

Project Funding and Costs

Funding/Funding Commitments

Design: DCNR C2P2 \$800,000

County TAP \$800,000

DCNR C2Pc \$500,000

County MPO \$1.5M

Township Contribution \$800,000

Total = \$4,400,000

Project Cost

○ Design Fees: \$500,000

○ Current Estimate: \$7,500,000

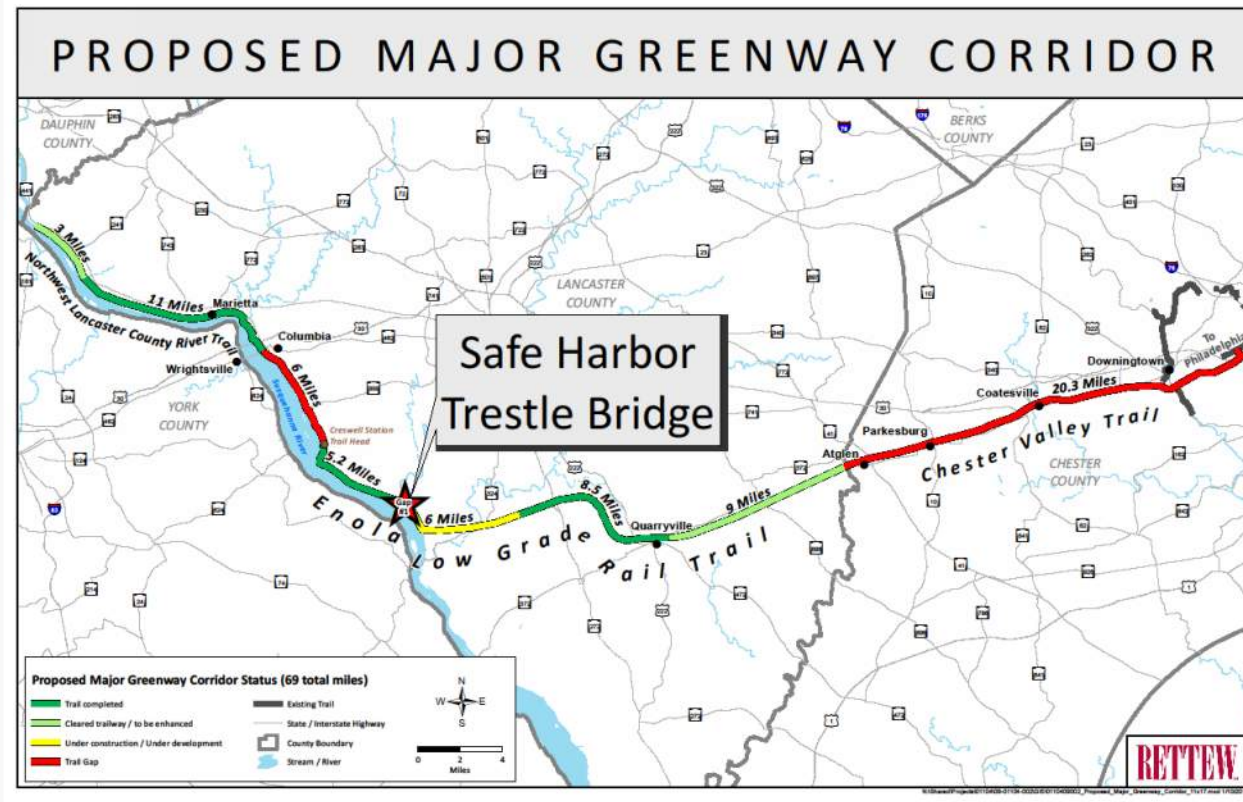
Total = \$8,000,000

Secretaries' Tour



Safe Harbor Trestle Bridge

End Game – Swatara to Philadelphia



Manor Township awarded a \$3M TAP Grant.

The project won the largest award in the state for that program.

