



Predicting Real World Performance of Your Designs with MicroStation V8i (SELECTseries 3)

Chris Bober, Platform Product Director

What is Performance?



What is Performance?



High Performance Infrastructure



- <http://www.nyc.gov/html/ddc/downloads/pdf/hpig.pdf>

The Green in Performance

- Environmental
 - Ecological Impact
 - Responsible Practices
- Economical
 - Project Execution
 - Approvals
 - Litigation
 - Lifecycle Maintenance





Real World Performance

- 75% of the decisions that drive the performance of a design are made in the conceptual phase
- Material Production
- Transportation Logistics: “think locally”
- Material Disposal
- Emissions
- Construction Costs
- Operations Costs



MicroStation®

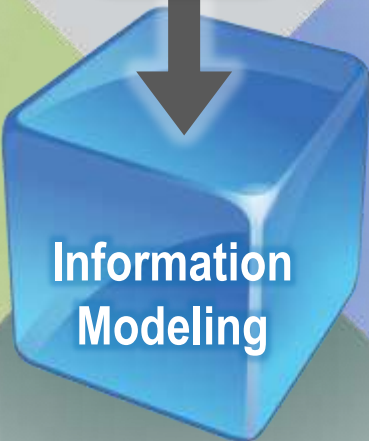
An unrivaled **information modeling environment** for architecture, engineering, construction, and operations for all infrastructure types...



...that can be used as both a **software application** and as a **technology platform** for discipline-specific applications.

MicroStation

Immersive Interaction

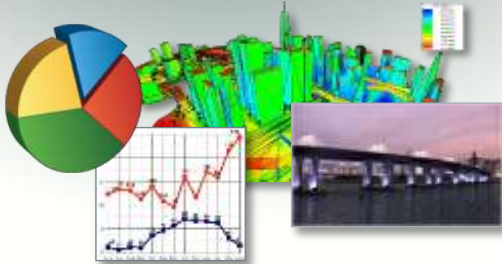


Comprehensive
Breadth and Depth



Trusted Deliverables

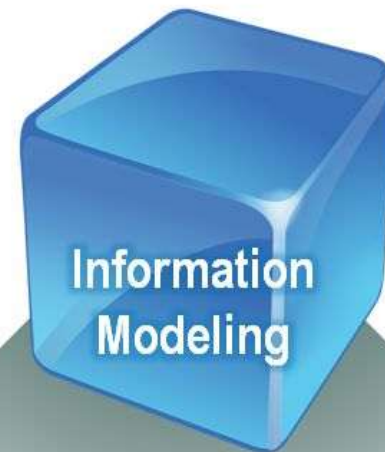
Performance Simulation



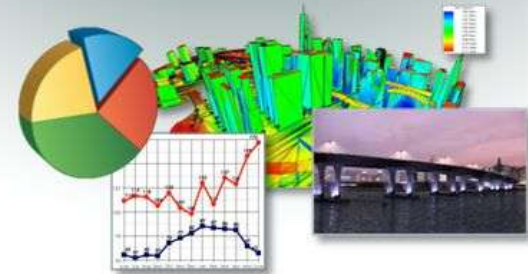
Performance Simulation

Predict real-world performance quickly and precisely

- Explore options for iterative refinement
- Improved engineering process
- Within one area of focus, or..
- Across multiple aspects of the lifecycle



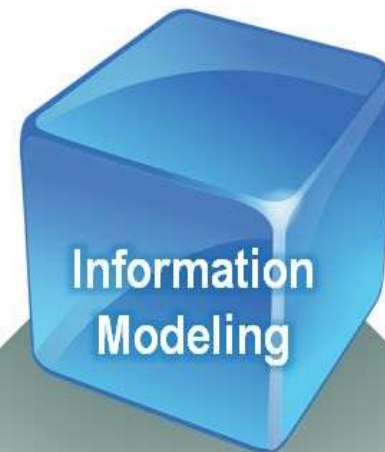
Performance Simulation



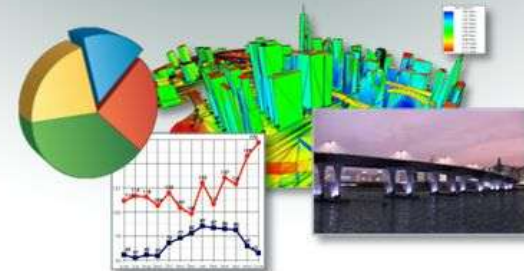
Performance Simulation

Predict real-world performance quickly and precisely

- LandXML, IFC, JT Interoperability
- Terrain Model Visualization
- GenerativeComponents
- Model Population
- Item Sets
- Document Linking
- ODBC Reporting
- Solar Study
- Solar Shadows
- Thematic Display
- Traffic Animation
- Schedule Simulation
- Clash Resolution



