

Bay du Vin River Bridge #5 Alternatives

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Project Goals & Objectives

The client has requested to:

- Analyze the benefits and trade-offs between the three material options presented by the client; concrete, steel and timber
- Widen the bridge to meet current specifications for two-way traffic
- Raise the height of the bridge due to rising water levels
- Minimize the carbon footprint associated with construction of the bridge
- Limit the project to one construction season

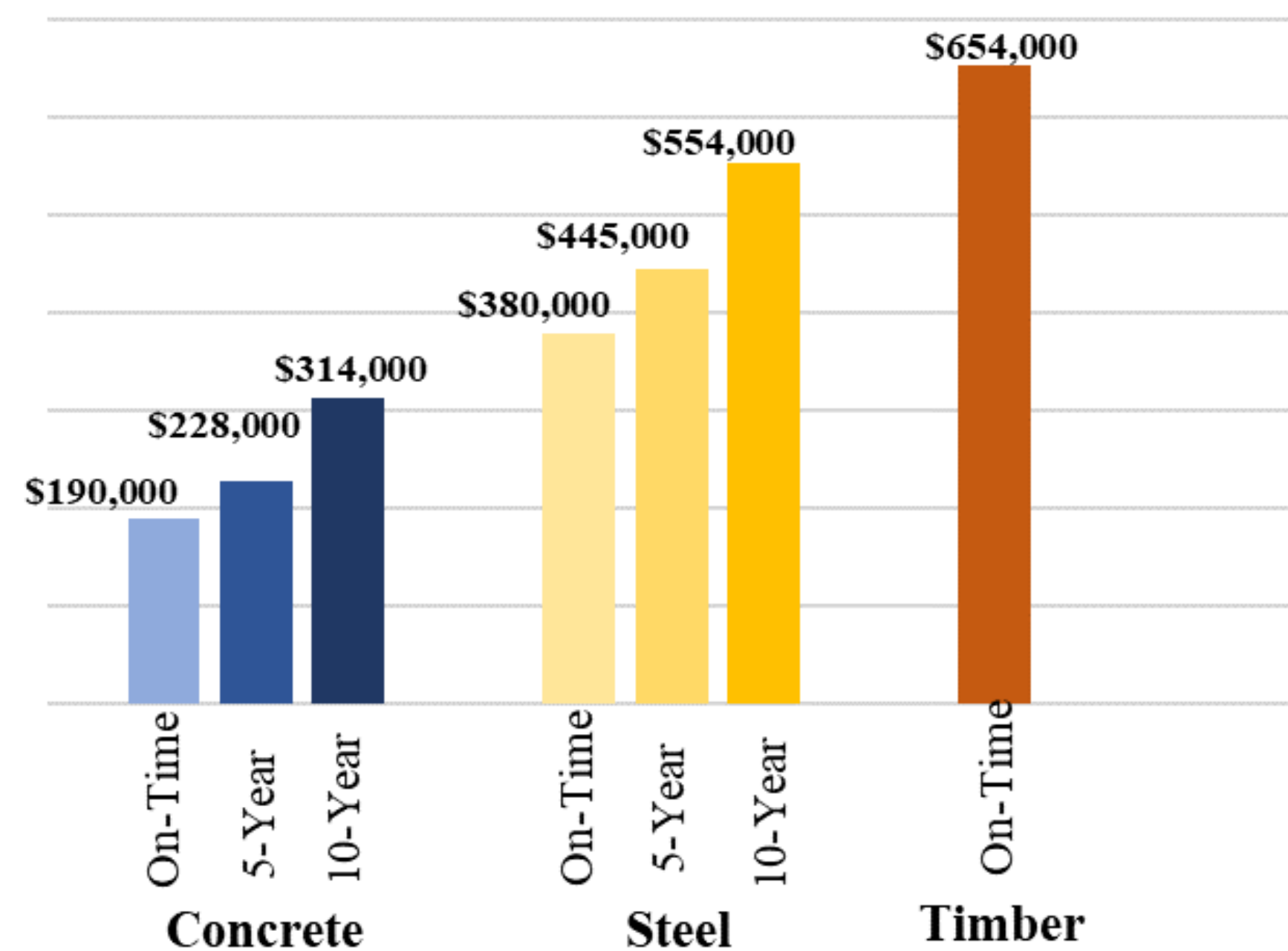
Lifecycle Rehabilitation Costs

Three options considered:

- **Concrete Superstructure + Concrete Deck**
- Steel Superstructure + Concrete Deck
- Timber Superstructure + Timber Deck

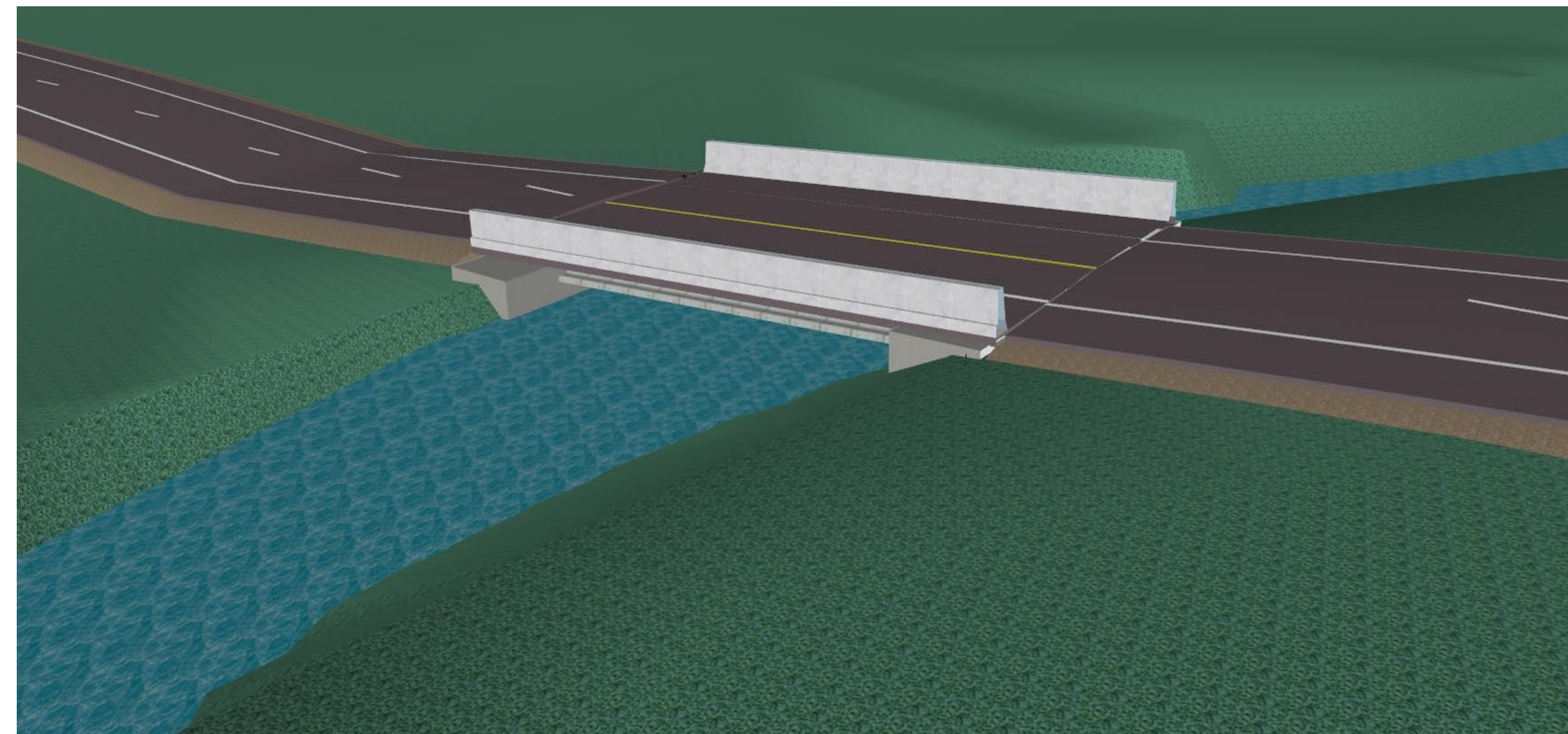
The additional costs associated with delaying rehabilitation by 5 or 10 years were considered.

Comparison of Lifecycle Cost



The concrete option yielded the lowest rehabilitation cost over the lifecycle of the bridge. This is beneficial to NBDTI as they may need to defer maintenance to address the needs of their large bridge inventory.

