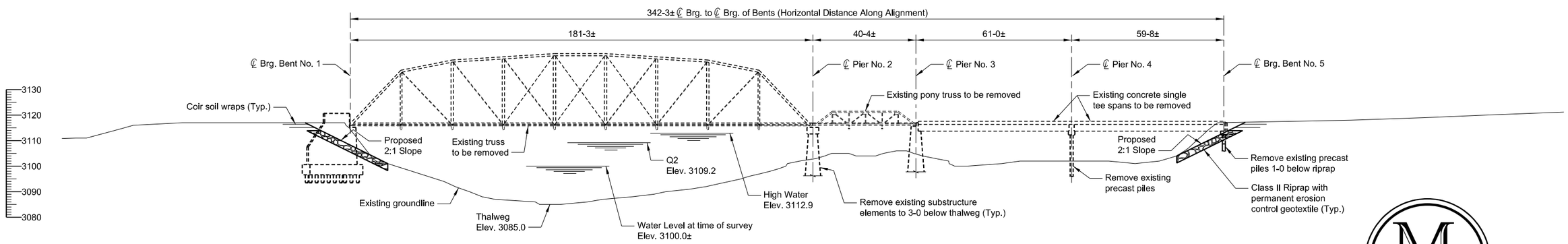
PLAN



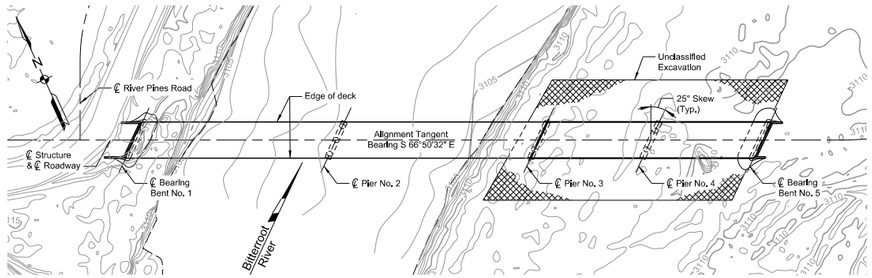
ELEVATION

PRELIMINARY

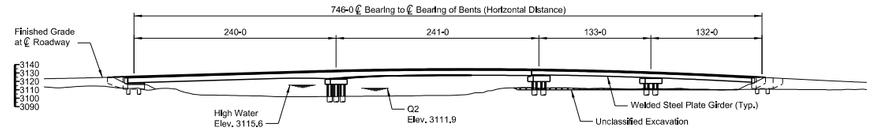
MACLAY BRIDGE REMOVAL AND RIVER BANK RESTORATION

JULY 2016

Scale 1" = 40'-0"



PLAN



ELEVATION

ALTERNATE 1A

POSSIBLE ADVANTAGES

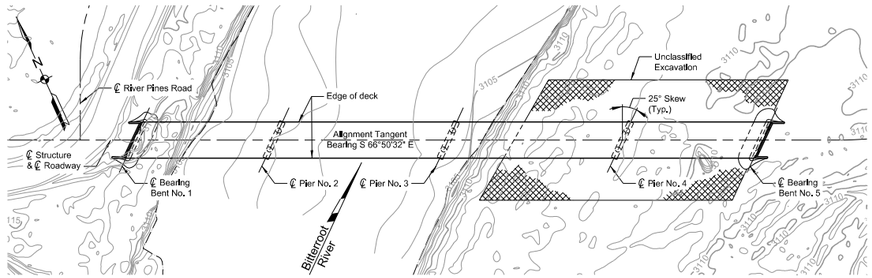
1. Only one pier in the active river channel.
2. Arched main span girder provides structural economy and potential aesthetic preference.
3. Tangent alignment.

POSSIBLE DISADVANTAGES

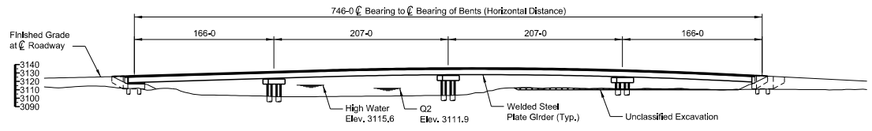
1. Girder dimensions may preclude local fabrication.
2. Skew requires additional analysis and detailing for cross frames.
3. Additional expansion joint between two superstructure systems.

ESTIMATED CONSTRUCTION COST

$14,070,000



PLAN



ELEVATION

ALTERNATE 1B

POSSIBLE ADVANTAGES

1. Balanced span configuration.
2. Girder depth within local fabricator capabilities.
3. Tangent alignment.
4. Within 1% of the low cost alternative.

