FAIRVIEW LOOP ROAD REHABILITATION AND PATHWAY – STAGES 1 & 2

Project No.: NFHWY00748 / 0002523

FINAL DESIGN STUDY REPORT

ALASKA
DEPARTMENT OF TRANSPORTATION
AND PUBLIC FACILITIES

PREPARED BY: R&M Consultants, Inc.
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Anchorage, AK 99507

July 2025

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ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
DESIGN AND ENGINEERING SERVICES – CENTRAL REGION

DESIGN STUDY REPORT

For

FAIRVIEW LOOP ROAD REHABILITATION AND PATHWAY – STAGES 1 & 2

Project No.: NFHWY00748/0002523

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NOTICE TO USERS

This report reflects the thinking and design decisions at the time of publication. Changes frequently occur during the evolution of the design process, so persons who may rely on information contained in this document should check with the Alaska Department of Transportation and Public Facilities for the most current design. Contact the Design Project Manager, Lauren Little at 907-378-5911 for this information.

PLANNING CONSISTENCY

This document has been prepared by the Alaska Department of Transportation and Public Facilities according to currently acceptable design standards and Federal regulations, and with the input offered by the local government and public. The department's Planning Section has reviewed and approved this report as being consistent with present community planning.

CERTIFICATION

The Alaska Department of Transportation and Public Facilities hereby certify that this document was prepared in accordance with Section 520.4.2 of the current edition of the department's Highway Preconstruction Manual.

The department has considered the project's social and economic effects upon the community, its impact on the environment and its consistency with planning goals and objectives as approved by the local community. All records are on file with Central Region - Design and Engineering Services Division, Highway Design Section, 4111 Aviation Avenue, Anchorage, AK 99502.

Signed by:
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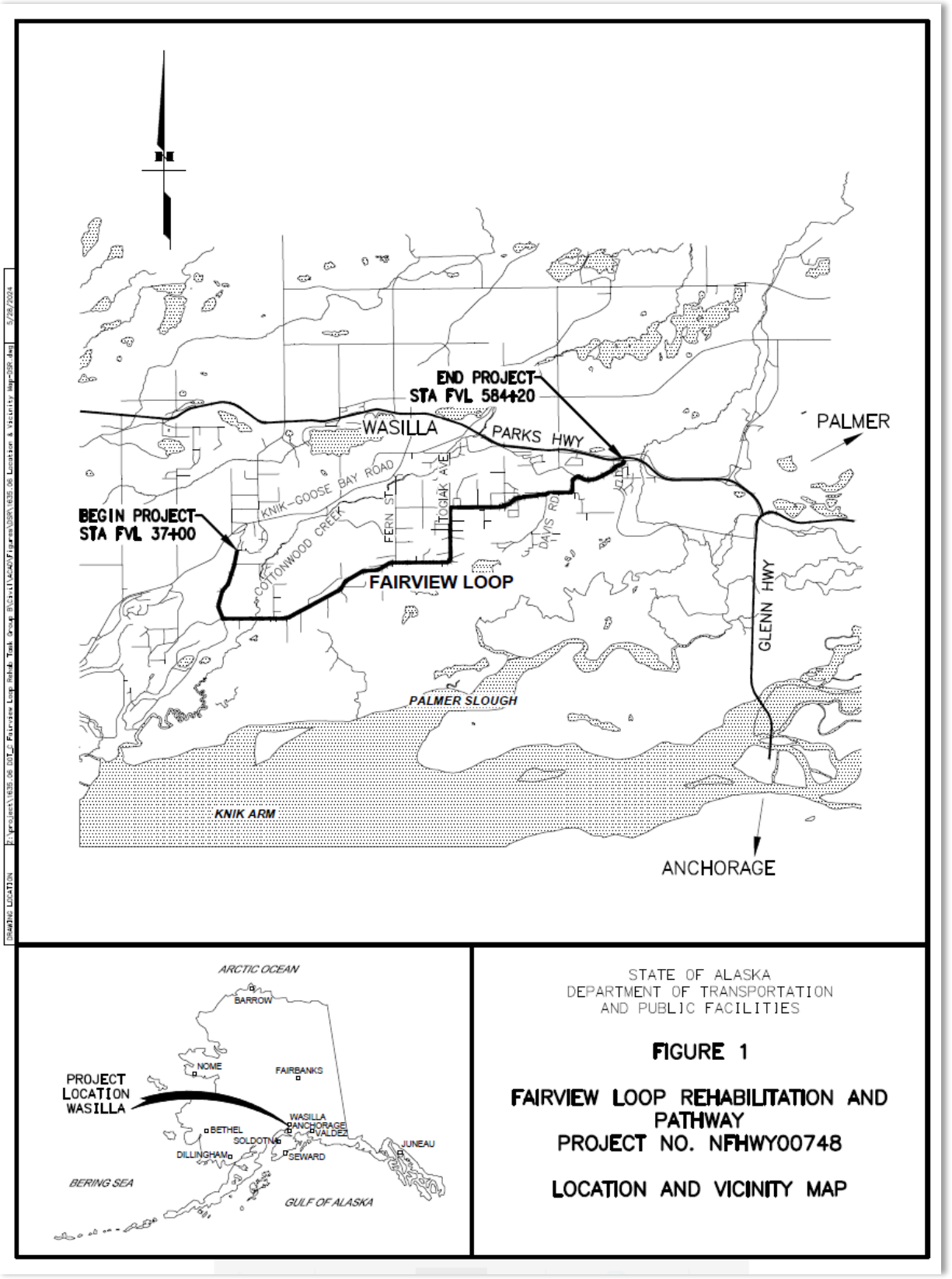
AADT	Annual Average Daily Traffic
AASHTO	American Association of State Highway and Transportation Officials
ADEC	Alaska Department of Environmental Conservation
ADF&G	Alaska Department of Fish & Game
APDES	Alaska Pollutant Discharge Elimination System
ARRC	Alaska Railroad Corporation
ATM	Alaska Traffic Manual
ATMS	Alaska Traffic Manual Supplement
BMP	Best Management Practice
CATV	Cable Television
CE	Categorical Exclusion
CRM	Central Region Materials
DIP	Ductile Iron Pipe
DOT&PF	Alaska Department of Transportation and Public Facilities
ESCP	Erosion and Sediment Control Plan
EPA	Environmental Protection Agency
FHWA	Federal Highway Administration
FY	Fiscal Year
GCI	General Communication, Inc.
H&H	Hydraulic and Hydrologic
HPCM	Alaska Highway Preconstruction Manual
ITS	Intelligent Transportation Systems
KE	Kinney Engineering, LLC
KGB	Knik-Goose Bay Road
MEA	Matanuska Electric Association
MOA	Memorandum of Agreement
MPH	Miles Per Hour
MSB	Matanuska Susitna Borough
MTA	Matanuska Telephone Association
MUTCD	Manual on Uniform Traffic Control Devices

PIOP	Public Information & Outreach Plan
PGDHS	A Policy on Geometric Design of Highways and Streets
PL	Plastic
RDG	Roadside Design Guide
ROW	Right-of-Way
ST	Steel
STIP	Alaska Statewide Transportation Improvement Program
SWPPP	Storm Water Pollution Prevention Plan
TMP	Traffic Management Plan
TP	Transmission Pipeline
TTCP	Temporary Traffic Control Plan
USACE	U.S. Army Corps of Engineers
VE	Value Engineering

Figure 1 Location and Vicinity Map



1.0 PROJECT DESCRIPTION

1.1 Project Location and Description

Fairview Loop is a two-lane roadway in Wasilla, Alaska. It starts at Knik-Goose Bay Road (KGB) and ends at East Fireweed Road, a frontage road of the Parks Highway. This road serves developments in the Knik and Fairview areas within the Matanuska Susitna Borough (MSB). The project is located in Township 17N, Range 1 & 2W, Seward Meridian. The location of the project is shown in Figure 1.

The proposed project includes improved drainage, including replacement of the large diameter culverts at Cottonwood Creek and Slough, grading, spot roadway geometry improvement locations, and constructing a multiuse pathway to accommodate non-motorized users from Top of the World Circle to Fern Street. Work also includes replacing roadside hardware, relocating utilities, replacing signage, striping, and re-vegetation of the disturbed area once construction is complete.

1.2 Existing Facilities and Land Use

Fairview Loop is an 11-mile-long rural major collector that serves as the primary link between KGB and the Parks Highway, via East Fireweed Road.

The posted speed limit of Fairview Loop is 50 mph. Numerous curves do not meet current posted speed limit standards. There is one school zone fronting Snowshoe Elementary School. The school zone is bracketed by 20 mph speed limit signs with accompanying flashing beacons that operate during school hours.

There are discontinuous earthen trails paralleling Fairview Loop created primarily by ATV users. They are typically offset 20-30 feet from the edge of the pavement and function as de facto pathways for non-motorized users.

Drainage is generally conveyed via roadside ditches and swales, ultimately leading to culverts at natural low points. The project area includes 4 stream crossings between the beginning of the project near Top of the World Circle and the end of the project at East Fireweed Road: Cottonwood Creek, Cottonwood Slough, and two unnamed streams located to the west and the north of Patty Drive. Cottonwood Creek flows through a 96-inch diameter metal culvert, while Cottonwood Slough flows through a 36-inch diameter metal culvert. Both Cottonwood Creek and Cottonwood Slough are cataloged as anadromous streams by the Alaska Department of Fish & Game (ADF&G).

There are approximately 140 paved and unpaved residential and public approaches that connect to Fairview Loop.

Within the project area, there are no signalized intersections. All intersecting public roads, side streets and driveways are stop/yield controlled.

Except for approximately 10 individual streetlights located at approaches, no highway lighting exists.

The adjacent land along Fairview Loop is primarily zoned rural residential. There are a few commercial businesses and public facilities along the roadway: Fairview Loop Baptist Church across from Redoubt Drive, a fire station and Snowshoe Elementary near Danielle Street, Babbling Brook Farm near Jackson Court, and Alaska Laestadian Lutheran Church on Sue Lane.

The existing ROW width along Fairview Loop varies between 51 feet and 100 feet. The Fairview Loop centerline is not always centered within the ROW. Prescriptive easements constrict the ROW width at locations along Fairview Loop, especially between Togiak Avenue and East Fireweed Road.

Sections of Fairview Loop were repaved during the summer of 2008. The first segment of Fairview Loop was repaved from KGB to Canter Circle and the second segment was repaved from east of Cotten Drive to East Fireweed Road. During the summer of 2015, under a 1R project, Fairview Loop was resurfaced between Canter Place/Circle and Candywine Road. The intersection of Fairview Loop and Knik Goose Bay Road was reconstructed in 2017. This project included the construction of a separated pathway along Fairview Loop between Knik Goose Bay Road and Top of the World Circle.

Alaska Railroad Corporation (ARRC) has one at-grade railroad crossing just southwest of Old Matanuska Road. The crossing is not being replaced as part of this project. See Railroad Crossing Checklist found in Appendix G.

1.3 Purpose and Need

The purpose of this project is to improve safety and extend the service life of Fairview Loop through the work described below.

1.4 Project History

In 2008, voters approved a general obligation bond to fund the design and construction of various state transportation projects. As part of that bond, $22 million was allocated to the Fairview Loop Road Reconstruction project for fiscal year (FY) 2009.

Fairview Loop Road Rehabilitation Design was advertised and awarded in 2009 for design.

In FY 2011, the state appropriated an additional $4.5 million to the project to construct 2.5 miles of separated pathway around Snowshoe Elementary School.

During the 2012 legislative session, legislators agreed to the issuance of general obligation bonds for the purpose of paying the cost of design and construction of state transportation projects. In November 2012, voters approved an additional $10 million for the Fairview Loop Reconstruction project.

In FY 2013, the state appropriated an additional $10 million to two Knik Goose Bay Road (KGB) safety corridor improvement projects. One was to realign Fairview Loop with the extension of Clapp Rd which was developed under the City of Wasilla's Fairview Loop Reconstruction: Realign and Signalization at KGB project. As part of the Knik-Goose Bay Road & Fern Street Intersection Improvements project, a new traffic signal, auxiliary lanes, illumination, drainage and pathway improvements at the KGB/Fern Street intersection were constructed.

The Fairview Loop Road Rehabilitation project was originally developed as a 3R (Resurfacing, Restoration, and Rehabilitation) along the entire project corridor, but it has been re-scoped and adapted throughout the environmental process.

In 2015, limited funding caused sections of Fairview Loop to be prioritized for improvements. The final decision was to prioritize the intersection improvements by their benefit/cost ratio. The intersection safety improvement locations ranked as follows:

- Edlund Road (now known as Fern Street)

- Togiak Avenue
- Marble Way
- Well Site Road
- Hayfield/Lupine Road
- Cotten Drive
- Davis Road
- Lookout Drive
- Patty Drive

With the project construction date getting pushed further into the future, 6.5 miles of Fairview Loop was resurfaced from Canter Place/Circle to Candywine Drive to extend the road's service life until safety improvements can be constructed.

In 2016, several capital projects (including Fairview Loop Road Reconstruction) were suspended due to the State's fiscal budget. A project rescoping effort involved reducing the length of separated pathway and limiting the project to safety improvement areas.

In 2018, a project "restart" began continuing the previous rescoping efforts. The project rescoping included reducing the length of separated pathway to extend from Top of the World Circle to Lookout Drive, added the safety improvement location of Carl Drive, combined Cotten to Davis as one improvement, removed improvement locations of Hayfield/Lupine, East Rod/Patty/Chugach, Jackfish/Well Site, and the area east of Old Matanuska Road.

In 2022, Fairview Loop Road was prioritized for the upcoming Alaska Statewide Transportation Improvement Program (STIP) 2024-2027. STIP projects receive partial or full federal funding. With the federalization of the project, Fairview Loop Road was split into two Stages (STIP ID 33921 & 34433).

A separated pathway from Lookout Drive to Fern Street was reinserted into the project to tie into the MSB's proposed Fern St pathway project. An updated safety analysis was conducted, and public comments were solicited to identify if there were additional intersection improvements needed. The intersection improvements at Hayfield/Lupine and East Rod/Patty/Chugach were identified and included in the proposed project. Safety improvements are discussed in further detail in Chapter 12.0.

2.0 DESIGN STANDARDS AND GUIDELINES

Design standards and guidelines that apply to the Fairview Loop Road Rehabilitation and Pathway are contained in the following publications:

Standards:

- A Policy on Geometric Design of Highways and Streets (PGDHS), 7th Edition, AASHTO, 2018.
- Roadside Design Guide (RDG), 4th Edition, AASHTO, 2011.
- Alaska Highway Preconstruction Manual (HPCM), DOT&PF, 2023
- The Alaska Traffic Manual (ATM), consisting of the Manual on Uniform Traffic Control Devices (MUTCD), 2009 as amended, U.S. DOT, FHWA) and the Alaska Traffic Manual Supplement (ATMS), DOT&PF, 2016.
- Guide for the Development of Bicycle Facilities, 4th Edition, AASHTO, 2012.
- The Alaska Highway Drainage Manual, DOT&PF, 2006

Appendix A contains the project Design Criteria and Design Designation.

3.0 DISCUSSION OF ALTERNATIVES

3.1 First Alternative: No-Build

The No-Build alternative does not meet the project's stated purpose and has been removed from consideration.

3.2 Second Alternative: 3R and Pathway from BOP to EOP

When the Fairview Loop project was scoped as a 3R project, a crash analysis report was prepared that recommended widening the roadway with 4-foot paved shoulders for the entire length and reconstructing 8 horizontal curves and 7 vertical curves where the existing roadway geometry did not meet new construction standards. The project cost (including design, construction, ROW acquisitions, and Utility Relocations) to construct the 3R recommendations and to construct a separated multi-use pathway from Hayfield Road to East Fireweed Road, exceeded $80 million. Due to the scope of the right of way, utility impacts and magnitude of the estimated construction costs, the 3R from BOP to EOP and pathway alternative has been removed from consideration.

4.0 PREFERRED ALTERNATIVE

Roadway

The preferred roadway alternative involves focusing roadway improvements at locations along Fairview Loop that would have the greatest potential benefit to improving safety. The locations were chosen based upon existing geometrics, crash history, stakeholder input or a combination of the three. The selected improvement locations are Marble Way, Carl Drive, Hayfield Road, Lookout Drive, Fern Street, East Rod Circle/Patty Drive, Togiak Avenue, and the 5,900-foot realignment of Fairview Loop from Cotten Drive to Davis Road.

Refer to Section 12.0 Safety Improvements for further details on improvement locations.

To meet driver's expectations for a consistent roadway, the reconstructed sections of Fairview Loop will closely match the existing roadway and shoulder widths.

Pathway

The preferred pathway alternative involves constructing a 4.8 mile separated multi-use pathway from Top of the World Circle to Fern Street. The pathway will serve attendees to Snowshoe Elementary School and provide a continuous pedestrian facility from KGB Road to Fern Street.

5.0 TYPICAL SECTIONS

Three typical sections are proposed for this project: a roadway section only, a pathway section only, and a combination roadway and pathway section. The pathway only section and the combination roadway and pathway section are used from Top of the World Circle to Fern Street. East of Fern Street, only the roadway section is used.

The preferred pathway section constructs a 3-foot-deep V-ditch between the pathway and the roadway. There are pathway sections without the 3-foot-deep V-ditch used in deep fill situations to minimize ROW impacts and where the pathway crosses over the top of the new culverts that serve Cottonwood Creek and Cottonwood Slough.

The section with a combination of pathway and roadway is the primary section west of Fern Street. Design standards recommend 11-foot travel lanes with 4-foot shoulders and a 20-foot clear zone. To meet driver's expectations of a consistent roadway and to remain cost effective, 11-foot travel lanes with 1-foot paved shoulders and 1-foot gravel shoulders along with 12-foot clear zones are provided on each side of the road.

A similar typical section is utilized east of Fern Street. This area of the project includes a roadway section only. No separated pathway will be included in this project east of Fern Street.

The typical sections are provided in Appendix B.

6.0 HORIZONTAL AND VERTICAL ALIGNMENT

6.1 Horizontal Alignment

The existing horizontal geometry follows section lines and other major right-of-way (ROW) features for most of the road. There are three sharp curves all with radii less than 225 feet and numerous other curves that require a speed limit reduction. The three most significant horizontal curves and their nearest intersection are Hayfield Road, Patty Drive, and Togiak Avenue.

A curve radius of less than 225 feet requires significantly lowering the speed limit. Existing posted speed limits range from 15 – 30 mph. All these curves have multiple crashes. See section 12.0 Safety Improvements for additional details.

6.2 Vertical Alignment

The existing vertical alignment conforms to the surrounding terrain which is generally categorized as rolling. There are several sections along the corridor that are level and multiple sections with steep grades. Vertical grade improvements are made at Marble Way, Carl Drive, Lookout Drive, and Patty Drive. See section 12.0 Safety Improvements for additional details.

7.0 EROSION AND SEDIMENT CONTROL

The project includes temporary and permanent measures to control or prevent erosion and sedimentation during construction and post construction. Prior to construction, the contractor will prepare a Storm Water Pollution Prevention Plan (SWPPP) that conforms to the DOT&PF Best Management Practices (BMPs) for Erosion and Sediment Control in accordance with the DOT&PF contract specifications and follows the guidelines of the Erosion and Sediment Control Plan (ESCP) provided to the contractor. The contractor will submit the SWPPP for approval by the Construction Project Engineer. The contractor will conduct construction activities in accordance with the approved SWPPP. Temporary BMPs will remain in place until permanent erosion and sediment control measures are in place and soil is permanently stabilized. Special attention shall be given to new culvert and culvert replacement installations.

8.0 DRAINAGE

The developed and undeveloped land surrounding the project area generally drains from north to south. Drainage adjacent to Fairview Loop is conveyed by ditches and culverts to natural low points along the roadway. Cottonwood Creek and Cottonwood Slough are the only anadromous streams that cross Fairview Loop where roadway or pathway improvements are to be constructed. Two unnamed streams also cross Fairview Loop at locations (east of Inlet Vista Circle and south of the railroad crossing) where no construction activity is anticipated.

Culverts that conflict with roadway or pathway improvements will be replaced; while driveway culverts or cross culverts located outside the improvement locations will not be replaced. New culverts will be sized according to criteria found in the Alaska Highway Drainage Manual. Minimum diameters will be as follows:

- 18-inch culverts will be installed under driveways and pathways where cover is limited
- 24-inch culverts are desirable for all crossings where drainage flows do not require a culvert with a larger diameter and the culvert length is less than 100 feet; and
- 36-inch culverts will be installed where crossing lengths exceed 100 feet or at locations of known glaciation.

DOT&PF Maintenance & Operations requested thaw pipes be included with new culverts that cross Fairview Loop where existing icing or glaciation problems currently exist.

The existing culverts serving Cottonwood Creek and Cottonwood Slough will be replaced. At Cottonwood Creek, the existing 96-inch diameter culvert will be replaced with a structural plate pipe arch meeting Tier 1 fish passage requirements per the Memorandum of Agreement (MOA) with ADF&G, and will pass the 100-year flood without causing a net rise of the water surface elevation.

A temporary diversion channel will likely be constructed prior to removing the existing culvert. Following the plate pipe arch construction, the temporary diversion channel will be removed, and the disturbed ground will be restored to its pre-construction condition.

At Cottonwood Slough, the existing 36-inch culvert will be replaced with a 60-inch diameter corrugated steel pipe meeting Tier 2 fish passage criteria per the MOA with ADF&G.

A Hydraulic and Hydrologic (H&H) Report has been prepared under a separate cover that discusses the culvert replacements at Cottonwood Creek and Cottonwood Slough in more detail.

A 3-foot deep ditch will be constructed between the pathway and Fairview Loop for most of the pathway length. At intermittent low spots along the ditch, 36-inch cross culverts will be constructed to convey drainage to the opposite side of Fairview Loop. To prevent erosion, ditch lining will be constructed along the flow line where the ditch grade exceeds 5%. Near Snowshoe Parkway and other locations along the Fairview Loop alignment, special ditches will be graded to promote positive drainage away from the subgrade of the road.

9.0 SOIL CONDITIONS

In July-September 2011, DOT&PF Central Region Materials (CRM) performed a geotechnical investigation to characterize subsurface conditions for a pavement preservation project along Fairview Loop. During the geotechnical investigation 91 test holes were drilled and 17 test pits were excavated. The summary of this work can be found under separate cover titled "*Geotechnical Report: Fairview Loop Road Pavement Preservation* (51774)", dated January 2019.

In October 2015, (CRM) performed a geotechnical investigation to characterize subsurface conditions for the current pathway and safety improvement project. In support of the geotechnical investigation 39 test holes were drilled along the proposed pathway, roadway re-alignment, and within the existing roadway where elevation changes are proposed. This report can be found under separate cover titled "*Geotechnical Report: Fairview Loop Pathway and Safety Improvements (GF/GO)"*, dated July 2021.

Subsurface soil conditions within the project area generally consist of various combinations of gravel, sand, and silt. Organic soil, cobbles, and boulders were also occasionally recorded in test holes throughout the project.

10.0 ACCESS CONTROL FEATURES

Approximately 27 public approaches and 65 private approaches will be reconstructed to match roadway and or pathway improvements. The reconstructed approaches will follow Section 1190 Driveway Standards published in the Alaska Highway Preconstruction Manual for width, landing grade, and approach grade. Access control onto Fairview Loop from the public approaches will remain stop/yield controlled.

11.0 TRAFFIC ANALYSIS

In 2023 Kinney Engineering, LLC (KE) performed a crash analysis update to the original 3R analysis which was also prepared by KE in 2010. This analysis utilized crash and traffic volume data from 2013-2021 to determine if additional improvements should be considered. Improvement locations derived from this analysis are described in section 12.0 of this report. See Appendix C for the original document.

12.0 SAFETY IMPROVEMENTS

Each safety improvement location was evaluated based upon existing geometrics, accident history, and improvement cost (the improvement cost includes ROW acquisitions, utility relocations, and construction).

The following summarizes the existing condition and geometric improvement for each improvement location.

Table 1 Safety Improvements Summary

Site	Description
A	**Marble Way – Figure 3** **Existing Conditions**: Just south of the intersection with Marle Way, Fairview Loop has sharp vertical curves with design speeds as low as 25 mph. This results in poor sight lines for vehicles on Fairview Loop and turning traffic from Marble Way. The recorded accident history between the years 1998 and 2007 indicated Marble Way as one of the locations with a vehicle collision resulting in major injuries. **Safety Improvements**: Flatten the grades and lengthening the vertical curves along Fairview Loop near Marble Way and minor realignment of the intersection to improve sight lines. The existing profile grade is near 7%, and will be flattened to just under 2%, improving visibility and driver experience.
B	**Carl Drive – Figure 4** **Existing Conditions**: Approximately 2,000 feet of Fairview Loop from Carl Drive to Chestnut Lane has a rolling profile with several vertical curves. Tangent sections in the existing profile are steep, approximately 12% max in multiple locations making winter driving treacherous. The rolling profile limits the sight distance of oncoming traffic **Safety Improvements**: The Fairview Loop profile between Carl Drive and Chestnut Lane will be improved by flattening the grades and replacing the existing vertical curves with fewer lengthened ones. The new roadway profile drastically reduces the grade to approximately 6%, improves intersection sight distance at Carl Drive, and improves sight distance of oncoming traffic.
C	**Lupine Lane/Hayfield Road – Figure 5** **Existing Conditions**: The existing configuration of the Hayfield-Lupine-Fairview intersection is stop-controlled via signage, while Fairview has a through motion. In its current configuration, vehicle movements have many points of conflict. It is not immediately clear to drivers which turning movements have the right-of-way and which movements are stop controlled. The intersection has a higher rate of crashes than the statewide average. **Safety Improvements**: The Hayfield-Lupine-Fairview intersection will be reconstructed, utilizing a 4 leg, single lane roundabout. The profile of the road will be raised to promote sight distance, drainage, and help calm traffic entering the intersection. The roundabout will also include pedestrian crossings and a pathway along the northside, connecting to the overall stage 2 pathway plan.
D	**Cottonwood Creek** **Existing Conditions**: The existing culvert does not meet fish passage requirements and is not long enough to accommodate the pathway. **Improvements**: Replace deficient Cottonwood Creek culvert to meet fish passage requirements. The new culvert will be lengthened to accommodate the pathway.
E	**Cottonwood Slough** **Existing Conditions**: The existing culvert does not meet fish passage requirements and is not long enough to accommodate the pathway. **Improvements**: Replace deficient Cottonwood Slough culvert to meet fish passage requirements. The new culvert will be lengthened to accommodate the pathway.
F	**Lookout Drive – Figure 6** **Existing Conditions**: Fairview Loop just north of Lookout Drive has sharp sag and crest vertical curves commensurate with a design speed less than 40 mph in addition to a horizontal curve that is not superelevated. The recorded accident history between the years 1998 and 2007 exceeds the accident history for a similar 2-lane rural Alaskan road. The section of Fairview Loop in the vicinity of the Lookout Drive intersection had seven reported vehicle collisions resulting in injuries, one of which was categorized as a major injury. **Safety Improvements**: Fairview Loop will be reconstructed on the existing alignment and grades reduced by lowering the profile up to 10 feet. Profile changes will reduce the grade from nearly 9% to just under 6%. Crest and sag vertical curve lengths will be improved to meet 50 mph design standards.

G	**Fern Street – Figure 7** **Existing Conditions**: In 2014, Fern Street was extended north to shorten the distance and reduce the travel time for motorists traveling between KGB and Fairview Loop. With the extension, the ADT at the Fern Street/Fairview Loop intersection has increased. At Fairview Loop, Fern Street is a two-lane, stop-controlled, T-intersection that lacks turn lanes. **Safety Improvements**: Existing roadway geometry, reported crash data, anecdotal evidence, and future traffic volume forecasts do not indicate the need for auxiliary turn lanes based on the PCM, AASHTO, and NCHRP guidance. However, to enhance safety and improve operations, an eastbound left turn lane will be constructed to separate vehicles that are slowing or stopping to turn left onto Fern Street from vehicles in the through lane. On Fern Street, separate southbound right and left turn lanes will be constructed to replace the single southbound lane. Refer to the Technical Memorandum found in Appendix C for additional information concerning the Fern Street/Fairview Loop intersection.
H	**Patty Drive – Figure 8** **Existing Conditions**: Fairview Loop from Patty to East Chugach View is comprised of multiple compound curves with a design speed of 30 mph. The existing vertical profile has an approximate maximum grade of 12% with a crest curve that prevents adequate intersection and stopping sight distance from being met. This location has a crash history making it a candidate for safety spot improvements. **Safety Improvements**: Fairview Loop will be realigned to accommodate a single, large curve that meets the horizontal geometry for a design speed of 40 MPH. The profile will also be adjusted, moving to a max grade of 8%. This design speed and profile grade are less than what is recommended for new construction but were selected to maximize safety improvements while remaining cost effective and minimizing impacts. The change in profile will lower the peak of the crest curve approximately eight (8) feet. With the combination of horizontal and vertical alignment changes, both intersection and stopping sight distance are improved for this location. In addition, the shoulder will be widened near Rod and Patty to eight (8) feet. This will provide space to allow vehicles to make an evasive maneuver if required.
I	**Togiak Avenue – Figure 9** **Existing Conditions**: The near 90-degree horizontal curve at the Fairview Loop and Togiak Avenue intersection has a radius for a design speed of approximately 30 mph. Vertically, the crest vertical curve has a K-value for a design speed of 40 mph. Between 1998-2007, twelve recorded accidents occurred in the vicinity of Togiak Avenue, two events having major injuries, and one of the twelve recorded accidents resulted in a fatality. **Safety Improvements**: A horizontal curve with a radius designed for a 40 mph design speed will be constructed. This increased curve radius enhances the horizontal geometry compared to the existing condition, creating a more consistent alignment along the corridor while minimizing impacts and remaining cost effective. Vertically, a crest vertical curve will be constructed with a K-value corresponding to a design speed of 50 mph. The west end of South Valley Loop will be accessible via Togiak Avenue rather than Fairview Loop. The realignment of South Valley Loop reduces the density of access points along Fairview Loop, improving traffic flow and safety.
J	**Cotten Drive & Davis Road – Figure 10** **Existing Conditions**: Horizontally, Fairview Loop between Cotten Drive and Davis Road consists of a series of S-curves. The design speed of the S-curves varies between 30 mph and 40 mph. Vertically, Fairview Loop is relatively flat. The K-values for the crest and sag vertical curves correspond to design speeds greater than 50 mph. Between 1998-2007, six recorded accidents occurred in the vicinity of Cotten Drive and six recorded accidents occurred in the vicinity of Davis Road. **Safety Improvements**: Adjustments to the horizontal alignment are needed to replace the existing series of S-curves. Long tangent sections and five flat sweeping curves with radii exceeding the 50 mph design speed will replace the existing 1.12 miles of Fairview Loop beginning just west of Cotten Drive to just east of Davis Road.
Pathway Improvements A separated pathway will be constructed from Top of the World Circle to Fern Street. Portions of the new pathway will tie into the pathway constructed under Stage 1 at Cottonwood Creek and Cottonwood Slough, creating a continuous 4.8 miles of pathway.	

