

US 59 over IA 92 Bridge Replacement

3D MODEL DELIVERY PROJECT

Presenters

Bryan Needs

Project Engineer

Godbersen-Smith Construction
Company

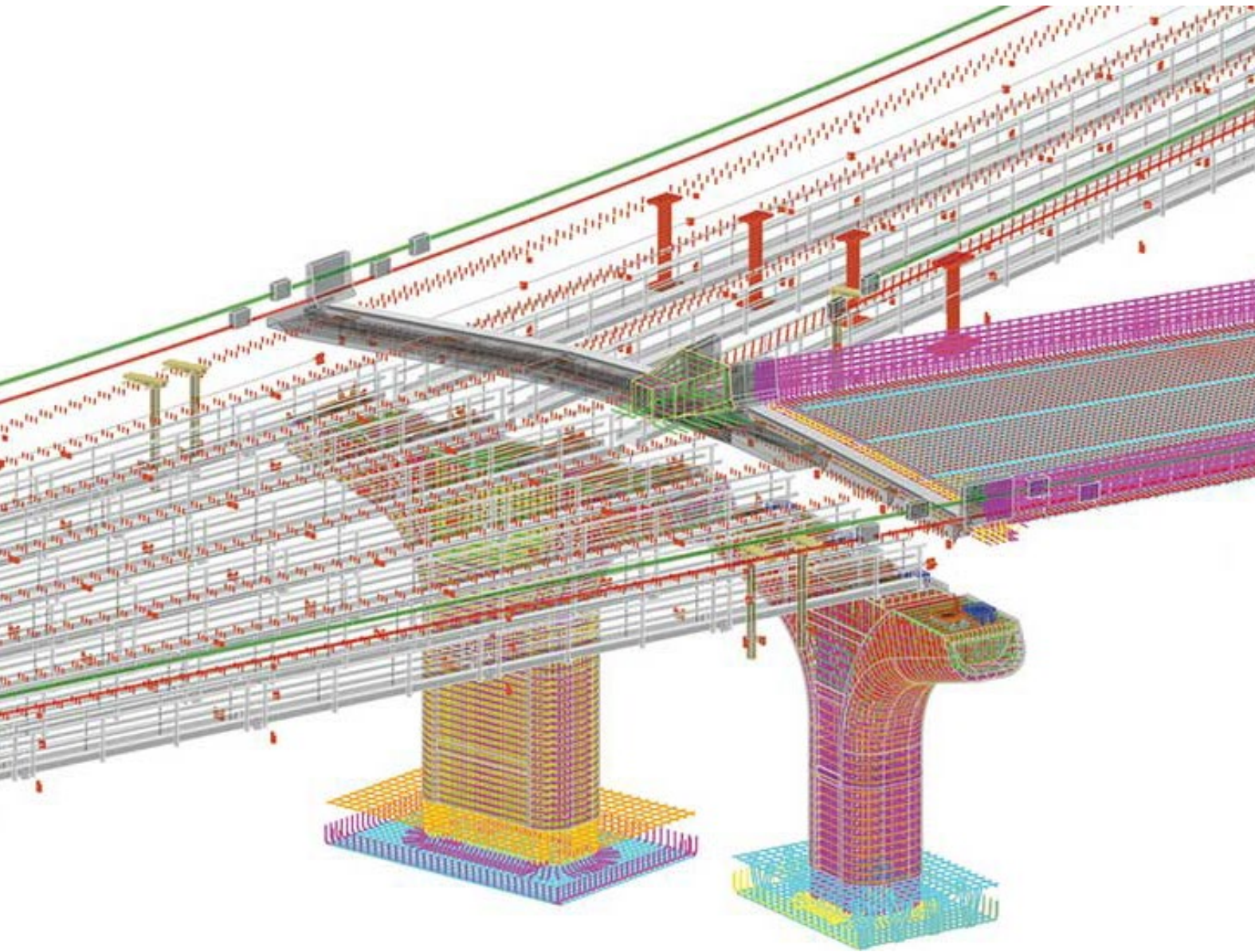


Thomas Hamski

Bridge BIM Engineer

Iowa Department of
Transportation





Previous BIM Pilot

Overall negative experience from contractor's perspective on first BIM pilot.

Proprietary format of model was used limiting contractor choice on software.

Field hardware in 2018 not as good as today.

Updates from BIM first pilot

Open data standard for project delivery, IFC

Left software choice open until contract awarding.

Contractor had voice in decision on field software to be used.

