

3D Models: A New Dimension of Understanding

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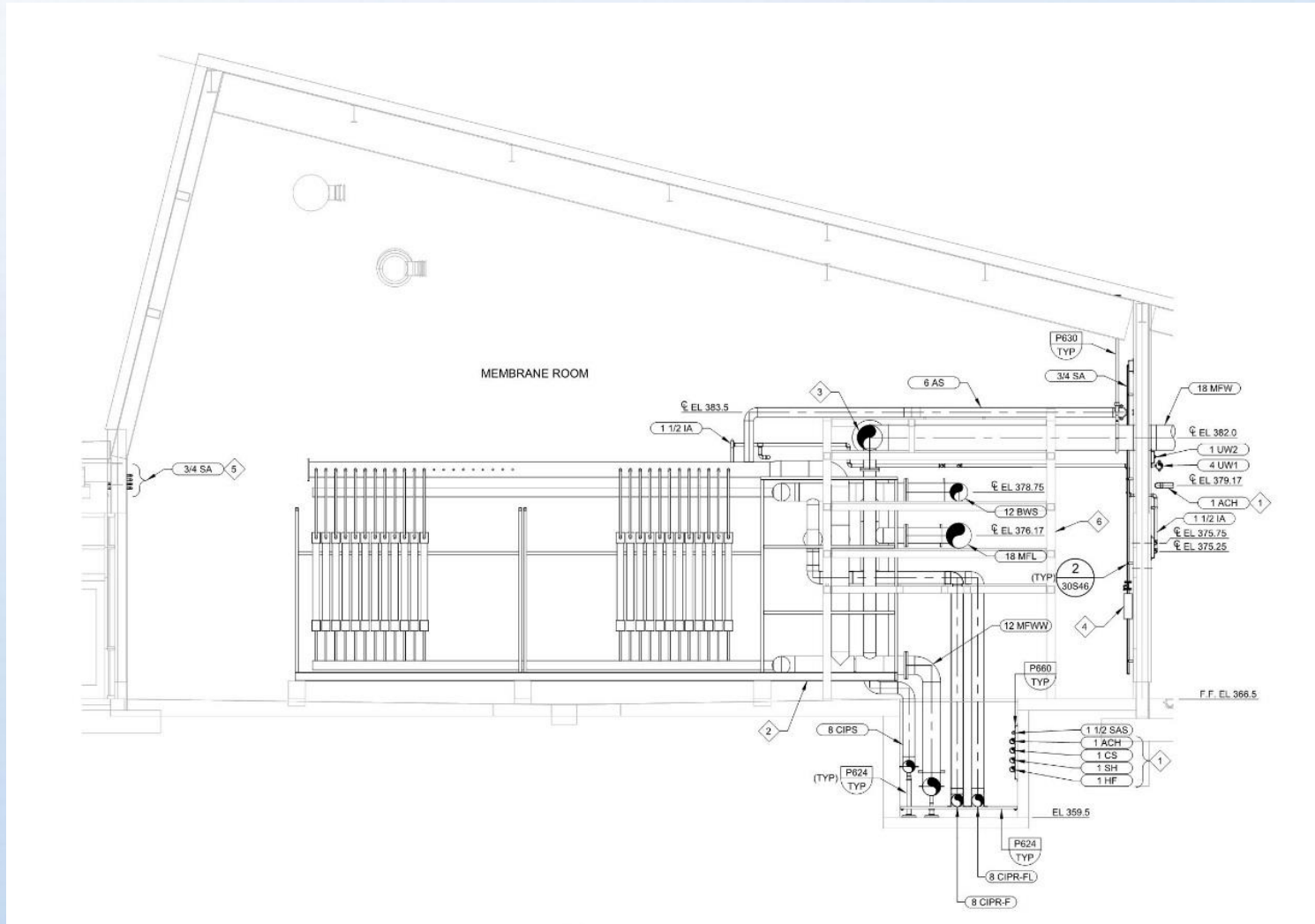
Real World Visualization Results in a Better Project

Because visualization...

- Facilitates communication
- Minimizes design changes
- Minimizes risk
- Facilitates design for safety

Considerations

Visualization: The *Right Tool* for the Right Job



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Visualization:

The *Right Tool* for the Right Job

- 3D best tool given schedule and budget
- Traditional design – bid – build
- Not design – build
 - 4D: time constraints
 - 5D: cost related information

Visualization:

The Right Tool for *the Right Job*

- Project Background
 - Started project over 10 years ago
 - Existing aging WTP
 - Resilient and redundant design
 - New 4.5 mgd membrane WTP
 - Raw water intake
 - Raw water pump station
 - Offsite utilities
- Necessary to have Stakeholder buy-in early
 - Visualization tools used to communicate with council, engineers, operators, and permitting agencies

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Visualization Facilities Communication to Stakeholders



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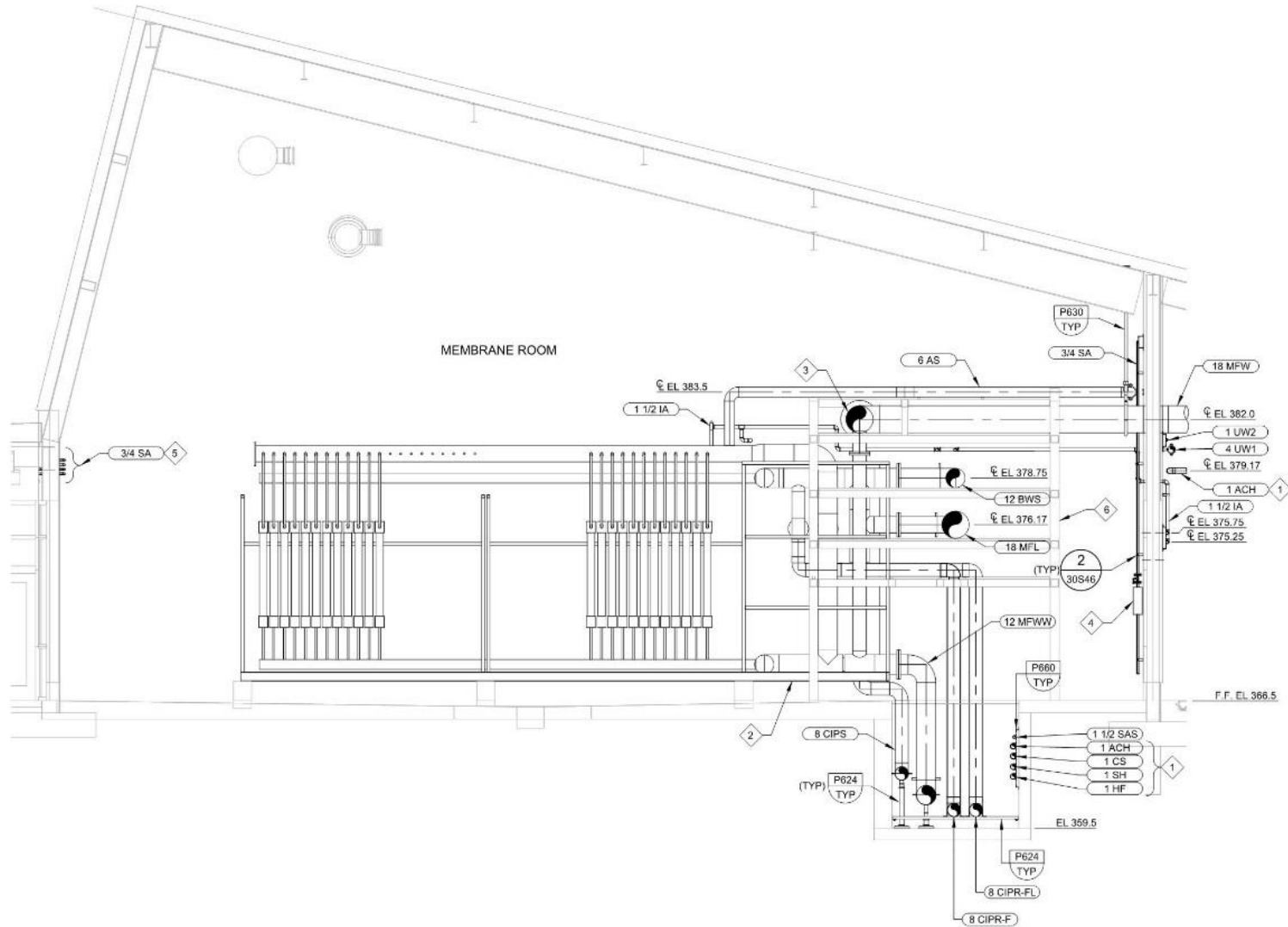