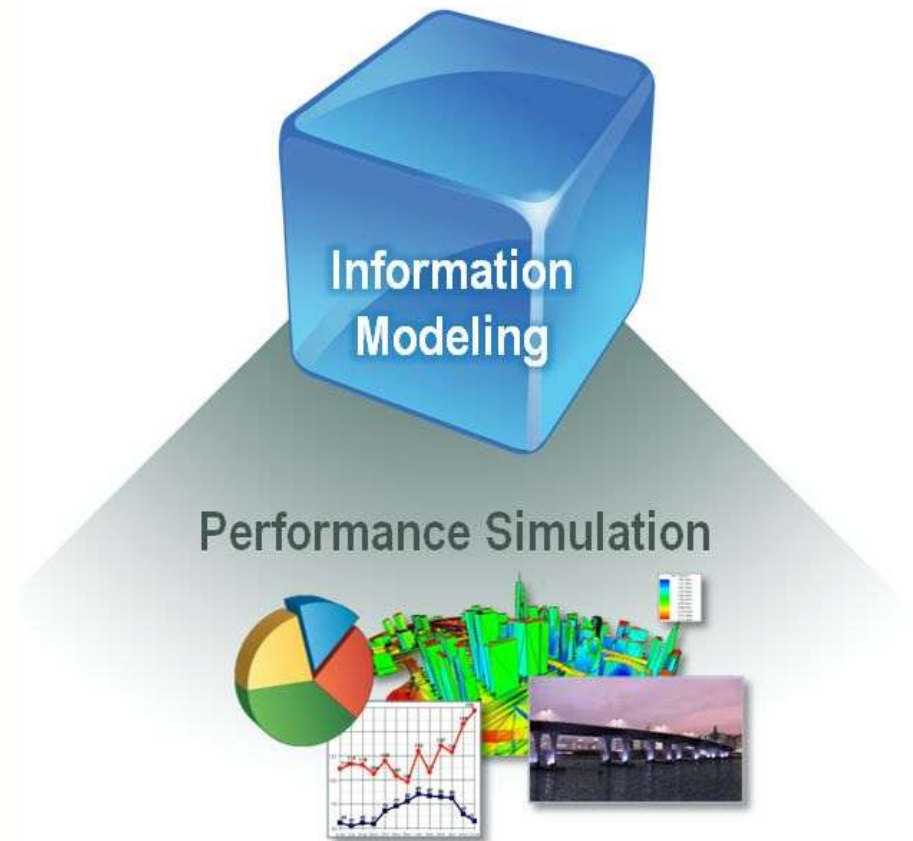
Performance Simulation



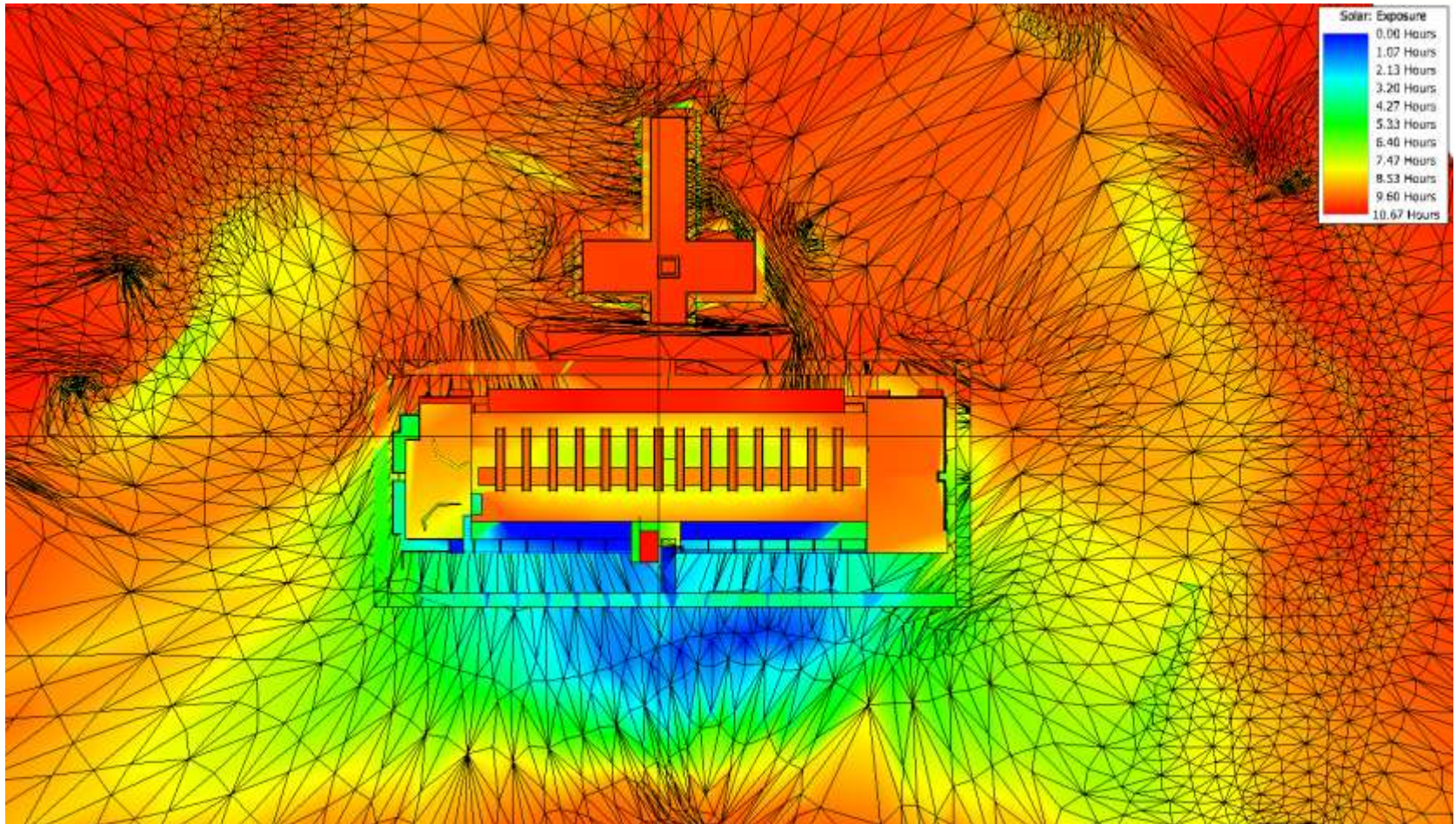
Performance Simulation

Predict real-world performance quickly and precisely

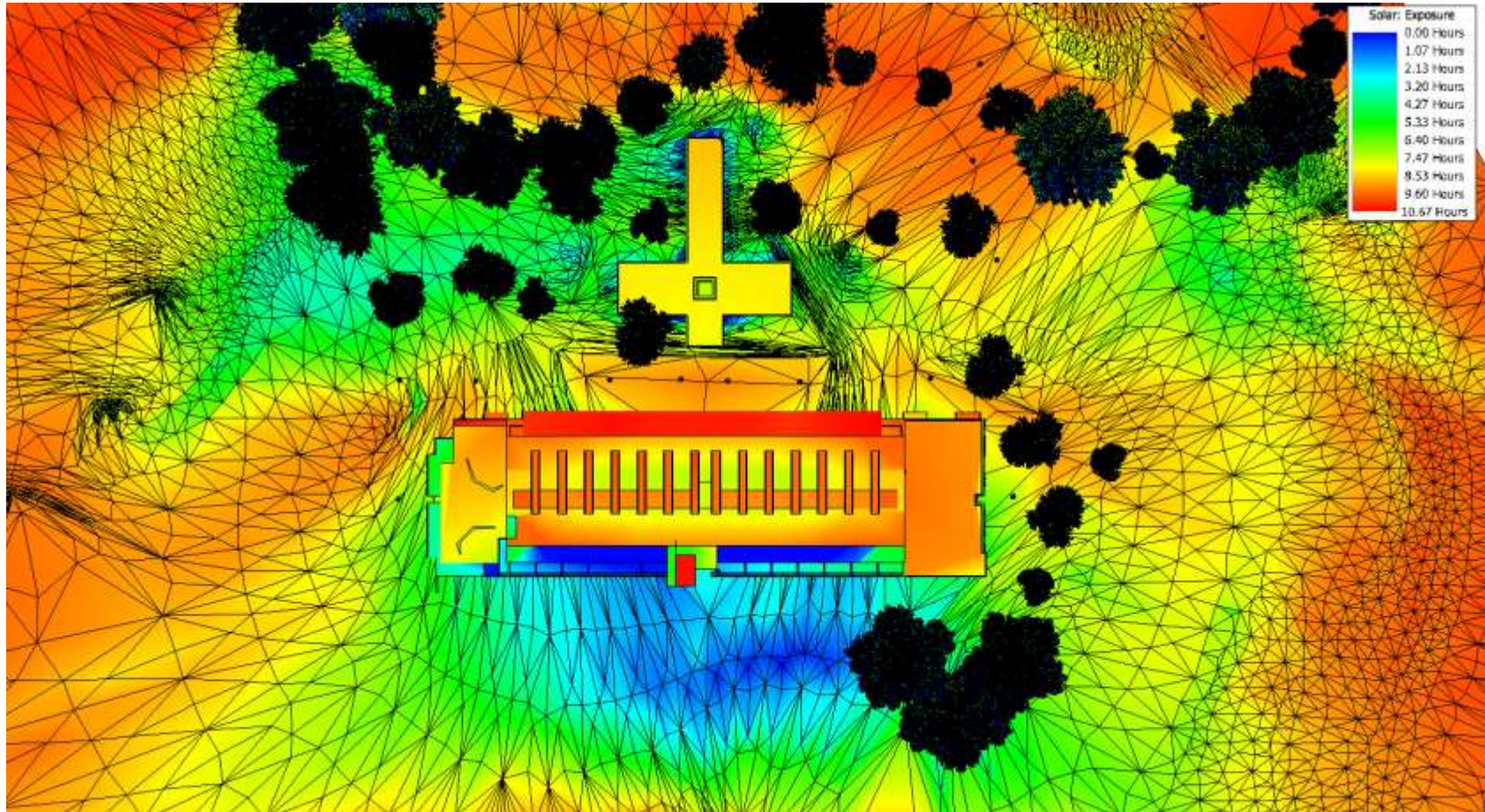
- Site feasibility
- Program management
- Material costs
- Environmental impact
- Traffic and safety
- Constructability
- Building and facility performance
- Facility retrofit



Site Feasibility



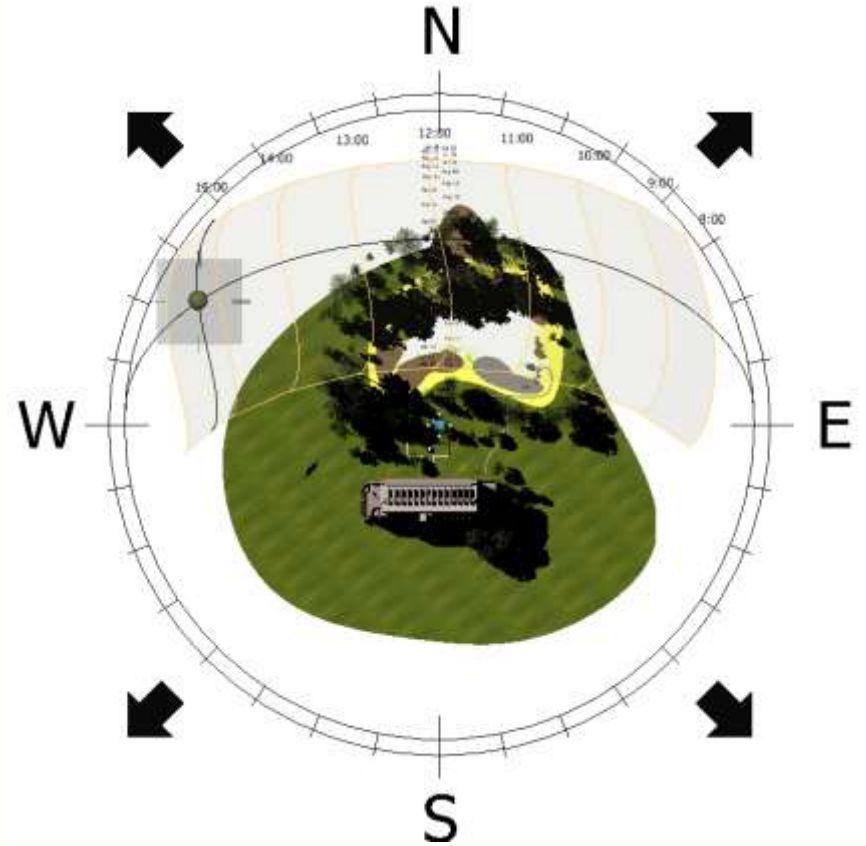
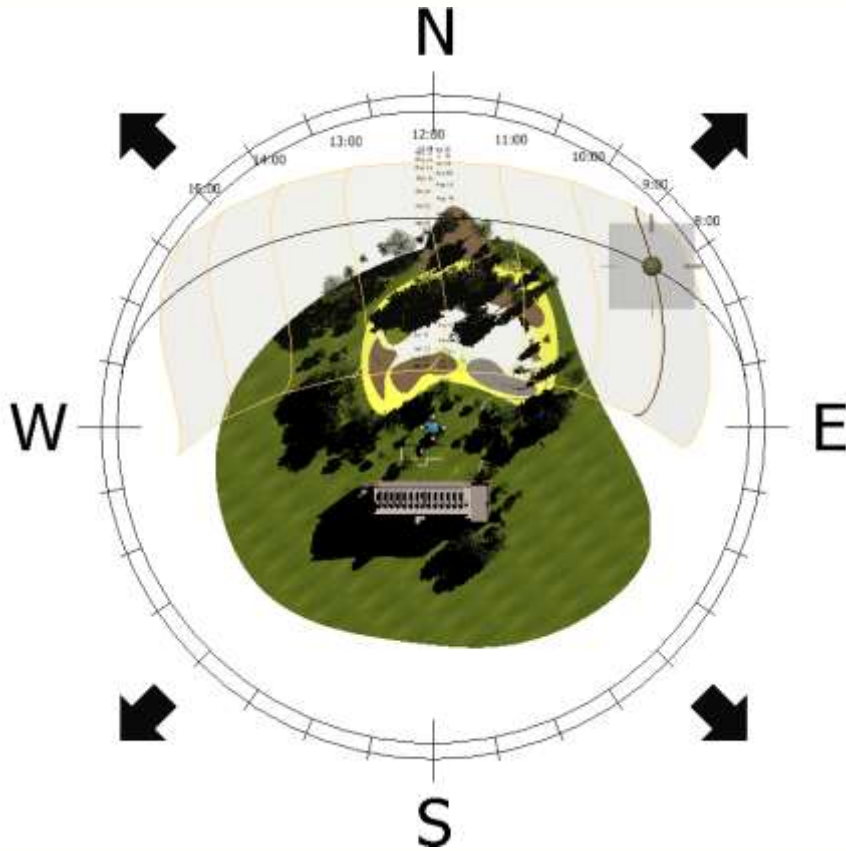
Site Feasibility



