

**Memorandum**

To: Distribution

From: Kelly Williams, P.E. *KMW*  
Consultant Design Engineer

Date: November 3, 2022

Subject: STPS 263-1(28)6  
West of Missoula - NW  
UPN 6141000  
Work Type 140 - Reconstruction – without added capacity

The Scope of Work Report for this project has been released on 11/09/2022.

We request that those on the distribution review this report and submit your concurrence within two weeks of the above date.

Your comments and recommendations are also requested if you do not concur or concur subject to certain conditions. When all the personnel on the distribution list have concurred, we will submit this report to the Preconstruction Engineer for approval.

I recommend approval:

Approved \_\_\_\_\_ Date \_\_\_\_\_

**Distribution:**

Bob Vosen, Missoula District Administrator  
Andy Cullison, Bridge Engineer  
Damian Krings, Highways Engineer  
Gabe Priebe, Traffic and Safety Engineer  
Jason Gilliam, Right-of-Way Bureau Chief

Rob Stapley, Rail, Transit, & Planning Division Administrator  
Jeff Jackson, Geotechnical and Pavement Bureau Chief  
Jon Swartz, Maintenance Division Administrator  
Tom Martin, Environmental Services Bureau Chief  
Joe Green, Construction Bureau – VA Engineer

cc:  
Located at the end of this document

## Scope of Work Report

### **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 to meet current MDT Design Standards for a Rural Collector (Secondary System). Guardrail, pavement markings, signing and fencing will also be replaced as a part of this project. With the proposed alignment, irrigation facilities and structures will need to be relocated outside of MDT right-of-way. An agreement was executed in March 2021 between MDT and Missoula County to include the design of a Shared-use Path (SUP) along the northeast side of Mullan Road.

Intersection improvements at Pulp Mill Road and Deschamps Lane will be included as part of the project. Turn lanes are not required at these intersections. The widened shoulder section will be carried through the Pulp Mill Road intersection and tapered down to meet the existing lane configuration of two 12-foot lanes with no shoulder to the north. Deschamps Lane will be realigned to intersect Mullan Road at a 90-degree angle and improve sight distance at the existing skewed intersection.

### **Purpose and Need**

The purpose of this project is to improve the roadway surface and overall safety of the roadway. This road has substandard features including roadway width, 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 increase significantly over the next 20 years. The reduction in traffic volumes is partially due to the closing of the paper mill that was located on the west end of the project limits. Traffic studies suggest that the recommended improvements will decrease crashes and improve the overall safety of the road.

### **Context Specific Criteria and Scope Specific Considerations**

In accordance with MDT's Baseline Criteria Practitioner's Guide published March 25, 2021, the following context-specific criteria are anticipated for the project:

**Lane Width:** Based on MDT's Baseline Criteria Practitioner's Guide, the recommended lane width for a Rural Major Collector in level terrain is 11-ft. Based on MDT's Segment Plan, Mullan Road has a recommended road width of 40-ft comprised of two 12-ft travel lanes and 8-ft shoulders from RP 4.54 to RP 7.30. The recommended roadway width from RP 7.30 to RP 10.52 is 36-ft comprised of two 12-ft travel lanes and 6-ft shoulders. It was determined during a design coordination meeting with MDT and Missoula County on January 22, 2018, that the typical section for Mullan Road would include roadway reconstruction with 6-ft shoulders for the extents of the project limits. As such, the proposed roadway will consist of two 12-ft travel lanes (one in each direction) to match current conditions and maintain corridor consistency and 6-ft shoulders for a total roadway width of 36-ft. The proposed lane width also follows the recommendations from the Preliminary Field Review Report (PFR) dated October 25, 2017.

The SUP is proposed as a 10-ft paved path with 2-ft earthen shoulders on either side. The path will be narrowed to 8-ft for a short distance between Mainline Sta. 244+50 to 245+75 to reduce impacts to the adjacent irrigation canal.

**Ditch Width and Configuration:** The standard ditch width for a Rural Major Collector is 10-ft, sloped back at 20:1, beginning 10-ft from the bottom of the pavement section. The proposed ditch is a 2-ft flat bottom ditch, to reduce impacts to the surrounding parcels.

**Surfacing Inslope:** The standard surfacing inslope is 6:1, which is reflected in the AGR design. During the AGR review meeting, it was discussed that a 4:1 surfacing inslope should be evaluated to determine if it reduced the overall footprint of the improvements and private property impacts. After evaluating 4:1 slopes it was determined that the standard 6:1 slopes should be used throughout the project limits. The 4:1 slopes resulted in a wider clear zone and did not provide a net benefit when compared to the 6:1 slope design. A 2:1 inslope will be utilized behind guardrail in constrained areas to reduce impacts to neighboring parcels, environmentally sensitive areas, hydraulic features, and irrigation ditches.

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**Minimum Horizontal Curve Length:** Per Section 3.2.5 of the MDT Road Design Manual, the minimum length of curve in rural conditions should be:

- a) The minimum radius that results in a normal crown
- b)  $15V$  where  $V$  is the design speed in mph, or 900-feet for this project
- c) A 500-foot length curve for a 5-degree deflection, add 100-feet for each 1-degree decrease in the central angle.

The minimum curve length was not met for 10 of the horizontal curves due to adjacent environmental, irrigation and/or property constraints. Horizontal curve length is not listed as controlling criteria in MDT's Baseline Criteria. Minimum radius requirements were met throughout the project limits and horizontal curve lengths have been adjusted to the extent practicable to match existing conditions. The proposed curve lengths provide improvement over the existing conditions while balancing impacts to adjacent sensitive areas. A summary of the horizontal curves not meeting minimum curve length is provided below.