Visualization Results in Efficient Design Approach with Multi-Discipline Team



- Backgrounds updated weekly

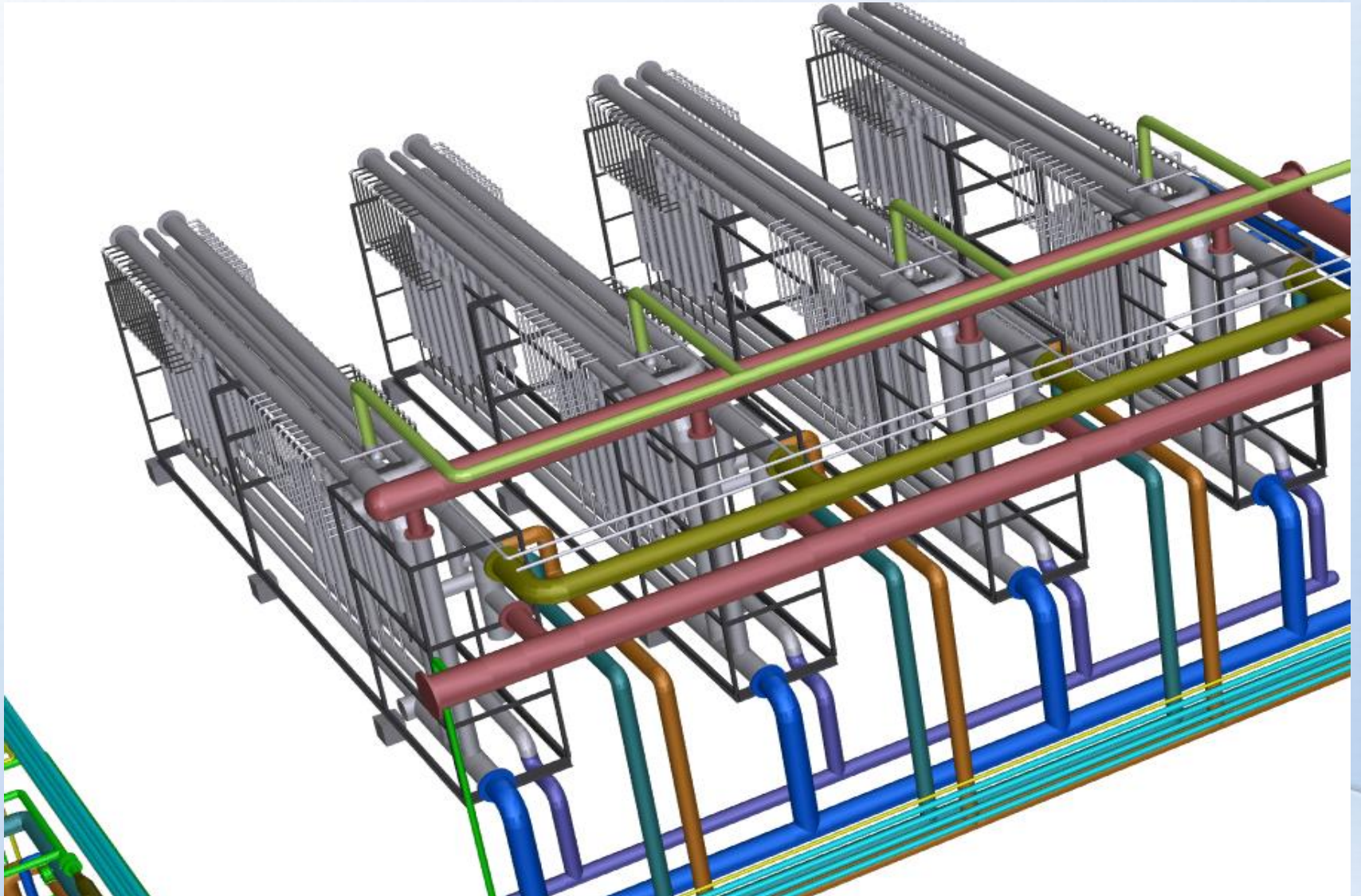
Renderings Simplify Design Complexity



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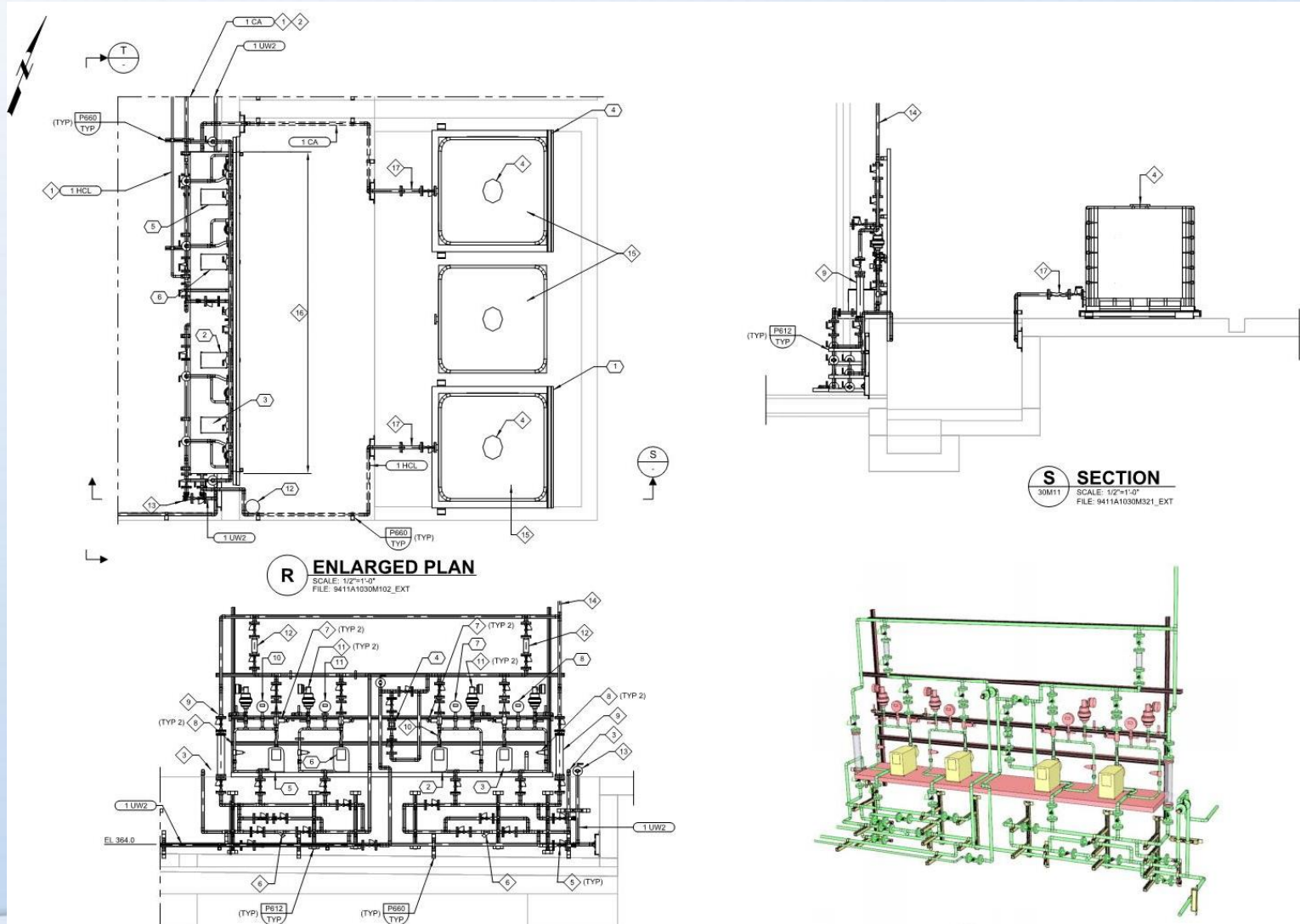
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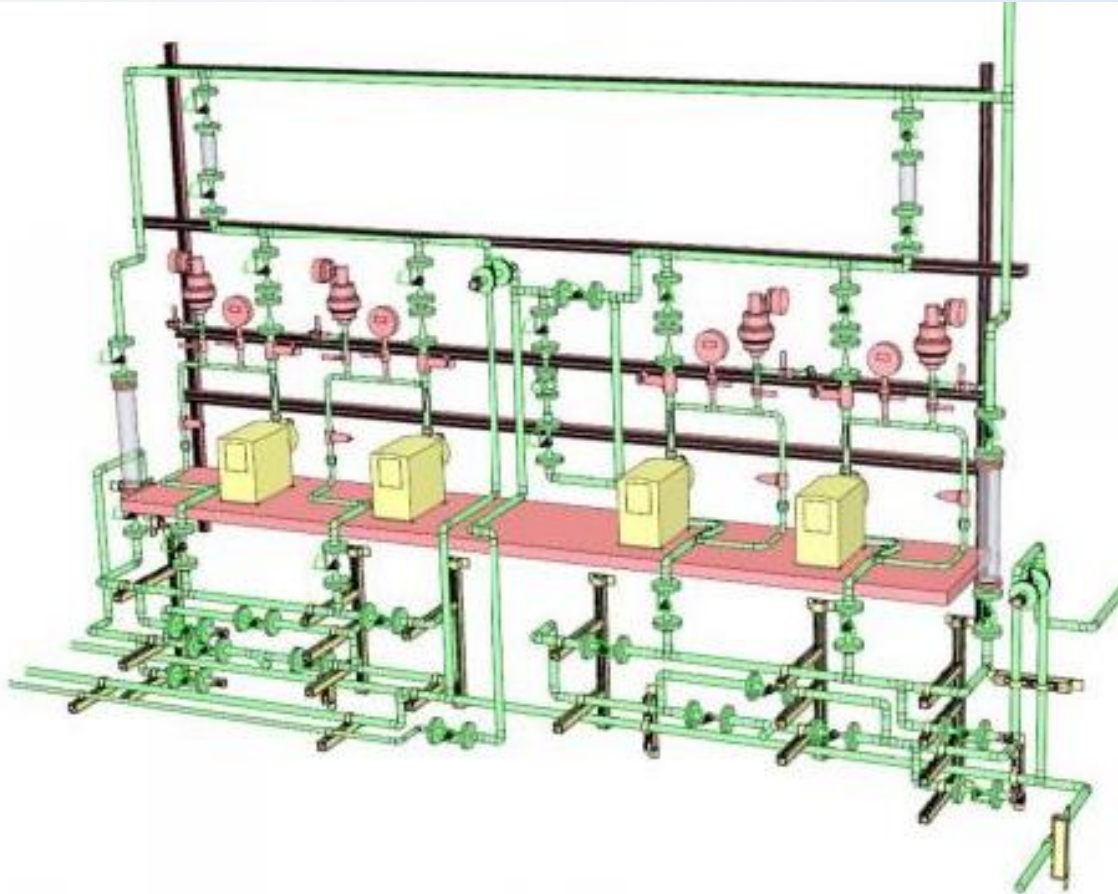
Renderings Simplify Design Complexity