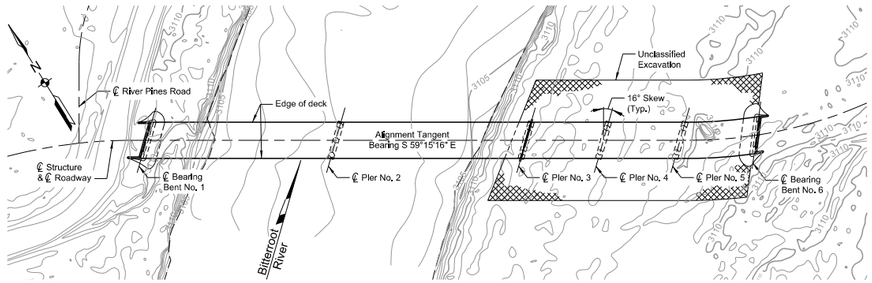
POSSIBLE DISADVANTAGES

1. Two piers in the active river channel.

ESTIMATED CONSTRUCTION COST

$13,130,000

PREFERRED ALTERNATE



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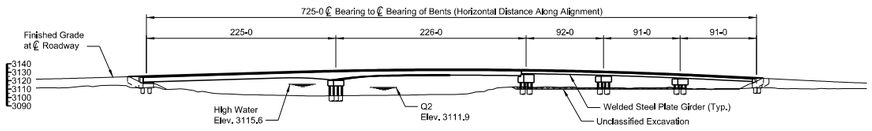


ELEVATION

ALTERNATE 2A

POSSIBLE ADVANTAGES

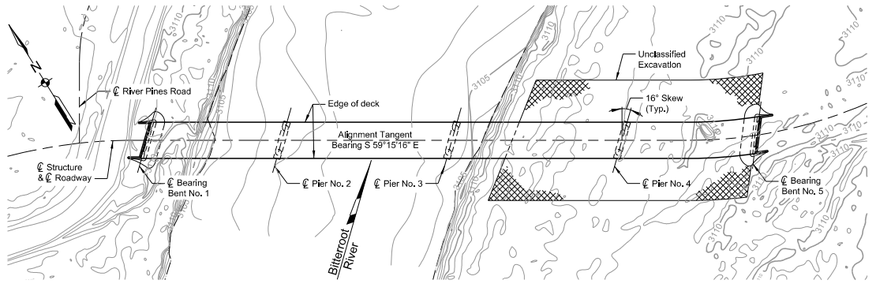
1. Only one pier in the active river channel.
2. Arched main span girder provides structural economy and potential aesthetic preference.
3. Lower roadway profile compared to Alternate 1A.

POSSIBLE DISADVANTAGES

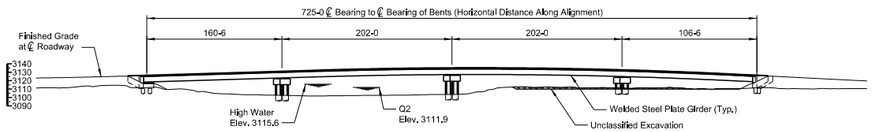
1. Girder dimensions may preclude local fabrication.
2. Additional expansion joint between two superstructure systems.
3. Curved alignment on east end of bridge.

ESTIMATED CONSTRUCTION COST

$13,770,000



PLAN



ELEVATION

ALTERNATE 2B

POSSIBLE ADVANTAGES

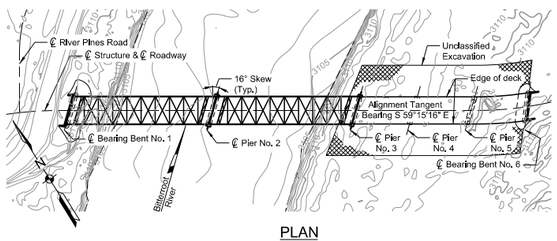
1. Balanced span configuration
2. Girder depth within local fabricators capabilities.
3. Low cost alternate.

POSSIBLE DISADVANTAGES

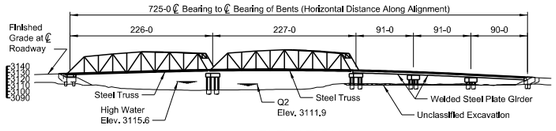
1. Two piers in the active river channel.
2. Curved alignment on east end of bridge.

ESTIMATED CONSTRUCTION COST

$13,110,000



PLAN



ELEVATION

ALTERNATE 2C

POSSIBLE ADVANTAGES

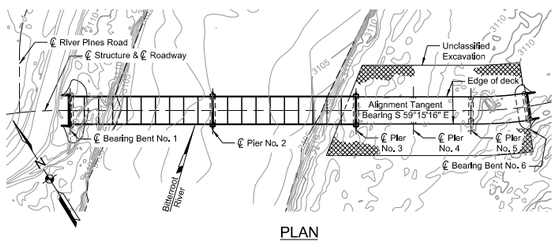
1. Relatively shallow superstructure could accommodate lower roadway profile grade.
2. Through trusses are visually similar to Maclay bridge.

POSSIBLE DISADVANTAGES

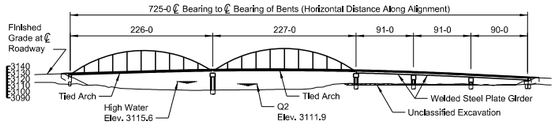
1. Truss spans do not accommodate future widening.
2. Curved alignment on east end of bridge.
3. Additional expansion joint between two superstructure systems.
4. Trusses may require protective coating system.
5. Trusses require non-redundant steel tension members.
6. Higher cost alternate.

