Bentley OpenRoads Implementation

I-80 Brookville East Reconstruction Project

November 8, 2023

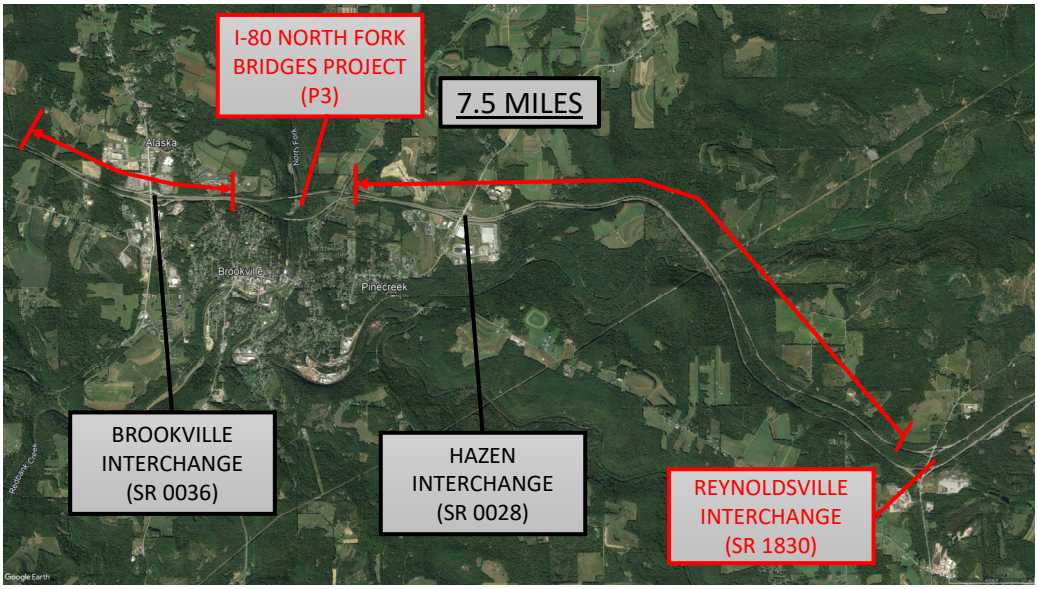
By: Tom Monda

Michael Baker INTERNATIONAL | *We Make a Difference*

1

Project Introduction

Michael Baker INTERNATIONAL



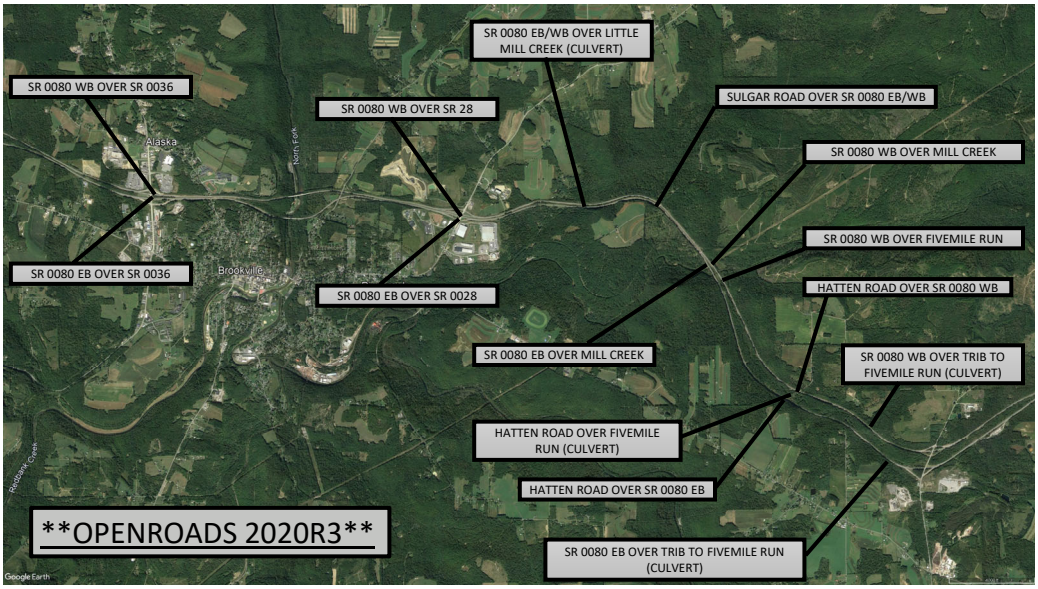
We Make a Difference

2

2

Project Introduction

Michael Baker INTERNATIONAL



