

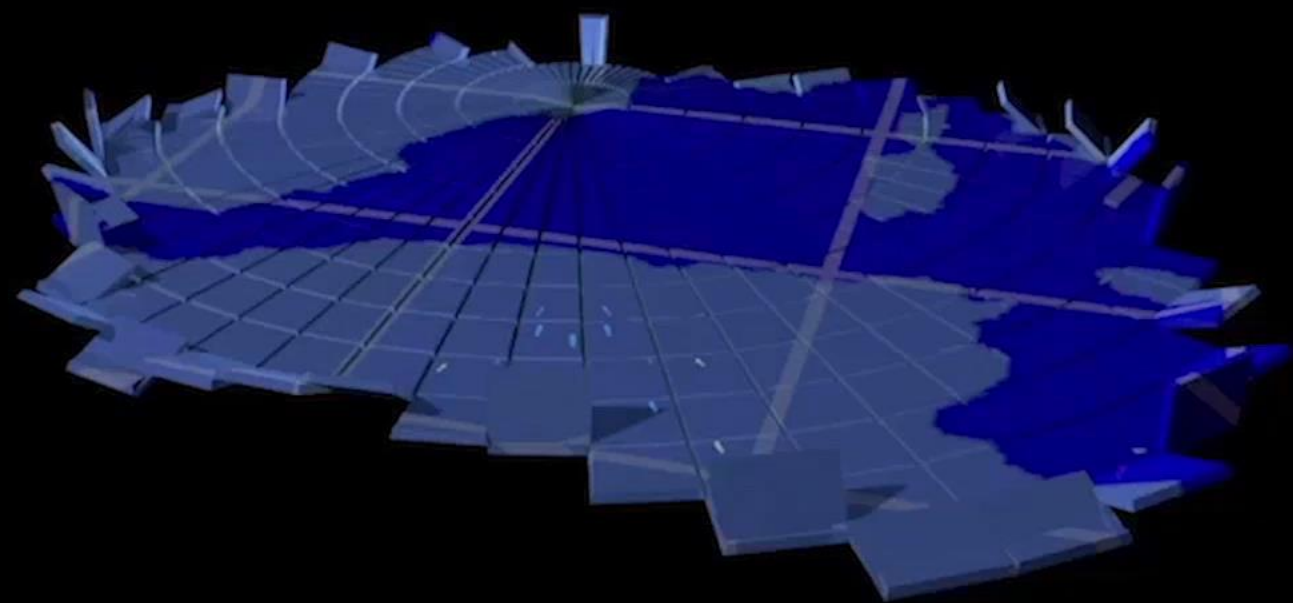


2022 Transportation Campaign

Introduction: Jameese McCray

- From Baton Rouge, Louisiana and received my B.S. in Civil Engineering from Southern University and A&M College.
- Experience in Structural Design and Project Engineering in the Petro-Chemical industry and has experience in MicroStation and other Bentley products.
- As a **Product Success Manager** with Virtuosity, I help Engineers, Architects, & Designers implement the technology that will enable them to maximize their efficiency while providing the best value design to their clients.





MicroStation: Modeling, Documentation, and Visualization Software

- With MicroStation, you can model, document, and visualize infrastructure projects of any type, scale, and complexity using a comprehensive set of design and documentation capabilities to reliably deliver even the most demanding projects.
- In addition, you can speed the production of detailed drawings and documentation, renderings, and animations.
- Reliably integrate any existing design content and work with any-size team using virtually any mix of design applications. MicroStation enables you to develop and document better designs in less time by better connecting you to your tools, data, and teams.



MicroStation: Working with DWG Data



AUTOCAD

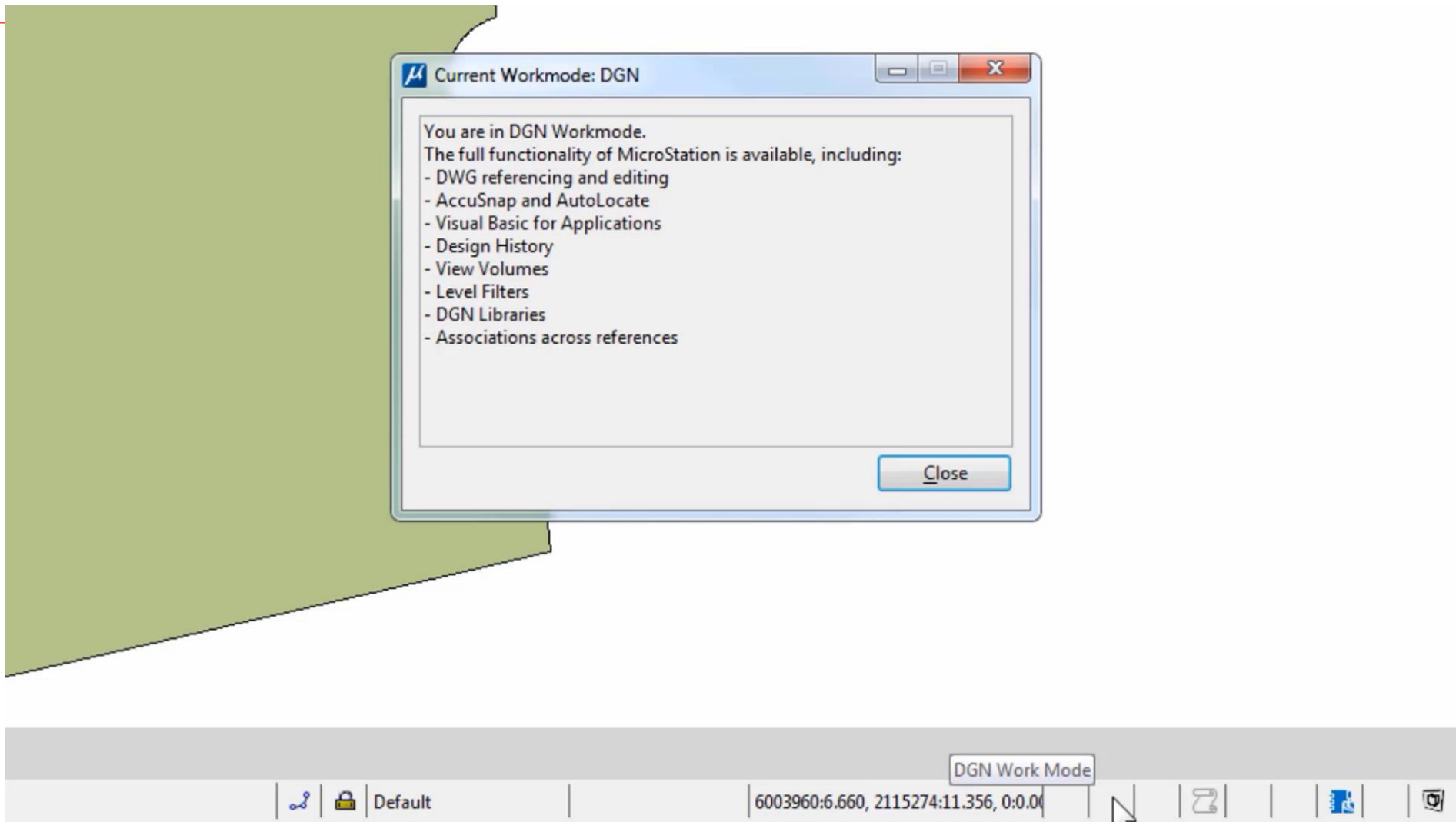


MicroStation
CONNECT Edition



MicroStation: Working with DWG Data

- MicroStation supports a mixed file format environment, which means that you can use DGN and DWG data in project files simultaneously. DWG files can stay in DWG format, and DGN files can stay in DGN format.
- Typically, you might maintain the main design file in MicroStation, but have project subcontractors who provide their portion of the project in DWG format.