ESTIMATED CONSTRUCTION COST

$19,590,000



PLAN



ELEVATION

ALTERNATE 2D

POSSIBLE ADVANTAGES

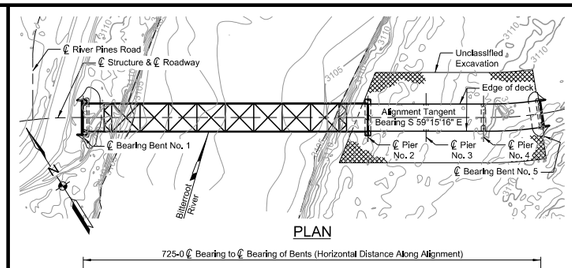
1. Relatively shallow superstructure could accommodate a lower roadway profile.
2. Aesthetics.

POSSIBLE DISADVANTAGES

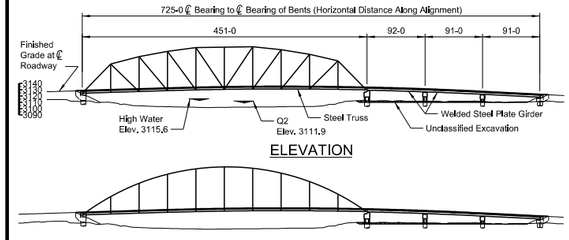
1. Arch spans do not accommodate future widening.
2. Curved alignment on east end of bridge.
3. Piers misaligned to river flow.
4. Arch spans may require protective coating system.
5. Additional expansion joint between two superstructure systems.
6. Arch requires non-redundant steel tension members.
7. Higher cost alternate.

ESTIMATED CONSTRUCTION COST

$22,280,000



PLAN



ELEVATION

ELEVATION - TIED ARCH MAIN SPAN OPTION

ALTERNATE 2E

POSSIBLE ADVANTAGES

1. Eliminates construction in active river channel.
2. Relatively shallow superstructure could accommodate lower roadway profile grade.
3. Aesthetics.

POSSIBLE DISADVANTAGES

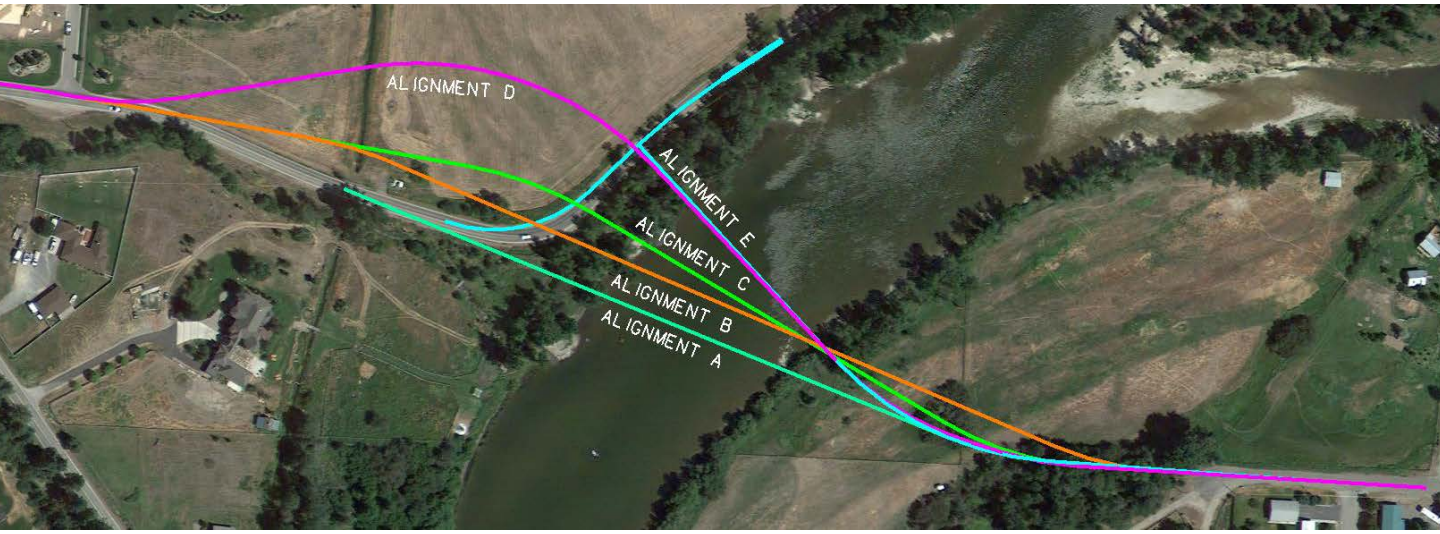
1. Main span does not accommodate future widening.
2. Curved alignment on east end of bridge.
3. Piers misaligned to river flow.
4. Main span may require protective coating system.
5. Main span requires non-redundant steel tension members.
6. Additional expansion joint between two superstructure systems.
7. Highest cost alternate.

