Montana Department of Transportation
PO Box 201001
Helena, MT 59620-1001

Memorandum

To: Stephanie Brandenberger, PE
Bridge Engineer

From: Tracy M. Stoner, PE TMS
Bridge Area Engineer

Date: November 17, 2020

Subject: STPB 264-1(1)7
Twelve Mile Creek – 2M W of Huntley
UPN 9719000
Work Type 220 - Bridge Replacement with added capacity

Please approve the attached Preliminary Field Review Report.

Approved Stephanie Brandenberger Date November 18, 2020
Stephanie Brandenberger
Bridge Engineer

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

Distribution (electronic only):
Rod Nelson, Billings District Administrator
Stephanie Brandenberger, Bridge Engineer
Damian Krings, Acting Highways Engineer
Gabe Priebe, Traffic and Safety Engineer
Robert Stapley, Right-of-Way Bureau Chief
Lynn Zanto, Rail, Transit, & Planning Division Administrator
Jeff Jackson, Geotechnical and Pavement Bureau Chief
Tom Martin, Environmental Services Bureau Chief
Jon Swartz, Maintenance Division Administrator

cc:
Tracy Stoner, PE, EPS Project Manager, Billings District

e-copies:
Located at the end of this document

Introduction

A preliminary field review for this project was held on July 24, 2019. The following people participated in this review:

Tracy Stoner	Bridge Engineering Manager – Billings District
David Schroeder	Bridge Designer
Jin Nelson	Bridge Designer
Jeremy Terry	Road Area Engineer
Louise Stoner	Road Design Supervisor
Rebecca Wacker	Road Designer
Kurtis Schnieber	Billings District Projects Engineer
Jacob Brotzler	Billings District Design Supervisor
Jay Muhlbeier	Construction - Billings
Miles Yerger	Pavement Design Engineer
Tommy Griffeth	Billings Project Development Engineer
Cameron Kloberdanz	Billings Geotechnical Engineering Specialist
James Stevenson	Construction - Billings
Kim Mathiason	Construction - Billings

Proposed Scope of Work

This project has been nominated to replace an existing two-lane, four-span timber girder structure over Twelve Mile Creek. The existing structure is structurally deficient. The existing bridge will be replaced with a new structure on or very near the existing horizontal alignment with potential changes to the vertical alignment.

This project will be designed in enhanced workspace as agreed during the review.

Needs and Objectives

The existing bridge is structurally deficient and eligible for replacement due to the deteriorated condition of the substructure. The bridge is currently posted for limited loads. The purpose of this project is to replace this deficient structure with a new bridge that will provide capacity for current design trucks.

Public Summary

The purpose of this project is to replace the existing deficient bridge over Twelve Mile Creek approximately two miles west of Huntley on Old Highway 312 with a new structure that will provide capacity for current and future traffic needs.

Project Location and Limits

This project is in Yellowstone County approximately 2 miles west of Huntley on Old Highway 312 (P-264, formerly X-56788) where it crosses Twelve Mile Creek at RP 6.6. This route is classified as a minor arterial. The limits of the project will be based on the minimum length required to tie the new bridge into the existing roadway and the length required to provide an offset alignment detour. Project stationing will increase to the east.

Work Zone Safety and Mobility

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

Physical Characteristics

(1) Existing Structure: The existing timber bridge was constructed in 1947 under FAP 53(8) and rehabbed in 2006 under STPX 56788(8) (UPN 5213). As-builts for this structure are available on SMS. Bridge details are included below:

Year Built:	1947
Inventory Number:	L56788010+03001 [MDT Structure ID #04862]
Length:	100 feet
Width (Face-of-Rail to Face-of-Rail):	30 feet (approach width 26 feet per SMS)
Number of Spans:	4 spans
Span Lengths:	25 feet
Bridge Rail Type:	T 101
Deck Type / Rating:	Timber/ (6) Satisfactory
Superstructure Type / Rating:	Timber/ (5) Fair
Substructure Type / Rating:	Timber Pile/ (5) Fair
Sufficiency Rating:	47.0
Posting	Yes: 14-17 Ton

Looking East

Looking at East Abutment

Looking Downstream

(2) Existing Roadway Geometrics:

a. The road consists of two 12-ft travel lanes with 3-ft gravel shoulders according to the SN-FAP 53(8) as-builts. However, site visits reveal the shoulders are less than 3-ft and closer to 1-ft in areas as shown in the 2001 - Safety Imp – W of Huntley as-builts.

b. The general terrain is level to gently rolling with the bridge located on a tangent section of road but near the sag of a large vertical curve. As-builts show that bridge is on an approximate 4.12% profile grade.

