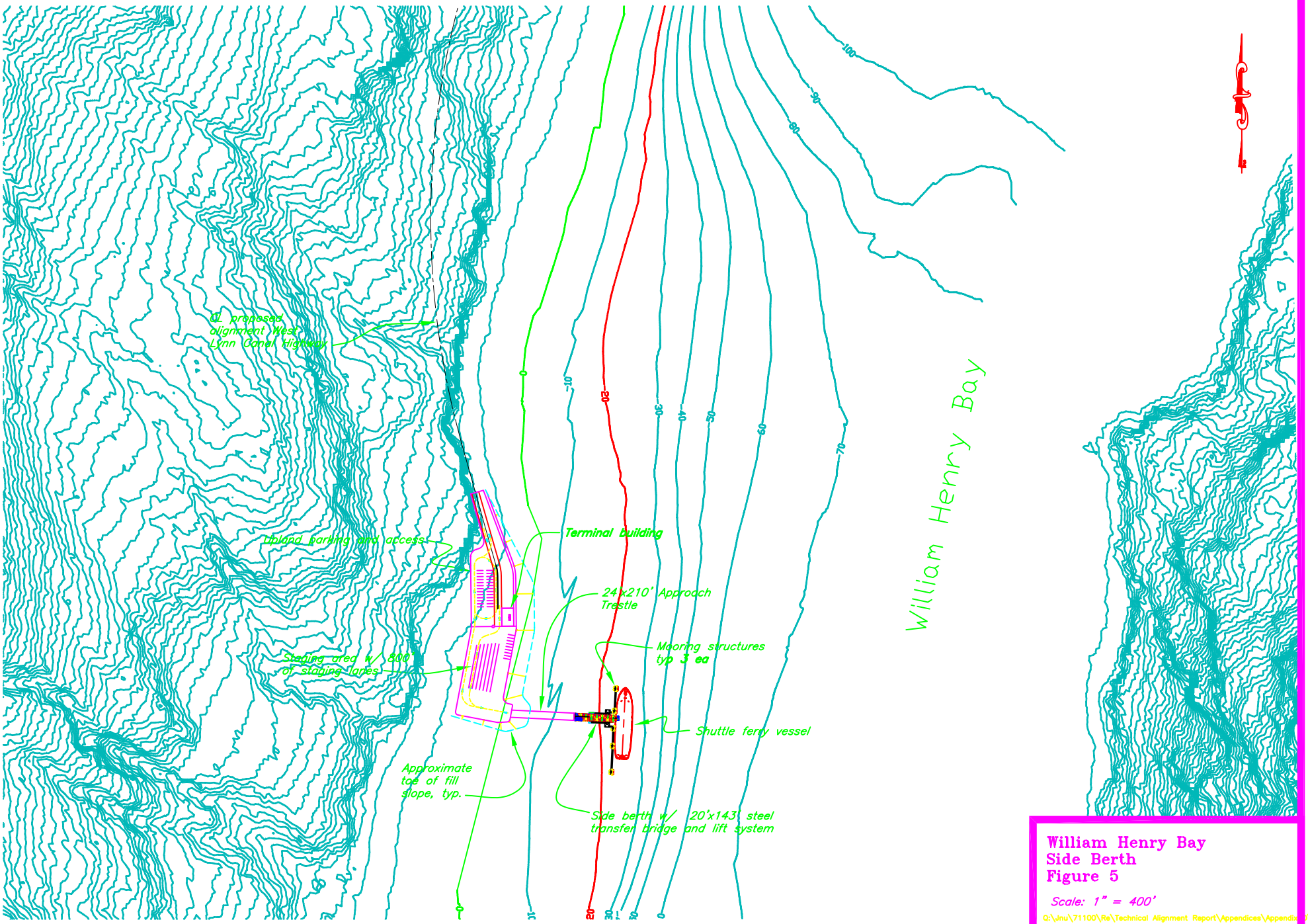

William Henry Bay
Side Berth
Figure 5

Scale: 1" = 400'

