



Montana Department of Transportation

PO Box 201001

Helena, MT 59620-1001

Memorandum

To: Ryan Dahlke, P.E.  
Consultant Design Engineer

From: Bryan Miller, P.E. *BM*  
Consultant Plans Engineer

Date: September 5, 2017

Subject: NH 5-2(159)37  
US 93 N – Post Creek Hill  
UPN 8008000  
Amended Alignment and Grade Review Submittal  
Work Type 140 - Reconstruction – without added capacity

Please approve the amended Alignment and Grade Review for this project. This report provides amended conditions to the April 11, 2016 AGR report

Approved *Ryan Dahlke* Date 9/12/2017  
Ryan Dahlke  
Consultant Design Engineer

We are requesting comments from the below distribution. If no comments are received within two weeks of the release date we will assume concurrence.

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  
Gene Kaufman FHWA - Operations Engineer (PODI)  
Jon Swartz, Maintenance Division Administrator

cc:

Miki Lloyd, P.E. EPS Project Manager, Consultant  
Design  
Dan Lozar, CSKT

Consultant Design Project File

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## Alignment and Grade Report

NH 5-2(159)37, US 93 N Post Creek Hill, UPN 8008000  
EPS Project Manager: Miki Lloyd, P.E.

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### Introduction

A second alignment review meeting was conducted on April 6, 2017, 9:30 am at the Mission Valley Power Conference Room in Pablo and MDT 2<sup>nd</sup> Floor Conference Room in Helena. The meeting was conducted via go-to-meeting and conference call. Those in attendance by location:

PABLO	
John Pavsek	MMI – Project Manager
Scott Fanning	KLJ- Assistant Project Manager
Miki Lloyd	MDT – Consultant Design
Bill Durbin	MDT – Consultant Design
Gene Kaufman	FHWA
Susan Kilcrease	MDT – Environmental
Ed Toavs	MDT – Missoula District Administrator
Dan Lozar	CSKT
Art Soukkala	CSKT
Mark Brooke	MMI – Environmental Coordinator
Joe Weigand	MDT - Environmental
Patricia Hogan	MDT - Utilities
Dale Becker	CSKT
Holly Hitchcock	CSKT
Seth Makepeace	CSKT
Margaret Sheridan	CSKT
Gabe Johnson	CSKT
Ben Nunnallee	MDT – Missoula District
HELENA	
Jeff Jackson	MDT - Geotechnical
Paul Hilchen	MDT - Geotechnical
Brett Warren	SK Geotechnical – Project Geotech
Ron Maynard	MDT - ROW/Utilities
Ben Schendel	MDT - Hydraulics
Bret Bounty	MDT - Geotech, Helena
Chris Hardan	MDT - Bridge, Helena
Jim Scoles	MMI - Bridge, Helena
BILLINGS	
Cory Rice	SK Geotechnical – Geotechnical Manager

The following meeting comments are amended to the previously approved April 11, 2016 Alignment & Grade Report (see attached).

### Scope of Work

The centerline alignment at Post Creek has changed since the original report was written. Reference the Horizontal alignment writeup below for a more detailed description of the change.

### Project Location and Limits

No change to original report

### Work Zone Safety and Mobility

No change to original report

## Alignment and Grade Report

NH 5-2(159)37, US 93 N Post Creek Hill UPN 8008000  
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### Physical Characteristics

No change to original report

### Horizontal Alignment

The original report is as amended below:

From the beginning of the project at Station POT 1+07.35 to POC at 195+63.19, the alignment will be aligned in accordance with Preferred *Alternative Rural 3* specified in the US Highway 93 Ninepipe/Ronan Project Final SEIS. The alignment departs from the present traveled way, shifting east and west of the existing centerline for the full length of the project.

The horizontal alignment has shifted near the Post Creek Bridge. The future highway alignment follows the existing roadway alignment through this area. The alignment change resulted from CSKT request to minimize impacts to the forested area and wetlands on the west side of the highway.

A detailed description of the horizontal alignment as shown in the AGR plans is characterized as follows:

- Tangent alignment from POT 1+07.35 to a PI at 16+95.06 – 1,587.71' length
- Tangent alignment from PI 16+95.06 to a PC at 58+09.59 – 4,114.53' length
- A 12,000' radius curve left beginning at PC 58+09.59 to PRC 65+58.31 – 748.72' length
- A 12,000' radius curve right beginning at PRC 65+58.31 to PRC 76+92.52 – 1,135.21' length
- A 12,000' radius curve left beginning at PRC 76+92.52 to PRC 82+80.86 – 588.34' length
- A 12,000' radius curve right beginning at PRC 82+80.86 to PRC 91+99.74 – 918.88' length
- A 50,000' radius curve left beginning at PRC 91+99.74 to PRC 147+88.19 – 5,588.45' length
- A 12,000' radius curve right beginning at PRC 147+88.19 to PT 155+71.09 – 782.90' length
- Tangent alignment from PT 155+71.09 to a PC at 171+69.29 – 1,598.20' length
- A 25,000' radius curve right beginning at PC 171+69.29 to PT 182+76.54 – 1,107.25' length
- Tangent alignment from PT 182+76.54 to a PC at 191+45.70 – 869.16' length
- A 12,000' radius curve right beginning at PC 191+45.70 to PT 195+15.70 – 370' length
- Tangent alignment from PT 195+15.70 to POT 195+63.19 – 47.49' length

Following is a general description of the future centerline in relation to the current centerline of the PTW:

- Between 1+07.35 (POT) to approximately 58+09.59, the new roadway is centered on the existing PTW.
- Between 58+09.59 to approximately 94+50, the centerline shifts left (west). The maximum centerline shift of 45' occurs at Sta. 71+50, north of West Post Creek Road.
- At Sta. 94+50, the design centerline crosses to the east of the PTW centerline. Between 92+50 to approximately 150+00, the realigned roadway is right (east) of the PTW. The maximum centerline shift of 72' occurs at Sta. 120+00, south of McDonald Lake Road.
- At Sta. 150+00, the design centerline crosses to the left (west) of the PTW centerline for a short distance, then crosses back over to the right of (east) of the PTW at Sta. 159+00. The maximum centerline shift of 8' to the west occurs at 153+50.
- At Sta. 159+00, the design centerline crosses to the right (east) of the PTW centerline. Between 159+00 and 195+15.70 (PT), the realigned road is right (east) of the PTW. The maximum centerline shift of 30' occurs at 175+00.

## Alignment and Grade Report

NH 5-2(159)37, US 93 N Post Creek Hill, UPN 8008000  
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- From Sta. 195+15.70, to Sta. 195+63.19 is back into existing PTW centerline.

The design vehicle for this project is a WB-67.

### Vertical Alignment

The following is a general description of the current vertical alignment as compared to the previous AGR vertical alignment:

- Grade remains relatively the same from project beginning to approximately station 90+00.
- Slight grade lowering from Station 90+00 to just before the crest of the hill at Station 160+00.
- The crest of the hill has been shifted north approximately 1,500 feet to Station 165+50 subsequently causing a grade raise from Station 160+00 to the project terminus.

Amend this section as addressed below:

At the beginning of the project at Sta. 1+07.35 (begin Project), the existing elevation and grade is established by the northerly terminus of the past US 93 reconstruction project NH 5-2(122)31. The more recent Dublin Road/Red Horn Road Safety project number is STPHS 5-2(99)37.

From Sta. 17+41.43 to the sag vertical curve at 45+50, positive grades of +0.678 and negative grades ranging from -0.400% to -1.407% are employed to maintain the elevation of the existing PTW. This area includes several residences and businesses near US 93; maintaining existing grades reduces impacts to private properties and access thereof, and facilitates drainage.

From Sta. 45+00 to 70+63.05 (Post Creek Road) is a continuous positive grade of +1.200%. The profile is influenced by several factors including bridge abutment height of fill on adjoining wetlands, bridge substructure height, and the intersection elevation at Post Creek Road.

From Sta. 70+63.05 to 91+00, a positive grade of +1.200% is maintained to match existing grades at centerline. Immediately north of Post Creek Road the typical section transitions to include a passing lane in advance of the steeper roadway section beginning at 91+00. An 800' sag curve is employed from 91+00 to 99+00 to steepen the profile to the maximum climbing grade of +4.000. This grade continues for 4,220' to Sta 141+20 which is the beginning of an 800' crest curve ending at 149+20. The incoming grade of +4.000 transitions to a +1.622% to the beginning of a crest curve at 158+00.

A 1,500' crest curve beginning at 158+00 extends to negative grades ranging from -0.823 to -0.470 is designed to minimize impacts to adjacent wetlands left and right of centerline thru the intersection of Olsen Road/Gunlock Road. Likewise, the design centerline grade crossing Olsen Road/Gunlock Road considers reduced impacts to the existing pond left (west) if the PTW north of Olsen Road/Gunlock Road (intersection Sta. 175+71).

From 176+34.36 to the project end Sta. 195+15.70, negative grades of -0.823% and -0.470 respectively end at a minor sag vertical curve starting at 193+00. The 200' sag vertical curve terminates at Sta. 195+15.70 at -0.144% to matches up with existing PTW grade north of the project limit.

### Surfacing and Typical Section

Amend the original report text as addressed below:

## **Alignment and Grade Report**

NH 5-2(159)37, US 93 N Post Creek Hill, UPN 8008000  
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Delete the 10<sup>th</sup> paragraph that addresses a design of a 3% super elevated curve (between Sta. 82+35.97 to 90+63.54. Modifications to the horizontal curve no longer require use of a super elevated curve.

### **Grading**

Amend the original report text as addressed below:

Supplemental Activity 106 CPT testing performed in February 2017 confirmed there is an artesian groundwater aquifer in the area of the future bridge. The depth to the artesian aquifer was measured at approximately 35 feet below grade. Piezometers measured groundwater pressures ranging from 11.8 feet head pressure at the south bridge foundation (south of Post Creek) to 17.0 feet head pressure at the north bridge foundation (immediately north of Post Creek). The presence of this artesian aquifer will require special bridge foundation design considerations as well as the approach to Activity 130 investigation.

### **Hydraulics**

No change to original report.

### **Permanent Erosion and Sediment Control (PESC) Features**

No change to original report.

