Welcome

COLORADO
Department of Transportation

OpenRoads
CONNECT Edition

Recording

Today's session will have areas recorded for training purposes. Your continued participation serves as your acknowledgement and permission.

Course Presenters

Jeremy Colip

Lindsey Rindal

Jordan Lerner

Matt Bauer

Jeff Freers

Mike Schwab

Breanna Hedges

Course Agenda

Day 1

- Overview of CDOT CADD and Digital Delivery Manual
- File Naming Convention
- ProjectWise Folder Structure
- Project File Information

Day 2

- ORD Interface
- Existing Terrain Models
- Horizontal Geometry (If time allows)

Day 3

- Geometry and Superelevation

Day 4

- Roadway Templates

Day 5

- Corridor Modeling

Day 6

- Proposed Terrain Models
- Calculating Earthwork

Day 7

- Plan Production
- 3D Modeling Deliverables (Quality Checks)

Day 1

Overview of CDOT CADD and Digital Delivery Manual

Introduction to Upcoming Manual

- Providing Best Practices and Workflows
- Focus on Consistency and Uniformity
- Digital Delivery and CADD Foundation
- Setup for Success

Matching Training Material

- Material Covered to Meet Expectations of Upcoming Manual

CDOT Standards and Best Practices

- Checklists, Folder Structure, File Naming
- Design and Modeling Expectations
- Production Expectations
- Setup for Success

File Naming Convention

Back to the Future

- Setting up File Names for Future Use

Naming Convention Background

- Current to Proposed Naming

Overview of File Naming for File Types

- Design and Modeling
- Production

CDOT ORD File Naming

File Naming Convention

All files **WILL** be named using all capital letters. The type of file such as. dgn, .xlsx, .docx, etc. **WILL** be in lower case at the end of the file name. Files will begin with the Project Number assigned by the client. A 5-letter project name abbreviation will be given If there is not a project number:

12345

This will be followed by an under bar and a 3-letter discipline designation of the file:

12345_RDY

Finally, the above will be followed by an under bar, 3-letter designation of the type of file (followed by a hyphen), and name of the file intent such as highway or street name:

12345_RDY_CNR-SHXX

File Designations

Specialty Group / Discipline Designations

- ENV - All Environmental files
- GEN - All General files, borders, notes files
- HYD - All Hydraulic and Hydrology files
- LND - All Landscape files
- LTG - All Lighting files
- PDM - Project Design Model master files
- PRM - All Meeting Minutes, Agendas, Project Schedules
- RAL - All Rail and Transit Files
- RDY - All Roadway files
- ROW - All Right-of-Way files
- SRV - All Survey files
- TRF - All Traffic files
- BRG - All Bridge files
- SWP - All Stormwater Management files
- UTL - All Utility files
- WRK - All Working files for Users

File Type Designations

- BND - All Named Boundary files for all plan production
- CNR - A Container file is an empty DGN file that references other ba
  file setup as well as federated files of common type
- COR - All files that contain corridor models containing intelligent at
- CLC - All files that contain design calculations, tabulations, and qua
- CTL - Point Control Files containing alignments used to help develop
  terrain files. The alignments may represent the edge of pavement t
  sawcut lines, raised median configuration, etc. and contains intellig
  content

CDOT ORD File Naming

- GEO - All Horizontal and Vertical Alignment files for geometric control for construction layout and contains intelligent attributed content
- LIN - All specialty group general base files containing non intelligent non-attributed linework such as landscaping features, SWMP, signing and striping
- MOD - Intelligent attributed model content not specified as other designation and defined features such as elements with ponds, infield grading, feature grading, 3D cells
- PLN - All plan sheet files of all natures (Plan, PnP, Profiles, Cross Sections, Typicals, Details, etc.) per discipline
- RPT - All files which are reports, memos, and forms
- DNU - All Drainage and Utility data models and networks that contain intelligent attributed content
- SUP - File that contains Superelevation information to be referenced to the COR contains intelligent attributed content
- TER - All files that contain a Terrain Model of either an existing or proposed surface contains intelligent attributed content
- STR - All structure related files

File Description

The description for the file shall be a designation to the file name that explains what the file is in terms as short as possible. For example, **12345_RDY_CNR-SHXX** should have a description of **Roadway Container SHXX.**

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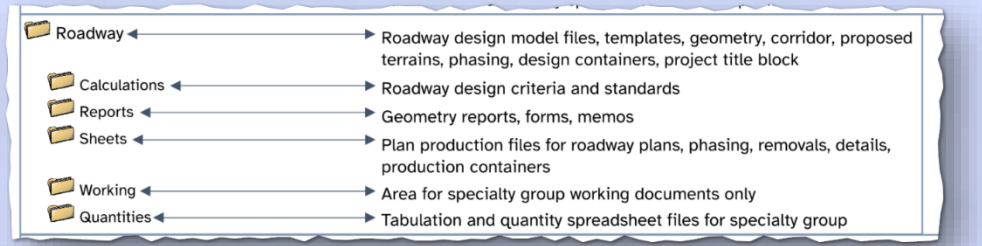
ProjectWise Folder Structure

Defining New Pre-Construction Folders

- Changes to Current Folder Structure
- Addressing Specialty Group Needs

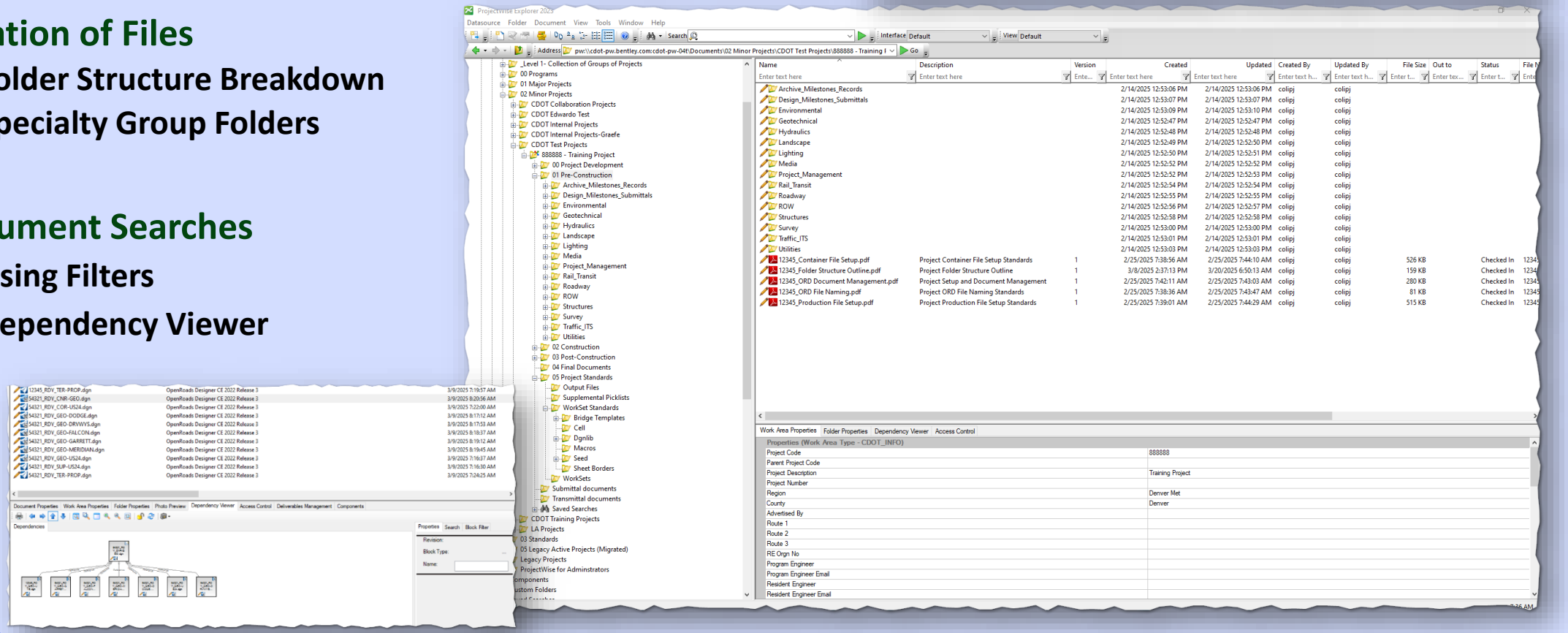


Location of Files

- Folder Structure Breakdown
- Specialty Group Folders

Document Searches

- Using Filters
- Dependency Viewer



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Project File Information

Design, Drawing, and Sheet Models

- Defining Spaces
- What Should be Included Within Each Model
- What Goes Where and Why

