



Civil Update V8i and Beyond

Bentley Civil V8i Applications



Bentley InRoads V8i

www.bentley.com



Bentley MXROAD V8i

www.bentley.com



Bentley GEOPAK V8i

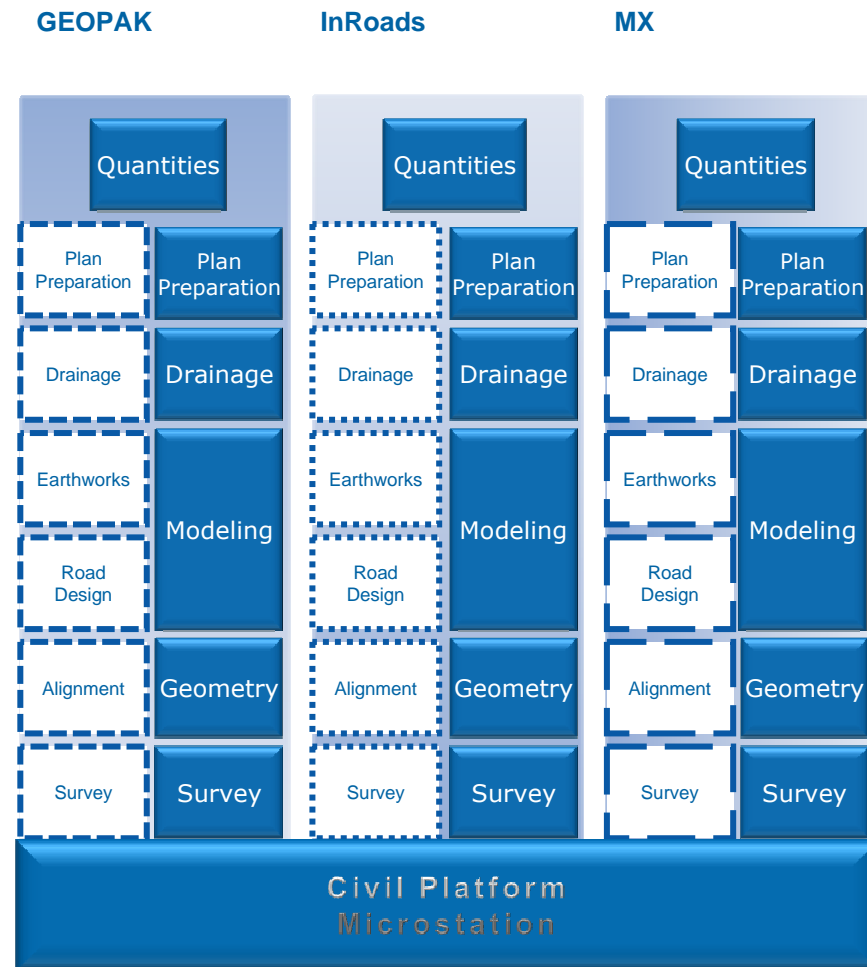


**Long time ago this was the "road".
Let's look at now and the future.**

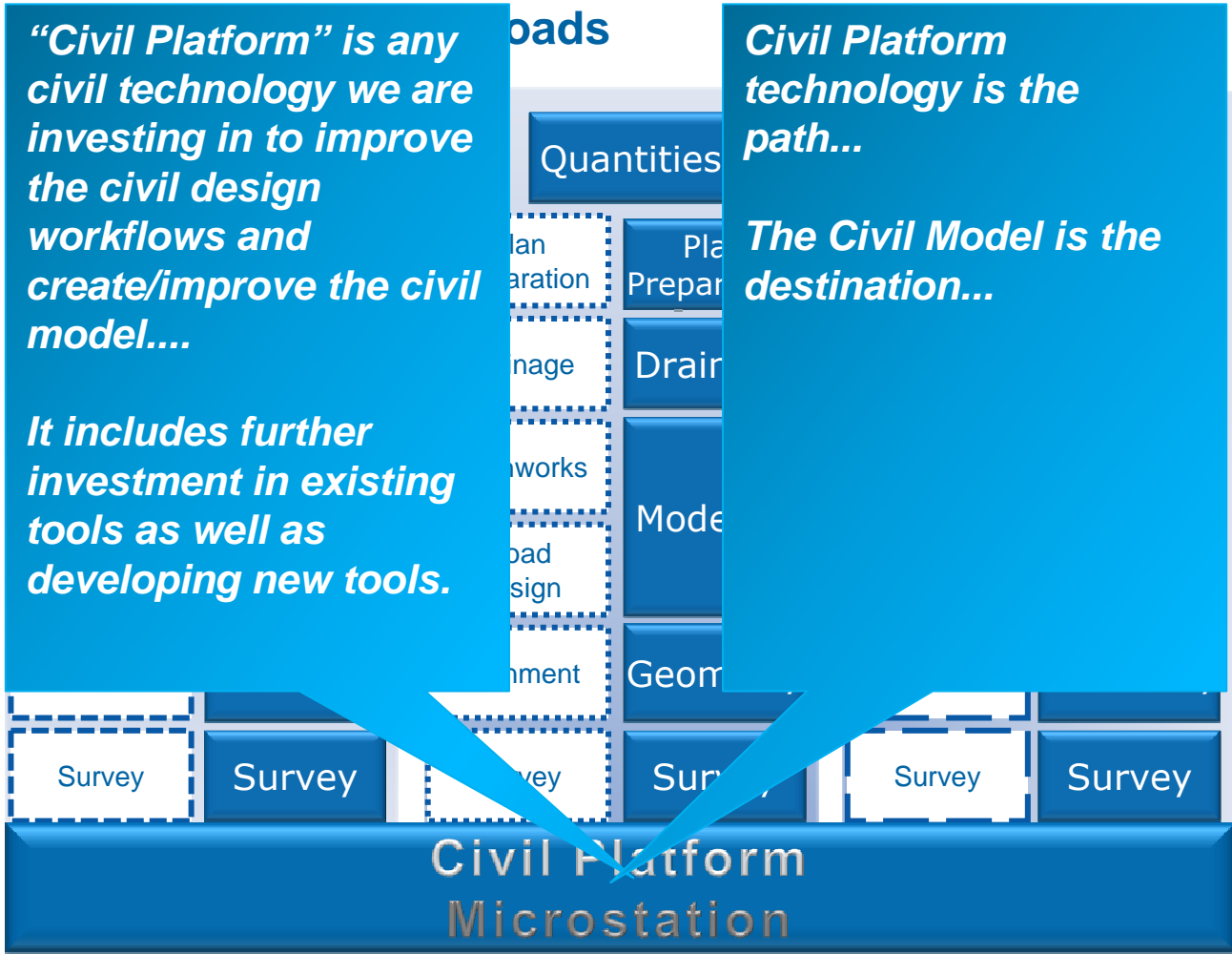


Civil Design Product Roadmap Review

- Innovate to provide new and better ways of doing things
- Adapt to new industry requirements and pressures
- Evolution to allow migration and integration to new tools and technology when you want
- Protect Investment in standards, file formats, training and workflows
- Maintain Productivity

