

# Life without BIM tools



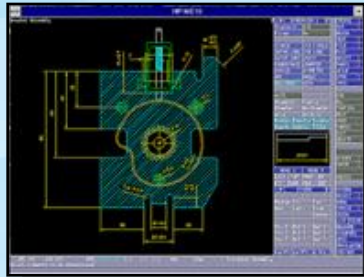
# BIMworkflow® & BIMLogistics

- Defining BIMworkflow®
  - BIM=Software Tools
  - Workflow= New methods to utilize the tools to optimize results
- BIMLogistics-Provisional Patent
  - Integrates IPv6 to the electrical device level
  - Need to develop standards, systems and processes
  - Large new and retrofit market for electrical devices
  - Integration with Design, Supply Chain and Construction

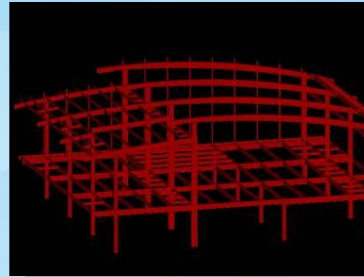
# BIM Evolution



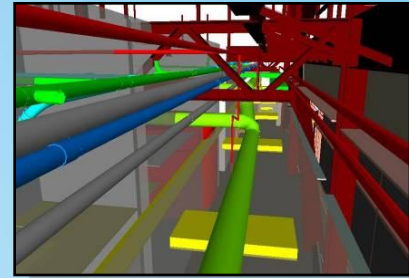
Hand Drawing



2D CAD

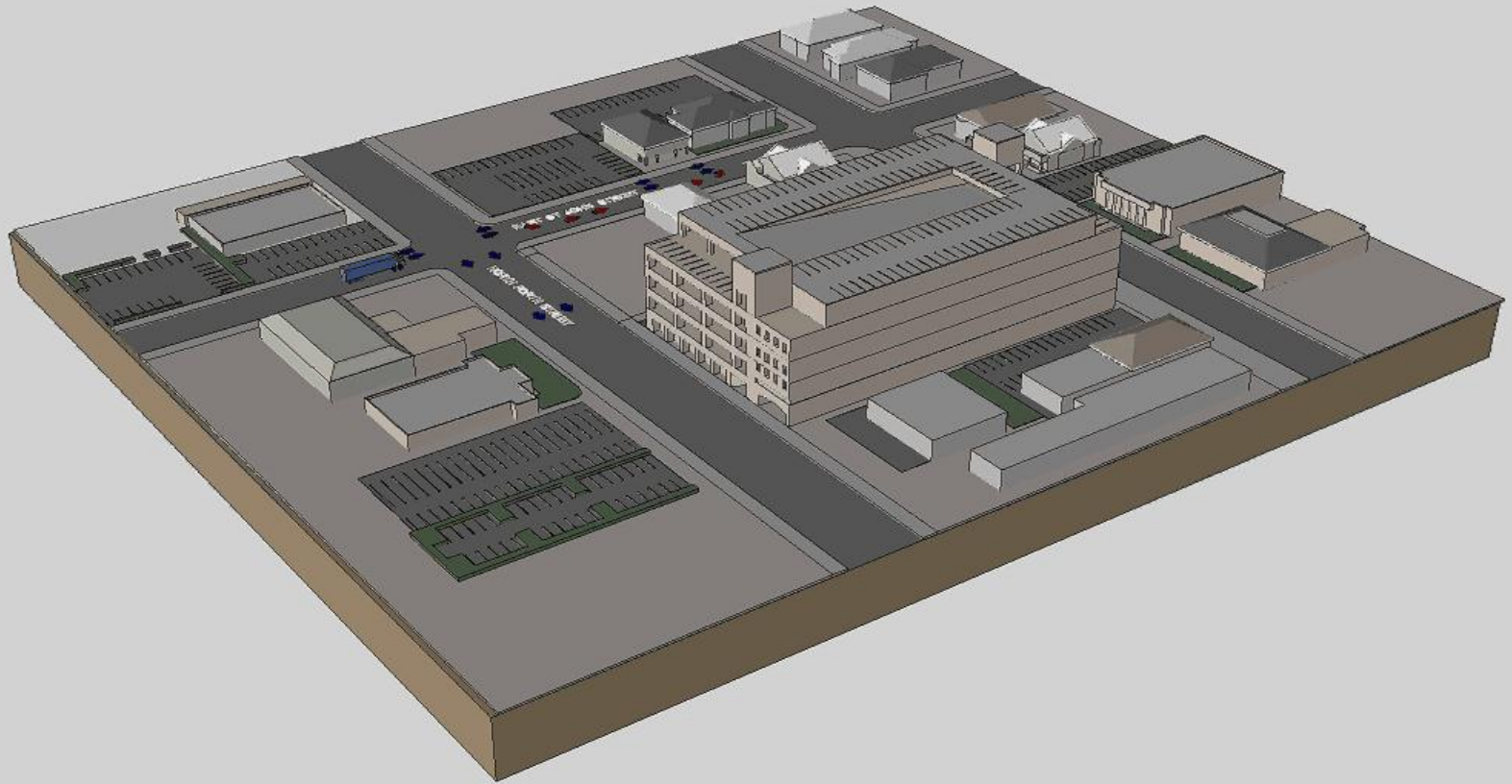


3D CAD

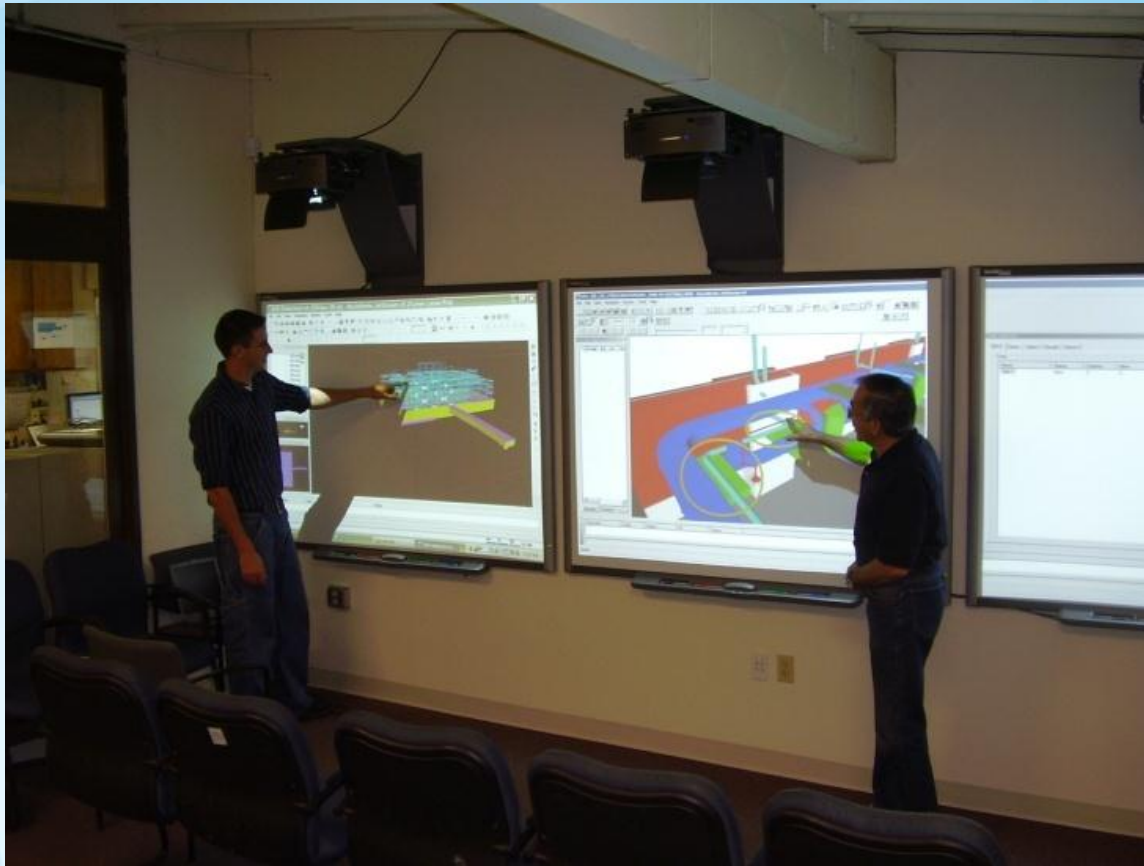


BIM  
3D/4D/5D..XD

evolution

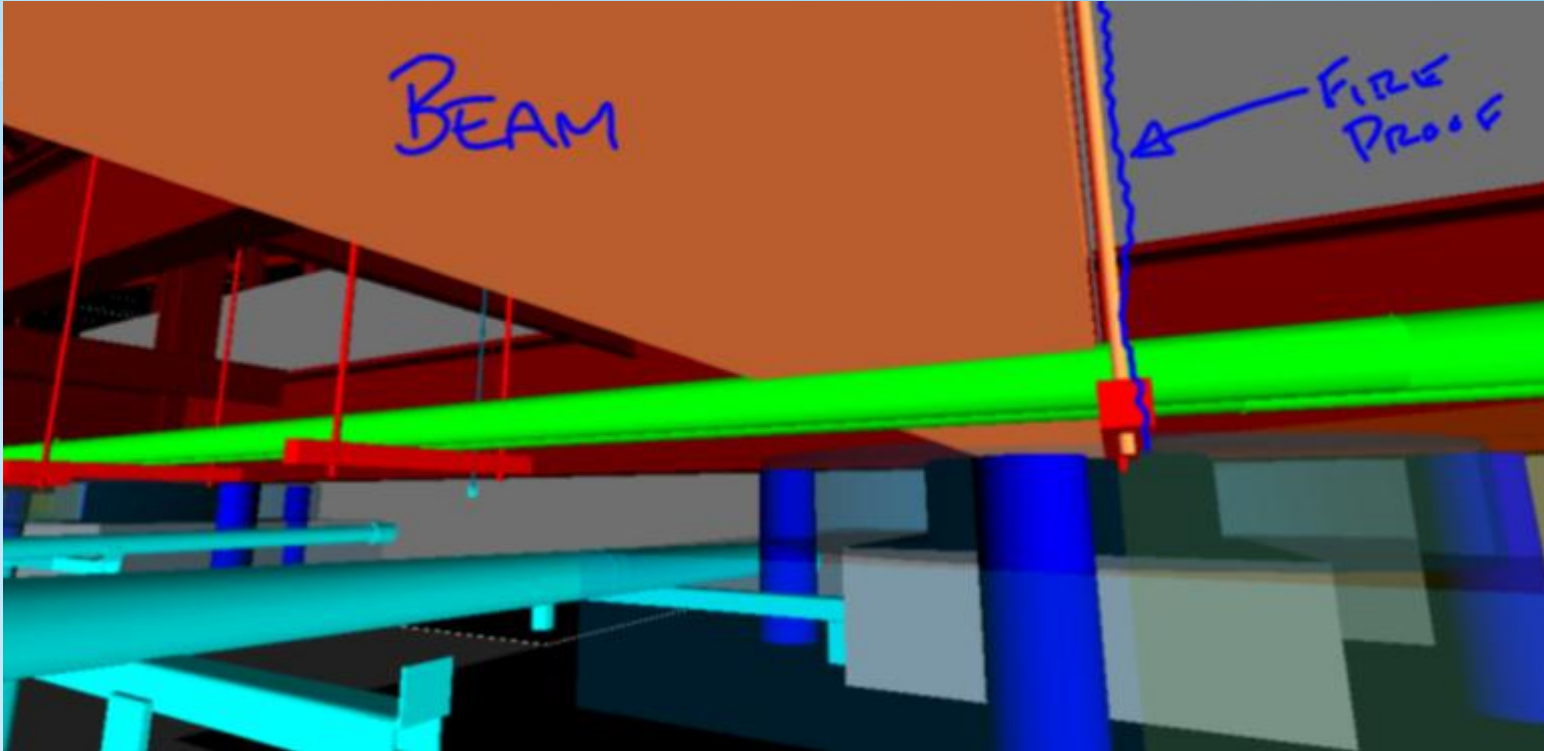


# Coordination Room

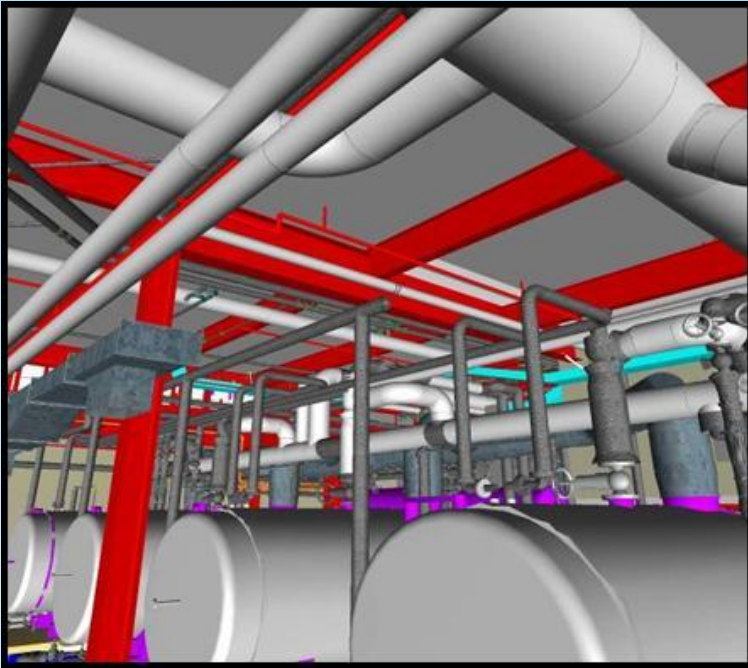




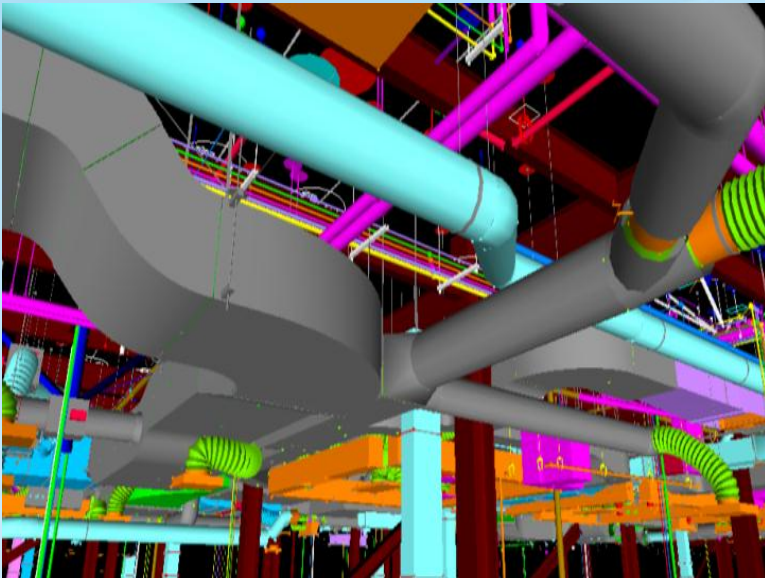
# Field Collaboration



# Planned vs. Actual

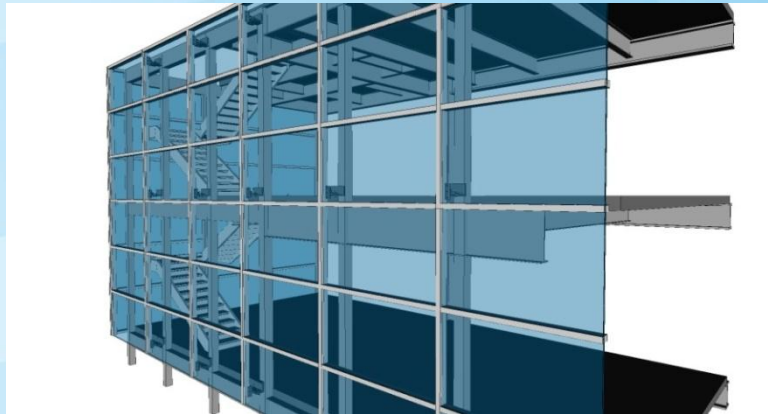
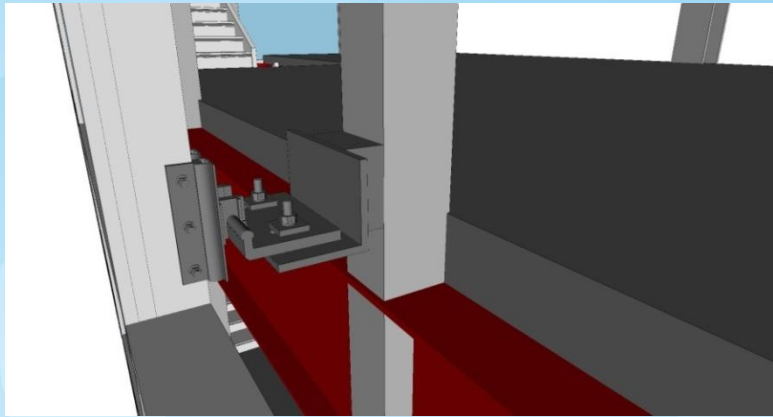