ESTIMATED CONSTRUCTION COST

$29,470,000

How the Alignment was Selected

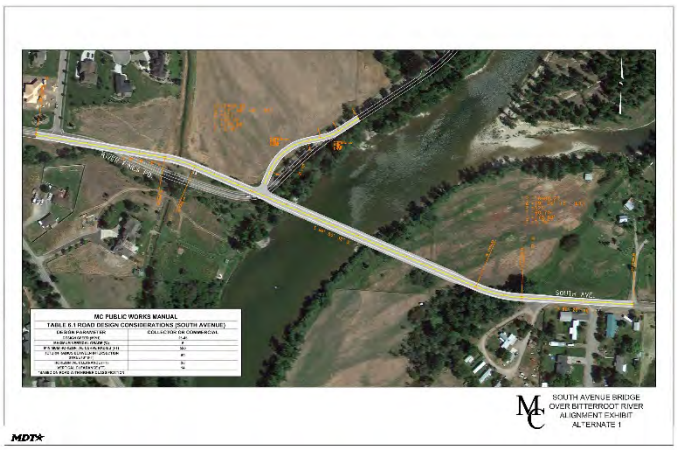
Step 1 – Develop Potential Alignments

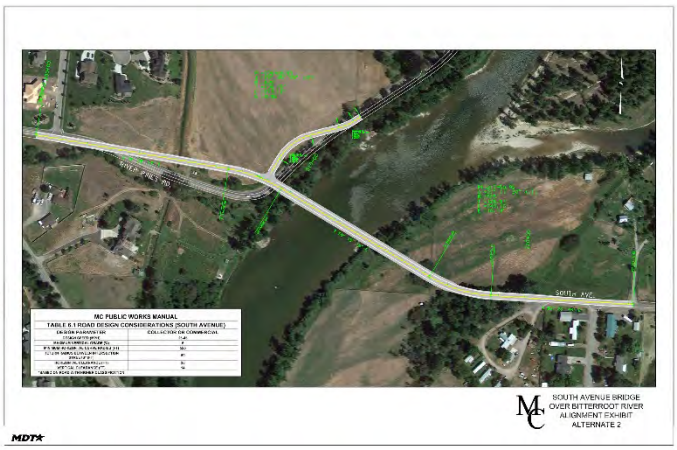


Step 2 – Refine Alignments

(Based on Design Criteria, Environmental Impacts, Right-of-Way, Overall Costs, Bridge Length, Safety, etc.)

Note: *Alignment B became Alignment 1 and Alignment C became Alignment 2*





Preferred Alignment

PRELIMINARY

SOUTH AVENUE BRIDGE PROJECT

PREFERRED ALIGNMENT (ALIGNMENT 1) AND PROJECT AREA MAP

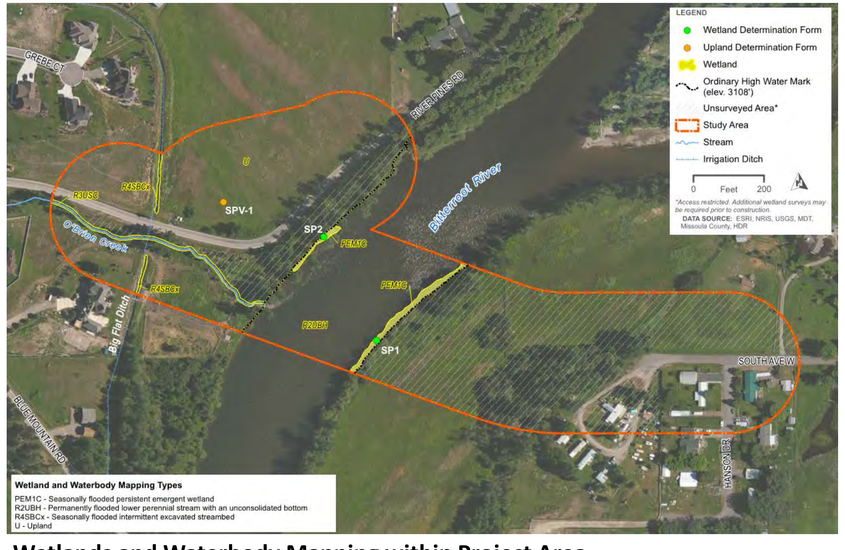
PATH: G:\PROJECTS\MISSOULA COUNTY\SOUTH AVE BRIDGE\GIS\MAP_DOCS\PI MTG\#2\PROJECT AREA.MXD - USER: JSCHICK - DATE: 8/15/2016

