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The Foundation for The Gator Nation

Evaluation of the Cost Impact of Florida's Specific Changes to 2015 I-Codes "Prescriptive Code Changes"

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Research Team

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- Graduate Students

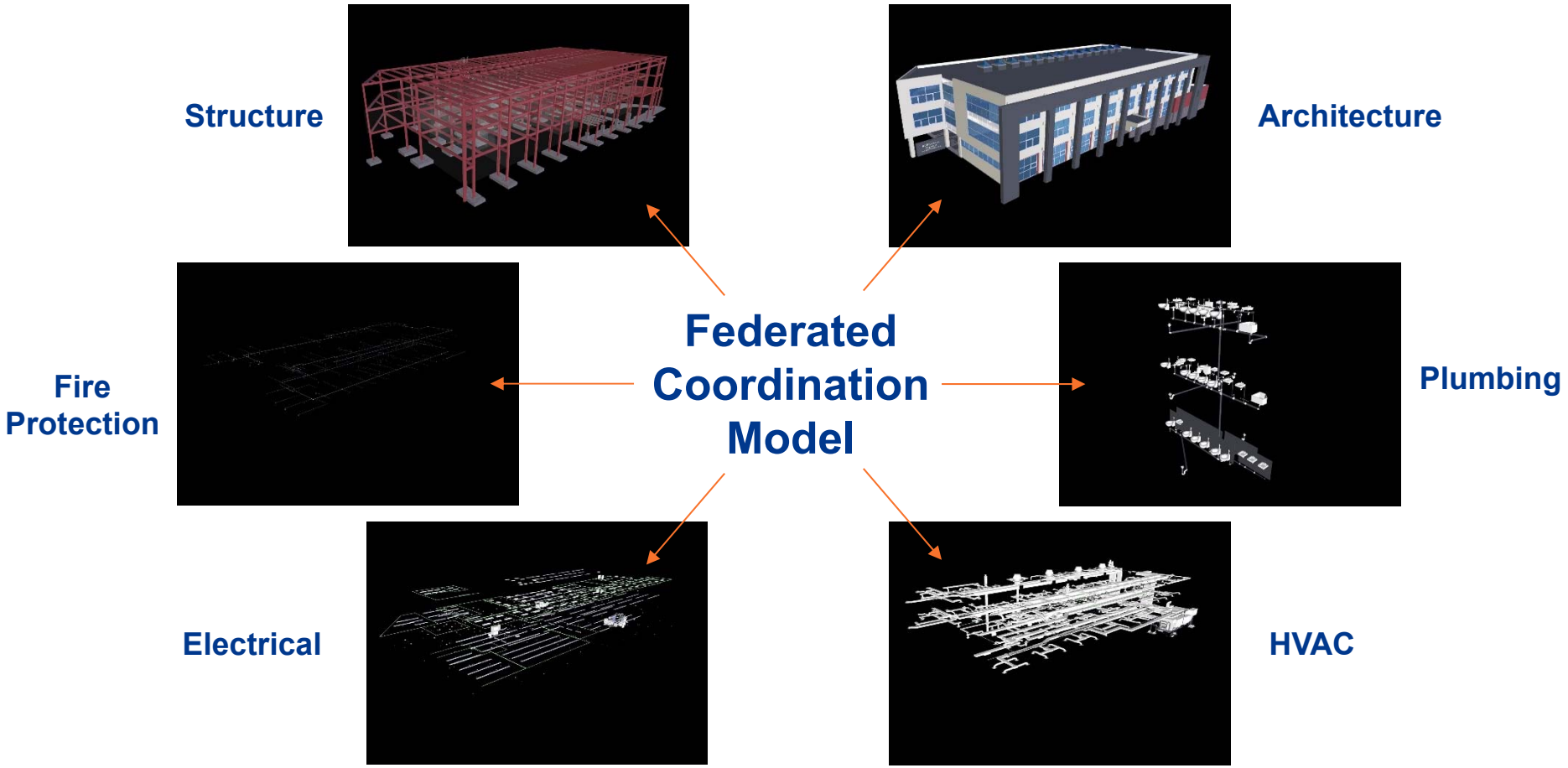
BIM: What is Building Information Modeling?