# Healthcare Example

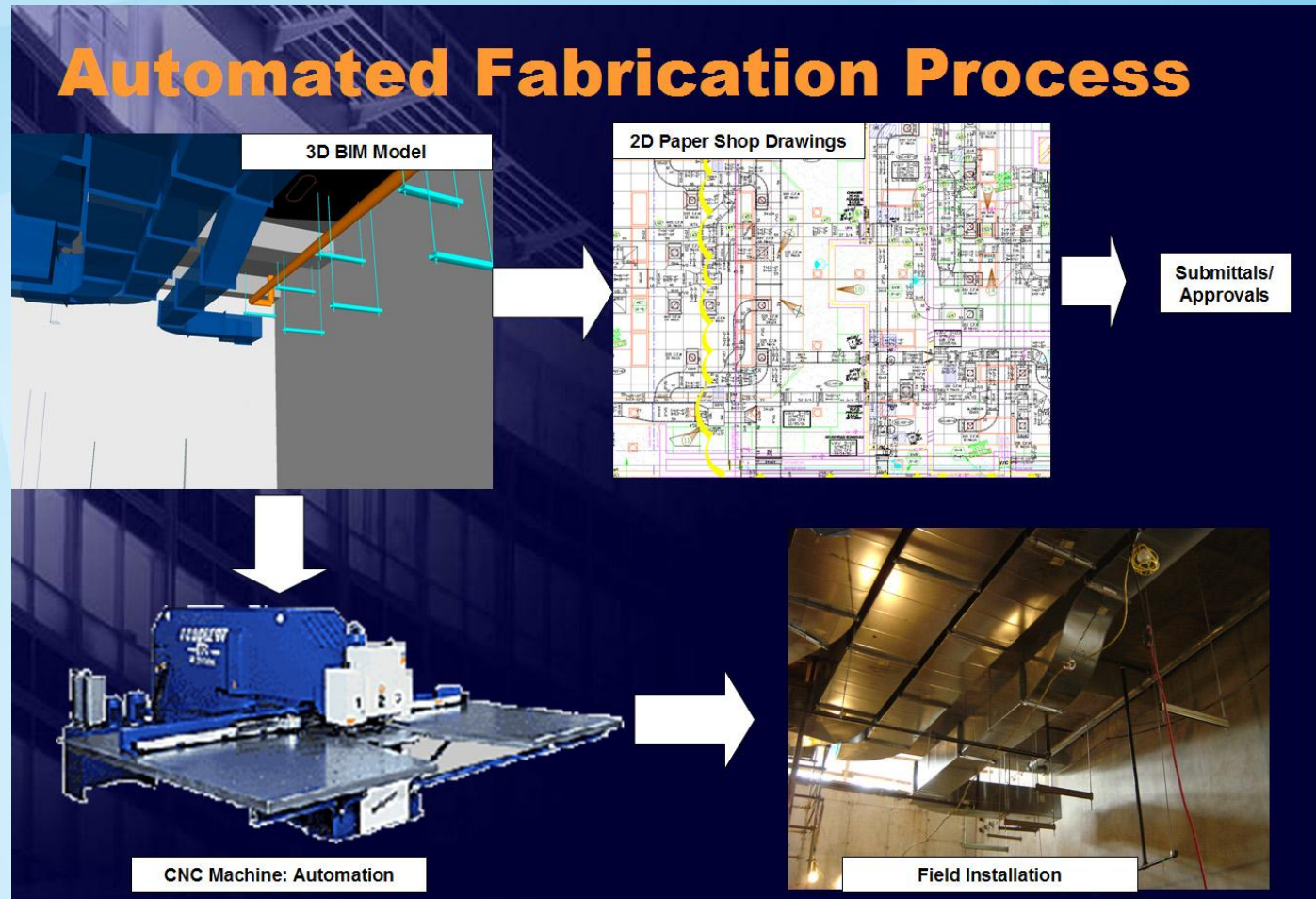




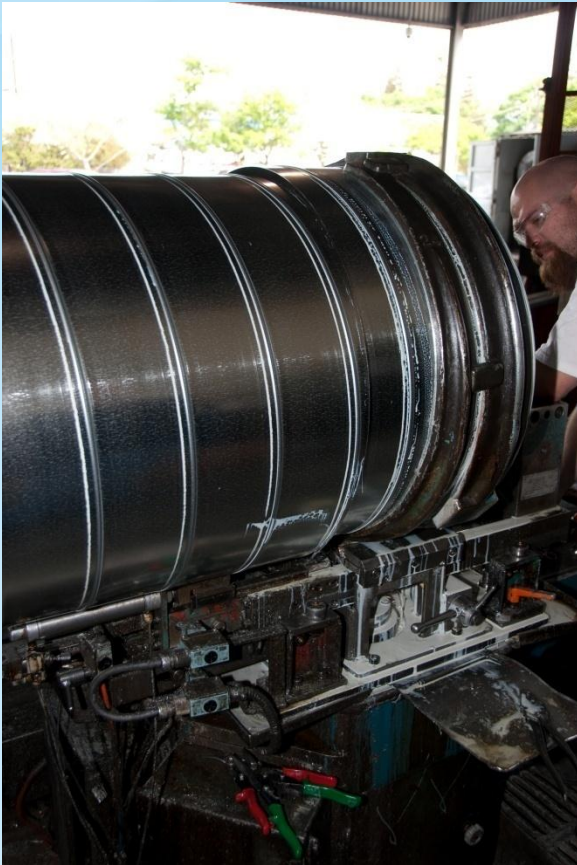
# Curtain Walls



# Fabrication from the Model

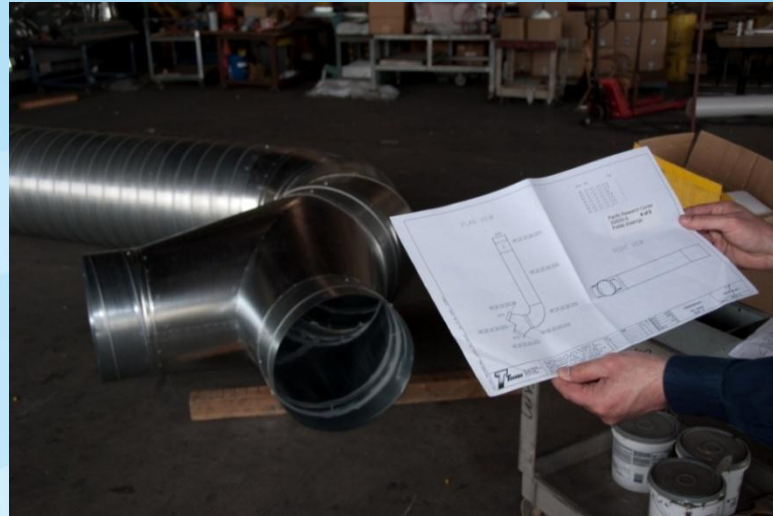
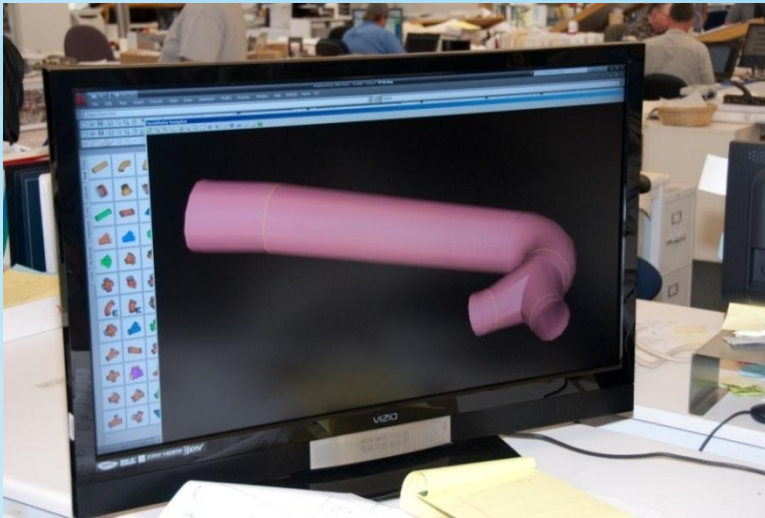