OPENROADS 2020R3

We Make a Difference

3

3

The Good!

Michael Baker INTERNATIONAL

STRUCTURE – HIGHWAY DESIGN COORDINATION

We Make a Difference

4

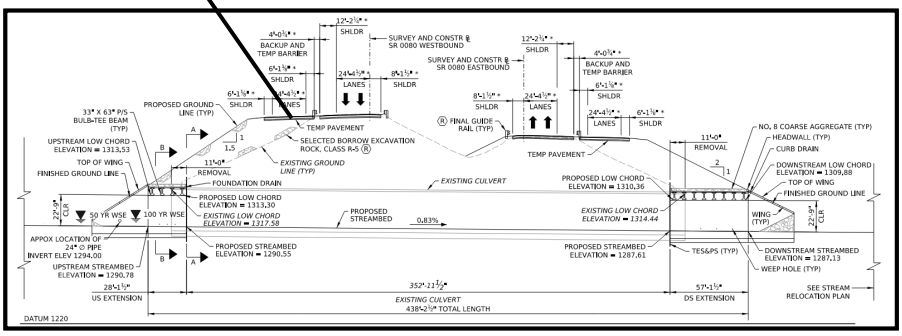
4

The Good!

Michael Baker INTERNATIONAL

STRUCTURE – HIGHWAY DESIGN COORDINATION

DYNAMIC LINES COMING FROM ROADWAY CORRIDORS AND TERRAINS

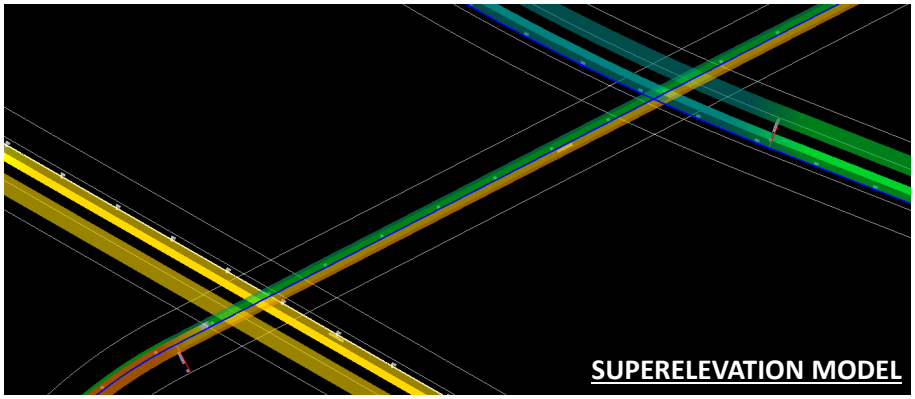


5

The Good!

