



AUTODESK UNIVERSITY

Melinda S. Hoffman

Virtual Construction Manager, LP Ciminelli

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BIM and VDC Present and Future





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About Me

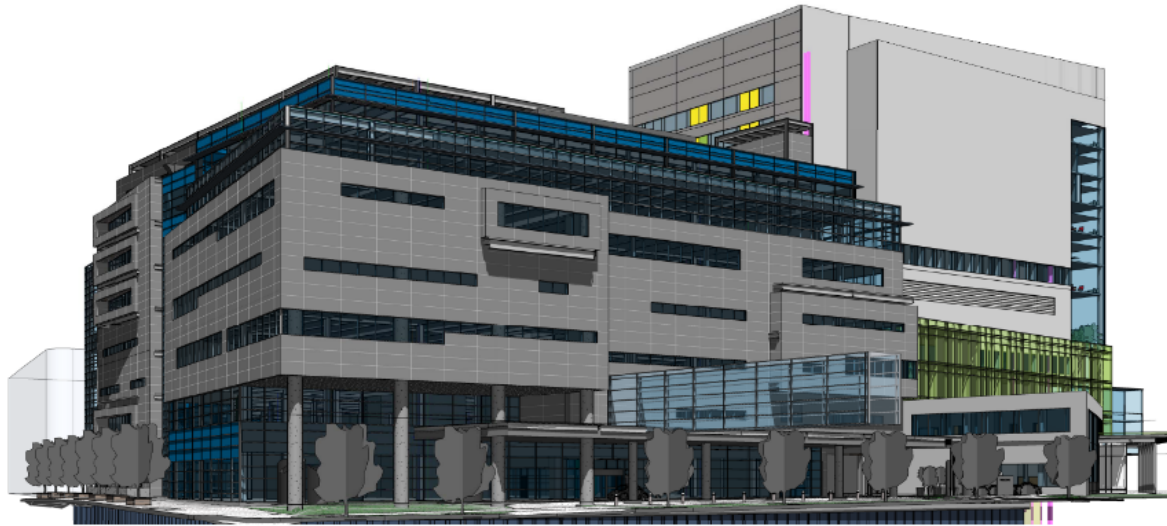


Melinda Hoffman
Virtual Construction Manager
mhoffman@lpciminelli.com

- In the AEC industry for 10+ years
- 2 years as an Intern Architect for SSOE Group
- 6 years as a Revit Technical Specialist for SSOE Group
- 2.5 years as a Virtual Construction Manager for LPCiminelli
- Focus is on the practice of Building Information Modeling and AEC Design Technology and Construction integration
- Specializes in Autodesk Revit and Navisworks, Laser Scanning, presentation materials, and mobile technology
- Provides training, project work coordination, virtual proposals & logistics, 4D Scheduling, Newforma support & integration
- Certified professional in Autodesk Revit
- Founder of the Buffalo BIM User Group
- Has been a member of NCS and NBIMS task teams
- Autodesk University Speaker

BIM

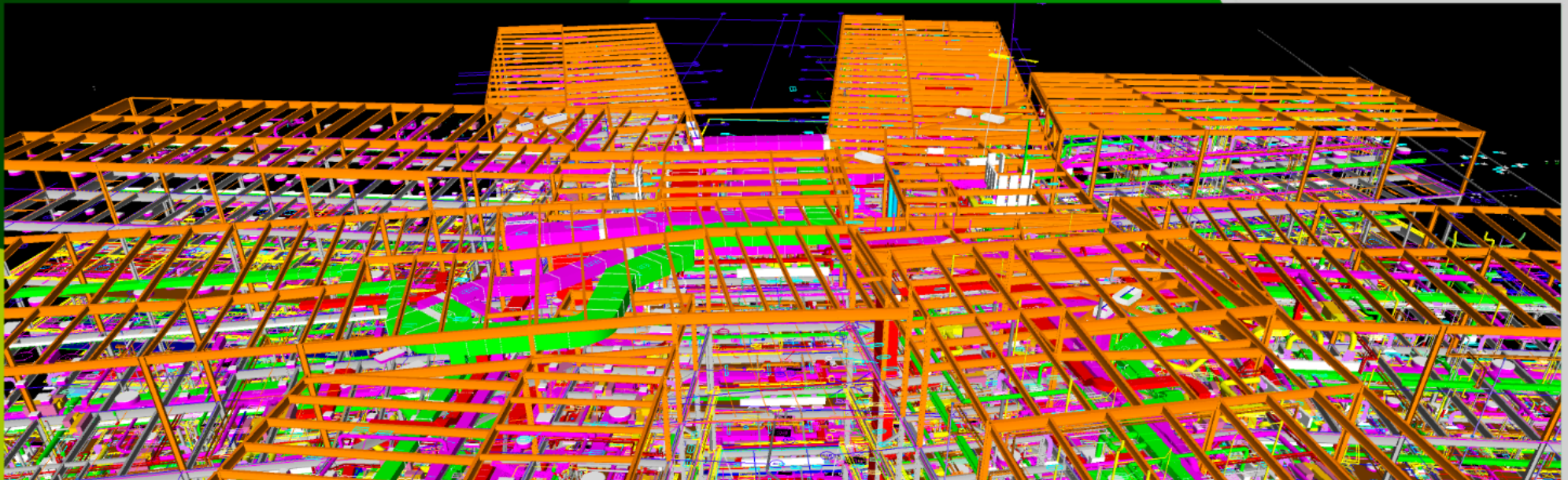
Building Information Modeling



- a digital representation of physical and functional characteristics of a facility. A BIM is a shared knowledge resource for information about a facility forming a reliable basis for decisions during its life-cycle; defined as existing from earliest conception to demolition.