Design Intent is Conveyed Through Visualization

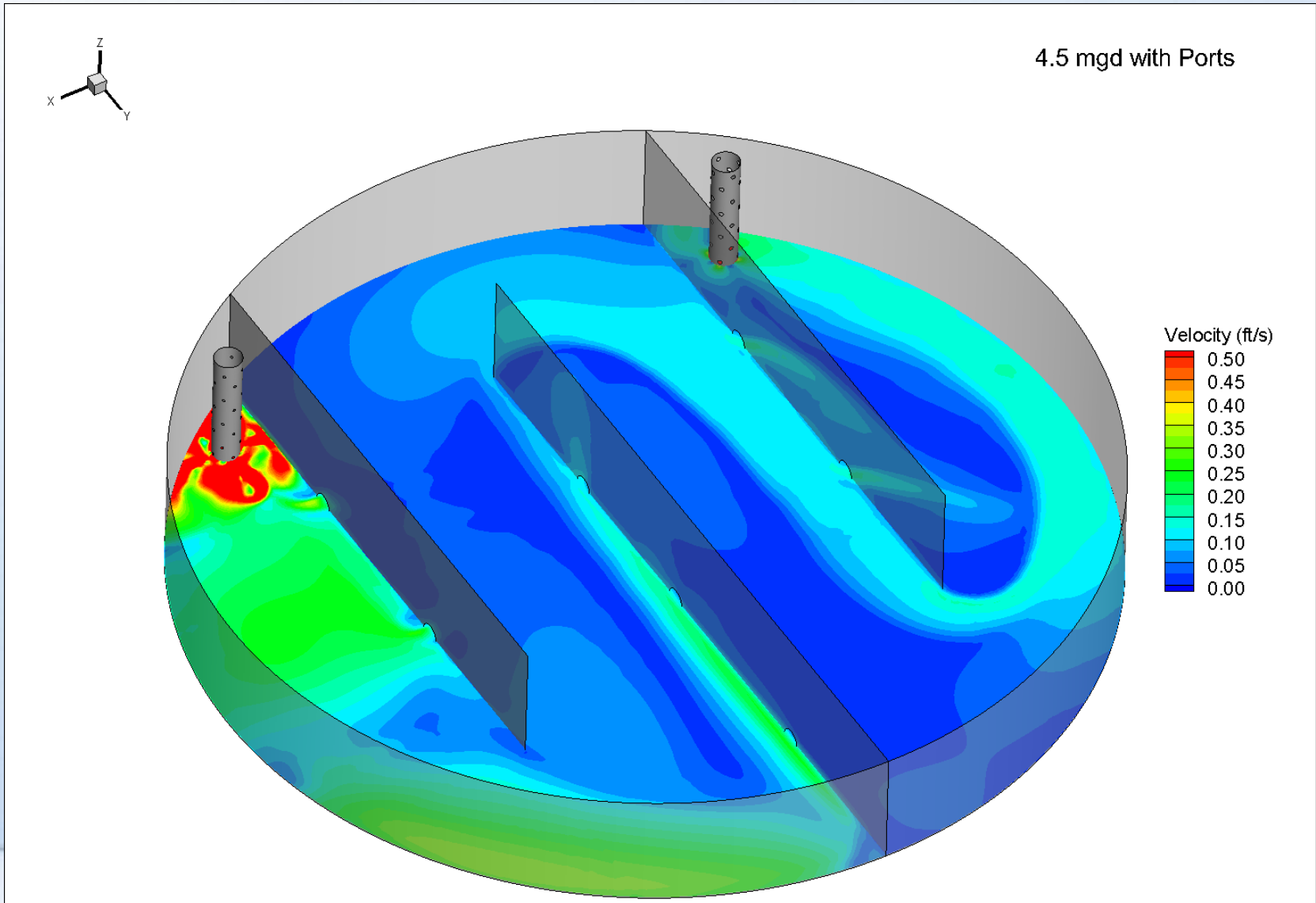


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U **ISOMETRIC**
SCALE: NTS
FILE: 9411A1030M405