### **Bridges**

At this second Alignment and Grade review there have not been any changes to the bridge structure layout since the initial AGR was conducted. It is worth noting that there have been recent discussions and considerations to change the bridge to a three span structure to limit the number of foundations. A meeting is scheduled with MDT Geotech and Bridge to discuss foundation options in this challenging geotechnical environment. The decision on an appropriate span configuration and foundation system will be address in the future and documented to amend this report.

In the original AGR report, it was stated that traffic would utilize the existing bridge while the new bridge is constructed. Since the alignment has shifted to straddle the existing PTW, traffic control in the Post Creek area will utilize a temporary detour road on the east side of the alignment. The detour will require a temporary bridge over Post Creek

### **Traffic**

Replace the 1<sup>st</sup> paragraph with the following:

The original AGR report design vehicle was a S-Bus-36. The design vehicle has been changed to a WB-67 truck since there is anticipated to be farm to market truck traffic to and from the intersecting highways. One of the design goals is to minimize the final construction impacts to the maximum degree practicable to avoid impacts to adjacent private properties and sensitive environmental areas. The impacts of the design turn radius of a WB-67 truck at intersections will have negligible property and wetlands impacts.

The passing lane transition begins south of Post Creek Road. MDT Traffic asked if the passing lane could begin north of the intersection with Post Creek Road. Starting the passing lane south of the intersection takes advantage of the flatter slopes south of the intersection. Beginning the transition north of the intersection reduces the length of the passing lane. It has been decided to leave the design as shown on the Alignment & Grade design

## **Alignment and Grade Report**

NH 5-2(159)37, US 93 N Post Creek Hill, UPN 8008000  
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### **Intelligent Transportation Systems (ITS) Features**

No change to original report.

### **Miscellaneous**

No change to original report.

### **Design Exceptions**

Amend the original report with text below.

c. The design exception for the grade is no longer need as the grade has been changed to meet standards

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

No change to original report.

### **Utilities**

Amend the original report text as addressed below:

Blackfoot Telephone has recently submitted an application to MDT to build fiber optic facilities in the US-93 right of way from the south end of the project to approximately Sta. 85+00. The preliminary utility application identifies the proposed utility on the right side of the highway near the R/W limit.

### **Environmental Considerations**

Amend the original report text as addressed below:

FHWA is looking into whether Tribal Trust properties should be classified as Section 4(f) properties. Further discussion and evaluations are necessary to confirm the status of these properties. In addition to the MT FWP Section 4(f) properties identified in the original AGR report, the following properties should be included:

- Station 151+50 to 170+50 LT ⇒ Approximately 0.3 acres
- Individual impacts at Stations 176+62, 178+25, and 181+50 RT that directly related to the turtle crossings – Approx. 0.01 Acres ⇒ Approximately 0.01 acres
- Station 601+45 to 601+87 LT of Olsen Road ⇒ Approximately 0.01 acres

Wildlife crossings, including the construction of the longer bridge over Post Creek outlined in the SEIS will be implemented with this project. The 10'x12' wildlife crossing at Sta. 48+00 as identified in the SEIS will be eliminated from this project. The original intent was to create a dry wildlife crossings. Groundwater in this area is approximately 1 ½ feet below the surface. In order to maintain a dry crossing, the wildlife culvert would need to be raised to avoid groundwater or surface water from flowing through the structure. Constructing a 10' high by 12' wide structure would require the roadway profile be raised in excess of 7-feet above the current design. Raising the highway would increase impacts to sensitive wetlands and preclude private approach access from the Hunts Timbers property. MDT, CSKT and FHWA determined that the structure could be eliminated and that the close proximity of the proposed 500' bridge provides adequate wildlife passage in the Post Creek wildlife corridor.

### **Experimental Features**

No change to original report.

### **Traffic Control**

Traffic control through the post creek area will require a temporary detour along the east side of the construction limits. The detour will include a temporary two lane bridge over Post Creek.



## Alignment and Grade Report

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### Public Involvement

No change to original report.

### Construction Cost Estimate

Replace the original report text with the following:

The revised cost estimate is from the Red Book in August 2017 and is attached for comparison. Since this project is within the boundaries of the CSKT Reservation, federal participation is 100%; therefore G-Matching does not apply.

	Estimated cost	Inflation (INF) (from PPMS)	w/INF + IDC (from PPMS)
Road Work	6,632,126		
New Structure	4,300,000		
Traffic Control	400,000		
<b>Subtotal</b>	<b>11,332,126</b>		
Mobilization (12%)	1,359,855		
<b>Subtotal</b>	<b>12,691,981</b>		
Contingencies (20%)	2,538,396		
<b>Total CN</b>	<b>\$15,230,377</b>	<b>\$1,357,030</b>	<b>\$18,405,386</b>
<b>CE (10%)</b>	<b>\$1,523,037</b>	<b>\$135,703</b>	<b>\$1,840,537</b>
<b>TOTAL CN+CE</b>	<b><u>\$16,753,415</u></b>	<b><u>\$1,492,733</u></b>	<b><u>\$20,245,923</u></b>

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 10.96% for FY 2017.

### Preliminary Engineering

Amend the original report to include the following:

There have been additional scope changes since the initial AGR. These scope changes include:

- Realign US-93 alignment over Post Creek to follow the PTW alignment,
- Monitor and mitigate the artesian spring created when structural drilling accidentally opened the spring on the north side of Post Creek left of US 93,
- Expand land survey and wetlands mapping associated with expanded stream restoration routes requested by CSKT,
- Perform a turtle crossing investigation to recommend cross structures near Gunlock/Olsen Road.

### Ready Date

The Ready Date is set to October 1, 2021 in EPS. The current proposed letting date is January 2021. The project schedule will be delayed as result of the inclusion of the Section 4f of the Post Creek Hill and Ninepipe Reservoir segments of US 93 and reevaluation process, a new schedule will need to be developed which will include a new planned finish date. The letting date will be evaluated after the 4f process and re-evaluation are completed. The current PE End Date is 10/31/2020.

e-copies

Dustin Rouse, Preconstruction Engineer  
James Combs, Highways Design Engineer  
REV 10/21/2015

Jake Goettle, Construction Bureau – VA Engineer  
Steve Giard, Acting Utilities Engineering Manager

## Alignment and Grade Report

NH 5-2(159)37, US 93 N Post Creek Hill UPN 8008000

EPS Project Manager: Miki Lloyd, P.E.

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Dave Hedstrom, Hydraulics Engineer  
Bryce Larsen, Supervisor, Photogrammetry & Survey  
Danielle Bolan, Traffic Operations Engineer  
Ivan Ulberg, Traffic Design Engineer  
Kraig McLeod, Safety Engineer  
Chad Richards, Engineering Cost Analyst  
John Pirre, Engineering Information Services  
Jan Nessel, Public Involvement Officer  
Sue Sillick, Research Section Supervisor  
Suzy Price, Contract Plans Bureau Chief  
Alyce Fisher, Fiscal Programming Section  
Kurtis Miros, Engineering Division  
John McClafferty, Engineering Division

David Hoerning, Lands Section Supervisor  
Greg Pizzini, Acquisition Section Supervisor  
Joe Zody, R/W Access Management Section Manager  
Jim Davies, Pavement Analysis Engineer  
Darin Reynolds, Surfacing Design Supervisor  
Jeff Jackson, Geotechnical Engineer  
Paul Johnson, Project Analysis Bureau  
Jean Riley, Planner  
Dawn Stratton, Fiscal Programming Section  
Amanda Jackson, Eng. Manager, Bridge Management System  
Matt Maze, ADA Coordinator  
Michelle Erb, Bicycle/Pedestrian Coordinator  
Sheila Ludlow, Bicycle/Pedestrian Coordinator

Shane Stack, Preconstruction Engineer  
Mike Dodge, Materials Lab  
Maureen Walsh, Right of Way Supervisor  
Robert Vosen, Construction Engineer  
Ben Schendel, Hydraulics Engineer  
Gabe Priebe, Traffic Project Engineer  
Joe Weigand, Biologist  
Benjamin Nunnallee, Projects Engineer  
Breta Palmer, District Utility Agent

Steve Felix; Gary Engman, Maintenance Chief  
Susan Foley, Right of Way Design Supervisor  
Dean Jones, Construction Ops Engineer  
Christopher Hardan, Bridge Area Engineer  
Brett Boundy, Geotechnical Manager  
Susan Kilcrease, Project Development Engineer  
Pat Metzger, District MCS Captain  
Andrew White, Surfacing Design  
Patricia Hogan, District Utility Agent



# Montana Department of Transportation

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BID PRICES  
June 2017

## Preliminary Estimate

Project Number: NH 5 2(159)37  
Project Name: US 93 N - Post Creek Hill  
UPN Number: 8008000  
Project Length: 3.6 Miles  
Design Stage: (AGR)-Alignment & Grade Review

Prepared By: KJ / MM  
Date: August 30, 2017  
County: LAKE COUNTY  
District: Missoula  
Type of Work: Grade, Gravel, Asphalt Pavement, Structure, Drainage