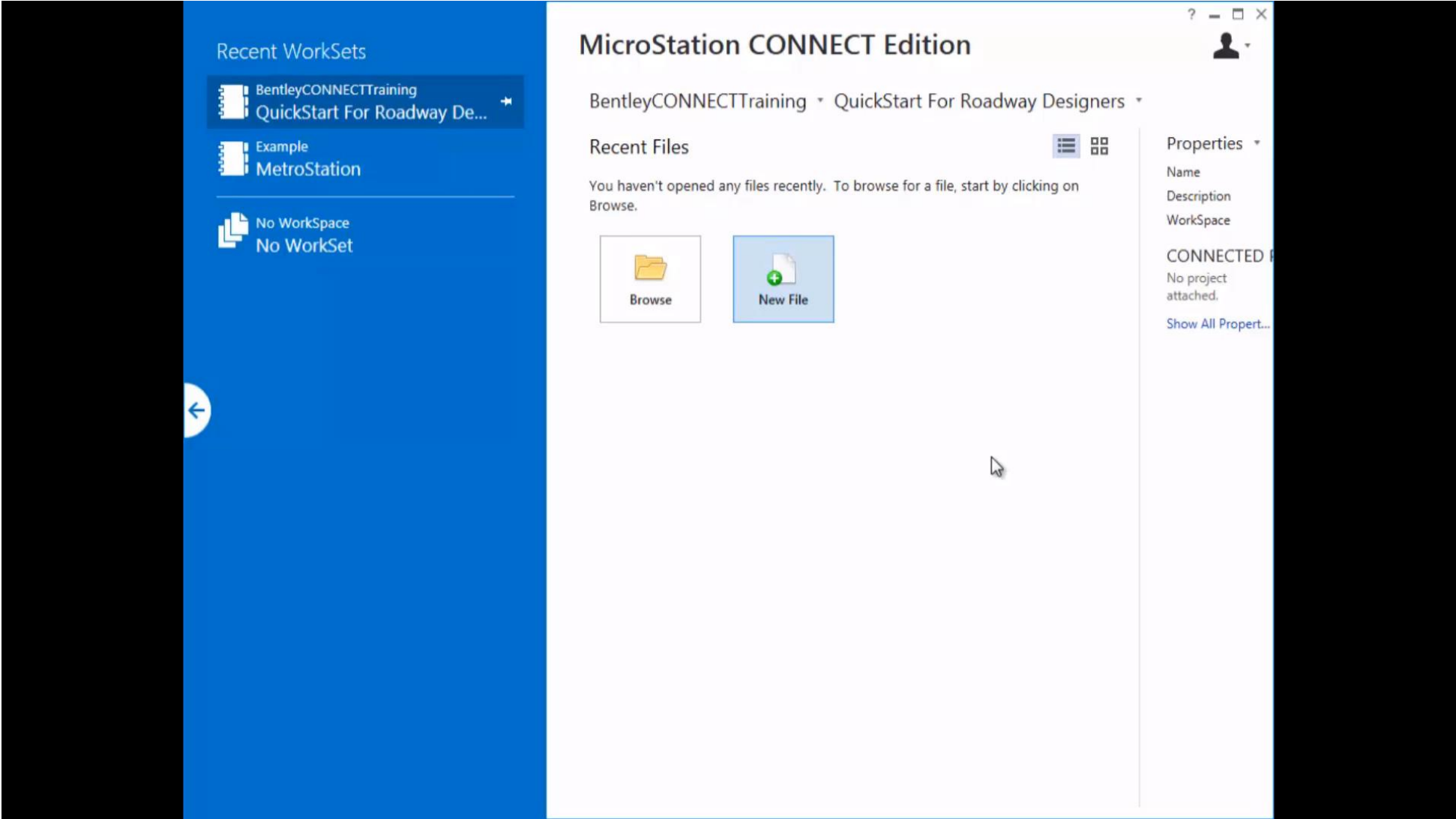


MicroStation: Develop Better Designs, Faster

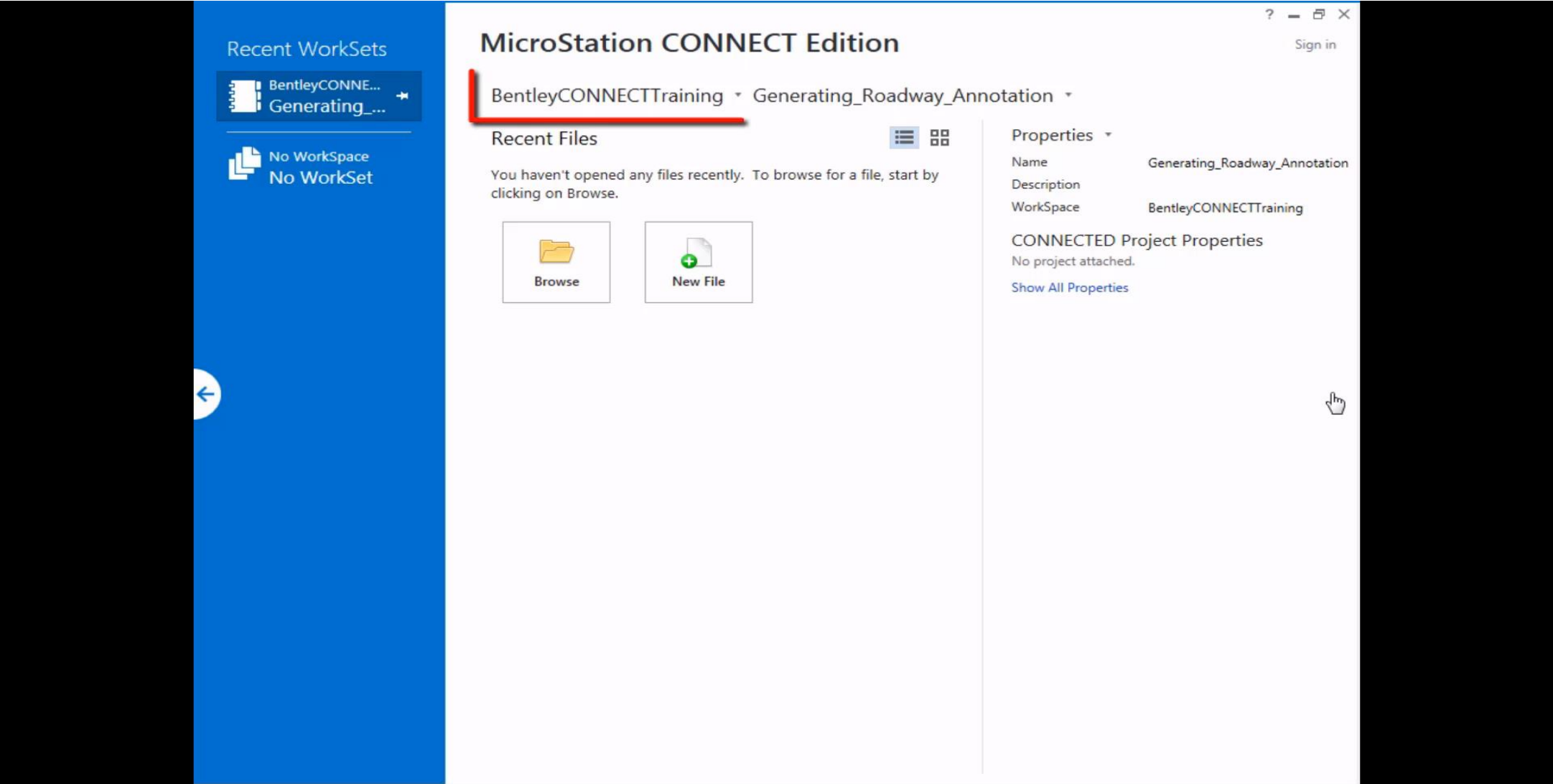
- Design in 2D
 - Develop precise drawings using a comprehensive set of drafting tools to efficiently create 2D geometry. Rapidly progress your designs from concept to completion using persistent constraints to maintain your design intent.
- Design in 3D
 - Develop models with a wide range of 3D design tools. Build and edit curve, surface, mesh, feature, and solids models. Build functional and parametric components with predefined variations to simplify managing and finding many similar components



Roadway Geometry



Roadway Plan & Section Labeling



MicroStation: Develop Better Designs, Faster

- Develop Hypermodels
 - Present documentation and related design information within the spatial context of the 3D model to significantly improve their clarity. Embed links to related Microsoft Office documents and websites. Easily navigate from content in one file or model to others.
- Analyze and Visualize Models
 - Analyze and visualize models based on their geometry or attributes. Detect and resolve clashes; perform analysis of real-world solar exposure and shading. Apply real-time display styles to visualize models based on each object's height, slope, aspect angle, and other embedded properties.



MicroStation: Develop Better Designs, Faster

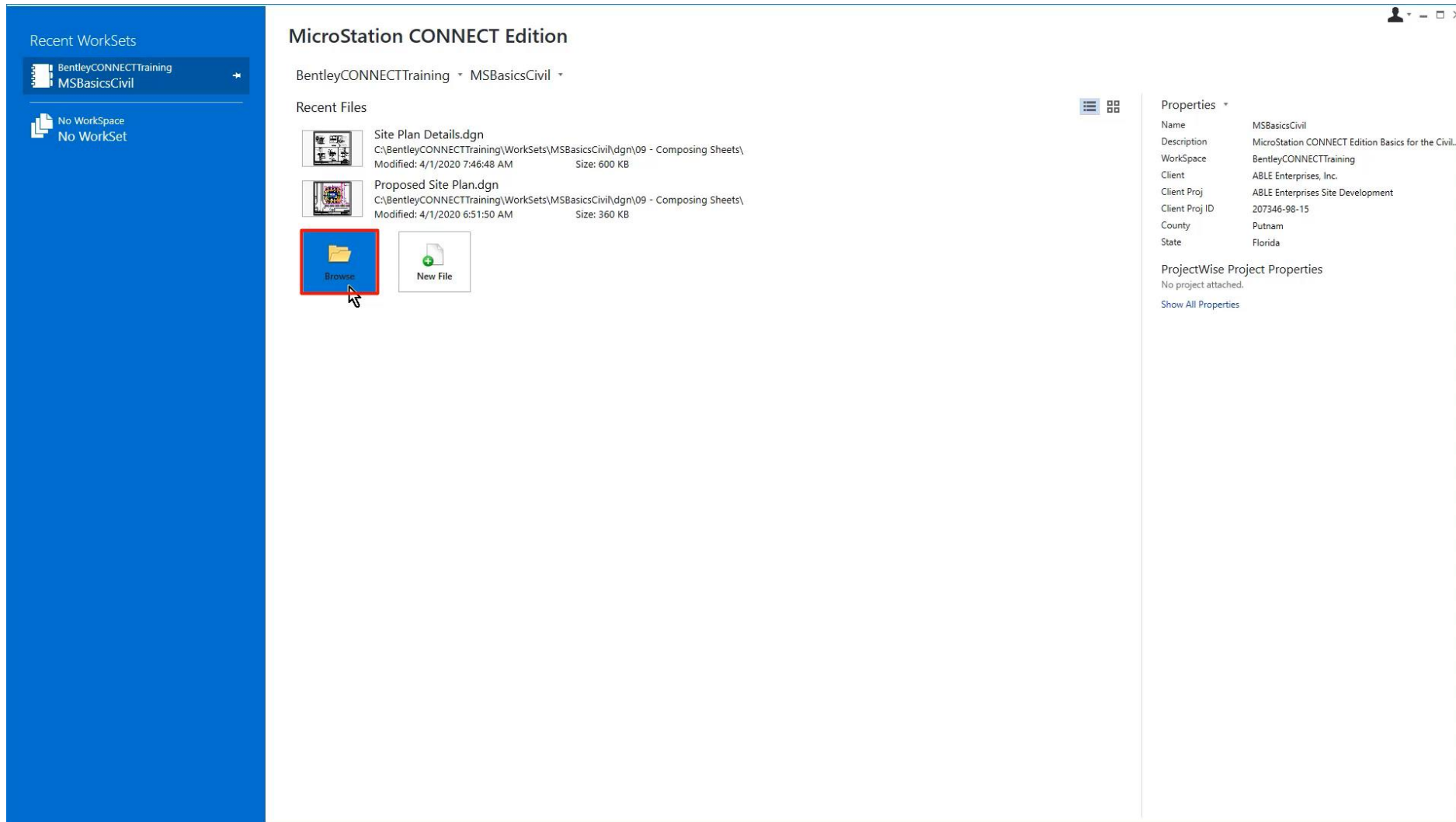
- Automate Common Tasks
 - Speed design tasks and related workflows with intelligent interactive snapping. Improve productivity with AccuDraw for dynamic data entry with heads-up display. Customize and group tools and tasks and reduce keystrokes with keyboard position mapping and the ability to quickly customize cursor menus.
- Control and Protect Files
 - Ensure that only certain individuals can view and/or edit files within a pre-defined time limit. You can ensure the integrity of your documents using digital signatures and control the digital rights to view, edit, print, and copy file contents, including a pre-defined expiration date when the file can be accessed.