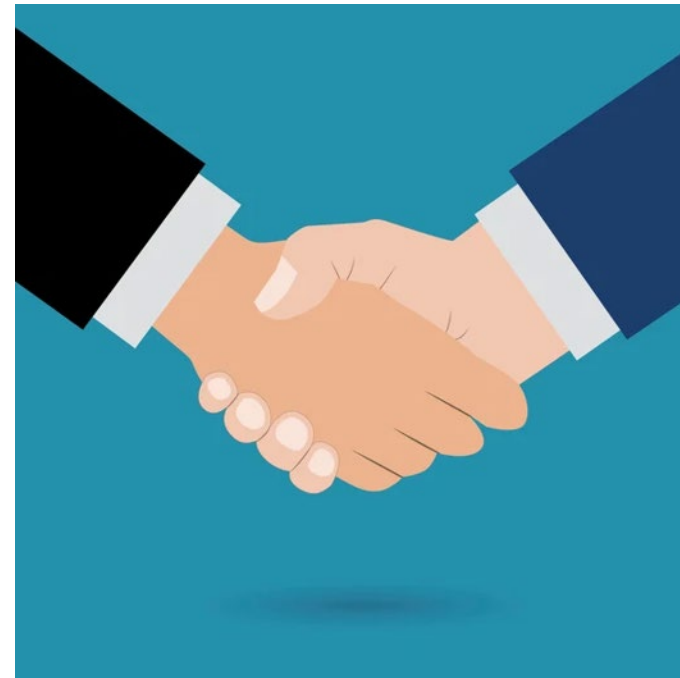


Pre-project DOT engagement

Met with DOT several times before project was advertised.

The DOT gave opportunity to guide them towards the needs of contracting community.

Didn't force MALD on contractors, worked to come to an agreeable contracting solution for both parties.



Pilot Project

The Bridge – US59 over IA92

199'-0" x 44'-0"