Figure 2 Safety Improvements Map

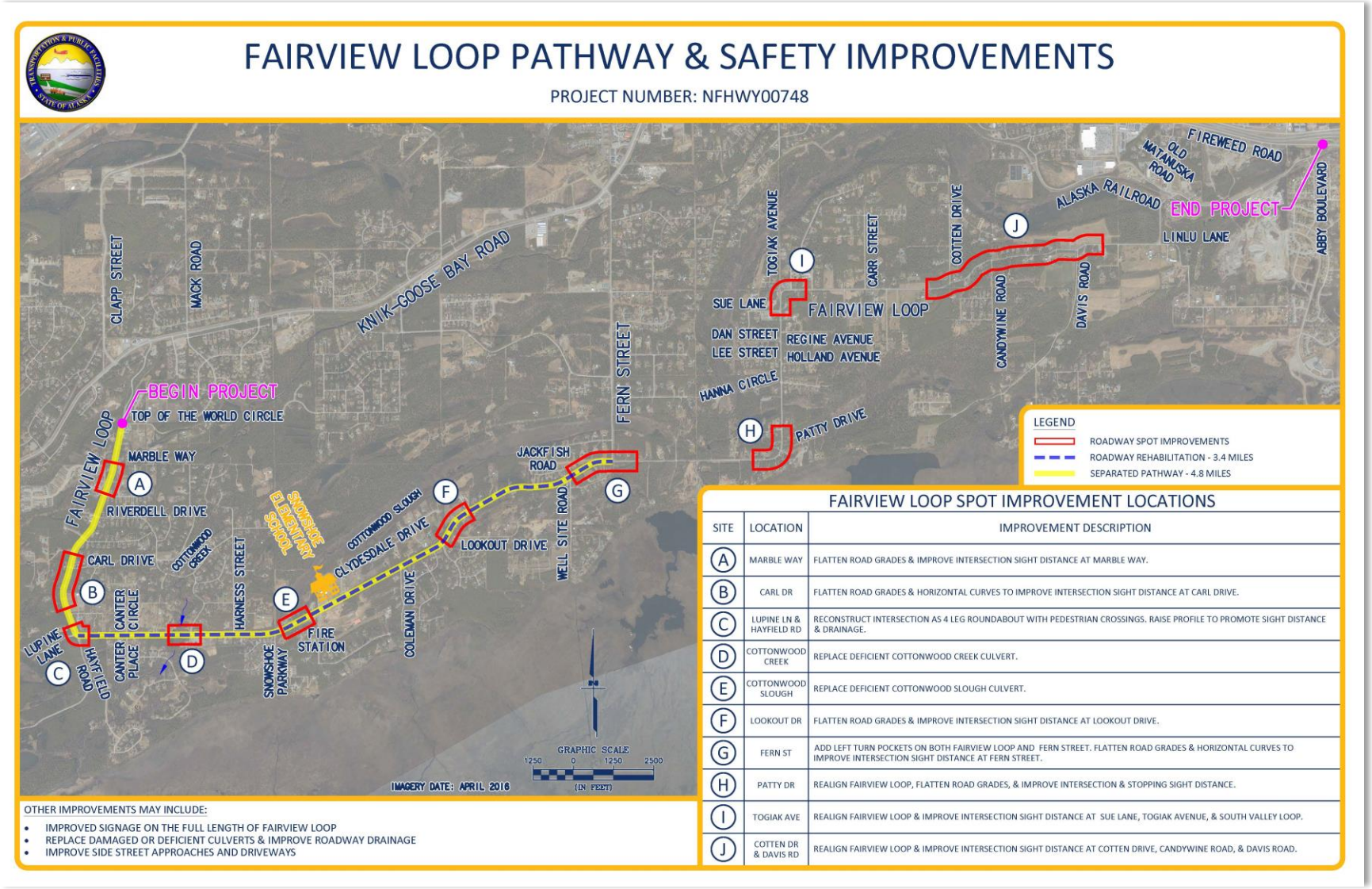


Figure 3 Marble Way

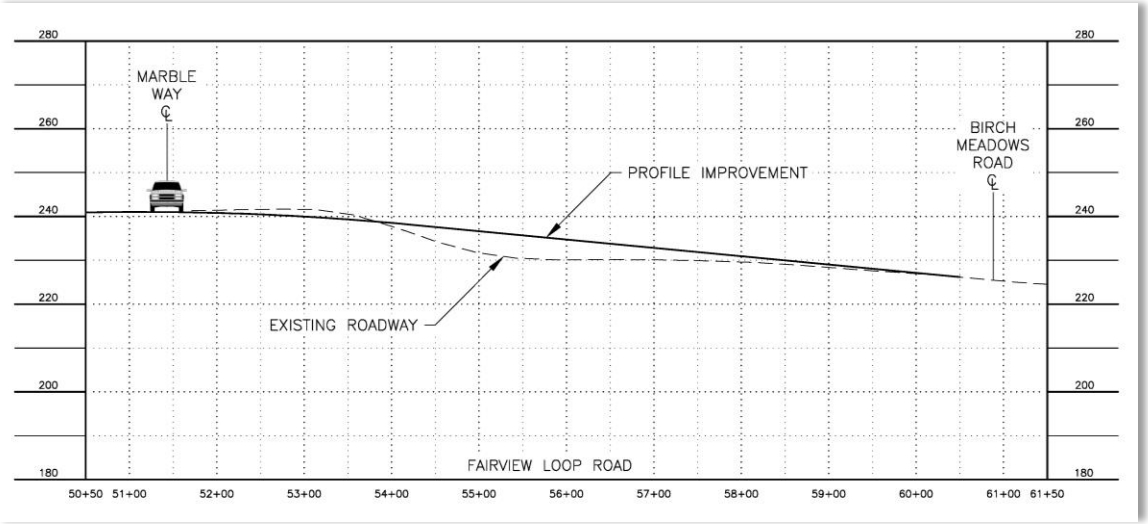


Figure 4 Carl Drive

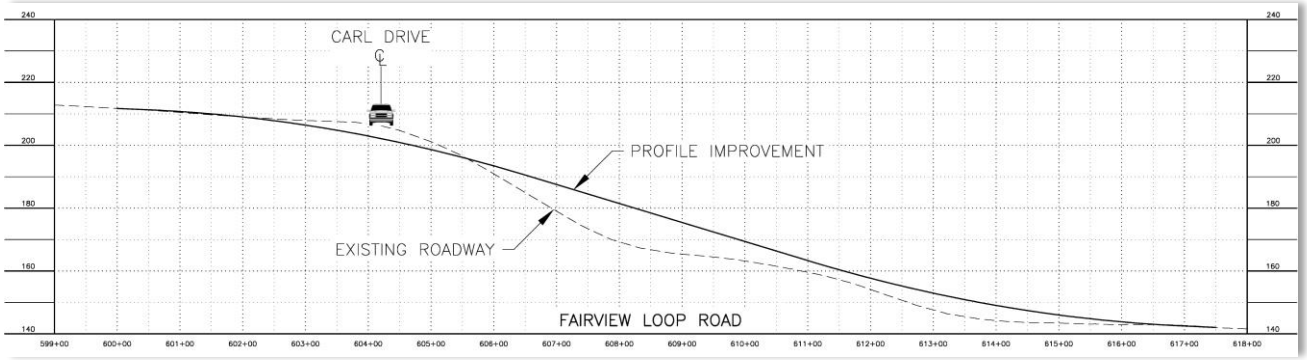


Figure 5 Hayfield-Lupine

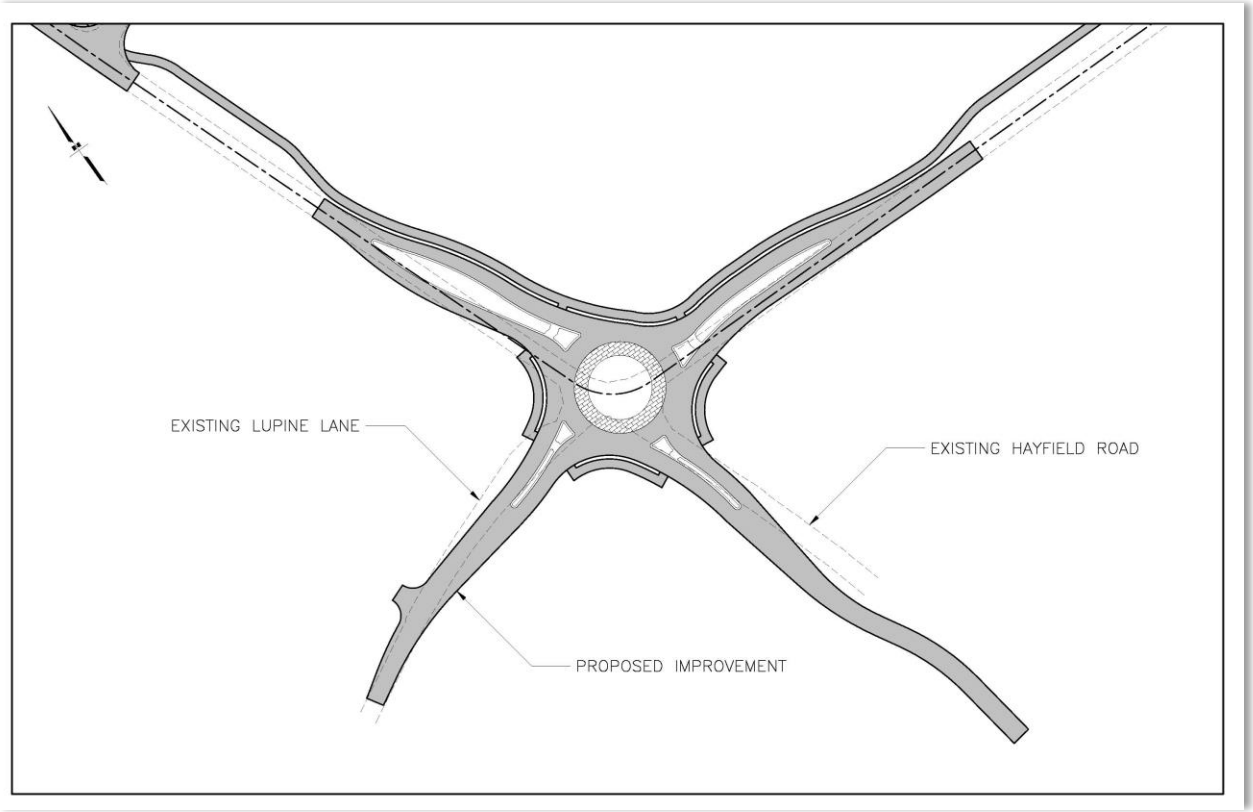


Figure 6 Lookout Drive

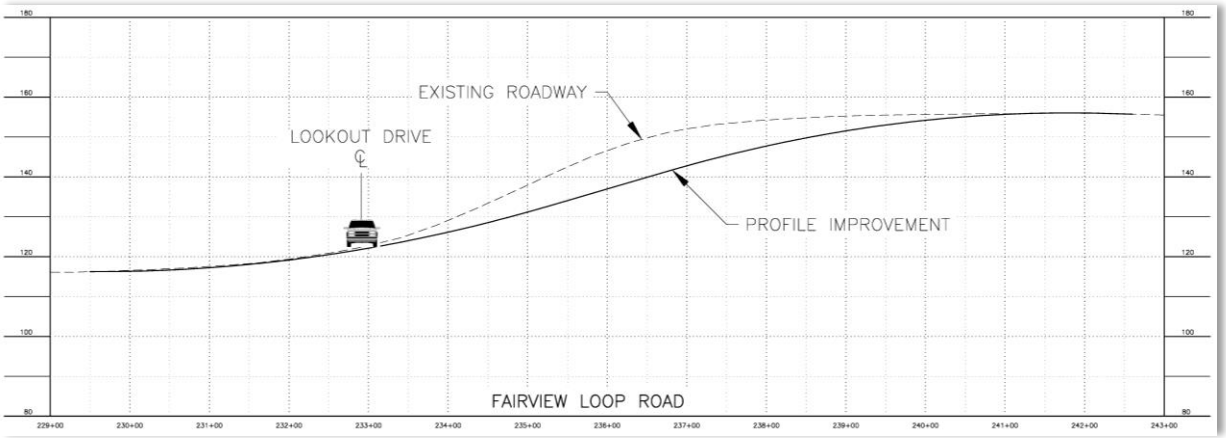


Figure 7 Fern Street

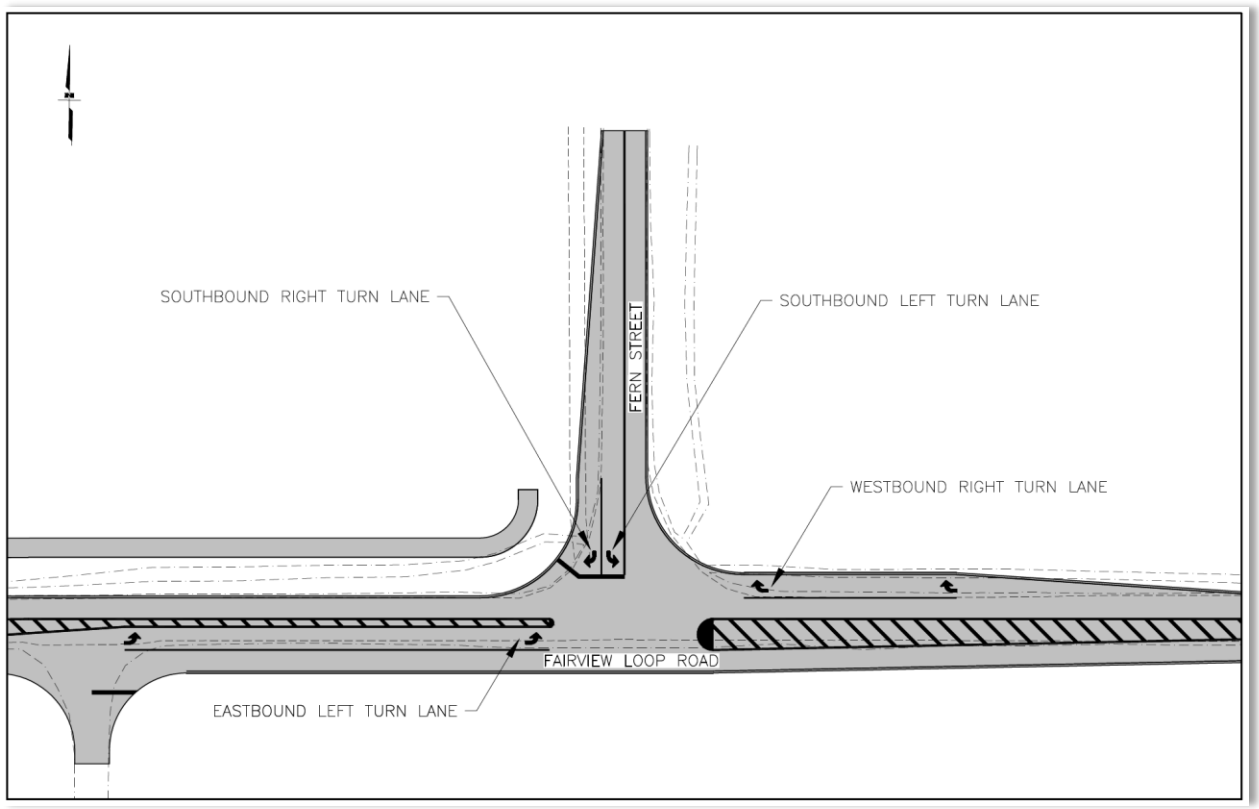


Figure 8 Patty-Rod

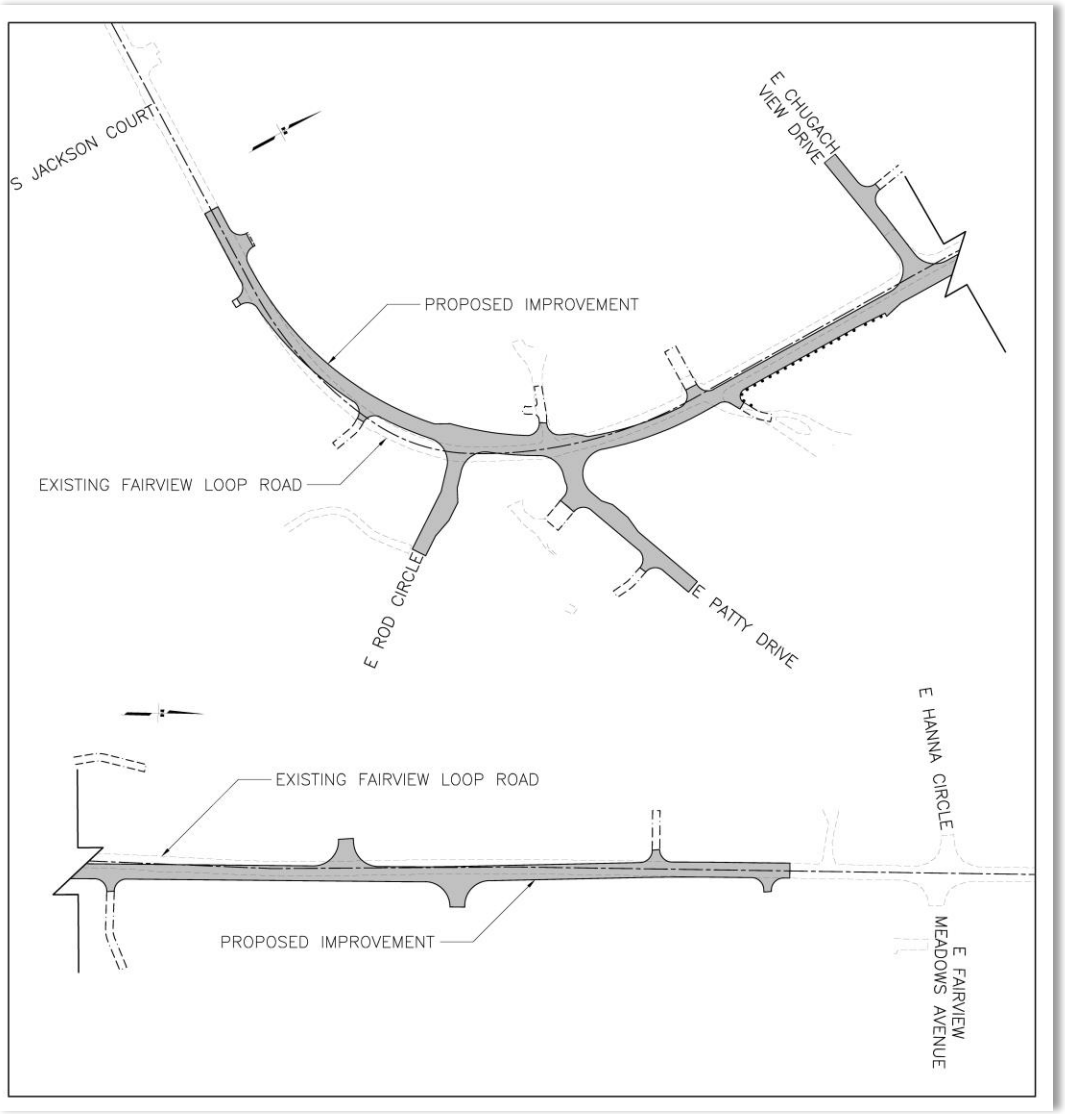


Figure 9 Togiak Avenue

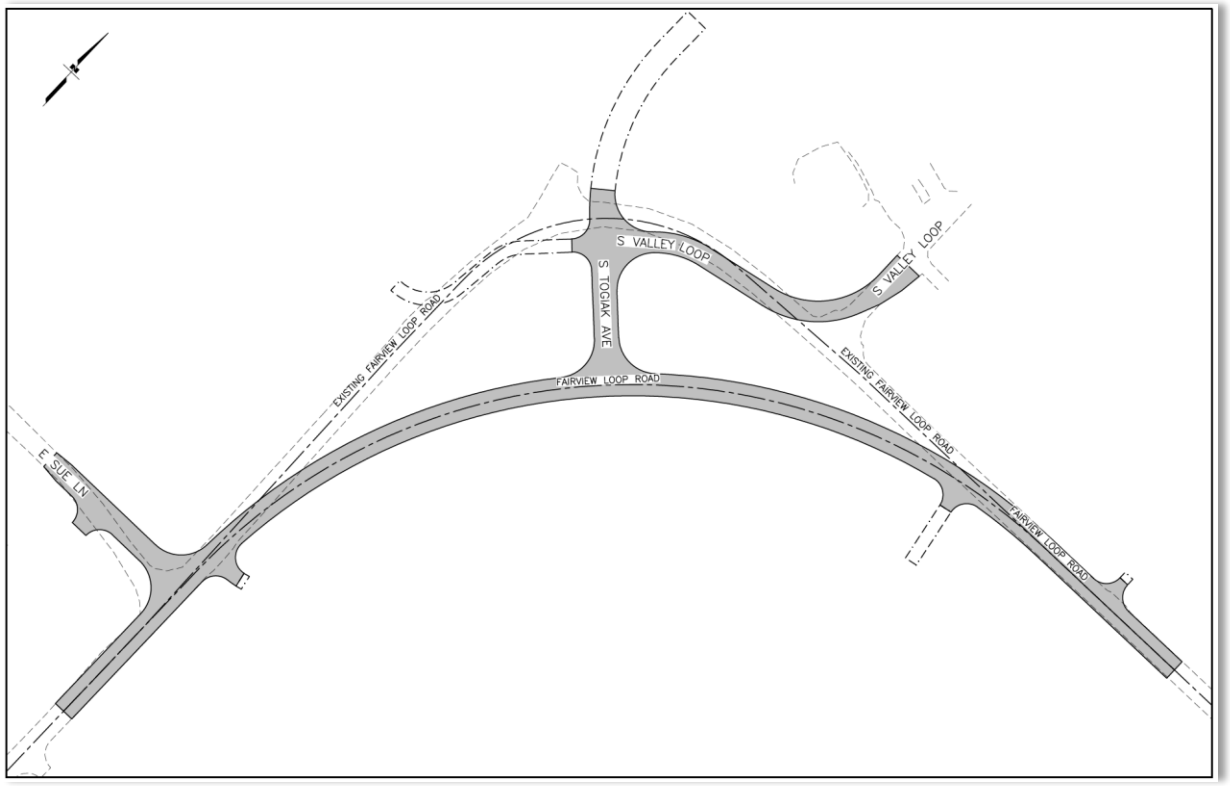
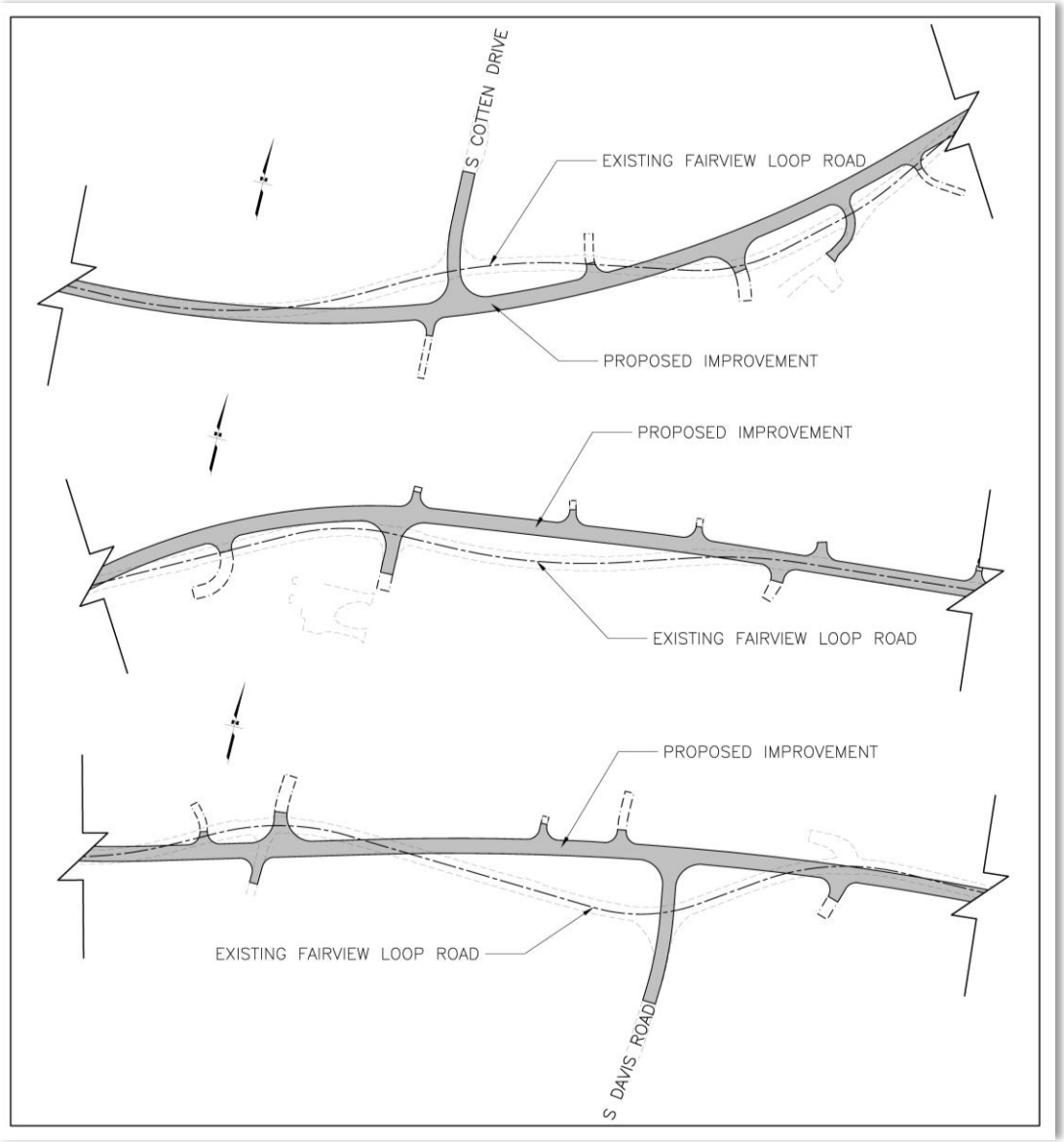


Figure 10 Cotten Drive & Davis Road



13.0 RIGHT-OF-WAY REQUIREMENTS

ROW acquisitions are needed to accommodate relocated utilities or slope limit expansion related to roadway, pathway, and safety improvements.

Temporary construction easements and permits will be required to construct the project. Approximate ROW impacts anticipated are summarized in Table 2.

Table 2 Approximate ROW Impact Summary

	Full Acquisition	Partial Acquisition	Permanent Easement (Utility)	Temporary Easement (Utility)	Temporary Construction Easement	Temporary Construction Permit
Stage 1	3	31	8	2	5	23
Stage 2	-	71	4	3	1	18
Future Stages	-	8	-	-	-	12
Total	**3**	**110**	**12**	**5**	**6**	**53**

14.0 PEDESTRIAN AND BICYCLE FACILITIES

Refer to Section 4.0 Preferred Alternative for additional information.

Pathway Improvements

The safety to non-motorized users of Fairview Loop will benefit with the separated pathway construction between Top of the World Circle and Fern Street, especially in the area near Snowshoe Elementary.

See Appendix B for pathway typical sections.

15.0 UTILITY RELOCATION AND COORDINATION

Utility companies with facilities in the project limits include Matanuska Electric Association, Inc. (MEA), Matanuska Telecom Association, Inc. (MTA), GCI Communication Corp. (GCI), ENSTAR Natural gas Company, LLC (ENSTAR), and Home Water LLC. Utilities will require relocation and agreements will be developed, at improvement locations throughout the project, to address the following conflicts:

15.1 Matanuska Electric Association, Inc.

MEA operates single and three phase overhead electric distribution facilities within the corridor. Overhead utility lines parallel nearly the entirety of Fairview Loop. Many of the utility poles will need to be relocated to the edge of the right-of-way to avoid the new slope limits from either the roadway or pathway construction.

15.2 Matanuska Telecom Association, Inc.

MTA facilities located within the project corridor include buried fiber optic (12-24 strand), buried filled copper cable (6-1200 strand), buried copper cable (12-25 strand), aerial copper cable (6-100 strand), and aerial fiber optic cables (24 strand). The buried lines terminate and split at many of the pedestals along the route and cross the Fairview Loop centerline at several locations. MTA's aerial lines will need to be relocated in conjunction with any utility pole relocations.

15.3 GCI Communication Corp.

GCI owns and operates many facilities along the corridor which are anticipated to conflict with the proposed improvements. These facilities consist of buried feeder (0.500" and 0.625") and trunk (0.750") coaxial Cable Television (CATV) cables and their associated pedestals. These lines run mainly in the existing roadway ditches and occasionally cross the Fairview Loop centerline.

15.4 ENSTAR Natural gas Company, LLC

ENSTAR owns and operates buried transmission, distribution, and service lines that are present in the project corridor. Pipe sizes and types range from 5/8" Plastic (PL), 1" PL, 2" PL, 4" PL, 6" PL, and 20" Steel (ST) Transmission Pipeline (TP). The transmission lines (4", 6", and 20") generally run in the existing roadside ditches, parallel to the existing alignment. Distribution and service lines (5/8", 1", 2" and 4") primarily cross Fairview Loop. To the extent possible, the proposed roadway improvements will be constructed to minimize impacts to the gas lines, but many of the transmission and distribution lines will be affected by the project excavations and the construction of the separated pathway.

15.5 Home Water LLC

Home Water LLC owns a 6" DIP waterline that runs south of the project alignment between Snowshoe Parkway and Clydesdale Drive. Fairview Loop Road Waterline Utility Conflict Report provided by Stephl Engineering recommends a 200' water main re-route around the Cottonwood Slough improvements.

16.0 PRELIMINARY WORK ZONE TRAFFIC CONTROL

The Alaska Highway Preconstruction Manual, Section 1400.2, sets forth the criteria for determining if a project is to be classified as a "Significant Project" for purposes of determining the level of effort required in developing a Traffic Management Plan (TMP). This project is not considered a "Significant Project" since Fairview Loop is classified as a rural major collector, is not located within a TMA, roadway AADTs are below 30,000 vehicles per day, and alternate routes are available in the event of a full closure.

16.1 Transportation Management Plan

Additional efforts performed as a part of the Transportation Management Plan not already detailed in the Temporary Traffic Control Plan (TTCP) and Public Information & Outreach Plan (PIOP) include the following.

Relocations for existing utilities that conflict with construction efforts have been coordinated with the appropriate utility companies and will either be relocated permanently or temporarily prior to construction. Those few utilities that are impracticable to relocate prior to construction will be relocated concurrently with roadway and pathway construction efforts.

In areas where there is insufficient space to support construction efforts, additional areas have been provided via permanent ROW acquisition, temporary construction easement, or temporary construction permit. Temporary construction impacts have been accounted for and documented in the environmental document.

16.2 Temporary Traffic Control Plan

Design has created a Temporary Traffic Control Plan to be used or modified for final use by the construction contractor, to safely guide and protect the traveling public in work zones, in accordance with the ATM and the project specifications. Temporary Traffic Control Plans will be reviewed and approved by the Construction Project Engineer.

The contractor is responsible for providing advance notice to the public, including local businesses, residents, and road travelers, of construction activities that could cause delays, detours, or affect access to adjacent properties.

16.3 Public Information & Outreach Plan

A Public Information & Outreach Plan has been developed and maintained during the design of the project that documents the public involvement scope, project team, communication methods, comment documentation, and key stakeholders.

There have been numerous public outreach activities for this project including onsite open houses, regional transportation fair booths, and public hearings. Project improvement locations and impacts were shared during these outreach efforts. Members of the public were offered the opportunity to share concerns and comments by speaking directly to a project design team member, leaving a written comment on a comment form, or submitting an online comment at a later date.

The PIOP will continue to be updated by the design team and will be transferred to the contractor for implementation during construction.

16.4 Transportation Operations Plan (TOP)

The Department will coordinate with relevant public agencies and event organizers and incorporate means and methods for minimizing traffic impacts with the contractor not covered by the TTCP or the PIOP within the project plans.

17.0 STRUCTURAL SECTION AND PAVEMENT DESIGN

Structural section recommendations were published in 2021 by DOT&PF. These recommendations were developed based upon a 2021 Geotechnical report which utilized a 2015 field investigation, both of which were performed by DOT&PF.

According to the 2021 geotechnical recommendations, the structural section for the asphalt pathway and the structural section for the areas where Fairview Loop is being widened are as follows:

Pathway
- 2” Asphalt Pathway
- 4” Aggregate Base Course, Grading D-1
- 24” Borrow, Type A
- Borrow, Type C (as needed in fill situations)

Roadway
- 2” HMA, Type II; Class A, HMA, PG 52-40 V
- STE-1 Tack Coat
- 2” ATB, PG 52-40 V

- 2” Aggregate Base Course, Grading D-1
- 12” Borrow, Type A (36” in areas of new alignment)
- Borrow, Type C (as needed in fill locations)

Material sources for this project will be contractor supplied.

Geotechnical recommendations can be found in Appendix D.

18.0 COST ESTIMATE

The project cost estimate is broken into Stages in table 2.

Table 3 Project Cost Estimate

	Stage 1	Stage 2	Future stages
Design	xx,xxx	xx,xxx	xx,xxx
Right of Way	xx,xxx	xx,xxx	xx,xxx
Utilities	xx,xxx	xx,xxx	xx,xxx
Construction	$16,050,000	$24,550,000	$5,900,000
Total	**xx,xxx**	**xx,xxx**	**xx,xxx**

A Value Engineering (VE) Study will be considered for this project as the total project cost estimate exceeds $40 million.

19.0 ENVIRONMENTAL COMMITMENTS AND CONSIDERATIONS

A Categorical Exclusion (CE) is being prepared by DOT&PF to minimize or mitigate potential impacts to cultural, economic, environmental, and social related interests affected by the construction of this project. Commitments found in the CE must be incorporated into the design and construction schedule.

DOT&PF will acquire the following Federal, State, and local permits for this project:

- U.S. Army Corps of Engineers (USACE) Section 404/10 Permit – Individual permit for placement of fill/dredging in wetlands and for in-water work.

- ADF&G Division of Habitat Title 16 Fish Habitat Permit – Required when constructing within an Anadromous River/Stream.

- Compliance with ADEC APDES Construction General Permit.

- MSB Flood Hazard Permit.

The contractor is responsible for obtaining all necessary permits and clearances for materials sites, disposal sites, and staging areas unless DOT&PF has obtained all necessary permits. See the Environmental Document in Appendix E for project specific commitments.

20.0 BRIDGES

No bridges are within the project limits.

21.0 EXCEPTIONS TO DESIGN STANDARDS

There are no exceptions to design standards for this project.

22.0 MAINTENANCE CONSIDERATIONS

Maintenance will remain the responsibility of the State of Alaska and the local DOT&PF Maintenance and Operations Station located at 289 Inner Springer Loop Palmer, Alaska. There are 17.6 roadway lane miles along Fairview Loop within the project limits between Top of the World Circle and South Bearing Tree Lane. Proposed project improvements do not change that number.

The project will increase maintenance efforts by additional snow removal during the winter months across the constructed 4.8 miles of separated pathway.

23.0 ITS FEATURES

No ITS elements are included in the project.

APPENDIX A

Approved Design Criteria and Design Designation

Project Design Criteria

Project Name: Fairview Loop Road Rehabilitation and Pathway - Stages 1 & 2					**Source/Comments**
Project Number: 00748					
Functional Classification:	Rural Major Collector				
Design Year:	2035	Present ADT:	2949		
Design Year ADT:	8380	Mid Design Period ADT:	6546		
DHV:	10.5	Directional Split:	65/35 (westbound/eastbound)		
Percent Trucks:	9	Equivalent Axle Loading:	Varies-380,000 to 1,420,000		
Pavement Design Year:	2035	Design Vehicle:	SU (Lane), WB-67 (Intersections)		
Terrain:	Rolling	Number of Roadways:	1		
Design Speed:	☐ As-Built	☑ Posted			50 mph
85th Percentile Speed:	☑ Speed Study	☐ Project Drive-thru	☐ Derived from Existing Geometrics		60 mph
Existing Lane Width:	11 ft				
Existing Shoulder Width:	Outside:	N/A	Inside:	N/A	Varies (0 ft - 1 ft)
Existing Lane + Shoulder Width:	12 ft				
Lane + Shoulder Width for 4R:	17 ft				HPCM 1160
Existing Superelevation Rate:	12% (Max)				
Min. Radius for 4R:	833 ft	(Evaluate Curves tighter than this)			HPCM 1160
Min. K-Value for Vert. Curves (4R):	Sag:	96	Crest:	84	HPCM 1160
Stopping Sight Distance:	425 ft				HPCM 1160
Passing Sight Distance:	800 ft				HPCM 1160
Existing Bridge No(s):	N/A				
Existing Bridge Width(s):	N/A				
Surface Treatment:	T/W:	Asphalt	Shoulders:	Asphalt/Gravel	
Vertical Clearance:	N/A				
Degree of Access Control:	N/A				
Median Treatment:	N/A				
Existing Illumination:	Yes				Spot Intersections
Proposed Illumination:	Yes				Roundabout
Curb Usage and Type:	N/A				
Existing Bicycle Accommodations:	N/A				
Proposed Bicycle Accommodations:	Yes				Separated Pathway
Existing Pedestrian Accommodations:	N/A				
Proposed Pedestrian Accommodations:	Yes				Separated Pathway
Misc. Criteria:	N/A				

The shaded area represents features requiring 3R evaluation per Section 1160.

Proposed - Designer/Consultant: _____ Date: _____

Endorsed - Engineering Manager: _____ Date: _____

Approved - Preconstruction Engineer: _____ Date: _____

Project Design Criteria

Project Name: Fairview Loop Road Rehabilitation and Pathway - Stages 1 & 2					**Source/Comments**
Project Number: 00748					
Functional Classification:	Shared Use Path				
Design Year:	2035	Present ADT:		N/A	
Design Year ADT:	N/A	Mid Design Period ADT:		N/A	
DHV:	N/A	Directional Split:		N/A	
Percent Trucks:	N/A	Equivalent Axle Loading:		N/A	
Pavement Design Year:	2035	Design Vehicle:		Class A Riders	
Terrain:	Rolling	Number of Roadways:		1	
Design Speed:	☐ As-Built	☐ Posted			
85th Percentile Speed:	☐ Speed Study	☐ Project Drive-thru	☐ Derived from Existing Geometrics		
Existing Lane Width:	N/A				
Existing Shoulder Width:	Outside:	N/A	Inside:	N/A	
Existing Lane + Shoulder Width:	N/A				
Lane + Shoulder Width for 4R:	10 ft				HPCM 1210.4.3
Existing Superelevation Rate:	N/A				
Min. Radius for 4R:	74 ft	(Evaluate Curves tighter than this)			GDBF - Table 5-2
Min. K-Value for Vert. Curves (4R):	Sag:	N/A	Crest:	N/A	
Stopping Sight Distance:	157 ft				GDBF - Table 5-4
Passing Sight Distance:	N/A				
Existing Bridge No(s):	N/A				
Existing Bridge Width(s):	N/A				
Surface Treatment:	T/W:	Asphalt	Shoulders:	Gravel	HPCM 1210.4.3
Vertical Clearance:	N/A				
Degree of Access Control:	N/A				
Median Treatment:	N/A				
Existing Illumination:	N/A				
Proposed Illumination:	N/A				
Curb Usage and Type:	N/A				
Existing Bicycle Accommodations:	N/A				
Proposed Bicycle Accommodations:	Yes				Separated Pathway
Existing Pedestrian Accommodations:	N/A				
Proposed Pedestrian Accommodations:	Yes				Separated Pathway
Misc. Criteria:	N/A				

The shaded area represents features requiring 3R evaluation per Section 1160.

Proposed - Designer/Consultant: _____ Date: _____

Endorsed - Engineering Manager: _____ Date: _____

Approved - Preconstruction Engineer: _____ Date: _____

Design Designation Forms

The following figures present the design designations forms (Figure 1100-1 from the ADOT&PF Highway Preconstruction Manual)

DESIGN DESIGNATION

State Route Number: 170028 Route Name: Fairview Loop Road

Project Limits: Fairview Loop Road Segment 1: Knik-Goose Bay Road to Hayfield Road

State Project Number: 51774 Federal Aid Number:

Project Description: 3R

Design Functional Classification: ☐ Urban Arterial ☐ Rural Arterial ☐ Major Collector ☑ Minor Collector ☐ Local

New Construction - Reconstruction: ☐ Rehabilitation (3R): ☑ Other

Project Design Life (Years): 5 ☐ 10 ☐ 20 ☑ 25 ☐ Other

	Existing Year 2011	Construction Year 2015	Mid - Life Year 2025	Future Year 2035
ADT*	2,620	2,824	3,198	4,094
DHV	275	297	336	430
Peak Hour Factor	Varies	0.95	0.95	0.95
PM Directional Distribution (East/West)	65/35	65/35	65/35	65/35
Recreational Vehicle Percentage (RV%)	4%	4%	4%	4%
Commercial Vehicle Percentage (CV%)	9.5%	9.5%	9.5%	9.5%
Compound Growth Rate		1.3%	2.5%	
Pedestrians (Number/Day)		>50	>50	>50
Bicyclists (Number/Day)				

*If urban then ADT is not required. Intersection diagrams shall be attached as part of this document.

Design Vehicles for Turning: SU

Design Vehicle Loading: HS15 ☐ HS20 ☑ HS25 ☐ Other

Equivalent Axle Loads: 880,000

APPROVED DATE
Regional Preconstruction Engineer

Figure 1100-1
Design Designation Form

Figure 1 - Design Designation Form: Segment 1

DESIGN DESIGNATION

State Route Number: **170028** Route Name: **Fairview Loop Road**

Project Limits: **Fairview Loop Road Segment 2: Hayfield Road to Coleman Drive**

State Project Number: **51774** Federal Aid Number: _____

Project Description: **3R**

Design Functional Classification: ☐ Urban Arterial ☐ Rural Arterial ☐ Major Collector ☑ Minor Collector ☐ Local

New Construction - Reconstruction: ☐ Rehabilitation (3R): ☑ Other _____

Project Design Life (Years): 5 ☐ 10 ☐ 20 ☑ 25 ☐ Other _____

	Existing Year 2011	Construction Year 2015	Mid - Life Year 2025	Future Year 2035
ADT*	937	1,481	2,673	3,422
DHV	98	156	281	359
Peak Hour Factor	Varies	0.95	0.95	0.95
PM Directional Distribution (East/West)	65/35	65/35	65/35	65/35
Recreational Vehicle Percentage (RV%)	2.5%	2.5%	2.5%	2.5%
Commercial Vehicle Percentage (CV%)	6.5%	6.5%	6.5%	6.5%
Compound Growth Rate		6.8%	2.5%	
Pedestrians (Number/Day)		>50	>50	>50
Bicyclists (Number/Day)				

*If urban then ADT is not required. Intersection diagrams shall be attached as part of this document.

Design Vehicles for Turning: **SU**

Design Vehicle Loading: HS15 ☐ HS20 ☑ HS25 ☐ Other _____

Equivalent Axle Loads: **380,000**

APPROVED _____ DATE _____
Regional Preconstruction Engineer

Figure 1100-1
Design Designation Form

Figure 2 - Design Designation Form: Segment 2

DESIGN DESIGNATION

State Route Number: **170028** Route Name: **Fairview Loop Road**

Project Limits: **Fairview Loop Road Segment 3: Coleman Drive to Edlund Road**

State Project Number: **51774** Federal Aid Number:

Project Description: **3R**

Design Functional Classification: ☐ Urban Arterial ☐ Rural Arterial ☐ Major Collector ☑ Minor Collector ☐ Local

New Construction - Reconstruction: ☐ Rehabilitation (3R): ☑ Other

Project Design Life (Years): 5 ☐ 10 ☐ 20 ☑ 25 ☐ Other

	Existing Year 2011	Construction Year 2015	Mid - Life Year 2025	Future Year 2035
ADT*	1,360	1,937	3,495	4,474
DHV	143	203	367	470
Peak Hour Factor	Varies	0.95	0.95	0.95
PM Directional Distribution (East/West)	35/65	35/65	35/65	35/65
Recreational Vehicle Percentage (RV%)	2.5%	2.5%	2.5%	2.5%
Commercial Vehicle Percentage (CV%)	6.5%	6.5%	6.5%	6.5%
Compound Growth Rate		6.1%	2.5%	
Pedestrians (Number/Day)		>50	>50	>50
Bicyclists (Number/Day)				

*If urban then ADT is not required. Intersection diagrams shall be attached as part of this document.

Design Vehicles for Turning: **SU**

Design Vehicle Loading: HS15 ☐ HS20 ☑ HS25 ☐ Other

Equivalent Axle Loads: **610,000**

APPROVED DATE
Regional Preconstruction Engineer

Figure 1100-1
Design Designation Form

Figure 3 - Design Designation Form: Segment 3

DESIGN DESIGNATION

State Route Number: **170028** Route Name: **Fairview Loop Road**

Project Limits: **Fairview Loop Road Segment 4: Edlund Road to Davis Road**

State Project Number: **51774** Federal Aid Number: _____

Project Description: **3R**

Design Functional Classification: ☐ Urban Arterial ☐ Rural Arterial ☐ Major Collector ☑ Minor Collector ☐ Local

New Construction - Reconstruction: ☐ Rehabilitation (3R): ☑ Other _____

Project Design Life (Years): 5 ☐ 10 ☐ 20 ☑ 25 ☐ Other _____

	Existing Year 2011	Construction Year 2015	Mid - Life Year 2025	Future Year 2035
ADT*	2,070	3,662	9,480	12,135
DHV	217	384	995	1,274
Peak Hour Factor	Varies	0.95	0.95	0.95
PM Directional Distribution (East/West)	35/65	35/65	35/65	35/65
Recreational Vehicle Percentage (RV%)	2.5%	2.5%	2.5%	2.5%
Commercial Vehicle Percentage (CV%)	6.5%	6.5%	6.5%	6.5%
Compound Growth Rate		10.0%	2.5%	
Pedestrians (Number/Day)		>50	>50	>50
Bicyclists (Number/Day)				

*If urban then ADT is not required. Intersection diagrams shall be attached as part of this document.

Design Vehicles for Turning: **SU**

Design Vehicle Loading: HS15 ☐ HS20 ☑ HS25 ☐ Other _____

Equivalent Axle Loads: **1,400,000**

APPROVED _____ DATE _____
Regional Preconstruction Engineer

Figure 1100-1
Design Designation Form

Figure 4 - Design Designation Form: Segment 4

DESIGN DESIGNATION

State Route Number: **170028** Route Name: **Fairview Loop Road**

Project Limits: **Fairview Loop Road Segment 5: Davis Road to East Fireweed Road**

State Project Number: **51774** Federal Aid Number:

Project Description: **3R**

Design Functional Classification: ☐ Urban Arterial ☐ Rural Arterial ☐ Major Collector ☑ Minor Collector ☐ Local

New Construction - Reconstruction: ☐ Rehabilitation (3R): ☑ Other

Project Design Life (Years): 5 ☐ 10 ☐ 20 ☑ 25 ☐ Other

	Existing Year	Construction Year	Mid - Life Year	Future Year
	2011	2015	2025	2035
ADT*	2,720	3,924	7,229	9,254
DHV	305	412	759	972
Peak Hour Factor	Varies	0.95	0.95	0.95
PM Directional Distribution (East/West)	35/65	35/65	35/65	35/65
Recreational Vehicle Percentage (RV%)	2.5%	2.5%	2.5%	2.5%
Commercial Vehicle Percentage (CV%)	6.5%	6.5%	6.5%	6.5%
Compound Growth Rate		6.3%	2.5%	
Pedestrians (Number/Day)		>50	>50	>50
Bicyclists (Number/Day)				

*If urban then ADT is not required. Intersection diagrams shall be attached as part of this document.

Design Vehicles for Turning: **SU**

Design Vehicle Loading: HS15 ☐ HS20 ☑ HS25 ☐ Other

Equivalent Axle Loads: **1,420,000**

APPROVED DATE

Regional Preconstruction Engineer

Figure 1100-1
Design Designation Form

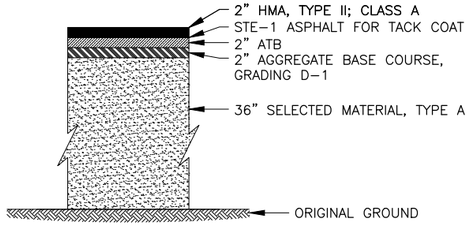
Figure 5 - Design Designation Form: Segment 5

APPENDIX B

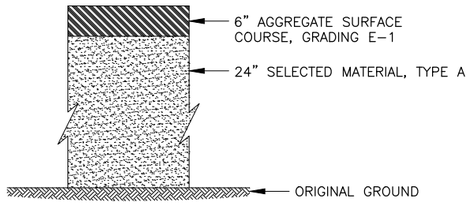
Typical Sections Stage 1

NO.	DATE	REVISION

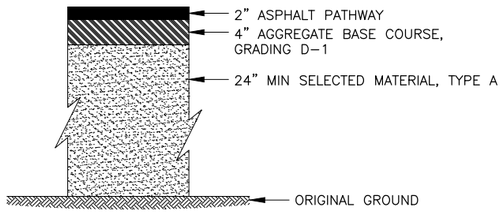
STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	PENDING/NFHWY00860	2025	B1	B5



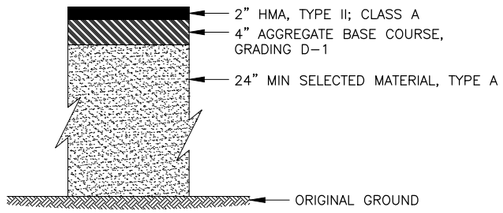
STRUCTURAL SECTION NO. 1



STRUCTURAL SECTION NO. 3



STRUCTURAL SECTION NO. 2



STRUCTURAL SECTION NO. 4

GENERAL TYPICAL SECTION NOTES:

1. SEE APPROACH DETAILS ON SHEET E1 FOR PATHWAY LAYOUT AT PUBLIC AND RESIDENTIAL APPROACHES.
2. WHEN DIRECTED BY THE ENGINEER, REDUCE THE 24" SELECTED MATERIAL, TYPE A THICKNESS TO 12" SELECTED MATERIAL, TYPE A.