Station Limits	Proposed Length	Minimum Length per 3.2.5
92+92.37 to 100+33.92	741.55	(c) 849.75
136+36.18 to 137+67.27	131.09	(c) 625.89
164+63.99 to 165+62.85	98.86	(c) 500
169+03.46 to 171+19.46	99.53	(c) 500
199+73.66 to 206+18.88	645.21	(c) 778.28
209+26.18 to 212+98.34	372.16	(c) 659.31
216+31.51 to 218+85.94	254.43	(b) 900
228+36.08 to 230+04.18	168.10	(c) 744.44
277+51.95 to 286+16.28	864.33	(b) 900
352+15.62 to 353+16.74	101.12	(c) 500

**Clear Zone:** There are trees and shrubs as well as six structures within the clear zone of the proposed roadway. Three historical properties have been identified within the project limits where removal of the obstruction (i.e., trees, shrubs, and abandoned structures/buildings) within clear zone would result in an adverse effect to the historic resources protected under Section 4(f). To avoid impacts, steepened slopes will be introduced through these areas along with new roadside barriers (guardrail). The proposed shared-use path is designed to be outside the clear zone of the roadway. Where roadside obstructions such as irrigation ditches are introduced, the path transitions to be 5-feet from the edge of pavement of the roadway (11.5-feet from edge of travel way) per minimum requirements listed.

**Full Superelevation Rates:** The intersection of Mullan Road and Deschamps Lane is located within a horizontal curve at Mainline Sta. 346+02. To improved grade-related tie-in conditions, a reduced superelevation for this curve is recommended to limit the algebraic difference between the paved travel way and the approach. MDT's RDM Section 3.3.1 establishes  $e_{max} = 8\%$  as the baseline criteria for the maximum superelevation rate in Rural Conditions. This would result in an undesirable rate of superelevation rollover between Mullan Road and Deschamps Lane, making the tie-in grade on Deschamps Lane to be 0% or greater to not exceed the maximum algebraic difference of 8%. To improve these conditions, it is recommended to use the design criteria from the AASHTO Green Book of  $e_{max} = 6\%$  while still utilizing a 60-mph design speed. Since there is an s-curve in the horizontal alignment at this location, the AASHTO design criteria would be applied at both curves from Mainline Sta. 334+48.15 to 355+32.74.

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Project Context Specific Criteria /Scope Specific Considerations				
Controlling Element	Existing Condition	Baseline Value	Proposed Criteria	Location
Lane Width	12-ft lanes	11-ft lanes	12-ft lanes	Entire Project Limits
Ditch Width and Configuration	Varies	10-ft	2-ft flat bottom	Entire Project Limits
Surfacing Inslope	Varies	6:1	6:1 throughout 2:1 behind guardrail	Entire Project Limits
Minimum Horizontal Curve Length	Varies	MDT Road Design Manual Section 3.2.5	Varies – See previous table	Entire project limits
Clear Zone	Varies	26-ft (Baseline fill condition per Exhibit 9-1 in Road Design Manual)	Varies 21-ft to 26-ft (protected by new roadside barrier)	Mainline Station: 231+50 to 238+00 Rt. 249+00 to 254+00 Rt. 301+00 to 307+50 Rt.
Full Superelevation Rate	2.2%	MDT Road Design Manual Section 3.3.1 $e_{max} = 8\%$	$e_{max} = 6\%$ AASHTO Table 3-8 V = 60 mph	Deschamps Lane Intersection Mainline Station: 334+48.15 to 355+32.74.

### **Public Summary**

The Montana Department of Transportation (MDT) will reconstruct Mullan Road (S 263) from the intersection with Pulp Mill Road (S 474) to just southeast of the intersection with Deschamps Lane. The improvements will provide an improved travel route for both vehicles, bicyclists, and pedestrians. Project improvements will include the following:

- Construct a wider roadway including two 12-ft lanes with 6-ft shoulders on each side
- Replace the culvert and bridge crossings at O'Keefe Creek, LaValle Creek, and the Primrose Irrigation Canal
- Straighten curves and flatten hills thereby increasing visibility, where feasible
- Design a new shared-use pathway for bicyclists and pedestrians
- Increase ditch sizes where possible to better handle snow storage and drainage
- Replace guardrail and upgrade pavement markings, signing, fencing and pavement for a smoother riding surface
- Reconfigure the intersection with Deschamps Lane to decrease the angle of the approach and improve safety.

### **Project Location and Limits**

The project is located along Mullan Road (Secondary Route 263) in Missoula County, west of the city limits of Missoula, MT, between Missoula and Frenchtown. The project begins approximately 200 feet northwest of the Pulp Mill Road (County Route 12) intersection and extends approximately 550 feet southeast of the Deschamps Lane intersection.

Description	Signed Route	Department Route	Corridor Route	Reference Post + Offset	Accumulated Miles
Project Begin	Route 263/Mullan Rd	S-263N	C000263N	010+0.584	10.6
Project End	Route 263/Mullan Rd	S-263N	C000263N	005+0.544	5.7

The direction of the project is from west to east (opposite of the reference posts).

The following as-built plans have been identified for this section of Mullan Road. As-built plans are not available from RP 9.18 to RP 5.7. Mullan Road is functionally classified as a Major Collector Road.

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Route	Project #	Project Name	Year Complete	Begin Mile Post	End Mile Post	Project Type
S-263	FAS 10 B(1)	Frenchtown-Missoula	1939	10.6	9.3	Grade, Gravel, PMS, Drainage
S-263	STPHS 263 1(10)9	Mullan Road at Frenchtown Substation	1985	9.18	9.41	Grade, Gravel & Plant Mix Surfacing

### **Physical Characteristics**

Mullan Road is a rural secondary highway in level terrain. The existing roadway consists of two 12-foot travel lanes (one in each direction) with little to no shoulders. The project travels through rural residential and farmland. The beginning of the project travels through the old paper mill site that is no longer in operation.

Existing fill and cut slopes are generally steep v-ditches with guardrail intermittingly throughout the project limits. Irrigation ditches parallel close to the roadside from RP 7.3 to RP 9.3.

There is an out-of-service at-grade Chicago Milwaukee St. Paul & Pacific Railroad crossing at Mainline Sta. 126+40, approximately 2,500-feet from the beginning of the project. The proposed roadway grade will closely match existing through this area to reduce impacts. The new SUP will also cross the railroad tracks at this location. The current crossing includes signals and flashers.

