

CS11241: In It to Win It General and Trade Contractors Working Together

Alex Edgar

Senior Engineer; Holder Construction

Scott LeMay

BIM Technology Administrator; McKenney's

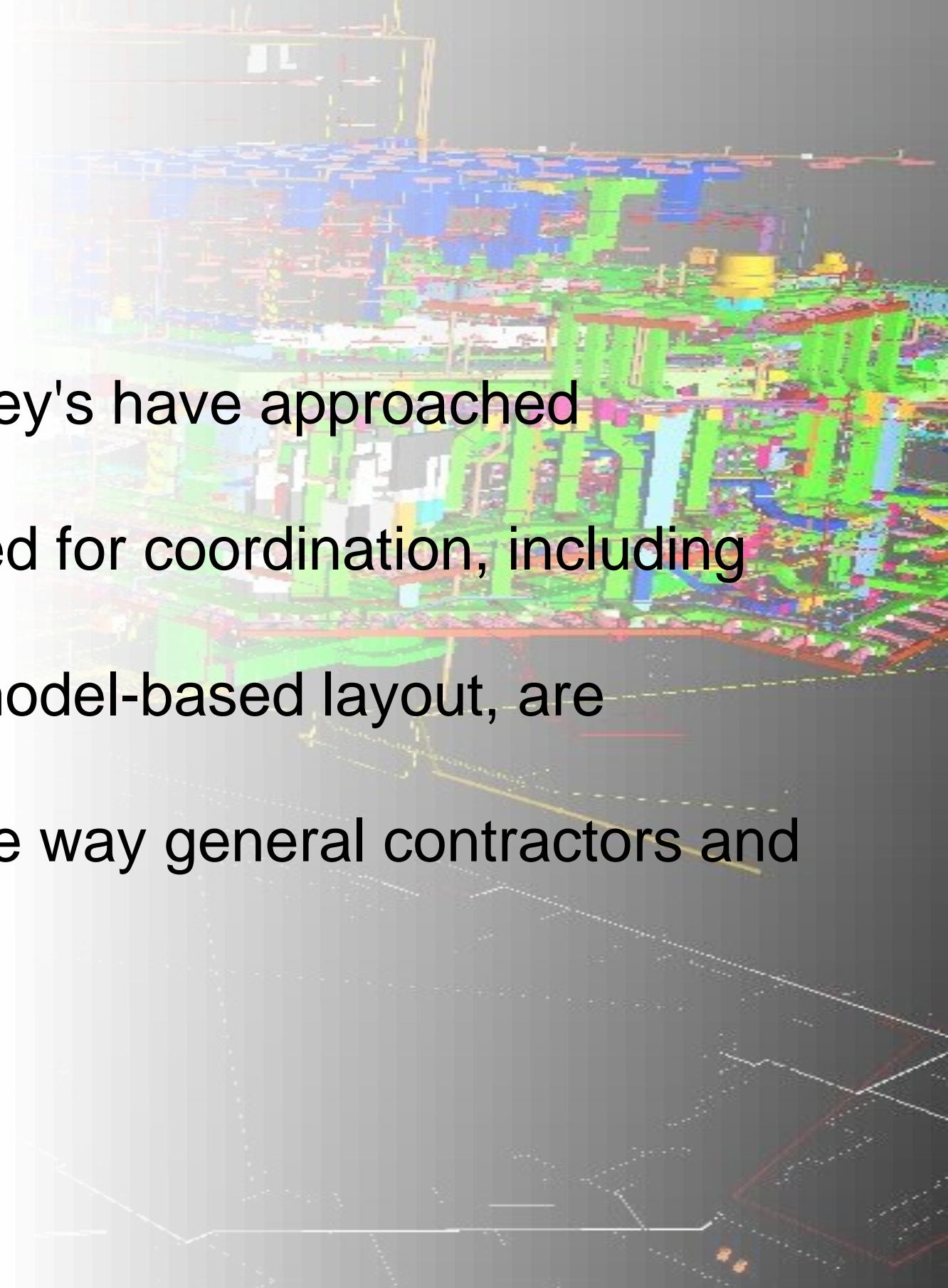
Class summary

During the construction process, general contractors and trade contractors work together every day in many ways to get the job done. One way these groups commonly work together to plan projects is through the use of Building Information Modeling (BIM) and 3D coordination. Holder Construction Company, a general contractor, and McKenney's, Inc., a mechanical contractor, have had a working relationship for many years and have built many projects together. In this time we've watched BIM become an integral part of the construction process. In this presentation we would like to explore the different ways we approach coordination, the tools we use, how this relationship has changed over the years, and how we expect it to change in the future.

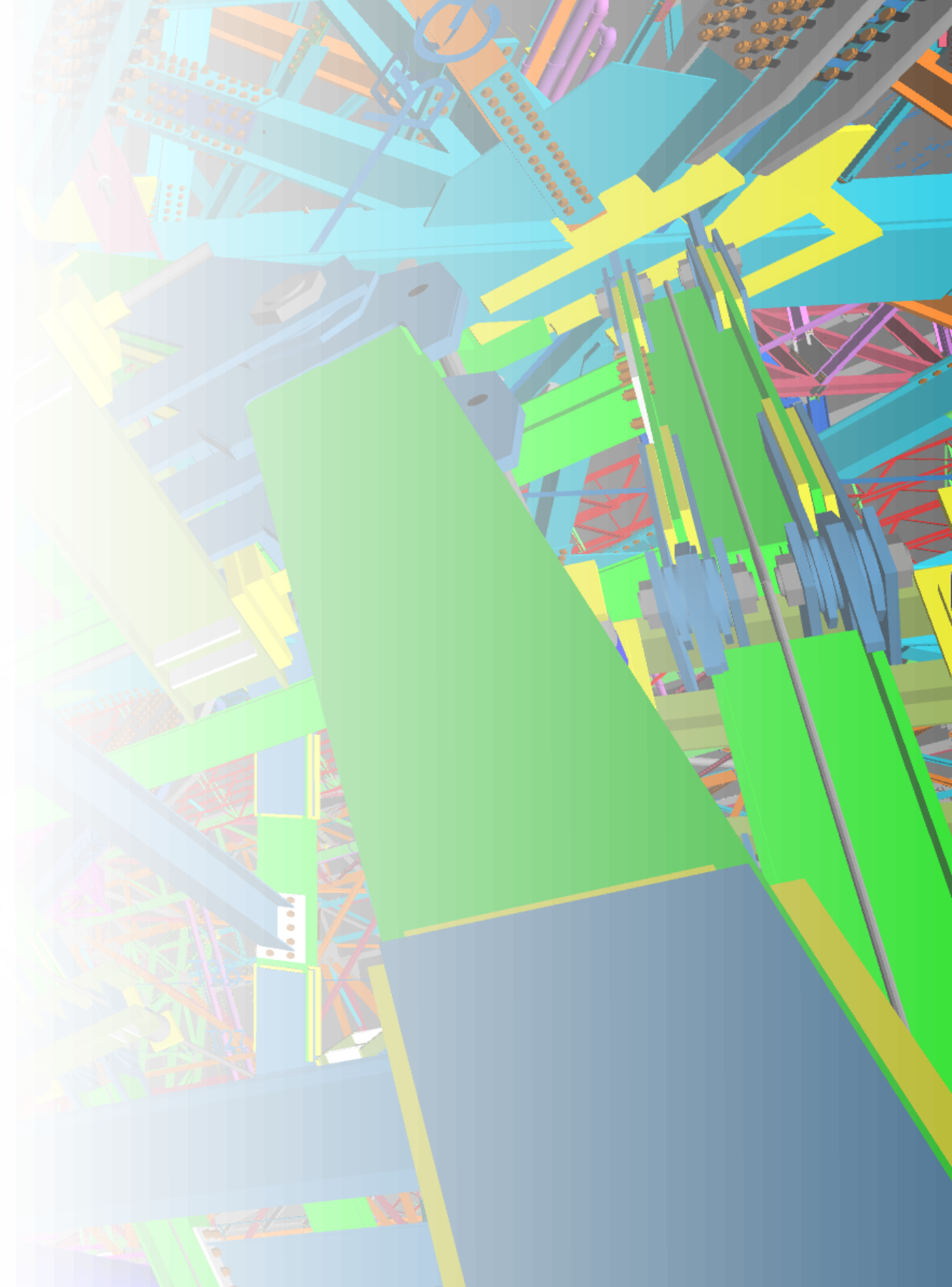
Key learning objectives

In this class, you will:

- Discover the various ways Holder and McKenney's have approached coordination
- Discover the pros and cons of various tools used for coordination, including BIM 360 Glue, Navisworks, and so on
- Learn how new tools, like laser scanning and model-based layout, are changing the coordination process
- Learn how these workflows and tools impact the way general contractors and trade contractors build buildings

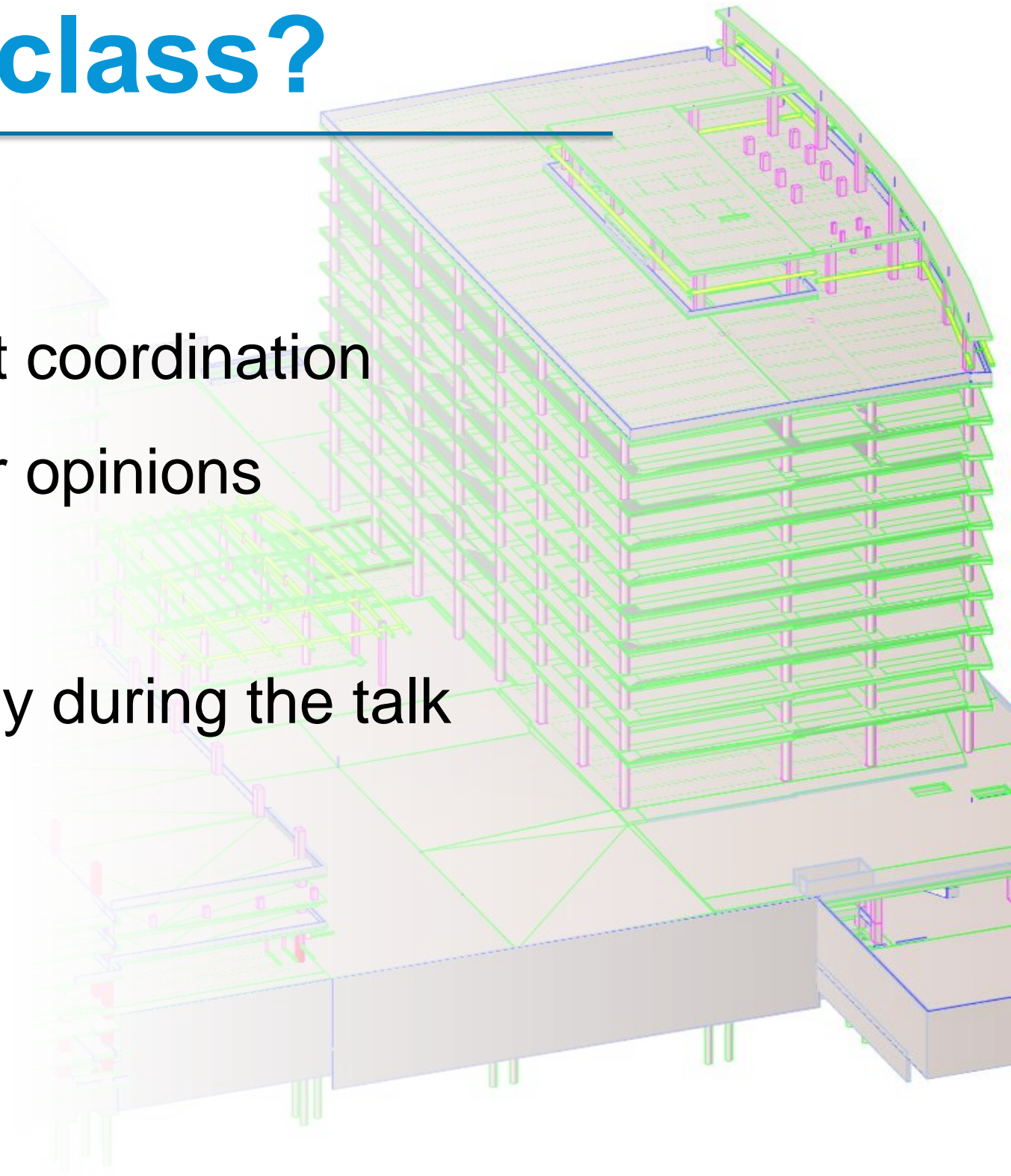


Introduction



What's the real point of this class?

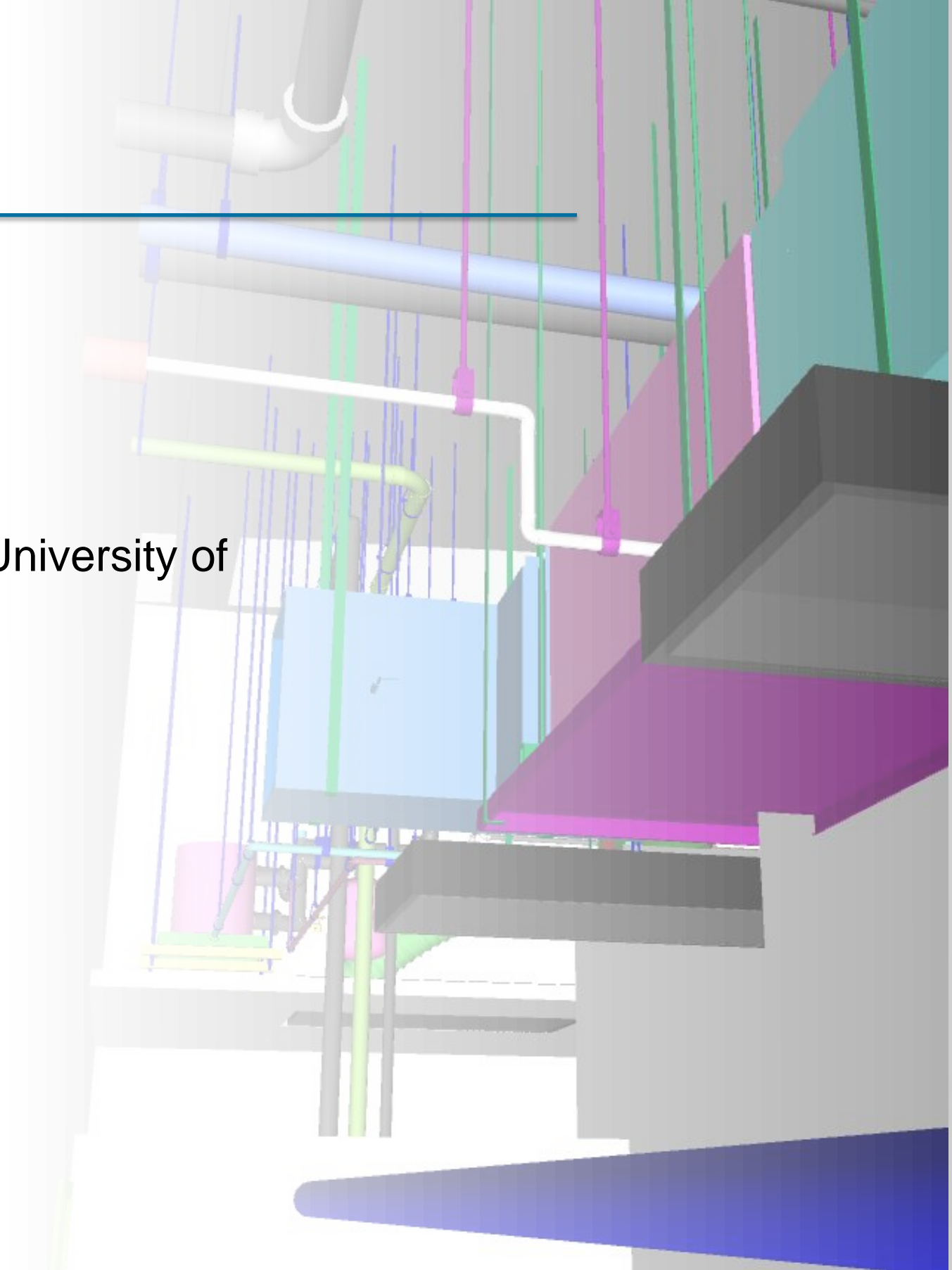
- Have a conversation
 - We want to share how we approach project coordination
 - We want to hear from the audience on their opinions
 - Feel free to disagree
- Ask questions, share opinions and engage freely during the talk



Who are we?