File Federation

- What Is It and Why To Use It

Container Files

- Defining What They Are
- Why and When To Use Them

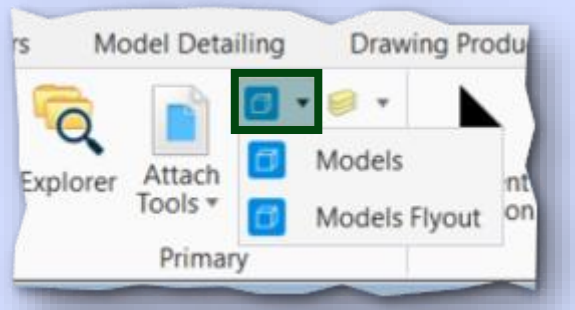
Maintenance of Files

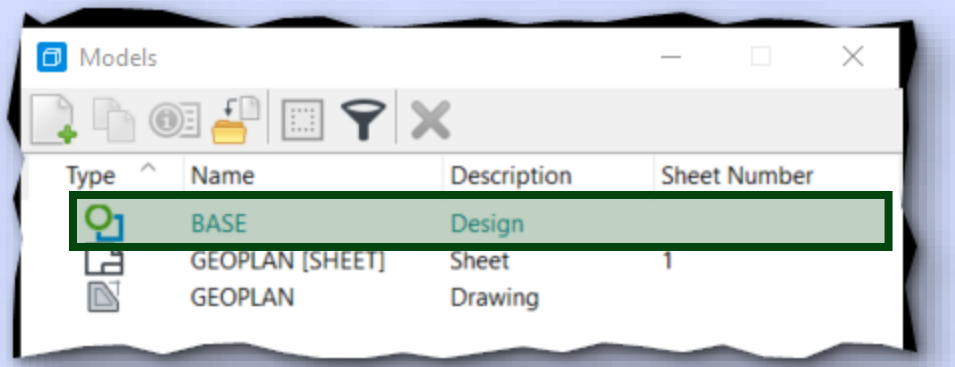
- Why This Is Important

File Models

Design

- References Container File or Reference Files
- 2D Model and/or 3D Model
- Geolocated
- Scale Set by User based on Purpose
- May not be present in all Sheet files
- Sheet and/or Drawing files may not be present
- Attach ONLY what is needed

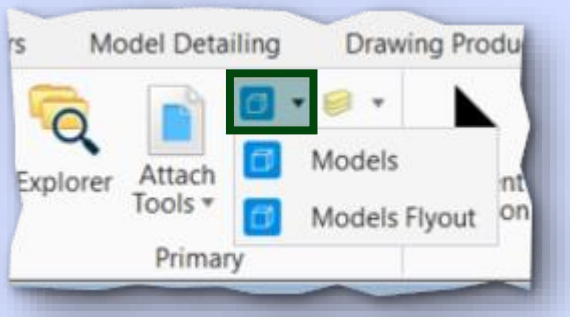


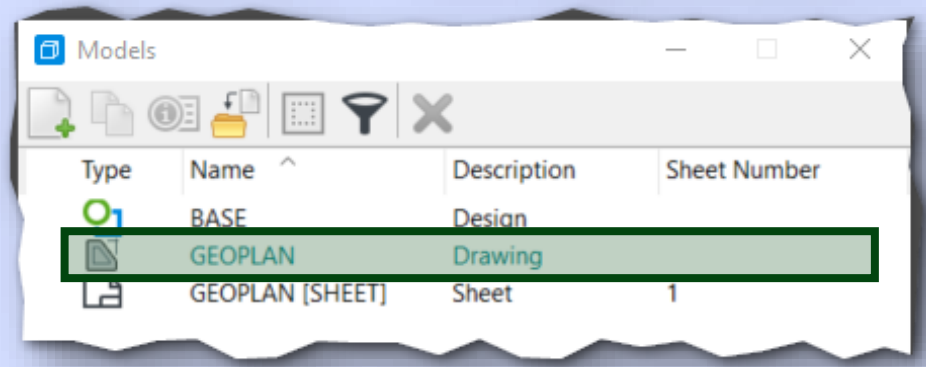


File Models

Drawing

- References Design Model
- 2D Model
- Clipped & Oriented based on Named Boundary
- Geolocated
- Scale based on Named Boundary
- Sheet Annotations may be Placed here
  - North Arrow
  - Scale Bar
  - Profile Grid

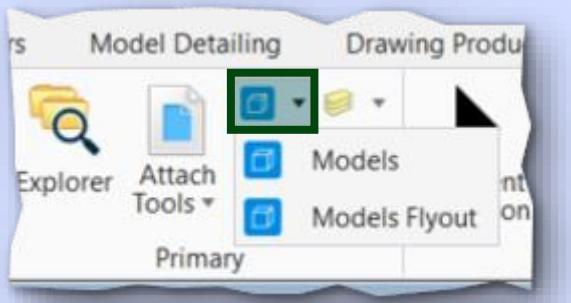


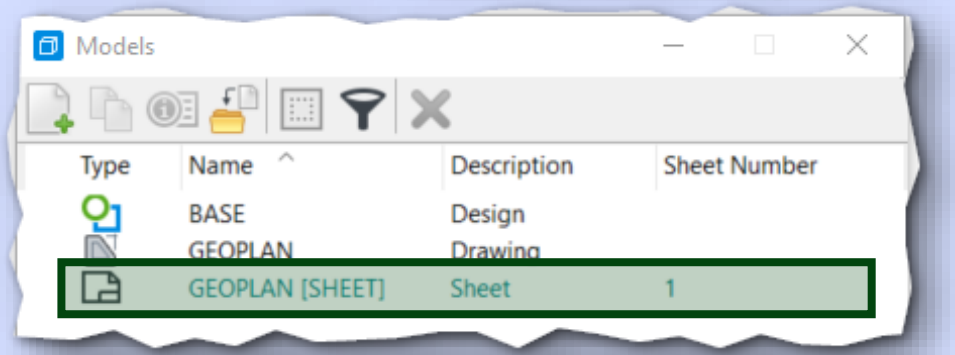


File Models

Sheet

- Drawing Model Nested Reference
- Titleblock Cell Replaced with Border Reference
- 2D Model
- NOT Georeferenced (at 0.0)
- NOT to Scale (1:1)
- NO Annotations
  - Except Titleblock
  - General Notes / Legends
  - Scale Bar
  - Tables





File Federation

What Is It?