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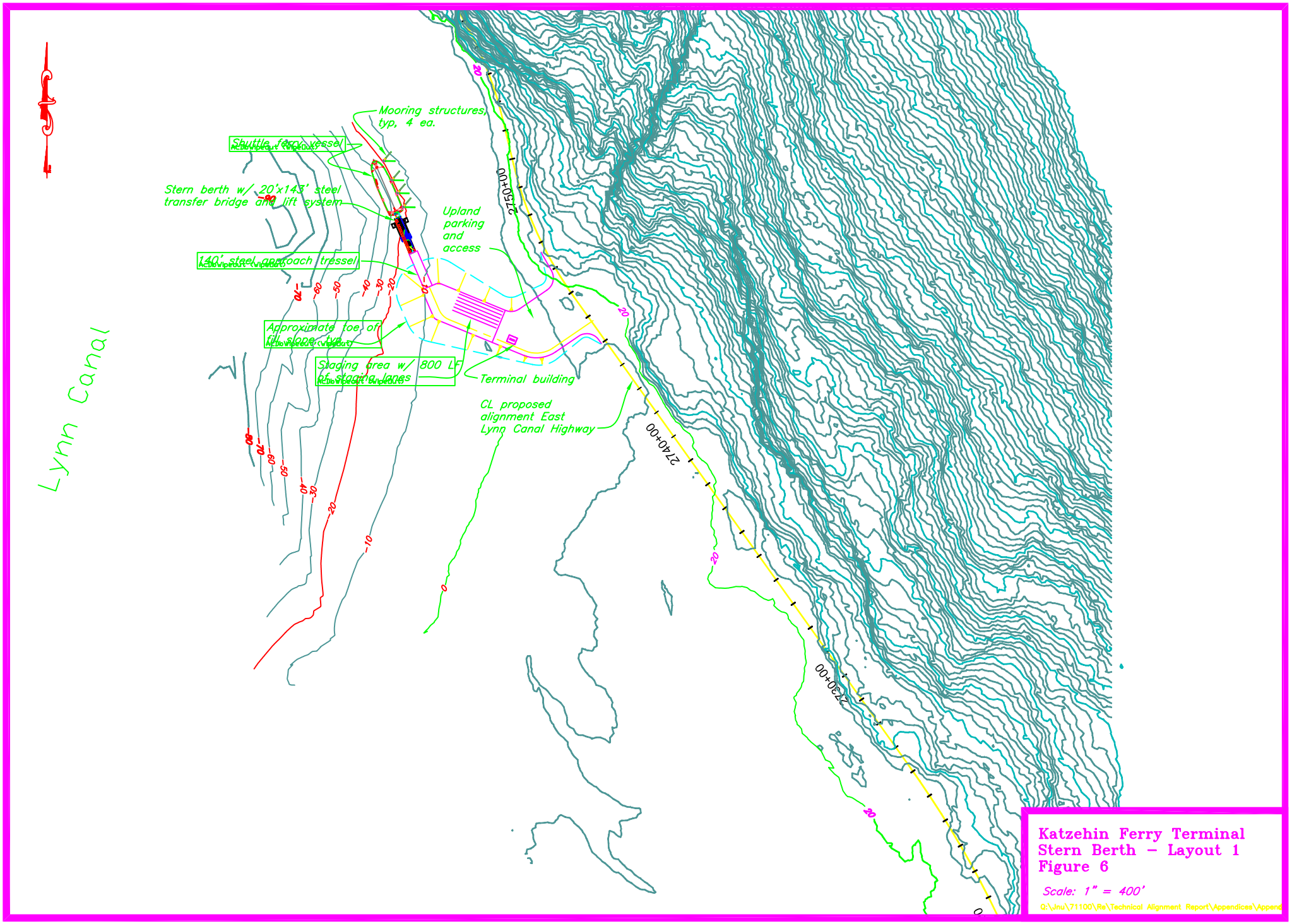
Mooring structures, typ, 4 ea.
Shuttle ferry vessel
Stern berth w/ 20'x143' steel transfer bridge and lift system
Upland parking and access
140' steel approach tressel
Approximate toe of fill slope, typ
Staging area w/ 800 LF of staging lanes
Terminal building
CL proposed alignment East Lynn Canal Highway
Lynn Canal
2250+00
2240+00
2230+00
Katzehin Ferry Terminal
Stern Berth – Layout 1
Figure 6
Scale: 1" = 400'
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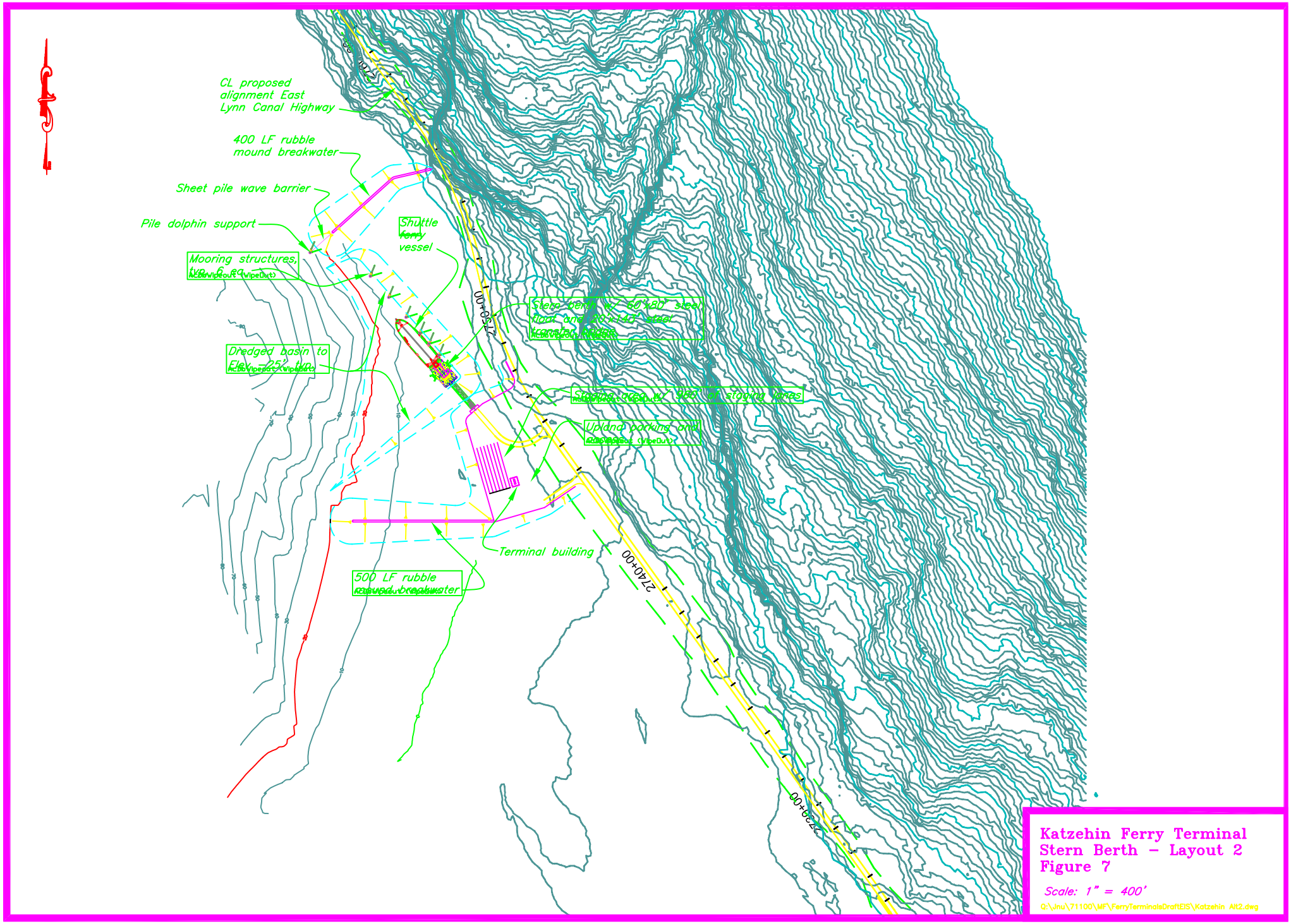

Katzehin Ferry Terminal
Stern Berth – Layout 2
Figure 7

Scale: 1" = 400'

