



2024 Spring Conference at Great Wolf Lodge
Perryville, Maryland
Astoria Bridge Replacement using CM/GC

Charles R Rodrigues

May 3rd, 2024

BIOGRAPHY

- Structural design of complex bridges
 - Bridges with vessel collision over navigable waters
 - Bridge with post-tensioning
 - Steel Box-girder
 - Bridges in high seismic zones
- Extensive experience in Alternate Delivery of Projects (DB & CM/GC)

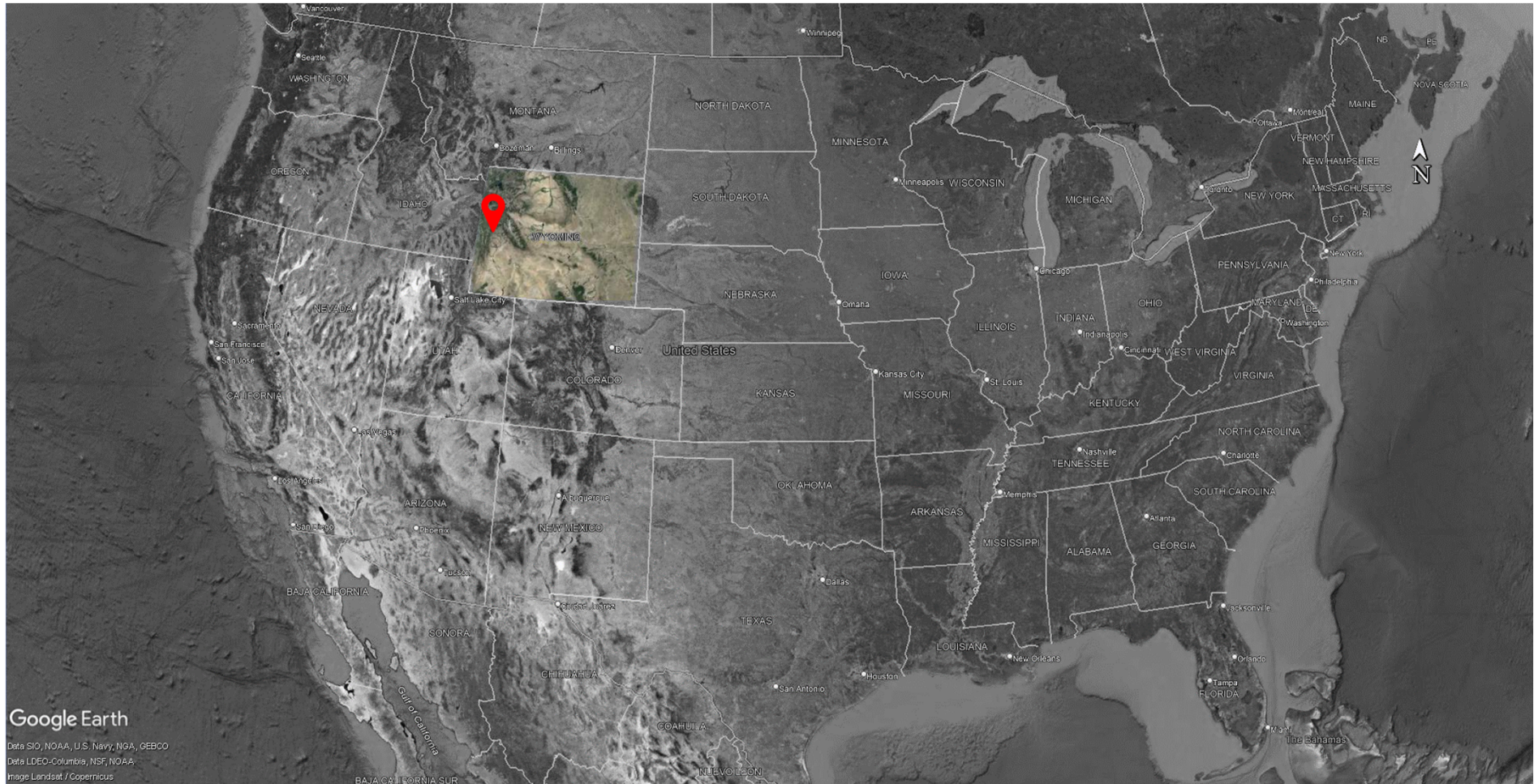
ABSTRACT

Astoria Bridge Replacement using CM/GC

Presentation Roadmap

- Bridge location and history
 - Need to replace
 - Challenges and solutions
 - Bridge overview
 - Q&A
-
- 1.0 PDH