Safe Harbor Trestle Bridge



The Design Schedule

December 2018 – Project kicked off with RETTEW, PennDOT, and KCI Technologies

February 2019 – PennDOT requests additional structural inspection

February 15, 2019 – Begin Falcon Restriction Season

June 2019 – Safety Review Approval

July 31, 2019 – End Falcon Restriction Season

August 2019 – Right-of-Way Clearance

October 2019 – GP-11 Submitted to PA DEP

November 2019 - Utility Clearance

December 2019 – PennDOT Environmental Clearance

February 2020 – Submit final structure plans

February 2020 – Submit Bid Package

June 2020 – Bid Opening

Safe Harbor Trestle Bridge



Constructability Memo

- Innovative time saver - Not a standard practice for federal aid projects.
- At the beginning of the project, a constructability memo was created.
- RETTEW demonstrated in writing how the bridge would be constructed.
- From there, we could assess what type of roadblocks the design process would encounter.
- If a roadblock was too large, we adjusted the constructability procedure.
- The result was the fastest possible design schedule with the cheapest construction cost.

Design Challenges

- 4(f) resource – Enola Low Grade Trail
- 4(f) resources – Safe Harbor Dam and Safe Harbor Railroad Trestle
- Peregrine Falcon – Endangered Species Restriction from February 15 to July 31
- Recreational Boating on the Conestoga River
- Active Norfolk Southern Railroad
- Hazardous Materials



Safe Harbor Trestle Bridge

Peregrine Falcons

- Endangered Species
- We needed to inspect bridge during falcon restriction season to keep schedule
- Met with Game Commission and local officials to get special monitoring
- Inspected at the beginning of July after the falcons fledged.
- Needed to keep them off bridge permanently so we could start construction.
- Couldn't use federal funds for construction purposes yet, so we used our DCNR money to advertise a contract to install falcon screening.
- Contractor had 45 days to install screening.



Safe Harbor Trestle Bridge

Deck Design

Challenge:

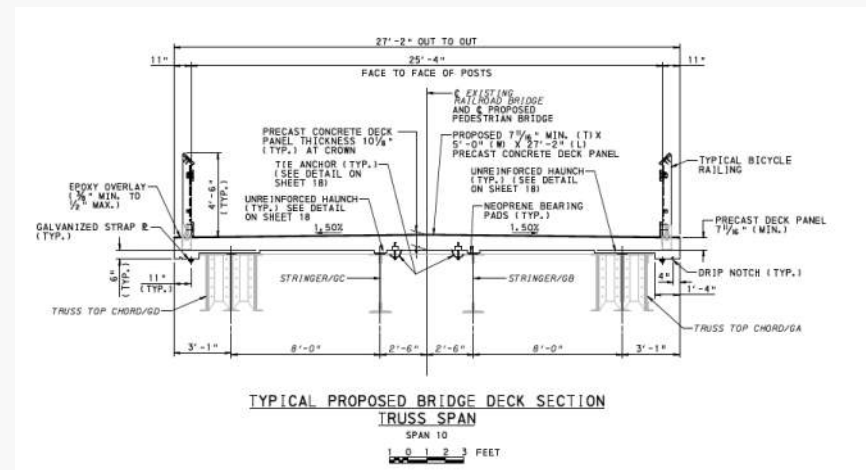
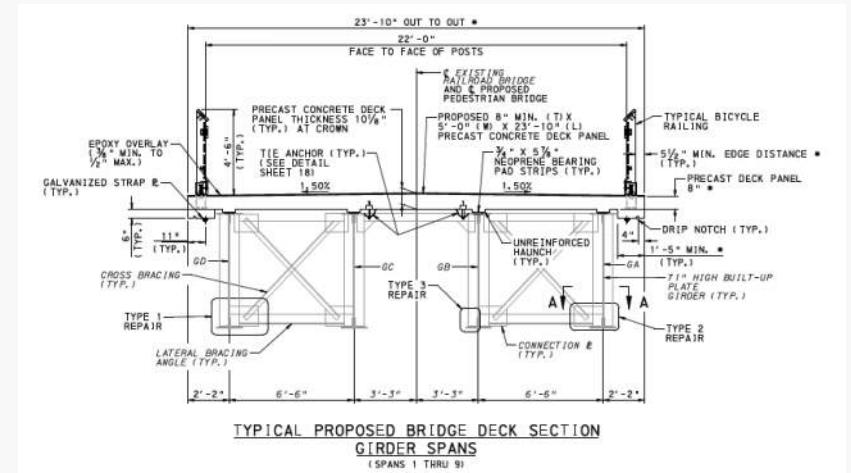
- We had to squeeze all deck work into one season outside of falcon restriction.
- Can't wait for concrete to cure.
- Can't erect from below. Need to set from above.
- Can't overload girders or the deck.

