MEMORANDUM

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

TO: Sarah E Schacher, P.E.
Preconstruction Engineer
Northern Region

DATE: 12/06/2022

FILE NO: h:\projects\rich_hwy\60715_rich_266_341_pass_lanes\04 ps&e\02 dsr\60715_adsr_richardson hwy mp 266-341_rev8.docx

THRU: Jason Hill, P.E. JH
Delivery Team Lead
Northern Region

TELEPHONE NO: 907-451-5359

SUBJECT: Richardson Highway MP 266-341
Passing Lanes
OA23(021)/Z607150000
Abbreviated Design Study Report

FROM: Carl F. Heim, P.E.
Engineering Manager
Northern Region

1. INTRODUCTION

The Richardson Highway, south of Fairbanks, is a two-lane two-way highway designated as a Rural Interstate of the National Highway System and is an important freight route to the interior. The Richardson Highway supports a high percentage of fuel and chemical transport between Fairbanks and outlying rural Alaskan communities, as well as military convoy traffic between Fort Greeley and Fort Wainwright.

During the 2019 calendar year, the highway supported an Average Annual Daily Traffic (AADT) volume ranging from 1,135 vehicles per day (South of Quartz Lake) to 2,638 vehicles per day (South of Eielson Air Force Base Access Road). The highway is generally located in rolling terrain following the Tanana River valley and provides recreation access to multiple state and federal recreation sites. Total traffic volume is composed of 13% commercial delivery and recreational vehicles (RV), 6% of combination tractor-trailer trucks, 1% buses, and 80% passenger vehicles.

The mixture of lower speed "sightseeing" passenger vehicles, RVs and large trucks with commuter vehicles causes conflict and results in driver impatience, inattention, following too close, excessive speed, improper passing, driver fatigue, etc. These are contributing factors in severe head-on and loss of control type of crashes that occur due to lack of passing opportunities at regular intervals. Constructing passing lanes along the Richardson Highway MP 266 to MP 341 supports the goals of Alaska's Strategic Highway Safety Plan to reduce head-on crashes.

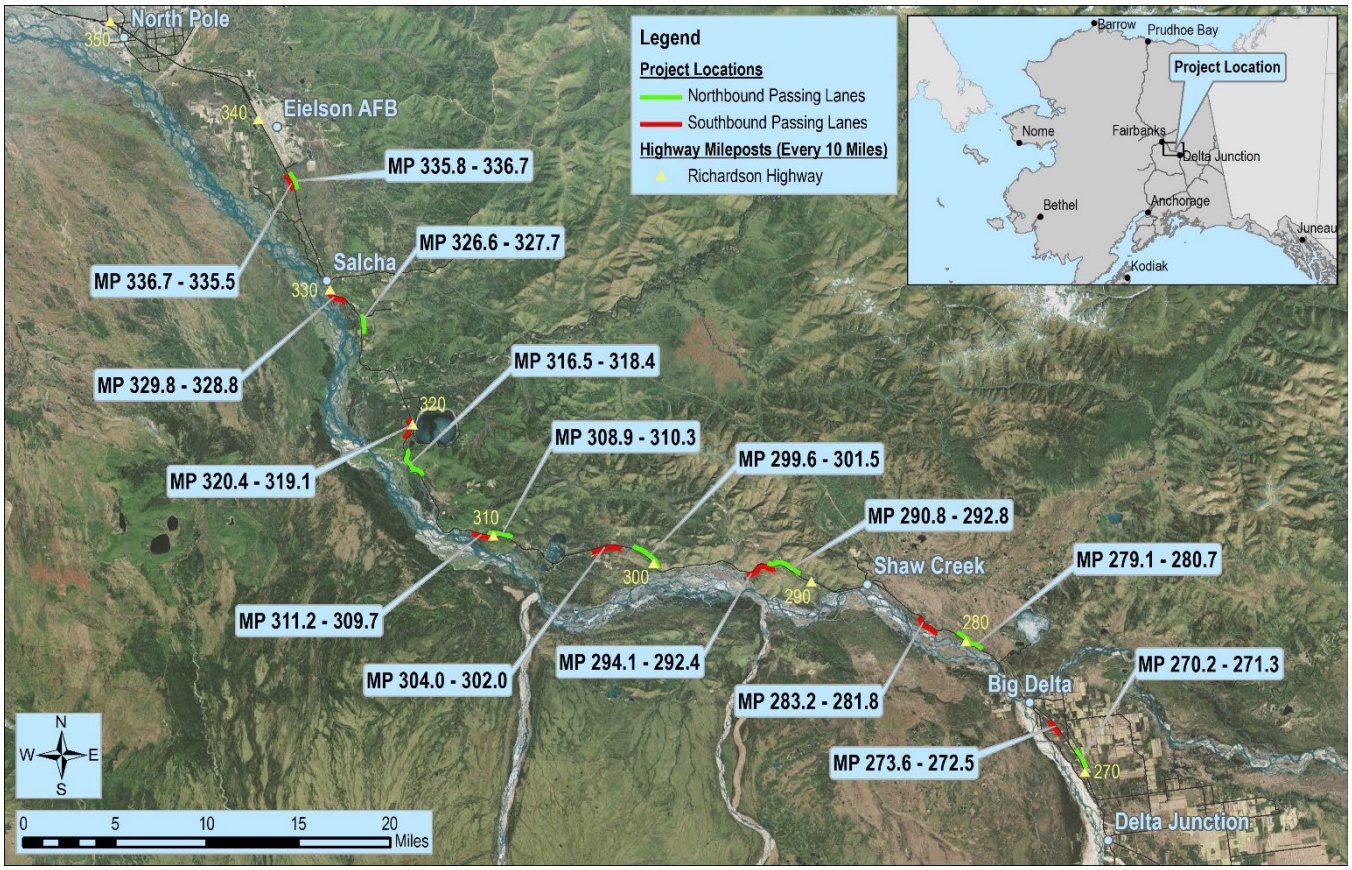


Figure 1: Location and Vicinity Map

2. PROJECT DESCRIPTION

The Alaska Department of Transportation and Public Facilities (ADOT&PF) is proposing to add passing lanes on the Richardson Highway between Delta Junction and Eielson Air Force Base (EAFB) (Mileposts [MP] 266 to 341) (Figure 1). The project study area begins on the north end at EAFB where the two-lane highway transitions into a four-lane highway, with two northbound and two southbound lanes. The project terminates at the south end near Delta Junction where the two-lane highway transitions into a four-lane highway with two northbound and two southbound lanes. Potential passing lanes have been selected in locations that would improve highway safety, capacity, and overall traffic operations. Passing lanes are an effective countermeasure to reduce conflict points for vehicles, the frequency and severity of crashes, aggressive driving behavior, and improve capacity on two-lane rural highways.

For the Richardson Highway, an 8-mile separation interval was used to determine potential locations of passing lanes due to its relatively low traffic volume and number of long tangent sections where existing passing opportunities in the opposing lane are available. Passing lanes are 1 to 2 miles in length (including tapers) to allow for breaking up of traffic platoons, sufficient passing opportunities, and transition[1]. Other improvements within passing lane locations include driveway approaches, clearing

[1] *Highway Capacity Manual* (HCM), 5th Edition, Transportation Research Board, 2010.

vegetation to the clear zone, drainage improvements, sign replacement where current signs do not meet retro reflectivity standards, new signs where applicable, and slope stabilization.

3. DESIGN STANDARDS

The design standards followed for this project are:

- *A Policy on the Geometric Design of Highways and Streets (GB), 2011, American Association of State Highway and Transportation Officials (AASHTO).*
- *Alaska DOT&PF Highway Preconstruction Manual (HPM), State of Alaska, Department of Transportation & Public Facilities (ADOT&PF).*
- *Alaska Flexible Pavement Design Manual, 2004, ADOT&PF, and associated software.*
- *Alaska Highway Drainage Manual, 2006, ADOT&PF*
- *Alaska Traffic Manual (ATM), 2016, ADOT&PF.*
- *Roadside Design Guide, 2011, AASHTO.*
- *Manual on Uniform Traffic Control Devices (MUTCD), 2009 as amended, U.S. DOT, FHWA).*
- *Highway Capacity Manual (HCM), 5th Edition, Transportation Research Board, 2010.*

The posted speed within the passing lane locations is 65 mph, and a 70 mph design speed was used for roadway widening in this area. See Appendix A for Design Criteria and Design Designations.

4. DESIGN EXCEPTIONS AND DESIGN WAIVERS

Per the HPM, section 1120.1 paragraph 1, "Use the design criteria set forth in the AASHTO *A Policy on the Geometric Design of Highways and Streets 2011*, as appropriate to the scope of any given project." It is not in the scope of this project to upgrade horizontal or vertical curvature for the current roadway. Roadway widening will match current horizontal and vertical curvature and roadway cross slopes. Therefore, a design exception or design waiver is not applicable for any horizontal or vertical curvature that may not meet current design standards.

5. DESIGN ALTERNATIVES

16 Bi-Directional Passing Lanes

This proposed alternative would construct 16 passing lanes to improve safety by providing assured passing opportunities and accommodate large vehicle traffic.

The location of the proposed passing lanes takes into account traffic operation of nearby intersections and passing lanes in the opposing direction of travel. Proposed passing lanes are generally located in pairs, where improvements to existing climbing lanes are feasible, and placed at regular intervals along the highway so as to provide sufficient passing opportunities and reduce driver frustration. Locations where a slow vehicle is most likely to be encountered were identified. These locations include uphill grades, developed areas where left-turning traffic is likely to occur, and at eight to 13 mile intervals along the highway where platooning traffic is likely to develop. Passing lanes should begin at, or be

extended to locations where truck speeds can be sustained to within a minimum of 10 mph, or desirably within 5 mph, of the design speed[2].

There are existing northbound and southbound designated climbing/passing lane sections within the project area that are included in the recommended passing lane locations. Generally, these existing lanes are shorter than desired and the adjacent shoulder widths are less than that required for new construction.

The existing climbing/passing lanes are shown in Table 1 below.

Table 1: Existing Climbing/Passing Lanes on Richardson Highway

Southbound	
MP	
Begin	End
310.7	309.7
302.5	302.1
299.1	298.7
294.0	292.4

Northbound	
MP	
End	Begin
310.3	309.3
301.5	301.1
292.8	291.9
280.7	280.3

Locating intersections within passing lanes should be done with careful consideration. A 1,500 foot separation is recommended from nearby street intersections where high turning volumes occur so that the intersection's traffic operation is unaffected by the passing lane. This separation distance exceeds the perception and reaction times listed in Table 2C-4 of ATM 2016 for the 65 mph posted speed where a lane change is required.

Sight distances conforming to the GB and the ATM recommended separation interval distances at conflict areas are used to identify the passing lane improvement limits. At the beginning and end of each passing lane, a clear line of sight of 1,000 feet is desirable as the vehicle enters the lane addition or merge transition taper.

Separation intervals included consideration of the existing four-lane section at either end of the project study area at MP 266 and MP 341.

The proposed passing lane locations are listed in Table 2.

[2] *A Policy on the Geometric Design of Highways and Streets (GB), 2011, American Association of State Highway and Transportation Officials (AASHTO)*

Table 2: Proposed Passing Lane Locations

Southbound				Northbound			
MP		Length (mi.)	Distance from Previous (mi.)	MP		Length (mi.)	Distance from Previous (mi.)
Begin	End			End	Begin		
336.7	335.8	1.0	4.0	336.7	335.8	1.0	8.0
329.8	328.8	1.0	6.0	327.7	326.6	0.9	8.1
320.4	319.1	1.3	8.3	318.4	316.5	1.9	6.0
311.2	309.7	1.5	7.7	310.3	308.9	1.3	7.3
303.9	302.1	1.7	5.8	301.5	299.6	1.9	6.5
294.1	292.4	1.7	7.7	292.8	290.8	2.0	9.8
283.2	281.8	1.4	9.0	280.7	279.1	1.7	7.6
273.6	272.5	1.0	8.2	271.3	270.2	1.1	3.7

6. PREFERRED DESIGN ALTERNATIVE

Of the 16 passing lane locations evaluated, 10 locations were selected based on available Right of Way (ROW), consideration of potential utility relocation, environmental impacts due to blasting, construction costs, and constructability. The 10 selected passing lanes locations and the six locations removed from consideration are discussed in the following sections.

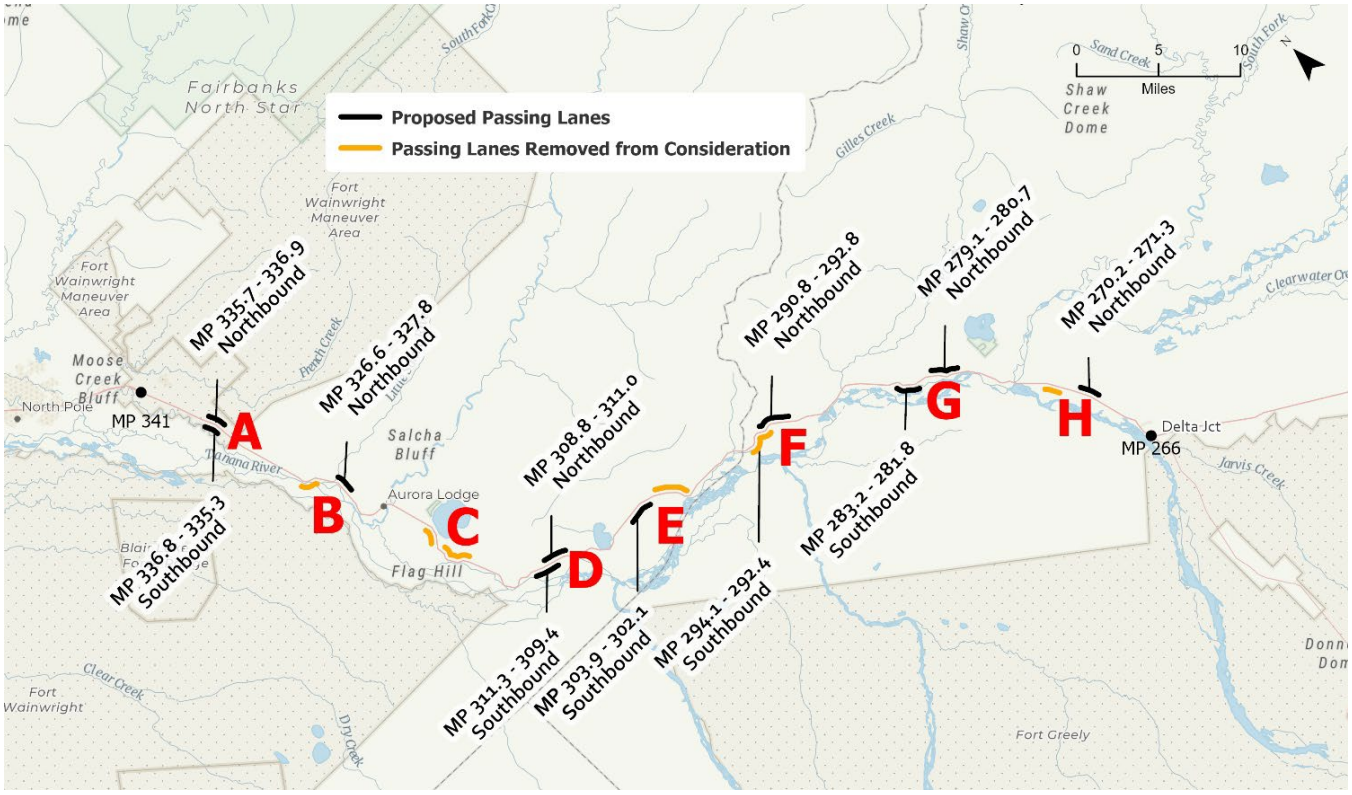


Figure 2: Proposed Passing Lane Locations

Passing Lanes Selected:

The 10 selected passing lane locations are described in detail below.

Table 3. Project Summary

Southbound				**Northbound**			
MP		Length	Distance from Previous	MP		Length	Distance from Previous
Begin	End	(mi.)	(mi.)	End	Begin	(mi.)	(mi.)
336.8	335.3	1.2	4.0	336.9	335.7	1.2	7.9
				327.8	326.6	1.2	8.1
311.3	309.4	2.1	24.0	311.0	308.8	2.2	15.6
303.9	302.1	1.7	5.5				
				292.8	290.8	2.0	16.0
283.2	281.8	1.4	18.9	280.7	279.1	1.7	7.8
				271.3	270.2	1.1	3.7

MP 336.8 – 335.3 Southbound and MP 335.7 – 336.9 Northbound

Northbound and southbound passing lanes are recommended immediately south of the south EAFB gated access road, maintaining 1,500 feet of separation from the intersection. This location is recommended as it provides a suitable separation interval between the Richardson Highway four-lane section at Moose Creek and recommended passing lanes near Salcha. This location is south of EAFB, does not encroach on adjacent EAFB lands, and no approaches are affected.

MP 326.6 – 327.8 Northbound

A northbound passing lane is recommended north of the Salcha Elementary School speed reduction zone where the posted speed is reduced to 55mph. The separation distance is 8.1 miles from the previous northbound passing lane. This location is the first opportunity to provide a dedicated northbound passing lane north of where the posted speed increases to 65mph. The north end of the passing lane would end approximately 800 feet prior to the Little Salcha River Bridge to avoid bridge widening.

MP 311.3 – 309.4 Southbound and MP 308.8 – 311.0 Northbound

A southbound passing lane is recommended to take advantage of an uphill grade and extend an existing southbound climbing lane (MP 309.7 to 310.7). The southern end of the passing lane ends at the existing climbing lane's merge taper, past the hill crest, where truck speeds to within 10 mph of the posted speed can be achieved.

A northbound passing lane is recommended to take advantage of an uphill grade and extend an existing northbound climbing lane (MP 309.3 to 310.5). The passing lane begins 0.4 mile south of the existing climbing lane and at the toe of an uphill slope so that vehicle speeds are maintained as passing begins.

Recommended improvements include widening the existing paved shoulder to 8 feet to maintain consistency with the rest of the highway and conform to new construction standards.

MP 303.9 – 302.1 Southbound

A southbound passing lane is recommended to take advantage of an uphill grade and extend an existing southbound climbing lane (MP 302.5-302.1). The proposed southbound passing lane terminates over the crest of the hill where the existing climbing lane ends and where truck speeds can be maintained to within 10 mph of the posted speed. Recommended improvements include widening the existing paved shoulder to 8 feet to maintain consistency with the rest of the highway and conform to new construction standards.

MP 290.8 – 292.8 Northbound

A northbound passing lane is recommended to take advantage of an uphill grade and extend the existing climbing lane (MP 291.9-292.8) approximately 1 mile south. This location takes advantage of slowing vehicles on a 4-mile climb at grade as the roadway moves away from the Tanana River Valley.

MP 283.2 – 281.8 Southbound and MP 279.1 – 280.7 Northbound

A southbound passing lane is recommended south of Shaw Creek where passing in the opposing lane is prohibited through a series of horizontal reverse curves. This location takes advantage of horizontal curvature where slow vehicles are likely to be encountered and wetland impacts are avoided.

A northbound passing lane is recommended where passing in the opposing lane is prohibited through a series of horizontal reverse curves. The existing northbound passing lane (MP 280.3-280.7) will be extended south approximately 1.3 miles.

MP 270.2 – 271.3 Northbound

A one-mile long northbound passing lane is recommended to begin approximately 3.6 miles from the existing Richardson Highway four-lane section at Delta Junction (MP 266.4) where the posted speed increases to 65mph. This location provides the first dedicated passing lane opportunity after the increase in posted speed at a location where passing in the opposing lane is currently prohibited. Potential impacts include relocation of the overhead fiber optic line to provide hazard-free recoverable slopes within the clear zone offset.

Proposed Passing Lanes Removed from Consideration:

The following six passing lanes were evaluated, but are not recommended for construction based on the detailed description below.

MP 329.8 – 328.8 Southbound

The southbound passing lane at this location could not be designed without affecting the Tanana floodplain. Several alternatives were considered to avoid widening the highway on the riverside and placing fill within the floodplain, such as shifting the existing centerline away from the Tanana River and steepening side slopes. However, based on the geotechnical evaluation, the existing cut slope on the northbound side of the highway is unstable and will not accommodate re-alignment inland. Relocating the southbound passing lane was also considered, and after initial design, research deemed this infeasible due to the geometric constraints of sight distance, the high density of driveways and nearby bridges. Based on these impacts, this passing lane was removed from the preferred alternative.

MP 320.5 - 319.0 Southbound and MP 316.4 - 318.5 Northbound

A southbound passing lane was evaluated at Harding Lake to take advantage of an uphill grade where slow vehicles may be encountered during summer months, due to a higher percentage of left-turning RV and boat-trailer traffic accessing Harding Lake. After design and cost analysis, this passing lane was eliminated due to the high amount of utility relocations required.

A northbound passing lane south of Harding Lake was evaluated to take advantage of an uphill grade and horizontal reverse curves improving efficient passing of slow vehicles. This lane was eliminated due to the need for substantial slope blasting, creating the potential for significant environmental impacts and construction schedule delays.

MP 299.6 - 301.5 Northbound

A northbound passing lane was evaluated to take advantage of an uphill grade and 55 mph advisory signed horizontal reverse curves where slow vehicles are likely to be encountered. Construction of this passing lane includes extensive cut and fill slopes as the roadway traverses away from the Tanana River Valley. This lane was eliminated due to the need for substantial slope blasting, creating the potential for significant environmental impacts and construction schedule delays.

MP 294.1 – 292.4 Southbound

A southbound passing lane was evaluated to take advantage of an uphill grade and extend the existing passing lane (MP 294.0-292.4). However, there is a significant amount of ground settlement occurring at this location and it was removed from consideration based upon constructability concerns and recommendations from ADOT&PF Geotechnical staff.

MP 273.6 – 272.5 Southbound

A southbound passing lane was evaluated at this location based on the desired 8-mile separation interval between the previous southbound passing lane at MP 281.8 and terminating at least 1,500 ft. north of the Deltana Volunteer Fire Department No. 5 driveway. However, due to a narrowed ROW at this location, construction would not be feasible without acquisitions. Shifting the passing lane south would bring the merge termination to an undesirable distance from the Deltana Volunteer Fire Department driveway. Shifting the passing lane north would not reduce the amount of ROW acquisitions needed to construct the southbound widening for the additional lane. Based on these impacts, this passing lane was removed from the preferred alternative.

7. 3R ANALYSIS

Not applicable for the scope of this project.

8. TRAFFIC ANALYSIS

Crashes reported from 2008 through 2012 (five-year period) were reviewed to determine crash experience on the Richardson Highway between North Pole and Delta Junction. During the five-year period, 250 crashes were reported and classified as follows:

- 80 crashes (32%) involved moose/animals;
- 144 crashes (58%) are non-intersection related, and;
- 26 crashes (10%) are intersection related.

Analysis of Alaska's statewide crash data revealed that 35% of crashes involve impatient driving behavior from causation factors described in the Alaska Highway Safety Plan, FFY2015 (ADOT&PF 2015b). Impatient driving behavior on highway segments is indicated by causation factors such as unsafe speed, following too closely, improper lane usage/change, improper passing, disregard for non-signal traffic control devices, and emotional driving. Similar behavior at intersections is indicated by causation factors such as failure to yield and improper turns. These causation factors were applied to the five-year period crashes pre-event condition to screen for crashes that should be directly addressed by passing lanes along the highway. That analysis resulted in 28 of the 144 non-intersection crashes and 12 of the 26 intersection related crashes that are related to impatient driving. Combined, this is 24% of the total crashes (not including moose/animal crashes).

9. HORIZONTAL/VERTICAL ALIGNMENT

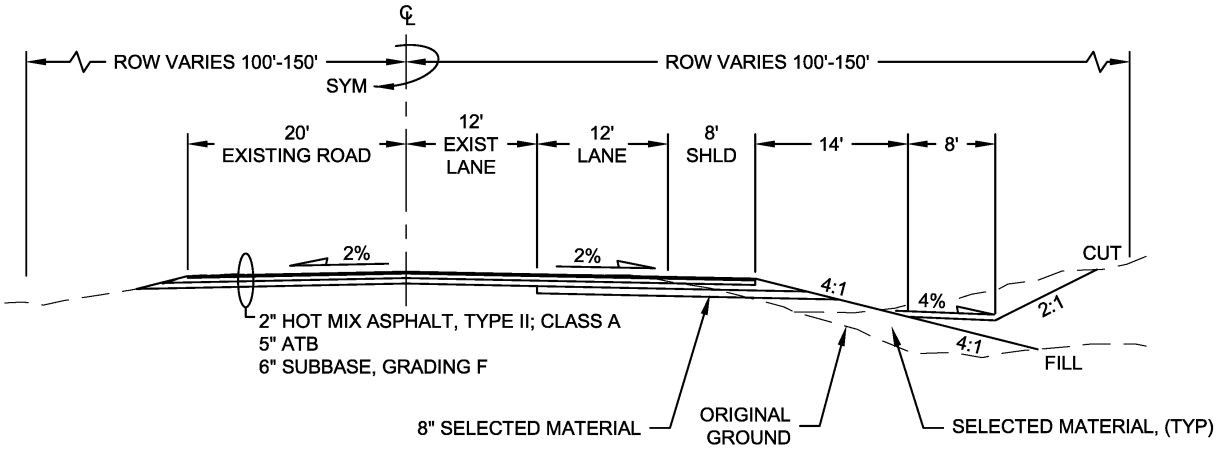
No horizontal or vertical adjustments will be made to the existing roadway profile. The super elevation of the existing Richardson Highway roadway will be matched and extended through to the passing lane widening.

11. TYPICAL SECTION

The existing Richardson Highway typical section will be maintained (two 12-ft lanes with 8-ft shoulders) with the addition of a northbound 12-ft lane, a southbound 12 ft-lane, or two 12-ft lanes in the passing sections. The existing paved surface will be excavated from edge of pavement to edge of pavement and replaced with a structural section consisting of:

- 2” HMA, Type II; Class A
- 5” ATB
- 6” Subbase, Grading F

The standard roadway section is shown below.



RICHARDSON HIGHWAY
ONE DIRECTION WIDENING

12. PAVEMENT DESIGN

The selected pavement design was developed using the Alaska Flexible Pavement Manual and associated software. The preliminary pavement design was based on General Policy-6 which requires a minimum of one layer of binder course, stabilized base, and a 30-year design life. General Policy-10 requires a minimum 2 inches of asphalt concrete thickness. The pavement design was analyzed using the mechanistic design method.

The preliminary preferred pavement structure will consist of:

- 2” HMA, Type II; Class A
- 5” ATB
- 6” Subbase, Grading F
- 8” Selected Material, Type A

Fill placed below the structural section will consist of mineral soil that is free of debris, ice, excess moisture, and other deleterious materials, meeting the requirements for Selected Material, Type B, except existing embankment material meeting the requirements of Selected Material C. A layer of geotextile will be placed outside of the existing embankments, over the existing ground prior to the placement of fill. The geotextile will meet the requirements for Separation as detailed in Section 729 of the DOT&PF Standard Specifications for Highway Facilities, 2020.

Encountering groundwater during typical embankment construction is not likely; however, groundwater levels are variable throughout the project corridor and can fluctuate. Construct embankments to promote drainage towards ditches in a manner that minimizes erosion potential. Construct ditches to a minimum depth of 3 feet below the pavement surface to minimize movement of water through the roadway structural section, promote drainage away from embankment, and minimize ponding near the embankment toe.

POTENTIAL DIG OUT LOCATIONS:

MP 290.8 to MP 292.8: Observed depressions and pavement distresses are present throughout this section at locations that appear to correspond with existing culverts. Match the overall existing structural section thickness for dig outs constructed in this location.

13. PRELIMINARY BRIDGE LAYOUT

No bridges are located within the passing lane locations.

14. RIGHT-OF-WAY REQUIREMENTS

All work will stay within the existing ROW.

15. MAINTENANCE CONSIDERATIONS

A riprap dike protects the highway along the Tanana River where the river has meandered increasingly closer to the highway. In areas where potential roadway widening is toward the river, the design will enhance the riprap slope as part of the project improvements.

In the project kick-off meeting, Maintenance and Operations (M&O) mentioned concerns with the road/pavement quality in the Tenderfoot Creek area, specifically road buckling that continues to occur near MP 293. The passing lanes within this area were removed from further consideration due to geotechnical recommendations. M&O also requested the use of driven pile signage and to grade side slopes such that they can be easily mowed.

The preferred passing lane additions would add approximately 16 lane-miles of roadway for M&O snow removal and other maintenance considerations.

16. MATERIAL SOURCES

To reduce material hauling and construction costs, the project proposes to extract material from four different material sites (see Table 4 for locations) spaced throughout the project corridor. The material extraction areas range in size from approximately 12 to 21 acres and are anticipated to provide an aggregate total of approximately 200,000 cubic yards of fill.

Table 4: Proposed Material Extraction Sites

Site	Milepost	Section(s)	Township	Range	Meridian	USGS Quadrangle	Latitude Longitude
MS 62-4-013-2	330.7	19	004S	004E	Fairbanks	Fairbanks C-2	64.54765 -147.02430
MS 62-4-096-2	314.1	36	006S	004E	Fairbanks	Big Delta B-6	64.35499 -146.85576
MS 62-4-105-2	295	28, 29	007S	007E	Fairbanks	Big Delta B-5	64.284355 -146.354601
MS 62-3-157-2&2A	276.5	6	009S	010E	Fairbanks	Big Delta A-4	64.166627 -145.86912

17. UTILITY RELOCATION & COORDINATION

Overhead and underground telecommunications lines run adjacent to the roadway throughout the project corridor. Some overhead crossings may require a line watch during construction.

Potential impacts will require the relocation of the underground fiber optic line to provide adequate coverage and hazard-free recoverable slopes within the clear zone offset from MP 270.2 to 271.3 in the northbound passing lane area.

18. ACCESS CONTROL FEATURES

Full access control exists along the Richardson Highway from Fairbanks to EAFB. This project will not alter access controlled areas. Access control through the project extents is maintained through the driveway permitting process.

19. PEDESTRIAN/BICYCLE (ADA) PROVISIONS

Pedestrians and bicycles will continue to utilize roadway shoulders.

20. SAFETY IMPROVEMENTS

Passing lanes improve safety and level of service on two-lane highways not only within the length of the added passing lane, but also downstream for four to five miles on the highway. Installing passing lanes as a countermeasure has been shown to reduce crashes up to 42%[3]. In Alaska, the Highway Safety Improvement Program (HSIP) has allowed a crash reduction of 25% of all crashes to be applied 5 miles

[3] *Benefits and Design/Location Criteria for Passing Lanes*, 2004, Missouri Department of Transportation (MoDOT)

downstream of a passing lane, recognizing its influence over long highway segments. Improved safety may be extended even further downstream where passing lanes are constructed systemically at intervals due to reduced traffic platooning on rural two-lane highways where typically low volumes occur.

21. INTELLIGENT TRANSPORTATION SYSTEM FEATURES

Not applicable for the scope of this project.

22. DRAINAGE

This project will replace or lengthen existing culverts in the passing lane locations. Culverts identified in the Drainage Assessment – Richardson Highway MP 266-341 Passing Lanes, October 2017 memo as needing replacement will be replaced, otherwise existing culverts will be lengthened where needed.

With some exceptions, topography is generally sloped towards the Tanana River from north to south and east to west. Runoff from the road surface is generally collected in side ditches draining to crossing culverts. Multiple culverts discharge directly to the Tanana River and its side sloughs, or small tributary streams. Existing cross culverts are 24 to 36 inches in diameter. Based on the review of as-built drawings, many of these pipes were installed in the 1960's. Existing ditches and culverts generally appear to be adequately sized and conveying surface runoff away from the roadway.

23. SOIL CONDITIONS

Silt and silt-rich soils will be exposed in the subgrade during construction and will be sensitive to moisture, making them difficult to compact. The design will limit exposure of the subgrade to reduce moisture exposer and to maintain the integrity of the subgrade.

In general, the excavated materials below stripping depth will meet the requirements for Selected Material, Type C.

24. EROSION AND SEDIMENT CONTROL

The Contractor will prepare a Storm Water Pollution Prevention Plan (SWPPP) prior to construction in accordance with Alaska Pollution Discharge Elimination System (APDES) General Permit for Alaska and the Storm Water Pollution Prevention Plan Guide. An Erosion and Sediment Control Plan (ESCP) will be included in the contract. The Contractor will be responsible for adapting the Department's ESCP to the Contractor's ways and means, and for providing and maintaining controls of erosion and hazardous materials. All disturbed areas will be stabilized to prevent erosion both during and after construction. APDES, Corps of Engineers Section 404/10, and Alaska Department of Environmental Conservation 401 permits are required.

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 will be installed at the toe of slopes and disturbed areas within

the project limits to prevent excessive sedimentation to down-slope vegetation and water bodies. The preferred perimeter protection method in the project area will be vegetated buffer. BMP's may include erosion control blankets, diversions berms, wattles and other measures. Seeding of finished slopes may be difficult due to the size of the slopes and lack of sunlight. Use of organic overburden and/or long term erosion control blankets will be investigated to assist in establishing vegetative cover.

All disturbed ground, approximately 78 acres, will be topsoil and seeded or covered with riprap or ditch lining for permanent stabilization.

25. ENVIRONMENTAL COMMITMENTS

The project will include environmental commitments to comply with state and federal environmental protections. A full list, including permit conditions, will be compiled with the final PS&E once the permits have been issued. The project is anticipated to require a U.S. Army Corps of Engineers Nationwide Permit for approximately 1.2 acres of impacts to wetlands. Wetland impacts will be reduced to the maximum extent practicable during final PS&E development. The Department intends to adhere to the USFWS guidance on avoiding mechanized vegetation clearing during the recommended bird nesting window for the project area (May 1- July 15).

26. WORK ZONE TRAFFIC CONTROL

This project is not classified as significant for traffic control per ADOT&PF's Policy and Procedure 05.05.015. The Richardson Highway is classified as a rural interstate. The AADT is less than 30,000 vehicles per day. Work is not expected to fully close the highway. Intermittent lane closure and/or reductions to travelled way widths will be needed. The project will require the extension of multiple culverts, possible dig outs, guardrail replacement and roadway widening. In locations where full culverts may be replaced, the use of partial width construction methodology and roadway detours will be constructed as necessary. The Contractor will be required to develop traffic control plans to execute the work for submittal and approval by the Department prior to implementation.