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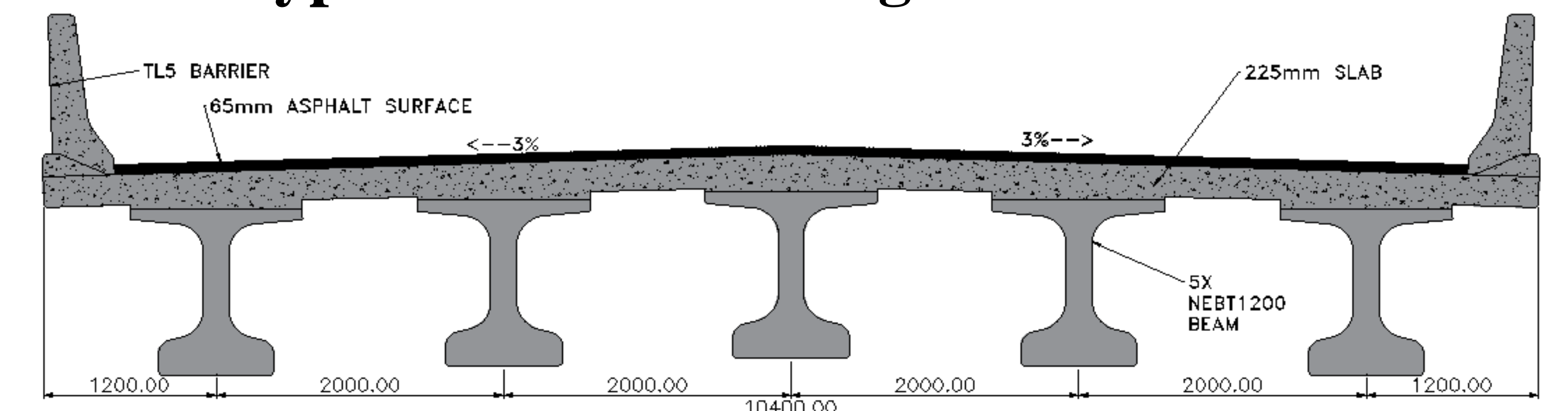


Bridge Background:

- Located in Northumberland County
- Superstructure constructed in 1927 and moved to current location in 1968.
- Issues regarding the current bridge include flooding which resulted in debris flow damaging the bottom chord of the truss.



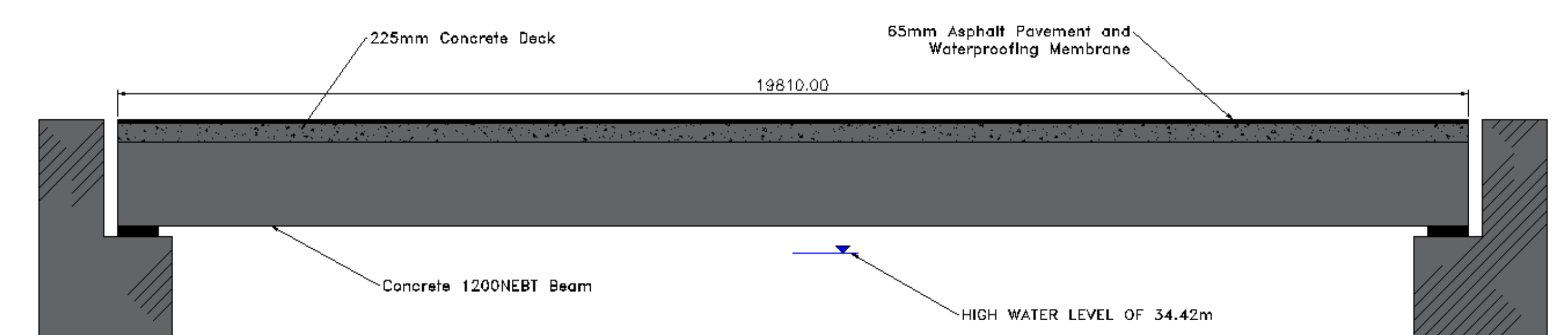
Typical Concrete Bridge Cross-Section



Includes:

- 5 NEBT1200 beams
- 225 mm Thick Concrete Deck
- 65 mm Asphalt Wearing Surface & Waterproofing Membrane
- TL5 Traffic Barrier

Elevation View of Concrete Bridge



Highlights:

- Raised deck elevation to 36.5 meters to accommodate high water levels.

Design References

The following items were used by The B-Team throughout the design process:

- NBDTI Standard Specifications for Highway Construction (2019)
- Canadian Highway Bridge Design Code (S6-14)
- Transportation Association of Canada Manual (2010)