Bridge location



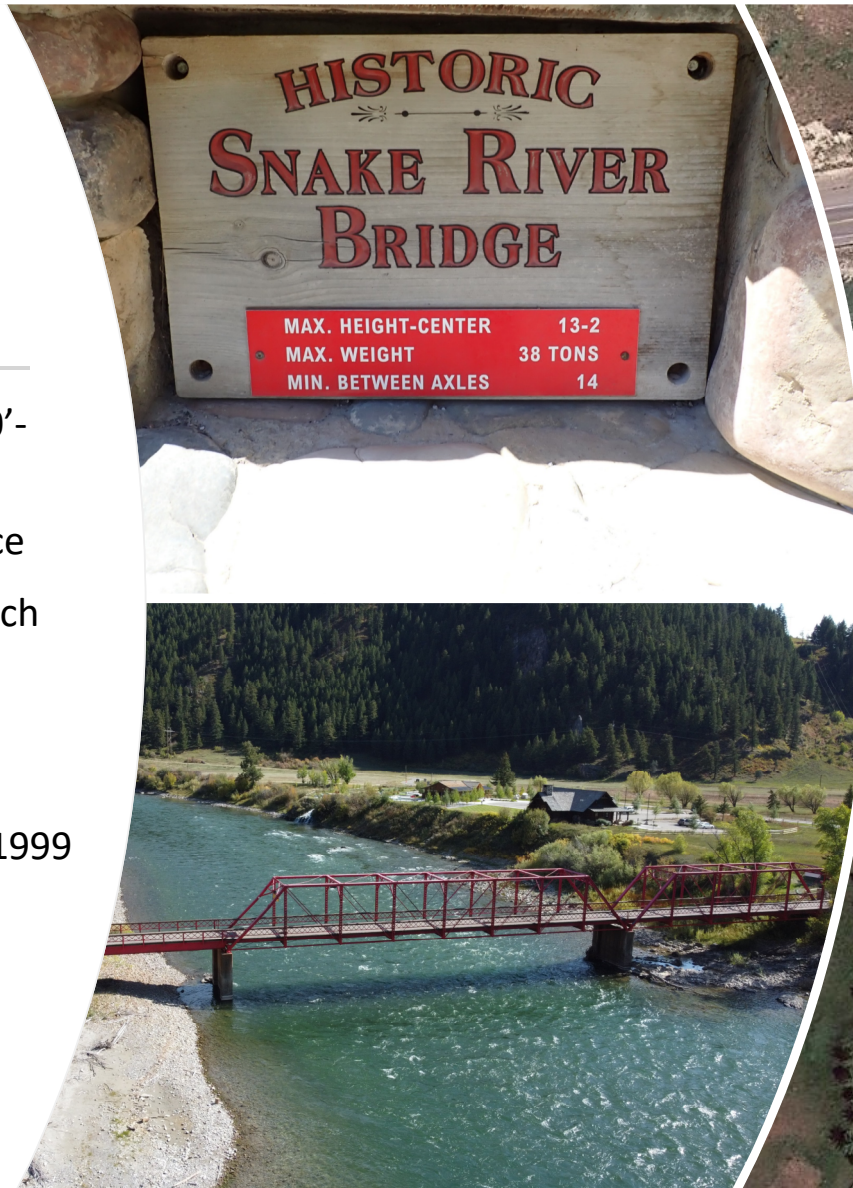


Bridge **location**

- Teton County, WY
- 16 miles south of Jackson
- Bridges over Snake River to provide access to Snake River Sporting Club
- Owned and maintained by Snake River Sporting Club Improvement Services District (SRSC-ISD)

Bridge configuration

- 4 span bridge (113'-150'-48'-48')
- 15ft wide, 13ft clearance
- One lane of traffic in each direction
- Load rated for limited capacity
- Historic Bridge built in 1999



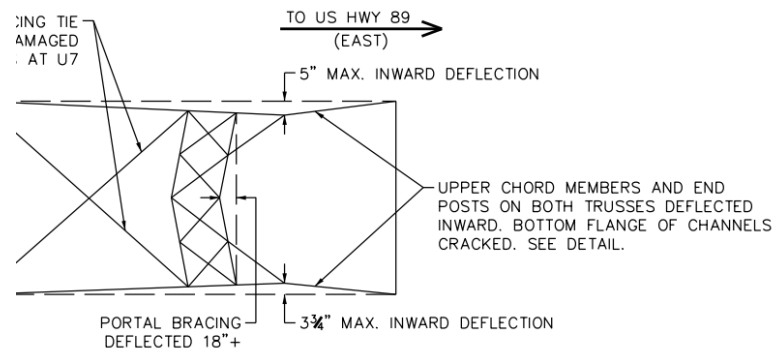
Why Historic!!

- Wilson Bridge – 1915 thru 1922
- 657ft - Longest bridge in WY
- Five 130ft long spans Pin-connected Pratt through truss steel bridge with wooden deck
- Decommissioned in Oct 1959.
- Reassembled as Swinging Bridge (3 spans) and Astoria Bridge (2 spans)
- Swinging Bridge – 1959
- Astoria Bridge – 1999



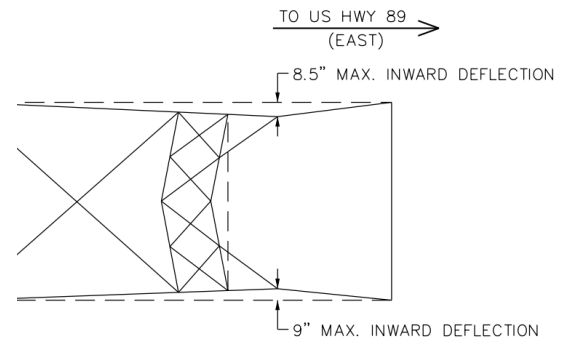
Collision Damage

June 2021



Collision Damage

December 2022



Next Steps?

Repair or

Replace

- Issues discovered
 - Bottom chords for main span were undersized during re-assembly in 1999
 - Truss configuration did not match original geometry. 7 panel truss was re-configured to 6 and 8 panel
 - Original load rating of 38 tons should have been 27 tons
- Collision damage – repeat offenders
 - Vertical clearance not sufficient for current needs
 - Costly and highly technical repairs
 - Detour through restricted and poorly maintained route
- Heavy construction vehicles needed access for current and future growth
- Speed posted to allow reduced load rating by limiting impact
- Load rating dropped from 38 tons to 5 tons

Replace ...