27. VALUE ENGINEERING

Per Department policy, a value engineering (VE) analysis must be considered for projects with a total estimated value greater than $40 Million. The alternative analysis process used value engineering principles for consideration of value added and cost savings, therefore no further benefit from a formal VE study is anticipated and additional analysis is not anticipated for this project.

28. COST ESTIMATE

A cost estimate was developed using the assumed pavement design sections and current unit prices for major construction items. The construction cost listed includes 15% Construction Engineering and an Indirect Cost Allocation Plan (ICAP) of 7.18%.

The estimated costs for this project are as follows:

Design	$4,370,000.00
Utilities	$1,700,000.00
Right of Way	$0.00
Construction (Includes 15% Engineering)	$35,690,000.00
Total Cost of Project	$41,760,000.00

Approved: _____ 12/14/2022
for Sarah E. Schacher, P.E., Preconstruction Engineer Date

cfh

Attachments:

Appendix A: Design Criteria and Design Designations
Appendix B: Environmental Document Signature Page
Appendix C: Pavement Design
Appendix D: Preliminary Plan and Profile Sheets

Copy to:

Preconstruction/Project File
Dan Schacher, M&O District Superintendent
Original to: Barbara Tanner, P.E., Chief of Contracts
Cc: NR Design Directive 20-01 Distribution

APPENDIX A

DESIGN CRITERIA AND DESIGN DESIGNATIONS

DESIGN CRITERIA

Richardson Highway Passing Lanes MP 266-351 Project No. OA23(021)/Z607150000

ELEMENT	VALUE	SOURCE
Construction Classification		
Design Functional Classification	Rural Interstate (Arterial)	DOT&PF Design Designation
Design Year	2050	DOT&PF Design Designation
AADT Construction Year (2024) Design Year (2050)	3063 4110	DOT&PF Design Designation DOT&PF Design Designation
Design Hourly Volume (DHV)	13.6%	DOT&PF Design Designation
Directional Split (%D)	55/45	DOT&PF Design Designation
Trucks (%T)	16.5% (Trucks, Bus, RV)	DOT&PF Design Designation
Equiv. Single Axle Load (ESAL)	2,464,868	HDL Engineering Consultants, LLC Geotechnical Report
Pavement Design Year	2050, 25-year life	DOT&PF Design Designation
Design Vehicle	AASHTO WB-67	GB 2011 pg. 2-5
Design Speed, Terrain	70 mph, Rolling	HPC 1120.2.2
Stopping Sight Distance Passing Sight Distance	730 ft 1,200 ft	GB 2011, Tbl. 3-1 pg.3-4 GB 2011, Tbl. 3-4 pg.3-9
Maximum Allowable Grade Minimum Allowable Grade	4.0% Longitudinal, 6% Transverse 2% (Normal Crown)	GB 2011, Tbl. 7-2, HPC Fig.1120-1 HPC 1130.1.2(2.) (GB 2011, pg. 3-29)
Minimum Radius of Curvature	1660 ft @ e_{max}=6% (Existing)	HPC 1120, Fig.1120-1
Minimum K-Value for Vertical Curves	Crest: 247 (Existing) Sag: 181 (Existing)	GB 2011, Tbl. 3-34 pg. 3-155 GB 2011, Tbl. 3-36 pg. 3-161
Number of Roadways	1 - two lane, two-way (Existing)	HPC 1120.2.3
Width of Traveled Way	2 - 12.0 ft lanes (24' Existing)	HPC 1120.2.3 (GB 2011, Tbl. 7-3)
Width of Shoulder	8.0 ft (Existing)	HPC 1120.2.3 (GB 2011, Tbl. 7-3)
Surface Treatment	Hot Mix Asphalt	HPC 1180.3.1
Side Slope Ratios	Fore: 4:1 (H:V) Back: 2:1 (H:V)	GB 2011, pg. 4-24
Degree of Access Control	By DOT&PF Permit	HPC 1120.2.4 and HPC 1190.3
Median Treatment	None	N/A
Illumination:	None	N/A
Curb Usage and Type	None	N/A
Bicycle Provisions	8 ft Shoulder (6 ft min)	HPC 1210.4.2 (FHWA-RD-92-073)
Pedestrian Provisions	8 ft Shoulder	
Miscellaneous Criteria: Clear Zone	30 ft	HPC 1130.2.3 (HPC Table 1130-2)

Proposed By: _____ 12/14/22
Consultant Designer Date

Recommended By: _____ 12-14-2022
Design Project Manager Date

Accepted By: _____ 12/14/2022
for Regional Preconstruction Engineer Date

MEMORANDUM

State of Alaska

Department of Transportation & Public Facilities

TO: Sarah E. Schacher, P.E.,
Preconstruction Engineer
Northern Region

DATE: October 12, 2016

FILE NO: I:\Traffic Data\DESIGN\2012\Rich Hwy Passing Lanes_60715.doc

TELEPHONE NO: 451-5150

FROM: Judy Chapman
Planning Chief
Northern Region

SUBJECT: Rich Hwy Passing Lanes MP 266-341
AKSAS #60715/0A23(021)
Design Designation

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

Due to the length of the proposed project, multiple volume and classification counts were used as data references. The data was applied to the specific milepost ranges for the proposed passing lanes.

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

10/15/2016

Sarah E. Schacher, P.E., Preconstruction Engineer — Date

RLM

cc: Jonathan Hutchinson, P.E., Engineering Manager, Northern Region

Attachment

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

DESIGN DESIGNATION

Northern Region Planning

Traffic Data & Forecasting

ROUTE NAME: **Richardson Highway**
STATE ROUTE NO: **190000**
CDS MILEAGE: **MP 266-341**
FUNCTIONAL CLASS: **Rural Interstate**

AADT & DHV		AADT by Year			DHV	
	CDS Milepost	2015	2035	2050	2035	2050
	266-268	2900	3540	4110	450	525
	269-278	2400	2930	3400	415	480
	279-308	1400	1710	1985	240	280
	309-341	2500	3350	3840	475	540
DHV	12.7 for MP 266-268 14.5 for MP 269-341					
D	55-45					
%		% Trucks in CDS MP Range				
	Class	266-278	279-308	309-341		
	4	0.05	0.40	0.15		
Trucks	5	11.3	13.0	10.00		
	6	0.65	0.90	0.80		
	8	0.25	2.20	1.00		
	9	1.00	2.00	1.00		
	10	0.50	1.50	0.55		
	13	0.25	1.00	0.50		
	Total % Trucks	**14.0**	**21.0**	**14.0**		
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: September 27, 2016

FILE NO: H:\Projects\Rich_Hwy\60715_Rich_266_341_Pass_Lanes\02 Scope, Schedule, Budget\Design Designation

THRU: Sarah E. Schacher, P.E.
Preconstruction Engineer
Northern Region

PHONE NO: 451-5479

FAX NO: 451-5126

FROM: Jonathan Hutchinson, P.E.
Engineering Manager
Northern Region

SUBJECT: Richardson Highway Passing Lanes MP266-341
AKSAS #60715/0A23(021)
Design Designation Request

Please provide a Design Designation for the subject project.

- ☒ Present AADT
- ☒ Design Year AADT (2048) 2050 SS
- ☒ Mid-Design Period AADT (2033) 2035 SS
- ☐ Design Hourly Volume
- ☒ Directional Split
- ☒ Percent Trucks
- ☒ Design Functional Classification
- ☐ Intersection Turning Movement Counts at:
- ☐ Other

The project is scheduled for construction in FY2018.

Please complete the attached Traffic Date Request Form.

Attachment: as stated

ncb/mlh

Traffic Data Request Form

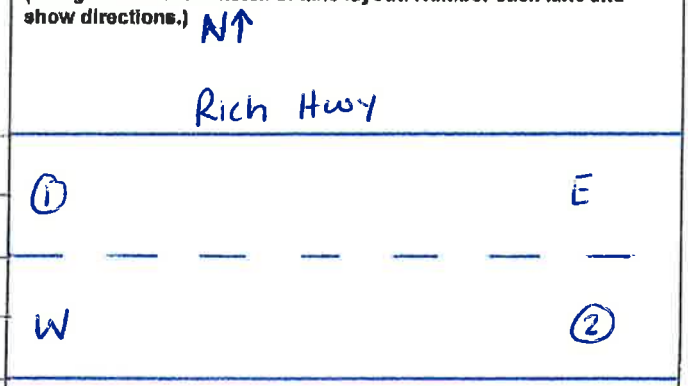
TDR Form-1-10/20/03

Alaska Department of Transportation & Public Facilities

Requested By: Jonathan Hutchinson	**Design Project Number:** AKSAS #60715	**Date Requested:** 9/27/16
Base Year: 2015 **Base Year Total AADT:** 2900 **AADT Growth Rate** **Forward (%/yr):** 1% **End Year:** **Back Cast (%/yr):** **Begin Year:**	**Common Route Name:** Rich Hwy **Functional Class:** Interstate **Urban/(Rural)** **Historic M.P. Interval:**	**CDS Route Name:** Richardson Hwy 190000 **CDS M.P. Interval:** MP 266-268

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.)



Percent of Base Year Total AADT for Each Numbered Lane in Configuration Sketch:

Lane # 1	% 55
Lane # 2	% 45
Lane #	%
Lane #	%
Lane #	%
Lane #	%

Comments:

Data Provided By:	Provider's Signature:	Date Provided:
Randi Motsko	RA Mat	10/12/16

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

Traffic Data Request Form

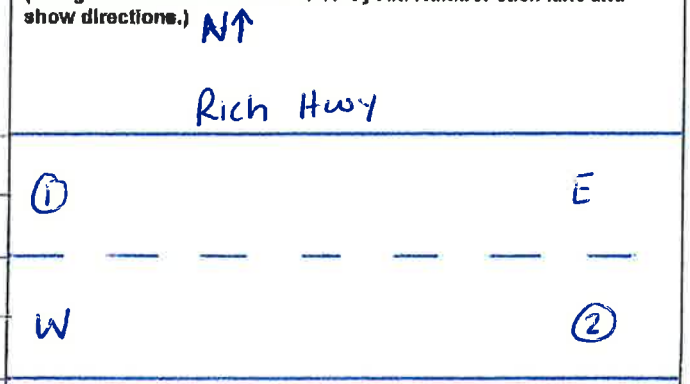
TDR Form-1-10/20/03

Alaska Department of Transportation & Public Facilities

Requested By: Jonathan Hutchinson	**Design Project Number:** AKSAS #60715	**Date Requested:** 9/27/16
Base Year: 2015 **Base Year Total AADT:** 2400 **AADT Growth Rate** **Forward (%/yr):** 1% **End Year:** **Back Cast (%/yr):** **Begin Year:**	**Common Route Name:** Rich Hwy **Functional Class:** Interstate **Urban/(Rural)** **Historic M.P. Interval:**	**CDS Route Name:** Richardson Hwy 190000 **CDS M.P. Interval:** MP 269-278

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.)



Percent of Base Year Total AADT for Each Numbered Lane in Configuration Sketch:

Lane # 1	% 55
Lane # 2	% 45
Lane #	%
Lane #	%
Lane #	%
Lane #	%

Comments:

Data Provided By:	Provider's Signature:	Date Provided:
Randi Motsko	RA Mat	10/12/16

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

Traffic Data Request Form

TDR Form-1-10/20/03

Alaska Department of Transportation & Public Facilities

Requested By: Jonathan Hutchinson	**Design Project Number:** AKSAS #60715	**Date Requested:** 9/27/16
Base Year: 2015 **Base Year Total AADT:** 1400 **AADT Growth Rate** **Forward (%/yr):** 1% **End Year:** **Back Cast (%/yr):** **Begin Year:**	**Common Route Name:** Rich Hwy **Functional Class:** Interstate **Urban/Rural** (Rural circled) **Historic M.P. Interval:**	**CDS Route Name:** Richardson Hwy 190000 **CDS M.P. Interval:** MP 279-308

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.) N↑

Rich Hwy

① E

— — — — — — —

W ②

Percent of Base Year Total AADT for Each Numbered Lane in Configuration Sketch:

Lane # 1	% 55
Lane # 2	% 45
Lane #	%
Lane #	%
Lane #	%
Lane #	%

Comments:

Data Provided By:	**Provider's Signature:**	**Date Provided:**
Randi Motsko	[illegible]	10/12/16

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

Traffic Data Request Form

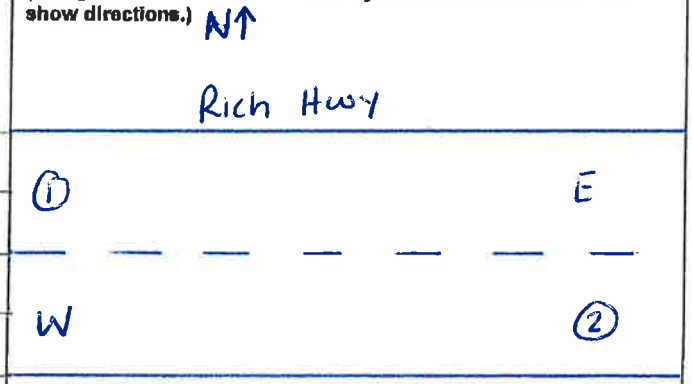
TDR Form-1-10/20/03

Alaska Department of Transportation & Public Facilities

Requested By: Jonathan Hutchinson	**Design Project Number:** AKSAS #60715	**Date Requested:** 9/27/16
Base Year: 2015 **Base Year Total AADT:** 2500 **AADT Growth Rate** **Forward (%/yr):** 1% **End Year:** **Back Cast (%/yr):** **Begin Year:**	**Common Route Name:** Rich Hwy **Functional Class:** Interstate **Urban/(Rural)** **Historic M.P. Interval:**	**CDS Route Name:** Richardson Hwy 190000 **CDS M.P. Interval:** MP 309 - 341

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.)



Percent of Base Year Total AADT for Each Numbered Lane in Configuration Sketch:

Lane # 1	% 55
Lane # 2	% 45
Lane #	%
Lane #	%
Lane #	%
Lane #	%

Comments:

Data Provided By:	Provider's Signature:	Date Provided:
Randi Motsko	RA Mat	10/12/16

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

Report Route Log

CDS Route RICHARDSON HIGHWAY (190000)

From Milepoint 268

To Milepoint 345

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
268	FHWA Urban Area	-	-	RURAL AREA (RURAL) (Start at Milepoint 0)	
268	Functional Class	-	-	MINOR ARTERIAL (Start at Milepoint 131.675)	
268.0485	Intersection	L	-	UNNAMED GATED ROAD	
268.1461	Intersection	R	-	SIXTH STREET	
268.1811	Intersection	R	-	5TH STREET	
268.3111	Intersection	B	-	4TH STREET	
268.4609	Intersection	B	-	2ND AVENUE	
268.4879	Traffic Station	-	-	32206000	
268.6317	Intersection	B	185060	GRIZZLY LANE	
268.6317	Intersection	L	185205	RICHARDSON HWY ON LANE	
268.8305	Intersection	R	180000	ALASKA HIGHWAY	
268.8305	Functional Class	-	-	MINOR ARTERIAL -> INTERSTATE	
268.8583	Milepost	R	-	266	
268.8854	Intersection	H	185205	RICHARDSON HIGHWAY ON LANE	
268.8854	Intersection	L	185205	RICHARDSON HIGHWAY ON LANE	

Milepoint	Attribute	Side	Feature CDS	Description	Viewer
268.9163	Intersection	L	185061	DIEHLS ROAD	
268.9163	Intersection	R	185020	NISTLER ROAD	
268.9926	Traffic Station	-	-	31635000	
269.0191	Intersection	L	-	BUFFALO LANE	
269.1354	Intersection	R	-	US POST OFFICE ACCESS ROAD	
269.1824	Intersection	R	-	KIMBALL STREET	
269.3697	Intersection	R	-	DEBRAH STREET	
269.5576	Intersection	R	185230	HAYES STREET	
269.7575	Intersection	R	185236	RAPIDS STREET	
269.8273	Intersection	R	-	DELTA JUNCTION AIRPORT ROAD	
269.8404	Milepost	R	-	267	
269.8581	Intersection	R	-	DELTA STATE RECREATIONAL SITE ENTRANCE	
269.954	Intersection	R	-	DELTA STATE RECREATIONAL SITE ENTRANCE	
270.022	Intersection	R	185328	REMINGTON ROAD	
270.4307	Intersection	L	-	UNNAMED ROAD	
270.6118	Intersection	R	182330	BREWIS BOULEVARD	
270.7949	Milepost	R	-	268	
270.9766	Traffic Station	-	-	31637000	
271.096	Intersection	R	185000	JACK WARREN ROAD	
271.2073	Traffic Station	-	-	31638000	
271.2546	Intersection	L	185300	LARRY SPENGLER ROAD	
271.7602	Milepost	R	-	269	
272.7125	Intersection	L	-	REBECCA LANE	

Milepoint	Attribute	Side	Feature CDS	Description	Viewer
272.737	Milepost	R	-	270	
272.8375	Intersection	L	-	SANDRA STREET	
273.0969	Intersection	R	-	UNNAMED ROAD	
273.8411	Milepost	R	-	271	
274.246	Intersection	R	-	BERM ROAD	
274.5312	Intersection	R	185400	TANANA LOOP ROAD	
274.6867	Milepost	R	-	272	
275.6662	Milepost	R	-	273	
276.0709	Intersection	R	-	BECKY LANE	
276.0825	Intersection	L	-	LEONA LANE	
276.1758	Intersection	R	-	TERRI LANE	
276.5556	Intersection	R	-	WALTONS WAY	
276.6391	Milepost	R	-	274	
277.0652	Intersection	R	-	PIPELINE ROAD	
277.1603	Intersection	L	-	PROBERT STREET	
277.2075	Intersection	L	-	MC AFEE STREET	
277.6025	Intersection	L	185300	LARRY SPENGLER ROAD	
277.6149	Intersection	R	185500	RIKA'S ROAD	
277.6548	Milepost	R	-	275	
277.6698	Intersection	L	-	TESORO NORTHERN ENTRANCE ACCESS ROAD	
277.8547	Intersection	R	-	PIPELINE AND TANANA RIVER ACCESS ROAD	
277.9046	Intersection	R	-	PIPELINE AND TANANA RIVER ACCESS ROAD	
278.1611	Bridge Midpoint	U	-	TANANA RIVER BIG DELTA (0524)	

Milepoint	Attribute	Side	Feature CDS	Description	Viewer
278.5536	Intersection	R	-	HANSON HOLLOW ROAD	
278.726	Milepost	R	-	276	
279.699	Traffic Station	-	-	31639000	
279.7048	Milepost	R	-	277	
280.4251	Intersection	R	185800	QUARTZ LAKE ROAD	
280.581	Milepost	R	-	278	
281.5438	Milepost	R	-	279	
282.6584	Milepost	R	-	280	
283.4708	Intersection	R	-	PIPELINE ROAD 49-APL-1	
283.6502	Milepost	R	-	281	
283.8423	Intersection	R	185820	OLD RICHARDSON HIGHWAY @ SHAW CREEK FLATS	
284.2701	Intersection	R	-	OLD RICHARDSON HIGHWAY @ SHAW CREEK FLATS	
284.591	Milepost	R	-	282	
285.539	Milepost	R	-	283	
286.6782	Milepost	R	-	284	
287.6527	Milepost	R	-	285	
288.0087	Intersection	R	185826	OLD RICH @ SHAW CREEK MP 285.5 ROAD	
288.658	Milepost	R	-	286	
288.7144	Intersection	R	-	PIPELINE ROAD 45-APL-1	
288.9616	Intersection	R	185826	OLD RICH @ SHAW CREEK MP 285.5 ROAD	
289.2236	Bridge Midpoint	U	-	SHAW CREEK (0525)	
289.2521	Intersection	R	186000	SHAW CREEK ROAD	
289.6418	Milepost	R	-	287	

Milepoint	Attribute	Side	Feature CDS	Description	Viewer
290.5041	Milepost	R	-	288	
290.5974	Intersection	L	-	TANANA RIVER TURN OUT LOOP ROAD	
290.6245	Intersection	L	-	TANANA RIVER TURN OUT LOOP ROAD	
291.1937	Intersection	R	185825	OLD RICH @ SHAW CREEK ROAD	
291.1958	Intersection	R	-	UNNAMED ROAD	
291.4117	Milepost	R	-	289	
292.1096	Intersection	R	-	TURN OUT LOOP ROAD	
292.2524	Intersection	R	-	TURN OUT LOOP ROAD	
292.3947	Milepost	R	-	290	
293.3637	Milepost	R	-	291	
294.316	Milepost	R	-	292	
294.8985	Intersection	L	-	NOOVIK ROAD	
295.3117	Milepost	R	-	293	
295.8669	Intersection	L	-	RUBY ROAD	
296.095	Intersection	L	-	TURN OUT LOOP ROAD	
296.2188	Intersection	L	-	TURN OUT LOOP ROAD	
296.2991	Milepost	R	-	294	
297.1404	Intersection	R	-	UNNAMED ROAD	
297.1637	Milepost	R	-	295	
297.2505	Intersection	R	-	UNNAMED ROAD	
297.5824	Bridge Midpoint	U	-	BANNER CREEK (0526)	
298.1128	Milepost	R	-	296	
299.0643	Milepost	R	-	297	

Milepoint	Attribute	Side	Feature CDS	Description	Viewer
299.7649	Intersection	L	-	UNNAMED ROAD TO RIVER	
300.0148	Milepost	R	-	298	
300.211	Intersection	L	-	UNNAMED TURN OUT LOOP ROAD	
300.2688	Intersection	L	-	UNNAMED TURN OUT LOOP ROAD	
300.6738	Intersection	L	-	UNNAMED ROAD	
300.9995	Milepost	R	-	299	
302.0326	Milepost	R	-	300	
302.9873	Intersection	R	-	OLD RICHARDSON HIGHWAY AT CANYON CREEK	
303.0054	Milepost	R	-	301	
303.5714	Intersection	R	-	UNNAMED LOOP ROAD	
303.8554	Intersection	R	-	UNNAMED LOOP ROAD	
303.9699	Intersection	L	-	UNNAMED ROAD	
304.0136	Milepost	R	-	302	
305.0744	Milepost	R	-	303	
305.9166	Milepost	R	-	304	
306.9124	Milepost	R	-	305	
307.1955	Intersection	R	-	BIRCH LAKE ROAD	
307.4352	Intersection	R	-	BOARDWALK DRIVE	
307.6173	Intersection	R	-	DOUGLAS STREET	
307.8856	Intersection	R	-	REST AREA LOOP ROAD AT BIRCH LAKE	
307.9152	Milepost	R	-	306	
307.9958	Intersection	R	-	REST AREA LOOP ROAD AT BIRCH LAKE	
308.0909	Intersection	L	186500	LOST LAKE ROAD	

Milepoint	Attribute	Side	Feature CDS	Description	Viewer
308.6159	Intersection	R	-	OLD RICHARDSON HIGHWAY LOOP	
308.937	Milepost	R	-	307	
309.0214	Intersection	R	-	OLD RICHARDSON HIGHWAY LOOP	
309.0664	Intersection	R	-	DOT MAINTENANCE CAMP BIRCH LAKE STATION ACCESS ROAD	
309.1109	Traffic Station	-	-	31695000	
309.937	Milepost	R	-	308	
310.9419	Milepost	R	-	309	
311.751	Intersection	L	-	TURN OUT LOOP ROAD	
311.7535	Intersection	R	-	OLD RICHARDSON HIGHWAY LOOP	
311.8213	Milepost	R	-	310	
311.8379	Intersection	L	-	TURN LOOP ROAD	
312.2469	Intersection	L	-	GOOSECALL DRIVE	
312.2799	Intersection	R	-	OLD RICHARDSON HIGHWAY LOOP	
312.4489	Intersection	R	-	SHARPS RIDGE	
312.6843	Intersection	R	-	OLD RICHARDSON HIGHWAY LOOP	
312.8229	Milepost	R	-	311	
313.3741	Intersection	R	-	OLD RICHARDSON HIGHWAY LOOP	
313.7513	Milepost	R	-	312	
314.7593	Milepost	R	-	313	
314.8077	Intersection	L	-	TANANA RIVER TURN OUT LOOP ROAD	
314.8978	Intersection	L	-	TANANA RIVER TURN OUT LOOP ROAD	
315.7561	Milepost	R	-	314	
315.8361	Intersection	R	-	SOLITA STREET/HAUL ROAD	

Milepoint	Attribute	Side	Feature CDS	Description	Viewer
316.8872	Milepost	R	-	315	
317.3226	Intersection	R	-	UNNAMED ROAD	
317.6837	Milepost	R	-	316	
317.7404	Intersection	R	-	JAMESTOWN COURT	
317.9939	Intersection	R	-	WILLIAMSBURG ROAD	
318.3187	Intersection	R	-	WRONG WAY LANE	
318.6142	Milepost	R	-	317	
319.3224	Intersection	L	-	OLD RICHARDSON HIGHWAY AT SALCHA /OLD VALDEZ TRAIL	
319.674	Milepost	R	-	318	
319.7788	Intersection	R	-	PERSPECTIVE DRIVE	
319.9279	Intersection	L	-	OLD VALDEZ TRAIL	
320.6302	Milepost	R	-	319	
320.9029	Intersection	R	187000	SALCHA DRIVE SOUTH	
321.3339	Intersection	L	-	ORCHID DRIVE	
321.4546	Intersection	R	187005	SALCHA DRIVE NORTH	
321.6086	Milepost	R	-	320	
322.577	Milepost	R	-	321	
322.6556	Intersection	L	-	ROLLING STONE COURT	
323.0907	Intersection	R	187200	HARDING LAKE DRIVE	
323.2993	Intersection	L	-	COUNTRY ROAD	
323.5473	Milepost	R	-	322	
323.7997	Intersection	R	-	HOLLIES ACRES DRIVE	
324.0708	Intersection	R	-	PRICE DRIVE	

Milepoint	Attribute	Side	Feature CDS	Description	Viewer
324.1505	Intersection	L	-	HARRY LUCKE TRAIL	
324.4488	Intersection	L	-	DOWNSTREAM ROAD	
324.5366	Milepost	R	-	323	
324.661	Intersection	R	-	UPHUES DRIVE	
324.7637	Intersection	L	-	STATION COURT	
325.0062	Bridge Midpoint	U	-	SALCHA RIVER (0527)	
325.0486	Traffic Station	-	-	31643000	
325.0524	Intersection	R	-	SALCHA RIVER ACCESS ROAD	
325.2445	Intersection	R	-	AURORA LODGE ROAD	
325.4365	Intersection	L	-	WALTS ROAD	
325.4951	Milepost	R	-	324	
325.6339	Bridge Midpoint	U	-	CLEAR CREEK (0528)	
325.8427	Intersection	R	187240	MUNSON SLOUGH ROAD	
325.8462	Intersection	L	-	OLD RICHARDSON HIGHWAY	
326.1629	Intersection	R	-	TURN OUT LOOP ROAD	
326.2432	Intersection	R	-	TURN OUT LOOP ROAD	
326.3614	Intersection	R	187240	MUNSON SLOUGH ROAD	
326.3958	Bridge Midpoint	U	-	MUNSON SLOUGH (0529)	
326.4864	Milepost	R	-	325	
327.5335	Milepost	R	-	326	
328.3315	Intersection	L	-	TRANSFER SITE ACCESS ROAD	
328.5246	Milepost	R	-	327	
329.0848	Intersection	R	187500	CANADAY ROAD	

Milepoint	Attribute	Side	Feature CDS	Description	Viewer
329.3468	Bridge Midpoint	U	-	LITTLE SALCHA RIVER (0530)	
329.4191	Milepost	R	-	328	
329.4221	Intersection	L	-	RIVER RUNNING ROAD	
329.5853	Intersection	B	187700	BALCH WAY	
330.0083	Intersection	R	187700	BALCH WAY	
330.3969	Milepost	R	-	329	
331.3999	Milepost	R	-	330	
331.7306	Intersection	L	-	BOONDOX DRIVE	
331.8202	Intersection	R	187900	JOHNSON ROAD	
331.912	Intersection	L	188000	OLD RICH/OLD VALDEZ TRAIL @ SALCHA	
332.3328	Intersection	R	-	SNOW WHITE COURT	
332.3802	Milepost	R	-	331	
332.5448	Intersection	L	-	COLDFOOD COURT	
332.6067	Intersection	L	-	FLYING SQUIRREL COURT	
332.7368	Intersection	L	-	BULLWINKLE COURT	
333.059	Intersection	R	-	GRIEME ROAD	
333.0622	Intersection	L	-	TOM BEAR TRAIL	
333.3781	Milepost	R	-	332	
333.3926	Intersection	L	-	MAGGIE DRIVE	
333.5983	Intersection	L	-	PIT RUN COURT	
333.7931	Intersection	L	-	PAULA COURT	
334.1017	Intersection	R	-	CLEVELAND AVENUE	
334.1035	Intersection	L	-	HOWELL ROAD	

Milepoint	Attribute	Side	Feature CDS	Description	Viewer
334.3589	Milepost	R	-	333	
334.4934	Intersection	R	-	TENDERFOOT COURT	
334.9108	Intersection	R	-	CRAZY HORSE LANE	
335.1363	Intersection	R	-	AICUZ AVENUE	
335.4299	Milepost	R	-	334	
335.54	Intersection	L	188010	STRINGER ROAD	
335.895	Intersection	L	-	TRANSFER SITE ACCESS ROAD	
336.4271	Milepost	R	-	335	
336.4832	Intersection	R	-	28 MILE POND ROAD	
337.3742	Milepost	R	-	336	
338.4387	Milepost	R	-	337	
338.4503	Intersection	R	-	GATED MILITARY ROAD	
339.0166	Intersection	R	-	GATED MILITARY ROAD	
339.4451	Milepost	R	-	338	
340.1657	Intersection	L	-	23 MILE SLOUGH ROAD	
340.5233	Milepost	R	-	339	
341.1303	Intersection	L	-	MILITARY ROAD	
341.5045	Milepost	R	-	340	
341.6959	Intersection	L	-	MILITARY ROAD	
342.0544	Intersection	L	190000SB	RICHARDSON HIGHWAY SB	
342.3339	Traffic Station	-	-	31646000	
342.4652	Intersection	B	-	CENTRAL AVENUE	
342.5303	Milepost	R	-	341	

Milepoint	Attribute	Side	Feature CDS	Description	Viewer
342.8507	Intersection	R	188121	RICH NB - OLD RICH @ EIELSON RAMP	
343.2286	Bridge Midpoint	U	-	EIELSON ACCESS UNDERCROSSING (2133)	
343.5354	Milepost	R	-	342	
343.5565	Intersection	B	188120	OLD RICH @ EIELSON - RICH NB RAMP	
343.5565	Intersection	R	188120	OLD RICH @ EIELSON - RICH NB RAMP	
344.0395	Intersection	B	-	HOPE STREET	
344.5344	Milepost	R	-	343	

Computations and Historic Data

Project: Rich Hwy Passing Lanes
Project # 60715
Milepost 266-268

Historic AADT

Route: 190000
Station: 31637000
Rich Hwy South of Jack Warren Rd
Milepoint 271.043

Year	AADT
2000	
2001	2315
2002	2662
2003	2794
2004	2855
2005	2803
2006	2728
2007	3239
2008	3032
2009	3070
2010	3191
2011	3233
2012	2882
2013	2846
2014	2184
2015	2938

Growth rate for calculations was 1.00% due to historic traffic patterns

Growth Rate factors
2035 1.220
2050 1.417

Future AADTs

Year	AADT
2015	2900
2035	3540
2050	4110

K-factor 12.70%
DHV= 2035 450
2050 525

Direction Split (D)= 55-45

Class Data

Route 180000

Station #	Description	CDS MP	Year	Percent By Class 4	5	6	8	9	10	13	Total Truck %
18001421	Ak Hwy @ Delta MP 1421	196.545	2015	0.05	11.30	0.65	0.25	1.00	0.50	0.25	14.00
		Load Factors		1	0.50	0.85	1.20	1.55	2.24	2.24	
		# Axles		2/3	2	3	4	5	6	7+	

Computations and Historic Data

Project: Rich Hwy Passing Lanes
Project # 60715
Milepost 269-278

Historic AADT

Route: 190000
Station: 31638000
Rich Hwy North of Jack Warren Rd
Milepoint 271.274

Year	AADT
2000	
2001	1392
2002	2009
2003	2302
2004	2328
2005	2218
2006	2411
2007	2628
2008	2256
2009	2407
2010	2502
2011	2773
2012	
2013	2215
2014	1910
2015	2424

Growth rate for calculations was 1.00% due to historic traffic patterns

Growth Rate factors
2035 1.220
2050 1.417

Future AADTs

Year	AADT
2015	2400
2035	2930
2050	3400

K-factor 14.10%
DHV= 2035 415
2050 480

Direction Split(D)= 55-45

Class Data

Route 180000

Station #	Description	CDS MP	Year	Percent By Class 4	5	6	8	9	10	13	Total Truck %
18001421	Ak Hwy @ Delta MP 1421	196.545	2015	0.05	11.30	0.65	0.25	1.00	0.50	0.25	14.00
		Load Factors		1	0.50	0.85	1.20	1.55	2.24	2.24	
		# Axles		2/3	2	3	4	5	6	7+	

Computations and Historic Data

Project: Rich Hwy Passing Lanes
Project # 60715
Milepost 279-308

Historic AADT

Route: 190000
Station: 31695000
Rich Hwy @ Birch Lake Maint Camp
Milepoint 309.111

Year	AADT
2000	
2001	866
2002	1505
2003	2706
2004	1345
2005	1424
2006	1284
2007	1655
2008	
2009	1193
2010	1181
2011	1225
2012	1194
2013	1125
2014	1198
2015	1430

Growth rate for calculations was 1.00% due to historic traffic patterns

Growth Rate factors
2035 1.220
2050 1.417

Future AADTs

Year	AADT
2015	1400
2035	1710
2050	1985

K-factor 14.10%
DHV= 2035 240
2050 280

Direction Split (D)= 55-45

Class Data

Route 190000

Station #	Description	CDS MP	Year	Percent By Class 4	5	6	8	9	10	13	Total Truck %
31695000	Rich Hwy @ Birch Lake Maint Camp	309.111	2015	0.40	13.00	0.90	2.20	2.00	1.50	1.00	21.00
		Load Factors		1	0.50	0.85	1.20	1.55	2.24	2.24	
		# Axles		2/3	2	3	4	5	6	7+	

Computations and Historic Data

Project: Rich Hwy Passing Lanes
Project # 60715
Milepost 309-341

Historic AADT

Route: 190000
Station: 31646000
Ric Hwy South of EAFB Access Rd
Milepoint 342.401

Year	AADT
2000	
2001	2581
2002	3278
2003	2904
2004	3710
2005	3411
2006	3377
2007	3287
2008	3005
2009	3425
2010	3115
2011	2811
2012	2718
2013	2839
2014	2267
2015	2519

Growth rate for calculations was 1.00% due to historic traffic patterns

Growth Rate factors

2035	1.220
2050	1.417

Future AADTs

Year	AADT
2015	2500
2035	3350
2050	3840

K-factor 14.10%
DHV= 2035 475
2050 540

Direction Split (D)= 55-45

Class Data

Route 190000

Station #	Description	CDS MP	Year	Percent By Class 4	5	6	8	9	10	13	Total Truck %
31646000	Rich Hwy South of EAFB Access Rd	342.401	2015	0.15	10.00	0.80	1.00	1.00	0.55	0.50	14.00
		Load Factors		1	0.50	0.85	1.20	1.55	2.24	2.24	
		# Axles		2/3	2	3	4	5	6	7+	

Traffic Data Request Form

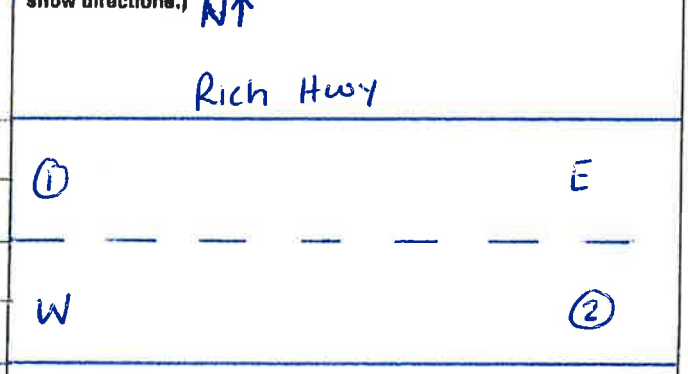
TDR Form-1-10/20/03

Alaska Department of Transportation & Public Facilities

Requested By: Jonathan Hutchinson	**Design Project Number:** AKSAS #60715	**Date Requested:** 9/27/16
Base Year: 2015 **Base Year Total AADT:** 1400 **AADT Growth Rate** **Forward (%/yr):** 1% **End Year:** **Back Cast (%/yr):** **Begin Year:**	**Common Route Name:** Rich Hwy **Functional Class:** Interstate **Urban/Rural** **Historic M.P. Interval:**	**CDS Route Name:** Richardson Hwy 190000 **CDS M.P. Interval:** MP 279-308

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.)