Environmental Documentation

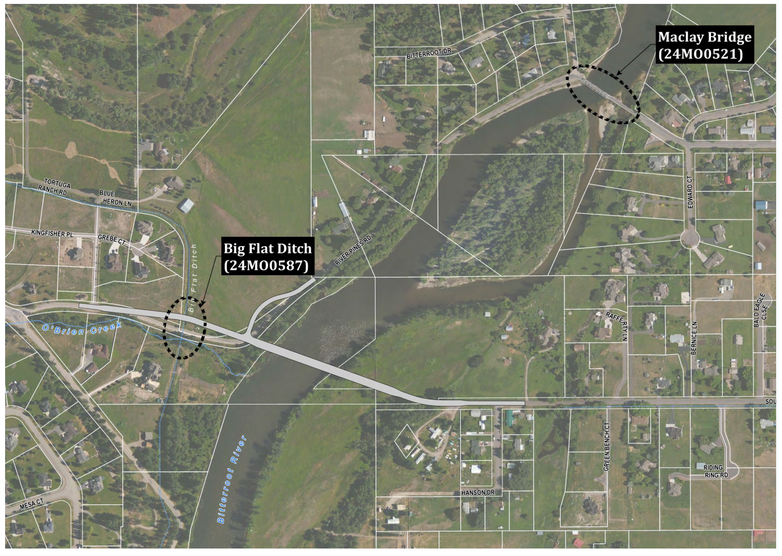
The South Avenue Bridge project will be designed and implemented in full accordance with the National Environmental Policy Act (NEPA), Montana Environmental Policy Act (MEPA), and all other applicable environmental laws, regulations, and executive orders.

<u>Major components of NEPA/MEPA process are in-progress and include:</u>

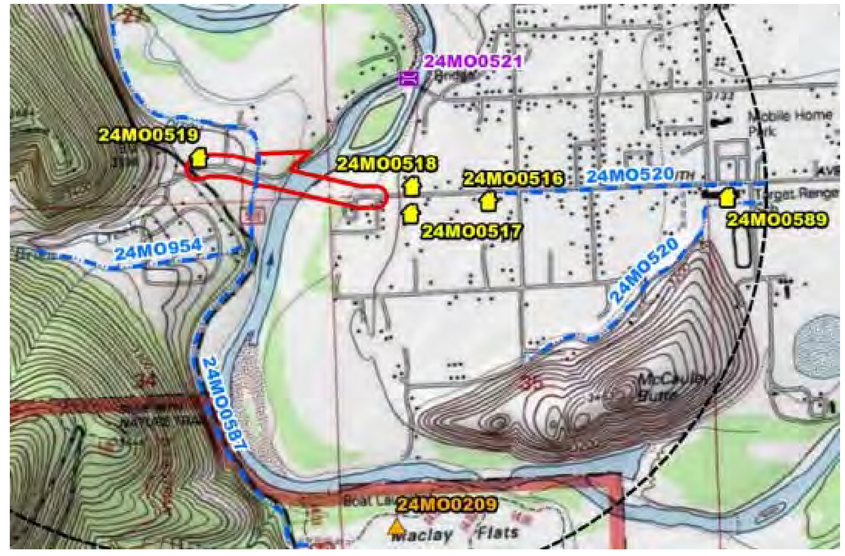
- Cultural Resources / Section 106 Compliance
- Hydraulic and Hydrology Evaluation (floodplains)
- Biological Resource Report / Biological Assessment
- Detailed Noise Analysis
- Section 4(f) Evaluation
- Environmental Document
  (Categorical Exclusion, narrative format)



Wetlands and Waterbody Mapping within Project Area



Potentially Affected Section 4(f) Resources



Previously Recorded Cultural Resources within the Project Area Vicinity

LEGEND

- Preliminary 100-Year Floodplain
- Preliminary Floodway Boundary
- Stream
- Irrigation Ditch
- Property Boundary

0 Feet 100

DATA SOURCES: Montana State Library, USGS, Missoula County, HDR, ESRI

Preliminary Floodplain Boundary
Area east of this boundary is within the floodplain

Preliminary Floodway Boundary

Approximate Excavation Limits
Excavation at the east overbank required to offset new roadway fill within the floodplain

Example of Excavation Area, Grant Creek, Missoula

RIVER PINES RD

RIVER PINES RD

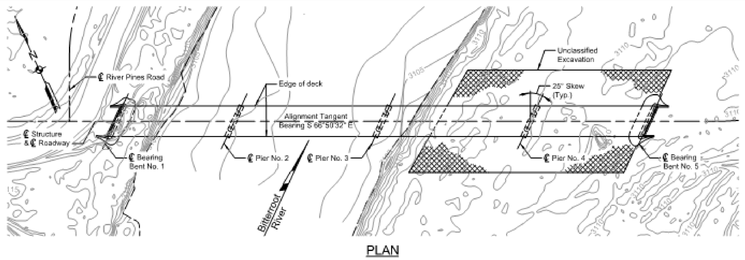
Bitterroot River

O'Brien Creek

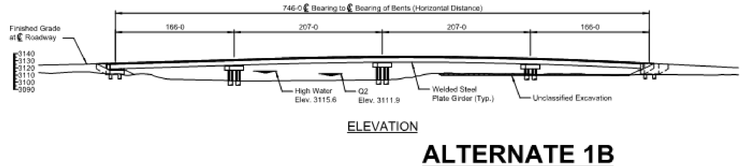
Big Flat Ditch

SOUTH AVE W

HANSON DR



PLAN



ELEVATION

ALTERNATE 1B

POSSIBLE ADVANTAGES

1. Balanced span configuration.
2. Girder depth within local fabricator capabilities.
3. Tangent alignment.
4. Within 1% of the low cost alternative.

