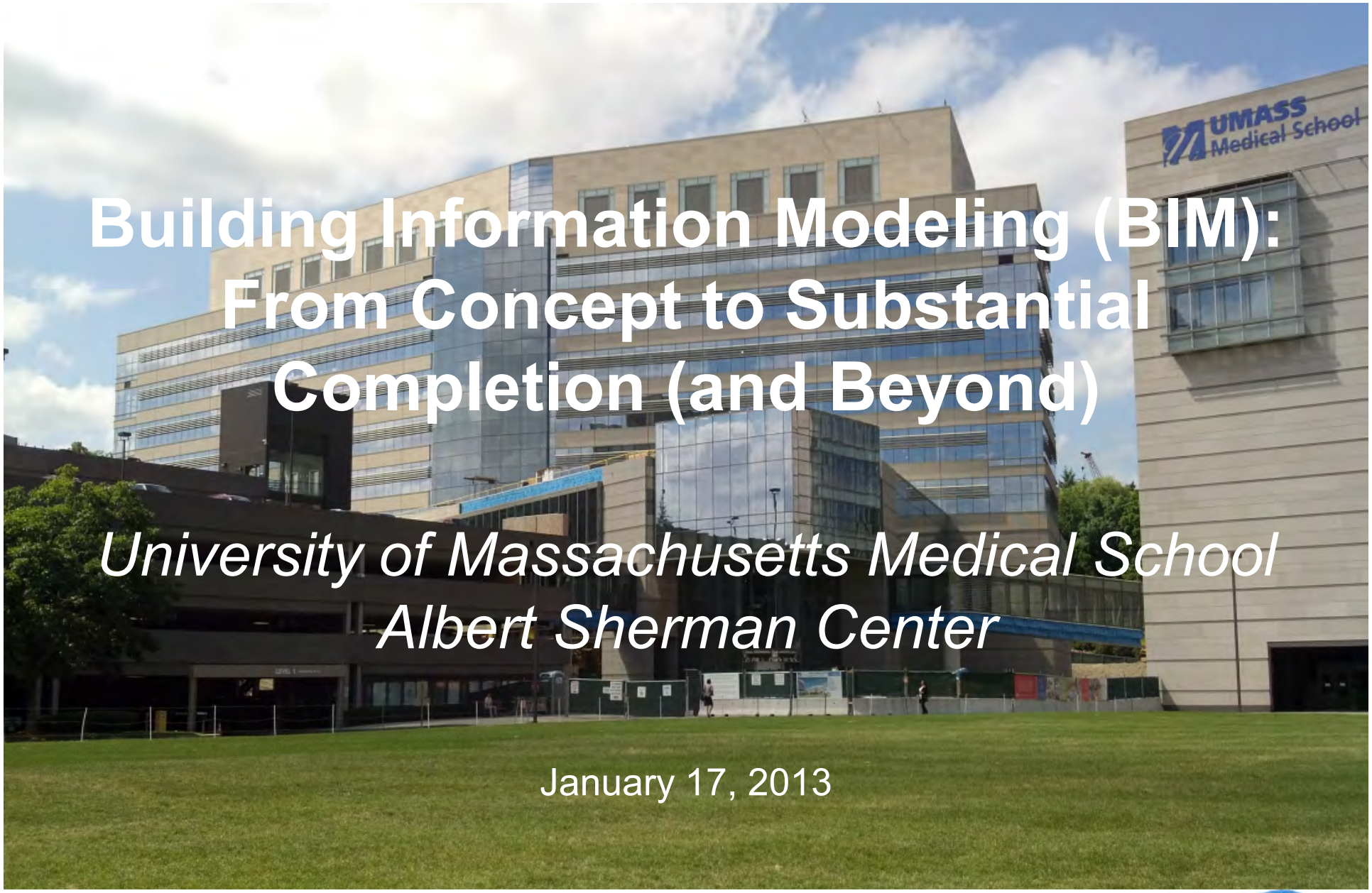

Building Information Modeling (BIM): From Concept to Substantial Completion (and Beyond)

University of Massachusetts Medical School
Albert Sherman Center

January 17, 2013

Connecting a World of Pharmaceutical Knowledge

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Speakers

- Erik Servies, AIA
  - Associate, PMA Consultants, Owner's Project Manager
- John Baker
  - Associate Vice Chancellor of Facilities, UMass Medical School
- Mark Dolny, AIA, LEED AP
  - Associate Principal, Architectural Resources Cambridge (ARC)
- Tom Watson
  - Regional BIM/VDC Manager, Suffolk Construction

Presentation Goals

- UMMS Vision and the Albert Sherman Center
- ARC response to the vision
- UMMS Operational needs
- Suffolk Construction response to the vision
- UMMS managing BIM moving forward

The Albert Sherman Center - Summary

- 515,000 SF BSL-2 Laboratory at the UMass Medical School
- Projected substantial completion 12/14/12
- Request from UMMS to utilize BIM for 6D deliverables

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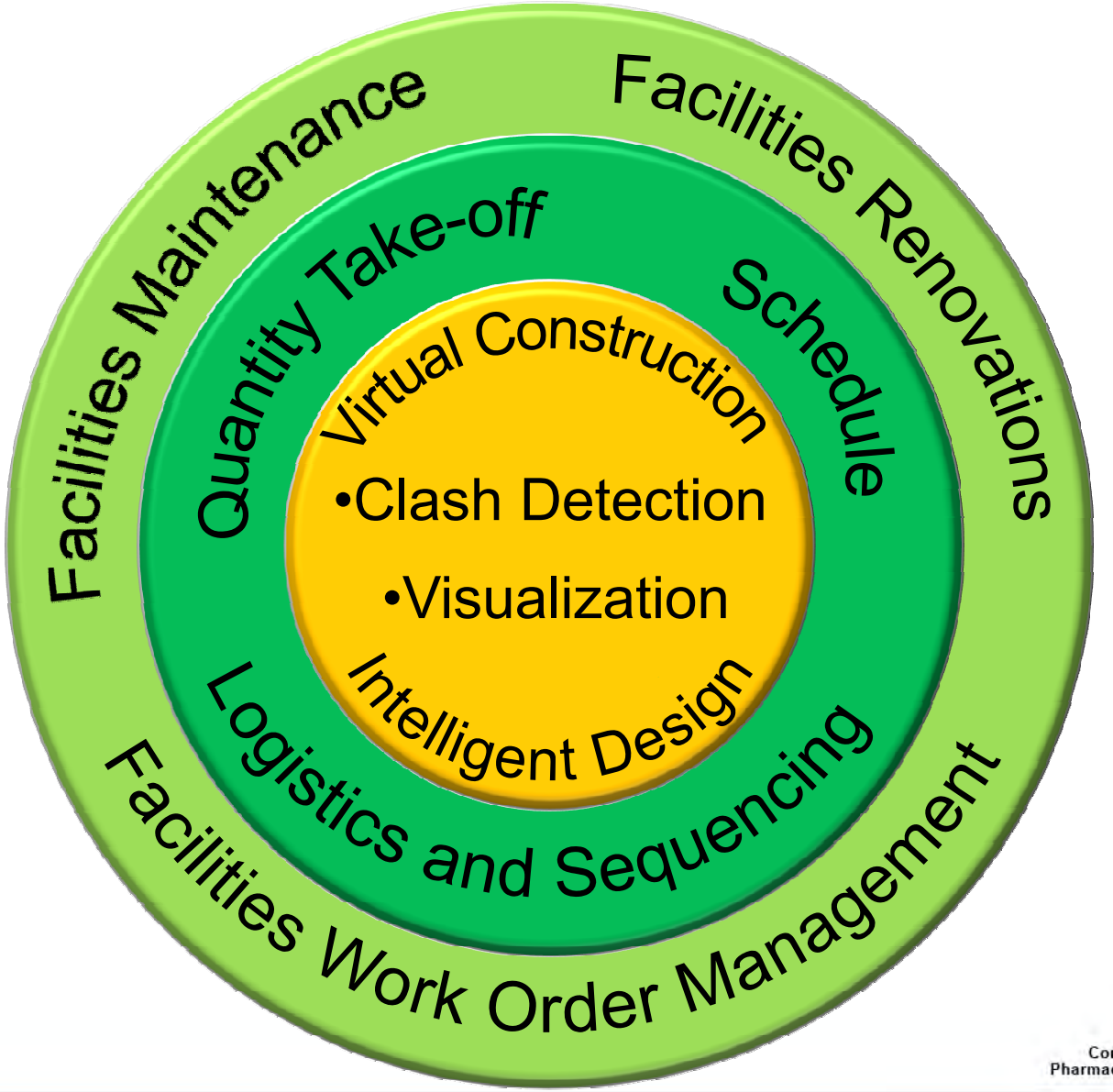
Campus BIM Vision at Project Inception

- Improve the user acceptance process through visualization
- Improve construction productivity
- Increase MEP coordination and clash detection
- Utilize the model for facility planning, operations and maintenance

Albert Sherman Center BIM Vision



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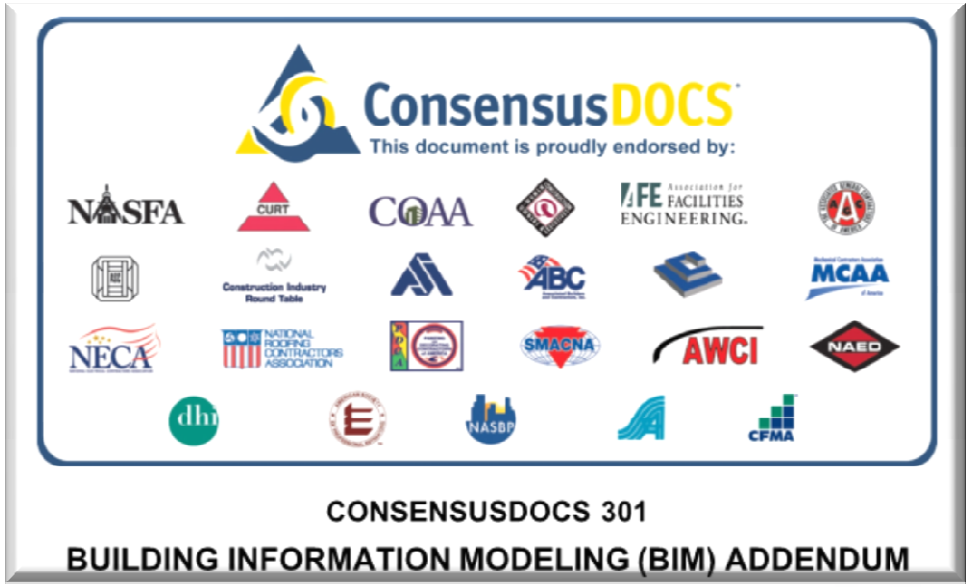
Managing BIM

- Team utilized a Consensus Docs 301 contract

- Creation of a BIM Execution plan with input from all parties



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Design Model Delivery Process

- Fast Track Using BIM
- Early Questions

- Model Size
- Contract Model vs. Construction Model
- Question of Single vs. Parallel?

Design Model Delivery Process

- Fast Track Using BIM
- Team Modeling

Design Model Delivery Process

- Fast Track Using BIM

- Design Models
  - Architecture
  - MEP/IT Core Shell
  - Structural
  - Lab and Kitchen
  - Site/Civil

Design Model Delivery Process

- Fast Track Using BIM

- 2-D Format
  - Fire Protection
  - A/V
  - Security
  - MEP Fit Out (late change)
  - Elevator

Design Model Delivery Process

- Fast Track Using BIM
- Proxy Development and Work Flow Issues
- Watch for hazards!

Design Model Delivery Process

- Fast Track Using BIM

- TOTAL :11 Design Models

- Fundamental Structure
  - Core Shell
  - Edu
  - Lab

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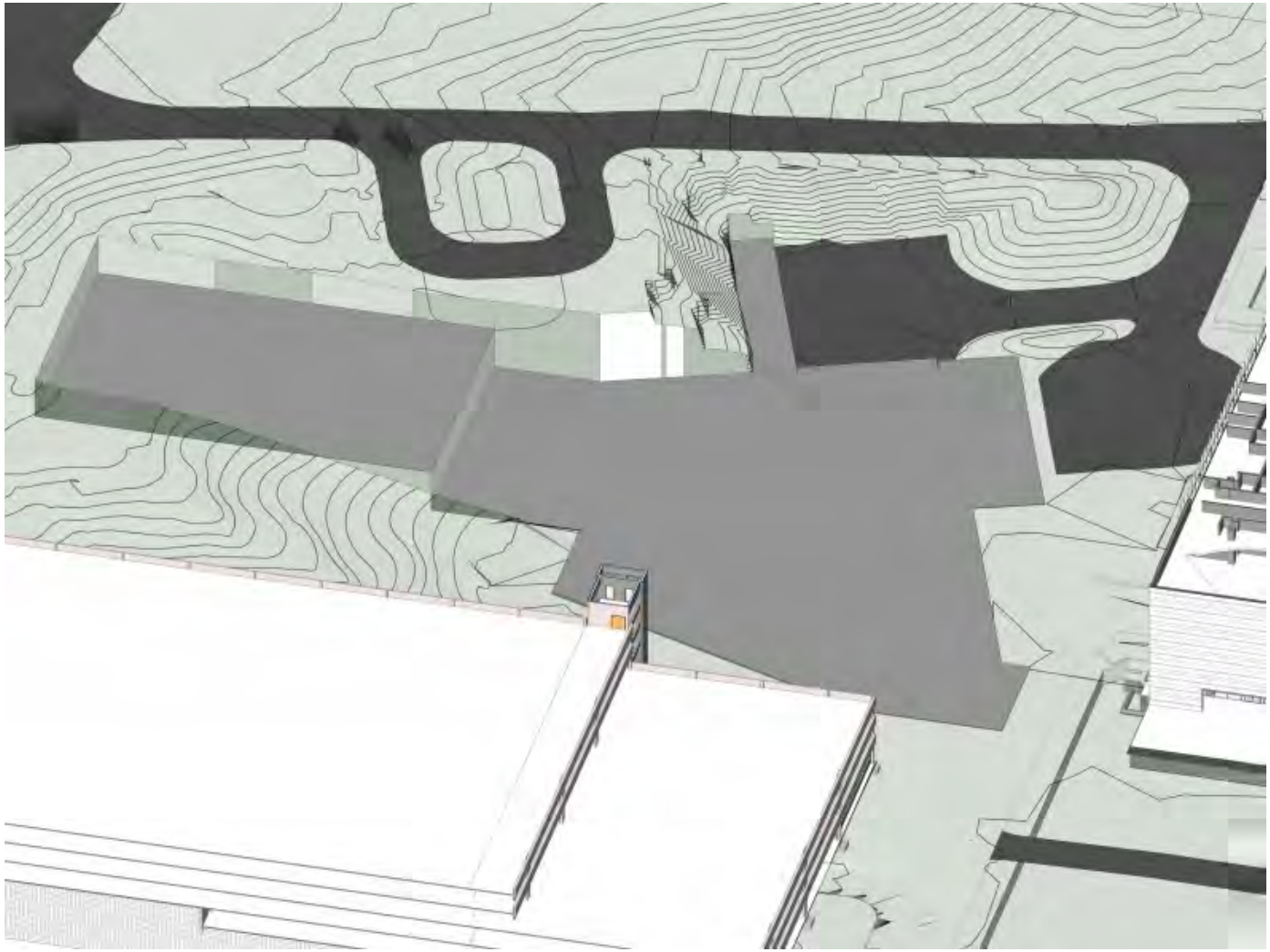
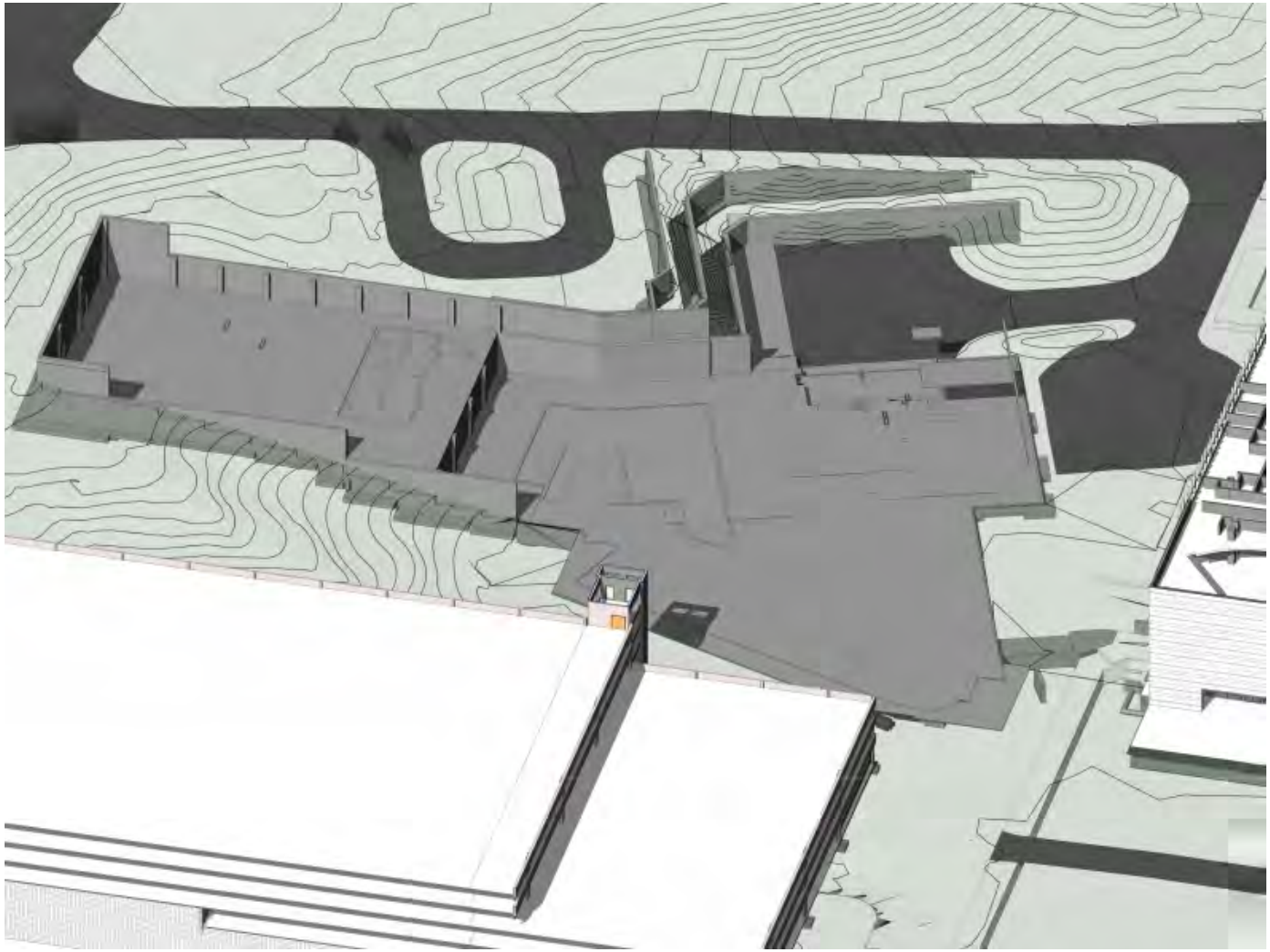
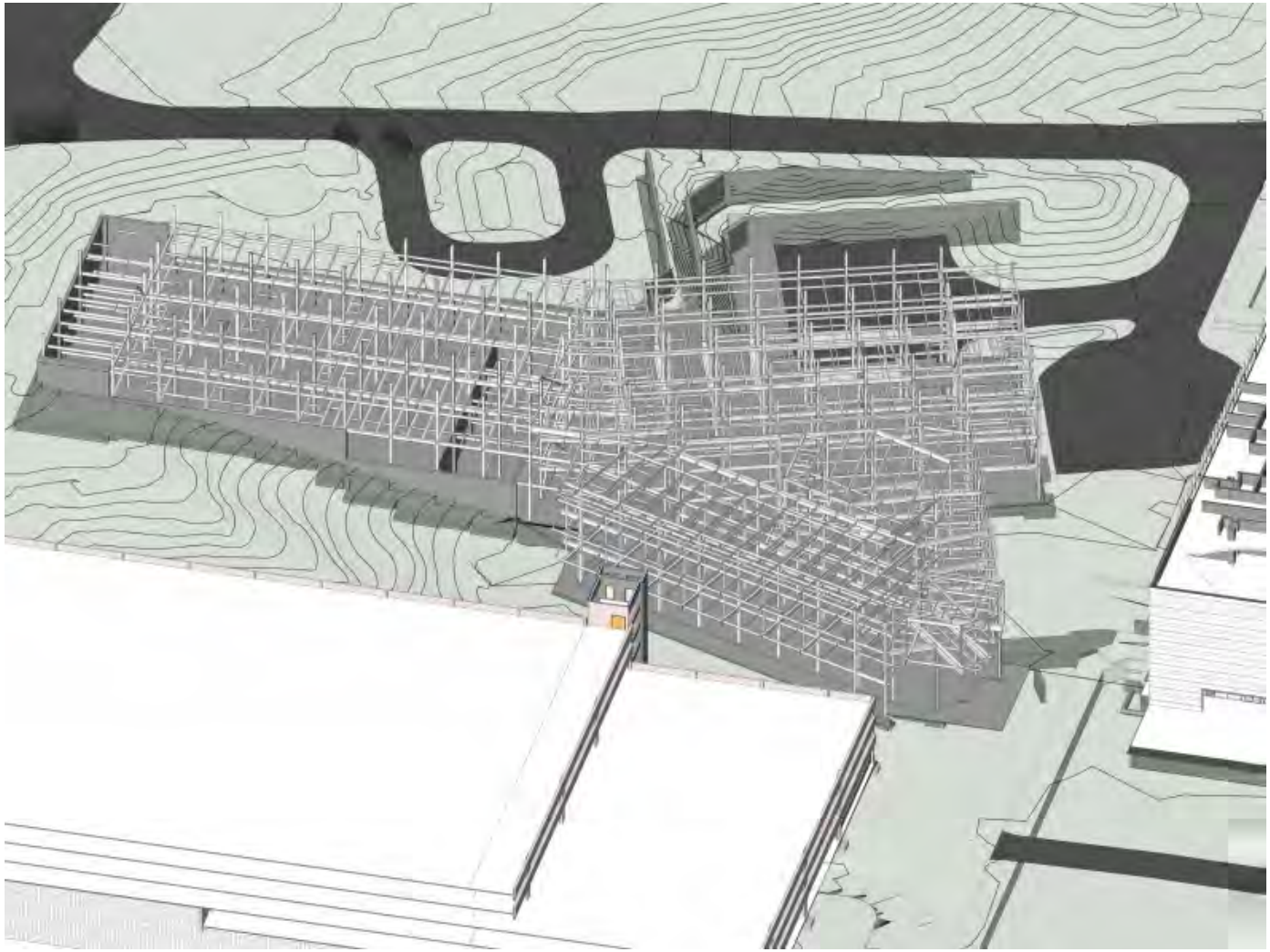
SITE PLANNING



CORE/SHELL



CORE/SHELL STEEL STRUCTURE



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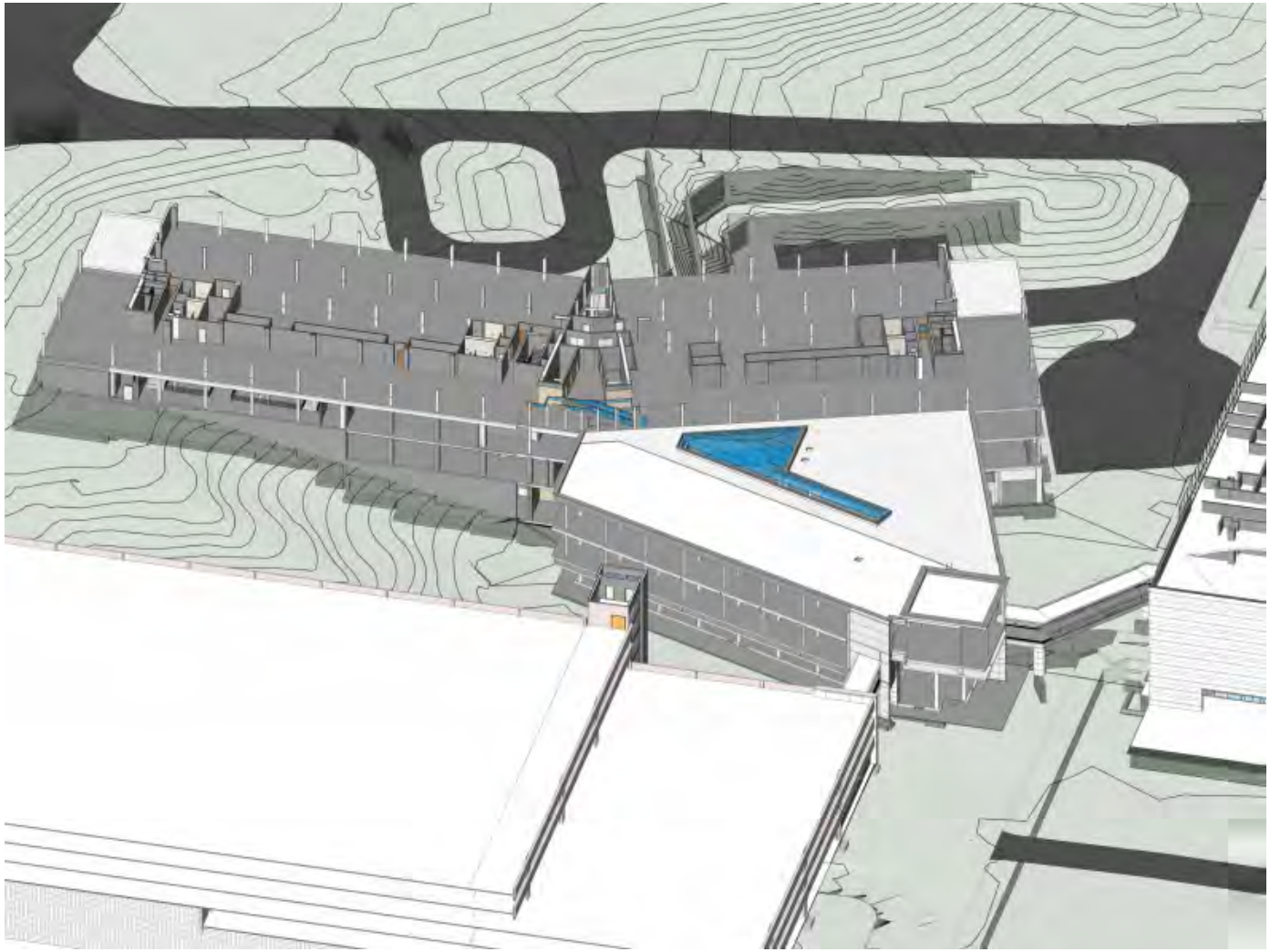