STATE OF ALASKA
49TH
DRAFT
APRIL 2025
REGISTERED PROFESSIONAL ENGINEER

R&M CONSULTANTS, INC.
9101 VANGUARD DRIVE
ANCHORAGE, AK 99507
(907) 522-1707
CERT. OF AUTH. NO. AECC111

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION
AND PUBLIC FACILITIES

FAIRVIEW LOOP ROAD REHABILITATION AND PATHWAY – STAGE 1

STRUCTURAL SECTIONS

DESIGNED BY
CHECKED BY
DRAFTED BY

SCALE

DATE 4/17/2025 TIME 9:57 AM

DRAWING LOCATION
Z:\PROJECT\1635.05 DOT_C FAIRVIEW LOOP REHAB TASK GROUP A\CIVIL\ACAD\1PHASE 1\1635.05-B1 - PHASE 1.DWG

NO.	DATE	REVISION

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	PENDING/NFHWY00860	2025	B2	B5

DESIGNED BY
CHECKED BY
DRAFTED BY

SCALE

DATE 4/17/2025 TIME 9:57 AM

DRAWING LOCATION
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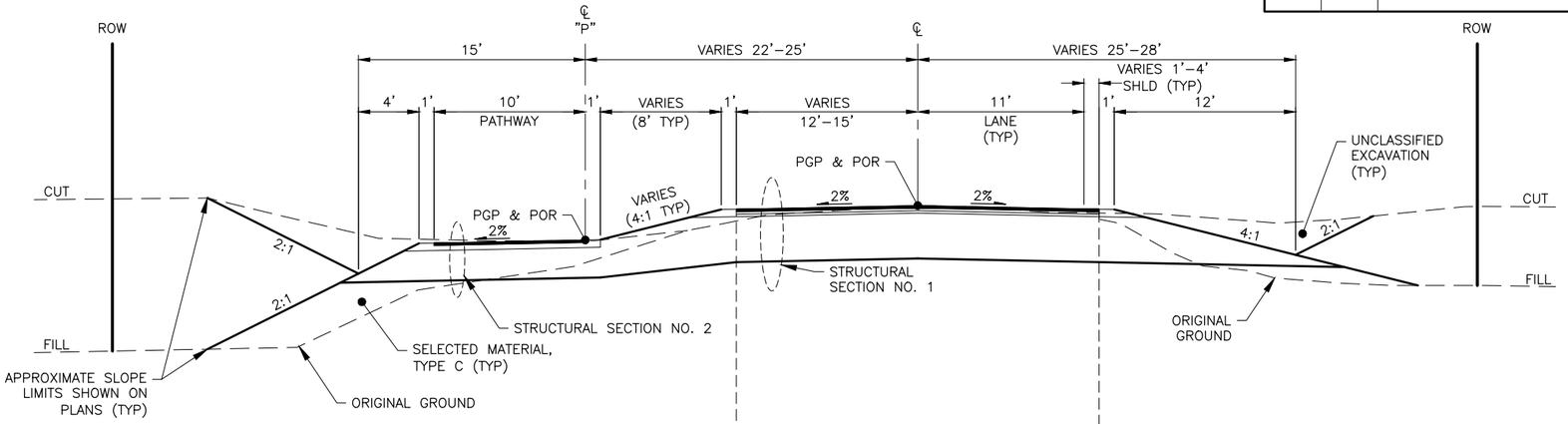


"FVL" DITCH TABLE

STATION RANGE		BACKSLOPE		FORESLOPE
FROM	TO	① WIDTH(FT)	② SLOPE(H:V)	③ WIDTH(FT)
143+72.00	147+00.00	4.5	1.5:1	15.5
147+00.00	150+50.00	7	2:1	13
150+50.00	151+50.00	8	2:1	12
151+50.00	152+50.00	8	1.5:1	12

SHEET B2 NOTES:

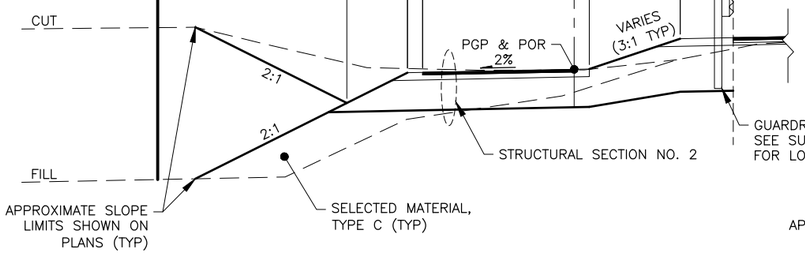
1. TAPER GRAVEL SHOULDER WIDTH FROM 3.5 FEET TO 11.5' OVER 50 LINEAR FEET.

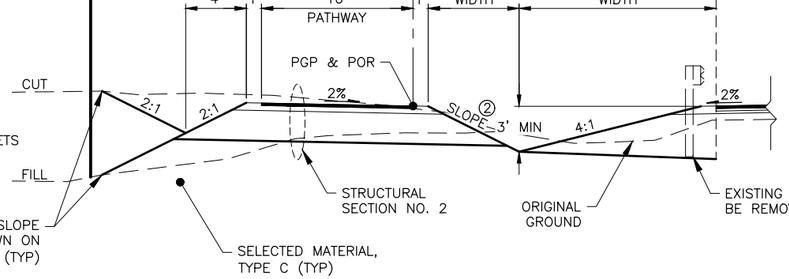
PATHWAY

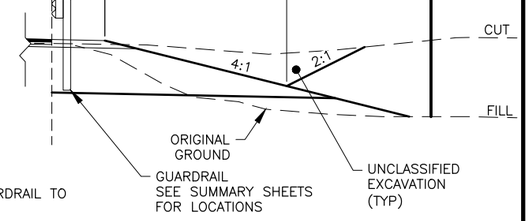
"P" STA 2098+04.37 TO "P" STA 2102+46.84

FAIRVIEW LOOP

"FVL" STA 135+50.00 TO "FVL" STA 140+00.00
"FVL" STA 143+72.00 TO "FVL" STA 152+50.00





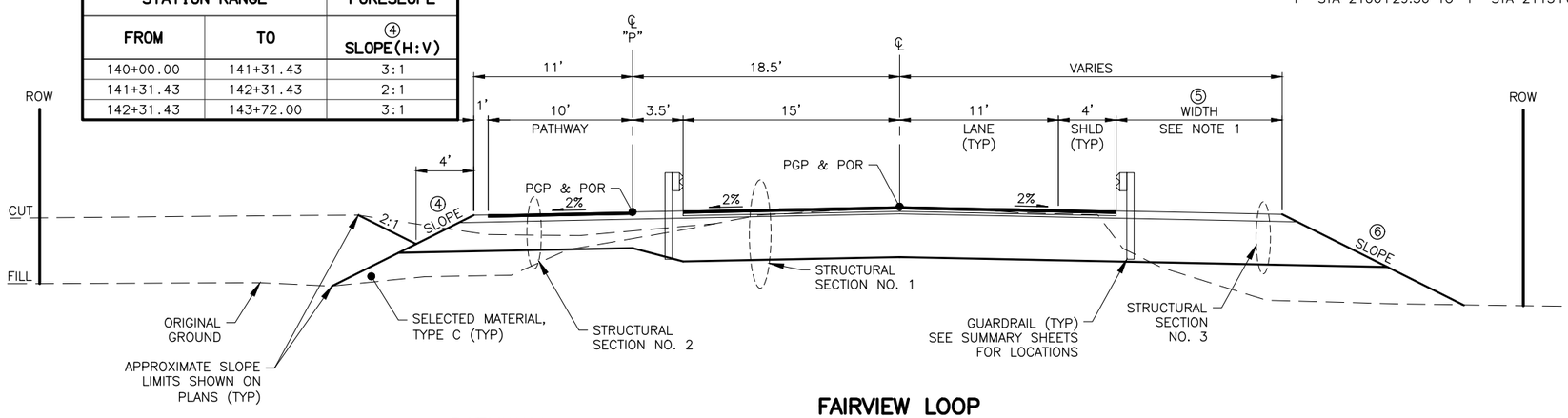


"FVL" EMBANKMENT TABLE (LT)

STATION RANGE		FORESLOPE
FROM	TO	④ SLOPE(H:V)
140+00.00	141+31.43	3:1
141+31.43	142+31.43	2:1
142+31.43	143+72.00	3:1

PATHWAY

"P" STA 2102+46.84 TO "P" STA 2102+56.91



PATHWAY

"P" STA 2102+56.91 TO "P" STA 2106+29.56

FAIRVIEW LOOP

"FVL" STA 140+00.00 TO "FVL" STA 143+72.00*

*"FVL" STA 141+87.29 CONSTRUCT COTTONWOOD CREEK SPPA

PATHWAY

"P" STA 2106+29.56 TO "P" STA 2115+09.93

FAIRVIEW LOOP

"FVL" STA 139+51.65 TO "FVL" STA 140+00.00

"FVL" EMBANKMENT TABLE (RT)

STATION RANGE		EMBANKMENT	
FROM	TO	⑤ WIDTH(FT)	⑥ SLOPE(H:V)
140+00.00	141+43.15	3.5	3:1
141+43.15	142+43.15	11.5	2:1
142+43.15	143+72.00	11.5	3:1

STATE OF ALASKA
49TH
DRAFT
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9101 VANGUARD DRIVE
ANCHORAGE, AK 99507
(907) 522-1707
CERT. OF AUTH. NO. AECC111

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION
AND PUBLIC FACILITIES

FAIRVIEW LOOP ROAD REHABILITATION AND PATHWAY – STAGE 1

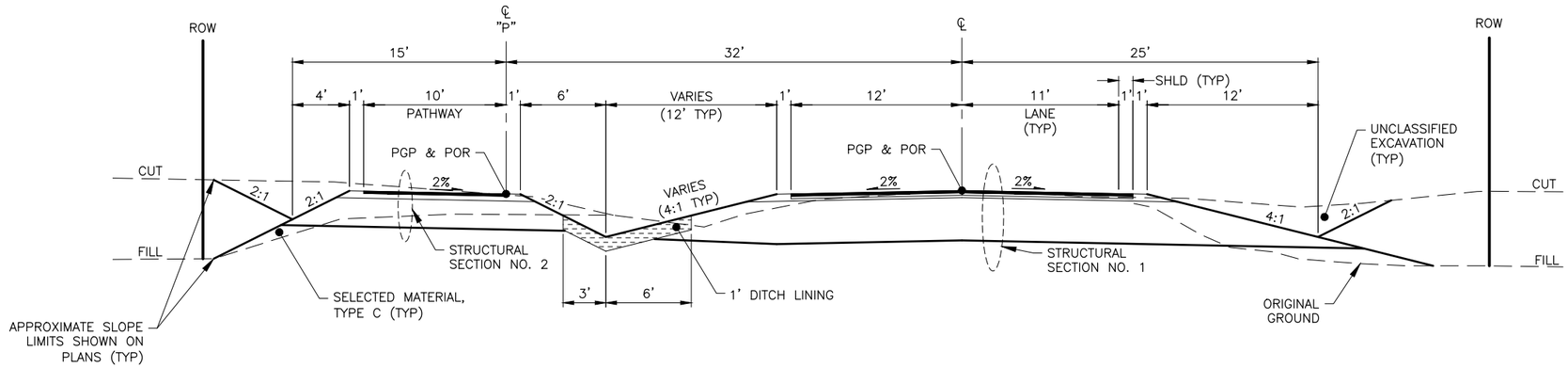
FAIRVIEW LOOP TYPICAL SECTIONS

NO.	DATE	REVISION

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	PENDING/NFHWY00860	2025	B3	B5

DESIGNED BY
CHECKED BY
DRAFTED BY
SCALE
DATE 4/17/2025
TIME 9:57 AM
DRAFT

DRAWING LOCATION
Z:\PROJECT\1635.05 DOT_C FAIRVIEW LOOP REHAB TASK GROUP A\CIVIL\ACAD\1PHASE 1\1635.05-B1 - PHASE 1.DWG

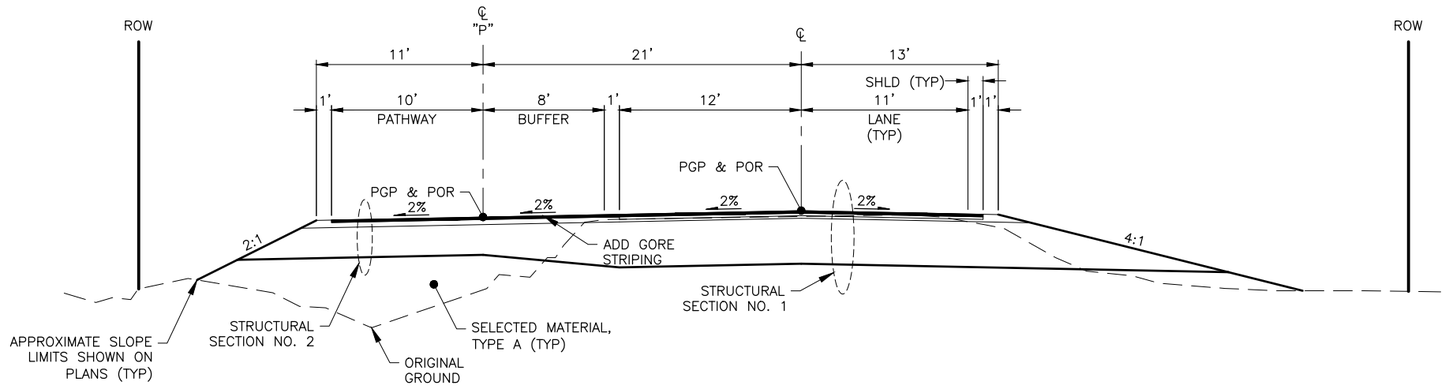


PATHWAY

"P" STA 2138+51.22 TO "P" STA 2139+52.57
"P" STA 2141+02.57 TO "P" STA 2142+03.79

FAIRVIEW LOOP

"FVL" STA 176+00.00 TO "FVL" STA 177+00.00
"FVL" STA 178+50.00 TO "FVL" STA 179+50.00



PATHWAY

"P" STA 2139+52.57 TO "P" STA 2141+02.57

FAIRVIEW LOOP

"FVL" STA 177+00.00 TO "FVL" STA 178+50.00*

*"FVL" STA 177+75.24 CONSTRUCT COTTONWOOD SLOUGH CULVERT.

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FAIRVIEW LOOP TYPICAL SECTIONS

NO.	DATE	REVISION

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	PENDING/NFHWY00860	2025	B4	B5

DESIGNED BY
CHECKED BY
DRAFTED BY
SCALE
DATE 4/17/2025 TIME 9:57 AM
DRAFT

DRAWING LOCATION
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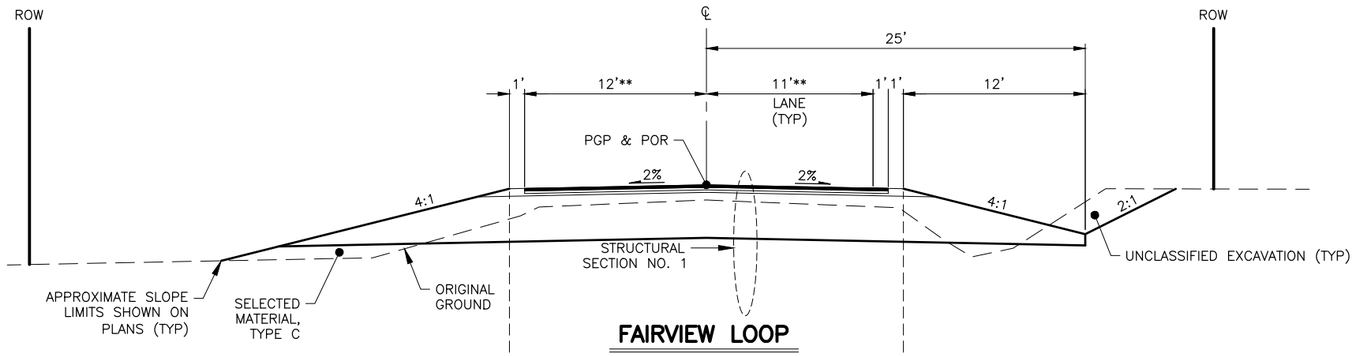
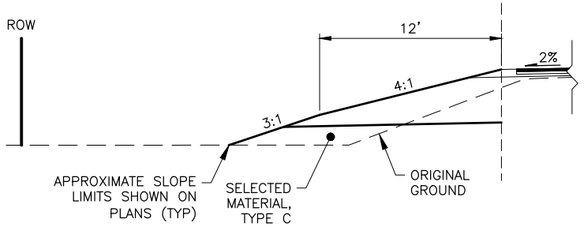


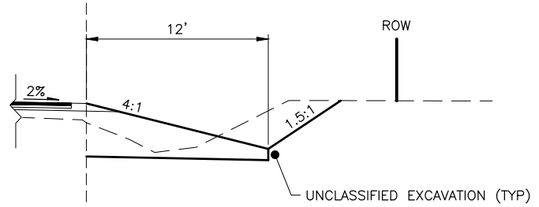
FAIRVIEW LOOP

"FVL3" STA 800+00.00 TO "FVL3" STA 814+00.00
"FVL4" STA 900+00.00 TO "FVL4" STA 959+00.00



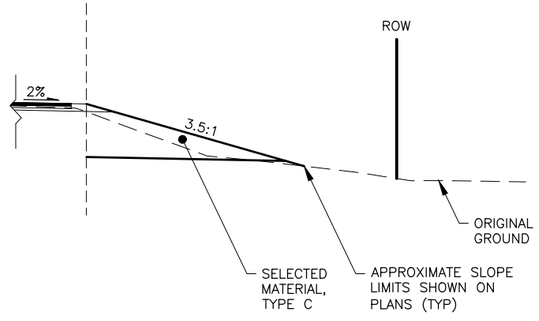
FORESLOPE EXCEPTION

"FVL4" STA 900+75.00 (LT) TO "FVL4" STA 902+00.00 (LT)



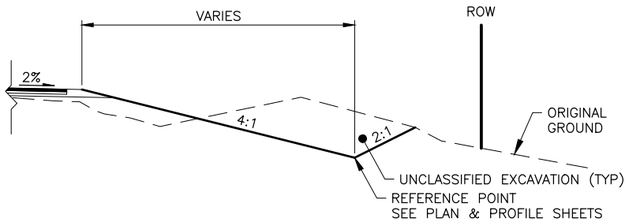
BACKSLOPE EXCEPTION

"FVL3" STA 801+50.00 (RT) TO "FVL3" STA 802+00.00 (RT)
"FVL4" STA 933+00.00 (RT) TO "FVL4" STA 937+50.00 (RT)



FORESLOPE EXCEPTION

"FVL3" STA 812+40.00 (RT) TO "FVL3" STA 812+70.00 (RT)



SPECIAL DITCH

"FVL4" STA 924+20.00 (RT) TO "FVL4" STA 924+90.00 (RT)

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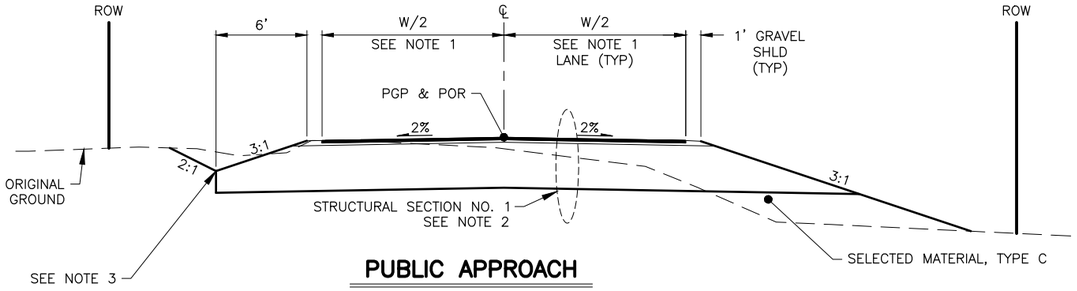
FAIRVIEW LOOP ROAD REHABILITATION AND PATHWAY – STAGE 1

FAIRVIEW LOOP TYPICAL SECTIONS

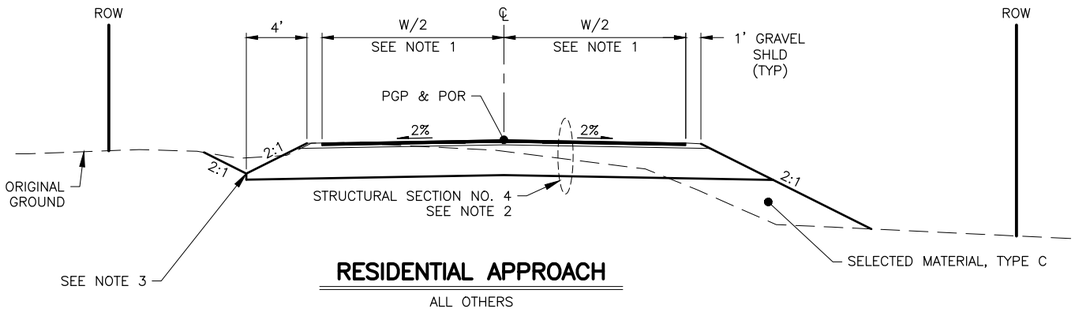
NO.	DATE	REVISION

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	PENDING/NFHWY00860	2025	B5	B5



PUBLIC APPROACH

S HOWDIE DRIVE, REDOUBT DRIVE, E SUE LANE, S TOGIAK AVENUE, S VALLEY LOOP, S COTTEN DRIVE, S CANDYWINE ROAD, E KIBBY DRIVE, S DAVIS ROAD



RESIDENTIAL APPROACH

ALL OTHERS

SHEET B5 NOTES:

1. SEE APPROACH SUMMARY TABLE FOR WIDTH (W)
2. CONSTRUCT APPROACHES USING STRUCTURAL SECTION NO. 3 BEYOND PAVING LIMITS SHOWN ON APPROACH DETAILS.
3. ADJUST DITCHES TO MATCH EXISTING CONDITIONS OR AS DIRECTED BY ENGINEER.

STATE OF ALASKA
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DEPARTMENT OF TRANSPORTATION
AND PUBLIC FACILITIES

FAIRVIEW LOOP ROAD REHABILITATION AND PATHWAY – STAGE 1

APPROACH TYPICAL SECTION

DESIGNED BY
CHECKED BY
DRAFTED BY
DRAFT

SCALE

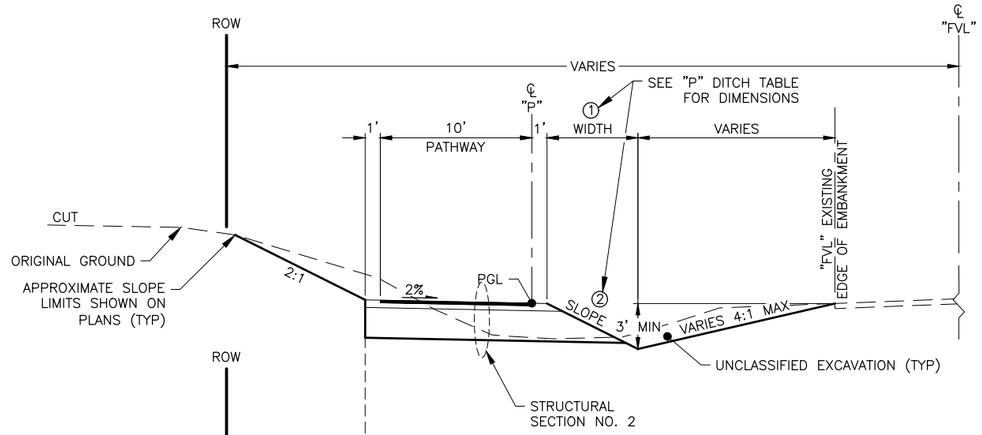
DATE 4/17/2025
TIME 9:57 AM
RFS/MN

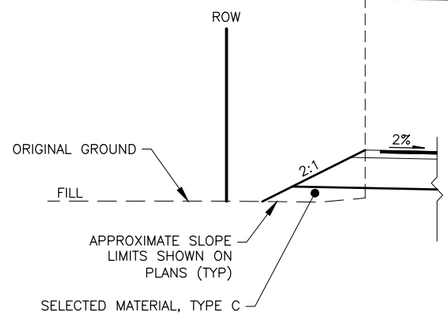
DRAWING LOCATION
Z:\PROJECT\1635.05 DOT_C FAIRVIEW LOOP REHAB TASK GROUP A\CIVIL\ACAD\1PHASE 1\1635.05-B1 – PHASE 1.DWG

Typical Sections Stage 2

NO.	DATE	REVISION

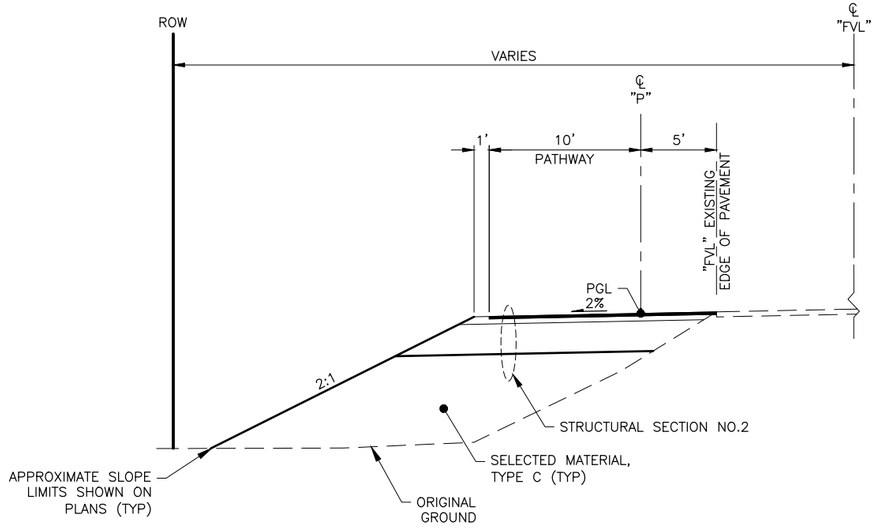
STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	PENDING	2025	B1	B5





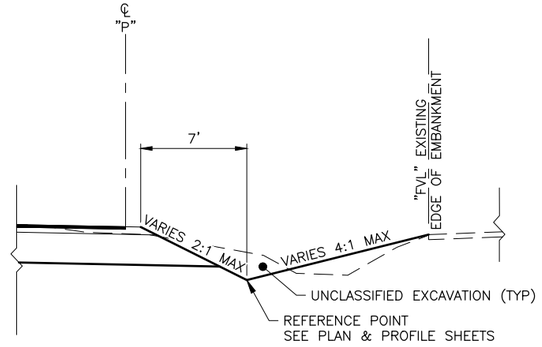
PATHWAY

"P" STA 2000+76.00 TO "P" STA 2011+43.11
"P" STA 2023+25.68 TO "P" STA 2044+95.97
"P" STA 2062+35.11 TO "P" STA 2098+04.37
"P" STA 2115+09.93 TO "P" STA 2138+51.22
"P" STA 2142+03.79 TO "P" STA 2192+10.71
"P" STA 2192+13.45 TO "P" STA 2206+69.98
"P" STA 2240+50.00 TO "P" STA 2240+79.19



PATHWAY

"P" STA 2011+43.11 TO "P" STA 2013+21.10



PATHWAY SPECIAL DITCH

"P" STA 2084+42.00 TO "P" STA 2085+61.86

"P" DITCH TABLE

STATION RANGE		BACKSLOPE	
FROM	TO	① WIDTH (FT)	② SLOPE(H:V)
2001+55.52	2010+75.45	6	2:1
2024+94.89	2026+75.00	7	2:1
2026+75.00	2028+00.00	8	2:1
2028+00.00	2030+04.44	7	2:1
2032+15.87	2038+32.87	6	2:1
2040+15.89	2044+95.97	6	2:1
2062+35.11	2063+63.39	6	2:1
2065+44.54	2085+61.86	6	2:1
2087+44.90	2098+00.52	6	2:1
2115+09.93	2118+00.00	8	1.5:1
2118+00.00	2118+86.49	8	2:1
2120+76.63	2121+75.00	7	2:1
2121+75.00	2123+75.00	8	2:1
2123+75.00	2126+00.00	7	2:1
2126+00.00	2127+50.00	8	2:1
2127+50.00	2131+00.00	6	2:1
2131+00.00	2132+00.00	7	2:1
2132+00.00	2133+25.00	8	2:1
2133+25.00	2135+00.00	7	2:1
2135+00.00	2138+00.00	6	1.5:1
2138+00.00	2138+51.22	7	2:1
2142+03.79	2145+00.00	7	2:1
2145+00.00	2147+49.71	6	2:1
2149+34.75	2150+82.36	7	2:1
2152+69.40	2153+00.00	7	2:1
2153+00.00	2154+50.00	8	2:1
2154+50.00	2156+15.79	7	2:1
2158+08.33	2160+00.00	10	2:1
2160+00.00	2163+00.00	9	2:1
2163+00.00	2164+50.00	8	2:1
2164+50.00	2167+50.00	7	2:1
2167+50.00	2168+50.00	8	2:1
2168+50.00	2169+50.00	10	2:1
2169+50.00	2170+50.00	12	2:1
2170+50.00	2172+75.00	15	2:1
2172+75.00	2174+50.00	10	2:1
2174+50.00	2177+00.00	7	2:1
2177+00.00	2179+00.00	10	2:1
2179+00.00	2181+00.00	14	2:1
2181+00.00	2182+25.00	16	2:1
2182+25.00	2185+00.00	10	2:1
2185+00.00	2185+50.00	16	2:1
2185+50.00	2186+00.00	18	2:1
2186+00.00	2187+00.00	16	2:1
2187+00.00	2189+00.00	12	2:1
2189+00.00	2191+52.03	14	2:1
2191+52.03	2192+13.45	14	3:1
2206+73.83	2228+00.00	6	2:1
2228+25.00	2232+00.00	6	2:1
2232+00.00	2238+50.00	6	2:1
2240+50.00	2240+75.00	6	2:1

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FAIRVIEW LOOP PATHWAY AND SAFETY IMPROVEMENTS

PATHWAY TYPICAL SECTION

DESIGNED BY
CHECKED BY
DRAFTED BY
SCALE
DATE TIME 4/17/2025 10:16 AM
DRAWING LOCATION
Z:\PROJECT\1635.06 DOT_C FAIRVIEW LOOP REHAB TASK GROUP B\CIVIL\ACAD\1635.06-B1.DWG

NO.	DATE	REVISION

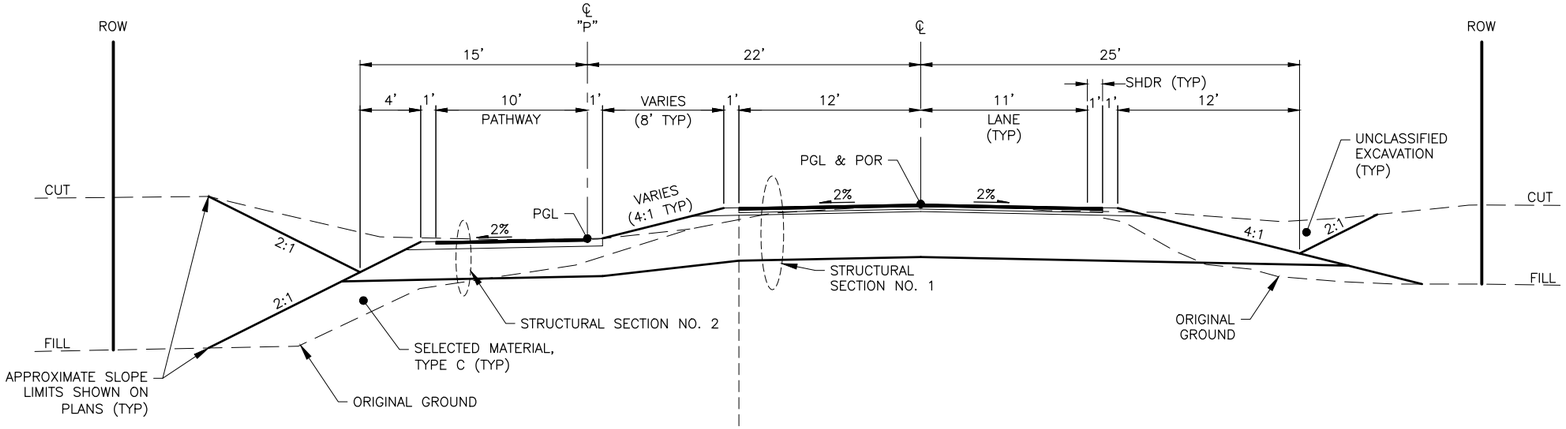
STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	PENDING	2025	B2	B5

DESIGNED BY
CHECKED BY
DRAFTED BY

SCALE

DATE TIME
4/17/2025 10:16 AM

DRAWING LOCATION
Z:\PROJECT\1635.06 DOT_C FAIRVIEW LOOP REHAB TASK GROUP B\CIVIL\ACAD\1635.06-B1.DWG

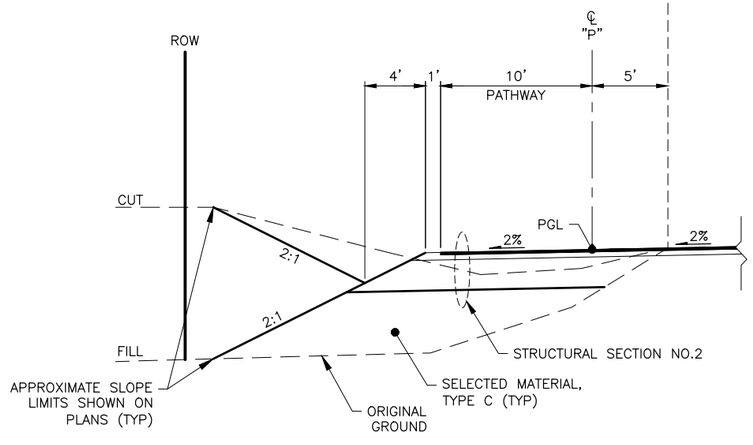


PATHWAY

"P" STA 2013+51.49 TO "P" STA 2023+25.68

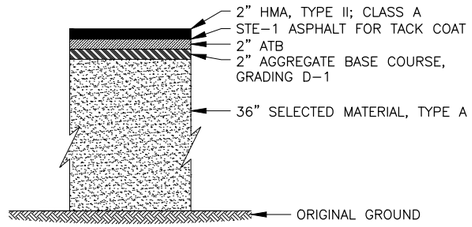
FAIRVIEW LOOP

"FVL" STA 50+50.00 TO "FVL" STA 60+50.00

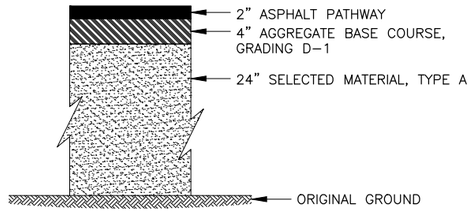


PATHWAY

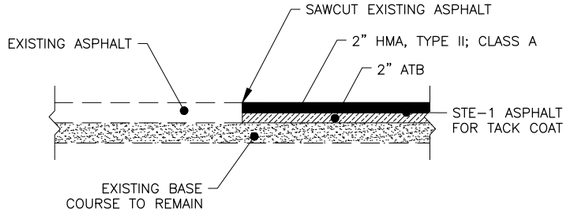
"P" STA 2013+21.10 TO "P" STA 2013+51.49



STRUCTURAL SECTION NO. 1



STRUCTURAL SECTION NO. 2



REPLACE PAVEMENT SECTION

"FVL" STA 49+85.00 TO "FVL" STA 50+50.00
"FVL" STA 60+50.00 TO "FVL" STA 61+69.00
"FVL" STA 99+49.73 TO "FVL" STA 102+20.00
"FVL" STA 242+60.00 TO "FVL" STA 244+00.00

GENERAL TYPICAL SECTION NOTES:

1. SEE SHEET B6 FOR PATHWAY ONLY TYPICAL SECTIONS.
2. SEE APPROACH DETAILS ON SHEET E1 FOR PATHWAY LAYOUT AT PUBLIC AND RESIDENTIAL APPROACHES.
3. WHEN DIRECTED BY THE ENGINEER, REDUCE THE 24" SELECTED MATERIAL, TYPE A THICKNESS TO 12" SELECTED MATERIAL, TYPE A.