Alex Edgar

- Senior Engineer in Holder's BIM Group
 - Based in Atlanta, GA
- Education
 - BA and MA in Construction Management from the University of Florida
- Experience
 - Aviation
 - Data Centers
 - Higher Education
 - Corporate Office



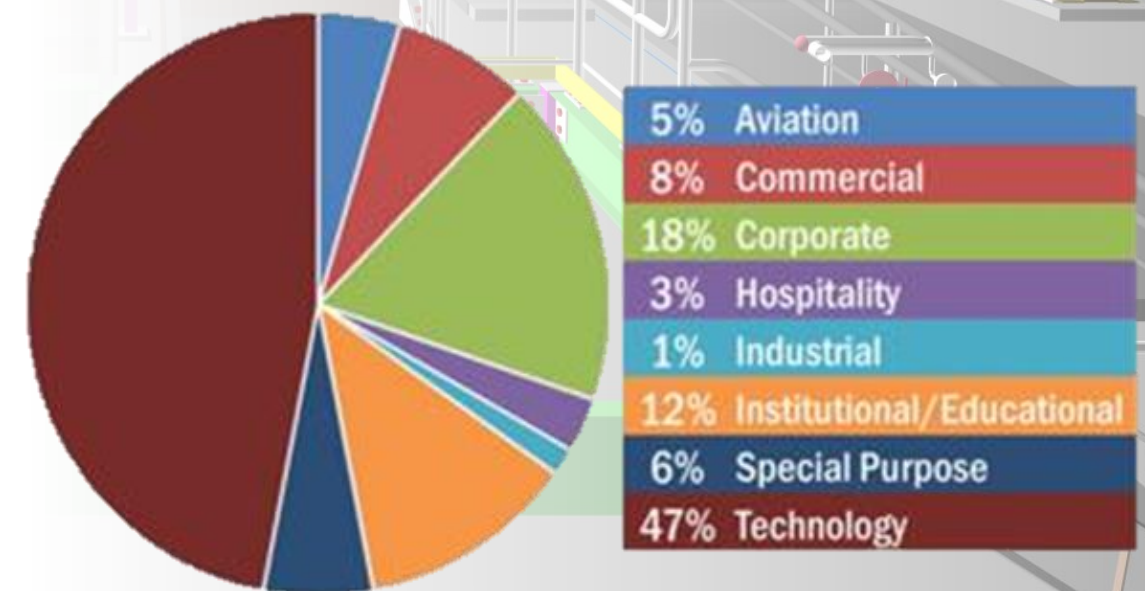
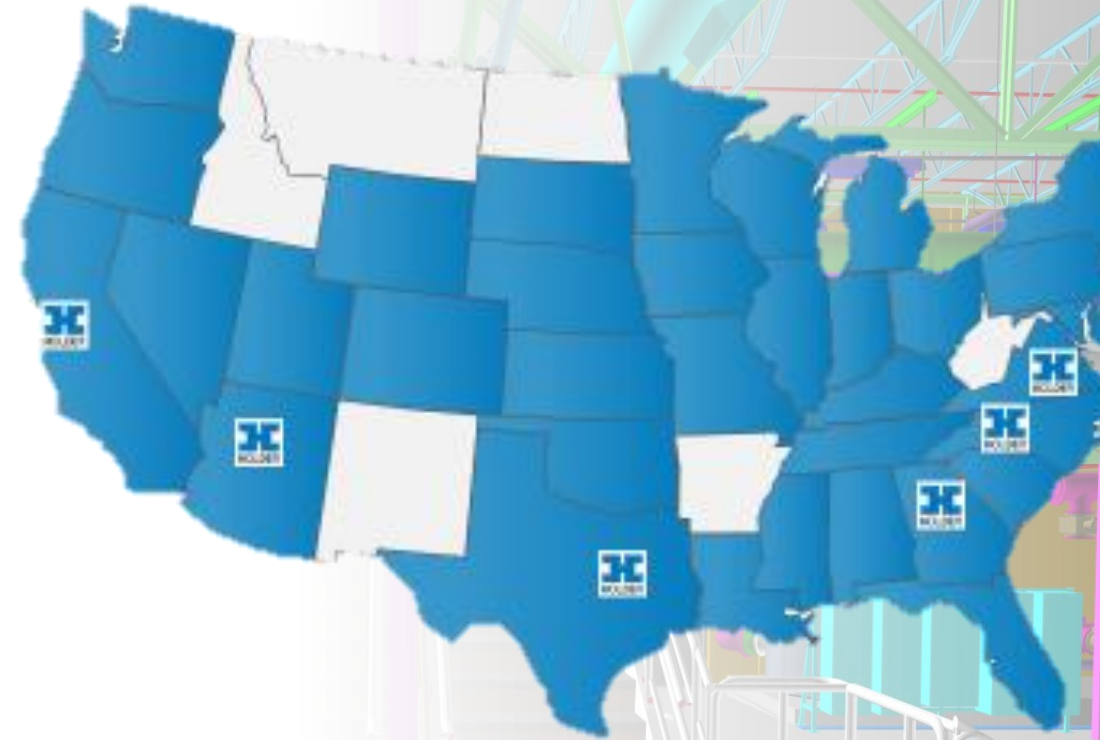
Who are we?

Holder Construction

- 80% Repeat Clients
- Experience in 38 states
- Offices
 - Atlanta
 - Charlotte
 - Dallas
 - Phoenix
 - San Jose
 - Washington DC
- ENR Rankings
 - #36 Top 400 Contractors
 - #1 Top 15 in Data Centers
 - #1 Top 25 in Telecommunications
 - #17 Top 100 Construction Managers at Risk
 - #19 Top 50 Green Contractors
 - #31 Top 100 Contractors by New Contracts
 - #49 Top 50 General Builders



FORTUNE

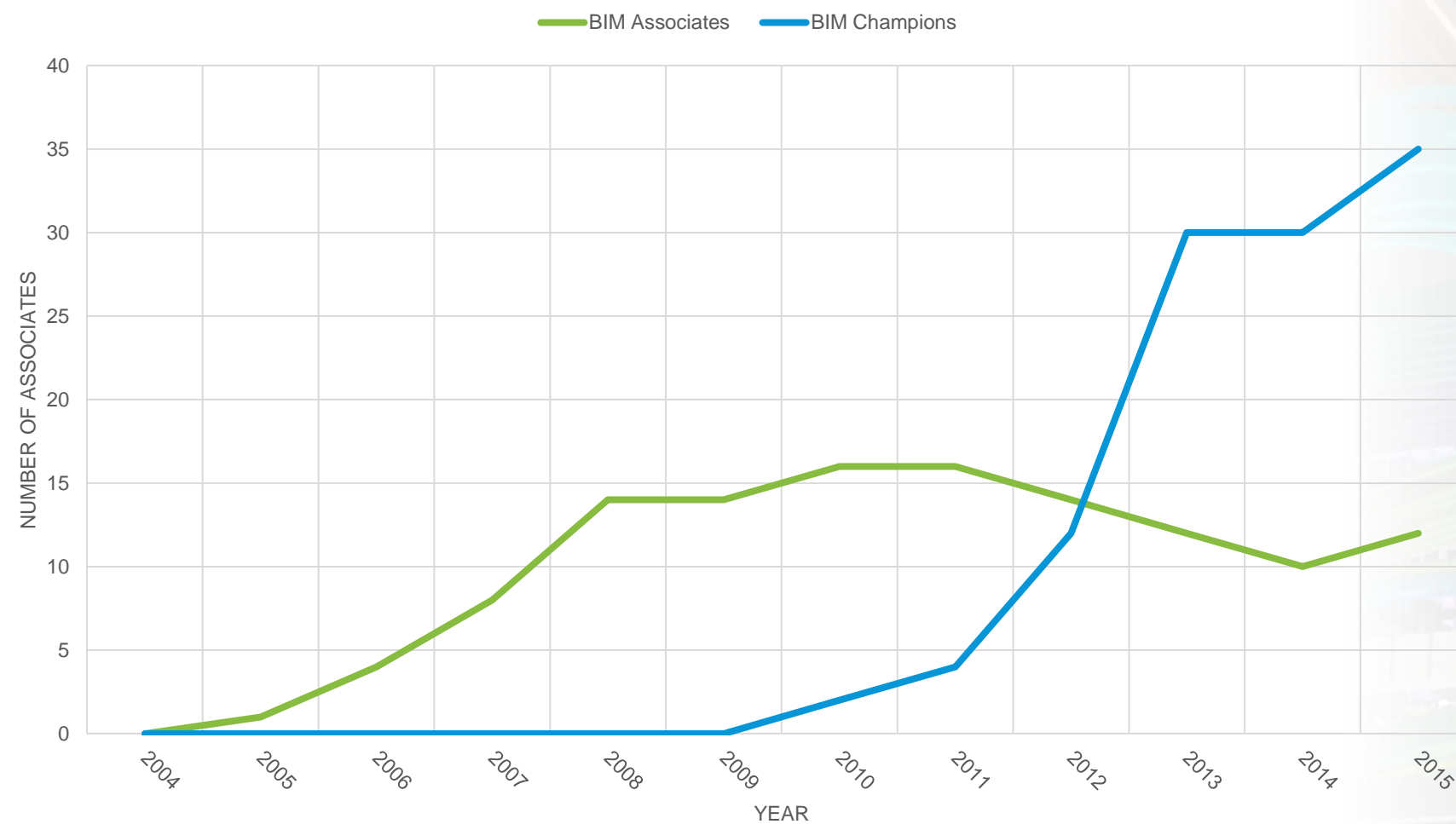


Who are we?

Holder's BIM History

- More than 10 years of experience
- BIM on all projects

Holder BIM Associates



Who are we?

- Scott LeMay
 - BIM Technology Administrator
 - Based in Atlanta, GA
 - Job history
 - Has worked in both manufacturing/machine mechanical and building mechanical industries • Relevant building experience
 - Data Centers/Mission Critical
 - Higher Education
 - Corporate Office
 - Medical - hospitals, MOBs
 - Government
 - Mixed use



Who are we?

- McKenney's
 - Offices in Atlanta and Charlotte
 - McKenney's operates state-of-the-art fabrication and assembly shops that allow us to control the schedule, cost, quality and safety of our work.
 - Atlanta Sheet Metal Fabrication Shop
 - 37,000-square foot shop equipped with automated coil-fed duct line with three bridge cranes
 - Computerized download to fitting cutter that provides optimized metal layout and minimizes scrap material
 - Normal-single-shift shop capacity is over five million pounds per year, with additional shift capacity topping seven million pounds
 - Charlotte Sheet Metal Fabrication Shop
 - 8,000-square foot shop equipped with automated coil-fed duct line
 - Capacity of 800,000 pounds per year



Who are we?

- McKenney's
 - Steel Pipe Fabrication Shop (Atlanta)
 - 27,556-square-foot shop equipped with five bridge cranes, pantograph capable of handling double random pipe (42'), and eight welding stations
 - Average 2,500 diameter inches of completed weld per week; peak is 4,200 diameter inches per week
 - Structural steel fabrication shop with paint booth
 - Copper/Plumbing Fabrication Shop (Atlanta)
 - 14,000-square-foot shop equipped with ergonomic worktables, tee drills and three overhead cranes
 - Assemblies include in-wall and copper assemblies, coil connections, pressure reducing valves (PRV) station, PVC and cast iron



Who are we?

- **McKenney's BIM History**

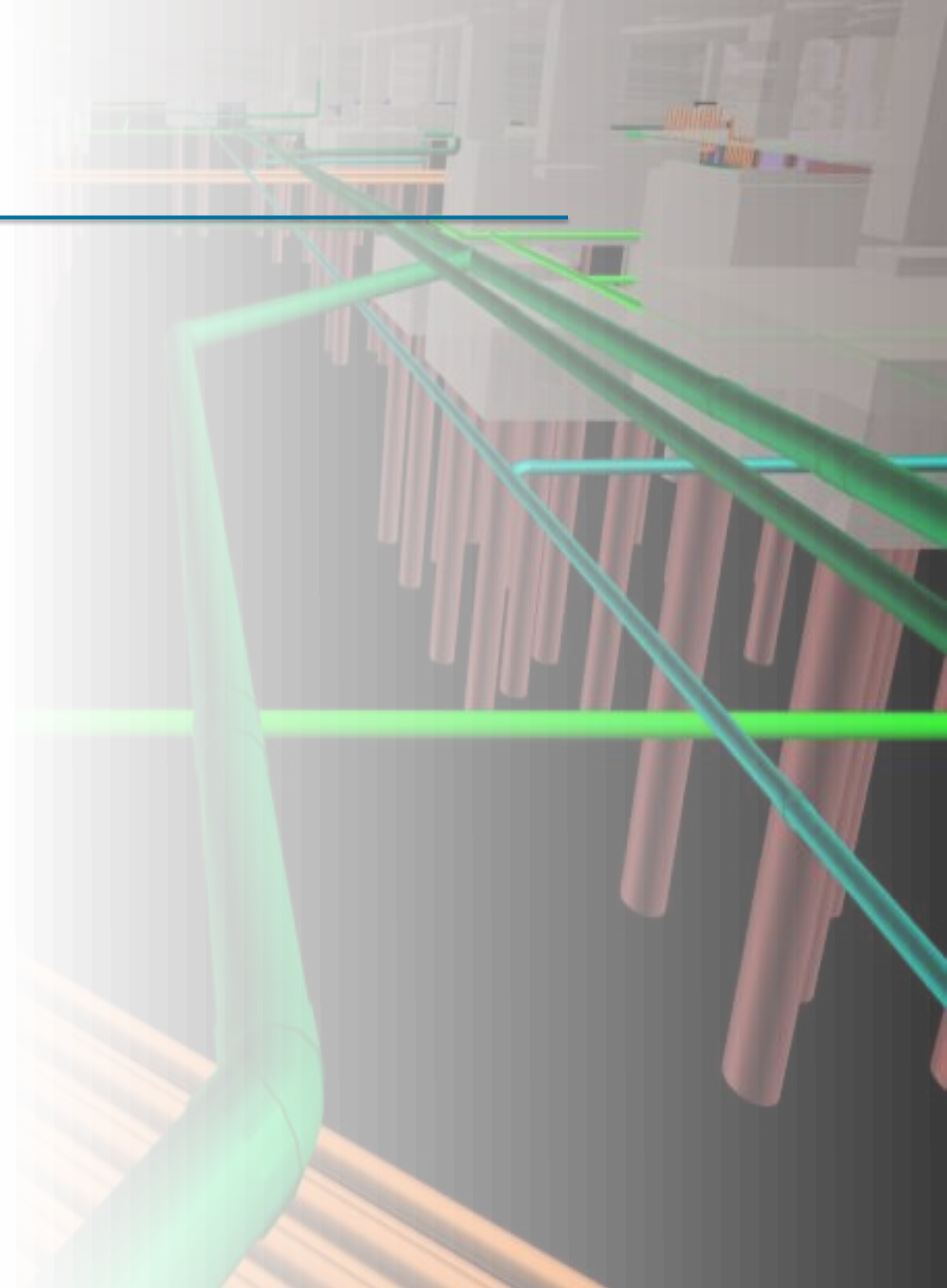
- Industrial
- Hospitality
- Government
- Education
- Retail
- Healthcare
- Central Plants
- Commercial Offices
- Mission Critical
- Historic Preservation
- Corporate Campuses
- Science & Technology
- Mixed-Use & Multifamily
- Performance Contractors
- Public Assembly & Places of Worship
- Entertainment & Media



Who are you?

What does your Company do?

