

PNWS AWWA CONFERENCE

Rapid, Collaborative 3D Modeling: Techniques to Improve Buy-In During Design

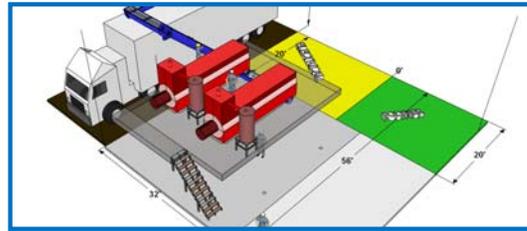
Chris Kitts, MWH

MAY 8, 2014

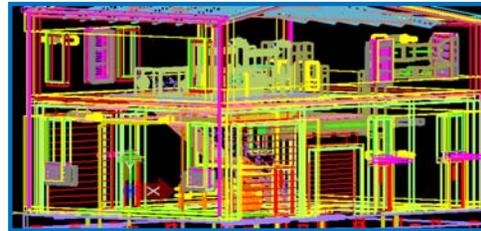


3D Modeling Techniques Over The Life of a Project

Conceptual Design

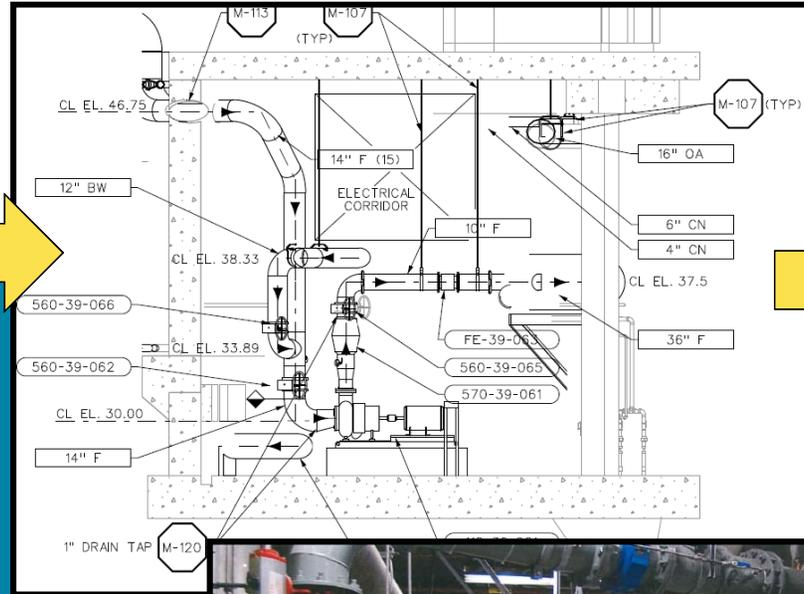
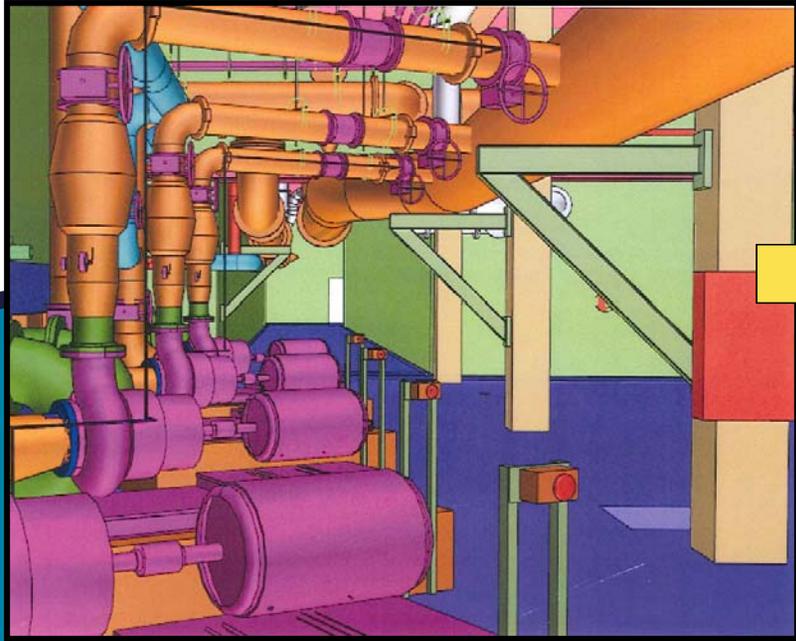


Detailed Design



Construction





WHY 3D MODEL?