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FAIRVIEW LOOP PATHWAY AND SAFETY IMPROVEMENTS

FAIRVIEW LOOP TYPICAL SECTION

NO.	DATE	REVISION

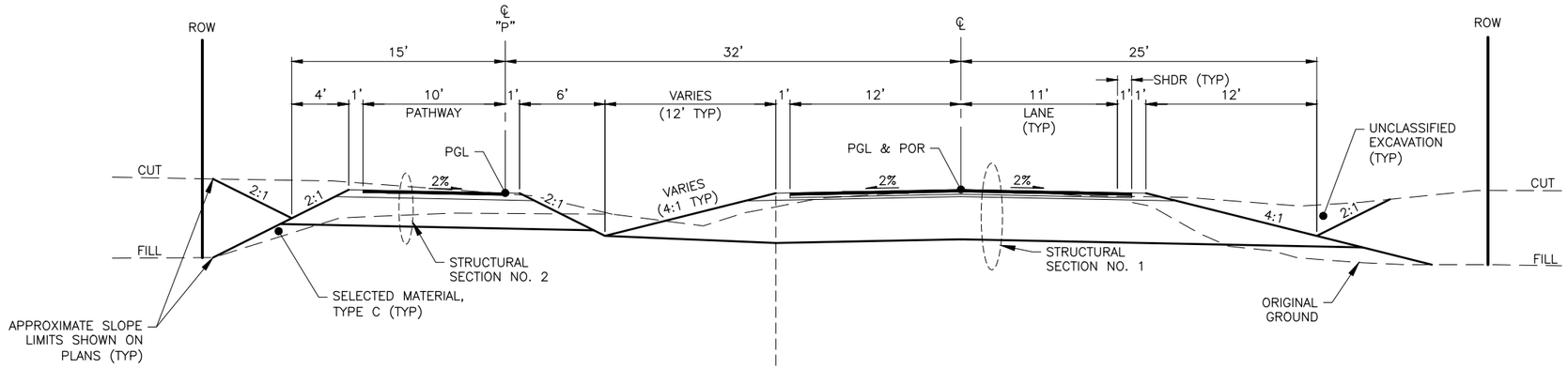
STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	PENDING	2025	B3	B5

DESIGNED BY
CHECKED BY
DRAFTED BY

SCALE

DATE TIME
4/17/2025 10:16 AM

DRAWING LOCATION
Z:\PROJECT\1635.06 DOT_C FAIRVIEW LOOP REHAB TASK GROUP BY\CIVIL\ACAD\1635.06-B1.DWG

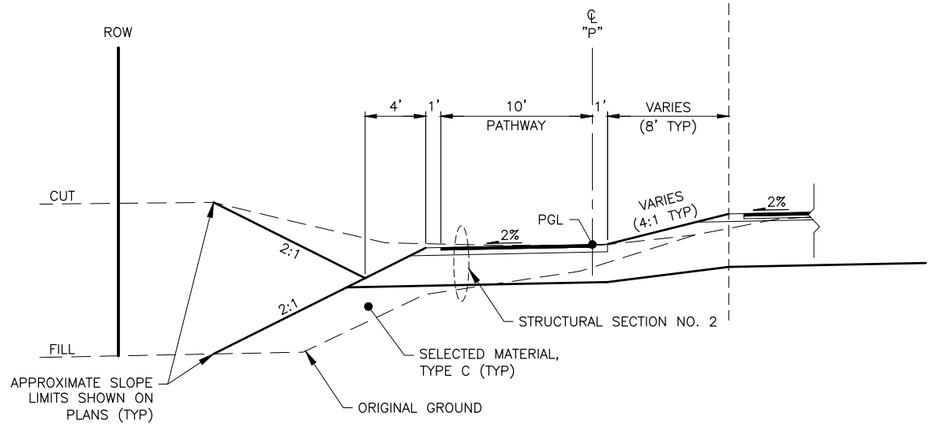


PATHWAY

"P" STA 2044+95.97 TO "P" STA 2049+19.34
"P" STA 2057+94.84 TO "P" STA 2062+35.11

FAIRVIEW LOOP

"FVL1" STA 600+00.00 TO "FVL1" STA 617+50.00



PATHWAY

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STATE OF ALASKA
49TH
DRAFT
APRIL 2025
REGISTERED PROFESSIONAL ENGINEER

R&M CONSULTANTS, INC.
9101 VANGUARD DRIVE
ANCHORAGE, AK 99507
(907) 522-1707
CERT. OF AUTH. NO. AECC111

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION
AND PUBLIC FACILITIES

FAIRVIEW LOOP PATHWAY AND SAFETY IMPROVEMENTS

FAIRVIEW LOOP TYPICAL SECTION

NO.	DATE	REVISION

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	PENDING	2025	B4	B5

DESIGNED BY
CHECKED BY
DRAFTED BY

SCALE

DATE 4/17/2025 TIME 10:16 AM

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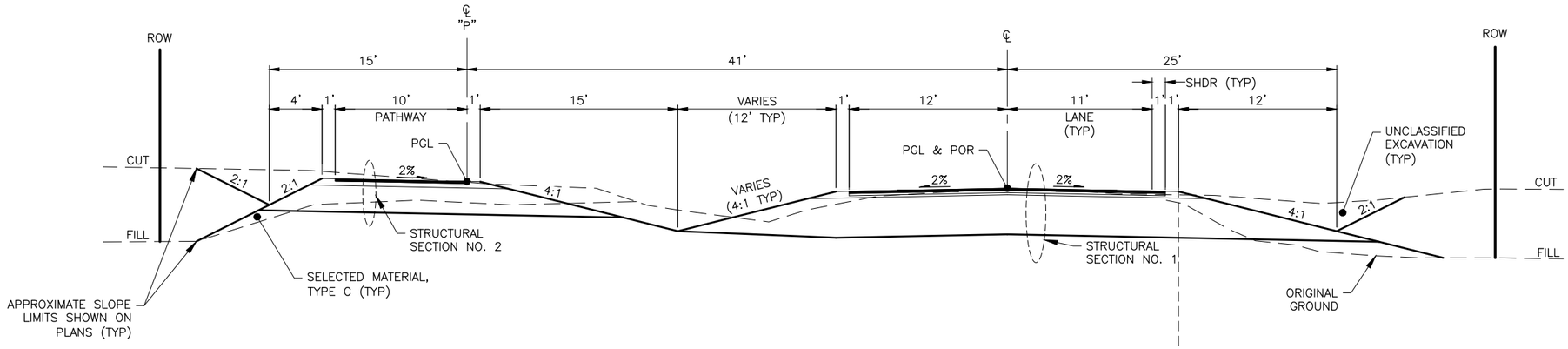

PATHWAY

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FAIRVIEW LOOP

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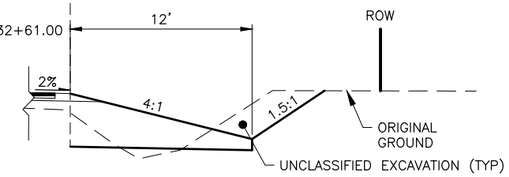

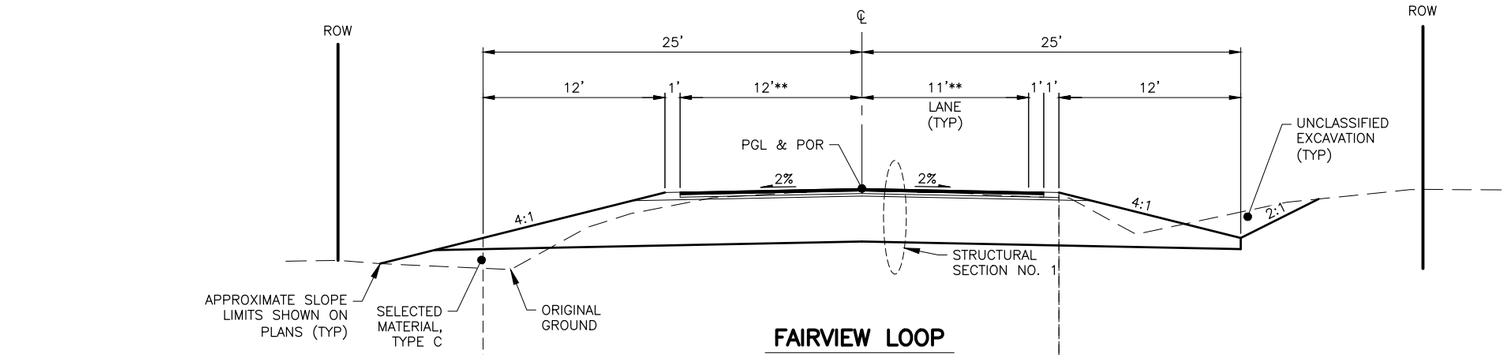

FAIRVIEW LOOP

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"FVL2" STA 700+00.00 TO "FVL2" STA 722+00.00
** SEE F SHEETS FOR TURNING LANE WIDTHS AND PAVING EXTENTS

BACKSLOPE EXCEPTION

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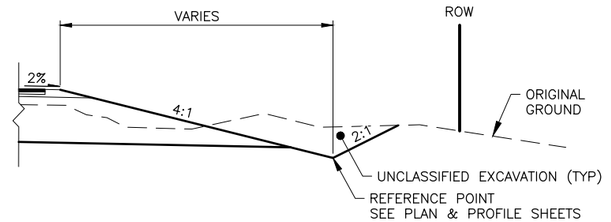

SPECIAL DITCH

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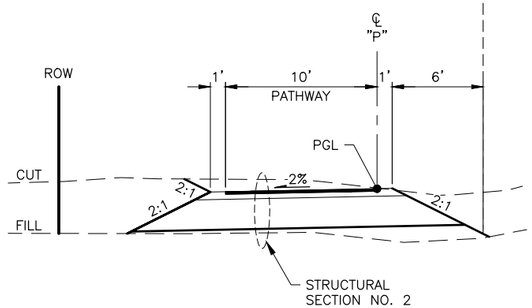

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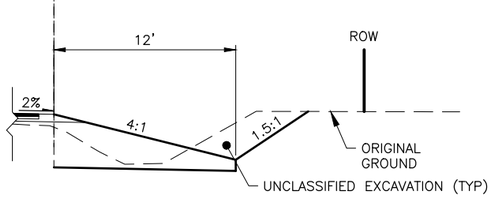

BACKSLOPE EXCEPTION

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STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION
AND PUBLIC FACILITIES

FAIRVIEW LOOP PATHWAY AND SAFETY IMPROVEMENTS

PATHWAY TYPICAL SECTION

STATE OF ALASKA
49TH
DRAFT
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REGISTERED PROFESSIONAL ENGINEER

R&M CONSULTANTS, INC.
9101 VANGUARD DRIVE
ANCHORAGE, AK 99507
(907) 522-1707
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NO.	DATE	REVISION

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	PENDING	2025	B5	B5

DRAFT

DESIGNED BY
CHECKED BY
DRAFTED BY

SCALE

DATE 4/17/2025 TIME 10:15 AM

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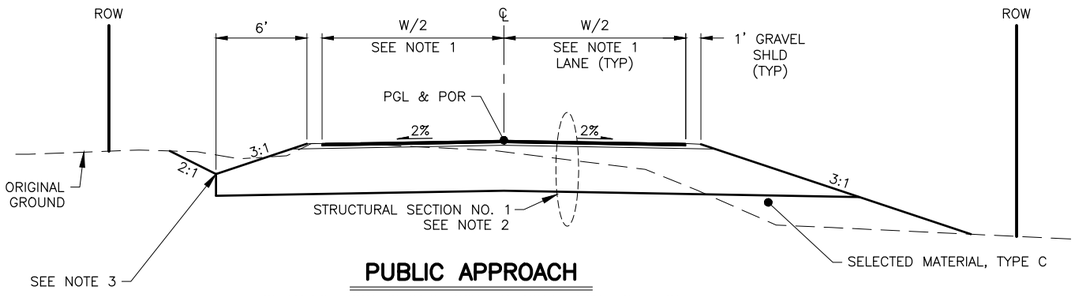

PUBLIC APPROACH

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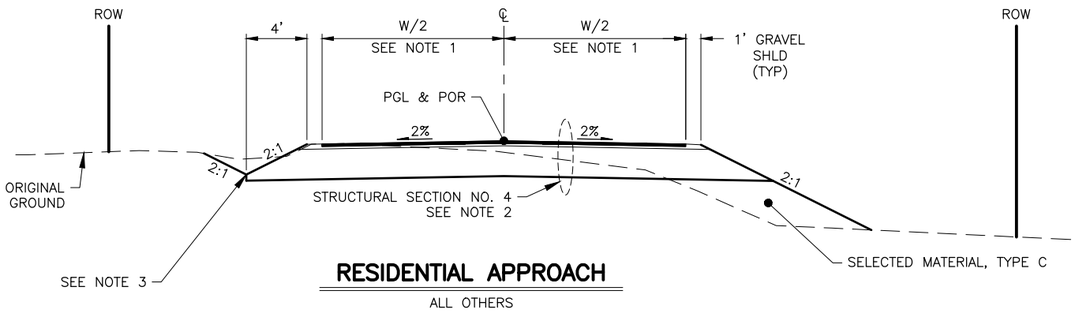
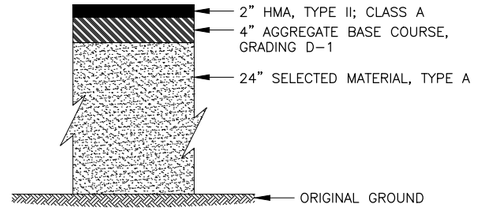
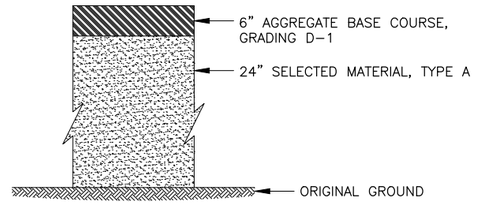


RESIDENTIAL APPROACH

ALL OTHERS



STRUCTURAL SECTION NO. 4



STRUCTURAL SECTION NO. 3

SHEET B5 NOTES:

1. SEE APPROACH SUMMARY TABLE FOR WIDTH (W)
2. CONSTRUCT APPROACHES USING STRUCTURAL SECTION NO. 3 BEYOND PAVING LIMITS SHOWN ON APPROACH DETAILS.
3. ADJUST DITCHES TO MATCH EXISTING CONDITIONS OR AS DIRECTED BY ENGINEER.

STATE OF ALASKA
49TH
DRAFT
APRIL 2025
REGISTERED PROFESSIONAL ENGINEER

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DEPARTMENT OF TRANSPORTATION
AND PUBLIC FACILITIES

FAIRVIEW LOOP PATHWAY AND SAFETY IMPROVEMENTS

APPROACH TYPICAL SECTION

APPENDIX C

Traffic Analysis

KINNEY ENGINEERING, LLC

MEMORANDUM

TO: Lance Debernardi, PE
R&M Consultants

FROM: Ron Martindale, Traffic Analyst
Jeanne Bowie, PE, PhD, PTOE
Randy Kinney, PE, PTOE

DATE: July 10, 2023

SUBJECT: Fairview Loop Road Pathway and Safety Improvements
Federal Project No. NFHWY00748
Updated Crash Analysis 2013-2021

Introduction

Kinney Engineering, LLC (KE) has been retained by R&M Consultants to provide a crash analysis update for the Fairview Loop Road Pathway and Safety improvements project. KE performed the original 3R analysis for Fairview Loop Road (Fireweed Road to Knik/Goose Bay Road) in 2010 using 1998-2007 crash and traffic volume data. This analysis uses updated crash and traffic volume information (2013-2021) for the limits evaluated in the 2010 3R analysis to review previous recommendations and determine if additional improvement should be considered based on this updated information. It should be noted that recommendations in the 2010 3R report have evolved based on budget constraints and scope changes that have occurred since the original 3R report was prepared. Some of the findings and recommendations contained in this updated review are subject to these previous scope and budget decisions.

Summary

Key findings comparing the 2010 3R report to the updated crash analysis include:

- Traffic volumes have increased on both the Fairview Loop segments and major side streets. Some of the major side streets have experienced significant AADT increases, which may be due to the addition of more connecting roadways and increased residential development in these areas.
- Overall study area crashes have increased from about 17.6 crashes/year to 22.9 crashes/year as traffic volumes have increased.
- Segment crashes (defined as not located within an intersection functional area and/or not intersection related) have decreased from an average of 13 crashes/year to 12.1 crashes/year. This is likely due to a shift from single vehicle run-off-the-road crashes to multi-vehicle intersection related crashes as the side street development increases.
- Intersection crashes (defined as occurring within the intersection functional area, excluding single vehicle run-off-the-road and animal related crashes) have increased from 4.6 crashes/year to 10.8 crashes/year. This may be due to the increase in volumes and the resulting crash experience at these intersections.
- Single vehicle crashes are down from 74% of total crashes to 48% of total crashes. This is due, in part, to more activity associated with the side street intersections.
- Multi-vehicle crashes have increased from 26% to 52%, reflecting the increase in intersection related crashes as the area develops.
- Crash severity has remained largely unchanged between the two time periods
- Crashes by season, crash time, roadway surface conditions and ambient light conditions are similar for both time periods.

- Proposed shoulder width improvements include some but not all the run-off-the-road crash locations revealed in the more recent crash data.
- Additional horizontal curve crash cluster locations were identified in the most recent analysis which are not included for improvement with the current project.
- Most but not all the crest vertical curve (CVC) locations identified in the 2010 3R report are being addressed with the current project.
- Additional intersections not discussed in the original 2010 3R report display crash clusters where crash mitigation could be considered.
- Additional crash cluster intersections were identified in the updated analysis where geometric improvements might be considered.

These items are discussed in further detail below.

Figure 1 shows the original 2010 3R analysis study area which we used for this updated analysis.

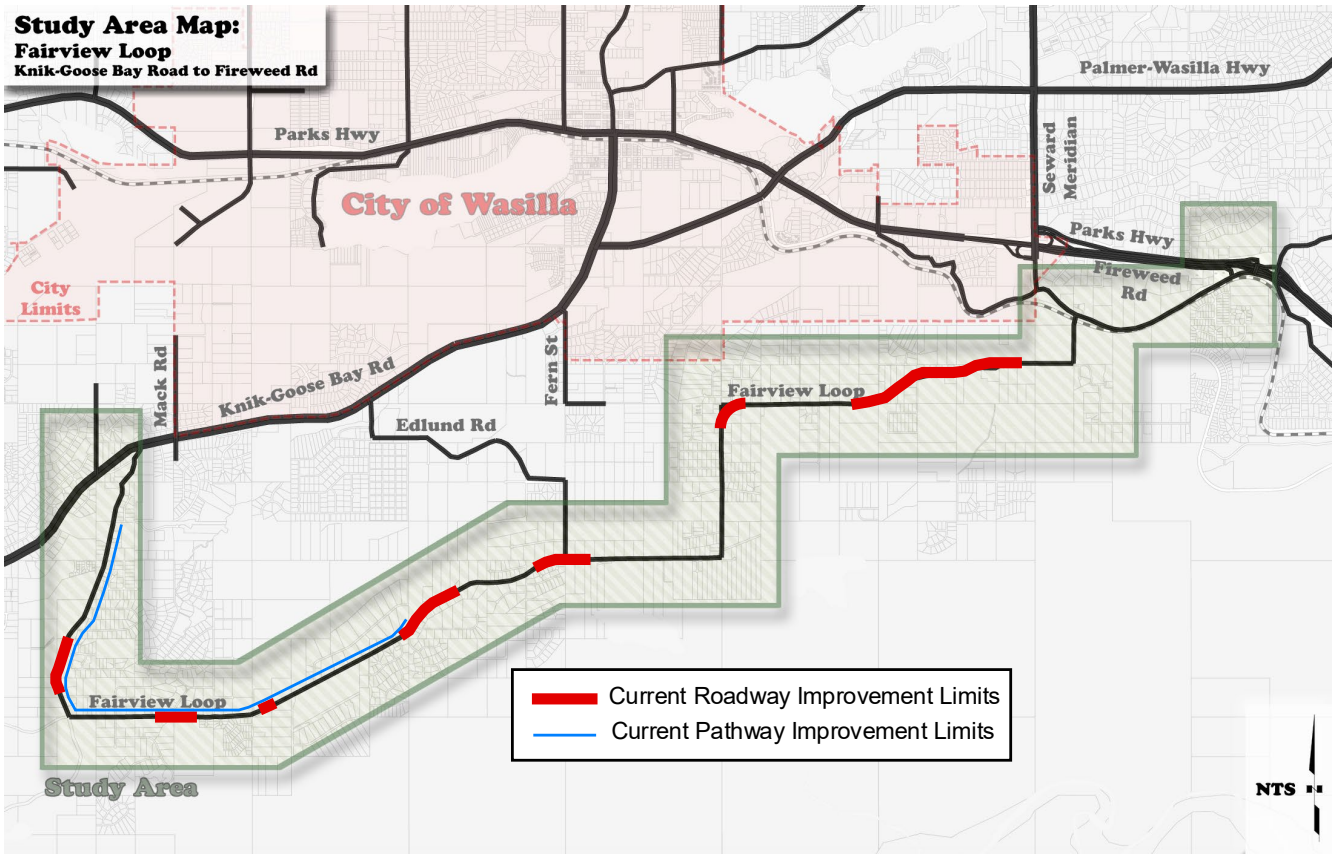


Figure 1. Study Area

The following report updates the crash analysis with 2013-2021 crash data and reviews key 3R analysis topics based on that analysis including:

- Lane and Shoulder Widths
- Horizontal Curves
- Vertical Curves
- Intersection Safety

The results of this analysis and comparisons to the 2010 3R crash analysis are discussed below.

Traffic Volumes

We reviewed average annual traffic volumes (AADT's) used in the 2010 3R report and compared them to current traffic volumes for major segments and side streets along the study area. Table 1 below summarizes averages for the 1998-2007 vs. 2013-2021 analysis time periods.

Table 1. Average Annual Daily Traffic (AADT) Comparison: 1998-2007 vs. 2013-2021 Time Periods

Fairview Loop Segment	1998-2007 Average AADT	2013-2021 Average AADT	% Increase (1998-2007 vs 2013-2021)
E. Fireweed Avenue to Davis Road	2289	2893	126%
Davis Road to S. Fern Street (formerly Edlund Rd.)	1437	2171	151%
S. Fern Street (formerly Edlund Rd.) to Coleman Drive	899	1870	208%
Coleman Drive to Hayfield Road	1113	1502	135%
Hayfield Road to Knik/Goose Bay Road	2821	2751	98%

Side Street	1998-2007 Average AADT	2013-2021 Average AADT	% Increase (1998-2007 vs 2013-2021)
Davis Road	406	541	133%
Old Matanuska Road	727	2071	285%
Hayfield Road	214	509	238%
S. Fern Street (formally Edlund Rd.)	1199	1448	121%
Knik/Goose Bay Road	8705	15695	180%

The following Figure 2 and Figure 3 provide a graphic comparison of AADT increases from the 2010 3R report to the most recent available volume data for Fairview Loop Road and major side streets.

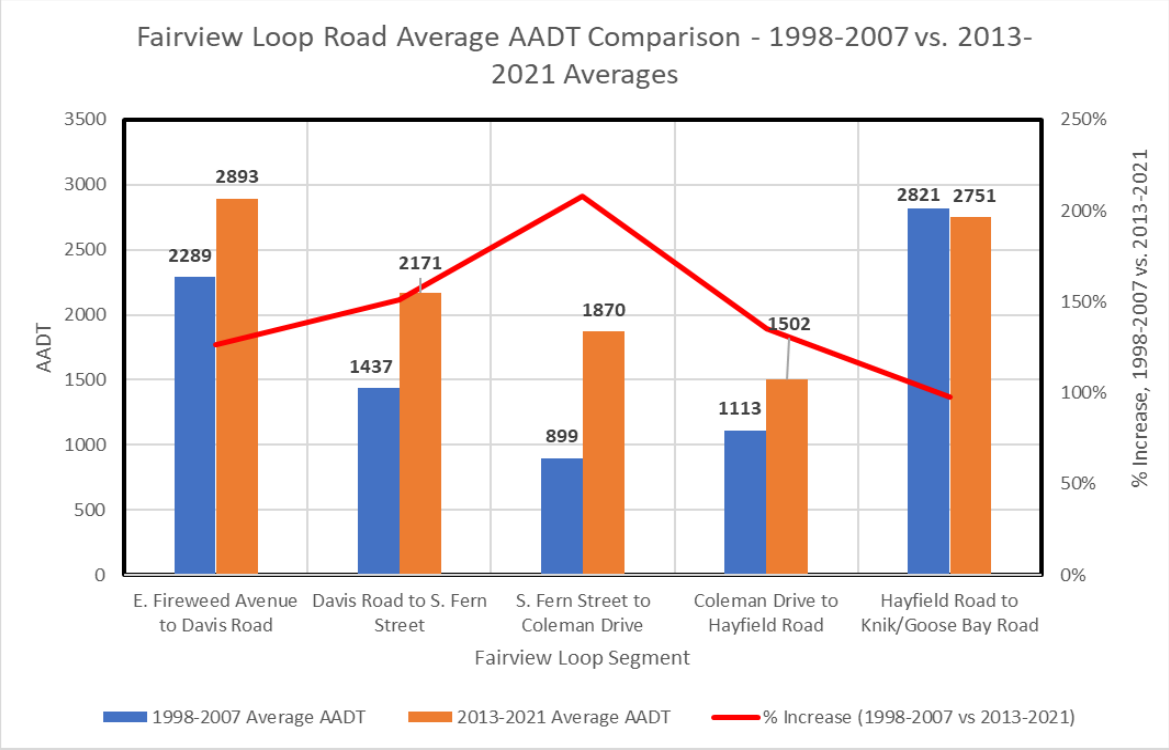


Figure 2. Average AADT Comparison – 1998-2007 vs. 2013-2021 for Fairview Loop

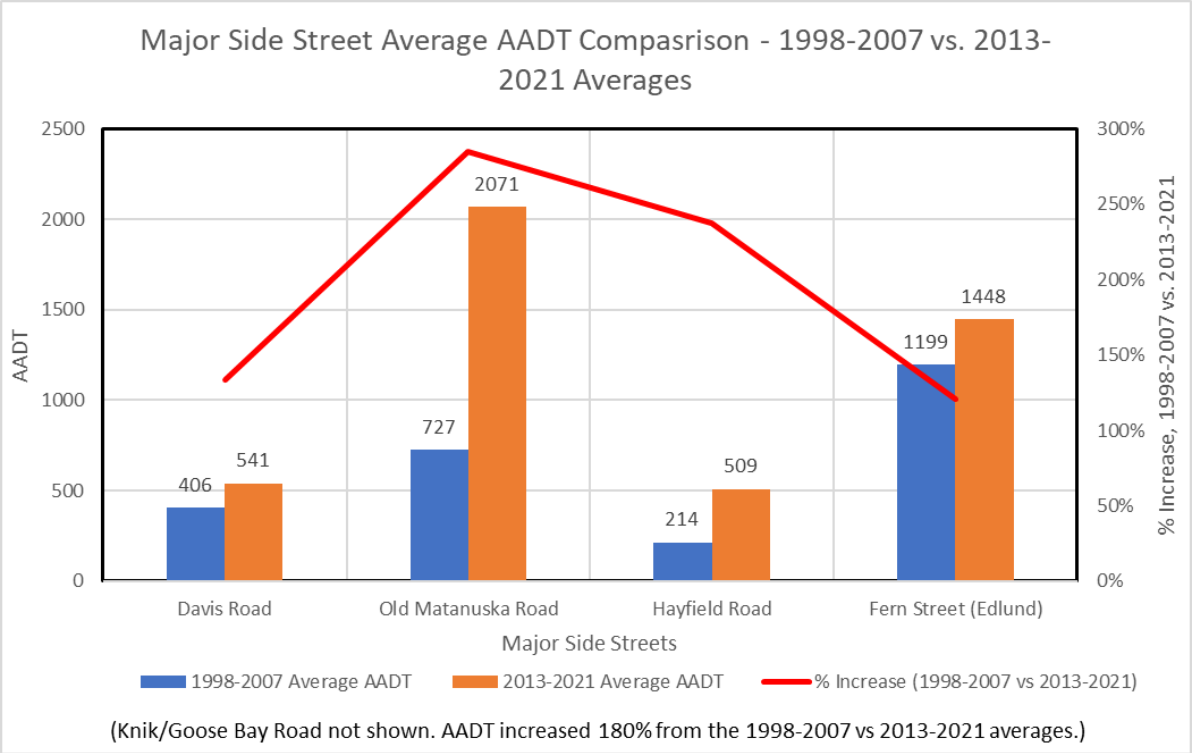


Figure 3. Average AADT Comparison – 1998-2007 vs. 2013-2021 for Major Side Streets

As shown in the preceding table and figures, traffic volumes have increased by 125-210% on most segments of Fairview Loop Road and by 120-285% at major side streets from the 1998-2007 time period used in the 2010 3R analysis and currently available traffic volume information.

Intersection and Segment crashes

The original 3R report identified crash clusters at the following locations:

- Old Matanuska area
- Davis Intersection
- South Cotten Area
- Togiak Curve
- Patty Drive area
- West of S. Fern Street (formerly Edlund Rd.)
- Well Site Road area
- Between Well Site and Coleman
- Hayfield Road
- Lord Baranof to Top of the World

Intersection crashes were evaluated but no specific recommendations were made for intersection improvements in the 2010 3R study.

2013-2021 Crash Cluster locations (intersections)

- Old Matanuska Road
- Davis Road
- S Cotten Drive
- S. Fern Street (formerly Edlund Rd.)
- Hayfield Road

2013-2021 Crash Cluster Locations (segments)

- Old Matanuska Road
- Togiak Curve
- Patty Drive Curve
- S. Fern Street (formerly Edlund Rd.) to S. Twin Peaks

Table 2 shows a comparison of crash types from the original 2010 3R report and the updated 2013-2021 crash analysis.

Table 2. Crash Type Comparison

Crash Type	2013-2021 Total Crashes	2013-2021 Average Crashes/Year	% of all 2013-2021 Crashes	1998-2007 Total Crashes	1998-2007 Average Crashes/Year	% of all 1998-2007 Crashes
Angle - Left Turning	18	2.0	8.74%	10	1.0	5.68%
Angle - T-Bone	21	2.3	10.19%	9	0.9	5.11%
Animal-Vehicle	30	3.3	14.56%	24	2.4	13.64%
Bicycle	2	0.2	0.97%	1	0.1	0.57%
Cargo Loss/Shift	1	0.1	0.49%	0	0.0	0.00%
Head-On	16	1.8	7.77%	8	0.8	4.55%
Head-On (hit and run veh #1)	1	0.1	0.49%	0	0.0	0.00%
Jackknife	1	0.1	0.49%	0	0.0	0.00%
Motorcycle	5	0.6	2.43%	0	0.0	0.00%
Pedestrian	0	0.0	0.00%	2	0.2	1.14%
Rear End	37	4.1	17.96%	10	1.0	5.68%
Sideswipe	10	1.1	4.85%	5	0.5	2.84%
Single Vehicle Run-Off-Road	61	6.8	29.61%	103	10.3	58.52%
Unknown	3	0.3	1.46%	4	0.4	2.27%
Grand Total	206	22.9	100.00%	176	17.6	100.00%

The major crash type, single vehicle run-off-the-road crashes, have decreased significantly during the two study periods while rear end, head-on and sideswipe crashes have all increased. This is reflected in the decrease in single vehicle and increase in multi-vehicle crashes discussed later in the report. The other large crash type, animal-vehicle, remained similar by percentage of total crashes.

Figure 4 compares crash types per year and Figure 5 compares percentage of intersection vs. segment crashes for the 1998-2007 vs. 2013-2021 time periods

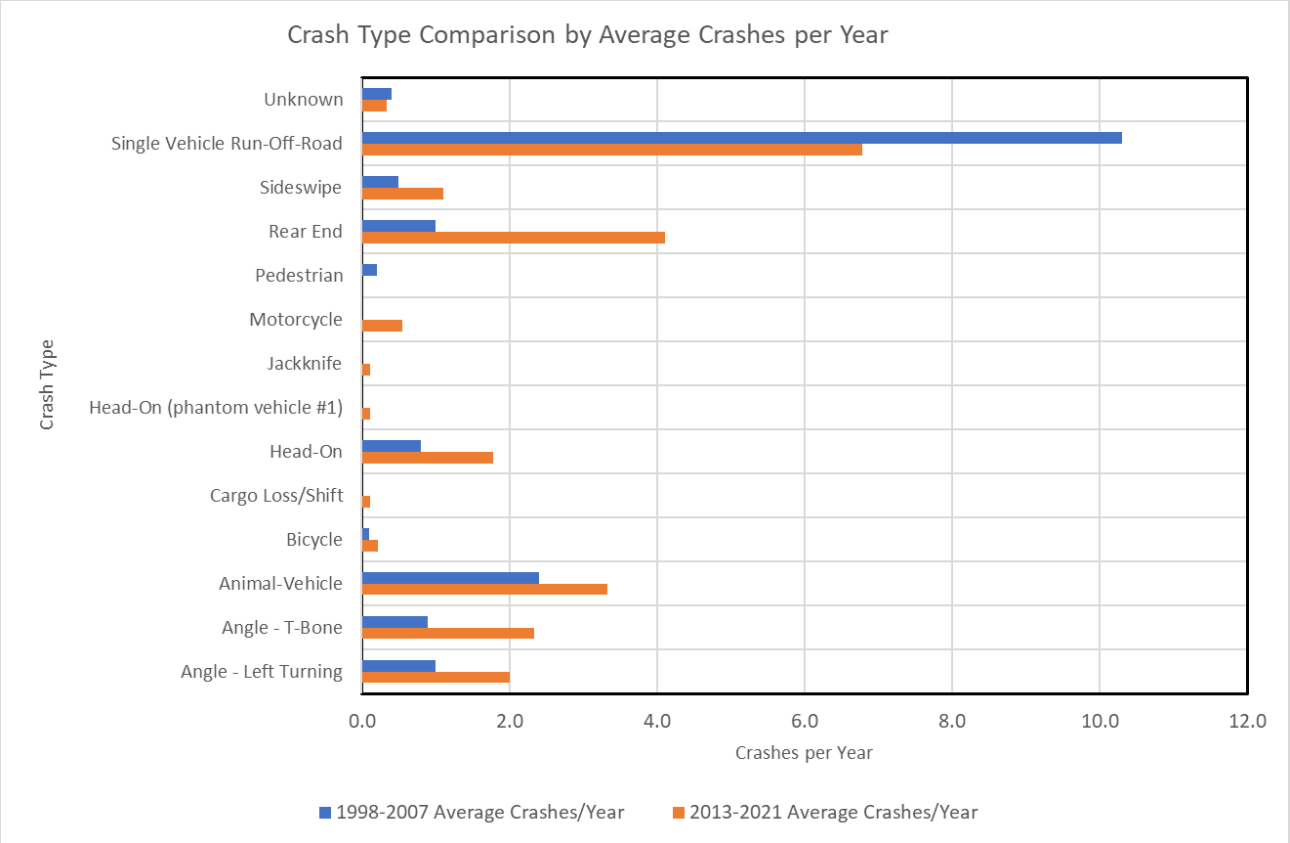


Figure 4. Crash Type Comparison by Average Crashes per Year for 1998-2007 vs. 2013-2021 Time Periods

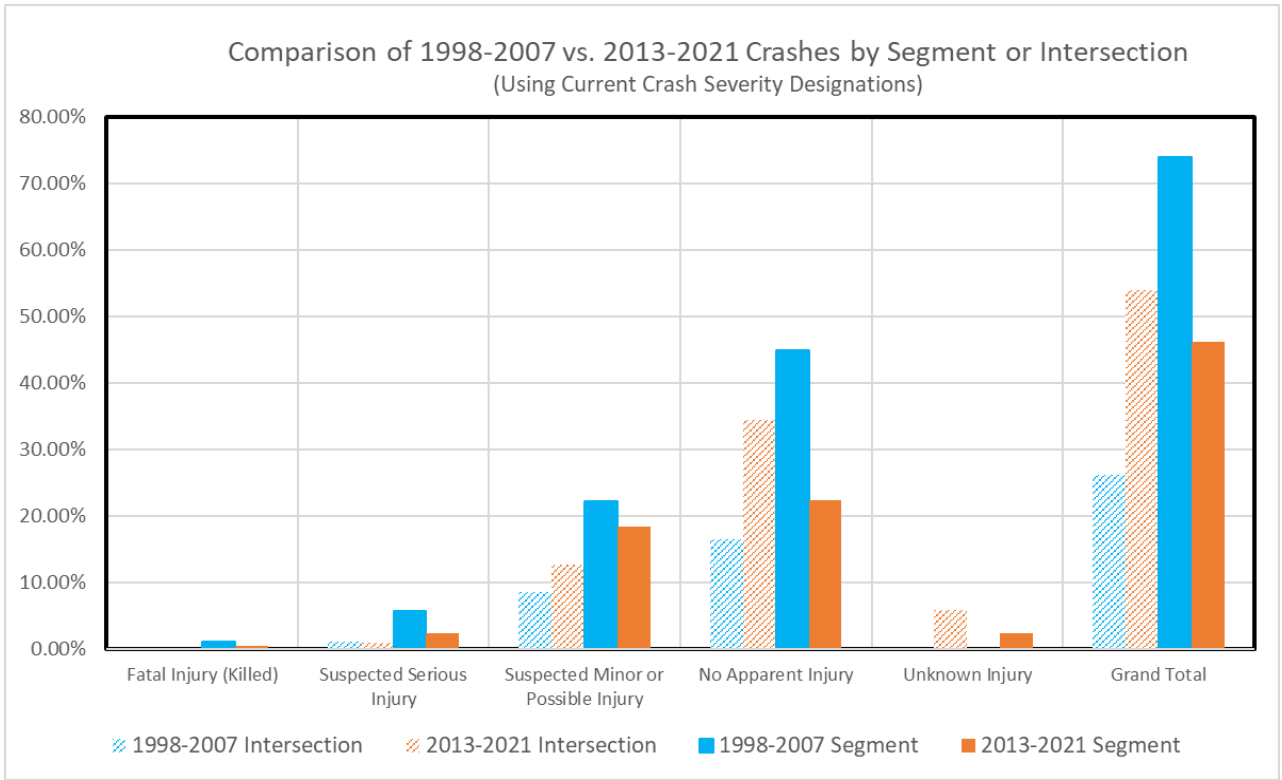


Figure 5. Crash Type Comparison by Intersection vs. Segment for 1998-2007 vs. 2013-2021 Time Periods

Table 3 shows a comparison of crash severity from the original 2010 3R report and the updated 2013-2021 crash analysis.

Table 3. Crash Severity Comparison

Crash Severity	2013-2021 Total Crashes	% of all 2013-2021 Crashes	1998-2007 Total Crashes	% of all 1998-2007 Crashes
Fatal Injury (Killed)	1	0.49%	2	1.14%
No Apparent Injury	117	56.80%	108	61.36%
Suspected Minor or Possible Injury	64	31.10%	54	30.68%
Suspected Serious Injury	7	3.40%	12	6.82%
Unknown Injury	17	8.25%	0	0.00%
Grand Total	206	100.00%	176	100.00%

Study area crashes (Fireweed Road to Knik/Goose Bay Road) have increased from about 17.6 crashes/year for the 1998-2007 period to 22.9/year in the 2013-2021 period. Segment crashes decreased from an average of 13 crashes/year for the 1998-2007 period to 12.1 crashes/year in the 2013-2021 period. At the same time, intersection crashes increased from an average of 4.6 crashes/year for the 1998-2007 period to 10.8 crashes/year in the 2013-2021 period.

Figure 6 compares crashes by single vs. multiple vehicles for the 1998-2007 and 2031-2021 time periods.

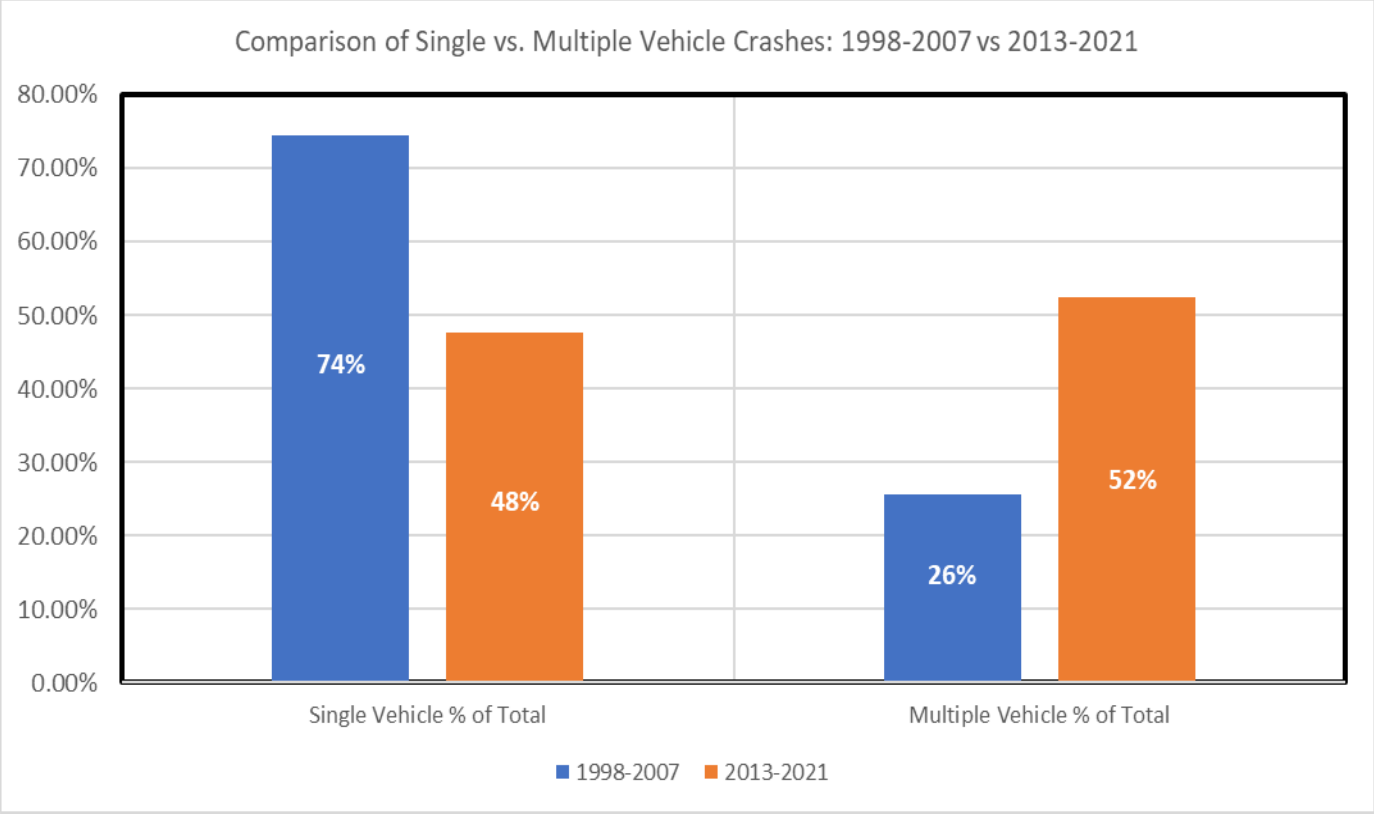


Figure 6. Comparison of Single vs. Multiple Vehicle Crashes for the 1998-2007 and 2013-2021 Time Periods

These data set comparisons also show that single vehicle crashes are down from 74% to 48% of total crashes for the two time periods. However, multi-vehicle crashes increased from 26% to 52% of total crashes during that same period.

Although the total number of study area crashes increased between the two time periods under review, the severity distributions are similar. In fact, there is no statistical difference in the 2013-2021 and 1998-2017 severity proportion distribution at a 5% level of significance (ANOVA and Chi-Square test). As such, we can conclude crashes increased but severity levels did not change.

The following tables compare segment and intersection crash location comparisons between the 1998-2007 and 2013-2021 crash data sets. (NOTE: Some segment crashes may be related to a minor intersection, but there was no more than one crash at these intersections, and they were not separately broken out for this analysis.) Table 4 shows crash location comparisons for segments along Fairview Loop Road.

Table 4. Crash Location Comparison - Segments

Roadway Segments	2013-2021 Total Crashes**	% of all 2013-2021 Crashes	1998-2007 Total Crashes*	% of all 1998-2007 Crashes
Fireweed Road to Abby Road	2**	0.97%	0	0.00%
Abby Road to Old Matanuska Road	2	0.97%	11*	6.25%
Old Matanuska Road to Linlu Lane	2	0.97%	3*	1.70%
Linlu Lane to Davis Road	2	0.97%	4*	2.27%
Davis Road to S Cotten Drive	7	3.40%	15*	8.52%
S Cotten Drive to Togiak Curve	13**	4.37%	12*	6.82%
Togiak Curve	13**	6.31%	12*	6.82%
Togiak Curve to Patty Drive-Rod Circle Curve	9	4.37%	10*	5.68%
Patty Drive-Rod Circle Curve	6**	2.91%	4*	2.27%
Patty Drive-Rod Circle Curve to S. Fern Street	4	1.94%	10*	5.68%
S. Fern Street (Edlund) to Well Site-Jack Fish	5**	2.43%	3*	1.70%
Well Site Road-Jack Fish to Hayfield Road	26	12.62%	25*	14.20%
Hayfield Road to Knik/Goose Bay Road	18	8.74%	21*	11.93%
TOTALS	109		130	

* Segment crash rates for these locations were above statewide averages using 1998-2007 crash data.
** Segment crash rates for these locations were above statewide averages using the 2013-2021 crash data.