MicroStation: Better Informed Teams

- Create Animations
 - Produce realistic movies and simulations from design, construction, and operational models with the built-in Luxology engine. Choose from keyframe and time-based animation. Get the results you want, faster, using live on-screen animation previews and distributed network processing.
- Create Lifelike Renderings
 - Create lifelike visualizations using built-in Luxology rendering. Use online and delivered libraries of physically correct materials, lighting, and rich photorealistic content (RPC). Get results faster with distributed network rendering.

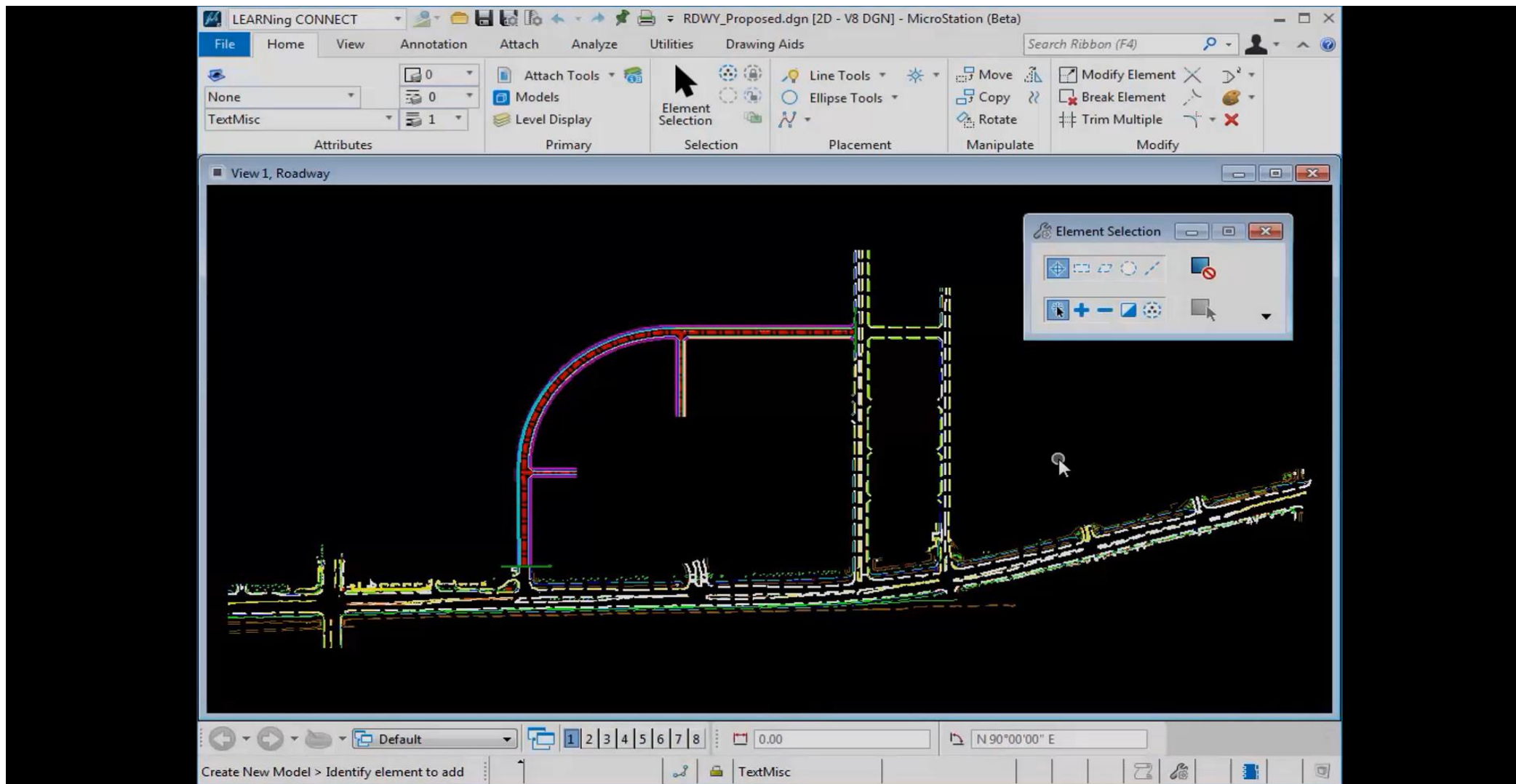
Adding Raster Images



MicroStation: Better Informed Teams

- Generate Intelligent Documentation
 - Generate consistent, high-quality paper and digital deliverables such as paper plots, reports, 2D/3D PDFs, and 3D physical models. Automate and speed annotation, display styles, and reports by generating them directly from the embedded properties of objects. This automates and speeds annotation, display styles, and reports and gives you confidence that they will always remain in sync with the model during work in progress.

Creating Sheets from Project Data

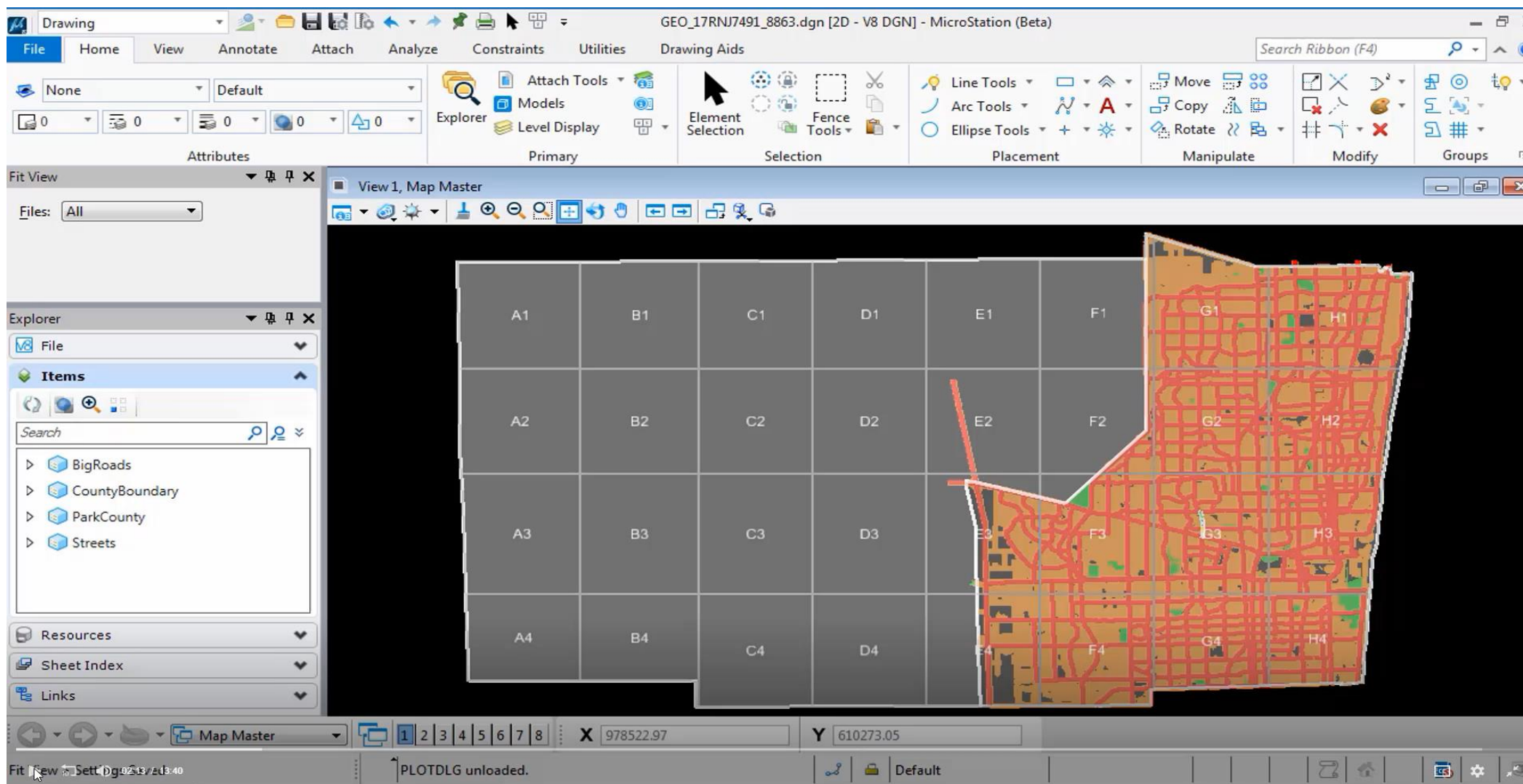


MicroStation: Better Informed Teams

- **Publish i-models**
 - Exchange project models and information using i-models. With i-models, you can implement unique and powerful workflows for information sharing, distribution, and design review. These workflows can be further enhanced using ProjectWise and other products and services that leverage the power of i-models.
- **Review Designs Collaboratively**
 - Create and exchange digital markups of designs with built-in tools. You can easily markup models and drawings with redlines and comments and manage them through a markup dashboard.
- **Maintain and Enforce Standards**
 - Ensure the proper application of organizational and project specific standards. Apply templates to control geometry and data standards such as styles for dimensions, text, lines, detail symbols, and more. Once designs are complete, use automated tools to check drawings for standards compliance.



Working with Geographic Data



MicroStation: DGNLib

- A DGN library is a DGN file used to store:
 - Cells
 - Levels
 - Level filters
 - Display styles
 - Line styles
 - Multi-line styles
 - Text styles
 - Dimension styles
 - Detailing symbol styles
 - Standards Checker settings
 - Element templates
 - Ribbon customizations
 - Explorer link sets
 - Print styles
 - Customized tools, ribbon, toolboxes, and tasks

MicroStation: DGNLib

- A DGN library has the same file format as a DGN file, except that it has a different file extension. The recommended file extension is *.dgnlib. The procedure for creating a DGN library, either by creating a new file from the beginning or by copying an existing file and saving it with a new name, is the same as for any DGN file.
- After DGN libraries are created, you need to set the configuration variable MS_DGNLIBLIST to point to the libraries in order to use them. Once this has been done, the shared resources stored in the DGN libraries will be available to you when you open a DGN file. For example, when you open the Element Templates dialog, all element templates in the configured DGN libraries appear in the list of element templates.