Traffic Data

RP *6.5 to 6.5*	
2020 AADT	3,290 – Present
2022 AADT	3,380 – Letting Year
2042 AADT	4,370 – Design Year
DHV	530
T	5.8%
ESAL	74
AGR	1.3%

Crash Analysis

As requested, a safety analysis was completed on a portion of Highway 312 (P-264E) from reference post 6.5 to reference post 6.7 from January 1, 2009 through December 31, 2018.

The Montana Highway Patrol records show seven crashes on this segment of roadway for the time period January 1, 2009 through December 31, 2018. All these crashes were non-junction crashes. Three crashes were fixed object crashes, one was a rear end crash, one was a jackknife crash, one was a lost control crash and the remaining was a wild animal crash. The severity of these crashes resulted in a suspected serious injury crash, two possible injury crashes and four no apparent injury crashes. There were no crashes occurring on or related to the approaches of the bridge. There has been one additional crash on this segment of roadway for the time period January 1, 2019 through March 31, 2020. This was a fixed object crash resulting in a suspected serious injury.

Major Design Features

a. **Design Speed.** The design speed is 55 mph for a rural minor arterial in rolling terrain. The posted speed limit is 60 mph.

b. **Horizontal Alignment**. The existing horizontal alignment consists of a tangent section throughout the length of the project. All the existing horizontal design features meet current road design standards. The project will utilize the existing horizontal alignment while potentially adding 6-ft or 8-ft shoulders.

c. **Vertical Alignment**. The grades range from +4.12% to -2.96%. The +4.12% grade at the beginning of the project falls outside the 4% maximum grade for rural minor arterials in rolling terrain and may be modified for this project.

d. **Typical Sections and Surfacing**. According to the Bridge Width Standards and Guidelines design memorandum (10/7/2020) for new on-system bridges, the new bridge roadway width will generally be equal to the required road width. The adjacent safety project, SF 179 Turn Lane W of Huntley (UPN 9598000), will consist of a 52-ft width including two 12-ft driving lanes, two 8-ft shoulders and a 12-ft TWLTL. It is unlikely that the 12-ft TWLTL will be carried across the bridge, but this option has not been ruled out. At a minimum, the bridge width will likely have two 12-ft driving lanes and two 8-ft shoulders to match the 8-ft shoulders on the safety project.

e. **Geotechnical Considerations**. No unique geotechnical issues were noted during the field review. The Geotechnical Section will perform a subsurface investigation as part of the foundation design for the structure.

f. **Hydraulics**. This bridge crossing Twelve Mile Creek is not located in a delineated floodplain and no floodplain permit will be required. Approximately 500-ft west of the bridge crossing a 24-in culvert inlet has eroded the road fill slope within the clear zone. This culvert appears to be used for irrigation and may need to be lengthened or replaced. A Location Hydraulics Study Report (LHSR) will be prepared for this project.

g. **Bridges.** The replacement of bridge L56788010+03001 is the primary objective of this project. A design to clear span the opening will be investigated.

h. **Traffic.** New pavement markings and potentially signing will be required.

i. **Pedestrian/Bicycle/ADA**. No dedicated pedestrian, bicycle, or ADA features are located within the project limits. No new features are proposed, but wider shoulders may benefit bicyclists and pedestrians.

j. **Miscellaneous Features**. At this time, there are no known miscellaneous features to be included in this project.

k. **Context Sensitive Design Issues**. Currently there are no known context sensitive design issues.

l. **Permanent Erosion and Sediment Control (PESC) Features**. No PESC features are currently anticipated.

Other Projects
It is anticipated this project may be tied for construction to adjacent project HSIP 56788(18), SF 179 Turn Lane W of Huntley (UPN 9598000).

Location Hydraulics Study Report
The Location Hydraulics Study Report will be completed at a later date.

Design Exceptions
No design exceptions are anticipated at this stage of the project.

Right-of-Way
As-builts show existing right-of-way transitions from 60-ft to 100-ft in the vicinity of the bridge. Right-of-way acquisition may be required due to the increase in road width. Specific needs will be identified during project development.