Solution:

Non-composite precast concrete deck panels

Still... with steel survey, shop drawings, fabrication, delivery and setting, there was not enough time to get it done in one season.

Added a special provision for the maintenance of the falcon netting for one year.



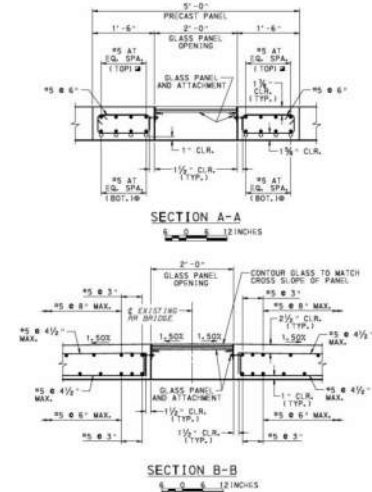
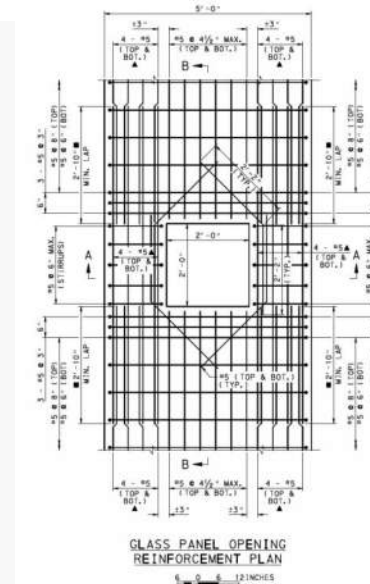
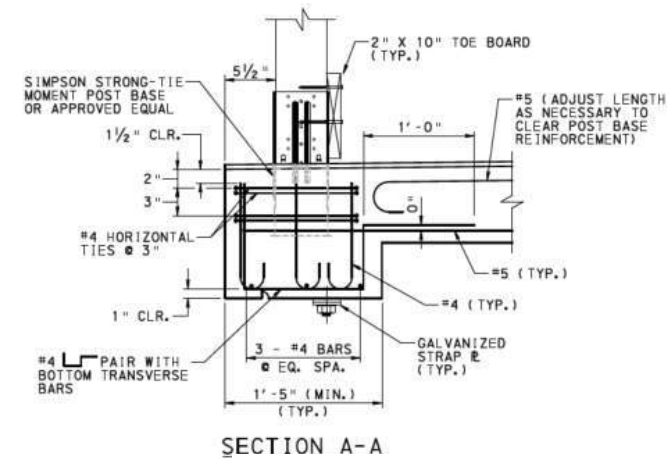
Deck Design

Non-composite precast panel challenges:

- Fabrication tolerances.
- 4 bearing points.
- Load was EV2 and EV3 with ped loads or construction.
- Couldn't be too heavy to set with a crane on the previous panel.

Glass Panels

Manor Township wanted glass panels to stand on and see the Conestoga River below.