Item Number	Quantity	Description	Unit	G-Match	Average Bid Prices		Adjusted Unit Prices	
					Unit Price	Amount	Unit Price	Amount
					Dollars	Dollars	Dollars	Dollars
105070000	1	CONTRACTOR SURVEY AND LAYOUT	LS	No	\$30,689.82	\$30,690.00	\$100,000.00	\$100,000.00
202020041	1	REMOVE STRUCTURE	LS	No	\$150,800.00	\$150,800.00	\$50,000.00	\$50,000.00
203020100	160551	EXCAVATION-UNCLASSIFIED	CUYD	No	\$3.14	\$504,130.00		\$504,130.00
203020200	20648	EXCAVATION-UNCLASS BORROW	CUYD	No	\$3.71	\$76,604.00		\$76,604.00
203020310	122651	SPECIAL BORROW-NEAT LINE	CUYD	No	\$11.85	\$1,453,414.00		\$1,453,414.00
203080100	20210	TOPSOIL-SALVAGING AND PLACING	CUYD	No	\$4.21	\$85,084.00		\$85,084.00
208010150	1	TEMPORARY EROSION CONTROL - LS	LS	No	\$22,958.34	\$22,958.00		\$22,958.00
208010200	500	TEMPORARY EROSION CONTROL	UNIT	No	\$1.00	\$500.00		\$500.00
301020340	39246	CRUSHED AGGREGATE COURSE	CUYD	No	\$21.89	\$859,095.00		\$859,095.00
301020625	162955	AGGREGATE TREATMENT	SQYD	No	\$0.34	\$55,405.00		\$55,405.00
401020048	43038	PLANT MIX SURF GR S-1/2 IN	TON	No	\$28.40	\$1,222,279.00		\$1,222,279.00
401020300	603	HYDRATED LIME	TON	No	\$191.37	\$115,396.00		\$115,396.00
402020095	2518.2	ASPHALT CEMENT PG 70-28	TON	No	\$417.82	\$1,052,154.00		\$1,052,154.00
402020315	22830	EMULSIFIED ASPHALT-TACK COAT	GAL	No	\$1.94	\$44,290.00		\$44,290.00
402020320	8759	EMULSIFIED ASPHALT-FOG SEAL	GAL	No	\$2.74	\$24,000.00		\$24,000.00
402020368	205.3	EMULSIFIED ASPHALT CRS-2P	TON	No	\$384.53	\$78,944.00		\$78,944.00
409000010	116300	COVER-TYPE 1	SQYD	No	\$0.52	\$60,476.00		\$60,476.00
411011135	8	RUMBLE STRIPS	MILE	Yes	\$700.54	\$5,604.00		\$5,604.00
603013387	87	REIN CONC BOX 14 X 10	LNFT	No		\$0.00	\$1,500.00	\$130,500.00
610100101	24.3	SEEDING AREA NO 1	ACRE	No	\$327.00	\$7,946.00		\$7,946.00
610100102	0.1	SEEDING AREA NO 2	ACRE	No	\$999.59	\$100.00		\$100.00
610100103	6.2	SEEDING AREA NO 3	ACRE	No	\$206.21	\$1,279.00		\$1,279.00
610100326	24.3	FERTILIZING AREA NO 1	ACRE	No	\$86.66	\$2,106.00		\$2,106.00
610100327	0.1	FERTILIZING AREA NO 2	ACRE	No	\$72.43	\$7.00		\$7.00
610100555	30.5	CONDITION SEEDBED SURFACE	ACRE	No	\$86.24	\$2,630.00		\$2,630.00
610220100	0.1	MULCH	ACRE	No	\$3,745.93	\$375.00		\$375.00
614010050	1440	REINFORCED CONCRETE RETAINING WALL	SQFT	No		\$0.00	\$50.00	\$72,000.00
618030080	1	TRAFFIC CONTROL	LS	No	\$41,476.87	\$41,477.00	\$400,000.00	\$400,000.00
622011084	148867	GEOTEXTILE STABILIZATION	SQYD	No	\$1.13	\$168,220.00		\$168,220.00
622011086	104712	SEPARATION GEOTEXTILE - HIGH	SQYD	No	\$1.25	\$130,890.00		\$130,890.00
	324	BOTTOMLESS ARCH RCP 3 X 4	LNFT			\$0.00	\$635.00	\$205,740.00
	1	BRIDGE ESTIMATE	LS			\$0.00	\$3,300,000.00	\$3,300,000.00
	1	EMBANKMENT FOUNDATION PREP	LS			\$0.00	\$1,000,000.00	\$1,000,000.00
	1	SIGNING AND MARKING ESTIMATE	LS			\$0.00	\$100,000.00	\$100,000.00
						\$6,196,853.00		\$11,332,126.00
	12%	Mobilization				\$743,622.36		\$1,359,855.12
		Subtotal				\$6,940,475.36		\$12,691,981.12
	20%	Contingency				\$1,388,095.07		\$2,538,396.22
		<b>Construction Total</b>				\$8,328,570.43		<b>\$15,230,377.34</b>
	10%	Construction Engineering						\$1,523,037.73
		<b>Total</b>						<b>\$16,753,415.08</b>
	10.96%	Indirect Cost (IDC)-Construction						\$1,669,249.36
		<b>Total Construction w/IDC</b>						<b>\$16,899,626.70</b>
	10.96%	Indirect Cost (IDC) - Construction Engineering						\$166,924.94
		<b>Total Construction Engineering w/IDC</b>						<b>\$1,689,962.67</b>
		<b>Total w/IDC</b>						<b>\$18,589,589.37</b>

Project Length	Miles	3.60		
Project Average Finish Top Width	Feet	54.0		
Cost per Mile (Uses Construction Total)				\$4,230,660.37
Cost per Sq. Yard (Uses Construction Total)				\$133.54



Montana Department of Transportation

PO Box 201001  
Helena, MT 59620-1001

Memorandum

To: Ryan Dahlke, P.E.  
Consultant Design Engineer

From: Bryan Miller, P.E. *Blm*  
Consultant Plans Engineer

Date: April 11, 2016

Subject: NH 5-2(159)37  
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Work Type 140 - Reconstruction – without added capacity

Please Approve the Alignment and Grade Review for this project.

Approved  Date 4/13/2016  
Ryan Dahlke  
Consultant Design Engineer

We are requesting comments from the below distribution. If no comments are received within two weeks of the release date we will assume concurrence.

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Ed Toavs, Missoula District Administrator  
Kent Barnes, Bridge Engineer  
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EPS Project Manager: Miki Lloyd, P.E.

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### Introduction

An alignment review meeting was conducted on December 14, 2015, 9:30 am at the Mission Valley Power Conference Room in Pablo and MDT 3<sup>rd</sup> Floor Conference Room in Helena. The meeting was conducted via conference call. Those in attendance by location:

#### HELENA

John Pavsek	MMI – Project Manager, Helena
Miki Lloyd	MDT – Consultant Design, Helena
Bill Durbin	MDT – Consultant Design, Helena
Gene Kaufman	FHWA, Helena
Bret Bounty	MDT - Geotech, Helena
Phill Forbes	MMI, Helena
Gabe Priebe	MDT - Traffic, Helena
KC Yahvah	MDT - Hydraulics, Helena
Chris Hardan	MDT - Bridge, Helena
Joe Weigand	MDT - Environmental, Helena
Jim Scoles	MMI - Bridge, Helena
Matt Maze	MDT – Civil Rights, Helena
Sheila Ludlow	MDT - Planning, Helena
Michelle Erb	MDT - Planning, Helena

#### PABLO

Kathy Harris	KLJ, Helena
Scott Fanning	KLJ, Helena
Gabe Johnson	CSKT, Pablo
Dan Lozar	CSKT, Pablo
Art Soukkala	CSKT, Pablo
Thompson Smith	CSKT, Pablo
Jordan Thompson	CSKT, Pablo
Seth Makepeace	CSKT, Pablo
Craig Barfoot	CSKT, Pablo
Dan Lipscomb	CSKT, Pablo
Susan Kilcrease	MDT - Environmental, Missoula
Ben Nunnallee	MDT – Missoula District, Missoula
Ed Toavs	MDT – Missoula District Administrator, Missoula

Meeting discussions from the meeting are attached for reference to this report.

### Scope of Work

The proposed scope of work for this project is the complete reconstruction and widening of National Highway US 93 between approximately 1300 feet south of Dublin Gulch Road/Red Horn Road and 2000 feet north of Olsen Road/Gunlock Road. The project includes construction of the roadway on the meandering alignment outlined in the US Highway 93 Ninepipe/Ronan Project Final Supplemental Environmental Impact Statement (SEIS), February 2008, a new shared use path extending from the intersection of US 93 and Dublin Gulch Road/Red Horn Road to the project northerly terminus. The project includes a 1.6-mile truck passing lane extending between Post Creek Road to just south of Olsen Road / Gunlock Road. Other major design features include a 500-feet long bridge over Post Creek and wildlife crossings.

The design speed for the project is 60 mph, in accordance with the US 93 Corridor Standards.

### Project Location and Limits

The project is located within the Confederated Salish and Kootenai Tribe Reservation, immediately south of Ninepipe Reservoir on US 93, between RP 37.0 and 40.3, in Lake County, Montana, Route N-5.

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Project stationing increases from south to north; the reference points also increase from south to north. Within the projects are the following intersections with US 93: 1) Dublin Gulch Road/Red Horn Road, 2) West Post Creek Road/East Post Creek Road, 3) Leon Road/McDonald Lake Road, and 4) Olsen Road/Gunlock Road. The project length is 3.3 miles. The functional classification is Rural Principal Arterial. The northerly terminus of the project is 6.1 miles south of the Town of Ronan. The project will connect with recent US 93 improvements project NH 5-2(122)31, located south of Dublin Gulch Road/Red Horn Road, as well as the more recent Dublin Road/Red Horn Road Safety project STPHS 5-2(99)37.

### **Work Zone Safety and Mobility**

At this time, Level 1 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 limited Transportation Operations (TO) component and a limited Public Information (PI) component to address wide load detours 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**

This project is located in rolling terrain in a rural setting. Adjacent properties primarily consist of open land, wildlife areas, wetlands, and farms and ranch usage. There are a few commercial establishments at the south end of the project. The highway is a two lane roadway with approximate 11-12 feet lanes. The section has narrow shoulders and includes relatively steep i.e., approximately 2:1, side slopes in many areas. The surfacing section appears to have received several overlays, with no safety edge.

The majority of roadside ditches include wetlands vegetation. Running and/or standing water was noticed in several roadside ditches. The highway crosses over two irrigation ditches owned and operated by Flathead Indian Irrigation Project (FIIP).

An existing 51 foot long two-span cast-in-place concrete tee-beam bridge crosses over Post Creek. The bridge carries two travel lanes and is 28'-0" from face of rail to face of rail. The bridge includes 1' tall by 1'-3" wide curb with W-section guardrail protection. The outside lane line is located approximately 2 feet from the face of the bridge railing. The bridge abutments and bent are normal to US-93 and are constructed with concrete columns and pile cap with 20' timber piles as shown on as-built drawings. The bridge was constructed in 1933 and widened in 1955. The structure sufficiency rating is 51.9 and is classified as functionally obsolete and eligible for rehabilitation based on the August 2013 inspection report. Two utility conduits (suspected to house communications cables) hang off of the east side of the bridge superstructure. Clearance under the bridge to the stream flow line is approximately 6 feet.