POSSIBLE DISADVANTAGES

1. Two piers in the active river channel.

ESTIMATED CONSTRUCTION COST

$13,130,000

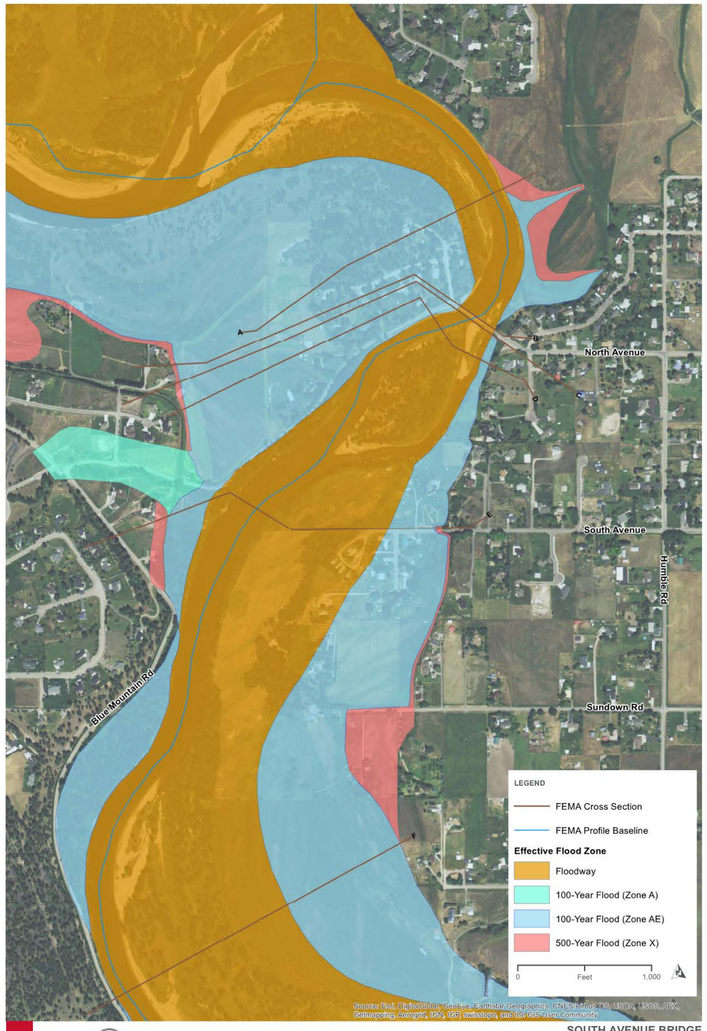
PREFERRED ALTERNATE

PRELIMINARY

SOUTH AVENUE BRIDGE PROJECT

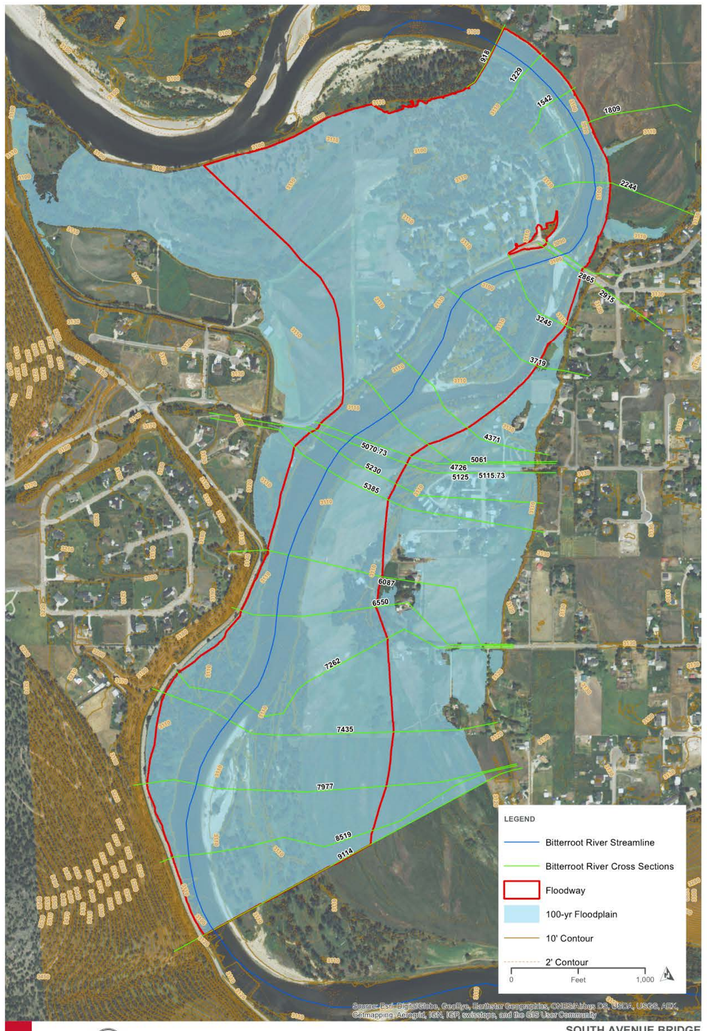
PREFERRED ALTERNATE (ALIGNMENT 1) AND PRELIMINARY HYDRAULIC INFORMATION

Hydraulic Model and Revised Floodplain



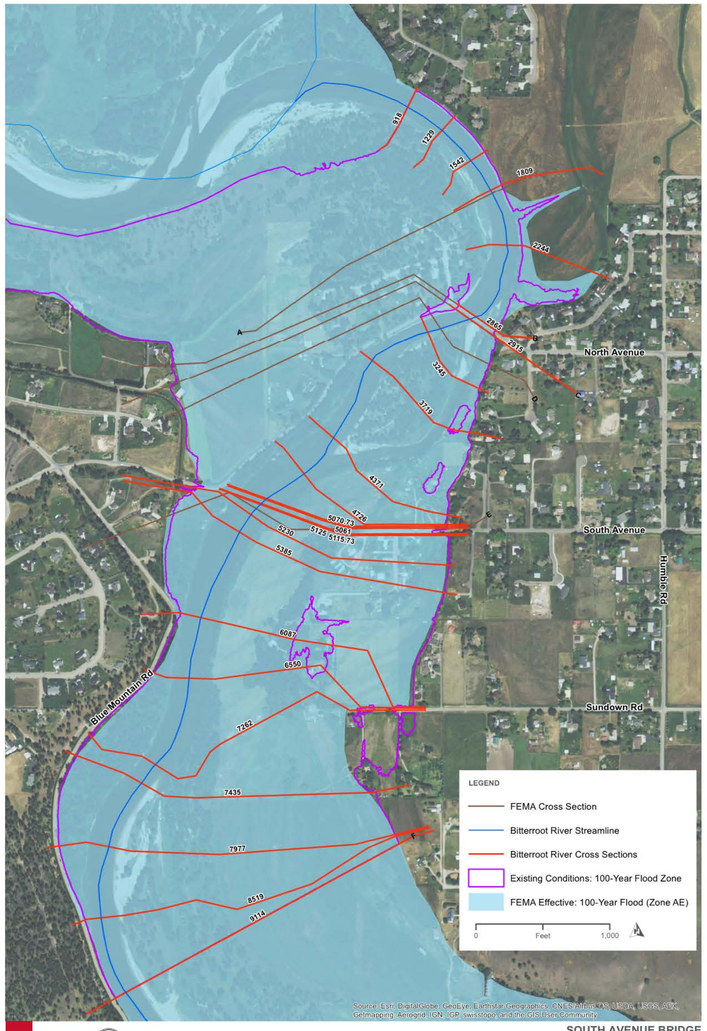
SOUTH AVENUE BRIDGE
UPN 6296