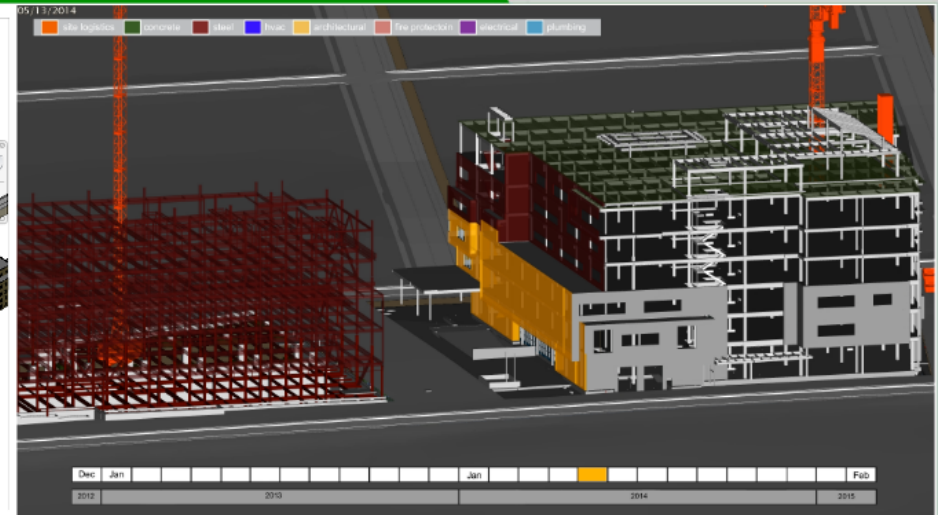
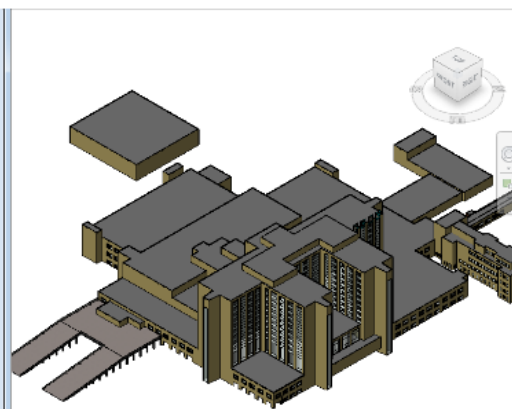
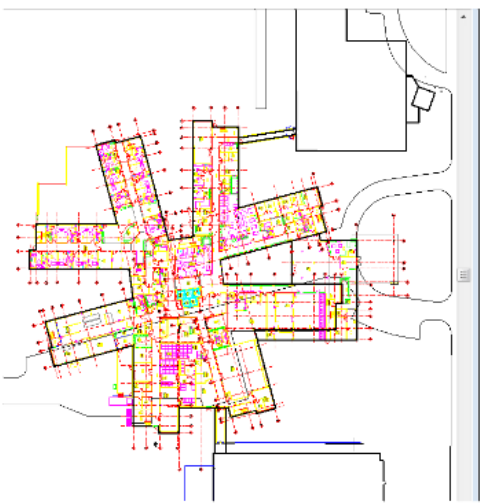
VDC

Virtual Design and Construction



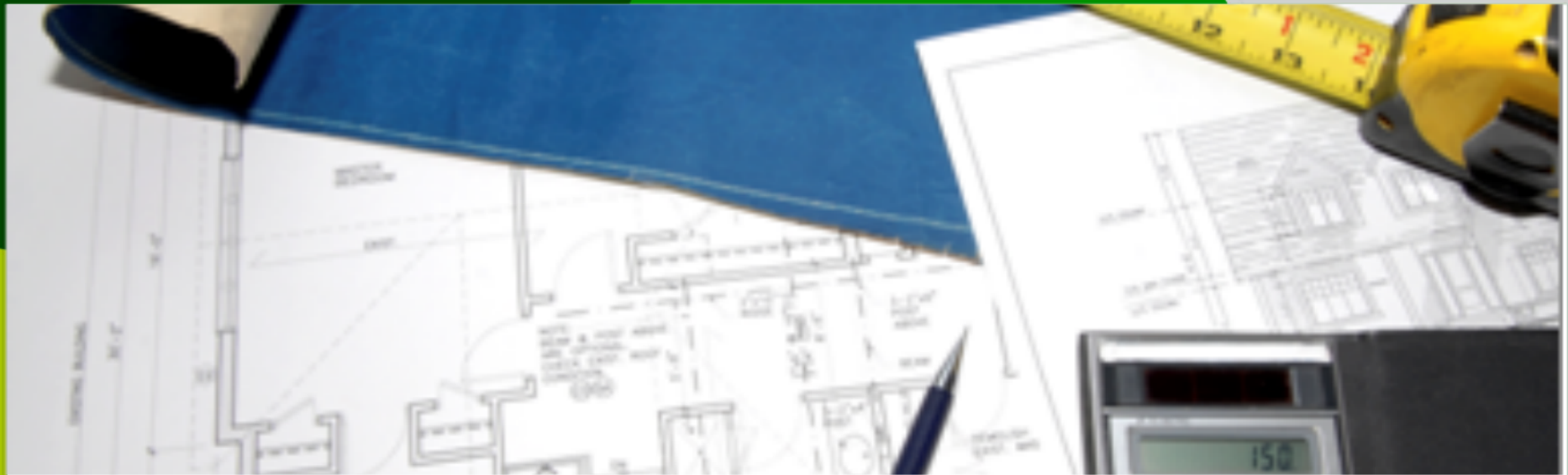
- the management of integrated multi-disciplinary performance models of design-construction projects, including the product (i.e., facilities), work processes and organization of the design - construction - operation team in order to support explicit and public business objectives.

The D's



- 2D CAD involves a design based upon the data that was program
- 3D CAD involves data intelligence and linking of a database to generate a BIM
- 4D CAD involves the scheduling and sequencing of construction process
- 5D CAD involves the cost and resources to complete the project.