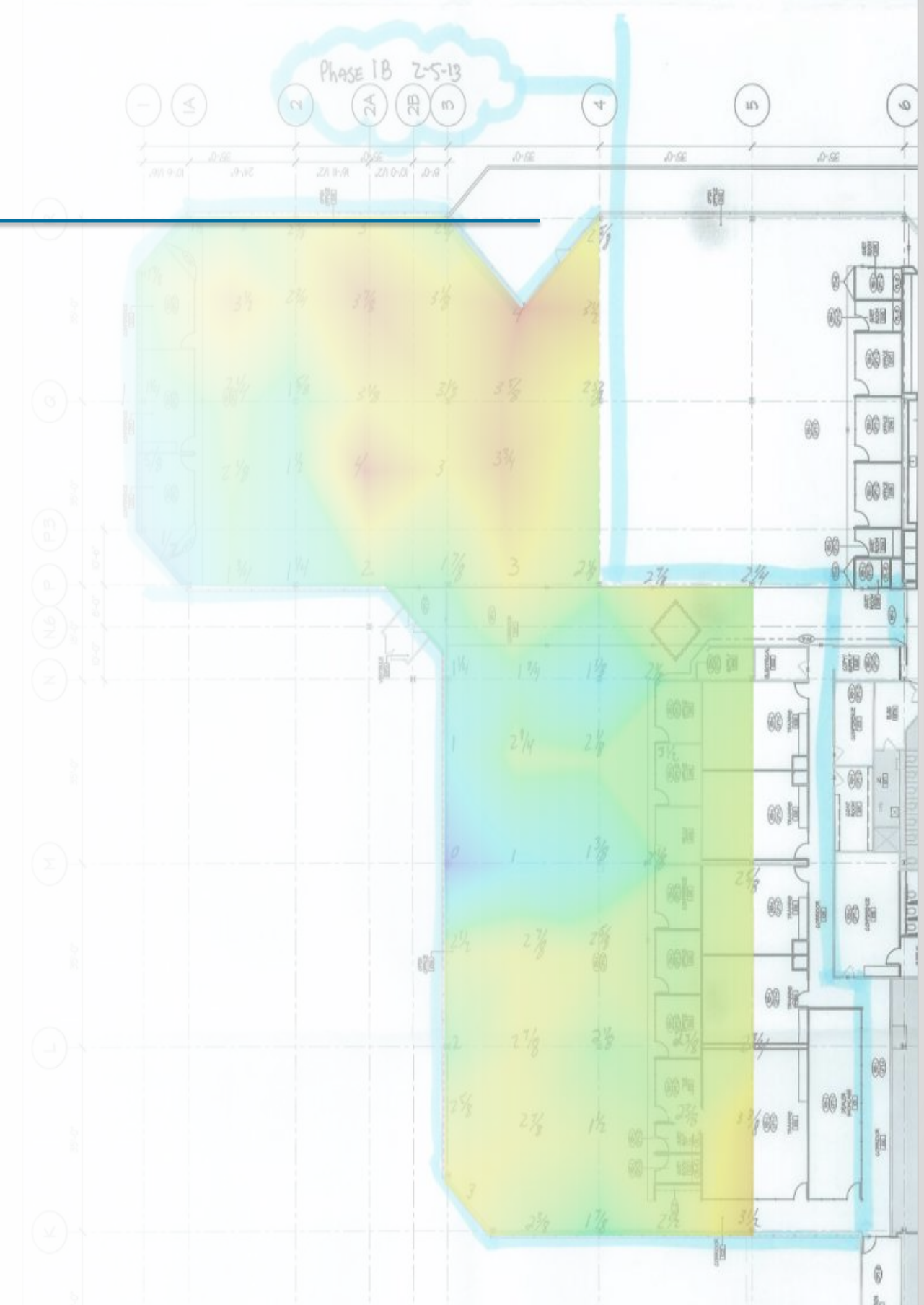
- Architect
- Engineer
- General Contractor
- Trade Contractor
- Owner's Representative
- Owner
- Developer
- Other



Who are you?

Where do you do business?

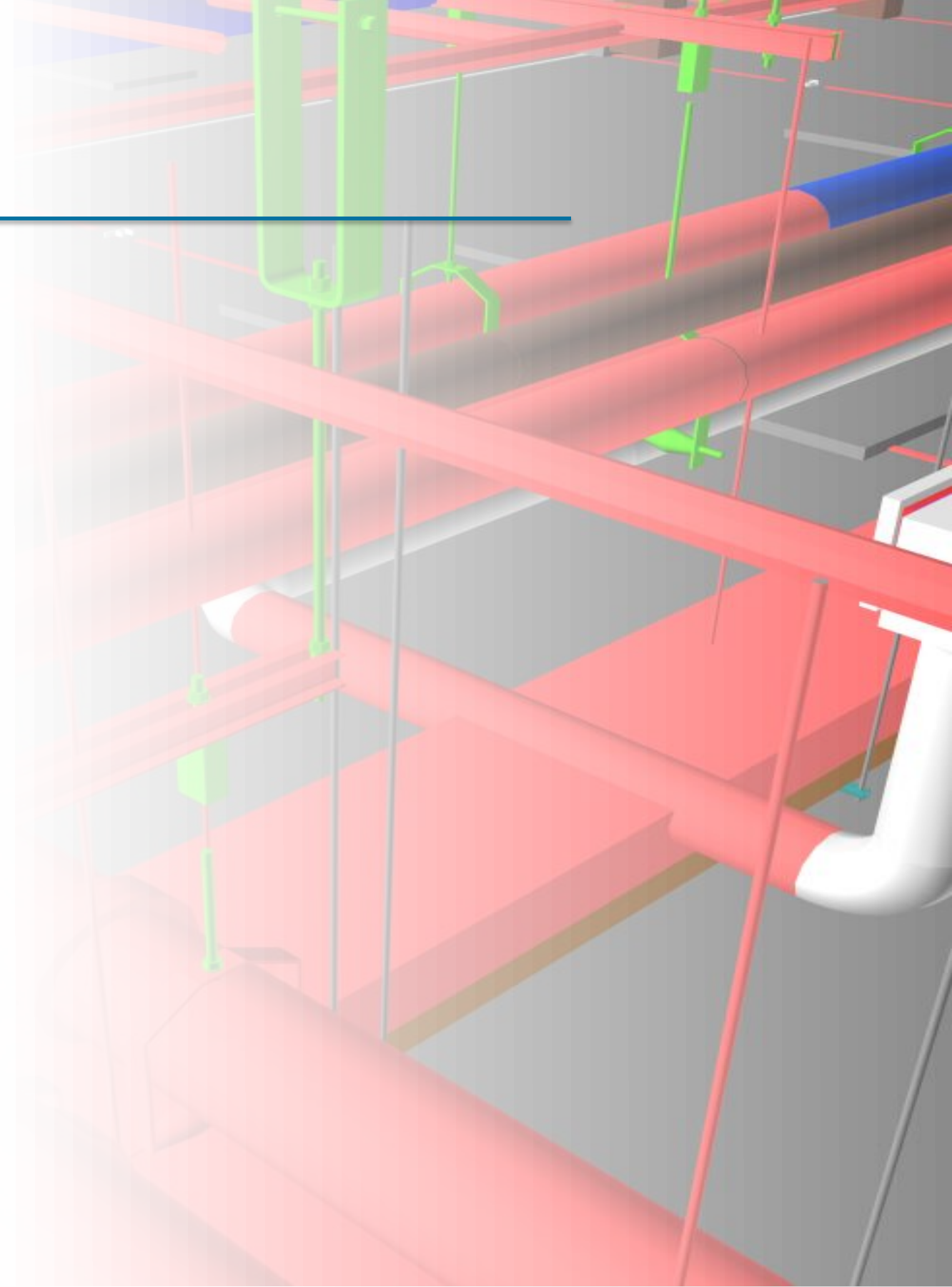
- Global
- US
- Regional
 - Northeast
 - Midwest
 - Southeast
 - Southwest
 - Northwest
- Other



Who are you?

What do you build?

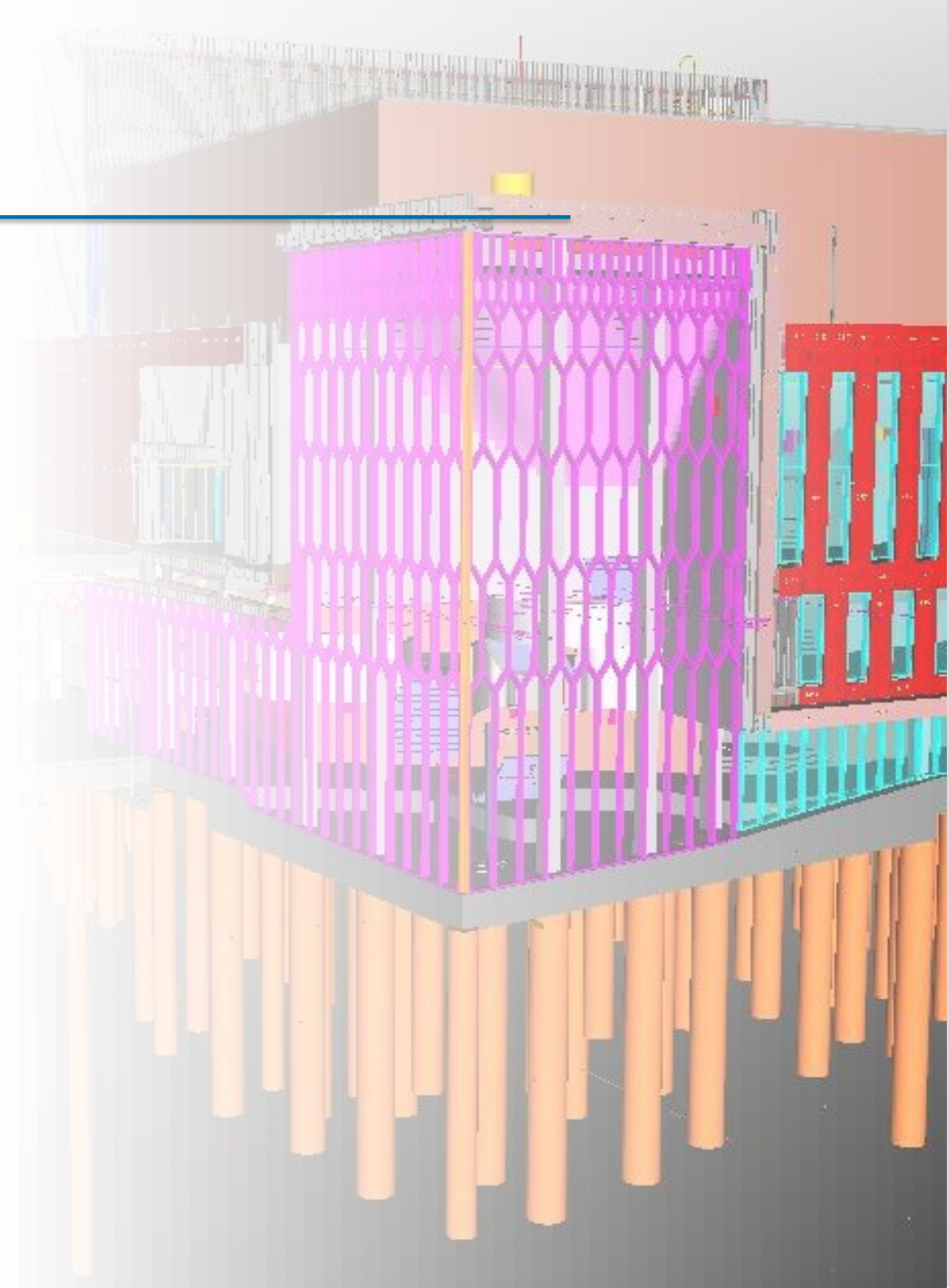
- Commercial
- Industrial
- Residential
- Specialty
- Combination
- Other



Who are you?

What do you do in your organization?

- Company Leadership
- Project Manager
- Field Supervision
- BIM / VDC
- Drafter
- Consultant
- Other



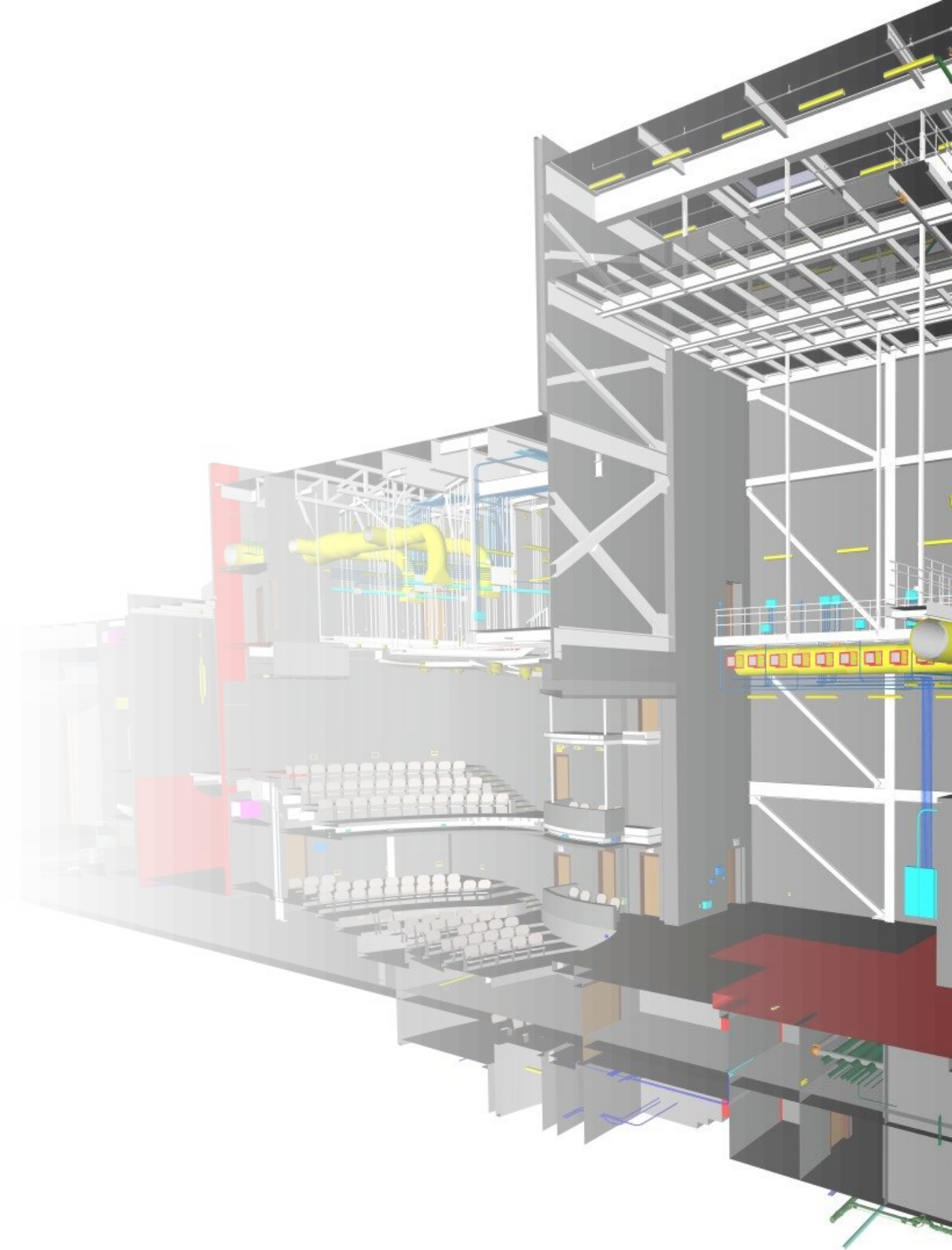
Who are you?



How much experience does your organization have with 3D coordination / clash detection?

- More than 10 years
- 5-10 years
- 2-5 years
- 1-2 years
- None – thinking about getting started
- None – not interested
- None – tried it but it isn't for us
- What's clash detection?