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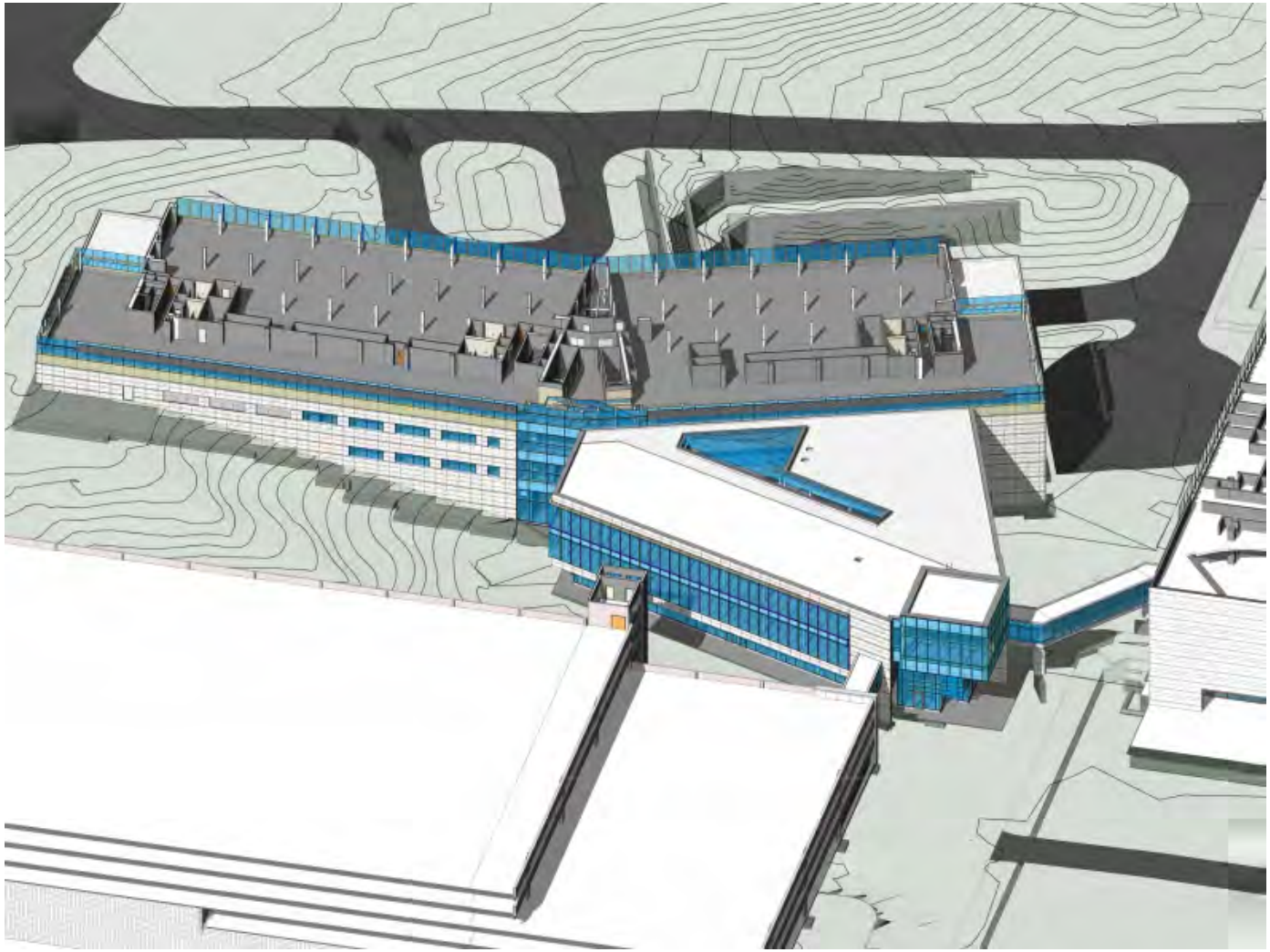
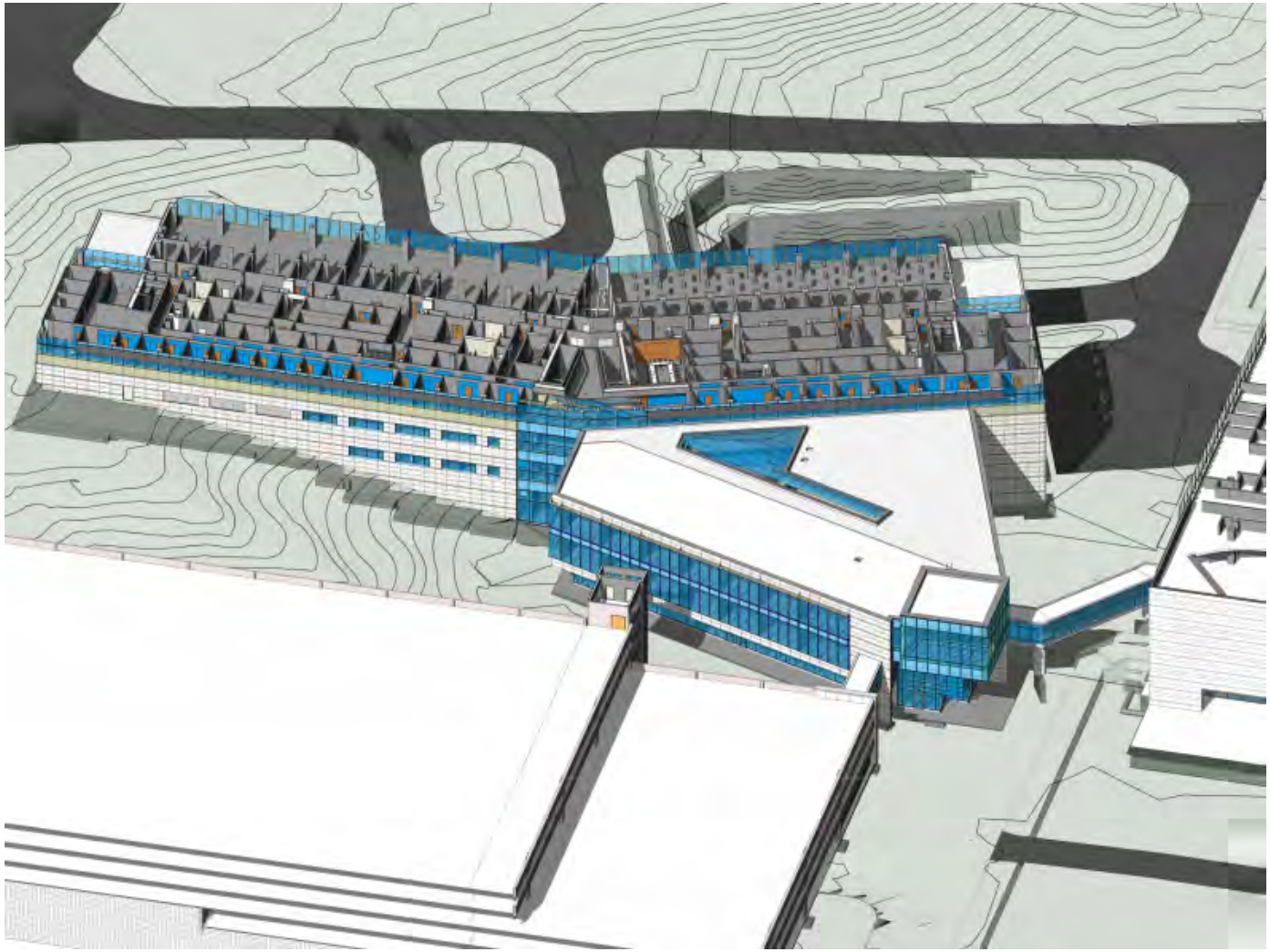
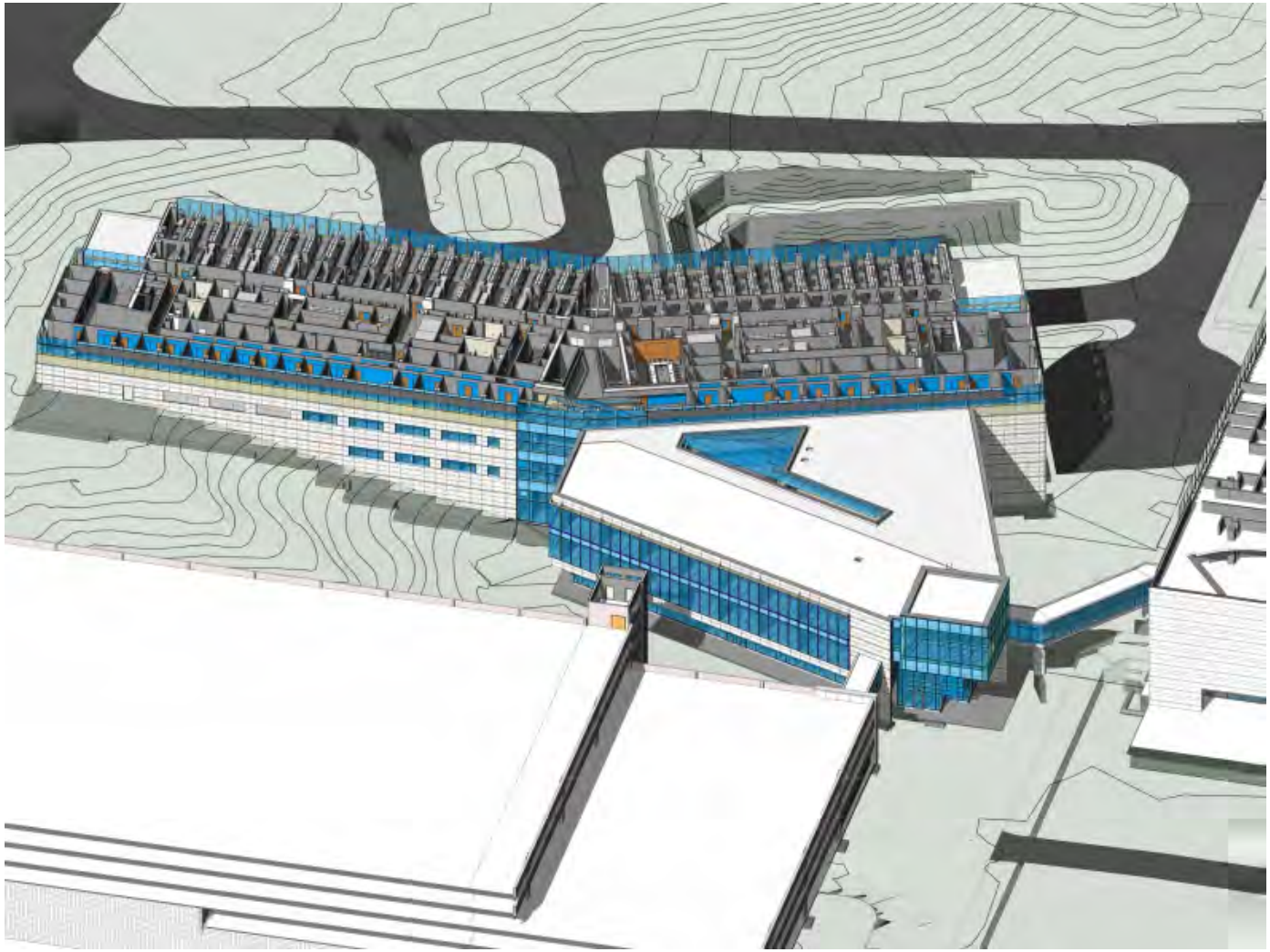


EDU



LABORATORY



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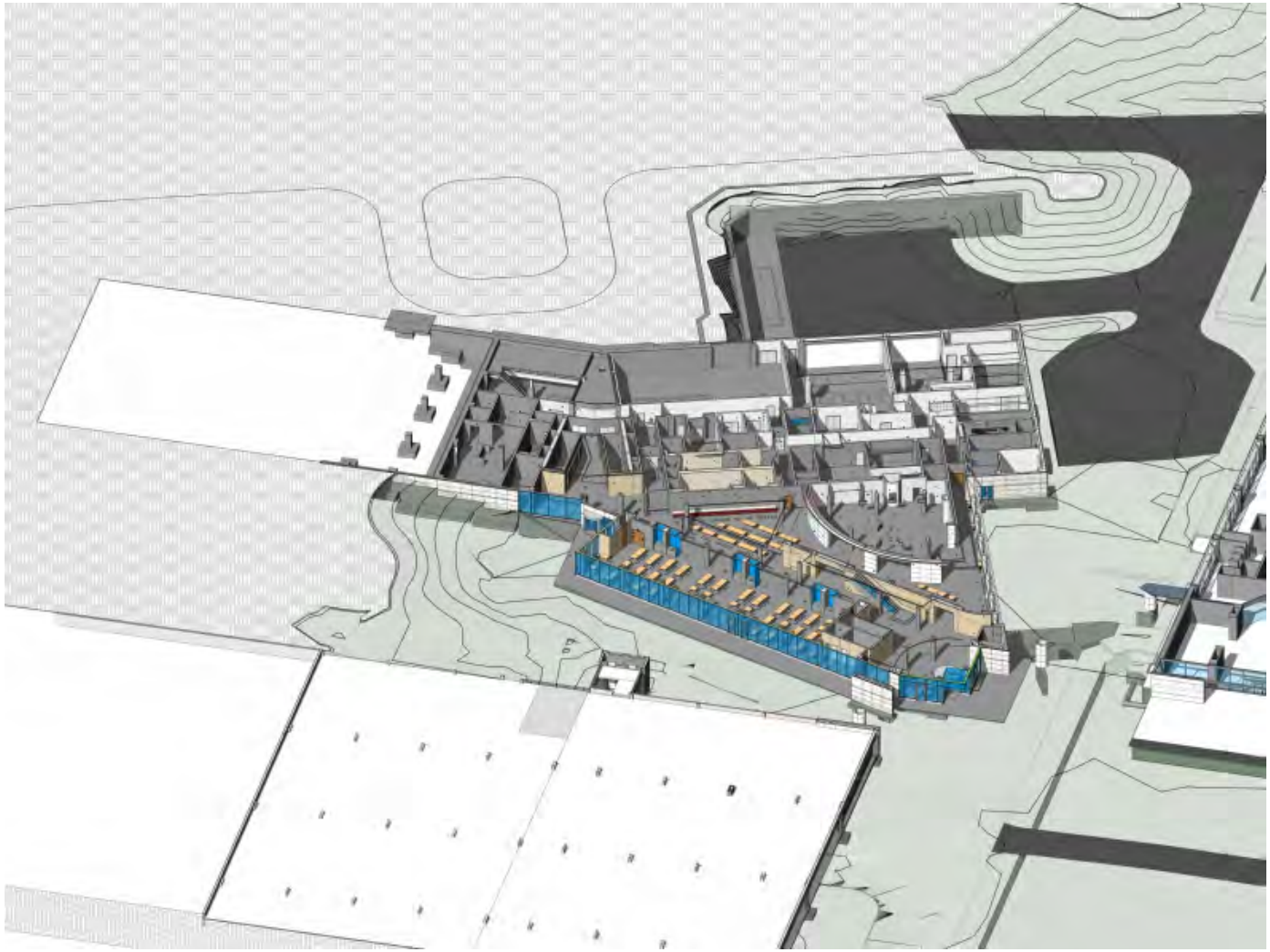
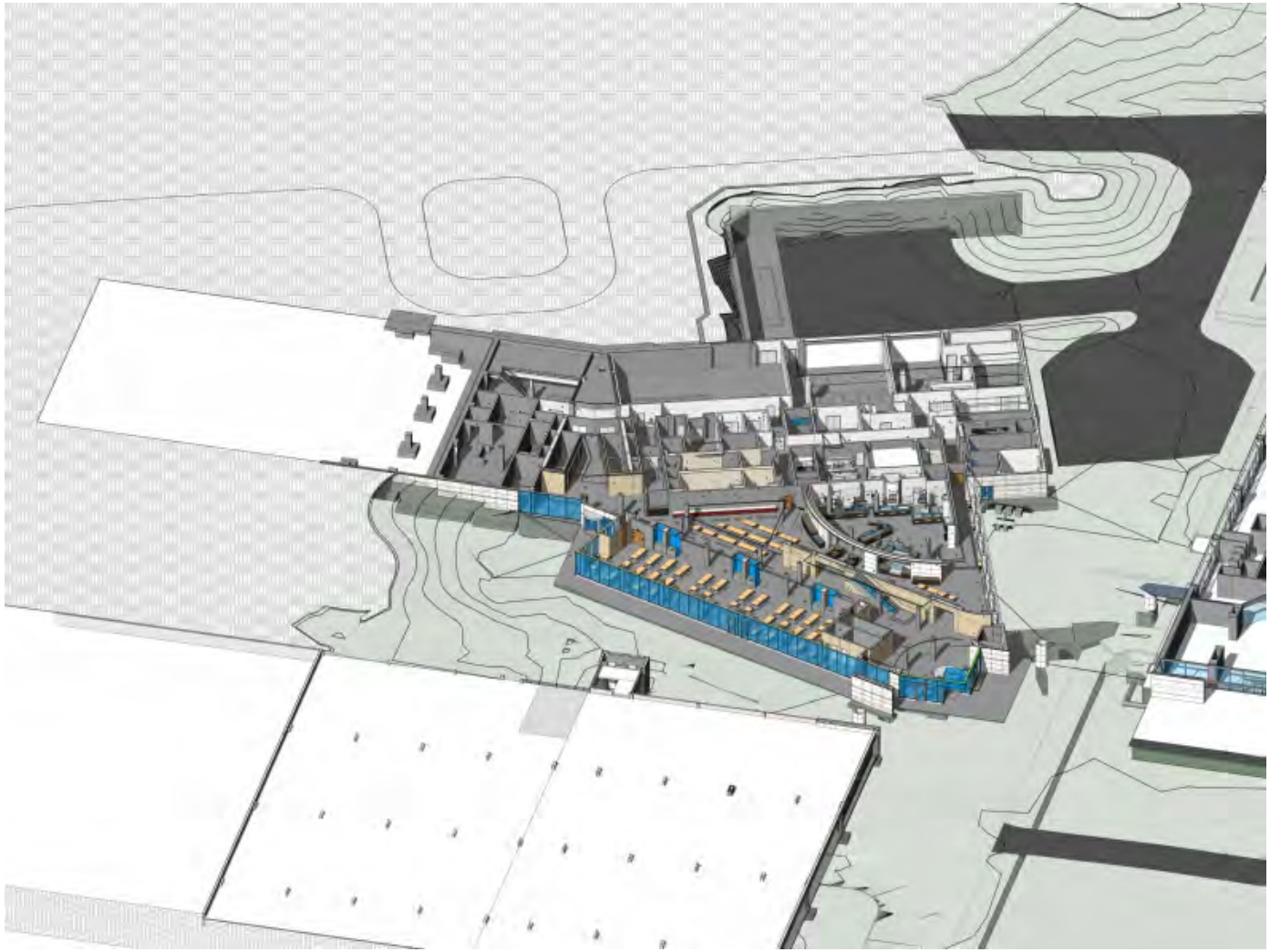


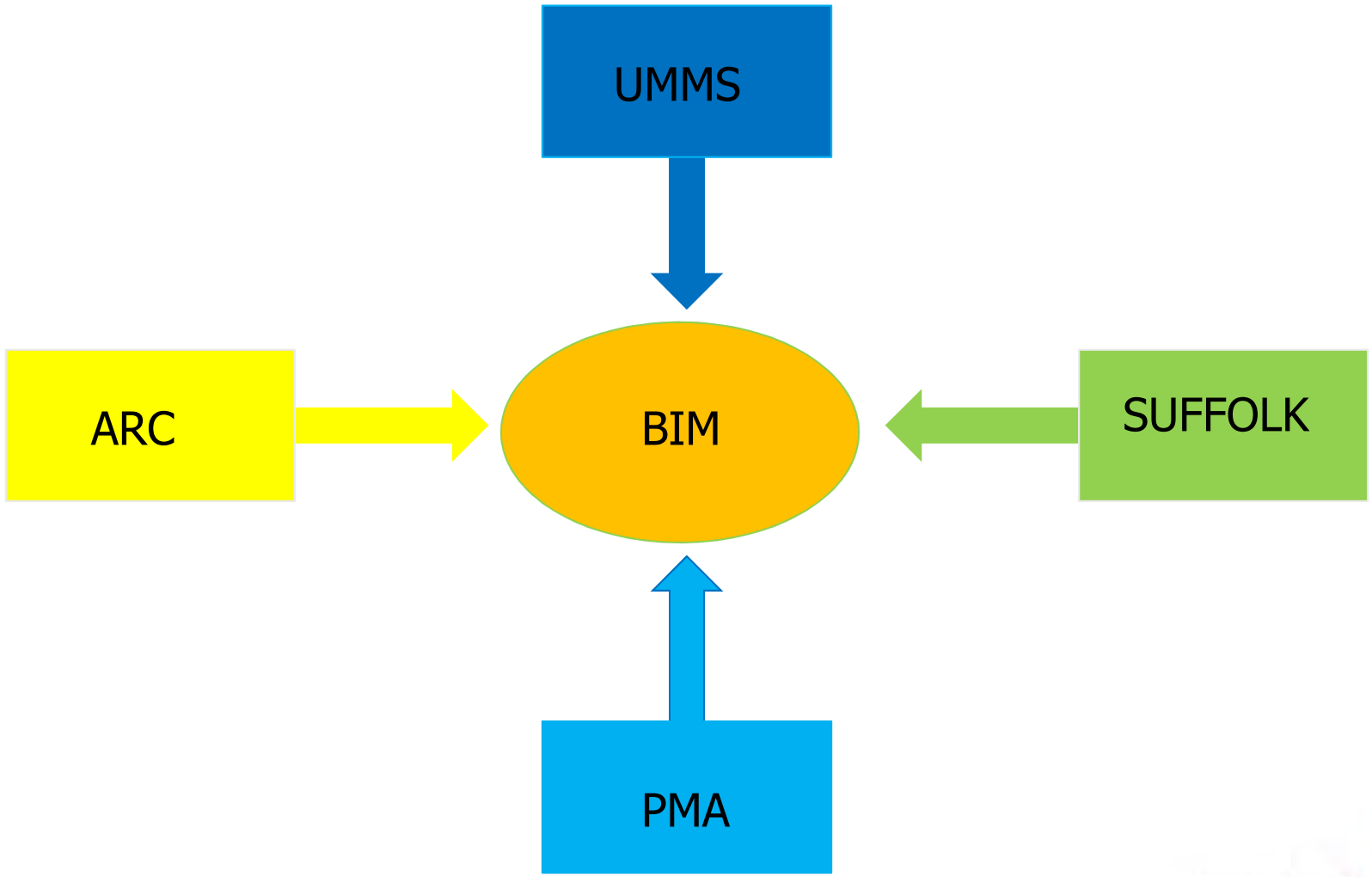
EDU



Joint Model Delivery Process

Single Phase Modeling	
Pro	Con
Seamless exchange of information	Legal vehicle
Consistency of design and construction	Design vs. construction needs
	Increased time for planning
	Conducive to fast track?

Joint Model Delivery Process



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Joint Model Delivery Process

Parallel Modeling	
Pro	Con
High level of quality control	Cost of 2 models (depending on contracts)
Less planning than Single Phase modeling	Increased need for coordination between Arch. and CM
Flexible relationship	
Less legal hurdles	

Joint Model Delivery Process

Single Phase vs. Parallel Modeling	
Single Phase	Parallel Modeling
Can be done in design/build or IPD model	Can be done in design/bid/build or CM at-risk
Requires Arch. and CM to model with same priorities	Arch. and CM each have a model
Model governs	2D drawings govern

Joint Model Delivery Process

- Defining contract limits
  - Who owns what?
  - What is a contract document?

- BIM Peer Review

3D to FM

- SCCI coordinated their parallel model in-house and with ARC
- Model was shared with subs as part of the bidding process
- Team began to focus on resolving UMMS FM concerns

UMMS Facility Resources

Achives
- As Builts
- Product Literature
- Ops Manuals

- **Building Management System**

- **Power Management System**

CMMS

- **Environmental Health and Safety**

Space Planning

- **Employee and Contract Services Training**

- **Security Systems**

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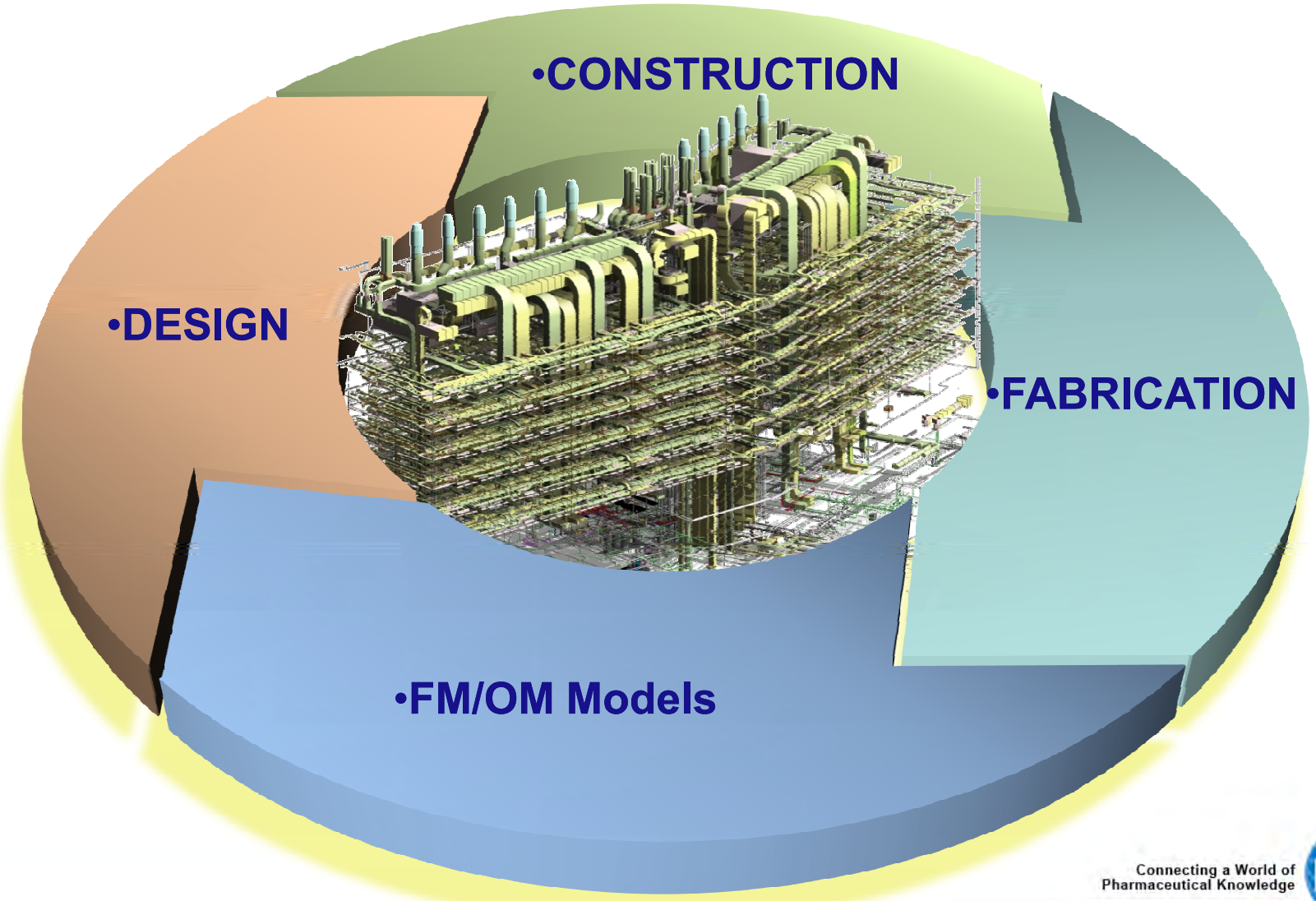
UMMS Facility Management

- Building inventory includes over 6 million square feet of space
  - Level One Trauma Hospital with 400 licensed beds
  - Over 350 wet lab researchers
  - Schools of Medicine, Biomedical Sciences and Nursing
- Co Generation power with 17.8MW electrical generation, 450,000pph steam production and 16,500 tons of chilled water production
- Computerized Maintenance Management System tracks
  - 20,500 pieces of equipment
  - 5,000 inventory parts
  - 130 buildings
- Essential accreditations include TJC, CMS, CDC/APHIS SAT, AAALAC, and LCME

UMMS 6D Considerations

- Full spatial as-built
- Design and actual capacity of systems – auto updates for design changes
- Asset tagging
- Ability to isolate a system for review
- Database of building information linked to a model
- Building Management System link

Beginning With the End in Mind



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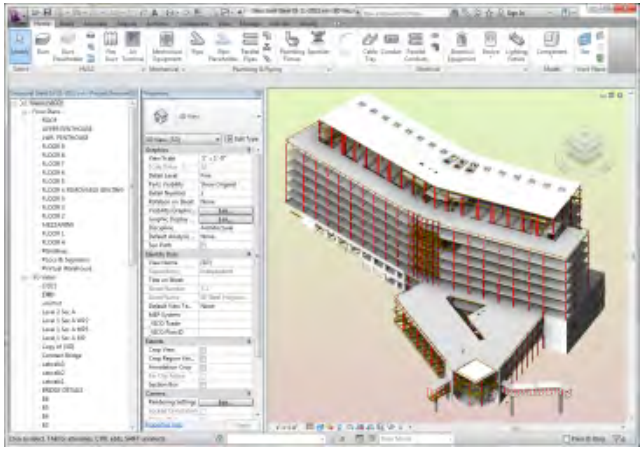
The Facilities Management BIM Model

Suffolk's 6D Definition…a model created for the long term maintenance and cost effective management of a building's life cycle.