Integration of BIM and Estimating



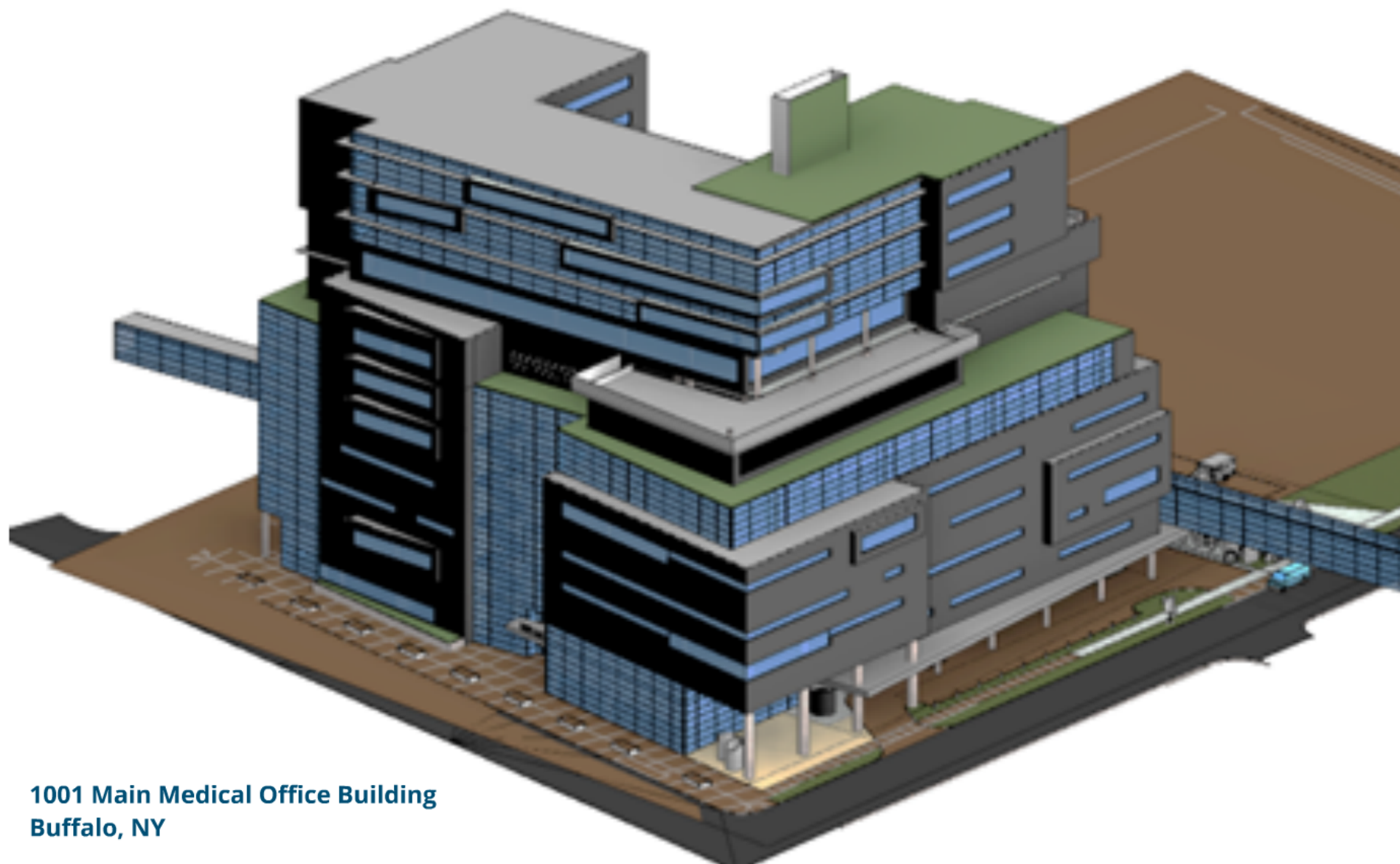
- Visualize areas for better understanding
- Extraction of quantities (based on model accuracy)
- Create in-house models for generic spaces, value-engineering and quantities
- Estimating cut & fill quantities for excavation



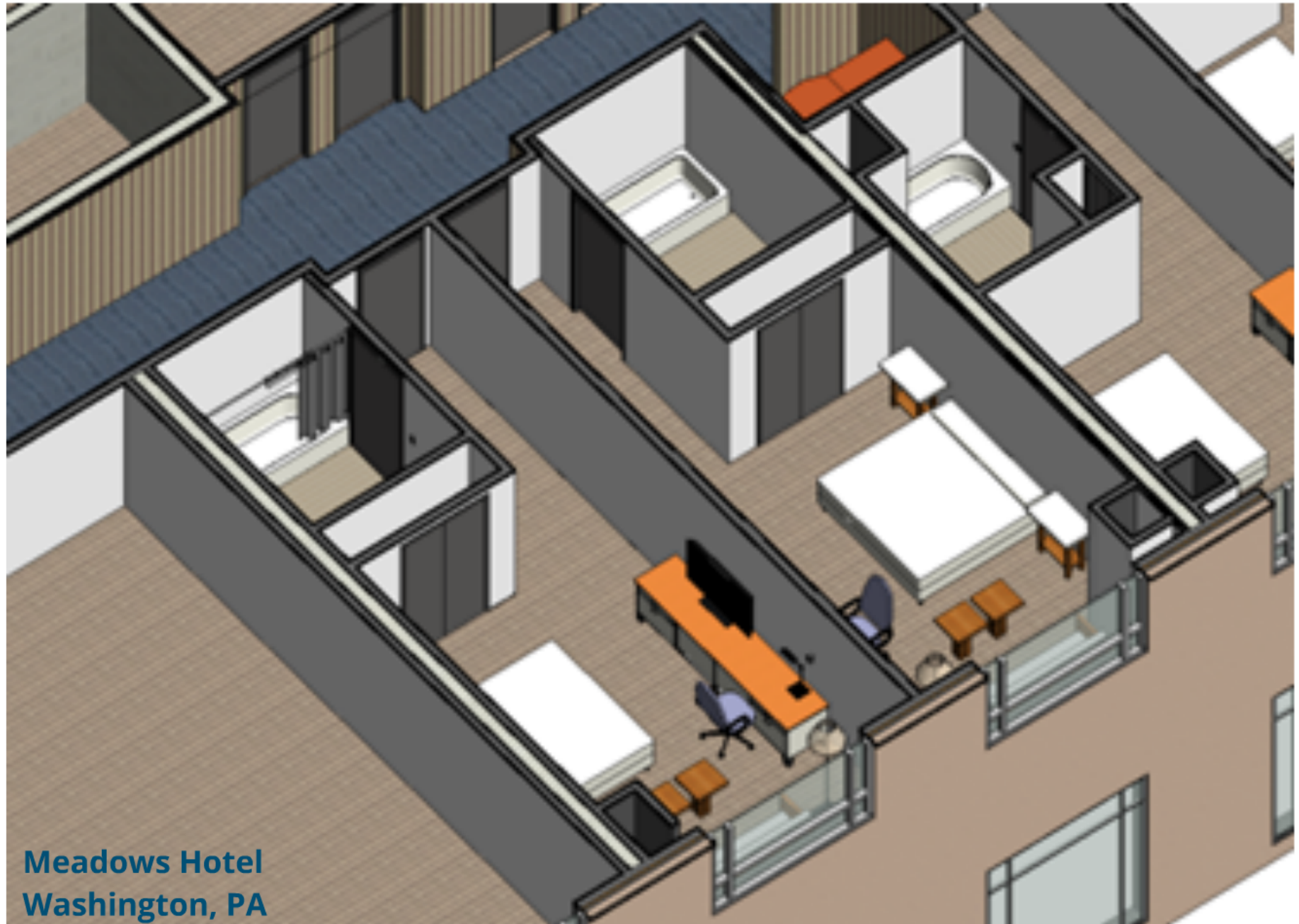
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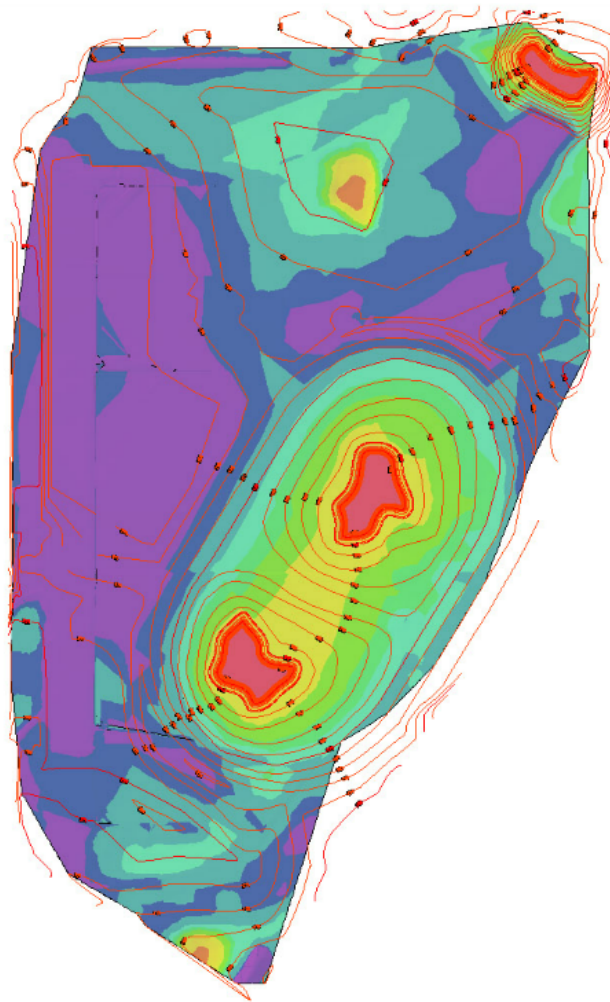
Stamford State Street Parking Garage
Stamford, Connecticut