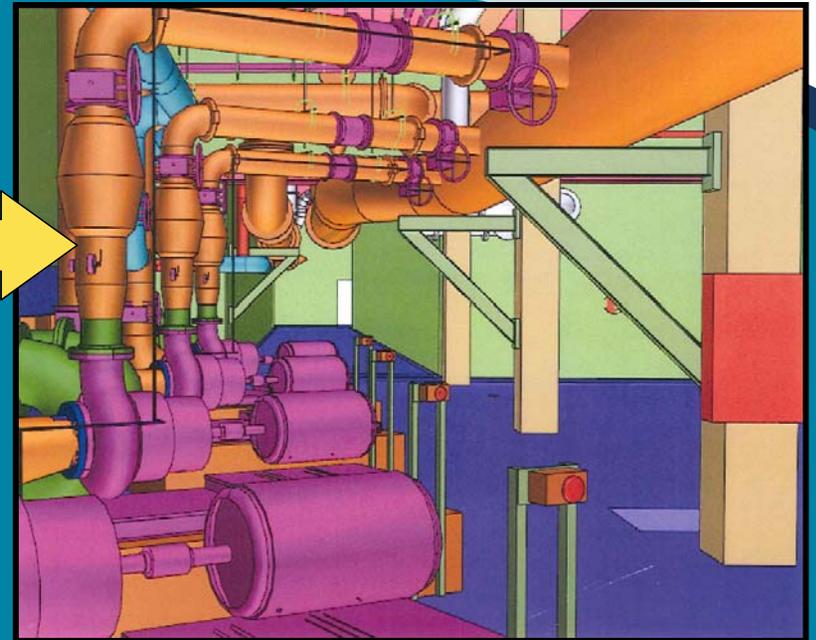
"To begin with the end in mind means to start with a clear understanding of your destination. It means to know where you're going so that you better understand where you are now, so that the steps you take are always in the right direction."

- Stephen Covey
The Seven Habits of Highly Effective People





Collaboration during the conceptual design phase requires a different approach to model creation and manipulation



**IMPROVING
COLLABORATION DURING
THE CONCEPTUAL DESIGN
PHASE**

Conceptual Design Process

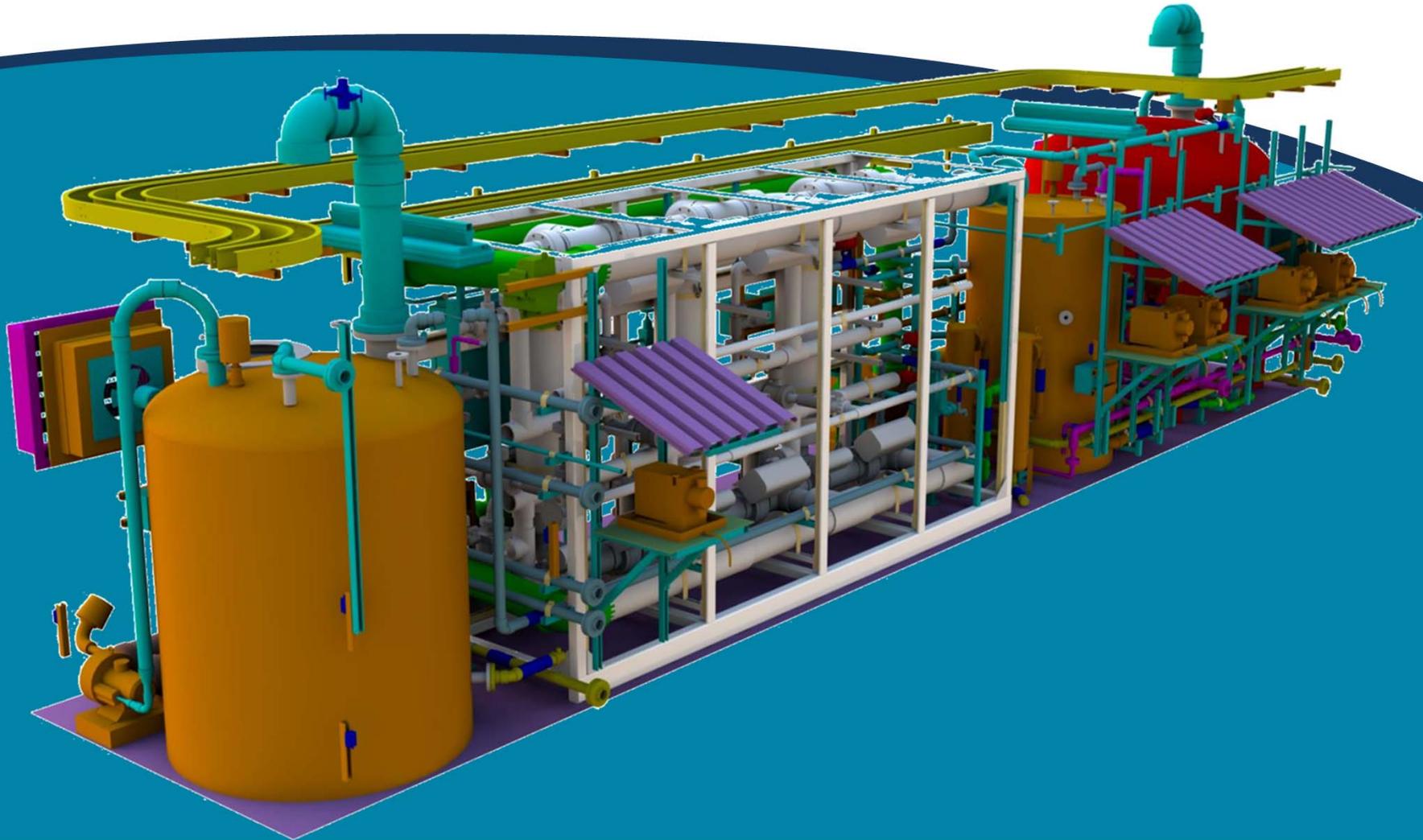
- Use of simple, fast moving 3D modeling software
- Simplified models that allow for easy manipulation on the fly.
- Improves concept communication and facilitates collaboration.
- Better spatial awareness.
- No more paper cutouts.