Design Intent is Confirmed Through Visualization



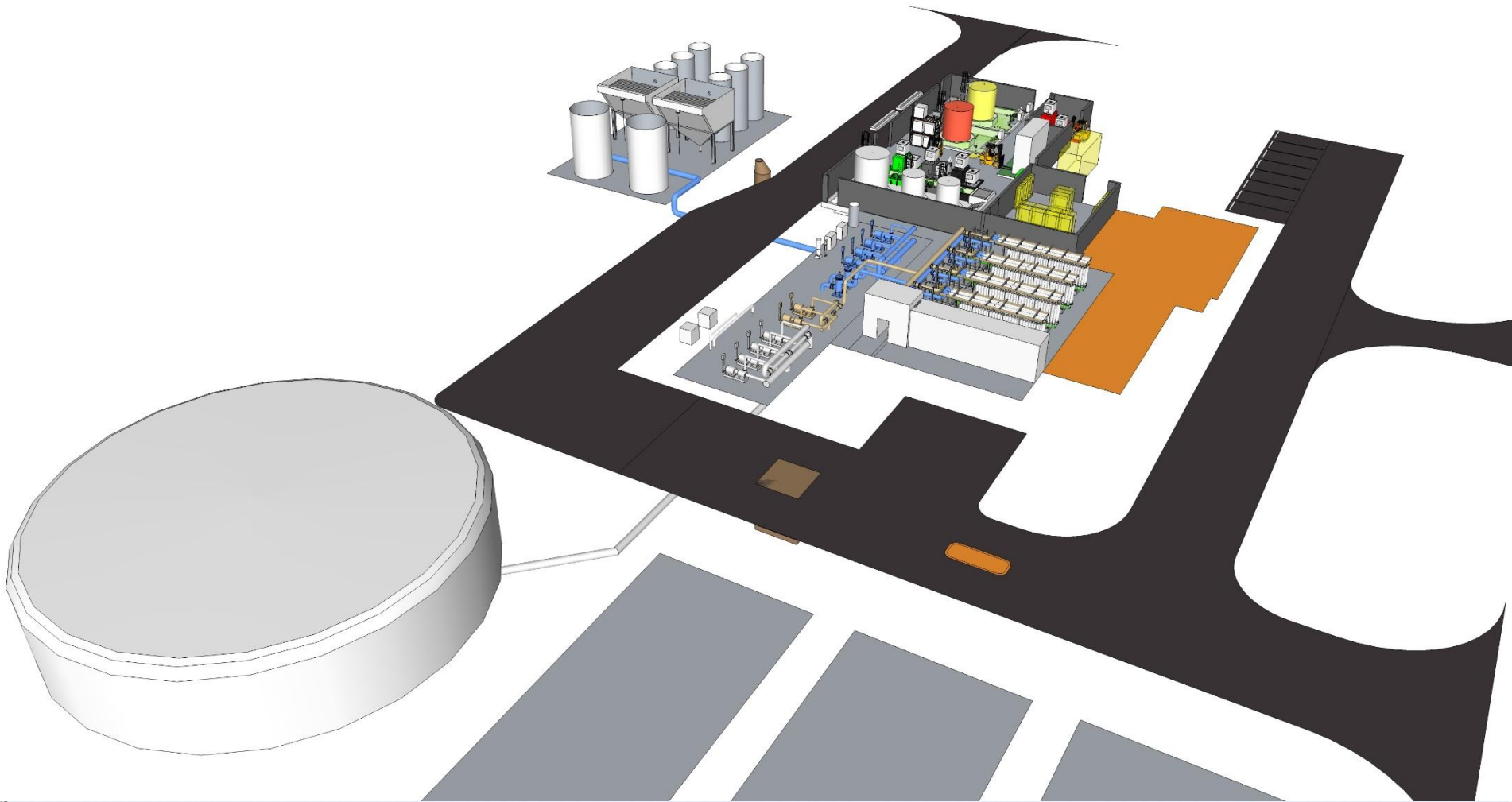
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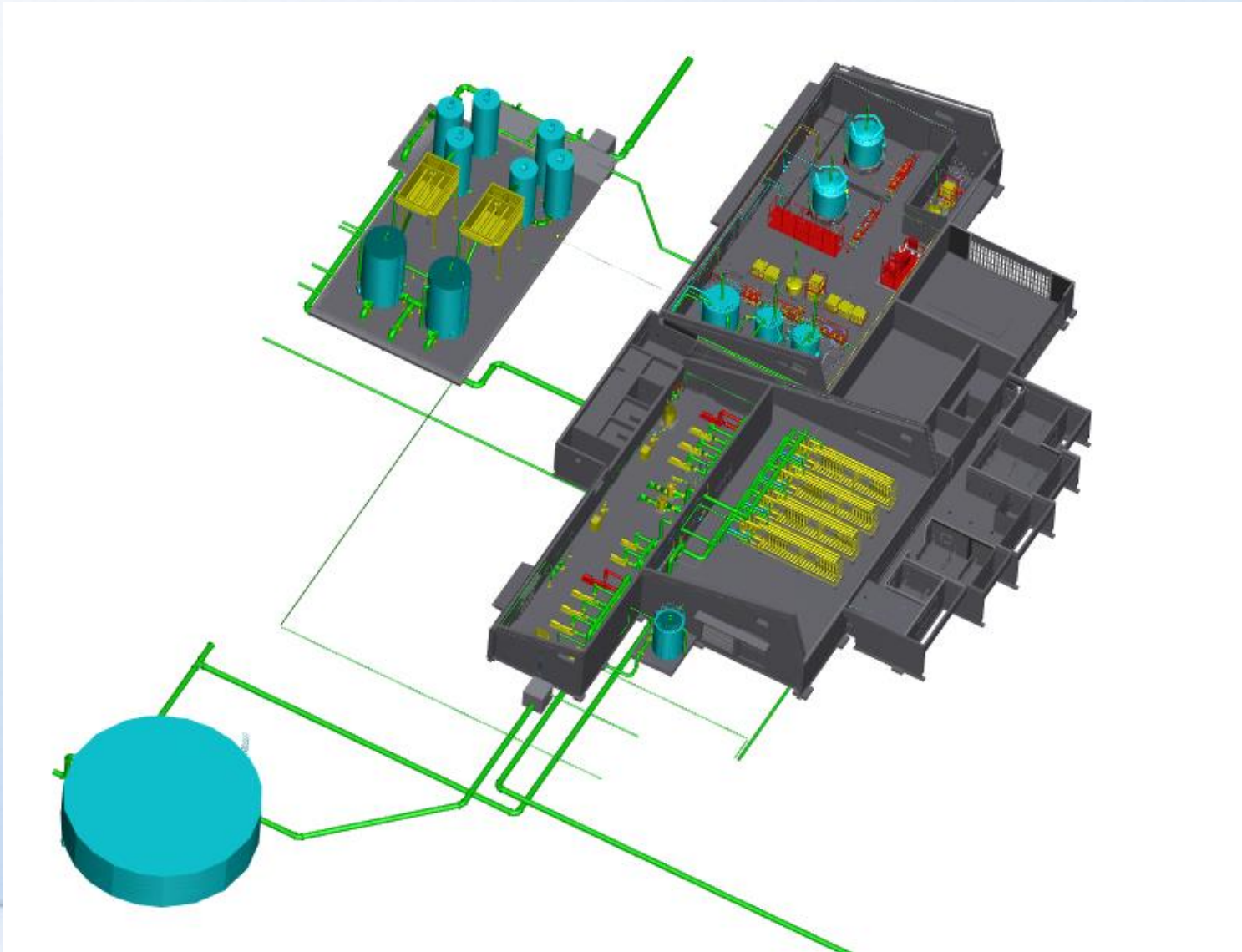
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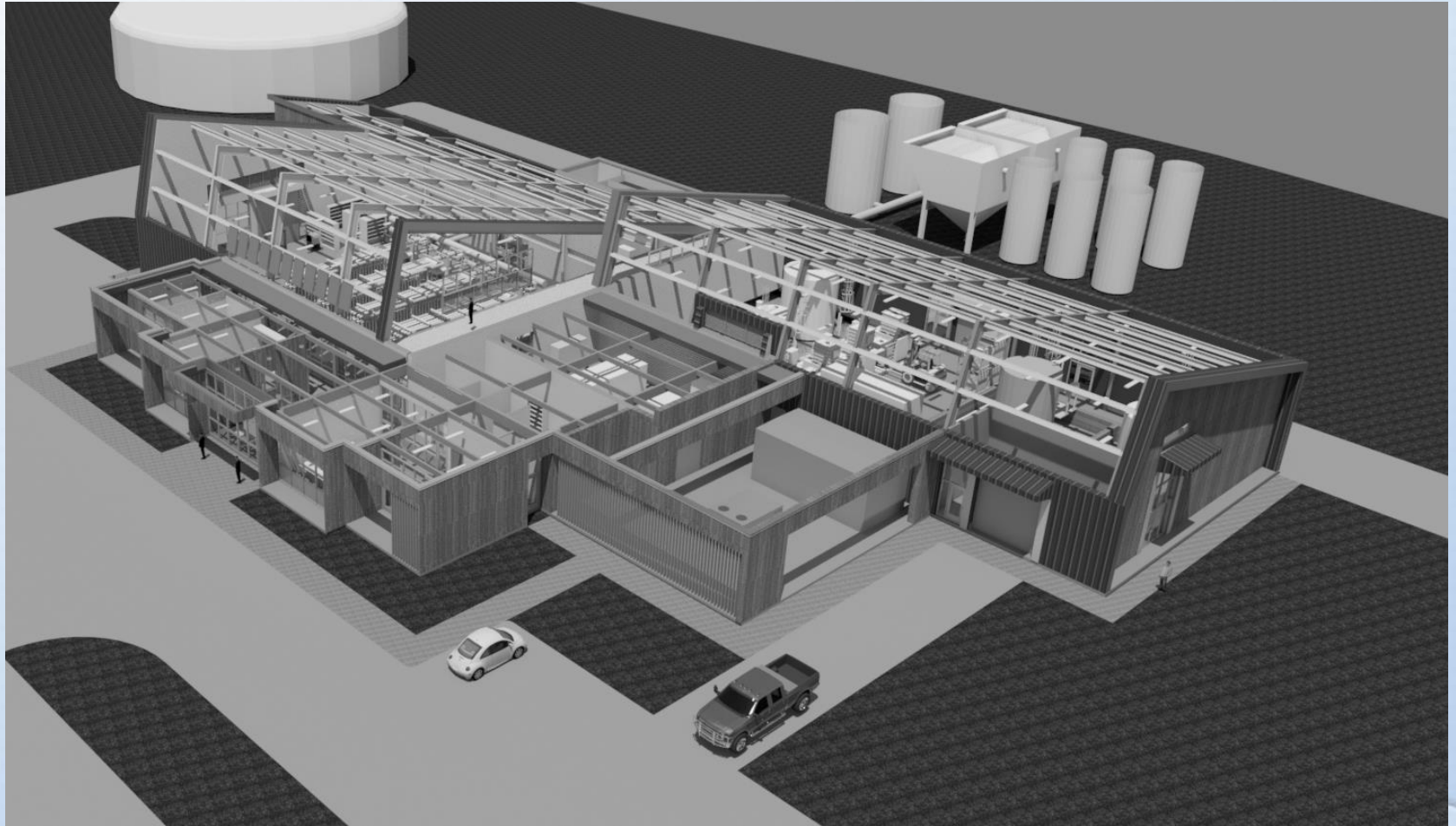
3D Communication Streamlines Getting to Final Layout



