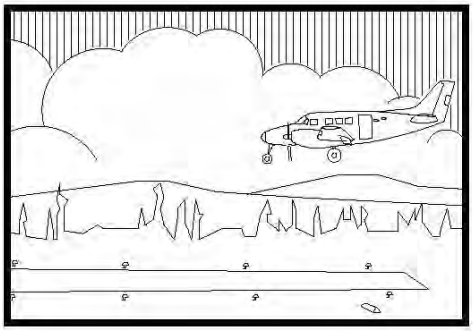
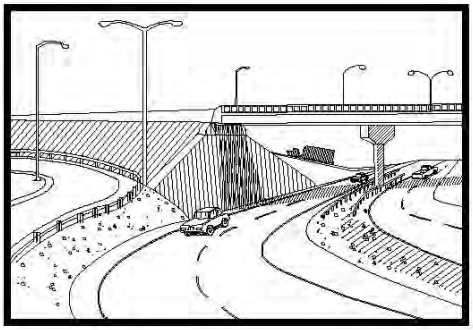
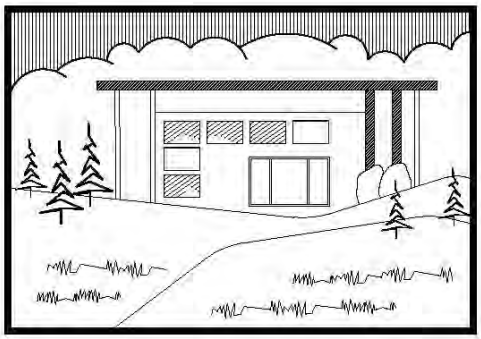
DESIGN STUDY REPORT

Parks Hwy MP 231 Enhancements

Z612990000/0A44020







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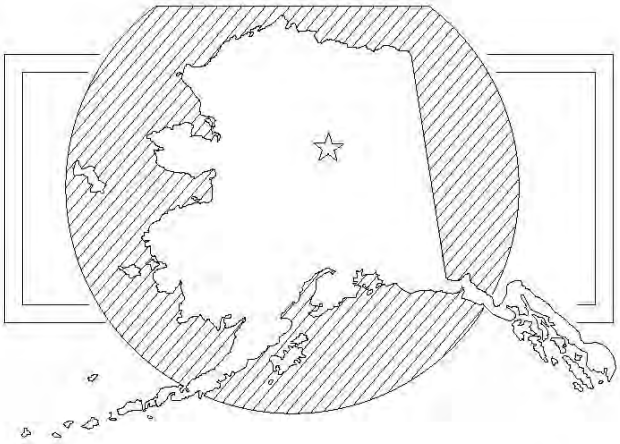

NORTHERN REGION

APRIL 2016

DESIGN APPROVAL

PARKS HWY MP 231 ENHANCEMENTS

PROJECT NO. Z612990000/0A44020

Requested by: 4/19/2016

Lauren M. Little, P.E.
Engineering Manager
Northern Region

Date

Design Approval Granted: 5/18/2016

Ryan F. Anderson, P.E.
Preconstruction Engineer
Northern Region

Date

Distribution: DSR Distribution Memo Recipients
Senator Click Bishop
Michael Cain, Northern Region Area Engineer, FHWA
Representative Dave Talerico
Don Striker, Superintendent Denali National Park and Preserve
Mayor Clay Walker, Denali Borough

DESIGN STUDY REPORT
FOR

PARKS HWY MP 231 ENHANCEMENTS

PROJECT NO. Z612990000/0A44020

PREPARED BY: David D. Jensen

UNDER THE SUPERVISION OF: Lauren Little, P.E.

ALASKA DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
NORTHERN REGION DESIGN AND ENGINEERING SERVICES
APRIL, 2016

PARKS HWY MP 231 ENHANCEMENTS
PROJECT NO. Z612990000/0A44020

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INTRODUCTION/HISTORY

The Alaska Department of Transportation & Public Facilities (Department), in cooperation with the Alaska Division Office of the Federal Highway Administration (FHWA) and the National Park Service (NPS), proposes to construct highway, intersection and pedestrian improvements near milepost (MP) 231 of the Parks Highway (Figure 1). Improvements will include reconstruction of the Parks Highway from MP 229.7 to 232.3, a pedestrian underpass, auxiliary turn lanes, pedestrian paths, a new NPS rest area, and replacement of the Nenana River Bridge No. 694 near MP 231 to accommodate turn lanes, 8-ft shoulders, and a pedestrian walkway.

This project will enhance safety and accommodations for motorized and non-motorized traffic near Parks Highway MP 231. This area experiences a high volume of commercial traffic (busses, vans, tractor trailers, and vehicles with boat trailers) as well as increased pedestrian and vehicle traffic during tourist season. Currently, pedestrians must cross the highway to access commercial facilities at McKinley Village and Grizzly Bear Cabins immediately south of the Nenana River Bridge. Pedestrians must also cross the Nenana River Bridge via 5-ft shoulders to access Denali National Park and Preserve trails located immediately north of the bridge.

At present there are no turn lanes for the facilities at MP 231, which include a heavily used public boat launch and multiple commercial facilities, or the Village View subdivision located near MP 231, resulting in potential conflicts between 65 mph through traffic and turning traffic. This risk is exacerbated at MP 231 due to a 6% grade immediately south of the intersection as well as a 3% grade to the north.

This project is utilizing the alternative construction project delivery method known as Construction Manager General Contractor (CMGC). The use of CMGC for this project was approved by the Department Commissioner on December 8, 2015.

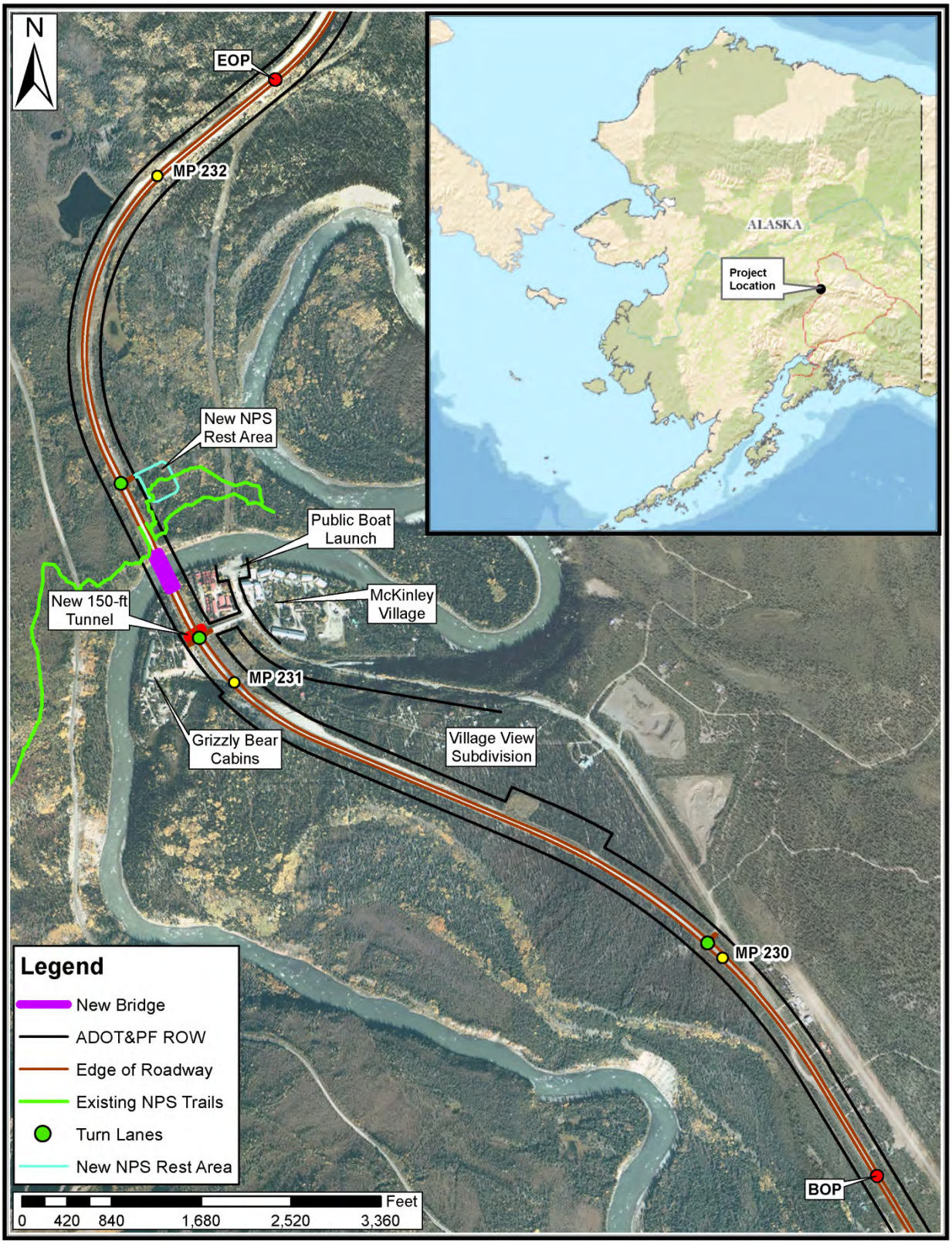


Figure 1 Project Location & Vicinity Map

PROJECT DESCRIPTION

This project will reconstruct the Parks Highway from MP 229.7 to 232.3 and replace the existing Nenana River Bridge No. 694, near MP 231 of the Parks Highway, with a wider structure meeting current design standards. The proposed bridge will be approximately 44-ft wider than the existing bridge to accommodate left and right turn lanes, 8-ft shoulders, and a 10-ft wide separated pedestrian walkway. The proposed bridge will also accommodate a pedestrian underpass beneath the north abutment, which will facilitate pedestrian access between NPS trails located on each side of the highway. In addition to the proposed bridge replacement, the project includes the following:

- Horizontal and vertical realignment of the Parks Highway to upgrade a sub-standard vertical sag curve near MP 231.
- Construction of a pedestrian underpass adjacent to the MP 231 McKinley Village and Grizzly Bear Cabins intersection.
- Construction of a new NPS rest area just north of the Nenana River Bridge near MP 231.
- Addition of left and right turn lanes for the new NPS rest area (just north of MP 231), McKinley Village and Grizzly Bear Cabins intersection (near MP 231), and Village View subdivision (near MP 230).
- Relocation of buried fiber optic and communication cable in conflict with the proposed improvements.

The project will address pedestrian and bicycle safety concerns surrounding the Parks Highway MP 231 area and the Nenana River Bridge, as well as improve safety for motorists by reducing the risk of conflict between through traffic and turning traffic.

The total project length is 2.6 miles. See Figure 2 for project layout.

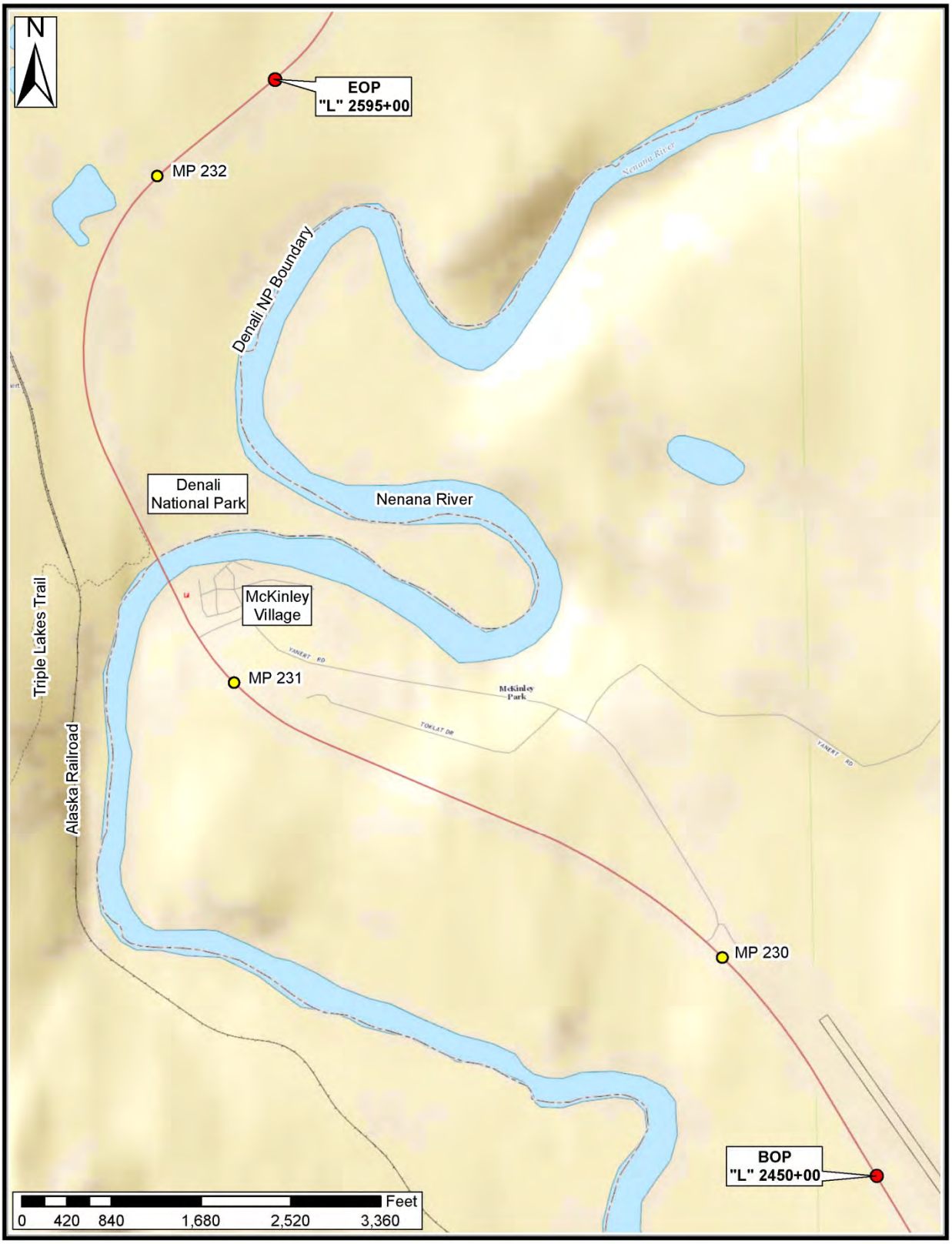


Figure 2 Project Layout

DESIGN STANDARDS

The design standards followed for this project are:

- *A Policy on the Geometric Design of Highways and Streets* (GB), 2001, American Association of State Highway and Transportation Officials (AASHTO).
- *Alaska DOT&PF Highway Preconstruction Manual* (PCM), State of Alaska, Department of Transportation & Public Facilities (ADOT&PF).
- *Alaska Flexible Pavement Design Manual*, 2004, ADOT&PF, and associated software.
- *Alaska Traffic Manual* (ATM), 2012, ADOT&PF.
- *Roadside Design Guide*, 2011, AASHTO.

The design criteria for this project are included in Appendix A. A design speed of 70 miles per hour was selected in accordance with GB and PCM guidance. The Parks Highway in this area is a rural interstate with rolling to mountainous terrain.

DESIGN EXCEPTIONS AND DESIGN WAIVERS

A design exception will be required to raise the maximum allowable grade from the standard 5% (AASHTO, 2001 Policy on Geometric Design of Highways and Streets) to 6%. This design exception is only required for 2,000-ft of roadway (Station 2510+00 to Station 2530+00). The existing grade within this location is approximately 6% and the current design proposes to maintain the existing 6% grade (see attached Plan & Profile sheets in Appendix E).

Attempting to meet the standard 5% maximum allowable grade would extend the project excavation limits beyond the existing right-of-way on the west side of the highway and into private property owned by AHTNA Corporation. Along the east side of the highway, the excavation limits would extend to the edge of right-of-way and likely require a temporary construction easement for equipment access, thus impacting the adjacent Village View subdivision. Meeting the standard would also increase the estimated project cost by approximately $2.5 million (9% of total construction cost), not including right-of-way acquisition.

See Appendix G for approved design exception form.

DESIGN ALTERNATIVES

There are no roadway design alternatives since the environmental document. See the Preliminary Bridge Layout section for discussion of bridge alternatives.

PREFERRED DESIGN ALTERNATIVE

The preferred roadway alternative consists of constructing a pedestrian underpass near MP 231 and replacing the existing Nenana River Bridge with a wider bridge to accommodate a pedestrian walkway, left and right turn lanes, and 8-ft shoulders. This alternative was selected over maintaining the existing bridge and constructing a separate pedestrian bridge due to the following reasons:

- Does not require relocation of existing approach to McKinley Village and Grizzly Bear Cabins.
- Provides improved accessibility and safety for commuter bicyclists.
- Allows for construction of left and right turn lanes for the MP 231 intersection (McKinley Village and Grizzly Bear Cabins).
- Consolidates temporary traffic impacts by reducing future bridge replacement impacts.

The preferred alternative will require relocation of GCI and MTA fiber optic lines and copper communication cables in the area. Additional discussion on this can be found in the Utility Relocation & Coordination section.

The preferred bridge alternative has been narrowed down to three bridge types. See the Preliminary Bridge Layout section on page 8 for discussion of the alternatives.

3R ANALYSIS

Not applicable. This is a reconstruction project.

TRAFFIC ANALYSIS

The Parks Highway is classified as a rural interstate in the project area. Present year (2014) ADT was 2,450 vehicles per day, and is projected to be 3,385 vehicles per day in the design year (2040). See the design designation in Appendix A for additional information.

The project will add left and right turn lanes for vehicles entering Grizzly Bear Cabins and McKinley Village located near MP 231, as well as Village View Subdivision located near MP 230 and the new National Park Service rest area to be located just north of MP 231. The left and right turn lanes do not meet warrants set forth in the GB, Exhibit 9-75; however, NCHRP Report 279, Intersection Channelization Design Guide, provides the following guidance for un-signalized intersection left-turn lanes:

“Left-turn lanes should be provided at all unstopped (i.e., through) approaches of primary, high-speed rural highway intersections with other arterials or collectors.”

In addition to the above guidance, comments from public outreach indicated a strong desire for auxiliary turn lanes at the MP 230 and 231 intersections to alleviate traffic congestion and conflict during peak tourist season.

Turn lane warrant calculations and turning movement data for the Parks Highway MP 230 and MP 231 intersections are included in Appendix C.

HORIZONTAL/VERTICAL ALIGNMENT

The project will reconstruct the Parks Highway primarily on the existing horizontal and vertical alignment from approximately MP 229.7 to 232.3. Horizontal and vertical realignment will be required near MP 231 to accommodate widening for turn lanes and fixing a substandard sag vertical curve. The realignment will increase the horizontal curve radius near MP 231, raise

finished grade across the Nenana River, and lower finished grade along the slope immediately south of MP 231.

Terrain in the project area varies from rolling to mountainous. The project begins in a rolling downhill section along a shallow 1% grade and soon drops down a steep 6% grade to MP 231 (McKinley Village and Grizzly Bear Cabins). As the project crosses the Nenana River it climbs uphill at moderate to shallow grades, less than 3%, until the end of the project limits.

Grades post-construction will be similar to the existing condition. Elevation adjustments are required for the vertical curve near MP 231 to meet current design standards. The 6% slope into MP 231 will be maintained due to ROW impacts involved with upgrading to 5% (see Design Exceptions and Design Waivers). The existing horizontal geometry meets the 70 mph design speed.

TYPICAL SECTION(S)

The Parks Highway will consist of 12-ft lanes with 8-ft shoulders. Right turn lanes on the Parks Highway will consist of 12-ft lanes with 4-ft shoulders. 8-ft shoulders will be maintained for left-turn lane sections. See Figure 3 and Figure 4 for fill and cut typical sections, respectively.

The pedestrian path will consist of an uncrowned, 10-ft wide paved surface with a 1.5% cross-slope, 2-ft wide unpaved shoulders or buffer-zone, and 2H:1V side slopes. The pavement will be underlain by 4-inches of D-1 and 2-ft of Select Material, Type B.

The pedestrian underpass will consist of a 14-ft, 6-inch span and a 13-ft, 5-inch rise. The paved surface will be uncrowned, 12-ft wide, with a 1.5% cross-slope. Continuous, vandal-resistant LED lighting and concrete headwalls will also be included.

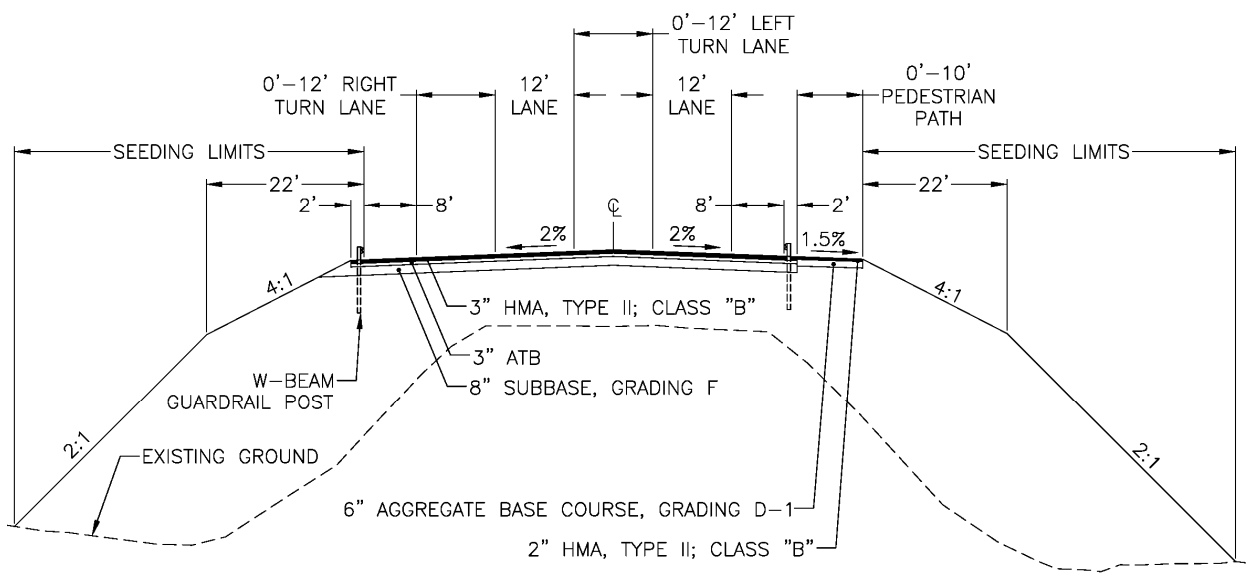


Figure 3 Parks Highway Typical Section (Fill)

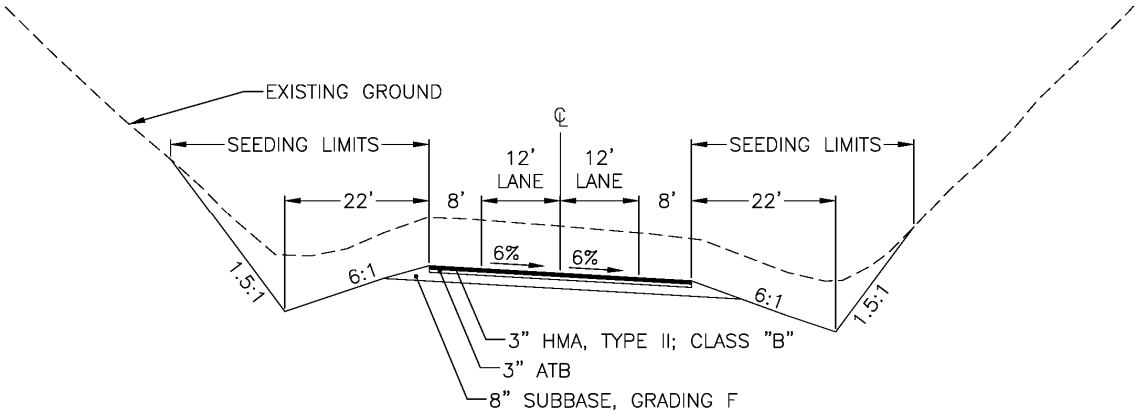


Figure 4 Parks Highway Typical Section (Cut)

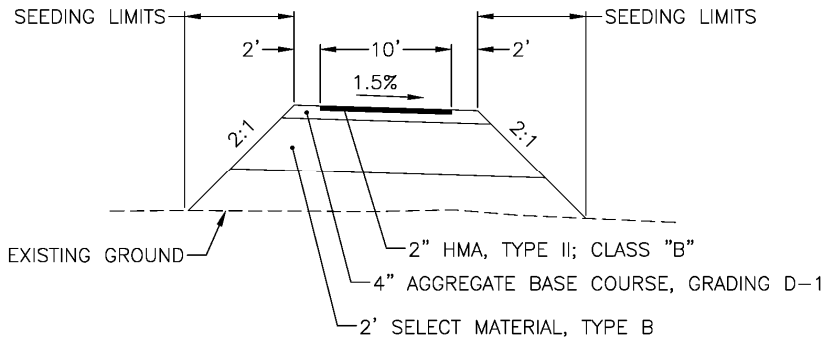


Figure 5 Pedestrian Path Typical Section

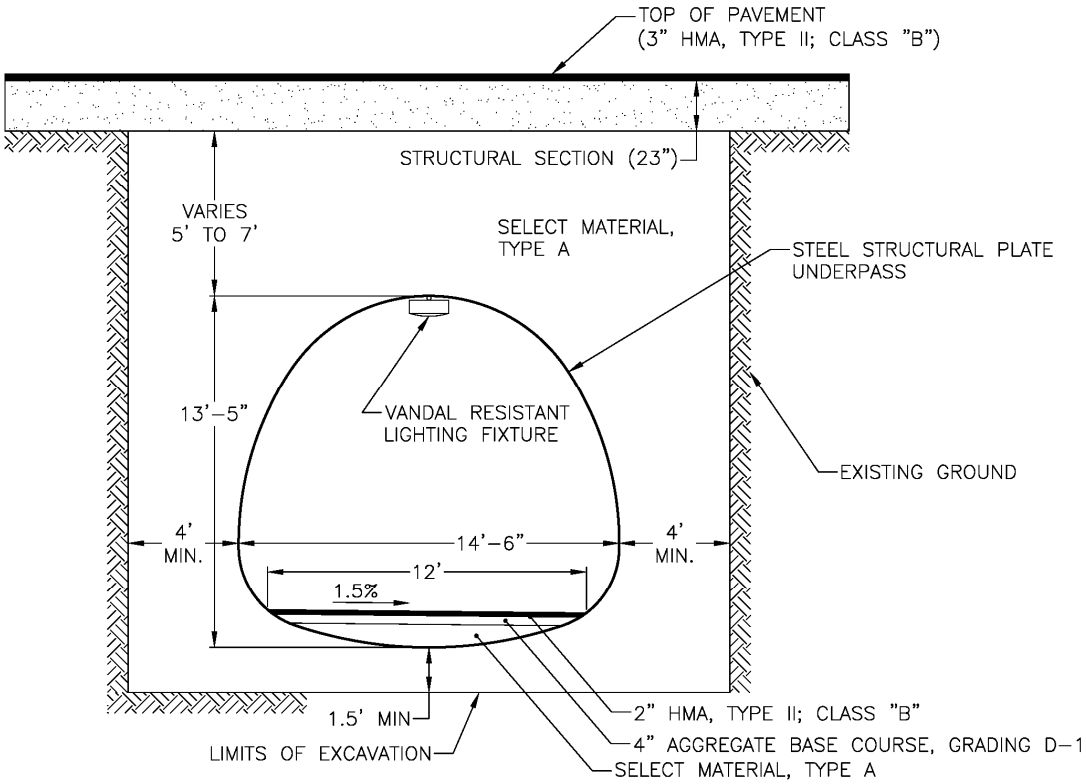


Figure 6 Pedestrian Underpass Typical Section

PAVEMENT DESIGN

The selected pavement design was evaluated using the Alaska Flexible Pavement Manual and associated software. The design life of the pavement is 15 years in accordance with General Policy-6. The preliminary pavement design was based on General Policy-6 which requires a minimum of one layer of binder course, asphalt-treated base, or other stabilized base. From General Policy-10 two-inches is the minimum asphalt concrete thickness.

The selected pavement design consists of 3-inches of hot mix asphalt, type II; class “B”, 3-inches of asphalt treated base, and 8-inches of Subbase F, underlain by borrow with less than 30% passing #200. The pavement design was analyzed using the mechanistic design method. See Appendix D for the approved pavement design and engineering calculations.

PRELIMINARY BRIDGE LAYOUT

The existing Nenana River Bridge No. 694 will be replaced with this project. The new bridge will be wider than the existing structure to accommodate a left turn lane and a right turn lane, 8-ft shoulders for vehicles and commuter bicyclists, and a 10-ft wide, separated multi-use path for pedestrians and bicyclists.

Three bridge length and superstructure alternatives are under consideration at this time (see Table 1 for a brief summary of each option). The final decision on bridge type will be based on cost and coordination with the CMGC contractor regarding traffic impacts and constructability. The horizontal dimensions are the same for each bridge option. See Appendix F for preliminary bridge drawings.

Table 1 Bridge Design Alternatives

Option	Length	Superstructure Type	Advantages	Disadvantages
Bridge Design Option 1	420-ft	Three-span concrete decked bulbed-tee girder	• Least expensive construction cost. • Faster construction time. • Very durable and low maintenance. • Common structure type built in Alaska.	• May require larger crane to erect. • Less roadway width during first construction stage. • Piers may require larger drilled shafts (increased cost). • Require two seasons for staged construction.
Bridge Design Option 2	420-ft	Three-span steel girder w/ cast-in-place concrete deck	• Lighter superstructure. • Piers closer to edge of water.	• More expensive construction cost. • Increased long-term maintenance. • May require additional construction season. • Less common structure type.
Bridge Design Option 3	420-ft	Two-span steel girder w/ cast-in-place concrete deck	• Reduces number of in-water supports. • May be more aesthetically pleasing.	• Most expensive construction cost. • Less vertical clearance under bridge. • Increased long-term maintenance. • May require additional construction season. • Less common structure type.

RIGHT-OF-WAY REQUIREMENTS

All improvements will occur within existing right of way limits. Temporary Construction Permits may be required for driveway reconstruction at Grizzly Bear Cabins and McKinley Village.

MAINTENANCE CONSIDERATIONS

Multiple site visits with M&O have been conducted since the project began in 2011. The maintenance superintendent identified one significant maintenance concern along a short section of the highway, just south of MP 231. The Parks Highway pavement at this location has historically required patching to maintain grade due to settlement issues. This area will be investigated during the centerline soils investigation. The geotechnical report will provide recommendations for stabilizing this area which will be incorporated into the final design.

The new bridge and auxiliary turn lanes will increase the total lane miles within the project area from 9.15 to 13.71 lane miles.

MATERIAL SOURCES

Material requirements include paving aggregates, aggregate base course, select material type A, select material type B, and rip-rap. The majority of borrow for this project will be generated from the excavated material. There are two material sites located near the project area; M.S. 52-2-051-2 (McKinley Village Pit), located off Yanert Road near Parks Highway MP 230, and M.S. 52-2-068-2 (Panorama Mountain), located near Parks Highway MP 217. The McKinley Village Pit has been used extensively and the amount of material remaining is questionable; however it has historically been suitable for select material type A and paving products. The Panorama Mountain Pit should provide suitable material for paving aggregates, aggregate base course, and rip-rap. Commercial sources are also available in the area for select material type A and paving products.

UTILITY RELOCATION & COORDINATION

Communications
Buried GCI and MTA fiber optic and copper communication cables are present in the project area. Both GCI fiber optic and MTA copper communication cables are in conflict with the proposed improvements and will require relocation (see Appendix F for Plan & Profile Sheets). GCI does not have relocation benefits in this area.

Power
GVEA overhead power lines are present in the project area. The proposed improvements are not anticipated to require modification of the existing power lines.

ACCESS CONTROL FEATURES

No access control features are included. The Parks Highway is not an access-controlled facility at this location.

PEDESTRIAN/BICYCLE (ADA) PROVISIONS

Existing 8-ft shoulders on the Parks Highway accommodate bicycles and pedestrians. The 8-ft shoulders will also be added to the new bridge (current shoulders are 5-ft) as well as a separated 10-ft wide multi-use pathway. A 150-ft long pedestrian underpass will be constructed adjacent to the existing Parks Highway MP 231 intersection. A 10-ft wide paved multi-use path will be constructed, connecting McKinley Village, Grizzly Bear Cabins, and the new NPS rest area north of the bridge. The new multi-use paths and pedestrian underpass will comply with current ADA standards.

SAFETY IMPROVEMENTS

This project involves the following safety improvements:

- reduce conflict between vehicles and pedestrians/bicyclists near MP 231 though addition of separated pedestrian pathways and a pedestrian underpass,

- provide grade separated NPS trail connection to reduce pedestrian/vehicle conflict at north bridge abutment,
- add left and right turn-lanes to reduce conflict between turning vehicles and through traffic at the new NPS rest area, MP 231 intersection, and MP 230 intersection,
- upgrade a sub-standard sag vertical curve near MP 231 to current 70 mph design standards.

The Parks Highway MP 231 intersection with Grizzly Bear Cabins and McKinley Village is a well-used intersection that experiences significant seasonal traffic from pedestrians, bicyclists, motorists, and commercial users, as well as year-round commercial truck traffic along the Parks Highway. The addition of auxiliary turn lanes, separated multi-use paths, and a pedestrian underpass, as well as upgrading the sub-standard sag vertical curve, will improve safety and operation at this rural intersection.

INTELLIGENT TRANSPORTATION SYSTEM FEATURES

Not applicable. There are no intelligent transportation system features within the project limits.

DRAINAGE

Drainage in the project area generally flows toward the Nenana River. Ditches will be maintained or enhanced to provide roadway drainage. Cross-culverts will be replaced or added as needed and are not expected to exceed 36-inch diameter. This area is well-drained and M&O has not indicated any problems with standing water. There are no current issues with snow storage.

The following table provides the average total precipitation and snow depths for the project area. Data is taken from the Western Regional Climate Center website using the NOAA Cooperative Stations data.

Table 1 Mean Annual Precipitation and Snow Depths

Nearest Station	**Mean Annual Precipitation (in.)**	**Mean Annual Snow Depth (in.)**
McKinley Park, AK	15.12	8

SOIL CONDITIONS

A geotechnical investigation for this project has not yet been conducted. Bridge foundation drilling is expected to occur in late March to early April, 2016, with highway centerline drilling planned for fall 2016. Previous geotechnical reports and investigations within the vicinity of this project include *Parks Highway McKinley Village to Dragonfly Creek (1987)*, *Parks Highway Mile 216 North Rehabilitation (1991)*, and *Foundation Report Nenana River at Park Boundary Bridge No. 694 (1971)*.

According to previous geotechnical reports, soil conditions in the project area range from silty, sandy gravels with cobbles, to organic silts and silts with sand. The highway foundation soils and surrounding terrain are generally well-drained alluvial and glacially deposited gravel.

The existing embankment is generally stable; however, just south of Parks Highway MP 231 is a section of embankment (Station 2527+50) that requires regular patching due to unstable ground.

Previous geotechnical investigation revealed wet embankment fill underlain by wet organic silt which was frozen 14-ft beneath the surface. A failed underdrain in the left ditch was believed to be the cause of the saturated embankment fill. It is likely that this section of embankment will require additional excavation to replace the failed underdrain and install stabilization fabric. Mitigation recommendations will be developed based on the results of the upcoming geotechnical investigation.

The average monthly air temperature, freezing degree days, and thawing degree days for McKinley Park, AK (approximately 7 miles north of MP 231) are provided in Table 2. Historical climate data was taken from the Western Regional Climate Center website using the NOAA Cooperative Stations data. The mean annual air temperature is 27.7 ºF, and the freezing index and thawing index is 4,064 ºF-days and 2,497 ºF-days, respectively.

Table 2 Mean Monthly Air Temperature and Freezing/Thawing Degree Days

Month	**Mean Temperature (ºF)**	**Freezing Degree Days (ºF-days)**	**Thawing Degree Days (ºF-days)**
Jan	3.9	872.1	0
Feb	6.9	702.1	0
Mar	14.0	559.2	0
Apr	27.6	146.5	14.3
May	42.4	0	322.8
Jun	52.6	0	616.8
Jul	55.3	0	722.1
Aug	50.4	0	571.1
Sep	40.3	0	249.3
Oct	23.2	274.4	0.9
Nov	8.9	692.5	0
Dec	5.6	817.3	0
	TOTAL	**4,064.1**	**2,496.4**

EROSION AND SEDIMENT CONTROL

The area of ground disturbance for this project is approximately 38 acres, not including material sites. A SWPPP will be required. The project will be constructed primarily in uplands, with potential for some minor wetland involvement just north of the Nenana River Bridge near MP 232. Vegetation in the project area varies from spruce and aspen forests to willows and alders in the ditches and on existing slopes. The existing soils are generally well-drained.

The proposed Parks Highway embankment will require temporary and permanent erosion and sediment control measures. Throughout the project, ground disturbance will be minimized as practical to prevent erosion. Existing vegetation will be preserved wherever it is practical.

Temporary erosion control measures may include, but are not limited to: temporary seeding, erosion control mats, watering and/or chemical stabilization for dust control, velocity control BMP’s, and perimeter controls. Perimeter controls may be installed at the toe of slope to prevent excessive sedimentation to down-slope vegetation and water bodies. The preferred perimeter

protection method in the project area will be vegetated buffer, with positive protection devices, such as straw wattles, at the edge of water bodies.

Seeding of finished slopes may be difficult due to the low fines and tall, steep slopes in the project area. Use of organic overburden from material sites and grubbing may be used as topsoil to help establish grass where needed.

All disturbed ground will be vegetated or covered with low erodible soil (e.g. Type A borrow, riprap, or ditch lining) for permanent stabilization.

ENVIRONMENTAL COMMITMENTS

The following environmental commitments are from the project Categorical Exclusion signed November 21, 2013.

- Coordinate with NPS and the community surrounding MP 231 as the project develops to minimize construction impacts.

WORK ZONE TRAFFIC CONTROL

This project is not considered significant for traffic control per DOT&PF's Policy and Procedure 05.05.015. The Parks Highway is an Interstate but the project is not in a Transportation Management Area, the AADT is less than 30,000 vehicles per day, and work is not expected to fully close the highway for more than one hour at a time.

Construction of the new bridge will utilize half-width staged construction. This will allow traffic to be maintained on the existing bridge while the first half of the new bridge is constructed. Upon completion, traffic would be transferred to the first half of the new bridge, allowing for removal of the existing bridge and construction of the second half of the new bridge.

Some portions of the work may require intermittent lane closures and/or reduction of traveled way widths. The Contractor will develop traffic control plans for the work that will be submitted to the Department for approval prior to implementation.

VALUE ENGINEERING

Not applicable. This reconstruction project on the Interstate System has a total value that is less than $40,000,000.

COST ESTIMATE

The Construction cost estimate is based on bridge option one. An itemized construction cost estimate was developed and can be made available to internal Department staff. Per Department Policy & Procedure 10.02.040, detailed construction cost estimates may not be made available to the public or other interested parties.