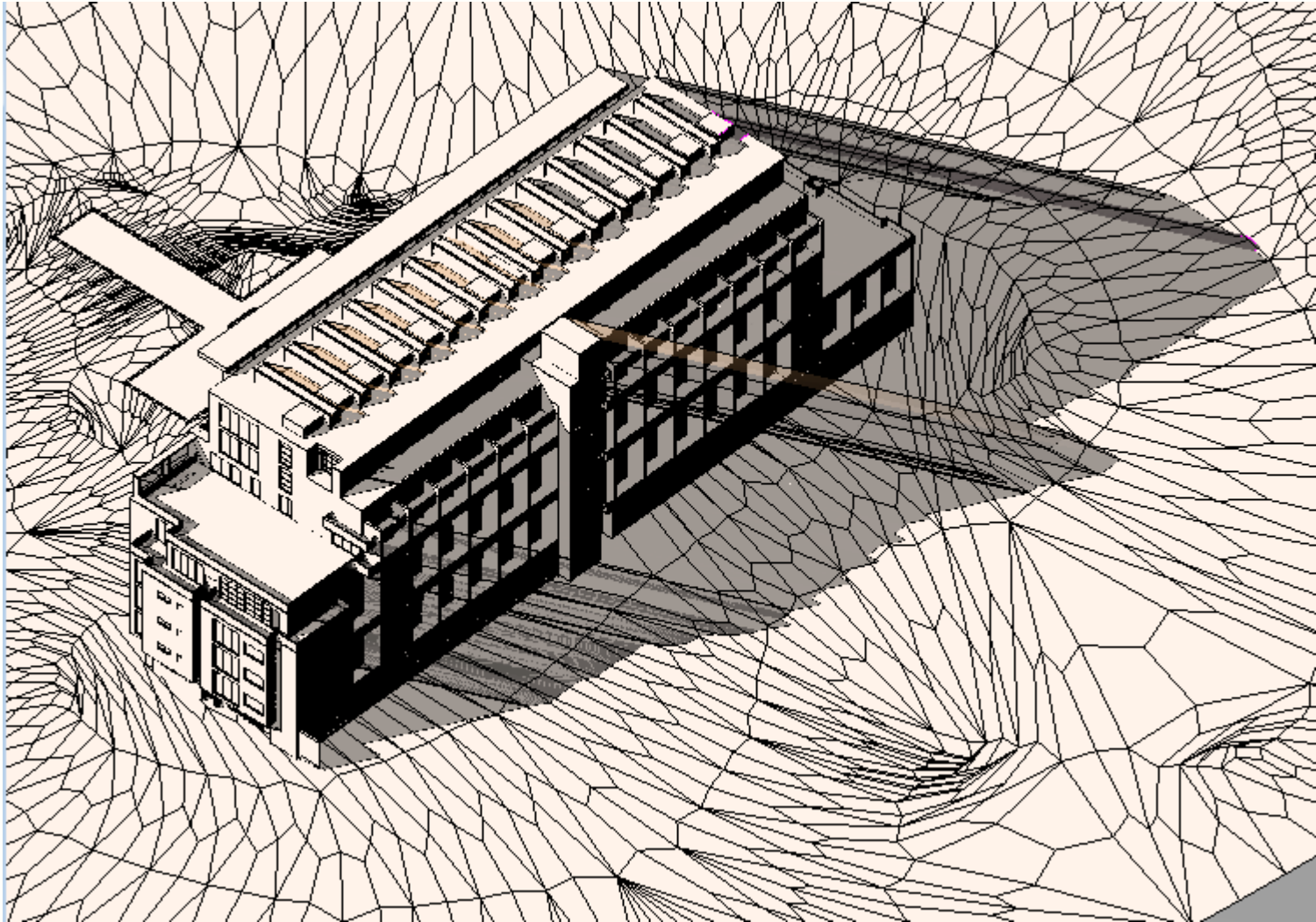
Site Feasibility



Site Feasibility

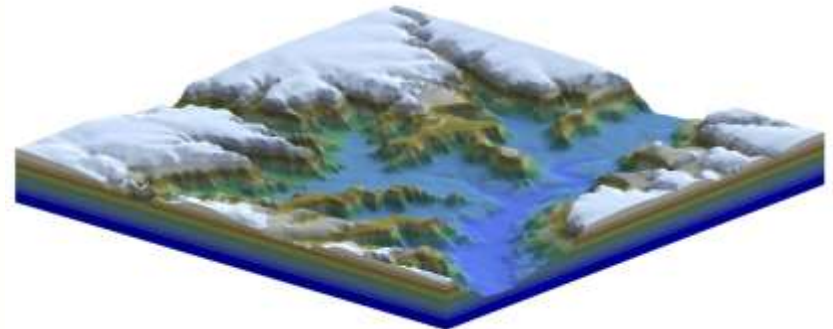
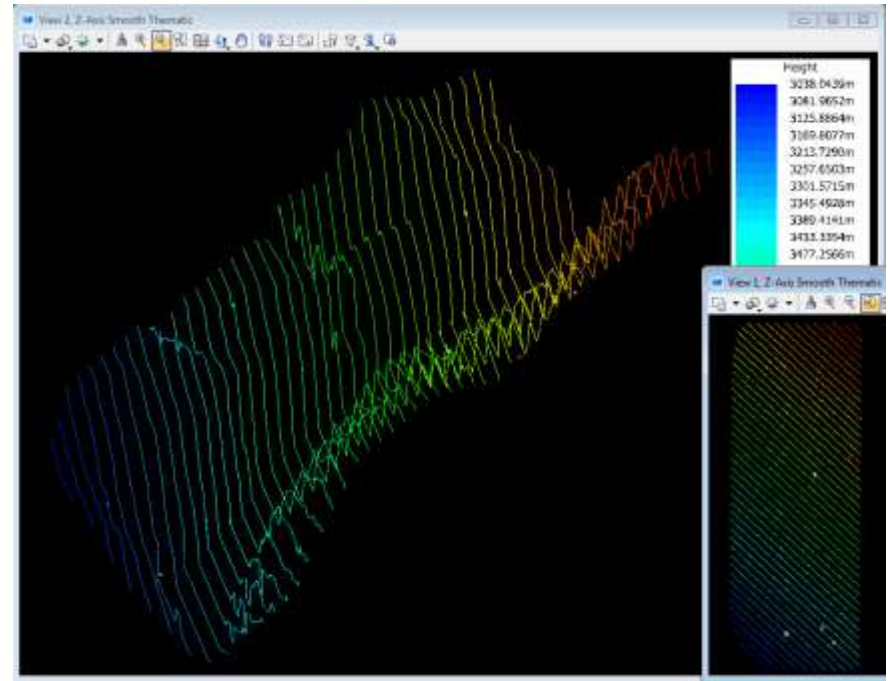


Site Feasibility

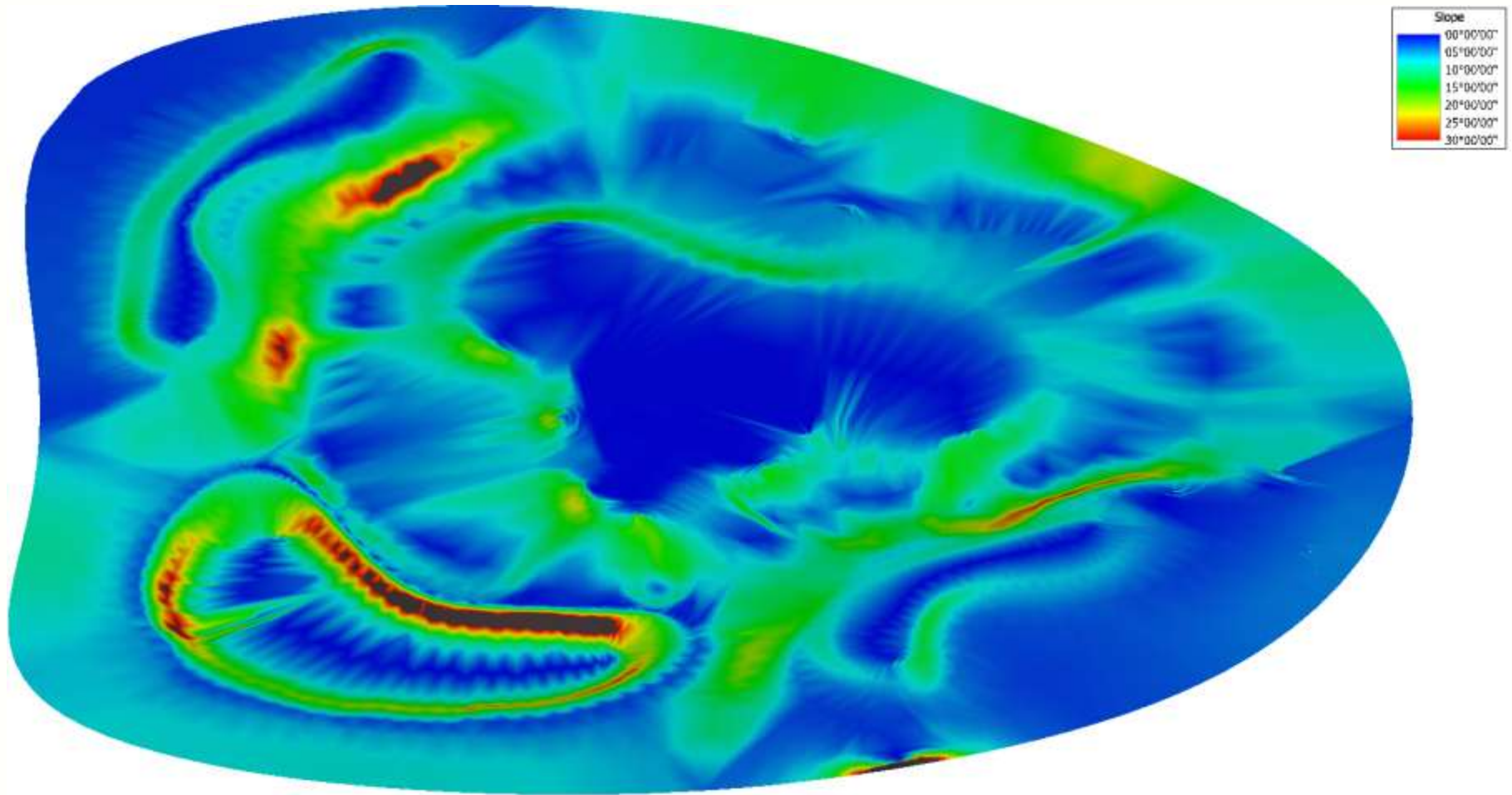


Thematic Visualization

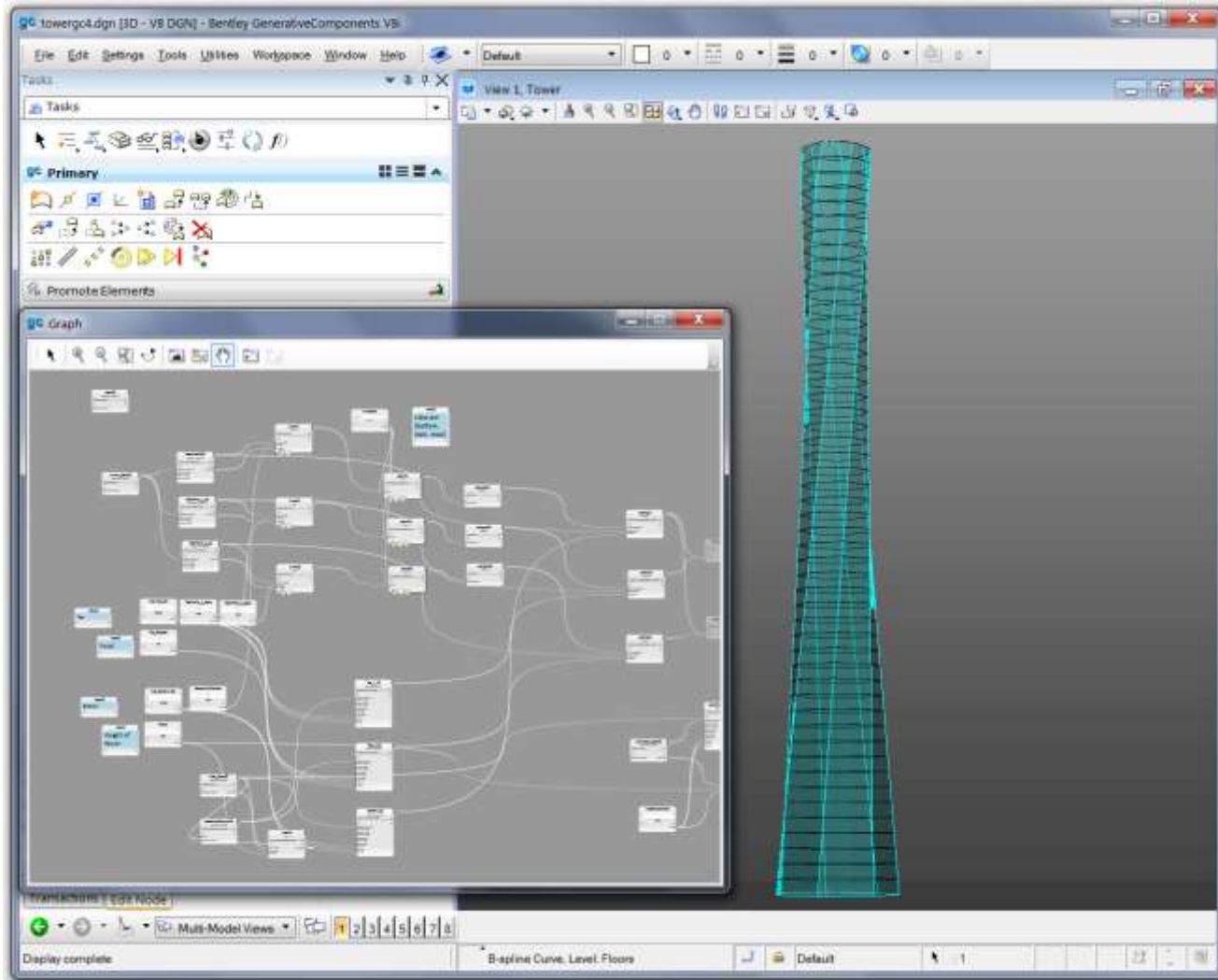
- Thematic Display Styles
 - Real-time display of Height, Slope, Aspect Angle, and Hill shade
 - Review thematic characteristics of models in real time
 - Produce maps and presentations based on thematic characteristics
 - Customize for your project