Three-Span Prestressed Beam

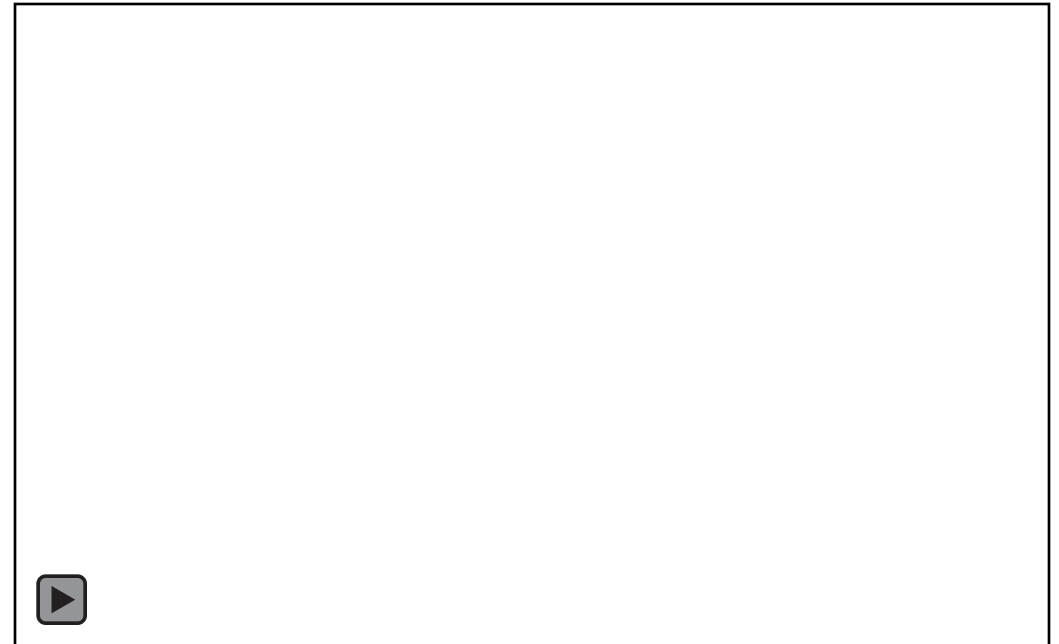
Multi-Column Piers

Integral Abutment

Zero Skew

No Aesthetics

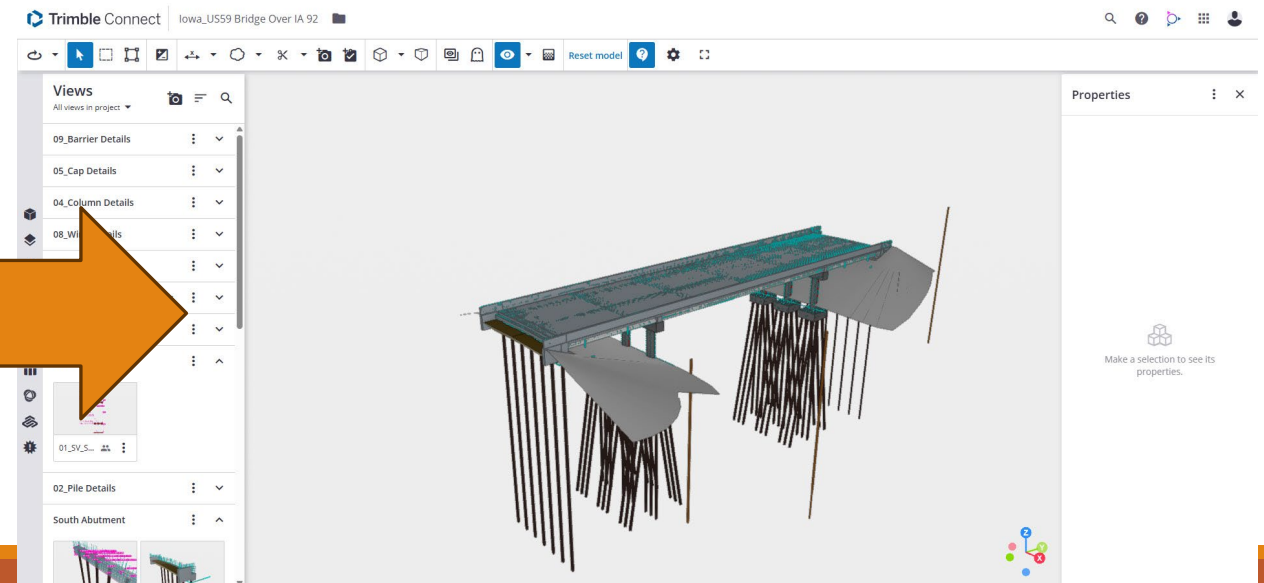
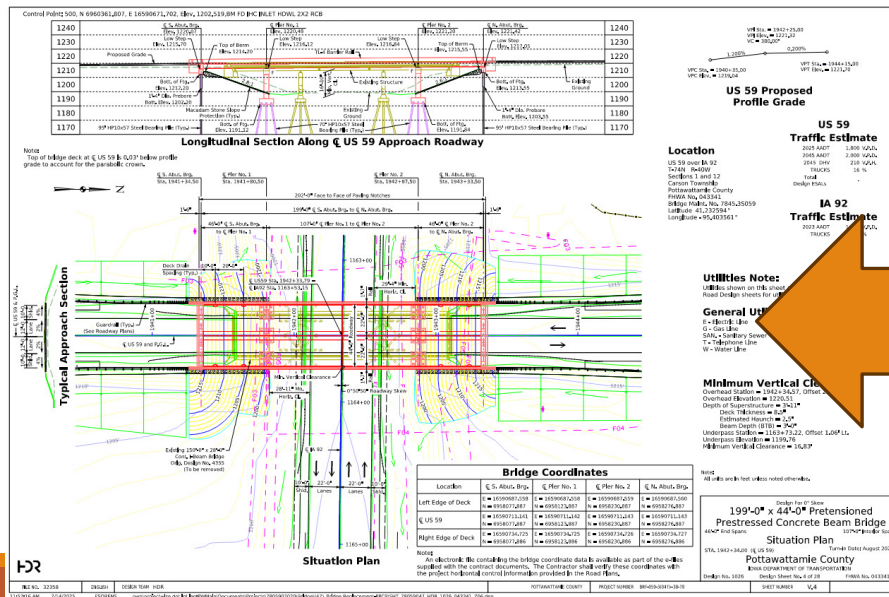
No Staging



Working with 3D models

Accelerated construction schedule did impact 3D model usage some.

Hybrid approach with traditional 2D plans and 3D model to supplement helped with construction.



3D Model Usage

Software had easy learning curve to navigate.

Designer was on hand throughout project to help update views needed for construction.

Really helps view the whole structure without having to look through multiple plan sheets.