The estimated costs for this project are as follows:

Design	$2,100,000.00
Utilities	$200,000.00
Right of Way	$0.00
Construction (Includes 15% Engineering)	$27,997,679.00
Total Cost of Project	$30,297,679.00

APPENDIX A

DESIGN CRITERIA
AND
DESIGN DESIGNATION

ALASKA DOT&PF PRECONSTRUCTION MANUAL
Chapter 11 - Design
PROJECT DESIGN CRITERIA

Project Name:	Parks Highway MP 231 Enhancements			
☑ New Construction/Reconstruction	☐ 3R	☐ PM	☐ Other:	
Project Number:	61299 / 0A44020		☑ NHS	☐ Non NHS
Functional Classification:	Rural Interstate			
Design Year:	2040	**Present ADT:**	2450 (2014)	
Design Year ADT:	3,385	**Mid Design Period ADT:**	2990 (2030)	
DHV:	16.8%	**Directional Split:**	40 / 60	
Percent Trucks:	20.0%	**Equivalent Axle Loading:**	2,106,250	
Pavement Design Year:	2035	**Design Vehicle:**	WB-40	
Terrain:	Rolling/Mountainous	**Number of Roadways:**	1	
Design Speed:	70 MPH			
Width of Traveled Way:	**24-ft**			
Width of Shoulders:	**Outside:**	8-ft	**Inside:**	0-ft
Cross Slope:	2%			
Superelevation Rate:	e_{max} = 6%			
Minimum Radius of Curvature:	2,050-ft			
Min. K-Value for Vert. Curves:	**Sag:**	181	**Crest:**	247
Maximum Allowable Grade:	6% #			
Minimum Allowable Grade:	0.3%			
Stopping Sight Distance:	730-ft			
Lateral Offset to Obstruction:	1.5-ft			
Vertical Clearance:	16-ft			
Bridge Width:	40-ft			
Bridge Structural Capacity:	HL-93			
Passing Sight Distance:	2,480-ft			
Surface Treatment:	**T/W:**	Asphalt Concrete	**Shoulders:**	Asphalt Concrete
Side Slope Ratios:	**Foreslopes:**	4H:1V	**Backslopes:**	1.5H:1V
Degree of Access Control:	Driveway/entrance regulations			
Median Treatment:	None			
Illumination:	Pedestrian Underpass Only			
Curb Usage and Type:	None			
Bicycle Provisions:	Shoulders, Separated Path, Underpass			
Pedestrian Provisions:	Shoulders, Separated Path, Underpass			
Misc. Criteria:	Clear Zone 30-ft			

Proposed - Designer/Consultant: David Jensen **Date:** 4/19/2016

Endorsed - Engineering Manager: **Date:** 4/19/2016

Approved - Preconstruction Engineer: **Date:** 5/12/2016

Shaded criteria are commonly referred to as the *FWHA 13 controlling criteria*. For NHS routes only, these criteria must meet the minimums established in the Green Book (*AASHTO A Policy on Geometric Design of Highways and Streets*). For all other routes, these criteria must meet the minimums established in the *Alaska Highway Preconstruction Manual*. Otherwise a Design Exception must be approved.

Design Criteria marked with a " # " do not meet minimums and must have a Design Exception(s) and/or Design Waiver(s) approved. See the Design Study Report for Design Exception/Design Waiver approval(s) and approved design criteria values.

MEMORANDUM

State of Alaska

Department of Transportation & Public Facilities

TO: Ryan F. Anderson, P.E.,
Preconstruction Engineer
Northern Region

DATE: December 28, 2015

FILE NO: I:\Traffic Data\DESIGN\2015\Parks_MP231.doc

TELEPHONE NO: 451-5150

FROM: Judy Chapman
Planning Chief
Northern Region

SUBJECT: Parks Highway MP 231 Enhancements
Z612990000/0A44020
Design Designation

Please approve the attached updated design designation by signing the endorsement below which enables your staff to proceed.

Any questions should be directed to Scott Vockeroth at 451-2251.

1/13/2016

Ryan F. Anderson, P.E., Preconstruction Engineer — Date

RLM

cc: Lauren Little, P.E., Engineering Manager, Northern Region

Attachment

Please circulate and return to Traffic Data & Forecasting Manager	
Planning Manager (outside FNSB)	JMC
Planning Chief	JMC
Fairbanks Area Planner (FNSB)	
Traffic & Safety	PLJ
Any changes, additions, or questions, Please write on this sheet	

DESIGN DESIGNATION

Northern Region Planning

Traffic Data & Forecasting

ROUTE NAME: Parks Highway
STATE ROUTE NO: 170000
CDS MILEAGE: 201.607
FUNCTIONAL CLASS: Interstate
URBAN/RURAL: Rural

	YEAR	AADT	%	
AADT	2014 2030 2040	2450 2990 3385		
DHV	2030 2040		16.8	500 570
D				40-60
T			**20.0 %** 10.0 .85 1.9 2.1 1.4 3.75	**Total** Class 5 Class 6 Class 8 Class 9 Class 10 Class 13
ESAL'S (Design Lane)	To Be Provided by Design			

MEMORANDUM

State of Alaska
Department of Transportation & Public Facilities
Northern Region Design and Engineering Services

TO: Judy Chapman.
Planning Chief
Northern Region

DATE: December 4, 2015

FILE NO: H:\Projects\Parks_Hwy\61299_Parks_231\Planning\61299_Design Designation Request Memo.Docx

THRU: Ryan F. Anderson, P.E.
Preconstruction Engineer
Northern Region

PHONE NO: (907) 451-5371

FAX NO: (907) 451-5126

FROM: Lauren Little, P.E.
Engineering Manager
Northern Region

SUBJECT: Parks Highway MP 231 Enhancements
Z612990000/0A44020
Design Designation Request

Please provide a Design Designation for the subject project.

- ☒ Present AADT
- ☒ Design Year AADT (2040)
- ☒ Mid-Design Period AADT (2030)
- ☒ Design Hourly Volume
- ☒ Directional Split
- ☒ Percent Trucks
- ☒ Design Functional Classification
- ☐ Intersection Turning Movement Counts at:
- ☐ Other (*Specify*)

The project is scheduled for construction in FY2018. Note that a Design Designation was recently completed for the Parks Highway MP 237 Riley Creek Bridge Replacement (Z637630000/IM-BR-0A4-4(19)) which included a segment of road very close to this project.

Please complete the attached Traffic Date Request Form.

Attachment: as stated

ddj/vzb

Traffic Data Request Form

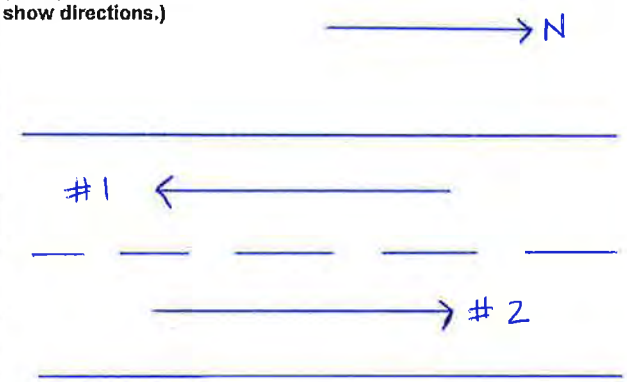
TDR Form-1-10/20/03

Alaska Department of Transportation & Public Facilities

Requested By: Lauren Little	**Design Project Number:**	**Date Requested:** 10/4/15
Base Year: 2014 **Base Year Total AADT:** 2450 **AADT Growth Rate** **Forward (%/yr):** 1.25 **End Year:** 2040 **Back Cast (%/yr):** **Begin Year:**	**Common Route Name:** Parks Hwy **Functional Class:** Urban/Rural **Historic M.P. Interval:**	**CDS Route Name:** Parks Hwy 170000 **CDS M.P. Interval:** 201.607

Truck Category	Load Factor (ESALs per Truck)	% of Total AADT in Truck Category
2-axle		See
3-axle		attached
4-axle		
5-axle		
≥ 6-axle		

Lane Configuration Sketch:
(Designer: Provide sketch of lane layout. Number each lane and show directions.)



Directional Split

Percent of Base Year Total AADT for Each Numbered Lane in Configuration Sketch:	
Lane # 1	% 40
Lane # 2	% 60
Lane #	%
Lane #	%
Lane #	%
Lane #	%

Comments:

Data Provided By:	Provider's Signature:	Date Provided:
Randi Motsko	RI MA	12/29/15

Figure 6-1. Traffic Data Request (TDR) Form

Report Route Log

CDS Route PARKS HIGHWAY (170000)

From Milepoint 185

To Milepoint 202

Filter

FacilityType: INTERCHANGE RAMP;NON-INVENTORY;WYE;SECONDARY FERRY ACCESS;ROUNDABOUT;PRIMARY FERRY ACCESS; NON-INTERCHANGE RAMP;MAINLINE;CONNECTOR

Milepoint	Attribute	Side	Feature CDS	Description	Viewer
185	Functional Class	-	-	INTERSTATE (Start at Milepoint 0)	
185	FHWA Urban Area	-	-	RURAL AREA (Start at Milepoint 13.4507)	
185.259	Milepost	R	-	221	
186.2478	Milepost	R	-	222	
187.2233	Milepost	R	-	223	
188.2391	Milepost	R	-	224	
188.2925	Bridge Midpoint	U	-	CARLO CREEK (0693)	
189.2597	Milepost	R	-	225	
190.3619	Milepost	R	-	226	
191.3764	Milepost	R	-	227	
192.2955	Milepost	R	-	228	
193.2769	Milepost	R	-	229	
194.282	Milepost	R	-	230	
194.3199	Intersection	R	172625	OLD PARKS @ MCKINLEY ROAD	
195.2774	Milepost	R	-	231	

Milepoint	Attribute	Side	Feature CDS	Description	Viewer
195.5198	Bridge Midpoint	U	-	NENANA RIVER PARK BOUNDARY (0694)	
196.288	Milepost	R	-	232	
197.2963	Milepost	R	-	233	
198.3551	Milepost	R	-	234	
199.3399	Milepost	R	-	235	
200.3375	Milepost	R	-	236	
201.0084	Bridge Midpoint	O	-	PARKS HIGHWAY RAILROAD UNDERPASS (0696)	
201.3121	Milepost	R	-	237	
201.5521	Bridge Midpoint	U	-	RILEY CREEK (0695)	
201.6065	Traffic Station	-	-	31014000	
201.6311	Intersection	L	141500	DENALI NATIONAL PARK ROAD	

Computations and Historic Data

Project: Parks Highway Milepost 231
Project #

Historic AADT

Route: 170000
Station: 31014000
Parks Hwy @ Riley Creek
Milepoint 201.607

Year	AADT
2000	1869
2001	2183
2002	2080
2003	1994
2004	2483
2005	2214
2006	2312
2007	2745
2008	2947
2009	2378
2010	2563
2011	2429
2012	2525
2013	2619
2014	1966

Growth rate for calculations was 1.25% due to historic traffic patterns and previous design designations

Growth Rate factors

2030	1.2199
2040	1.3812

Future AADTs

Year	AADT
2014	2450
2030	2990
2040	3385

K-factor 16.80%

DHV=		
	2030	500
	2040	570

Direction Spilt (D)= 40-60

Class Data

Route 170000

Station #	Description	CDS MP	Year	Percent By Class 5	6	8	9	10	13	Total Truck %
36070000	Parks Hwy at MP 216	180.978	2014	10.00	0.85	1.90	2.10	1.40	3.75	20.00
		Load Factors		0.50	0.85	1.20	1.55	2.24	2.24	
		# Axles		2	3	4	5	6	7+	

APPENDIX B

ENVIRONMENTAL DOCUMENT

State of Alaska
Department of Transportation & Public Facilities

CATEGORICAL EXCLUSION DOCUMENTATION FORM FOR FEDERAL HIGHWAY ADMINISTRATION PROJECTS

Project Name: Parks Highway MP 231 Enhancements
Project Number (state/federal):61299/0A44020
Date: June 26, 2015
CE Designation: 23 CFR 771.117(c)(3)
23 CFR 771.117(d)(5,13)
List of Attachments:
Figure 1: Location and Vicinity Map
Figure 2: Proposed Improvements
Appendix A: Class of Action Determination
Appendix B: Section 106 Consultation
Appendix C: Traffic Noise Analysis
Appendix D: Water Quality Consultation
Appendix E: Section 4(f)
Appendix F: Public and Agency Coordination

I. Project Purpose and Need

The Parks Highway MP 231 Enhancements project is designed to improve vehicle and pedestrian safety in the vicinity of MP 231 (McKinley Village) area through the construction of dedicated pedestrian facilities and vehicle turn lanes.

Purpose: Enhance safety and accommodations for motorized and non-motorized traffic between MP 229.7 and 232.3 on the Parks Highway.

Need: The Parks Highway MP 231 area (also known as McKinley Village) experiences a high volume of commercial traffic (buses, vans with boat trailers, and tractor trailers) as well as increased pedestrian and vehicle traffic during tourist season.

Pedestrians must cross the highway to access commercial facilities at McKinley Village and Grizzly Bear Cabins on the south end of the project, and must cross the Nenana River highway bridge via five-foot shoulders to access Denali National Park and Preserve (DNP&P) trails on the north end of the project.

At present there are no turn lanes for the facilities at MP 231 (which include a heavily used public boat launch in addition to the two commercial establishments), or the subdivision at MP 230, resulting in risk of conflict between 65 mph through traffic and turning traffic. The risk is exacerbated at MP 231 due to the nearly 6% grades on the south and north approaches to the intersection.

II. Project Description

The Alaska Department of Transportation and Public Facilities (ADOT&PF), in cooperation with the Alaska Division of the Federal Highway Administration (FHWA), proposes to construct intersection and pedestrian improvements at Parks Highway milepost (MP) 231 (also known as McKinley Village). The proposed project is located in Sections 25, 26, 35, & 36, Township 14 South, Range 7 West, Fairbanks Meridian (U.S. Geological Survey Quadrangle Healy C-4) (Figure 1).

The Parks Highway will be reconstructed from MP 229.7 to MP 232.3, including (Figures 2A-2C):

- Dedicated left and right turn lanes at MP 230 (Village View Subdivision access), MP 231 (hotel

facilities, public boat launch, and Denali Education Center access), and MP 231.5 (new DNP&P wayside);

- Replacement of the existing Nenana River bridge with a wider structure that will accommodate through traffic, turn lanes for MP 231, a separated multi-use path, and 8-ft shoulders for commuter bicyclists;
- Construction of a pedestrian tunnel under the Parks Highway near the MP 231 intersection;
- A new DNP&P owned and maintained wayside near the northeast quadrant of the Nenana River bridge;
- Relocation of the existing Denali National Park entrance sign to the new wayside to enhance photo opportunities;
- A grade separated connection between the existing Oxbow and Triple Lakes Trails, routed underneath the new highway bridge;
- Relocation of Triple Lakes and Oxbow trailheads to coincide with the proposed wayside and trail connection;
- Drainage and pavement improvements throughout the project;
- And utility relocations (buried fiber optic and overhead power).

The FHWA determined the Class of Action for the project to be a Categorical Exclusion under Code of Federal Regulations (CFR) 23 CFR 771.117(c)(3) and (d)(5 &13). The Class of Action Determination form is included in Appendix A.

III. Environmental Consequences

- For each yes, summarize the activity evaluated and the magnitude of the impact.
- For any consequence category with an asterisk (*), additional information must be attached such as an alternatives analysis, agency coordination or consultation, avoidance measures, public notices, or mitigation statement.
- Include direct and indirect impacts in each analysis.

A. Right-of-Way Impacts	N/A	YES	NO
1. Additional right-of-way required.		☐	☒
• Permanent easements required.	☒	☐	☐
• Estimated number of parcels: 0			
• Full or partial property acquisition required.	☒	☐	☐
• Estimated number of full parcels: 0			
• Estimated number of partial parcels: 0			
• Property transfer from state or federal agency required. *If yes, list agency in No. 4 below.*	☒	☐	☐
• Business or residential relocations required. *If yes, summarize the findings of the conceptual stage relocation study in No. 4 below and attach the conceptual stage relocation study.*	☒	☐*	☐
• Number of relocations: 0			
• Type of relocation: Residential: ☐ Business: ☐ Residential (Indicate number: N/A) Business (Indicate number: N/A)			
• Last-resort housing required.	☒	☐	☐

A. **Right-of-Way Impacts**	N/A	YES	NO
2. Will the project or activity have disproportionately high and adverse human health or environmental effects on minority populations and low-income populations as defined in E.O. 12898 (DOT Order 6640.23, December 1998)?		☐	☒
3. The project will involve use of ANILCA land that requires an ANILCA Title XI approval. *If yes, the project is not assigned to the State per the 6004 MOU and the CE must be processed by FHWA.*		☐	☒

4. Summarize the right-of-way impacts, if any:

The proposed project is not anticipated to require acquisition of additional right-of-way or permanent easements. Temporary construction permits may be required for driveway work. Facilities within DNP&P will remain the property of DNP&P and no land transfer will occur.

B. **Social and Cultural Impacts**	N/A	YES	NO
1. The project will affect neighborhoods or community cohesion.		☐	☒
2. The project will affect travel patterns and accessibility (e.g. vehicular, commuter, bicycle, or pedestrian).		☒	☐
3. The project will affect school boundaries, recreation areas, churches, businesses, police and fire protection, etc.		☒	☐
4. The project will affect the elderly, handicapped, nondrivers, transit-dependent, minority and ethnic groups, or the economically disadvantaged.		☐	☒
5. There are unresolved project issues or concerns of a federally-recognized Indian Tribe [as defined in 36 CFR 800.16(m)]. *If yes, the project is not assigned to the State per the 6004 MOU and the CE must be processed by FHWA.*		☐	☒

6. Summarize the social and cultural impacts, if any:

The proposed project will provide a long-term benefit to the traveling public, residents, and businesses within the project area by improving travel conditions and safety in the project area.

Post construction travel patterns and accessibility will be improved through added turn lanes, dedicated pedestrian facilities, and a new driving surface.

The project will have a beneficial impact to recreation areas and businesses by adding pedestrian and parking facilities to accommodate visitor use of the area.

Adverse social or cultural impacts are not expected.

No project issues or concerns have been identified related to a federally-recognized Indian Tribe as defined by 36 CFR 800.16(m).

Road users may be temporarily affected by traffic delays caused by construction activities. Refer to Section III, Part P for discussion of construction related traffic impacts.

C. **Economic Impacts**	N/A	YES	NO
1. The project will have adverse economic impacts on the regional and/or local economy, such as effects on development, tax revenues and public expenditures, employment opportunities, accessibility, and retail sales.		☐	☒
2. The project will adversely affect established businesses or business districts.		☐	☒

3. Summarize the economic impacts, if any:
The proposed project will provide a long-term economic benefit by improving

safety and efficiency of commercial traffic on the roadway. Several businesses are located in the vicinity of the proposed project area and are anticipated to experience beneficial impacts as a result of the project's pedestrian and intersection improvements.

Refer to Section III, Part P for discussion of construction related economic impacts.

D. Land Use and Transportation Plans	N/A	YES	NO
1. Project is consistent with land use plan(s).	☐	☒	☐
a. Identify the land use plan(s) and date Denali Borough Comprehensive Plan, January 2009 (amended November 2011); DNP&P Entrance Area and Road Corridor Development Concept Plan, February 1997.			
2. Project is consistent with transportation plan(s).	☐	☒	☐
a. Identify the transportation plan(s) and date. Alaska Statewide Long-Range Transportation Plan, Let's Get Moving 2030, February 2008 (updated December 2010); Interior Alaska Transportation Plan (IATP), November 2010; 2012-2015 Alaska Statewide Transportation Improvement Program (STIP), February 2012 (amended June 2015).			
3. Project would induce adverse indirect and cumulative effects on land use or transportation. *If yes, attach analysis.*		☐	☒

4. Summarize how the project is consistent or inconsistent with the land use plan(s) and transportation plan(s):

Land Use Plans

Land use in the proposed project area consists of primarily undeveloped land and parkland, with some residential and commercial properties occurring south of the Nenana River Bridge. Short- and long-term land use changes are expected as a result of the proposed project, including increased recreational use of lands north of the Nenana River. The changes are consistent with the existing land use and development plan for DNP&P that includes developing recreational facilities. The proposed project is not identified in the Denali Borough Comprehensive Plan; however, the Denali Borough Assembly and Planning Commission each passed resolutions in support of the project.

Transportation Plans

Although not specifically identified in the transportation plans listed above, the project is consistent with their goals of improving transportation and recreational infrastructure. The project is consistent with the IATP objectives to provide rest stops or waysides along highways at reasonable intervals and implement the National Highway Safety Improvement Program, including goals for accommodating cyclists and pedestrians. The project is consistent with the Let's Get Moving 2030 policy to develop the multimodal transportation system to provide safe, cost-effective, and energy-efficient accessibility and mobility for people and freight. The project is identified in the latest amended version of the 2012 – 2015 STIP (Amendment 12, March 2015) and is consistent with the project description contained therein.

E. **Impacts to Historic Properties**	N/A	YES	NO
1. Does the project involve a road that is included on the "List of Roads Treated as Eligible" in the Alaska Historic Roads PA? *If yes, follow the Interim Guidance for Addressing Alaska Historic Roads.*		☐	☒
2. Does the project qualify as a listed activity that has no potential to cause effects to historic properties? *If yes, attach concurrence from the FHWA Area Engineer (non-assigned projects) or Statewide NEPA Manager for 6004-assigned projects.*		☐*	☒
a. Indicate the appropriate policy directive or memo that identifies the project as an action with no potential to cause effects to historic properties: N/A			
3. Is a National Register of Historic Places listed or eligible property in the Area of Potential Effect?	☐	☐	☒

4. Date Consultation/Initiation Letters sent June 12, 2013 *Attach copies to this form.*

   a. List consulting parties State Historic Preservation Officer (SHPO), Native Village of Cantwell, Lake Minchumina Traditional Council, Nenana Native Association, Edzeno Village Council/Nikolai Village, Telida Native Village Council/Telida Village, Denali Borough, Denali National Park & Preserve, Ahtna, Inc., Doyon, Ltd.

   b. If no letters were sent, explain why not. *Attach "Section 106 Proceed Directly to Findings Worksheet", if applicable* N/A

5. Date "Finding of Effect" Letters sent June 1, 2015 *Attach copies to this form*

   a. State any changes to consulting parties None.

6. List responding consulting parties, comment date, and summarize:

   DNP&P responded to initiation letter on July 10, 2013 identifying a potential cultural resource located outside the Area of Potential Effect (APE).

   Doyon, Limited responded to initiation letter on June 3, 2013 indicating the project does not impact any Doyon owned lands.

7. Are there any unresolved issues with consulting parties?	☐	☐	☒
a. If yes, list N/A			

8. Date SHPO concurred with "Finding of Effect" June 8, 2015 *Attach copy to this form.*

9. Will there be an adverse effect on a historic property? *If yes, attach correspondence (including response from ACHP) and signed MOA. If yes, Programmatic Agreements (PCEs) do not apply.*	☒	☐	☐

10. Summarize any effects to historic properties. *List affected sites (by AHRS number only) and any commitments or mitigative measures. Include any commitments or mitigative measures in Section VI.*

    The proposed project does not impact cultural or historic resources. See Appendix B for figures and consultation related to Section 106 compliance.

    If cultural, archaeological, or historical sites are discovered during construction, all work that may impact these sites would cease and the SHPO would be notified.

F. **Wetland Impacts**	N/A	YES	NO
1. Project affects wetlands as defined by the U.S. Army Corps of Engineers (USACE). *If yes, document public and agency coordination required per E.O. 11990, Protection of Wetlands.*		☐*	☒
2. Are the wetlands delineated in accordance with the "*Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Alaska Region (Version 2.0) Sept. 2007*"?	☐	☒	☐
3. Estimated area of wetland involvement (acres): 0			
4. Estimated fill quantities (cubic yards): 0			
5. Estimated dredge quantities (cubic yards): 0			
6. Is a USACE authorization anticipated? *If yes, identify type*: NWP ☒ Individual ☐ General Permit ☐ Other ☐	☐	☒	☐
7. Wetlands Finding *Attach the following supporting documentation as appropriate:*			
• *Avoidance and Minimization Checklist, and Mitigation Statement*			
• *Wetlands Delineation.*			
• *Jurisdictional Determination.*			
• *Copies of public and resource agency letters received in response to the request for comments.*			
a. Are there practicable alternatives to the proposed construction in wetlands? *If yes, the project cannot be approved as proposed.*	☒	☐	☐
b. Does the project include all practicable measures to minimize harm to wetlands? *If no, the project cannot be approved as proposed.*	☒	☐	☐
c. Only practicable alternative: Based on the evaluation of avoidance and minimization alternatives, there are no practicable alternatives that would avoid the project's impacts on wetlands. The project includes all practicable measures to minimize harm to the affected wetlands as a result of construction. *If no, the project cannot be approved as proposed.*	☒	☐	☐

8. Summarize the wetlands impacts and mitigation, if any. *Include any commitments or mitigative measures in Section VI.*

A wetlands delineation of a 236-acre study area in the vicinity of the project, conducted in September 2012, identified and mapped 5.97 acres of wetlands under USACE jurisdiction.

The proposed project is not anticipated to directly impact wetlands under Section 404 jurisdiction as a result of the proposed improvements; therefore, USACE authorization for impacts to wetlands is not required. The project will, however, require USACE approval for work below the ordinary high water mark (OHWM) of Nenana River, a Section 404/10 water body (see Section G, Water Body Involvement).

G. **Water Body Involvement**	N/A	YES	NO
1. Project affects a water body.		☒	☐
2. Project affects a navigable water body as defined by USCG, (i.e. Section 9).	☐	☒*	☐
3. Project affects Waters of the U.S. as defined by the USACE, Section 404.	☐	☒*	☐
4. Project affects Navigable Waters of the U.S. as defined by the USACE (Section 10)	☐	☒*	☐
5. Project affects fish passage across a stream frequented by salmon or other fish (i.e. Title 16.05.841)	☐	☒	☐

G. **Water Body Involvement**	N/A	YES	NO
6. Project affects a cataloged anadromous fish stream, river or lake (i.e. Title 16.05.871).	☐	☐*	☒
7. Project affects a designated Wild and Scenic River or land adjacent to a Wild and Scenic River. *If yes, the Regional Environmental Manager should consult with the Statewide NEPA Manager (assigned CEs) or FHWA Area Engineer and FHWA Environmental Program Manager (non-assigned CEs) to determine applicability of Section 4(f).*		☐	☒
8. Proposed water body involvement: Bridge ☒ Culvert ☐ Embankment Fill ☐ Relocation ☐ Diversion ☒ Temporary ☒ Permanent ☒ Other ☐	☐		
9. Type of stream or river habitat impacted: Spawning ☐ Rearing ☐ Pool ☐ Riffle ☐ Undercut bank ☐ Other ☒	☐		

10. Amount of fill below (cubic yards): OHW 600 MHW _____ HTL _____

11. Summarize the water body impacts and mitigation, if any. *Include any commitments or mitigative measures in Section VI.*

The Parks Highway crosses the Nenana River near MP 231 and is a navigable water under the U.S. Coast Guard (USCG) and USACE jurisdiction.

The project proposes to replace and widen the existing Parks Highway bridge over the Nenana River, which would involve removal of the existing bridge, including piers (2 concrete piers), and installation of a new bridge and new piers (2 steel pile piers). Estimated acreage below OHW is less than 0.25.

Fill below OHW will consist of concrete filled steel piles. Pier locations will be selected to minimize hydraulic changes to the Nenana River.

The project will require USCG authorization under Section 9 jurisdiction and USACE authorization under Section 10/404 jurisdiction prior to construction.

H. **Fish and Wildlife**	N/A	YES	NO
1. Anadromous and resident fish habitat. *Any activity or project that is conducted below the ordinary high water mark of an anadromous stream, river, or lake requires a Fish Habitat Permit.*			
a. Database name(s) and date(s) queried: Alaska Department of Fish and Game (ADFG) Anadromous Waters Catalog and Fish Resource Monitor, February 24, 2015; ADFG correspondence, June 26, 2013.			
b. Anadromous fish habitat present in project area.		☐*	☒
c. Resident fish habitat present in project area		☒*	☐
d. Adverse effect on spawning habitat.	☐	☐*	☒
e. Adverse effect on rearing habitat.	☐	☐*	☒
f. Adverse effect on migration corridors.	☐	☐*	☒
g. Adverse effect on subsistence species.	☐	☐*	☒
2. Essential Fish Habitat (EFH). *EFH includes any anadromous stream used by any of the five species of Pacific salmon for migration, spawning or rearing, as well as other coastal, nearshore and offshore areas as designated by NMFS.*			
a. Database name(s) and date(s) queried: Anadromous Waters Catalog, February 24, 2015.			
b. EFH present in project area		☐	☒

H. **Fish and Wildlife**	N/A	YES	NO
c. Project proposes construction in EFH. *If yes, describe EFH impacts in H.6.*	☐	☐	☒
d. Project may adversely affect EFH. *If yes, attach EFH Assessment.*	☐	☐*	☒
e. Project includes conservation recommendations proposed by NMFS. *If NMFS conservation recommendations are not adopted, formal notification must be made to NMFS. Summarize the final conservation measures in H.6 and list in Section VI.*	☒	☐	☐
3. Wildlife Resources:			
a. Project is in area of high wildlife/vehicle accidents.		☐	☒
b. Project would bisect migration corridors.		☐	☒
c. Project would segment habitat.		☐	☒
4. Bald and Golden Eagle Protection Act. *If yes to any below, consult with USFWS and attach documentation of consultation.*			
a. Eagle data source(s) and date(s) : N/A			
b. Project visible from an eagle nesting tree?		☐*	☒
c. Project within 330 feet of an eagle nesting tree?		☐*	☒
d. Project within 660 feet of an eagle nesting tree?		☐*	☒
e. Will the project require blasting or other activities that produce extreme loud noises within 1/2 a mile from an active nest?		☐*	☒
f. Is an eagle permit required?		☐*	☐
5. Is the project consistent with the Migratory Bird Treaty Act?		☒	☐

6. Summarize fish and wildlife impacts and mitigation, including timing windows, if any. *Include any commitments or mitigative measures in Section VI.*

Anadromous or Resident Fish and Essential Fish Habitat
A review of ADF&G's Anadromous Waters Catalog and Fish Resource Monitor online mapping applications indicated there are no streams supporting anadromous or resident fish in the project area. The ADF&G responded during agency scoping, however, that the project could affect fish passage, and is considered to support resident fish. The project has the potential to impact resident fish and their efficient passage as a result of bridge pier installation below the OHWM of the Nenana River. Measures to minimize impacts to resident fish and their habitat will be developed in consultation with ADF&G and implemented during pier installation. As such, the proposed work is not likely to adversely affect resident fish or their habitat. Measures to protect water quality during construction are listed in Section III, Part P.

Wildlife
According to ADOT&PF's Moose-Vehicle Collision Rankings 2006-2010, this segment of the Parks Highway is not considered to be a top moose-vehicle collision corridor in the state. The proposed changes to roadway configuration and travel patterns are not likely to increase the frequency of moose-vehicle collisions as capacity will remain the same. The proposed project will have the potential for minor impacts on wildlife habitat as a result of constructing the proposed parking area in undisturbed forest.

Migratory Birds
A review of the U.S. Fish and Wildlife Service's (USFWS) Information, Planning,

and Conservation (IPaC) system and the Alaska Natural Heritage Program BIOTICS Data Portal indicated there are several migratory bird species protected by the Migratory Bird Treaty Act that may pass through or inhabit the project area and could be disturbed by construction. To avoid adverse impacts to migratory birds and their nests, ADOT&PF would follow the USFWS's Recommended Time Periods for Avoiding Vegetation Clearing in Alaska in Order to Protect Migratory Birds advisory.

Within the project area the USFWS recommends avoiding vegetation clearing from May 1st through July 15.

Bald and Golden Eagles
Suitable eagle nesting habitat may exist adjacent to the proposed project corridor along the Nenana River. Adverse impacts to eagles are not anticipated. Should construction be necessary within 330 feet or 660 feet (the primary or secondary zones, respectively) of an active eagle nest, work would stop in the area and the USFWS would be notified.

I.	**Threatened and Endangered Species (T&E)**	N/A	YES	NO
1.	Database name(s) and date(s) queried: IPaC, February 24, 2015.			
2.	Listed threatened or endangered species present in the project area.		☐*	☒
3.	Threatened or endangered species migrate through the project area.		☐*	☒
4.	Designated critical habitat in the project area.		☐*	☒
5.	Proposed species present in project area.		☐*	☒
6.	Candidate species present in project area.		☐*	☒
7.	What is the effect determination for the project? *Select one.*			
	a. Project has no effect on listed or proposed T&E species or designated critical habitat.		☒	
	b. Project is not likely to adversely affect a listed or proposed T&E species or designated critical habitat. *Informal Section 7 consultation is required. Attach consultation documentation, including concurrence from the Federal agency, to this form.*		☒	
	c. Project is likely to adversely affect a listed or proposed T&E species or designated critical habitat. *If yes, consult the FHWA Area Engineer (non-assigned projects) or Statewide NEPA Manager for 6004-assigned projects.*		☒	

8. Summarize the findings of the consultation, conferencing, biological evaluation, or biological assessment and the opinion of the agency with jurisdiction, or state why no coordination was conducted. *Include any commitments or mitigative measures in Section VI.*
A review of the USFWS's IPaC system indicated there are no listed threatened or endangered species or critical habitats found in the vicinity of the project area. The project will have no effect on threatened or endangered species or critical habitat as a result of the proposed project.

J.	**Invasive Species**	N/A	YES	NO
1.	Database name(s) and date(s) queried: Alaska Exotic Plants Information Clearinghouse (AKEPIC), February 25, 2015			

J. **Invasive Species**	N/A	YES	NO
2. Does the project include all practicable measures to minimize the introduction or spread invasive species, making the project consistent with E.O. 13112 (Invasive Species)? *If yes, list measures in J.3.*		☒	☐

3. Summarize invasive species impacts and minimization measures, if any. *Include any commitments or mitigative measures in Section VI.*

   A review of the AKEPIC mapping application indicated there are several non-native and invasive species known to occur within the project area. Because the proposed project will be disturbing new ground, there is potential to introduce or spread invasive species during construction. To minimize the risk of introducing or spreading invasive species, ADOT&PF will comply with all federal, state, and local laws and regulations regarding invasive species during construction of the proposed project. Additionally, the area of ground disturbance will be kept to a minimum and certified weed-free seed will be used to re-establish vegetation after construction.

K. **Hazardous Waste**	N/A	YES	NO
1. Database name(s) and date(s) queried: Alaska Department of Environmental Conservation (ADEC) Contaminated Sites Database, February 25, 2015.			
2. There are potentially contaminated sites within or adjacent to the existing and/or proposed ROW.		☐	☒
3. There are identified contaminated sites within or adjacent to the existing and/or proposed ROW.		☐	☒
4. Extensive excavation is proposed adjacent to, or within, a known hazardous waste site, or the potential for encountering hazardous waste during construction is high. *If yes, attach the hazardous waste investigation report and approved ADEC Corrective Action Plan.*		☐*	☒

5. Summarize the hazardous waste impacts and mitigation, if any. *Include any commitments or mitigative measures in Section VI.*

   A review of the ADEC Contaminated Sites Database mapping application indicated there are no sites listed as “active” or “cleanup with institutional controls” near the proposed project area. If contaminated or hazardous materials are encountered during construction, all work in the vicinity of the contaminated site would be stopped and ADEC would be notified.

L. **Air Quality (Conformity)**	N/A	YES	NO
1. The project is located in an air quality maintenance area or nonattainment area (CO or PM-10 or PM-2.5). *If yes, indicate CO ☐ or PM-10 ☐ or PM-2.5 ☐, and complete the remainder of this section.*		☐	☒
2. The project is included in a conforming Long Range Transportation Plan (LRTP) and Transportation Improvement Program (TIP).	☒	☐	☐

   a. List dates of FHWA/FTA conformity determination: N/A

L.	**Air Quality (Conformity)**	N/A	YES	NO
3.	The project is exempt from an air quality analysis per 40 CFR 93.126 (Table 2 and Exempt Projects). *If no, a project-level air quality conformity determination is required for CO nonattainment and maintenance areas, and a qualitative project-level analysis is required for both PM-2.5 and PM-10 nonattainment and maintenance areas.*	☒	☐	☐
4.	Have there been a significant change in the scope or the design concept as described in the most recent conforming TIP and LRTP? *If yes, describe changes in L.8. In addition, the project must satisfy the conformity rule's requirements for projects not from a plan and TIP, or the plan and TIP must be modified to incorporate the revised project (including a new conformity analysis).*	☒	☐	☐
5.	A CO project-level analysis was completed meeting the requirements of Section 93.123 of the conformity rule. The results satisfy the requirements of Section 93.116(a) for all areas or 93.116(b) for nonattainment areas. *Attach a copy of the analysis.*	☒	☐*	☐
6.	A PM-2.5 project-level air quality analysis was completed meeting the requirements of Section 93.123 of the conformity rule. The results satisfy the requirements of Section 93.116. *Attach a copy of the analysis.*	☒	☐*	☐
7.	A PM-10 project-level air quality analysis was completed meeting the requirements of Section 93.123 of the conformity rule. The results satisfy the requirements of Section 93.116. *Attach a copy of the analysis.*	☒	☐*	☐

8. Summarize air quality impacts, mitigation, and agency coordination, if any. *Include any commitments or mitigative measures in Section VI.*

A review of the U.S. Environmental Protection Agency's (EPA) list of Non-attainment Areas for Criteria Pollutants in Alaska indicated the proposed project is not within a non-attainment or maintenance area. According to Alaska Administrative Code (AAC) 18 AAC 50, DNP&P is considered a Class I area. As such, there are designated maximum allowable increases for PM-10, nitrogen oxide, and sulfur dioxide. Activities in these areas must operate in such a way that they do not exceed listed air quality controls for these compounds.

The proposed project would result in a minor change in traffic patterns, and traffic volumes would likely increase in areas where new parking facilities are proposed. The nature and extent of the proposed project is not likely to significantly change or increase emissions along the project corridor or contribute to a violation of an ambient air quality standard or exceed a maximum allowable increase for a Class I area.

No adverse impacts to air quality are expected to occur as a result of the proposed project. Refer to Section III, Part P for discussion of construction-related air quality impacts and mitigation measures.

M. **Floodplain Impacts (23 CFR 650, Subpart A)**	N/A	YES	NO
1. Project encroaches into the base (100 year) flood plain in fresh or marine waters. Identify floodplain map source and date : N/A		☐*	☒
If yes, attach documentation of public involvement conducted per E.O. 11988 and 23 CFR 650.109. Consult with the regional or Statewide Hydraulics/Hydrology expert. Attach the required location hydraulic study developed per 23 CFR 650.111. Answer questions M.1.a through d.			
If no, skip to M.2.			
a. Is there a longitudinal encroachment into the 100-year floodplain?	☒	☐*	☐
b. Is there significant encroachment as defined by 23 CFR 650.105(q)? *If yes, the project cannot be approved as proposed without a finding that the proposed action is the "Only Practicable Alternative" as defined in 23 CFR 650.113. Attach the finding for approval.*	☒	☐*	☐
c. Project encroaches into a regulatory floodway.	☒	☐*	☐
d. The proposed action would increase the base flood elevation one-foot or greater.	☒	☐*	☐
2. Project conforms to local flood hazard requirements.	☒	☐	☐
3. Project is consistent with E.O. 11988 (Floodplain Protection). *If no, the project cannot be approved as proposed.*		☒	☐
4. Summarize floodplain impacts and mitigation, if any. *Include any commitments or mitigative measures in Section VI.*			

A review of the Federal Emergency Management Agency's (FEMA) Map Service Center website indicates that FEMA has not completed a study to determine flood hazards for the proposed project area and, therefore, a flood map has not been published. There are no regulatory floodplains or floodways within the proposed project area. Adverse impacts to floodplains are not anticipated.

N. **Noise Impacts (23 CFR 772)**	N/A	YES	NO
1. Does the project involve any of the following? *If yes, complete N.1.a.*		☒	☐
If no, a noise analysis is not required. Skip to section O.			