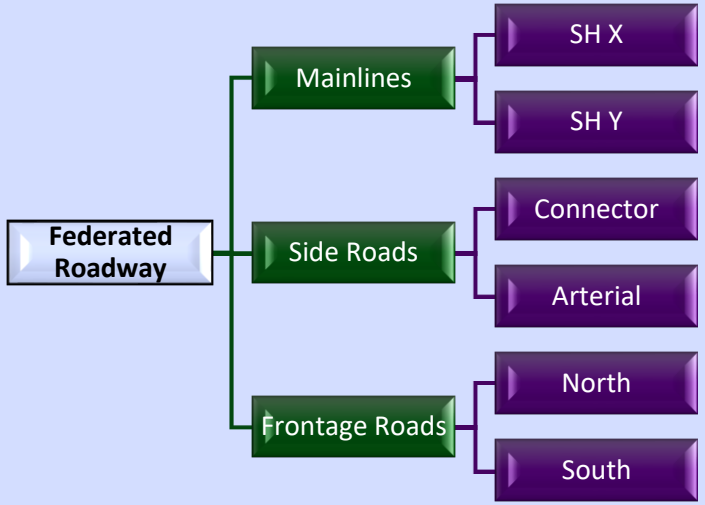
Why Do We Do It?

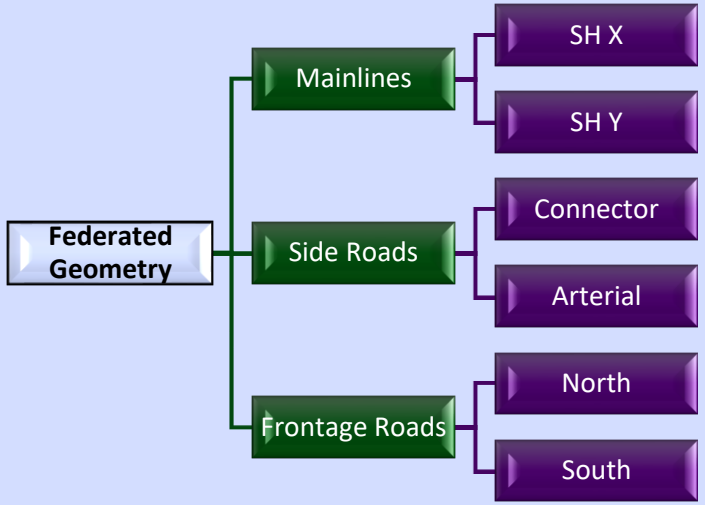
Best Practices

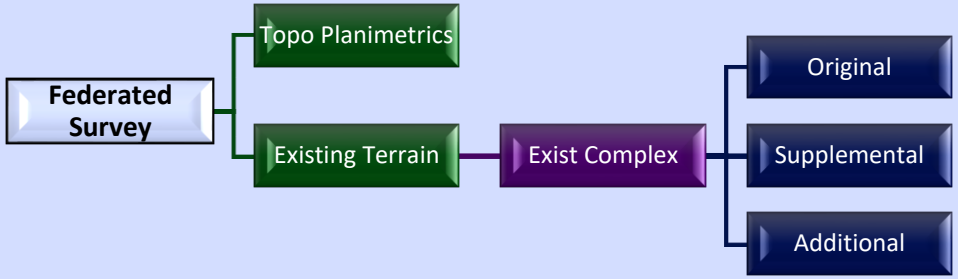
- Non-attributed (LIN) vs. Attributed (MOD)
- Container Files

Many Issues Arise From Improper Federation

- Software performance
- File Corruption







Container Files

Reference File Nesting Depth

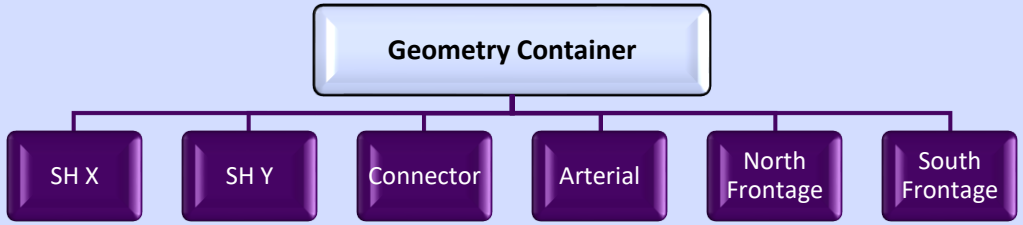
- 0 for Container File Referencing
- 1 for Production Design Models
- 2 for Production Drawing Models
- 3 for Production Sheet Models