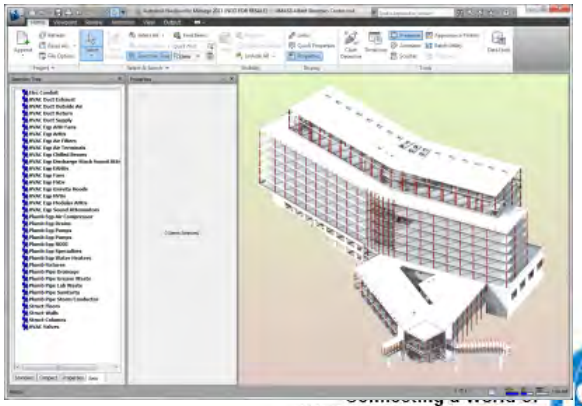
Suffolk's 6D Deliverable



Design Modeling Software

Virtual Document

Clash Detection/Maintenance

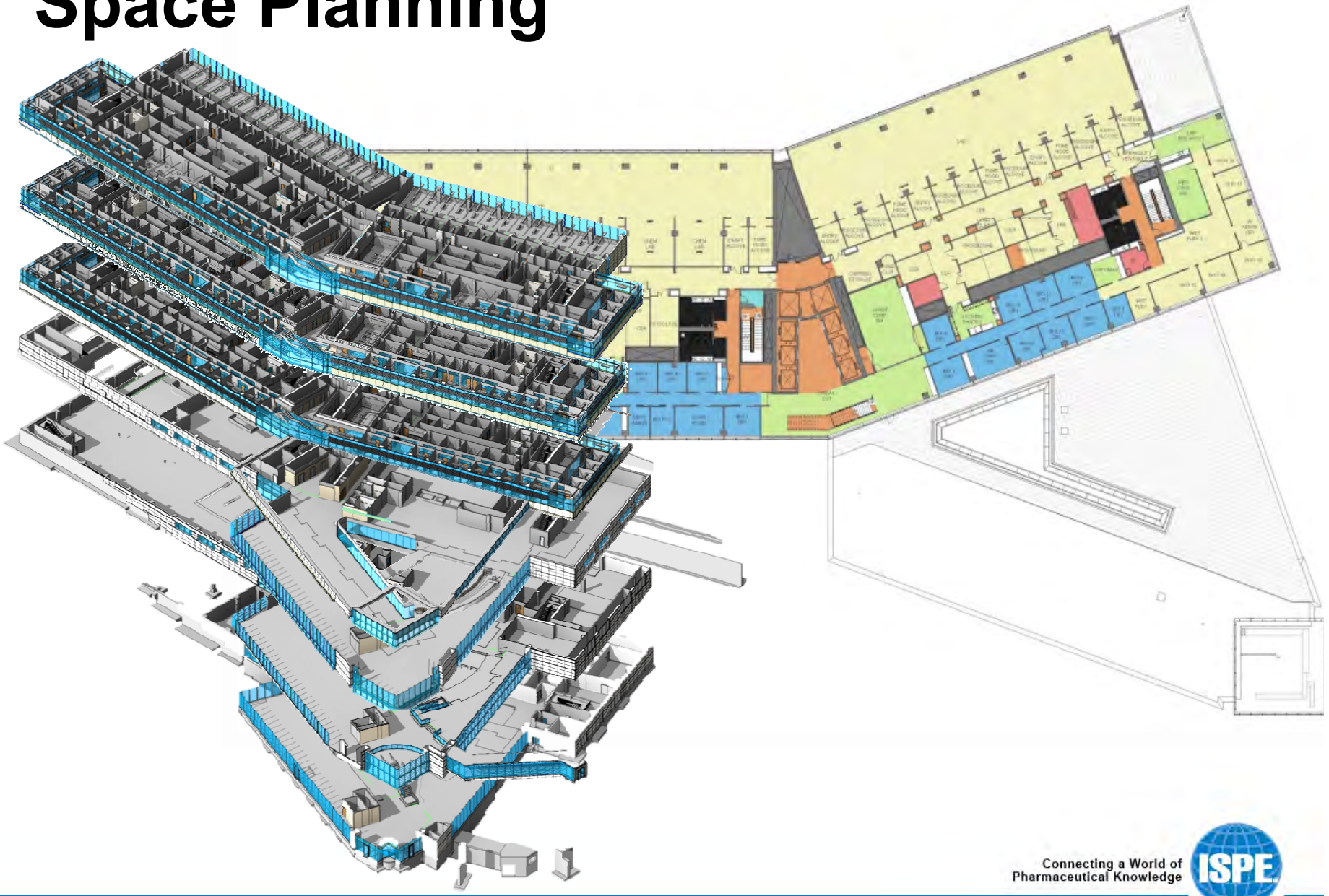


Pharmaceutical Knowledge

Architectural Benefits

- Space Planning and Management
- Area Analysis
- Asset Management

Space Planning



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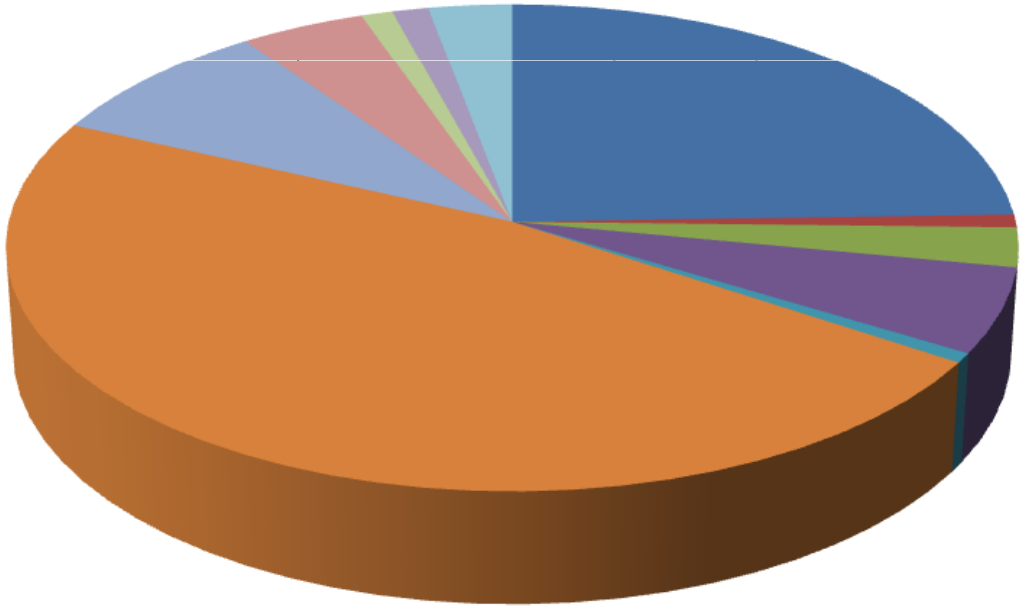
Area Analysis

SPACE SCHEDULE

LEVEL	NUMBER	NAME	AREA	TYPE
2nd Level	270E	ELEC	186 SF	Electrical/Mechanical
2nd Level	234E	ELECTRIC	211 SF	Electrical/Mechanical
2nd Level	281D	ELECTRON MICRO	134 SF	<Building>
2nd Level	217	ENG-LAB IRVINE	1731 SF	Laboratory - Office
2nd Level	221	ENG-LAB MANALIS	1393 SF	Laboratory - Office
2nd Level	291	ENG-WITTRUP	1389 SF	Laboratory - Office
2nd Level	287	ENG-WITTRUP	532 SF	Laboratory - Office
2nd Level	232A	EQUIPMENT	276 SF	Electrical/Mechanical
2nd Level	221B	EQUIPMENT	266 SF	Electrical/Mechanical
2nd Level	223	EQUIPMENT	855 SF	Electrical/Mechanical
2nd Level	246	EQUIPMENT ROOM	196 SF	Electrical/Mechanical
2nd Level	261F	FELLOW	92 SF	<Building>



/Multipurpose

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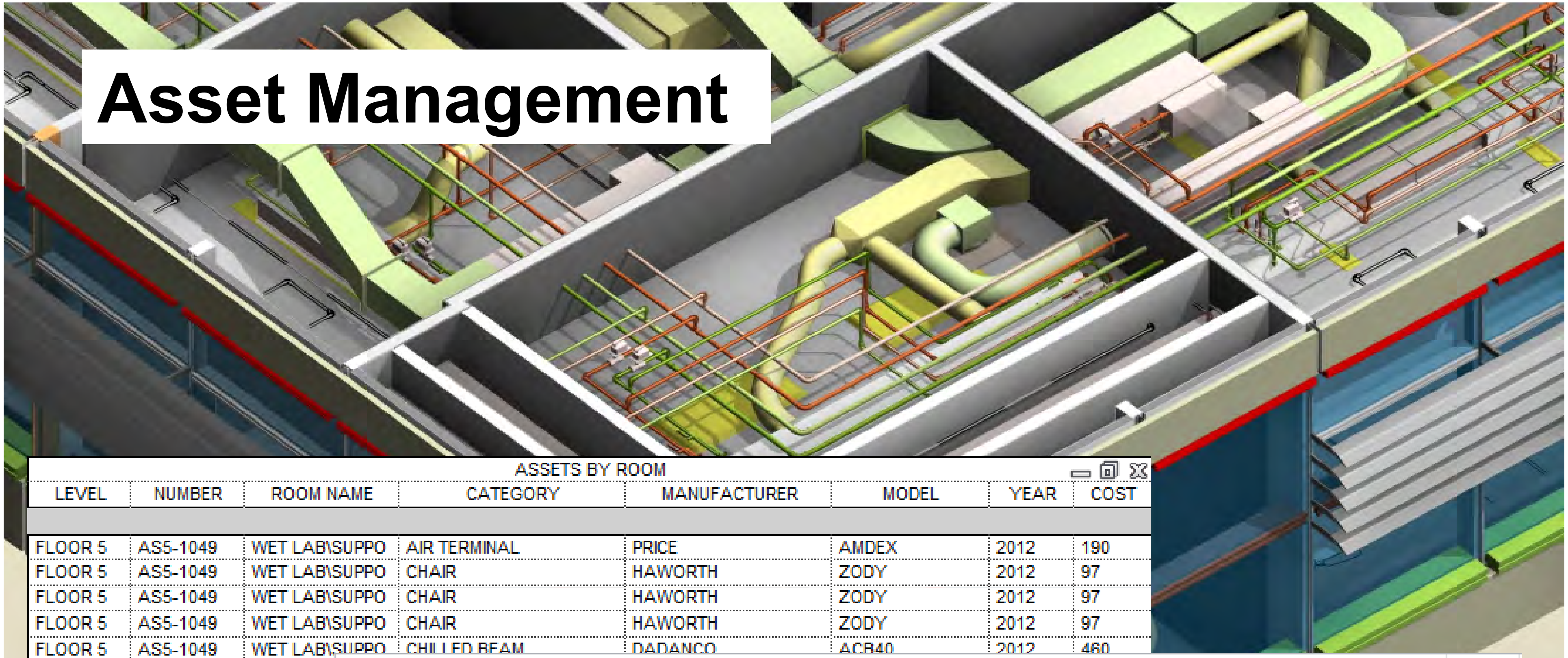
Asset Management



ASSETS BY ROOM

LEVEL	NUMBER	ROOM NAME	CATEGORY	MANUFACTURER	MODEL	YEAR	COST
FLOOR 5	AS5-1049	WET LAB\SUPPO	AIR TERMINAL	PRICE	AMDEX	2012	190
FLOOR 5	AS5-1049	WET LAB\SUPPO	CHAIR	HAWORTH	ZODY	2012	97
FLOOR 5	AS5-1049	WET LAB\SUPPO	CHAIR	HAWORTH	ZODY	2012	97
FLOOR 5	AS5-1049	WET LAB\SUPPO	CHAIR	HAWORTH	ZODY	2012	97
FLOOR 5	AS5-1049	WET LAB\SUPPO	CHILLED BEAM	DADANCO	ACB40	2012	460
FLOOR 5	AS5-1049	WET LAB\					
FLOOR 5	AS5-1049	WET LAB\					
FLOOR 5	AS5-1049	WET LAB\					
FLOOR 5	AS5-1049	WET LAB\					
FLOOR 5	AS5-1049	WET LAB\					

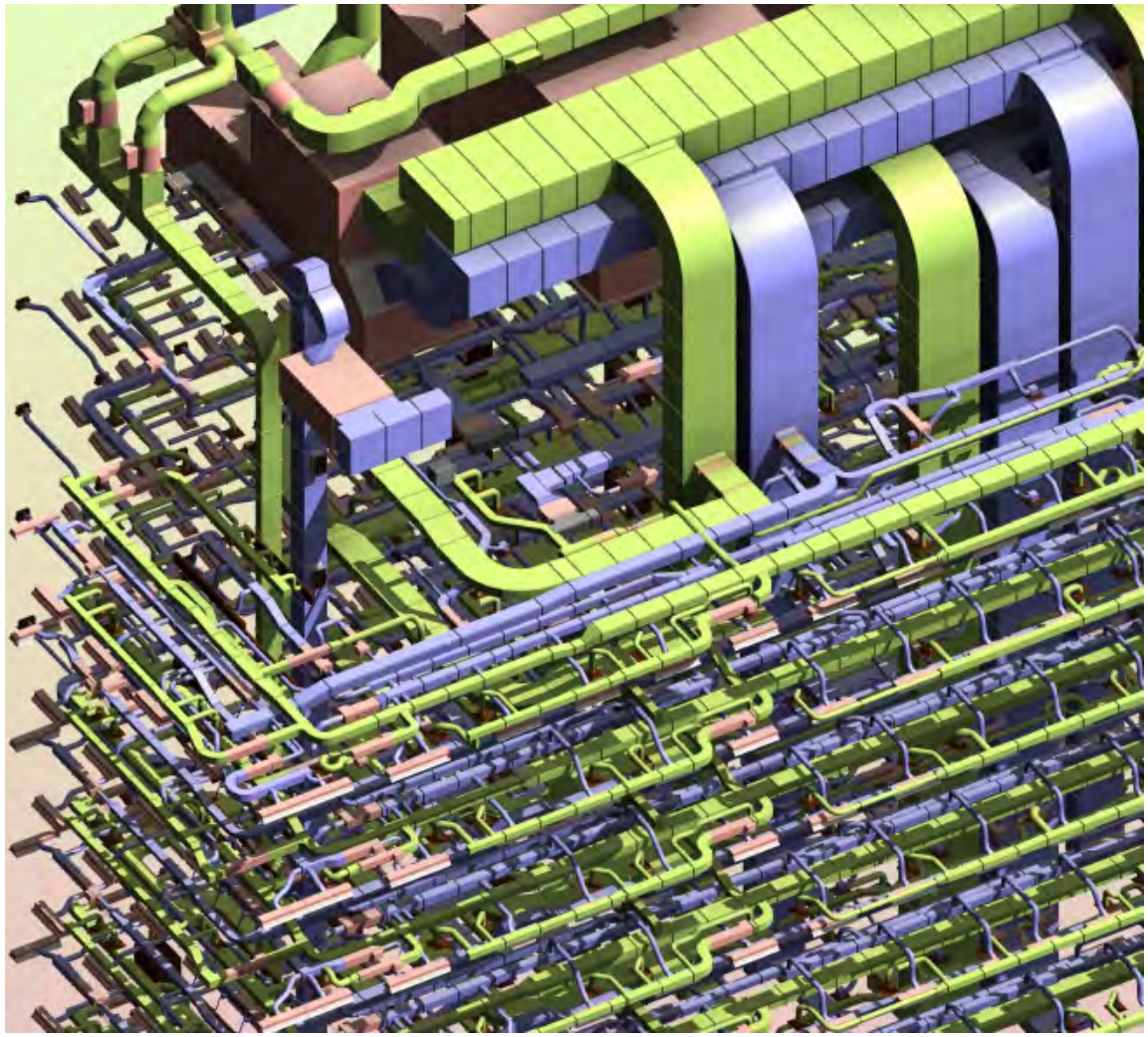
AMORTIZATION SCHEDULE

									PAYMENTS TO FUND			
LEVEL	NUMBER	ROOM NAME	CATEGORY	MANUFACTURER	MODEL	YEAR	COST	REPL. COST	2013	2014	2015	2016
FLOOR 5	AS5-1049	WET LAB\SUPPORT	AIR TERMINAL	PRICE	AMDEX	2012	$190	$247	$41	$41	$41	$41
FLOOR 5	AS5-1049	WET LAB\SUPPORT	CHAIR	HAWORTH	ZODY	2012	$97	$126	$21	$21	$21	$21
FLOOR 5	AS5-1049	WET LAB\SUPPORT	CHAIR	HAWORTH	ZODY	2012	$97	$126	$21	$21	$21	$21
FLOOR 5	AS5-1049	WET LAB\SUPPORT	CHAIR	HAWORTH	ZODY	2012	$97	$126	$21	$21	$21	$21
FLOOR 5	AS5-1049	WET LAB\SUPPORT	CHILLED BEAM	DADANCO	ACB40	2012	$460	$598	$100	$100	$100	$100
FLOOR 5	AS5-1049	WET LAB\SUPPORT	CHILLED BEAM	DADANCO	ACB40	2012	$460	$598	$100	$100	$100	$100
FLOOR 5	AS5-1049	WET LAB\SUPPORT	LIGHTING	LITHONIA	SP8 2' X 4'	2012	$210	$273	$46	$46	$46	$46
FLOOR 5	AS5-1049	WET LAB\SUPPORT	LIGHTING	LITHONIA	SP8 2' X 4'	2012	$210	$273	$46	$46	$46	$46
FLOOR 5	AS5-1049	WET LAB\SUPPORT	TABLE	HAWORTH	36"	2012	$300	$390	$65	$65	$65	$65
FLOOR 5	AS5-1049	WET LAB\SUPPORT	WORKSTATION	DELL	DIMENSIC	2012	$1,800	$2,340	$1,170	$1,170		
FLOOR 5	AS5-1050	WET LAB\SUPPORT	LIGHTING	LITHONIA	ES8P 1X4	2012	$210	$273	$46	$46	$46	$46
FLOOR 5	AS5-1050	WET LAB\SUPPORT	LIGHTING	LITHONIA	ES8P 1X4	2012	$210	$273	$46	$46	$46	$46
FLOOR 5	AS5-1050	WET LAB\SUPPORT	LIGHTING	LITHONIA	ES8P 1X4	2012	$210	$273	$46	$46	$46	$46
FLOOR 5	AS5-1050	WET LAB\SUPPORT	LIGHTING	LITHONIA	ES8P 1X4	2012	$210	$273	$46	$46	$46	$46
							TOTAL PAYMENTS		$1,812	$1,812	$642	$642

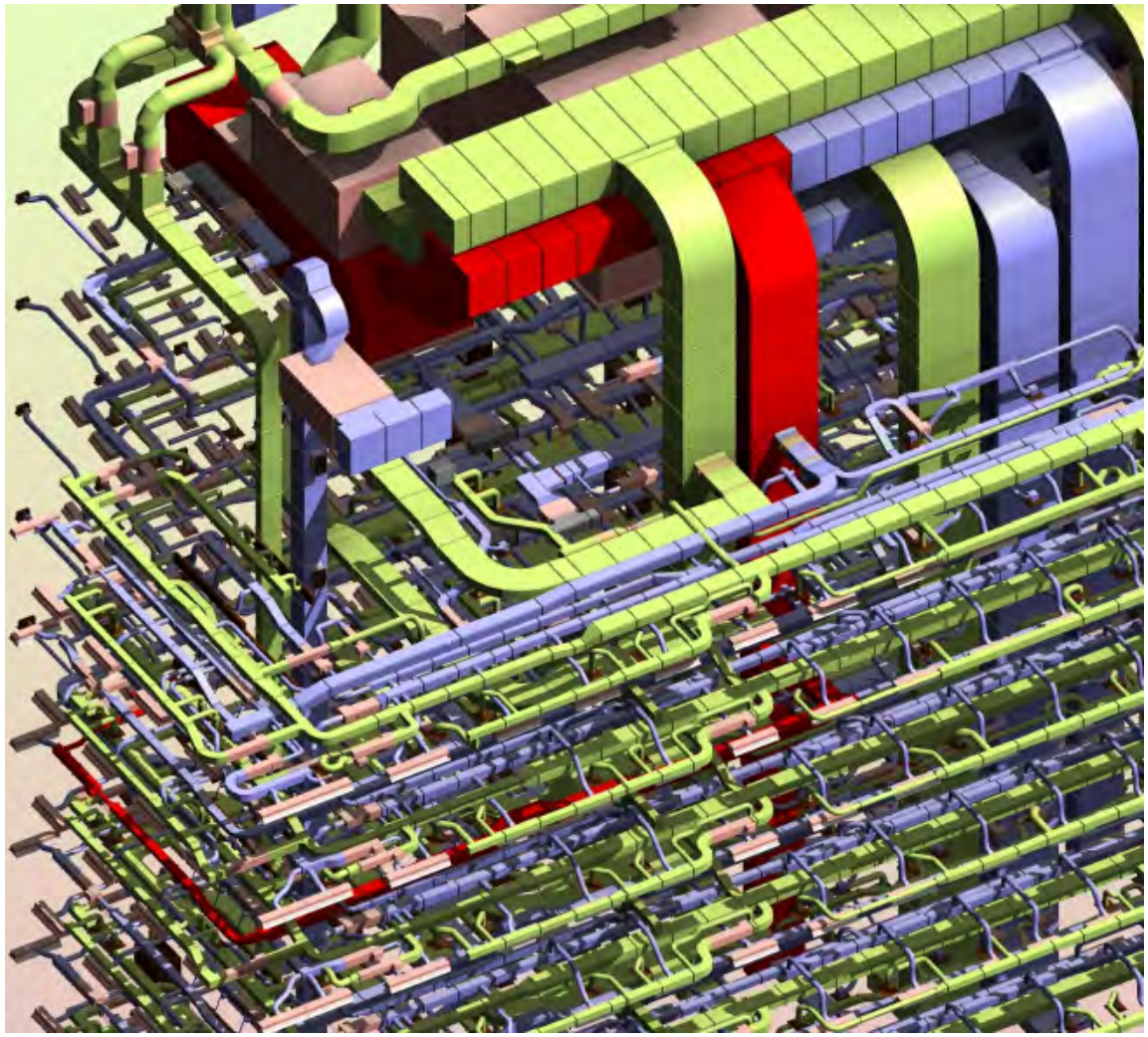
HVAC System Benefits

- Balanced Air Flow Data
- Balanced Water Flow Data
- System Identification
- Capacity Testing (“What If” Scenarios)
- Barcode Data for Equipment

HVAC Ductwork



HVAC Ductwork Air Flow



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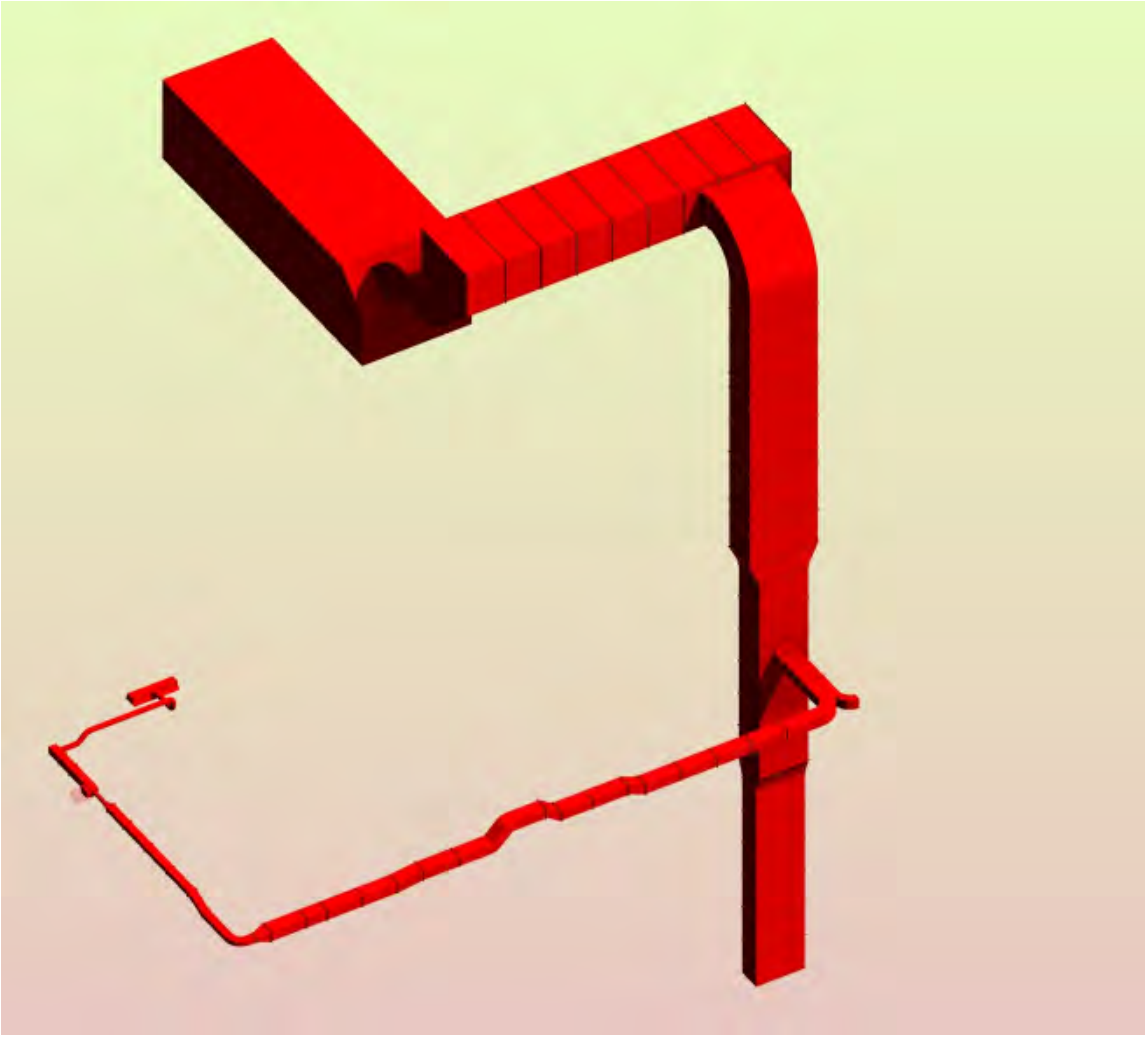
Understanding a Balanced Air system