- Construction of highway on a new location.
- Substantial alteration in vertical or horizontal alignment as defined in 23 CFR 772.5.
- An increase in the number of through lanes.
- Addition of an auxiliary lane (except a turn lane).
- Addition or relocation of interchange lanes or ramps added to a quadrant to complete an existing partial interchange.
- Restriping existing pavement for the purpose of adding a through-traffic lane or an auxiliary lane.
- Addition of a new or substantial alteration of a weigh station, rest stop, ride-share lot or toll plaza.

N.	**Noise Impacts (23 CFR 772)**	N/A	YES	NO
a.	Identify below which category of land uses are adjacent: *A noise analysis is required if any lands in Categories A through E are identified, and the response to N.1 is 'yes'.*			
	Category A: Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.	☐	☐	☒
	Category B: Residential. *This includes undeveloped lands permitted for this category.*	☐	☒	☐
	Category C (exterior): Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, daycare centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings. *This includes undeveloped lands permitted for this category.*	☐	☒	☐
	Category D (interior): Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios.	☐	☐	☒
	Category E: Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not listed above. *This includes undeveloped lands permitted for this category.*	☐	☒	☐
2.	Does the noise analysis identify a noise impact? *If yes, explain in N.3*		☐	☒

3. Summarize the findings of the attached noise analysis and noise abatement worksheet, if applicable:
A Traffic Noise Analysis was completed in June 2015 using the FHWA Traffic Noise Model Version 2.5. Existing noise levels were measured at five locations within the project corridor and were modeled at an additional 13 locations in noise sensitive areas. Existing peak-hour noise levels do not approach or exceed the ADOT&PF Noise Abatement Criteria (NAC) at any location, and predicted future peak-hour noise levels would not approach or exceed the NAC at any location under the 'build' or 'no-build' scenario.

The feasibility and cost-reasonableness of using noise abatement measures to reduce traffic noise levels were not analyzed since no impacts have been identified, and the report proposes no noise abatement measures for the project.

The June 2015 Traffic Noise Analysis is included in Appendix C.

O.	**Water Quality Impacts**	N/A	YES	NO
1.	Project would involve a public or private drinking water source. *If yes, explain in O.7*		☐	☒
2.	Project would result in a discharge of storm water to a Water of the U.S. (per 40 CFR 230.3(s))		☒	☐
3.	Project would discharge storm water into or affect an ADEC designated Impaired Waterbody. *If any of the Impaired Waterbodies have an approved or established Total Maximum Daily Load, describe project impacts in O.7*		☐	☒

a. List name(s), location(s), and pollutant(s) causing impairment:

N/A

O. **Water Quality Impacts**	N/A	YES	NO
4. Estimate the acreage of ground-disturbing activities that will result from the project? 45 acres			
5. Is there a municipal separate storm sewer system (MS4) APDES permit, or will runoff be mixed with discharges from an APDES permitted industrial facility?		☐	☒
a. If yes, list APDES permit number and type: N/A			
6. Would the project discharge storm water to a water body within a national park or state park; a national or state wildlife refuge? *If yes and Alaska Construction General Permit applies to the project, consultation with ADEC is required at least 30 days prior to planned start of construction activities.*		☒	☐

7. Summarize the water quality impacts and mitigation, if any. *Include any commitments or mitigative measures in Section VI.*

Storm water within the proposed project area sheet flows off the roadway into vegetated areas and adjacent ditches where it infiltrates into the ground or is conveyed and discharged into the Nenana River. A review of ADEC's Impaired Waters mapping application and Alaska's FINAL 2012 Integrated Water Quality Monitoring and Assessment Report indicated the Nenana River is not designated as impaired. There are no MS4 facilities in the area. A review of the ADEC Drinking Water Protection Areas mapping application indicated there are multiple private drinking water sources within the project area, none of which will be impacted by new ground disturbance resulting from the proposed project.

The proposed project would increase the amount of impervious surfaces as a result of a new parking area and roadway widening to accommodate turning lanes. Post-construction BMP's, including drainage conveyance and storage will be designed to reduce impacts to the Nenana River.

The Nenana River is the eastern boundary of the DNP&P in the project area. The ADEC was consulted to determine if specific water quality protection measures or an antidegradation analysis are needed to meet the requirements of the 2011 Alaska Pollutant Discharge Elimination System (APDES) Construction General Permit (CGP). The ADEC responded and determined that no additional information is required to be in compliance with the CGP. A Storm Water Pollution Prevention Plan (SWPPP) will be required for the project that implements Best Management Practices (BMPs) to limit storm water discharge into the Nenana River.

No long-term adverse impacts to water quality are expected to occur as a result of the proposed project. Refer to Section III, Part P for discussion of construction related water quality impacts.

See Appendix D for ADEC Water Quality Consultation.

P. **Construction Impacts**	N/A	YES	NO
1. There will be temporary degradation of water quality.		☒	☐
2. There will be a temporary stream diversion.		☒	☐
3. There will be temporary degradation of air quality.		☒	☐
4. There will be temporary delays and detours of traffic.		☒	☐

P. Construction Impacts	N/A	YES	NO
5. There will be temporary impacts on businesses.		☒	☐
6. There will be temporary noise impacts.		☒	☐
7. There will be other construction impacts.		☒	☐

8. Summarize construction impacts and mitigation for each 'yes' above. *Include any commitments or mitigative measures in Section VI.*

Water Quality
Temporary water quality degradation during construction may result from installation of piers for bridge construction, ground disturbance, and sedimentation of storm water runoff. These impacts will be minimized through the development and implementation of a SWPPP in accordance with ADOT&PF's contract specifications and the APDES & NPDES CGPs for storm water discharge in Alaska. BMPs would be implemented during construction to minimize transport of sediment beyond the construction site.

Air Quality
The operation of construction equipment may lead to a temporary decrease in air quality because of increased airborne dust and emission-related particulate matter. Air quality impacts would be temporary and mitigated through the use of BMP's such as watering and sweeping disturbed and dust prone surface areas and ensuring that construction equipment receives regular maintenance.

Traffic Impacts
Temporary traffic impacts may include delays or detours for road users. These impacts will be mitigated by providing advance notice to the public and an approved traffic control plan.

Business Impacts
Businesses may be impacted by commercial and tourism traffic delays during construction. However, these impacts would be temporary and access would be maintained throughout construction.

Noise Impacts
Temporary noise impacts will result from the operation of heavy equipment, the presence of construction crews, and other associated construction activities. Noise from construction equipment can be minimized by maintaining their noise control devices.

Other – Invasive Species
Soil disturbance provides opportunity for invasive plants to become established, out-compete native plants, and/or spread invasive plants present in the project area. Practicable measures would be implemented to minimize the introduction or spread of invasive species, such as the use of certified weed-free seed.

Other – Hazardous Materials
The contractor will be required to develop a Hazardous Materials Control Plan to address containment, cleanup, and disposal of all construction related discharges of petroleum fuels, oils, and other hazardous substances. Wastes generated during construction would be properly handled, contained, and disposed of at an appropriately permitted disposal facility, in accordance with State and Federal laws.

Q. **Section 4(f)/6(f)**	N/A	YES	NO
1. Section 4(f) (23 CFR 774)			
a. Does a Section 4(f) resource exist within the project area; or is the project adjacent to a Section 4(f) resource? *If yes, attach consultation with the Statewide NEPA Manager (assigned CEs) or FHWA Environmental Program Manager (non-assigned CEs) to determine applicability of Section 4(f)*		☒	☐
b. Does an exception listed in 23 CFR 774.13 apply to this project? *If yes, attach consultation with the Statewide NEPA Manager (assigned CEs) or FHWA Environmental Program Manager (non-assigned CEs), and documentation from the official with jurisdiction, if required.*	☐	☒	☐
c. Does the project result in the "use" of a Section 4(f) property? *"Use" includes a permanent incorporation of land, adverse temporary occupancy, or constructive use.*	☐	☐	☒
d. Has a *de minimis* impact finding been prepared for the project? *If yes, attach the finding.*	☒	☐	☐
e. Has a Programmatic Section 4(f) Evaluation been prepared for the project? *If yes, attach the evaluation.*	☒	☐	☐
f. Does the project require an Individual Section 4(f) Evaluation? *If yes, the project is not assigned to the State per the 6004 MOU and the CE must be processed by FHWA. Attach the evaluation.*	☒	☐	☐
2. Section 6(f) (36 CFR 59)			
a. Were funds from the Land and Water Conservation Fund Act (LWCFA) used for improvement to a property that will be affected by this project?	☐	☐	☒
b. Is the use of the property receiving LWCFA funds a "conversion of use" per Section 6(f) of the LWCFA? *Attach the correspondence received from the ADNR 6(f) Grants Administrator.*	☒	☐	☐

3. Summarize Section 4(f)/6(f) involvement, if any:

The Parks Highway is located within DNP&P north of the Nenana River Bridge. DNP&P is a publicly-owned national park that is protected under Section 4(f) of the Department of Transportation Act of 1966. The proposed project would construct a new rest area within DNP&P on the east side of the Parks Highway at approximately MP 231.5 and trail connections on DNP&P property. All facilities constructed on DNP&P property would remain the property of DNP&P and will be maintained by the Park Service. The work in DNP&P is being done at the request of the National Park Service. The FHWA determined, and the official with jurisdiction over the property concurred in writing on June 29, 2015, that the project is solely for the purpose of preserving or enhancing the activities, features, or attributes that qualify DNP&P for protection under Section 4(f). The FHWA determined that the exception to the requirement for Section 4(f) approval for transportation enhancement activities (23 CFR 774.13(g)) is applicable to the proposed project.

A temporary occupancy under 23 CFR 774.11(d) was also utilized for staging on the proposed wayside. The official with jurisdiction concurred with this exception on June 29, 2015.

Section 4(f) consultation documents are included in Appendix E.

IV. Permits and Authorizations

	N/A	YES	NO
1. USACE, Section 404/10 *Includes Abbreviated Permit Process, Nationwide Permit, and General Permit*		☒	☐
2. Coast Guard, Section 9		☒	☐
3. ADF&G Fish Habitat Permit (Title 16.05.871 and Title 16.05.841)		☒	☐
4. Flood Hazard		☐	☒
5. ADEC Non-domestic Wastewater Plan Approval		☐	☒
6. ADEC 401		☒	☐
7. ADEC APDES		☒	☐
8. Noise		☐	☒
9. Eagle Permit		☐	☒
10. Other. *If yes, list below.*		☒	☐

The project area is partially within DNP&P and is required to obtain permit coverage under the EPA National Pollutant Discharge Elimination System Construction General Permit for storm water discharges. The Contractor would be responsible for obtaining all necessary permits and clearances for material and disposal sites, and borrow or equipment storage areas, including compliance with the NPDES & APDES CGP for storm water discharge.

V. Comments and Coordination

	N/A	YES	NO
1. Public/agency involvement for project. *Required if protected resources are involved.*		☒	☐
2. Public Meetings. Date(s): August 28, 2014; September 30, 2014; April 15, 2015		☒	☐
3. Newspaper ads. *Attach certified affidavit of publication as an appendix.* Name of newspaper and date: Fairbanks Daily News-Miner, August 24 and September 28, 2014, March 29, April 5, and April 12, 2015; ADOT&PF Online Public Notice, August 19 and September 5, 2014; Alaska Dispatch News, March 29, April 5, and April 12, 2015.		☒	☐
4. Agency scoping letters. Date sent: May 30, 2013		☒	☐
5. Agency scoping meeting. Date of meeting: N/A		☐	☒
6. Field review. Date: N/A		☐	☒

7. Summarize comments and coordination efforts for this project. Discuss pertinent issues raised. *Attach correspondence that demonstrates coordination and that there are no unresolved issues.*

Public Involvement

Notices of a public open house in Healy, Alaska and two public meetings in McKinley Village, Alaska were posted in the ADOT&PF Online Public Notice system, the Fairbanks Daily News-Miner, and the Anchorage Daily News. Flyers were also posted in Healy, Denali National Park & McKinley Village.

The first two meetings provided the team an opportunity to understand the issues and problems to be solved with the project and seek comment on early concept designs. The third meeting sought input on two alternatives developed from input received at the first two meetings and coordination with the Park Service and

Denali Borough.

The ADOT&PF received several comments from residents in the project area. Pertinent issues raised include:

- Concern regarding the safety of pedestrians traveling and crossing the roadway in the McKinley Village business area, at the Nenana River Bridge, at the Triple Lakes and Oxbow trailheads, and at the DNP&P boundary sign.
- Concern about construction impacts including traffic, noise, and materials sources.
- Support for the wider bridge with turn lanes and a separated pedestrian walkway, rest area, and turn lanes.

The project manager responded to commenters on June 26, 2015 and has maintained a project website to keep the public informed. Coordination will continue throughout the design process.

Agency Scoping
A request for early coordination was sent to the following parties: ADEC, ADF&G, Alaska Department of Natural Resources, Bureau of Land Management, Denali Borough, Doyon, Ltd., Ahtna, Inc., EPA, National Oceanic and Atmospheric Administration, National Park Service (NPS), Representative David Guttenberg, USCG, and USFWS.

The proposed parking area and trail connections are being developed in consultation with the NPS. The ADOT&PF and NPS have conducted regular meetings to discuss development of the proposed improvements. The conceptual layout and design of the parking area is being completed by NPS.

Other comments received from agencies and other parties include the following:

- A resolution from the Denali Borough in support of the project;
- ADF&G indicated that the project has to the potential to block the efficient passage and movement of fish, and that a fish habitat permit will be required for work below the ordinary high water mark;
- and NPS commented on proposed location of the parking area and provided suggested pedestrian and wayside facilities to be considered throughout the project area.

See Appendix F for Public and Agency Coordination.

VI. Environmental Commitments and Mitigation Measures

List all environmental commitments and mitigation measures included in the project.

Standard environmental commitments and mitigation measures are outlined within each section above. Environmental commitments and mitigation measures that are unique to this project include the following:

1. The ADOT&PF will continue to coordinate with the NPS and the community surrounding MP 231 as the project develops to minimize construction impacts.

VII. Environmental Documentation Approval

	N/A	YES	NO
1. Do any unusual circumstances exist, as described in 23 C.F.R. 771.117 (b)? *If yes, the CE Documentation form cannot be approved.*		☐	☒
2. Does this 6004 Program approval statement apply? "The State has determined that this project has no significant impact(s) on the environment and that there are no unusual circumstances as described in 23 CFR 771.117(b). As such, the project is categorically excluded from the requirements to prepare an environmental assessment or environmental impact statement under the National Environmental Policy Act. The State has been assigned, and hereby certifies that it has carried out, the responsibility to make this determination pursuant to Chapter 3 of title 23, United States Code, Section 326 and a Memorandum of Understanding dated September 20, 2012, executed between the FHWA and the State." *If no, the CE must be approved by FHWA.*		☐	☒
3. **For 6004 projects:** The project meets the criteria of the DOT&PF Programmatic Approval 2 authorized in the November 6, 2012 "CE Directive – Delegation of Approval Authority for Certain CEs under 6004 MOU". *If* yes, *the CE may be approved by the Regional Environmental. If no, the CE may be approved by a Statewide NEPA Manager.*	☒	☐	☐
4. **For non-assigned projects:** The project meets the criteria of the April 13, 2012 "Programmatic Categorical Exclusion for Use on Federal-Aid Highway Projects in Alaska" between FHWA and DOT&PF. *If yes, the CE may be approved by the Regional Environmental Manager. If no, the CE may be approved by FHWA Area Engineer.*	☐	☐	☒

VIII. Environmental Documentation Approval Signatures

Prepared by: Melissa L Jensen Date: 7/9/2015
[Sign] Environmental Impact Analyst

Melissa L. Jensen
[Print Name] Environmental Impact Analyst

Reviewed by: Lauren Little Date: 7/9/2015
[Sign] Engineering Manager

Lauren Little
[Print Name] Engineering Manager

Approved by: Brett D Nelson Date: 7-9-15
[Sign] Regional Environmental Manager

Brett Nelson
[Print Name] Regional Environmental Manager

Assigned CE
Approved by: _____ Date: _____
[Sign] DOT&PF Statewide NEPA Manager

_____
[Print Name] DOT&PF Statewide NEPA Manager

Non-Assigned CE
Approved by: Austin Armstrong Date: 8/4/15
[Sign] FHWA Area Engineer

Austin Armstrong
[Print Name] FHWA Area Engineer

APPENDIX C

TRAFFIC ANALYSES AND SPEED STUDIES

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION
AND
PUBLIC FACILITIES

Computations

Item No. _____

DATE 2/5/2016
Project No. 61299
Project Name Parks MP 231
Calc. by D. Jensen
Checked by _____

For Left-Turn Warrants

MP 231

N

7/7/2015
Peak
17:00
to
18:00

12 | 144 | 20

Advancing Vol = 176 VPH

Opposing Vol = 100 VPH

% Left = 11.4%

[No Warrant]
GB 2001 Ex 9-75

5 | 88 | 7

Advancing
Vol. = 100 VPH

Opposing
Vol. = 176 VPH

% Left = 5.0%

[No Warrant]

GB 2001 Ex 9-75

7/7/2015
Peak
17:00
to
18:00

S

Sheet 1 of 2 Sheets

25D-120 (5/84)

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION
AND
PUBLIC FACILITIES

Computations

Item No. _____

DATE 2/5/2016
Project No. 61299
Project Name Parks MP 231
Calc. by D. Jensen
Checked by _____

For. Left-Turn Warrants

MP 230

Advancing Vol = 141 VPH

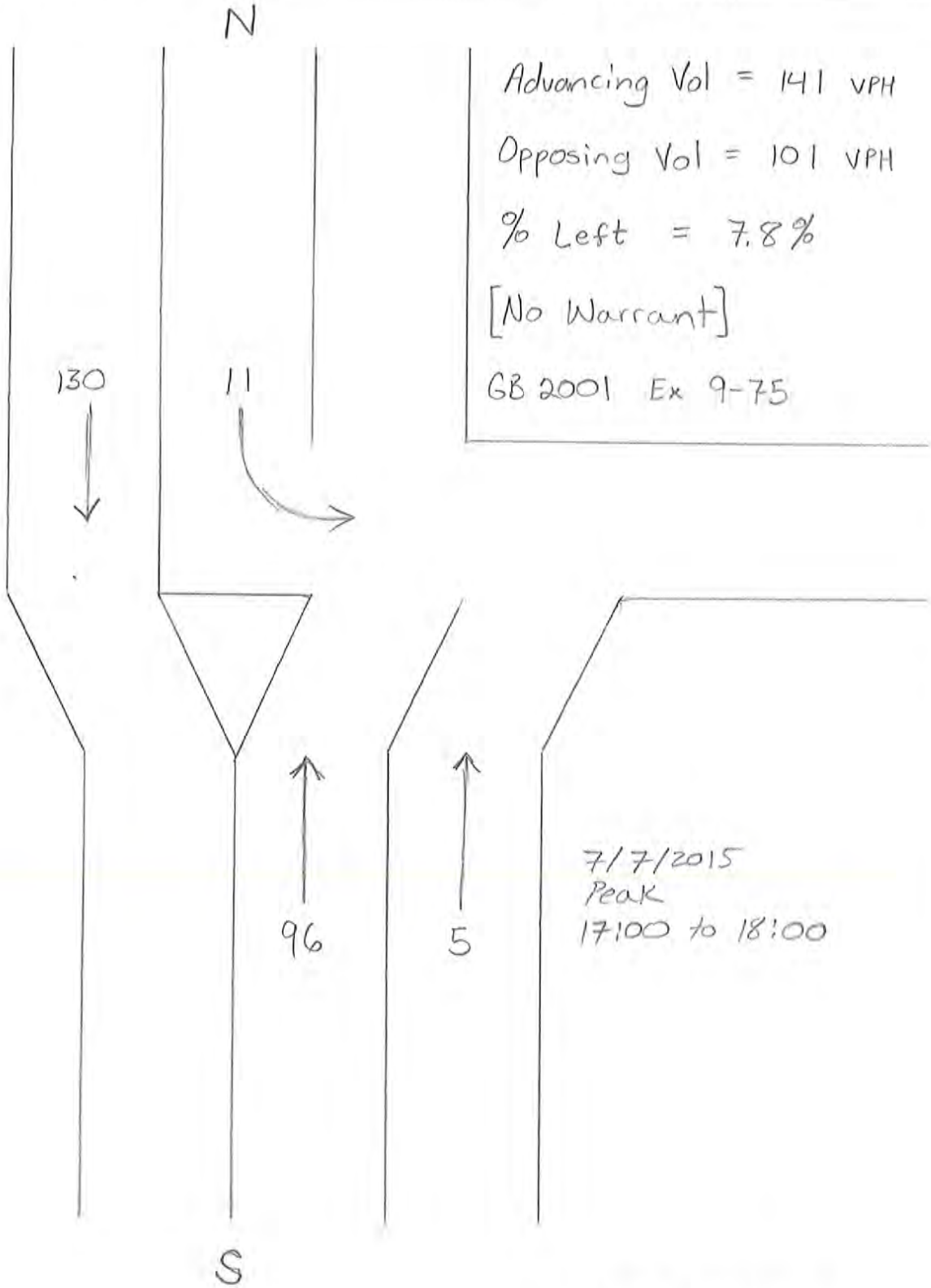
Opposing Vol = 101 VPH

% Left = 7.8%

[No Warrant]

GB 2001 Ex 9-75

7/7/2015
Peak
17:00 to 18:00



7/7/2015
Peak
17:00 to 18:00

Sheet 2 of 2 Sheets

25D-120 (5/84)

Alaska Department of Transportation & Public Facilities
Traffic Data & Forecasting
2301 Peger Road
Fairbanks, Alaska, United States 99709
907-451-2251 scott.vockeroth@alaska.gov

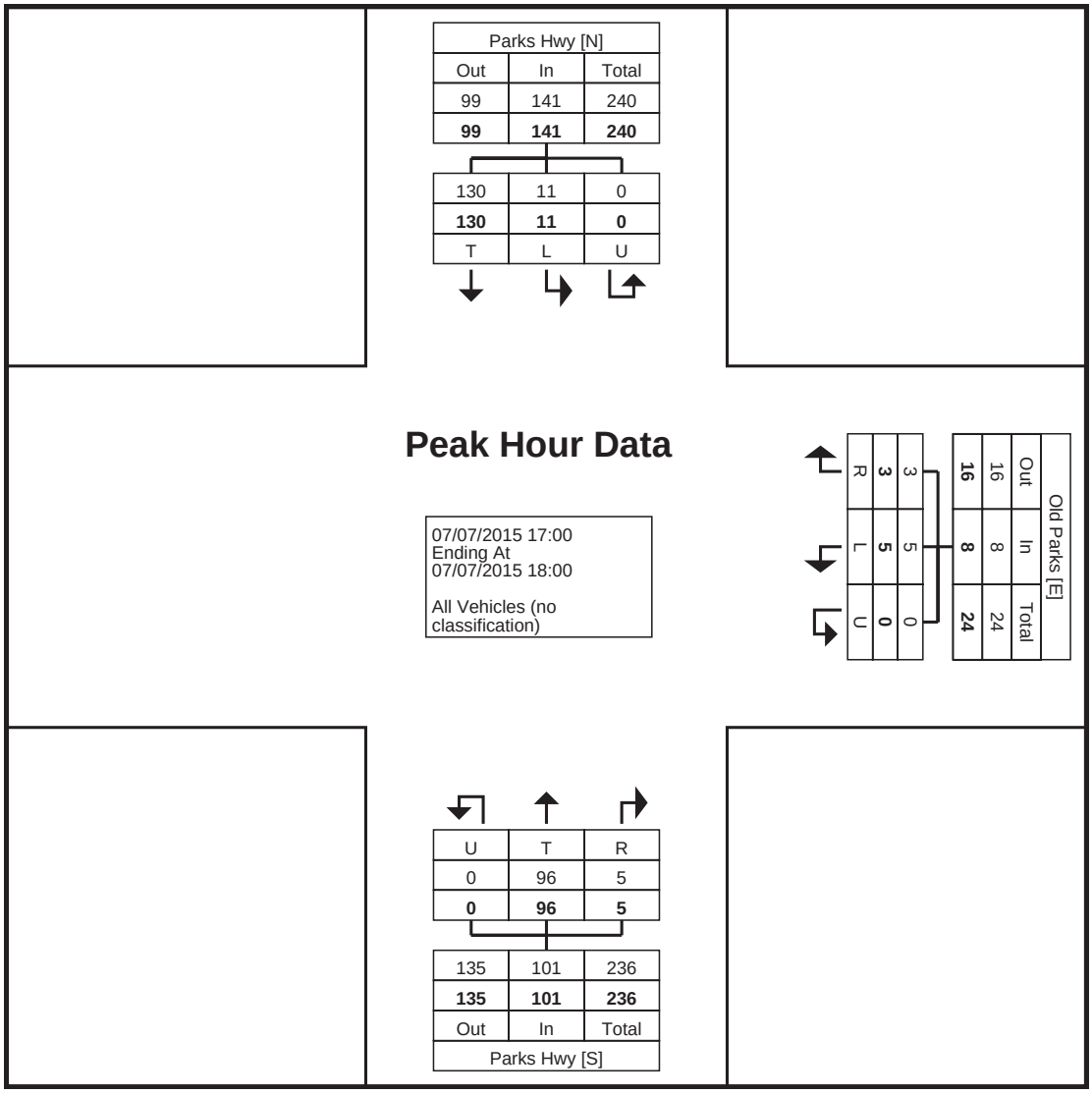
Count Name: Parks Hwy and Old Parks Hwy@ MP230
Site Code: 170000172625
Start Date: 07/07/2015

Turning Movement Data

Start Time	Parks Hwy Southbound				Old Parks Westbound				Parks Hwy Northbound				
	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
7:00	9	1	0	10	0	0	0	0	2	10	0	12	22
7:15	6	1	0	7	12	1	0	13	0	12	0	12	32
7:30	12	0	0	12	0	0	0	0	0	10	0	10	22
7:45	9	1	0	10	6	0	0	6	2	15	0	17	33
Hourly Total	36	3	0	39	18	1	0	19	4	47	0	51	109
8:00	18	0	0	18	6	2	0	8	0	5	0	5	31
8:15	15	0	0	15	1	1	0	2	0	14	0	14	31
8:30	12	0	0	12	2	0	0	2	0	14	0	14	28
8:45	12	2	0	14	5	1	0	6	1	18	0	19	39
Hourly Total	57	2	0	59	14	4	0	18	1	51	0	52	129
9:00	21	0	0	21	1	2	0	3	0	10	0	10	34
9:15	13	0	0	13	1	0	0	1	1	15	0	16	30
9:30	11	0	0	11	4	3	0	7	1	18	0	19	37
9:45	27	0	0	27	2	0	0	2	0	9	0	9	38
Hourly Total	72	0	0	72	8	5	0	13	2	52	0	54	139
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-
11:00	49	2	0	51	2	1	0	3	1	21	0	22	76
11:15	28	1	0	29	0	0	0	0	1	18	0	19	48
11:30	21	1	0	22	1	1	0	2	0	22	0	22	46
11:45	15	0	0	15	0	0	0	0	0	6	0	6	21
Hourly Total	113	4	0	117	3	2	0	5	2	67	0	69	191
12:00	35	1	0	36	1	1	0	2	0	20	0	20	58
12:15	9	0	0	9	0	1	0	1	0	8	0	8	18
12:30	19	2	0	21	0	0	0	0	0	20	0	20	41
12:45	30	0	0	30	1	1	0	2	1	28	0	29	61
Hourly Total	93	3	0	96	2	3	0	5	1	76	0	77	178
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-
15:00	19	0	0	19	1	1	0	2	1	6	0	7	28
15:15	17	1	0	18	1	0	0	1	3	36	0	39	58
15:30	25	0	0	25	1	0	0	1	1	29	0	30	56
15:45	16	1	0	17	1	0	0	1	1	29	0	30	48
Hourly Total	77	2	0	79	4	1	0	5	6	100	0	106	190
16:00	23	1	0	24	2	2	0	4	0	20	0	20	48
16:15	18	4	0	22	2	0	0	2	2	18	0	20	44
16:30	7	1	0	8	4	0	0	4	0	39	0	39	51
16:45	16	2	0	18	0	0	0	0	1	31	0	32	50
Hourly Total	64	8	0	72	8	2	0	10	3	108	0	111	193
17:00	41	1	0	42	1	0	0	1	1	7	0	8	51
17:15	25	3	0	28	0	3	0	3	2	35	0	37	68
17:30	34	3	0	37	0	1	0	1	1	38	0	39	77
17:45	30	4	0	34	2	1	0	3	1	16	0	17	54
Hourly Total	130	11	0	141	3	5	0	8	5	96	0	101	250
Grand Total	642	33	0	675	60	23	0	83	24	597	0	621	1379
Approach %	95.1	4.9	0.0	-	72.3	27.7	0.0	-	3.9	96.1	0.0	-	-
Total %	46.6	2.4	0.0	48.9	4.4	1.7	0.0	6.0	1.7	43.3	0.0	45.0	-
All Vehicles (no classification)	642	33	0	675	60	23	0	83	24	597	0	621	1379
% All Vehicles (no classification)	100.0	100.0	-	100.0	100.0	100.0	-	100.0	100.0	100.0	-	100.0	100.0

Alaska Department of Transportation & Public Facilities
Traffic Data & Forecasting
2301 Peger Road
Fairbanks, Alaska, United States 99709
907-451-2251 scott.vockeroth@alaska.gov

Count Name: Parks Hwy and Old Parks Hwy@ MP230
Site Code: 170000172625
Start Date: 07/07/2015



Turning Movement Peak Hour Data Plot (17:00)

Alaska Department of Transportation & Public Facilities
Traffic Data & Forecasting
2301 Peger Road
Fairbanks, Alaska, United States 99709
907-451-2251 scott.vockeroth@alaska.gov

Count Name: Parks Hwy and McKinley Village (Crabbie's Crossing)
Site Code: 170000172625
Start Date: 07/07/2015
Page No: 1

Turning Movement Data

Start Time	Parks Hwy Southbound					McKinley Park Village Westbound					Parks Hwy Northbound					Grizzly Bear Cabins Eastbound					
	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
7:00	1	7	2	0	10	3	0	1	0	4	0	10	0	0	10	0	1	3	0	4	28
7:15	0	8	2	0	10	3	0	1	0	4	3	20	0	0	23	1	1	2	0	4	41
7:30	1	11	5	0	17	1	0	1	0	2	0	11	0	0	11	0	0	0	0	0	30
7:45	0	7	3	0	10	4	0	3	0	7	3	18	0	0	21	2	1	1	0	4	42
Hourly Total	2	33	12	0	47	11	0	6	0	17	6	59	0	0	65	3	3	6	0	12	141
8:00	0	13	7	0	20	4	1	3	0	8	0	10	0	0	10	2	0	2	0	4	42
8:15	0	13	2	0	15	3	0	1	0	4	1	13	0	0	14	0	0	0	0	0	33
8:30	1	10	2	0	13	5	0	1	0	6	0	17	1	0	18	2	0	2	0	4	41
8:45	0	7	4	0	11	1	0	3	0	4	2	19	0	0	21	4	0	3	0	7	43
Hourly Total	1	43	15	0	59	13	1	8	0	22	3	59	1	0	63	8	0	7	0	15	159
9:00	0	17	0	0	17	6	0	2	0	8	1	12	0	0	13	1	0	3	0	4	42
9:15	1	12	0	0	13	2	1	0	0	3	2	16	0	0	18	2	0	0	0	2	36
9:30	1	16	0	0	17	1	0	1	0	2	1	21	0	0	22	0	3	6	0	9	50
9:45	0	23	3	0	26	2	0	0	0	2	1	7	0	0	8	1	0	3	0	4	40
Hourly Total	2	68	3	0	73	11	1	3	0	15	5	56	0	0	61	4	3	12	0	19	168
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11:00	0	47	3	0	50	6	0	1	0	7	0	19	0	1	20	3	0	2	0	5	82
11:15	0	24	2	0	26	3	0	4	0	7	1	15	1	0	17	2	1	0	0	3	53
11:30	1	21	0	0	22	5	0	1	0	6	5	16	0	0	21	1	0	0	0	1	50
11:45	0	13	3	0	16	2	0	2	0	4	0	12	0	0	12	0	0	0	0	0	32
Hourly Total	1	105	8	0	114	16	0	8	0	24	6	62	1	1	70	6	1	2	0	9	217
12:00	2	37	2	0	41	3	1	1	0	5	0	22	0	0	22	1	0	0	0	1	69
12:15	4	11	4	0	19	4	0	1	0	5	0	4	1	0	5	1	0	0	0	1	30
12:30	0	16	1	0	17	5	0	0	0	5	2	22	0	0	24	0	0	1	0	1	47
12:45	2	30	2	0	34	1	1	0	0	2	5	25	0	0	30	0	0	2	0	2	68
Hourly Total	8	94	9	0	111	13	2	2	0	17	7	73	1	0	81	2	0	3	0	5	214
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15:00	4	22	1	1	28	7	0	2	0	9	1	6	0	0	7	1	4	0	0	5	49
15:15	2	11	5	0	18	4	0	0	0	4	2	33	1	0	36	0	0	0	0	0	58
15:30	2	23	6	0	31	2	4	2	0	8	0	29	0	0	29	2	0	1	0	3	71
15:45	1	22	2	0	25	4	3	0	0	7	0	29	1	0	30	1	0	2	0	3	65
Hourly Total	9	78	14	1	102	17	7	4	0	28	3	97	2	0	102	4	4	3	0	11	243
16:00	0	20	3	0	23	2	1	0	0	3	2	9	0	0	11	0	1	1	0	2	39
16:15	0	20	6	0	26	0	0	3	0	3	0	28	1	0	29	0	2	0	0	2	60
16:30	1	5	6	0	12	4	0	1	0	5	0	42	1	0	43	0	1	0	0	1	61
16:45	2	16	5	0	23	5	0	1	0	6	2	30	0	0	32	0	0	0	0	0	61
Hourly Total	3	61	20	0	84	11	1	5	0	17	4	109	2	0	115	0	4	1	0	5	221
17:00	7	45	7	0	59	4	0	0	0	4	0	6	2	0	8	0	0	1	0	1	72
17:15	2	26	3	0	31	3	1	1	0	5	4	30	1	0	35	0	1	0	0	1	72
17:30	2	34	8	0	44	4	1	3	0	8	3	35	1	0	39	3	0	2	0	5	96
17:45	1	39	2	0	42	7	0	2	0	9	0	17	1	0	18	0	0	2	0	2	71
Hourly Total	12	144	20	0	176	18	2	6	0	26	7	88	5	0	100	3	1	5	0	9	311
Grand Total	38	626	101	1	766	110	14	42	0	166	41	603	12	1	657	30	16	39	0	85	1674
Approach %	5.0	81.7	13.2	0.1	-	66.3	8.4	25.3	0.0	-	6.2	91.8	1.8	0.2	-	35.3	18.8	45.9	0.0	-	-
Total %	2.3	37.4	6.0	0.1	45.8	6.6	0.8	2.5	0.0	9.9	2.4	36.0	0.7	0.1	39.2	1.8	1.0	2.3	0.0	5.1	-
All Vehicles (no classification)	38	626	101	1	766	110	14	42	0	166	41	603	12	1	657	30	16	39	0	85	1674
% All Vehicles (no classification)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	-	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	-	100.0	100.0

Alaska Department of Transportation & Public Facilities
Traffic Data & Forecasting
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907-451-2251 scott.vockeroth@alaska.gov

Count Name: Parks Hwy and McKinley Village (Crabbie's Crossing)
Site Code: 170000172625
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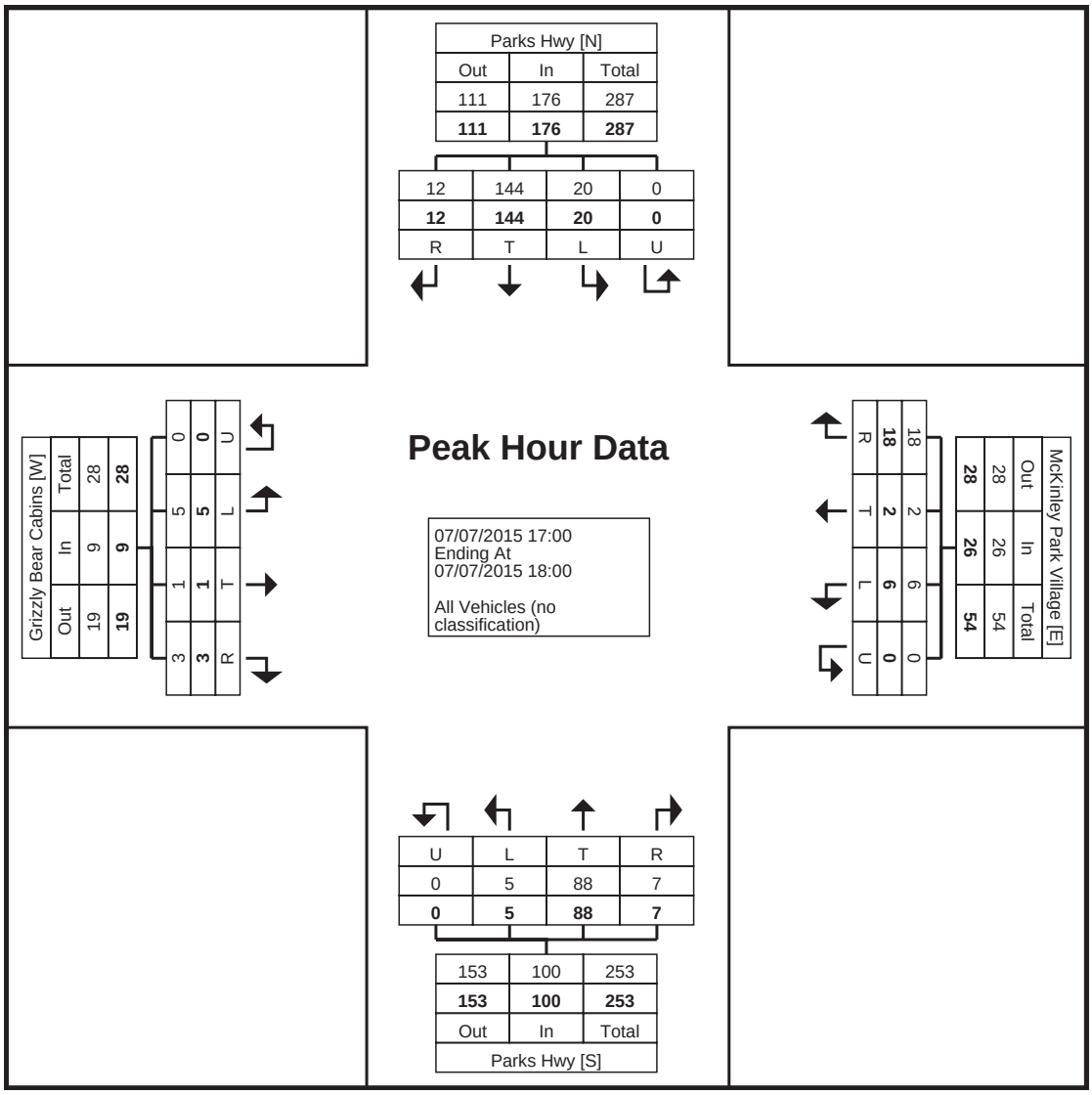


Turning Movement Peak Hour Data Plot (17:00)