Michael Baker INTERNATIONAL

STRUCTURE – HIGHWAY DESIGN COORDINATION

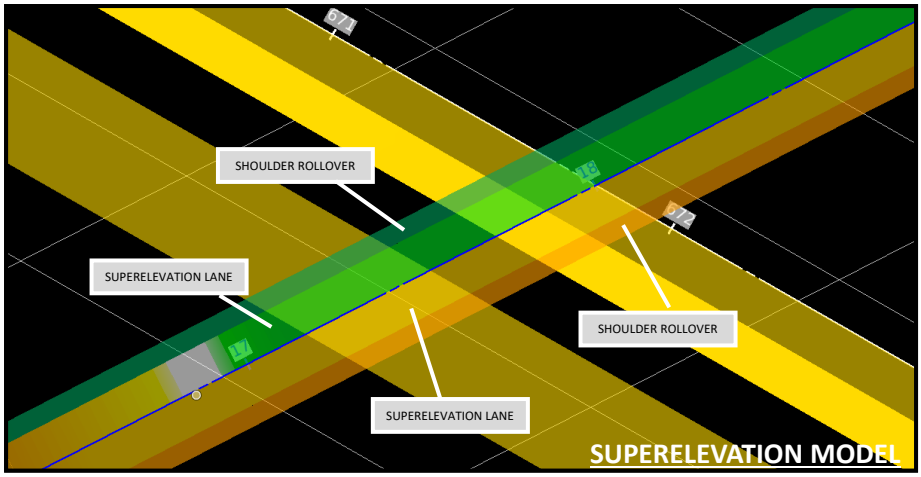


6

The Good!

Michael Baker INTERNATIONAL

STRUCTURE – HIGHWAY DESIGN COORDINATION

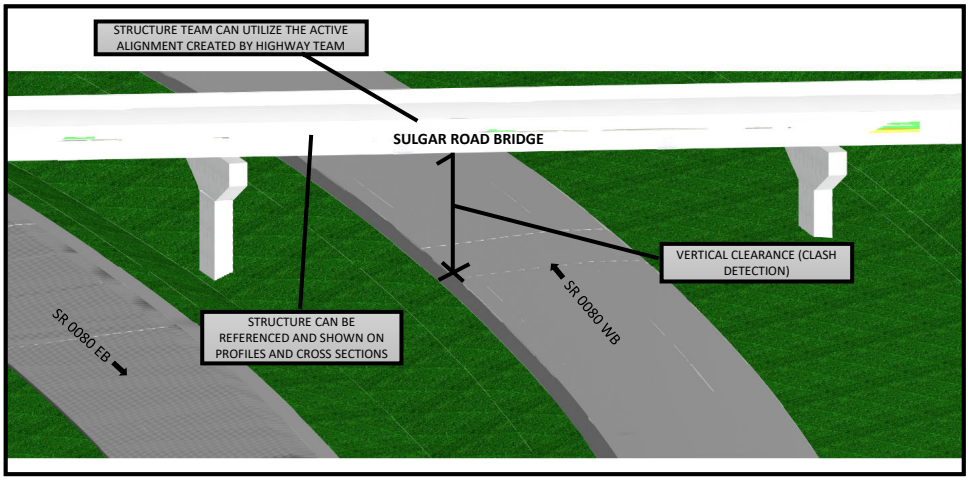


7

The Good!