Two sheet pile retaining walls are located at the south end of the project, both left and right of centerline. They were constructed as part of the Turn Bays – Ninepipe project. These walls will likely need to be removed with this project.

### **Horizontal Alignment**

From the beginning of the project at Station 17+41 to PC at 194+52, the alignment will be aligned in accordance with Preferred *Alternative Rural 3* specified in the US Highway 93 Ninepipe/Ronan Project Final SEIS. The alignment departs from the present traveled way, shifting east and west of the existing centerline for the full length of the project. A detailed description of the horizontal alignment as shown in the AGR plans is characterized as follows:

- A 23,000' radius curve left beginning at PC 17+72 to PT 20+67 – 295' length
- Tangent alignment from PT 20+67 to a PC at 41+04 – 2,037' length
- A 12,000' radius curve left beginning at PC 41+04 to PRC 46+60 – 278' length
- A 12,000' radius curve right beginning at PRC 46+60 to PT 50+95 – 218' length
- Tangent alignment from PT 50+95 to PC 57+00 – 605' length

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- A 12,000 radius curve right beginning at PC 57+00 to PRC 68+16 – 1,116' length
- A 12,000 radius curve left beginning at PRC 68+16 to PRC 81+69 – 677' length
- A 7,700 radius curve right beginning at PRC 81+69 to PT 90+88 – 919 length
- Tangent alignment from PT 90+88 to PC 105+66 – 1,478' length
- A 16,000 radius curve left beginning at PC 105+66 to PT 126+39 – 2,073' length
- Tangent alignment from PT 126+39 to PC 147+12 – 2,073' length
- A 12,000' curve right from 147+12 to PT 155+08 – 796' length
- Tangent alignment from PT 155+08 to PC 171+06 – 1,598' length
- A 25,000' curve left from PC 171+06 to PT 181+69 – 1,063' length
- Tangent alignment from PT 181+69 to PC 191+38 – 969' length
- A 12,000' curve right from PC 191+38 to POC 194+52

Following is a general description of the future centerline in relation to the current centerline of the PTW:

- Between 17+41.43 (POT) to approximately 92+50, the realigned roadway is left (west) of the PTW. The maximum centerline shift of 79' occurs at Sta. 62+00, north of Post Creek and south of West Post Creek Road.
- At Sta. 92+50, the design centerline crosses to the east of the PTW centerline. Between 92+50 to approximately 149+00, the realigned roadway is right (east) of the PTW. The maximum centerline shift of 135' occurs at Sta. 120+00, south of McDonald Lake Road.
- At Sta. 149+00, the design centerline crosses to the left (west) of the PTW centerline for a short distance, then crosses back over to the right of (east) of the PTW at Sta. 159+00. The maximum centerline shift of 8' to the west occurs at 153+50.
- At Sta. 159+00, the design centerline crosses to the right (east) of the PTW centerline. Between 159+00 and 194+52 (POC), the realigned road is right (east) of the PTW. The maximum centerline shift of 30' occurs at 175+00.

There was discussion at AGR about potentially shifting the roadway centerline west near the intersection of Leon Road/McDonald Lake Road intersection (Sta 122+80). A westerly shift could reduce fill and reduce the length of roadway improvements east of US 93 on McDonald Lake Road. The westerly shift of centerline would likely impact wetlands along US 93 north and south of Leon Road/McDonald Lake Road. The consultant will address this issue with MDT before SOW to finalize the centerline alignment in this area.

The design vehicle for this project is an S-Bus-36. Reference the Traffic section below for detailed discussion on justification for this design vehicle.

The design of the shared use path will follow the 2012 AASHTO Guide for the Development of Bicycle Facilities. The District and CSKT emphasized minimizing impacts to adjacent properties. Reduction of ROW impacts, impacts to wetlands, and impacts to Section 4f properties may be achieved by keeping the proposed shared use path alignment as close as reasonable to the new roadway. The minimum recommended distance between the path and the edge of travel way is 5 feet. Use of this minimum design standard will be limited and may only be used where absolutely necessary over culverts/WL crossings. Otherwise the path will be on the fill or cut slope or beyond the construction limits where R/W is available. In areas where there is adequate right-of-way, and sensitive wetlands is not an issue, CSKT requested the shared use path meander and blend with the natural environment.

### **Vertical Alignment**

At the beginning of the project at Sta. 17+41.43 (POT), the existing elevation and grade is established by the northerly terminus of the past US 93 reconstruction project NH 5-2(122)31. The more recent Dublin Road/Red Horn Road Safety project number is STPHS 5-2(99)37.

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From Sta. 17+41.43 (begin Project) to 30+50, negative grades ranging from -0.486% to -1.491% are employed to maintain the elevation of the existing PTW. This area includes several residences and businesses near US 93; maintaining existing grades reduces impacts to private properties and access thereof.

From Sta. 30+50 to the bottom of the sag vertical curve at 45+10, a negative grade of -0.849% is used to facilitate drainage and establish the low point before the roadway profile begins the climb north to and beyond Post Creek.

From Sta. 45+00 to 69+93 (Post Creek Road), positive grades range from +1.361% to +1.038%. The profile is influenced by several factors including bridge abutment height of fill on adjoining wetlands, bridge substructure height, and the intersection elevation at Post Creek Road.

From Sta. 69+93 to 83+00, a positive grade of +1.038% is maintained to match existing grades at centerline. Immediately north of Post Creek Road the typical section transitions to include a passing lane in advance of the steeper roadway section beginning at 83+00. A 2,000' sag curve is employed from 83+00 to 103+00 to steepen the profile to the maximum climbing grade of +4.089. This grade is maintained for 3,464' to Sta 137+64; the beginning of a 2,500' crest curve. The incoming grade of +4.089% transitions to a negative grade of -0.352%.

The aforementioned 2,500' crest curve and subsequent exiting grade of -0.352% is designed to minimize impacts to adjacent wetlands left and right of centerline from Sta. 141+00 to the intersection with Olsen Road/Gunlock Road. Likewise, the design centerline grade crossing Olsen Road/Gunlock Road considers reduced impacts to the existing pond left (west) of the PTW north of Olsen Road/Gunlock Road (intersection Sta. 175+71).

Between approximately 161+00 to Olsen Road/Gunlock Road intersection, the Geotechnical Engineer noted high groundwater conditions disclosed in the initial site drilling and stated there may be potential adverse impacts to the roadway section as currently designed. The consultant will review these drill logs and assess whether or not the grade needs to be raised or if lateral drains need to be employed to intercept high groundwater.

From 175+71 to the project end Sta. 194+52.16, the negative grade is maintained at -0.352%. This grade matches up with existing PTW grade north of the project limit.

### **Surfacing and Typical Section**

The surfacing section will include 0.50' PMS over 0.60' of CAC. Special borrow under the CAC will be used for the full length of the project in accordance with the District's direction for corridor consistency. The Project pavement design will match other nearby US 93 project asphalt contents to include Grade S, 70-28 Binder. The District requires ½-inch plant mix for longevity of all projects beginning January 2016. Based on this aggregate size, the preliminary pavement design recommends an asphalt content of 5.85%. The District requested that a fog seal be placed over the chip seal.

At the bridge ends, the pavement thickness is 0.70' over 0.60' of CAC. The typical section will maintain 1.8' of special borrow below this thickened bridge end section.

MDT Geotechnical recommends placing a geotextile under all of the special borrow for the full length of the project.

The typical section for the project will vary according to location. The general sections will consist of the following general conditions:

1. Two-lane configuration - Northbound and southbound 12' travel lanes with 8' shoulders both

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- sides, finished top width = 40'
- 2. Passing lane – Southbound 12' travel lane, northbound 12' passing lane and 12' travel lane; 8' shoulders both sides
- 3. Protected turn lanes at intersections – 14' protected left turn lanes on north and south legs of all four major intersections.
- 4. A 10-foot wide paved shared use path located within ROW – horizontal and vertical location will vary.

It was decided to not include additional shoulder width in the typical section to accommodate future overlays. The reasoning behind this decision is to economize ROW acquisition and minimize impacts to sensitive wetlands and Section 4(f) properties.

Striped median tapers will be used at the approaches to the intersections.

Side slopes will be in conformance with the requirements of Figure 12-3 in Chapter 12 of the Road Design Manual for Rural Principal Arterial Roads. Standard slopes will be employed except that 4:1 fill slopes will be considered throughout the project where it will reduce wetlands impacts and in the case of the north end of the project, limited impacts to MTFWP Section 4(f) properties. A design exception would be required for this deviation from standard 6:1 fill slopes. The SEIS Appendix A recommends using 4:1 recoverable in-slopes in areas where there are Section 4(f) properties as a means to avoid impacts to the properties.

Another impact reduction measure that will be considered is to build V-ditches in lieu of the standard flat bottom ditch. This approach would require a design exception and hydraulic justification that a V-ditch has the necessary capacity to convey runoff.

The nature of the soils in and adjoining Post Creek requires the design to consider liquefaction in a seismic event. The fill slopes will be designed to take this consideration into account and could limit the ability to steepen the roadway fill slopes over the Post Creek floodplain. Additional analysis and laboratory strength testing will be performed in Activity 130 as the project design is advanced.

From Station 82+35.97 to 90+63.54, a 3% cross slope super elevated curve is included in the AGR design. The District requested the consultant evaluate removing the super elevation in favor of a standard crowned section, this will be evaluated for feasibility. In addition, the new Road Design Manual will require that all super elevations rotate about the centerline, the District requested that this project be in compliance with the new RDM requirement where super elevations are required.

In areas of the project where the future 2' special borrow is lower than the ditch i.e., bottom of borrow is below the adjacent catch limit, roadway profile adjustment will be considered in the design to eliminate potential bathtub effects in the subgrade. Alternatively, edge drains will be considered in limited areas to mitigate potential bathtub effect.

### **Grading**

During the geotechnical investigation, 26 soil borings were drilled primarily along the design centerline of the realigned highway. Though soils vary, the native soils generally consist of lean clay, silt and clayey gravel with sand. In 12 of the borings, groundwater was observed from 3.9 feet below the surface to 19.2 feet below the surface. Soils at the site generally consist of heavy vegetation and highly compressible organic sandy lean clay and silt underlie by soft silts. Preliminary calculations indicate that 12 to 16 inches of settlement can be expected, especially near the bridge ends. Fills will include overburden to expedite settlement of the fill to minimize settlement of the bridge ends. The height, width, and settlement duration of the overburden will be computed with the final geotechnical report.