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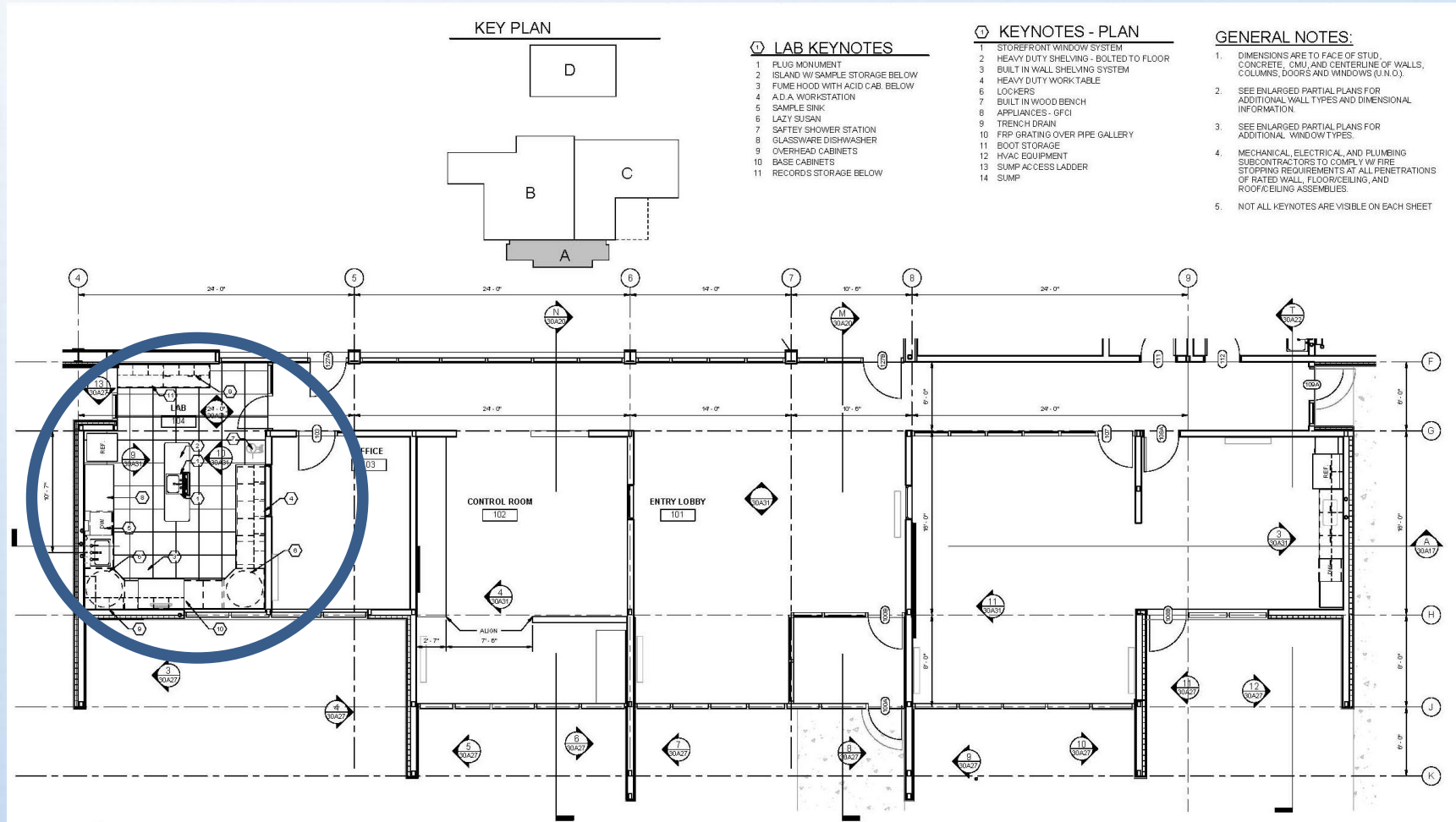
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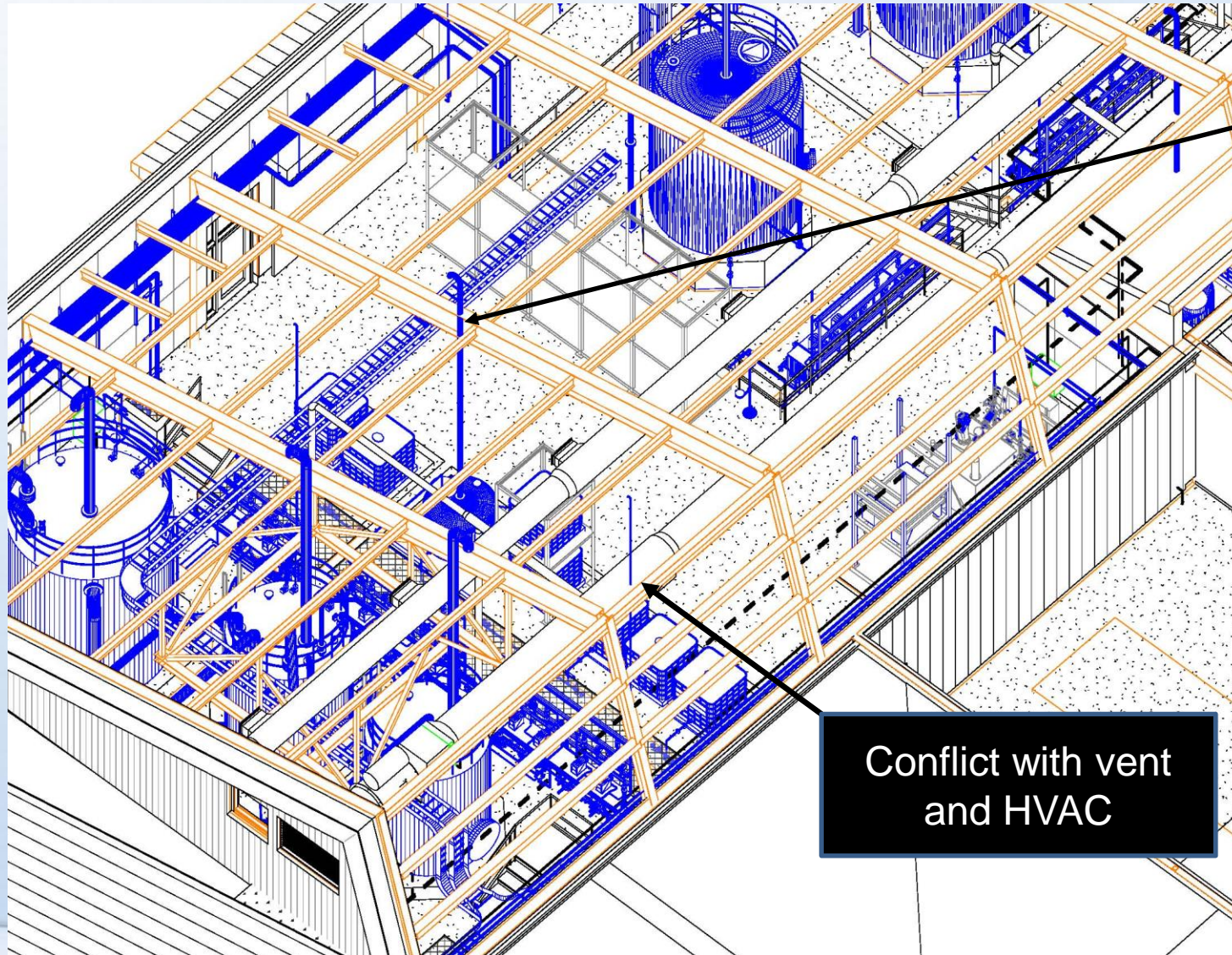
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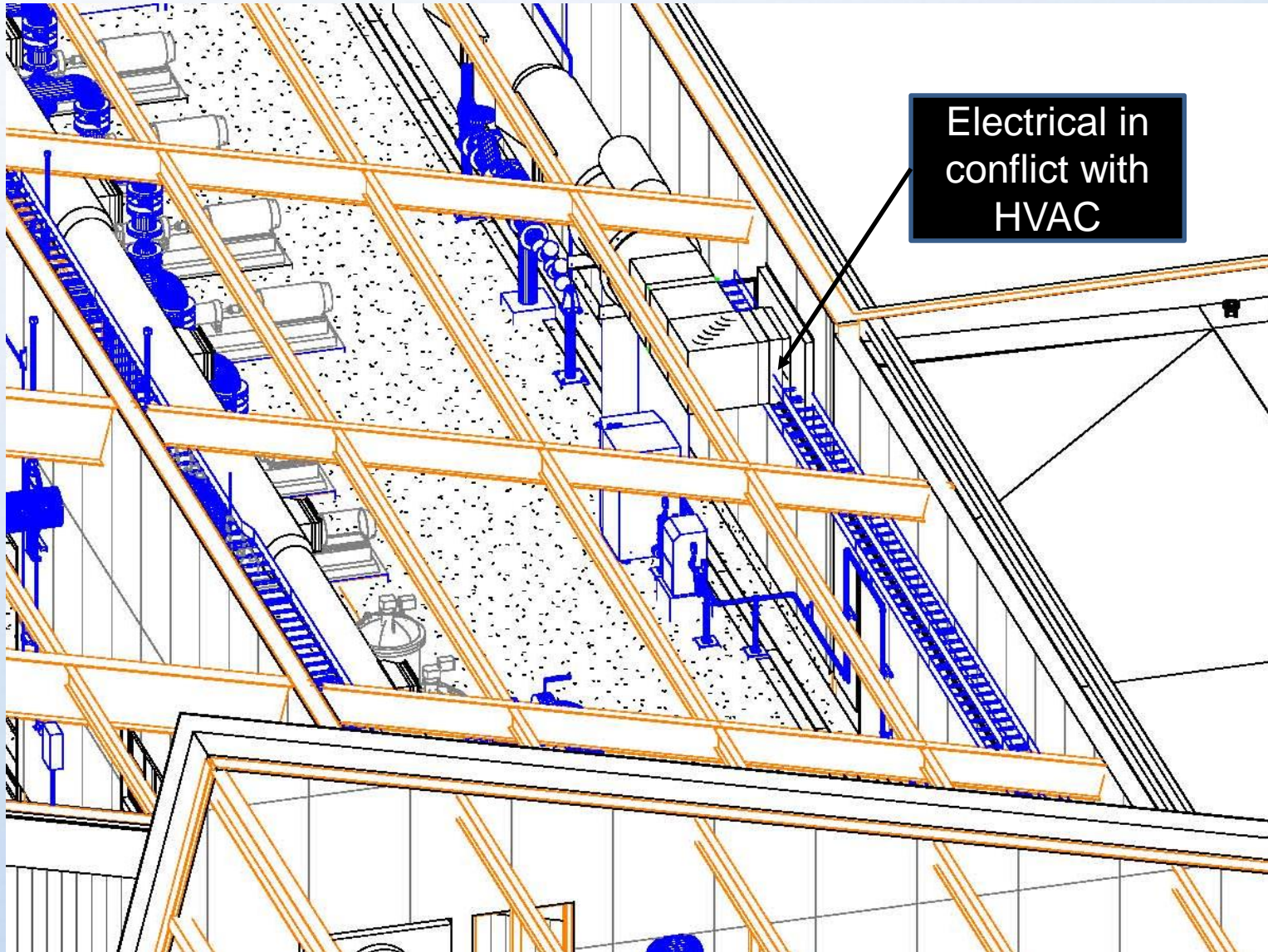
Conflicts Arise Early in Project Life Cycle



