

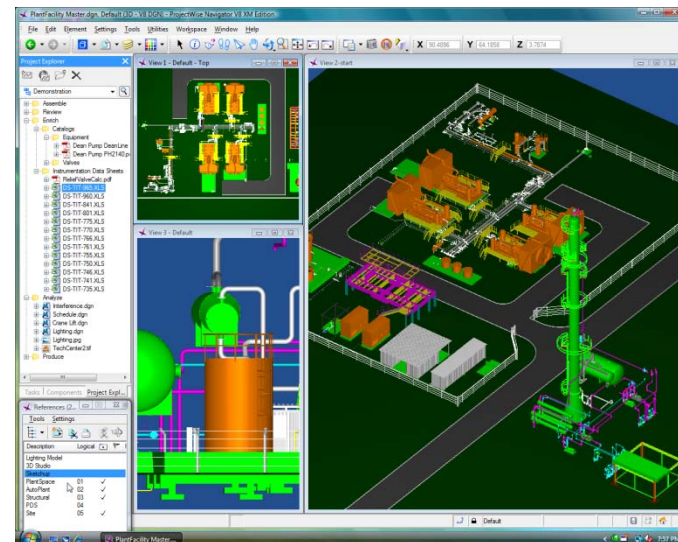
Agenda

- ProjectWise Navigator overview
- Enhancements in ProjectWise Navigator 08.09.05.
- Product presentations
 - Design review
 - Assemble and publish protected files
- Questions and answers

What is ProjectWise Navigator?

ProjectWise Navigator supports visual collaboration for immersive project review & analysis

- Design Review
- Visual Collaboration
- Simulation
- Interference detection



ProjectWise Navigator

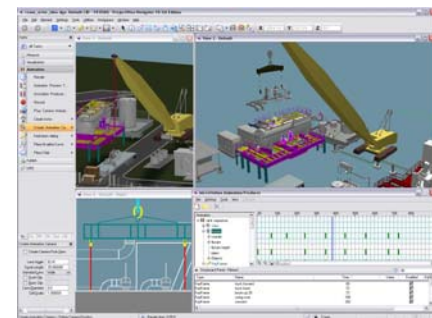
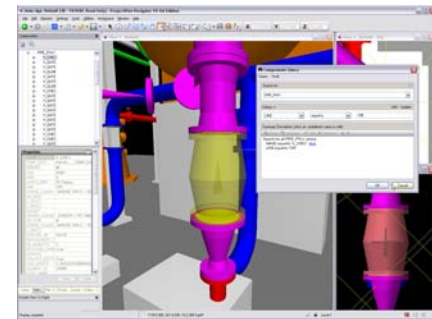
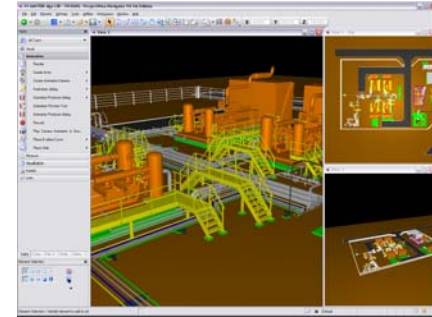
Assemble – Single Project View

Review – Search and Retrieve

Enrich – Work Package Assembly

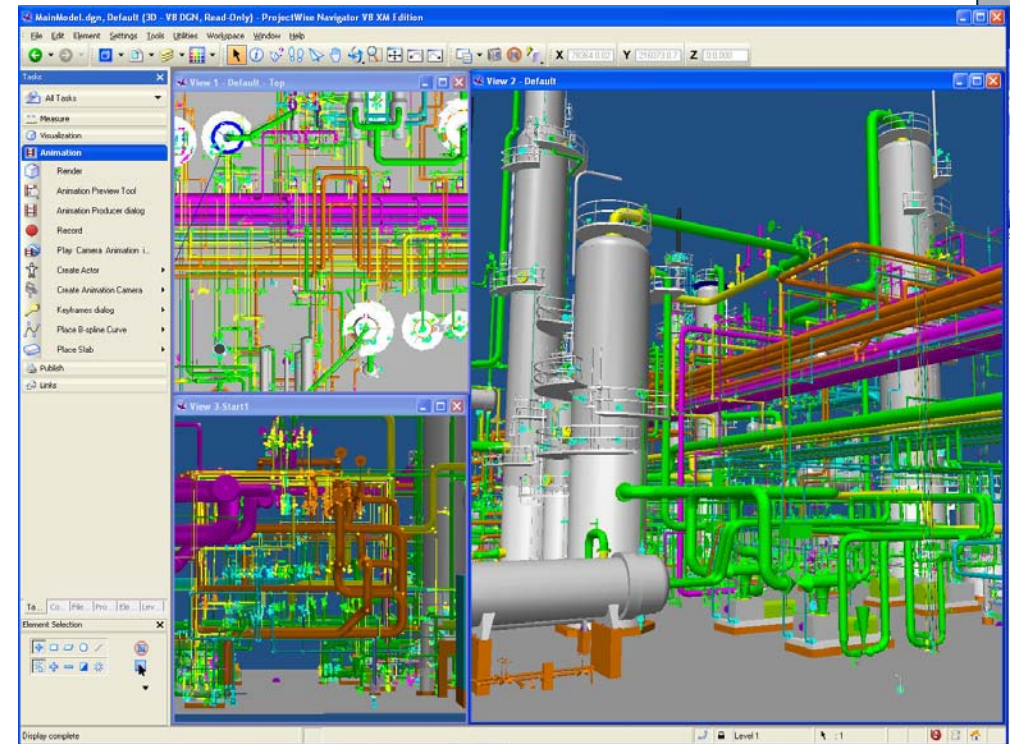
Analyze – Examine Project Constructability

Produce – Intelligent Deliverables



ProjectWise Navigator V8 XM Edition

- Design review
- Schedule simulation
- Animations
- Plant models
 - 2D, 3D, DGN / DWG, raster
 - PlantSpace, AutoPLANT
 - PDS, PDMS
 - AutoPIPE, STAAD
 - XMpLant
 - ISO 15926
- Query and view data