Percent of Base Year Total AADT for Each Numbered Lane in Configuration Sketch:

Lane # 1	% 55
Lane # 2	% 45
Lane #	%
Lane #	%
Lane #	%
Lane #	%

Comments:

Data Provided By:	Provider's Signature:	Date Provided:
Randi Motsko	RA Mat	10/12/16

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

Traffic Data Request Form

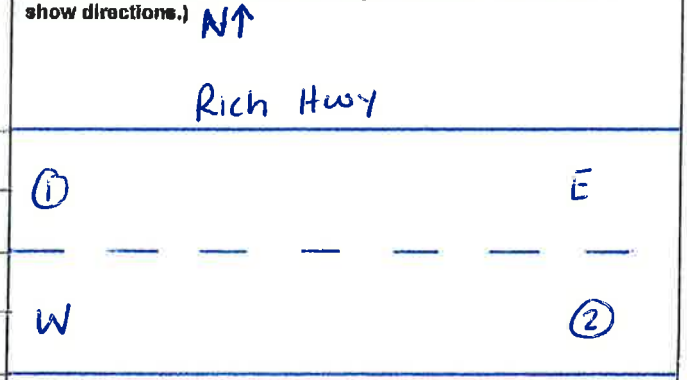
TDR Form-1-10/20/03

Alaska Department of Transportation & Public Facilities

Requested By: Jonathan Hutchinson	**Design Project Number:** AKSAS #60715	**Date Requested:** 9/27/16
Base Year: 2015 **Base Year Total AADT:** 2500 **AADT Growth Rate** **Forward (%/yr):** 1% **End Year:** **Back Cast (%/yr):** **Begin Year:**	**Common Route Name:** Rich Hwy **Functional Class:** Interstate **Urban/Rural** **Historic M.P. Interval:**	**CDS Route Name:** Richardson Hwy 190000 **CDS M.P. Interval:** MP 309 - 341

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.)



Percent of Base Year Total AADT for Each Numbered Lane in Configuration Sketch:

Lane # 1	% 55
Lane # 2	% 45
Lane #	%
Lane #	%
Lane #	%
Lane #	%

Comments:

Data Provided By:	Provider's Signature:	Date Provided:
Randi Motsko	RA Mat	10/12/16

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

Report Route Log

CDS Route RICHARDSON HIGHWAY (190000)

From Milepoint 268

To Milepoint 345

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
268	FHWA Urban Area	-	-	RURAL AREA (RURAL) (Start at Milepoint 0)	
268	Functional Class	-	-	MINOR ARTERIAL (Start at Milepoint 131.675)	
268.0485	Intersection	L	-	UNNAMED GATED ROAD	
268.1461	Intersection	R	-	SIXTH STREET	
268.1811	Intersection	R	-	5TH STREET	
268.3111	Intersection	B	-	4TH STREET	
268.4609	Intersection	B	-	2ND AVENUE	
268.4879	Traffic Station	-	-	32206000	
268.6317	Intersection	B	185060	GRIZZLY LANE	
268.6317	Intersection	L	185205	RICHARDSON HWY ON LANE	
268.8305	Intersection	R	180000	ALASKA HIGHWAY	
268.8305	Functional Class	-	-	MINOR ARTERIAL -> INTERSTATE	
268.8583	Milepost	R	-	266	
268.8854	Intersection	H	185205	RICHARDSON HIGHWAY ON LANE	
268.8854	Intersection	L	185205	RICHARDSON HIGHWAY ON LANE	

Milepoint	Attribute	Side	Feature CDS	Description	Viewer
268.9163	Intersection	L	185061	DIEHLS ROAD	
268.9163	Intersection	R	185020	NISTLER ROAD	
268.9926	Traffic Station	-	-	31635000	
269.0191	Intersection	L	-	BUFFALO LANE	
269.1354	Intersection	R	-	US POST OFFICE ACCESS ROAD	
269.1824	Intersection	R	-	KIMBALL STREET	
269.3697	Intersection	R	-	DEBRAH STREET	
269.5576	Intersection	R	185230	HAYES STREET	
269.7575	Intersection	R	185236	RAPIDS STREET	
269.8273	Intersection	R	-	DELTA JUNCTION AIRPORT ROAD	
269.8404	Milepost	R	-	267	
269.8581	Intersection	R	-	DELTA STATE RECREATIONAL SITE ENTRANCE	
269.954	Intersection	R	-	DELTA STATE RECREATIONAL SITE ENTRANCE	
270.022	Intersection	R	185328	REMINGTON ROAD	
270.4307	Intersection	L	-	UNNAMED ROAD	
270.6118	Intersection	R	182330	BREWIS BOULEVARD	
270.7949	Milepost	R	-	268	
270.9766	Traffic Station	-	-	31637000	
271.096	Intersection	R	185000	JACK WARREN ROAD	
271.2073	Traffic Station	-	-	31638000	
271.2546	Intersection	L	185300	LARRY SPENGLER ROAD	
271.7602	Milepost	R	-	269	
272.7125	Intersection	L	-	REBECCA LANE	

Milepoint	Attribute	Side	Feature CDS	Description	Viewer
272.737	Milepost	R	-	270	
272.8375	Intersection	L	-	SANDRA STREET	
273.0969	Intersection	R	-	UNNAMED ROAD	
273.8411	Milepost	R	-	271	
274.246	Intersection	R	-	BERM ROAD	
274.5312	Intersection	R	185400	TANANA LOOP ROAD	
274.6867	Milepost	R	-	272	
275.6662	Milepost	R	-	273	
276.0709	Intersection	R	-	BECKY LANE	
276.0825	Intersection	L	-	LEONA LANE	
276.1758	Intersection	R	-	TERRI LANE	
276.5556	Intersection	R	-	WALTONS WAY	
276.6391	Milepost	R	-	274	
277.0652	Intersection	R	-	PIPELINE ROAD	
277.1603	Intersection	L	-	PROBERT STREET	
277.2075	Intersection	L	-	MC AFEE STREET	
277.6025	Intersection	L	185300	LARRY SPENGLER ROAD	
277.6149	Intersection	R	185500	RIKA'S ROAD	
277.6548	Milepost	R	-	275	
277.6698	Intersection	L	-	TESORO NORTHERN ENTRANCE ACCESS ROAD	
277.8547	Intersection	R	-	PIPELINE AND TANANA RIVER ACCESS ROAD	
277.9046	Intersection	R	-	PIPELINE AND TANANA RIVER ACCESS ROAD	
278.1611	Bridge Midpoint	U	-	TANANA RIVER BIG DELTA (0524)	

Milepoint	Attribute	Side	Feature CDS	Description	Viewer
278.5536	Intersection	R	-	HANSON HOLLOW ROAD	
278.726	Milepost	R	-	276	
279.699	Traffic Station	-	-	31639000	
279.7048	Milepost	R	-	277	
280.4251	Intersection	R	185800	QUARTZ LAKE ROAD	
280.581	Milepost	R	-	278	
281.5438	Milepost	R	-	279	
282.6584	Milepost	R	-	280	
283.4708	Intersection	R	-	PIPELINE ROAD 49-APL-1	
283.6502	Milepost	R	-	281	
283.8423	Intersection	R	185820	OLD RICHARDSON HIGHWAY @ SHAW CREEK FLATS	
284.2701	Intersection	R	-	OLD RICHARDSON HIGHWAY @ SHAW CREEK FLATS	
284.591	Milepost	R	-	282	
285.539	Milepost	R	-	283	
286.6782	Milepost	R	-	284	
287.6527	Milepost	R	-	285	
288.0087	Intersection	R	185826	OLD RICH @ SHAW CREEK MP 285.5 ROAD	
288.658	Milepost	R	-	286	
288.7144	Intersection	R	-	PIPELINE ROAD 45-APL-1	
288.9616	Intersection	R	185826	OLD RICH @ SHAW CREEK MP 285.5 ROAD	
289.2236	Bridge Midpoint	U	-	SHAW CREEK (0525)	
289.2521	Intersection	R	186000	SHAW CREEK ROAD	
289.6418	Milepost	R	-	287	

Milepoint	Attribute	Side	Feature CDS	Description	Viewer
290.5041	Milepost	R	-	288	
290.5974	Intersection	L	-	TANANA RIVER TURN OUT LOOP ROAD	
290.6245	Intersection	L	-	TANANA RIVER TURN OUT LOOP ROAD	
291.1937	Intersection	R	185825	OLD RICH @ SHAW CREEK ROAD	
291.1958	Intersection	R	-	UNNAMED ROAD	
291.4117	Milepost	R	-	289	
292.1096	Intersection	R	-	TURN OUT LOOP ROAD	
292.2524	Intersection	R	-	TURN OUT LOOP ROAD	
292.3947	Milepost	R	-	290	
293.3637	Milepost	R	-	291	
294.316	Milepost	R	-	292	
294.8985	Intersection	L	-	NOOVIK ROAD	
295.3117	Milepost	R	-	293	
295.8669	Intersection	L	-	RUBY ROAD	
296.095	Intersection	L	-	TURN OUT LOOP ROAD	
296.2188	Intersection	L	-	TURN OUT LOOP ROAD	
296.2991	Milepost	R	-	294	
297.1404	Intersection	R	-	UNNAMED ROAD	
297.1637	Milepost	R	-	295	
297.2505	Intersection	R	-	UNNAMED ROAD	
297.5824	Bridge Midpoint	U	-	BANNER CREEK (0526)	
298.1128	Milepost	R	-	296	
299.0643	Milepost	R	-	297	

Milepoint	Attribute	Side	Feature CDS	Description	Viewer
299.7649	Intersection	L	-	UNNAMED ROAD TO RIVER	
300.0148	Milepost	R	-	298	
300.211	Intersection	L	-	UNNAMED TURN OUT LOOP ROAD	
300.2688	Intersection	L	-	UNNAMED TURN OUT LOOP ROAD	
300.6738	Intersection	L	-	UNNAMED ROAD	
300.9995	Milepost	R	-	299	
302.0326	Milepost	R	-	300	
302.9873	Intersection	R	-	OLD RICHARDSON HIGHWAY AT CANYON CREEK	
303.0054	Milepost	R	-	301	
303.5714	Intersection	R	-	UNNAMED LOOP ROAD	
303.8554	Intersection	R	-	UNNAMED LOOP ROAD	
303.9699	Intersection	L	-	UNNAMED ROAD	
304.0136	Milepost	R	-	302	
305.0744	Milepost	R	-	303	
305.9166	Milepost	R	-	304	
306.9124	Milepost	R	-	305	
307.1955	Intersection	R	-	BIRCH LAKE ROAD	
307.4352	Intersection	R	-	BOARDWALK DRIVE	
307.6173	Intersection	R	-	DOUGLAS STREET	
307.8856	Intersection	R	-	REST AREA LOOP ROAD AT BIRCH LAKE	
307.9152	Milepost	R	-	306	
307.9958	Intersection	R	-	REST AREA LOOP ROAD AT BIRCH LAKE	
308.0909	Intersection	L	186500	LOST LAKE ROAD	

Milepoint	Attribute	Side	Feature CDS	Description	Viewer
308.6159	Intersection	R	-	OLD RICHARDSON HIGHWAY LOOP	
308.937	Milepost	R	-	307	
309.0214	Intersection	R	-	OLD RICHARDSON HIGHWAY LOOP	
309.0664	Intersection	R	-	DOT MAINTENANCE CAMP BIRCH LAKE STATION ACCESS ROAD	
309.1109	Traffic Station	-	-	31695000	
309.937	Milepost	R	-	308	
310.9419	Milepost	R	-	309	
311.751	Intersection	L	-	TURN OUT LOOP ROAD	
311.7535	Intersection	R	-	OLD RICHARDSON HIGHWAY LOOP	
311.8213	Milepost	R	-	310	
311.8379	Intersection	L	-	TURN LOOP ROAD	
312.2469	Intersection	L	-	GOOSECALL DRIVE	
312.2799	Intersection	R	-	OLD RICHARDSON HIGHWAY LOOP	
312.4489	Intersection	R	-	SHARPS RIDGE	
312.6843	Intersection	R	-	OLD RICHARDSON HIGHWAY LOOP	
312.8229	Milepost	R	-	311	
313.3741	Intersection	R	-	OLD RICHARDSON HIGHWAY LOOP	
313.7513	Milepost	R	-	312	
314.7593	Milepost	R	-	313	
314.8077	Intersection	L	-	TANANA RIVER TURN OUT LOOP ROAD	
314.8978	Intersection	L	-	TANANA RIVER TURN OUT LOOP ROAD	
315.7561	Milepost	R	-	314	
315.8361	Intersection	R	-	SOLITA STREET/HAUL ROAD	

Milepoint	Attribute	Side	Feature CDS	Description	Viewer
316.8872	Milepost	R	-	315	
317.3226	Intersection	R	-	UNNAMED ROAD	
317.6837	Milepost	R	-	316	
317.7404	Intersection	R	-	JAMESTOWN COURT	
317.9939	Intersection	R	-	WILLIAMSBURG ROAD	
318.3187	Intersection	R	-	WRONG WAY LANE	
318.6142	Milepost	R	-	317	
319.3224	Intersection	L	-	OLD RICHARDSON HIGHWAY AT SALCHA /OLD VALDEZ TRAIL	
319.674	Milepost	R	-	318	
319.7788	Intersection	R	-	PERSPECTIVE DRIVE	
319.9279	Intersection	L	-	OLD VALDEZ TRAIL	
320.6302	Milepost	R	-	319	
320.9029	Intersection	R	187000	SALCHA DRIVE SOUTH	
321.3339	Intersection	L	-	ORCHID DRIVE	
321.4546	Intersection	R	187005	SALCHA DRIVE NORTH	
321.6086	Milepost	R	-	320	
322.577	Milepost	R	-	321	
322.6556	Intersection	L	-	ROLLING STONE COURT	
323.0907	Intersection	R	187200	HARDING LAKE DRIVE	
323.2993	Intersection	L	-	COUNTRY ROAD	
323.5473	Milepost	R	-	322	
323.7997	Intersection	R	-	HOLLIES ACRES DRIVE	
324.0708	Intersection	R	-	PRICE DRIVE	

Milepoint	Attribute	Side	Feature CDS	Description	Viewer
324.1505	Intersection	L	-	HARRY LUCKE TRAIL	
324.4488	Intersection	L	-	DOWNSTREAM ROAD	
324.5366	Milepost	R	-	323	
324.661	Intersection	R	-	UPHUES DRIVE	
324.7637	Intersection	L	-	STATION COURT	
325.0062	Bridge Midpoint	U	-	SALCHA RIVER (0527)	
325.0486	Traffic Station	-	-	31643000	
325.0524	Intersection	R	-	SALCHA RIVER ACCESS ROAD	
325.2445	Intersection	R	-	AURORA LODGE ROAD	
325.4365	Intersection	L	-	WALTS ROAD	
325.4951	Milepost	R	-	324	
325.6339	Bridge Midpoint	U	-	CLEAR CREEK (0528)	
325.8427	Intersection	R	187240	MUNSON SLOUGH ROAD	
325.8462	Intersection	L	-	OLD RICHARDSON HIGHWAY	
326.1629	Intersection	R	-	TURN OUT LOOP ROAD	
326.2432	Intersection	R	-	TURN OUT LOOP ROAD	
326.3614	Intersection	R	187240	MUNSON SLOUGH ROAD	
326.3958	Bridge Midpoint	U	-	MUNSON SLOUGH (0529)	
326.4864	Milepost	R	-	325	
327.5335	Milepost	R	-	326	
328.3315	Intersection	L	-	TRANSFER SITE ACCESS ROAD	
328.5246	Milepost	R	-	327	
329.0848	Intersection	R	187500	CANADAY ROAD	

Milepoint	Attribute	Side	Feature CDS	Description	Viewer
329.3468	Bridge Midpoint	U	-	LITTLE SALCHA RIVER (0530)	
329.4191	Milepost	R	-	328	
329.4221	Intersection	L	-	RIVER RUNNING ROAD	
329.5853	Intersection	B	187700	BALCH WAY	
330.0083	Intersection	R	187700	BALCH WAY	
330.3969	Milepost	R	-	329	
331.3999	Milepost	R	-	330	
331.7306	Intersection	L	-	BOONDOX DRIVE	
331.8202	Intersection	R	187900	JOHNSON ROAD	
331.912	Intersection	L	188000	OLD RICH/OLD VALDEZ TRAIL @ SALCHA	
332.3328	Intersection	R	-	SNOW WHITE COURT	
332.3802	Milepost	R	-	331	
332.5448	Intersection	L	-	COLDFOOD COURT	
332.6067	Intersection	L	-	FLYING SQUIRREL COURT	
332.7368	Intersection	L	-	BULLWINKLE COURT	
333.059	Intersection	R	-	GRIEME ROAD	
333.0622	Intersection	L	-	TOM BEAR TRAIL	
333.3781	Milepost	R	-	332	
333.3926	Intersection	L	-	MAGGIE DRIVE	
333.5983	Intersection	L	-	PIT RUN COURT	
333.7931	Intersection	L	-	PAULA COURT	
334.1017	Intersection	R	-	CLEVELAND AVENUE	
334.1035	Intersection	L	-	HOWELL ROAD	

Milepoint	Attribute	Side	Feature CDS	Description	Viewer
334.3589	Milepost	R	-	333	
334.4934	Intersection	R	-	TENDERFOOT COURT	
334.9108	Intersection	R	-	CRAZY HORSE LANE	
335.1363	Intersection	R	-	AICUZ AVENUE	
335.4299	Milepost	R	-	334	
335.54	Intersection	L	188010	STRINGER ROAD	
335.895	Intersection	L	-	TRANSFER SITE ACCESS ROAD	
336.4271	Milepost	R	-	335	
336.4832	Intersection	R	-	28 MILE POND ROAD	
337.3742	Milepost	R	-	336	
338.4387	Milepost	R	-	337	
338.4503	Intersection	R	-	GATED MILITARY ROAD	
339.0166	Intersection	R	-	GATED MILITARY ROAD	
339.4451	Milepost	R	-	338	
340.1657	Intersection	L	-	23 MILE SLOUGH ROAD	
340.5233	Milepost	R	-	339	
341.1303	Intersection	L	-	MILITARY ROAD	
341.5045	Milepost	R	-	340	
341.6959	Intersection	L	-	MILITARY ROAD	
342.0544	Intersection	L	190000SB	RICHARDSON HIGHWAY SB	
342.3339	Traffic Station	-	-	31646000	
342.4652	Intersection	B	-	CENTRAL AVENUE	
342.5303	Milepost	R	-	341	

Milepoint	Attribute	Side	Feature CDS	Description	Viewer
342.8507	Intersection	R	188121	RICH NB - OLD RICH @ EIELSON RAMP	
343.2286	Bridge Midpoint	U	-	EIELSON ACCESS UNDERCROSSING (2133)	
343.5354	Milepost	R	-	342	
343.5565	Intersection	B	188120	OLD RICH @ EIELSON - RICH NB RAMP	
343.5565	Intersection	R	188120	OLD RICH @ EIELSON - RICH NB RAMP	
344.0395	Intersection	B	-	HOPE STREET	
344.5344	Milepost	R	-	343	

Computations and Historic Data

Project: Rich Hwy Passing Lanes
Project # 60715
Milepost 266-268

Historic AADT

Route: 190000
Station: 31637000
Rich Hwy South of Jack Warren Rd
Milepoint 271.043

Year	AADT
2000	
2001	2315
2002	2662
2003	2794
2004	2855
2005	2803
2006	2728
2007	3239
2008	3032
2009	3070
2010	3191
2011	3233
2012	2882
2013	2846
2014	2184
2015	2938

Growth rate for calculations was 1.00% due to historic traffic patterns

Growth Rate factors
2035 1.220
2050 1.417

Future AADTs

Year	AADT
2015	2900
2035	3540
2050	4110

K-factor 12.70%
DHV= 2035 450
2050 525

Direction Split (D)= 55-45

Class Data

Route 180000

Station #	Description	CDS MP	Year	Percent By Class 4	5	6	8	9	10	13	Total Truck %
18001421	Ak Hwy @ Delta MP 1421	196.545	2015	0.05	11.30	0.65	0.25	1.00	0.50	0.25	14.00
		Load Factors		1	0.50	0.85	1.20	1.55	2.24	2.24	
		# Axles		2/3	2	3	4	5	6	7+	

Computations and Historic Data

Project: Rich Hwy Passing Lanes
Project # 60715
Milepost 269-278

Historic AADT

Route: 190000
Station: 31638000
Rich Hwy North of Jack Warren Rd
Milepoint 271.274

Year	AADT
2000	
2001	1392
2002	2009
2003	2302
2004	2328
2005	2218
2006	2411
2007	2628
2008	2256
2009	2407
2010	2502
2011	2773
2012	
2013	2215
2014	1910
2015	2424

Growth rate for calculations was 1.00% due to historic traffic patterns

Growth Rate factors

2035	1.220
2050	1.417

Future AADTs

Year	AADT
2015	2400
2035	2930
2050	3400

K-factor 14.10%
DHV= 2035 415
2050 480

Direction Split(D)= 55-45

Class Data

Route 180000

Station #	Description	CDS MP	Year	Percent By Class 4	5	6	8	9	10	13	Total Truck %
18001421	Ak Hwy @ Delta MP 1421	196.545	2015	0.05	11.30	0.65	0.25	1.00	0.50	0.25	14.00
		Load Factors		1	0.50	0.85	1.20	1.55	2.24	2.24	
		# Axles		2/3	2	3	4	5	6	7+	

Computations and Historic Data

Project: Rich Hwy Passing Lanes
Project # 60715
Milepost 279-308

Historic AADT

Route: 190000
Station: 31695000
Rich Hwy @ Birch Lake Maint Camp
Milepoint 309.111

Year	AADT
2000	
2001	866
2002	1505
2003	2706
2004	1345
2005	1424
2006	1284
2007	1655
2008	
2009	1193
2010	1181
2011	1225
2012	1194
2013	1125
2014	1198
2015	1430

Growth rate for calculations was 1.00% due to historic traffic patterns

Growth Rate factors

2035	1.220
2050	1.417

Future AADTs

Year	AADT
2015	1400
2035	1710
2050	1985

K-factor 14.10%
DHV= 2035 240
2050 280

Direction Split (D)= 55-45

Class Data

Route 190000

Station #	Description	CDS MP	Year	Percent By Class 4	5	6	8	9	10	13	Total Truck %
31695000	Rich Hwy @ Birch Lake Maint Camp	309.111	2015	0.40	13.00	0.90	2.20	2.00	1.50	1.00	21.00
		Load Factors		1	0.50	0.85	1.20	1.55	2.24	2.24	
		# Axles		2/3	2	3	4	5	6	7+	

Computations and Historic Data

Project: Rich Hwy Passing Lanes
Project # 60715
Milepost 309-341

Historic AADT

Route: 190000
Station: 31646000
Ric Hwy South of EAFB Access Rd
Milepoint 342.401

Year	AADT
2000	
2001	2581
2002	3278
2003	2904
2004	3710
2005	3411
2006	3377
2007	3287
2008	3005
2009	3425
2010	3115
2011	2811
2012	2718
2013	2839
2014	2267
2015	2519

Growth rate for calculations was 1.00% due to historic traffic patterns

Growth Rate factors

2035	1.220
2050	1.417

Future AADTs

Year	AADT
2015	2500
2035	3350
2050	3840

K-factor 14.10%
DHV= 2035 475
2050 540

Direction Split (D)= 55-45

Class Data

Route 190000

Station #	Description	CDS MP	Year	Percent By Class 4	5	6	8	9	10	13	Total Truck %
31646000	Rich Hwy South of EAFB Access Rd	342.401	2015	0.15	10.00	0.80	1.00	1.00	0.55	0.50	14.00
		Load Factors		1	0.50	0.85	1.20	1.55	2.24	2.24	
		# Axles		2/3	2	3	4	5	6	7+	

APPENDIX B

ENVIRONMENTAL DOCUMENT SIGNATURE PAGE

State of Alaska
Department of Transportation & Public Facilities

EXPEDITED RE-EVALUATION APPROVAL FORM

(NEPA Assignment Program Projects)

The environmental review, consultation, and other actions required by applicable Federal environmental laws for this project are being, or have been carried out by DOT&PF pursuant to 23 U.S.C. 327 and a Memorandum of Understanding dated November 3, 2017, and executed by FHWA and DOT&PF.

I. Project Information:

A. Project Name: Richardson Highway MP 266-341 Passing lanes

B. Federal Project Number: 0A23(021)

C. State Project Number: Z607150000

D. Primary/Ancillary Project Connections:

NFHWY00161 Richardson Highway MP 337 Eielson AFB Intersection Improvments, Need ID 29811. The first phase (Need ID 29811) has already been completed.

E. Document Type:

☒ CE: 23 CFR 771.117(d)(13)
☐ EA
☐ EIS

F. Project Scope *(Use STIP Project Description)*:
This project is listed in the 2018-2021 Alaska Statewide Transportation Improvement Program [STIP] Amendment 2; Approved January 30, 2019 as Need ID (NID) 30284: "Construct passing lanes at various locations (yet to be determined) on the Richardson Highway to improve safety. Construction will happen in three stages, under NID 30284, NID 30449, and the original NID 29811."

Under the original NID 29811 the project description is: "Construct passing lanes at various locations (yet to be determined) on the Richardson Highway to improve safety. Including intersection improvements at the southern access of Eielson Air Force Base to accommodate freight volumes in support of the addition of two F-35A aircraft squadrons. This is the overall design for the entire termini. Construction will happen in two stages under NID 30284 and this NID 29811".

G. Approval date(s) and impact summary(ies) of the original environmental document and any re-evaluations:
CE 9 July 2019 - Section 106 No Historic Properties Affected finding; approximately 2 acres of wetlands will be impacted by fill placed to construct the passing lanes; three anadromous fish passage culverts, and riprap revetments; floodplain encroachments, FNSB floodplain permit required; Type I project noise study completed, no noise impacts; no mechanized vegetation clearing during nesting window (May 1-July 15).

H. Describe changes to project:

Including prior re-evaluations, identify any changes in the project impacts from those identified in the original environmental document. Describe the resulting impacts.

No changes to the project.

I. List of Attachments:

N/A

II. Expedited Re-evaluation:

A. The project meets the criteria of the Programmatic Approval 1, 2, or 3 in the Nov. 13 2017 Chief Engineer Directive. ☐ Yes ☒ No*

- *If yes, the REM may approve the re-evaluation.*
- *If no, the NEPA Program Manager must approve the re-evaluation.*

B. Does the following statement apply? ☒ Yes ☐ No

"Based on the information provided I verify that this project as described at this time remains consistent with the conclusions and commitments of the original environmental document, and any prior re-evaluations, and that the environmental document remains valid."

- *If yes, sign appropriate line below.*
- *If no, the action **cannot** be approved.*

C. Additional Information:

III. Re-evaluation Approval Signatures

Programmatic CE

Approved by: _____ Date: _____

[Signature] Regional Environmental Manager

_____

[Print Name] Regional Environmental Manager

Non-Programmatic CE

Approval Recommended by: Brett D Nelson Date: 4/8/2020

[Signature] Regional Environmental Manager

Brett Nelson

[Print Name] Regional Environmental Manager

Approved by: Adam Moser Date: 4/8/2020

[Signature] NEPA Program Manager

Adam Moser

[Print Name] NEPA Program Manager

APPENDIX C

PAVEMENT DESIGN

Mine Truck ESALs

Traffic Data for Design and Historic ESALs

Design Data Input	
Design Construction Year:	2024
Design Length in Years:	5
Base Year:	2024
Base Year Total AADT:	192
Growth Rate % per Year:	0

Historic Data Input	
Historic Construction Year:	
Backcast % per Year:	

% of Base Year AADT for Each Lane	
Lane	%
1	80
2	20
3	0
4	0
5	0
6	0

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

Truck Category	Load Factor	% AADT
2-Axle (Class 5)	0.50	0
3-Axle (Class 6,8)	0.85	0
4-Axle (Class 7,8)	1.20	0
5-Axle (Class 9,11)	1.55	0
>=6-Axle (Class 10,12,13)	2.24	99.999

Truck Category	Load Factor	% AADT
2-Axle (Class 5)	0.50	
3-Axle (Class 6,8)	0.85	
4-Axle (Class 7,8)	1.20	
5-Axle (Class 9,11)	1.55	
>=6-Axle (Class 10,12,13)	2.24	

Design Lane AADT:	154
Computed Design ESALs:	**629,545**

Historical Lane AADT:	
Computed Historical ESALs:	

Construction Year ESAL Calculations

Truck Category	% AADT	Load Factor for Truck Category	ESALs
	0	0.5	0
	0	0.85	0
	0	1.2	0
	0	1.55	0
	99.999	2.24	125,909
	Total Construction Year ESALs:		125,909

Historical Construction Year ESAL Calculations

Truck Category	% AADT	Load Factor for Truck Category	ESALs
		Total Historic Year ESALs:	

MP 269-278 ESALs

Traffic Data for Design and Historic ESALs

Design Data Input	
Design Construction Year:	2024
Design Length in Years:	26
Base Year:	2024
Base Year Total AADT:	2,643
Growth Rate % per Year:	1

Historic Data Input	
Historic Construction Year:	
Backcast % per Year:	

% of Base Year AADT for Each Lane	
Lane	%
1	55
2	45
3	0
4	0
5	0
6	0

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

Truck Category	Load Factor	% AADT
2-Axle (Class 5)	0.50	11.3
3-Axle (Class 6,8)	0.85	0.65
4-Axle (Class 7,8)	1.20	0.25
5-Axle (Class 9,11)	1.55	1
>=6-Axle (Class 10,12,13)	2.24	0.75

Truck Category	Load Factor	% AADT
2-Axle (Class 5)	0.50	
3-Axle (Class 6,8)	0.85	
4-Axle (Class 7,8)	1.20	
5-Axle (Class 9,11)	1.55	
>=6-Axle (Class 10,12,13)	2.24	

Design Lane AADT:	1,454
Computed Design ESALs:	**1,525,028**

Historical Lane AADT:	
Computed Historical ESALs:	

Construction Year ESAL Calculations

Truck Category	% AADT	Load Factor for Truck Category	ESALs
	11.3	0.5	29,985
	0.65	0.85	2,932
	0.25	1.2	1,592
	1	1.55	8,226
	0.75	2.24	8,916
	Total Construction Year ESALs:		51,651

Historical Construction Year ESAL Calculations

Truck Category	% AADT	Load Factor for Truck Category	ESALs
	Total Historic Year ESALs:		

MP 269-278 Results

Project Name: Richardson Hwy Passing Lanes | **Project Number:** 15-041-07 | **Analysis Date:** 12/1/2022 | Project Status

Design Type: New Design | **Designer:** J. Dvorak | **Unit:** US Customary | All layer damages less than 100%.