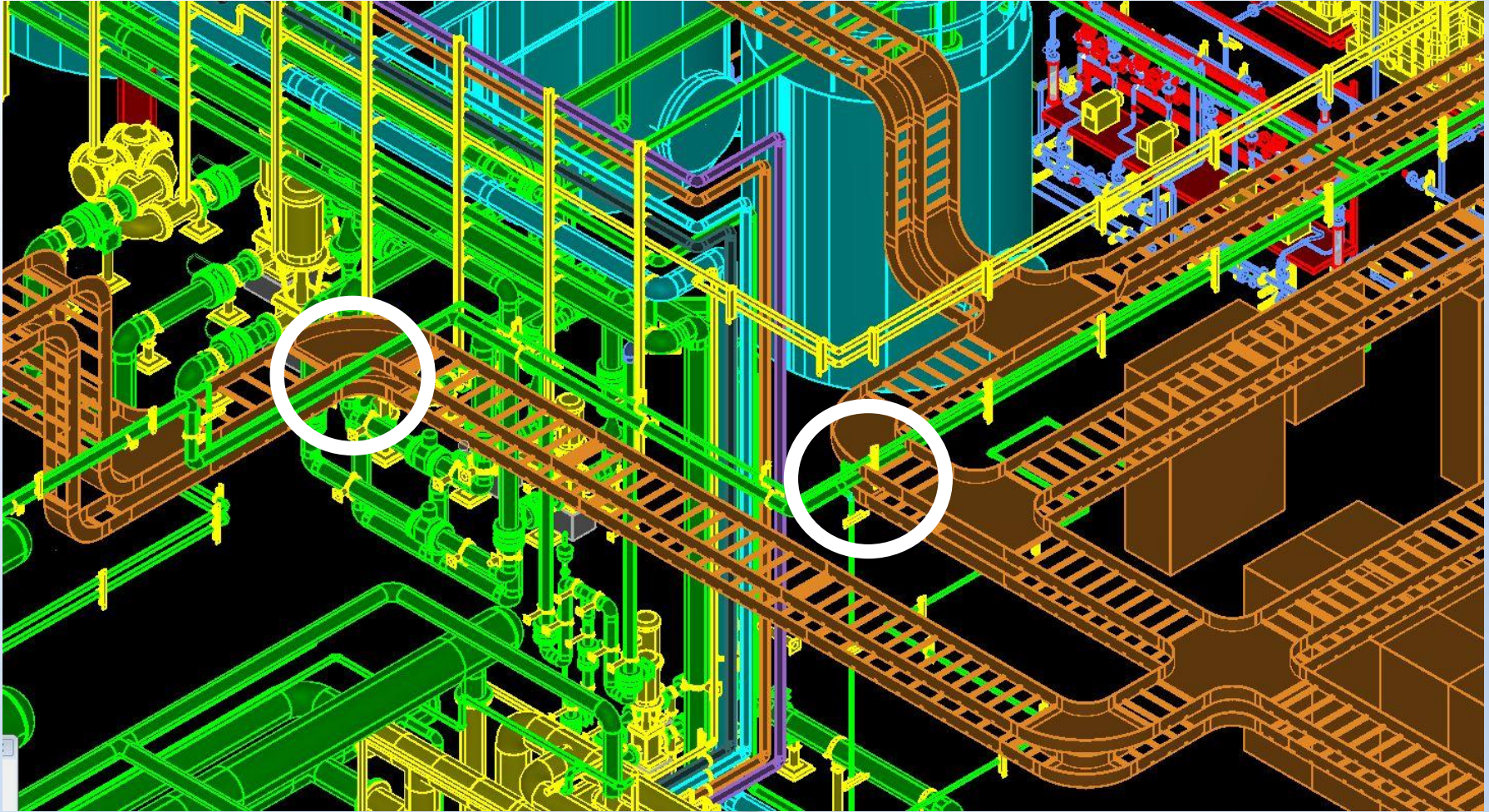
Conflict with vent and beam

Conflict with vent and HVAC

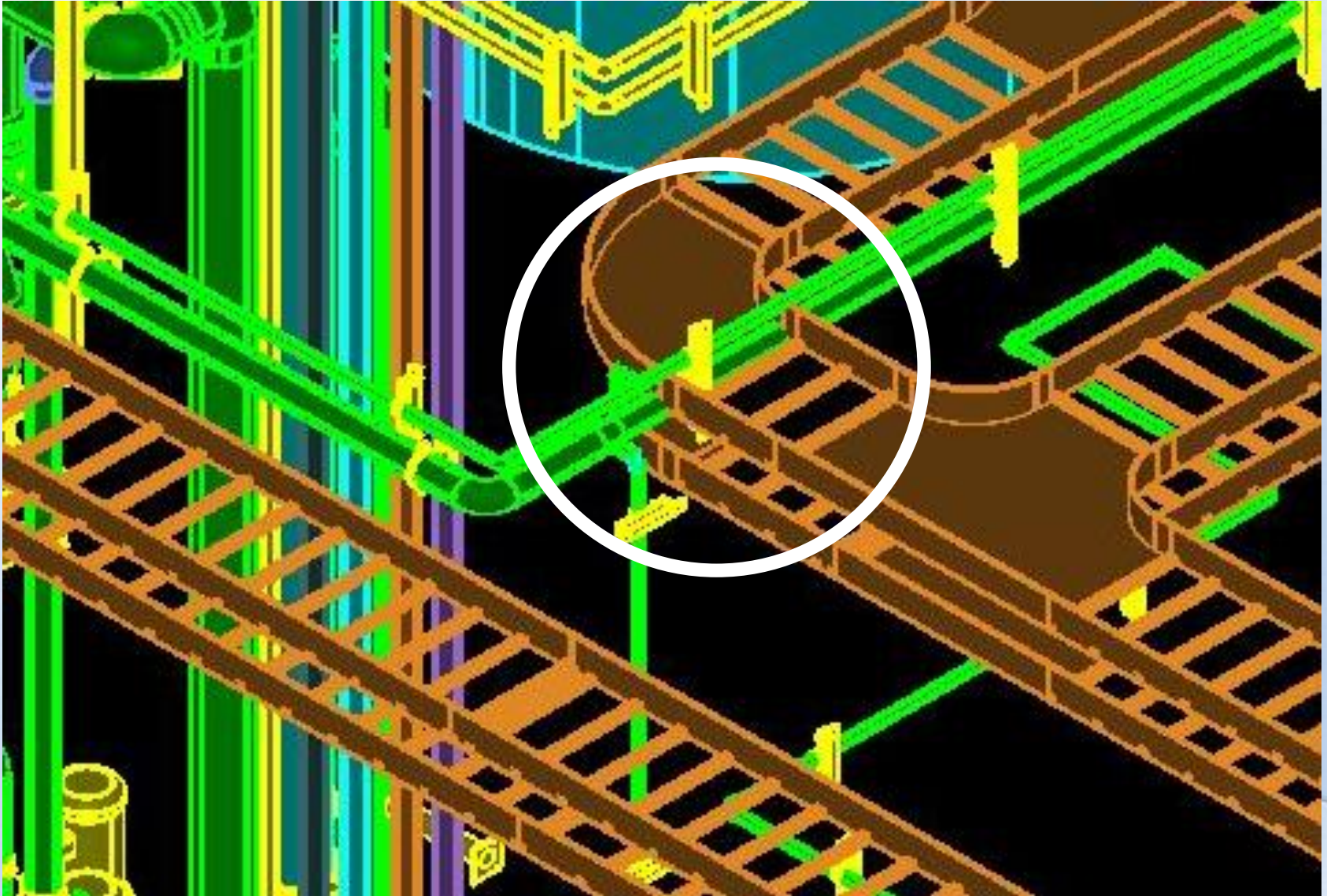
Discipline Conflicts Are Easily Identified