1. An intelligent 3D model with embedded **information** and specifications for all the material and system selections of a project, as well as their associated properties.
2. Virtual collaboration resource which aids in the decision making and information exchange process throughout the lifecycle of a building from conception to facilities management.

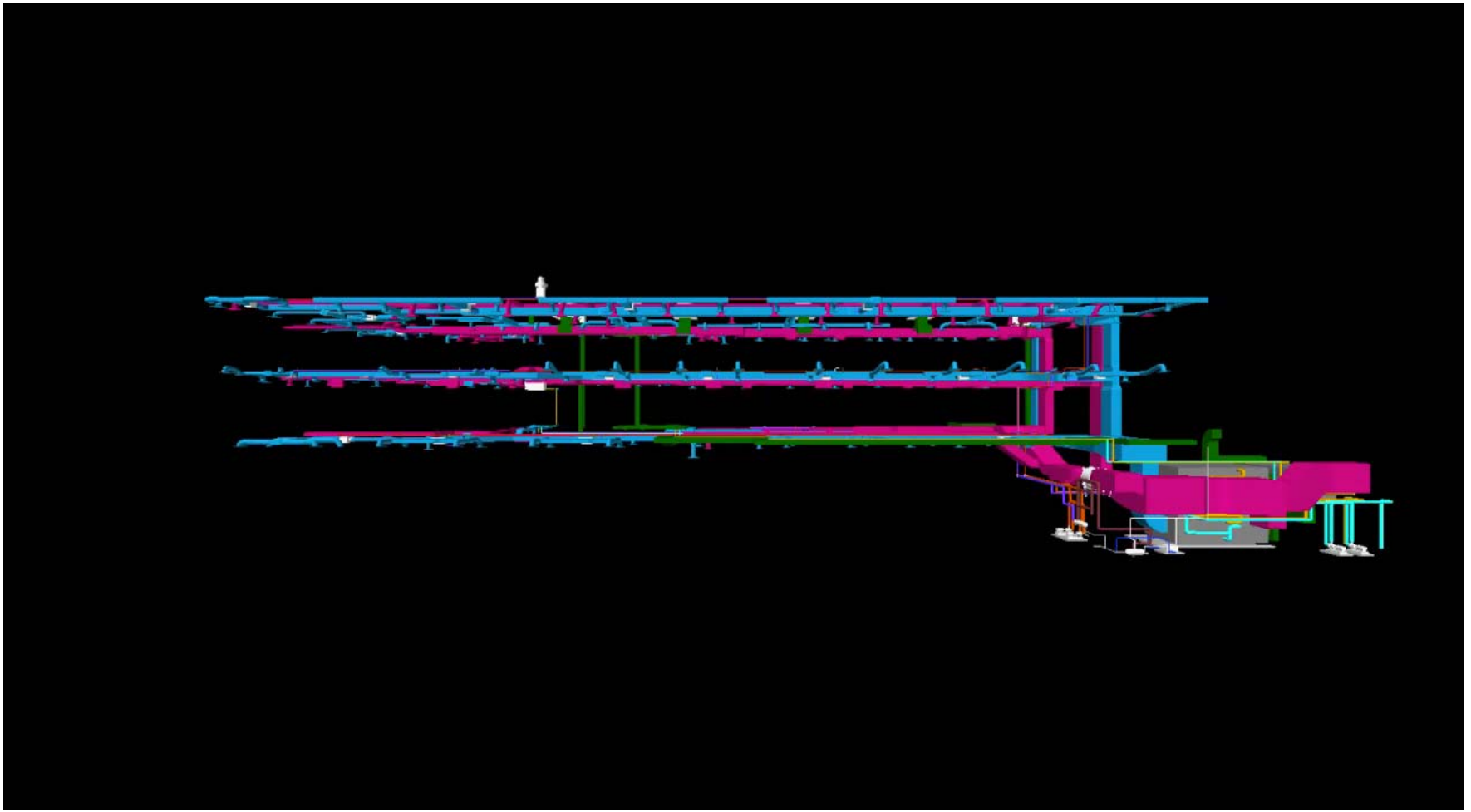
BIM: Benefits of BIM?