Project Location:	BIG DELTA AP			Tire Load (lbs) 4500	Load Description:			ESAL				
					Load Loc (in)							
			Design	Tire Press. (psi)	X:	0	13.5					
Design AADT:	2,643		Loadings	110	Y:	0	0					
Spring%:	9		193,912		Eval Loc (in)							
Summer%:	33		711,009		X:	0	6.75					
Fall%:	8		172,366		Y:	0	0					
Winter%:	50		1,077,287									
Total%:	100		2,154,573									

Layer	Critical Z Coordinate (in)	Asphalt Properties		Season	Modulus (Ksi)	Poisson's Ratio	Tensile Micro Strain	Compressive Stress (psi)	Million Cycles to Failure	Past Damage (%)	Future Damage (%)	Total Damage (%)
		Air%:	5	Spring	450	0.30	51		220.45		0.09	0.09
Thickness (in): 2	1.99	Asphalt%:	5.5	Summer	400	0.30	47		332.26		0.21	0.21
Name: Asphalt Concrete (Modified Asph.)		Density (pcf)	148	Fall	400	0.30	47		332.26		0.05	0.05
Use TAI: Yes				Winter	1200	0.30	11		16686.93		0.01	0.01
									Total Damage:		0.36	0.36
		Air%:	6	Spring	200	0.35	219		1.38		14.02	14.02
Thickness (in): 5	6.99	Asphalt%:	4.5	Summer	200	0.35	205		1.72		41.36	41.36
Name: 4-5% Asphalt Treated Base		Density (pcf)	145	Fall	200	0.35	205		1.72		10.03	10.03
Use TAI: Yes				Winter	600	0.35	84		12.82		8.40	8.40
									Total Damage:		73.81	73.81
		Air%:		Spring	35	0.40		15.4	5.75		3.37	3.37
Thickness (in): 6	7.01	Asphalt%:		Summer	40	0.40		16.7	6.83		10.41	10.41
Name: Subbase F P200<6%		Density:		Fall	40	0.40		16.7	6.83		2.52	2.52
Use TAI:				Winter	90	0.40		14.1	168.23		0.64	0.64
									Total Damage:		16.94	16.94
		Air%:		Spring	35	0.40		6.2	111.40		0.17	0.17
Thickness (in): 8	13.01	Asphalt%:		Summer	40	0.40		6.5	150.76		0.47	0.47
Name: Select A P200<6%		Density:		Fall	40	0.40		6.5	150.76		0.11	0.11
Use TAI:				Winter	90	0.40		5.1	4643.67		0.02	0.02
									Total Damage:		0.77	0.77
				Spring	5	0.45		2.2	2.65		7.31	7.31
Thickness (in): 0	21.01			Summer	5	0.45		2.1	2.92		24.34	24.34
Name: Subgrade P200>30%				Fall	5	0.45		2.1	2.92		5.90	5.90
				Winter	5	0.45		1.2	19.01		5.67	5.67
									Total Damage:		43.22	43.22

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MP 279-308 ESALs

Traffic Data for Design and Historic ESALs

Design Data Input	
Design Construction Year:	2024
Design Length in Years:	26
Base Year:	2024
Base Year Total AADT:	1,544
Growth Rate % per Year:	1

Historic Data Input	
Historic Construction Year:	
Backcast % per Year:	

% of Base Year AADT for Each Lane	
Lane	%
1	55
2	45
3	0
4	0
5	0
6	0

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

Truck Category	Load Factor	% AADT
2-Axle (Class 5)	0.50	13
3-Axle (Class 6,8)	0.85	0.9
4-Axle (Class 7,8)	1.20	2.2
5-Axle (Class 9,11)	1.55	2
>=6-Axle (Class 10,12,13)	2.24	2.5

Truck Category	Load Factor	% AADT
2-Axle (Class 5)	0.50	
3-Axle (Class 6,8)	0.85	
4-Axle (Class 7,8)	1.20	
5-Axle (Class 9,11)	1.55	
>=6-Axle (Class 10,12,13)	2.24	

Design Lane AADT:	849
Computed Design ESALs:	1,702,300

Historical Lane AADT:	
Computed Historical ESALs:	

Construction Year ESAL Calculations

Truck Category	% AADT	Load Factor for Truck Category	ESALs
	13	0.5	20,143
	0.9	0.85	2,371
	2.2	1.2	8,181
	2	1.55	9,606
	2.5	2.24	17,354
	Total Construction Year ESALs:		57,655

Historical Construction Year ESAL Calculations

Truck Category	% AADT	Load Factor for Truck Category	ESALs
	Total Historic Year ESALs:		

MP 279-308 Results

Project Name: Richardson Hwy Passing Lanes | **Project Number:** 15-041-07 | **Analysis Date:** 12/1/2022 | Project Status

Design Type: New Design | **Designer:** J. Dvorak | **Unit:** US Customary | All layer damages less than 100%.

Project Location:	BIG DELTA AP			Tire Load (lbs) 4500	Load Description:			ESAL				
					Load Loc (in)							
			Design	Tire Press. (psi)	X:	0	13.5					
Design AADT:	1,544		Loadings	110	Y:	0	0					
Spring%:	9		209,866		Eval Loc (in)							
Summer%:	33		769,509		X:	0	6.75					
Fall%:	8		186,548		Y:	0	0					
Winter%:	50		1,165,923									
Total%:	100		2,331,845									

Layer	Critical Z Coordinate (in)	Asphalt Properties		Season	Modulus (Ksi)	Poisson's Ratio	Tensile Micro Strain	Compressive Stress (psi)	Million Cycles to Failure	Past Damage (%)	Future Damage (%)	Total Damage (%)
		Air%:	5	Spring	450	0.30	51		220.45		0.10	0.10
Thickness (in): 2	1.99	Asphalt%:	5.5	Summer	400	0.30	47		332.26		0.23	0.23
Name: Asphalt Concrete (Modified Asph.)		Density (pcf)	148	Fall	400	0.30	47		332.26		0.06	0.06
Use TAI: Yes				Winter	1200	0.30	11		16686.93		0.01	0.01
									Total Damage:		0.40	0.40
		Air%:	6	Spring	200	0.35	219		1.38		15.18	15.18
Thickness (in): 5	6.99	Asphalt%:	4.5	Summer	200	0.35	205		1.72		44.76	44.76
Name: 4-5% Asphalt Treated Base		Density (pcf)	145	Fall	200	0.35	205		1.72		10.85	10.85
Use TAI: Yes				Winter	600	0.35	84		12.82		9.09	9.09
									Total Damage:		79.88	79.88
		Air%:		Spring	35	0.40		15.4	5.75		3.65	3.65
Thickness (in): 6	7.01	Asphalt%:		Summer	40	0.40		16.7	6.83		11.26	11.26
Name: Subbase F P200<6%		Density:		Fall	40	0.40		16.7	6.83		2.73	2.73
Use TAI:				Winter	90	0.40		14.1	168.23		0.69	0.69
									Total Damage:		18.33	18.33
		Air%:		Spring	35	0.40		6.2	111.40		0.19	0.19
Thickness (in): 8	13.01	Asphalt%:		Summer	40	0.40		6.5	150.76		0.51	0.51
Name: Select A P200<6%		Density:		Fall	40	0.40		6.5	150.76		0.12	0.12
Use TAI:				Winter	90	0.40		5.1	4643.67		0.03	0.03
									Total Damage:		0.85	0.85
				Spring	5	0.45		2.2	2.65		7.91	7.91
Thickness (in): 0	21.01			Summer	5	0.45		2.1	2.92		26.34	26.34
Name: Subgrade P200>30%				Fall	5	0.45		2.1	2.92		6.39	6.39
				Winter	5	0.45		1.2	19.01		6.13	6.13
									Total Damage:		46.77	46.77

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MP 309-341 ESALs

Traffic Data for Design and Historic ESALs

Design Data Input	
Design Construction Year:	2024
Design Length in Years:	26
Base Year:	2024
Base Year Total AADT:	2,871
Growth Rate % per Year:	1

Historic Data Input	
Historic Construction Year:	
Backcast % per Year:	

% of Base Year AADT for Each Lane	
Lane	%
1	55
2	45
3	0
4	0
5	0
6	0

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

Truck Category	Load Factor	% AADT
2-Axle (Class 5)	0.50	10
3-Axle (Class 6,8)	0.85	0.8
4-Axle (Class 7,8)	1.20	1
5-Axle (Class 9,11)	1.55	1
>=6-Axle (Class 10,12,13)	2.24	1.05

Truck Category	Load Factor	% AADT
2-Axle (Class 5)	0.50	
3-Axle (Class 6,8)	0.85	
4-Axle (Class 7,8)	1.20	
5-Axle (Class 9,11)	1.55	
>=6-Axle (Class 10,12,13)	2.24	

Design Lane AADT:	1,579
Computed Design ESALs:	**1,834,723**

Historical Lane AADT:	
Computed Historical ESALs:	

Construction Year ESAL Calculations

Truck Category	% AADT	Load Factor for Truck Category	ESALs
	10	0.5	28,817
	0.8	0.85	3,919
	1	1.2	6,916
	1	1.55	8,933
	1.05	2.24	13,555
	Total Construction Year ESALs:		62,140

Historical Construction Year ESAL Calculations

Truck Category	% AADT	Load Factor for Truck Category	ESALs
	Total Historic Year ESALs:		

MP 309-341 Results

Project Name: Richardson Hwy Passing Lanes | **Project Number:** 15-041-07 | **Analysis Date:** 12/1/2022 | Project Status

Design Type: New Design | **Designer:** J. Dvorak | **Unit:** US Customary | All layer damages less than 100%.

Project Location:	BIG DELTA AP			Tire Load (lbs) 4500	Load Description:			ESAL				
					Load Loc (in)							
			Design	Tire Press. (psi)	X:	0	13.5					
Design AADT:	2,871		Loadings	110	Y:	0	0					
Spring%:	9		221,784		Eval Loc (in)							
Summer%:	33		813,208		X:	0	6.75					
Fall%:	8		197,141		Y:	0	0					
Winter%:	50		1,232,134									
Total%:	100		2,464,268									

Layer	Critical Z Coordinate (in)	Asphalt Properties	Season	Modulus (Ksi)	Poisson's Ratio	Tensile Micro Strain	Compressive Stress (psi)	Million Cycles to Failure	Past Damage (%)	Future Damage (%)	Total Damage (%)
Thickness (in): 2	1.99	Air%: 5	Spring	450	0.30	51		220.45		0.10	0.10
Name: Asphalt Concrete (Modified Asph.)		Asphalt%: 5.5	Summer	400	0.30	47		332.26		0.24	0.24
Use TAI: Yes		Density (pcf) 148	Fall	400	0.30	47		332.26		0.06	0.06
			Winter	1200	0.30	11		16686.93		0.01	0.01
								Total Damage:		0.41	0.41
Thickness (in): 5	6.99	Air%: 6	Spring	200	0.35	219		1.38		16.04	16.04
Name: 4-5% Asphalt Treated Base		Asphalt%: 4.5	Summer	200	0.35	205		1.72		47.30	47.30
Use TAI: Yes		Density (pcf) 145	Fall	200	0.35	205		1.72		11.47	11.47
			Winter	600	0.35	84		12.82		9.61	9.61
								Total Damage:		84.42	84.42
Thickness (in): 6	7.01	Air%:	Spring	35	0.40		15.4	5.75		3.86	3.86
Name: Subbase F P200<6%		Asphalt%:	Summer	40	0.40		16.7	6.83		11.90	11.90
Use TAI:		Density:	Fall	40	0.40		16.7	6.83		2.89	2.89
			Winter	90	0.40		14.1	168.23		0.73	0.73
								Total Damage:		19.38	19.38
Thickness (in): 8	13.01	Air%:	Spring	35	0.40		6.2	111.40		0.20	0.20
Name: Select A P200<6%		Asphalt%:	Summer	40	0.40		6.5	150.76		0.54	0.54
Use TAI:		Density:	Fall	40	0.40		6.5	150.76		0.13	0.13
			Winter	90	0.40		5.1	4643.67		0.03	0.03
								Total Damage:		0.90	0.90
Thickness (in): 0	21.01		Spring	5	0.45		2.2	2.65		8.36	8.36
Name: Subgrade P200>30%			Summer	5	0.45		2.1	2.92		27.84	27.84
			Fall	5	0.45		2.1	2.92		6.75	6.75
			Winter	5	0.45		1.2	19.01		6.48	6.48
								Total Damage:		49.43	49.43

H:\jobs\15-041 Richardson Hwy MP266-341 Passing (DOT-NR)\07-Geotechnical\06 Calcs\Flexible Pavement Design\December 2022 Revisions\Richardson Hwy Passing Lanes_309-341.xml

APPENDIX D

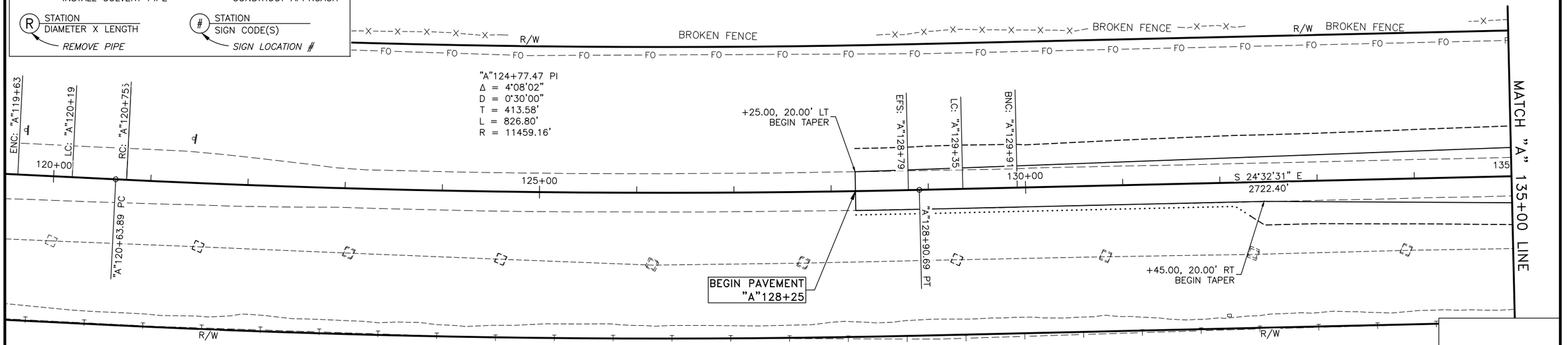
PREMIMINARLY PLAN AND PROFILE SHEETS

NO.	DATE	REVISION

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	0A23(021)/Z607150000	2022	F1	F43

PLAN VIEW KEY

- (P) STATION / DIAMETER X LENGTH — *INSTALL CULVERT PIPE*
- (A) STATION / TYPE, WIDTH — *CONSTRUCT APPROACH*
- (R) STATION / DIAMETER X LENGTH — *REMOVE PIPE*
- (#) STATION / SIGN CODE(S) — *SIGN LOCATION #*



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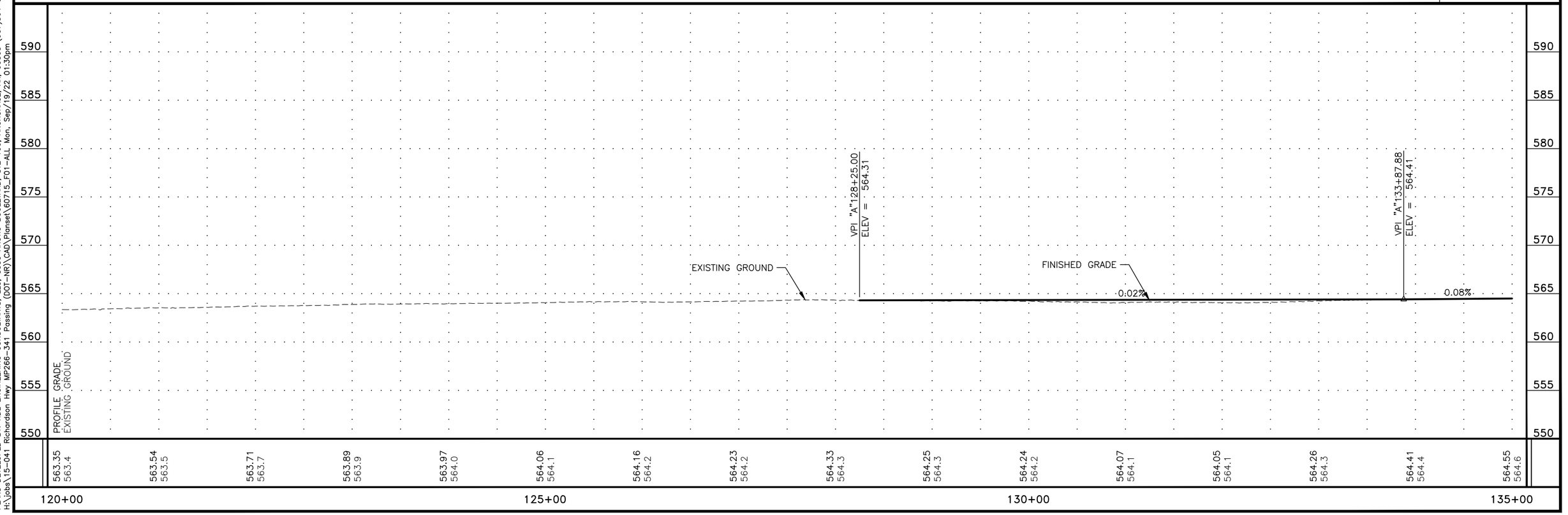

PLANS DEVELOPED BY: HDL ENGINEERING CONSULTANTS, LLC, 3335 ARCTIC BOULEVARD, STE 100, ANCHORAGE, AK, 99503 (907)564-2120, AECL861
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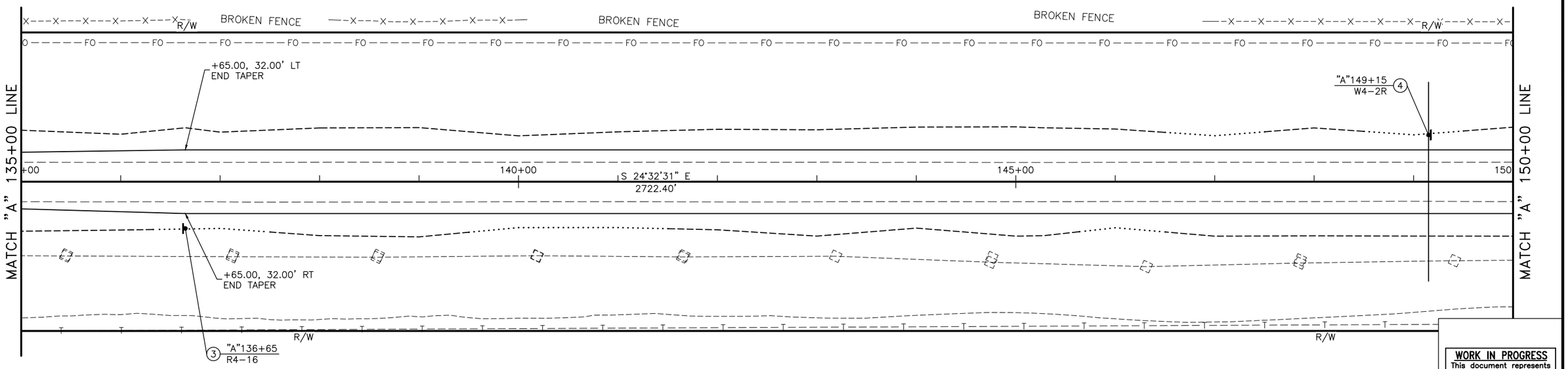
NO.	DATE	REVISION

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	0A23(021)/Z607150000	2022	F2	F43



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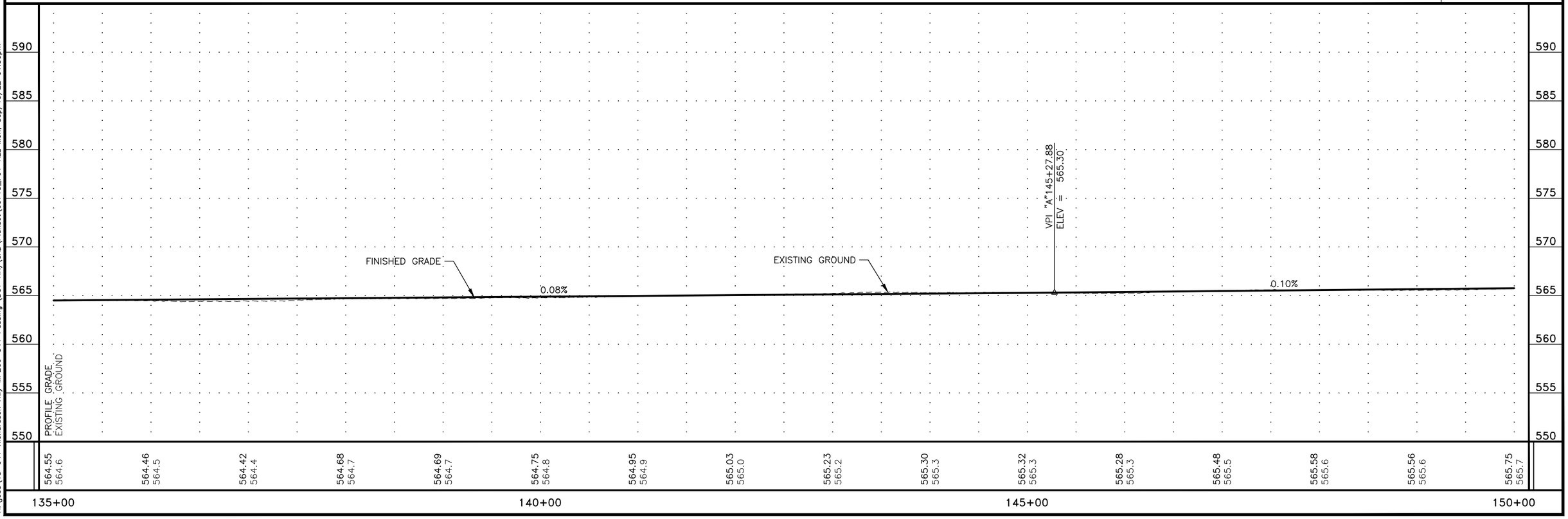

PLANS DEVELOPED BY: HDL ENGINEERING CONSULTANTS, LLC, 3335 ARCTIC BOULEVARD, STE 100, ANCHORAGE, AK, 99503 (907)564-2120, AECL861
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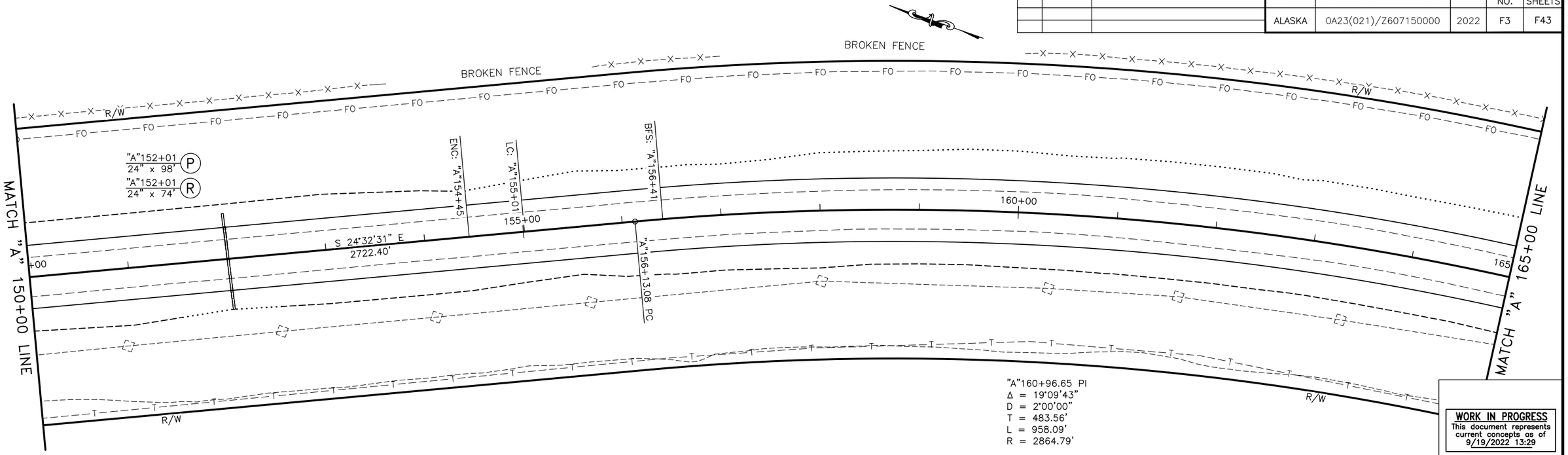
NO.	DATE	REVISION

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	0A23(021)/Z607150000	2022	F3	F43



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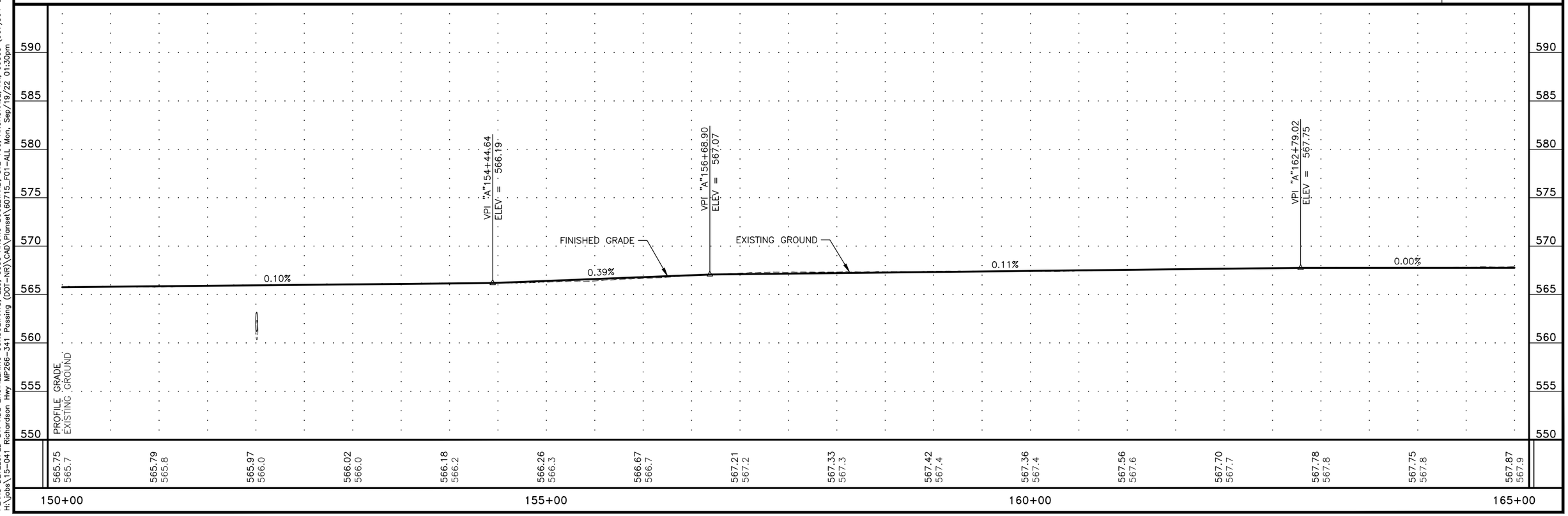

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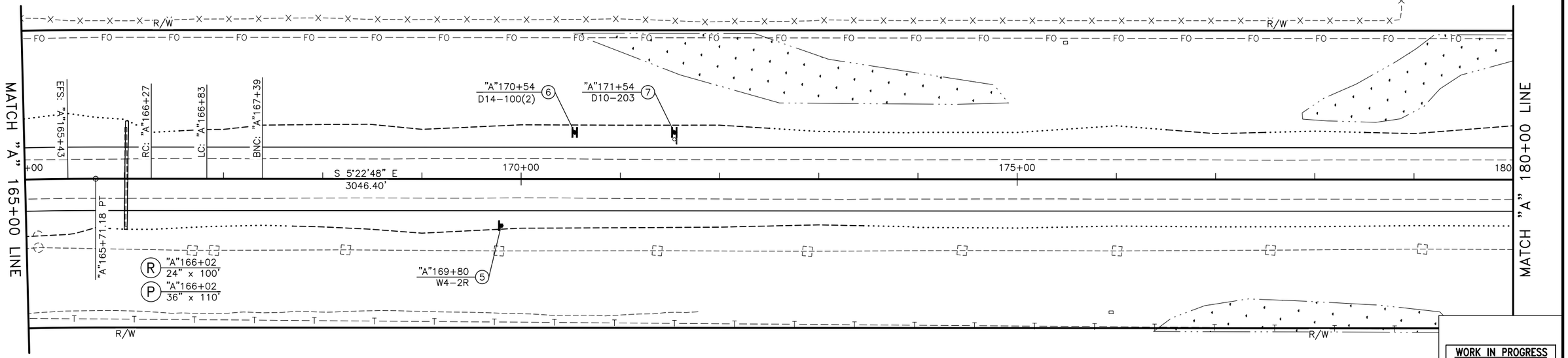
NO.	DATE	REVISION

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	0A23(021)/Z607150000	2022	F4	F43



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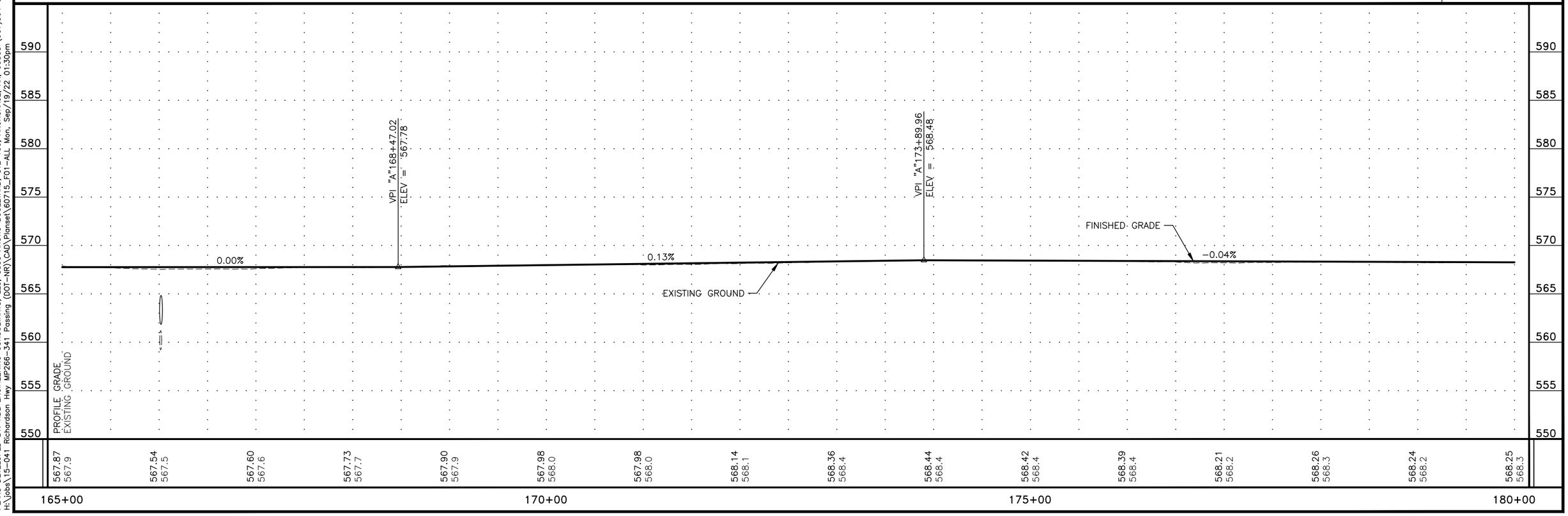

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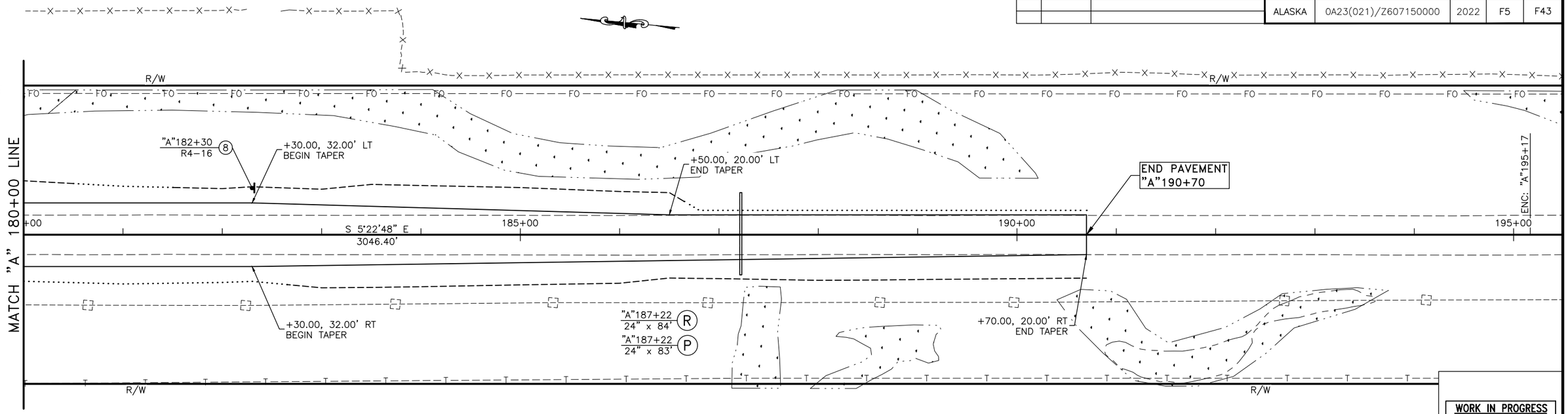
NO.	DATE	REVISION

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	0A23(021)/Z607150000	2022	F5	F43