Modifications During Construction Are Avoided



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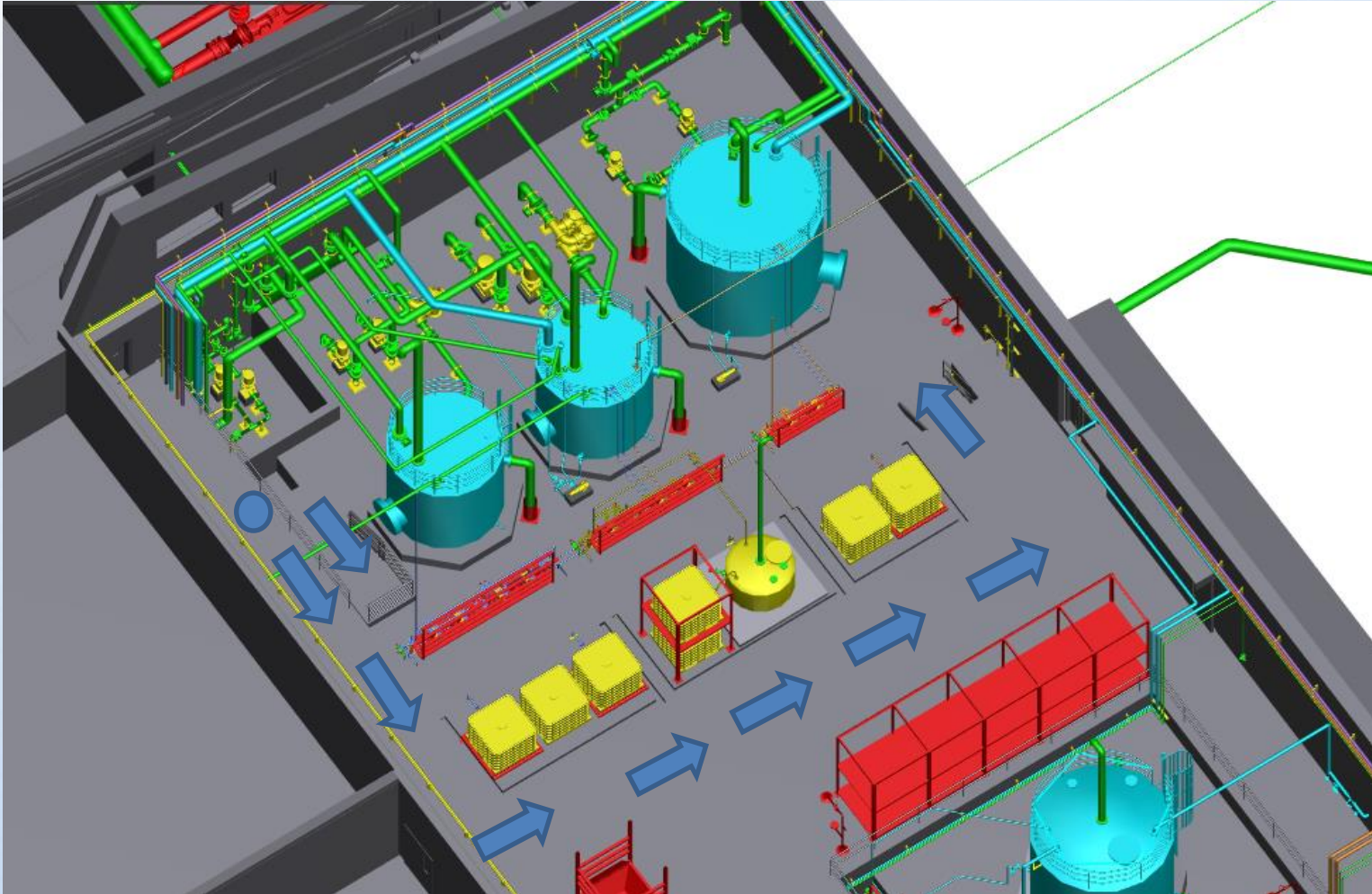
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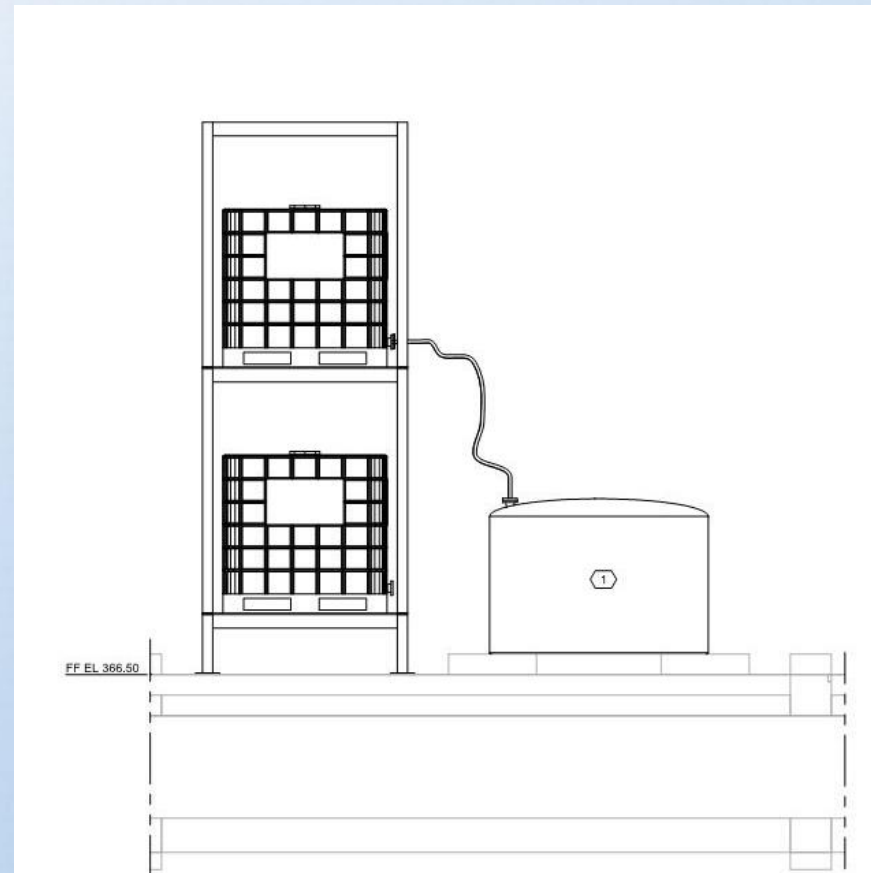
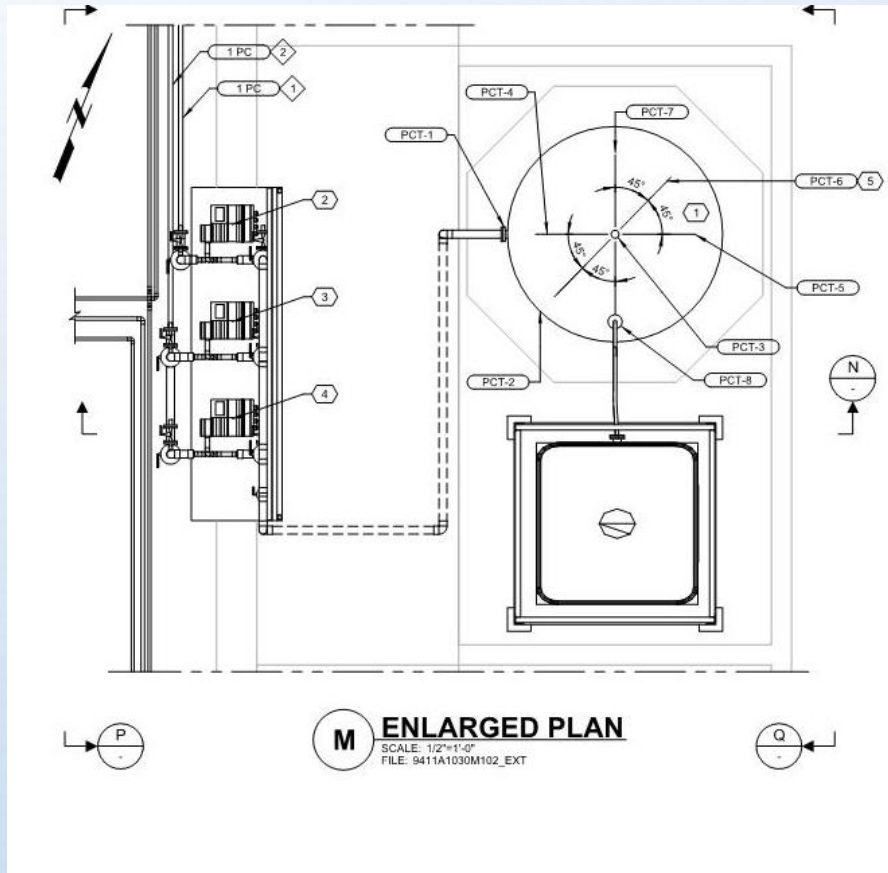
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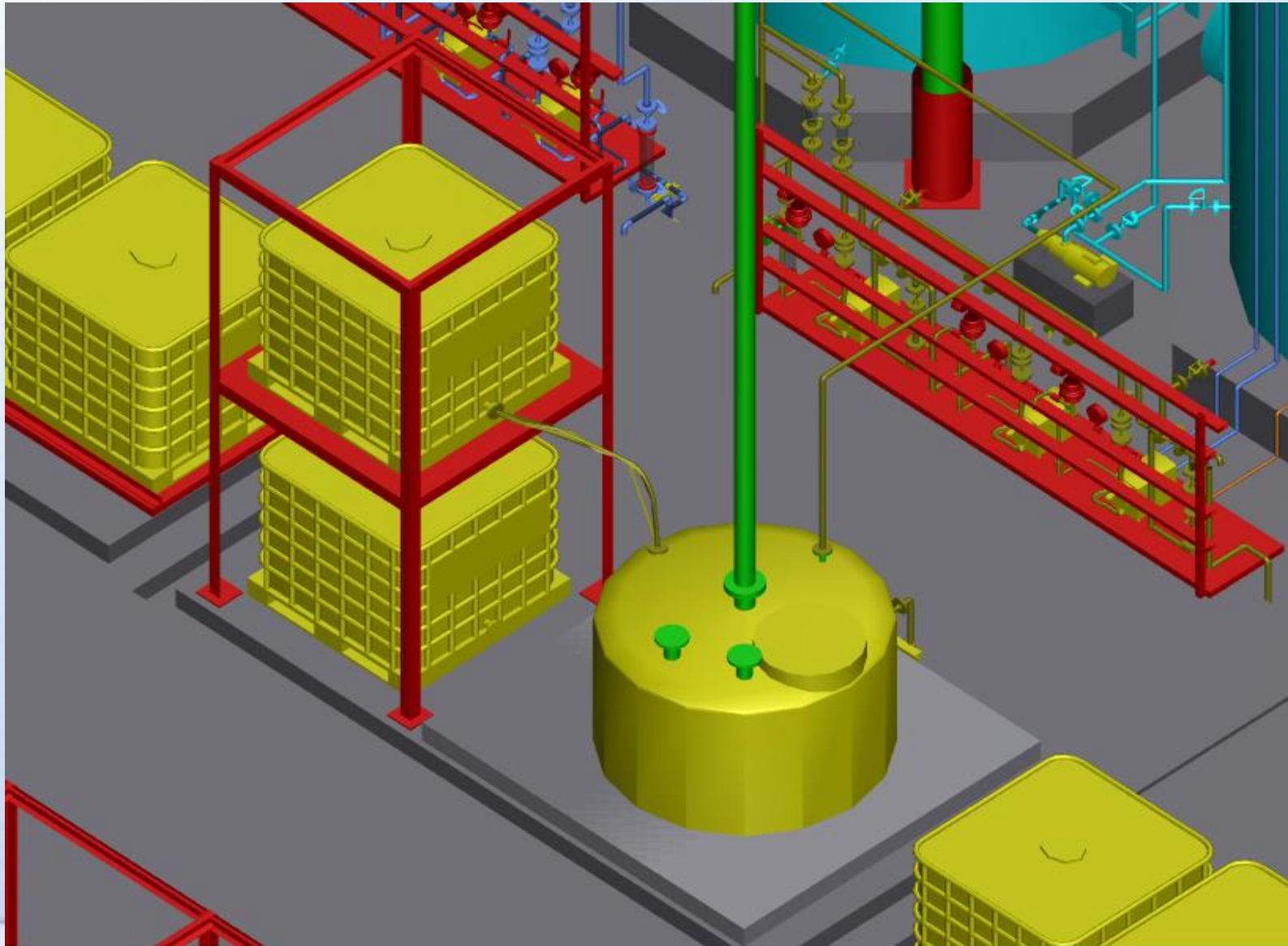
Maintenance Challenges Become Clear