1. Enhanced collaboration capabilities among all members of a project team.
2. Coordination of all building systems and the testing of design alternatives prior to construction.
3. Ability to tie model to schedule for visualization and quality assurance purposes. (4D BIM)
4. Greater access to live data regarding building material quantities for more accurate cost estimates. (5D BIM)
5. Creation of more accurate and thorough as-built documents.

BIM: Collaborative Platform



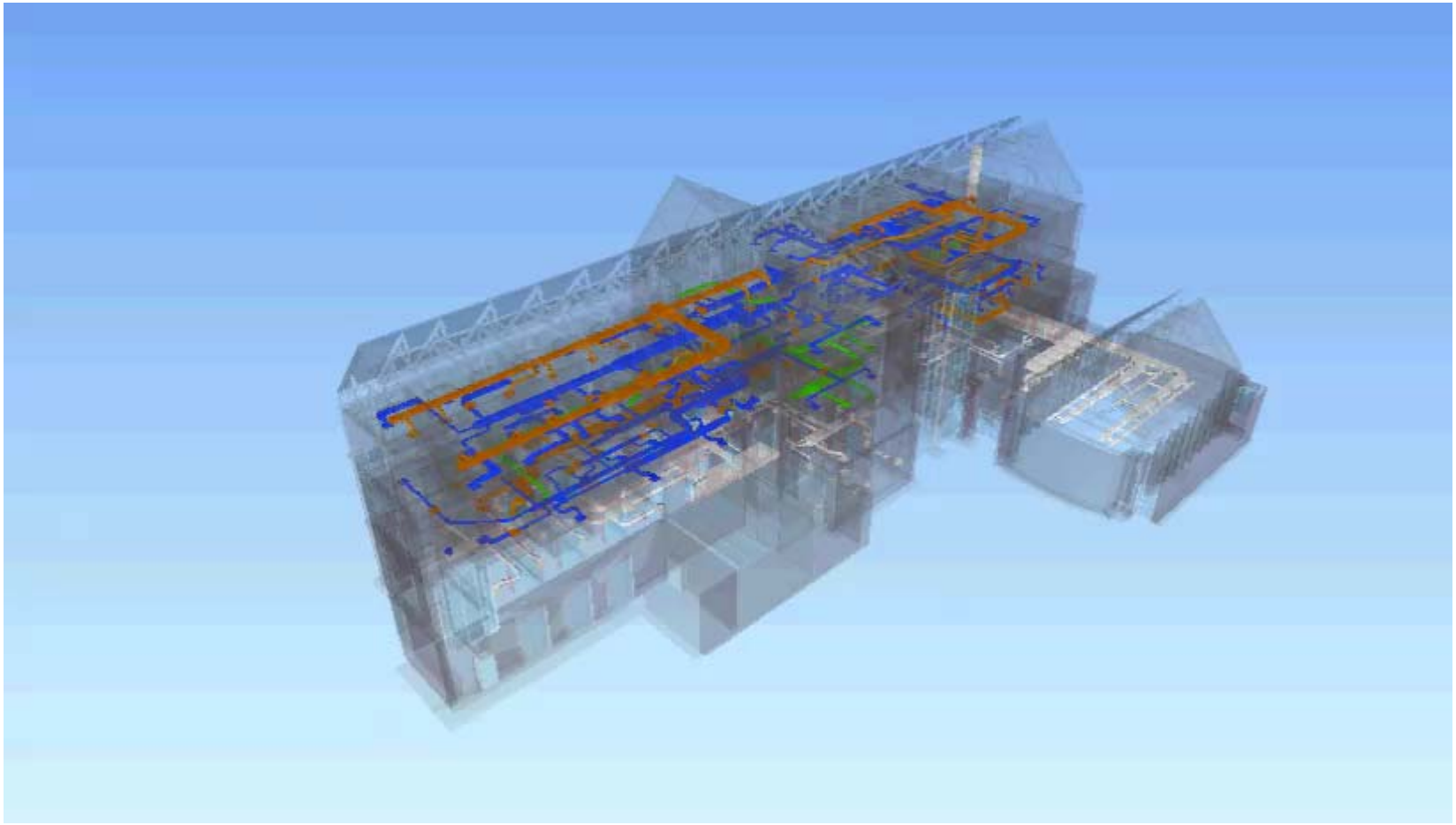
BIM: HVAC Model of Rinker Hall



BIM: Building Information Modeling

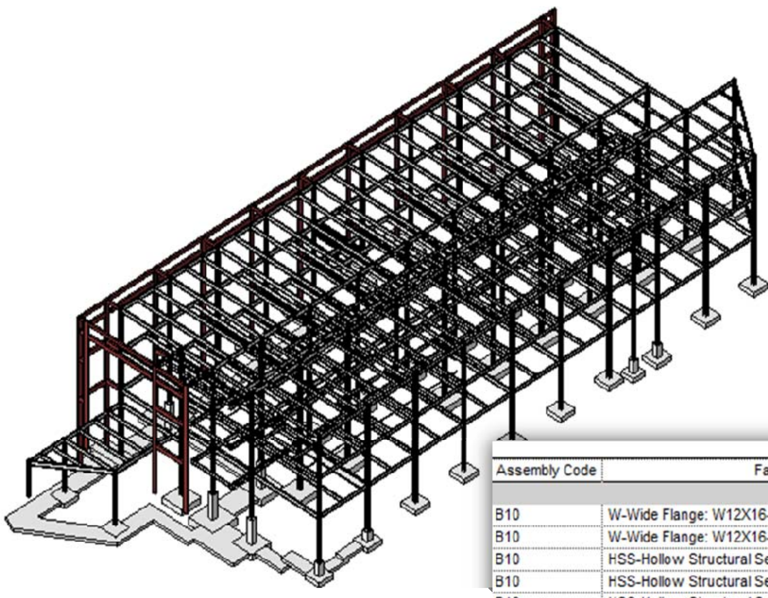
- Federated Multi-Disciplinary Model

BIM: Embedded MEP Model of Gerson Hall



BIM: Quantity Surveys

- Material quantity data built into model for instantaneous updates as the project changes.



F7-84"x84"x18"					
A101010	Footing-Rectangular	F7-84"x84"x18"	6' - 0"	6' - 0"	1
A101010	Footing-Rectangular	F7-84"x84"x18"	6' - 0"	6' - 0"	1
A101010	Footing-Rectangular	F7-84"x84"x18"	6' - 0"	6' - 0"	1
A101010	Footing-Rectangular	F7-84"x84"x18"	6' - 0"	6' - 0"	1
A101010	Footing-Rectangular	F7-84"x84"x18"	6' - 0"	6' - 0"	1
A101010	Footing-Rectangular	F7-84"x84"x18"	6' - 0"	6' - 0"	1
A101010	Footing-Rectangular	F7-84"x84"x18"	6' - 0"	6' - 0"	1
A101010	Footing-Rectangular	F7-84"x84"x18"	6' - 0"	6' - 0"	1
A101010	Footing-Rectangular	F7-84"x84"x18"	6' - 0"	6' - 0"	1
A101010	Footing-Rectangular	F7-84"x84"x18"	6' - 0"	6' - 0"	1
F7-84"x84"x18": 10					10