There is an existing 23-foot long, 28-foot wide steel span bridge between Primrose Lane and Primrose Drive (approximately 1.5 miles from the end of the project) to convey water for the Primrose Irrigation Canal that will be replaced with the project.

### **RP 10.6 – 9.18**

There are four horizontal curves between RP 10.6 and RP 9.18. The design superelevation could not be determined from the as-built information. The horizontal curve at Sta. 249+74.30 has a radius that does not meet current design standards.

Based on available as-built information, there are eight vertical curves between RP 10.6 and RP 9.18. Six of the curves do not meet current design standards as shown in the table below.

PI Station	Curve Type	G <sub>1</sub> (%)	G <sub>2</sub> (%)	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	0.30	200	136
284+21	Crest	0.30	-0.40	150	151
290+21	Sag	-0.40	0.29	100	136

### **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 was re-created using a “best-fit” method to the existing centerline from survey and was brought up to current design standards.

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### Traffic Data

RP 5.5 to RP 10.6	
2017 AADT	1,670 – Present
2021 AADT	1,770 – Letting Year
2041 AADT	2,390 – Design Year
DHV	250
T	7.7%
EAL	77 Daily
AGR	1.5%

### Crash Analysis

A safety analysis was completed by MDT on a portion of S-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 three fatal crashes and 36 injury crashes. Ninety-seven of the 121 crashes were non-intersection related.

In general, the entire portion of S-263 is performing at a Level 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 calculations. Segment 1 is 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 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. 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 upgrades from RP 7.0 to 10.6 to address this crash trend. 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.

The following recommendations were provided within the *Accident Analysis Report*:

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

### Major Design Features

- Design Speed.** The design speed for the project is 60 mph. The existing posted speed limit is 35 mph from Pulp Mill Road to the at-grade railroad tracks (near RP 10.2), then increases to 45 mph from the railroad tracks for approximately 800-feet, then increases to 55 mph for the remainder of the project. Although the posted speed is lower than the design speed at the beginning of the project, the design speed will still be used to set the horizontal and vertical alignments. A speed study is not included in the scope of the project and the posted speed limit will remain as-is.
- Horizontal Alignment.** The proposed alignment differs from the existing alignment to bring the roadway up to current design standards and improve safety. Tangents have been shifted to reduce impacts to major structures, utilities, irrigation facilities and large trees where possible. The horizontal curves were flattened to meet the minimum radius requirements and superelevation transitions. The minimum curve length was not met for 10 of the horizontal curves

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due to the surrounding environmental, irrigation and/or property constraints. The proposed curve lengths improve the existing conditions while balancing impacts to surrounding areas.

The alignment begins just north of the intersection with Pulp Mill Road, matching the existing alignment, then shifts west to reduce impacts to transmission lines on the east and flattening the curve to meet minimum requirements. The "S" curve near station 165+00 will be reconstructed to flatten the curves while shifting west to minimize impacts to the substation. The alignment then shifts west to avoid major impacts to structures on the east, requiring the realignment of the irrigation facility on the west. From Station 205+00 to 240+00 the alignment is shifted east to avoid impacts to parcels and reduce impacts to the irrigation facility. The alignment then generally follows existing until station 280+00 where the alignment shifts east to minimize impacts to the parcels on the west, including the Section 4(f)/6(f) parcel (Council Grove State Park). The proposed alignment then shifts east to reduce impacts along the west before transitioning back into the existing alignment near station 340+00. The alignment then closely follows the existing until the project ends approximately 550 feet south of the Deschamps Lane intersection. A clear zone distance of 26 feet is proposed for the project per Exhibit 9-1 in the MDT Design manual and referencing a 60-mph design speed, a 2390 design AADT and standard 6:1 fill slopes.

The Deschamps Lane road approach will be realigned to improve safety, reducing the large skew and improving sight distance.

- c. **Vertical Alignment.** The proposed vertical alignment is generally raised slightly above the existing profile throughout the project limits in order to accommodate a thicker pavement section. The proposed vertical alignment follows existing through controlling areas such as the at-grade railroad crossing and within the floodplain area. The existing bridge will be replaced with a new bridge as part of the project and the grade will be set based on the hydraulic requirements of the irrigation canal.

The maximum proposed grade along the corridor is 1.107%. There is no major steepening or flattening of the existing grade proposed, however a minimum grade of 0.2% is proposed near the O'Keefe Creek crossing to maintain the proper conveyance of water. A maximum grade of 5% is allowable for Rural Major Collectors.

A minimum curve length of three times the design speed, 180-feet, is maintained throughout with vertical curves of greater length where necessary to meet minimum stopping and passing sight distances. For Sag curves, a minimum K-Value of 136 for 60 mph is met. For crest curves, a minimum K-Value of 151 for stopping sight distance and 357 for passing sight distance is met throughout the project limits, where possible.

A 2-foot subgrade cap is recommended throughout the project limits due to existing gravel fill and clay subgrade. The existing asphalt base layer that will be excavated to accommodate the subgrade cap can be used in the widening fill areas.

The proposed vertical alignment and horizontal alignment were set to avoid ponding and verify that superelevation transitions do not fall within a high point or low point.

The roadway profile was set to maintain a no-rise condition as part of the floodplain modeling, while trying to minimize wetland impacts. This will be further evaluated with the addition of the new SUP as the design progresses.

- d. **Typical Sections.** Based on comments received at AGR, an urban typical section will be evaluated from the Pulp Mill Road intersection to the at-grade railroad crossing. This typical section will include a 36-foot paved width consisting of two 12-foot travel lanes and 6-foot shoulders and curb and gutter will be proposed.

The remainder of the project will consist of a rural section with two 12-foot lanes and 6-foot shoulders, totaling 36-foot paved width as documented in the shoulder width memo dated July 18, 2019.

The standard cross slope of 2% will be maintained in tangent sections and the standard superelevation transitions will be used for the curves.