# Fabrication





# Monitor to shop floor

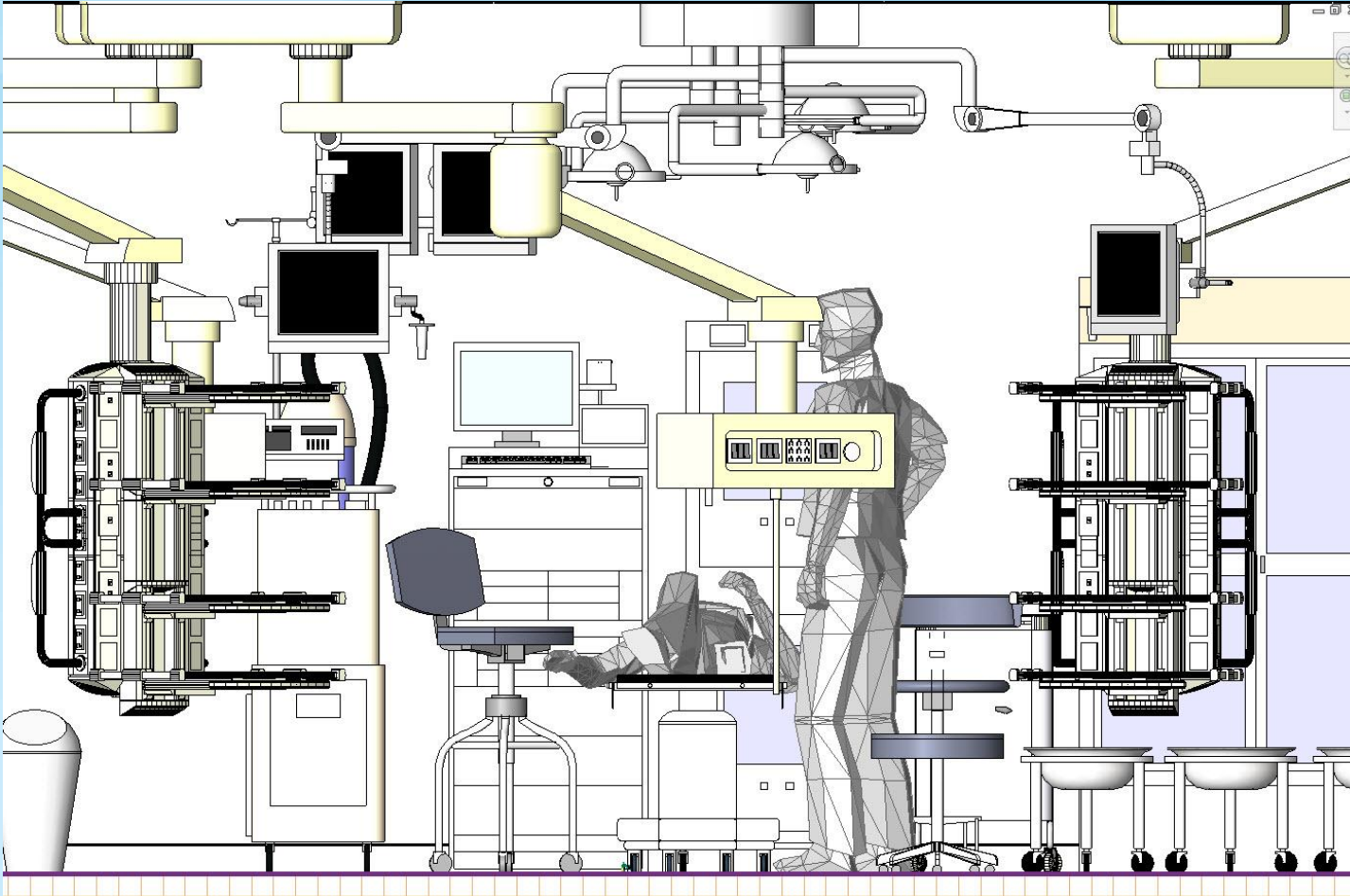




# Laser Scanning

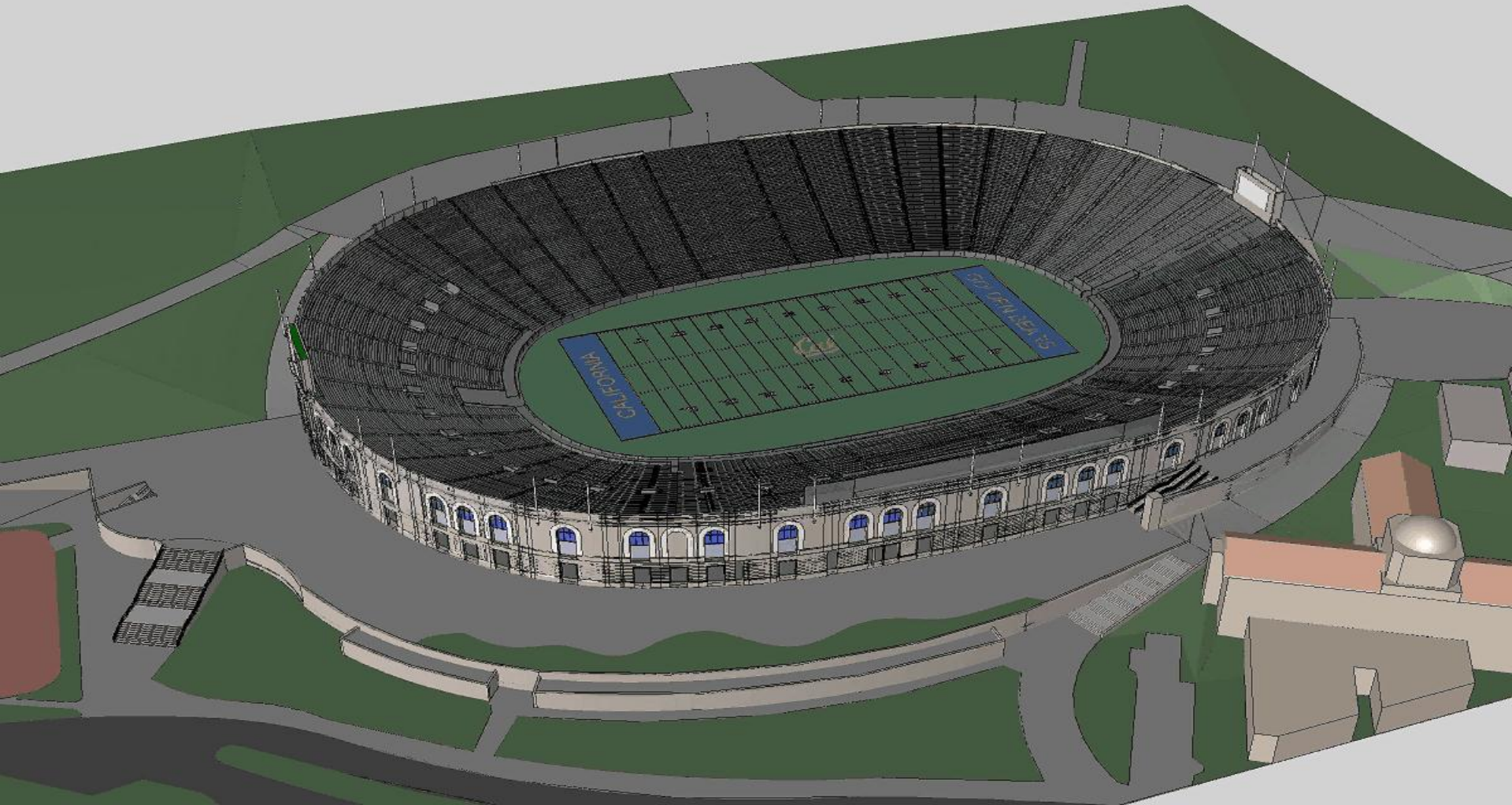


# Virtual Mock Up



# 4D Logistics Planning

Living Room: 10/17





# Construction Industry Trends

NEWS | SMART GRID



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JEFF ST. JOHN: DECEMBER 21, 2011

## Top 5 Smart Grid Trends of 2011

Integration is the name of the smart grid game, whether it's making good on corporate acquisitions or ensuring smart grid systems live up to their promises.

If you had to pick one word to sum up the key imperative for the smart grid industry at the close of 2011, it would have to be "integration."

That word means different things when taken in different contexts, of course. But whether we're talking about corporate acquisition activity in the smart grid space or the increasing pressure on utilities and vendors to tie together formerly separate systems in a working whole, it's a useful concept to apply to some of the most important smart grid trends we've seen over the past year, as well as the challenges the industry faces in the year to come.



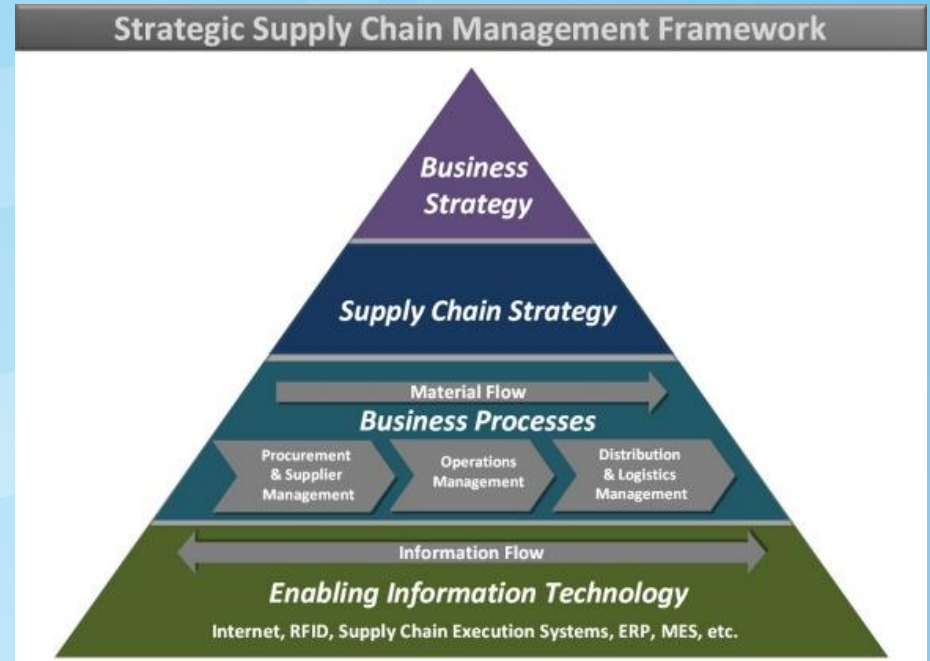


# 12th CMAA/FMI Owners Survey Sheds Light on

- For the first time, construction owners responding to the annual CMAA/FMI Owners Survey have ranked **“Transitioning to ongoing operations and maintenance”** as the most important area in which they expect their Construction Managers to make significant contributions to their success.
- The finding was one of several that reflect continued adoption among owners of a “more holistic, life-cycle view” of their projects.