At this time, it is anticipated that the project will not require a modification (addition or reduction) to the current federal aid agreement for RW.

Access Control
There are no anticipated impacts to access control associated with this project.

Utilities/Railroads
Utility relocations may be required along the project. Pictures from site visits show existing overhead power line and buried fiber optic. Utility relocation will be identified during project development.

It is anticipated that the project will not require a modification (addition or reduction) to the current federal aid agreement for IC.

Maintenance Items
No Maintenance tasks were identified at the field visit. No items are planned to be paid for using state funds and charged to Maintenance.

Intelligent Transportation Systems (ITS) Features
No ITS solutions are currently being considered as part of the design process.

Experimental Features
No Experimental Features are currently anticipated for this project.

Survey
The survey requirements are described in the Survey Request Form. Most of the survey has been completed with the exception of the Cadastral survey which was ordered November 10, 2020 in conjunction with the adjacent project – SF 179 Turn Lane W of Huntley (UPN 9598000).

Public Involvement
The project Level of Impact (LOI) has been determined to be Moderate and level of public involvement C, as defined by MDT's Public Involvement Plan. Specific strategies identified in the project-specific Public Involvement Plan (as described in the Engineering Project Communication Process Guide) include:

Level C (Moderate or Substantial Impact)

1. News release explaining the project and including a department point of contact.
2. Project information, including public summary, posted to MDT website (GIS map).
3. Personal contacts with local officials, interest groups, and other organizations.
4. Personal contacts with adjacent landowners at the time of right of entry and at major project milestones (PFR, AGR, PIH).
5. Electronic phase/milestone updates for stakeholders and other entities requesting updates. Contact list maintained on project specific electronic database.
6. Notification of initial project selection to all parties on electronic notification list.
7. Investigate the use of other types of media, such as electronic social media, to provide information to the public regarding the status of the project.
8. Construction notification and information during construction.

Environmental Considerations
The appropriate level of Environmental Document is expected to be a (c)-listed Categorical Exclusion (CE(c)). A Biological Resources Report (BRR) will be completed and the effect of the project on any protected species will be assessed. The need for Clean Water Act Section 404 and Stream Protection Act 124 permits are anticipated; the type of permits required will be determined once the BRR is complete and the project's impacts to wetlands/waters of the U.S. are known. A cultural resource survey is required. While the bridge is of historic age and was last documented in the early 1980s, the need for mitigation under the Historic Bridges & Roads Programmatic Agreement is not anticipated. The need for a "Nationwide" Programmatic Section 4(f) Evaluation for Historic Bridges will be evaluated once the Section 106 process is complete. An Initial Site Assessment (ISA) will be completed to identify any hazardous waste impacts, air quality transportation conformity needs, and the need to determine traffic noise impacts. An asbestos inspection of the bridge structure is necessary prior to demolition and removal.

Wildlife Friendly Fencing is a standard Wildlife Accommodation request for all projects involving a fencing component. All other Wildlife Accommodation Recommendations will be identified after the Preliminary Field Review Report has been distributed and the project's scope is defined.

Energy Savings/Eco-Friendly Considerations
The timbers from the existing structure may be salvaged for future use. Rapid construction techniques, if appropriate, will reduce construction time and site impacts.

Traffic Control
The existing bridge will be closed during construction and either an adjacent detour bridge will be constructed, or traffic will be detoured to alternate routes. An off-site detour to the south of the project may be utilized by directing through traffic around the site on Mcgirl Road and Vermillion Road. This detour would be approximately 4.2 miles long.

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

Traffic issues that will require special consideration are as follows:

- Maintain traffic flow until new structure is open to traffic.

Preliminary Construction Cost Estimate

	Estimated cost	Inflation (INF) (from PPMS)	TOTAL costs w/INF + IDC (from PPMS)
STPB CN	**$2,800,000**	**$423,104**	**$3,577,323**
CE (10%)	**$280,000**	**$42,310**	**$357,731**
Project TOTAL from all of the funding types above:			
Project TOTAL CN+CE	**$3,080,000**	**$465,414**	**$3,935,054**

The estimate above includes $*75,000* for traffic control, 20% allowance for contingency, and 20% for mobilization.

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 10.99% for FY 2021.