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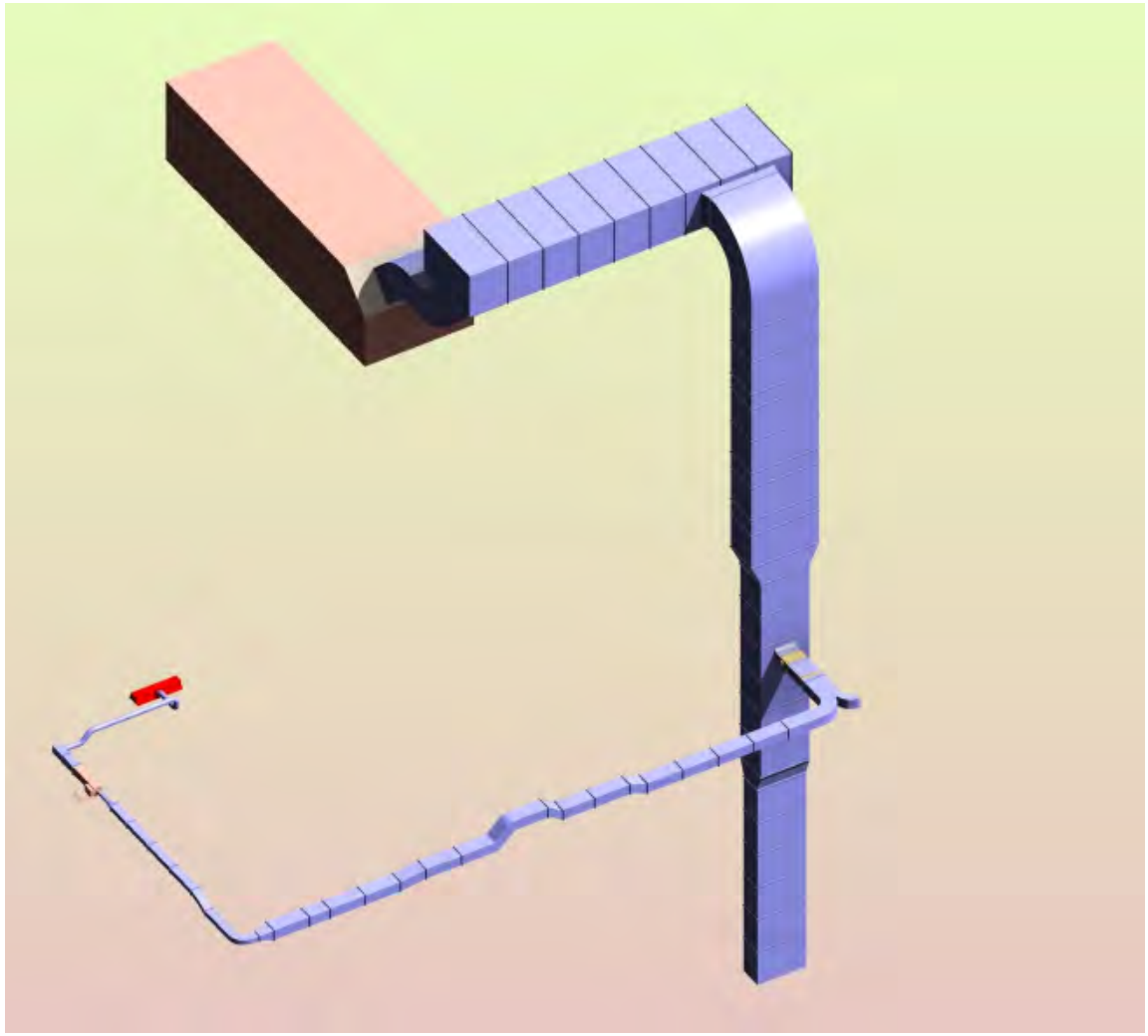
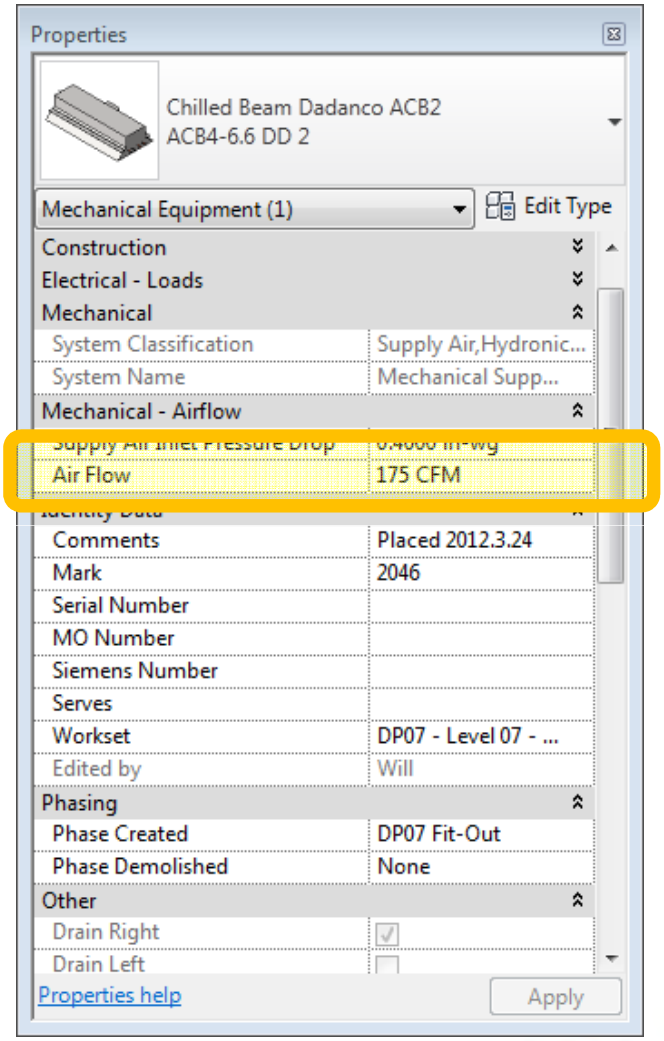
Understanding Air Flow





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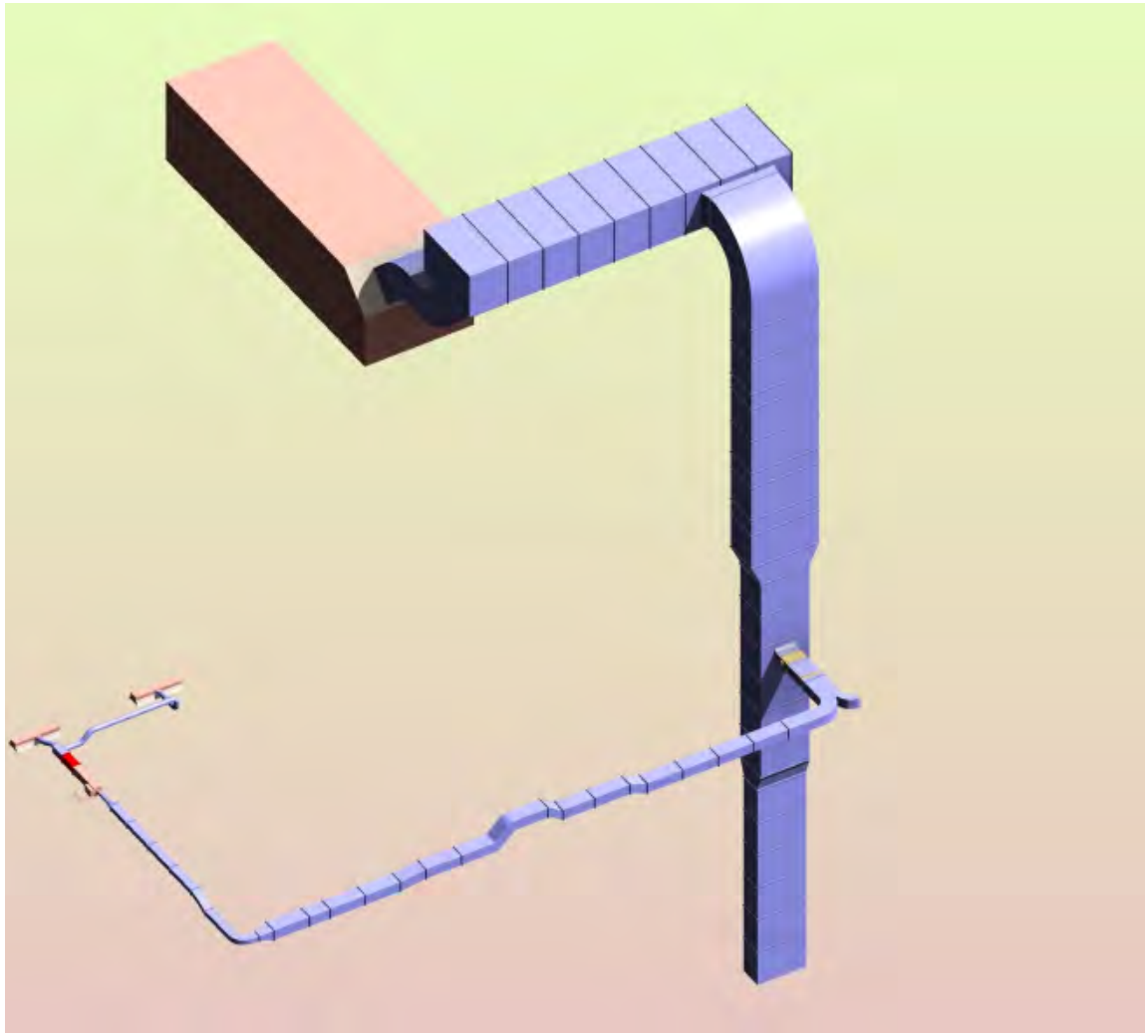
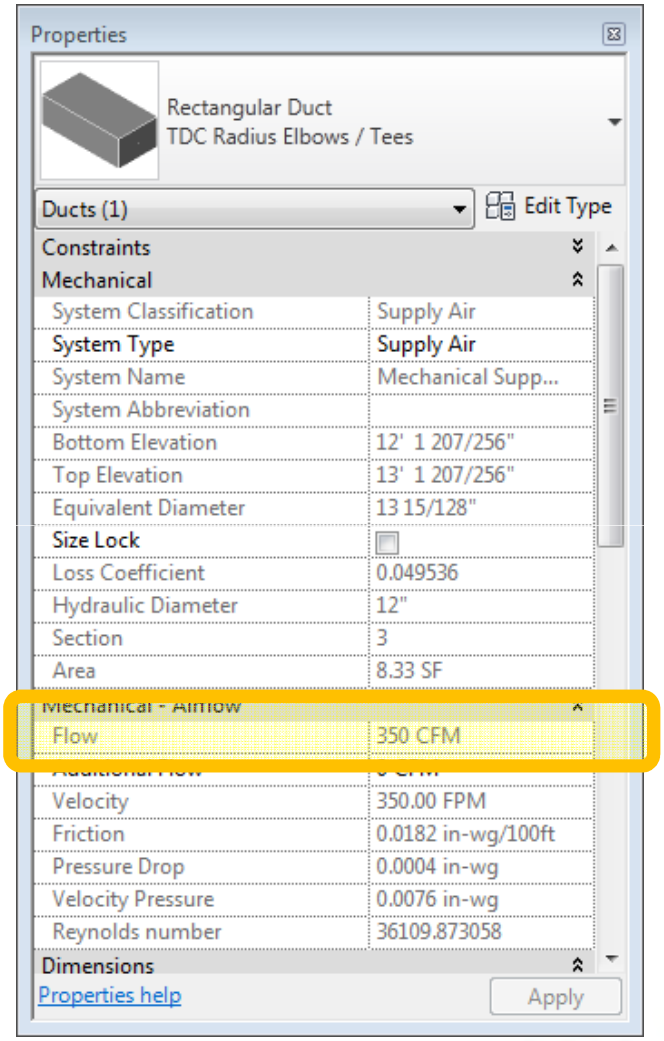
Understanding Air Flow





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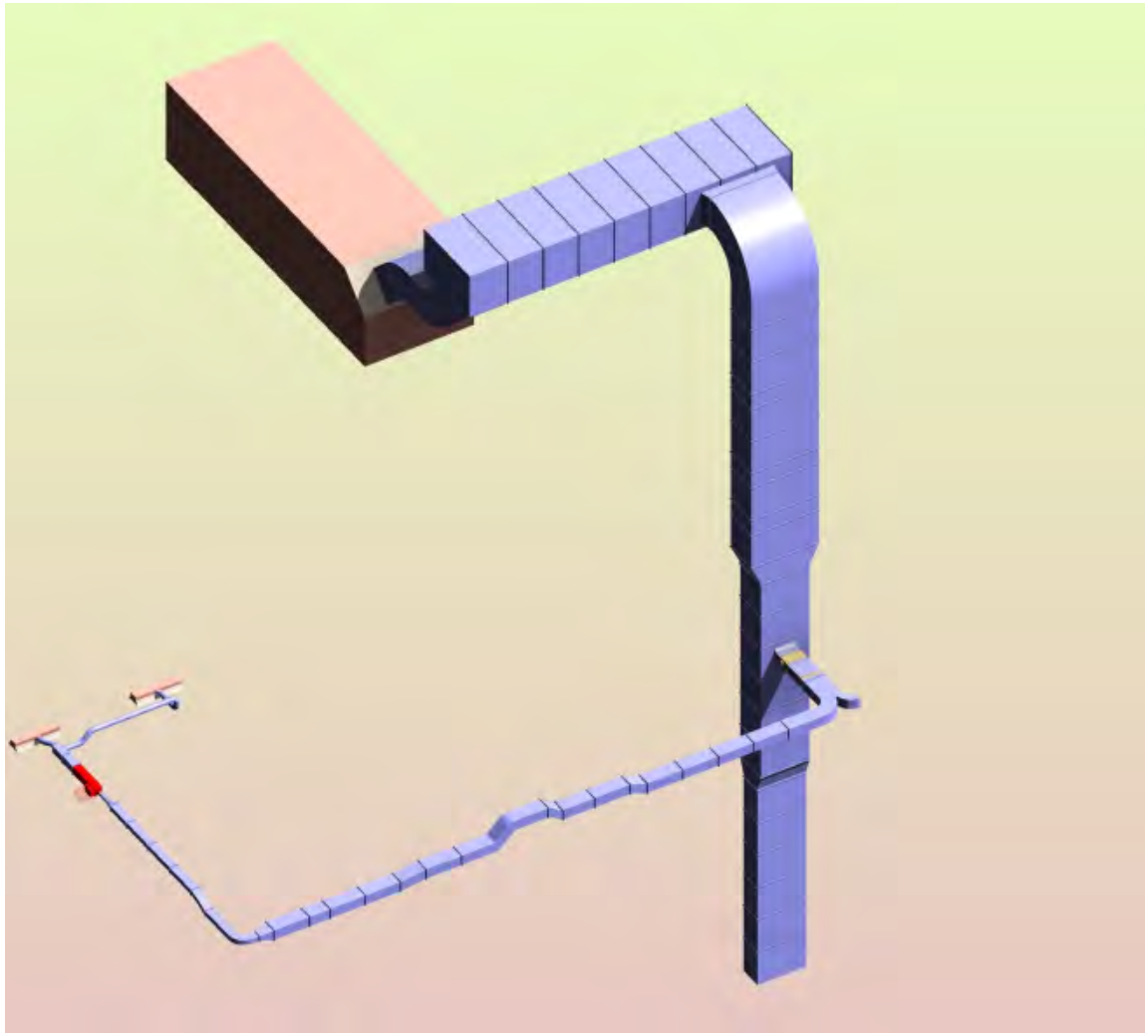
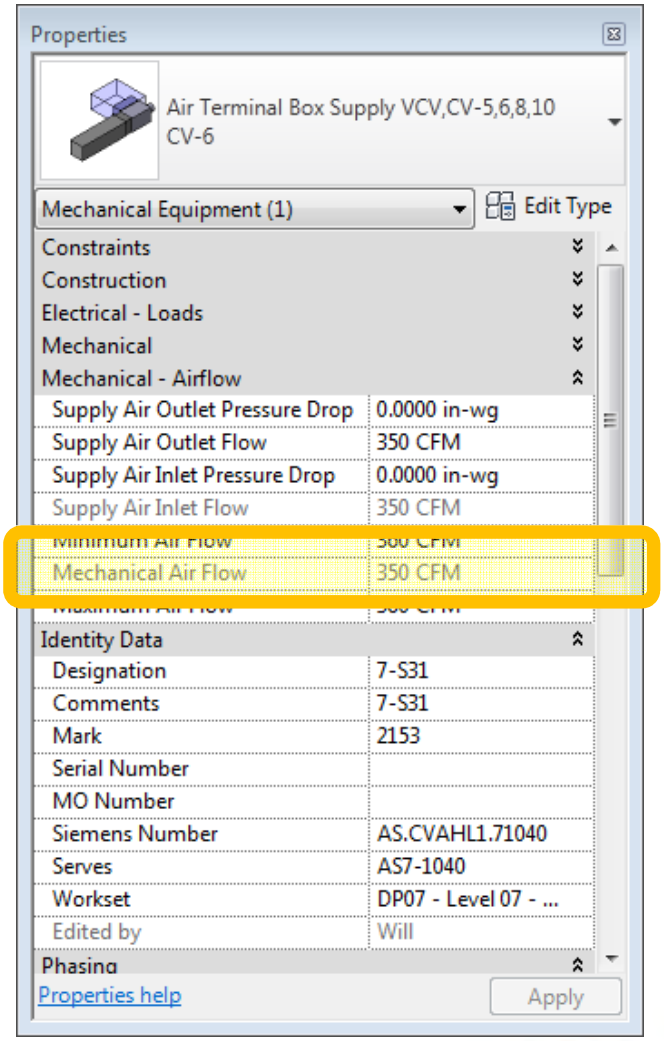
Understanding Air Flow





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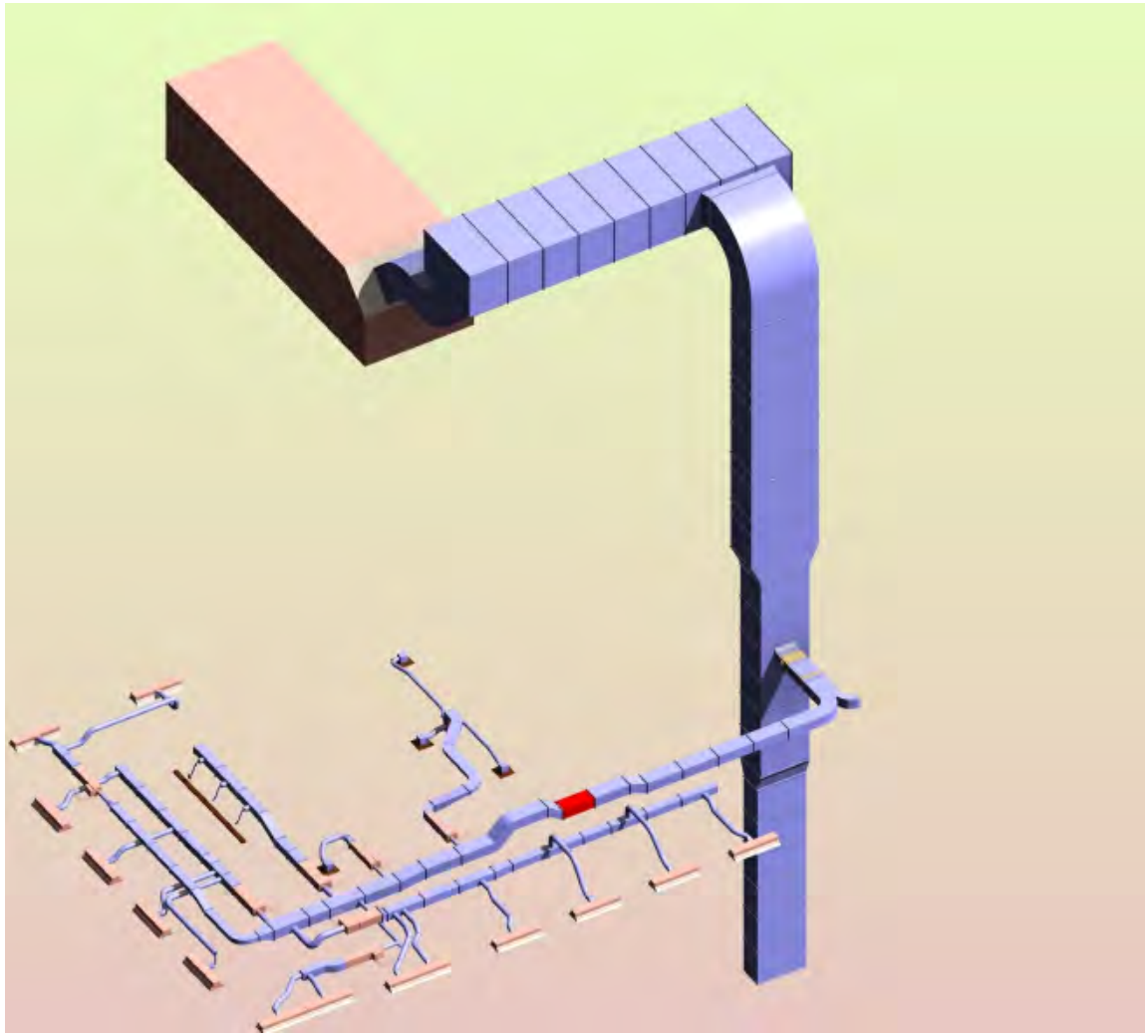
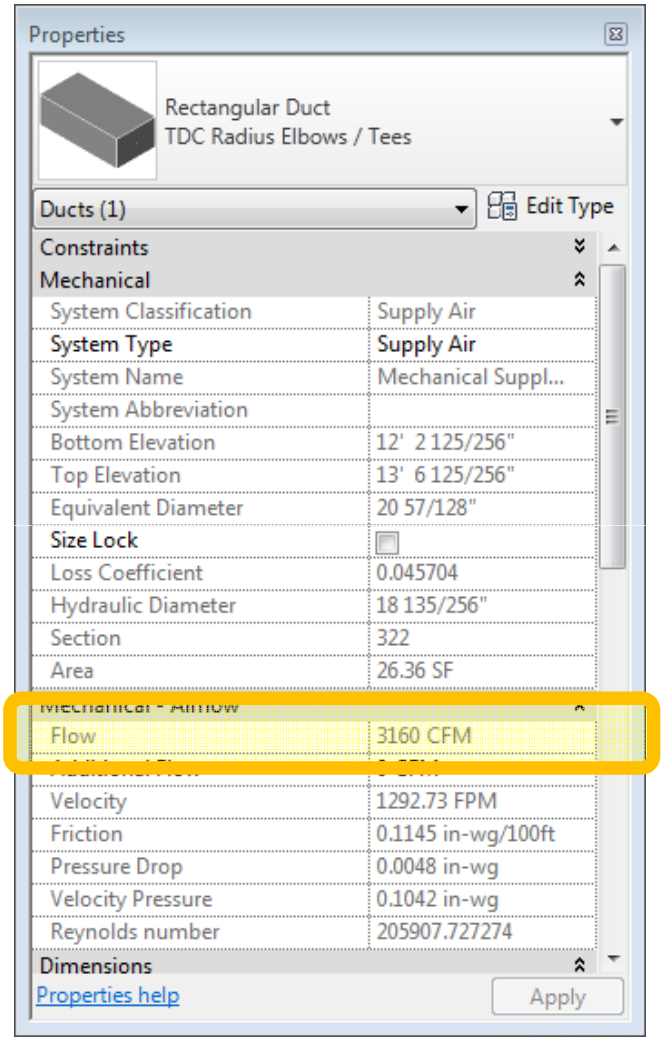
Understanding Air Flow