Content Source

AutoCAD 11-2007, ADT 3.3 to 2006, Revit Building 8.1, Building Systems, Revit Structure 2.0, Inventor 11.2, Max 3 to 7, MDT 6 to 2006, V to 2006, Maya, AutoPLANT, P&ID, ARPS, AutoPLANT Structural Engineering, AutoPLANT Isometrics, AutoPLANT Structural Modeler, Architecture, Coax, Arenyum, Connector for mySAP.com, AutoPIPE, Connectors, AXSYS, Engine, System, DigitalPlant Solutions, CADScript, Driver Packs, CloudWorx, eWarehouse, Expert Designer, Fiber, Explorer, Web Publisher, Explorer Interference Detection, Explorer, Geospatial M, Explorer, Hookups, Facilities Planner, Instrumentation and Wiring, Facilities Planner, Interfer, Canger, Facilities Reports, MAPScript, MXROAD, PowerMap, Communications, NXSITE, PowerRelay, for ArcGIS, Navigator, ProjectW, Connector for Oracle PlantFLOW, Publisher, Factor, PULS, PowerCivil, Rebar, Redline, Darwin Callibrator, Structural Darwin Designer, Transportation, Data Man, terPlot, View, FlowMe, AK Bridge, Suite, Civil, GEOPAR, Survey, GISCnect, InRoads Survey, HAMMER, Location Data Manager, HEC, on Data Manager Express (LDM), InRoads, GeoGraphics, InRoads, MicroStation, Bridge, MicroStation SE, InRoads Site, MicroStation Storm and Sanitary, MicroStation v8 to 8.5, InRoads Storm and Sanitary, PowerDraft, InRoads Suite, Optiram Condition Modules, Optiram Enterprise Asset Man, Inter, Pack, Own, Enterprise, Project, Interface, PlantSpace Equipment, Right-of-Way Office, PlantSpace Isometrics, SCADAConnect, PlantSpace Orthographics, Space P&ID, SewerCAD, Pipe, ewerGEMS, PlantSpace Support, StormCAD, StormCAD, Triforma J, CADPipe, Triforma v8 to 8.5, PDMS, WaterCAD, CADKEY 20, Water, IntelliSAFE, Plant4D, ArchiCAD 6.5 to 9, STE, 8 to 9, BSLink, Framing, RoCAD, Catia, SketchUp, All Plan, Google Earth, 3D, elcoCAD R4, Pro/Engineer, PDS, CADD5, MicroGDS, PipeDesigner3D, TriCAD, D-Duct, 17, Rhino, Soil, FactoryCAD, thinkdesign, FabPro Pipe, PDEAS, X-Plant

(un)Managed Services

- Lifecycle Management
- ProjectWise StartPoint
- File Services
- Component Services
- Web Services
- Schedule Simulation
- Interference Detection
- Plotting Services
- File System

PW Clients / Applications



Business Requirements

- Create
- Manage
- Find
- Share
- Assemble
- Review
- Enrich
- Analyze
- Produce

Functional Requirements

- Projects, Files, Link Sets, Wizards, Standards Management, Audit Trail
- Access control/permissions, Reference Files / X-Refs, check-in / check-out, versions, Reference File healing, Caching Servers
- Search, Query, Retrieve, Documents, Files, Meetings, People, Full Text Indexing, Saved Searches, Component Indexing
- Collaborate, Inform, Publish, Access, Full-featured Thick Client & SharePoint Portal
- 2D, 3D, CAD, DGN, DWG, Models, Office documents, PDF, Raster, XML, database content
- Design, Security, Safety, Evacuation, Aesthetics, Real-time conditions, environments
- Redline, Materials, Lighting, Links - Specs, Real-time devices, documents, construction objects
- Interferences, Schedule simulation, construction operations, lighting & visibility, change, cost estimating
- Work packages, bid packages, contract packages, archives, plots, PDF, compound PDF, 3D PDF, digital pen & paper, photorealistic images, animations, web publishing, bills of materials, business objects, Google Earth, 3D printing

Assemble information

- Different sources – design review
 - AutoPLANT P&ID, AutoPLANT 3D
 - 2D, 3D, DGN / DWG, raster
 - PlantSpace
 - PDS
 - AutoPIPE, STAAD
 - XMpLant, ISO 15926
 - ...
- Packaging files and issueing for construction
 - Work packages
 - Isometric drawings
 - 3D models and visualiation

ProjectWise Navigator V8 XM 08.09.05

Key Enhancements

1. Improved Performance

- Introduced the concept of PublishedDGN to optimize content for performance
- Support both Desktop and Server DGN Publishing

2. Visualize Component Data

- Type (wiring, pipes, steel, etc.)
- Attributes (length, width, weight, etc.),
- Aggregate data from many formats
- Define reusable views

For example...

