



Montana Department of Transportation

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Memorandum

To: Lesly Tribelhorn, PE
Highways Engineer
From: Shane Stack, PE
Missoula District Preconstruction Engineer
Date: Date Submitted to Engineer.
Subject: STPS 263 - 1(28)6
West of Missoula - NW
UPN 6141000
Work Type 140 - Reconstruction - without added capacity

Please approve the attached Preliminary Field Review Report.

Approved _____ Date _____
Lesly Tribelhorn, PE.
Highways Engineer

We are requesting comments from those on the distribution list. We will assume their concurrence if we receive no comments within two weeks of the approval date.

Distribution:

- Ed Toavs, Missoula, District Administrator
Kent Barnes, Bridge Engineer
Lesly Tribelhorn, Highways Engineer
Roy Peterson, Traffic and Safety Engineer
Robert Stapley, Right-of-Way Bureau Chief
Tom Martin, Environmental Services Bureau Chief
Lynn Zanto, Rail, Transit, & Planning Division Administrator
Kevin Christensen, Construction Engineer
Matt Strizich, Materials Engineer
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cc:

- 35T EPS Project Manager, Missoula District
Missoula County Commissioners
Courthouse - 200 West Broadway
Missoula, MT 59802-4292

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Preliminary Field Review Report

STPS 263 – 1(28)6, West of Missoula - NW, UPN 6141000

EPS Project Manager:

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Introduction

An onsite field review was held on July 14th, 2014. The following people attended:

Ben Nunnallee, Missoula District Projects Engineer - Missoula
Donny Pfeifer, Missoula Design Manager – Missoula
Shane Stack, Missoula District Preconstruction Engineer - Missoula
K.C. Yahvah, District Hydraulics Engineer - Helena
Darin Reynolds, Pavement Engineer - Helena
Wayne Noem, Secondary Roads Engineer - Helena
Glen Cameron, Traffic Engineer – Missoula
Chris Harden, Bridge Engineer – Helena
Bill Squires, Missoula District Area Engineer - Helena
Angie Zanin, Missoula Transportation Planning – Helena
Darrin Reynolds – Pavement Project Engineer - Helena
Jim Davies – Pavement Analysis Engineer - Missoula
Josh Dold – Missoula Design Supervisor - Helena

Proposed Scope of Work

The proposed project has been nominated and programmed to improve the driving surface and safety by widening the roadway shoulders, flattening the side slopes, improving the horizontal and vertical alignments, and upgrading the clear zone. The updating of guardrail, pavement markings, signing, and fencing will also be included. It is believed that these improvements will reduce the crash rate and crash severity on this road. The project will require full pavement reconstruction the entire length. The project will likely require the relocation and/or removal of irrigation canals and privately owned structures that closely parallel the roadway.

Needs and Objectives

The purpose of this project is to improve the roadway surface and provide a safer road. This road has substandard roadway width, roadway side slopes, and horizontal/vertical alignments. The road has a growing traffic demand, and although the ADT has declined since 2009 it is expected to double in the next 20 years. The reduction in traffic volumes are partially due to the closing of the paper mill that is located on the western end of this project. Traffic studies suggest that improvement of these roadway features will greatly decrease crashes and improve the safety of the road.

Project Location and Limits

This project is located in Missoula County, beginning on S-263 RP 5.5, which is just west of the intersection with Deschamp's Ln. The beginning of the project English calculated station is 481+56.8 (FAS 10 B (1)). The project extends west to RP 10.6 just past intersection of S-263 (Mullan Road) with S-474 (Pulp Mill Road), English As-Built station 216+28.2 (FAS 10 B (1)). This segment of road is located in Township 41 N, Range 20 W (Sections 4 and 5); Township 14 N, Range 21 W (Sections 30, 31, and 32); and Township 14 N, Range 21 W (Sections 13, 24, and 25).

Secondary 263 is functionally classified as a Rural Collector Road. The geometric design criteria for Rural Collector Roads (Secondary System) will be used.