Detailed Design Practices

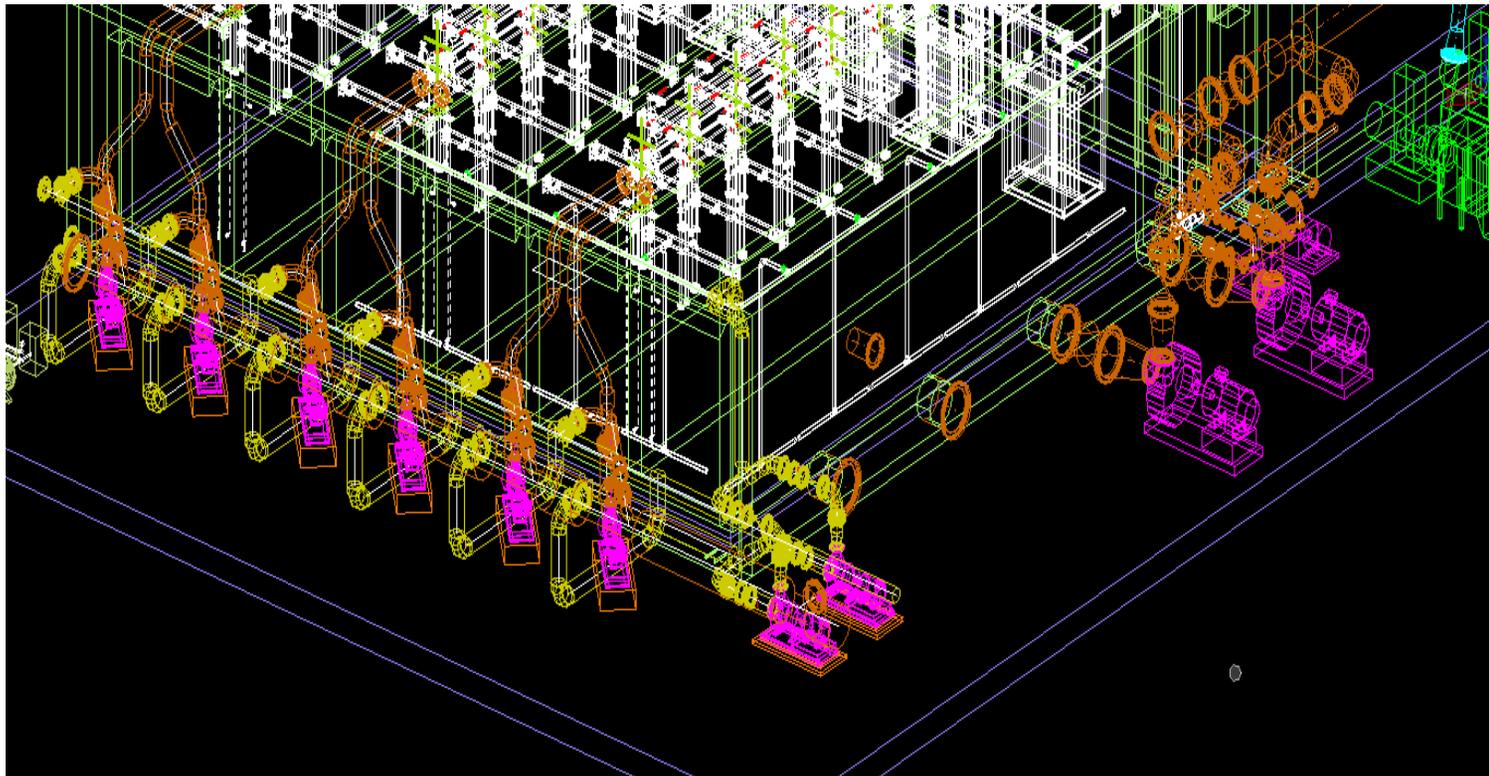
- Use of heavy duty modeling software such as Autodesk Revit, AutoCAD Civil3D, and Bentley OpenPlant Modeling.
- Complex 3D models developed by each design discipline.
- Annotated plans and sections extracted from 3D models.