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The geotechnical consultant will further assess the liquefaction potential once the Activity 130 deep structural borings in 2015/2016. Final design of structural foundation systems and fills will address liquefaction at the project site based on geotechnical recommendations in Activity 130 report and owner preferences.

The project is expected to require nearly 180,000 cubic yards of unclassified excavation, and 156,000 cubic yards of unclassified borrow with the curvilinear roadway alignment. In accordance with the geotechnical investigation, a 25% shrinkage will be assumed for the project.

### Hydraulics

The Post Creek bridge crossing is located within a regulated Zone A floodplain. The bridge has been designed to accommodate all flood events. The Lake County Floodplain Administrator was contacted to coordinate the Floodplain Permit for the project. The administrator indicated that both the bridge replacement and highway improvement projects will require review and approval of a Floodplain Development Permit. The project will require changing the Zone A floodplain delineation. A Conditional Letter of Map Revision (CLOMR) and Letter of Map Revision (LOMR) will be required for permit approval.

Major hydraulic design elements for the project vertical alignment include the following:

- a. A new box culvert crossing at an **unnamed tributary** at Station 25+88. The grade over the proposed box is set to nominally provide sufficient cover for the surfacing section and 2' of special borrow over the box,
- b. A "potential" new culvert structure passing **Ashley Creek** under US 93 near the Hunt's Timber's private approach
- c. A new bridge crossing **Post Creek**. The existing creek alignment will not be moved from its present location where it will cross under the new bridge. Bridge foundations will be located outside of the 2-year flood plain. Drainage off of the bridge traveled way will flow to the south bridge abutment to be conveyed into the flood plain.
- d. A new box culvert at **Post F Canal** at Station 101+48. The grade over the proposed box is set to nominally provide sufficient cover for the surfacing section and 2' of special borrow over the box,
- e. A new box culvert at **Post G Canal** at Station 169+94. The grade over the proposed box is set to nominally provide sufficient cover for the surfacing section and 2' of special borrow over the box,

A Stream Mitigation study is being conducted for both Post Creek and Ashley Creek. Both the Post Creek realignment and Ashley Creek realignment options will be reviewed by MDT and CSKT to assess the stream credits in relation to normal evaluation metrics (e.g., cost, non-fisheries habitat impacts, etc.). If realignment of one or both of the streams is deemed feasible, the concepts will be advanced to the USACE for their approval.

### Permanent Erosion and Sediment Control (PESC) Features

Stream restoration design of Post Creek realignment and Ashley Creek Realignment will incorporate erosion control features as necessary to establish the future watercourses. Measures will be included in the Activity 119 Concept Mitigation Designs for the two creek realignments.

The 500-foot bridge will collect runoff to the south end of the bridge. The bridge abutment design will include stormwater collection and energy dissipation features to avoid embankment erosion. The design will address runoff channelization through the Post Creek riparian overbank area and into Post Creek.

The project will include an erosion control plans for the contractors use. Given the significant amount of roadway realignment and earthwork impacts during construction, a SWPPP will be required for construction. At this time, standard (i.e., temporary) erosion and sediment control measures should apply

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to construction. The project will not however need to provide permanent measures other than inclusion of the energy dissipater at the south end of the new bridge as described above.

### **Bridges**

There will be one bridge on this project located at station 54+27.00. The structure will include two 12'-0" lanes (one in each direction) and two 8'-0" shoulders for an overall clear roadway width of 40'-0". There will be no turn lanes on the structure. The structure will also include a 10'-0" wide shared use path separated from traffic by standard W830 steel rail on the east side of the vehicle bridge. The east edge of the shared use path will be a standard MDT pedestrian rail.

The structure will include a straight profile at a grade of +1.361%. The horizontal alignment is tangent across the structure.

The bridge is a 500' long four-span structure utilizing 5 lines of MTS 63 prestressed concrete girders built in one phase while traffic is maintained on the existing alignment.

The preliminary geotechnical analysis concludes that either closed pipe piles or drilled shafts can be employed to support the bridge. Bridge end bents are expected to employ driven closed pipe piles. Intermediate bents can be supported on either driven pipe piles or drilled shafts, with piles likely the more cost effective approach. All appropriate foundations system will be considered during final design and after the Activity 130 deep structural borings are completed.

Correspondence received from USFWS indicates concerns related to instream work and pile driving impacting Bull Trout. MDT will coordinate with CSKT and USFWS to assess pile driving or other construction operation restrictions to help determine which foundation system to use.

### **Traffic**

The design vehicle for the alignment and grading design geometrics is an S-Bus-36. Based on the predominant annual truck traffic currently and will continue to be on US 93, the single unit/bus design vehicle is considered appropriate for this project. One of the design goals is to minimize the final construction impacts to the maximum degree practicable to avoid impacts to adjacent private properties and sensitive environmental areas. The shorter design vehicle allows adequate turn movements to remain in their lane without encroachment into opposing lanes. The occasional WB-67 truck will need to extend out of their lane for a short distance but are able to return to their lane within a reasonable distance. This applies for when Right turns off of US 93 will encroach into opposing side street traffic lanes at the stop control intersections and Right turns off of side streets will encroach into protected left turn lanes on US 93.

In the horizontal alignment section above, MDT Traffic established guidelines for the location of the beginning of the northbound passing lane (530 feet south of Post Creek Road or 100' north of Post Creek Road). The recommended configuration is to start the passing lane taper south of Post Creek road to afford the maximum passing lane possible before the lane is terminated near Gunlock Road.

The Dublin Gulch Road/Redhorn Road Safety project (HSIP 5-2(162)137, UPN 8068000) is currently in MDT Contract Plans and scheduled to be advertised in March, 2016. Construction will occur late spring/early summer 2016. The US 93 project will be designed to accommodate these new safety improvements without any changes thereto.

Public comments have been received from the Fort Connah Historic Society and the Methodist Church requesting the design include protected left turns at their private approaches. This section of US 93 is

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designated a limited access highway, turn lanes are only being assigned to public approach intersections.

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

No ITS solutions have been identified for inclusion in this project at this time.

### **Miscellaneous**

No Miscellaneous items have been identified for inclusion in this project at this time.

### **Design Exceptions**

At this time, the following design exceptions are being proposed and will be submitted for approval:

- a. Use of non-standard fill and cut slopes in areas of wetlands, private properties (where structures would be impacted), and Section 4(f) properties.
- b. Use of non-standard ditches (V-Ditches) to reduce impacts to private properties (where structures would be impacted), Section 4(f) properties, and wetlands.
- c. 4.089% grade exceeds max grade for rolling terrain.

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

The existing right-of-way is consistent throughout the project length with the centerline of the PTW approximately in the center of the ROW. A cadastral survey has been performed to retrace the right of way and property lines along the full length of the project.

In accordance with the SEIS, the alignment of the new roadway meanders from the existing roadway centerline for the full length of the project and new right-of way will need to be acquired. Standard right of way widths will be obtained to facilitate highway cut and fill slopes, highway drainage, and room for utility corridors. Where feasible, and justified via design exceptions, cut or fill slopes may be steepened to reduce impacts to sensitive properties, e.g., wetlands and Section 4(f) property. V-ditches to reduce impacts to sensitive properties may be used in lieu of flat bottom ditches provided they do not compromise drainage capacity or safety. None of the new right of way acquisition will require removal of existing structures or relocation of residences or businesses.

Limited Access control will be implemented for the project, based on the access control plan developed by the consultant and approved by the Transportation Commission.

The project is anticipated to require 30 acres of new right of way.

### **Utilities**

There are three utilities located along the alignment that will be impacted by the project. Utilities include Blackfoot Telephone (buried copper and buried FO), Centurylink buried FO, and Mission Valley Power overhead power distribution lines. MDT and the consultant met with each of the utility companies to discuss the project alignment and potential relocation requirements. Given the meandering nature of the new roadway, utility impacts cannot be avoided. The extent of the utility relocations will be explored with the utility companies and MDT as the design progresses.

There are no railroads along the project alignment.

### **Environmental Considerations**

The US Highway 93 Ninepipe/Ronan Project Final Supplemental Environmental Impact Statement (SEIS) was completed in February 2008 and the Record of Decision was approved on May 5, 2008.

There will be impacts to FWP WMA Section 4(f) properties by the proposed improvements. The alignment and grade design construction limits currently encroach onto FWP WMA property as follows:

- Station 145+00 to 171+23 ± LT => Approximately 2.2 acres
- Station 172+00 to 186+00 ± RT => Approximately 1.3 acres

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Per the SEIS, it is concluded that with a couple exceptions (6.1.6 and 6.1.7), no Section 4(f) properties will be “permanently” impacted with this project. In fact, this is not the case with the SEIS design alignment reflected in the AGR design. The AGR plans identify that the project will impact FWP property (WMA) west of US 93 south of Gunlock and the east side of US 93 north of Gunlock. There does not appear to be adverse impacts to the Ninepipe Reservoir NWR with this project.

In order to minimize impacts to Section 4(f) properties, steeper cut and fill slopes and modified ditch sections will be considered in the design (reference discussion in the right-of-way section herein). Even with the modifications to the design, it is concluded that encroachments into Section 4(f) properties is unavoidable and that reevaluation of the SEIS will be required to address this issue.

FHWA requires that the reevaluation must be complete before the scope of work report can be executed. The reevaluation will provide approximate right-of-way impacts associated with the current design. It is anticipated that the re-evaluation and Section 4f evaluation for the US 93 Post Creek Hill segment and the Section 4f evaluation for the Ninepipe Reservoir segment will delay the project schedule. The reevaluation will not require an alternative analysis (e.g., roadway realignment) with the exception that roadway cross section design modifications be considered to minimize impacts to the Section 4(f) properties.