The proposed project alignment and stationing will begin at 10+00 near RP 10.6 and increase as the project extends east.

Work Zone Safety and Mobility

At this time, Level 2 construction zone impacts are anticipated for this project as defined in the Work Zone Safety and Mobility (WZSM) guidance. The plans package will include a Transportation Management Plan (TMP) consisting mainly of a Traffic Control Plan (TCP). A Public Information (PI)

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component to address public notification during construction will also be included in the plan package. These issues are discussed in more detail under the Traffic Control and Public Involvement sections.

Physical Characteristics

The existing terrain of the project is level. The project begins at the RP 5.5 and continues west to RP 10.6, where S-263 intersects with S-474. The roadway currently has two – 12' travel lanes and no shoulders. The roadway travels through residential and farm land. The existing side slopes through much of the section are steep with fairly deep ditches. Irrigation ditches parallel close to the roadside from RP 7.3 to RP 9.3.

The As-Built plans show that the project is stationed from West to East which is the opposite direction that the RP's run. Previous As-Built from FAS 10-B(1) constructed in 1939 provide horizontal and vertical curve information between RP 10.6 and 9.3. Also, a small reversing curve project built in conjunction with the construction of a substation in 1985 (STPHS 263 1(10)9 provides geometry information from RP 9.18 to RP 9.41. However, no As-Built information can be found from RP 9.18 to 5.5, which is a majority of the stretch of road. S-263 (Mullan Road), was originally a military road and then later adopted or maintained by Missoula County prior to it becoming a State route. This long history is likely the reason As-built information is not available for much of the road. Current geometry survey of the road will be best fit to what is currently in place.

A 60 mph design speed is recommended for Rural Collector Roads with level terrain. From the available As-Built information, the maximum grade on this section of roadway is 0.62%.

Surfacing inslopes are 5:1 with steep adjacent fill and cut slopes. There is guardrail located intermittently throughout the project length. The paved width consists of two 12.0' travel lanes with no shoulders.

RP 10.6 – 9.18

From the As-built information there are eight vertical curves between RP 10.6 and RP 9.18. Six of the curves do meet current design standards.

PI Station	Curve Type	G ₁ (%)	G ₂ (%)	Length (ft)	Minimum Length (ft)
205+00	Crest	0.06	-0.06	200	151
215+00	Sag	-0.06	0.28	600	136
225+00	Crest	0.28	0.06	300	151
239+00	Crest	0.06	-0.62	200	151
244+00	Sag	-0.62	-0.09	200	136
254+40	Sag	-0.09	0.03	200	136
284+21	Crest	0.30	-0.40	150	151
290+21	Sag	-0.40	0.29	100	136

There are four horizontal curves between RP 10.6 and 9.18. The design super elevation could not be determined from the as-built information. The horizontal curve at station 249+74.3 has a radius that does not meet the current standards.

PI Station	Radius (ft)	As-Built Super (%)	Required Super (%)	Design Speed Provided (mph)
209+99.0	5730	?	3	60
249+74.3	1146	?	8	55
280+27.7	1041*	?	8	55
285+44.5	1041*	?	8	55

*Curves are reversing curves with an approx. 100' tangent in between.

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RP 9.18 – 5.5

Due to the lack of as-built plans, the horizontal and vertical alignment geometry for this section of road is not known. The existing geometry will be re-created using a “best-fit” method to the existing centerline once the survey is completed.

Traffic Data

RP 5.5 to RP 10.6

2008 AADT	= 2,140 Present
2021 AADT	= 2,730 Letting Year
2041 AADT	= 5,430 Design Year
DHV	= 650
T	= 6.8%
EAL	= 155 Daily

Crash Analysis

As requested, a safety analysis was completed on a portion of *Secondary 263* from reference posts 5.5 to 10.6 for the 10-year period *January 1, 2003 to December 31, 2012*. Out of the 121 crashes there were 3 fatal crashes and 36 injury crashes. 97 of the 121 crashes were non-intersection related.