BIM Modeling Software

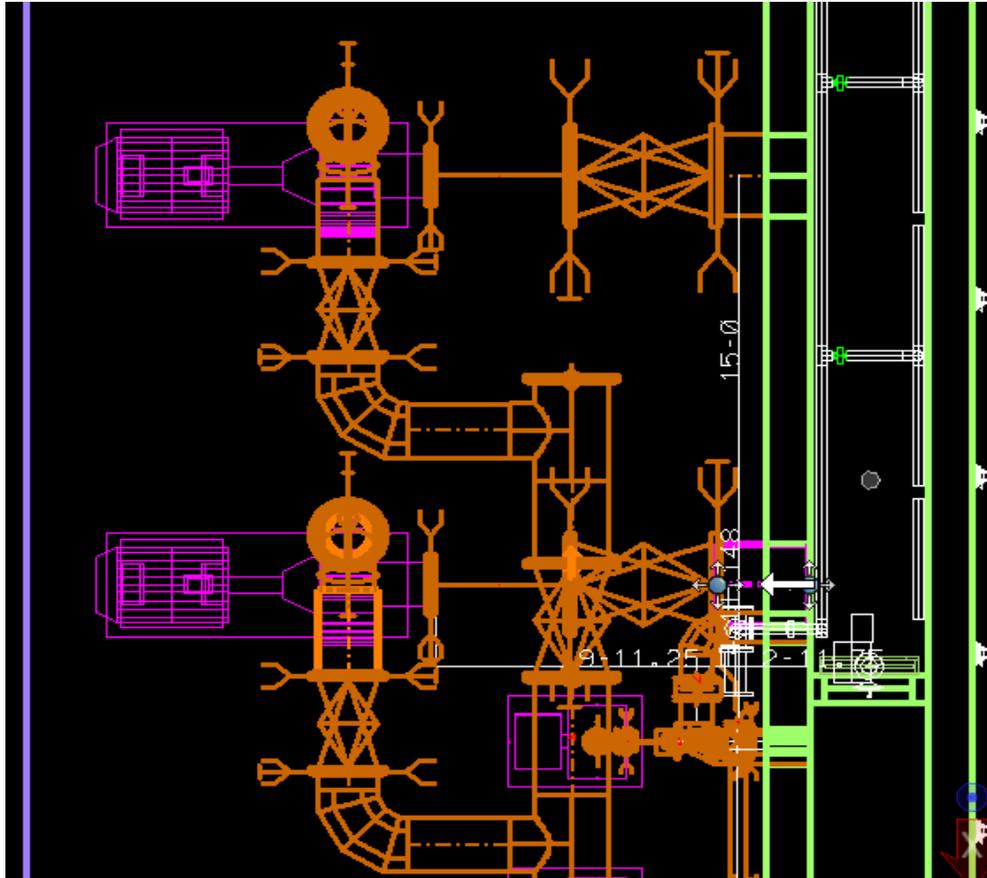
ADVANCED TOOLS FOR 3D DESIGN



Intelligent 3D Models

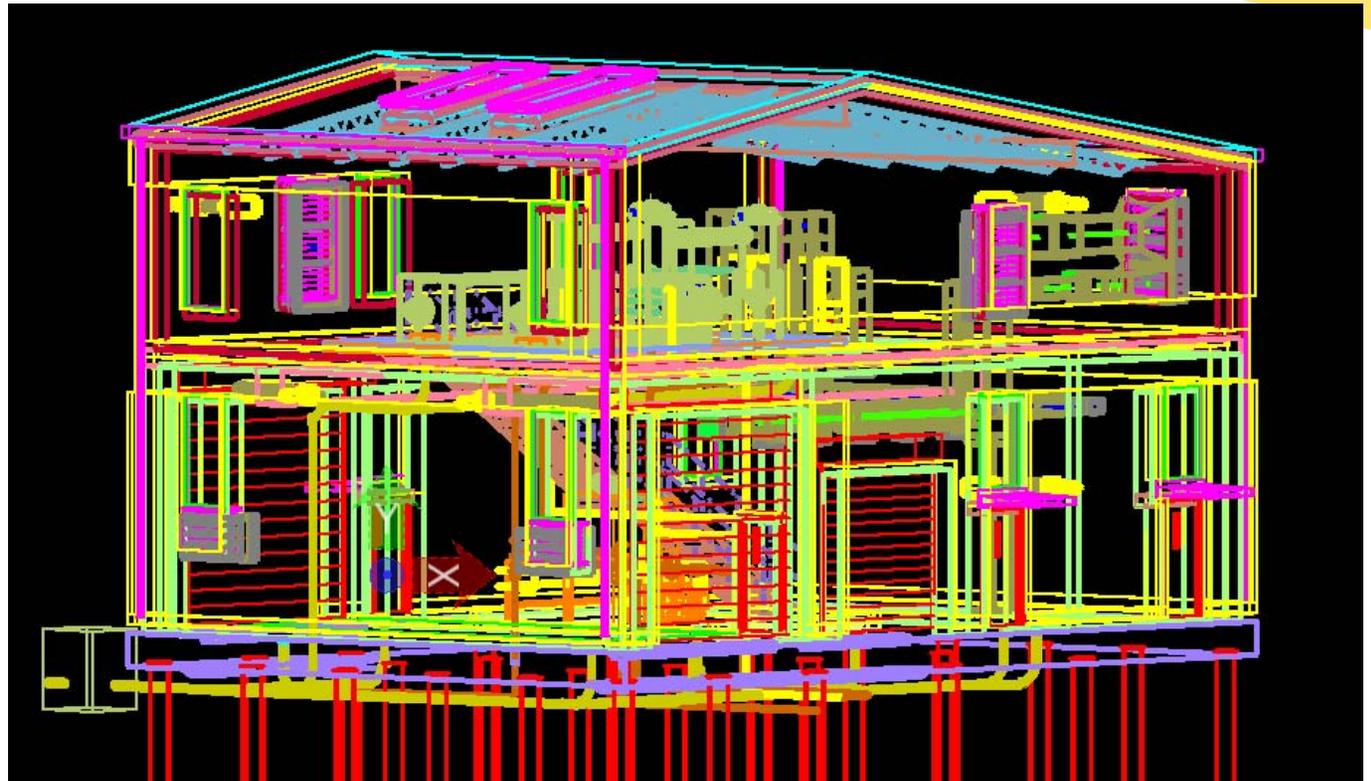