Segment crashes have fallen since the 2010 3R report with one hundred thirty (130) occurring in the 1998-2007 (10 year) period and one hundred-nine (109) occurring in the 2013-2121 (9 year) period.

Table 5 shows crash location comparisons for intersections along Fairview Loop Road. (Note: Crashes not intersection related including single vehicle run-off-the-road and animal related crashes have been removed and placed with segment crashes.)

Table 5. Crash Location Comparison - Intersections

Intersection Crash Clusters	2013-2021 Total Crashes	% of all 2013-2021 Crashes	1998-2007 Total Crashes	% of all 1998-2007 Crashes
E Fireweed Road at Fairview Loop Road	2	0.97%	0	0.00%
Fairview Loop at Abby Boulevard	3	1.46%	1	0.57%
Fairview Loop at Old Matanuska Road	28**	13.59%	6	3.41%
Fairview Loop at Linlu Lane	4	1.94%	3	1.70%
Fairview Loop at Davis Road	3	1.46%	12*	6.82%
Fairview Loop at S Cotten Drive	1	0.49%	1	0.57%
Fairview Loop at S. Fern Street (formerly Edlund Rd.)	5**	2.43%	5*	2.84%
Fairview Loop at Well Site-Jack Fish Road	3**	1.46%	8	4.55%
Fairview Loop at Hayfield Road	5**	2.43%	3	1.70%
Fairview Loop at Knik/Goose Bay Road	43	20.87%	7	3.98%
TOTALS	97		46	

* Intersection crash rates for these locations were above statewide averages using 1998-2007 crash data.
** Intersection crash rates for these locations were above statewide averages using the 2013-2021 crash data.

Intersection crashes have increased significantly since the 2010 3R report with forty-six (46) occurring in the 1998-2007 (10 year) period and ninety-seven (97) occurring in the 2013-2121 (9 year) period. We have identified particularly large crash increases for the Old Matanuska Road and Knik/Goose Bay Road intersections while there was a significant drop in crashes at the Davis Road intersection.

Crashes by Season and Time Period

Table 6 through Table 9 shows a comparison of crashes by season, time of day, roadway surface condition and ambient light for the Fairview Loop study area.

Table 6. Crash Comparison by Season

Season	2013-2021 Total Crashes	% of all 2013-2021 Crashes	1998-2007 Total Crashes	% of all 1998-2007 Crashes
FALL: September - October	37	17.96%	36	20.45%
SPRING: April - May	20	9.71%	12	6.82%
SUMMER: June - August	40	19.42%	41	23.30%
WINTER: November - March	109	52.91%	87	49.43%

Table 7. Crash Comparison by Time Period

Time Period	2013-2021 Total Crashes	% of all 2013-2021 Crashes	1998-2007 Total Crashes	% of all 1998-2007 Crashes
AM PEAK: 6 AM - 9 AM	26	12.62%	20	11.36%
MIDDAY: 9 AM - 4 PM	60	29.13%	56	31.82%
PM PEAK: 4 PM - 7 PM	58	28.16%	40	22.73%
EVENING: 7 PM- 10 PM	25	12.14%	20	11.36%
NIGHT: 10 PM- 6 AM	37	17.96%	38	21.59%

Table 8. Crash Comparison by Roadway Surface Condition

Roadway Surface Conditions	2013-2021 Total Crashes	% of all 2013-2021 Crashes	1998-2007 Total Crashes	% of all 1998-2007 Crashes
Dry	99	48.06%	80	45.45%
Ice/Frost/Snow	80	38.83%	69	39.20%
Other	3	1.46%	4	2.27%
Unknown	6	2.91%	4	2.27%
Wet	18	8.74%	19	10.80%
Grand Total	**206**	100.00%	176	100.00%

Table 9. Crash Comparison by Ambient Light Conditions

Ambient Light Conditions	2013-2021 Total Crashes	% of all 2013-2021 Crashes	1998-2007 Total Crashes	% of all 1998-2007 Crashes
Dark - Lighted	14	6.80%	12	6.82%
Dark - Not Lighted or Unknown	55	26.70%	52	29.55%
Dawn/Dusk	14	6.80%	9	5.11%
Daylight	115	55.83%	89	50.57%
Unknown	8	3.88%	14	7.95%
Grand Total	**206**	100.00%	176	100.00%

Through inspection of the above tables (without statistical evaluation), we find that distributions for crash season, crash time, roadway surface conditions and ambient light conditions are similar for both the 1998-2007 and 2013-2021 time periods.

Improvements Planned for Fairview Loop Road as Currently Designed

Intersection, Shoulder Widening, Vertical Curve and Realignment Improvements

Roadway improvements planned as part of the current project include:

- Vertical curve and shoulder widening: W. Marble Way to W. Birch Meadows Road
- Vertical curve and shoulder widening: W. Coyne Circle to W. Chestnut Lane
- Shoulder widening: S. Howdie Drive to 900' east of Redoubt Drive
- New culvert and shoulder widening: Cottonwood Slough
- Vertical curve and shoulder widening: S Twin Peaks Drive to 1100' east of Lookout Drive
- Intersection improvements: S. Fern Street (Edlund) EBLT and WBRT Lanes
- Realignment and shoulder widening: Sue Lane to S Valley Loop (E) – Togiak Curve
- Realignment and shoulder widening: West of S. Cotten Drive to east of Davis Road

Pathway Improvements

Pathway improvements consist of a new north side pathway on the east and north sides of Fairview Loop from Top of the World Circle to W. Lookout Drive with the potential to extend to S. Fern Street.

Lane and Shoulder Widths

The 2010 3R report divided Fairview Loop into five segments based on segment volume for lane and shoulder analysis. The analysis produced the following results by segment. Table 10 shows the result of the 2010 3R lane and shoulder width analysis.

Table 10. 2010 3R Lane and Shoulder Width Analysis Results

Segment Number	Segment	Existing Lane Width	Existing Shoulder Width	Cross Section with Widening (feet)	New Construction X-Sec per 60 MPH Design Speed (feet)	3R Recommended X-Sec Width (Feet)	New X-Sec Width for Project
5	Parks to Davis Rd	11	0	28	40	**28**	**30**
4	Davis Rd to Edlund Rd (Now S. Fern St.)	11	0	32	40	**32**	
3	Edlund Rd (Now S. Fern St.) to Colemen Dr	11	0	36	30	**30**	
2	Coleman Dr to Hayfield Rd	11	0	22	30	**22**	
1	Hayfield Rd to S. Kink-Goose Bay Rd	11	0	22	40	**22**	

The 2010 analysis selected a typical section consisting of 11-foot lanes and 4-foot shoulders. This was the product of the 3R lane and shoulder width analysis for the widest calculated roadway width of thirty feet applied to the entire route to maintain driver expectations.

The current project calls for shoulder widening (1 foot paved, 1 foot gravel) and/or horizontal and vertical curve improvements at the following locations shown in Table 11.

Table 11. Locations where Shoulder Widening is Currently Planned

Segment	Shoulder Widening?	Horizontal Curve Realignment?	Vertical Curve Realignment?	Comments
200 feet west of Marble Way to Birch Meadows Road (1100')	Yes	No	Yes	
W. Coyne Circle to W. Chestnut Lane (1750')	Yes	Yes	Yes	
S. Howdie Drive to 900' east of Redoubt Drive (1700')	Yes	No	No	Cottonwood Creek structure replacement
Cottonwood Slough (350')	Yes	No	No	Cottonwood Slough structure upgrades
S. Twin Peaks Drive to 1100' east of Lookout Drive (1310')	Yes	No	Yes	
S. Mountain Circle to 900' east of Fern Street (2200', Fern Street turn lanes)	Yes	Yes	Yes	Includes Fern Street intersection channelization
Sue Lane to S. Valley Loop (1400', Togiak Curve realignment)	Yes	Yes	Yes	New horizontal curve will not match the 50 MPH design speed (V=45MPH).
800' west of S. Cotten Drove to 800' west of S. Davis Road (5900', realignment	Yes	Yes	Yes	New horizontal curves will meet the standards for new construction, V=50MPH.

KE reevaluated the run-off-the-road crash experience using the 2013-2021 crash data and compared to the areas currently proposed for shoulder widening. Table 12 shows all run-off-the-road crashes by roadway segment and intersection and indicated which locations are receiving shoulder widening based on current plans.

Table 12. 2013-2021 Run-off-the-road Crash Locations and Included in Proposed Shoulder Improvement Areas

Segment or Intersection	Run-off-the-road Crashes	Shoulder Improvements?
Fairview Loop at Abby Boulevard	1	No
Abby Boulevard to Old Matanuska Road	2	No
Fairview Loop at Old Matanuska Road	5	No
Fairview Loop at Davis Road	2	Yes
Davis Road to S Cotten Drive	7	Yes
Fairview Loop at S Cotten Drive	3	Yes
S Cotten Drive to Togiak Curve	4	No
Togiak Curve	7	Yes
Togiak Curve to Patty Drive-Rod Circle Curve	2	No
Patty Drive-Rod Circle Curve	2	No
Patty Drive-Rod Circle Curve to Fern Street	1	Partial
Fairview Loop at S. Fern Street (formerly Edlund Rd.)	2	Yes
S. Fern Street (formerly Edlund Rd.) to Well Site-Jack Fish	2	Partial
Well Site Road-Jack Fish to Hayfield Road	10	Partial
Fairview Loop at Hayfield Road	2	No
Hayfield Road to Knik/Goose Bay (KGB) Road	7	Partial
Fairview Loop at Well Site-Jack Fish Road	2	No
Grand Total	61	

The 2013-2021 run-off-the-road crash experience is not fully addressed in the current plan. The current plans call for 11-foot lanes and 2-foot shoulders (1-foot paved, 1-foot gravel) on approximately 1.8 miles of the 10.73-mile route as shown in Table 11. The current shoulder improvements as they relate to run-off-the-road crashes are summarized as follows:

- 2013-2021 Run-off-the-road crashes in areas planned for widening: 26
- 2013-2021 Run-off-the-road crashes not included in shoulder widening: 35

As shown in Table 10 on page 11, the 2010 3R analysis for lane and shoulder widths indicated that a 30-foot typical section consisting of 11-foot lanes and 4-foot shoulders was appropriate for Fairview Loop Road. The updated analysis supports this earlier conclusion as shoulder widening could help to address run-of the run-off-the-road crashes occurring in areas not currently planned for widening.

Horizontal Curve Analysis

The 2010 3R report identified horizontal curves where the actual crash experience is greater than the predicted crash experience. Table 13 shows the horizontal curves identified as candidates for curve flattening based on the following 85th percentile speeds used for initial 3R evaluation: (as opposed to the 50 MPH design speed selected for the current project)

- 55 MPH (Davis Road to Fireweed Drive)
- 60 MPH (Knik/Goose Bay Road to Davis Road)

Table 13. Horizontal Curves Identified for Curve Flattening in 2010 3R Report

Location	Radius R (feet)	Radius Needed to Reduce Crashes to Predicted Levels based on 85th Percentile Speeds (55-60 MPH)*	Included in Current Project?	Comments
Lookout Drive Curve	975	1330	No	
Wellsite Road Curve	1050	1330	No	
Rod/Patty Curves	610	744	No	
Rod/Patty Curves	695	1121	No	
Togiak Curve	212	883	Yes (R=643', 45 MPH curve)	Horizontal and vertical improvements identified
Cotten Drive Curve #1	825	959	Yes (R=1800')	
Cotten Drive Curve #2	875	1330	Yes (R=1000, 50+MPH curve)'	
Davis Road Curve	270	711	Yes (R=4500')	

*NOTE: The 2010 3R analysis used 85th percentile speeds (55-60 MPH) to calculate the radius required to reduce crashes to predicted levels in accordance with 3R guidelines. The current design has adopted a 50 PMH design speed.

Additional horizontal curves identified in 2013-2021 crash analysis not included in current project are further described in Table 14, Table 15 and Table 16.

Table 14. Old Matanuska Road Curve and Intersection Crashes by Type and Severity

Fairview Loop at Old Matanuska Road	No Apparent Injury	Possible Injury	Suspected Minor Injury	Unknown Injury	Grand Total
Angle - Left Turning	5	2	1		8
Angle - T-Bone	5		1		6
Head-On	2	1			3
Rear End	1			1	2
Sideswipe	3			1	4
Single Vehicle Run-Off-Road	3		2		5
Grand Total	19	3	4	2	28

This location is included in both the segment and intersection analysis as there are both segment and intersection related crashes here. Although the 2010 3R analysis did not identify a crash cluster that warranted horizontal curve mitigation, more recent crash data reveals a larger cluster of both curve and intersection related crashes here. Some of these crashes could be mitigated by realignment of the curve, reducing the downgrade approach on Old Matanuska Road, adding shoulders, and improving the intersection channelization. Potential geometric improvements are shown in Figure 10 and a discussion of significant improvement constraints is included on page 17.

Table 15. Rod Circle/Patty Drive Curve Crashes by Type and Severity

Rod Circle-Patty Drive Curve	No Apparent Injury	Possible Injury	Suspected Minor Injury	Grand Total
Animal-Vehicle	1			1
Head-On		1		1
Motorcycle			1	1
Sideswipe		1		1
Single Vehicle Run-Off-Road	2			2
Grand Total	3	2	1	6

This curve was identified as having a greater number of actual vs. predicted crashes in the 2010 3R analysis. The current plans do not call for curve flattening or shoulder widening here. Some of these crashes could be mitigated by adding shoulders and curve realignment, although the 2010 3R analysis had not previously identified this curve for realignment.

Table 16. Fern Street (Edlund) to S. Twin Peaks Curves Crashes by Type and Severity

S. Fern Street (Edlund) to S. Twin Peaks	No Apparent Injury	Possible Injury	Suspected Minor Injury	Suspected Serious Injury	Fatal Injury	Grand Total
Head-On		1				1
Rear End	1					1
Animal-Vehicle	5		1	1		7
Single Vehicle Run-Off-Road	8	1	1	1	1	12
Grand Total	14	2	2	2	1	21

Two of the horizontal curves and one crest vertical curve were identified as having a greater number of actual vs. predicted crashes in the 2010 3R analysis. Flattening of the vertical curve at W. Lookout Drive and partial roadway widening for shoulders is part of the current plans. No horizontal curve realignment is specified in this area.

Some of these crashes could be mitigated by adding shoulders in accordance with the 2010 3R report lane and shoulder width analysis. Additional roadside clearing could improve driver visibility of animals entering the roadway and help reduce animal-vehicle crashes.

Vertical Curve Analysis

The 2010 3R report identified vertical curves where the actual crash experience is greater than the predicted crash experience. Recommended based on 3R Report, Table 17 shows the crest vertical curves (CVC) that were identified as candidates for curve flattening.

Table 17. Crest Vertical Curves (CVC) Identified as Candidates for Sight Distance Improvements

Location	Existing Vertical Curve Length, Feet	Vertical Curve Length Needed for V=55/60 MPH, Feet*	Included in Current Project?	Comments
300' S of Top of the World	200	241	No	
600' S of Top of the World	150	421	No	
200' E of Lookout	300	1280	Yes	New CVC meets minimum 50 MPH design speed. (CVC length = 550'.)
1000' E of Inlet Vista	300	723	No	
Togiak Curve	300	1001	Yes	Horizontal and vertical improvements identified. New CVC meets minimum 50 MPH design speed. (CVC length = 780'.)
Old Matanuska Road	350	637	No	
1500' E of Old Matanuska	700	960	No	

*NOTE: The 2010 3R analysis used 85th percentile speeds (55-60 MPH) to calculate the crest vertical curve (CVC) required to reduce crashes to predicted levels in accordance with 3R guidelines. The current design has adopted a 50 PMH design speed.

There are additional vertical curves identified in 2013-2021 crash analysis which are not included in the current project but crashes at these locations do not appear to relate to vertical curvature. These locations are discussed below.

S. Fern Street (Edlund) to S. Twin Peaks
Well Site Road, W. Lookout Drive and S. Coleman Drive were all identified in the crest vertical curve (CVC) analysis in the 2010 3R report but only the W. Lookout drive CVC was determined have an actual crash rate higher than the predicted rate and CVC flattening is included in the current project. Crash types at the other vertical curves mentioned above do not appear to be specifically related to the CVC.

Hayfield Road
This location was not identified in the 2010 3R analysis and vertical curvature does not appear to contribute to these crashes. These crashes more likely relate to the intersection geometrics, covered later in the report.

Lord Baranof to Top of the World
Lord Baranof Road, near Marble Way, and south of Top of the World Circle were all identified in the crest vertical curve analysis in the 2010 3R report but only the Top of the World Circle CVC was determined have an actual crash rate higher than the predicted rate and no CVC improvements are currently planned here.

Intersections

The 2010 3R analysis identified forty-six intersection related crashes in the study area for the 1998-2007 period. The 2013-2021 crash analysis identified 111 crashes, a significant increase.

Twenty-three intersections along the Fairview Loop study area were evaluated as part of the 2010 3R report. Of those, three intersections had an above-average crash rate when compared to statewide averages in use at the time the 3R report was done. The three intersections identified were:

- West Lookout Drive
- Wellsite Road/Jack Fish Road
- Davis Road

Analysis of crash data from the 2013-2021 period revealed additional intersections containing crash clusters. They include:

- Old Matanuska Road (28 crashes)
- S. Fern Street (formerly Edlund Road) (5 crashes)
- Hayfield Road (5 crashes)

The S. Fern Street intersection is already included in the current plans. The following section discussed the two intersections identified in the 2013-2021 crash data analysis not included in the current plans.

Fairview Loop at Old Matanuska Road intersection

A crash summary for this location was previously shown on Table 14 on page 13. As stated earlier, this location is included in both the segment and intersection analysis as there are both segment and intersection related crashes here.

A review of individual crash narratives for crashes at this location (either officer or driver) refer to not being able to stop at stop/yield sign due to the downhill approach on Old Matanuska Road. Figure 7 and Figure 8 show the downgrade approach to Fairview Loop on Old Matanuska Road.

Figure 7. Looking East on Old Matanuska Road showing the downhill approach to Fairview Loop Road

Other narratives also site the lack of a visual queue as to the alignment of westbound Fairview Loop at Old Matanuska Road, making it difficult for drivers waiting at the stop sign on Old Matanuska Road determine if westbound Fairview Loop traffic is turning onto Old Matanuska Road or continuing west on Fairview Loop. Figure 8 shows the alignment issue.

Figure 8. Intersection geometry on westbound Fairview Loop appears to become Old Matanuska Road

Another issue affecting the intersection geometry is the nearby railroad/highway grade crossing which limits the ability to improve both approach grades and intersection alignment. Figure 9 shows the proximity of the railroad/highway grade crossing to the intersection.

Figure 9. Proximity of Old Matanuska Road Intersection to Railroad/Highway Grade Crossing

Some of these crashes could be mitigated by realignment of the curve, reducing the downgrade approach on Old Matanuska Road, adding shoulders, and improving the intersection channelization. Figure 10 shows possible geometric improvements which could help mitigate crashes at this intersection.

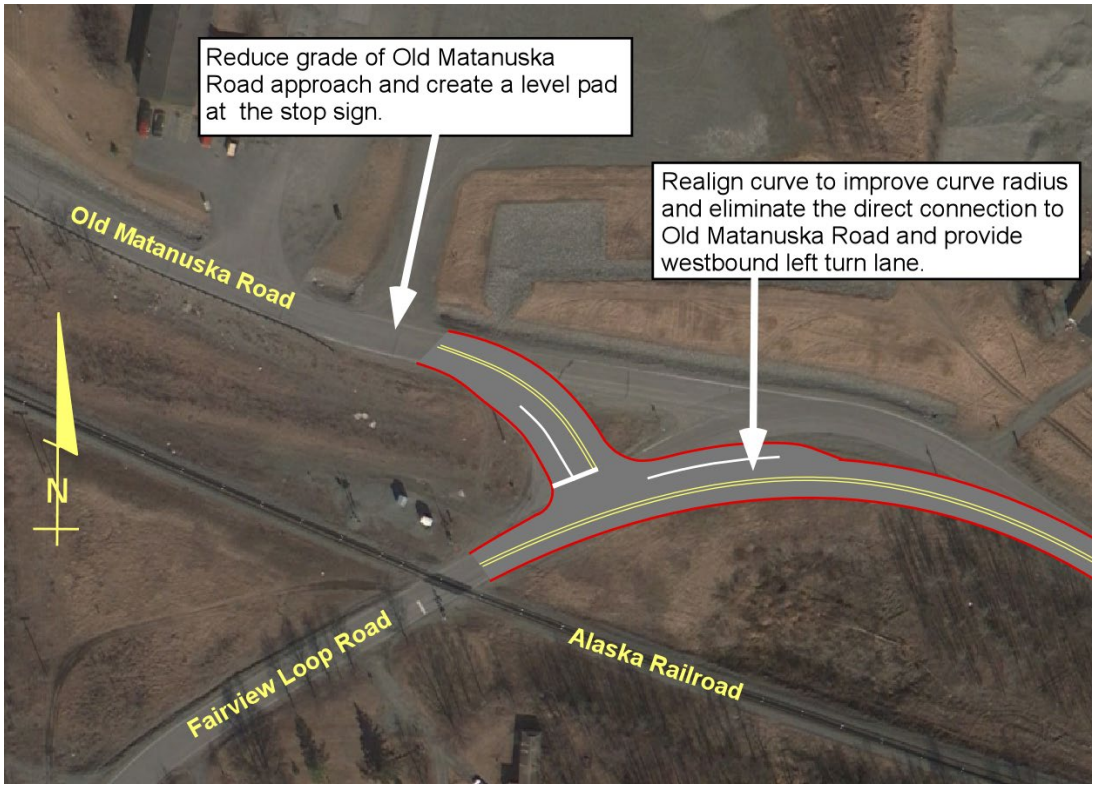


Figure 10. Potential Geometric Improvements at Old Matanuska Road

Although some of these changes could improve the crash situation here, it is important to note that there are several issues relating to potential realignment of this intersection and flattening of the horizontal curve which may require a separate project to address. They include:

- Right of Way restrictions
- The proximity of the Alaska Railroad mainline track just south of the intersection
- Required overhead and underground utility relocations
- Insufficient space to lower the approach grade on the Old Matanuska Road approach

Fairview Loop at Hayfield Road intersection

A summary of crashes occurring at this intersection is shown in Table 18.

Table 18. Fairview Loop at Hayfield 2013-2021 Crashes by Severity and Type

Fairview Loop at Hayfield Road	No Apparent Injury	Possible Injury	Unknown Injury	Grand Total
Angle - T-Bone	2			2
Single Vehicle Run-Off-Road	1		1	2
Unknown		1		1

Although this intersection appears to have a greater than average crash rate, there are only five crashes of low or no severity in a 9-year period, and they do not display a discernable crash pattern that warrants significant geometric improvements.

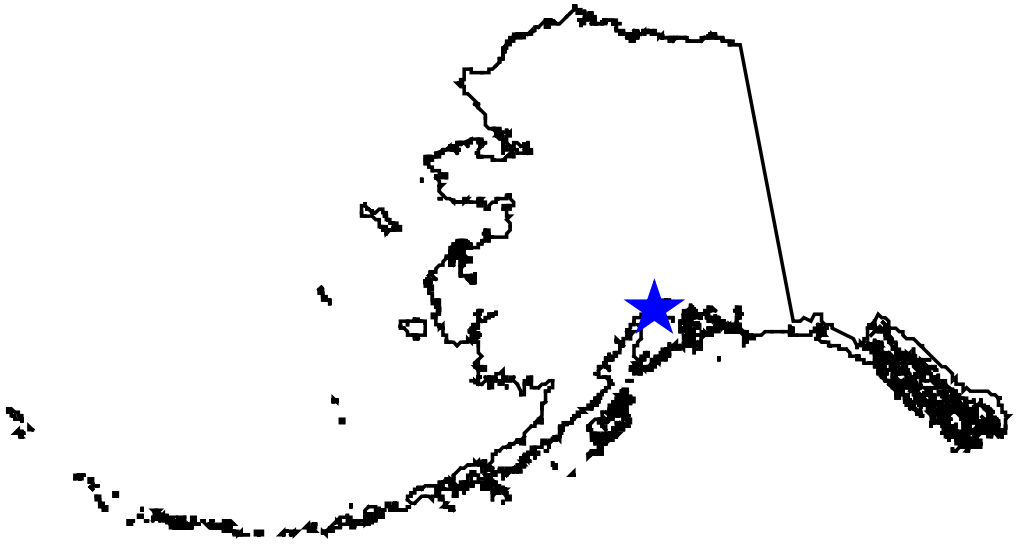
APPENDIX D

Material Recommendations

GEOTECHNICAL RECOMMENDATIONS

FAIRVIEW LOOP: PATHWAY & SAFETY IMPROVEMENTS
PROJECT NO. Z560200000

JULY 2021



Prepared By
ALASKA DEPARTMENT OF TRANSPORTATION & PUBLIC FACILITIES
Central Region Materials
Anchorage, Alaska

ALASKA
Department of Transportation
And Public Facilities

GEOTECHNICAL RECOMMENDATIONS

FAIRVIEW LOOP PATHWAY AND SAFETY IMPROVEMENTS

Project No. Z560200000

July 2021

Prepared By:

Ashley DeVore, P.E.
Geotechnical Engineer

Approved By:

for Mike Yerkes, P.E.
Regional Materials Group Chief

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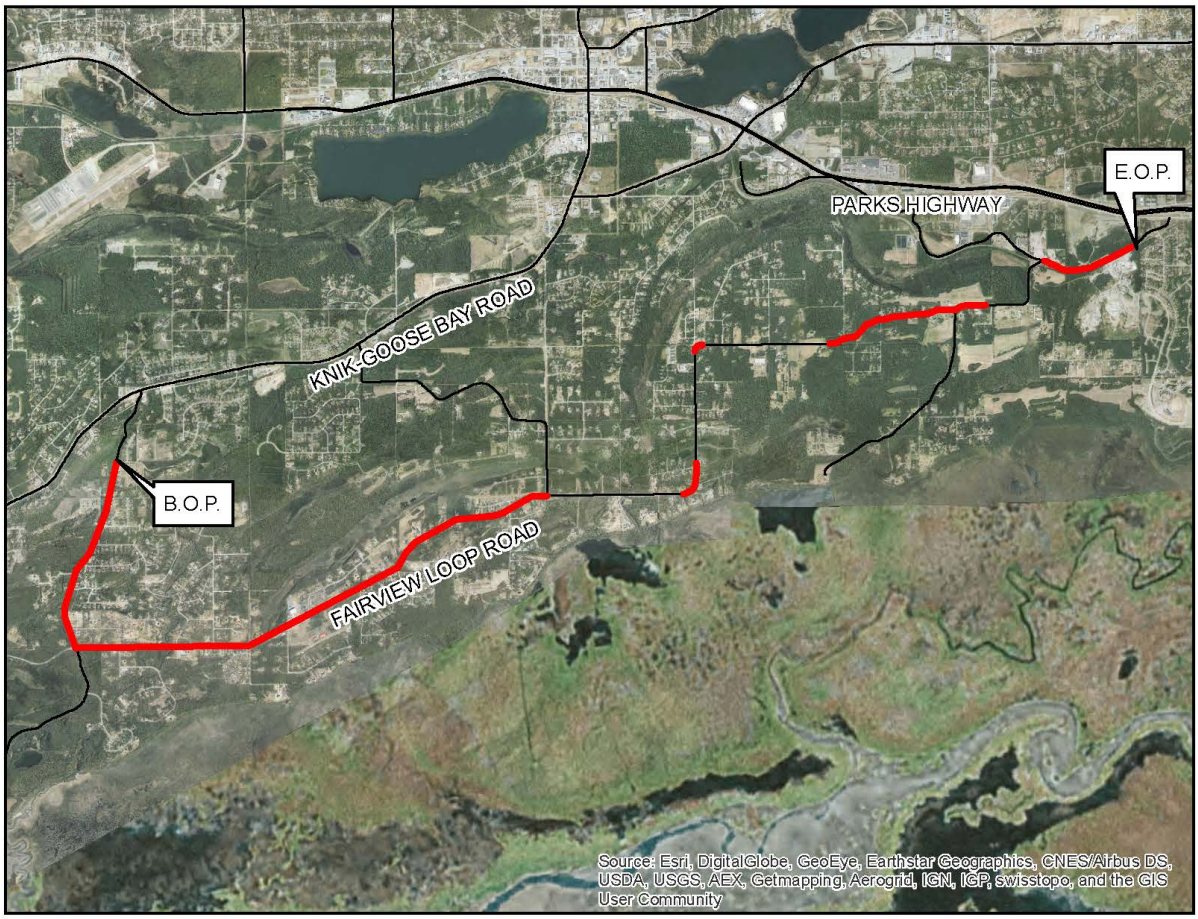


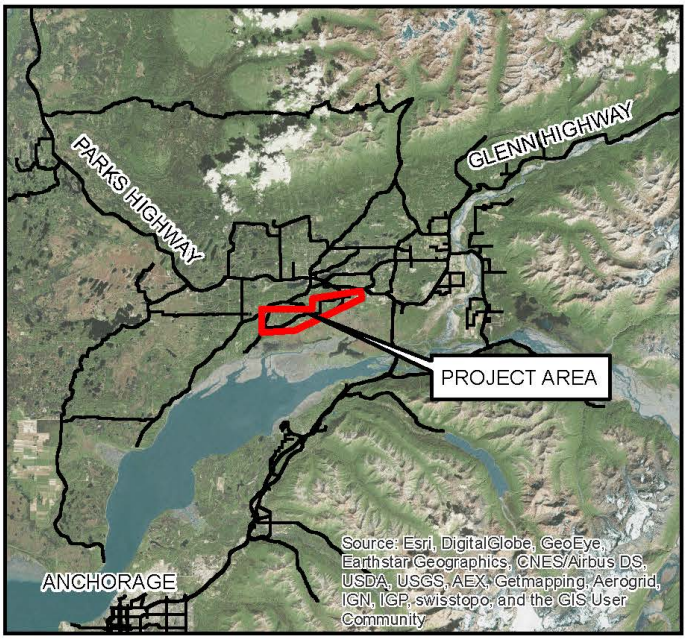


Figure 1
Vicinity Map
Fairview Loop Pathway and Safety Improvements
Project No. 56020

Map Created by
Central Region Materials
January 2016

N

0 0.25 0.5 1 1.5
Miles

1.0 INTRODUCTION

PURPOSE AND SCOPE OF WORK

This report presents the results of our geotechnical investigation performed for the Fairview Loop Pathway and Safety Improvements project. In general, the purpose of this investigation was to evaluate the subsurface conditions, the engineering properties of the subsurface soils, and to provide geotechnical recommendations for the project. Recommendations are based on subsurface data gathered during field exploration activities conducted by the DOT&PF Central Region Materials Section (CR Materials) in July-September 2011 and October 2015. See Appendix A for the Geotechnical Report.

PROJECT DESCRIPTION

This project will construct about 5 miles of separated pathway along Fairview Loop Road from Top of the World Circle to Edlund Road. Safety improvements include grade changes, and increasing the radii on three curves.

REFERENCES

The following information was provided to CR Materials in the course of this investigation and serves as the basis of our understanding of the project scope:

- Cross sections: Fairview Loop Pathway and Safety Improvements. Project No. 56020, prepared by R&M, September 2015.
- Plan and profile sheets; Fairview Loop Pathway and Safety Improvements. Project No. 56020, prepared by R&M, September, 2015.
- Typical section sheets; Fairview Loop Pathway and Safety Improvements. Project No. 56020, prepared by R&M, September, 2015.
- Geotechnical Report; Fairview Loop Pavement Preservation, Project No. 51774, prepared by CR Materials, 2011.

HISTORICAL PROJECT INFORMATION

Historical project information (attached as Appendix B) was used in the development of these recommendations as follows:

- DOT&PF, Fairview Loop Road Grading, Drainage, Paving and Off System Railroad Warning Flashers, Project No. RRO-1(032)/X-14458, October 1979.

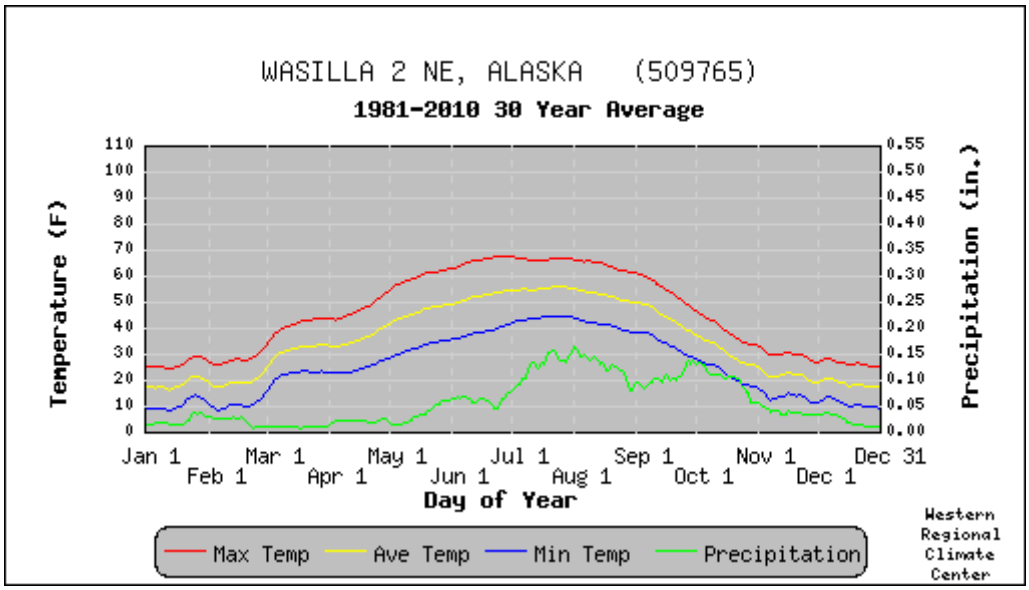
LIMITATIONS

This report documents subsurface geotechnical conditions and provides analyses and interpretation of anticipated site conditions on the project. This report recommends design and construction criteria for the project and is only intended for use by the project design engineering staff.

2.0 CLIMATE

Climate data for this project was obtained from the Wasilla 2 NE, Alaska station through the Western Regional Climate Center (http://www.wrcc.dri.edu). Annual total precipitation averages 21.5" and annual average snowfall averages 59.3".

The average maximum temperature in January is 23 degrees Fahrenheit with an average minimum temperature of 8 degrees. In July, average maximum and minimum temperatures are 67 and 45 degrees Fahrenheit, respectively.



Graph 1- Maximum, Minimum Temperatures (http://www.wrcc.dri.edu)

The depth of freeze is directly related to ambient temperatures, structural material type, moisture content, locations of surface and groundwater, and foundation soil. Using the ModBerg program developed by the US Army Corps of Engineers, Cold Regions Research and Engineering Lab and its closest data source (Wasilla 3 S); the estimated active depth of frost penetration is approximately 10' beneath clear pavement.

3.0 EXISTING CONDITIONS

STATION TO STATION DESCRIPTIONS

Generalized subsurface profiles have been developed based upon boring logs and laboratory data, as shown below. See Appendix A for the Geotechnical Report. (BGS = Below Ground Surface)

Pathway

Existing Soils:

Median Depth BGS (ft)	Generalized profile	Usability Classification	Groundwater Depth BGS
0' to 2'	*Silt with Sand Moisture 27%	*Varies	Groundwater was indicated in 3 of the 11 test holes, at depths ranging from 3.2' to 10.5'.
2' to 5'	Gravel with Silt and Sand P200 5-16% Moisture 2-10%	Useable C	
5'+	Sand with Silt and Gravel P200 5% Moisture 3%	Useable B	

*TH15-25 and TH15-29 indicated Organic Silt at depths of 1.5' and 0.5' respectfully.

Fairview Loop Road

Existing Fairview Loop Road Embankment

Median Depth BGS (ft)	Generalized profile	Usability Classification	Groundwater Depth BGS
*0' to ~4.0"	HMA	RAP	Groundwater was indicated in 3 of the 26 test holes at depths ranging from 6' to 20'.
~0.33'+	Sand with Gravel P200 4-15% Moisture 3%	**Varies	

*Bore logs indicate existing pavement depth ranging from 2.5" to 5.5"
**Data was collected in 2011 and 2015, material has degraded since at an unknown rate. Classification ranges from Useable B to Useable C.

Proposed Realignment 1 Sta 803+00 to Sta 810+50-off road

Median Depth BGS (ft)	Generalized profile	Usability Classification	Groundwater Depth BGS
~0.2'	Vegetative Mat	Waste	No groundwater was indicated in the test holes drilled in this area.
~0.2' to 10'	Sand P200 3% Moisture 5%	Useable B	
10'+	Sand with Gravel	*Useable C	

*Unknown P200 to accurately classify usability. No organics observed in field.

Proposed Realignment 2 Sta 906+50 to 951+50-off road

Median Depth BGS (ft)	Generalized profile	Usability Classification	Groundwater Depth BGS
0'+	*Silty Sand with Gravel P200 30% Moisture 9%	Useable C	Groundwater was not indicated in any of the 7 test holes drilled in the area.

*TH15-37 and TH15-11 indicate sandy silt with gravel for the top 7.5' and then silty sand with gravel until 17'.

GROUNDWATER AND DRAINAGE RECOMMENDATIONS

Groundwater

Groundwater was observed at depths ranging from 3.2’ to 20’ BGS along the proposed alignment, but was found to be well below the proposed structural section. See the Geotechnical Report in Appendix A for specific groundwater information.

Drainage Recommendations

Drainage from the proposed road surface is expected to sheet flow to proposed ditching. It is recommended that contouring be used to move surface water away from the structural section to eliminate water ponding at the toe of the proposed embankment. Ditches should be designed to move surface water to culverts and should be constructed to a minimum depth of 3’ below the pavement surface (after placement of topsoil) to promote natural drainage within the structural section and protect against frost heaving.

A culvert replacement is proposed at about station 178+00. Soils in this area contained gravel with sand and silt. Proposed culverts, drainage channels, and related erosion protection (including evaluation and improvements to existing riprap slopes) should be designed as recommended and/or approved by the Regional Hydrologist.

Best Management Practices are recommended throughout the construction of the project as defined by the approved Storm Water Prevention and Pollution Plan to minimize erosion, control sediment and establish vegetation as the project progresses.

4.0 EARTHWORK

CLEARING AND GRUBBING

Recommend grubbing within the proposed road and pathway footprints when filling over virgin ground, prior to the placement of fill. Waste from grubbing should be disposed of in designated waste areas or hauled off the project to contractor provided waste areas. See Waste Excavation section for waste recommendations.

Test holes advanced in the area between Pathway Station 2005+50 and 2007+00 indicated organic soils to a depth of 1.5’ BGS. While this can be addressed with Unclassified Excavation as sub-excavation, given the minimal depth and short distance, this material could be removed with grubbing.

EXCAVATION and EMBANKMENT

General Excavation

Borings indicate existing soils range from organic soils to useable material, therefore it is recommended that excavation be paid for under Item 203(3) Unclassified Excavation. See Station to Station descriptions for suitability of excavation. Unsuitable excavation may be disposed of within project limits in accordance with Waste Excavation recommendations.

General Embankment

The existing structural section of Fairview Loop Road contained ~10' of gravel with silt and sand, fine content (P200's) ranging from ~4-15%, and an average moisture of 3%. Existing pavement thickness ranged from 2.5" to 5". The project proposes to flatten several vertical curves throughout the corridor requiring cuts of varying depths. On road test holes indicate low P200 material with low moistures below the bottom of these proposed cuts; therefore it is anticipated that minimal structural section rehabilitation will be needed for on road construction.

Embankment Slopes

Soil slopes created by embankment fills/cuts shall be constructed to a maximum of 2H:1V. Slopes may be constructed at a 1.5H:1V, but they should be further evaluated to determine if embankment stabilization is required. All slopes should be vegetated by seeding or other measures to establish native vegetation, minimizing erosion potential.