1001 Main Medical Office Building
Buffalo, NY

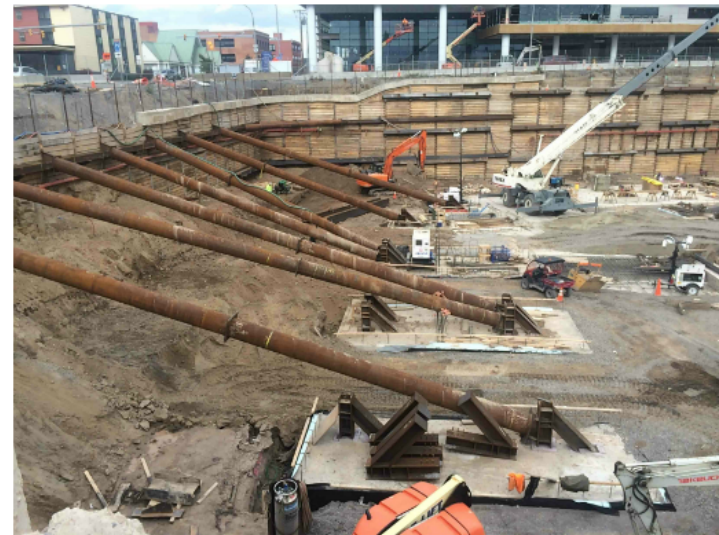
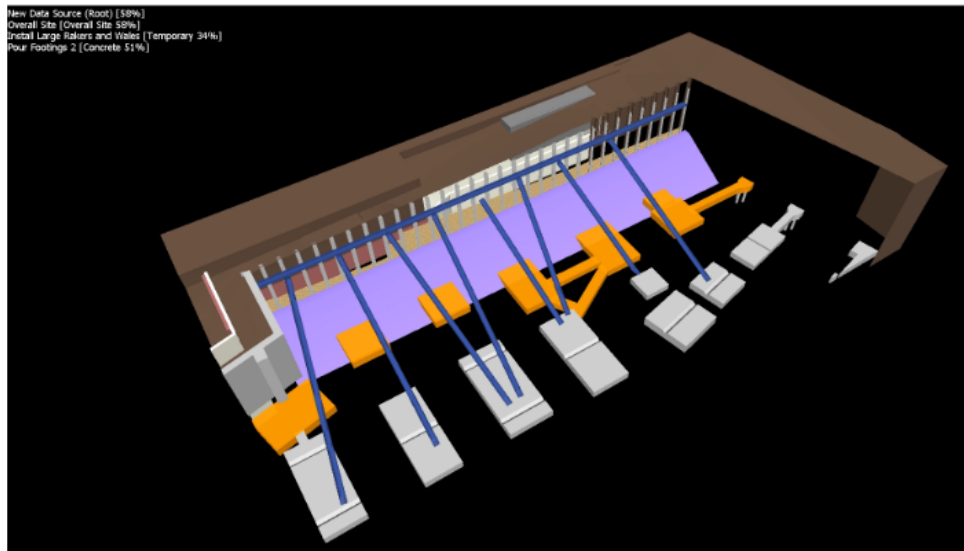


Meadows Hotel
Washington, PA

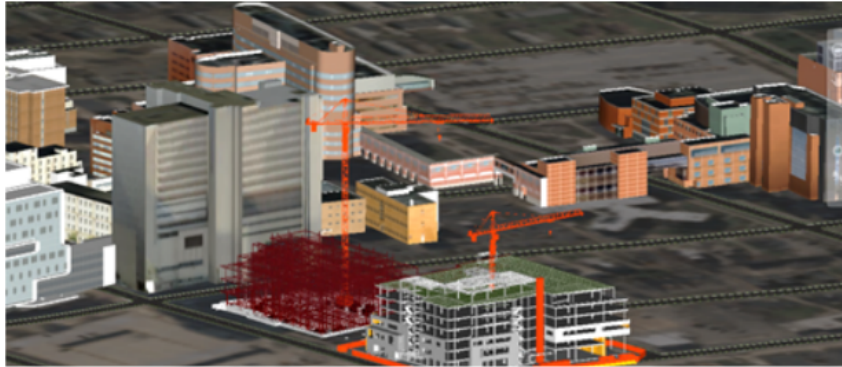


Elevations Table			
Number	Minimum Elevation	Maximum Elevation	Color
1	-15.000	-11.679	Red
2	-11.678	-8.181	Orange
3	-8.181	-6.136	Yellow
4	-6.136	-4.768	Light Green
5	-4.768	-3.129	Green
6	-3.123	-2.037	Light Blue
7	-2.037	-0.917	Blue
8	-0.917	0.626	Dark Blue
9	0.626	2.120	Very Dark Blue
10	2.120	13.336	Purple