Structural Steel

Assembly Code	Family and Type	Count	Length	Cost
B10	W-Wide Flange: W12X16-Rinker	1	12' - 11"	
B10	W-Wide Flange: W12X16-Rinker	1	12' - 11"	
B10	HSS-Hollow Structural Section: HSS12X8X.3125-RINKER	1	5' - 0"	10.00
B10	HSS-Hollow Structural Section: HSS12X8X.3125-RINKER	1	18' - 9 5/16"	10.00
B10	HSS-Hollow Structural Section: HSS12X8X.3125-RINKER	1	18' - 8"	10.00
B10	HSS-Hollow Structural Section: HSS12X8X.3125-RINKER	1	18' - 8"	10.00
B10	HSS-Hollow Structural Section: HSS12X8X.3125-RINKER	1	18' - 8"	10.00
B10	HSS-Hollow Structural Section: HSS12X8X.3125-RINKER	1	18' - 8"	10.00
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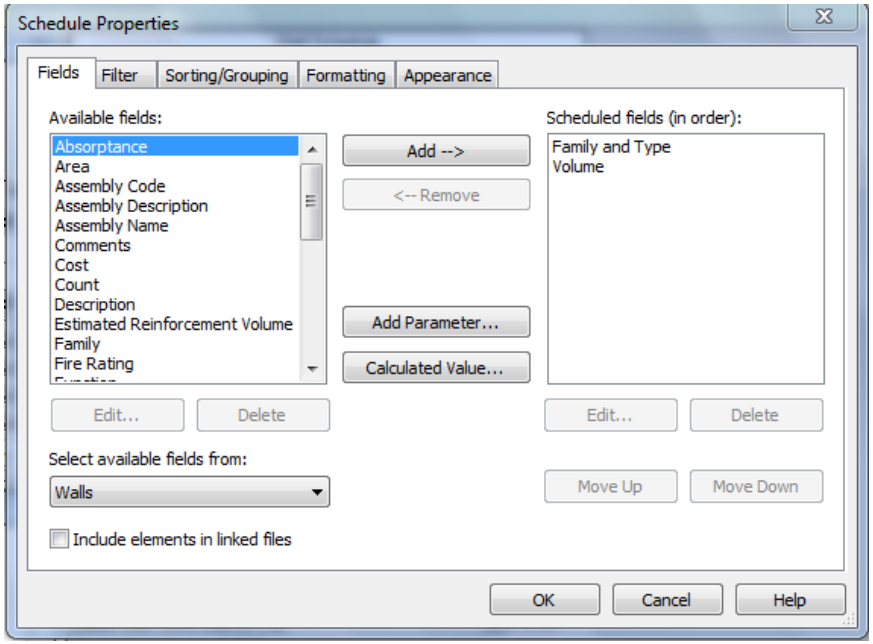
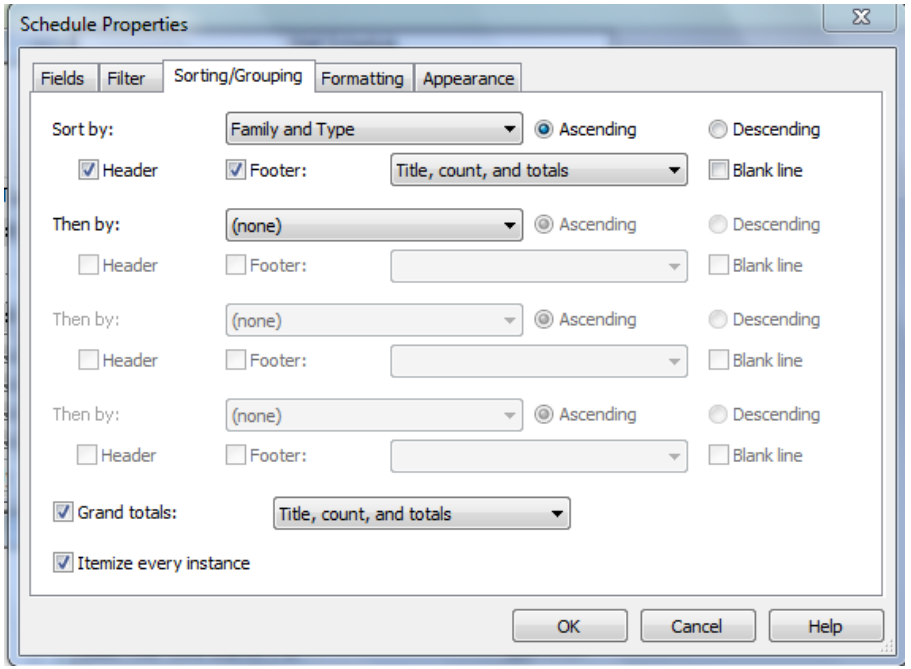
B10	HSS-Hollow Structural Section: HSS12X8X.3125-RINKER	1	18' - 8"	10.00
B10	HSS-Hollow Structural Section: HSS12X8X.3125-RINKER	1	18' - 8"	10.00
B10	HSS-Hollow Structural Section: HSS12X8X.3125-RINKER	1	18' - 8"	10.00
B10	HSS-Hollow Structural Section: HSS12X8X.3125-RINKER	1	9' - 10"	10.00
B10	HSS-Hollow Structural Section: HSS12X8X.3125-RINKER	1	11' - 7"	10.00
B10	HSS-Hollow Structural Section: HSS12X8X.3125-RINKER	1	26' - 11"	10.00