Why choose

Alternative Delivery Contracting Methods



- Owner with **limited knowledge** and in-hour engineering resources



- **Critical infrastructure** to access Snake River Sporting Club



- Design and construction **funding** source unknown



- Highly restrictive **schedule**



- Remote location with **limited access**



- Unknown **engineering challenges**



- Limited **construction techniques**



- **Historic** Bridge Replacement



- Multiple **stakeholders**



- **Risk** management

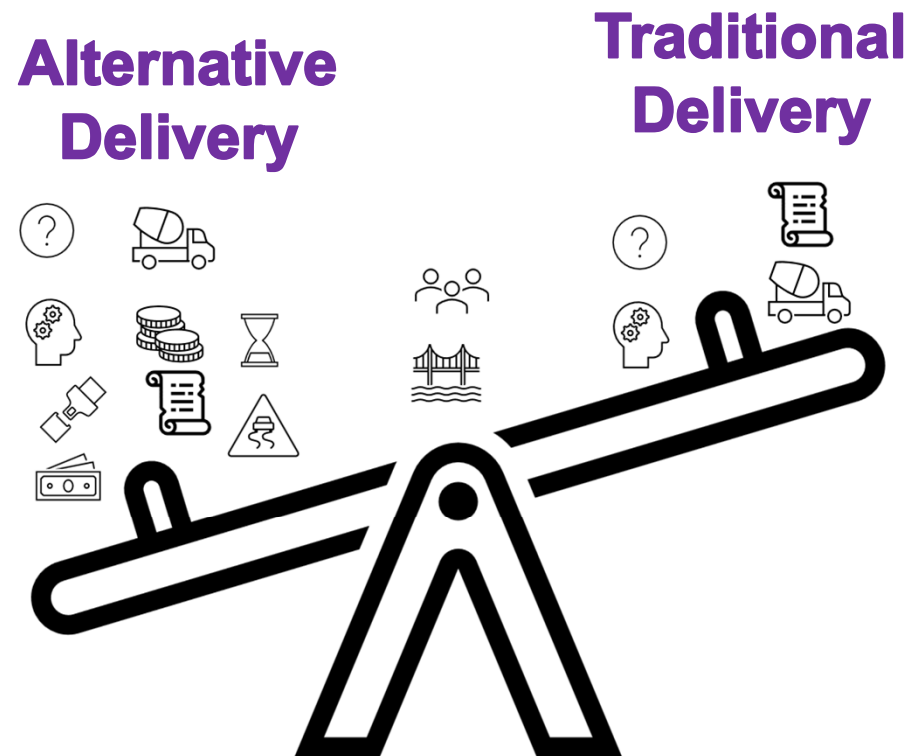


- **Cost** Control

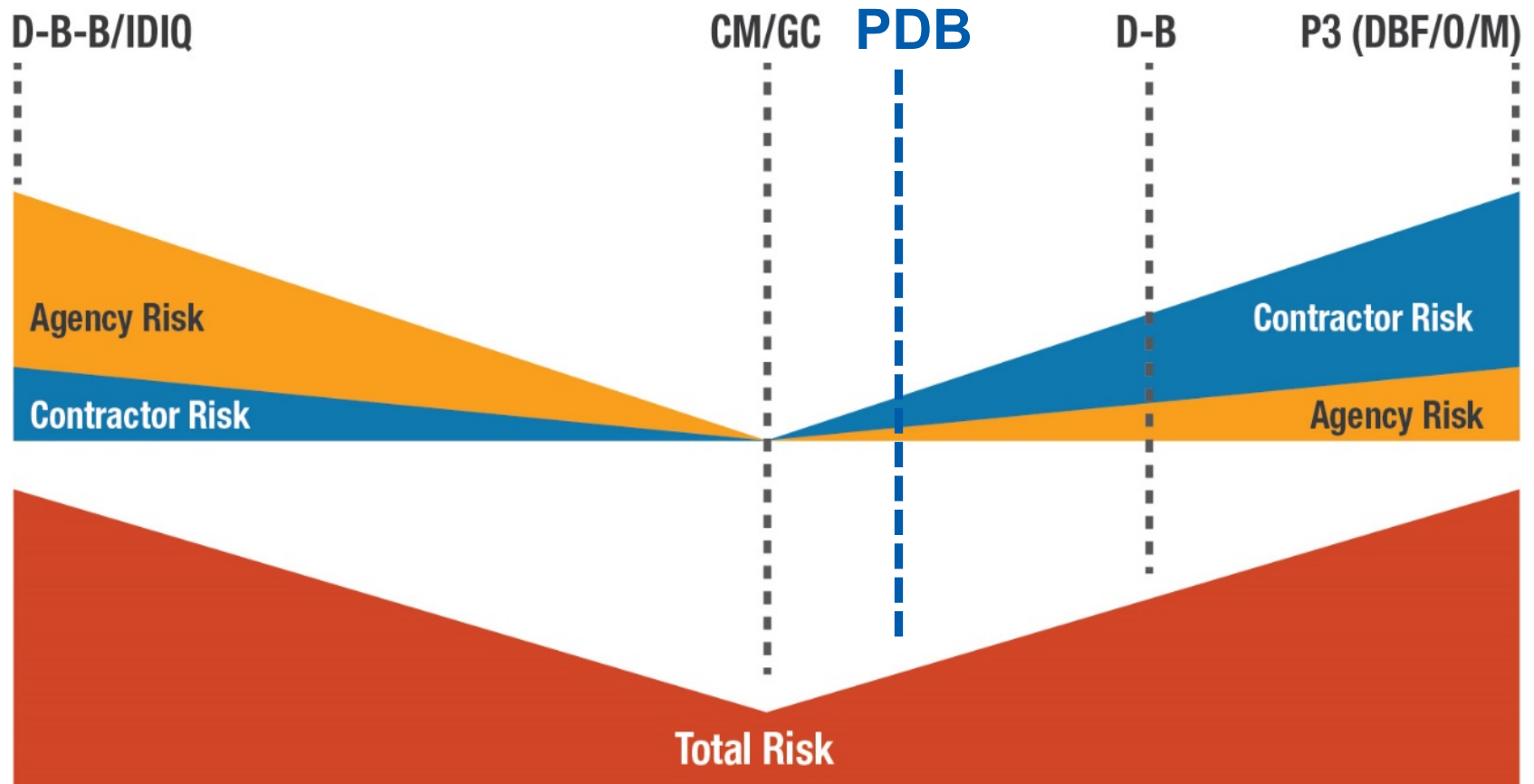
Replace ...