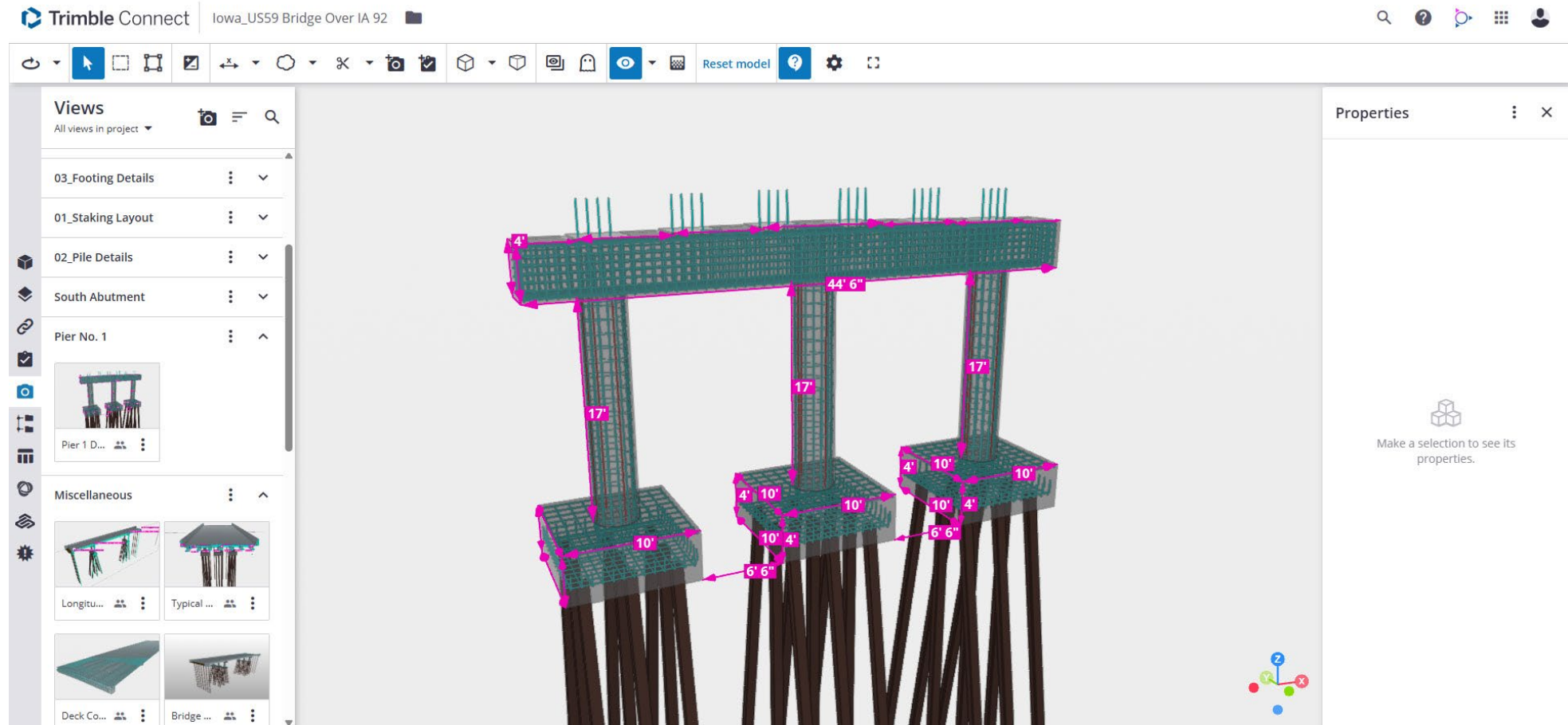
3D benefits

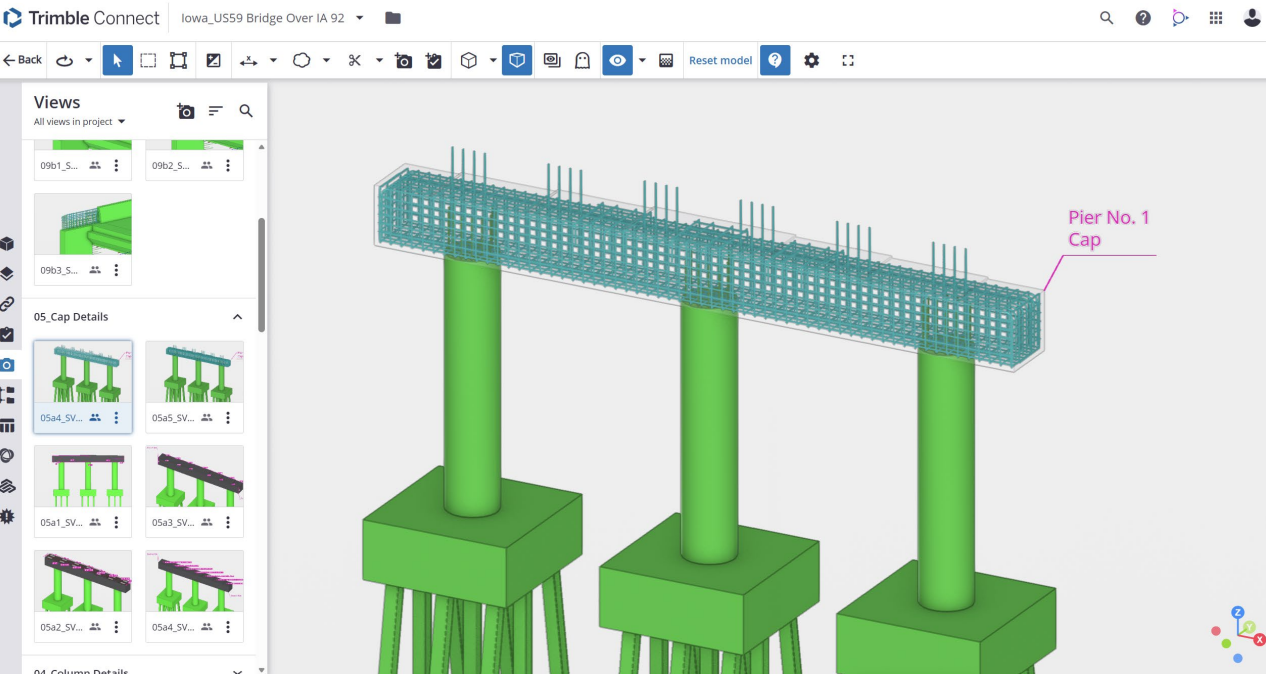
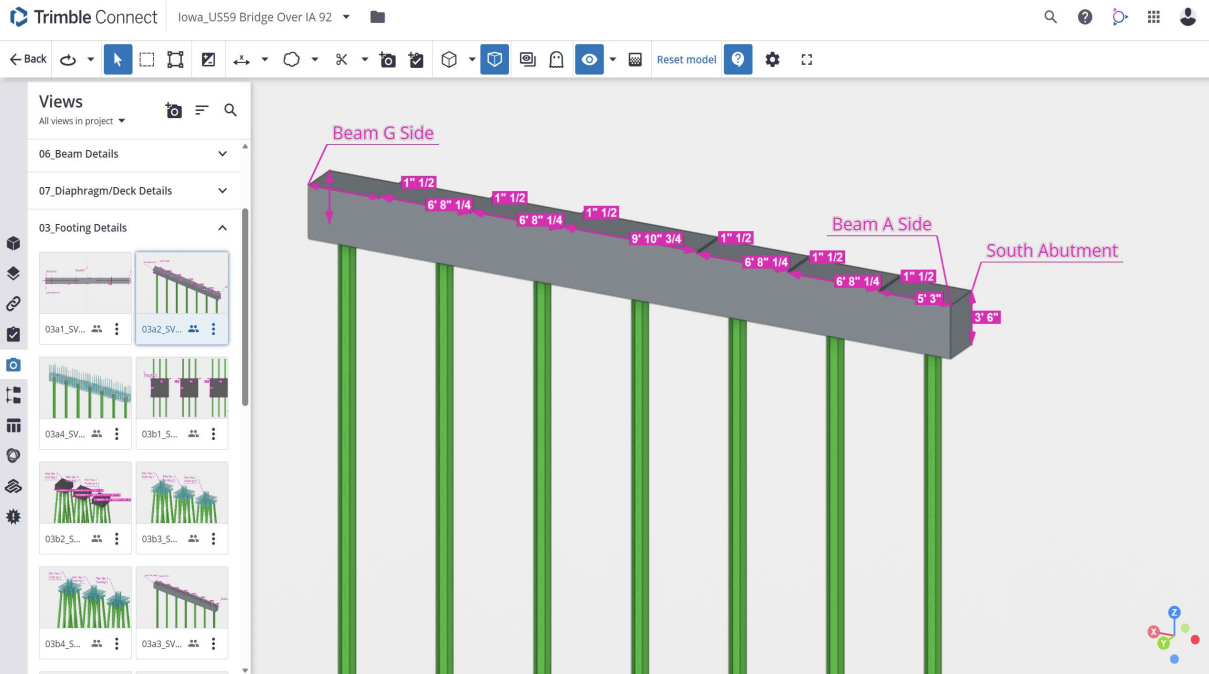