BIM: Quantity Surveys

- A wide range of data fields within the BIM environment can be accessed and exported to show the specific information needed.



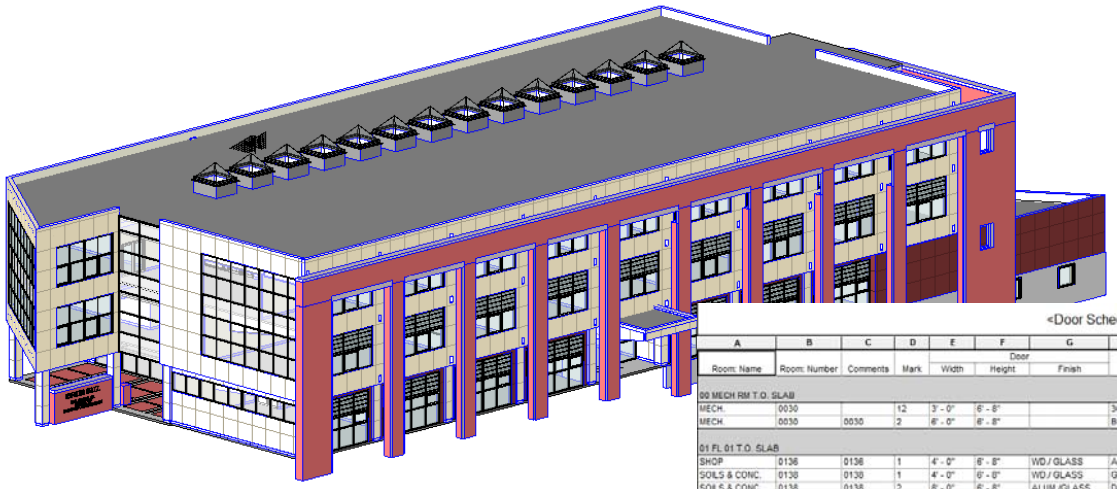


BIM: Quantity Surveys

- Quantities can be exported from the model of any system and used to calculate cost.

<Room Schedule>

A	B	C	D	E	F	G	H	I
Room Nu	Room Name	Area	Floor Finish	Base Finish	Wall Finish	Ceiling Finish	Ceiling Height	Comments
0030	MECH.	1420 SF						
0030A	ELEC. ROOM	251 SF						
0106	MEDIUM CLASSROOM	908 SF						
0110	LARGE CLASSROOM	1750 SF						
0110A	ELEC.	65 SF						
0115	STUDENT LOUNGE	471 SF						
0125	M.E.P STUDIO	1611 SF						
0134	SHOWER	75 SF						
0136	SHOP	274 SF						
0138	SOILS & CONC. LAB	706 SF						
0140	STRUCTURES STUDIO	1292 SF						
0140A	STORAGE	418 SF						
0141	INTERVIEW	100 SF						
0143	INTERVIEW	100 SF						
0145	MEN	224 SF						
0146	WOMEN	253 SF						
0146A	MECH. ROOM	66 SF						
0201	BIM LAB	845 SF						