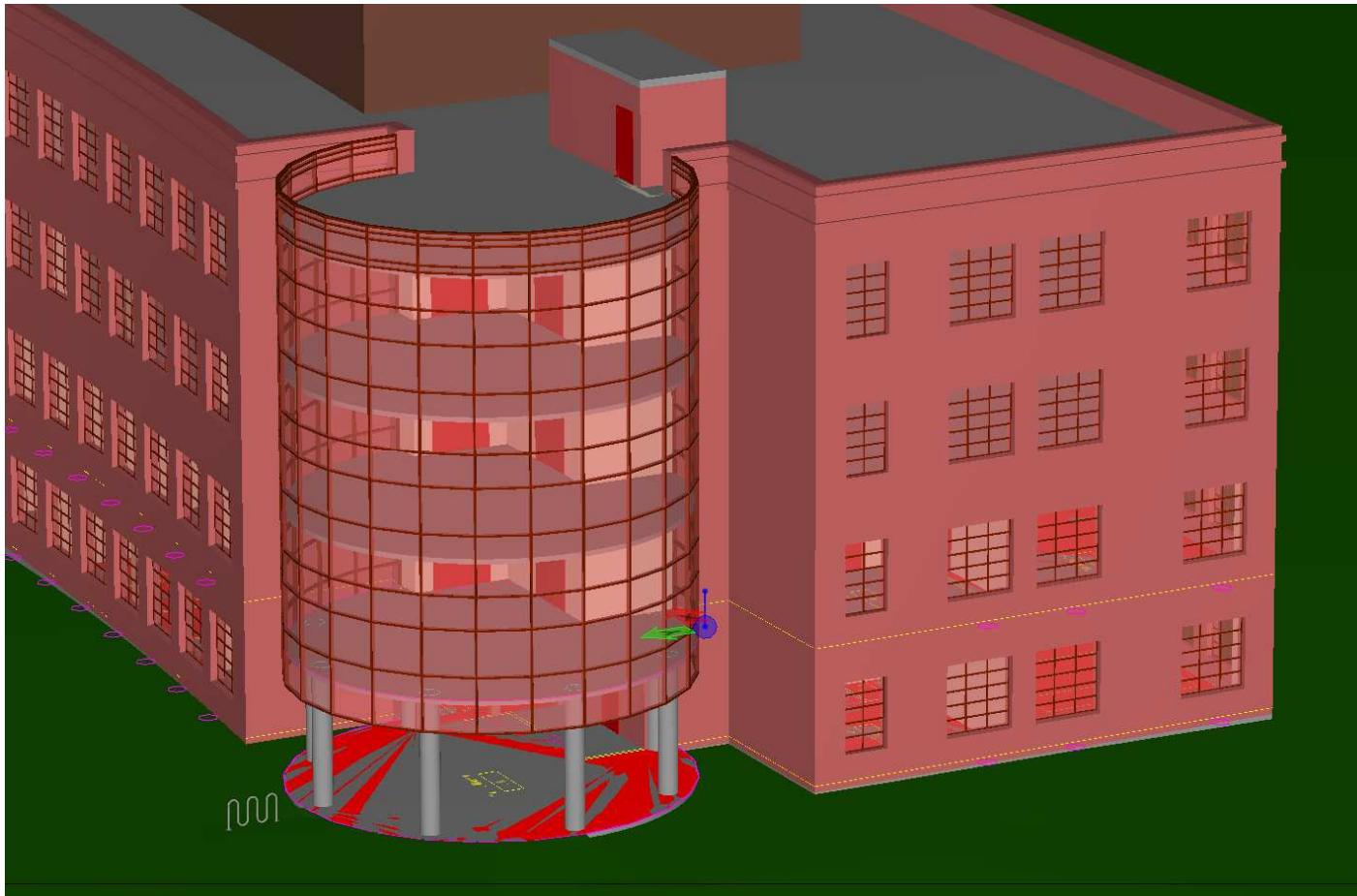


Civil Design Roadmap – The Path



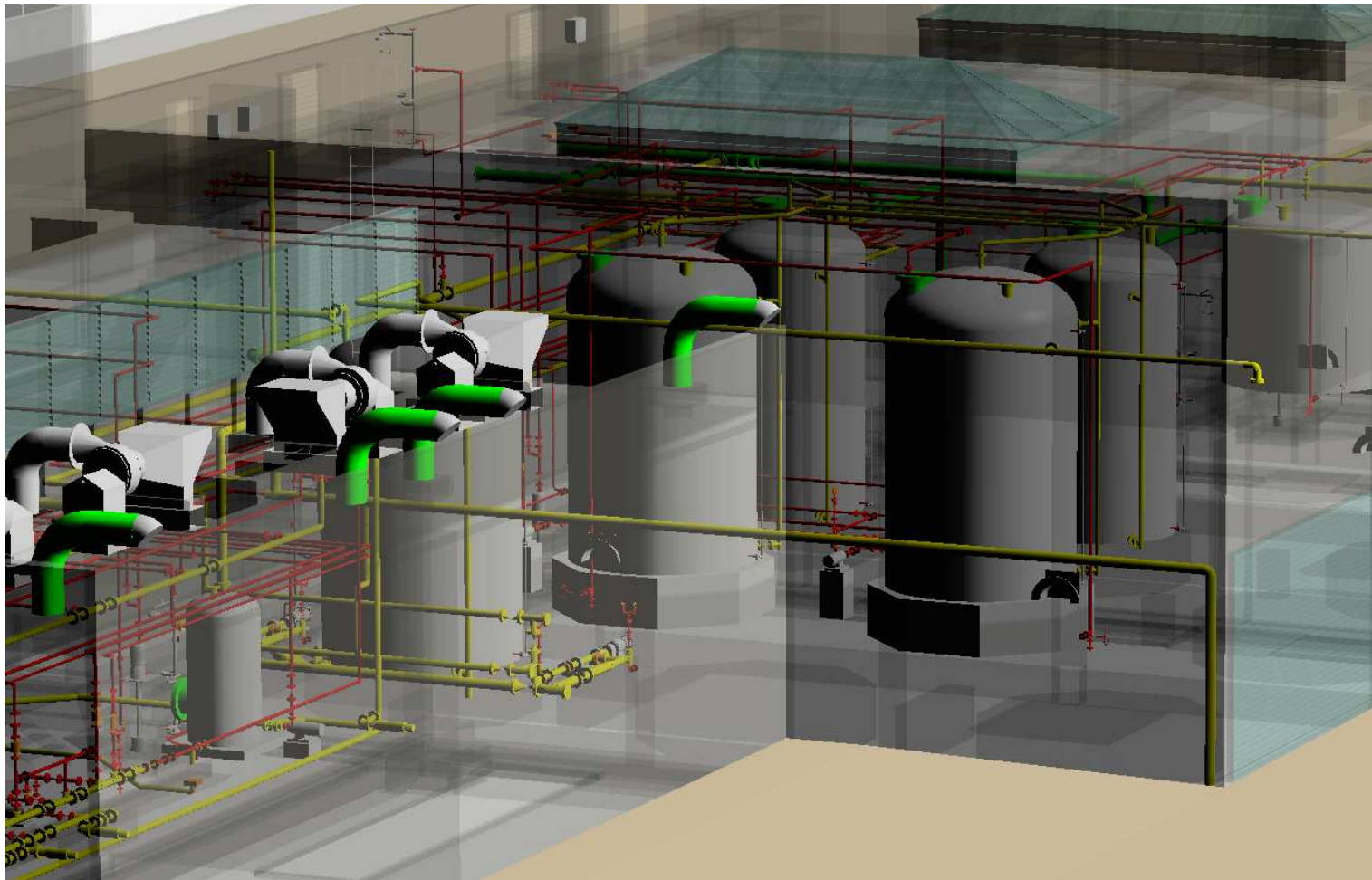
Models

- Building Models – doors, windows and walls



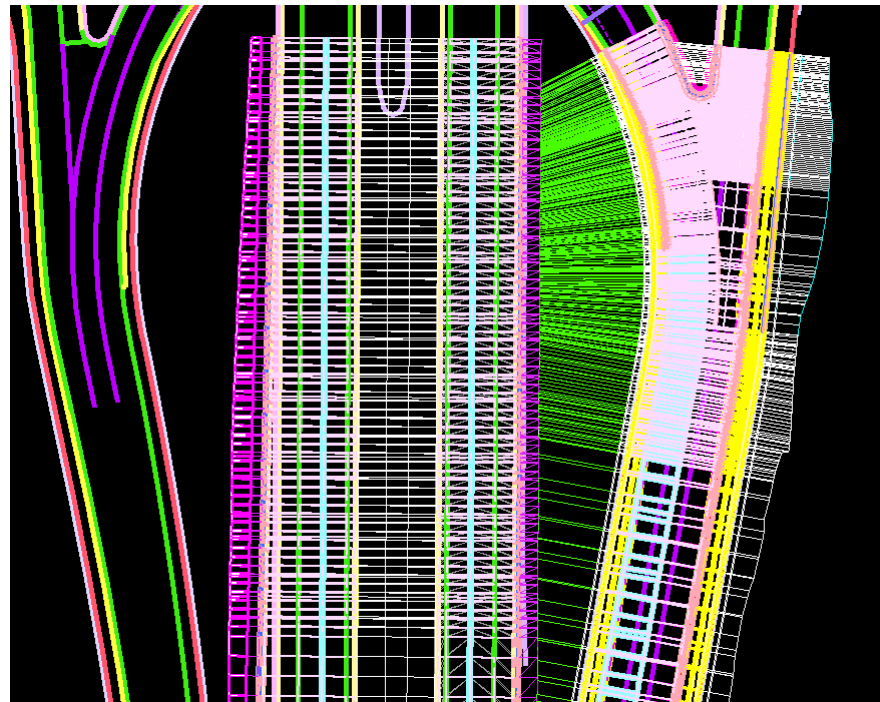
Models

- Plant Models – pipes, valves, vessels



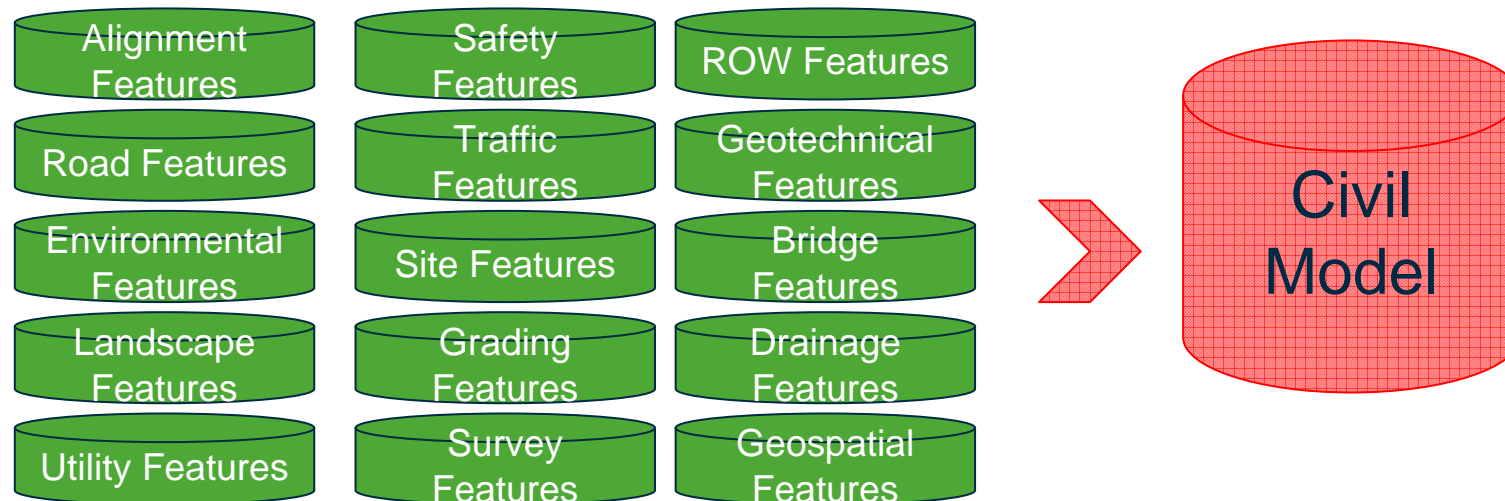
Models

- Civil Models – points, lines and triangles ??
- More than machine control ?