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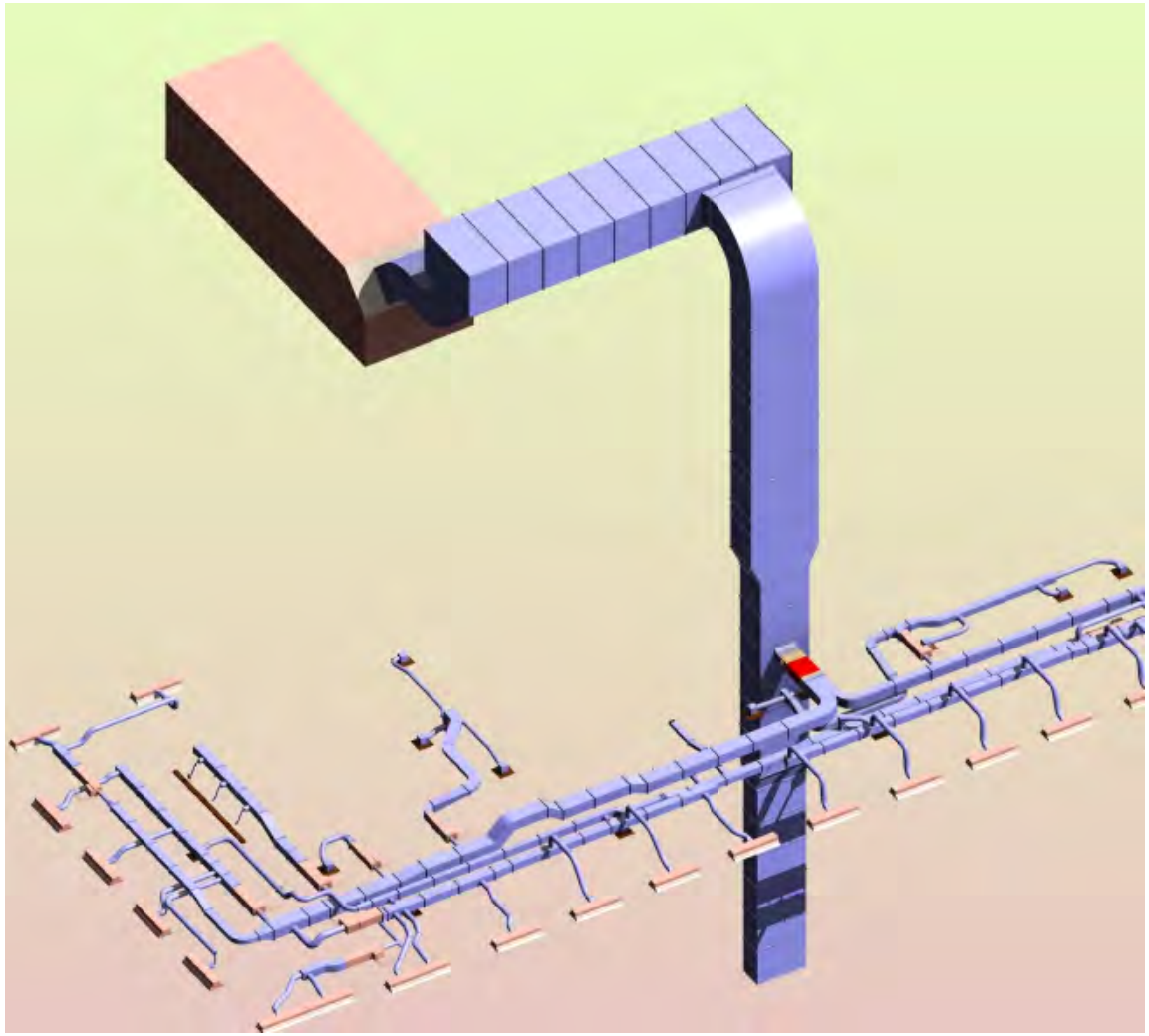
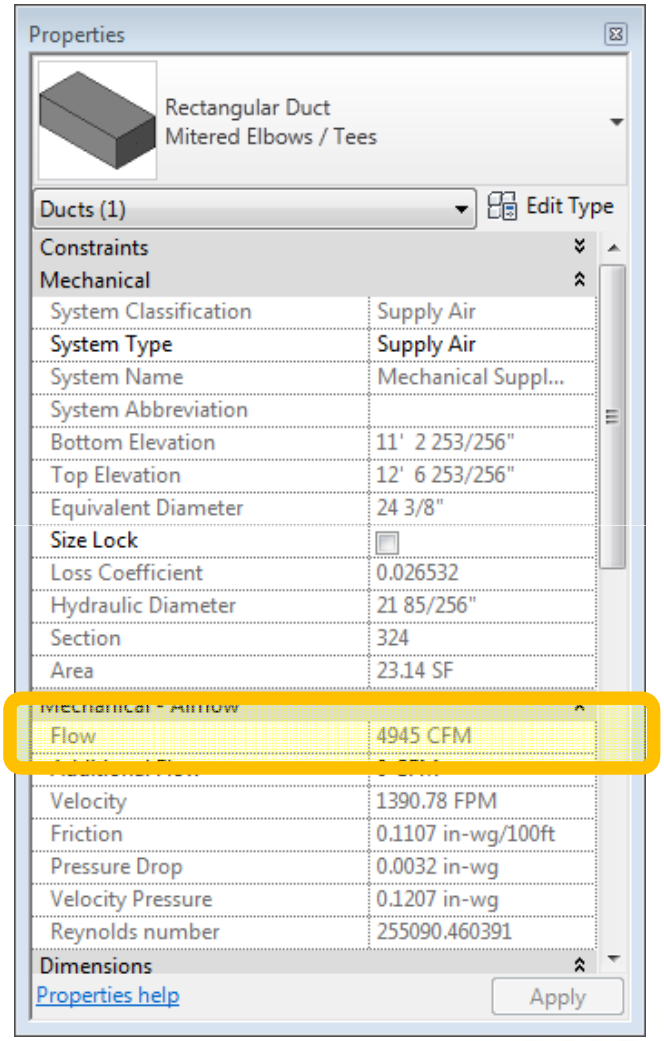
Understanding Air Flow





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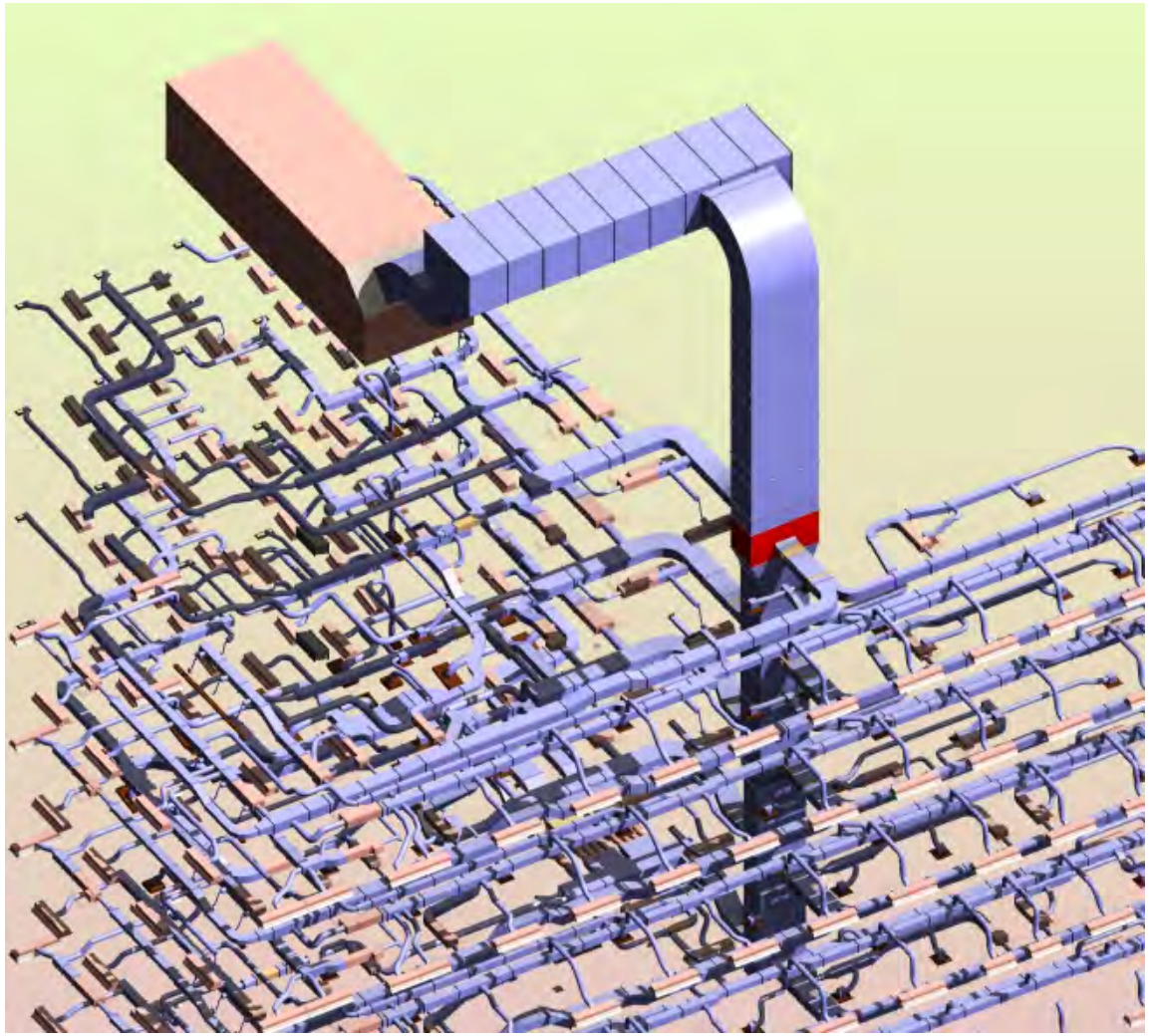
Understanding Air Flow



Properties

Rectangular Duct
TDC Radius Elbows / Tees

Ducts (1) | Edit Type

Constraints	
Mechanical	
System Classification	Supply Air
System Type	Supply Air
System Name	Mechanical Suppl...
System Abbreviation	
Bottom Elevation	10' 8 21/64"
Top Elevation	15' 4 99/128"
Equivalent Diameter	82 67/256"
Size Lock	
Loss Coefficient	0.011215
Hydraulic Diameter	72"
Section	12
Area	127.00 SF
Mechanical - Airflow	
Flow	24812 CFM
Velocity	612.64 FPM
Friction	0.0056 in-wg/100ft
Pressure Drop	0.0003 in-wg
Velocity Pressure	0.0234 in-wg
Reynolds number	379241.553576
Dimensions	

Properties help | Apply

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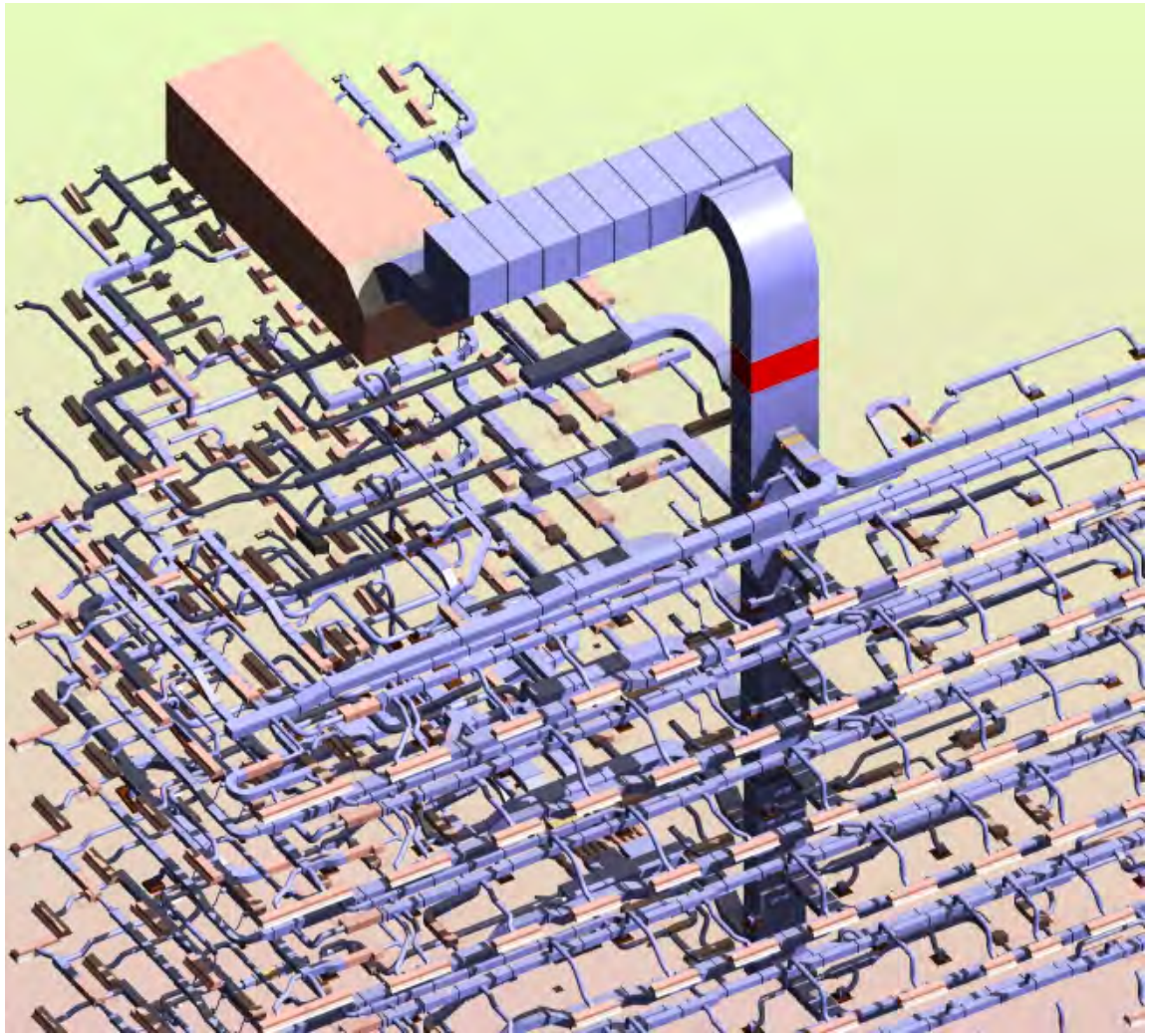
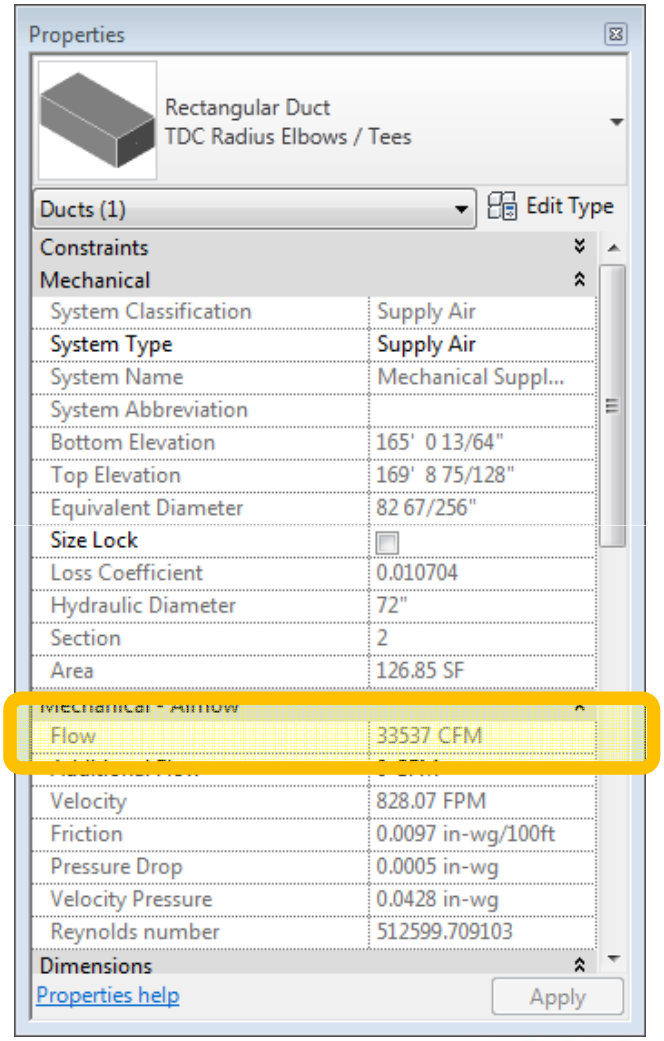
Understanding Air Flow





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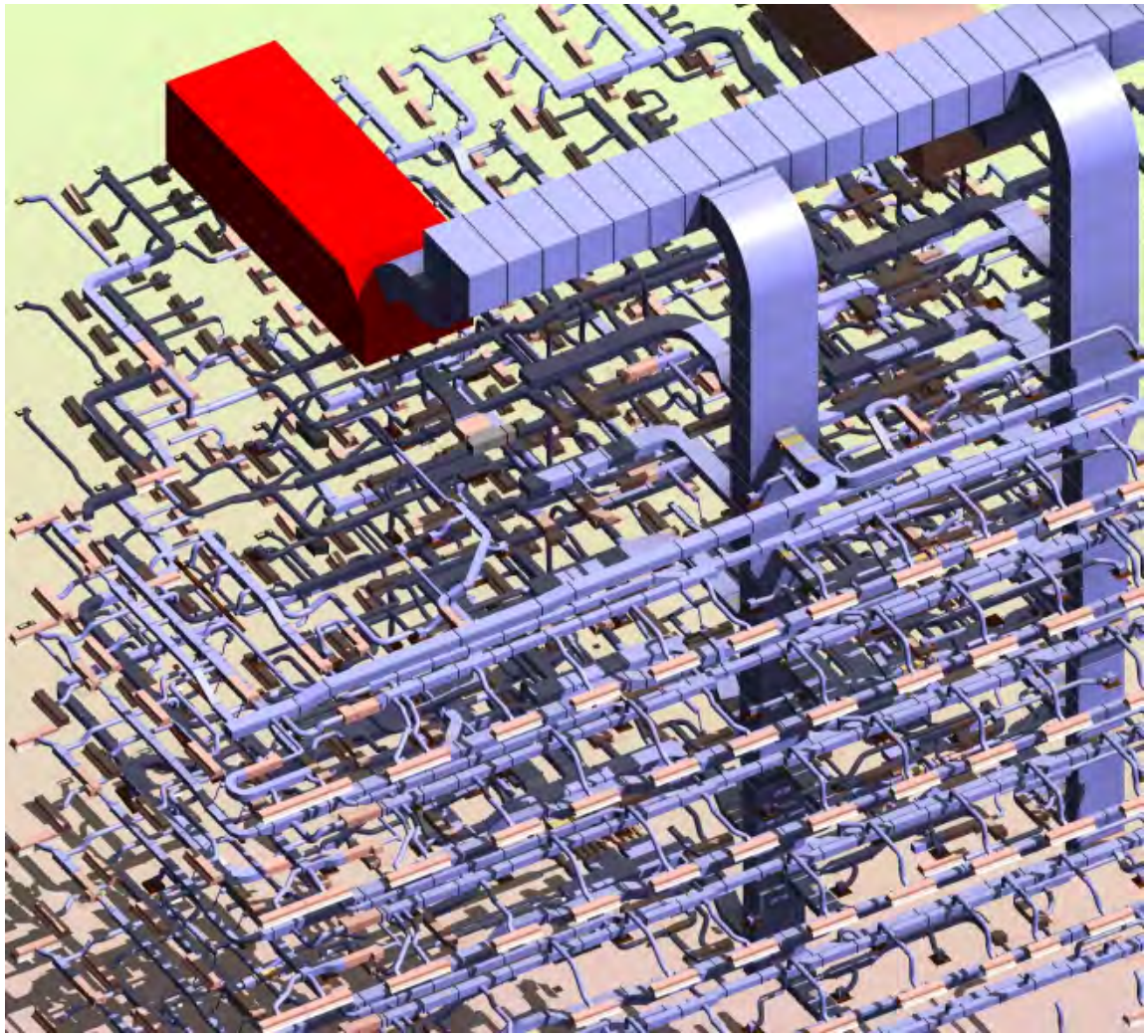
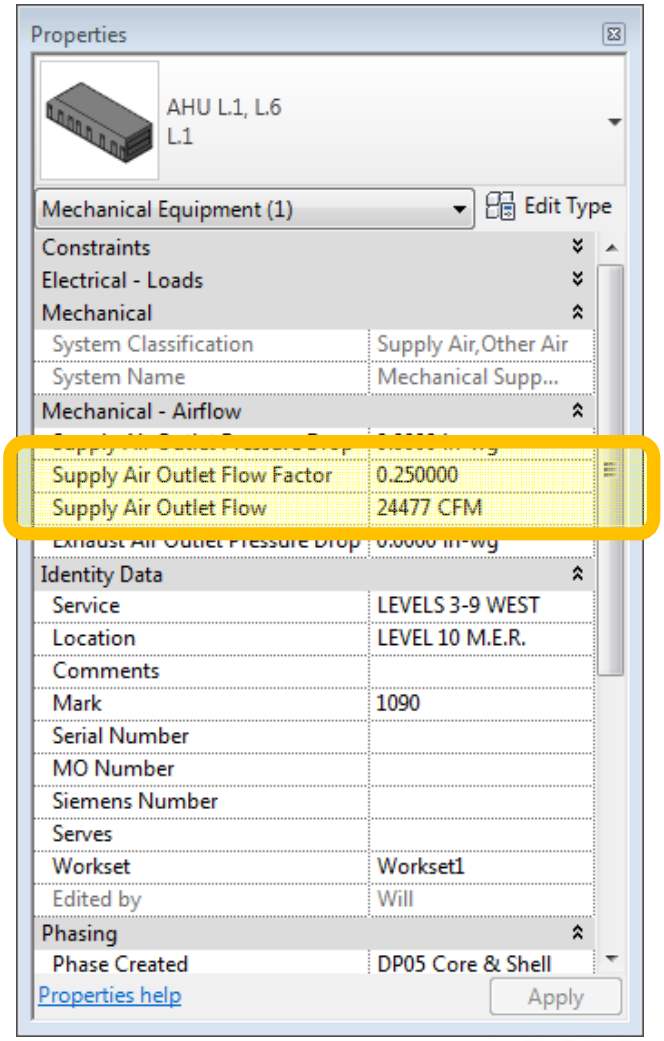
Understanding Air Flow





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Flow Rate (Chilled Water)

Type Properties

Family: MIT AHU-18 A-E | Load...

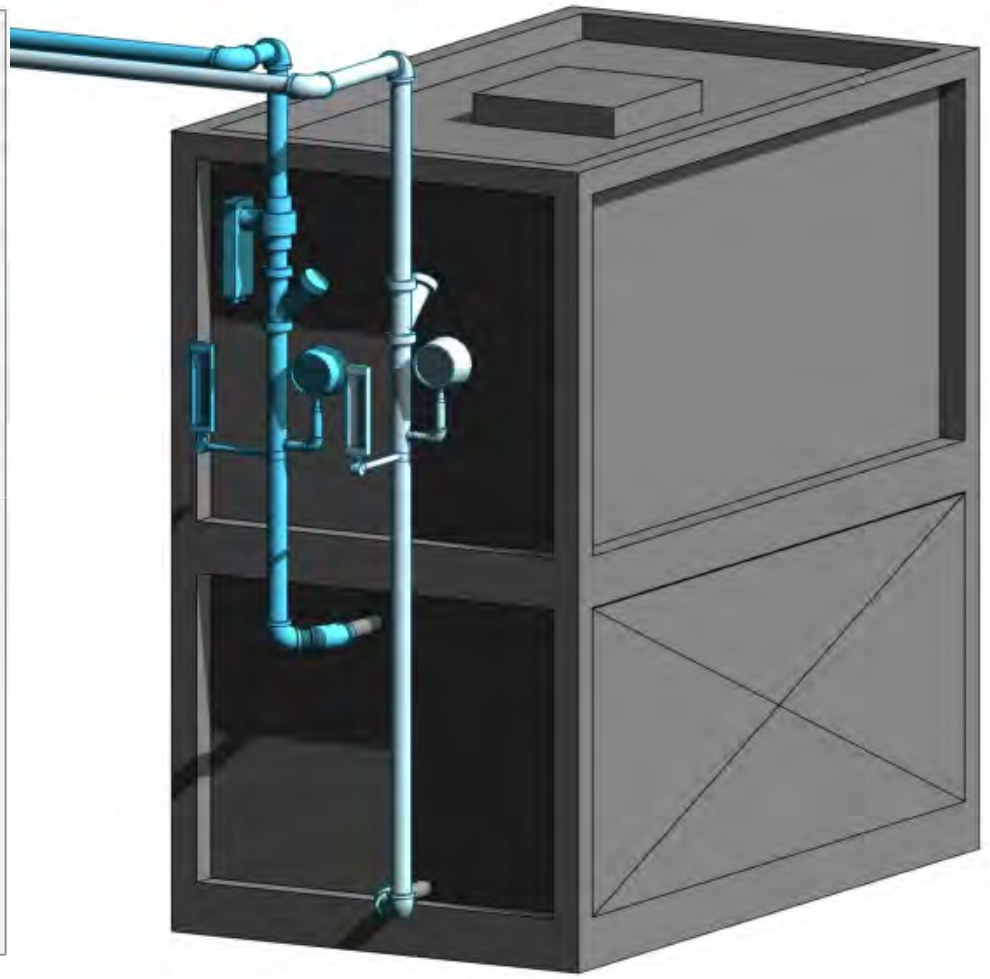
Type: AHU-18E | Duplicate...

Rename...