WASTE EXCAVATION

Designated waste areas may be included in the project where possible (within existing right-of-way and environmental constraints) for the disposal of cleared/grubbed vegetation and unusable excavation. The following criteria are recommended for designated waste areas (when connected to the proposed embankment):

- Waste areas should be located in areas with firm thawed ground to reduce potential for subgrade failure after loaded with waste material.
- Waste material should be thawed and placed at least 3' below the finished pavement surface to allow for adequate drainage of the structural section.
- Waste areas should have a 3% (min.) cross slope from the embankment to direct drainage away from the structural section.
- Waste slopes should be restricted to 3H:1V or flatter to eliminate shear failure.
- Recommend leaving a 10' buffer between the toe of waste and ROW in order to allow access for construction and maintenance equipment.

MATERIAL SOURCES

No material source investigations were performed for this project as all materials are expected to be imported from local private sources.

5.0 STRUCTURAL SECTION RECOMMENDATIONS

PAVEMENT and STRUCTURAL SECTION DESIGN CRITERIA

- Construction Year: 2022-*Per March 2021 Design Status Report*
- Design Life: 20 years
- Traffic Data: 767,749 ESAL's-*Developed using design designations provided by R&M Consultants Inc. and Kinney Engineering, LLC. for Fairview Loop Road Rehabilitation project No. 51774, February 2011*

PAVEMENT and STRUCTURAL SECTION RECOMMENDATIONS

The following structural section recommendations were developed using bore logs, laboratory test results, the Mechanistic Design process in accordance with the general policies of the Alaska Flexible Pavement Design Manual, and the Alaska Preconstruction Manual.

Pathway

- 2" Asphalt Pathway
- 4" Aggregate Base Course, Grading D-1
- *24" (min.) Borrow, Type A
- Borrow C (as needed)

**In areas where the pathway is connected to the existing roadway, 36" of Selected Material, Type A material is recommended to match the adjoining road section, and promote adequate drainage of the roadway structural section.*

Fairview Loop Road; Existing and Proposed Realignments

- 2" HMA Type II, Class A, PG 52-40V
- STE-1 Tack Coat
- 2" Asphalt Treated Base Course (ATB), PG 52-40V
- 2" Aggregate Base Course, Grading D-1
- *12" min. Borrow, Type A
- Borrow C (as needed)

**In areas of new realignment, 36" of Selected Material, Type A material is recommended for the structural section. Road material was indicated to be mainly Selected Material, Type B material in bore logs, and due to acceptable past performance, it is recommended the majority of the roadbed be left in place. Recommend replacing top 12" since data is almost 8 years old and fines in areas were on the higher end of acceptable for Selected Material, Type B.*

APPENDIX E

Approved Environmental Document

APPENDIX F

Design Memos

MEMORANDUM

State of Alaska

Department of Transportation & Public Facilities
Design and Engineering Services – Central Region

TO: Ken Morton, P.E.
Preconstruction Engineer

DATE: March 23, 2015

TELEPHONE NO: 269-0610

FROM: Eric Miyashiro, P.E.
PD&E Chief

SUBJECT: Fairview Loop Road Pathway and Safety Improvements - Recommended Scope of Improvements

There is a fixed amount of funds available to construct improvements on Fairview Loop Road. This memorandum provides a description of the existing road, summarizes the available funding, describes the recommended improvements and provides the recommended project phasing for construction. I am seeking your concurrence on the recommendations contained within this memorandum.

Existing Road Description

Fairview Loop Road (FLR) is a two-way, two-lane roadway in Wasilla, Alaska which runs from its intersection with Kink-Goose Bay Road (KGB), to its termination point at East Fireweed Road. FLR has a 22 foot wide asphalt surface and is approximately 11 miles long. The road functions as a rural minor collector linking other collector, local and private roads. The posted speed limit is 50 mph. There is one school zone with 20 mph signs and flashing beacons at Snowshoe Elementary School and there is an at-grade railroad crossing near the intersection with the Old Matanuska Road. Several of the horizontal and vertical curves along the road do not meet current design standards. A pavement overlay was applied to roughly two miles of FLR (from Candywine to Fireweed Road) in 2008. The remaining pavement is mostly in fair condition with alligator cracking starting to appear in the wheel path in some areas.

FLR was transferred from the federal government to the State of Alaska at statehood. It did not have a dedicated right-of-way but instead used existing section line easements or relied on a "prescriptive claim" that ended at the existing toe of slope. Over time, the utility companies placed their services adjacent to the road surface because they also did not have an easement to place their facilities in. The lack of right-of-way and utilities located adjacent to the existing road makes improving the road very expensive. Any widening or realignment of road requires purchasing property from the adjacent property owners and relocating any affected utilities.

Available Funding

The table below summarizes the available project funding:

FY	Type of Funding	Amount	Comments
13	General Obligation Bonds	$10,000,000	For pathway
13	General Fund	$10,000,000	
11	General Fund	$4,100,000	For pathway
09	General Obligation Bonds	$22,000,000	
	Total	$46,100,000	

Recommended Improvements

The recommended general hierarchy for funding improvements is as follows:

1. pavement preservation,
2. cross culvert and sign replacement,
3. construction of a pathway and,
4. construction of intersection safety improvements.

Pavement Preservation – PJ 51774 Fairview Loop Pavement Preservation Project will repave Fairview Loop Road between Canter Place and Candywine Road, a distance of roughly 6.5 miles. This project is scheduled for construction in the summer of 2015.

Cross Culverts and Sign Replacement - Many of the cross culverts and signs requiring replacement require either temporary or permanent easements for replacement since the culverts or signs they are replacing are on the border of or outside of the right-of-way.

Construction of a Pathway – A new pathway will be constructed from Top of the World Circle to Edlund Road. Where practical, we are obtaining 15' of right-of-way beyond the edge of the new pathway for utilities. We also intend to reconstruct the ditch and driveways between the pathway and the existing road. The replacement of the culvert at Cottonwood Creek is included as part of this effort. There is $14,100,000 appropriated for the construction of a pathway and all of these funds must be expended for this purpose.

Intersections and Safety Improvements - Edlund Road/Fern Street was connected directly to Fairview Loop Road last summer. This provides a connection to Fairview Loop Road roughly at its mid-point and is expected to change traffic patterns in the area. As a result, our top intersection improvement is to construct turn pockets on both Fairview Loop Road and Edlund Road approaches.

High accident intersections along Fairview Loop Road were analyzed to determine if there were cost effective improvements that could be implemented. The resulting recommended improvements were documented in the draft Intersection Evaluation Matrix. An ad-hoc committee consisting of following individuals was formed to review the results and prioritize the intersections to be improved:

Scott Thomas	Traffic & Safety
Burrell Nickeson	Maintenance
Matt Morrow	Construction
Jonathan Knowles	Traffic & Safety
Eric Miyashiro	Highway Design

The final decision of the committee was to prioritize the intersection improvements by their benefit/cost ratios based on construction cost and accident history. This resulted in following ranking for the intersection improvements:

1. Edlund Road
2. Togiak Avenue
3. Marble Way
4. Well Site Road
5. Hayfield Road
6. Cotton Drive
7. Davis Road
8. Lookout Drive
9. Patty Drive

The recommendation for improvements to be included with the available funding is provided in the table below. The estimated costs include right-of-way, utilities, construction, construction engineering, 20% construction contingency and ICAP.

Project	Improvement	Estimated Cost
all	design	$5,934,000
51774	pavement preservation	$7,350,860
56020	cross culvert and sign replacement	$500,000
56020	pathway construction	$16,056,000
56020	intersection improvements	
	Edlund Road	$700,000
	Togiak Avenue	$580,000
	Marble Way	$390,000
	Well Site Road	$520,000
	Hayfield Road	$560,000
	Cotton Drive	$1,910,000
	Davis Road	$1,670,000
	Lookout Drive	$1,050,000
	Patty Drive	$1,530,000
56020	contingency 15%	$6,915,000
	Total	$45,665,860
	Surplus/(Deficit)	$434,140

Currently, the project has budget for additional improvements. My recommendation is to develop additional safety or maintenance improvements to consume all remaining funds.

Project Phasing

The project will be constructed in two phases. The first phase, PJ 51774 Fairview Loop Pavement Preservation Project will repave Fairview Loop Road between Canter Place and

Candywine Road, a distance of roughly 6.5 miles. This project is scheduled for construction in the summer of 2015.

The second phase, PJ 56020 Fairview Loop Pathway and Safety Improvements will construct a pathway between Top of the World Circle and Edlund Road (roughly 4.8 miles), replace culverts and signs as needed and construct safety improvements at high accident intersections.

Summary

At this time I need to amend the consultant contract to include a design for the recommended intersection improvements to keep the project progressing. The estimated costs for the various improvements will change as we continue with the design process; however, I believe we have completed enough analysis to proceed with designing the remaining improvements. We inform you if there are significant changes to the recommended scope and budget.

Please let me know if you concur with the recommendations above or if additional information and/or analysis is needed.

Attachment: Draft Intersection Evaluation Matrix (revised)

cc: Ken Chapman, Consultant Coordinator

rmconsult.com

R&M CONSULTANTS, INC.

9101 Vanguard Drive
Anchorage, Alaska 99507

phone: 907.522.1707
fax: 907.522.3403

December 10, 2014 R&M No. 1635.04

Mr. Eric Miyashiro, PE
Project Manager
State of Alaska
Department of Transportation
& Public Facilities
4111 Aviation Drive
Anchorage, Alaska 99519

RE: Draft Intersection Evaluation Matrix
Fairview Loop Road (FVL) Rehabilitation Design Services
Phase II, FVL Pathway and Safety Improvements Project
Agreement No. 02592054; AKSAS 51774/56020

Dear Mr. Miyashiro:

Attached for your review and use is the draft Intersection Evaluation Matrix. This matrix is a departure from the draft Intersection Evaluation Report submitted on September 8, 2014 based largely on review comments to summarize the scope of improvements at the selected intersections in table format. This matrix is in accordance with Article B13, Task 2 - Traffic and Safety Analysis, Task Group D of the Modified Statement of Services.

Accompanying the matrix are plan and profile figure(s) and estimated construction costs for the recommended geometric improvements at each location. Important elements to be aware of when reviewing and evaluating the matrix include:

- The Hayfield/Lupine location was added to the matrix due to comment received during the Plan In Hand review from Traffic and Safety;
- The Patty Drive/Rod Circle/Chugach View Drive location was added to the matrix due to public comment received;
- The recommended geometric improvements meet a 50 mph design speed with the exception of Hayfield/Lupine, Patty Drive/Rod Circle/Chugach View Drive, and Togiak Avenue locations. At these locations, we propose geometric improvements commensurate with a design speed less than 50 mph in an effort to minimize right of way (ROW) and utility impacts. This follows the original 3R project approach to develop cost effective design solutions.
- Estimated construction costs are for roadway improvements only. Phase II Pathway from Top of the World to Edlund Road and the turn lanes at Edlund Road are not included in the cost totals shown in the matirx.
- ROW acquisition needs east of Edlund Road account for a future pathway;
- Geometric improvement opportunities at Old Matanuska Highway generally do not exist as the site is extremely constrained by topography, the Alaska Railroad, the historic Carson Colony Farm and future plans to connect Fairview Loop to the Parks Highway in the vicinity of the Parks Highway/Seward Meridian Interchange.

- We developed a schematic level alignment within the general project corridor to improve the safety and operational capacity of the mainline with the intent of reducing the potential for conflicts by changing the Old Matanuska Highway intersection to function as a local road.

We look forward to the Department's review and are available to discuss at your earliest convenience.

Sincerely,

R&M CONSULTANTS, INC.

Lance W. DeBernardi, P.E.
Project Manager

Enclosures: Draft Intersection Evaluation Matrix

cc w/o enclosures:
Tom Garrett,
Morgan Welch

Intersection Evaluation Matrix (REVISED)

Intersection	Existing Conditions					Accident History[1]	Recommended Geometric Improvement (50 m.p.h. Design Speed, Horizontal Curve R^{min}=833, K_{sag}=96, K_{crest}=84)	Costs[2]			
	Horizontal Curve	Superelevation	Vertical Curve	Intersection Landing	Subgrade Condition			ROW Acquisition Costs[3]	Utility Relocation Costs[4]	Construction Cost[5]	Total
Marble Way	N/A tangent section	N/A tangent section	K Value for Sag Vertical Curve matches a design speed less than 25 m.p.h. For Crest Vertical Curve, K Value matches a design speed less than 30 m.p.h.	Landing grade for Marble Way is 2%	Not a recommended digout per Geotechnical Report dated 11/13/11	Fatalities - 0; Major Injuries - 1; Minor Injuries - 5; Total Accidents - 2	Reconstruct 660 feet of FLR between Sta 51+80 and Sta 58+20, including the crest and sag vertical curves. Horizontal alignment unchanged.	$0.00 Roadway improvements fit within Existing ROW - No ROW Acquisitions Needed.	$100,000.00	$390,000.00	$490,000.00
Lookout Drive	Radius = 975'	No superelevation - Normal crown through horizontal curve	K Value for sag vertical curve matches a design speed less than 35 m.p.h. For crest vertical curve, K Value matches a design speed less than 40 m.p.h.	Landing grade for Lookout Drive > 4%	Differential settlement in subgrade - Recommended digout per Geotechnical Report dated 11/13/11	Fatalities - 0; Major Injuries - 1; Minor Injuries - 7; Total Accidents - 7	Reconstruct 1020 feet of FLR between Sta 231+70 and Sta 241+90, including the crest and sag vertical curves. Horizontal alignment unchanged. Construct 2% landing at Lookout Drive. Construct proposed pathway closer to FLR. Flatten the profile grade from approximately 9.1% to 6.1%.	$136,000.00 4 parcels needed from the south side. Combined area for the 4 parcels is approximately 26,600 SF.	$490,000.00	$1,050,000.00	$1,676,000.00
Well Site Road and Jackfish	Radius = 1,050'	No superelevation - Normal crown through horizontal curve	K Value for crest vertical curve matches a design speed less than 45 m.p.h.	Landing grade for Well Site > 5%. Landing grade for Jackfish > 6.5%	Recommended digout per Geotechnical Report dated 11/13/11	Fatalities - 0; Major Injuries - 3; Minor Injuries - 1; Total Accidents - 3	Reconstruct 770 feet of FLR between Sta 271+10 and Sta 278+80, including the crest and sag vertical curves. Horizontal alignment unchanged. Construct 2% Landings at Well Site Road and Jackfish Road.	$31,000.00 1 parcel needed from the south side. Parcel area is approximately 5,500 SF.	$441,000.00	$520,000.00	$992,000.00

Intersection Evaluation Matrix (REVISED)

Intersection	Existing Conditions					Accident History[1]	Recommended Geometric Improvement (50 m.p.h. Design Speed, Horizontal Curve R^{min}=833, K_{sag}=96, K_{crest}=84)	Costs[2]			
	Horizontal Curve	Superelevation	Vertical Curve	Intersection Landing	Subgrade Condition			ROW Acquisition Costs[3]	Utility Relocation Costs[4]	Construction Cost[5]	Total
Togiak Avenue	Radius = 212', Corresponds to a design speed of approximately 30 m.p.h.	Superelevation for WB/SB lane varies between 5% and 8%. Superelevation for NB/EB lane varies between 9% and 12%.	K Value for crest vertical curve matches a design speed of approximately 40 m.p.h.	Landing grade for Togiak Avenue > 5.5%	Not a recommended digout per Geotechnical Report dated 11/13/11	Fatalities - 1; Major Injuries - 3; Minor Injuries - 20; Total Accidents - 12	A horizontal curve with a radius of 833' severly impacts 3 properties with residences. At least two of the three properties would require a full acquisition. To minimize impacts, reconstruct 1060 feet of FLR between Sta 389+20 and Sta 399+80 with a horizontal curve with a 375' radius. A horizontal curve with a 375' radius exceeds a 35 m.p.h. design speed. Construct Sag and Crest vertical curves that closely match a 40 m.p.h. design speed. Construct a landing at Togiak Avenue with a 2% grade.	$197,000.00 2 parcels are needed from the west side, 1 parcel is needed from the east side, and 1 parcel is needed from the north side. The combined area for the 4 parcels is approximately 47,100 SF.	$135,000.00	$580,000.00	$912,000.00
Cotten Drive	Radius = 875', Corresponds to a design speed of approximately 40 m.p.h. when considering superelevaton for WB lane	Superelevation for WB lane varies between 1% and 3%. Superelevation for EB lane is greater than 6%.	K Value for crest vertical curve matches a design speed close to 50 m.p.h.	Landing grade for Cotten Drive < 1.5%	Recommended digout per Geotechnical Report dated 11/13/11	Fatalities - 0; Major Injuries - 4; Minor Injuries - 6; Total Accidents - 6	Reconstruct 2,970 feet of FLR between Sta 438+90 and Sta 468+60. Replace horizontal and vertical curves east of Cotten Drive to match 50 m.p.h. design speed.	$753,000.00 8 parcels needed from the north side and 3 parcels needed from the south side. Combined area for the 11 parcels is approximately 199,650 SF.	$531,000.00	$1,910,000.00	$3,194,000.00
Davis Road	Radius = 270', Corresponds to a design speed less than 30 m.p.h. when considering superelevaton for WB lane	Superelevation for WB lane is approximately 6%. Superelevation for EB lane is less than 0.5%.	Grade is relatively flat - No vertical curve	Landing grade for Davis Road is approximately 2.8%	Not a recommended digout per Geotechnical Report dated 11/13/11	Fatalities - 0; Major Injuries - 3; Minor Injuries - 6; Total Accidents - 6.	Replace 2840 feet of FLR with 2,810 feet from Sta 468+60 to 497+00. Replace horizontal and vertical curves west of Davis Drive to match a 50 m.p.h. design speed. Construct a landing at Davis Road with a 2% grade.	$619,000.00 4 parcels needed from the north side and 4 parcels needed from the south side. Combined area for the 8 parcels is approximately 168,970 SF.	$382,000.00	$1,670,000.00	$2,671,000.00

Intersection Evaluation Matrix (REVISED)

Intersection	Existing Conditions					Accident History[1]	Recommended Geometric Improvement (50 m.p.h. Design Speed, Horizontal Curve R^{min}=833, K_{sag}=96, K_{crest}=84)	Costs[2]			
	Horizontal Curve	Superelevation	Vertical Curve	Intersection Landing	Subgrade Condition			ROW Acquisition Costs[3]	Utility Relocation Costs[4]	Construction Cost[5]	Total
Old Matanuska Highway[6]	Radius = 200', Corresponds to a design speed greater than 25 m.p.h.	Superelevation for WB lane is at least 5.9%. Superelevation for EB is greater than 8%.	Two crest vertical curves coincide with a 200 foot horizontal curve. The crest vertical curve to the west (V.P.I. Sta 532+25.06) has a K Value that matches a 25 m.p.h. design speed. The crest vertical Curve to the east (V.P.I. Sta 533+53.02) has a K Value that matches a 35 m.p.h. design speed.	The landing grade for the east approach at Old Matanuska Highway is approximately 5.7%. The landing grade for the south approach at Old Matanuska Highway varies. Adjacent to the stop sign, the landing grade is approximately 9.2%. Approximately 10 feet from the stop sign, the landing grade exceeds 14.5%.	Not a recommended digout per Geotechnical Report dated 11/13/11	Fatalities - 0; Major Injuries - 0; Minor Injuries - 9; Total Accidents - 4.	Construct 3,060 feet of roadway between Stations 511+00 and 551+00. The new alignment ties in at Linlu Lane and approximately 1800 feet east of Old Matanuska Road. This alternative involves the construction of a new bridge over the existing railroad tracks and avoids the Carson Colony Farm.	Because the realignment is beyond the topo base and R.O.W. mapping boundaries, utility and R.O.W. costs have not been estimated.		$7,380,000.00	$7,380,000.00
								Located at 4000 E. Fairview Loop, the Carson Colony Farm is eligible for listing in the National Register of Historic Places.			
Hayfield Road & Lupine Lane	Radius = 73', corresponds to a design speed less than 20 m.p.h.	Superelevation for WB lane is greater than 6%. Superelevation for EB varies between 0.50% and 1.6%.	Through the curve, the K Value for the crest vertical curve matches a design speed close to 40 m.p.h. East of the curve, the K value for the sag vertical curve matches a design speed close to 30 m.p.h	Landing grade for Lupine Lane is greater than 3.3% and the landing grade for Hayfield Road is less than 2%. For Chugach View Drive, the crest vertical curve to the north interferes with the intersection sight distance.	Not a recommended digout per Geotechnical Report dated 11/13/11.	Fatalities - 0; Major Injuries - 1; Minor Injuries - 3; Total Accidents - 2.	Reconstruct 770 feet of FLR between Sta 104+60 and Sta 112+30. A horizontal curve with an 850' radius (50 m.p.h. design speed) requires the acquisition of 3 parcels including the full acquisition of Parcel 3/3A, Lot 2 Block 2 Valley Ranch Estates. Construct a horizontal curve with a 500 foot radius. A horizontal curve with a 500 foot radius has a design speed greater than 40 m.p.h. and avoids impacting the existing residence. Reconnect Lupine Lane to FLR and connect Hayfield Road to Lupine Lane.	$128,000.00	$176,000.00	$560,000.00	$864,000.00
								2 parcels needed from the west side and 1 parcel needed from the east side. Combined area for the 3 parcels is approximately 28,560 SF.			
Patty Drive, Rod Circle, Chugach View Drive	A 90 degree bend is comprised of 3 curves. In the eastbound travel direction, the first curve has a 610 foot radius, the second curve has a 285 foot radius, and the third curve has a 695 foot radius.	Superelevation for WB lane is greater than 11%. Superelevation for EB varies between 3% and 6%.	Near Chugach View Drive, FLR has three vertical curves consisting of one sag vertical curve with a design speed of 25 m.p.h. and two crest vertical curves with a design speeds closely matching 30 m.p.h. and 35 m.p.h.	Landing grade for Rod Circle is greater than 6.5% and the Landing Grade for Patty Drive is greater than 9.5%. For Chugach View Drive, the crest vertical curve to the north interferes with the intersection sight distance.	Not a recommended digout per Geotechnical Report dated 11/13/11.	Fatalities - 0; Major Injuries - 0; Minor Injuries - 4; Total Accidents - 3.	Reconstruct 2,150 feet of FLR between Sta 337+50 and Sta 359+00. A horizontal curve with an 850' radius requires the acquisition of 6 parcels, including the full acquisition of multi-family residence located on Northridge L19 B1. Replace the compound curve with a single horizontal curve with a 550' radius. A horizontal curve with a 550 foot radius has a design speed greater than 40 m.p.h. Construct 2% landings for Rod Circle and Patty Drive. Remove a portion of the crest vertical curve north of Chugach View and raise Chugach View to improve the intersection sight distance.	$672,000.00	$442,000.00	$1,530,000.00	$2,644,000.00
								$2,536,000.00	2,697,000.00	15,590,000.00	20,823,000.00

(1) Crash History is for the study period between 1998-2007.
(2) Estimate based upon 2014 Unit Costs
(3) R.O.W. costs include: $3/SF for property acquisition plus $6500/parcel for negotiations plus $7500/parcel for appraisals (based on current cost for Fairview ROW acquisitions). R.O.W. acquisition needs East of Edlund Road account for a future pathway.
(4) Utility relocation costs obtained from 2013 spreadsheet prepared by DOT&PF utilities.
(5) Includes 15% for Construction Engineering, 4.79% for ICAP, and a 20% for Contingency.
(6) Additional design survey and R.O.W. mapping is needed for the Old Matanuska Road alternative between the tie-in location near Linlu Lane and the tie-in location east of the Old Matanuska intersection.

Item Number	Description	Quantity	Unit	Unit Price	Amount
202(2)	Removal of Pavement	1,707	SY	$ 5.00	$ 8,530.00
203(3)	Unclassified Excavation	3,146	CY	$ 15.00	$ 47,190.00
203(6A)	Borrow, Type A	6,834	TON	$ 18.00	$ 123,020.00
203(6C)	Borrow, Type C	2,118	TON	$ 10.00	$ 21,180.00
301(1)	Aggregate Base Course, Grading D-1	192	TON	$ 26.00	$ 4,990.00
306(1)	ATB	195	TON	$ 100.00	$ 19,460.00
306(2)	Asphalt Cement, Grade PG 58-34	11	TON	$ 800.00	$ 8,560.00
401(1A)	Hot Mix Asphalt, Type II; Class A	195	TON	$ 140.00	$ 27,240.00
401(2)	Asphalt Cement, Grade PG 58-34	11	TON	$ 800.00	$ 8,560.00
630(2)	Geotextile, Stabilization	3,129	SY	$ 4.00	$ 12,520.00
639(6)	Approach	0	EACH	$ 2,500.00	$ -
				Subtotal:	$ 272,720.00
	Construction Engineering (Percentage)	15%		CENG	$ 40,908.00
				Subtotal:	$ 313,628.00
	Indirect Cost Allocation Plan (ICAP)	4.79%			$ 15,022.78
	Total Participating				$ 328,650.78
	Added Costs (Not part of the Contract) Contingency (20%)				$ 65,730.16
	Total Construction Cost				**$ 390,000.00**

Item Number	Description	Quantity	Unit	Unit Price	Amount
202(2)	Removal of Pavement	2,721	SY	$ 5.00	$ 13,600.00
203(3)	Unclassified Excavation	26,532	CY	$ 15.00	$ 397,980.00
203(6A)	Borrow, Type A	9,781	TON	$ 18.00	$ 176,050.00
203(6C)	Borrow, Type C	0	TON	$ 10.00	$ -
301(1)	Aggregate Base Course, Grading D-1	306	TON	$ 26.00	$ 7,960.00
306(1)	ATB	310	TON	$ 100.00	$ 31,020.00
306(2)	Asphalt Cement, Grade PG 58-34	17	TON	$ 800.00	$ 13,650.00
401(1A)	Hot Mix Asphalt, Type II; Class A	310	TON	$ 140.00	$ 43,420.00
401(2)	Asphalt Cement, Grade PG 58-34	17	TON	$ 800.00	$ 13,650.00
630(2)	Geotextile, Stabilization	4,988	SY	$ 4.00	$ 19,950.00
639(6)	Approach	4	EACH	$ 2,500.00	$ 10,000.00
				Subtotal:	$ 727,280.00
	Construction Engineering (Percentage)	15%		CENG	$ 109,092.00
				Subtotal:	$ 836,372.00
	Indirect Cost Allocation Plan (ICAP)	4.79%			$ 40,062.22
	Total Participating				$ 876,434.22
	Added Costs (Not part of the Contract) Contingency (20%)				$ 175,286.84
	Total Construction Cost				**$ 1,050,000.00**

Item Number	Description	Quantity	Unit	Unit Price	Amount
202(2)	Removal of Pavement	2,053	SY	$ 5.00	$ 10,270.00
203(3)	Unclassified Excavation	7,710	CY	$ 15.00	$ 115,650.00
203(6A)	Borrow, Type A	7,381	TON	$ 18.00	$ 132,860.00
203(6C)	Borrow, Type C	0	TON	$ 10.00	$ -
301(1)	Aggregate Base Course, Grading D-1	231	TON	$ 26.00	$ 6,010.00
306(1)	ATB	234	TON	$ 100.00	$ 23,410.00
306(2)	Asphalt Cement, Grade PG 58-34	13	TON	$ 800.00	$ 10,300.00
401(1A)	Hot Mix Asphalt, Type II; Class A	234	TON	$ 140.00	$ 32,770.00
401(2)	Asphalt Cement, Grade PG 58-34	13	TON	$ 800.00	$ 10,300.00
630(2)	Geotextile, Stabilization	3,764	SY	$ 4.00	$ 15,060.00
639(6)	Approach	2	EACH	$ 2,500.00	$ 5,000.00
				Subtotal:	$ 361,630.00
	Construction Engineering (Percentage)	15%		CENG	$ 54,244.50
				Subtotal:	$ 415,874.50
	Indirect Cost Allocation Plan (ICAP)	4.79%			$ 19,920.39
	Total Participating				$ 435,794.89
	Added Costs (Not part of the Contract) Contingency (20%)				$ 87,158.98
	Total Construction Cost				**$ 520,000.00**

Construction Cost for:
Togiak Avenue

Item Number	Description	Quantity	Unit	Unit Price	Amount
202(2)	Removal of Pavement	2,827	SY	$ 5.00	$ 14,130.00
203(3)	Unclassified Excavation	6,106	CY	$ 15.00	$ 91,590.00
203(6A)	Borrow, Type A	8,594	TON	$ 18.00	$ 154,690.00
203(6C)	Borrow, Type C	1,000	TON	$ 10.00	$ 10,000.00
301(1)	Aggregate Base Course, Grading D-1	318	TON	$ 26.00	$ 8,270.00
306(1)	ATB	322	TON	$ 100.00	$ 32,220.00
306(2)	Asphalt Cement, Grade PG 58-34	18	TON	$ 800.00	$ 14,180.00
401(1A)	Hot Mix Asphalt, Type II; Class A	322	TON	$ 140.00	$ 45,110.00
401(2)	Asphalt Cement, Grade PG 58-34	18	TON	$ 800.00	$ 14,180.00
630(2)	Geotextile, Stabilization	5,182	SY	$ 4.00	$ 20,730.00
639(6)	Approach	5	EACH	$ 2,500.00	$ 12,500.00
				Subtotal:	$ 403,470.00
	Construction Engineering (Percentage)	15%		CENG	$ 60,520.50
				Subtotal:	$ 463,990.50
	Indirect Cost Allocation Plan (ICAP)	4.79%			$ 22,225.14
	Total Participating				$ 486,215.64
	Added Costs (Not part of the Contract) Contingency (20%)				$ 97,243.13
	Total Construction Cost				**$ 580,000.00**

Construction Cost for:
Cotten Drive (East)

Item Number	Description	Quantity	Unit	Unit Price	Amount
202(2)	Removal of Pavement	7,920	SY	$ 5.00	$ 39,600.00
203(3)	Unclassified Excavation	16,756	CY	$ 15.00	$ 251,340.00
203(6A)	Borrow, Type A	26,440	TON	$ 18.00	$ 475,930.00
203(6C)	Borrow, Type C	18,257	TON	$ 10.00	$ 182,570.00
301(1)	Aggregate Base Course, Grading D-1	891	TON	$ 26.00	$ 23,170.00
306(1)	ATB	903	TON	$ 100.00	$ 90,290.00
306(2)	Asphalt Cement, Grade PG 58-34	50	TON	$ 800.00	$ 39,730.00
401(1A)	Hot Mix Asphalt, Type II; Class A	903	TON	$ 140.00	$ 126,400.00
401(2)	Asphalt Cement, Grade PG 58-34	50	TON	$ 800.00	$ 39,730.00
630(2)	Geotextile, Stabilization	14,520	SY	$ 4.00	$ 58,080.00
639(6)	Approach	13	EACH	$ 2,500.00	$ 32,500.00
				Subtotal:	$ 1,319,740.00
	Construction Engineering (Percentage)	15%		CENG	$ 197,961.00
				Subtotal:	$ 1,517,701.00
	Indirect Cost Allocation Plan (ICAP)	4.79%			$ 72,697.88
	Total Participating				$ 1,590,398.88
	Added Costs (Not part of the Contract) Contingency (20%)				$ 318,079.78
	Total Construction Cost				**$ 1,910,000.00**

Item Number	Description	Quantity	Unit	Unit Price	Amount
202(2)	Removal of Pavement	7,573	SY	$ 5.00	$ 37,870.00
203(3)	Unclassified Excavation	14,893	CY	$ 15.00	$ 223,400.00
203(6A)	Borrow, Type A	26,916	TON	$ 18.00	$ 484,490.00
203(6C)	Borrow, Type C	0	TON	$ 10.00	$ -
301(1)	Aggregate Base Course, Grading D-1	852	TON	$ 26.00	$ 22,150.00
306(1)	ATB	863	TON	$ 100.00	$ 86,340.00
306(2)	Asphalt Cement, Grade PG 58-34	47	TON	$ 800.00	$ 37,990.00
401(1A)	Hot Mix Asphalt, Type II; Class A	863	TON	$ 140.00	$ 120,870.00
401(2)	Asphalt Cement, Grade PG 58-34	47	TON	$ 800.00	$ 37,990.00
630(2)	Geotextile, Stabilization	13,884	SY	$ 4.00	$ 55,540.00
639(6)	Approach	18	EACH	$ 2,500.00	$ 45,000.00
				Subtotal:	$ 1,151,640.00
	Construction Engineering (Percentage)	15%		CENG	$ 172,746.00
				Subtotal:	$ 1,324,386.00
	Indirect Cost Allocation Plan (ICAP)	4.79%			$ 63,438.09
	Total Participating				$ 1,387,824.09
	Added Costs (Not part of the Contract) Contingency (20%)				$ 277,564.82
	Total Construction Cost				**$ 1,670,000.00**

Item Number	Description	Quantity	Unit	Unit Price	Amount
202(2)	Removal of Pavement	2,053	SY	$ 5.00	$ 10,270.00
203(3)	Unclassified Excavation	3,760	CY	$ 15.00	$ 56,400.00
203(6A)	Borrow, Type A	6,634	TON	$ 18.00	$ 119,410.00
203(6C)	Borrow, Type C	0	TON	$ 10.00	$ -
301(1)	Aggregate Base Course, Grading D-1	231	TON	$ 26.00	$ 6,010.00
306(1)	ATB	234	TON	$ 100.00	$ 23,410.00
306(2)	Asphalt Cement, Grade PG 58-34	13	TON	$ 800.00	$ 10,300.00
401(1A)	Hot Mix Asphalt, Type II; Class A	234	TON	$ 140.00	$ 32,770.00
401(2)	Asphalt Cement, Grade PG 58-34	13	TON	$ 800.00	$ 10,300.00
630(2)	Geotextile, Stabilization	3,764	SY	$ 4.00	$ 15,060.00
639(6)	Approach	2	EACH	$ 50,000.00	$ 100,000.00
				Subtotal:	$ 383,930.00
	Construction Engineering (Percentage)	15%		CENG	$ 57,589.50
				Subtotal:	$ 441,519.50
	Indirect Cost Allocation Plan (ICAP)	4.79%			$ 21,148.78
	Total Participating				$ 462,668.28
	Added Costs (Not part of the Contract) Contingency (20%)				$ 92,533.66
	Total Construction Cost				**$ 560,000.00**

Item Number	Description	Quantity	Unit	Unit Price	Amount
202(2)	Removal of Pavement	5,733	SY	$ 5.00	$ 28,670.00
203(3)	Unclassified Excavation	24,525	CY	$ 15.00	$ 367,880.00
203(6A)	Borrow, Type A	20,266	TON	$ 18.00	$ 364,790.00
203(6C)	Borrow, Type C	0	TON	$ 10.00	$ -
301(1)	Aggregate Base Course, Grading D-1	645	TON	$ 26.00	$ 16,770.00
306(1)	ATB	654	TON	$ 100.00	$ 65,360.00
306(2)	Asphalt Cement, Grade PG 58-34	36	TON	$ 800.00	$ 28,760.00
401(1A)	Hot Mix Asphalt, Type II; Class A	654	TON	$ 140.00	$ 91,500.00
401(2)	Asphalt Cement, Grade PG 58-34	36	TON	$ 800.00	$ 28,760.00
630(2)	Geotextile, Stabilization	10,511	SY	$ 4.00	$ 42,040.00
639(6)	Approach	10	EACH	$ 2,500.00	$ 25,000.00
				Subtotal:	$ 1,059,530.00
	Construction Engineering (Percentage)	15%		CENG	$ 158,929.50
				Subtotal:	$ 1,218,459.50
	Indirect Cost Allocation Plan (ICAP)	4.79%			$ 58,364.21
	Total Participating				$ 1,276,823.71
	Added Costs (Not part of the Contract) Contingency (20%)				$ 255,364.74
	Total Construction Cost				**$ 1,530,000.00**

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DRAFTED BY

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MARBLE

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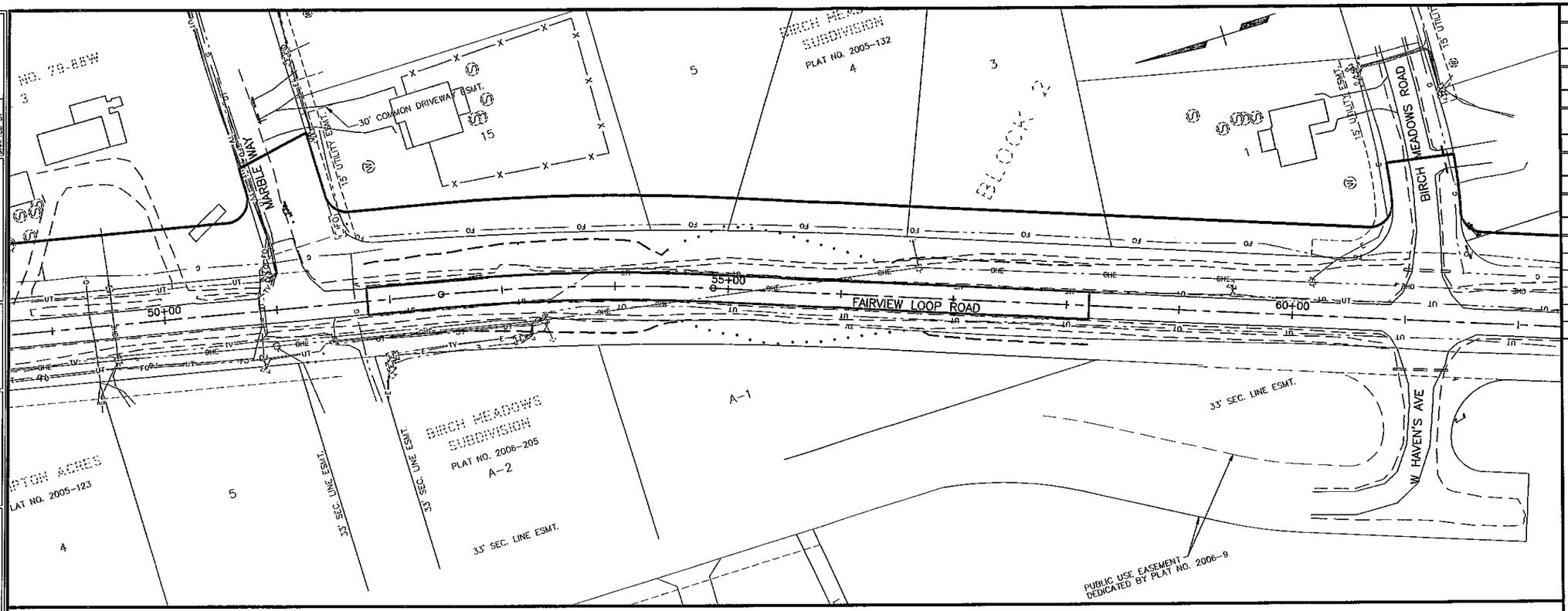
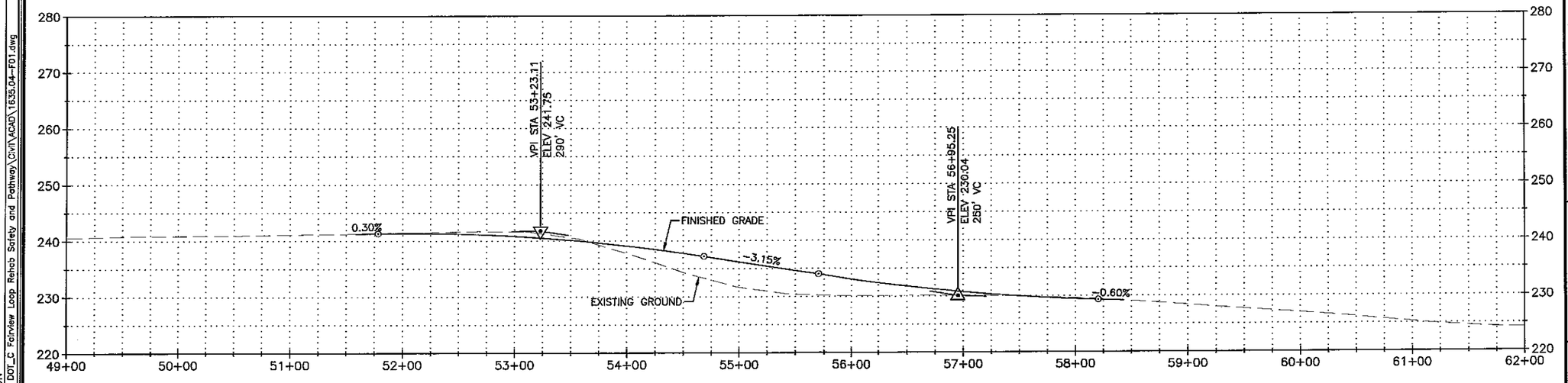


INTERSECTION IMPROVEMENTS -- MARBLE WAY



SHEET NO.	TOTAL SHEETS
1	1
STATE	YEAR
ALASKA	2014

PROJECT DESIGNATION

ADDENDUM NO.