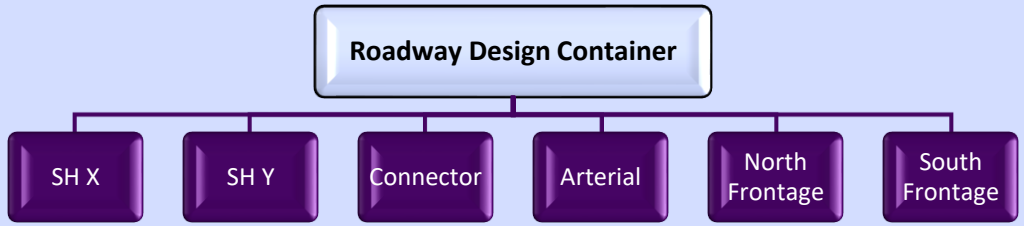
Display Control & Symbology

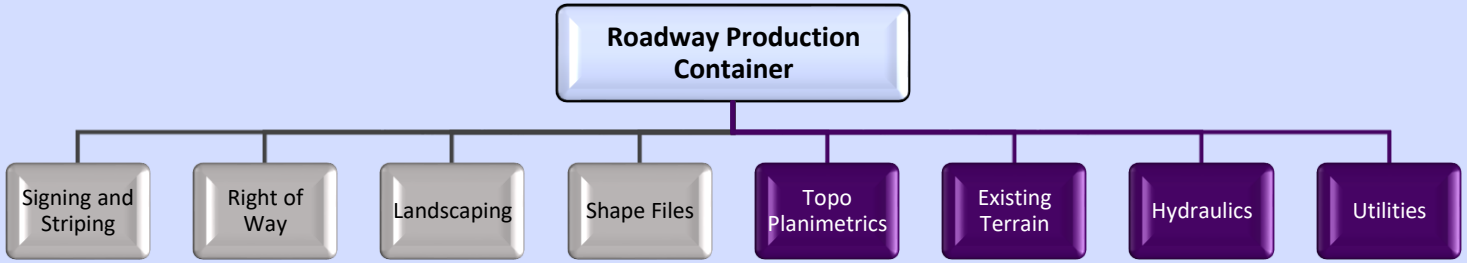
- Level Display
- Level Overrides

File Sequence & Priority

Attach **ONLY** what is Needed







File Maintenance

Clean

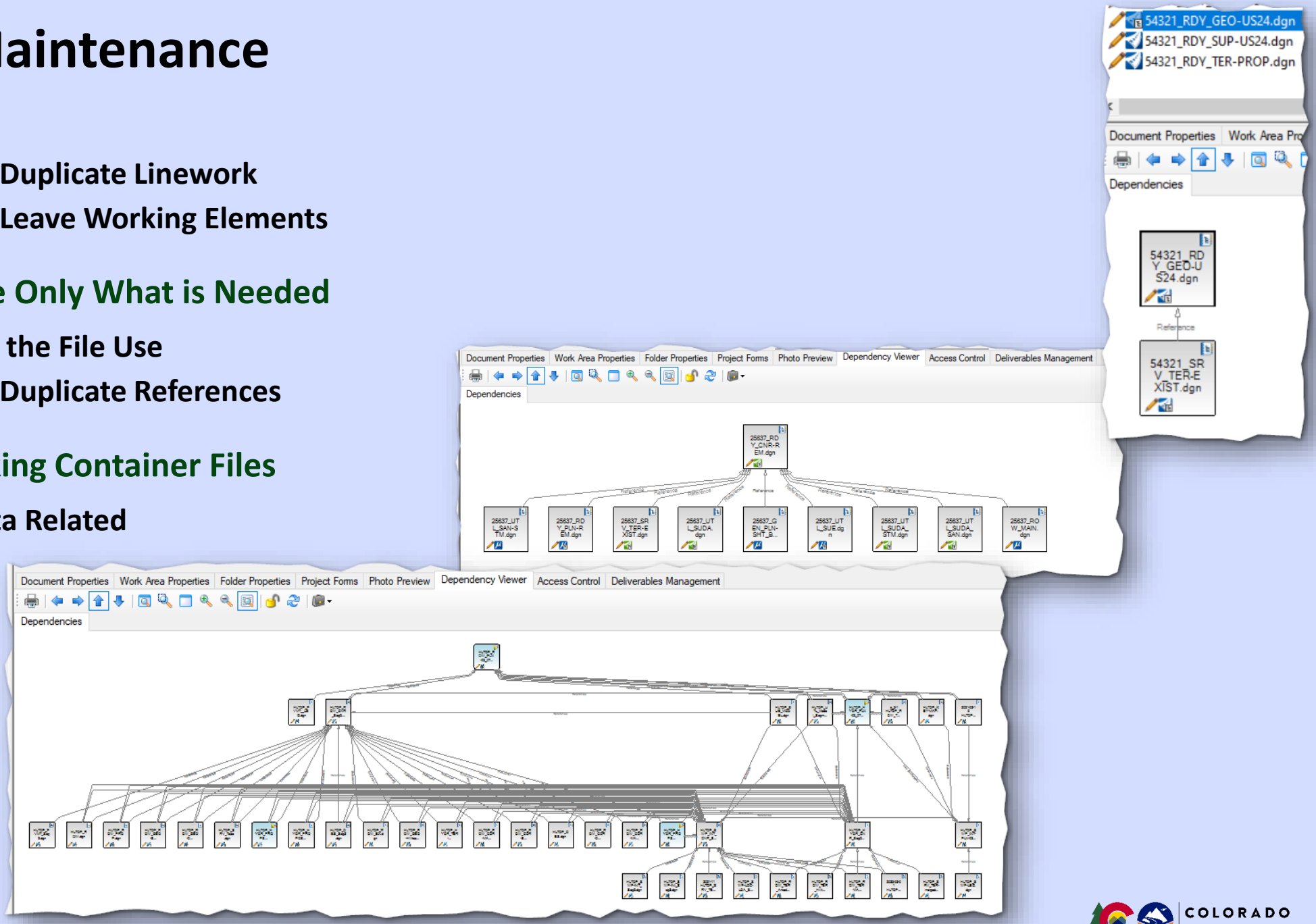
- Do Not Duplicate Linework
- Do Not Leave Working Elements

Reference Only What is Needed

- What is the File Use
- Do Not Duplicate References

Use Working Container Files

- Not Data Related



Day 2

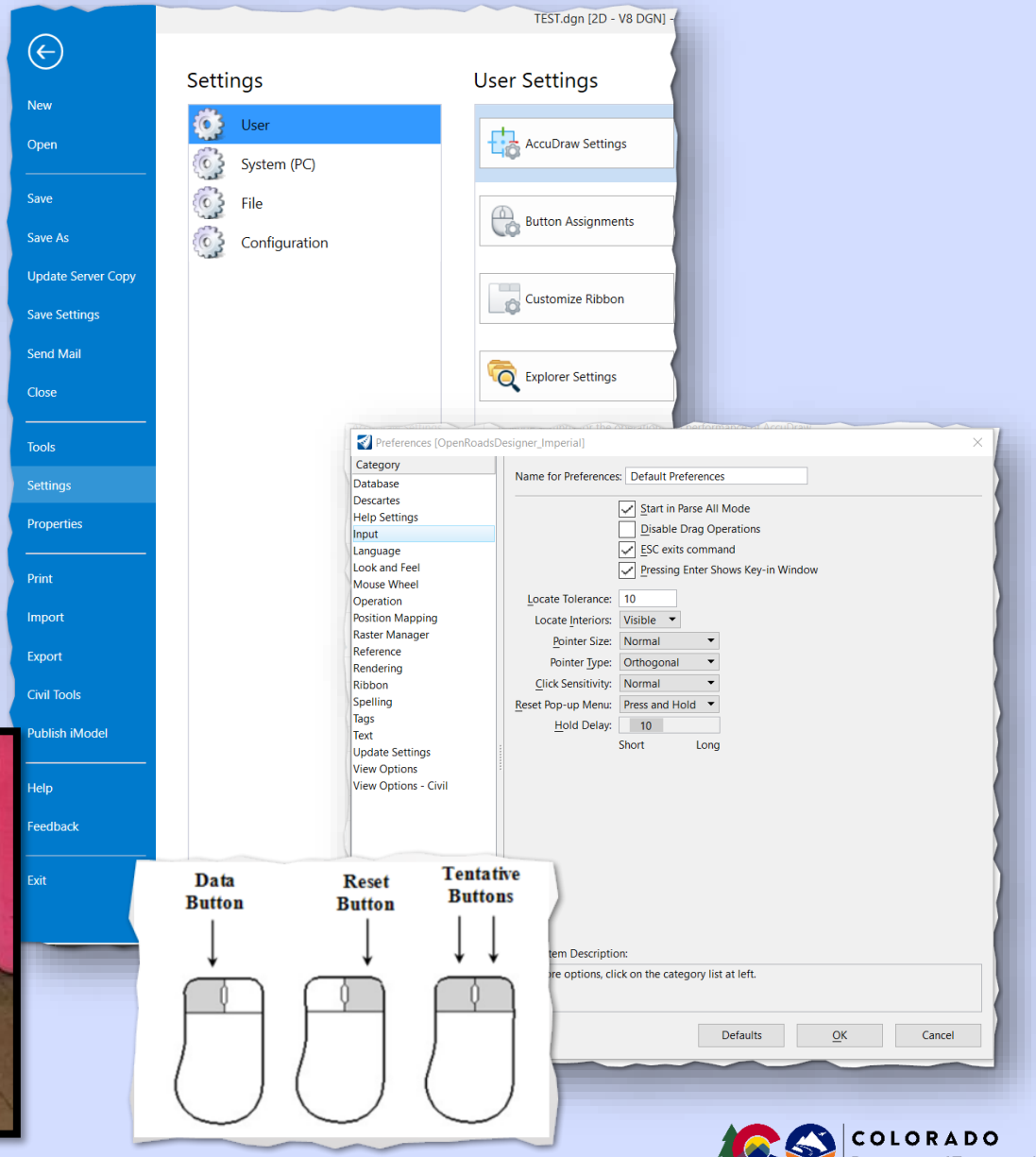
ORD Interface

Backstage Settings and Preferences

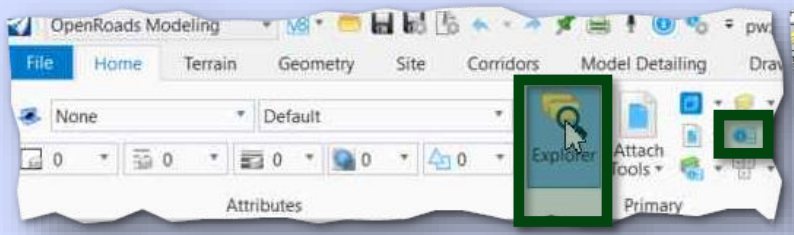
- Importance of Version and Platform
- What is the Backstage?
- User Settings
  - Button Assignments (Tentative)
  - Preferences
  - Tool Boxes
- File Settings
  - Design File Settings

Tips and Tricks

- Message Center
- Search Bar
- Rotate View
- Detail Dialog Box
- View Attributes
- Select by Attributes