MicroStation: Element Templates

- When adding properties to a template you can select them from the following categories:
 - General
 - Closed linear
 - Text styles and text style overrides
 - Cells
 - Points
 - Patterns/Hatch
 - Multi-line styles
 - Dimension styles
 - Detailing Symbol Styles
 - Materials
 - Items
 - Terrain Model

MicroStation: Element Templates

- When you add a template, it adopts the following properties from the active settings in the Attributes toolbox:
 - Level
 - Color
 - Line Style
 - (Line) Weight

MicroStation: Point Cloud Solution

- Point clouds are a rich source of information that may be used to supplement a civil design workflow. A point cloud can provide background information for a project, be used to verify geographic data, or view existing infrastructure.
- In MicroStation CONNECT you can attach a point cloud to a DGN and use it as a visual reference. The Point Cloud dialog, along with the Point Cloud toolbox, lets you control all aspects of attaching and manipulating point cloud files.

MicroStation: Point Cloud Solution

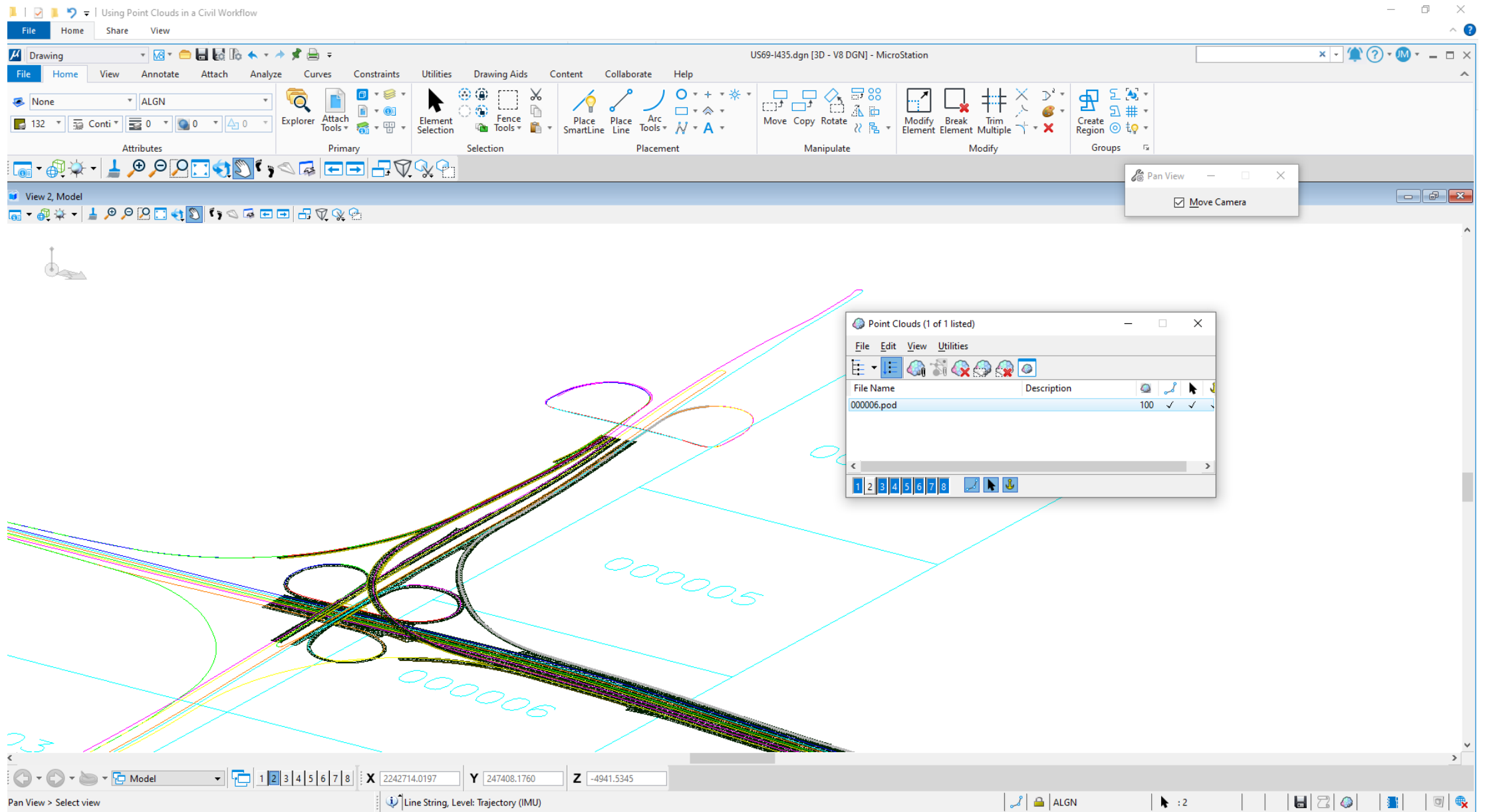
- Attach a point cloud to use as a visual project reference in a MicroStation-based workflow
- Convert from LiDAR format to the POD format
- Modify the presentation style of a point cloud
- Review the point cloud data with Element Information
- Modify the displayable area by defining clip boundaries and clip masks

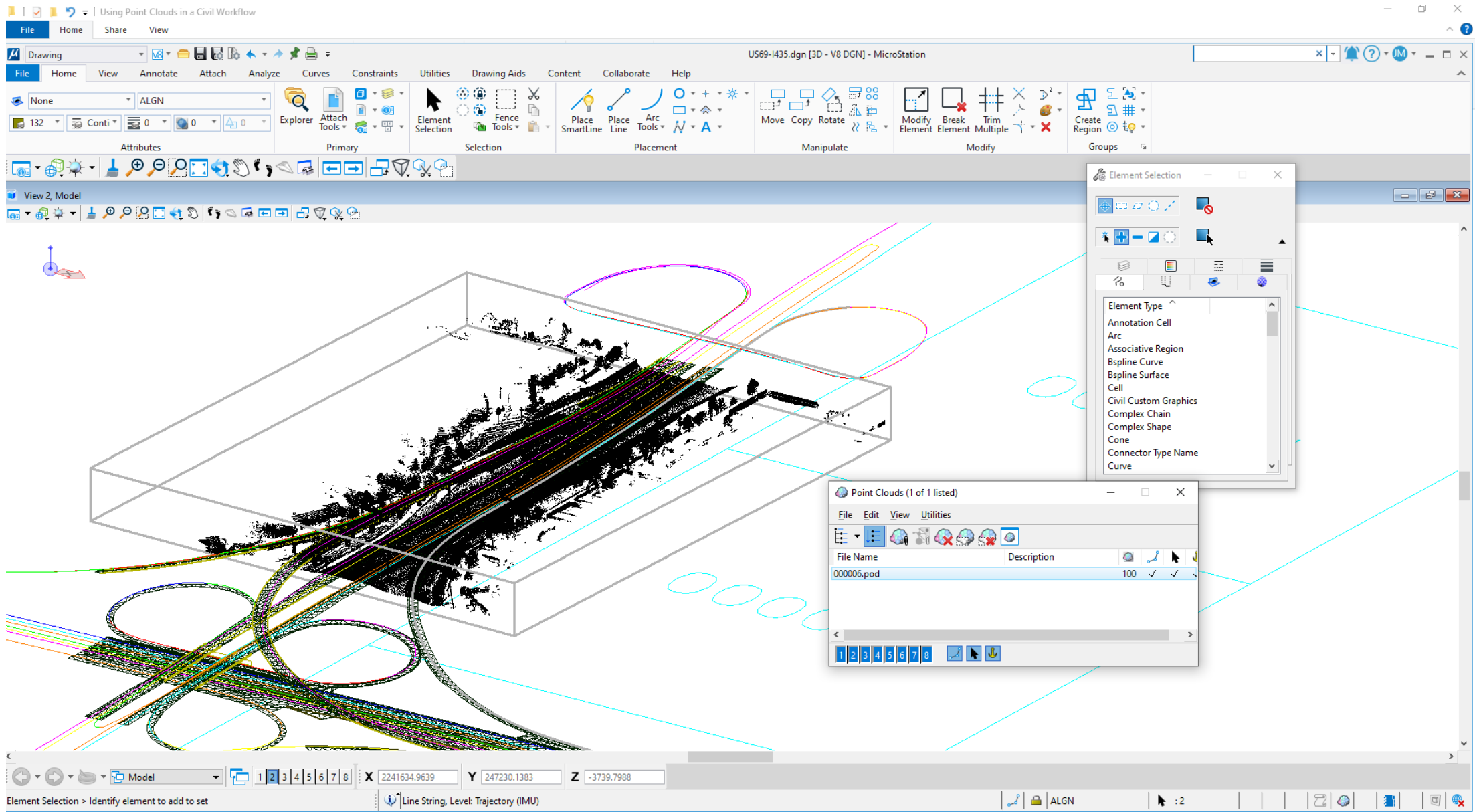
MicroStation: Point Cloud Solution

- Many point cloud file formats are supported, such as POD, BIN, CL3, FLS, FWS, LAS, PTG, PTS, PTX, 3DD, RXP, RSP, XYZ, IXF, E57, and TXT.
- However, only POD files can be attached to a design file since it is the only point cloud format that can be natively used by the point cloud engine. This engine is a library developed by Pointools.
- The POD format allows you to work with huge point clouds at an unmatched performance. For all other formats, the file must be converted to the POD format

MicroStation: Point Cloud Solution

- **Snap:** Allows you to turn on or off the Snap functionality. If the icon is pressed, the setting is on allowing MicroStation command to span to points in the point cloud. This can be helpful when creating geometry or using measuring commands.
- **Locate:** Allows you to turn on or off the Locate functionality. If the icon is pressed, the setting is on allowing you to locate points in the point cloud.
- **Anchored:** Allows you to turn on or off the Anchored functionality. This means that the point cloud will not be affected by commands such as Move, copy, rotate, delete etc





Why MicroStation?