4D Sequencing



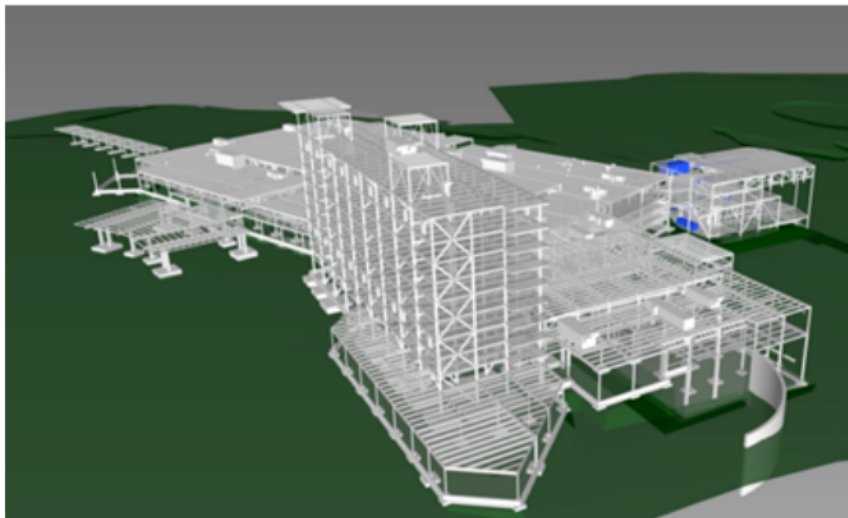
- Construction delivery schedules
- Coordination with other buildings or trades
- Understanding logistics & phasing



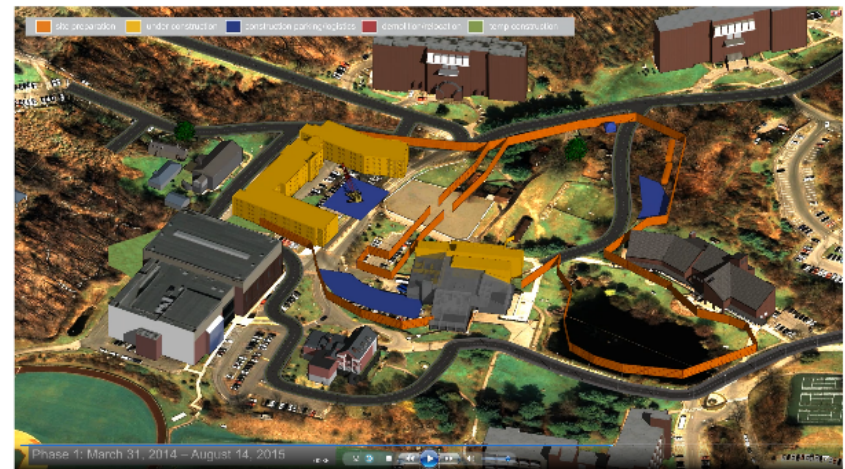
Conventus Medical Office Building



Meadowlands Grandstand



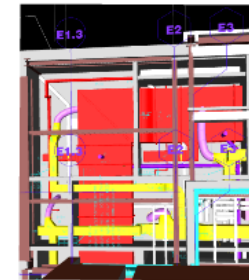
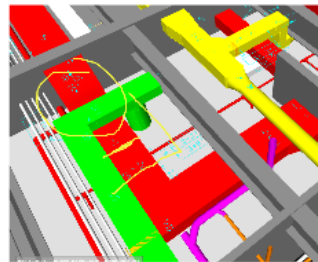
Empire Resorts Casino & Hotel



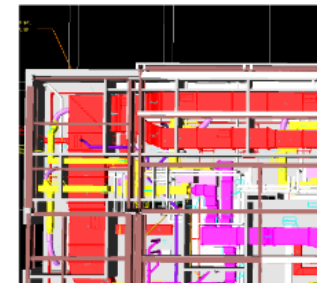
University Dormitories

Benefits of coordination process

Name	Status	Clashes	New	Active	Reviewed	Approved	Resolved
SM vs GP	Done	67	0	4	0	0	63
SM vs Lighting	Done	624	0	119	0	0	505
SM vs MP	Done	1007	0	451	0	0	546
SM vs PL	Done	166	0	0	0	0	166
GP vs Ceiling	Done	110	0	108	0	0	2
Cable tray vs duct	Done	222	15	145	0	0	62
GP vs Steel	Done	87	0	45	0	0	42
SM vs Steel	Done	23	0	0	0	0	23
Access vs Everything	Done	285	26	42	0	0	217
GP vs MP	Done	163	0	47	0	0	116
GP vs PL	Done	250	0	18	0	0	232
Sprinklers vs Everything	Done	675	15	200	0	0	460
PL vs MP	Done	38	0	0	0	0	38
Spray foam vs everything	Done	58	0	56	0	0	2



Design Intent



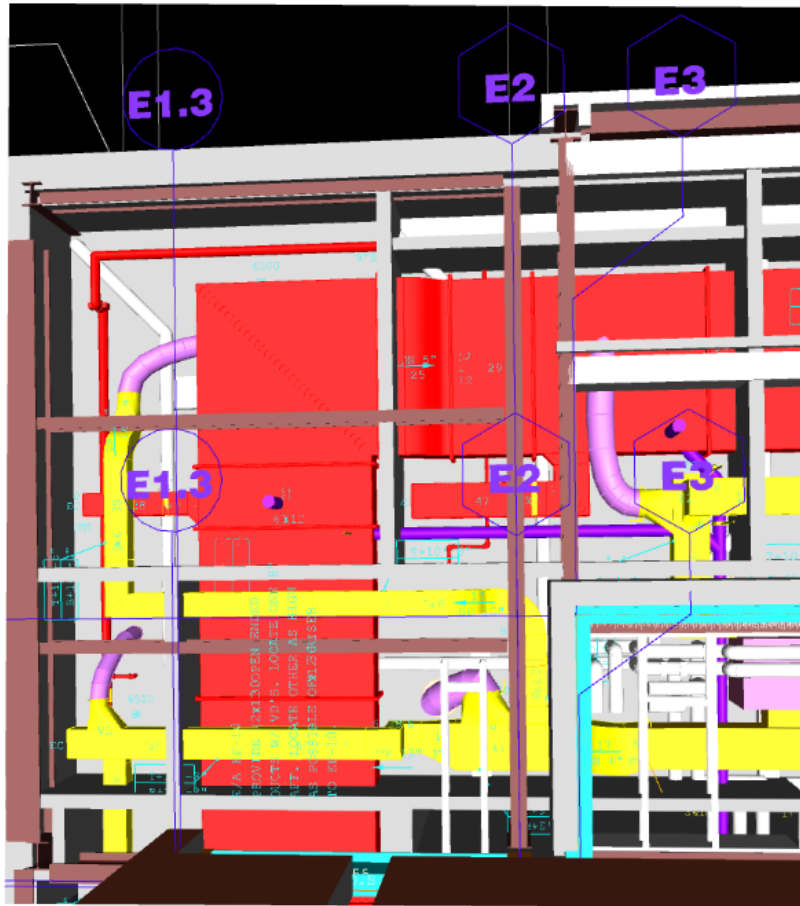
After Coordination

- Resolve clashes virtually before shop drawings are ordered
- Save time and money by identifying constructability issues
- Understand sequence of installation between trades
- View models in the field to aid in installation and verification

