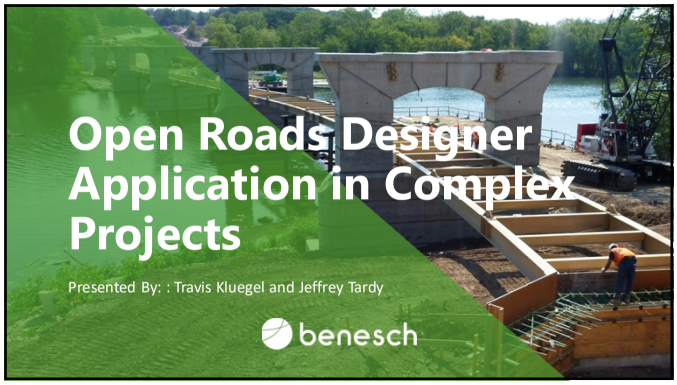

1

Abstract

3D Design Technology

- Power and flexibility within complex, large-scale projects spanning multiple years

Utilizing ORD

- Modeling and quantification of over 900,000 cubic yards of staged earthwork within a $225M interstate and interchange reconstruction

Earthwork

- Staged to account for multiple contracts, earthwork storage and access across construction seasons, realignment of the mainline interstate pavement
- Includes the conversion of an existing cloverleaf to a diverging diamond interchange

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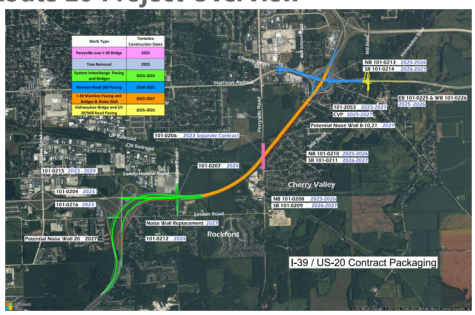
I-39 at US Route 20 Project Overview



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I-39 at US Route 20

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I-39 at US Route 20

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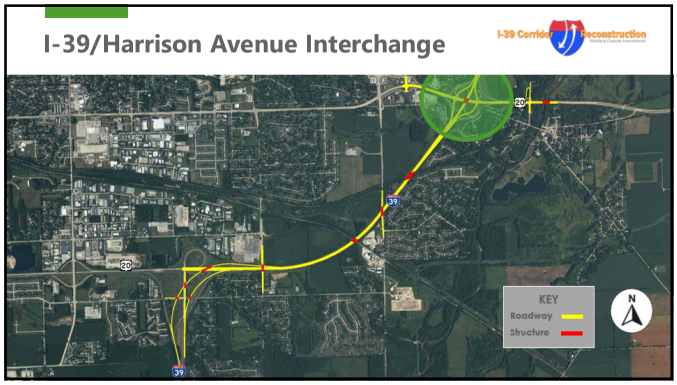

I-39/Harrison Avenue Interchange
I-39 Corridor Reconstruction
KEY
Roadway
Structure
N