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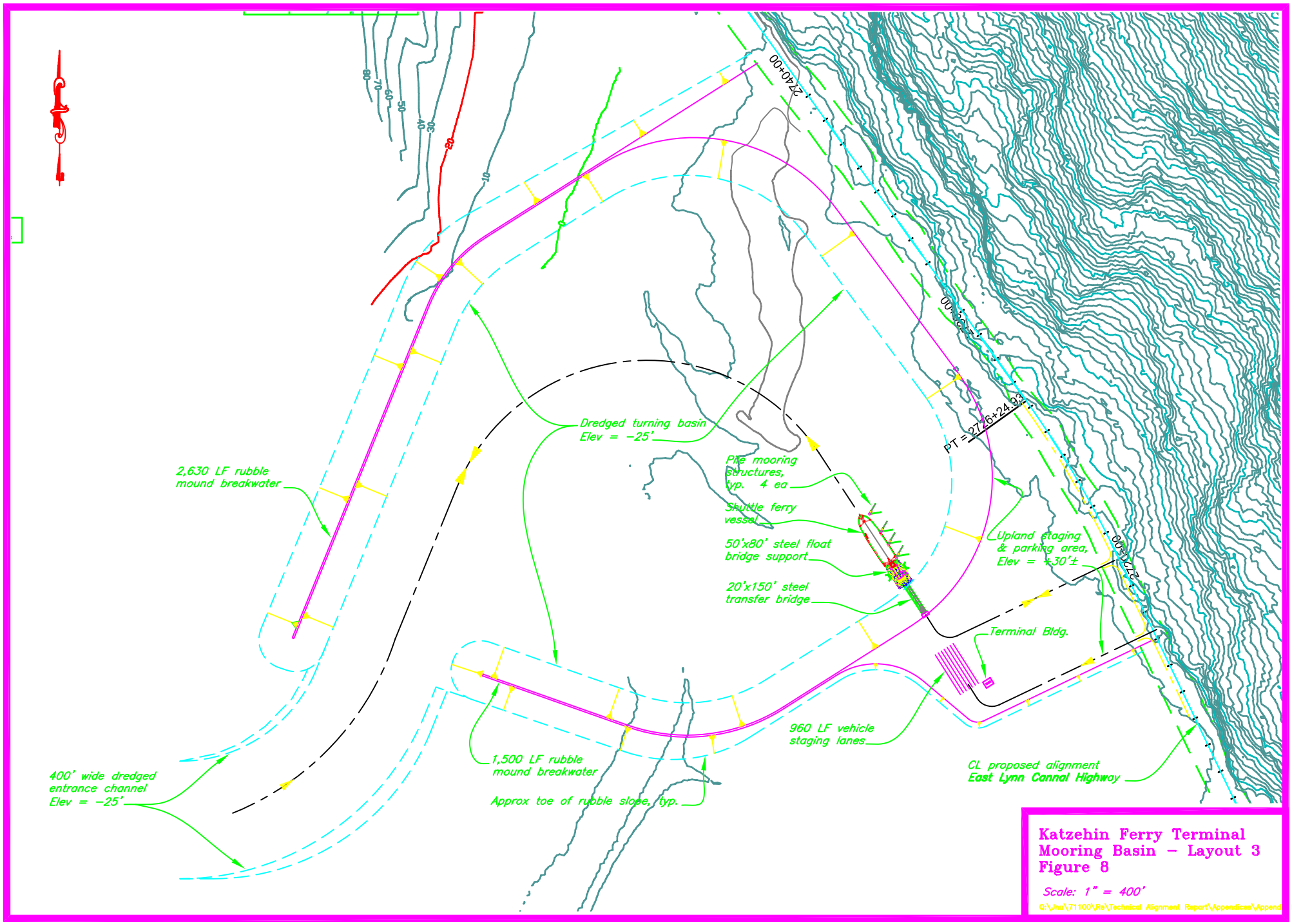

Katzehin Ferry Terminal
Mooring Basin – Layout 3
Figure 8

Scale: 1" = 400'

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SE Region - Marine Engineering

Project Construction Cost Estimate

PROJECT NUMBER: 71100
PROJECT TITLE: Juneau Access Ferry Terminals
DESCRIPTION: Sawmill Cove Ferry Terminal - Twin Stern Berth

Item No.	Item	Units	Unit Price	Quantity	Amount
1	***General***				
	Mobilization/Demobilization	LS	$700,000	1	$700,000
	Temporary Erosion and Pollution Control	CS	$350,000	1	$350,000
	Constr. Surveying by the Contractor	LS	$150,000	1	$150,000
	Construction Camp Facilities	LS	$350,000	1	$350,000
2	***Dredged Mooring Basin***				
	Dredged Mooring Basin	CY	$8.00	16,000	$128,000
	(Includes placement as upland fill or disposal)				
3	***Marine Facilities***				
	Pile Supported Bridge Approach Abutment	LS	$80,000	2	$160,000
	20'x142' Steel Transfer Bridge	LS	$800,000	2	$1,600,000
	50'x80' Steel Bridge Float	LS	$1,600,000	2	$3,200,000
	(w/ Intermediate Ramp, Apron & Fenders)				
	4-Pile Bridge Float Restraint Dolphins	EA	$250,000	3	$750,000
	6-Pile Double Sided Breasting Dolphins	EA	$350,000	4	$1,400,000
	Electrical Power and Lighting System (Terminal)	LS	$300,000	1	$300,000
3	***Upland Improvements (Access/Staging Area)***				
	Embankment (Local Excavation)	CY	$6.00	68,000	$408,000
	Riprap Slope Protection	CY	$40	5,500	$220,000
	12" Aggregate Surface Course	CY	$20.00	5,000	$100,000
	(Approx 135,000sf)				
	Asphalt Concrete Surfacing (2" thick)	Ton	$60.00	1,500	$90,000
	(Approx 135,000 sf)				
	Metal Beam Guardrail	LF	$40	950	$38,000
	Potable Water Supply (Well & Piping)	LS	$200,000	1	$200,000
	Sanitary Sewer (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	$300,000	1	$300,000
4	***Access Road***				
	Terminal Access Road	LF	$400	2,400	$960,000
5	***Building Structures***				
	Terminal Building (24'x40')	SF	$450	960.00	$432,000

Item Totals	*$12,736,000*
Estimating & Construction Contingencies @ 10%	$1,273,600
Construction Subtotal	***$14,009,600***
6% Design & Permitting	$840,576
8% Construction Admin	$1,120,768
5.5% ICAP	$770,528
Project Total =	***$16,741,472***

Prepared by: KDM **Date:** 10/30/03
Checked by: **Date:**

SE Region - Marine Engineering

Project Construction Cost Estimate

PROJECT NUMBER: 71100
PROJECT TITLE: Juneau Access Ferry Terminals
DESCRIPTION: Slate Cove Ferry Terminal

Item No.	Item	Units	Unit Price	Quantity	Amount
1	***General***				
	Mobilization/Demobilization	LS	$650,000	1	$650,000
	Temporary Erosion and Pollution Control	CS	$250,000	1	$250,000
	Constr. Surveying by the Contractor	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
	20'x142' Steel Transfer Bridge	LS	$800,000	1	$800,000
	40'x60' Steel Bridge Float (w/ Intermediate Ramp & Apron)	LS	$1,000,000	1	$1,000,000
	3-Pile Bridge Float Restraint Dolphins	EA	$200,000	2	$400,000
	5-Pile Breasting Dolphins	EA	$300,000	3	$900,000
	Electrical Power and Lighting System (Terminal)	LS	$300,000	1	$300,000
3	***Upland Improvements (Access/Staging Area)***				
	Clearing & Grubbing	LS	$45,000	1	$45,000
	Embankment (Local Excavation)	CY	$10.00	16,000	$160,000
	Riprap Slope Protection	CY	$40	3,000	$120,000
	12" Aggregate Surface Course (Approx 92,000 sf)	CY	$20.00	3,500	$70,000
	Asphalt Concrete Surfacing (2" thick) (Approx 92,000 sf)	Ton	$60.00	1,000	$60,000
	Metal Beam Guardrail	LF	$45	350	$15,750
	Potable Water Supply (Well & Piping)	LS	$200,000	1	$200,000
	Sanitary Sewer (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	$300,000	1	$300,000
4	***Access Road***				
	Terminal Access Road	LF	$350	2,900	$1,015,000
5	***Building Structures***				
	Terminal Building (24'x40')	SF	$450	960.00	$432,000