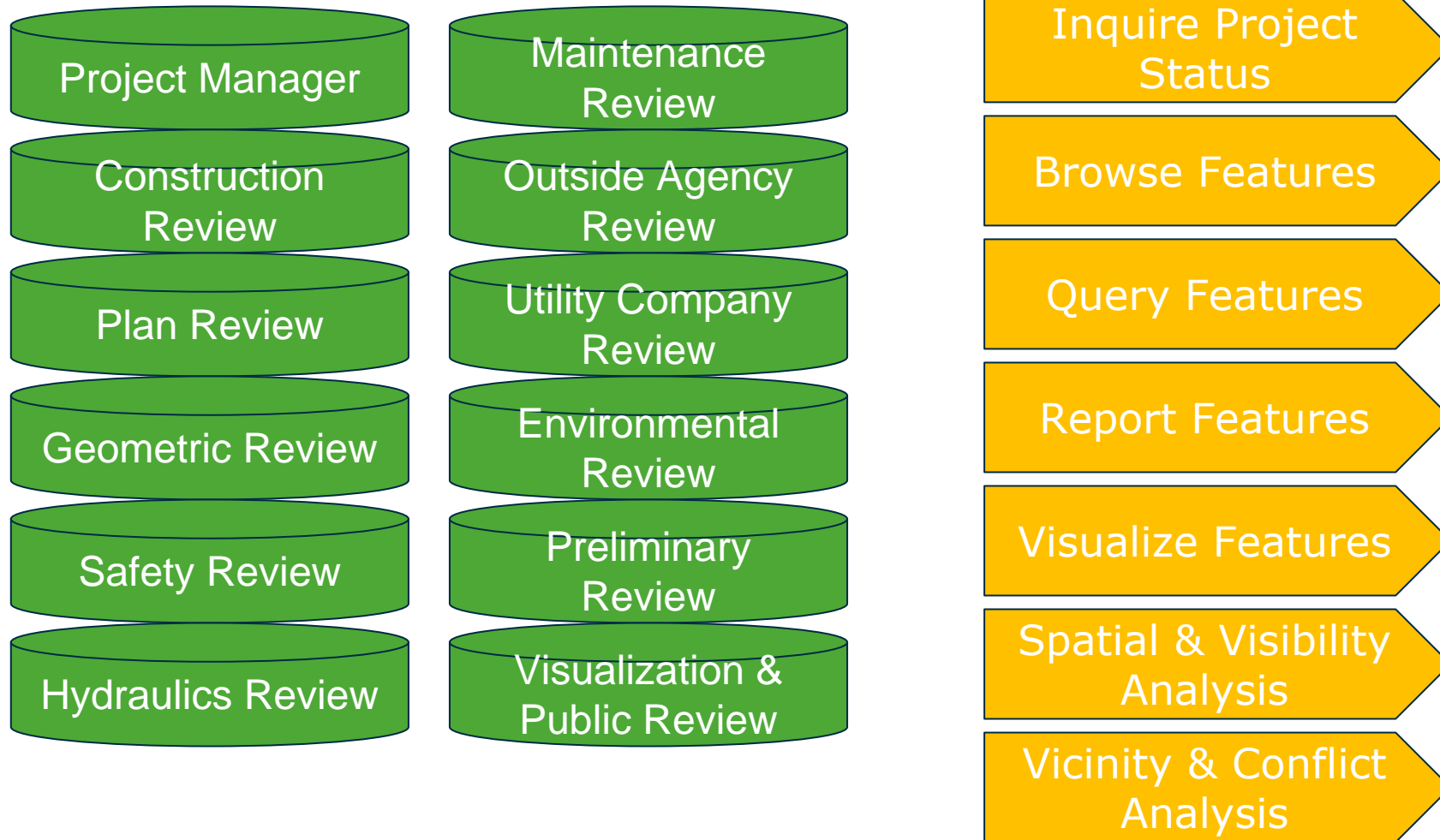


Civil Information Model

- Represent/collect multi disciplinary features into a single targeted entity available for collaboration, analysis, review and referencing.
- Support federated organization of model components but facilitate single referenced model.

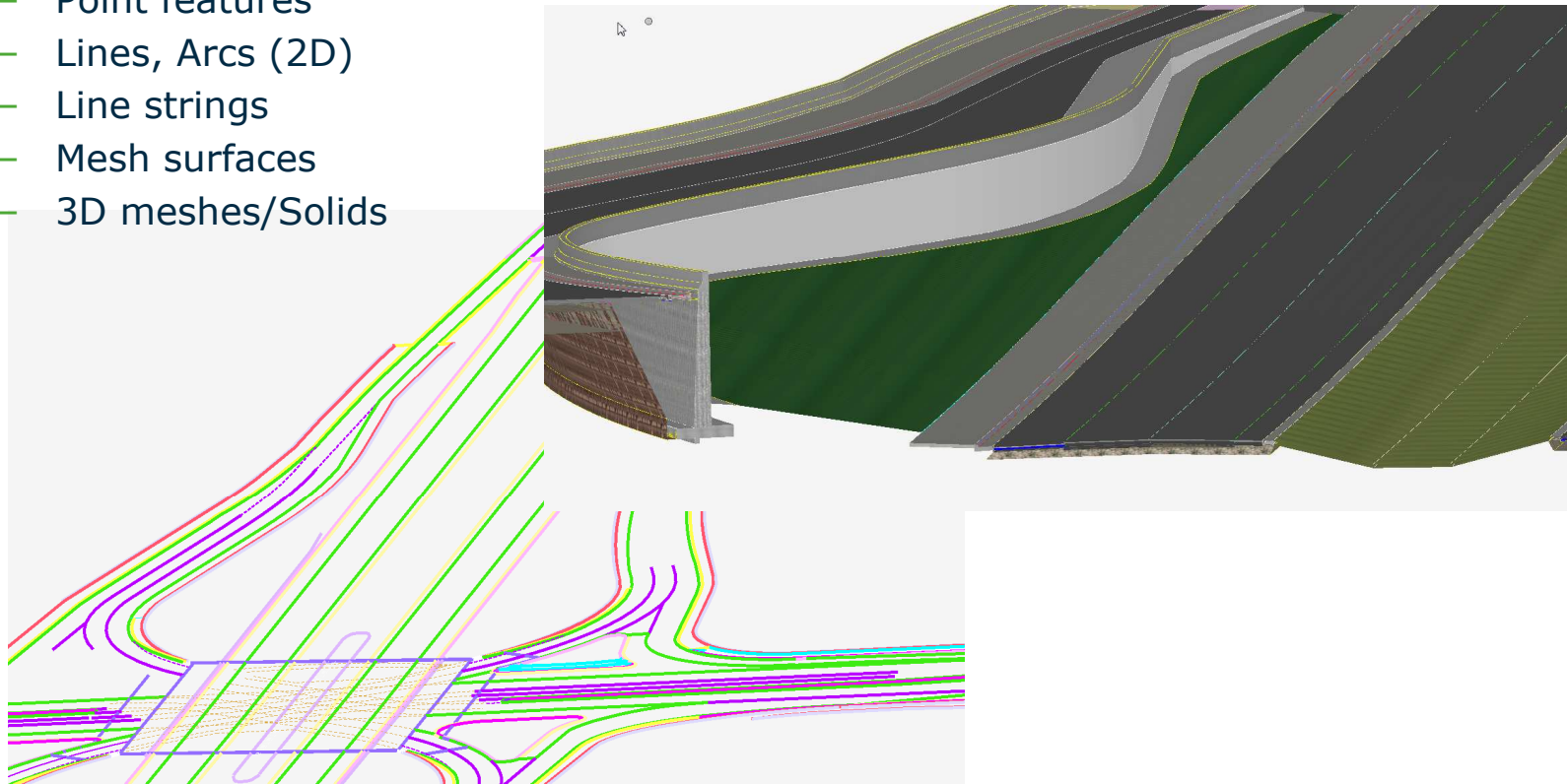


Civil Information Model - Consumers



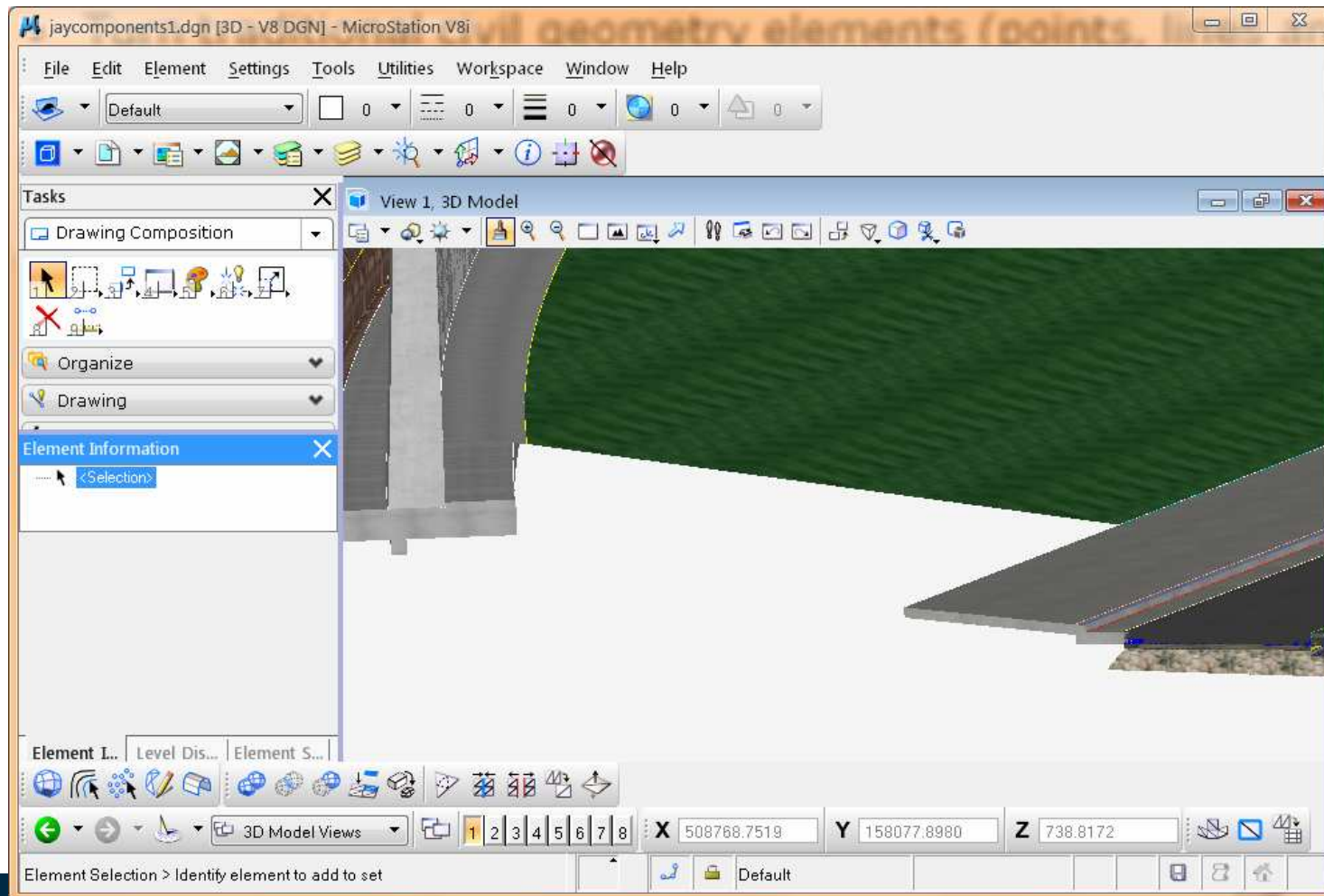
Civil Information Model

- Precise 2D and 3D geometric representation of all civil project features
 - Point features
 - Lines, Arcs (2D)
 - Line strings
 - Mesh surfaces
 - 3D meshes/Solids

