

Belmont Bridge Replacement Whitman County, WA 2021

By: W. Mark Storey, PE



Pre-Fabricated Modular Beam Bridge

Belmont Bridge, Black Road, Whitman County, WA

Fabricator: True North Steel – Missoula, MT
Contractor: Whitman County Crew
Design Engineer: Mark Storey, County Engineer

Existing Structure – 19 ft Span, 22 ft Wide

Built/Rebuilt 1921/2002

Wood Deck/Stringers with Wood Piles & Wood Backwalls

Wood Deterioration & Susceptibility to Flooding

Replacement Structure Requirements

- Increase Hydraulic opening – 30 ft Channel
- 32 ft long by 28 ft wide
- Raise Clearance for 100 yr Flood, longer span
- Gravel Roadway
- Piles to rock through alluvial soils

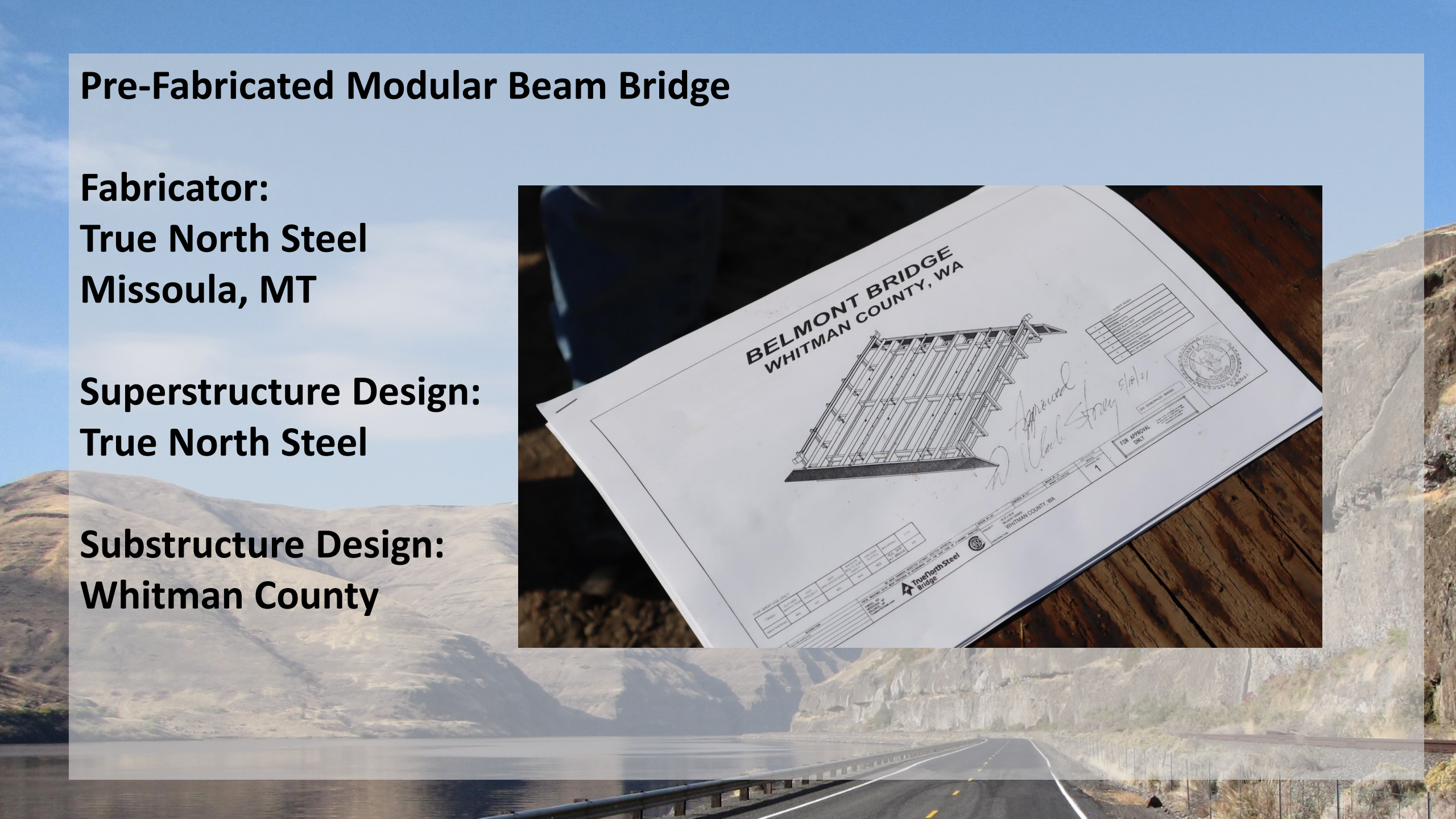
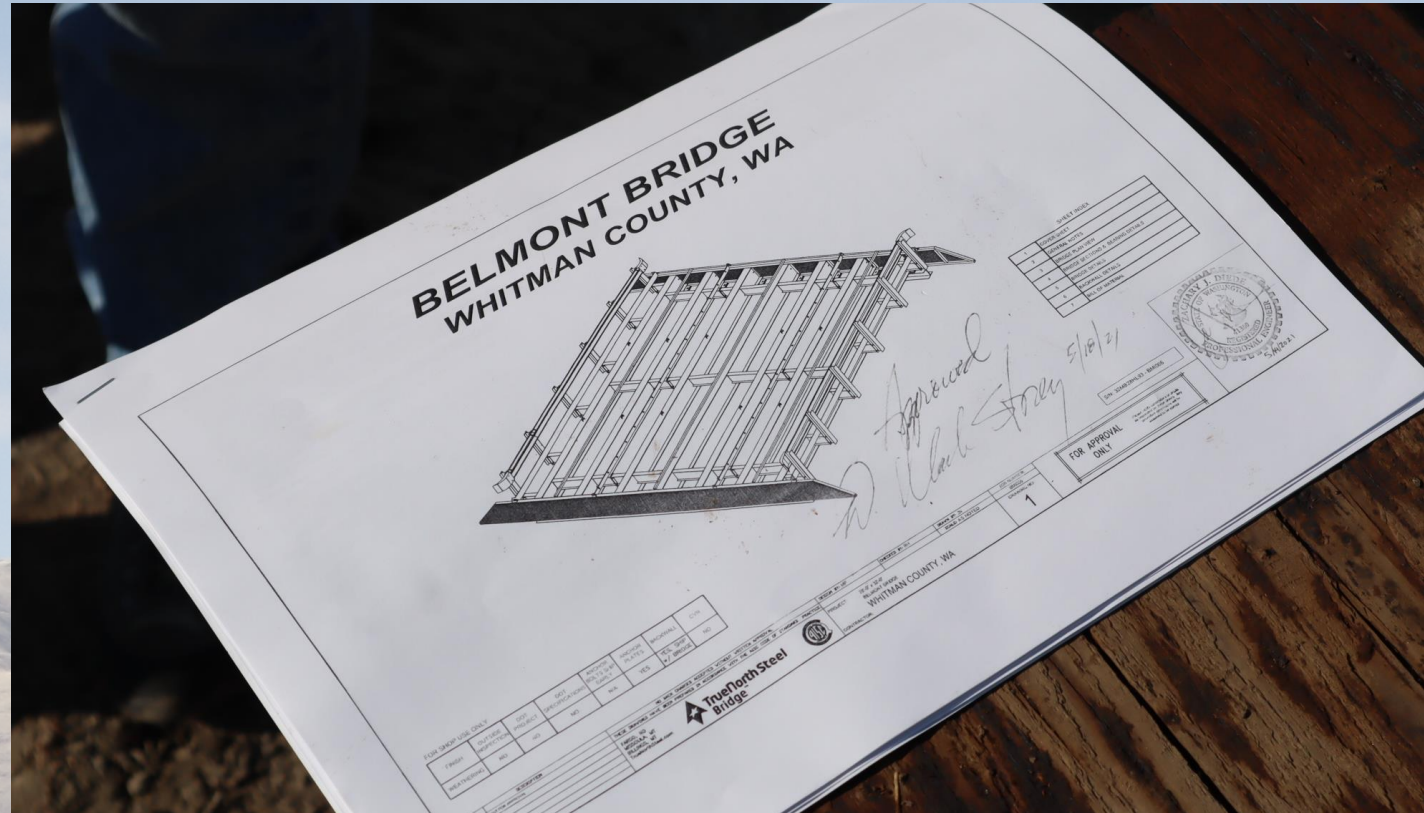