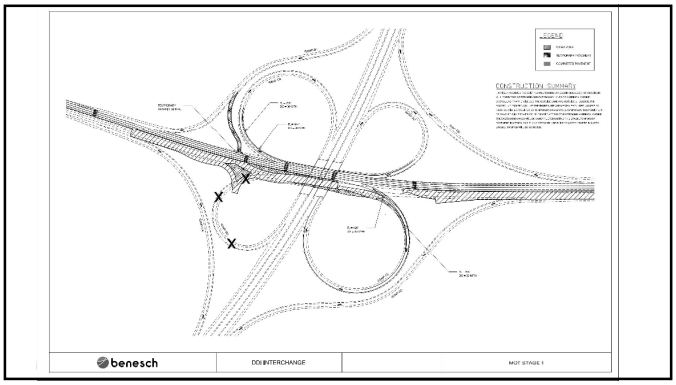
7

I-39/Harrison Avenue Interchange
Existing Cloverleaf Interchange

8

Diverging Diamond Interchange

9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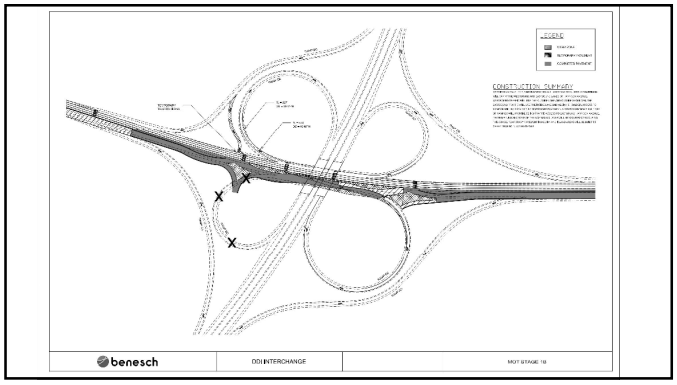
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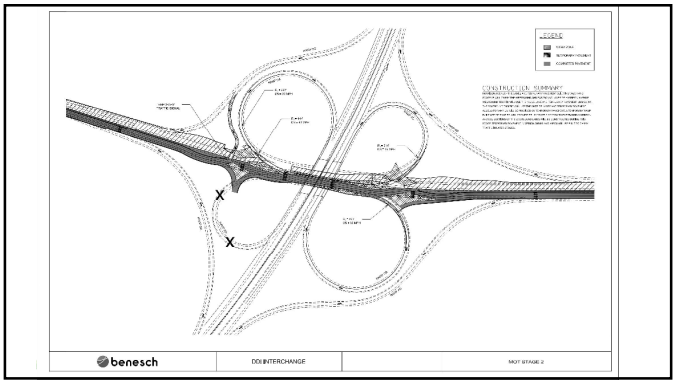
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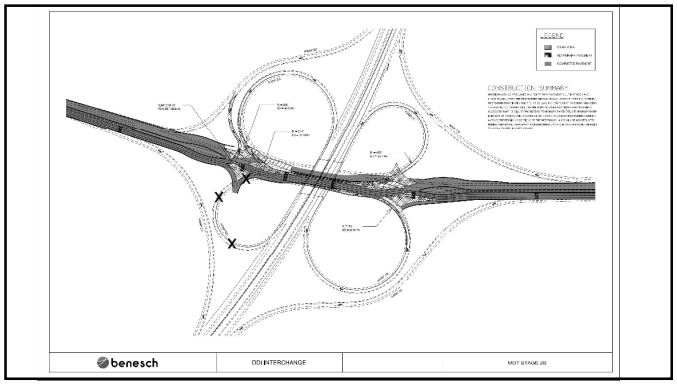

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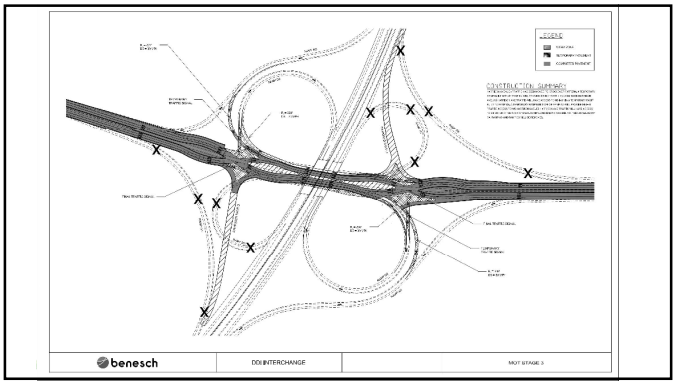

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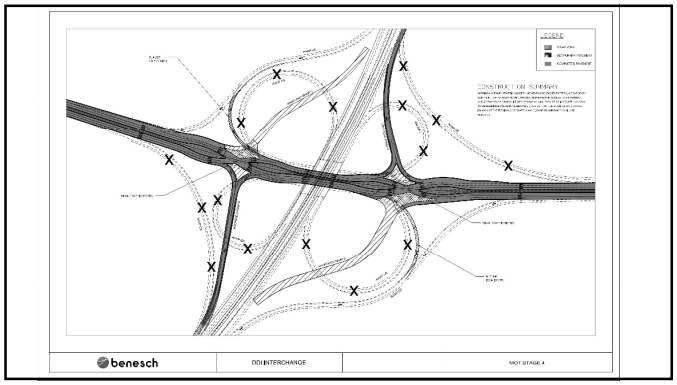