APPENDIX D

PAVEMENT DESIGN

Project: Parks Highway MP 231 Enhancements Proj No.: 61299/0A44020										New Construction by:D. Jensen 1/28/2016 10:07:26 AM	
AADT = 2,450	Past Loadings	Future Loadings						X/Y Load Locations (in): Load = 4500 (lbs) Tire Pressure = 110 (psi)		0 0	13.5 0
10% Spring 40% Summer 20% Fall 30% Winter ---------- Total:	---------	210,625 842,500 421,250 631,875 --------- 2,106,250							X/Y Evaluation Points (in):	6.75 0	0 0
Layer	Critical Z Coordinate	Asphalt Properties	Season	Modulus (ksi)	Poisson's Ratio	Tensile Critical Micro Strain	Critical Compressive Stress (psi)	Million Cycles to Failure		Future Damage %	Total Damage %
3(in) Asphalt_Concrete	2.99	4% Air 5.5% Asph 148 pcf	Spring	755	0.3	122		13.08		1.61	1.61%
			Summer	510	0.3	115		22.22		3.79	3.79%
			Fall	510	0.3	115		22.22		1.90	1.90%
			Winter	1,500	0.3	87.1		22.07		2.86	2.86%
								Total Damage:		**10.16**	**10.16**
3(in) 3-4% Asph.Tr.Base	3.01		Spring	200	0.35		48.20	40.81		0.52	0.52%
			Summer	200	0.35		55.30	26.08		3.23	3.23%
			Fall	200	0.35		55.30	26.08		1.62	1.62%
			Winter	200	0.35		41.90	64.43		0.98	0.98%
								Total Damage:		**6.34**	**6.34**
8(in) Select_A_P200<6%	6.01		Spring	25	0.4		16.30	1.59		13.24	13.24%
			Summer	35	0.4		17.10	4.08		20.67	20.67%
			Fall	35	0.4		17.10	4.08		10.33	10.33%
			Winter	90	0.4		18.00	74.96		0.84	0.84%
								Total Damage:		**45.08**	**45.08**
S-Infinite Subgrade_P200<30%	14.01		Spring	50	0.45		9.63	84.76		0.25	0.25%
			Summer	10	0.45		5.28	2.04		41.29	41.29%
			Fall	10	0.45		5.28	2.04		20.64	20.64%
			Winter	10	0.45		3.46	8.09		7.81	7.81%
								Total Damage:		**69.99**	**69.99**

OK
1-28-16

Project Name:	Parks Highway MP 231 Enhancements	Designer:	D. Jensen
Project Number:	61299	Date:	1/21/2016

Traffic Data for Design and Historic ESALs

Design Data Input

Design Construction Year:	2018
Design Length in Years:	15
Base Year:	2014
Base Year Total AADT:	2450
Growth Rate % per Year:	1.25

% of Base Year AADT for Each Lane	
Lane	%
1	40
2	60
3	0
4	0
5	0
6	0

Truck Category	Load Factor (ESALs per Truck)	% AADT in Truck Category
2-Axle	0.5	10
3-Axle	0.85	0.85
4-Axle	1.2	1.9
5-Axle	1.55	2.1
>=6-Axle	2.24	5.15

TOTAL DESIGN ESALs:

2,106,250

Historic Data Input

Historic Construction Year:	
Backcast % per Year:	

% of Base Year AADT for Each Lane	
Lane	%
1	
2	
3	
4	
5	
6	

Truck Category	Load Factor (ESALs per Truck)	% AADT in Truck Category
2-Axle	0.5	
3-Axle	0.85	
4-Axle	1.2	
5-Axle	1.55	
>=6-Axle	2.24	

TOTAL HISTORIC ESALs:

-

Construction Year ESAL Calculations

Truck Category	Design Lane AADT	% AADT in Truck Category	Load Factor for Truck Category	Construction Year ESALs
2-Axle	1545	10	0.5	28,196
3-Axle	1545	0.85	0.85	4,074
4-Axle	1545	1.9	1.2	12,857
5-Axle	1545	2.1	1.55	18,356
>=6-Axle	1545	5.15	2.24	65,054
			Total Construction Year ESALs:	128,537

Historic Construction Year ESAL Calculations

Truck Category	Design Lane AADT	% AADT in Truck Category	Load Factor for Truck Category	Historic Construction Year ESALs
2-Axle		0	0.5	0
3-Axle		0	0.85	0
4-Axle		0	1.2	0
5-Axle		0	1.55	0
>=6-Axle		0	2.24	0
			Total Historic Construction Year ESALs:	0

CLICK HERE FOR MORE INFORMATION ON ESAL CALCULATIONS

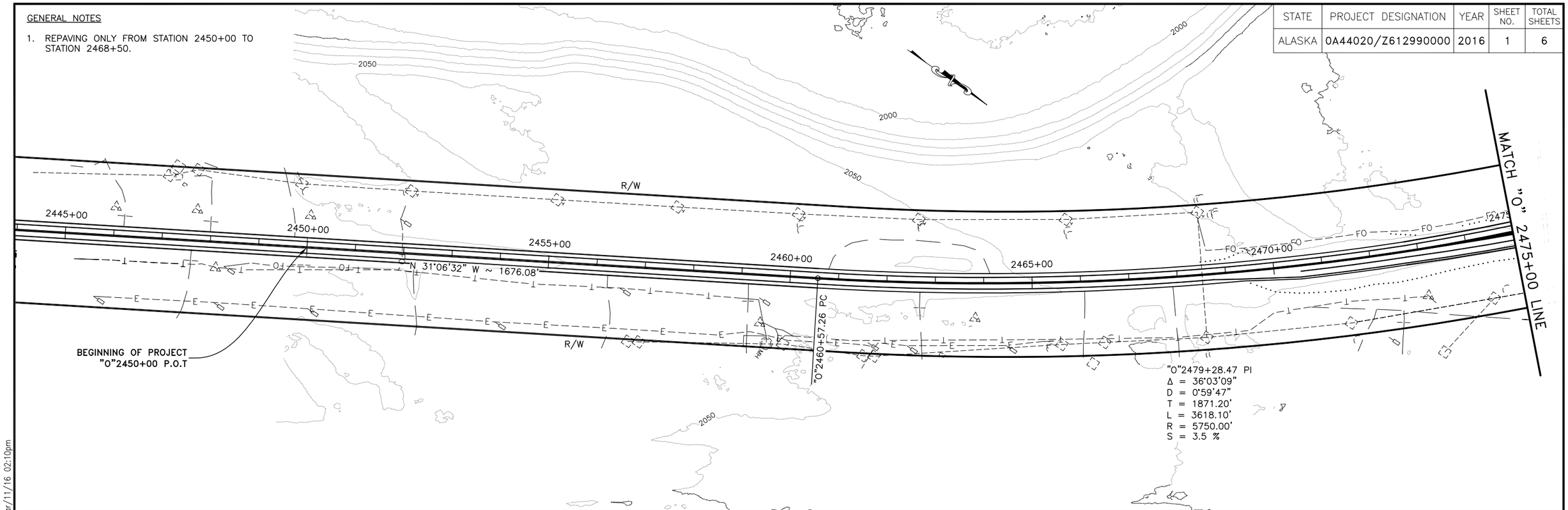
APPENDIX E

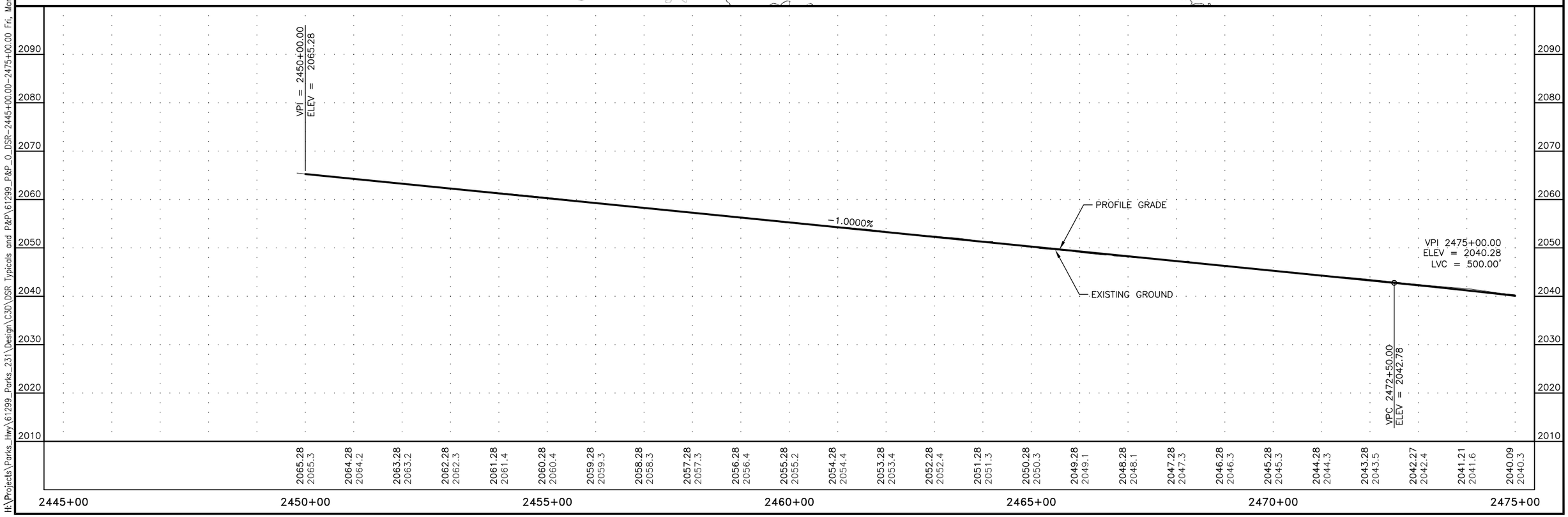
PRELIMINARY PLAN AND PROFILE SHEETS

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	0A44020/Z612990000	2016	1	6

GENERAL NOTES

1. REPAVING ONLY FROM STATION 2450+00 TO STATION 2468+50.





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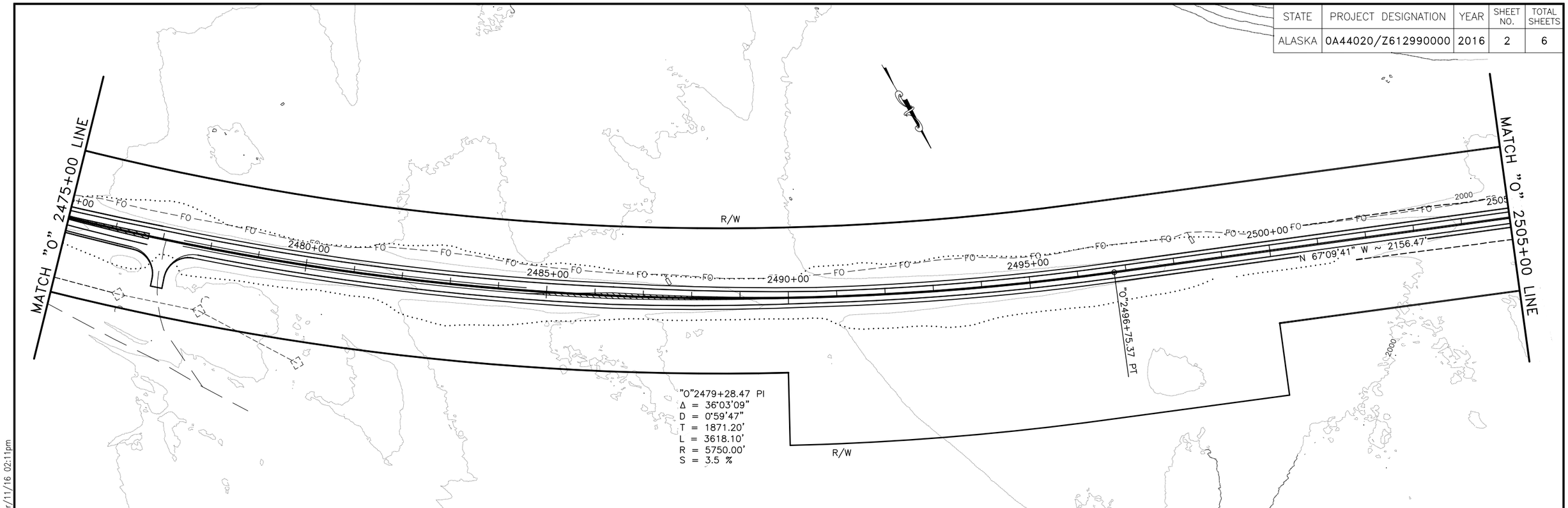
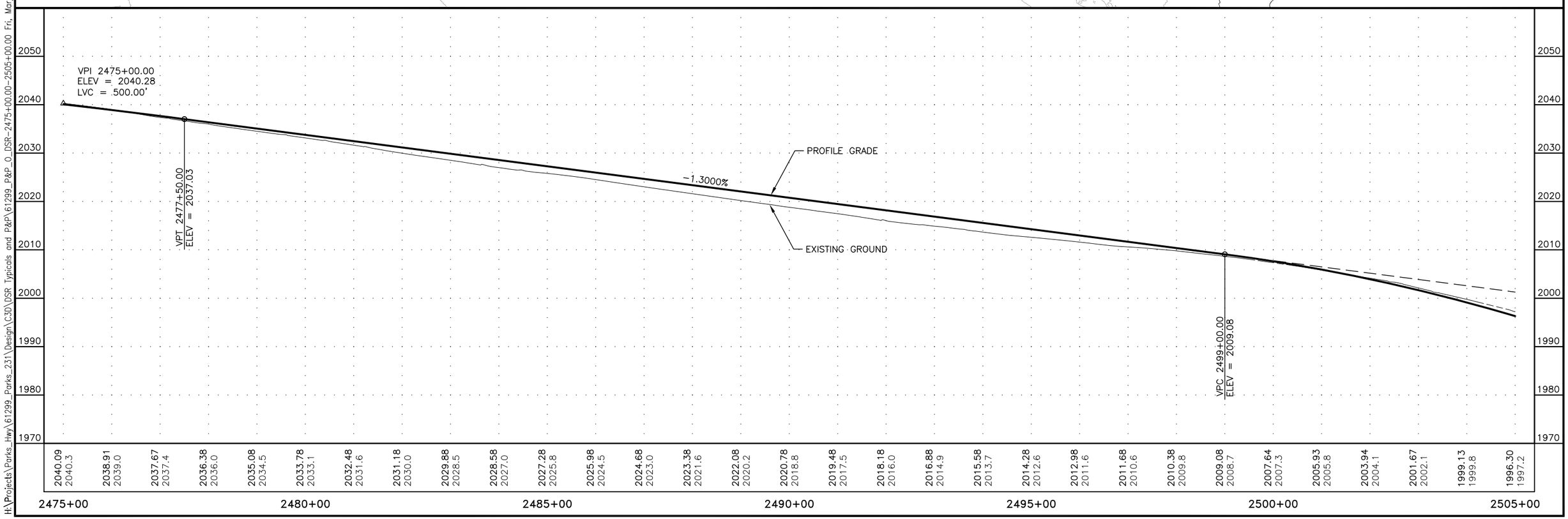
STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	0A44020/Z612990000	2016	2	6





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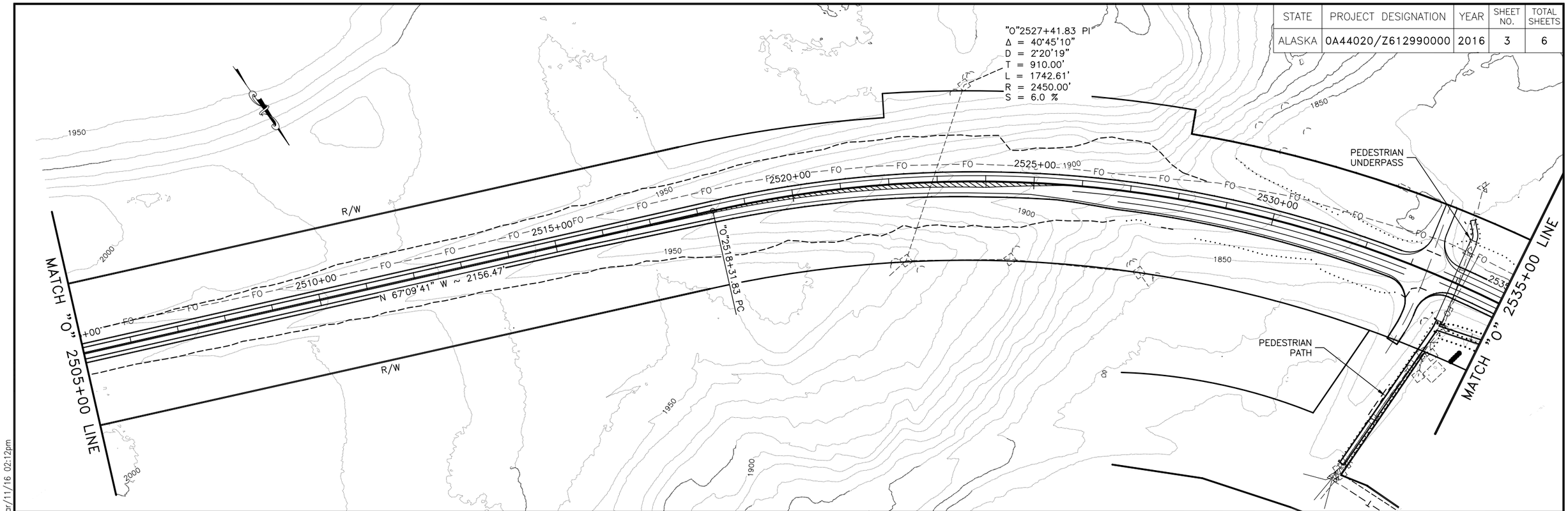
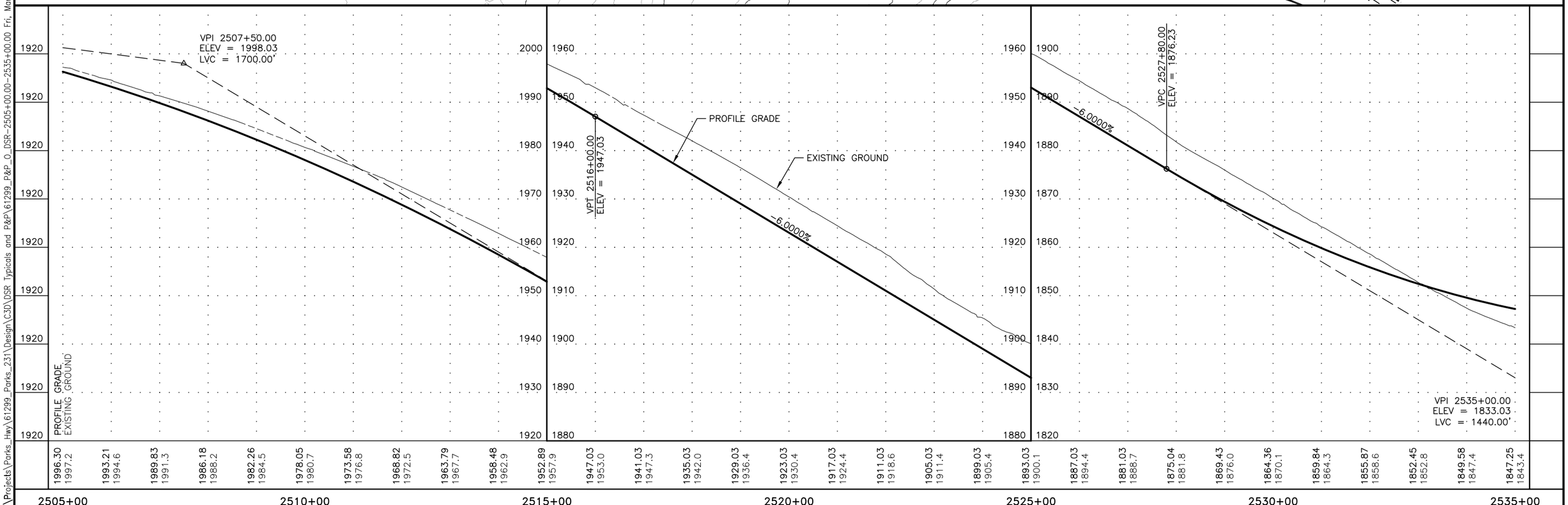
STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	0A44020/Z612990000	2016	3	6





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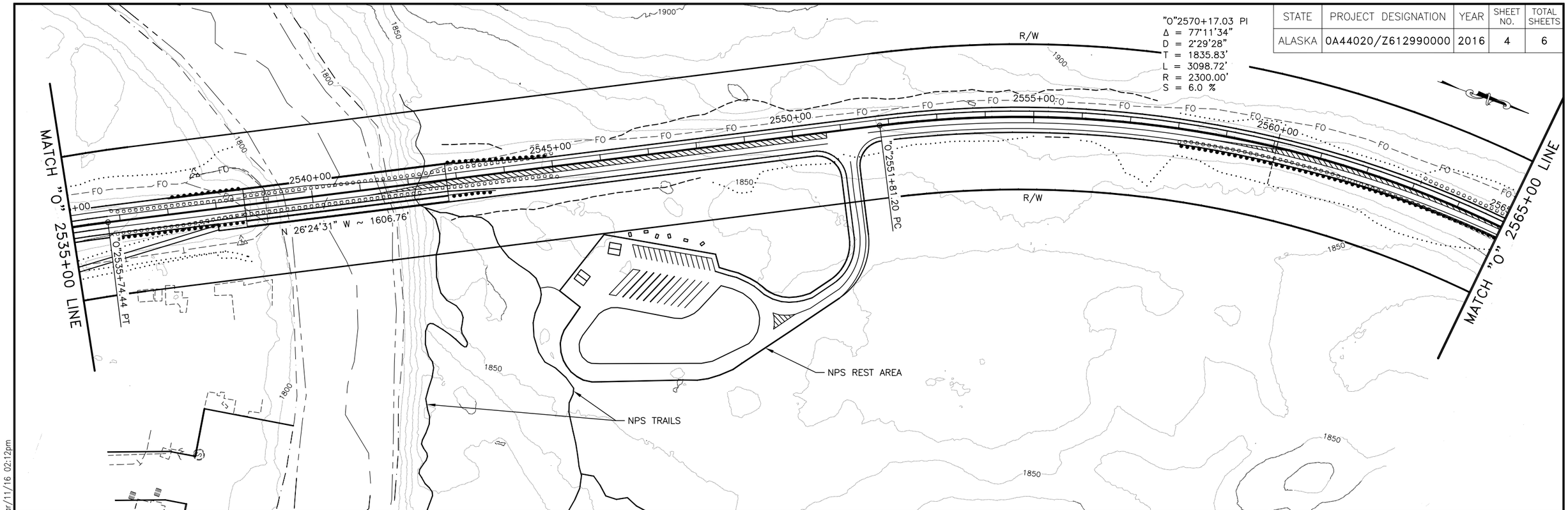
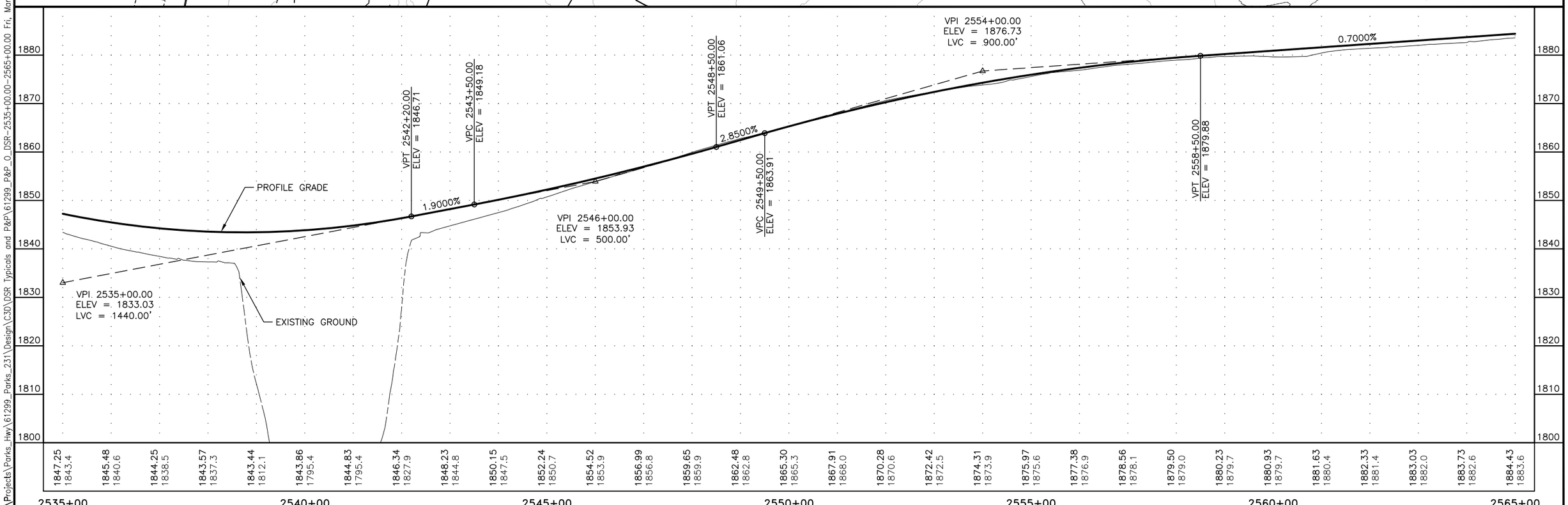
STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	0A44020/Z612990000	2016	4	6





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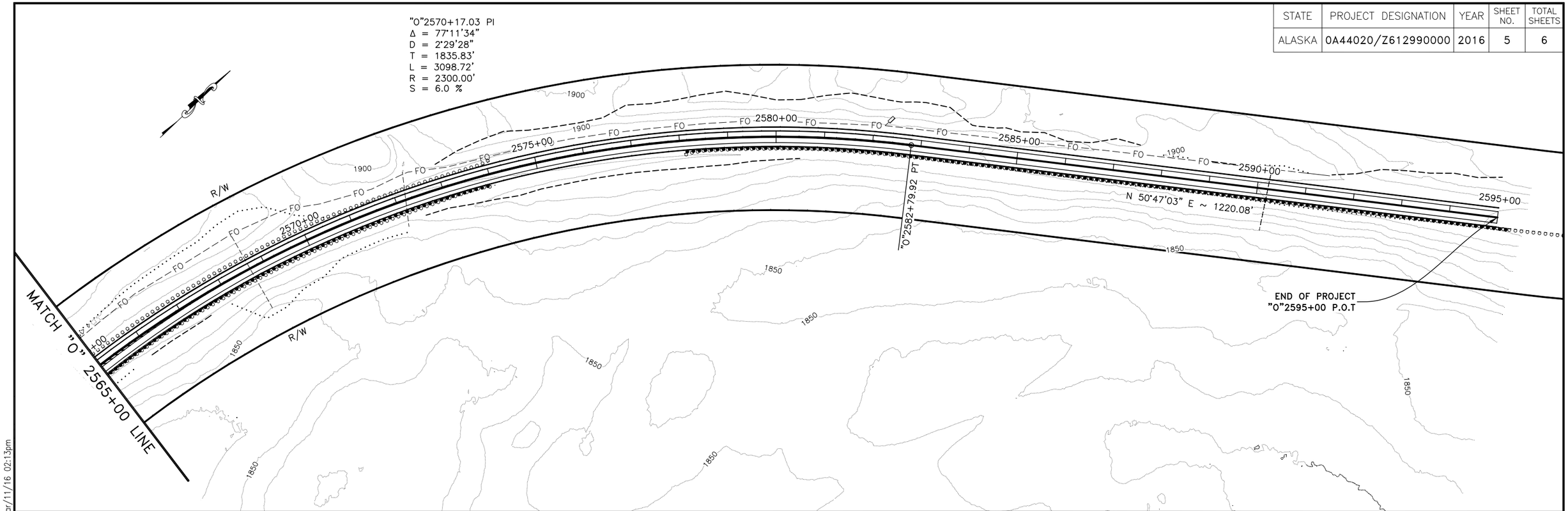

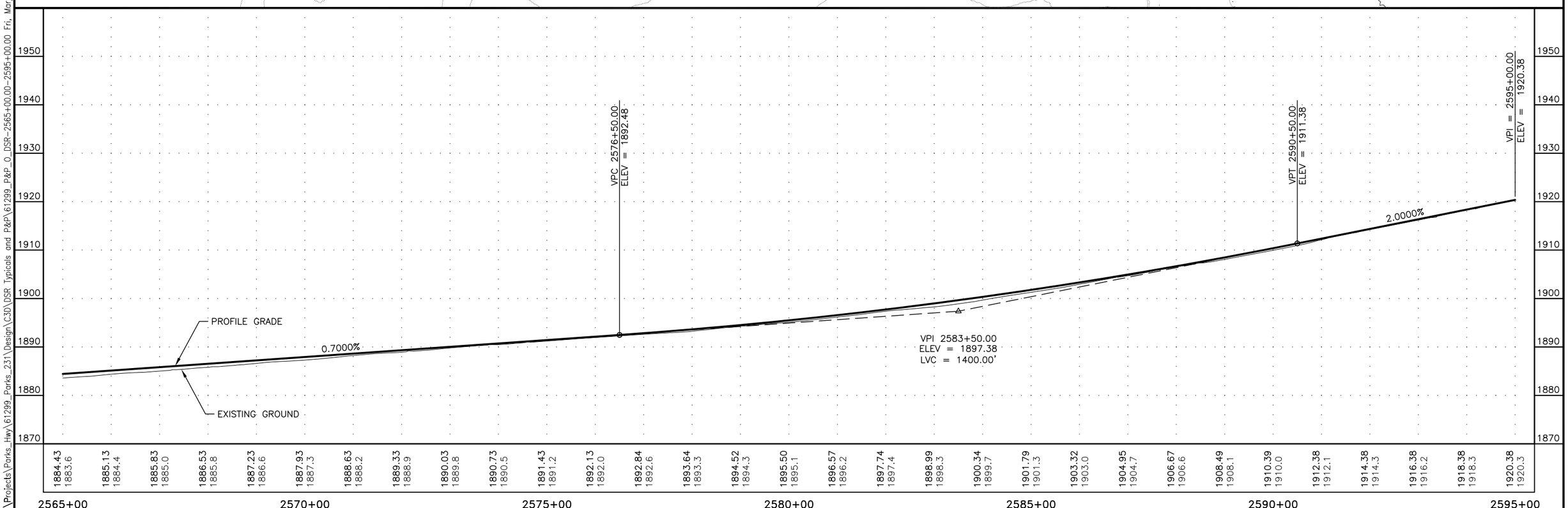

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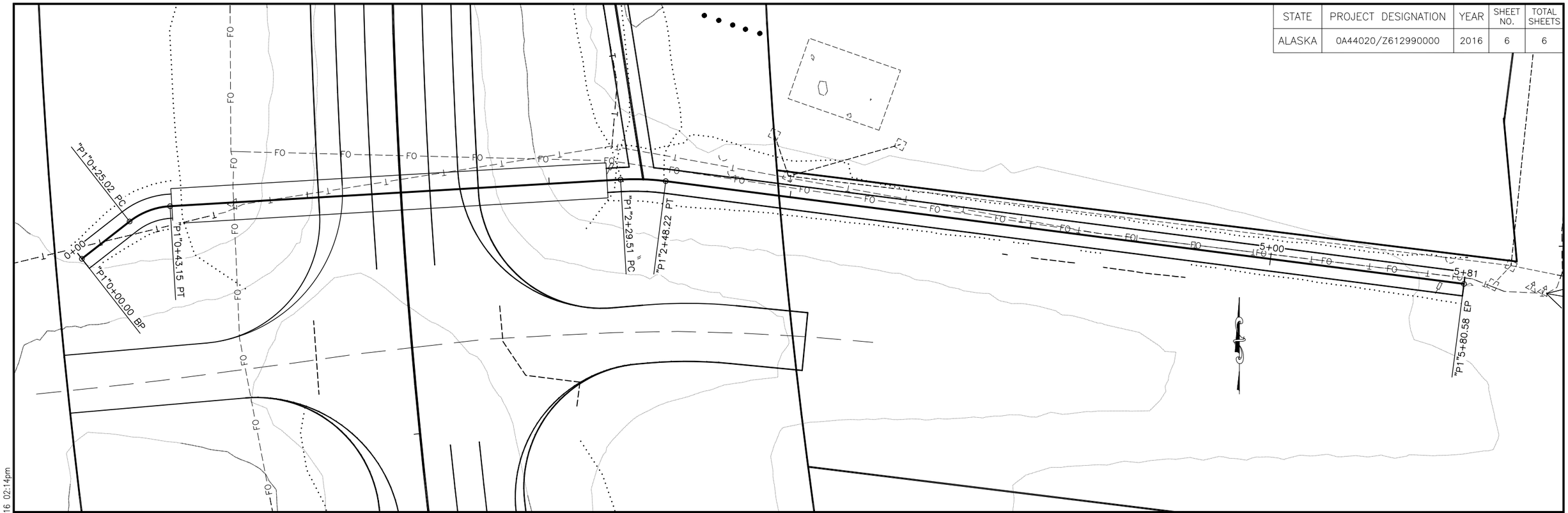
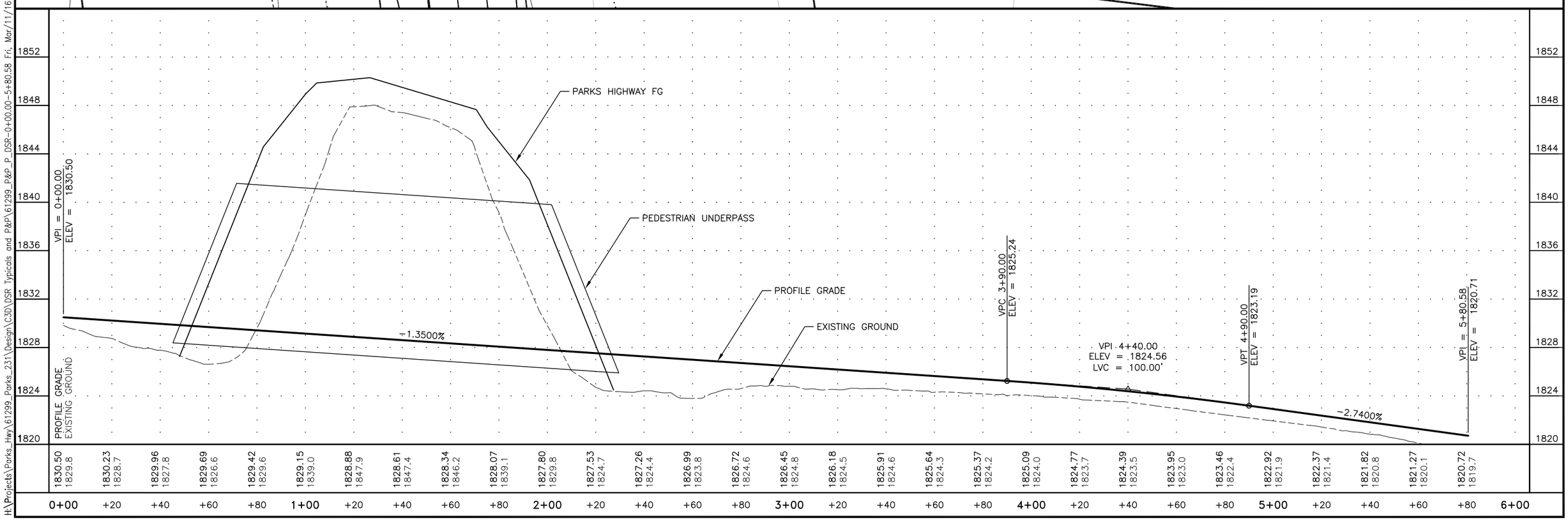
STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	0A44020/Z612990000	2016	6	6





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APPENDIX F

PRELIMINARY BRIDGE PLANS

MEMORANDUM

State of Alaska

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

TO:	Lauren Little, P.E. Project Manager Northern Region Design	**DATE:**	February 1, 2016
		BRIDGE No.:	694
FROM:	Richard A. Pratt, P.E. Chief Bridge Engineer	**TELEPHONE:** **TEXT**	465-2975 465-3652
CONTACT:	Elmer E. Marx, P.E. (907) 465 - 6941	**SUBJECT:**	Nenana River Bridge Replacement - Preliminary bridge design options

As requested, we have prepared some preliminary General Layout and Site Plan drawings for the subject crossing. Three bridge options are being advanced for your consideration.

Option 1 – Three span prestressed concrete decked bulb-tee girder bridge
Option 2 – Three span steel girder bridge with CIP deck
Option 3 – Two span steel girder bridge with CIP deck

The preliminary cost estimate for each option is attached. The cost estimate includes all materials and labor for the bridge related pay items as well as 10% for mobilization and demobilization, 15% for construction engineering, and 4.65% for ICAP.

We do not yet have the foundation or hydraulic recommendations for this project. Also, the proposed driven pipe pile extension piers are relatively slender and may not be technically feasible when considering scour, ice and seismic demands. Large diameter drilled shafts may be required at the piers. Consequently, a 30% contingency is included in the preliminary estimates. As information becomes available, we will incrementally decrease the contingency value (percentage) until we provide the final cost estimate.

The low spot of the proposed sag vertical curve is located on the proposed bridges. This situation is typically avoided due to bridge deck drainage and traffic safety concerns. Please consider locating the low point off the bridge.

The proposed options replace the existing structure on the existing roadway alignment. We have proposed using staged (half-width) construction to accommodate traffic. In this situation, two narrow traffic lanes can be provided without the need for a separate detour bridge. Thus, the cost of a temporary detour bridge is not included in the attached cost estimates. It may be advantageous to either widen the proposed bridge section or shift the new roadway centerline to provide for a wider bridge during the first stage of construction.

Although a temporary detour bridge is not required, a temporary work structure (i.e., a trestle across the river) will be required to erect the new bridge and assist in the demolition of the existing bridge. The cost of a temporary work trestle has been included in the cost estimates as a separate pay item to illustrate the need but will not be included in the final bridge estimate. The cost of the trestle will be distributed over the relevant pay items such as concrete, girders and piles.