Why choose

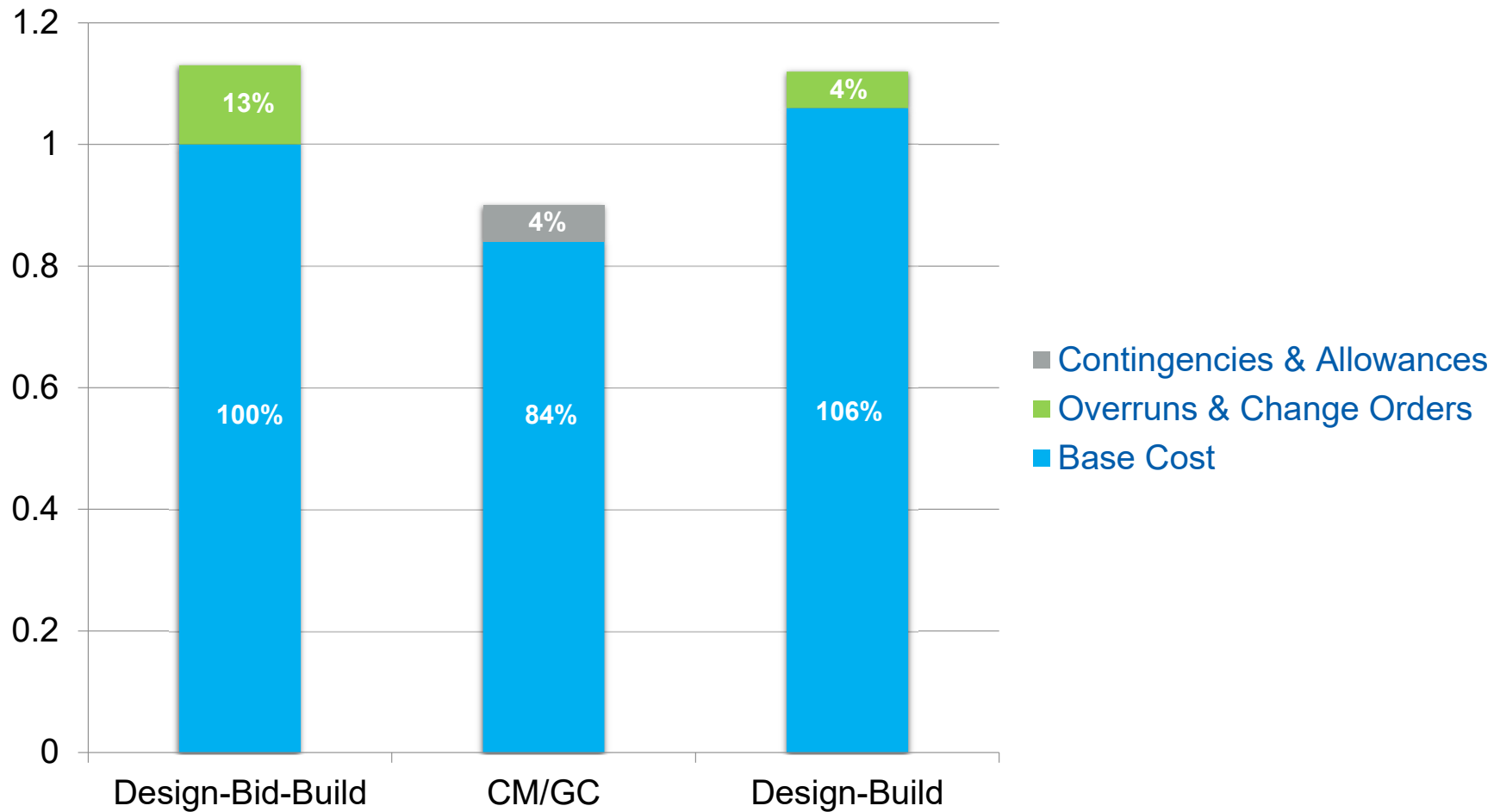
Alternative Delivery Contracting Methods



Risk management



Cost control



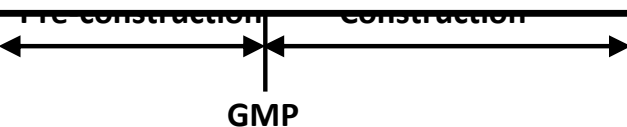
Rapid delivery

Traditional Design Bid Build

Design

Ave Duration for D-B-B, CM/GC and D-B/LB Projects between \$10M-50M

Contract Method	Mean Cost (\$)	Mean Project Duration (Days)	Mean Agency Design Duration (Days)	Mean Construction Duration (Days)*
D-B-B (n=34)	\$21,188,585	2,130	1,139	818
CM/GC (n=10)	\$23,912,981	662	281	349
D-B/BV (n=10)	\$18,604,503	1,420	638	639
Total (n=54)	\$21,214,569	1,726	904	699