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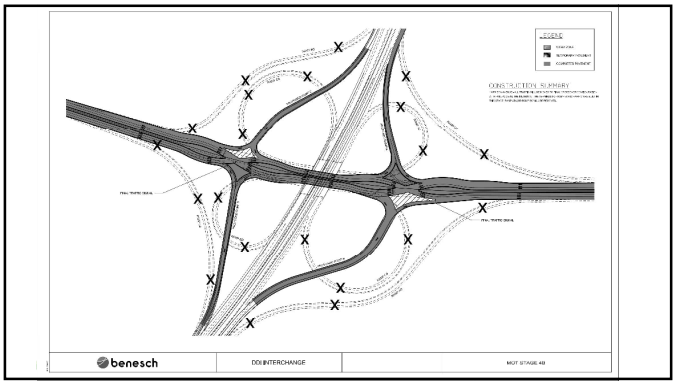

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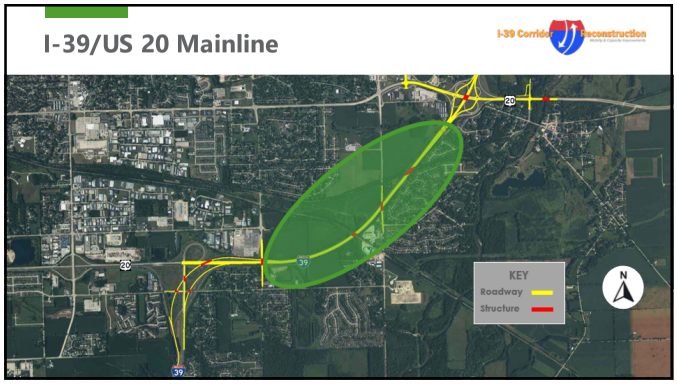

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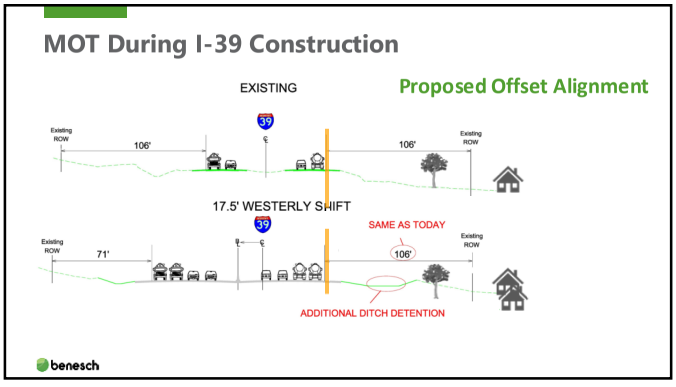

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Project Specific Challenges

- Pond Grading and Match lines
- Rock and Unsuitable Excavation
- Staged Cross section and Earthwork
- MSE Wrap Around Wall
- Workspace Updates
- Design Unit Changes During an Active Project

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Best Practices Overview

- iModel as a Review Tool
- Model Optimization
- Template and Corridor Management
- Item Types
- SUDA
- Sheet Creation and Annotation
- Ongoing Software Developments

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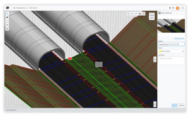
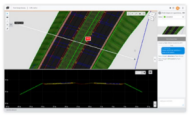
Best Practices: iModel as a Review Tool

- Designers designing in 3D – reviewers reviewing in 2D

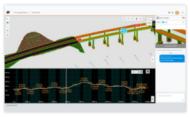
Eliminate intermediate steps and artifacts by initiating reviews directly from your design models.



Streamline review sessions by collaborating in a 2D/3D hybrid design environment.



Avoid wasting time by working in an environment purpose-built for your discipline-specific reviews.



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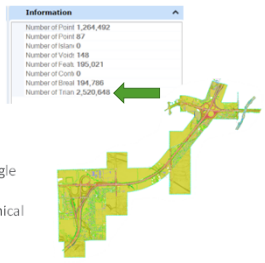
Best Practices: Model Optimization

- **Files are slow to open……could be from:**
  - Other programs running in the background
  - Loading individual dgnlibs
  - Intensive graphics (triangle, contours, mesh)



- **Corridors are slow to process…could be from:**
  - End condition processes that solve at each triangle
  - Civil rules/Civil cells processing time
  - Creation of final surfaces are based on the graphical filters instead of meshes

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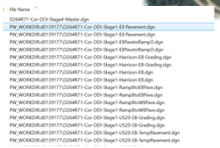
Best Practices: Template and Corridor Management

- **Separate data storage by dgn files**
  - Superelevation, corridors, SUDA, geometry…..
  - Helps stability (and processing times)
- **Consideration: Separate corridors by discipline or stage**
  - One complete roadway corridor/template vs separate corridors
  - Troubleshooting
  - Earthwork calculations