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

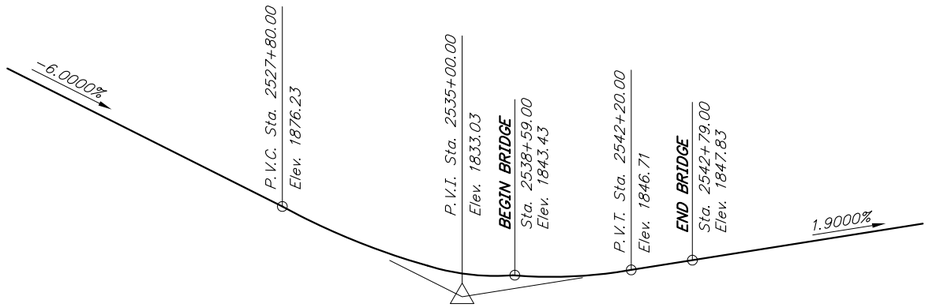
Option 1 – Three span prestressed concrete decked bulb-tee girder bridge

Maximum individual span length ~140 feet
Vertical clearance over DHW ~ 35 feet
Bridge related pay items (w/o mobilization, CE, ICAP, or contingency) = $11.9M
Bridge related pay items (w/ mobilization, CE, ICAP, and 25% contingency) = $20.6M

ADVANTAGES	DISADVANTAGES
Least expensive bridge option	Comparatively heavy girders than other options may require larger cranes to erect
This structure can likely be built more quickly and easily than the other bridge options	Provides less roadway width during the first stage of construction than the other options
Very durable structure type that requires little future maintenance	The proposed piers may be found to be too slender and larger diameter drilled shafts (more expensive) may be required
Common structure type that has been successfully constructed throughout the state	Staged construction will require two construction seasons to complete

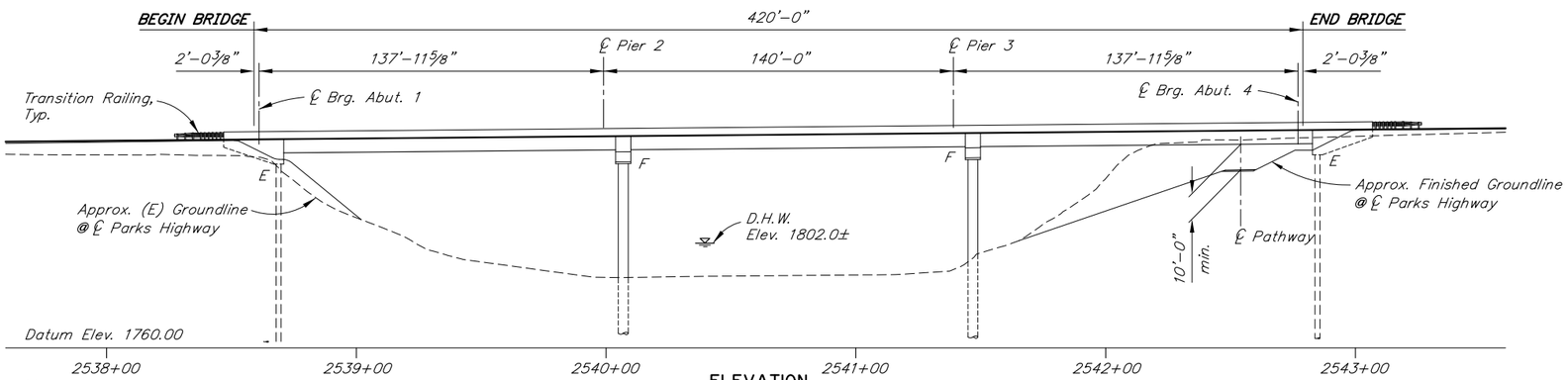
Figure 1 – Somewhat similar bridge – White's Crossing #1923 (a longer concrete girder bridge over the railroad but with the same tall, slender pipe pile extension piers)

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA		2016		



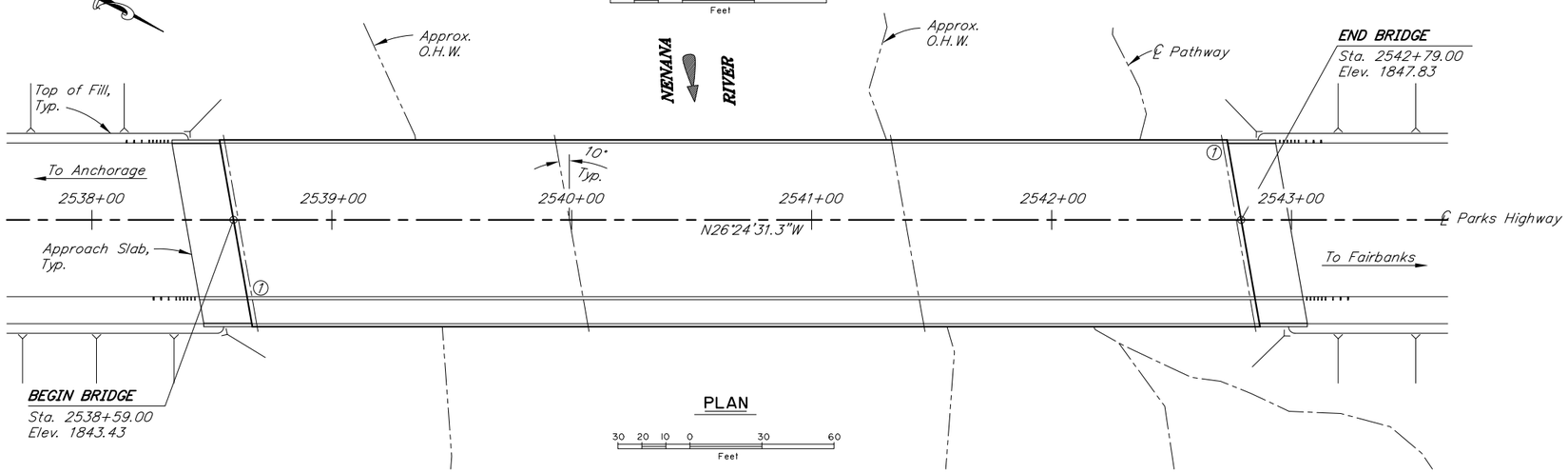
PROFILE GRADE DATA

No Scale



ELEVATION

30 20 10 0 30 60
Feet



PLAN

30 20 10 0 30 60
Feet

BRIDGE DRAWING INDEX

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

PRELIMINARY PLAN

OPTION 1

NOTES:

(1) = Approximate location of Bridge Number Plate.

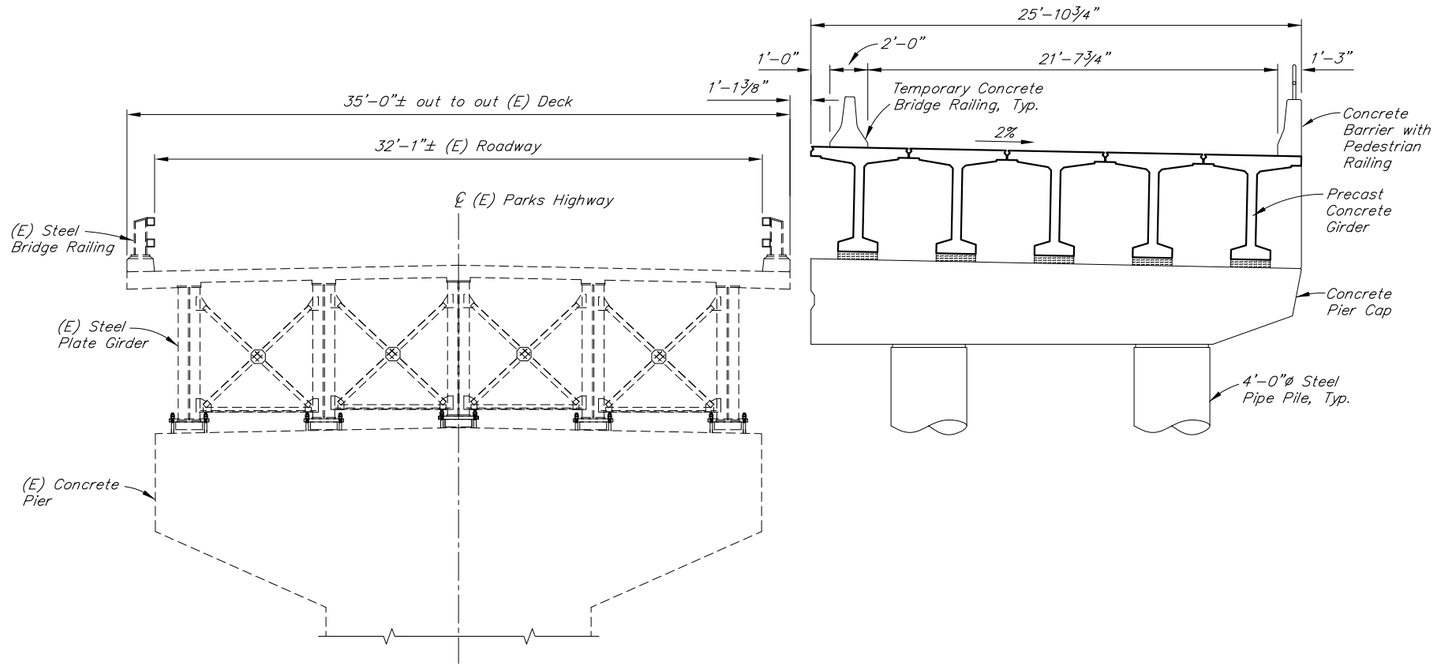
DESIGNED BY: Elmer Marx	CHECKED: Engineer	LAYOUT BY: Elmer Marx	CHECKED BY: Engineer
DRAWN BY: Sam Sollie	CHECKED: Elmer Marx	SPECIFICATIONS BY: Elmer Marx	P S & E COMPARED: Engineer
QUANTITIES BY: Elmer Marx	CHECKED: Engineer	APPROVAL RECOMMENDED BY: Rich Pratt	

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
BRIDGE SECTION

NENANA RIVER BRIDGE
AT PARK BOUNDARY
PARKS HIGHWAY
GENERAL LAYOUT

BRIDGE NO. 694
DWG. NO. 1

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	PROJECT NUMBER	2016		

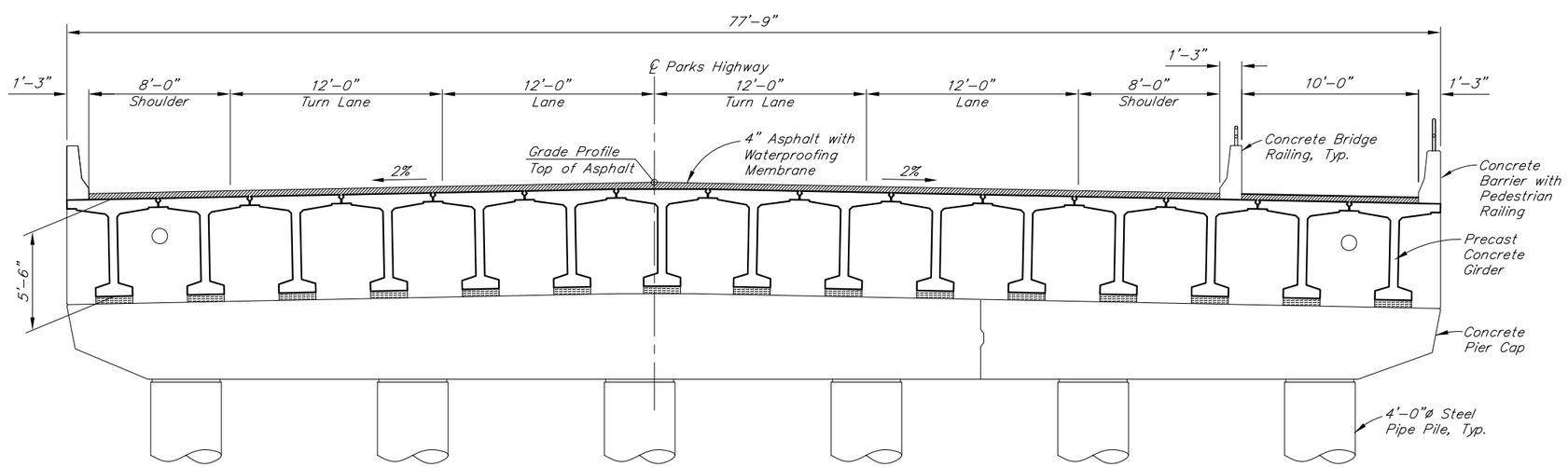


STAGE I

12 0 4 8
In. Feet

STAGED CONSTRUCTION NOTES

1. Place riprap under first stage of bridge prior to setting girders on bearings.
2. Cast all Diaphragms before applying loads to bridge.
3. Splice all reinforcing steel crossing the vertical construction joint with mechanical couplers. Stagger splices.
4. Roughen the surfaces of all vertical construction joints.
5. Pin temporary concrete barriers to the bridge deck. Fill holes in deck with Epoxy for Bonding Dowels after removing temporary barriers.
6. Do not cast approach slabs or concrete bridge barriers until after completing Stage 2 portion of the bridge.
7. Provide earth retaining structure along approach roadway between stages. Remove prior to back filling for Stage 2.
8. See civil drawings for utility details.



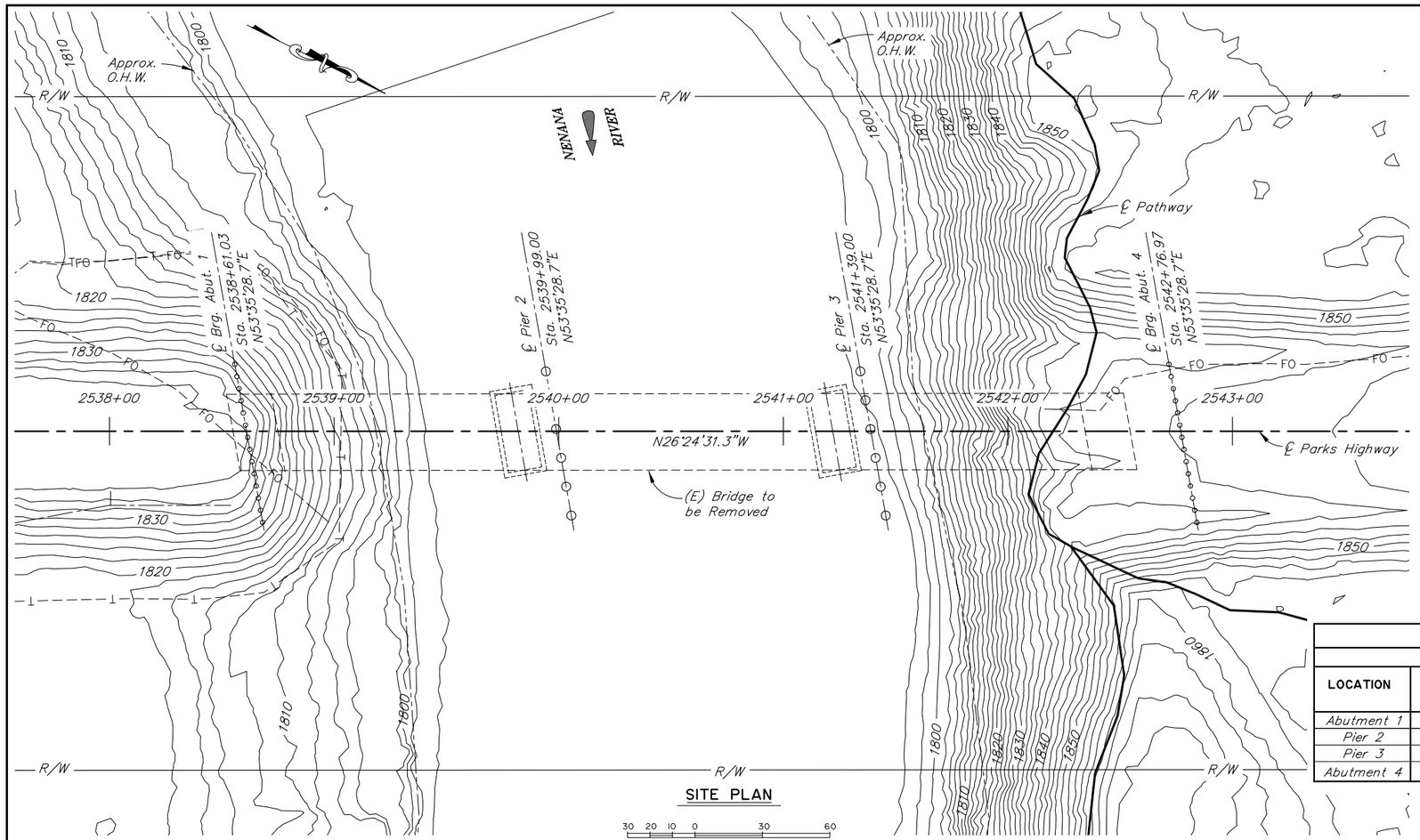
STAGE 2

12 0 4 8
In. Feet

OPTION 1

DESIGNED BY: Elmer Marx	CHECKED: Engineer	**PRELIMINARY PLAN**	STATE OF ALASKA DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES BRIDGE SECTION	NENANA RIVER BRIDGE AT PARK BOUNDARY PARKS HIGHWAY TYPICAL SECTION
DRAWN BY: Sam Sollie	CHECKED: Elmer Marx			BRIDGE NO. 694
QUANTITIES BY: Elmer Marx	CHECKED: Engineer			DWG. NO. 2

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA		2016		



SITE PLAN

30 20 10 0 30 60
Feet

GENERAL NOTES

DESIGN:..... AASHTO LRFD Bridge Design Specifications, 2014 Edition, with latest interim specifications.
Seismic design per AASHTO Guide Specifications for LRFD Seismic Bridge Design, 2011 Edition, with latest interim specifications.

LIVE LOAD:..... HL-93

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

SEISMIC PARAMETERS:..... PGA = 0.39
Ss = 0.87
S1 = 0.36
Site Class = D
Liquefaction Potential = High
AASHTO 7% probability of exceedance in 75 years.

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

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

CONCRETE:..... Class A Concrete unless otherwise, f'c = 4000 psi.
Provide rubbed finish on all vertical surfaces.

STRUCTURAL STEEL:..... ASTM A709, Grade 36T3, Fy = 36,000 psi,
Galvanize all structural steel in accordance with AASHTO M111 unless shown otherwise.

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

PILE DATA TABLE

LOCATION	PILE TYPE	DRIVING CRITERIA: MINIMUM PENETRATION (ft)	DRIVING CRITERIA: ESTIMATED PILE TIP ELEVATION (ft)	DRIVING CRITERIA: DRIVING RESISTANCE (K)	DESIGN DATA: STRENGTH I FACTORED LOAD (K)	DESIGN DATA: NOMINAL RESISTANCE (K)	DESIGN DATA: RESISTANCE FACTOR, φ
Abutment 1	2'-0"ø x 1/2"						0.65
Pier 2	4'-0"ø x 1"						0.65
Pier 3	4'-0"ø x 1"						0.65
Abutment 4	2'-0"ø x 1/2"						0.65

BRIDGE BASIS OF ESTIMATE

ITEM NO.	ITEM	PAY UNIT	ESTIMATING UNIT	SUBST.	SUPERST.	TOTAL
202(23)	Removal of existing Bridge No. 694	LS	SF			
205(1)	Excavation for Structures	CY	CY			
205(3)	Structural Fill	CY	CY			
501(1)	Class A Concrete	LS	CY			
501(7)	Precast Concrete Member (138'-6" Decked Bulb-Tee)	EA	EA			
503(1)	Reinforcing Steel	LS	LBS			
503(2)	Epoxy-Coated Reinforcing Steel	LS	LBS			
505(5A)	Furnish Structural Steel Piles (2'-0" dia. x 1/2" Pipe Piles)	LF	LF			
505(5B)	Furnish Structural Steel Piles (4'-0" dia. x 1" Pipe Piles)	LF	LF			
505(6A)	Drive Structural Steel Piles (2'-0" dia. x 1/2" Pipe Piles)	EA	EA			
505(6B)	Drive Structural Steel Piles (4'-0" dia. x 1" Pipe Piles)	EA	EA			
507(X)	Concrete Barrier	LF	LF			
508(1)	Waterproofing Membrane	LS	SF			
512(X)	Temporary Work Trestle	LS	SF			
606(16)	Transition Rail	EA	EA			
611(1)	Riprap, Class II	CY	CY			
631(2)	Geotextile, Erosion Control, Class I	SY	SY			

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

OPTION 1

BRIDGE SHEET ABBREVIATIONS:

℄	= centerline	——FO——	= fiber optic cable
ℙ	= plate	Hwy.	= highway
&	= and	H.J.	= high strength
@	= at	Int.	= interior
ø	= diameter	Jt.	= joint
±	= approximate	ksf	= 1000 pounds per square foot
Abut.	= abutment	LB	= pound
Approx.	= approximate	LF	= linear foot
b.f.	= back/dirt face	LS	= lump sum
bot.	= bottom	Lt.	= left
Br.	= bridge	max.	= maximum
btwn.	= between	min.	= minimum.
Brg.	= Bearings	N/A	= not applicable
C.I.P.	= cast in place	n.f.	= near face
C.G.	= center of gravity	No.	= number
Clr.	= clear, clearance	o.c.	= on center
CMP	= corrugated metal pipe	R/W	= right of way
CY	= cubic yard	Rt.	= right
dia.	= diameter	Rd.	= road
Dwg.	= drawing	spcs.	= space, spaces
E	= expansion	Sta.	= station
(E)	= existing	Std.	= standard
EA	= each	SF	= square feet
Elev.	= elevation	Symm.	= symmetric
e.f.	= each face	---T-----T---	= telephone cable
e.w.	= each way	Typ.	= typical
Ext.	= exterior	V.P.C.	= point of vertical curve
F	= fixed	V.P.I.	= point of vertical intersection
f.f.	= front/air face	V.P.T.	= point of vertical tangent

DESIGNED BY: Designed	CHECKED: Engineer	HYDRAULICS BY: Engineer	CHECKED BY: Engineer
DRAWN BY: Drafter	CHECKED: Engineer	FOUNDATIONS REVIEWED BY: Engineer	
QUANTITIES BY: Engineer	CHECKED: Engineer		

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
BRIDGE SECTION

NENANA RIVER BRIDGE AT PARK BOUNDRY

PARKS HIGHWAY

SITE PLAN

BRIDGE NO. 694

DWG. NO. 3

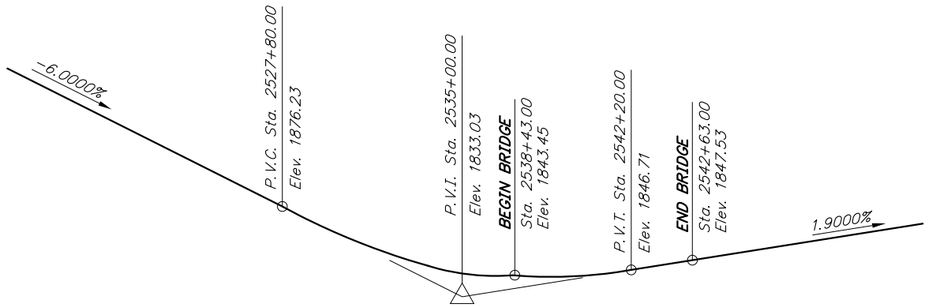
Option 2 – Three span steel girder bridge with CIP deck

Maximum individual span length ~160 feet
Vertical clearance over DHW ~ 34 feet
Bridge related pay items (w/o mobilization, CE, ICAP, or contingency) = $14.6M
Bridge related pay items (w/ mobilization, CE, ICAP, and 25% contingency) = $25.4M

ADVANTAGES	DISADVANTAGES
Lighter superstructure may result in smaller, less expensive substructure and foundation cost.	Not the least expensive option
If necessary, can accommodate more complicated roadway geometry such as horizontal curves and superelevation transitions	About one foot deeper than the concrete option results in slightly less vertical clearance under the bridge. The superstructure depth could be reduced but the construction cost would increase
Relatively durable structure type that requires little future maintenance	Requires more long-term maintenance than concrete option
Piers are located closer to the edge of water making for short piles and, perhaps, easier pile driving	Would require more time to build than Option 1 due to cast-in-place concrete deck that may add another construction season
	Somewhat less common structure type than the concrete option

Figure 2 – Somewhat similar bridge – Wood River Bridge #1902 (a slightly longer but narrower steel girder bridge with a single column pier rather than pile extensions similar to that shown in Figure 1)

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA		2015		



PROFILE GRADE DATA

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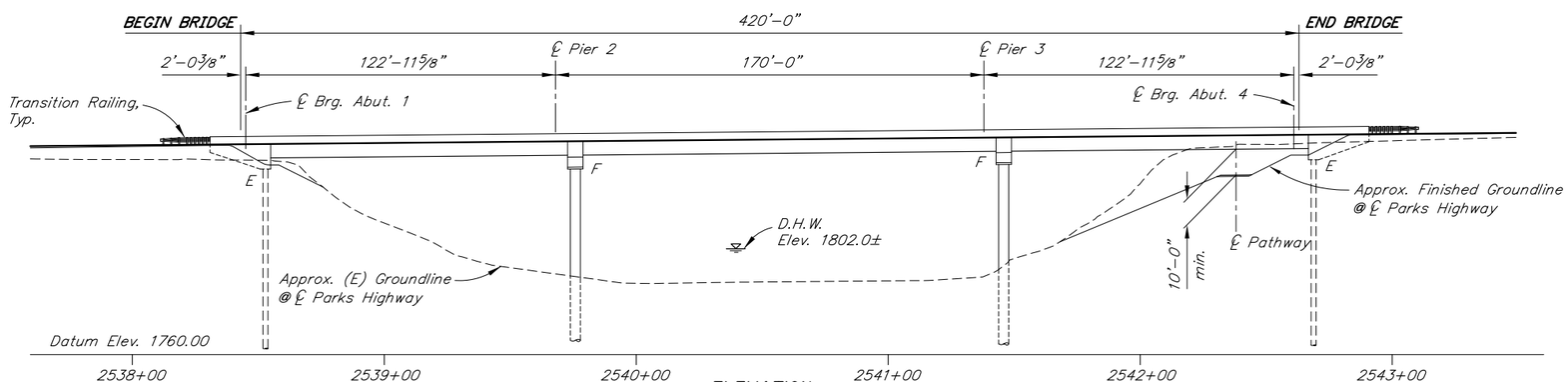
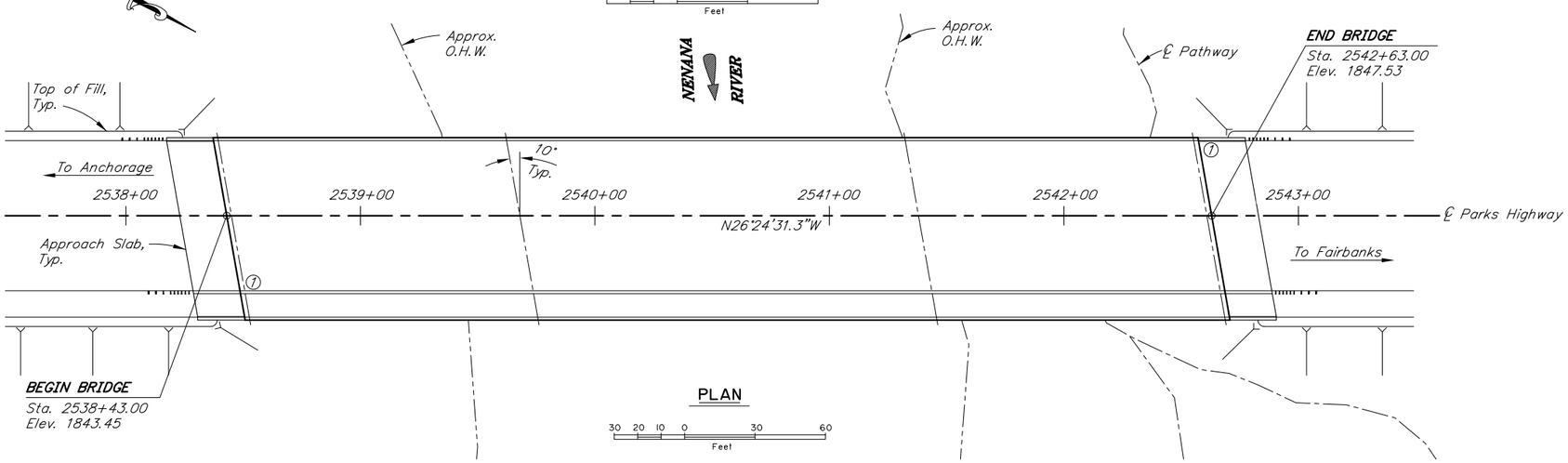


ELEVATION

30 20 10 0 30 60
Feet



PLAN

30 20 10 0 30 60
Feet

BRIDGE DRAWING INDEX

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

PRELIMINARY PLAN

OPTION 2

NOTES:

(1) = Approximate location of Bridge Number Plate.

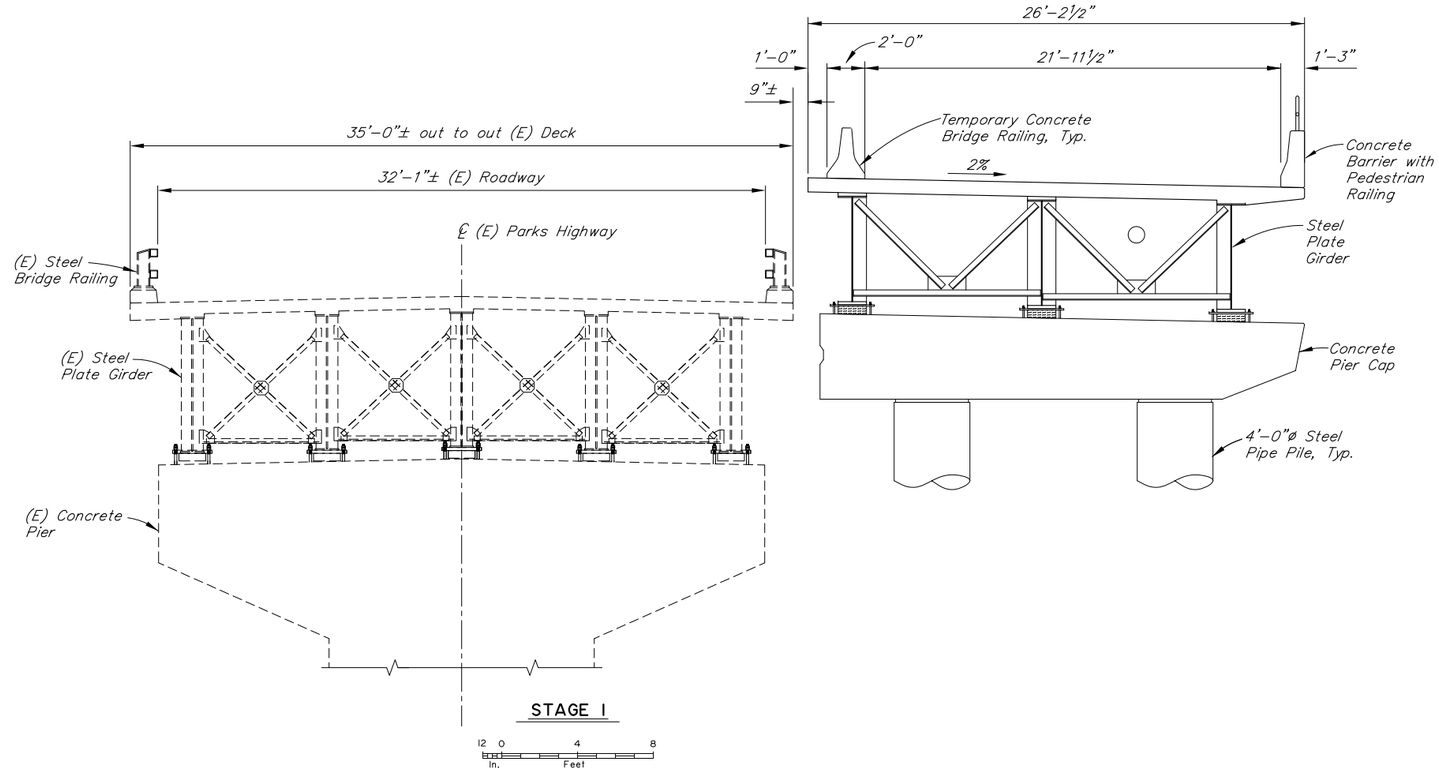
DESIGNED BY: Elmer Marx	CHECKED: Engineer	LAYOUT BY: Elmer Marx	CHECKED BY: Engineer
DRAWN BY: Sam Sollie	CHECKED: Elmer Marx	SPECIFICATIONS BY: Elmer Marx	P S & E COMPARED: Engineer
QUANTITIES BY: Elmer Marx	CHECKED: Engineer	APPROVAL RECOMMENDED BY: Rich Pratt	

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
BRIDGE SECTION

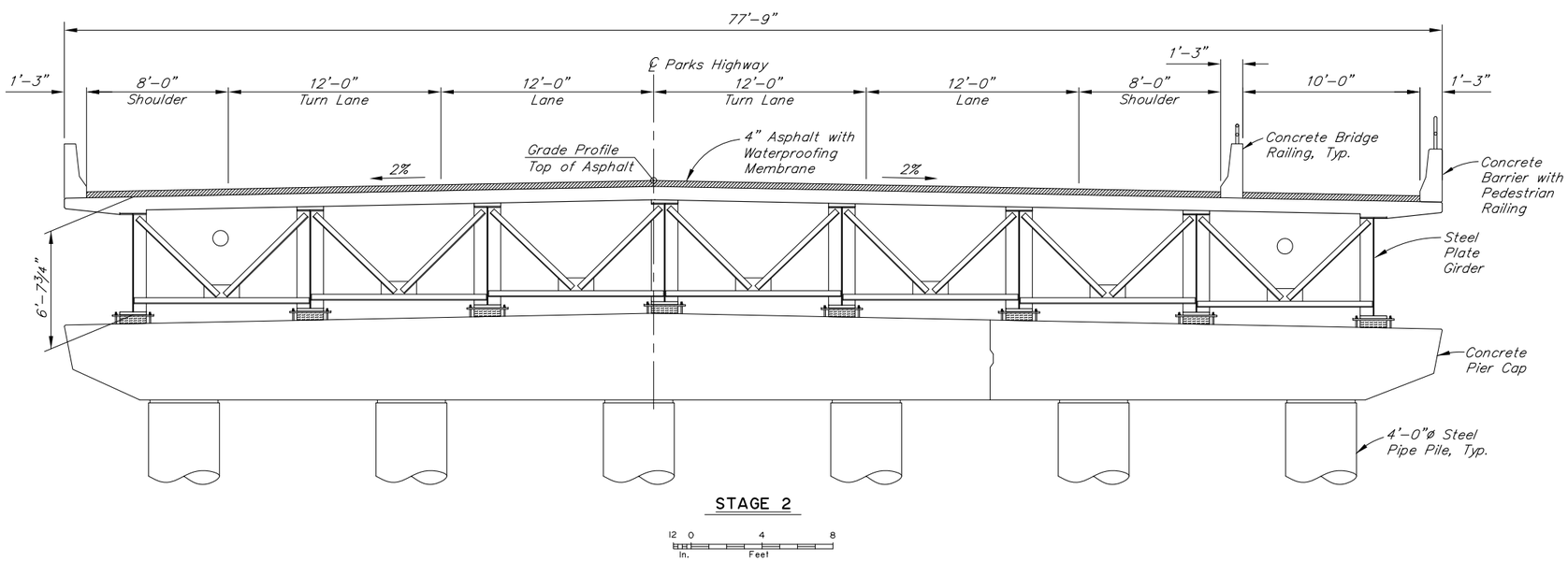
NENANA RIVER BRIDGE
AT PARK BOUNDARY
PARKS HIGHWAY
GENERAL LAYOUT

BRIDGE NO. 694
DWG. NO. 1

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	PROJECT NUMBER	2015		



STAGE 1



STAGE 2

STAGED CONSTRUCTION NOTES

1. Place riprap under first stage of bridge prior to setting girders on bearings.
2. Place all cross frames before applying loads to bridge.
3. Splice all reinforcing steel crossing the vertical construction joint with mechanical couplers. Stagger splices.
4. Roughen the surfaces of all vertical construction joints.
5. Pin temporary concrete barriers to the bridge deck. Fill holes in deck with Epoxy for Bonding Dowels after removing temporary barriers.
6. Do not cast approach slabs or concrete bridge barriers until after completing Stage 2 portion of the bridge.
7. Provide earth retaining structure along approach roadway between stages. Remove prior to back filling for Stage 2.

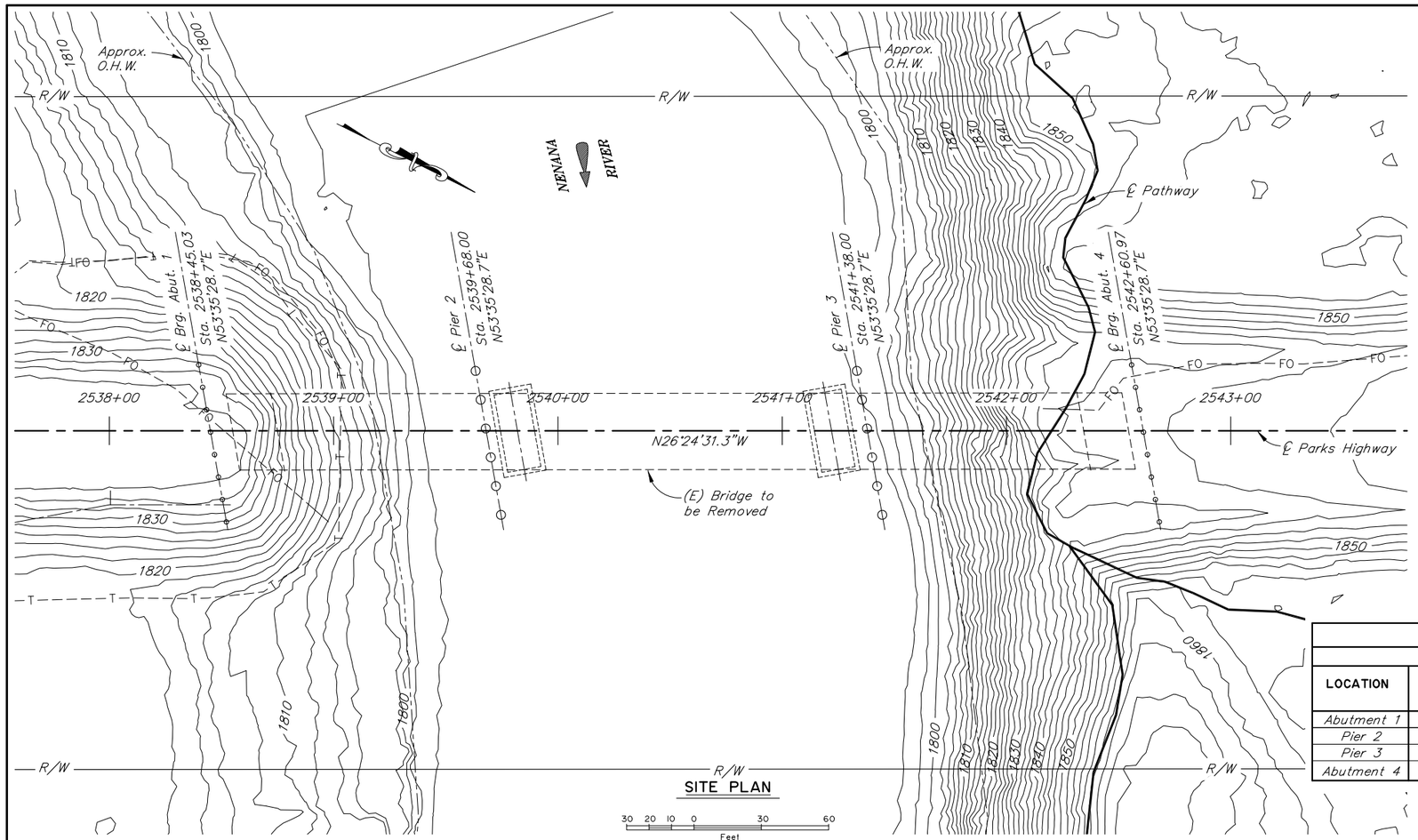
OPTION 2

DESIGNED BY: Elmer Marx	CHECKED: Engineer	**PRELIMINARY PLAN**	STATE OF ALASKA DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES BRIDGE SECTION
DRAWN BY: Sam Sollie	CHECKED: Elmer Marx		
QUANTITIES BY: Elmer Marx	CHECKED: Engineer		

NENANA RIVER BRIDGE
AT PARK BOUNDARY
PARKS HIGHWAY
TYPICAL SECTION

BRIDGE NO. 694
DWG. NO. 2

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA		2016		



SITE PLAN

30 20 10 0 30 60
Feet

GENERAL NOTES

DESIGN:..... AASHTO LRFD Bridge Design Specifications, 2014 Edition, with latest interim specifications.
Seismic design per AASHTO Guide Specifications for LRFD Seismic Bridge Design, 2011 Edition, with latest interim specifications.