ATTACHMENT NO.

REVISIONS

NO.	DATE	DESCRIPTION

ASPHALT LIMIT

CUT SLOPE LIMIT

FILL SLOPE LIMIT

ROW CURRENTLY IN ACQUISITION

ROW NEEDED FOR INTERSECTION IMPROVEMENTS

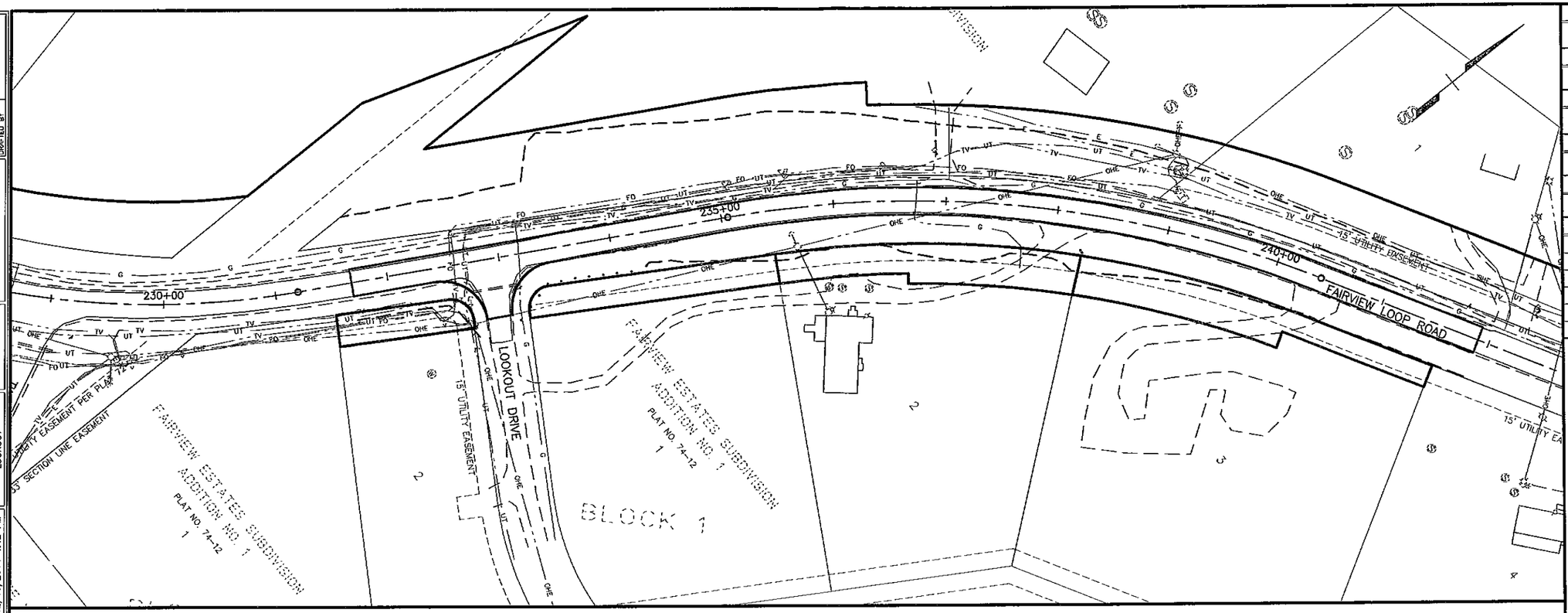
STATE OF ALASKA
49TH
Name
License #
REGISTERED PROFESSIONAL ENGINEER

R&M CONSULTANTS, INC.

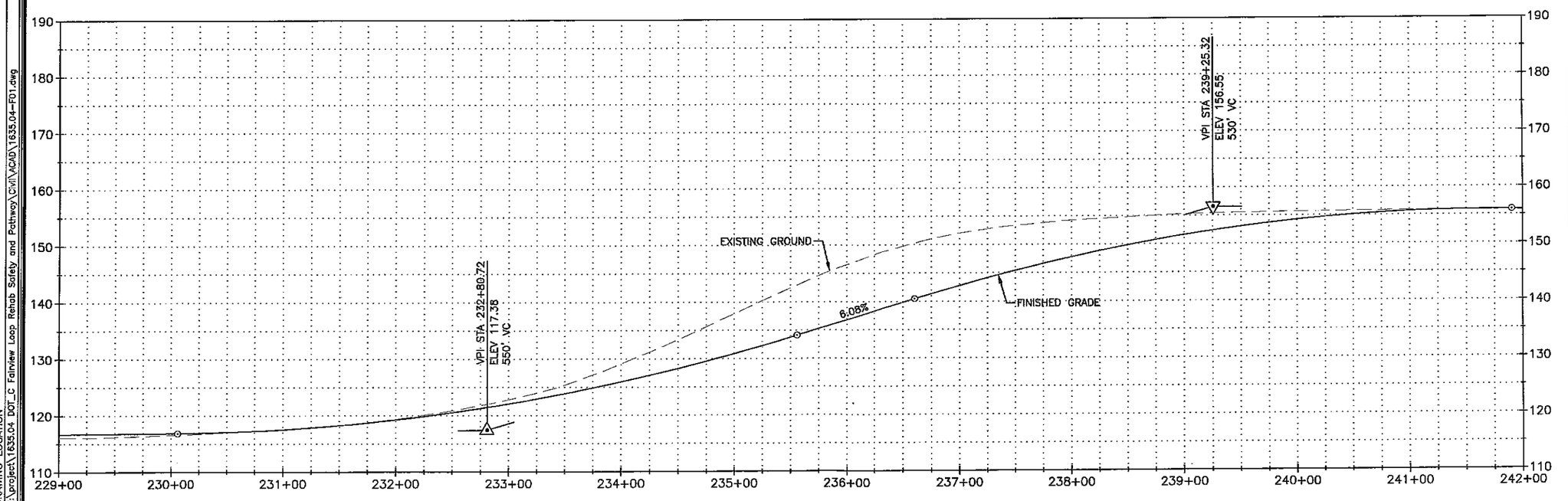
STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

FAIRVIEW LOOP ROAD SAFETY IMPROVEMENTS

INTERSECTION IMPROVEMENTS MARBLE WAY



INTERSECTION IMPROVEMENTS -- LOOKOUT DRIVE



SHEET NO.	TOTAL SHEETS
1	1
STATE	YEAR
ALASKA	2014

PROJECT DESIGNATION

ADDENDUM NO.

ATTACHMENT NO.

REVISIONS

NO.	DATE	DESCRIPTION

ASPHALT LIMIT

CUT SLOPE LIMIT

FILL SLOPE LIMIT

ROW CURRENTLY IN ACQUISITION

ROW NEEDED FOR INTERSECTION IMPROVEMENTS

STATE OF ALASKA 49 TH Name License # REGISTERED PROFESSIONAL ENGINEER

R&M CONSULTANTS, INC.

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION
AND PUBLIC FACILITIES

FAIRVIEW LOOP ROAD
SAFETY IMPROVEMENTS

INTERSECTION IMPROVEMENTS
LOOKOUT DRIVE

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SCALE

LAYOUT
LOOKOUT

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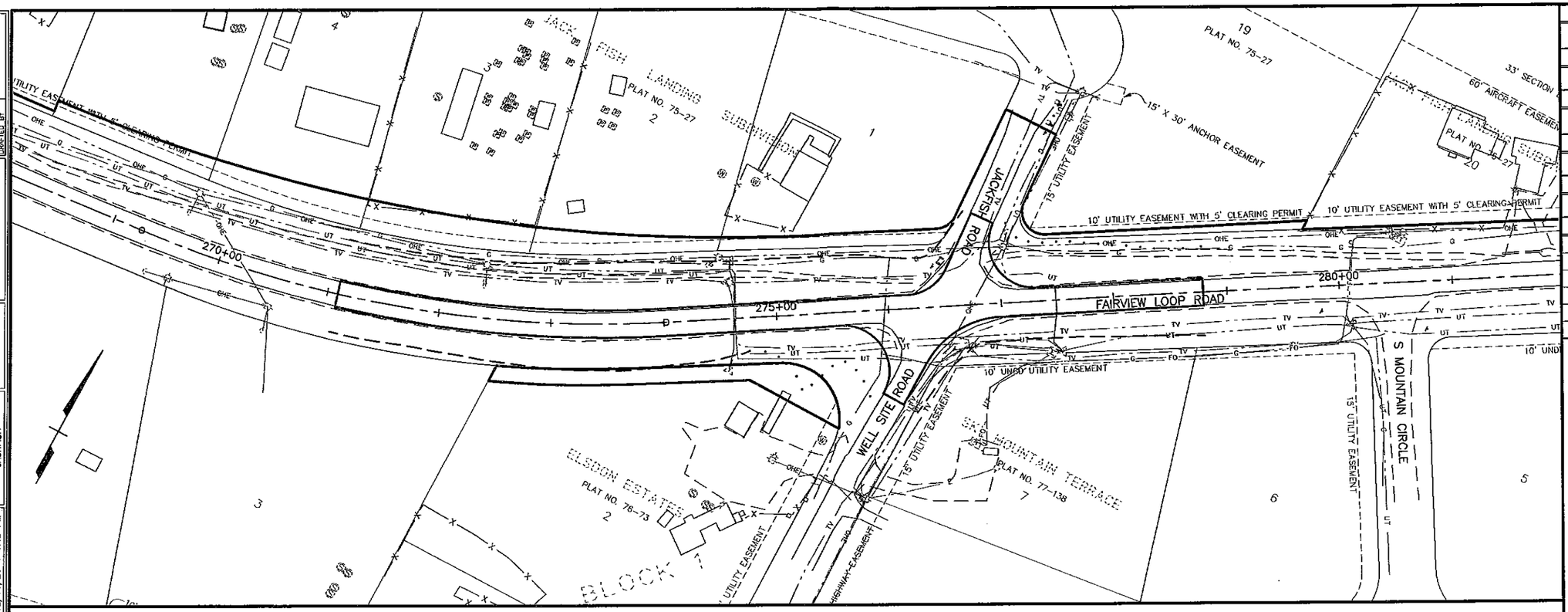
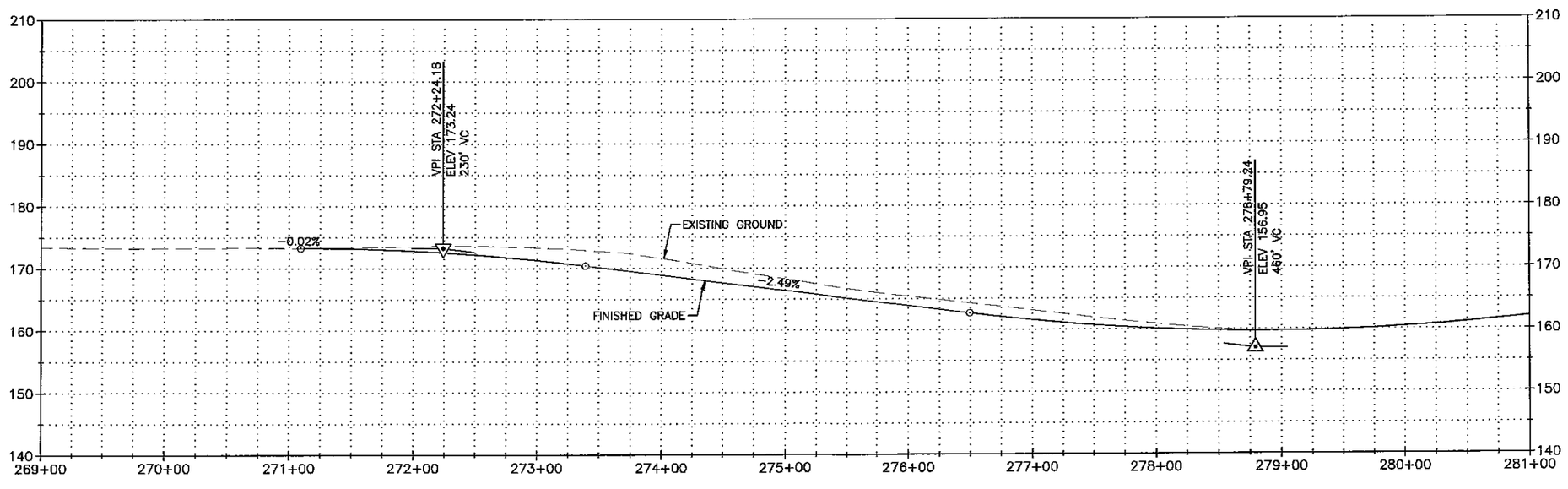


INTERSECTION IMPROVEMENTS -- WELLSITE ROAD & JACKFISH ROAD



SHEET NO.	TOTAL SHEETS
1	1
STATE	YEAR
ALASKA	2014

PROJECT DESIGNATION

ADDENDUM NO.

ATTACHMENT NO.

REVISIONS

NO.	DATE	DESCRIPTION

ASPHALT LIMIT

CUT SLOPE LIMIT

FILL SLOPE LIMIT

ROW CURRENTLY IN ACQUISITION

ROW NEEDED FOR INTERSECTION IMPROVEMENTS

STATE OF ALASKA 49TH
Name
License #
REGISTERED PROFESSIONAL ENGINEER

R&M CONSULTANTS, INC.

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

FAIRVIEW LOOP ROAD
SAFETY IMPROVEMENTS

INTERSECTION IMPROVEMENTS
WELLSITE RD & JACKFISH RD

DESIGNED BY
CHECKED BY
DATE TO PLT

XREFS

SCALE

LAYOUT
JACKFISH

DATE TIME
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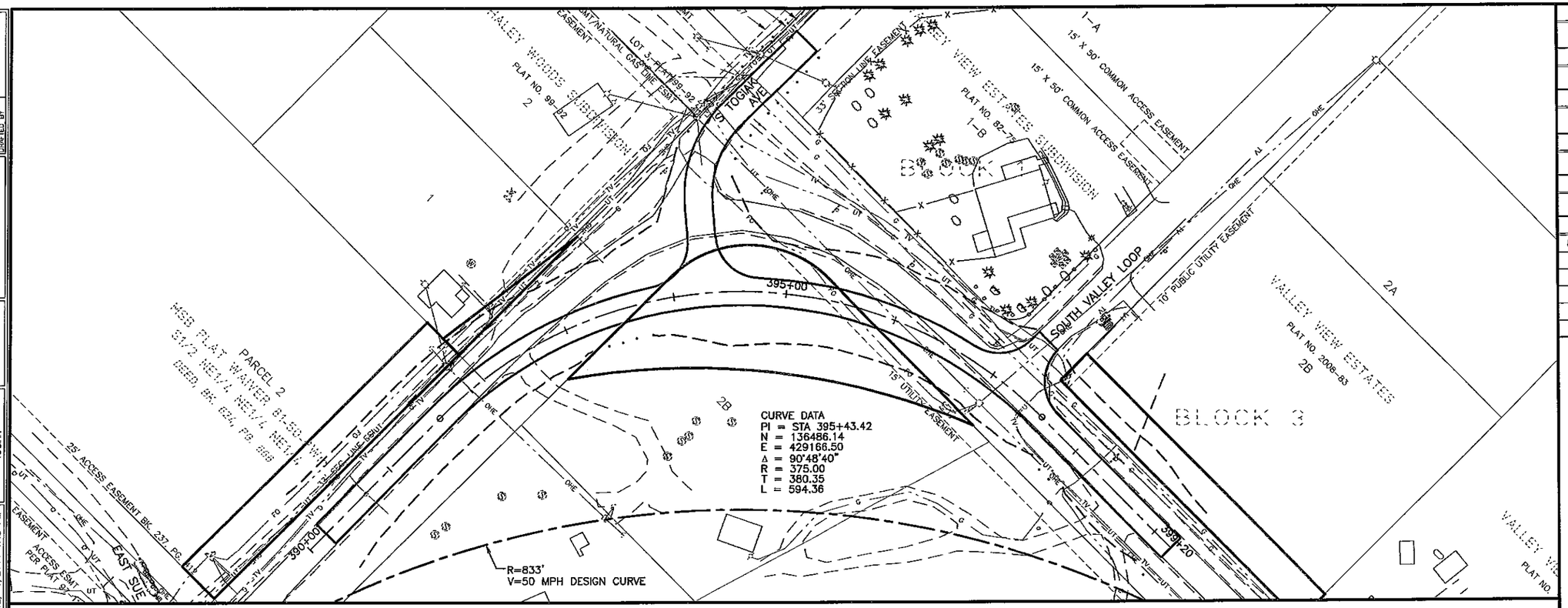
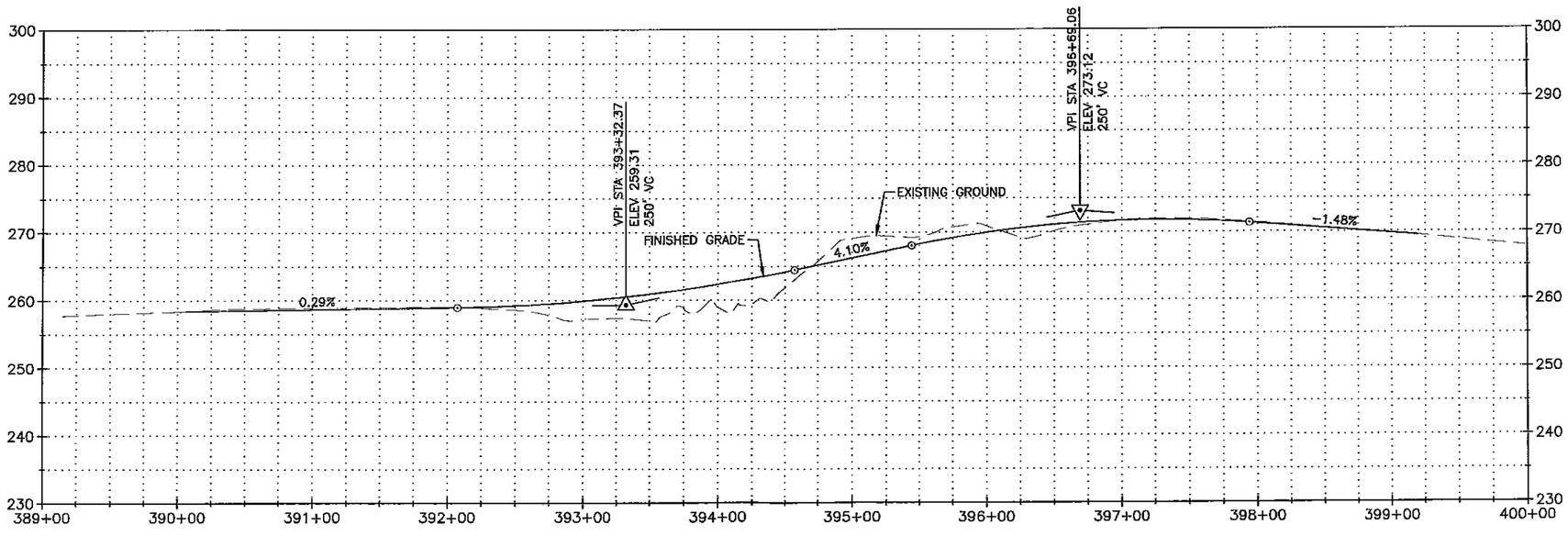


INTERSECTION IMPROVEMENTS -- TOGIAK AVENUE



SHEET NO.	TOTAL SHEETS
1	1
STATE	YEAR
ALASKA	2014

PROJECT DESIGNATION

ADDENDUM NO.

ATTACHMENT NO.

REVISIONS

NO.	DATE	DESCRIPTION

ASPHALT LIMIT

CUT SLOPE LIMIT

FILL SLOPE LIMIT

ROW CURRENTLY IN ACQUISITION

ROW NEEDED FOR INTERSECTION IMPROVEMENTS

STATE OF ALASKA
49TH
Name
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STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION
AND PUBLIC FACILITIES

FAIRVIEW LOOP ROAD
SAFETY IMPROVEMENTS

INTERSECTION IMPROVEMENTS
TOGIAK AVENUE

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PARCEL D
MSB PLAT WAIVER 83-86-PWm
PLAT NO. 83-172W
SE1/4 SE1/4 SE1/4
DEED GRANTING LIFE ESTATE, BK. 418, PG. 192

CURVE DATA
PI = STA 4+29.39
N = 136520.35
E = 434146.73
Δ = 21°34'18"
R = 1400.00
T = 266.70
L = 527.09

PRESCRIPTIVE EASEMENT
0.23 AC, SEE SHT 54

33' SEC. LINE ESMT.

SOUTH COTTEN DRIVE

ROW DEDICATED BY
PLAT NO. 70-22
RECORD WIDTH 30'
COMPUTED WIDTH 28'±

MATCH LINE STA 11+00

60' ROADWAY & UTILITY EASEMENT (30' EACH SIDE OF CENTERLINE) PER PLAT NO.

CURVE DATA
PI = STA 11+18.52
N = 136782.22
E = 434790.98
Δ = 20°19'53"
R = 850.00
T = 152.41
L = 301.62

1A

33' PUBLIC ROADWAY ESMT., BK. 80, PG. 749

COMPUTED POSITION SEC. COR. (SEE NOTE 26, SHT 56)

33' GAS ESMT. BK 334 PG 471

20' DRAINAGE EASEMENT AND 20' GAS ESMT. BK 334 PG 468

33' GAS ESMT. BK 334 PG 471

PRESCRIPTIVE EASEMENT 0.17 AC, SEE SHT 54

15' MEA ESMT. BK 192 PG 451

UNIT NO. 1
CANDYWINE SUBD.

INTERSECTION IMPROVEMENTS -- COTTEN DRIVE (1 OF 2)

CURVE DATA
PI = STA 11+18.52
N = 136782.22
E = 434790.98
Δ = 20°19'53"
R = 850.00
T = 152.41
L = 301.62

MATCH LINE STA 11+00

LINES OF 70-22

IMPERIAL ACRES SUBDIVISION
PLAT NO. 78-130
2A

3A

5' POWERLINE EASEMENT

PRESCRIPTIVE EASEMENT CLAIMED FOR EXISTING ROAD 0.05 AC, SEE SHT 54

TRACT 6

30' ROADWAY & UTILITY EASEMENT

CURVE DATA
PI = STA 20+38.04
N = 137405.03
E = 435471.81
Δ = 40°16'53"
R = 1000.00
T = 366.75
L = 703.04

MATCH LINE STA 21+00

6

ASPHALT LIMIT
CUT SLOPE LIMIT
FILL SLOPE LIMIT
ROW CURRENTLY IN ACQUISITION
ROW NEEDED FOR INTERSECTION IMPROVEMENTS

SHEET NO.	TOTAL SHEETS
1	1
STATE	YEAR
ALASKA	2014

PROJECT DESIGNATION

ADDENDUM NO.

ATTACHMENT NO.

REVISIONS

NO.	DATE	DESCRIPTION

STATE OF ALASKA 49TH
Name
License #
REGISTERED PROFESSIONAL ENGINEER

R&M CONSULTANTS, INC.

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
FAIRVIEW LOOP ROAD SAFETY IMPROVEMENTS

INTERSECTION IMPROVEMENTS
COTTEN DRIVE

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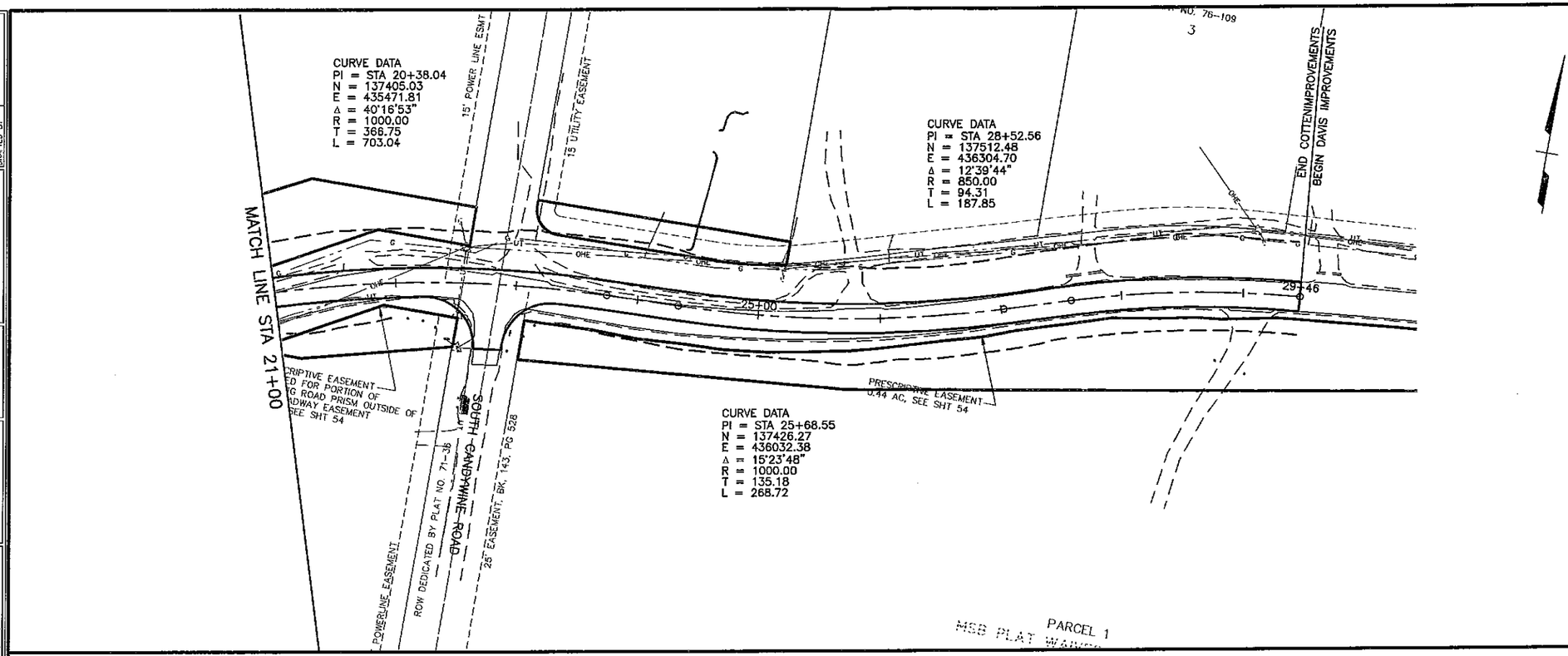

INTERSECTION IMPROVEMENTS -- COTTEN DRIVE (2 OF 2)

SHEET NO.	TOTAL SHEETS
2	2
STATE	YEAR
ALASKA	2014

PROJECT DESIGNATION

ADDENDUM NO.

ATTACHMENT NO.

REVISIONS

NO.	DATE	DESCRIPTION

ASPHALT LIMIT

CUT SLOPE LIMIT

FILL SLOPE LIMIT

ROW CURRENTLY IN ACQUISITION

ROW NEEDED FOR INTERSECTION IMPROVEMENTS

STATE OF ALASKA 49TH
Name
License #
REGISTERED PROFESSIONAL ENGINEER

R&M CONSULTANTS, INC.

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

FAIRVIEW LOOP ROAD SAFETY IMPROVEMENTS

INTERSECTION IMPROVEMENTS COTTEN DRIVE

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LAYOUT
COTTEN 2

DATE TIME
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SHEET NO.	TOTAL SHEETS
1	1
STATE	YEAR
ALASKA	2014

PROJECT DESIGNATION

ADDENDUM NO.

ATTACHMENT NO.

REVISIONS

NO.	DATE	DESCRIPTION

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DATE TIME
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INTERSECTION IMPROVEMENTS -- DAVIS ROAD (1 OF 2)

END COTTEN IMPROVEMENTS
BEGIN DAVIS IMPROVEMENTS

CURVE DATA
PI = STA 3+95.50
N = 137554.40
E = 436792.67
Δ = 1°52'48"
R = 10000.00
T = 164.08
L = 328.12

CURVE DATA
PI = STA 10+22.35
N = 137587.54
E = 437418.68
Δ = 18°32'47"
R = 850.00
T = 138.78
L = 275.14

15' UTILITY EASEMENT

MATCH LINE STA 12+00

HYCE PROPERTY
PLAT NO. 2004-43

PUBLIC ACCESS EASEMENT, BK 266, PG 69

EAST KIBBY DRIVE

EAST ROW LINE KIBBY DRIVE PER McNEESE SUBD. ADD. NO. 3

POR. SW1/4 SE1/4 SEC. 13

DEED EXCEPTION SEE NOTE 18, SHT 56

MATCH LINE STA 24+00

CURVE DATA
PI = STA 14+47.29
N = 137744.70
E = 437816.10
Δ = 14°17'41"
R = 850.00
T = 106.59
L = 212.07

QC DEED TO STATE OF ALASKA, INST. NO. 2004-023866-0

PRESCRIPTIVE EASEMENT 0.58 AC. SEE SHT 54

PRESCRIPTIVE EASEMENT 0.03 AC. SEE SHT 54

PRESCRIPTIVE EASEMENT 0.46 AC. SEE SHT 54

SOUTH DAVIS ROAD

PARCEL 1
MSB PLAT WAIVER 2004-203

PARCEL A
MSB PLAT WAIVER

ASPHALT LIMIT

CUT SLOPE LIMIT

FILL SLOPE LIMIT

ROW CURRENTLY IN ACQUISITION

ROW NEEDED FOR INTERSECTION IMPROVEMENTS

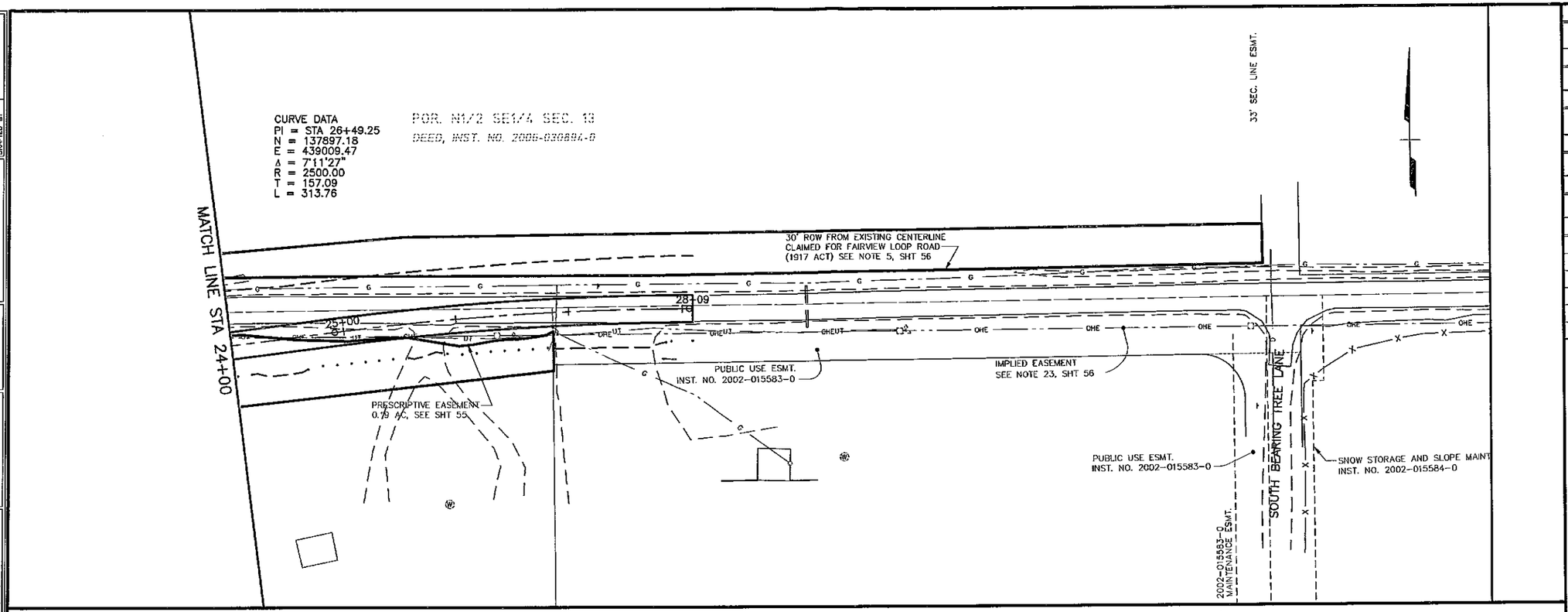
STATE OF ALASKA
49TH
Name
License #
REGISTERED PROFESSIONAL ENGINEER

R&M CONSULTANTS, INC.

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

FAIRVIEW LOOP ROAD SAFETY IMPROVEMENTS

INTERSECTION IMRPROVEMENTS DAVIS ROAD



INTERSECTION IMPROVEMENTS -- DAVIS ROAD (2 OF 2)

SHEET NO.	TOTAL SHEETS
2	2
STATE	YEAR
ALASKA	2014

PROJECT DESIGNATION

ADDENDUM NO.

ATTACHMENT NO.

REVISIONS

NO.	DATE	DESCRIPTION

ASPHALT LIMIT

CUT SLOPE LIMIT

FILL SLOPE LIMIT

ROW CURRENTLY IN ACQUISITION

ROW NEEDED FOR INTERSECTION IMPROVEMENTS

STATE OF ALASKA 49TH
Name
License #
REGISTERED PROFESSIONAL ENGINEER

R&M CONSULTANTS, INC.

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

FAIRVIEW LOOP ROAD SAFETY IMPROVEMENTS

INTERSECTION IMPROVEMENTS DAVIS ROAD

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DRAFTED BY

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SCALE

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DATE TIME
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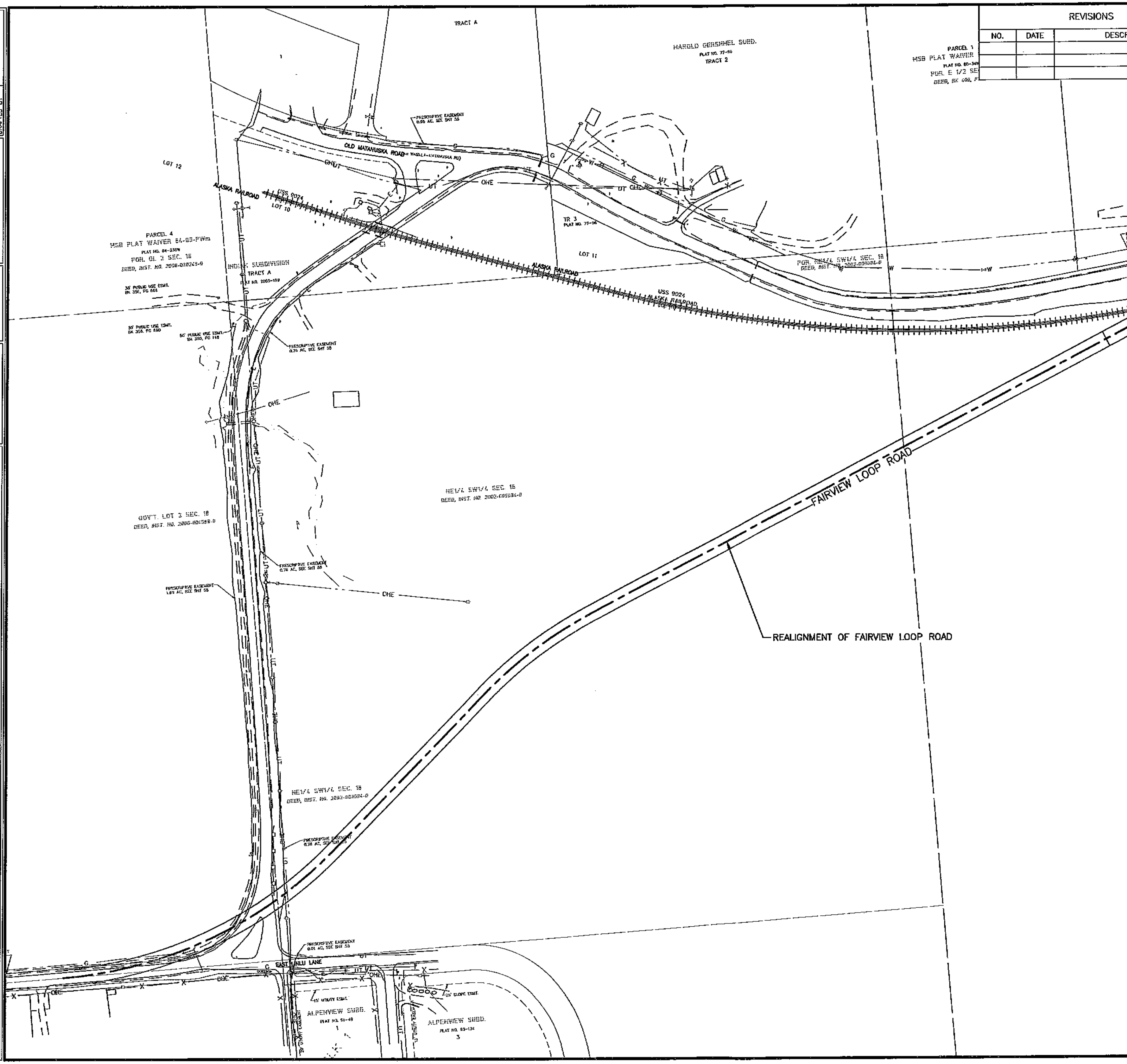

REVISIONS			STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
NO.	DATE	DESCRIPTION	ALASKA		2014		

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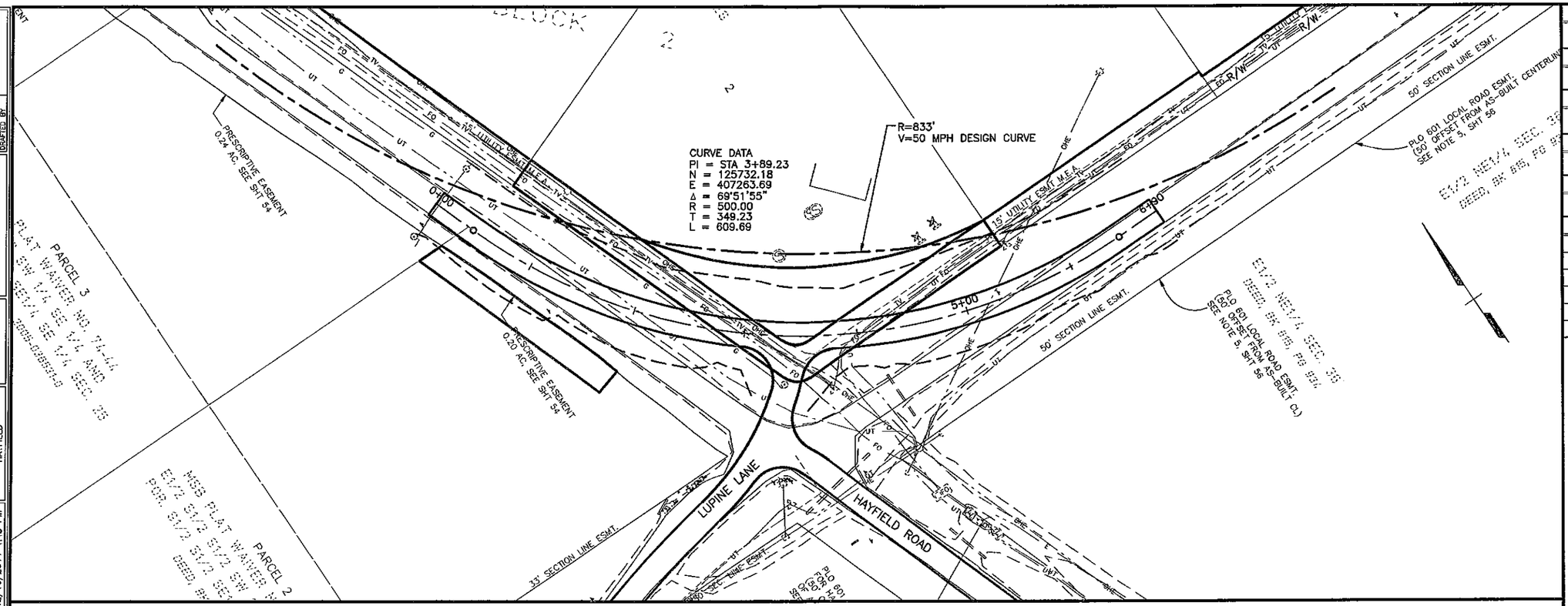
STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION
AND PUBLIC FACILITIES

FAIRVIEW LOOP ROAD
SAFETY IMPROVEMENTS

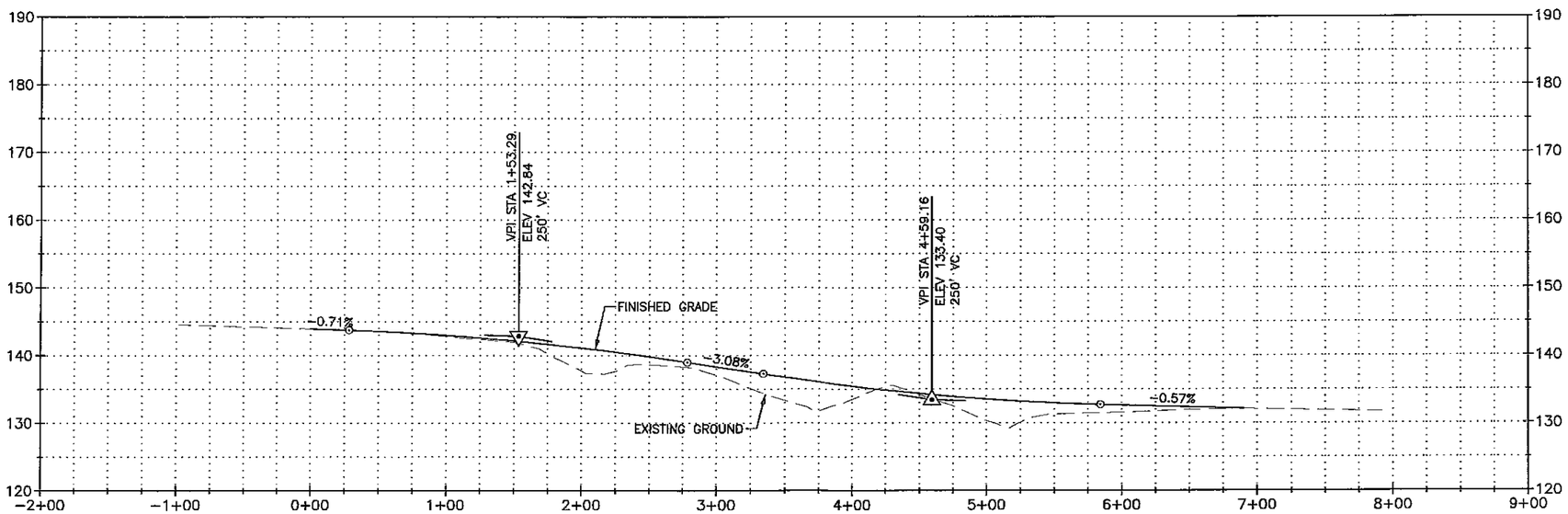
INTERSECTION IMPROVEMENTS
OLD MATANUSKA HIGHWAY

STATE OF ALASKA 49TH Name License # REGISTERED PROFESSIONAL ENGINEER

R&M CONSULTANTS, INC.