Intelligent 3D Models



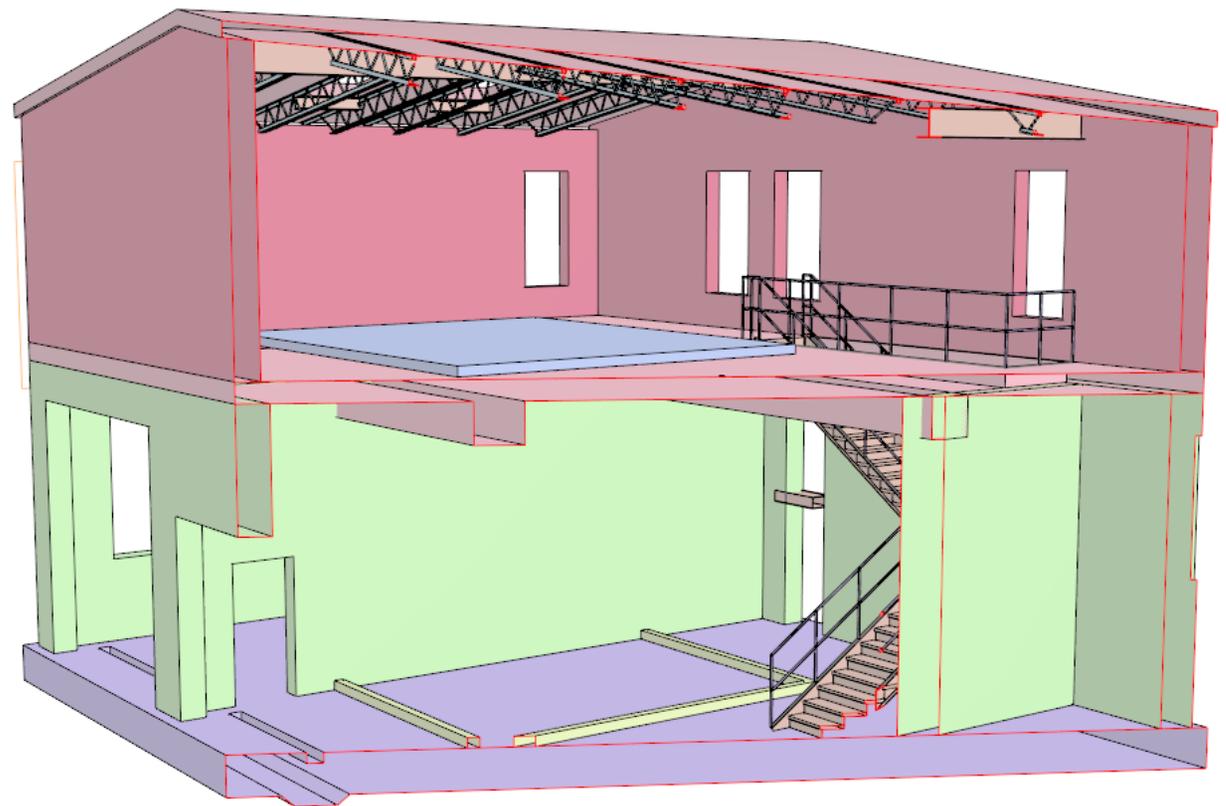
Detailed Design Phase Modeling

- Models developed in wireframe.
- CAD models are not good for collaboration.