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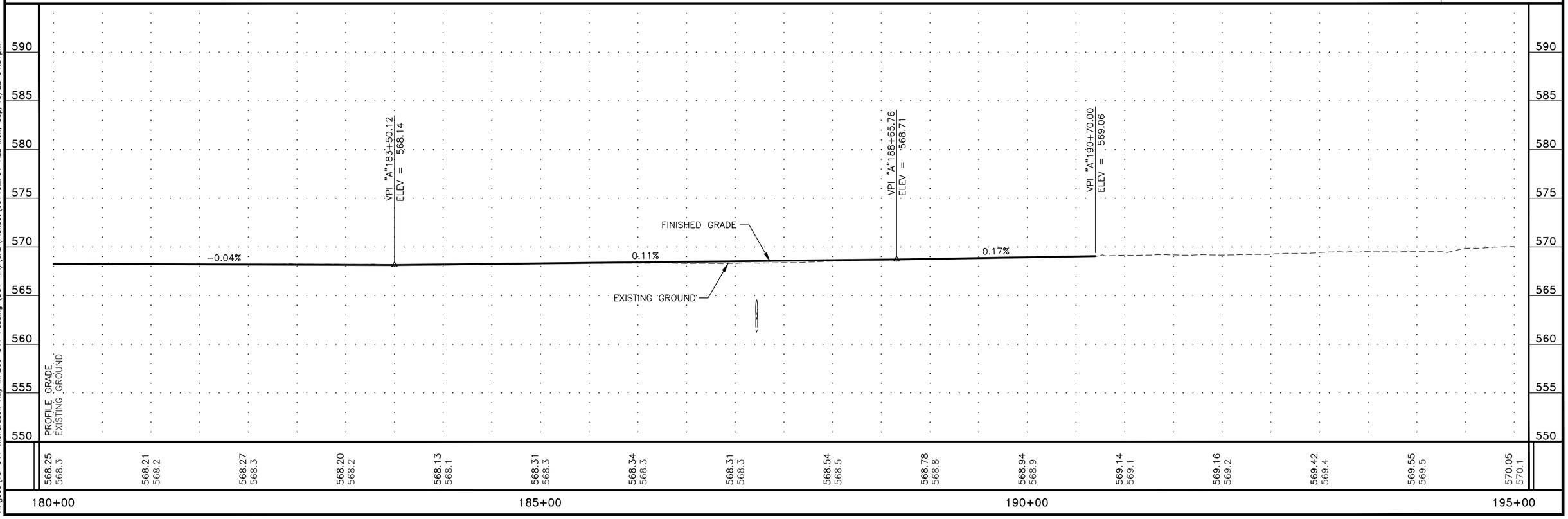

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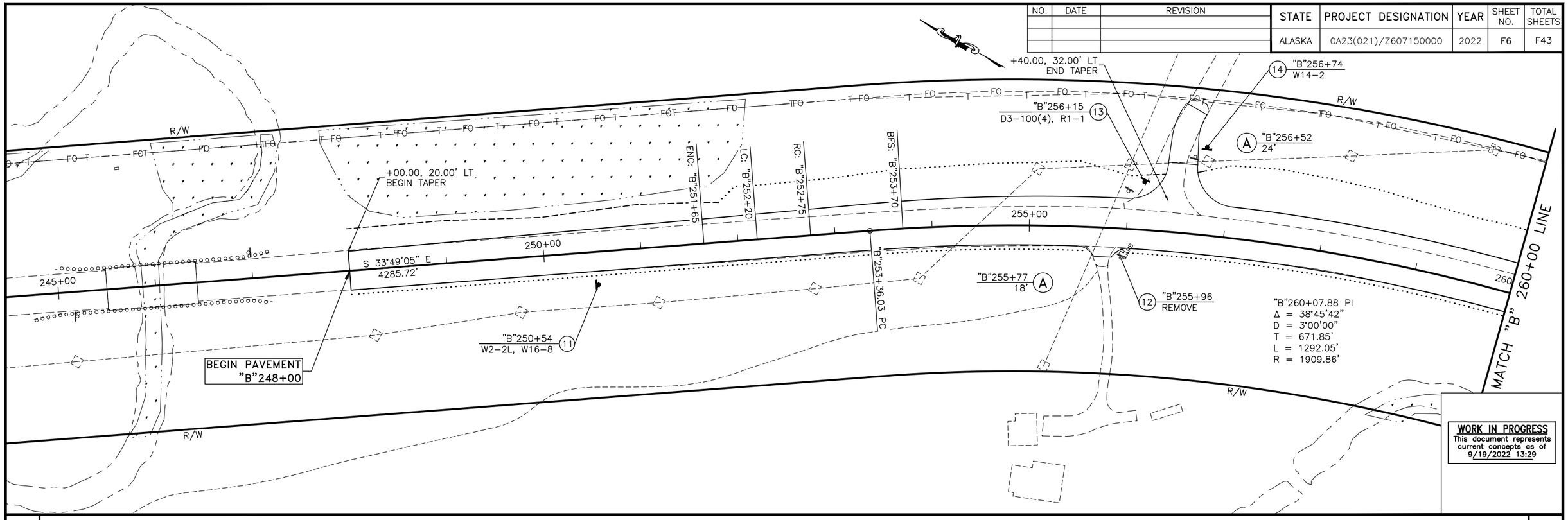
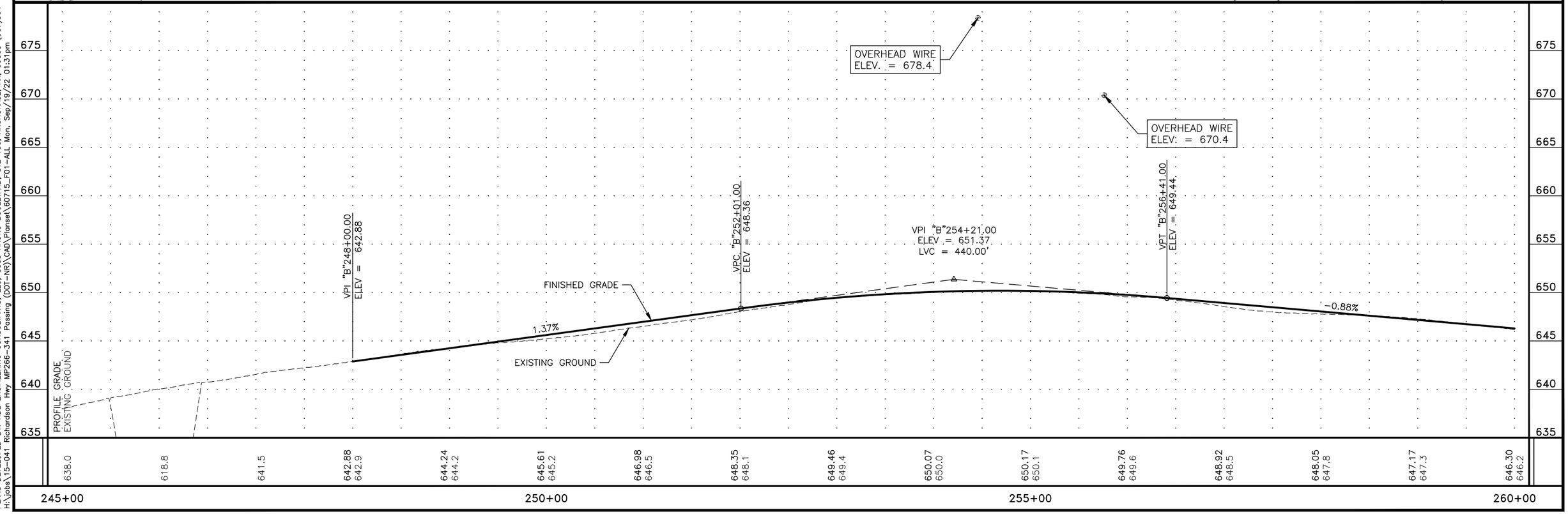
NO.	DATE	REVISION

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	0A23(021)/Z607150000	2022	F6	F43





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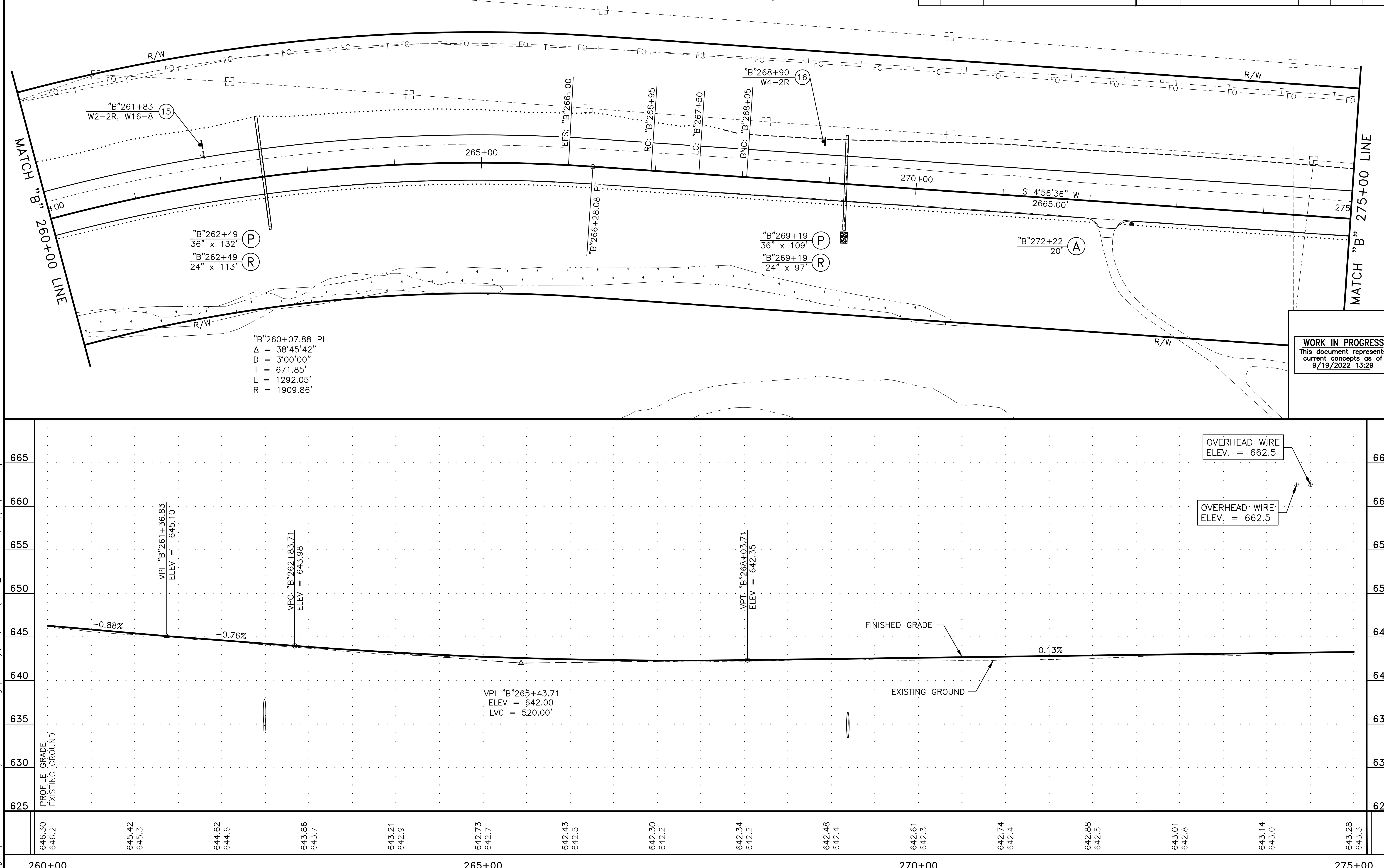
NO.	DATE	REVISION

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	0A23(021)/Z607150000	2022	F7	F43



PLANS DEVELOPED BY: HDL ENGINEERING CONSULTANTS, LLC, 3335 ARCTIC BOULEVARD, STE 100, ANCHORAGE, AK, 99503 (907)564-2120, AECL861
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NO.	DATE	REVISION

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	0A23(021)/Z607150000	2022	F8	F43

"B"284+89 D14-100(2) (17)

"B"285+89 D10-203 (18)

R/W

MATCH "B" 275+00 LINE

MATCH "B" 290+00 LINE

+00

280+00

S 4°56'36" W
2665.00'

285+00

290

"B"285+06 24" x 108' (R)

"B"285+06 36" x 117' (P)

(A) "B"286+17 20'

WORK IN PROGRESS
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660
655
650
645
640
635
630
625
620

PROFILE GRADE
EXISTING GROUND

VPI "B"275+90.63
ELEV. = 643.40

VPI "B"281+35.09
ELEV = 644.01

VPC "B"282+83.86
ELEV = 643.86

VPI "B"285+27.41
ELEV = 643.62
LVC = 487.11'

VPT "B"287+70.97
ELEV = 643.35

0.13%

0.11%

-0.10%

-0.11%

OVERHEAD WIRE
ELEV. = 662.0

OVERHEAD WIRE
ELEV. = 661.9

EXISTING GROUND

FINISHED GRADE

643.28 643.3 | 643.41 643.4 | 643.52 643.5 | 643.63 643.5 | 643.75 643.7 | 643.86 643.8 | 643.97 644.0 | 643.95 643.9 | 643.85 643.8 | 643.75 643.7 | 643.64 643.6 | 643.54 643.4 | 643.43 643.2 | 643.32 643.0 | 643.20 643.2 | 643.09 643.3

275+00 280+00 285+00 290+00

PLANS DEVELOPED BY: HDL ENGINEERING CONSULTANTS, LLC, 3335 ARCTIC BOULEVARD, STE 100, ANCHORAGE, AK, 99503 (907)564-2120, AECL861
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NO.	DATE	REVISION

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	0A23(021)/Z607150000	2022	F9	F43

MATCH "B" 290+00 LINE

MATCH "B" 305+00 LINE

R/W

"B"292+93.08 PC

"B"293+00 (19) D9-230

"B"294+93 (20) R2-1

"B"296+03 (A) 57'

"B"295+98.09 PI
Δ = 0°30'30"
D = 0°05'00"
T = 305.00'
L = 610.00'
R = 68754.94'

"B"298+98 (21) D9-230

"B"299+03.08 PT

"B"302+60 (22) REMOVE

"B"304+80 (23) R4-16

+80.00, 32.00' LT
BEGIN TAPER

S 4°56'36" W
2665.00'

S 5°27'06" W
4557.83'

290+00 295+00 300+00 305

WORK IN PROGRESS
This document represents current concepts as of 9/19/2022 13:29

OVERHEAD WIRE
ELEV. = 664.1

OVERHEAD WIRE
ELEV. = 659.2

VPI "B"293+16.46
ELEV = 642.74

VPI "B"297+74.90
ELEV = 642.26

VPI "B"299+86.51
ELEV = 642.37

VPI "B"302+00.06
ELEV = 641.89

VPI "B"303+81.41
ELEV = 641.82

EXISTING GROUND

FINISHED GRADE

−0.11% −0.10% 0.05% −0.23% −0.04% −0.22%

660 655 650 645 640 635 630 625 620

PROFILE GRADE
EXISTING GROUND

643.09 643.3 | 642.98 643.1 | 642.87 642.9 | 642.76 642.7 | 642.65 642.8 | 642.55 642.7 | 642.44 642.5 | 642.34 642.1 | 642.27 642.2 | 642.33 642.1 | 642.34 642.4 | 642.12 642.1 | 641.89 641.9 | 641.85 641.9 | 641.78 641.9 | 641.56 641.6

290+00 295+00 300+00 305+00

PLANS DEVELOPED BY: HDL ENGINEERING CONSULTANTS, LLC, 3335 ARCTIC BOULEVARD, STE 100, ANCHORAGE, AK, 99503 (907)564-2120, AECL861
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NO.	DATE	REVISION

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	0A23(021)/Z607150000	2022	F10	F43

MATCH "B" 305+00 LINE

+00.00, 20.00' LT
END TAPER

END PAVEMENT
"B"309+00

A "B"308+61
20'

S 5°27'06" W
4557.83'

R/W

+00 | 310+00 | 315+00 | 320+00

WORK IN PROGRESS
This document represents current concepts as of 9/19/2022 13:43

OVERHEAD WIRE
ELEV. = 658.9

OVERHEAD WIRE
ELEV. = 660.5

VPI "B"309+00.00
ELEV = 640.68

FINISHED GRADE
−0.22%

EXISTING GROUND

PROFILE GRADE
EXISTING GROUND

660 | 655 | 650 | 645 | 640 | 635 | 630 | 625 | 620

641.56 641.6 | 641.34 641.3 | 641.12 641.0 | 640.90 640.8 | 640.68 640.7 | 640.7 | 640.7 | 640.6 | 640.6 | 640.5 | 640.6 | 640.7 | 640.9 | 640.9 | 641.1 | 641.5

305+00 | 310+00 | 315+00 | 320+00

PLANS DEVELOPED BY: HDL ENGINEERING CONSULTANTS, LLC, 3335 ARCTIC BOULEVARD, STE 100, ANCHORAGE, AK, 99503 (907)564-2120, AECL861
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NO.	DATE	REVISION

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	0A23(021)/Z607150000	2022	F11	F43

"D"133+80.47 PI
Δ = 30°58'10"
D = 2°14'59"
T = 705.52'
L = 1376.52'
R = 2546.67'

EFS: "D"140+25

RC: "D"141+20

LC: "D"141+75

BNC: "D"142+30

P "D"142+18 / 36" x 119'

R "D"142+18 / 36" x 118'

"D"148+15 / 31' (A)

P "D"149+93 / 36" x 105'

R "D"149+93 / 24" x 94'

140+00

145+00

150+00

S 65°48'48" E
2838.89'

"D"139+55 REMOVE (29)

"D"140+51.47 PT

+20.00, 20.00' RT
BEGIN TAPER

BEGIN PAVEMENT
"D"141+20

"D"145+40 / R4-16 (30)

+40.00, 28.00' RT
END TAPER

"D"149+09 / 27' (A)

MATCH "D" 153+00 LINE

R/W

R/W

R/W

R/W

WORK IN PROGRESS
This document represents current concepts as of 9/19/2022 13:29

OVERHEAD WIRE
ELEV. = 788.3

VPI "D"141+20.00
ELEV = 754.54

VPC "D"141+73.75
ELEV = 755.18

VPI "D"143+73.84
ELEV = 757.56
LVC = 400.16'

VPT "D"145+73.92
ELEV = 761.74

VPI "D"148+86.38
ELEV = 768.27

1.19%

2.09%

1.98%

FINISHED GRADE

EXISTING GROUND

PROFILE GRADE
EXISTING GROUND

785 780 775 770 765 760 755 750 745

752.1 752.6 753.3 754.3 755.50 755.5 756.86 756.9 758.45 758.4 760.26 760.2 762.28 762.2 764.37 764.4 766.46 766.5 768.54 768.4 770.52 770.3 772.50 772.2 774.49 774.2 776.47 776.0

138+00 140+00 145+00 150+00 153+00

PLANS DEVELOPED BY: HDL ENGINEERING CONSULTANTS, LLC, 3335 ARCTIC BOULEVARD, STE 100, ANCHORAGE, AK, 99503 (907)564-2120, AECL861
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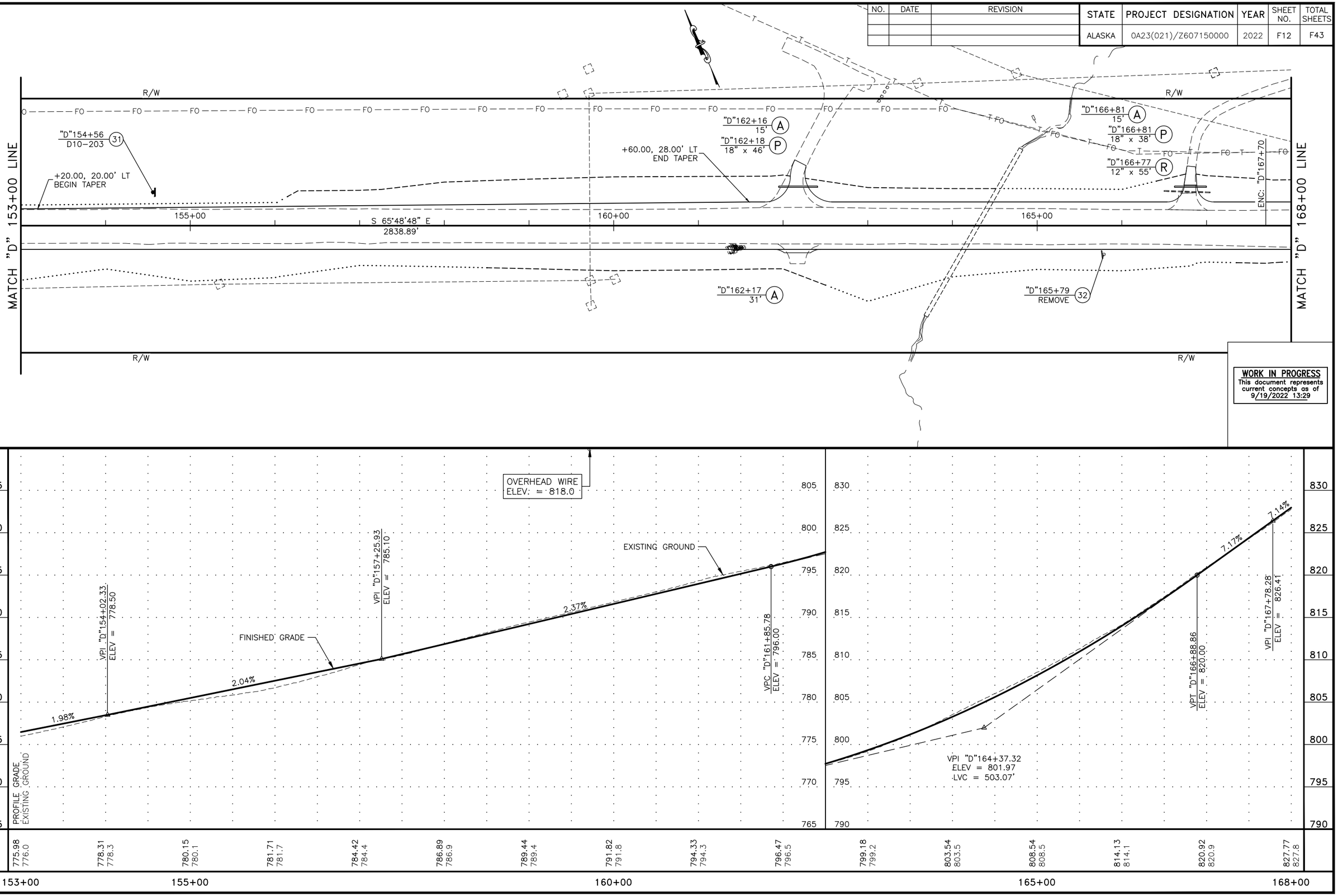
NO.	DATE	REVISION

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	0A23(021)/Z607150000	2022	F12	F43



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NO.	DATE	REVISION

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	0A23(021)/Z607150000	2022	F13	F43

MATCH "D" 168+00 LINE

R/W

LC: "D"168+25

RC: "D"168+80

BFS: "D"169+10

S 65°48'48" E
2838.89'

"D"168+90.36 PC

"D"169+86
15" (A)

"D"169+86
18" x 37' (P)

"D"172+72.22 PI
Δ = 7°37'32"
D = 1°00'00"
T = 381.86'
L = 762.60'
R = 5730.00'

END PAVEMENT
"D"173+00

"D"174+10
W4-2R (33)

EFS: "D"176+40

RC: "D"176+65

"D"176+52.96 PT

LC: "D"177+25

BNC: "D"177+80

S 73°26'19" E
1485.39'

170+00

175+00

180+00

R/W

R/W

R/W

OVERHEAD WIRE
ELEV. = 899.5

FINISHED GRADE

7.14%

PROFILE GRADE
EXISTING GROUND

VPI "D"173+00.00
ELEV = 863.67

7.14%

EXISTING GROUND

860 855 850 845 840 835 830 825 820

895 890 885 880 875 870 865 860 855

940 935 930 925 920 915 910 905 900

827.96 827.8 | 835.10 835.0 | 842.24 842.2 | 849.38 849.5 | 856.53 856.4 | 863.67 863.7 | 870.8 | 877.8 | 884.7 | 891.3 | 897.8 | 904.5 | 910.9 | 918.1 | 925.1 | 931.1

168+00 170+00 175+00 180+00 183+00

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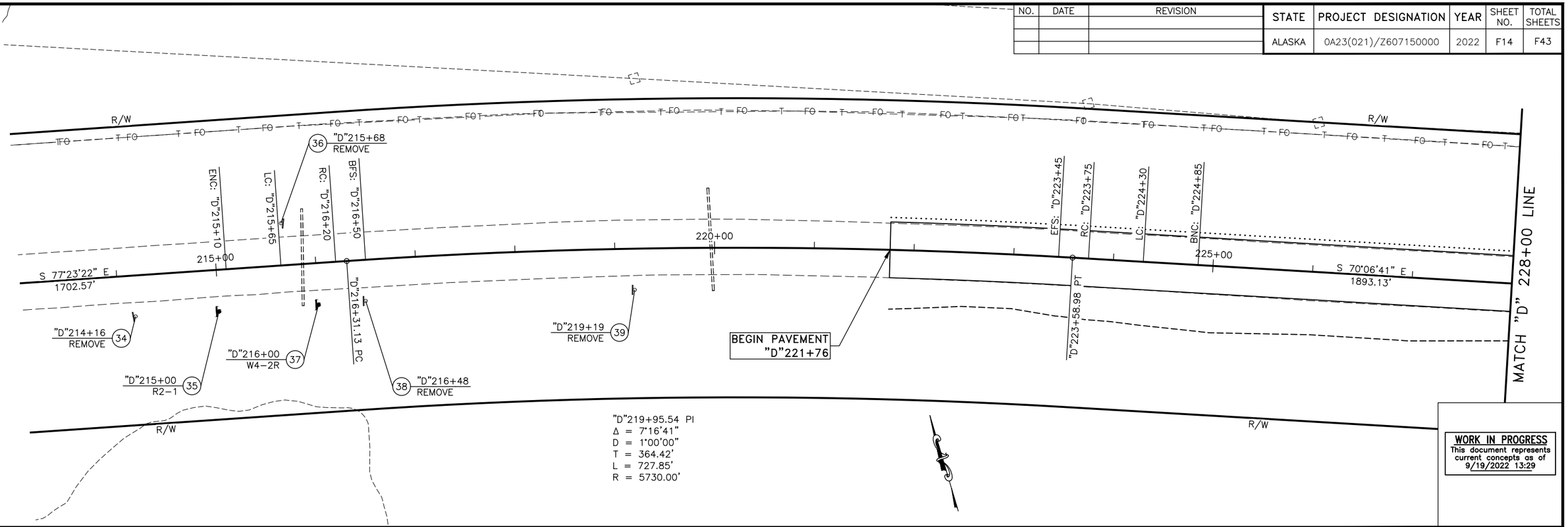
H:\Jobs\15-041 Richardson Hwy MP266-341 Passing (DOT-NR)\CAD\Planset\60715_F01-ALL Mon, Sep/19/22 01:33pm

NO.	DATE	REVISION

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	0A23(021)/Z607150000	2022	F14	F43



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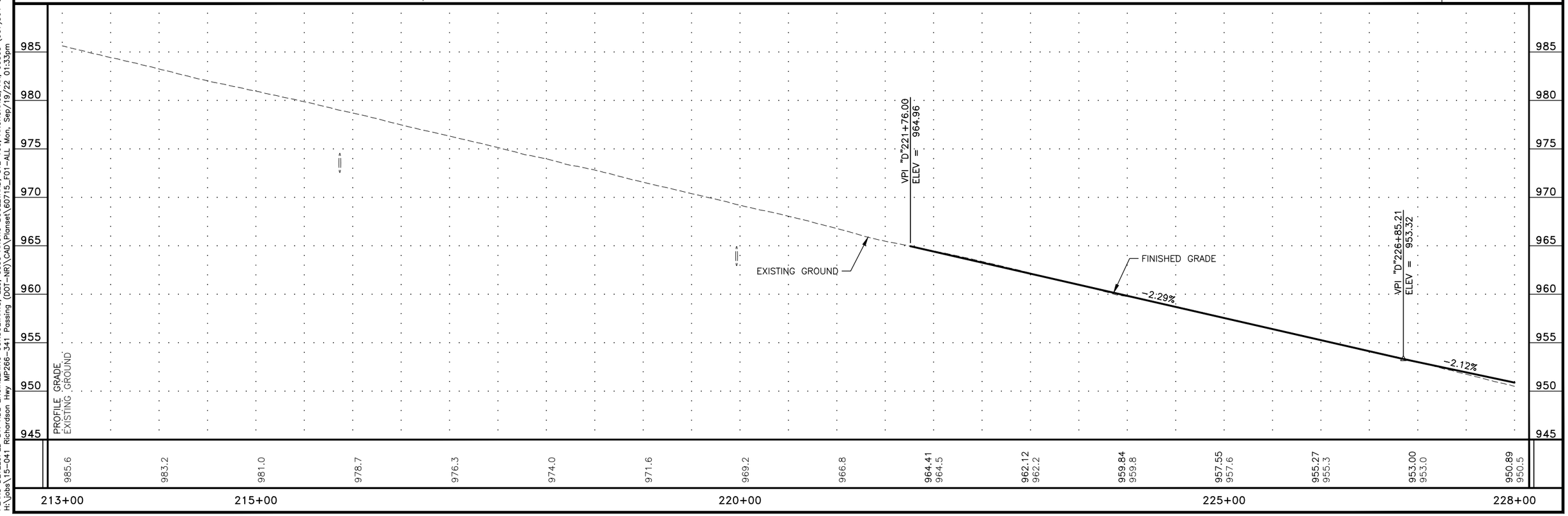

PLANS DEVELOPED BY: HDL ENGINEERING CONSULTANTS, LLC, 3335 ARCTIC BOULEVARD, STE 100, ANCHORAGE, AK, 99503 (907)564-2120, AECL861
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NO.	DATE	REVISION

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	0A23(021)/Z607150000	2022	F15	F43

MATCH "D" 228+00 LINE

MATCH "D" 243+00 LINE

R/W

P "D"228+39 36" x 118'
R "D"228+39 24" x 99'

P "D"233+35 36" x 110'
R "D"233+34 36" x 99'

P "D"236+36 24" x 96'
R "D"236+36 24" x 84'

"D"239+88 W8-5, SPECIAL (41)

"D"242+10 REMOVE (42)

ENC: "D"241+30

LC: "D"241+85

RC: "D"242+45

BFS: "D"242+70

230+00

S 70°06'41" E
1893.13'

235+00

240+00

+50.00, 28.00' RT
BEGIN TAPER

"D"234+34 W8-5, SPECIAL (40)

+90.00, 20.00' RT
END TAPER

CMB

A "D"237+38 36'

"D"242+37 18" x 92' R
"D"242+37 36" x 119' P

"D"242+52.11 PC

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OVERHEAD WIRE
ELEV. = 965.5'

FINISHED GRADE

EXISTING GROUND

-2.12%

-1.61%

-2.81%

VPI "D"230+90.66
ELEV = 944.73

VPC "D"234+92.40
ELEV = 938.28

VPI "D"237+69.26
ELEV = 933.83
LVC = 553.71'

VPT "D"240+46.11
ELEV = 926.07

PROFILE GRADE
EXISTING GROUND

950 945 940 935 930 925 920 915 910

950.89 950.5 | 948.77 948.5 | 946.65 946.3 | 944.58 944.6 | 942.97 942.7 | 941.37 941.0 | 939.76 939.3 | 938.16 937.8 | 936.43 936.2 | 934.48 934.4 | 932.32 932.2 | 929.93 929.8 | 927.34 927.2 | 924.55 924.4 | 921.75 921.4 | 918.94 918.7

228+00 230+00 235+00 240+00 243+00

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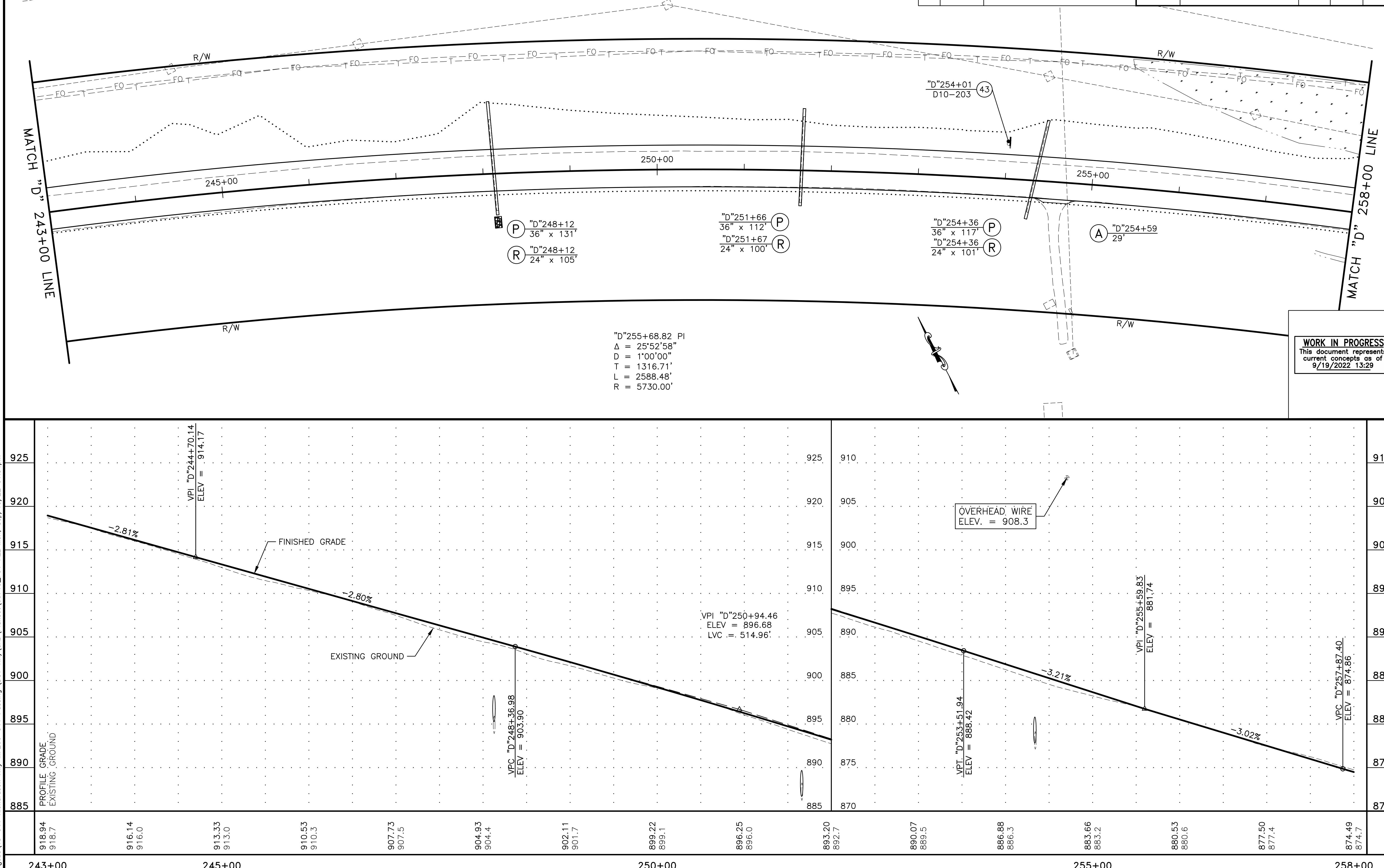
NO.	DATE	REVISION