Type Parameters

Parameter	Value
Electrical	
Voltage	460.00 V
Electrical Engineering	
Number of Poles	3
Full Load Current	6.50 A
Electrical - Loads	
Load Classification	HVAC
Apparent Load	2990.00 VA
Mechanical	
Chilled Water Outlet Pressure Drop	2.731 psi
Chilled Water Outlet Flow	30.000 GPM
Chilled Water Inlet Pressure Drop	0.000 psi
Chilled Water Inlet Flow	30.000 GPM
Dimensions	
Total Unit Height	7' 9"
Segment Width	7' 0"
Tier Length	4' 1"
Segment 1 Height	3' 0"

<< Preview | OK | Cancel | Apply



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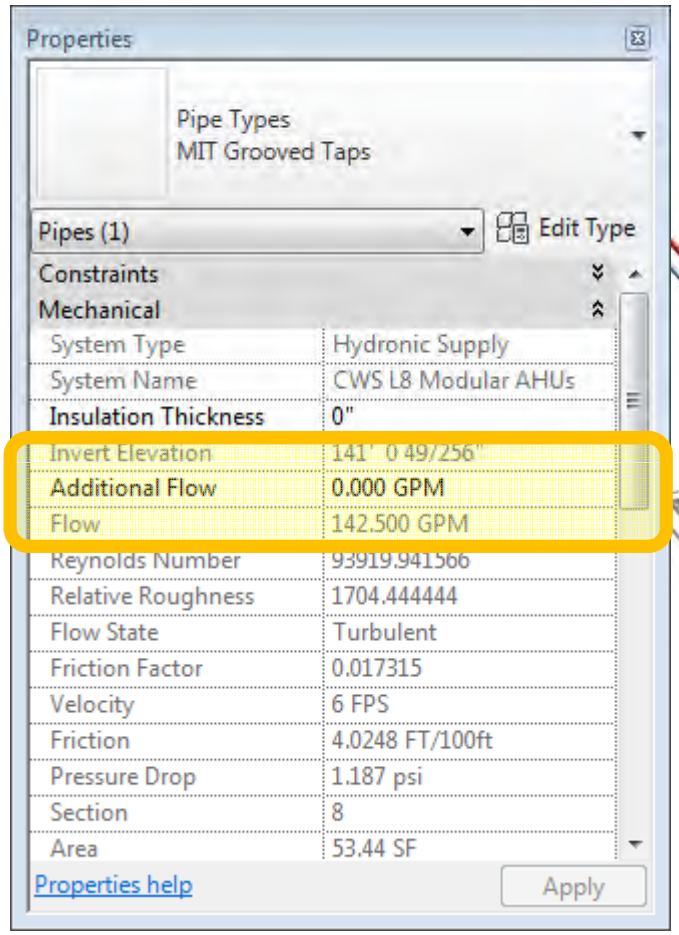
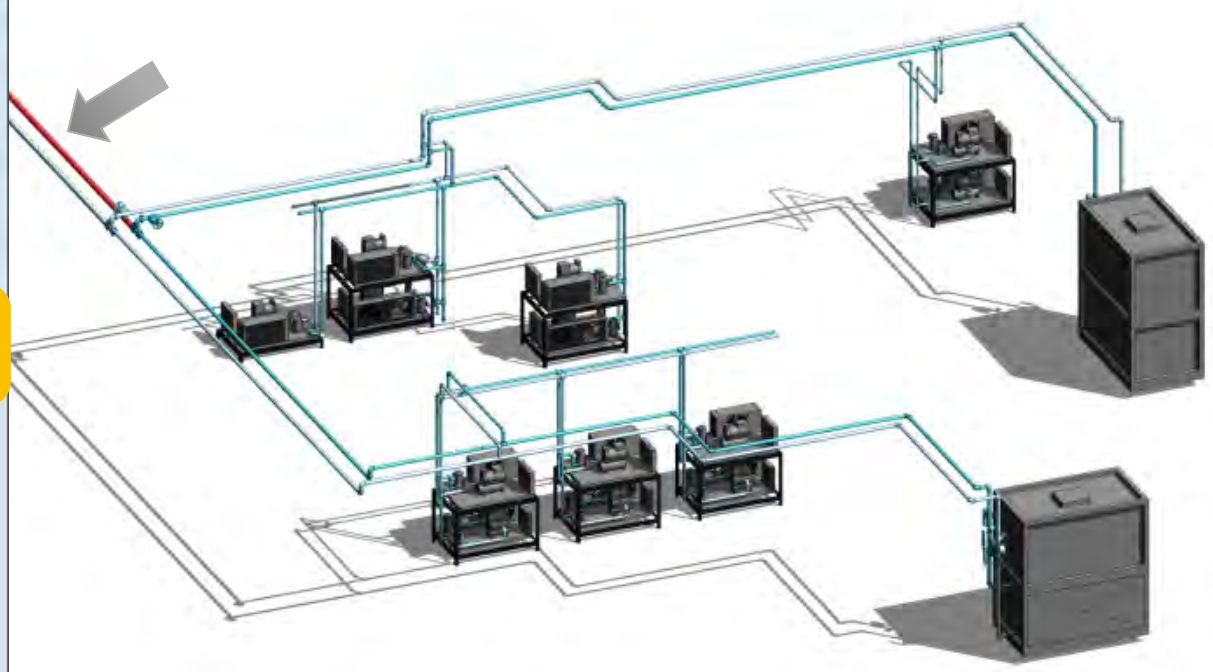
Flow Rate (Chilled Water)

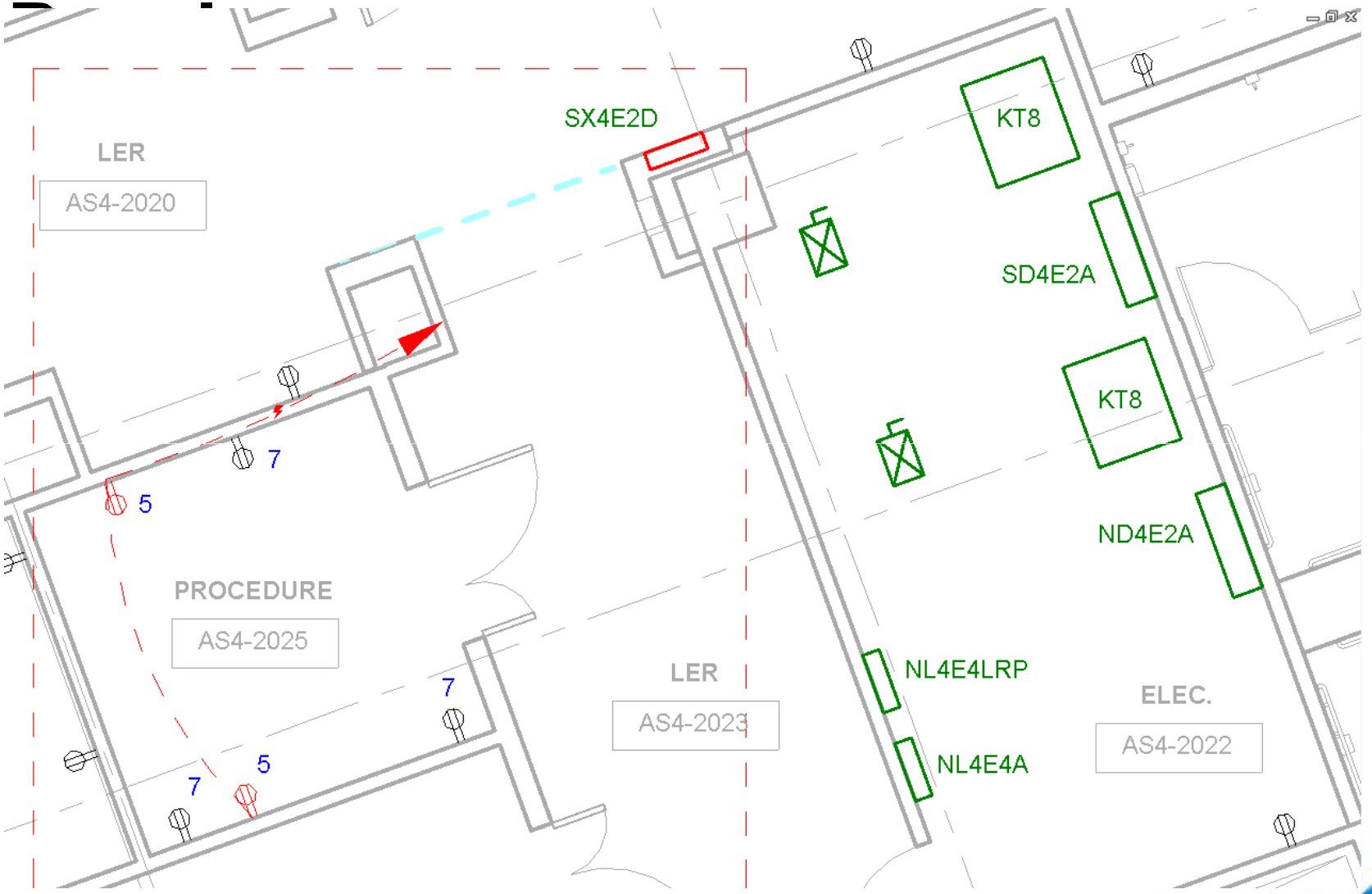




Electrical Benefits

- Intelligent Circuiting
- Receptacles Scheduling/Lighting Scheduling
- Panel Scheduling
- Total Building Electrical Loading
- Future Circuiting Analysis

Devices Circuited to Receptacle



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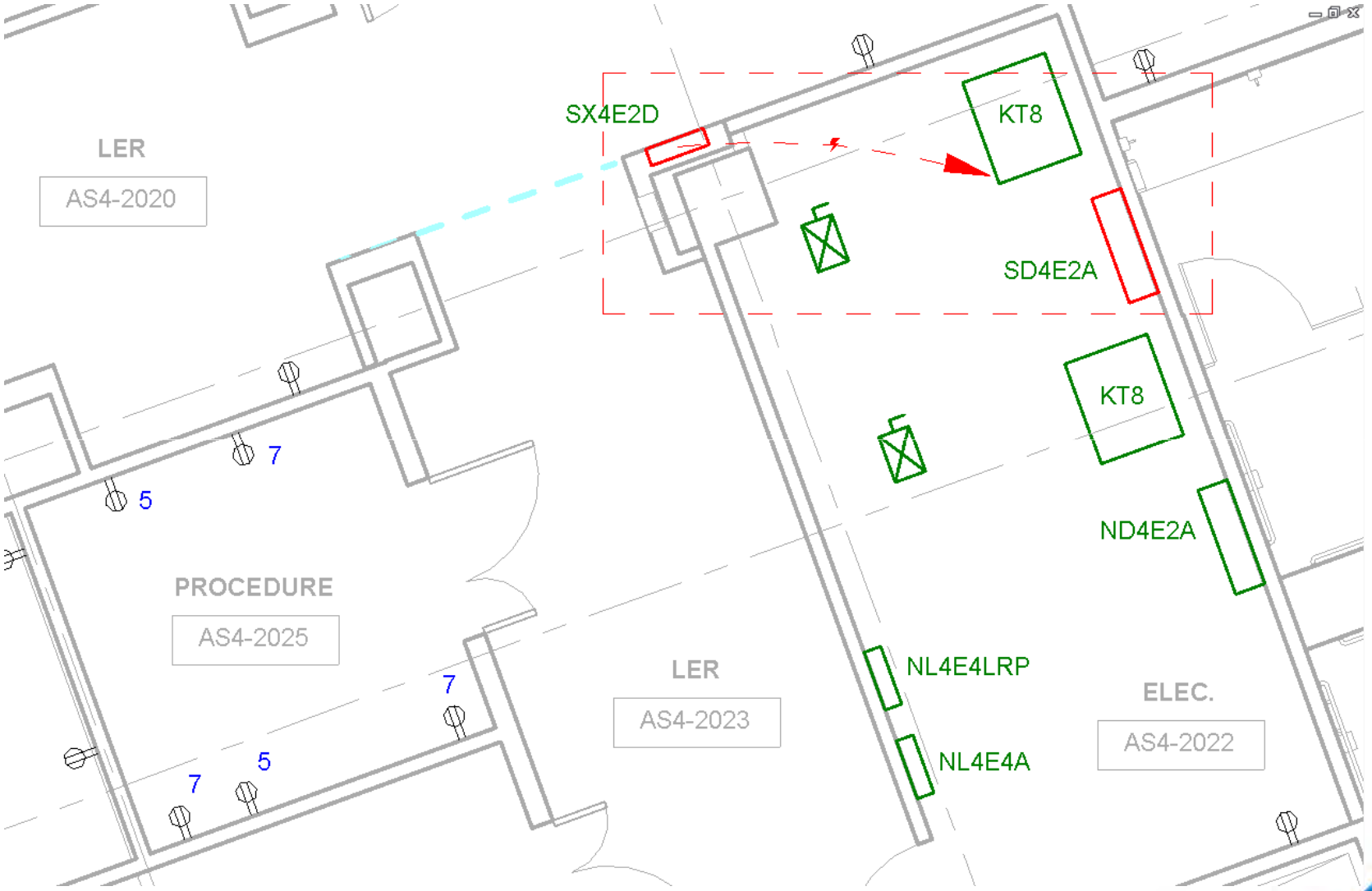
Receptacle Panel Circuited to Distribution Panel



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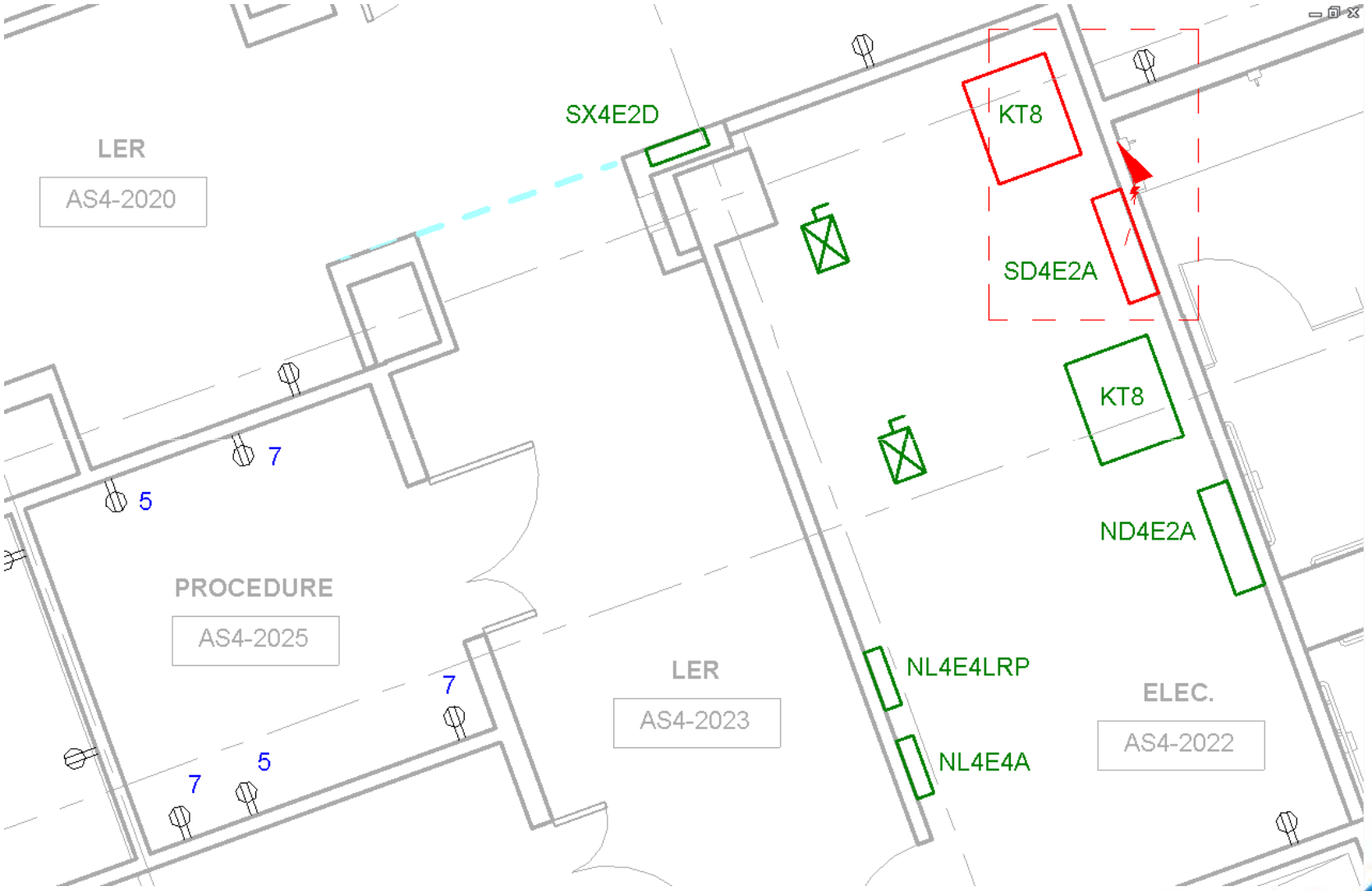
Distribution Panel Circuited to Transformer



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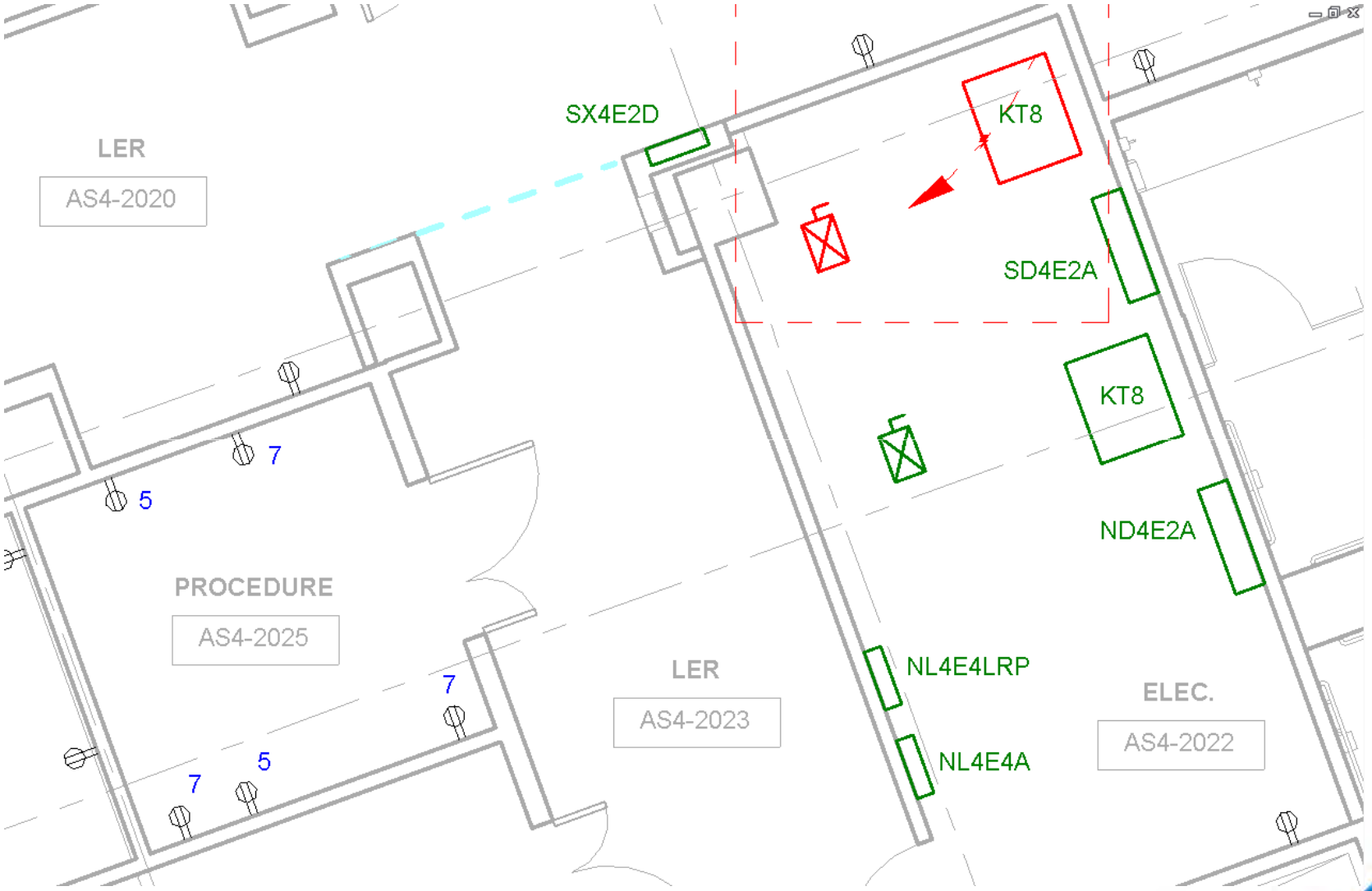
Transformer Circuited to Bus Duct



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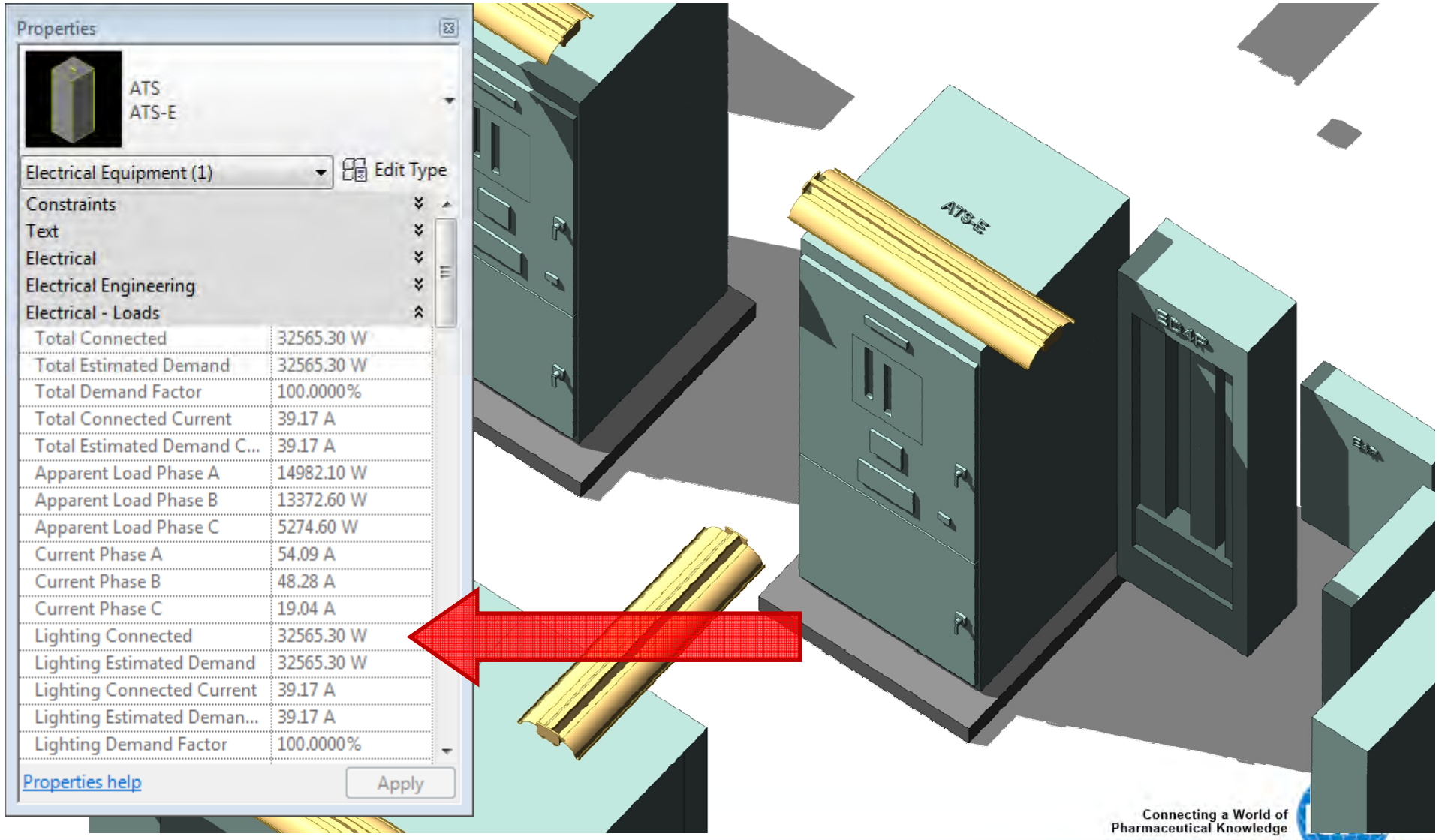
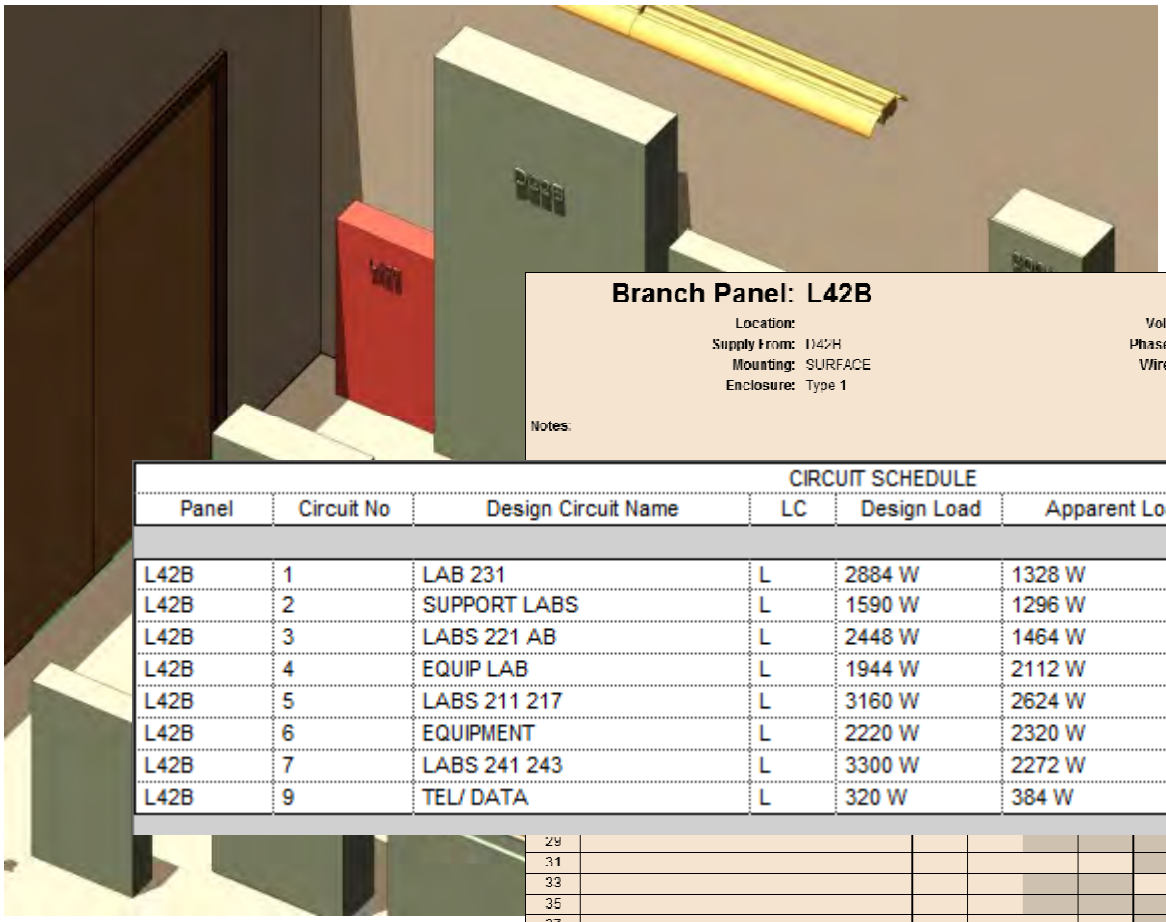
Electrical Intelligence



Circuit Scheduling



Branch Panel: L42B

Location:		Volts:	480/277 Wye	A.I.C. Rating:	
Supply From:	L42H	Phases:	3	Mains Type:	
Mounting:	SURFACE	Wires:	4	Mains Rating:	100 A
Enclosure:	Type 1			MCB Rating:	400 A

Notes:

CIRCUIT SCHEDULE

Panel	Circuit No	Design Circuit Name	LC	Design Load	Apparent Load	Rating	True Current	% Rating
L42B	1	LAB 231	L	2884 W	1328 W	20 A	5 A	24
L42B	2	SUPPORT LABS	L	1590 W	1296 W	20 A	5 A	23
L42B	3	LABS 221 AB	L	2448 W	1464 W	20 A	5 A	26
L42B	4	EQUIP LAB	L	1944 W	2112 W	20 A	8 A	38
L42B	5	LABS 211 217	L	3160 W	2624 W	20 A	9 A	47
L42B	6	EQUIPMENT	L	2220 W	2320 W	20 A	8 A	42
L42B	7	LABS 241 243	L	3300 W	2272 W	20 A	8 A	41
L42B	9	TEL/ DATA	L	320 W	384 W	20 A	1 A	7