Produce all deliverables
with one application



Explore more design
options



Integrate any data type



Ensure project-specific
standards

MicroStation and Transportation Projects

Landscape Graphics

Create 3D Utility Graphics

Hydraulic Graphics

Place Guardrail Lines

Bridge Typical Section

3D View Controls

Project and Design Model



MicroStation and Transportation Projects

Plan/Profile Sheet for Intersection

Project Specific Boards

General Bridge Layout

General Notes/Details for Sheets

Annotate Bridge/Roadway

Roadway Signs

General Roadway Layout



OpenRoads Designer: The Ultimate Roadway Design Software





OpenRoads Designer: The Ultimate Roadway Design Software

- The application provides complete detailed design capabilities for:
 - Conceptual Design
 - Surveying
 - Geotechnical
 - Road Design
 - Site Design
 - Drainage and Utilities
 - Visualization
 - Contract Documents

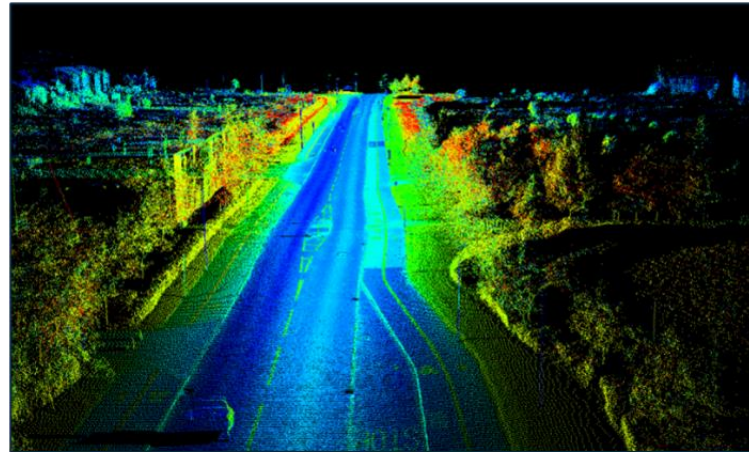
ConceptStation

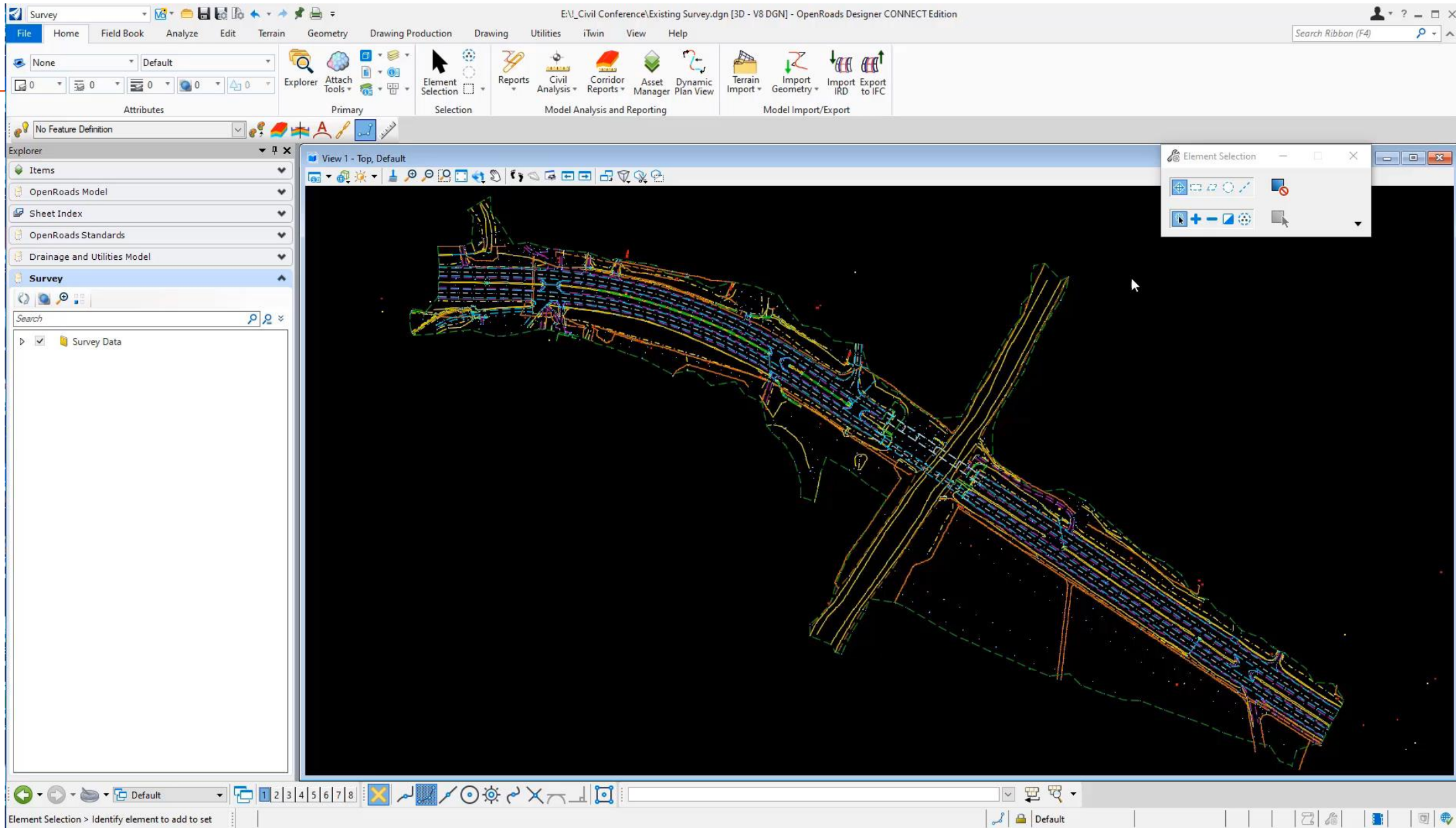
- Allows you to rapidly create conceptual designs and improve the decision-making process. OpenRoads ConceptStation offers roadway and bridge design capabilities to help road and land development engineers create intelligent models in context. Explore conceptual design options with real-world data and cost analysis to improve project results.



Survey

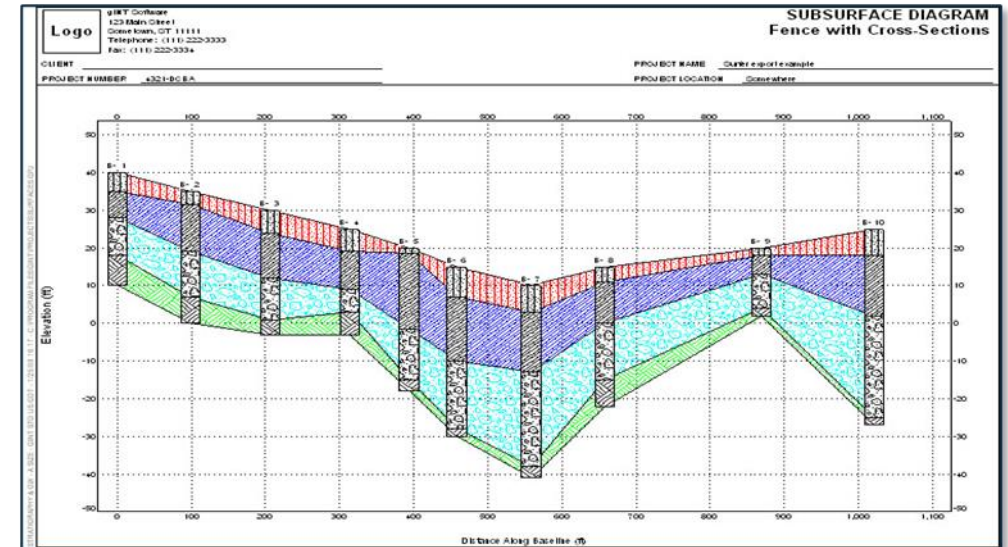
- Import and process data from various source including industry standard survey equipment
- Total Station data
- GPS data
- LiDAR
- Reality Models
- Create existing terrain





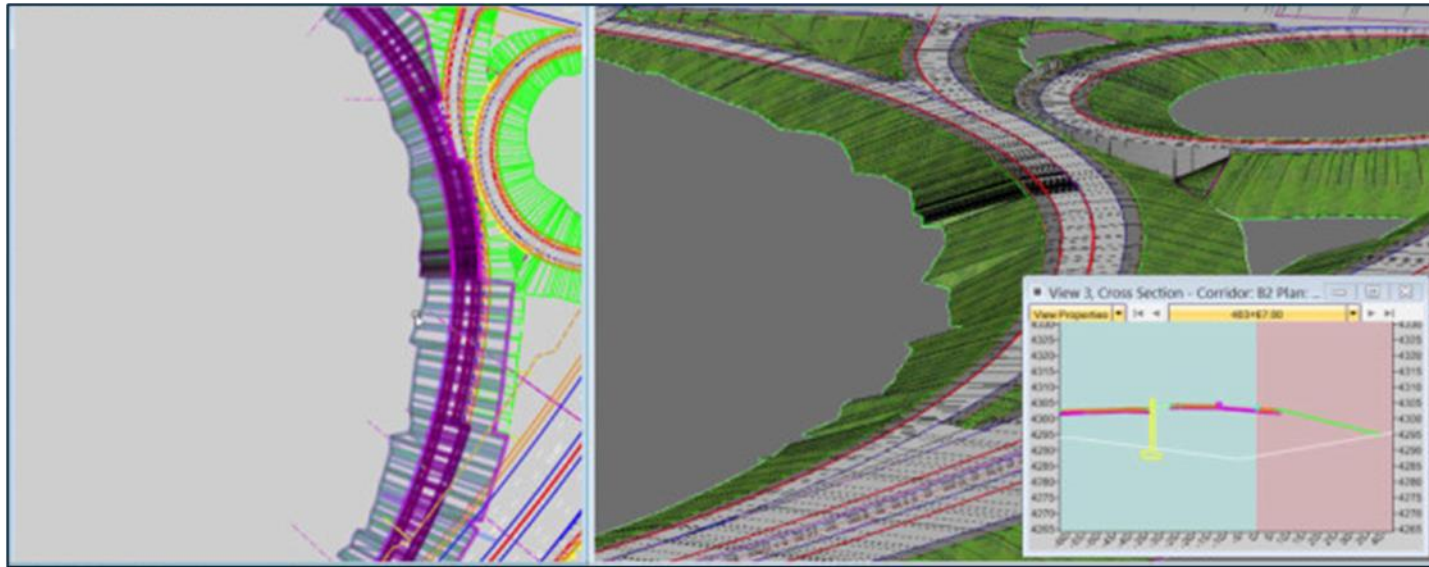
Geotechnical

- Connect to geotechnical database
- View borelog in 3D
- Create Fence Diagrams
- Report on borelogs
- Create subsurface strata