- e. **Surfacing.** The geotechnical report recommends 0.30' of plant mix bituminous surface over 0.85' of crushed aggregate course. The report also recommends a 2-foot subgrade cap alternative be

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used. As discussed in the Activity 130 Final Geotechnical and Materials Report dated July 20, 2022, this recommended option was the most economical. The existing asphalt and base layer can be reclaimed in place then graded or hauled into the fill areas associated with the shoulder widening. This surfacing section also provides a homogenous subgrade throughout the project length, which will prevent differential movement, provides better drainage beneath the pavement section, and lowers the potential for frost heave or swelling of the existing clay subgrade soils.

For preliminary design, the SUP will consist of 0.20-feet of plant mix bituminous surface over 0.50' of crushed aggregate course. Additional borings were taken in 2021 to evaluate soil conditions and final surfacing recommendations for the SUP and the roadway are in progress.

- f. **Grading.** The project will consist of unclassified excavation and will likely be a waste project. The excavation will include removing the existing roadway and building up the wider roadway footprint. Balancing earthwork with the addition of the SUP will continue to be evaluated as the design progresses.

At this time there are no known special soil considerations that may require shifting the alignment. Due to the potential of clay subgrade soils, a subgrade cap is recommended for the project. Additional information can be found in the Geotechnical section of the report. It is unlikely that an alignment shift is possible due to the surrounding environmental constraints and nearby residences so if poor soils are encountered, the pavement section and subgrade work will need to accommodate the soil constraints.

It is not recommended to reclaim the existing asphalt and base layer since there is a varying percentage of silt and clay fines, making it not suitable as part of the 2-foot subgrade cap recommended in the Preliminary Geotechnical Report.

- g. **Slope Design.** All existing guardrail will be removed and new guardrail will be provided to meet MASH compliance and slopes will be flattened to meet standard guardrail requirements. A barn roof fill slope will be used throughout the project to provide 6:1 slopes within clear zone that would steepen to 3:1 to reduce neighboring property impacts. Steeper slopes behind guardrail will be introduced where necessary to avoid impacts to wetlands, irrigation ditches and 4(f) properties.
- h. **Geotechnical.** A 2-foot subgrade cap is recommended for the project to prevent differential movement due to varying subgrade types, to provide better drainage beneath the pavement section, and to lower the potential for frost heave or swelling potential of the clay subgrade soils. Several options were considered to re-use existing materials, including reclaiming the existing asphalt and base layer in place, stockpiling, then re-using for all or part of the 2-foot cap layer or ripping or reclaiming the existing asphalt and base layer in place then grading into the widening fill areas. Given the variability of the base and gravel fill layer with varying percentage of silt and clay fines it is not particularly suited as a 2-foot cap layer. Trying to reuse the existing base layer would not be cost efficient due to the need to process or handle the material up to three times to get it back into place for use as subbase or the subgrade cap. It would be most economical to reclaim or rip the existing asphalt layer in place, then grade or haul the reclaimed layer into the fill areas. This method would save the cost to break up and haul the existing asphalt off site.

Spread footings and driven pipe pile foundations were evaluated as part of the proposed bridge design. Spread footings typically are more economical than driven pipe piles but both options are being evaluated based on the construction phasing options and if any shoring will be required. Lateral earth pressures for abutment walls were also evaluated to aid in final bridge design. The design recommendations for the bridge foundation alternatives and wall design are provided in the Activity 130 Final Geotechnical and Materials Report dated July 20, 2022. The bridge foundation type and abutment wall design will be determined as the project moves towards PIH and the bridge design is finalized.

- i. **Hydraulics.** There are significant irrigation ditches and structures paralleling and crossing the roadway alignment. Consideration was made to balance the impacts between irrigation facilities and adjacent parcels to minimize realignment of the irrigation ditches. All irrigation facilities impacted by the project are part of the Frenchtown Irrigation Project, which is owned by the United States Bureau of Reclamation and operated and maintained by the Frenchtown Irrigation District.



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A culvert and bridge option were considered where the Frenchtown Irrigation Project Main Canal crosses the roadway just north of Primrose Drive. A precast concrete bridge is recommended because it meets the hydraulic criteria, provides an opening that will completely span the canal for the design flow so as not to impede upon canal operations, and will assist with the grading as the box would extend beyond the roadway limits and would require ditch grading/realignment due to the ditch geometry changes on the east side of the bridge.

The realignment of irrigation ditches will be required for multiple locations/reaches due to roadway and SUP impacts. Irrigation ditches which are realigned will be reconstructed in-kind outside of MDT right-of-way with relocated ditches matching the conveyance and operation of existing facilities. This includes the replacement of all irrigation structures in-kind, including all irrigation delivery facilities (e.g., turnouts, etc.). Ditch realignments are anticipated to require Section 404 permitting. The permit application will quantify and provide dimensions for irrigation ditch impacts separately from other waters of the U.S. A ditch liner was shown on the as-builts for the existing irrigation canal; however, no liner was found during the field review. Due to the proposed ditch being constructed mostly above ground and with fill material, as well as local soil conditions, a ditch liner will be included as an alternative as part of the proposed improvements to limit infiltration, pending the Frenchtown Irrigation District's approval. Where irrigation facilities are adjacent to the proposed SUP, cut/fill slopes will be evaluated and AASHTO guidance will be utilized to identify the need for handrail based on slope height. For portions of the irrigation ditch impacted by the roadway where realignment is not a viable option, steepened roadway side slopes and guardrail will be considered.

Due to the increased widening of the roadway shoulder and the addition of the SUP, impacts on adjacent streams are certain. In addition to the design of hydraulic structures to compensate for the additional roadway width, approximately 260 feet of LaValle Creek on the west side of the road will need to be shifted to accommodate the proposed roadway and SUP.