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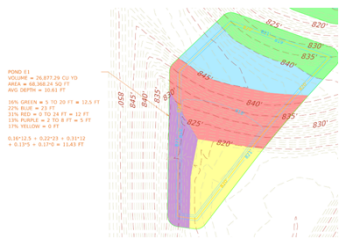
Best Practices: Template and Corridor Management

- **Consideration: Separate corridors by discipline or stage**
  - Earthwork calculations



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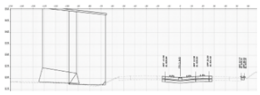
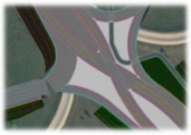
Best Practices: Template and Corridor Management

- Consideration: Separate corridors by discipline or stage
  - Allows for more flexible cross section annotation
- Utilize: Surface templates and projected profiles





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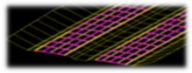
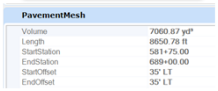
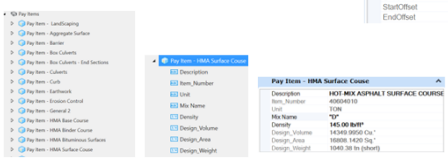
Best Practices: Item Types

- Item Types add Meta Data to Elements
  - Computed from OpenRoads Designer Properties
  - Includes calculated or conditional information
  - Excel "Pick List" and Lookup Functions







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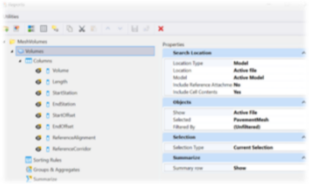
Best Practices: Item Types

- Create displays rules to help view the meta data
- Add to feature definitions to auto populate
- Create Pay Item Reports from Corridor Objects
  - Bulk editing
  - Export to Excel



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Best Practices: SUDA

- The dgn is populated with seed file information once upon creation
- Stormcad database (stsw) is in the user temp folder, then syncs to ProjectWise
  - If this file is out of sync, the program crashes. (Synchronize Graphics may help)
- For stability, consider Separating Outlets by dgn

What to avoid?
- **DO NOT** Free a file while in ProjectWise.
- **DO NOT** reference a file Drainage file of the same name.
- **DO NOT** copy a drainage file. Use Save As instead.
- When deleting nodes, delete the pipes connected to it FIRST and then delete the pipes. Same goes for Catchments.

- NEVER USE THE UNDO BUTTON!

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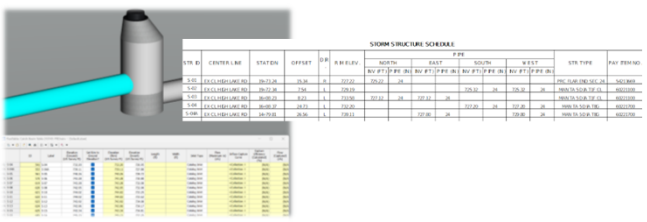
Best Practices: SUDA

Flex Tables → Excel → Plan Schedule



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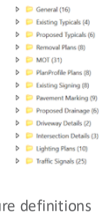
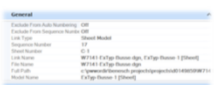
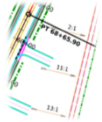
Best Practices: Sheet Creation and Annotation

- Sheet Seeds and Assembly
- Sheet Index
  - Separate by discipline
  - Populates title block info.
  - Allows for bulk edits





- Annotation groups and feature definitions



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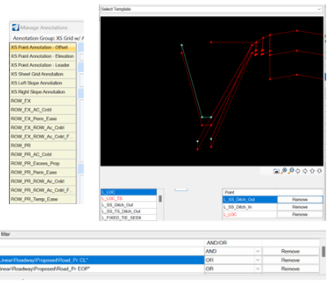
Best Practices: Sheet Creation and Annotation

- Cross section template annotation
  - Feature Definition & Template Point Selection



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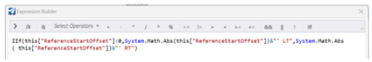
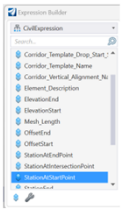
Best Practices: Ongoing Software Developments

- Annotation Development
- Improved Item Types
  - Pick List
  - Expression Building





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THANK YOU

Travis Kluegel
tkluegel@benesch.com
Jeffrey Tardy
jtardy@benesch.com

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