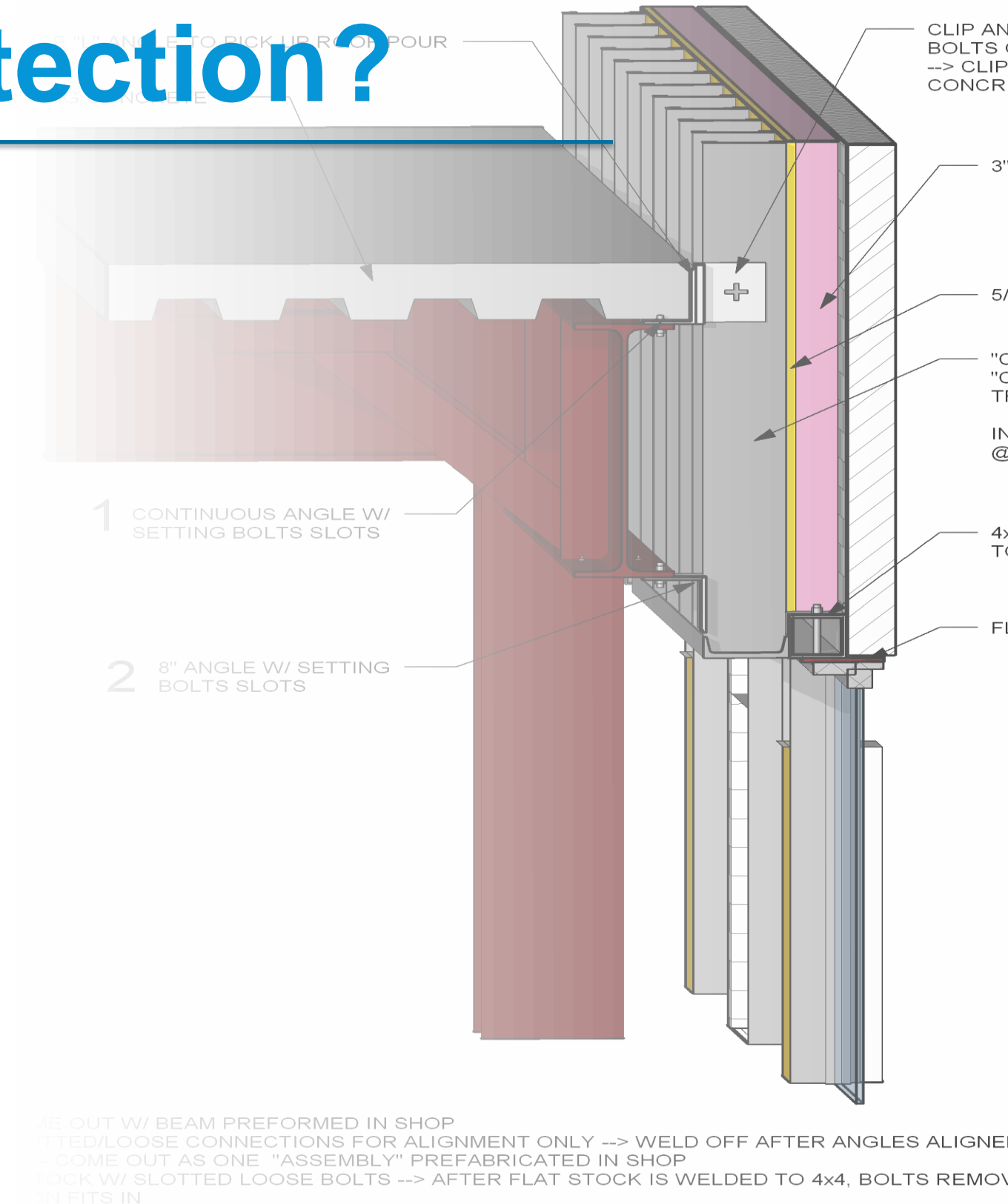
Clash Detection



How have we used clash detection?

Holder

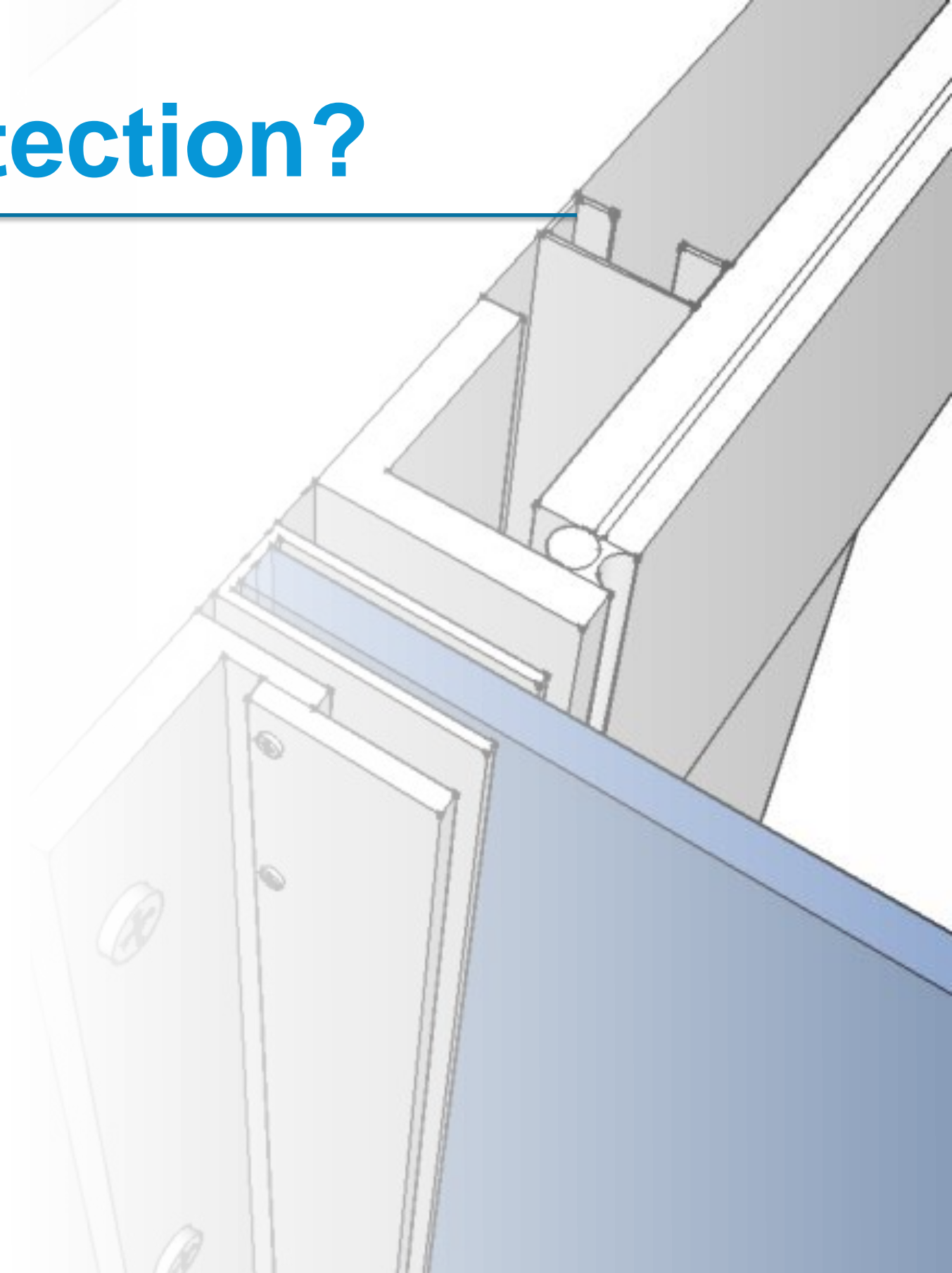
- Clash Detection 1.0
 - Just us
 - Developed all of our own models
 - Challenges translating to the field



How have we used clash detection?

Holder

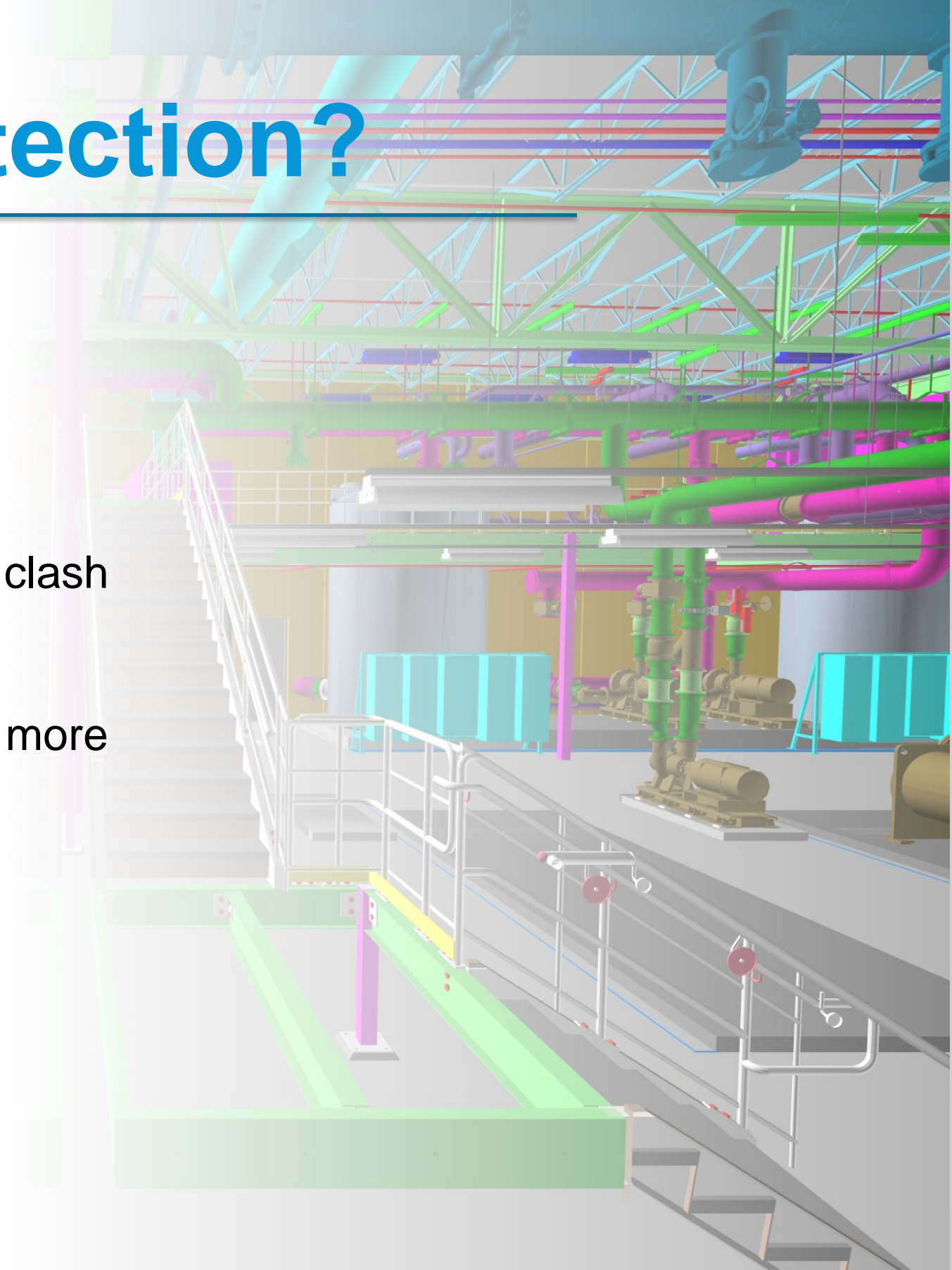
- Clash Detection 2.0
 - We run clashes and lead
 - MEP-FP modeling their systems
 - We model architecture and structure sometimes
 - Streamlined and automated process
 - Challenges
 - Uneven ownership from trades
 - Size of BIM group to support needs



How have we used clash detection?

Holder

- Coordination 3.0
 - Trades lead clash detection
 - Holder focuses on quality and coordination beyond clash detection
 - Generally we only model if we self perform or need more detailed content
 - Challenges
 - Uneven process



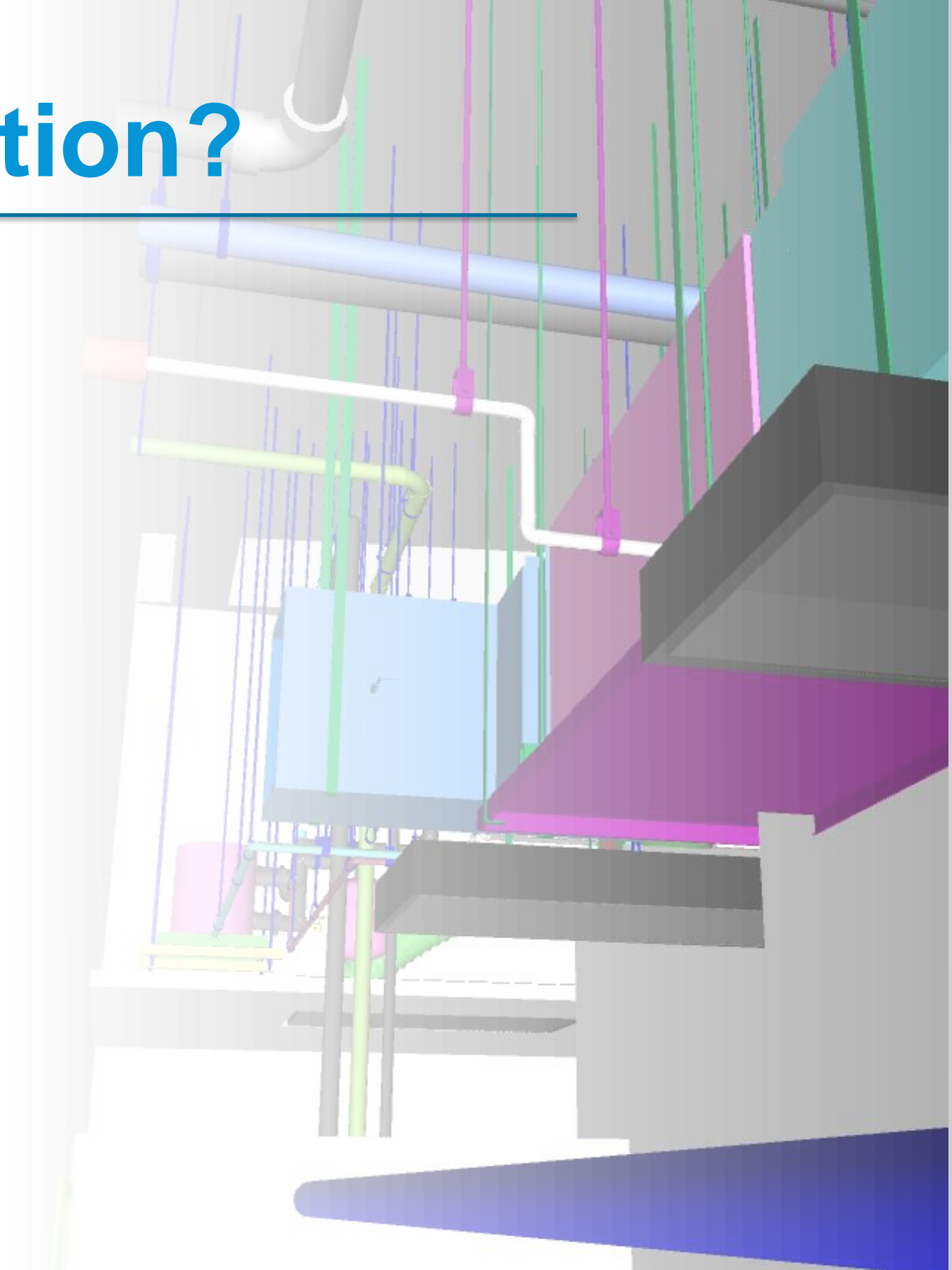
How have we used clash detection?

- McKenney's
 - We take the approach that every job is a BIM job - even if it is not, externally
 - Clash detection is done in-house between McKenney's trades whether McKenney's is the BIM lead or not
 - When selected for the lead on BIM jobs, McKenney's will facilitate the coordination process
- Meeting evolutions
 1. In the office
 2. On site
 3. Online

How do you use clash detection?