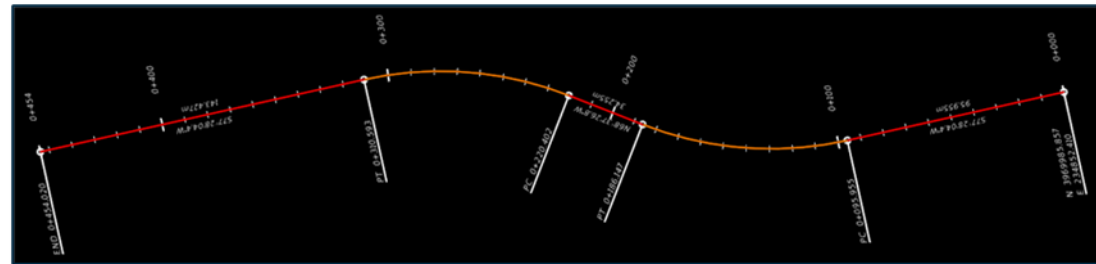
Road Design

- OpenRoads Designer road modeling capabilities are unsurpassed. From geometry layout, superelevation, typical sections (templates), simple and complex corridors for all types of scenarios.



Road Design: Geometry

- Provides multiple geometry tools to layout base line geometry for simple and complex project, right-of-way, parcels, and more...
- Horizontal Alignment
- Vertical Alignments
- Best Fit
- Complex Alignment
- Parcels
- Boundaries
- Superelevation



File Home Field Book Analyze Edit Terrain Geometry Drawing Production Drawing Utilities iTwin View Help

Search Ribbon (F4)

Primary Selection Create Edit

Element Selection From File From Graphical Filter From Elements Additional Methods Topo Import Active Edit Model Boundary Options Transform Points Calculate Area Volumes Hydraulic Reporting Aquaplaning Sight Visibility Graphical Filter Manager Export To File Label Terrain Contours Label Terrain Spots

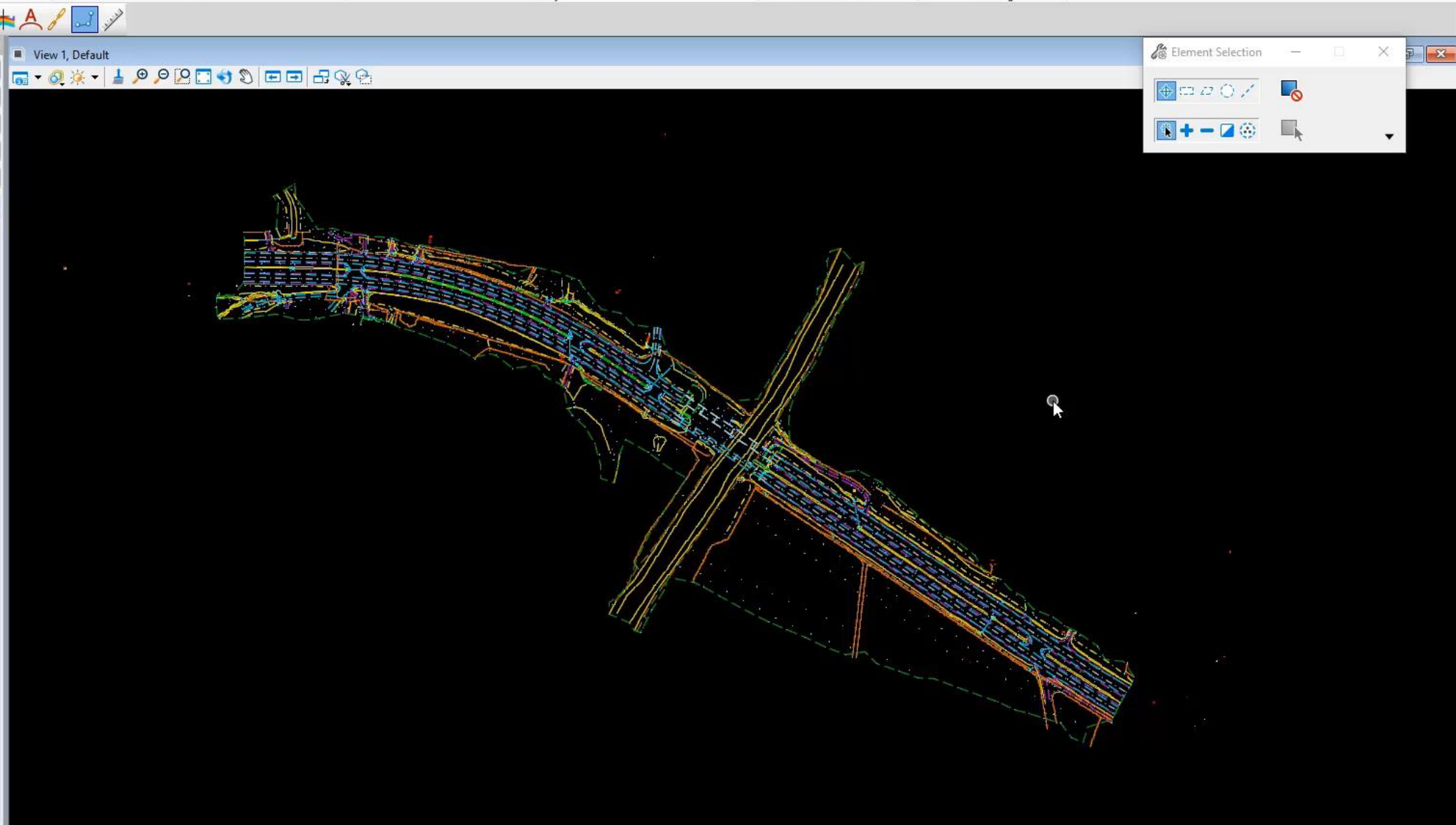
No Feature Definition

Explorer

- Items
- OpenRoads Model
- Sheet Index
- OpenRoads Standards
- Drainage and Utilities Model
- Survey**

Search

- Survey Data



Element Selection

Navigation and selection tools for the Element Selection tool, including icons for pan, zoom, and selection.

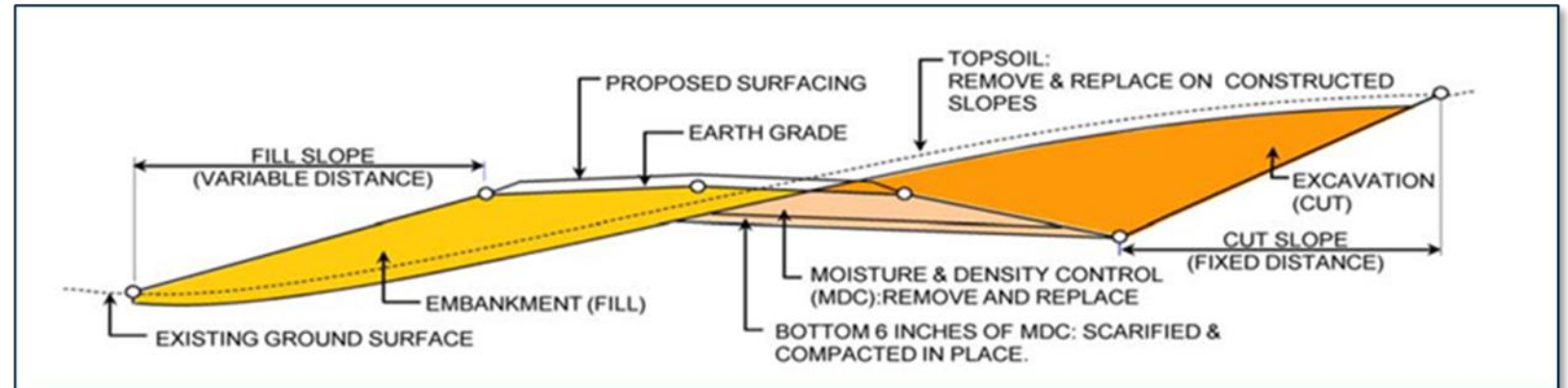
Multi-Model Views 1 2 3 4 5 6 7 8

Element Selection > Identify element to add to set

Default

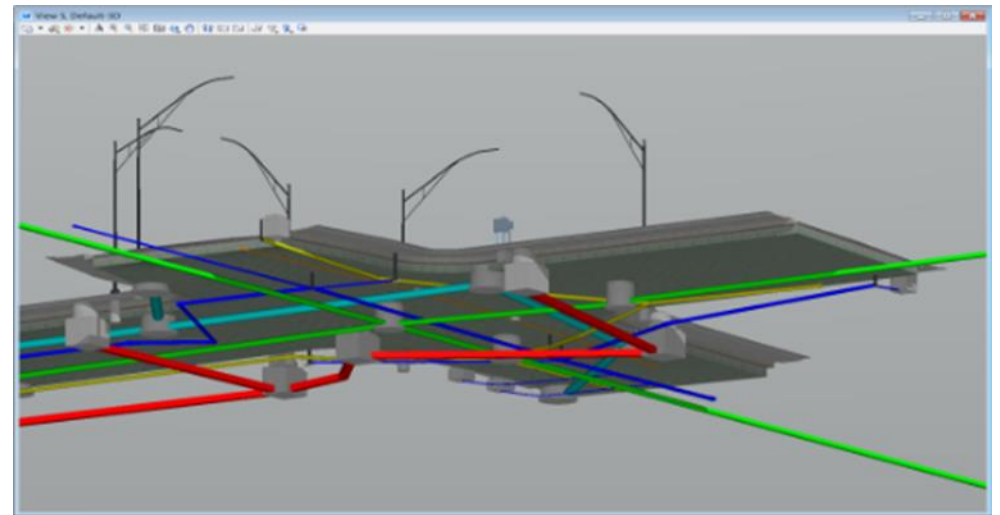
Road Design: Volumes

- Many ways to compute volumes for your project. Volumes can be reported by:
 - Surface to Surface
 - Components
 - End Area
 - Plan Boundary
 - More.....