<Door Schedule>

A	B	C	D	E	F	G	H	I	J	K	L	M
				Door				Frame	Fire			
Room: Name	Room: Number	Comments	Mark	Width	Height	Finish	Type	Type	Rating	Hardware	Cost	Level
00 MECH RM T.O. SLAB												
MECH.	0030		12	3' - 0"	6' - 8"		36" x 80"					00 MECH RM T.O.
MECH.	0030	0030	2	6' - 0"	8' - 8"		B		45			00 MECH RM T.O.
01 FL 01 T.O. SLAB												
SHOP	0136	0136	1	4' - 0"	8' - 8"	WD./ GLASS	A	H.M./PTD.	60 min	9		01 FL 01 T.O. SLA
SOILS & CONC.	0138	0138	1	4' - 0"	6' - 8"	WD./ GLASS	G	H.M./PTD.		4		01 FL 01 T.O. SLA
SOILS & CONC.	0138	0138	2	6' - 0"	6' - 8"	ALUM./GLASS	D-Doule	ALUM.		4		01 FL 01 T.O. SLA
STORAGE	0140A	140	2	8' - 0"	6' - 8"	ALUM./GLASS	D-Doule	ALUM.		6		01 FL 01 T.O. SLA
INTERVIEW	0141	141	1	3' - 0"	6' - 8"	ALUM./GLASS	C	ALUM.		5		01 FL 01 T.O. SLA
CORRIDOR	C199D	143	1	3' - 0"	6' - 8"	ALUM./GLASS	C	ALUM.		5		01 FL 01 T.O. SLA
MECH. ROOM	0146A	0146A	1	3' - 0"	6' - 8"	H.M./PTD.	E-FIRE RATED	H.M./PTD.	45 min	4		01 FL 01 T.O. SLA
CORRIDOR	C199D	C196A	4	3' - 0"	6' - 9 11/16"	ALUM./GLASS	D-Left	ALUM.		1		01 FL 01 T.O. SLA
CORRIDOR	C199D	C196A	5	6' - 1"	6' - 9 11/16"	ALUM./GLASS	D-Doule	ALUM.		3		01 FL 01 T.O. SLA
CORRIDOR	C199D	C196A	6	3' - 0"	6' - 9 11/16"	ALUM./GLASS	D-Right	ALUM.		2		01 FL 01 T.O. SLA
MEDIUM CLASS	0106	C199B	1	6' - 0"	8' - 8"	WD./ GLASS	K	H.M./PTD.		10		01 FL 01 T.O. SLA
LARGE CLASS	0110	C199B	2	6' - 0"	8' - 8"	WD./ GLASS	K	H.M./PTD.		10		01 FL 01 T.O. SLA
ELEC.	0110A	C199B	3	6' - 0"	6' - 8"	H.M./PTD.	B	H.M./PTD.	45	21		01 FL 01 T.O. SLA
ELEC.	0110A	C199B	4	6' - 0"	6' - 8"	H.M./PTD.	B	H.M./PTD.	45	12		01 FL 01 T.O. SLA
LARGE CLASS	0110	C199C	1	3' - 0"	8' - 8"	H.M./PTD.	A - 6'8x3'0	H.M./PTD.	45 min	13		01 FL 01 T.O. SLA
WOMEN	0146	C199D	1	3' - 0"	6' - 8"	H.M./PTD.	E	H.M./PTD.		14		01 FL 01 T.O. SLA
MEN	0145	C199D	2	3' - 0"	6' - 8"	H.M./PTD.	E	H.M./PTD.		14		01 FL 01 T.O. SLA
STRUCTURES S	0140	C199D	3	3' - 0"	6' - 8"	WD./ GLASS	G- 6'8x3'0	H.M./PTD.		15		01 FL 01 T.O. SLA
STUDENT LOUN	0115	C199D	4	3' - 0"	6' - 8"	WD./ GLASS	G- 6'8x3'0	H.M./PTD.		15		01 FL 01 T.O. SLA
M.E.P STUDIO	0125	C199D	5	3' - 0"	6' - 8"	WD./ GLASS	G- 6'8x3'0	H.M./PTD.		15		01 FL 01 T.O. SLA

ISSUES

- The proposed research assesses the cost impact of Florida's Specific Changes to 2015 I-Codes that are prescriptive in nature and that have the potential of adding cost to construction.