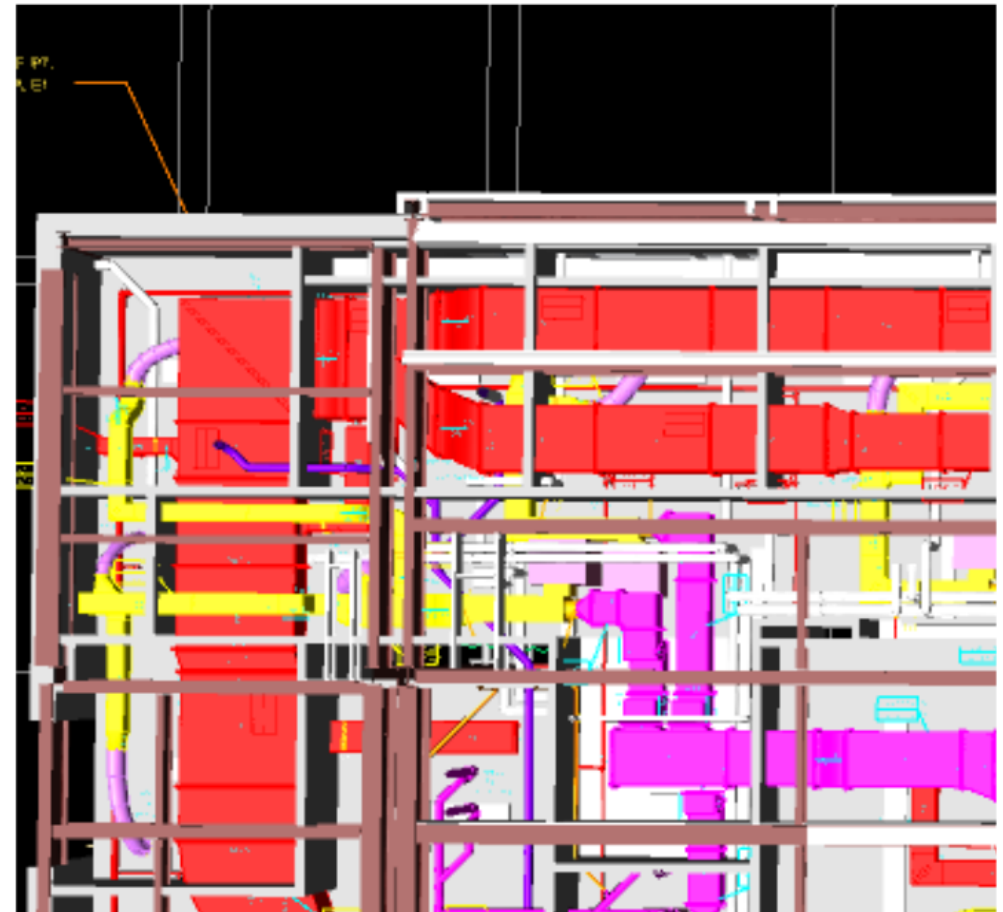
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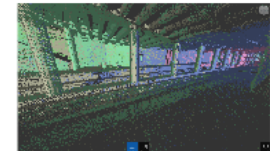
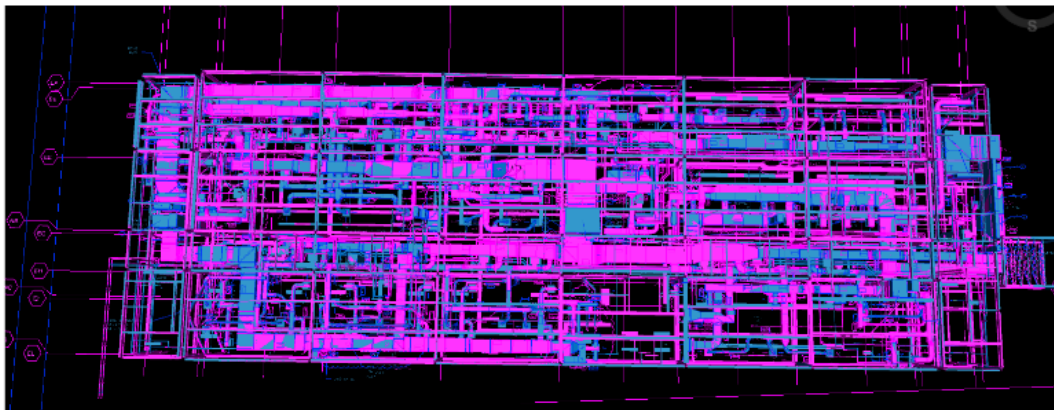