Who

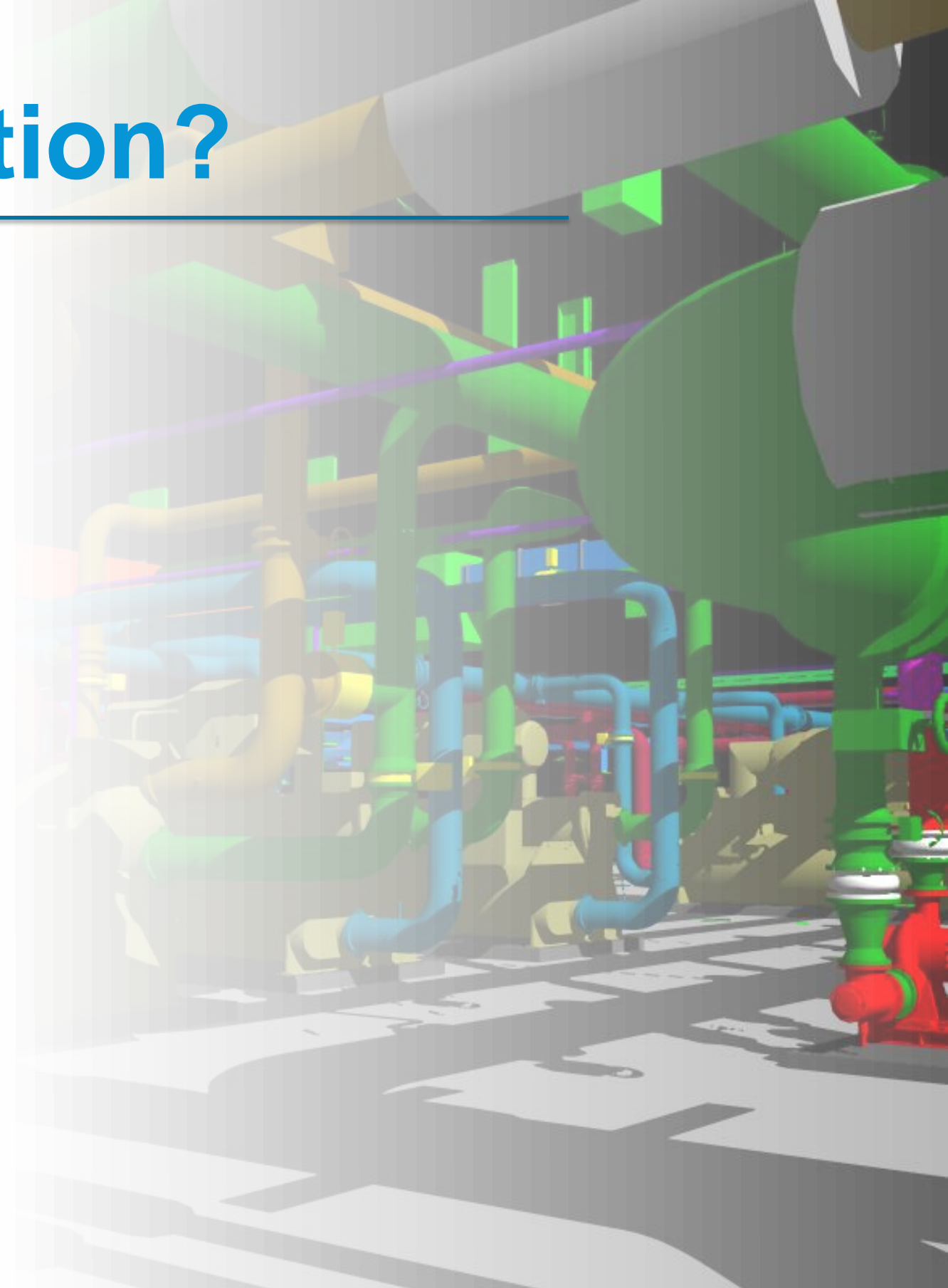
- Who is running clashes?
 - General contractor
 - Trade contractor
 - Consultant
 - Everyone runs their own clashes
 - Nobody



How do you use clash detection?

Who

- Who do you think should run clashes?
 - General contractor
 - Trade contractor
 - Consultant
 - Me, nobody else will do it as well
 - Nobody



How do you use clash detection?

What

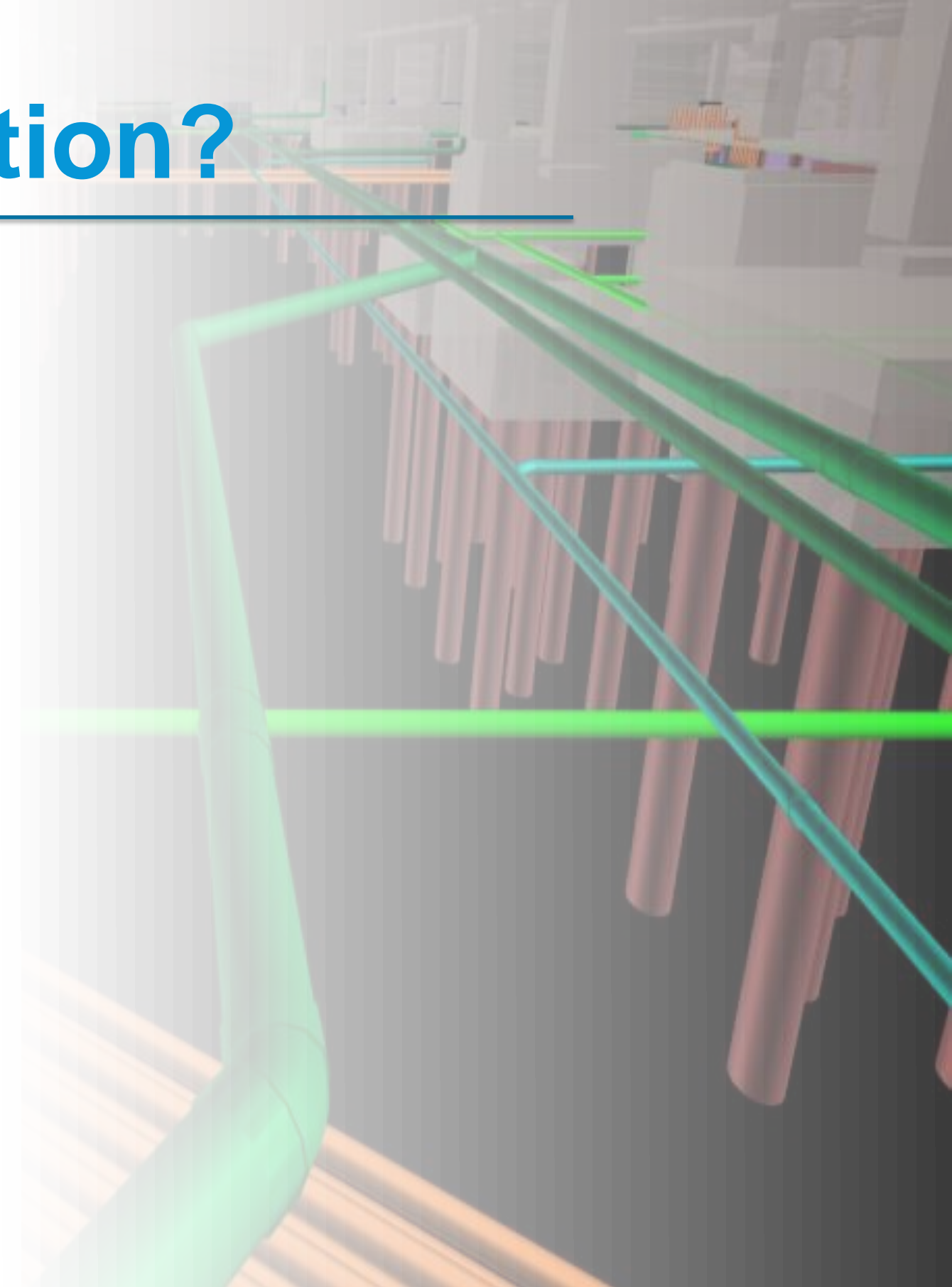
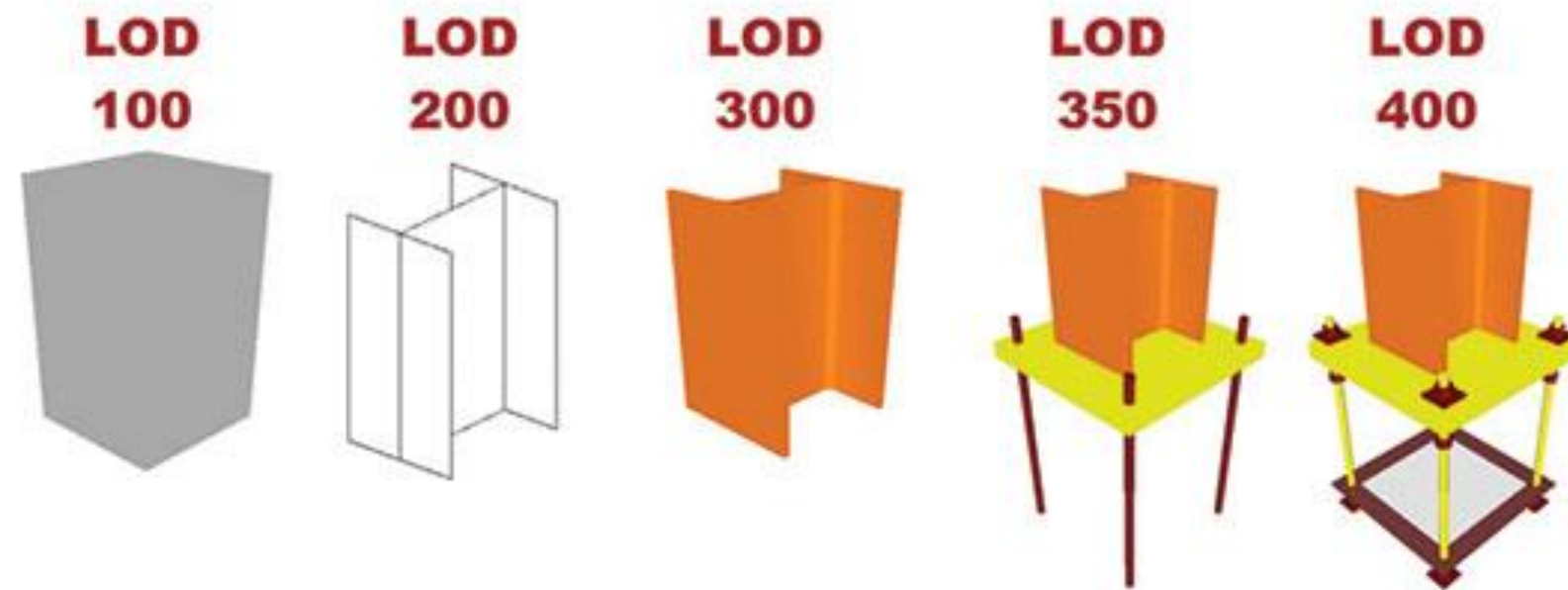
- What are you clashing?
 - Just MEP-FP models
 - Structure
 - Architecture
 - Clearances for code, maintenance, installation, etc



How do you use clash detection?

What

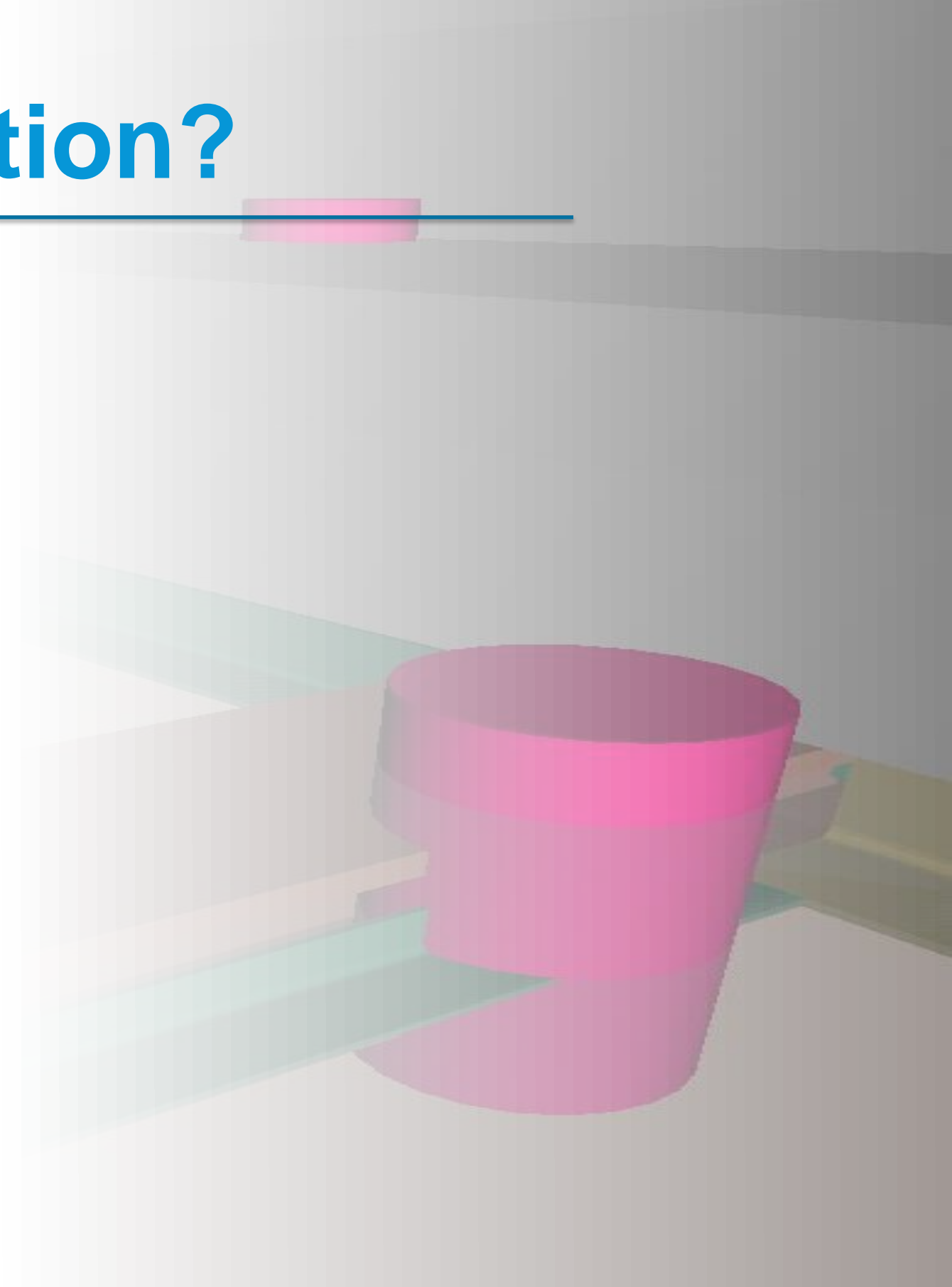
- LOD of models?



How do you use clash detection?

What

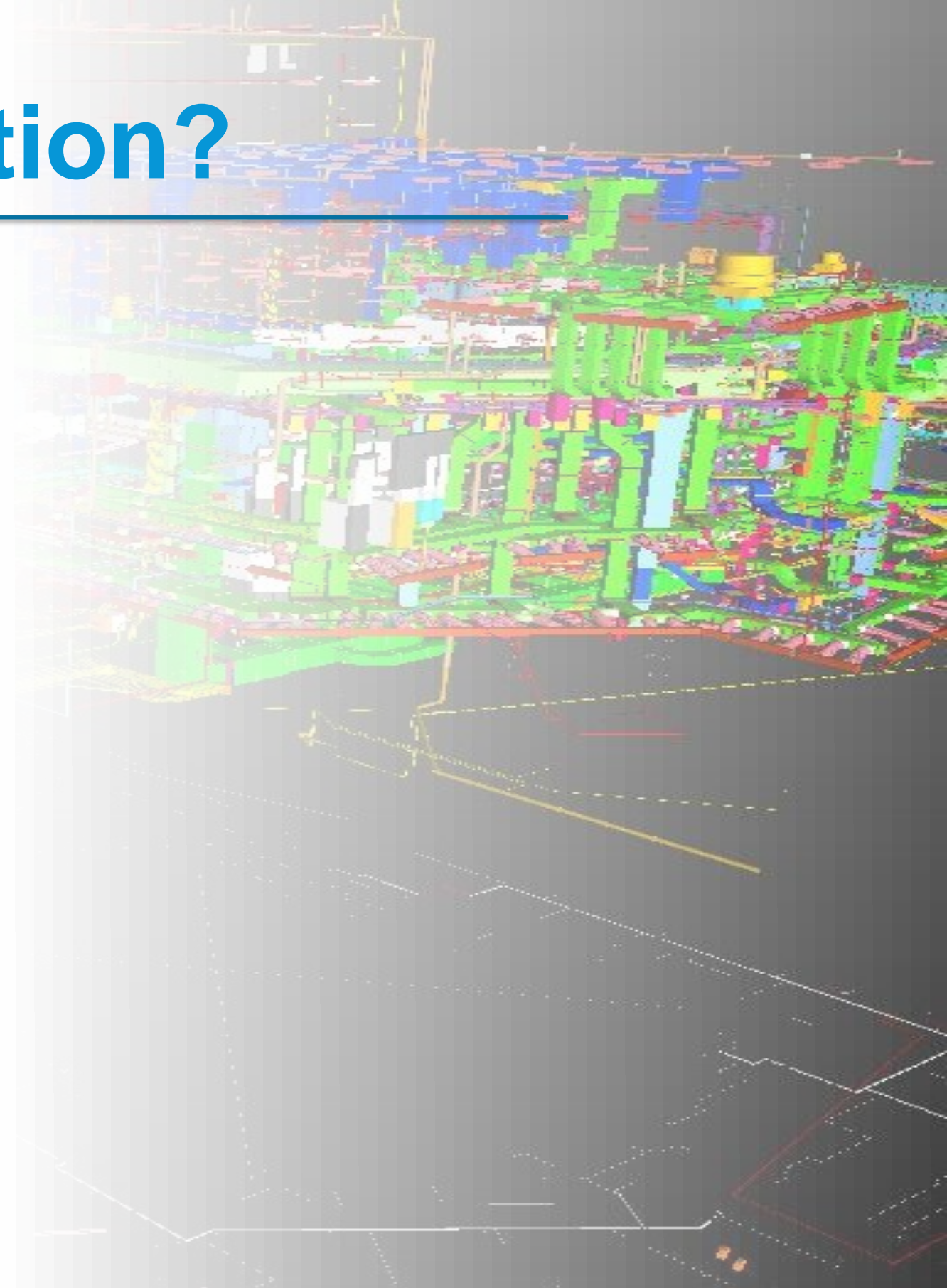
- What aren't you clashing?