- *“Just show the second floor HVAC system...”*

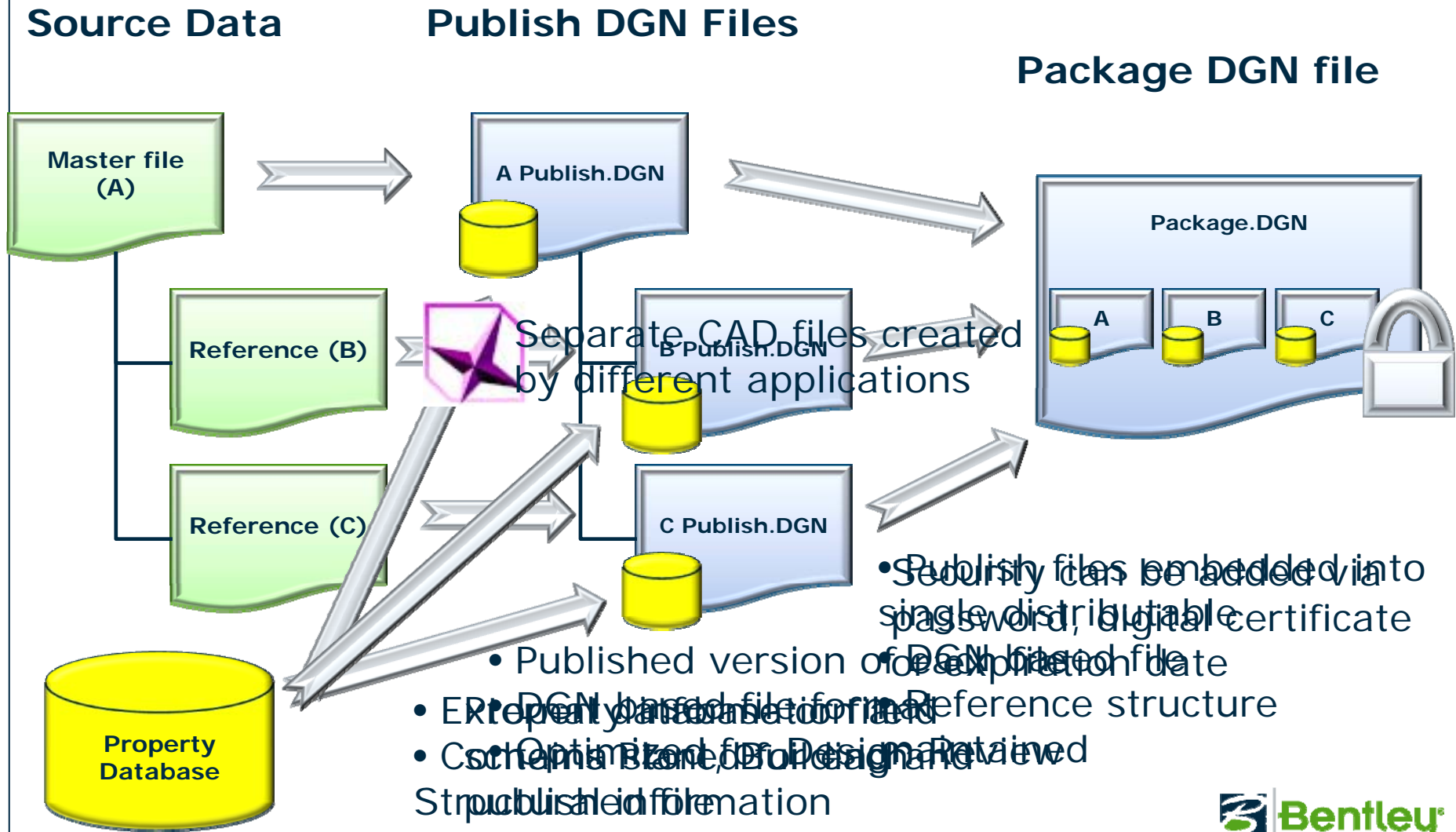
PublishedDGN Characteristics

- Fast
- Secure
- Handle Large data sets
- Transportable

ProjectWise Navigator Workflow

- **Prepare**
 - How engineering content is prepared for design review
- **Notify**
 - How participants are made aware of required actions
- **Access**
 - How participants find and open the required content for design review
- **Review**
 - How participants navigate and comment
- **Analysis**
 - How participants add relevant intelligence to project information
- **Communicate**
 - How participants inform others that a design review stage is complete

DGN Publish Workflow



PublishDGN vs. Native DWG

AutoPLANT Dataset

- PublishedDGN file opens ~4X faster than native file.
- Component information loads ~7.5x faster.
- Major reduction in file size – typically 5x.

File Type	Size	File Load Time	Component Load Time
Native DWG	826 MB	4:00 minutes	15 minutes
PublishedDGN	158 MB	0:30 seconds	2 minutes

PW Navigator vs. NavisWorks Performance (AutoPLANT Data)

- PublishedDGN files are typically smaller than NWD
- Performance is equivalent, AND we display component data

	PW Navigator	NavisWorks
File Size	99 MB (PackagedDGN)	155 MB (NWD)
Load Time	17 seconds	19 seconds
Component Data Display	All	Limited

Component Data

- Query, Visualize Business Data
 - From all source files – not just DGN
 - Re-usable queries for consistent decision making
 - Replacement for Object Sets in Bentley Navigator
 - Competitive differentiator from NavisWorks
- *Just show me the second floor HVAC system in Building Four.*

Component Data Visualization

The screenshot displays the Bentley ProjectWise Navigator V8 XM Edition interface. The main window shows a 3D model of a building's HVAC system, with orange ductwork and return systems overlaid on a wireframe structure. The interface includes a menu bar (File, Edit, Element, Settings, Tools, Utilities, Workspace, Window, Help), a toolbar, and a 'Tasks' panel on the left. The 'Tasks' panel is currently set to 'Measure', with options for Measure Distance, Measure Radius, Measure Angle, Measure Length, Measure Area, and Measure Volume. Below this are 'Visualization', 'Animation', 'Publish', and 'Links' options. At the bottom, the 'Component Sets Manager' window is open, showing a table of component sets. A blue arrow points from the 'HVAC Return' row in the table to the corresponding orange ductwork in the 3D model.

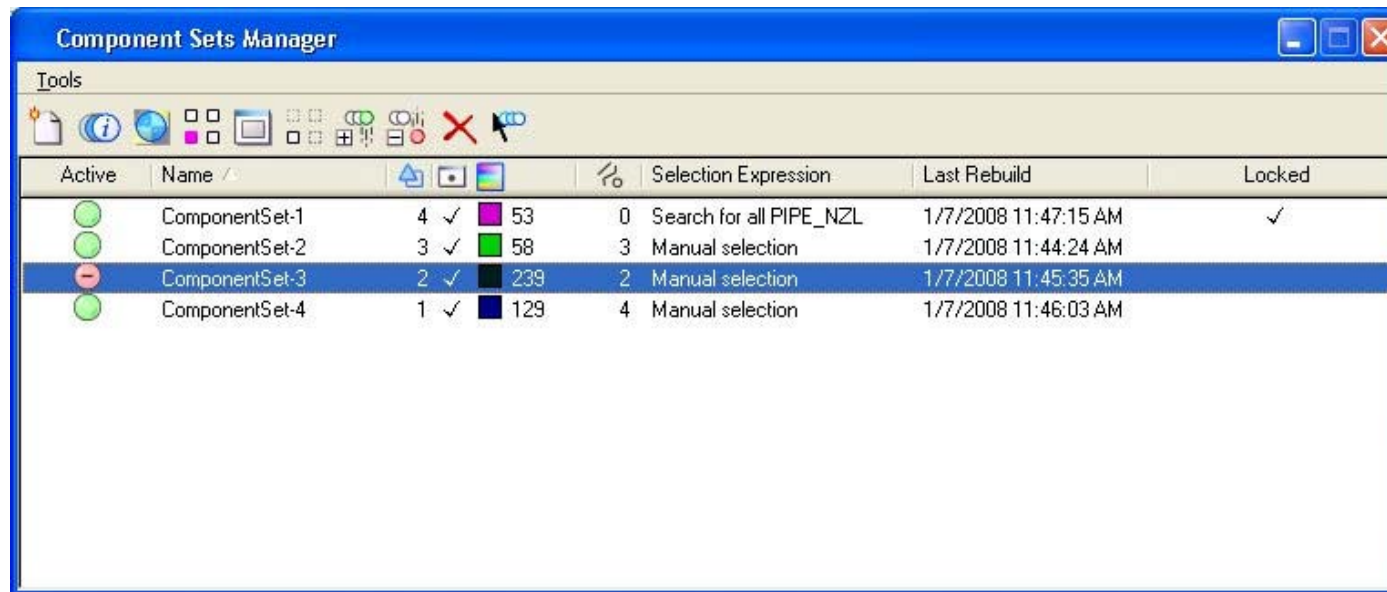
Active	Name	Description	Count	Checked	Color	Selection Expression	Last Rebuild
<input checked="" type="checkbox"/>	HVAC Return	HVAC return system	3	<input checked="" type="checkbox"/>	6	553 Manual selection	5/23/2008 10:23:19 AM
<input checked="" type="checkbox"/>	Pushing Inlet	Round pushing inlets	4	<input checked="" type="checkbox"/>	6	19 Search for all ROUND...	5/23/2008 9:00:00 AM
<input checked="" type="checkbox"/>	Return Duct	Round return duct	1	<input checked="" type="checkbox"/>	6	140 Search for all ROUND...	5/23/2008 9:02:05 AM
<input checked="" type="checkbox"/>	Square diffusers	all square diffusers	2	<input checked="" type="checkbox"/>	6	346 Search for all SQCELLI...	5/23/2008 8:57:54 AM