In general, the entire portion of Secondary 263 is performing at a Level of Service of Safety (LOSS) IV. This LOSS boundary indicates a high potential for crash reduction. However, the project contains two distinct segments when performing Safety Performance Function calculation. Segment 1 from RP 5.5 to 8.05 and Segment 2 from RP 8.05 to 10.6. Segment 1 is performing at a LOSS III for severe crashes (fatal and injury), but it is performing at a LOSS IV for roadway departure crashes, as well as, severe road departure crashes. Segment 2 is performing at a LOSS IV for severe crashes, roadway departure crashes, and severe road departure crashes.

The 24 intersection crashes were evenly distributed within the project limits with no specific concentrations observed. Ten of the 24 crashes were related to left-turning conflicts at both private and public approaches within the study area.

A crash analysis was also conducted to identify crash clusters within the project area. In general there were a total of 4 crash cluster locations. The locations of the crash clusters were at RP 5.59 to 6.6, 6.9 to 7.38, 7.61 to 8.83, and 9.47 to 9.97.

- RP 5.59 to 6.6 was identified as a crash cluster in 2010 and 2012. No feasible countermeasures were identified to address a specific crash trend in this location.
- RP 6.9 to 7.38 was identified as a crash cluster in 2010, 2011, and 2012. Traffic has proposed the installation of chevrons and delineation, and a project to address this was completed in 2014 (HSIP 263 – 1(26)6, UPN 7894000).
- RP 7.61 to 8.83 was identified as a crash cluster in 2012. Traffic has proposed corridor wide signing upgrade from RP 7.0 to 10.6 to address this crash trend, and a project to address this was completed in 2014 (HSIP 263 – 1(26)6, UPN 7894000).
- RP 9.473 to 9.973 was identified as a crash cluster in 2012 and 2014. Traffic has not identified a feasible countermeasure at this location yet, but it is still under analysis.

The following recommendations were provided within the Accident Analysis Report:

- Design roadway to current standards.
- Installing centerline rumble strips

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Major Design Features

The road will be designed to comply with the Geometric Design Standards for a rural collector road. Figure 12-5 of the Montana Road Design Manual will provide geometric design criteria for project development. The project will be developed using US Customary Units.

- a. **Design Speed.** A design speed of 60 mph is appropriate for a rural collector road with level terrain. The posted speed limit on this road is 55 MPH from RP 3.5 to 9.9, 45 MPH from RP 9.9 to 10.0, and 35 MPH from RP 10.0 to 10.7. It should be noted that currently the EB traffic speed is not decreased to 35 MPH until RP 10.4. This is not consistent with the WB speed zone, the location of the S-474 stop controlled intersection, and the location of the Pedestrian crossing (RP 10.48). The project will include a traffic speed study and may provide a recommendation to relocate the EB 35 MPH speed sign to RP 10.7 or remove the speed reduction altogether.
- b. **Horizontal Alignment.** Of the known geometry there is 1 horizontal curve on this project which does not meet the minimum radius, the recommended superelevation, or both. Other horizontal curves likely do not meet the current design standard. The proposed horizontal alignment will bring all horizontal curves up to current standards.
- c. **Vertical Alignment.** All the vertical curves examined on the project meets or exceed vertical alignment criteria for a design speed of 60 mph with the exception of curve length for two of the curves. The proposed horizontal alignment will bring all horizontal curves up to current standards.
- d. **Typical Sections and Surfacing.** The present AADT of 2,140 requires a 36 foot paved width. Therefore, the minimum typical section will include two – 12.0' travel lanes with 6.0' shoulders. However, the adjacent section to the East has 8' shoulders. The MDT will consider wider shoulders if Missoula County is in favor of matching to the existing section. Also, the addition of a separated shared use path will be considered as well (See Ped/Bike/ADA section below). The determination of the final paved width will balance the need for additional width with the cost of taking/relocating the adjacent irrigation canals, right-of-way, wetlands, and other environmental concerns. Surfacing has not sent out a recommendation yet..
- e. **Geotechnical Considerations.** A geotechnical investigation will be conducted throughout the project location to determine if there are any special geotechnical considerations. Currently the concerns are that there will be locations of soft soils and high ground water. During the investigation cores will be taken along the project at intervals determined by the geotechnical engineer, at the Primrose bridge location, the O'Keefe Creek culvert location, and any other locations of large culvers which may need to be replaced.
- f. **Hydraulics.** The Hydraulics Department of MDT was contacted concerning a Location Hydraulics Study Report.