The project resides in a FEMA regulated Approximate Zone A floodplain. Based on the roadway design presented at AGR, the proposed hydraulic crossings along the impacted reaches of LaValle Creek and O'Keefe Creek have been designed to not increase the 100-year water surface elevation greater than 0.5 foot or increase the 100-year flood risk on an insurable structure. Due to the encroachment of the roadway and the SUP on the south side of the LaValle Creek floodplain, the maximum increase in the floodplain elevation is less than 0.3 feet when measured across the floodplain. This is below the acceptable 0.5 foot maximum allowed for an Approximate Zone A in MT.

- j. **Permanent Erosion and Sediment Control (PESC) Features.** No known permanent erosion and sediment control features are necessary at this time. As design continues, the outfall of culverts and ditch sections will be evaluated to identify erosion potential and PESC features will be proposed, if necessary.

As stated in the previous section, a ditch liner will be included as an alternative as part of the proposed irrigation ditch improvements, pending the Irrigation Owner's approval.

- k. **Bridges.** One bridge exists within the project limits and will need to be fully replaced to accommodate the increased roadway width and SUP.

There is an existing 23-foot long, 28-foot wide steel span bridge between Primrose Lane and Primrose Drive (approximately 1.5 miles from the end of the project) to convey water for an irrigation canal (Primrose Irrigation Canal). The bridge structure number is S00263008+00001.

The bridge will be fully replaced to accommodate the increased roadway width and SUP. The bridge is on a tangent and is near public approaches. Guardrail termini will likely require special designs to accommodate the approaches. Both a 4-sided box culvert and bridge options were considered, and a precast concrete bridge is recommended because it meets the hydraulic criteria, the opening will completely span the canal for the design flow and canal operations are not impacted.

The typical section of the bridge is currently proposed using two 12-foot lanes, two 6-foot shoulders, a 2-foot buffer between the roadway and the path, an 8-foot shared use path and two 1'-2" wide 42" Open Rail barriers.

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- l. Safety Enhancements.** All existing guardrail will be removed and replaced with new guardrail to meet MASH compliance. Slopes will be flattened to meet standard guardrail requirements. The clear zone will be cleared of vegetation and obstructions. A new SUP will be introduced along the project corridor to separate pedestrians from vehicular traffic. The path is placed outside clear zone where possible and protected by guardrail outside the deflection distance otherwise. The Deschamps intersection will be realigned to reduce the intersection skew to improve sight distance
- m. Context Sensitive Design.** There are three historic residences located along the project corridor and adverse impacts to these properties are being avoided through steepened slopes and guardrail. Irrigation facilities will be realigned with the project, coordination with the irrigation district is expected. There are six structures that will be removed with the project, one being a residence, and coordination with the landowners will be necessary. Preliminary discussions were held with private landowners during the preliminary design phase of the project and additional discussions will take place as the design progresses.
- n. Traffic.** The Pulp Mill Road intersection is currently operating as a 3-way stop with stop signs located on both Mullan Road approaches as well as Pulp Mill Road approach on the northeast quadrant. The southwest quadrant is the entrance to the old pulp mill and is not currently in operation. The existing 3-way stop will remain in place and signing and pavement markings will be updated at the intersection. Intersection lighting will be upgraded at this intersection to meet current design standards.

The Deschamps Lane intersection is at a severe skew angle causing poor sight distances for traffic turning from Deschamps Lane onto Mullan Road. Deschamps Lane will be realigned to reduce the skew and allow for a more perpendicular intersection. The radius used to tie back into the existing Deschamps Lane alignment will be flattened in order to accommodate farm equipment for the neighboring agricultural parcels. Missoula County is planning to pave this route in the future due to the increased traffic on Deschamps Lane. The design team will continue to coordinate with the County for additional work at this intersection.

Shoulder rumble strips will be added in the proposed 6-ft shoulders. The preliminary traffic report also recommends adding centerline rumble strips which will require additional evaluation due to the close proximity to residences.

- o. Miscellaneous Features.** Fencing will be replaced, as appropriate, throughout the project due to the need to acquire additional right-of-way.
- p. Pedestrian/Bicycle/ADA.** The project will include a 10-ft wide SUP for the entire length of the project. The path will narrow to 8-ft for short distances when constrained by irrigation facilities. Signing will be provided in these areas to alert path users of the changing width. The SUP will cross numerous approaches. Current ADA recommendations will be taken into consideration at these locations. There is an existing shared-use path from RP 6.7 (Mainline Sta. 306+00) and RP 6.4)319+00. The path at this location will be shifted slightly to the east to accommodate the wider typical section on Mullan Road.

### **Design Exceptions and Baseline Variances**

No design exceptions or baseline variances are identified at this time.

### **Right-of-Way**

Right-of-way acquisition will be necessary from most of the parcels along the corridor to accommodate the additional footprint of the roadway and SUP. A 10-foot clearance from the construction limits to the proposed right-of-way was used to relocate utilities within the new right-of-way and remain outside the roadway clear zone. Right-of-way impacts will include residential relocation and the removal of six structures. These impacts will be documented as the design progresses. Separate easements will be needed for the irrigation relocations. Coordination with the Frenchtown Irrigation District and Bureau of Reclamation will include a combined effort between the Missoula District and HDR for easement preparation.

### **Access Control**

This section will not be considered for access control resolution; however, there is an opportunity to

## Scope of Work Report

eliminate/combine some access point during right-of-way acquisition. Access management should be addressed during the design and right-of-way 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 reduce the number of approaches, improving the safety of the corridor.

### **Utilities/Railroads**

A Phase I SUE was completed and extensive utility relocations are needed to complete the project. Overhead power, underground power, underground fiber and gas lines will require relocation. Overhead power lines parallel the roadway throughout most of the project limits with existing power poles located within the clear zone. Coordination with utility companies has occurred prior to AGR. Coordination between MDT Utilities and HDR will continue as the design progresses to keep owners informed of the need for relocations and the anticipated project schedule. Utility owners have requested a 6-month lead time to relocate.

A Phase II SUE will be required due to the excavation associated with the 2-foot subgrade cap and at culvert crossing locations.