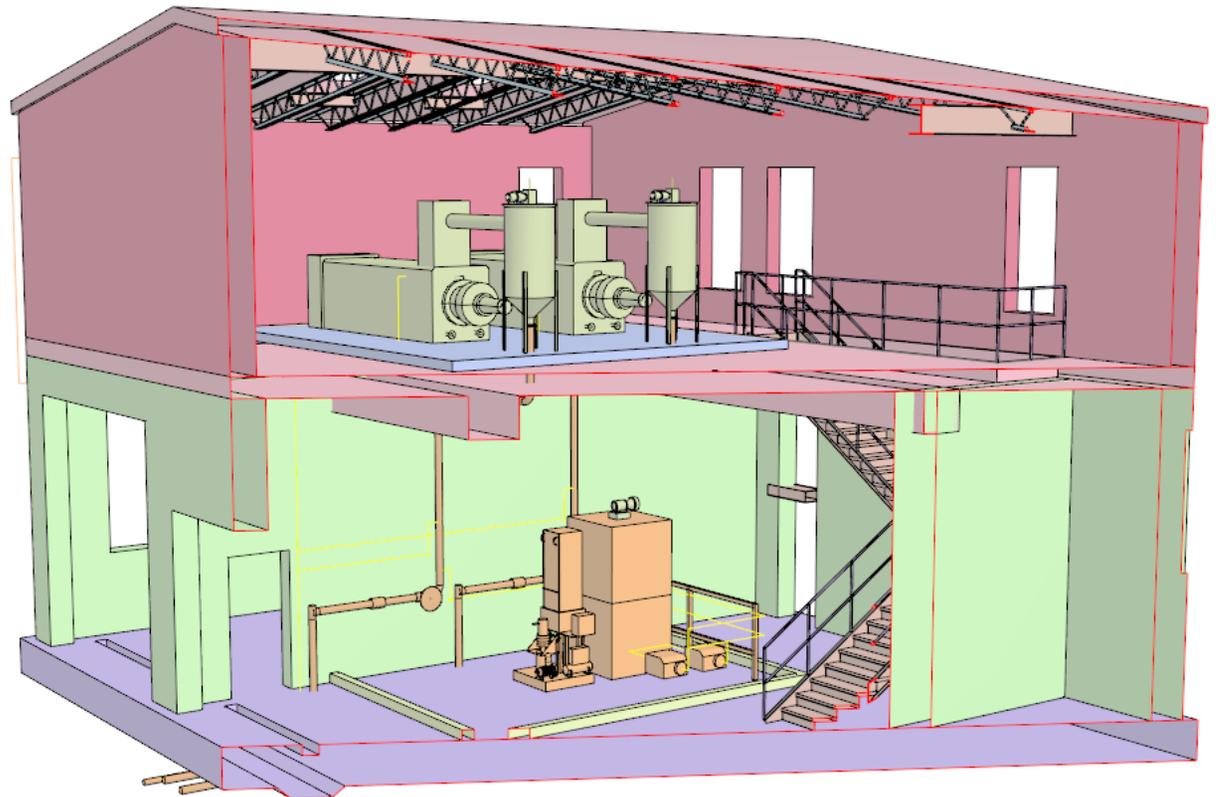
Detailed Design Phase Modeling

- Rendered Views provide better collaborative tool.
- Each design discipline creates an individual model that gets referenced into a master model.