The PFR revealed that the project will have numerous conflicts with existing irrigation canals that parallel the road. In many locations the canals will likely have to be relocated in order to reconstruct the roadway.

O'Keefe creek crosses under S-263 near RP 9.8. Currently the stream flows through a battery of three old CMP's. The project will likely replace the culverts with a larger opening possibly a concrete box.

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- g. **Bridges.** There is one existing structure in the project location. The bridge structure number is S00263008+00001. The bridge is a 23' long x 28' wide steel pan bridge which allows an irrigation canal (Primrose Irrigation Canal) to flow under the roadway. The superstructure was built in 1970 and appears to have been placed on an existing concrete abutment of an unknown age. Due to the condition, age, and difficulty widening the structure it will likely be recommended to be replaced with a new bridge structure. There are a variety of pre-cast concrete structures including boxes and slabs that could be used at this location.

As noted in the Hydraulics section, a concrete box structure may replace the existing CMP's at the O'Keefe Creek crossing (RP 9.8).

- h. **Traffic.** There are two intersections that will need to be further analyzed and reconfigured. Also, as mentioned above there is a 35 MPH speed zone at the older Mill location with a pedestrian crossing. The need for the speed zone should be analyzed, and the pedestrian crossing should probably be removed.

The intersection with Deschamps Ln (RP 5.6) connects to S-263 at a very high skew angle. This intersection can be reconfigured to intersect with S-263 at a safer angle closer to 90 degrees, which will improve intersection sight distance and right turning movements.

The intersection of S-263 and S-474 (Pulp Mill Road) currently is a 3-way stop controlled T-intersection. A traffic study should be conducted to determine a safer and more efficient type of intersection. Discussion during the PFR was to either create a protected left turn lane for EB S-263 traffic turning onto S-474 or provide a roundabout intersection.

- i. **Pedestrian/Bicycle/ADA.** There currently is limited bicycle or pedestrian access on the roadway due to the narrow or non-existing shoulders. There is a pedestrian crossing at RP 10.479, which includes flashing beacons on both crossing signs. MDT does not own the signs, and they were installed when the paper mill was in operation. The mill no longer operates, and the signs and crossing will likely be removed with the project as there is no longer any need for the marked crossing. There is a short segment of shared use path on the north side of the roadway between RP 6.45 (Cavern Dr.) and RP 6.69. No other dedicated pedestrian/bicycle/ADA features currently exist on the project. The project scope does not currently include a shared use path. S-263 does have a shared use path that extends from RP 0.78 (Flynn Lane) to RP 3.46 (Cote Lane) and is located on the South side of the roadway. The existing paths will be mitigated. No new paths are planned.
- j. **Miscellaneous Features.** Fencing will be installed throughout the project due to the extension of the right-of-way. Rumble strips will be included as it was a recommendation from traffic as a means to reduce crashes.
- k. **Context Sensitive Design Issues.** No context sensitive design features are proposed.
- l. **Permanent Erosion and Sediment Control (PESC) Features.** According to the USDA, the soils in the area are a mix of Grassvalley and Xerofluvents. Grassvalley soils are nearly level and very deep. They are well drained and clayey. They are formed in glaciolacustrine deposits on lake plains. Xerofluent soils are very deep, somewhat poorly drained to well drained and are loamy or sandy. They formed in alluvium. The vegetative cover is mostly domesticated farming plants, along with pockets of grasses generally used for landscaping purposes in subdivisions. The topography is flat valley bottom near the Clarkfork River. Areas of erosion along the roadway are virtually non-existent. There are no existing control features for the purposes of erosion control.