# BIMLogistics with IPv6

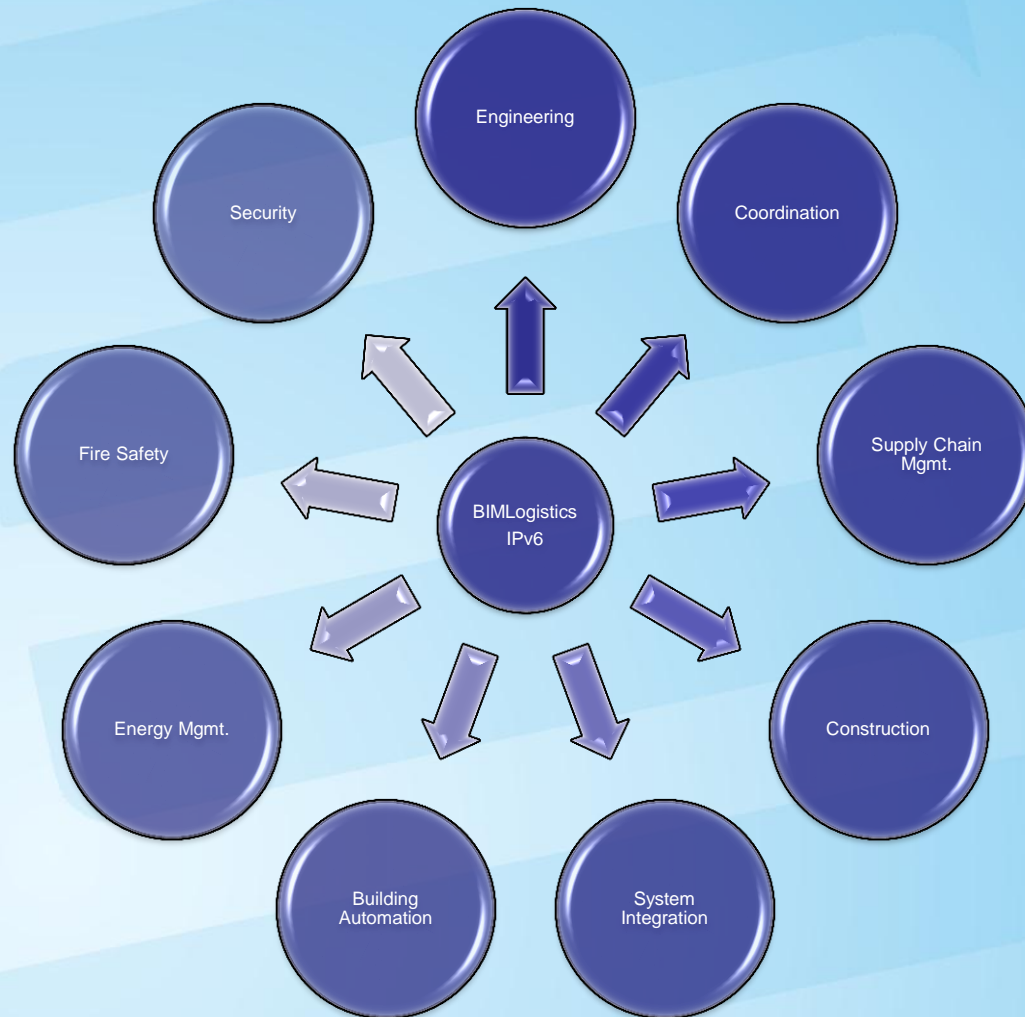
- IP to the device level
- Model Management
- Coordination
- Procurement
- Demand Response
- Manufacturing Execution System (MES)
- Installation
- System Integration
- Digital Facility Management



# BIMLogistics-Provisional Patent

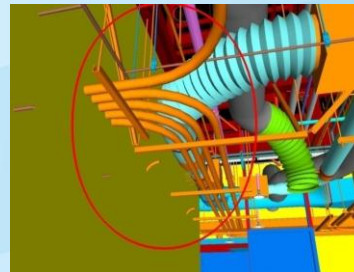
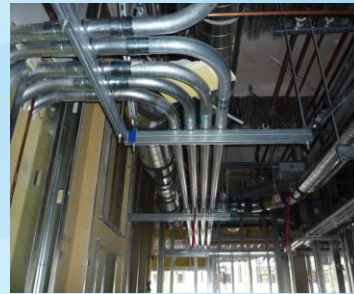
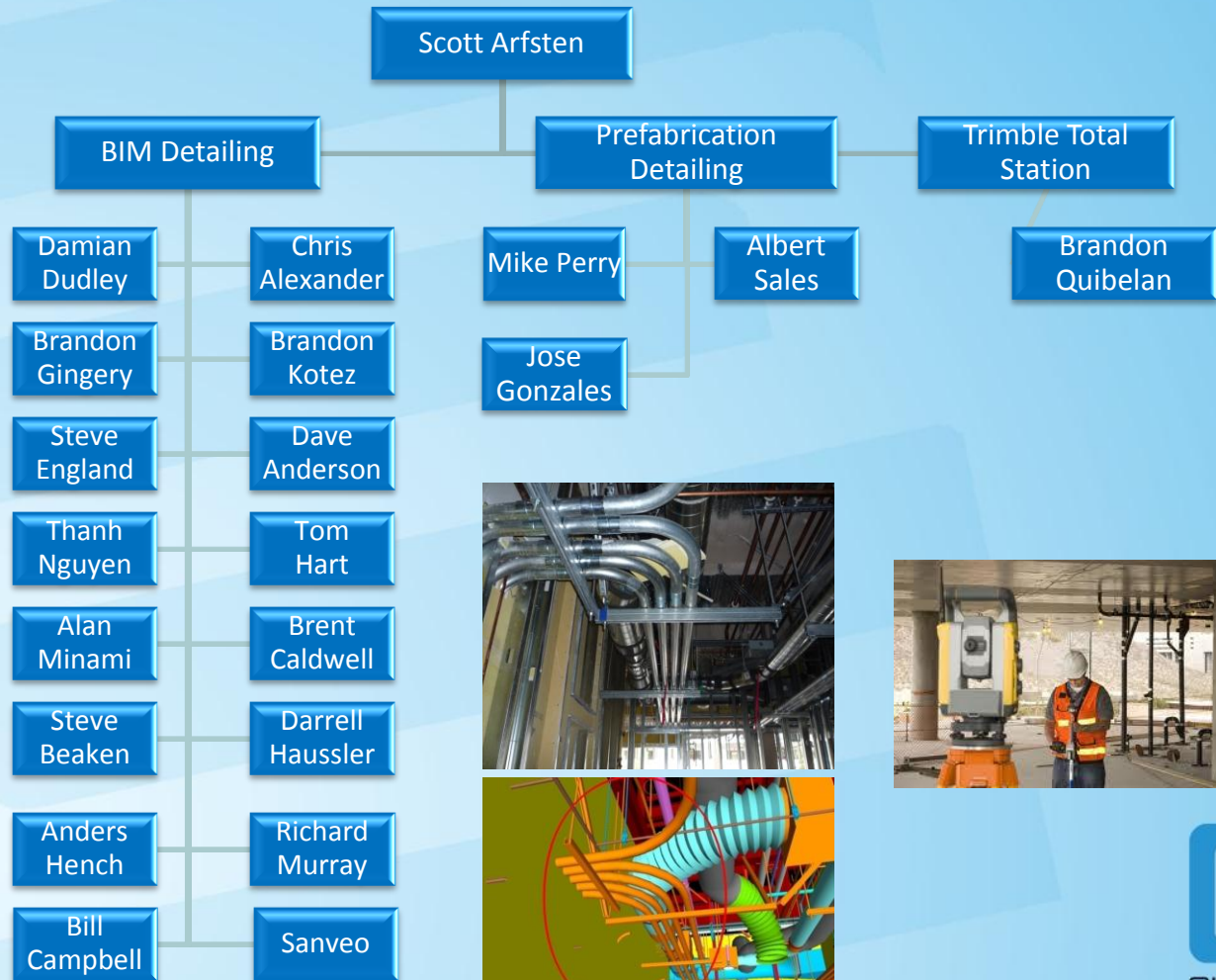
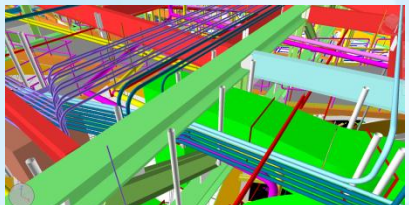
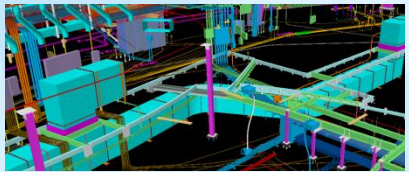
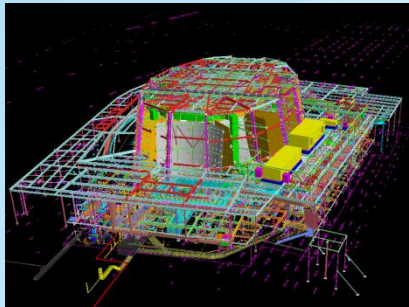
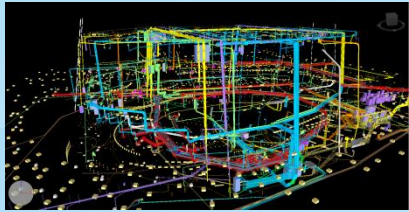
- Database of IP addresses for the Construction Industry
- Pre-Construction Modeling
- Construction Coordination
- Building Systems Integration
- BIM System Integration
  - 3D Model
  - Database of building systems
  - Centralized Control
  - Efficient Energy, Facility and Operations Management

# Value Proposition





# BIM Pre-Construction Services



# CEI BIMworkflow®

“Optimizing Speed, Cost, Quality and Safety”

Estimating

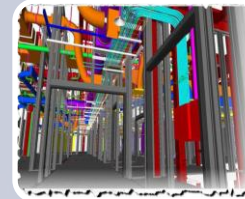
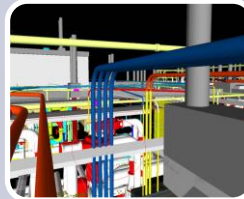
Engineering

Detailing

Pre-Fab

Construction

Digital  
Project  
Database\*



## Accubid®

- Conceptual estimate
- Detailed estimate
- Budget estimate

## Autodesk®

- AutoCAD MEP 2012
- Establish standards
- Communicate BIM execution plan to team
- LEED®

## 3D Models

- AutoCAD MEP 2012
- Coordination
- WebEx®
- Weekly updates
- File management process

## Shop work

- Increased safety
- Increased speed
- Reduced cost
- Improved quality
- FabPro 10

## Navisworks®

- Consolidated models
- Clash detection
- Virtual build
- Identify issues early
- Lean construction
- Trimble Total Station®