LIVE LOAD:..... HL-93

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

SEISMIC PARAMETERS:..... PGA = 0.39
Ss = 0.87
S1 = 0.36
Site Class = D
Liquefaction Potential = High
AASHTO 7% probability of exceedance in 75 years.

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

CONCRETE:..... Class A Concrete unless otherwise, f'c = 4000 psi.
Provide rubbed finish on all vertical surfaces.

STRUCTURAL STEEL:..... ASTM A709, Grade 36T3, Fy = 36,000 psi,
Galvanize all structural steel in accordance with AASHTO M111 unless shown otherwise.

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

PILE DATA TABLE

LOCATION	PILE TYPE	DRIVING CRITERIA: MINIMUM PENETRATION (ft)	DRIVING CRITERIA: ESTIMATED PILE TIP ELEVATION (ft)	DRIVING CRITERIA: DRIVING RESISTANCE (K)	DESIGN DATA: STRENGTH I FACTORED LOAD (K)	DESIGN DATA: NOMINAL RESISTANCE (K)	DESIGN DATA: RESISTANCE FACTOR, φ
Abutment 1	2'-0"ø x 1/2"						0.65
Pier 2	4'-0"ø x 1"						0.65
Pier 3	4'-0"ø x 1"						0.65
Abutment 4	2'-0"ø x 1/2"						0.65

BRIDGE BASIS OF ESTIMATE

ITEM NO.	ITEM	PAY UNIT	ESTIMATING UNIT	SUBST.	SUPERST.	TOTAL
202(23)	Removal of existing Bridge No. 694	LS	SF			
205(1)	Excavation for Structures	CY	CY			
205(3)	Structural Fill	CY	CY			
501(1)	Class A Concrete	LS	CY			
501(2)	Class A-A Concrete	LS	CY			
503(1)	Reinforcing Steel	LS	LBS			
503(2)	Epoxy-Coated Reinforcing Steel	LS	LBS			
505(5A)	Furnish Structural Steel Piles (2'-0" dia. x 1/2" Pipe Piles)	LF	LF			
505(5B)	Furnish Structural Steel Piles (4'-0" dia. x 1" Pipe Piles)	LF	LF			
505(6A)	Drive Structural Steel Piles (2'-0" dia. x 1/2" Pipe Piles)	EA	EA			
505(6B)	Drive Structural Steel Piles (4'-0" dia. x 1" Pipe Piles)	EA	EA			
507(X)	Concrete Barrier	LF	LF			
508(1)	Waterproofing Membrane	LS	SF			
512(X)	Temporary Work Trestle	LS	SF			
606(16)	Transition Rail	EA	EA			
611(1)	Riprap, Class II	CY	CY			
631(2)	Geotextile, Erosion Control, Class I	SY	SY			

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

OPTION 2

BRIDGE SHEET ABBREVIATIONS:

℄	= centerline	——FO——	= fiber optic cable
ℙ	= plate	Hwy.	= highway
&	= and	H.J.	= high strength
@	= at	Int.	= interior
ø	= diameter	Jt.	= joint
±	= approximate	ksf	= 1000 pounds per square foot
Abut.	= abutment	LB	= pound
Approx.	= approximate	LF	= linear foot
b.f.	= back/dirt face	LS	= lump sum
bot.	= bottom	Lt.	= left
Br.	= bridge	max.	= maximum
btwn.	= between	min.	= minimum.
Brg.	= Bearings	N/A	= not applicable
C.I.P.	= cast in place	n.f.	= near face
C.G.	= center of gravity	No.	= number
Clr.	= clear, clearance	o.c.	= on center
CMP	= corrugated metal pipe	R/W	= right of way
CY	= cubic yard	Rt.	= right
dia.	= diameter	Rd.	= road
Dwg.	= drawing	spcs.	= space, spaces
E	= expansion	Sta.	= station
(E)	= existing	Std.	= standard
EA	= each	SF	= square feet
Elev.	= elevation	Symm.	= symmetric
e.f.	= each face	---T-----T---	= telephone cable
e.w.	= each way	Typ.	= typical
Ext.	= exterior	V.P.C.	= point of vertical curve
F	= fixed	V.P.I.	= point of vertical intersection
f.f.	= front/air face	V.P.T.	= point of vertical tangent

DESIGNED BY: Designed	CHECKED: Engineer	HYDRAULICS BY: Engineer	CHECKED BY: Engineer
DRAWN BY: Drafter	CHECKED: Engineer	FOUNDATIONS REVIEWED BY: Engineer	
QUANTITIES BY: Engineer	CHECKED: Engineer		

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
BRIDGE SECTION

NENANA RIVER BRIDGE AT PARK BOUNDRY

PARKS HIGHWAY

SITE PLAN

BRIDGE NO. 694

DWG. NO. 3

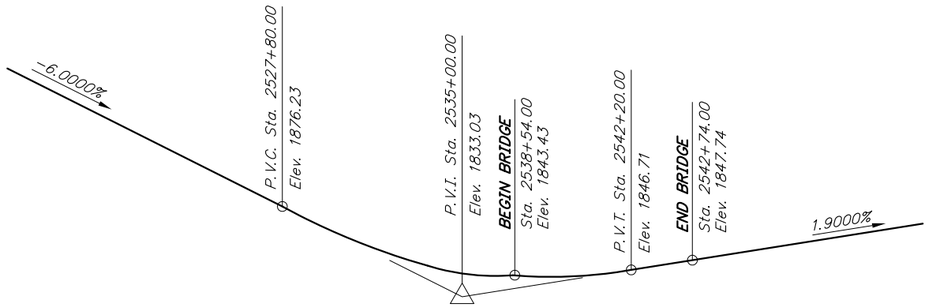
Option 3 – Two span steel girder bridge with CIP deck

Maximum individual span length ~210 feet
Vertical clearance over DHW ~ 32feet
Bridge related pay items (w/o mobilization, CE, ICAP, or contingency) = $16.3M
Bridge related pay items (w/ mobilization, CE, ICAP, and 25% contingency) = $28.4M

ADVANTAGES	DISADVANTAGES
Reduces the total number of in-water supports which may be beneficial for permitting issues	Most expensive option
If necessary, can accommodate more complicated roadway geometry such as horizontal curves and superelevation transitions	Almost 4 feet deeper than the concrete girder option results in less vertical clearance under the bridge – about 6 inches less than the existing bridge. The superstructure depth could be reduced but the cost would increase
Relatively durable structure type that requires little future maintenance	Requires more long-term maintenance than concrete girder option
May be considered to be a more aesthetically pleasing bridge	Would require more time to build than Option 1 due to cast-in-place concrete deck that may add another construction season
	Somewhat less common structure type than the concrete option

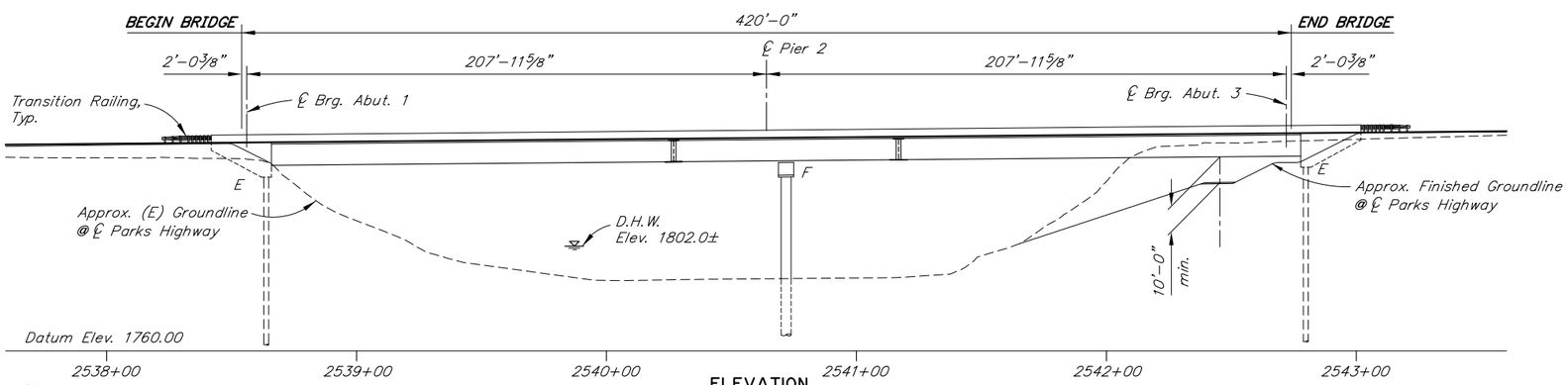
Figure 3 – Somewhat similar bridge – Matanuska River Bridge #1951 (a two-span steel girder bridge but with a shorter pile extension pier – not the truss in the background)

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA		2016		



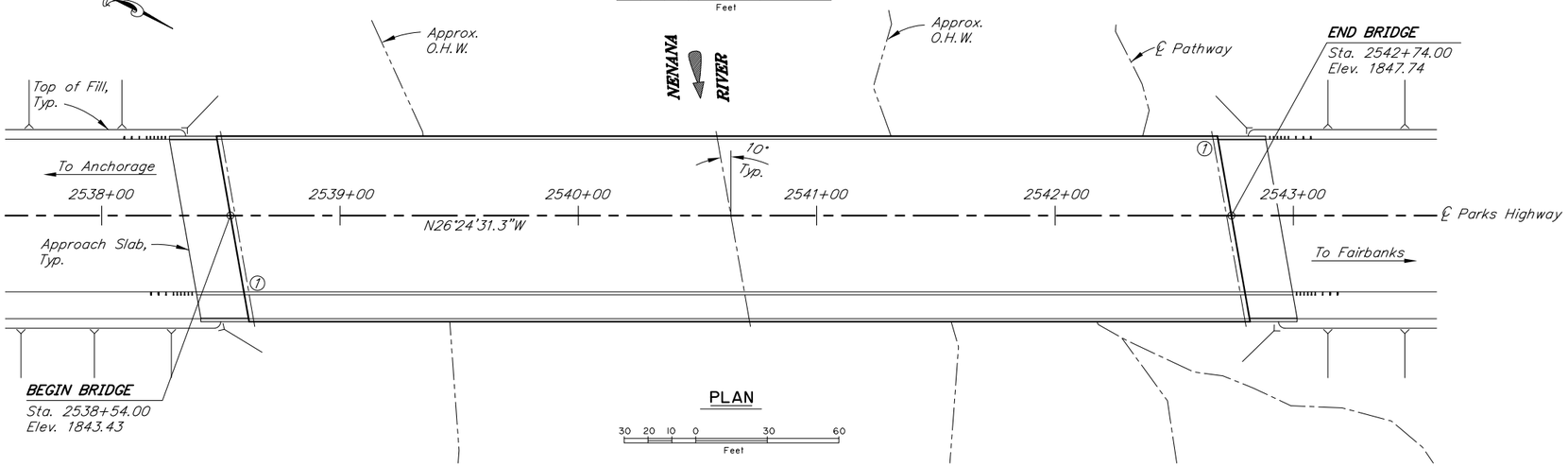
PROFILE GRADE DATA

No Scale



ELEVATION

30 20 10 0 30 60
Feet



PLAN

30 20 10 0 30 60
Feet

BRIDGE DRAWING INDEX

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

PRELIMINARY PLAN

OPTION 3

NOTES:

1 = Approximate location of Bridge Number Plate.

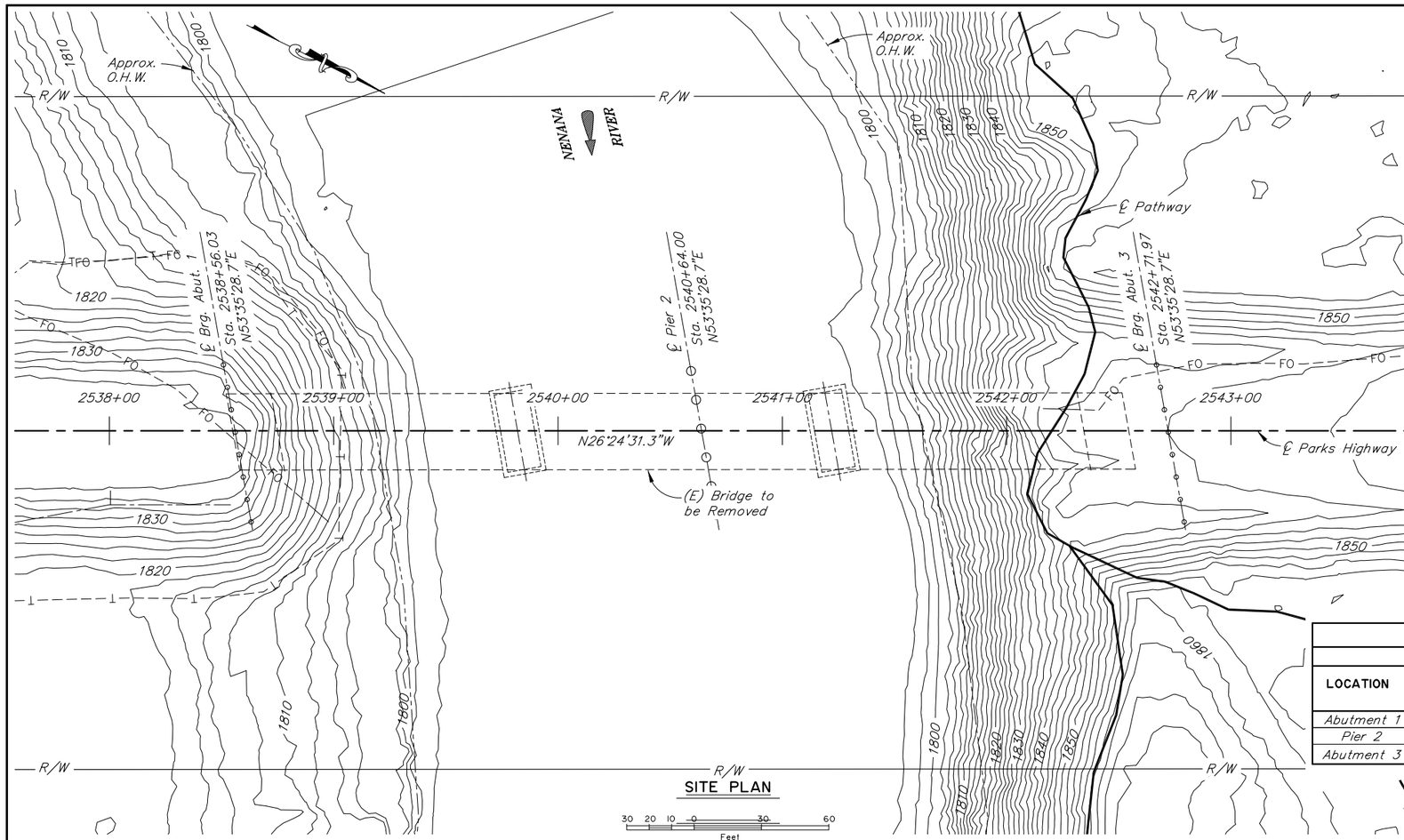
DESIGNED BY: Elmer Marx	CHECKED: Engineer	LAYOUT BY: Elmer Marx	CHECKED BY: Engineer
DRAWN BY: Sam Sollie	CHECKED: Elmer Marx	SPECIFICATIONS BY: Elmer Marx	P S & E COMPARED: Engineer
QUANTITIES BY: Elmer Marx	CHECKED: Engineer	APPROVAL RECOMMENDED BY: Rich Pratt	

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
BRIDGE SECTION

NENANA RIVER BRIDGE
AT PARK BOUNDARY
PARKS HIGHWAY
GENERAL LAYOUT

BRIDGE NO. 694
DWG. NO. 1

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA		2016		



SITE PLAN

30 20 10 0 30 60
Feet

GENERAL NOTES

DESIGN:..... AASHTO LRFD Bridge Design Specifications, 2014 Edition, with latest interim specifications.
Seismic design per AASHTO Guide Specifications for LRFD Seismic Bridge Design, 2011 Edition, with latest interim specifications.

LIVE LOAD:..... HL-93

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

SEISMIC PARAMETERS:..... PGA = 0.39
Ss = 0.87
S1 = 0.36
Site Class = D
Liquefaction Potential = High
AASHTO 7% probability of exceedance in 75 years.

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

CONCRETE:..... Class A Concrete unless otherwise, f'c = 4000 psi.
Provide rubbed finish on all vertical surfaces.

STRUCTURAL STEEL:..... ASTM A709, Grade 36T3, Fy = 36,000 psi,
Galvanize all structural steel in accordance with AASHTO M111 unless shown otherwise.

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

PILE DATA TABLE

LOCATION	PILE TYPE	DRIVING CRITERIA: MINIMUM PENETRATION (ft)	DRIVING CRITERIA: ESTIMATED PILE TIP ELEVATION (ft)	DRIVING CRITERIA: DRIVING RESISTANCE (K)	DESIGN DATA: STRENGTH I FACTORED LOAD (K)	DESIGN DATA: NOMINAL RESISTANCE (K)	DESIGN DATA: RESISTANCE FACTOR, Φ
Abutment 1	2'-0"ø x 1/2"						0.65
Pier 2	4'-0"ø x 1"						0.65
Abutment 3	2'-0"ø x 1/2"						0.65

BRIDGE BASIS OF ESTIMATE

ITEM NO.	ITEM	PAY UNIT	ESTIMATING UNIT	SUBST.	SUPERST.	TOTAL
202(23)	Removal of existing Bridge No. 694	LS	SF			
205(1)	Excavation for Structures	CY	CY			
205(3)	Structural Fill	CY	CY			
501(1)	Class A Concrete	LS	CY			
501(2)	Class A-A Concrete	LS	CY			
503(1)	Reinforcing Steel	LS	LBS			
503(2)	Epoxy-Coated Reinforcing Steel	LS	LBS			
505(5A)	Furnish Structural Steel Piles (2'-0" dia. x 1/2" Pipe Piles)	LF	LF			
505(5B)	Furnish Structural Steel Piles (4'-0" dia. x 1" Pipe Piles)	LF	LF			
505(6A)	Drive Structural Steel Piles (2'-0" dia. x 1/2" Pipe Piles)	EA	EA			
505(6B)	Drive Structural Steel Piles (4'-0" dia. x 1" Pipe Piles)	EA	EA			
507(X)	Concrete Barrier	LF	LF			
508(1)	Waterproofing Membrane	LS	SF			
512(X)	Temporary Work Trestle	LS	SF			
606(16)	Transition Rail	EA	EA			
611(1)	Riprap, Class II	CY	CY			
631(2)	Geotextile, Erosion Control, Class I	SY	SY			

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

PRELIMINARY PLAN

OPTION 3

BRIDGE SHEET ABBREVIATIONS:

℄	= centerline	——FO——	= fiber optic cable
ℙ	= plate	Hwy.	= highway
&	= and	H.J.	= high strength
@	= at	Int.	= interior
ø	= diameter	Jt.	= joint
±	= approximate	ksf	= 1000 pounds per square foot
Abut.	= abutment	LB	= pound
Approx.	= approximate	LF	= linear foot
b.f.	= back/dirt face	LS	= lump sum
bot.	= bottom	Lt.	= left
Br.	= bridge	max.	= maximum
btwn.	= between	min.	= minimum.
Brg.	= Bearings	N/A	= not applicable
C.I.P.	= cast in place	n.f.	= near face
C.G.	= center of gravity	No.	= number
Clr.	= clear, clearance	o.c.	= on center
CMP	= corrugated metal pipe	R/W	= right of way
CY	= cubic yard	Rt.	= right
dia.	= diameter	Rd.	= road
Dwg.	= drawing	spcs.	= space, spaces
E	= expansion	Sta.	= station
(E)	= existing	Std.	= standard
EA	= each	SF	= square feet
Elev.	= elevation	Symm.	= symmetric
e.f.	= each face	---T-----T---	= telephone cable
e.w.	= each way	Typ.	= typical
Ext.	= exterior	V.P.C.	= point of vertical curve
F	= fixed	V.P.I.	= point of vertical intersection
f.f.	= front/air face	V.P.T.	= point of vertical tangent

DESIGNED BY: Designed	CHECKED: Engineer	HYDRAULICS BY: Engineer	CHECKED BY: Engineer
DRAWN BY: Drafter	CHECKED: Engineer	FOUNDATIONS REVIEWED BY: Engineer	
QUANTITIES BY: Engineer	CHECKED: Engineer		

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
BRIDGE SECTION

NENANA RIVER BRIDGE AT PARK BOUNDRY

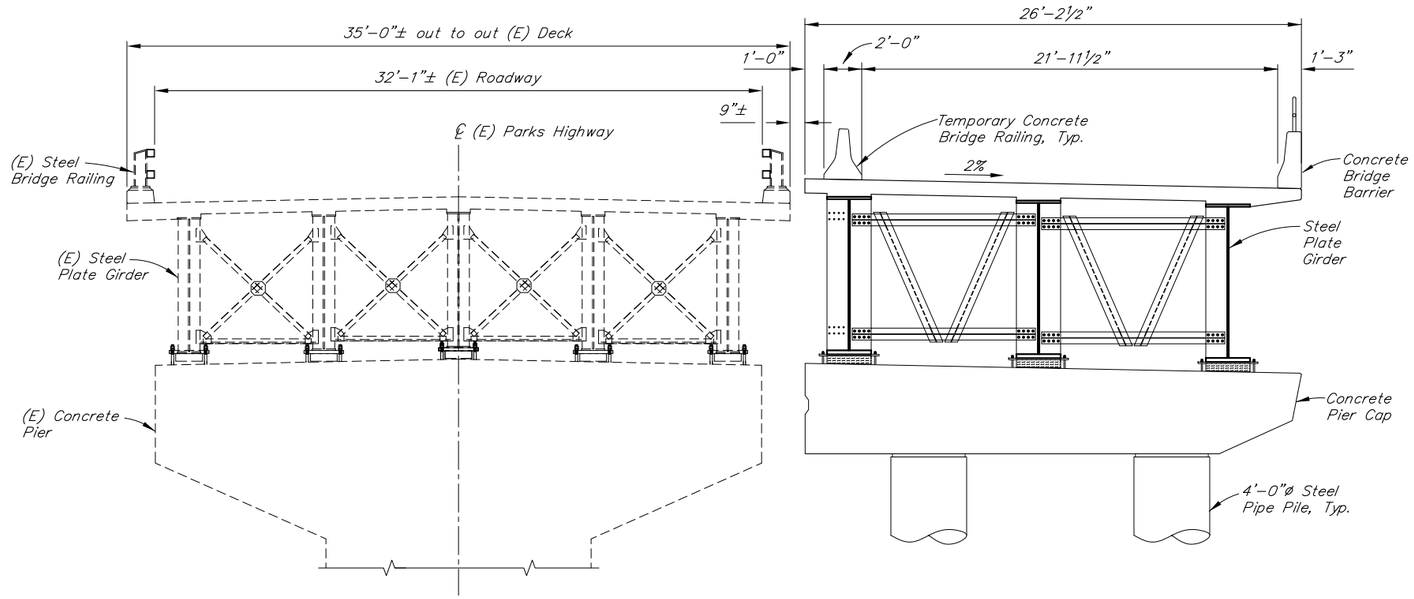
PARKS HIGHWAY

SITE PLAN

BRIDGE NO. 694

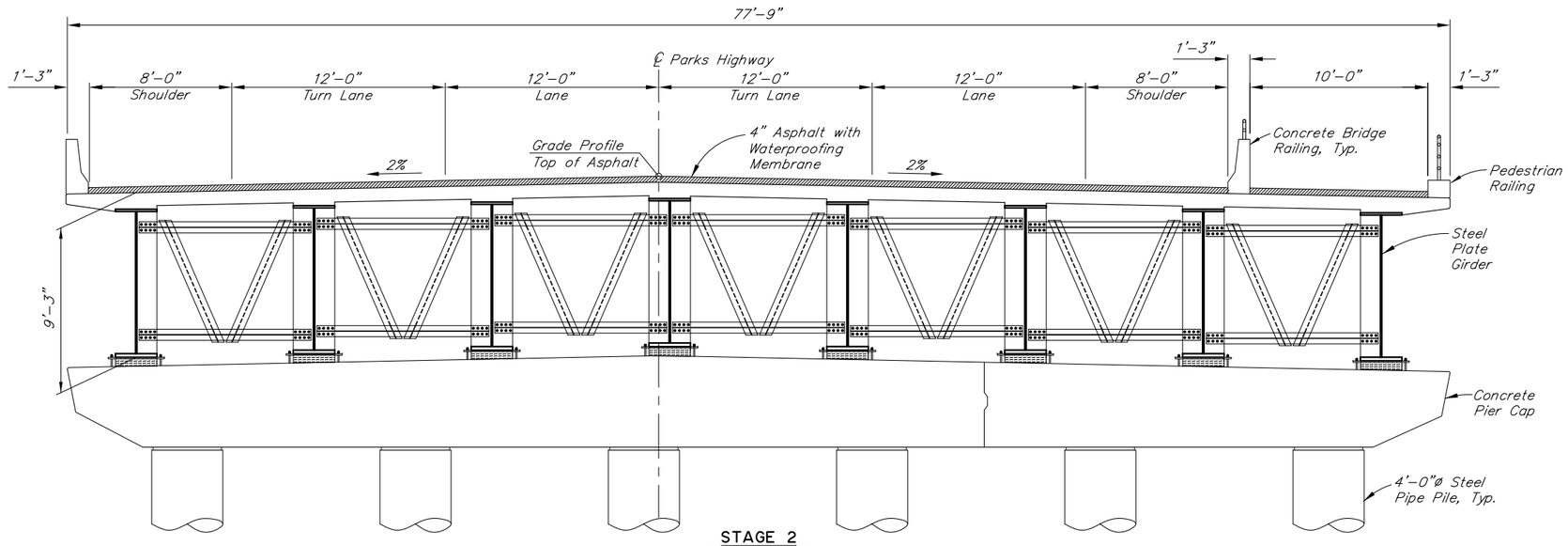
DWG. NO. 3

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	PROJECT NUMBER	2016		



STAGE 1

12 0 4 8
In. Feet



STAGE 2

12 0 4 8
In. Feet

STAGED CONSTRUCTION NOTES

1. Place riprap under first stage of bridge prior to setting girders on bearings.
2. Place all cross frames before applying loads to bridge.
3. Splice all reinforcing steel crossing the vertical construction joint with mechanical couplers. Stagger splices.
4. Roughen the surfaces of all vertical construction joints.
5. Pin temporary concrete barriers to the bridge deck. Fill holes in deck with Epoxy for Bonding Dowels after removing temporary barriers.
6. Do not cast approach slabs or concrete bridge barriers until after completing Stage 2 portion of the bridge.
7. Provide earth retaining structure along approach roadway between stages. Remove prior to back filling for Stage 2.

PRELIMINARY PLAN

OPTION 3

DESIGNED BY: Elmer Marx	CHECKED: Engineer	STATE OF ALASKA DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES BRIDGE SECTION	NENANA RIVER BRIDGE AT PARK BOUNDARY PARKS HIGHWAY TYPICAL SECTION
DRAWN BY: Sam Sollie	CHECKED: Elmer Marx		BRIDGE NO. 694
QUANTITIES BY: Elmer Marx	CHECKED: Engineer		DWG. NO. 2

APPENDIX G

DESIGN EXCEPTIONS AND DESIGN WAIVERS

ALASKA DOT&PF PRECONSTRUCTION
DESIGN EXCEPTION/DESIGN WAIVER FORM

Type of Request: (select one or both)

☒ Design Exception (FHWA controlling design criteria only)

☐ Design Waiver (all other design criteria)

PROJECT INFORMATION:

Project Name: Parks Highway MP 231 Enhancements

Project Number: Z612990000

☒ NHS ☐ Non NHS

Functional Classification: Rural Interstate

Design Year: 2040

Present ADT: 2,450 (2014)

Design Year ADT: 3,385

Mid Design Period ADT: 2,990 (2030)

DHV: 16.8%

Directional Split: 40 / 60

Percent Trucks: 20.0%

Equivalent Axle Loading: 2,106,250

Pavement Design Year: 2035

Design Vehicle: WB-40

Terrain: Rolling/Mountainous

Number of Roadways: 1

*Design Speed: 70 MPH

Posted Speed: 65 MPH

Operational Speed: 70 MPH

* *If requesting a design exception for design speed, use the recommended not reduced design speed here. Further, any design which uses a design speed below the posted or regulatory speed limit should not be approved (Source: FHWA Supplement, Section 8.,b. Application of Design Standards, Uniform Federal Accessibility Standards, and Bridges located here: http://www.fhwa.dot.gov/design/0625sup.cfm). FHWA also recommends evaluating specific geometric element(s) and treating those as design exceptions instead of design speed.*

PROJECT INFORMATION:

It is required that a location map, as a minimum, be provided with your package. It is highly recommended that other exhibits be provided to support your request. Exhibits may include typical sections, geometric details, correspondence from other sections, agency correspondence, etc.

1. ***Design Exception requested for the following design criteria. Mark the criteria to be discussed:***

- ☐ Design Speed
- ☐ Lane Width
- ☐ Shoulder Width
- ☐ Cross Slope
- ☐ Superelevation Rate
- ☐ Horizontal Alignment (minimum radius of curvature)
- ☐ Vertical Alignment (minimum sag and/or crest K values)
- ☒ Grade (minimum and/or maximum allowable grades)
- ☐ Stopping Sight Distance
- ☐ Lateral Offset to Obstruction
- ☐ Vertical Clearance
- ☐ Bridge Width
- ☐ Bridge Structural Capacity

These 13 design criteria are commonly referred to as the *FHWA 13 controlling criteria*. For NHS routes only, these criteria must meet the minimums established in the Green Book (*AASHTO A Policy on Geometric Design of Highways and Streets*). For all other routes, these criteria must meet the minimums established in the *Alaska Highway Preconstruction Manual*. Otherwise a Design Exception must be approved.

Design Waiver requested for the following design criteria.

- ☐ Other

Explain:

Design Waivers are required for any design criteria, other than the *FHWA 13 controlling criteria*, which do not meet the minimums established in the *Alaska Highway Preconstruction Manual*.

2. Provide a synopsis of the project scope (including purpose and need), the situation you are encountering, and the problem you are attempting to mitigate.

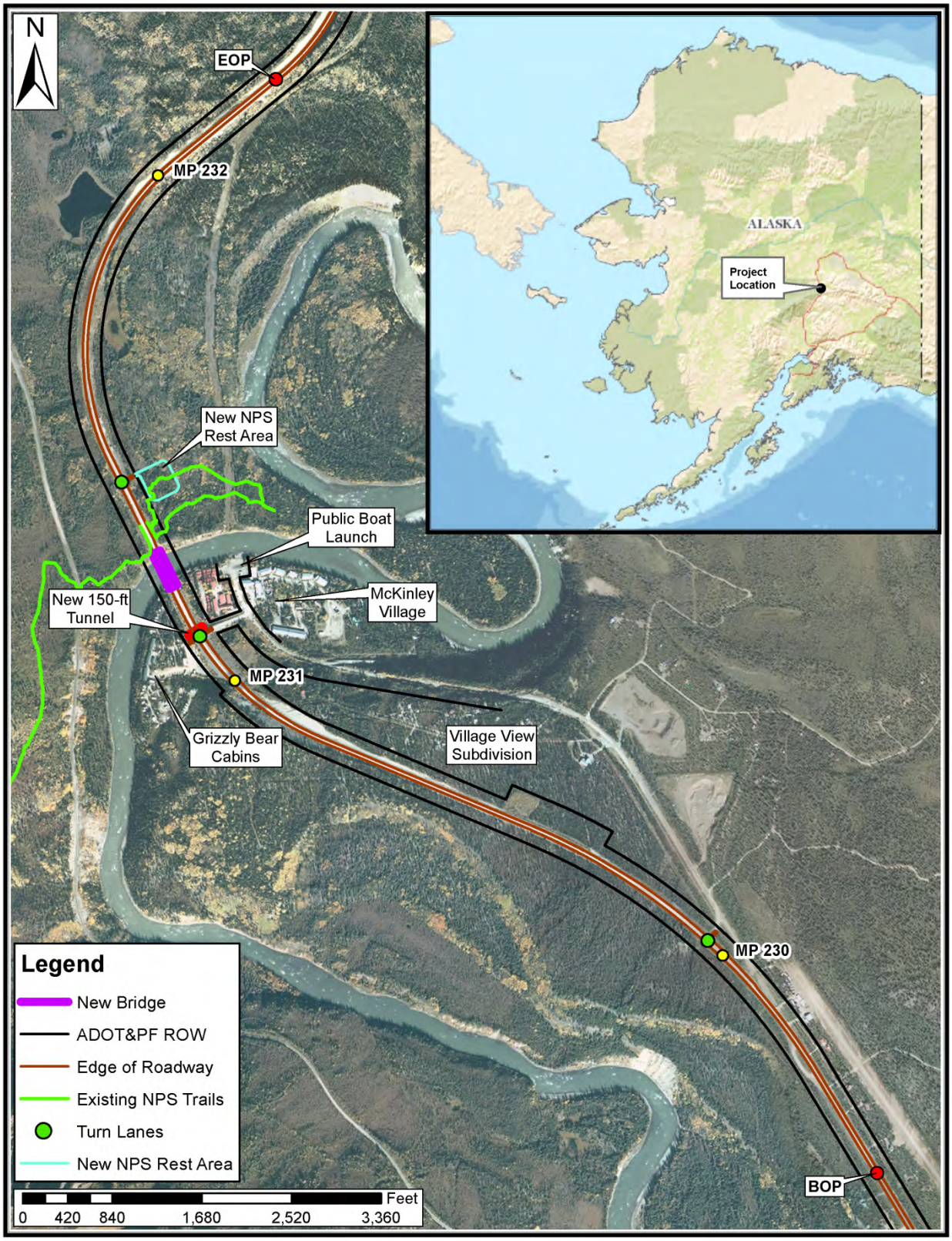


Figure 1 Project Location & Vicinity Map (total project length is approximately 2.6 miles)

This project will reconstruct the Parks Highway from milepost (MP) 229.7 to 232.3 and enhance safety and accommodations for motorized and non-motorized traffic near MP 231. Improvements will include a pedestrian underpass, auxiliary turn lanes, pedestrian paths, a new NPS rest area, and replacement of the Nenana River Bridge near MP 231 to accommodate turn lanes, 8-ft shoulders, and a pedestrian walkway. This project will improve safety by reducing pedestrian, bicycle, and vehicle conflicts.

This area experiences a high volume of commercial traffic (busses, vans, tractor trailers, and vehicles with boat trailers) as well as increased pedestrian and vehicle traffic during tourist season. Currently, pedestrians must cross the highway to access commercial facilities at McKinley Village and Grizzly Bear Cabins immediately south of the Nenana River Bridge. Pedestrians must also cross the Nenana River Bridge via 5-ft shoulders to access Denali National Park and Preserve trails located immediately north of the bridge.

3. Provide a concise written description of the proposed Design Exception(s)/Design Waiver(s). It is required to be specific in stating which design standard(s) is being requested to be excepted or waived and the location (either the entire project length or a station range). State the standard and proposed values of the design criteria exception/waiver citing AASHTO, Department, or other standards. Include the date of the design standard references cited. Whenever possible, reference AASHTO guidelines to support your design decisions.

Proposed Design Exceptions/Design Waivers Summary			
Criteria	**Standard[1]**	**Proposed**	**Location** ***(entire project or station range)***
Maximum Allowable Grade	5%	6%	Sta. 2510+00 to Sta. 2530+00

[1] AASHTO, 2001, Policy on Geometric Design of Highways and Streets

<u>Maximum Allowable Grade</u>

The maximum allowable grade is proposed to be increased from 5% to 6% within the design exception location. The existing grade within this location is approximately 6% and the current design proposes to maintain the existing 6% grade (see attached Plan & Profile Sheets and Cross Sections).

4. Discuss the terrain in the area of the project and the proposed Design Exception(s)/Design Waiver(s).

The terrain in the project area varies from rolling to mountainous. This design exception is dependent on terrain. Within the location of the proposed design exception, the terrain is mountainous.

5. Discuss the traffic characteristics in the area of the project and the proposed Design Exception(s)/Design Waiver(s).

Traffic in the area is a mix of commercial, tourist, and commuter. The boundary of Denali National Park is located within the project limits, generating higher volumes during the peak tourist season (May 30 – September 1 typically). Design features for this project are based on a 70 mph design speed, which is consistent with the 65 mph posted speed and Interstate standards.

6. Discuss the crash history of the project and the proposed Design Exception(s)/Design Waiver(s). State if any anomalies are present within the project limits.

From 2007 to 2010, a total of 4 accidents occurred near the location of the proposed design exception. These accidents consisted of one overturn, one sideswipe, one run off the road, and one head on collision. These accidents resulted in property damage and one minor injury. There are no known anomalies present within the project limits. The calculated crash rate for the design exception area is 0.6 crashes/million vehicle miles (mvm), while the statewide average crash rate for two-lane rural roads is 2.2 crashes/mvm.

7. Discuss the degree to which a standard is being reduced, whether the exception/waiver will affect other standards, and are they any additional features being introduced, e.g., signing or delineation that would mitigate the deviation and the proposed Design Exception(s)/Design Waiver(s). Also, discuss if multiple Design Exceptions/Waivers are being requested in the same segment and if they will influence each other.

The standard maximum allowable grade is 5% and the proposed maximum allowable grade is 6%. This design exception will not affect any other standards. No other design exceptions or design waivers are being requested for this highway segment. Grades along the rest of the Parks Highway routinely exceed 5% as the highway traverses through the Alaska Range in the Denali State and Denali National Park areas.

8. Explain why the proposed Design Exception(s)/Design Waiver(s) is needed. (Provide supporting information as to why the minimum design criteria cannot be met. Substantiate reasons with facts, historical data, cost estimates, etc.)

This design exception is needed to prevent the project excavation limits from extending beyond the existing right-of-way on the west side of the highway and into private land owned by AHTNA Corporation (see attached Plan & Profile Sheets and Cross Sections). On the east side of the highway, the excavation limits extend to the edge of right-of-way and would likely require a temporary construction easement for equipment access, thus impacting the adjacent Village View subdivision.

In addition to right-of-way limitations and subdivision impacts, attempting to meet the design standard is estimated to increase project cost by approximately $2.5 million (9% of total construction cost), not including right-of way acquisition.

9. Discuss the cost of the project and the proposed Design Exception(s)/Design Waiver(s). Provide information that reflects the cost with and without the Design Exception(s)/Design Waiver(s). Attach detailed cost estimates.

Use of a 6% maximum grade for the proposed highway segment would reduce project cost by approximately $2.5 million based on current bid prices for unclassified excavation. See attached sheet for detailed calculations.