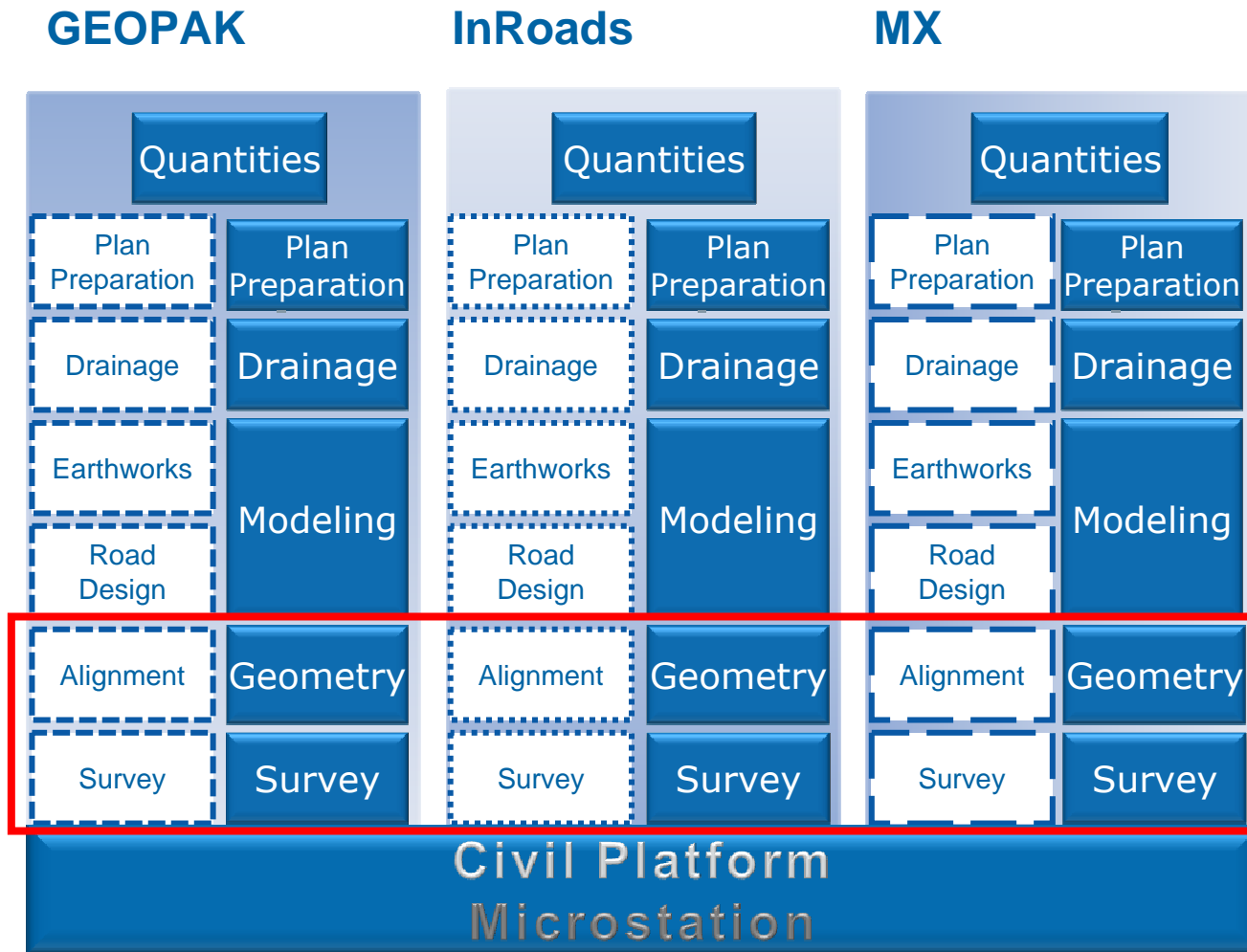


Civil Information Model

- Turn traditional civil geometry elements (points, lines and triangles) into their real world entities such as curbs, walls, and pavement.

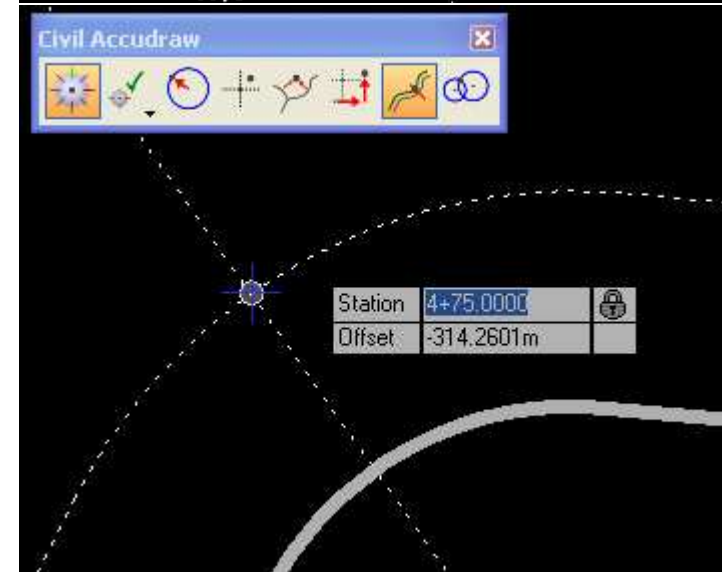
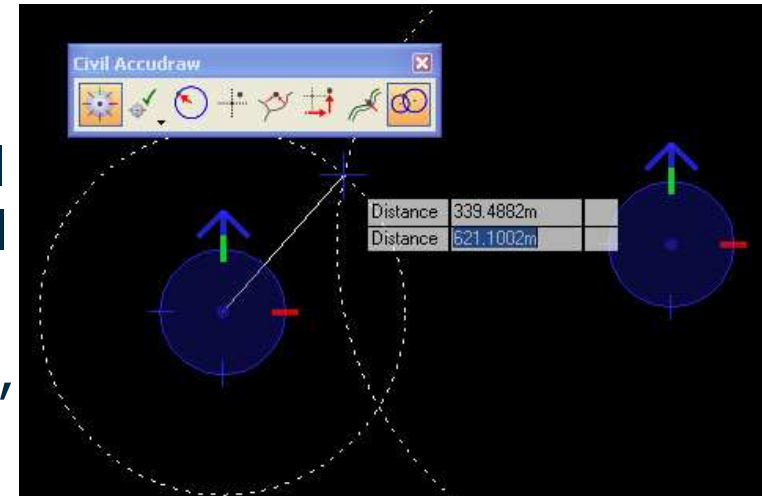