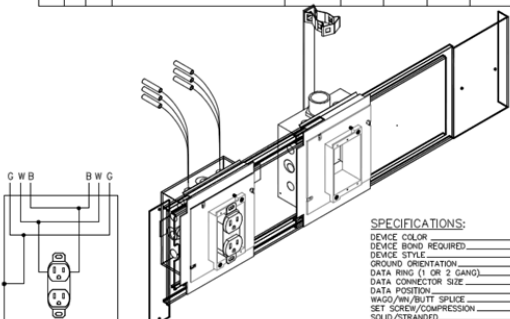
## CEI IT Systems

- Link to 3D model
  - Capture content in digital format
  - Scanned submittals
  - Native CAD files
  - FM information
- \* Additional charges may apply*

# Engineering & BIM

**BILL OF MATERIAL**

MARK	QTY	SIZE	DESCRIPTION	LENGTH	NOTES	TASK CODE	LABOR UNIT	LABOR HRS
1	2	NA	55 10 ADJUSTABLE RING	--	--	105	0.019500	0.039000
2	1	NA	55 DEEP W/ 1/2" & 3/4" ROW	--	--	105	0.025000	0.025000
3	1	6-32	6-32 x 1/2" RND HD MS	--	--	0	0.000000	0.000000
4	6	NA	8" POWER TAIL #12 TRSH	--	--	106	0.025000	0.150000
5	6	--	BUTT SPICE	--	--	0	0.000000	0.000000
6	1	NA	CADDY 812HE18A-5	--	--	105	0.019500	0.019500
7	1	3/4	CONDUIT CONNECTOR, DWT	--	--	105	0.019500	0.019500
8	2	NA	DECKE TAIL #12 TRSH	--	--	106	0.025000	0.050000
9	1	NA	DUPLEX RECEPT 120V/250A	--	--	140	0.026000	0.026000
10	1	NA	ORBIT USB 55 MOUNTING PLATE	--	--	0	0.000000	0.000000
11	1	NA	ORBIT-BRACKET/BOX/GROUND TAIL	--	--	0	0.000000	0.000000
12	1	--	PD COVER	--	--	0	0.000000	0.000000
13	3	--	WIREBUT	--	--	0	0.000000	0.000000
			Material Handling					0.025000
			Supervision					0.014000
			Detailing					0.050000
			Labor Total					0.418000 Hrs



**SPECIFICATIONS:**  
 DEVICE COLOR \_\_\_\_\_  
 DEVICE RING REQUIRED \_\_\_\_\_  
 DEVICE STYLE \_\_\_\_\_  
 GROUND ORIENTATION \_\_\_\_\_  
 DATA RING (1 OR 2 GANG) \_\_\_\_\_  
 DATA CONNECTOR SIZE \_\_\_\_\_  
 DATA POSITION \_\_\_\_\_  
 WAGO/WH/BUTT SPICE \_\_\_\_\_  
 SET SCREW/COMPRESSION \_\_\_\_\_  
 WIRE TYPE \_\_\_\_\_

CATALOG #	DESCRIPTION	NOTES
5-1-10-1-22		
X-1-10-X-10		

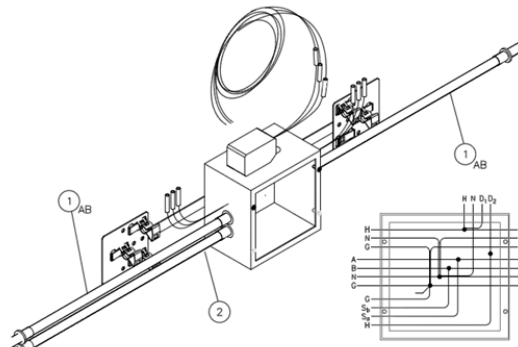
DRAWN BY \_\_\_\_\_  
 CHECKED \_\_\_\_\_  
 APPROVED \_\_\_\_\_  
 JOB NO \_\_\_\_\_

MP \_\_\_\_\_  
 JOB NAME \_\_\_\_\_  
 DRAWING NO. **E2**

REV. \_\_\_\_\_  
 DATE \_\_\_\_\_  
 QTY. # \_\_\_\_\_

**BILL OF MATERIAL**

MARK	QTY	SIZE	DESCRIPTION	LENGTH	NOTES	TASK CODE	LABOR UNIT	LABOR HRS
1	3	1/2	12/3 MC CABLE (BROWN, ORANGE)	10'	--	109	0.006310	0.127600
2	1	1/2	12/3 MC CABLE (BROWN, ORANGE)	10'	--	109	0.006310	0.114960
3	1	NA	14/3 1/2" CABLE	--	--	0	0.000000	0.000000
4	1	NA	Subst VLN MC BOX	--	--	116	0.020000	0.020000
5	6	NA	8" POWER TAIL #12 TRSH	--	--	106	0.025000	0.150000
6	1	NA	BOX GROUND TAIL #12 TRSH	--	--	106	0.025000	0.025000
7	6	--	BUTT SPICE	--	--	0	0.000000	0.000000
8	5	NA	CADDY 812	--	--	105	0.019500	0.097500
9	1	NA	HARNESS BRACKET	--	--	105	0.019500	0.019500
10	3	--	1/2" BUTT SPICE	--	--	0	0.000000	0.000000
11	6	1/2	MC CONNECTOR	--	--	109	0.012500	0.075000
12	1	NA	POWER RACK	--	--	0	0.019500	0.019500
			Material Handling					0.025000
			Supervision					0.014000
			Detailing					0.050000
			Labor Total					1.043960 Hrs



**Wiring Diagram:**  
 H N D, D<sub>2</sub>  
 H N D  
 A B C  
 A B C  
 H N D, D<sub>2</sub>  
 H N D  
 A B C  
 A B C

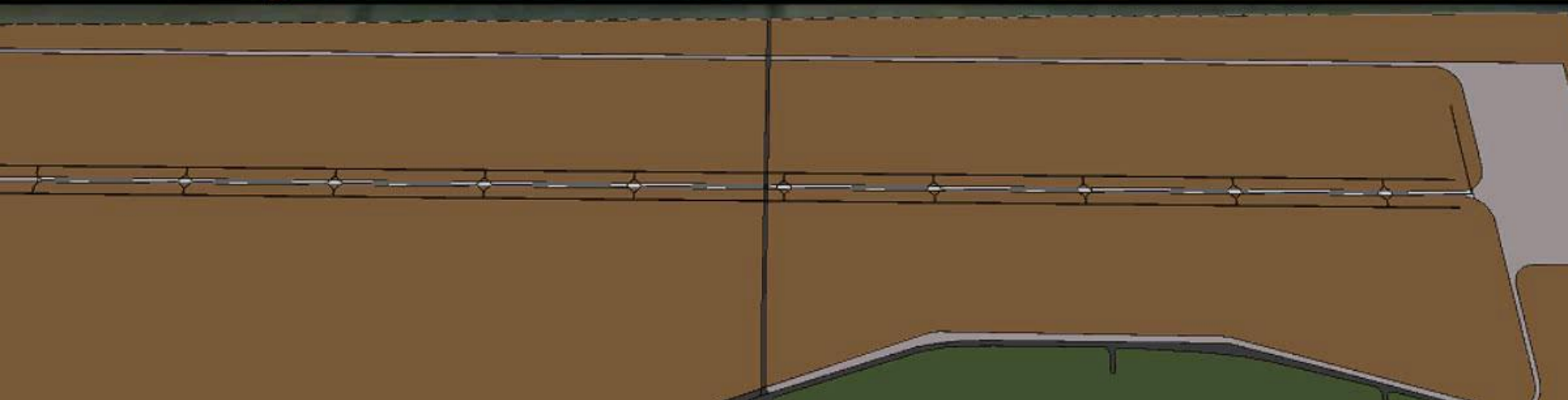
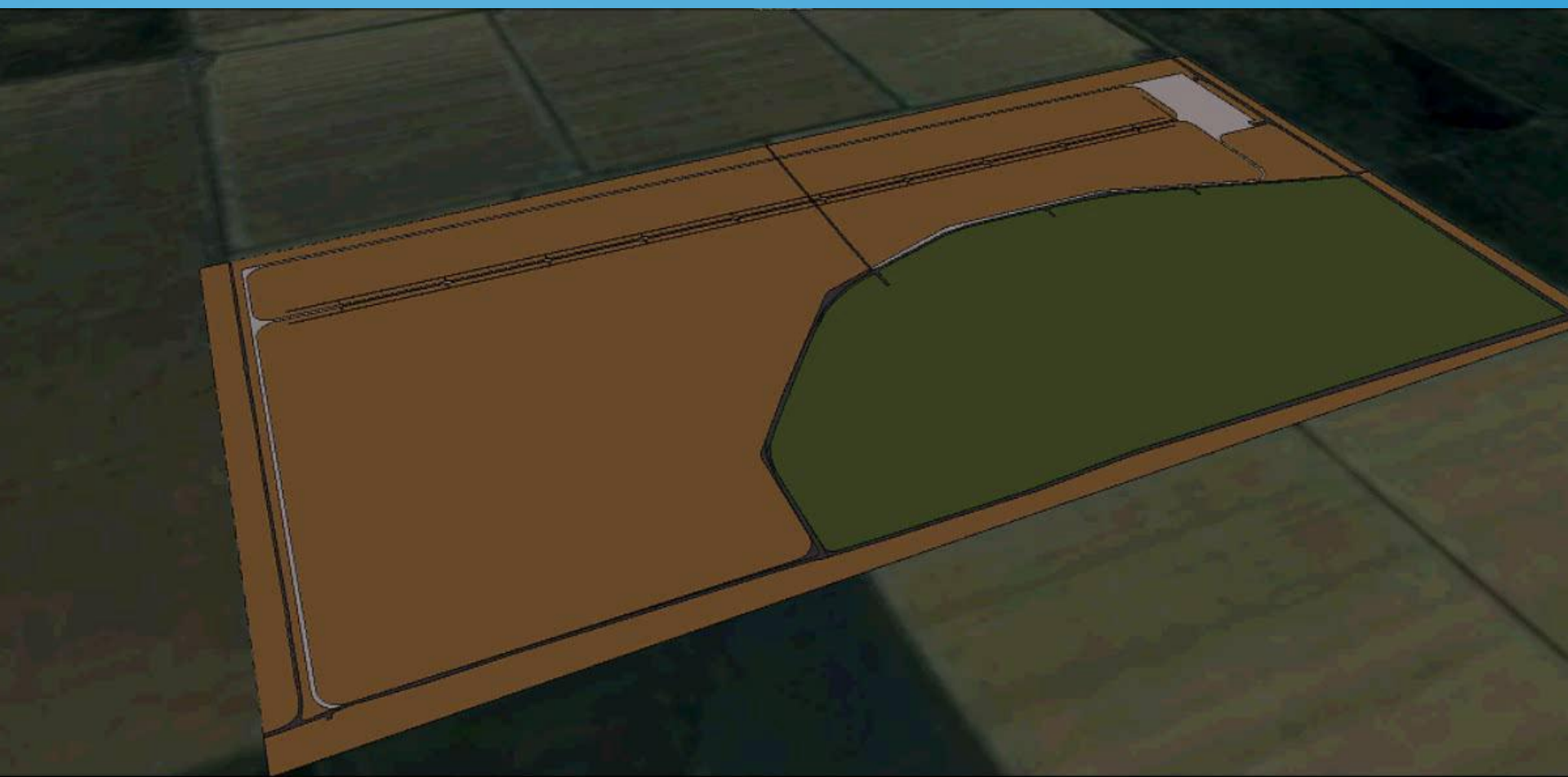
CATALOG #	DESCRIPTION	NOTES