Need for Preparation

- Performance
- Normalize data from different applications
- Support for large data sets
- Security
- Transportable
- Incremental

Additional Features

- Component Sets
 - Named groups created by the results of component queries
 - Replacement for Object Sets in Bentley Navigator
 - Competitive differentiator from NavisWorks

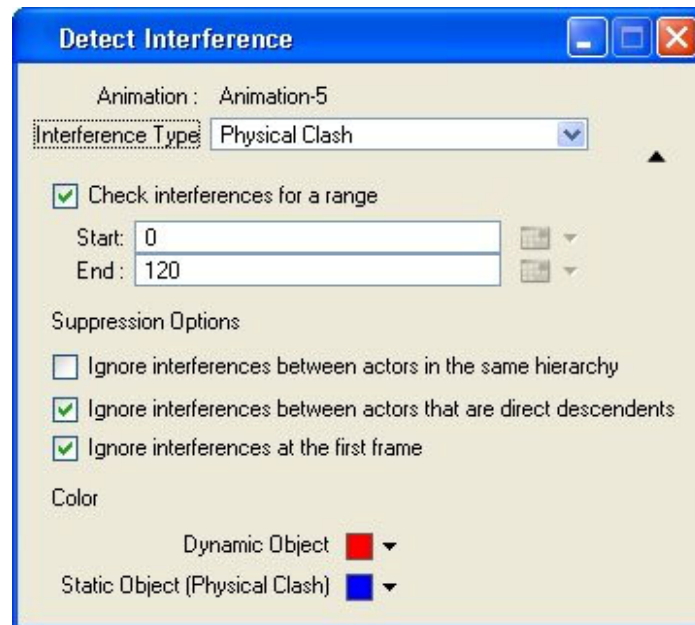


The screenshot shows the 'Component Sets Manager' window with a toolbar and a table of component sets. The table has columns for Active status, Name, Selection Expression, Last Rebuild, and Locked. The 'ComponentSet-3' row is highlighted in blue.

Active	Name			Selection Expression	Last Rebuild	Locked
●	ComponentSet-1	4 ✓	53	0 Search for all PIPE_NZL	1/7/2008 11:47:15 AM	✓
●	ComponentSet-2	3 ✓	58	3 Manual selection	1/7/2008 11:44:24 AM	
●	ComponentSet-3	2 ✓	239	2 Manual selection	1/7/2008 11:45:35 AM	
●	ComponentSet-4	1 ✓	129	4 Manual selection	1/7/2008 11:46:03 AM	

Additional Features

- Interference Detection for Animations
 - Check for interferences on moving parts of an animation
 - Review physical and clearance violations

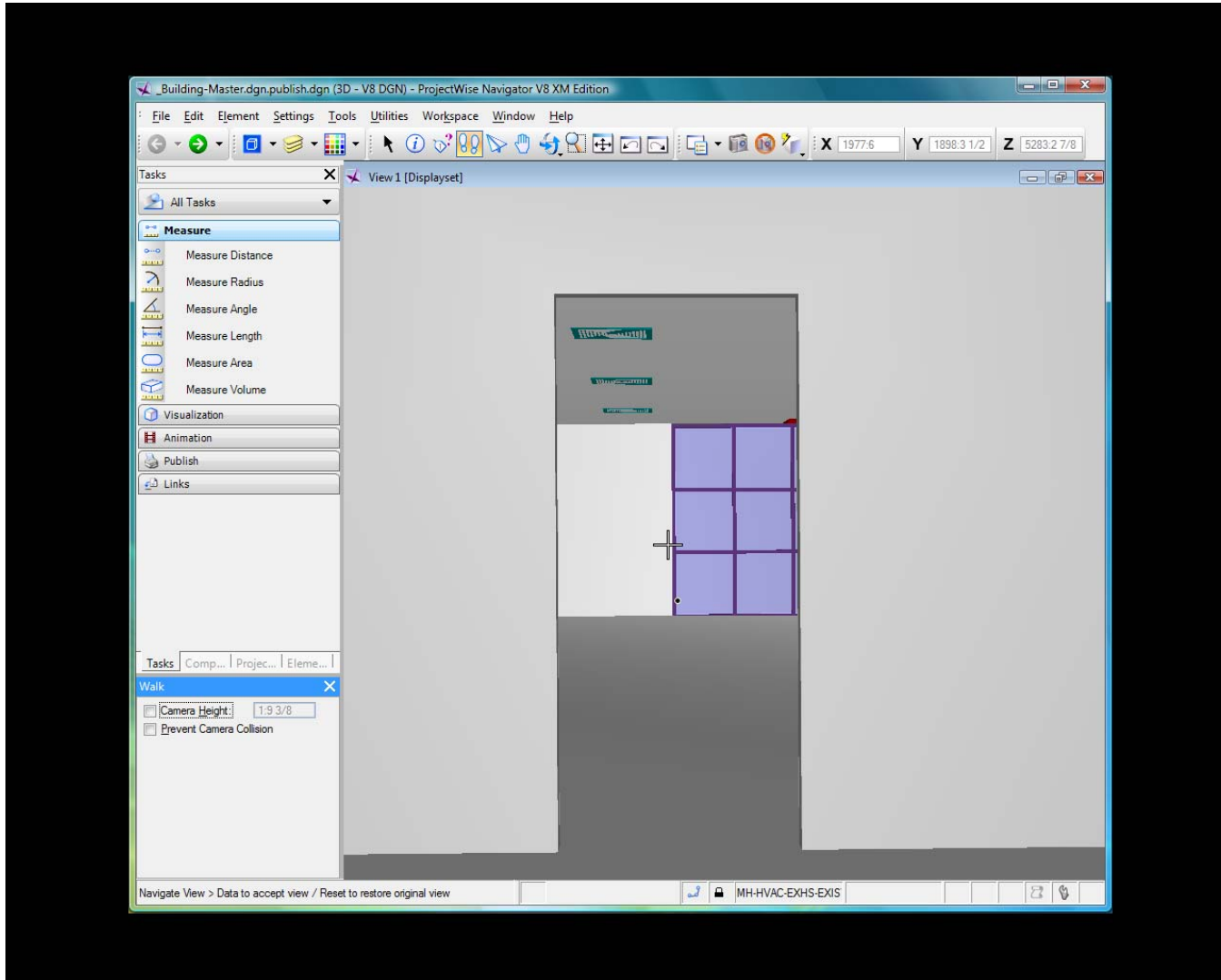


The 'Interferences' table displays the following data:

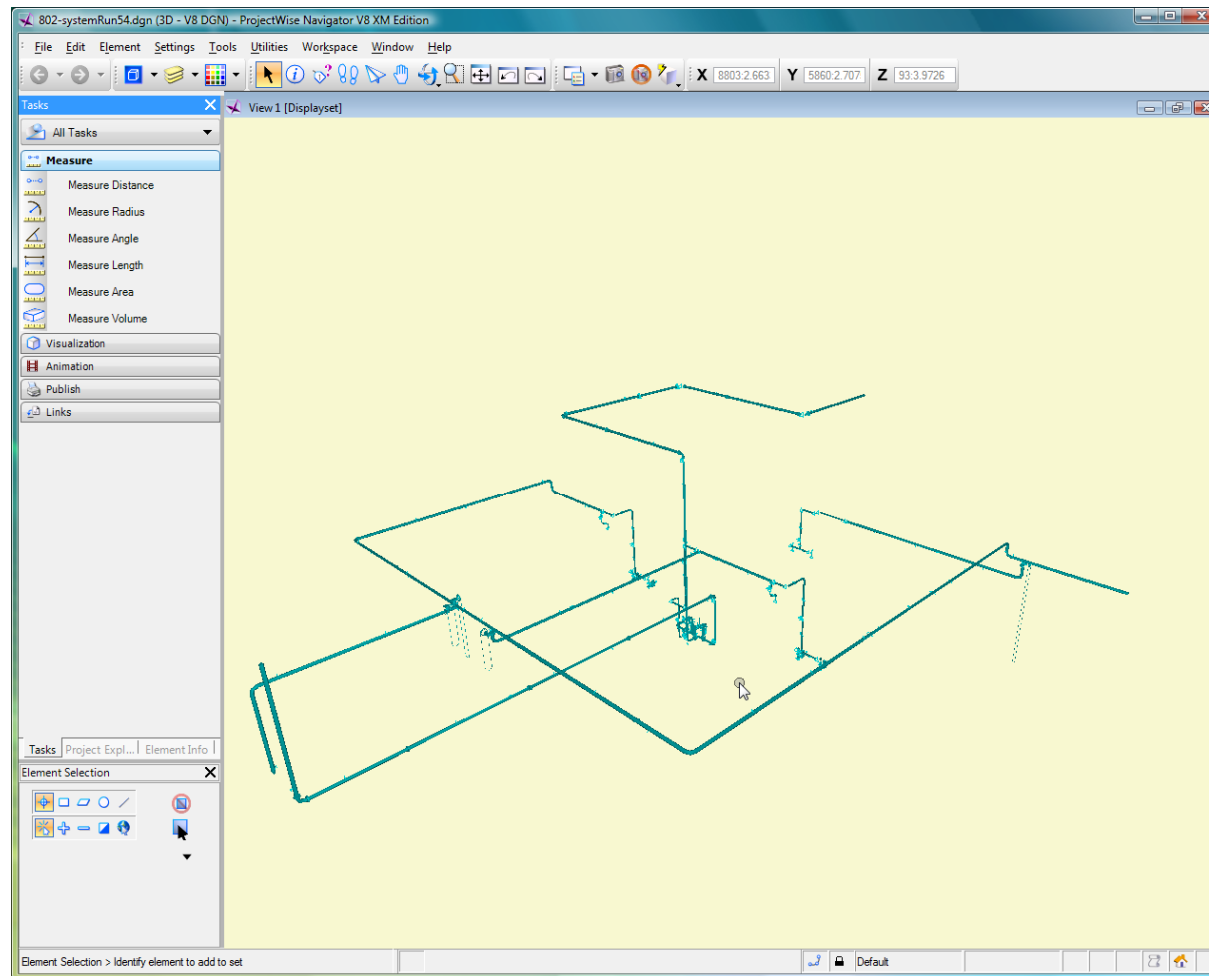
Start	End	Name	Type	Enabled
25	50	Interference 1	Physical Clash	<input checked="" type="checkbox"/>
16	50	Interference 0	Physical Clash	<input checked="" type="checkbox"/>