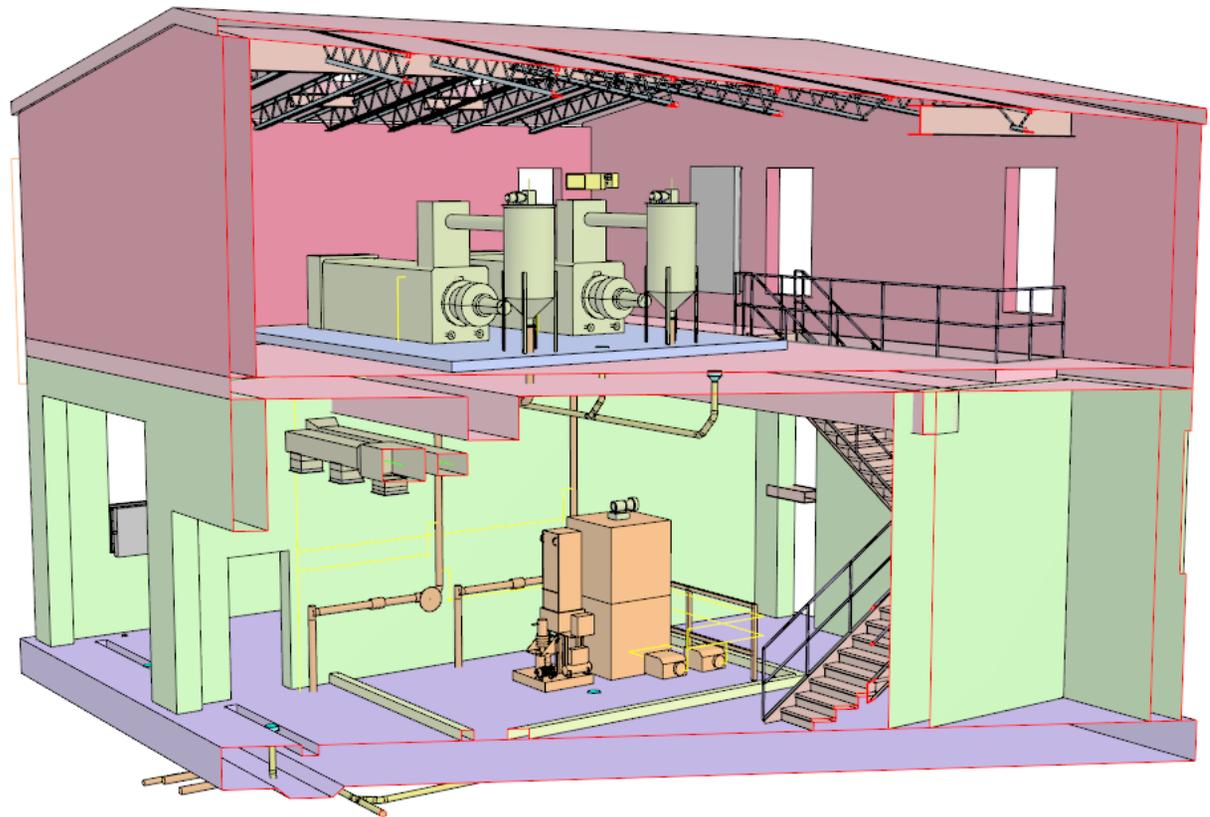
Detailed Design Phase Modeling

- Detailed modeling improves design team collaboration and prevents clashes.



Detailed Design Phase Modeling

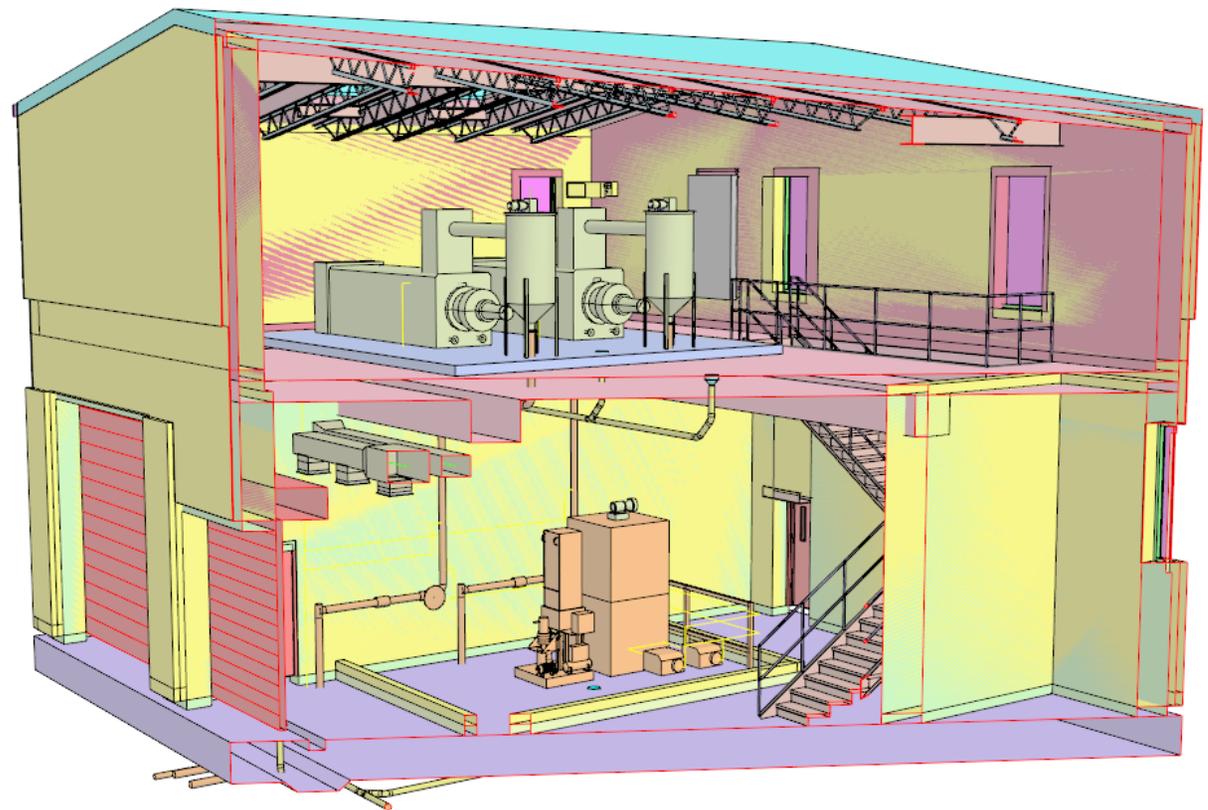
- A highly detailed model improves constructability and limits change orders in the field.