FIGURE D-2. FLOOD BOUNDARY AND FLOODWAY MAP FROM THE ORIGINAL BITTERROOT STUDY

Current FEMA Effective Model



SOUTH AVENUE BRIDGE
UPN 6296
FIGURE D-3. HYDRAULIC WORKMAP - EXISTING CONDITIONS

Corrected Hydraulic Model used to analyze proposed bridge alternatives



SOUTH AVENUE BRIDGE
UPN 6296
FIGURE D-4. EXISTING CONDITIONS FLOODPLAIN COMPARISON

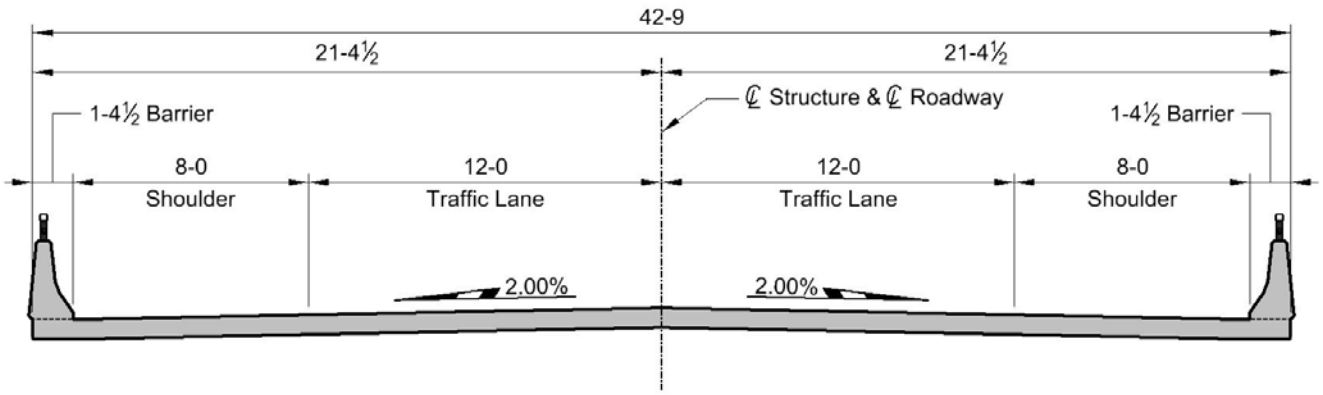
Existing Conditions Floodplains Comparison