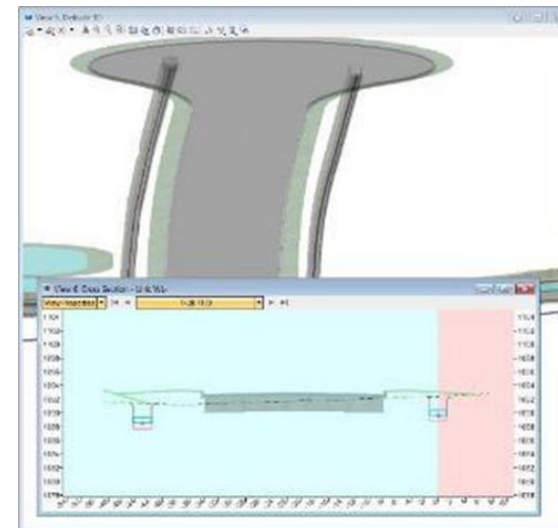
Utilities

- The same toolset can also be used for creating utility models...
- Extract from Graphics
- Import from external files
- A range of layout tools
- Utilities can then be adjusted and regraded, to:
 - Provide better 3D data
 - Avoid conflicts



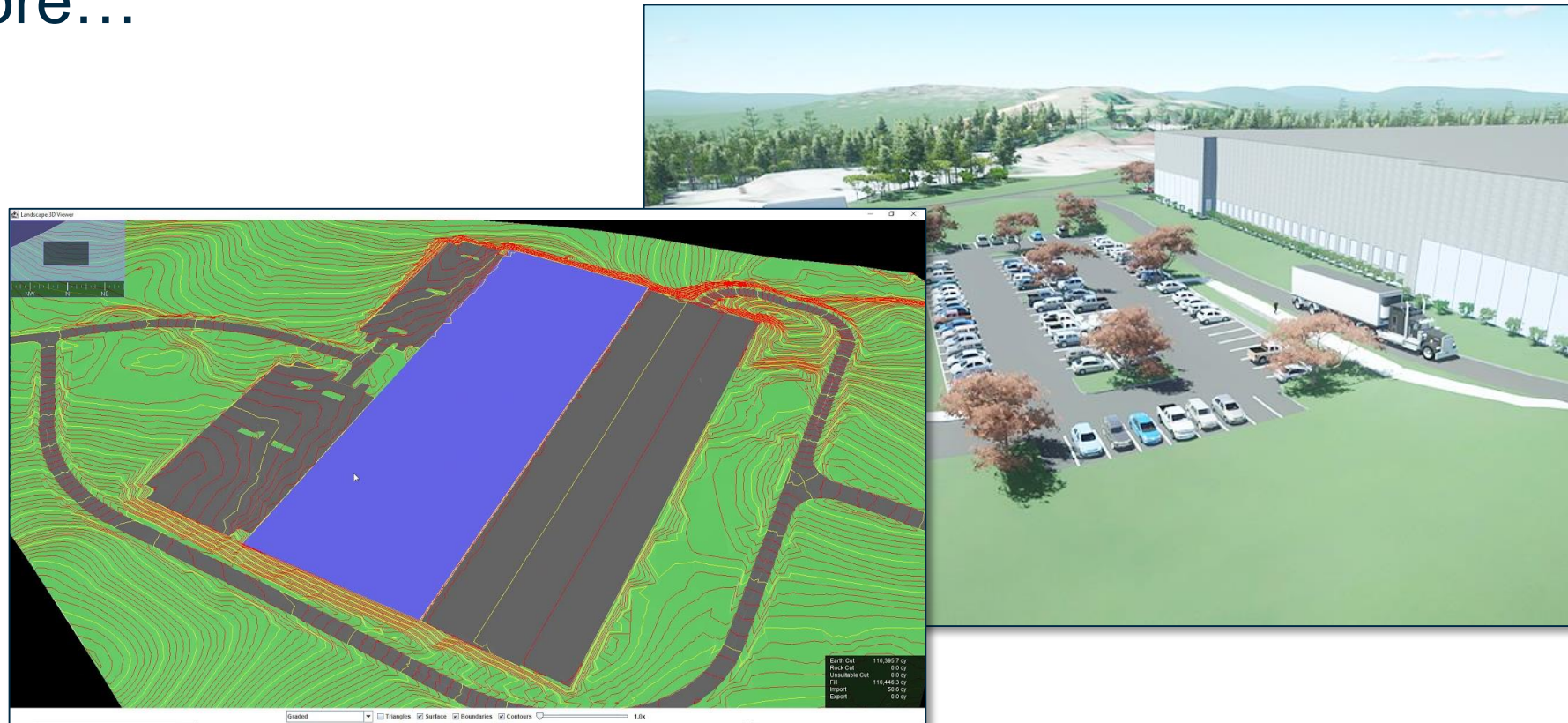
Drainage Design

- Provides several methods of creating drainage models, including Extract from Graphics, Import from external files, and a range of layout tools.
- All create a 3D model, which can reference and be related to the road model.
- Once you have a relationship between the drainage and the road, if the road changes then the drainage updates.
- Because you're using the same file format, it's easy to share and collaborate.



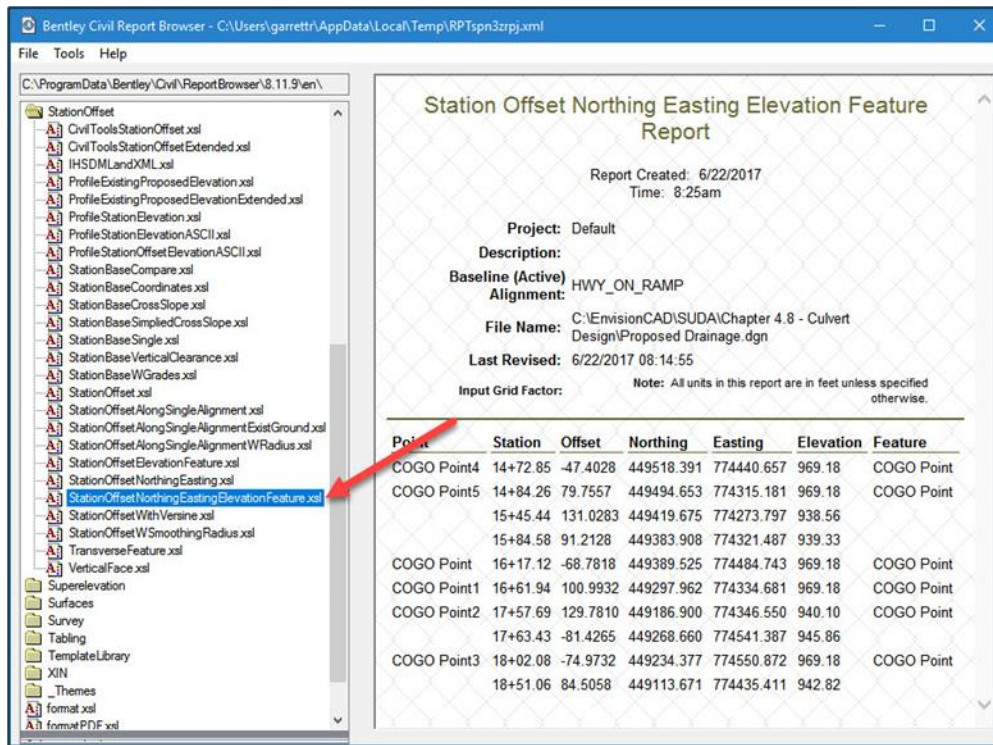
Site Design

- OpenRoads Designer has all the tools for site designs for many types of sites including, rest areas, subdivisions, landfills, mining and more...



Contract Documents: Reports

- OpenRoads Designer reports on geometry, corridors, templates, terrains, superelevation, volumes and more.



The Component Quantities window displays a table with the following data:

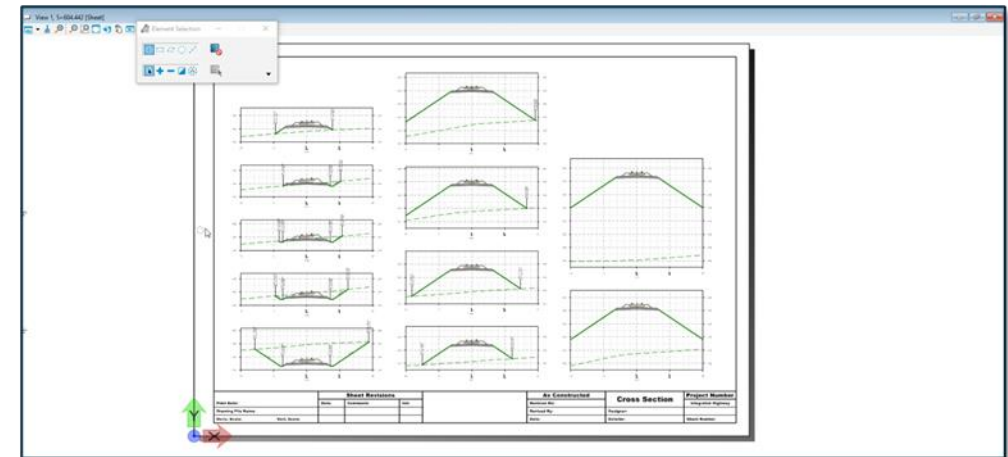
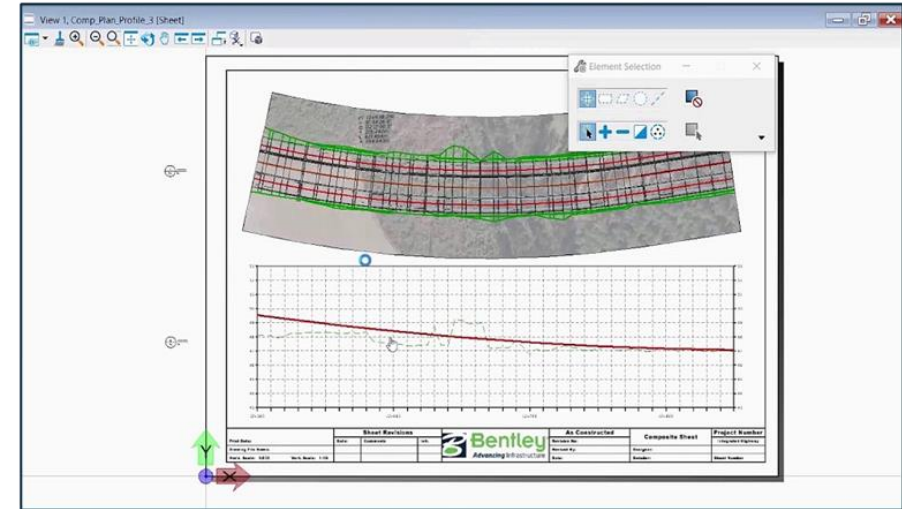
Material	Surface Area	Volume	Units	Unit Cost	Total Cost/Material
Bottom Mesh	0.0000	230.7981	CuM	1.00	230.80
Cut Volume	0.0000	481.3793	CuM	1.00	481.38
Fill Volume	0.0000	419.0631	CuM	1.00	419.06
Grade_Cut	37.6709	0.0000	SqM	1.00	37.67
Grade_Fill	541.9699	0.0000	SqM	1.00	541.97
Road_Pave_Aggregate	0.0000	526.8012	CuM	1.00	526.80
Road_Pave_Concrete	0.0000	158.0404	CuM	1.00	158.04
Road_Pave_Shoulder	0.0000	24.3889	CuM	1.00	24.39
Road_Pave_Subbase	0.0000	351.2008	CuM	1.00	351.20