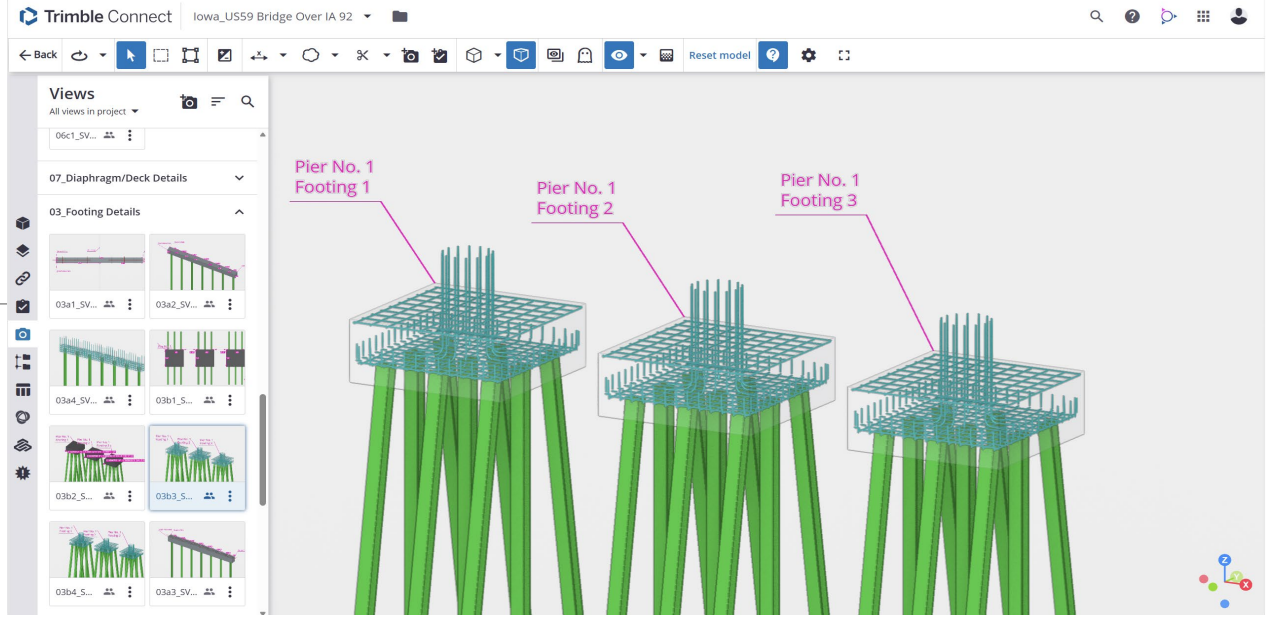
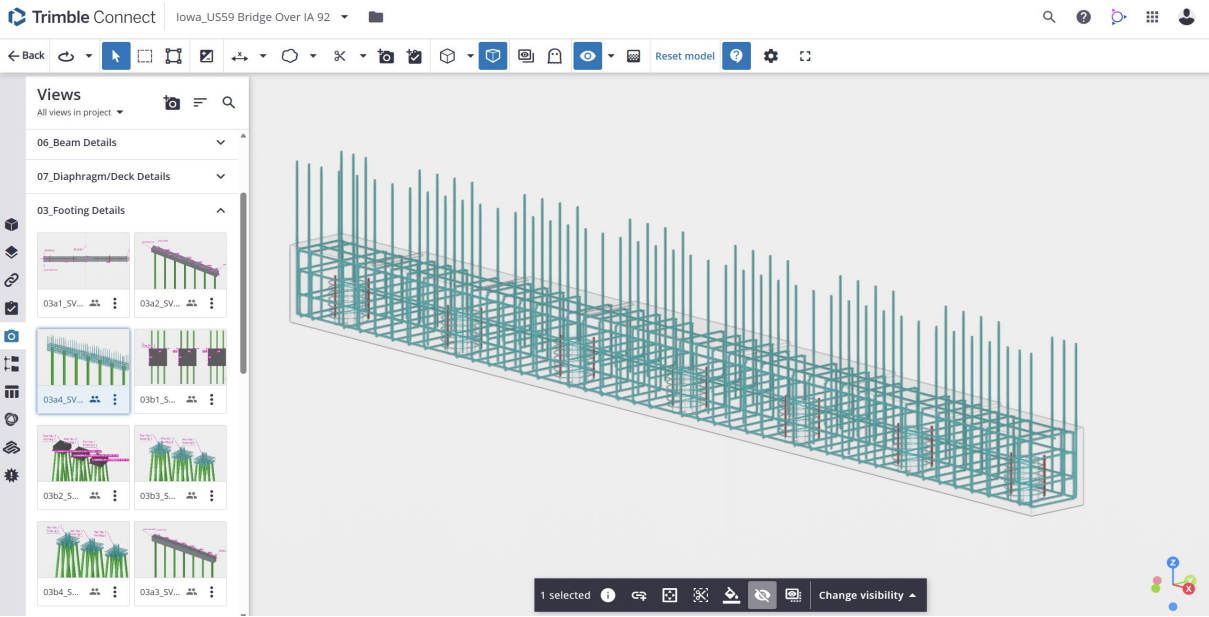
Having a 3D model that can be cut into any saved view and shared with staff is beneficial.