Pick the right **Team . . .**



SNAKE RIVER
SPORTING CLUB



CONSOR



CONTECH[®]
ENGINEERED SOLUTIONS

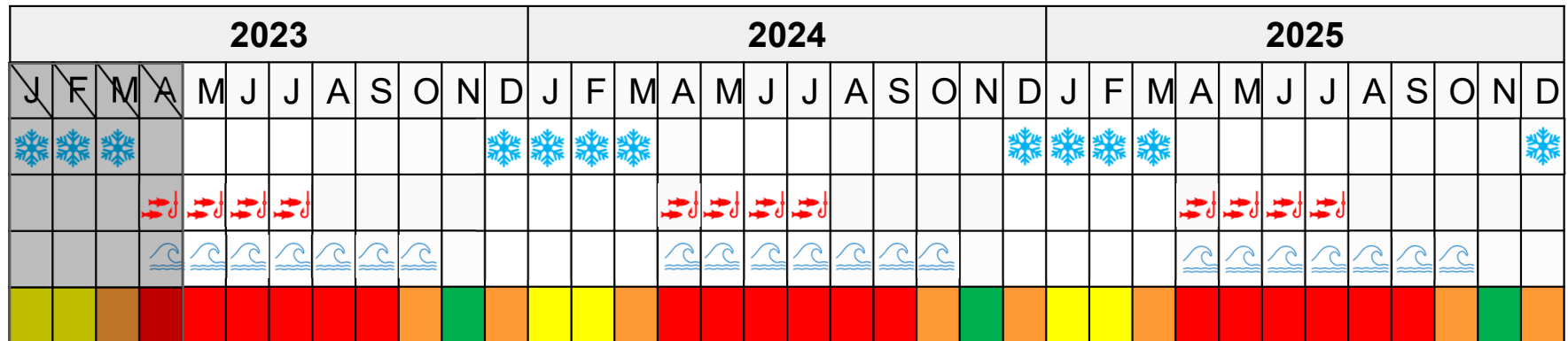


JORGENSEN

research & consulting inc.
B i o t a



Let's talk **Schedule!!**



**May
2023**

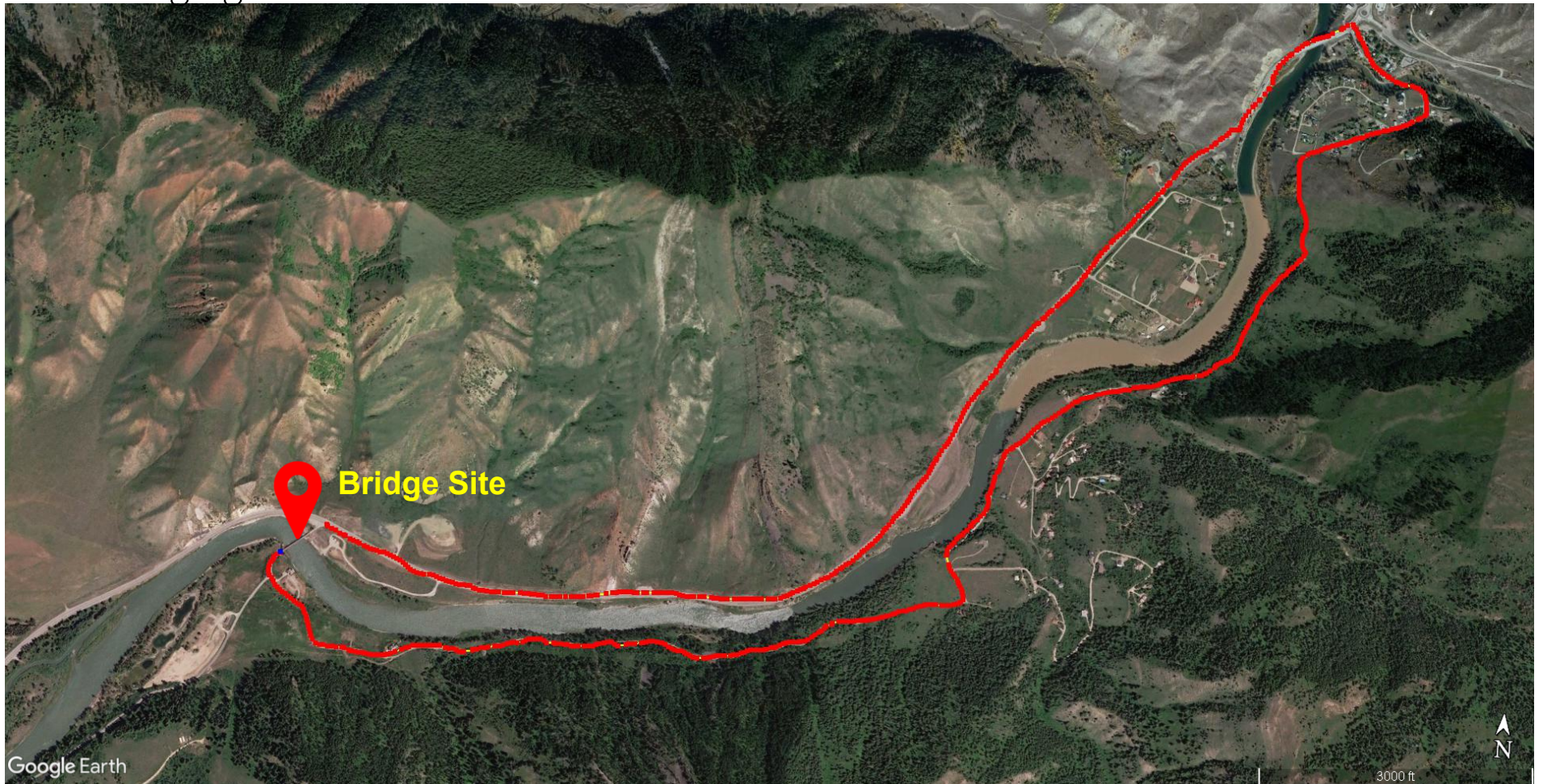


**Spring
2026**

- ❄️ Below freezing temperatures
- 🔞 Game and Fish Restrictions – April 15th – July 31st
- 🌊 High water discharge – mid April thru mid October
- 🟢 Ideal working conditions
- 🟡 Predictable working conditions
- 🟠 Dynamically adapted working conditions
- 🔴 Work restrictions