INTERSECTION IMPROVEMENTS -- HAYFIELD ROAD & LUPINE LANE



SHEET NO.	TOTAL SHEETS
1	1
STATE	YEAR
ALASKA	2014

PROJECT DESIGNATION

ADDENDUM NO.

ATTACHMENT NO.

REVISIONS

NO.	DATE	DESCRIPTION

ASPHALT LIMIT

CUT SLOPE LIMIT

FILL SLOPE LIMIT

ROW CURRENTLY IN ACQUISITION

ROW NEEDED FOR INTERSECTION IMPROVEMENTS

STATE OF ALASKA 49TH
Name
License #
REGISTERED PROFESSIONAL ENGINEER

R&M CONSULTANTS, INC.

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION
AND PUBLIC FACILITIES

FAIRVIEW LOOP ROAD
SAFETY IMPROVEMENTS

INTERSECTION IMPROVEMENTS
HAYFIELD RD & LUPINE LN

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SCALE

LAYOUT
HAYFIELD

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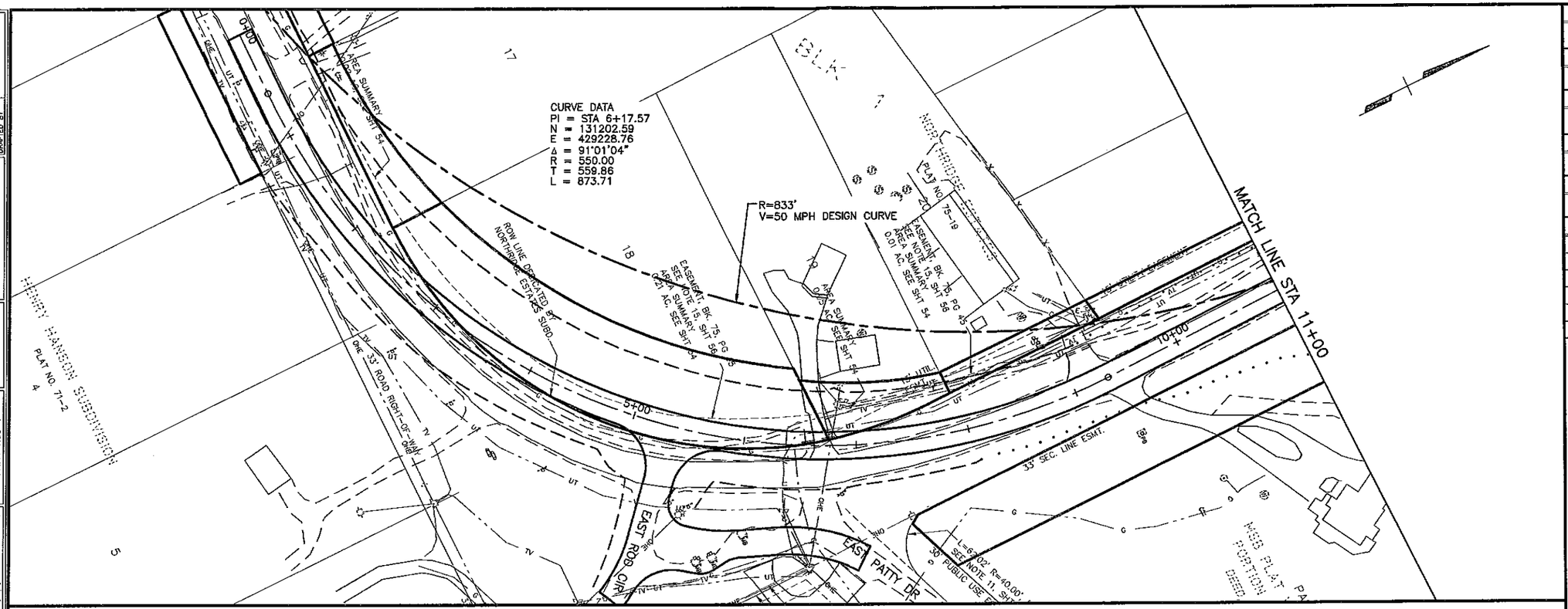
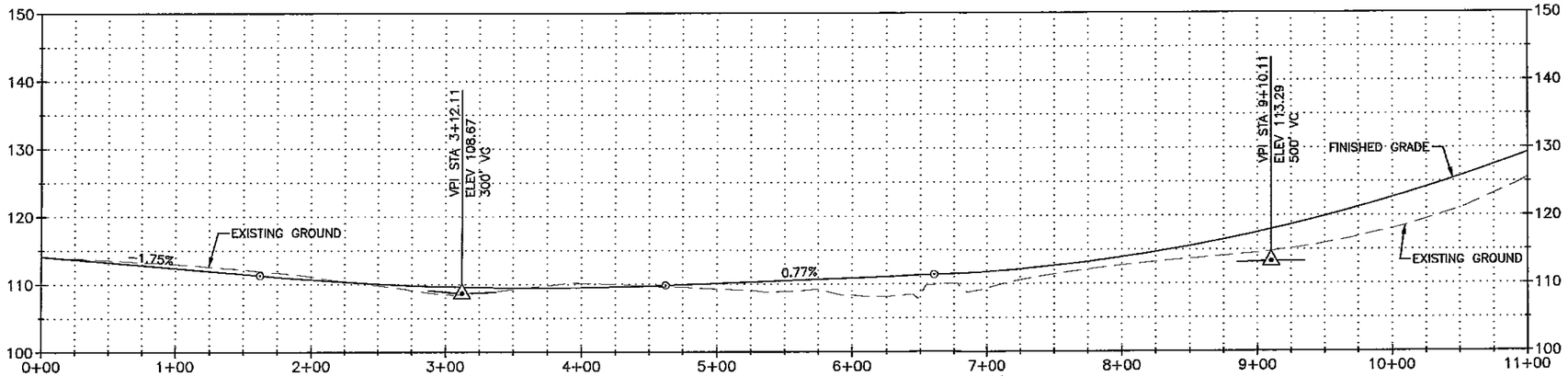


INTERSECTION IMPROVEMENTS -- PATTY DRIVE & E ROD CIRCLE (1 OF 2)



SHEET NO.	TOTAL SHEETS
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ALASKA	2014

PROJECT DESIGNATION

ADDENDUM NO.

ATTACHMENT NO.

REVISIONS

NO.	DATE	DESCRIPTION

ASPHALT LIMIT

CUT SLOPE LIMIT

FILL SLOPE LIMIT

ROW CURRENTLY IN ACQUISITION

ROW NEEDED FOR INTERSECTION IMPROVEMENTS

STATE OF ALASKA 49TH Name License # REGISTERED PROFESSIONAL ENGINEER

R&M CONSULTANTS, INC.

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

FAIRVIEW LOOP ROAD SAFETY IMPROVEMENTS

INTERSECTION IMPROVEMENTS PATTY DRIVE & E ROD CIRCLE

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QA/QC BY

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SCALE

LAYOUT
PATTY ROD 1

DATE TIME
12/10/2014 4:43 PM

DRAWING LOCATION
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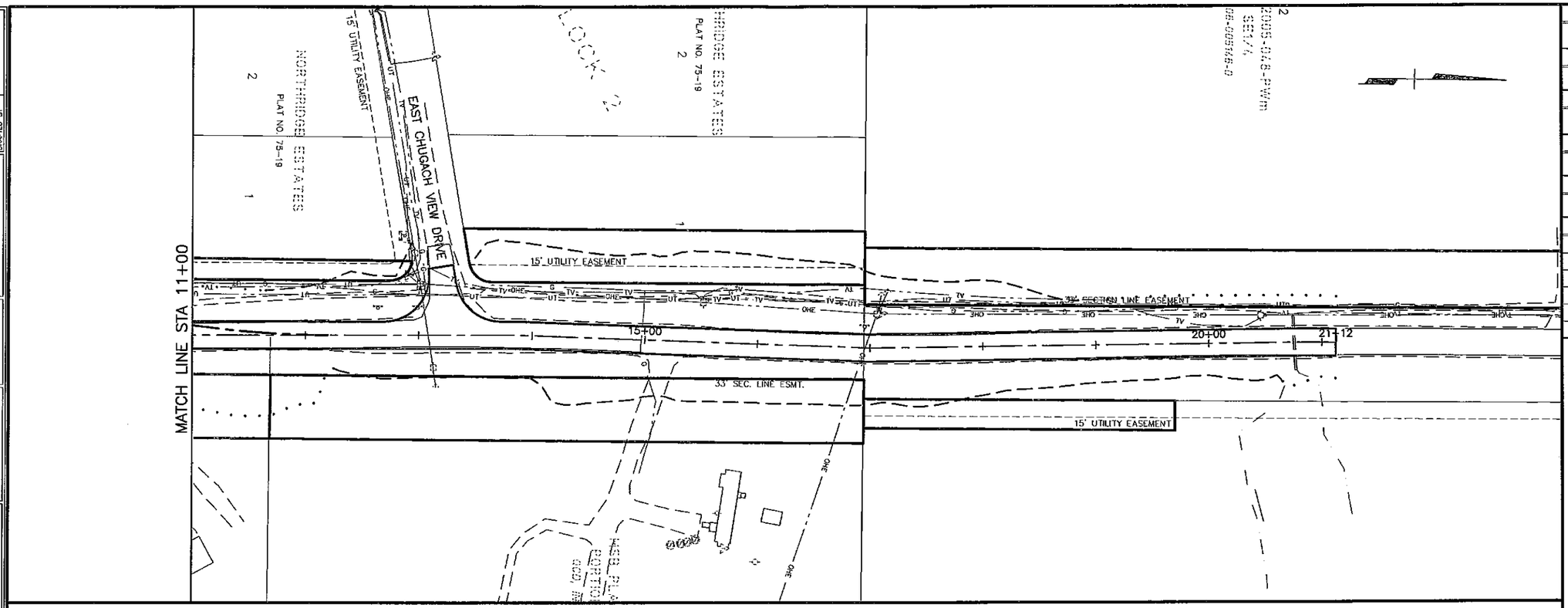
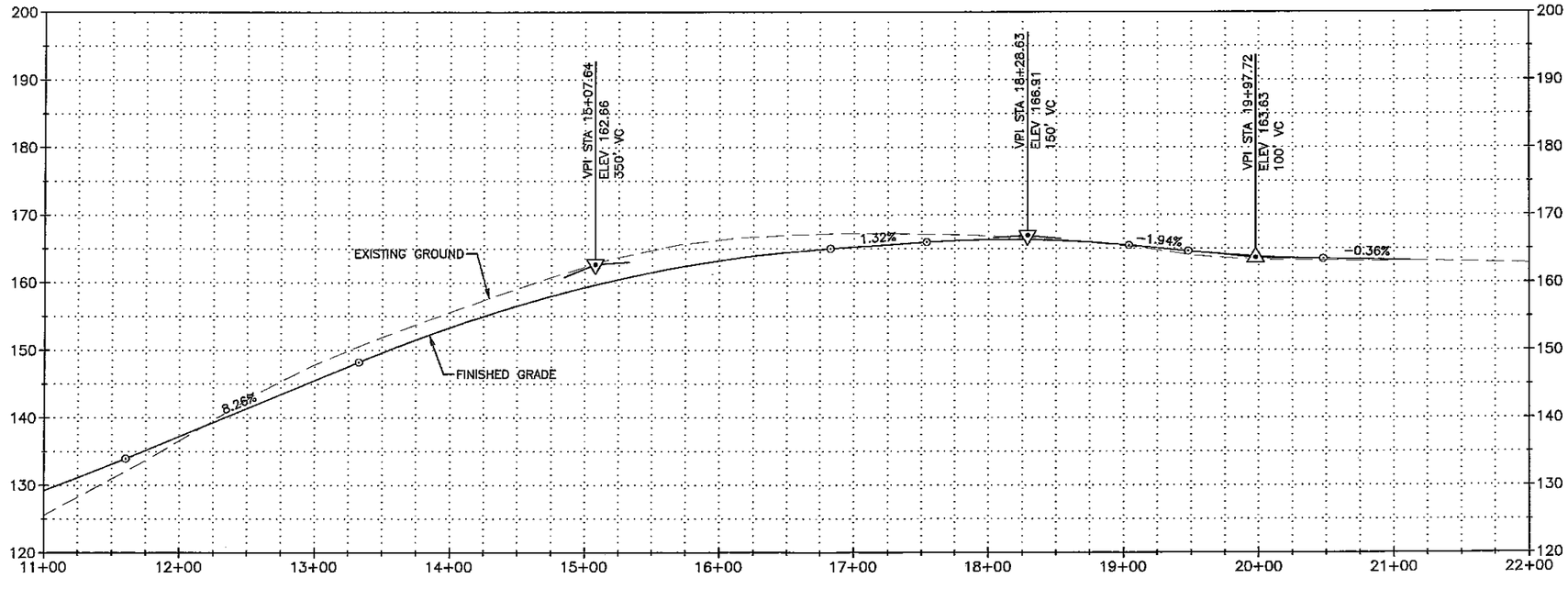


INTERSECTION IMPROVEMENTS -- PATTY DRIVE & E ROD CIRCLE (2 OF 2)



SHEET NO.	TOTAL SHEETS
2	2
STATE	YEAR
ALASKA	2014

PROJECT DESIGNATION

ADDENDUM NO.

ATTACHMENT NO.

REVISIONS

NO.	DATE	DESCRIPTION

ASPHALT LIMIT

CUT SLOPE LIMIT

FILL SLOPE LIMIT

ROW CURRENTLY IN ACQUISITION

ROW NEEDED FOR INTERSECTION IMPROVEMENTS

STATE OF ALASKA 49TH — Name — License # — REGISTERED PROFESSIONAL ENGINEER

R&M CONSULTANTS, INC.

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

FAIRVIEW LOOP ROAD
SAFETY IMPROVEMENTS

INTERSECTION IMPROVEMENTS
PATTY DRIVE & E ROD CIRCLE

DESIGNED BY
DRAWN BY
CHECKED BY
DRAFTED BY

XREFS

SCALE

LAYOUT
PATTY ROD 2

DATE/TIME
12/10/2014 4:44 PM

DRAWING LOCATION
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APPENDIX G

Railroad Crossing Checklist

State of Alaska
Department of Transportation and Public Facilities

RAILROAD CROSSING ENGINEER'S CHECKLIST

RR MP	Road name	Road MP	Cross Street/Intersection	Dist From:
156.20	FAIRVIEW LOOP ROAD	1.029	OLD MATANUSKA RD	150' S

Federal Crossing #	Nearest Community	Max Train Speed	Roadway Posted Speed
868315 D	WASILLA AK	35 mph	50 mph

Road Ownership	Location notes:
DOT & PF	VEGETATION LIMITING SIGHT DISTANCE FROM FAIRVIEW

	Name	State#	Federal#
PROJECT	FAIRVIEW LOOP PATHWAY AND SAFETY IMPROVEMENTS	52020	N/A

[ ] **NO RAILROAD CROSSINGS ARE AFFECTED BY THIS ROAD PROJECT.**

OR **SELECT THE SCHEDULE OF WORK FOR THE AFFECTED RAILROAD CROSSING:**

[ ] **All crossing devices work will be completed before road work begins.**

[X] **Crossing devices work will be concurrent with road work. Railroad notified.**

CHECK FORMS APPLICABLE TO EACH CROSSING AND ATTACH THEM

1 [X] **SIGHT DISTANCE TRIANGLES: All Locations**
See ADVANCE WARNING SIGNS page. ALWAYS ATTACH. Form 1.

2 [X] **ADVANCE WARNING SIGNS: All Locations**
See ADVANCE WARNING SIGNS page. ALWAYS ATTACH. Form 2.

3 [ ] **PASSIVE DEVICES: Signs & Markings Only**
See PASSIVE DEVICES page. Attach if no lights or gates at this crossing. Form 3.

4 [X] **ACTIVE DEVICES: Flashing Lights & Gates**
See ACTIVE DEVICES page. Attach if there are lights or gates. Form 4.

5 [X] **PAVEMENT MARKINGS: 40 MPH or greater**
See PAVEMENT MARKINGS page. Attach only where markings used. Form 5.

6 [ ] **PATHWAY SIGNS or MARKINGS**
See PATHWAY page. Attach if path signs and/or markings used. Form 6.

Field inspected by: DAVID CARLSON

On this date: 9 (Month) / 9 (Day) / 2015 (Year)

Engineer's Approval: LANCE W. DEBERNARDI (Printed name)

X [signature]

Date: 9 / 10 / 2015

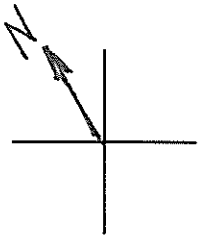
Notes: This form compiled from ATM & 2009 MUTCD requirements by Traffic & Safety in 2015. This list does NOT address Temporary Traffic Control. All references are to sections of the 2009 MUTCD and the Alaska Traffic Manual Supplement (ATM).

SIGHT TRIANGLES

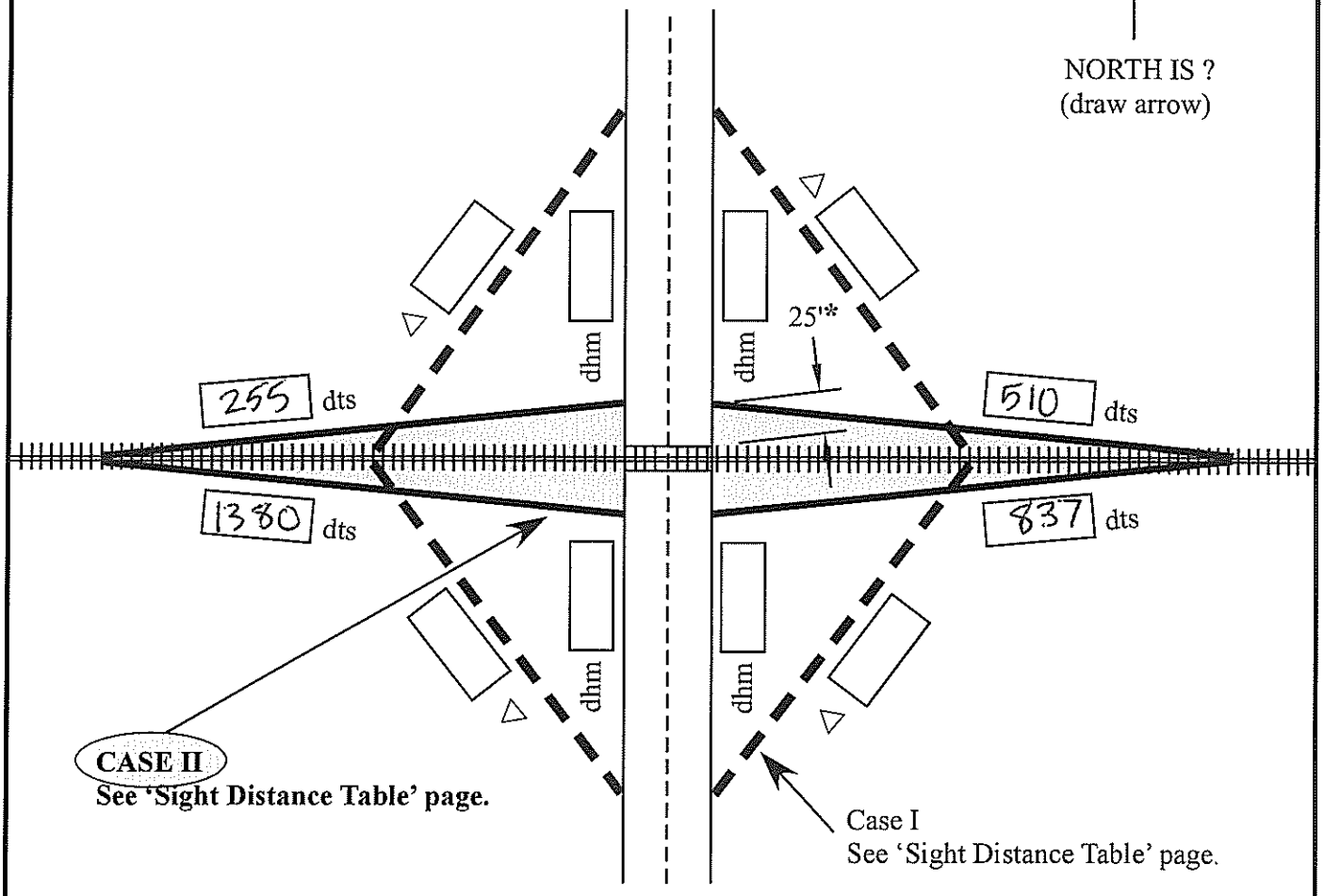
Is a Diagnostic Team (DT) Review on file? Yes No (ask Traffic & Safety)

Roadway Posted Speed 50 **Maximum Approved Train Speed** 35

See following page 'Sight Distance Table' for value of **dhm**, then:
Measure sight triangle from road shoulder, or Edge of Traveled Way, to Nearest Rail, using a hand held laser or range finder.
See 'Sight Distance Tables' page for **dts**, **dhm**.



NORTH IS ?
(draw arrow)



*25 ft. = Stopped Condition for motorist, measured from the nearest rail. This will normally be 10 ft. back from the STOP bar or the Crossbuck Sign.

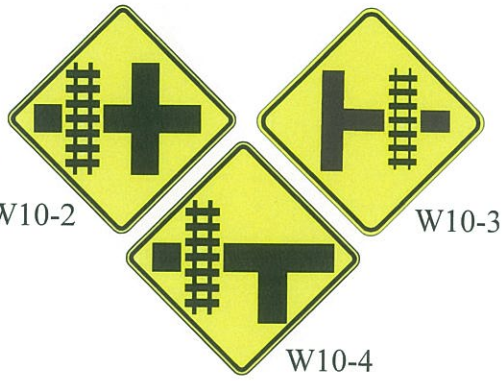
All distances in feet.
DO NOT WALK along tracks or measure along RR Right of Way.
ALL measurements can be taken from road shoulder.

ADVANCE WARNING SIGNS
TYPICALLY REQUIRED

See the bottom of this page for the few exceptions to using Railroad Advance Warning Signs.

	bound	bound	ROAD APPROACH DIRECTION
			Checklist:
8B.06 AK Policy	☑	☑	**Advance warning sign (W10-1), is almost always used unless adjacent parallel roadway is less than 100 ft away;**
8B.06	☐	☐	**THEN use W10-2, 3 or 4 series warning sign, with the correct;**
8B.06	☐	☐	**W10-11 series distance sign on the same post. These are always used with the W10-2, 3 or 4 signs**
Std.Dwg S-30.03	☑	☑	**Frangible post base, or maximum of 2.5" PST post**
8B.21	☐	☐	**No train horn sign if in a Quiet Zone, ARR MP 104 to 114, (Oceanview Dr. to 30th Ave.)**
8B.28 AK Policy	☐	☐	**Low grade clearance (graphic) sign (and text sign for 3 years), if crossing vertical profile could hang up long vehicles**
8B.06	☑	☑	**Advance warning sign(s) placed sufficiently in advance, see Table 2C-4, attached**
8B.10	☐	☐	**Tracks out of service sign, for tracks that are not in use, but not removed from roadway**
8C.12	☐	☐	**If a roundabout is within 200 ft, was a design study done, to review queuing to the tracks?**

W10-1


W10-2 W10-3 W10-4

W10-11a

W10-9P


W10-5

W10-5P

R8-9

W10-series, Railroad Advance Warning Signs may ONLY be omitted:
1) On low-speed low-volume roads where users are advised by personnel on the ground when not to enter the crossing,
2) In business or commercial areas where active devices are in use,
3) Or where physical conditions do not permit an even partially effective display of the signs.

All references are to the ATM & 2009 Manual on Uniform Traffic Control Devices.

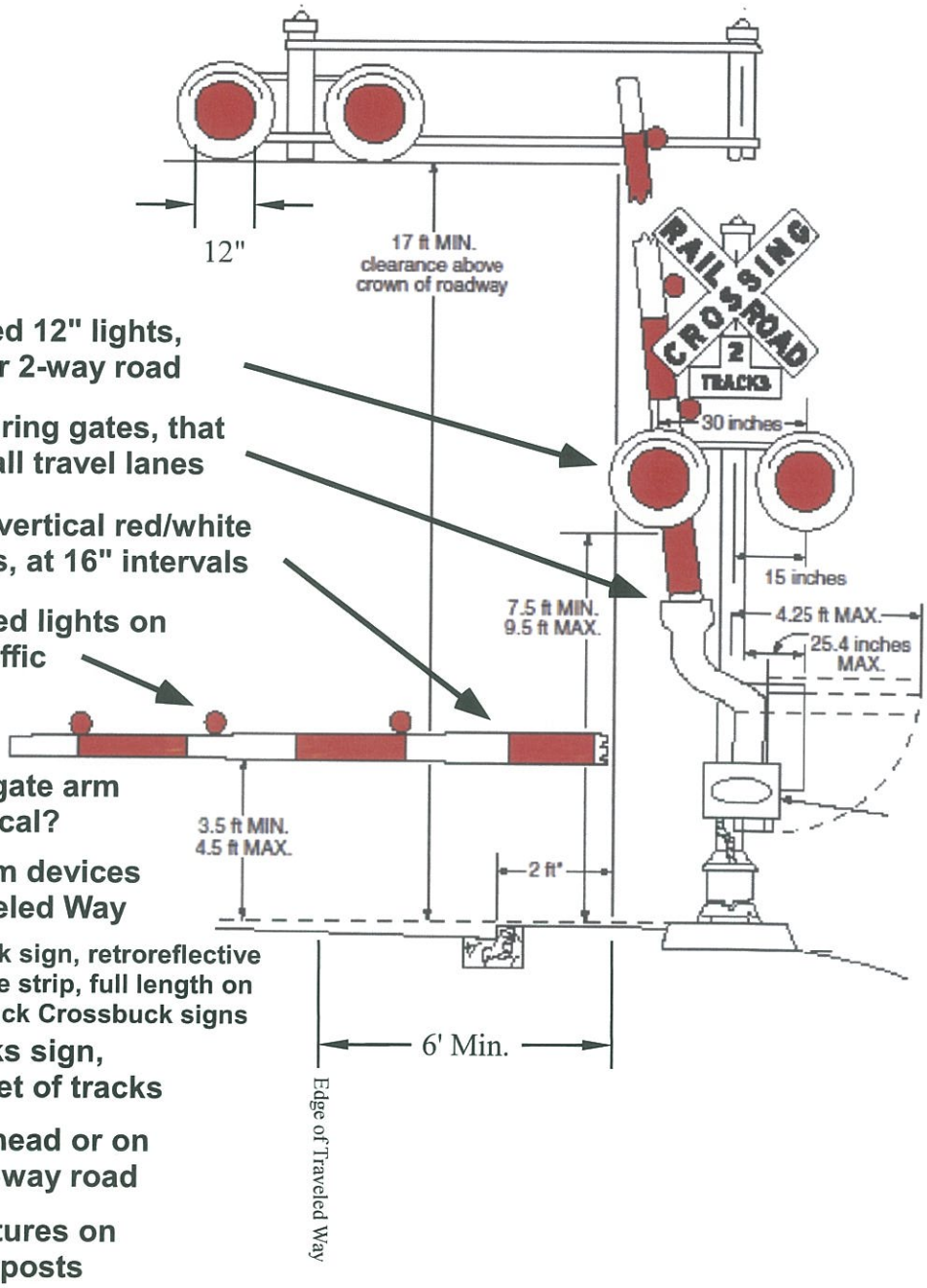
ACTIVE DEVICES
Flashing Lights & Gates

bound bound

ROAD APPROACH DIRECTION →

Checklist:

8C.04	☑	☑	Dual flashing red 12" lights, back to back for 2-way road
8C.04	☑	☑	Automatic lowering gates, that extend across all travel lanes
8C.04	☑	☑	Retroreflective vertical red/white stripes on gates, at 16" intervals
8C.04	☑	☑	Minimum of 3 red lights on gates facing traffic
8C.04	☑	☑	Does lowering gate arm rest nearly vertical?
	☑	☑	6' minimum from devices to Edge of Traveled Way
8B.03 8C.02	☐	☐	Railroad Crossbuck sign, retroreflective front & min. 6" wide strip, full length on back, or back to back Crossbuck signs
8C.01	☐	☐	Number of tracks sign, if more than 1 set of tracks
8C.02	☐	☐	Red lights overhead or on left side for Oneway road
8C.02	☐	☐	Overhead structures on non-breakaway posts
8B.18	☐	☐	Emergency notification sign present
8C.06	☐	☐	4 quadrant gate system used where vehicles may try to short-cut through the gates?
8C.06	☐	☐	Median barriers used between the lanes for the same reason?

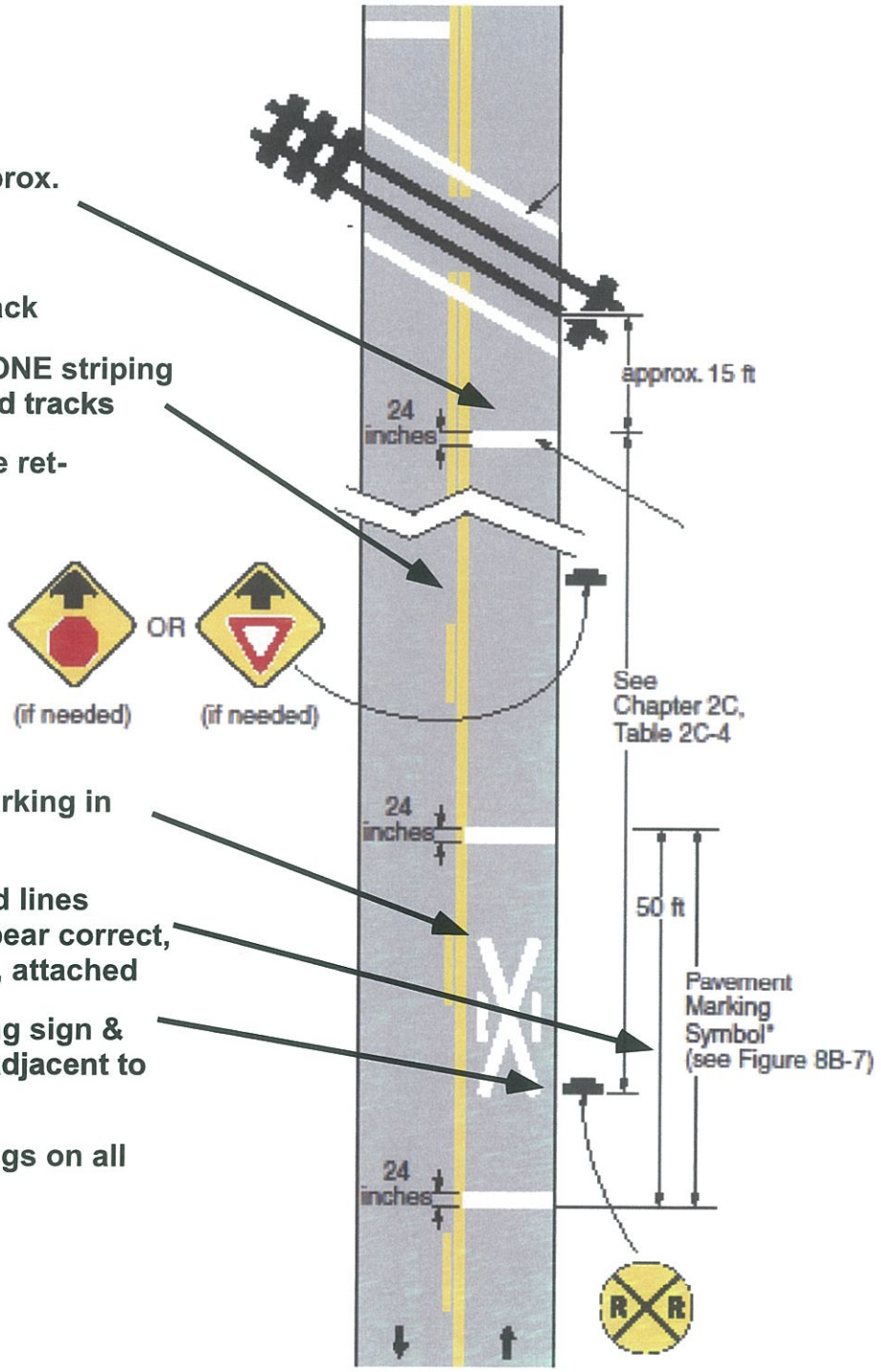


All references are to the ATM & 2009 Manual on Uniform Traffic Control Devices.

PAVEMENT MARKINGS

	bound	bound	ROAD APPROACH DIRECTION
			Checklist:
8B.28	☐	☐	**Stop Bar, at approx. 8' from gate**
8B.28	☑	☑	**OR approx. 15' from edge of track**
8B.27	☑	☑	**NO PASSING ZONE striping between "X" and tracks**
8B.27	☐	☐	**All markings are ret-roreflective**

	bound	bound	ROAD APPROACH DIRECTION
8B.27	☐	☐	**Elongated X marking in roadway**
8B.27	☐	☐	**Elongated X and lines dimensions appear correct, per Figure 8B-7, attached**
8B.06	☐	☐	**Advance warning sign & Elongated "X" adjacent to each other**
8B.27	☐	☐	**Identical markings on all approach lanes**

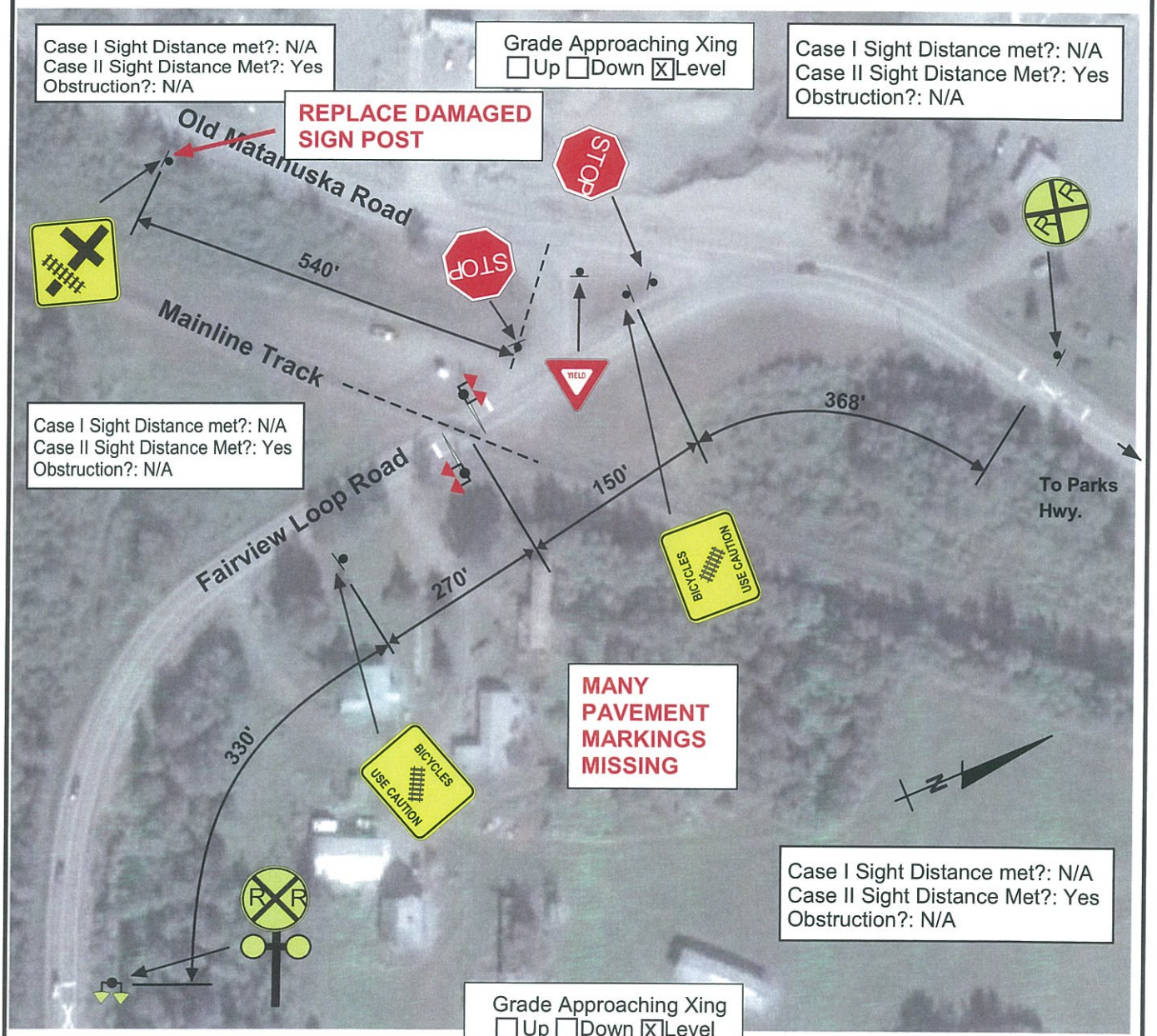


All references are to the ATM and 2009 Manual on Uniform Traffic Control Devices.

#41

State of Alaska DOT/PF Central Region
Railroad Crossing Inventory Form

Crossing ID #: **868315D**	Road Name: **Fairview Loop Road**	Date of Last Inventory: **7/26/2012**
RR Milepoint: **156.20**	CDS Route #: **170028**	Inventory By: **LH/BA**
Maximum Train Speed: **35 MPH**	CDS Milepoint: **1.029**	Highway Surface: **Paved**
Crossing Surface: **Rubberized**	Posted Highway Speed: **50 MPH**	State Highway System: **Yes**



Case I Moving Vehicle Sight Distance	
Highway	**N/A**
Tracks	**N/A**

Case II Stopped Vehicle Sight Distance	
Highway	**25'**
Tracks	**840'**

Traffic Control Device Key

- Cantilever Railroad Signal
- Cantilever Railroad Signal with Gate
- Post-Mounted Railroad Signal
- Post-Mounted Railroad Signal with Gate
- Advance Flasher with Sign
- Highway Sign
- Rubberized Crossing Surface
- Asphalt Crossing Surface
- Wood Plank Crossing Surface