V8i Survey & Geometry



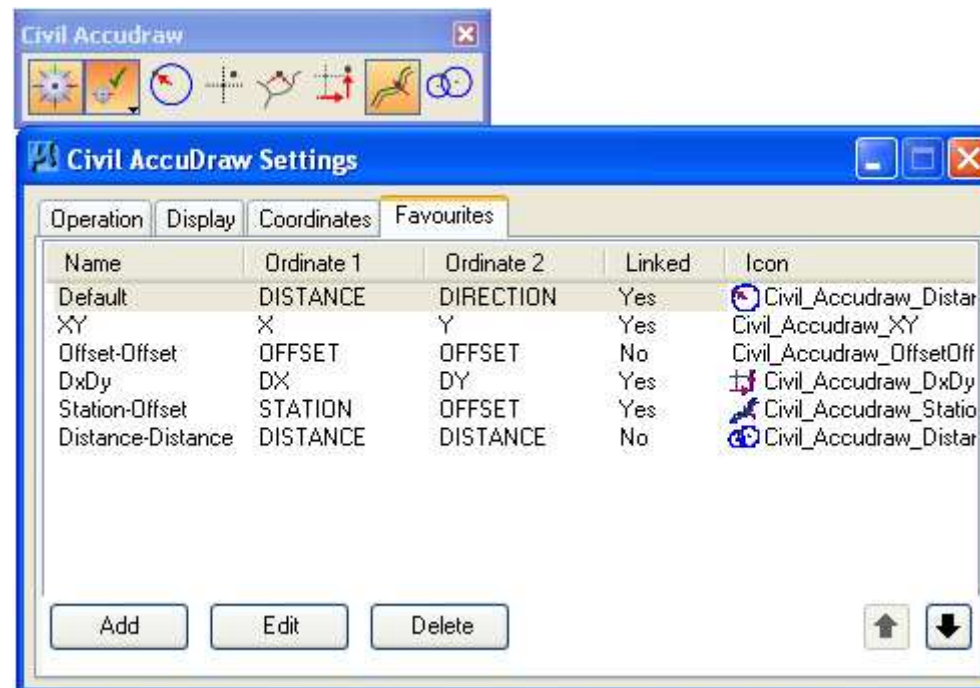
V8i – Survey & Geometry

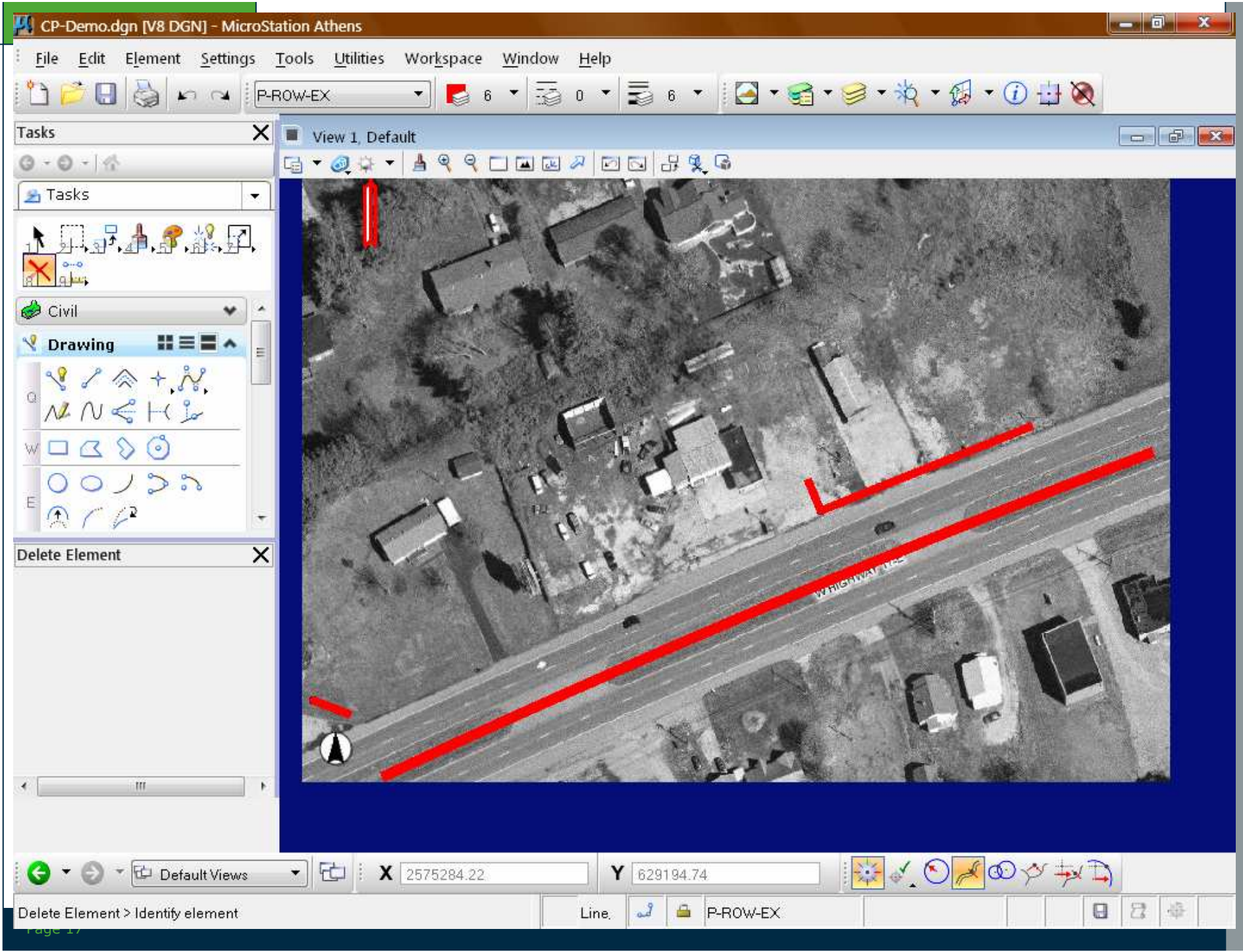
- Civil Accudraw
 - Civil oriented point location tool providing more precise and civil formatted options
 - Combinations of Station, Offset, Direction, Distance and other ordinates can be combined to replace existing multiple step geometric operations
 - Enhances the user experience of civil tools with its customizable heads up UI.



V8i Survey & Geometry

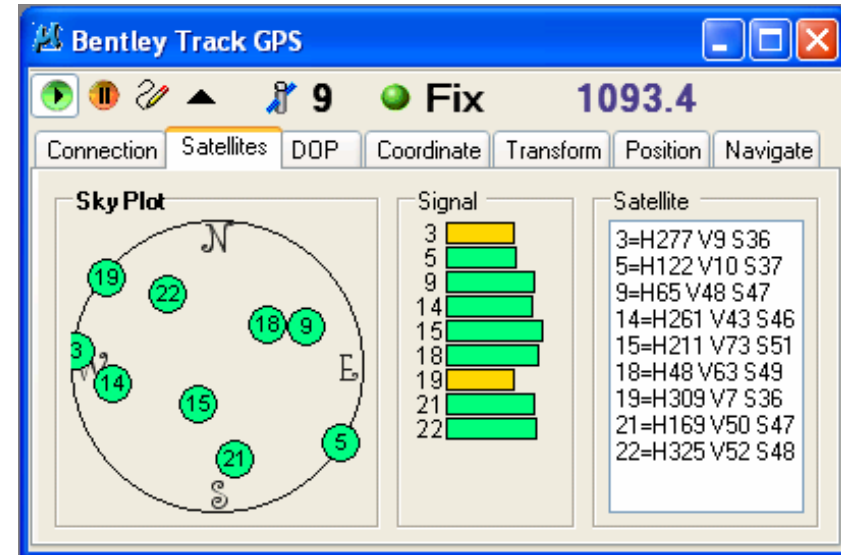
- Civil AccuDraw user definable ordinate systems and favorites





V8i Survey & Geometry

- Civil GPS
 - Extensions to MicroStation's GPS tool
 - Positional Accuracy
 - Transformations
 - Navigation
 - Waypoint tracking

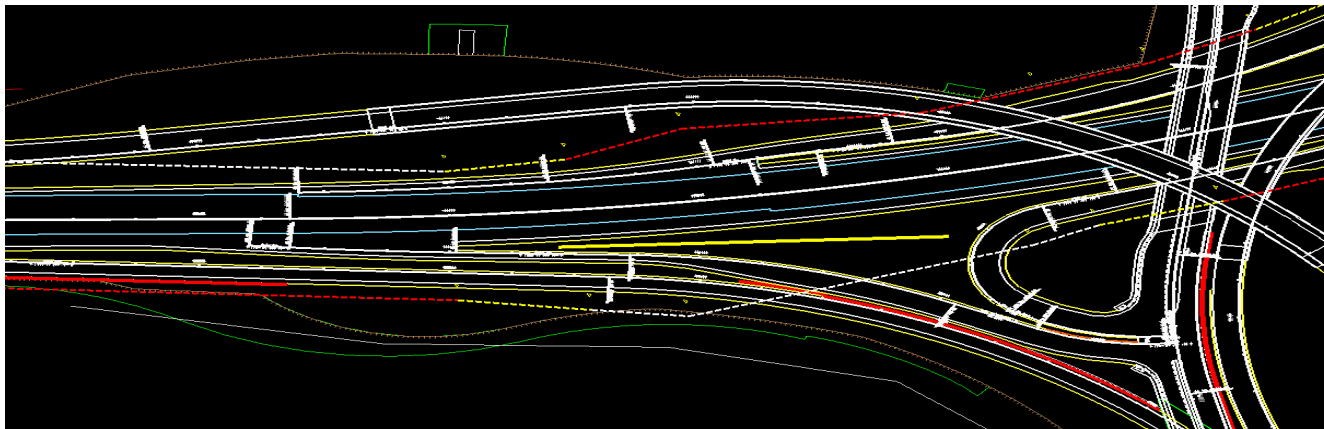


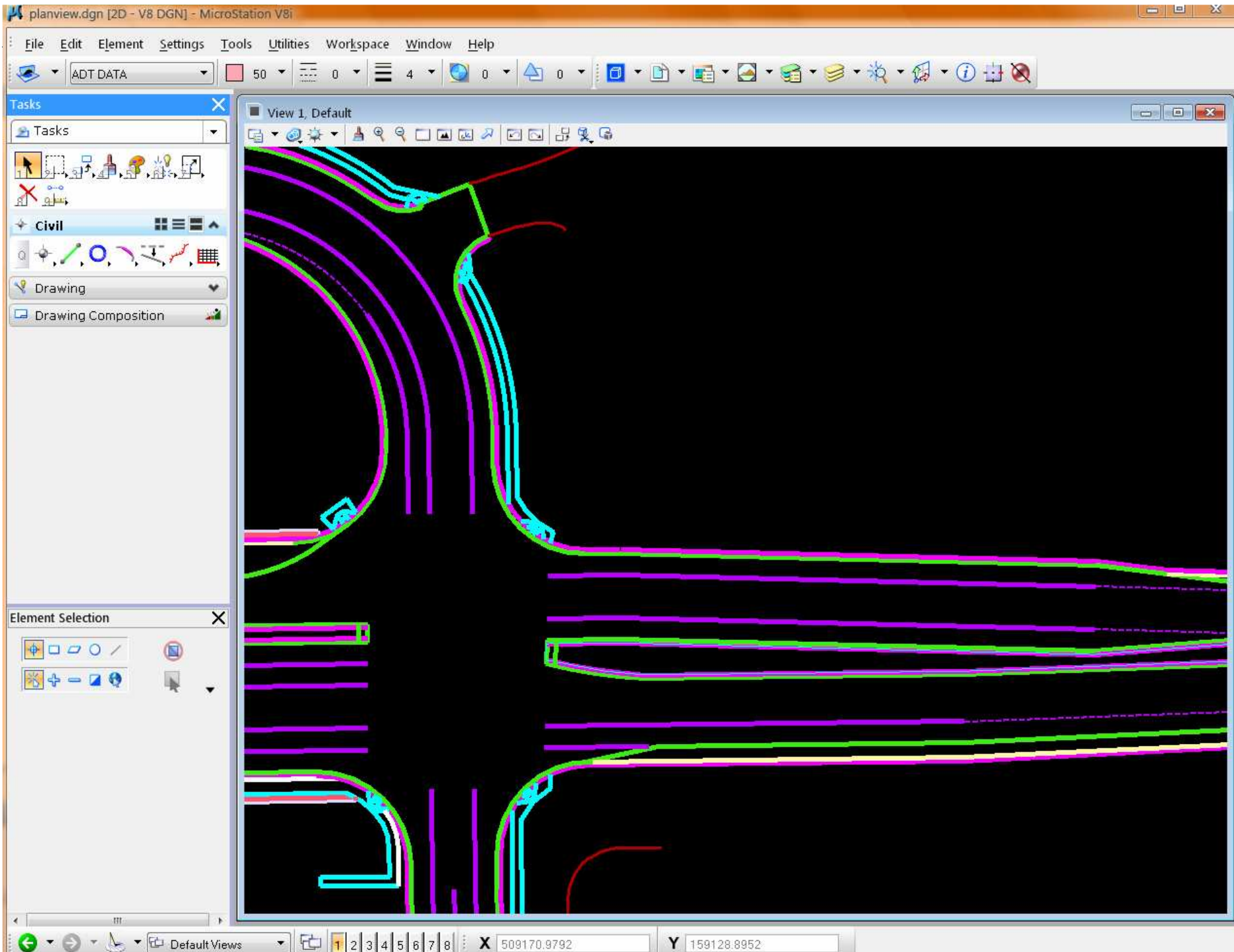
Beyond – Geometry & Alignments

- We all have it today but can we....
 - create it “Heads Up” ?
 - modify and edit it in place ?
 - Undo/Redo ?
 - remember our design intent for changes ?
 - update related graphics after every change ?
 - create more varied and complex real world geometric features – turn lanes, intersections, parking lots... ?