Item Totals	*$8,197,750*
Estimating & Construction Contingencies @ 10%	$819,775
Construction Subtotal	***$9,017,525***
8% Design & Permitting	$721,402
8% Construction Admin	$721,402
5.5% ICAP	$495,964
Project Total =	***$10,956,293***

Prepared by: KDM **Date:** 10/30/03
Checked by: **Date:**

SE 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

Item No.	Item	Units	Unit Price	Quantity	Amount
1	***General***				
	Mobilization/Demobilization	LS	$900,000	1	$900,000
	Temporary Erosion and Pollution Control	CS	$375,000	1	$375,000
	Constr. Surveying by the Contractor	LS	$175,000	1	$175,000
	Construction Camp Facilities	LS	$450,000	1	$450,000
2	***Marine Facilities***				
	Pile Supported Bridge Approach Abutment	LS	$80,000	1	$80,000
	24' x 360' Pile Supported Approach Trestle	SF	$225	8,640	$1,944,000
	20'x142' Steel Transfer Bridge	LS	$800,000	1	$800,000
	Bridge Lift Towers & Syncro Lift or Counter Wt	LS	$1,000,000	2	$2,000,000
	5-Pile Breasting Dolphins	EA	$250,000	3	$750,000
	Electrical Power and Lighting System (Terminal)	LS	$425,000	1	$425,000
3	***Upland Improvements (Access/Staging Area)***				
	Clearing & Grubbing	LS	$60,000	1	$60,000
	Embankment (Local Excavation)	CY	$10.00	30,000	$300,000
	Riprap Slope Protection	CY	$40	6,200	$248,000
	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	$65.00	1,200	$78,000
	Metal Beam Guardrail	LF	$45	750	$33,750
	Potable Water Supply (Well & Piping)	LS	$225,000	1	$225,000
	Sanitary Sewer (Pkg Treatment Plant/Outfall)	LS	$325,000	1	$325,000
	Diesel Generator System, Bldg & Fuel Storage Tank	LS	$625,000	1	$625,000
	Electrical Power Supply & Area Lighting System	LS	$350,000	1	$350,000
4	***Building Structures***				
	Terminal Building (24'x40')	SF	$450	960.00	$432,000

Item Totals	*$10,647,750*
Estimating & Construction Contingencies @ 10%	$1,064,775
Construction Subtotal	***$11,712,525***
8% Design & Permitting	$937,002.00
8% Construction Admin	$937,002
5.5% ICAP	$644,189
Project Total =	***$14,230,718***

Prepared by: KDM **Date:** 10/30/03
Checked by: **Date:**

SE Region - Marine Engineering

Project Construction Cost Estimate

PROJECT NUMBER: 71100
PROJECT TITLE: Juneau Access Ferry Terminals
DESCRIPTION: Katzehin Ferry Terminal Alt 1 (Unprotected)

Item No.	Item	Units	Unit Price	Quantity	Amount
1	***General***				
	Mobilization/Demobilization	LS	$700,000	1	$700,000
	Temporary Erosion and Pollution Control	CS	$200,000	1	$200,000
	Constr. Surveying by the Contractor	LS	$125,000	1	$125,000
	Construction Camp Facilities	LS	$350,000	1	$350,000
2	***Marine Facilities***				
	Pile Supported Bridge Approach Abutment	LS	$100,000	1	$100,000
	20'x150' Steel Transfer Bridge	LS	$800,000	1	$800,000
	Syncro Lift or Counterweight Lift Towers	EA	$1,000,000	2	$2,000,000
	Stern Breasting Dolphins	EA	$325,000	2	$650,000
	5-Pile Breasting Dolphins	EA	$300,000	4	$1,200,000
	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	90,000	$1,080,000
	Riprap Slope Protection (Class IV)	CY	$30	16,500	$495,000
	12" Aggregate Surface Course (Approx 80,500 sf)	CY	$20.00	3,000	$60,000
	Asphalt Concrete Surfacing (2" thick) (Approx 80,500 sf)	Ton	$60.00	1,000	$60,000
	Metal Beam Guardrail	LF	$40	1,200	$48,000
	Potable Water Supply (Well & Piping)	LS	$200,000	1	$200,000
	Sanitary Sewer (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	$300,000	1	$300,000
4	***Building Structures***				
	Terminal Building	SF	$500	864.00	$432,000

Item Totals	*$10,050,000*
Estimating & Construction Contingencies @ 10%	$1,005,000
Construction Subtotal	***$11,055,000***
8% Design & Permitting	$884,400
8% Construction Admin	$884,400
5.5% ICAP	$608,025
Project Total =	***$13,431,825***

Prepared by: KDM **Date:** 10/29/03
Checked by: **Date:**

SE Region - Marine Engineering

Project Construction Cost Estimate

PROJECT NUMBER: 71100
PROJECT TITLE: Juneau Access Ferry Terminals
DESCRIPTION: Katzehin Ferry Terminal Alt 2 (North & South Breakwaters)

Item No.	Item	Units	Unit Price	Quantity	Amount
1	***General***				
	Mobilization/Demobilization	LS	$700,000	1	$700,000
	Temporary Erosion and Pollution Control	CS	$350,000	1	$350,000
	Constr. Surveying by the Contractor	LS	$150,000	1	$150,000
	Construction Camp Facilities	LS	$350,000	1	$350,000
2	***Mooring Basin & Breakwaters***				
	Dredged Mooring Basin	CY	$8.00	40,000	$320,000
	(Includes placement as upland/breakwater fill where usable)				
	North Rubble Mound Breakwater	LF	$1,800	400	$720,000
	North Sheet Pile Wave Barrier	LF	$1,500	110	$165,000
	Protection Dolphin at Wave Barrier End	EA	$200,000	1	$200,000
	South Rubble Mound Breakwater	LF	$1,800	500	$900,000
	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	$800,000	1	$800,000
	50'x80' Steel Bridge Float	LS	$1,600,000	1	$1,600,000
	(w/ Intermediate Ramp & Apron)				
	4-Pile Bridge Float Restraint Dolphins	EA	$250,000	2	$500,000
	5-Pile Breasting Dolphins	EA	$300,000	6	$1,800,000
	Electrical Power and Lighting System (Terminal)	LS	$300,000	1	$300,000
3	***Upland Improvements (Access/Staging Area)***				
	Import Embankment - Borrow	CY	$12.00	50,000	$600,000
	(Classified Materials)				
	Riprap Slope Protection (NIC Breakwaters)	CY	$30	6,000	$180,000
	12" Aggregate Surface Course	CY	$20.00	4,000	$80,000
	(Approx 103,000 sf)				
	Asphalt Concrete Surfacing (2" thick)	Ton	$60.00	1,200	$72,000
	(Approx 103,000 sf)				
	Metal Beam Guardrail	LF	$40	850	$34,000
	Potable Water Supply (Well & Piping)	LS	$200,000	1	$200,000
	Sanitary Sewer (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	$300,000	1	$300,000
4	***Building Structures***				
	Terminal Building (24'x40')	SF	$450	960.00	$432,000