													CKT
												210, 220, 224, 226, 204	2
												227, 227A	4
												, 236, 238	6
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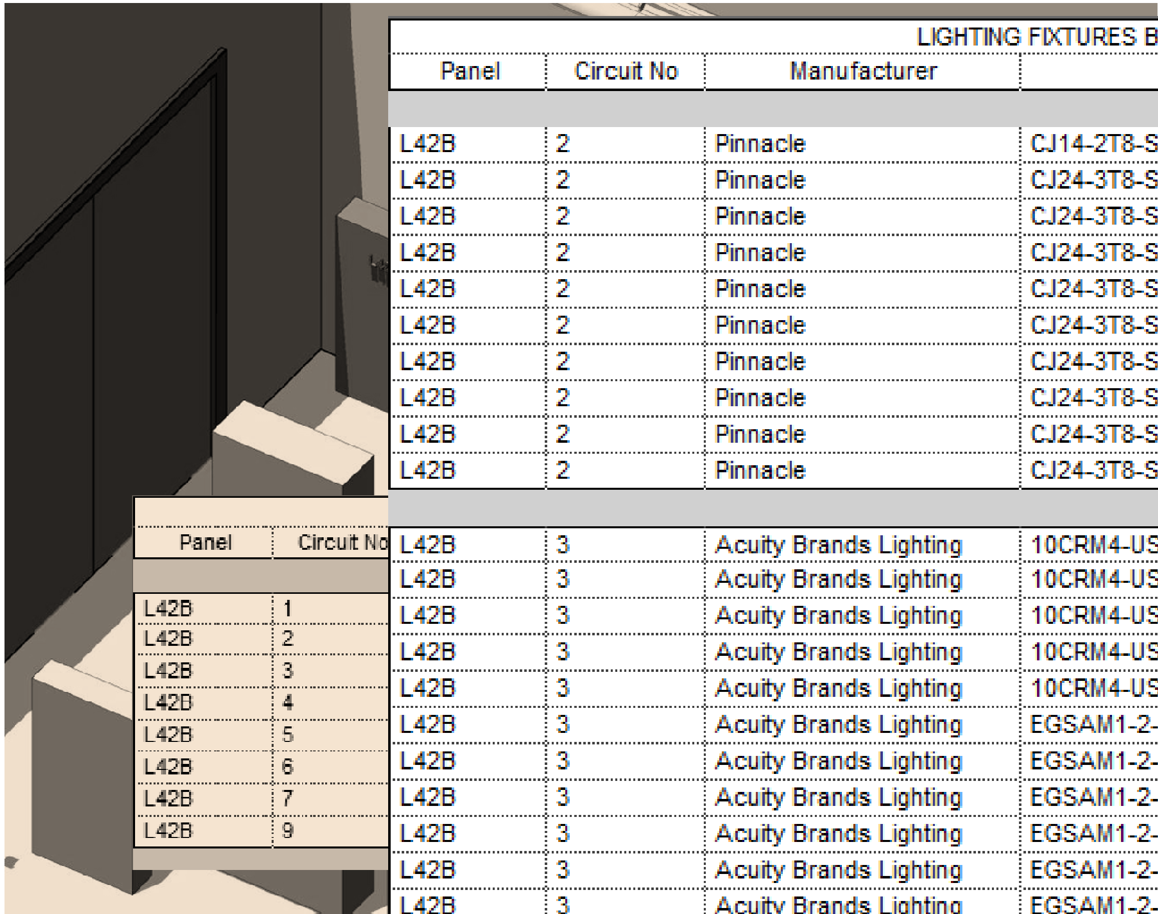
35													36
37													38
39													40
41													42
				Total Load:		4896 W		3960 W		4944 W			
				Total Amps:		18 A		14 A		18 A			

Lighting Schedule by Circuit



Panel	Circuit No
L42B	1
L42B	2
L42B	3
L42B	4
L42B	5
L42B	6
L42B	7
L42B	9

LIGHTING FIXTURES BY CIRCUIT

Panel	Circuit No	Manufacturer	Model	Room No.	Room Name
L42B	2	Pinnacle	CJ14-2T8-SPECIFY MOUNTIN	226	MICROSCOPE
L42B	2	Pinnacle	CJ24-3T8-SPECIFY MOUNTIN	222	LAB SUPPORT
L42B	2	Pinnacle	CJ24-3T8-SPECIFY MOUNTIN	212	STORAGE
L42B	2	Pinnacle	CJ24-3T8-SPECIFY MOUNTIN	212	STORAGE
L42B	2	Pinnacle	CJ24-3T8-SPECIFY MOUNTIN	212	STORAGE
L42B	2	Pinnacle	CJ24-3T8-SPECIFY MOUNTIN	210	LAB SUPPORT
L42B	2	Pinnacle	CJ24-3T8-SPECIFY MOUNTIN	210	LAB SUPPORT
L42B	2	Pinnacle	CJ24-3T8-SPECIFY MOUNTIN	222	LAB SUPPORT
L42B	2	Pinnacle	CJ24-3T8-SPECIFY MOUNTIN	222	LAB SUPPORT
L42B	2	Pinnacle	CJ24-3T8-SPECIFY MOUNTIN	204	STORAGE
L42B	3	Acuity Brands Lighting	10CRM4-US-2-32-WHR-SBL	221A	WRITE-UP
L42B	3	Acuity Brands Lighting	10CRM4-US-2-32-WHR-SBL	221A	WRITE-UP
L42B	3	Acuity Brands Lighting	10CRM4-US-2-32-WHR-SBL	221	ENG-LAB MANALIS
L42B	3	Acuity Brands Lighting	10CRM4-US-2-32-WHR-SBL	221	ENG-LAB MANALIS
L42B	3	Acuity Brands Lighting	10CRM4-US-2-32-WHR-SBL	221	ENG-LAB MANALIS
L42B	3	Acuity Brands Lighting	EGSAM1-2-28-T5-F1/18	221	ENG-LAB MANALIS
L42B	3	Acuity Brands Lighting	EGSAM1-2-28-T5-F1/18	221	ENG-LAB MANALIS
L42B	3	Acuity Brands Lighting	EGSAM1-2-28-T5-F1/18	221	ENG-LAB MANALIS
L42B	3	Acuity Brands Lighting	EGSAM1-2-28-T5-F1/18	221	ENG-LAB MANALIS
L42B	3	Acuity Brands Lighting	EGSAM1-2-28-T5-F1/18	221	ENG-LAB MANALIS
L42B	3	Acuity Brands Lighting	EGSAM1-2-28-T5-F1/18	221	ENG-LAB MANALIS
L42B	3	Acuity Brands Lighting	EGSAM1-2-28-T5-F1/18	221	ENG-LAB MANALIS
L42B	3	Acuity Brands Lighting	EGSAM1-2-28-T5-F1/18	221	ENG-LAB MANALIS
L42B	3	Acuity Brands Lighting	EGSAM1-2-28-T5-F1/18	221	ENG-LAB MANALIS
L42B	3	Acuity Brands Lighting	EGSAM1-2-28-T5-F1/18	221	ENG-LAB MANALIS
L42B	3	Edison Price	TRPH-126-6-UNV-WW-ECOL	221A	WRITE-UP

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Facilities Information by Lighting Type

LIGHTING FIXTURES BY CIRCUIT

LIGHTING FIXTURE SCHEDULE

TAG	MANUFACTURER	MODEL	QTY	SUBMITTAL	NO. OF POLES	VOLTAGE	LAMP
EBUC	ACUITY BRANDS LIGHTING	ELM2	7	16000-033-A	1	277 V	T5
EXP1	PHOENIX	LFV7-232	8	16000-033-A	1	277 V	2
L1A - 48"	Acuity Brands Lighting	10CRM4-US-2-32-WHR-SBL	22	16000-062	1	277 V	T8
L1A - 72"	Acuity Brands Lighting	10CRM4-US-2-32-WHR-SBL	49	16000-062	1	277 V	T8
L1C - 48"	Acuity Brands Lighting	10CRM4-US-2-32-WHR-SBL	104	16000-062	1	277 V	T5
L1D - 96"	Acuity Brands Lighting	CRW4-2-32-WHR-SCEP	11	16000-062	1	277 V	T5
L1F - 36"	Acuity Brands Lighting	10CRM4-US-3-32-WHR-SBL	4	16000-062	1	277 V	T5
L1F - 48"	Acuity Brands Lighting	10CRM4-US-3-32-WHR-SBL	50	16000-062	1	277 V	T5
L1F - 72"	Acuity Brands Lighting	10CRM4-US-3-32-WHR-SBL	5	16000-062	1	277 V	T5
L1F - 96"	Acuity Brands Lighting	10CRM4-US-3-32-WHR-SBL	19	16000-062	1	277 V	T5
L1H - 48"	Acuity Brands Lighting	10CRM4-US-3-32-WHR-SBL	11	16000-062	1	277 V	T5
L1J - 48"	Acuity Brands Lighting	10CRM4-US-2-32-WHR-SBL	5	16000-062	1	277 V	T8
L1J - 96"	Acuity Brands Lighting	10CRM4-US-2-32-WHR-SBL	103	16000-062	1	277 V	T8
L1K	Acuity Brands Lighting	10CRM4-US-2-32-WHR-SBL	38	16000-062	1	277 V	T8
L2A	Acuity Brands Lighting	EGSAM1-2-28-T5-F1/18	10	16000-062	1	277 V	T5
L2B	Acuity Brands Lighting	EGSAM1-2-28-T5-F1/18	26	16000-062	1	277 V	T5
L2C	Acuity Brands Lighting	EGSAM1-2-28-T5-F1/18	146	16000-062	1	277 V	T5
L2D	Acuity Brands Lighting	EGAW1-2-28-T5-OSPS	11	16000-062	1	277 V	T5

L42B	3	Acuity Brands Lighting	EGSAM1-2-28-T5-F1/18	221	ENG-LAB MANALIS
L42B	3	Acuity Brands Lighting	EGSAM1-2-28-T5-F1/18	221	ENG-LAB MANALIS
L42B	3	Acuity Brands Lighting	EGSAM1-2-28-T5-F1/18	221	ENG-LAB MANALIS
L42B	3	Acuity Brands Lighting	EGSAM1-2-28-T5-F1/18	221	ENG-LAB MANALIS
L42B	3	Acuity Brands Lighting	EGSAM1-2-28-T5-F1/18	221	ENG-LAB MANALIS
L42B	3	Acuity Brands Lighting	EGSAM1-2-28-T5-F1/18	221	ENG-LAB MANALIS
L42B	3	Acuity Brands Lighting	EGSAM1-2-28-T5-F1/18	221	ENG-LAB MANALIS

24 26 28 30 32 34 36 38 40 42

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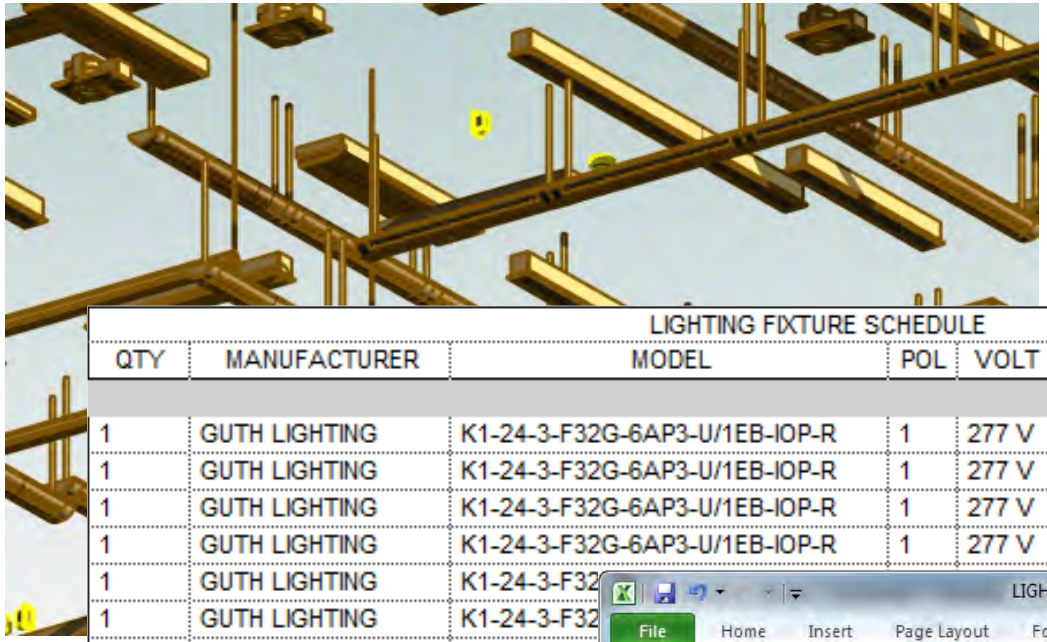

LIGHTING FIXTURE SCHEDULE

QTY	MANUFACTURER	MODEL	POL	VOLT	LOAD	WATTAGE	COST PER HOUR
1	GUTH LIGHTING	K1-24-3-F32G-6AP3-U/1EB-IOP-R	1	277 V	96 W	38 W	0.005546
1	GUTH LIGHTING	K1-24-3-F32G-6AP3-U/1EB-IOP-R	1	277 V	96 W	38 W	0.005546
1	GUTH LIGHTING	K1-24-3-F32G-6AP3-U/1EB-IOP-R	1	277 V	96 W	38 W	0.005546
1	GUTH LIGHTING	K1-24-3-F32G-6AP3-U/1EB-IOP-R	1	277 V	96 W	38 W	0.005546
1	GUTH LIGHTING	K1-24-3-F32					
1	GUTH LIGHTING	K1-24-3-F32					
1	GUTH LIGHTING	K1-24-3-F32					
1	GUTH LIGHTING	VPW-42T					
1	GUTH LIGHTING	VPW-42T					
1	GUTH LIGHTING	VPW-42T					
1	GUTH LIGHTING	VPW-42T					
396							

LIGHTING FIXTURE SCHEDULE.txt - Microsoft Excel

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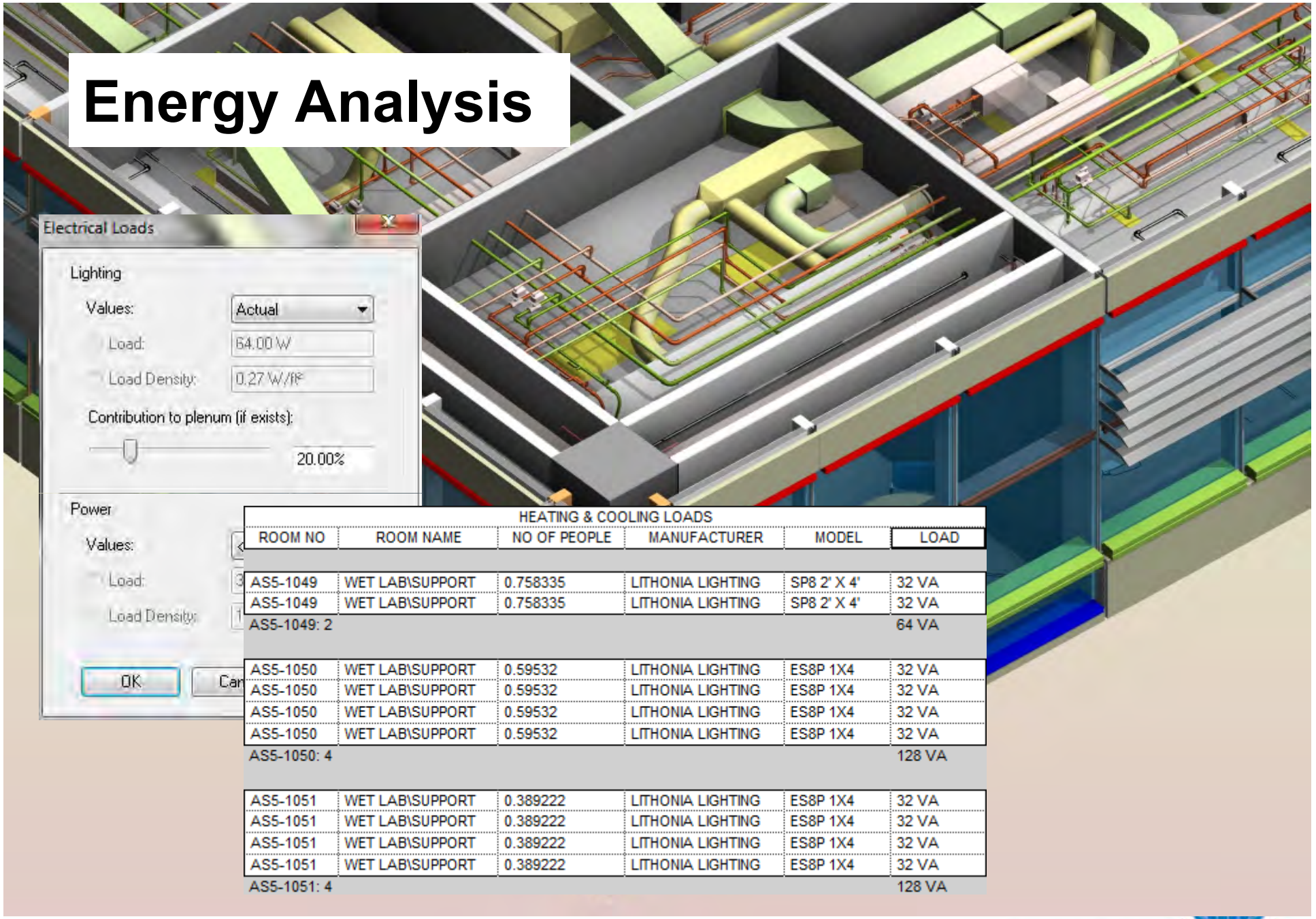
	A	B	C	D	E	F	G	H
1			LIGHTING FIXTURE SCHEDULE					
2	QTY	MANUFACTURER	MODEL	POLES	VOLT	LOAD	WATT	COST PER HOUR
3								
4	1	GUTH LIGHTING	K1-24-3-F32G-6AP3-U/1EB-	1	277 V	96 W	38 W	$0.0055
5	1	GUTH LIGHTING	K1-24-3-F32G-6AP3-U/1EB-	1	277 V	96 W	38 W	$0.0055
6	1	GUTH LIGHTING	K1-24-3-F32G-6AP3-U/1EB-	1	277 V	96 W	38 W	$0.0055
7	1	GUTH LIGHTING	K1-24-3-F32G-6AP3-U/1EB-	1	277 V	96 W	38 W	$0.0055
8	1	GUTH LIGHTING	K1-24-3-F32G-6AP3-U/1EB-	1	277 V	96 W	38 W	$0.0055
9	1	GUTH LIGHTING	K1-24-3-F32G-6AP3-U/1EB-	1	277 V	96 W	38 W	$0.0055
10	1	GUTH LIGHTING	K1-24-3-F32G-6AP3-U/1EB-	1	277 V	96 W	38 W	$0.0055
11	1	GUTH LIGHTING	K1-24-3-F32G-6AP3-U/1EB-	1	277 V	96 W	38 W	$0.0055
12	1	GUTH LIGHTING	VPW-42T	1	277 V	42 W	9 W	$0.0014
13	1	GUTH LIGHTING	VPW-42T	1	277 V	42 W	9 W	$0.0014
14	1	GUTH LIGHTING	VPW-42T	1	277 V	42 W	9 W	$0.0014
15	1	GUTH LIGHTING	VPW-42T	1	277 V	42 W	9 W	$0.0014
16	396						14815 W	$2.1794

