Memo

Date:	Monday, August 05, 2019
Project:	STPS 263-1(28)6 West of Missoula - NW UPN 6141000 Work Type: 140 – Reconstruction w/o Added Capacity
To:	Fred Bente, P.E. MDT Project Manager
From:	Lisa Fischer, P.E. HDR Project Manager
Subject:	ACT 118 – Multi-Use Path Impacts

Scope of Work

Mullan Road in the project limits currently has a single 12 foot travel lane in each direction with limited to no roadway shoulder. The proposed scope of work of this project includes reconstruction of the existing roadway, including widening of the roadway to 2-12 foot lanes, and 6 foot shoulders, as well as updating the existing horizontal alignment to meet current design standards. Other proposed work includes signing and striping, bridge replacement, irrigation relocations and hydraulic improvements.

ACT 118 – Multi-Use Path Impacts

After the roadway Alignment and Grade Review (AGR), MDT requested that HDR further evaluate the addition of a 10 foot wide multi-use path along the northeast side of Mullan Road within the current project limits located within the current proposed right-of-way for the roadway project. Horizontal and vertical alignments of the path were established to reduce additional right of way impacts and accommodate the multi-use path between the new right of way limits, as specified in the Roadway AGR design, and the proposed Mullan Road construction limits.

The following sections describe the impacts associated with the multi-use path in addition to those already identified with the Mullan Road reconstruction, as shown in the attached plan/profile and cross section sheets.

Hydraulics

The addition of the multi-use path will result in an increased width to the overall project corridor. This increased width will impact the hydraulic aspects of the project by requiring increased culvert lengths, possible increased size (opening) of culverts, relocation of waterways and ditches, as well as floodplain encroachment. These possible impacts are further specified below.

IRRIGATION

The increased width of the project corridor due to the path will require the previously proposed hydraulic crossings to be lengthened. In order to offset the increased length of the crossings,

the size of the culverts may need to be increased to reduce the headloss. Further detailed analysis will be required to identify the actual size needed. In addition to impacts to the hydraulic structures, relocation or modification of the irrigation ditches will be required to accommodate the increased width. **Table 1** below provides information on the location and type of impact associated with the irrigation facilities of the project.

Table 1: Summary of Proposed Path Impacts to Irrigation Facilities

Path Station	Irrigation Impact
145+69	Culvert Crossing – M1 lateral – Lengthen siphon by approximately 18’
145+69 – 150+50	M1 lateral canal – Realignment/canal modification
151+60 – 176+70	Primrose canal – Realignment/canal modification
176+70	Bridge Crossing – Primrose Canal Bridge – lengthen proposed structure by approximately 20’

FLOODPLAIN

The increased width of the project corridor due to the path further increases the project encroachment into the Zone A floodplain as described in the Preliminary Hydraulics Report for the project. In addition to the encroachment, the increased width will also require the previously proposed hydraulic crossings to be lengthened. In order to offset the increased length of culverts and encroachment associated with the path, the size of the culverts may need to be increased to reduce the headloss. Further detailed analysis will be required to identify the actual size increases needed. In addition, between Path Sta. 119+33 and 121+95, the path is set to overlay the existing alignment of LaValle Creek. The creek will need to be relocated to accommodate the additional width. **Table 2** below provides information on the location and type of impact associated with the floodplain aspects of the project.

Table 2: Summary of Proposed Path Impacts to Existing 100-Yr Floodplain

Path Station	Floodplain Impact
38+30	Culvert Crossing – North Ditch - Lengthen culvert by approx. 20’
45+42	Culvert Crossing – O’Keefe Creek – Lengthen culvert by approx. 20’
82+80	Culvert Crossing – Moccasin Ditch– Lengthen culvert by approx. 5’
82+80 – 84+30	Open flow ditch – Moccasin Ditch – Grading at ditch bend
108+51	Culvert Crossing – LaValle Ditch – Lengthen culvert by approx. 25’
119+69	Culvert Crossing – LaValle Creek – Lengthen culvert by approx. 40’
119+33-121+95	Open channel – LaValle Creek – Relocate/realign channel

Environmental

The 10 foot wide multi-use path and associated fill slopes will have additional impacts on environmental resources throughout the project corridor. Some of the impacts can be quantified as described below, while others are qualitatively described based on a conceptual level of detail.

WETLANDS

Additional wetland impacts are anticipated due to added construction limits associated with the path. Based on the preliminary alignment and grade of the proposed roadway improvements, an estimated 0.54 acre of wetland impacts would occur. The multi-use path results in an additional 0.56 acre of wetland impacts, increasing the total project wetland impacts to from 0.54 acre to 1.10 acres. **Table 3** below provides information on the wetland, location, and type of impact.