Wildlife crossings, including the construction of the longer bridge over Post Creek outlined in the SEIS will be implemented with this project. At Station 48+00, a 10' x 12' wildlife crossing and associated wildlife fencing will be constructed under US 93. North of Gunlock Road, the project will include dual small animal culverts immediately north and south of the existing pond on the west side of the highway. Previous discussion with CSKT and MDT environmental specialists concluded that the original SEIS recommended 12'x20' large mammal crossing is not appropriate for this location. It was concluded that providing a crossing for turtles is more applicable for this location. The proposed culverts and associated guidance fencing will be prepared as the design progresses. At Post Creek, a 500-foot long bridge and wildlife fencing will be employed to allow improved wildlife connectivity along this documented wildlife corridor.

The Consultant identified that south of Gunlock Road there have been several observed turtle kills on the highway. Turtles appear to travel between wetlands on both sides of the road. CSKT and MDT will further consider adding a crossing between these two wetland areas to facilitate turtle crossing. The roadway profile may need to be raised to facilitate a dry crossing; it was agreed that connecting the wetlands from the west side of the road to the east side could create a drainage problem that could upset the balance of the respective water surface elevations, i.e. drain or lower wetlands.

CSKT desires that Post Creek stream mitigation be implemented with this project. The predominant improvements will include removal of a man-made berm on the northeast side of the current US 93 bridge over Post Creek and channel improvements downstream to reduce the current scour of the glacial till embankment. Likewise, options will be evaluated to redirect the current west side ditch (north of Post Creek) to the east side of the highway. The Post Creek stream mitigation was originally scoped with the project. Comments were received from MDT and CSKT on February 8, 2016 to be considered with the mitigation design.

CSKT requested that Ashley Creek be redirected to cross under US 93 near Hunts Timbers and intercept Post Creek downstream of its current alignment. The Consultant met with MDT and CSKT to scope the stream mitigation analysis. The analysis will consider up to four alternative alignments, two that originate at a future crossing under US 93 at Hunts Timbers and two that generally follow the existing stream alignment on the east side of US 93. The second element of the analysis will consider the feasibility to discharge the existing pond south of Hunts Timbers to the west side of the highway onto CSKT mitigation property.



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The Ashley Creek stream mitigation analysis will be combined with the Post Creek analysis to provide one Concept mitigation analysis. The analysis will compile project stream and wetlands mitigation credits associated with the improvements. MDT directed that the stream mitigation analysis include adequate data and conclusions to be used for their permit applications with the resource agencies.

### **Experimental Features**

No experimental features have been identified for inclusion in this project at this time.

### **Traffic Control**

At this time, Level 1 construction zone impacts are anticipated for this project as defined in the Work Zone Safety and Mobility (WZSM) guidance. The PIH effort will include a Transportation Management Plan (TMP) consisting mainly of a Traffic Control Plan (TCP). A Transportation Operations (TO) component and a Public Information (PI) component to address lane restrictions, traffic management and wide load restrictions will also be included in the plan package.

Alternative detour routes outside of the US 93 corridor i.e., county or private roads, are discouraged by the District. Traffic will be maintained through the corridor and work zone.

The October 31, 2014 Design Concept Review technical memo, and follow up Design Concept Review meeting conducted on November 17, 2014 included a recommendation that traffic over Post Creek use the existing bridge while the 500-foot long bridge is constructed. In that discussion were specific recommendations for the horizontal and vertical alignment of the bridge that will allow traffic to use the existing PTW while the bridge and approach roadway fill is constructed.

The consultant scope will initially include application of conventional roadway and bridge construction techniques. Accelerated roadway and bridge construction techniques will be considered later in the project after AGR. Non-conventional/accelerated construction techniques include: use of alternative materials; application of temporary shoring, and temporary bridge structures. Supporting documentation required to support alternative construction methods include preliminary estimates, preliminary construction schedules, and application of incentives/disincentives will be considered.

Due to the high traffic volumes and critical nature of this this NH corridor, traffic control plans and accompanying special provisions will be required for this project. Likewise, consideration will be given to how to handle wide and oversized loads. Staging criteria will be discussed with MDT and CSKT to provide specific requirements for contractor to accommodate this specialty traffic through the project.

The MOA indicated that temporary detour travel should be on paved surface. The District requested the use of gravel surfacing in lieu of paved temporary detour lanes, this will require further discussion with CSKT. The District would like traffic to provide additional compactive effort where vehicles are located on the subgrade or base layer.

### **Public Involvement**

A formal public meeting has not been held for the project prior to alignment and grade. Level C Public Involvement is deemed necessary for this project. Public informational open houses are anticipated to be conducted after alignment and grade and plan in hand, as necessary. A public hearing for this project is not anticipated.

A public service announcement (PSA) was published by MDT in the local press outlining the proposed project. Several written responses have been received. None of the comments expressed opposition to the project. Based on comments received, none warranted changing the scope and focus of the project.

### **Construction Cost Estimate**

Updated the PFR cost estimate using the more detailed grading and surfacing quantities. The previous

## Alignment and Grade Report

NH 5-2(159)37, US 93 N – Post Creek Hill, UPN 8008000

EPS Project Manager: Miki Lloyd, P.E.

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cost estimate from the Red Book in August 2015 is attached for comparison. Since this project is within the boundaries of the CSKT Reservation, federal participation is 100%; therefore G-Matching does not apply.

	Estimated cost	Inflation (INF) (from PPMS)	TOTAL costs w/INF + IDC (from PPMS)
Road Work	7,275,000		
New Structure	4,250,000		
Traffic Control	400,000		
<b>Subtotal</b>	<b>11,925,000</b>		
Mobilization (12%)	1,431,000		
<b>Subtotal</b>	<b>13,356,000</b>		
Contingencies (20%)	2,671,000		
<b>Total CN</b>	<b>\$16,027,000</b>	<b>\$2,347,348</b>	<b>\$20,279,768</b>
<b>CE (10%)</b>	<b>\$1,603,000</b>	<b>\$234,779</b>	<b>\$2,028,356</b>
<b>TOTAL CN+CE</b>	<b><u>\$17,630,000</u></b>	<b><u>\$2,582,127</u></b>	<b><u>\$22,308,124</u></b>

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 10.37% for FY 2016.

### Preliminary Engineering

The percent PE expended is 37%. 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 is needed.

- There have been several scope changes after the preliminary field review which significantly altered the amount of design work required. These scope changes include:
  - Conduct supplemental structural foundation borings in Post Creek,
  - Extend the project 2000-feet north of Gunlock Road (Original scope ended at Gunlock Road),
  - Perform stream route research of the historic alignment of Ashley Creek across US 93,
  - Prepare Concept Mitigation Analysis for the realignment of Ashley Creek across US 93,
  - Perform Section 4f Evaluation for the Post Creek Hill and Ninepipe Reservoir segments of US 93. Evaluation includes Reevaluation effort associated with several Post Creek Hill project design impacts to the SEIS,
  - Conduct a second AGR meeting with CSKT and MDT in early summer 2016 to address alignment and grade, environmental and cultural impacts, and stream mitigation efforts. This AGR effort includes adding aerial photography plan sheets for illustration of impacts to the natural environment.

### Ready Date

The proposed Ready Date is October 1, 2019, pursuant to the Project Management System. The current proposed letting date is January 2020. The project schedule will be delayed as result of the inclusion of the Section 4f of the Post Creek Hill and Ninepipe Reservoir segments of US 93 and reevaluation process associated with the Post Creek Hill design, a new schedule will need to be developed which will include a new planned finish date. An updated letting date has not been determined until the supplemental environmental effort is completed. The current PE End Date is 10/31/2020.

### e-copies

Dustin Rouse, Preconstruction Engineer  
James Combs, Highways Design Engineer  
Dave Hedstrom, Hydraulics Engineer

Jake Goettle, Construction Bureau – VA Engineer  
Steve Giard, Acting Utilities Engineering Manager  
David Hoerning, Lands Section Supervisor

## Alignment and Grade Report

NH 5-2(159)37: US 93 N – Post Creek Hill, UPN 8008000

EPS Project Manager: Miki Lloyd, P.E.

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Bryce Larsen, Supervisor, Photogrammetry & Survey  
Danielle Bolan, Traffic Operations Engineer  
Ivan Ulberg, Traffic Design Engineer  
Kraig McLeod, Safety Engineer  
Chad Richards, Engineering Cost Analyst  
John Pirre, Engineering Information Services  
Jan Nasset, Public Involvement Officer  
Sue Sillick, Research Section Supervisor  
Suzy Price, Contract Plans Bureau Chief  
Alyce Fisher, Fiscal Programming Section  
Kurtis Miros, Engineering Division  
John McClafferty, Engineering Division

Greg Pizzini, Acquisition Section Supervisor  
Joe Zody, R/W Access Management Section Manager  
Jim Davies, Pavement Analysis Engineer  
Darin Reynolds, Surfacing Design Supervisor  
Jeff Jackson, Geotechnical Engineer  
Paul Johnson, Project Analysis Bureau  
Jean Riley, Planner  
Dawn Stratton, Fiscal Programming Section  
Amanda Jackson, Eng. Manager, Bridge Management System  
Matt Maze, ADA Coordinator  
Michelle Erb, Bicycle/Pedestrian Coordinator  
Sheila Ludlow, Bicycle/Pedestrian Coordinator

Shane Stack, Preconstruction Engineer  
Mike Dodge, Materials Lab  
Maureen Walsh, Right of Way Supervisor  
Robert Vosen, Construction Engineer  
KC Yahvah, Hydraulics Engineer  
Gabe Priebe, Traffic Project Engineer  
Joe Weigand, Biologist  
Benjamin Nunnallee, Projects Engineer  
Breta Palmer, District Utility Agent

Steve Felix, Gary Engman, Maintenance Chief  
Susan Foley, Right of Way Design Supervisor  
Dean Jones, Construction Ops Engineer  
Christopher Hardan, Bridge Area Engineer  
Brett Boundy, Geotechnical Manager  
Susan Kilcrease, Project Development Engineer  
Pat Metzger, District MCS Captain  
Andrew White, Surfacing Design  
Patricia Hogan, District Utility Agent



# Montana Department of Transportation

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BID PRICES  
JULY 2015

## Preliminary Estimate

Project Number: NH 5-2(160)37  
Project Name: US 93 N - POST CREEK HILL  
UPN Number: 8008000  
Project Length: 3.3 Miles  
Design Stage: (AGR)-Alignment & Grade Review