Michael Baker INTERNATIONAL

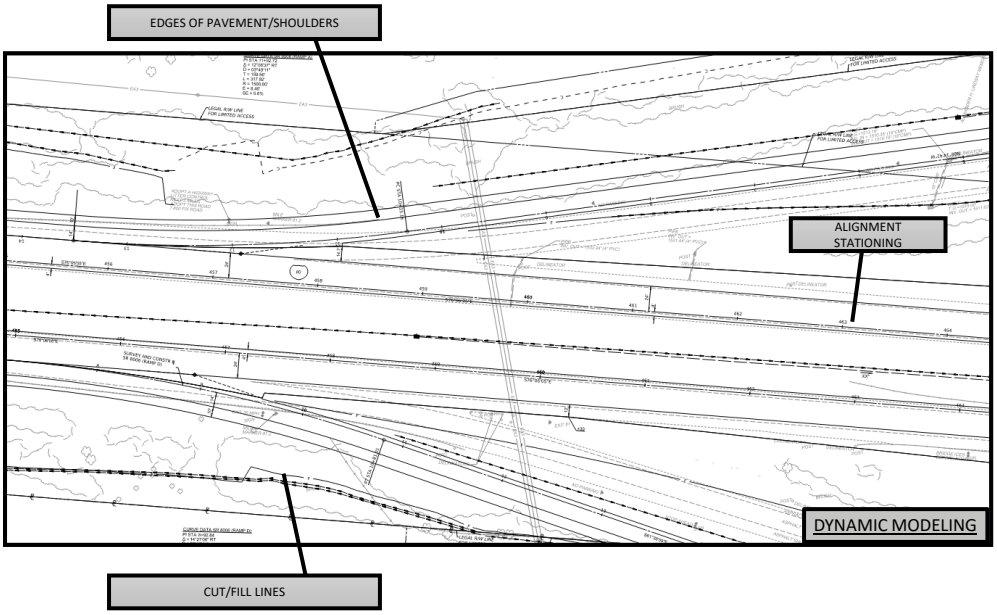
STRUCTURE – HIGHWAY DESIGN COORDINATION



8

The Good!

Michael Baker INTERNATIONAL



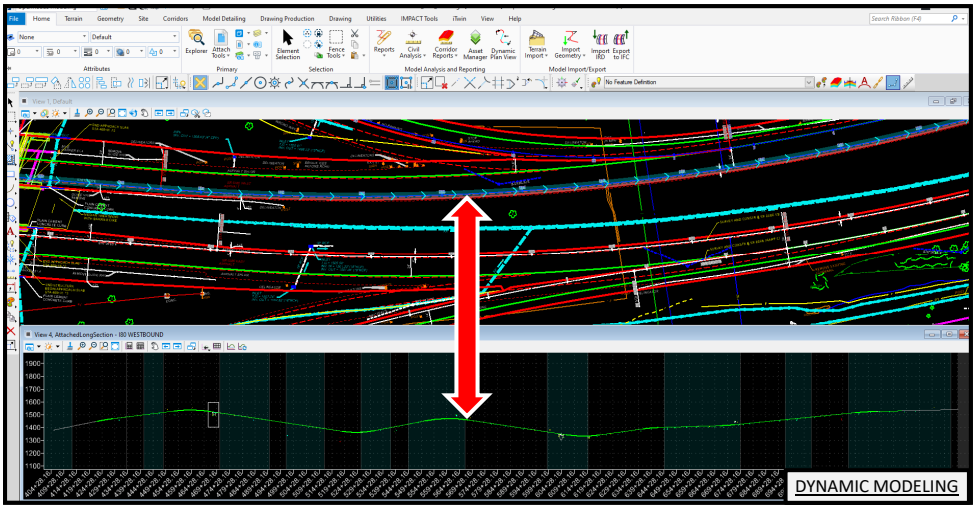
We Make a Difference

9

9

The Good!

Michael Baker INTERNATIONAL



- Plan View, Profile View, Dynamic Cross Sections View

We Make a Difference

10

10

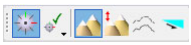
The Good!

Michael Baker INTERNATIONAL

CIVIL ACCUDRAW

Civil Accudraw – Allows the user to utilize "smart" information to place a feature

- Plan
  - Station Offset
  - Coordinate Based



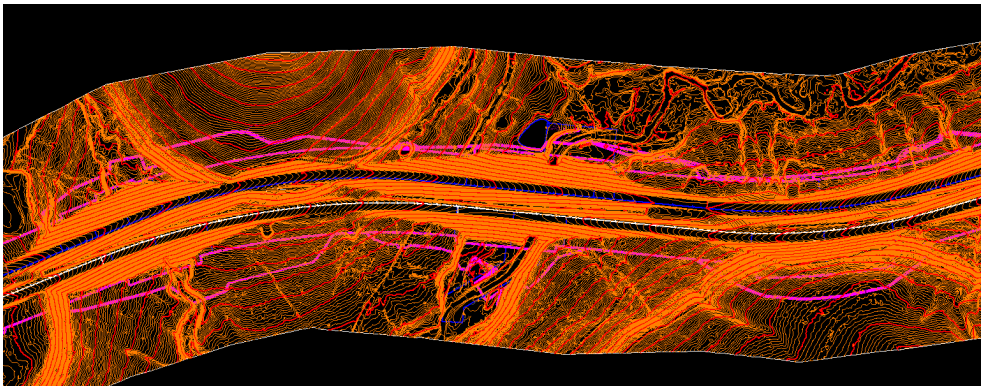
- Profile
  - Station
  - Elevation
  - Slope

11

The Bad!