Challenging Access



Can I see your **Permits!!**

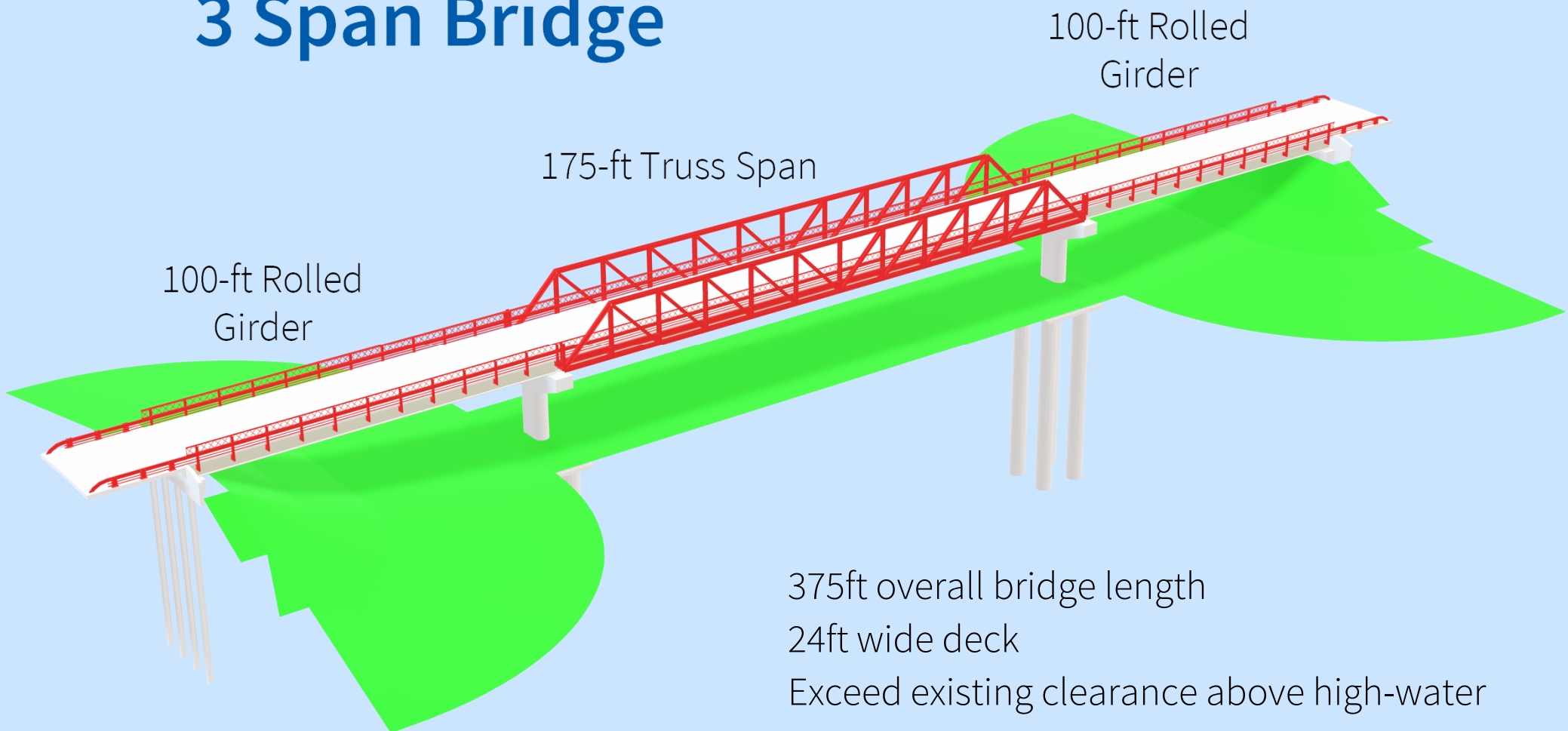


Preserving **History**

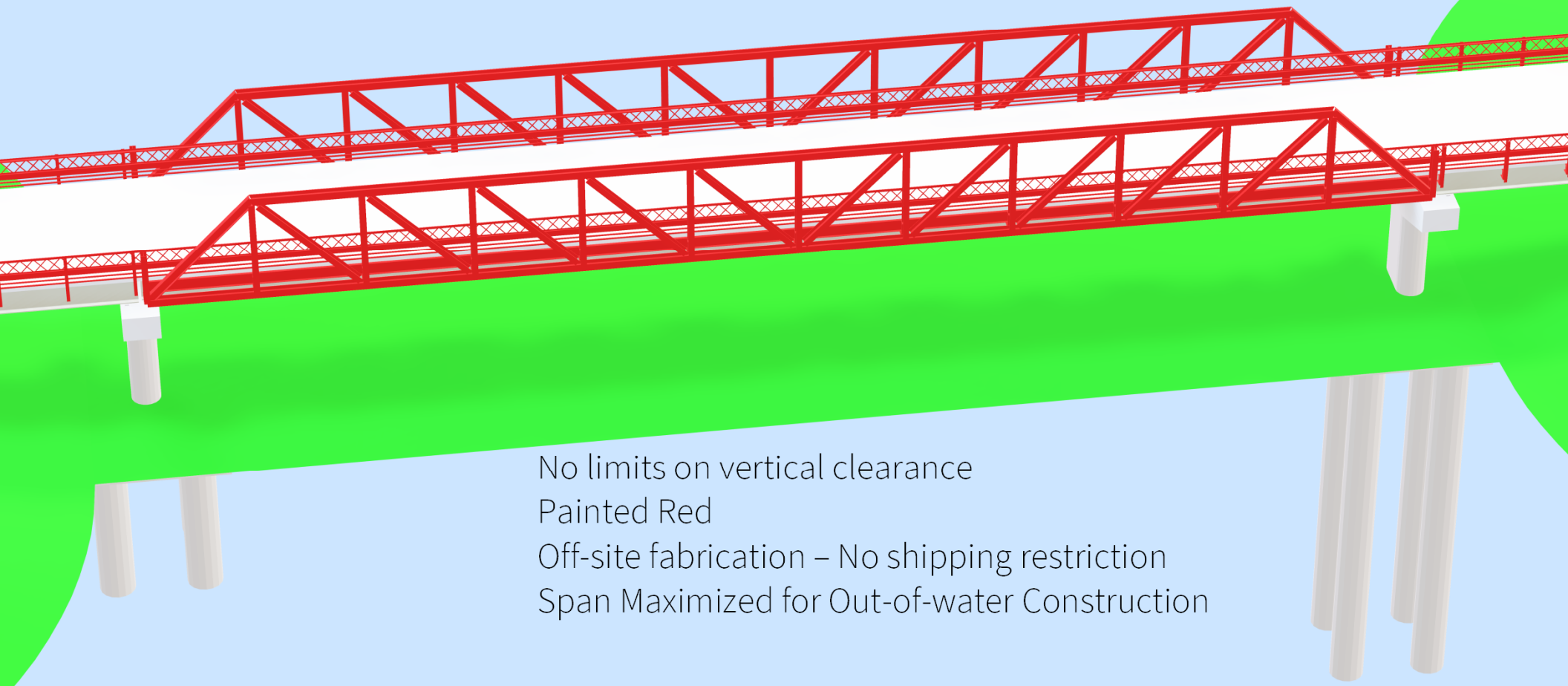
- Truss changed from 7-panel to 6/8 panel truss during relocation
- Re-use existing lattice railing
- Match overall bridge aesthetic
 - Truss bridge
 - Red color
 - Narrow-tunnel like feeling
- Historical monument