Improvements for Access are Visible



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Visualization Highlights Safety Features



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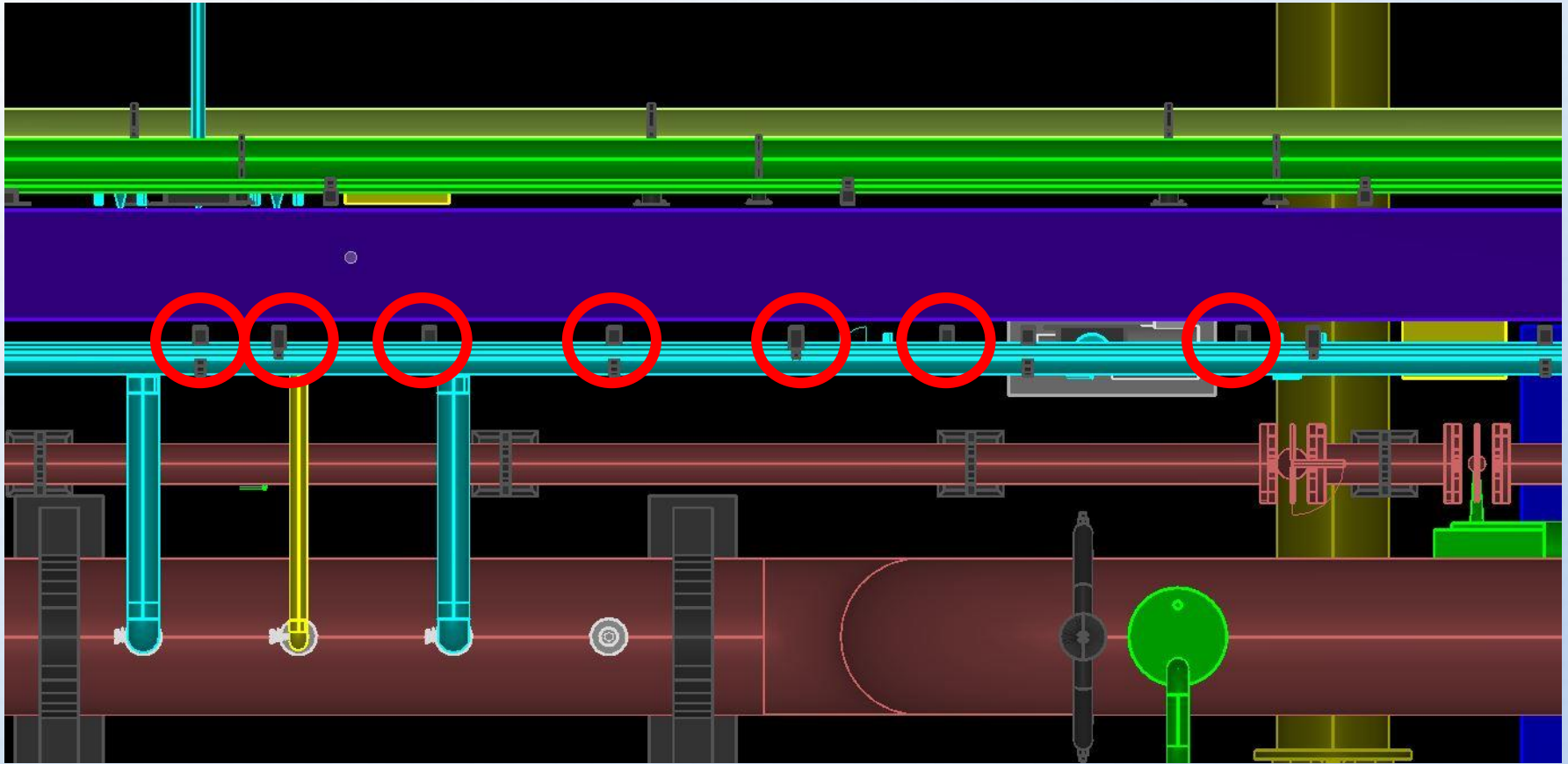
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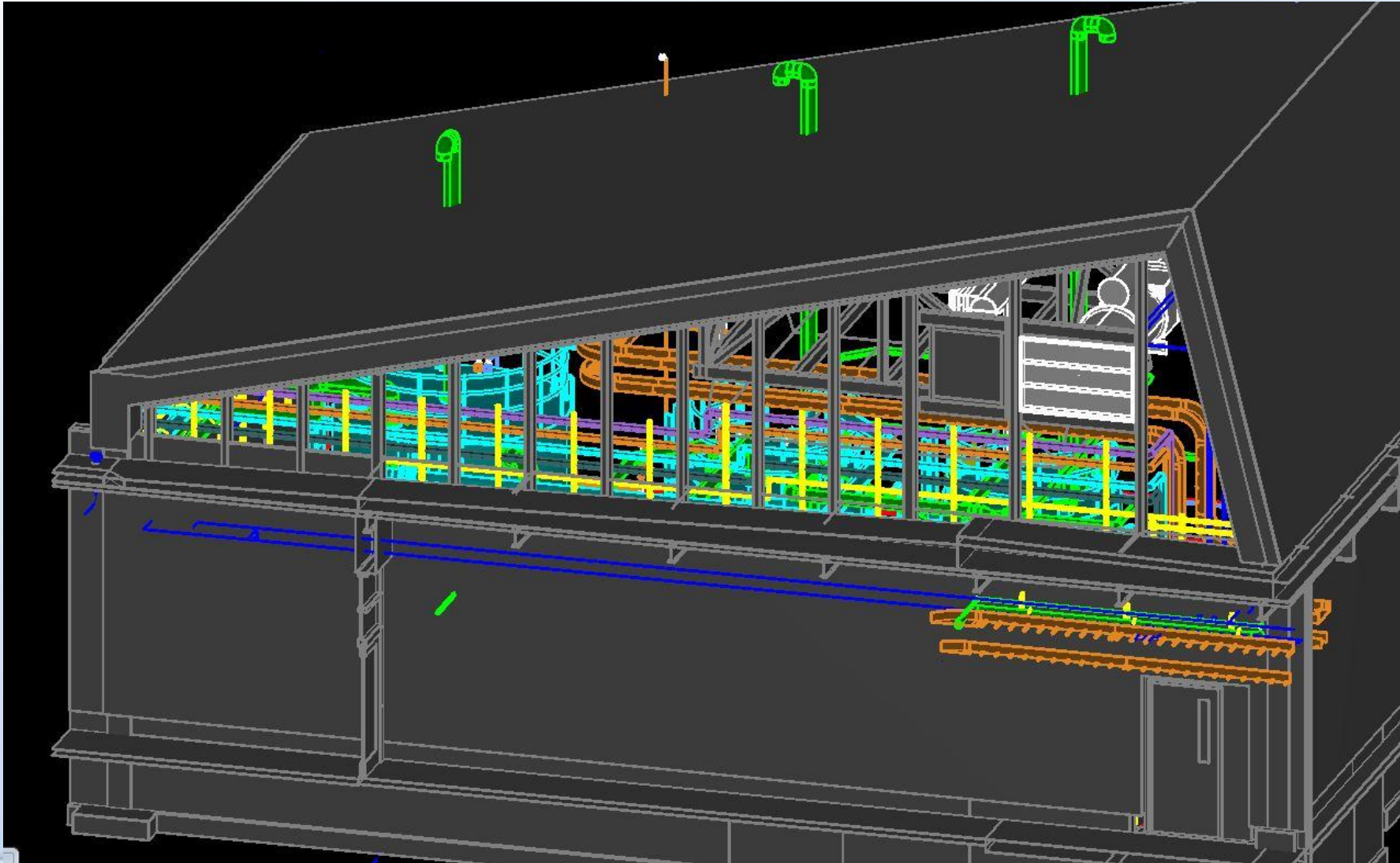
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Considerations – Too Much of A Good Thing?

Perfectionism Must Be Kept In Check



Meshing Models Can Bring Surprises



Visualization Tools Must Be Used Wisely

- Vendor Package Limitations
 - Limited CAD file availability
 - Time consuming to model details
 - Show box with outer dimensions
 - Alternatively too much detail
- Project is bid in 2D; 3D information must be easily translated

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QUESTIONS?