Discussions throughout project helped develop these views in a better way.

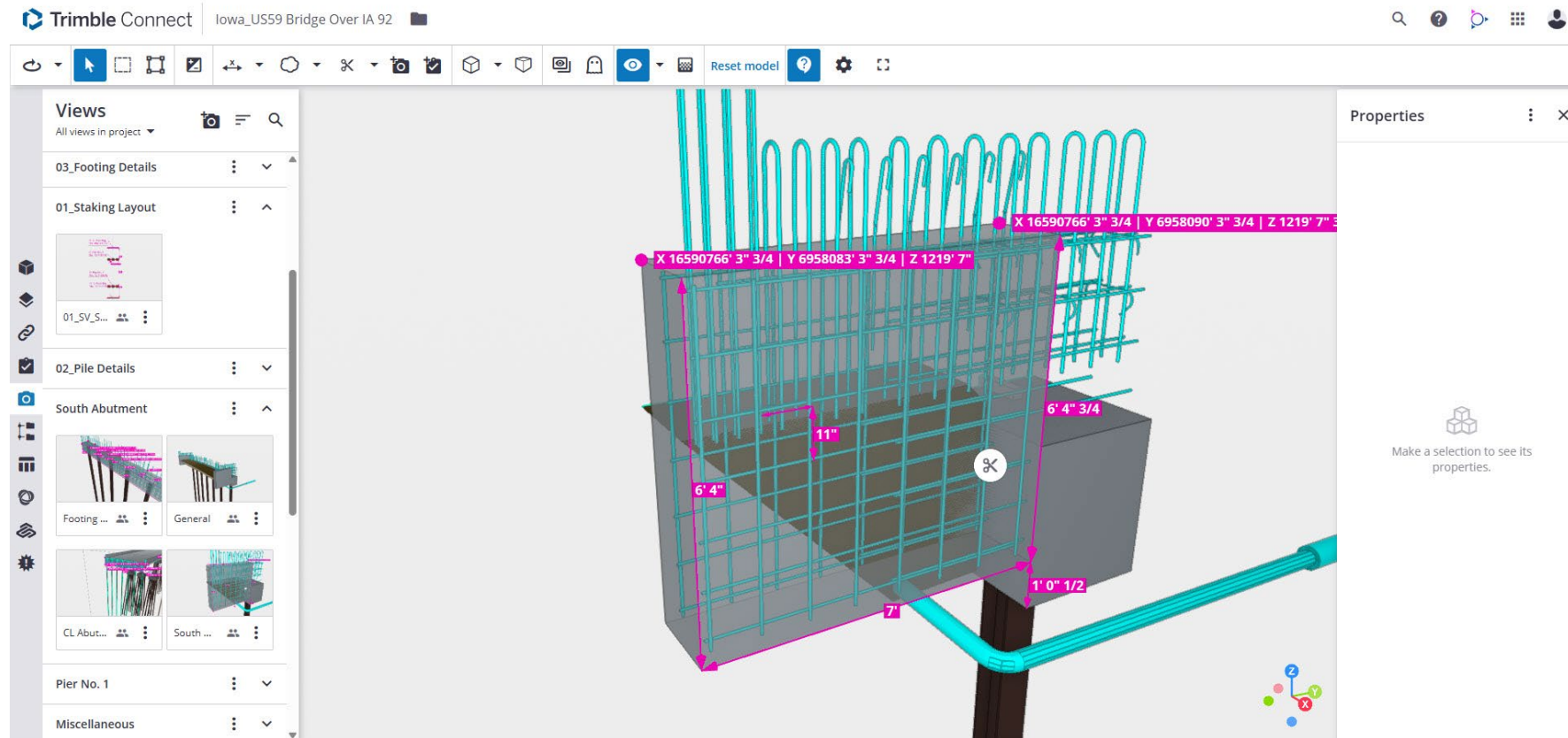
Views		
All views in project ▼		
09_Barrier Details	⋮	▼
05_Cap Details	⋮	▼
04_Column Details	⋮	▼
08_Wing Details	⋮	▼
06_Beam Details	⋮	▼
07_Diaphragm/Deck Details	⋮	▼
03_Footing Details	⋮	▼
01_Staking Layout	⋮	▼
02_Pile Details	⋮	▼
South Abutment	⋮	▼
Pier No. 1	⋮	▼
Miscellaneous	⋮	▼