Item Totals	*$11,773,000*
Estimating & Construction Contingencies @ 10%	$1,177,300
Construction Subtotal	***$12,950,300***
8% Design & Permitting	$1,036,024
8% Construction Admin	$1,036,024
5.5% ICAP	$712,267
Project Total =	***$15,734,615***

Prepared by: KDM **Date:** 10/29/03
Checked by: **Date:**

SE Region - Marine Engineering

Project Construction Cost Estimate

PROJECT NUMBER: 71100
PROJECT TITLE: Juneau Access Ferry Terminals
DESCRIPTION: Katzehin Mooring Basin - Alt 3

Item No.	Item	Units	Unit Price	Quantity	Amount
1	***General***				
	Mobilization/Demobilization	LS	$2,500,000	1	$2,500,000
	Temporary Erosion and Pollution Control	CS	$750,000	1	$750,000
	Constr. Surveying by the Contractor	LS	$225,000	1	$225,000
	Construction Camp Facilities	LS	$650,000	1	$650,000
2	***Mooring Basin & Breakwaters***				
	Dredged Mooring Basin	CY	$4.00	2,400,000	$9,600,000
	(Includes placement as upland/breakwater fill where usable)				
	North Rubble Mound Breakwater	LF	$1,200	2,600	$3,120,000
	South Rubble Mound Breakwater	LF	$1,200	1,500	$1,800,000
	Entrance Channel Markers/Guide Dolphins	EA	$150,000	4	$600,000
	Navigational Aids	EA	$10,000	4	$40,000
3	***Marine Facilities***				
	Pile Supported Bridge Approach Abutment	LS	$100,000	1	$100,000
	20'x150' Steel Transfer Bridge	LS	$800,000	1	$800,000
	50'x80' Steel Bridge Float	LS	$1,600,000	1	$1,600,000
	(w/ Intermediate Ramp & Apron)				
	4-Pile Bridge Float Restraint Dolphins	EA	$250,000	2	$500,000
	5-Pile Breasting Dolphins	EA	$300,000	4	$1,200,000
	Electrical Power and Lighting System (Terminal)	LS	$300,000	1	$300,000
4	***Upland Improvements (Staging Area)***				
	Misc. Import Embankment - Borrow	CY	$12.00	50,000	$600,000
	(Classified Materials)				
	Riprap Slope Protection (Class IV)	CY	$25	4,000	$100,000
	12" Aggregate Surface Course - Grading E	CY	$15.00	21,000	$315,000
	(Approx 600,000 sf)				
	Asphalt Concrete Surfacing (2" thick)	Ton	$60.00	7,000	$420,000
	(Approx 600,000 sf)				
	Metal Beam Guardrail	LF	$40	3,600	$144,000
	Potable Water Supply (Well & Piping)	LS	$200,000	1	$200,000
	Sanitary Sewer (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	$300,000	1	$300,000
5	***Building Structures***				
	Terminal Building	SF	$500	864.00	$432,000

ATTACHMENT E

Engineers Estimate

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Engineers Estimate

State of Alaska -- Department of Transportation and Public Facilities -- Southeast Region

Project Name: **Juneau Access**

Project Number: **71100-alt2,2c**

Basic Bid

Item No	Pay Item	Pay Unit	Unit Price	Quantity	Amount
201(1A)	Clearing	Lump Sum	$925,000.00	All Required	$925,000.00
203 (2)	Rock Excavation	Cubic Yard	$6.25	13123000	$82,018,750.00
203 (3)	Unclassified Excavation	Cubic Yard	$2.50	1959000	$4,897,500.00
203 (10)	Controlled Blasting	Station	$4,000.00	1680	$6,720,000.00
301(2)	Crushed Aggregate Base	Cubic Yard	$12.00	165000	$1,980,000.00
307(3)	EATB	Square Yard	$3.75	1210000	$4,537,500.00
401(1)	Asphalt Concrete Pavement	Ton	$25.00	138000	$3,450,000.00
401(2)	Asphalt Cement	Ton	$350.00	8300	$2,905,000.00
501(1)	Bridge Structure	Linear Foot	$4,400.00	11040	$48,576,000.00
602(2)	Structural Plate Pipe Arch	Linear Foot	$300.00	6000	$1,800,000.00
603(1a)	24-inch Diameter Corrugated Steel Pipe	Linear Foot	$30.00	24000	$720,000.00
603(1b)	48-inch Diameter Corrugated Steel Pipe	Linear Foot	$50.00	7000	$350,000.00
606(1)	W-Beam Guardrail	Linear Foot	$22.00	127000	$2,794,000.00
611(1)	Riprap	Cubic Yard	$15.00	579900	$8,698,500.00
614(1a)	Monumentation	Each	$200.00	447	$89,400.00
615(1)	Standard Sign	Square Foot	$50.00	5000	$250,000.00
618(1)	Seeding	Lump Sum	$100,000.00	All Required	$100,000.00
633(1)	Silt Fence	Linear Foot	$1.00	206000	$206,000.00
636(1)	Gabions	Square Foot	$20.00	664000	$13,280,000.00
637(1)	Reinforced Earth Wall	Square Foot	$35.00	87260	$3,054,100.00
640(1)	Mobilization and Demobilizaiton	Lump Sum	$16,300,000.00	All Required	$16,300,000.00
641(1)	Erosion and Pollution Control	Contingent Sum	$500,000.00	All Required	$500,000.00
642(1)	Construction Surveying	Lump Sum	$1,000,000.00	All Required	$1,000,000.00

Basic Bid Subtotal: $205,151,750.00

Prepared by T. Moore Date __/__/__

Checked by JDB Date __/__/__

Engineers Estimate

State of Alaska -- Department of Transportation and Public Facilities -- Southeast Region

Project Name:	Project Number:
Juneau Access	71100-alt2,2c

Item No	Pay Item	Pay Unit	Unit Price	Quantity	Amount

**********Project Summary**********

Project Subtotal:	$205,151,750.00	Preliminary Development	$9,500,000.00
		Mitigation	$5,000,000.00
8.00 % Contingencies:	$16,412,140.00	Right of Way	$526,000.00
Construction Engineering @ 8.00 %	$17,725,111.20	Maintenance Building	$1,000,000.00
Construction Subtotal:	$239,289,001.20	Road Assistance	($1,600,000.00)
		Project Total	$262,209,760.63
3.55 % ICAP	$8,494,759.43	Available Funding	$0.00
Total Phase 4	$247,783,760.63		