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	0A23(021)/Z607150000	2022	F16	F43



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NO.	DATE	REVISION

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	0A23(021)/Z607150000	2022	F17	F43

"D"259+55
R4-16 (44)

R/W

+55.00, 28.00' LT
BEGIN TAPER

MATCH "D" 258+00 LINE

260+00

265+00

270+00

+75.00, 20.00' LT
END TAPER

(45) "D"268+25
REMOVE

EFS: "D"268+25

RC: "D"268+55

LC: "D"269+10

BNC: "D"269+65

"D"268+40.59 PT

S 44°13'43" E
2891.40'

(R) "D"260+57
24" x 101'

(P) "D"260+58
36" x 107'

END PAVEMENT
"D"263+75

"D"255+68.82 PI
Δ = 25°52'58"
D = 1°00'00"
T = 1316.71'
L = 2588.48'
R = 5730.00'

R/W

R/W

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VPT "D"260+51.09
ELEV = 870.56

VPI "D"263+75.00
ELEV = 869.79

FINISHED GRADE

-0.24%

VPI "D"259+19.25
ELEV = 870.87
LVC = 263.69'

EXISTING GROUND

PROFILE GRADE
EXISTING GROUND

890
885
880
875
870
865
860
855
850

874.49
874.7

872.13
872.0

870.82
870.7

870.44
870.0

870.20
869.7

869.97
870.0

869.6

869.5

870.1

870.2

870.3

870.3

869.8

869.1

258+00

260+00

265+00

270+00

273+00

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NO.	DATE	REVISION

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	0A23(021)/Z607150000	2022	F18	F43

"E"150+73.56 PI
Δ = 2°58'26"
D = 0°15'00"
T = 594.92'
L = 1189.58'
R = 22918.31'

R/W

P "E"156+65 24" x 82'
R "E"156+65 24" x 72'
"E"158+85 20' A
"E"162+53 36" x 101' P
"E"162+53 24" x 76' R
A "E"162+99 20'
P "E"165+39 36" x 109'
R "E"165+39 24" x 100'

155+00 160+00 165+00

N 81°23'21" E
4367.43'

"E"156+68.21 PT

+00.00, 20.00' RT
BEGIN TAPER

"E"159+20 R4-16 (51)

+20.00, 32.00' RT
END TAPER

"E"161+83 REMOVE (52)

BEGIN PAVEMENT
"E"155+00

MATCH "E" 169+00 LINE

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VPI "E"155+00.00
ELEV = 949.08

PROFILE GRADE
EXISTING GROUND

FINISHED GRADE

2.06%

EXISTING GROUND

VPI "E"167+49.58
ELEV = 974.79
LVC = 599.85'

VPC "E"164+49.65
ELEV = 968.62

980 975 970 965 960 955 950 945 940

947.5
949.08 949.1
951.14 951.1
953.20 953.3
955.25 955.3
957.31 956.8
959.37 958.8
961.43 961.0
963.48 963.1
965.54 965.4
967.60 967.6
969.61 969.6
971.33 971.3
972.72 972.6
973.76 973.8
974.47 974.6

154+00 155+00 160+00 165+00 169+00

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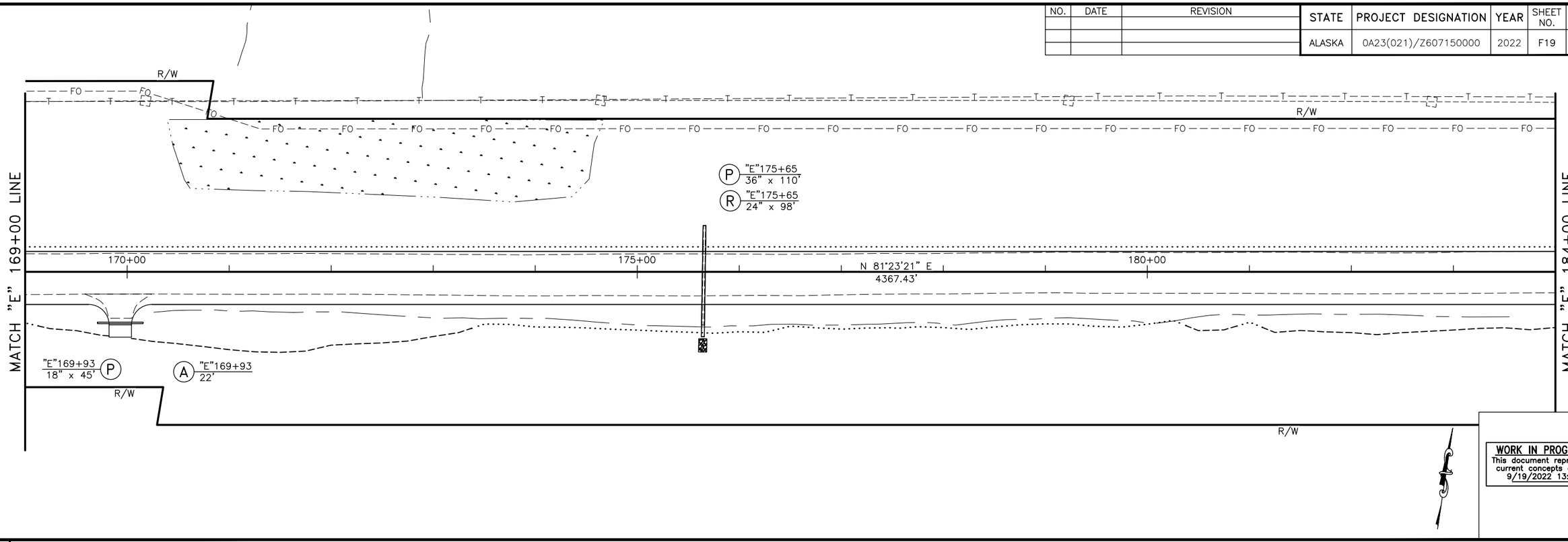
NO.	DATE	REVISION

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	0A23(021)/Z607150000	2022	F19	F43



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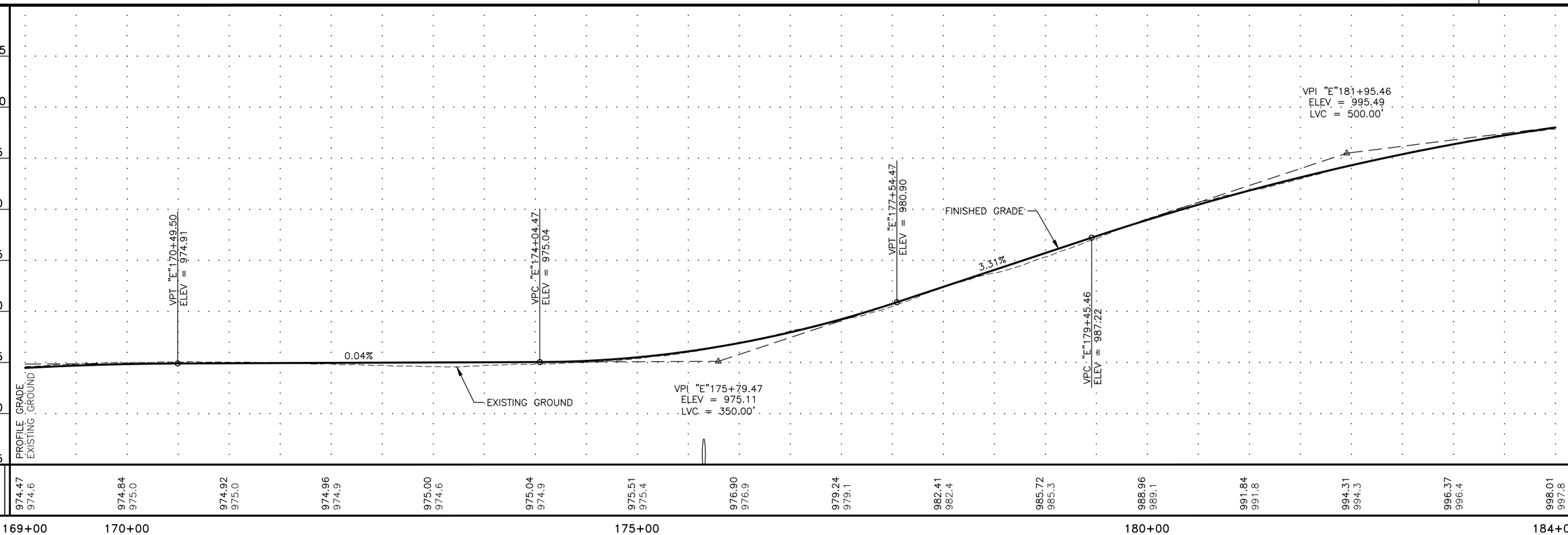

PLANS DEVELOPED BY: HDL ENGINEERING CONSULTANTS, LLC, 3335 ARCTIC BOULEVARD, STE 100, ANCHORAGE, AK, 99503 (907)564-2120, AECL861
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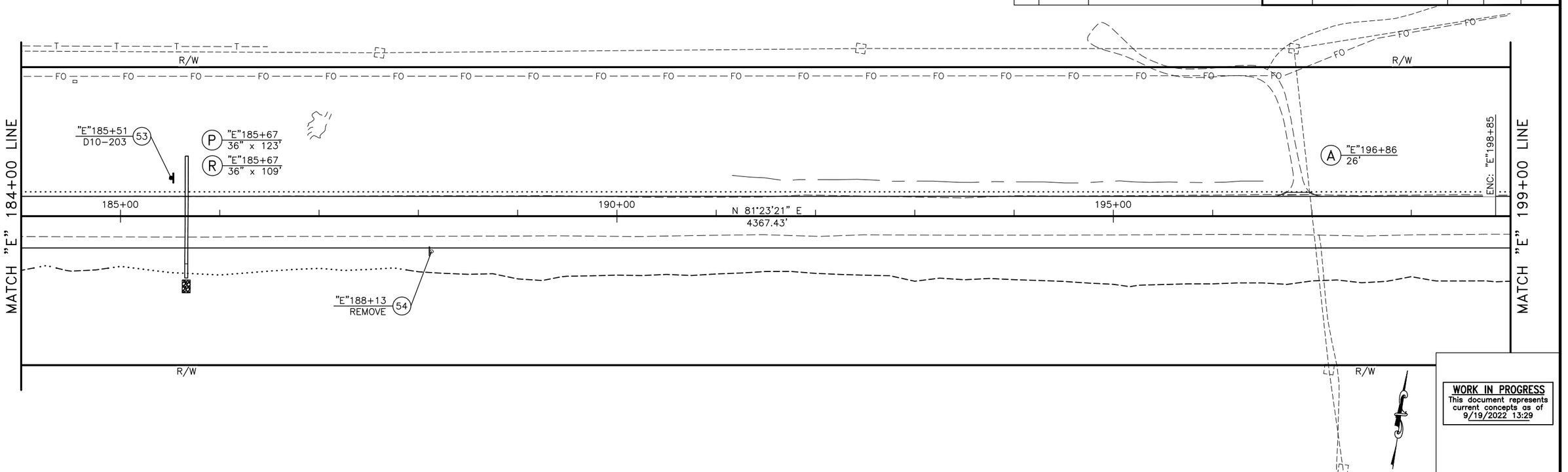
NO.	DATE	REVISION

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	0A23(021)/Z607150000	2022	F20	F43



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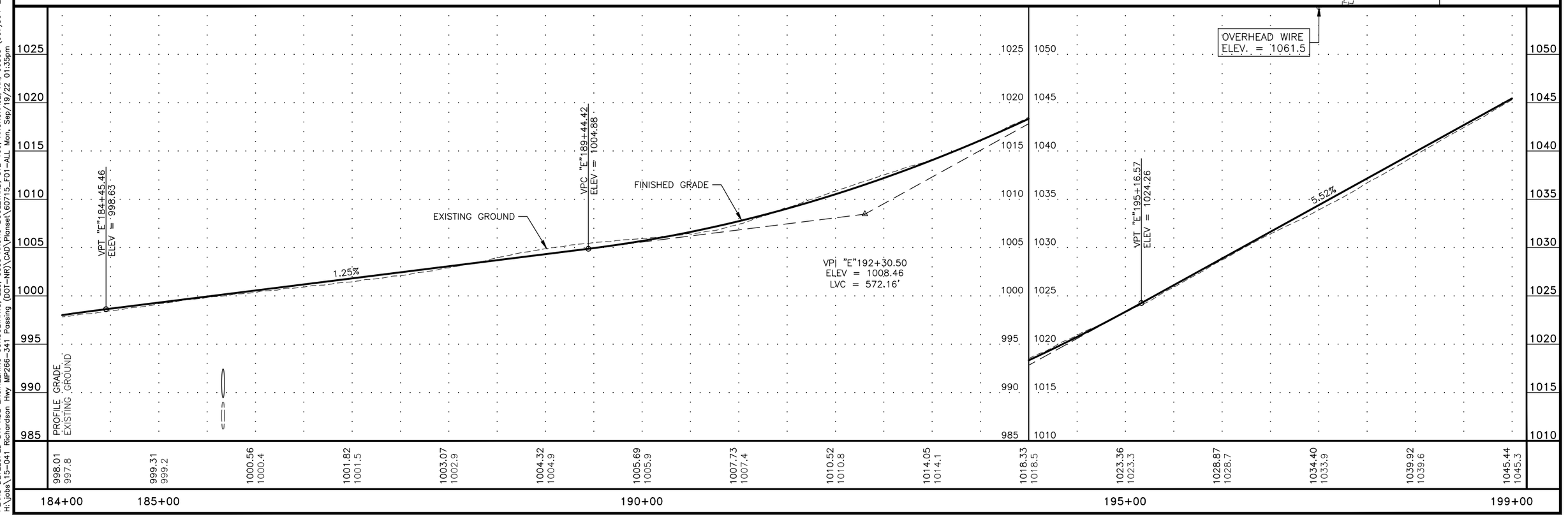

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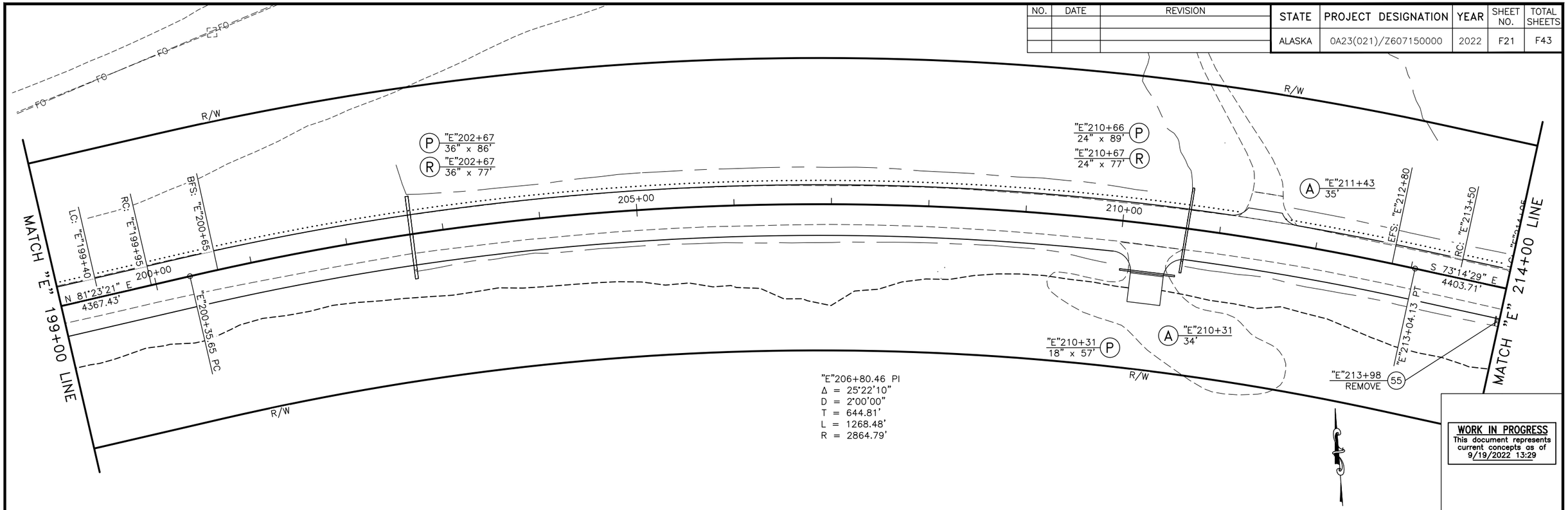
NO.	DATE	REVISION

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	0A23(021)/Z607150000	2022	F21	F43



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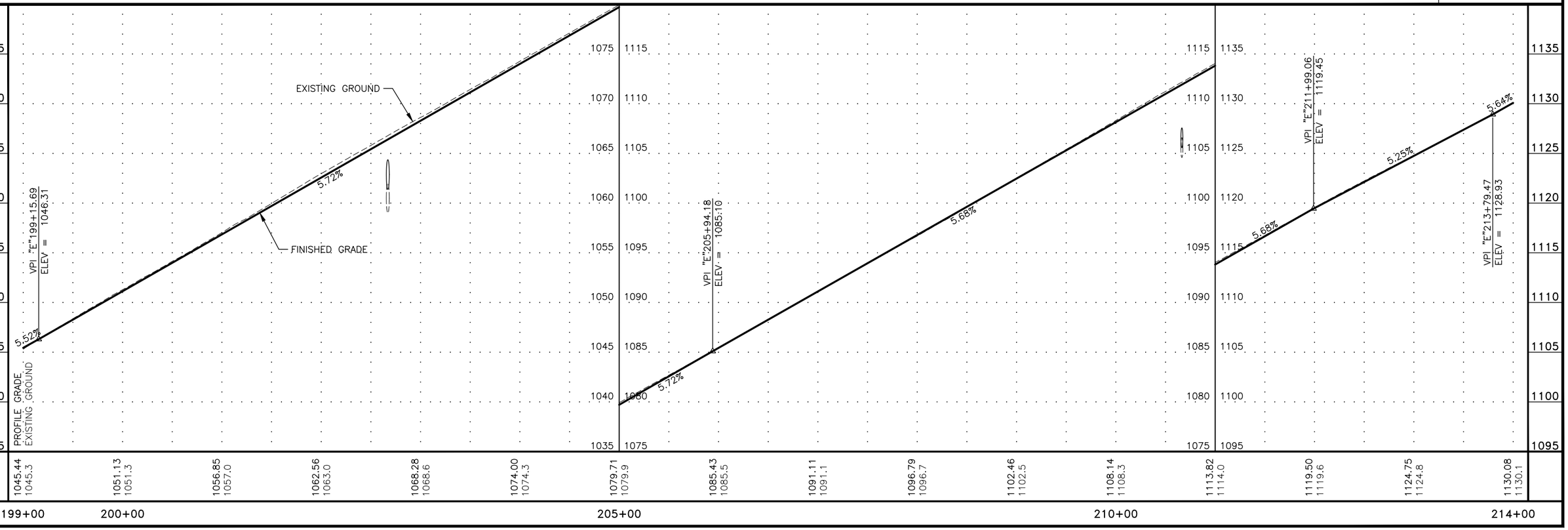

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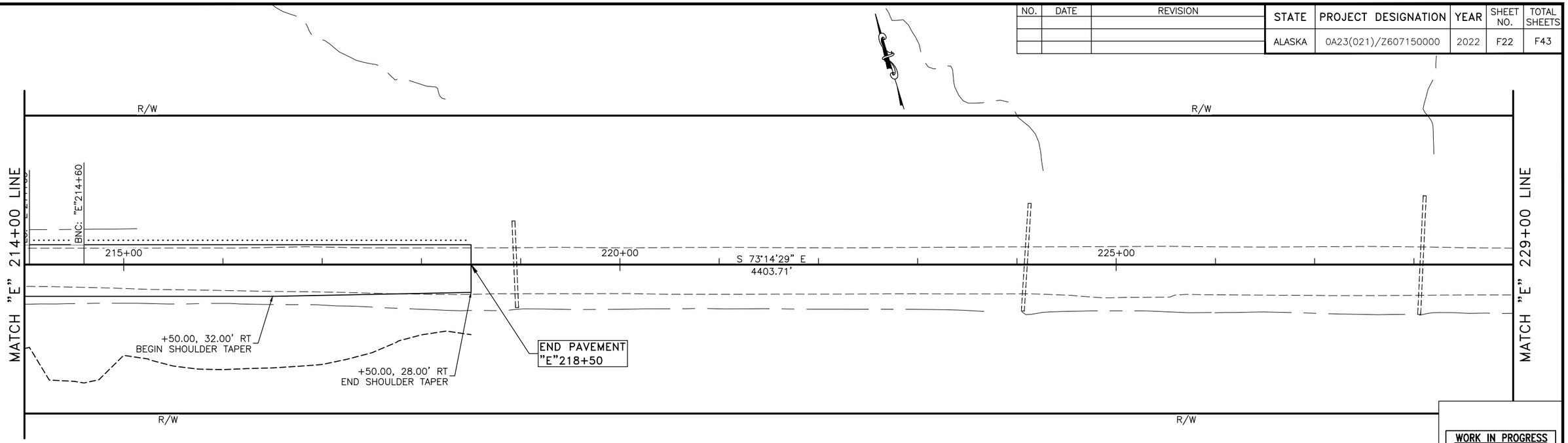
NO.	DATE	REVISION

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	0A23(021)/Z607150000	2022	F22	F43



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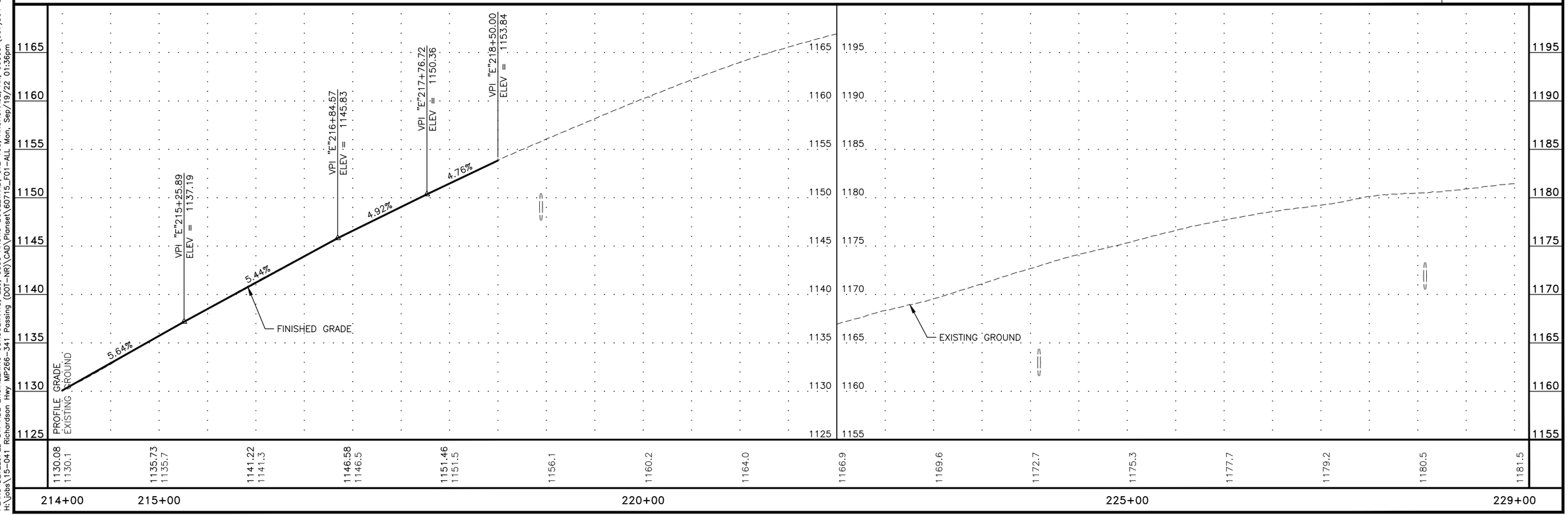

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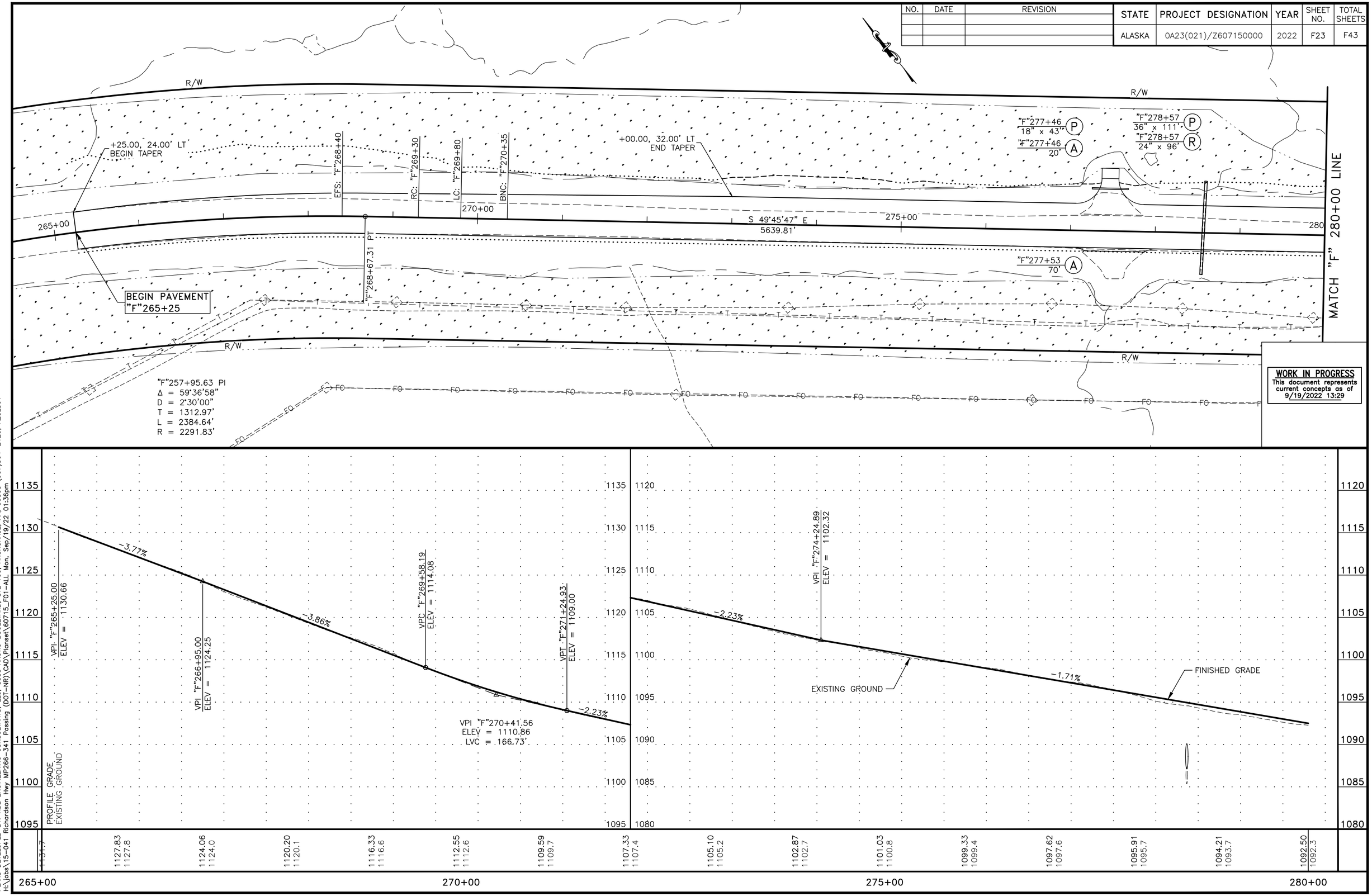
NO.	DATE	REVISION

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	0A23(021)/Z607150000	2022	F23	F43



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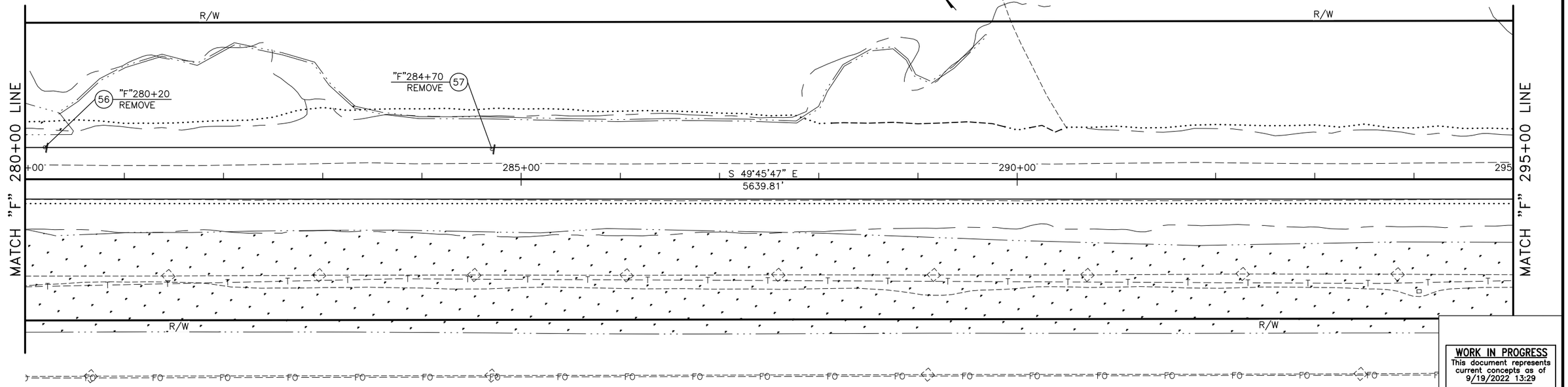
NO.	DATE	REVISION

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	0A23(021)/Z607150000	2022	F24	F43



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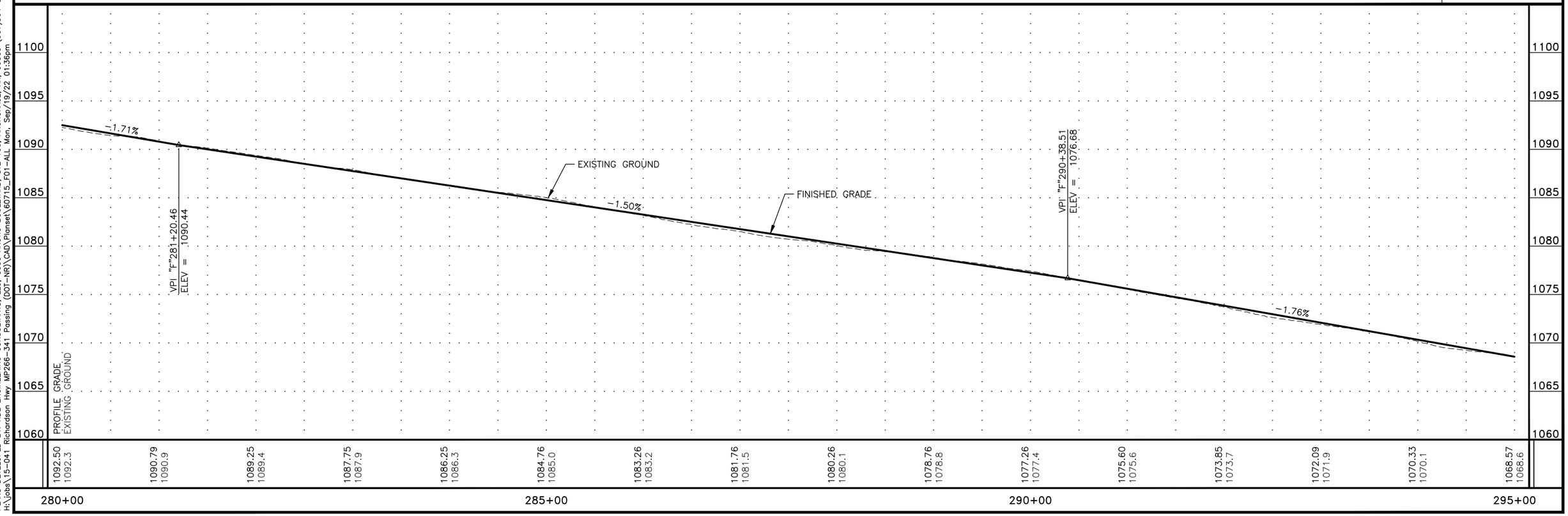