Michael Baker INTERNATIONAL

CONTOURS



- Elevation Labels move as you zoom in and out
  - Different locations when printing
- Printing "grey" existing contours
- File Speed

12

The Bad!

Michael Baker INTERNATIONAL

CROSS SECTIONS

SIZE

33008045B_XSEC01_1.dgn	59,728 KB
33008045B_XSEC01_2a.dgn	49,232 KB
33008045B_XSEC01_2b.dgn	41,192 KB
33008045B_XSEC01_3a.dgn	50,671 KB
33008045B_XSEC01_3b.dgn	48,391 KB
33008045B_XSEC02_1.dgn	50,719 KB
33008045B_XSEC02_2a.dgn	53,425 KB
33008045B_XSEC03_Hatten.dgn	28,142 KB
33008045B_XSEC03_SR28.dgn	8,671 KB
33008045B_XSEC03_Sulgar.dgn	11,596 KB
33008054B_XSEC01_L.dgn	34,387 KB
33008054B_XSEC02_2b.dgn	31,540 KB
33008054B_XSEC02_3a.dgn	42,319 KB
33008054B_XSEC02_3b.dgn	90,851 KB
33008054B_XSEC02_L.dgn	38,091 KB
33008054B_XSEC03_L.dgn	8,042 KB
33008054B_XSEC04a.dgn	41,242 KB
33008054B_XSEC04b.dgn	38,767 KB

Note: These sections were cut at 100’ intervals

We Make a Difference

13

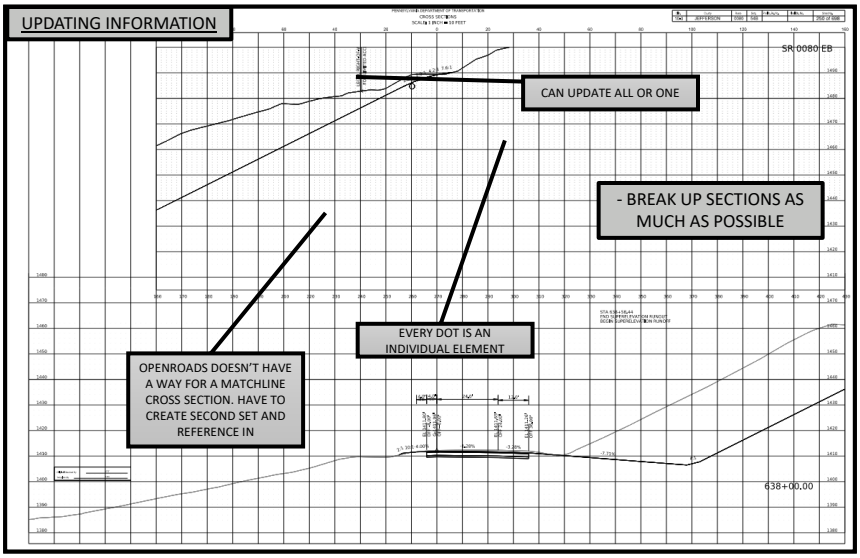
13

The Bad!