Beyond – Geometry Value Proposition

- Complete set of horizontal tools for schematic and horizontal geometric design
- Tools for Alignments **AND** the other 99% of geometric civil features
- Provide the Civil Workflow better geometry
 - Integrated
 - Better User Experience
 - Rule based placement and editing to maintain relationships
- The start of a bigger concept - begin to implement more advanced geometric features – ie. intersections

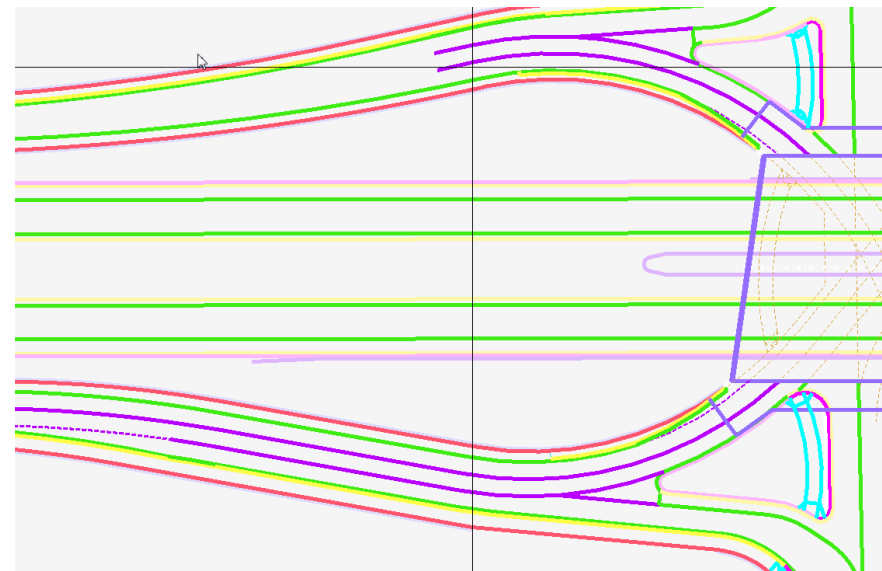
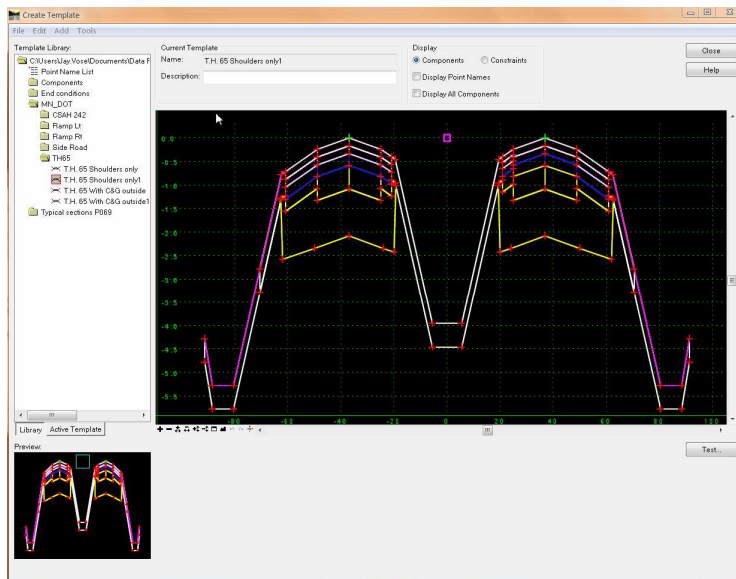




Beyond - Geometry

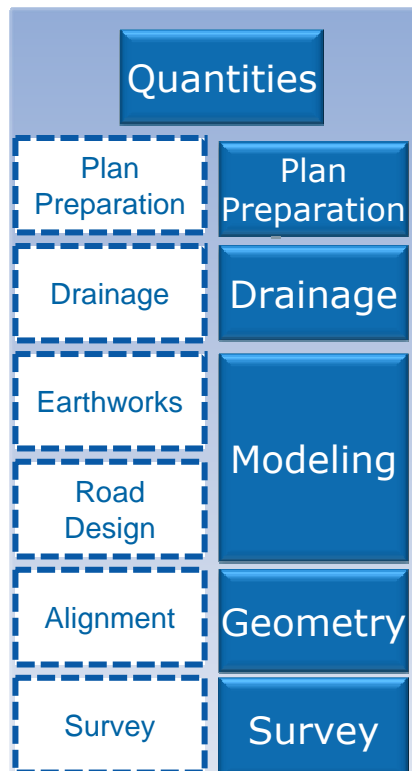
- Template Geometry

- Use templates and the fixed feature definitions to create precise 2D featurized geometry of backbone
- Facilitates geometric layouts, schematics, intersection and transitions by bulk placement of fixed features
- Use *ANY* geometry commands to detail variations and transitions prior to modeling