Pre-Fabricated Modular Beam Bridge

Fabricator:
True North Steel
Missoula, MT

Superstructure Design:
True North Steel

Substructure Design:
Whitman County



Pre-Fabricated Modular Beam Bridge

Bridge Demolition,
Surveying, Erosion Control,
Permit Requirements



Pre-Fabricated Modular Beam Bridge:

Foundation and Abutment:

County Owned Pile Driver

(44 ton/pile capacity)

HP12x53 Piles

HP12x53 Pile Cap



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Abutment top plate, backwall, and backfill



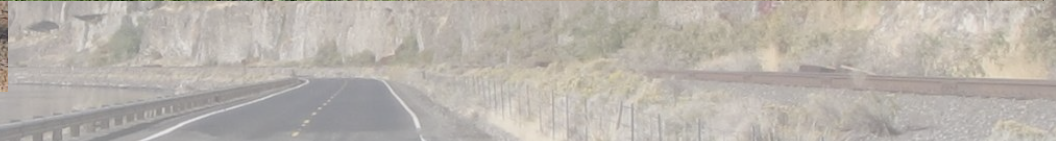
Pre-Fabricated Modular Beam Bridge

Completed
Abutment &
Rip Rap



Pre-Fabricated Modular Beam Bridge

Modular Components Delivered
And set on abutments.



Pre-Fabricated Modular Beam Bridge

Modular Bridge units Assembled



Pre-Fabricated Modular Beam Bridge

Nearly finished Bridge



Pre-Fabricated Modular Beam Bridge

Nearly finished Bridge



Pre-Fabricated Modular Beam Bridge

Timing

Temp Bridge, Bridge Demolition, Excavation, Stream Restoration, Road Building & Bridge Installation ~ 4 Weeks

Costs

Steel Superstructure	\$ 50,000
Labor & Equipment	\$ 75,000
Pile Foundations	\$ 20,000
Road Building	\$ 15,000
Permitting	\$ 8,000
Total	\$168,000

~\$ 187/ ft²

Concrete Superstructure Alternative

\$ 85,000



Pre-Fabricated Modular Beam Bridge

Take-Aways – Steel Bridges

Economical

Lighter Superstructure

Lighter Equipment

Lighter Abutments

Ease of Erection

Modular

Accelerated Bridge

Construction

Match-Fit Fabrication

Sustainability

Recyclable

Reusable / Movable



A gravel road with a guardrail and a culvert, with a large blue building in the background.

**Thank You
Questions?**

By: W. Mark Storey, PE