Some examples of how we broke these saved views down during the construction process. Beneficial for substructures/superstructure layouts, rebar and pile details, color coordination, and concrete construction joints.



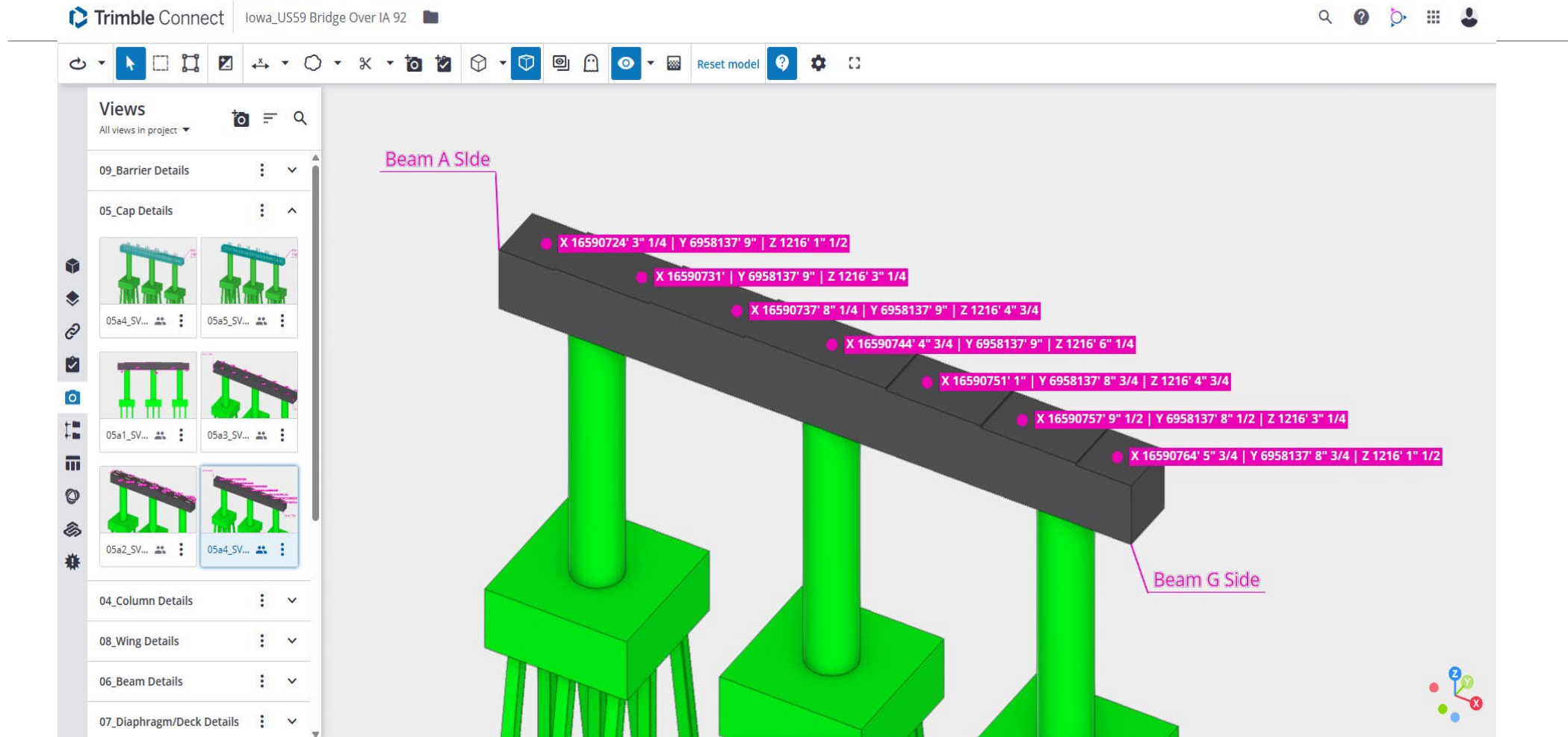


Helped the contractor break down the wing wall details. The new style of barrier rail has a different rebar layout. These saved views were helpful showing the details without having to flip through multiple plan sheets in the 2D plans.