Preliminary Engineering

The current Preliminary Engineering (PE) cost estimate including inflation and IDC is $575,000 as calculated in PPMS. After overrides have been completed for this project, a refined estimate of the PE costs will be made along with a determination if a PE modification is necessary.

Project and Risk Management

The Bridge Bureau is managing this project with Tracy Stoner as the Project Design Manager. The District Road Design in Billings will be the lead for the road design portion of the project. This project is not considered a Project of Division Interest (PoDI) by FHWA.

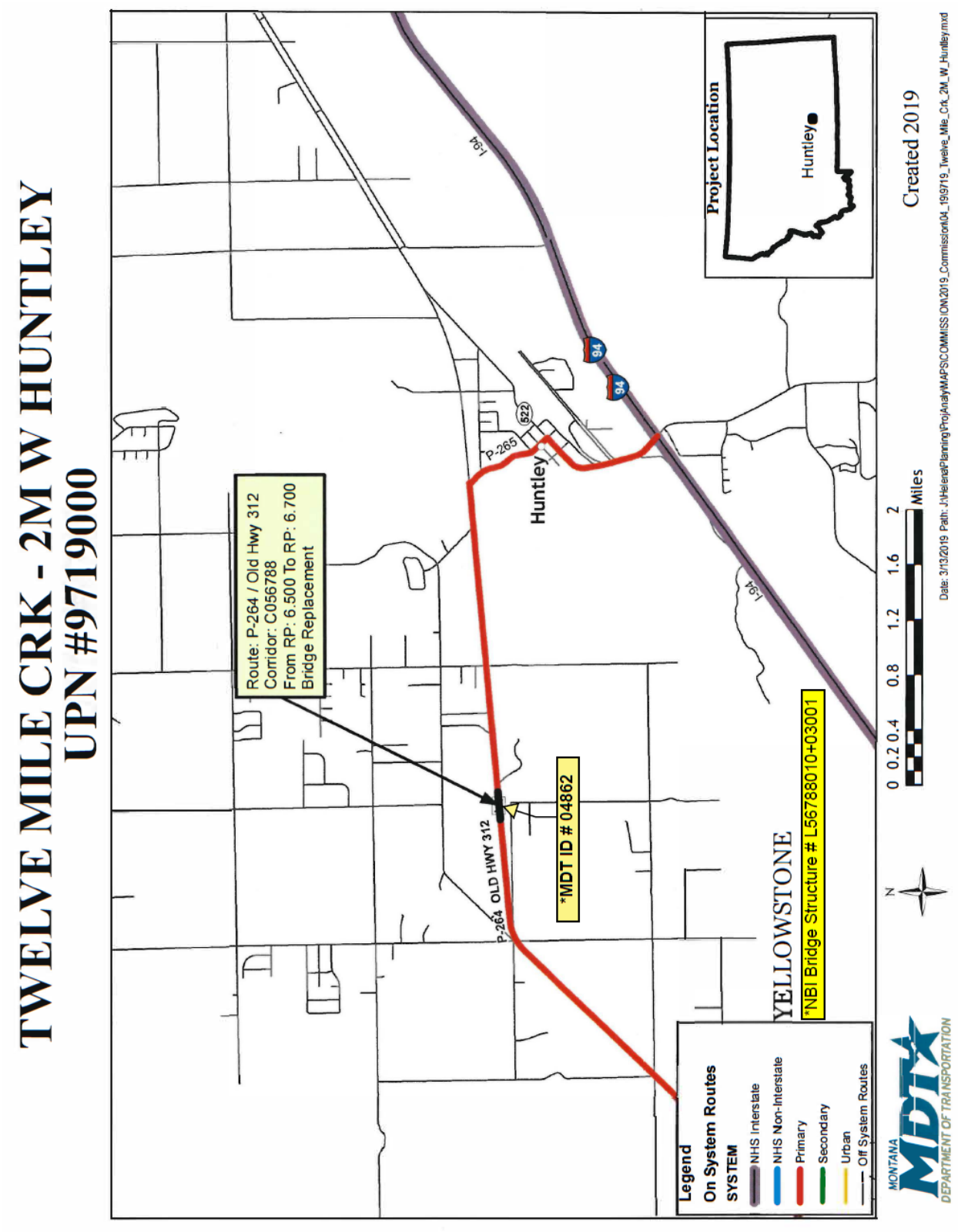
The required coordination with the adjoining safety project does pose a risk of delay to the project schedule. Early and ongoing coordination efforts between the Bridge Bureau and District Road Design team will help mitigate that risk.