Demo

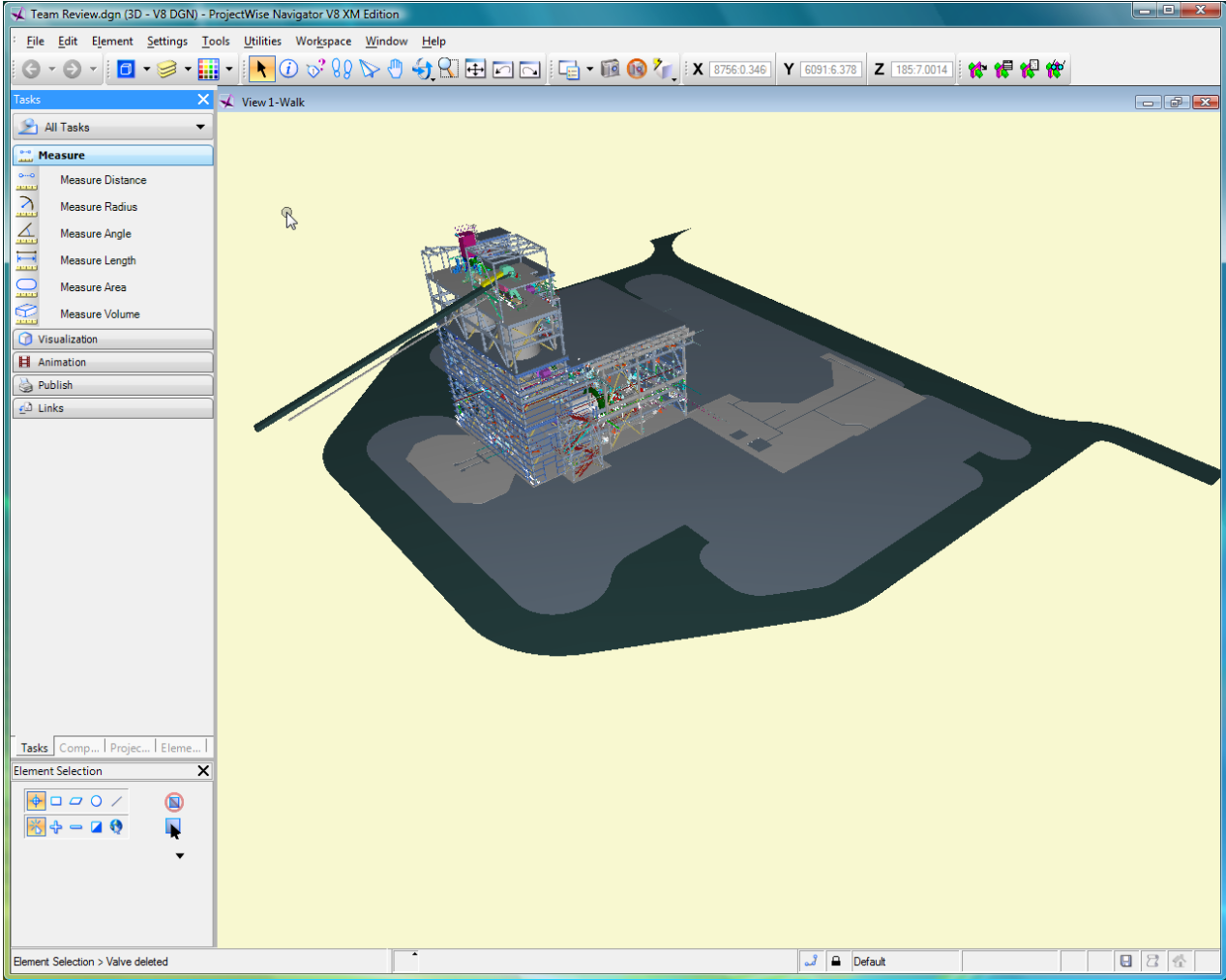
ProjectWise Navigator Overview



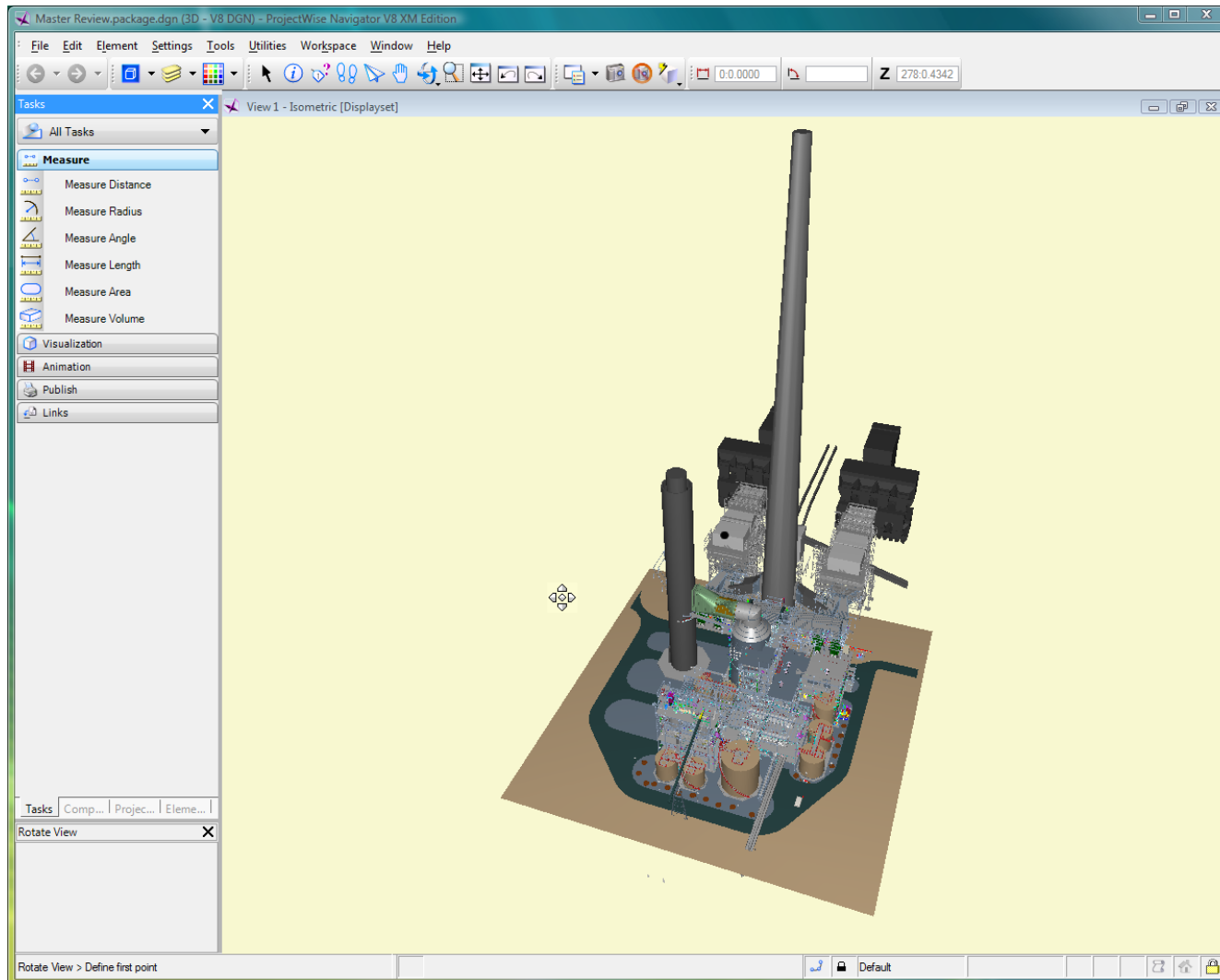
Plant Individual Review



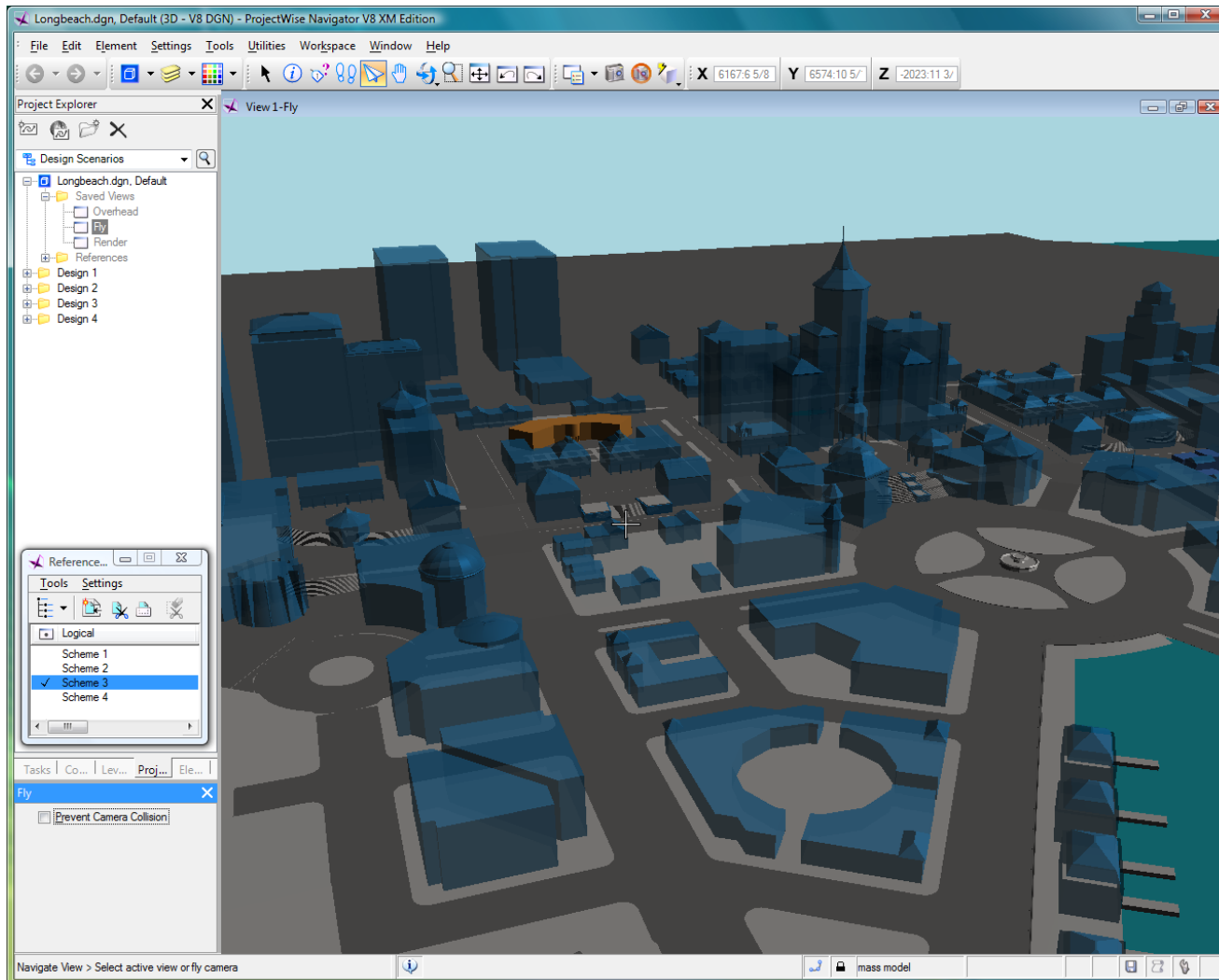
Plant Team Review



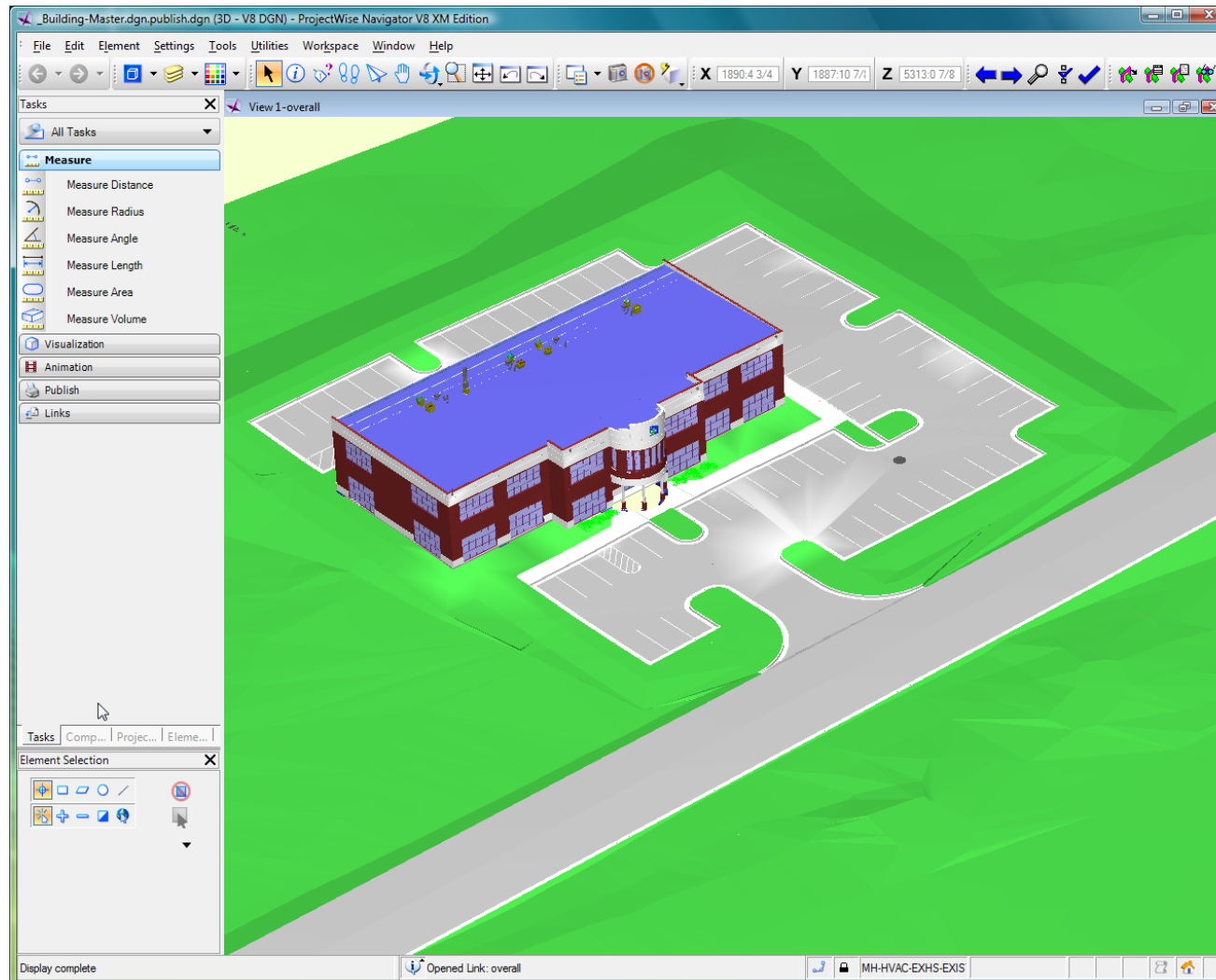
Plant Milestone Review