How do you use clash detection?

What

- What is driving these decisions?
 - Contractual obligations
 - Installation efficiency
 - Prefabrication
 - Reduce rework
 - Reduce RFIs
 - Improve quality
- Are we actually delivering on these goals?



How do you use clash detection?

When

- Do you have a coordination schedule?
- Who creates or maintains this schedule?
 - General contractor
 - Trade contractors
 - Collaboratively created
- What drives your coordination schedule?
 - Done before install
 - Done just in time for shop drawings
 - Truly a preconstruction activity



How do you use clash detection?

When

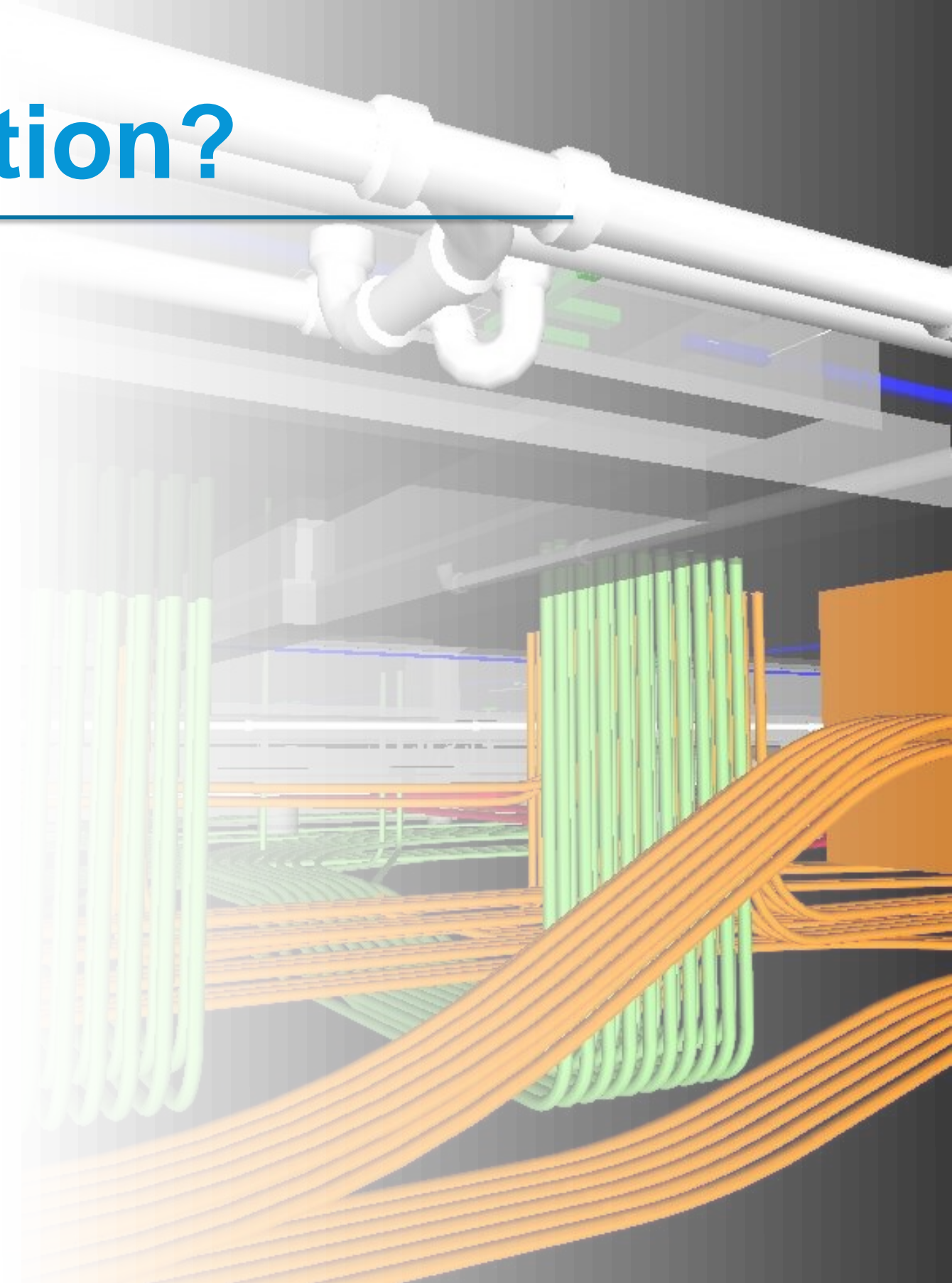
- Does your schedule usually change?
 - Do you see this as a problem?
- How do you normally finish
 - Ahead of time
 - Behind schedule
 - Just in time



How do you use clash detection?

Where

- Modeling and clashing onsite or remotely
 - What do you do?
 - What would you like to do?
 - How do you make this decision?



How do you use clash detection?

Why

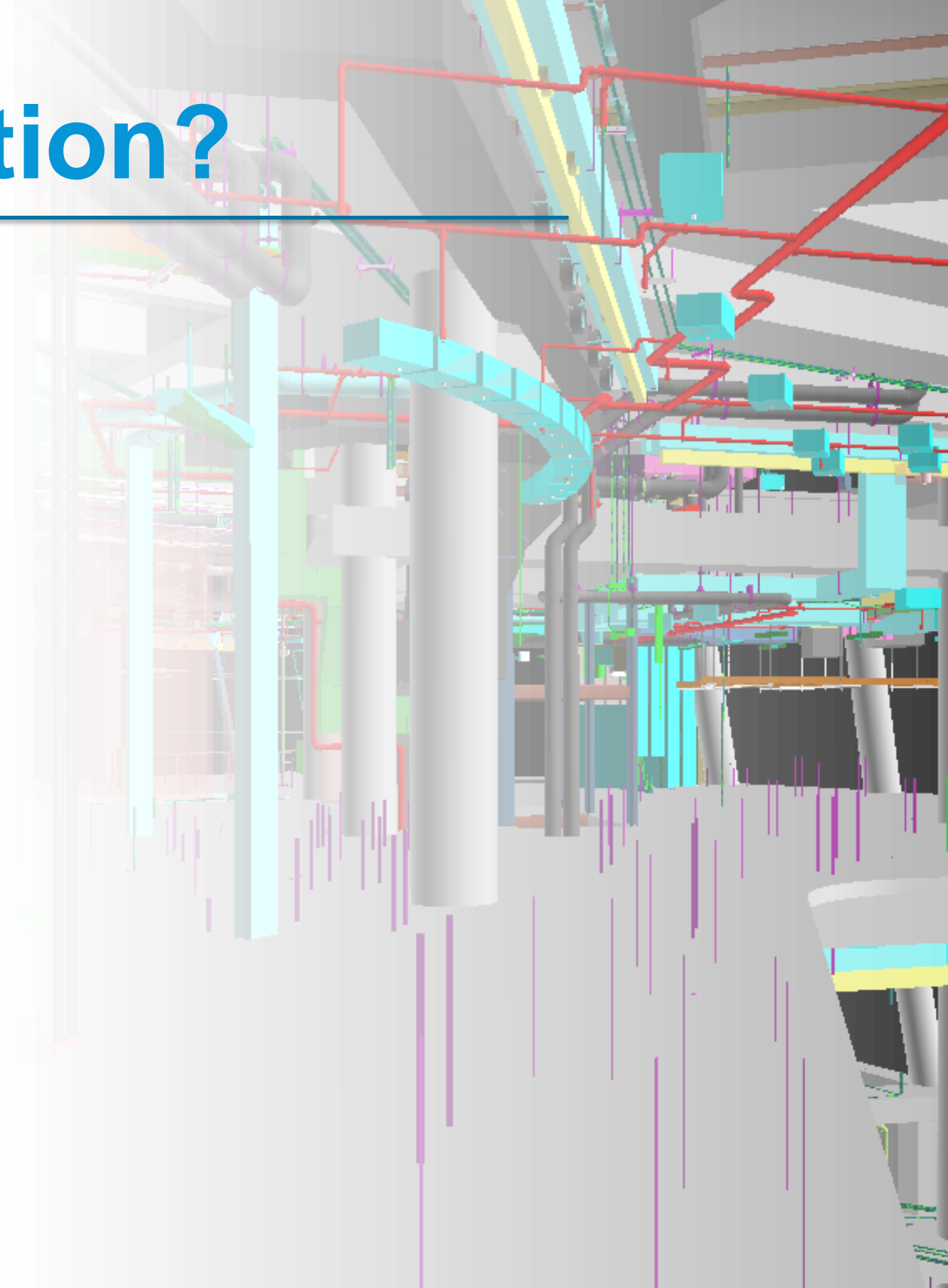
- What influences these decisions?
 - Owner requirements
 - General contractor requirements
 - Part of your process
 - Part of your quality program
 - Other



How do you use clash detection?

How

- What tool do you use for clash detection?
 - Navisworks
 - Glue
 - Tekla
 - Bentley
 - Solibri
 - Synchro
 - Other



How do you use clash detection?

How

- What tool do you use for model exchange?
 - Box/Dropbox/Similar
 - ftp
 - Glue
 - Projectwise
 - Buzzsaw
 - A360
 - Other



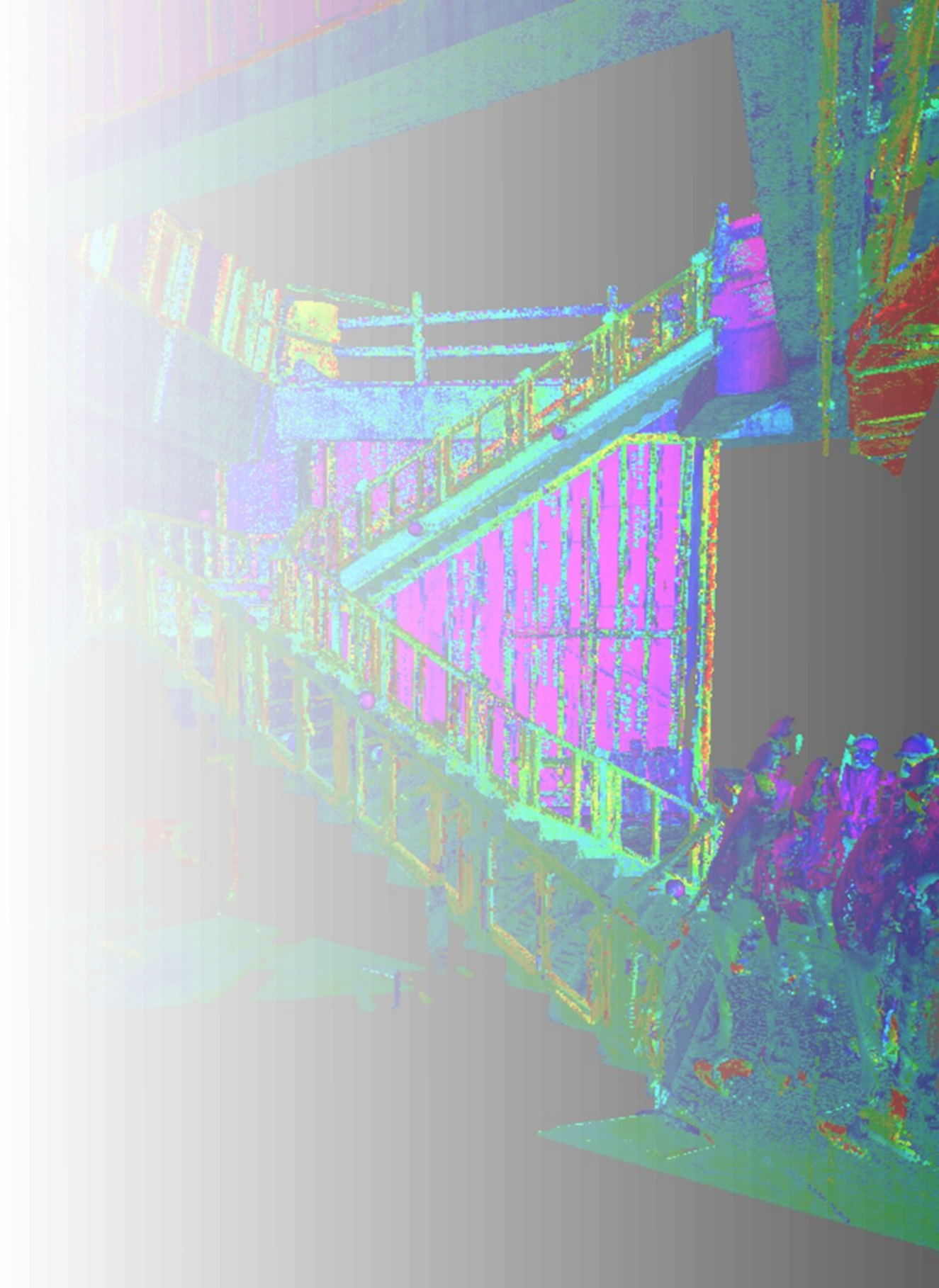
How do you use clash detection?

How

- Why are you using these tool?
- Who determines what tools are used?
- Are your tools good enough?
 - Why not?