DRAWN BY \_\_\_\_\_  
 CHECKED \_\_\_\_\_  
 APPROVED \_\_\_\_\_  
 JOB NO \_\_\_\_\_

MP \_\_\_\_\_  
 JOB NAME \_\_\_\_\_  
 DRAWING NO. **2SE**

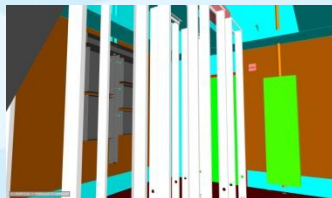
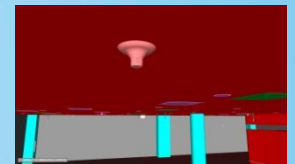
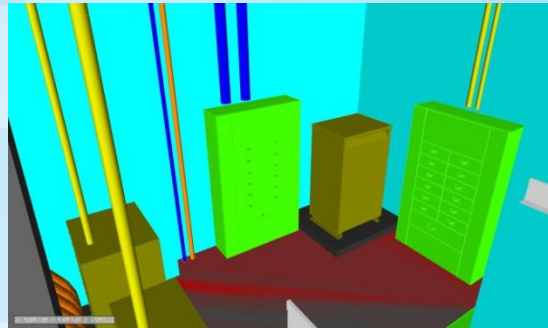
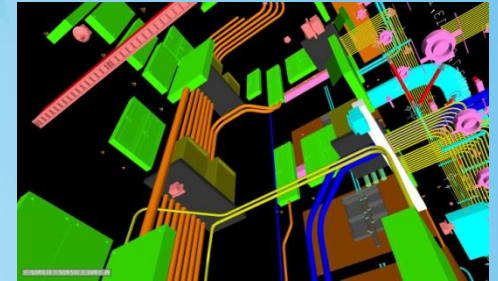
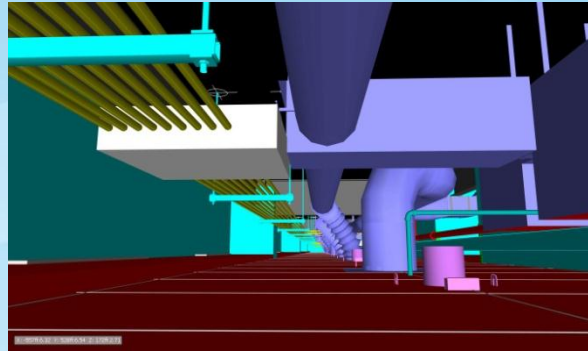
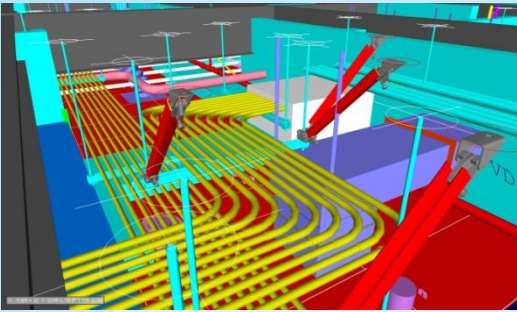
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Model Layout1 / Layout2 /

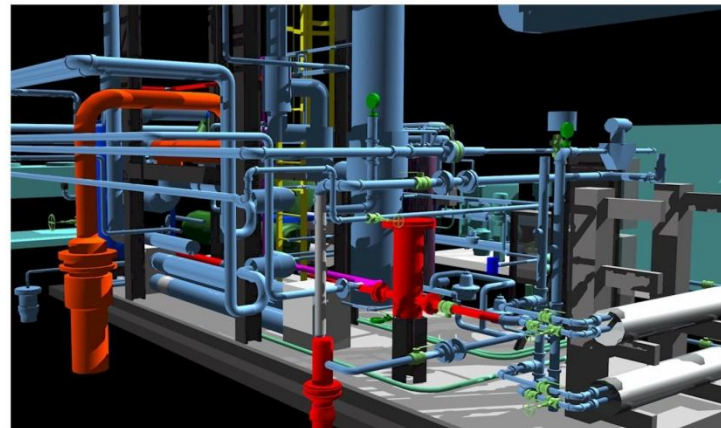
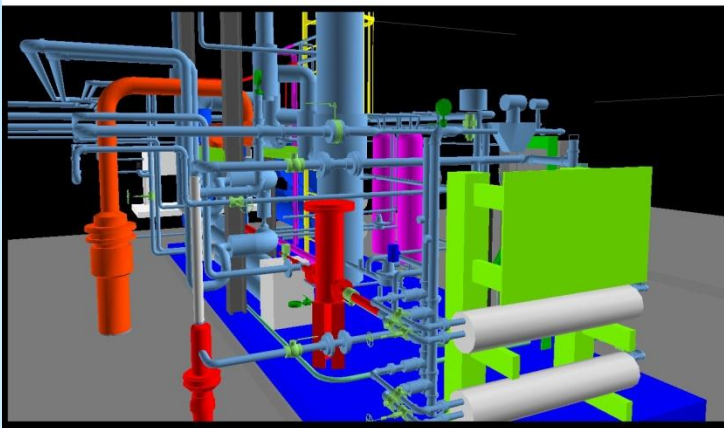
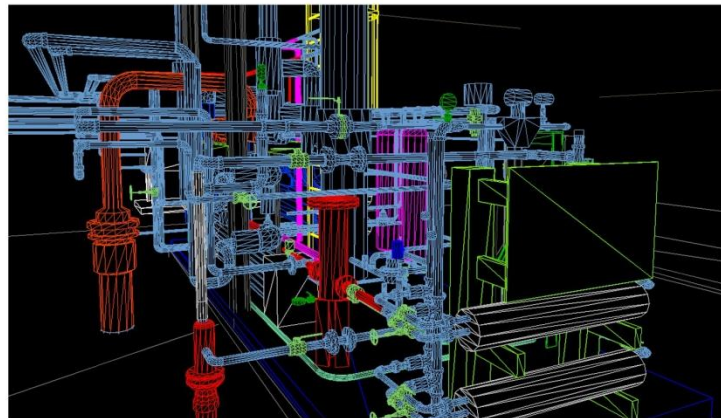
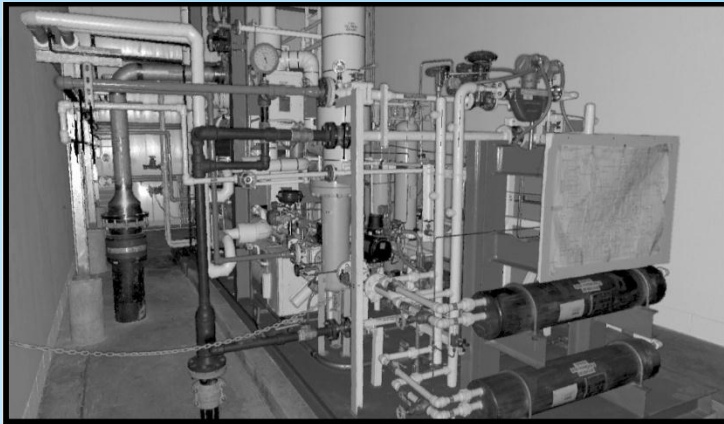