Prepared by T. Morrow Date __/__/__ Checked by JDB Date __/__/__

Engineers Estimate

State of Alaska -- Department of Transportation and Public Facilities -- Southeast Region

Project Name: Juneau Access

Project Number: 71100 Alt 2A

Basic Bid

Item No	Pay Item	Pay Unit	Unit Price	Quantity	Amount
201 (1A)	Clearing	Lump Sum	$750,000.00	All Required	$750,000.00
203 (2)	Rock Excavation	Cubic Yard	$6.25	11197500	$69,984,375.00
203 (3)	Unclassified Excavation	Cubic Yard	$2.50	1323000	$3,307,500.00
203(10)	Controlled Blasting	Station	$4,000.00	1430	$5,720,000.00
301 (2)	Crushed Aggregate Base	Cubic Yard	$12.00	137000	$1,644,000.00
307 (3)	EATB	Square Yard	$3.75	1007300	$3,777,375.00
401 (1)	Asphalt Concrete Pavement	Ton	$25.00	120000	$3,000,000.00
401 (2)	Asphalt Cement	Ton	$350.00	7200	$2,520,000.00
501 ()	Bridge Structure	Linear Foot	$4,400.00	5880	$25,872,000.00
602 (2)	Structural Plate Pipe Arch	Linear Foot	$300.00	5800	$1,740,000.00
603 (1A)	24-inch Diameter Corrugated Steel Pipe	Linear Foot	$30.00	21000	$630,000.00
603 (1B)	48-inch Diameter Corrugated Steel Pipe	Linear Foot	$50.00	6000	$300,000.00
606 (1)	W - Beam Guardrail	Linear Foot	$22.00	127000	$2,794,000.00
611 (1)	Rip Rap	Cubic Yard	$15.00	387000	$5,805,000.00
614 (1A)	Monumentation	Each	$200.00	380	$76,000.00
615 (1)	Standard Sign	Square Foot	$50.00	4250	$212,500.00
618 (1)	Seeding	Lump Sum	$83,000.00	All Required	$83,000.00
633 (1)	Silt Fence	Linear Foot	$1.00	206000	$206,000.00
636 (1)	Gabions	Square Foot	$20.00	580000	$11,600,000.00
637 (1)	Reinforced Earth Wall	Square Foot	$35.00	69000	$2,415,000.00
640 (1)	Mobilization and Demobilizaiton	Lump Sum	$13,000,000.00	All Required	$13,000,000.00
641 (1)	Erosion and Pollution Control	Contingent Sum	$430,000.00	All Required	$430,000.00
642 (1)	Construction Surveying	Lump Sum	$850,000.00	All Required	$850,000.00

Basic Bid Subtotal: $156,716,750.00

Prepared by T. Moore Date __/__/__

Checked by JDB Date __/__/__

Engineers Estimate

State of Alaska -- Department of Transportation and Public Facilities -- Southeast Region

Project Name:	Project Number:
Juneau Access	71100 Alt 2A

Item No	Pay Item	Pay Unit	Unit Price	Quantity	Amount

**********Project Summary**********

Project Subtotal:	$156,716,750.00	Preliminary Development	$8,000,000.00
		Mitigation	$5,000,000.00
8.00 % Contingencies:	$12,537,340.00	Right of Way	$526,000.00
Construction Engineering @ 8.00 %	$13,540,327.20	Maintenance Building	$1,000,000.00
Construction Subtotal:	$182,794,417.20	Road Assistance	($1,600,000.00)
		Project Total	$202,209,618.92
3.55 % ICAP	$6,489,201.72	Available Funding	$0.00
Total Phase 4	$189,283,618.92		

Prepared by T. Morn Date __/__/__ Checked by JDB Date __/__/__

Engineers Estimate

State of Alaska -- Department of Transportation and Public Facilities -- Southeast Region

Project Name: Juneau Access

Project Number: 71100-alt2b

Basic Bid

Item No	Pay Item	Pay Unit	Unit Price	Quantity	Amount
201(1A)	Clearing	Lump Sum	$630,000.00	All Required	$630,000.00
203 (2)	Rock Excavation	Cubic Yard	$6.25	7241000	$45,256,250.00
203 (3)	Unclassified Excavation	Cubic Yard	$2.50	1453000	$3,632,500.00
203 (10)	Controlled Blasting	Station	$4,000.00	840	$3,360,000.00
301(2)	Crushed Aggregate Base	Cubic Yard	$12.00	108000	$1,296,000.00
307(3)	EATB	Square Yard	$3.75	895400	$3,357,750.00
401(1)	Asphalt Concrete Pavement	Ton	$25.00	102000	$2,550,000.00
401(2)	Asphalt Cement	Ton	$350.00	6100	$2,135,000.00
501( )	Bridge Structure	Linear Foot	$4,400.00	9120	$40,128,000.00
602(2)	Structural Plate Pipe Arch	Linear Foot	$300.00	4440	$1,332,000.00
603(1a)	24-inch Diameter Corrugated Steel Pipe	Linear Foot	$30.00	17760	$532,800.00
603(1b)	48-inch Diameter Corrugated Steel Pipe	Linear Foot	$50.00	5000	$250,000.00
606(1)	W-Beam Guardrail	Linear Foot	$22.00	94000	$2,068,000.00
611(1)	Riprap	Cubic Yard	$15.00	574500	$8,617,500.00
614(1a)	Monumentation	Each	$200.00	330	$66,000.00
615(1)	Standard Sign	Square Foot	$50.00	4000	$200,000.00
618(1)	Seeding	Lump Sum	$80,000.00	All Required	$80,000.00
633(1)	Silt Fence	Linear Foot	$1.00	186000	$186,000.00
636(1)	Gabions	Square Foot	$20.00	465000	$9,300,000.00
637(1)	Reinforced Earth Wall	Square Foot	$35.00	55000	$1,925,000.00
640(1)	Mobilization and Demobilizaiton	Lump Sum	$12,000,000.00	All Required	$12,000,000.00
641(1)	Erosion and Pollution Control	Contingent Sum	$325,000.00	All Required	$325,000.00
642(1)	Construction Surveying	Lump Sum	$600,000.00	All Required	$600,000.00
				Basic Bid Subtotal:	$139,827,800.00

Prepared by T. Moore Date __/__/__

Checked by JDB Date __/__/__

Engineers Estimate

State of Alaska -- Department of Transportation and Public Facilities -- Southeast Region