ORD Interface

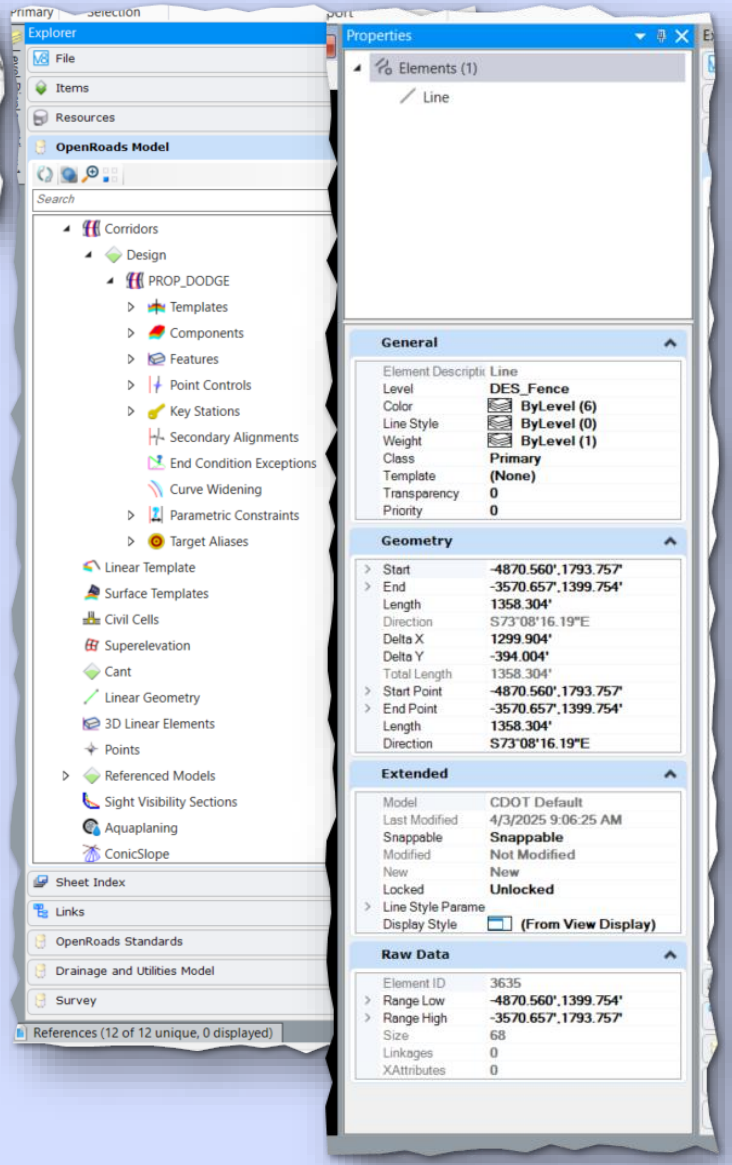


File Explorer Dialog Box

- File
- Items
- Resources
- OpenRoads Model
- Links
- OpenRoads Standards
- Drainage and Utilities Model
- Survey

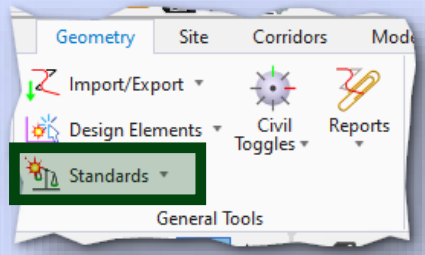
Properties Dialog Box

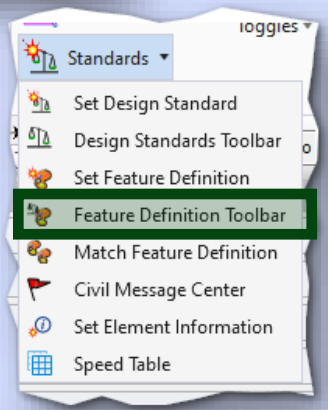
- File Explorer Connection
- Multiple Uses