At the bottom of the window, the **Total Estimated Cost** is 2771.31 and the **Corridor Name** is Sidevej.



Contract Documents: Plan Sets

- OpenRoads Designer automates the contract documents. Plan, Profile and Cross Section sheets can easily be created using the tools provided.
- Whether printing to paper or producing PDF deliverables OpenRoads Designer has all the tools to complete they workflow. (Plug for other presentation)



File Home Terrain Geometry Site Corridors Model Detailing Drawing Production Drawing Utilities iTwin View Help

Search Ribbon (F4)

1"=50'
ACS Plane Lock
Annotation Scale Lock

Primary Selection Clip Saved Views Tables Notes Text Annotations Named Boundaries Drawing Scales

Element Selection
Clip Volume
Create Saved View
Update Saved View Settings
Apply Saved View
Place Table
Place Note
Place Label
Place Text
Edit Text
Change Text Attributes
Element Annotation
Model Annotation
Named Boundary

Explorer

Items

OpenRoads Model

Search

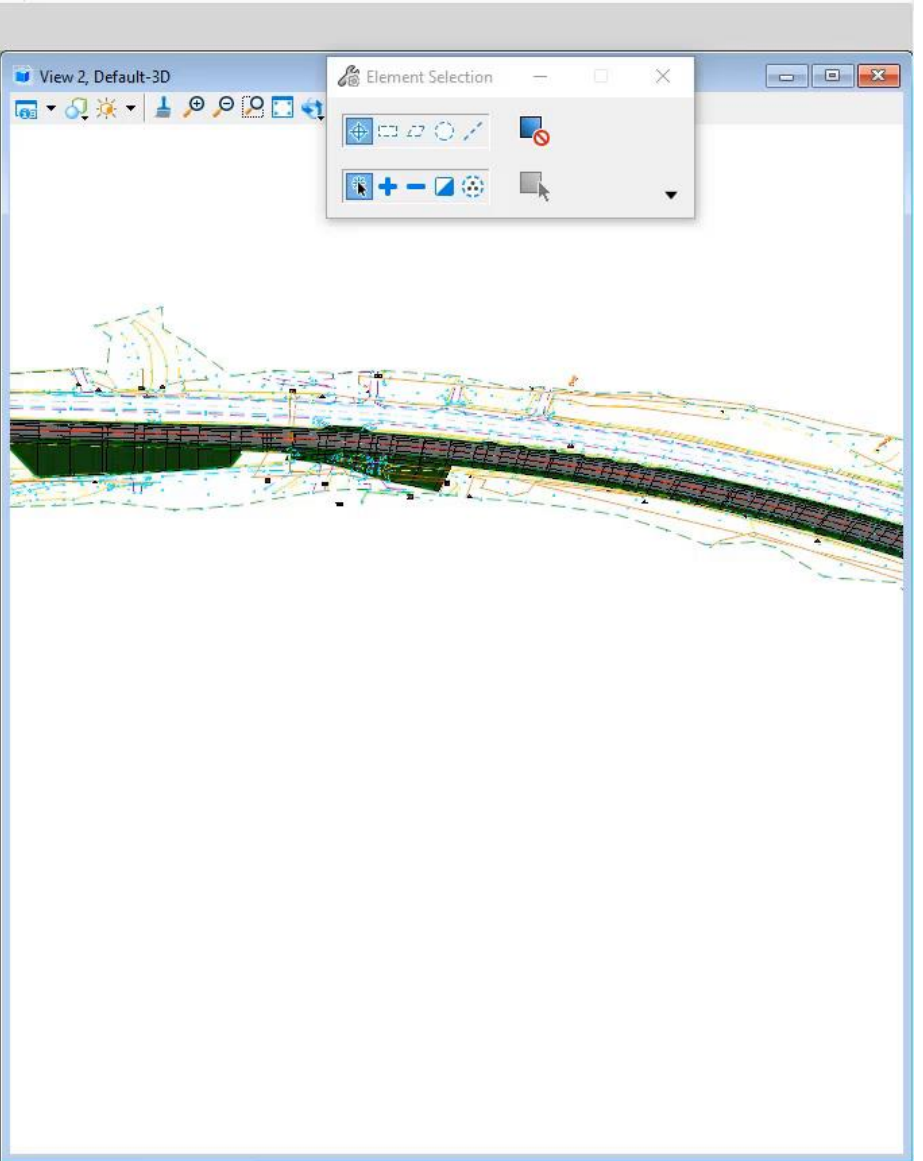
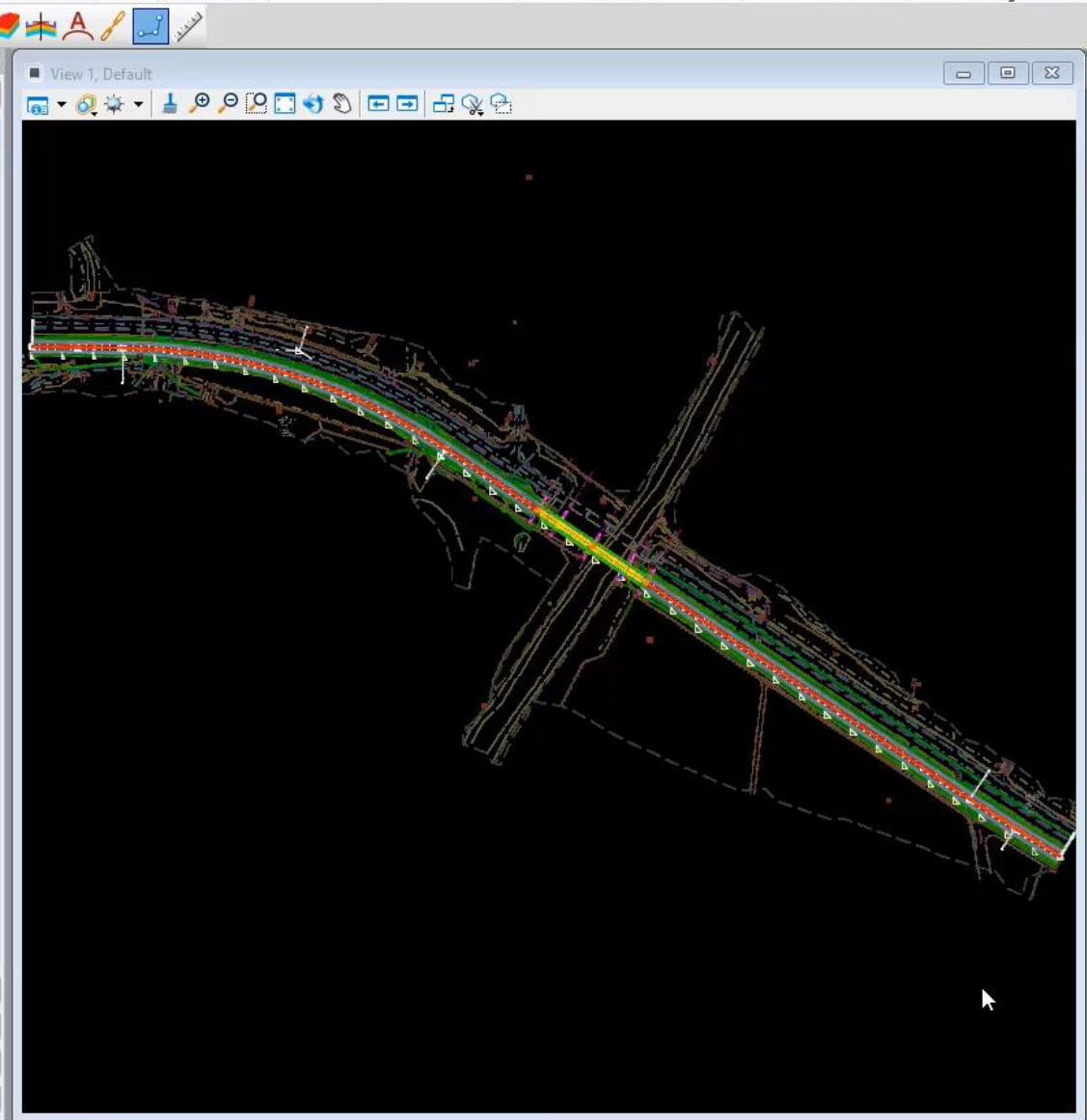
Corridors_Final.dgn (Default)

Sheet Index

OpenRoads Standards

Drainage and Utilities Model

Survey



OpenRoads Designer: The Ultimate Roadway Design Software

- In Summary OpenRoads Designer is Bentley's latest offering for a comprehensive modeling environment to provide construction-driven engineering to help accelerate project delivery of road networks, unifying design and construction processes from concept to completion. The application provides complete detailed design capabilities for:
 - Surveying
 - Geotechnical
 - Road Design
 - Site Design
 - Drainage Design
 - Subsurface utilities
 - Visualization
 - Contract Documents