Project Name:	Project Number:
Juneau Access	71100-alt2b

Item No	Pay Item	Pay Unit	Unit Price	Quantity	Amount

**********Project Summary**********

Project Subtotal:	$139,827,800.00	Preliminary Development	$8,000,000.00
		Mitigation	$3,000,000.00
8.00 % Contingencies:	$11,186,224.00	Right of Way	$45,000.00
Construction Engineering @ 8.00 %	$12,081,121.92	Maintenance Building	$1,000,000.00
Construction Subtotal:	$163,095,145.92	Road Assistance	($1,600,000.00)
		Project Total	$179,330,023.52
3.55 % ICAP	$5,789,877.60	Available Funding	$0.00
Total Phase 4	$168,885,023.52		

Prepared by T. Moon Date __/__/__ Checked by JDB Date __/__/__

Engineers Estimate

State of Alaska -- Department of Transportation and Public Facilities -- Southeast Region

Project Name: Juneau Access

Project Number: 71100-alt3

Basic Bid

Item No	Pay Item	Pay Unit	Unit Price	Quantity	Amount
201(1A)	Clearing	Lump Sum	$540,000.00	All Required	$540,000.00
203 (2)	Rock Excavation	Cubic Yard	$6.25	4146500	$25,915,625.00
203 (3)	Unclassified Excavation	Cubic Yard	$2.50	2204000	$5,510,000.00
203 (10)	Controlled Blasting	Station	$4,000.00	526	$2,104,000.00
301(2)	Crushed Aggregate Base	Cubic Yard	$12.00	82000	$984,000.00
307(3)	EATB	Square Yard	$3.75	684000	$2,565,000.00
401(1)	Asphalt Concrete Pavement	Ton	$25.00	80000	$2,000,000.00
401(2)	Asphalt Cement	Ton	$350.00	4800	$1,680,000.00
501( )	Bridge Structure	Linear Foot	$4,400.00	15885	$69,894,000.00
602(2)	Structural Plate Pipe Arch	Linear Foot	$300.00	4600	$1,380,000.00
603(1a)	24-inch Diameter Corrugated Steel Pipe	Linear Foot	$30.00	27000	$810,000.00
603(1b)	48-inch Diameter Corrugated Steel Pipe	Linear Foot	$50.00	7600	$380,000.00
606(1)	W-Beam Guardrail	Linear Foot	$22.00	29000	$638,000.00
611(1)	Riprap	Cubic Yard	$15.00	164500	$2,467,500.00
614(1a)	Monumentation	Each	$200.00	172	$34,400.00
615(1)	Standard Sign	Square Foot	$50.00	3400	$170,000.00
618(1)	Seeding	Lump Sum	$200,000.00	All Required	$200,000.00
633(1)	Silt Fence	Linear Foot	$1.00	206000	$206,000.00
636(1)	Gabions	Square Foot	$20.00	145000	$2,900,000.00
637(1)	Reinforced Earth Wall	Square Foot	$35.00	35000	$1,225,000.00
640(1)	Mobilization and Demobilizaiton	Lump Sum	$13,000,000.00	All Required	$13,000,000.00
641(1)	Erosion and Pollution Control	Contingent Sum	$350,000.00	All Required	$350,000.00
642(1)	Construction Surveying	Lump Sum	$1,000,000.00	All Required	$1,000,000.00

Basic Bid Subtotal: $135,953,525.00

Prepared by T. Morr Date __/__/__

Checked by JDB Date __/__/__

Engineers Estimate

State of Alaska -- Department of Transportation and Public Facilities -- Southeast Region

Project Name:	Project Number:
Juneau Access	71100-alt3

Item No	Pay Item	Pay Unit	Unit Price	Quantity	Amount

**********Project Summary**********

Project Subtotal:	$135,953,525.00	Preliminary Development	$8,500,000.00
		Mitigation	$3,500,000.00
8.00 % Contingencies:	$10,876,282.00	Right of Way	$1,255,000.00
Construction Engineering @ 8.00 %	$11,746,384.56	Maintenance Building	$500,000.00
Construction Subtotal:	$158,576,191.56	Road Assistance	($1,600,000.00)
		Project Total	$176,360,646.28
3.55 % ICAP	$5,629,454.72	Available Funding	$0.00
Total Phase 4	$164,205,646.28		

Prepared by T. Mou Date __/__/__ Checked by JDB Date __/__/__

Engineers Estimate

State of Alaska -- Department of Transportation and Public Facilities -- Southeast Region

Project Name: **Juneau Access**

Project Number: **71100-alt4b,d**

Basic Bid

Item No	Pay Item	Pay Unit	Unit Price	Quantity	Amount
201(1A)	Clearing	Lump Sum	$10,000.00	All Required	$10,000.00
203 (2)	Rock Excavation	Cubic Yard	$6.25	357000	$2,231,250.00
203 (3)	Unclassified Excavation	Cubic Yard	$2.50	357000	$892,500.00
203 (10)	Controlled Blasting	Station	$4,000.00	10	$40,000.00
301(2)	Crushed Aggregate Base	Cubic Yard	$12.00	8000	$96,000.00
307(3)	EATB	Square Yard	$3.75	73000	$273,750.00
401(1)	Asphalt Concrete Pavement	Ton	$25.00	8500	$212,500.00
401(2)	Asphalt Cement	Ton	$350.00	510	$178,500.00
501( )	Bridge Structure	Linear Foot	$4,400.00	110	$484,000.00
602(2)	Structural Plate Pipe Arch	Linear Foot	$300.00	260	$78,000.00
603(1a)	24-inch Diameter Corrugated Steel Pipe	Linear Foot	$30.00	940	$28,200.00
603(1b)	48-inch Diameter Corrugated Steel Pipe	Linear Foot	$50.00	380	$19,000.00
606(1)	W-Beam Guardrail	Linear Foot	$22.00	1620	$35,640.00
611(1)	Riprap	Cubic Yard	$15.00	1000	$15,000.00
614(1a)	Monumentation	Each	$200.00	30	$6,000.00
615(1)	Standard Sign	Square Foot	$50.00	100	$5,000.00
618(1)	Seeding	Lump Sum	$10,000.00	All Required	$10,000.00
633(1)	Silt Fence	Linear Foot	$1.00	20000	$20,000.00
636(1)	Gabions	Square Foot	$20.00	250	$5,000.00
637(1)	Reinforced Earth Wall	Square Foot	$35.00	100	$3,500.00
640(1)	Mobilization and Demobilizaiton	Lump Sum	$170,000.00	All Required	$170,000.00
641(1)	Erosion and Pollution Control	Contingent Sum	$20,000.00	All Required	$20,000.00
642(1)	Construction Surveying	Lump Sum	$20,000.00	All Required	$20,000.00

Basic Bid Subtotal: $4,853,840.00

Prepared by T. Moore Date __/__/__

Checked by JDB Date __/__/__

Engineers Estimate

State of Alaska -- Department of Transportation and Public Facilities -- Southeast Region