Michael Baker INTERNATIONAL

CROSS SECTIONS

UPDATING INFORMATION



CAN UPDATE ALL OR ONE

- BREAK UP SECTIONS AS MUCH AS POSSIBLE

EVERY DOT IS AN INDIVIDUAL ELEMENT

OPENROADS DOESN’T HAVE A WAY FOR A MATCHLINE CROSS SECTION. HAVE TO CREATE SECOND SET AND REFERENCE IN

We Make a Difference

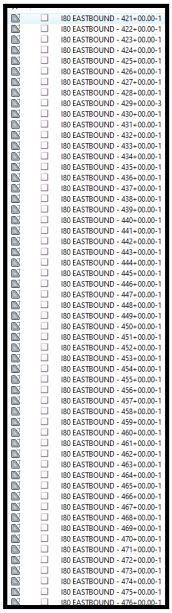
14

14

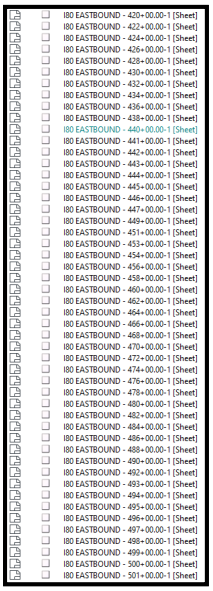
The Bad!

Michael Baker INTERNATIONAL

CROSS SECTIONS



- The pain to go into each model to add notes and details
- The pain to have to go into each model to update the section graphics
- The pain to have to go into each model for the sheet number to update using the sheet index



We Make a Difference

15

15

The Bad!

Michael Baker INTERNATIONAL

TIME TO CREATE AND PERFECT CROSS SECTIONS → TIME TO ADD DETAIL TO THE MODEL FOR DIGITAL DELIVERY

We Make a Difference

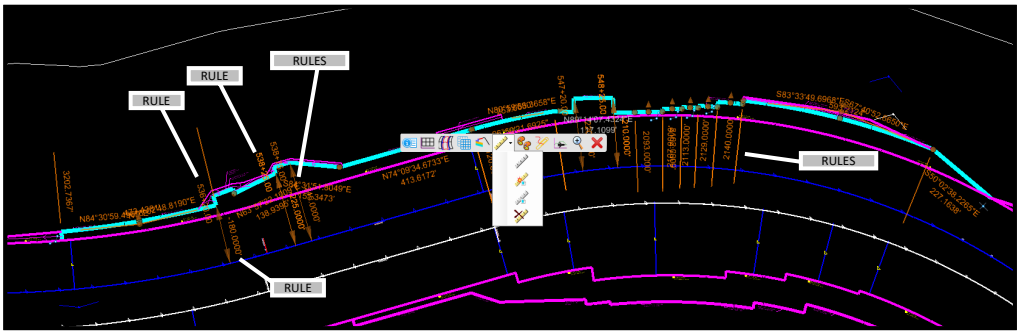
16

16

The Bad!

Michael Baker INTERNATIONAL

Rules



- "Deactivate Rule"
- "Activate Referencing Rules"
- "Deactivate Referencing Rules"
- "Remove Rule"

- If you click "remove rule", it creates 2 version of the line, each having rules their own rules associated with the features!!!!!

We Make a Difference 17

17

The Ugly!

Michael Baker INTERNATIONAL

The Versions

2022 R1 = 10.11.00.115

2021 R2 = 10.10.21.04

2021 R1 = 10.10.01.03

2020 R3 = 10.09.00.91

2020 R2 = 10.08.01.033

2020 R1 = 10.08.00.088

- Coordination with design team and subs on what version a project is using
- Decisions with Project Managers (non-CAD users) on when to switch to new version
- Having multiple projects in multiple versions with multiple programs on your computer
- I-80 Brookville East is stuck in 2020R3 due to a change in folder structure in the workspace
  - Utilities and Drainage not included
  - Added Feature Definitions/Cells/Levels/Line Styles

We Make a Difference 18

18

The Ugly!

Michael Baker INTERNATIONAL

Program Optimization

- Slow, Clunky, Non-User Friendly
- Not knowing whether its you or the program (trust in the program)
- Retooling your design process to incorporate OpenRoads
  - Rules
  - New way to create Profiles and Cross Sections (can't do it the "old" way)
  - Brookville East Specific – How to split up the project based on how ORD creates files (cross sections size)
  - When to create certain corridors or terrains or sheets
    - Sometimes you realize you've gone to far and the easiest way to fix your issue is just to start over (tangled fishing line)

We Make a Difference

19

19

Michael Baker INTERNATIONAL | *We Make a Difference*

THANK YOU!

20