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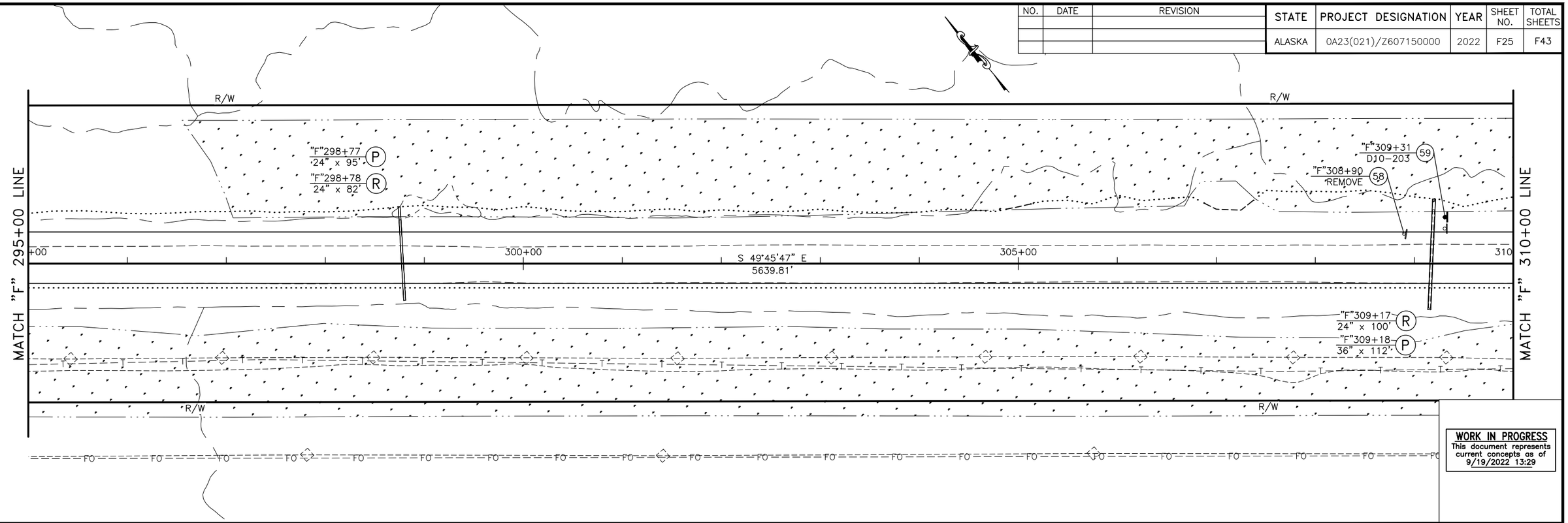
NO.	DATE	REVISION

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	0A23(021)/Z607150000	2022	F25	F43



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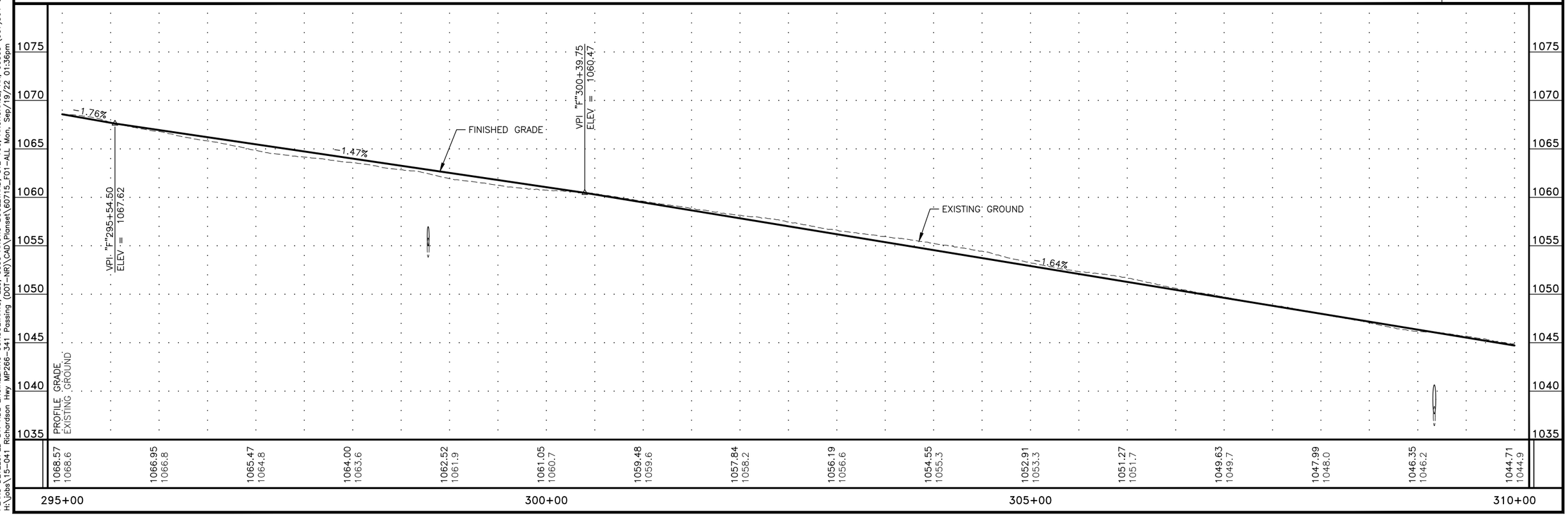

PLANS DEVELOPED BY: HDL ENGINEERING CONSULTANTS, LLC, 3335 ARCTIC BOULEVARD, STE 100, ANCHORAGE, AK, 99503 (907)564-2120, AECL861
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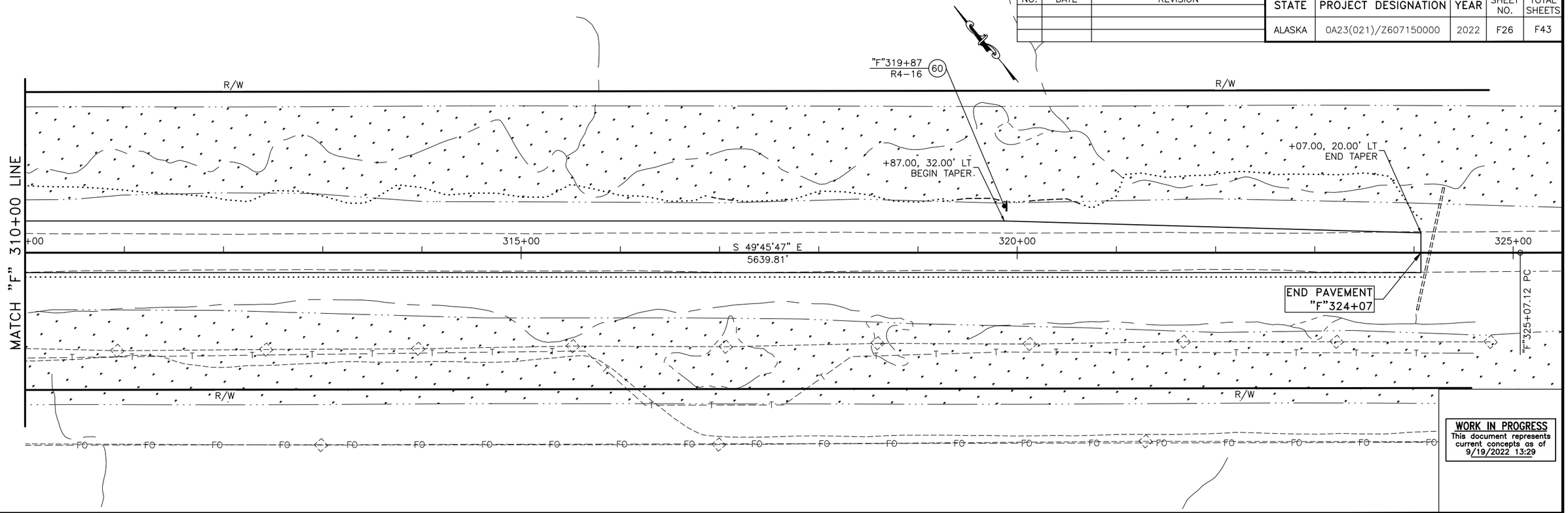
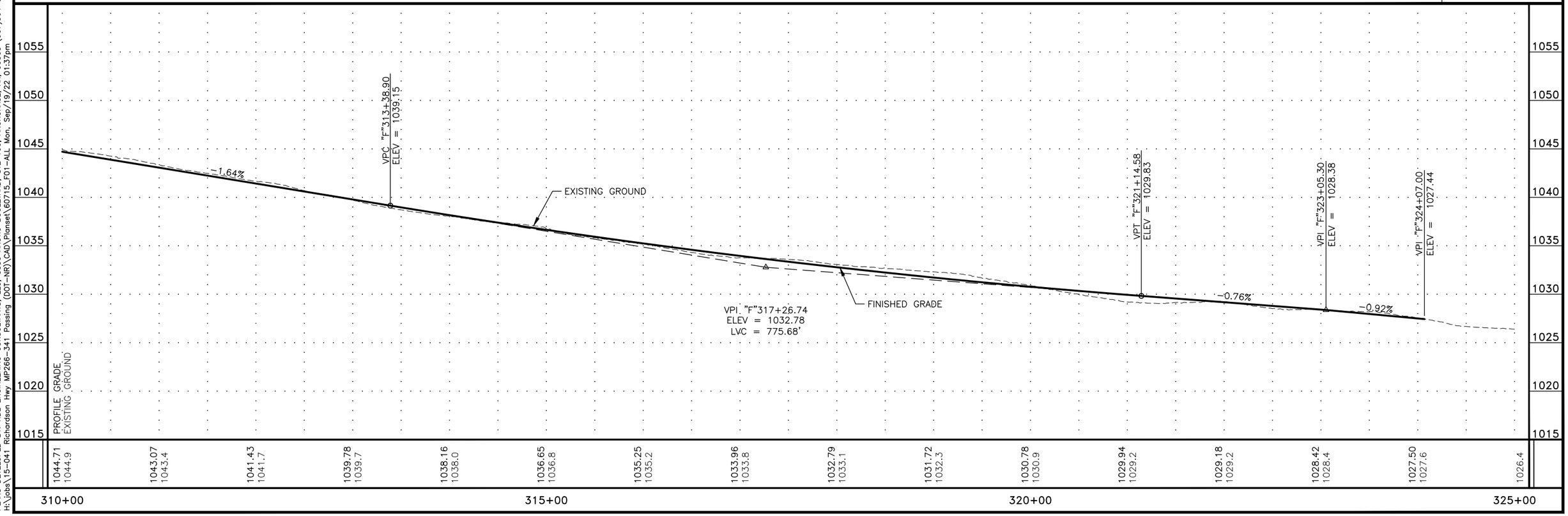
NO.	DATE	REVISION

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	0A23(021)/Z607150000	2022	F26	F43





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NO.	DATE	REVISION

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	0A23(021)/Z607150000	2022	F27	F43

R/W

R/W

"G"156+97
34'
(A)

ENC: "G"157+85

LC: "G"158+35

RC: "G"158+90

BFS: "G"159+95

160+00

"G"165+64
19'
(A)

165+00

MATCH "G" 166+00 LINE

BEGIN PAVEMENT
"G"153+13

155+00

S 63°57'04" E
1854.71'

"G"159+92.88 PC

"G"157+33
R4-16
(66)

"G"155+00
W1-4R, W13-1
(65)

+13.00, 20.00' RT
BEGIN TAPER

+33.00, 32.00' RT
END TAPER

"G"167+15.25 PI
Δ = 55°25'04"
D = 3°59'59"
T = 752.37'
L = 1385.56'
R = 1432.51'

R/W

R/W

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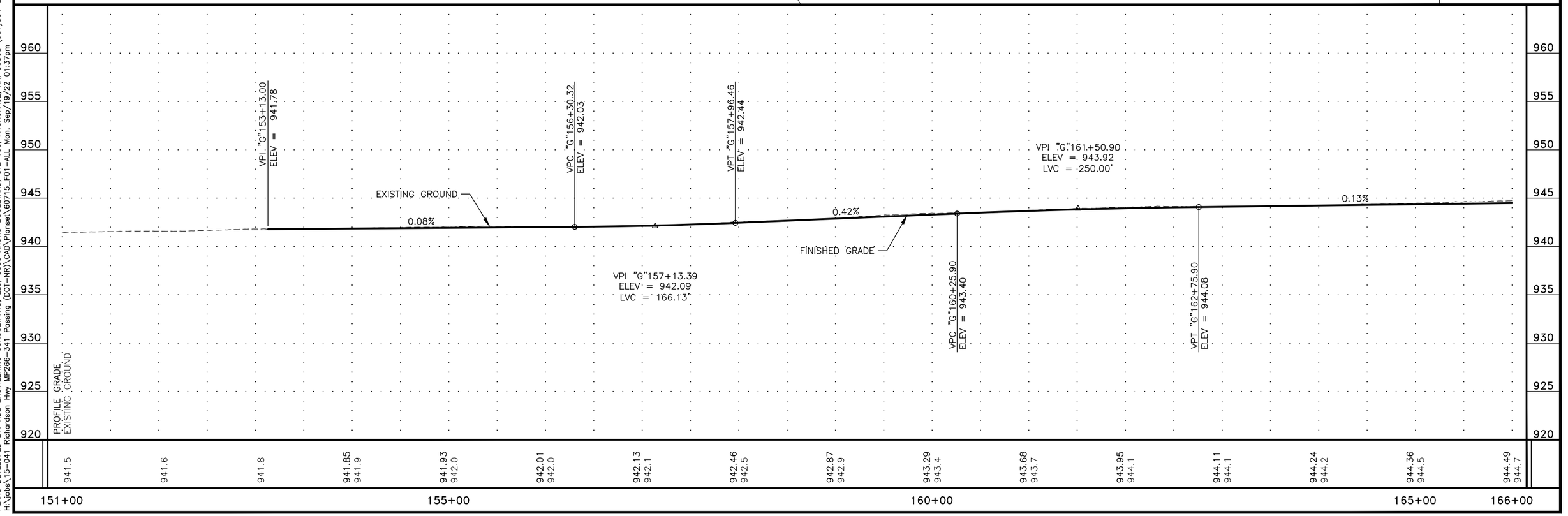

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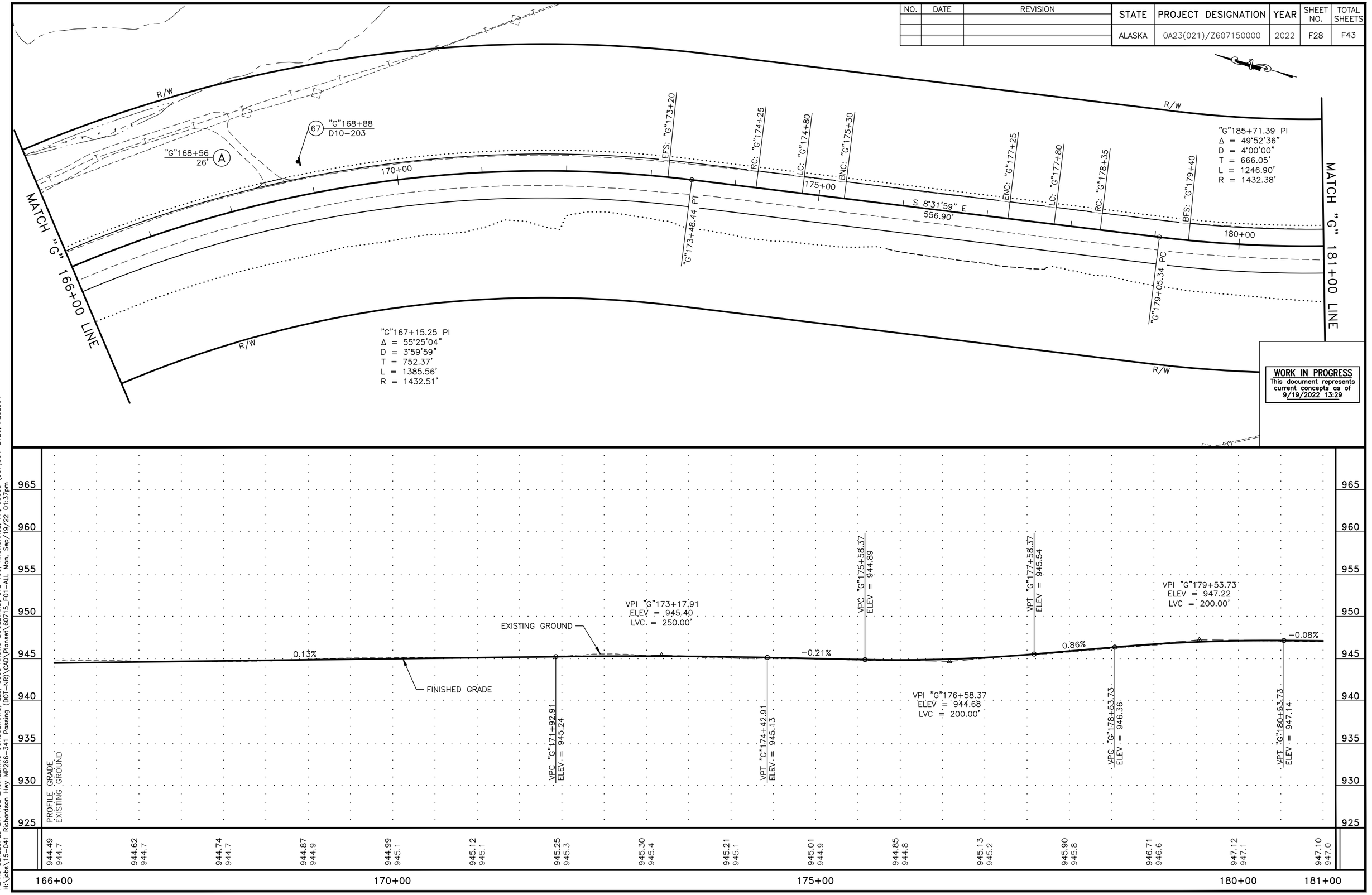
NO.	DATE	REVISION

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	0A23(021)/Z607150000	2022	F28	F43



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NO.	DATE	REVISION

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	0A23(021)/Z607150000	2022	F29	F43

"G"185+71.39 PI
Δ = 49°52'36"
D = 4°00'00"
T = 666.05'
L = 1246.90'
R = 1432.38'

MATCH "G" 181+00 LINE

MATCH "G" 196+00 LINE

R/W

185+00

190+00

195+00

EFS: "G"191+25

RC: "G"192+30

LC: "G"192+85

BNC: "G"193+35

ENC: "G"195+50

LC: "G"196+00

"G"191+52.24 RT

S 58°24'36" E
507.05'

FO

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PROFILE GRADE
EXISTING GROUND

EXISTING GROUND

FINISHED GRADE

-0.08%

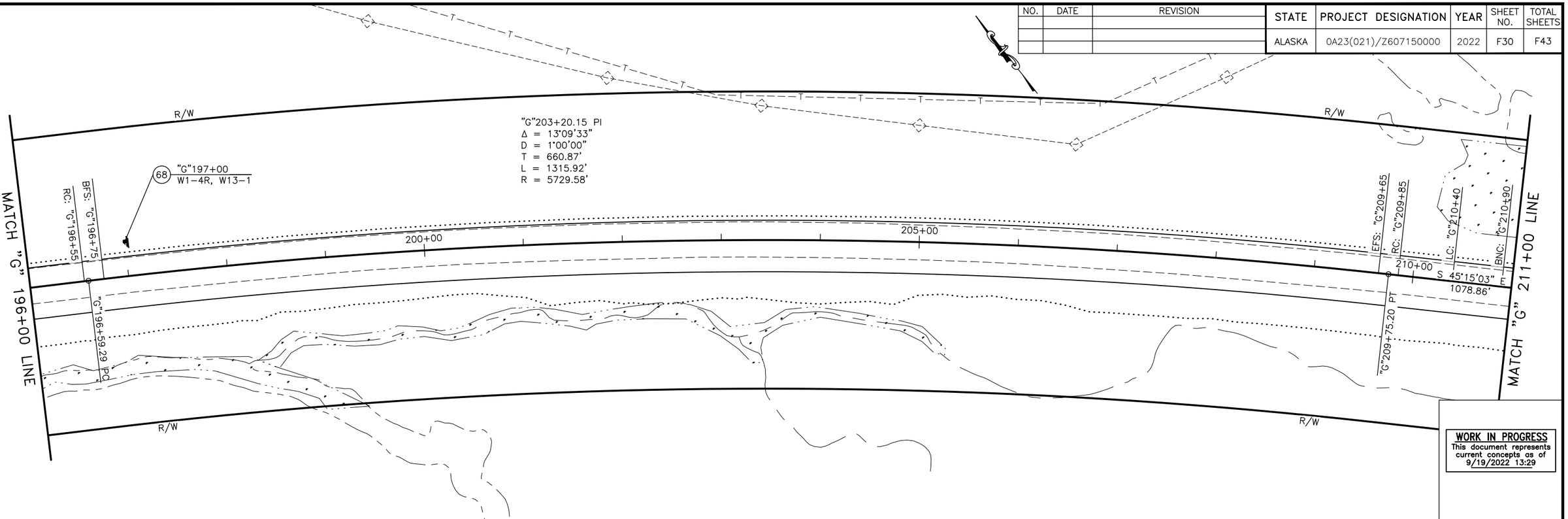
965 960 955 950 945 940 935 930 925

181+00	185+00	190+00	195+00	196+00
947.10 / 947.0	947.02 / 947.0	946.94 / 946.6	946.86 / 946.6	946.78 / 946.6
946.71 / 946.9	946.63 / 946.9	946.55 / 946.5	946.47 / 946.4	946.39 / 946.6
946.31 / 946.4	946.23 / 945.9	946.15 / 945.6	946.07 / 945.3	945.99 / 945.3
945.91 / 945.4				

PLANS DEVELOPED BY: HDL ENGINEERING CONSULTANTS, LLC, 3335 ARCTIC BOULEVARD, STE 100, ANCHORAGE, AK, 99503 (907)564-2120, AECL861
H:\Jobs\15-041 Richardson Hwy MP266-341 Passing (DOT-NR)\CAD\Planset\60715_F01-ALL Mon, Sep/19/22 01:38pm

NO.	DATE	REVISION

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	0A23(021)/Z607150000	2022	F30	F43



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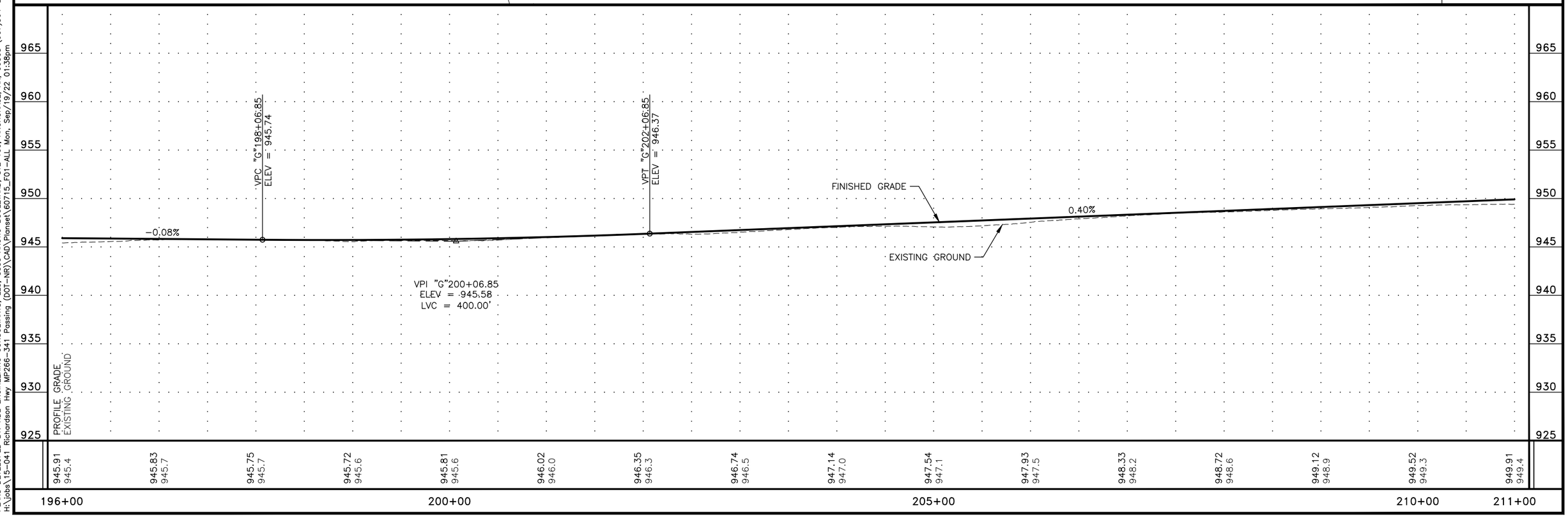
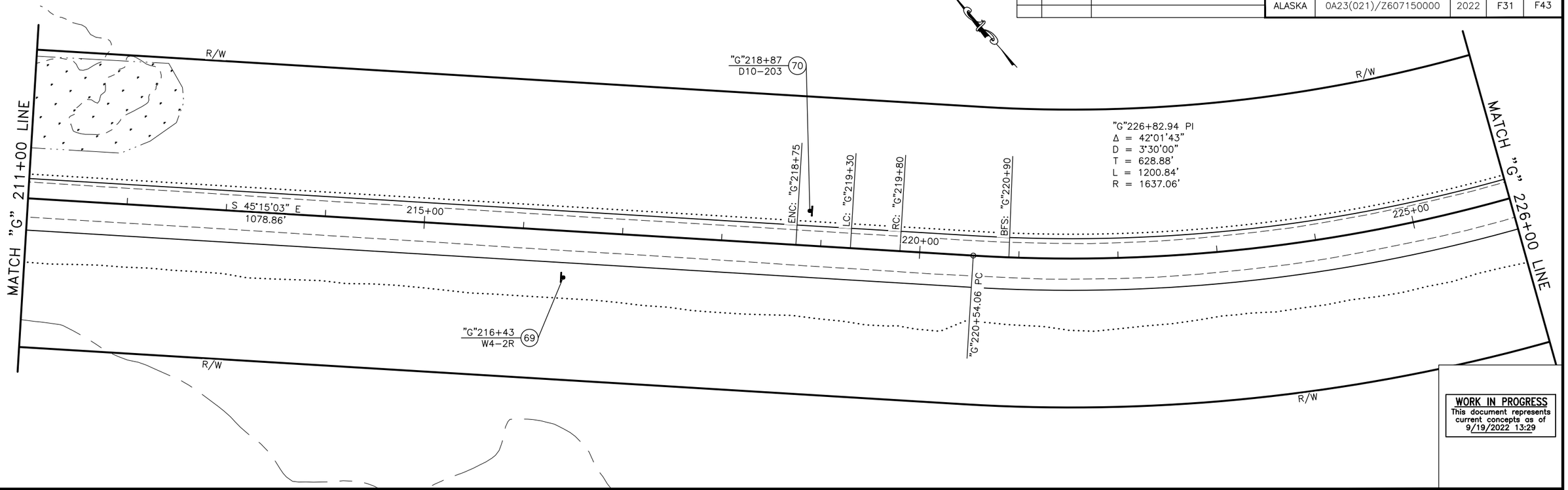


PLANS DEVELOPED BY: HDL ENGINEERING CONSULTANTS, LLC, 3335 ARCTIC BOULEVARD, STE 100, ANCHORAGE, AK, 99503 (907)564-2120,
H:\Jobs\15-041 Richardson Hwy MP266-341 Passing (DOT-NR)\CAD\Planset\607150_F01-ALL Mon, Sep/19/22 01:38pm AECL861

NO.	DATE	REVISION

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	0A23(021)/Z607150000	2022	F31	F43



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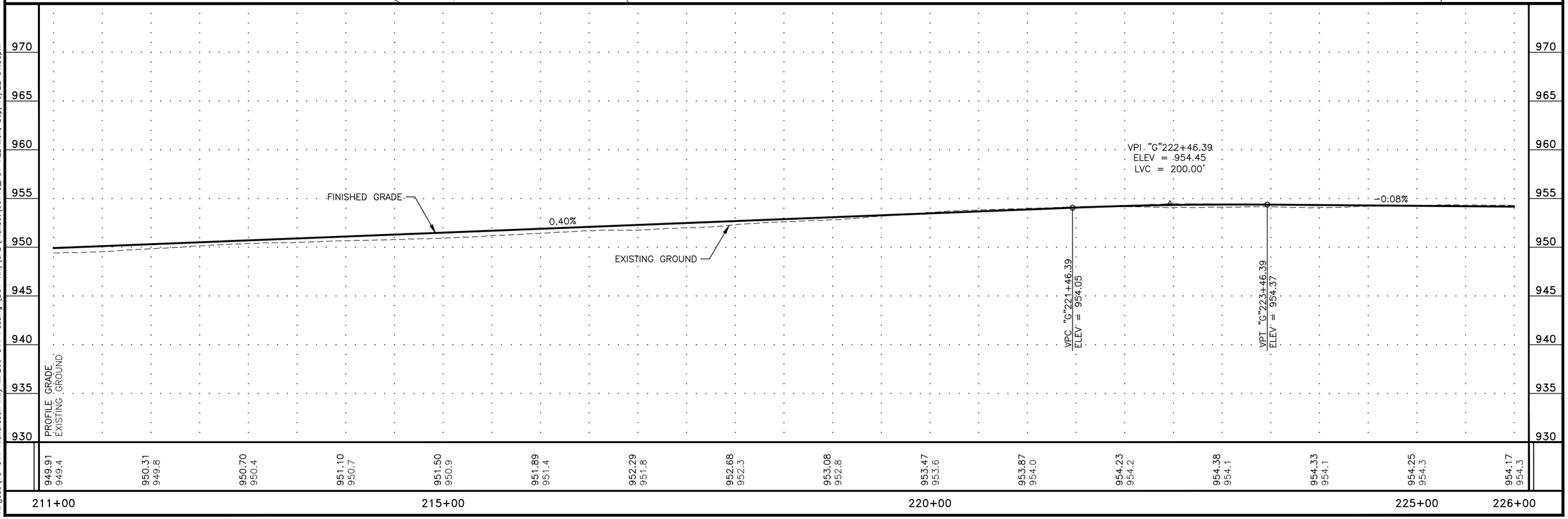

PLANS DEVELOPED BY: HDL ENGINEERING CONSULTANTS, LLC, 3335 ARCTIC BOULEVARD, STE 100, ANCHORAGE, AK, 99503 (907)564-2120, AECL861
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NO.	DATE	REVISION

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	0A23(021)/Z607150000	2022	F32	F43

"G"226+82.94 PI
Δ = 42°01'43"
D = 3°30'00"
T = 628.88'
L = 1200.84'
R = 1637.06'

MATCH "G" 226+00 LINE

R/W

EFS: "G"232+25

RC: "G"233+30

LC: "G"233+85

BNC: "G"234+40

"G"235+90
25'

S 87°16'46" E
1660.05'

"G"228+80
15'

+93.00, 32.00' RT
BEGIN TAPER

"G"232+54.91 PT

END PAVEMENT
"G"237+33

+33.00, 20.00' RT
END TAPER

FO

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VPC "G"226+62.73
ELEV = 954.11

-0.08%

EXISTING GROUND

VPI "G"230+29.58
ELEV = 953.82
LVC = 733.71'

VPT "G"233+96.44
ELEV = 958.83

FINISHED GRADE

1.37%

VPI "G"237+33.00
ELEV = 963.43

PROFILE GRADE
EXISTING GROUND

980 975 970 965 960 955 950 945 940

954.17 954.3 | 954.10 954.2 | 954.19 954.1 | 954.48 954.4 | 954.97 955.1 | 955.65 955.6 | 956.53 956.7 | 957.61 957.7 | 958.88 958.6 | 960.25 960.0 | 961.62 961.4 | 962.98 963.0 | 964.1 | 964.9 | 965.7 | 966.3

226+00 230+00 235+00 240+00 241+00

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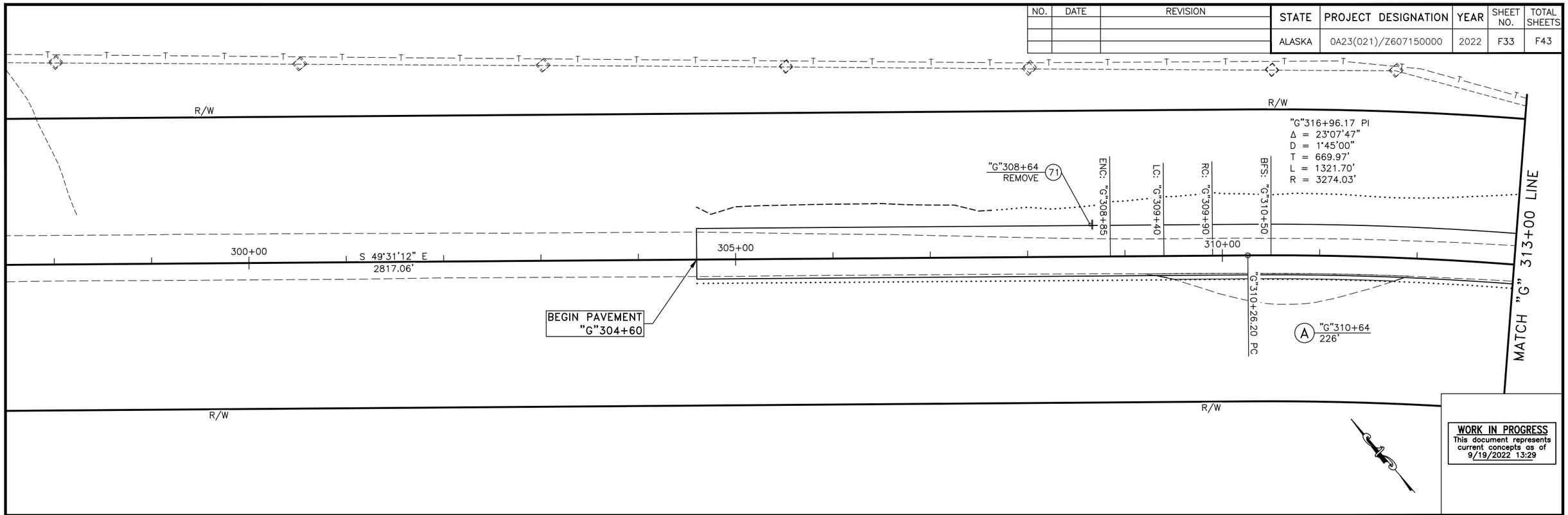
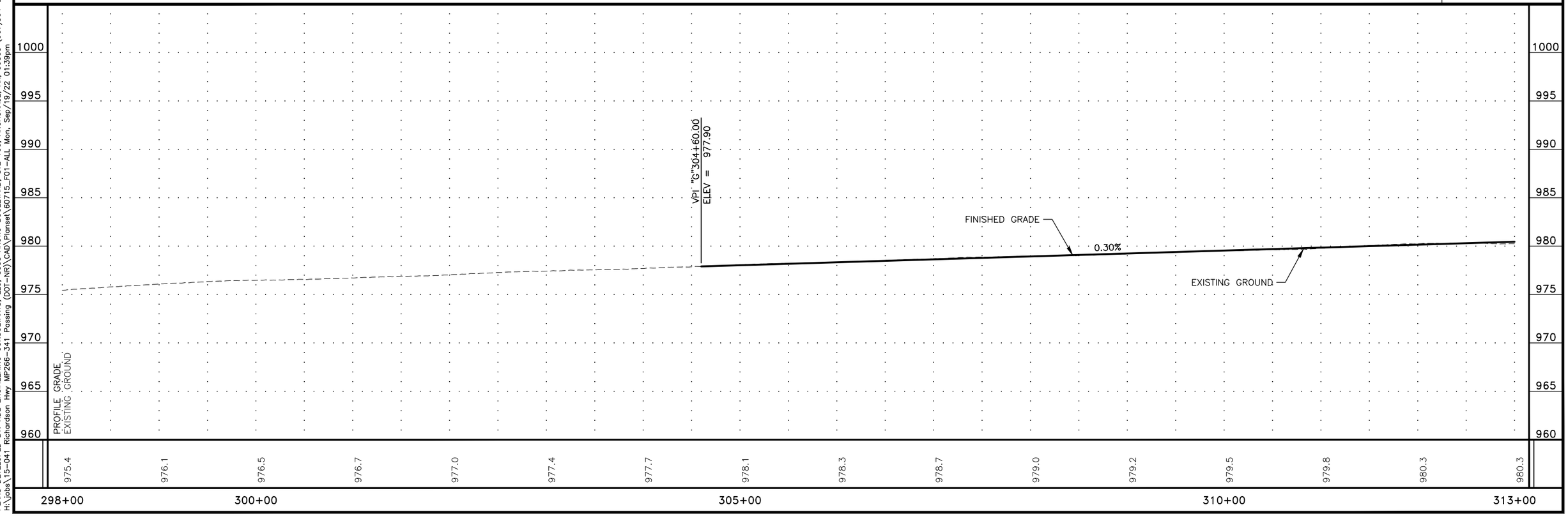
NO.	DATE	REVISION