Design Intent

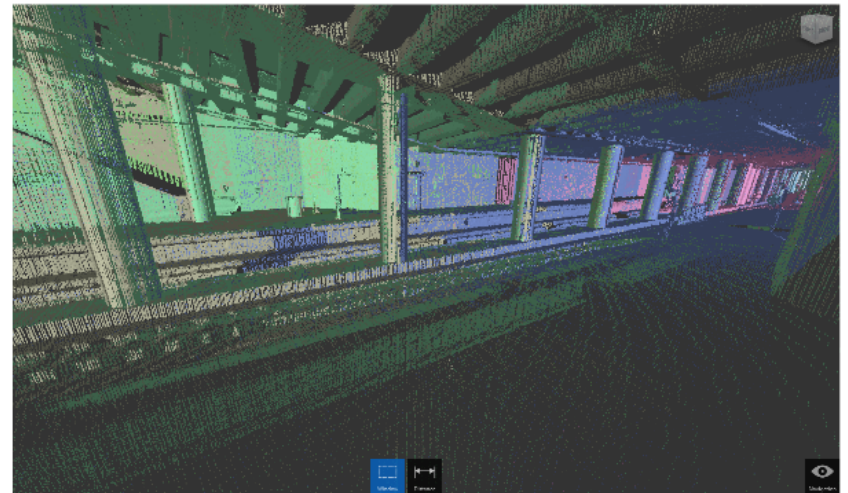
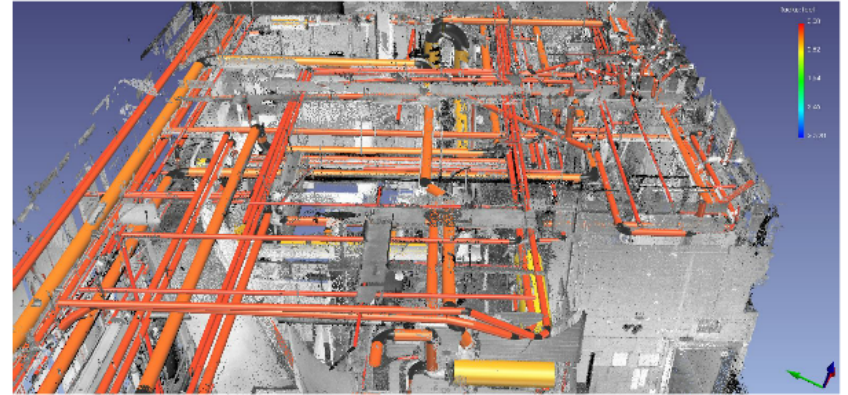


After Coordination

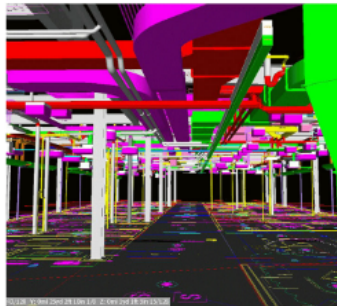
Benefits of coordinating a renovation



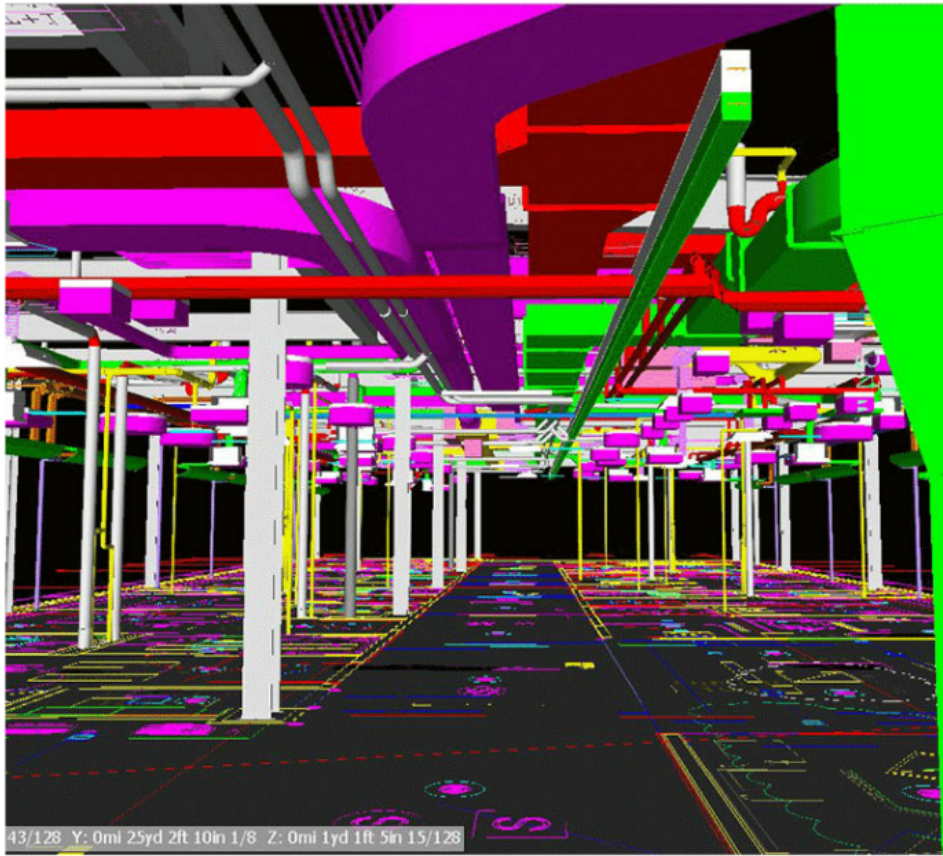
- Renovations (7 coordinated to date)
- Coordinate scans with removal of ceilings, walls, etc.
- Scanning existing conditions
- Model existing elements to remain



Utilizing as-built models

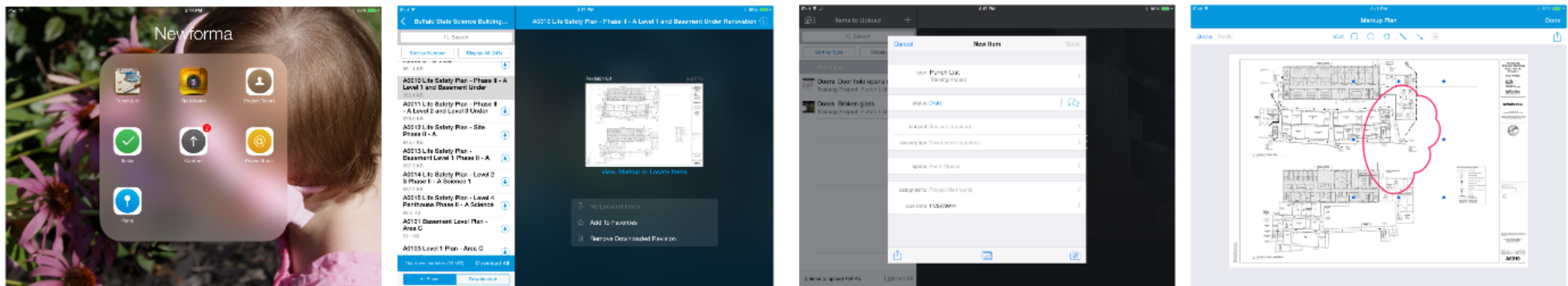


- Ability to use later for additions and/or renovations
- 360 photography (laser scans) for MEP verification
- Differences between design intent and actual installation can vary greatly
- Can utilize for Facility Management