LIGHTING FIXTURE SCHEDULE

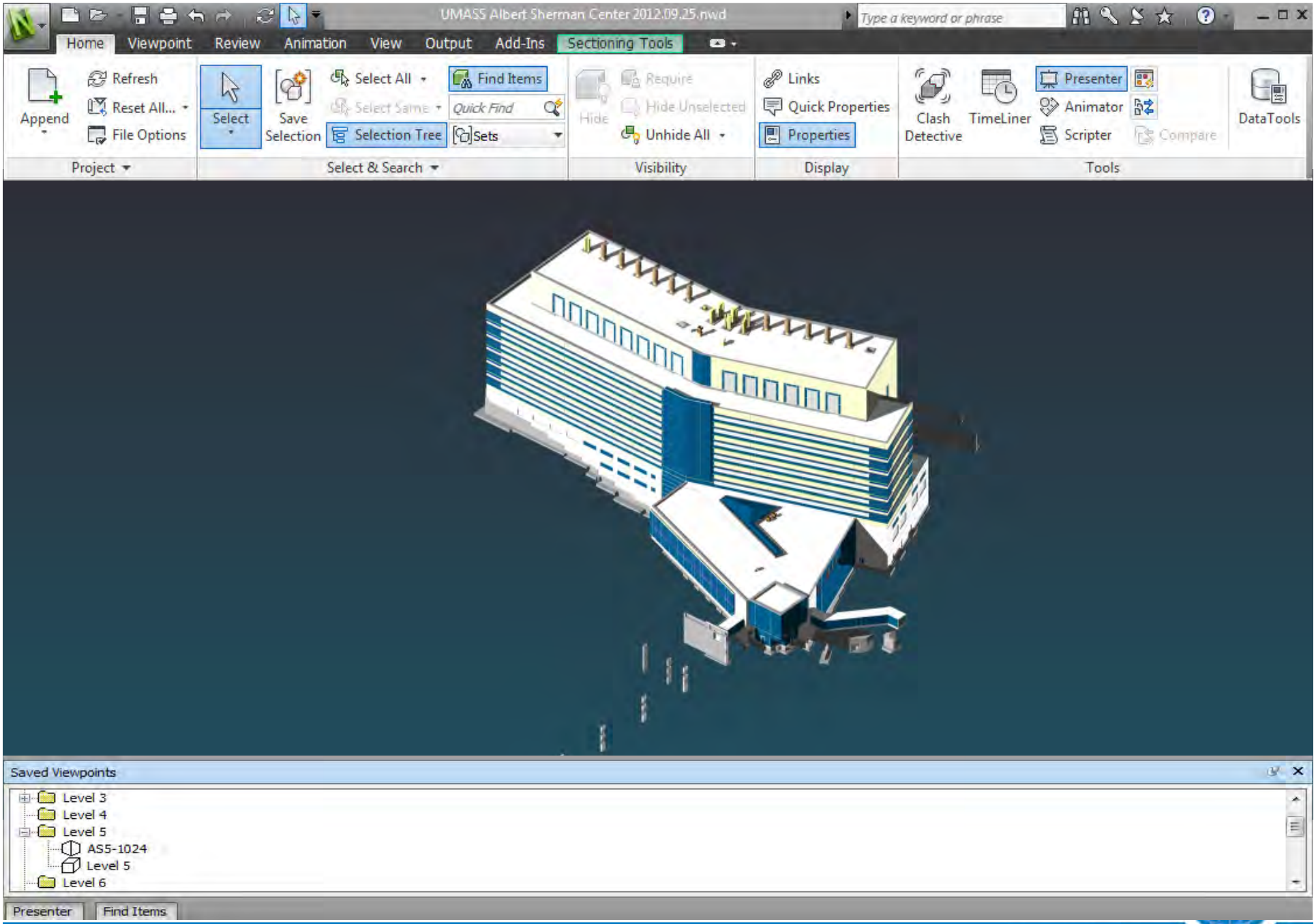
Ready 100%

Energy Analysis



HEATING & COOLING LOADS

ROOM NO	ROOM NAME	NO OF PEOPLE	MANUFACTURER	MODEL	LOAD
AS5-1049	WET LAB\SUPPORT	0.758335	LITHONIA LIGHTING	SP8 2' X 4'	32 VA
AS5-1049	WET LAB\SUPPORT	0.758335	LITHONIA LIGHTING	SP8 2' X 4'	32 VA
AS5-1049: 2					64 VA
AS5-1050	WET LAB\SUPPORT	0.59532	LITHONIA LIGHTING	ES8P 1X4	32 VA
AS5-1050	WET LAB\SUPPORT	0.59532	LITHONIA LIGHTING	ES8P 1X4	32 VA
AS5-1050	WET LAB\SUPPORT	0.59532	LITHONIA LIGHTING	ES8P 1X4	32 VA
AS5-1050	WET LAB\SUPPORT	0.59532	LITHONIA LIGHTING	ES8P 1X4	32 VA
AS5-1050: 4					128 VA
AS5-1051	WET LAB\SUPPORT	0.389222	LITHONIA LIGHTING	ES8P 1X4	32 VA
AS5-1051	WET LAB\SUPPORT	0.389222	LITHONIA LIGHTING	ES8P 1X4	32 VA
AS5-1051	WET LAB\SUPPORT	0.389222	LITHONIA LIGHTING	ES8P 1X4	32 VA
AS5-1051	WET LAB\SUPPORT	0.389222	LITHONIA LIGHTING	ES8P 1X4	32 VA
AS5-1051: 4					128 VA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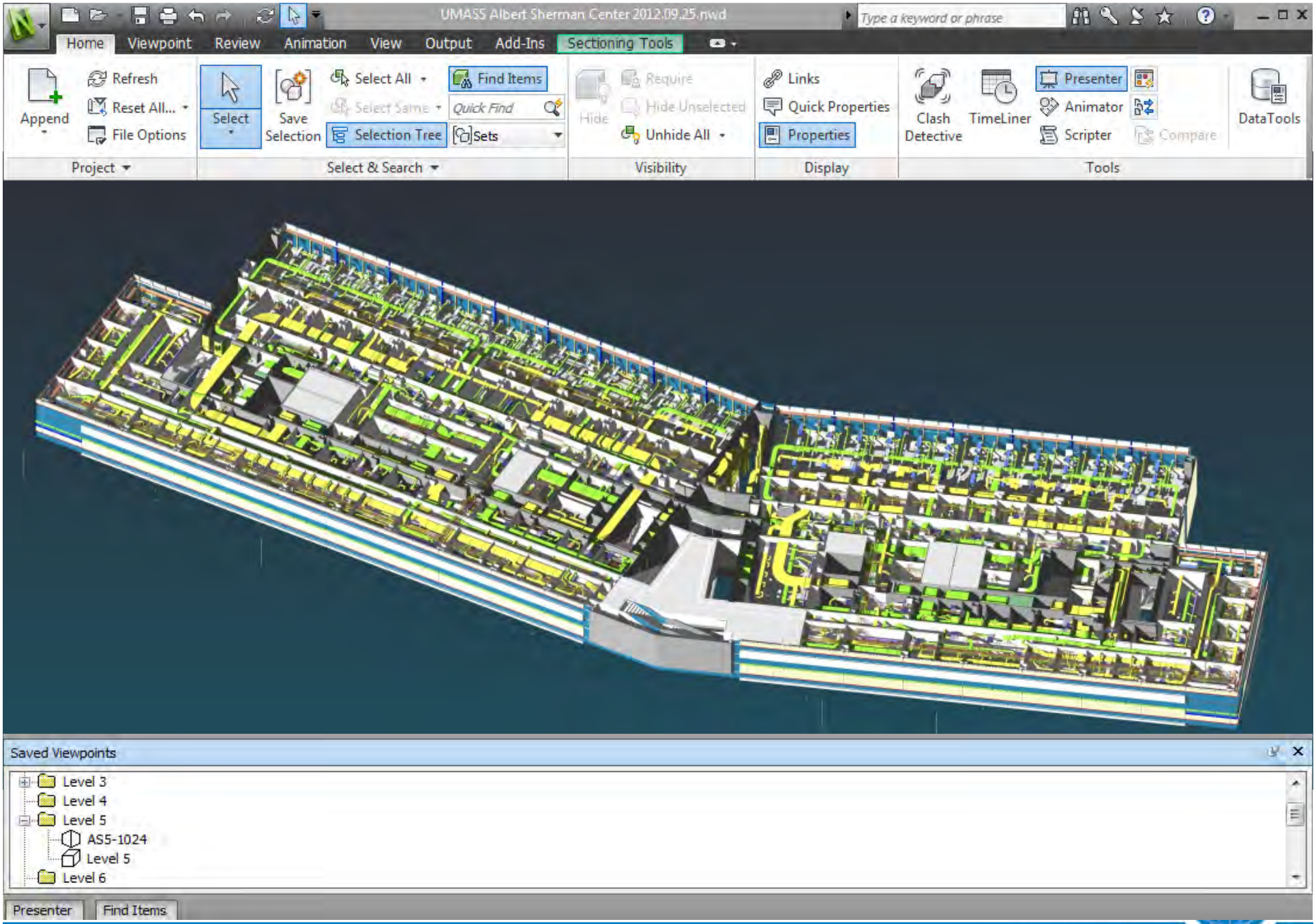
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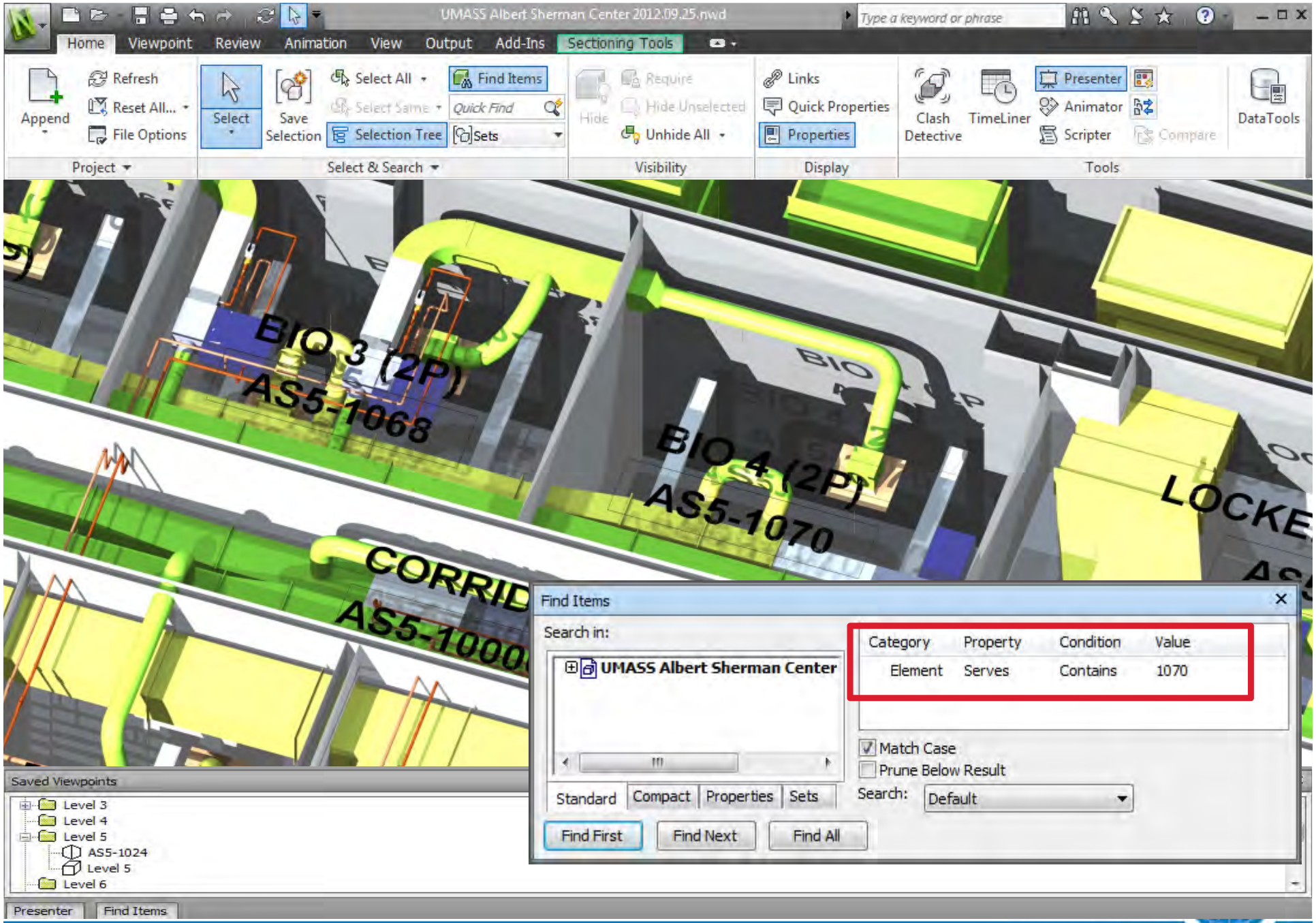
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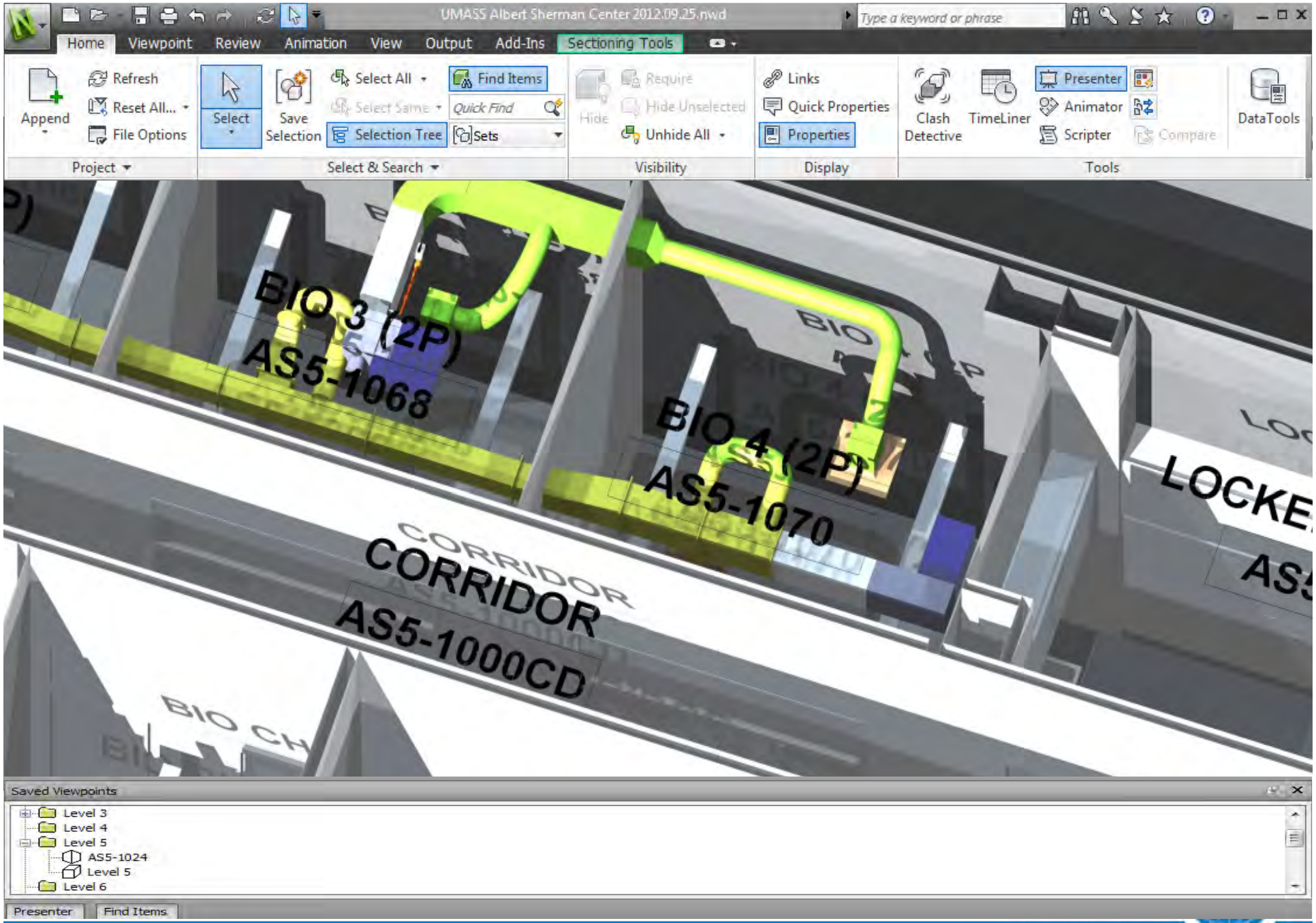
Find Items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BIO 4 (2P)
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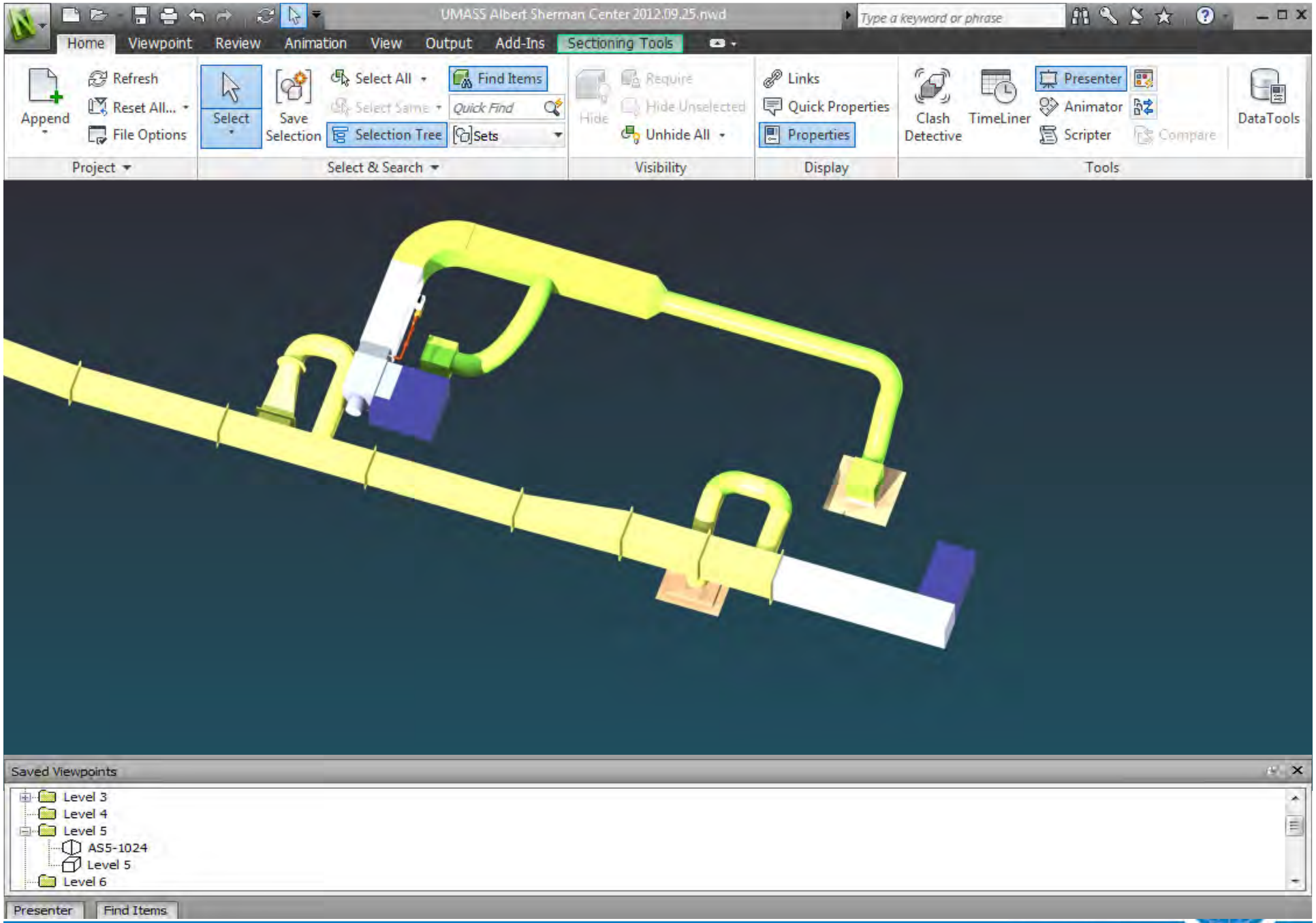
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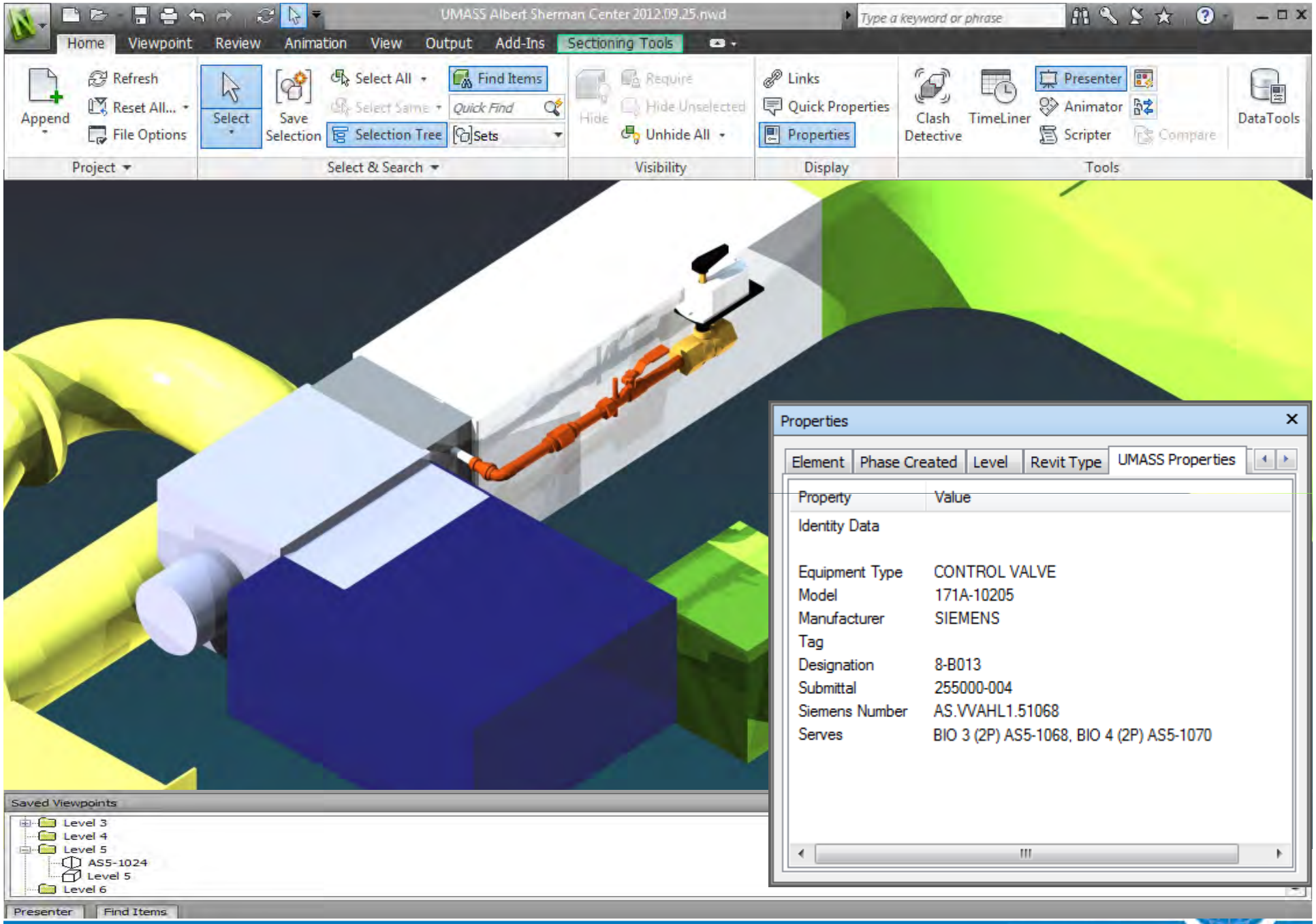
Find Items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Quick Find
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Clash Detective
TimeLiner
Presenter
Animator
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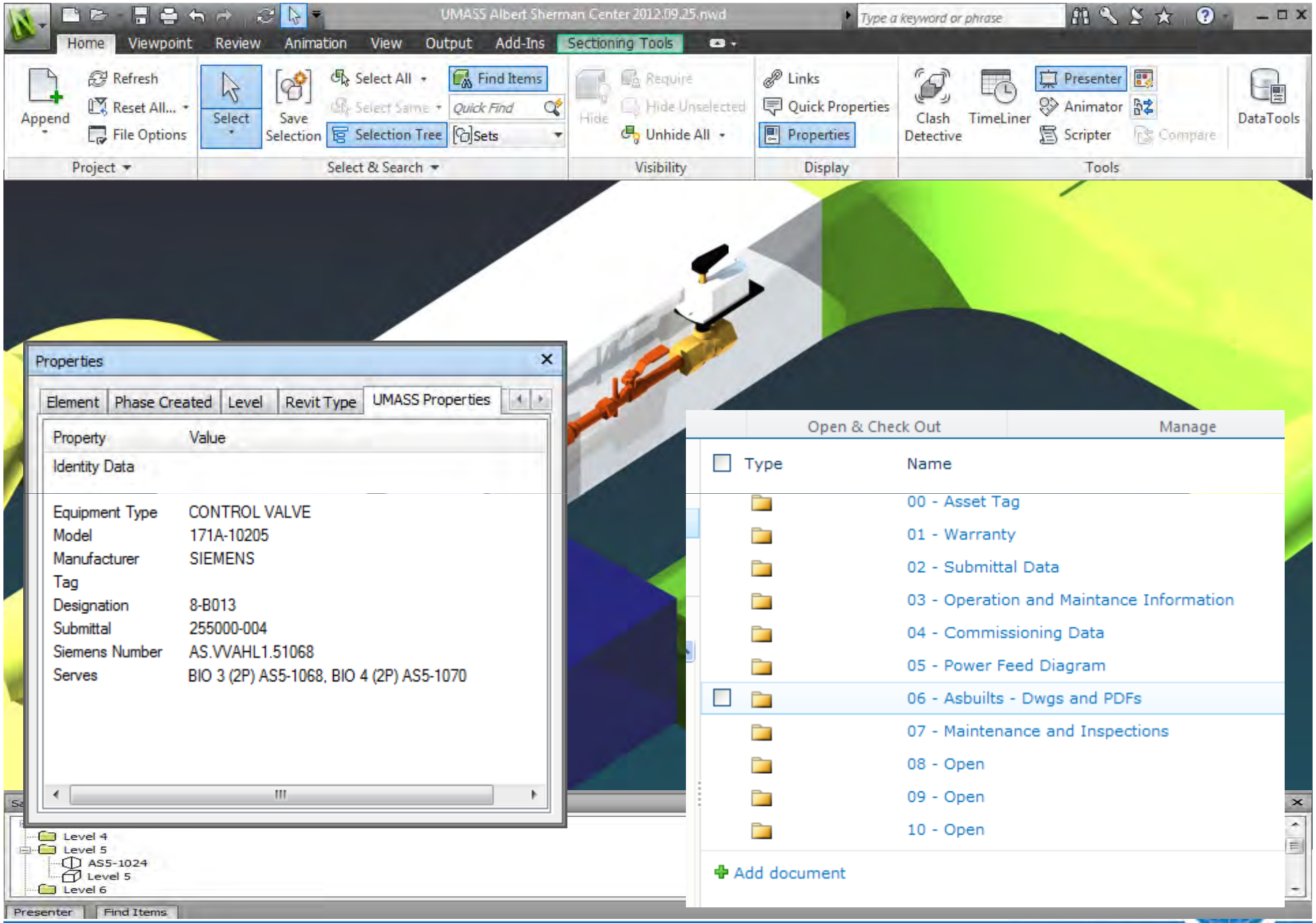
Identity Data
Equipment Type
CONTROL VALVE
Model
171A-10205
Manufacturer
SIEMENS
Tag
Designation
8-B013
Submittal
255000-004
Siemens Number
AS.VVAHL1.51068
Serves
BIO 3 (2P) AS5-1068, BIO 4 (2P) AS5-1070
Saved Viewpoints
Level 3
Level 4
Level 5
AS5-1024
Level 5
Level 6
Presenter
Find Items


UMASS Albert Sherman Center 2012.09.25.nwd
Type a keyword or phrase
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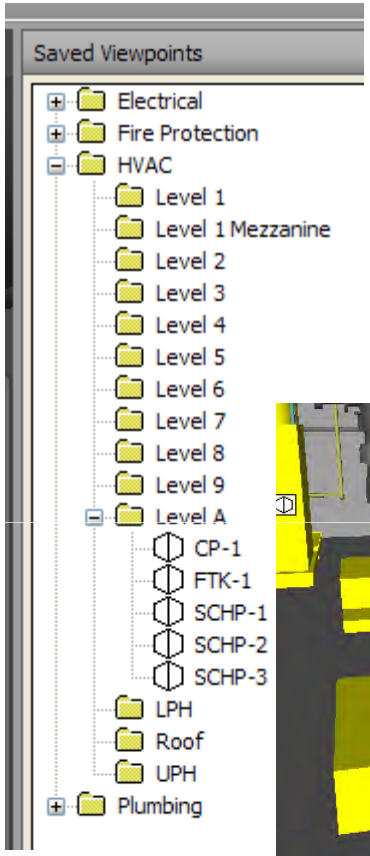
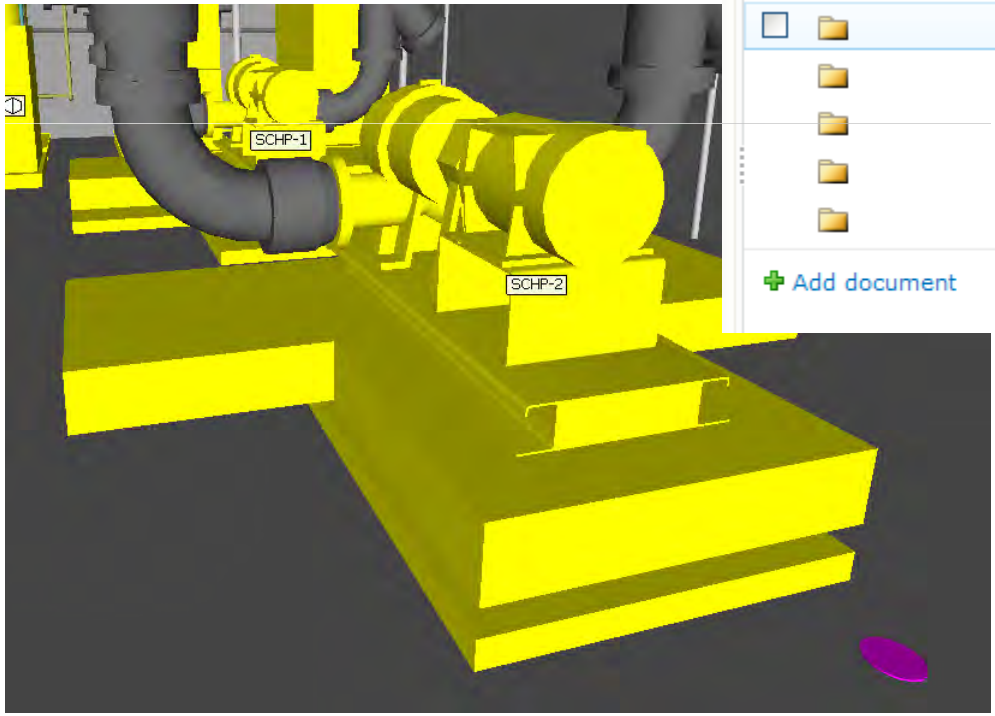
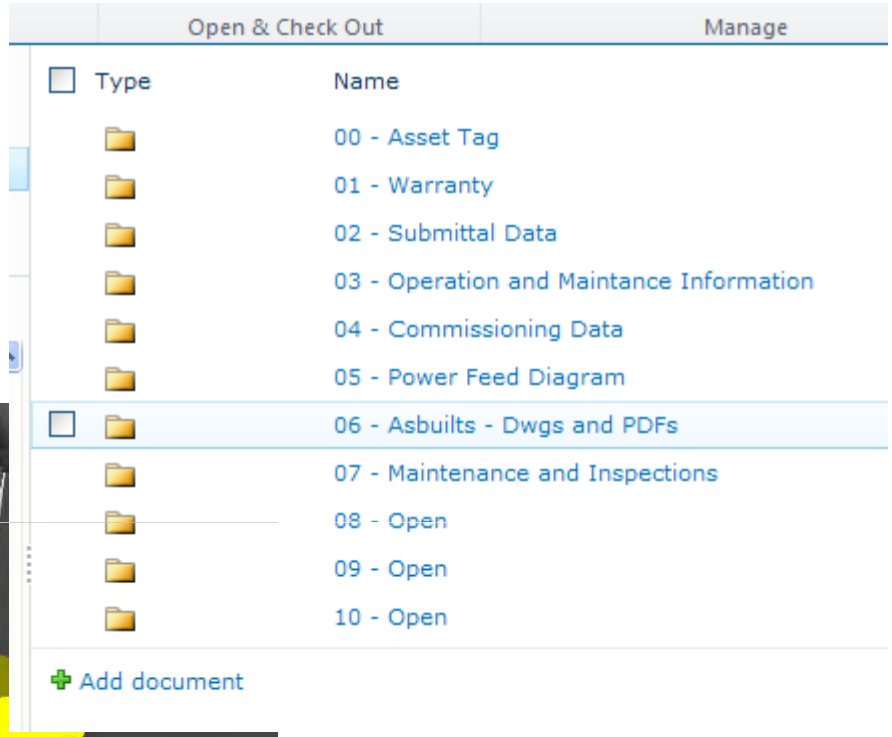
BIO 3 (2P) AS5-1068, BIO 4 (2P) AS5-1070
Open & Check Out
Manage
Type
Name
00 - Asset Tag
01 - Warranty
02 - Submittal Data
03 - Operation and Maintance Information
04 - Commissioning Data
05 - Power Feed Diagram
06 - Asbuilts - Dwgs and PDFs
07 - Maintenance and Inspections
08 - Open
09 - Open
10 - Open
Add document
Level 4
Level 5
AS5-1024
Level 5
Level 6
Presenter
Find Items

Facilities Maintenance and Virtual Document Storage







Connecting a World of Pharmaceutical Knowledge

Training

- Types of Training
  - New Building – Initial Training
  - New Employees
  - Refresher Training
  - Contractor
  - Occupants
- 3D Models
- Electronic, searchable data base of all construction and maintenance documents
- Tracing piping, ductwork, electrical, etc
- Challenges
  - Multiply buildings with same operators/maintainers
  - Similar buildings with different systems and layouts

Required Trouble Shooting Information

- Basis of Design – System Descriptions
- One-Line Diagrams – all major components shown
- Control diagrams and sequence of operations
- Zone drawings
- Riser Diagrams
- Submittals
- Balancing Reports
- Commissioning Reports
- As-built drawings

The Accreditation Visit

- Show a since of confidence in building operations and code compliance to an inspector
- Visualization of the extent and location of special spaces
- Link to critical air balancing reports
- Linkage to real time data from the BAS and central fire alarm controls
- Link to the computerized maintenance management system – show the PM achievement
- Show the sequence of operations
- Show the HVAC fault diagnostic system
- “TRUST BUT VERIFY”

The Questions That Remain

- Management of the models by the owner?
- Future modification to the models thru renovations?
- Moving on from traditional facilities mindsets?
- Future use of models in a renovation environment?
- Approach to utilizing models for future design improvement?
- Linking to BAS Systems in the future?

Questions?

Speakers

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