Table 3: Summary of Proposed Impacts to Existing Wetlands

Wetland	Station Range	Impacted Area Due to Roadway Improvements (acres)	Additional Impacted Area Due to Multi-Use Path (acres)
WL-1	6+25 – 6+89	0.01	-
WL-2A	45+21 - 45+43	-	0.01
WL-3C	81+55 - 89+88	0.05	-
WL-5B	82+77 - 82+91	0.01	-
WL-5A	82+81 - 85+68	-	0.01
WL-3D	92+98 - 93+74	0.02	-
WL-3E	96+71 - 97+31	0.02	-
WL-6B	107+88 - 109+53	0.02	-
WL-6A	108+13 - 109+11	0.04	0.03
WL-7B	112+28 - 119+35	0.04	-
WL-7A	119+02 - 147+27	0.27	0.51
WL-8A	180+74 - 189+51	0.06	-
	Total	**0.54**	**0.56**

An increase in wetland impacts has implications on the level of environmental permitting and compensatory mitigation required for the project. Highway reconstruction projects similar to the proposed project are commonly permitted under Section 404 Nationwide Permit (NWP) No. 14 – Linear Transportation Projects. Project authorization under NWP 14 can occur only if the impacts to waters of the U.S., including wetlands, are less than 0.50 acre, beyond which an Individual Permit is required. Based on preliminary wetland impact calculations, the roadway improvements alone exceed the 0.50 acre NWP threshold suggesting an Individual Permit will be required regardless of including the multi-use path in the project design.

SURFACE WATERS

Two perennial streams are located within the project area. O'Keefe Creek crosses Mullan Road at approximately RP 9.8 and LaValle Creek crosses at two locations, RP 8.4 and RP 9.1. **Table 4** provides information on the stream, location, and quantifies the linear feet of potential impact by impact type. Per the United States Army Corps of Engineers (USACE) 2013 Montana Stream Mitigation Procedure, projects that result in more than 300 linear feet of new impact on streams will usually require compensatory mitigation; and projects resulting in 150 linear feet of stream or more being placed into a new culvert or pipe, and projects extending existing culverts or pipes by 150 linear feet or more, will require compensatory mitigation.

Table 4: Summary of Path Impacts to Existing Surface Waters

Stream	Path Station Range	Impacted Area Due to Roadway Improvements (linear feet)	Additional Impacted Area Due to Multi-Use Path (linear feet)
O'Keefe Creek	45+24 – 45+43	1.4	18.7
LaValle Creek	108+13 – 109+11	38.4	12.9
	Total	**39.8**	**31.6**

FARMLAND

Soils meeting the criteria of Important Farmland are abundant in the vicinity of the project area. Due to the anticipated right-of-way acquisition throughout the project corridor, the proposed project will result in the direct conversion of soils meeting Important Farmland classification to non-agricultural uses. While not quantified for purposes of this memo, the addition of the multi-use path will likely increase the amount of farmland impacts for the project.

HISTORIC SITES

The cultural resources inventory of the project area is not complete at this time. Several structures are located adjacent to the existing highway and will be impacted by the project. The Private Property section below lists the structure impacts resulting from the proposed roadway improvements as well as the addition of the multi-use path. Further work is required, however, to determine whether any of the affected structures are potentially eligible for inclusion on the National Register of Historic Places.

Private Property

Private property impacts associated with the addition of the path are summarized in **Table 5**. These impacts are in addition to those identified for the Mullan Road improvements as shown in the roadway AGR plans. The new right-of-way required for the path as noted in **Table 5** is included in the 1.09 acres of new right-of-way summarized in **Table 6**. For any private property impacts associated with the reconstruction of Mullan Road, refer to the Mullan Road AGR Plans.

Table 5: Summary of Proposed Path Impacts to Existing Private Property Features

Path Station	Parcel	Property Impacts	Description
17+00 - 17+45	4	Tree removal	Additional tree overhang and root impacts due to path construction
80+43 - 81+00	12	Tree removal	New r/w required for path
93+00 - 93+75	19	Tree removal	Additional tree overhang and root impacts due to path construction
178+79 - 179+30	52 & 53	Tree removal	Additional tree overhang and root impacts due to path construction
180+48 -181+40	54 & 55	Tree removal	Additional tree overhang and root impacts due to path construction
184+24 – 184+90	56	Tree removal	New r/w required for path
186+38	56 & 60	Corral on proposed trail	New r/w required for path
195+96 - 196+47	61	Tree removal & Landscaping features	Private approach improvements extended due to path
211+40	72	Tree removal	New r/w required for path
214+00	72	Landscaping feature on proposed trail	New r/w required for path
214+15	72	Tree removal	New r/w required for path
215+10	72	Tree removal	New r/w required for path
217+10	72	Tree removal	New r/w required for path
223+43	72	Landscaping feature on proposed trail	Private approach improvements extended due to path
245+40 - 246+60	83	Tree removal	New r/w required for path
256+46	90	Tree removal	New r/w required for path

Bridge

The existing Irrigation Main Canal Bridge will be replaced as part of this project. The bridge design presented in the TS&L Study will be modified to include the 10 foot multi-use path on the left side of the travel way. The proposed bridge typical section is shown in **Figure 1** below.