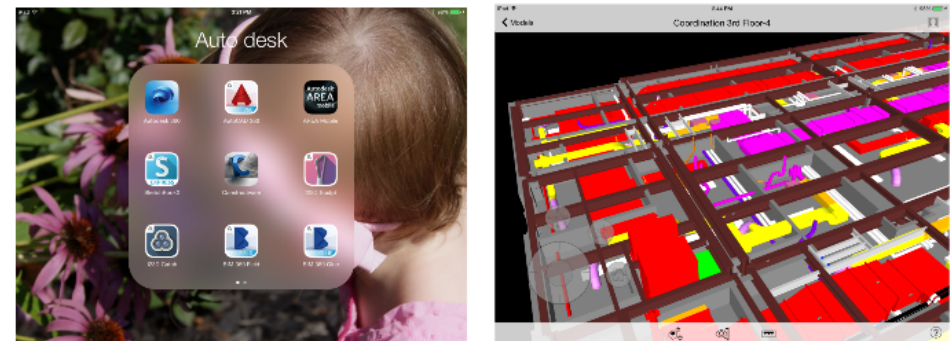


Mobile Technology

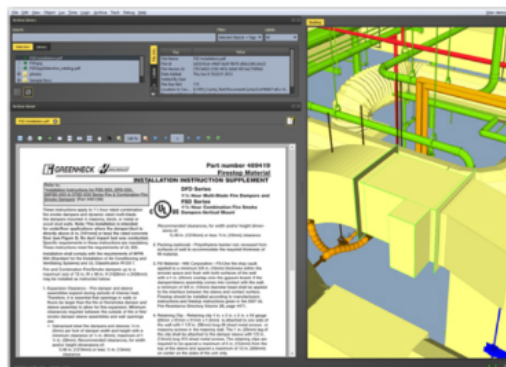


In the field use:

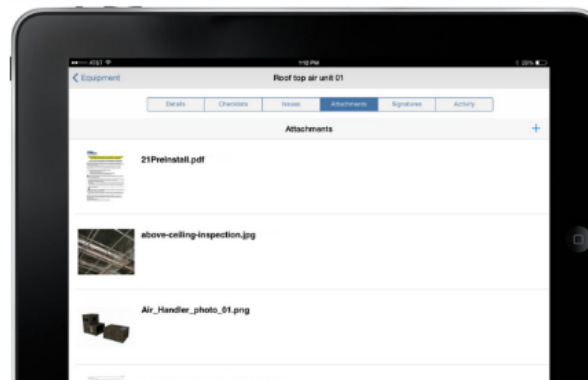
- View Drawings
- Punchlists
- RFI's and Submittals
- Markups
- View Models



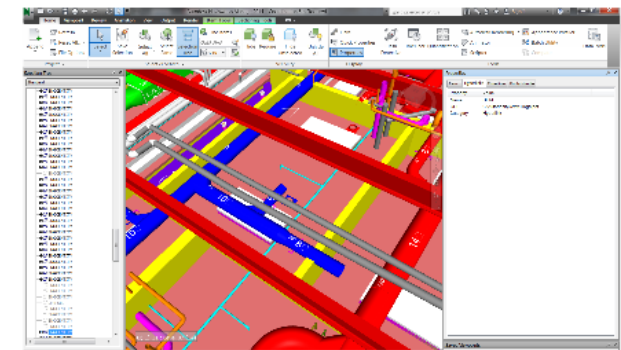
BIM and project closeout



M-SIX VEO



Autodesk BIM 360 Field



Autodesk Navisworks Manage

- Updating model with as built information
- Including specifications and equipment maintenance with model elements
- Handing over models for owners when required



Future Capabilities

Augmented Reality



Working looking at a stair through the iPad to see it in the building before it is built



Visualizing a city model



Visualizing a model on the site using Google Earth to verify the impacts on skyline and community

- Ability to see model in place as construction is going on
- Show the owner the building on the site live where they are standing
- Use mobile technology to understand impacts of specific projects on the site



Working looking at a stair through the ipad to see it in the building before it is built



Visualizing a city model



Visualizing a model on the site using Google Earth to verify the impacts on skyline and community

Building Lifecycle

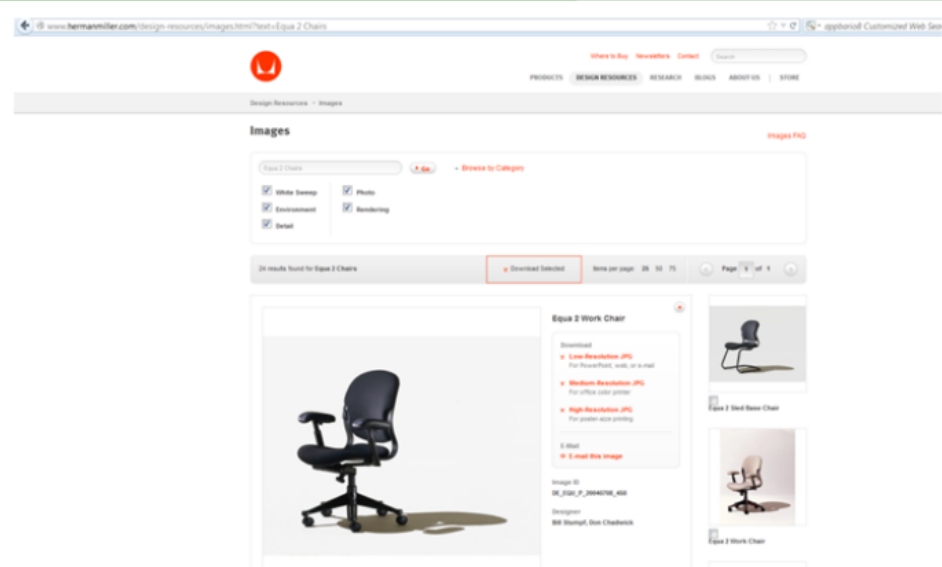
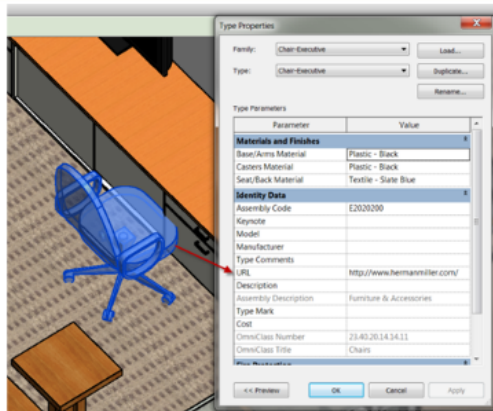


Model is update from 100% completion

- Updating changing equipment
- Updating spaces/people
- Change order and work requests
- Who updates the model?



Facilities Management



- Utilitizing models beyond As Builts:
- Data Entry for As Builts
- The "I" in BIM
- Understanding what the owner wants to utilize for Facilities Management
- Building extra into the contract for FM



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