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The local climate has an average temperature of 45.9 F, with an average rainfall of 14.13 inches and an average snowfall of 37 inches.

Other Projects

The Frenchtown SE S&C project is currently scheduled for construction during the summer of 2018. The project begins at RP 10.6 and ends at RP 14.8. The UPN for the project is 8962000.

Location Hydraulics Study Report

A Location Hydraulics Study Report will need to be prepared.

Design Exceptions

There are no known design exceptions at this point, however given the location of irrigation and homes along the corridor it is likely that there may be a design exception requested to include V-ditches instead of the 20:1 flat bottom ditches at select locations.

Right-of-Way

The existing right-of-way widths vary on the project. It is clear that additional right-of-way will be necessary to complete the construction of roadway. The current right-of-way was recently adjusted from 66' to 60' and realigned to match the existing centerline of the roadway. The documented right-of-way was likely from the early 1900's did not match what was fenced and constructed. The right-of-way was located in homes and other structures, therefore MDT staff coordinated with the County Commissioners and property owners to adjust the right-of-way to better fit what was on the ground. The estimated future right-of-way will likely be closer to 150' to 180' wide. The project is roughly 5 miles long, with an increase in width close to 100'. Using those numbers it is estimated that the project will need somewhere near 60 acres. It is estimated that the cost per acre will be around \$50,000, which will cost an estimated \$3,000,000.

Access Control

The section will likely not be considered for an access control resolution; however, there is an opportunity to eliminate/combine some access points during ROW acquisition. Access management should be addressed during the design and ROW acquisition phase of this project. Several abutting parcels in the section from RP 6.8 to RP 9.1 have multiple accesses and/or access that are very close to an adjacent parcel access. The use of limiting parcels to a single access and/or permitting joint use access will significantly reduce the number of approaches and should improve safety of the corridor.

Utilities/Railroads

Utilities - A field survey will be required to locate the overhead and underground utilities.

Railroad – There is a Montana Rail Link Line that more or less parallels the road to the North. While the trunk line never enters into the project location, there are two locations where a spur line is of interest to the project. At RP 10.07 a spur line that access the mill site crosses the highway with an at-grade crossing. Currently this crossing has automated crossing signals. At the location from RP 8.1 to 8.4 a spur line runs approximately 300' to the North of the roadway. The tracks in this location are well outside the right of way and there are no anticipated conflicts.

Maintenance Items

The project will reconstruct S-263 from RP 5.5 to RP 10.6. Maintenance will continue to complete standard maintenance activities. No additional work is planned to be completed by maintenance.

Intelligent Transportation Systems (ITS) Features

No ITS features are planned for this project.

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Experimental Features

No experimental features are planned for this project.

Survey

Initial survey was performed via aerial mapping. Additional survey information is being performed to pick up utilities, guardrail, culverts, etc.

Cadastral Survey is nearing completion and adjustments from the original Mullan Road were made through a petition process and approved by Missoula County. The new existing RW is based on the existing roadway centerline.

Public Involvement

Level C is the appropriate level of public involvement at this time and may include some or all of the following:

1. Letter of Intent and News Release explaining the project will be sent to local media and will include a department point of contact. Contact with a newspaper or papers serving the area will be established in order to develop a story and graphics that explain and illustrate the proposal. Radio and television may also be contacted.
2. Personal contacts with adjacent landowners will be made at the time of right of entry, and a preliminary right of way report will be generated.
3. Personal contacts with local officials, interest groups, and other organizations will be established.
4. A public information meeting will be held to present basic concepts and information in addition to seeking input from the public.

Environmental Considerations

The Environmental Document for this project will likely be a Categorical Exclusion. The standard environmental surveys and reports will be required (e.g., hazardous waste, waterways, wetlands, archaeological/cultural sites) and applicable environmental permits will need to be processed.

Cost Estimate

The programmed cost for construction for this project is currently \$5,806,000 (not including INF and IDC). Refined cost estimates will be developed as the project design develops.