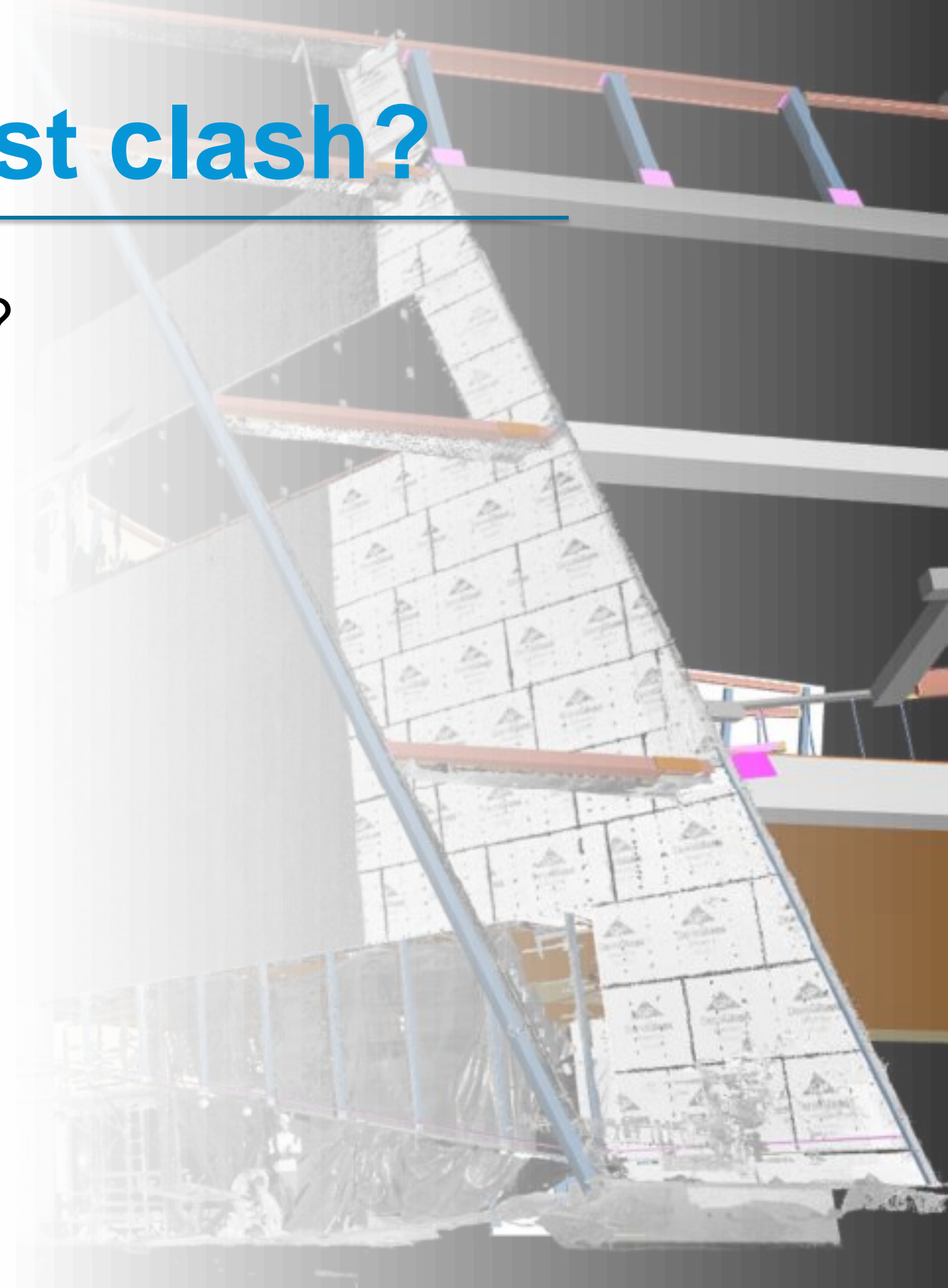
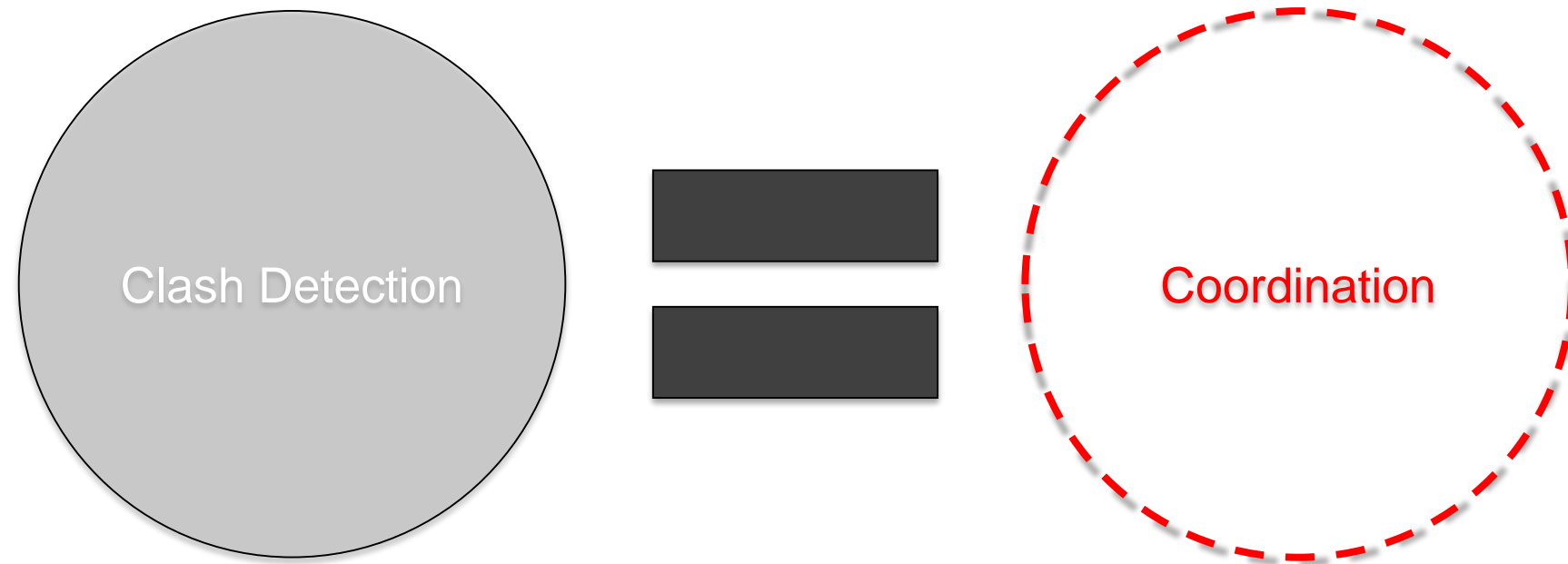


More than Clash Detection



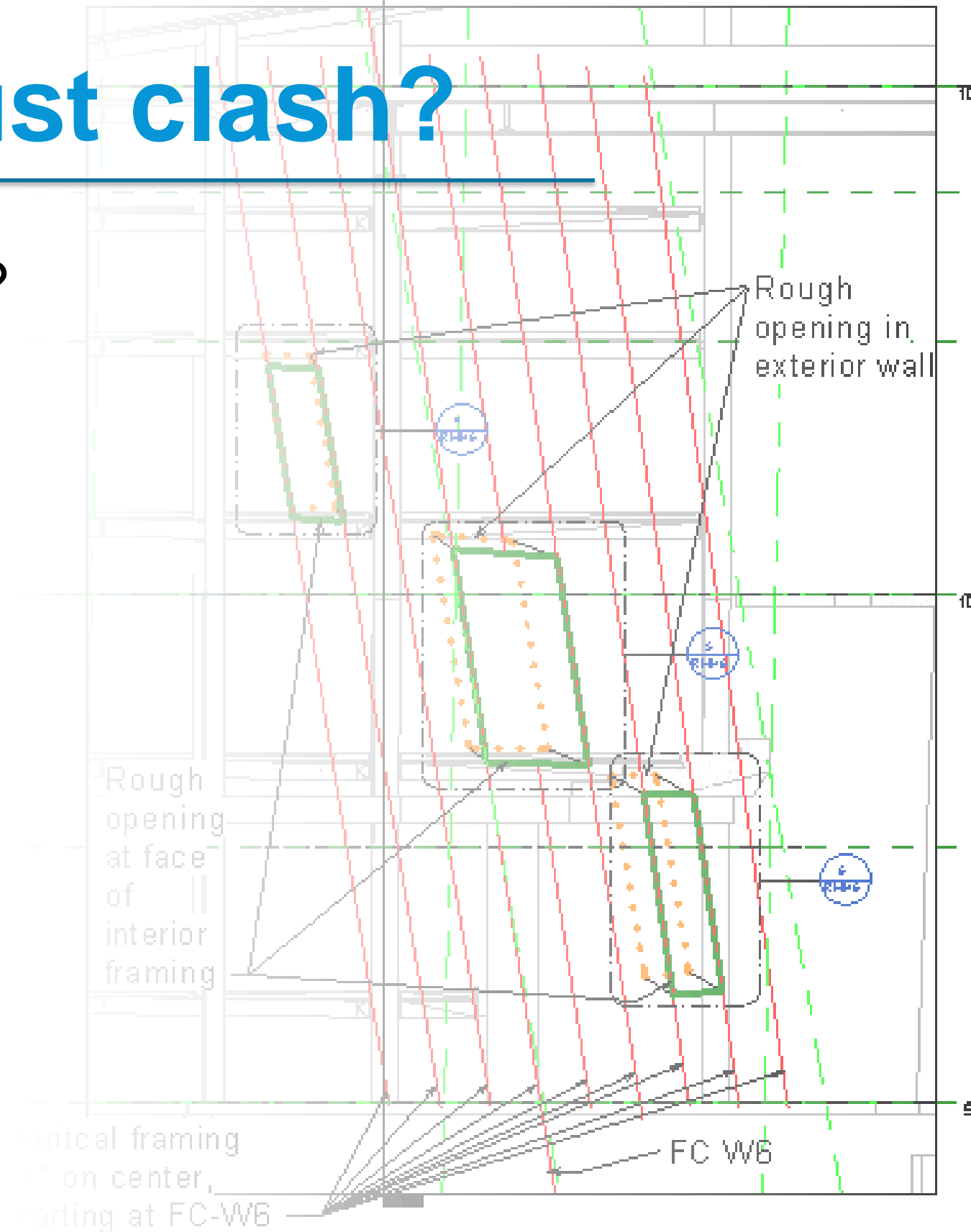
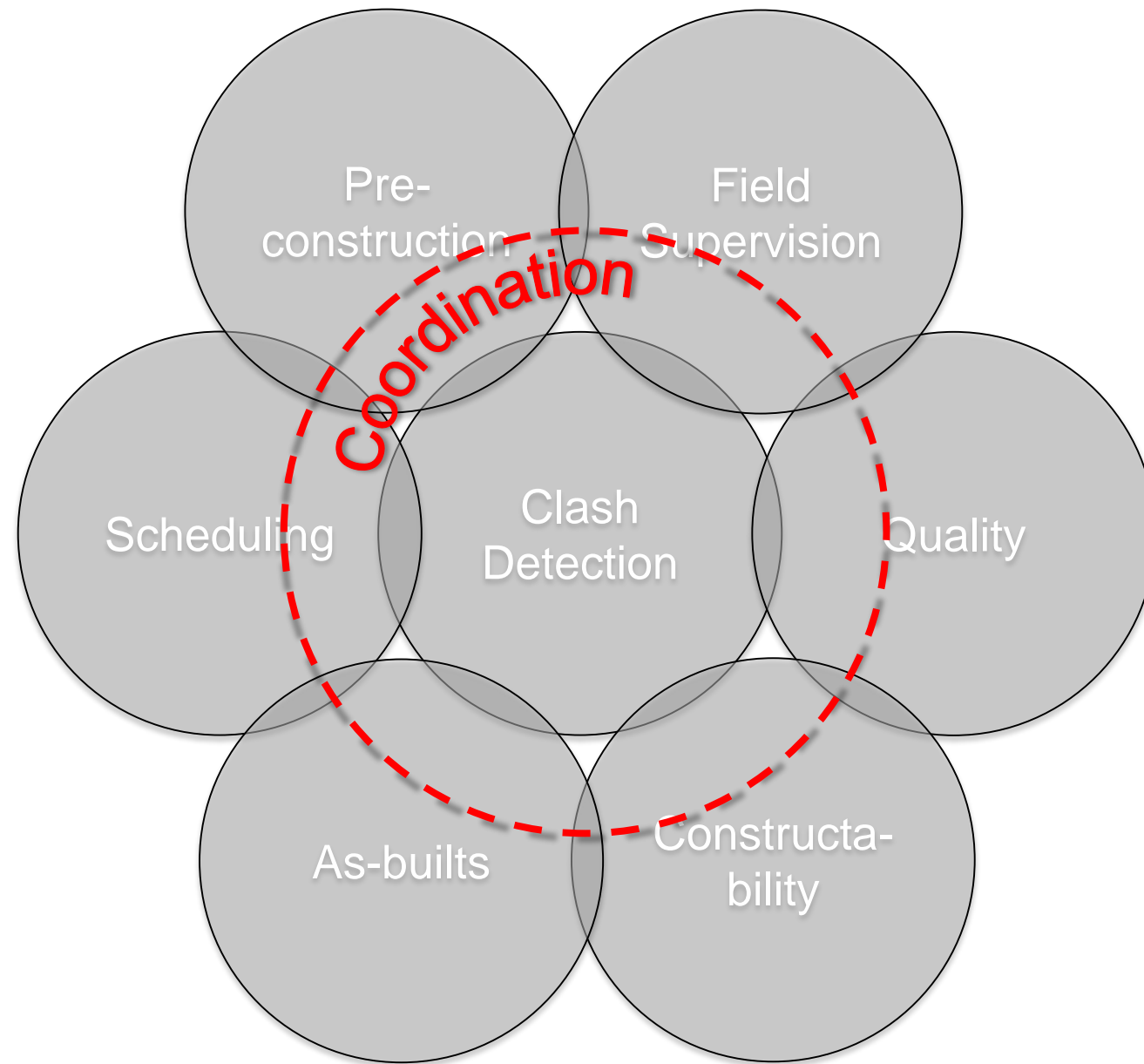
Is coordination more than just clash?

- Are clash detection and coordination synonyms?



Is coordination more than just clash?

- Is coordination bigger than just clash detection?



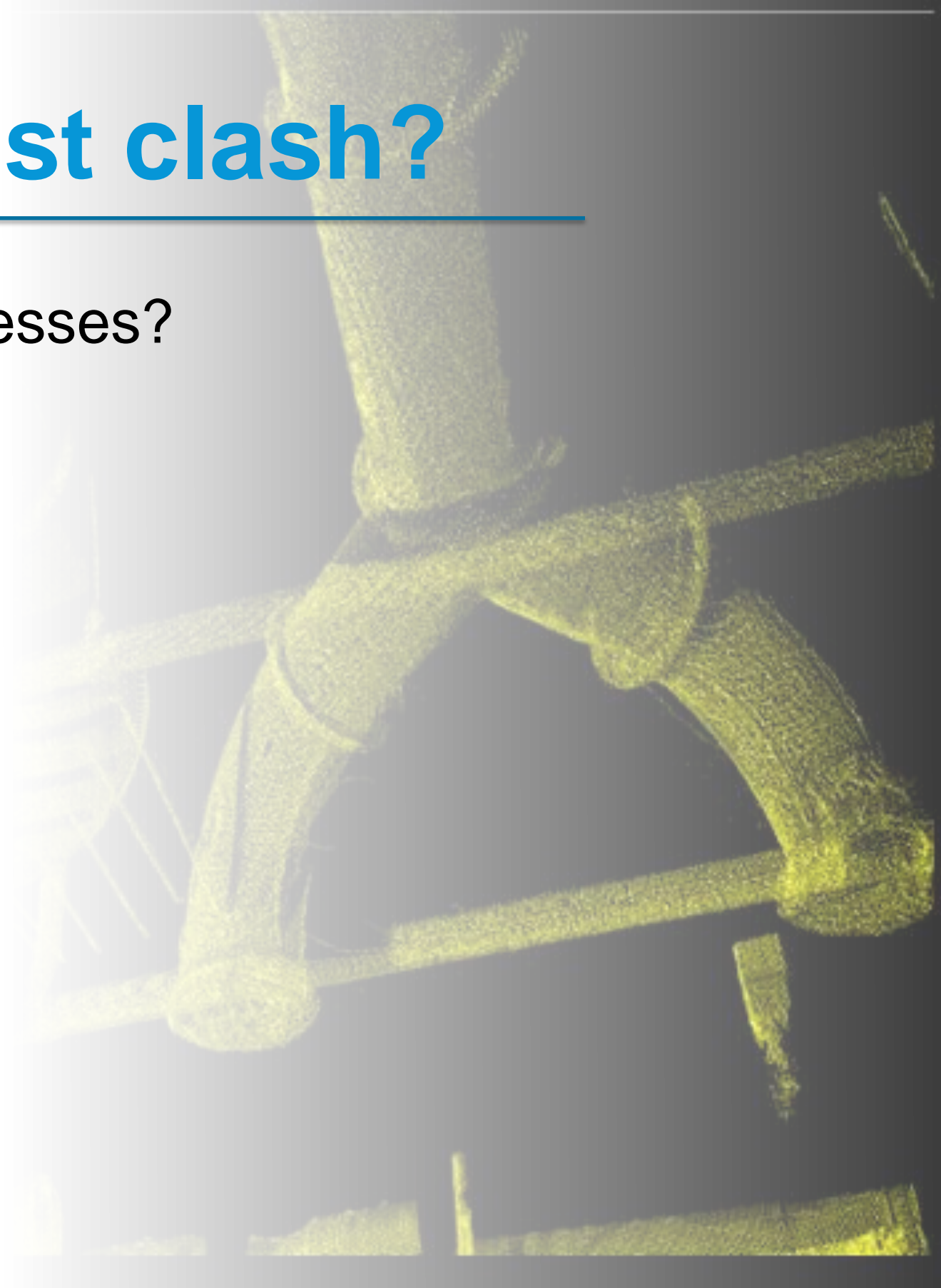
Is coordination more than just clash?