Site Feasibility



Program Management





Generative Components Visual Programming

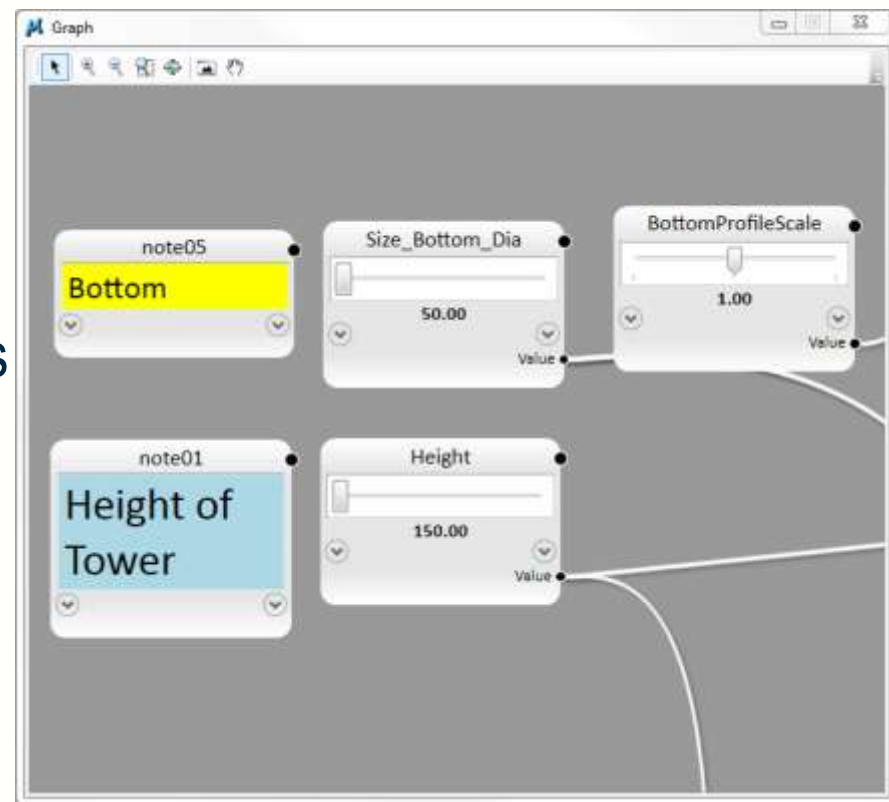
Pain: Time consuming to explore many design options without programming skills

Solution:

- Easy, visual creation of model relationships without scripting
- Combine and connect nodes and use controls to explore alternatives

Use Cases:

- Curved building envelope design
- Panelization options



Tasks

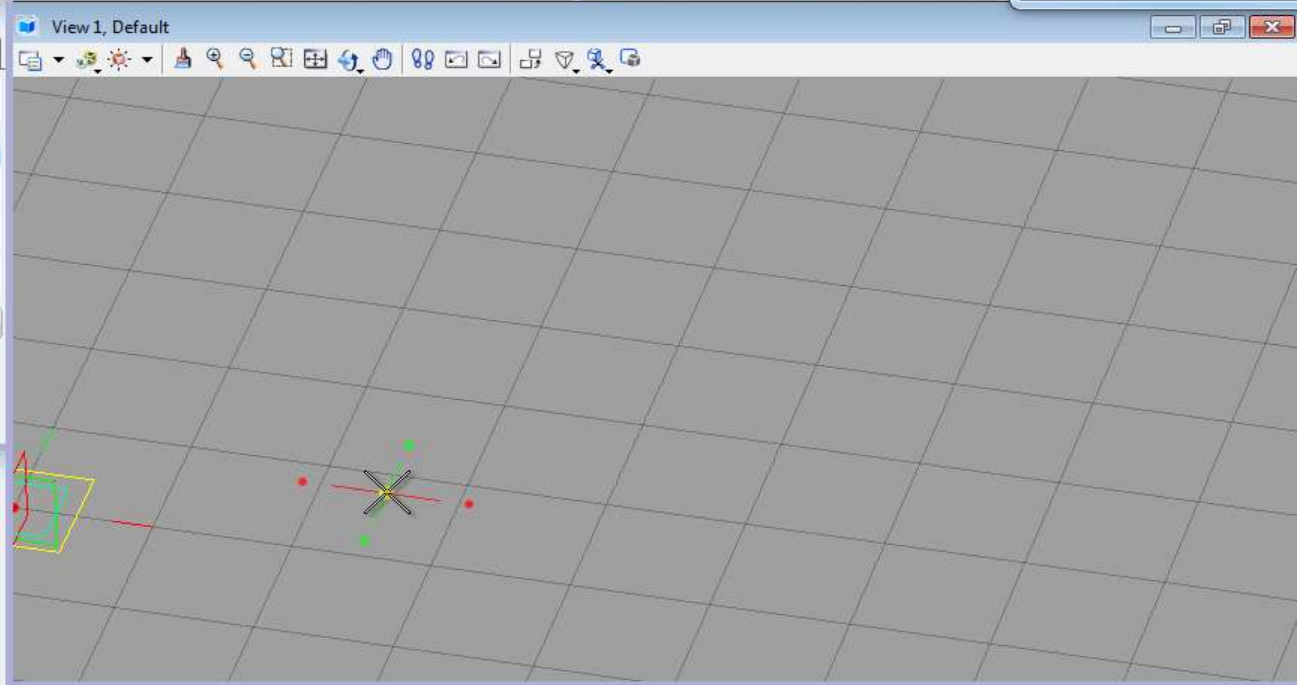
Tasks

1 2 3 4 5 6 7 8 9

GC Primary

Q W E

Promote Elements



New Node

Node types, techniques Show general properties

Node Type

- Technique
- ByAngleCenterStartPlanePoint
- ByCenterRadiusSweepAngle
- ByCenterStartSweepPoint
- ByFunction
- ByImportedData
- ByLengthStartEndPoint
- ByPointsOnCurve
- ByTangentCurveStartEndPoint
- ByTangentDirectionEndPoint
- CircularOffset
- ComplementArc
- ConvertCurveToArcSegments
- CopyTransformGeometricContents
- ExtractRegionUsingParameterSpan
- ExtractRegionUsingStartEndPoint
- FilletTangentToCurves
- FromDEllipse3d
- FromElementsInAttachment
- FromElementsInCell
- MirrorCopyGeometricContentsAboutPlane
- PartialDeleteUsingParameterSpan
- PartialDeleteUsingStartEndPoint
- ReverseArc
- SelectFeaturesOfThisBase...

Type:

Technique: Example

Name of new node:

Assign active symbology

Edit Last OK

Graph

Generative Design

VISUALIZATIONS



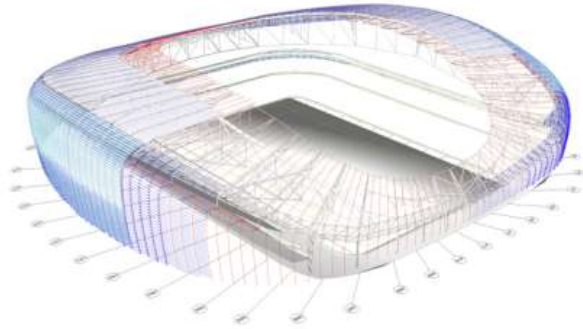
Generative design lets architects and engineers express their innovation resulting in design excellence.



Stone Towers
Zaha Hadid Architects
Cairo, Egypt

Generative Design

- Parametric Modeling



Aviva Stadium
Populus
Dublin, Ireland



Generative Design



The Lagoons
Thompson, Ventulett, Stainback & Associates
Dubai, UAE

- Design creativity



Ukrainian Health Protection Centre
for Women and Children
BDP
Kiev, Ukraine

Fast Render Previews and Progressive Refinement

Pain: Waiting for rendering wastes time

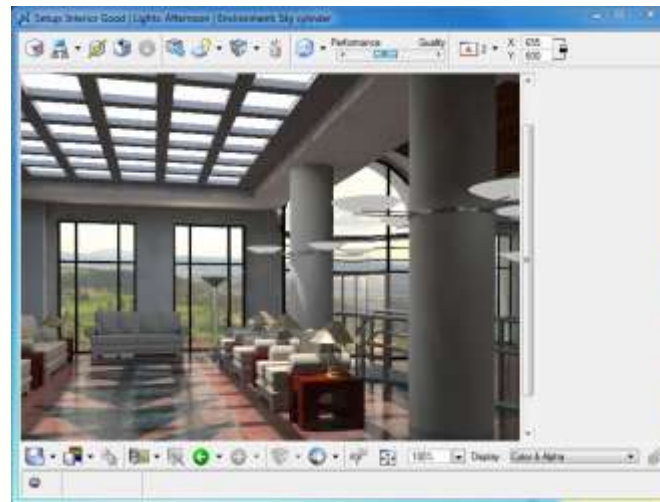
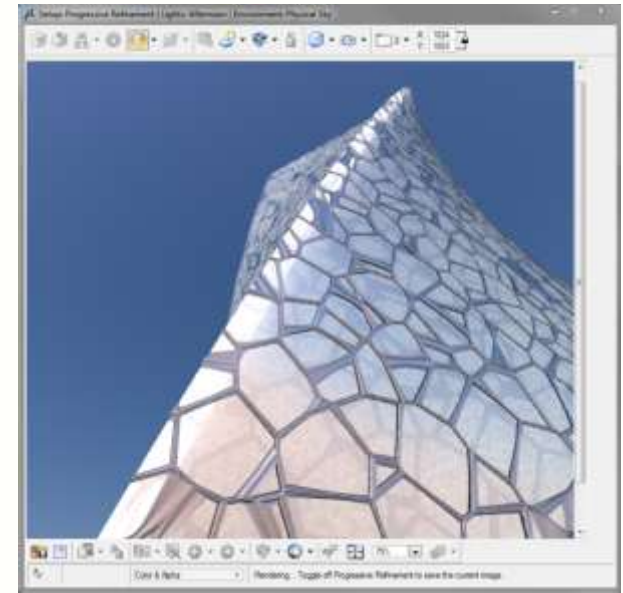
Solution:

- Previews produced in near-real time
- Results improve as render progresses

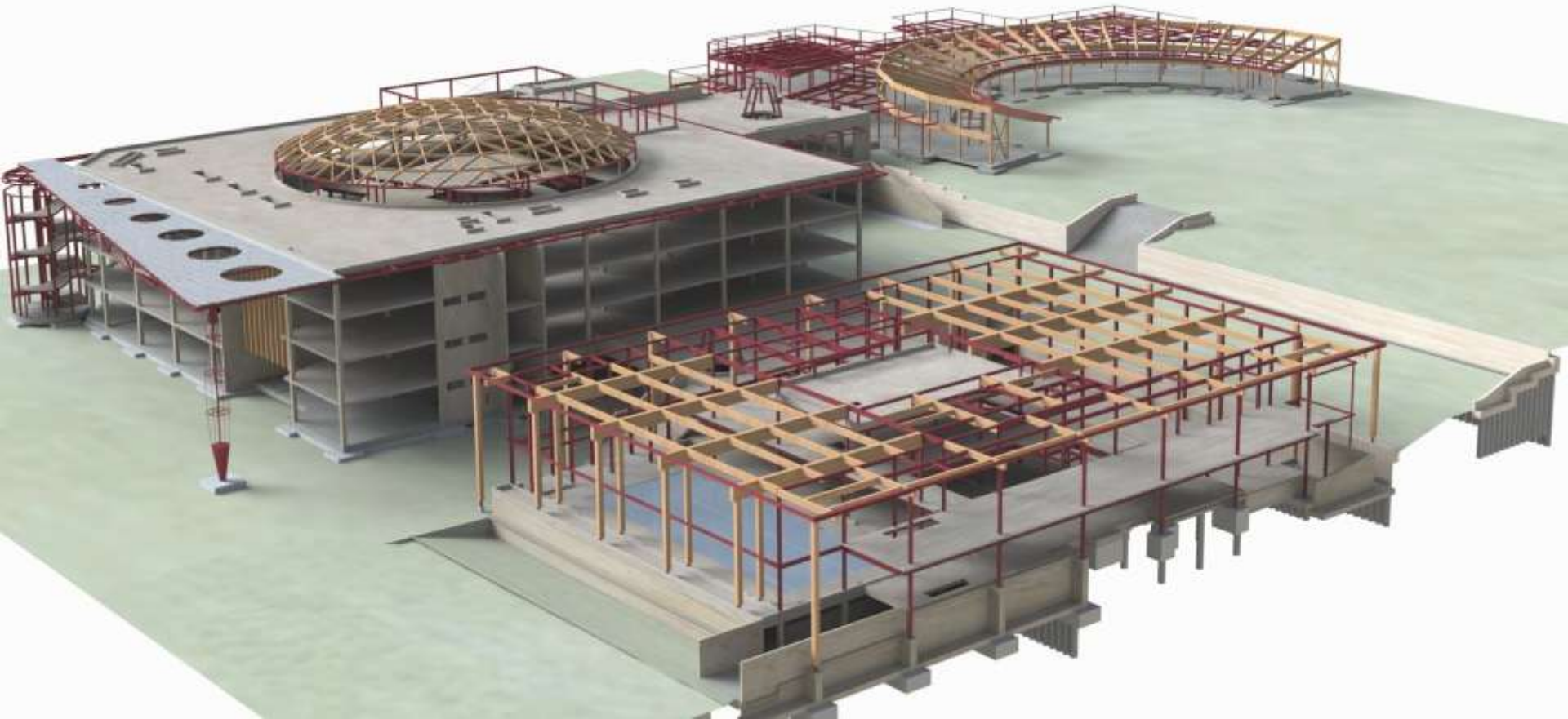
Use Cases:

Quickly Explore multiple:

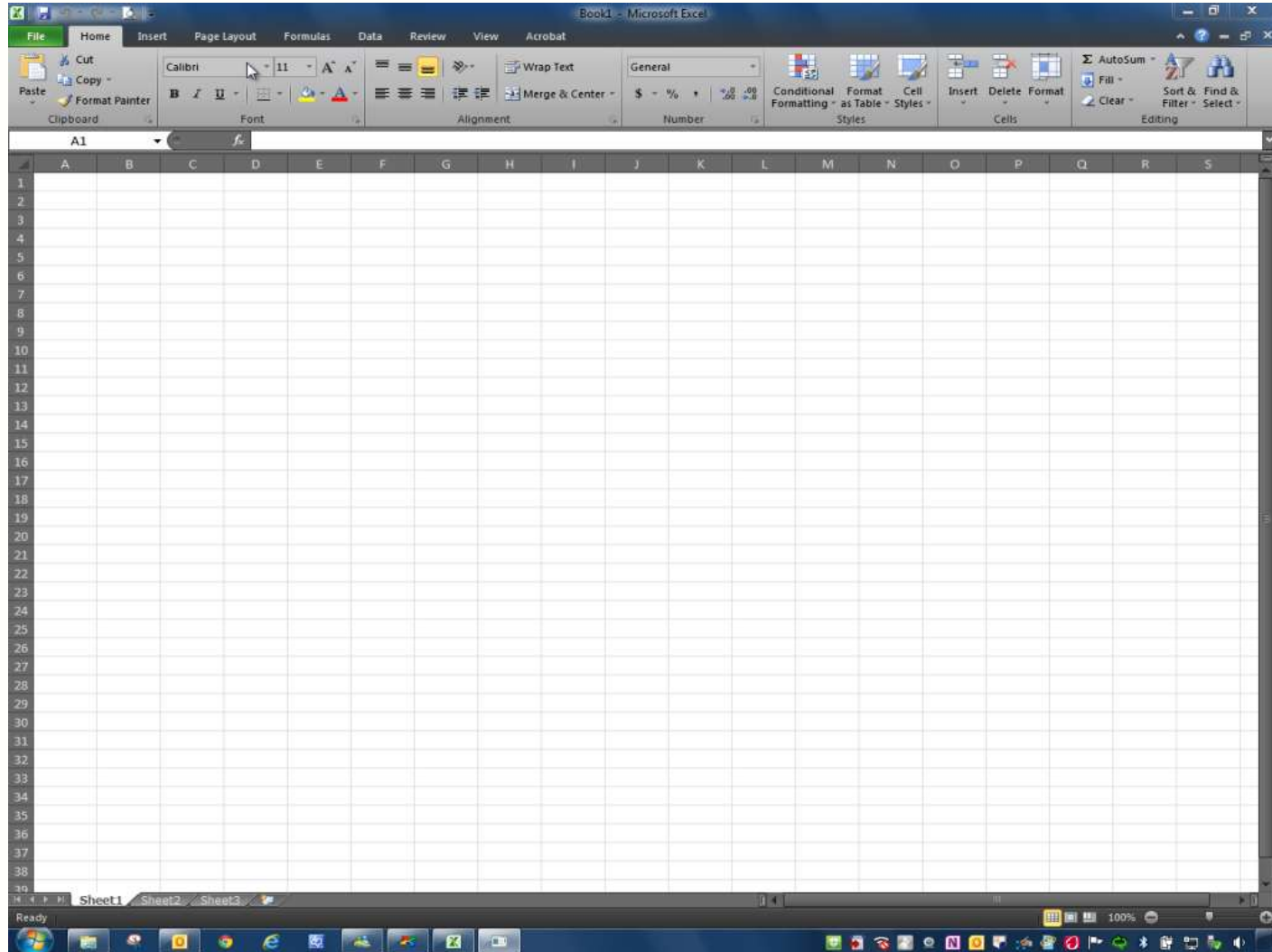
- Materials
- Lighting options
- Camera positions



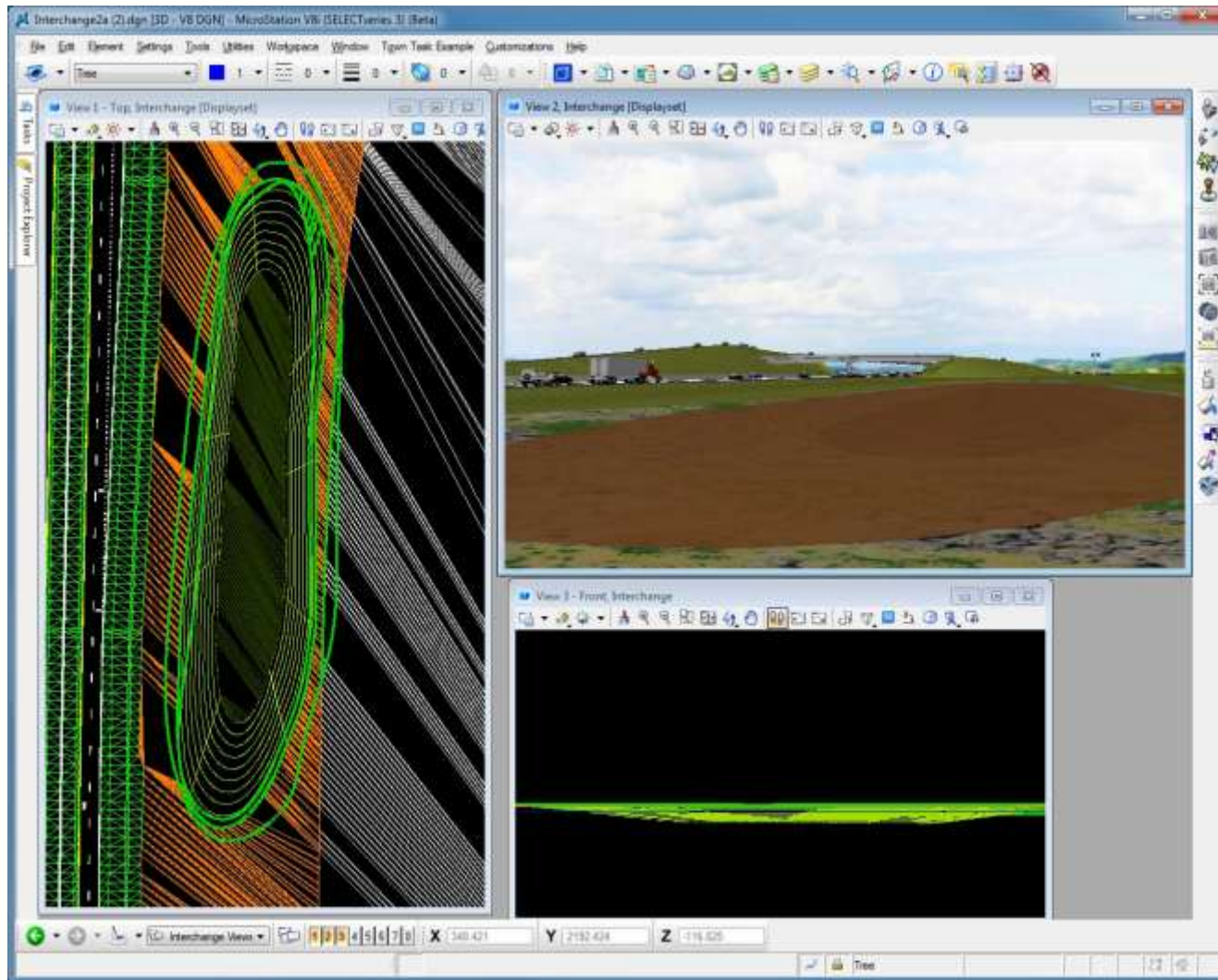
Material Performance



Material Performance



Environmental Impact



Environmental Impact



Traffic and Safety



Traffic Animation

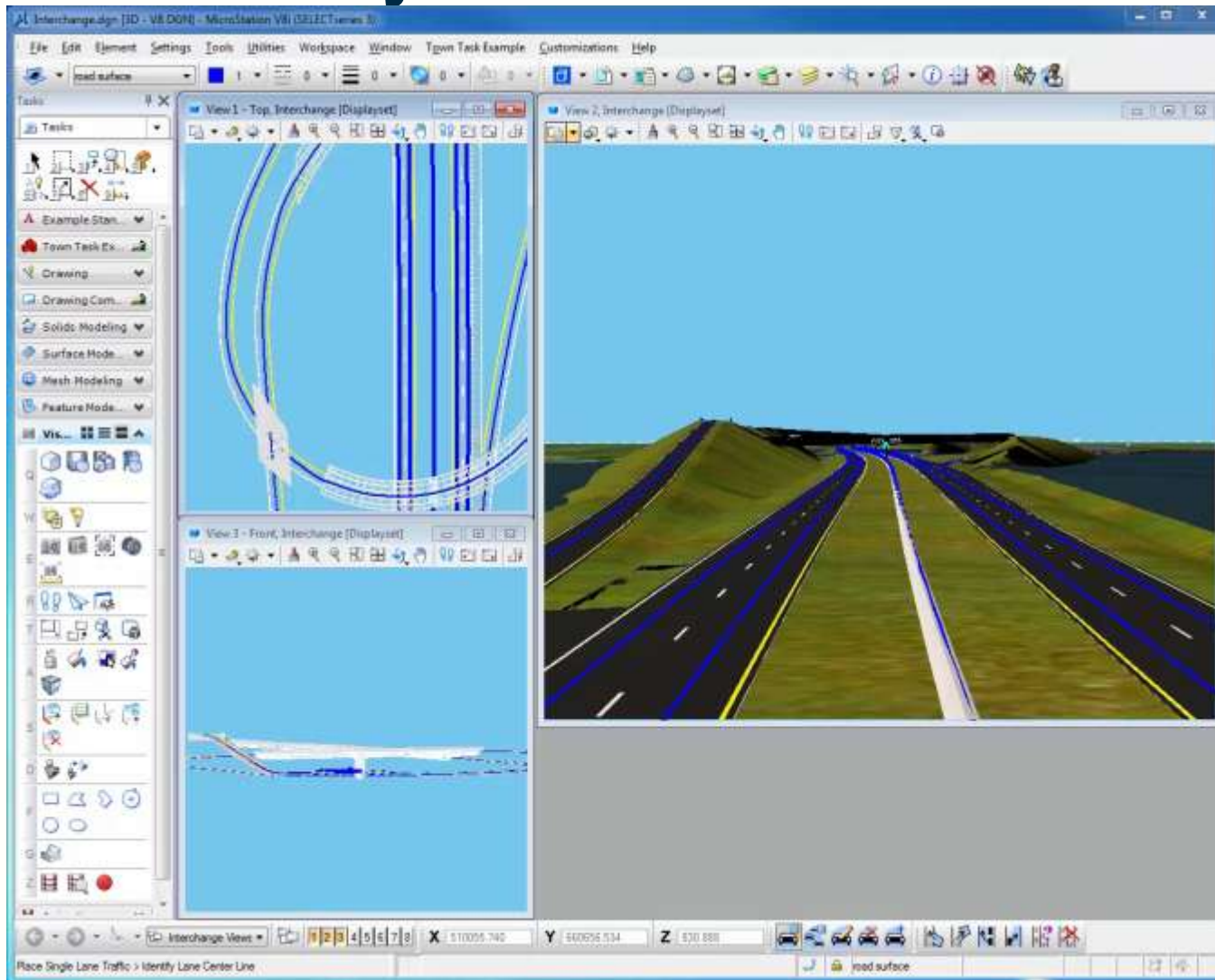
Pain: Creating animations including moving traffic are labor-intensive