Project Cost Summary	
To Standards	**With approved Design Exceptions/ Design Waivers**
$30,500,000	$28,000,000

Proposed **Designer/Consultant:** _____ **Date:** 4/25/2016

Endorsed **Engineering Manager:** _____ **Date:** 4/25/2016

Approved **Preconstruction Engineer:** _____ **Date:** 5/12/2016

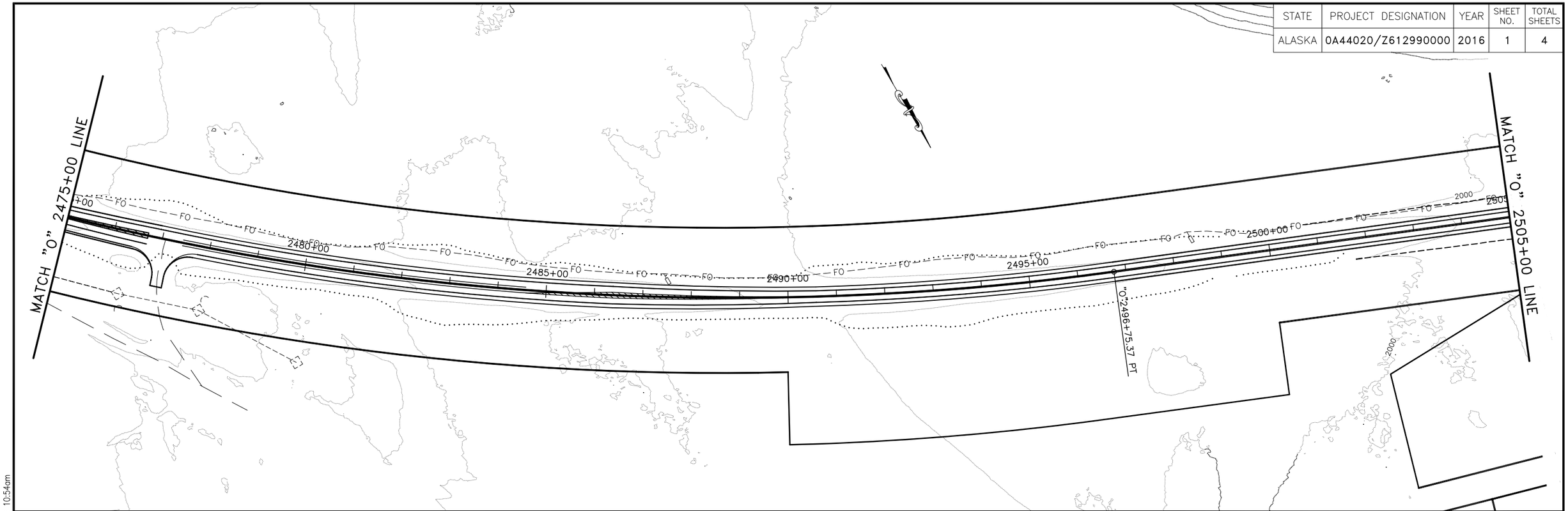
Concur – FHWA: Michael J. Cain Jr. **Date:** 5-18-16

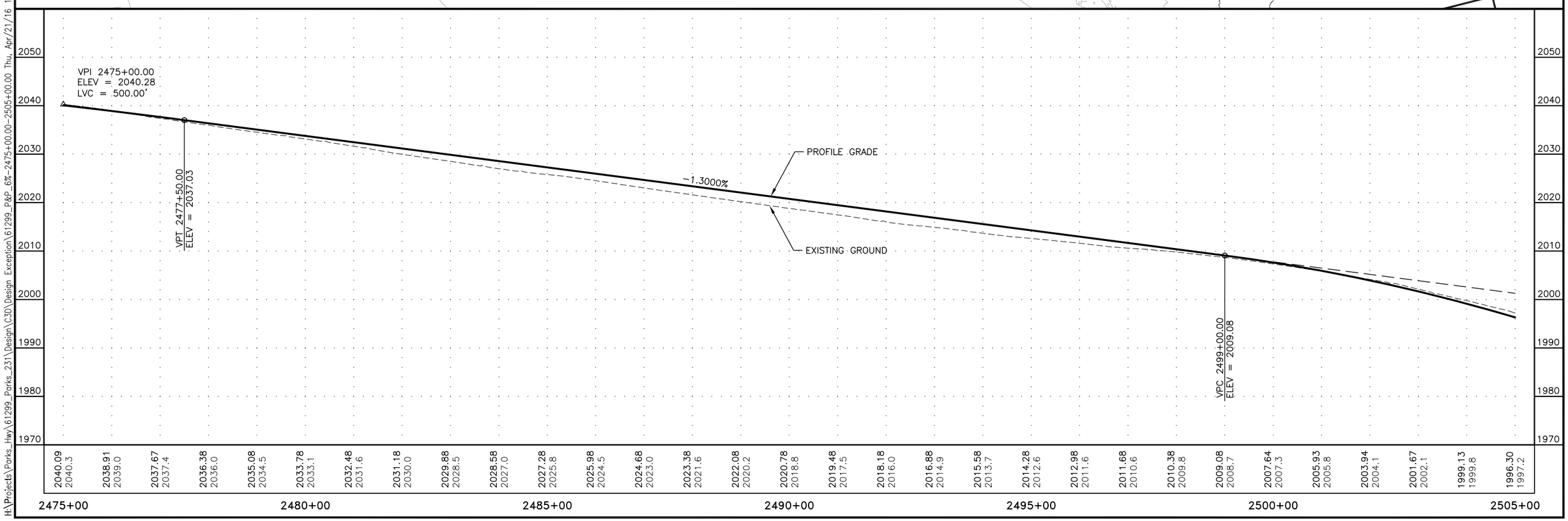
FHWA concurrence required for high profile projects only.

Project Cost With Design Exception					
ITEM	DESCRIPTION	UNIT	QUANTITY	PRICE	TOTAL
203(3)	Unclassified Excavation	C.Y.	97,305	$10.00	$973,050.00
Total Project Cost W/ Contingency, CE, and ICAP:					$27,997,679.11
Note: Estimated unclassified excavation for design with maximum 6% grade.					

Project Cost Without Design Exception					
ITEM	DESCRIPTION	UNIT	QUANTITY	PRICE	TOTAL
203(3)	Unclassified Excavation	C.Y.	308,349	$10.00	$3,083,490.00
Total Project Cost W/ Contingency, CE, and ICAP:					$30,537,540.88
Note: Estimated unclassified excavation for design with maximum 5% grade.					

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	0A44020/Z612990000	2016	1	4





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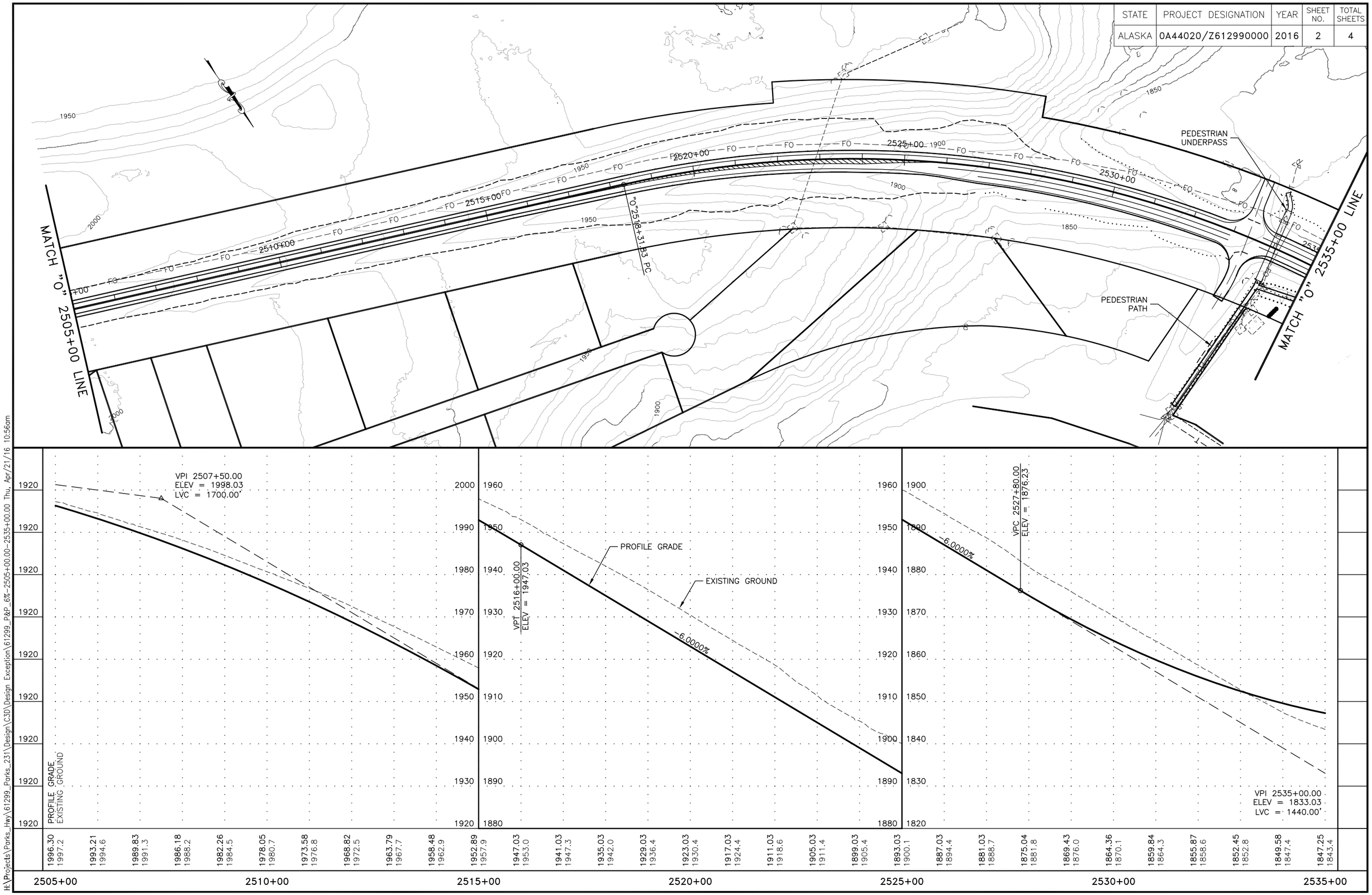
STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	0A44020/Z612990000	2016	2	4



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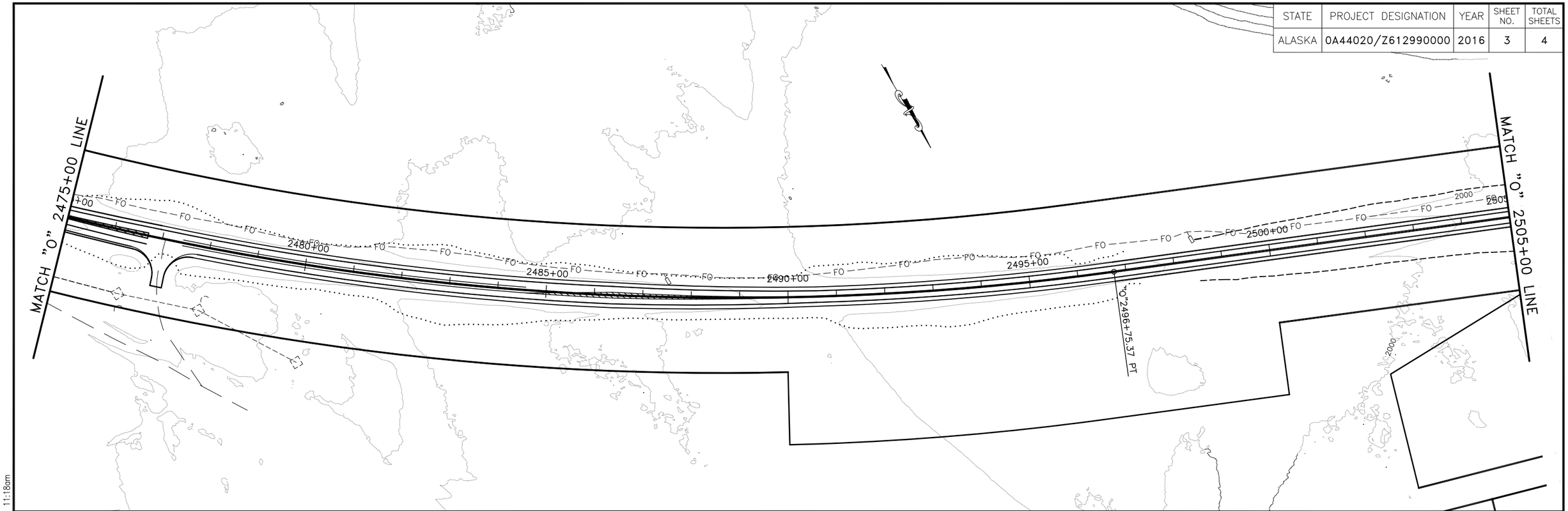
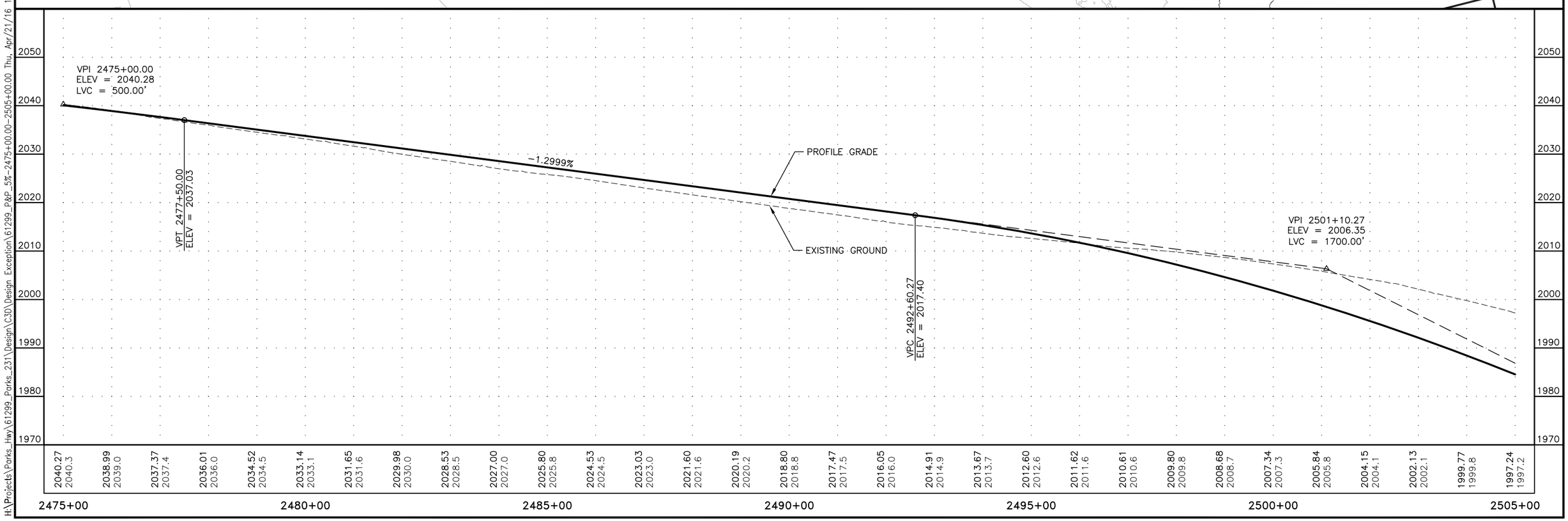
STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	0A44020/Z612990000	2016	3	4





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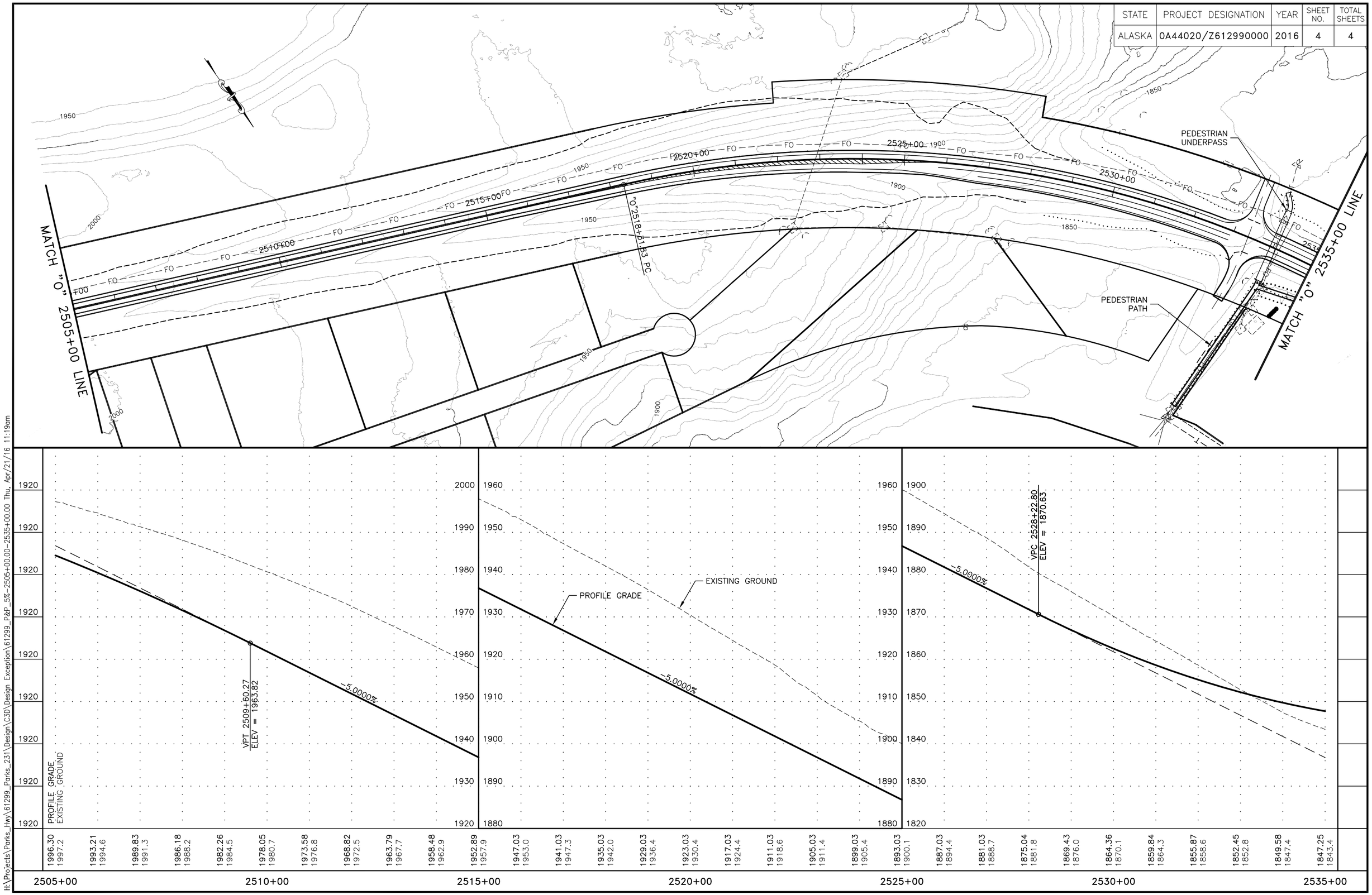
ALASKA	0A44020/Z612990000	2016	4	4



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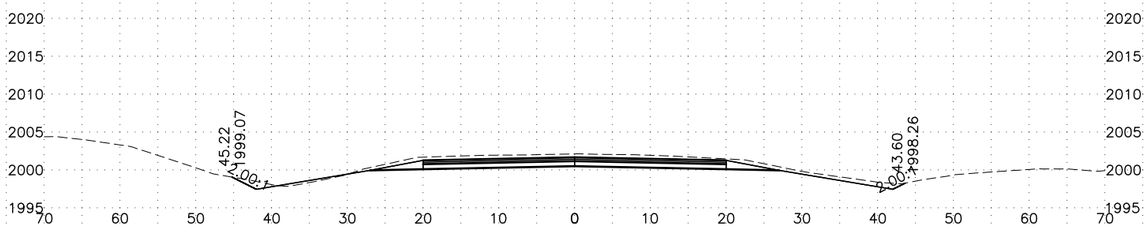

2503+00

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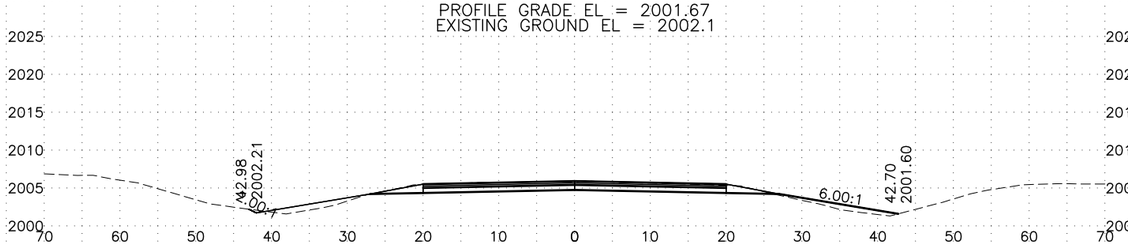
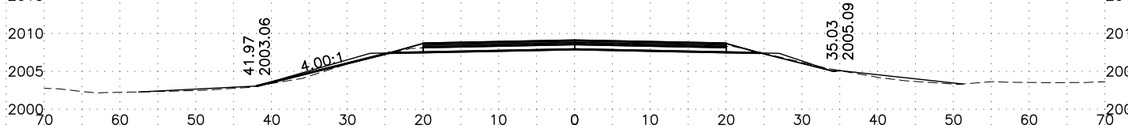
EXISTING GROUND EL = 2002.1



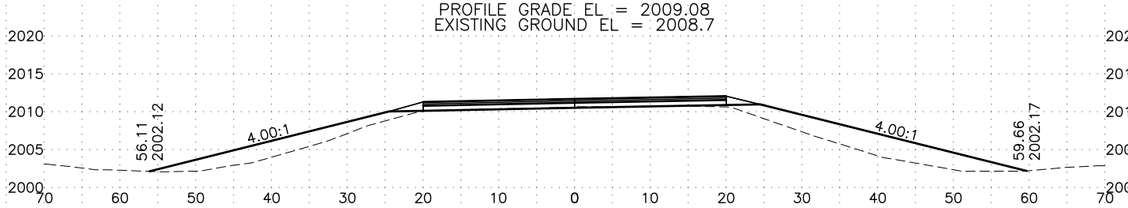
2501+00

PROFILE GRADE EL = 2005.93
EXISTING GROUND EL = 2005.8



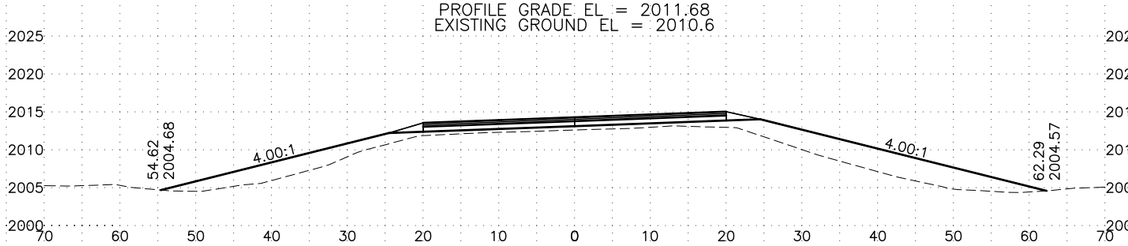
2499+00

PROFILE GRADE EL = 2009.08
EXISTING GROUND EL = 2008.7



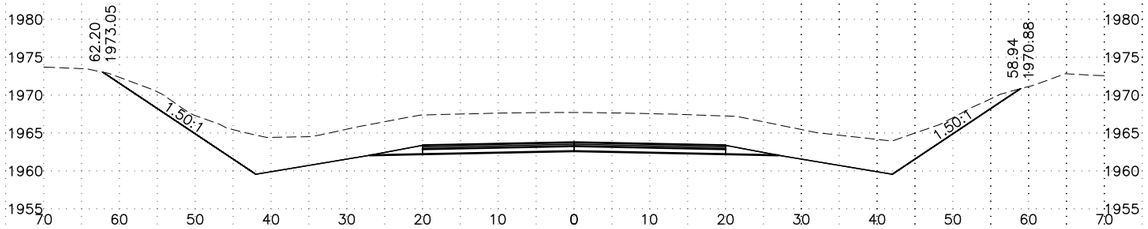
2497+00

PROFILE GRADE EL = 2011.68
EXISTING GROUND EL = 2010.6



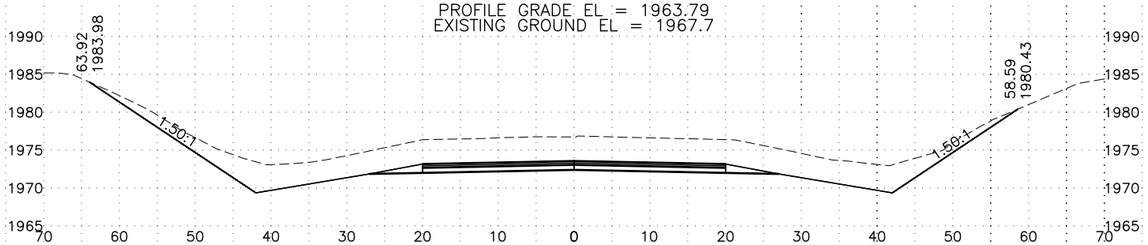
2495+00

PROFILE GRADE EL = 2014.28
EXISTING GROUND EL = 2012.6



2513+00

PROFILE GRADE EL = 1963.79
EXISTING GROUND EL = 1967.7



2511+00

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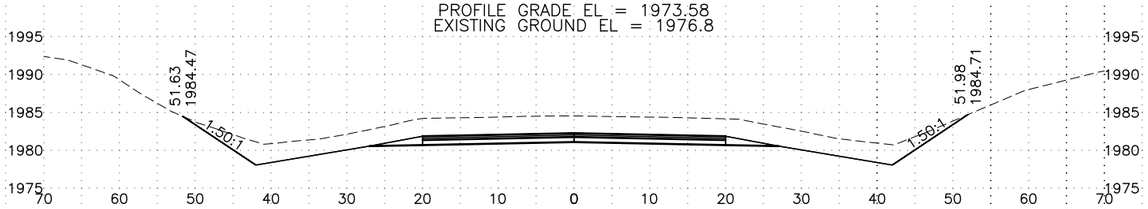
EXISTING GROUND EL = 1976.8



2509+00

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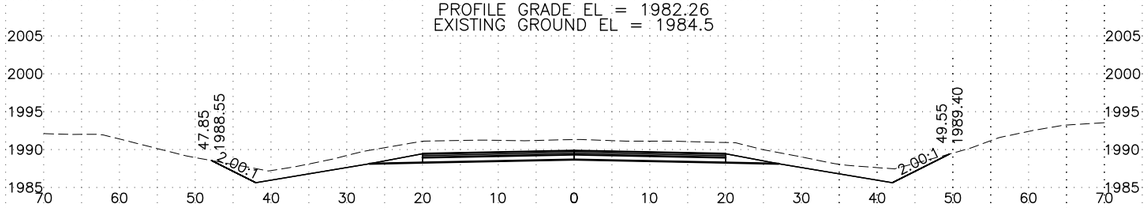
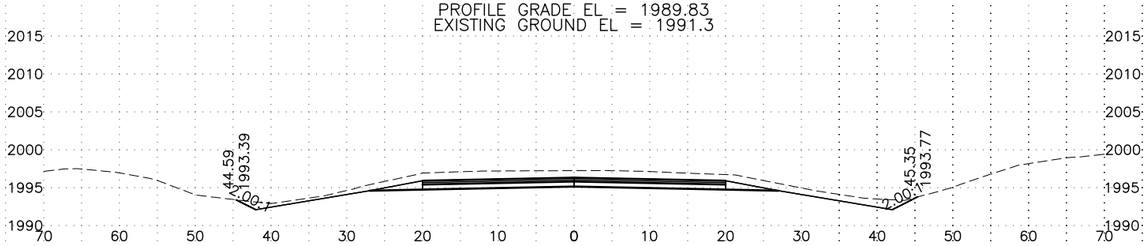
EXISTING GROUND EL = 1984.5



2507+00

PROFILE GRADE EL = 1989.83
EXISTING GROUND EL = 1991.3



2505+00

PROFILE GRADE EL = 1996.30
EXISTING GROUND EL = 1997.2

LINE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
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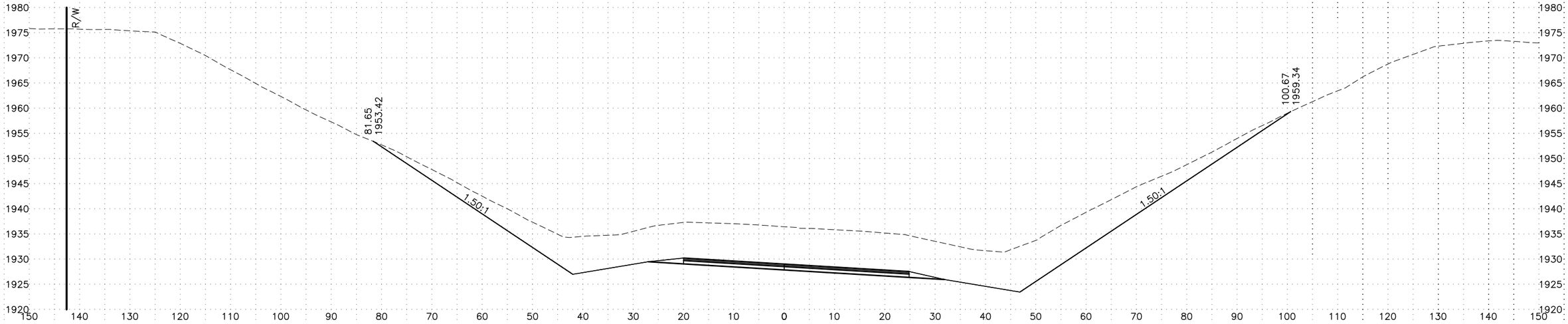
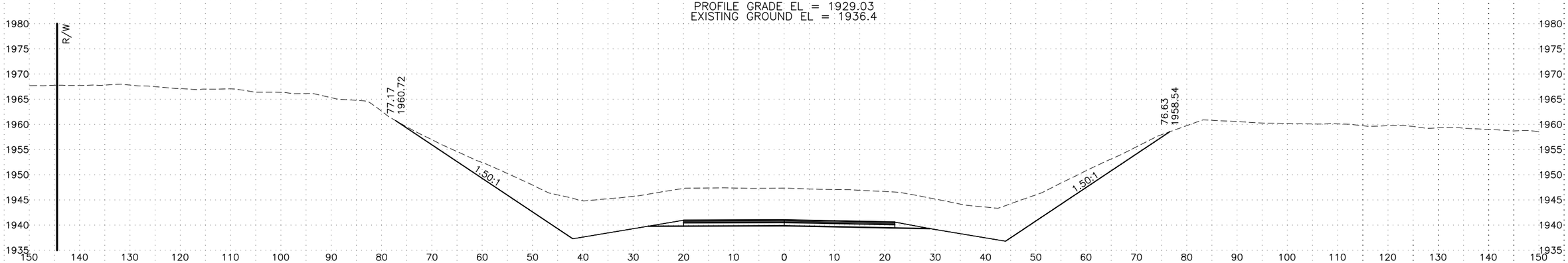


2519+00

PROFILE GRADE EL = 1929.03
EXISTING GROUND EL = 1936.4



2517+00

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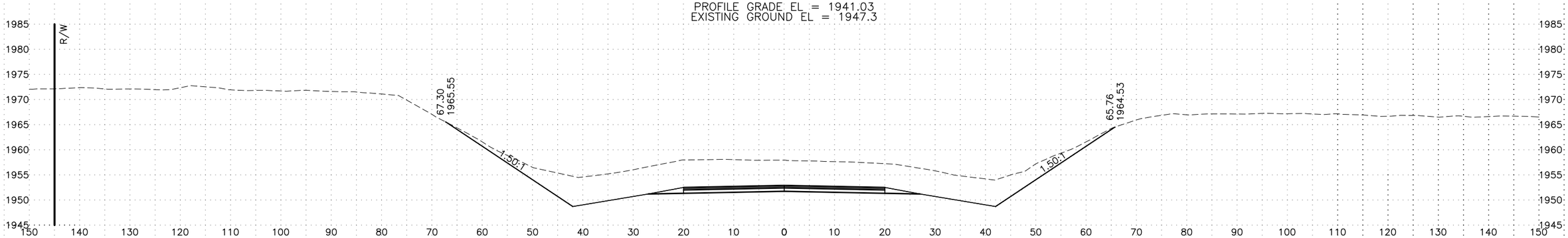

2515+00

PROFILE GRADE EL = 1952.89
EXISTING GROUND EL = 1957.9

LINE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
6%-02	Z612990000/0A44020	2	5

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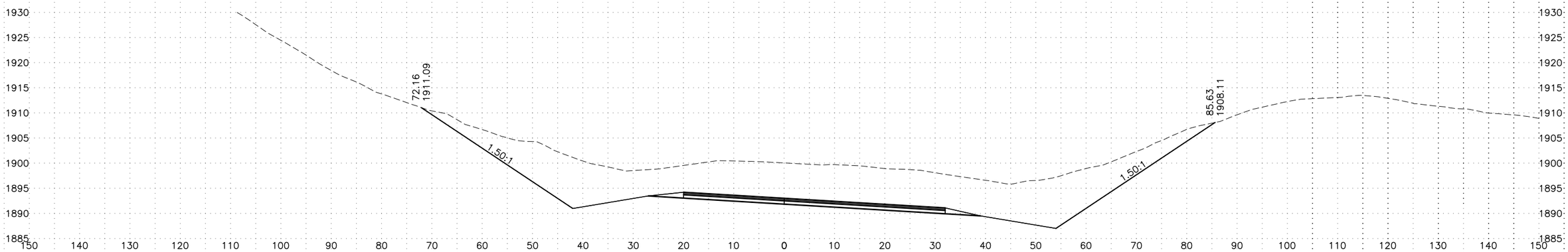

2525+00

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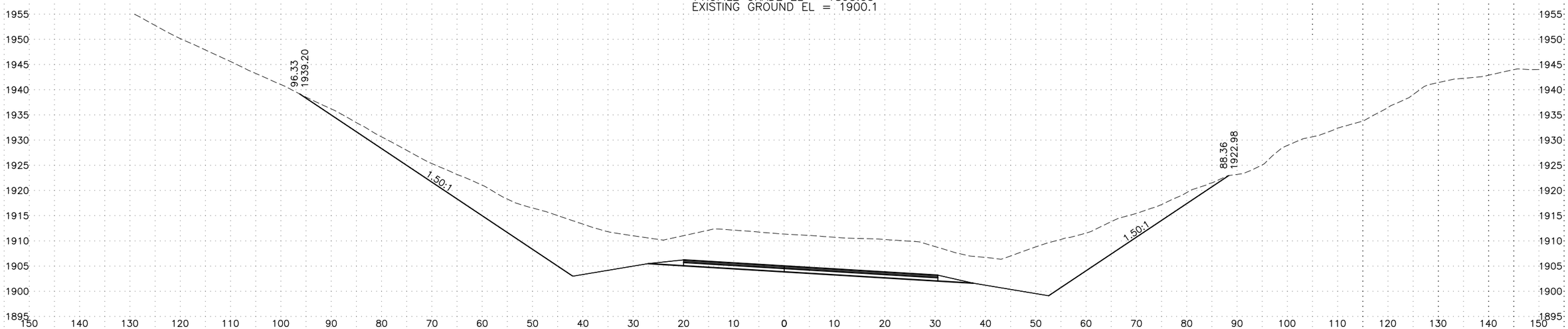
EXISTING GROUND EL = 1900.1



2523+00

PROFILE GRADE EL = 1905.03
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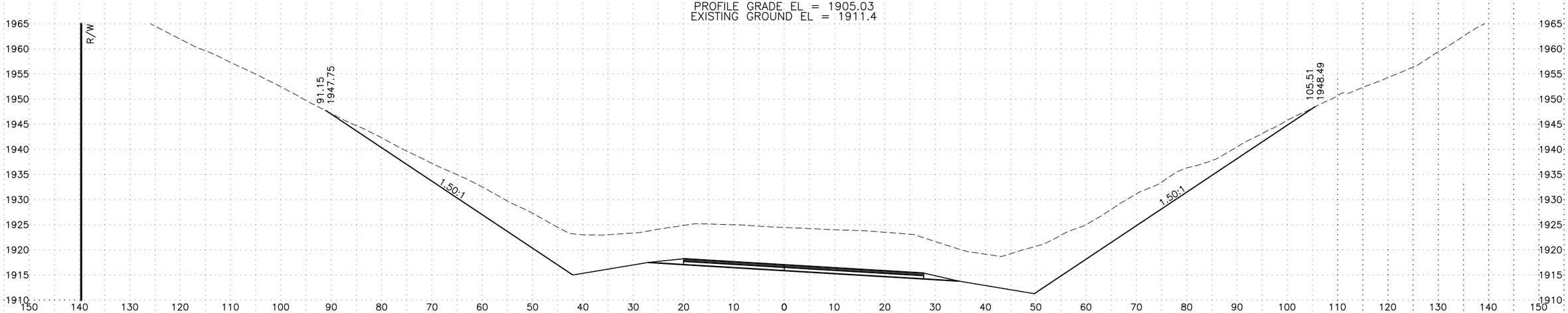

2521+00

PROFILE GRADE EL = 1917.03
EXISTING GROUND EL = 1924.4

LINE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
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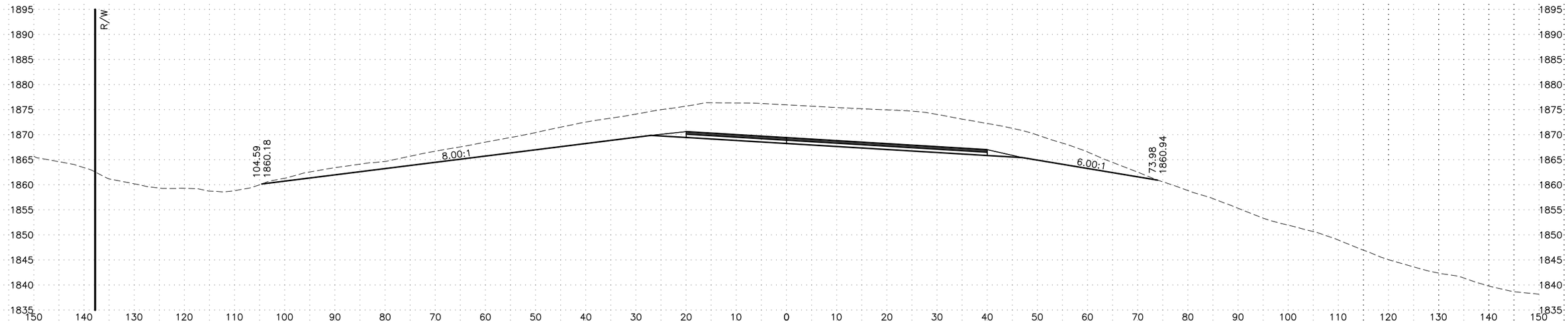

2529+00

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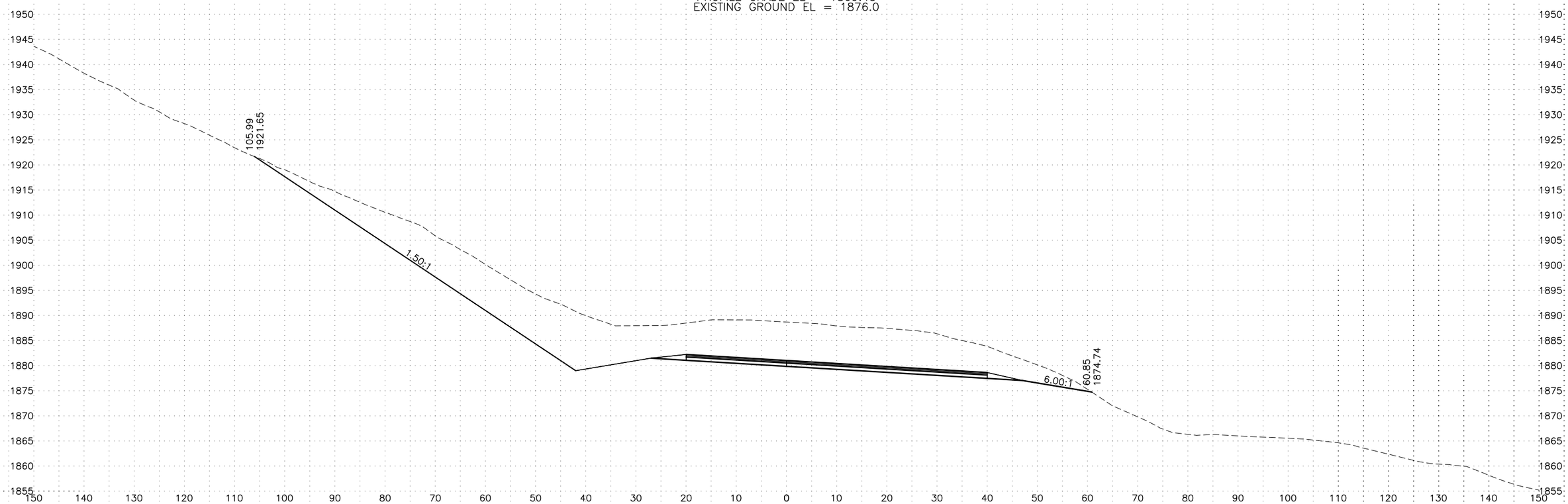
EXISTING GROUND EL = 1876.0