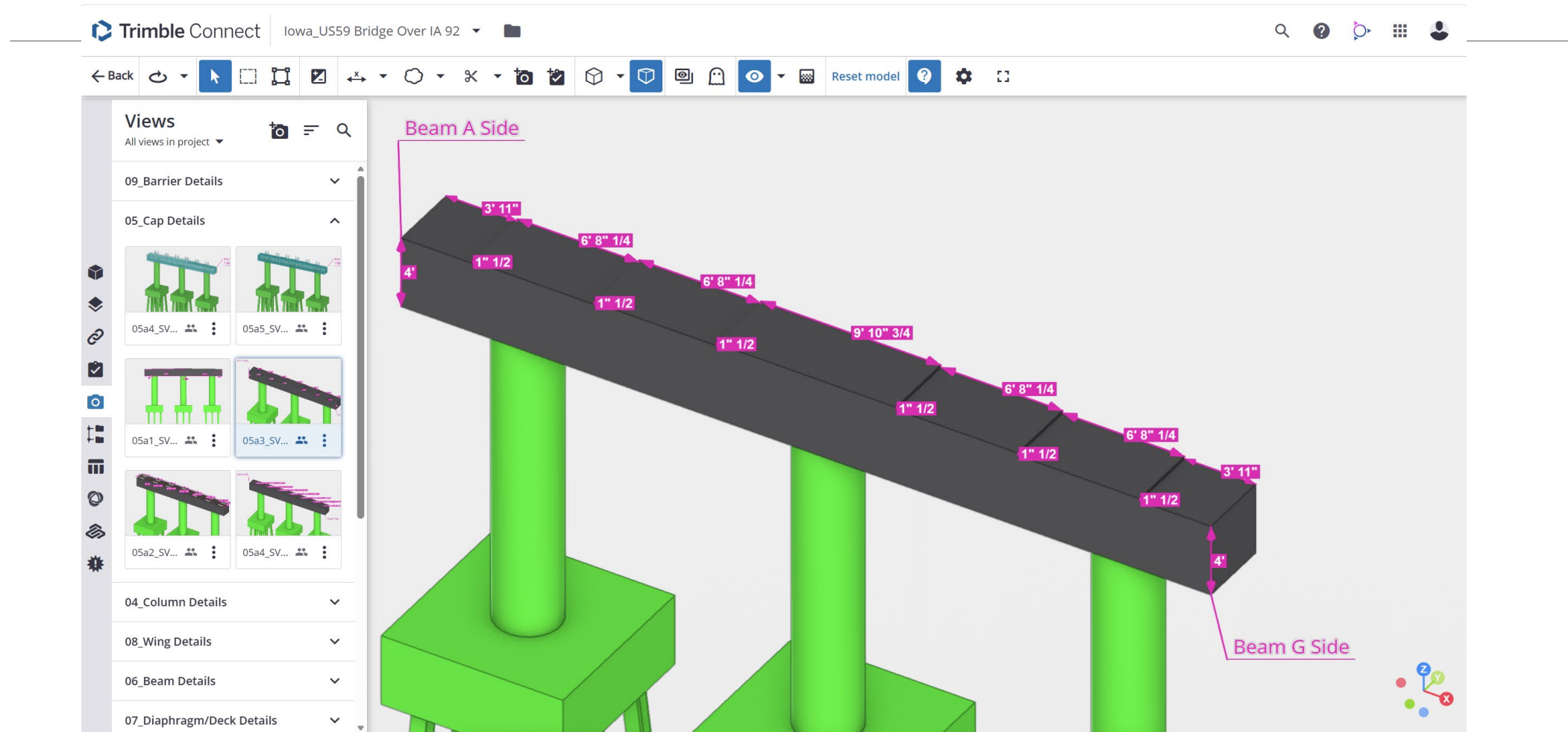




Still Some Quirks



How We Simplified Some Quirks



Improvements to be made



Augmented Reality devices on project, slightly more beneficial for inspectors right now.

Good as a guide for visualization.

Realities of design model vs. reality of construction site tolerances limits accuracy when comparing the two.

Summary

2D plans are still something we're looking to use for a while as the DOT transitions

3D model is beneficial but currently assistance from designer on updating saved views is more efficient.

- Looking at the DOT for standardization on saved views for construction.

3D model was beneficial to less experienced staff in visualizing what they were building.

Still concerns on bidding projects from only a model.

Thank you for your attention

Contact Information:

Bryan Needs
Project Engineer
Godbersen-Smith Construction Company
bneeds@gs-const.com
Mobile: (712)-371-3475

Thomas Hamski
Bridge BIM Engineer
Iowa Department of Transportation
Thomas.Hamski@iowadot.us