Safe Harbor Trestle Bridge

Railing Design

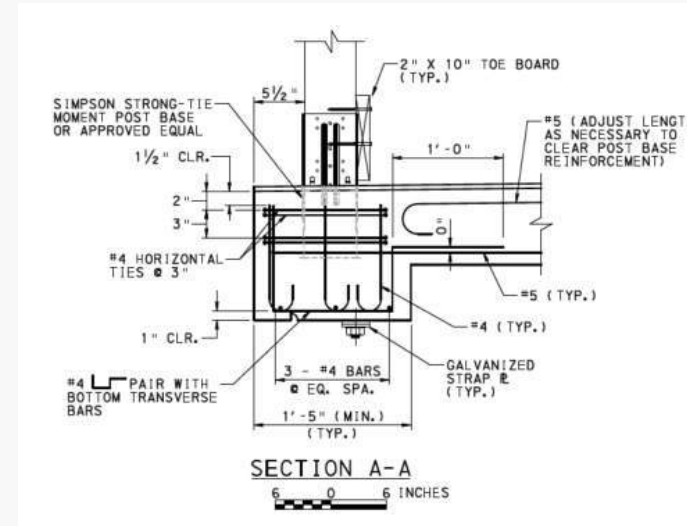
Manor Township wanted timber railing with black steel balusters.

100% custom design for impact forces and linear loading of any member in any direction.

Tall enough for bicyclists, but not so tall that couldn't see the Susquehanna over it.

Anchorage into deck required tight rebar tolerances and a Simpson Strong Tie post anchor.

Safe Harbor Trestle Bridge

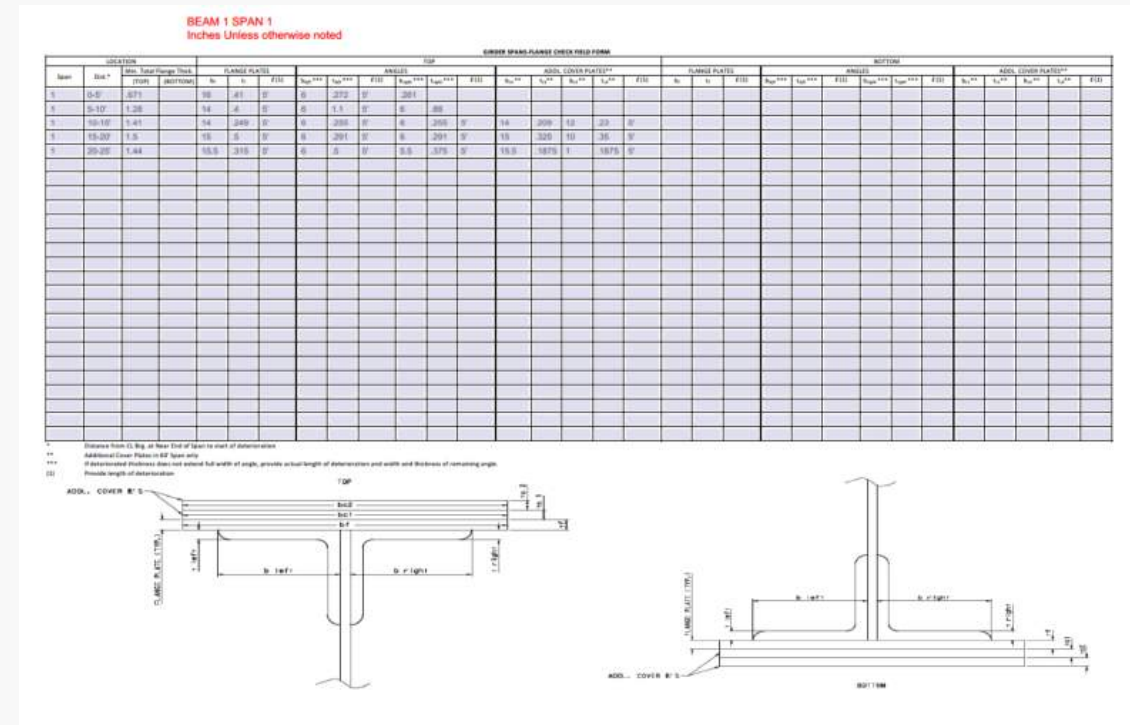


Steel Evaluation

Railroad ties in place. We don't know, nor would we ever know the condition of the top flange until construction started.

