IA 9 over W. Fork Nodaway River Bridge Information Model (BIM)

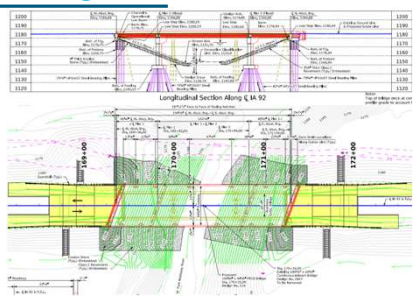
2025 ACEC-IA + Iowa DOT + FHWA
Iowa Transportation Conference

IOWA | DOT
Foth

Project Background

- IA 92 over W. Fork Nodaway River
- Adair Design No. 524
- Existing Bridge
  - 180' x 26' Continuous I-Beam
- Proposed Bridge
  - 194' x 44' PPCB Bridge, 20° Skew
- Concepted for Staged Construction
- Changed to Full Closure in Final Design

Project Background



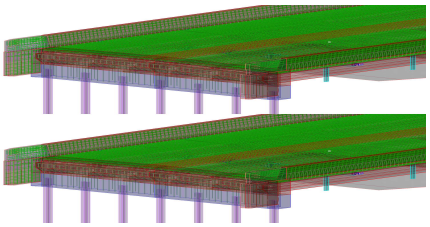
BIM Pilot Project

- Model all bridge geometry
- Superstructure modeled to LOD400
- Reinforcing in deck, barrier rails, end sections, wings and abutment & pier diaphragms
- Steel intermediate diaphragms and deck drains
- PPCB reinforcing not modeled
- Cut 2D plan sections from model
- Issue model in IFC format for Information-Only contract deliverable

Static Bridge Scan

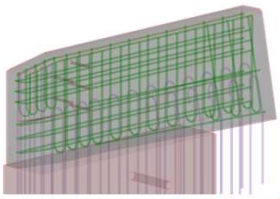
Modeling Resources

OpenBridge Modeler	ProStructures	ProjectWise
General Bridge Layout & 3D Parametric Modeling	Reinforcing Steel Detailing Deck, Diaphragms & Rails	IFC Model



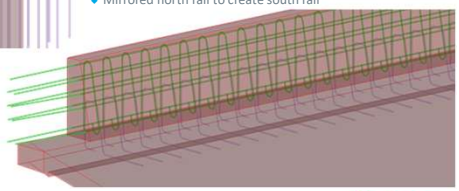
Deck & Diaphragm Modeling

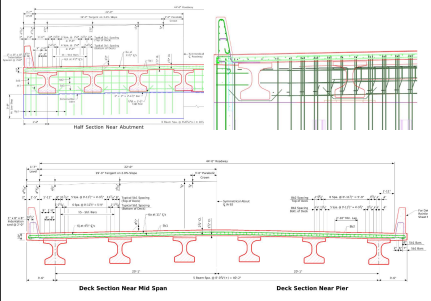
- Modeling Challenges
  - Modeled along profile grade
  - Irregular shapes (@ 20° Skew)
  - Cross Section Includes Parabolic Crown
- Targeted Modeling Effort
  - Reinforcing steel
  - Coil Rods in beams
  - Rolled tube deck drains



Barrier Rail Modeling

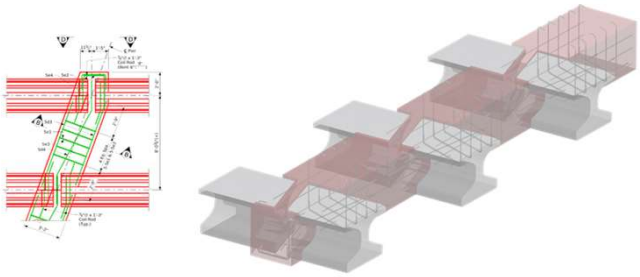
- Single distribution tool for transverse reinforcing in standard rail
- Lap/splice tool for longitudinal reinforcing
- End section reinforcing steel modeling required higher level of effort
- Mirrored north rail to create south rail





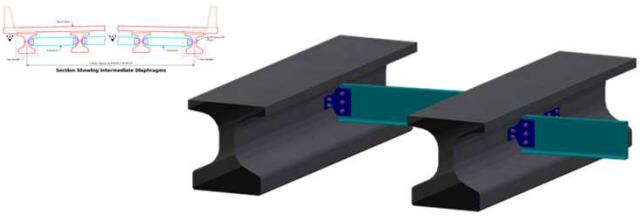
Plan Production

- Difficult to reproduce standard sections and typicals for skewed bridges
- 3D model increases document management efforts
- Real time updates benefits redrafting efforts
- Identified reinforcing conflicts & clear cover issues



Generate interactive 3D views into final 2D plans

Creative Solutions



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Questions & Answers

Q&A