Feature Definition Toolbar

- Use Active Feature Definition
- Select Feature Definition
- Commands





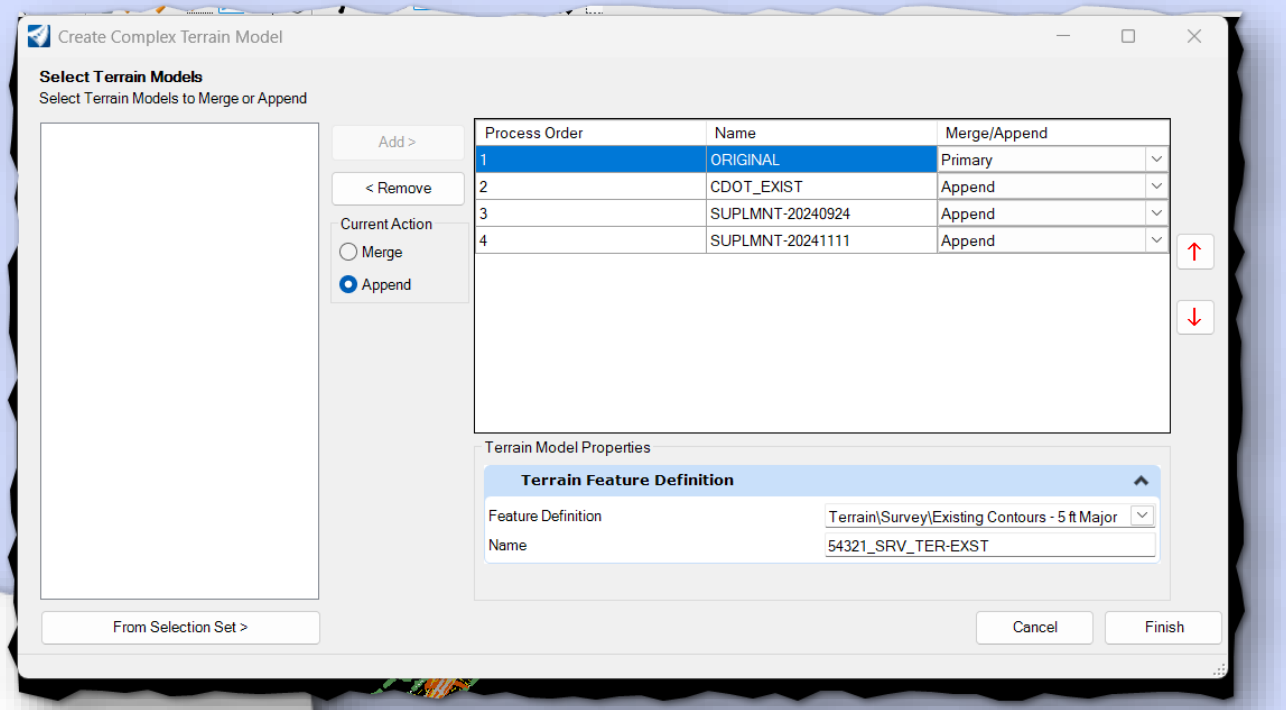
Existing Terrain Models

Existing Terrain and Planimetric Deliverables

- Separate Files
- Why this matters
- What To Check For

Creating Complex Terrains

- Reasoning Behind The Method
- 3D Seed
- Stepping Through the Process



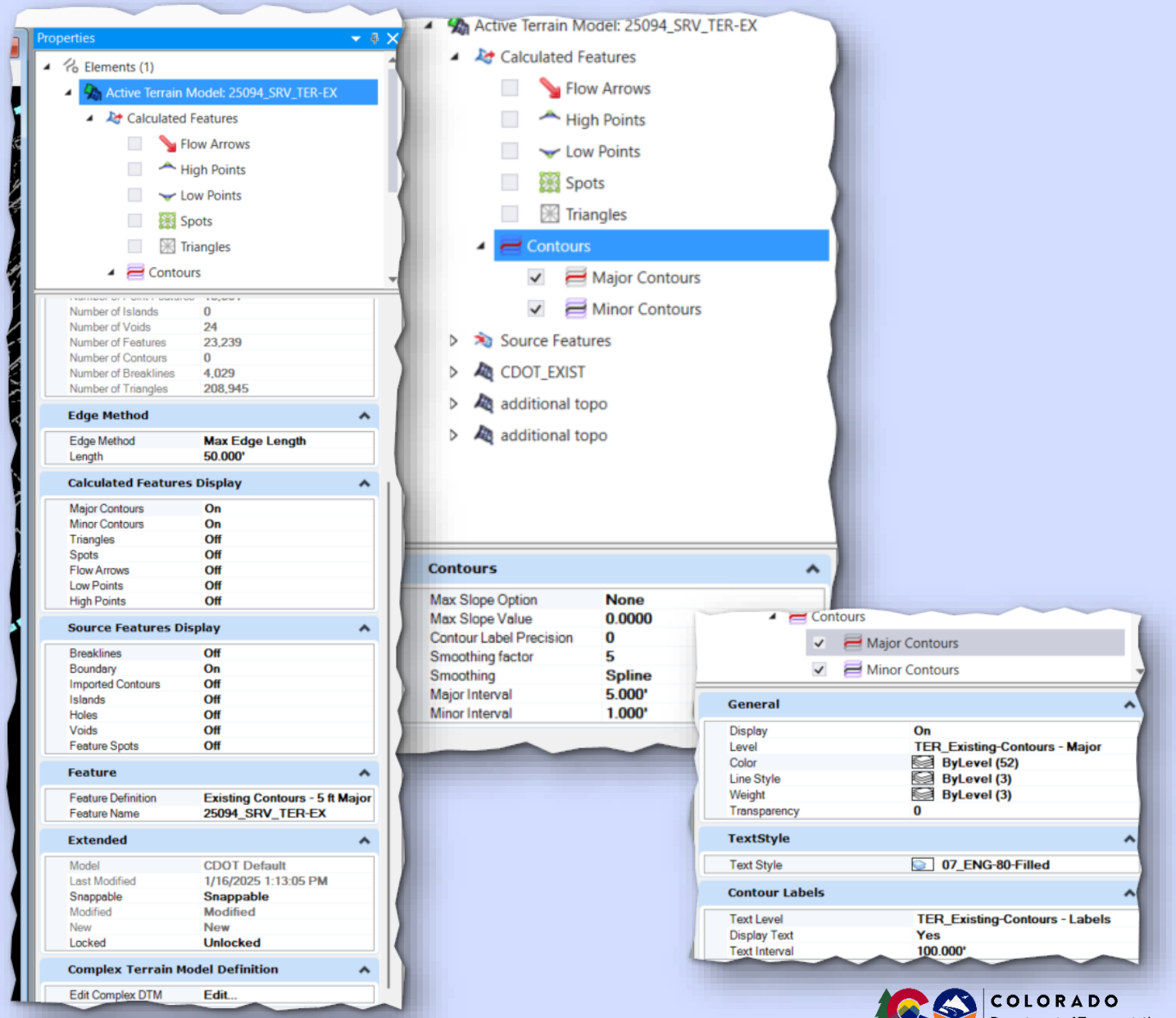
Existing Terrain Models

Methods to Display Contours

- Using Properties Dialog Box

Level Overrides Symbology

- Settings
- Following the CADD and Digital Delivery Manual



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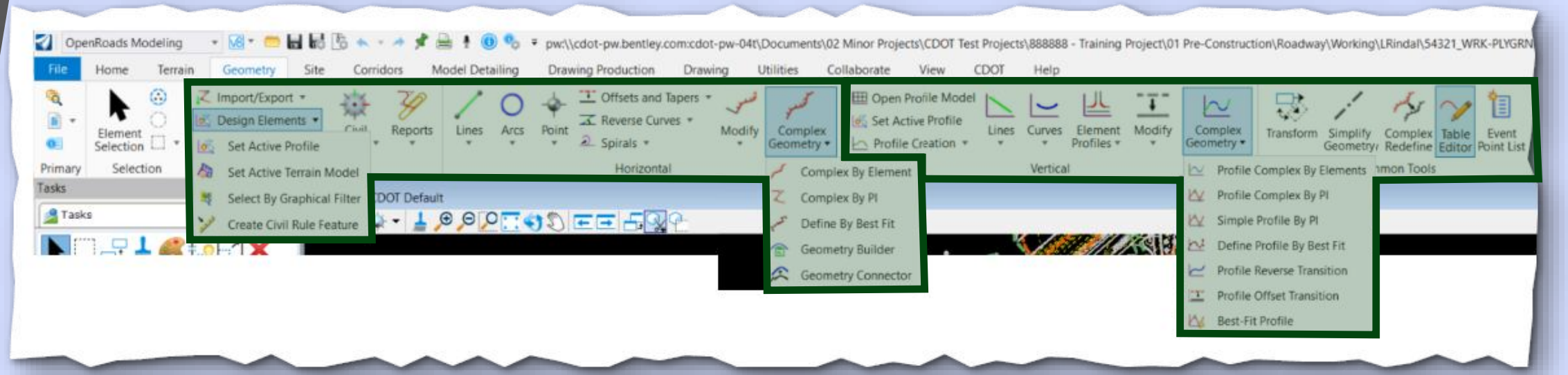
Day 3

Geometry



Horizontal Geometry

- Methods for Alignment Creation
- Complex By PI
- Setting Civil Rule
- Import/Export
- Editing Horizontal Geometry
- Annotation
- Geometry Reports

Vertical Geometry

- Methods for Profile Creation
- Profile Complex By PI and Insert Curve
- Profile Complex By Elements
- Import/Export
- Editing Profiles
- 3D Cuts
- Profile Project To Element
- Annotation
- Geometry Reports

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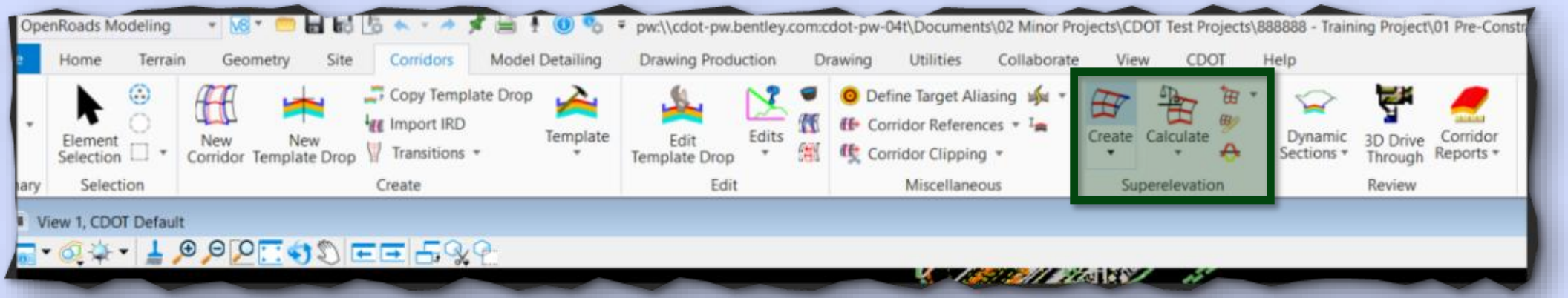
Geometry