Solution: Simple workflow-centric approach for producing compelling traffic animations





Traffic and Safety



*Louis van Amerongen
Designer, Witteveen+Bos*



*Tim Kohn, Director, Technology Solutions
AECOM office of the CTO*

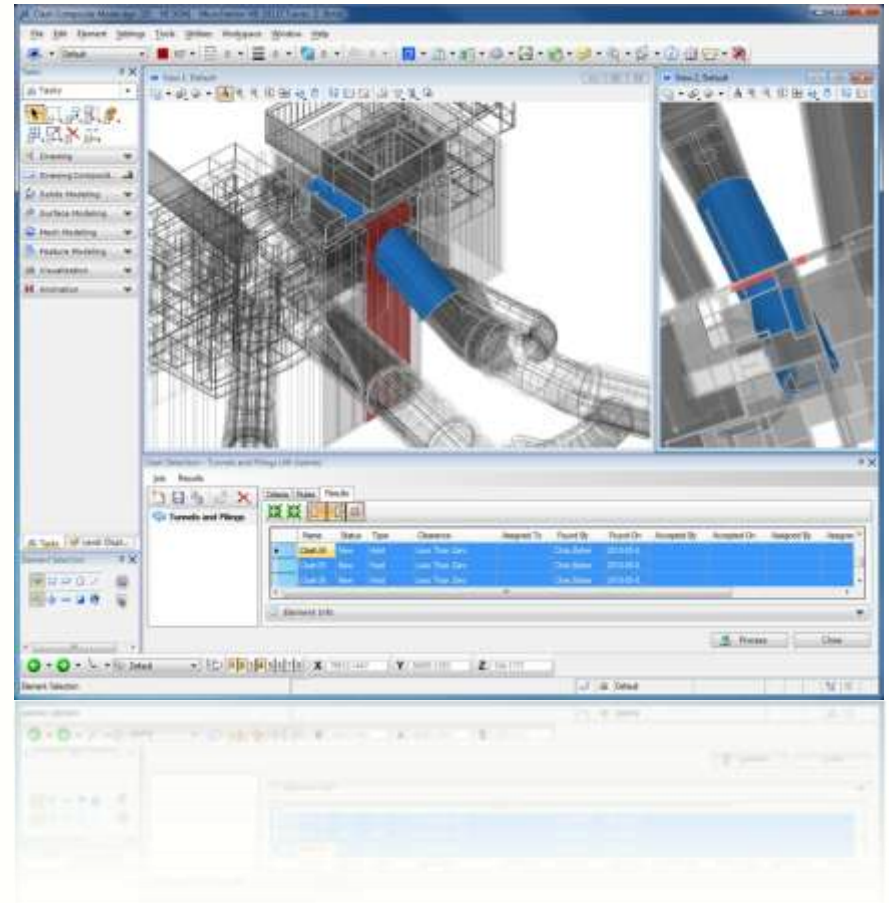


Traffic and Safety



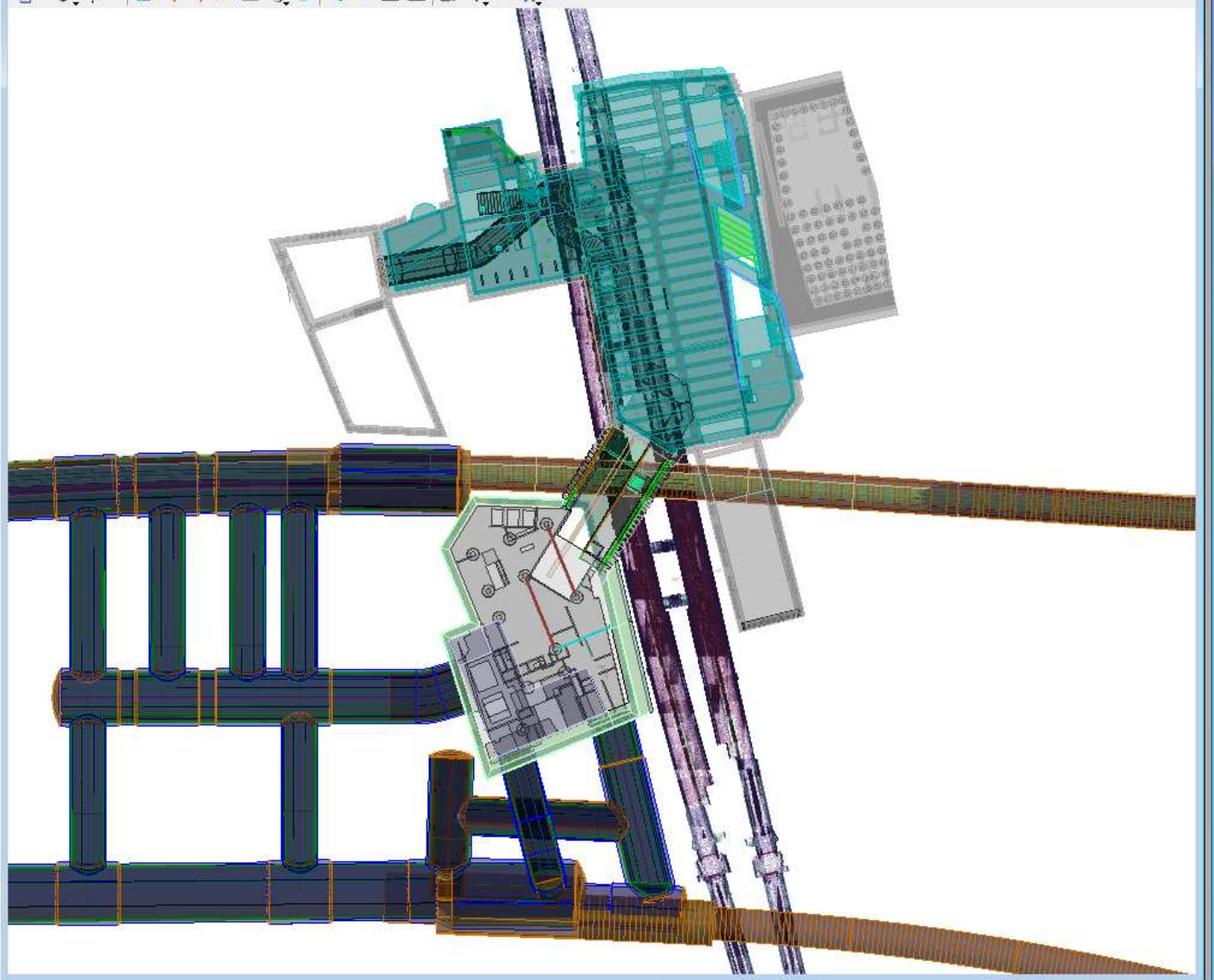
Constructability

- Clash Resolution
 - Validate design at the time of creation
 - Make changes in real-time during design and layout to avoid costly mistakes downstream
 - ProjectWise Clash Resolution Visa Required