Ready Date

The ready date for this project will be established after this report has been approved and overrides have been completed in EPS. A target let date will be determined after the ready date has been established and the project is prioritized within the Tentative Construction Plan (TCP).

The current PE End Date is December 31, 2024 as listed in the PE Obligation and Expenditures Report. No adjustment to the date is anticipated at this time.

Site Map


TWELVE MILE CRK - 2M W HUNTLEY
UPN #9719000
Route: P-264 / Old Hwy 312
Corridor: C056788
From RP: 6.500 To RP: 6.700
Bridge Replacement
*MDT ID # 04862
*NBI Bridge Structure # L56788010+03001
Huntley
YELLOWSTONE
P-264 OLD HWY 312
P-265
I-94
94
522
Project Location
Huntley
Created 2019
Legend
On System Routes
SYSTEM
NHS Interstate
NHS Non-Interstate
Primary
Secondary
Urban
Off System Routes
0 0.2 0.4 0.8 1.2 1.6 2
Miles
N
MONTANA
MDT
DEPARTMENT OF TRANSPORTATION
Date: 3/13/2019 Path: J:\Helena\Planning\ProjAnaly\MAPS\COMMISSION\2019_Commission\04_19\9719_Twelve_Mile_Crk_2M_W_Huntley.mxd

e-copies:

Dustin Rouse, Preconstruction Engineer
Bill Squires, Acting Highways Design Engineer
Dave Hedstrom, Hydraulics Engineer
Bill Weber, Supervisor, Photogrammetry & Survey
Stanton Brelin, Traffic Operations Engineer
Ivan Ulberg, Traffic Design Engineer
Patricia Burke, Safety Engineer
Chad Richards, Engineering Cost Analyst
John Pirre, Engineering Information Services
Vacant, Public Involvement Officer
Sue Sillick, Research Section Supervisor
Lisa Hurley, Fiscal Programming Section
David Phillips, Engineering Division
Ashley Higgins, Engineering Division
Karen Grosulak-McCord, Bicycle/Ped. Coordinator
Joe Radonich, Remediation and Assessment
Shane Pegram, Construction Bureau – VA Engineer
Nathan Haddick, Bridge Design Engineer
Darin Reynolds, Engr. Const. Contracting Bureau

Steve Giard, Utilities Engineering Manager
David Hoerning, Lands Section Supervisor
Jerilee Weibel, Acquisition Section Supervisor
Jon Burnett, R/W Access Management Section Manager
Jim Davies, Materials Bureau Chief
DJ Berg, Pavement Analysis Engineer
Miles Yerger, Surfacing Design Supervisor
Scott Helm, Geotechnical Operations Manager
Paul Johnson, Project Analysis Bureau
Jean Riley, Planner
Tom Gocksch, ESB, Engineering Section Supervisor
Dawn Stratton, Fiscal Programming Section
Amanda Jackson, Eng. Manager, Bridge Management System
Jeremy Terry, Road Design Engineer
Becky Duke, Traffic Data Collection Section Supervisor (WIM)
Doug McBroom, Maintenance Division Operations Mgr (RWIS)
Matt Maze, ADA Coordinator
Bill Semmens, Environmental Resources Section Supervisor
Jon Axline, Historian
Darcy Goodson, Reclamation Specialist

Mike Taylor, District Preconst. Engineer
Steven Helms, Materials Lab
Michael Fabricius, Acting Right of Way Supervisor
Ted Thronson, Construction Engineer
Jennifer Davis, Hydraulics Engineer
LeRoy Wosoba, Traffic Project Engineer
Susan Lenard, Biologist
Kurtis Schnieber, Billings District Projects Engineer
Andrew Harmon, District Utility Agent

Tom Tilzey; Ron “Bud” Pederson, Maintenance Chief
Aaron Eschler, Right of Way Design Supervisor
TJ Ramaeker, Construction Ops Engineer
Tracy Stoner, Bridge Area Engineer
Dan Kluth, Acting Geotechnical Manager
Tommy Griffeth, Project Development Engineer
Kevin Adkins, District MCS Captain
Miles Yerger, Surfacing Design
Christopher Trautmann, Constructability Reviewer
Jacob Brotzler, Acting Road Design Area Engineer