3 Span Bridge

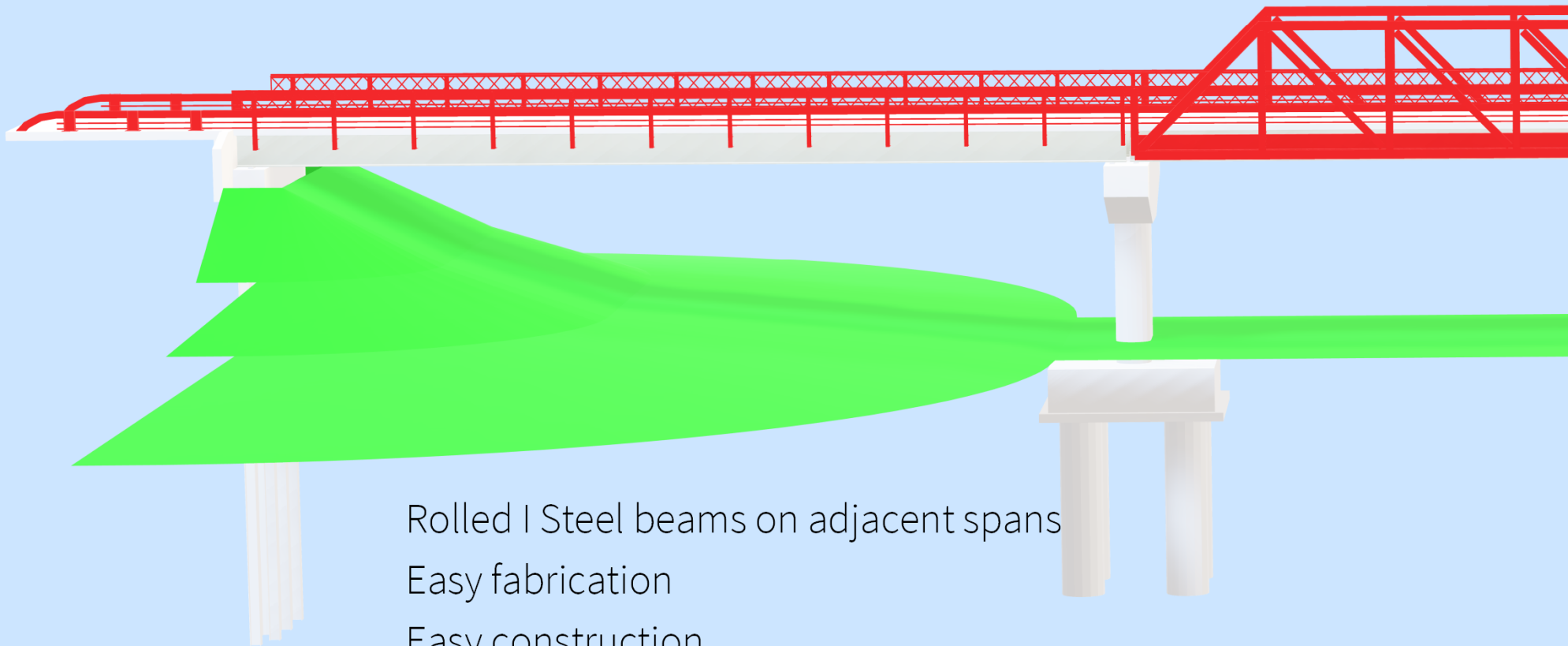


Pony Truss



No limits on vertical clearance
Painted Red
Off-site fabrication – No shipping restriction
Span Maximized for Out-of-water Construction