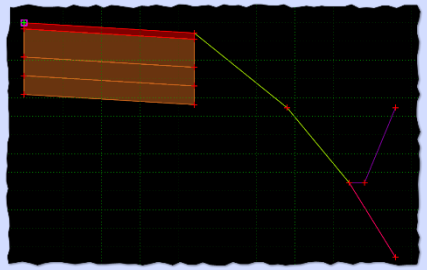


Superelevation

- Superelevation Sections and Parametric Constraints Controls
- One Superelevation Section per Alignment and Separate Files
- Edited Graphically or by Superelevation Dialog
- Import Superelevation by CSV and Editing

Day 4

Roadway Templates



Template Library and Template Setup

- Best Practices

Naming Conventions

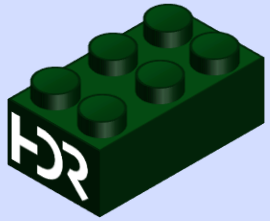
- Importance of Identification and Selection
- Naming Convention Spreadsheet

Creating Templates

- Template Points and Components
- Assigning Feature Definitions
- Assigning Points and Component Constraints
- Template Organizer

Display Rules and Switches

- What Conditions to Use
- Organization of Conditions

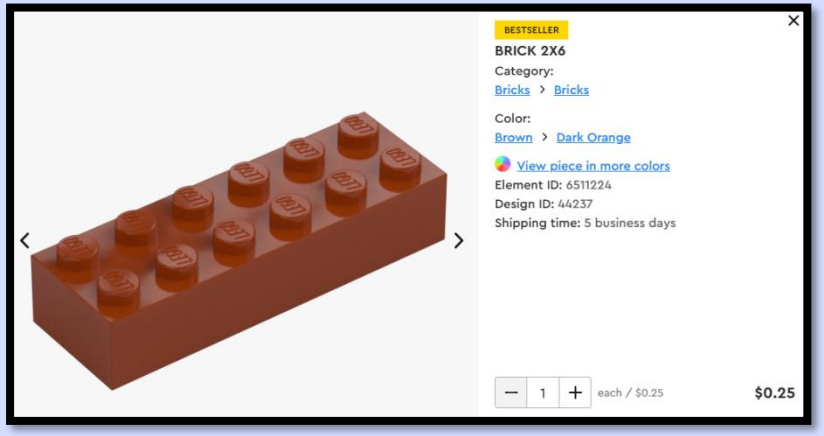


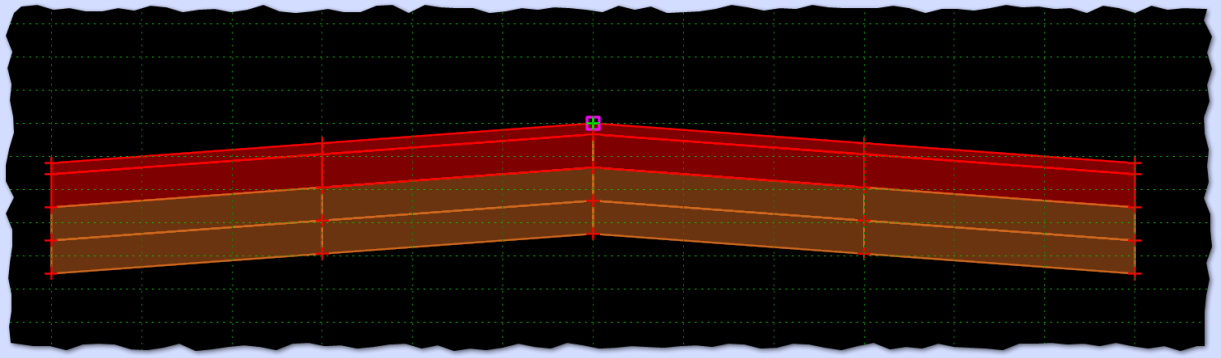
End Conditions

- "Building the Tree"

Target Aliasing Setup

- Setting Seek Points





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Day 5

Design and Corridor Modeling

Setup and Creation of Corridor
- Best Practices

Corridor Objects (Bucket)
- Template Intervals
- Point Controls
- Parametrics
- Key Point Stations