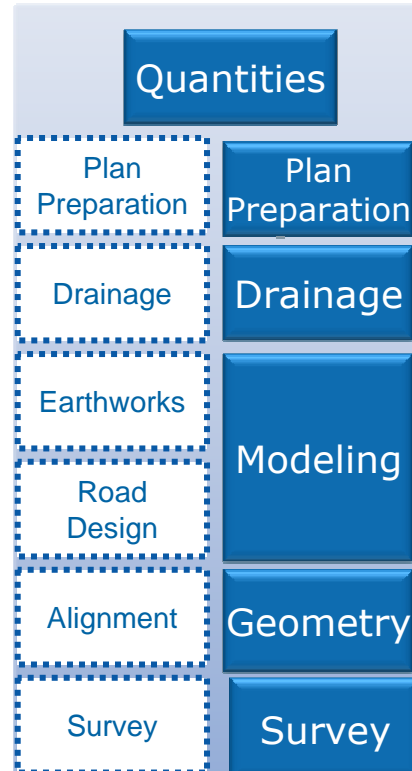


Modeling

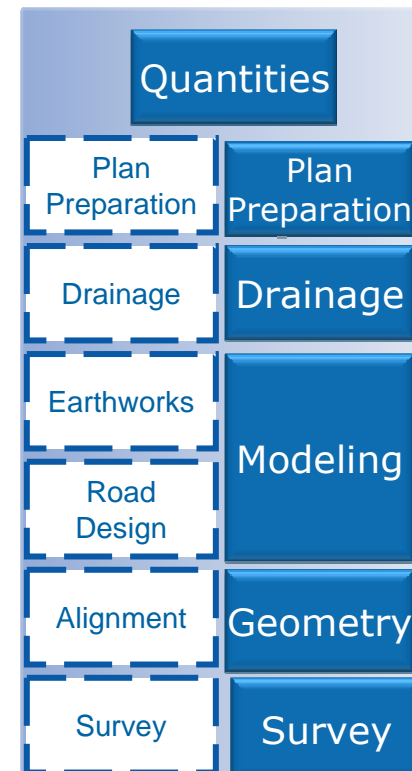
GEOPAK



InRoads



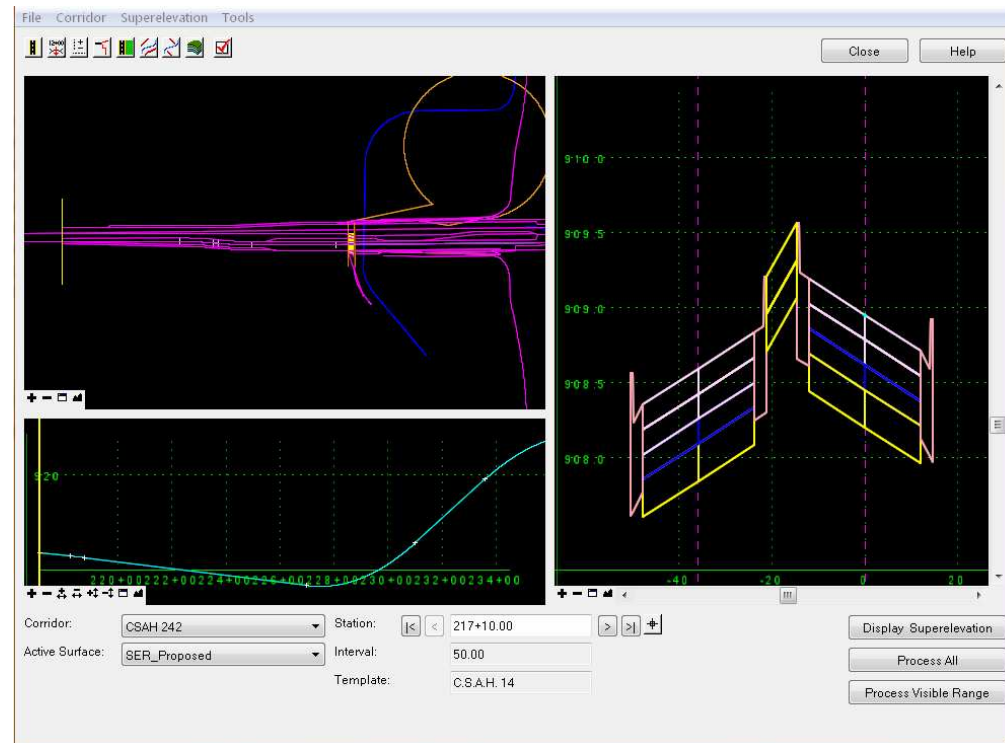
MX



Civil Platform
Microstation

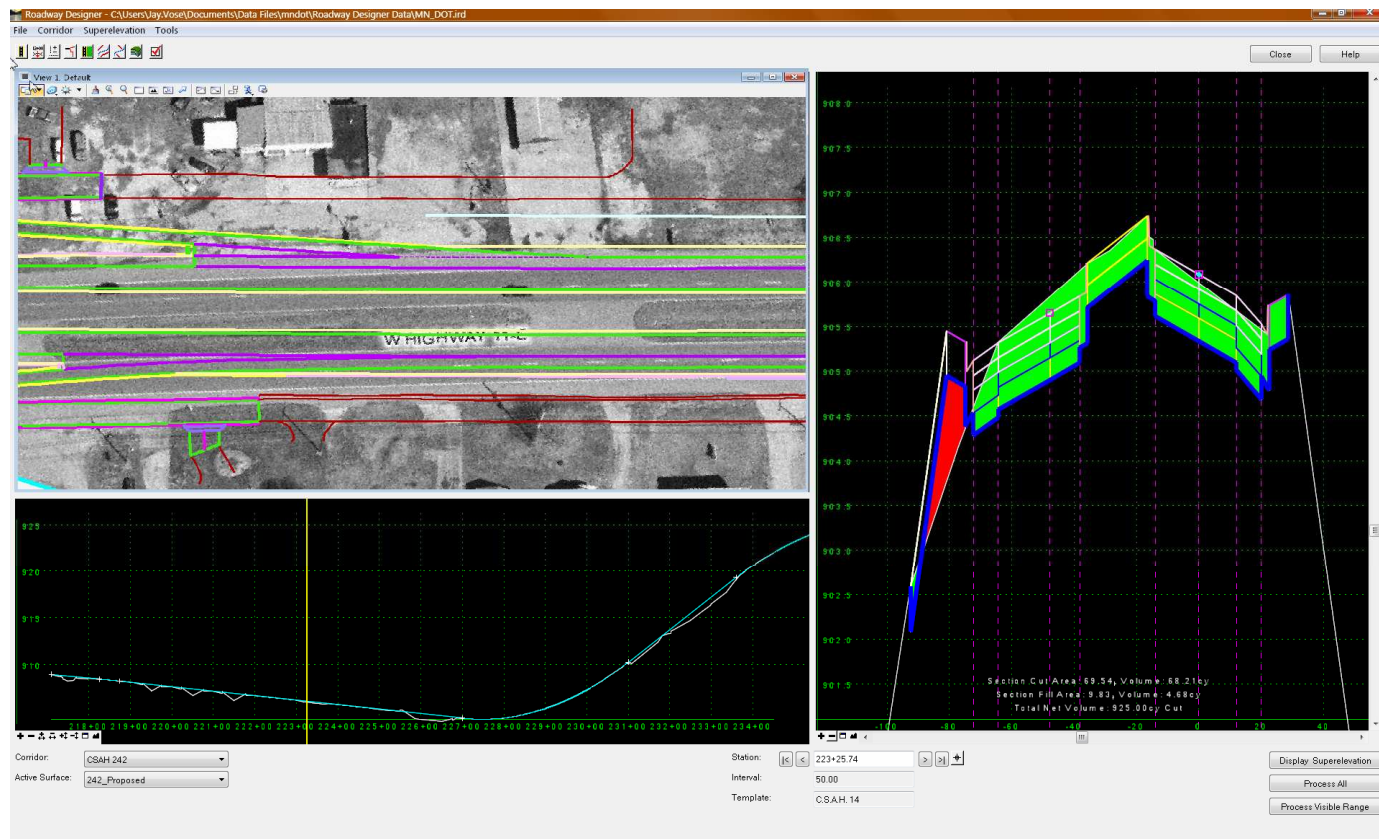
V8i - Modeling

- **Roadway Designer primary corridor modeling tool for all Bentley Civil products.**
- Further investments to improve workflow and create better models enhances all products.



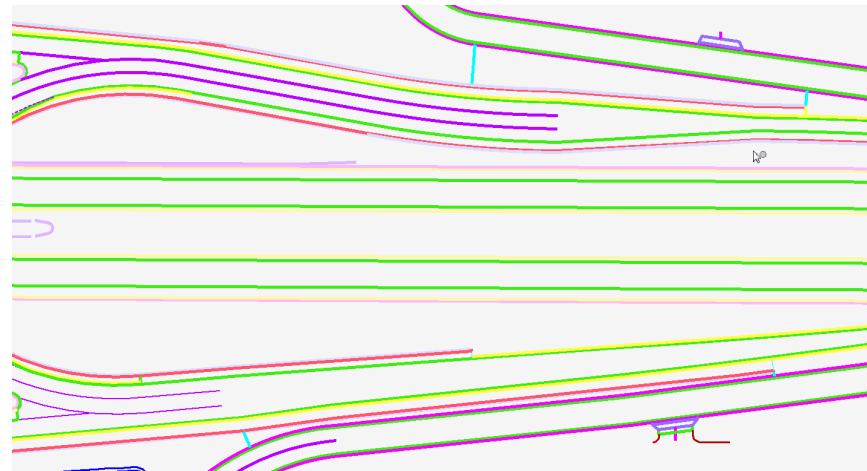
Beyond Modeling - Environment

- True MicroStation View
 - View reference files and raster images as background for design
 - Roadway designer output as 2D/3D transient graphics for snapping, measurement and visualization during design



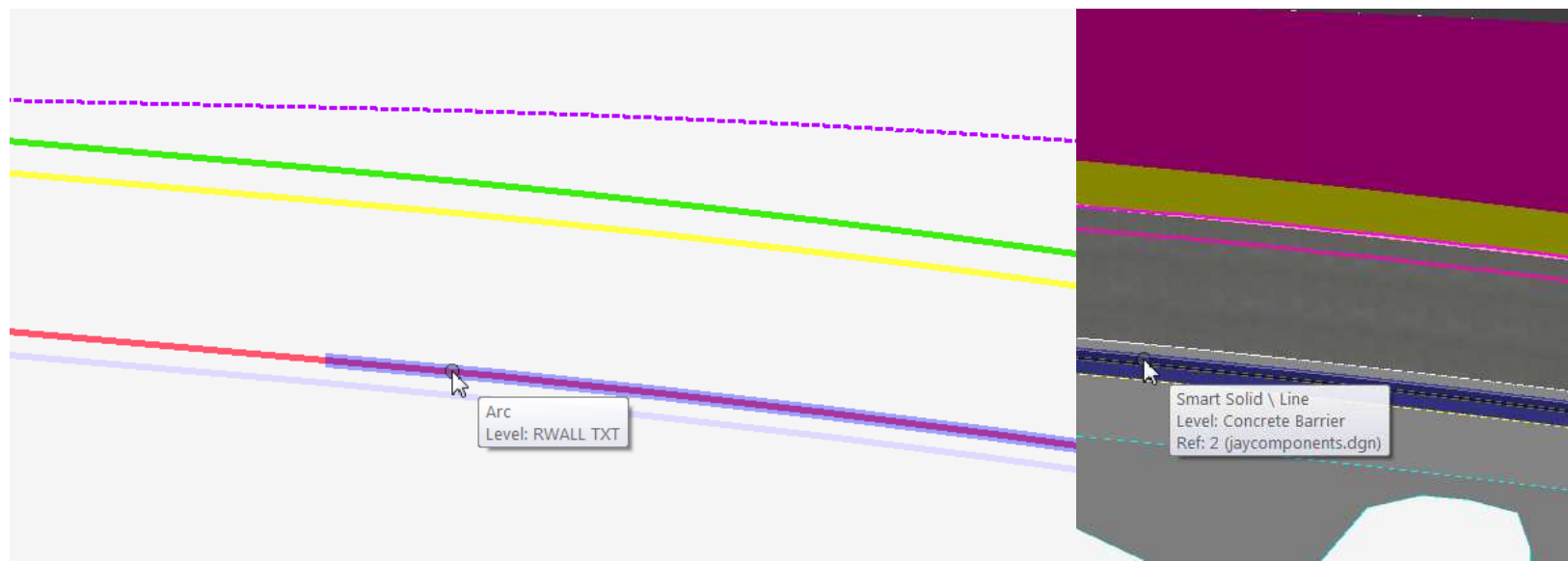
Beyond Modeling – Geometry

- Target and use plan geometry directly
 - Streamline existing workflows that consist of storing and updating controlling or transitional plan geometry as DTM features.
 - Eliminating the need to stroking perfectly good geometry and managing un-triangulated features
 - Reduce the requirements to create and maintain alignments for features that again represent simple controlling and transitional geometric features – save alignments for alignments.
 - Leverage MicroStation and Civil Platform geometric elements without steps to convert and maintain the synchronization with the ALG



Beyond Modeling – Geometry

- Real 2D geometry from model components
 - Creates real parallel 2D arcs and lines
 - Facilitates annotation – radii of line strings ?
 - Facilitates staking – PC, PT and real arc data available...
 - Improves downstream value of model features by accommodating better manipulations and consumption in MicroStation – its easier to move or copy a line/arc than a bunch of line strings...

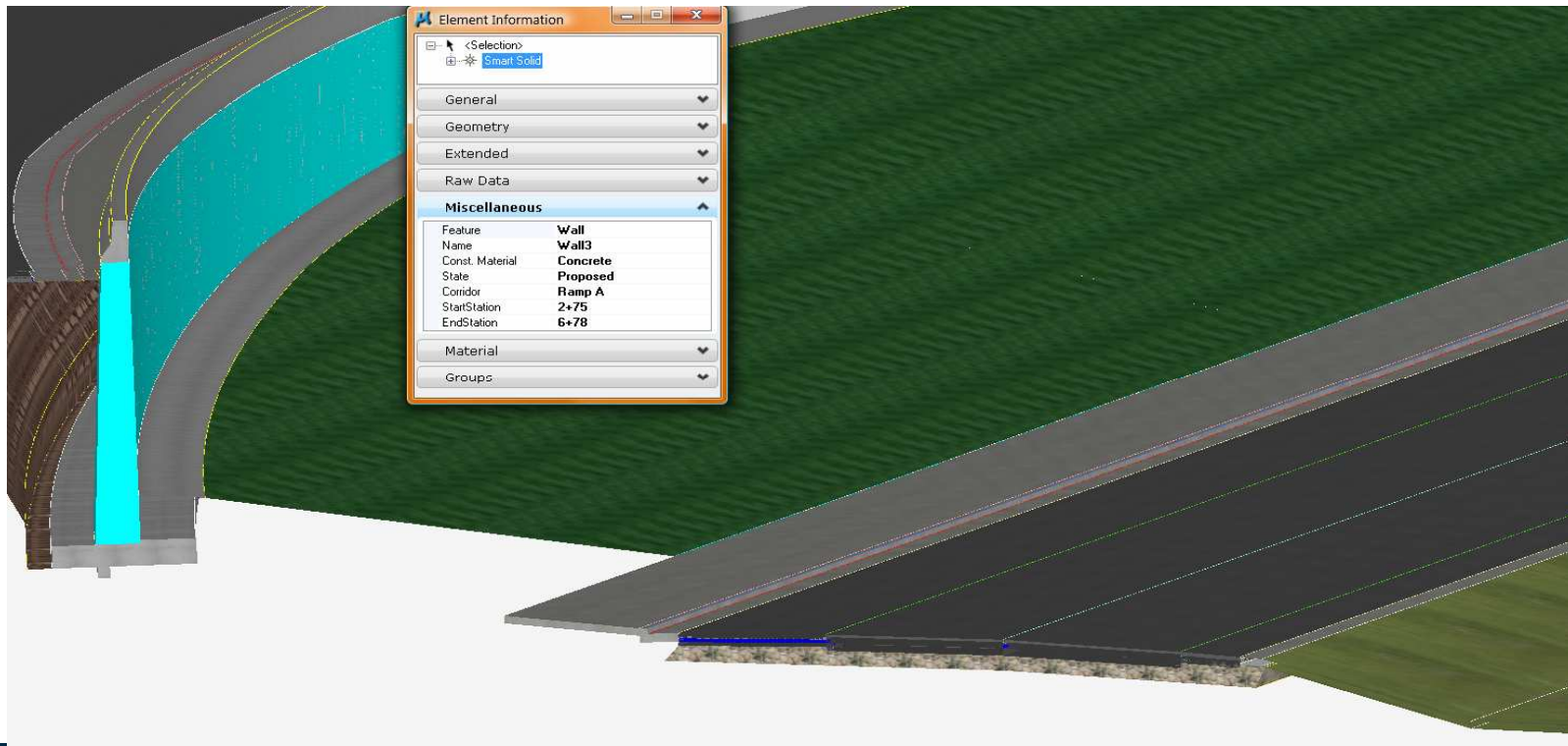


Beyond Modeling – Geometry

- Live horizontal alignment, feature, and graphics edits taken into account
 - Streamlines workflow of making changes and reduces the need to leave roadway designer
 - Extends model creation functionality towards “model editing”