2527+00

PROFILE GRADE EL = 1881.03
EXISTING GROUND EL = 1888.7

LINE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
6%-04	Z612990000/0A44020	4	5

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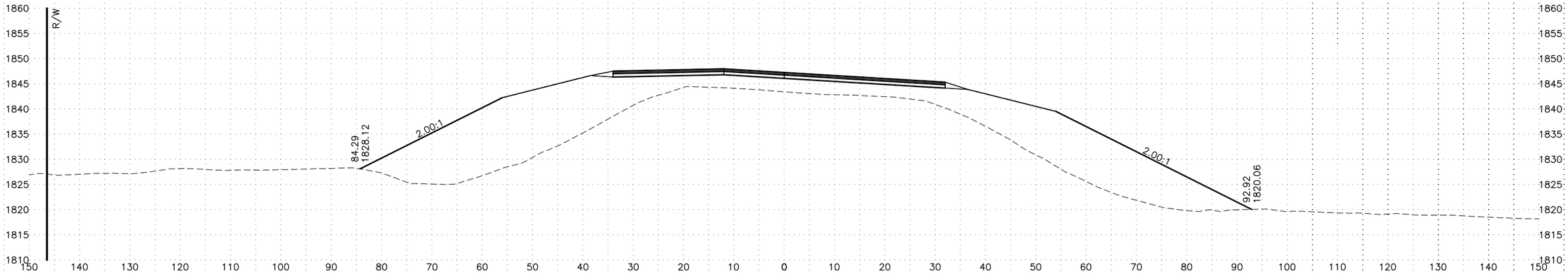

2535+00

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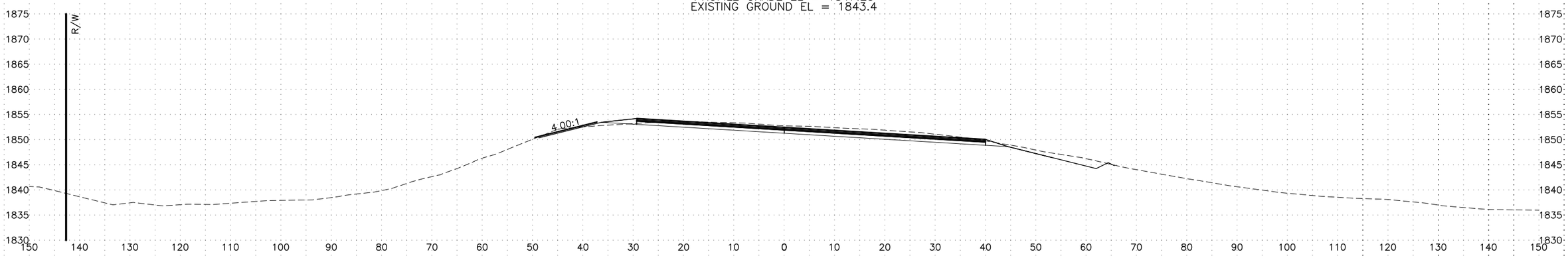
EXISTING GROUND EL = 1843.4



2533+00

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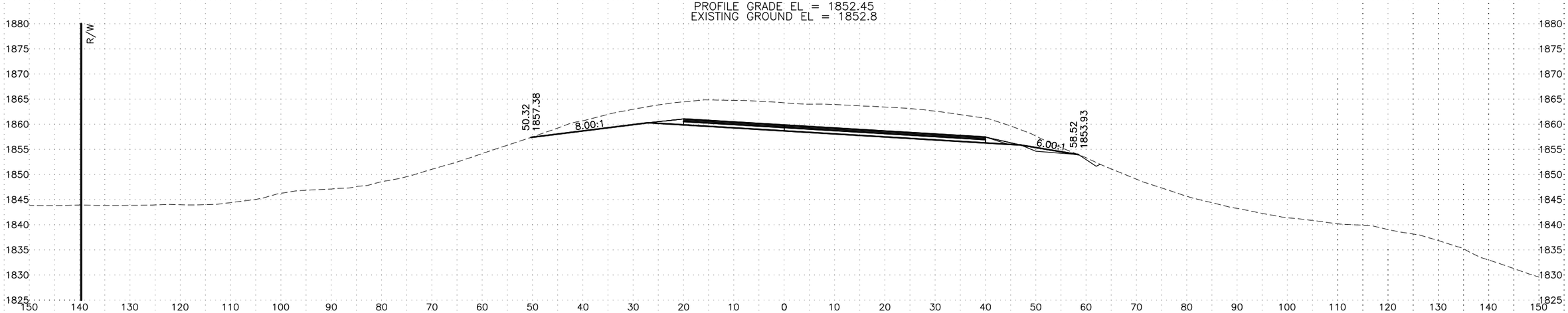
EXISTING GROUND EL = 1852.8



2531+00

PROFILE GRADE EL = 1859.84
EXISTING GROUND EL = 1864.3

LINE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
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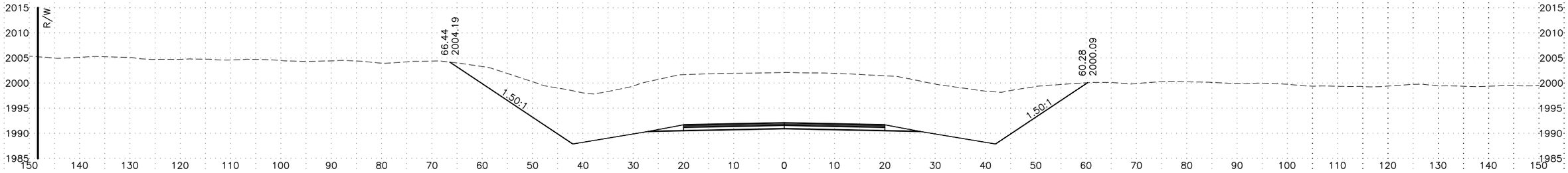
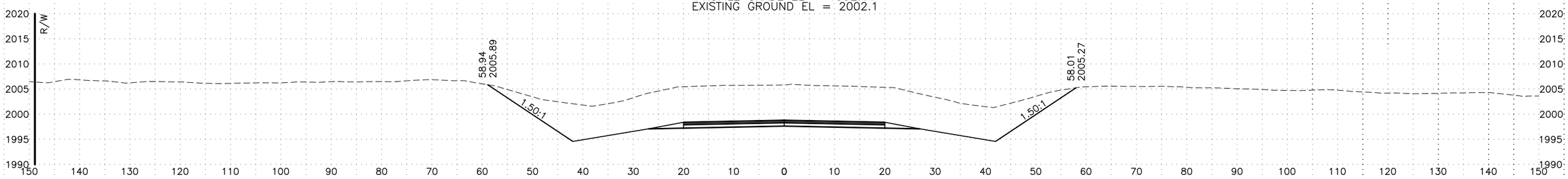


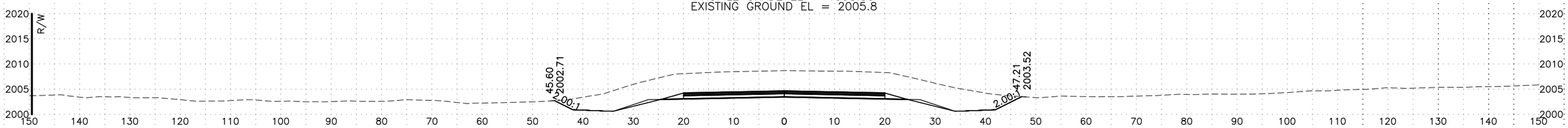
2503+00

PROFILE GRADE EL = 1992.11
EXISTING GROUND EL = 2002.1



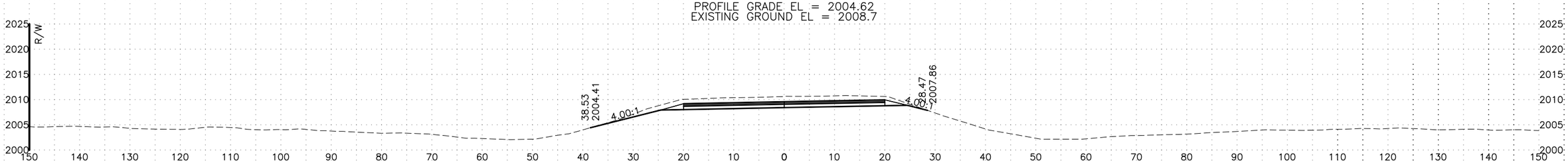
2501+00

PROFILE GRADE EL = 1998.80
EXISTING GROUND EL = 2005.8



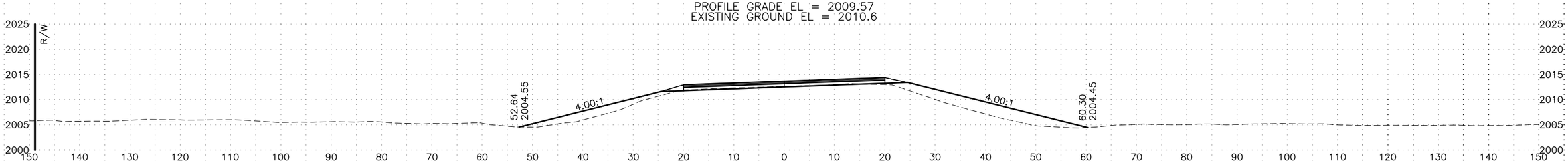
2499+00

PROFILE GRADE EL = 2004.62
EXISTING GROUND EL = 2008.7



2497+00

PROFILE GRADE EL = 2009.57
EXISTING GROUND EL = 2010.6



2495+00

PROFILE GRADE EL = 2013.66
EXISTING GROUND EL = 2012.6

LINE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
5%-01	Z612990000/0A44020	1	7

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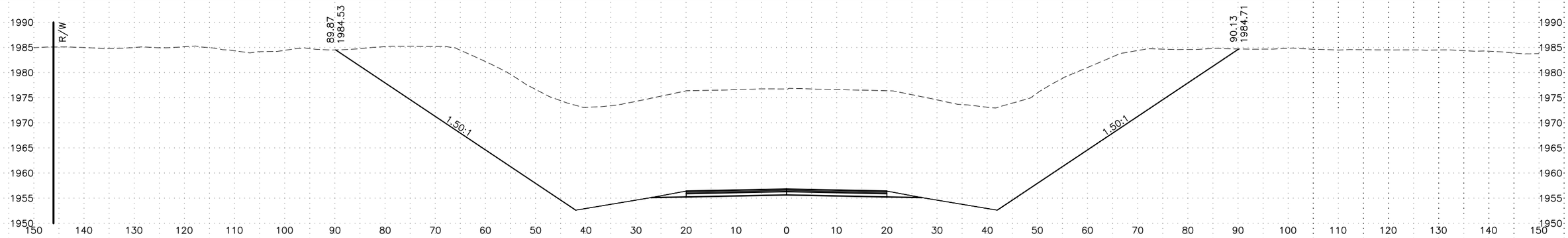
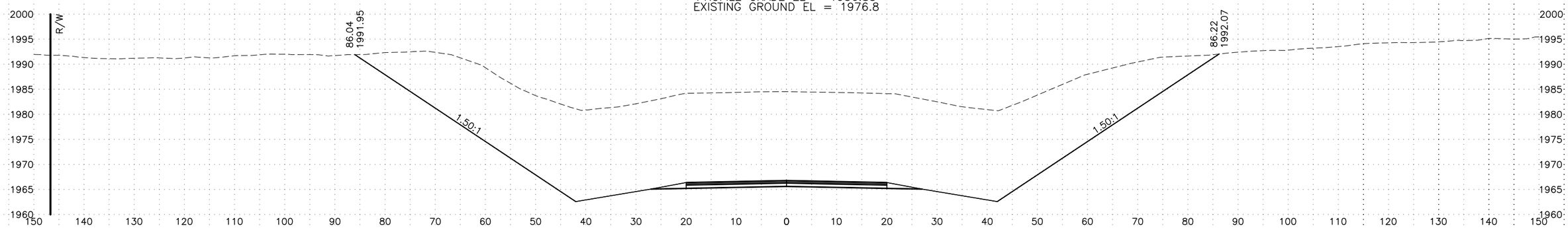


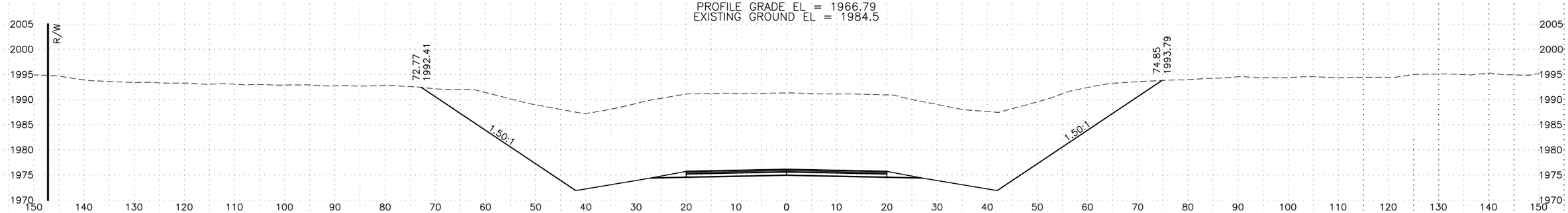
2511+00

PROFILE GRADE EL = 1956.83
EXISTING GROUND EL = 1976.8



2509+00

PROFILE GRADE EL = 1966.79
EXISTING GROUND EL = 1984.5



2507+00

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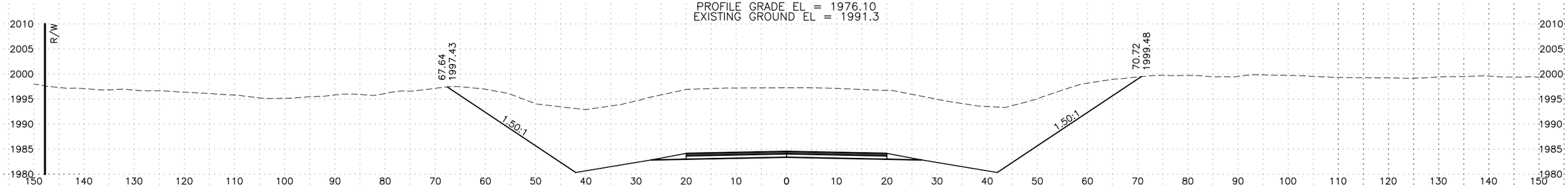
EXISTING GROUND EL = 1991.3



2505+00

PROFILE GRADE EL = 1984.54
EXISTING GROUND EL = 1997.2

LINE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
5%-02	Z612990000/0A44020	2	7

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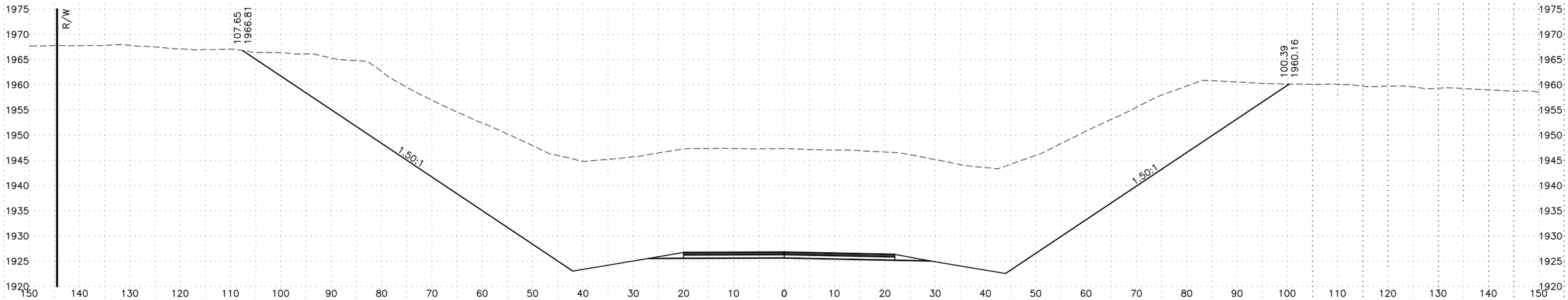

2517+00

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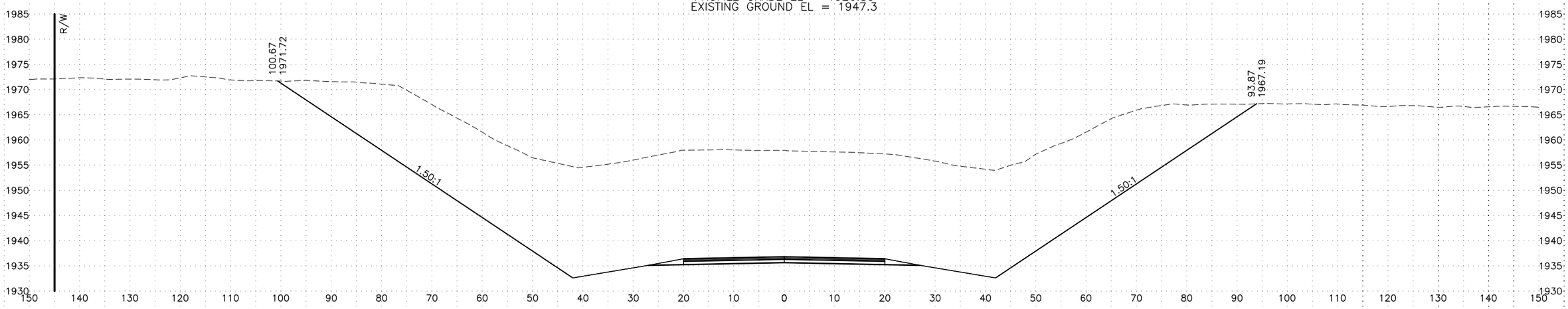
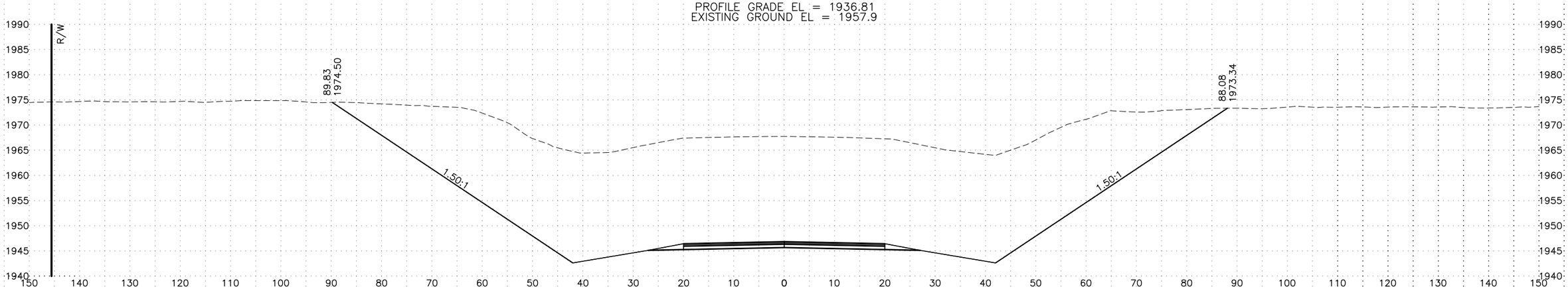


2515+00

PROFILE GRADE EL = 1936.81
EXISTING GROUND EL = 1957.9



2513+00

PROFILE GRADE EL = 1946.82
EXISTING GROUND EL = 1967.7

LINE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
5%-03	Z612990000/0A44020	3	7

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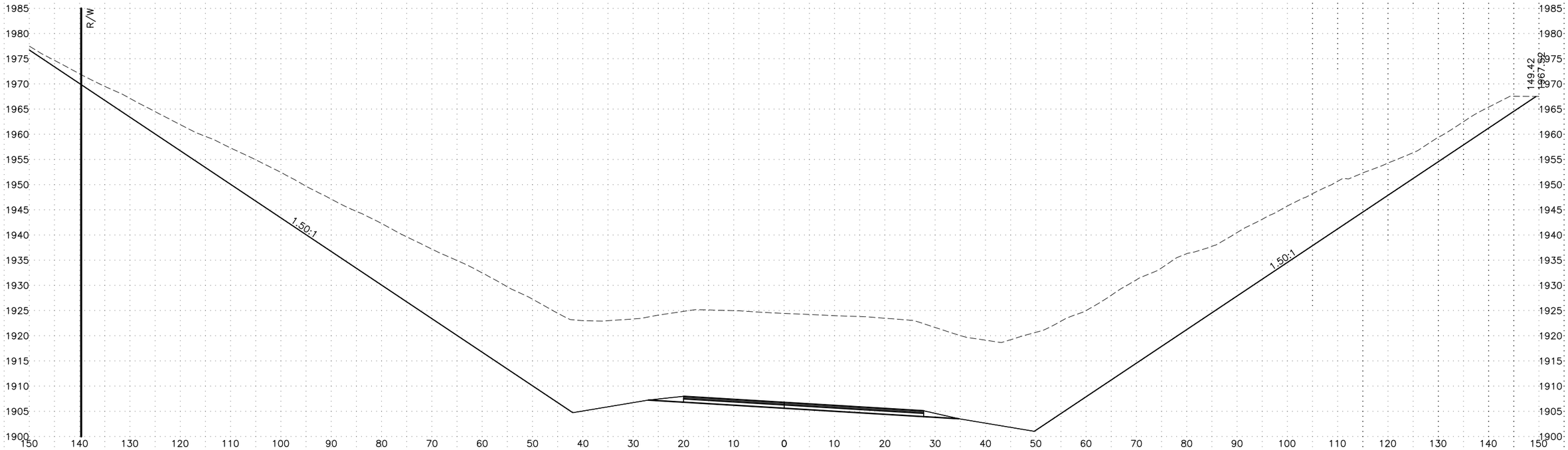
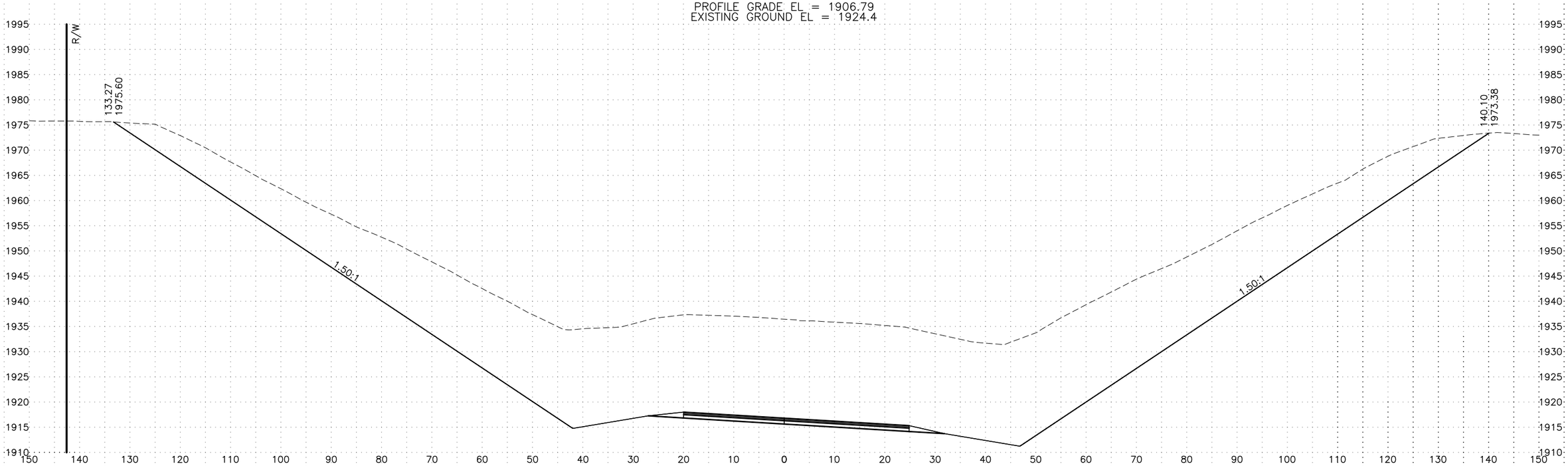


2521+00

PROFILE GRADE EL = 1906.79
EXISTING GROUND EL = 1924.4



2519+00

PROFILE GRADE EL = 1916.80
EXISTING GROUND EL = 1936.4

LINE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
5%-04	Z612990000/0A44020	4	7

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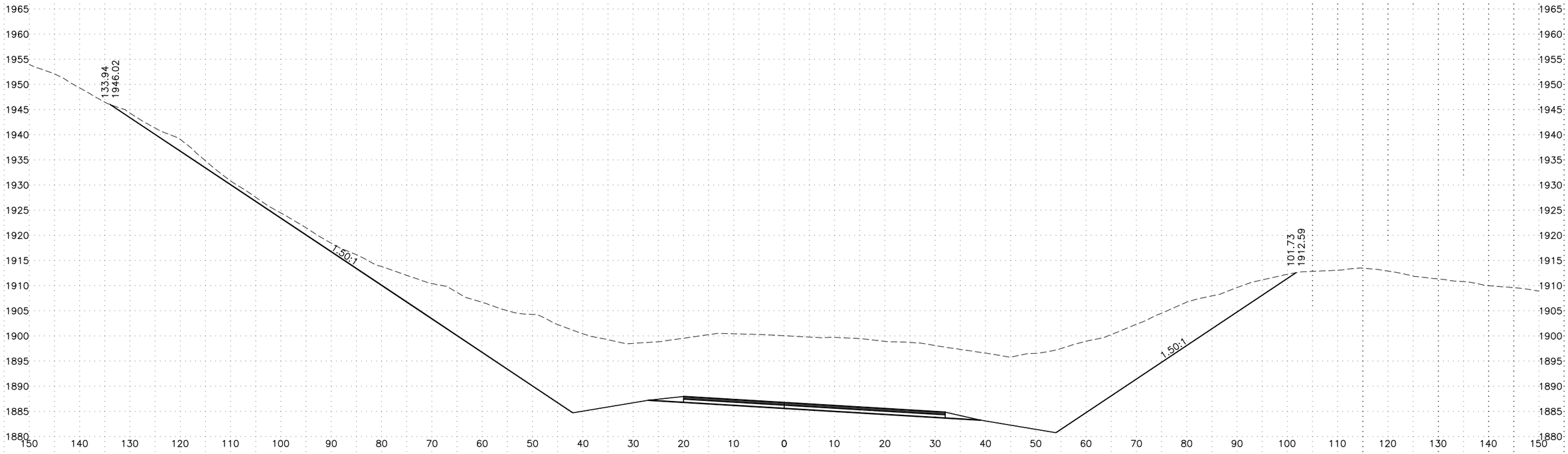

2525+00

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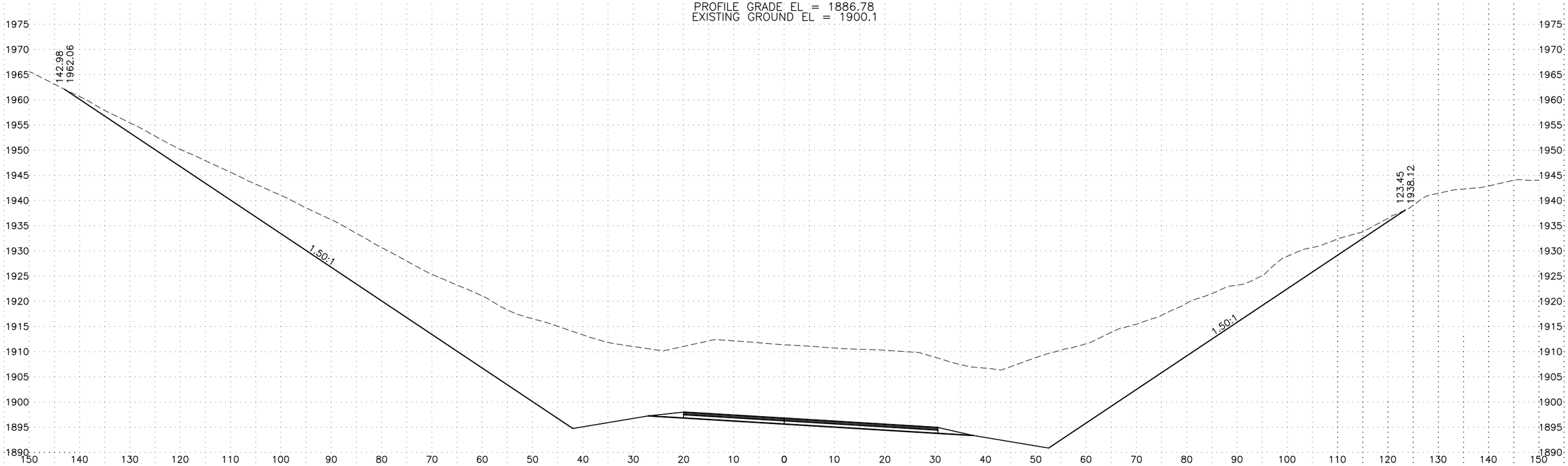
EXISTING GROUND EL = 1900.1



2523+00

PROFILE GRADE EL = 1896.78
EXISTING GROUND EL = 1911.4

LINE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
5%-05	Z612990000/0A44020	5	7

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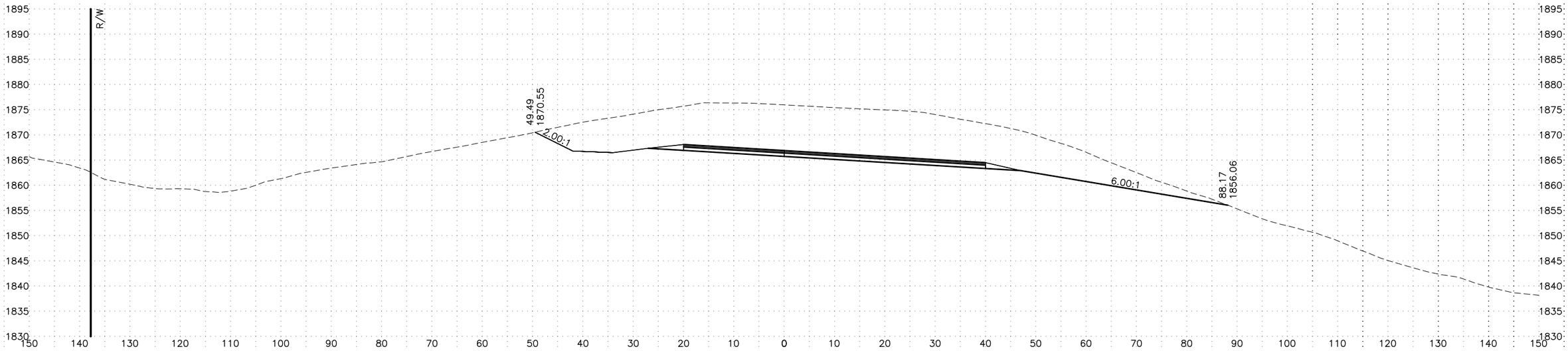
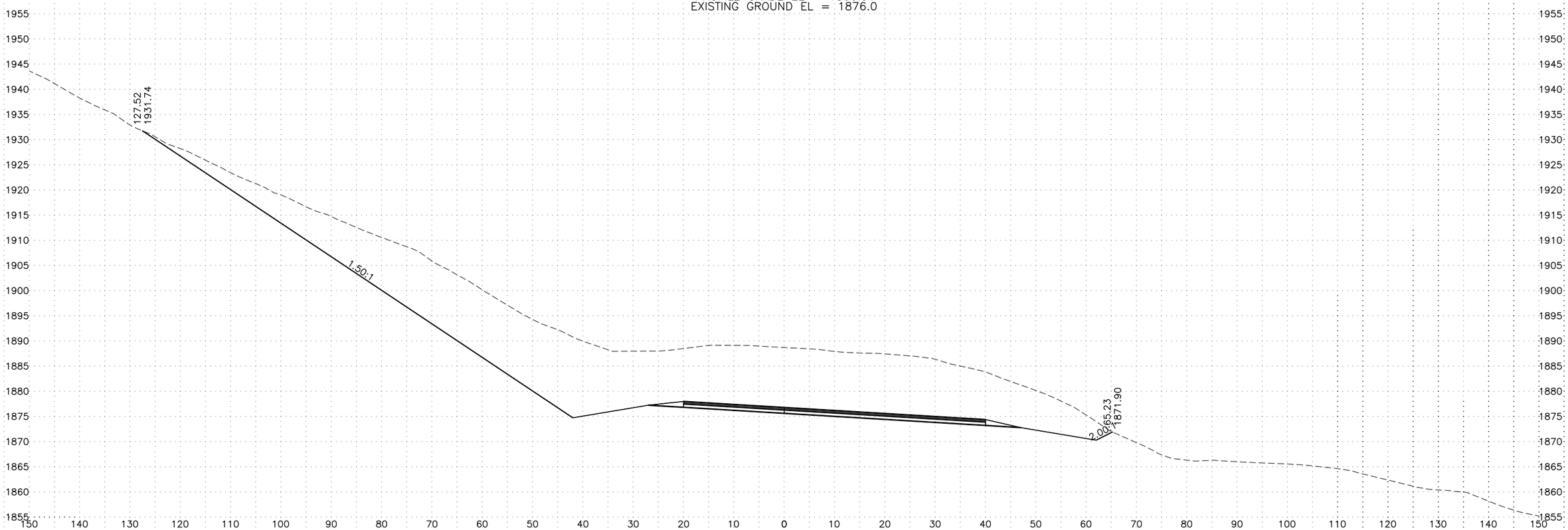


2529+00

PROFILE GRADE EL = 1866.91
EXISTING GROUND EL = 1876.0



2527+00

PROFILE GRADE EL = 1876.77
EXISTING GROUND EL = 1888.7

LINE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
5%-06	Z612990000/0A44020	6	7

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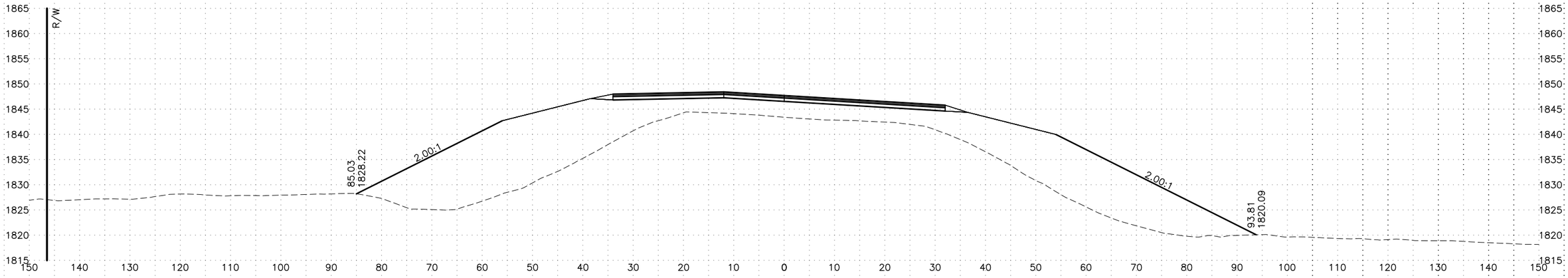
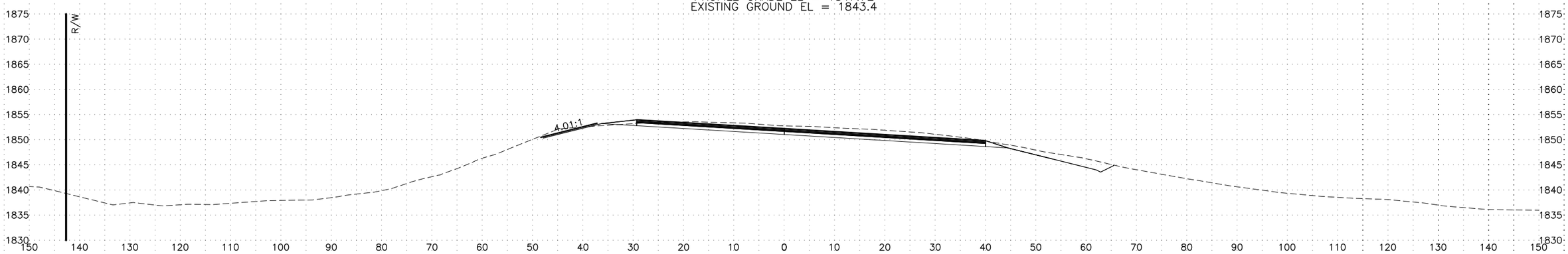


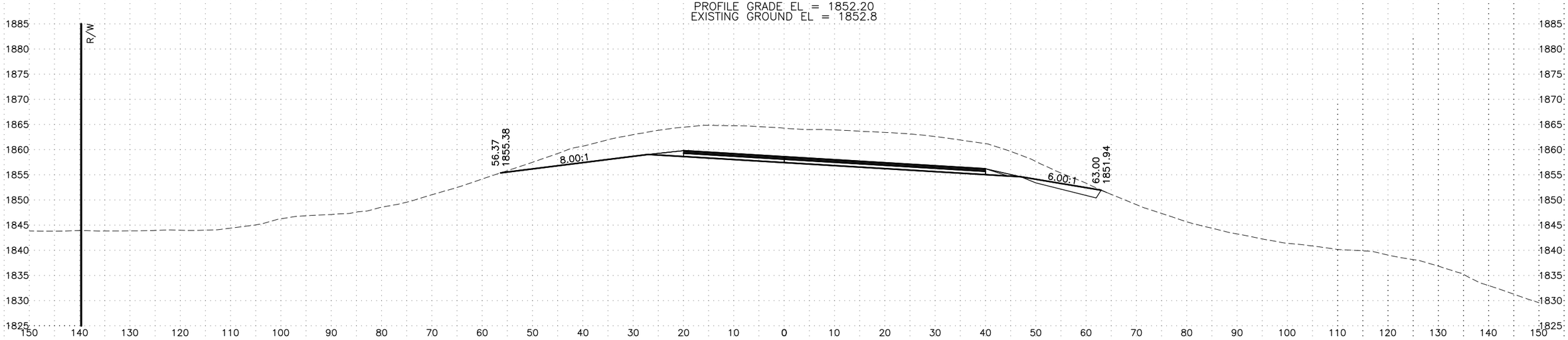
2535+00

PROFILE GRADE EL = 1847.72
EXISTING GROUND EL = 1843.4



2533+00

PROFILE GRADE EL = 1852.20
EXISTING GROUND EL = 1852.8



2531+00

PROFILE GRADE EL = 1858.60
EXISTING GROUND EL = 1864.3

LINE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
5%-07	Z612990000/0A44020	7	7

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