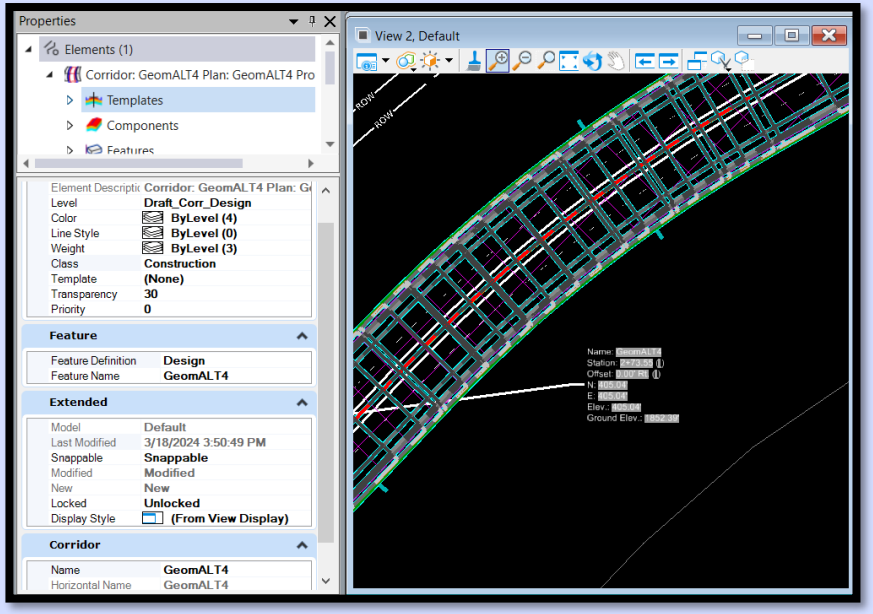
Modeling Pavement Area
- Best Practices

Corridor to Corridor Modeling
- Utilizing Corridor Edges

Assigning Superelevation
- Connecting Corridor

Target Aliasing
- Gore Areas
- End Conditions

Linear Templates
- Pros and Cons



Surface Templates
- Create Pavement Sections

Corridor Clipping and Referencing
- Best Practices

Corridor Updates and Reattach
- Synchronizing
- Connecting to Geometry

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Day 6

Proposed Terrain Models

Setup and Creating Terrains

- Best Practices

Methods for Creating Terrains

- From Elements
- Top Mesh Method
- Graphical Filter

Feature Grading

- Using Feature Data Integration

Editing Terrains

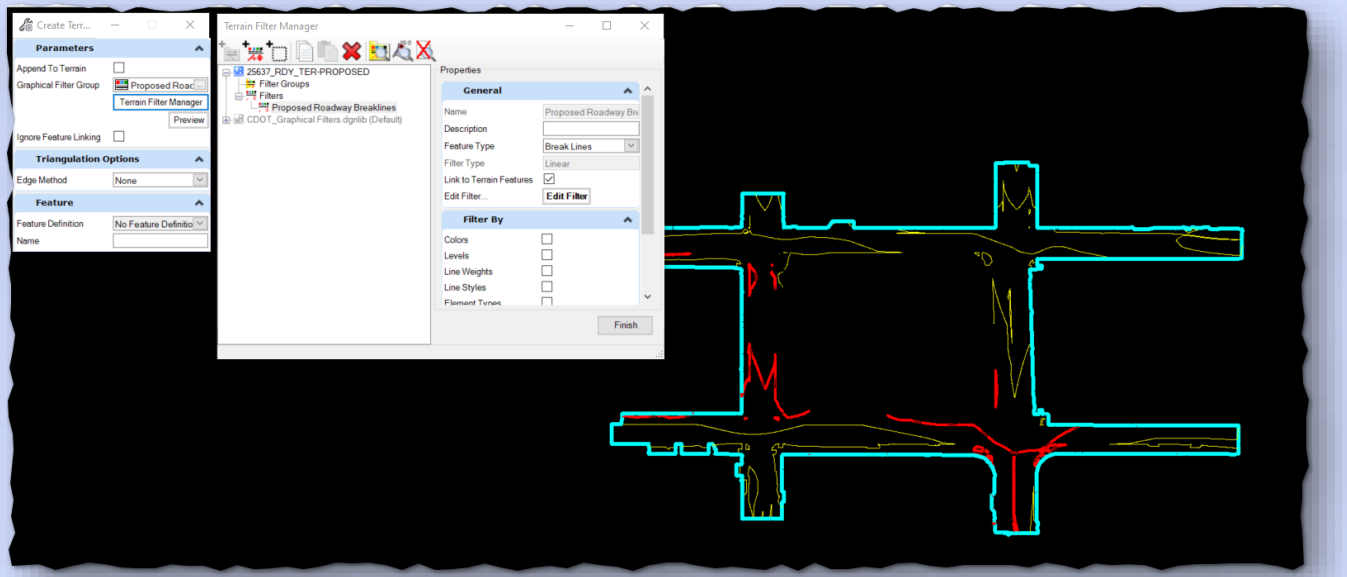
- Adding Additional Features
- Updating Graphical Filter Terrains

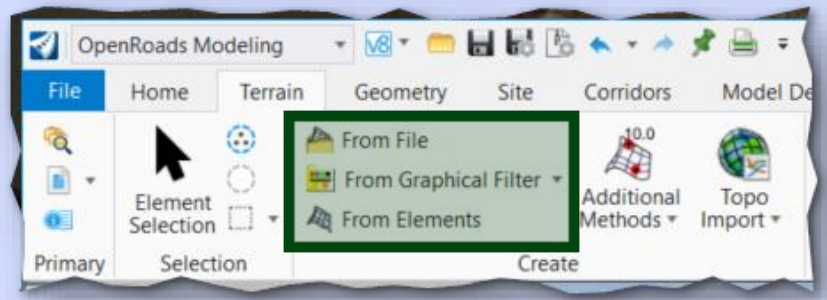
Creating Groups, Holes, Closing Terrains

- Adding to Terrains

Creating Proposed Complex Terrain

- Method Used





Calculating Earthwork

Setup for Earthwork Calculations

- Best Practices

Creating Cut and Fill Volumes

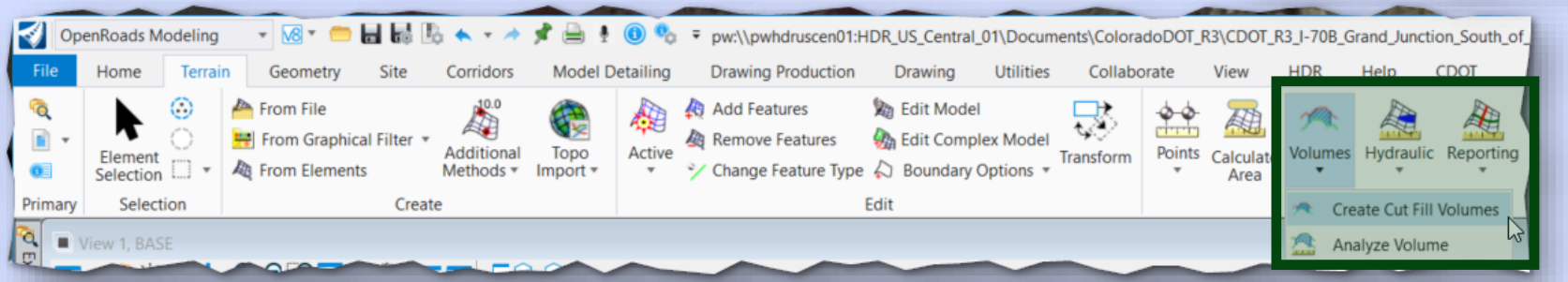
- Surface to Corridor

End Area vs Volumetric Calculations

- Utilizing Cross Sectional Named Boundary
- Analyze Volume

Method for End Area Volumes

- CDOT Specification



Day 7

Plan Production

Sheet Setup
- Best Practices

Containers Used for Plan Production
- Specialty Group Containers

Creating Named Boundaries and Sheets
- Plan
- Profiles, Plan and Profiles
- Cross Sections

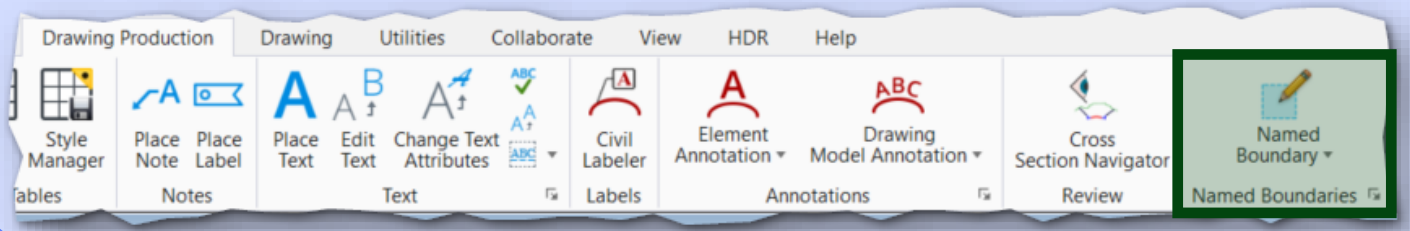
Production Annotation
- Element Annotation
- Using Civil Labeler
- Place Note

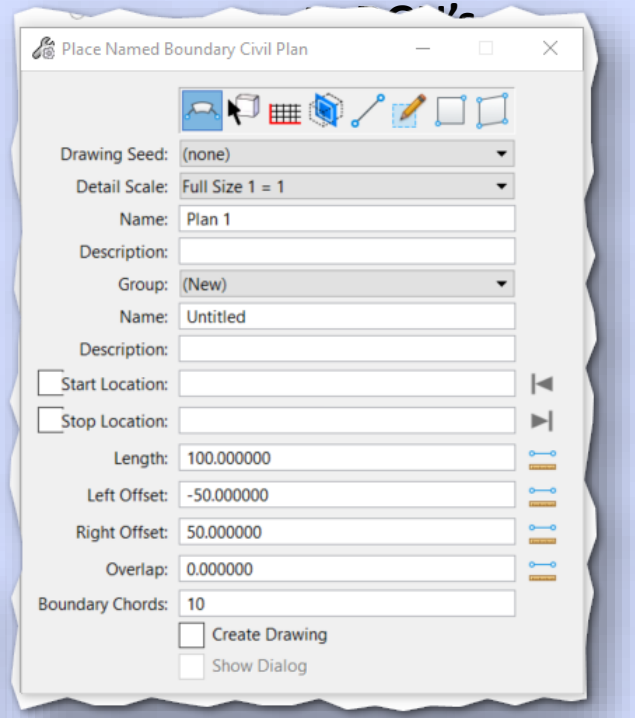
Creating Typical Sections
- Utilizing Cross Sections

Creating General Sheets
- Utilizing PDF's

Creating Quantity and Tabulation Sheets
- Spreadsheets

Printing
- One Print Driver
- One Pen Table
- Plot Sets





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Model and Electronic Digital Deliverables

Project Deliverables
- Best Practices

Creating XML Files
- Alignments (Checks)
- Terrains (Checks)

Model Files
- Corridor Files
- Terrain Files

Spreadsheets
- Using What's in the Plans

Defining Deliverables
- Consistent
- Repeatable
- Consumable

Thank You!

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Until Next Time!

Contact Jeremy Colip