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	0A23(021)/Z607150000	2022	F33	F43





PLANS DEVELOPED BY: HDL ENGINEERING CONSULTANTS, LLC, 3335 ARCTIC BOULEVARD, STE 100, ANCHORAGE, AK, 99503 (907)564-2120, AECL861
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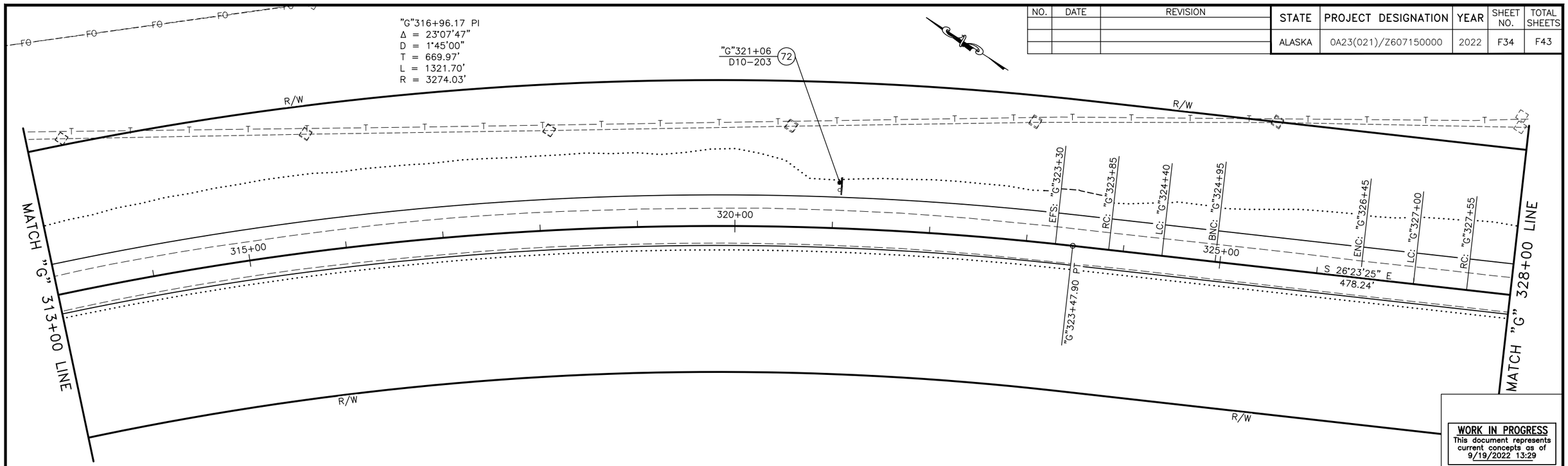
NO.	DATE	REVISION

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	0A23(021)/Z607150000	2022	F34	F43



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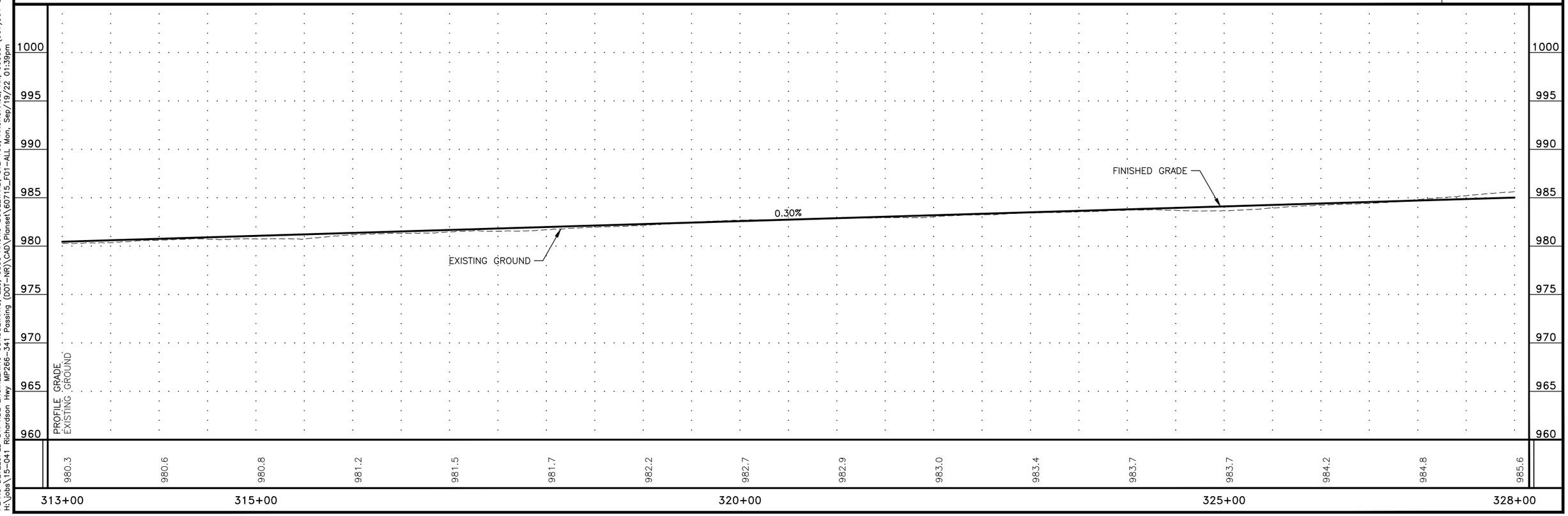

PLANS DEVELOPED BY: HDL ENGINEERING CONSULTANTS, LLC, 3335 ARCTIC BOULEVARD, STE 100, ANCHORAGE, AK, 99503 (907)564-2120, AECL861
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NO.	DATE	REVISION

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	0A23(021)/Z607150000	2022	F35	F43

MATCH "G" 328+00 LINE

MATCH "G" 343+00 LINE

R/W

"G"334+93.82 PI
Δ = 49°59'04"
D = 4°00'00"
T = 667.69'
L = 1249.59'
R = 1432.37'

BFS: "G"328+60

"G"328+26.14 PC

330+00

"G"335+26
REMOVE
73

335+00

EFS: "G"340+45

RC: "G"341+55

LC: "G"342+05

BNC: "G"342+60

S 76°22'29" E
565.94'

340+00

"G"340+75.72 PT

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1000
995
990
985
980
975
970
965
960

PROFILE GRADE
EXISTING GROUND

VPI "G"330+96.06
ELEV = 985.92

VPI "G"340+61.62
ELEV = 985.34

EXISTING GROUND

FINISHED GRADE

0.30%

-0.06%

-0.94%

985.6	985.8	985.9	985.9	985.8	985.7	985.9	985.9	985.8	985.6	985.2	985.5	985.4	984.9	983.9	982.9

328+00 330+00 335+00 340+00 343+00

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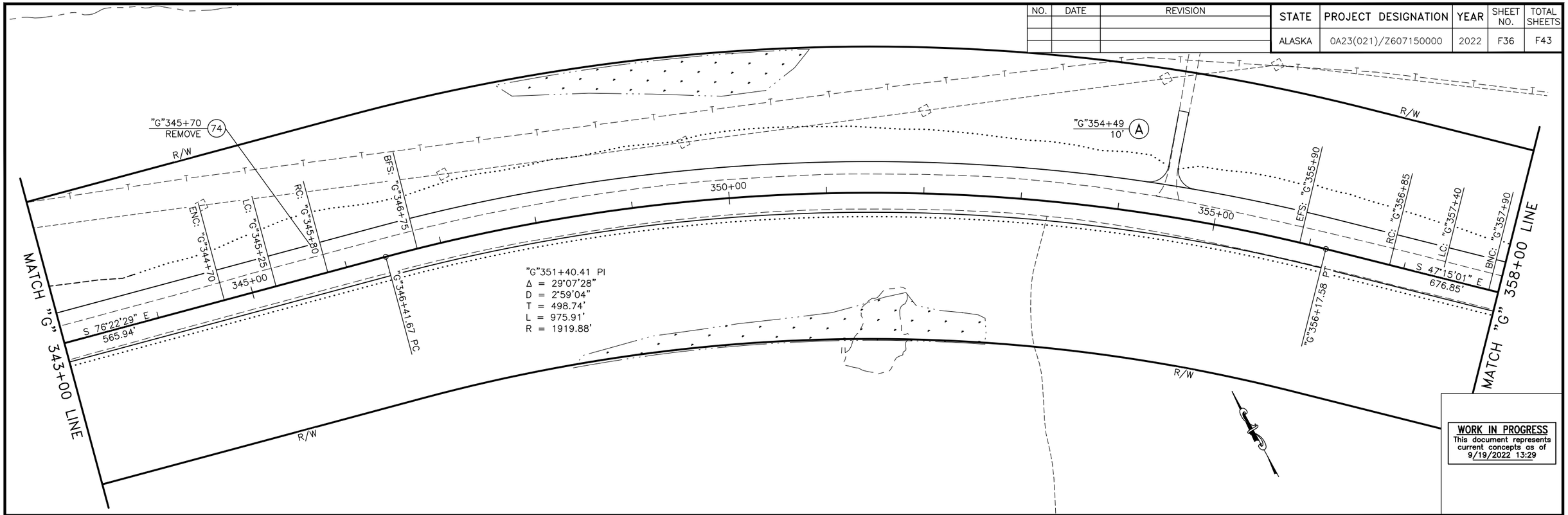
NO.	DATE	REVISION

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	0A23(021)/Z607150000	2022	F36	F43



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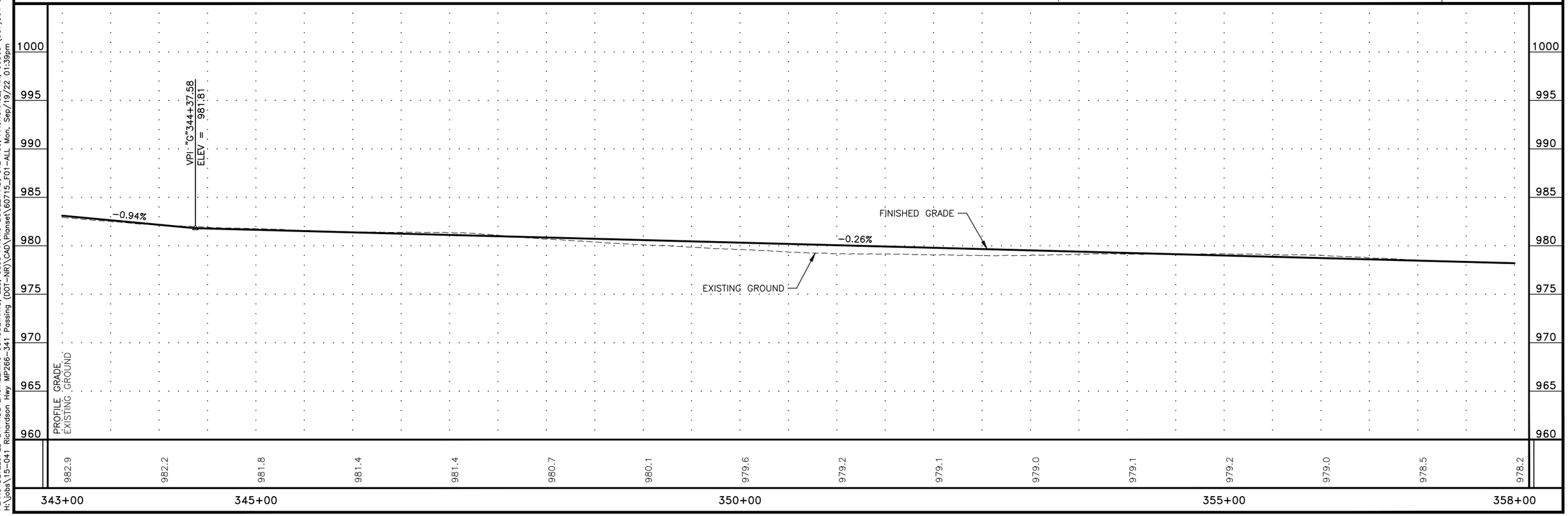

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NO.	DATE	REVISION

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	0A23(021)/Z607150000	2022	F37	F43

"G"366+00.92 PI
Δ = 13°43'33"
D = 2°15'00"
T = 306.49'
L = 610.04'
R = 2546.53'

R/W

MATCH "G" 358+00 LINE

"G"360+66
8" (A)

(75) "G"361+54
REMOVE

ENC: "G"361+40

LC: "G"361+95

RC: "G"362+50

BFS: "G"363+25

S 47°15'01" E
676.85'

360+00

365+00

"G"362+94.43 PC

EFS: "G"368+80

RC: "G"369+55

LC: "G"370+10

BNC: "G"370+65

370+00

S 60°58'33" E
1197.85'

"G"369+04.47 PT

"G"370+43
26" (A)

MATCH "G" 373+00 LINE

R/W

R/W

R/W

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VPI "G"359+84.50
ELEV = 977.72

VPI "G"369+24.40
ELEV = 982.79

EXISTING GROUND

FINISHED GRADE

-0.26%

0.54%

0.11%

PROFILE GRADE
EXISTING GROUND

1000
995
990
985
980
975
970
965
960

978.2 978.3 978.2 978.4 979.0 979.6 980.1 980.7 981.3 981.8 982.2 982.4 982.6 982.9 983.1 983.1

358+00 360+00 365+00 370+00 373+00

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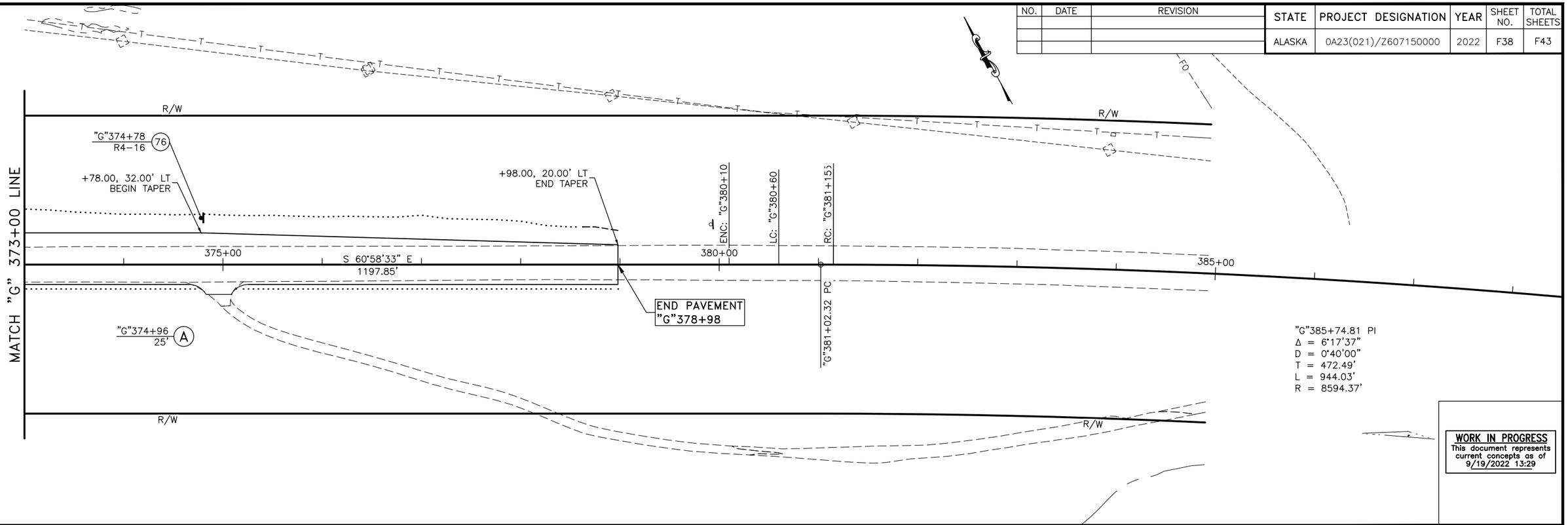
NO.	DATE	REVISION

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	0A23(021)/Z607150000	2022	F38	F43



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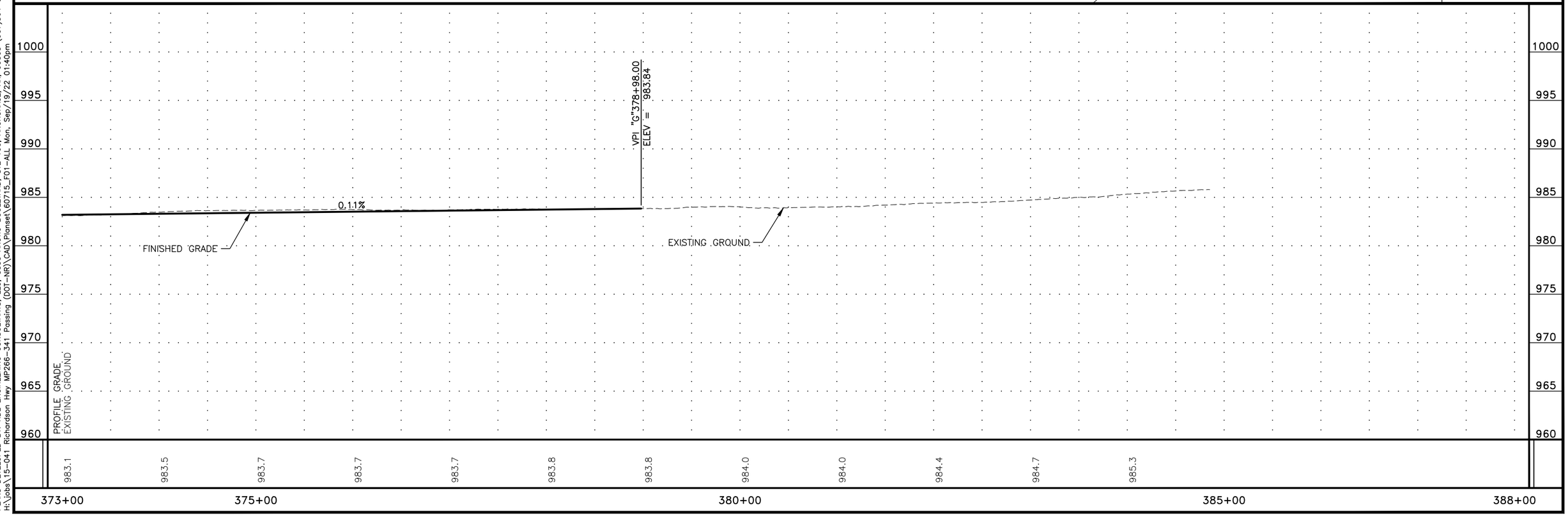

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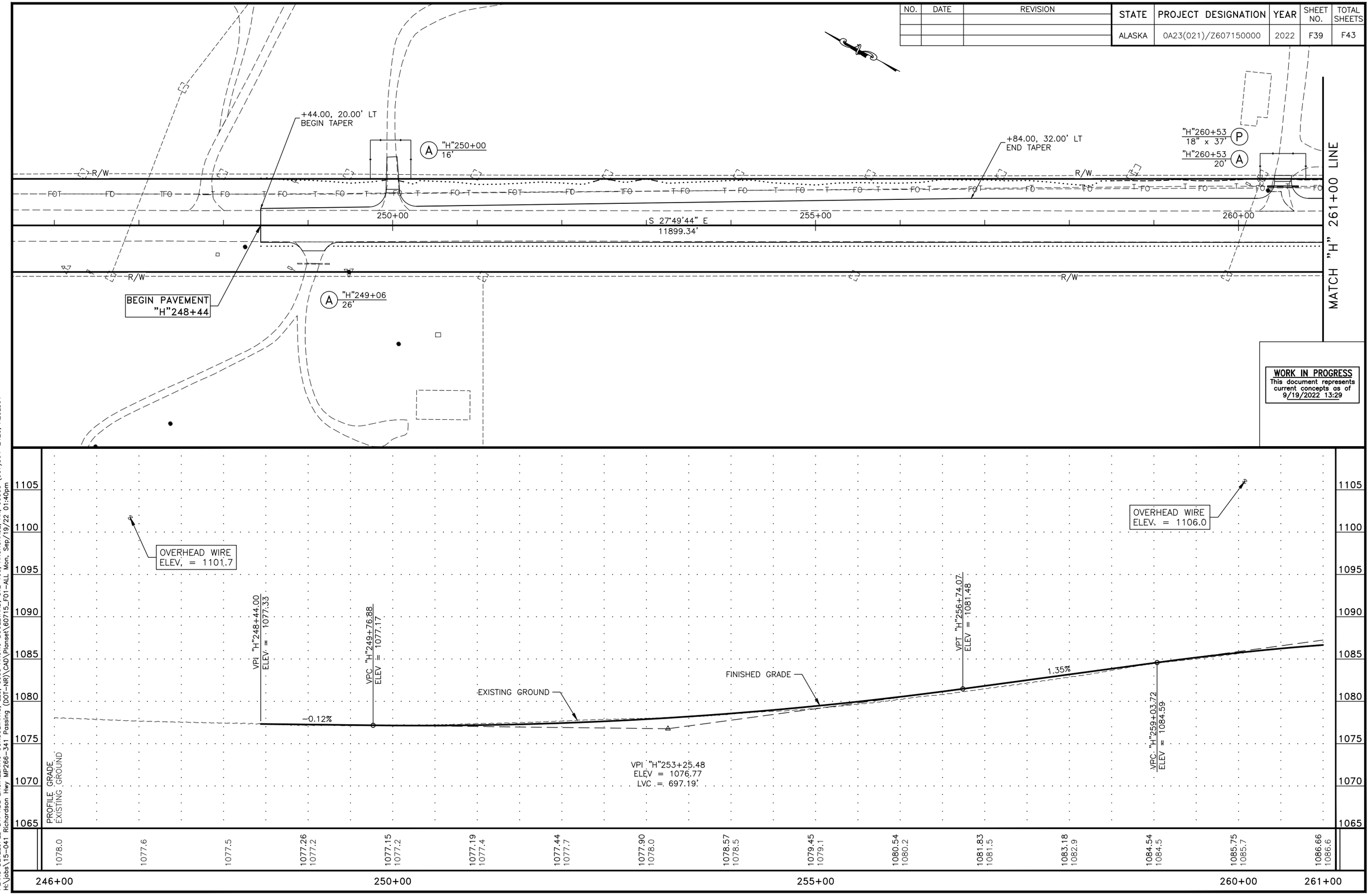
NO.	DATE	REVISION

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	0A23(021)/Z607150000	2022	F39	F43



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NO.	DATE	REVISION

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	0A23(021)/Z607150000	2022	F40	F43

79 "H"261+31 D14–100

"H"262+00 18" x 37' P

"H"262+00 14' A

80 "H"262+31 D10–203

P "H"263+08 18" x 35'

A "H"263+08 12'

"H"269+34 W4–2R 81

A "H"269+79 14'

"H"273+61 KEEP IN PLACE 82

P "H"273+93 18" x 38'

A "H"273+93 15'

MATCH "H" 261+00 LINE

MATCH "H" 276+00 LINE

R/W

265+00

S 27°49'44" E
11899.34'

270+00

275+00

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OVERHEAD WIRE ELEV. = 1108.4

OVERHEAD WIRE ELEV. = 1110.8

VPI "H"261+53.72
ELEV = 1087.97
LVC = 500.00'

VPT "H"264+03.72
ELEV = 1087.60

EXISTING GROUND

−0.15%

FINISHED GRADE

VPC "H"270+99.75
ELEV = 1086.56

VPI "H"273+49.75
ELEV = 1086.19
LVC = 500.00'

VPT "H"275+99.75
ELEV = 1087.29

0.44%

PROFILE GRADE
EXISTING GROUND

1110 1105 1100 1095 1090 1085 1080 1075 1070

1086.66	1087.28	1087.59	1087.60	1087.45	1087.31	1087.16	1087.01	1086.86	1086.71	1086.56	1086.48	1086.50	1086.65	1086.91	1087.29
1086.6	1087.3	1087.5	1087.6	1087.5	1087.4	1087.2	1086.9	1086.9	1086.7	1086.3	1086.3	1086.5	1086.6	1087.1	1087.6

261+00 265+00 270+00 275+00 276+00

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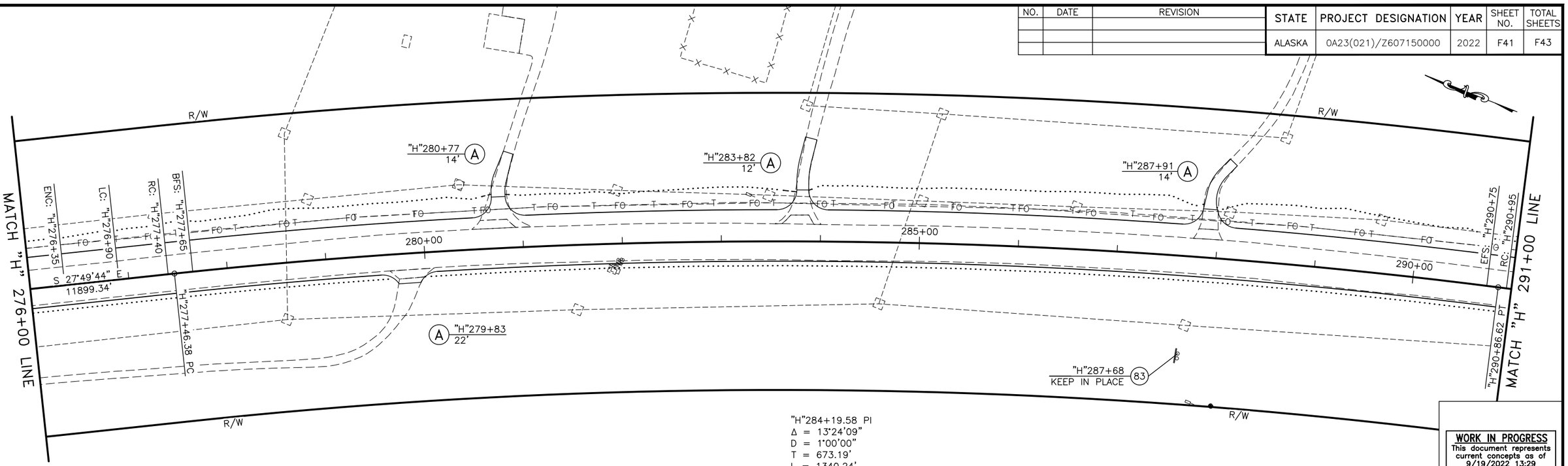
NO.	DATE	REVISION

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	0A23(021)/Z607150000	2022	F41	F43



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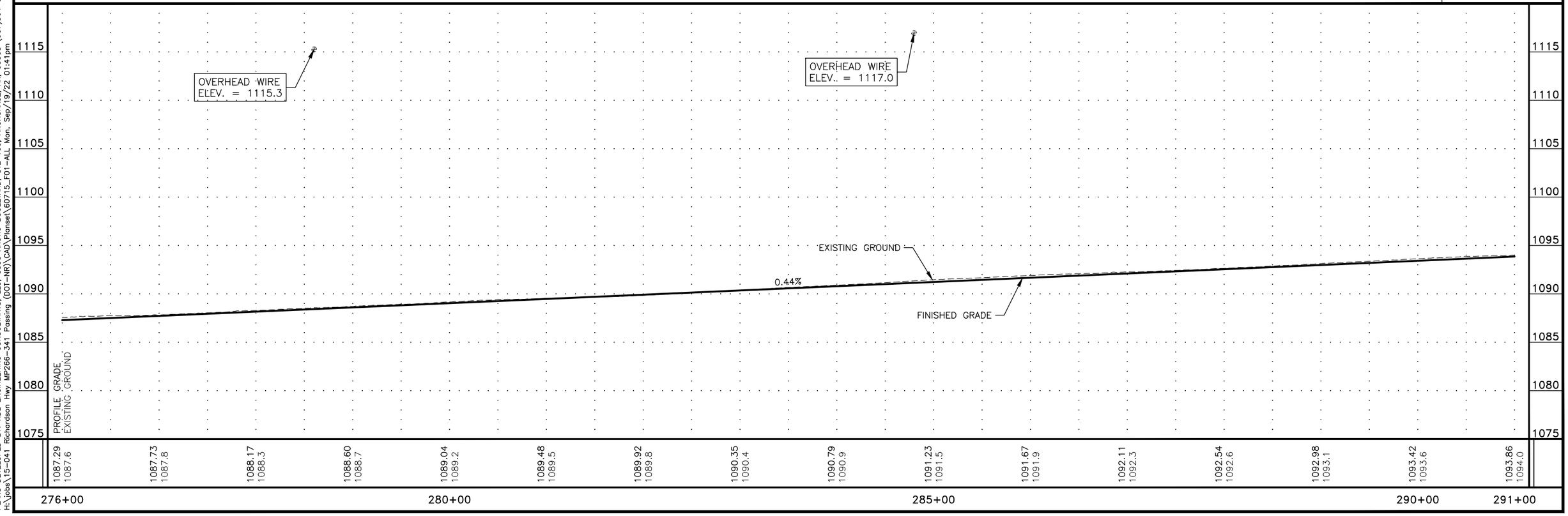

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NO.	DATE	REVISION

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	0A23(021)/Z607150000	2022	F42	F43

MATCH "H" 291+00 LINE

MATCH "H" 306+00 LINE

R/W

R/W

R/W

R/W

"H"291+41
14'

BNC: "H"292+05

LC: "H"291+50

"H"295+17
15.4'

"H"297+87
13.4'

"H"298+27
14'

"H"301+85
14'

"H"302+87
D1-1
84

"H"303+83
18" x 43'

"H"303+83
20'

"H"305+84
14'

"H"305+70
56'

295+00

300+00

305+00

S 14°25'36" E
6291.38'

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OVERHEAD WIRE
ELEV. = 1118.5

OVERHEAD WIRE
ELEV. = 1125.1

VPI "H"294+50.10
ELEV = 1095.39

VPI "H"305+09.12
ELEV = 1100.54
LVC = 700.00'

FINISHED GRADE

EXISTING GROUND

0.44%

0.49%

VPC "H"301+59.12
ELEV = 1098.84

PROFILE GRADE
EXISTING GROUND

1120
1115
1110
1105
1100
1095
1090
1085
1080

1093.86 1094.0
1094.30 1094.2
1094.73 1094.5
1095.17 1095.1
1095.63 1095.4
1096.12 1095.6
1096.61 1095.9
1097.09 1096.2
1097.58 1096.8
1098.07 1097.4
1098.55 1098.1
1099.03 1098.7
1099.38 1099.2
1099.60 1099.3
1099.67 1099.5
1099.61 1099.8

291+00 295+00 300+00 305+00 306+00

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NO.	DATE	REVISION

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	0A23(021)/Z607150000	2022	F43	F43

"H"309+46 18" x 37' (P)
"H"309+46 14' (A)
(86) "H"309+74 R4-16
R/W
+44.00, 32.00' LT BEGIN TAPER
+64.00, 20.00' LT END TAPER
MATCH "H" 306+00 LINE
310+00
S 14°25'36" E 6291.38'
315+00
320+00
(85) "H"306+23 R1-1
END PAVEMENT "H"313+64

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OVERHEAD WIRE ELEV. = 1129.4
OVERHEAD WIRE ELEV. = 1124.8
VPC "H"308+60.52 ELEV = 1098.76
VPT "H"311+58.65 ELEV = 1099.41
VPI "H"313+64.00 ELEV = 1101.36
EXISTING GROUND
0.51%
0.95%
VPT "H"308+59.12 ELEV = 1098.77
VPI "H"310+09.58 ELEV = 1098.00 LVC = 298.13'
FINISHED GRADE
PROFILE GRADE EXISTING GROUND

1125 1120 1115 1110 1105 1100 1095 1090 1085

1099.61 1099.8 | 1099.40 1099.4 | 1099.04 1098.7 | 1098.60 1098.5 | 1098.53 1098.5 | 1098.94 1099.0 | 1099.81 1099.9 | 1100.75 1100.7 | 1101.8 | 1103.2 | 1104.2 | 1105.4 | 1106.1 | 1107.0

306+00 310+00 315+00 320+00 321+00

PLANS DEVELOPED BY: HDL ENGINEERING CONSULTANTS, LLC, 3335 ARCTIC BOULEVARD, STE 100, ANCHORAGE, AK, 99503 (907)564-2120, AECL861
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