An out-of-service at-grade railroad crossing is located at Mainline Sta. 126+40, approximately 2,500-ft from the beginning of the project. The proposed roadway grade will closely match the existing in this area and the new SUP will also cross the railroad tracks at this location. The current crossing includes signal and flashers. Coordination with Chicago Milwaukee St. Paul & Pacific Railroad will be needed as the design progresses and to address right-of-way impacts in the area.

### **Maintenance Items**

Maintenance will continue to complete standard maintenance activities. No additional work is planned to be completed by maintenance.

### **Agreements**

A Construction, Maintenance & Funding Agreement between MDT and Missoula County was established to include a SUP along Mullan Road for the extent of the project. Per the agreement, two bid packages will be prepared for the project including the SUP surfacing and pedestrian rail items as an alternative bid package. MDT has agreed to perform the grading, right-of-way acquisition, utility relocation, and culvert installation/extension as required to accommodate the SUP. Missoula County will be responsible to fund the surfacing and pedestrian rail components. Refer to the executed agreement for further details and clarification.

### **Environmental Considerations**

The Categorical Exclusion for this project was approved on 9/14/22. The proposed project qualifies as a Categorical Exclusion under the provisions of 23 CFR 771.129(d). This proposed action also qualifies as a categorical exclusion under the provisions of ARM 18.2.261 (Sections 75-1-103 and 75-1-201, M.C.A.). Substantial acquisition of right-of-way will be necessary to construct the project and the relocation of one residence is anticipated. (See discussion under Right-of-Way).

A cultural resource report was completed in October 2021. The study updated the site forms for three sites (24MO0295, 24MO0713, and 24MO0789) that have previously been determined eligible for the National Register of Historic Places (NRHP). The study also recorded and evaluated ten properties within the Area of Potential Effect (APE) that date to the historic period and had never been inventoried. Three of the ten properties (24MO01801, 24MO01797, and 24MO01795) have been determined as eligible for the NRHP on December 14, 2021, by the State Historic Preservation Office (SHPO). MDT provided SHPO a Determination of Effect on March 23, 2022, that identified No Adverse Effect to all historic properties. The SHPO concurred with the determination on March 30, 2022.

The project results in a "use" of two separate Section 4(f) properties. The proposed project will require realigning the Frenchtown Irrigation District Canal (24MO0789), which has previously been determined eligible for the National Register of Historic Places (NRHP). This action was determined to have No Adverse Effect to the historic resource. Similarly, a permanent "use" is occurring to the property located at 12795 Mullan Road (24MO01797), a site determined as eligible for the NRHP, where a minor amount of

## Scope of Work Report

right-of-way would be acquired from the property. This action was determined to have No Adverse Effect to the historic resource. Both "uses" were determined to be a *de minimis* impact. MDT notified the SHPO of FHWA's intent to make a *de minimis* impact finding for 24MO0789 and 24MO01797 in a letter dated March 23, 2022. SHPO concurred with the determination in a letter dated March 30, 2022.

Council Grove State Park has been identified as a Section 4(f)/6(f) property. The park entrance abuts the project area; however, the alignment has been shifted to the north in this area and no impact on this property is anticipated. Approach improvements for Council Grove will be completed as part of a construction permit if needed and a "use" is not anticipated.

The proposed project is anticipated to result in unavoidable impacts to streams, irrigation canals, and wetlands due to the widening of the roadway footprint and SUP. Preliminary estimated wetland impacts total 0.9 acre and impacts to waters of the U.S. have not been quantified. It is conservatively estimated that the project may require Section 404 authorization through an Individual Permit; however, additional coordination with the USACE will be necessary to determine the appropriate 404 permit (i.e., Nationwide Permit No. 23 may be applicable). Once final design is complete and construction limits established, impacts on aquatic resources would be quantified and described in greater detail in the Aquatic Resources Finding Report (AFR) and the Section 404 permit application. Considerations will be made to further minimize impacts on wetlands as design progresses.

An updated addendum has been developed for the June 2018 Biological Resource Report/Preliminary Biological Assessment that updates the Endangered Species Act (ESA)-listed species potentially occurring in the project vicinity and validating previous effect determination. The project will have no effect on ESA-listed species. The June 2018 report did not identify any wildlife accommodation needs and a Wildlife Accommodation Recommendation Memo (WARM) has not been deemed necessary for the project.

The removal of many trees and shrubs will be required to complete the project. The Environmental Specifications special provision will be included in the final construction bid documents and include Migratory Bird Treaty Act Compliance – Vegetation Removal Subsection 208.03.4A(1) to avoid and minimize potential impacts on migratory birds resulting from vegetation removal and Migratory Bird Treaty Act Compliance – Structures Subsection 208.03.4A(2) to avoid and minimize potential impacts on migratory birds resulting from bridge work that may directly impact active nests.

The former Smurfit-Stone mill site located at the northwest end of the project area contains contaminated soils and potentially contaminated groundwater. On December 12, 2013, the Smurfit-Stone Mill site was proposed to be added to the National Priorities List (NPL). The proposed project intersects with Operable Units (OU) 2 and 3. Soil sampling results within OU2 immediately adjacent to the proposed project show levels of toxicity equivalents (TEQ) dioxins and metals that exceed DEQ risk-based screening levels. Based on this, it is anticipated that a preliminary site investigation will be necessary. Coordination with DEQ and the EPA is ongoing and guidance from DEQ is anticipated to provide direction on whether additional soil investigations are necessary in areas of project disturbance and/or right-of-way acquisition. In addition, the project involves a bridge demolition, and an asbestos inspection is required. (See ISA Form for more information).

### **Energy Savings/Eco-Friendly Considerations**

New overhead LED lights will be utilized at the intersection with S-474 (Pulp Mill Road).

### **Experimental Features and Proprietary Products**

There are no experimental features for the project at this time.

### **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) 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.

### **Other Projects**

There are no additional projects in the area that have been identified.

## Scope of Work Report

### **Traffic Control**

Single lane closures will likely be in place during construction while maintaining private property access.