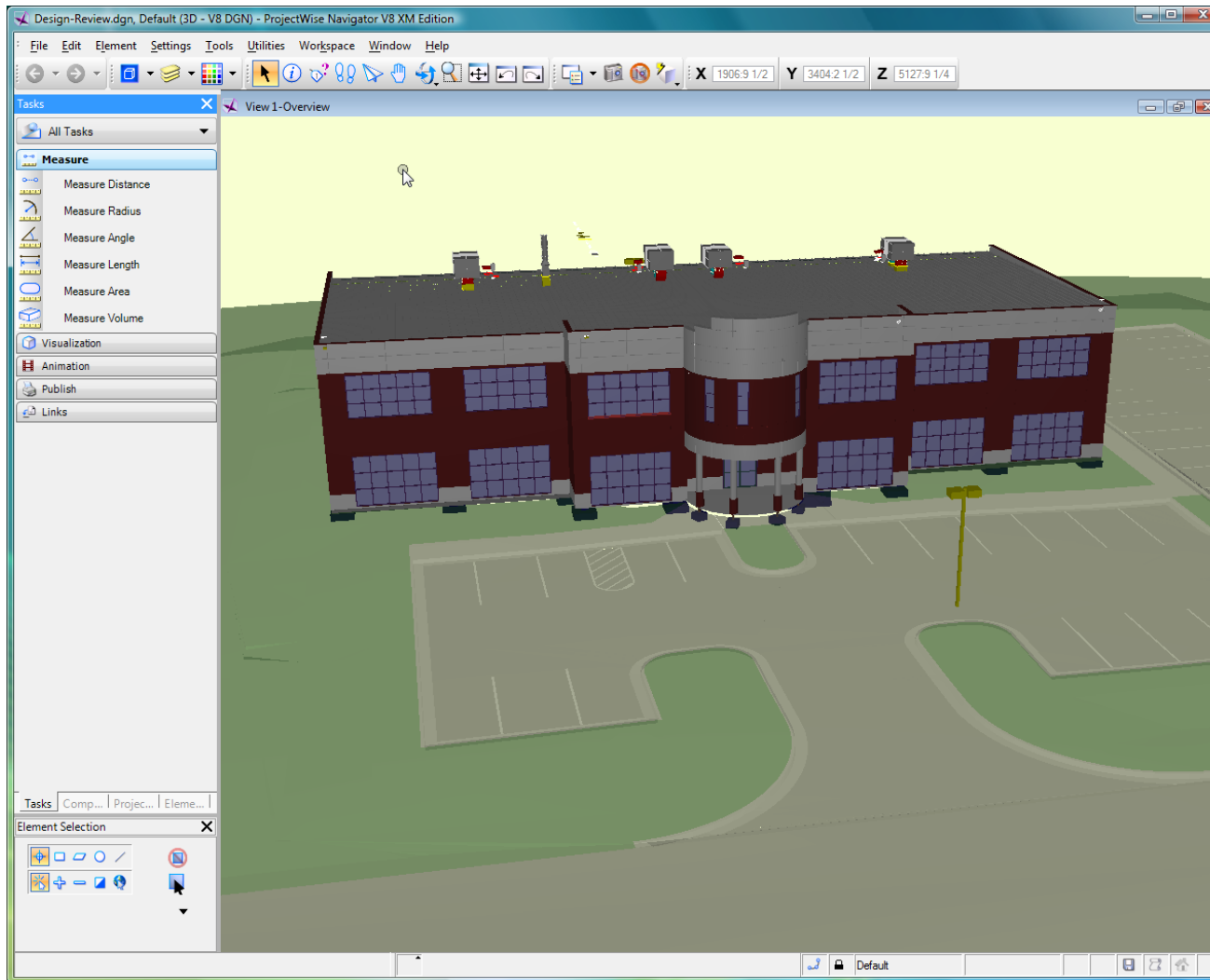
Building Planning Review



Building Design Review



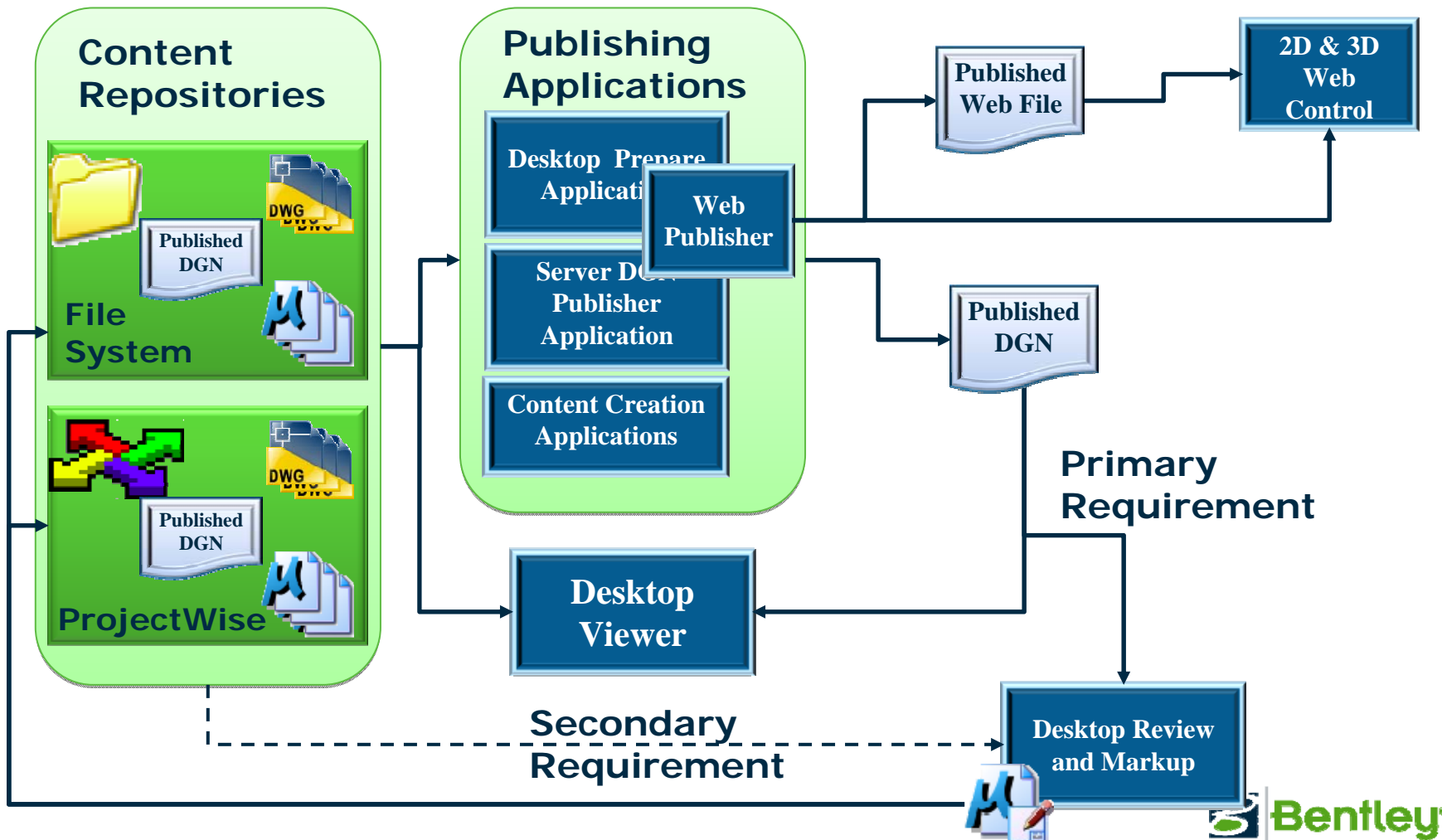
Building Construction Review



Future enhancements (Athens)

- ProjectWise Automation Service for publishing
- 3D commentting
- User interface

Overview Design Review Workflow



Primary Features

- Overlay File concept
 - Replacement for .rdl file
- 3D Redline workflow
 - New set of tools
 - Unique markup models that contain status and history
- Optimize Publish and Package File
 - Reduce size of the file
 - Optimizations for source DGN data
- Simplify Interface