- If it's bigger what do you do to go beyond clash detection?
 - Laser scanning
 - As-built verification
 - Prefabrication
 - Model based layout
 - Part of a quality program
 - A tool for the client?



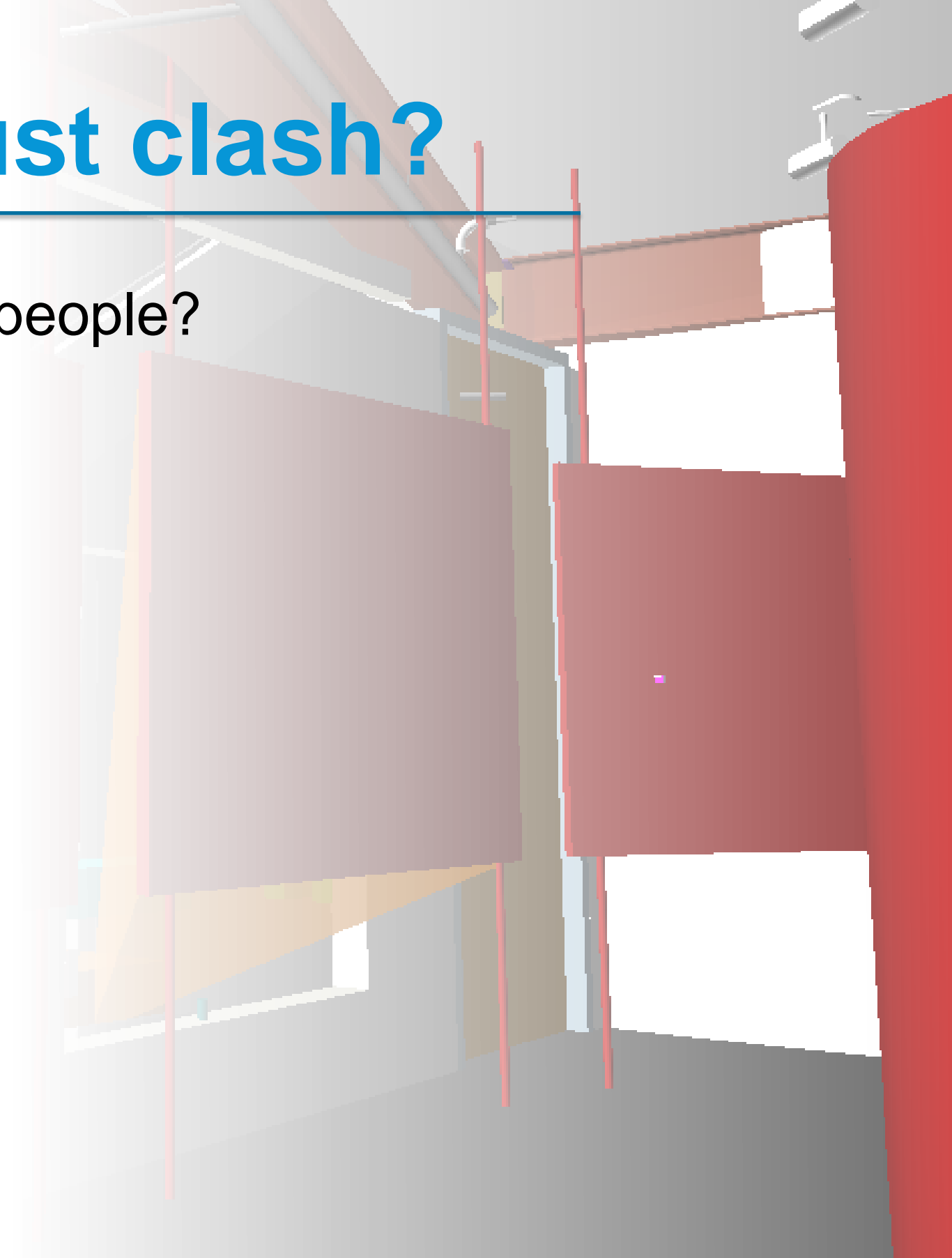
Is coordination more than just clash?

- How are new technologies impacting your processes?
 - Laser scanning
 - Model based layout
 - Drones
 - 3D printing

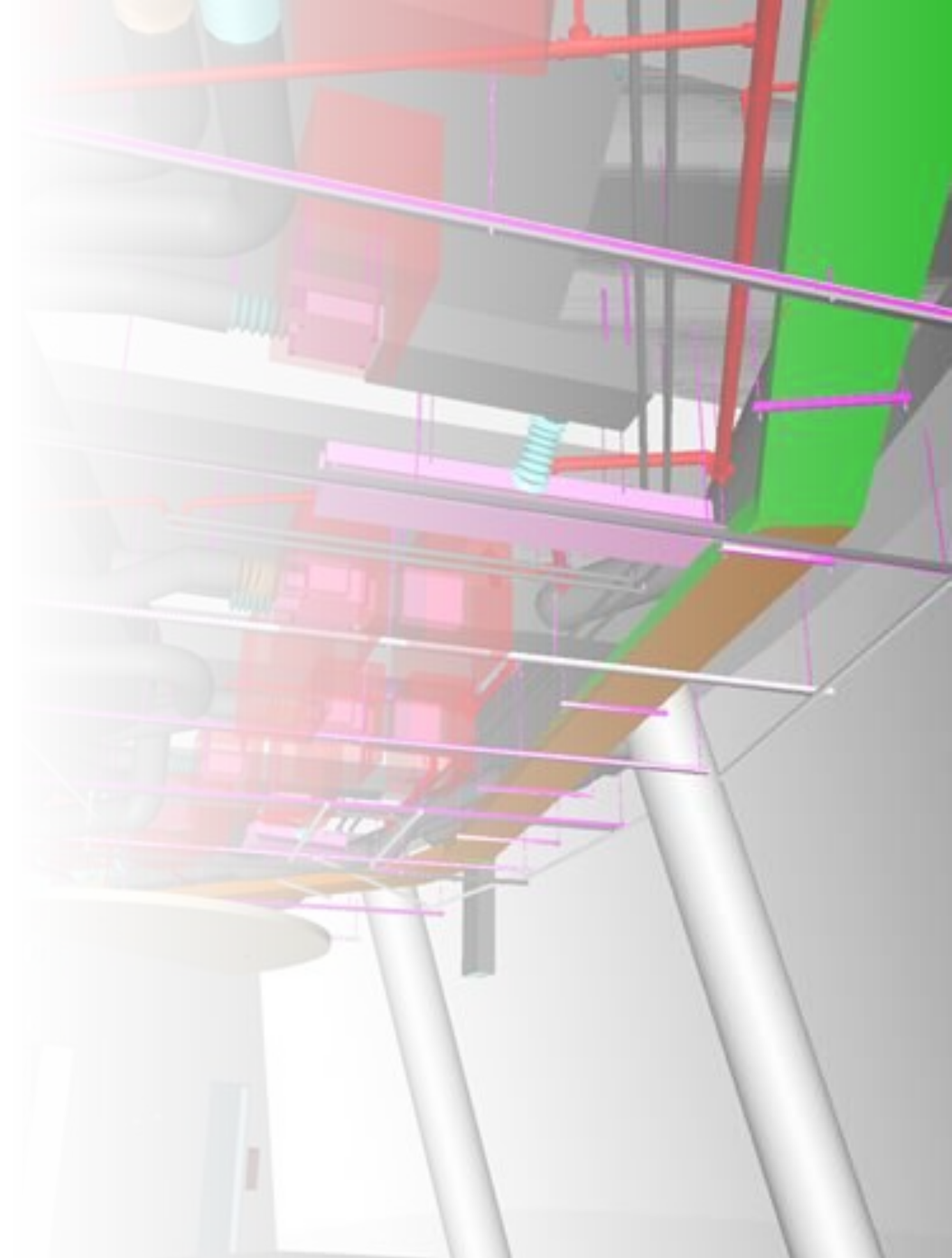


Is coordination more than just clash?

- Does your software do these things or do your people?

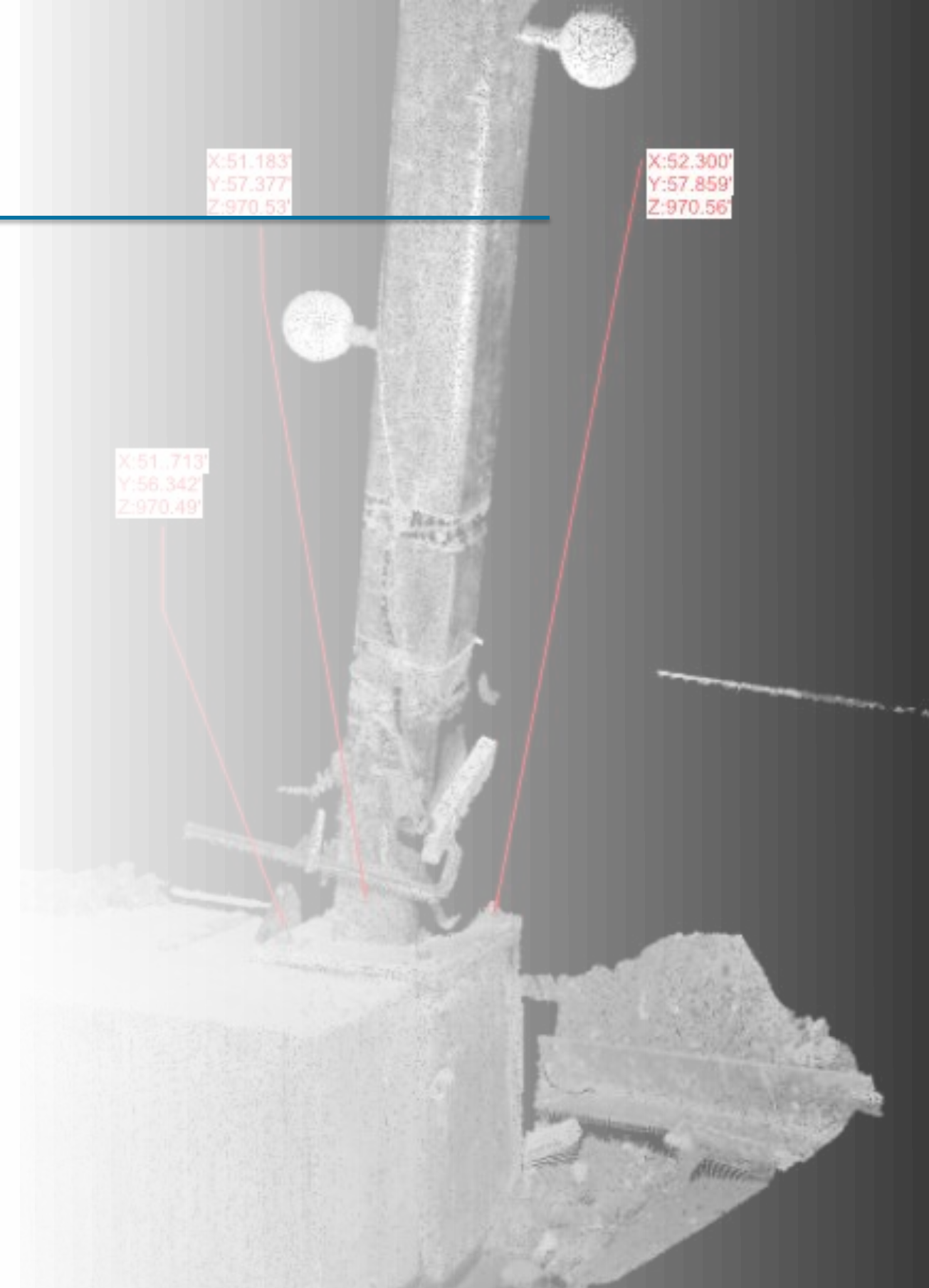


Motivations

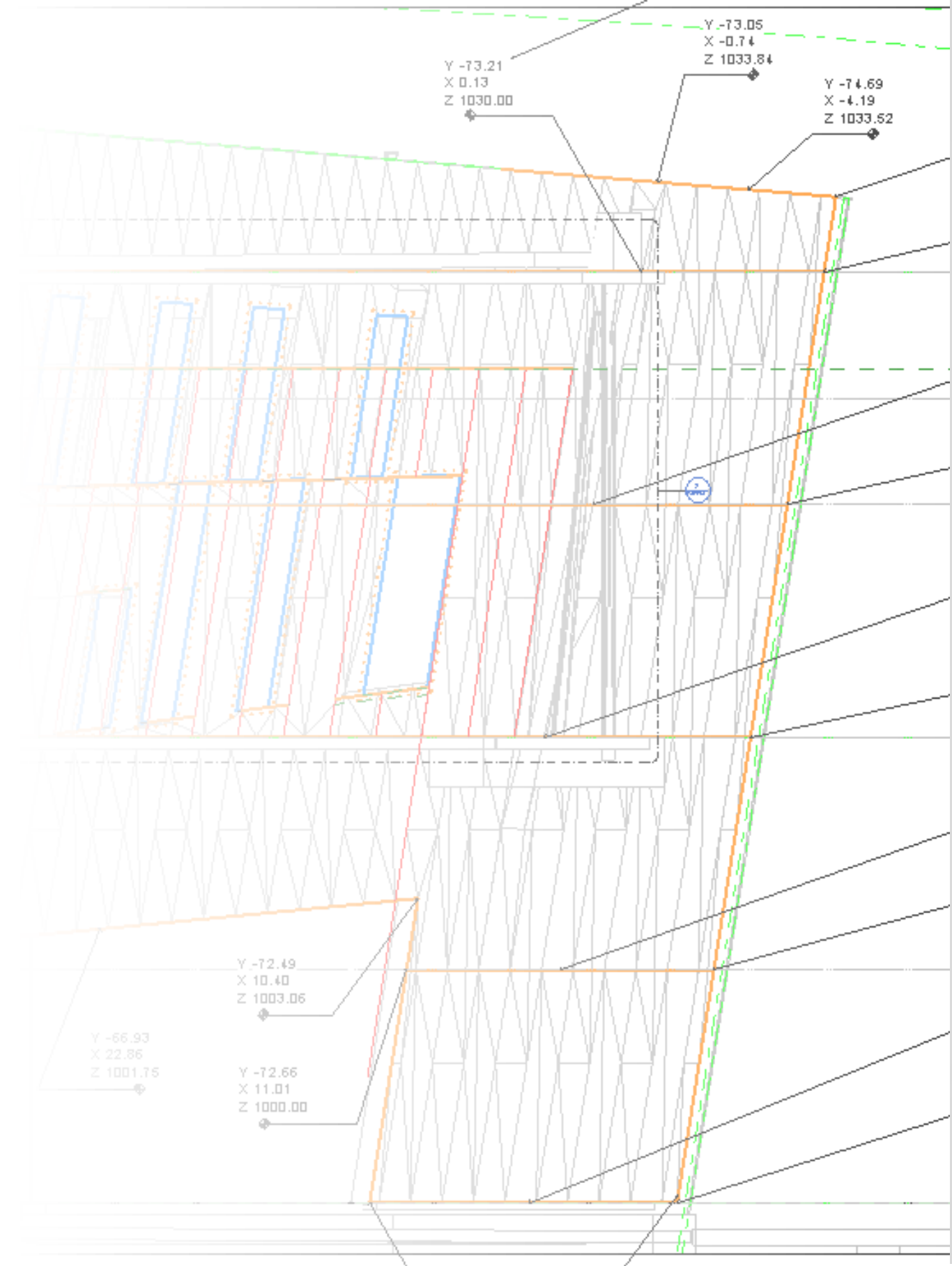


Motivations

- Why?
- Why do more?
- Why be better?
- Who should drive these expectations?



Conclusion



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