A Transportation Management Plan (TMP) consisting of a Traffic Control Plan (TCP) and a limited Public Information (PI) component is appropriate for this project.

Traffic issues that will require special consideration are as follows:

- Maintaining private property access throughout construction
- Temporary detours for structure and hydraulic upgrades

Limited PI components will be included to mitigate these impacts to the traveling public. Strategies that will be considered are:

- A project open house informational meeting for the general public
- Multiple landowner and stakeholder meetings for coordination
- Presentations to the Frenchtown Community Coalition
- Project website (maintained by MDT)

### **Intelligent Transportation Systems (ITS) Features**

No ITS features are planned for this project.

### **Public Involvement**

The project Level of Impact (LOI) has been determined to be Moderate and level of public involvement C, as defined by MDT's Public Involvement Plan.

MDT and the design team have met with eight property owners since AGR development to discuss potential property impacts. Additional stakeholder outreach is anticipated between AGR and PIH development and will be focused on property owner outreach and a presentation to the Frenchtown Community Coalition (West Valley Community Council) to provide an update of the design and the project schedule. An open house public meeting will be conducted in winter 2022-2023 to present the current scope of improvements included in the project. Press releases and newsletter content for the open house public meeting will be provided three weeks and one week prior to the meeting.

### **Construction Cost Estimate**

The cost estimate in the AGR Report dated March 7, 2022, was \$15,000,000 and included Project Total CN+CE-w/INF+IDC. That estimate included the shared use path which will be a locally funded additive alternative to the contract plans package.

## Scope of Work Report

	Estimated cost	Inflation (INF) (from PPMS)	TOTAL costs w/INF + IDC (from PPMS)
<b>STPS CN</b>	<b>\$8,900,000</b>	<b>\$1,100,000</b>	<b>\$ 11,000,000</b>
<b>HSIP CN</b>	<b>\$0.00</b>	<b>\$0.00</b>	<b>\$ 0.00</b>
<b>(Local) CN</b>	<b>\$1,700,000</b>	<b>\$220,000</b>	<b>\$ 2,200,000</b>
<b>TOTAL CN</b>	<b>\$11,000,000</b>	<b>\$1,300,000</b>	<b>\$ 13,000,000</b>
<b>CE (11.5%)</b>	<b>\$1,000,000</b>	<b>\$130,000</b>	<b>\$ 1,300,000</b>
<b>CE (11.5%) Local</b>	<b>\$180,000</b>	<b>\$22,000</b>	<b>\$220,000</b>

*Project TOTAL from all of the funding types above:*

<b>Project TOTAL CN+CE</b>	<b>\$12,000,000</b>	<b>\$1,500,000</b>	<b>\$ 15,000,000</b>
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The estimate above includes \$340,000 for traffic control, 20% allowance for contingency, and 8% for mobilization and 1.5% of CN for CE PI services.

Note: Inflation is calculated in PPMS to the letting date. If there is no letting date, the project is assumed to be inside the current TCP and is given a maximum of 5 years until letting. IDC is calculated at 10.71% for FY 2023.

### **Preliminary Engineering**

The percent PE expended is 72%. A review of the expended preliminary engineering and hours used compared to the anticipated amounts required for completing the project design indicates that a modification isn't needed at this time.

### **Project and Risk Management**

The Consultant Design Bureau will be responsible for the plans on this project. Fred Bente is the Project Design Manager. This project is being designed by HDR and Lisa Fischer is their project manager. This project is not considered a Project of Division Interest (PoDI) by FHWA.

No significant risks concerning the project cost and schedule have been identified. Since there are a large number of R/W parcels on the project, R/W acquisition has the biggest risk potential.

### **Ready Date**

The ready date shown in the Project Management System is November 25 ,2025. The project does not currently have a proposed letting in the Tentative Construction Plan, however, the current plan is to have the project ready to let in Fiscal Year 2026. The planned finish for all activities in EPS is October 27, 2025. The project is generally on schedule in terms of EPS and it is not expected that design issues will affect the design timeline.