Detailed Design Phase Modeling

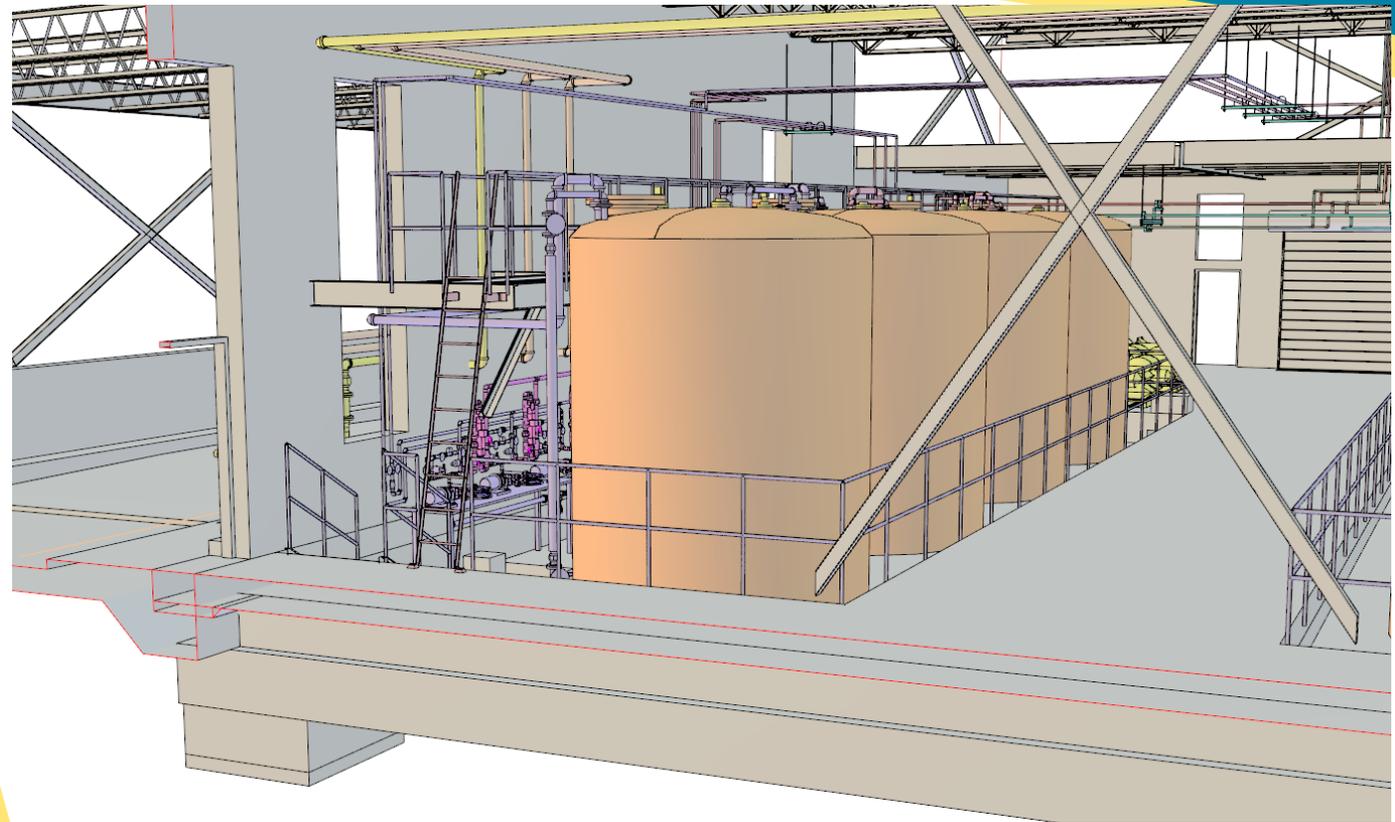
“The 3D design models really helped the maintenance crew visualize the mechanical layouts early in the design process to ensure the final design would be operator friendly, and all staff comments were warmly received.”

Michael Trent
Operations Supervisor
Tri-City WPCP



Simple Tools for Design Review

- Use of 3D PDF's greatly reduces the learning curve to access and manipulate 3D models.
- Standard 3D PDF's allow model manipulation, cutting sections, turning references on/off.
- Client software is free!



Construction Support Practices

- 3D collaboration still beneficial during construction.
- Contractor's needs are different
 - Rapid response time.
 - Construction planning and sequencing.
- Intelligent 3D models save time.
- Large contractors use 3D modeling software.



Questions?

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