Developed thickness spreadsheets that told the inspector the required top flange thickness along each span to meet the required loading.

Inspection contract also included a requirement that the TCIS inspector also have an NBIS certified inspector on the team.



Lots of Special Provisions

- Panels and panel bearing developed – 4 points of bearing. Panel fabrication tolerances.
- Maintenance/construction/disposal of falcon netting
- Steel repairs with rivet-head bolts.
- Norfolk Southern coordination.
- Survey of steel when ties removed.
- Railing.
- Glass flooring panels.
- Temporary protective fence for trail.
- Removal of old wires on bridge.
- Painting steel repairs.
- Steel repairs both known and unknown.
- Haz waste testing and disposal.
- Special signage and ATON.

Safe Harbor Trestle Bridge



Construction Begins

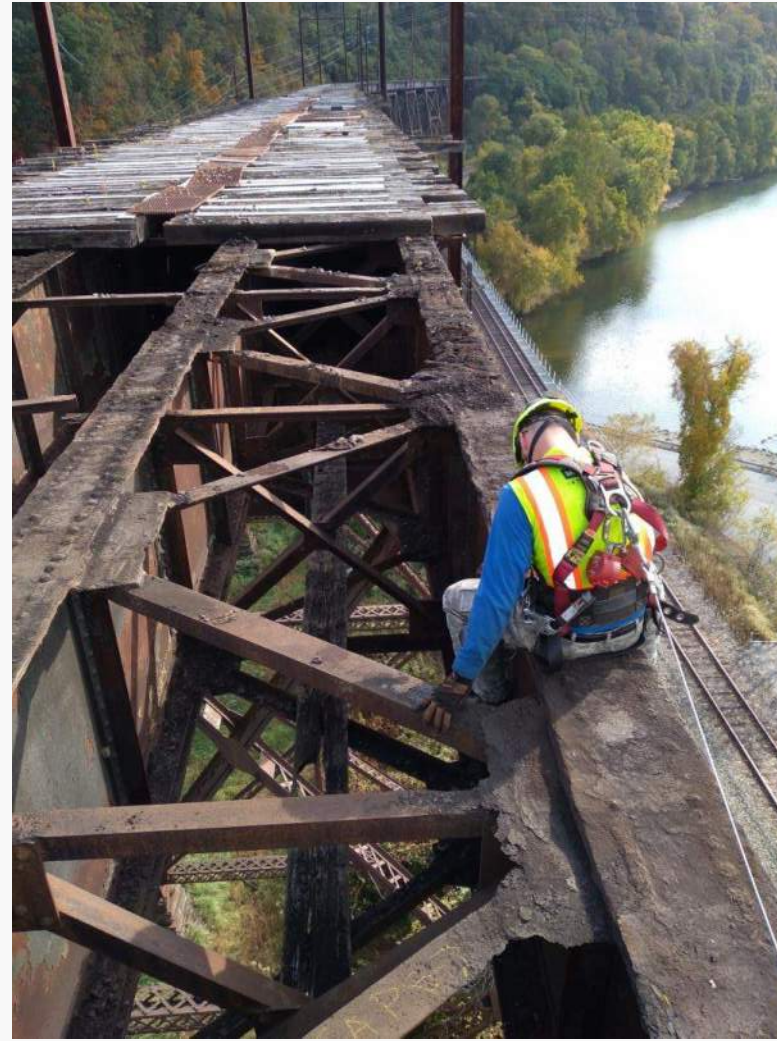


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Top Flange Condition – Lateral Braces



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Top Flange Repairs



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Precast Panels



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Precast Panels



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