Beyond Modeling – Components

- Smarter solid and/or surface geometry
- Interact with MicroStation solids/surface technology to further enhance the precise details of 3d model
- Attributed with alignment, component, and quantity information



Beyond Modeling – Components

- Renderable with material definitions
- Interoperable (EC Framework) – ProjectWise Navigator

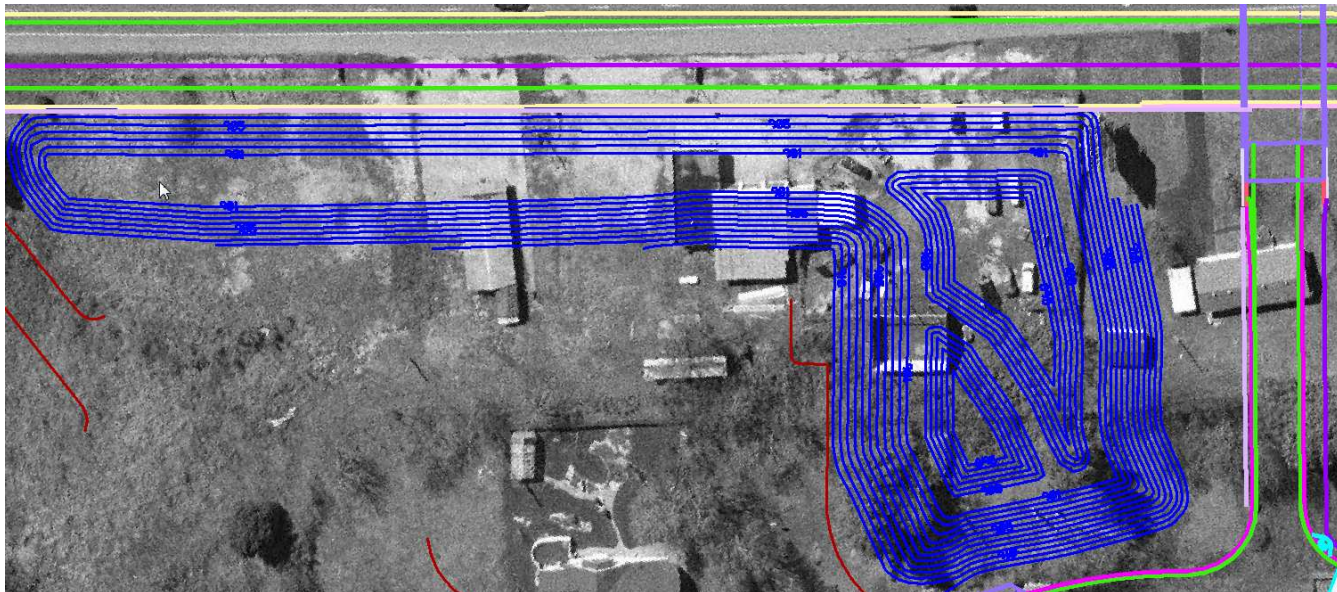
The screenshot displays a 3D rendering of a road cross-section with various components like a median barrier, aggregate, wall footing, and subgrade. Two windows are overlaid on the model:

- Engineering Content Browser:** Shows a tree view of components under the 'Active' tab.
- Engineering Content Details:** A table listing the details of the selected components.

Item	Const. Mate...	Corridor	EndStation	Feature	Name	StartStation	State
Components	Concrete	Ramp A	3+50	Median Barrier	Med1	1+25	Proposed
Components	Aggregate	Ramp A	3+50	Aggregate	Agg1	1+25	Proposed
Components	Concrete	Ramp A	6+75.32	Wall Footing	Wall1	3+26	Proposed
Components	Concrete	Ramp A	6+78	Wall	Wall3	2+75	Proposed
Components	Base	Mainline A	6+75	Subgrade	Sub1	1+25	Proposed
Components	Grass	Mainline A	6+76	Clearzone	CZ1	1+25	Proposed
Components	Asphalt	Mainlane A	6+75	Lane	Lane1	1+10	Proposed
Components	Concrete	Mainlane A	6+75	Curb	Curb12	2+75	Proposed

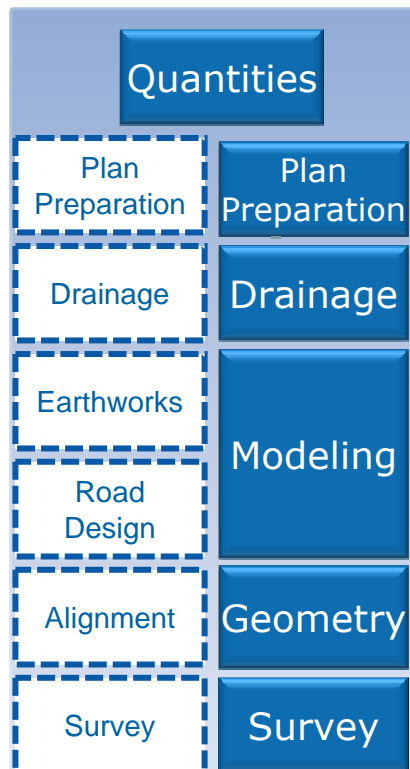
Beyond Modeling – Site Modeling

- Integrate GEOPAK site modeling functionality into InRoads to deal with non linear design situations
- Relationship based technology to define and modify surface model elements

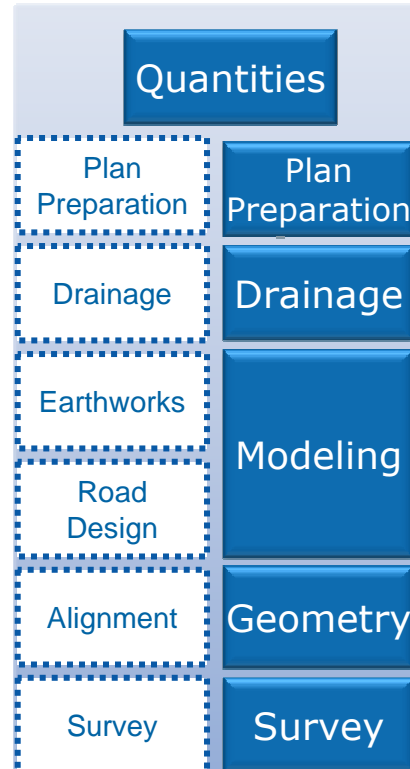


Drainage

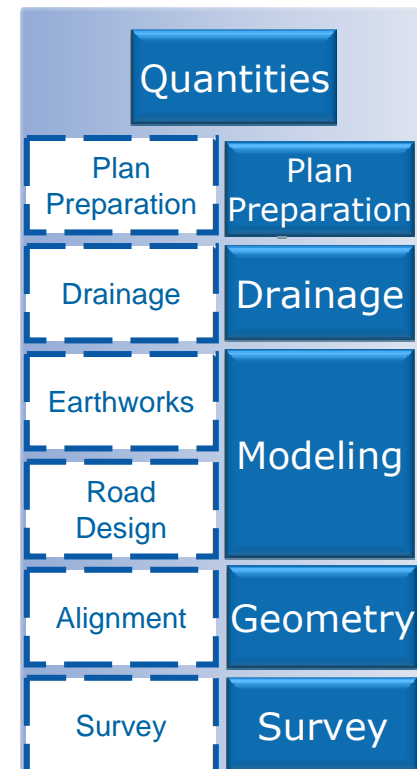
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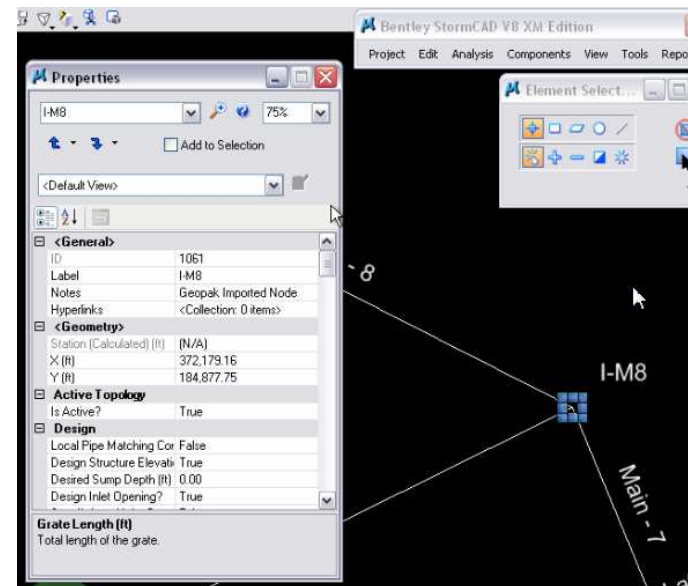
MX



Civil Platform
Microstation

Beyond – Drainage & Utilities

- InRoads S&S – StormCAD Integration
 - Interoperability of S&S database and StormCAD model
 - Leverage Haestad hydraulic computations
 - Use extended Haestad functionality on an S&S project
 - for example design scenarios
 - Entry point to more complex hydraulic analysis of an S&S project to CivilStorm



Thank You