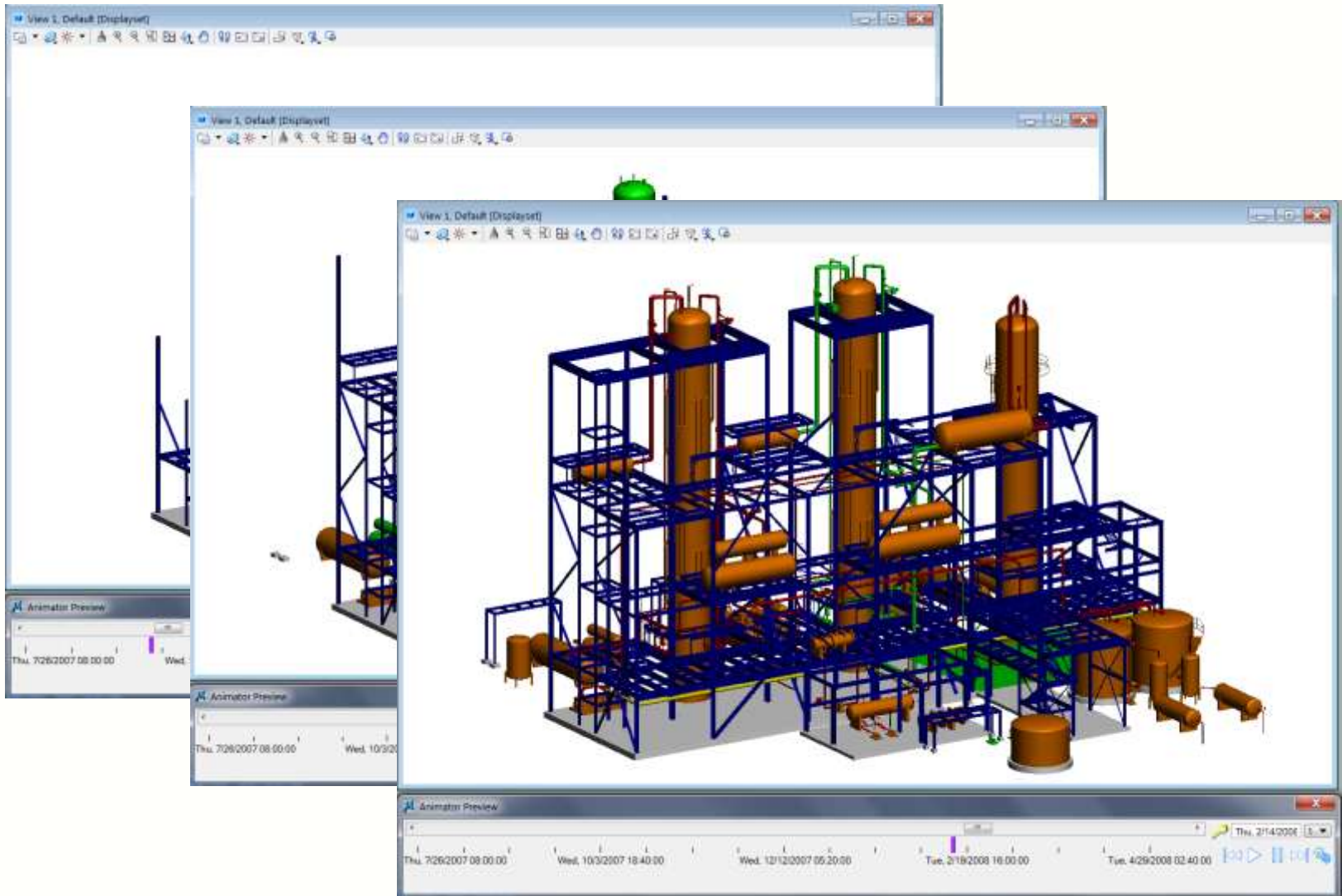


Tasks

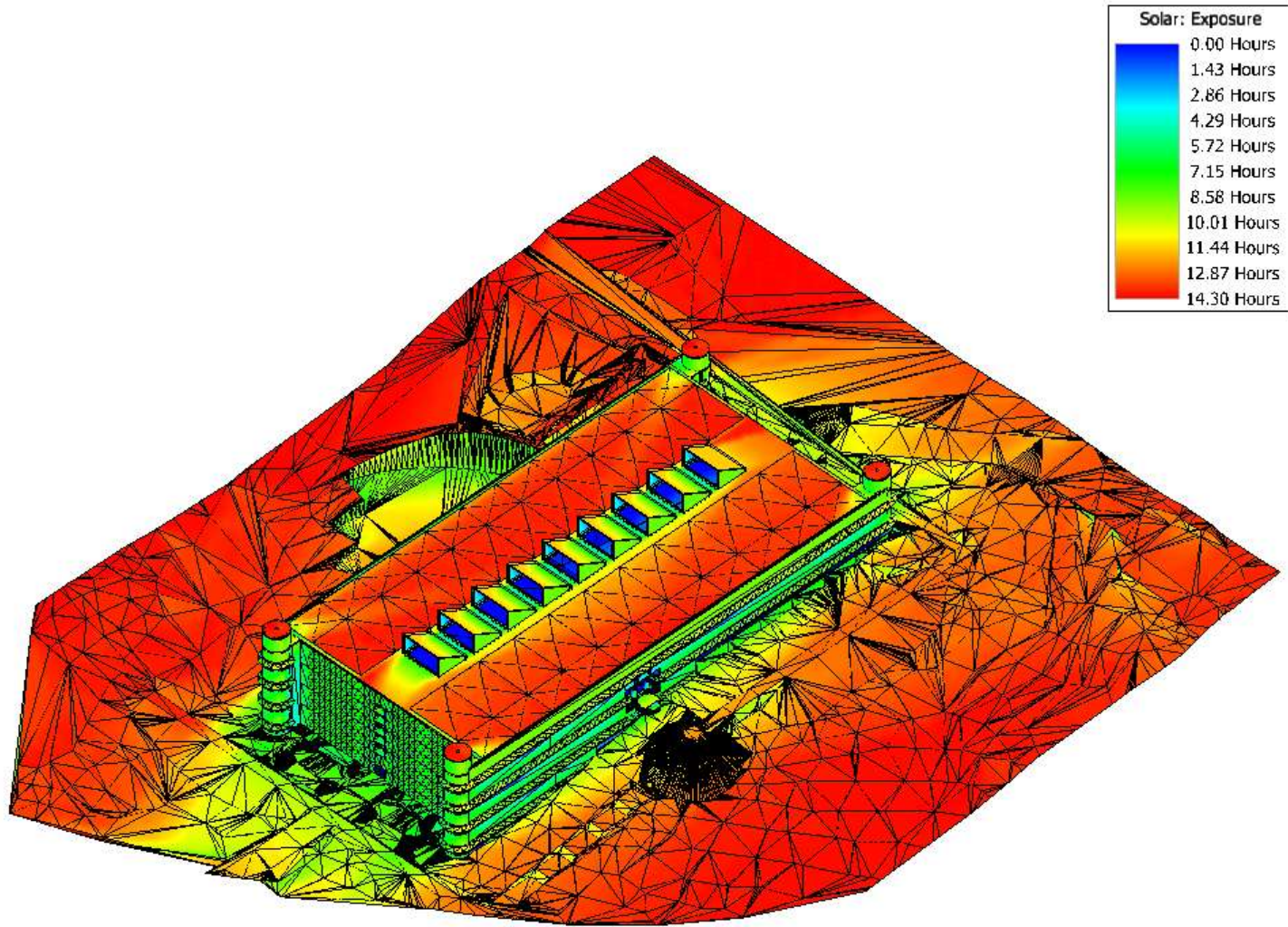
- Tasks
- Drawing
- Drawing Composition
- Solids Modeling
- Surface Modeling
- Mesh Modeling
- Feature Modeling
- Visualization
- Animation



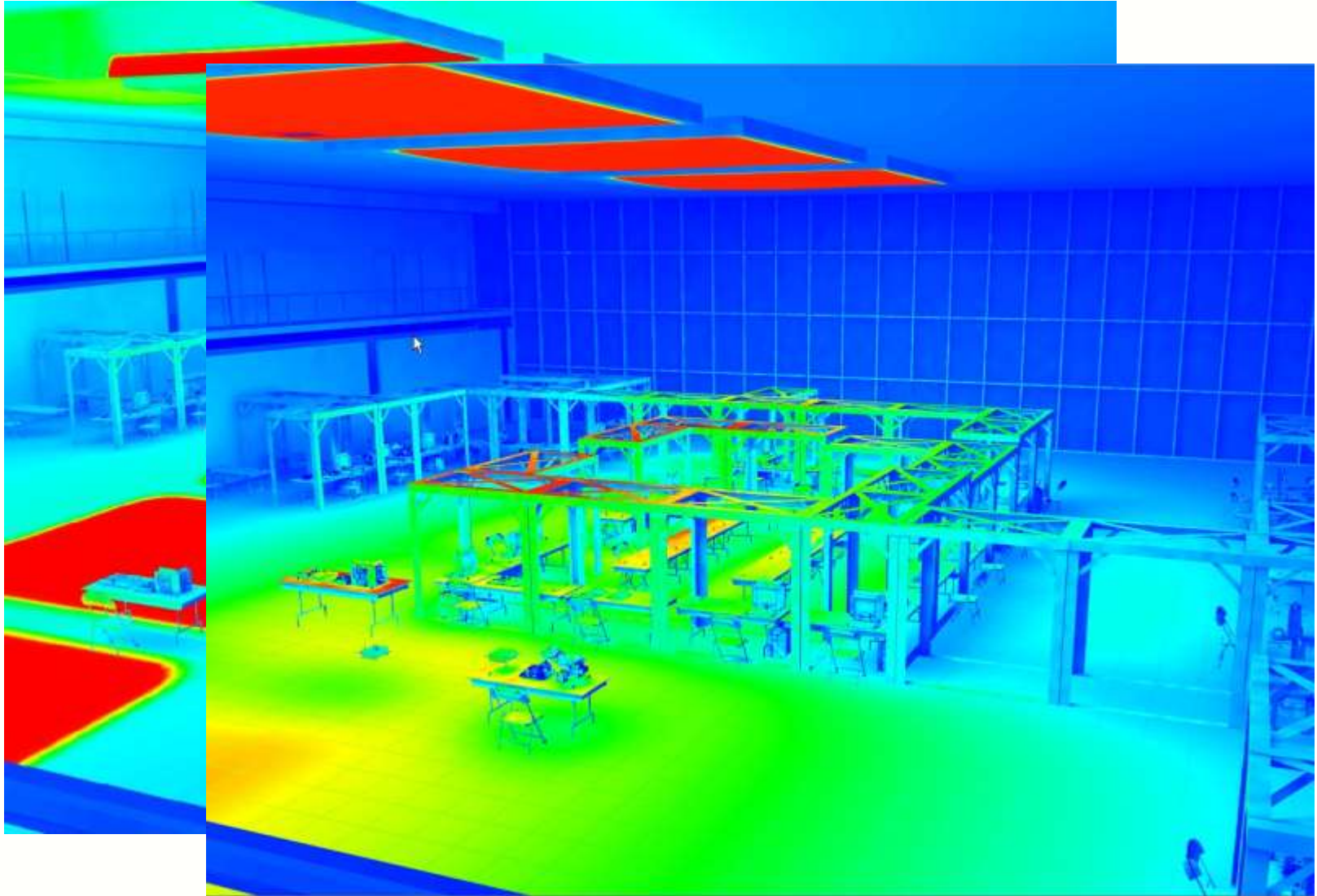
Constructability



Building Performance



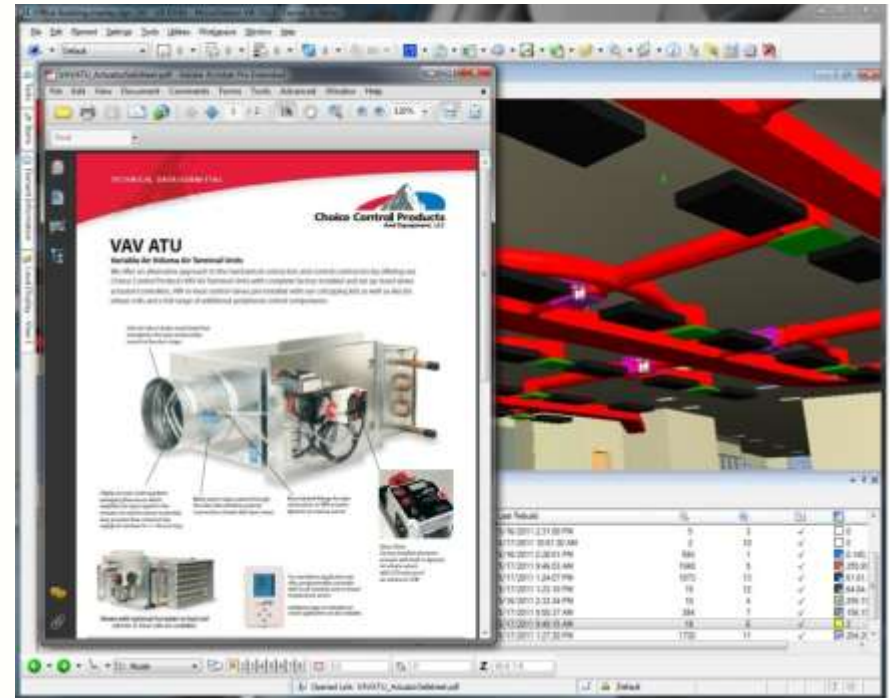
Building Performance

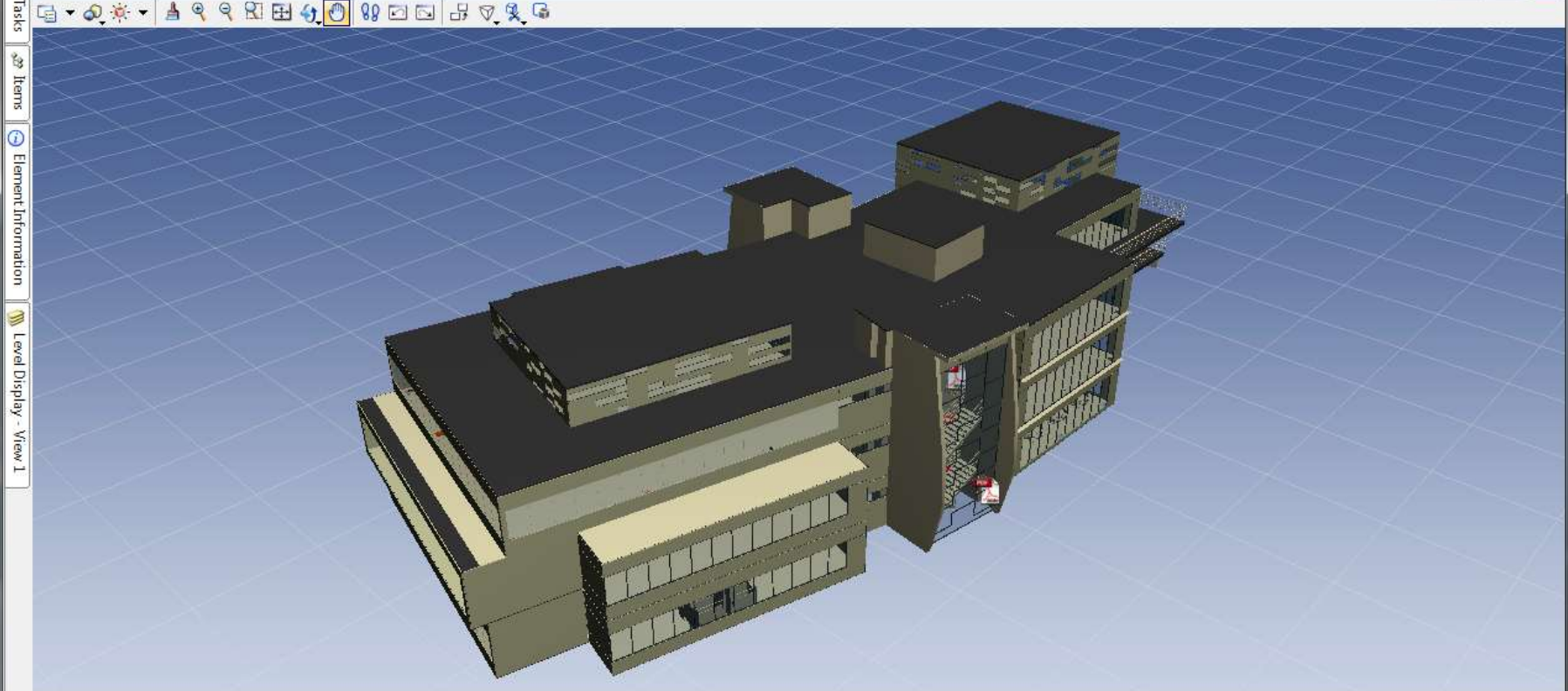




Facility Performance

- Group objects by construction status for design review
- Link details, specifications, or other content to sets of items
- Build operational models to provide quick access to related operations/maintenance documents