Proposed Bridge Design

Shown with straight girder profile and column piers

Shown with arched girder profile and wall piers

Typical Bridge/Roadway Sections & Walkway Options



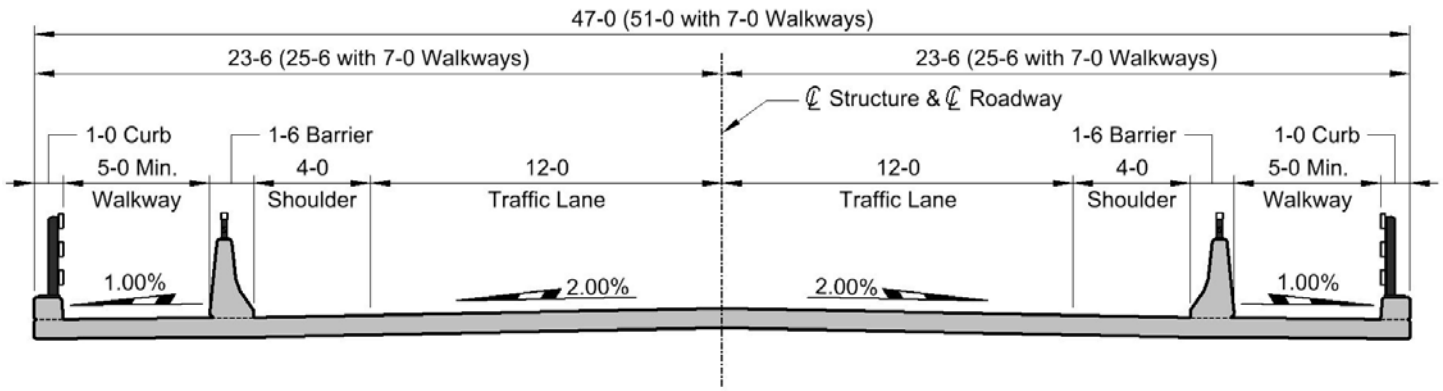
TYPICAL SECTION WITHOUT WALKWAYS

(Bikes & Pedestrians Use Shoulders)

No Walkway

- Low cost option
- No dedicated facility for bikes & pedestrians
- Current cost estimates based on this configuration

Your Choice?



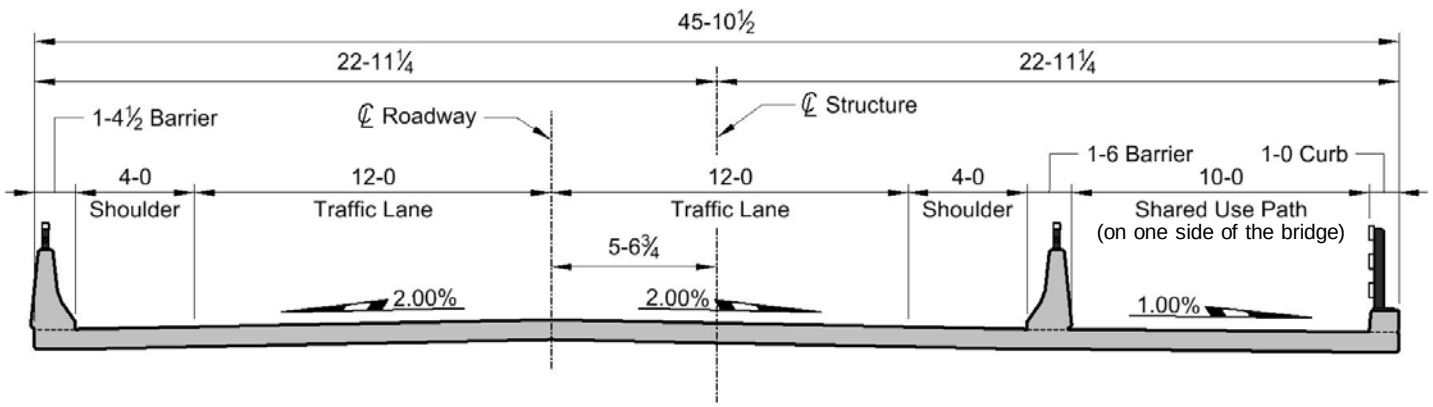
TYPICAL SECTION WITH SEPARATED WALKWAYS

(Bikes Use Shoulders; Pedestrians on Walkways)

Separated Walkway

- Physical separation from traffic
- Accommodates pedestrian access on both sides of bridge
- Cyclist would use the shoulder
- Walkway width could be increased to 7 FT

Your Choice?



TYPICAL SECTION WITH SHARED USE PATH

(Bikes & Pedestrians Use Shared Use Path)

Shared Use

- Physical separation from traffic
- Bikes and pedestrians occupy a “shared use” path
- Access on one side of bridge only

Your Choice?