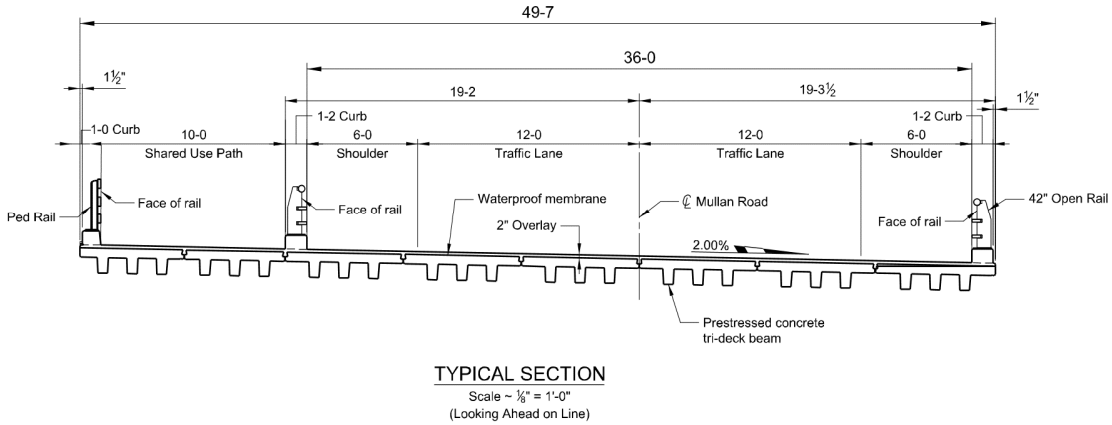

Figure 1: Typical Section of Proposed Main Canal Bridge

Two additional tri-deck girders and a pedestrian rail were added to the north side of the structure to accommodate the multi-use path. The widened bridge impacts the north-west section of the irrigation canal which may cause a need for canal realignment. The additional cost is summarized in the Cost Estimate section of the memo.

Right of Way

There are 10 locations along Mullan Road that will require additional right-of-way in order to accommodate the 10 foot wide path outside of the right-of-way proposed for the roadway project. These locations are noted in **Table 6** below and called out in the Multi-Use Path Plan and Profile sheets.

Table 6: Summary of Additional Right-of-Way Required for the Proposed Path

Path Station	Parcel	Additional R/W Area (acres)
27+66 – 33+66	4	0.07
68+56 – 70+24	8	0.04
79+38 – 82+17	12 & 15	0.03
85+58 – 90+99	15 & 18	0.08
110+13 – 113+60	6	0.03
113+60 – 117+03	26	0.04
132+82 – 138+68	35	0.07
183+54 – 190+76	55, 56 & 60	0.11
210+85 – 216+58	69, 70 & 72	0.27
241+01 – 256+94	81, 82, 83 & 90	0.35
	Total	**1.09**

Cost Estimate

The preliminary cost estimate for the addition of the multi-use path is shown in **Table 7**. The table contains the cost estimate from the West of Missoula - NW AGR submittal as well as the additional cost associated with the multi-use path.

Table 7: Cost Estimates for the Original AGR Submittal & Proposed Path Addition

	AGR Cost Estimate	Multi-Use Path Cost Estimate	Combined Cost Estimate
Roadway Improvements	$4,701,594		$4,701,594
Path Surfacing, Guardrail, Clearing/Grubbing		$750,815	$750,815
Irrigation Relocation	$250,000	$50,000	$300,000
New Bridge	$175,000	$73,430	$248,430
Subtotal	**$5,126,594**	**$874,245**	**$6,000,839**
Mobilization (8%)	$410,128	$69,940	$480,068
Subtotal	**$5,536,722**	**$944,185**	**$6,480,907**
Contingencies (20%)	$1,107,344	$188,837	$1,296,181
Construction Total	**$6,644,066**	**$1,133,022**	**$7,777,088**
CE (10%)	$664,407	$113,302	$777,709
Total	**$7,308,473**	**$1,246,324**	**$8,554,797**
IDC @ 10.49% - Construction	$696,963	$118,854	$815,817
IDC @ 10.49% - Construction Engineering	$69,696	$11,885	$81,581
Total w/ IDC	**$8,075,132**	**$1,377,063**	**$9,452,195**
Right-of-Way (Acres)	43.76	1.09	44.85
Right-of-Way Cost	$2,625,600	$65,400	$2,691,000
PE (10%)		$124,632	$124,632
Total	**$10,700,732**	**$1,567,095**	**$12,267,827**
Inflation (2.5%)		$162,685	$162,685
Total w/ Inflation	**$10,700,732**	**$1,729,780**	**$12,430,512**