End Spans



Rolled I Steel beams on adjacent spans
Easy fabrication
Easy construction

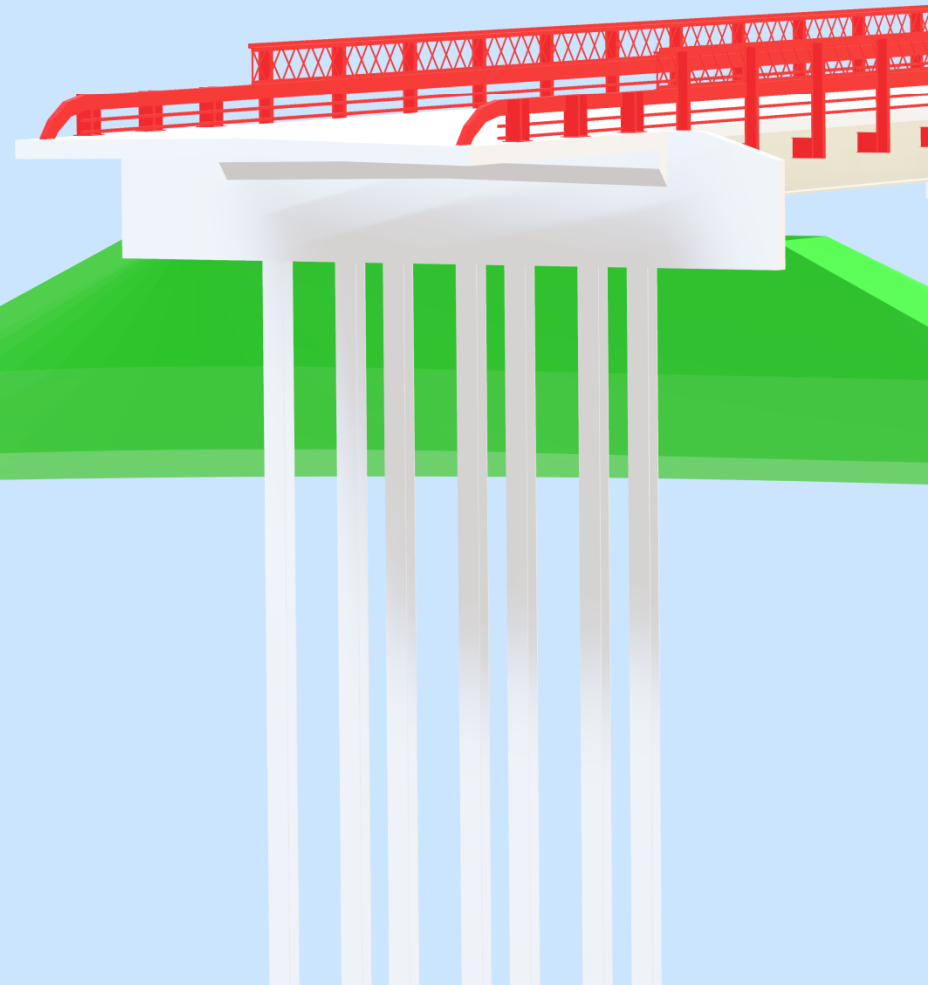


Hammerhead Piers

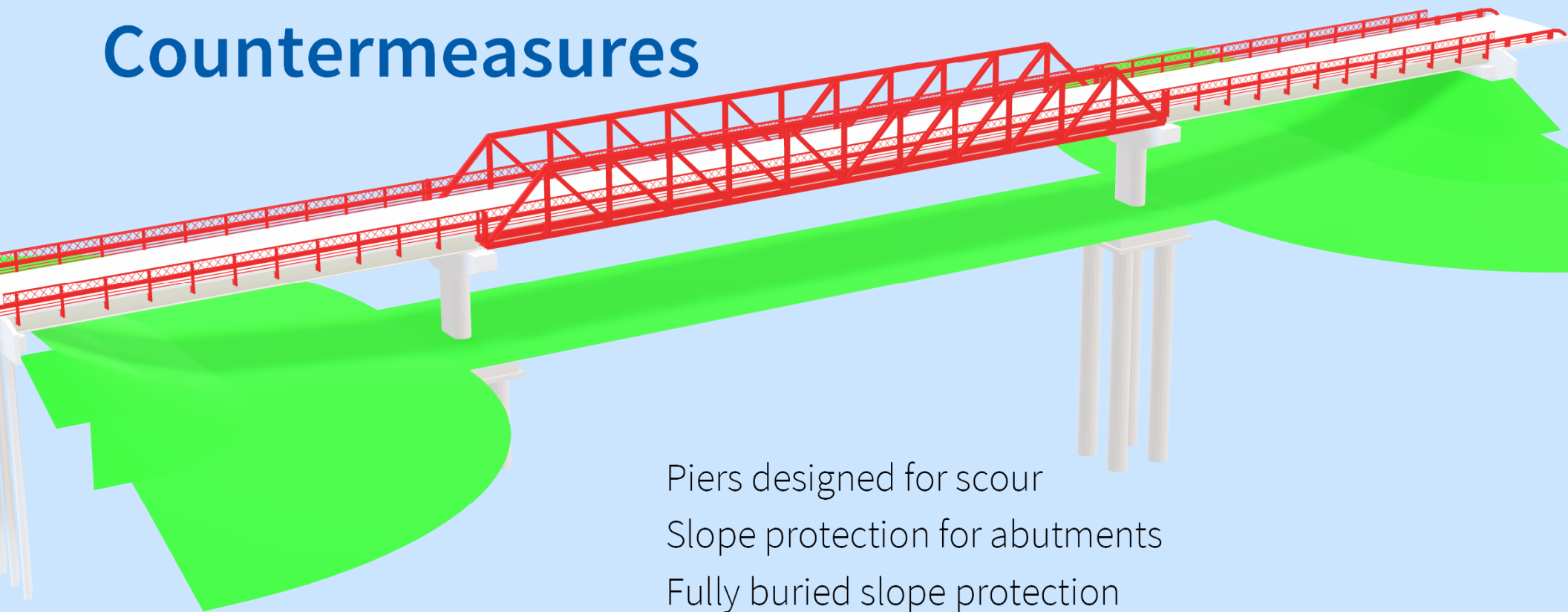
- Tapered Pier Caps
- Oval Shaped Columns
- Minimal obstruction to flow
- Smaller footprint in-water
- Variable lengths of shafts

Traditional Abutments

Concrete Abutments
2 rows of Steel H Piles
Predrilled Holes for drivability



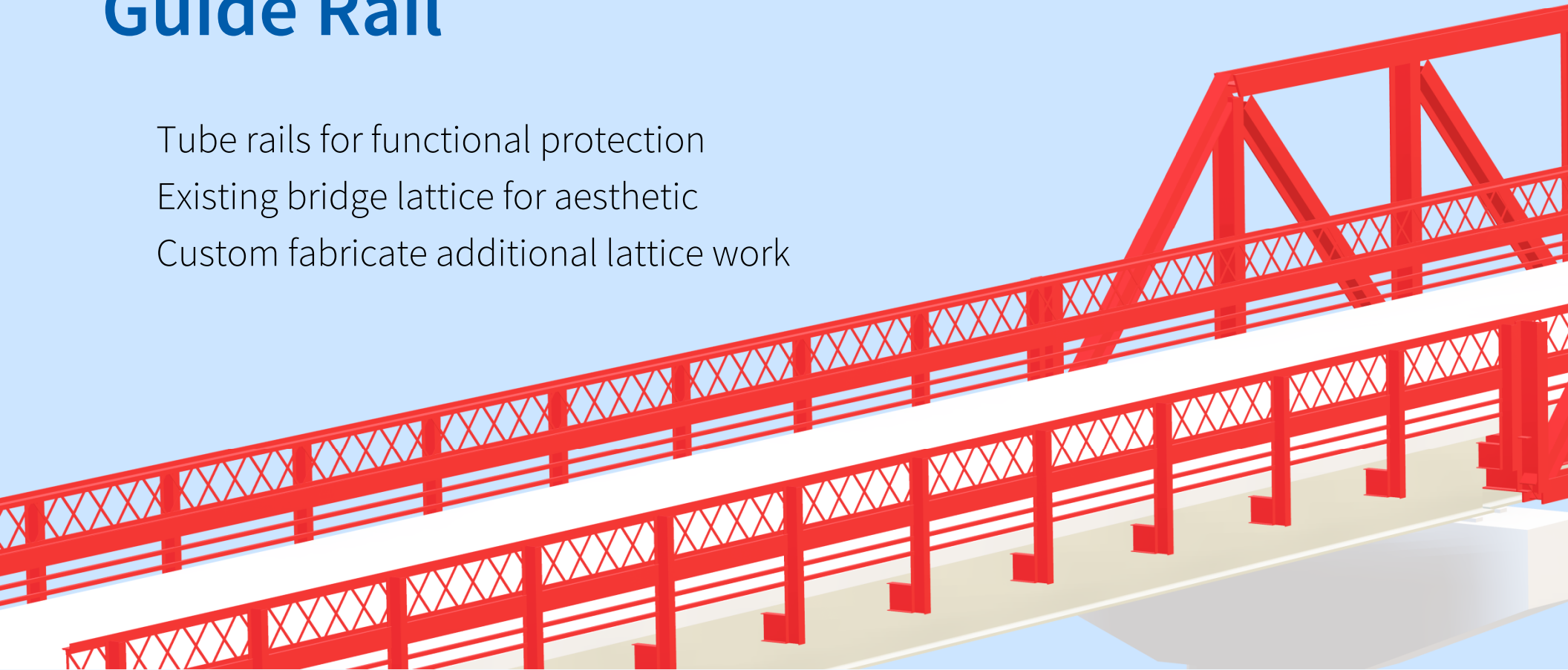
Scour Countermeasures



Piers designed for scour
Slope protection for abutments
Fully buried slope protection

Guide Rail

Tube rails for functional protection
Existing bridge lattice for aesthetic
Custom fabricate additional lattice work



Get There **One Way Or Another . . .**



Construction
Progress . .



QUESTIONS?

Contact:

Charles R Rodrigues, PE, SE

Consor Engineers LLC

Phone: 508-654-1539

E-mail: crodrigues@consoreng.com