Project Name:	Project Number:
Juneau Access	71100-alt4b,d

Item No	Pay Item	Pay Unit	Unit Price	Quantity	Amount

**********Project Summary**********

Project Subtotal:	$4,853,840.00	Preliminary Development	$200,000.00
		Mitigation	$30,000.00
8.00 % Contingencies:	$388,307.20	Right of Way	$0.00
Construction Engineering @ 8.00 %	$419,371.78	Road Assistance	($1,600,000.00)
Construction Subtotal:	$5,661,518.98	0	$0.00
		Project Total	$4,492,502.90
3.55 % ICAP	$200,983.92	Available Funding	$0.00
Total Phase 4	$5,862,502.90		

Prepared by T. Moore Date __/__/__ Checked by JDB Date __/__/__

East Lynn Canal Alternative 2/2C

Segment	Total Volume of Excavation	% Rock	Rock Excavation	Unclassified Excavation	Embankment	Processed Materials	Select "A"	Total Volume of Embankment
Echo Cove to Berners Bay Crossing Station 73+14 to Station 602+00	1,999,925	91.00%	1,819,932	179,993	540,993	32,214	81,611	654,818
Berners Bay Crossing Station 602+00 to Station 761+00	7,876	0.00%	0	7,876	534,282	7,680	17,231	559,194
Berners Bay Crossing to Independence Lake Station 761+00 to Station 1390+00	1,755,648	34.00%	596,920	1,158,728	786,884	38,127	96,385	921,396
Independence Lake North Station 1390+00 to Station 1503+00	42,722	95.00%	40,586	2,136	318,147	6,865	17,371	342,383
Met Point South Station 1503+00 to Station 1640+00	670,639	97.00%	650,520	20,119	110,518	8,327	21,074	139,919
Met Point North to Level Point Station 1640+00 to Station 2150+00	1,412,445	98.00%	1,384,196	28,249	1,194,368	31,092	78,797	1,304,256
Level Point to Katzehin River Station 2150+00 to Station 2590+00	2,766,849	98.00%	2,711,512	55,337	437,777	26,547	66,973	531,298
South Katzehin River to Katzehin Point Station 2590+00 to Station 2754+00	38,488	98.00%	37,718	770	890,926	9,040	21,849	921,816
Katzehin Point to Sturgill's Landing Station 2754+00 to Station 3505+00	5,251,054	98.00%	5,146,033	105,021	604,169	45,423	114,716	764,308
Sturgill's Landing to Skagway Station 3505+00 to Station 3696+00	1,145,069	65.00%	744,295	400,774	122,183	11,306	28,280	161,770
TOTAL	**15,090,715**	**-**	**13,131,712**	**1,959,003**	**5,540,247**	**216,621**	**544,288**	**6,301,156**

East Lynn Canal Alternative 2A

Segment	Total Volume of Excavation	% Rock	Rock Excavation	Unclassified Excavation	Embankment	Processed Materials	Select "A"	Total Volume of Embankment
Echo Cove to Sawmill Cove Station 73+14 to Station 343+00	713,850	50.00%	356,925	356,925	193,750	21,998	55,748	271,496
Slate Cove to Independence Lake Station 909+71 to Station 1390+00	478,500	34.00%	162,690	315,810	71,000	29,157	73,759	173,917
Independence Lake North Station 1390+00 to Station 1503+00	42,722	95.00%	40,586	2,136	318,147	6,865	17,371	342,383
Met Point South Station 1503+00 to Station 1640+00	670,639	97.00%	650,520	20,119	110,518	8,327	21,074	139,919
Met Point North to Level Point Station 1640+00 to Station 2150+00	1,412,445	98.00%	1,384,196	28,249	1,194,368	31,092	78,797	1,304,256
Level Point to Katzehin River Station 2150+00 to Station 2590+00	2,766,849	98.00%	2,711,512	55,337	437,777	26,547	66,973	531,298
South Katzehin River to Katzehin Point Station 2590+00 to Station 2754+00	38,488	0.00%	0	38,488	890,926	9,040	21,849	921,816
Katzehin Point to Sturgill's Landing Station 2754+00 to Station 3505+00	5,251,054	98.00%	5,146,033	105,021	604,169	45,423	114,716	764,308
Sturgill's Landing to Skagway Station 3505+00 to Station 3696+00	1,145,069	65.00%	744,295	400,774	122,183	11,306	28,280	161,770
TOTAL	**12,519,616**	**-**	**11,196,757**	**1,322,859**	**3,942,838**	**189,755**	**478,568**	**4,611,161**

Note: Stationing backed in from mainline station 928+00 to Slate Cove Terminal

West Lynn Canal Alternative 3

Segment	Total Volume of Excavation	% Rock	Rock Excavation	Unclassified Excavation	Embankment	Processed Materials	Select "A"	Total Volume of Embankment
Echo Cove to Sawmill Cove Station 73+14 to Station 343+00	713,850	50%	356,925	356,925	193,750	21,998	55,748	271,496
William Henry Bay to Endicott River Crossing Station 4025+00 to Station 4293+00	1,161,928	71%	824,969	336,959	290,517	16,072	40,438	347,028
Endicott River Crossing Station 4293+00 to Statoin 4346+00	2,574	56%	1,441	1,133	337,576	2,770	6,508	346,854
Endicott River Crossing to the Sullivan River Crossing Station 4346+00 to Station 4757+00	1,915,360	56%	1,072,602	842,758	650,934	24,682	62,139	737,755
Sullivan River Crossing Station 4757+00 to Station 4910+00	303,553	50%	151,777	151,777	417,444	9,026	22,540	449,010
Sullivan River Crossing North Station 4910+00 to Station 5107+00	397,009	50%	198,505	198,505	160,624	11,992	30,372	202,988
Glacier Point S Base South Station 5107+00 to Station 5412+00	642,449	81%	520,384	122,065	512,754	18,239	45,829	576,822
Davidson Glacier Station 5412+00 to Station 5660+00	122,512	84%	102,910	19,602	494,915	14,767	37,035	546,718
South Chilkat River Station 5660+00 to Station 5970+00	1,091,544	84%	916,897	174,647	547,987	18,473	46,345	612,805
Chilkat River Crossing Station 5970+00 to Station 6078+00	106	100%	106	0	139,978	**2,685**	**2,479**	145,142
TOTAL	**5,637,035**	**-**	**4,146,515**	**2,204,370**	**3,552,729**	**140,704**	**349,435**	**4,236,617**

East Lynn Canal Alternative 4B and 4D

Segment	Total Volume of Excavation	% Rock	Rock Excavation	Unclassified Excavation	Embankment	Processed Materials	Select "A"	Total Volume of Embankment
Echo Cove to Sawmill Cove Station 73+14 to Station 343+00	713,850	50.00%	356,925	356,925	193,750	21,998	55,748	271,496
TOTAL	**713,850**	**-**	**356,925**	**356,925**	**193,750**	**21,998**	**55,748**	**271,496**