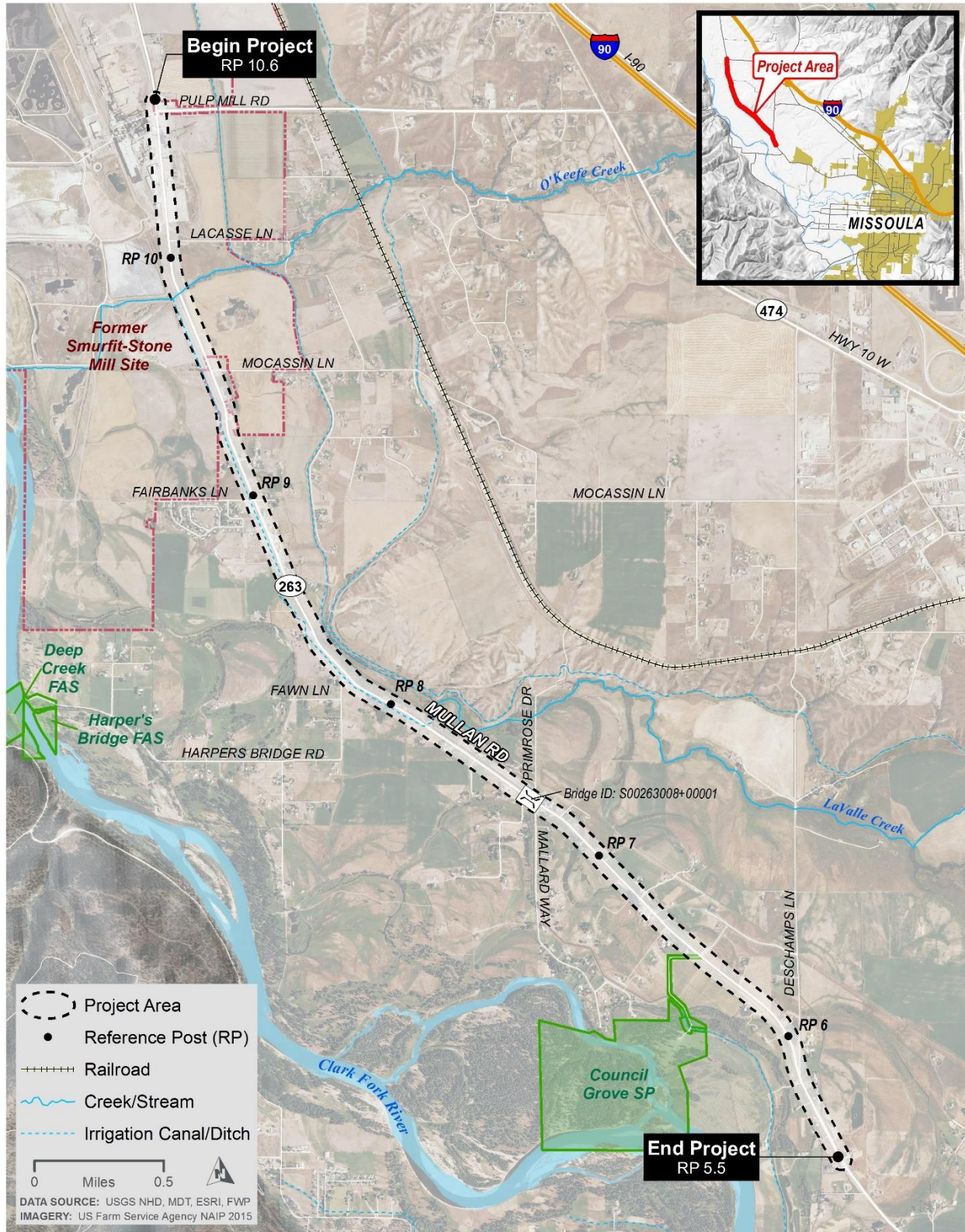
The current PE End Date is 10/31/23. A review of the remaining EPS schedule, critical path activities, and target letting date indicates that a modification to the PE End Date is needed. Since the current proposed letting date is January 1, 2028 (i.e., outside the current Tentative Construction Plan) we would request a new PE End Date of August 1, 2028.

### **Site Map**

A project site map is attached.



# Scope of Work Report



**PROJECT LOCATION MAP**  
 WEST OF MISSOULA - NW  
 STPS 263 - 1(28)6 | UPN 6141000



## Scope of Work Report

STPS 263-1(28)6, West of Missoula - NW, UPN 6141000  
EPS Project Manager: Fred Bente

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CC:

Fred Bente, EPS Project Manager

Shane Stack, Missoula County

### **Headquarters**

Ryan Dahlke, Preconstruction Engineer  
Chris Ward, Highways Design Engineer (acting)  
Dave Hedstrom, Hydraulics Engineer  
Bill Weber, Supervisor, Photogrammetry & Survey  
Stanton Brelin, Traffic Operations Engineer  
Tyrel Murfitt, Traffic Design Engineer  
Patricia Burke, Safety Engineer  
Brett Harris, Engineering Cost Analyst  
Vacant, Engineering Information Services  
Megan Redmond, Communications Assistant  
Rebecca Ridenour, Research Section Supervisor  
Chad DeAustin, Experimental Project Manager  
Lisa Hurley, Fiscal Programming Section  
David Phillips, Engineering Division  
Ed Cohlhepp, Engineering Division  
Andy White, Secondary Roads Engineer  
Shelby Clark, Bicycle/Pedestrian Coordinator  
Joe Radonich, Remediation and Assessment  
Joe Green, Construction Bureau – VA Engineer  
Darin Reynolds, Engr. Const. Contracting Bureau Chief  
Mike Poole, MCS Scale Site Coordinator

Steve Giard, Utilities Engineering Manager  
Jonathan Ries, Lands Section Supervisor  
Bob Heiser, Acquisition Section Supervisor  
Jon Burnett, R/W Access Management Section Manager  
Jim Davies, Materials Bureau Chief  
DJ Berg, Pavement Analysis Engineer  
Miles Yerger, Surfacing Design Supervisor  
Scott Helm, Geotechnical Operations Manager  
Paul Johnson, Project Analysis Bureau  
Jean Riley, Planner  
Tom Gocksch, ESB, Engineering Section Supervisor  
Erin Murphy, Fiscal Programming Section  
Vacant, Eng. Manager, Bridge Management System  
Matt Maze, ADA Coordinator  
Bill Semmens, Environmental Resources Section Supervisor  
Jon Axline, Historian  
Darcy Goodson, Reclamation Specialist  
Nathan Haddick, Bridge Design Engineer  
Gene Kaufman, FHWA - Operations Engineer

### **Missoula**

Vacant, Preconstruction Engineer  
Joel Boucher, Materials Lab Supervisor  
Amber Jensen, Right of Way Supervisor  
Johnathon Schmidt, Construction Engineer  
Jon Rainwater, Hydraulics Engineer  
Dan Cunningham, Traffic Project Engineer  
Joe Weigand, Biologist  
Benjamin Nunnallee, Projects Engineer  
Peter Thelen, District Utility Agent (Kalispell)  
Nick Tholt, Signing Designer Supervisor  
Glen Cameron, Traffic Engineer - Missoula  
Josh Dold, Road Design Area Engineer  
Michael Ivanoff, Environmental Engineer

Steve Felix, Maintenance Chief (Missoula)  
Justun Juelfs, Maintenance Chief (Kalispell)  
Darrell Williams, Construction Ops Engineer  
DeWayne Wilson, Bridge Area Engineer  
Bret Boundy, Geotechnical Manager  
Grant Rodway, Project Development Engineer  
Pat Metzger, District MCS Captain  
Tim Hufford, Surfacing Design  
Gregg Wood, District Utility Agent (Missoula)  
Jim Turner, Registered Land Surveyor  
Rebecca Franke, Traffic Engineer - Kalispell  
Joe Green, Constructability Reviewer