# 3D Detailing



# Laser Scan Example

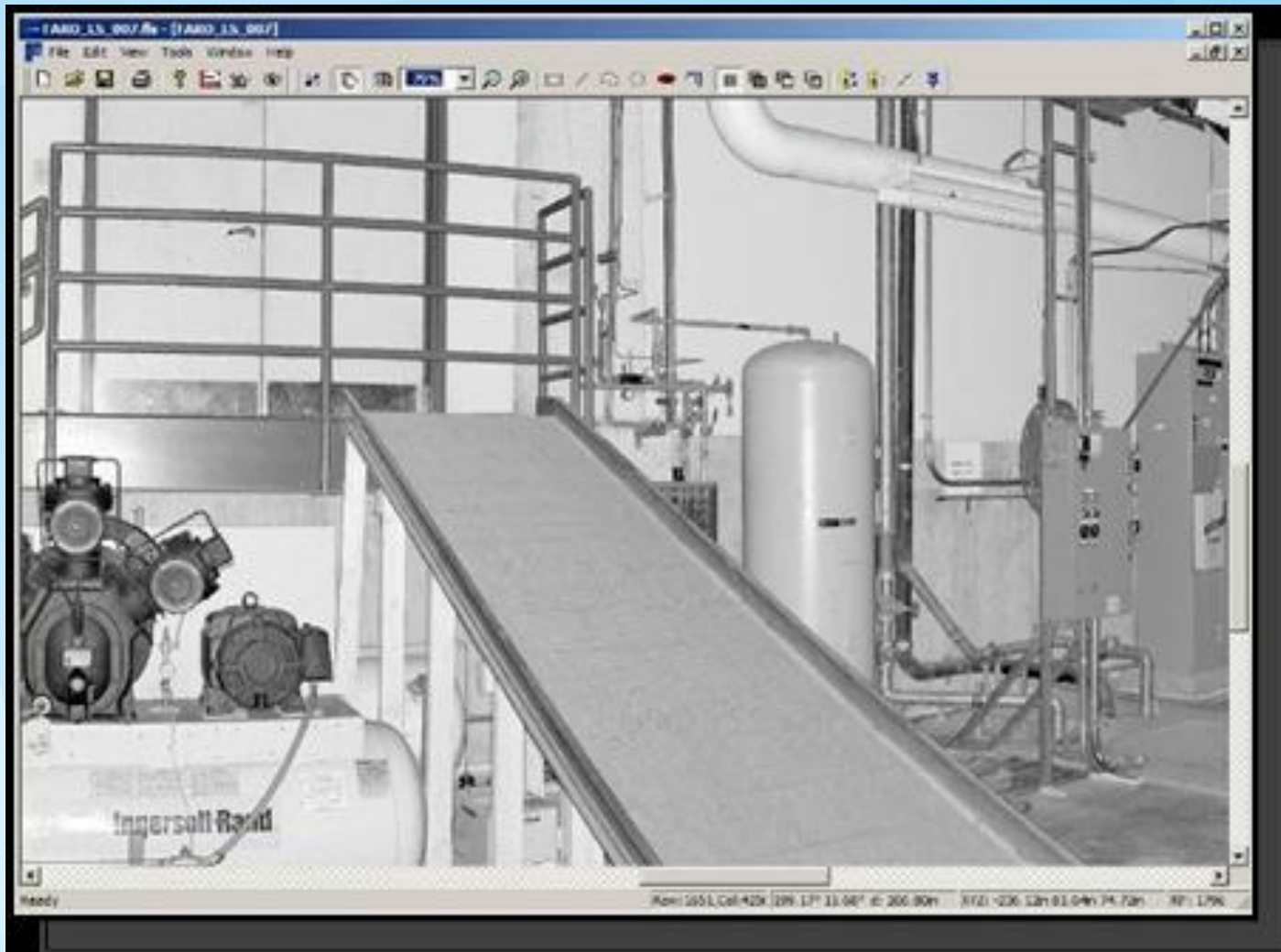


# Laser Scanning

- Variety of Scanners
- Typically 1:3 ratio to model
- Very precise
- Fast, efficient, cost effect



# Point Cloud Model



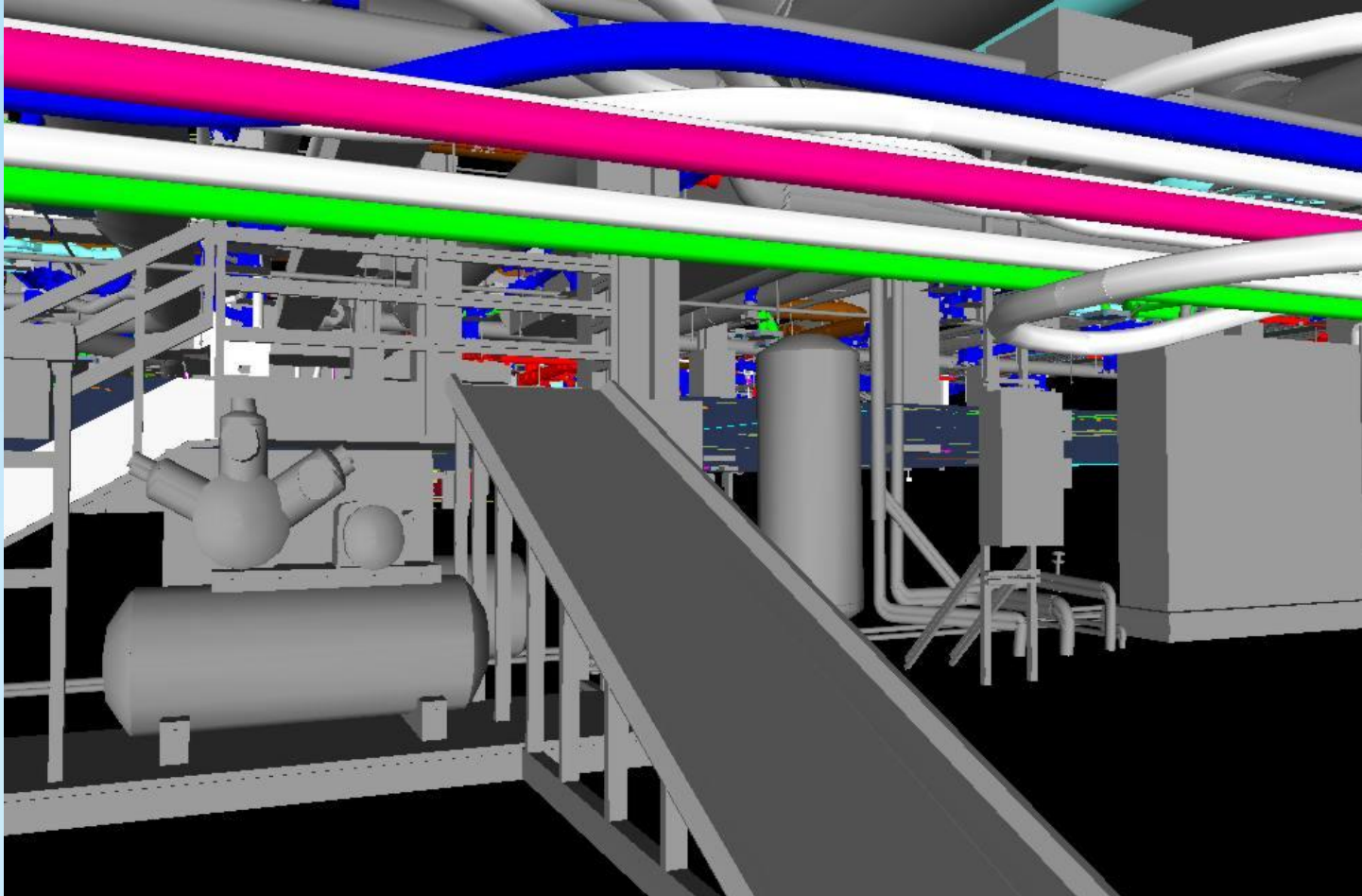


# Model from Point Cloud

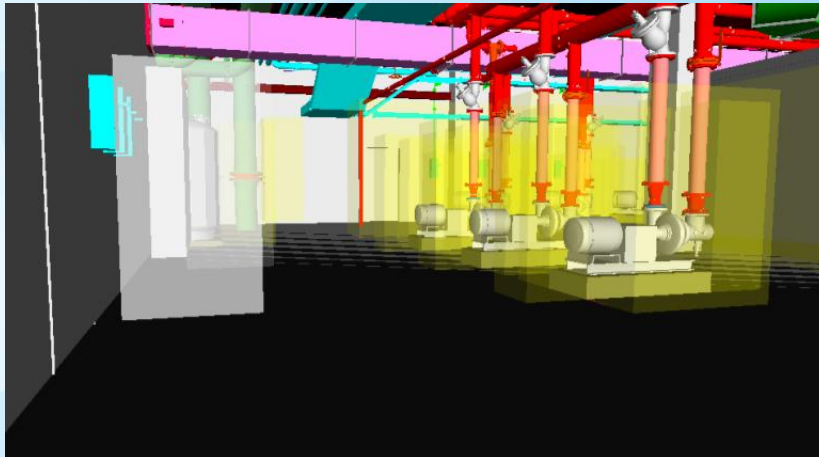
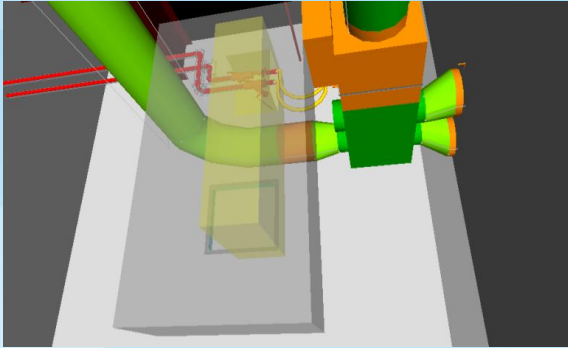




# Adding Conduit



# Facility Management



# Performing Arts Center



# Q&A