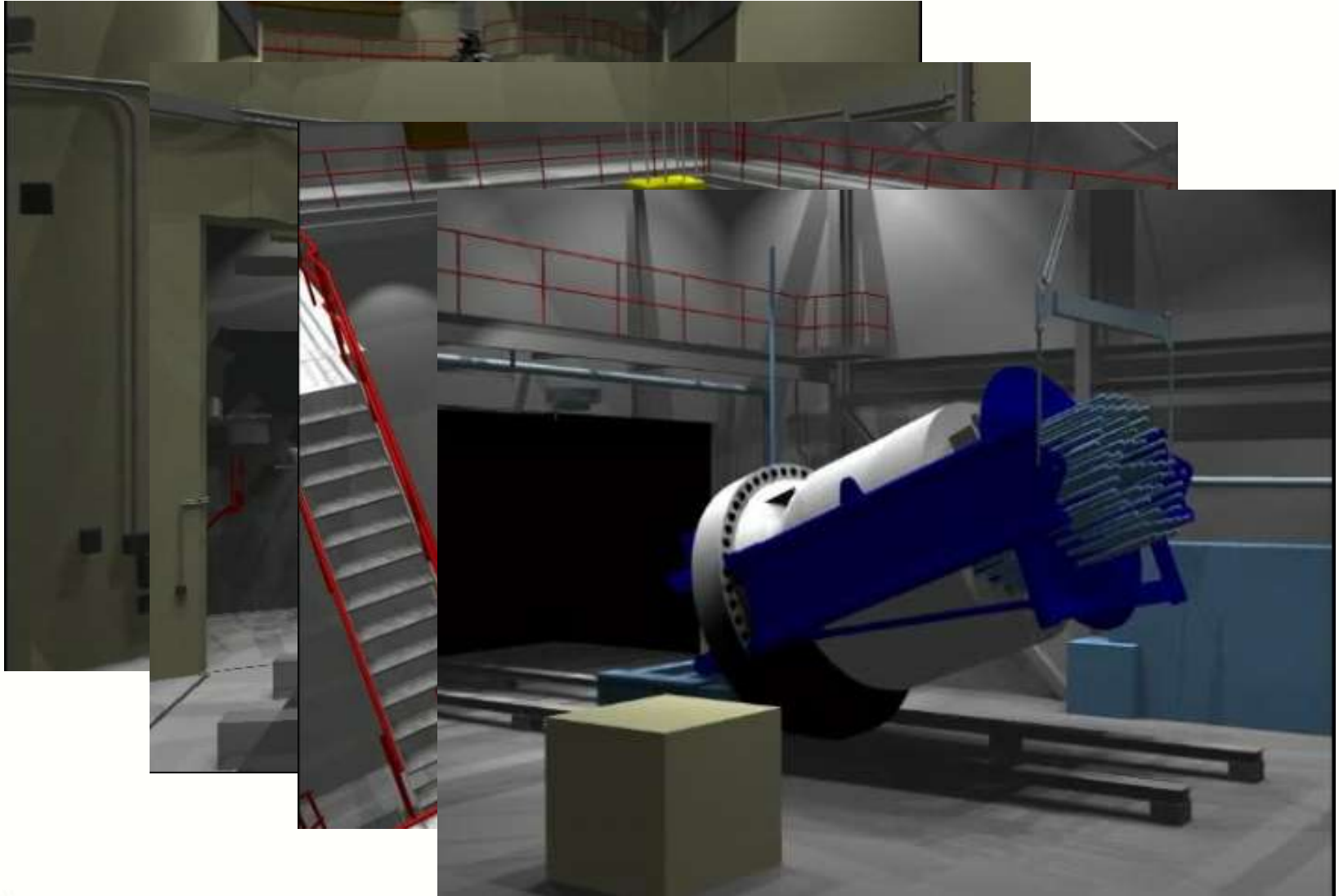




Item Sets

Active	Name	Description	Selection Expression	Last Rebuild				
<input checked="" type="checkbox"/>	Walls	Architecture	Search for items of type "Curtain Panels" where Family is equal to 'System P...	5/17/2011 1:27:20 PM	1730	11	<input checked="" type="checkbox"/>	204,26
<input checked="" type="checkbox"/>	VAV Units	MEP	Search for items of type "Mechanical Equipment" where Family is equal to "...	10/6/2011 9:26:39 AM	18	6	<input checked="" type="checkbox"/>	2
<input checked="" type="checkbox"/>	Structural	Structural	Search for any items where RevitConnectorDocument is equal to 'Bentley St...	5/17/2011 9:50:37 AM	384	7	<input checked="" type="checkbox"/>	156,15
<input checked="" type="checkbox"/>	Single Flush Doors	Architecture	Search for items of type "Doors" where Family is equal to 'Single-Flush'	5/16/2011 2:33:34 PM	10	4	<input checked="" type="checkbox"/>	255,19
<input checked="" type="checkbox"/>	Roof	Architecture	Search for items of type "Roofs" where Category is equal to 'Roofs'	5/17/2011 1:23:10 PM	15	12	<input checked="" type="checkbox"/>	64,64,
<input checked="" type="checkbox"/>	Mullion	Architecture	Search for items of type "Curtain Wall Mullions"	5/17/2011 1:24:07 PM	1873	13	<input checked="" type="checkbox"/>	61,61,
<input checked="" type="checkbox"/>	MEP	MEP	Search for any items where RevitConnectorDocument is equal to 'Bentley M...	5/17/2011 9:46:03 AM	1040	5	<input checked="" type="checkbox"/>	255,89
<input checked="" type="checkbox"/>	Glazing	Architecture	Search for items of type "Curtain Panels" where Type is equal to 'Glazed'	5/16/2011 2:28:51 PM	593	1	<input checked="" type="checkbox"/>	0,140.
<input type="checkbox"/>	Elevators	Equipment	Search for any items where Family is equal to 'Elevator-Electric'	5/17/2011 10:01:30 AM	2	10	<input checked="" type="checkbox"/>	0
<input type="checkbox"/>	Double Glass Doors	Architecture	Search for items of type "Doors" where Type is equal to 'Curtain Wall Dbl Gl...	5/16/2011 2:31:00 PM	5	3	<input checked="" type="checkbox"/>	0

Facility Retrofit



MicroStation

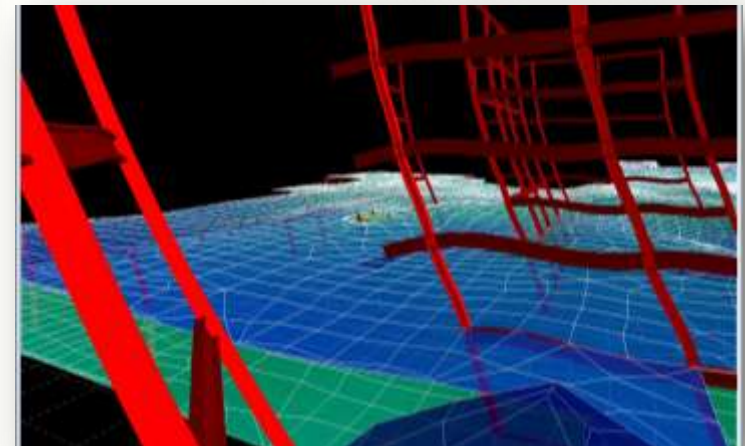
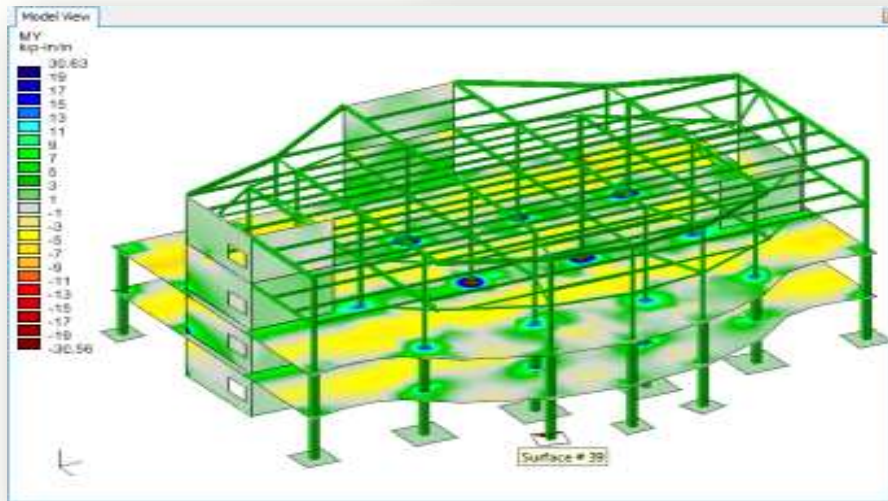
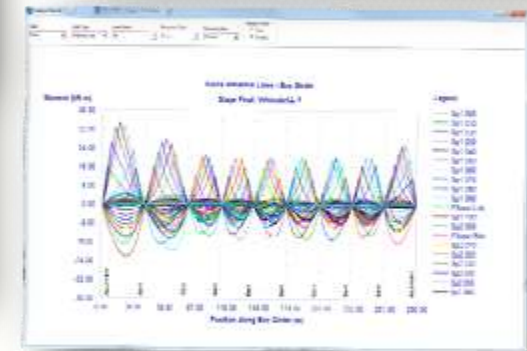
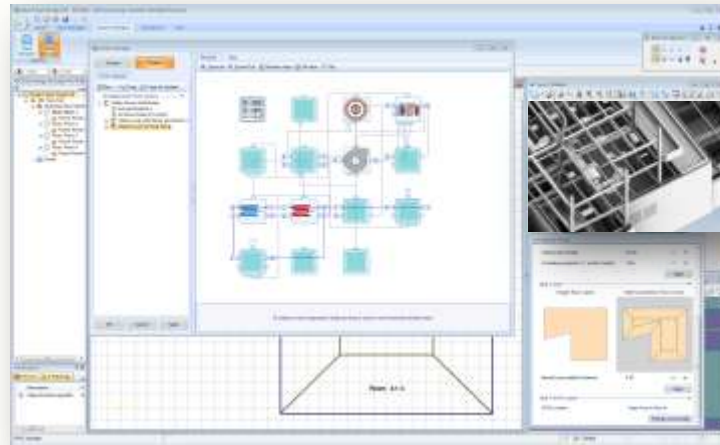
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...that can be used as both a **software application** and as a **technology platform** for discipline-specific applications.

Bentley's Performance Portfolio

- Building
- Bridge
- Structural
- More..





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