Prepared By: KLI / MMI  
Date: November 18, 2015  
County: LAKE COUNTY  
District: Missoula  
Type of Work: Grading, Gravel, Asphalt Pavement, Structure, Drain

Item Number	Quantity	Description	Unit	Average Bid Prices		Adjusted Unit Prices	
				Unit Price	Amount	Unit Price	Amount
				Dollars	Dollars	Dollars	Dollars
105070000	1	CONTRACTOR SURVEY AND LAYOUT	LS	\$43,551.81	\$43,552.00	\$100,000.00	\$100,000.00
202020041	1	REMOVE STRUCTURE	LS	\$75,666.63	\$75,667.00	\$20,000.00	\$20,000.00
203020100	183920	EXCAVATION-UNCLASSIFIED	CUYD	\$4.69	\$862,585.00		\$862,585.00
203020200	156975	EXCAVATION-UNCLASS BORROW	CUYD	\$3.76	\$590,226.00		\$590,226.00
203020310	113115	SPECIAL BORROW-NEAT LINE	CUYD	\$11.79	\$1,333,626.00	\$11.00	\$1,244,265.00
301020340	32018	CRUSHED AGGREGATE COURSE	CUYD	\$22.12	\$708,238.00	\$20.00	\$640,360.00
301020625	149716	AGGREGATE TREATMENT	SQYD	\$0.40	\$59,886.00		\$59,886.00
401020048	40501	PLANT MIX SURF GR S-1/2 IN	TON	\$30.00	\$1,215,030.00	\$27.70	\$1,121,878.00
401020300	565	HYDRATED LIME	TON	\$208.12	\$117,588.00		\$117,588.00
402020095	2349	ASPHALT CEMENT PG 70-28	TON	\$547.59	\$1,286,289.00	\$526.00	\$1,235,574.00
402020368	198.4	EMULSIFIED ASPHALT CRS-2P	TON	\$579.90	\$115,052.00		\$115,052.00
409000010	110873	COVER-TYPE 1	SQYD	\$0.61	\$67,633.00		\$67,633.00
603013387	200	REIN CONC BOX 14 X 10	LNFT		\$0.00	\$4,750.00	\$950,000.00
618030080	1	TRAFFIC CONTROL	LS	\$15,285.16	\$15,285.00	\$400,000.00	\$400,000.00
	1	EMBANKMENT FOUNDATION PREP	LS		\$0.00	\$1,000,000.00	\$1,000,000.00
	1	BRIDGE ESTIMATE			\$0.00	\$3,300,000.00	\$3,300,000.00
	1	SIGNING AND STRIPING ESTIMATE			\$0.00	\$100,000.00	\$100,000.00
					\$6,490,657.00		\$11,925,047.00
	12%	Mobilization			\$778,878.84		\$1,431,005.64
		Subtotal			\$7,269,535.84		\$13,356,052.64
	20%	Contingency			\$1,453,907.17		\$2,671,210.53
		<b>Construction Total</b>			<b>\$8,723,443.01</b>		<b>\$16,027,263.17</b>
	10%	Construction Engineering					\$1,602,726.32
		<b>Total</b>					<b>\$17,629,989.48</b>
	10.37%	Indirect Cost (IDC)-Construction					\$1,662,027.19
		<b>Total Construction w/IDC</b>					<b>\$17,689,290.36</b>
	10.37%	Indirect Cost (IDC) - Construction Engineering					\$166,202.72
		<b>Total Construction Engineering w/IDC</b>					<b>\$1,768,929.04</b>
		<b>Total w/IDC</b>					<b>\$19,458,219.39</b>

Project Length	Miles	3.30			
Project Average Finish Top Width	Feet	48.8			
Cost per Mile (Uses Construction Total)					\$4,856,746.41
Cost per Sq. Yard (Uses Construction Total)					\$169.64

PET Preliminary Estimate - English

Item Number	Quantities	Description	Unit	Average Bid Prices		Adjusted Unit Prices	
				Unit Prices	Amount	Unit Prices	Amount
				Dollars	Dollars	Dollars	Dollars
104030010	90000.00	MISCELLANEOUS WORK	UNIT	\$1.00	\$90,000.00		\$90,000.00
105080115	38016.00	FINISH GRADE CONTROL	CRFT	\$0.63	\$23,950.00		\$23,950.00
203020100	91961.96	EXCAVATION-UNCLASSIFIED	CUYD	\$4.35	\$400,035.00		\$400,035.00
203020200	9196.20	EXCAVATION-UNCLASS BORROW	CUYD	\$5.09	\$46,809.00		\$46,809.00
203020250	4598.10	SPECIAL BORROW-EXCAVATION	CUYD	\$8.05	\$37,015.00		\$37,015.00
203080100	32325.68	TOPSOIL-SALVAGING AND PLACING	CUYD	\$4.06	\$131,242.00		\$131,242.00
208010200	20000.00	TEMPORARY EROSION CONTROL	UNIT	\$1.00	\$20,000.00		\$20,000.00
301020340	25726.21	CRUSHED AGGREGATE COURSE	CUYD	\$21.69	\$558,001.00		\$558,001.00
301020521	0.00	TOP SURF 3/4 IN GR 2A	CUYD	\$0.00	\$0.00		\$0.00
301020718	91656.00	COVER - TYPE 1	SQYD	\$0.54	\$49,494.00		\$49,494.00
301020600	742.20	BLOTTER MATERIAL	TON	\$30.51	\$22,645.00		\$22,645.00
301020268	5632.00	TRAFFIC GRAVEL	CUYD	\$14.61	\$82,284.00		\$82,284.00
401020045	31768.26	PLANT MIX BIT SURF GR S-3/4 IN	TON	\$30.74	\$976,556.00		\$976,556.00
401020300	446.00	HYDRATED LIME	TON	\$192.18	\$85,712.00		\$85,712.00
402020092	1715.49	ASPHALT CEMENT PG 64-28	TON	\$685.62	\$1,176,172.00		\$1,176,172.00
402020105	135.40	LIQUID ASPHALT MC-70	TON	\$0.00	\$0.00		\$0.00
402020368	163.70	EMULS ASPHALT CRS-2P	TON	\$613.48	\$100,427.00		\$100,427.00
411010000	0.00	COLD MILLING	SQYD	\$1.42	\$0.00		\$0.00
501010100	0.00	PORT CEM CONC PAVEMENT	SQYD	\$131.10	\$0.00		\$0.00
606010030	950.40	GUARD RAIL-STEEL	LNFT	\$16.51	\$15,691.00		\$15,691.00
606010047	95.04	GD RAIL-STL INT RDWY TERM SECT	LNFT	\$48.23	\$4,584.00		\$4,584.00
606010150	4.00	GUARD RAIL-STL/BR APPR-TY 1	EACH	\$2,301.05	\$9,204.00		\$9,204.00
606010642	6.90	GUARD RAIL-OPTIONAL TERM SECT	EACH	\$2,574.32	\$17,753.00		\$17,753.00
607100271	38016.00	FARM FENCE-TYPE F5W & F5M	LNFT	\$0.00	\$0.00		\$0.00
608010020	0.00	SIDEWALK-CONCRETE 4"	SQYD	\$57.78	\$0.00		\$0.00
608010050	0.00	SIDEWALK-CONCRETE 6"	SQYD	\$66.91	\$0.00		\$0.00
609010200	0.00	CURB AND GUTTER-CONC	LNFT	\$18.15	\$0.00		\$0.00
610100101	35.78	SEEDING AREA NO 1	ACRE	\$361.26	\$12,927.00		\$12,927.00
610100102	10.02	SEEDING AREA NO 2	ACRE	\$1,523.04	\$15,260.00		\$15,260.00
610100103	14.31	SEEDING AREA NO 3	ACRE	\$252.38	\$3,612.00		\$3,612.00
610100326	35.78	FERTILIZING AREA NO 1	ACRE	\$100.70	\$3,603.00		\$3,603.00
610100327	10.02	FERTILIZING AREA NO 2	ACRE	\$93.64	\$938.00		\$938.00
610100555	50.10	CONDITION SEEDBED SURFACE	ACRE	\$111.44	\$5,583.00		\$5,583.00
610220100	10.02	MULCH	ACRE	\$6,142.57	\$61,544.00		\$61,544.00
	3.60	Signs - Rural	MILE	\$8,000.00	\$28,800.00		\$28,800.00
	0.00	Signs - Urban	MILE	\$52,000.00	\$0.00		\$0.00
	3.60	Striping & Pavement Markings - Rural	MILE	\$8,000.00	\$28,800.00		\$28,800.00
	0.00	Striping & Pavement Markings - Urban	MILE	\$20,000.00	\$0.00		\$0.00
	3.60	Drainage Pipe - Rural	MILE	\$82,000.00	\$295,200.00		\$295,200.00
	0.00	Drainage Pipe - Urban	MILE	\$240,000.00	\$0.00		\$0.00
	0	Concrete Roundabouts - One Lane	EACH	\$425,000.00	\$0.00		\$0.00
	0	Concrete Roundabouts - Two Lanes	EACH	\$575,000.00	\$0.00		\$0.00
	0.00	New Interchange - Rural	LS	\$1,800,000.00	\$0.00		\$0.00
	0.00	New Interchange - Urban/Interstate	LS	\$7,900,000.00	\$0.00		\$0.00
	0.00	Remove Rural Interchange	LS	\$60,000.00	\$0.00		\$0.00
	0.00	Remove Urban/Interstate Interchange	LS	\$450,000.00	\$0.00		\$0.00

MEETING MINUTES  
ALIGNMENT AND GRADE MEETING  
US 93 N – Post Creek Hill,  
NH 5-2(159)37, Project N. 8008000  
Project Work Type 140 - Reconstruction – Without Added Capacity

To: Miki Lloyd, P.E.  
Consultant Project Engineer

From: John Pavsek, P.E.  
Project Manager

Date: February 5, 2016

**Introduction**

An alignment and grade meeting was held on December 14, 2015. 9:30 am at the Mission Valley Power Conference Room in Pablo and MDT 3<sup>rd</sup> Floor Conference Room in Helena. The meeting was conducted via conference call. Those in attendance by location:

HELENA

John Pavsek	MMI, Helena
Miki Lloyd	MDT, Helena
Bill Durbin	MDT, Helena
Gene Kaufman	FHWA, Helena
Bret Bounty	MDT, Helena
Phill Forbes	MMI, Helena
Gabe Priebe	MDT, Helena
KC Yahvah	MDT, Helena
Chris Hardan	MDT, Helena
Joe Weigand	MDT, Helena
Jim Scoles	MMI, Helena
Matt Maze	MDT, Helena
Sheila Ludlow	MDT, Helena
Michelle Erb	MDT, Helena

PABLO

Kathy Harris	KLJ, Helena
Scott Fanning	KLJ, Helena
Gabe Johnson	CSKT, Pablo
Dan Lozar	CSKT, Pablo
Art Soukkala	CSKT, Pablo
Thompson Smith	CSKT, Pablo
Jordan Thompson	CSKT, Pablo
Seth Makepeace	CSKT, Pablo
Craig Barfoot	CSKT, Pablo
Dan Lipscomb	CSKT, Pablo
Susan Kilcrease	MDT, Missoula
Ben Nunnallee	MDT, Missoula
Ed Toavs	MDT, Missoula

## General

Miki Lloyd started the meeting with introductions and outlined the meeting format will be to review comments received from reviewers and conduct a section by section review of the plans package.