STATEMENT OF WORK

- **1. Review/analyze the Florida's specific changes to the 2015 I – Codes to identify those code changes/ provisions that are prescriptive in nature and have the potential of adding cost to construction.**

STATEMENT OF WORK

- **2. Use the standard set of baseline residential and commercial building designs previously used to evaluate the I-Codes prescriptive changes to estimate the potential cost of Florida's specific changes.**
  - **Develop modified building information models**
  - **Generate material quantity surveys**

STATEMENT OF WORK

- 3. Estimating the additional construction cost of those provisions that are not covered under (2) using good engineering judgment and feedback from general contractors and consulting engineers.
  - Generate cost estimates
  - Perform overall cost impact analysis

DELIVERABLES

- A report providing technical information on the problem background, results and cost implications of the prescriptive Code changes.
- An analysis of individual code changes will also be provided in the Appendix.

Florida Specific Changes to 2015 IPC Cost Impact Disclaimer - Probable Construction Costs Opinions

Assumptions

- This Estimate is not a guarantee of Final Bid Cost or of Final Project Cost.
- This is an Opinion of Probable Cost of Mechanical, Electrical, and Piping (MEP) Systems for the proposed buildings.
- The estimate was compiled using documents provided by various sources.
- The estimate is representative of average unit pricing and labor from historical job costs of similar type, cost and labor data from Mechanical Contractors Association of America (MCAA), CostWorks 2015 Qtr. 2 (Change Date and Qtr) by R.S. Means Company Inc, National Electrical Contractors Association (NECA) and Sheet Metal Estimating by Wendes.
- The subcontractor unit rates include the subcontractor's overhead and profit, unless otherwise stated.
- The mark-ups included in the unit prices cover the cost of field overhead, home office overhead and profit, and range from 15% to 25% of the costs of a particular item.
- Since we have no control over the cost of labor, material and equipment, or the contractor's method of carrying out the work and determining the price, or over competitive bidding or market conditions, this opinion of probable construction cost provided is made on the basis of experience and qualifications. This opinion represents our best judgment as professional construction consultants with the Construction Industry. However, we cannot and do not guarantee that proposals, bids or the construction cost will not vary from the opinions of probable cost in this estimate.

Florida Specific Changes to 2015 IPC Cost Impact Disclaimer - Probable Construction Costs Opinions

General Assumptions:

- "Allowances" are considered to be an allotted sum of money for a particular system or scope of work for which sufficient detail is not available to determine a definitive cost.
- These cost allowances are included to project a final cost to include labor, material, equipment and any subcontractor costs.
- The owner receives the savings for any amount under the allowance and is at risk for any amount over the allowance.
- The estimate is in today's dollars, and has been adjusted to the local area.
- This estimate does not include any fees or permits.
- This estimate is intended to reflect construction costs only.
- This estimate is intended to reflect normal construction schedules only.
- Variations in material costs, labor efficiencies, wage rates, union practices, and bid climate will effect final costs.
- Workers will report to the actual job site.
- Materials delivered to the actual job site will need to be scheduled.
- No premium or overtime has been included.
- No General Construction costs have been included.
- All utilities have sufficient capacity for the added loads.

Excerpts – Florida Specific Changes to 2015 IPC Cost Impact Analysis

APPENDIX D - Table 4. Florida Specific Changes to the 2015 I-Codes- Plumbing Cost Impact Analysis		
CODE CHANGE #	Florid Specific Changes to 2015 IPC CHANGE SUMMARY	ESTIMATED AMOUNT*
P6416	Restores in Section 614 of the 2010 FBC Plumbing code which regulates private potable water wells.	Permit Fee.

*For prescriptive Code changes only.

Excerpts – Florida Specific Changes to 2015 IRC Residential Cost Impact Analysis

APPENDIX D - Table 4. Florida Specific Changes to the 2015 I-Codes- Residential Cost Impact Analysis		
CODE CHANGE #	Florid Specific Changes to 2015 IPC CHANGE SUMMARY	ESTIMATED AMOUNT*
F6822-R1 (Residential)	Reinstates exception for zero lot line fire separation distance and substitutes reference to Table R302.1 for reference to Tables R302.1(1) and R302.1(2).	Decreases unit cost by $2000 to $3000.
F6823 (Residential)	Modifies definition of Fire Separation Distance in Section R202 to include zero lot line.	Decreases unit cost by $2000 to $3000.

*For prescriptive Code changes only.

QUESTIONS ?