The following topics were discussed at the meeting:

- The project is scheduled for construction in 2020. The District desires that the project schedule be followed as close as possible to meet this construction goal.
- The Post Creek Stream Mitigation analysis report (Activity 119) will be delivered in early January 2016. The document will be distributed to MDT environmental staff for review and comment. *The document was delivered to MDT on January 12, 2016.*
- The Ashley Creek Stream mitigation options (4-each) will be prepared in Spring/early summer 2016. The consultant is in the process of preparing the scope of services for MDT review/approval.
- As part of the Ashly Creek mitigation, Art Soukala expressed desire that the discharge from the Hunts Timber's pond (south of Hunts Timbers) be routed under US 93 onto the mitigation property.
- Susan Kilcrease indicated that the USACE permit and ALCO permit, for the geotechnical drilling only, are in-hand and will be provided to the consultant. The permits are necessary for the consultant geotechnical engineer to drill structural foundation borings in the Post Creek area. *The permits were provided to the consultant on December 18, 2015.*
- Matt Maze indicated the preference to call the bike path as a "Shared Use Path". It was determined that where feasible, the path should be located further away from the highway than in areas where 4F and /or wetlands impacts are of concern. The closest the path can be placed adjacent to the highway (per AASHTO) is 5-feet (from edge of roadway pavement to edge of path pavement). The design of the path needs to consider a balance between an aesthetically pleasing and safe pedestrian/cyclist alignment (i.e., user's experience) and minimization of impacts to adjacent properties and environmental resources.
- Matt stated that the 2012 AASHTO design guidance document be used for the project. He further requested that the consultant keep Sheila Ludlow and Michelle Erb (MDT Planning) in the loop on future design related correspondence and coordination.
- Ed Toavs expressed his desire that the overall design minimize ROW impacts to the maximum extent practical. Potential design measures to reduce the overall footprint may include use of 4:1 slopes, V-ditches and keeping the path within a reasonable distance from the roadway should be considered.

*In a follow up discussion on March 2, 2016, MDT indicated that the application of steepened slopes, use of V-ditches, and tightening the shared use path closer to the highway should be used in areas where wetlands and 4f property impacts can be reduced. The design will need to consider safety, hydraulic capacity and constructability and provide documentation that can be incorporated into design exceptions (where necessary).*

- MDT requested the shoulder be reduced from the current design of 9.4 foot to an 8-foot shoulder width. The current design was intended to facilitate future overlay. The District prefers the standard 8-foot shoulder to reduce the footprint.
- The Red Horn Road Safety Improvements Project will be constructed in 2016 (currently in Contract Plans). MDT requested the consultant review the plans to determine if there

would be any future impacts from the US 93 Post Creek Hill project on this upcoming safety project. Plans will be provided to MMI/KLJ.

- Ben Nunnallee requested all alignments use separate stationing to differentiate the path and roadway.
- For the bridge end pavement section design, the plant mix section is 0.2' thicker per standard design procedures. The District indicated that the plans should remain as shown with a 1.8' special borrow section rather than increasing the section accordingly (i.e., compensate for the additional paving depth) to maintain the minimum footprint.
- MDT Traffic Engineer Darcy O'Dell requests that the passing lane taper transition be accomplished before or after the intersection with Post Creek Road.
- Ben stated that a fog seal be applied over the chip seal pavement.
- Brett Warren of SK Geotech indicated that the geotechnical stability of the soils in Post Creek will potentially dictate the slopes at the bridge end approaches. The 130 drilling will help determine the physical characteristics of the subgrade.
- Jordan Thompson requested that the area hydrology design under the bridge consider the bridge end abutment fill slope. MMI informed that the preliminary hydraulic analysis has considered this and adequately conveys flood flow under the future 500-foot long bridge. The bridge will not need to be lengthened to accommodate the design flows in Post Creek.
- CSKT and the District reiterated that the design footprint be kept as narrow as possible without compromising the SEIS requirements, motorist safety, and non-motorized user positive experience.
- Where the shared use path is located on the roadway fill slope, highway runoff will be allowed to sheet flow across the paved path. The design will consider ditches between the road and the path and culverts under the path where ROW or environmental impacts are not an issue.
- In response to an inquiry whether the shared use path needs to be incorporated in the highway right of way, Gene Kaufman indicated that use of public funds require the path be located within public right of way.
- Ben asked if the one horizontal curve (just north of Post creek Road) that requires super elevation can be revised to a large enough radius to achieve a normal crown section. The consultant will review whether this can be accomplished. If this could not be done it should follow the new road design manual with rotation about centerline not inside shoulder.
- In the review of summary frames, a comment was made that gravel sources will "need some thought". The cost estimate will need to consider gravel availability and estimated accordingly.
- There was discussion related to the project impacts to Section 4f properties and the need for a re-evaluation to address various items that vary slightly from the SEIS. FHWA indicated that the re-evaluation and Section 4f must be completed and signed off before the SOW Report can be approved.
- Susan indicated that she will coordinate with Jon Axline to look at the Weber (Historic 4f) in the context of the SEIS. She indicated that the design must consider avoidance if possible.
- The canal structure south of McDonald Lake Road is historically significant and is identified as being impacted by the future improvements in the SEIS.



- CSKT requested that an aerial photo be used as background on the plan sheets. The consultant will coordinate with MDT to prepare aerial photo plan sheets illustrating the proposed highway improvements, wetlands, construction limits and right of way. These plans will supplement the existing plan and profile sheets that currently include conventional road design plan data, i.e., proposed improvements, existing features, utilities, drainage features, etc. It was agreed that placing the aerials on the plan and profile sheets would result in loss of detail and clarity. The supplemental plan sheets will not be included in the construction plans.
- Brian Anderson may have better aerial photography for the consultants use. If available, these plans will be provided.
- Seth Makepeace asked if the design is considering the existing sheet piling at the unnamed stream near station 16+50. The consultant is aware of the piling and it will be addressed with the design.
- Ben would like the design to consider lowering the US 93 profile as much as possible to lessen impacts to side streets. The consultant responded that keeping the profile as low as possible without compromising the section design and hydraulics is one of our design goals.
- FHWA would like the Reevaluation and Section 4f to do whatever is needed to disclose approximate impacts to adjacent properties. *A follow up meeting was held by MDT, FHWA and the consultant on January 15, 2016 to scope the extent of the reevaluation/4f effort. A second meeting was held on February 3, 2016 to address extending the Section 4f evaluation through the Nine Pipe region of US 93. The summary minutes for these two meetings are incorporated by reference.*
- Gabe Priebe requested the consultant check to see if sight distance is achieved on East Post Creek Road.
- A comment was made that there is an apparent field access on the east side of US 93 near the south end of the future bridge. The question was posed whether this access needs to be perpetuated on the east side of the highway. Access off of US 93 is not feasible due to the height of the fill (i.e., 14-feet high) and the bridge end close proximity to the Hunt's property line. An access can be provided off of the west side of US 93 in the proximity of the Hunt's Timber's approach.
- There was discussion on what level of encroachment into sensitive property constitutes a "major" impact vs a "minor" impact. Ed Toavs directed the consultant to work with Susan Kilcrease to establish these thresholds on specific site impacts.
- There was discussion on potentially moving the design centerline to avoid impacting wetlands, historic properties, or other sensitive properties. It was agreed that any alignment design impact that encroaches over the SEIS ROW is considered one of the reevaluation thresholds. The designer will strive to maintain the roadway within the SEIS ROW limits.
- MDT Traffic asked why a WB 67 design vehicle is not used for geometric designs at intersection. The current design employs a S-Bus-36 design vehicle. The consultant indicated the shorter vehicle was used to minimize intersection footprints and impacts to private properties/wetlands. The predominant large vehicle is estimated to be a school bus or delivery truck. Given the agricultural nature of the area, larger truck movements are most likely limited to farm-to-market periods. MDT will check to see if there is a precedence set with other previous US 93 projects. The design vehicle discussion will need to be addressed before SOW.

- Joe Weigand asked that the design be watchful to avoid draining one wetlands to another on the opposite side of the road. South of Gunlock road is a potential additional turtle crossing. The crossing needs to be a dry crossing.
- Chris Hardan asked if a barrier rail on the Post Creek bridge should be placed between traffic and the path for user comfort. It was agreed that the design should remain as currently planned with a standard (Wyoming Rail) bridge rail separating the vehicles and peds. This application is used at the Mud Creek Bridge.
- Matt Maze requested an exterior curb on the bridge for detection purposes. All drainage off of the bridge (from both vehicle lanes and shared use path needs to be conveyed to the south end of the bridge and not be allowed to drain over the bridge edge. Susan added that the design carefully consider runoff on the bridge ends be conveyed to energy dissipation/rip rap pads.
- The cost estimate contingency should be increased to 18%.
- MDT and CSKT requested there be a follow-up AGR meeting with CSKT in Pablo. The consultant will coordinate with consultant design to establish an agenda, displays, and visuals for the meeting. A date has not been set but it was agreed that it be held as soon as possible. The consultant will include in the future meeting a discussion on the Post Creek and Ashley Creek stream mitigation efforts.